TIP PROJECT: B-4654

CONTRACT: C204410

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

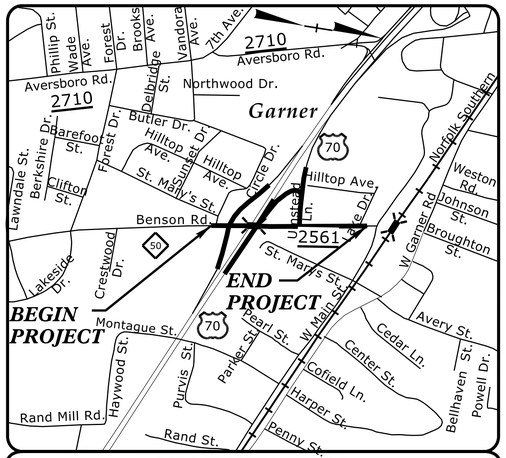
WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4654		

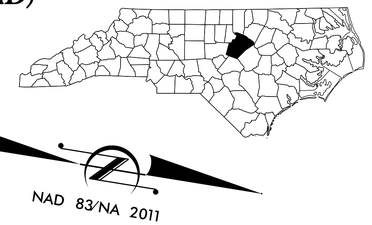
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38454.1.2		PE
38454.2.1		R/W & UTILITIES
38454.3.1	0070245	CONSTRUCTION

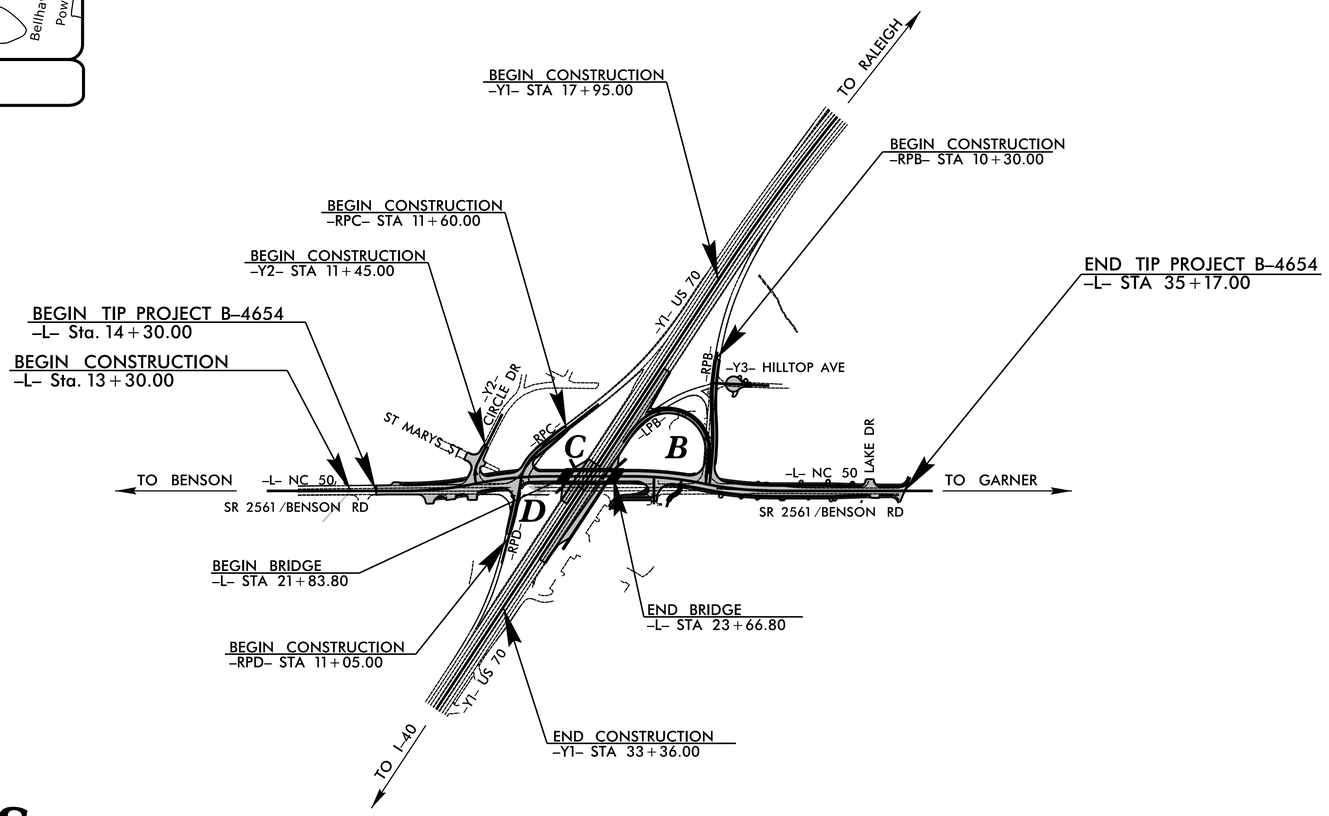
LOCATION: REPLACE BRIDGE 910069 OVER US 70 ON NC 50 (BENSON ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE, RETAINING WALLS & STRUCTURES



VICINITY MAP
NOT TO SCALE





STRUCTURES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2020 = 13,420
ADT 2040 = 14,700
K = 10%
D = 55%
T = 6 % *
V = 40 MPH
* TTST =1% DUAL 5%
FUNC CLASS = MINOR ARTERIAL REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–4654 = 0.361 MILES

LENGTH BRIDGE TIP PROJECT B–4654 = 0.035 MILES

TOTAL LENGTH OF TIP PROJECT B–4654 = 0.396 MILES

Prepared in the Office of:
AECOM
NC FIRM LICENSE No: F-0342
5438 Wade Park Blvd., Suite 200
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 2, 2018

LETTING DATE:
APRIL 16, 2024

JOHN C. MORRISON, PE
PROJECT ENGINEER

EDWARD G. EDENS JR., PE
PROJECT DESIGN ENGINEER

DAVID S. STUTTS, PE
NCDOT CONTACT

STRUCTURE DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON
C957B167F93242D...
1/11/2024

JOHN C. MORRISON P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

F.A. PROJECT NO. 0070245

21+00 21+50 22+00 22+50 23+00 23+50 24+00 24+50

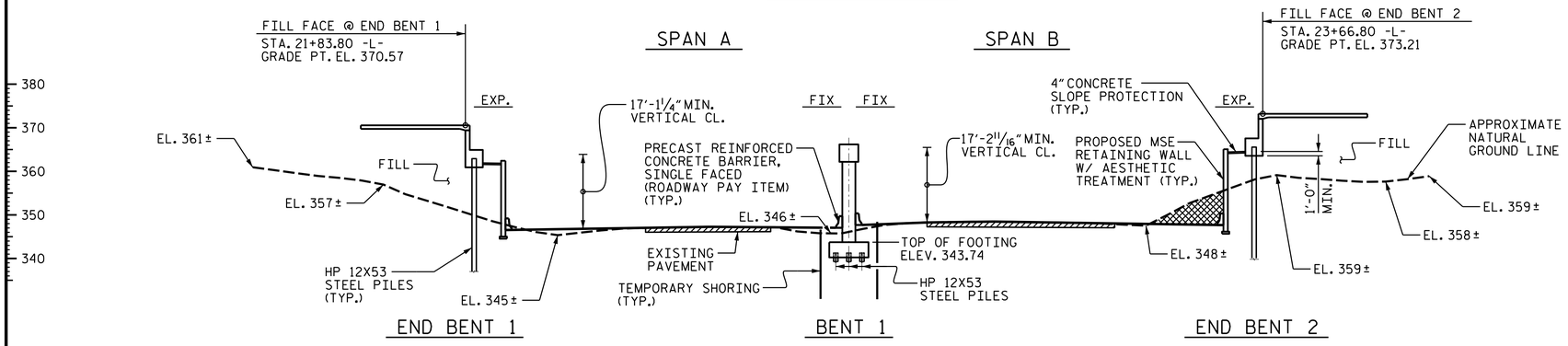
(+)4.4000% (-)1.5000%
PI = 22+75.00
EL = 374.75'
VC = 260'

GRADE DATA -L-

UNCLASSIFIED STRUCTURE EXCAVATION

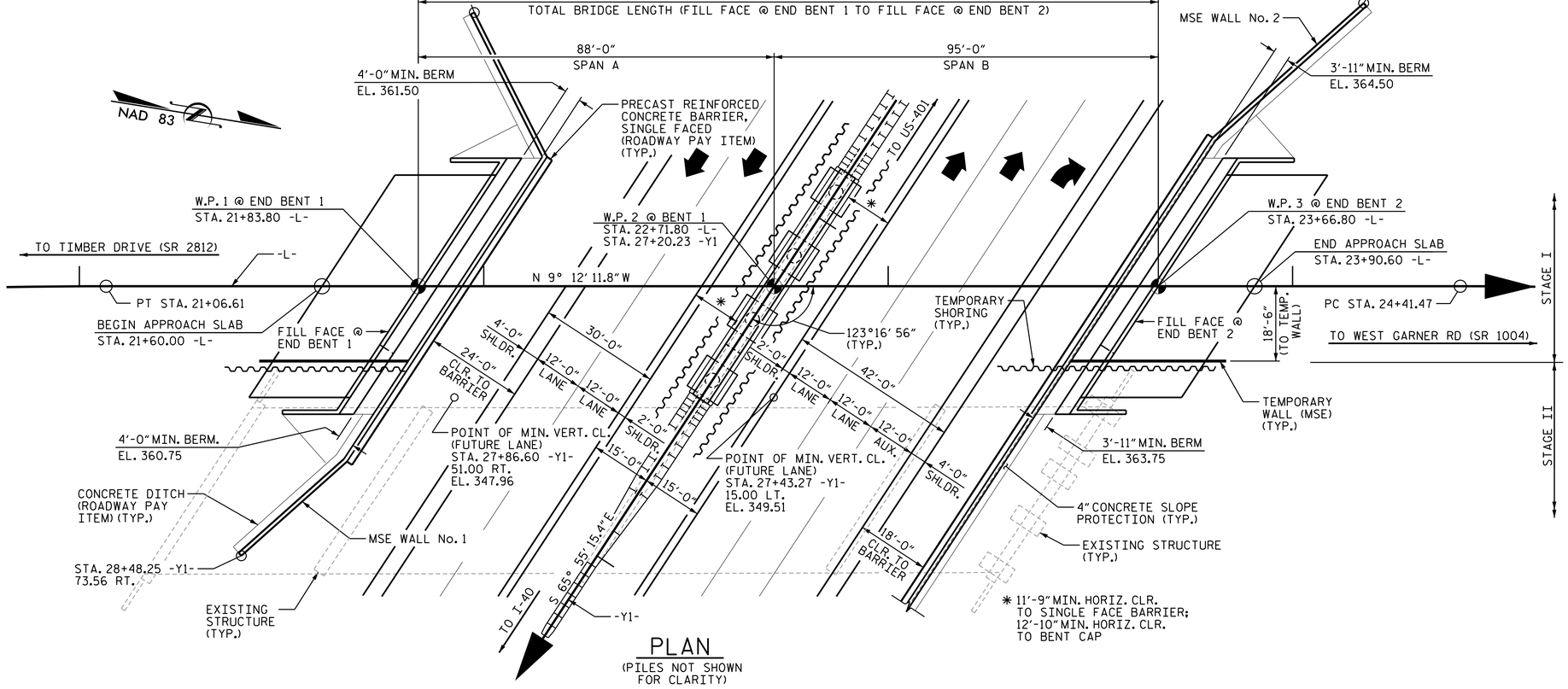
HORIZONTAL CURVE DATA -L-

PI STA. 19+65.61	PI STA. 25+83.43
Δ = 11° 34' 50.6"(RT)	Δ = 11° 34' 50.6"(RT)
D = 4° 05' 33.2"	D = 4° 05' 33.2"
L = 282.97'	L = 282.97'
T = 141.97'	T = 141.97'
R = 1,400.00'	R = 1,400.00'



SECTION ALONG -L-

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



PLAN

(PILES NOT SHOWN FOR CLARITY)

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-
27+20.23 -Y1-

SHEET 1 OF 3 REPLACES BRIDGE NO. 910069

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
5438 WADE PARK BOULEVARD, SUITE 200
RALEIGH, NC 27607
(919) 854-6200 www.aecom.com
AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON
DocuSigned by: John C. Morrison
C957B167F932420...
1/11/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON NC 50 OVER US 70 BETWEEN SR 2812 & SR 1004

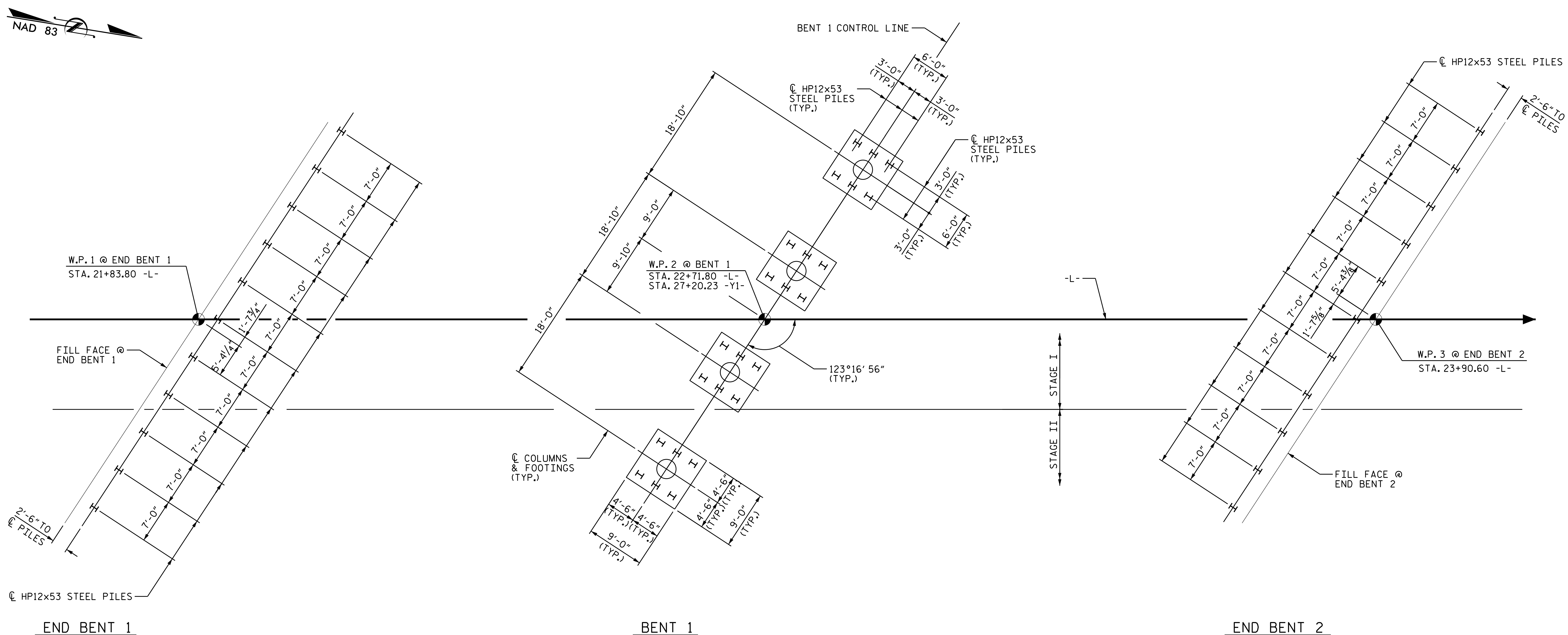
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-01
1			3			TOTAL SHEETS
2			4			49

DRAWN BY : T.B. STUMP DATE : 12/2018
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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DATE: 1/11/2024
TIME: 10:22 PM

USER: cotern
DGN: Z:\Raleigh-USRAL3\agency\Projects\60436195-B-4654\900_Work\910_CADD\10_NCDOT_TIP\Structures\04 Drawings\2022 Updates\400_01_50_B4654_SMU_GD.dgn



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO CENTERLINE OF PILES.
DIMENSIONS LOCATING FOOTINGS ARE SHOWN TO CENTERLINE OF COLUMNS AND FOOTINGS.

FOUNDATION NOTES:

1) FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
2) PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.
3) PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.
4) PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.
5) DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE.
6) DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.
7) DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 185 TONS PER PILE.
8) INSTALL PILES AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 318.0 FT.
9) 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.
10) DYNAMIC PILE TESTING OF THE FIRST PRODUCTION PILE DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. FOR DYNAMIC PILE TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
11) DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 AFTER CONSTRUCTION OF THE MSE WALL.

PROJECT NO. B-4654
WAKE COUNTY
STATION: 22+71.80 -L-
SHEET 2 OF 3

DRAWN BY : K. MUENCH	DATE : 11/2018
CHECKED BY : J.C. MORRISON	DATE : 11/2018
DESIGNED BY : K. MUENCH	DATE : 11/2018
DESIGN CHECKED BY : J.C. MORRISON	DATE : 11/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON
1/11/2024

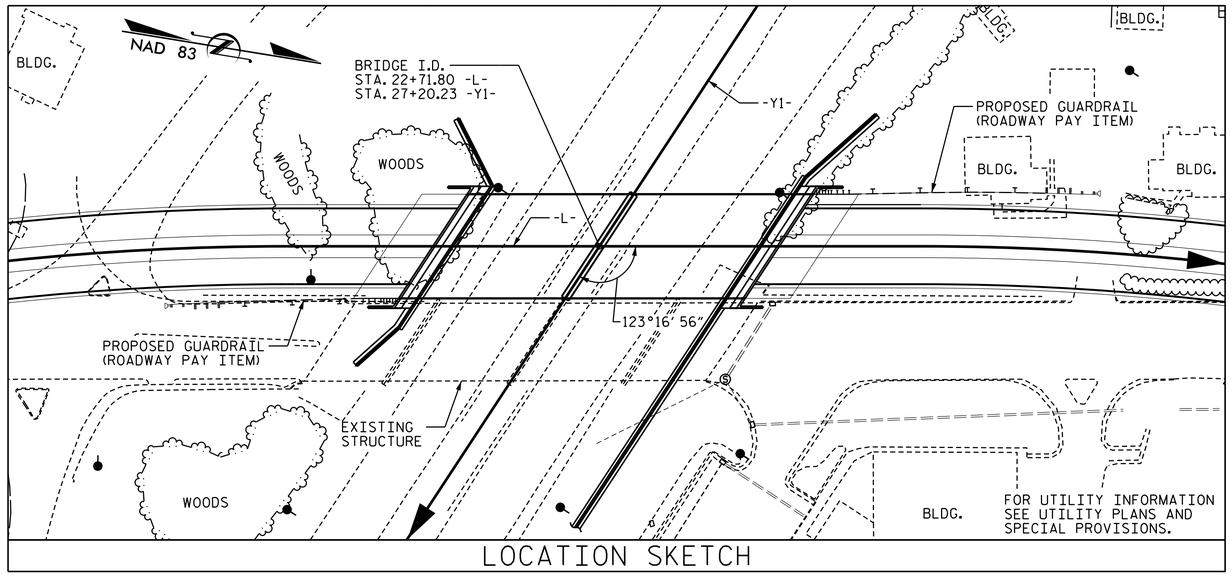
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON NC 50 OVER US 70 BETWEEN SR 2812 & SR 1004

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S-02
1			3				TOTAL SHEETS
2			4				49

BENCHMARK: #4 BENCH TIE NAIL SET IN 10" PINE TREE, -Y1- STATION 38+08.91, OFFSET 159' RT., N 711903' E 2115087' EL. 360.66'



LOCATION SKETCH

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.

