

**TIP PROJECT: B-5980**

**CONTRACT: C204350**

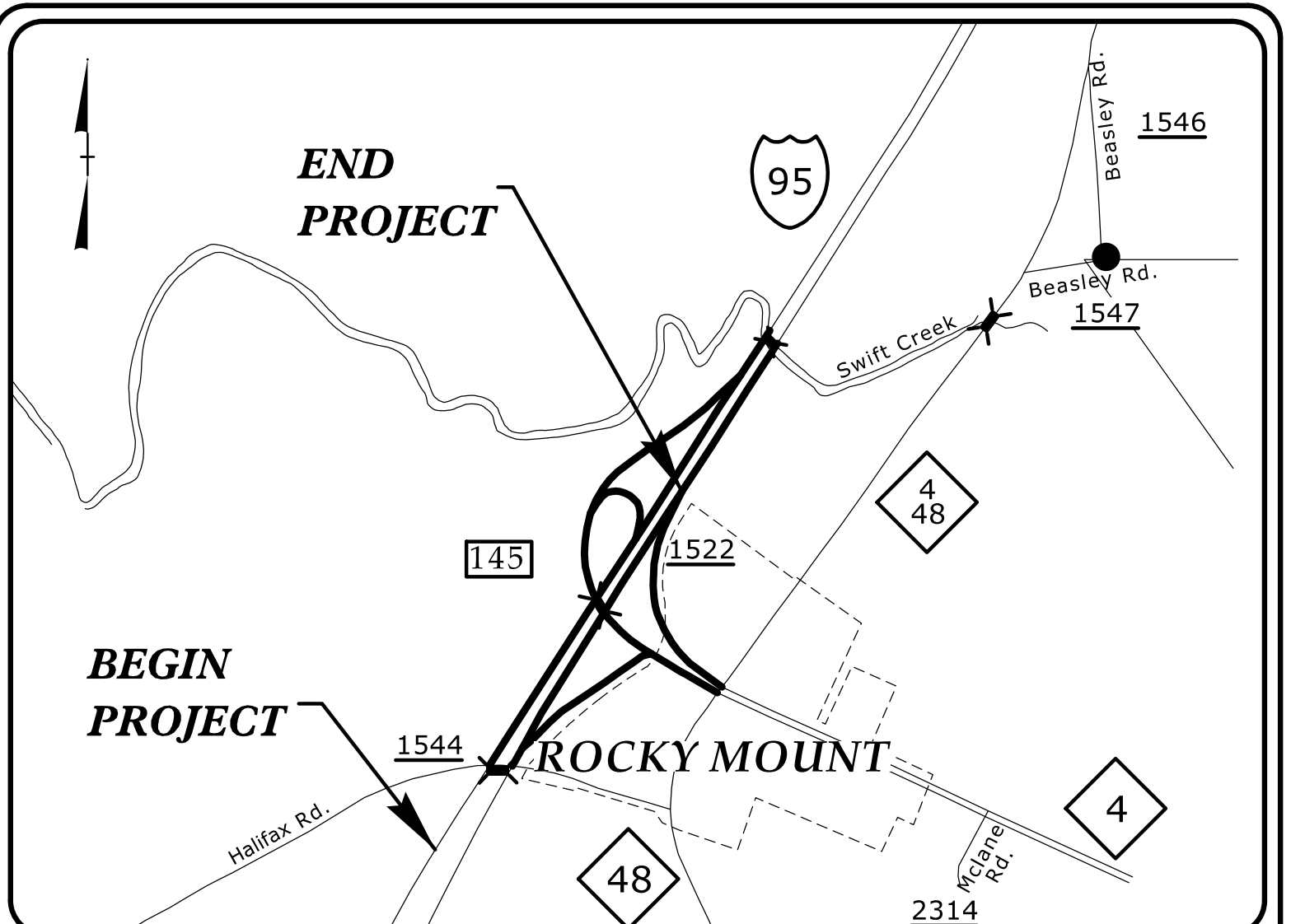
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# NASH COUNTY

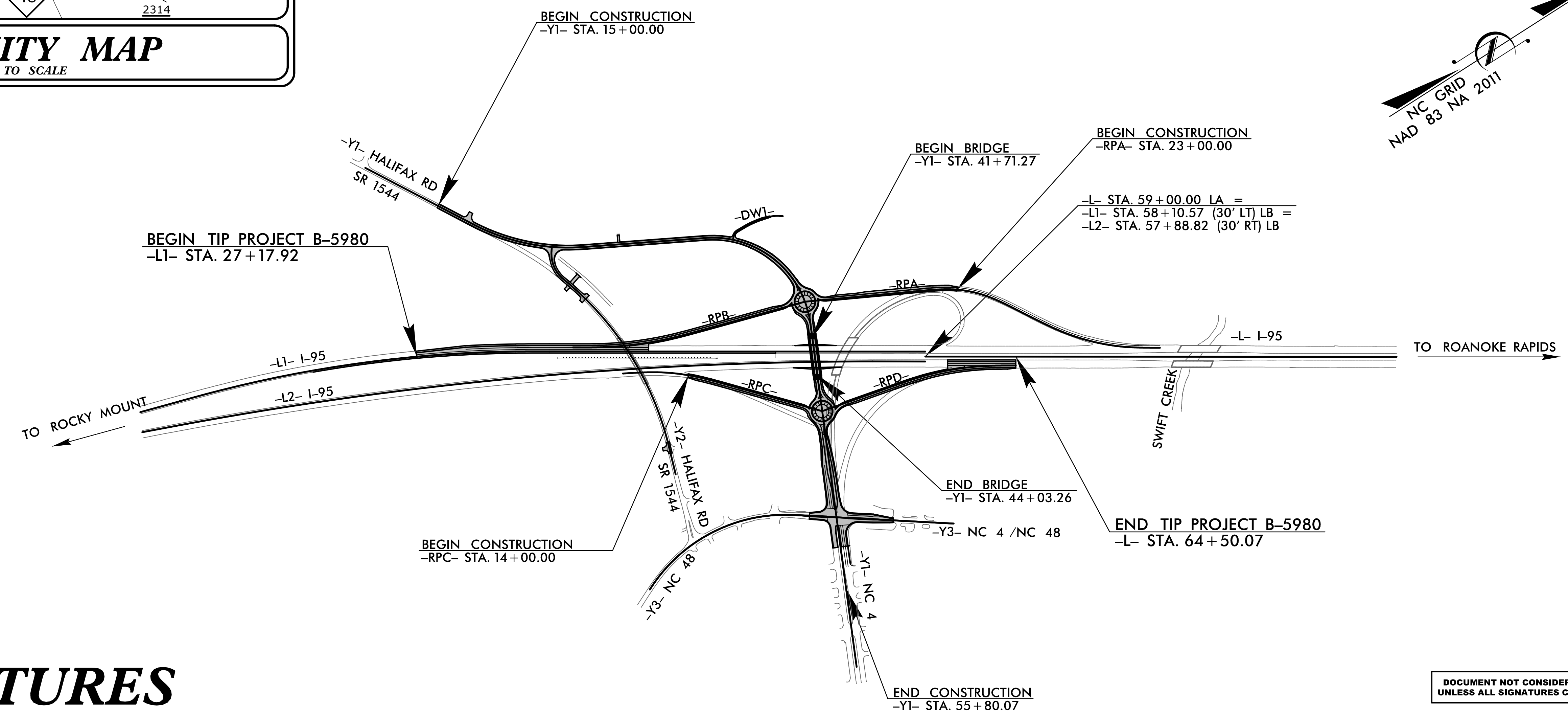
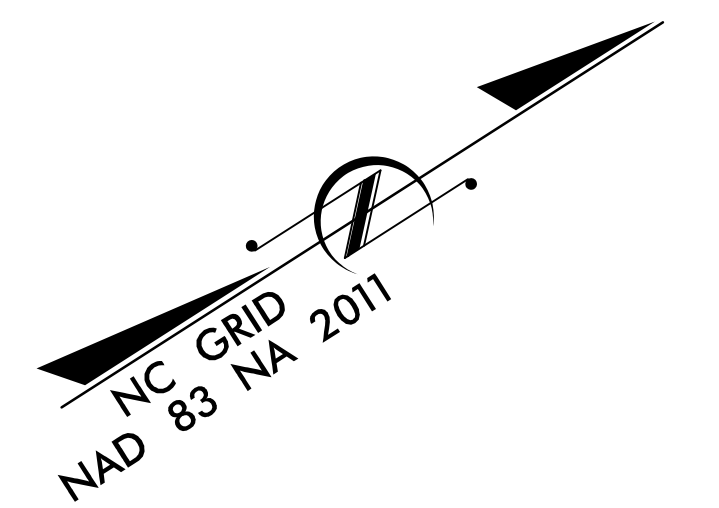
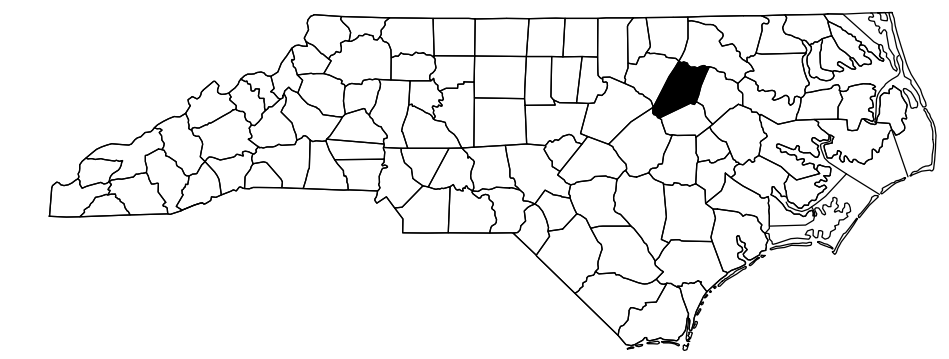
**LOCATION: I-95 INTERCHANGE IMPROVEMENTS  
AT HALIFAX ROAD (SR 1544)**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, UTILITY CONSTRUCTION,  
AND STRUCTURES**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	<b>B-5980</b>	<b>1</b>	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
47617.1.1	NHP-1552(005)	PE	
47617.2.1	NHP-1552(005)	ROWUTILITIES	
47617.3.1	NHP-1552(005)	CONSTRUCTION	



**VICINITY MAP**  
NOT TO SCALE



## STRUCTURES

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

**DESIGN DATA**

ADT 2017	=	27,500
ADT 2040	=	39,700
K	=	6 %
D	=	55 %
T	=	17 % *
V	=	75 MPH
* (TTST 15% + DUAL 2%)		
FUNC CLASS = INTERSTATE STATEWIDE TIER		

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-5980	=	0.690 MILES
TOTAL LENGTH OF TIP PROJECT B-5980	=	0.690 MILES

Prepared in the Office of:  
**AECOM**  
NC FIRM LICENSE No: F-0342  
701 Corporate Center Drive, Suite 475  
Raleigh, NC 27607  
(919) 854-6200 - (919) 854-6259(FAX)

**RIGHT OF WAY DATE:**  
JANUARY 11, 2019

**LETTING DATE:**  
JUNE 15, 2021

**KIMBERLY A. KOIVUNIEMI, P.E.**  
PROJECT ENGINEER

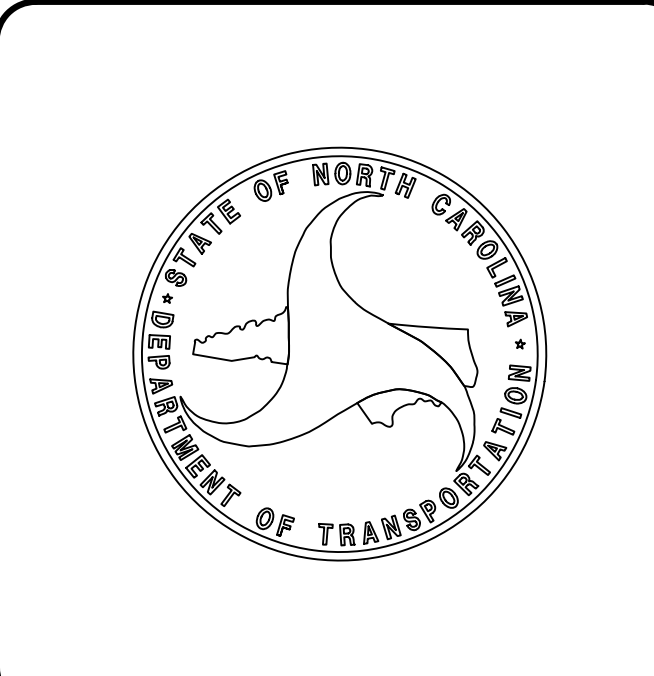
**EDWARD G. EDENS, P.E.**  
PROJECT DESIGN ENGINEER

**RUSSELL BROADWELL, P.E.**  
PROJECT DESIGN ENGINEER

**STRUCTURAL ENGINEER**

**JOHN C. MORRISON, P.E.**  
SIGNATURE

4/16/2021



41+00 42+00 43+00 44+00

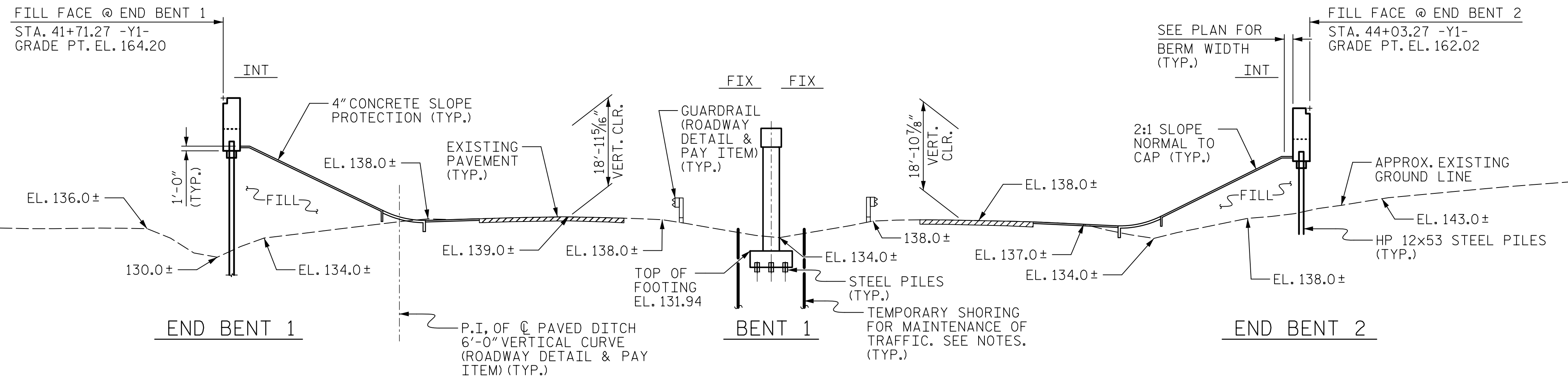
GRADE DATA -Y1-

PI = 42+80.00  
EL = 166.40'  
VC = 245'

(+2.0000% (-)3.5500%

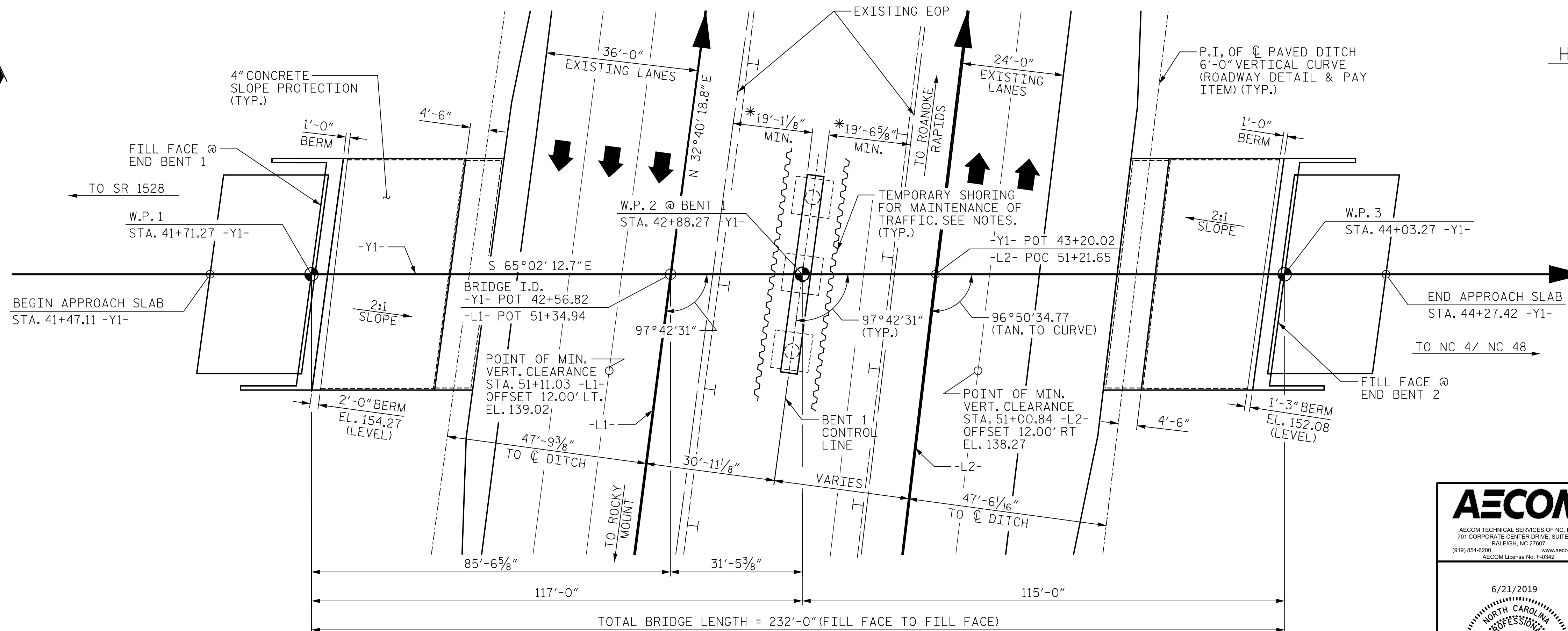
SPAN A

SPAN B



SECTION ALONG -Y1-

(SECTION TAKEN AT RIGHT ANGLE TO BENTS AND END BENTS)



PLAN

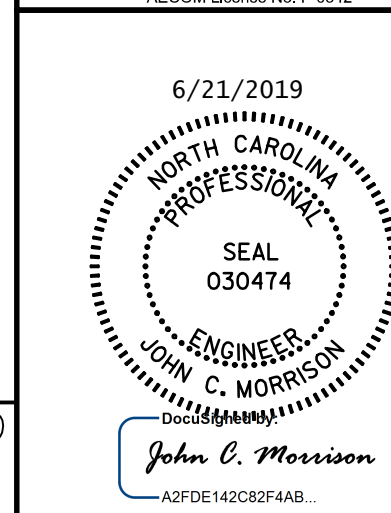
(PILES NOT SHOWN IN PLAN FOR CLARITY)

\* MIN. HORIZ. CLR. TO FACE OF CAP

HORIZONTAL CURVE DATA -L2-

PI STA. 33+24.86  
 $\Delta$  = 10°42'53.6" (RT)  
D = 0°14'56.8"  
L = 4301.23'  
T = 2156.90'  
R = 23000.00'

PROJECT NO. B-5980  
NASH COUNTY  
STATION: 42+56.82 -Y1-  
51+34.94 -L1-  
SHEET 1 OF 3 REPLACES BRIDGE NO. 630221



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
GENERAL DRAWING  
BRIDGE ON SR 1544  
(HALIFAX RD.) OVER I-95  
BETWEEN SR 1528  
& NC 4 / NC 48

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-01
1			3			TOTAL SHEETS
2			4			33

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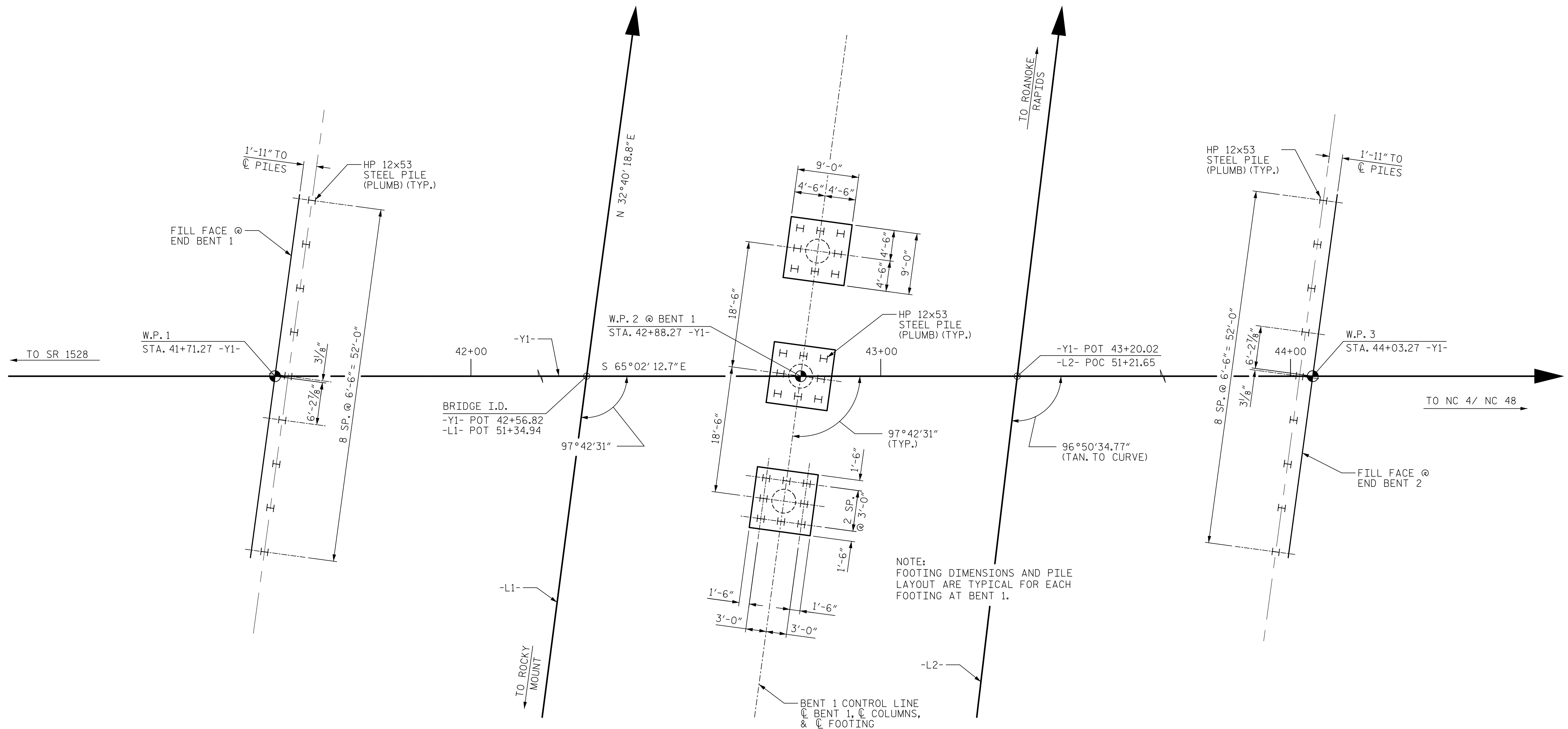
DRAWN BY : T.B. STUMP DATE : 1/2019  
 CHECKED BY : J.C. MORRISON DATE : 1/2019  
 DESIGNED BY : T.B. STUMP DATE : 1/2019  
 DESIGN CHECKED BY : J.C. MORRISON DATE : 1/2019

DATE: 6/20/2019  
TIME: 5:55:50 PM

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DATE: 6/20/2019  
TIME: 8:00:00 PM

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END BENT 1

BENT 1

END BENT 2

FOUNDATION LAYOUT

FOUNDATION NOTES:

- 1) FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- 2) OBSERVE A 6 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2-FT OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENTS NO.1 AND 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.
- 3) PILES AT END BENTS NO.1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.
- 4) DRIVE PILES AT END BENTS NO.1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.
- 5) PILES AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.
- 6) DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.
- 7) TESTING PILES WITH PDA DURING DRIVING, RESTRIKING, OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- 8) STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT BENT NO.1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. B-5980  
NASH COUNTY  
 STATION: 42+56.82 -Y1-

SHEET 2 OF 3

**AECOM**  
AECOM TECHNICAL SERVICES OF NC, INC.  
 701 CORPORATE CENTER DRIVE, SUITE 475  
 RALEIGH, NC 27607  
 (919) 854-6200 www.aecom.com  
 AECOM License No. F-0342

6/21/2019  
 NORTH CAROLINA  
 PROFESSIONAL  
 SEAL  
 030474  
 ENGINEER  
 JOHN C. MORRISON

John C. Morrison  
A2FDE142C82F4A8

STATE OF NORTH CAROLINA  
**DEPARTMENT OF TRANSPORTATION**  
 RALEIGH

GENERAL DRAWING  
**BRIDGE ON SR 1544  
 (HALIFAX RD.) OVER I-95  
 BETWEEN SR 1528  
 & NC 4 / NC 48**

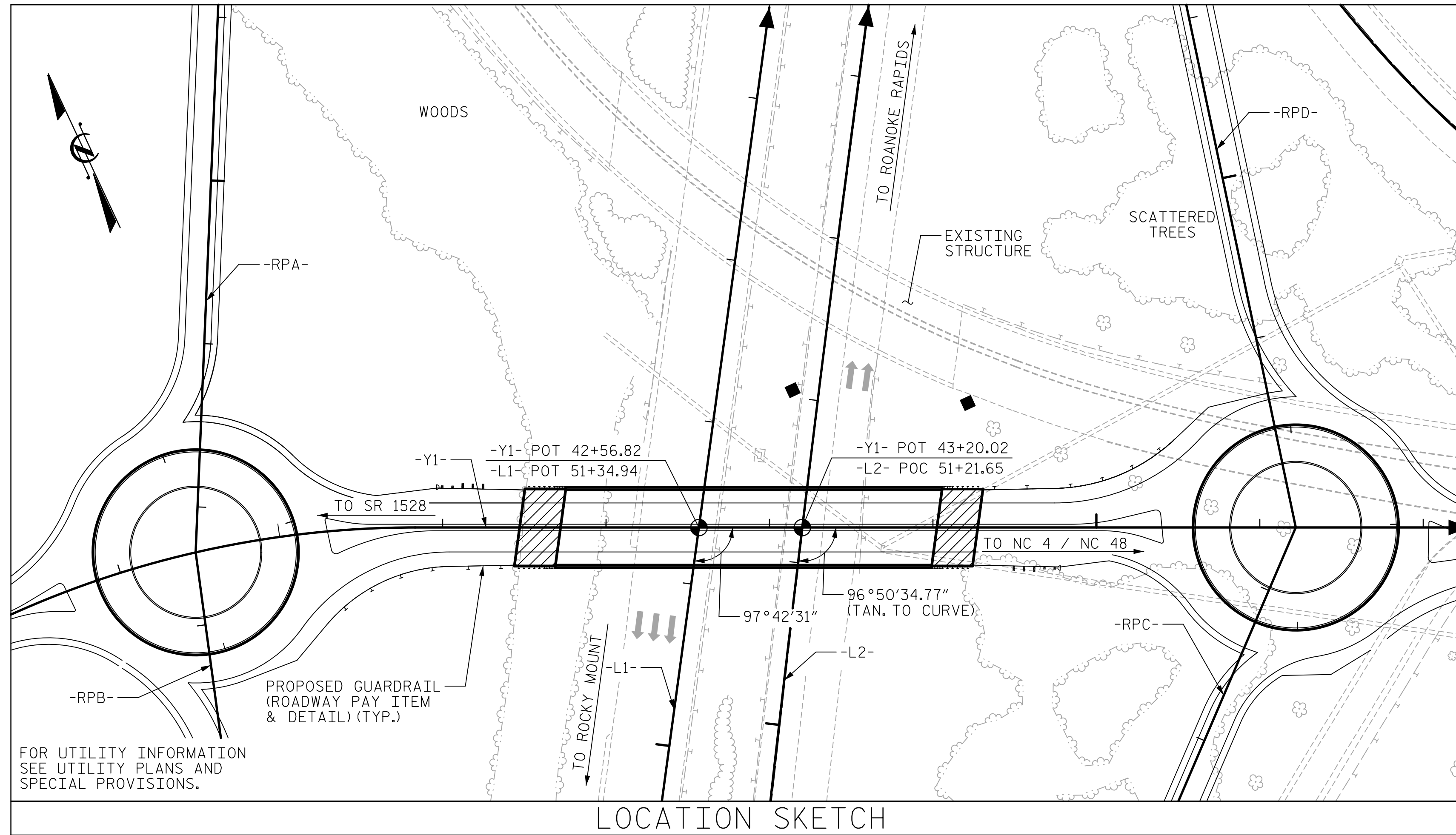
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-02  
 TOTAL SHEETS 33

DRAWN BY : S.G. STREDNAK	DATE : 2/2019
CHECKED BY : J.C. MORRISON	DATE : 2/2019
DESIGNED BY : T.B. STUMP	DATE : 2/2019
DESIGN CHECKED BY : J.C. MORRISON	DATE : 2/2019

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

BENCHMARK: BM#1 BENCHTIE NAIL IN 32" PINE, 592.96' LT. OF -Y1- STA. 49+61.76, ELEV. 139.57, COORDINATES: N 844439 E 2348872



GENERAL 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 FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, 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 SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

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.

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

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

INASMUCH THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR REMOVAL OF EXISTING STRUCTURE AT STATION 42+56.82 -Y1- AND STATION 17+07.50 -Y2-.

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

THE EXISTING STRUCTURE, CONSISTING OF 4 SPANS: 1 @ 42.5', 1 @ 66', 1 @ 60.5' & 1 @ 42.5', 41.08' CLEAR ROADWAY WIDTH AND A 7/4" REINFORCED CONCRETE DECK WITH A 4" ASPHALT WEARING SURFACE ON I-BEAMS; AND END BENTS CONSISTING OF REINFORCED CONCRETE CAP WITH STEEL PILES AT END BENT 1, SPREAD FOOTINGS AT END BENT 2, AND INTERIOR BENTS CONSISTING OF REINFORCED CONCRETE POST AND BEAM COLUMNS ON PILE FOOTINGS AND LOCATED AT AND EAST OF THE PROPOSED BRIDGE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE SUBSTRUCTURE OF THE EXISTING 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.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STA. 42+56.82 -Y1-	REMOVAL OF EXISTING STRUCTURE AT STA. 17+07.50 -Y2-	ASBESTOS ASSESSMENT	FOUNDATION EXCAVATION FOR BENT 1	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP12x53 STEEL PILES	HP12x53 STEEL PILES	STEEL PILE POINTS	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FIBER OPTIC CONDUIT SYSTEM WITH HANGERS	JUNCTION BOX (OVER-SIZED, HEAVY DUTY)		
	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	EA.	NO.	LIN. FT.	EACH	LIN. FT.	SQ. YDS.	LUMP SUM	LIN. FT.	EA.
SUPERSTRUCTURE						11,343	12,011					10	1143.33			461				284		
END BENT 1								47.2		7,418			9	9	495			206				
BENT 1								91.5		17,063	1,679		24	24	720	24						
END BENT 2								47.0		7,441			9	9	585			191				
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	2	11,343	12,011	185.7	LUMP SUM	31,922	1,679	10	1143.33	42	42	1800	24	461	397	LUMP SUM	284	2

PROJECT NO. B-5980

NASH COUNTY

STATION: 42+56.82 -Y1-

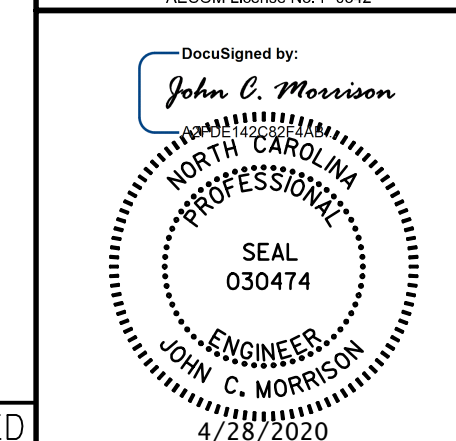
SHEET 3 OF 3

SAMPLE BAR REPLACEMENT			
SIZE	LENGTH	SIZE	LENGTH
#3	6'-2"	#8	12'-0"
#4	7'-4"	#9	13'-2"
#5	8'-6"	#10	14'-6"
#6	9'-8"	#11	15'-10"
#7	10'-10"		

NOTE: SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND  $f_s = 60$  ksi.

SAMPLE BAR REPLACEMENT FOR FEDERAL AID PROJECTS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

GENERAL DRAWING  
BRIDGE ON SR 1544 (HALIFAX RD.) OVER I-95 BETWEEN SR 1528 & NC 4 / NC 48

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-03
1			3			TOTAL SHEETS
2			4			34

DATE: 4/28/2020  
TIME: 2:46:38 PM

USER: jstump  
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DRAWN BY : T.B. STUMP DATE : 1/2019  
CHECKED BY : J.C. MORRISON DATE : 1/2019  
DESIGNED BY : T.B. STUMP DATE : 1/2019  
DESIGN CHECKED BY : J.C. MORRISON DATE : 1/2019

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 × RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVE-LOAD FACTORS (γ <sub>LL</sub> )	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ <sub>LL</sub> )	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 (INVENTORY)	N/A	1	1.05	--	1.75	0.86	1.23	A	E	56.96	1.02	1.17	A	I	10.83	0.80	0.780	1.05	A	I	56.96		
	HL-93 (OPERATING)	N/A		1.54	--	1.35	0.86	1.59	A	E	56.96	1.02	1.54	A	I	10.83	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.00	2	1.53	55.08	1.75	0.86	1.78	A	E	56.96	1.02	1.67	A	I	10.83	0.80	0.780	1.53	A	I	56.96		
	HS-20 (OPERATING)	36.00		2.20	79.20	1.35	0.86	2.30	A	E	56.96	1.02	2.20	A	I	10.83	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.50		3.69	49.82	1.40	0.86	5.37	A	E	56.96	1.02	5.72	A	I	10.83	0.80	0.780	3.69	A	I	56.96	
		SNGARBS2	20.00		2.64	52.80	1.40	0.86	3.84	A	E	56.96	1.02	3.96	A	I	10.83	0.80	0.780	2.64	A	I	56.96	
		SNAGRIS2	22.00		2.46	54.12	1.40	0.86	3.58	A	E	56.96	1.02	3.64	A	I	10.83	0.80	0.780	2.46	A	I	56.96	
		SNCOTTS3	27.25		1.83	49.87	1.40	0.86	2.67	A	E	56.96	1.02	2.74	A	I	10.83	0.80	0.780	1.83	A	I	56.96	
		SNAGGRS4	34.93		1.49	52.04	1.40	0.86	2.17	A	E	56.96	1.02	2.11	A	I	10.83	0.80	0.780	1.49	A	I	56.96	
		SNS5A	35.55		1.46	51.90	1.40	0.86	2.12	A	E	56.96	1.02	2.08	A	I	10.83	0.80	0.780	1.46	A	I	56.96	
		SNS6A	39.95		1.32	52.73	1.40	0.86	1.92	A	E	56.96	1.02	1.90	A	I	10.83	0.80	0.780	1.32	A	I	56.96	
	SNS7B	42.00		1.26	52.92	1.40	0.86	1.83	A	E	56.96	1.02	1.83	A	I	10.83	0.80	0.780	1.26	A	I	56.96		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.00		1.61	53.13	1.40	0.86	2.34	A	E	56.96	1.02	2.27	A	I	10.83	0.80	0.780	1.61	A	I	56.96	
		TNT4A	33.08		1.61	53.25	1.40	0.86	2.34	A	E	56.96	1.02	2.20	A	I	10.83	0.80	0.780	1.61	A	I	56.96	
		TNT6A	41.60		1.30	54.08	1.40	0.86	1.89	A	E	56.96	1.02	1.89	A	I	10.83	0.80	0.780	1.30	A	I	56.96	
		TNT7A	42.00		1.30	54.60	1.40	0.86	1.89	A	E	56.96	1.02	1.83	A	I	10.83	0.80	0.780	1.30	A	I	56.96	
		TNT7B	42.00		1.32	55.44	1.40	0.86	1.93	A	E	56.96	1.02	1.75	A	I	10.83	0.80	0.780	1.32	A	I	56.96	
TNAGRIT4		43.00		1.27	54.61	1.40	0.86	1.86	A	E	56.96	1.02	1.71	A	I	10.83	0.80	0.780	1.27	A	I	56.96		
TNAGT5A	45.00		1.21	54.45	1.40	0.86	1.76	A	E	56.96	1.02	1.67	A	I	10.83	0.80	0.780	1.21	A	I	56.96			
TNAGT5B	45.00		3	1.20	54.00	1.40	0.86	1.75	A	E	56.96	1.02	1.72	A	I	10.83	0.80	0.780	1.20	A	I	56.96		

DATE: 6/20/2019  
TIME: 8:00:07 PM

USER: \\usrd01\p001\Users\Projects\60557176 - B-5980\900\_CAD\_GIS\900\_CAD\G05\900\_CAD\DOT\_TripStructures\04 Drawings\400\_D0T\_S04\_B5980\_SML\_LRFR.dgn  
DATE: 6/20/2019 8:00:07 PM

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ <sub>DC</sub>	γ <sub>DW</sub>
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

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

COMMENTS:

1. GIRDERS DESIGNED AS SIMPLE SPANS FOR FLEXURE. GIRDERS DESIGNED AS SIMPLE-MADE-CONTINUOUS (FOR LIVE LOAD AND SUPERIMPOSED DEAD LOAD) FOR SHEAR.

# CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

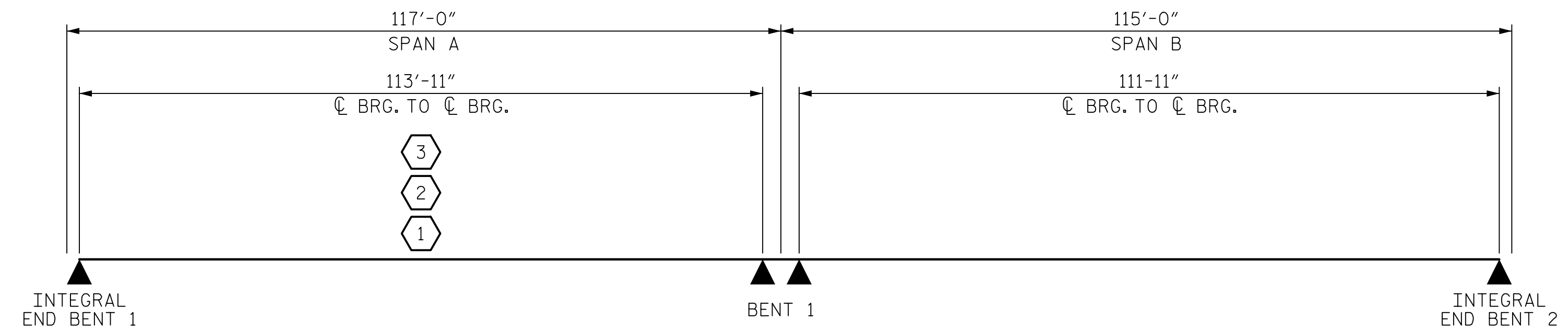
3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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GIRDER LOCATION

I - INTERIOR GIRDER  
E - EXTERIOR GIRDER



LRFR SUMMARY

PROJECT NO. B-5980  
NASH COUNTY  
STATION: 42+56.82 -Y1-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

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

6/21/2019

JOHN C. MORRISON  
ENGINEER

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

SHEET NO.  
S-04

TOTAL SHEETS  
33

ASSEMBLED BY : D. RITACCO DATE : 04/2019  
CHECKED BY : J.C. MORRISON DATE : 04/2019

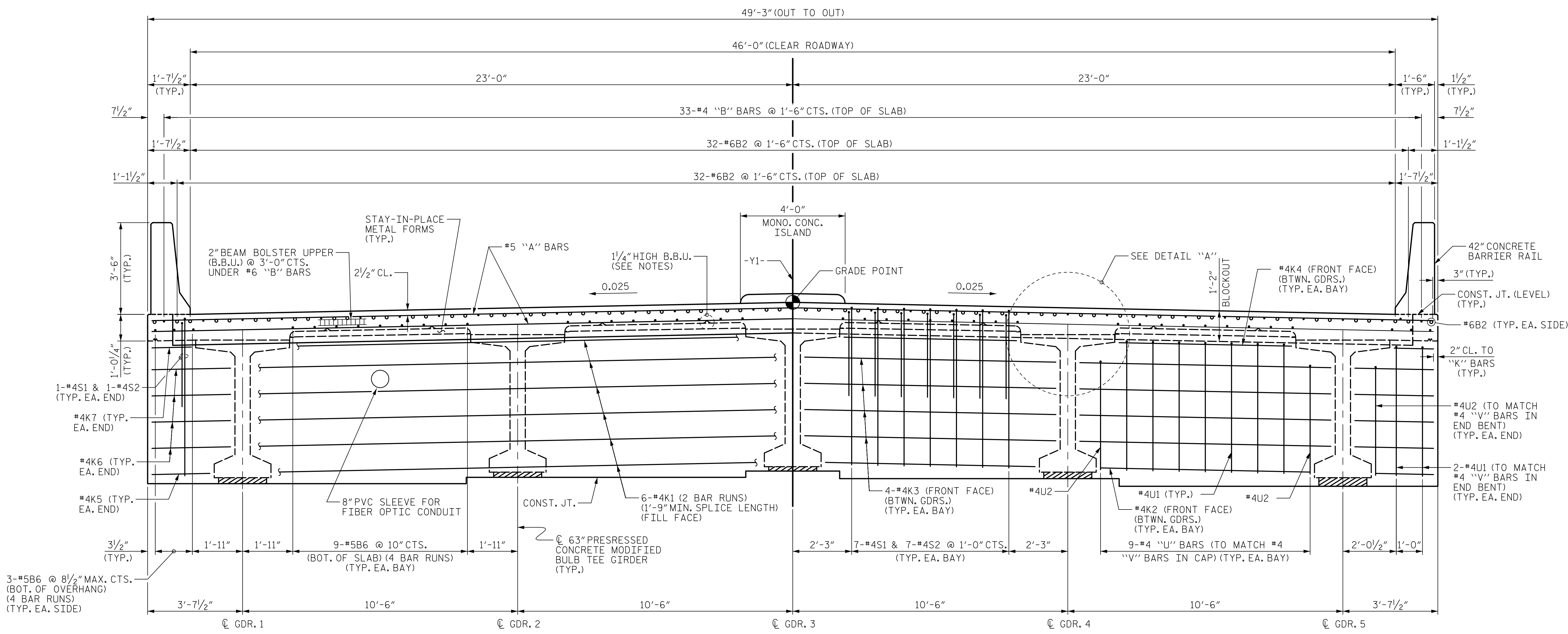
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CHECKED BY : GM/DI 2/08

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REV. 10/1/11 MAA/GM  
REV. 12/17 MAA/THC

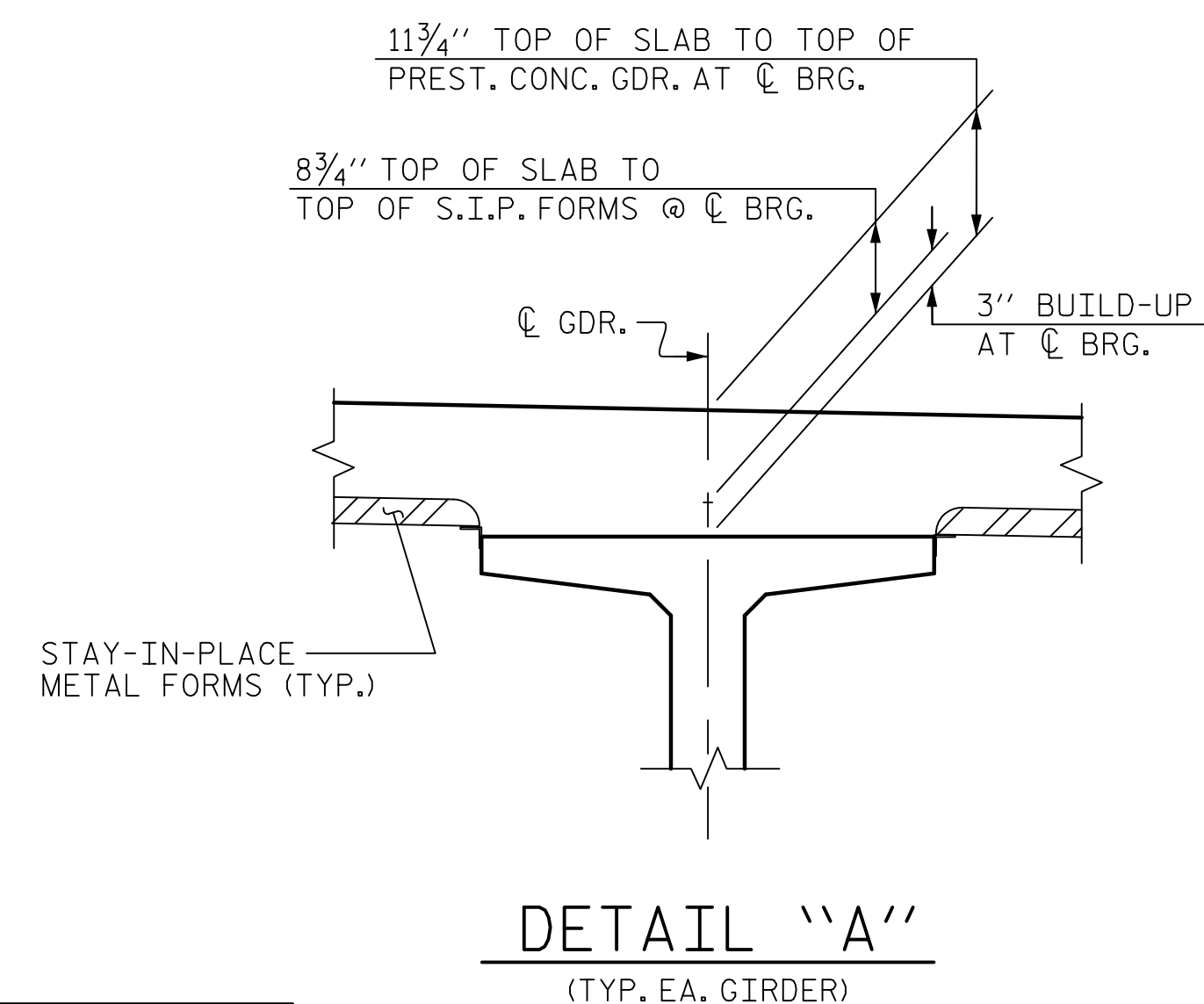
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**TYPICAL SECTION**  
(SHOWING INTEGRAL END BENT)



**NOTES:**

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

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO 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.

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.

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

PROJECT NO. B-5980  
NASH COUNTY  
STATION: 42+56.82 -Y1-  
SHEET 1 OF 3

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AECOM TECHNICAL SERVICES OF NC, INC.  
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RALEIGH, NC 27607  
www.aecom.com  
(919) 854-6200  
AECOM License No. F-0342

3/15/2020  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 030474  
JOHN C. MORRISON  
John C. Morrison  
A2FDE142C8F4AB

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

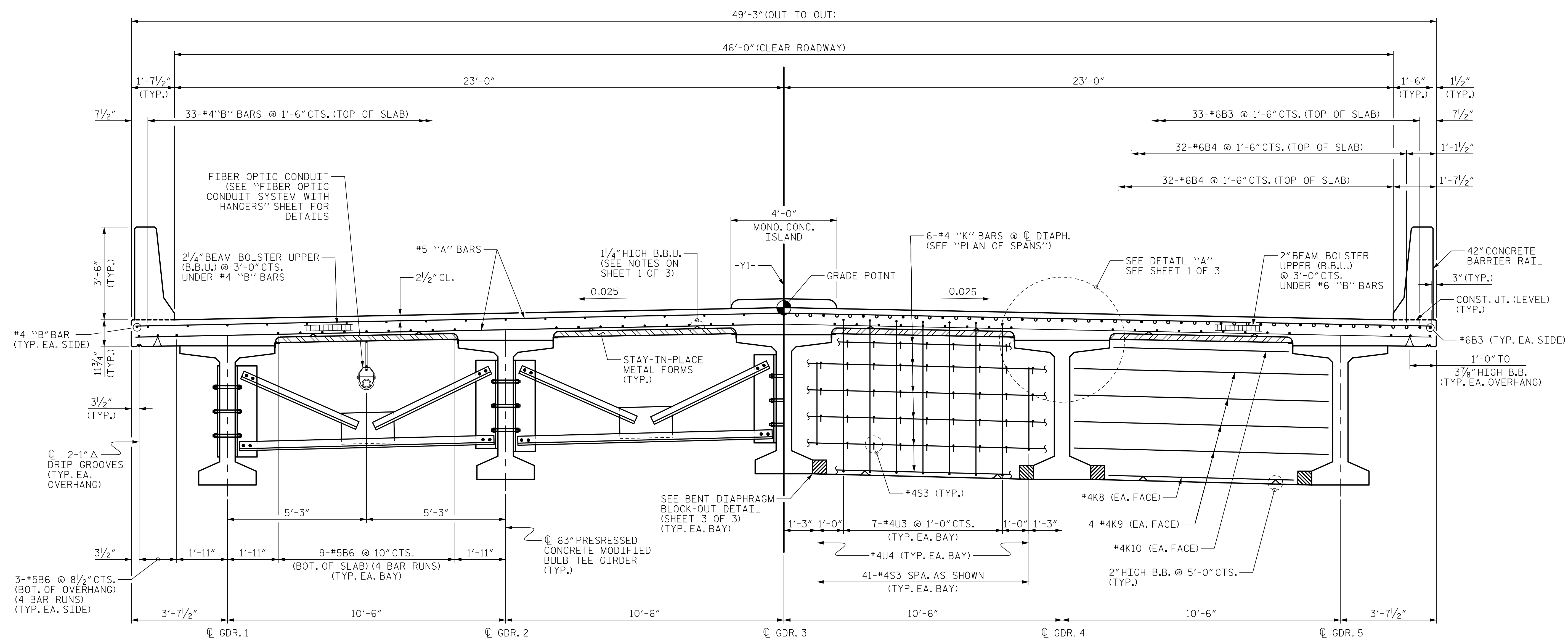
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DRAWN BY : T.B. STUMP DATE : 02/2019  
CHECKED BY : J.C. MORRISON DATE : 02/2019  
DESIGNED BY : T.B. STUMP DATE : 02/2019  
DESIGN CHECKED BY : J.C. MORRISON DATE : 02/2019

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**PARTIAL TYPICAL SECTION**  
(SHOWING INTERMEDIATE DIAPHRAGMS)

**PARTIAL TYPICAL SECTION**  
(SHOWING CONTINUOUS FOR LIVE LOAD BENT DIAPHRAGMS)

**TYPICAL SECTION**

**NOTES:**

FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET

PROJECT NO. B-5980  
NASH COUNTY  
STATION: 42+56.82 -Y1-

SHEET 2 OF 3

DRAWN BY : T.B. STUMP	DATE : 02/2019
CHECKED BY : J.C. MORRISON	DATE : 02/2019
DESIGNED BY : T.B. STUMP	DATE : 02/2019
DESIGN CHECKED BY : J.C. MORRISON	DATE : 02/2019

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3/15/2020  
NORTH CAROLINA PROFESSIONAL SEAL  
030474  
ENGINEER  
JOHN C. MORRISON  
John C. Morrison  
A2FDE142C82F4AB

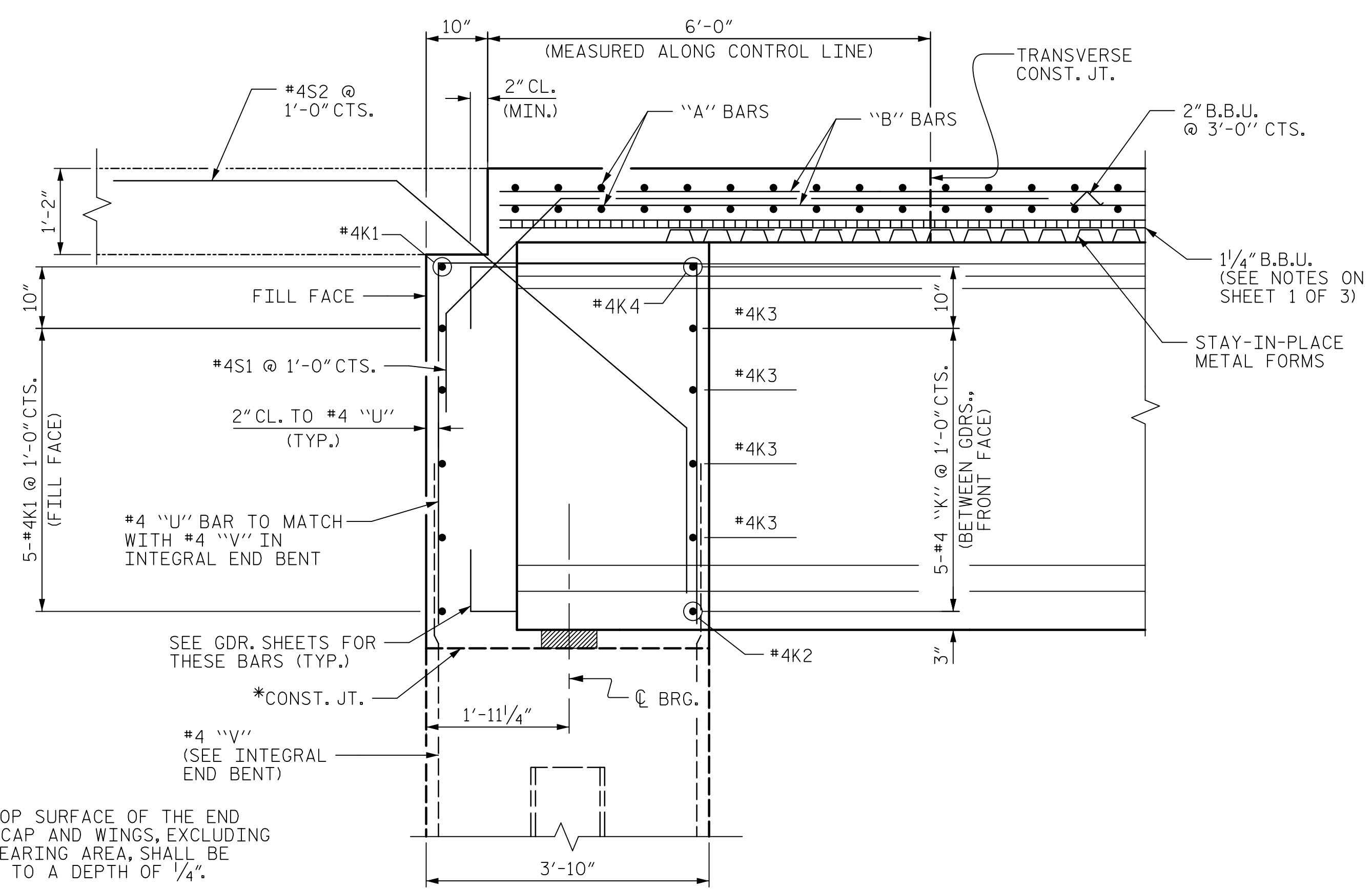
STATE OF NORTH CAROLINA  
**DEPARTMENT OF TRANSPORTATION**  
RALEIGH  
SUPERSTRUCTURE  
**TYPICAL SECTION**

