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TIP PROJECT: B-4761

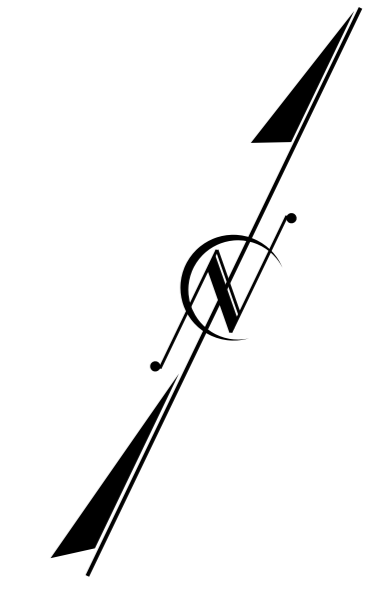
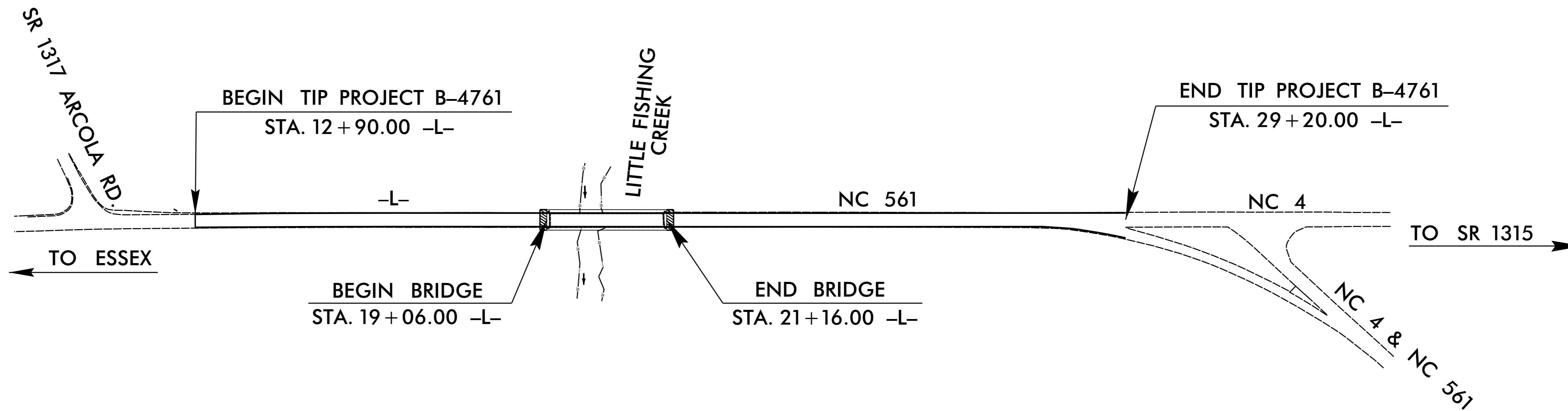
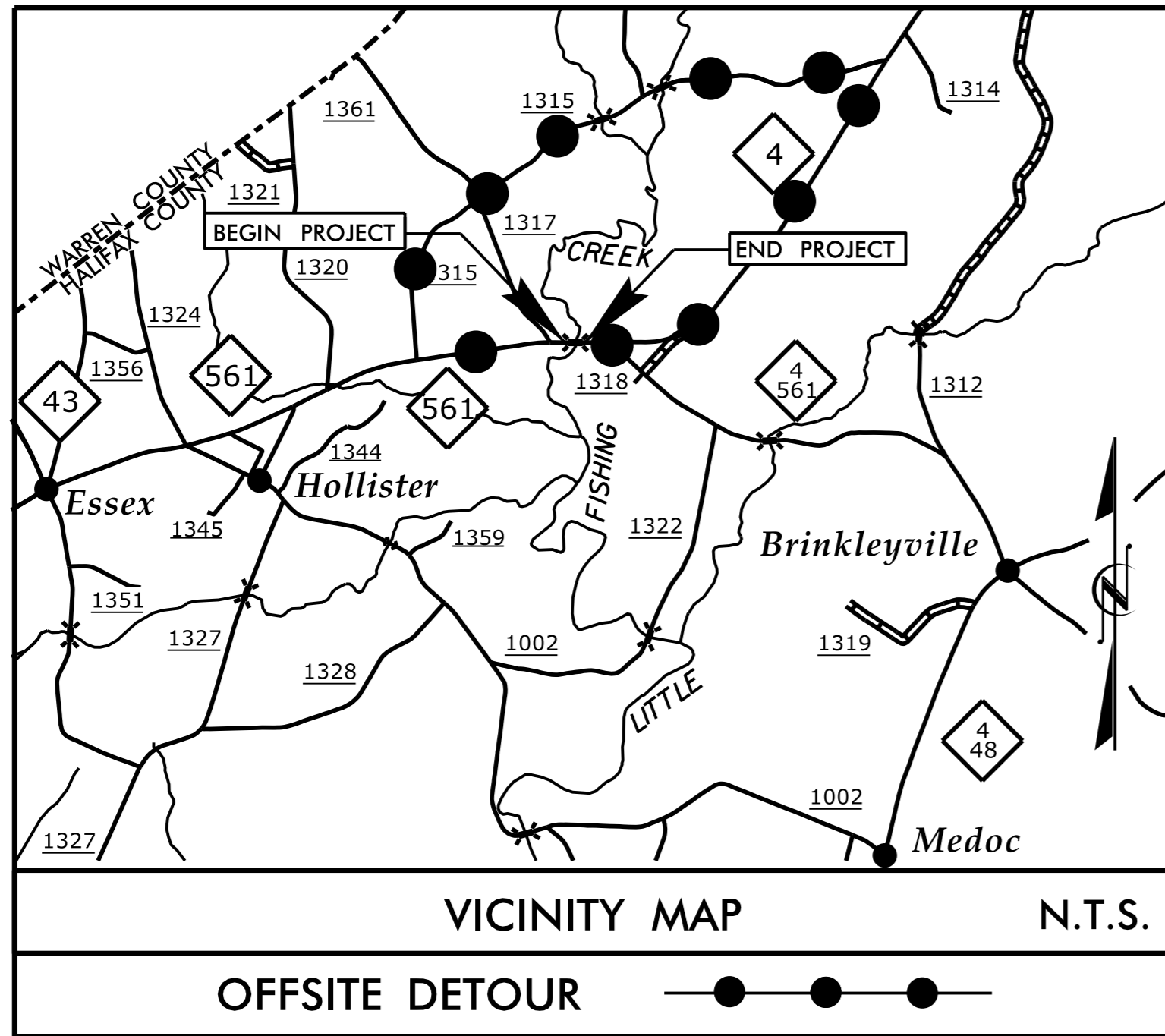
CONTRACT: C203749

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
HALIFAX COUNTY

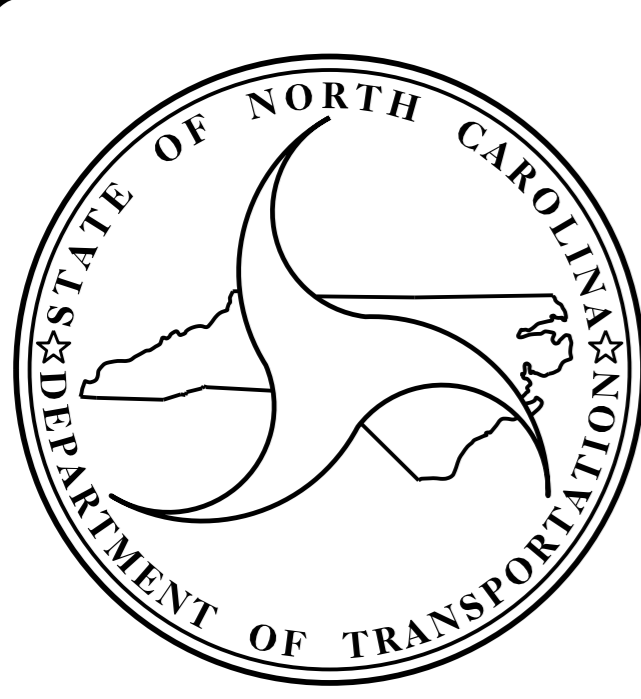
LOCATION: REPLACE BRIDGE NO. 29 OVER LITTLE FISHING CREEK ON NC 561

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4761		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38533.1.1	BRSTP-561(18)	P.E.	
38533.2.1		ROW & UTIL	
38533.2.1		CONST.	



STRUCTURES



DESIGN DATA

ADT 2016 = 2,590
 ADT 2035 = 3,100
 K = 10 %
 D = 55 %
 T = 18 % **
 * V = 60 MPH
 ** TTST = 10 % DUAL = 8 %

FUNC CLASS = MINOR ARTERIAL
 REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4761 = 0.269 MILES
 LENGTH STRUCTURE TIP PROJECT B-4761 = 0.040 MILES

TOTAL LENGTH TIP PROJECT B-4761 = 0.309 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 :
 JULY 19, 2016

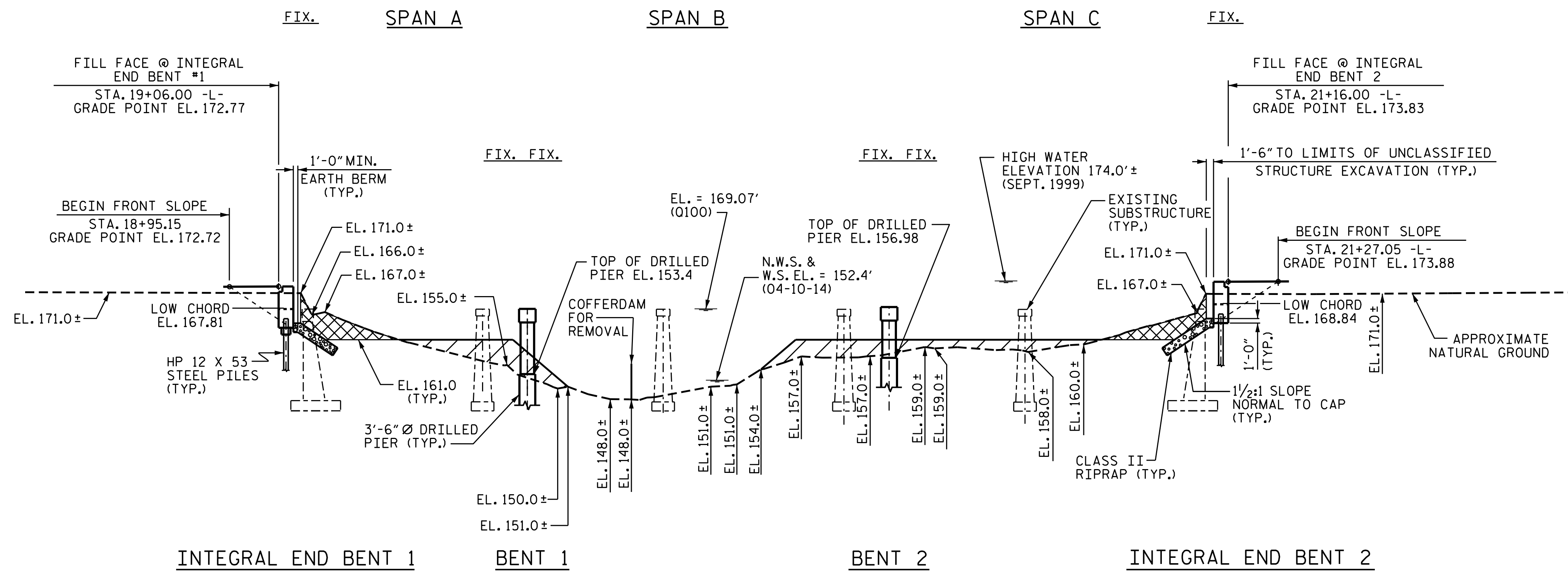
 EMILY E. MURRAY, P.E.
PROJECT ENGINEER

 KEITH PASCHAL, P.E.
PROJECT DESIGN ENGINEER

18+50 19+00 19+50 20+00 20+50 21+00 21+50 22+00

PI. = 22+80.00 -L-
EL. = 174.65'
VC = 270'
(+)-0.5016% (-)-1.2650%

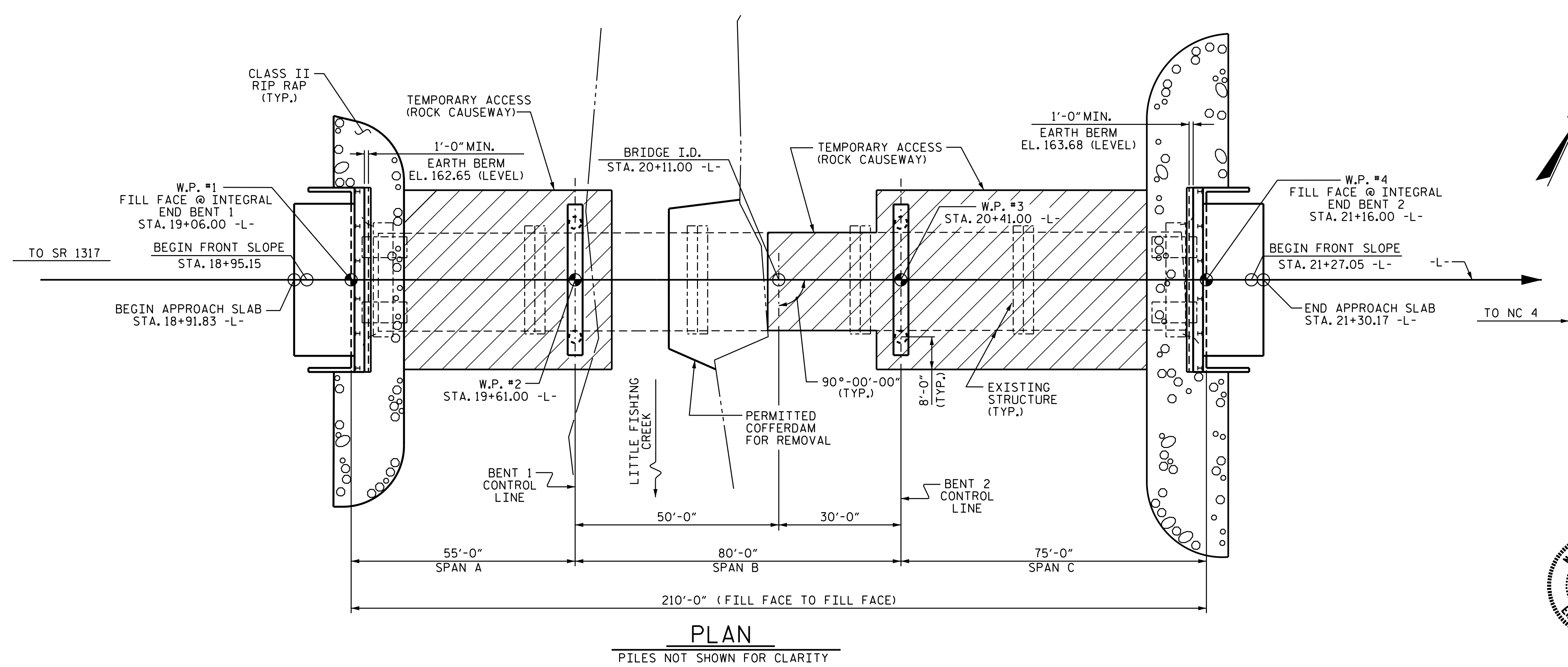
GRADE DATA



UNCLASSIFIED STRUCTURE EXCAVATION

TEMPORARY ACCESS (ROCK CAUSEWAY)

SECTION ALONG -L-



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. B-4761
HALIFAX COUNTY
STATION: 20+11.00 -L-
SHEET 1 OF 3 REPLACES BRIDGE #29

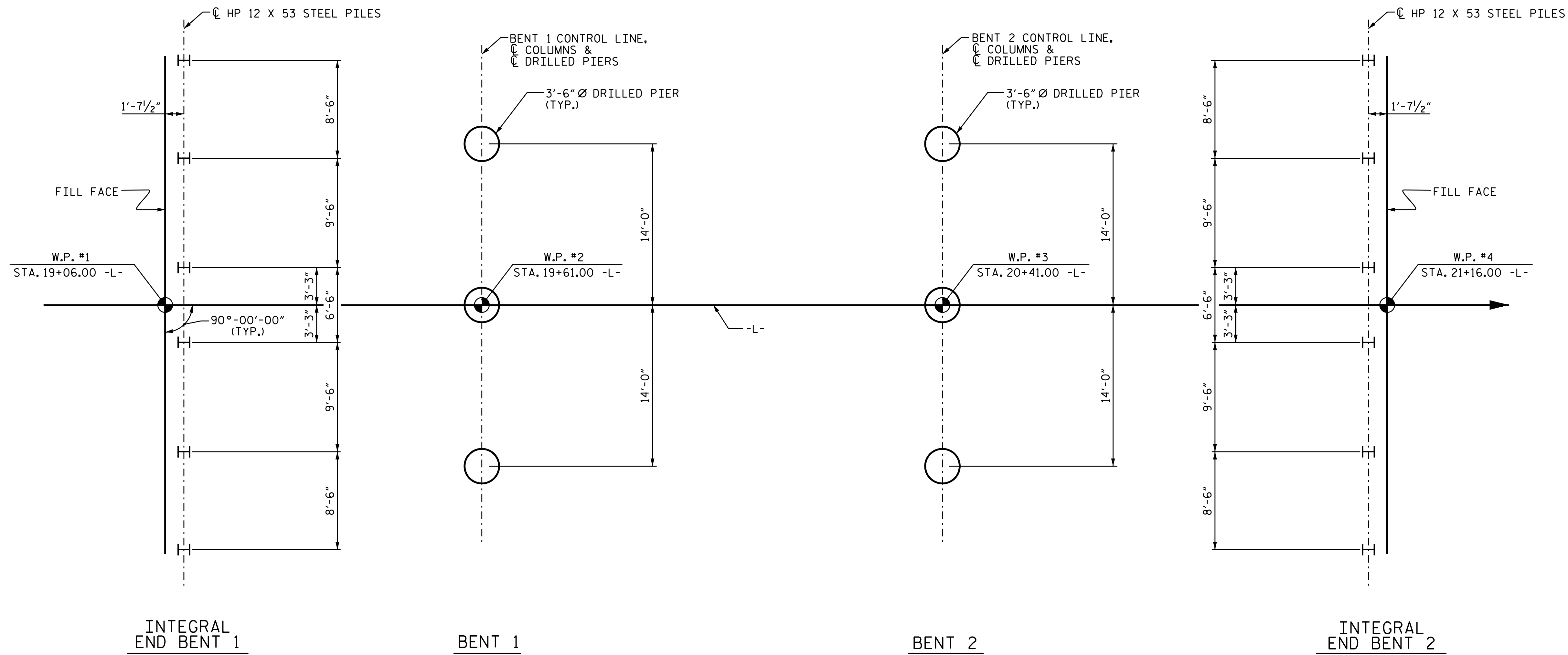


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
FOR BRIDGE ON NC 561 OVER
LITTLE FISHING CREEK
BETWEEN NC 4 & SR 1317

DRAWN BY: B. N. BARODAWALA DATE: 6/1/15
CHECKED BY: G. KOUCHEKI DATE: 6/8/15
DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE: 3/14/16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			31



FOUNDATION LAYOUT
 DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE SHOWN TO CENTERLINE

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

PILES AT INTEGRAL END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.

DRIVE PILES AT INTEGRAL END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE.

PILES AT INTEGRAL END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.

DRIVE PILES AT INTEGRAL END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.

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

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 335 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 90 TSF.

DRILLED PIERS AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 365 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 45 TSF.

INSTALL DRILLED PIERS AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN EL. 134.0 WITH THE REQUIRED TIP RESISTANCE AND PENETRATION OF AT LEAST 7 FT. INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

INSTALL DRILLED PIERS AT BENT 2 TO A TIP ELEVATION NO HIGHER THAN EL. 133.0 WITH THE REQUIRED TIP RESISTANCE.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW EL. 143.0 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

IF REQUIRED, INSTALL PERMANENT STEEL CASING AT BENT 1 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW EL. 145.0.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 2. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW EL. 147.0 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

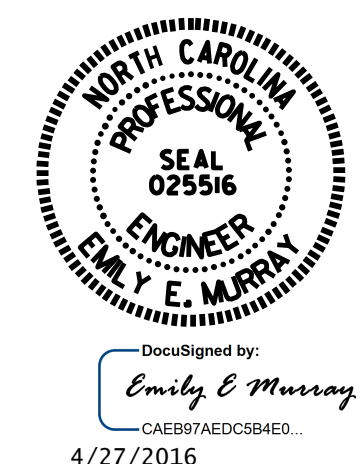
IF REQUIRED, INSTALL PERMANENT STEEL CASING AT BENT 2 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW EL. 147.7.

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.

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

DRAWN BY : B.N.BARODAWALA DATE : 6/1/15
 CHECKED BY : G. KOUCHEKI DATE : 6/8/15
 DESIGN ENGINEER OF RECORD : G. KOUCHEKI DATE : 3/14/16



PROJECT NO. B-4761
HALIFAX COUNTY
 STATION: 20+11.00 -L-

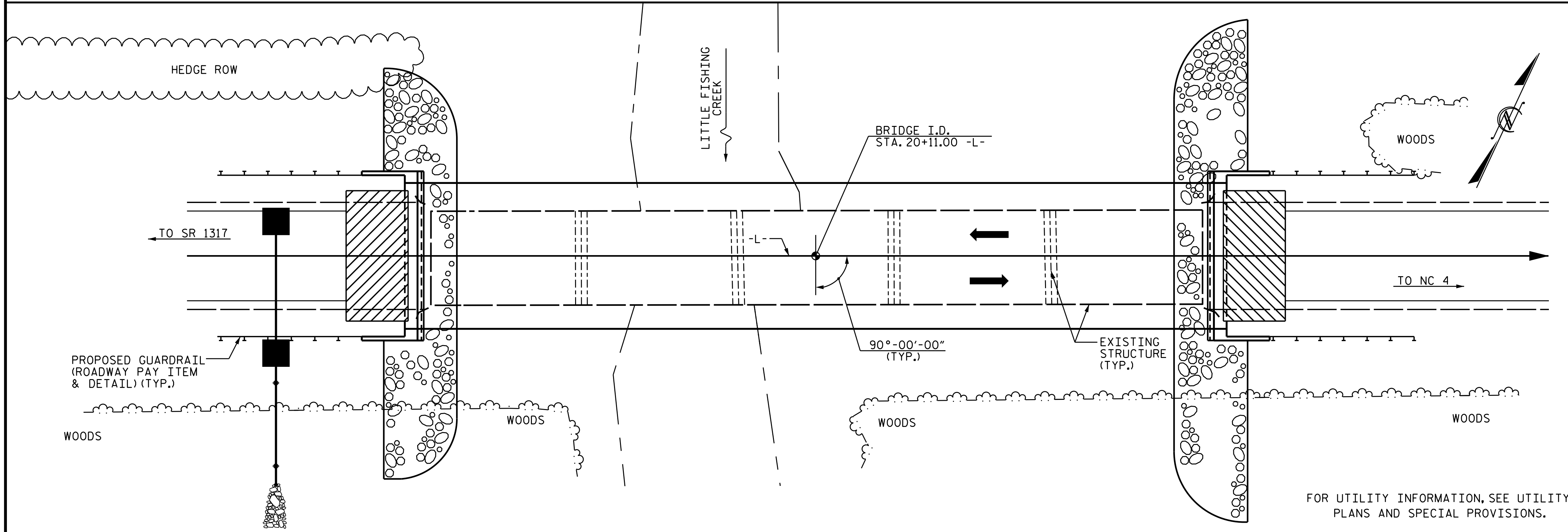
SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON NC 561 OVER
 LITTLE FISHING CREEK
 BETWEEN NC 4 & SR 1317

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			31

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B.M. #2: R/R SPIKE IN BASE OF 15" SWEET GUM TREE, 29.03' LEFT OF STA. 21+60.65 -L-, EL. 164.68'



LOCATION SKETCH

HYDRAULIC DATA	
DESIGN DISCHARGE	= 11,000 C.F.S.
FREQUENCY OF DESIGN DISCHARGE	= 50 YEARS
DESIGN HIGH WATER ELEVATION	= 168.5 FT.
DRAINAGE AREA	= 101.0 SQ. MI.
BASE DISCHARGE (Q100)	= 13,100 C.F.S.
BASE HIGH WATER ELEVATION	= 169.07 FT.

OVERTOPPING DATA	
OVERTOPPING DISCHARGE	= 16,300 C.F.S.
FREQUENCY OF OVERTOPPING	= 500± YEARS
OVERTOPPING ELEVATION	= 171.1 FT.

TOTAL BILL OF MATERIAL																								
	CONSTRUCTION MAINTANCE & REMOVAL OF TEMP. ACCESS	REMOVAL OF EXISTING STRUCTURE	3'-6" Ø DRILLED PIERS IN SOIL	3'-6" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIERS	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	45" PRESTRESSED CONCRETE GIRDERS	HP 12 X 53 STEEL PILES	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	ASBESTOS ASSESSMENT		
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE										8243	7795					15	1032.08			416.67				
INTEGRAL END BENT 1														3947			6	150			200	220		
BENT 1			28.3	30.0	31.2									10373	2008									
BENT 2			48.0	24.0	32.9									10598	2080									
INTEGRAL END BENT 2														3947			6	120			210	235		
TOTAL	LUMP SUM	LUMP SUM	76.3	54.0	64.1	2	3	2	LUMP SUM	8243	7795	108.3	LUMP SUM	28865	4088	15	1032.08	12	270	416.67	410	455	LUMP SUM	LUMP SUM

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.

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.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 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 20+11.00 -L-.

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET 1 OF 3 SHALL BE EXCAVATED FOR A DISTANCE OF 50 FT EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

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

PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE CONSISTING OF 5 SPANS @ 40'-0" OF REINFORCED DECK WITH 7" THICK ASPHALT WEARING SURFACE AND 23'-11" CLEAR ROADWAY WIDTH ON REINFORCED CONCRETE DECK GIRDERS SUPPORTED ON REINFORCED CONCRETE END BENT CAPS ON COLUMNS & SPREAD FOOTINGS AND ROUND NOSE POST AND WEB INTERIOR BENTS ON SPREAD FOOTINGS LOCATED AT THE SAME LOCATION AS THE PROPOSED STRUCTURE 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.

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

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

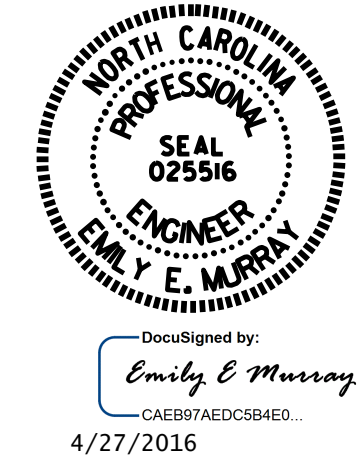
PROJECT NO. B-4761
HALIFAX COUNTY
 STATION: 20+11.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOR BRIDGE ON NC 561 OVER
 LITTLE FISHING CREEK
 BETWEEN NC 4 & SR 1317



DRAWN BY: B. N. BARODAWALA DATE: 6/1/15
 CHECKED BY: G. KOUCHEKI DATE: 6/8/15
 DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE: 3/14/16

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			31
2			4			

LOAD FACTORS:

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

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVELOAD FACTORS	MOMENT					SHEAR					LIVELOAD FACTORS	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.06	--	1.75	0.755	1.42	A	I	26.146	0.832	1.45	A	I	20.917	0.80	0.832	1.06	B	I	38.917		
	HL-93(0pr)	N/A	--	1.84	--	1.35	0.755	1.84	A	I	26.146	0.832	1.88	A	I	20.917	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.40	50.445	1.75	0.755	1.78	A	I	26.146	0.832	1.65	A	I	20.917	0.80	0.693	1.40	B	I	38.917		
	HS-20(0pr)	36.000	--	2.14	77.054	1.35	0.755	2.30	A	I	26.146	0.832	2.14	A	I	20.917	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.20	43.244	1.40	0.755	4.62	A	I	26.146	0.832	4.21	A	I	20.917	0.80	0.693	3.20	B	I	38.917	
		SNGARBS2	20.000	--	2.37	47.396	1.40	0.755	3.60	A	I	26.146	0.832	3.20	A	I	20.917	0.80	0.693	2.37	B	I	38.917	
		SNAGRIS2	22.000	--	2.24	49.216	1.40	0.755	3.48	A	I	20.917	0.832	3.05	A	I	20.917	0.80	0.693	2.24	B	I	38.917	
		SNCOTTS3	27.250	--	1.59	43.424	1.40	0.755	2.30	A	I	26.146	0.832	2.12	A	I	20.917	0.80	0.693	1.59	B	I	38.917	
		SNAGGRS4	34.925	--	1.33	46.277	1.40	0.755	1.99	A	I	26.146	0.832	1.91	A	I	20.917	0.80	0.693	1.33	B	I	38.917	
		SNS5A	35.550	--	1.30	46.080	1.40	0.755	1.94	A	I	26.146	0.832	2.02	A	I	20.917	0.80	0.693	1.30	B	I	38.917	
		SNS6A	39.950	--	1.19	47.402	1.40	0.755	1.80	A	I	26.146	0.832	1.91	A	I	20.917	0.80	0.693	1.19	B	I	38.917	
	SNS7B	42.000	--	1.13	47.453	1.40	0.755	1.72	A	I	26.146	0.832	1.98	A	I	20.917	0.80	0.693	1.13	B	I	38.917		
	TRUCK TRACTOR SEMI-TRAILOR (TTST)	TNAGRIT3	33.000	--	1.45	47.721	1.40	0.755	2.21	A	I	26.146	0.832	2.22	A	I	20.917	0.80	0.693	1.45	B	I	38.917	
		TNT4A	33.075	--	1.45	48.015	1.40	0.755	2.23	A	I	26.146	0.832	2.09	A	I	20.917	0.80	0.693	1.45	B	I	38.917	
		TNT6A	41.600	--	1.18	49.268	1.40	0.755	1.85	A	I	26.146	0.832	2.28	A	I	20.917	0.80	0.693	1.18	B	I	38.917	
		TNT7A	42.000	--	1.19	49.931	1.40	0.755	1.87	A	I	26.146	0.832	2.02	A	I	20.917	0.80	0.693	1.19	B	I	38.917	
		TNT7B	42.000	--	1.23	51.510	1.40	0.755	1.95	A	I	26.146	0.832	1.85	A	I	20.917	0.80	0.693	1.23	B	I	38.917	
		TNAGRIT4	43.000	--	1.17	50.278	1.40	0.755	1.85	A	I	26.146	0.832	1.78	A	I	20.917	0.80	0.693	1.17	B	I	38.917	
TNAGT5A		45.000	--	1.10	49.665	1.40	0.755	1.73	A	I	26.146	0.832	1.88	A	I	20.917	0.80	0.693	1.10	B	I	38.917		
TNAGT5B	45.000	3	1.09	49.113	1.40	0.755	1.70	A	I	26.146	0.832	1.68	A	I	20.917	0.80	0.693	1.09	B	I	38.917			

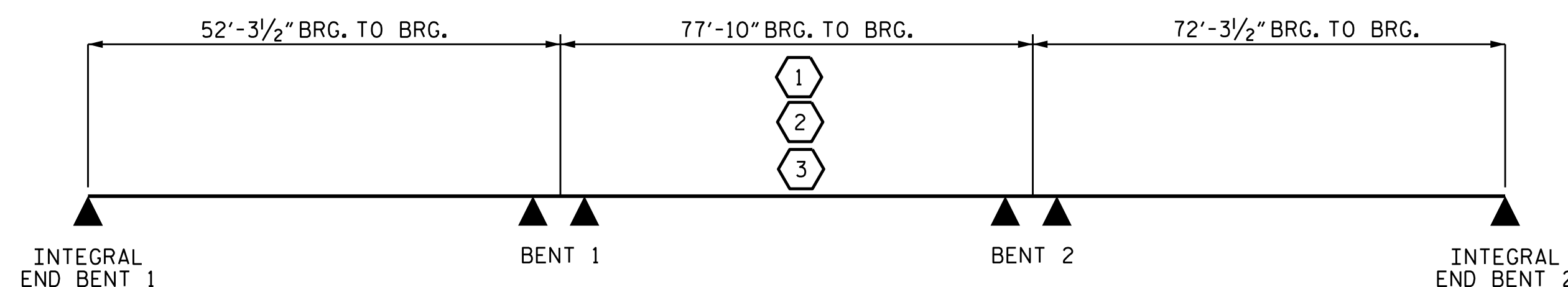
NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

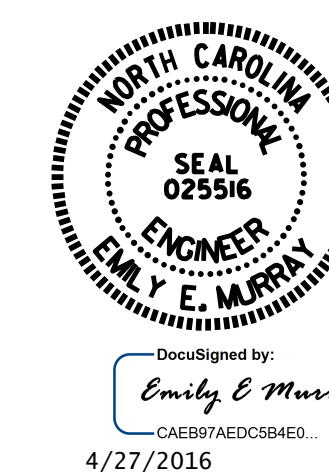
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#	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER	



LRFR SUMMARY

PROJECT NO. B-4761
HALIFAX COUNTY
 STATION: 20+11.00 -L-



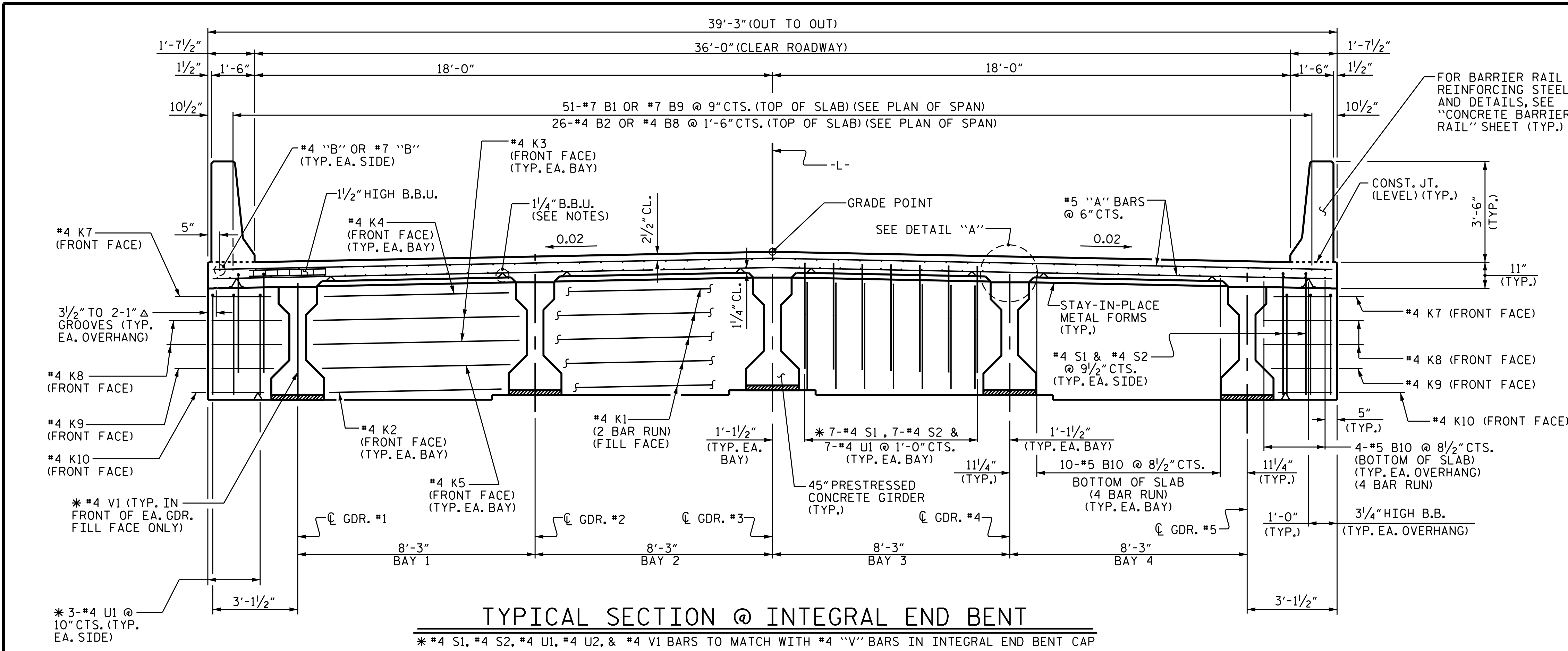
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS 31
2			4			

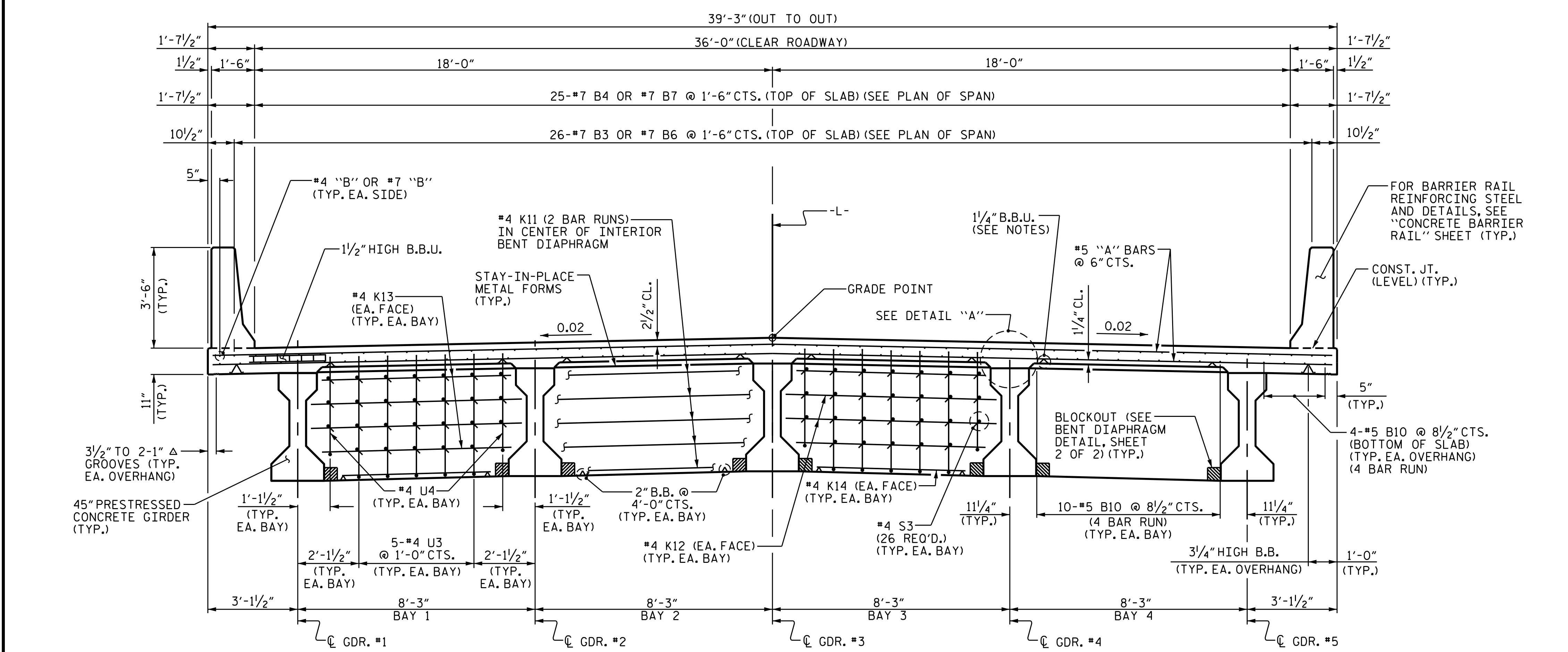
ASSEMBLED BY : G. KOUCHEKI DATE : 5/14/15
 CHECKED BY : N. RUEFFIN DATE : 7/27/15
 DRAWN BY : MAA 1/08 REV. 11/2/08RR MAA/GM
 CHECKED BY : GM/DI 2/08 REV. 10/1/11 MAA/GM
 DESIGN ENGINEER OF RECORD:
 G. KOUCHEKI DATE : 3/14/16

DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED



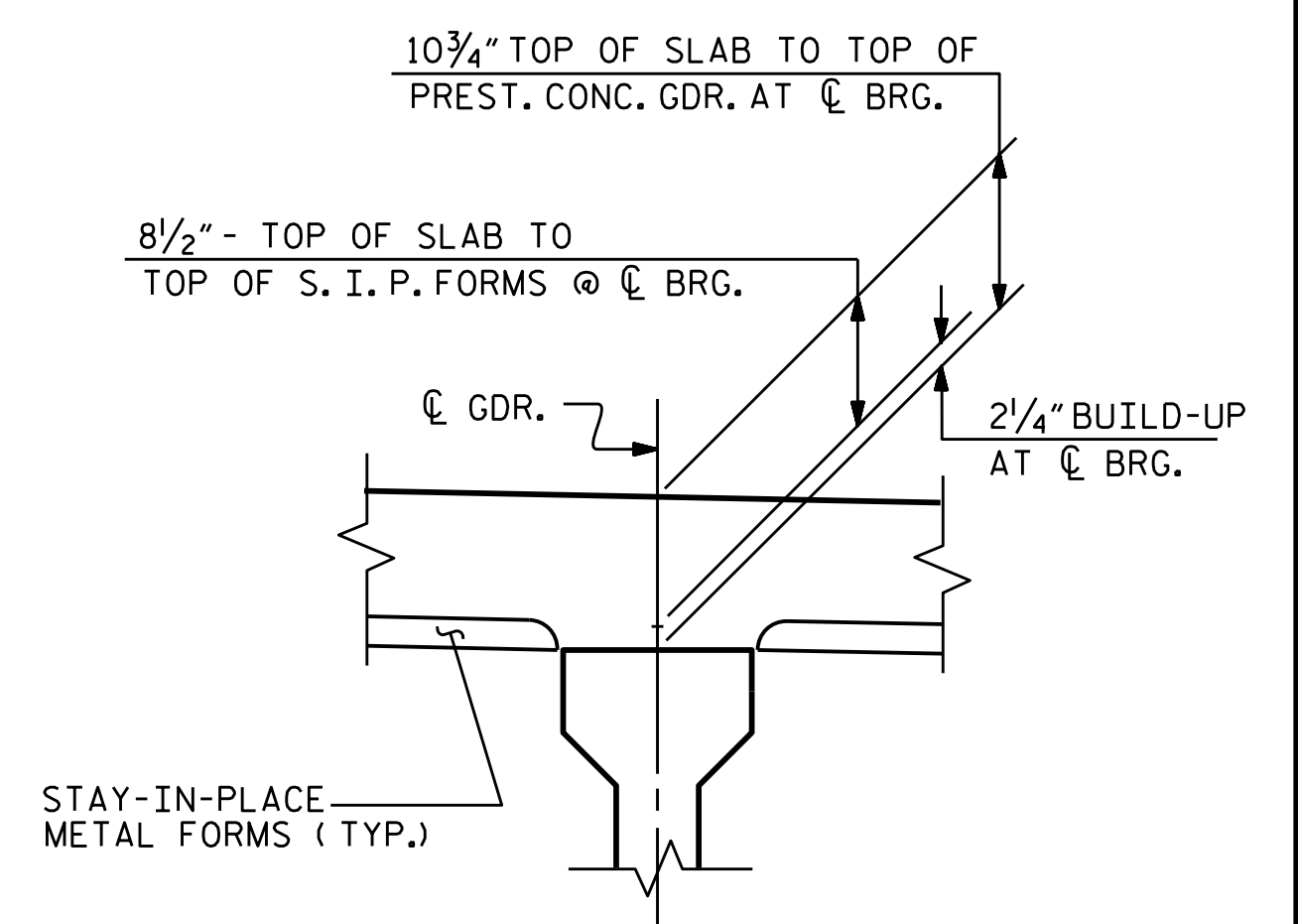
TYPICAL SECTION @ INTEGRAL END BENT

* #4 S1, #4 S2, #4 U1, #4 U2, & #4 V1 BARS TO MATCH WITH #4 'V' BARS IN INTEGRAL END BENT CAP



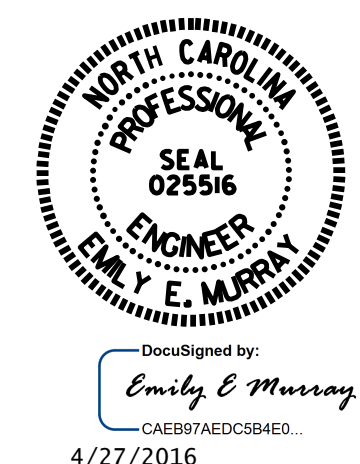
TYPICAL SECTION @ CONTINUOUS BENT DIAPHRAGM

NOTES:
 LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
 PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
 PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE OF THE REMOVABLE FORM.



DETAIL "A"

PROJECT NO. B-4761
HALIFAX COUNTY
 STATION: 20+11.00 -L-
 SHEET 1 OF 2

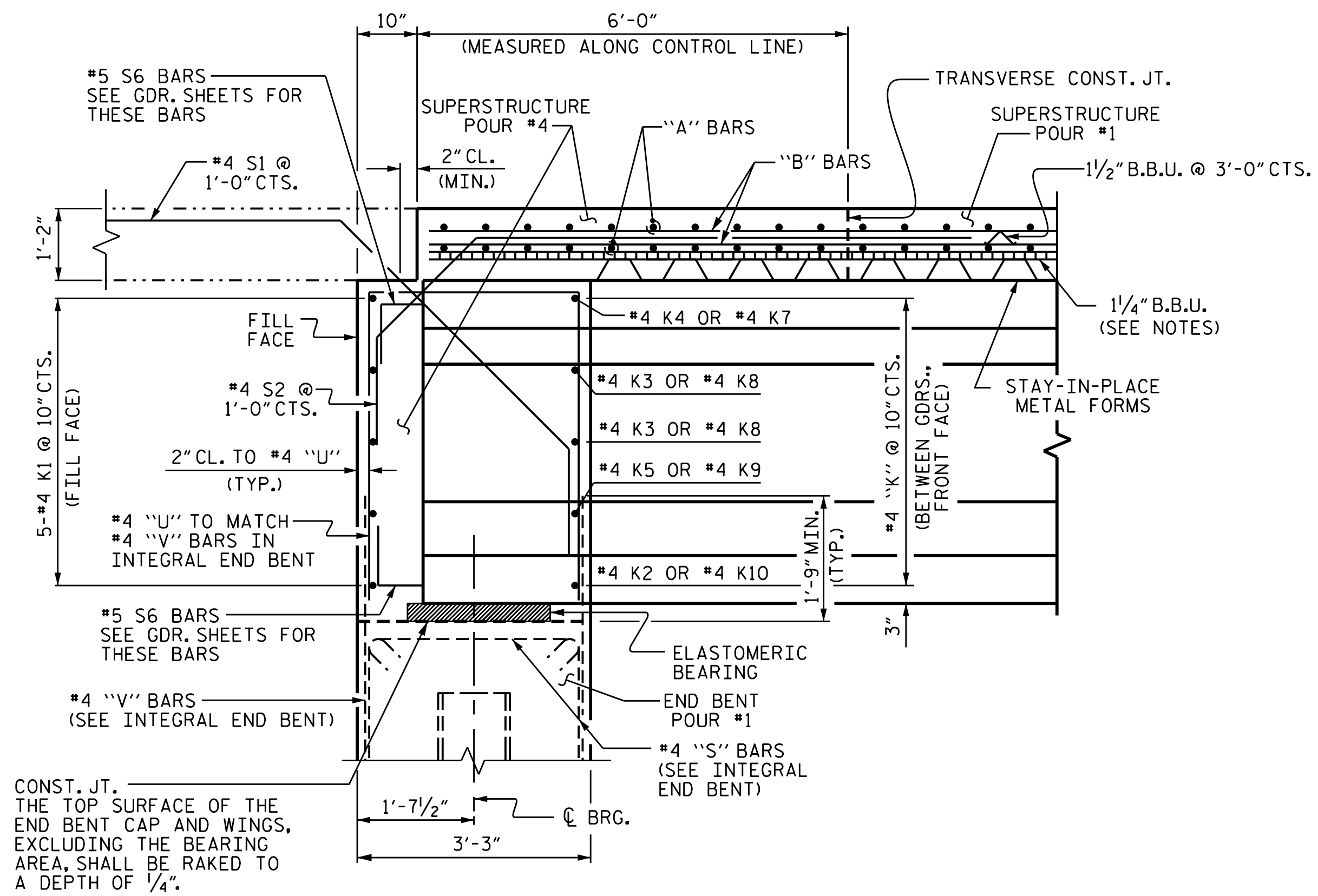


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION

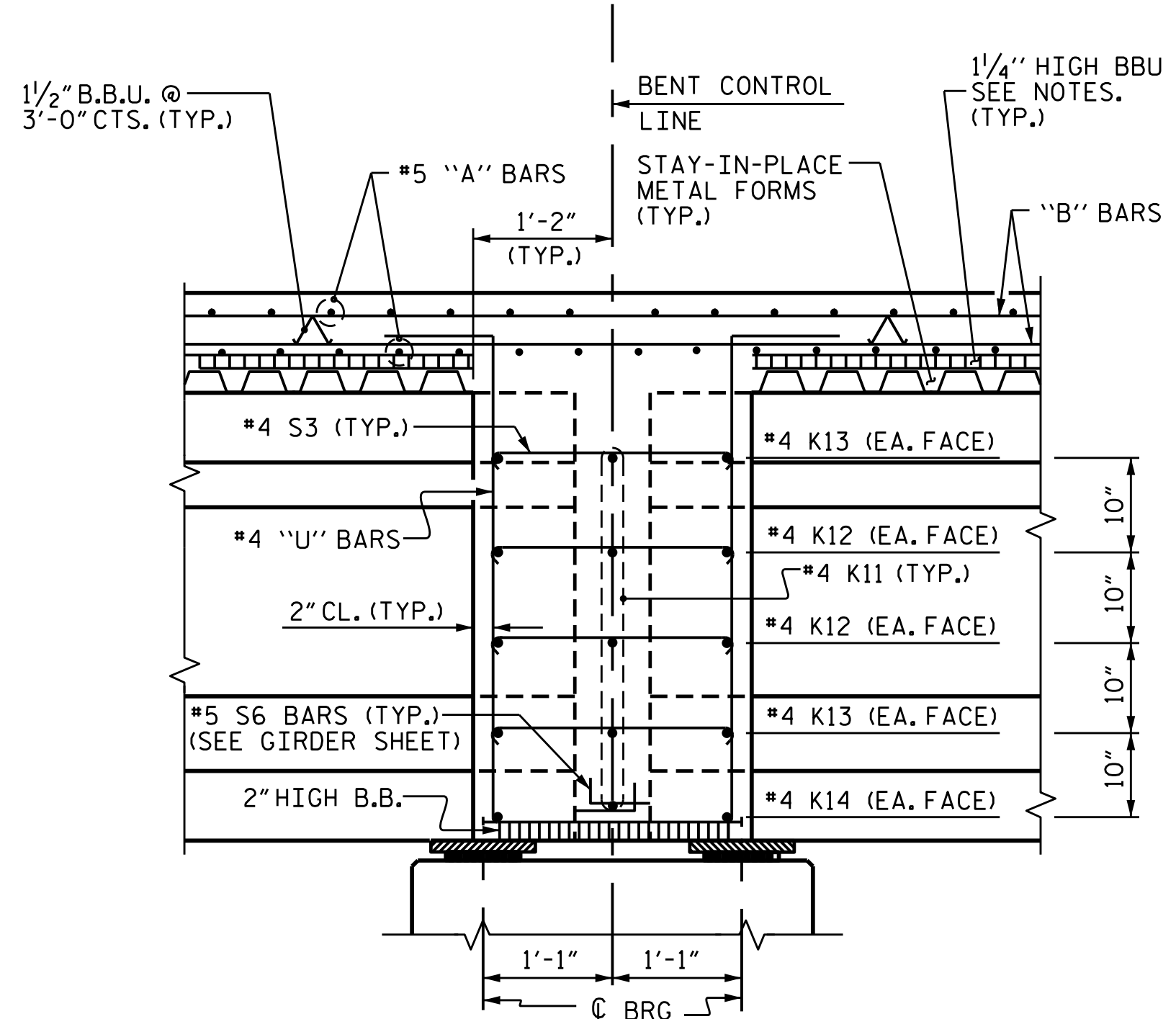
DRAWN BY: M.D.PISO DATE: 7-07-2015
 CHECKED BY: N.RUFFIN DATE: 8-05-2015
 DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE: 3/14/16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

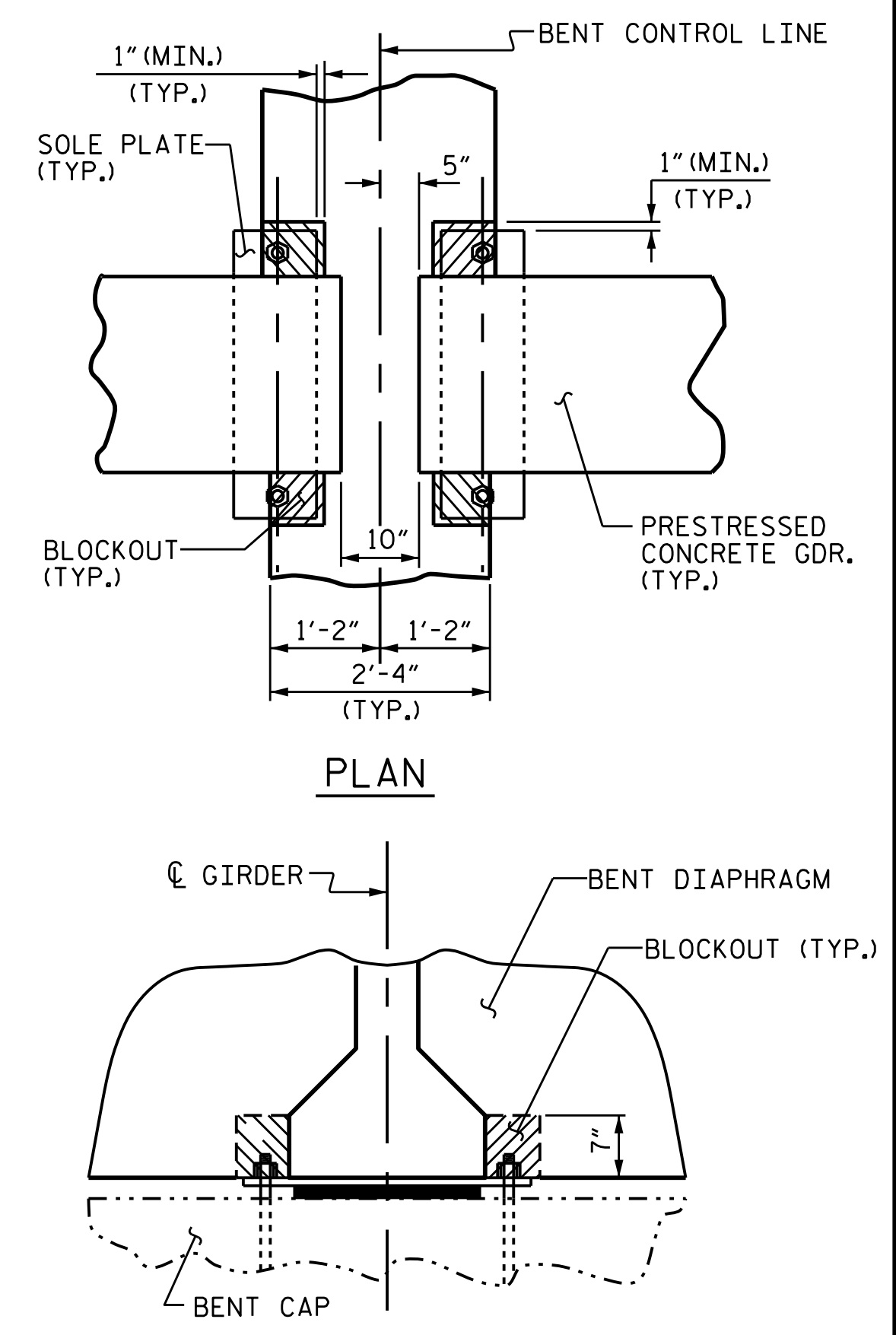
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5	
1			3			TOTAL SHEETS	
2			4			31	