FOR CLASSIC CONCRETE BRIDGE RAIL, SEE SPECIAL PROVISIONS.

FOR ELECTRICAL CONDUIT SYSTEM, SEE ELECTRICAL CONDUIT SYSTEM SPECIAL PROVISIONS.

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

FOR MSE WALLS, SEE GEOTECHNICAL 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 SHOUL 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.

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.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE EQUAL TO THE LENGTH OF PROPOSED MSE WALL AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

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 22+71.80 -L-.

TEMPORARY SHORING WILL BE REQUIRED IN THE AREAS INDICATED IN THE PLAN VIEW.

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 1/4" 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 WHATSOVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRCUTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	FOUNDATION EXCAVATION FOR BENT 1	DYNAMIC PILE TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS		PILE DRIVING EQUIPMENT SETUP FOR HP12x53 STEEL PILES	HP12X53 STEEL PILES		STEEL PILE POINTS	PILE REDRIVES	CLASSIC CONCRETE BRIDGE RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	STRIP SEAL EXPANSION JOINTS
	LUMP SUM	LUMP SUM	LUMP SUM	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	EA.	NO.	LIN. FT.	EACH	EACH	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE						10,341	9,425					14	1247.17						360.7			
END BENT 1								79.2		10,944				11	11	825		6		61.2		
BENT 1								116.1		17,130	2,047			24	24	1440	24	12				
END BENT 2								71.6		10,484				11	11	880		6		57.0		
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	1	LUMP SUM	10,341	9,425	266.9	LUMP SUM	38,558	2,047	14	1247.17	46	46	3145	24	24	360.7	118.2	LUMP SUM	LUMP SUM

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

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

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 3 OF 3

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RALEIGH, NC 27607
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AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON
C957B167F932420...
1/11/2024

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON NC 50 OVER US 70 BETWEEN SR 2812 AND SR 1004

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-03
1			3			TOTAL SHEETS
2			4			49

DRAWN BY : K. MUENCH DATE : 05/2022
CHECKED BY : J.C. MORRISON DATE : 05/2022
DESIGNED BY : K. MUENCH DATE : 05/2022
DESIGN CHECKED BY : J.C. MORRISON DATE : 05/2022

DATE: 1/11/2024
TIME: 10:22:22 PM

USER: cotten
DGN: Z:\Raleigh-USRAL3\Legacy\Projects\60436195-B-4654\900_Work\910_CAD\70_NCDOT_TIP\Structures\04 Drawings\2022 Updates\400_05_503_B4654_SMU_LOC.dgn

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: LIVE-LOAD FACTORS (γ_{LL})	STRENGTH I MOMENT: DISTRIBUTION FACTORS (DF)	STRENGTH I MOMENT: RATING FACTOR	STRENGTH I MOMENT: SPAN	STRENGTH I MOMENT: GIRDER LOCATION	STRENGTH I MOMENT: DISTANCE FROM LEFT END OF SPAN (ft)	STRENGTH I SHEAR: DISTRIBUTION FACTORS (DF)	STRENGTH I SHEAR: RATING FACTOR	STRENGTH I SHEAR: SPAN	STRENGTH I SHEAR: GIRDER LOCATION	STRENGTH I SHEAR: DISTANCE FROM LEFT END OF SPAN (ft)	SERVICE III LIMIT STATE: LIVE-LOAD FACTORS (γ_{LL})	SERVICE III MOMENT: DISTRIBUTION FACTORS (DF)	SERVICE III MOMENT: RATING FACTOR	SERVICE III MOMENT: SPAN	SERVICE III MOMENT: GIRDER LOCATION	SERVICE III MOMENT: DISTANCE FROM LEFT END OF SPAN (ft)	COMMENT NUMBER
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.33	--	1.75	0.770	1.60	A	E	42.08	1.010	1.33	B	I	73.36	0.80	0.710	1.41	A	I	42.08	
DESIGN LOAD RATING		HL-93 (OPERATING)	N/A		1.41	--	1.35	0.770	2.07	A	E	45.58	1.010	1.76	B	I	73.36	N/A	--	--	--	--	--	
DESIGN LOAD RATING		HS-20 (INVENTORY)	36.000	2	1.74	62.640	1.75	0.770	2.15	A	E	45.58	1.010	1.74	B	I	73.36	0.80	0.710	1.90	A	I	42.08	
DESIGN LOAD RATING		HS-20 (OPERATING)	36.000		1.90	68.400	1.35	0.770	2.78	A	E	45.58	1.010	2.29	B	I	73.36	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.40	59.400	1.40	0.770	6.22	A	E	45.58	1.010	5.51	B	I	73.36	0.80	0.710	4.40	A	I	42.08	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNGARBS2	20.000		3.23	64.600	1.40	0.770	4.56	A	E	45.58	1.010	3.86	B	I	73.36	0.80	0.710	3.23	A	I	42.08	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNAGRIS2	22.000		3.04	66.880	1.40	0.770	4.29	A	E	45.58	1.010	3.56	A	I	73.36	0.80	0.710	3.04	A	I	42.08	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNCOTTS3	27.250		2.19	59.678	1.40	0.770	3.09	A	E	45.58	1.010	2.68	B	I	73.36	0.80	0.710	2.19	A	I	42.08	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNAGGRS4	34.925		1.81	63.214	1.40	0.770	2.56	A	E	45.58	1.010	2.19	B	I	73.36	0.80	0.710	1.81	A	I	42.08	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNS5A	35.550		1.77	62.924	1.40	0.770	2.50	A	E	45.58	1.010	2.21	B	I	73.36	0.80	0.710	1.77	A	I	42.08	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNS6A	39.950		1.62	64.719	1.40	0.770	2.29	A	E	45.58	1.010	2.00	B	I	73.36	0.80	0.710	1.62	A	I	42.08	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNS7B	42.000		1.54	64.680	1.40	0.770	2.18	A	E	45.58	1.010	1.95	B	I	73.36	0.80	0.710	1.54	A	I	42.08	
LEGAL LOAD RATING	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.97	65.010	1.40	0.770	2.78	A	E	45.58	1.010	2.40	B	I	73.36	0.80	0.710	1.97	A	I	42.08	
LEGAL LOAD RATING	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNT4A	33.075		1.98	65.489	1.40	0.770	2.79	A	E	45.58	1.010	2.35	A	I	73.36	0.80	0.710	1.98	A	I	42.08	
LEGAL LOAD RATING	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNT6A	41.600		1.61	66.976	1.40	0.770	2.27	A	E	45.58	1.010	2.07	B	I	73.36	0.80	0.710	1.61	A	I	42.08	
LEGAL LOAD RATING	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNT7A	42.000		1.61	67.620	1.40	0.770	2.28	A	E	45.58	1.010	2.03	B	I	73.36	0.80	0.710	1.61	A	I	42.08	
LEGAL LOAD RATING	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNT7B	42.000		1.66	69.720	1.40	0.770	2.34	A	E	45.58	1.010	1.91	A	I	73.36	0.80	0.710	1.66	A	I	42.08	
LEGAL LOAD RATING	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT4	43.000		1.59	68.370	1.40	0.770	2.24	A	E	45.58	1.010	1.84	B	I	73.36	0.80	0.710	1.59	A	I	42.08	
LEGAL LOAD RATING	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGT5A	45.000		1.50	67.500	1.40	0.770	2.12	A	E	45.58	1.010	1.82	A	I	73.36	0.80	0.710	1.50	A	I	42.08	
LEGAL LOAD RATING	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGT5B	45.000	3	1.48	66.600	1.40	0.770	2.10	A	E	45.58	1.010	1.75	B	I	73.36	0.80	0.710	1.48	A	I	42.08	
EMERGENCY VEHICLE (EV)		EV2	28.750		2.28	65.550	1.30	0.770	3.47	A	E	42.08	1.010	2.98	A	I	67.76	0.80	0.710	2.28	A	I	42.08	
EMERGENCY VEHICLE (EV)		EV3	43.000	4	1.50	64.500	1.30	0.770	2.28	A	E	42.08	1.010	1.97	A	I	67.76	0.80	0.710	1.50	A	I	42.08	

LOAD FACTORS:

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

NOTES:

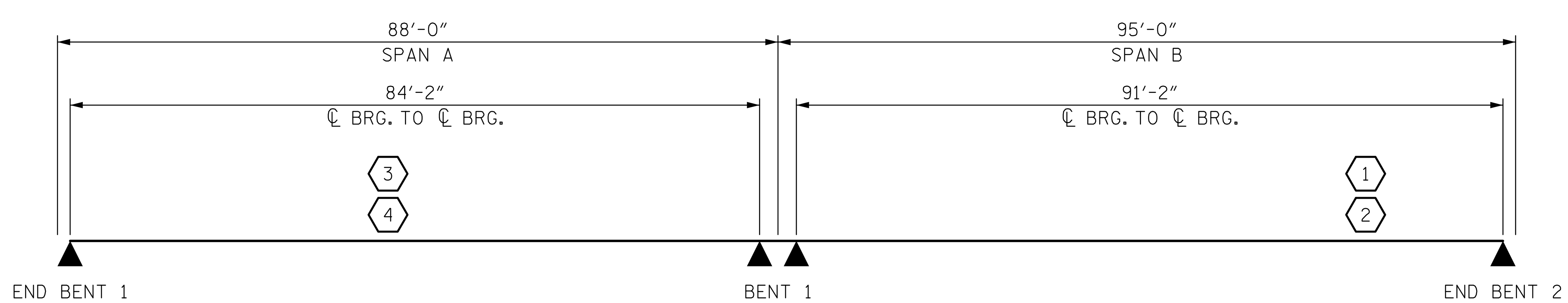
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:

(#) CONTROLLING LOAD RATING
(1) DESIGN LOAD RATING (HL-93)
(2) DESIGN LOAD RATING (HS-20)
(3) LEGAL LOAD RATING **
(4) EMERGENCY VEHICLE LOAD RATING
** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION
I - INTERIOR GIRDER
E - EXTERIOR GIRDER



LRFR SUMMARY

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

AECOM

AECOM TECHNICAL SERVICES OF NC, INC.
5438 WADE PARK BOULEVARD, SUITE 200
RALEIGH, NC 27607
(919) 854-6200 www.aecom.com
AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030474 JOHN C. MORRISON

DocuSigned by: John C. Morrison 8/24/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-04
1			3			TOTAL SHEETS
2			4			49

ASSEMBLED BY : K. MUENCH DATE : 05/2022
CHECKED BY : J.C. MORRISON DATE : 05/2022

DRAWN BY : MAA 1/08
CHECKED BY : GM/DI 2/08

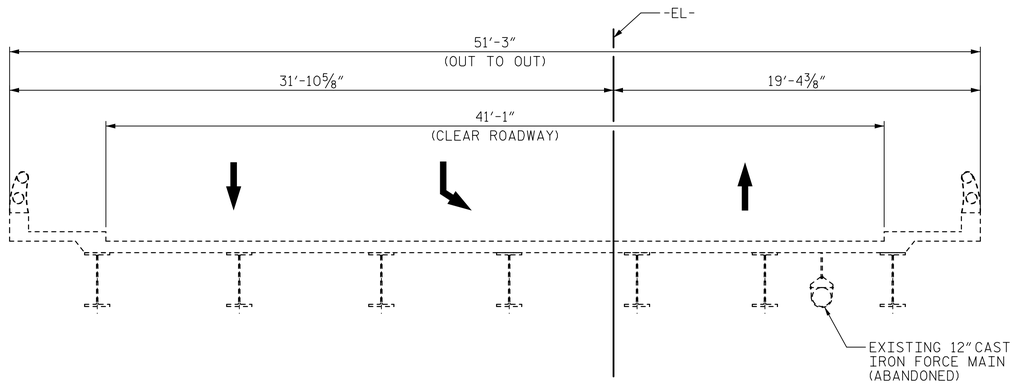
REV. 11/12/08RR MAA/GM
REV. 10/1/11 MAA/GM
REV. 12/17 MAA/THC

STD. NO. LRFR1

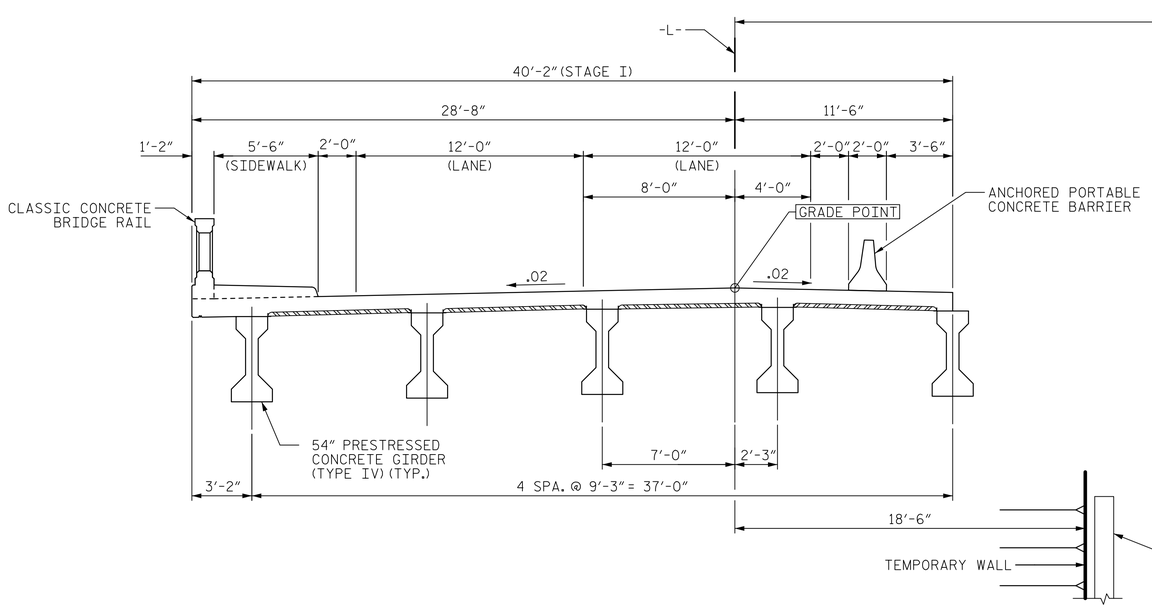
NOTES:

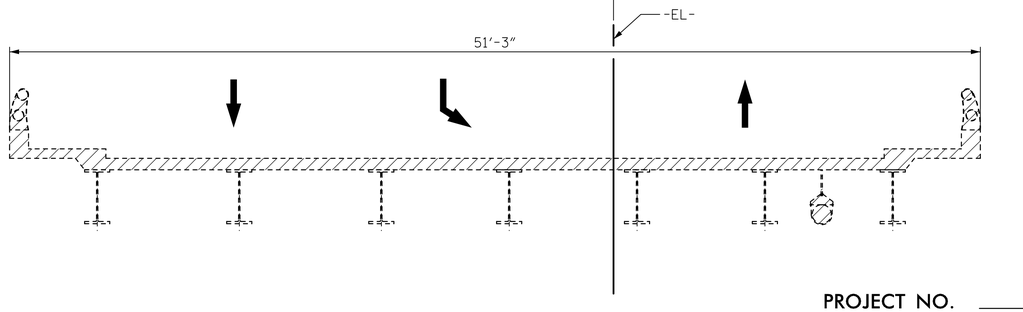
SEE TRAFFIC CONTROL PLANS FOR PAY LIMIT OF ANCHORED PORTABLE CONCRETE BARRIER.

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.