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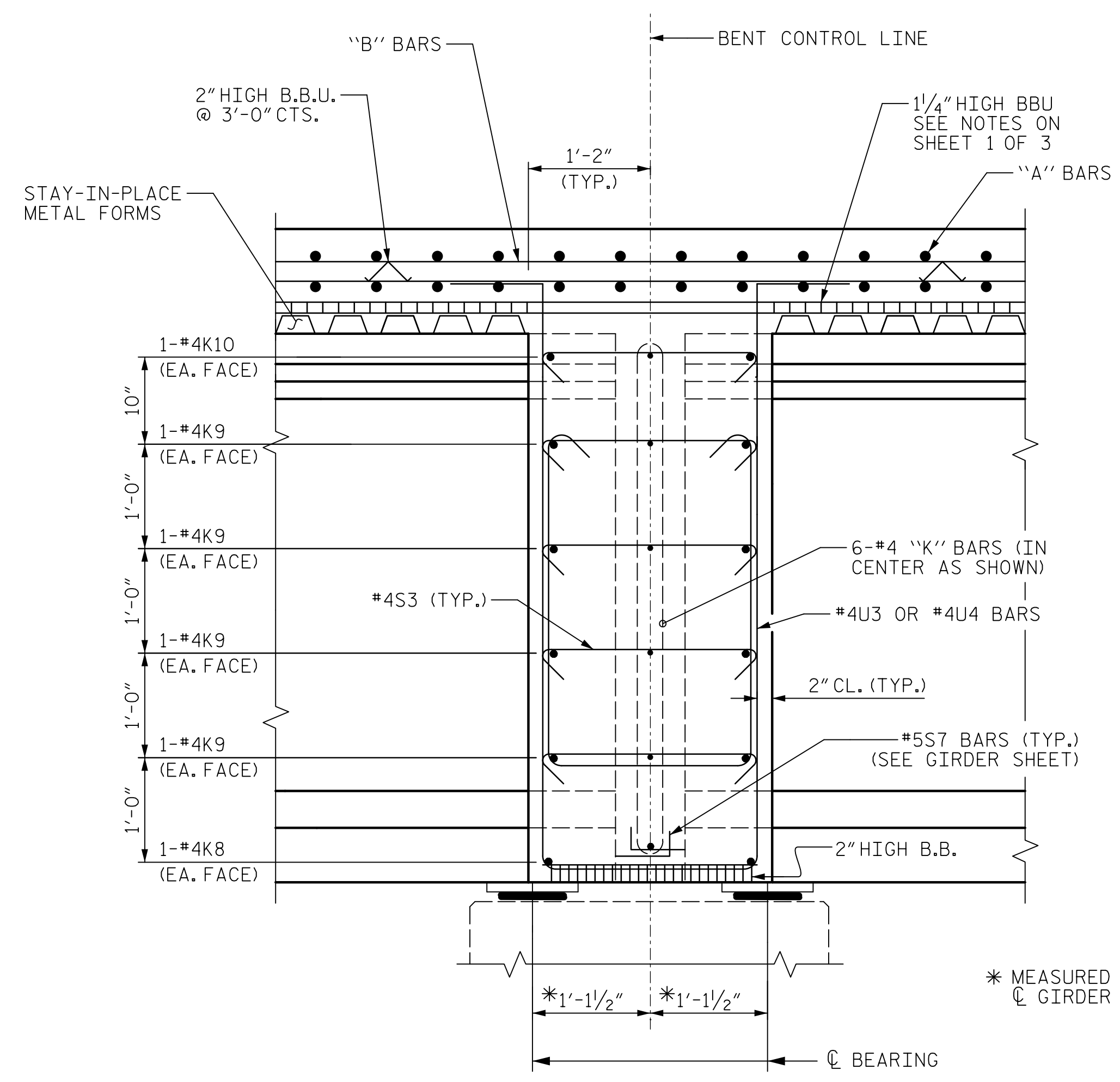
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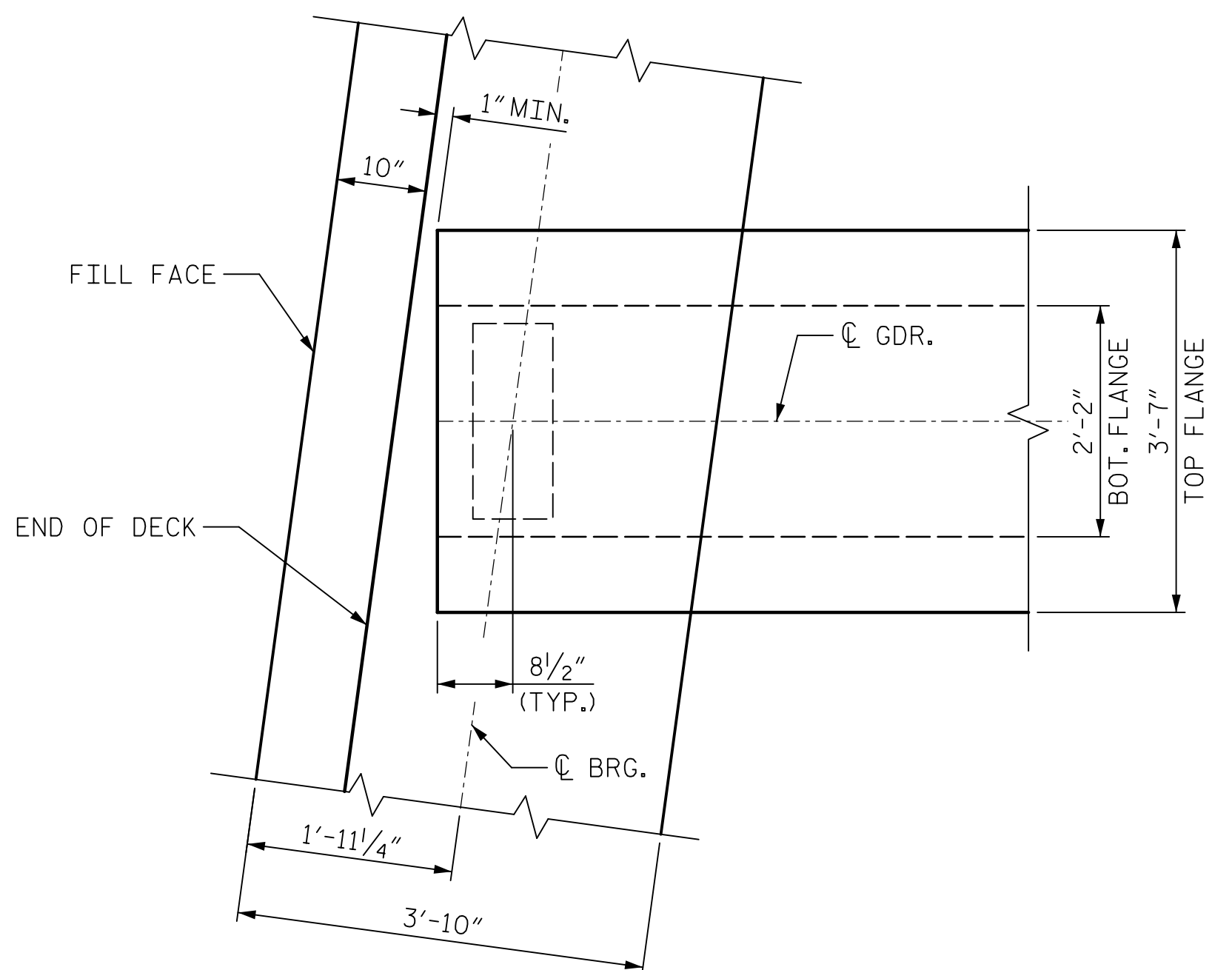


**SECTION THRU INTEGRAL END BENT**

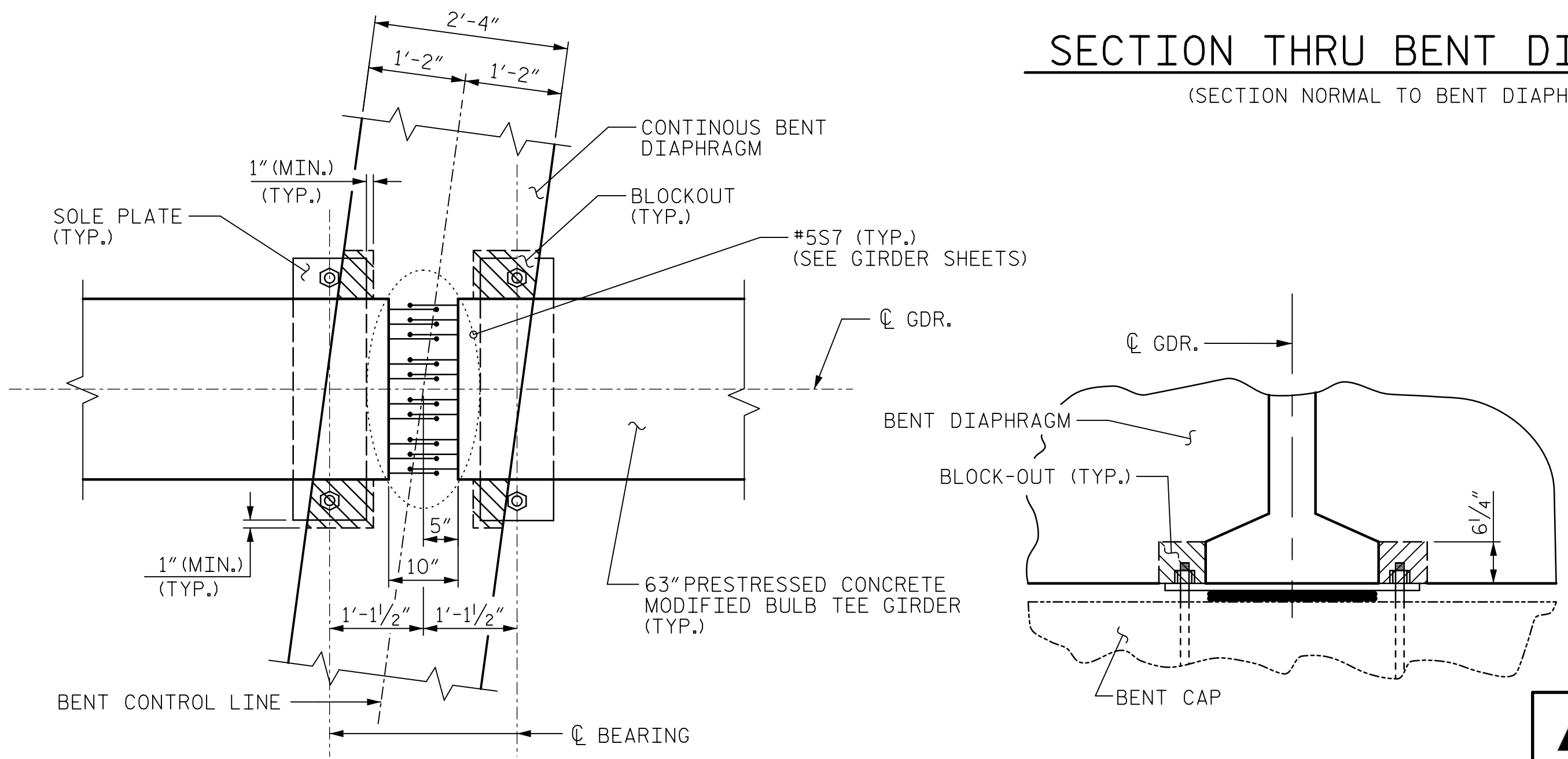


**SECTION THRU BENT DIAPHRAGM**

(SECTION NORMAL TO BENT DIAPHRAGM)



**PLAN OF GIRDER AT INTEGRAL END BENT**



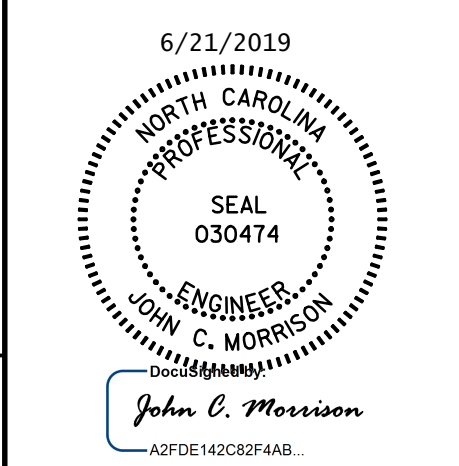
**PLAN**

**SECTION**

**BENT DIAPHRAGM BLOCK-OUT DETAIL**

PROJECT NO. B-5980  
NASH COUNTY  
 STATION: 42+56.82 -Y1-

SHEET 3 OF 3



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

DRAWN BY : T.B. STUMP	DATE : 02/2019
CHECKED BY : J.C. MORRISON	DATE : 02/2019
DESIGNED BY : T.B. STUMP	DATE : 02/2019
DESIGN CHECKED BY : J.C. MORRISON	DATE : 02/2019

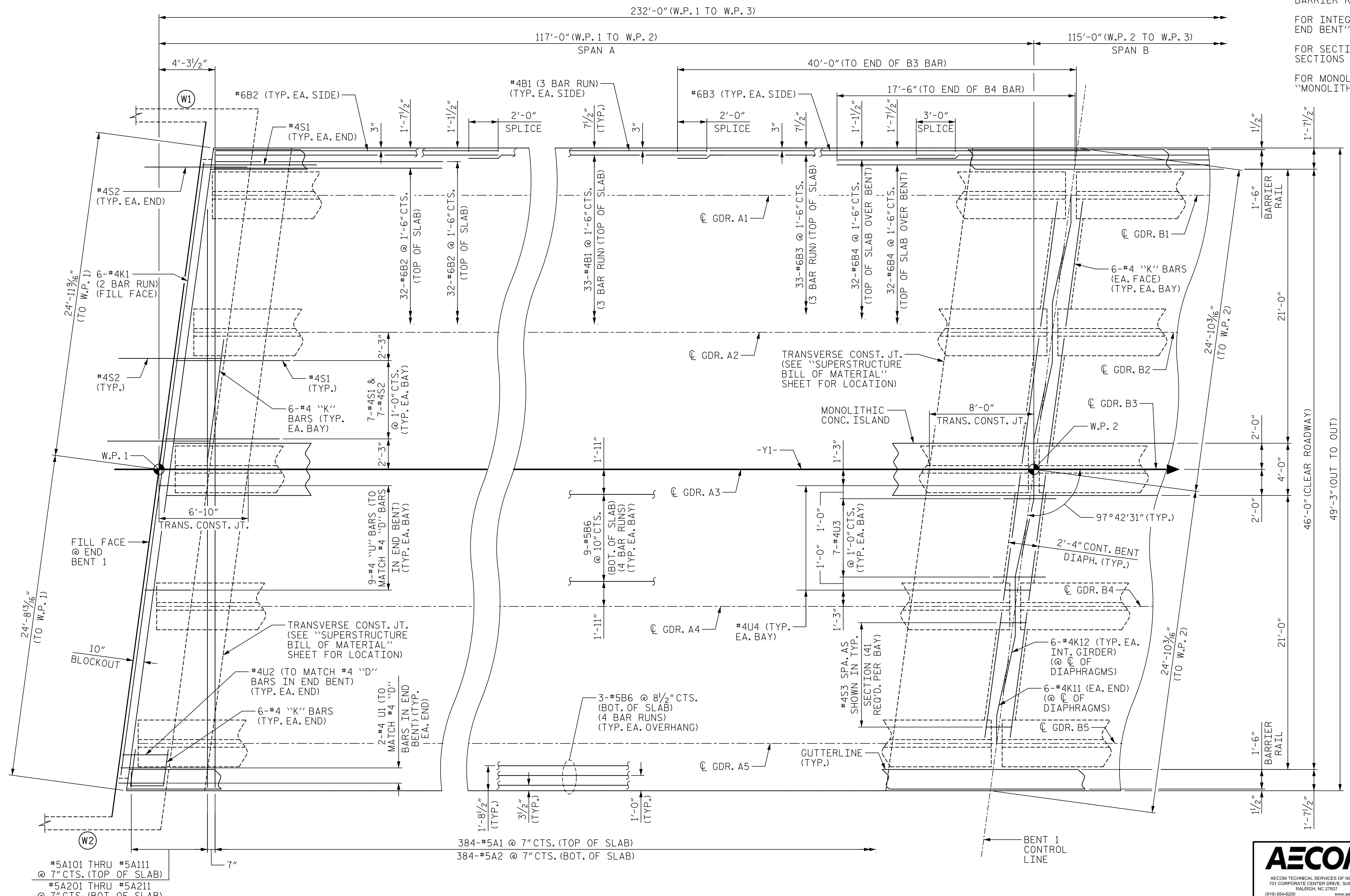
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REVISIONS						SHEET NO.
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**NOTES:**  
 FOR CONCRETE BARRIER RAIL DETAILS, SEE "CONCRETE BARRIER RAIL DETAILS" SHEET.  
 FOR INTEGRAL END BENT AND WING DETAILS, SEE "INTEGRAL END BENT" SHEETS.  
 FOR SECTION VIEWS, SEE SUPERSTRUCTURE "TYPICAL SECTIONS AND DETAILS" SHEET.  
 FOR MONOLITHIC CONCRETE ISLAND DETAILS, SEE "MONOLITHIC CONCRETE ISLAND DETAILS" SHEET.

PROJECT NO. B-5980  
 NASH COUNTY  
 STATION: 42+56.82 -Y1-

SHEET 1 OF 2

DRAWN BY : S.G. STREDNAK DATE : 2/2019  
 CHECKED BY : J.C. MORRISON DATE : 2/2019  
 DESIGNED BY : T.B. STUMP DATE : 2/2019  
 DESIGN CHECKED BY : J.C. MORRISON DATE : 2/2019

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6/21/2019  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 030474  
 JOHN C. MORRISON  
John C. Morrison  
 A2FDE142C82F4A8

STATE OF NORTH CAROLINA  
**DEPARTMENT OF TRANSPORTATION**  
 RALEIGH

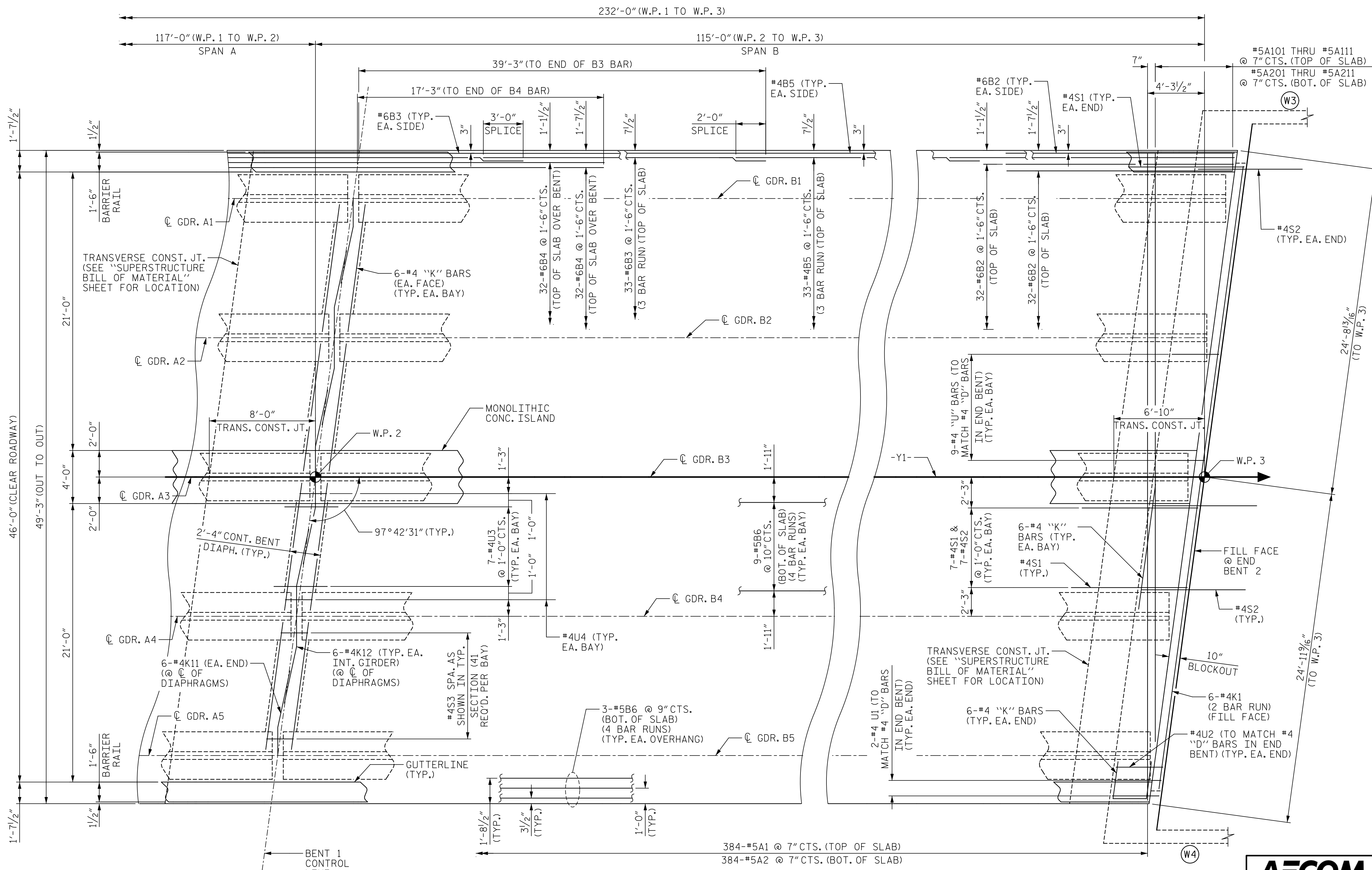
**SUPERSTRUCTURE**

**PLAN OF SPANS**

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

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SPAN A

SPAN B

PARTIAL PLAN OF SPANS

PROJECT NO. B-5980  
 NASH COUNTY  
 STATION: 42+56.82 -Y1-

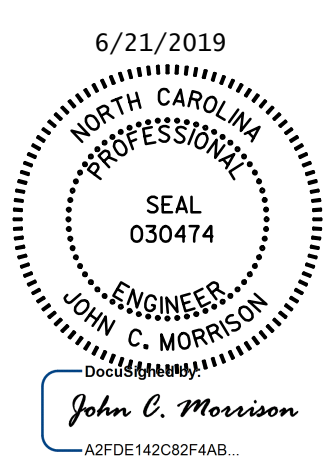
SHEET 2 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS



DRAWN BY : S.G. STREDNAK DATE : 2/2019  
 CHECKED BY : J.C. MORRISON DATE : 2/2019  
 DESIGNED BY : T.B. STUMP DATE : 2/2019  
 DESIGN CHECKED BY : J.C. MORRISON DATE : 2/2019

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REVISIONS						SHEET NO.
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DN: cn=stump, ou=Structures, o=CDOT, c=NC, email=stump@cdot.nc.gov

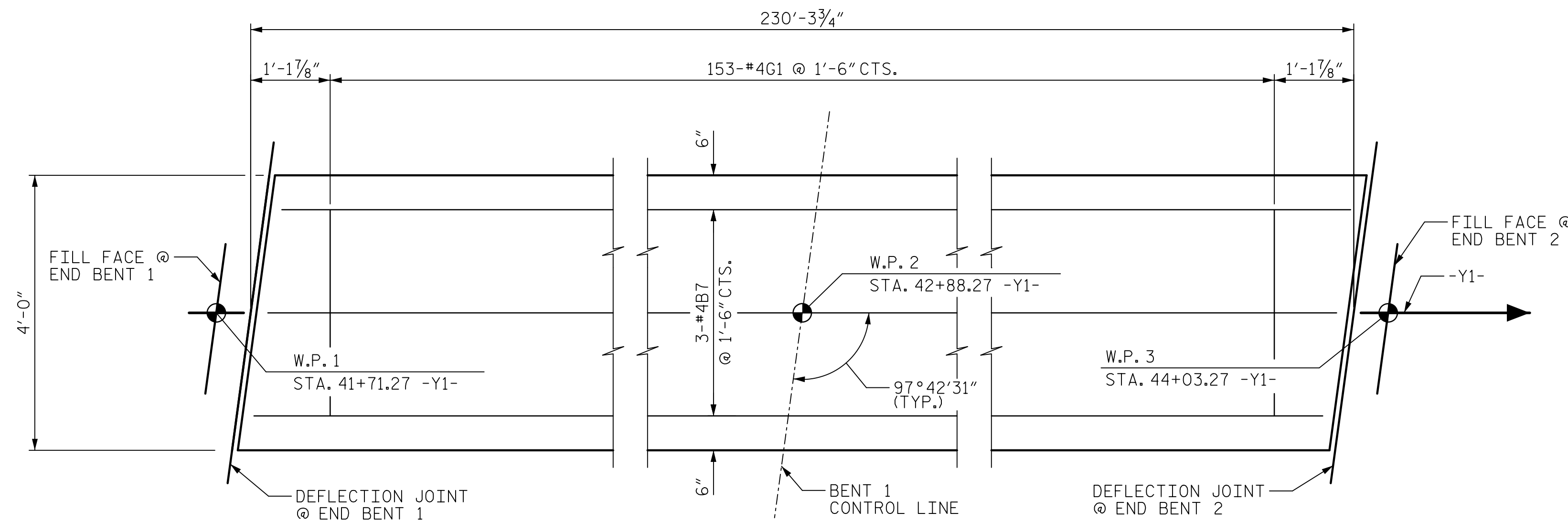
**NOTES:**

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

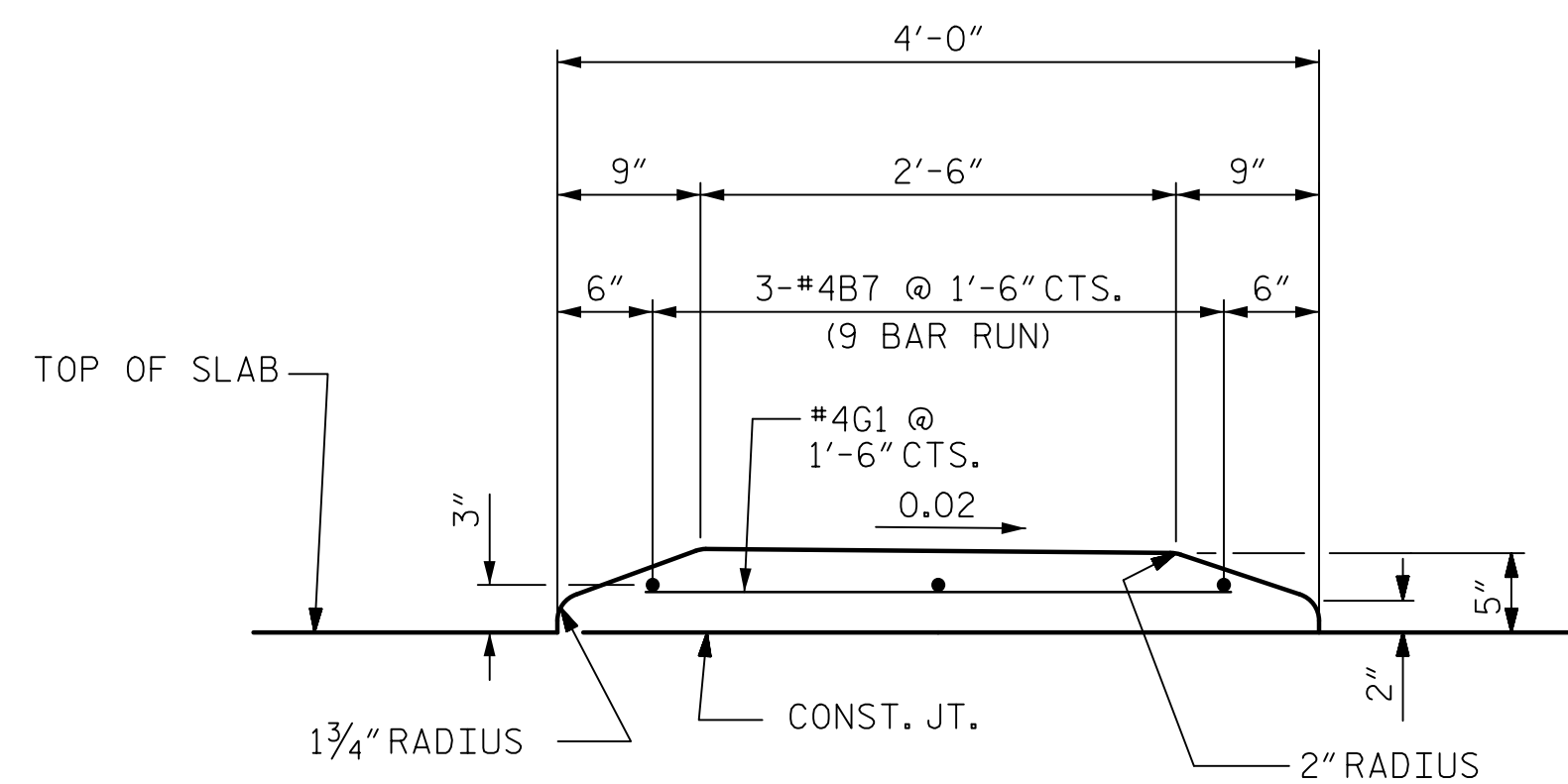
ALL REINFORCING STEEL IN THE MONOLITHIC CONCRETE ISLAND SHALL BE EPOXY COATED.

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

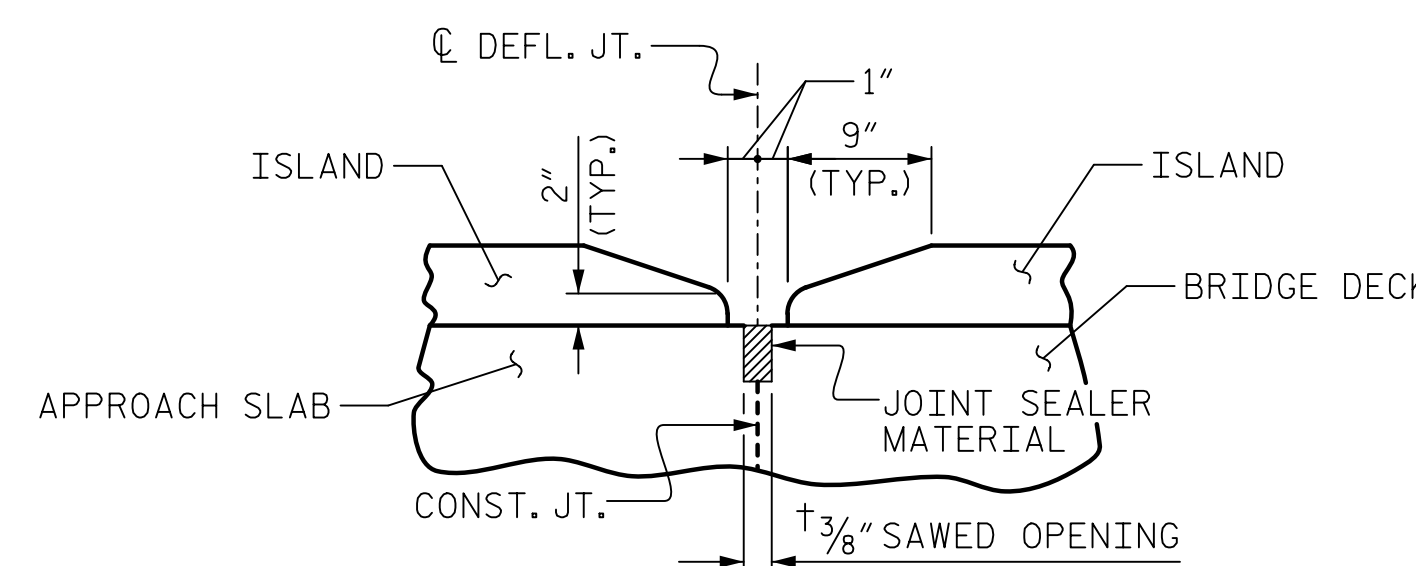
PAYMENT FOR THE MONOLITHIC CONCRETE ISLAND SHALL BE INCLUDED IN UNIT PRICE FOR "REINFORCED CONCRETE DECK SLAB".



SPAN A  
SPAN B  
**PLAN OF MONOLITHIC CONCRETE ISLAND**



**SECTION THROUGH MONOLITHIC CONCRETE ISLAND**



**DETAILS AT DEFLECTION JOINT**

† NORMAL TO END BENT

PROJECT NO. B-5980  
NASH COUNTY  
 STATION: 42+56.82 -Y1-

DRAWN BY : T.B. STUMP      DATE : 2/2019  
 CHECKED BY : J.C. MORRISON      DATE : 2/2019  
 DESIGNED BY : T.B. STUMP      DATE : 2/2019  
 DESIGN CHECKED BY : J.C. MORRISON      DATE : 2/2019

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6/21/2019  
 NORTH CAROLINA  
 PROFESSIONAL  
 SEAL  
 030474  
 ENGINEER  
 JOHN C. MORRISON

John C. Morrison  
A2PDE142C82F4A8

STATE OF NORTH CAROLINA  
**DEPARTMENT OF TRANSPORTATION**  
 RALEIGH

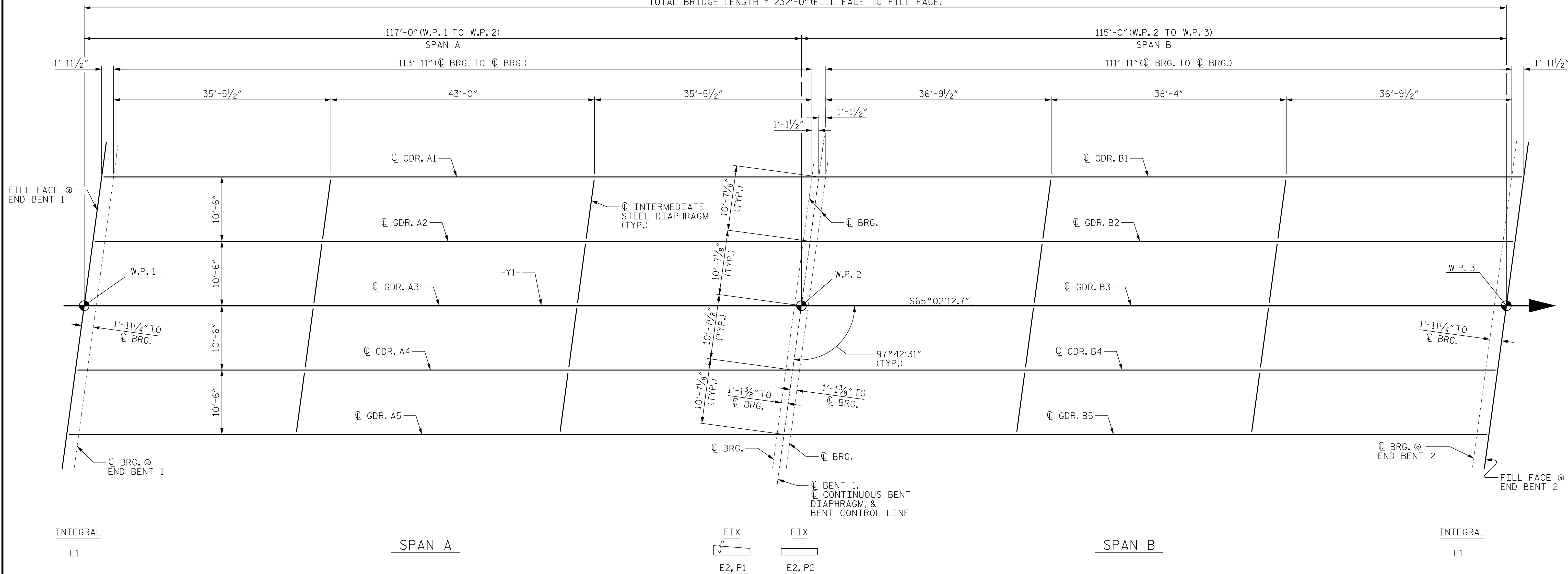
SUPERSTRUCTURE

**MONOLITHIC CONCRETE ISLAND DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			33

**NOTES:**  
 EXP = EXPANSION BEARING ASSEMBLY  
 FIX = FIXED BEARING ASSEMBLY  
 E = ELASTOMERIC BEARING PAD MARK  
 P = STEEL SOLE PLATE MARK

TOTAL BRIDGE LENGTH = 232'-0" (FILL FACE TO FILL FACE)



**FRAMING PLAN**

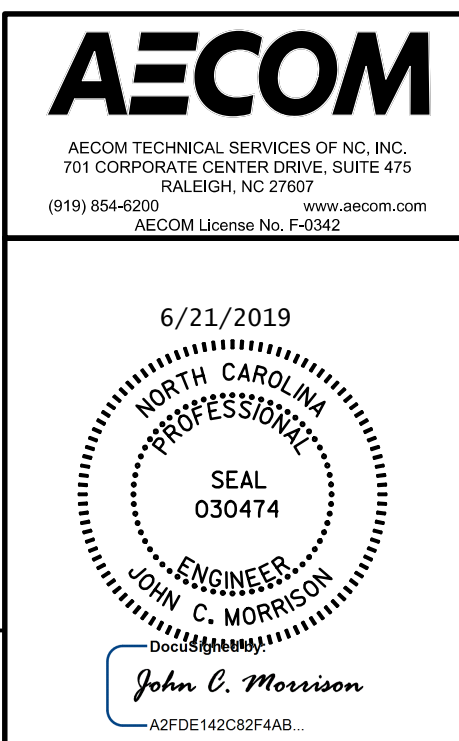
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NASH COUNTY  
 STATION: 42+56.82 -Y1-

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DRAWN BY : T.B. STUMP      DATE : 2/2019  
 CHECKED BY : J.C. MORRISON      DATE : 2/2019  
 DESIGNED BY : T.B. STUMP      DATE : 2/2019  
 DESIGN CHECKED BY : J.C. MORRISON      DATE : 2/2019

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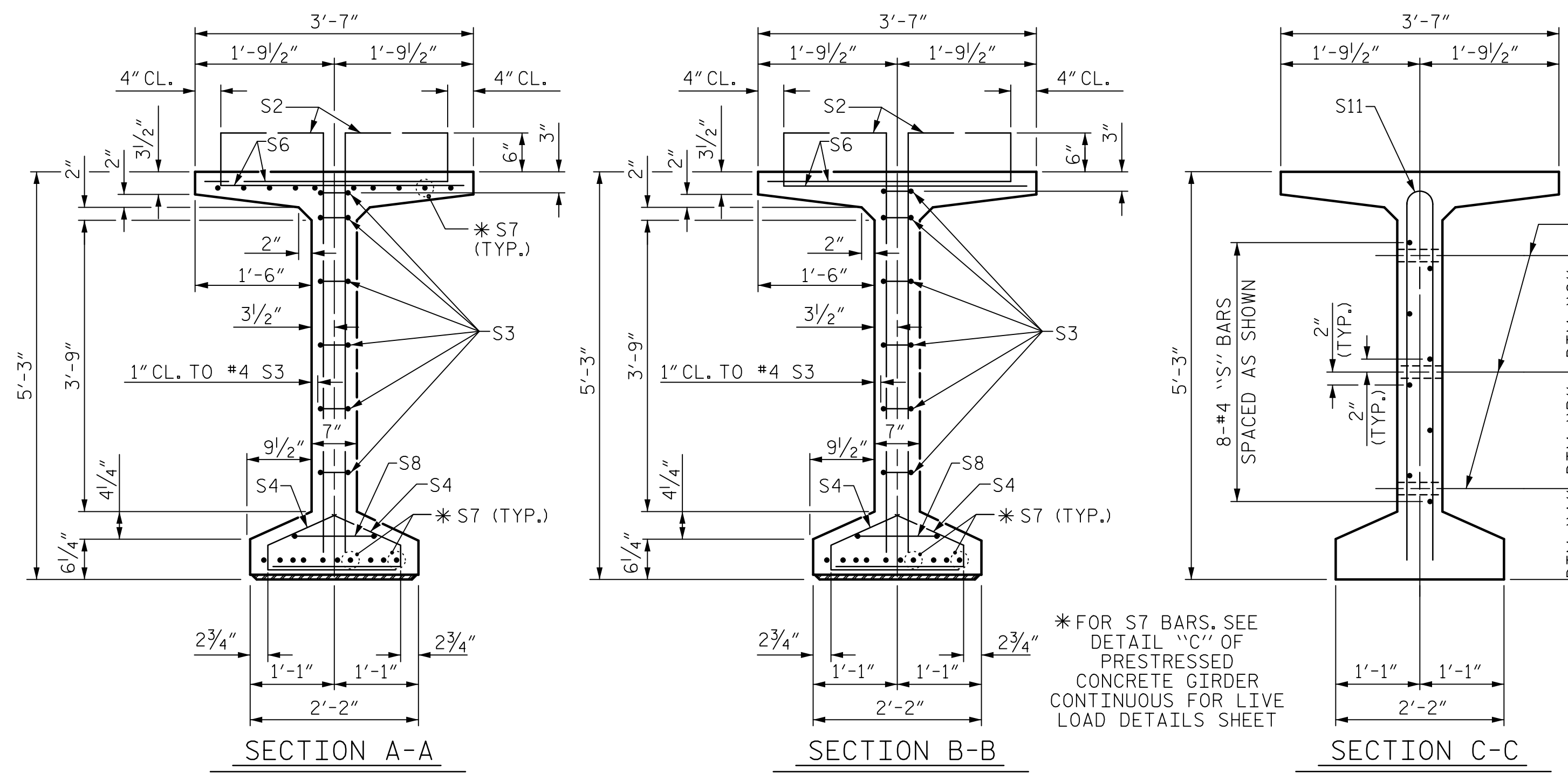
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 FRAMING PLAN

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

SHEET NO. S-11  
 TOTAL SHEETS 33

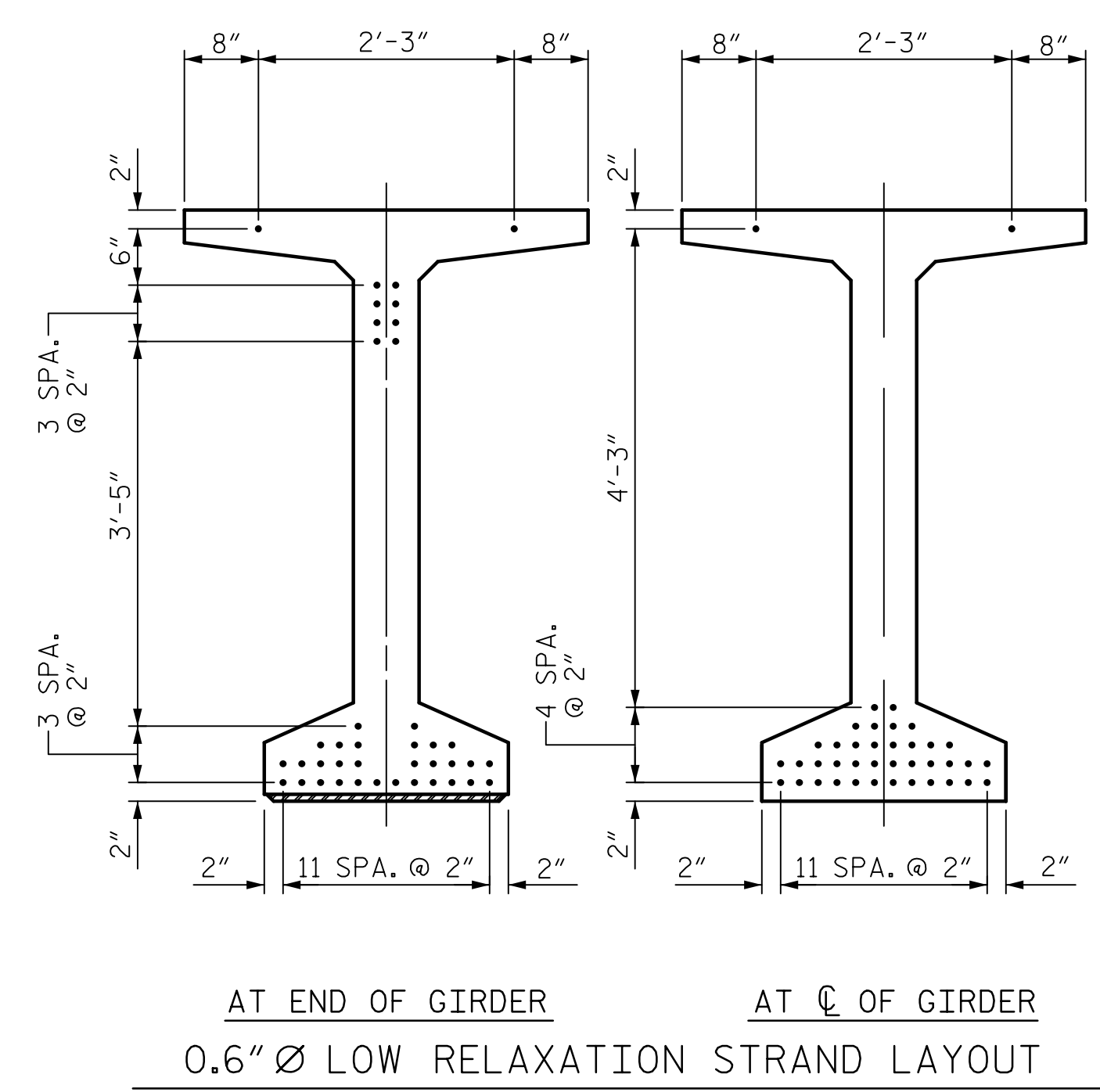
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1/2" Ø FORMED HOLE. SEE "INTERMEDIATE STEEL DIAPHRAGMS" SHEET FOR LOCATION AND FOR DIM. "A", "B" & "C".

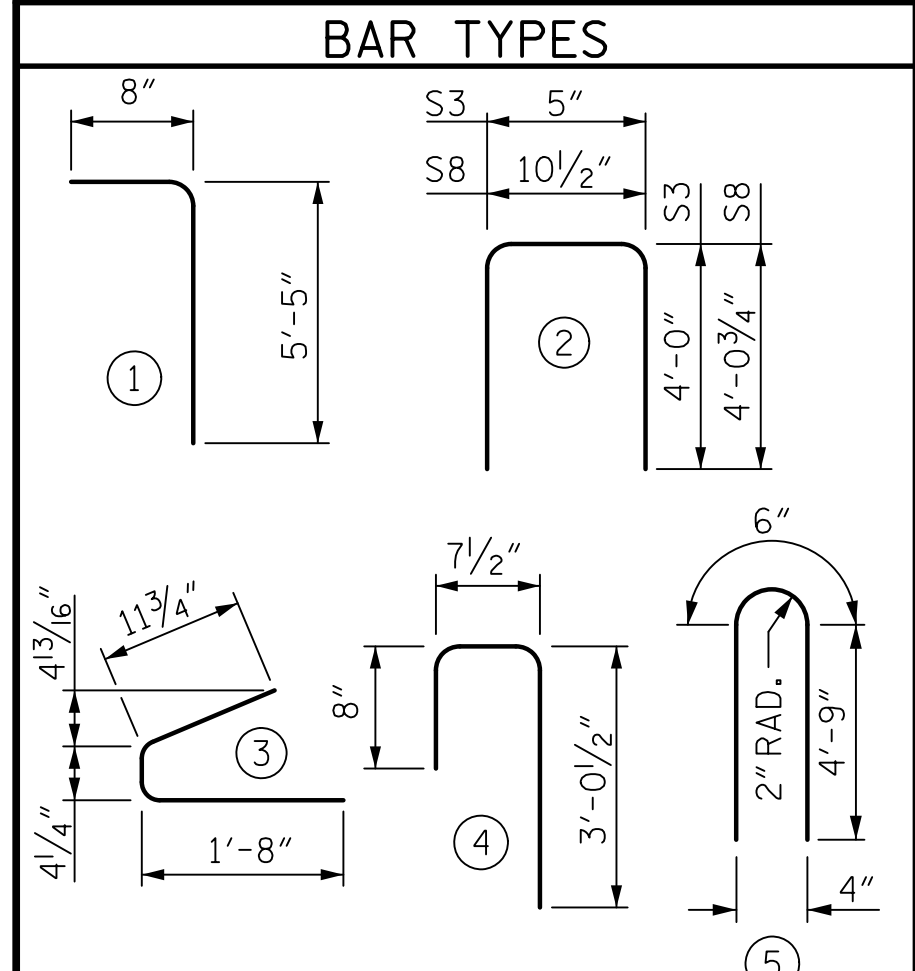
\* FOR S7 BARS, SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET



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

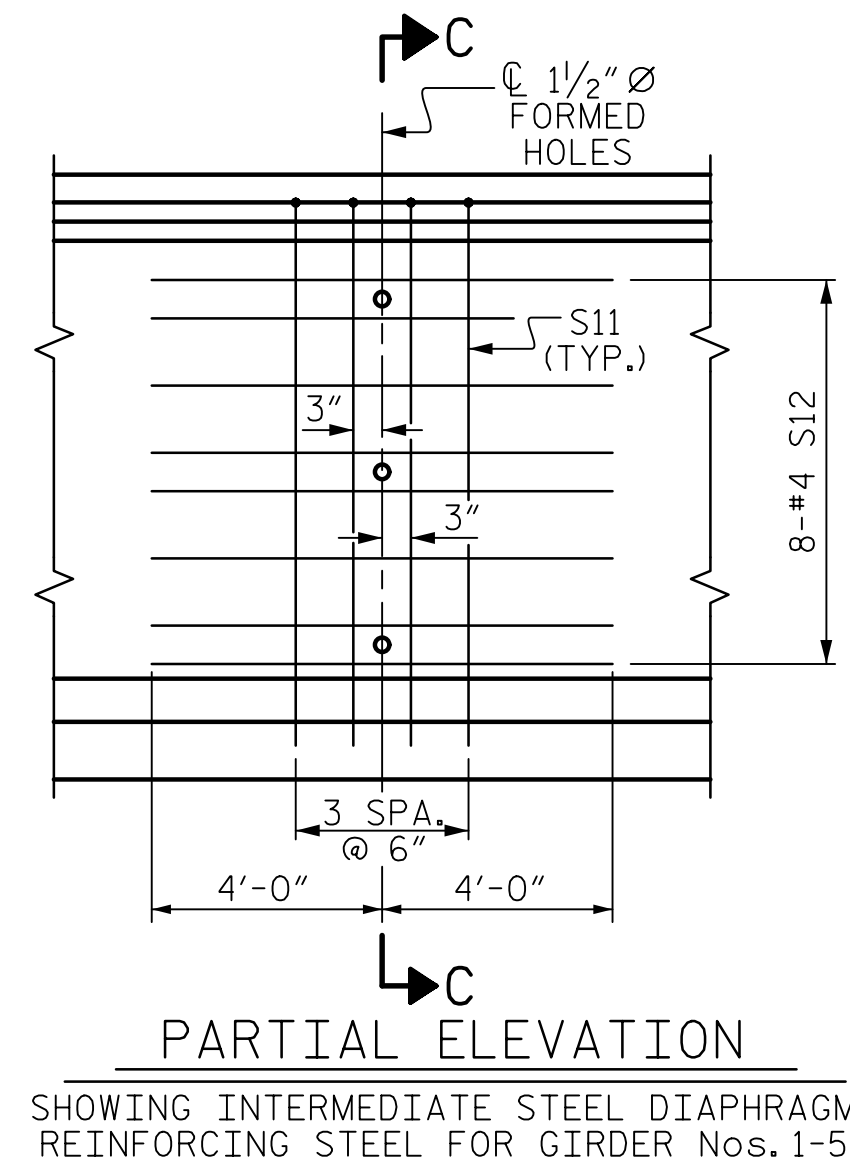
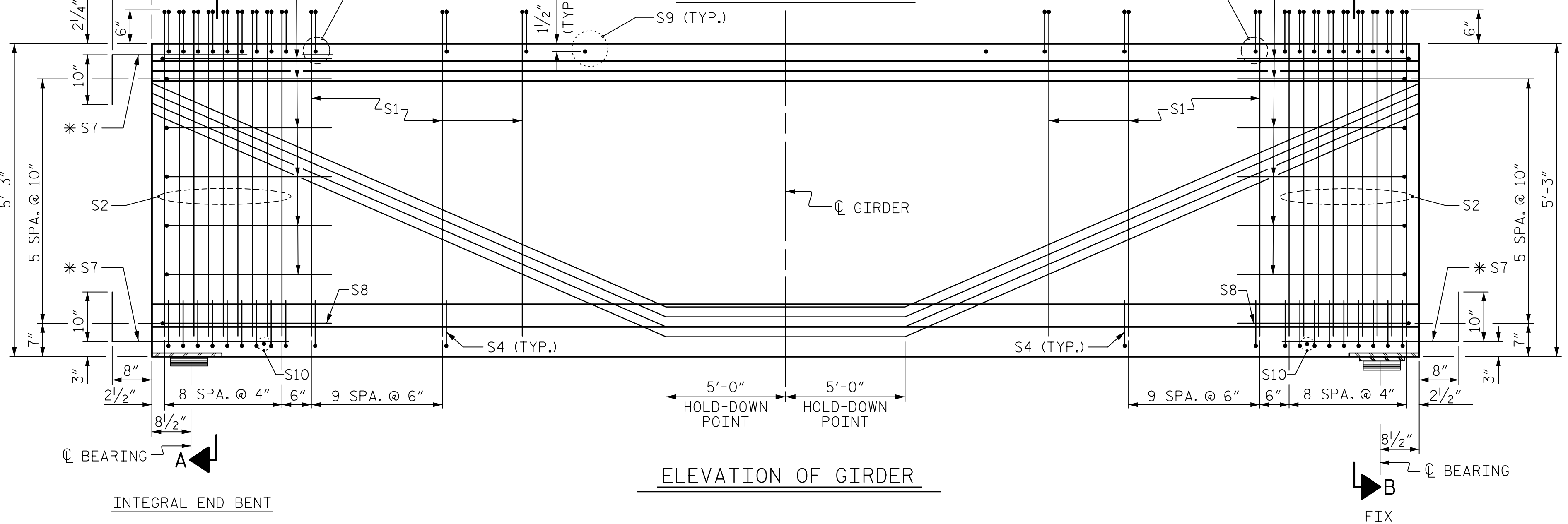
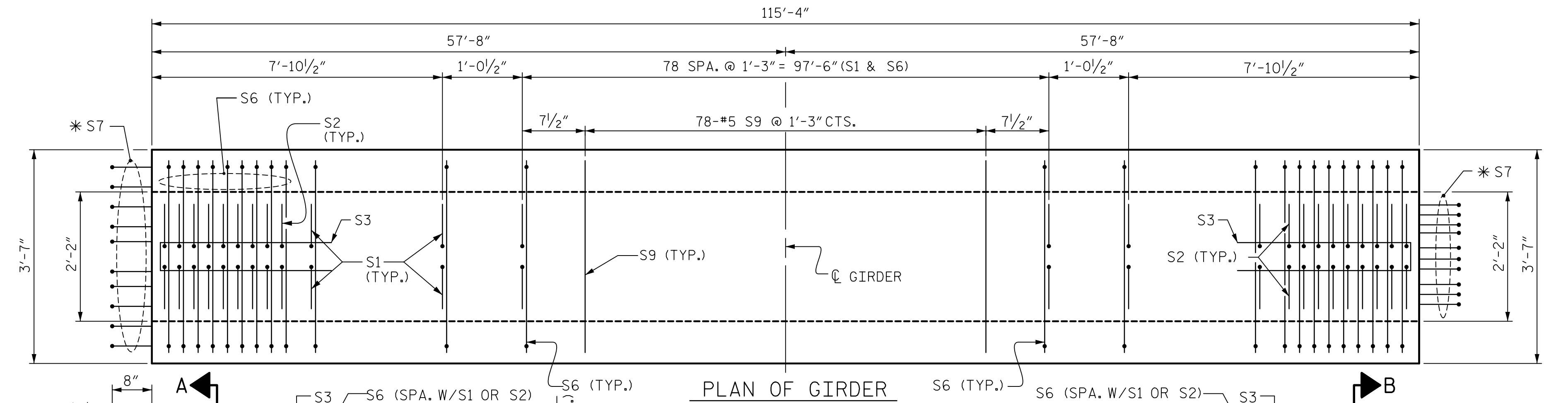
REINFORCING STEEL FOR ONE GDR					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	198	#4	1	6'-1"	805
S2	36	#5	1	6'-1"	228
S3	12	#4	2	8'-5"	67
S4	76	#4	3	3'-0"	152
S6	234	#5	4	4'-4"	1058
*S7	30	#5	STR	3'-8"	115
S8	2	#5	2	9'-0"	19
S9	78	#5	STR	3'-3"	264
S10	2	#3	STR	1'-10"	1
S11	8	#5	5	10'-0"	83
S12	16	#4	STR	8'-0"	86

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



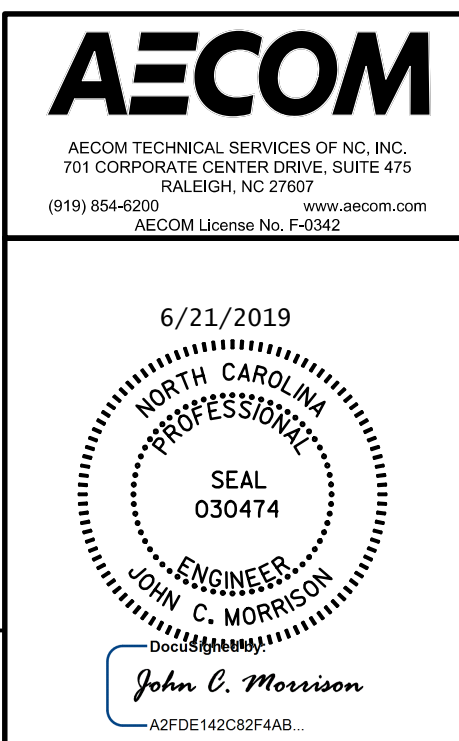
QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GDR'S A1-A5	2878	22.8	40

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
5	115'-4"	576'-8"



PROJECT NO. B-5980  
 COUNTY NASH  
 STATION: 42+56.82 -Y1-

SHEET 1 OF 5  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 63" PRESTRESSED CONCRETE  
 MODIFIED BULB TEE  
 CONTINUOUS FOR LIVE LOAD  
 SPAN A



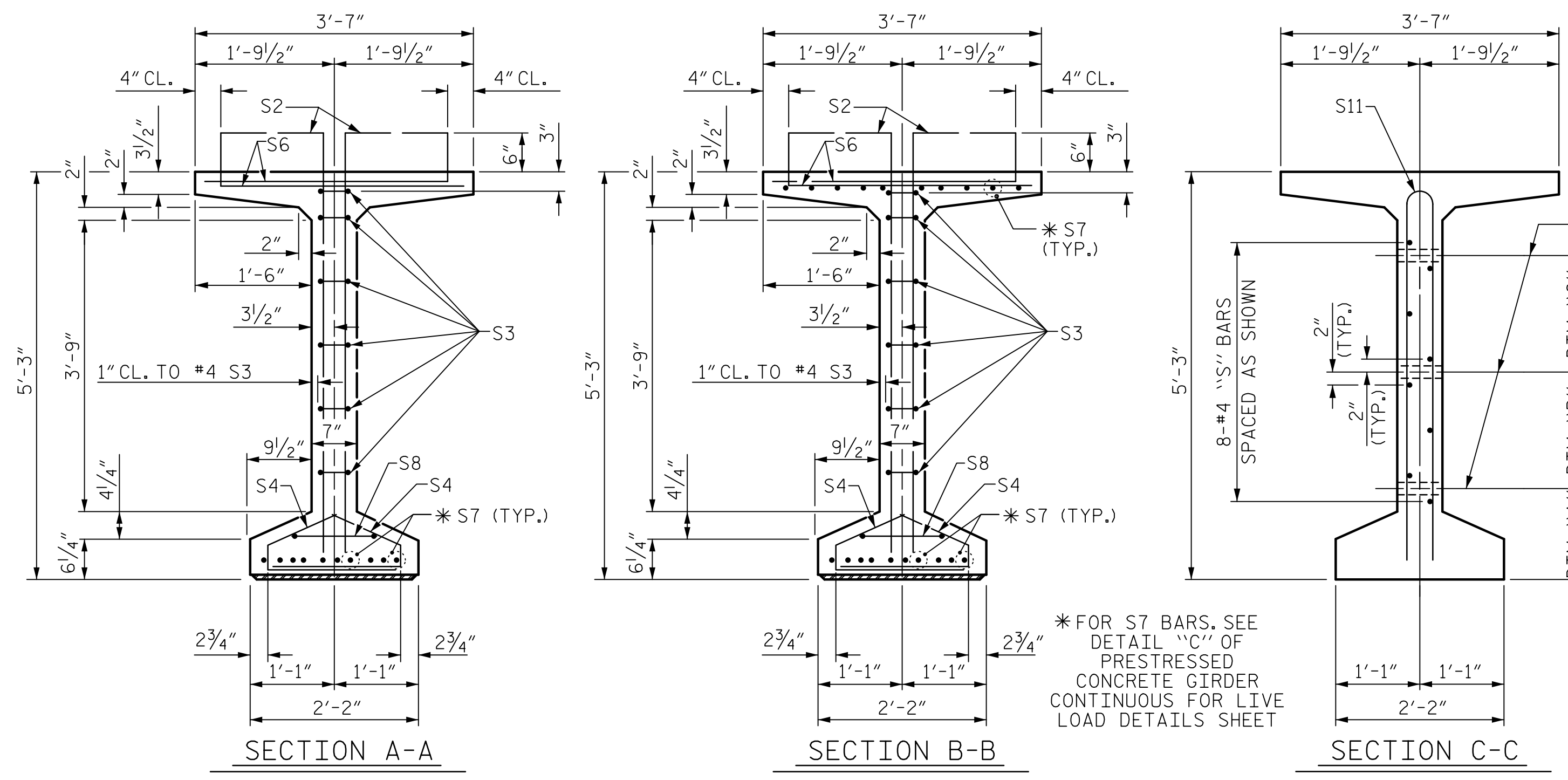
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 CHECKED BY: J.C. MORRISON DATE: 2/2019  
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 CHECKED BY: VAP 2/6/97 REV. 1/15 MAA/TMG  
 REV. 12/17 MAA/THC

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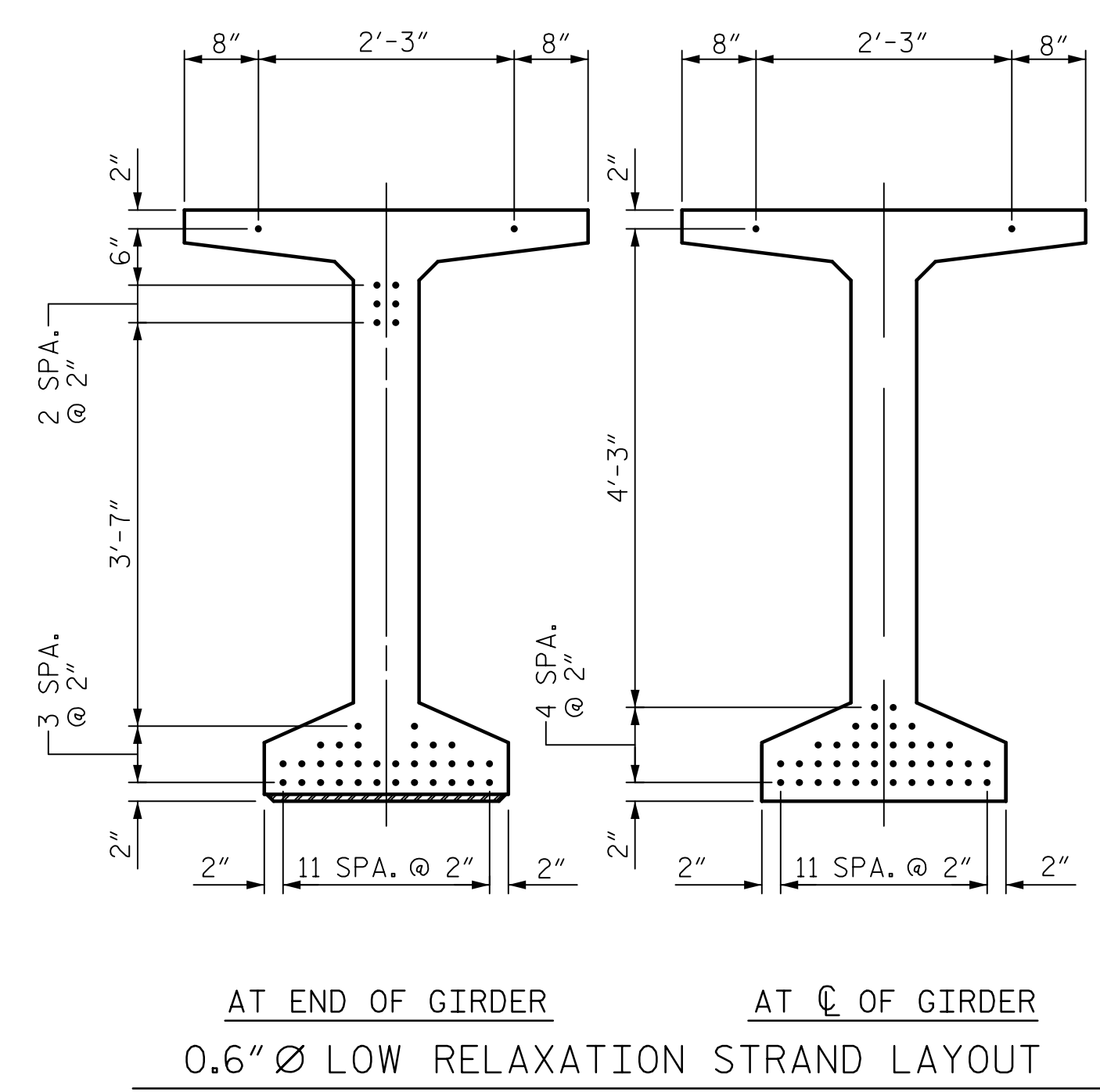
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© 1/2" Ø FORMED HOLE. SEE "INTERMEDIATE STEEL DIAPHRAGMS" SHEET FOR LOCATION AND FOR DIM. "A", "B" & "C".