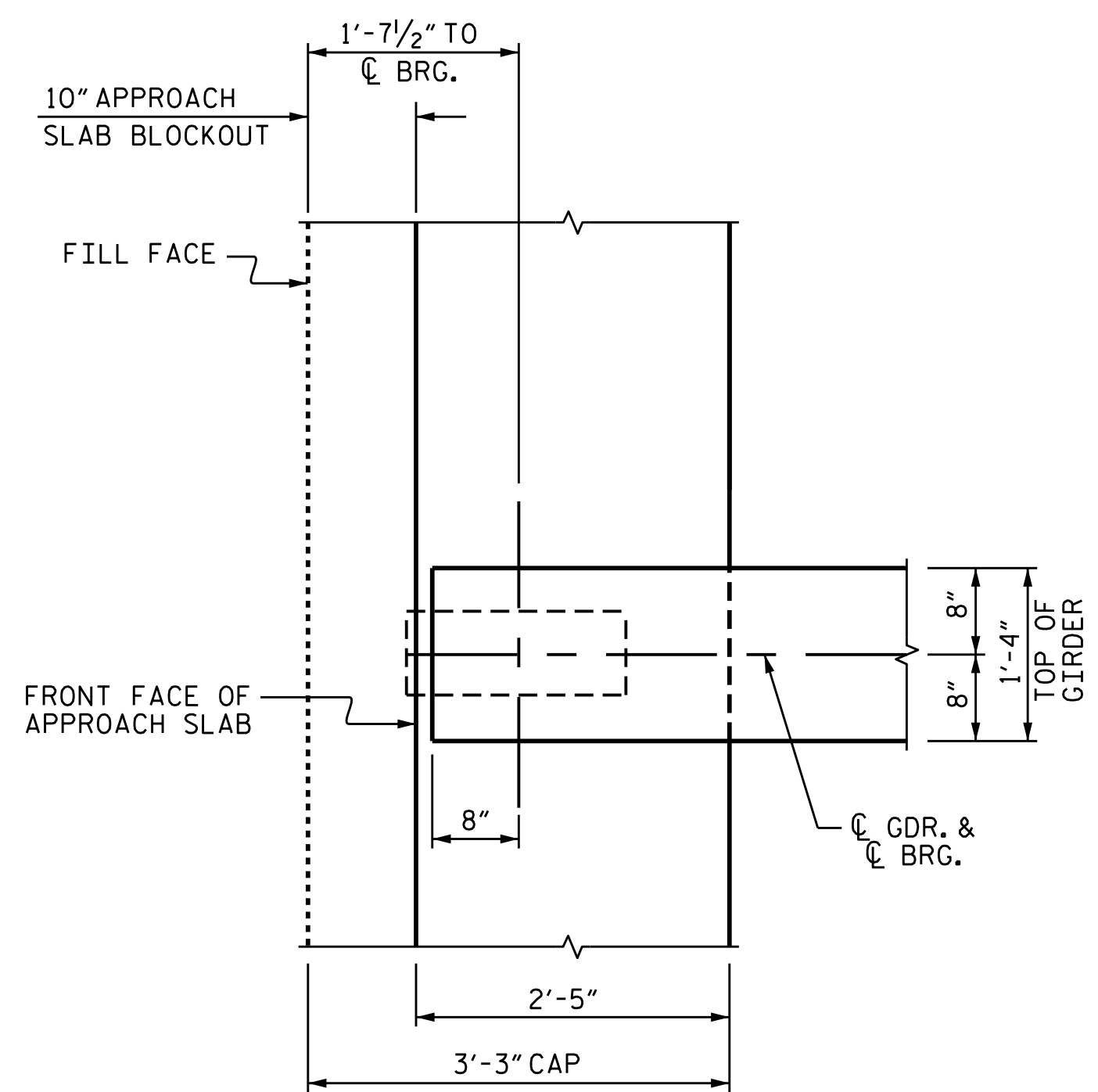
SECTION AT INTEGRAL END BENT



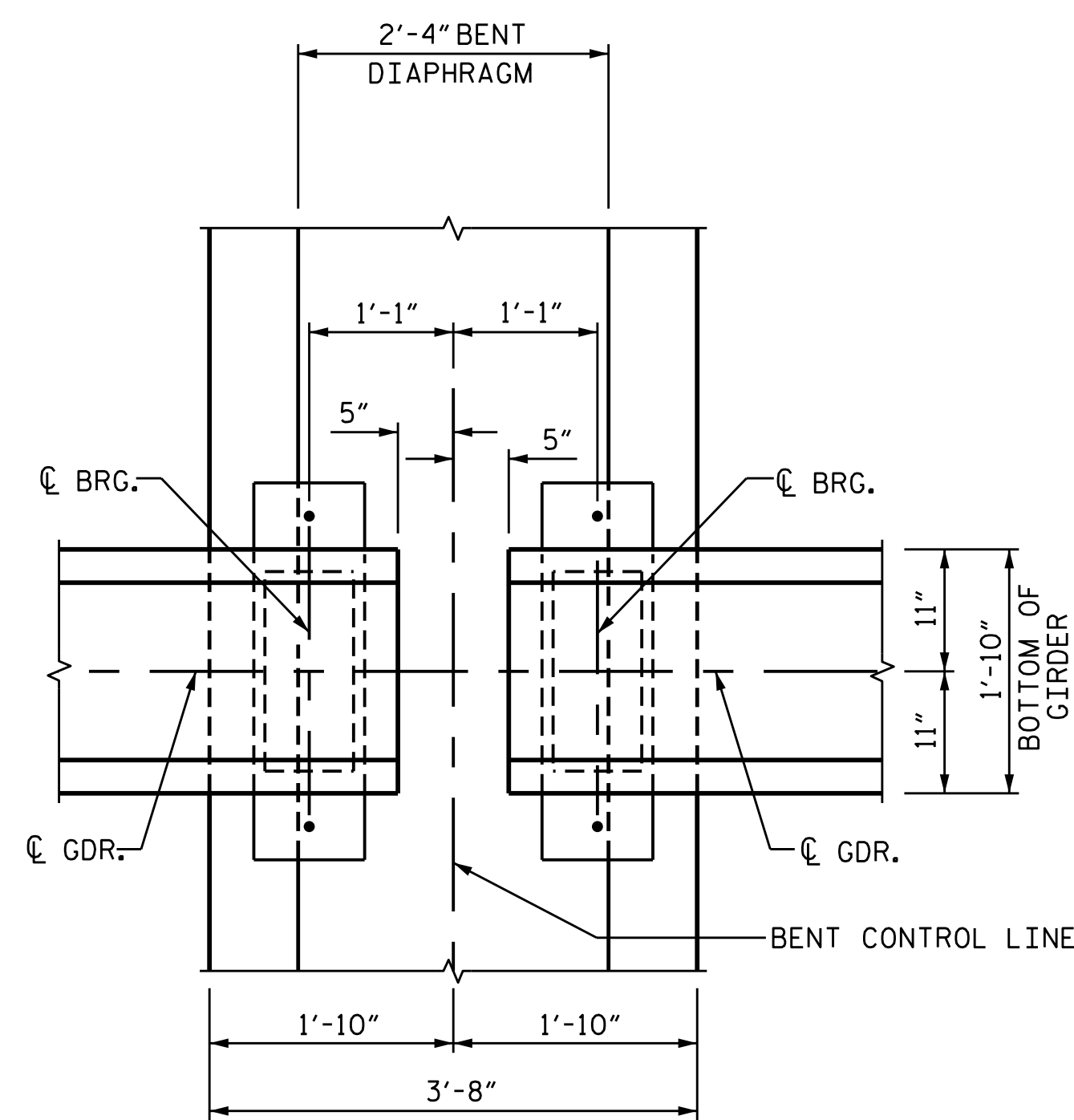
SECTION AT INTERIOR BENT DIAPHRAGM



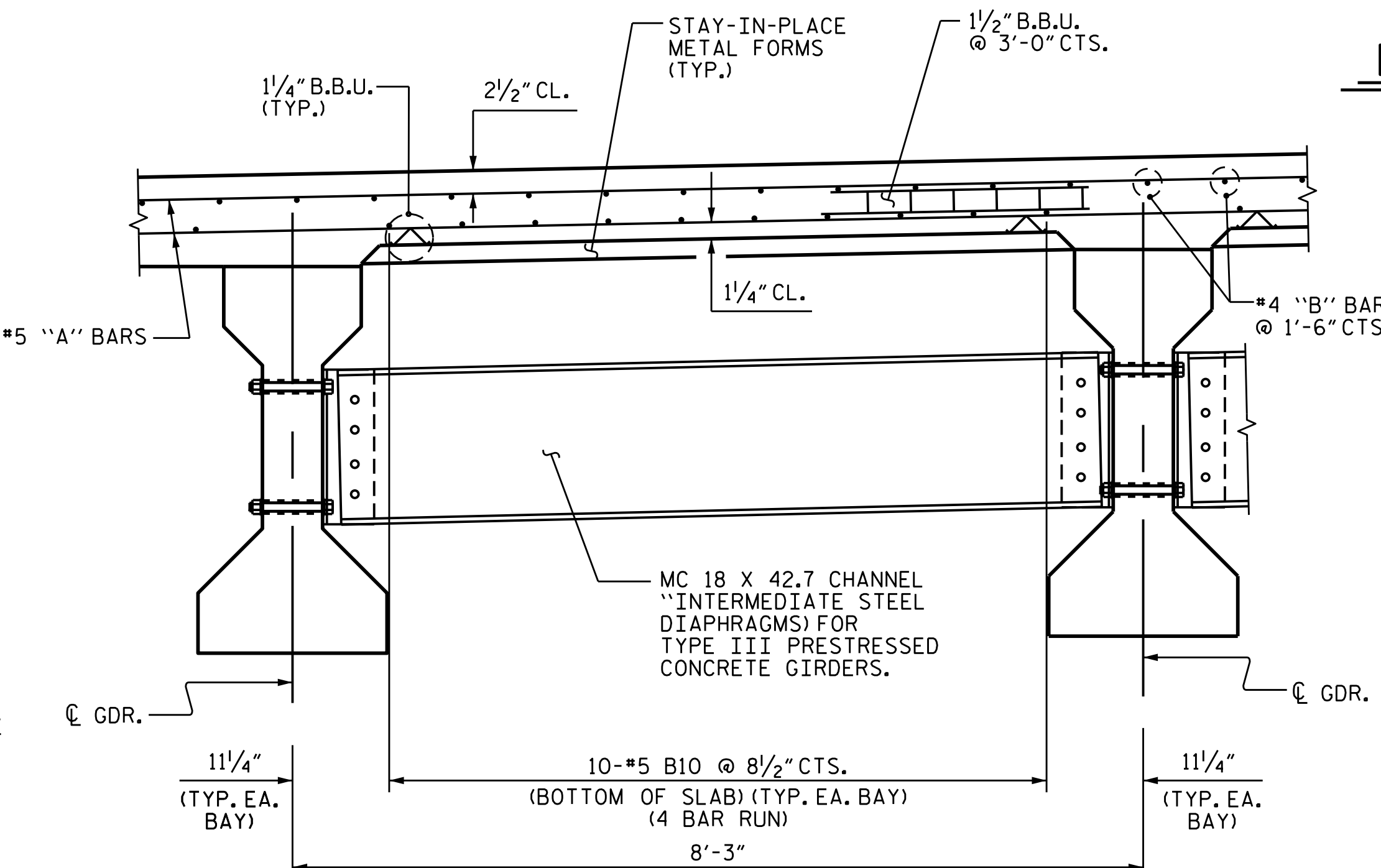
BENT DIAPHRAGM BLOCKOUT DETAIL



END BENT DIAPHRAGM



BENT DIAPHRAGM



EXTERIOR GIRDER INTERIOR GIRDER

PARTIAL TYPICAL SECTION @ INTERMEDIATE DIAPHRAGMS

SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS" SHEET FOR DETAILS



DocuSigned by:
Emily E. Murray
CAE87AEDC594E0
4/27/2016

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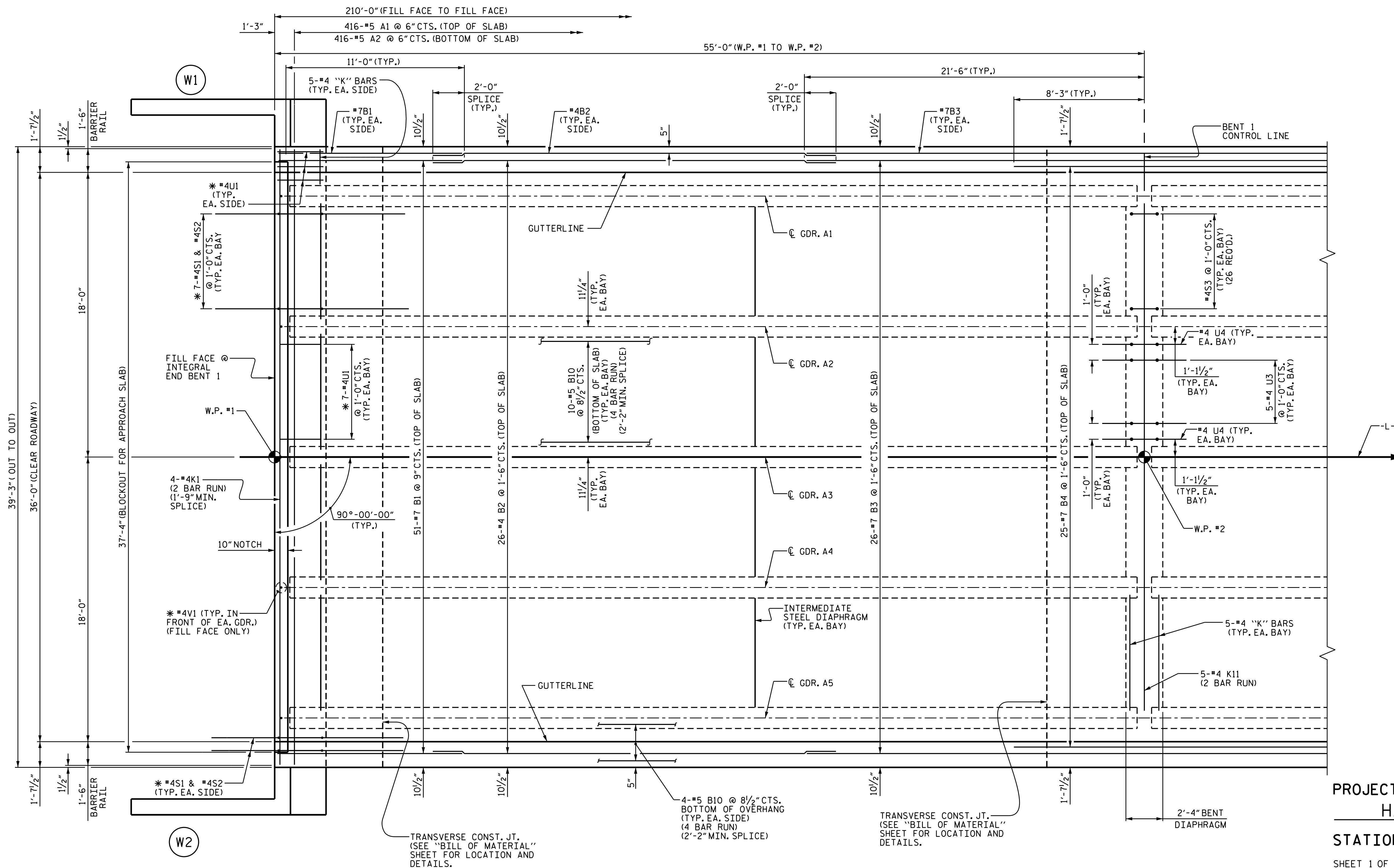
PROJECT NO. B-4761
HALIFAX COUNTY
 STATION: 20+11.00 -L-

SHEET 2 OF 2

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

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6	
1			3			TOTAL SHEETS	
2			4			31	

DRAWN BY: M.D. PISO DATE: 7-07-2015
 CHECKED BY: N. RUFFIN DATE: 8-05-2015
 DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE: 3/14/16

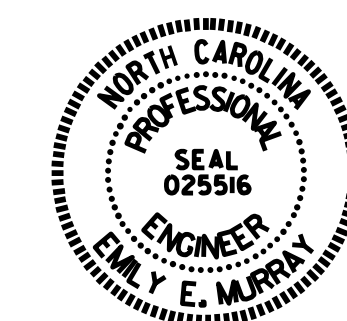


PLAN OF SPAN A

* #4S1, #4S2, #4U1, #4U2 & #4V1 TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP.
 FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "GIRDER LAYOUT"

PROJECT NO. B-4761
 HALIFAX COUNTY
 STATION: 20+11.00 -L-

SHEET 1 OF 3



Designed by:
 Emily E. Murray
 4/27/2016

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

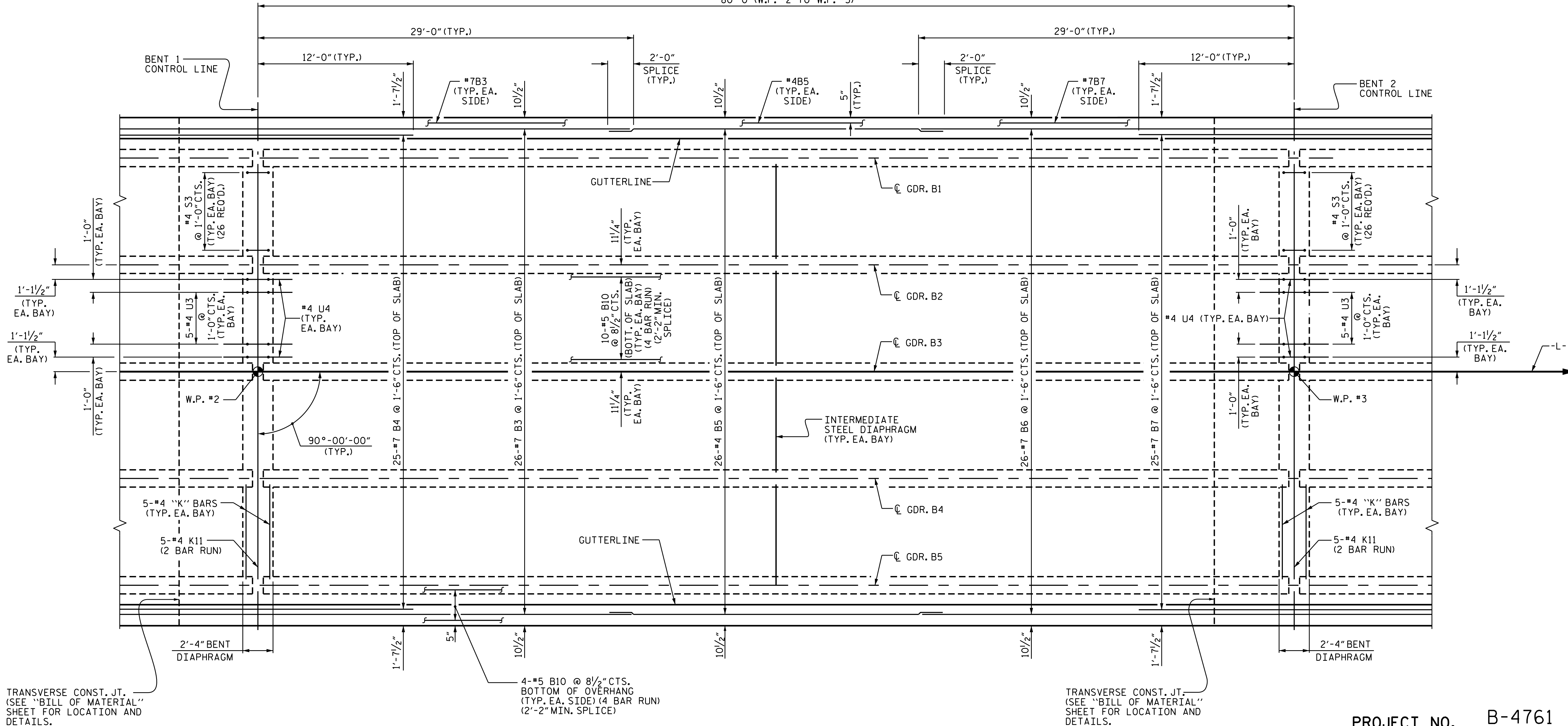
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 CHECKED BY : N.RUFFIN DATE : 8-05-2015
 DESIGN ENGINEER OF RECORD: G.KOUCHEKI DATE : 3/14/16

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NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
1			3			S-7	
2			4			31	

210'-0" (FILL FACE TO FILL FACE)
 416-#5 A1 @ 6" CTS. (TOP OF SLAB)
 416-#5 A2 @ 6" CTS. (BOTTOM OF SLAB)

80'-0" (W.P. #2 TO W.P. #3)



PLAN OF SPAN B
 FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "GIRDER LAYOUT"

PROJECT NO. B-4761
 HALIFAX COUNTY
 STATION: 20+11.00 -L-

SHEET 2 OF 3

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

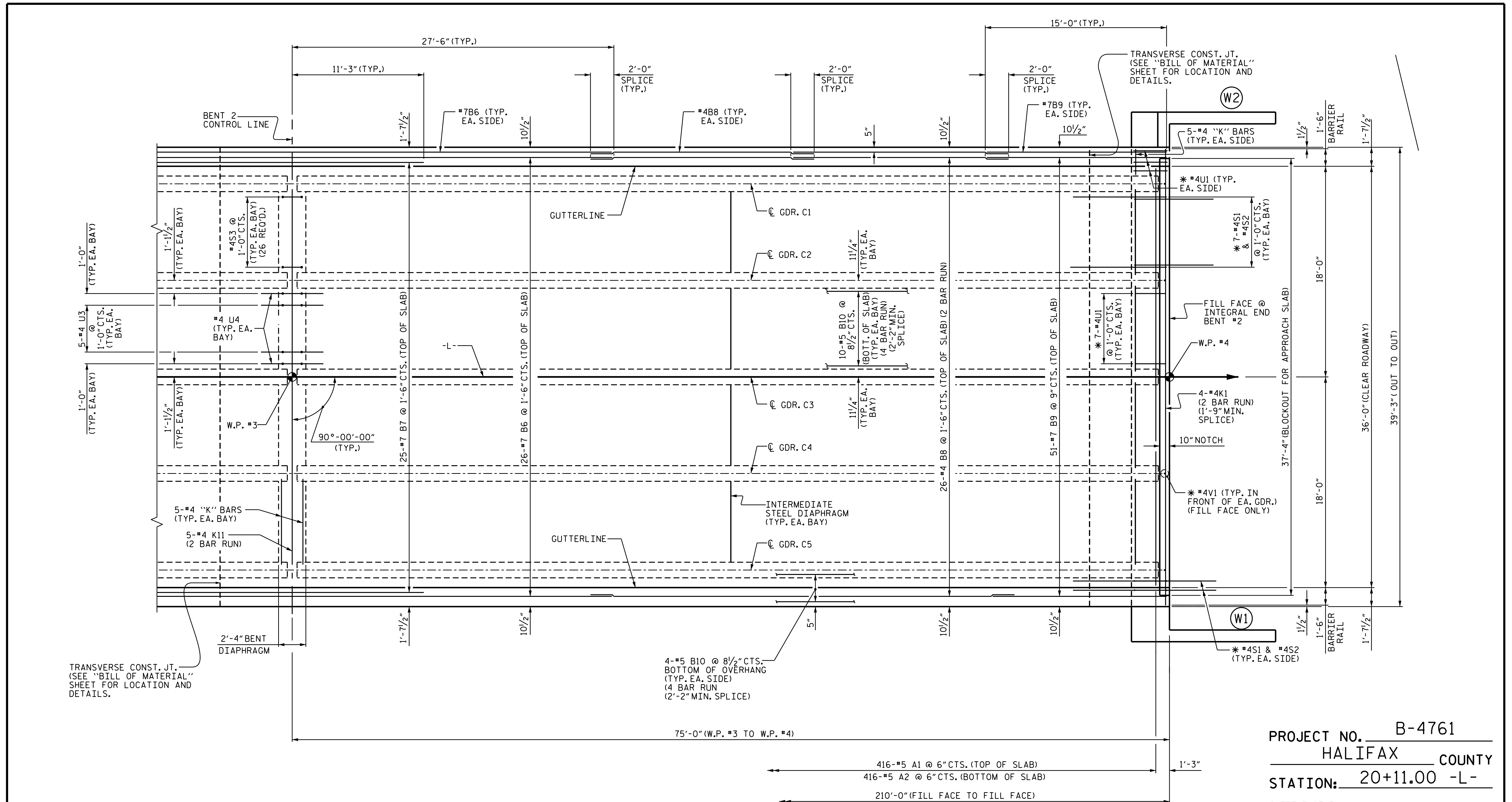


DocuSigned by:
 Emily E. Murray
 CAESR/ADCS/BEH...
 4/27/2016

DRAWN BY : M.D.PISO DATE : 6-10-2015
 CHECKED BY : N.RUFFIN DATE : 8-06-2015
 DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE : 3/14/16

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8	
1			3			TOTAL SHEETS	
2			4			31	



PLAN OF SPAN C

* #4 S1, #4 S2, #4 U1, #4 U2 & #4 V1 BARS TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP.
 FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "GIRDER LAYOUT"

PROJECT NO. B-4761
 HALIFAX COUNTY
 STATION: 20+11.00 -L-

SHEET 3 OF 3



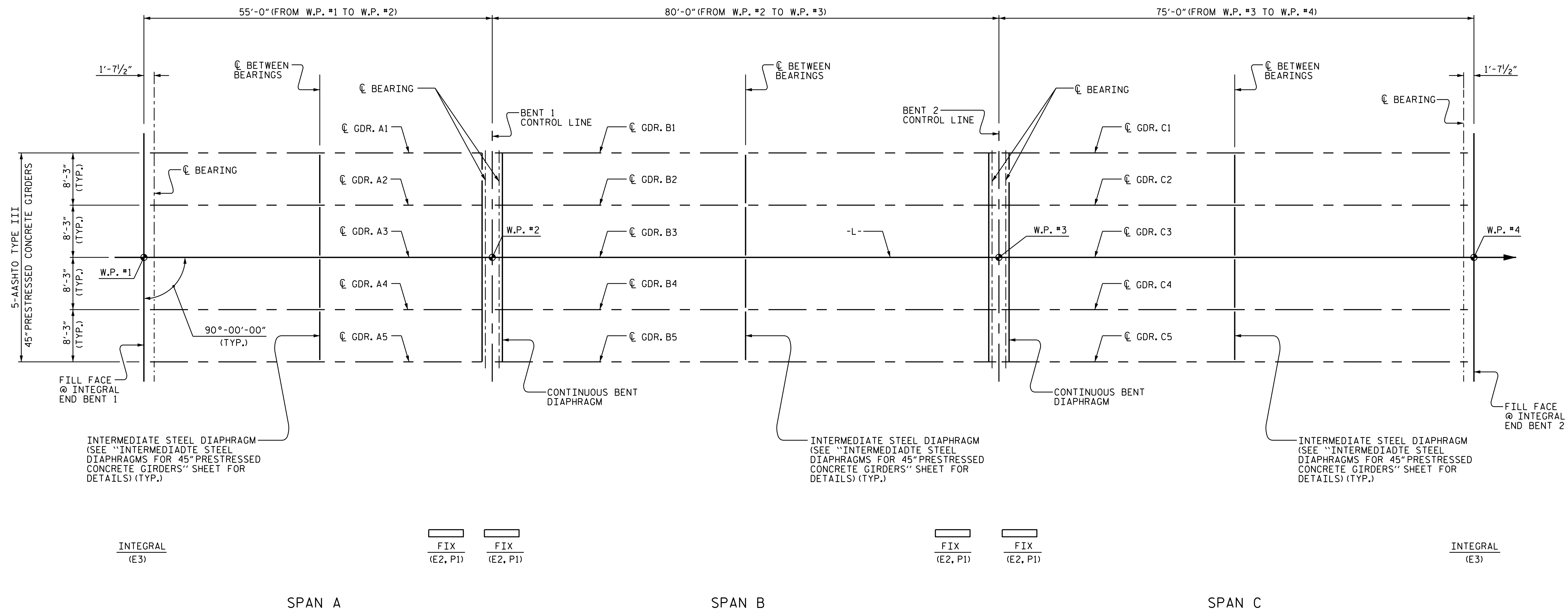
Designed by:
Emily E. Murray
 4/27/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPAN C

DRAWN BY : M.D.PISO DATE : 6-10-2015
 CHECKED BY : N.RUFFIN DATE : 8-06-2015
 DESIGN ENGINEER OF RECORD : G. KOUCHEKI DATE : 3/14/16

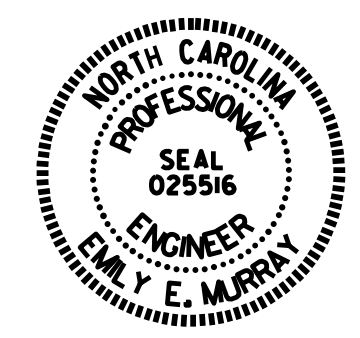
DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9	
1			3			TOTAL SHEETS	
2			4			31	



GIRDER LAYOUT

PROJECT NO. B-4761
HALIFAX COUNTY
 STATION: 20+11.00 -L-

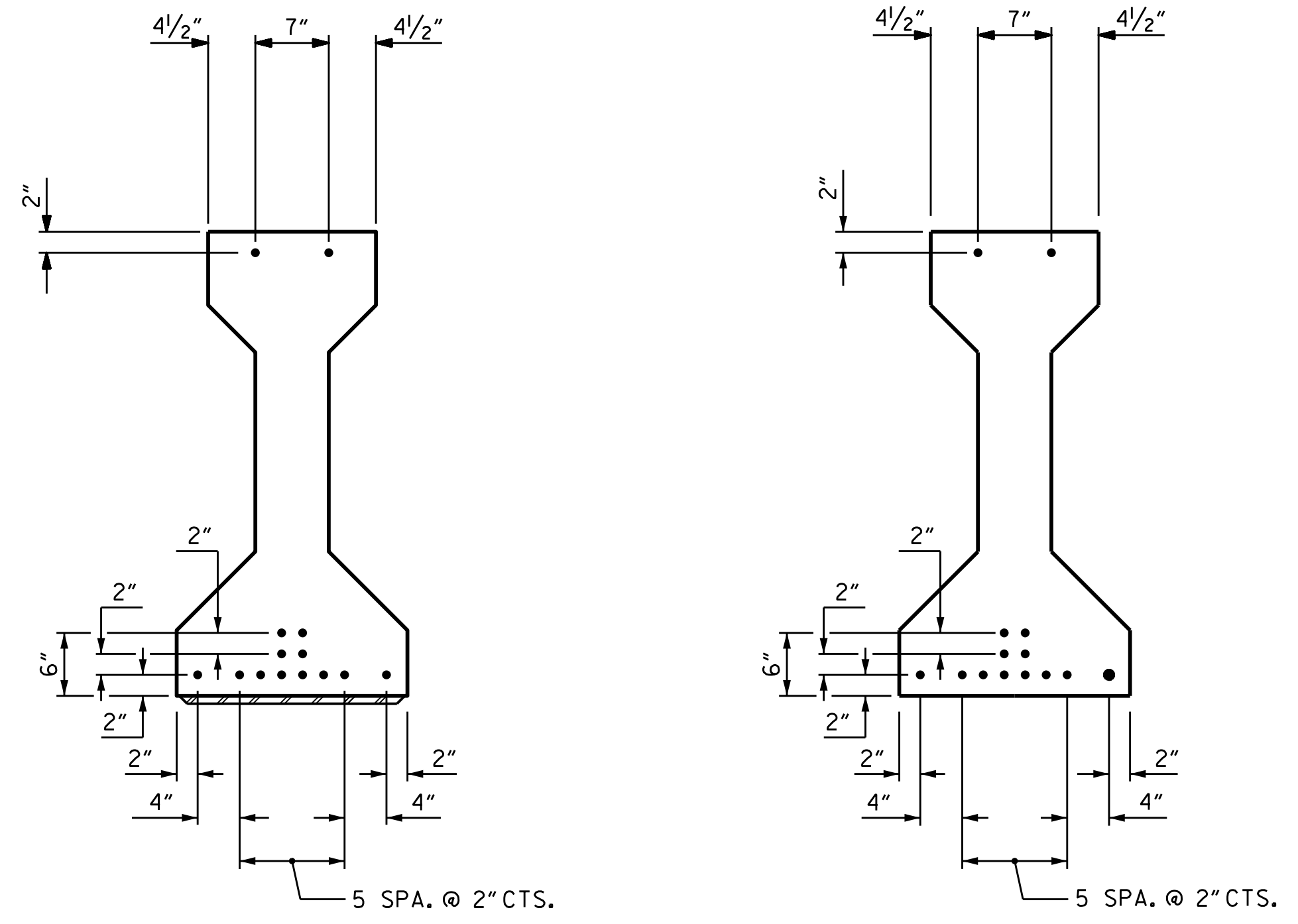
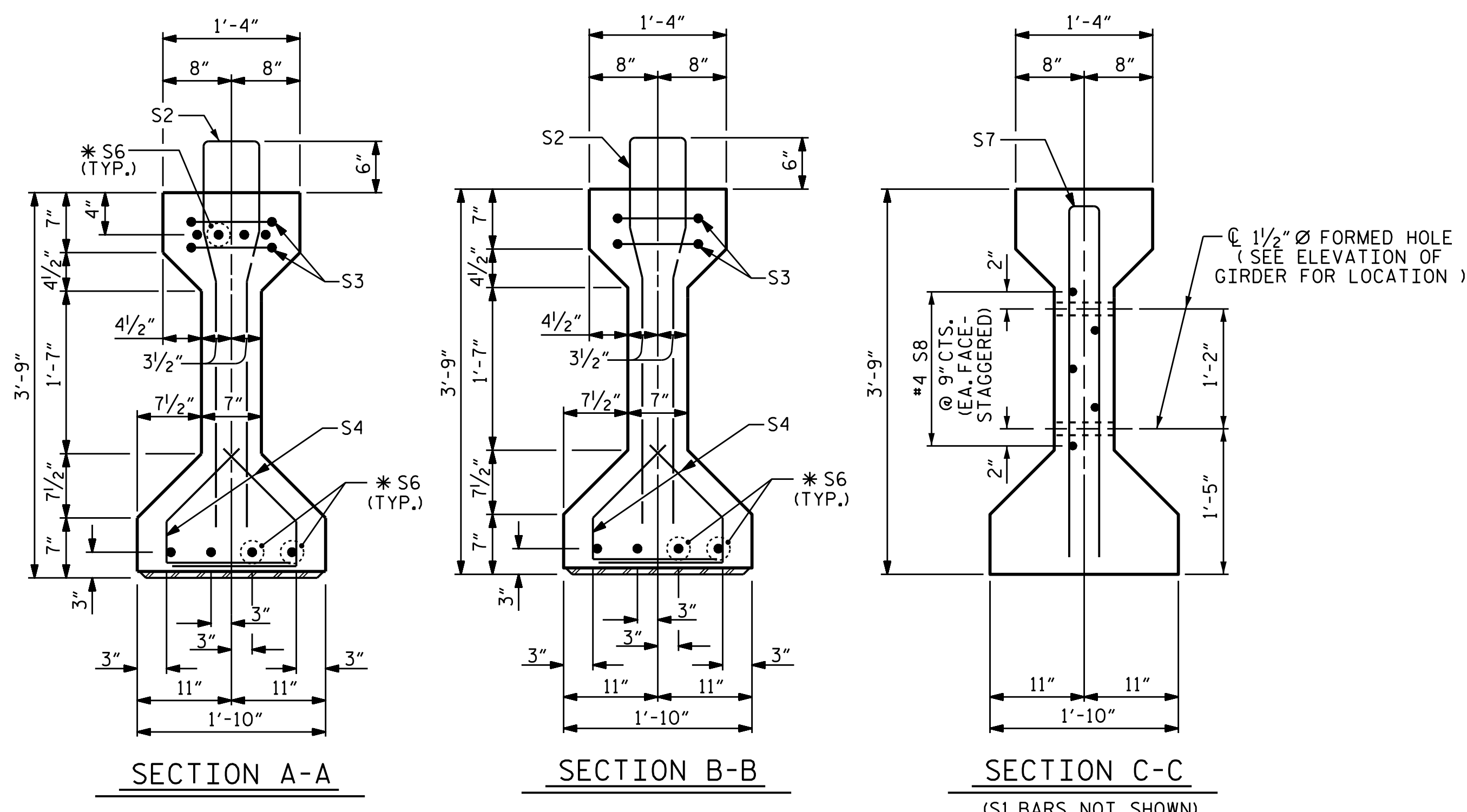


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 GIRDER LAYOUT

DRAWN BY : M.D.PISO DATE : 6-29-2015
 CHECKED BY : N.RUFFIN DATE : 8-6-2015
 DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE : 3/14/16

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10	
1			3			TOTAL SHEETS	31
2			4				



AT END OF GIRDER
 AT C OF GIRDER
 0.6" Ø LOW RELAXATION STRAND LAYOUT
 (14 STRANDS)

0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

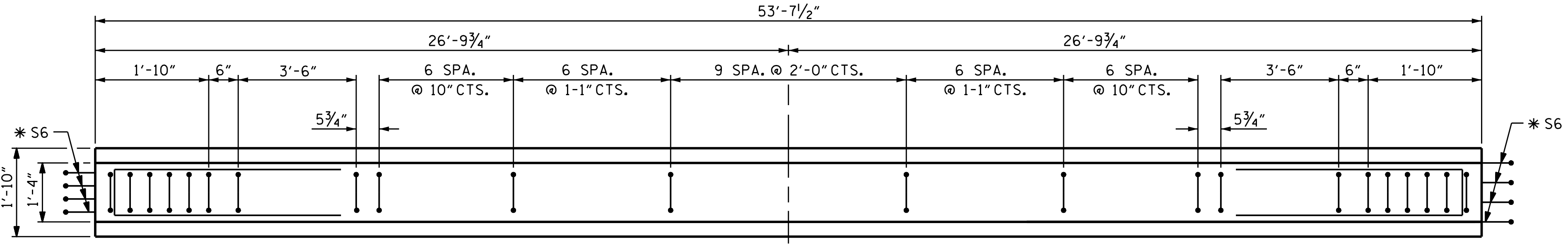
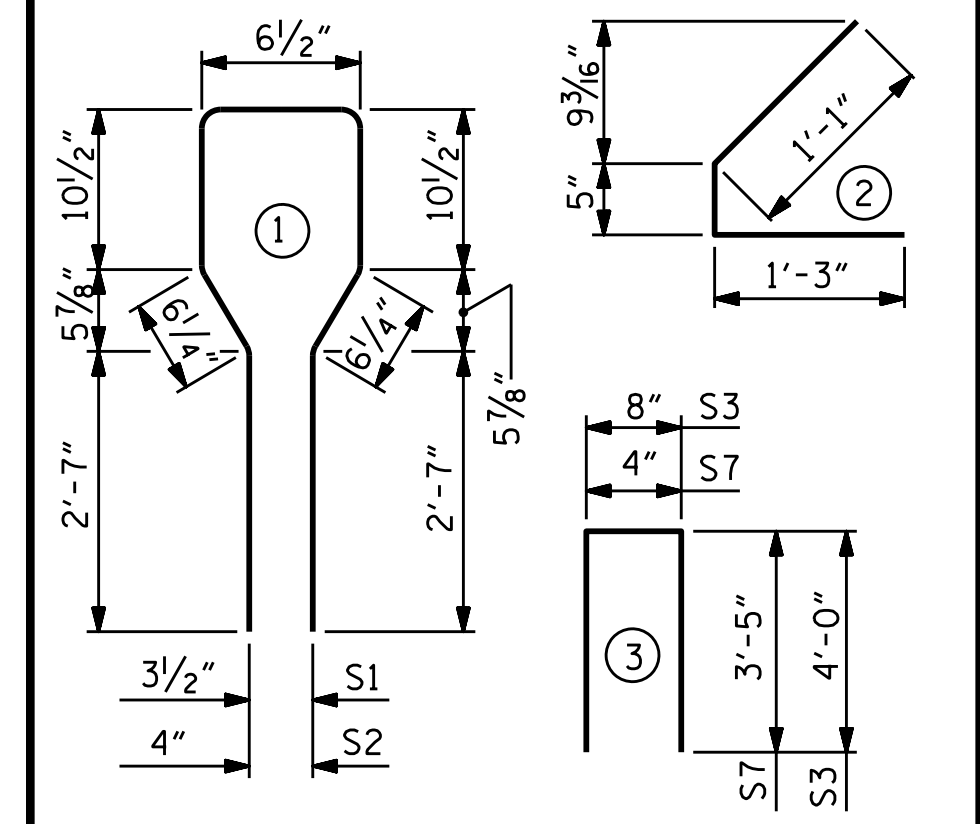
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	50	#4	1	8'-6"	284
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	56	#4	2	2'-9"	103
* S6	12	#5	STR	3'-8"	46
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	23
S10	1	#3	STR	1'-0"	1

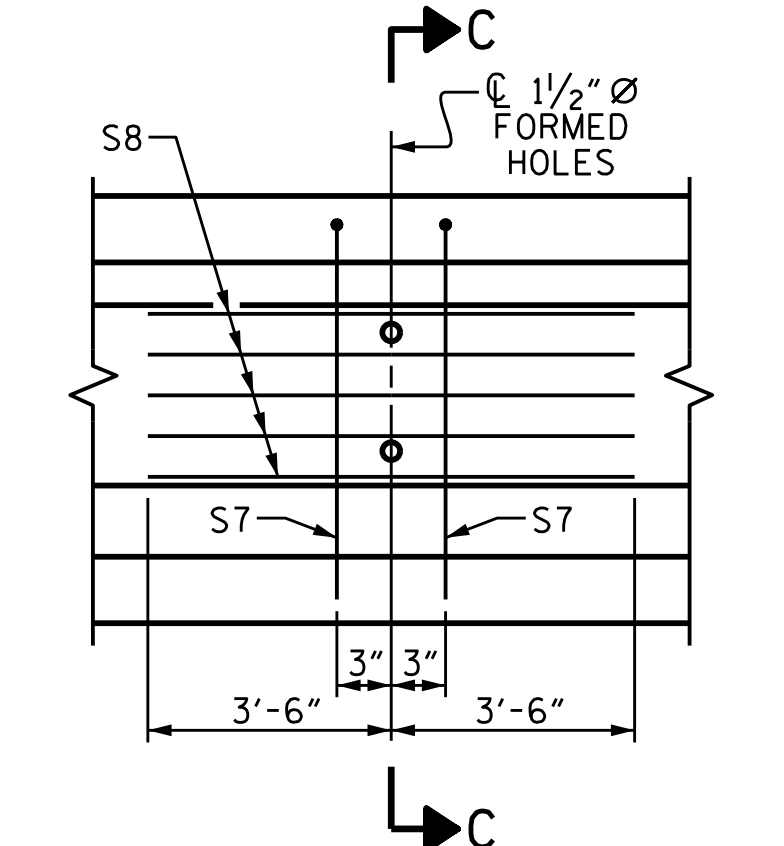
TOTAL REINFORCING STEEL 648 LBS.

* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

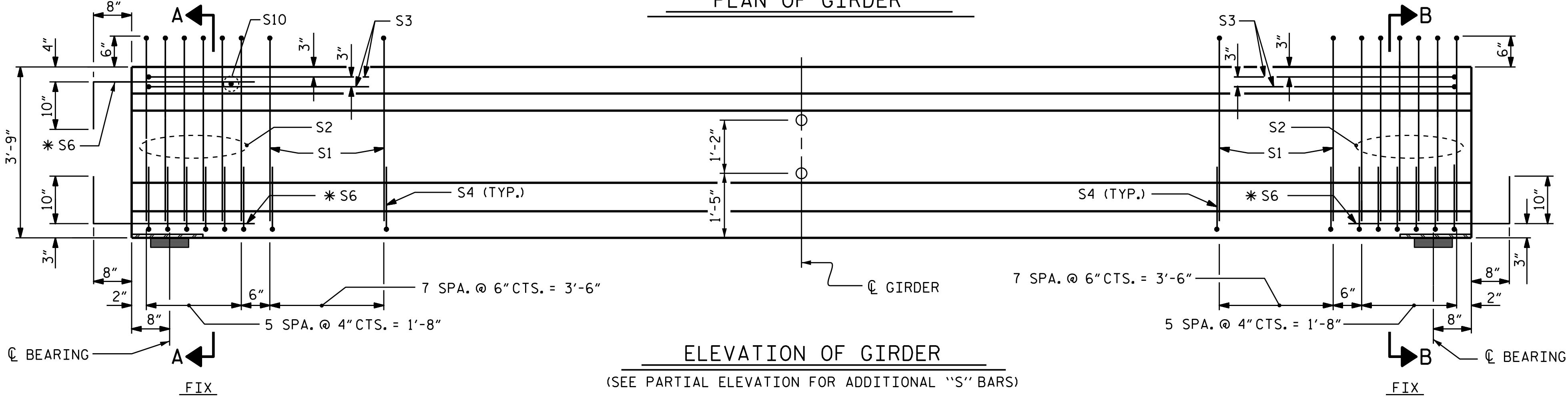
BAR TYPES
 ALL BAR DIMENSIONS ARE OUT-TO-OUT



PLAN OF GIRDER



PARTIAL ELEVATION
 SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1-5



ELEVATION OF GIRDER
 (SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

QUANTITIES FOR ONE GIRDER

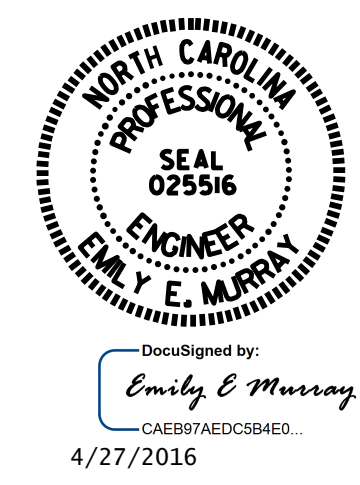
SPAN	REINFORCING STEEL	5,000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
SPAN A	648	7.7	14

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	53'-7 1/2"	268'-1 1/2"

PROJECT NO. B-4761
 HALIFAX COUNTY
 STATION: 20+11.00 -L-

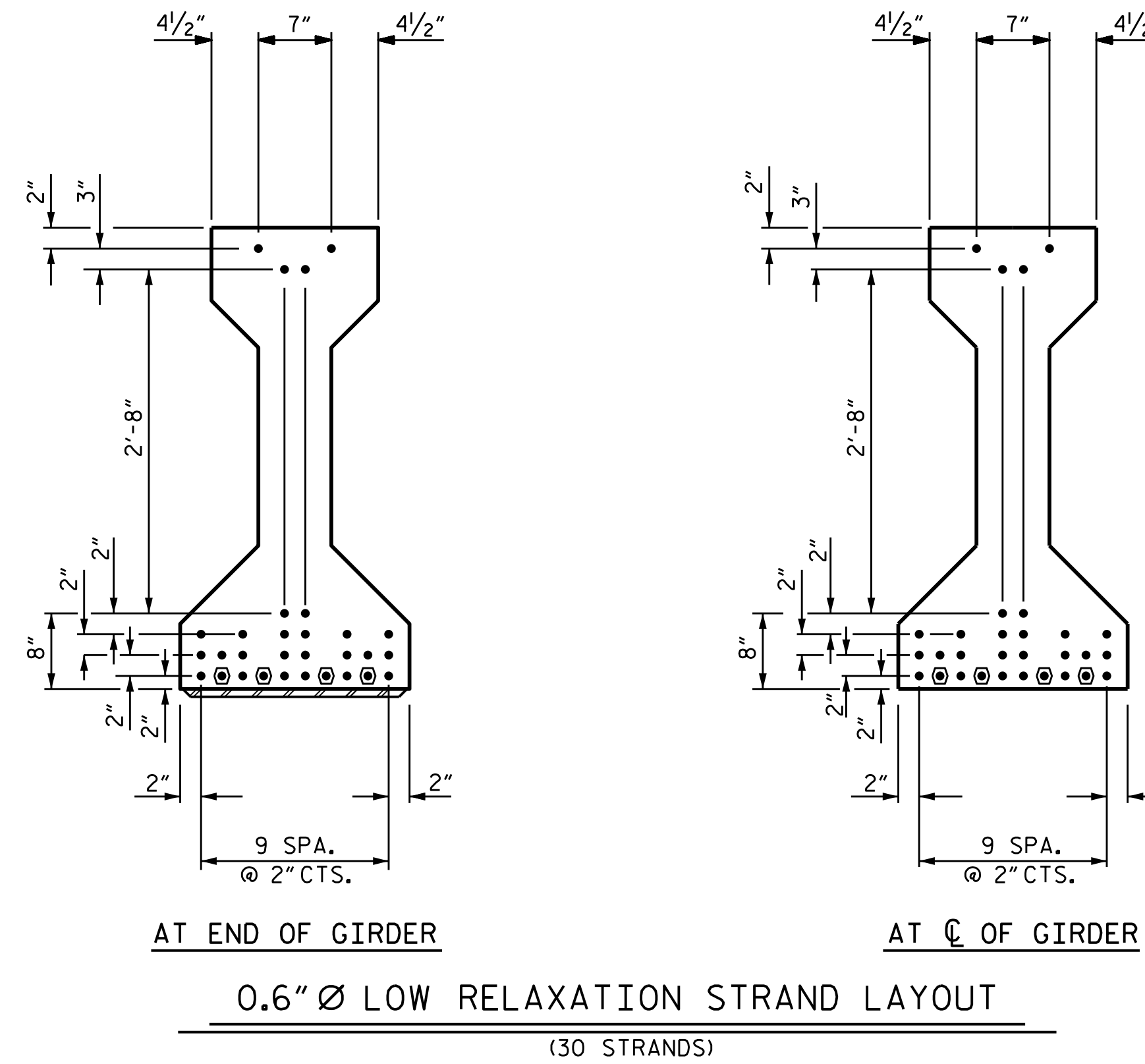
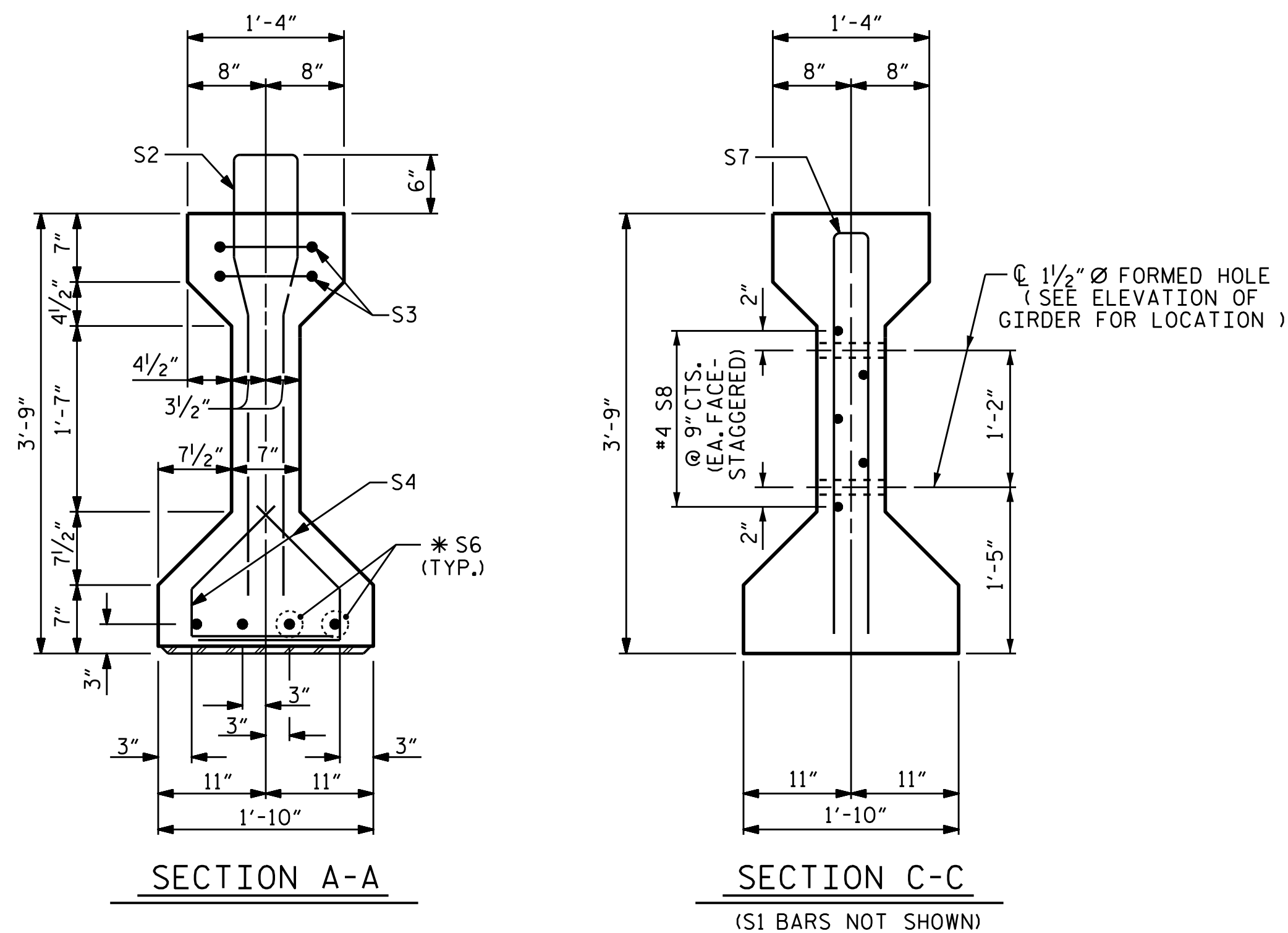
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 AASHTO TYPE III
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 SPAN A



ASSEMBLED BY : M.D.PISO	DATE : 6-29-2015
CHECKED BY : N.RUFFIN	DATE : 8-06-2015
DRAWN BY : ELR 8/91	REV. 5/1/06R
CHECKED BY : GRP 8/91	REV. 10/1/11
	REV. 1/15
DESIGN ENGINEER OF RECORD:	DATE : 3/14/16
G. KOUCHEKI	

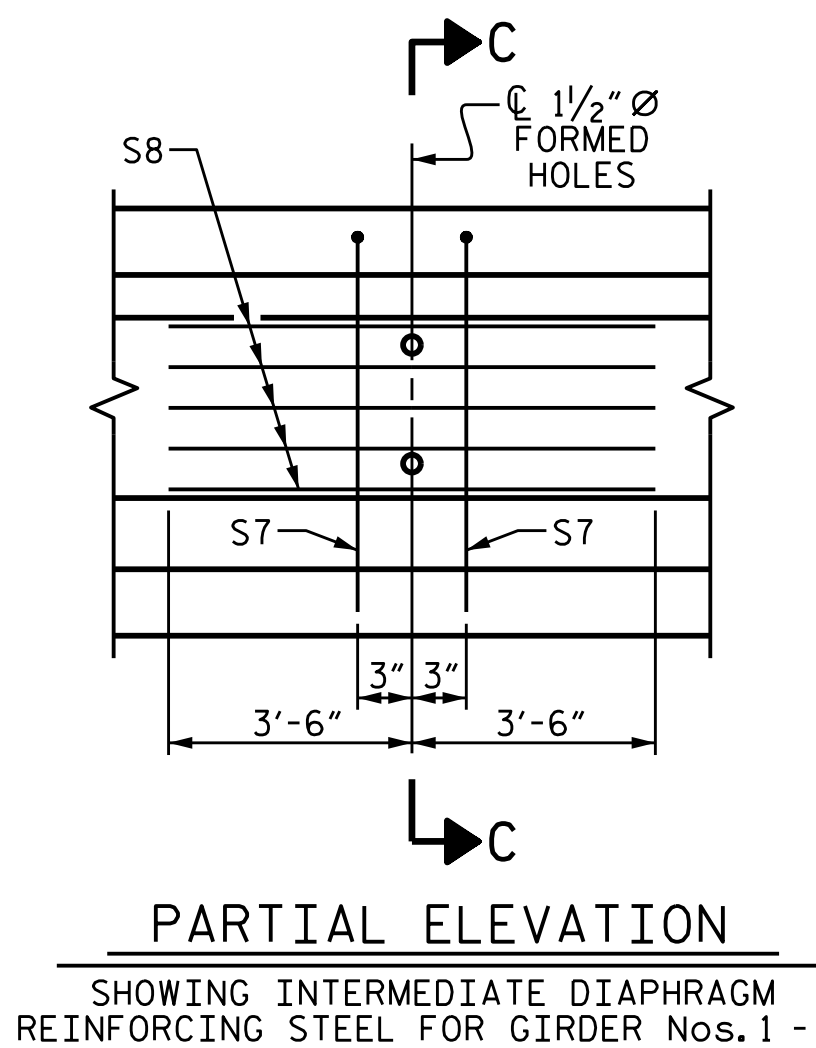
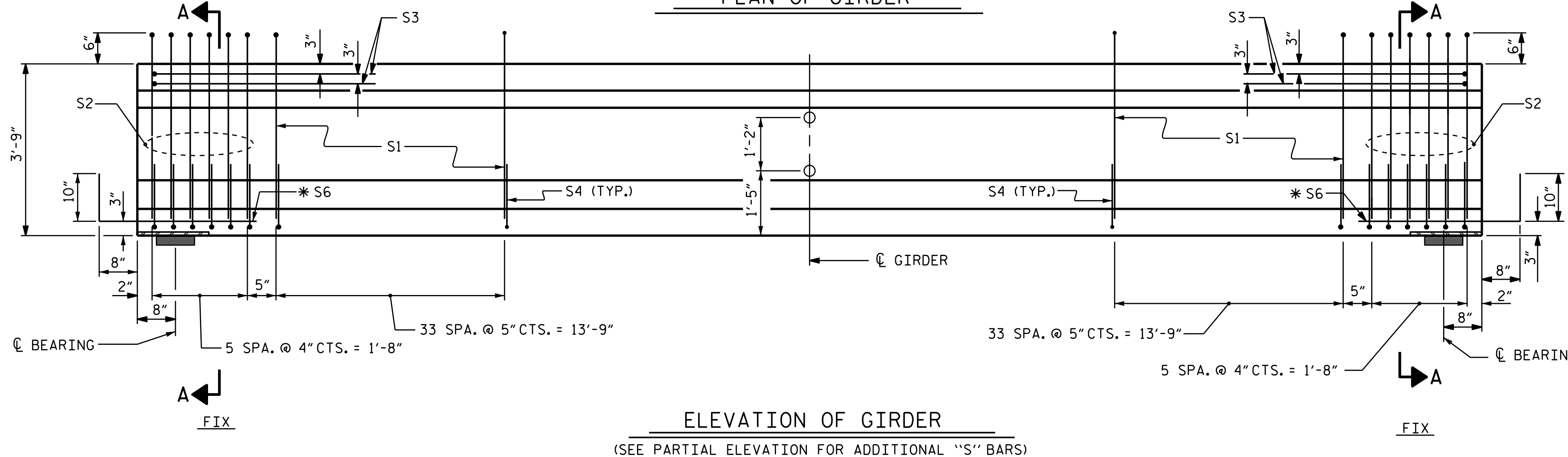
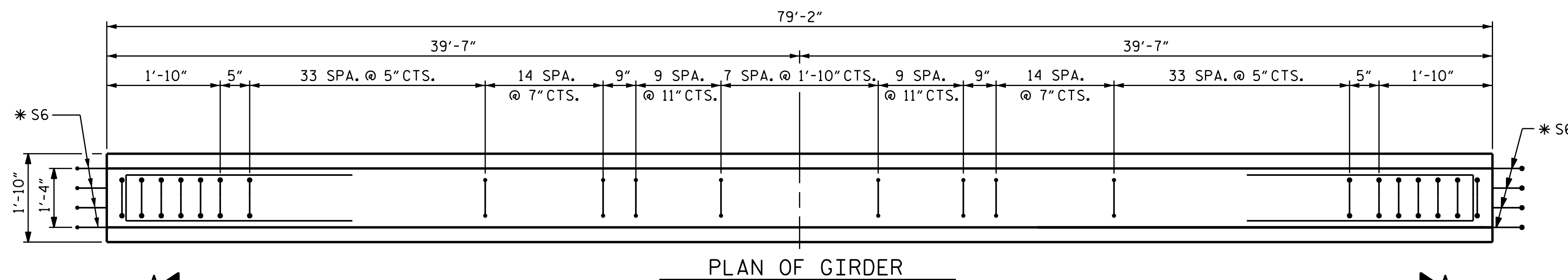
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS 31
2			4			



DEBONDING LEGEND

- FULLY BONDED STRANDS
- ⊙ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER



0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

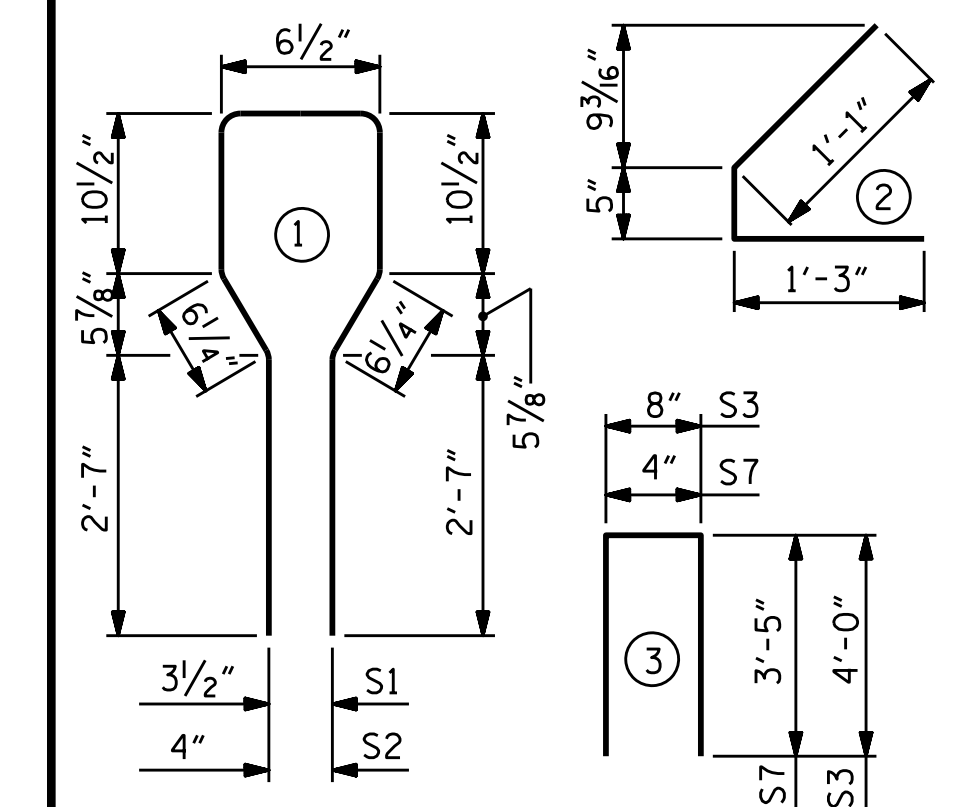
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	122	#4	1	8'-6"	693
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	160	#4	2	2'-9"	294
* S6	8	#5	STR	3'-8"	31
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	23

TOTAL REINFORCING STEEL 1,232 LBS.

* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT.



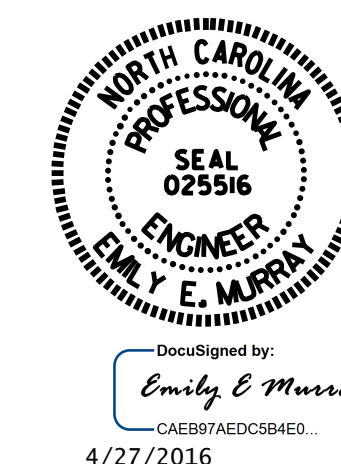
QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL (LB.)	8,000 PSI CONCRETE (C.Y.)	0.6" Ø L. R. STRANDS (No.)
SPAN B	1,232	11.4	30

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	79'-2"	395'-10"

PROJECT NO. B-4761
HALIFAX COUNTY
 STATION: 20+11.00 -L-



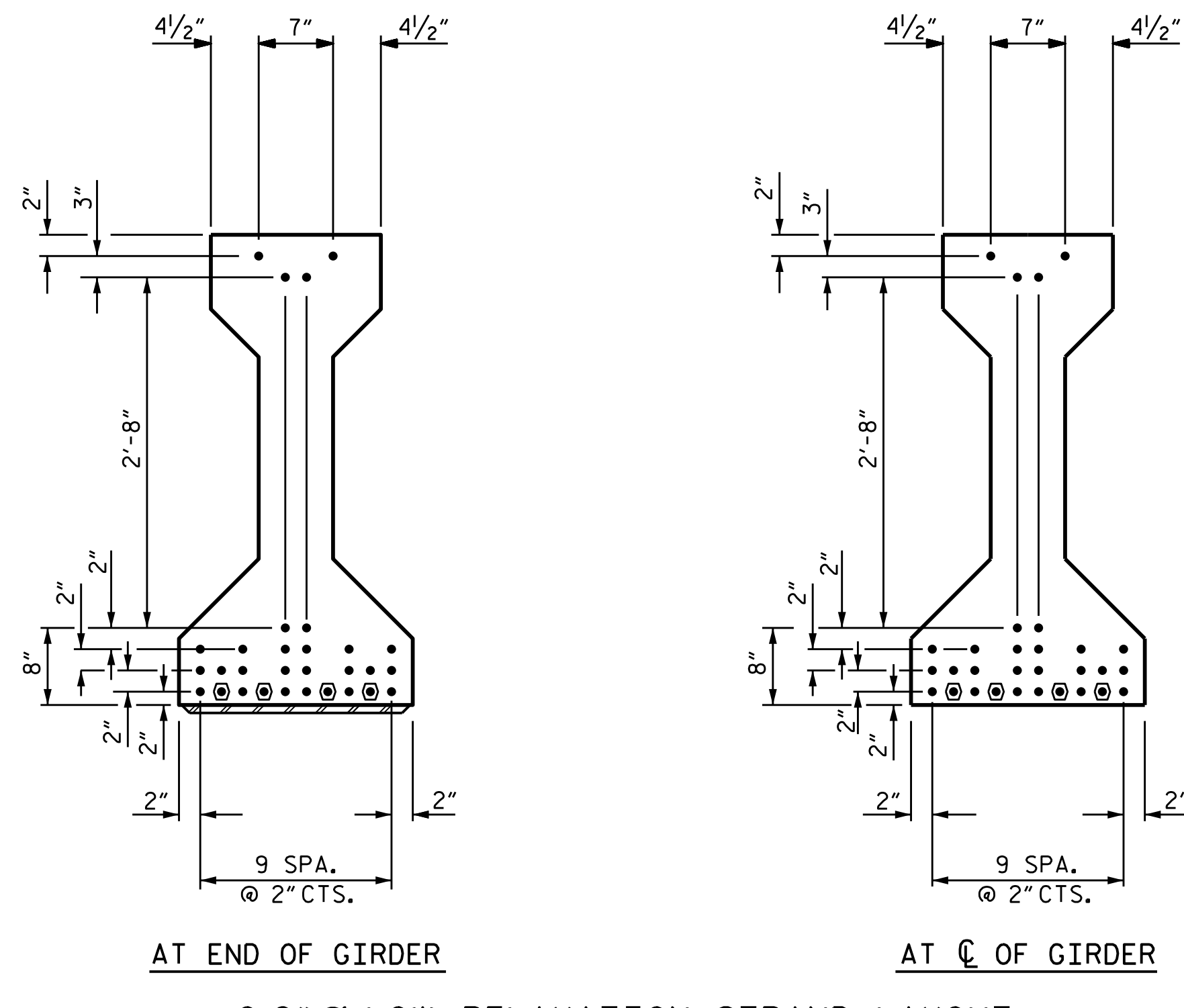
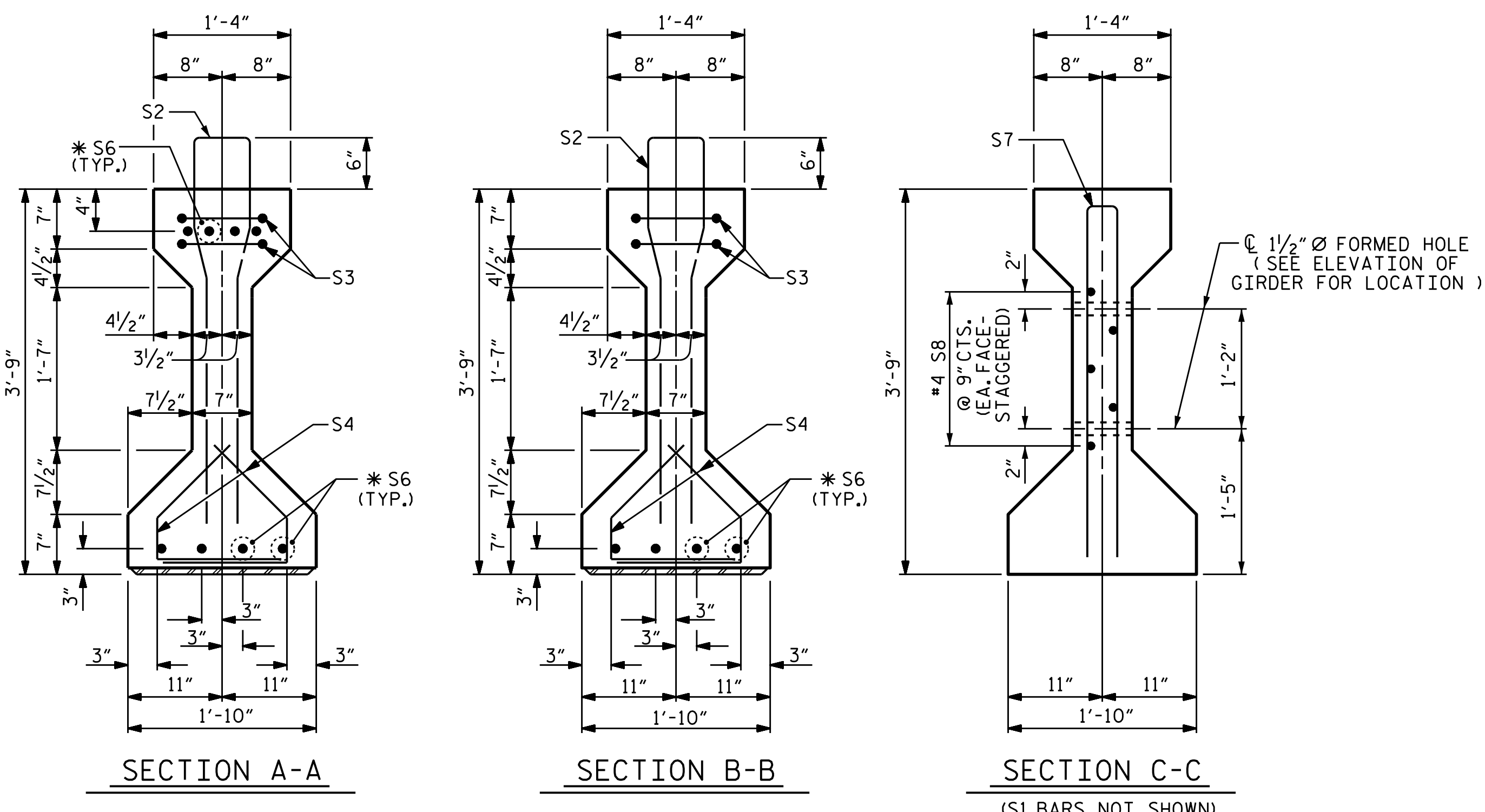
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 AASHTO TYPE III
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS 31
2			4			

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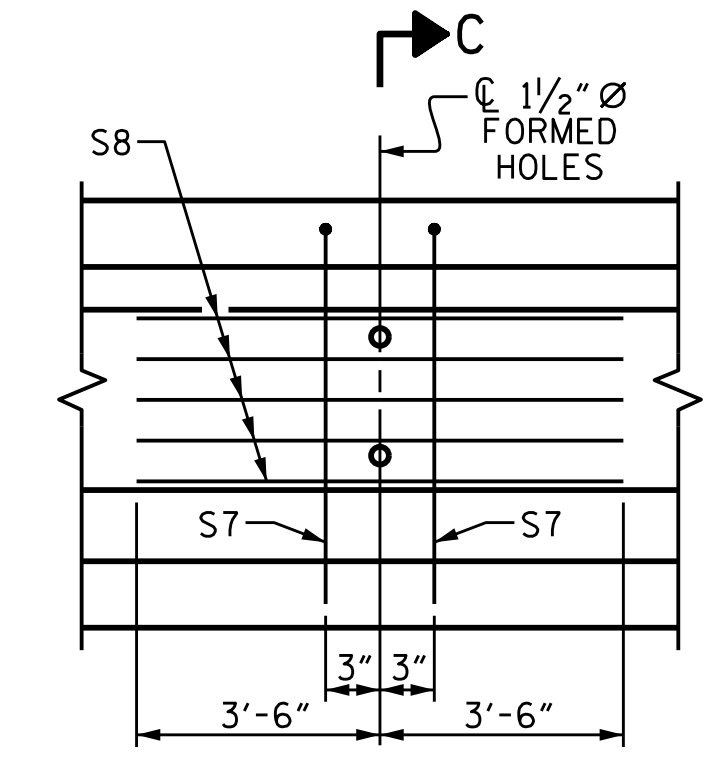
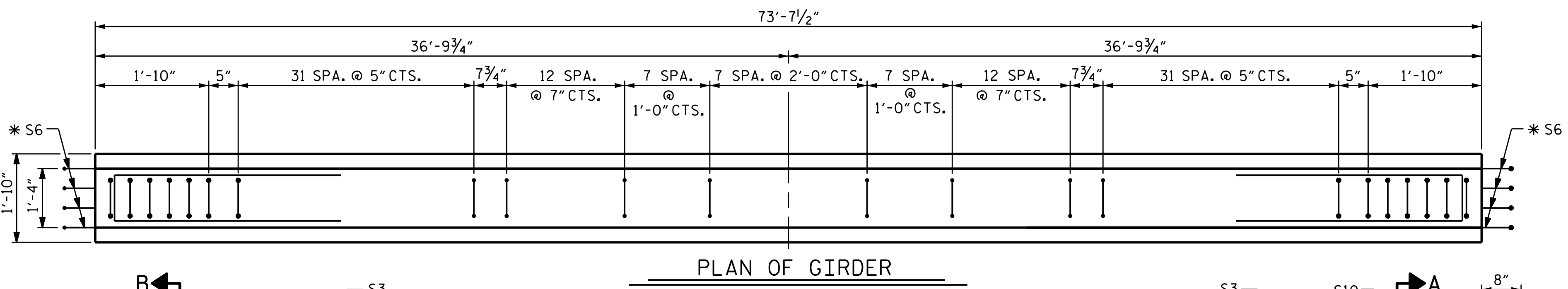
ASSEMBLED BY : M.D.PISO DATE : 6-30-2015
 CHECKED BY : N.RUFFIN DATE : 8-07-2015
 DRAWN BY : ELR 8/91
 CHECKED BY : GRP 8/91

DESIGN ENGINEER OF RECORD:
G. KOUCKEKI DATE : 3/14/16

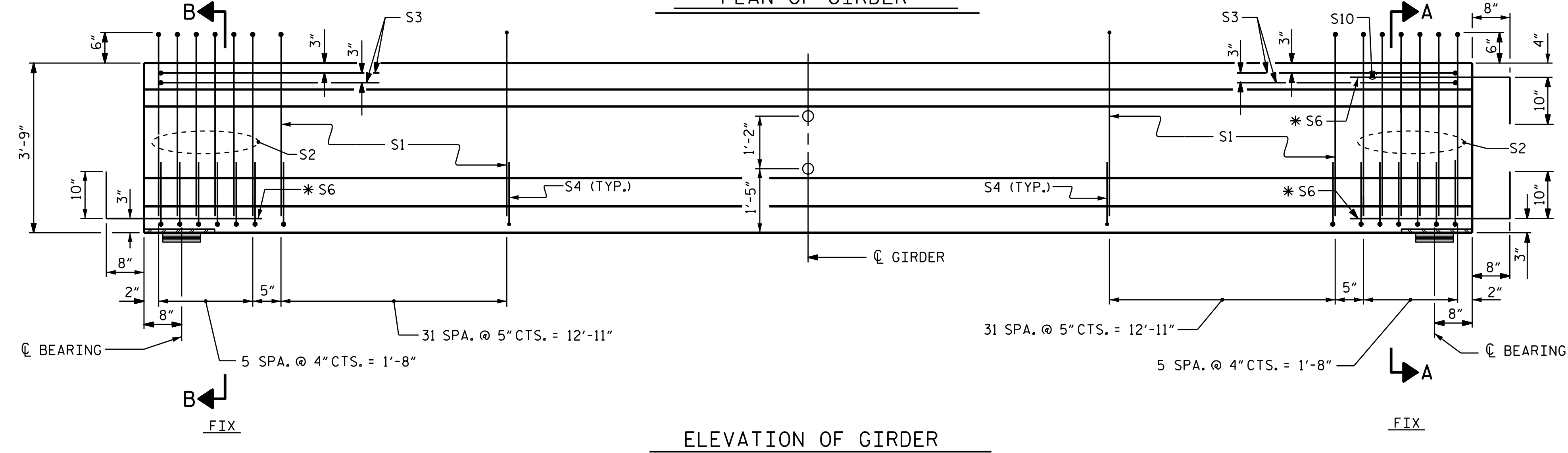


0.6" Ø LOW RELAXATION STRAND LAYOUT
(30 STRANDS)

DEBONDING LEGEND
 • FULLY BONDED STRANDS
 ⊙ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER



SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 - 5



(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

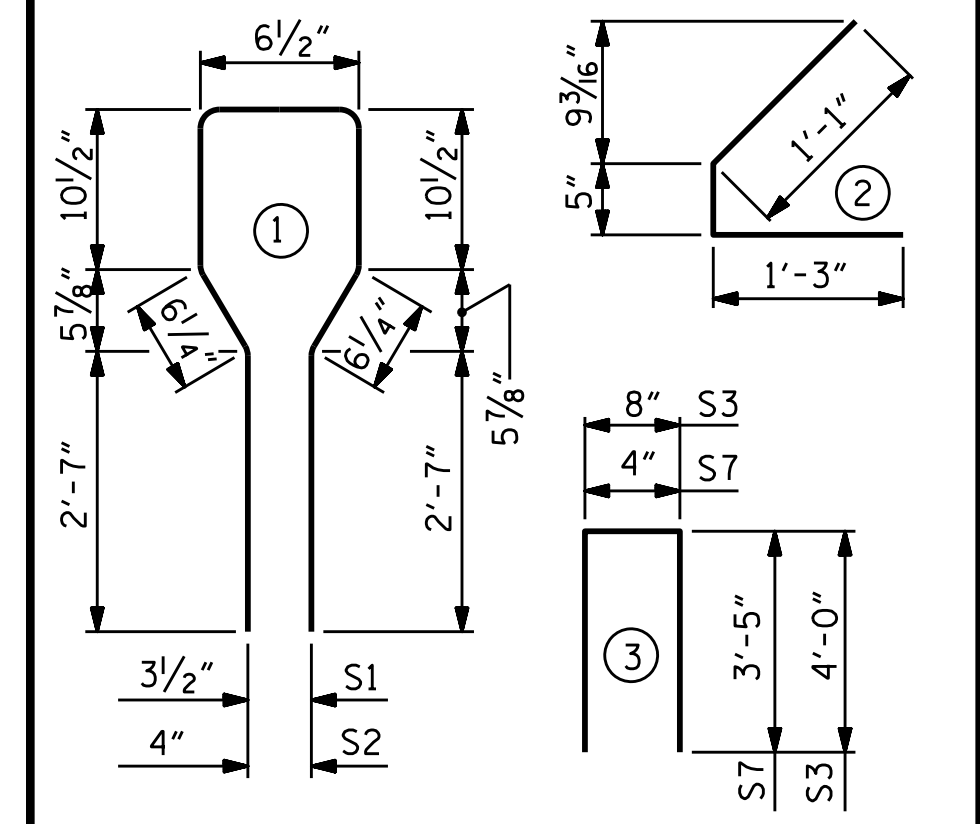
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	110	#4	1	8'-6"	625
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	152	#4	2	2'-9"	279
*S6	12	#5	STR	3'-8"	46
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	23
S10	1	#3	STR	1'-0"	1

TOTAL REINFORCING STEEL 1,165 LBS.

* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

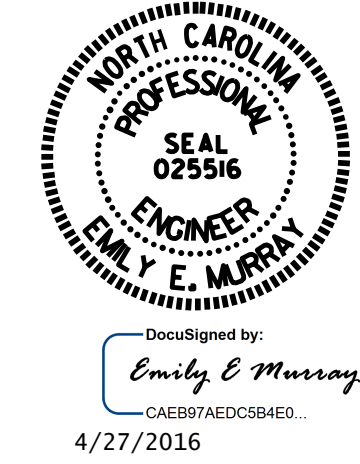
	REINFORCING STEEL (LB.)	8,000 PSI CONCRETE (C.Y.)	0.6" Ø L. R. STRANDS (No.)
SPAN C	1,165	10.6	30

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	73'-7 1/2"	368'-1 1/2"

PROJECT NO. B-4761
 HALIFAX COUNTY
 STATION: 20+11.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 AASHTO TYPE III
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 SPAN C



ASSEMBLED BY : M.D.PISO DATE :6-30-2015
 CHECKED BY : N.RUFFIN DATE :8-07-2015
 DRAWN BY : ELR 8/91
 CHECKED BY : GRP 8/91

DESIGN ENGINEER OF RECORD:
 G. KOUCHEKI DATE : 3/14/16

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1			3			TOTAL SHEETS 31	
2			4				

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

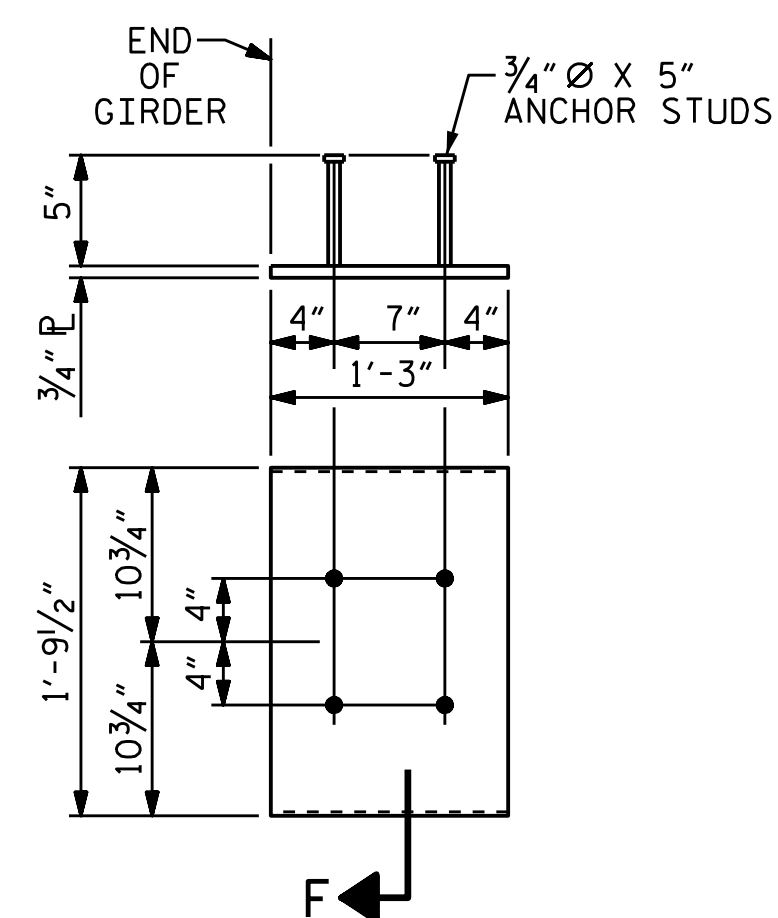
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

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

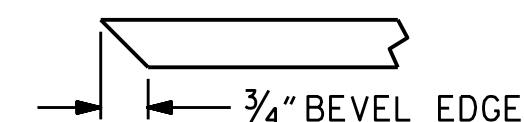
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4,000 PSI. FOR SPAN A, 6,400 PSI. FOR SPAN B, AND 6,400 PSI. FOR SPAN C.

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

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



EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE III GIRDER
(2 REQ'D PER GIRDER)



SECTION "F"
(SEE NOTES)

DEAD LOAD DEFLECTION TABLE FOR SPAN A											
0.6" LOW RELAXATION	GIRDER 2,3,&4										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	0.020	0.038	0.052	0.061	0.064	0.061	0.052	0.038	0.020	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	0.010	0.019	0.026	0.030	0.032	0.030	0.026	0.019	0.010	0.0
FINAL CAMBER ↑	0.0	1/8"	1/4"	5/16"	3/8"	3/8"	3/8"	5/16"	1/4"	1/8"	0.0

DEAD LOAD DEFLECTION TABLE FOR SPAN A											
0.6" LOW RELAXATION	GIRDER 1,5										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	0.020	0.038	0.052	0.061	0.064	0.061	0.052	0.038	0.020	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	0.009	0.017	0.023	0.027	0.029	0.027	0.023	0.017	0.009	0.0
FINAL CAMBER ↑	0.0	1/8"	1/4"	3/8"	7/16"	7/16"	7/16"	3/8"	1/4"	1/8"	0.0

DEAD LOAD DEFLECTION TABLE FOR SPAN B											
0.6" LOW RELAXATION	GIRDER 2,3,&4										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	0.055	0.104	0.142	0.166	0.175	0.166	0.142	0.104	0.055	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	0.039	0.073	0.100	0.117	0.123	0.117	0.100	0.073	0.039	0.0
FINAL CAMBER ↑	0.0	3/16"	3/8"	1/2"	9/16"	3/4"	9/16"	1/2"	3/8"	3/16"	0.0

DEAD LOAD DEFLECTION TABLE FOR SPAN B											
0.6" LOW RELAXATION	GIRDER 1 & 5										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	0.055	0.104	0.142	0.166	0.175	0.166	0.142	0.104	0.055	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	0.035	0.066	0.091	0.106	0.112	0.106	0.091	0.066	0.035	0.0
FINAL CAMBER ↑	0.0	1/4"	7/16"	5/8"	3/4"	3/4"	3/4"	5/8"	7/16"	1/4"	0.0

DEAD LOAD DEFLECTION TABLE FOR SPAN C											
0.6" LOW RELAXATION	GIRDER 2,3,&4										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	0.051	0.096	0.131	0.154	0.161	0.154	0.131	0.096	0.051	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	0.029	0.054	0.074	0.087	0.092	0.087	0.074	0.054	0.029	0.0
FINAL CAMBER ↑	0.0	1/4"	1/2"	11/16"	13/16"	13/16"	13/16"	11/16"	1/2"	1/4"	0.0

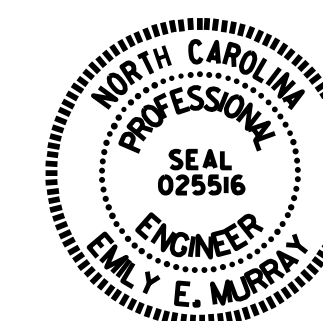
DEAD LOAD DEFLECTION TABLE FOR SPAN C											
0.6" LOW RELAXATION	GIRDER 1 & 5										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	0.051	0.096	0.131	0.154	0.161	0.154	0.131	0.096	0.051	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	0.026	0.049	0.068	0.079	0.083	0.079	0.068	0.049	0.026	0.0
FINAL CAMBER ↑	0.0	1/4"	9/16"	3/4"	7/8"	15/16"	7/8"	3/4"	9/16"	1/4"	0.0

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

ASSEMBLED BY : M.D.PISO DATE : 6-30-2015
CHECKED BY : N.RUFFIN DATE : 8-21-2015

DRAWN BY : ELR 11/91 REV. 10/1/11 MAA/GM
CHECKED BY : GRP 11/91 REV. 1/15 MAA/TMG
REV. 2/15 MAA/TMG

DESIGN ENGINEER OF RECORD:
G. KOUCHEKI DATE : 3/14/16



DocuSigned by:
Emily E. Murray
4/27/2016

PROJECT NO. B-4761
HALIFAX COUNTY
STATION: 20+11.00 -L-

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

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14	
1			3			TOTAL SHEETS 31	
2			4				

STRUCTURAL STEEL NOTES

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

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

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

THE PLATES, BENT PLATES, CHANNELS, AND ANGLES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

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

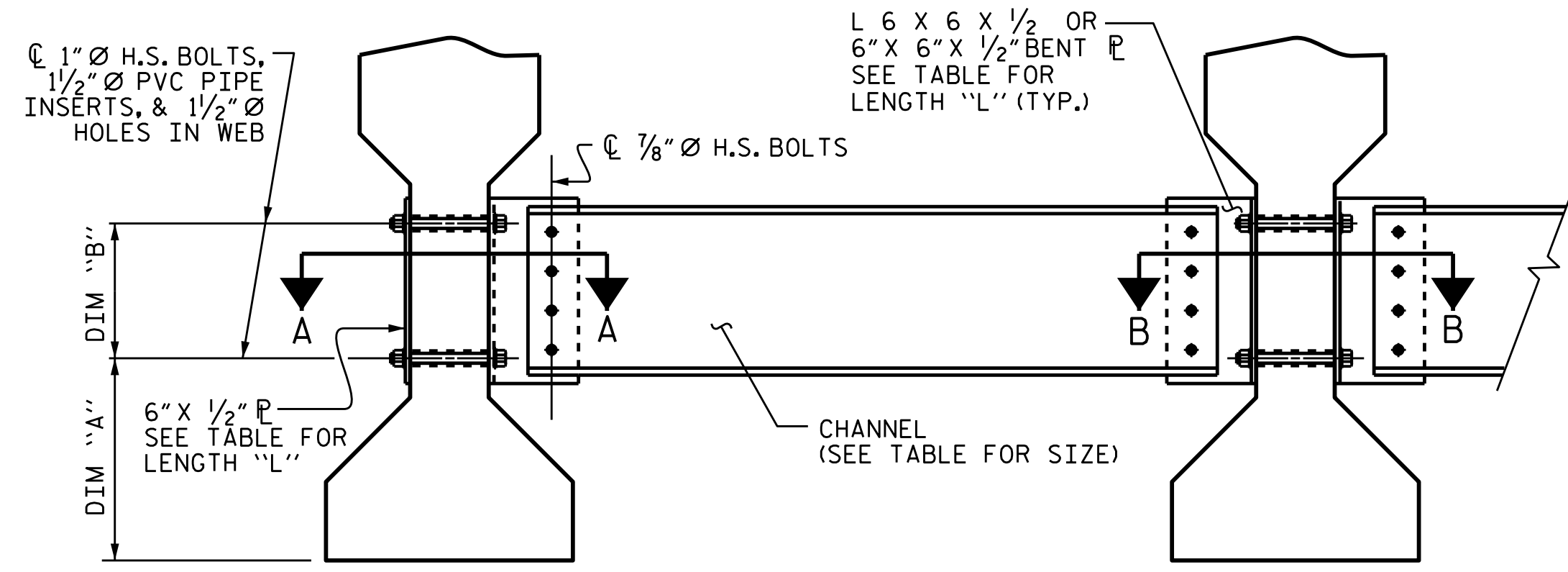
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

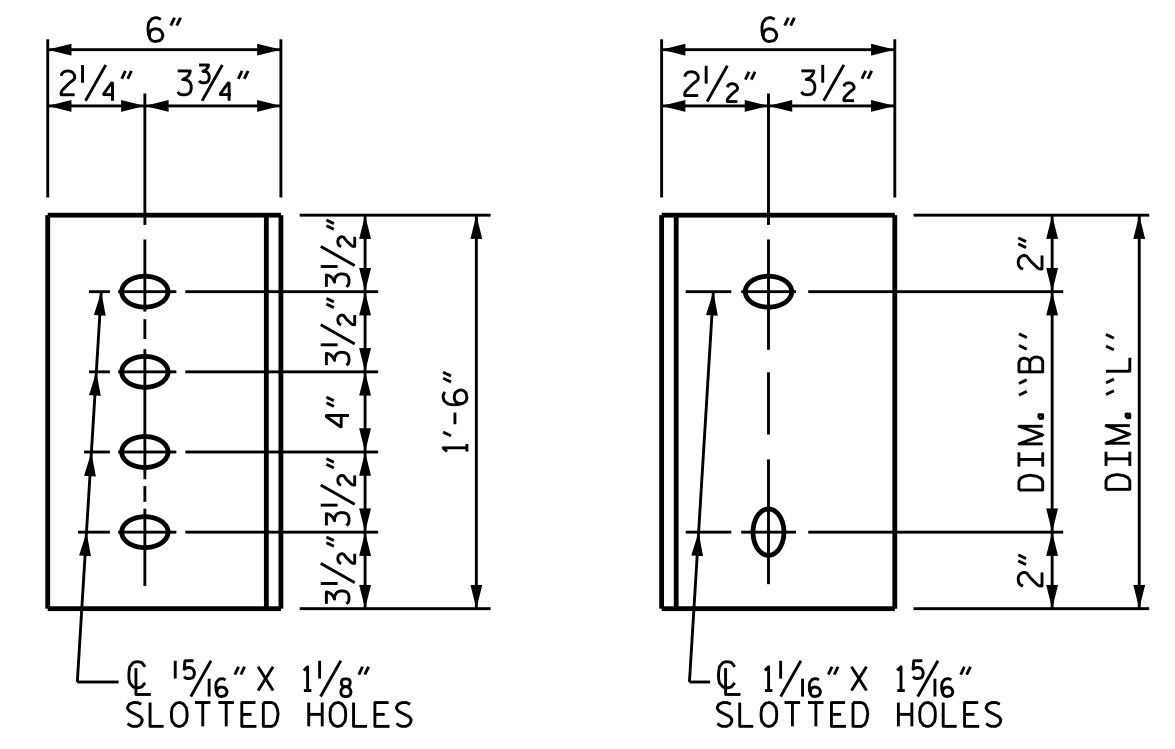
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

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



EXTERIOR GIRDER **INTERIOR GIRDER**
PART SECTION AT INTERMEDIATE DIAPHRAGM
 (TYPE III OR TYPE IV GIRDER SHOWN)



DIAPHRAGM FACE **WEB FACE**
CONNECTOR PLATE DETAILS

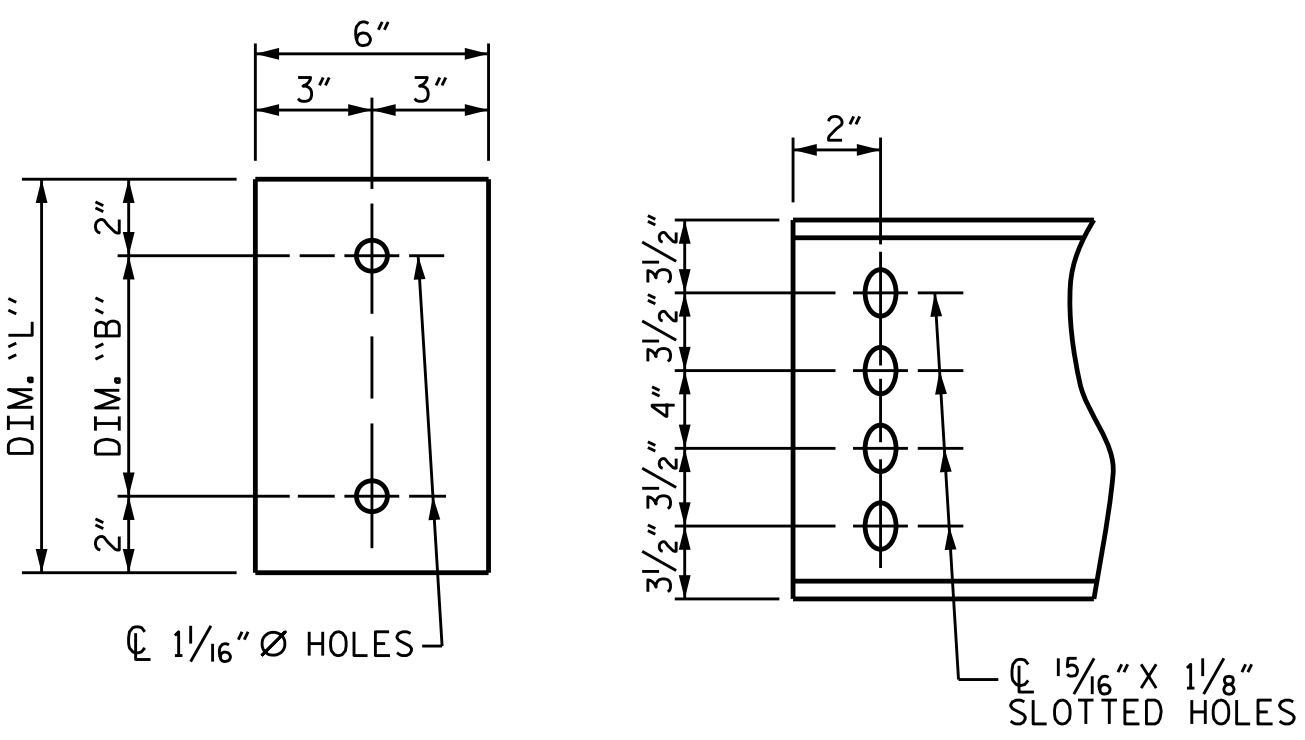
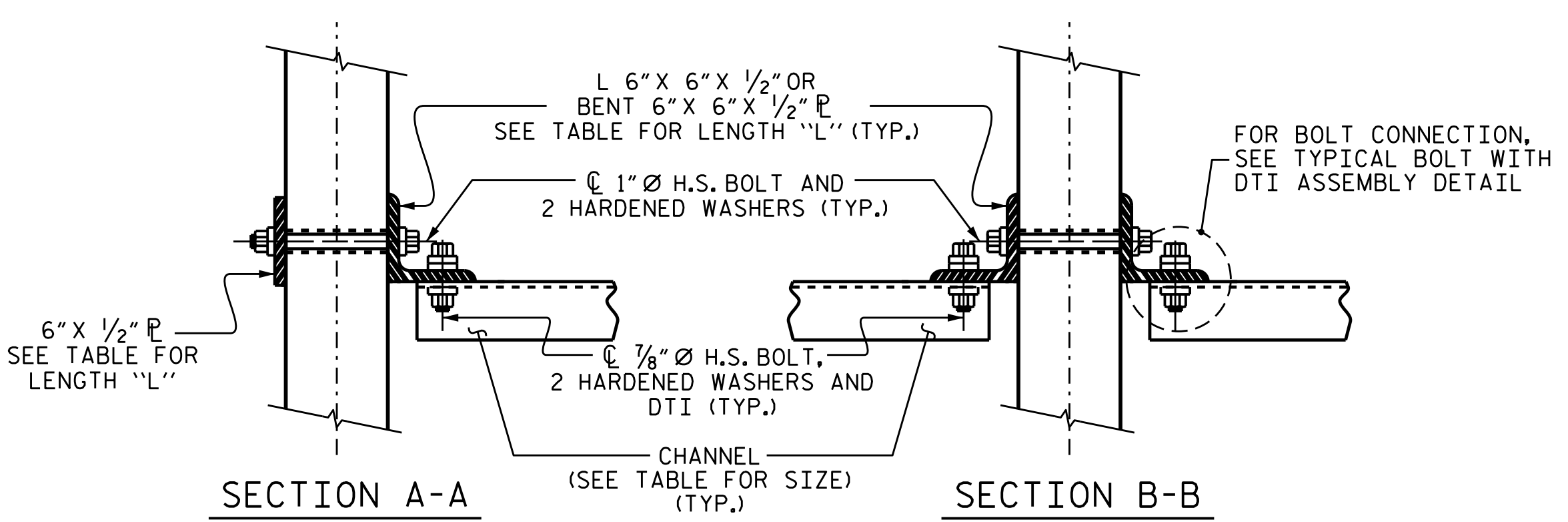
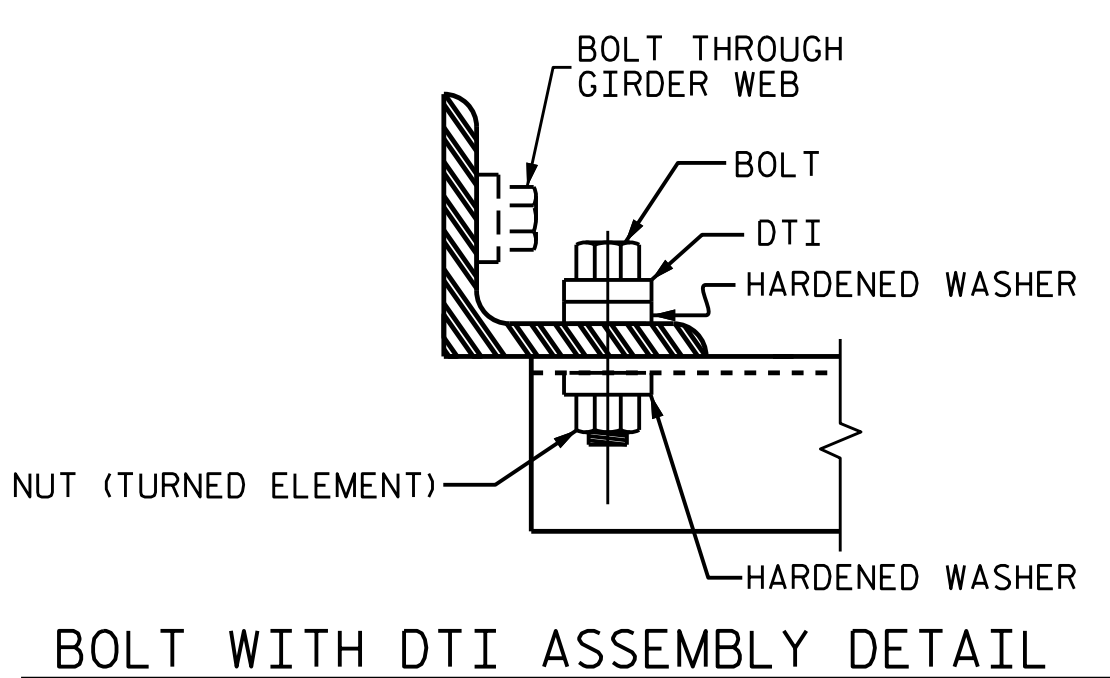


PLATE DETAILS **CHANNEL END**



SECTION A-A **SECTION B-B**
CONNECTION DETAILS

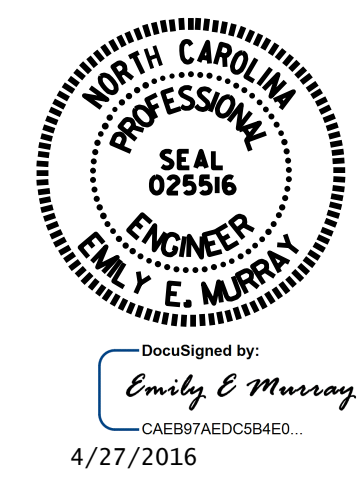


BOLT WITH DTI ASSEMBLY DETAIL

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
III	MC 18 x 42.7	1'-5"	1'-2"	1'-6"

PROJECT NO. B-4761
 HALIFAX COUNTY
 STATION: 20+11.00 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 INTERMEDIATE
 STEEL DIAPHRAGMS
 FOR TYPE II, III, & IV
 PRESTRESSED CONCRETE
 GIRDERS

ASSEMBLED BY : M.D.PISO	DATE : 6-29-15
CHECKED BY : N.RUFFIN	DATE : 7-29-15
DRAWN BY : TLA 6/05	ADDED 10/21/05
CHECKED BY : VC 6/05	REV. 5/1/06RRR KMM/GM
	REV. 10/1/11 MAA/GM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS 31
2			4			

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.