EXISTING STRUCTURE





STAGE I CONSTRUCTION

(MAINTAIN TRAFFIC ON EXISTING STRUCTURE. CONSTRUCT STAGE I OF PROPOSED STRUCTURE)

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 1 OF 2

AECOM
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NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON
1/19/2023

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

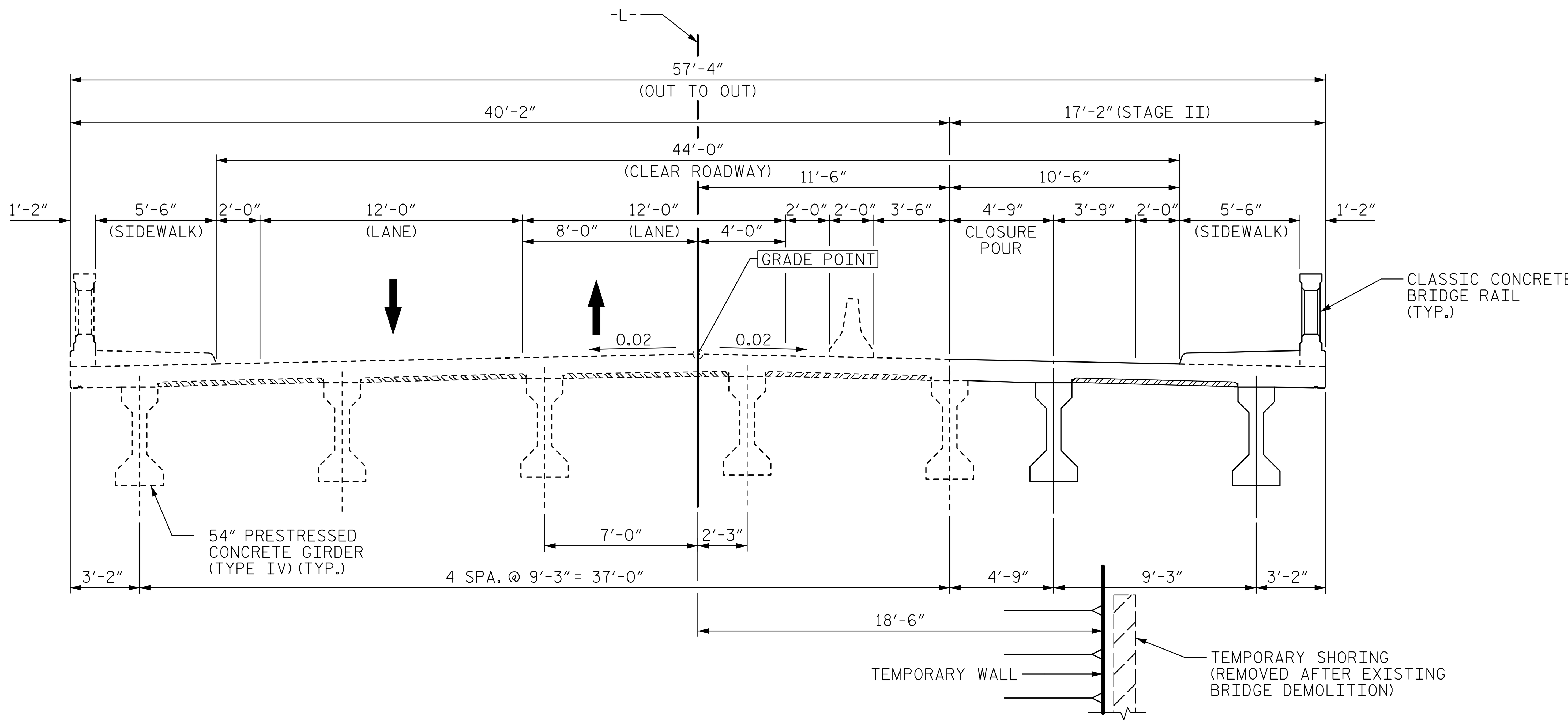
CONSTRUCTION SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-05
1			3			TOTAL SHEETS
2			4			49

DRAWN BY :	K. MUENCH	DATE :	05/2022
CHECKED BY :	J.C. MORRISON	DATE :	05/2022
DESIGNED BY :	K. MUENCH	DATE :	05/2022
DESIGN CHECKED BY :	J.C. MORRISON	DATE :	05/2022

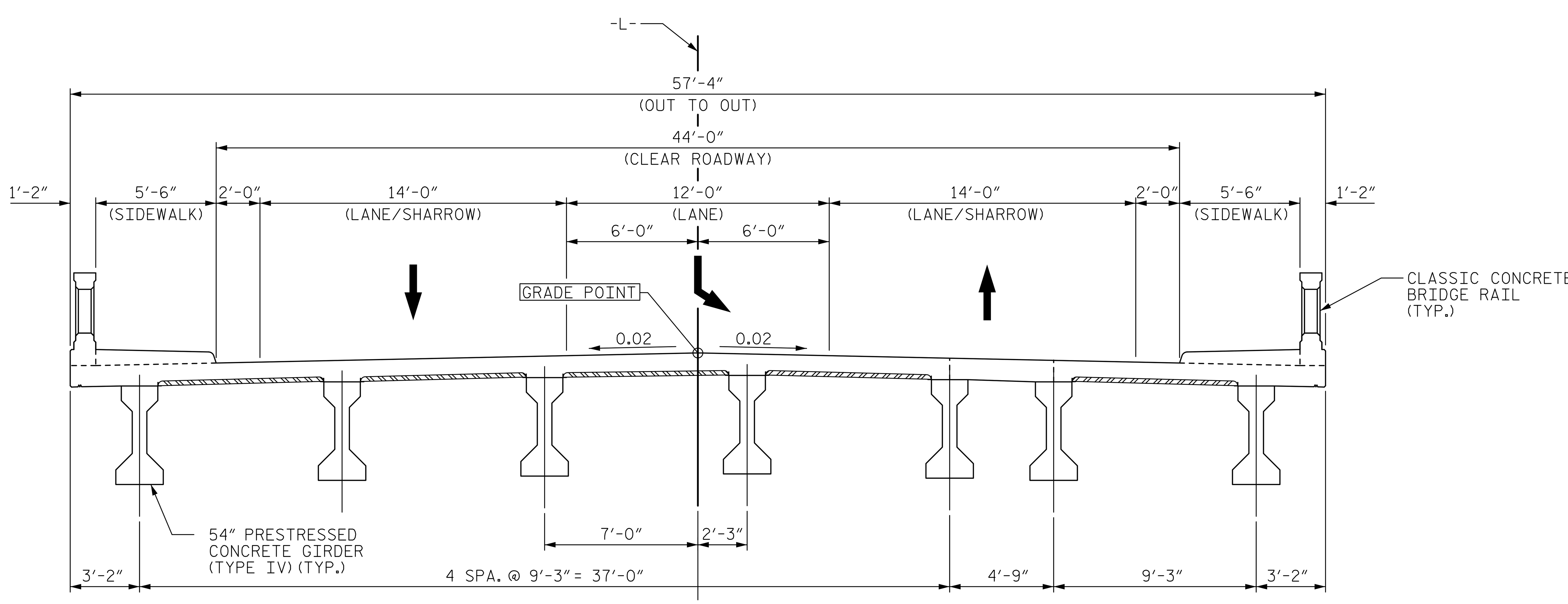
DATE: 1/19/2023
TIME: 9:50:47 AM

USER: muenck
DGN: \\vzaecomnet.com\1\AMER\Raleigh-USRAL3\Legacy Projects\60436955-B-4654\900_Work\90_CADD_NCDOT_TIP\Structures\04 Drawings\2022\ Updates\400_09_S05_B4654_SMU_SEQ.dgn



STAGE II CONSTRUCTION

(SHIFT TRAFFIC ONTO STAGE I CONSTRUCTION; REMOVE EXISTING BRIDGE AND TEMPORARY SHORING; CONSTRUCT STAGE II INCL. CLOSURE POUR)



FINAL CONSTRUCTION

(REMOVE PORTABLE BARRIER; PROVIDE FINAL LANE CONFIGURATION)

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 2 OF 2

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030474 JOHN C. MORRISON

1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

CONSTRUCTION SEQUENCE

DRAWN BY : K. MUENCH	DATE : 05/2022
CHECKED BY : J.C. MORRISON	DATE : 05/2022
DESIGNED BY : K. MUENCH	DATE : 05/2022
DESIGN CHECKED BY : J.C. MORRISON	DATE : 05/2022

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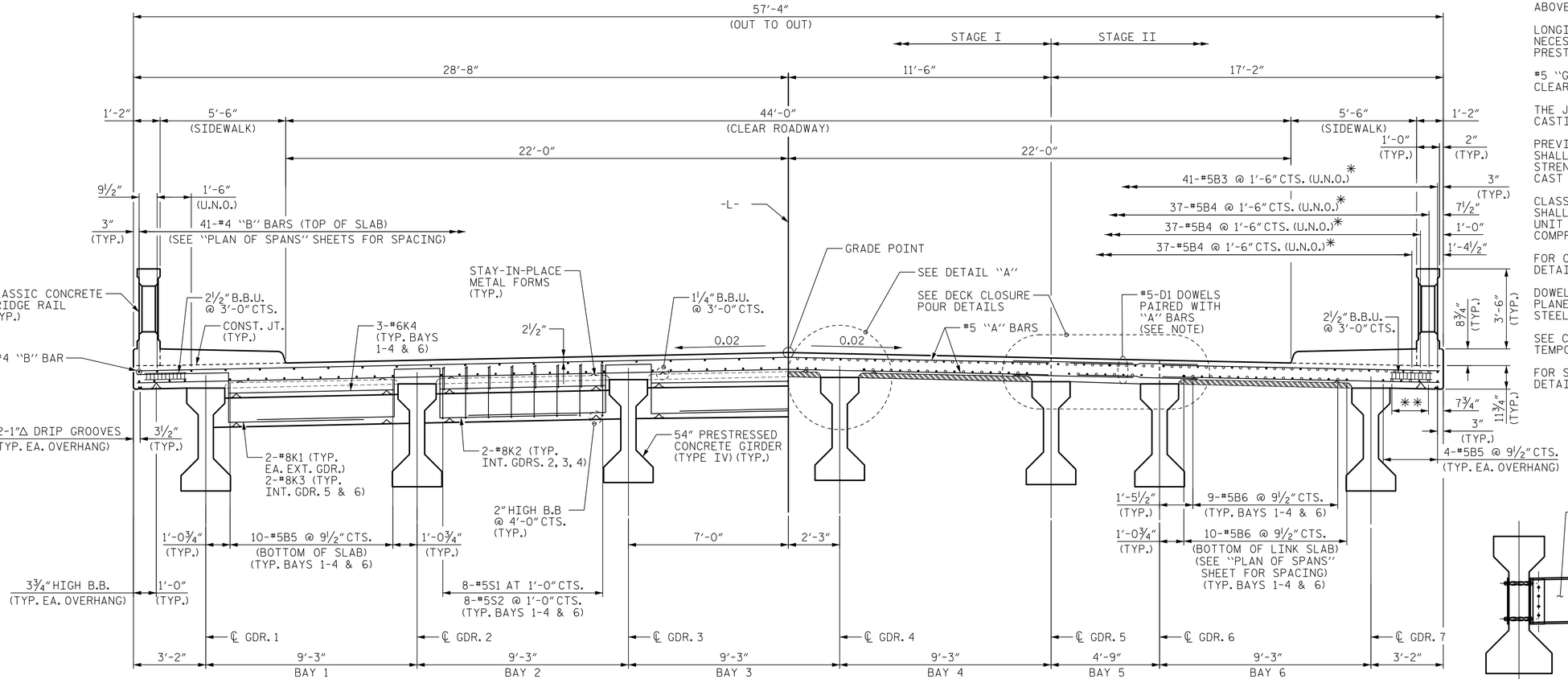
REVISIONS

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

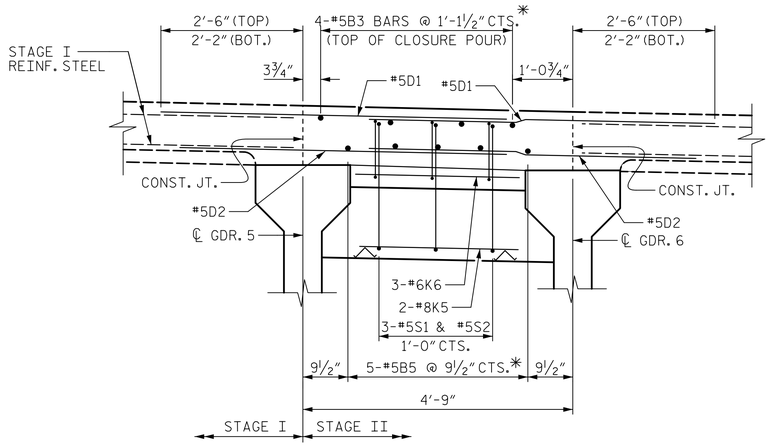
SHEET NO. S-06

TOTAL SHEETS 49

* #4 "B" BARS MAY BE ADJUSTED LATERALLY TO TIE WITH BRIDGE RAIL REINFORCING.

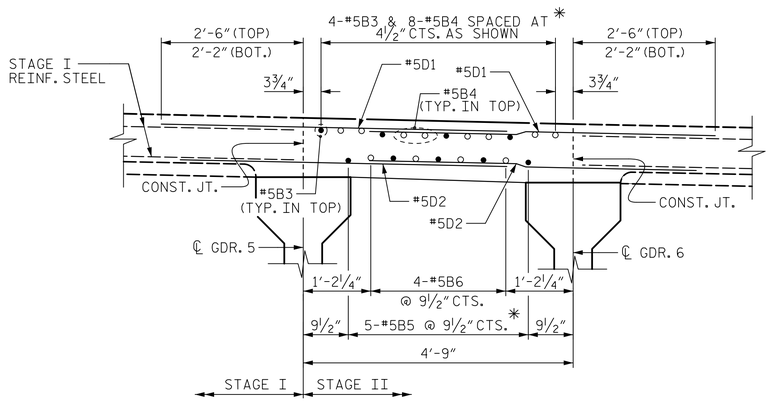


TYPICAL HALF SECTION
(SHOWING END BENT DIAPHRAGMS)



DECK CLOSURE POUR DETAIL @ END BENT

TYPICAL HALF SECTION
(SHOWING LINK SLABS AT BENTS)



DECK CLOSURE POUR DETAIL @ BENT

NOTES:

PROVIDE 1¼" 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 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

#5 "G" BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

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

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.

CLASSIC CONCRETE BRIDGE 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 CLASSIC CONCRETE BRIDGE RAIL REINFORCING AND DETAILS, SEE "CLASSIC CONCRETE BRIDGE RAIL" SHEETS.

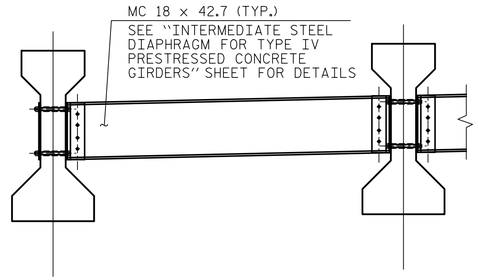
DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM SLAB REINFORCING STEEL.

SEE CONSTRUCTION SEQUENCE SHEETS FOR LOCATION OF TEMPORARY PORTABLE CONCRETE BARRIER (ANCHORED).

FOR SIDEWALK REINFORCING AND DETAILS, SEE "SIDEWALK DETAILS" SHEET.

* SEE "PLAN OF SPANS" SHEETS FOR BAR SPACING AND LOCATION

** 3-#5B6 @ 9½" CTS. SPACED BTWN. #5B5



EXTERIOR GIRDER INTERIOR GIRDER

PART TYPICAL SECTION
(SHOWING INTERMEDIATE STEEL DIAPHRAGMS)

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 1 OF 2

DRAWN BY : K. MUENCH	DATE : 05/2022
CHECKED BY : J.C. MORRISON	DATE : 05/2022
DESIGNED BY : D. RITACCO	DATE : 05/2022
DESIGN CHECKED BY : J.C. MORRISON	DATE : 05/2022

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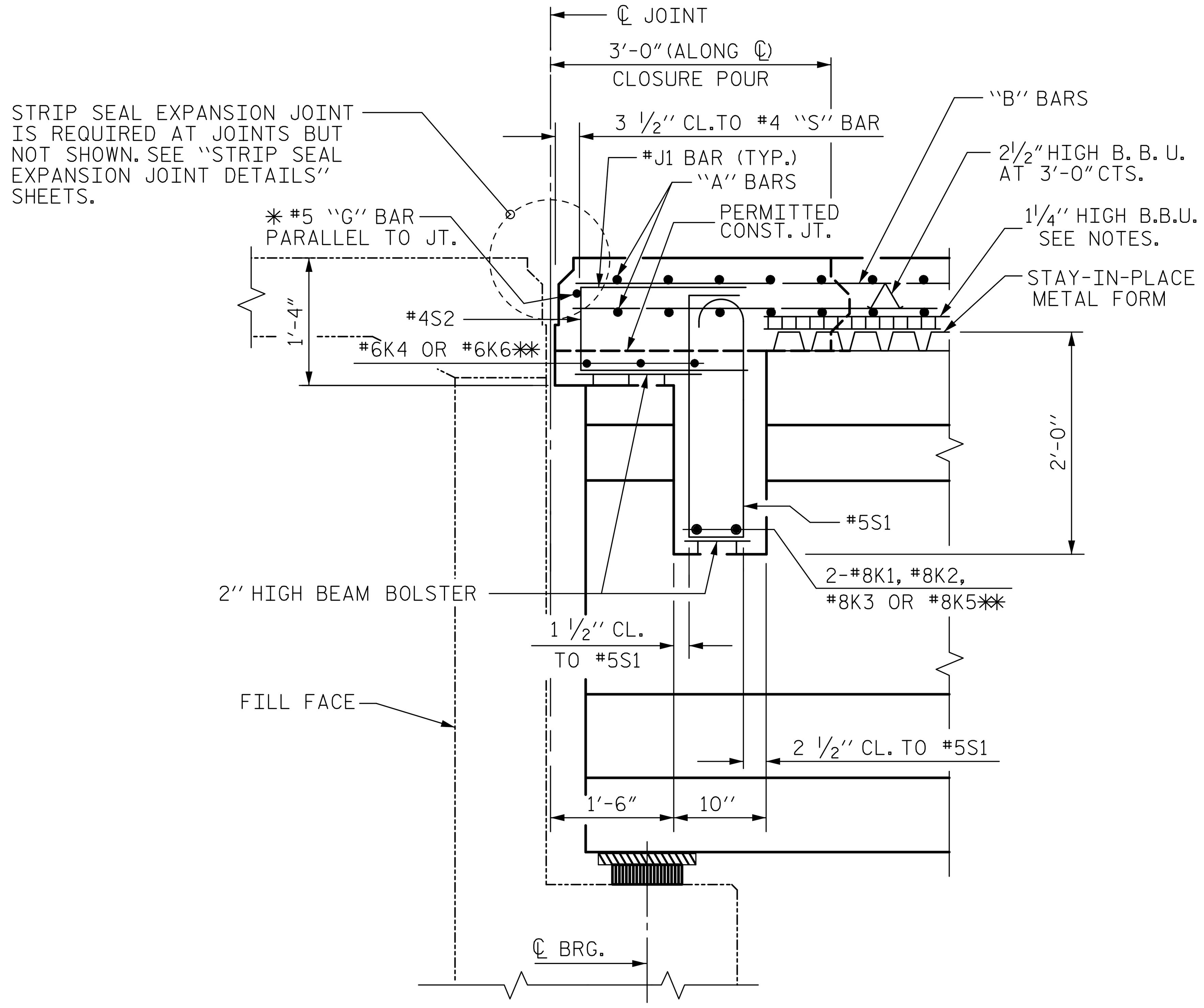
NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON
1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