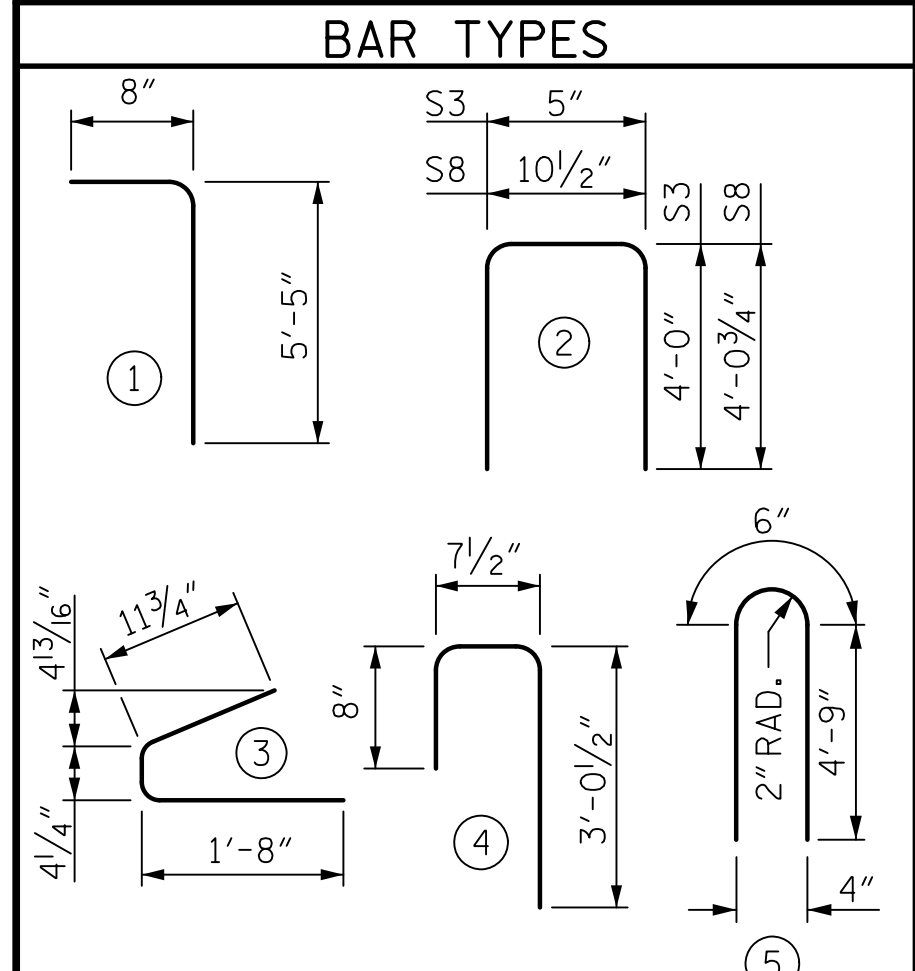
0.6" Ø L. R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
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S6	232	#5	4	4'-4"	1049
*S7	30	#5	STR	3'-8"	115
S8	2	#5	2	9'-0"	19
S9	77	#5	STR	3'-3"	261
S10	2	#3	STR	1'-10"	1
S11	8	#5	5	10'-0"	83
S12	16	#4	STR	8'-0"	86

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

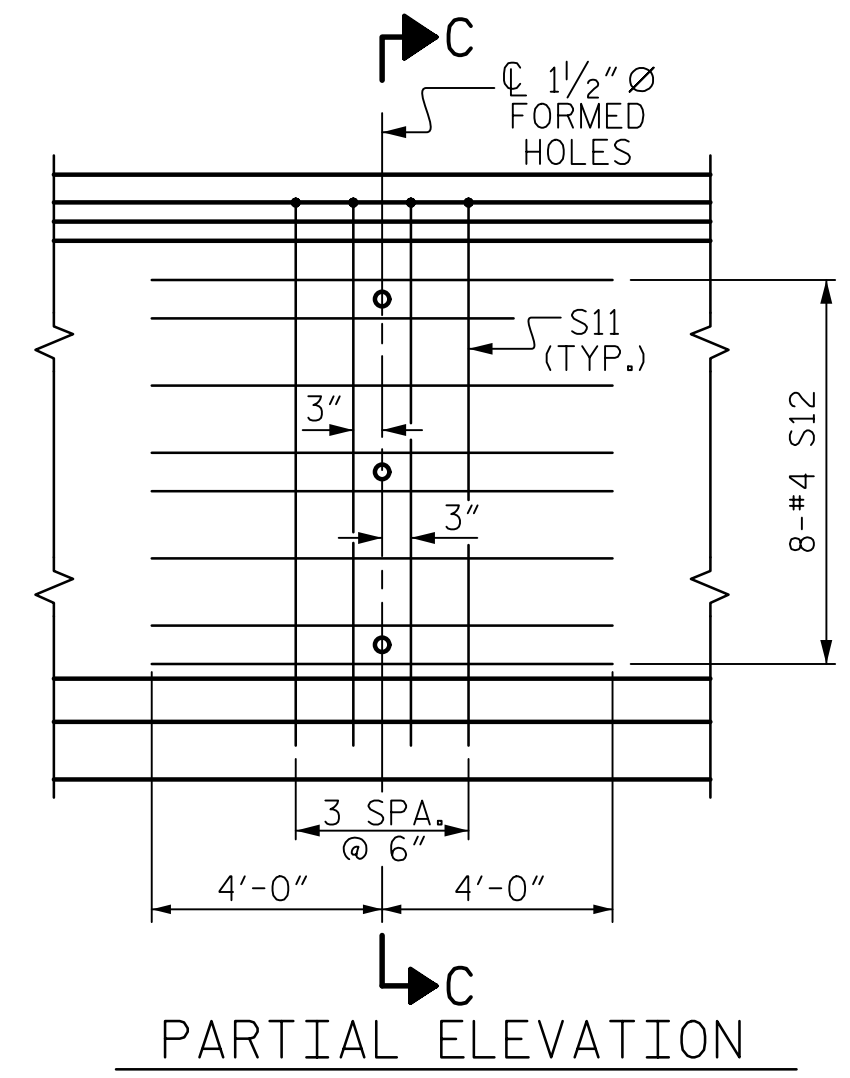
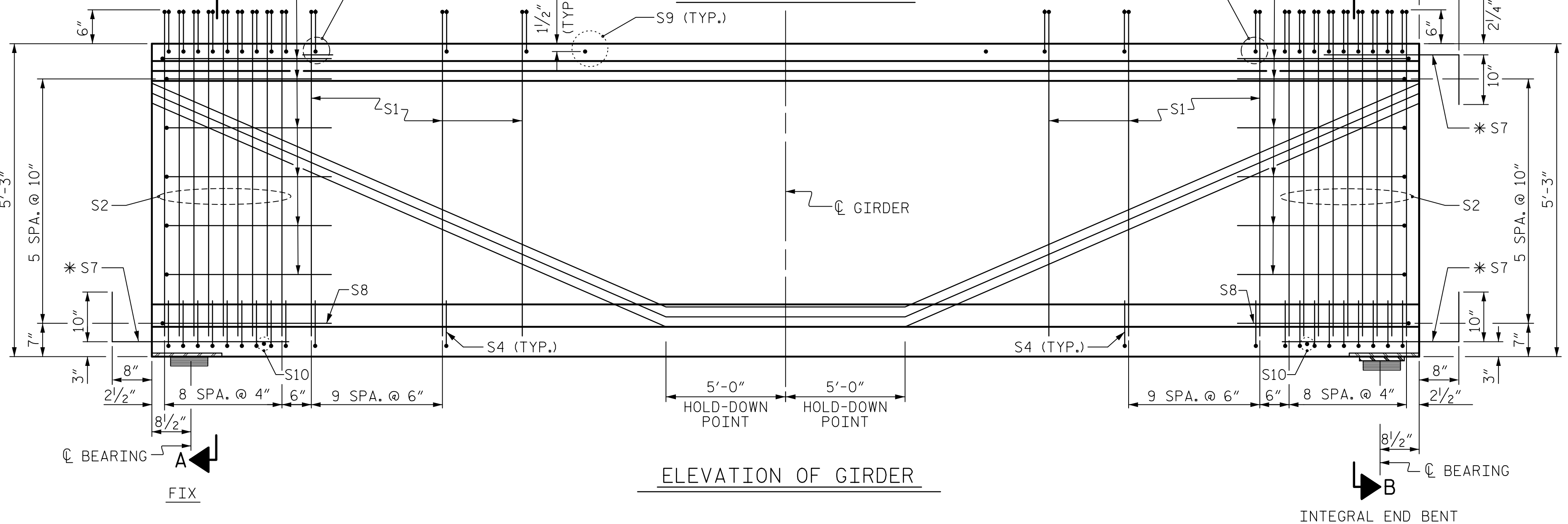
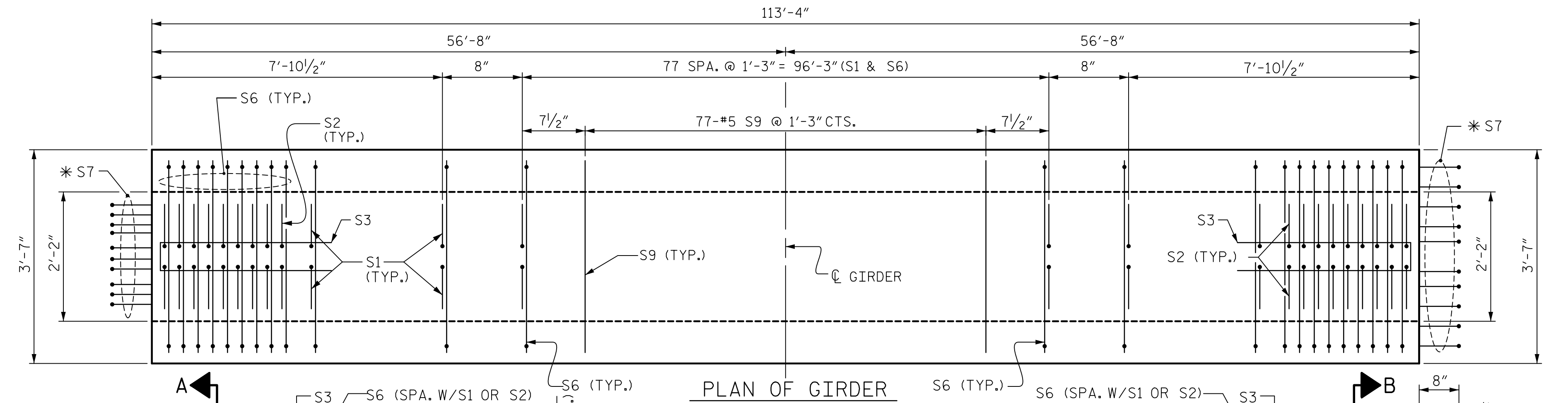


QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL (LB.)	9000 PSI CONCRETE (C.Y.)	0.6" Ø L.R. STRANDS (No.)
GDR'S B1-B5	2857	22.4	40

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	113'-4"	566'-8"



PROJECT NO. B-5980  
NASH COUNTY  
STATION: 42+56.82 -Y1-  
SHEET 2 OF 5

**AECOM**  
AECOM TECHNICAL SERVICES OF NC, INC.  
701 CORPORATE CENTER DRIVE, SUITE 475  
RALEIGH, NC 27607  
(919) 854-6200 www.aecom.com  
AECOM License No. F-0342

6/21/2019  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 030474  
JOHN C. MORRISON

John C. Morrison  
A2FDE142C82F4A8..

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE

63" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN B

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

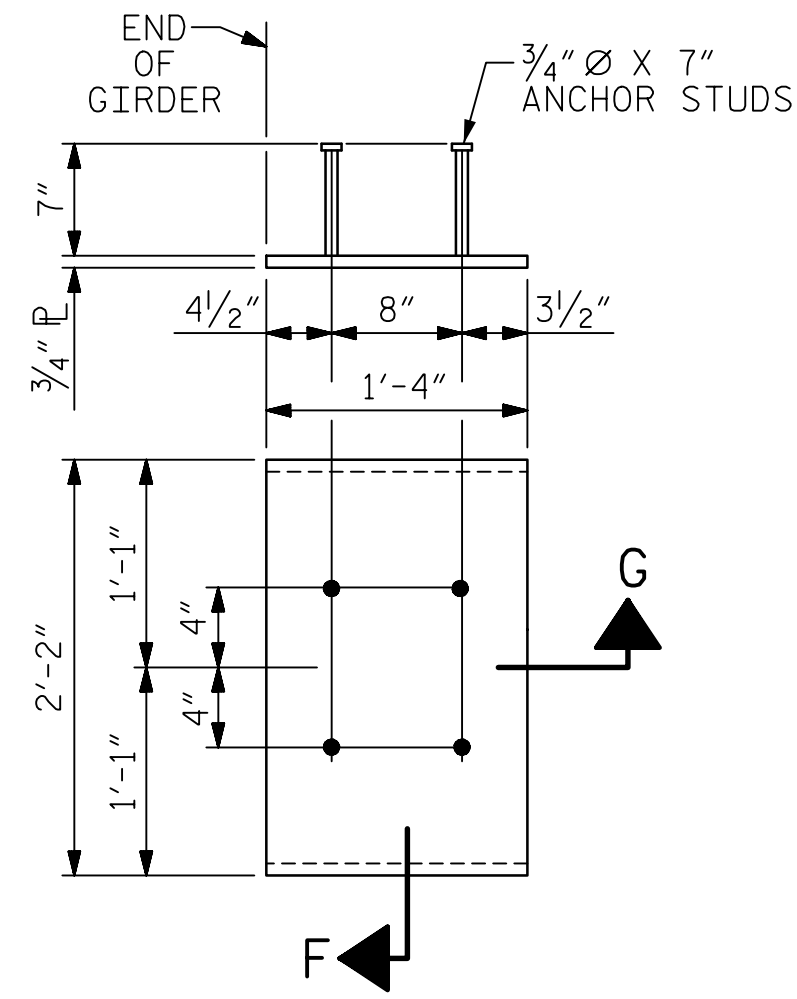
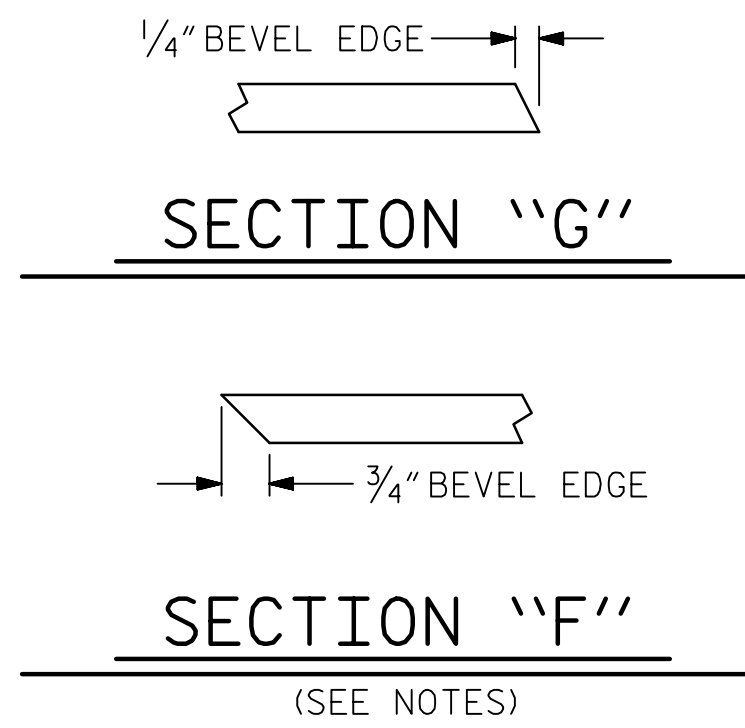
SHEET NO. S-13  
TOTAL SHEETS 33

ASSEMBLED BY: T.B. STUMP DATE: 2/2019  
CHECKED BY: J.C. MORRISON DATE: 2/2019  
DRAWN BY: EEM 2/6/97 REV. 6/13 MAA/GM  
CHECKED BY: VAP 2/6/97 REV. 1/15 MAA/TMG  
REV. 12/17 MAA/THC

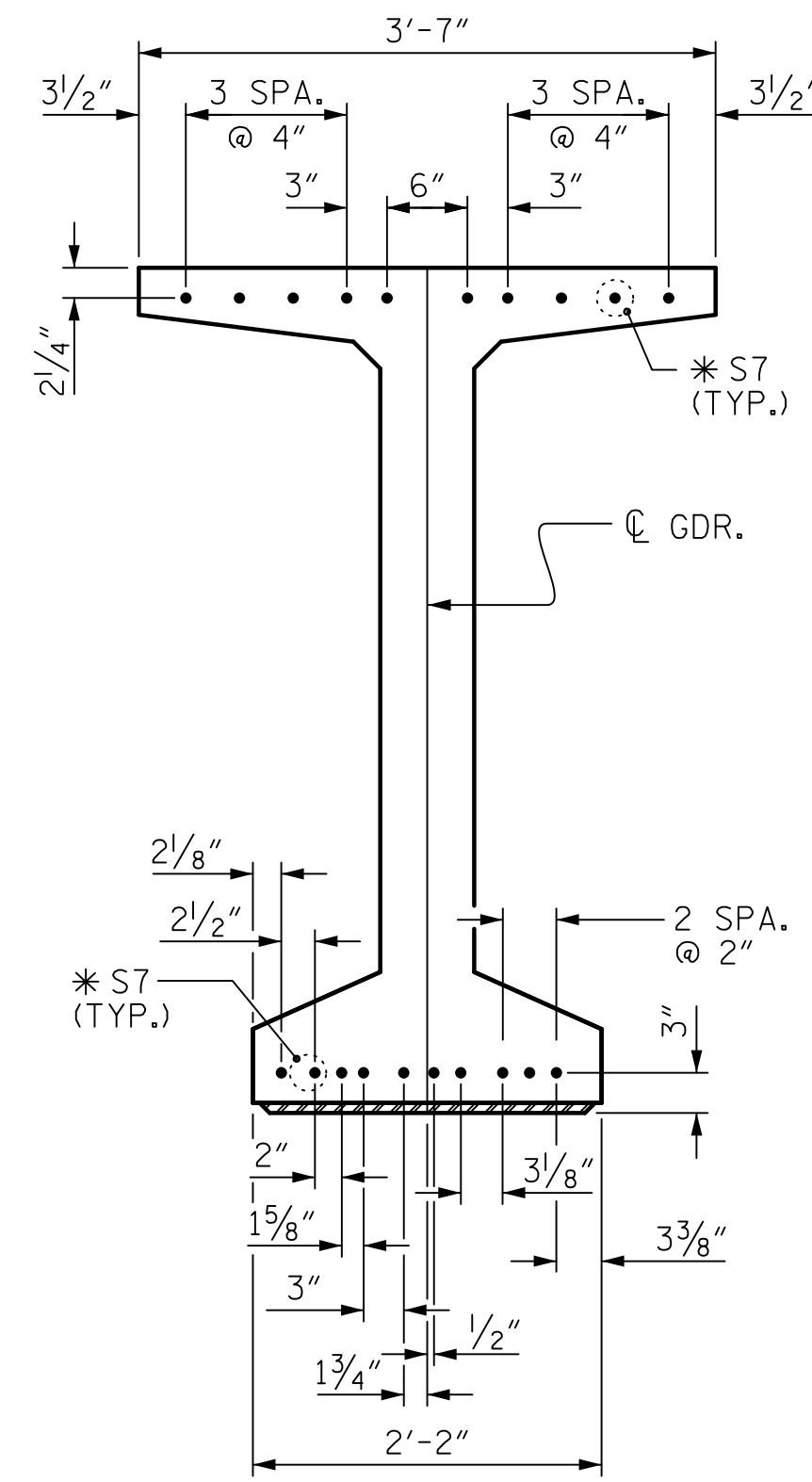
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DATE: 6/20/2019 TIME: 6:01:50 PM

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**EMBEDDED PLATE "B-1" DETAILS FOR 63" MODIFIED BULB TEES**  
(2 REQ'D PER GIRDER)



**DETAIL "C"**

**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. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 7,500 PSI.

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

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

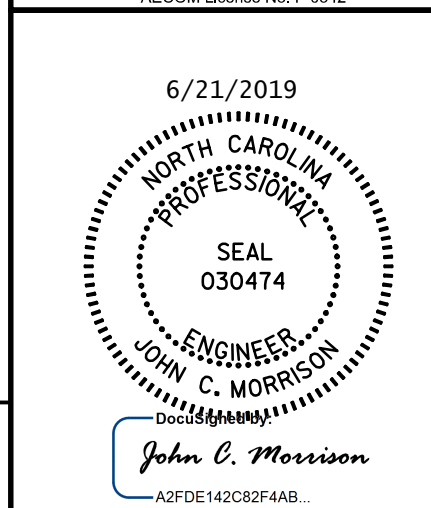
WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" MODIFIED BULB TEES ONLY.

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

PROJECT NO. B-5980  
NASH COUNTY  
 STATION: 42+56.82 -Y1-

SHEET 3 OF 5



STATE OF NORTH CAROLINA  
**DEPARTMENT OF TRANSPORTATION**  
 RALEIGH  
 SUPERSTRUCTURE  
**63" PRESTRESSED CONCRETE  
 MODIFIED BULB TEE  
 CONTINUOUS FOR LIVE LOAD  
 DETAILS**

ASSEMBLED BY : T.B. STUMP	DATE : 2/2019
CHECKED BY : J.C. MORRISON	DATE : 2/2019
DRAWN BY : ELR 11/91	REV. 1/15 MAA/TMG
CHECKED BY : GRP 11/91	REV. 2/15 MAA/TMG
	REV. 12/17 MAA/THC

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
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TIME: 6:03:56 PM

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DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6" DIA. LOW-RELAXATION		SPANS A																				
		GIRDERS 1 & 5																				
TENTH POINTS		BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑		0.000	0.047	0.093	0.136	0.176	0.211	0.241	0.265	0.282	0.292	0.296	0.292	0.282	0.265	0.241	0.211	0.176	0.136	0.093	0.047	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.000	0.032	0.065	0.095	0.125	0.149	0.173	0.188	0.203	0.208	0.214	0.208	0.203	0.188	0.173	0.149	0.125	0.095	0.065	0.032	0.000
FINAL CAMBER ↑		0	3/16	5/16	1/2	5/8	3/4	13/16	15/16	15/16	1	1	1	15/16	15/16	13/16	3/4	5/8	1/2	5/16	3/16	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6" DIA. LOW-RELAXATION		SPANS A																				
		GIRDERS 2 & 4																				
TENTH POINTS		BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑		0.000	0.047	0.093	0.136	0.176	0.211	0.241	0.265	0.282	0.292	0.296	0.292	0.282	0.265	0.241	0.211	0.176	0.136	0.093	0.047	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.000	0.035	0.070	0.103	0.135	0.161	0.187	0.203	0.219	0.225	0.231	0.225	0.219	0.203	0.187	0.161	0.135	0.103	0.070	0.035	0.000
FINAL CAMBER ↑		0	1/8	1/4	3/8	1/2	5/8	5/8	3/4	3/4	13/16	13/16	13/16	3/4	3/4	5/8	5/8	1/2	3/8	1/4	1/8	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6" DIA. LOW-RELAXATION		SPANS A																				
		GIRDER 3																				
TENTH POINTS		BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑		0.000	0.047	0.093	0.136	0.176	0.211	0.241	0.265	0.282	0.292	0.296	0.292	0.282	0.265	0.241	0.211	0.176	0.136	0.093	0.047	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.000	0.036	0.071	0.105	0.138	0.164	0.191	0.207	0.224	0.230	0.235	0.230	0.224	0.207	0.191	0.164	0.138	0.105	0.071	0.036	0.000
FINAL CAMBER ↑		0	1/8	1/4	3/8	1/2	5/8	5/8	11/16	11/16	3/4	3/4	3/4	11/16	11/16	5/8	5/8	1/2	3/8	1/4	1/8	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6" DIA. LOW-RELAXATION		SPANS B																				
		GIRDERS 1 & 5																				
TENTH POINTS		BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑		0.000	0.048	0.096	0.140	0.181	0.217	0.248	0.273	0.290	0.301	0.305	0.301	0.290	0.273	0.248	0.217	0.181	0.140	0.096	0.048	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.000	0.030	0.060	0.089	0.117	0.139	0.161	0.175	0.189	0.194	0.199	0.194	0.189	0.175	0.161	0.139	0.117	0.089	0.060	0.030	0.000
FINAL CAMBER ↑		0	1/4	1/6	5/8	3/4	15/16	1/16	13/16	13/16	15/16	15/16	15/16	13/16	13/16	1/16	15/16	3/4	5/8	7/16	1/4	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6" DIA. LOW-RELAXATION		SPANS B																				
		GIRDERS 2 & 4																				
TENTH POINTS		BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑		0.000	0.048	0.096	0.140	0.181	0.217	0.248	0.273	0.290	0.301	0.305	0.301	0.290	0.273	0.248	0.217	0.181	0.140	0.096	0.048	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.000	0.033	0.065	0.096	0.126	0.150	0.174	0.189	0.204	0.210	0.215	0.210	0.204	0.189	0.174	0.150	0.126	0.096	0.065	0.033	0.000
FINAL CAMBER ↑		0	3/16	3/8	9/16	11/16	13/16	7/8	1	1	1 1/8	1 1/8	1 1/8	1	1	7/8	13/16	11/16	9/16	3/8	3/16	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6" DIA. LOW-RELAXATION		SPANS B																				
		GIRDER 3																				
TENTH POINTS		BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑		0.000	0.048	0.096	0.140	0.181	0.217	0.248	0.273	0.290	0.301	0.305	0.301	0.290	0.273	0.248	0.217	0.181	0.140	0.096	0.048	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.000	0.033	0.066	0.098	0.129	0.153	0.178	0.193	0.209	0.214	0.219	0.214	0.209	0.193	0.178	0.153	0.129	0.098	0.066	0.033	0.000
FINAL CAMBER ↑		0	3/16	3/8	1/2	5/8	3/4	13/16	15/16	1	1 1/16	1 1/16	1 1/16	1	15/16	13/16	3/4	5/8	1/2	3/8	3/16	0

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

PROJECT NO. B-5980  
NASH COUNTY  
STATION: 42+56.82 -Y1-

SHEET 4 OF 5

ASSEMBLED BY : D. RITACCO	DATE : 4/2019
CHECKED BY : C. MORRISON	DATE : 4/2019
DRAWN BY : ELR 11/91	REV. 1/15 MAA/TMG
CHECKED BY : GRP 11/91	REV. 2/15 MAA/TMG
	REV. 12/17 MAA/THC

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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

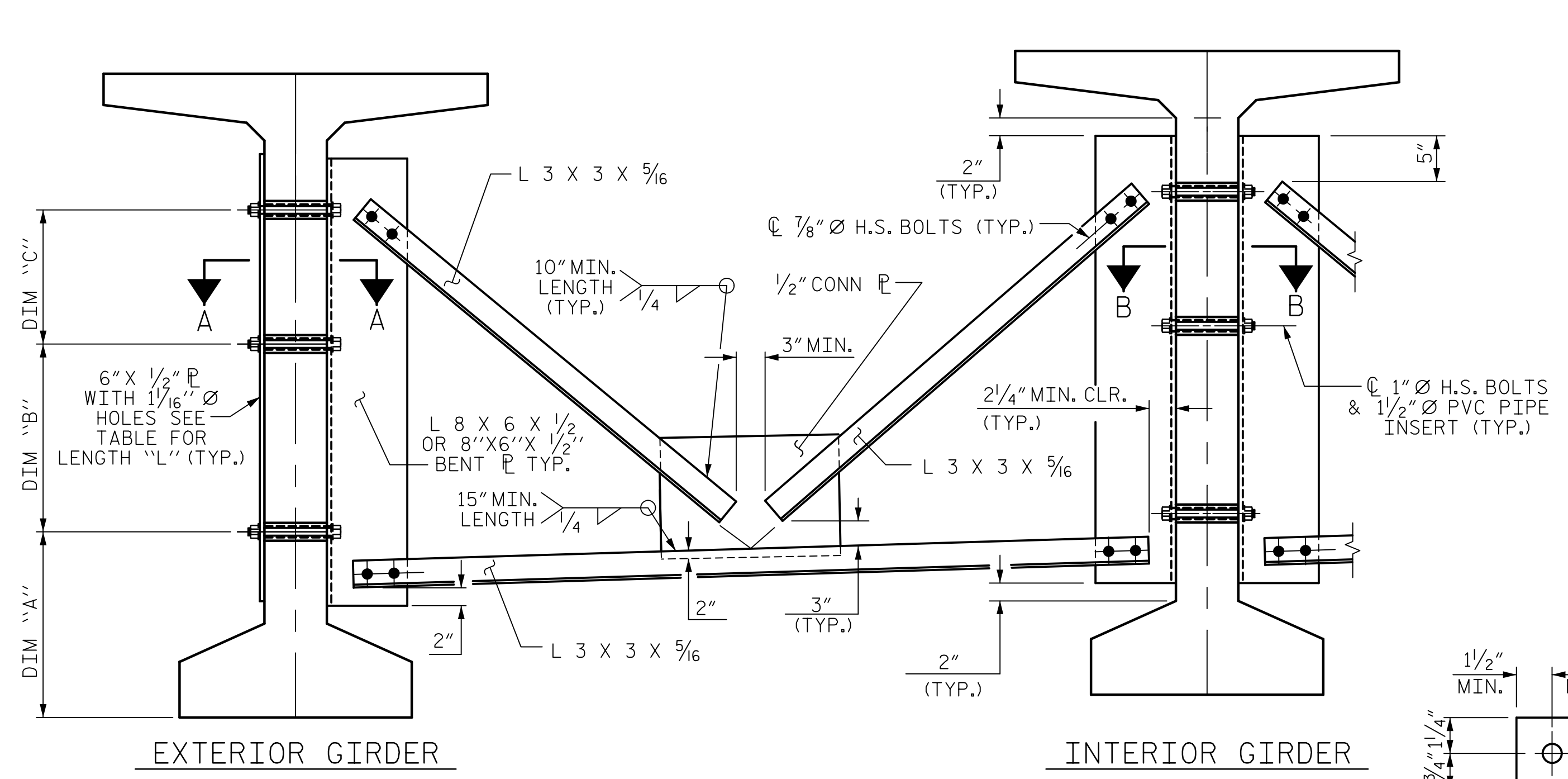
SUPERSTRUCTURE  
CAMBER & DEFLECTION  
TABLES FOR  
SPANS A & B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			33

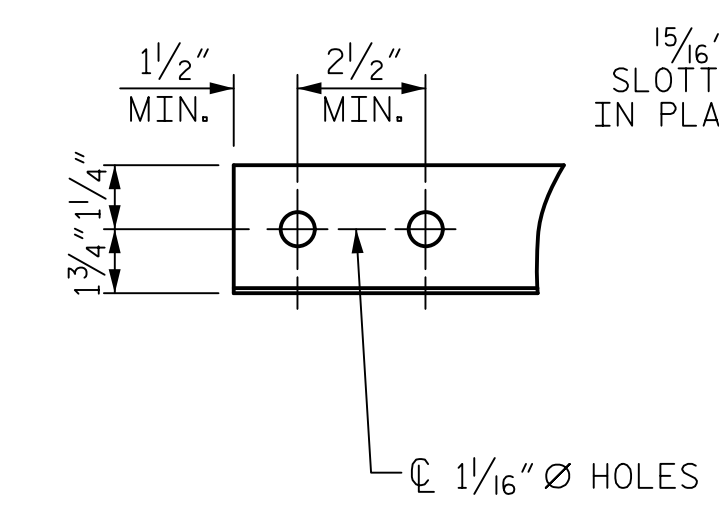


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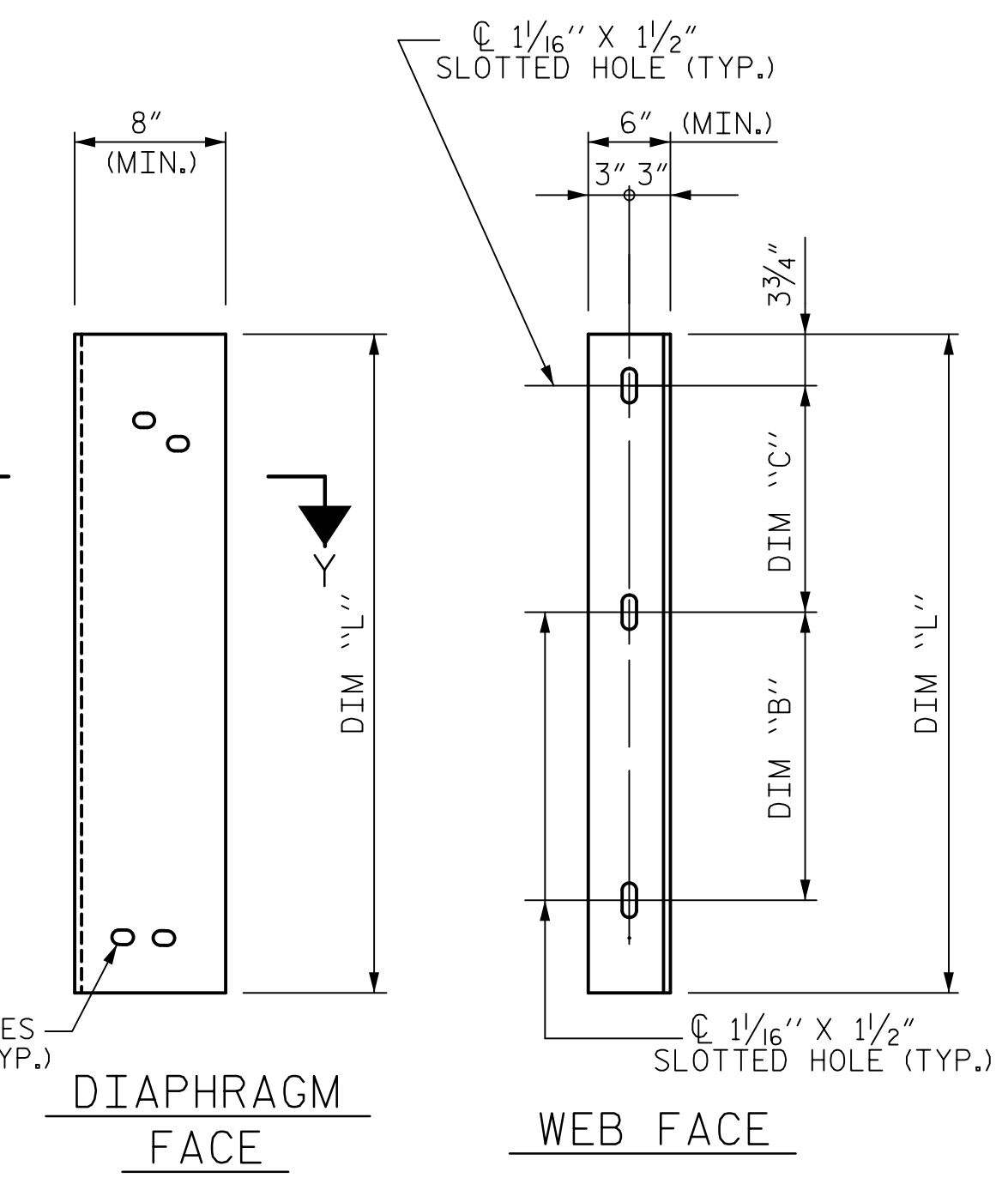
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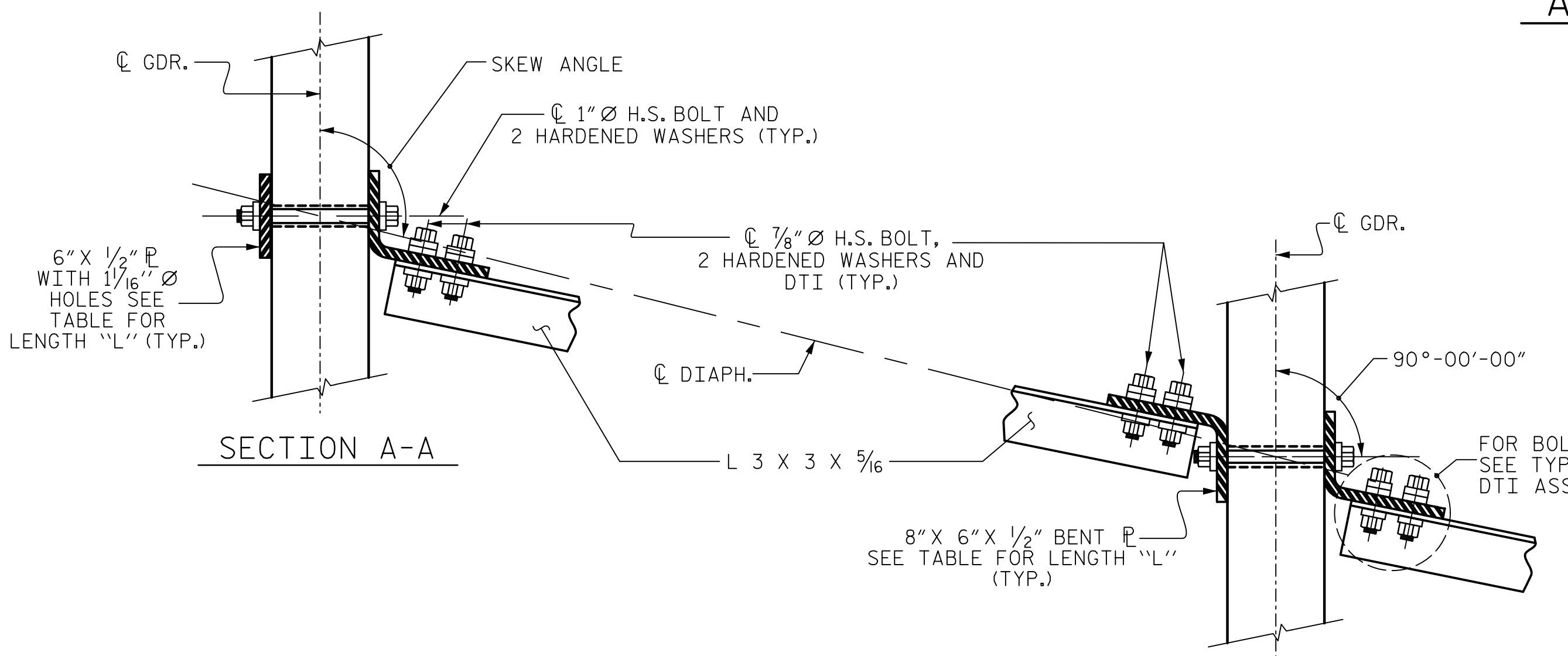
**PART SECTION AT INTERMEDIATE DIAPHRAGM**  
(63" BULB TEE OR 72" BULB TEE GIRDER SHOWN)



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



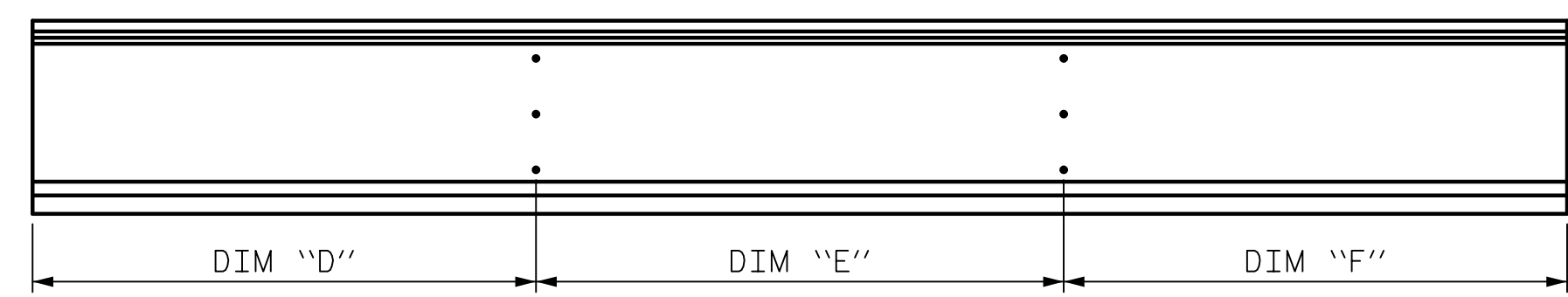
**CONNECTOR PLATE DETAIL**



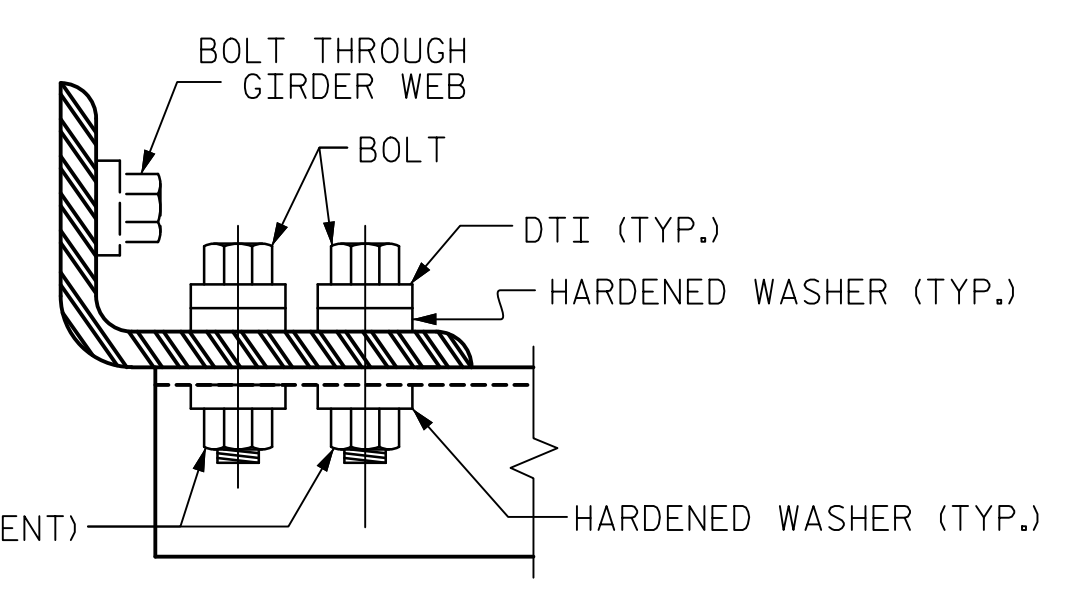
**CONNECTION DETAILS**

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"	DIM "F"	DIM "L"
SPAN A	1'-4 1/4"	1'-5"	1'-4 1/2"	36'-2"	43'-0"	36'-2"	3'-5"
SPAN B	1'-4 1/4"	1'-5"	1'-4 1/2"	37'-6"	38'-4"	37'-6"	3'-5"

**TABLE**



**GIRDER ELEVATION & BOLT HOLE PLACEMENT**



**BOLT WITH DTI ASSEMBLY DETAIL**

**STRUCTURAL STEEL NOTES**

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

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

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

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

FOR METALLIZATION, APPLY A THERMAL SPRAYED COATING WITH A SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM, 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.

ASSEMBLED BY : K.J. MUENCH	DATE : 04/2019
CHECKED BY : D. RITACCO	DATE : 04/2019
DRAWN BY : RWW 11/09	REV. 10/11
CHECKED BY : GM 11/09	REV. 12/17
	MAA/GM
	MAA/THC

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6/21/2019  
NORTH CAROLINA PROFESSIONAL SEAL 030474  
ENGINEER JOHN C. MORRISON

John C. Morrison  
A2FDE142C82F4A8

PROJECT NO. B-5980  
NASH COUNTY  
STATION: 42+56.82 -Y1-

SHEET 5 OF 5

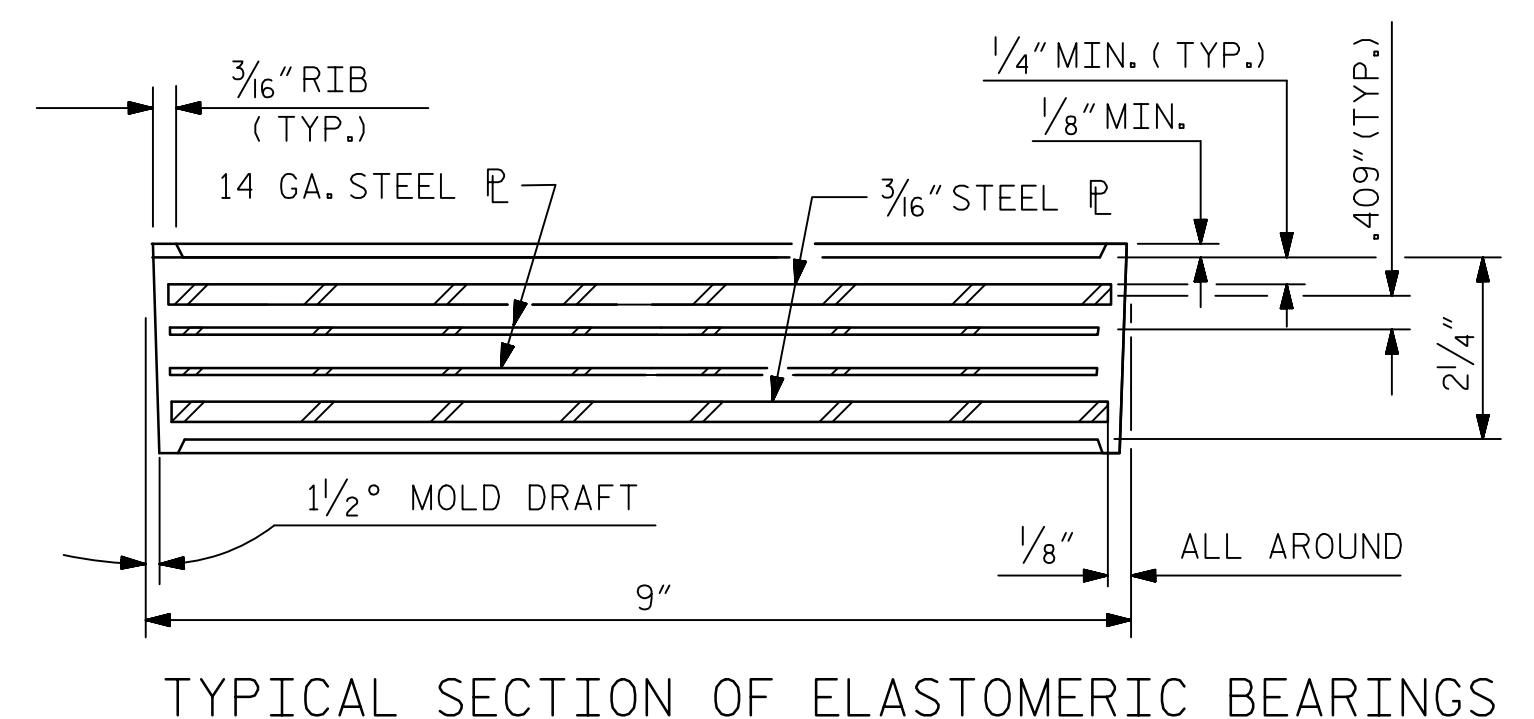
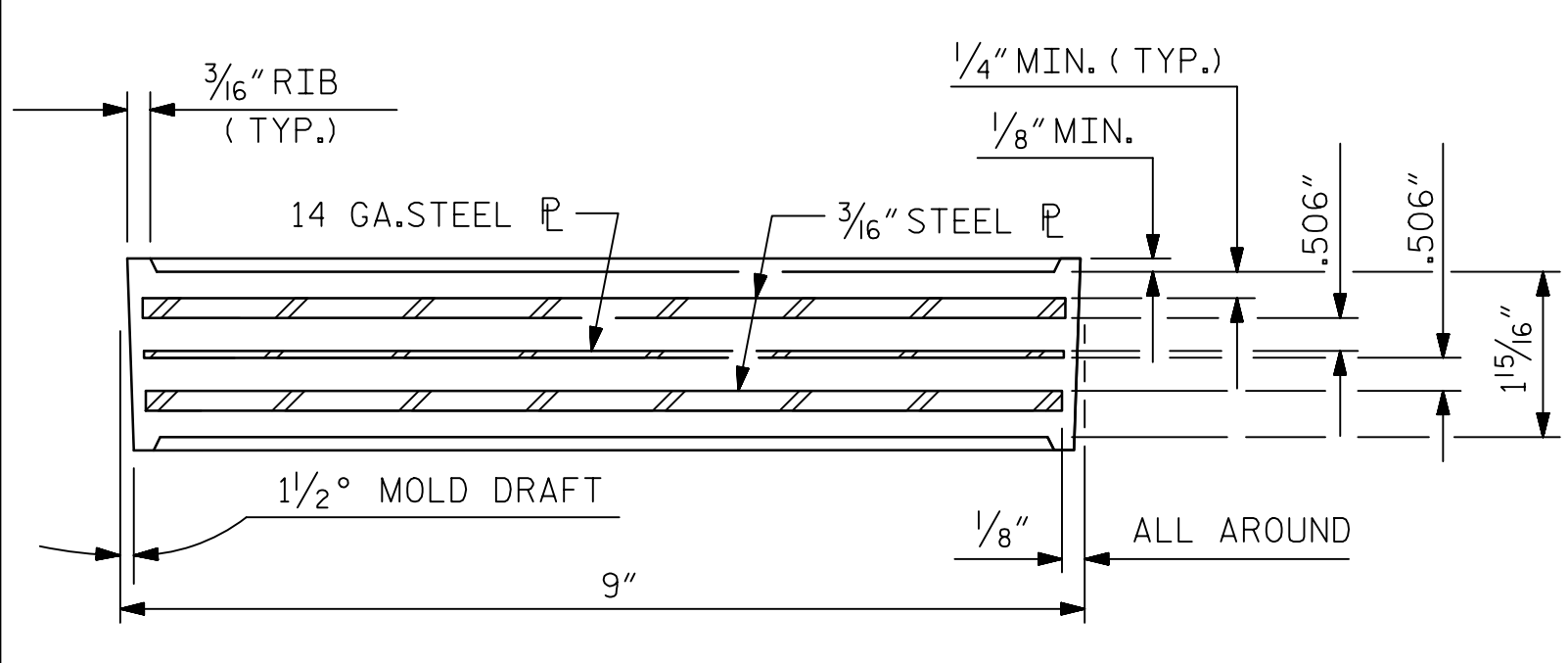
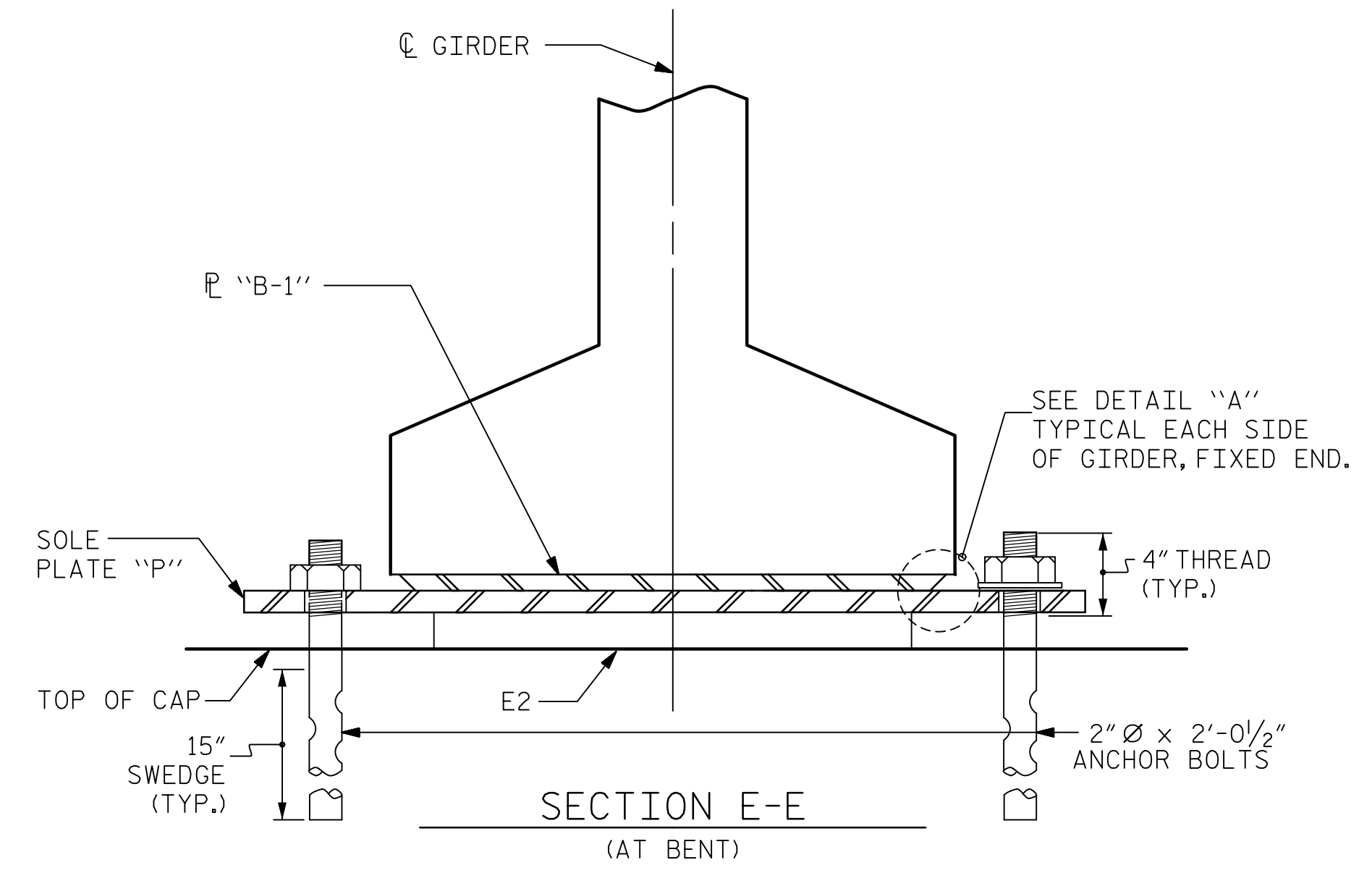
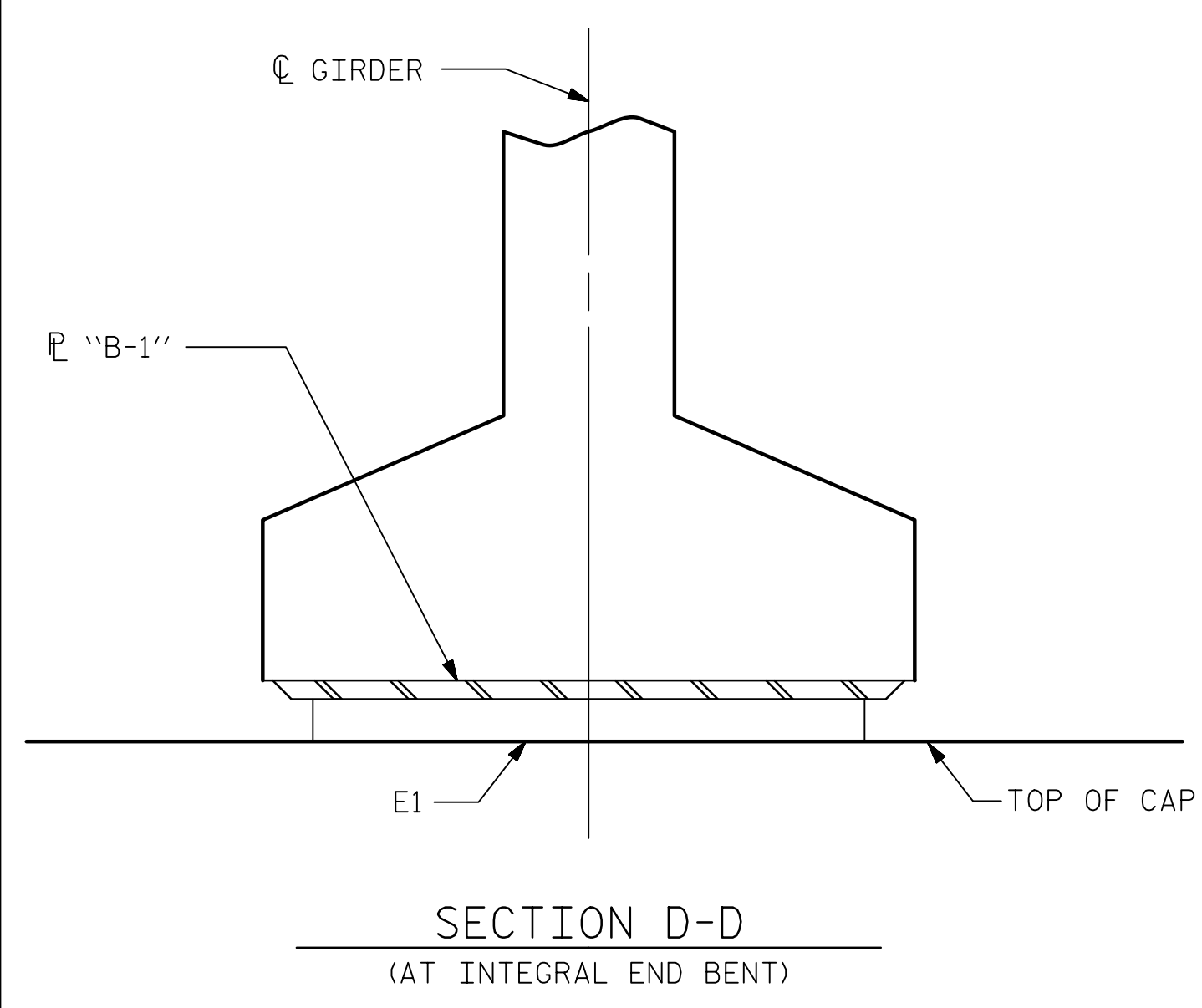
STATE OF NORTH CAROLINA  
**DEPARTMENT OF TRANSPORTATION**  
RALEIGH