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

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

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

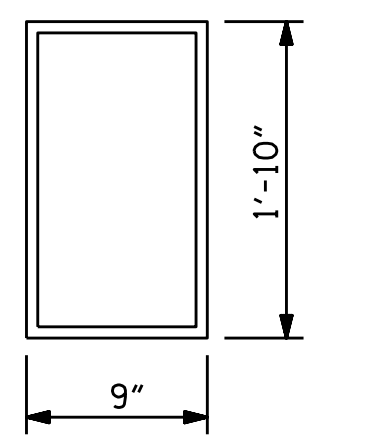
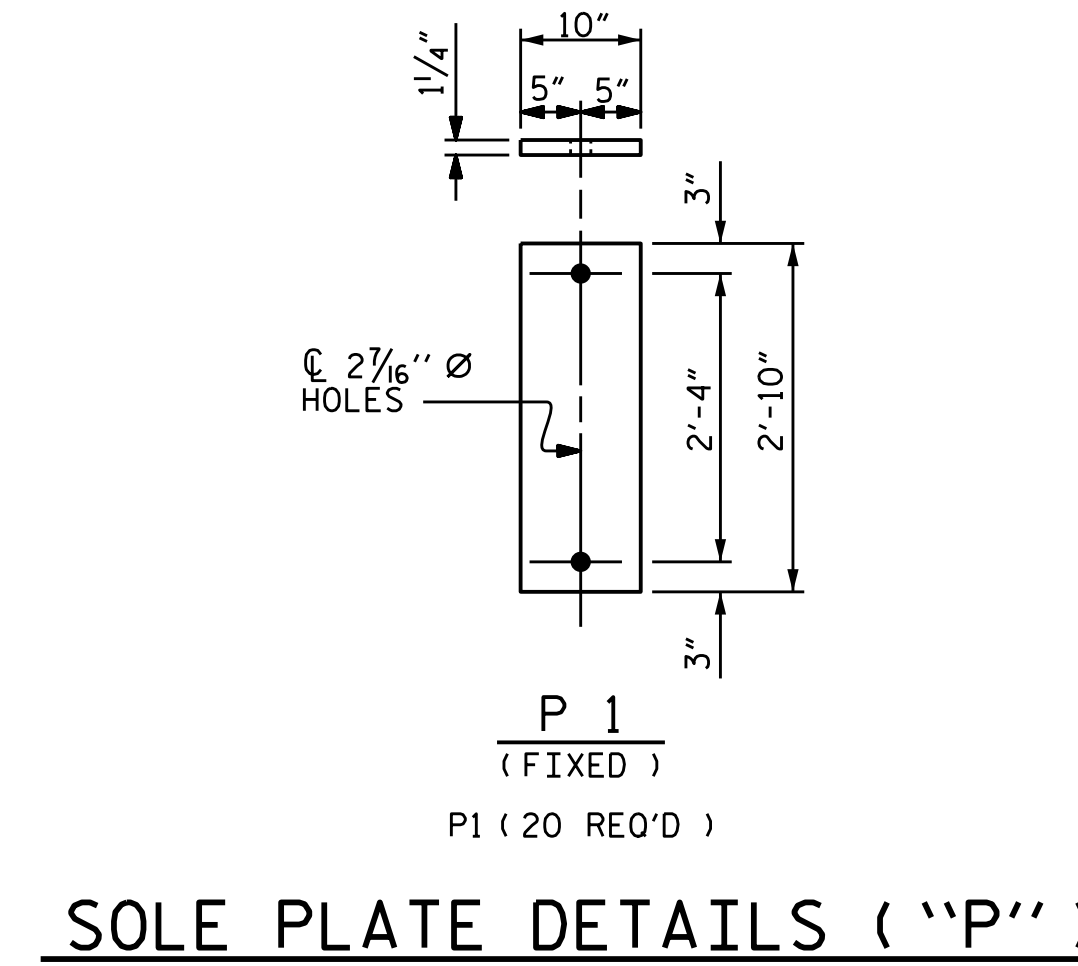
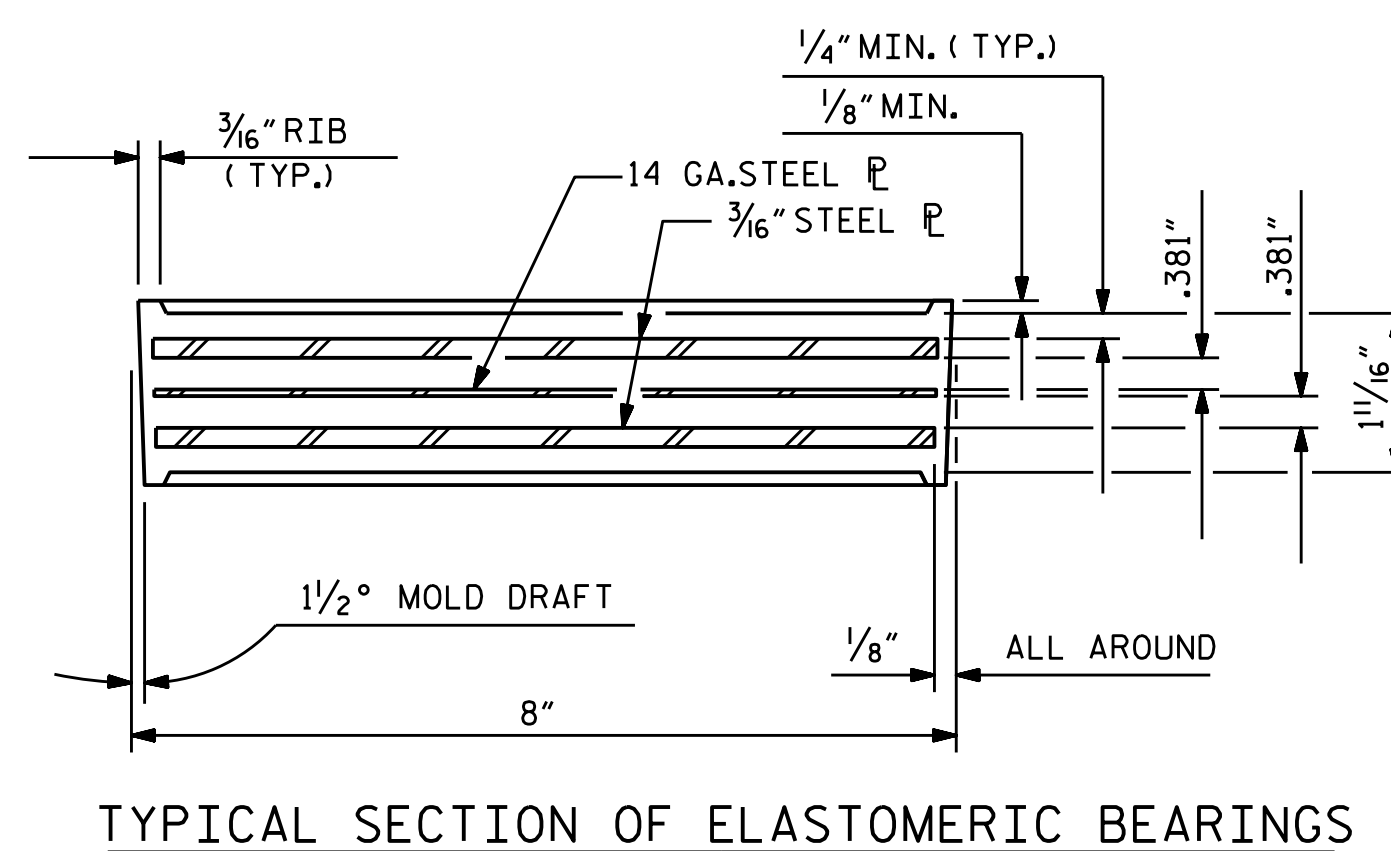
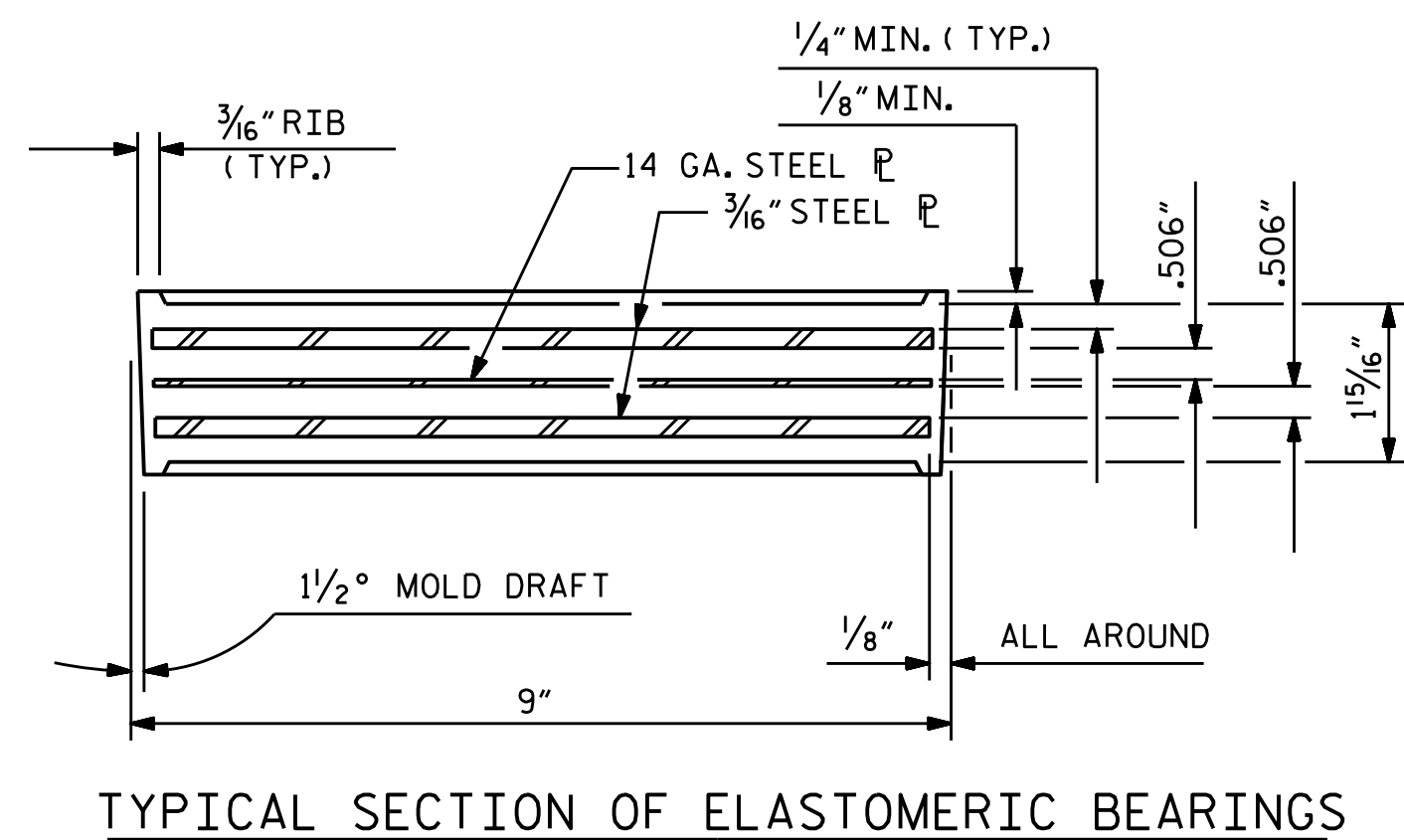
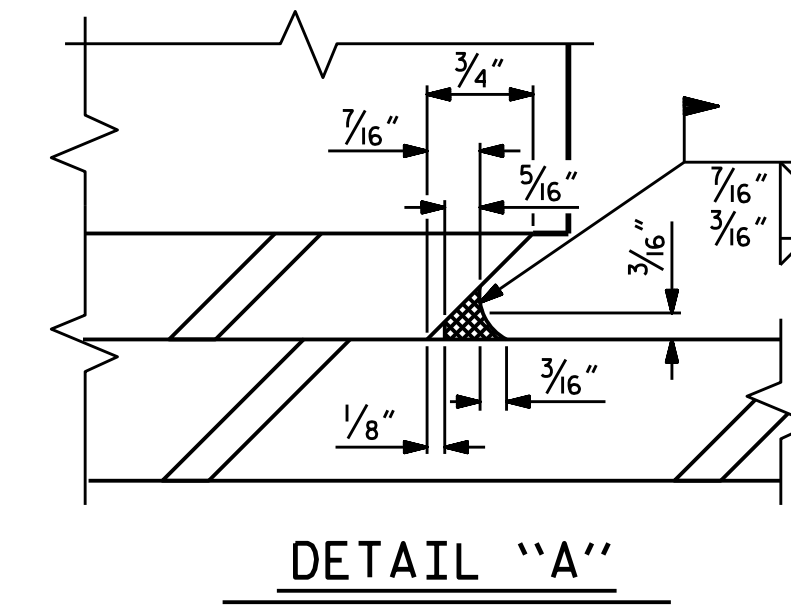
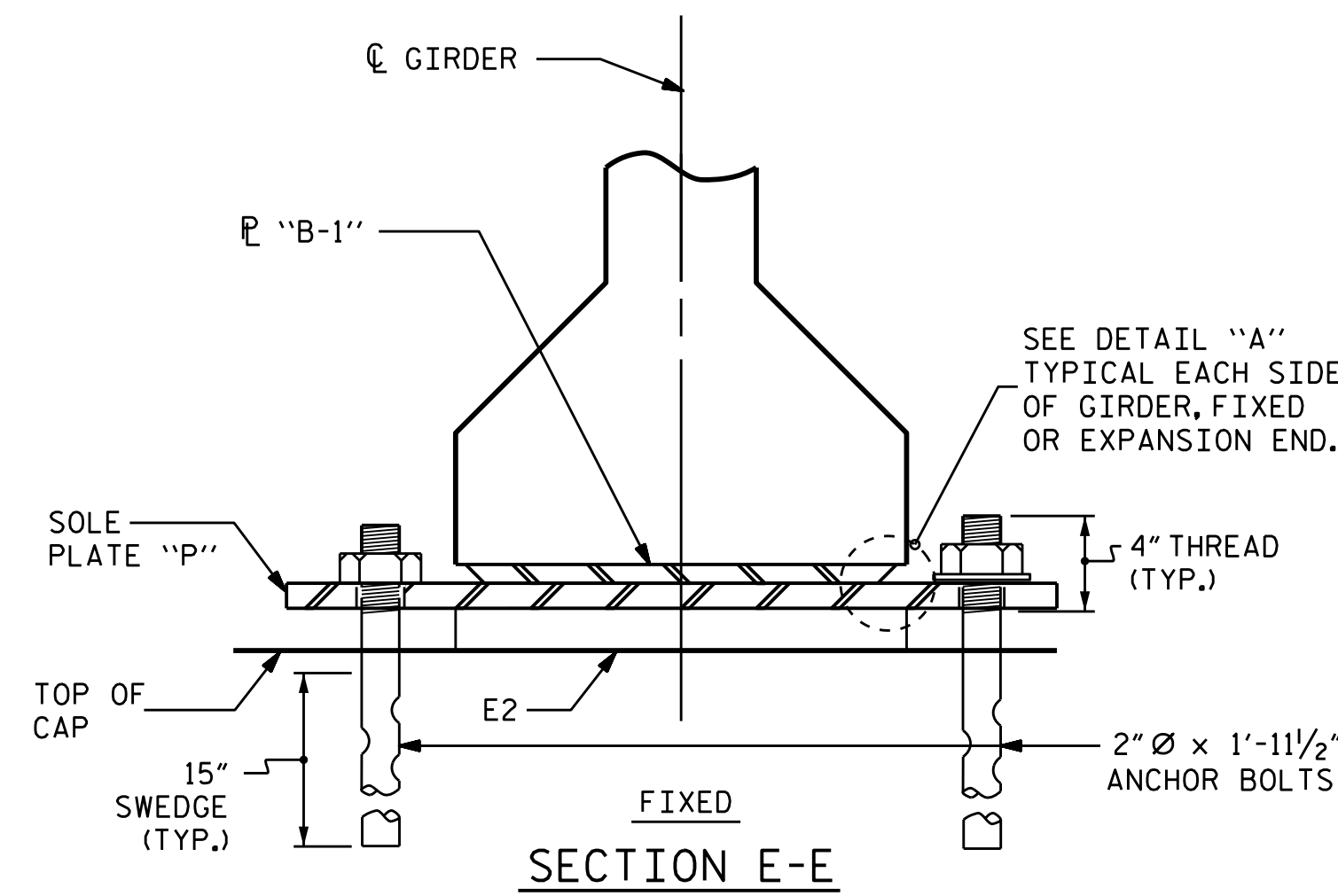
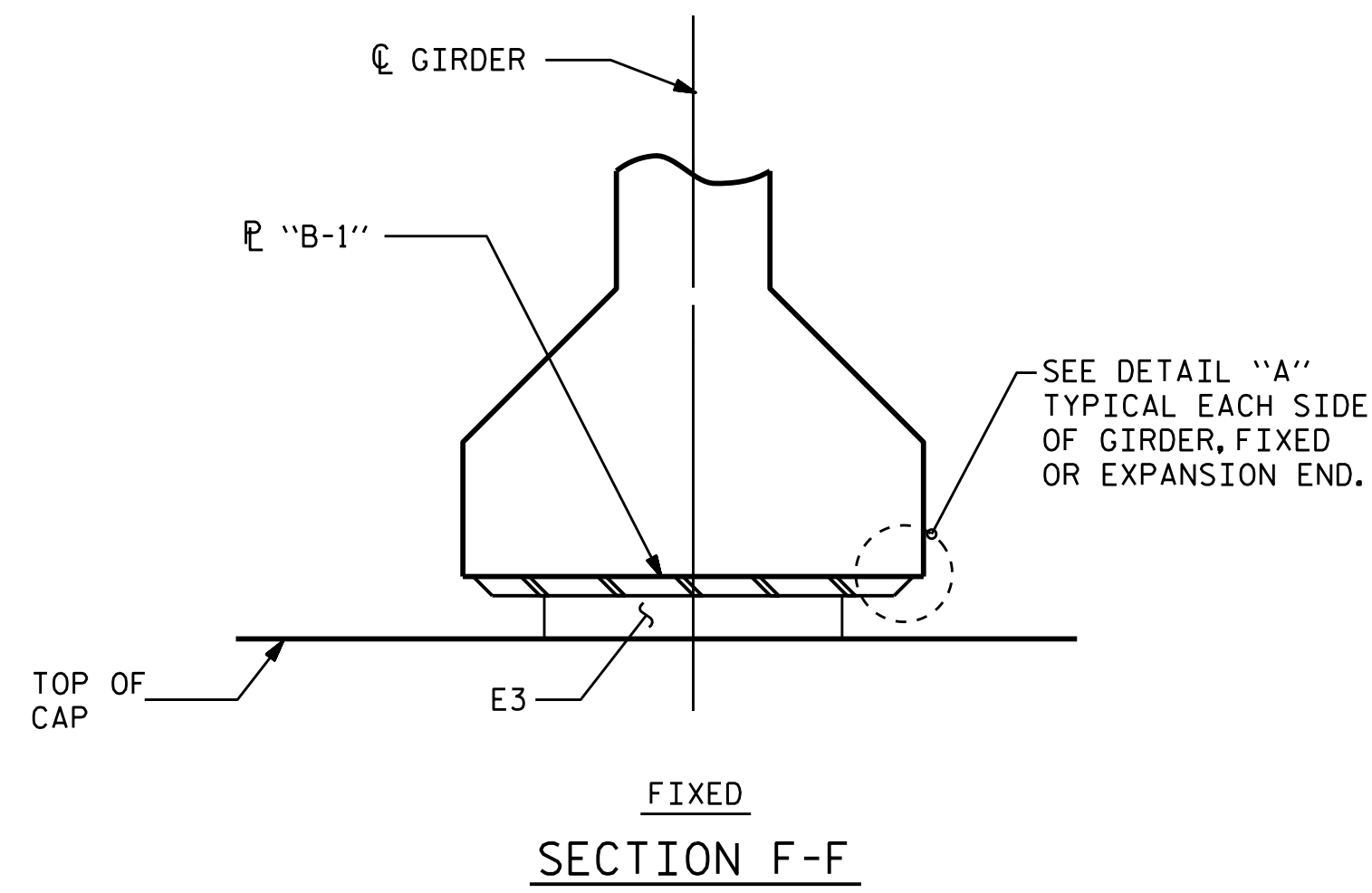
SOLE PLATE "P", BOLTS, NUTS, AND WASHERS SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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

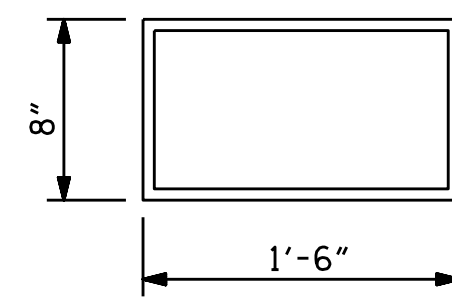
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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.



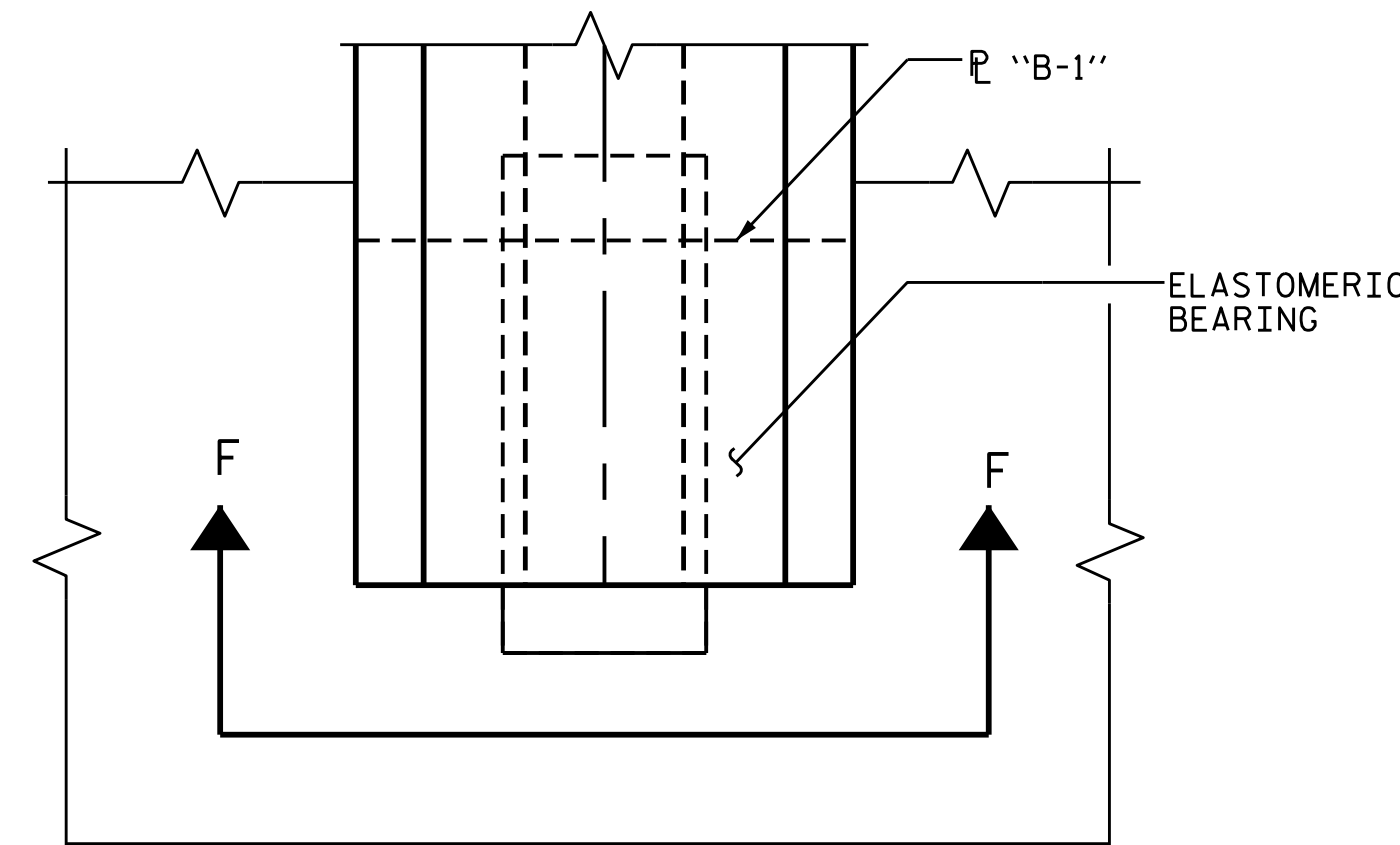
PLAN VIEW OF ELASTOMERIC BEARING



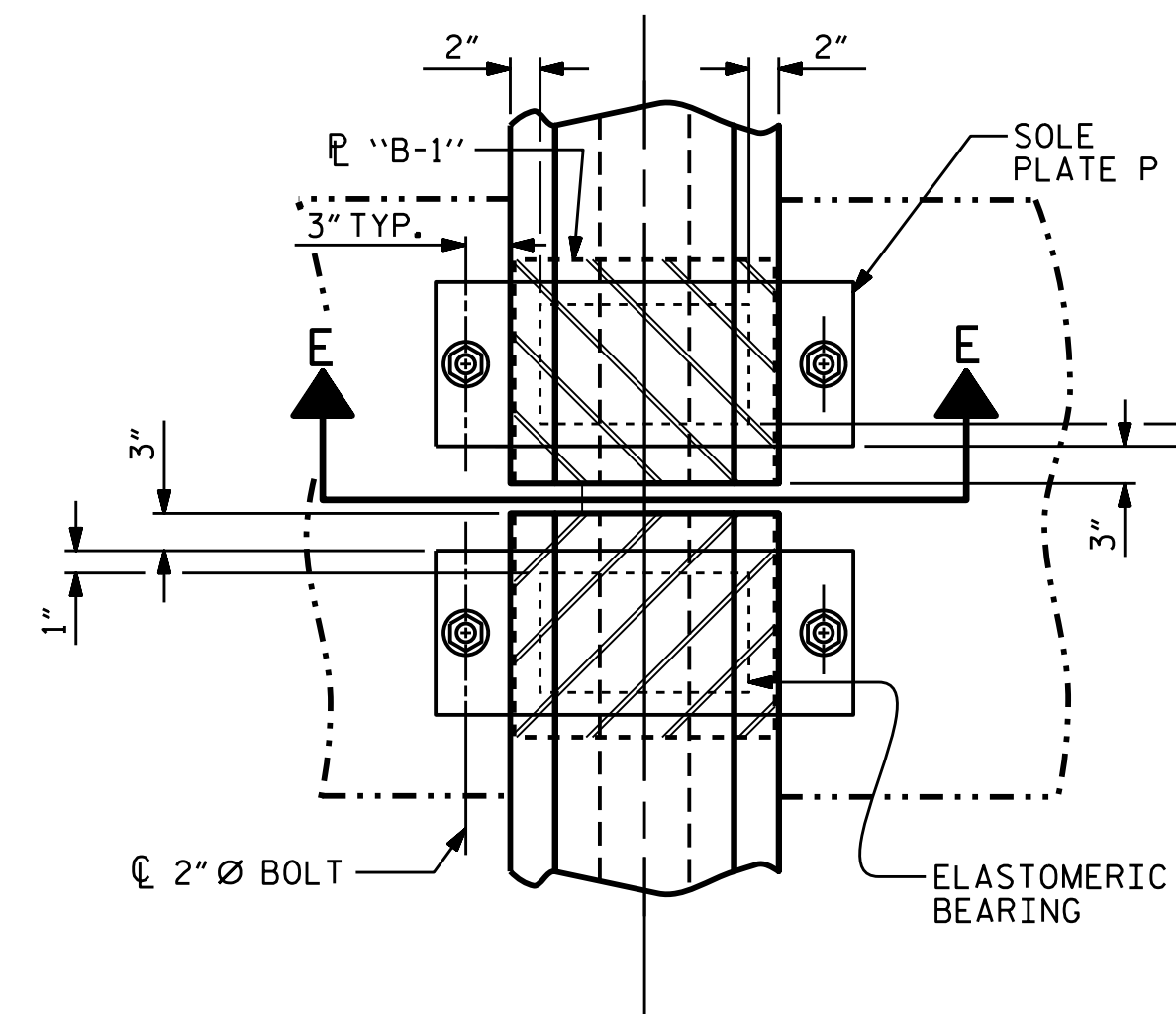
PLAN VIEW OF ELASTOMERIC BEARING

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE III	205 k
TYPE IV	225 k

TYPE IV
(AT INTEGRAL END BENTS)



TYPE III
(AT BENT 1 & BENT 2)



PROJECT NO. B-4761
HALIFAX COUNTY
 STATION: 20+11.00 -L-

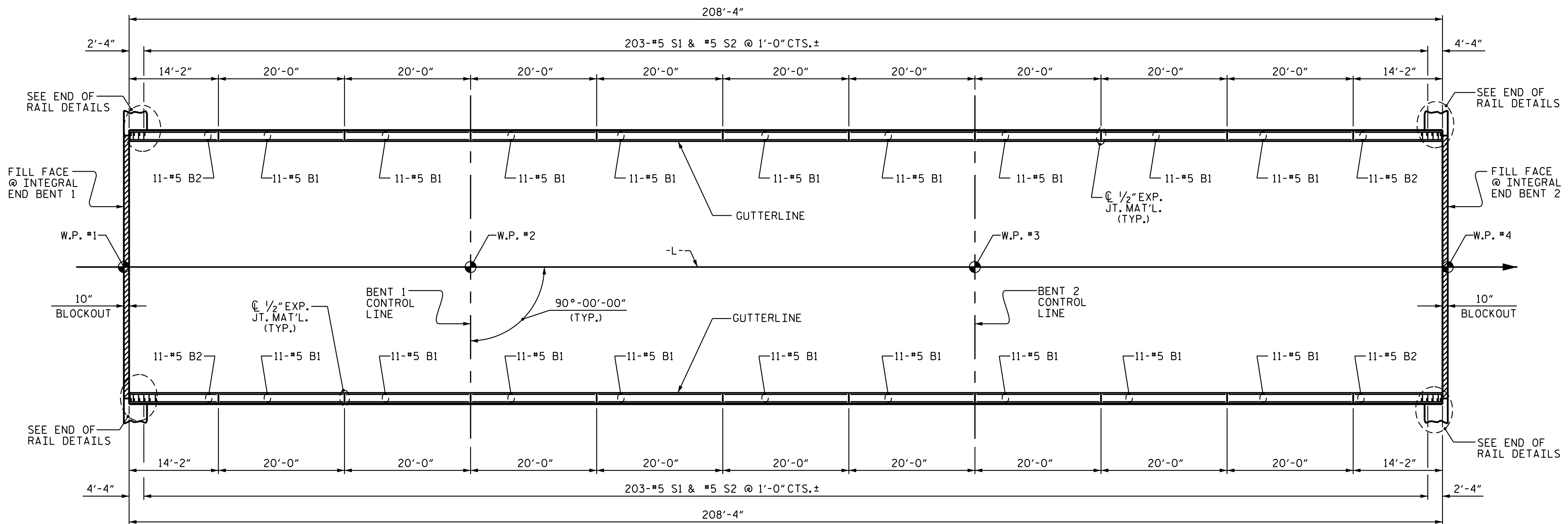


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
**ELASTOMERIC BEARING
 DETAILS**
 PRESTRESSED CONCRETE GIRDER
 SUPERSTRUCTURE

ASSEMBLED BY : M.D.PISO	DATE : 6-30-2015
CHECKED BY : N.RUFFIN	DATE : 7-29-2015
DRAWN BY : WJH 8/89	REV. 10/1/11
CHECKED BY : CRK 8/89	REV. 6/13
	REV. 1/15
DESIGN ENGINEER OF RECORD:	DATE : 3/14/16
G. KOUCHEKI	

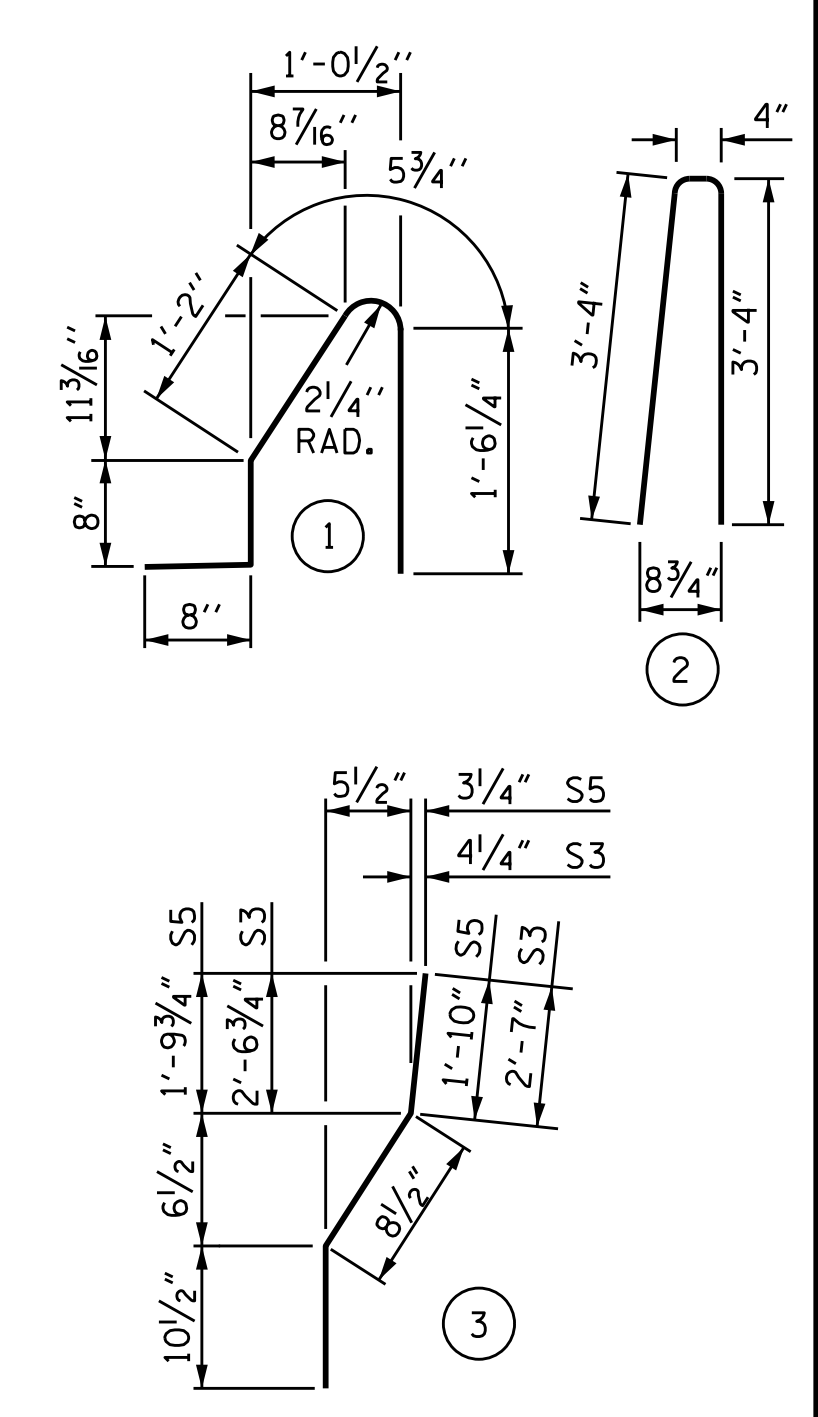
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16	
1			3			TOTAL SHEETS	31
2			4				



PLAN

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
*B1	198	#5 STR.	19'-6"	4,027	
*B2	44	#5 STR.	13'-9"	631	
*S1	406	#5	4'-6"	1,906	
*S2	406	#5	7'-0"	2,964	
*S3	4	#5	3	4'-2"	17
*S4	4	#5 STR.	4'-0"	17	
*S5	8	#5	3	3'-5"	29
*S6	8	#5 STR.	3'-3"	27	

* EPOXY COATED REINFORCING STEEL 9,618 LBS.
 CLASS A CONCRETE 56.7 CU. YDS.
 CONCRETE BARRIER RAIL 416.67 LIN. FT.

NOTES

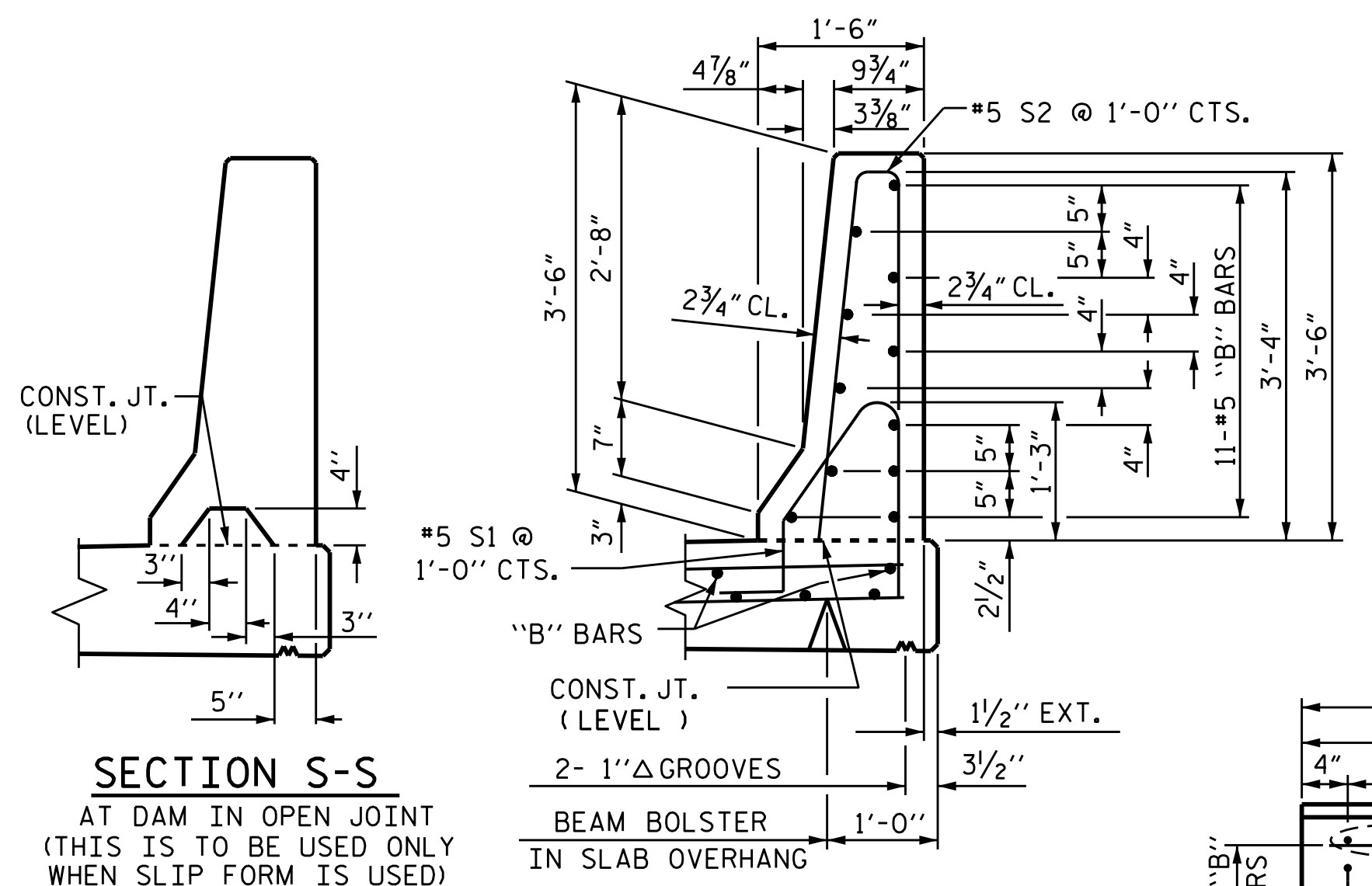
THE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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 TEN FEET IN LENGTH.

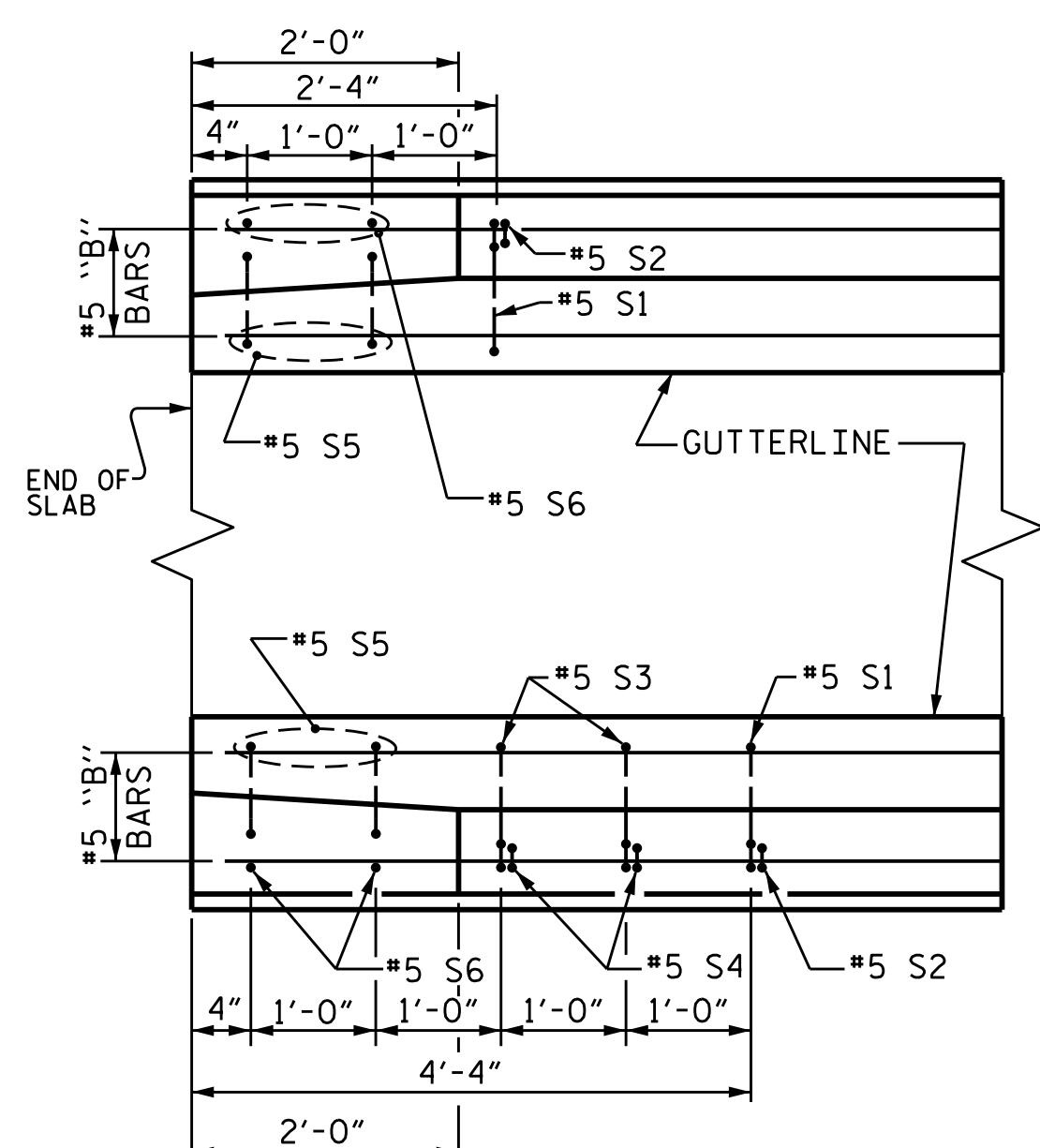
*5S1 AND *5S2 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL IN RAIL.

THE *5S3, *5S4, *5S5 AND *5S6 BARS SHALL BE INSTALLED USING AN ADHESIVE ANCHORING SYSTEM AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE *5S3, *5S4, *5S5 AND *5S6 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

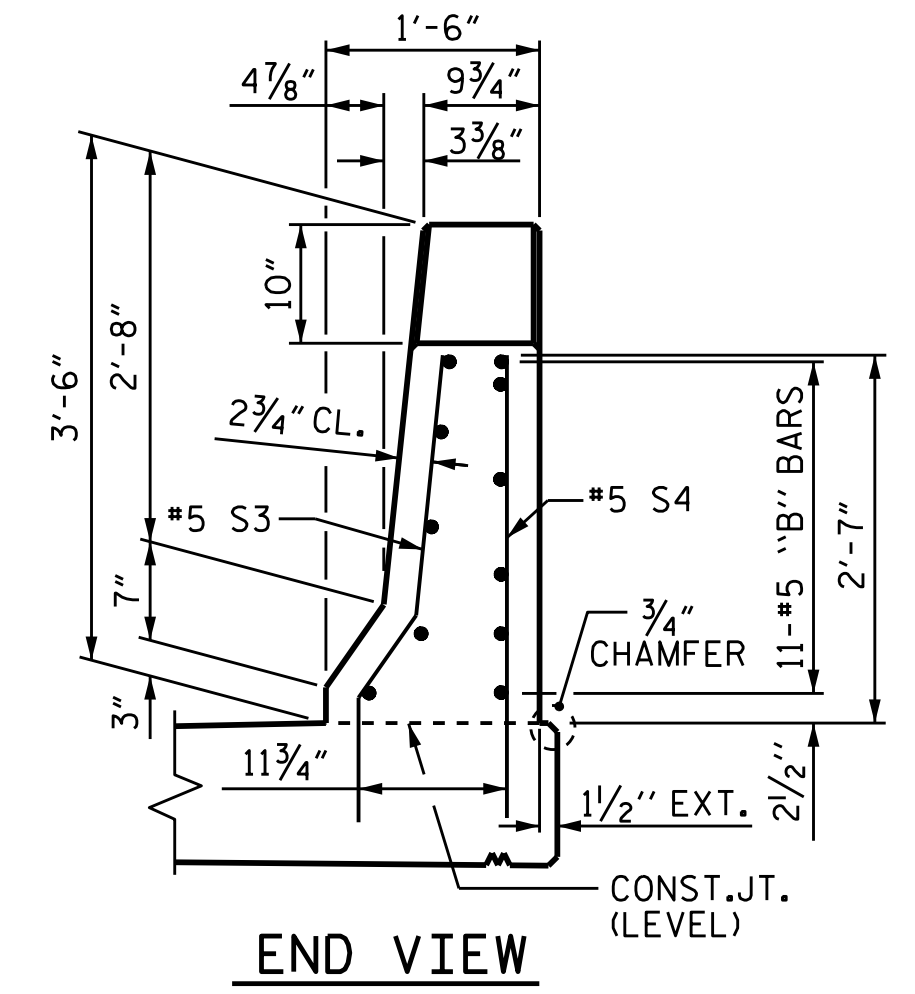


SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED)

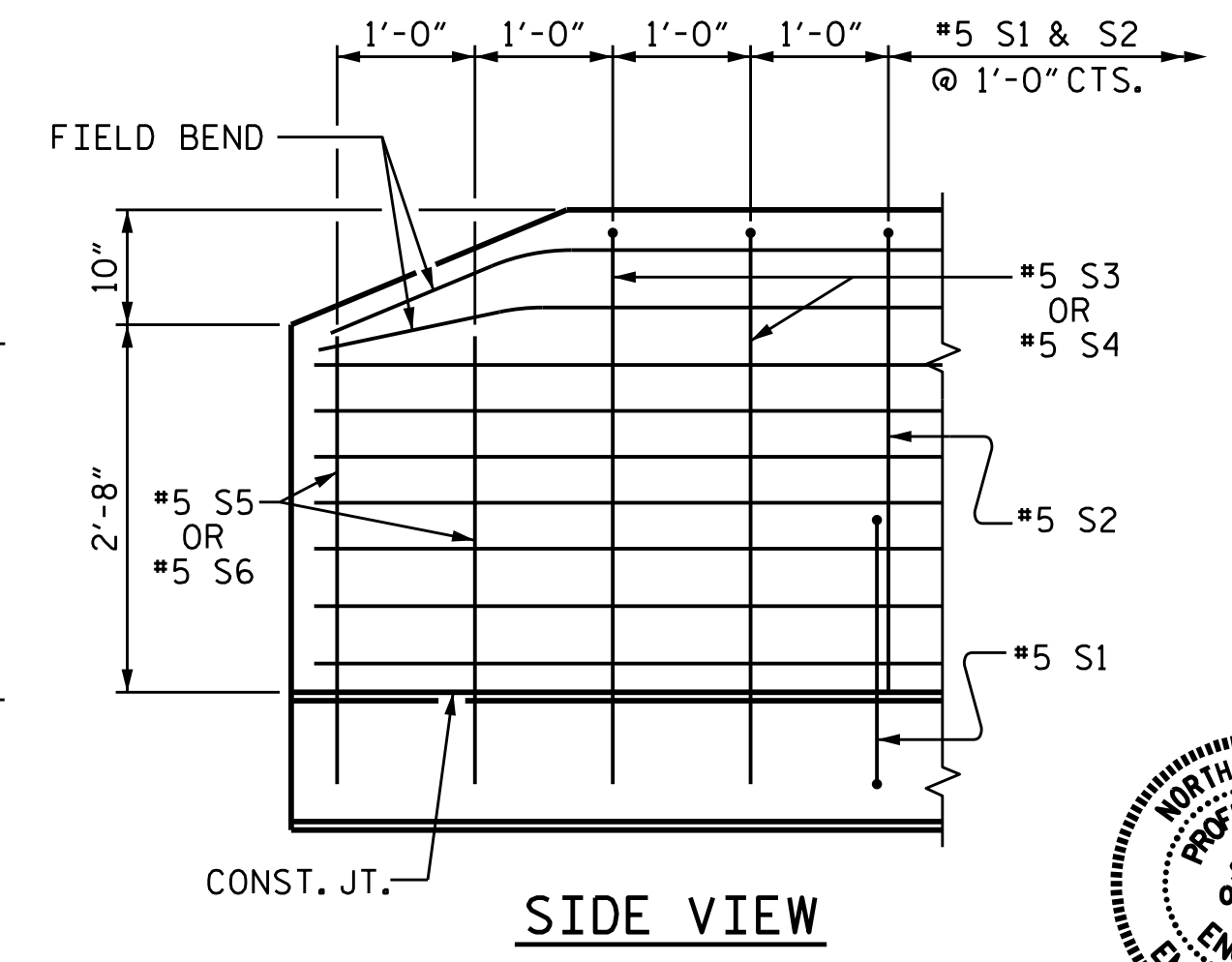
SECTION THRU RAIL



PLAN

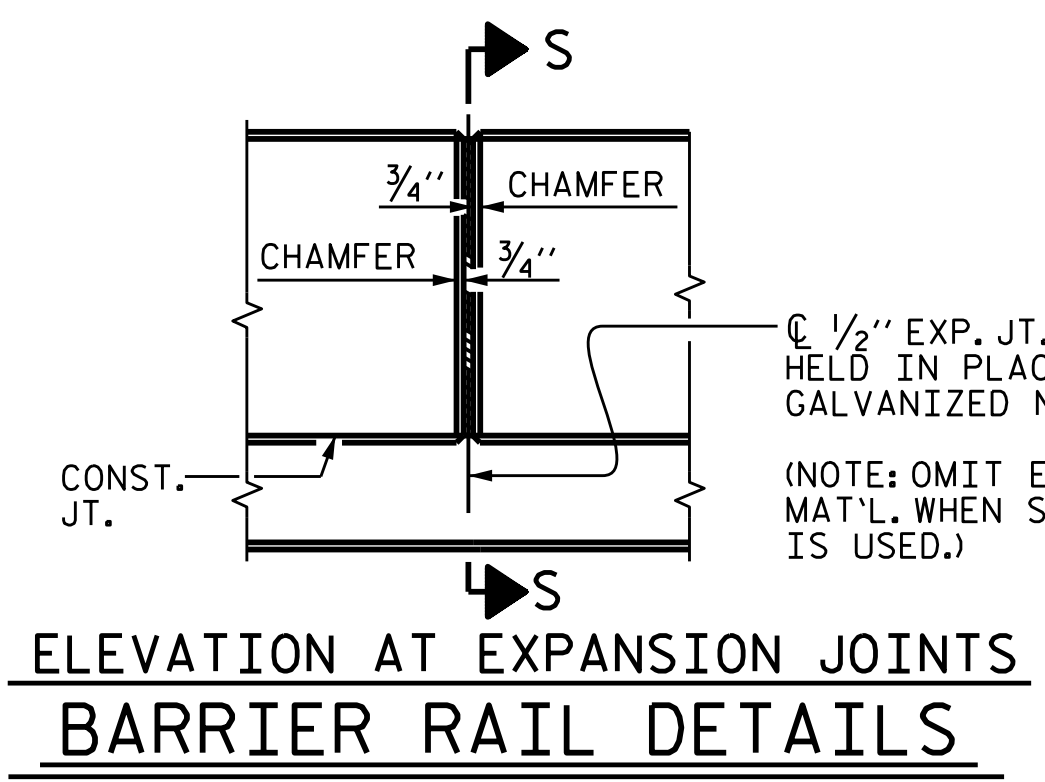


END VIEW



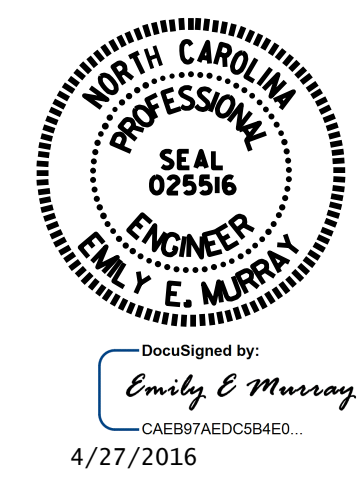
SIDE VIEW

END OF RAIL DETAILS
FOR ADHESIVE ANCHORING AT RAIL ENDS



ELEVATION AT EXPANSION JOINTS
BARRIER RAIL DETAILS

PROJECT NO. B-4761
HALIFAX COUNTY
 STATION: 20+11.00 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
CONCRETE BARRIER RAIL

DRAWN BY : M.D.PISO DATE : 6-08-2015
 CHECKED BY : N.RUFFIN DATE : 7-31-2015
 DESIGN ENGINEER OF RECORD : G. KOUCHEKI DATE : 3/14/16

DOCUMENT NOT CONSIDERED
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS 31
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.)

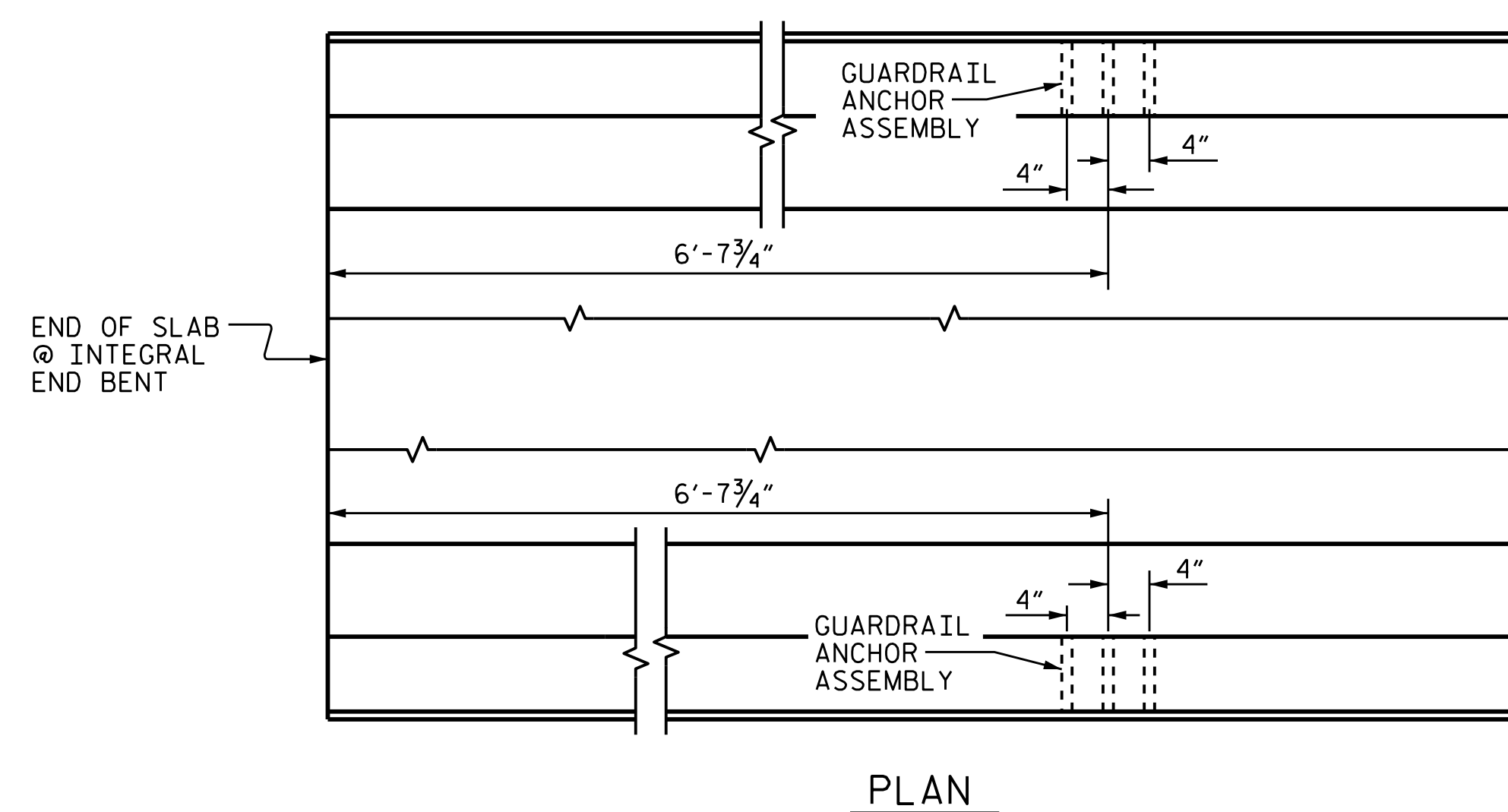
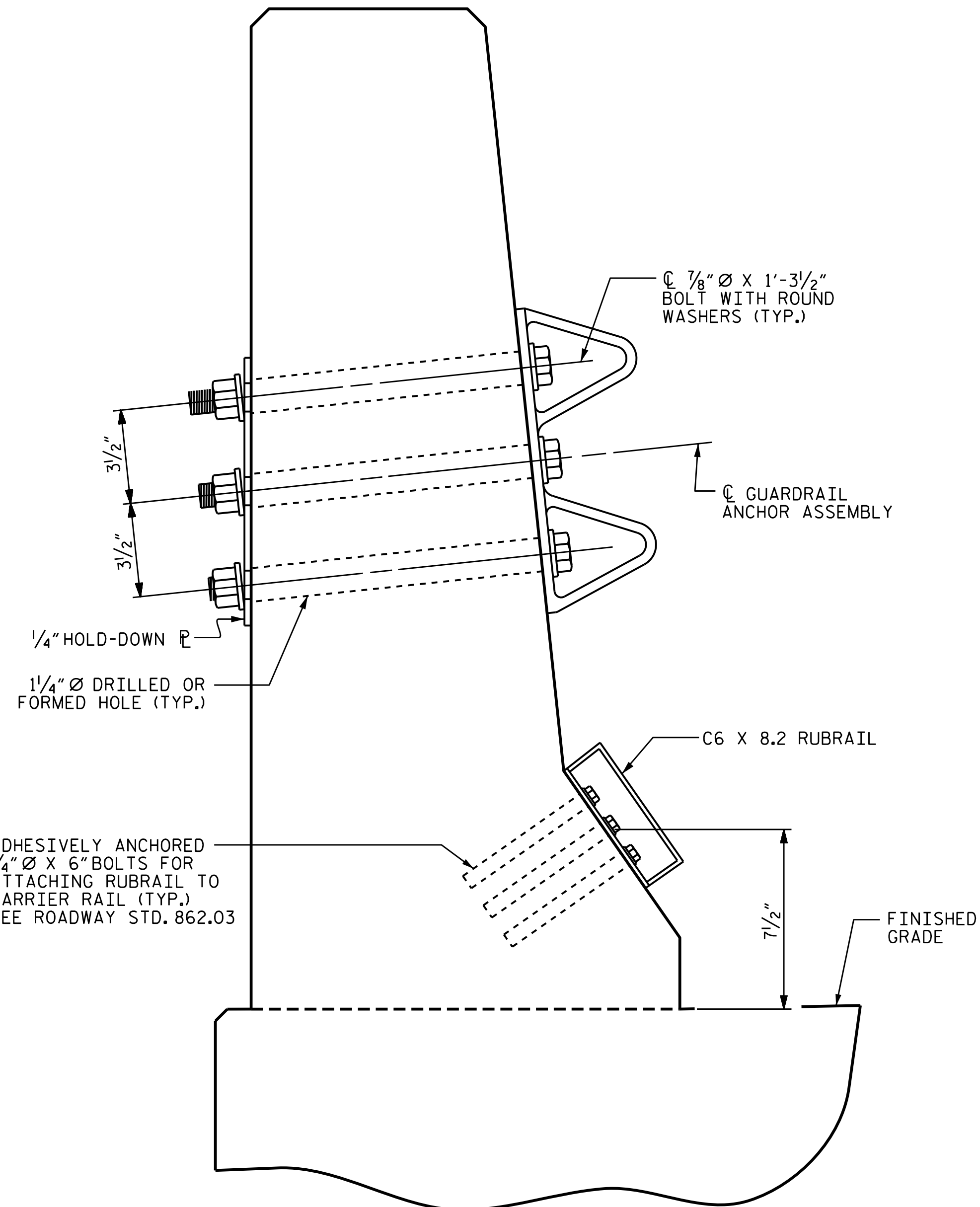
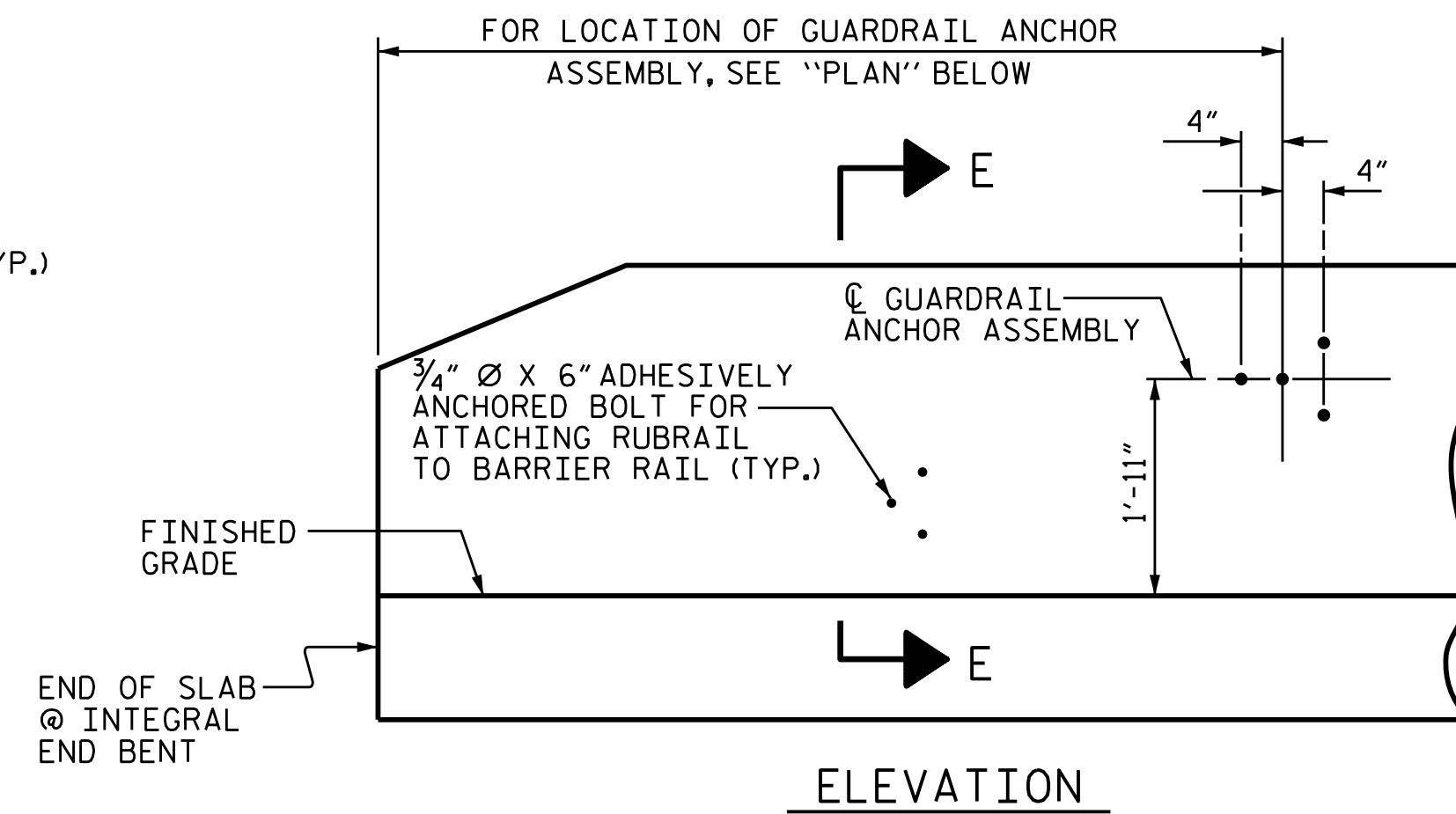
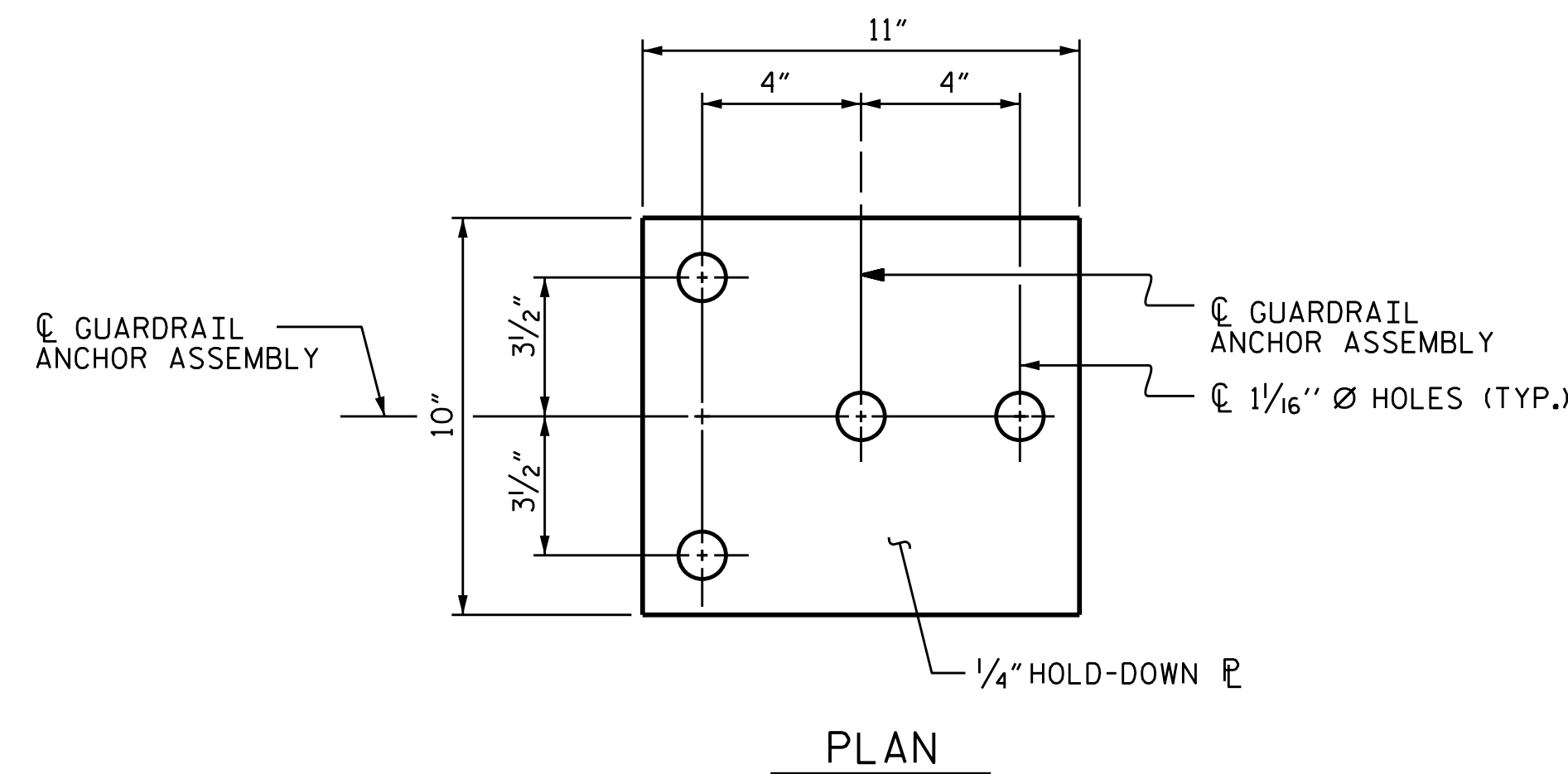
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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 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