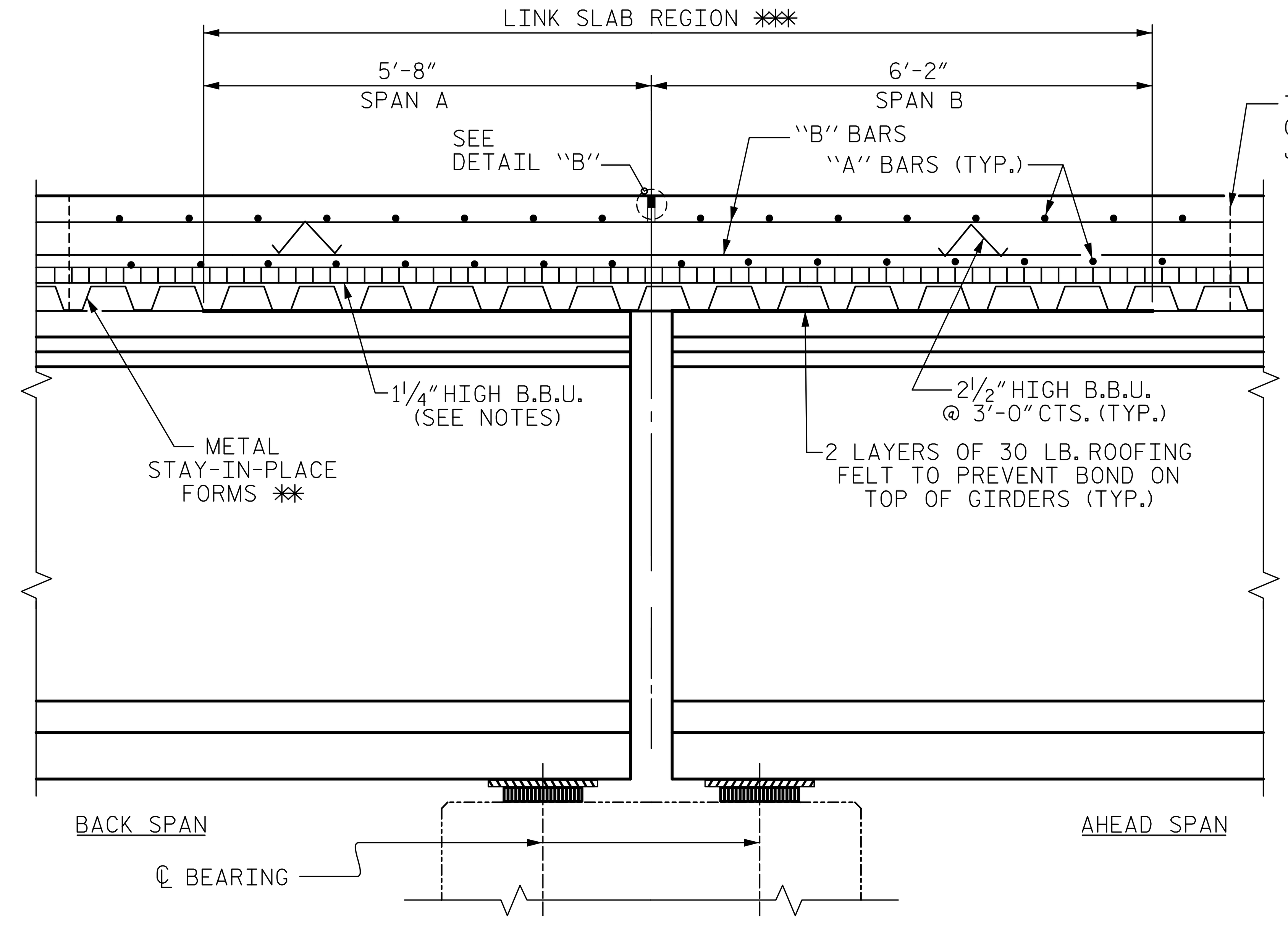
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-07
1			3			TOTAL SHEETS
2			4			49



SECTION THRU END BENT DIAPHRAGMS

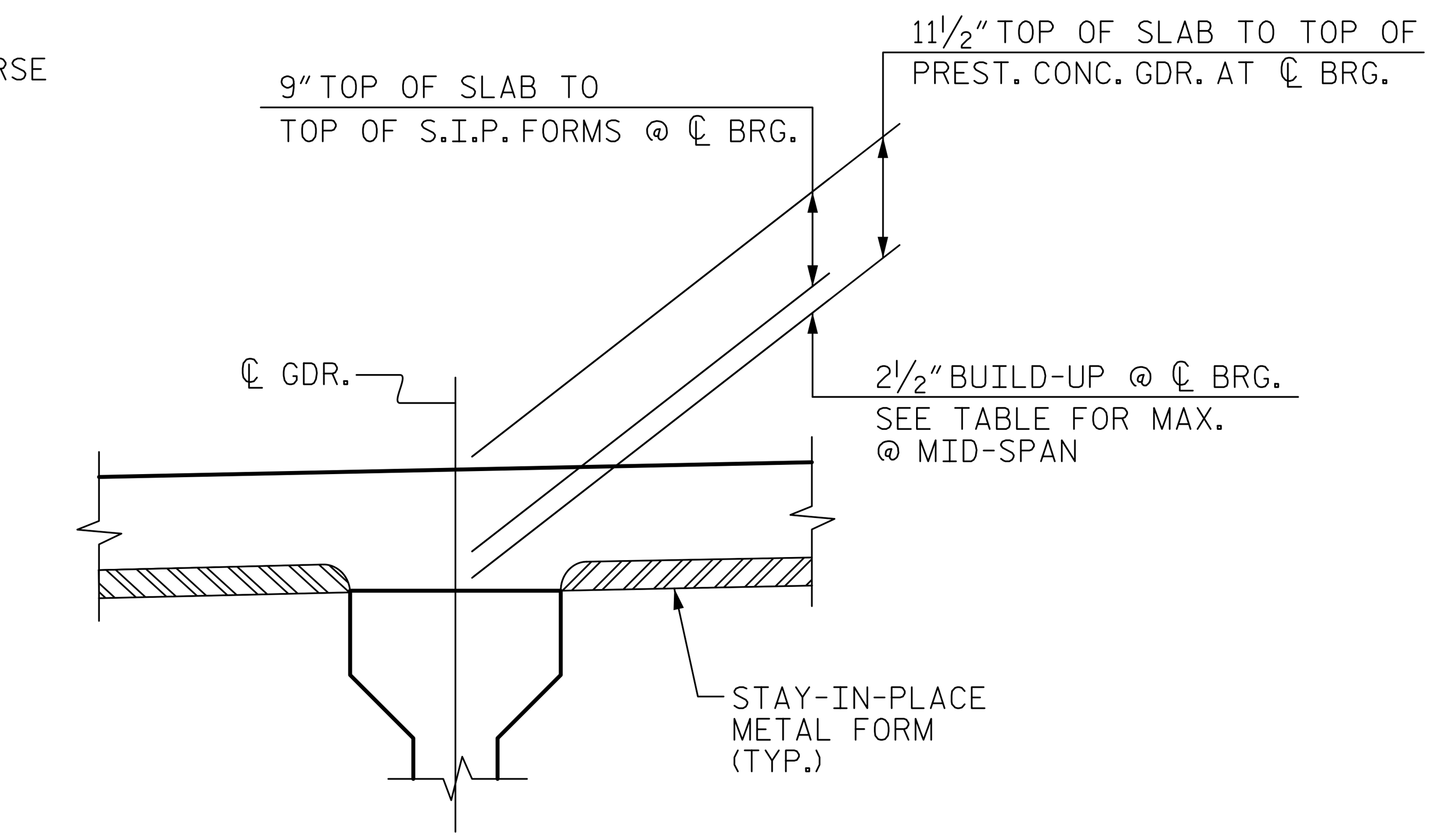
* #5 "G" BAR MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS.

** #8K5 AND #6K6 IN CLOSURE POUR



SECTION B-B @ LINK SLAB

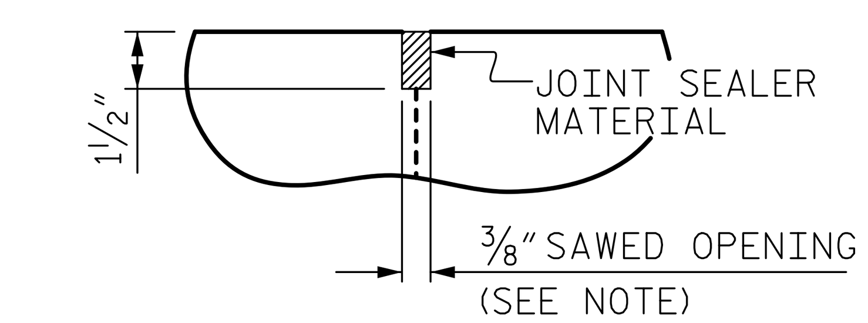
SECTION SHOWN ALONG GIRDER



SPAN	MAX. MID-SPAN BUILD-UP (INCHES) *	CONTROLLING GIRDER
A	1 5/16"	2, 3 & 4
B	2 3/8"	2, 3 & 4

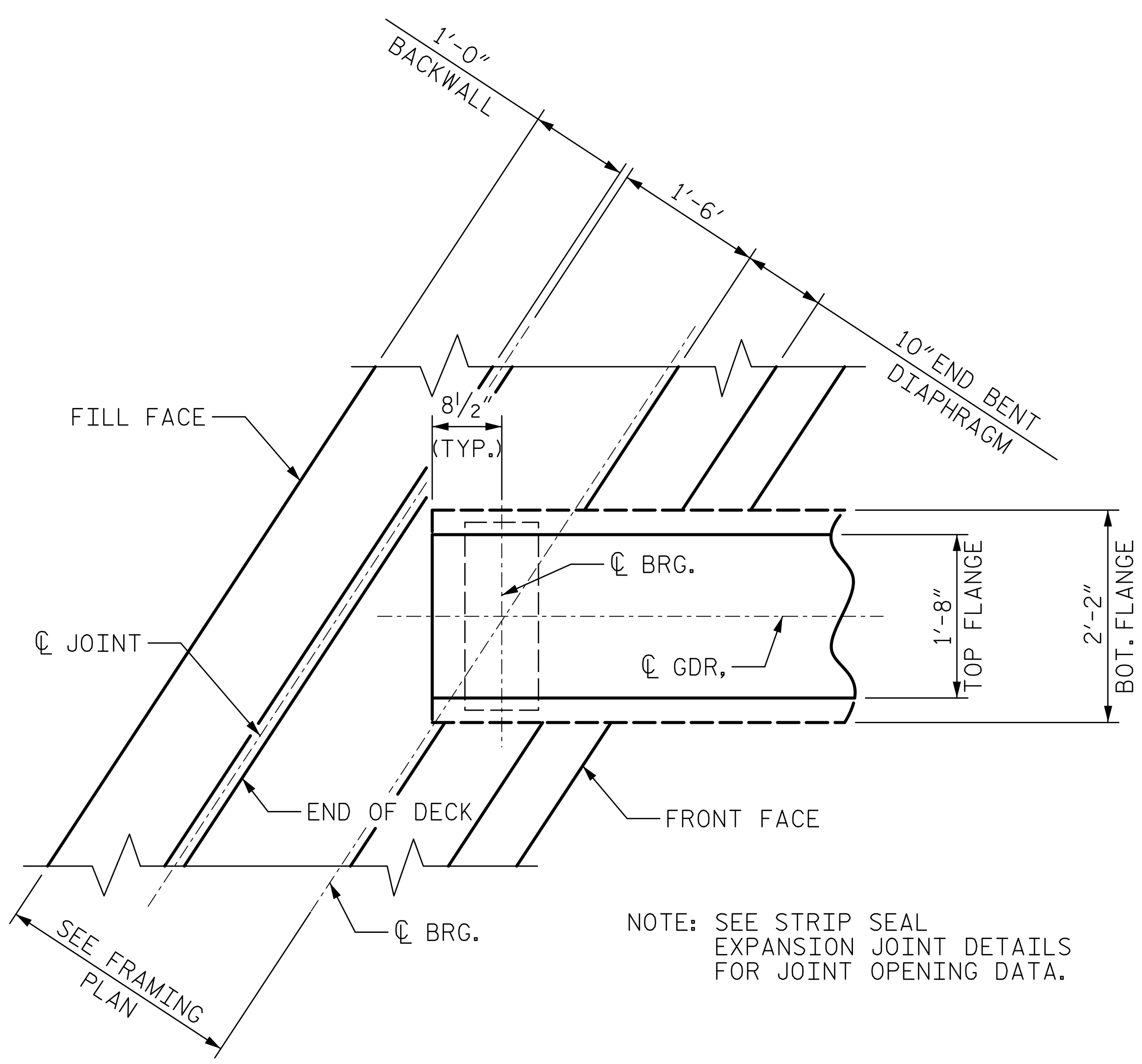
* BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS

DETAIL "A"



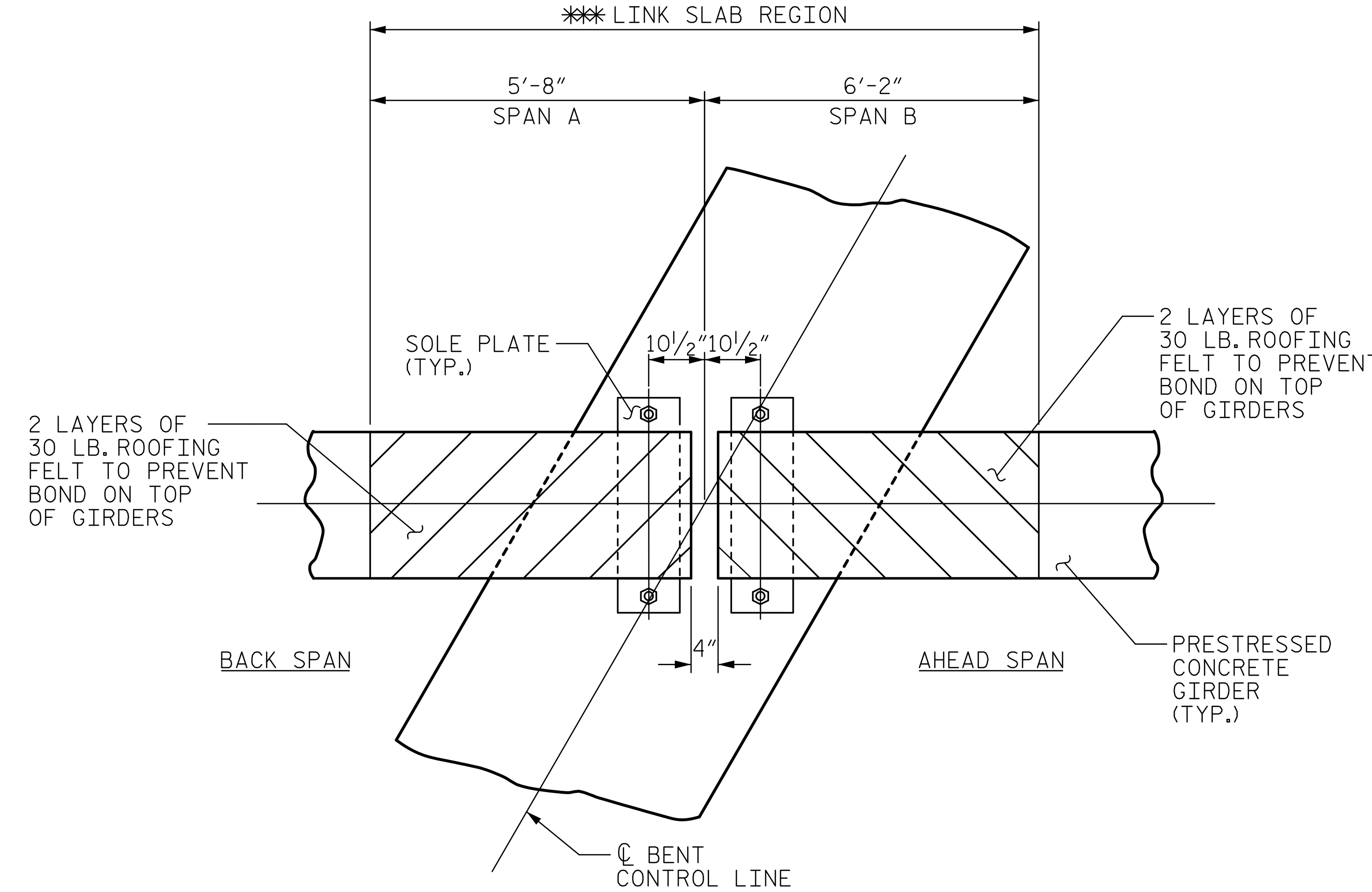
A 1 1/2" DEEP, 3/8" WIDE CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWN WITHIN 24 HOURS OF POURING THE DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

DETAIL "B"



NOTE: SEE STRIP SEAL EXPANSION JOINT DETAILS FOR JOINT OPENING DATA.

PLAN VIEW OF END BENT DIAPHRAGM



*** : THE TOP OF GIRDER IN THE REGION OF THE LINK SLAB SHALL BE SMOOTH (NOT RAKED) AND FREE OF STIRRUPS, ANCHOR STUDS, DECK FORMWORK ATTACHMENTS, AND OVERHANG FALSEWORK/FORMWORK ATTACHMENTS.

METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO THE GIRDER FLANGES IN THE REGION OF THE LINK SLAB.