**SUPERSTRUCTURE**  
**INTERMEDIATE**  
**STEEL DIAPHRAGMS**  
**FOR 63" MODIFIED**  
**BULB TEE PRESTRESSED**  
**CONCRETE GIRDERS**

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			37

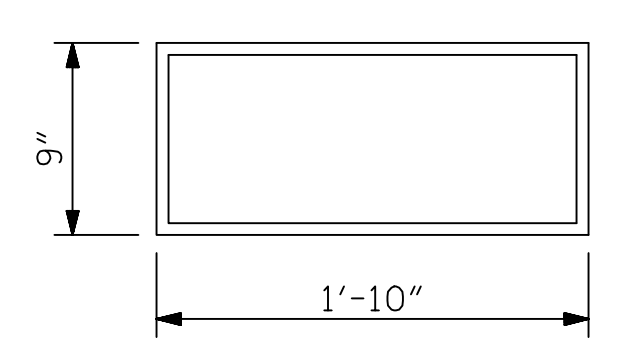
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TYPICAL SECTION OF ELASTOMERIC BEARINGS

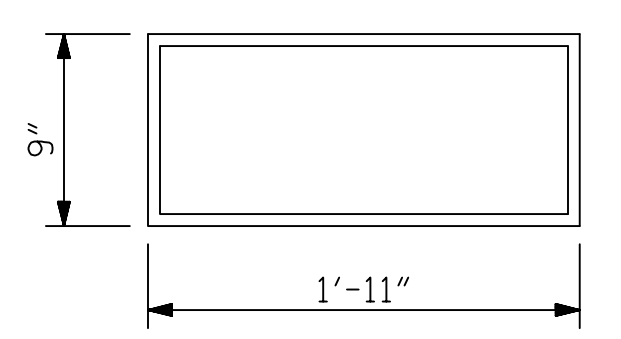
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E1 (10 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

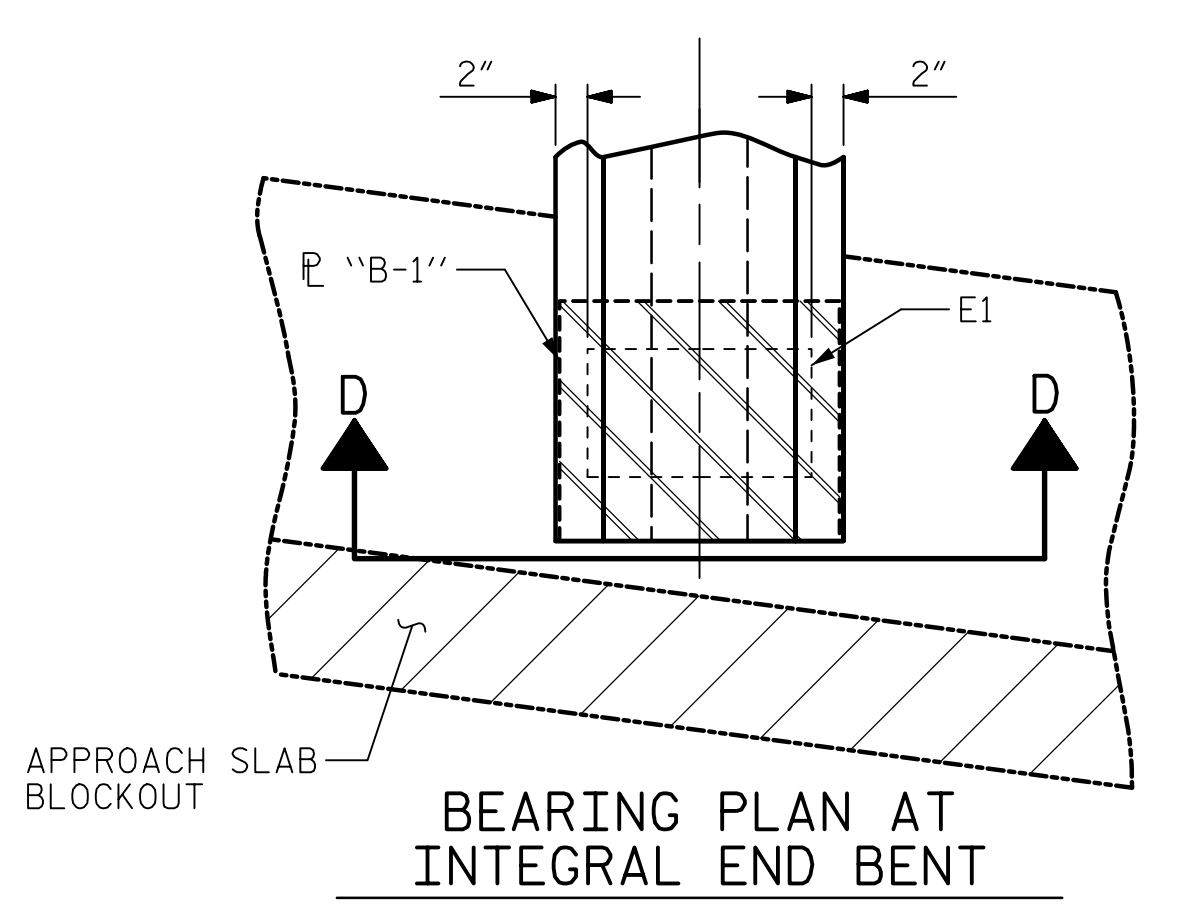
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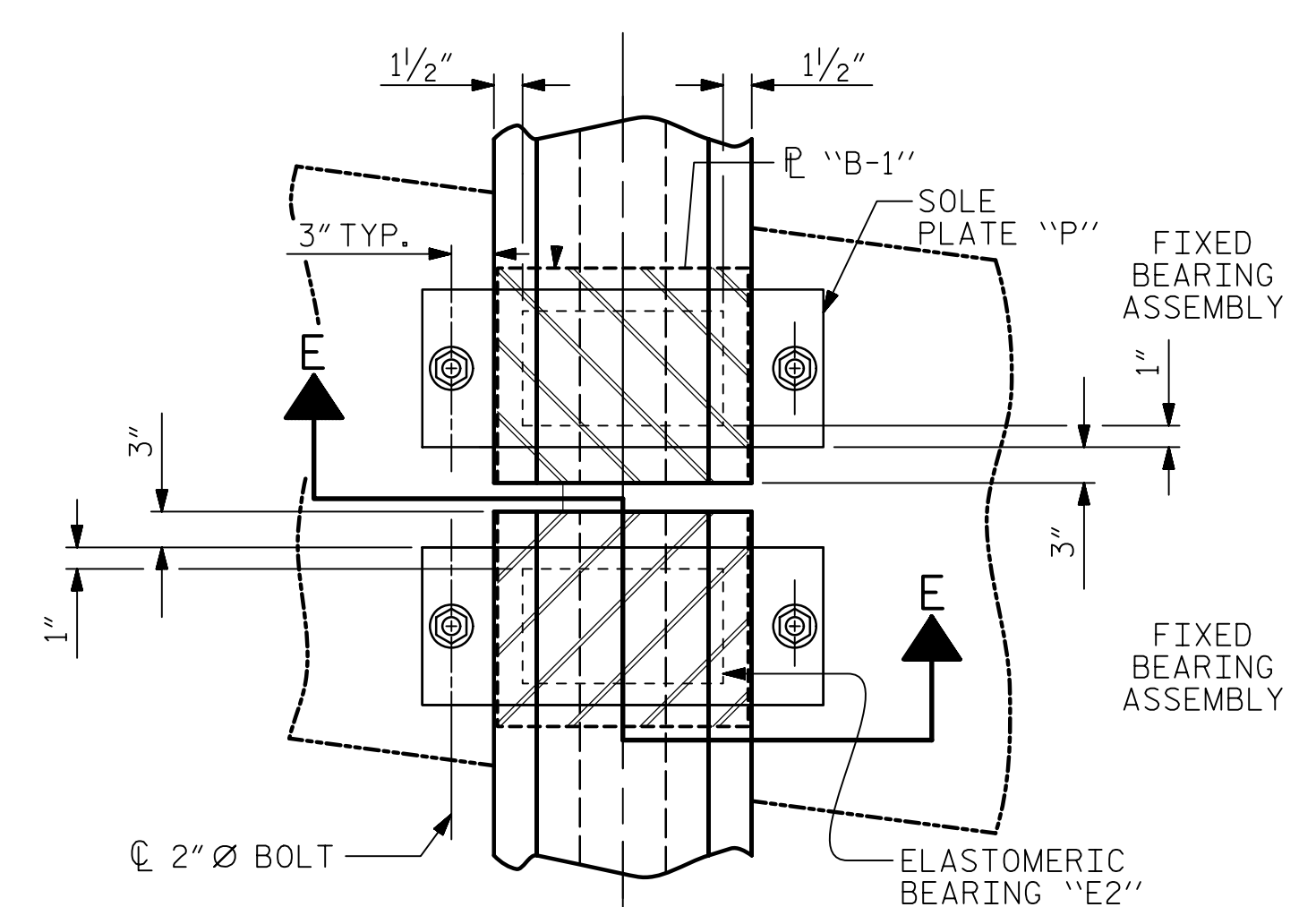
E2 (10 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

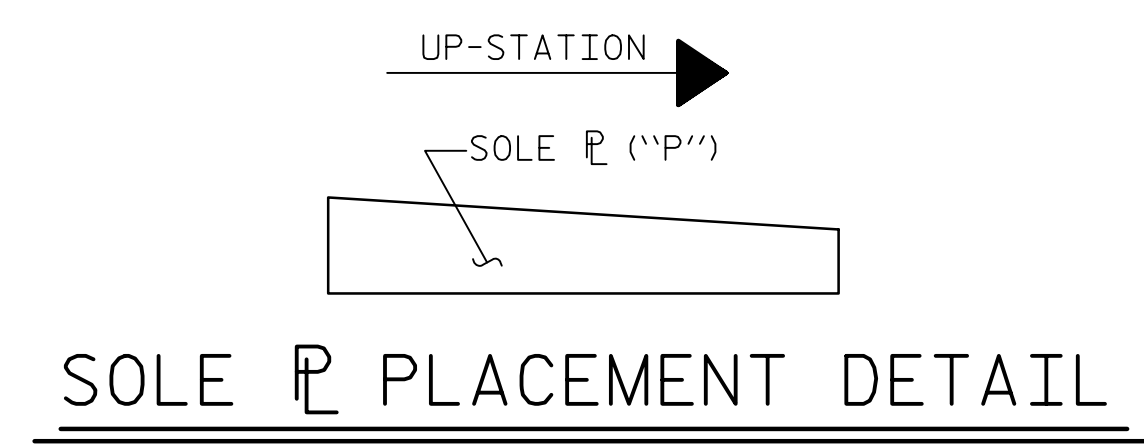
TYPE V



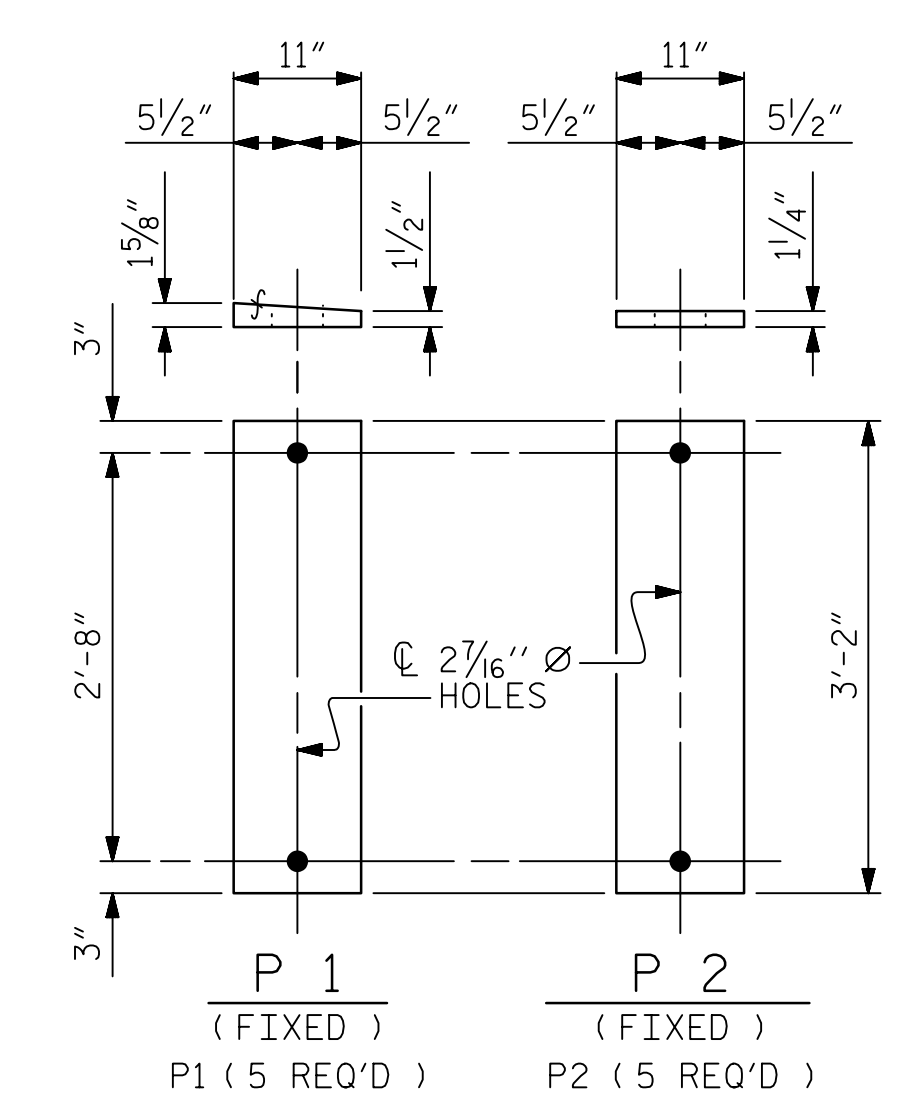
BEARING PLAN AT INTEGRAL END BENT



BEARING PLAN AT BENT (SHOWING CONTINUOUS BENT)

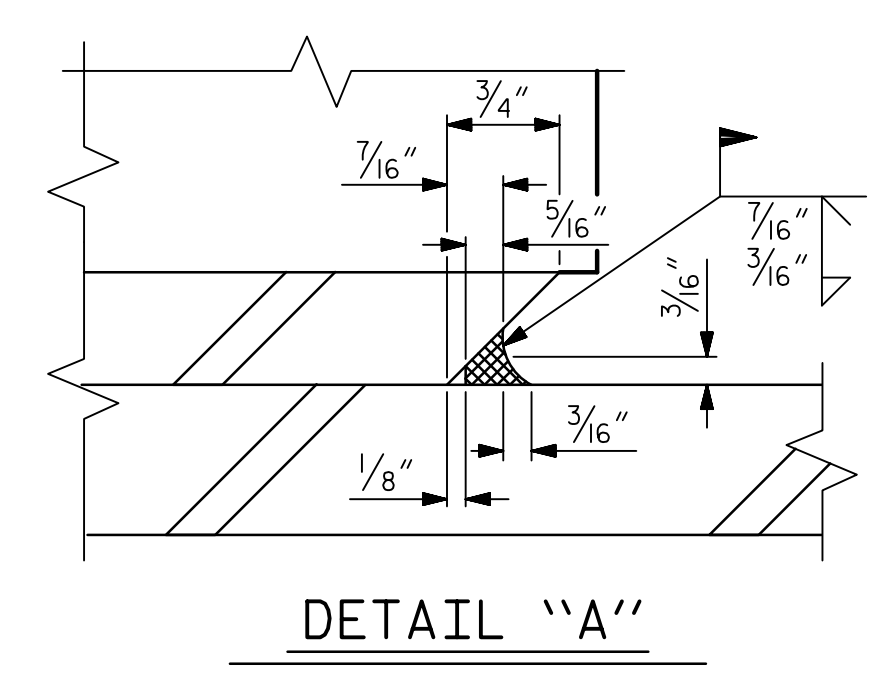


SOLE PLATE 'P' PLACEMENT DETAIL



SOLE PLATE DETAILS ('P')

(SEE 'FRAMING PLAN' FOR SOLE PLATE 'P' LOCATIONS AND PLATE ORIENTATION)



DETAIL 'A'

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.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	225 k
TYPE V	365 k

PROJECT NO. B-5980  
NASH COUNTY  
 STATION: 42+56.82 -Y1-

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6/21/2019  
 NORTH CAROLINA PROFESSIONAL SEAL  
 030474  
 ENGINEER  
 JOHN C. MORRISON  
DocuSign  
 John C. Morrison  
A2FDE142C82F4AB...

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 ELASTOMERIC BEARING  
 DETAILS  
 PRESTRESSED CONCRETE GIRDER  
 SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			33

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ASSEMBLED BY : T.B. STUMP	DATE : 03/2019
CHECKED BY : J.C. MORRISON	DATE : 03/2019
DRAWN BY : WJH 8/89	REV. 6/13 AAC/MAA
CHECKED BY : CRK 8/89	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

DATE: 6/20/2019  
TIME: 6:02:25 PM

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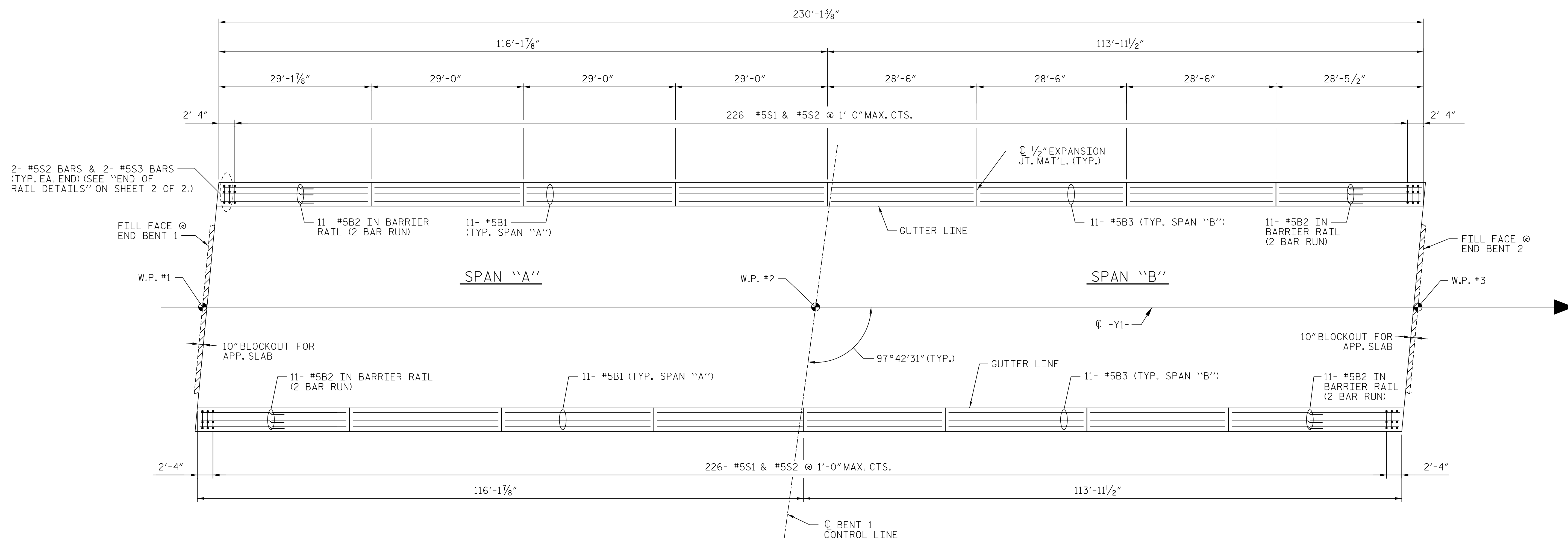
**NOTES:**

FOR REINFORCING STEEL IN BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEET (SHEET 2 OF 2).

SEE "GUARDRAIL ANCHORAGE FOR BARRIER RAIL" SHEET FOR ANCHOR ASSEMBLY PLACEMENT.

DIMENSIONS ARE GIVEN ALONG OUTSIDE FACE OF RAIL UNLESS OTHERWISE NOTED.

#5 "S" BARS MAY BE SHIFTED AS NECESSARY TO CLEAR EXPANSION JOINTS IN RAIL.



**PLAN OF BARRIER RAIL**

PROJECT NO. B-5980

NASH COUNTY

STATION: 42+56.82 -Y1-

SHEET 1 OF 2

DRAWN BY : K.J. MUENCH DATE : 04/2019  
 CHECKED BY : D. RITACCO DATE : 04/2019  
 DESIGNED BY : D. RITACCO DATE : 04/2019  
 DESIGN CHECKED BY : J.C. MORRISON DATE : 04/2019

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 A2FDE142C82F4A8...

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**DEPARTMENT OF TRANSPORTATION**  
 RALEIGH

SUPERSTRUCTURE

**CONCRETE BARRIER RAIL**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			33

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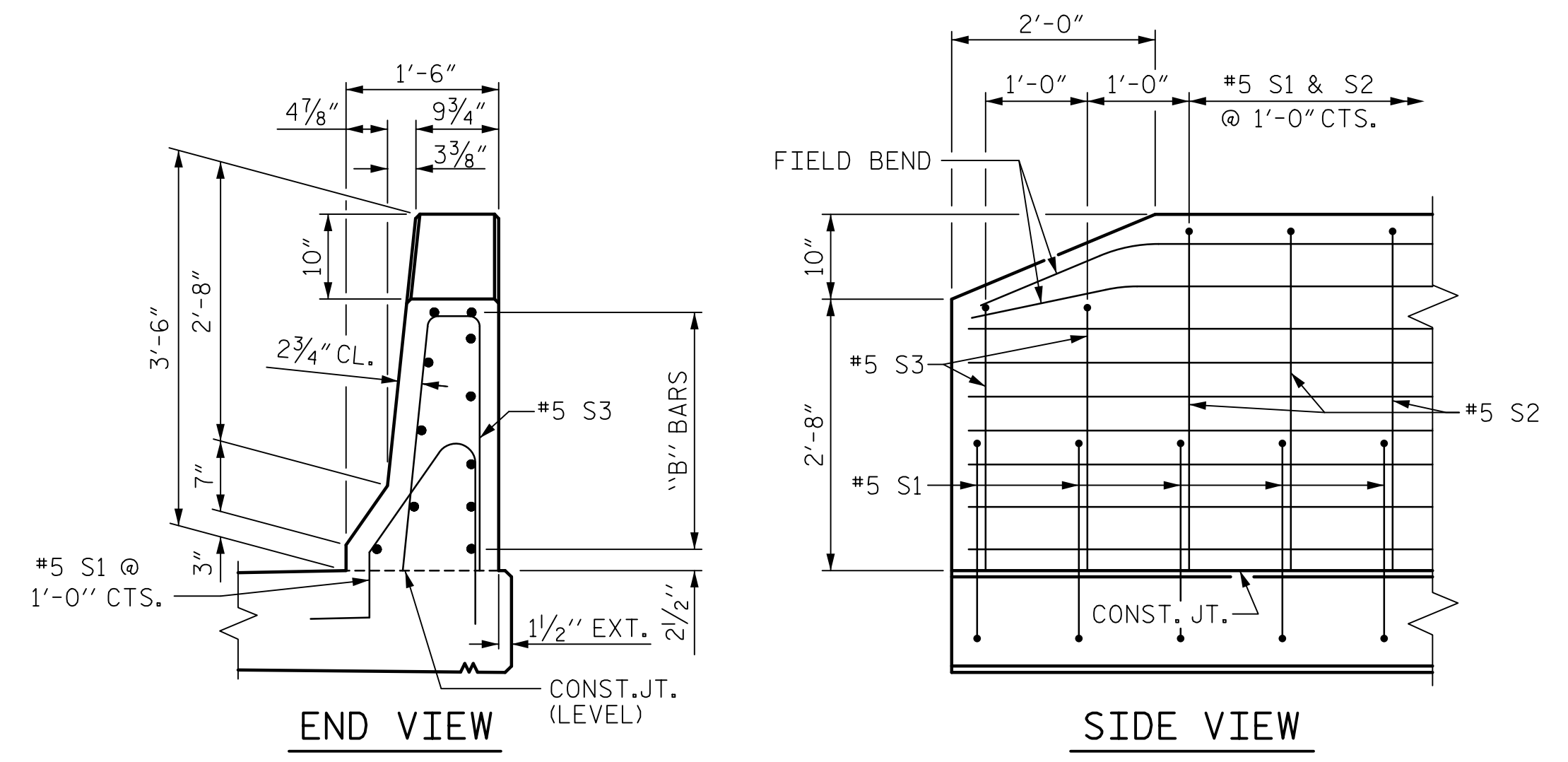
USER: jhnb66jfb  
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### NOTES

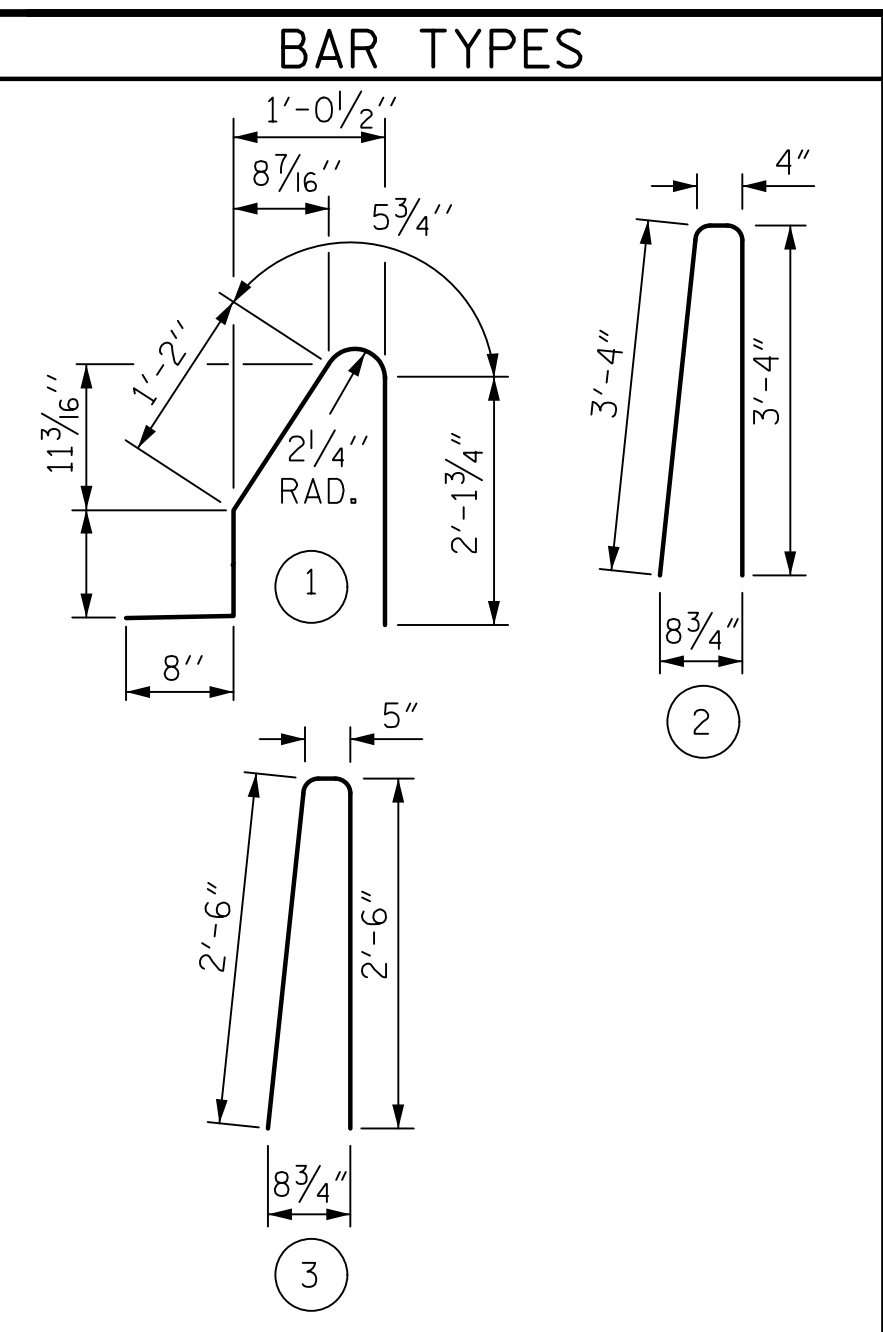
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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



### END OF RAIL DETAILS



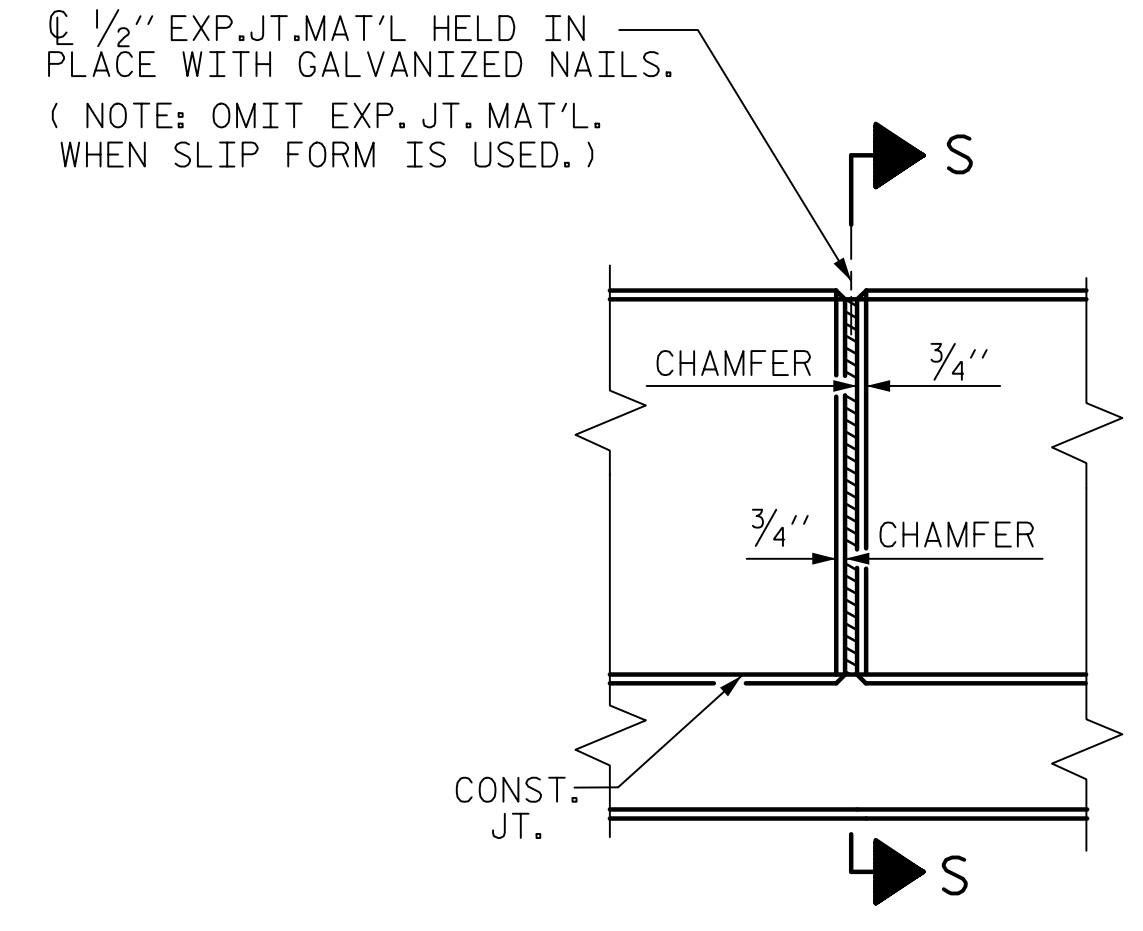
ALL BAR DIMENSIONS ARE OUT TO OUT

### BILL OF MATERIAL

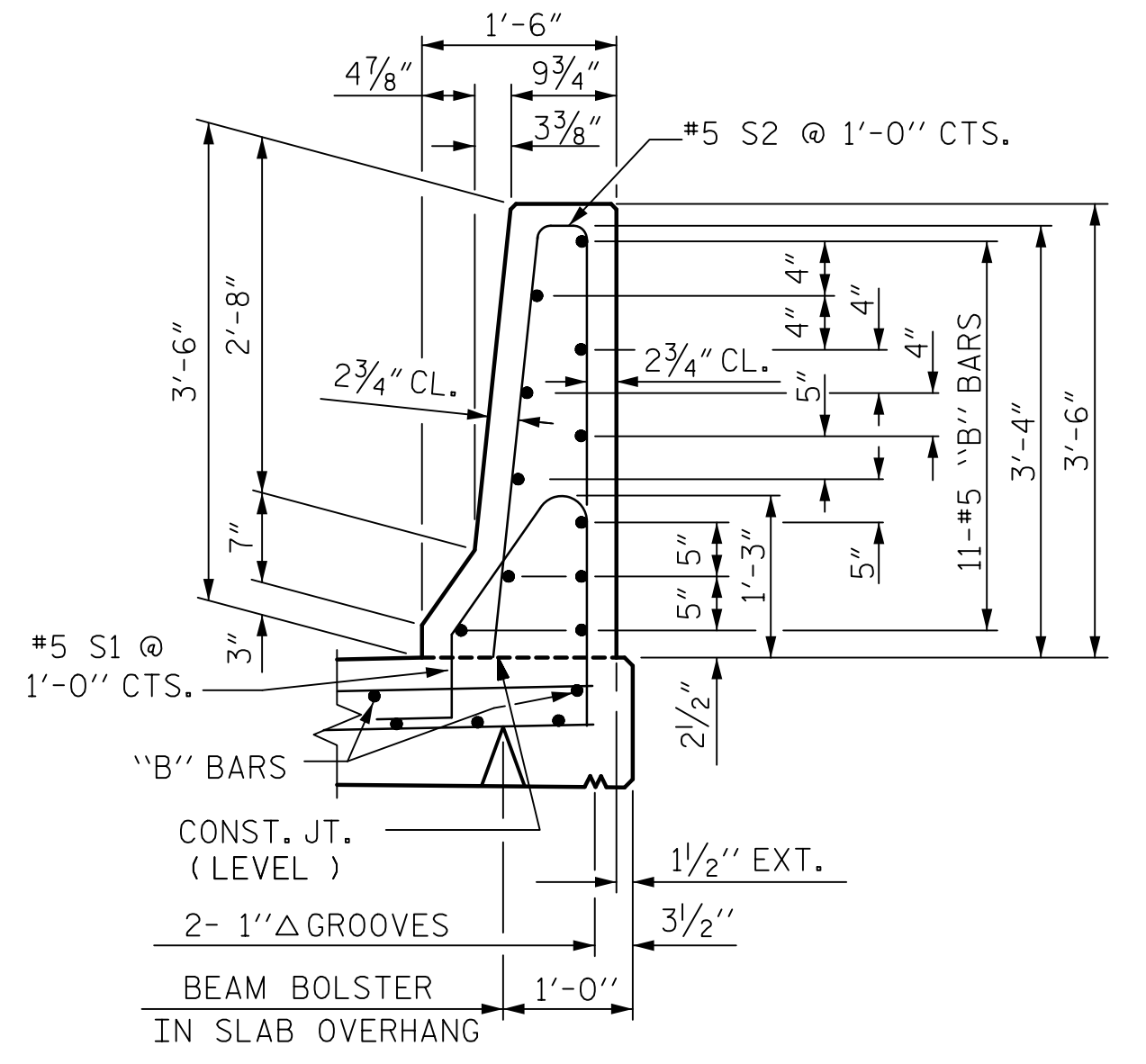
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	66	5	STR	28'-8"	1973
* B2	88	5	STR	16'-0"	1469
* B3	66	5	STR	28'-2"	1939
* S1	468	5	1	4'-6"	2176
* S2	452	5	2	7'-0"	3300
* S3	8	5	3	5'-5"	45

\* EPOXY COATED  
REINFORCING STEEL 10,902 LBS.  
CLASS AA CONCRETE 62.6 CU. YDS.  
CONCRETE BARRIER RAIL 460.31 LIN. FT.

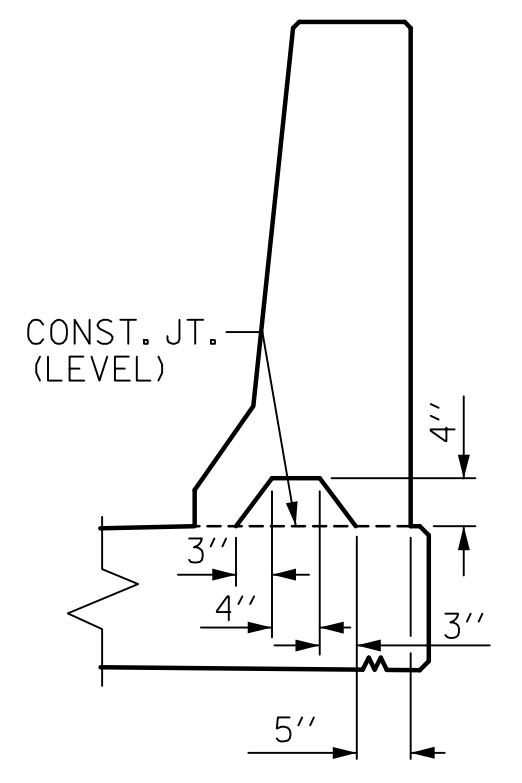


### ELEVATION AT EXPANSION JOINTS



### SECTION THRU RAIL

### BARRIER RAIL DETAILS



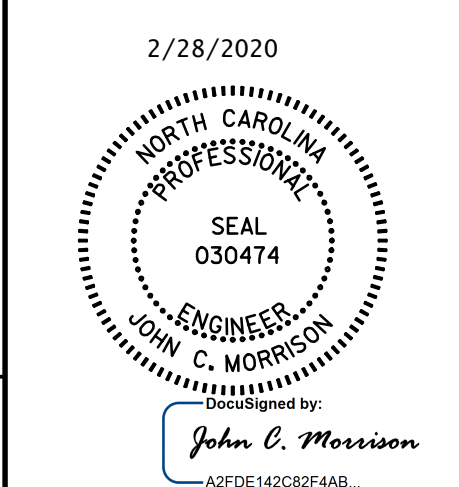
### SECTION S-S

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

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NASH COUNTY  
STATION: 42+56.82 -Y1-

SHEET 2 OF 2

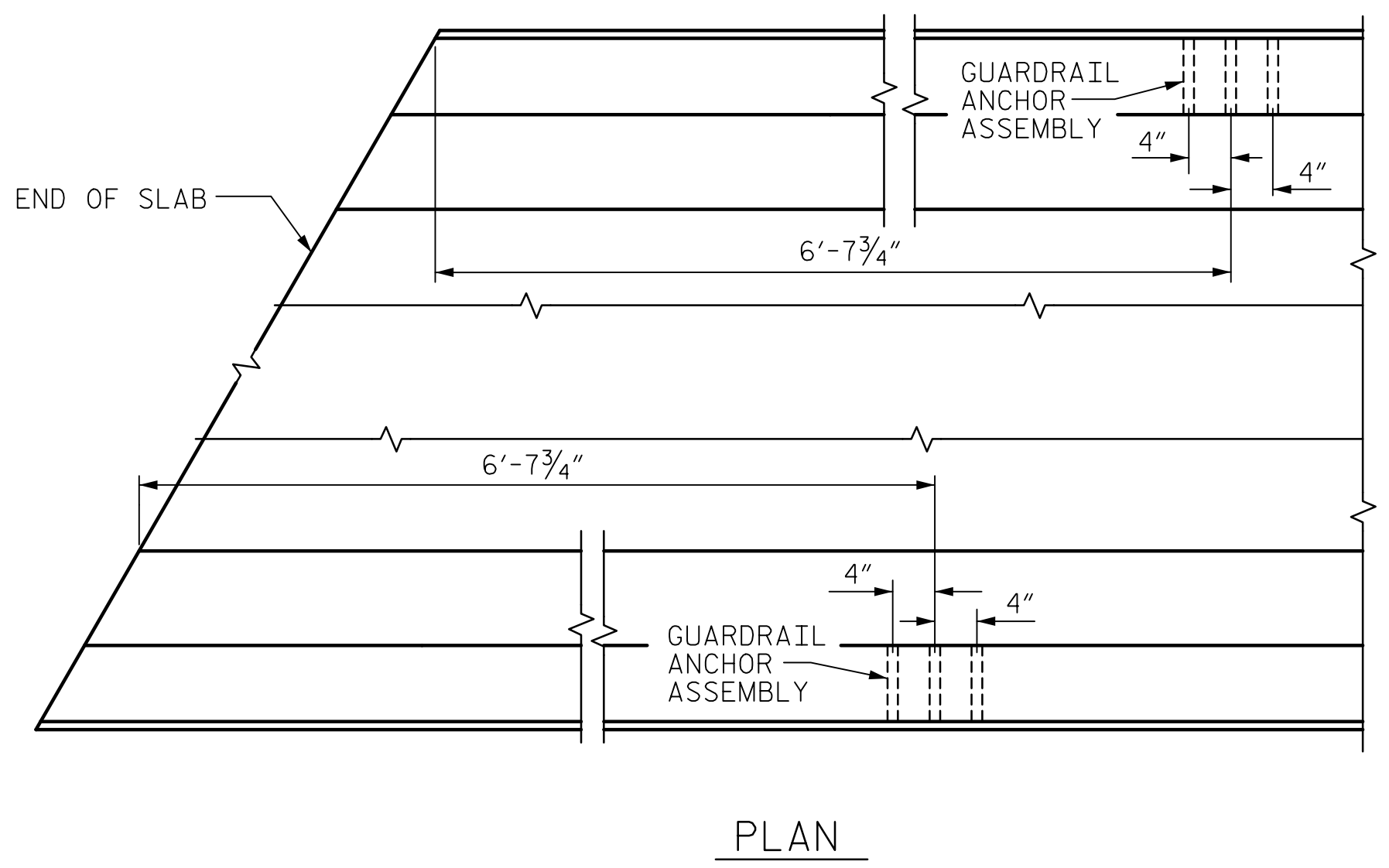
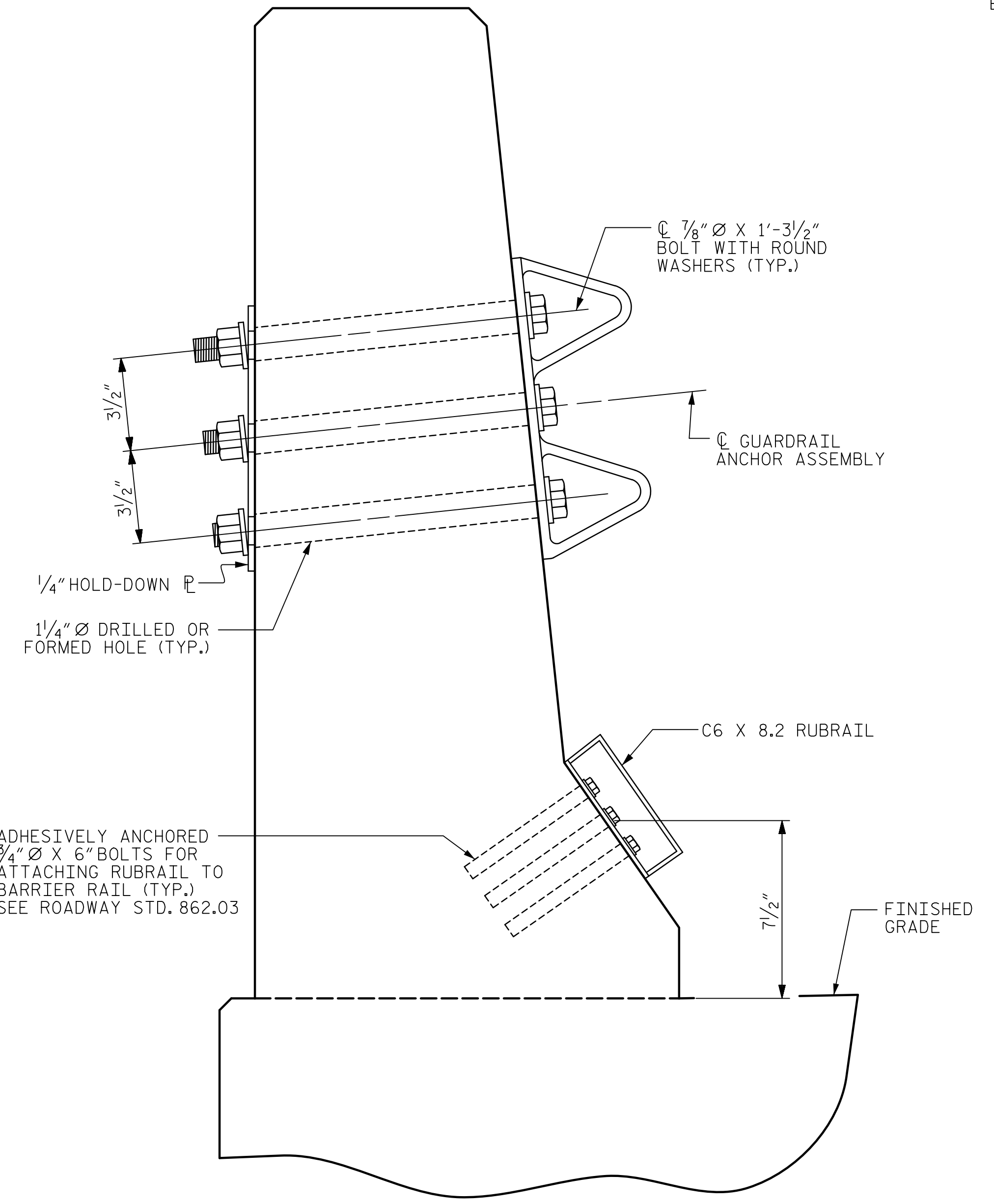
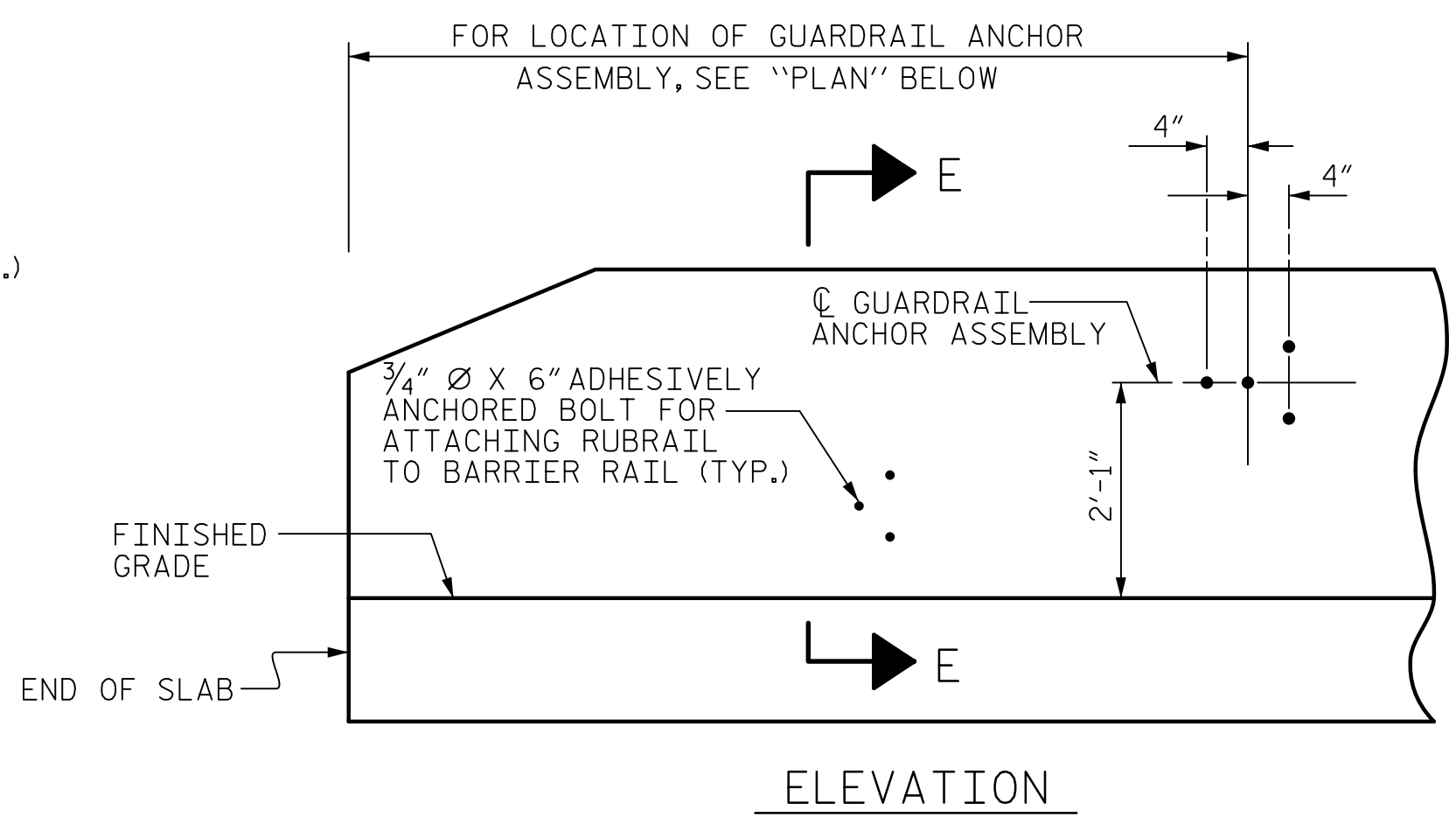
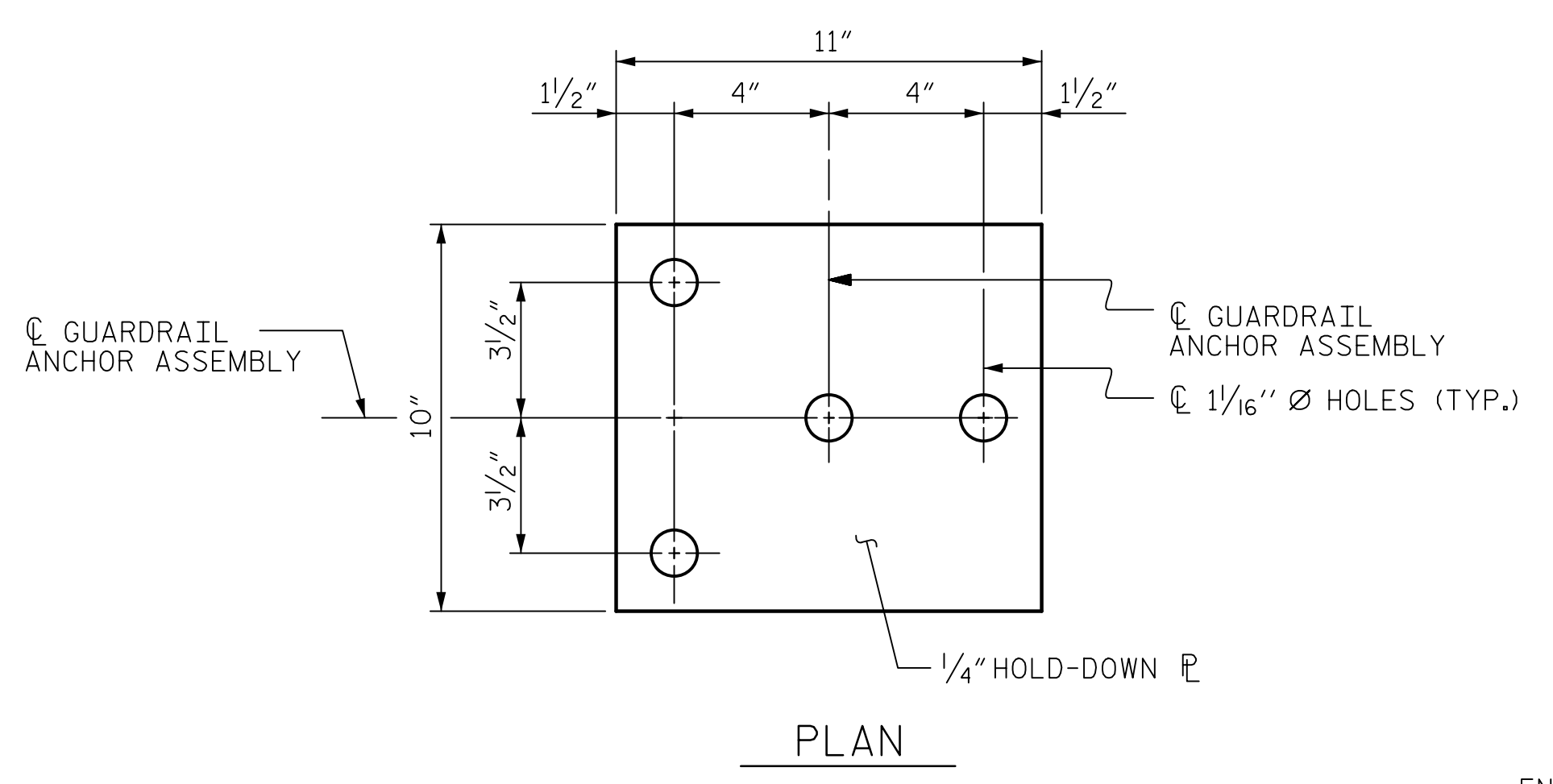


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
CONCRETE BARRIER RAIL

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

ASSEMBLED BY : K.J. MUENCH	DATE : 04/2019	
CHECKED BY : D. RITACCO	DATE : 04/2019	
DRAWN BY : ARB 5/87	REV. 10/1/11	MAA/GM
CHECKED BY : SJD 9/87	REV. 7/12	MAA/GM
	REV. 6/13	MAA/GM

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LOCATION OF ANCHORS FOR GUARDRAIL

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



\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

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.

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 STATION: 42+56.82 -Y1-

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 John C. Morrison  
A2FDE142C82F4A8...

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-20					TOTAL SHEETS 33

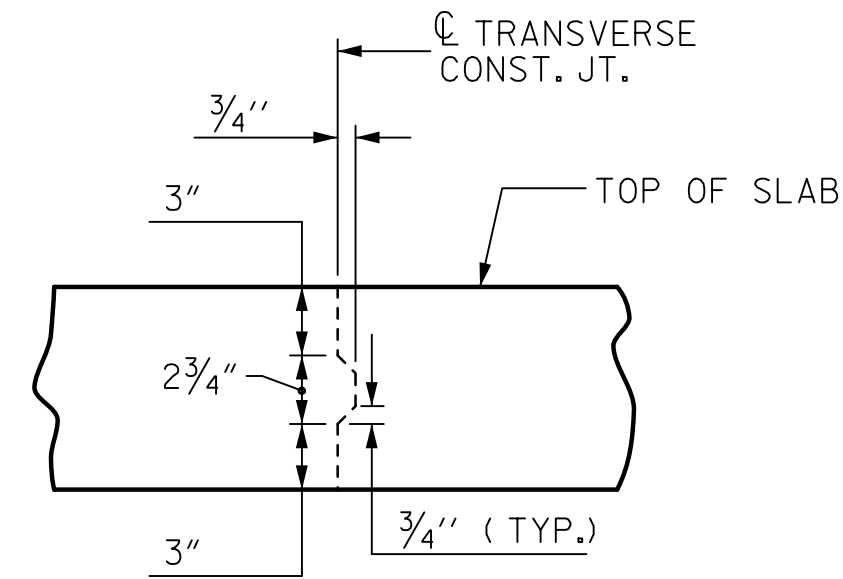
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### GROOVING BRIDGE FLOORS

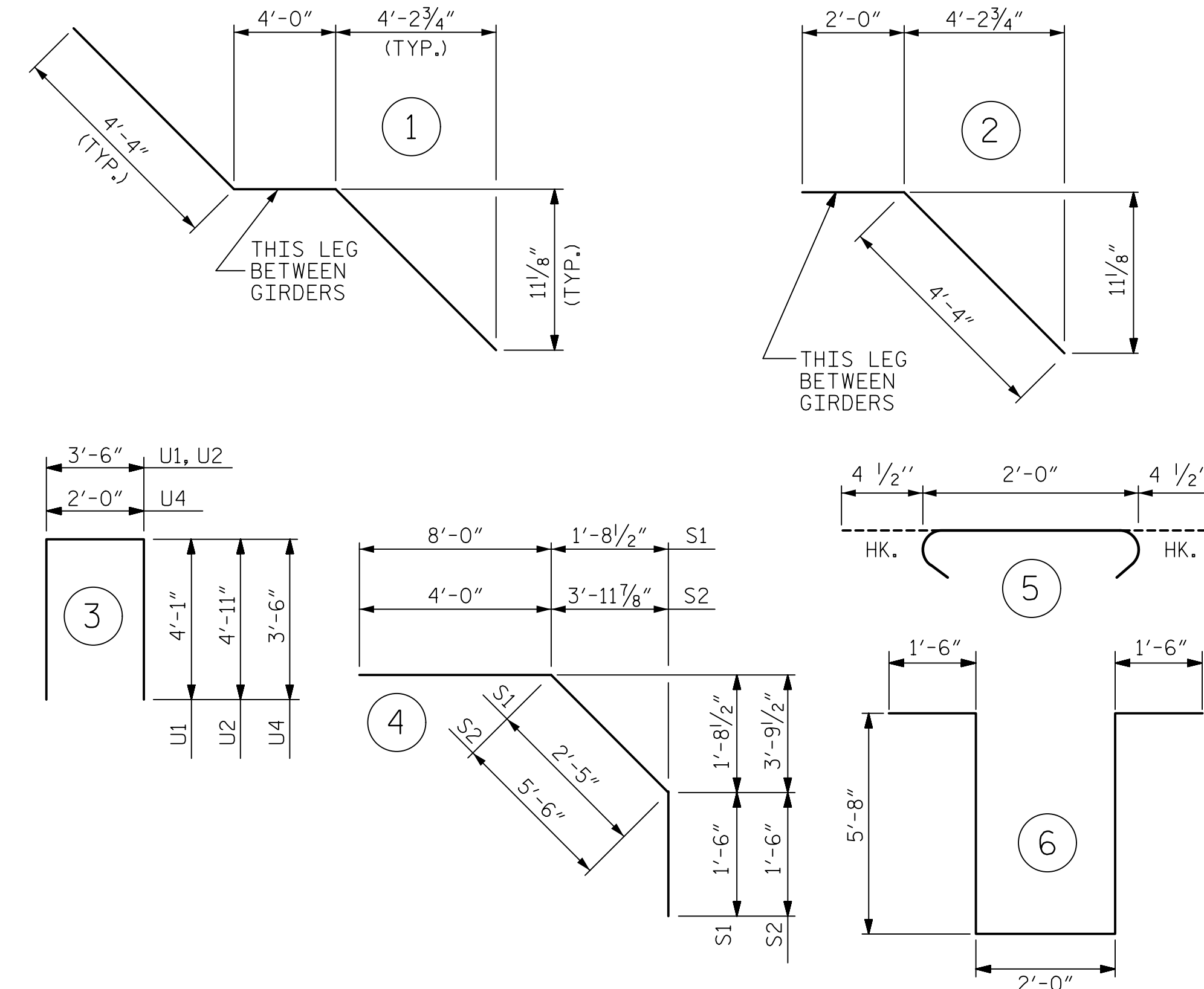
APPROACH SLABS	2,107 SQ.FT.
BRIDGE DECK	9,904 SQ.FT.
TOTAL	12,011 SQ.FT.