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



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4761
HALIFAX COUNTY
 STATION: 20+11.00 -L-



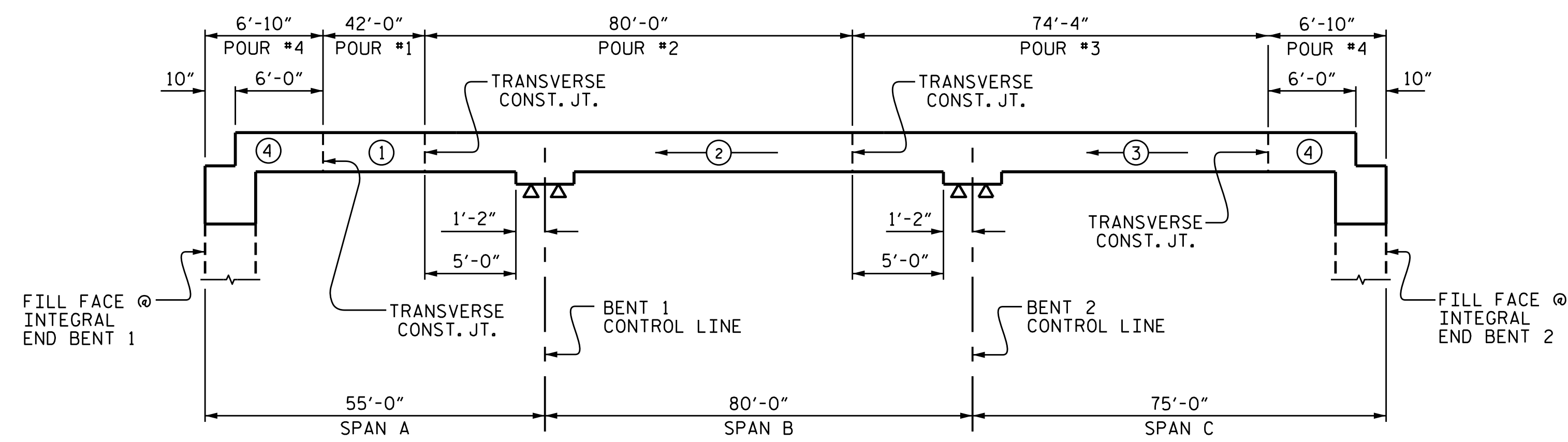
Designed by:
 Emily E. Murray
 4/27/2016

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

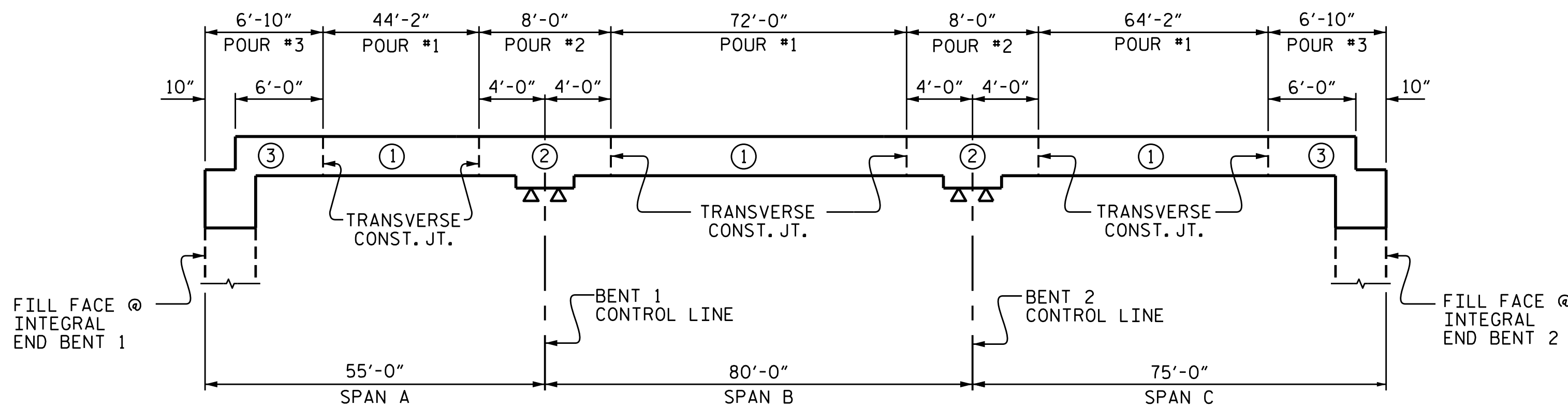
ASSEMBLED BY : M.D.PISO	DATE : 6-08-2015
CHECKED BY : N.RUFFIN	DATE : 7-31-2015
DRAWN BY : TLA 5/06	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS 31
2			4			

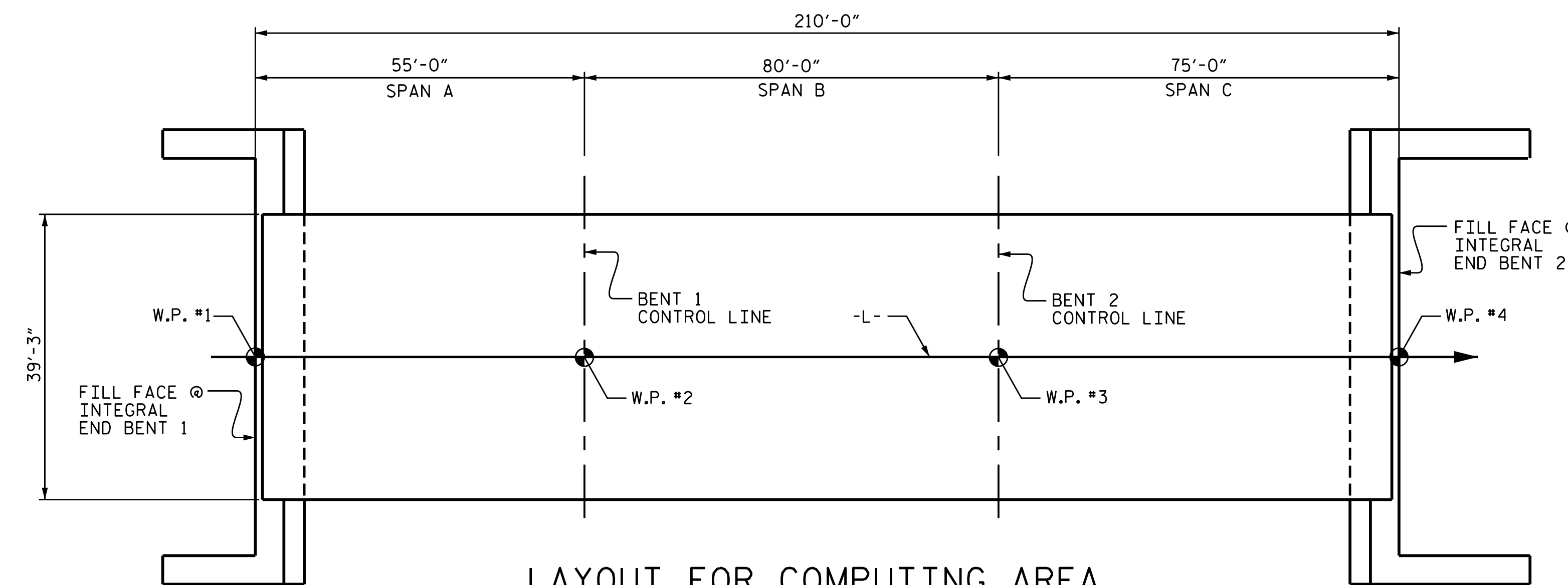


POURING SEQUENCE

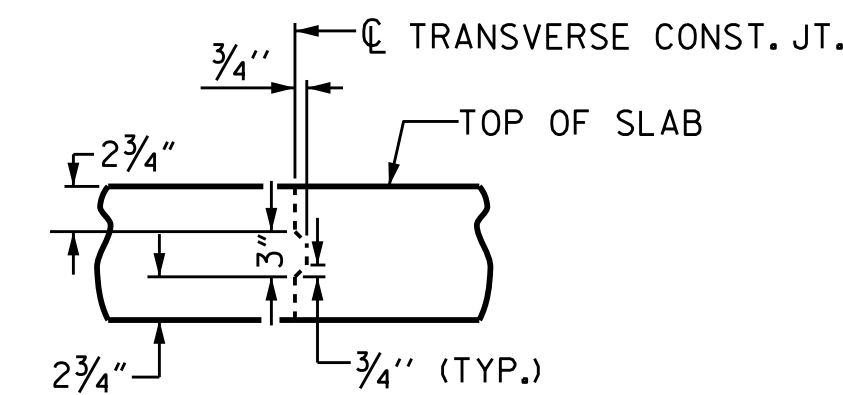


OPTIONAL POURING SEQUENCE

POUR ② CAN NOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3000 PSI



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 8,243)



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

CLASS AA CONCRETE QUANTITIES	
POUR #1	50.9 CU.YDS.
POUR #2	107.4 CU.YDS.
POUR #3	100.5 CU.YDS.
POUR #4	48.6 CU.YDS.
TOTAL CLASS AA CONCRETE	307.4 CU.YDS.

NOTE: QUANTITY FOR BARRIER RAIL AND LOWER PORTION OF CAP IS NOT INCLUDED.

QUANTITIES ALSO REFLECT DEDUCTIONS FOR CONCRETE DISPLACEMENT OF GIRDERS.

BAR TYPES

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	416	#5	STR.	38'-10"	16,849
A2	416	#5	STR.	38'-10"	16,849
*B1	53	#7	STR.	11'-0"	1,192
*B2	28	#4	STR.	25'-6"	477
*B3	28	#7	STR.	50'-6"	2,890
*B4	25	#7	STR.	20'-3"	1,035
*B5	28	#4	STR.	26'-0"	486
*B6	28	#7	STR.	56'-6"	3,234
*B7	25	#7	STR.	23'-3"	1,188
*B8	56	#4	STR.	18'-9"	701
*B9	53	#7	STR.	15'-0"	1,625
B10	192	#5	STR.	53'-9"	10,764
K1	20	#4	STR.	20'-4"	272
K2	8	#4	STR.	6'-1"	33
K3	16	#4	STR.	7'-2"	77
K4	8	#4	STR.	6'-7"	35
K5	8	#4	STR.	6'-11"	37
K7	4	#4	STR.	2'-1"	6
K8	8	#4	STR.	2'-5"	13
K9	4	#4	STR.	2'-3"	6
K10	4	#4	STR.	1'-10"	5
K11	20	#4	STR.	18'-2"	243
K12	32	#4	STR.	7'-4"	157
K13	32	#4	STR.	6'-7"	141
K14	16	#4	STR.	5'-2"	55
*S1	64	#4	1	10'-0"	428
*S2	64	#4	1	11'-11"	509
S3	208	#4	2	2'-9"	382
U1	68	#4	3	10'-3"	466
U3	40	#4	4	11'-8"	312
U4	16	#4	4	10'-0"	107
V1	10	#4	STR.	3'-8"	24
REINFORCING STEEL					29,984 LBS.
* EPOXY COATED REINFORCING STEEL					30,614 LBS.

ALL BAR DIMENSIONS ARE OUT TO OUT.

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

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLAB		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"			

GROOVING BRIDGE FLOORS

APPROACH SLAB	933 SQ. FT.
BRIDGE DECK	6,862 SQ. FT.
TOTAL	7,795 SQ. FT.



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Emily E. Murray
4/27/2016

PROJECT NO. B-4761
HALIFAX COUNTY
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
BILL OF MATERIAL

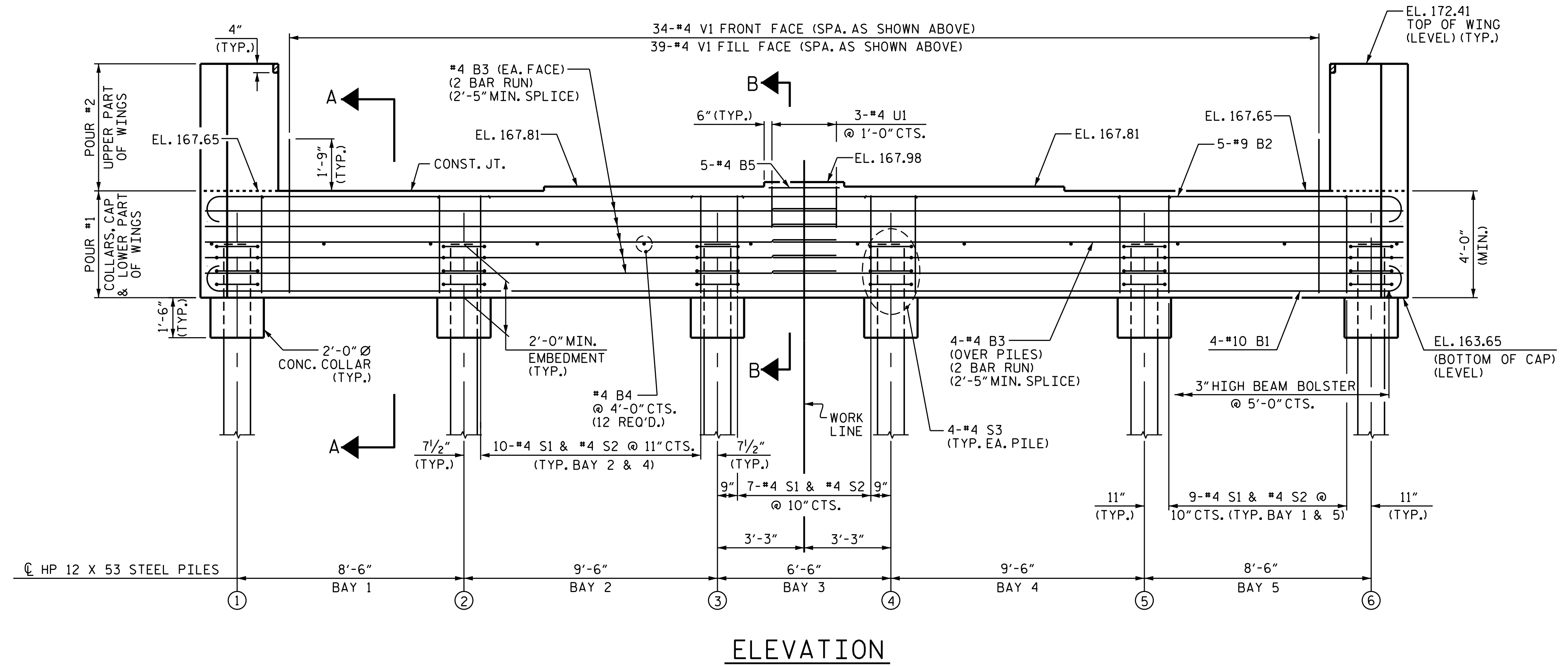
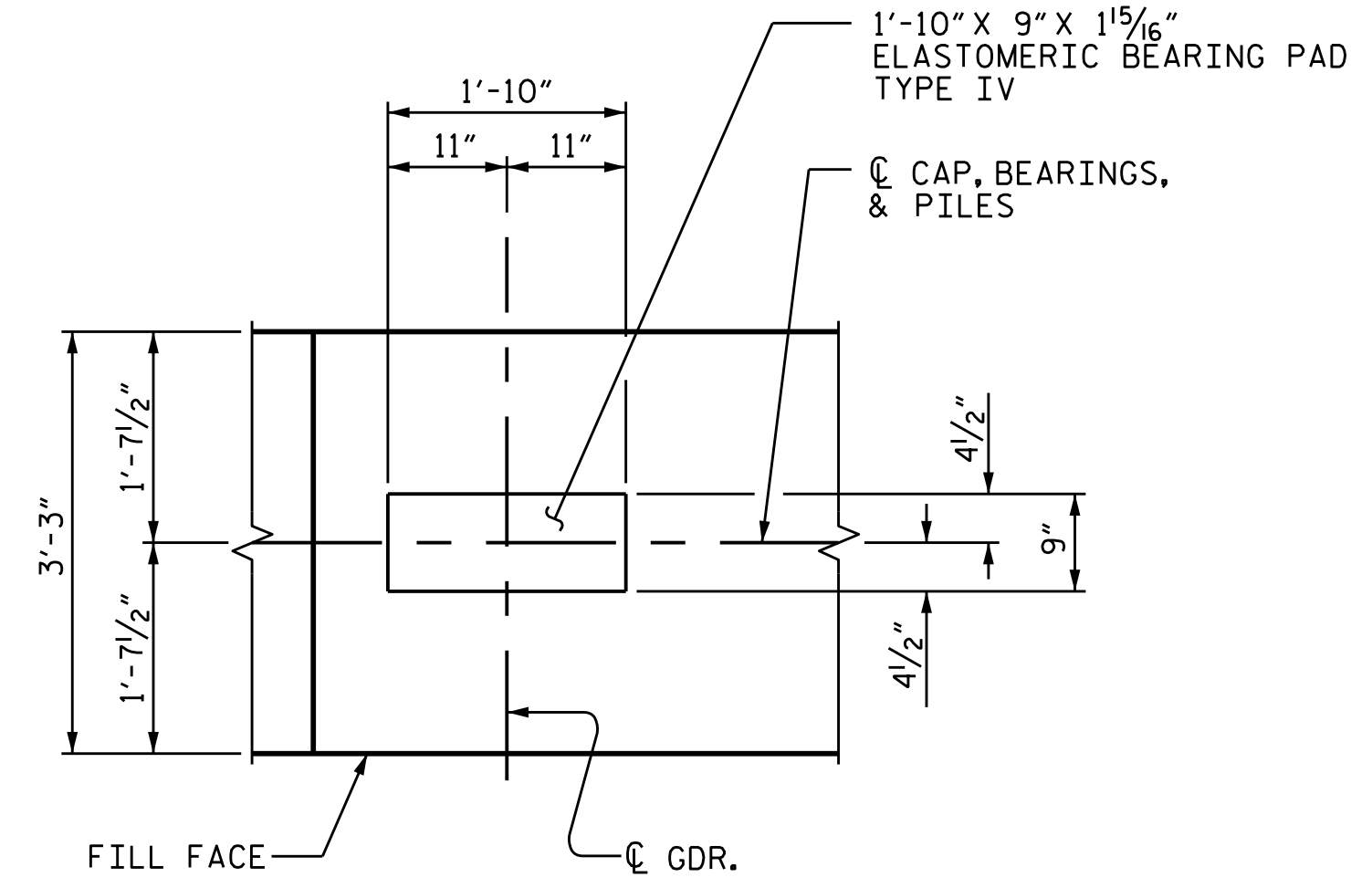
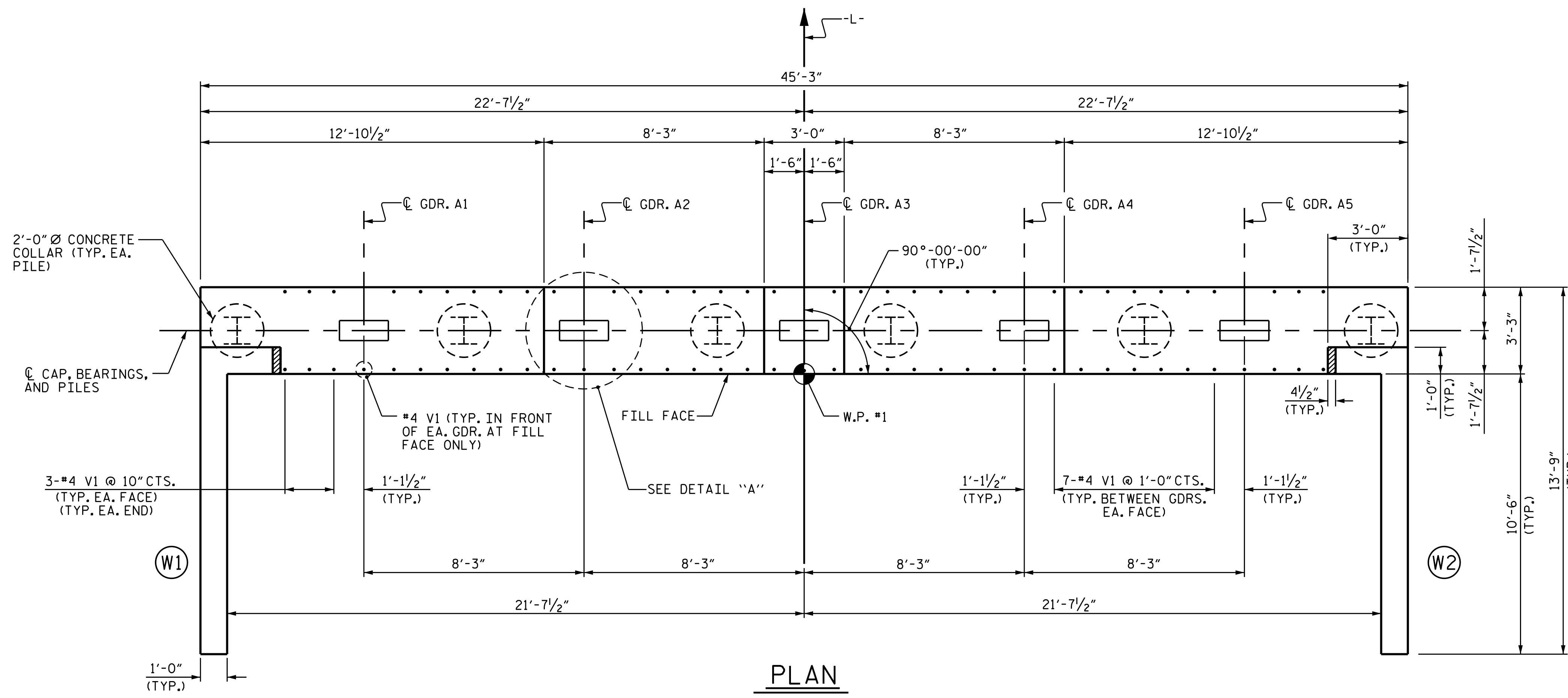
DRAWN BY: M.D.PISO DATE: 7-20-2015
 CHECKED BY: N.RUFFIN DATE: 7-31-2015

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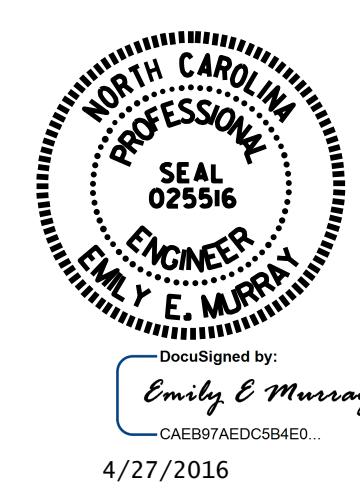
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS 31
2			4			

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.
- THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".
- THE UPPER PORTION OF THE INTEGRAL END BENT SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE PLANS.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



PROJECT NO. B-4761
 HALIFAX COUNTY
 STATION: 20+11.00 -L-
 SHEET 1 OF 3

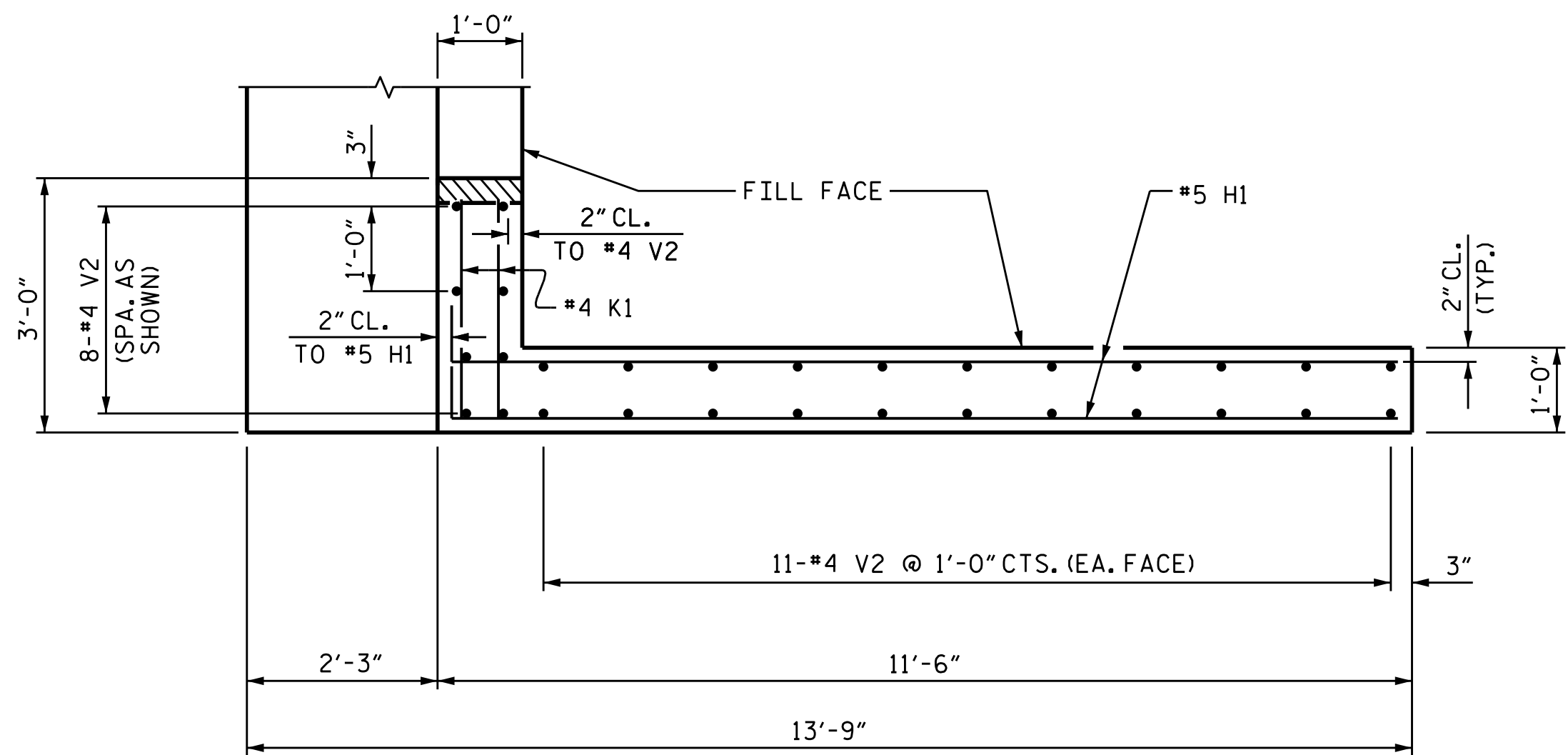


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
INTEGRAL END BENT 1

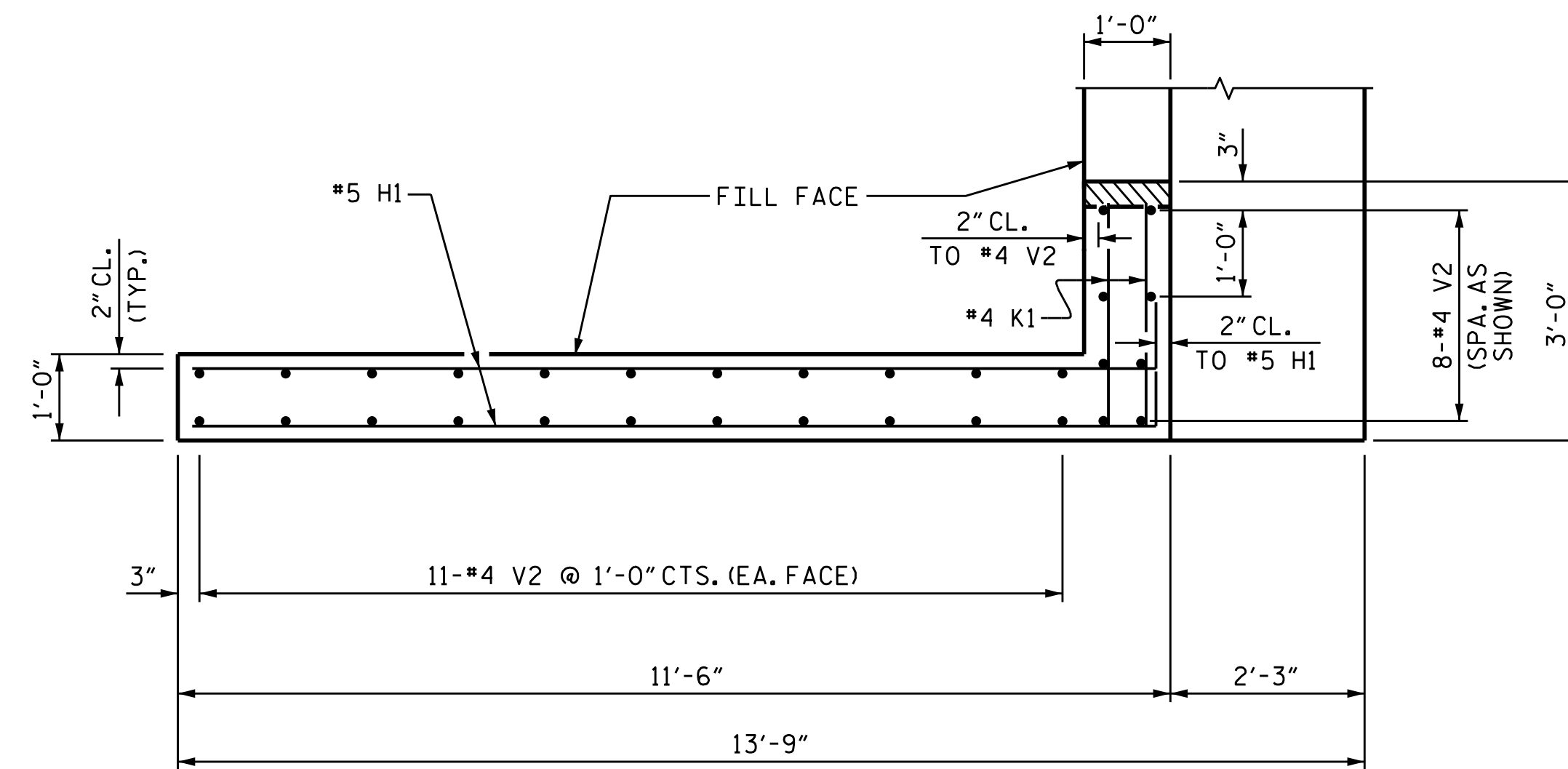
DRAWN BY: M.D. PISO DATE: 8-03-2015
 CHECKED BY: D.G. ELY DATE: 8-25-2015
 DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE: 3/14/16

REVISIONS						SHEET NO.
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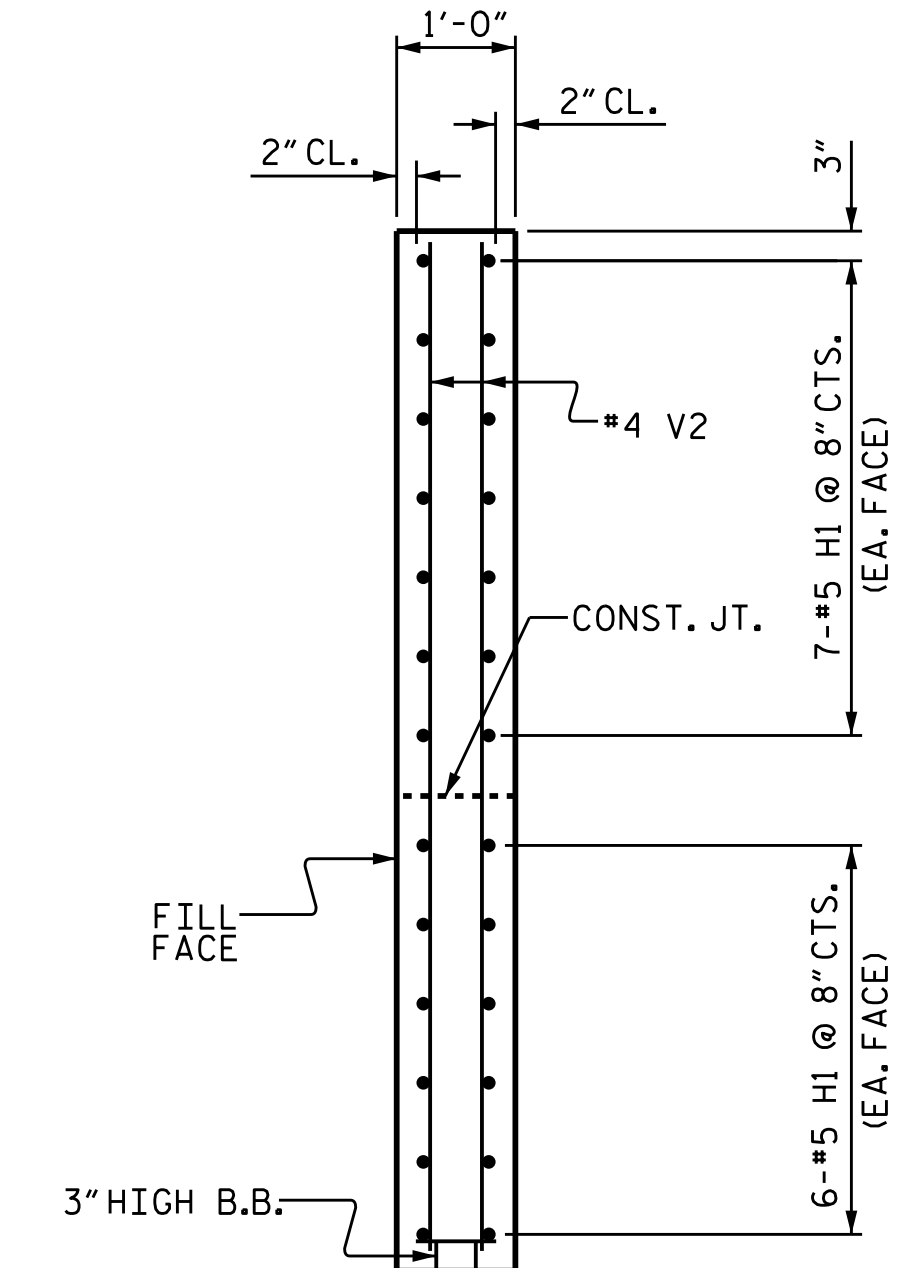
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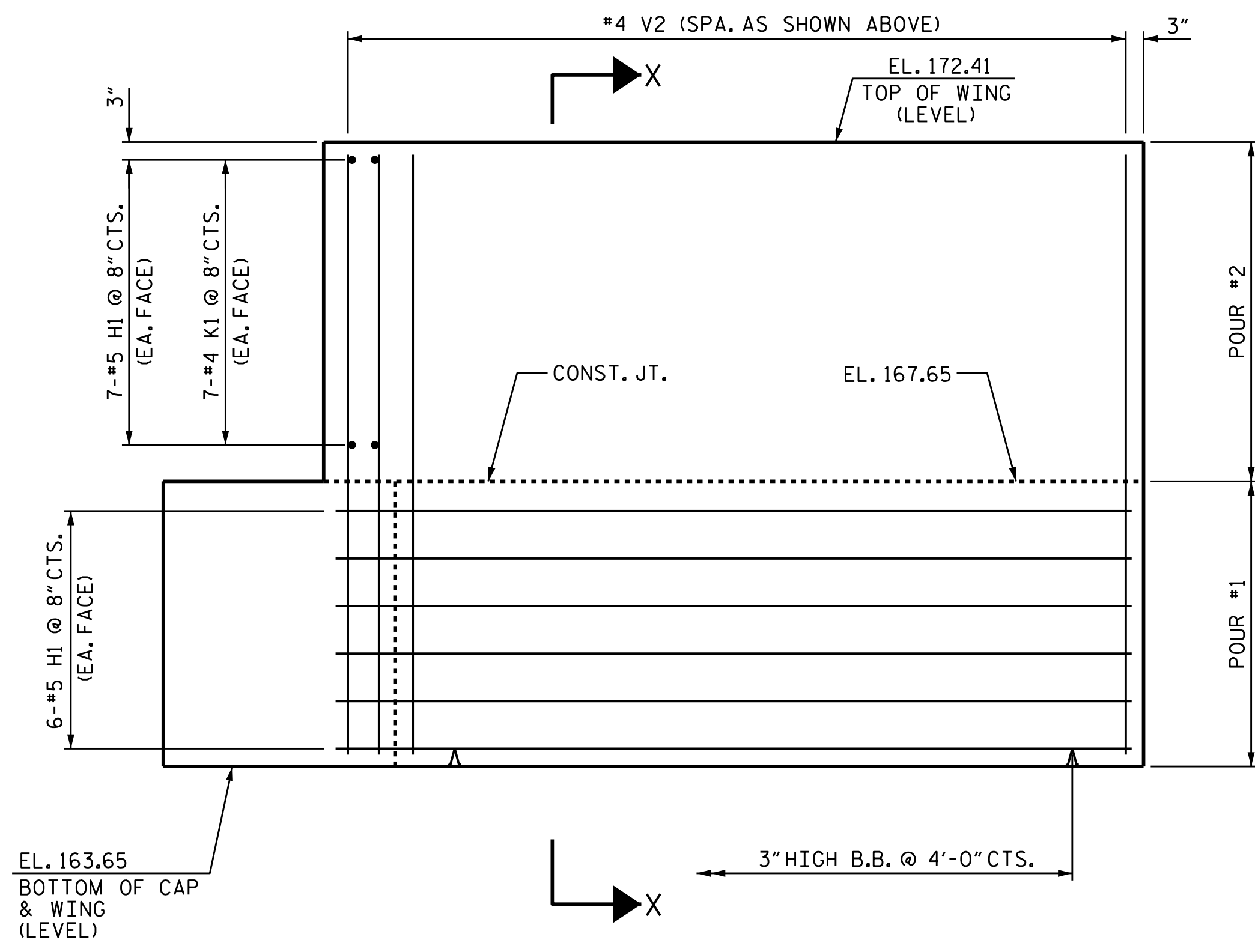
PLAN (W1)



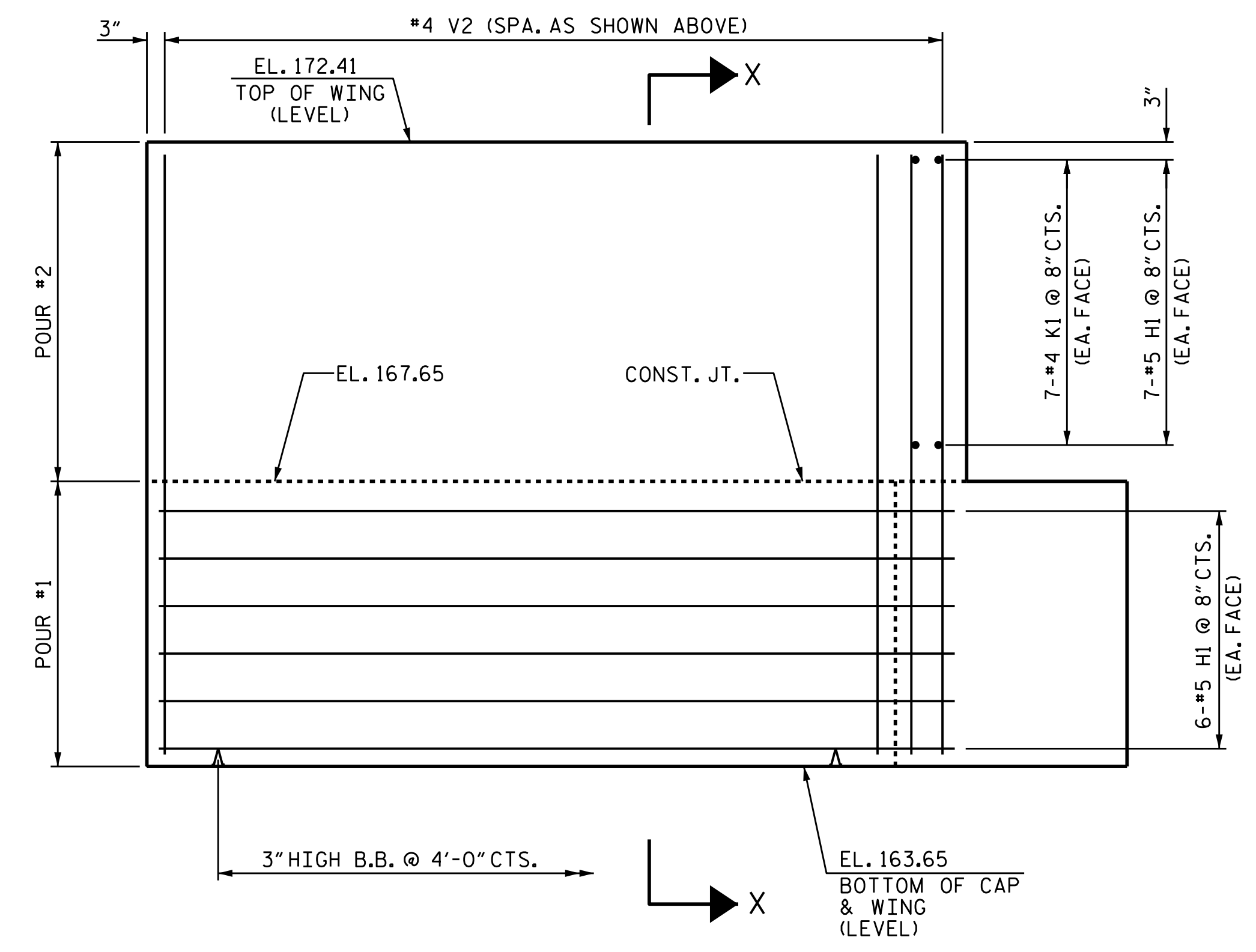
PLAN (W2)



SECTION X-X



ELEVATION (W1)



ELEVATION (W2)

PROJECT NO. B-4761
 HALIFAX COUNTY
 STATION: 20+11.00 -L-

SHEET 2 OF 3



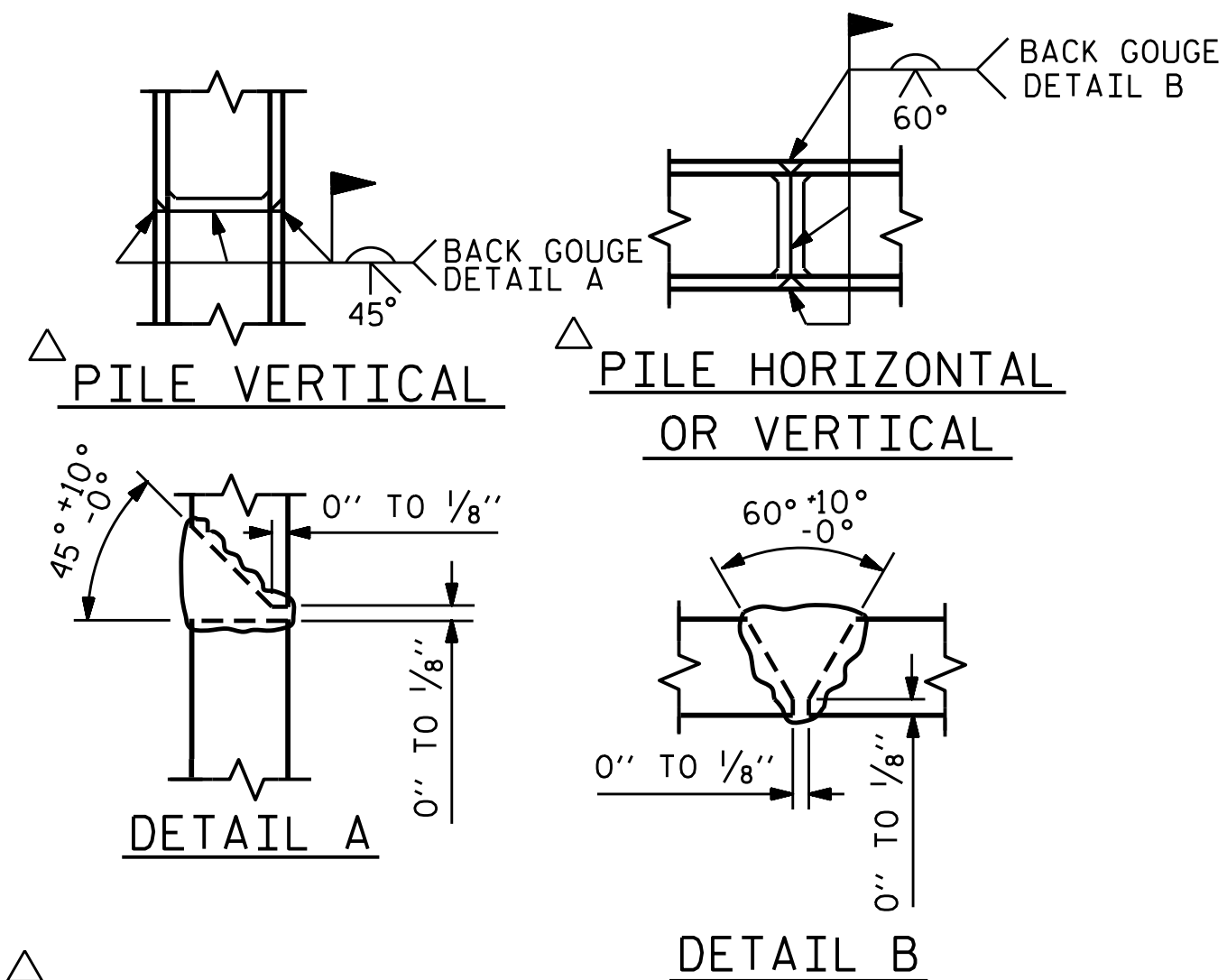
DocuSigned by:
 Emily E Murray
 CA5897AEDC8B6D
 4/27/2016

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

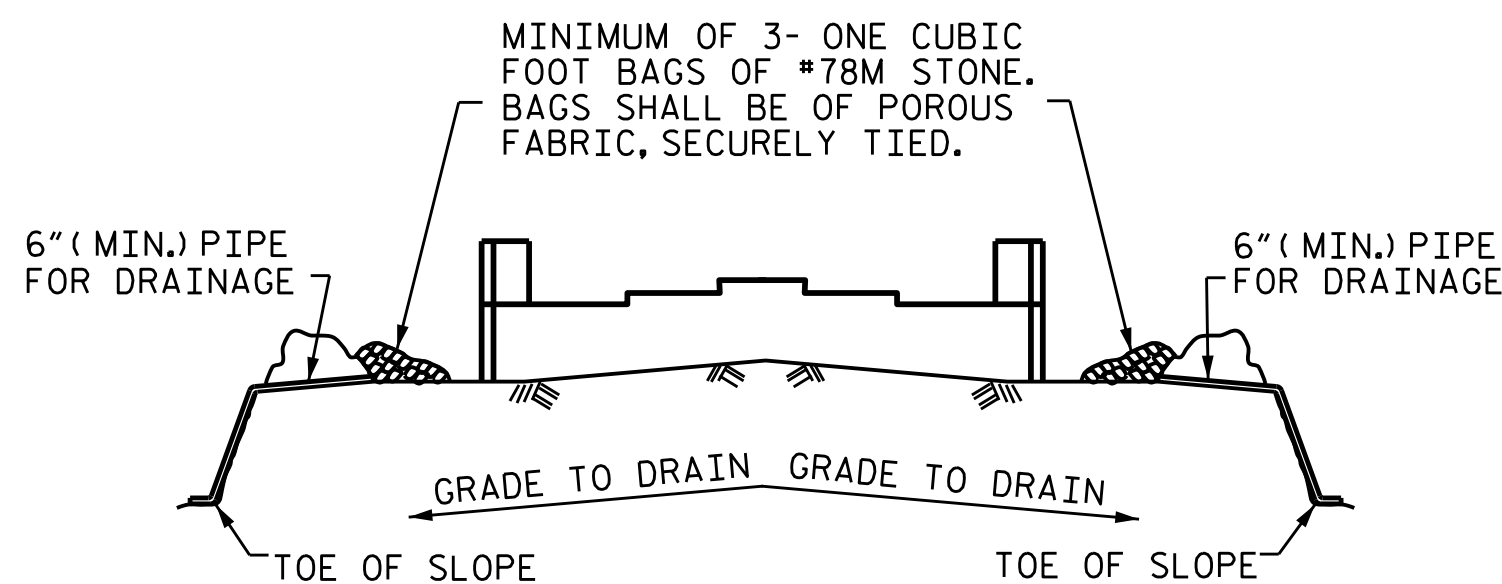
DRAWN BY: M.D.PISO DATE: 8-04-2015
 CHECKED BY: D.G.ELY DATE: 8-25-2015
 DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE: 3/14/16

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1			3			TOTAL SHEETS 31
2			4			



PILE SPLICE DETAILS



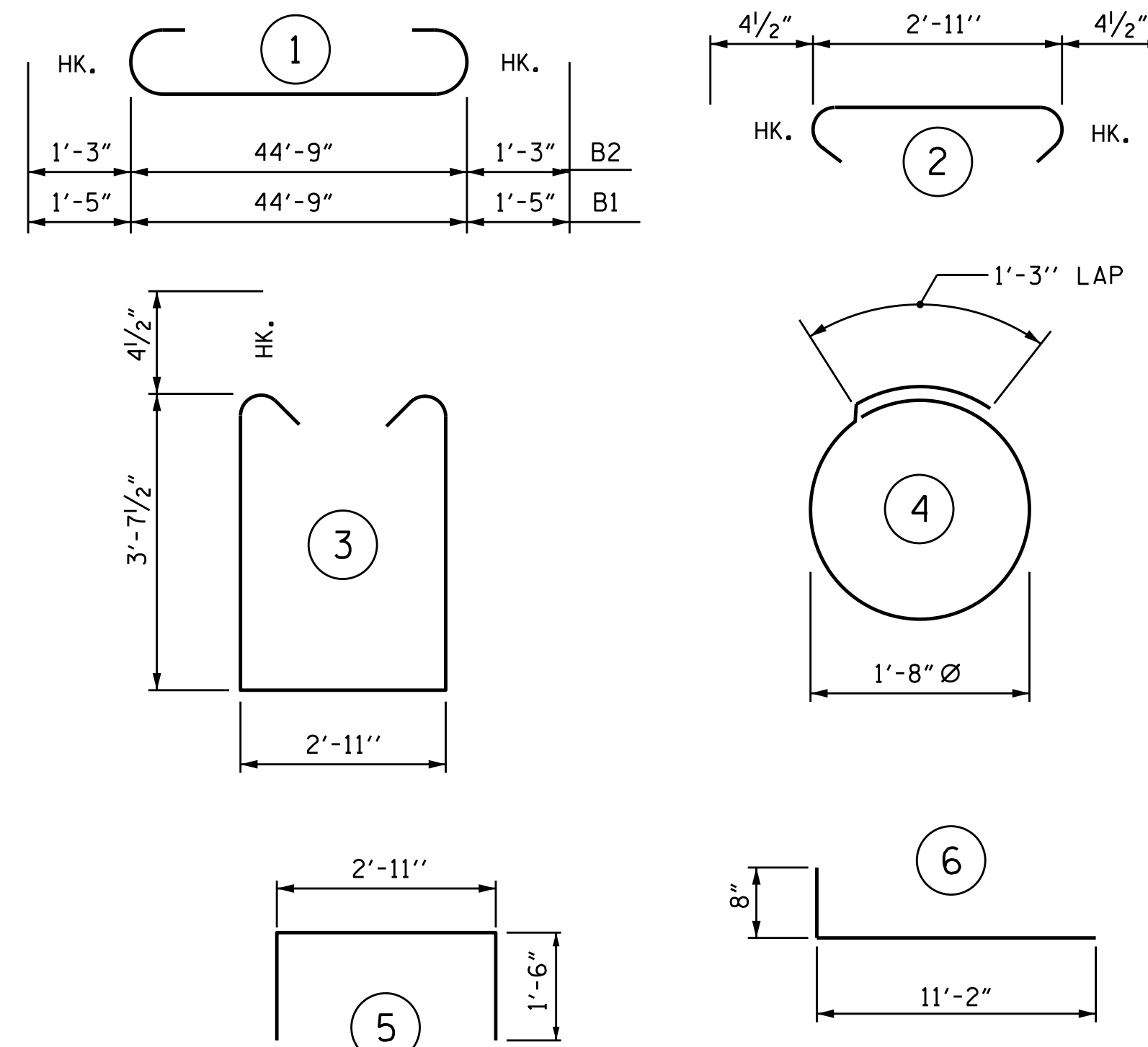
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BAR TYPES