PLAN @ BENT

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 2 OF 2

AECOM
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5438 WADE PARK BOULEVARD, SUITE 200
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NORTH CAROLINA PROFESSIONAL SEAL 036474 ENGINEER JOHN C. MORRISON

1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

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

SHEET NO. S-08

TOTAL SHEETS 49

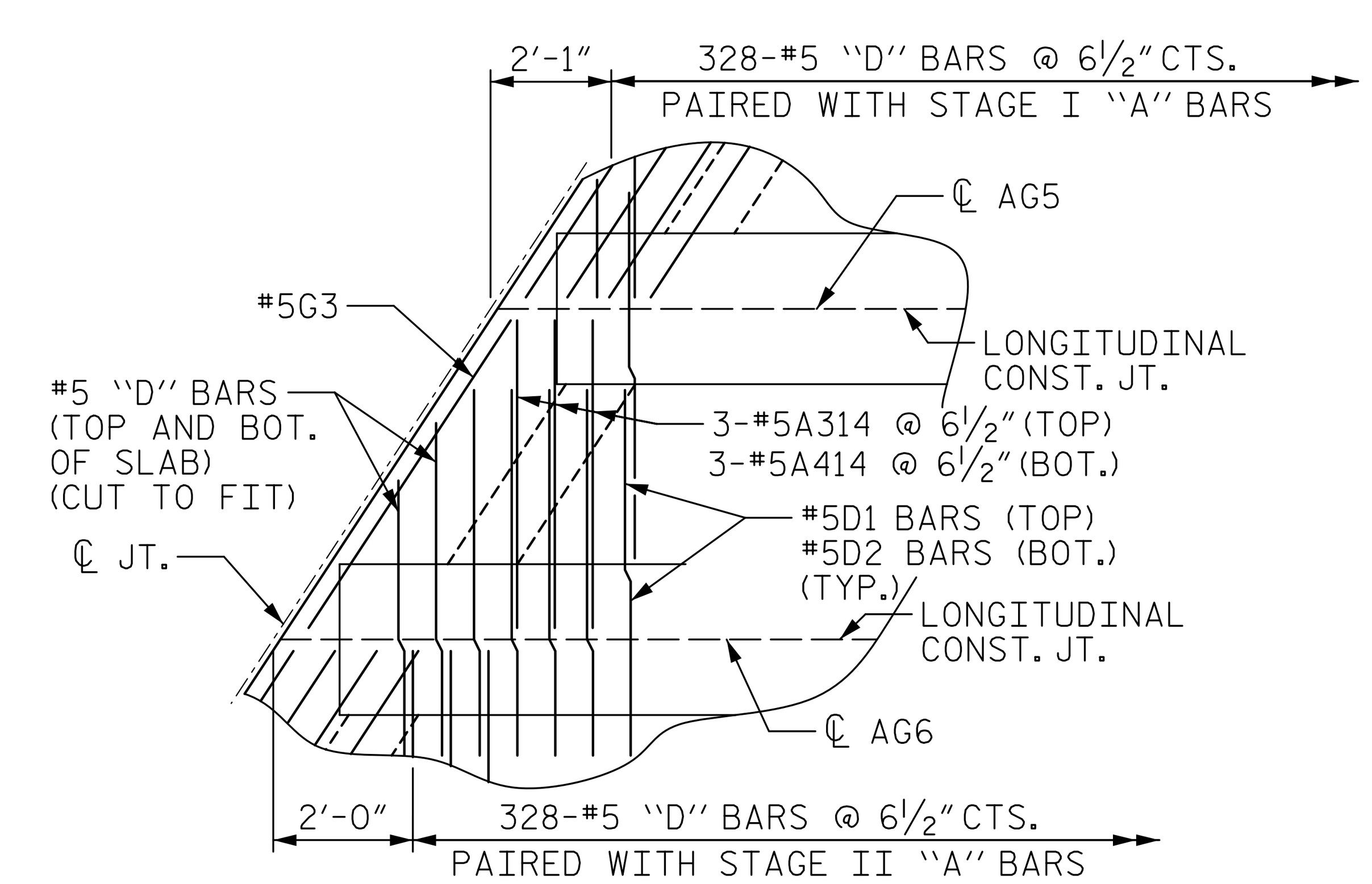
DRAWN BY : K. MUENCH	DATE : 05/2022
CHECKED BY : J.C. MORRISON	DATE : 05/2022
DESIGNED BY : D. RITACCO	DATE : 05/2022
DESIGN CHECKED BY : J.C. MORRISON	DATE : 05/2022


88'-0" (W.P. 1 TO W.P. 2)
SPAN A
#5A101 THRU #5A146 @ 6½" CTS. (TOP OF SLAB)
#5A201 THRU #5A246 @ 6½" CTS. (BOT. OF SLAB)
284-#5A1 @ 6½" CTS. (TOP OF SLAB)
284-#5A2 @ 6½" CTS. (BOT. OF SLAB)
#4B1 IN TOP (2 BAR RUN)
#4B1
#5B4
#5B3 IN TOP (3 BAR RUN)
1'-2" CLASSIC CONCRETE BRIDGE RAIL
SIDEWALK
6'-8"
5'-6"
22'-0"
57'-4" (OUT TO OUT)
44'-0" (CLEAR ROADWAY)
11'-6"
10'-6"
STAGE I
STAGE II
℄ JT. @ END BENT 1
℄ AG1
℄ AG2
℄ AG3
℄ AG4
℄ AG5
℄ AG6
℄ AG7
CLASSIC RAIL
3'-0" STAGGER
21'-3" OR 18'-3" TO END OF #5B4
(#5B4 @ 4.5" CTS. BTWN. #5B3) (TYP.)
SEE DETAIL "B"
GUTTERLINE
INTERMEDIATE STEEL DIAPH. (TYP.)
9-#5B6 @ 9½" CTS. (BOTTOM OF SLAB) (4 BAR RUN) (TYP. BAYS 1-4 & 6)
10-#5B6 @ 9½" CTS. (BOTTOM OF SLAB) (4 BAR RUN) (TYP. BAYS 1-4 & 6)
#5G1
4'-3 7/16"
FILL FACE @ END BENT 1
W.P. 1
SEE DETAIL "C"
TRANSVERSE CONST. JT.
27-#4B1 @ 1'-6" CTS. (TOP OF SLAB) (2 BAR RUNS)
79-#5B4 @ 4½" CTS. (3 IN BTWN. EA. #5B3) (TOP OF SLAB) (STAGGER BARS BY 3'-0")
27-#5B3 @ 1'-6" CTS. (TOP OF SLAB) (3 BAR RUN)
9'-8"
10'-2"
W.P. 2
-L-
3-#6A5 @ 6" CTS. (IN ACUTE CORNER) (TOP OF SLAB) (STAGE I)
#5A147 OR #5A247
#5A1 OR #5A2
TRANSVERSE CONST. JT. (TYP.)
123°16' 56" (TYP.)
SEE DETAIL "A"
LONGITUDINAL DECK SLAB CONST. JT.
3-#5A314 (TOP)
3-#5A414 (BOT.)
32'-3" TO END OF #5B3 (3 BAR RUN) (TYP.)
#4B1
*#5D1 (TOP)
#5D2 (BOT.)
4-#4B1 @ 1'-3" CTS. (2 BAR RUNS)
2-#5B4 BARS (TYP. BTWN. #5B3 BARS)
8-#5B4 @ 4½" CTS.** (PAIRED BTWN. EA. #5B3)
4-#5B3 SPA. @ 1'-1½" (3 BAR RUN)
3-#6A5 @ 6" CTS. (IN ACUTE CORNER) (TOP OF SLAB)
*656-#5D1 @ 6½" CTS. (TOP OF SLAB)
656-#5D2 @ 6½" CTS. (BOT. OF SLAB) (EA. SIDE OF CLOSURE POUR)
5-#5B5 @ 9½" CTS. (BOTTOM OF SLAB) (4 BAR RUN)
3'-0" STAGGER EA. PAIR
21'-3" OR 18'-3" TO END OF #5B4 (ALTERNATE ADJACENT BARS) (TYP.)
#5B4 BAR
#5A3 OR #5A4
2'-6"
#5A313 OR #5A413
#5G2
9-#4B1 @ 1'-6" CTS. (TOP OF SLAB) (2 BAR RUNS)
GUTTERLINE
CLASSIC RAIL
24-#5B4 @ 4½" CTS. (3 SPA. BTWN. EA. #5B3)
9-#5B3 @ 1'-6" CTS. (3 BAR RUN)
#4B1
20'-3¼" FROM W.P. 1 TO FIRST #5A1 OR #5A2
8'-11¾" FROM W.P. 1 TO FIRST #5A301 OR #5A401
3-#5B6 @ 9½" CTS. BTWN. #5B5 (4 BAR RUN) (BOT. OF SLAB) (TYP. EA. OVERHANG)
4-#5B5 @ 9½" CTS. (4 BAR RUN) (BOTTOM OF SLAB) (TYP. EA. OVERHANG)
BENT 1 CONTROL LINE
#5A301 THRU #5A313 @ 6½" CTS. (TOP OF SLAB)
#5A401 THRU #5A413 @ 6½" CTS. (BOT. OF SLAB)
318-#5A3 @ 6½" CTS. (TOP OF SLAB)
318-#5A4 @ 6½" CTS. (BOT. OF SLAB)

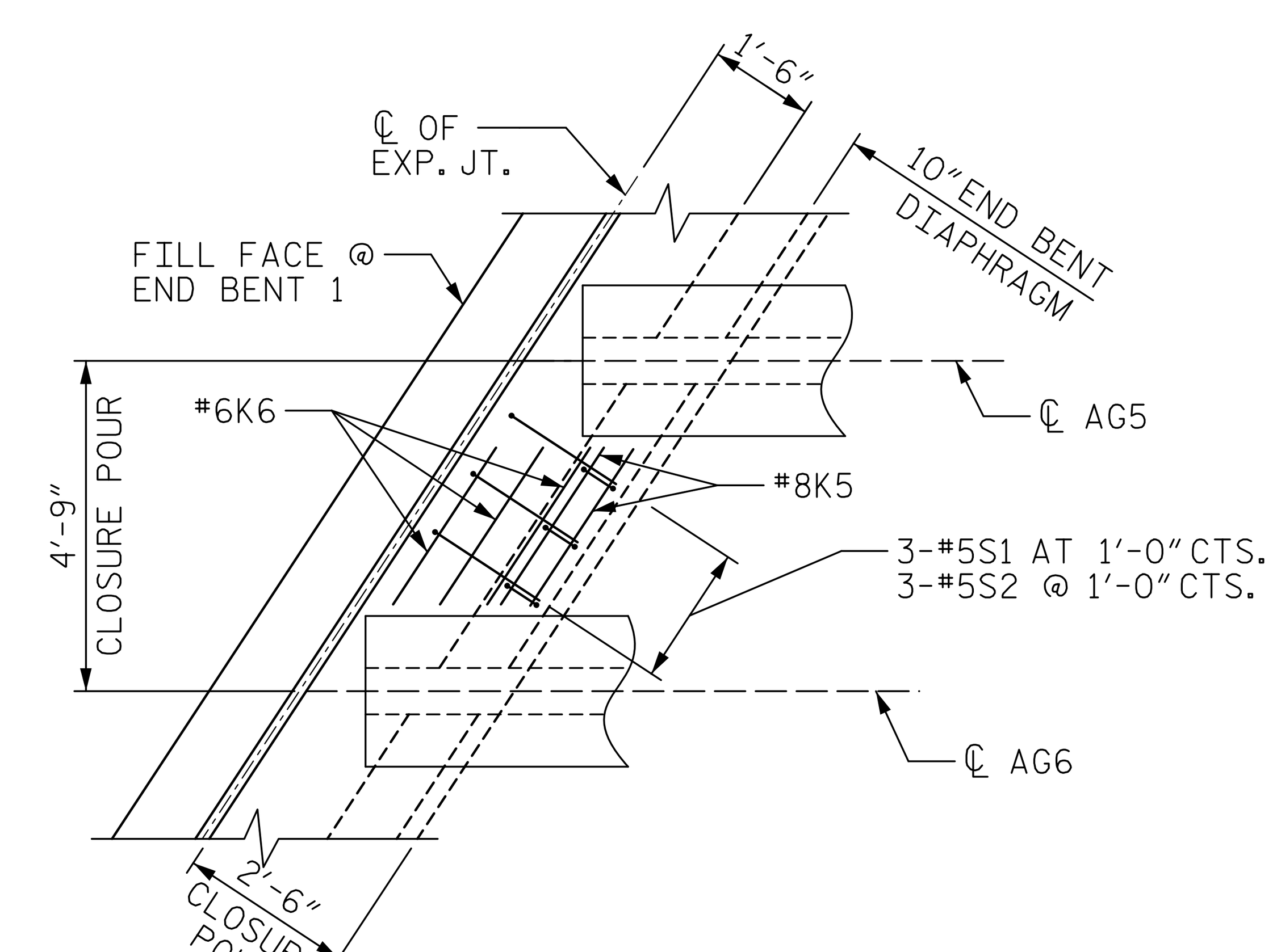
PLAN OF SPAN A

** STAGGER EACH PAIR OF #5B4 BARS 3'-0" @ CLOSURE POUR

* DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM REINFORCING STEEL ("A" BARS).

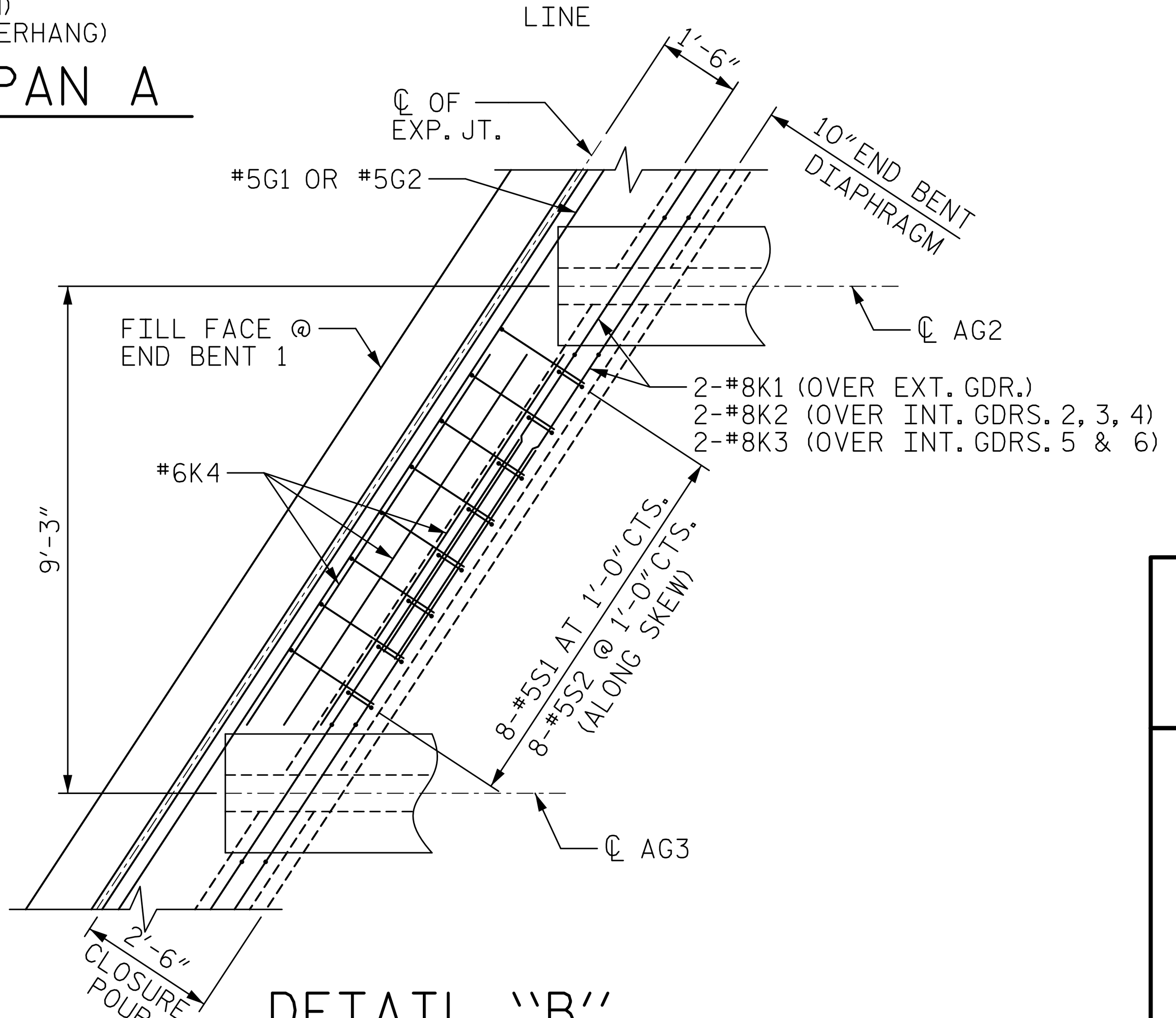


DECK REINFORCEMENT



END BENT DIAPRAGM

DETAIL "A"



DETAIL "B"

(END BENT DIAPHRAGM)
(J1 BARS NOT SHOWN FOR CLARITY)

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 1 OF 2

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NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON
1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS
SPAN A

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S-09
1			3					TOTAL SHEETS
2			4					49