### TRANSVERSE CONSTRUCTION JOINT DETAIL

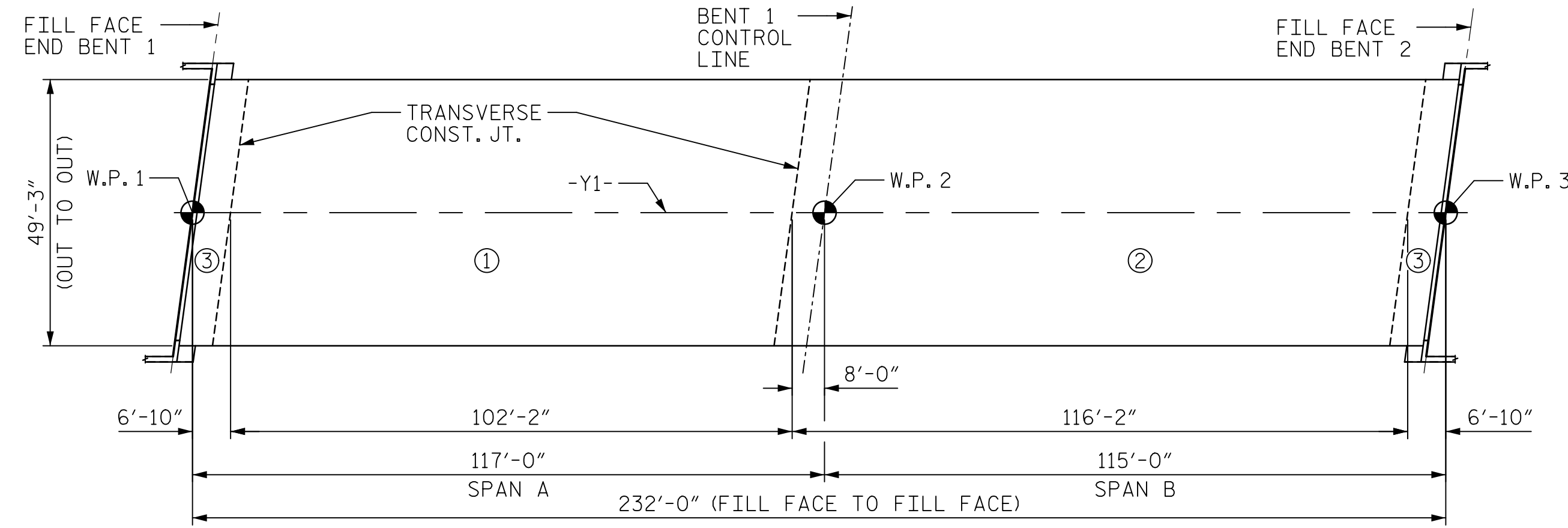
NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT

### BAR TYPES

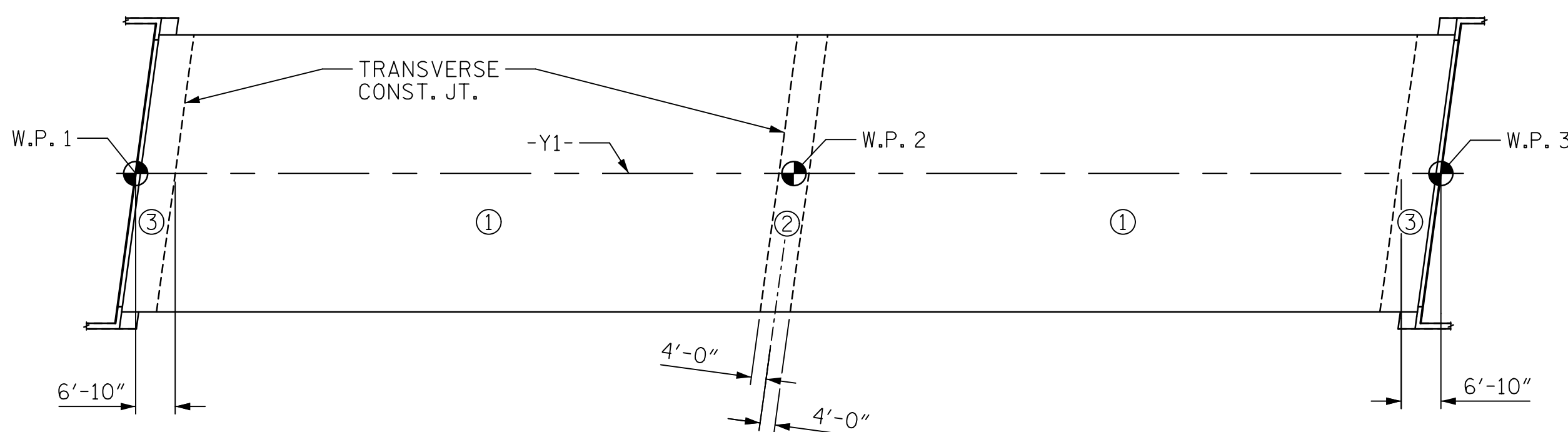


### BILL OF MATERIAL

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT	BAR	No.	SIZE	TYPE	LENGTH	WEIGHT	
* A1	384	5	STR	48'-9"	19525	K1	24	4	STR	28'-6"	457	
A2	384	5	STR	48'-9"	19525	K2	8	4	STR	8'-0"	43	
						K3	32	4	STR	9'-8"	207	
* A101	2	5	STR	1'-3"	3	K4	8	4	STR	6'-8"	36	
* A102	2	5	STR	5'-6"	11	K5	4	4	STR	2'-2"	6	
* A103	2	5	STR	9'-10"	21	K6	16	4	STR	3'-0"	32	
* A104	2	5	STR	14'-2"	30	K7	4	4	STR	1'-6"	4	
* A105	2	5	STR	18'-5"	38	K8	8	4	STR	8'-0"	43	
* A106	2	5	STR	22'-9"	47	K9	32	4	STR	9'-8"	207	
* A107	2	5	STR	27'-0"	56	K10	8	4	STR	6'-8"	36	
* A108	2	5	STR	31'-5"	66	K11	12	4	2	6'-4"	51	
* A109	2	5	STR	35'-8"	74	K12	18	4	1	12'-8"	152	
* A110	2	5	STR	40'-0"	83							
* A111	2	5	STR	44'-4"	92	* S1	60	4	4	11'-11"	478	
						* S2	60	4	4	11'-0"	441	
A201	2	5	STR	1'-3"	3	S3	164	4	5	2'-9"	301	
A202	2	5	STR	5'-6"	11							
A203	2	5	STR	9'-10"	21	U1	64	4	3	11'-8"	499	
A204	2	5	STR	14'-2"	30	U2	10	4	3	13'-4"	89	
A205	2	5	STR	18'-5"	38	U3	28	4	6	16'-4"	305	
A206	2	5	STR	22'-9"	47	U4	8	4	3	9'-0"	48	
A207	2	5	STR	27'-0"	56							
A208	2	5	STR	31'-5"	66							
A209	2	5	STR	35'-8"	74							
A210	2	5	STR	40'-0"	83							
A211	2	5	STR	44'-4"	92							
* B1	105	4	STR	27'-4"	1917							
* B2	68	6	STR	26'-6"	2707							
* B3	101	6	STR	28'-5"	4311							
* B4	64	6	STR	34'-9"	3340							
* B5	105	4	STR	26'-11"	1888							
B6	168	5	STR	52'-10"	9258							
* B7	27	4	STR	27'-6"	496							
* G1	153	4	STR	3'-0"	307							
											REINFORCING STEEL	31,820 LBS.
											*EPOXY COATED REINF. STEEL	35,931 LBS.



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB & POUR SEQUENCE (SQ. FT. = 11,343)



### OPTIONAL POURING SEQUENCE

DRAWN BY : S.G. STREDAK	DATE : 02/2019
CHECKED BY : J.C. MORRISON	DATE : 02/2019
DESIGNED BY : T.B. STUMP	DATE : 02/2019
DESIGN CHECKED BY : J.C. MORRISON	DATE : 02/2019

### —SUPERSTRUCTURE BILL OF MATERIAL—

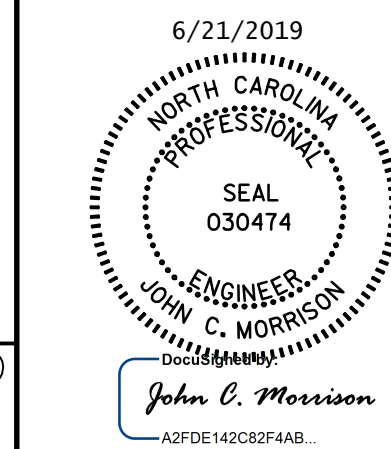
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
SPANS A, B		31,820	35,931
POUR #1	156.3		
POUR #2	196.1		
POUR #3	90.5		
CONC. ISLAND*	12.7		
TOTALS**	455.6		

\* ONLY MONOLITHIC CONCRETE ISLAND QUANTITIES ON BRIDGE DECK INCLUDED  
\*\* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

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

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

PROJECT NO. B-5980  
NASH COUNTY  
STATION: 42+56.82 -Y1-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

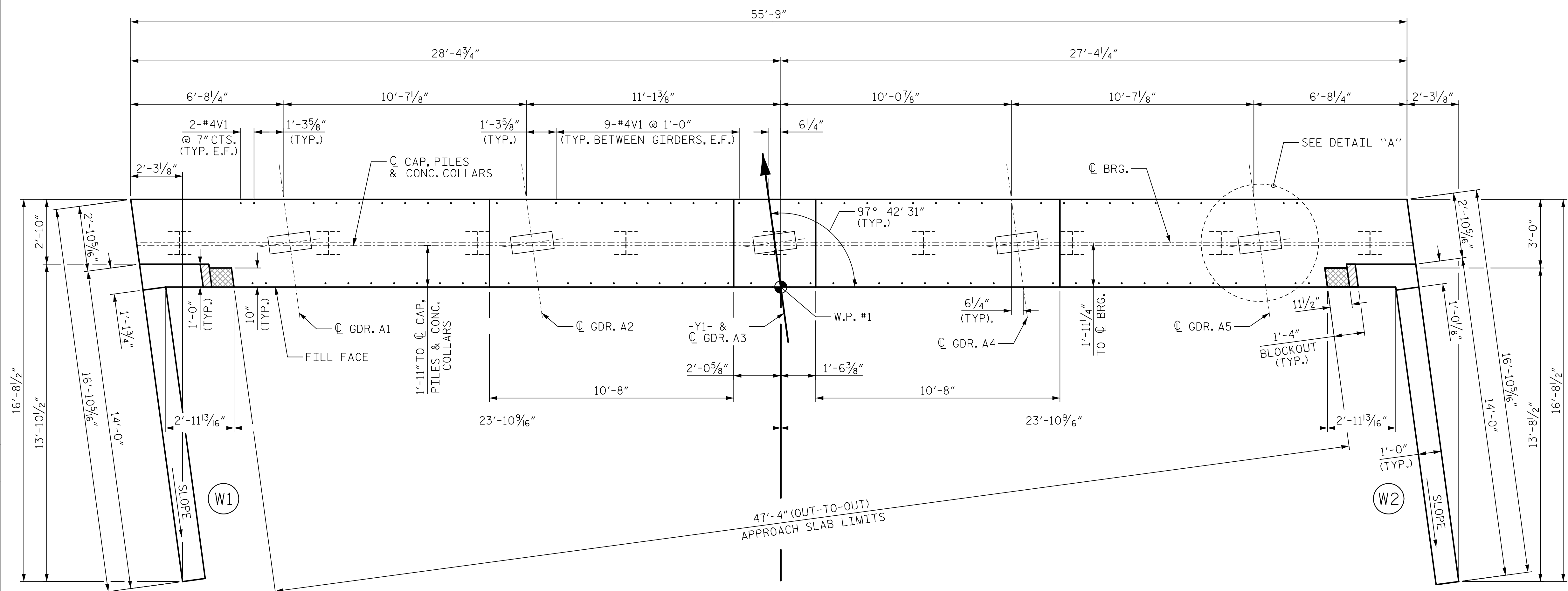
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
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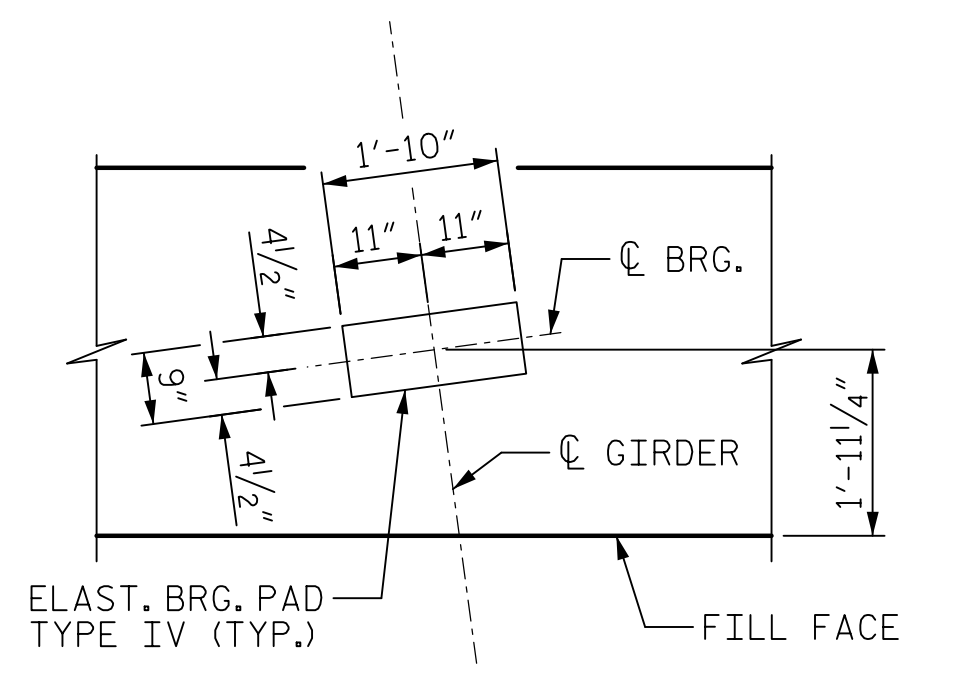
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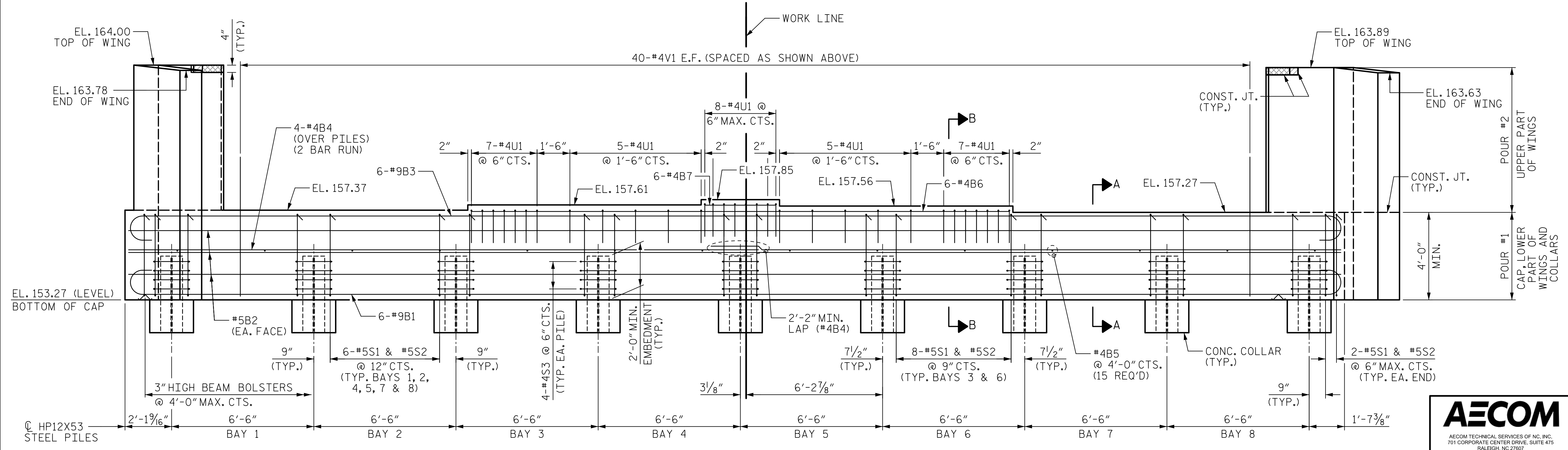


PLAN

**NOTES:**  
 THE TOP SURFACE OF THE END BENT CAP AND WINGS EXCEPT THE BEARING AREA AND AREA BEYOND THE LIMITS OF THE DECK, SHALL BE RAKED TO A DEPTH OF 1/4".  
 THE TOP SURFACE OF THE INTEGRAL END BENT CAP, BEYOND THE LIMITS OF THE DECK, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.  
 FOR "BLOCKOUT IN WING WALL", SEE SHEET 2 OF 3.

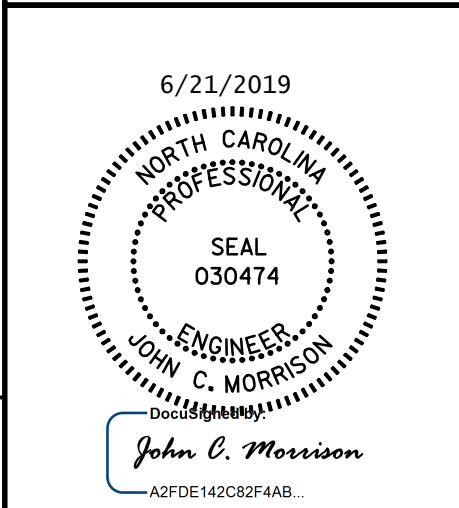


DETAIL "A"



ELEVATIONS

PROJECT NO. B-5980  
NASH COUNTY  
 STATION: 42+56.82 -Y1-  
 SHEET 1 OF 3



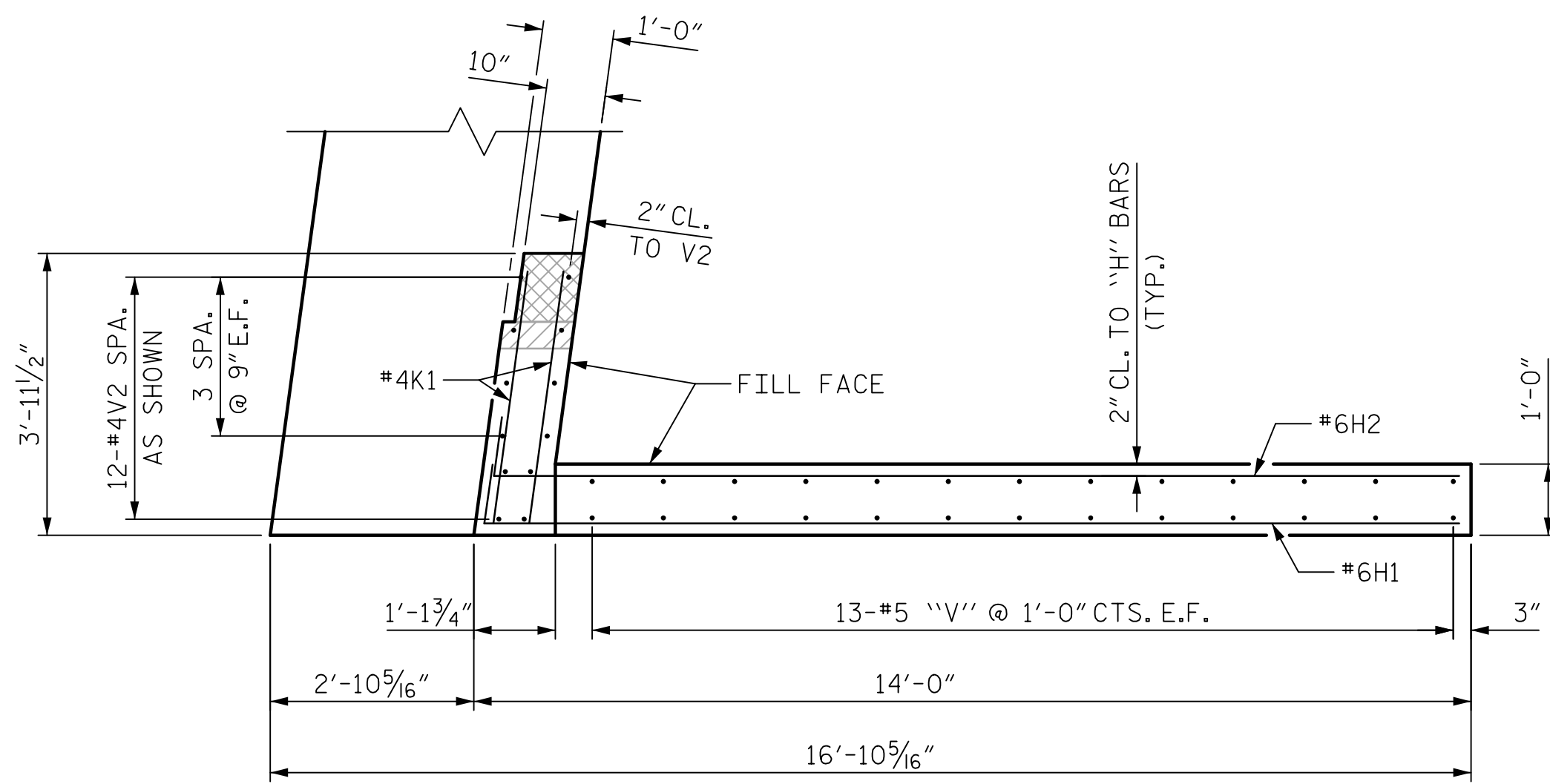
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
INTEGRAL END BENT 1					
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1			3		
2			4		
SHEET NO. S-22					TOTAL SHEETS 33

DRAWN BY : T.B. STUMP DATE : 03/2019  
 CHECKED BY : D. RITACCO DATE : 03/2019  
 DESIGNED BY : D. RITACCO DATE : 03/2019  
 DESIGN CHECKED BY : J.C. MORRISON DATE : 03/2019

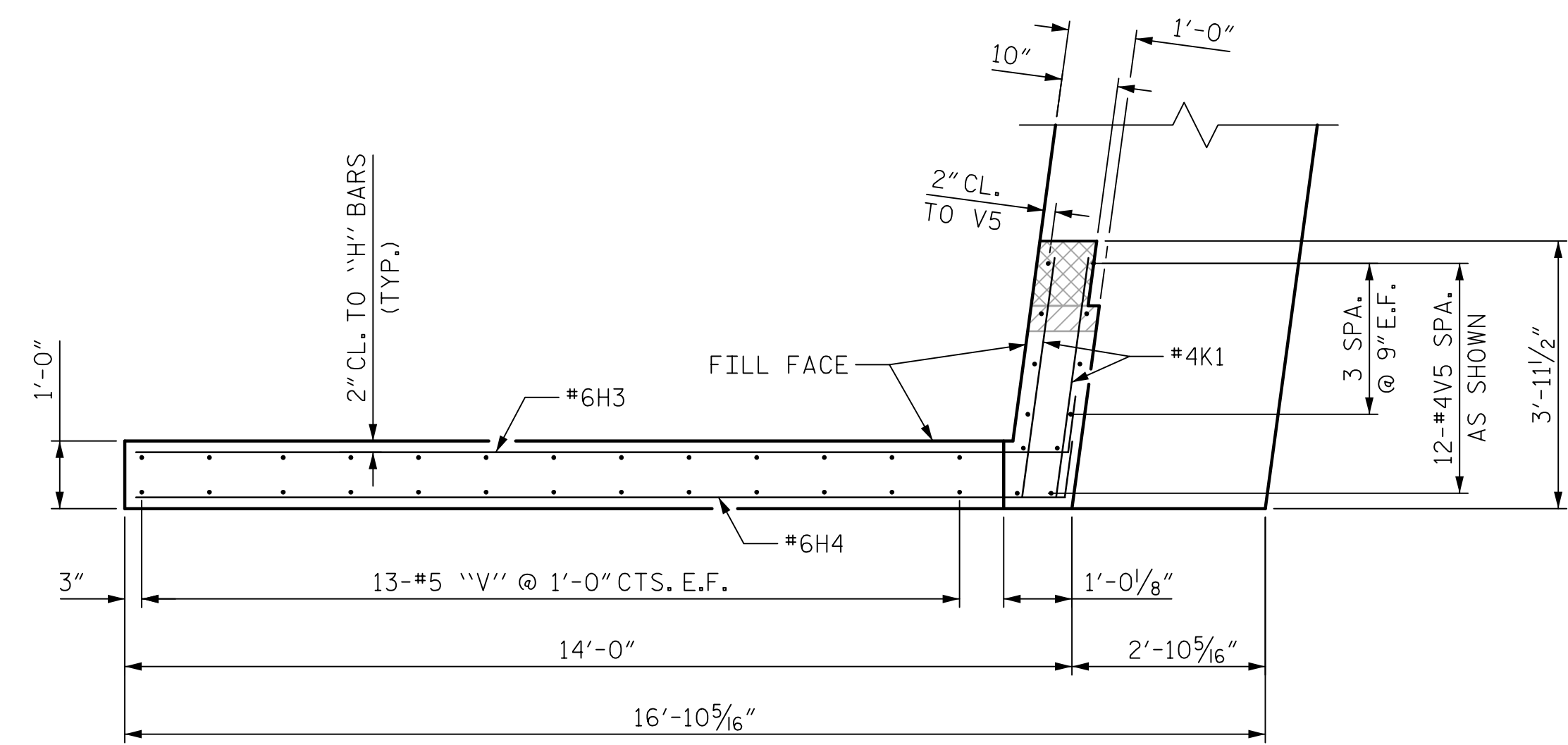
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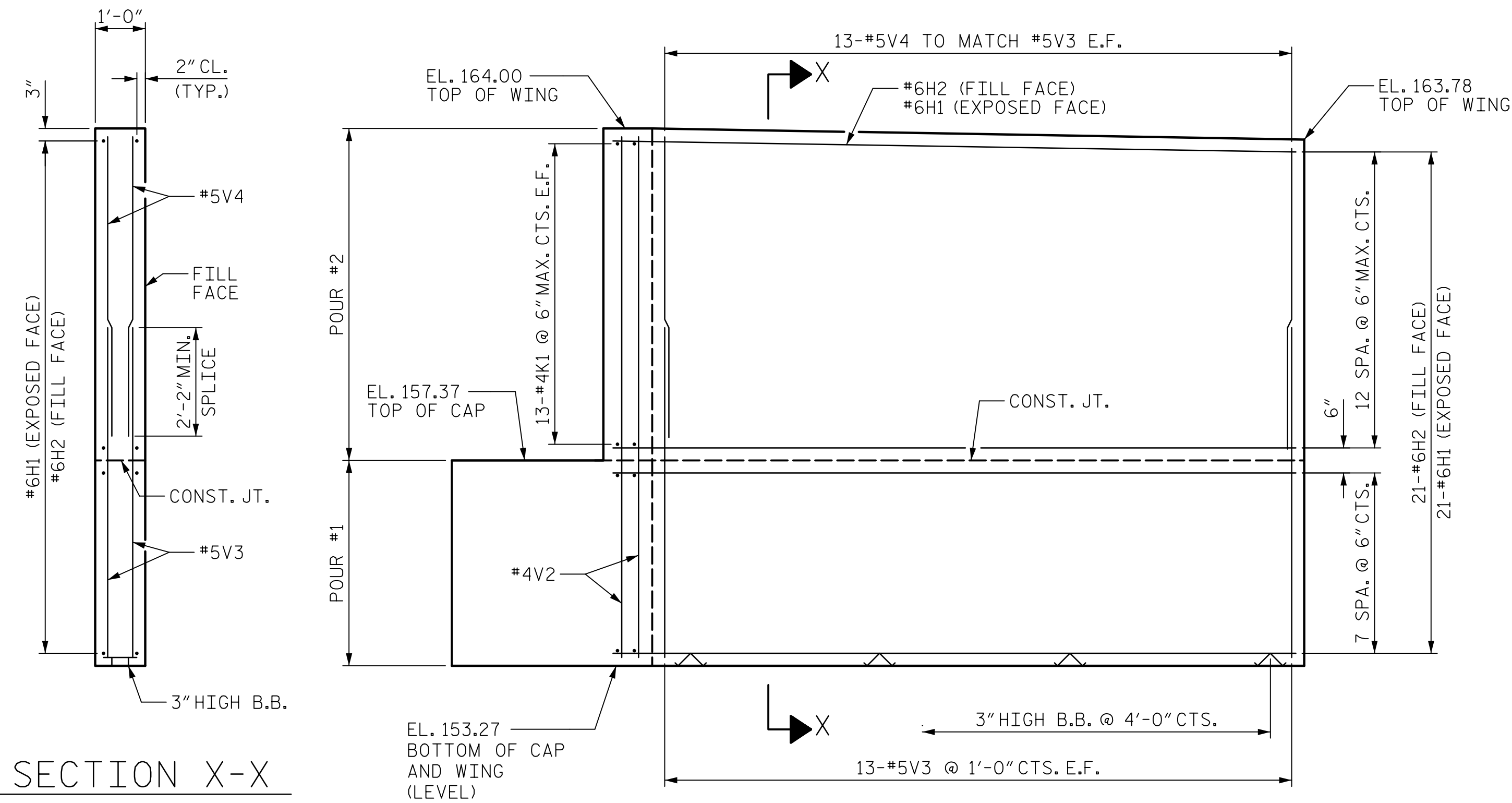
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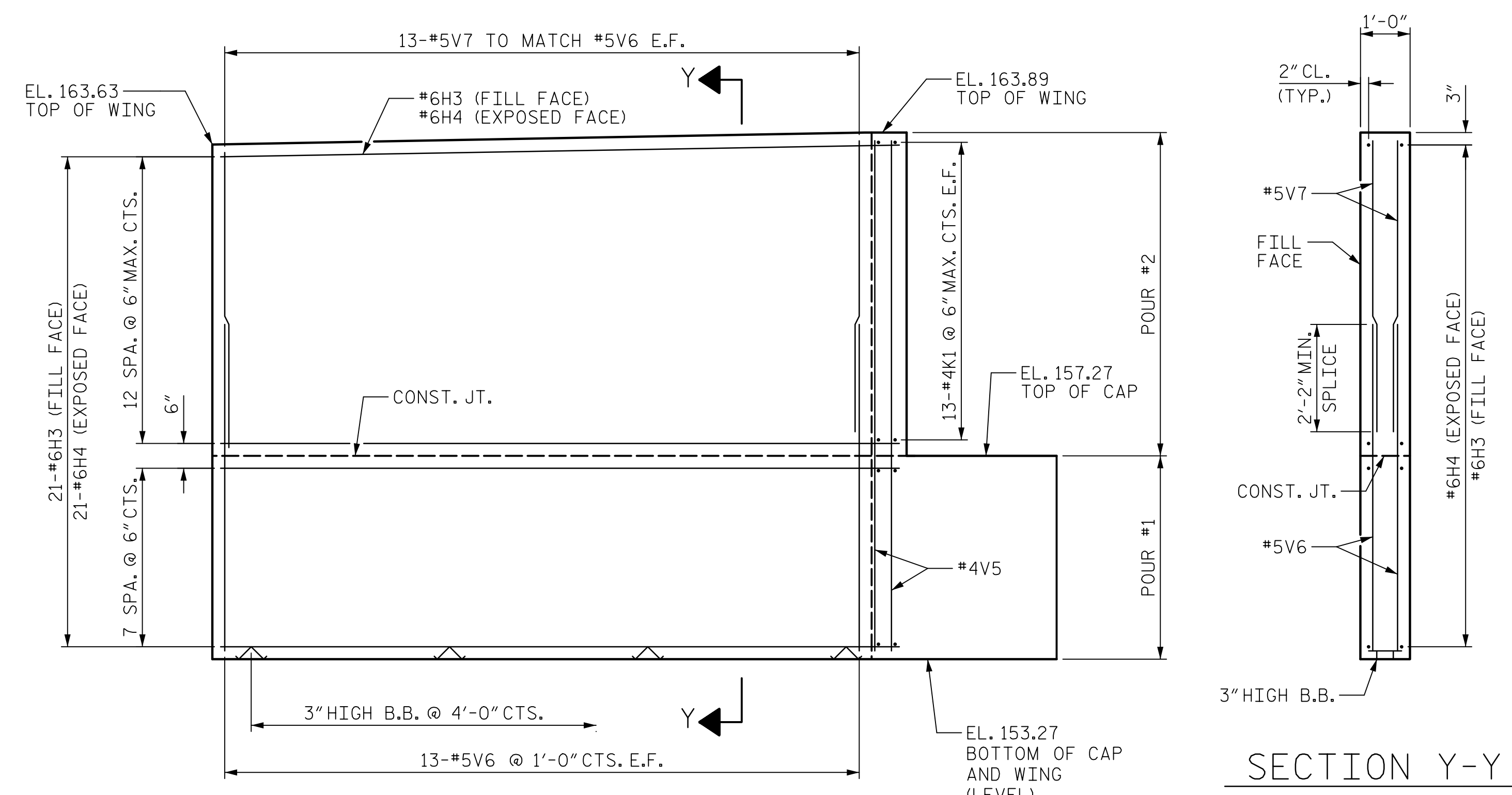
PLAN WING W1



PLAN WING W2



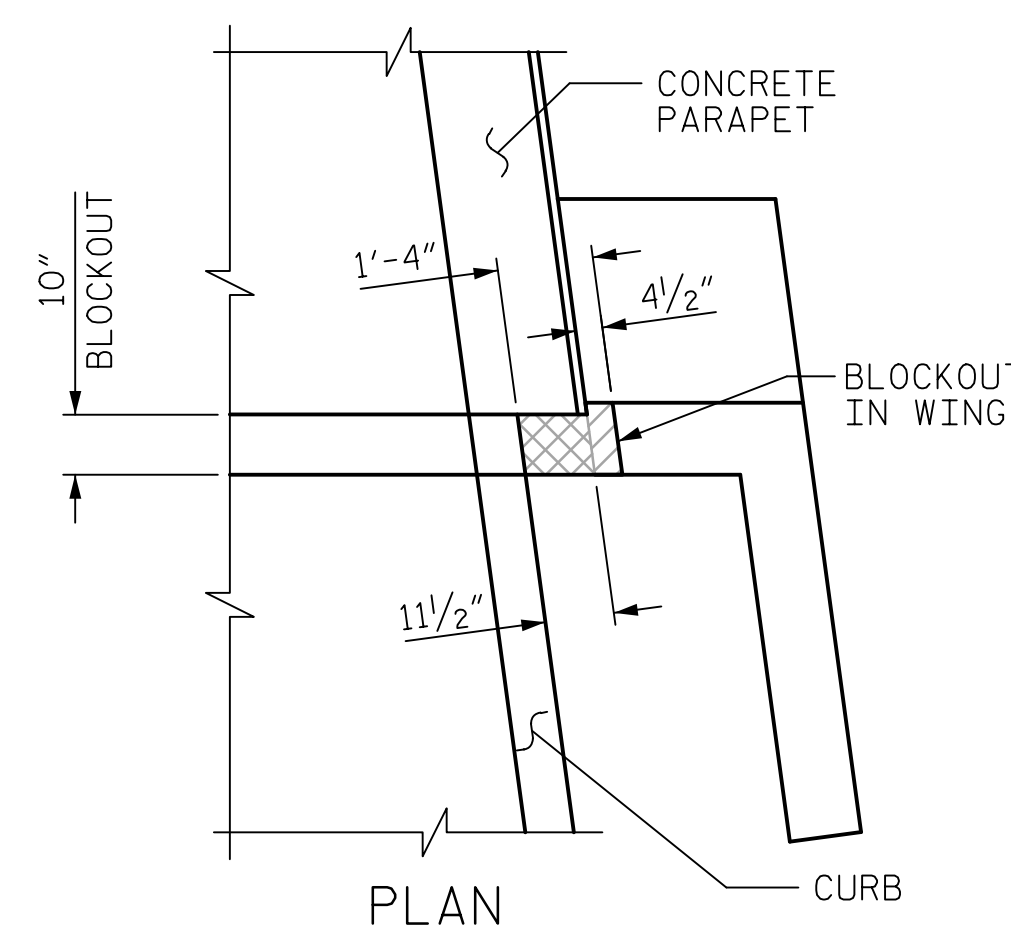
SECTION X-X



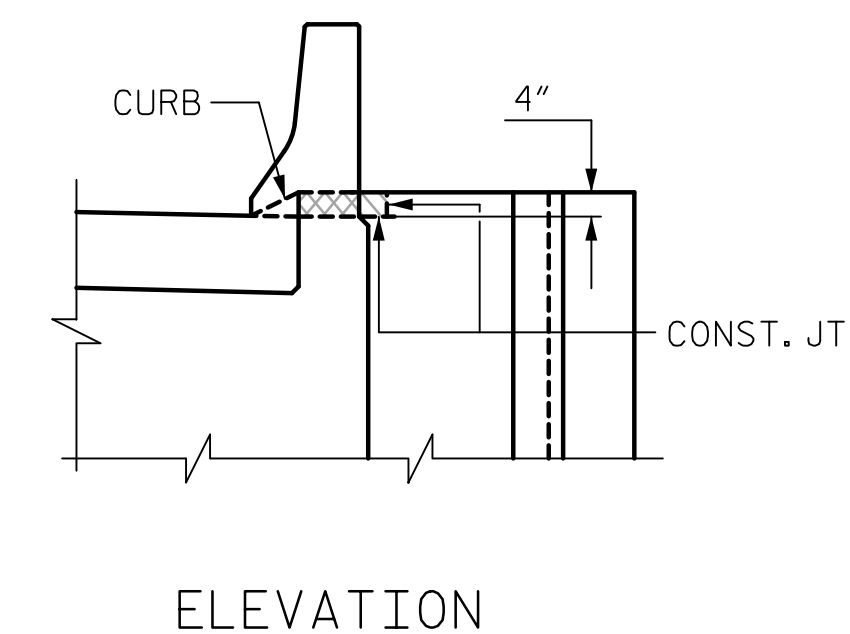
SECTION Y-Y

ELEVATION WING W1

ELEVATION WING W2



BLOCKOUT IN WING WALL



ELEVATION

NOTE: CONCRETE SHALL BE POURED IN THE CROSS-HATCHED AREA TO MATCH THE TOP OF CURB AND INTEGRAL END BENT WING ELEVATION, UNLESS OTHERWISE DIRECTED BY THE ENGINEER. THE CONCRETE IN THESE AREAS SHALL BE PLACED AT THE SAME TIME THE BLOCKOUTS IN THE END BENT WINGS ARE POURED.

PROJECT NO. B-5980

NASH COUNTY

STATION: 42+56.82 -Y1-

SHEET 2 OF 3

**AECOM**  
AECOM TECHNICAL SERVICES OF NC, INC.  
701 CORPORATE CENTER DRIVE, SUITE 475  
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(919) 854-6200  
AECOM License No. F-0342

6/21/2019  
NORTH CAROLINA  
PROFESSIONAL  
SEAL  
030474  
ENGINEER  
JOHN C. MORRISON

John C. Morrison  
A2FDE142C82F4A8

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 1

DRAWN BY : T.B. STUMP	DATE : 04/2019
CHECKED BY : D. RITACCO	DATE : 04/2019
DESIGNED BY : D. RITACCO	DATE : 04/2019
DESIGN CHECKED BY : J.C. MORRISON	DATE : 04/2019

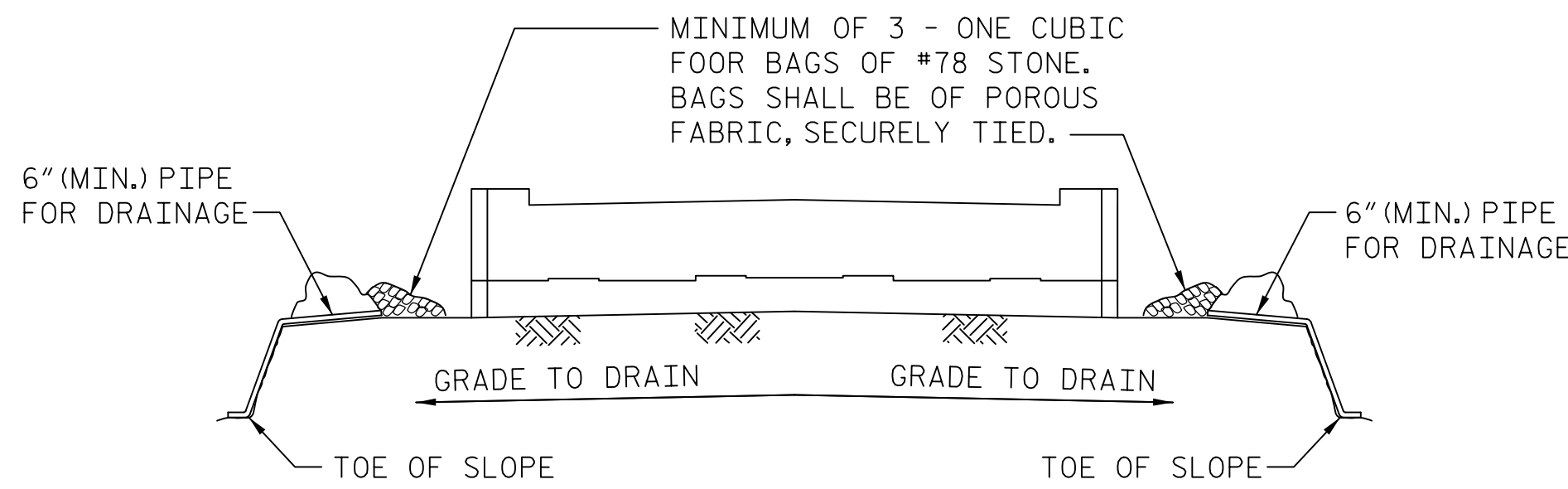
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REVISIONS						SHEET NO. S-23
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 33
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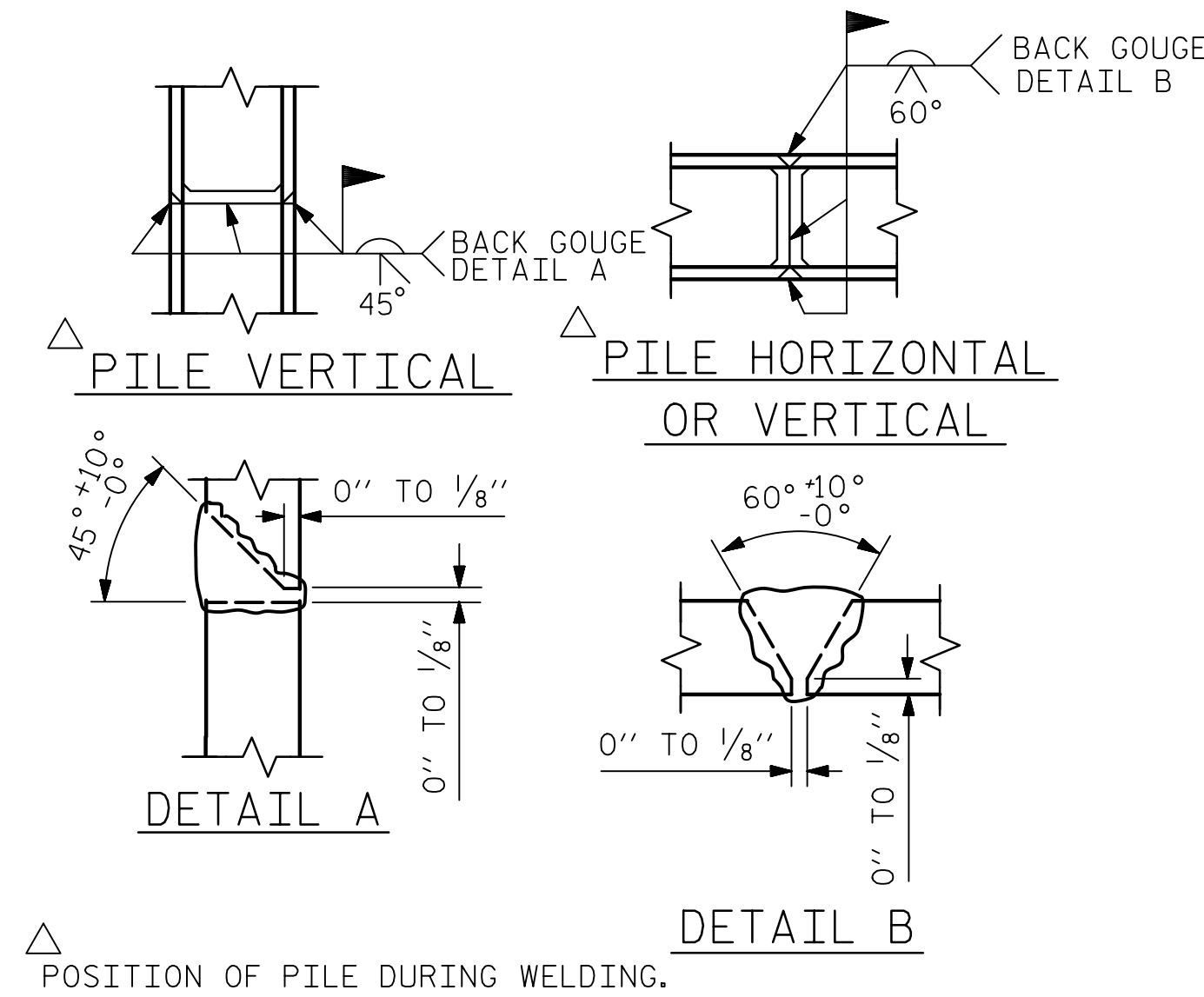


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

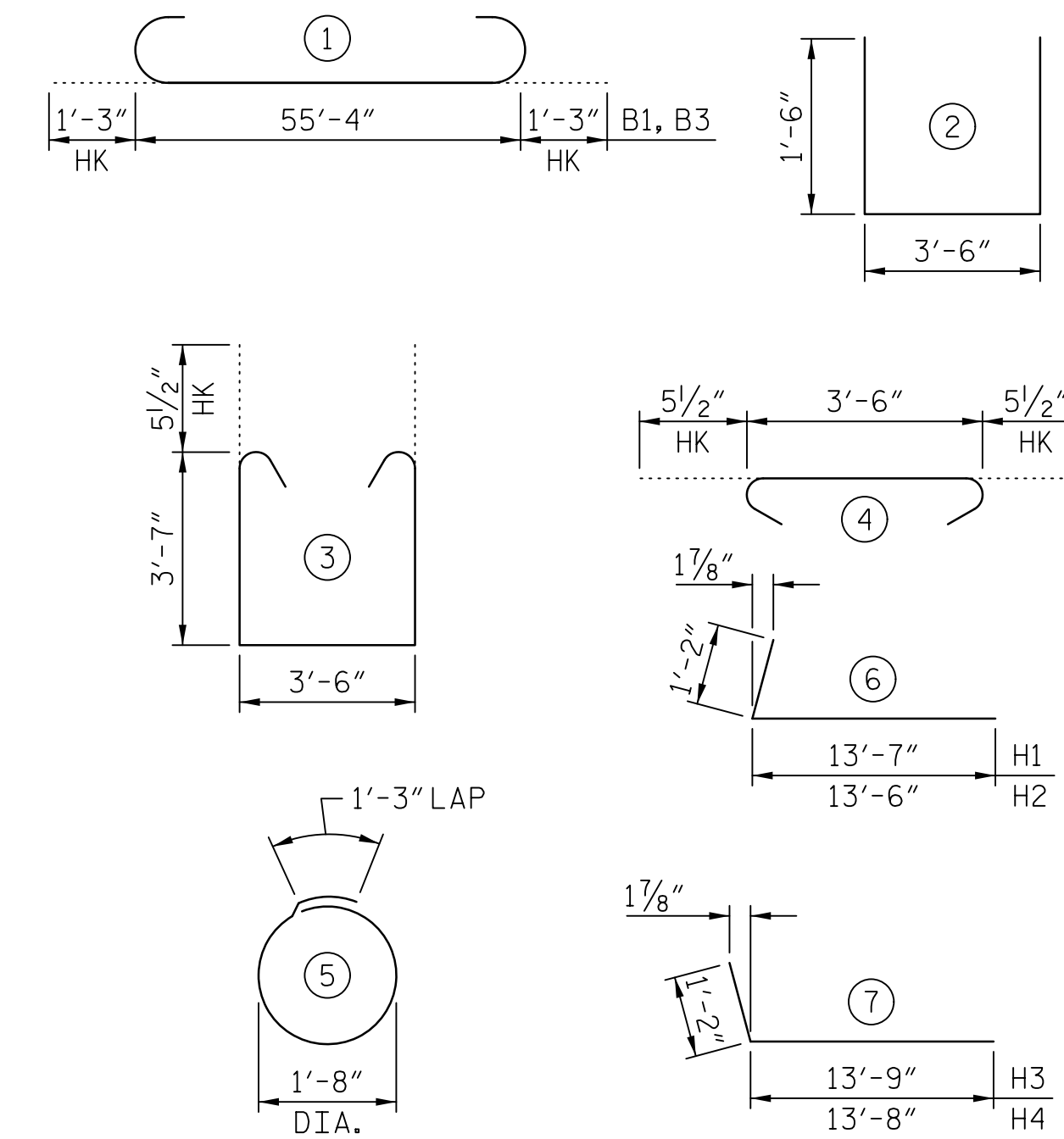
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

TEMPORARY DRAINAGE AT END BENT



BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	9	①	57'-10"	1180
B2	6	5	STR	55'-4"	346
B3	6	9	①	57'-10"	1180
B4	8	4	STR	28'-10"	154
B5	15	4	STR	3'-6"	35
B6	6	4	STR	24'-7"	99
B7	6	4	STR	3'-3"	13
H1	21	6	⑥	14'-9"	465
H2	21	6	⑥	14'-8"	463
H3	21	6	⑦	14'-11"	471
H4	21	6	⑦	14'-10"	468
K1	52	4	STR	3'-6"	122
S1	56	5	③	11'-7"	677
S2	56	5	④	4'-5"	258
S3	36	4	⑤	6'-6"	156
U1	32	4	②	6'-6"	139
V1	80	4	STR	6'-5"	343
V2	12	4	STR	10'-4"	83
V3	26	5	STR	6'-7"	179
V4	26	5	STR	6'-0"	163
V5	12	4	STR	10'-3"	82
V6	26	5	STR	6'-7"	179
V7	26	5	STR	6'-0"	163

TOTAL REINFORCING STEEL 7,418 LBS.

CLASS A CONCRETE

POUR #1 (CAP, COLLARS & LOWER WINGWALLS) 38.8 C.Y.

POUR #2 (UPPER WINGWALL) 8.4 C.Y.

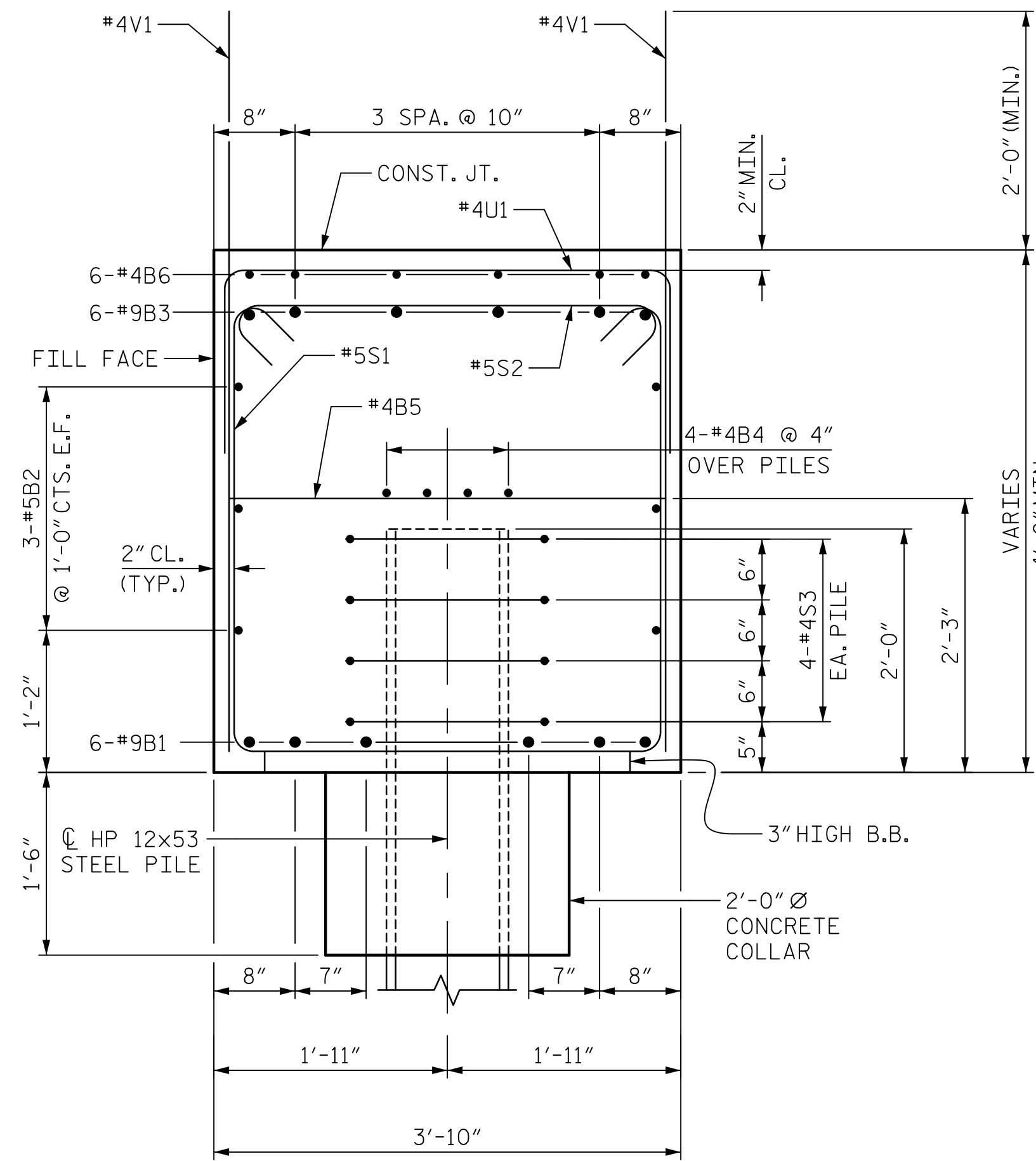
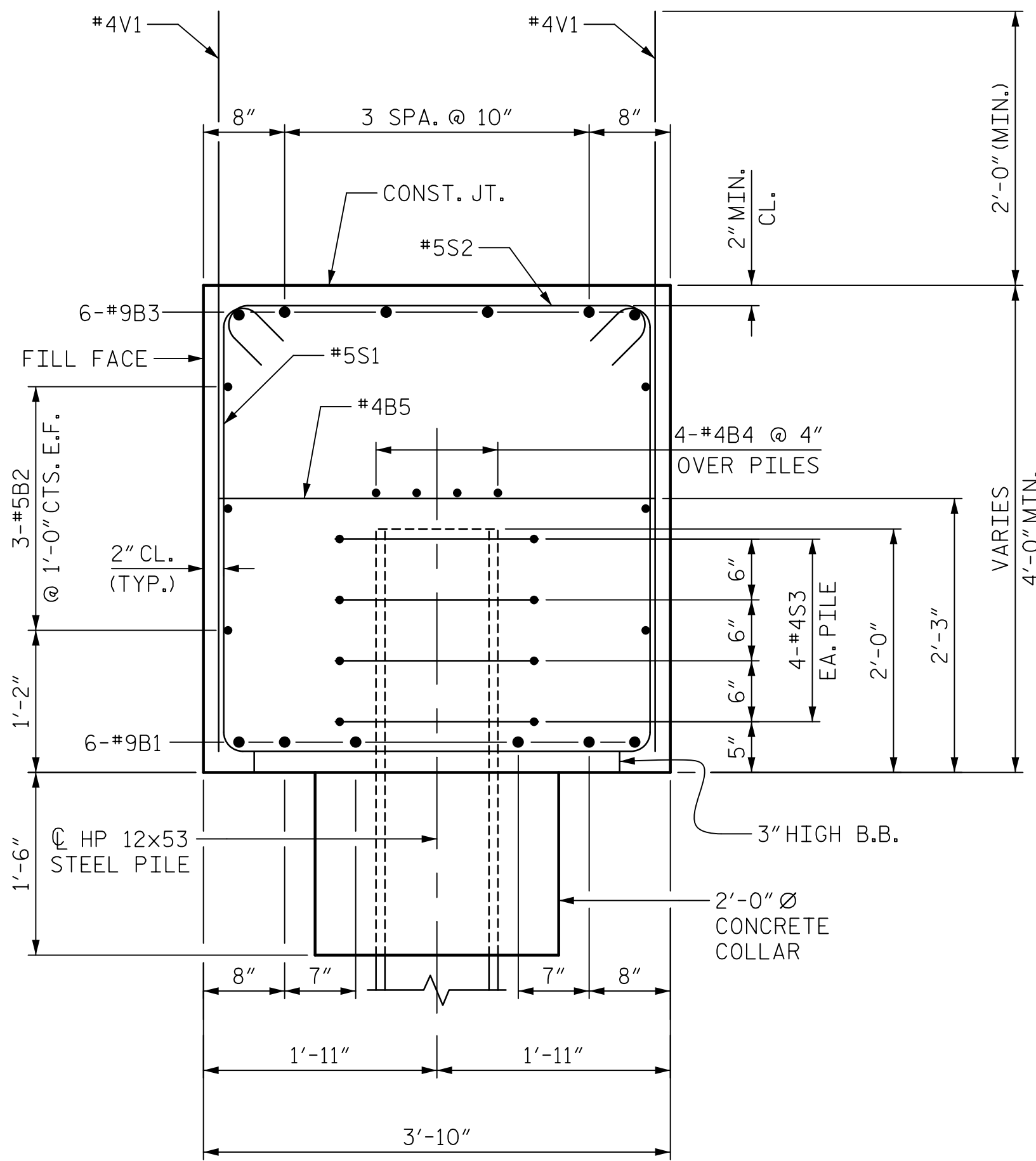
TOTAL = 47.2 C.Y.