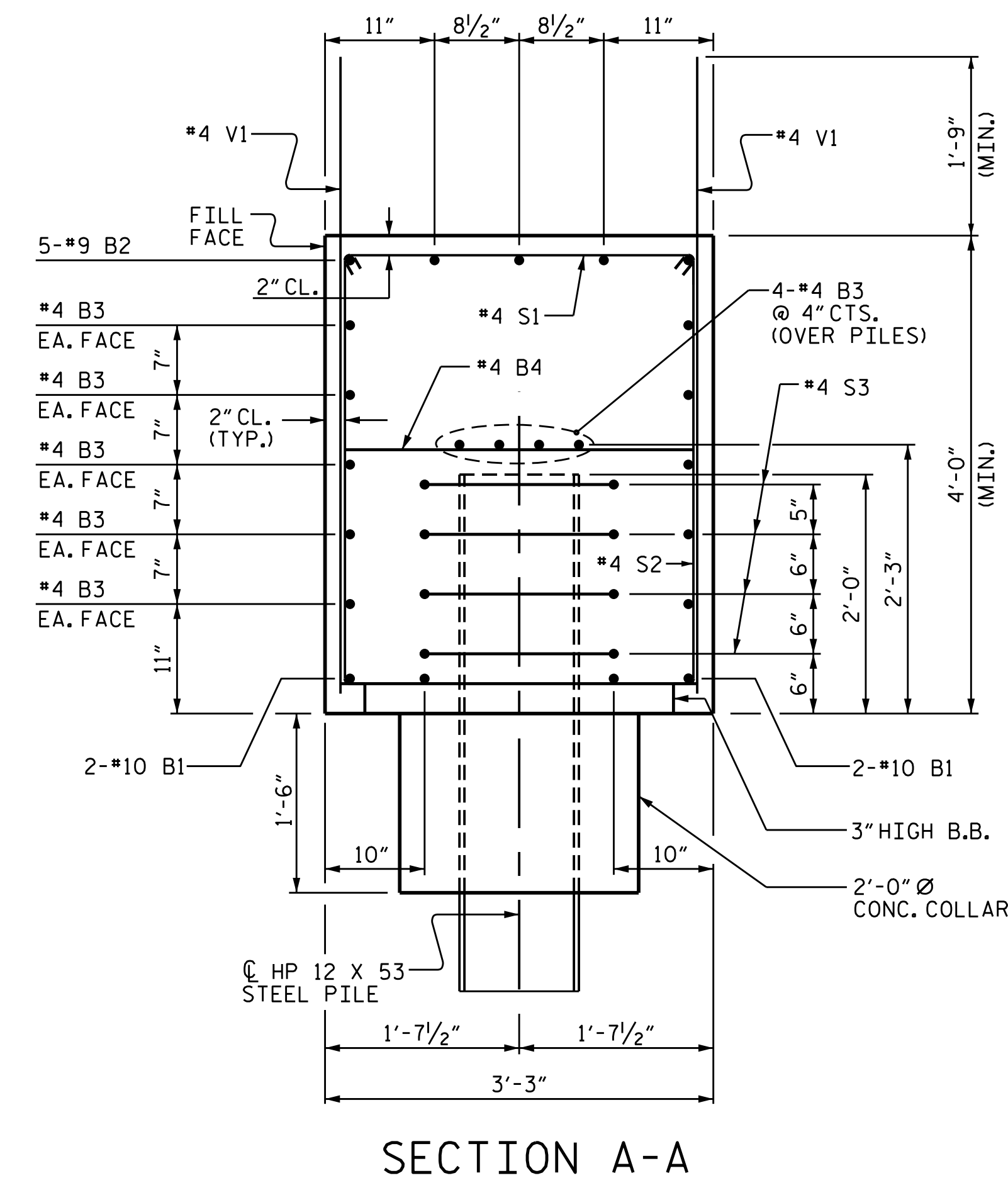
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

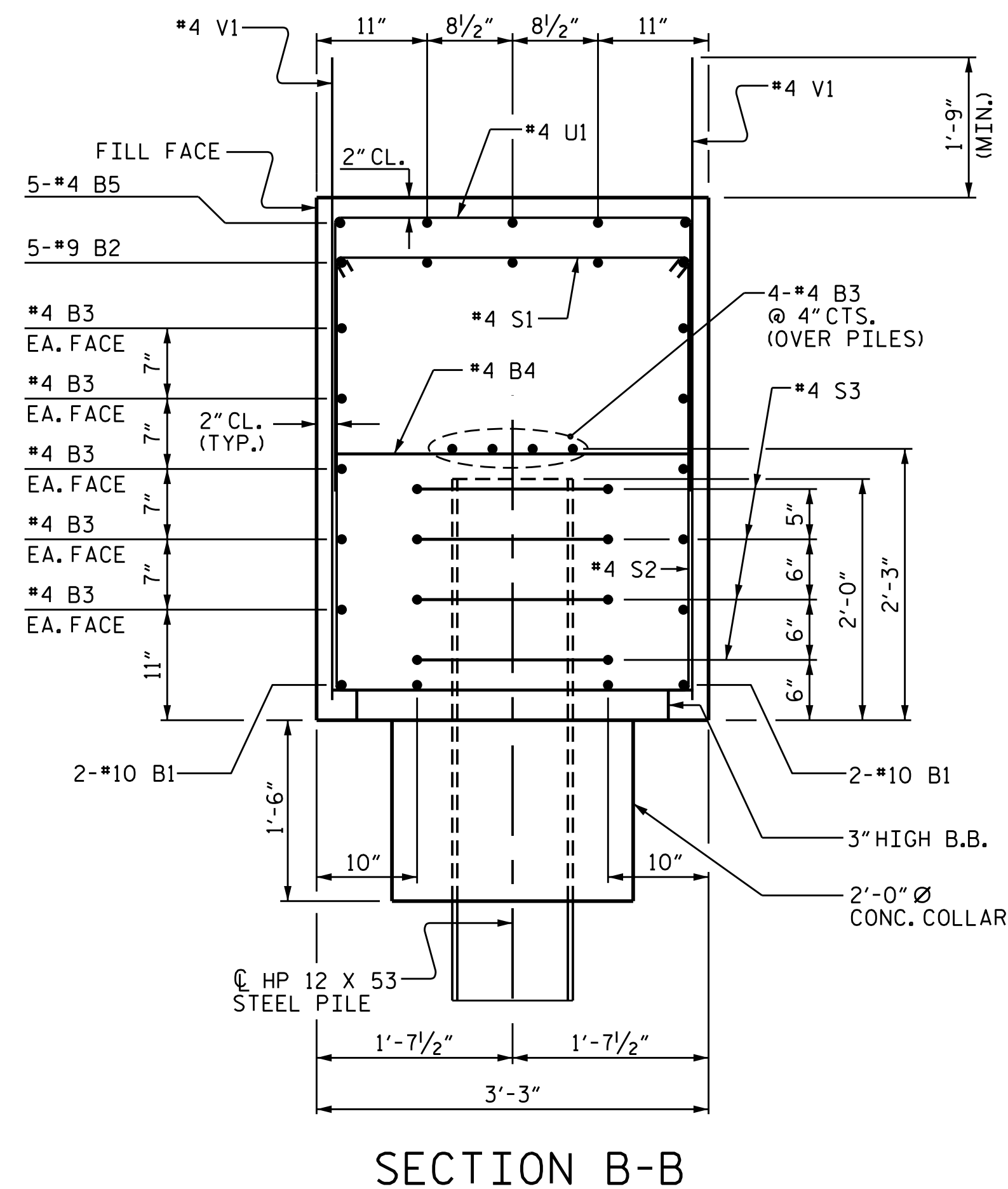
INTEGRAL END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	47'-7"	819
B2	5	#9	1	47'-3"	803
B3	28	#4	STR.	23'-8"	443
B4	12	#4	STR.	2'-11"	23
B5	5	#4	STR.	2'-8"	9
H1	52	#5	6	11'-10"	642
K1	28	#4	STR.	2'-7"	48
S1	45	#4	2	3'-8"	110
S2	45	#4	3	10'-11"	328
S3	24	#4	4	6'-6"	104
U1	3	#4	5	5'-11"	12
V1	73	#4	STR.	5'-7"	272
V2	60	#4	STR.	8'-4"	334

REINFORCING STEEL	3,947 LBS.
CLASS A CONCRETE	
POUR #1-CAP, LOWER WINGS & CONCRETE COLLARS	26.4 CU.YDS.
POUR #2-UPPER PART OF WINGS	4.4 CU.YDS.
TOTAL	30.8 CU.YDS.
HP 12 X 53 STEEL PILES	
NO. LINEAR FEET	
6 150 LIN.FT.	



SECTION A-A



SECTION B-B

PROJECT NO. B-4761
HALIFAX COUNTY
 STATION: 20+11.00 -L-
 SHEET 3 OF 3



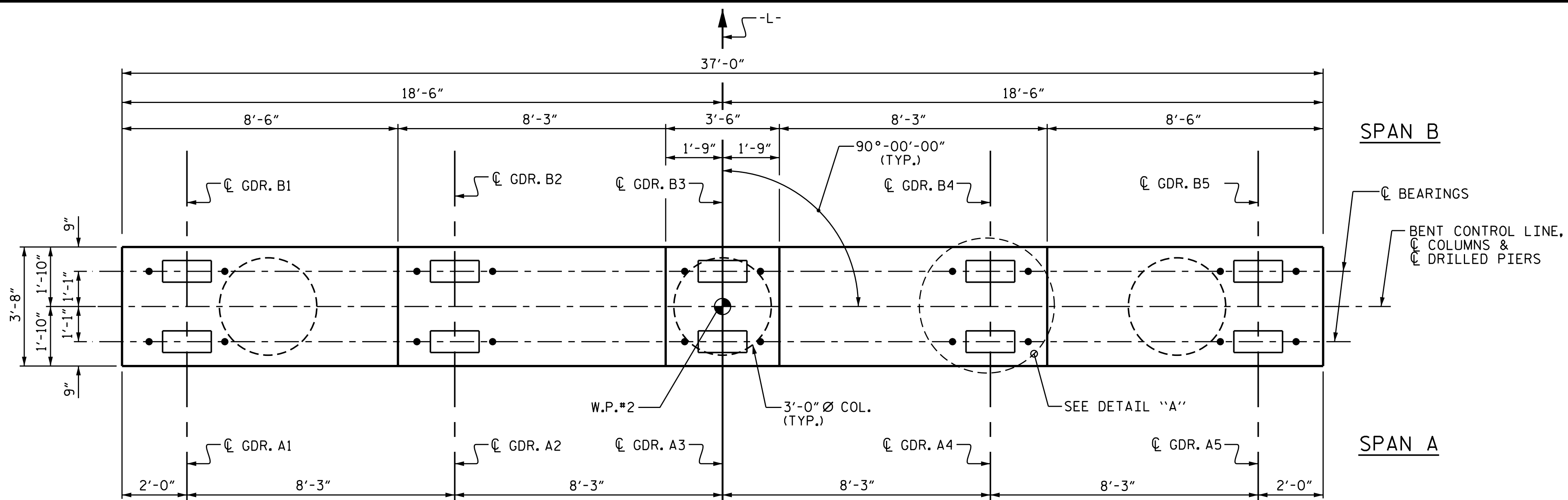
Designed by:
 Emily E. Murray
 4/27/2016

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

DRAWN BY : M.D.PISO DATE : 8-05-2015
 CHECKED BY : D.G.ELY DATE : 8-25-2015
 DESIGN ENGINEER OF RECORD : G.KOUCHEKI DATE : 3/14/16

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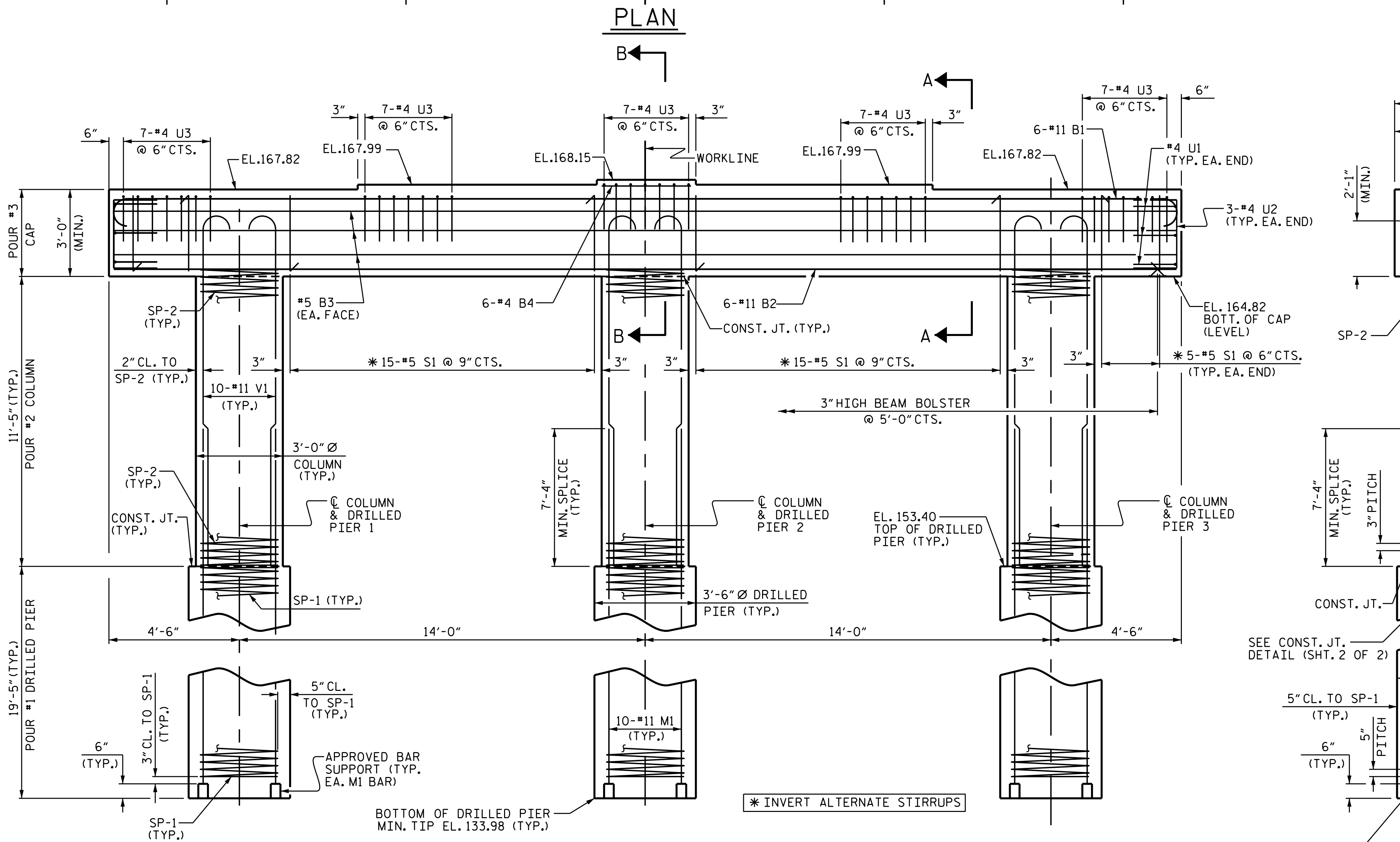
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			31



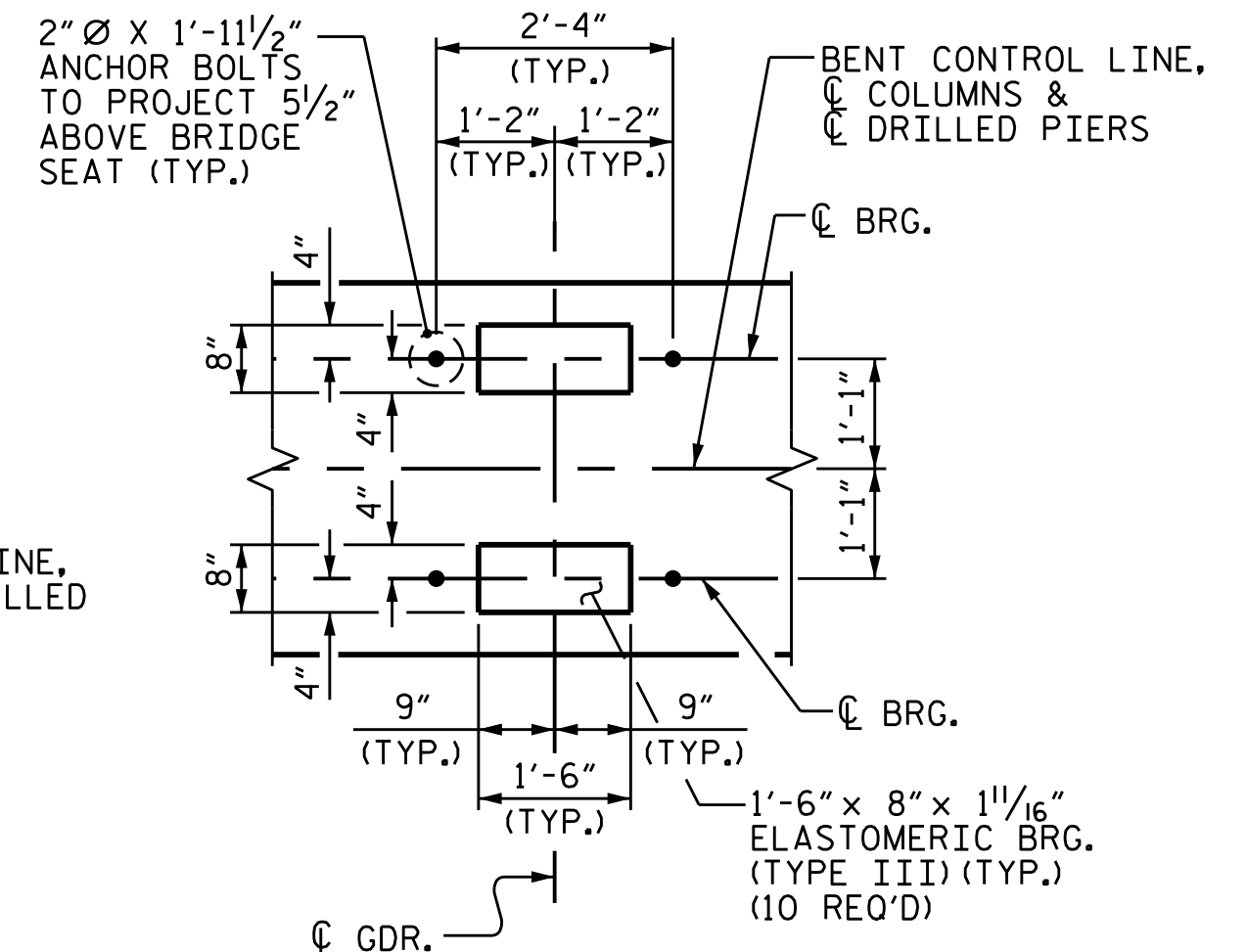
PLAN

NOTES

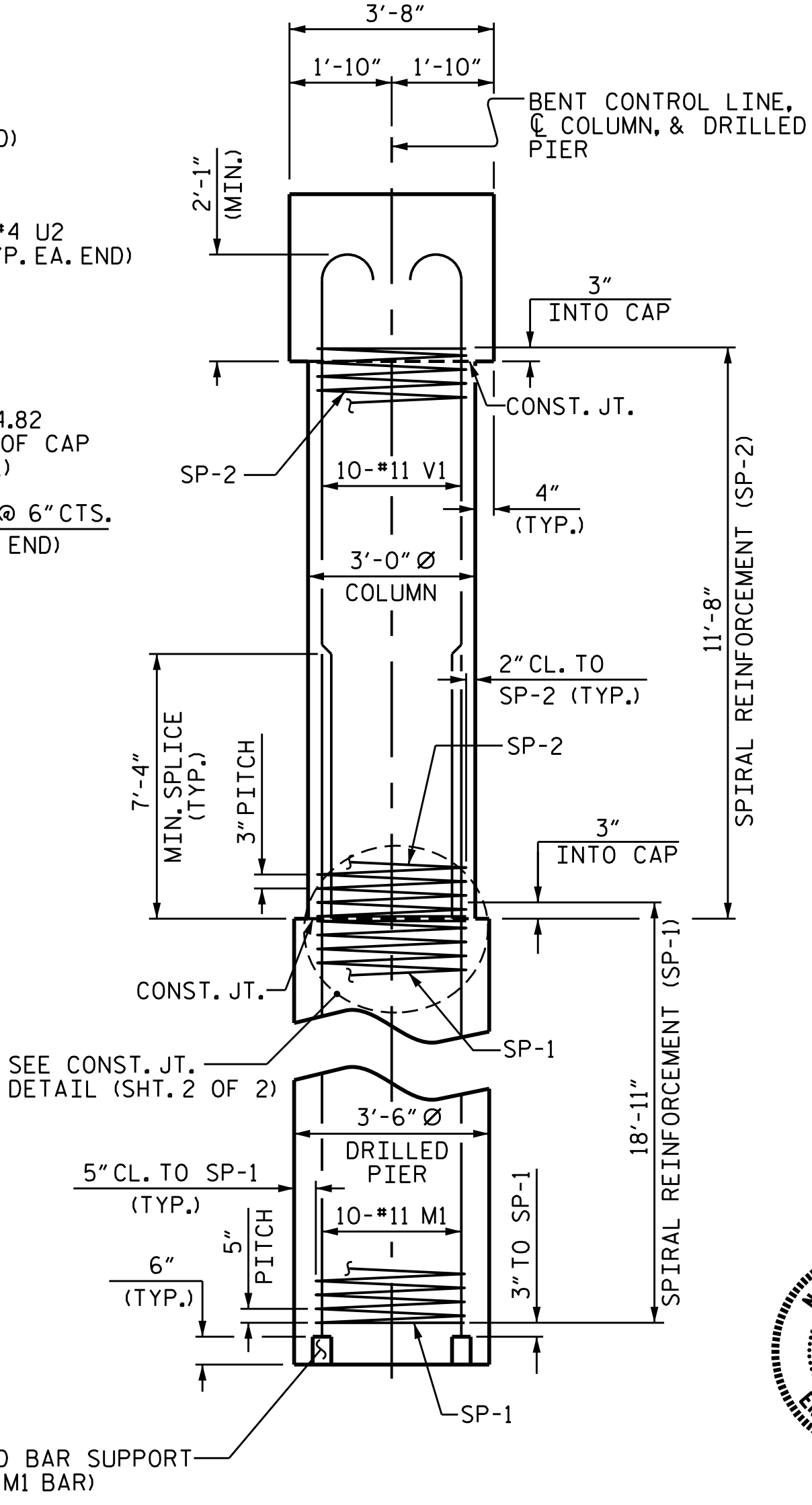
STIRRUPS AND U3 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
 DRILLED PIERS SHALL BE TERMINATED 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.



ELEVATION

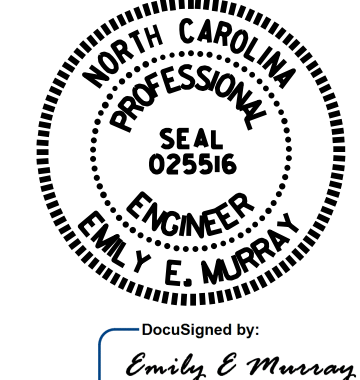


DETAIL "A"



END ELEVATION

PROJECT NO. B-4761
 HALIFAX COUNTY
 STATION: 20+11.00 -L-
 SHEET 1 OF 2

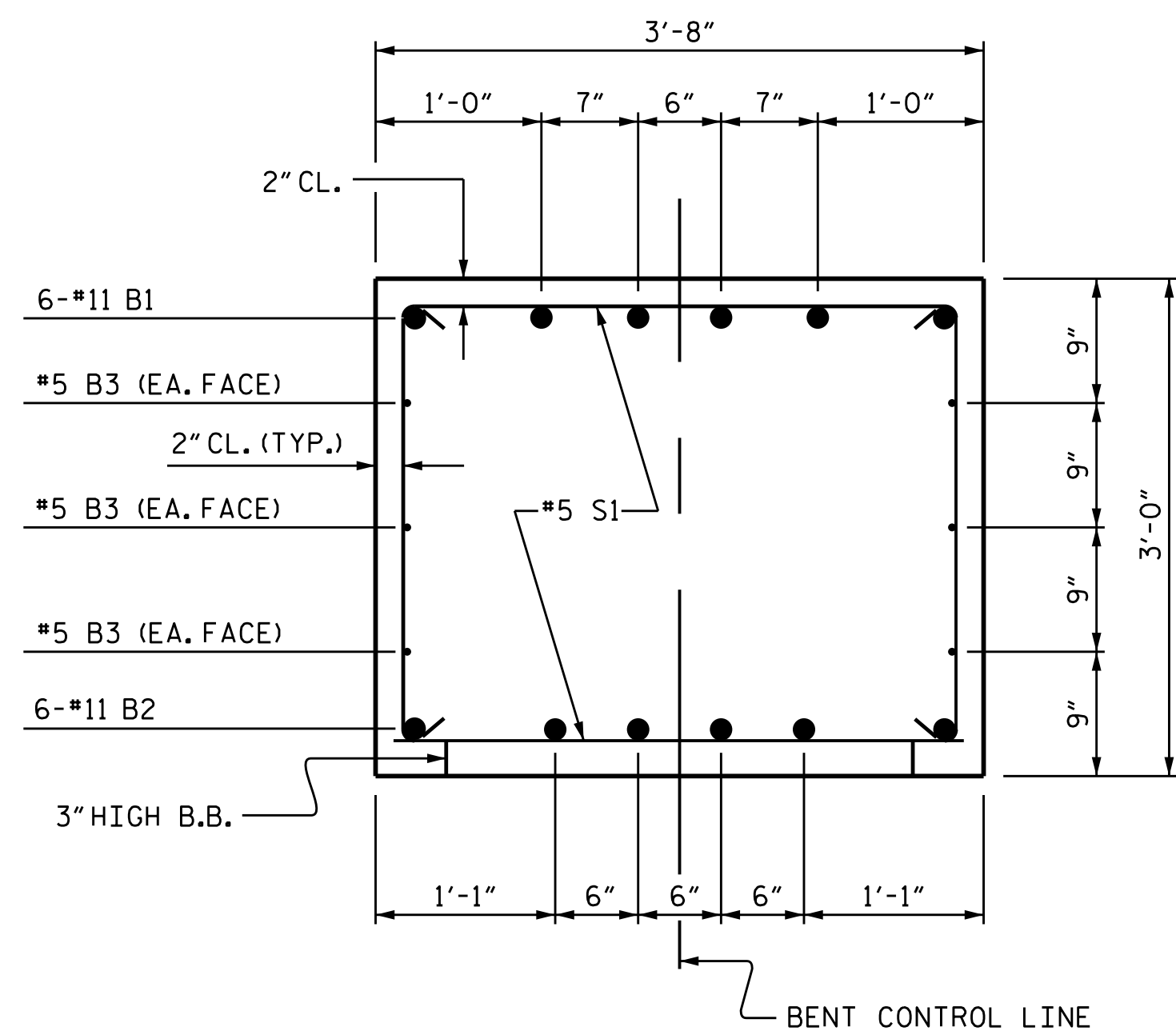


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH			
SUBSTRUCTURE			
BENT 1			
REVISIONS			
NO.	BY:	DATE:	SHEET NO.
1			S-23
2			TOTAL SHEETS 31

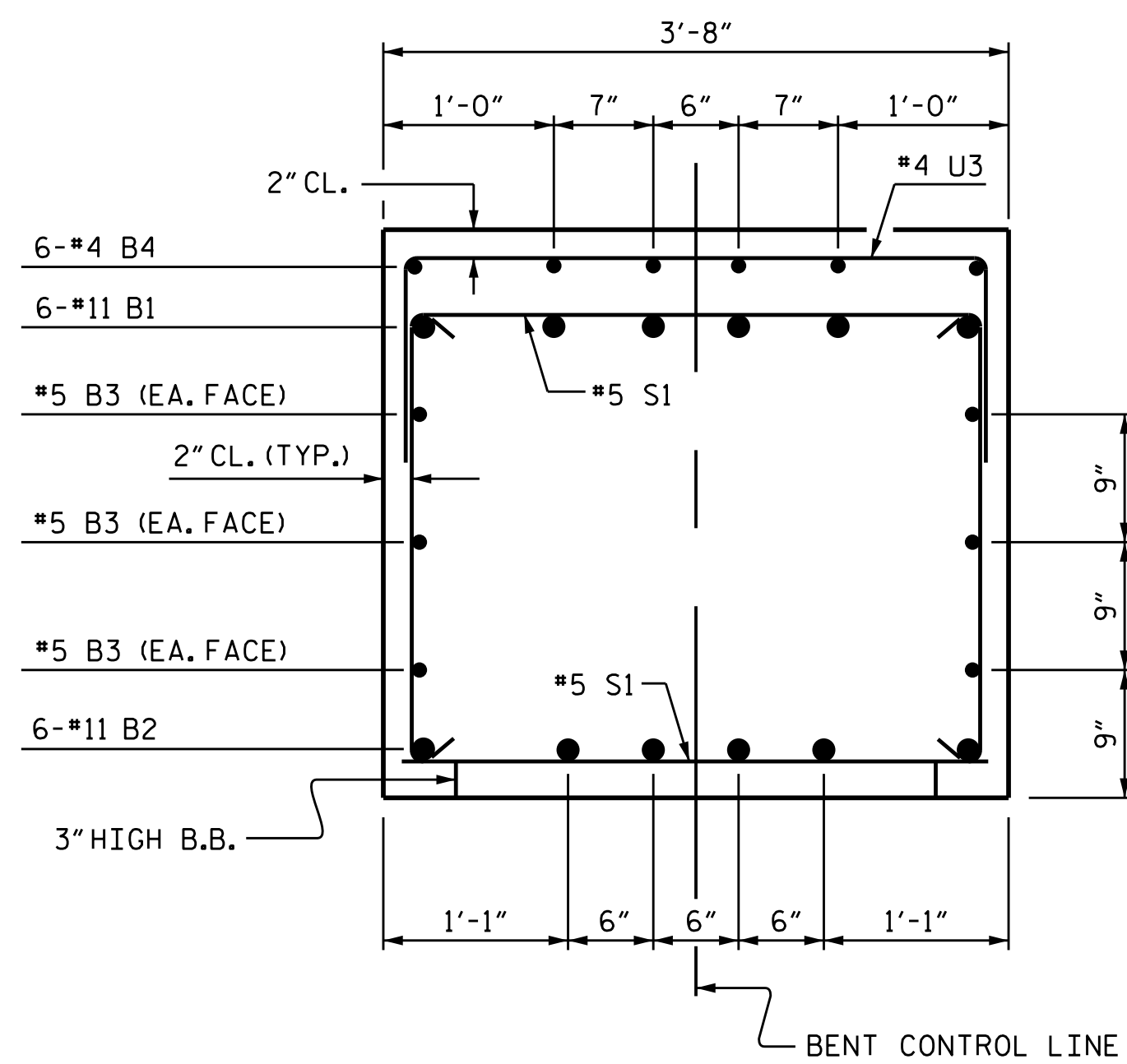
DRAWN BY: M.D.PISO DATE: 8-10-2015
 CHECKED BY: D.G.ELY DATE: 8-26-2015
 DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE: 3/14/16

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

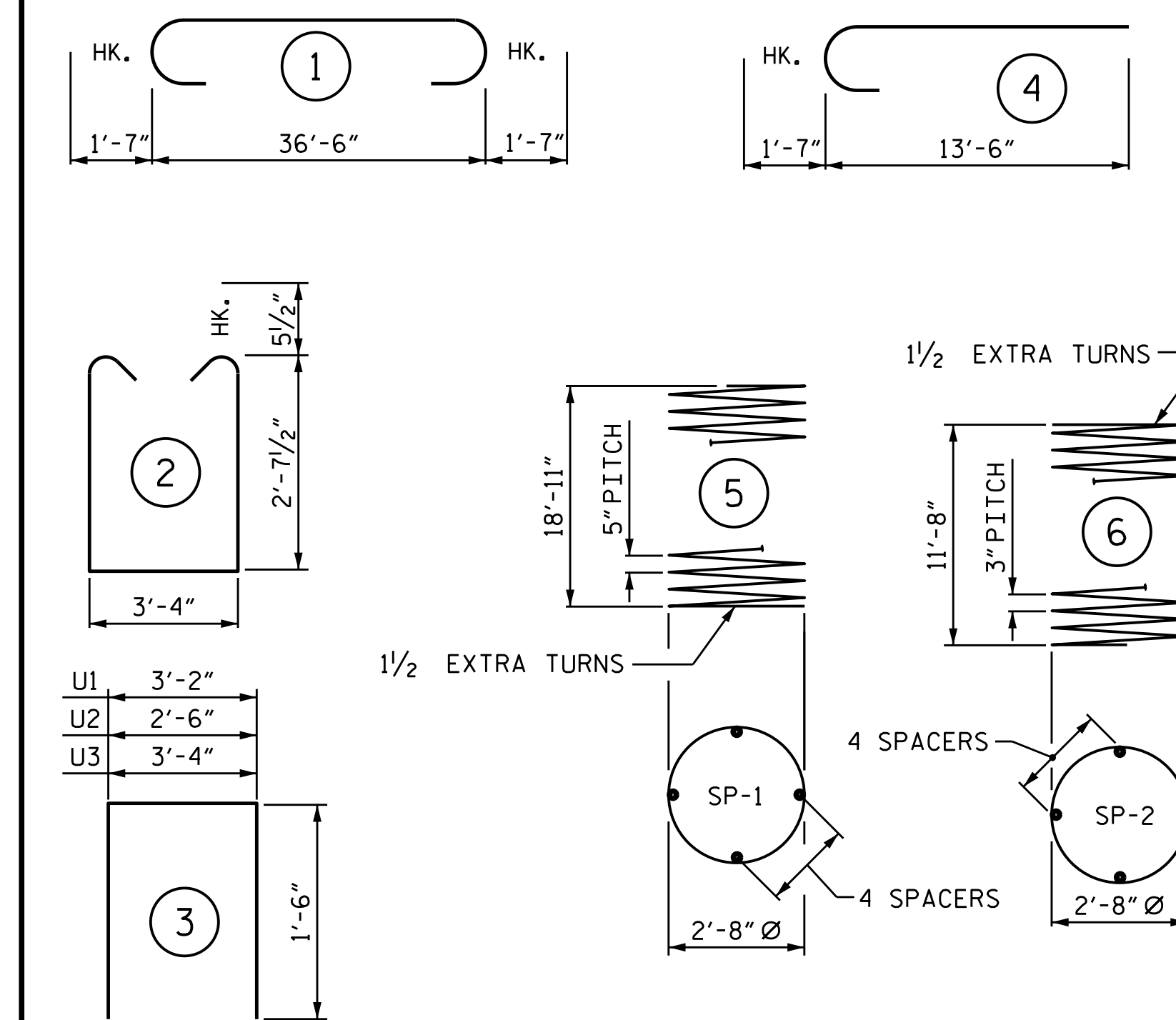


SECTION A-A



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	1	39'-8"	1,264
B2	6	#11	STR.	36'-8"	1,169
B3	6	#5	STR.	36'-8"	229
B4	6	#4	STR.	3'-2"	13
M1	30	#11	STR.	29'-6"	4,703
S1	40	#5	2	9'-6"	396
U1	6	#4	3	6'-2"	25
U2	6	#4	3	5'-6"	22
U3	35	#4	3	6'-4"	148
V1	30	#11	4	15'-1"	2,404

REINFORCING STEEL 10,373 LBS.

SPIRAL REINFORCING STEEL

SP	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-1	3	*	5	386'-7"	1,210
SP-2	3	**	6	398'-2"	798

SPIRAL COLUMN REINFORCING STEEL 2,008 LBS.

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

CLASS A CONCRETE BREAKDOWN

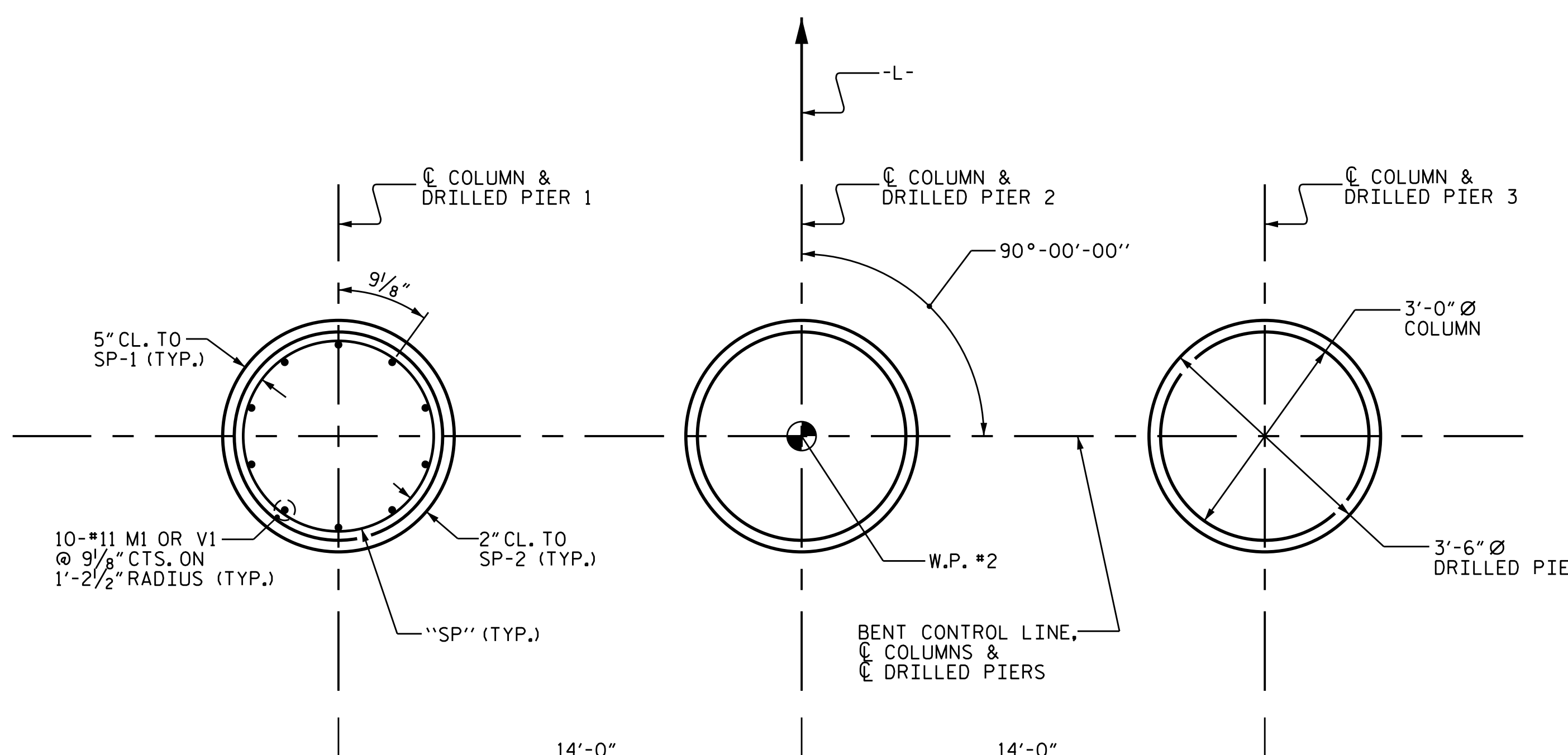
POUR #2 COLUMNS	9.0 CU.YDS.
POUR #3 CAP	15.6 CU.YDS.
TOTAL CLASS A CONCRETE	24.6 CU.YDS.

DRILLED PIERS:

POUR #1 DRILLED PIERS	20.8 CU.YDS.
3'-6" Ø DRILLED PIER NOT IN SOIL	30.0 LIN. FT.
3'-6" Ø DRILLED PIER IN SOIL	28.3 LIN. FT.

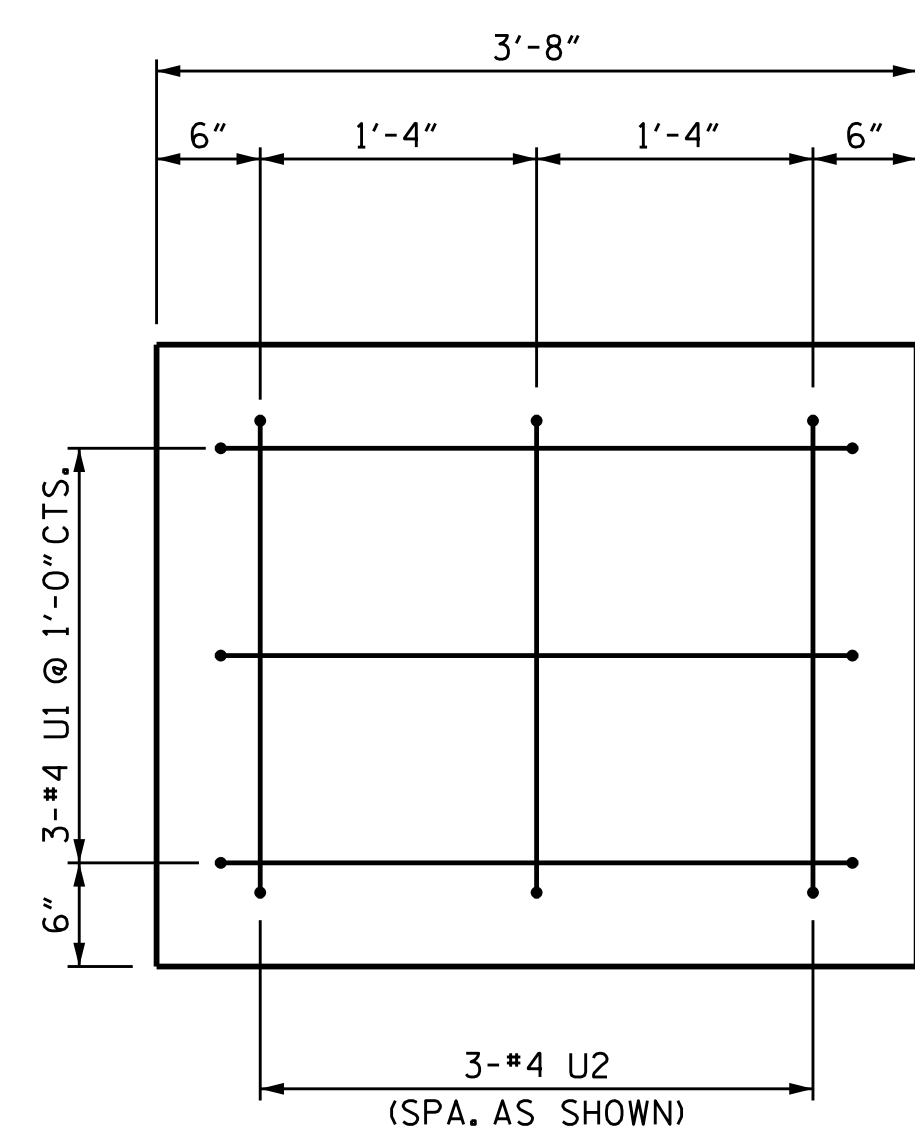
PERMANENT STEEL CASING FOR

3'-6" Ø DRILLED PIER	31.2 LIN. FT.
CSL TUBES	251 LIN. FT.



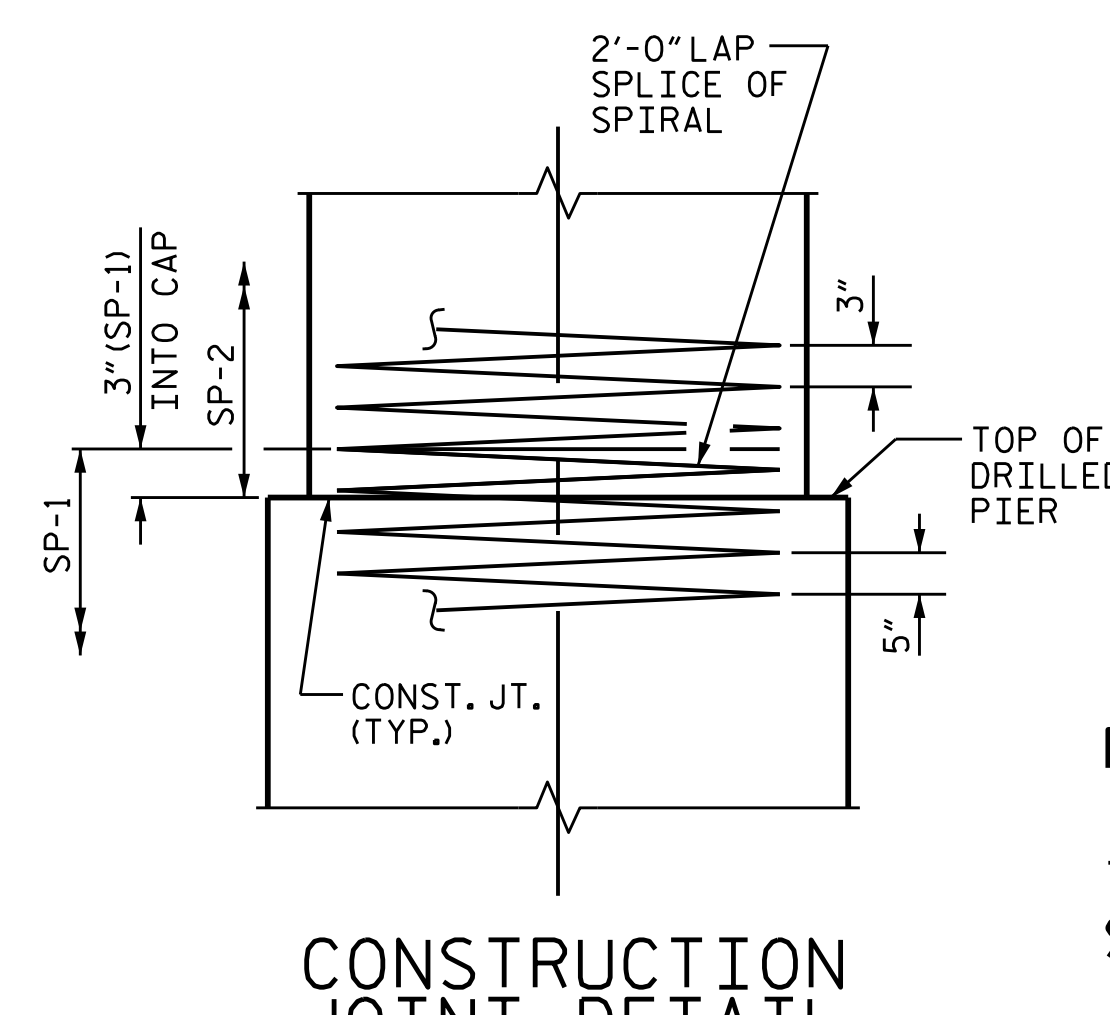
PLAN OF DRILLED PIERS & COLUMNS

(DETAILS ARE TYPICAL FOR EACH DRILLED PIER & COLUMN)



END OF CAP VIEW

(TYP. EA. END)



CONSTRUCTION JOINT DETAIL

PROJECT NO. B-4761
 HALIFAX COUNTY
 STATION: 20+11.00 -L-
 SHEET 2 OF 2

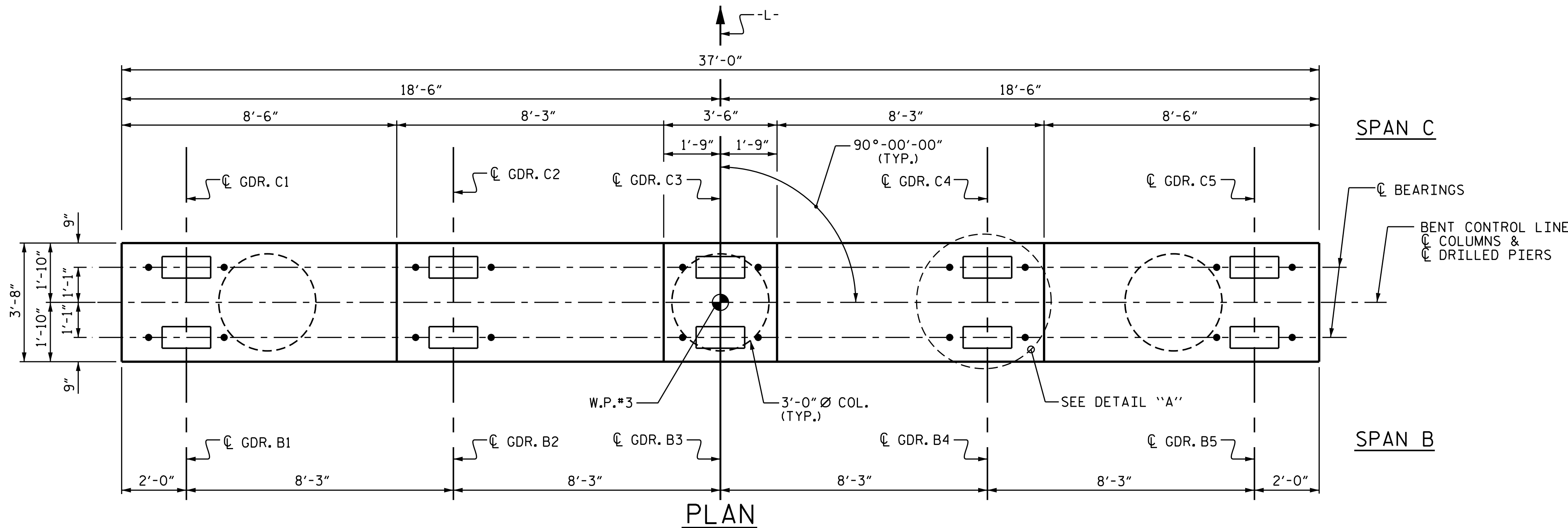


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 1

DRAWN BY: M.D.PISO DATE: 8-10-2015
 CHECKED BY: D.G.ELY DATE: 8-26-2015
 DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE: 3/14/16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

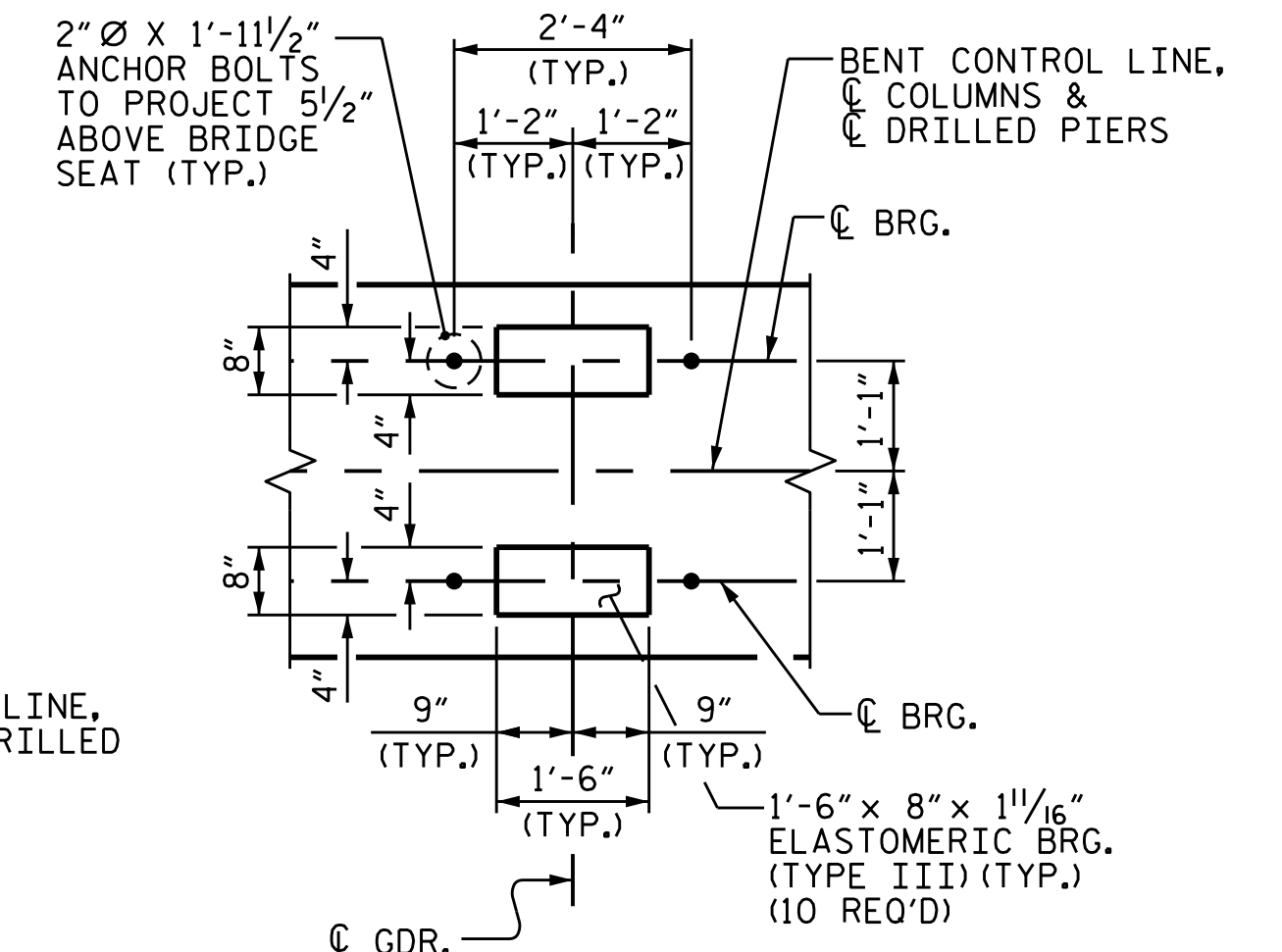
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS 31
2			4			



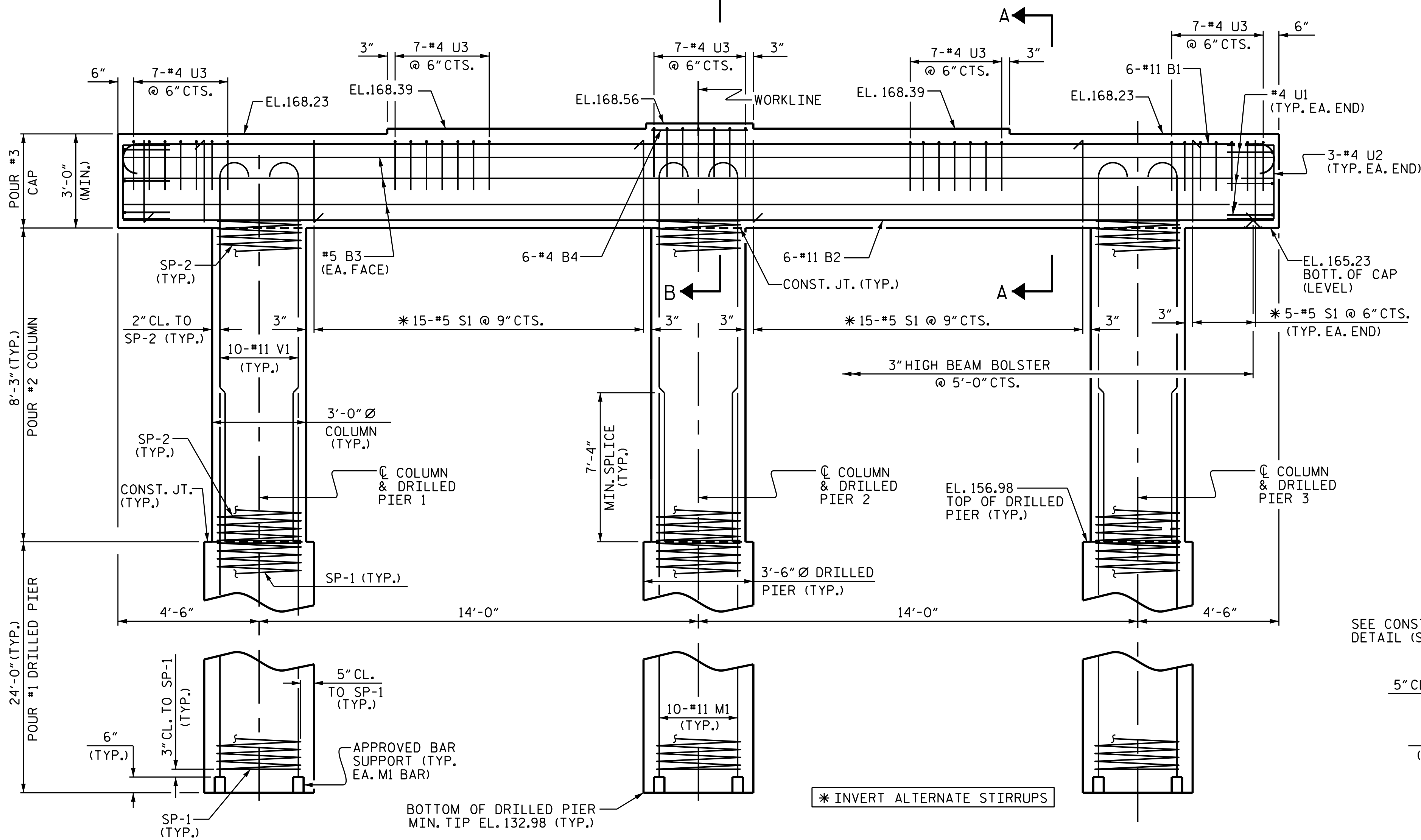
PLAN

NOTES

STIRRUPS AND U3 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
 THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE COSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.
 THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

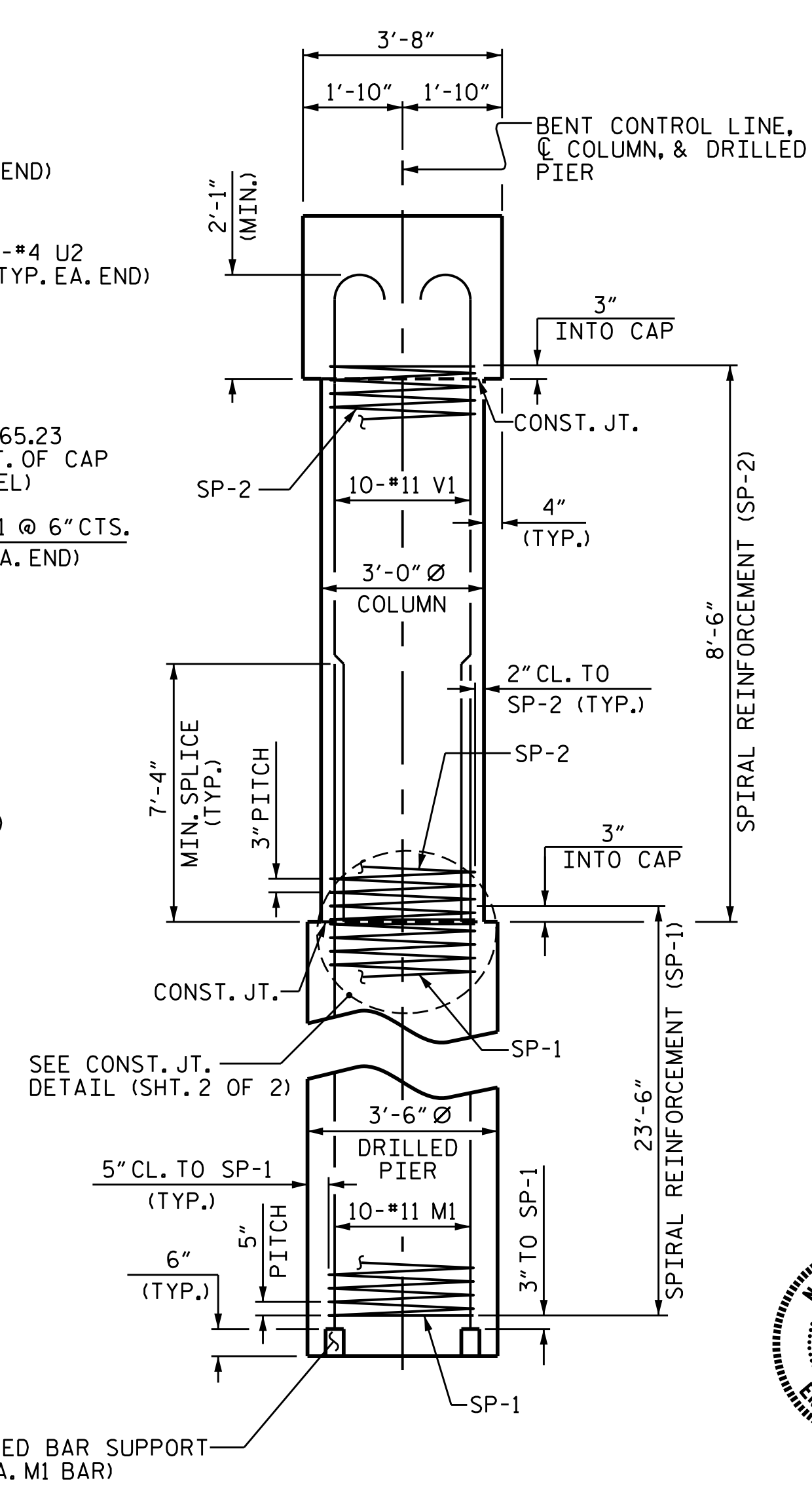


DETAIL "A"
(TYP. EA. GDR.)