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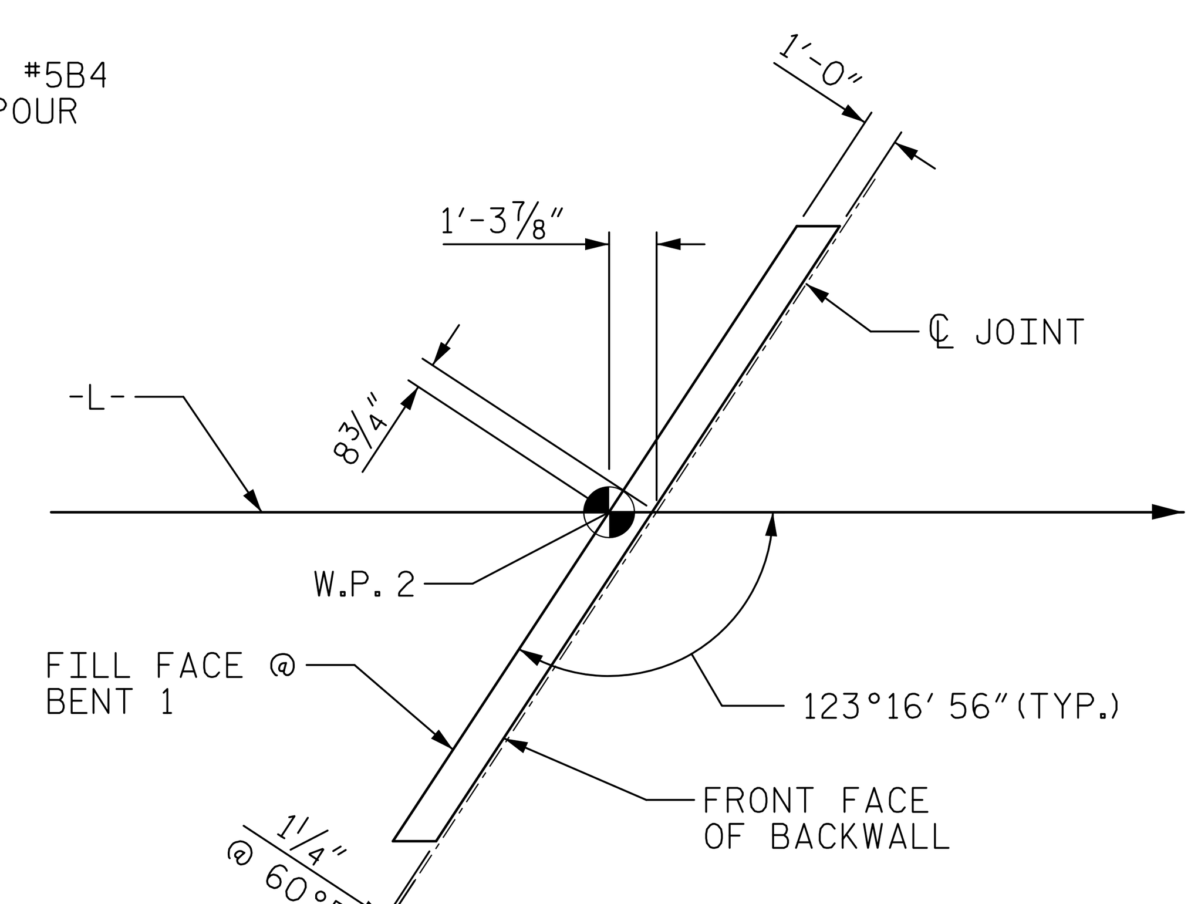
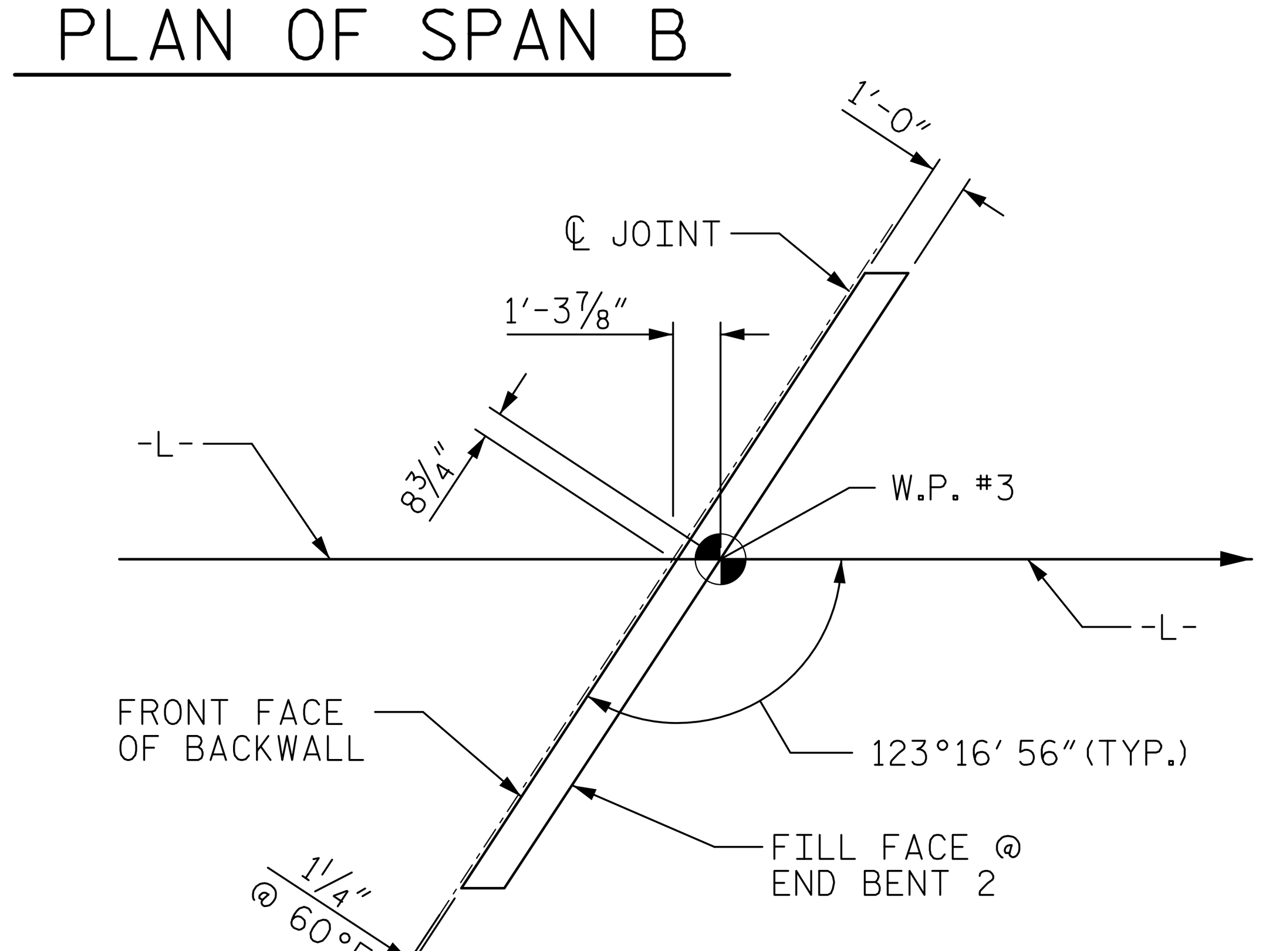
DRAWN BY : K. MUENCH	DATE : 05/2022
CHECKED BY : J.C. MORRISON	DATE : 05/2022
DESIGNED BY : D. RITACCO	DATE : 05/2022
DESIGN CHECKED BY : J.C. MORRISON	DATE : 05/2022

PLAN OF SPAN B

✱✱ STAGGER EACH PAIR OF #5B4 BARS 3'-0" @ CLOSURE POUR



DETAIL "C"



DETAIL "D"

✱ DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM REINFORCING STEEL ("A" BARS).

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 2 OF 2

AECOM
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RALEIGH, NC 27607
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AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON
1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

PLAN OF SPANS
SPAN B

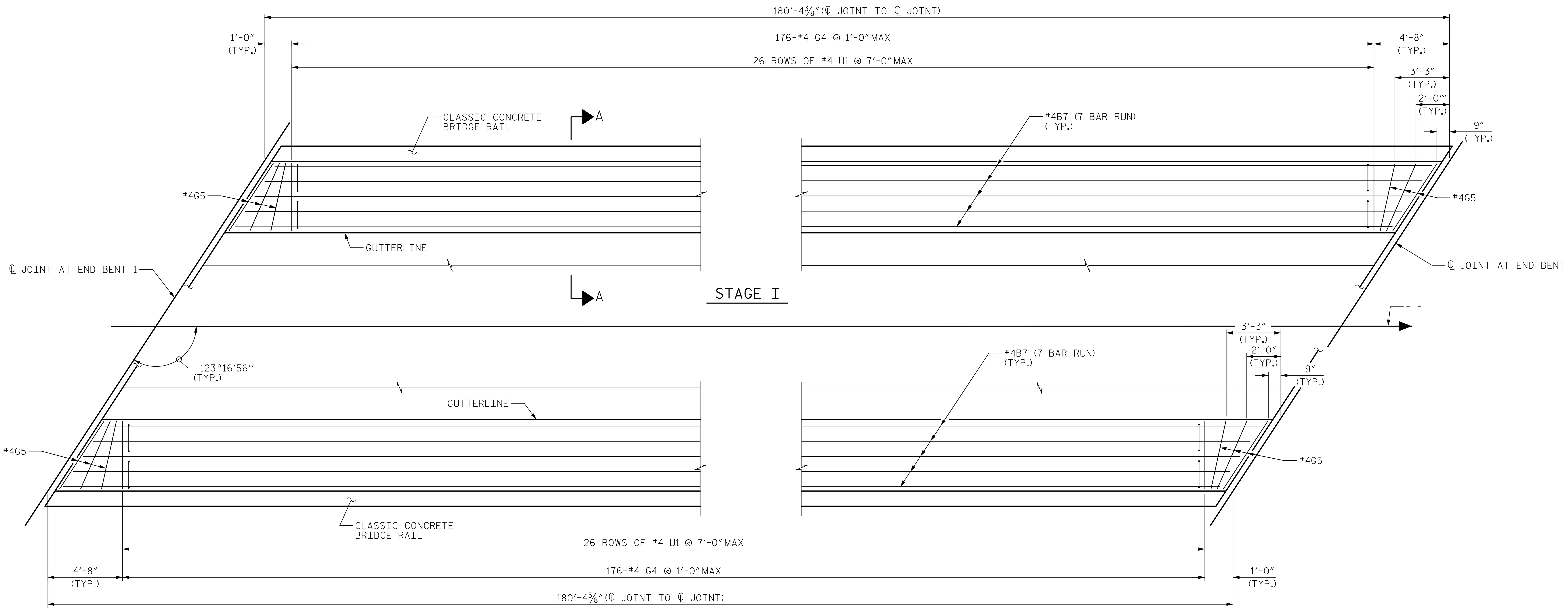
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

SHEET NO. S-10

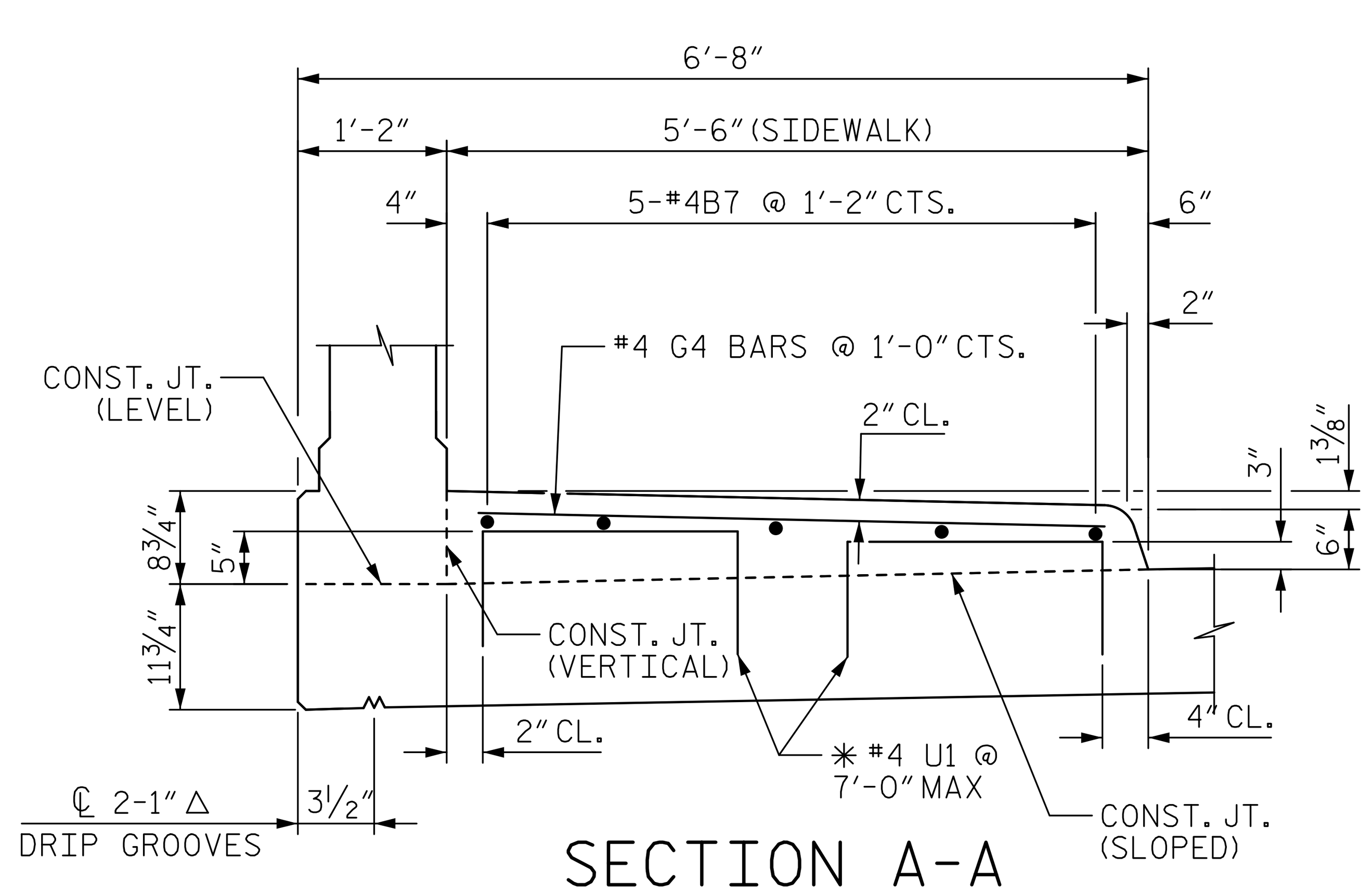
TOTAL SHEETS 49

DRAWN BY : K. MUENCH DATE : 05/2022
CHECKED BY : J.C. MORRISON DATE : 05/2022
DESIGNED BY : D. RITACCO DATE : 05/2022
DESIGN CHECKED BY : J.C. MORRISON DATE : 05/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PLAN OF SIDEWALK



SECTION A-A

(LEFT SIDE SHOWN, RIGHT SIDE EQUAL AND OPPOSITE)

NOTES:

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

ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JT. SHALL BE LOCATED AT A SPACING OF 8 TO 10FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED FOR SEFMENTS LESS THAN 10 FEET IN LENGTH.

SIDEWALKS ON THE BRIDGE EXTENDING TO THE END OF THE APPROACH SLABS ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIAL AND PAID FOR AS PART OF THE REINFORCED CONCRETE DECK PAY ITEM.

✳ "U" BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

ADJUST #4G4 BARS AND #4U1 BARS AS NECESSARY TO CLEAR CONDUIT JUNCTION BOX. CUT #4B7 BARS AT JUNCTION BOX LOCATIONS.

PROJECT NO. B-4654
WAKE COUNTY
STATION: 22+71.80 -L-

DRAWN BY : K. MUENCH	DATE : 05/2022
CHECKED BY : J.C. MORRISON	DATE : 05/2022
DESIGNED BY : D. RITACCO	DATE : 05/2022
DESIGN CHECKED BY : J.C. MORRISON	DATE : 05/2022

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NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON
1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

SIDEWALK DETAILS

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S-11
1			3				TOTAL SHEETS
2			4				49

FRAMING PLAN

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030474 JOHN C. MORRISON

1/19/2023

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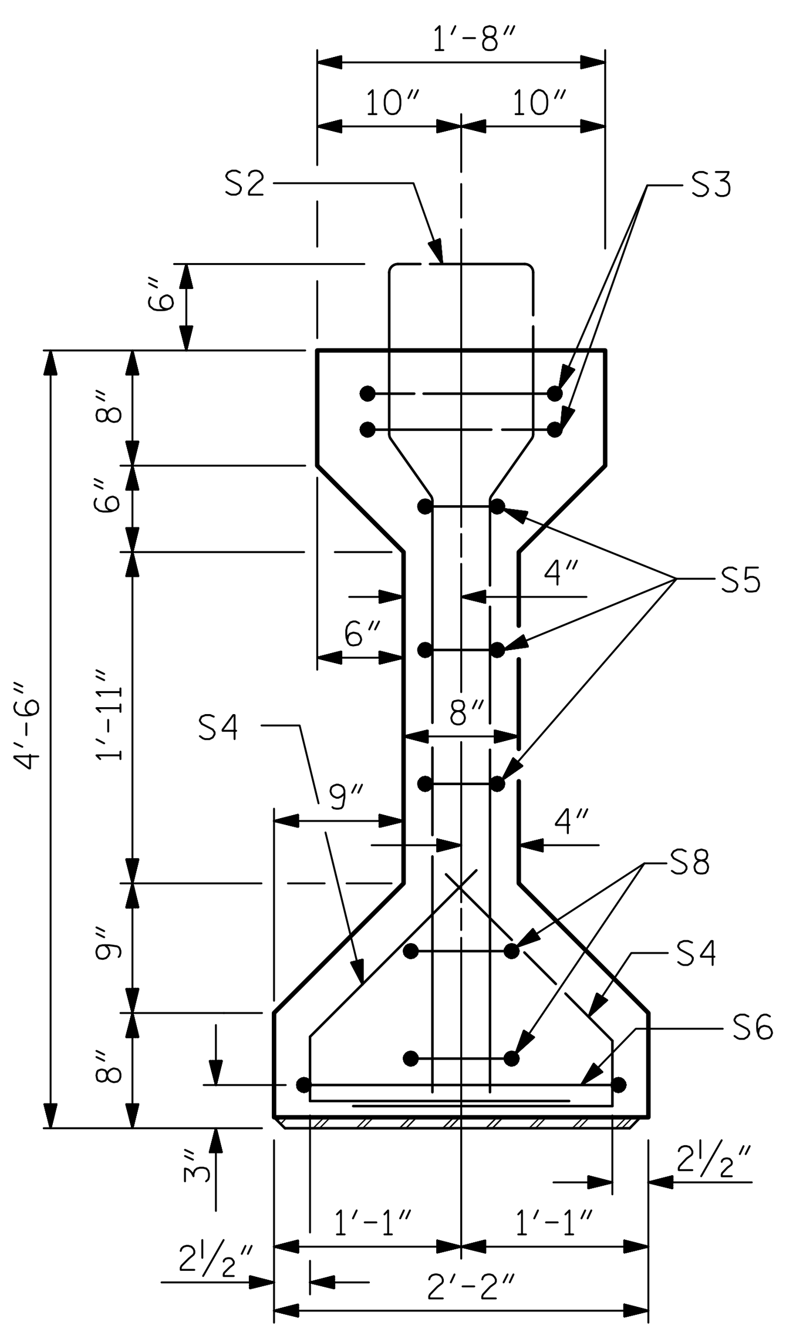
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