HP 12x53 STEEL PILES:

NO. = 9 LIN. FT. = 495

PILE DRIVE EQUIPMENT SETUP

NO. = 9

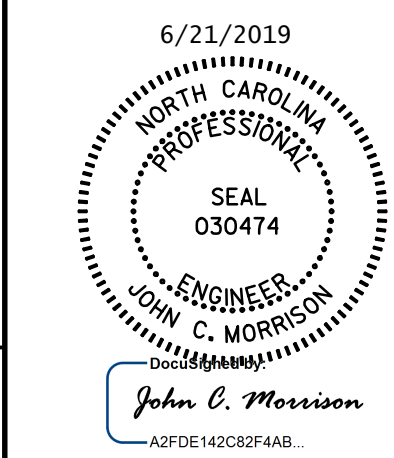


PROJECT NO. B-5980

NASH COUNTY

STATION: 42+56.82 -Y1-

SHEET 3 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 1

REVISIONS

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

SHEET NO.

S-24

TOTAL SHEETS

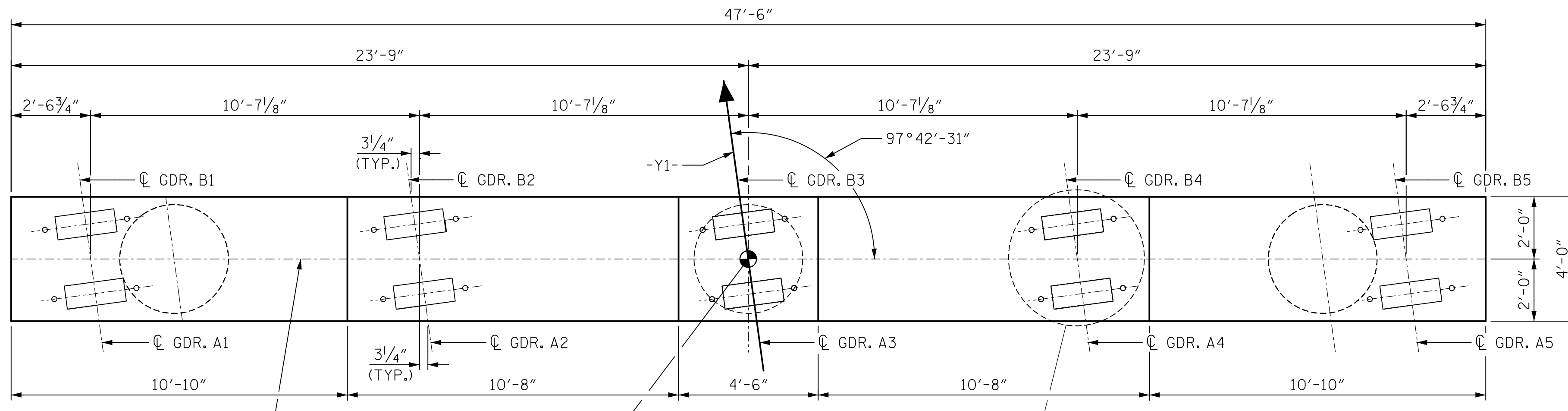
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 CHECKED BY : D. RITACCO DATE : 04/2019  
 DESIGNED BY : D. RITACCO DATE : 04/2019  
 DESIGN CHECKED BY : J.C. MORRISON DATE : 04/2019

DATE: 6/20/2019  
TIME: 6:03:28 PM

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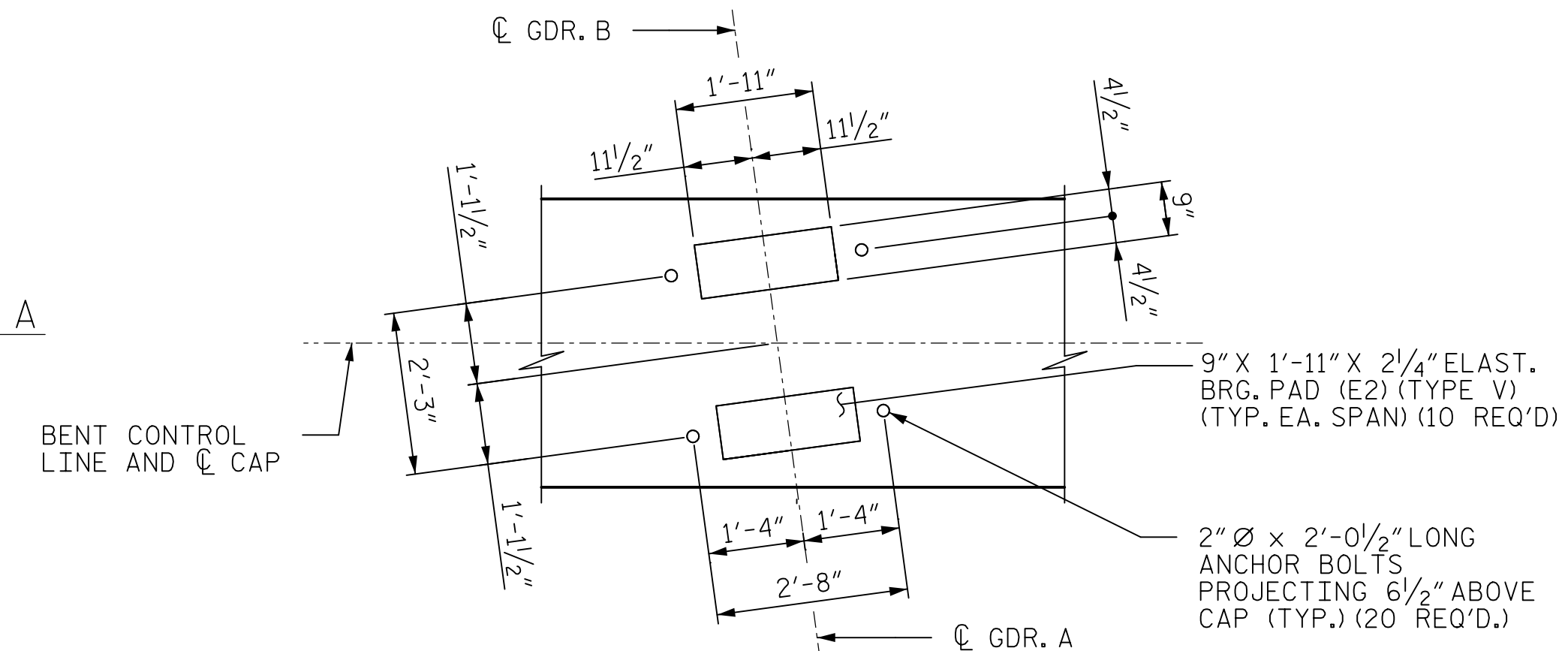
PLAN

SPAN B

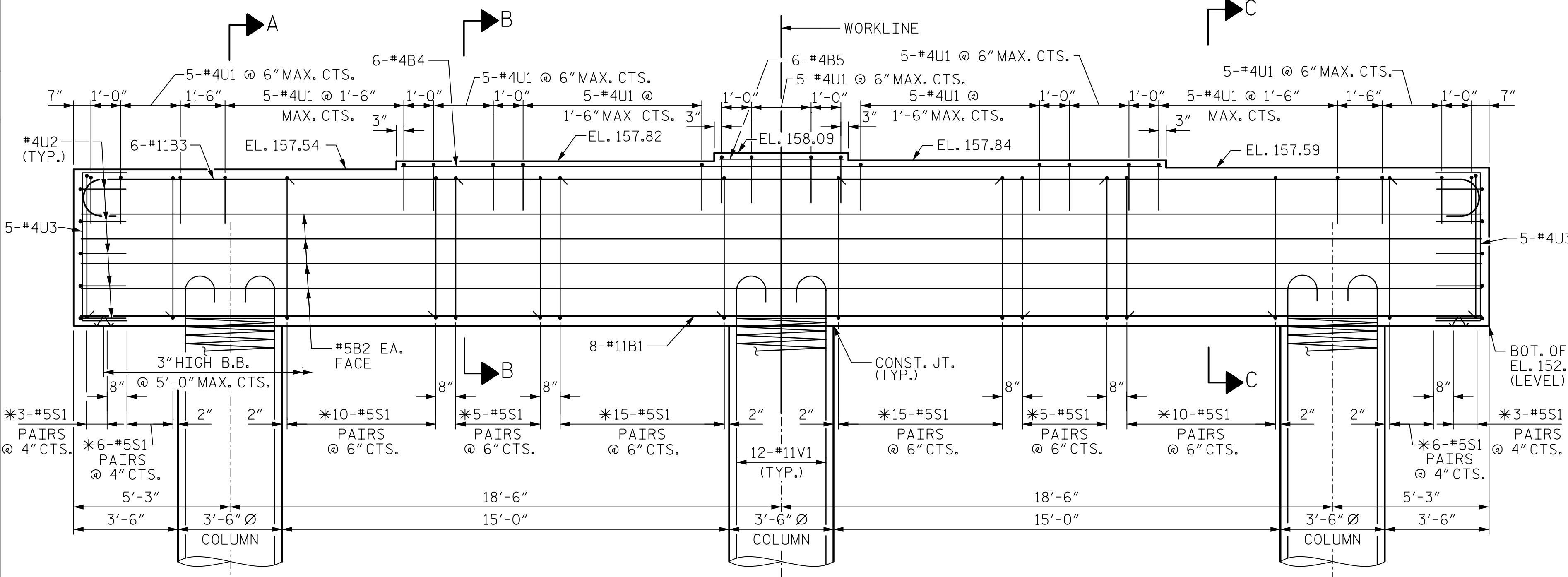
SPAN A

NOTES:

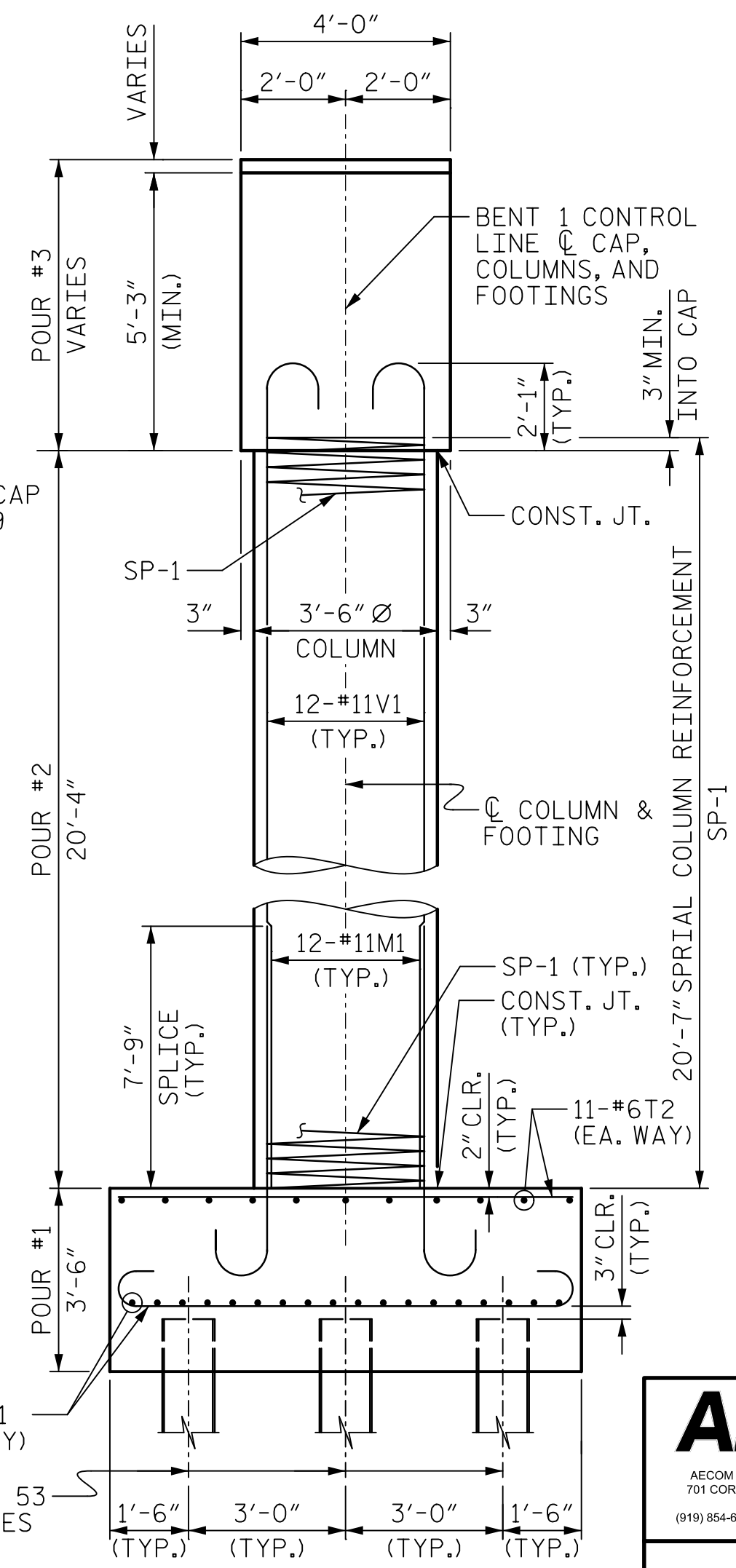
- STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- FOR ADDITIONAL SECTIONS AND DETAILS, SEE SHEET 2 OF 2.



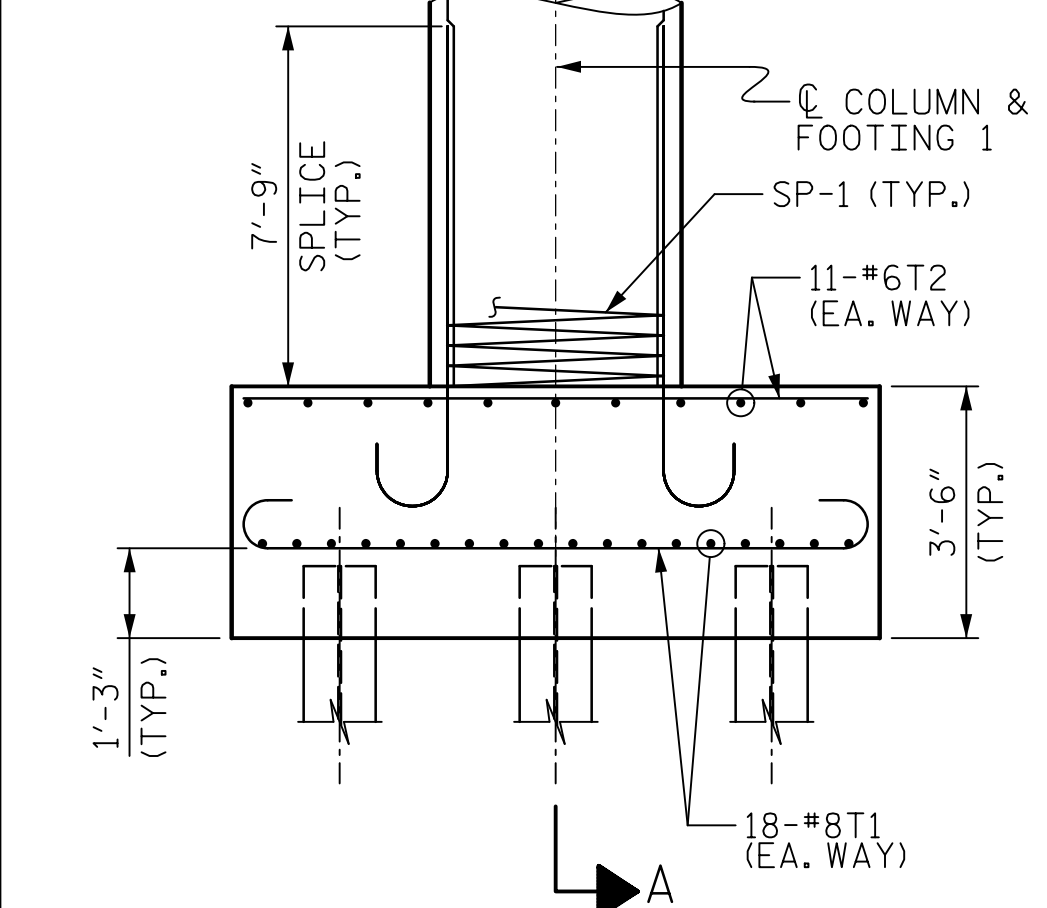
DETAIL A  
(TYPICAL EACH GIRDER)



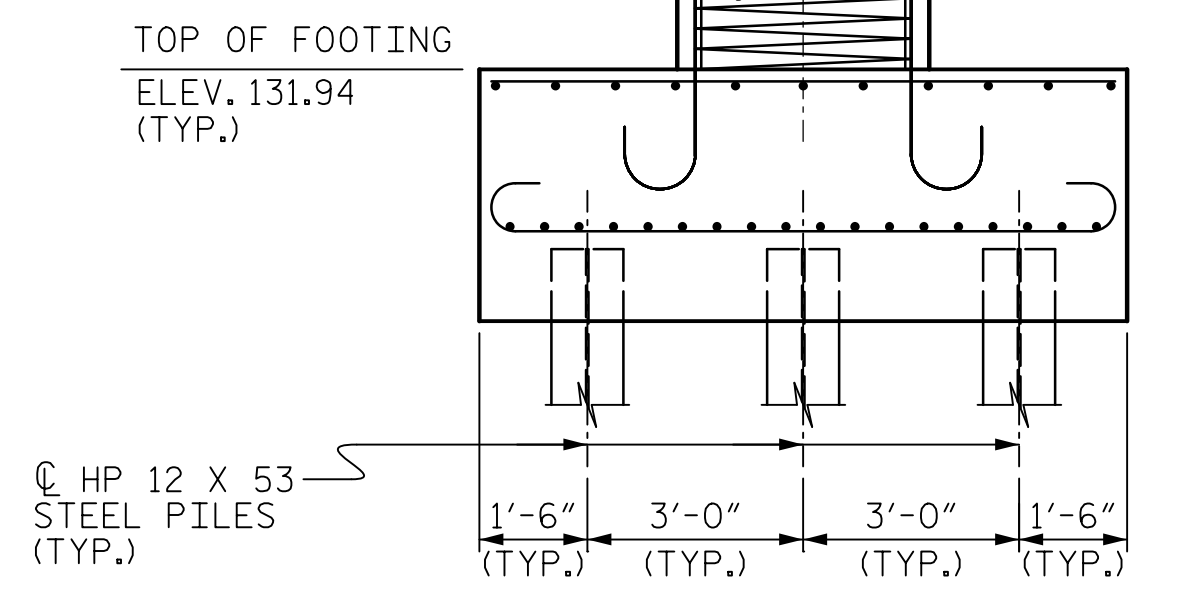
ELEVATION



SECTION A-A



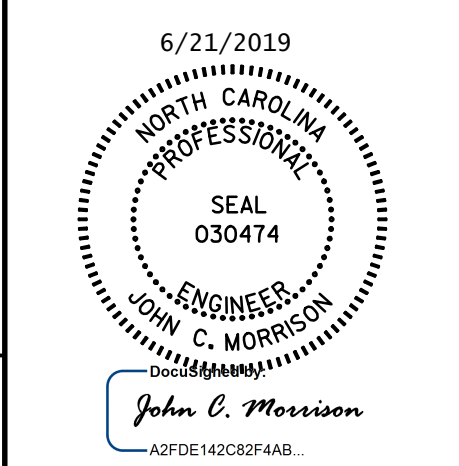
\*INVERT ALTERNATE STIRRUPS



HP 12 X 53 STEEL PILES (TYP.)

PROJECT NO. B-5980  
NASH COUNTY  
STATION: 42+56.82 -Y1-

SHEET 1 OF 2



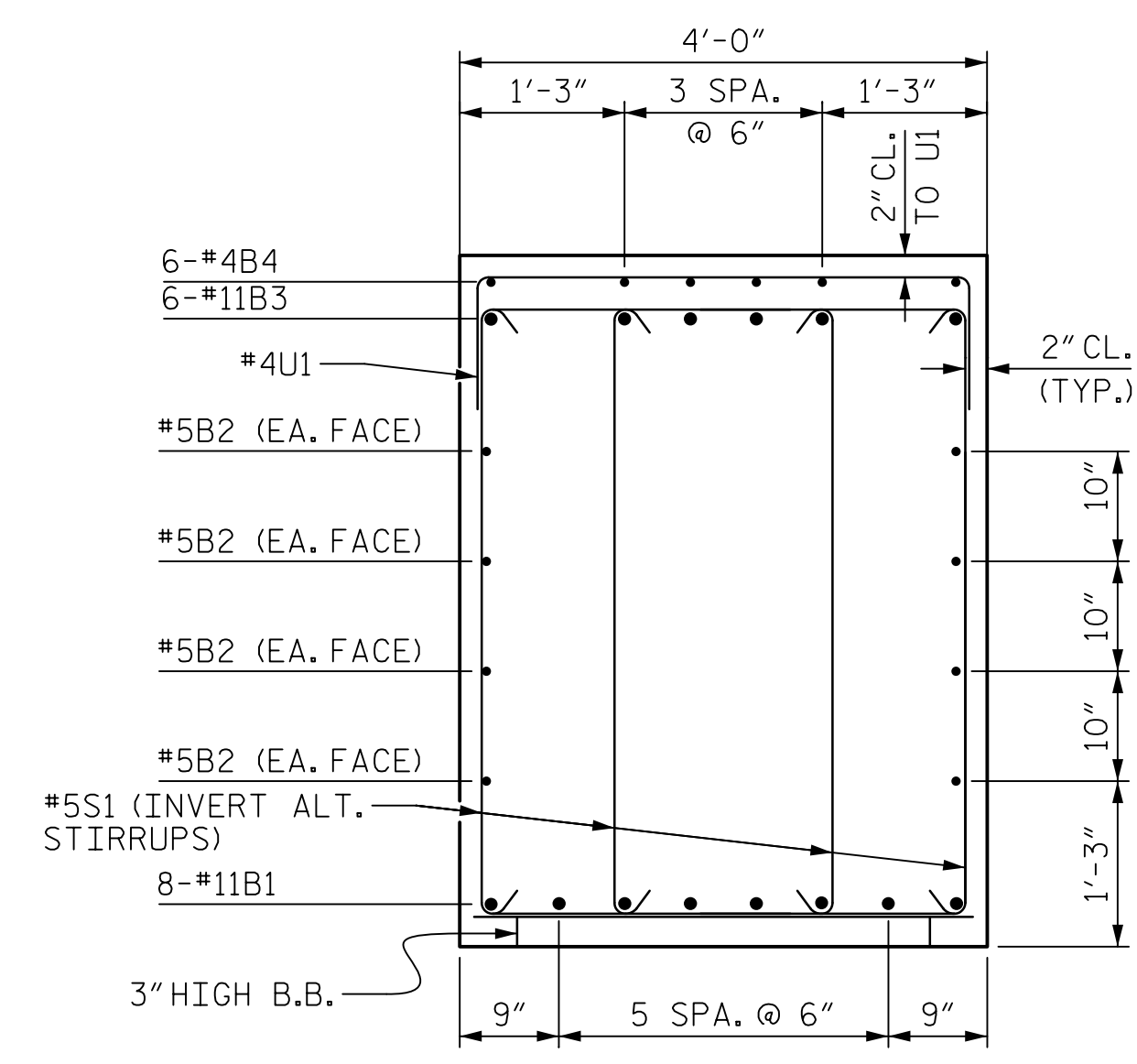
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SUBSTRUCTURE					
BENT 1					
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SHEET NO. S-25					TOTAL SHEETS 33

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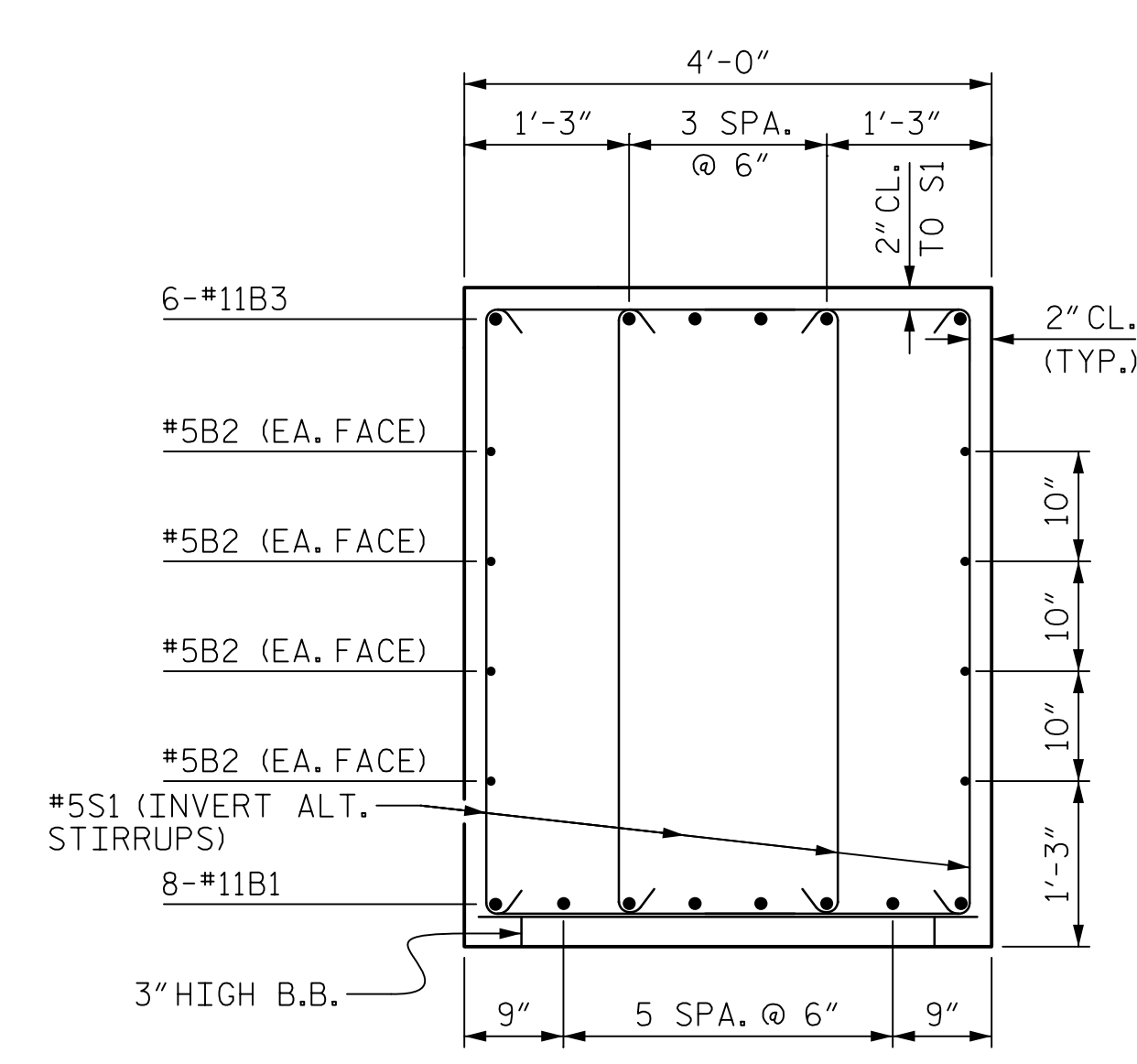
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CHECKED BY: J.C. MORRISON DATE: 03/2019  
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DESIGN CHECKED BY: J.C. MORRISON DATE: 03/2019

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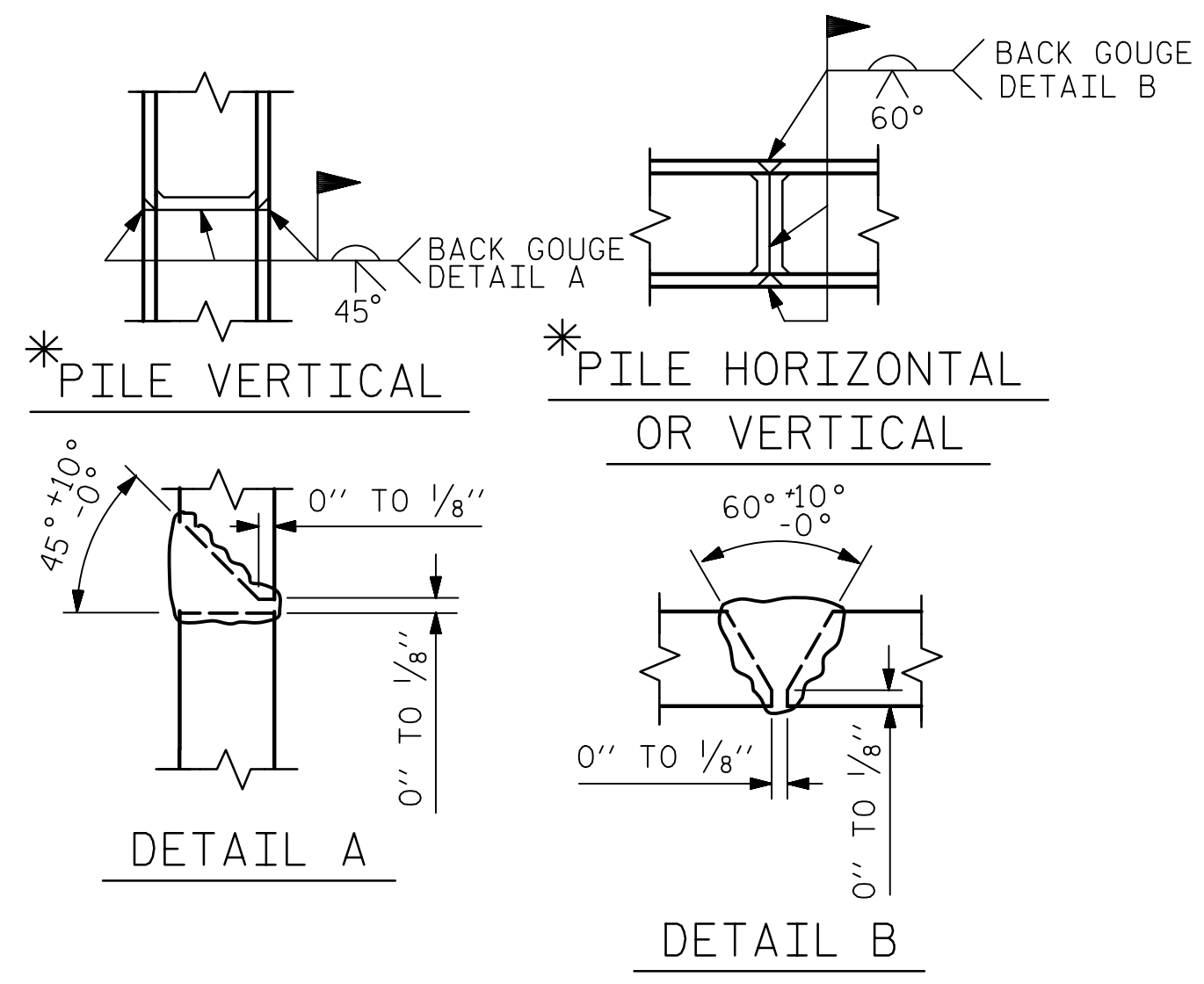
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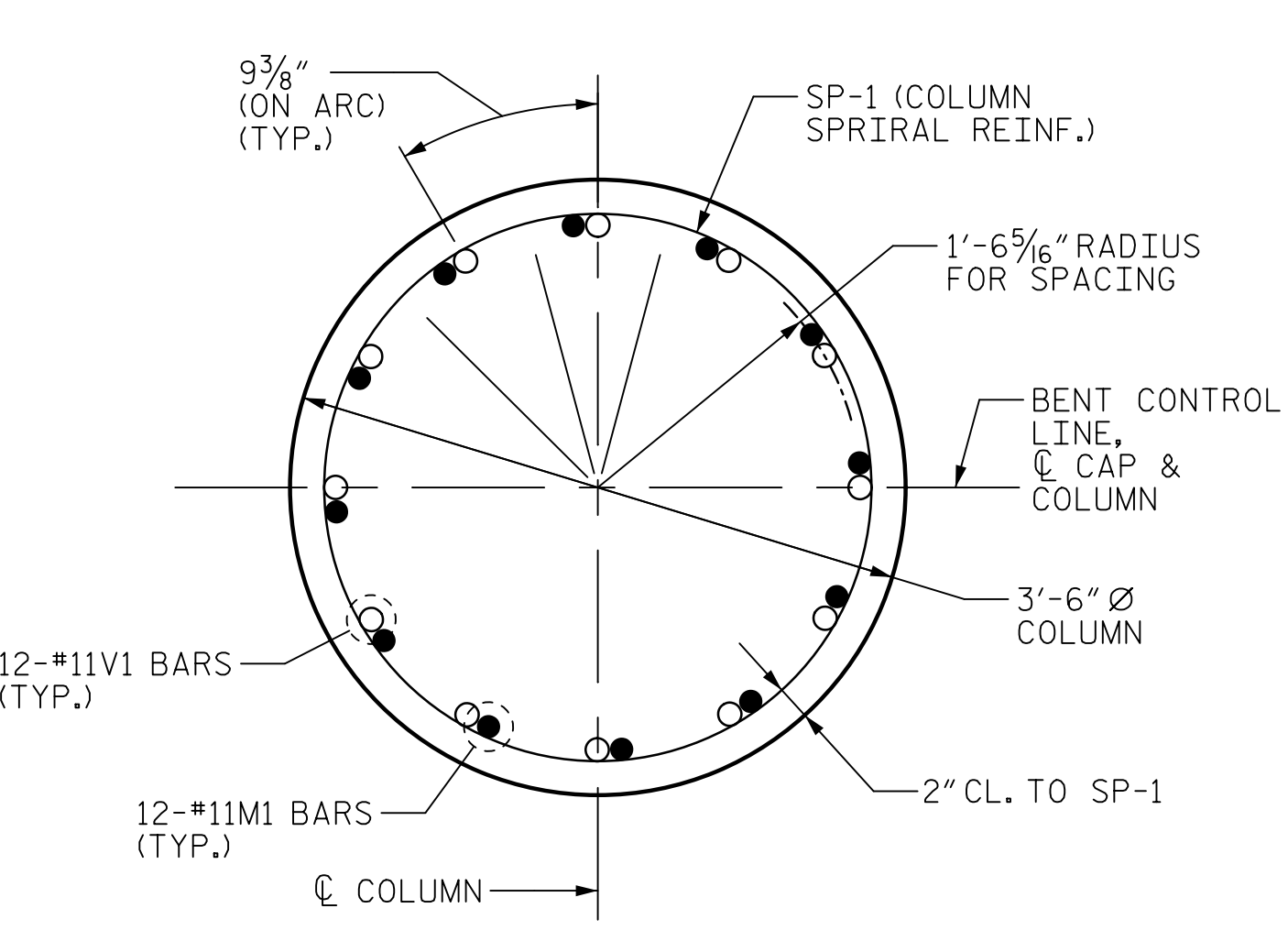
SECTION B-B



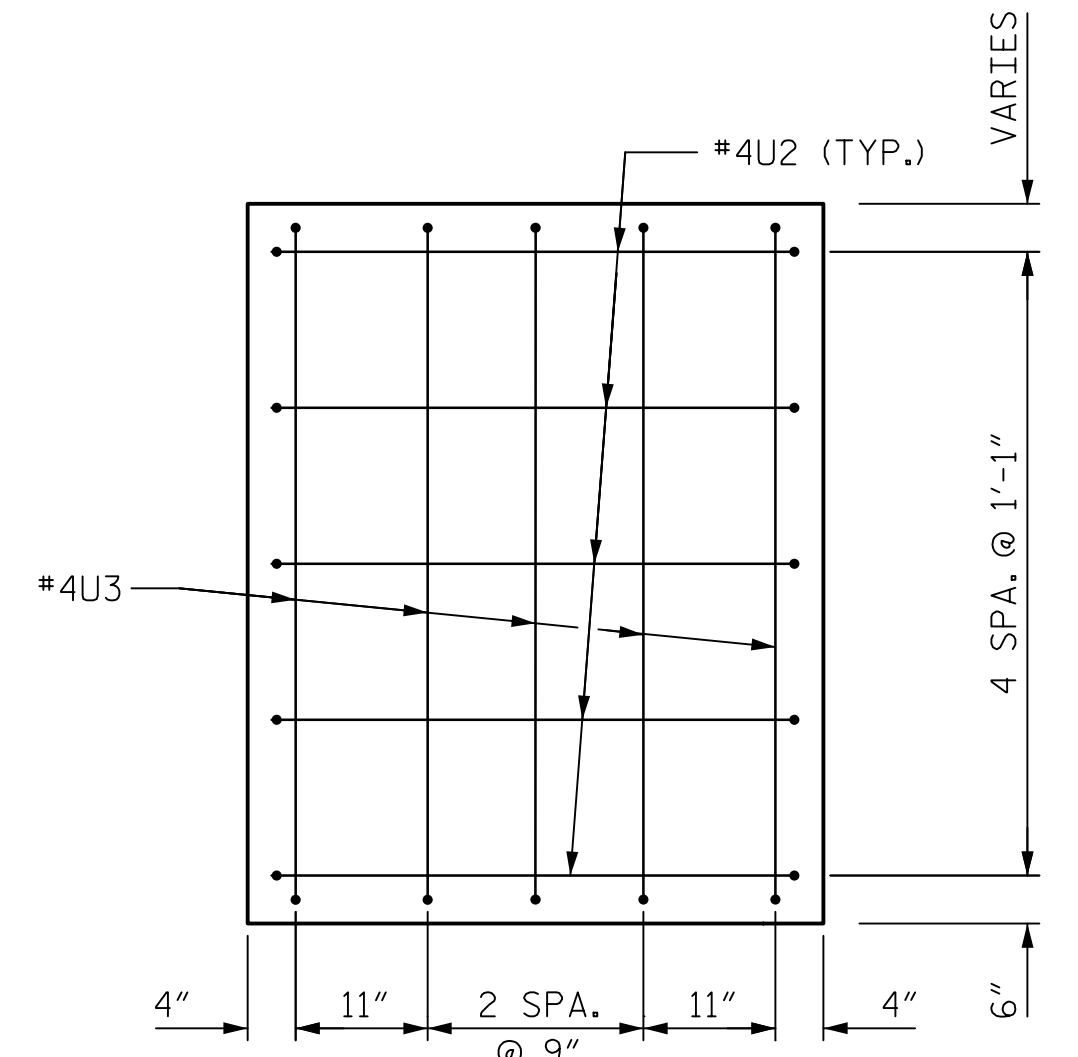
SECTION C-C



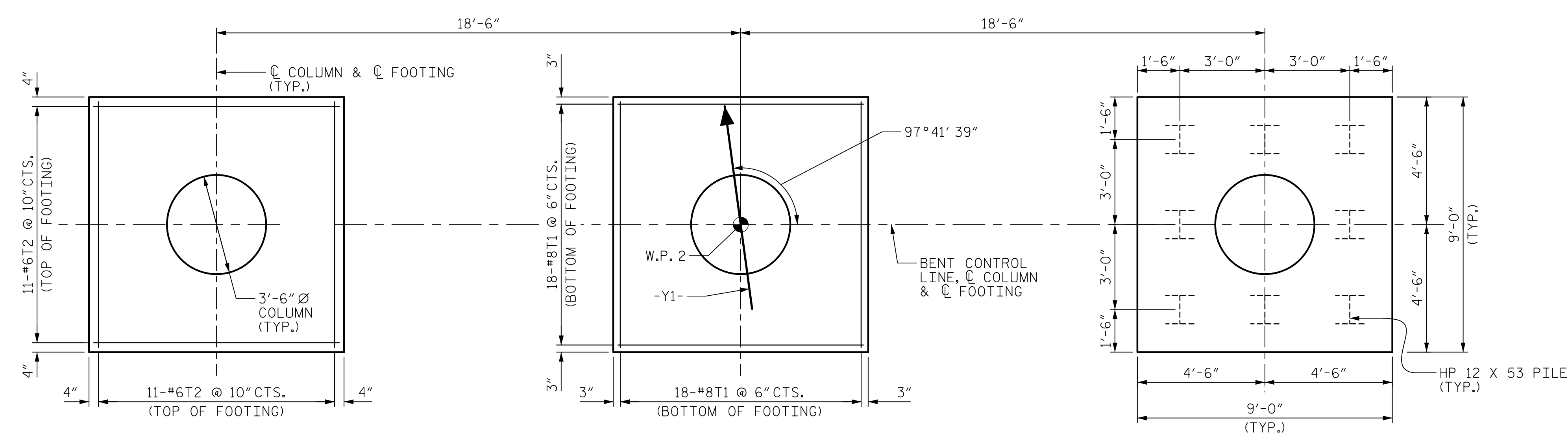
PILE SPLICE DETAILS  
\* POSITION OF PILE DURING WELDING.



SECTION THRU COLUMN

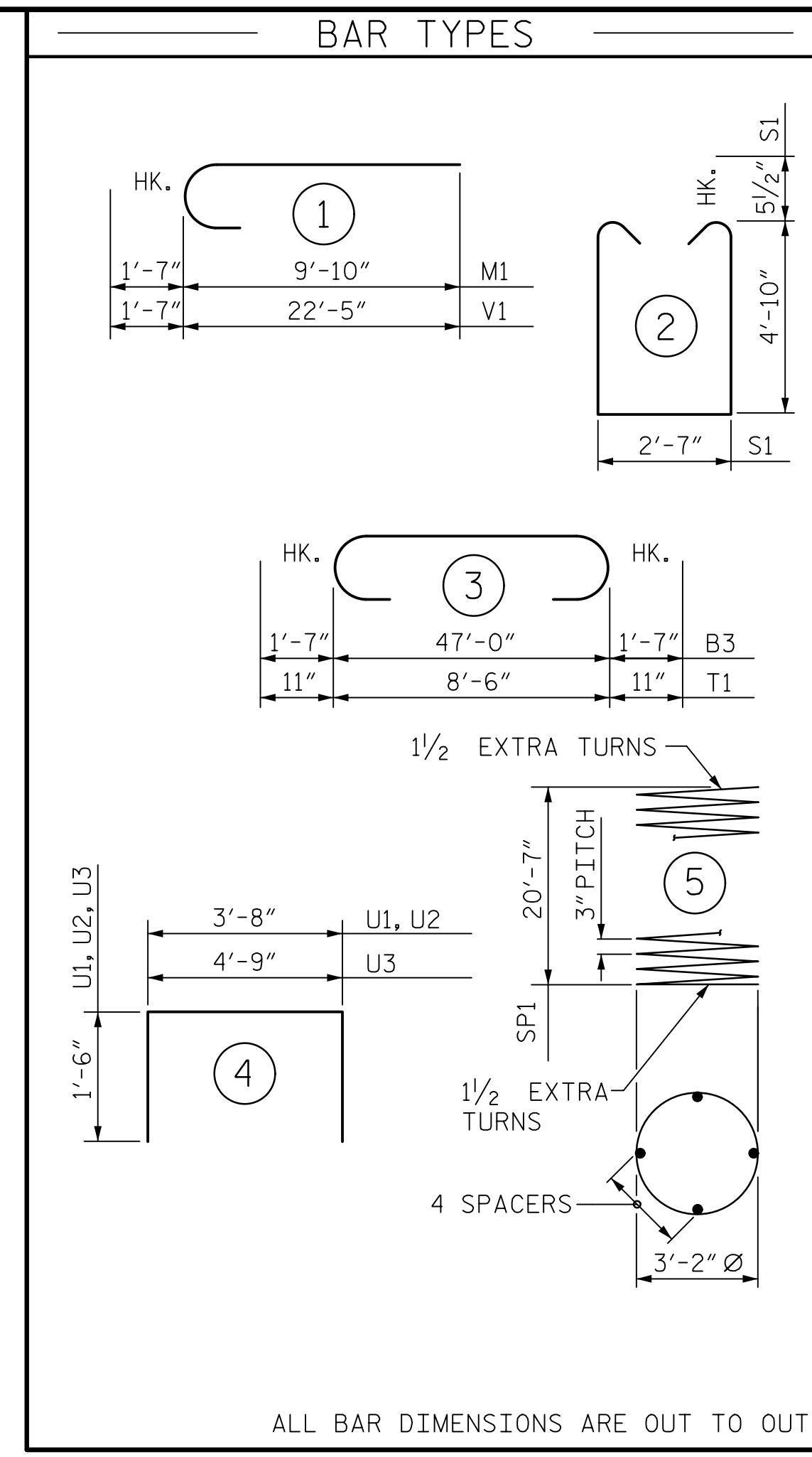


CAP END VIEW



PLAN OF FOOTINGS & COLUMNS

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND FOOTING.



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	11	STR	47'-0"	1998
B2	6	5	STR	47'-0"	294
B3	6	11	3	50'-2"	1599
B4	6	4	STR	25'-4"	102
B5	6	4	STR	4'-0"	16
M1	36	11	1	11'-5"	2184
S1	156	5	2	13'-2"	2142
T1	108	8	3	10'-4"	2980
T2	66	6	STR	8'-6"	843
U1	49	4	4	6'-8"	218
U2	10	4	4	6'-8"	45
U3	10	4	4	7'-10"	52
V1	36	11	1	24'-0"	4590
REINFORCING STEEL					17,063 LBS.
SP-1	3	*	5	838'-0"	1679
SPIRAL COLUMN REINFORCING STEEL					1679 LBS.
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN					
POUR #1 (FOOTINGS)					31.5 C.Y.
POUR #2 (COLUMNS)					21.7 C.Y.
POUR #3 (CAP)					38.3 C.Y.
TOTAL CLASS A CONCRETE					91.5 C.Y.
HP 12 X 53 STEEL PILES					
NO. = 24					720 LIN. FT.
STEEL PILE POINTS					24 EA.
PILE DRIVE EQUIPMENT SETUP					
NO. = 24					

PROJECT NO. B-5980  
NASH COUNTY  
 STATION: 42+56.82 -Y1-  
 SHEET 2 OF 2

**AECOM**  
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 AECOM License No. F-0342

6/21/2019  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 030474  
 JOHN C. MORRISON  
 JOHN C. MORRISON  
 A2FDE142C82F4A8

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

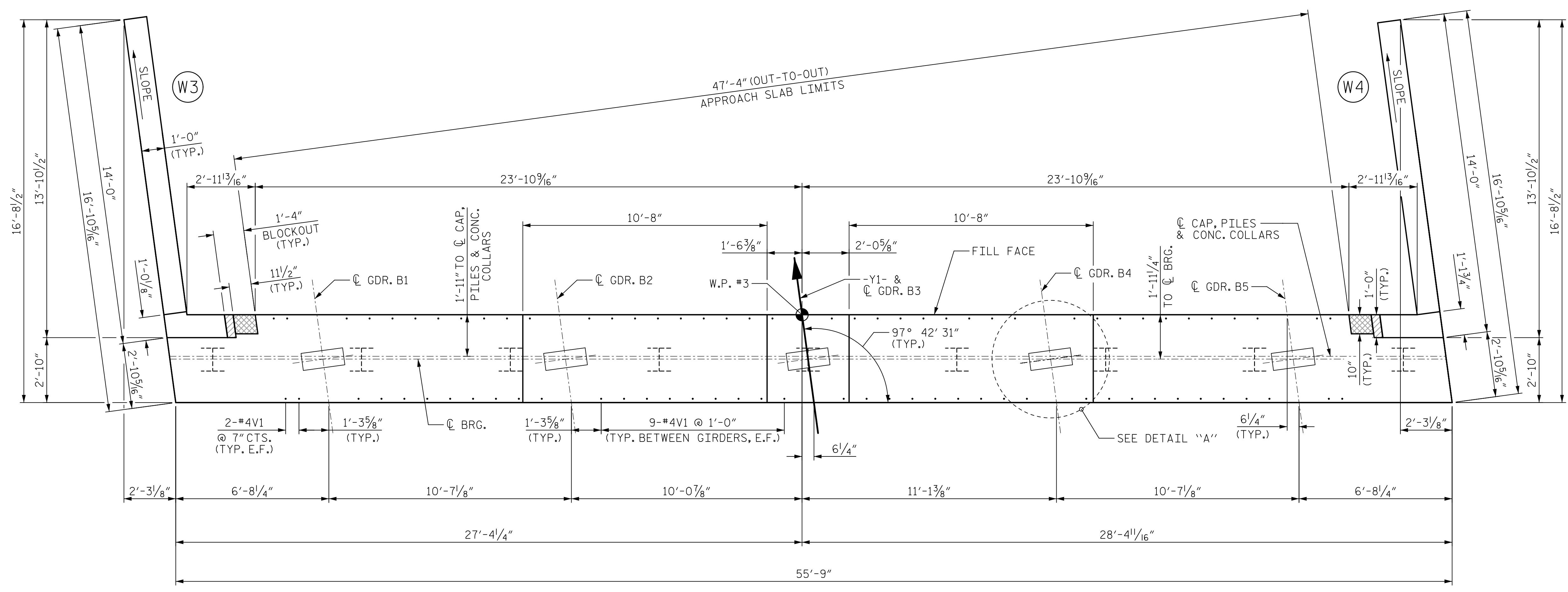
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 CHECKED BY : J.C. MORRISON DATE : 12/2018  
 DESIGNED BY : T.B. STUMP DATE : 12/2018  
 DESIGN CHECKED BY : J.C. MORRISON DATE : 12/2018

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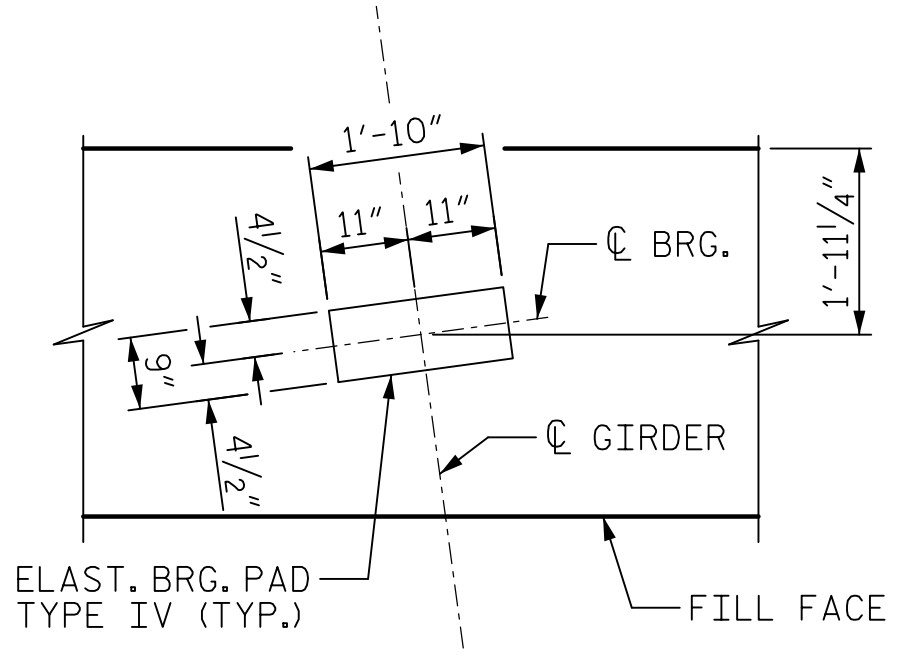
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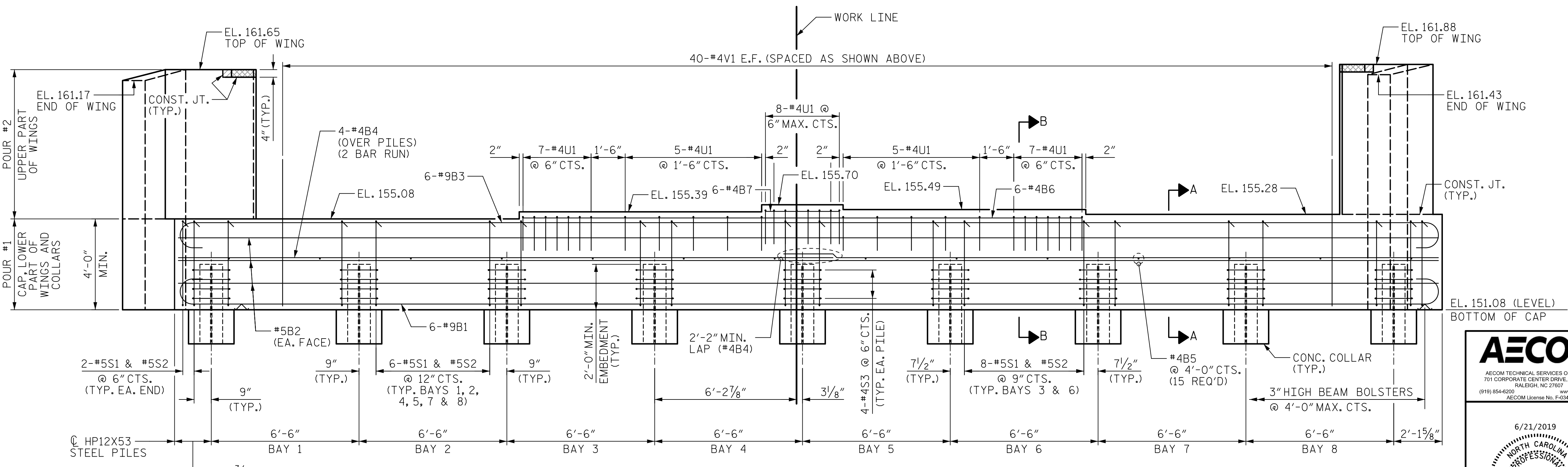


PLAN

**NOTES:**  
 THE TOP SURFACE OF THE END BENT CAP AND WINGS EXCEPT THE BEARING AREA AND AREA BEYOND THE LIMITS OF THE DECK, SHALL BE RAKED TO A DEPTH OF 1/4".  
 THE TOP SURFACE OF THE INTEGRAL END BENT CAP, BEYOND THE LIMITS OF THE DECK, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.  
 FOR "BLOCKOUT IN WING WALL", SEE SHEET 2 OF 3.