ELEVATION

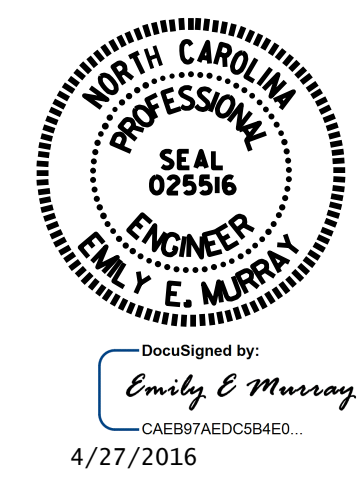
DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.



END ELEVATION

PROJECT NO. B-4761
 HALIFAX COUNTY
 STATION: 20+11.00 -L-
 SHEET 1 OF 2

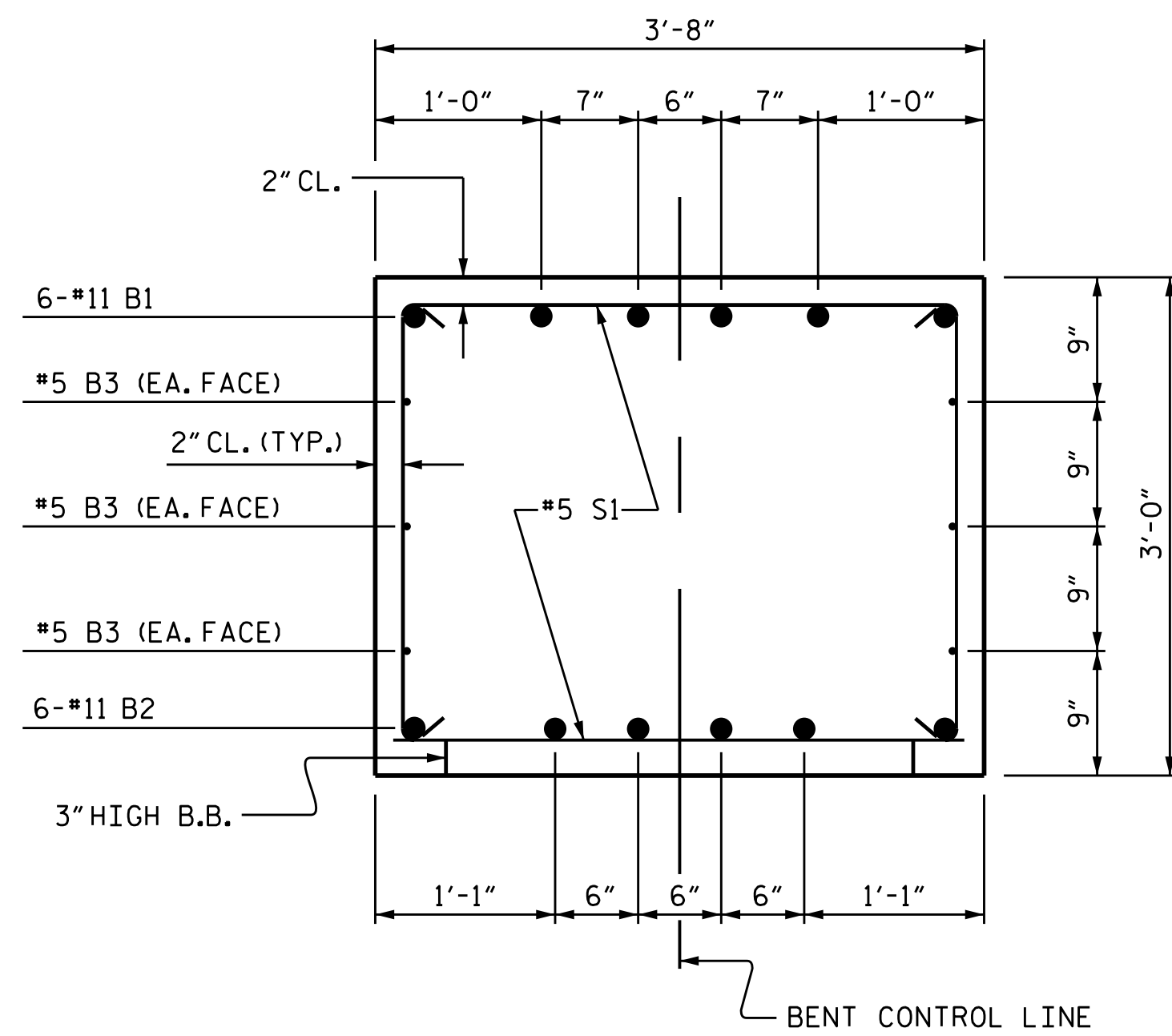
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 2



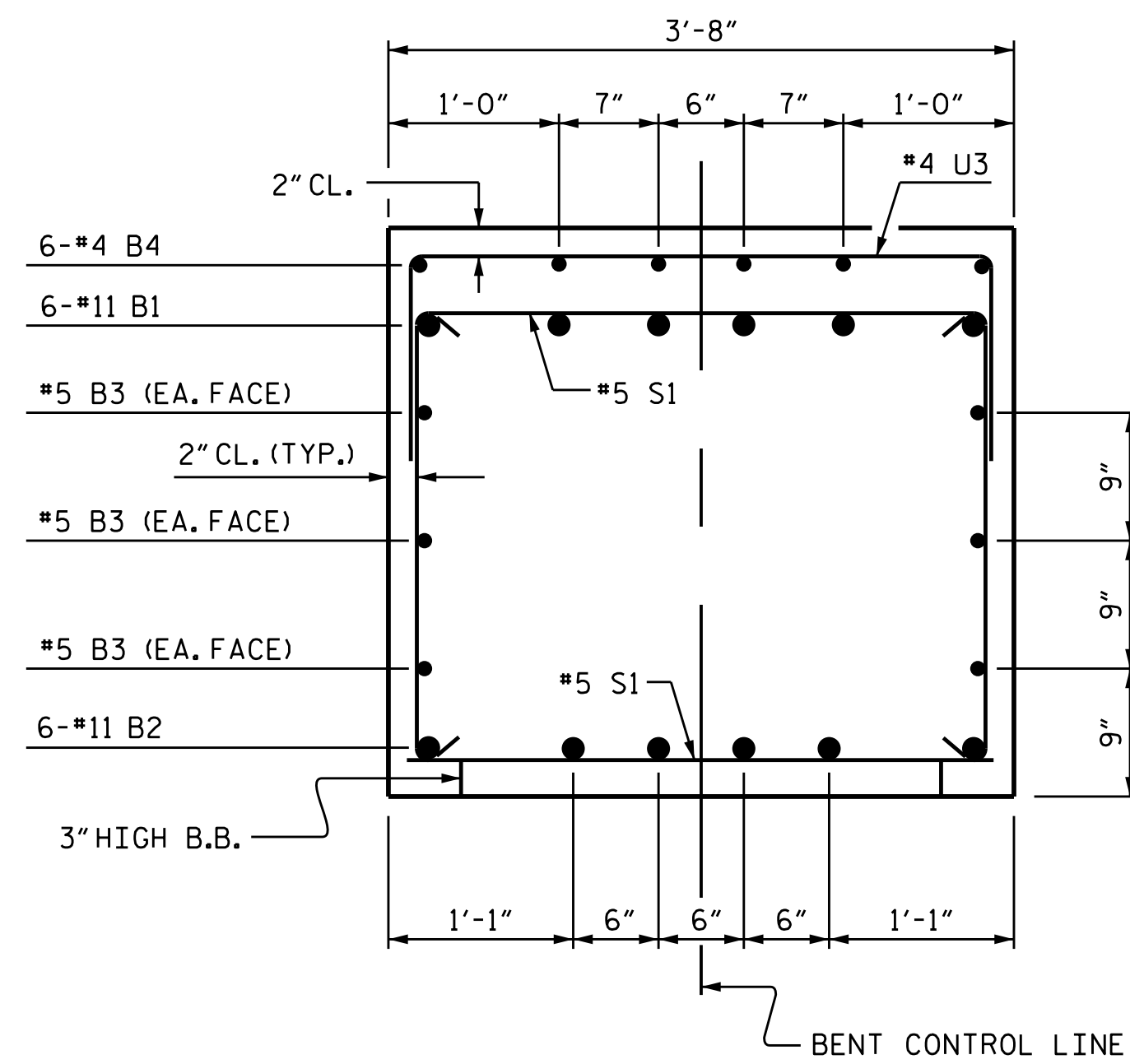
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			31

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DRAWN BY: M.D.PISO DATE: 8-10-2015
 CHECKED BY: D.G.ELY DATE: 8-26-2015
 DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE: 3/14/16

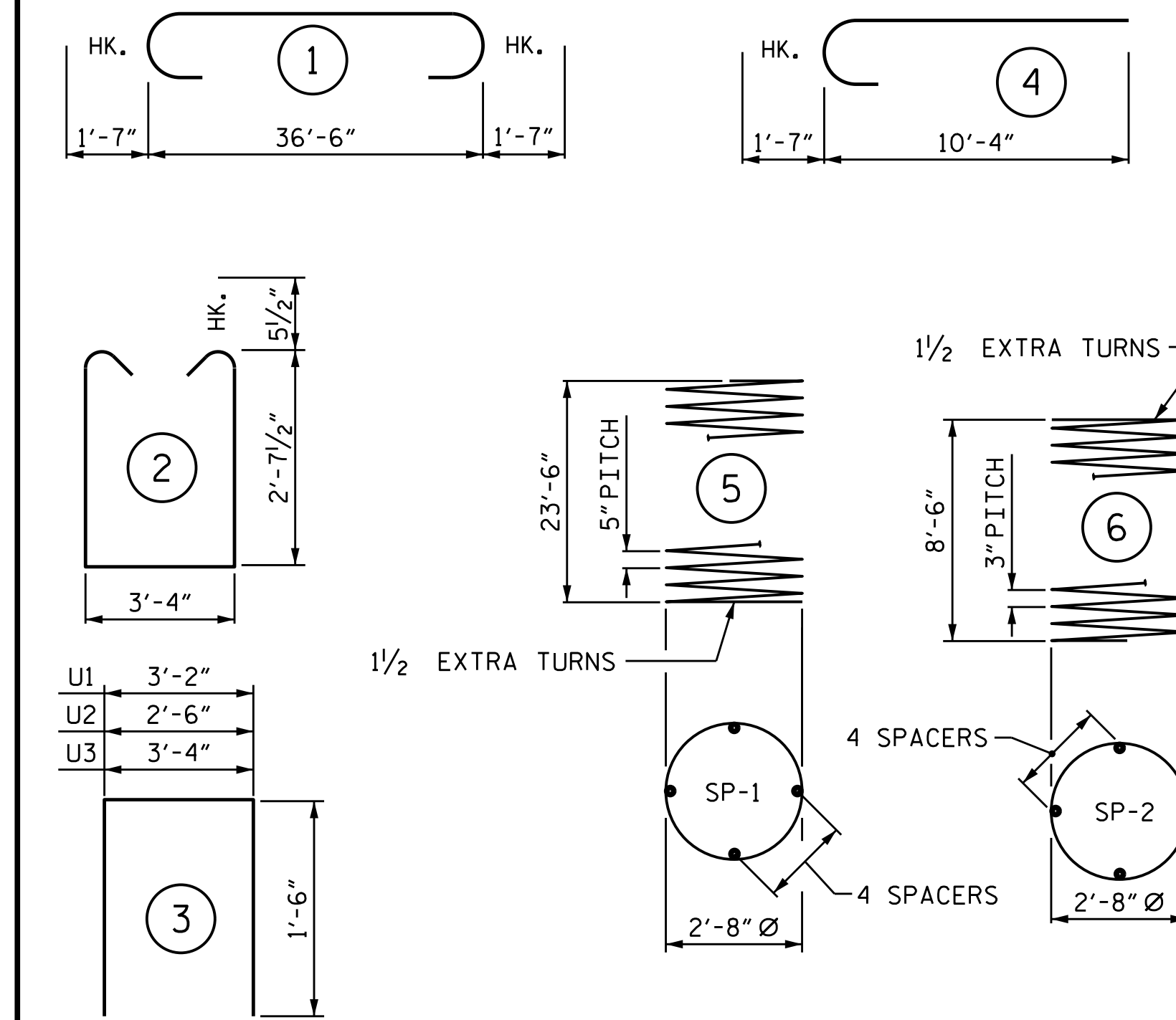


SECTION A-A



SECTION B-B

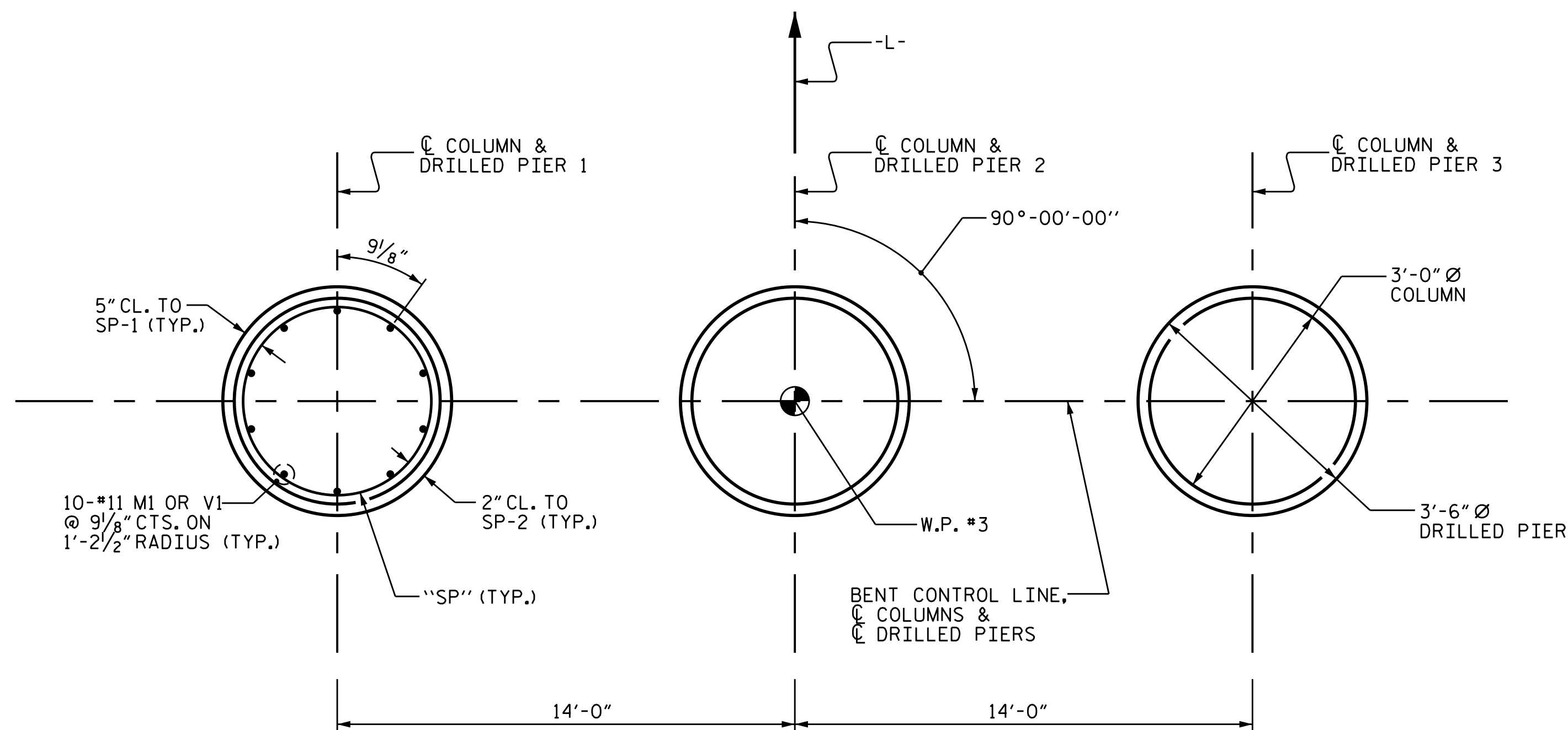
BAR TYPES



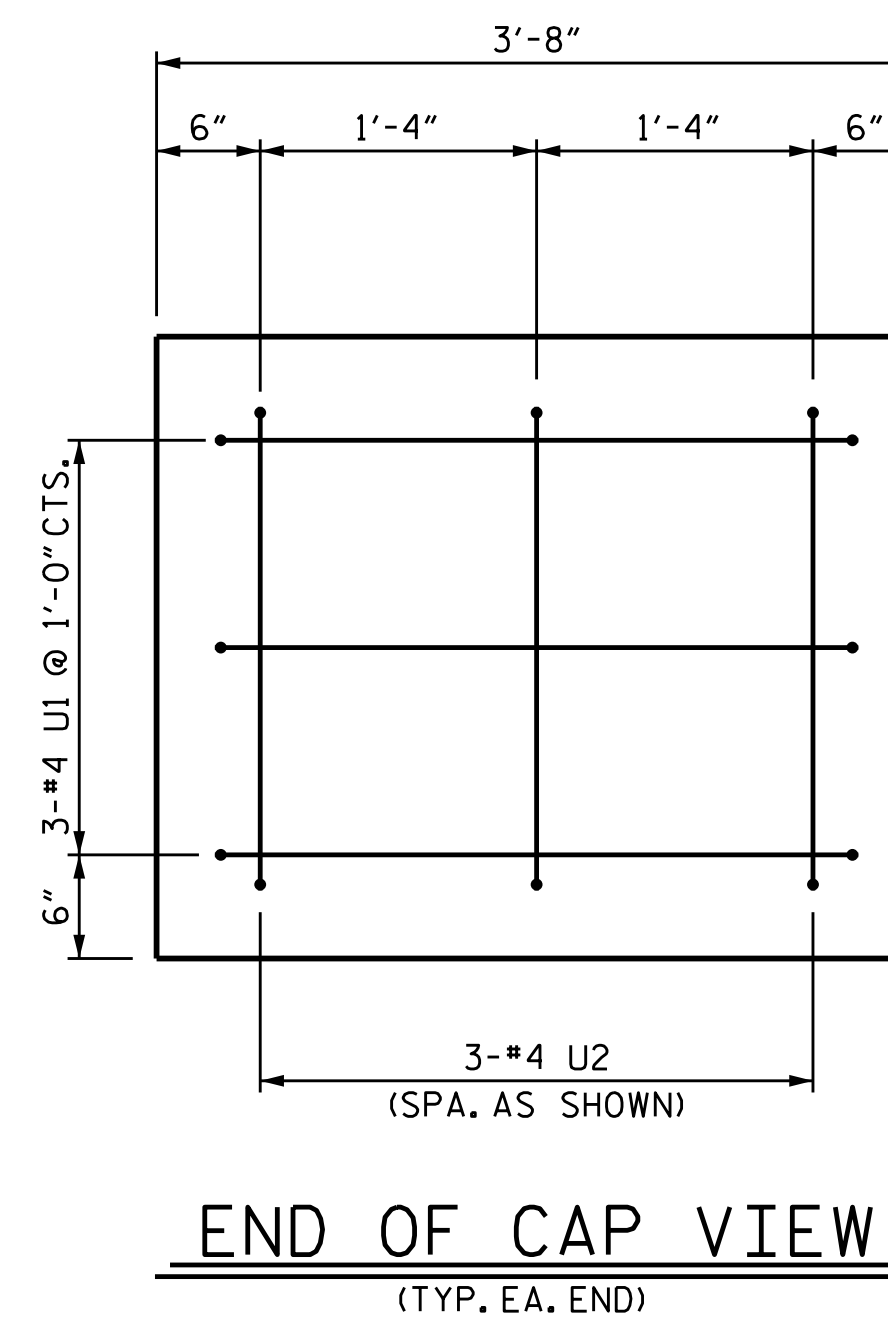
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

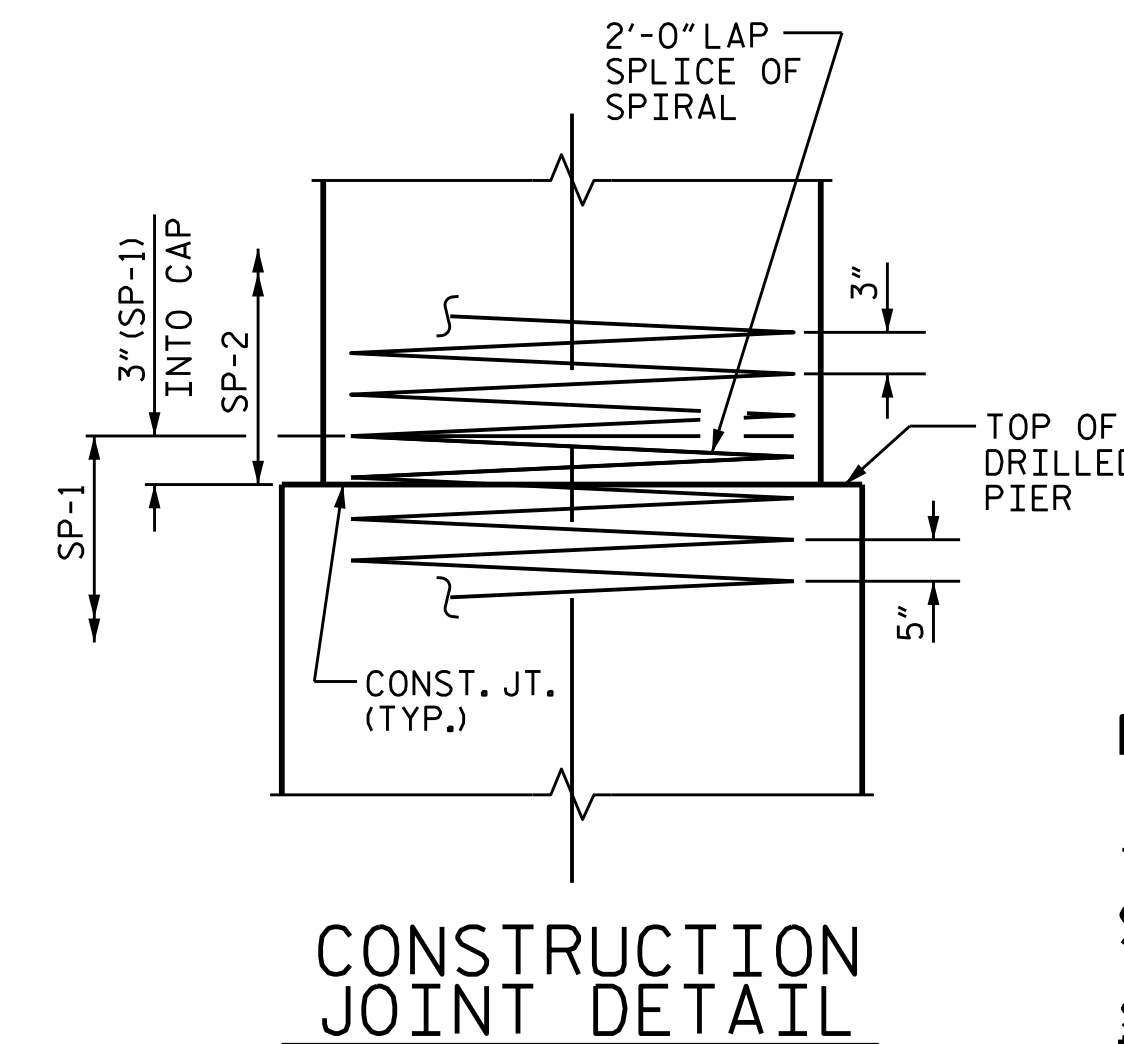
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	1	39'-8"	1,264
B2	6	#11	STR.	36'-8"	1,169
B3	6	#5	STR.	36'-8"	229
B4	6	#4	STR.	3'-2"	13
M1	30	#11	STR.	34'-1"	5,433
S1	40	#5	2	9'-6"	396
U1	6	#4	3	6'-2"	25
U2	6	#4	3	5'-6"	22
U3	35	#4	3	6'-4"	148
V1	30	#11	4	11'-11"	1,899
REINFORCING STEEL					10,598 LBS.
SPIRAL REINFORCING STEEL					
SP-1	3	*	5	477'-1"	1,493
SP-2	3	**	6	292'-11"	587
SPIRAL COLUMN REINFORCING STEEL					2,080 LBS.
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN					
POUR #2 COLUMNS				6.5 CU.YDS.	
POUR #3 CAP				15.6 CU.YDS.	
TOTAL CLASS A CONCRETE				22.1 CU.YDS.	
DRILLED PIERS:					
POUR #1 DRILLED PIERS				25.7 CU.YDS.	
3'-6" Ø DRILLED PIER NOT IN SOIL				24.0 LIN. FT.	
3'-6" Ø DRILLED PIER IN SOIL				48.0 LIN. FT.	
PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIER					32.9 LIN. FT.
CSL TUBES				306 LIN. FT.	



PLAN OF DRILLED PIERS & COLUMNS
(DETAILS ARE TYPICAL FOR EACH DRILLED PIER & COLUMN)



END OF CAP VIEW
(TYP. EA. END)



CONSTRUCTION JOINT DETAIL

PROJECT NO. B-4761
HALIFAX COUNTY
 STATION: 20+11.00 -L-
 SHEET 2 OF 2



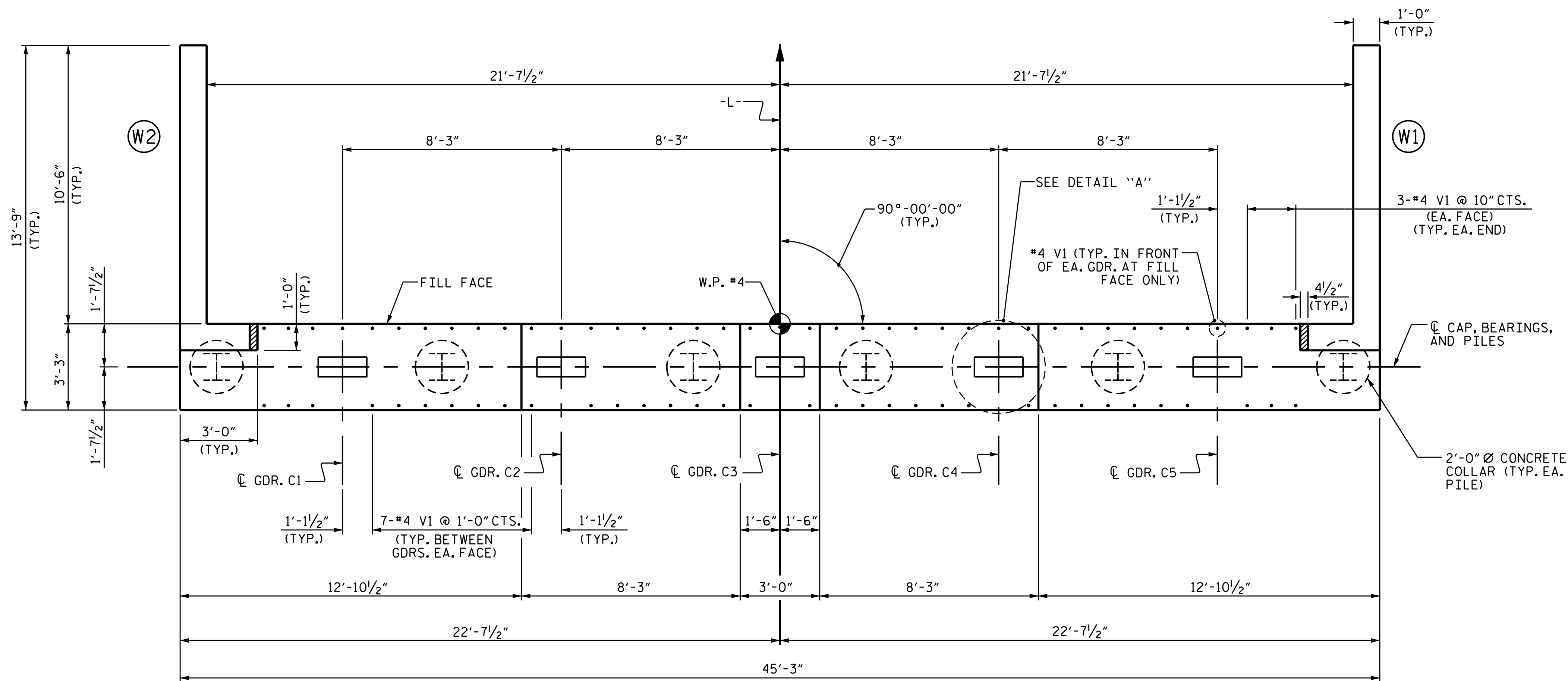
DocuSigned by:
 Emily E. Murray
 CA587AEDC8BEE
 4/27/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 2

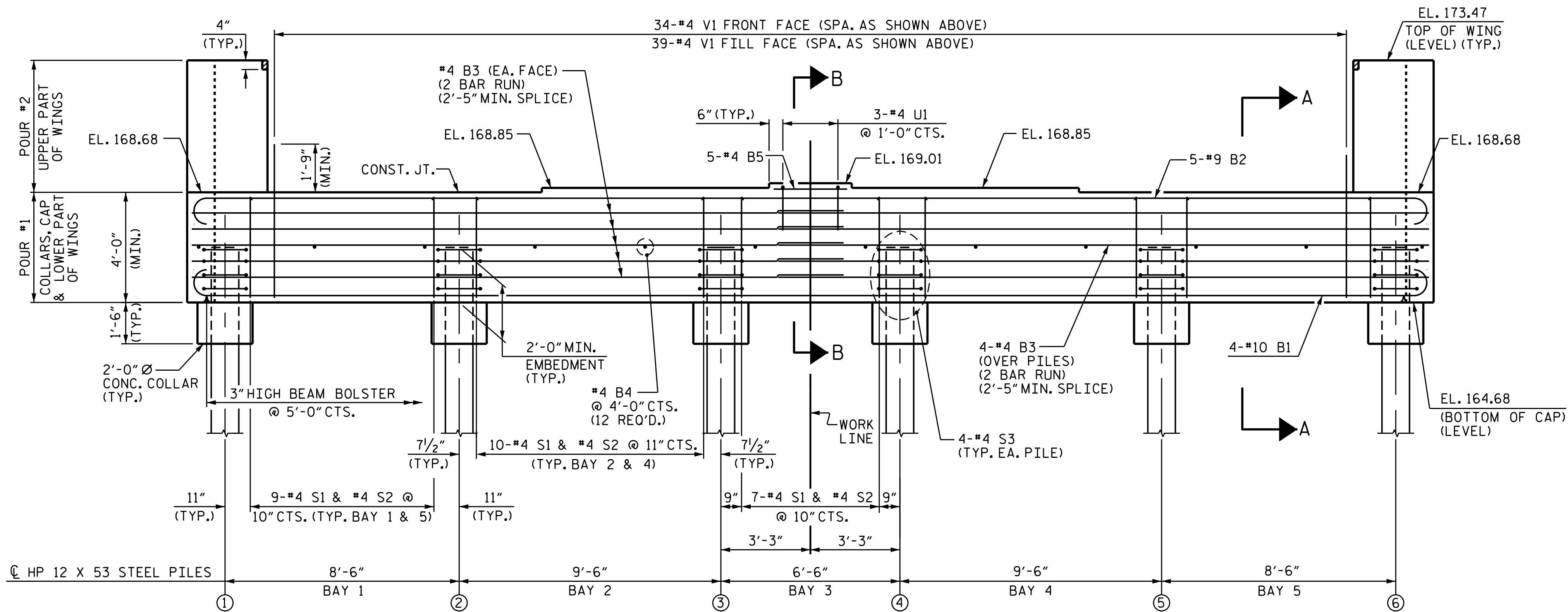
DRAWN BY : M.D.PISO DATE : 8-10-2015
 CHECKED BY : D.G.ELY DATE : 8-26-2015
 DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE : 3/14/16

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1			3			TOTAL SHEETS
2			4			31



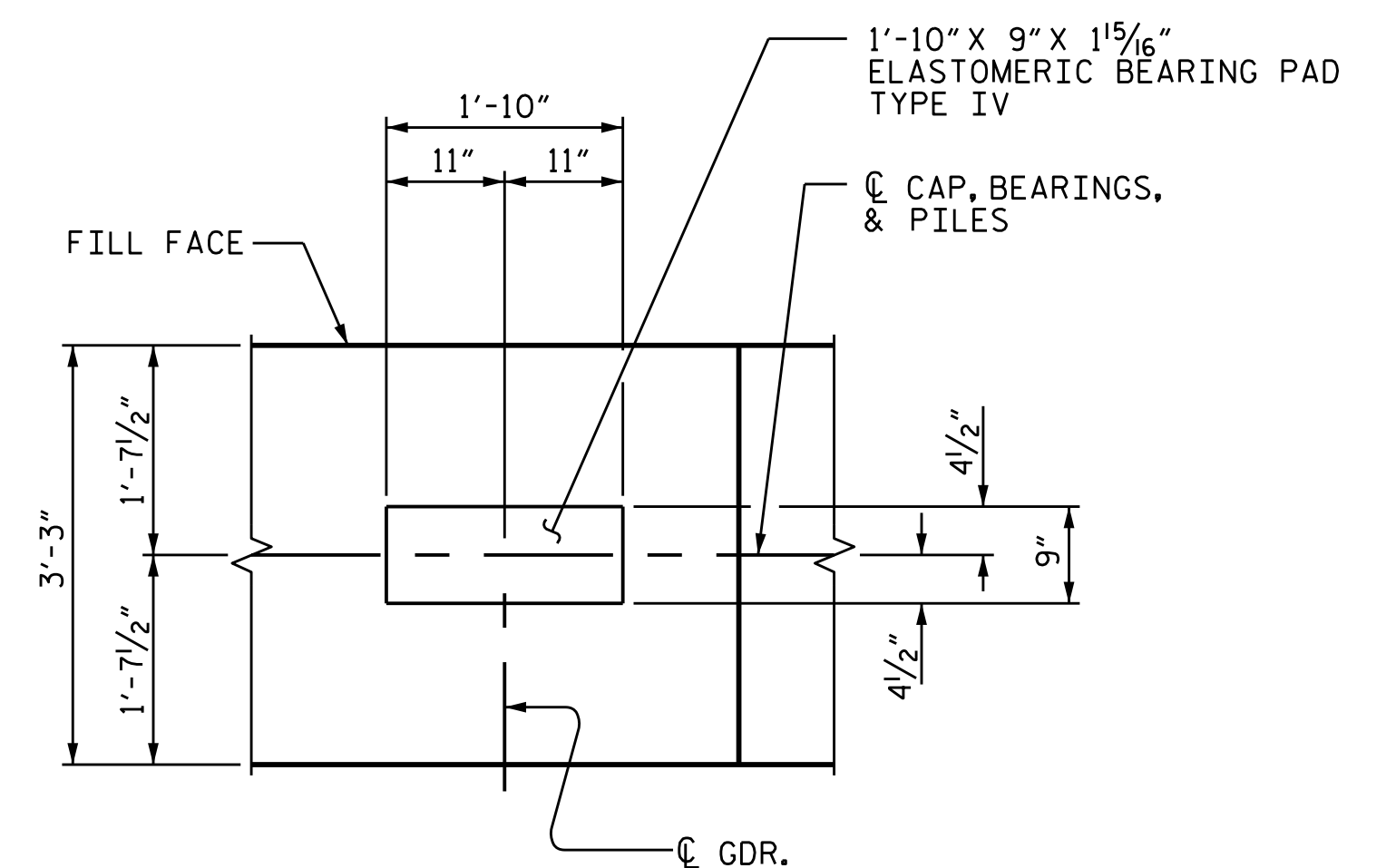
PLAN



ELEVATION

NOTES

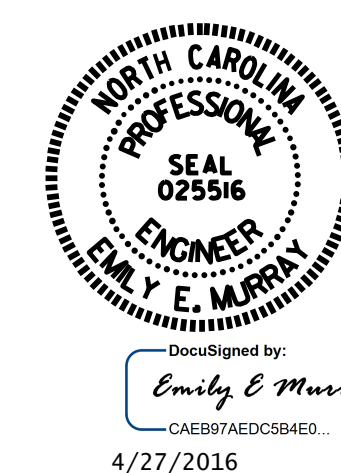
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.
- THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".
- THE UPPER PORTION OF THE INTEGRAL END BENT CAP SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE PLANS.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



DETAIL "A"

(DETAILS AND DIMENSIONS ARE TYP. FOR EA. BEARING)

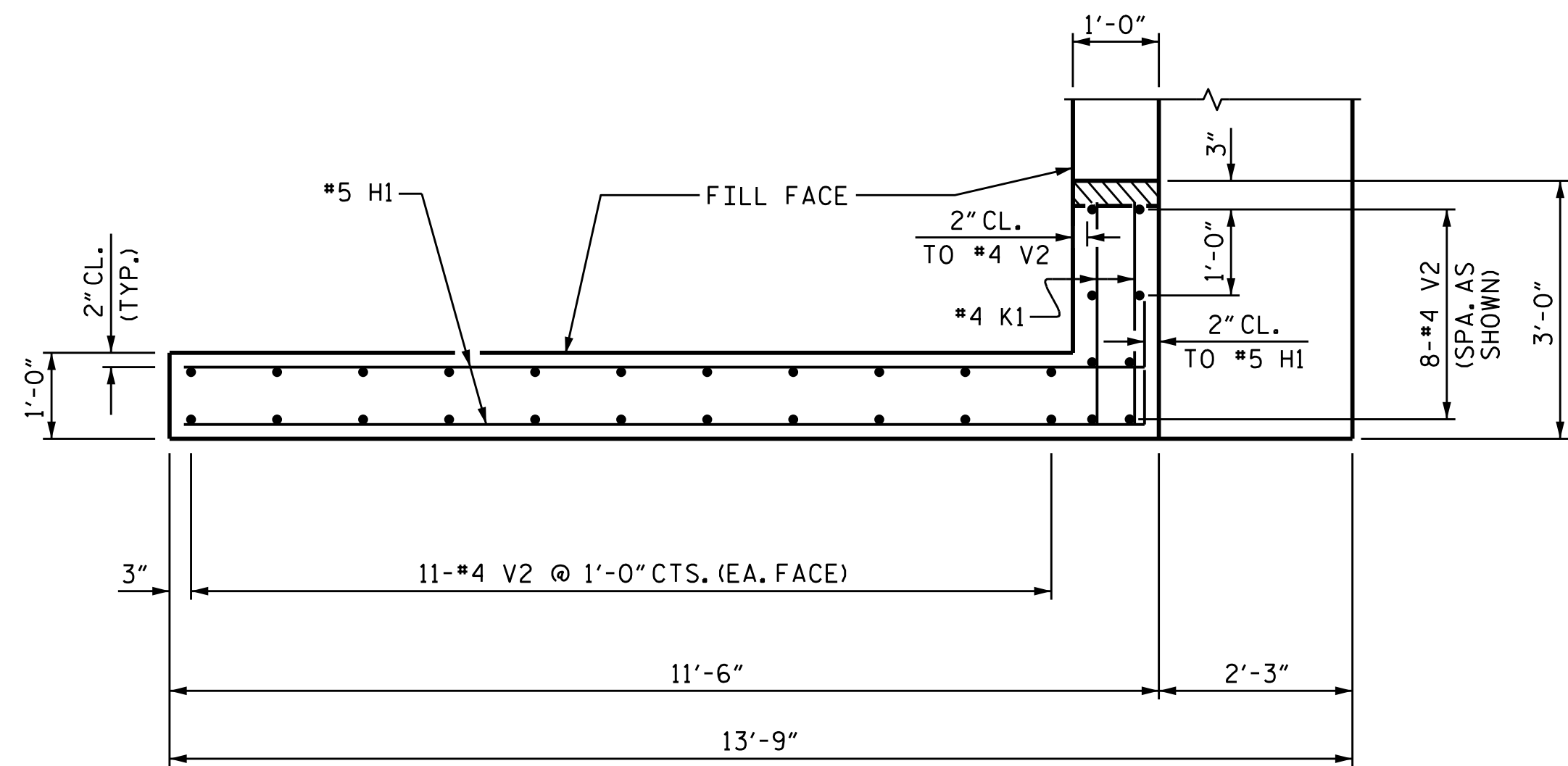
PROJECT NO. B-4761
HALIFAX COUNTY
 STATION: 20+11.00 -L
 SHEET 1 OF 3



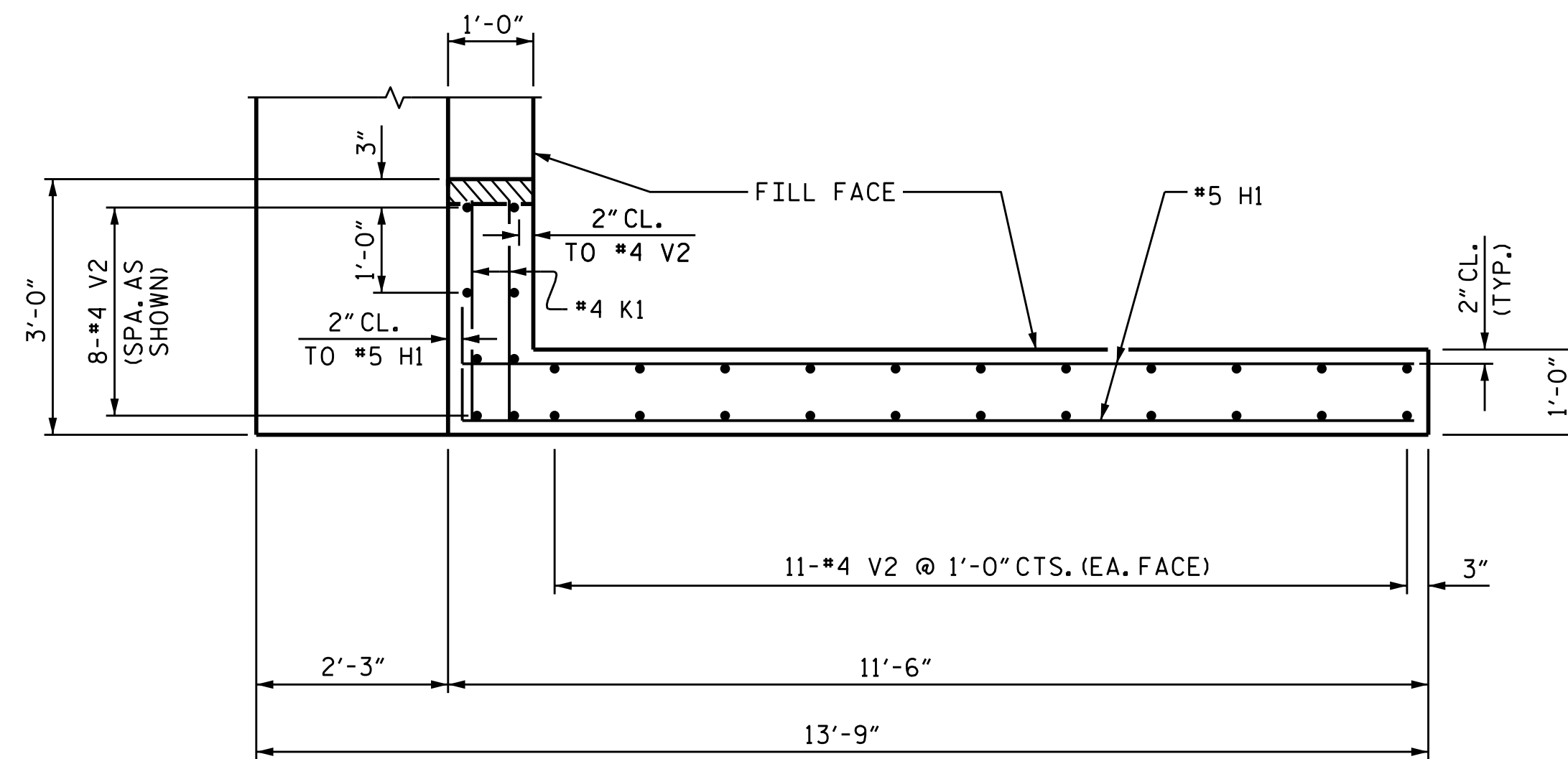
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 INTEGRAL END BENT 2

DRAWN BY: M.D.PISO DATE: 8-05-2015
 CHECKED BY: D.G.ELY DATE: 8-25-2015
 DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE: 3/14/16

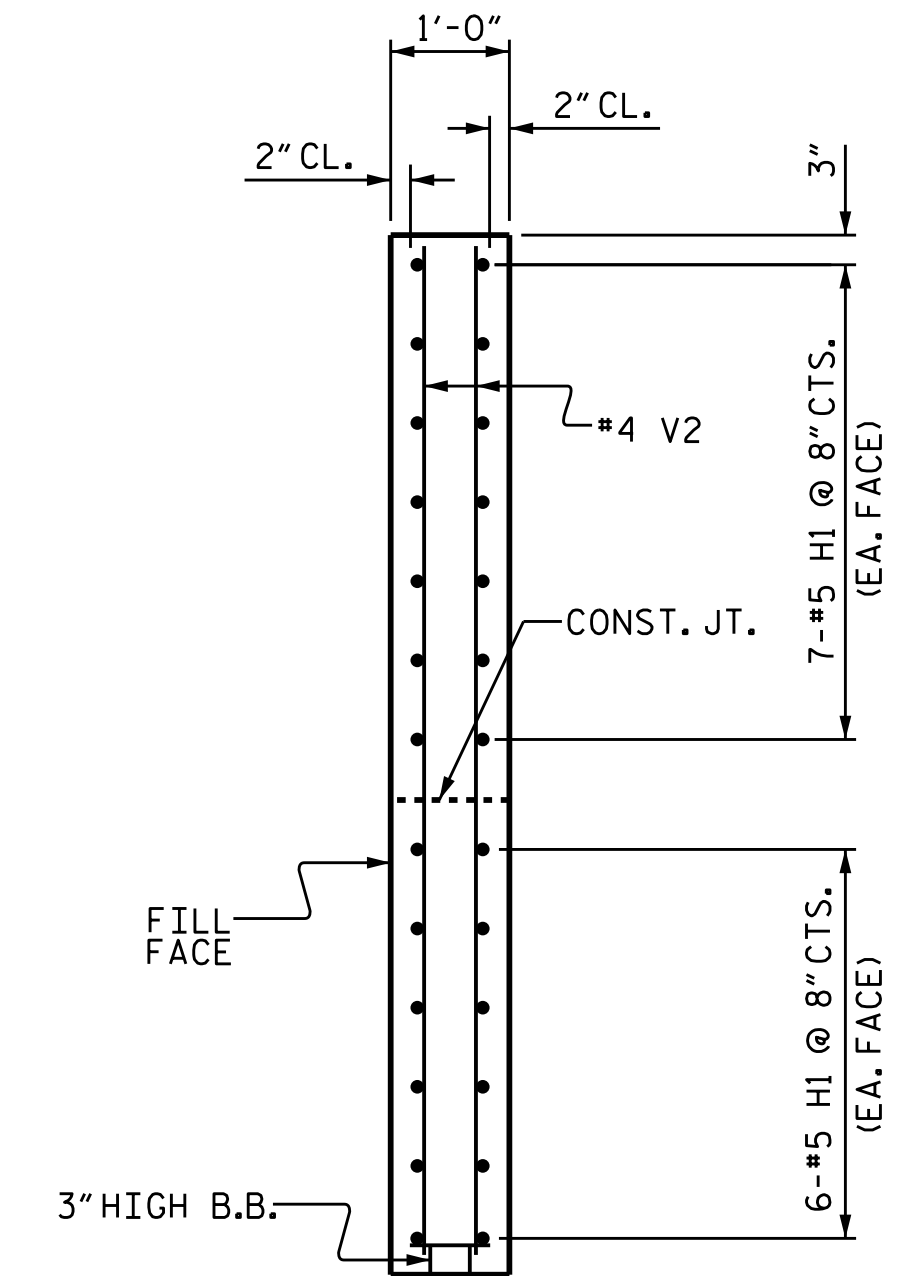
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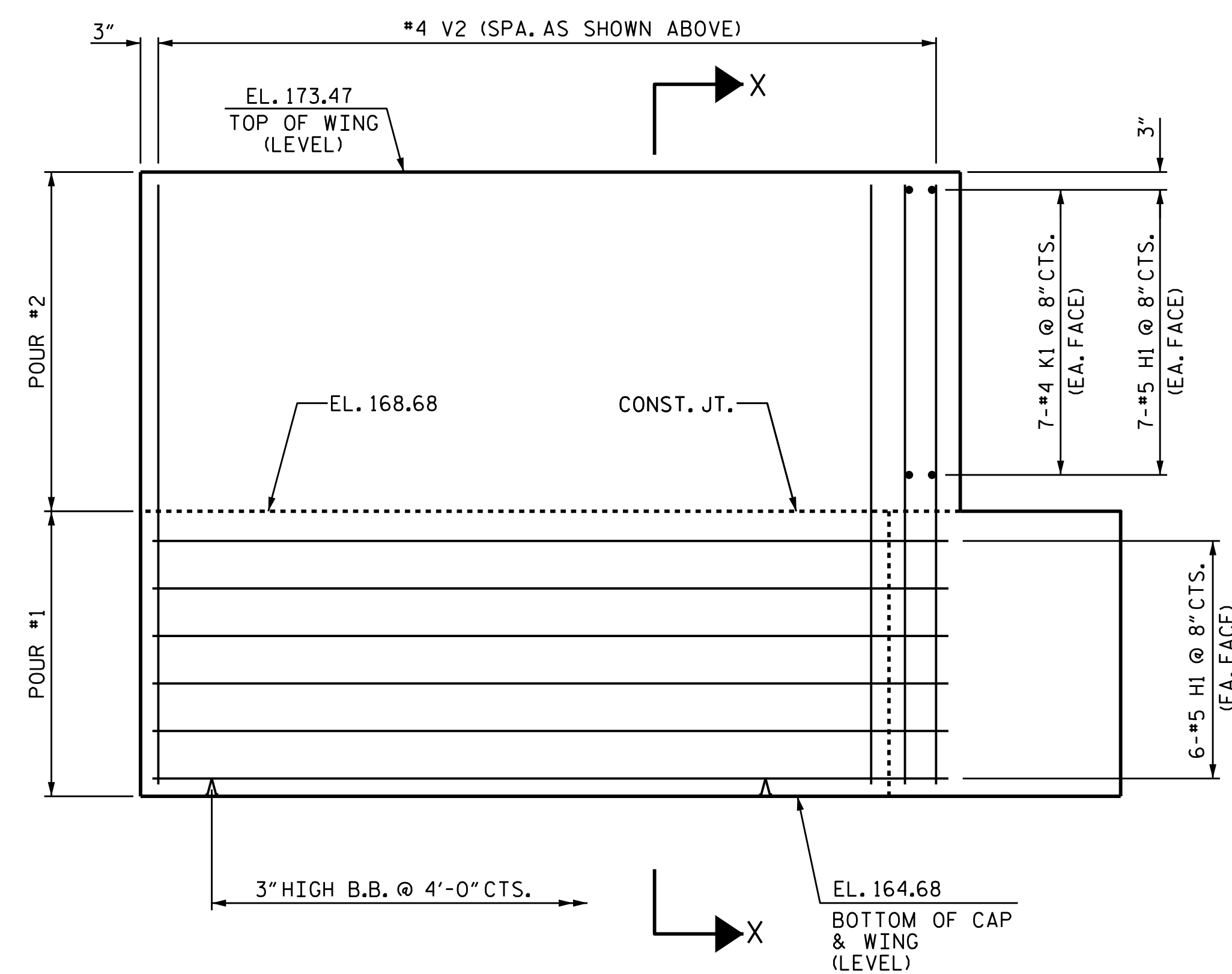
PLAN (W2)