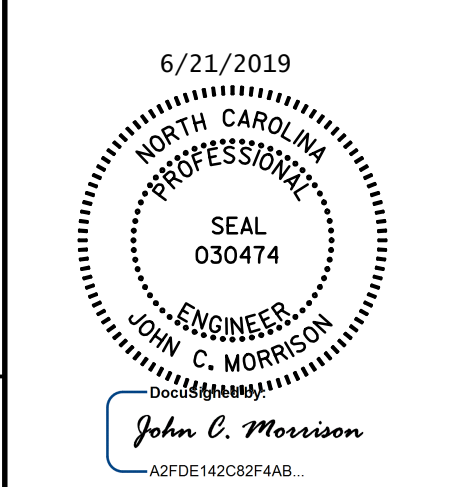


DETAIL "A"



ELEVATIONS

PROJECT NO. B-5980  
NASH COUNTY  
 STATION: 42+56.82 -Y1-  
 SHEET 1 OF 3



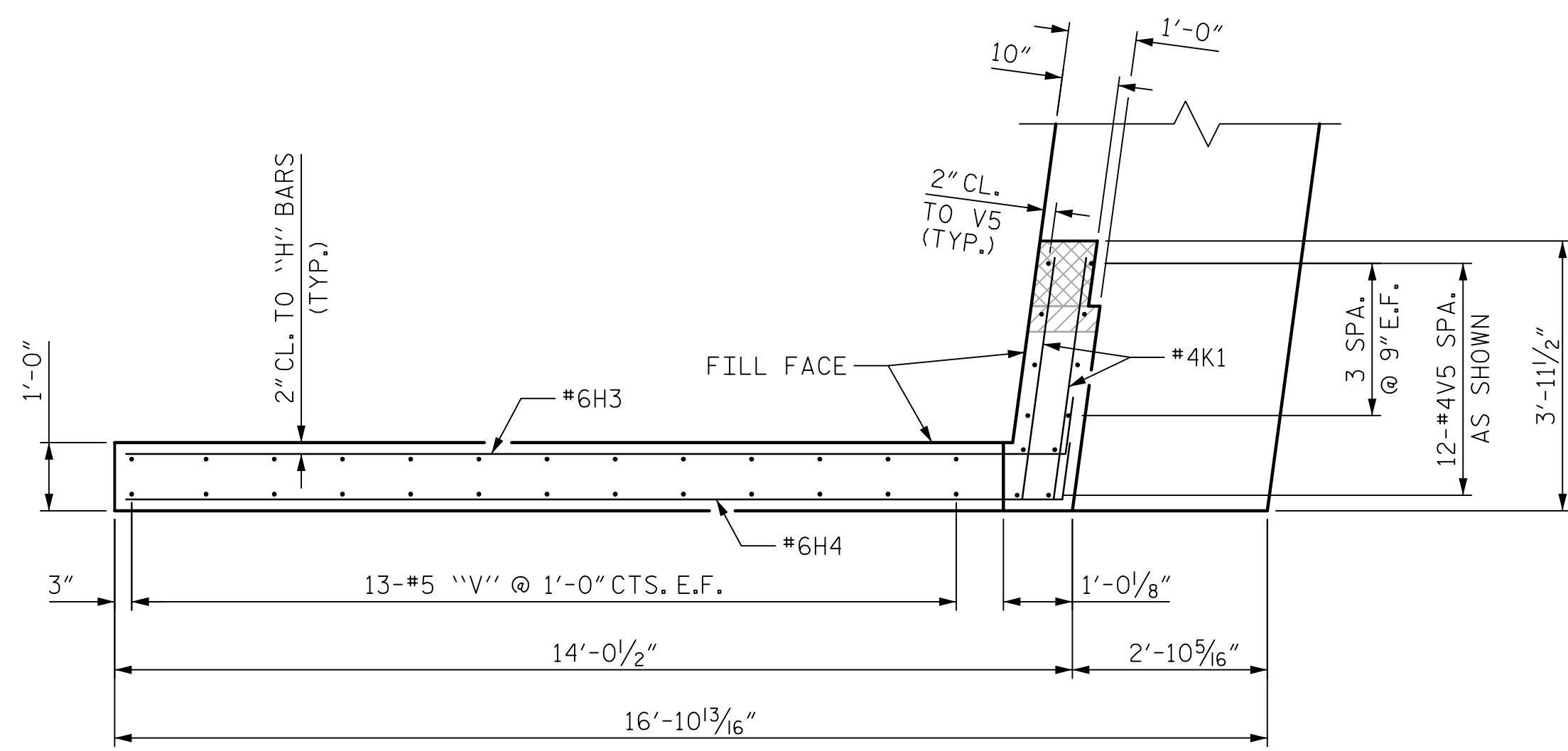
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REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		
SHEET NO.					S-27
TOTAL SHEETS					33

DRAWN BY : T.B. STUMP DATE : 03/2019  
 CHECKED BY : D. RITACCO DATE : 03/2019  
 DESIGNED BY : D. RITACCO DATE : 03/2019  
 DESIGN CHECKED BY : J.C. MORRISON DATE : 03/2019

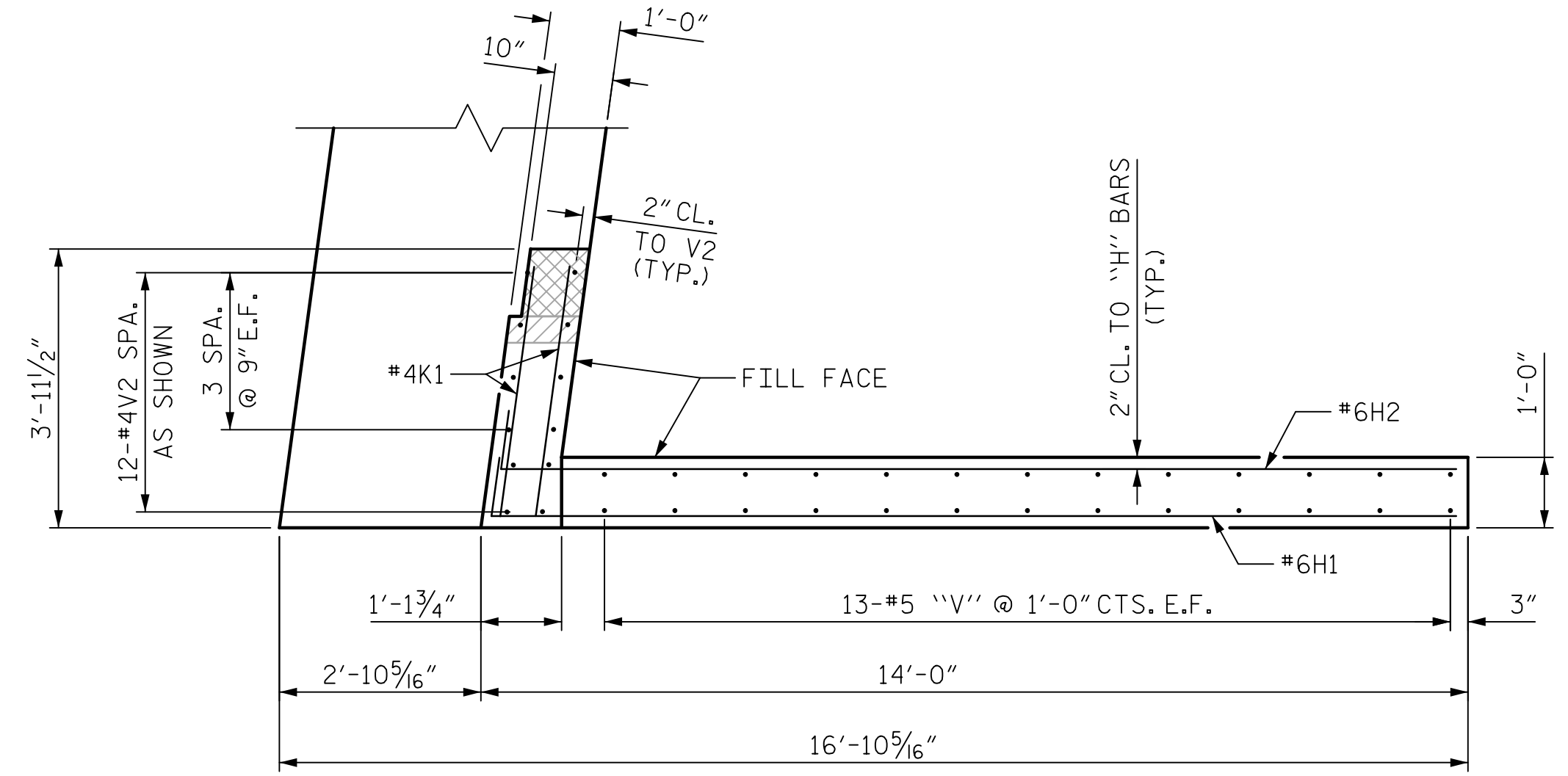
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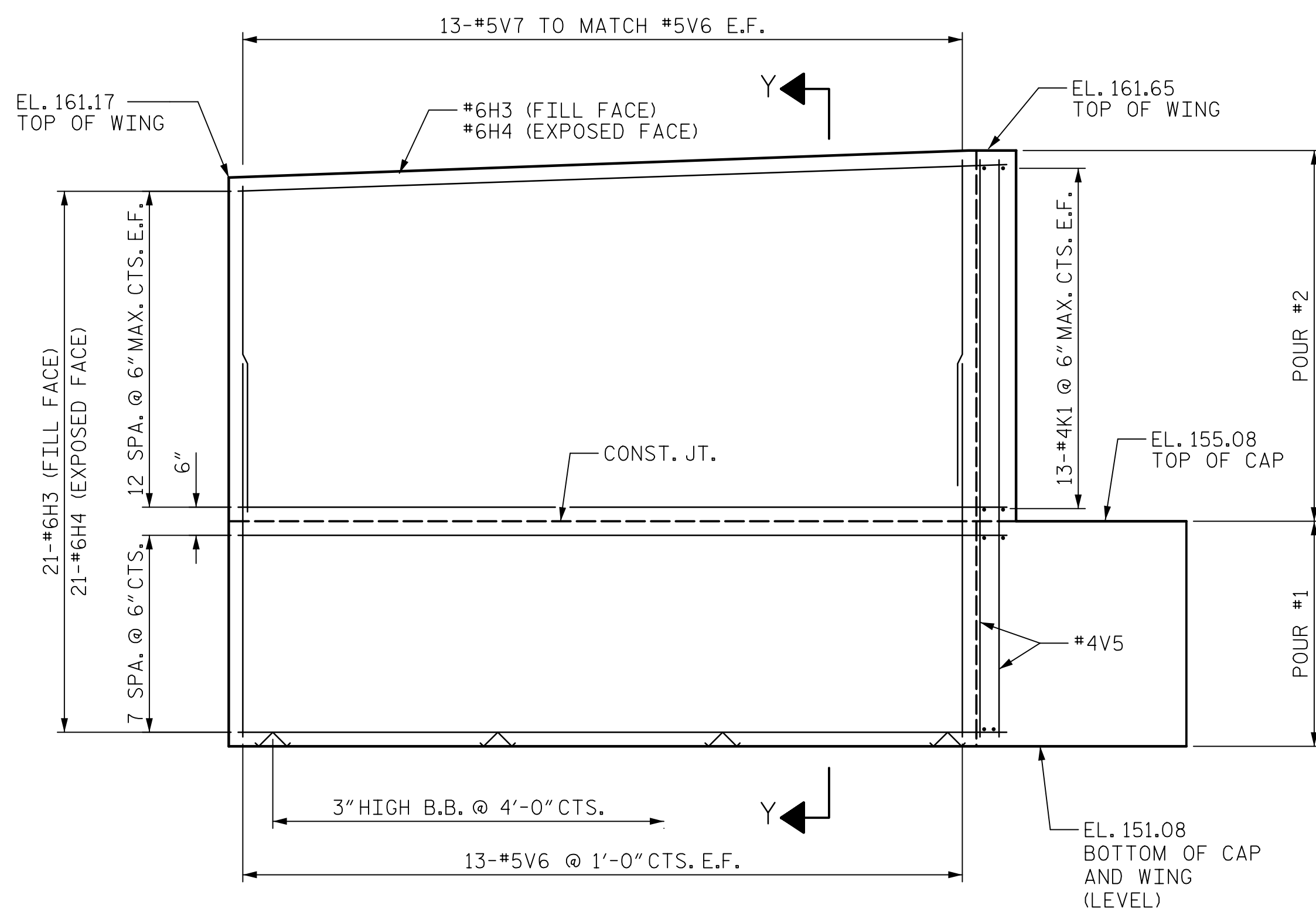
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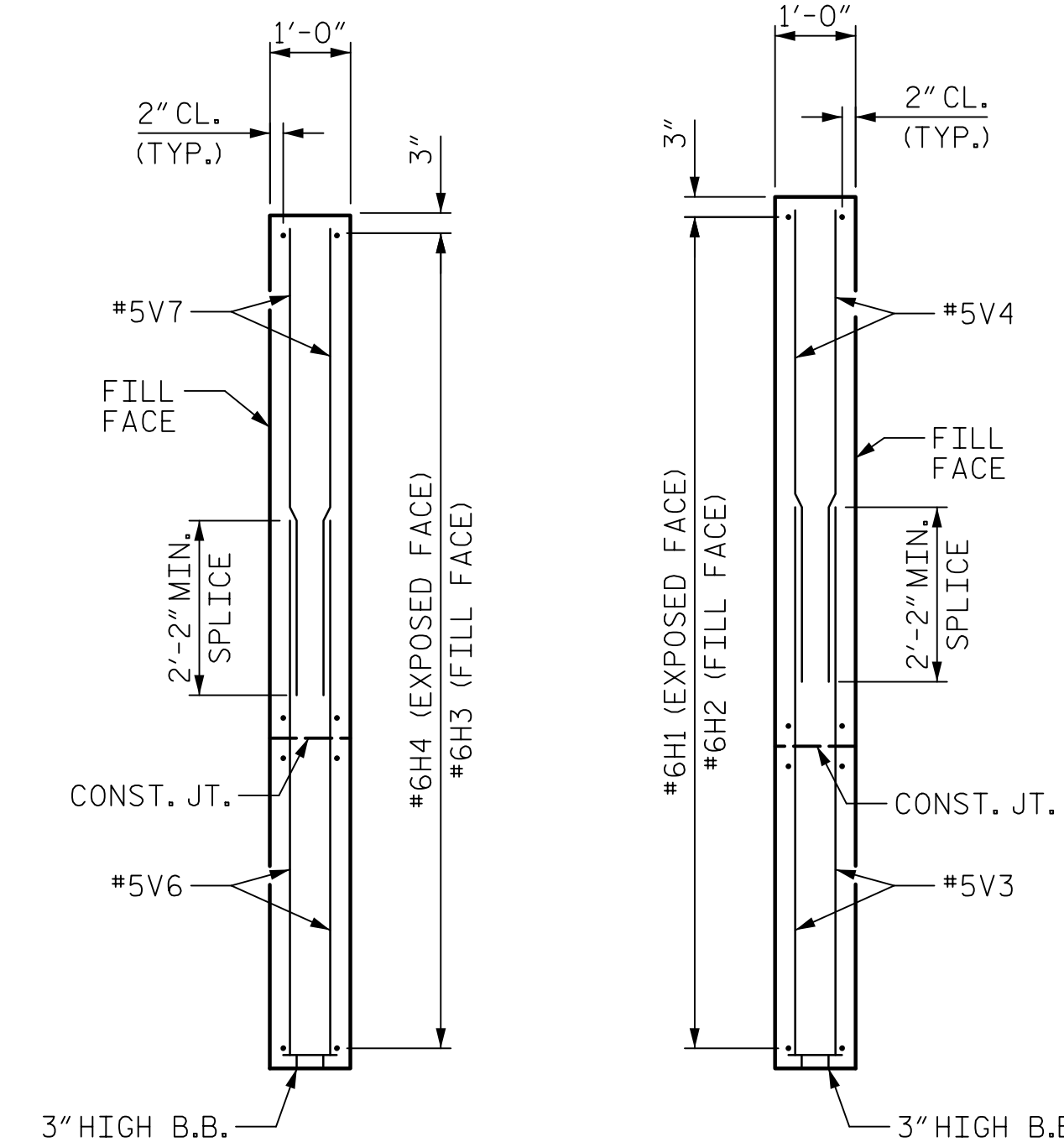
PLAN WING W3



PLAN WING W4

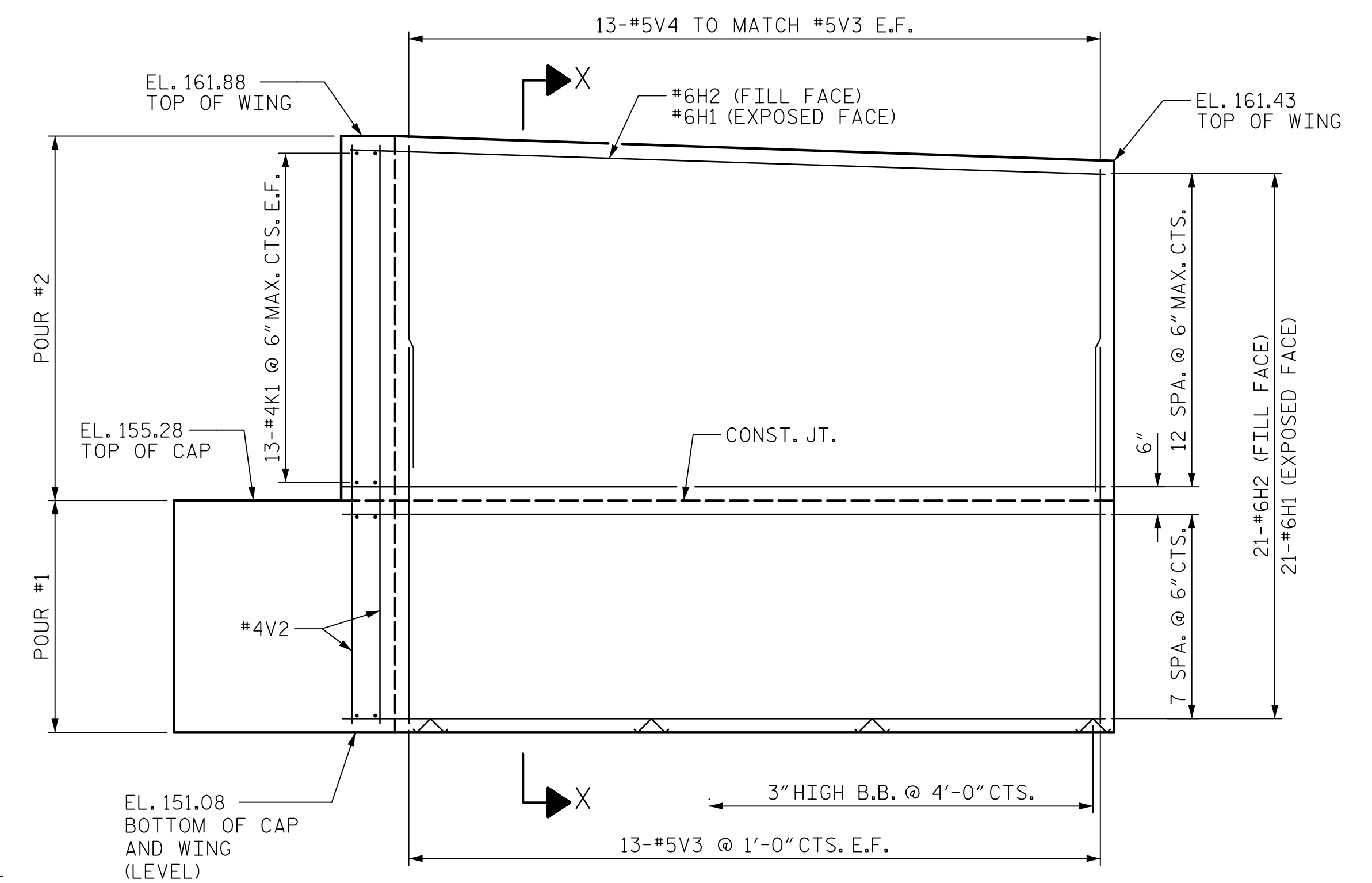


ELEVATION WING W3

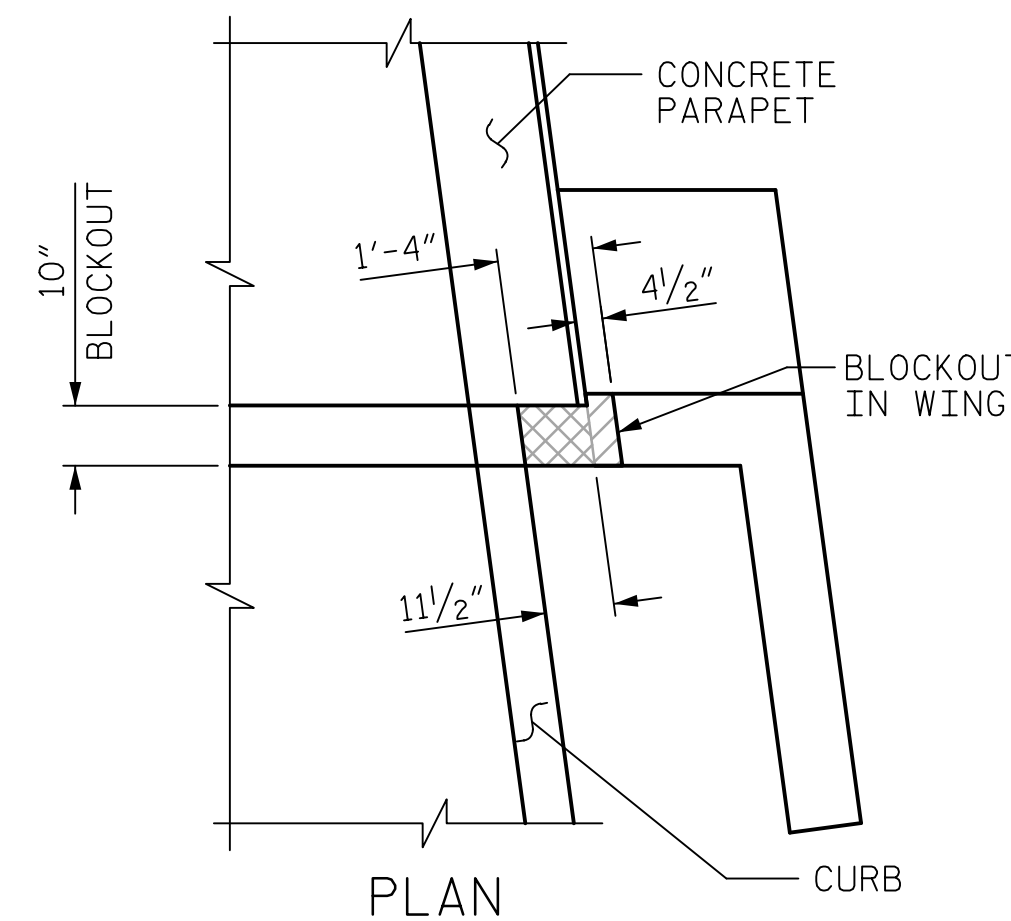


SECTION Y-Y

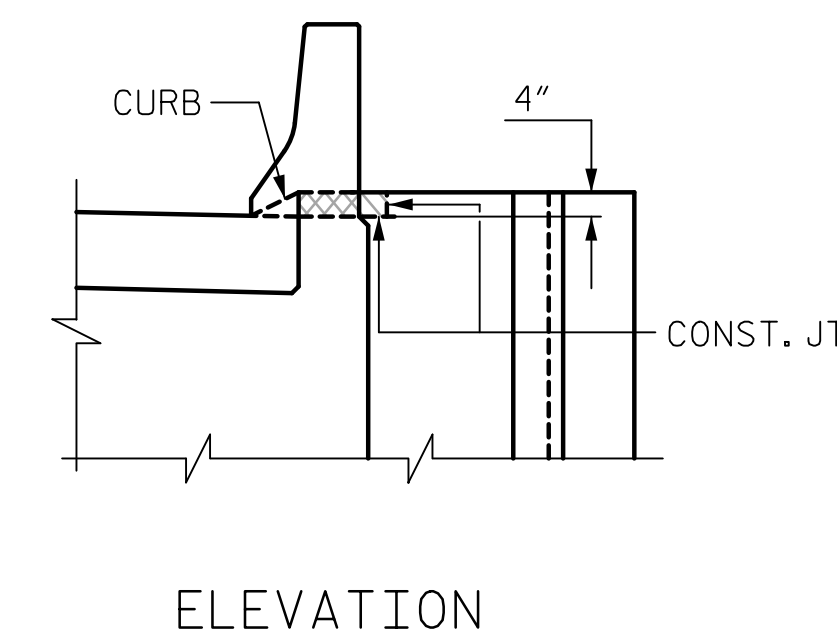
SECTION X-X



ELEVATION WING W4



BLOCKOUT IN WING WALL



ELEVATION

NOTE: CONCRETE SHALL BE POURED IN THE CROSS-HATCHED AREA TO MATCH THE TOP OF CURB AND INTEGRAL END BENT WING ELEVATION, UNLESS OTHERWISE DIRECTED BY THE ENGINEER. THE CONCRETE IN THESE AREAS SHALL BE PLACED AT THE SAME TIME THE BLOCKOUTS IN THE END BENT WINGS ARE POURED.

PROJECT NO. B-5980

NASH COUNTY

STATION: 42+56.82 -Y1-

SHEET 2 OF 3

**AECOM**  
AECOM TECHNICAL SERVICES OF NC, INC.  
701 CORPORATE CENTER DRIVE, SUITE 475  
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6/21/2019  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 030474  
JOHN C. MORRISON

John C. Morrison  
A2PDE142C82F4A8..

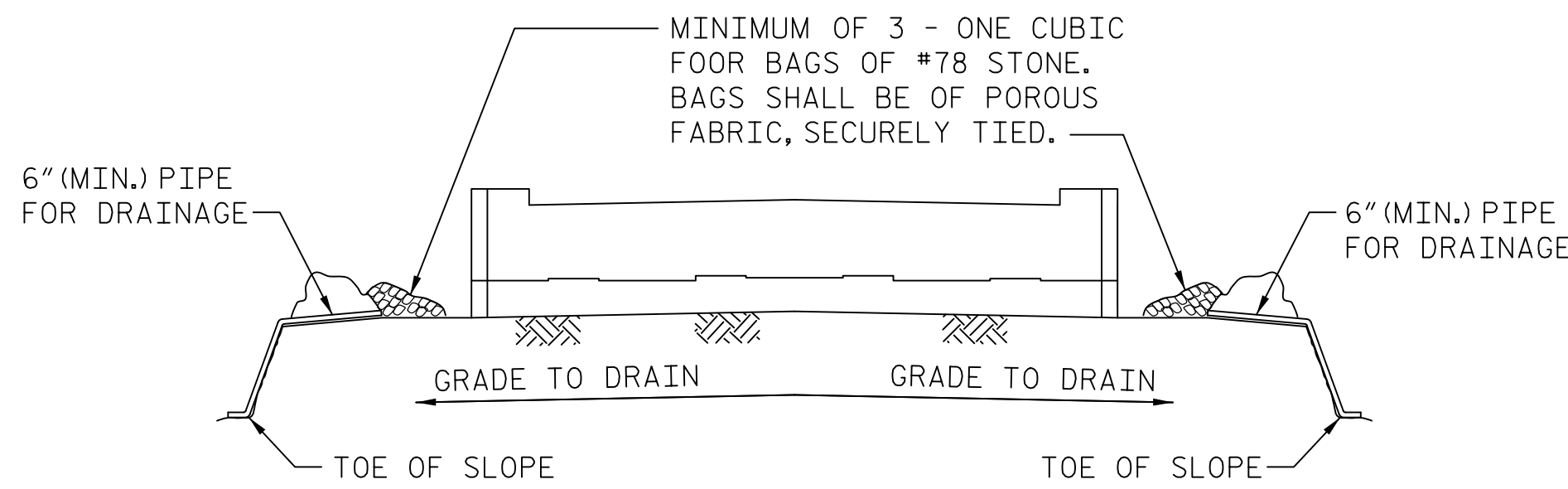
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SUBSTRUCTURE					
INTEGRAL END BENT 2					
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1			3		
2			4		
SHEET NO. S-28					TOTAL SHEETS 33

DRAWN BY: T.B. STUMP	DATE: 04/2019
CHECKED BY: D. RITACCO	DATE: 04/2019
DESIGNED BY: D. RITACCO	DATE: 04/2019
DESIGN CHECKED BY: J.C. MORRISON	DATE: 04/2019

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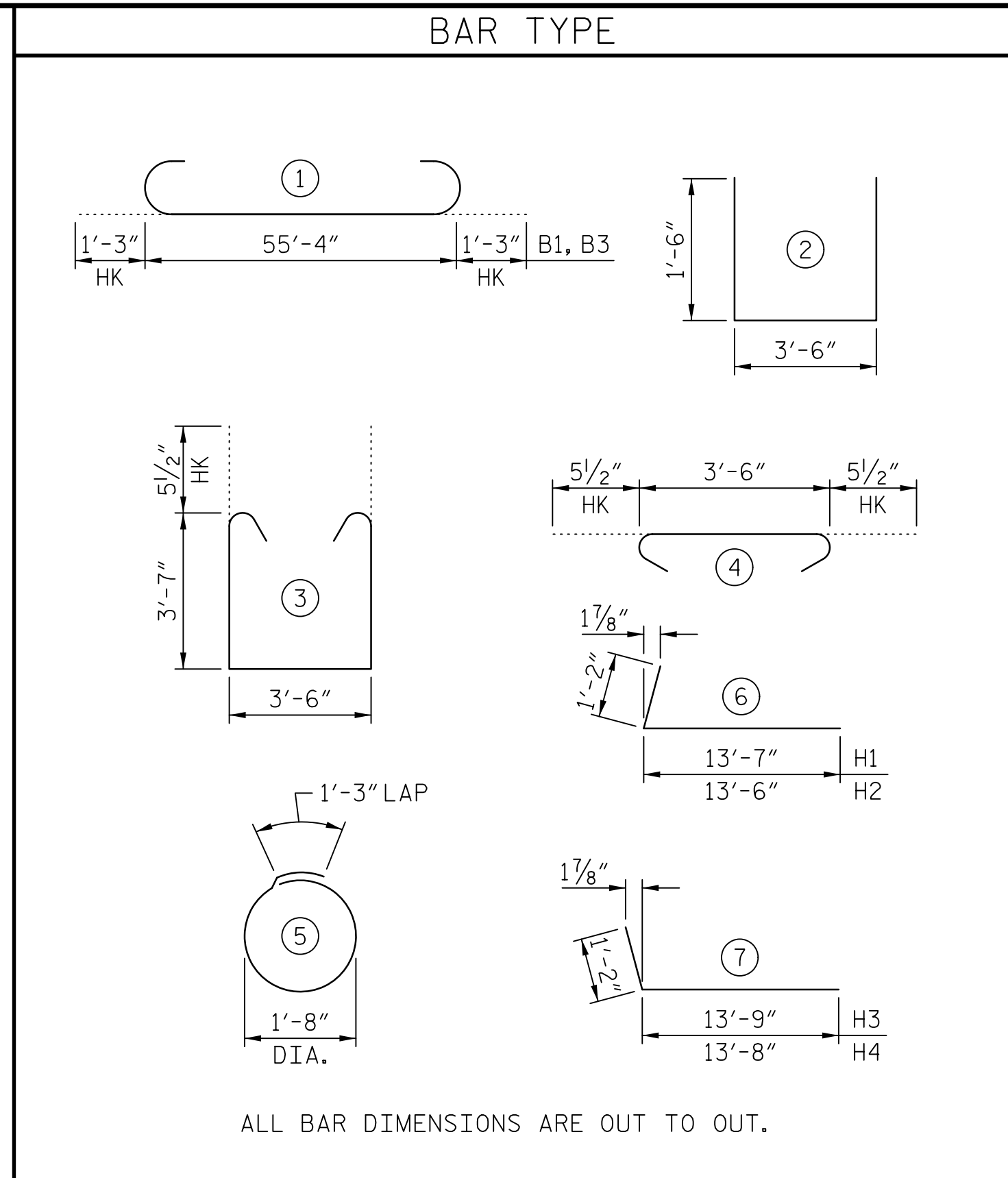
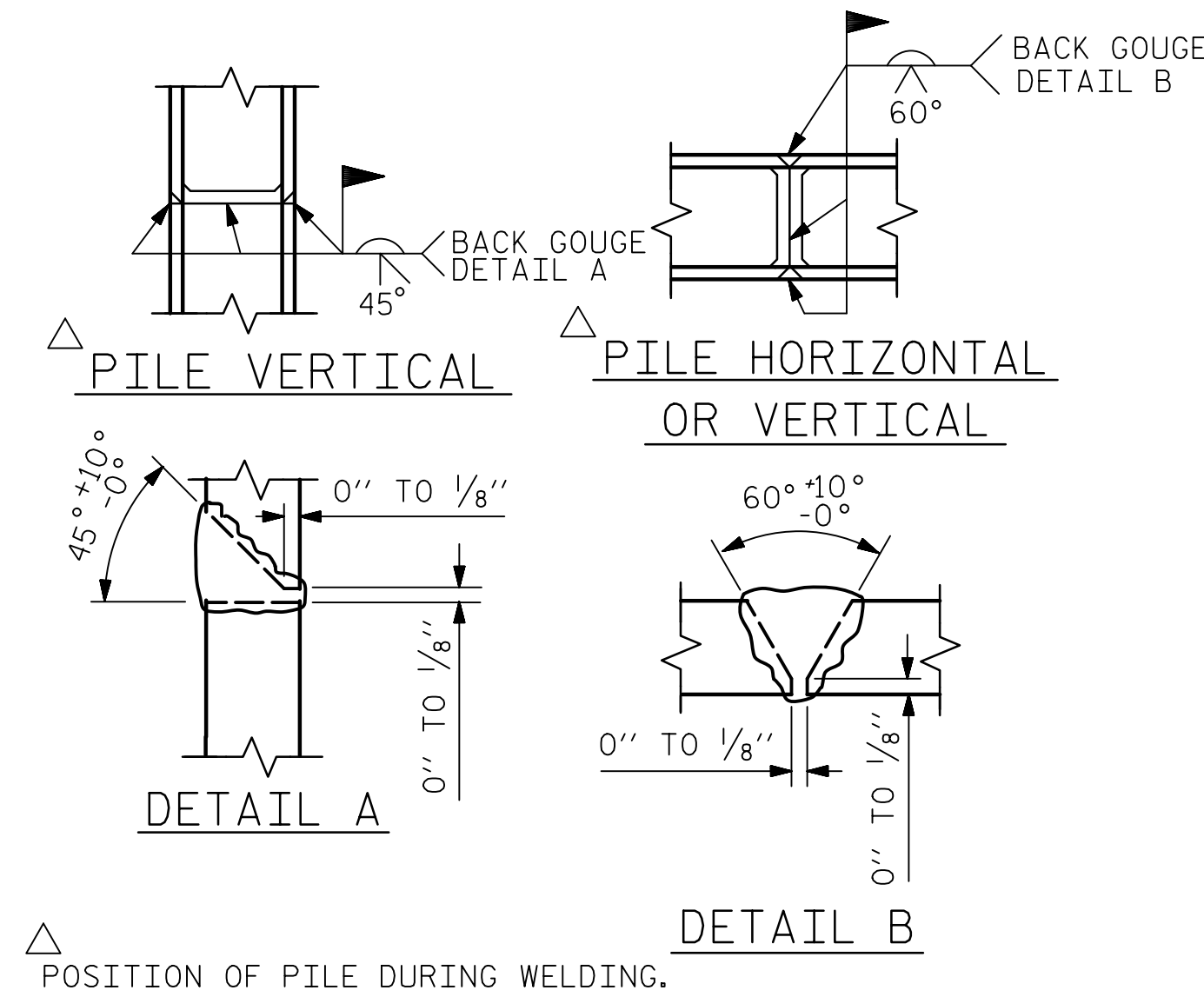


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

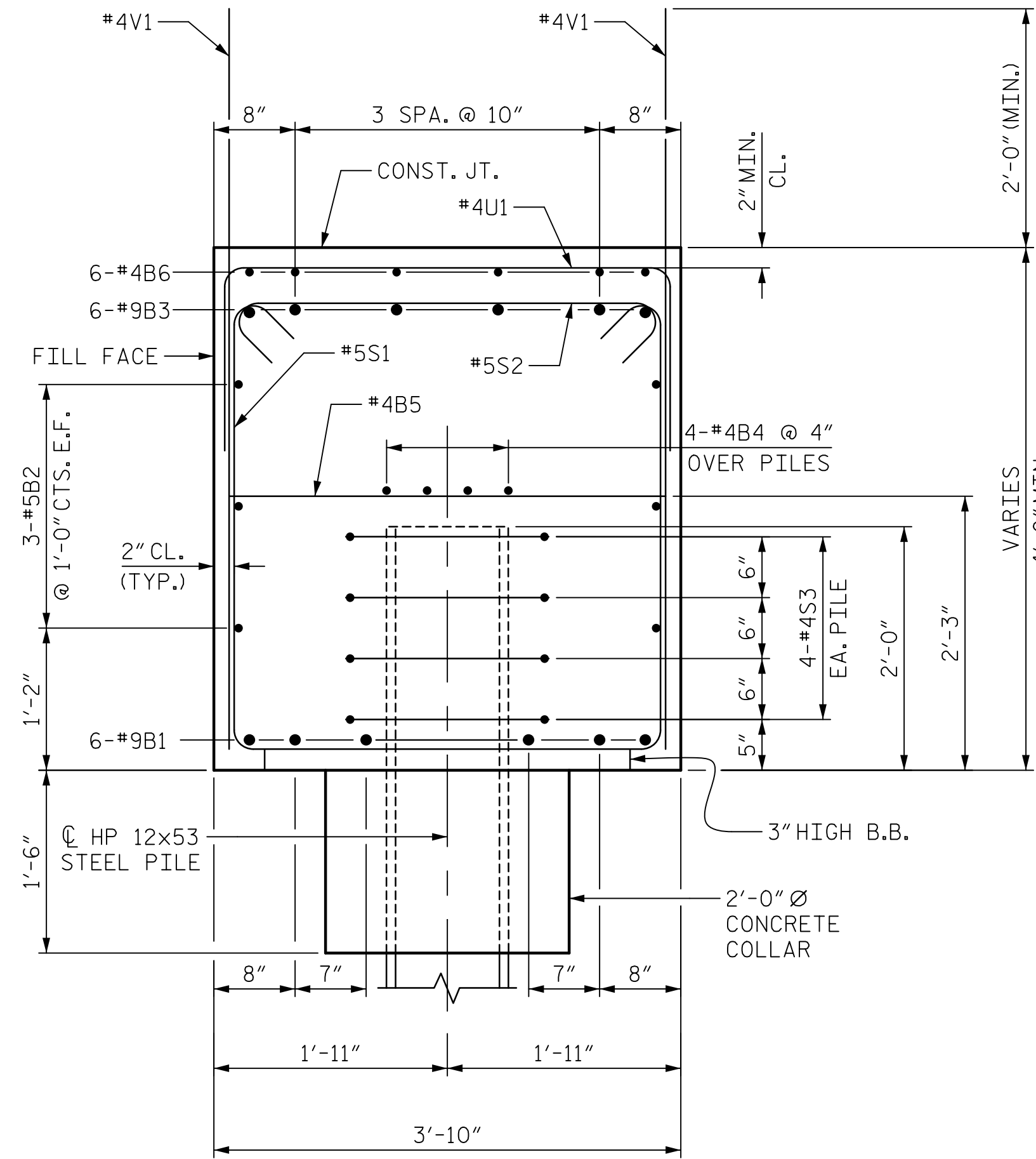
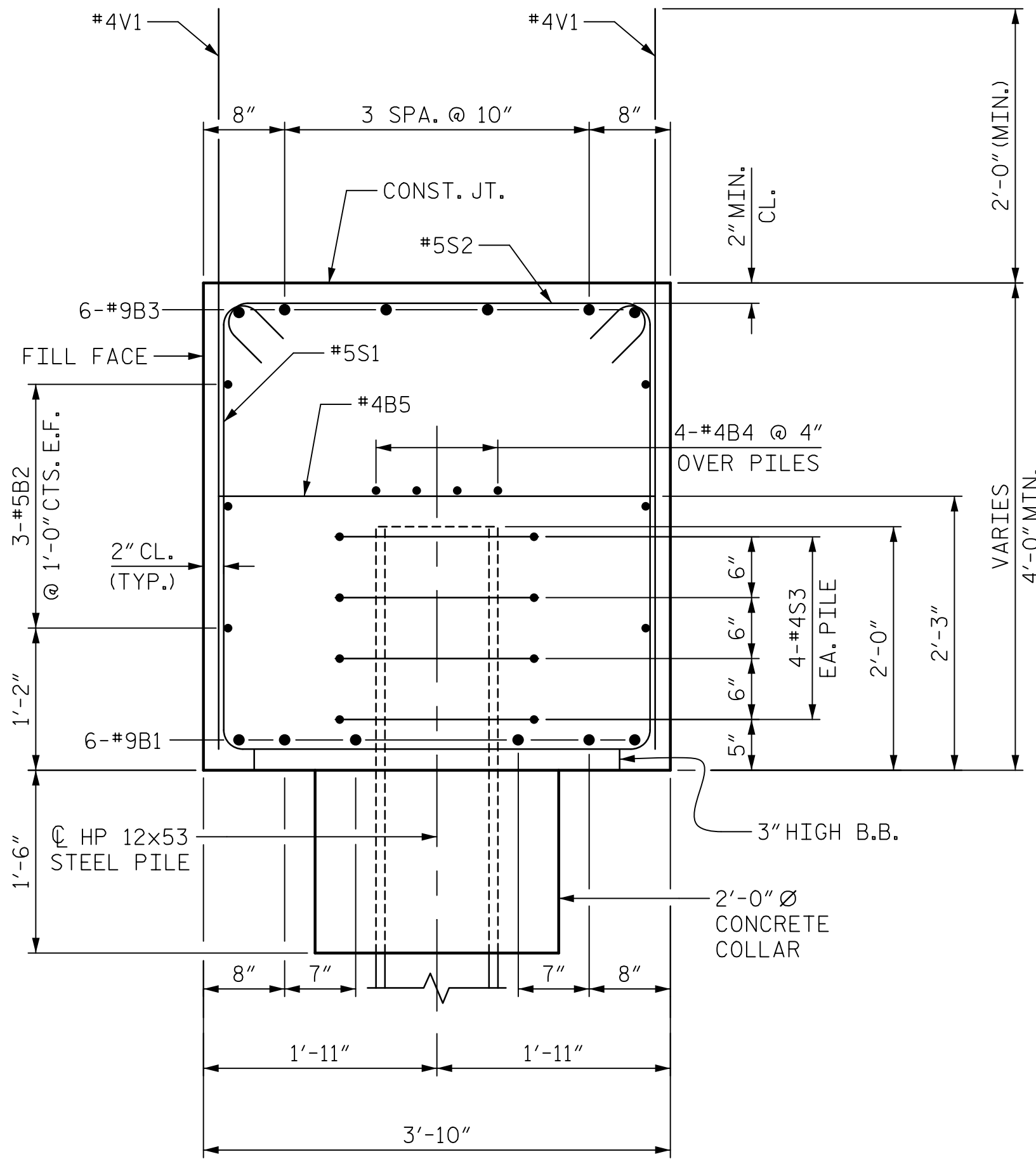
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

TEMPORARY DRAINAGE AT END BENT



BILL OF MATERIAL					
END BENT 2					
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	9	①	57'-10"	1180
B2	6	5	STR	55'-4"	346
B3	6	9	①	57'-10"	1180
B4	8	4	STR	28'-10"	154
B5	15	4	STR	3'-6"	35
B6	6	4	STR	24'-7"	99
B7	6	4	STR	3'-3"	13
H1	21	6	⑥	14'-9"	465
H2	21	6	⑥	14'-8"	463
H3	21	6	⑦	14'-11"	471
H4	21	6	⑦	14'-10"	468
K1	52	4	STR	3'-6"	122
S1	56	5	③	11'-7"	677
S2	56	5	④	4'-5"	258
S3	36	4	⑤	6'-6"	156
U1	32	4	②	6'-6"	139
V1	80	4	STR	6'-6"	347
V2	12	4	STR	10'-5"	84
V3	28	5	STR	6'-9"	197
V4	28	5	STR	5'-9"	168
V5	12	4	STR	10'-3"	82
V6	26	5	STR	6'-8"	181
V7	26	5	STR	5'-9"	156
TOTAL REINFORCING STEEL					7,441 LBS.
CLASS A CONCRETE					
POUR #1 (CAP, COLLARS & LOWER WINGWALLS)					39.0 C.Y.
POUR #2 (UPPER WINGWALL)					8.0 C.Y.
TOTAL =					47.0 C.Y.
HP 12x53 STEEL PILES:					
NO. = 9					LIN. FT. = 585
PILE DRIVE EQUIPMENT SETUP					
NO. = 9					



PROJECT NO. B-5980

NASH COUNTY

STATION: 42+56.82 -Y1-

SHEET 3 OF 3

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 AECOM License No. F-0342

6/21/2019  
 NORTH CAROLINA PROFESSIONAL SEAL  
 030474  
 JOHN C. MORRISON  
 ENGINEER  
22FDE142C82F4A8

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

**INTEGRAL END BENT 2**

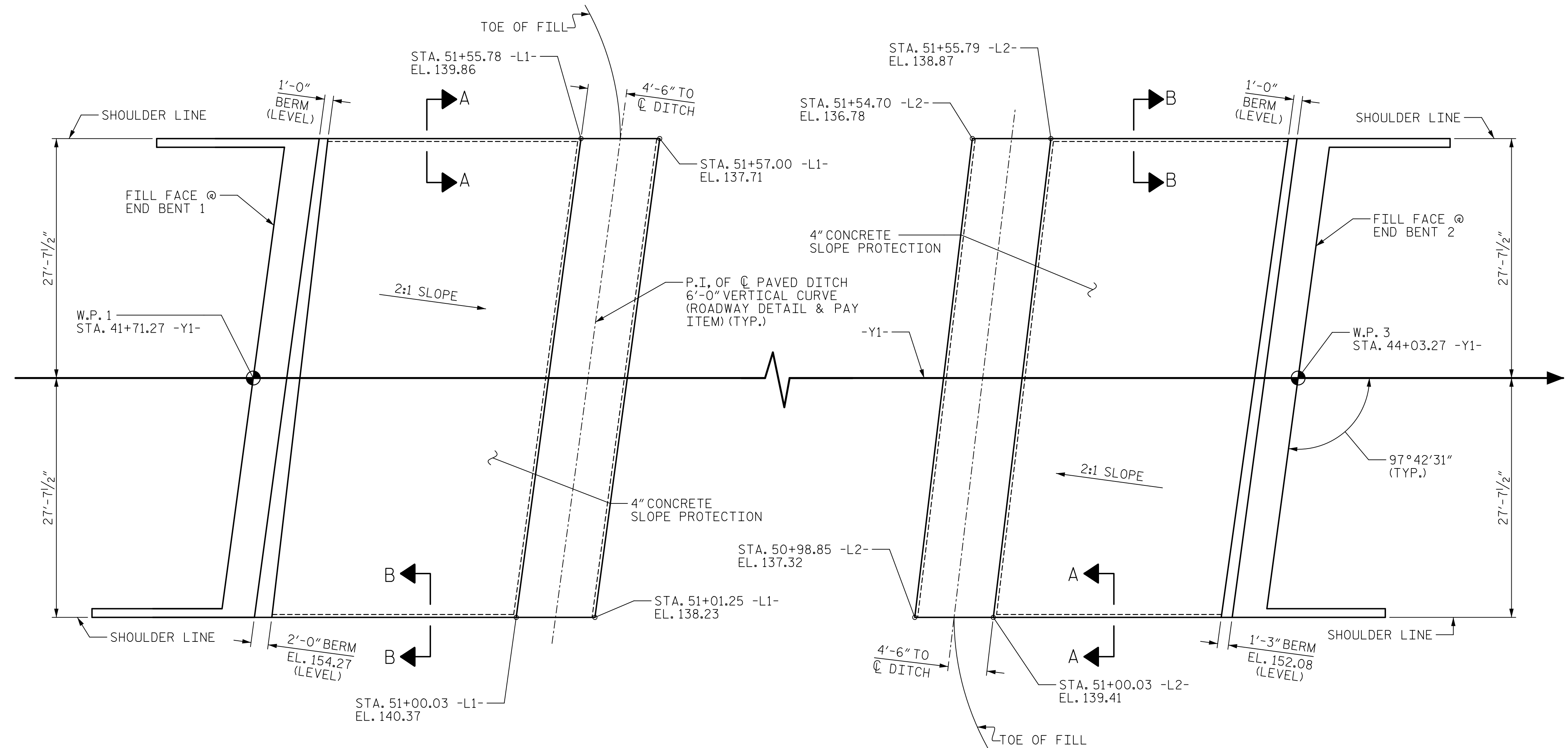
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DRAWN BY : T.B. STUMP DATE : 04/2019  
 CHECKED BY : D. RITACCO DATE : 04/2019  
 DESIGNED BY : D. RITACCO DATE : 04/2019  
 DESIGN CHECKED BY : J.C. MORRISON DATE : 04/2019

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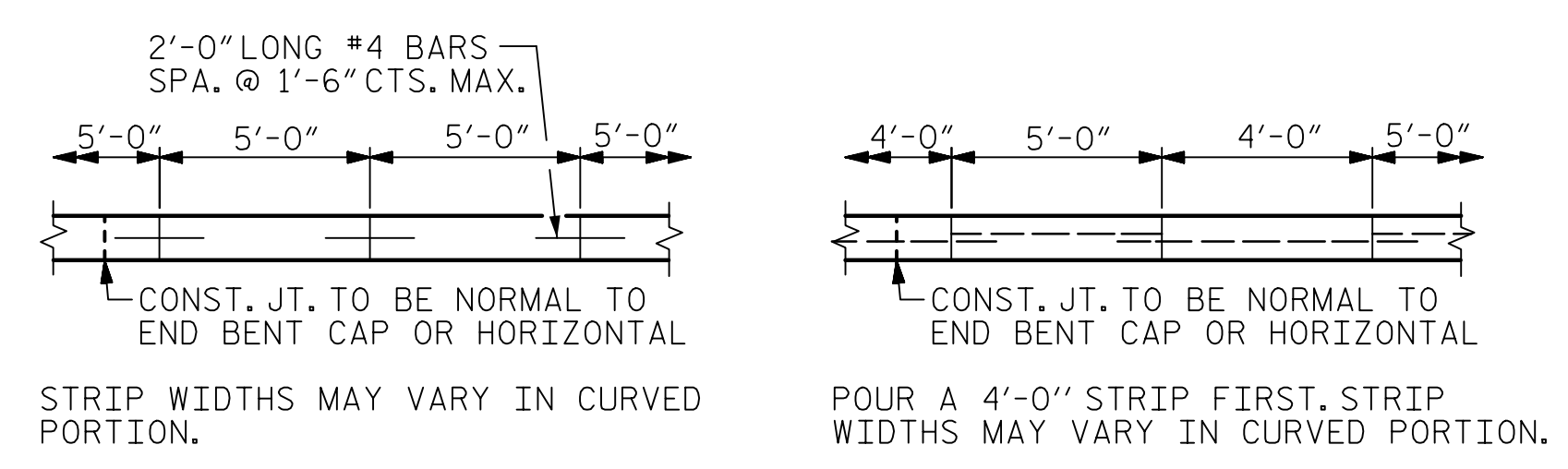
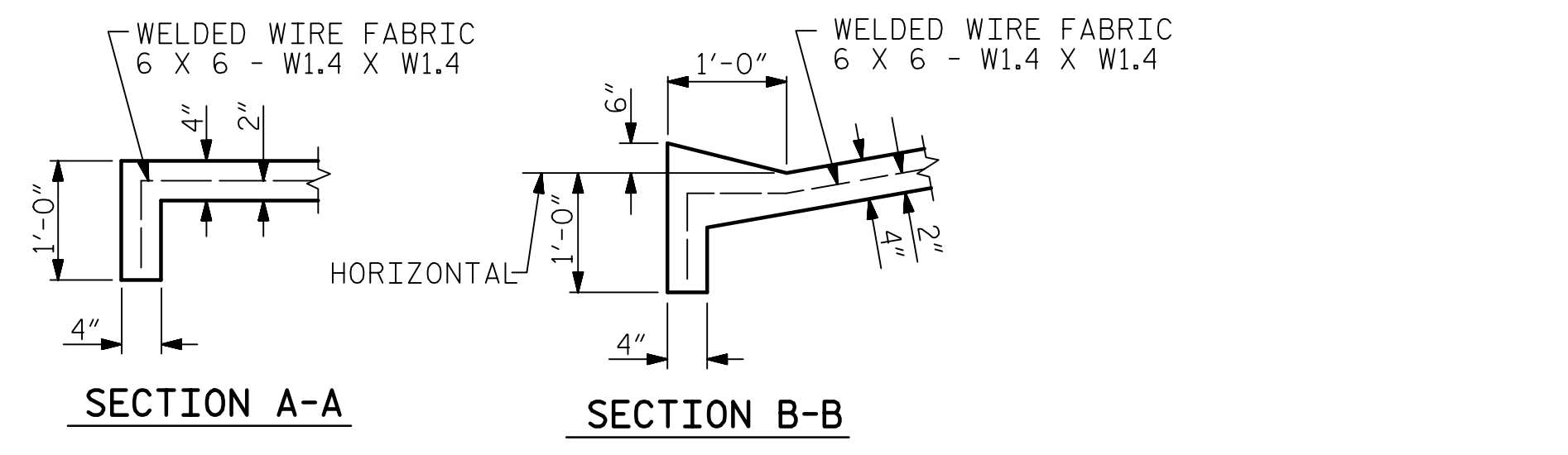
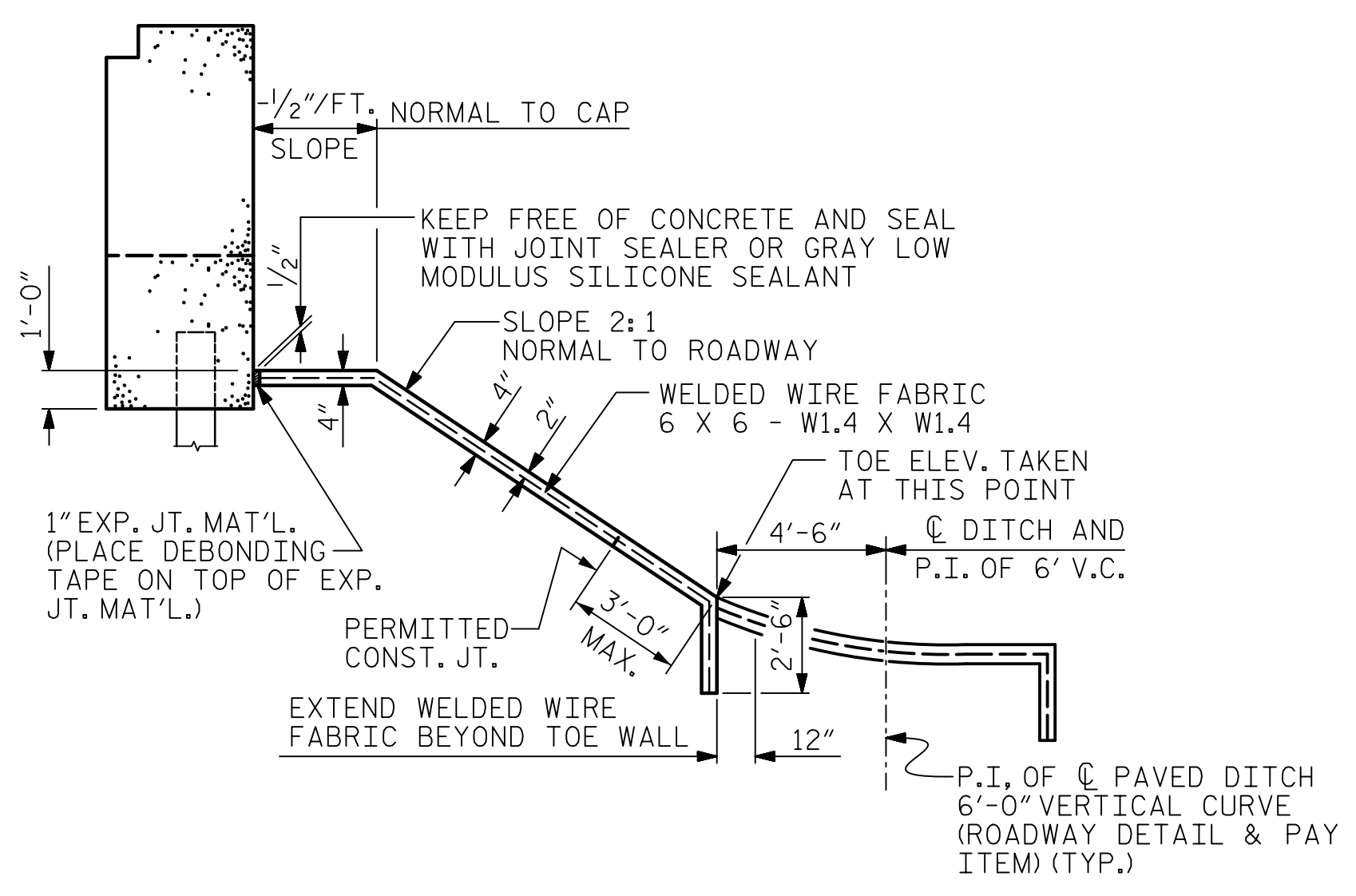
**NOTES**

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 42+56.82 -Y1-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	206	371
END BENT 2	191	373

\* QUANTITY SHOWN IS BASED ON 5' POURS.



PROJECT NO. B-5980  
NASH COUNTY  
 STATION: 42+56.82 -Y1-  
 SHEET 1 OF 2

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6/21/2019  
 NORTH CAROLINA PROFESSIONAL SEAL  
 030474  
 JOHN C. MORRISON  
 ENGINEER  
 A2FDE142C82F4A8

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
**SLOPE PROTECTION DETAILS**

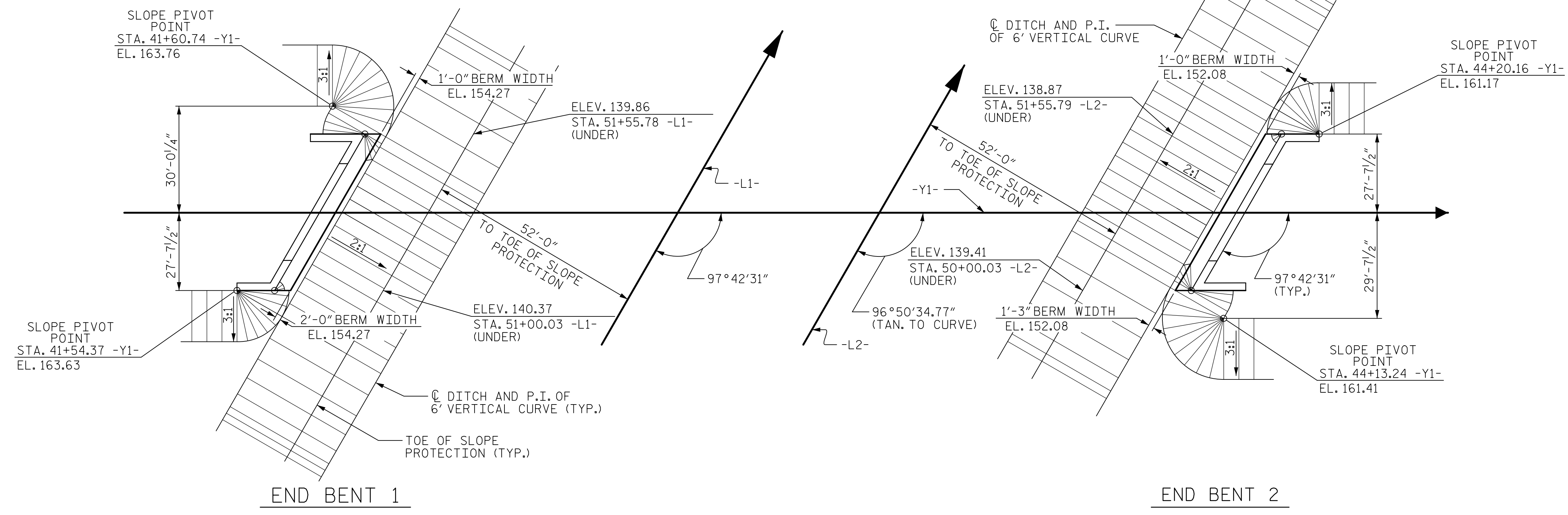
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ASSEMBLED BY : T.B. STUMP	DATE : 02/2019
CHECKED BY : J.C. MORRISON	DATE : 02/2019
DRAWN BY : ELR 5/92	REV. 12/21/11 MAA/GM
CHECKED BY : GRP 6/92	REV. 1/16 MAA/TMG
	REV. 12/17 MAA/THC

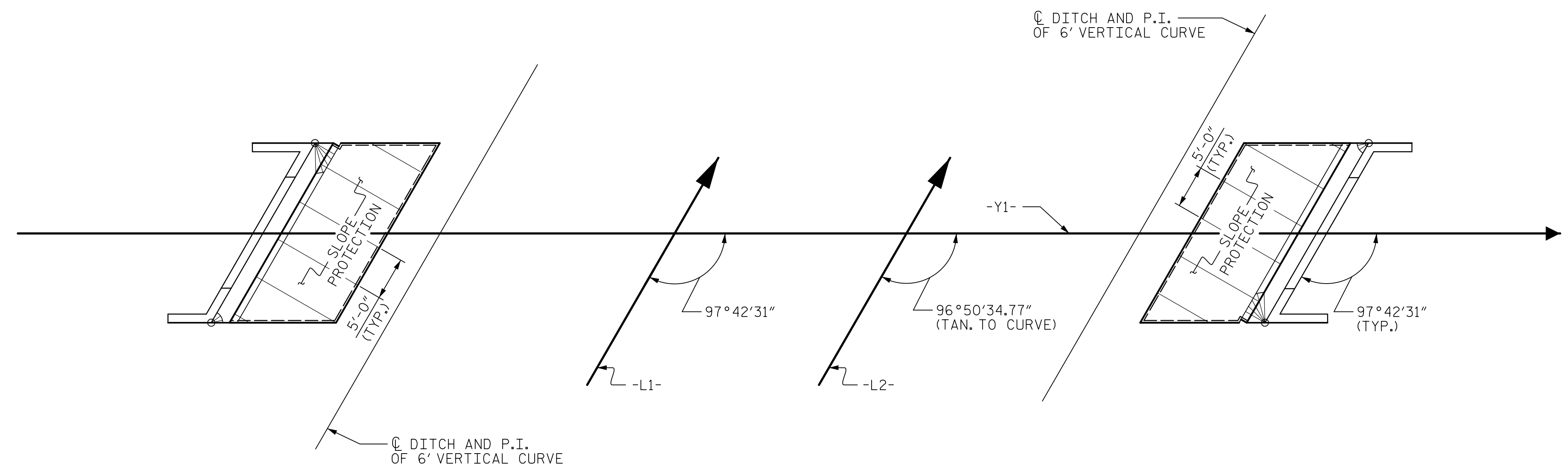
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PLAN - GRADING



PLAN - CONCRETE PLACEMENT

PROJECT NO. B-5980  
NASH COUNTY  
 STATION: 42+56.82 -Y1-

SHEET 2 OF 2

ASSEMBLED BY : T.B. STUMP	DATE : 02/2019
CHECKED BY : J.C. MORRISON	DATE : 02/2019
DRAWN BY : WJH 10/88	REV. 10/1/11 MAA/GM
CHECKED BY : FCJ 10/88	REV. 1/16 MAA/TMG
	REV. 12/17 MAA/THC

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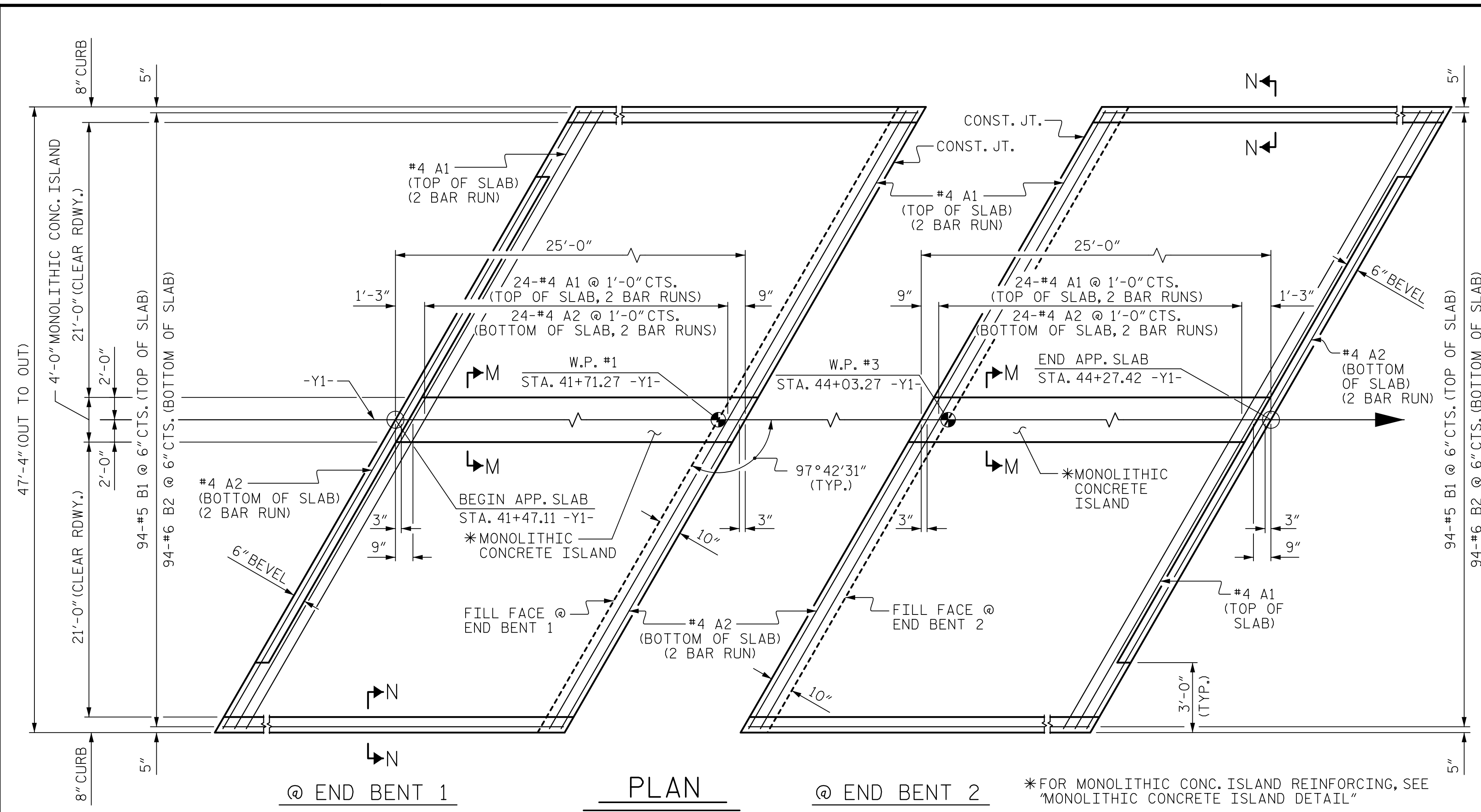
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 030474  
 ENGINEER  
 JOHN C. MORRISON  
DocuSign Envelope ID: 833D0891-5EE2-48A8-9C32-96B275F664F4  
 John C. Morrison  
A2FDE142C82F4A8...