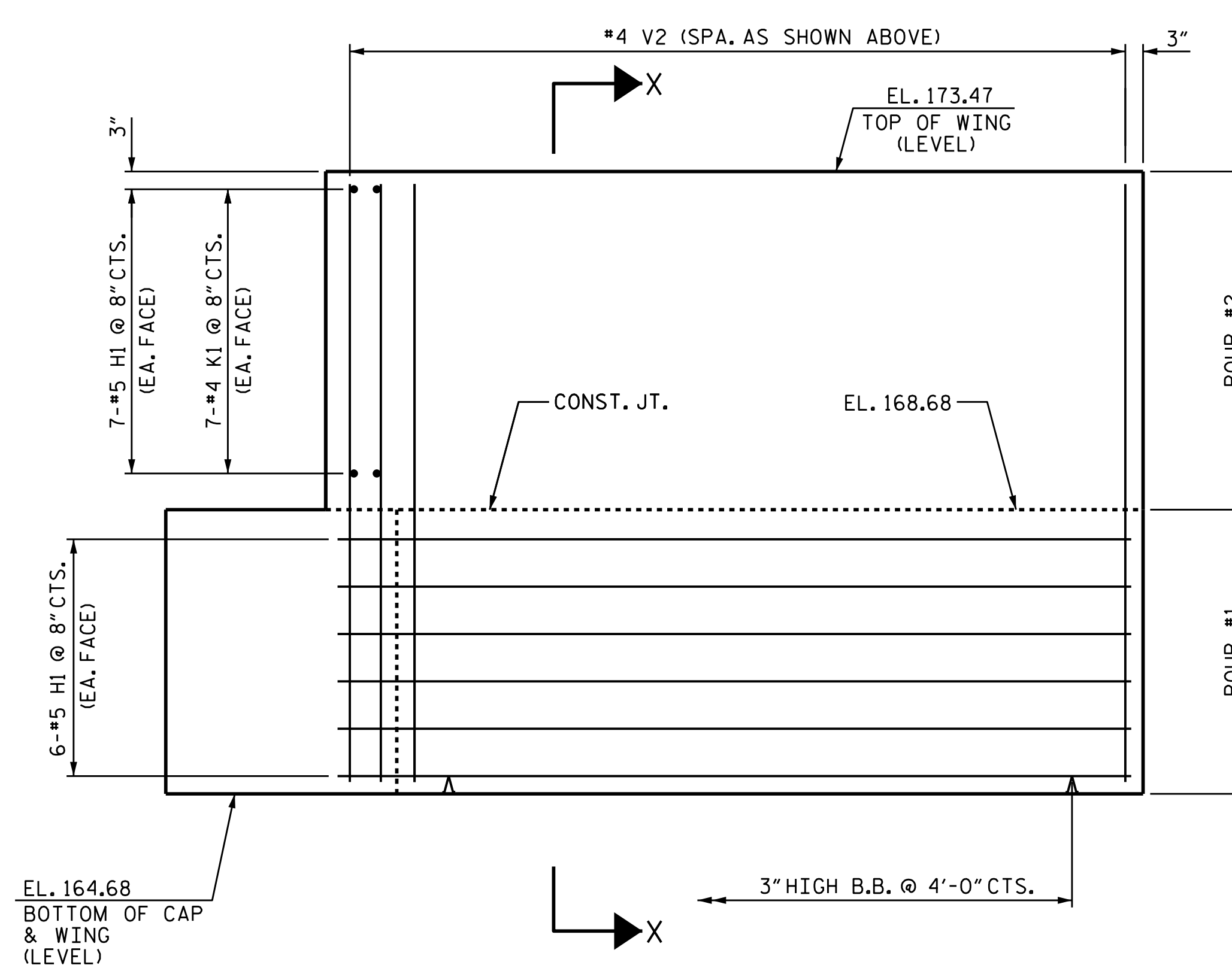
PLAN (W1)



SECTION X-X

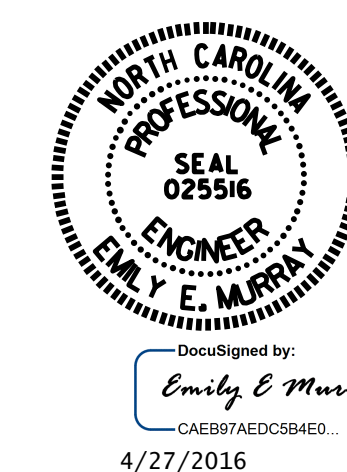


ELEVATION (W2)



ELEVATION (W1)

PROJECT NO. B-4761
HALIFAX COUNTY
 STATION: 20+11.00 -L-
 SHEET 2 OF 3

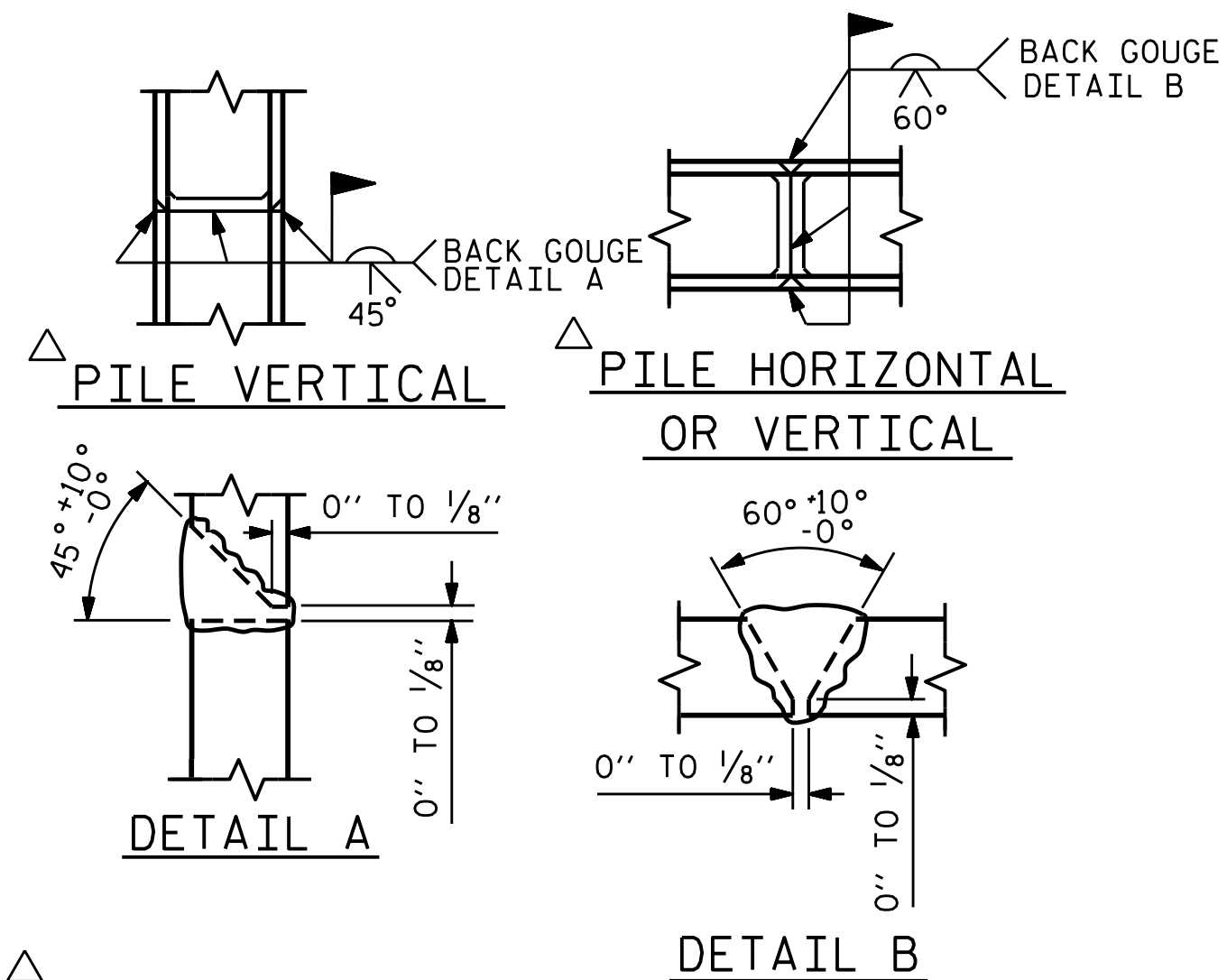


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 INTEGRAL END BENT 2

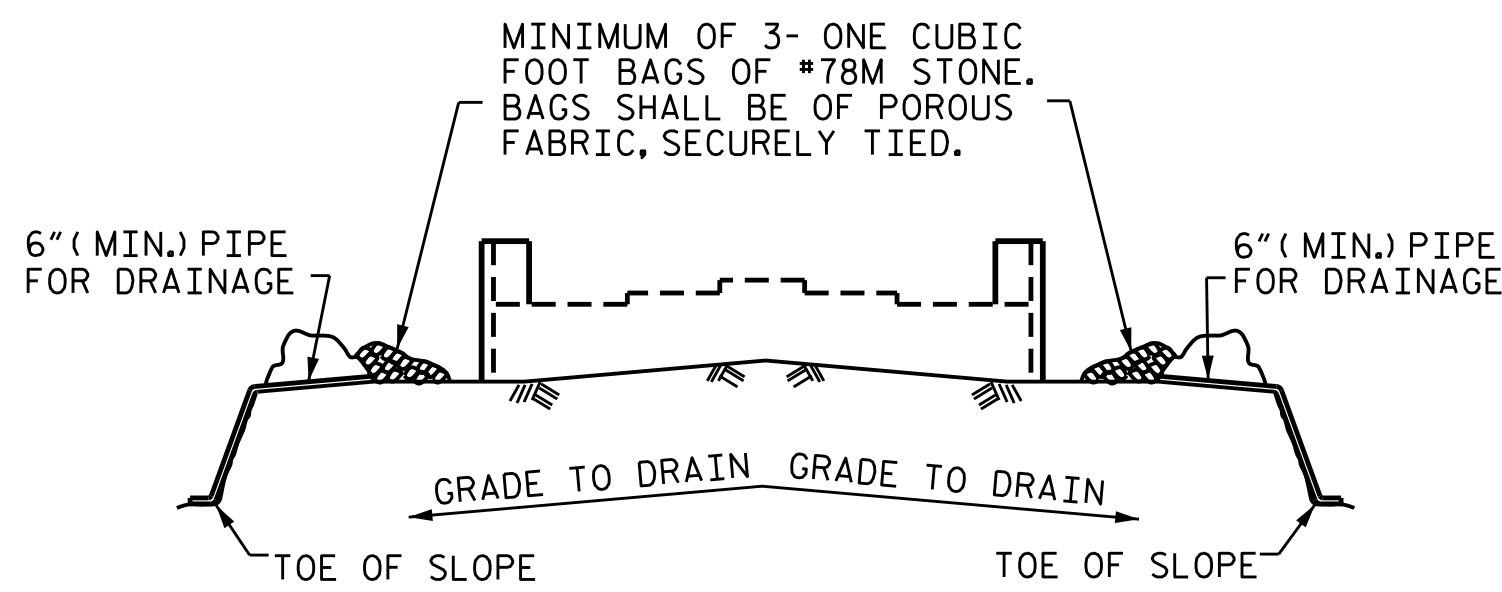
DRAWN BY: M.D.PISO DATE: 8-04-2015
 CHECKED BY: D.G.ELY DATE: 8-25-2015
 DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE: 3/14/16

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2			4			



POSITION OF PILE DURING WELDING.
PILE SPLICE DETAILS



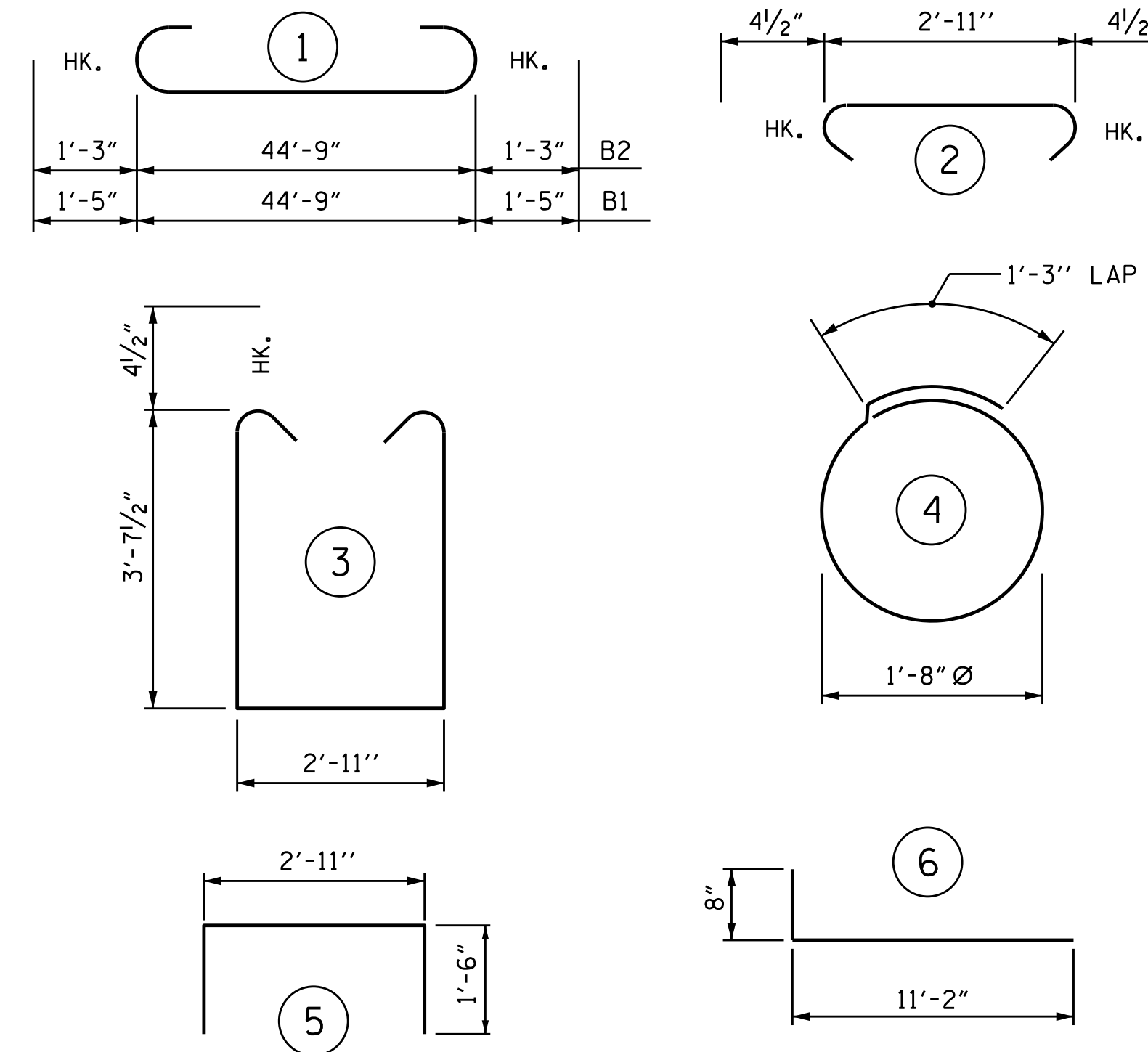
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

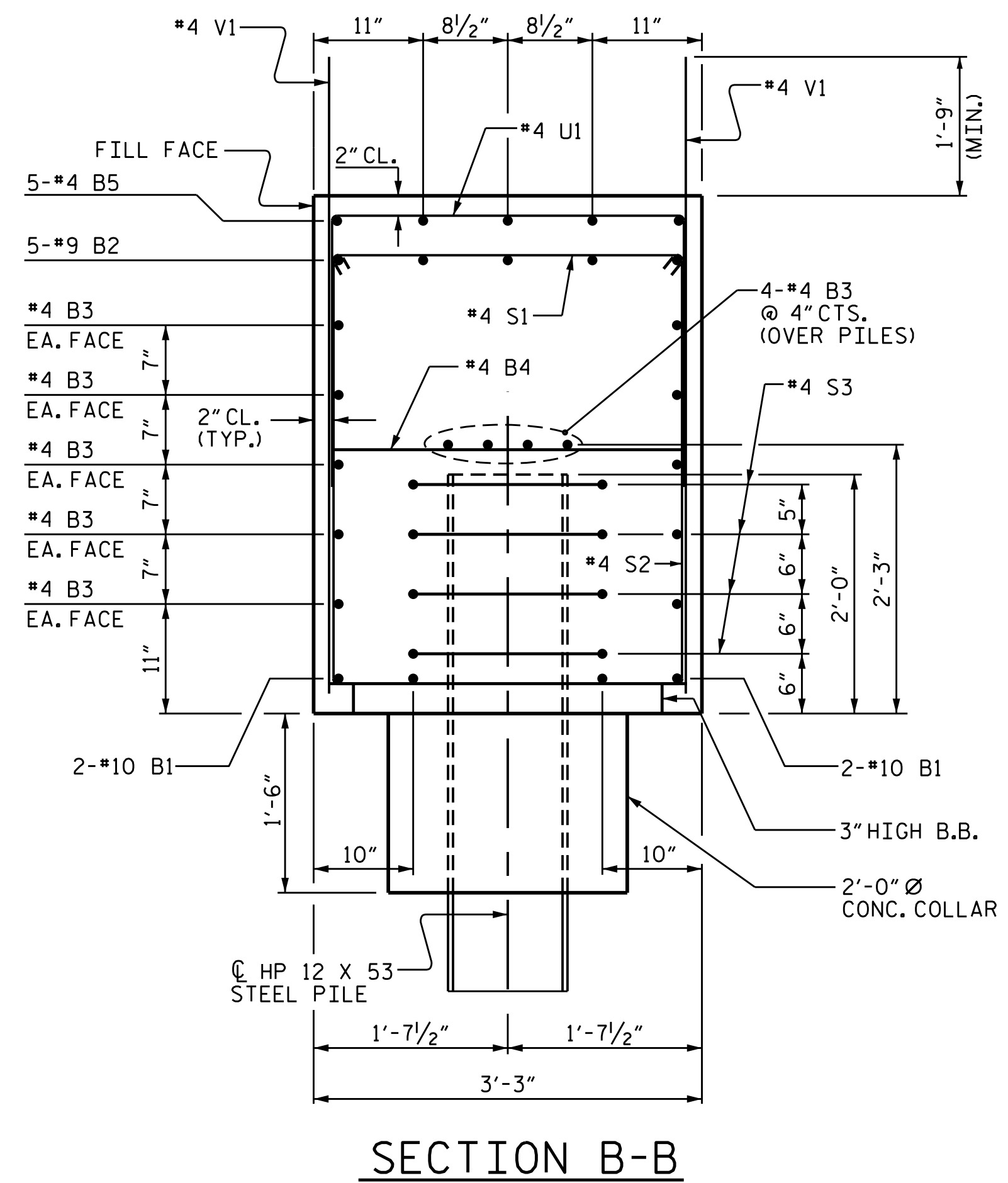
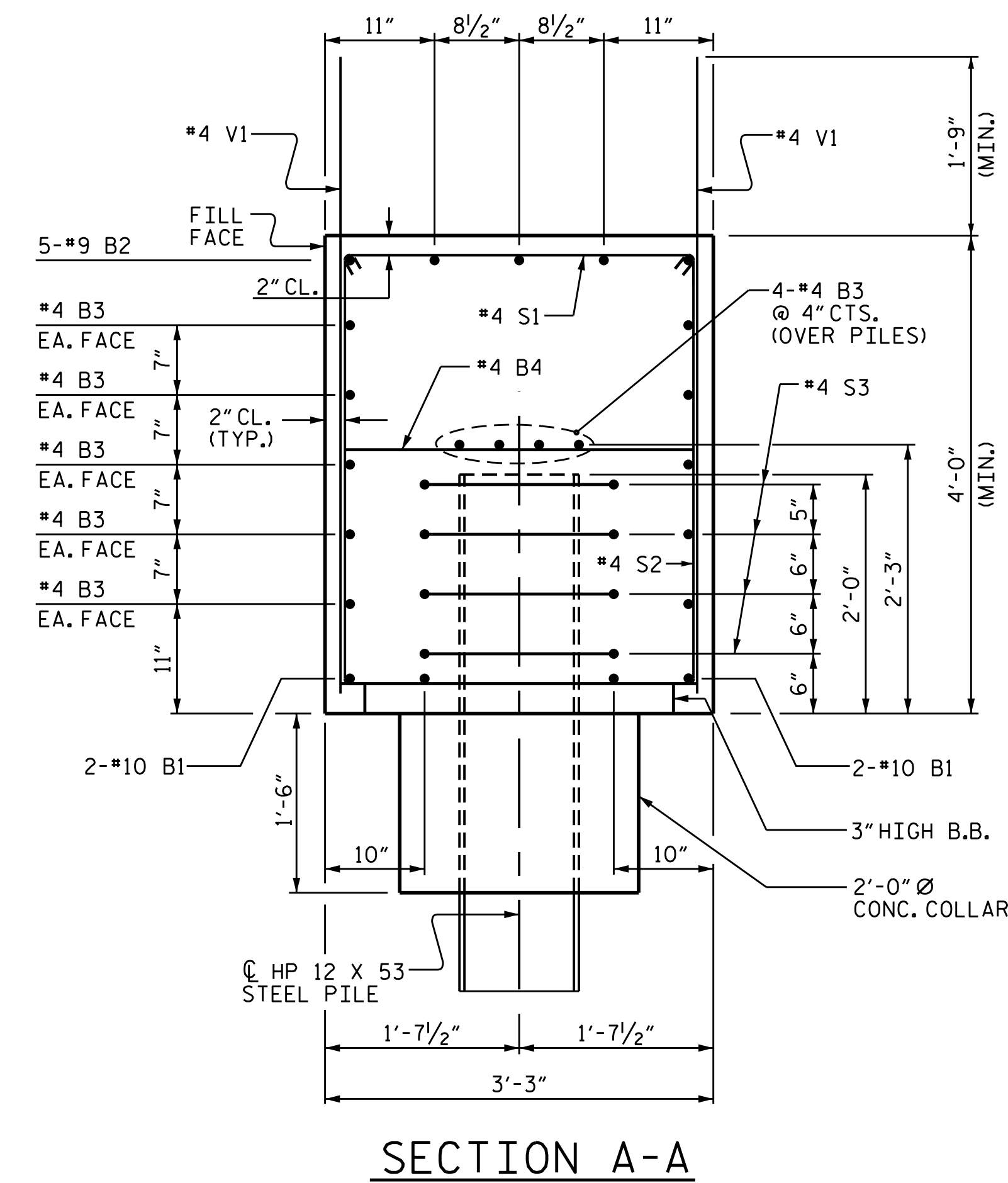
INTEGRAL END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	47'-7"	819
B2	5	#9	1	47'-3"	803
B3	28	#4	STR.	23'-8"	443
B4	12	#4	STR.	2'-11"	23
B5	5	#4	STR.	2'-8"	9
H1	52	#5	6	11'-10"	642
K1	28	#4	STR.	2'-7"	48
S1	45	#4	2	3'-8"	110
S2	45	#4	3	10'-11"	328
S3	24	#4	4	6'-6"	104
U1	3	#4	5	5'-11"	12
V1	73	#4	STR.	5'-7"	272
V2	60	#4	STR.	8'-4"	334

REINFORCING STEEL 3,947 LBS.

CLASS A CONCRETE	POUR #1-CAP, LOWER WINGS & CONCRETE COLLARS	26.4 CU.YDS.
	POUR #2-UPPER PART OF WINGS	4.4 CU.YDS.
TOTAL		30.8 CU.YDS.

HP 12 X 53 STEEL PILES	NO.	LINEAR FEET
	6	120 LIN.FT.



PROJECT NO. B-4761
HALIFAX COUNTY
 STATION: 20+11.00 -L-
 SHEET 3 OF 3



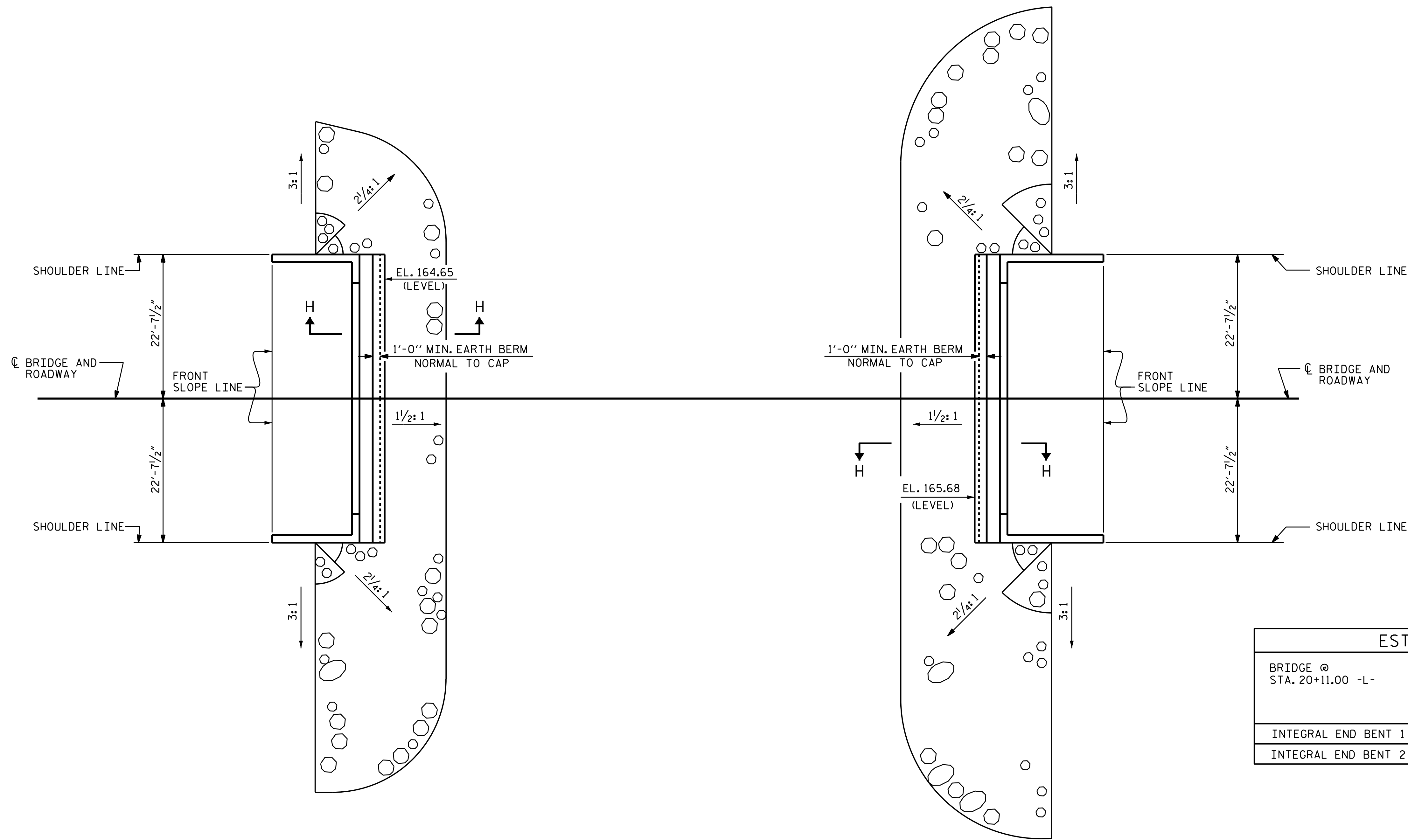
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
INTEGRAL END BENT 2

DRAWN BY: M.D.PISO DATE: 8-05-2015
 CHECKED BY: D.G.ELY DATE: 8-25-2015
 DESIGN ENGINEER OF RECORD: G.KOUCEKI DATE: 3/14/16

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1			3			TOTAL SHEETS
2			4			31

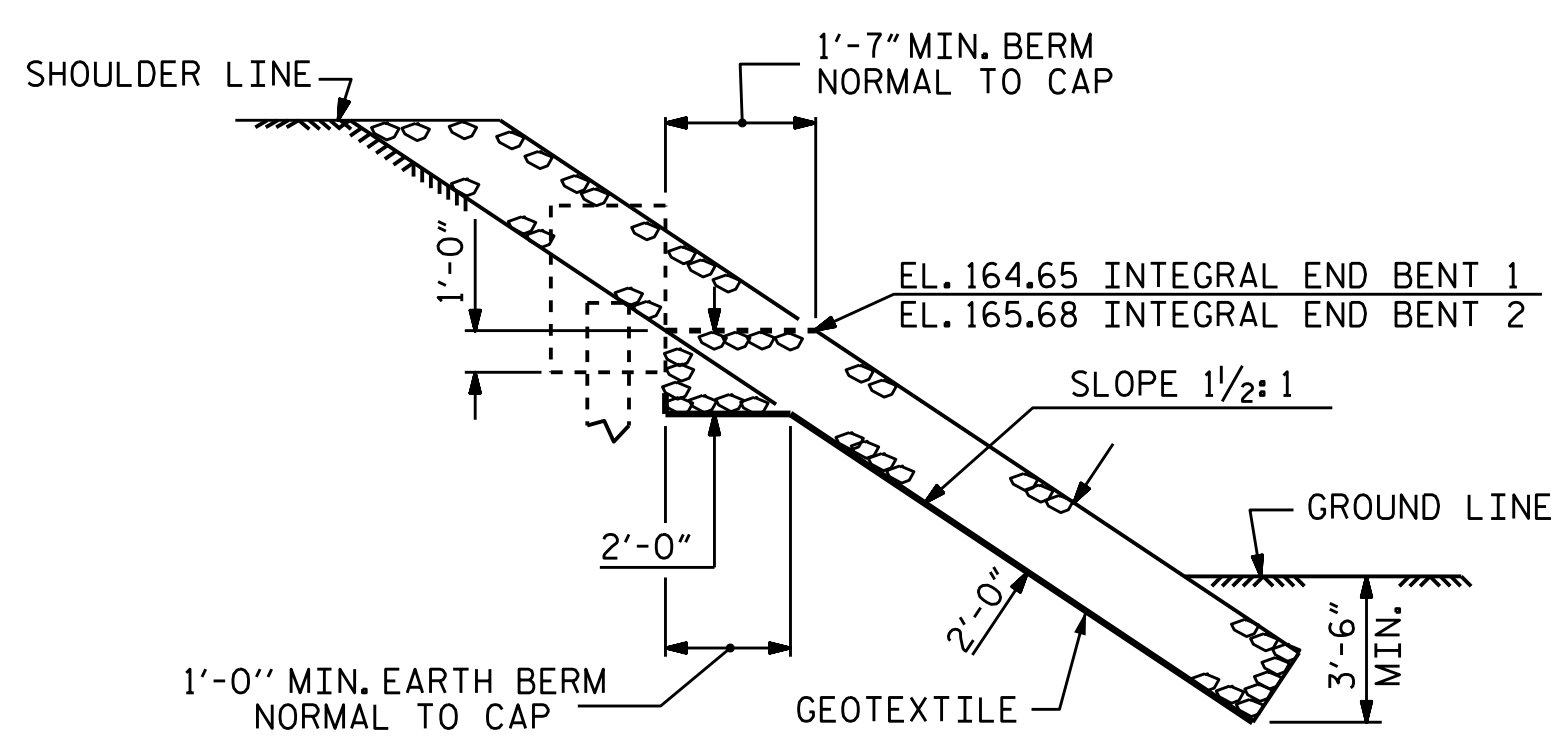
NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



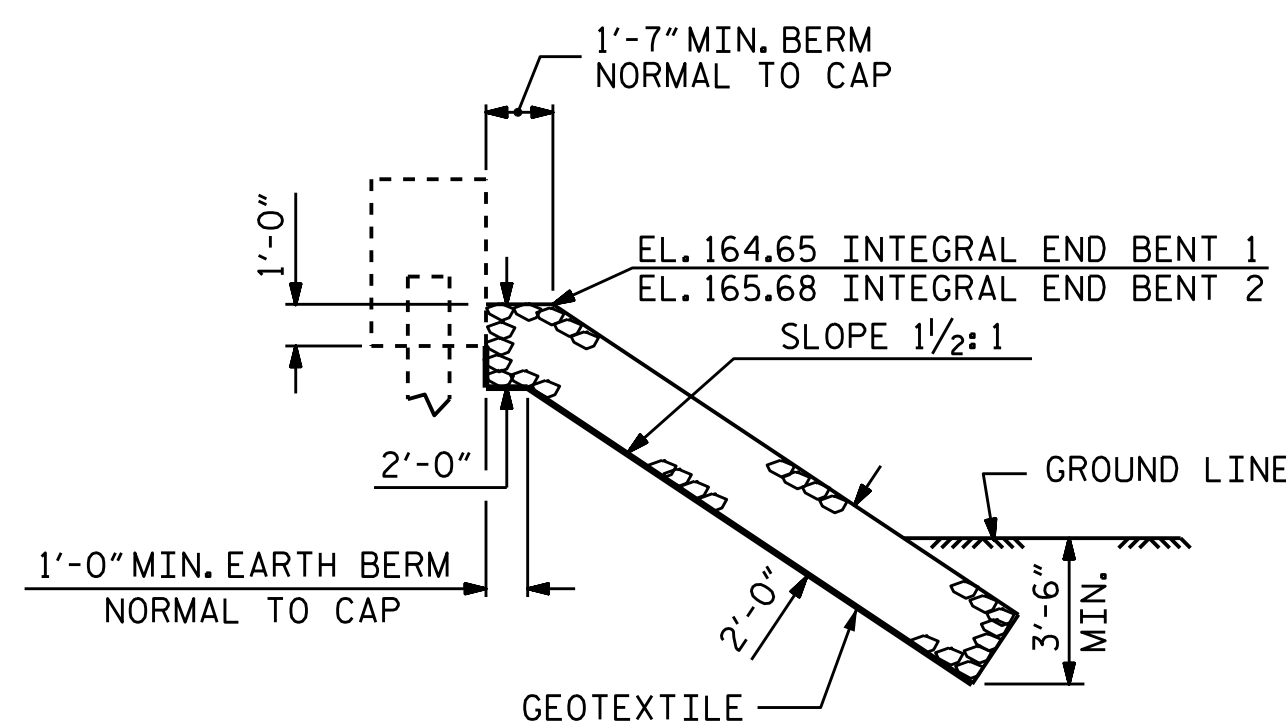
INTEGRAL END BENT 1

INTEGRAL END BENT 2

ESTIMATED QUANTITIES		
BRIDGE @ STA. 20+11.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
INTEGRAL END BENT 1	200	220
INTEGRAL END BENT 2	210	235



SECTION H-H



SECTION C-C

PROJECT NO. B-4761
HALIFAX COUNTY
STATION: 20+11.00 -L-



Designed by:
Emily E. Murray
4/27/2016

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

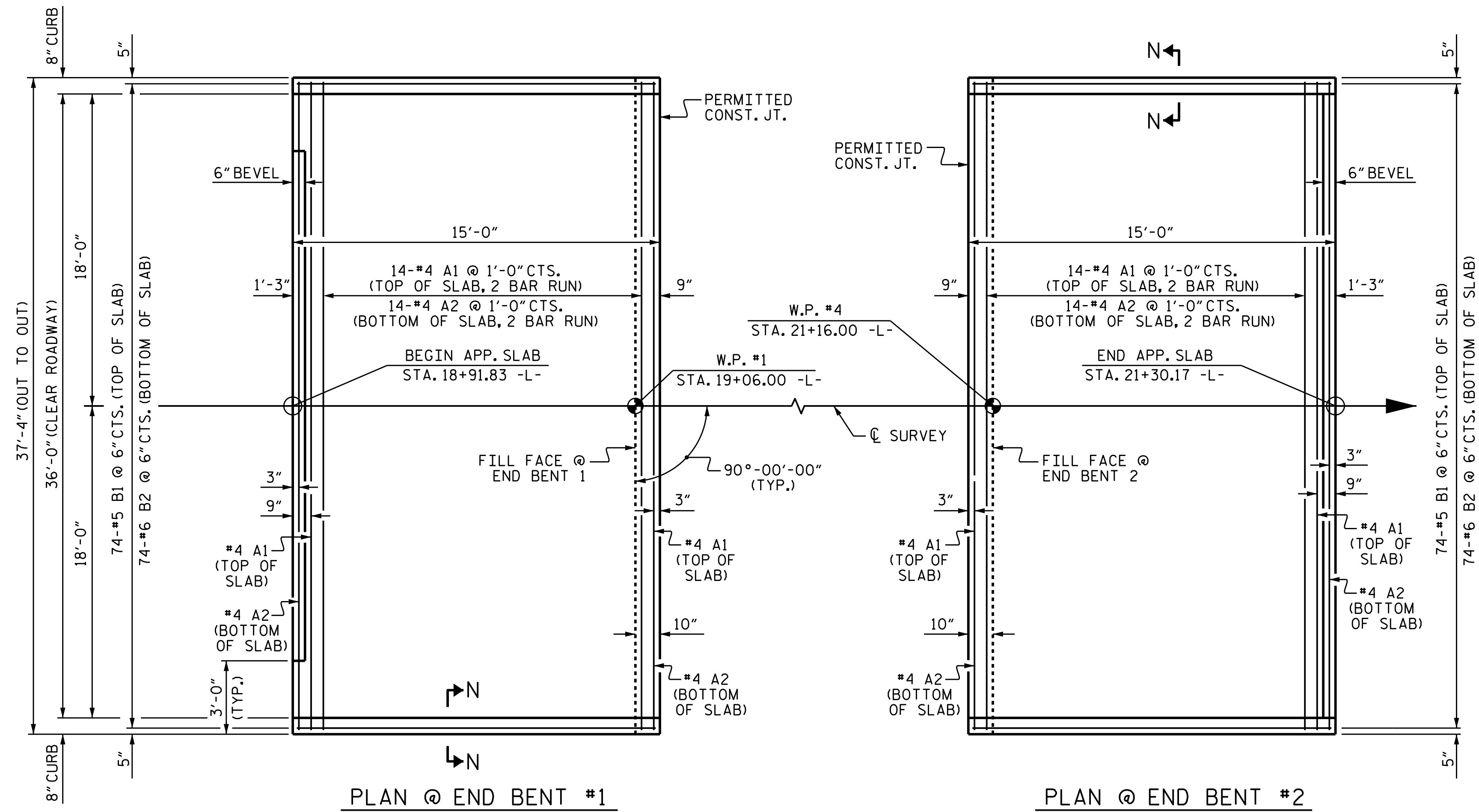
ASSEMBLED BY : M.K. BEARD DATE : 2/22/16
CHECKED BY : D.A. DAVENPORT DATE : 2/23/16

DRAWN BY : REK 1/84 REV. 5/1/06R TLA/GM
CHECKED BY : ROU 1/84 REV. 10/1/11 MAA/GM
REV. 12/21/11 MAA/GM

DESIGN ENGINEER OF RECORD:
G. KOUCHEKI DATE : 3/14/16

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2			4			



NOTES

THE APPROACH SLAB MAY BE CAST MONOLITHICALLY WITH THE END BENT DIAPHRAGM AND THE END SECTION OF THE BRIDGE DECK NEAR THE INTEGRAL END BENT.

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.

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.

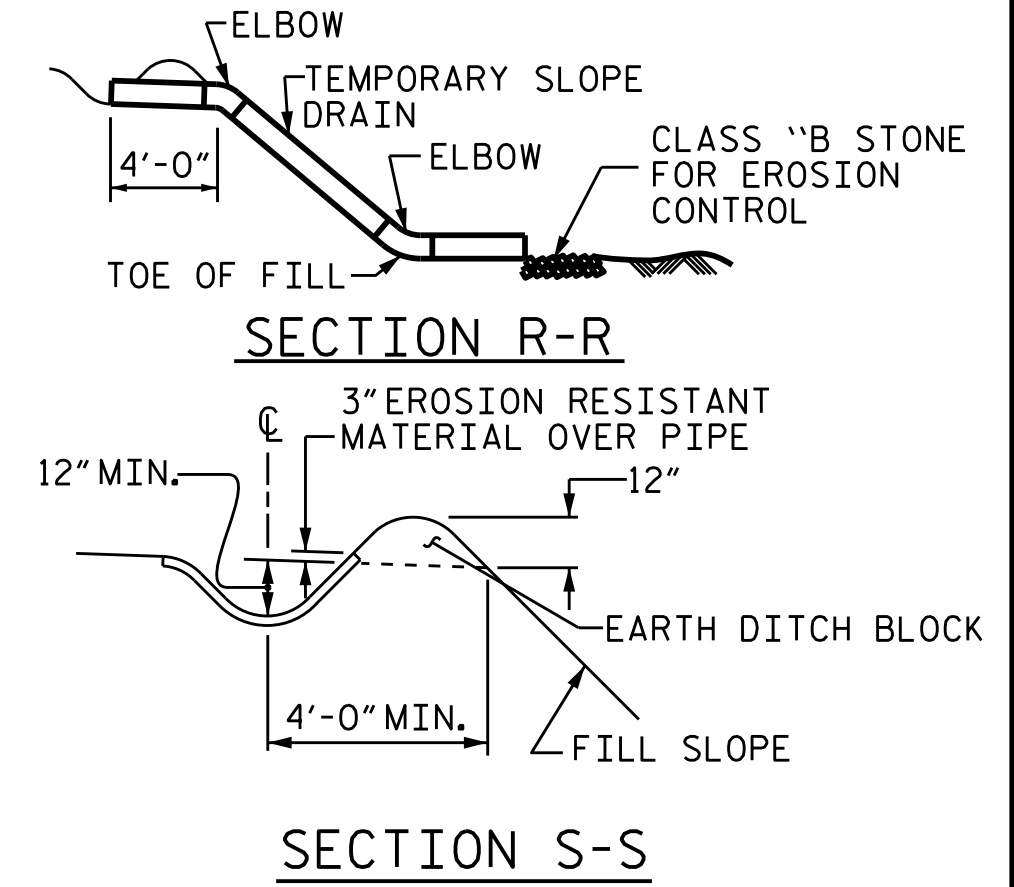
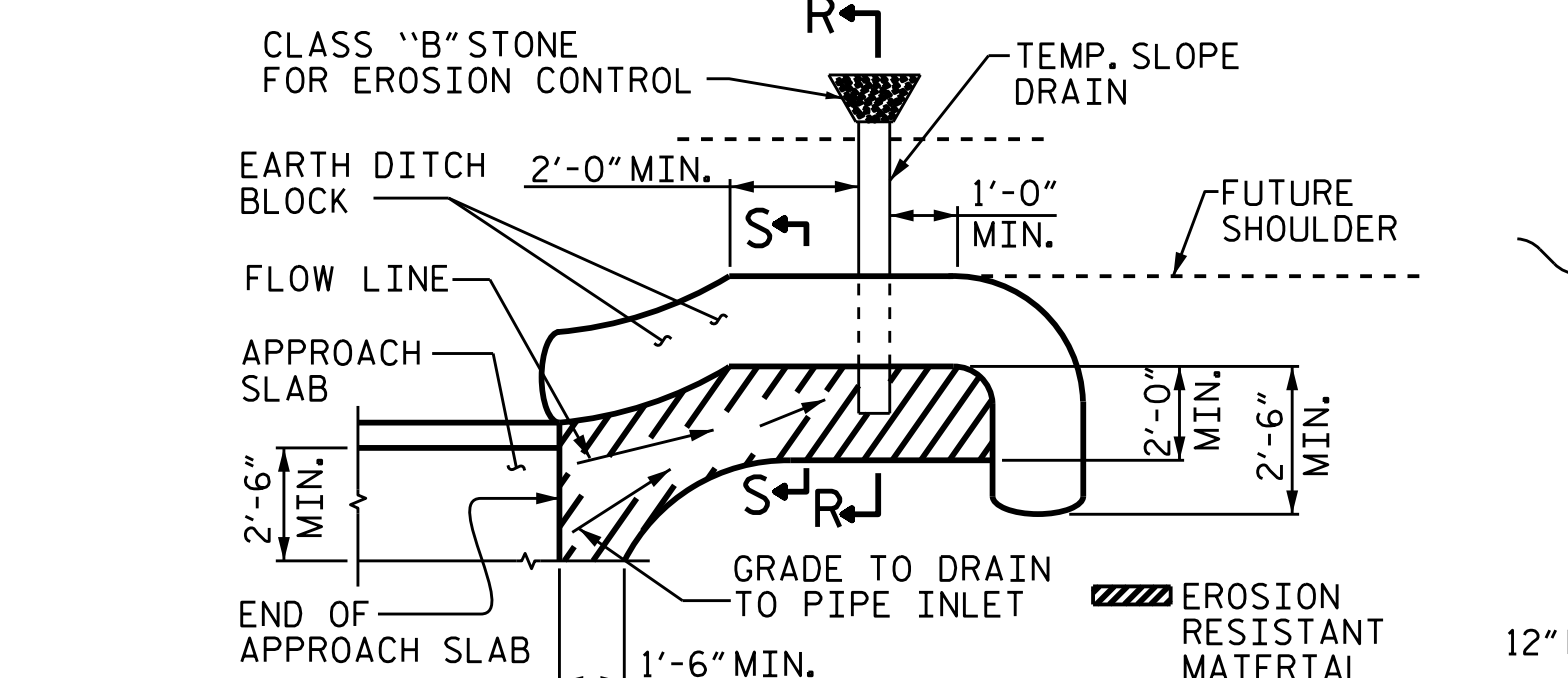
#78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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					
FOR ONE APPROACH SLAB (2 REQ'D)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	32	#4	STR	19'-6"	417
A2	32	#4	STR	19'-4"	413
* B1	74	#5	STR	14'-3"	1,100
B2	74	#6	STR	14'-8"	1,630
REINFORCING STEEL				LBS.	2,043
* EPOXY COATED REINFORCING STEEL				LBS.	1,517
CLASS AA CONCRETE				C. Y.	24.1

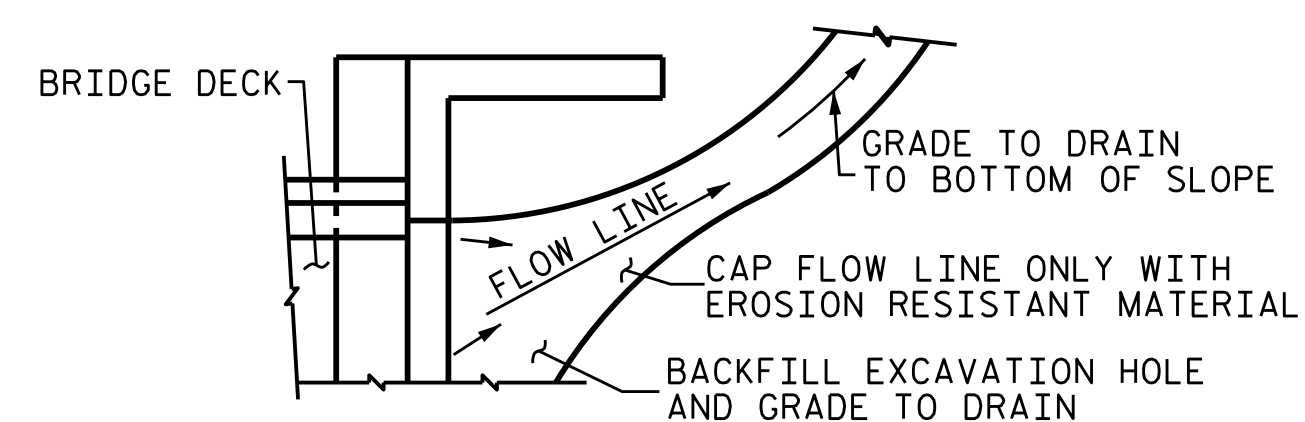
SPLICE LENGTH CHART	
BAR	SPLICE LENGTH
#4 A1	2'-0"
#4 A2	1'-9"



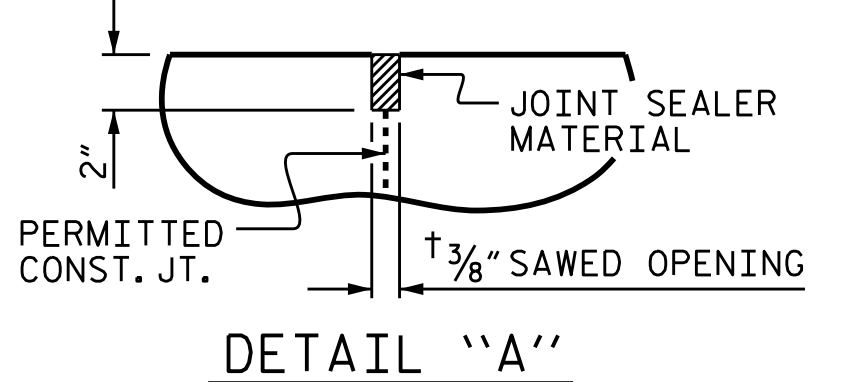
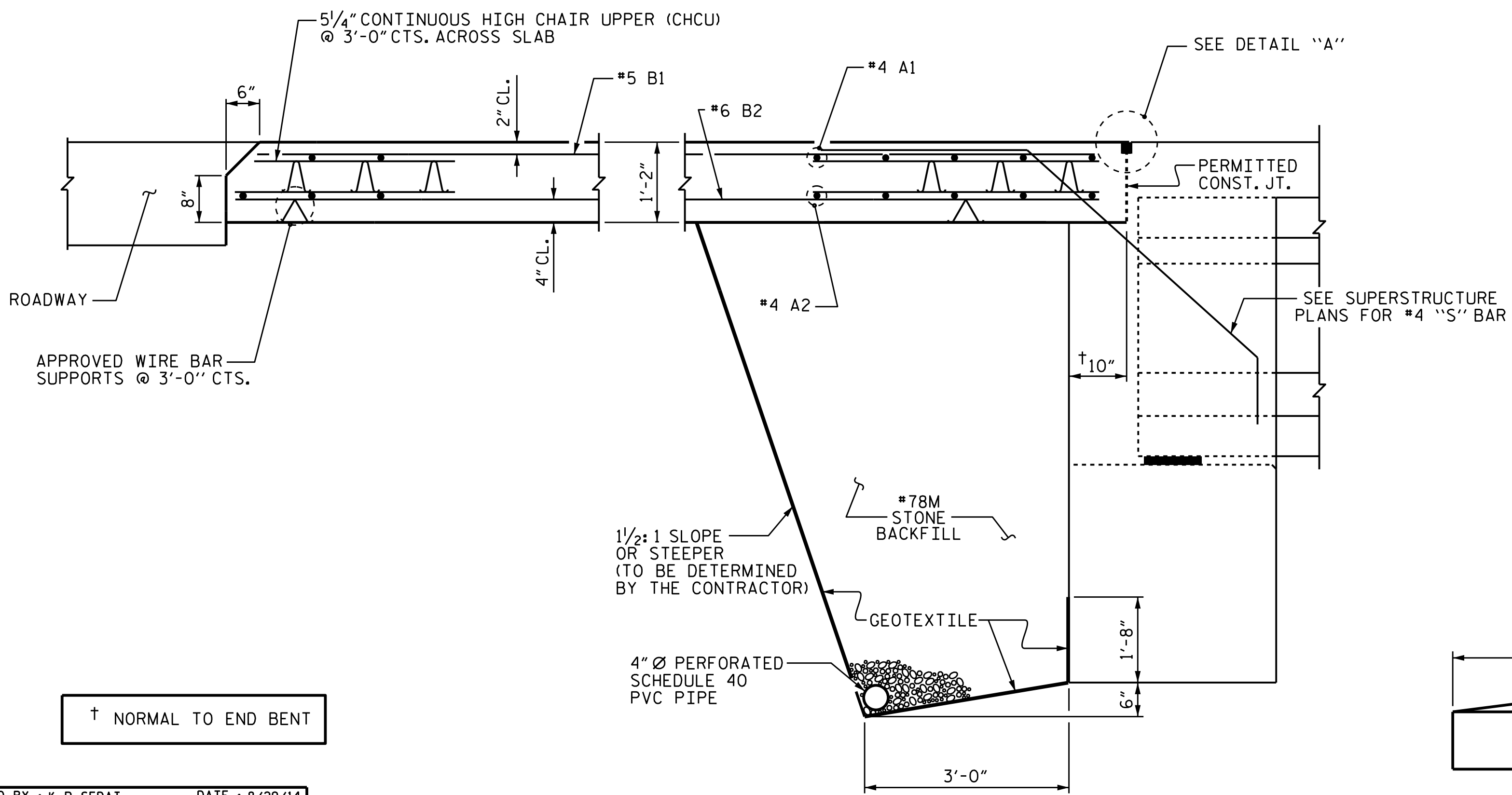
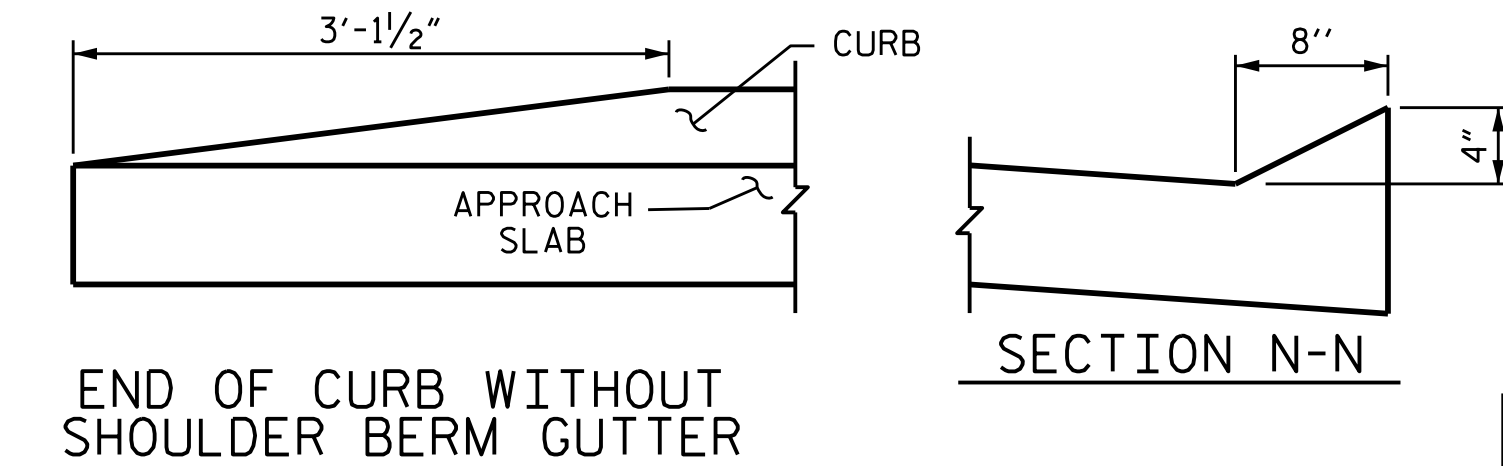
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

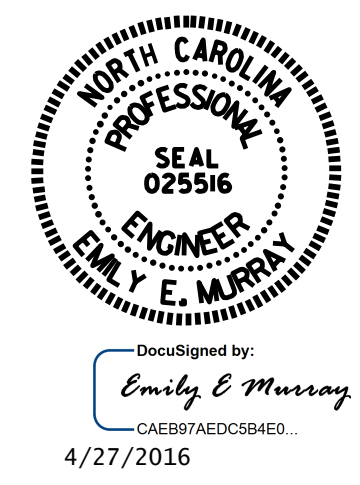


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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



PROJECT NO. B-4761
 HALIFAX COUNTY
 STATION: 20+11.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT



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2			4		

S-31
 TOTAL SHEETS 31

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ASSEMBLED BY : K. P. SEDAI	DATE : 8/29/14
CHECKED BY : REZA KOUCHEKI	DATE : 9/4/14
DESIGN ENG. OF RECORD: G. KOUCHEKI	DATE : 3/14/16
DRAWN BY : TLA	REV. 10/1/11 MAA/GM
CHECKED BY : GM	REV. 12/21/11 MAA/GM
	REV. 6/13 MAA/GM

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.

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