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
SLOPE PROTECTION DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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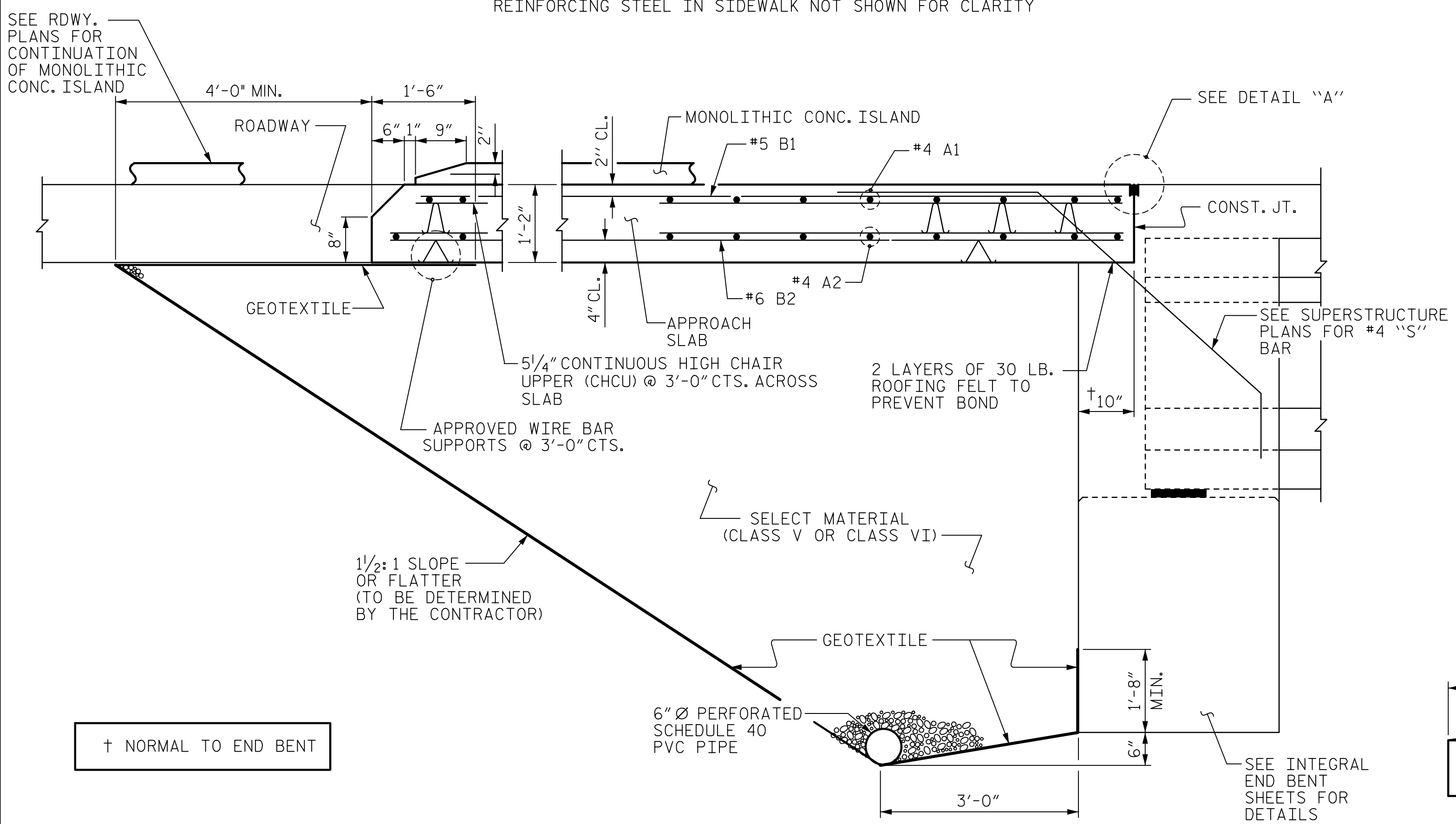
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PLAN @ END BENT 1 @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS  
REINFORCING STEEL IN SIDEWALK NOT SHOWN FOR CLARITY

\*FOR MONOLITHIC CONC. ISLAND REINFORCING, SEE  
"MONOLITHIC CONCRETE ISLAND DETAIL"



SECTION THRU SLAB  
(TYPE I - STANDARD APPROACH FILL)

ASSEMBLED BY : K.J. MUENCH	DATE : 02/2019
CHECKED BY : D. RITACCO	DATE : 02/2019
DRAWN BY : TLA 10/05	REV. 12/21/11 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

NOTES

- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, AND SELECT MATERIAL, SEE ROADWAY PLANS.
- GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.
- SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.
- SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.
- FOR THE 6" 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.
- 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.
- AT THE CONTRACTORS OPTION, "TYPE A - ALTERNATE APPROACH FILL" IN LIEU OF "TYPE I - STANDARD APPROACH FILL" MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT. SEE SHEET 2 OF 2 FOR DETAILS AND NOTES.
- THE MONOLITHIC CONCRETE ISLAND SHALL NOT BE CAST UNTIL APPROACH SLAB CONCRETE HAS BEEN CAST AND REACHES A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
- ALL REINFORCING STEEL IN MONOLITHIC CONCRETE ISLAND SHALL BE EPOXY COATED.
- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE MONOLITHIC CONCRETE ISLAND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN JOINTS IN APPROACH SLAB. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.
- PAYMENT FOR THE MONOLITHIC CONCRETE ISLAND SHALL BE INCLUDED IN UNIT PRICE FOR "APPROACH SLAB".

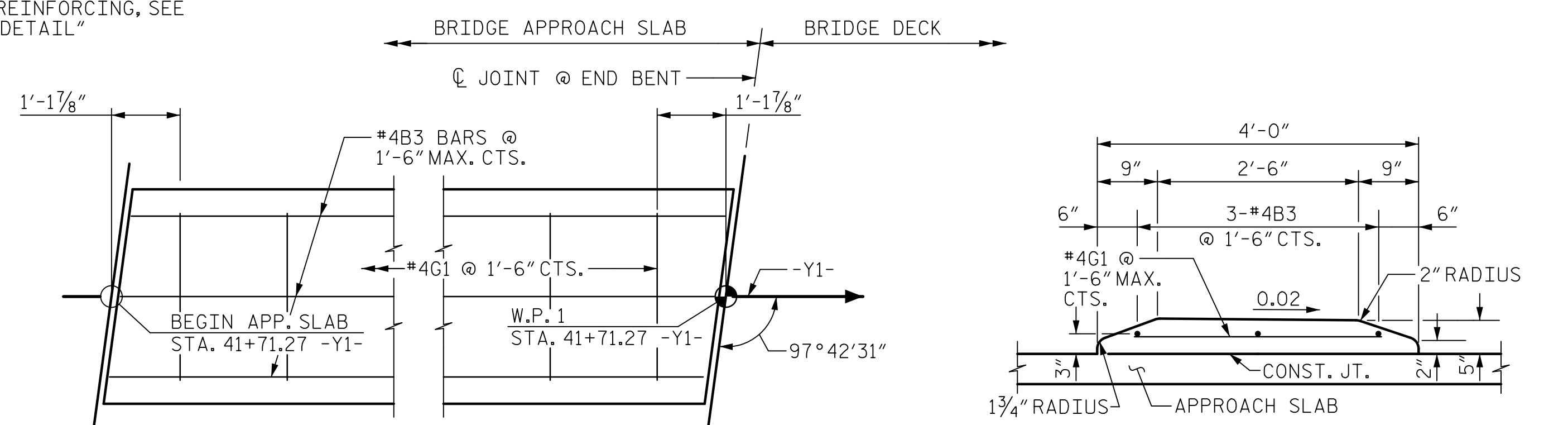
BILL OF MATERIAL

FOR ONE APPROACH SLAB  
(2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	52	4	STR	24'-9"	860
A2	52	4	STR	24'-7"	854
* B1	94	5	STR	24'-2"	2369
B2	94	6	STR	24'-8"	3483
* B3	3	4	STR	23'-4"	47
* G1	15	4	STR	3'-0"	30
REINFORCING STEEL					LBS. 4,337
* EPOXY COATED REINFORCING STEEL					LBS. 3,306
POUR #1 (SLAB)					50.9
POUR #2 (CONC. ISLAND)					1.3
CLASS AA CONCRETE					C. Y. 52.5

SPLICE LENGTHS

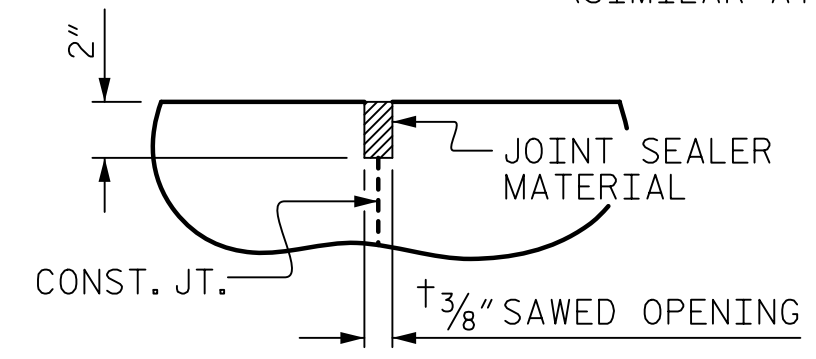
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"



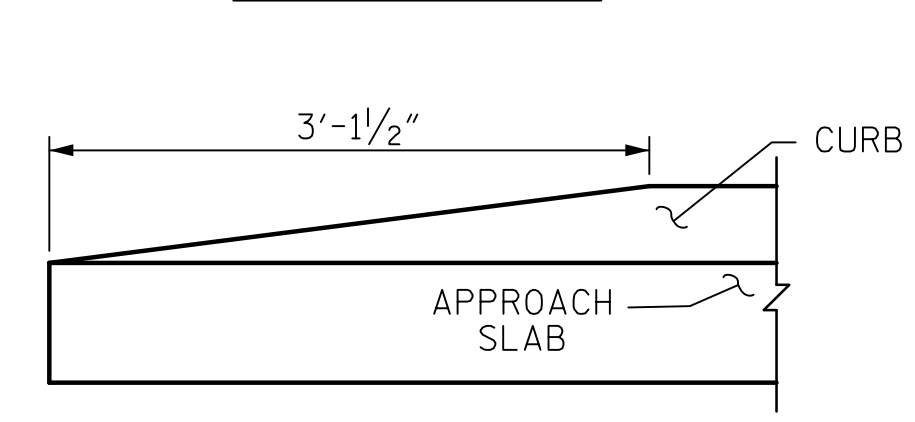
MONOLITHIC CONCRETE ISLAND DETAIL

SHOWN AT END BENT 1  
(SIMILAR AT END BENT 2)

SECTION M-M



DETAIL "A-A"



SECTION N-N

END OF CURB WITHOUT  
SHOULDER BERM GUTTER

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PROJECT NO. B-5980  
NASH COUNTY  
STATION: 42+56.82 -Y1-

SHEET 1 OF 2

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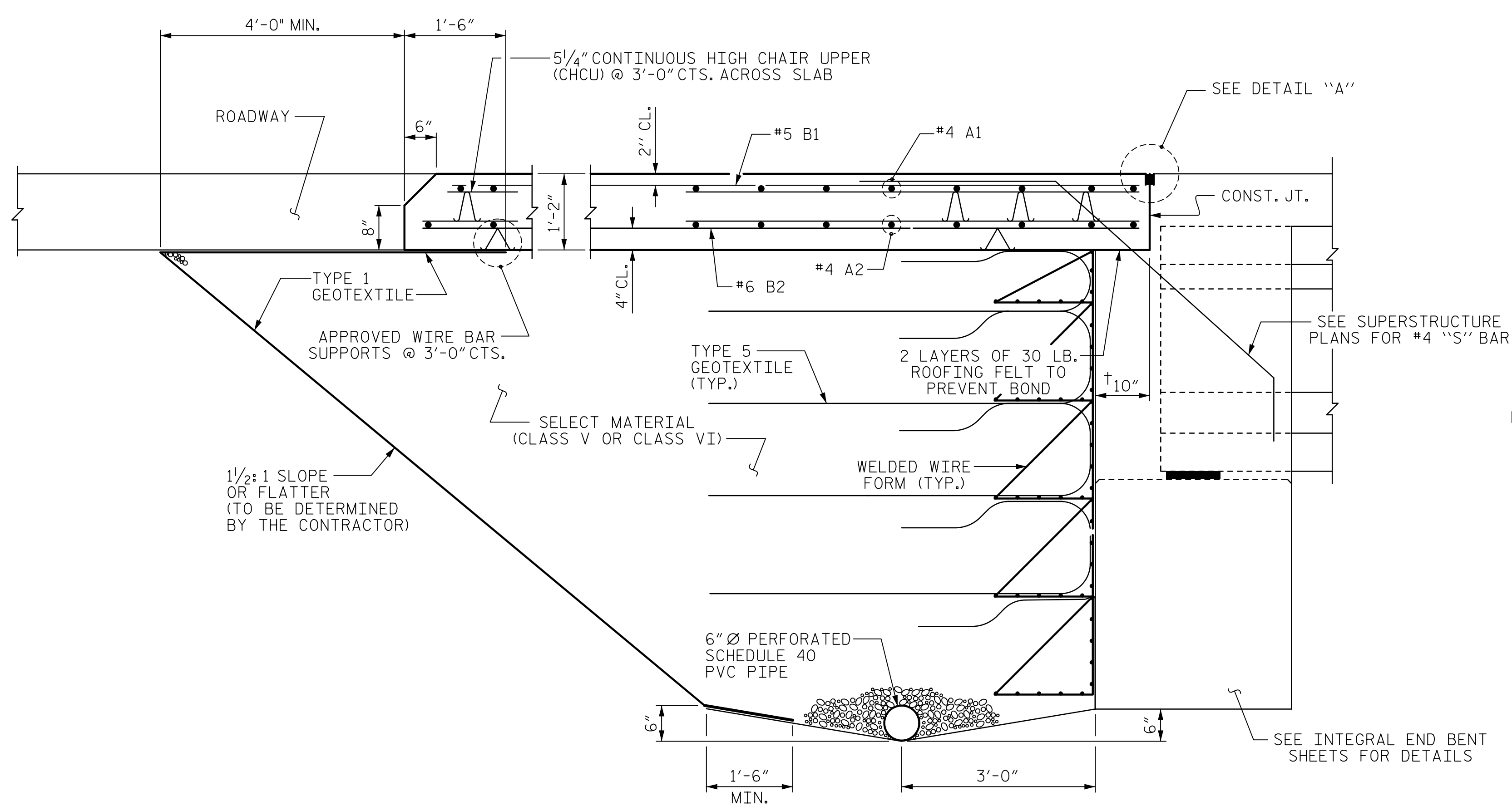
6/21/2019  
NORTH CAROLINA PROFESSIONAL SEAL  
030474  
JOHN C. MORRISON  
ENGINEER  
A2PDE142C82F4A8

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

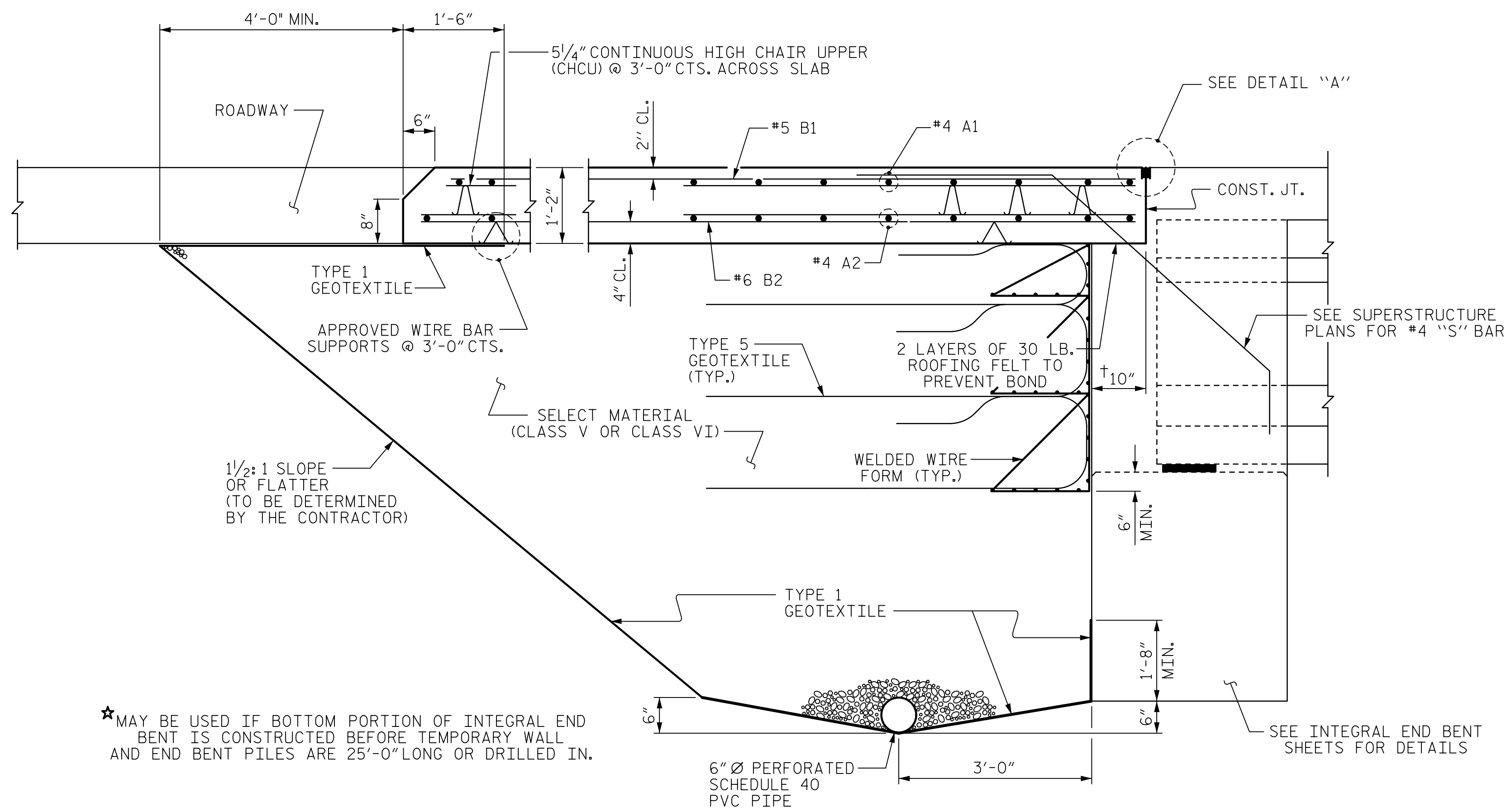
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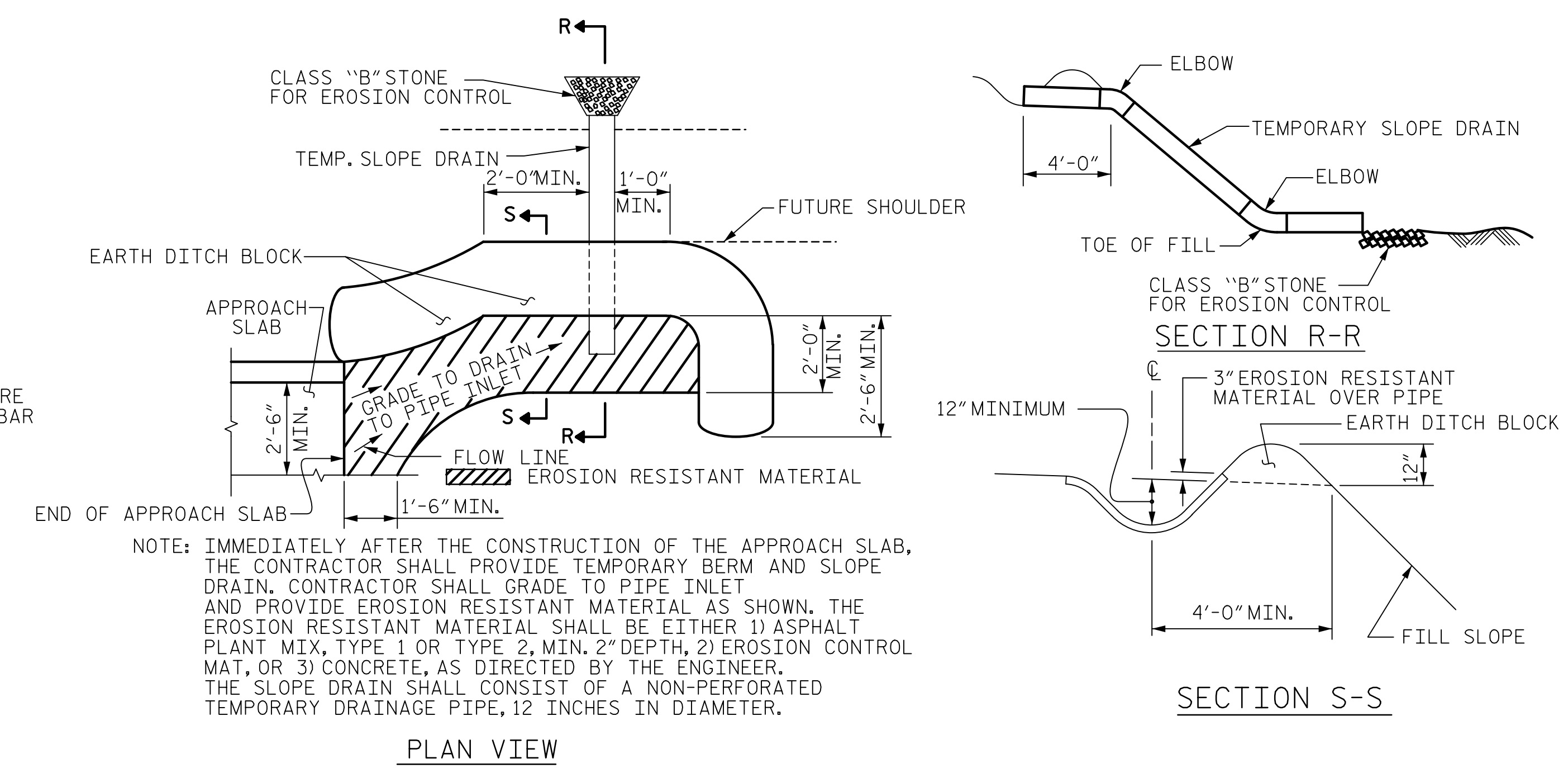
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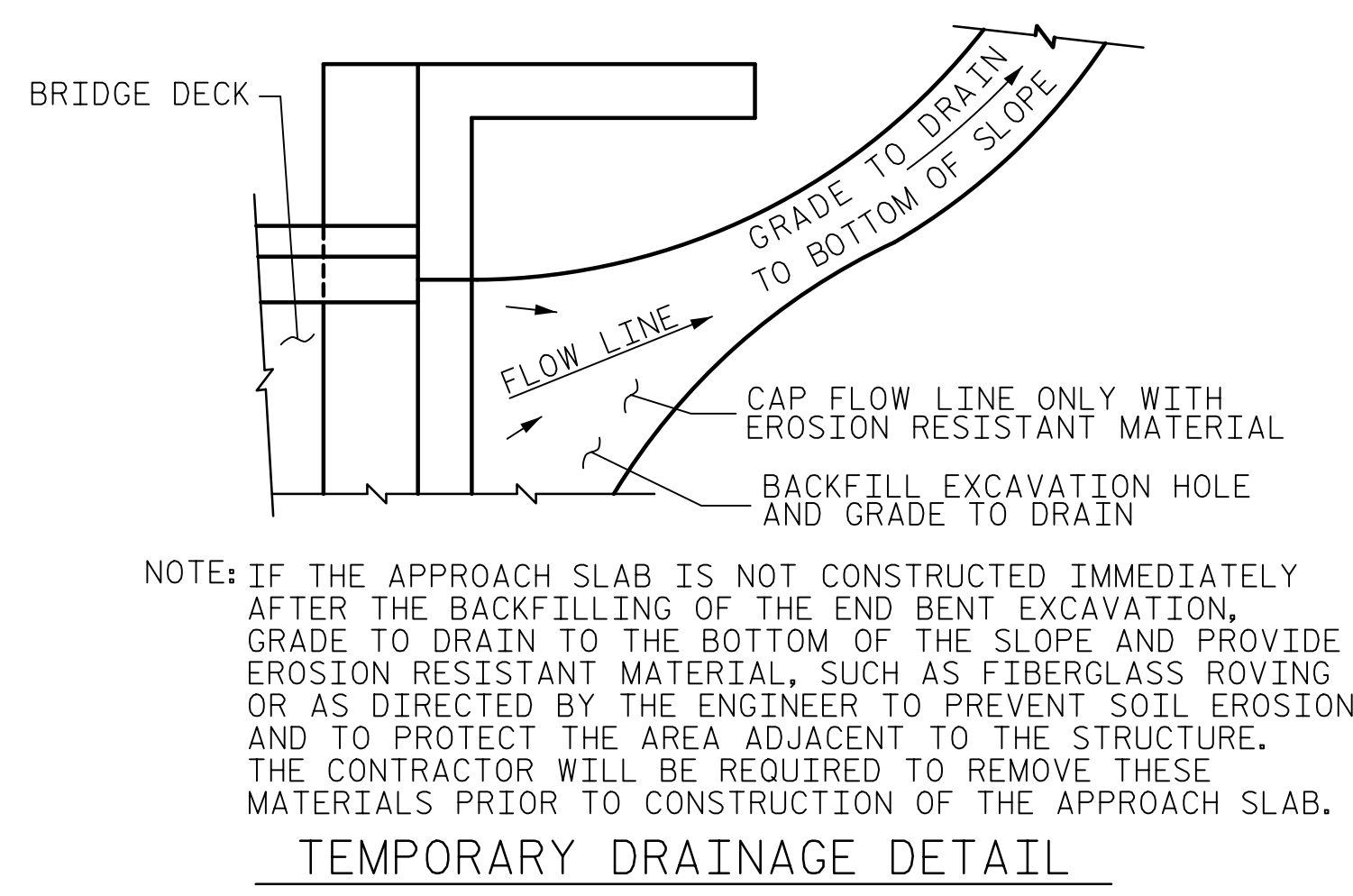
SECTION THRU SLAB  
(TYPE A - ALTERNATE APPROACH FILL)



SECTION THRU SLAB  
(TYPE A - ALTERNATE APPROACH FILL)



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



PROJECT NO. B-5980  
NASH COUNTY  
 STATION: 42+56.82 -Y1-

SHEET 2 OF 2

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 ENGINEER  
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 A2FDE142C82F4A8

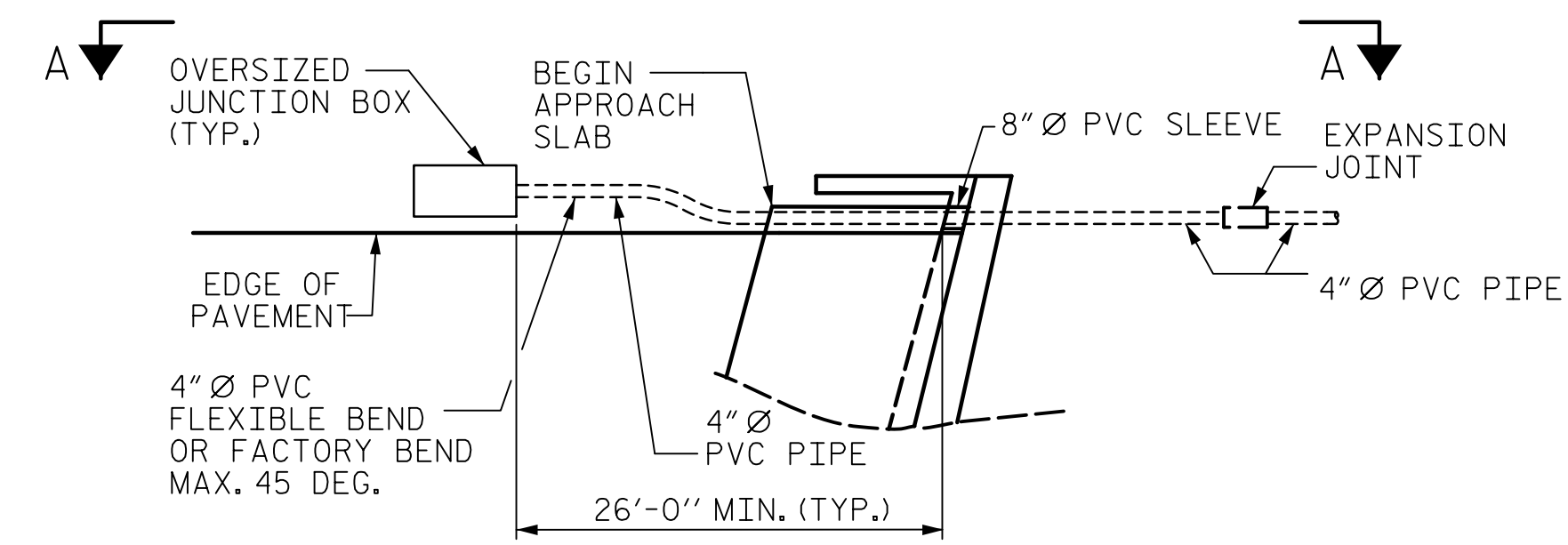
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		
SHEET NO. S-33					TOTAL SHEETS 33

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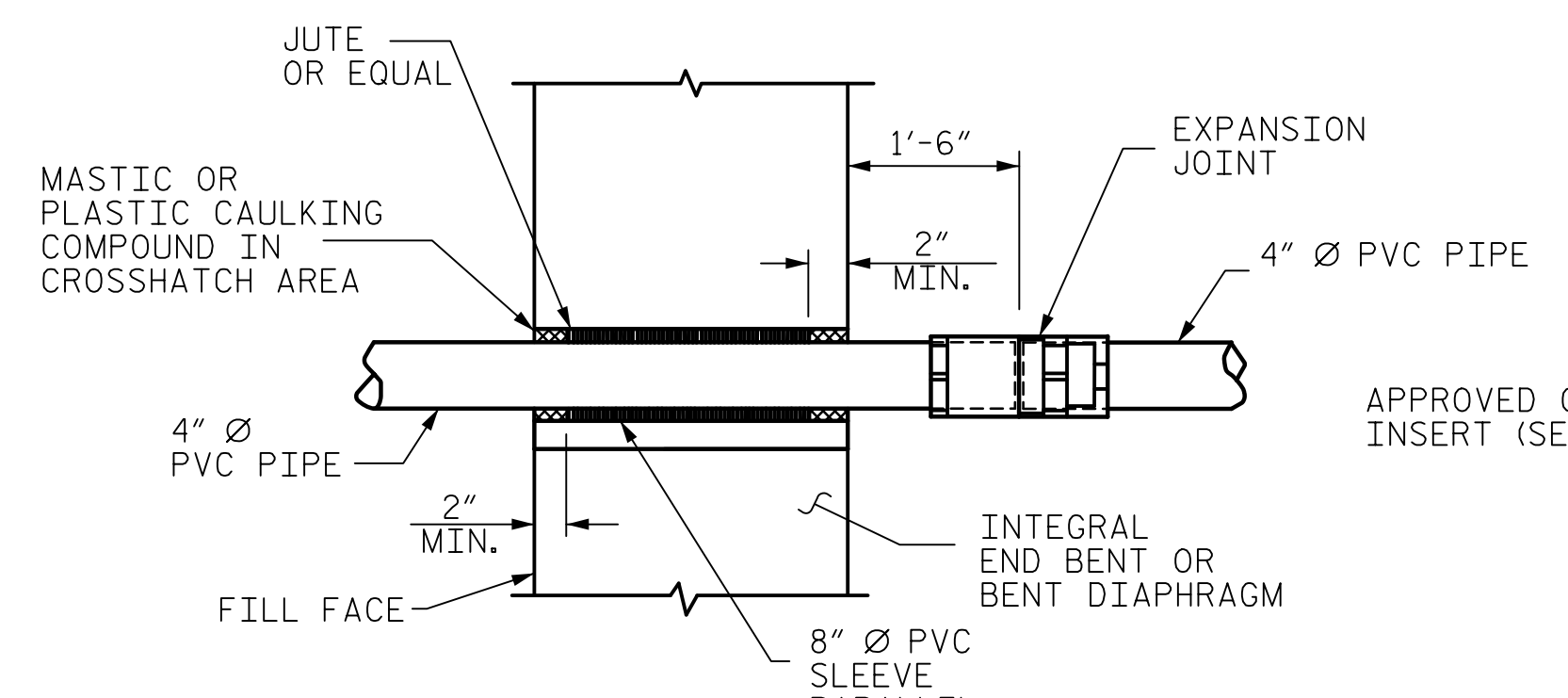
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CHECKED BY : J.C. MORRISON	DATE : 02/2019
DRAWN BY : TLA 10/05	REV. 12/21/11 MAA/GM
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	REV. 12/17 MAA/THC

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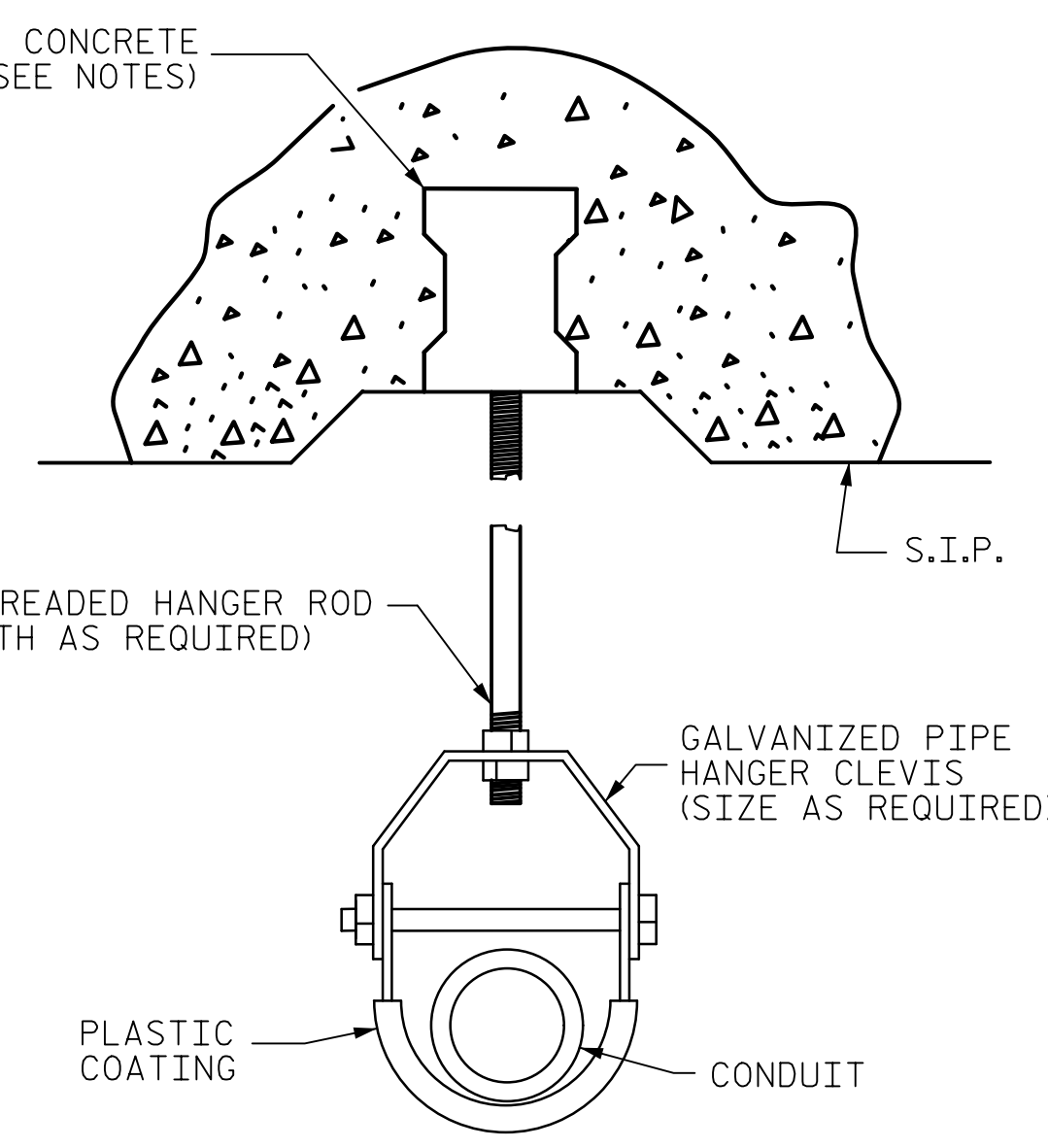
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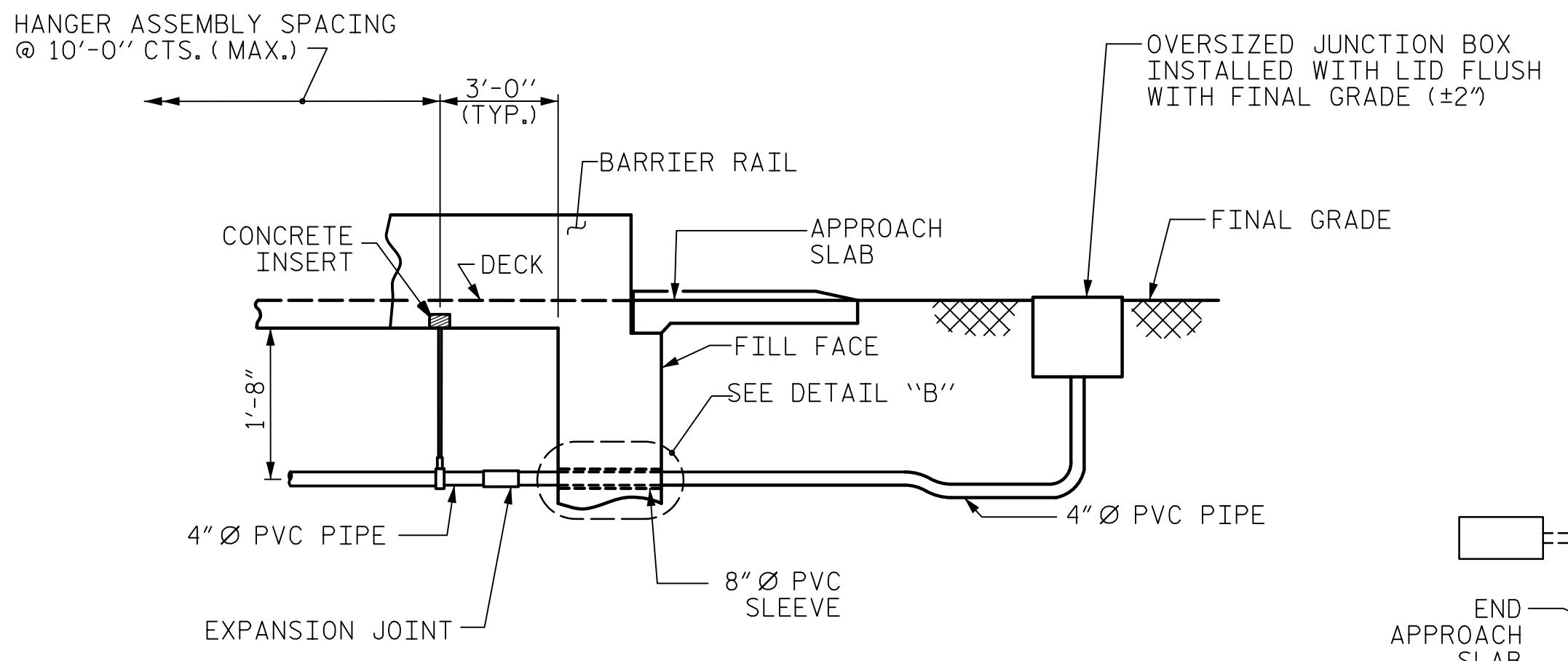
**DETAIL "A"**  
TERMINATION OF CONDUIT AT WING WALL TO OVERSIZED JUNCTION BOX



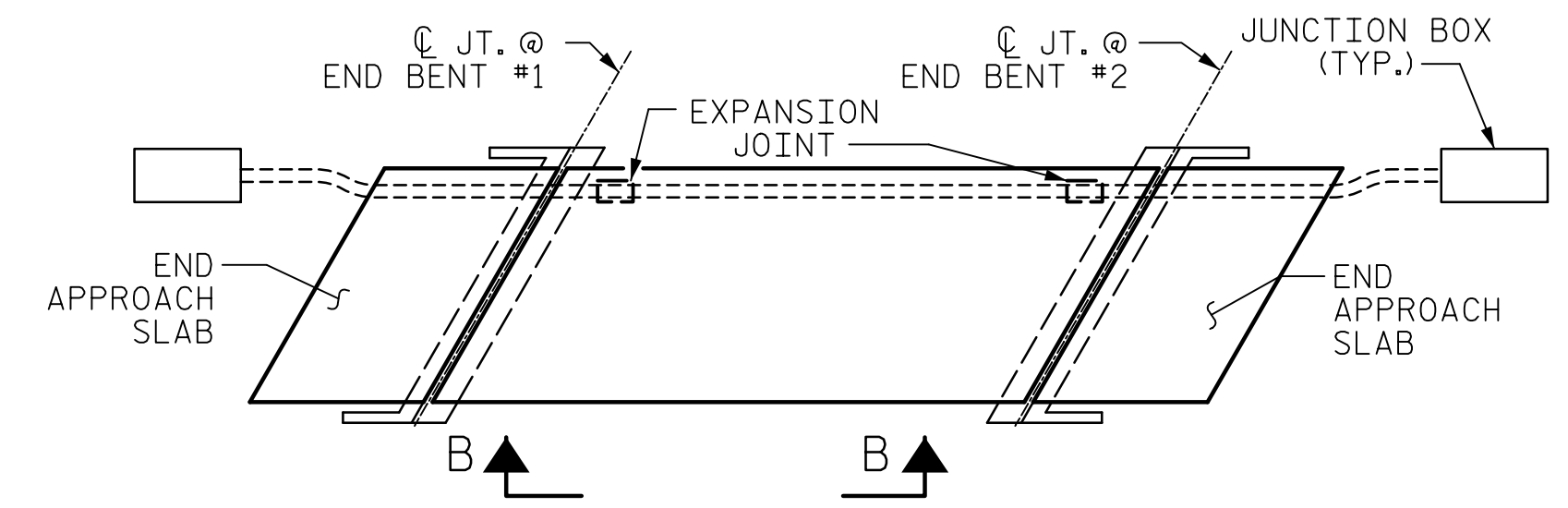
**DETAIL "B"**  
PVC SLEEVE INSTALLATION & EXPANSION JOINT AT BACKWALL



**DETAIL "C"**  
HANGER ASSEMBLY

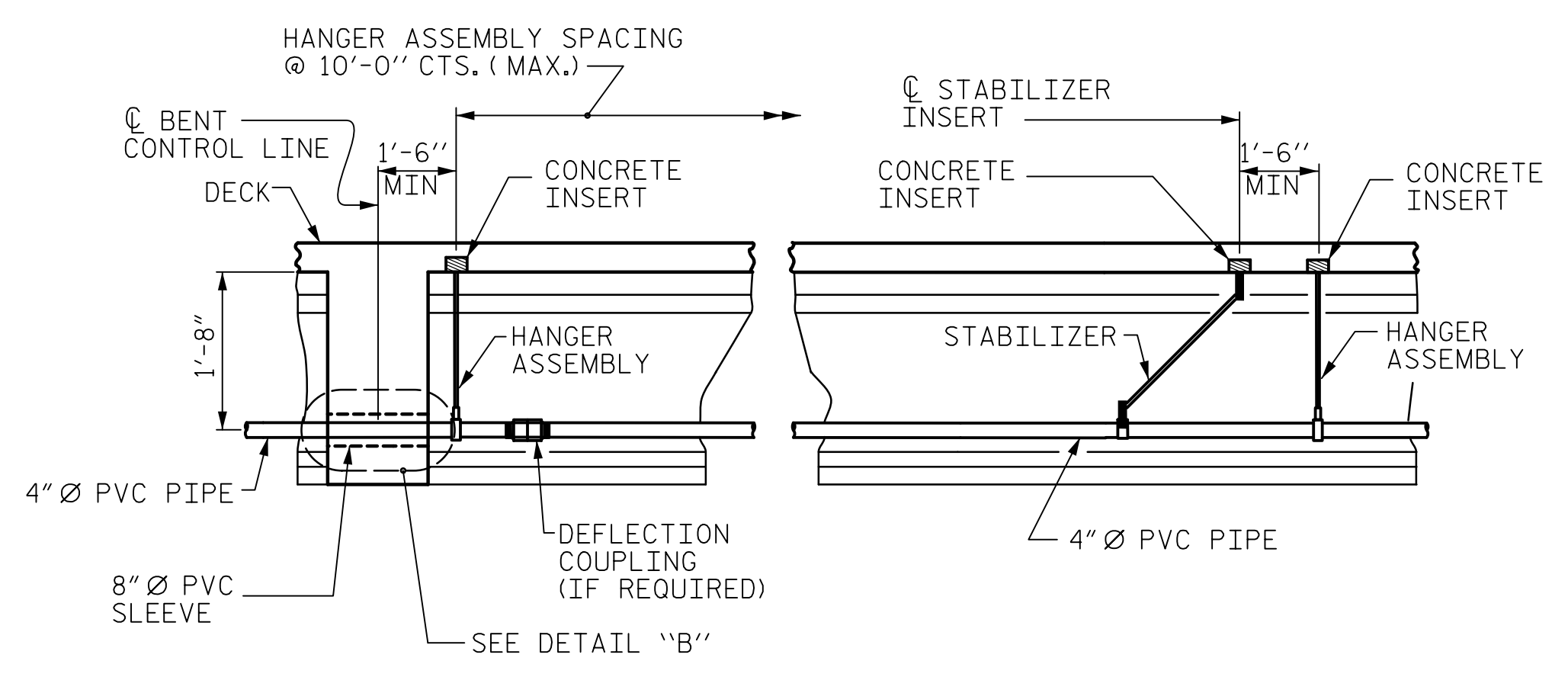


**VIEW A-A**

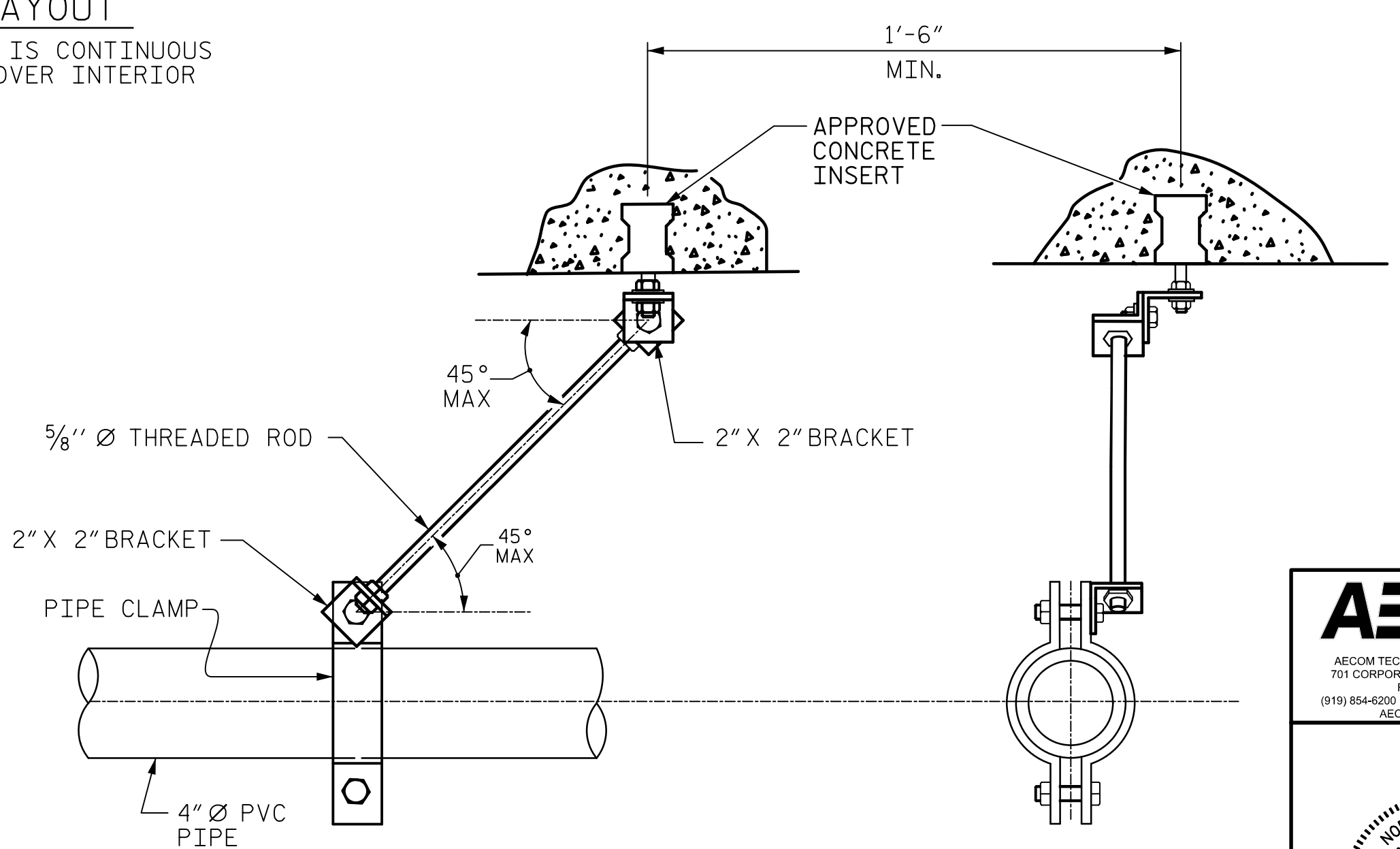


**CONDUIT LAYOUT**

NOTE: SUPERSTRUCTURE IS CONTINUOUS FOR LIVE LOAD OVER INTERIOR BENT.



**VIEW B-B**  
PRESTRESSED GIRDERS CONTINUOUS FOR LIVE LOAD



**DETAIL "E"**  
STABILIZER

**NOTES**

THE INSTALLATION OF THE CONDUIT SYSTEM SHALL BE PAID FOR AS LINEAR FEET. THE PRICE SHALL INCLUDE ALL CONDUIT, HANGERS, STABILIZERS, EXPANSION JOINTS, CONCRETE INSERTS, PVC SLEEVES AND ALL NECESSARY HARDWARE TO COMPLETE THE WORK.

THE CONTRACTOR SHALL FIELD VERIFY THAT THE CONDUIT SYSTEM IS NOT IN CONFLICT WITH THE GUARDRAIL POST.

SEE DETAIL "C" FOR HANGER ASSEMBLY INSTALLATION.

INSTALL SLEEVES PARALLEL TO GIRDERS. SEE DETAIL "B" FOR SLEEVE INSTALLATION.

INSTALL STABILIZERS MIDWAY BETWEEN DECK EXPANSION JOINTS STABILIZER CAN NOT BE INSTEAD OF A HANGER ASSEMBLY.

INSTALL EXPANSION JOINTS AT EACH END BENT.

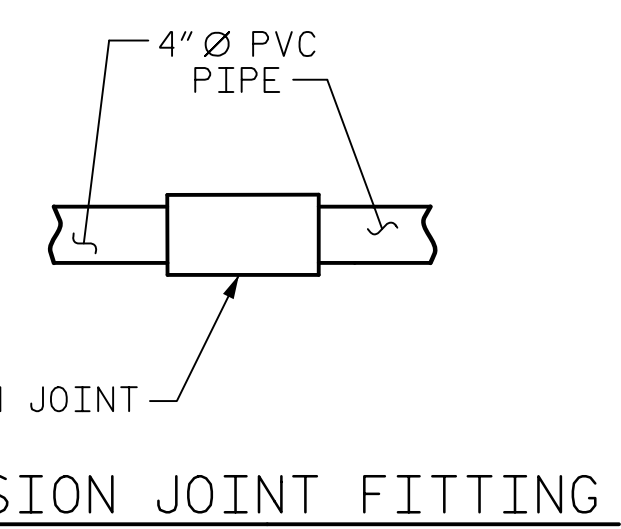
THE CONCRETE SCREW INSERT SHALL HAVE A ROD SIZE OF 5/8" AND A PULL FORCE OF 1260 lbs.

FOR FIBER OPTIC CONDUIT SYSTEM WITH HANGERS, SEE SPECIAL PROVISIONS.

PVC PIPE AND COUPLINGS SHALL BE SCHEDULE 80.

FOR OVERSIZED JUNCTION BOX, SEE ARTICLE 1098-5 OF THE STANDARD SPECIFICATIONS.

PAY LENGTH = 284 LINEAR FEET



**EXPANSION JOINT FITTING**

PROJECT NO. B-5980  
NASH COUNTY  
 STATION: 42+56.82 -Y1-

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3/17/2020  
 NORTH CAROLINA PROFESSIONAL SEAL 030474  
 ENGINEER JOHN C. MORRISON  
DocuSigned by: John C. Morrison 42FE14AC82E48E

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE FIBER OPTIC CONDUIT SYSTEM WITH HANGERS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-34					TOTAL SHEETS 34

DRAWN BY : T.B. STUMP	DATE : 3/2020
CHECKED BY : J.C. MORRISON	DATE : 3/2020
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**ELECTRIC CONDUIT DETAILS**

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

## 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.
	--	27,000 LBS. PER SQ. IN.
	--	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 2018 "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  $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO  $1\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A  $\frac{1}{4}$ " 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  $\frac{1}{4}$ " 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  $\frac{7}{8}$ "  $\emptyset$  SHEAR STUDS FOR THE  $\frac{3}{4}$ "  $\emptyset$  STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 -  $\frac{7}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF  $\frac{7}{8}$ "  $\emptyset$  STUDS ALONG THE BEAM AS SHOWN FOR  $\frac{3}{4}$ "  $\emptyset$  STUDS BASED ON THE RATIO OF 3 -  $\frac{7}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  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  $\frac{3}{16}$ " 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  $\frac{1}{16}$ " 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. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

### SPECIAL NOTES:

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

# ENGLISH

JANUARY, 1990

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