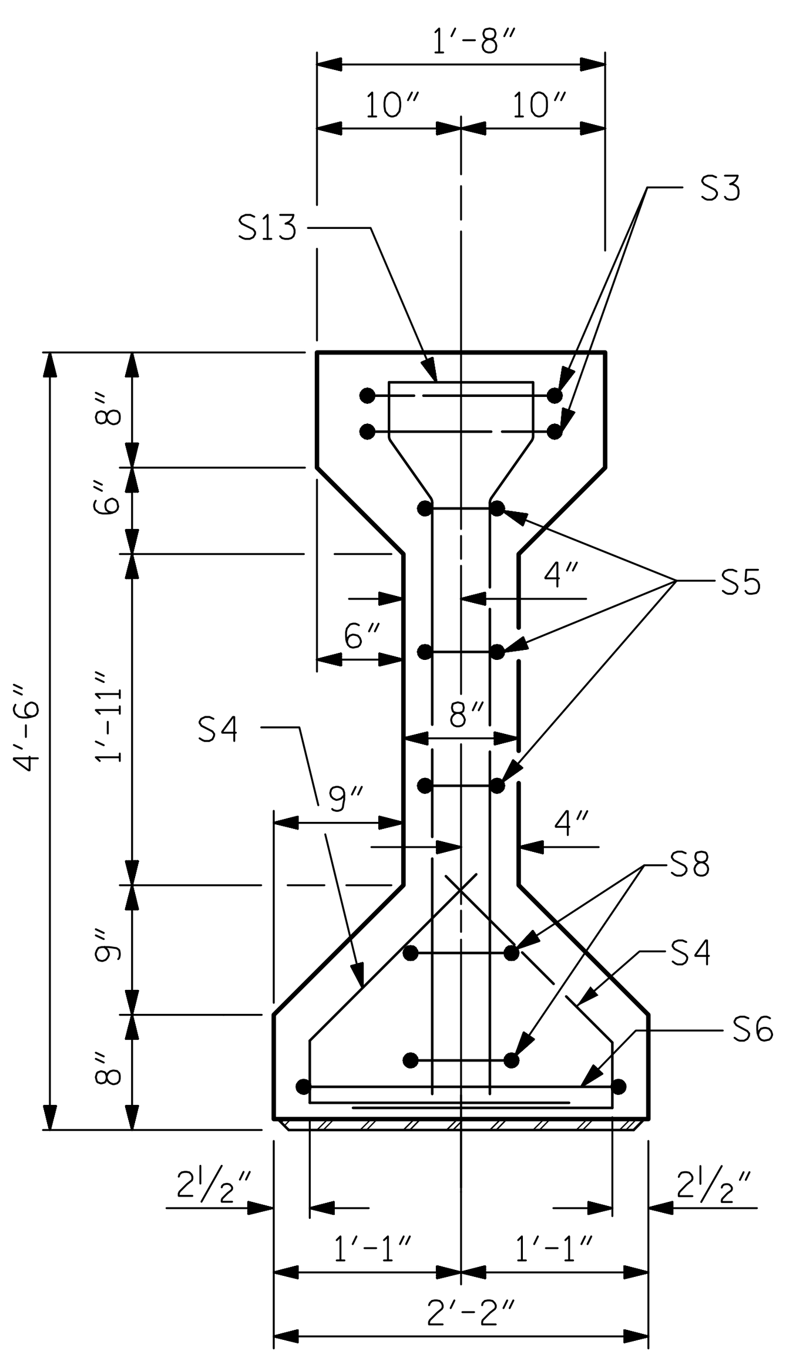
SHEET NO. S-12

TOTAL SHEETS 49

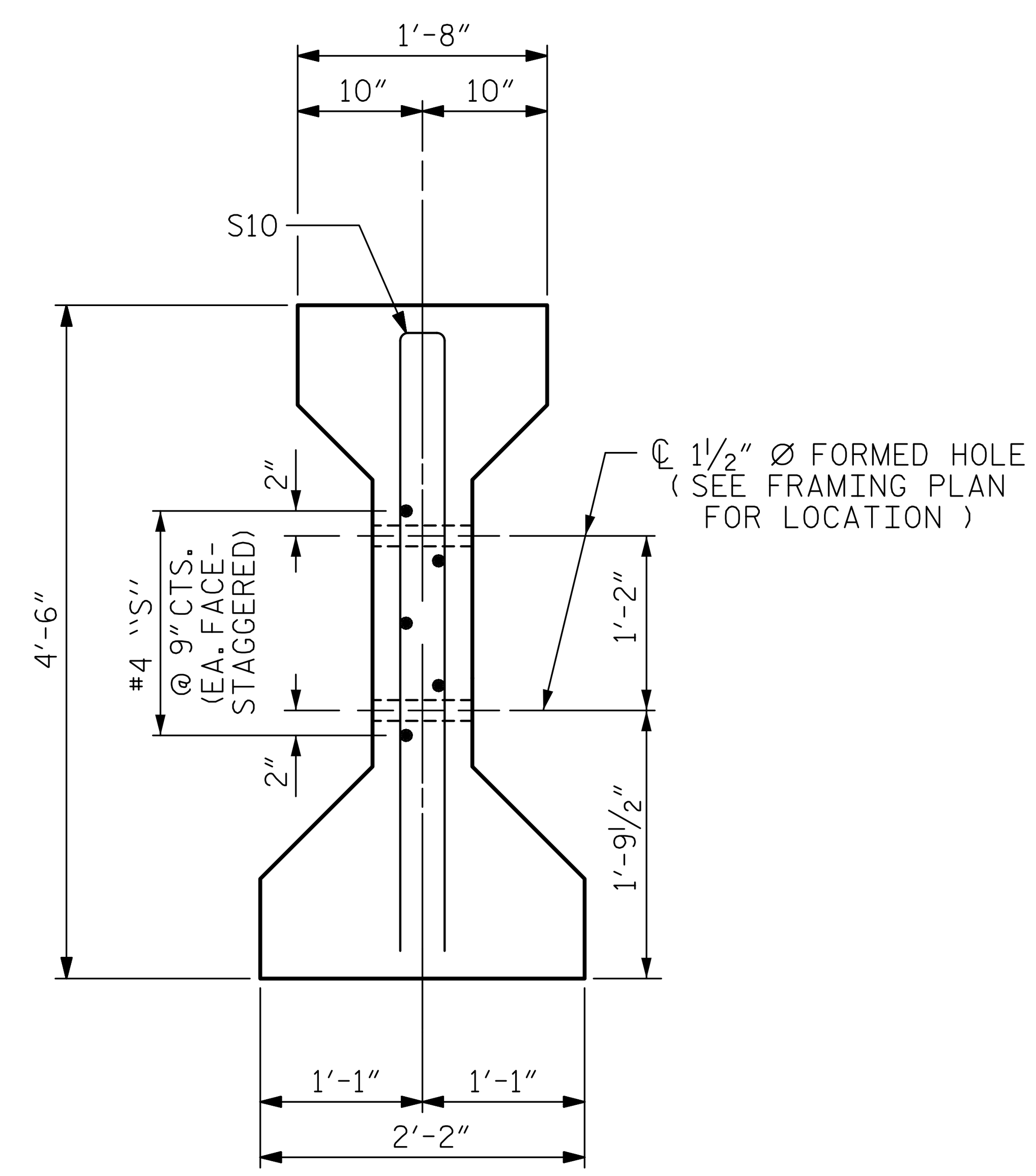
DRAWN BY :	K. MUENCH	DATE :	05/2022
CHECKED BY :	J.C. MORRISON	DATE :	05/2022
DESIGNED BY :	D. RITACCO	DATE :	05/2022
DESIGN CHECKED BY :	J.C. MORRISON	DATE :	05/2022



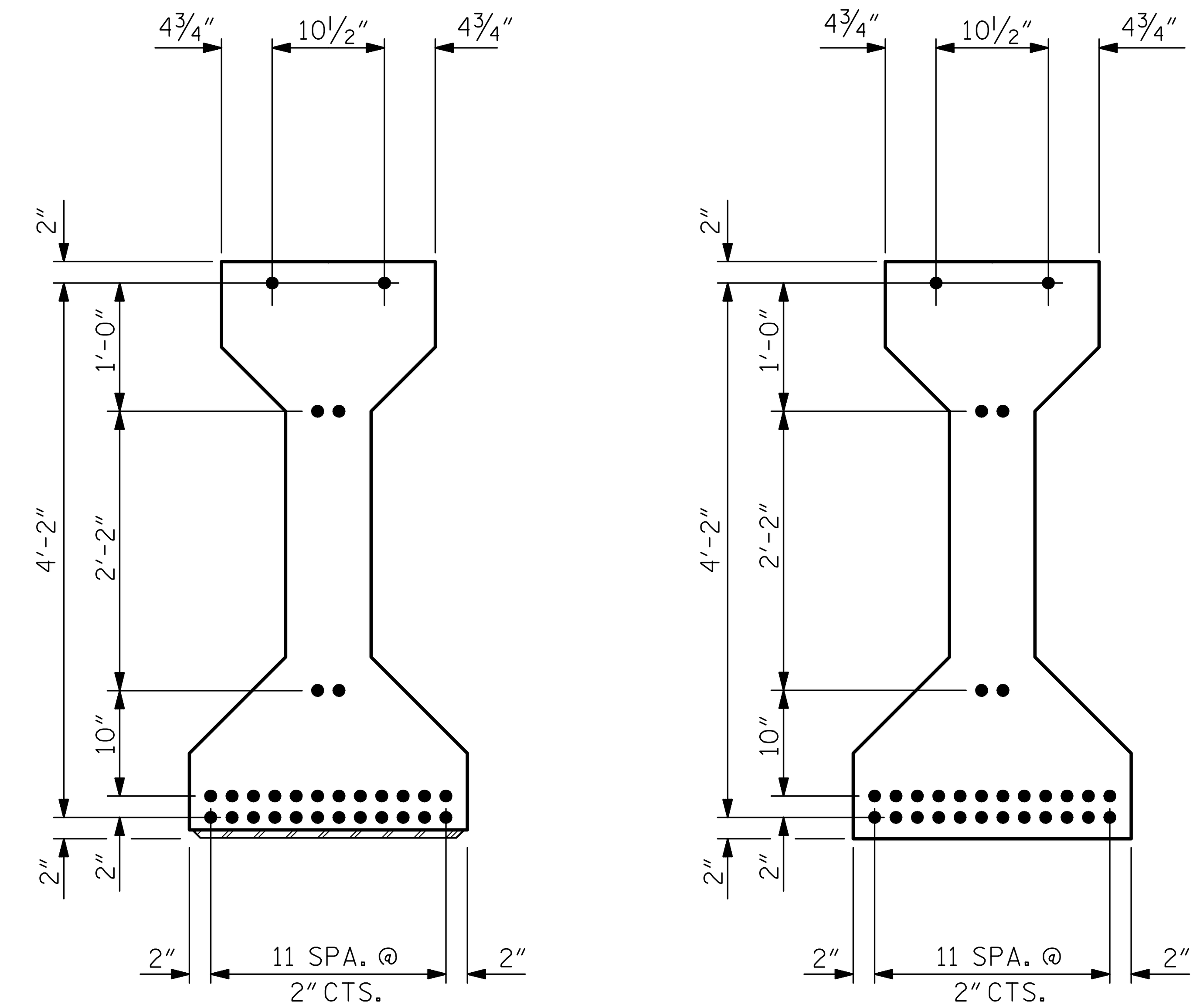
SECTION A-A



SECTION B-B



SECTION C-C
(S1 BARS NOT SHOWN)



AT END OF GIRDER

AT ℄ OF GIRDER

0.6″ Ø LOW RELAXATION STRAND LAYOUT

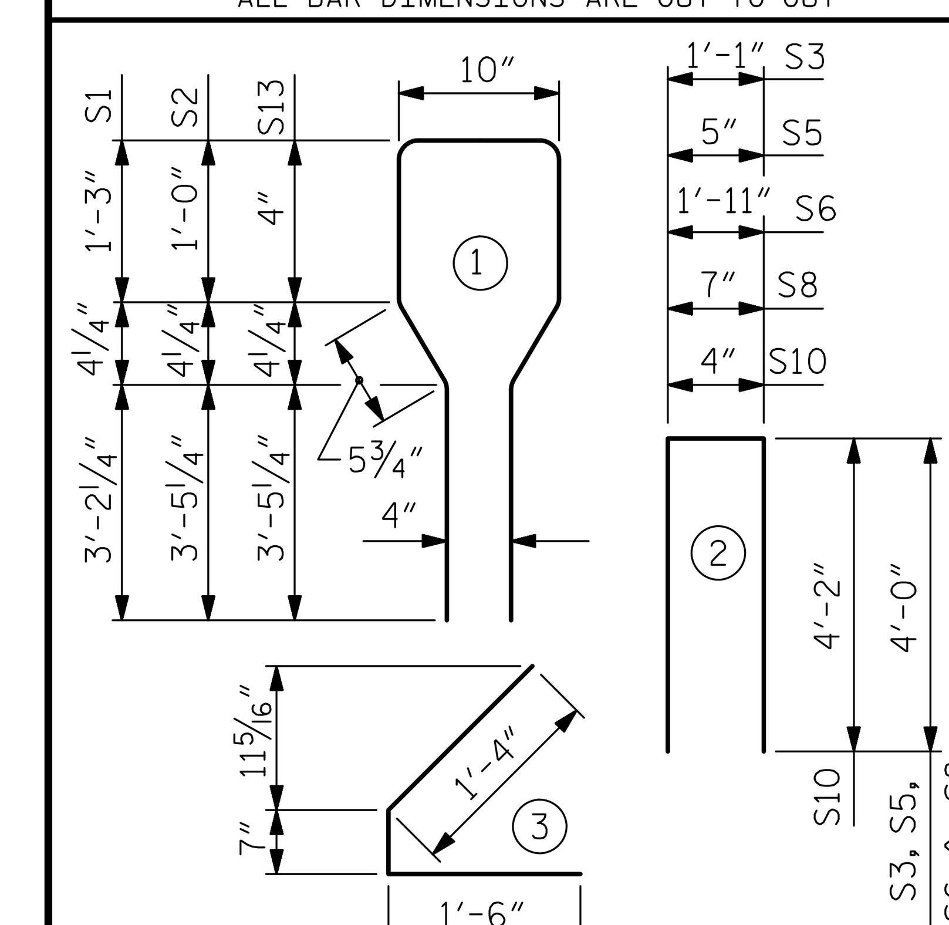
0.6″ Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

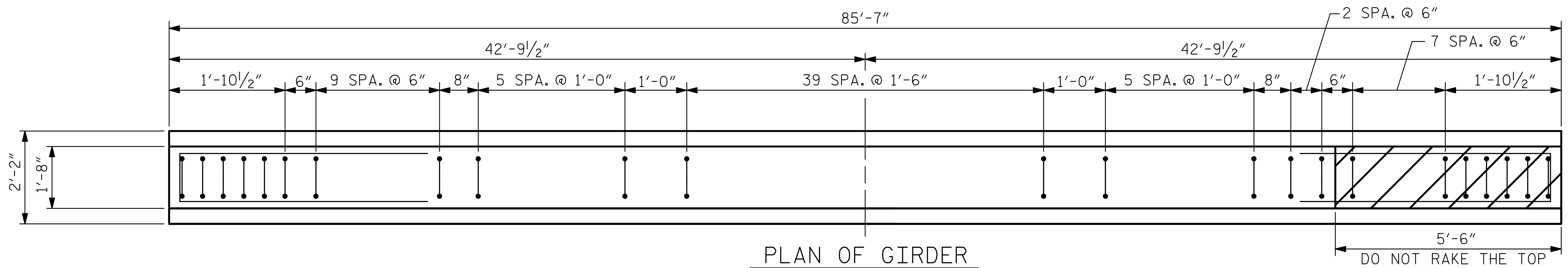
REINFORCING STEEL FOR ONE GIRDER

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	65	#4	1	10′-8″	463
	S2	6	#6	1	10′-8″	96
	S3	4	#4	2	9′-1″	24
	S4	64	#4	3	3′-5″	146
	S5	6	#4	2	8′-5″	34
	S6	2	#4	2	9′-11″	13
	S8	4	#4	2	8′-7″	23
GDR. 1, 7	S10	2	#5	2	8′-8″	18
GDR. 2-4	S10	4	#5	2	8′-8″	36
GDR. 1, 7	S11	5	#4	STR	7′-0″	23
GDR. 2-4	S12	5	#4	STR	13′-2″	44
	S13	13	#6	1	9′-4″	182

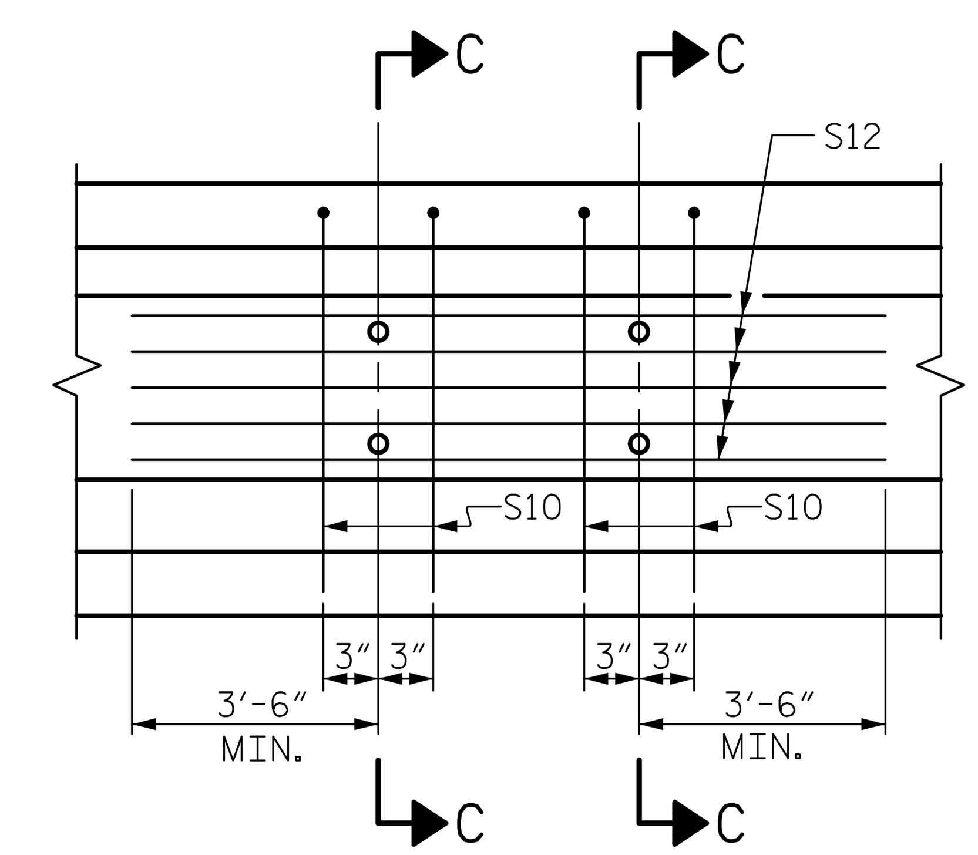
BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT





PLAN OF GIRDER



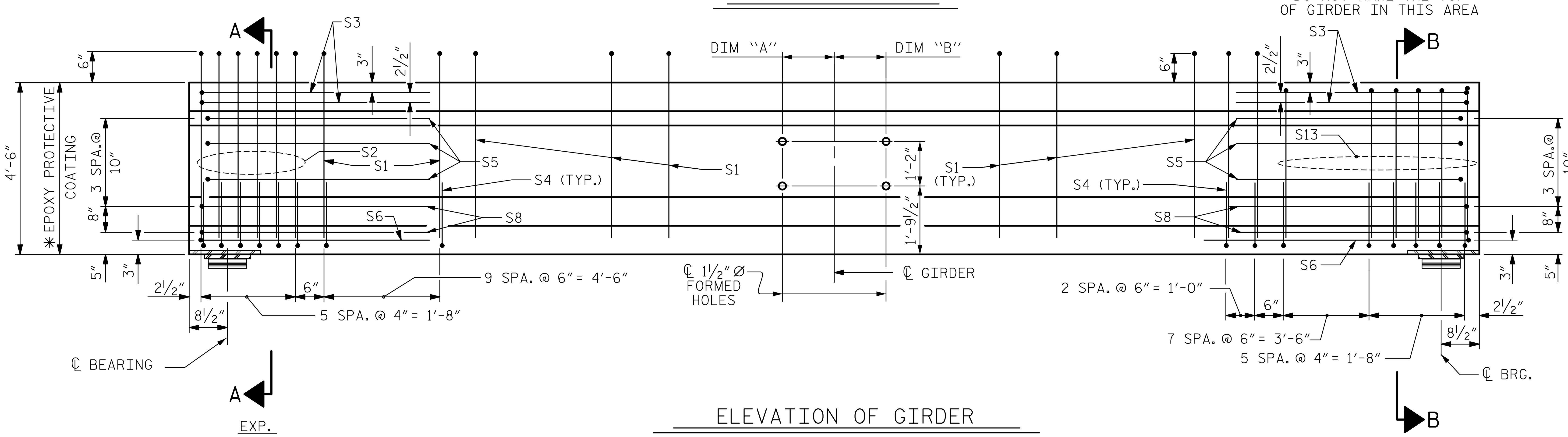
PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 2-4

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	7000 PSI CONCRETE C.Y.	0.6″ Ø L. R. STRANDS No.
GDR. 1, 6, 7	1022	17.4	30
GDR. 2-4	1061	17.4	30

GIRDERS REQUIRED

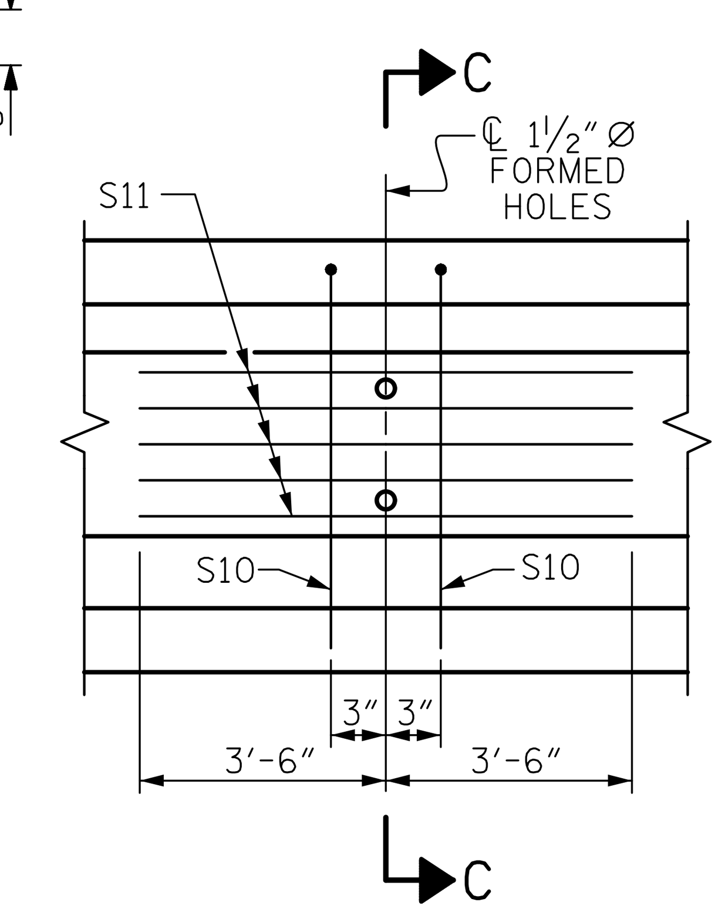
	NUMBER	LENGTH	TOTAL LENGTH
STAGE I	4	85′-7″	342′-4″
STAGE II	1	85′-7″	85′-7″
TOTAL	5	-	427′-11″



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

✻ TYPICAL BOTH ENDS

1½″ FORMED HOLE LOCATIONS		
	DIM "A"	DIM "B"
GDR. 1	3′-0⁷⁄₁₆″	-
GDR. 2, 3 & 4	3′-0⁷⁄₁₆″	3′-0⁷⁄₁₆″
GDR. 7	-	3′-0⁷⁄₁₆″



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 & 7

PROJECT NO. B-4654
WAKE COUNTY
STATION: 22+71.80 -L-

SHEET 1 OF 5

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NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON
1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

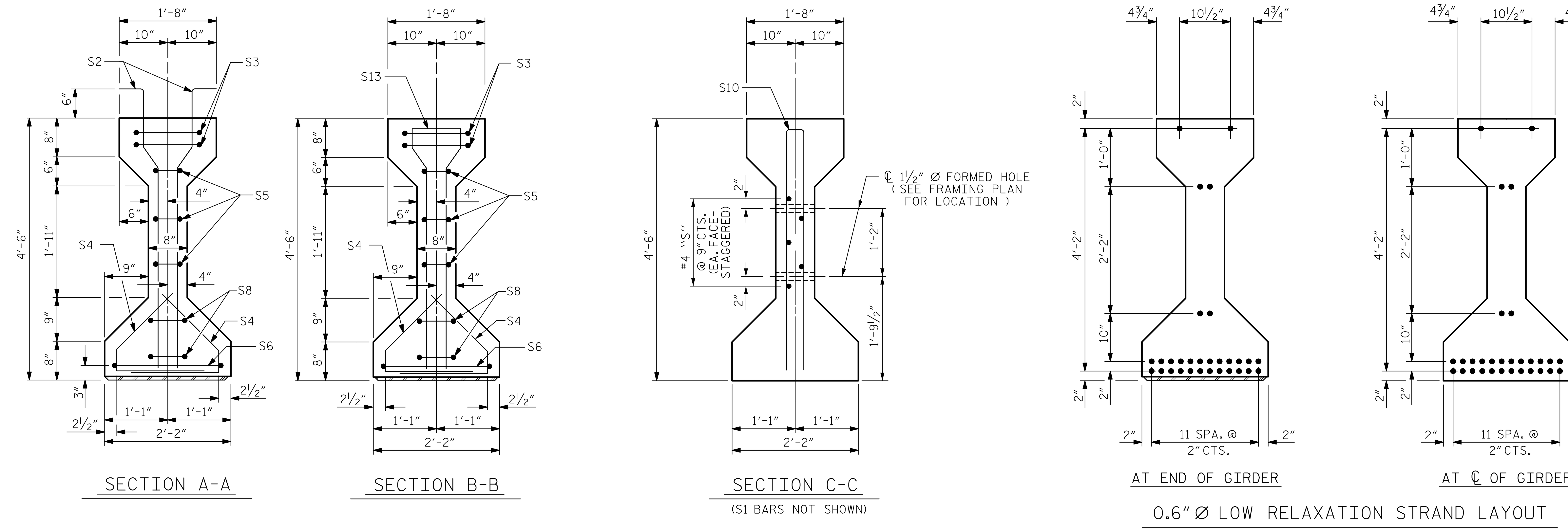
STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
LINK SLAB
(SPAN A, GIRDERS 1-4 & 7)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : K. MUENCH	DATE : 05/2022
CHECKED BY : J.C. MORRISON	DATE : 05/2022
DRAWN BY : BNB 09/21	REV. --- ---/---
CHECKED BY : AAI 09/21	REV. --- ---/--- REV. --- ---/---

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S-13
1			3					TOTAL SHEETS
2			4					49

STD. NO. PCG6



SECTION A-A

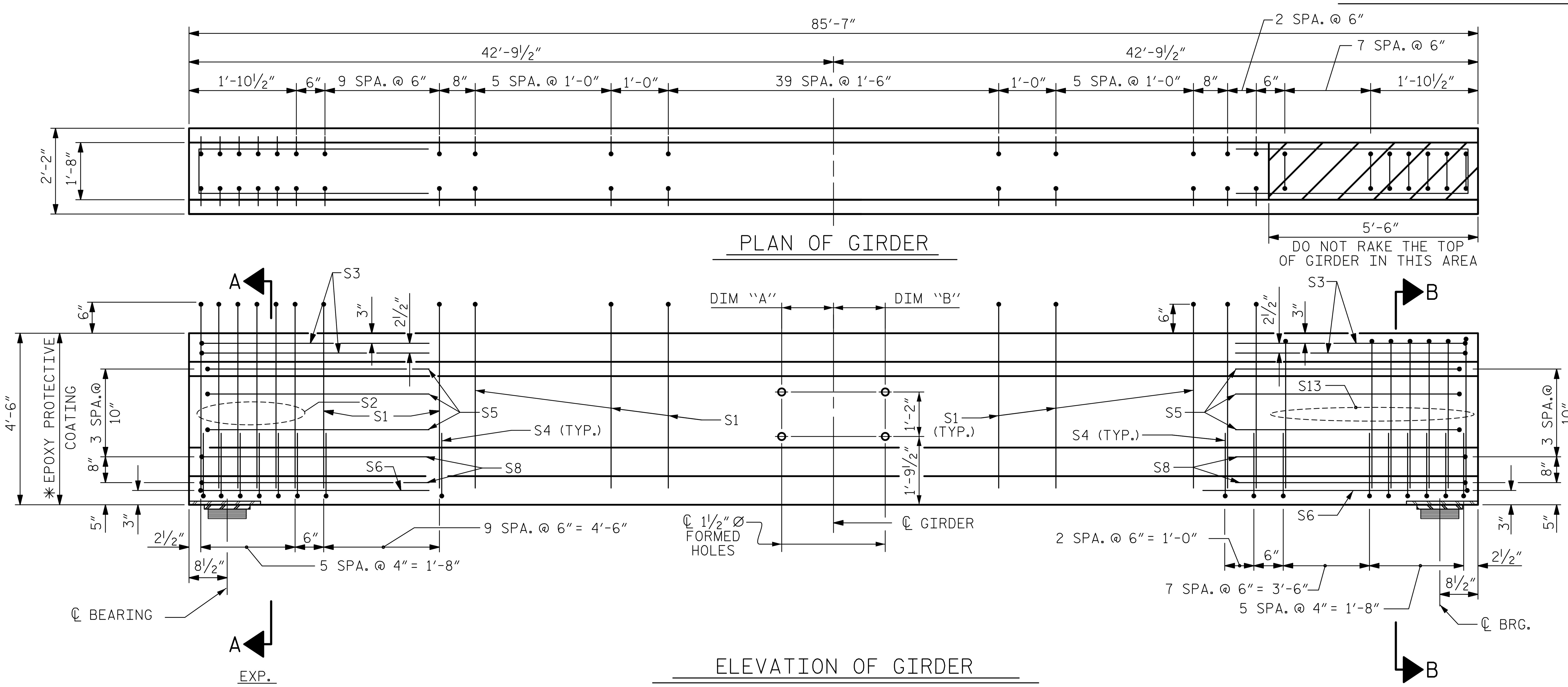
SECTION B-B

SECTION C-C
(S1 BARS NOT SHOWN)

AT END OF GIRDER

AT ℄ OF GIRDER

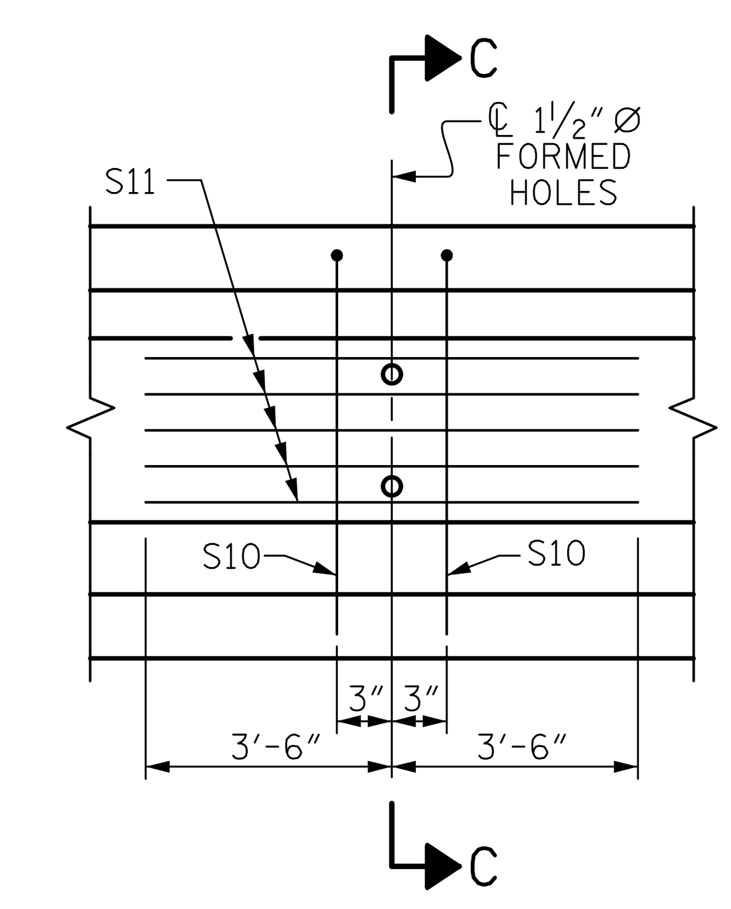
0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER

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

✱ TYPICAL BOTH ENDS



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 5 & 6

1½" FORMED HOLE LOCATIONS	DIM "A"	DIM "B"
GDR. 5	-	3'-0 7/16"
GDR. 6	3'-0 7/16"	-

0.6" Ø L. R. GRADE 270 STRANDS

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

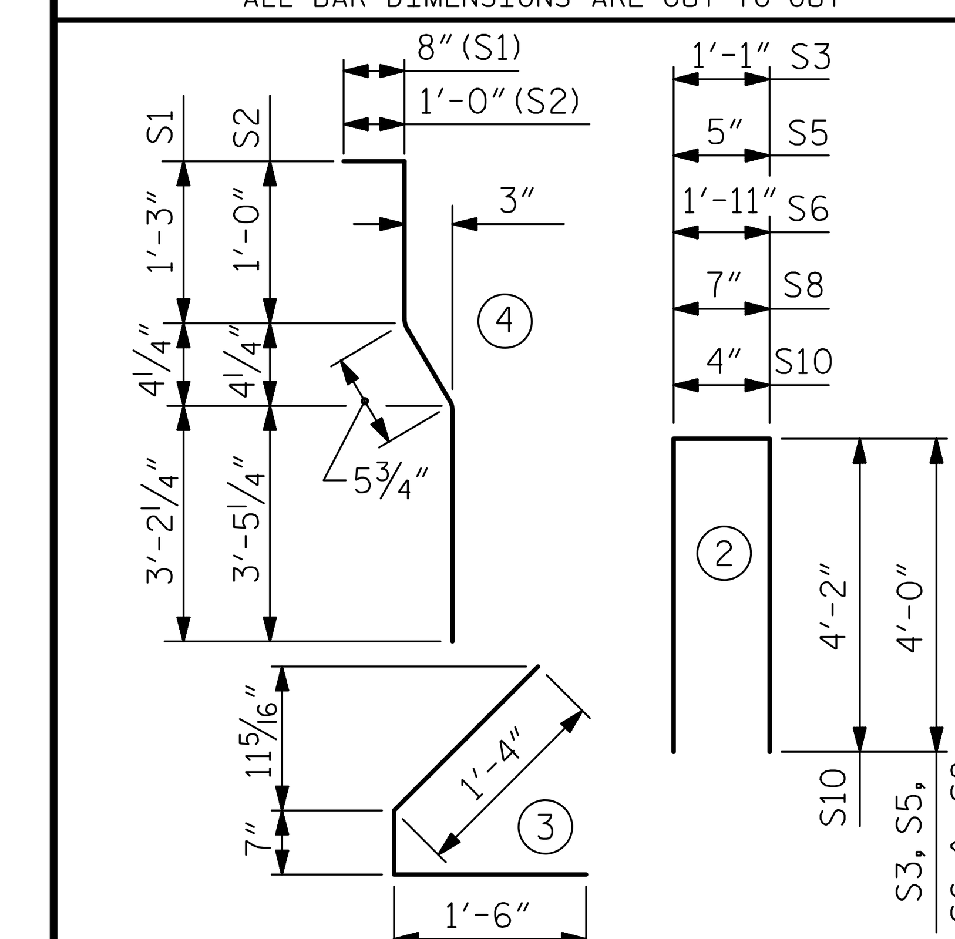
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	130	#4	4	5'-7"	485
S2	12	#6	4	5'-11"	107
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	2	#4	2	9'-11"	13
S8	4	#4	2	8'-7"	23
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S13	13	#6	1 ✱✱	9'-4"	182

✱✱ FOR BAR S13 BEND DIAGRAM, SEE SHEET S-13

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL (LB.)	7000 PSI CONCRETE (C.Y.)	0.6" Ø L. R. STRANDS (No.)
GDR. 5 & 6	1055	17.4	30

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
2	85'-7"	171'-2"

PROJECT NO. B-4654
WAKE COUNTY
STATION: 22+71.80 -L-

SHEET 2 OF 5

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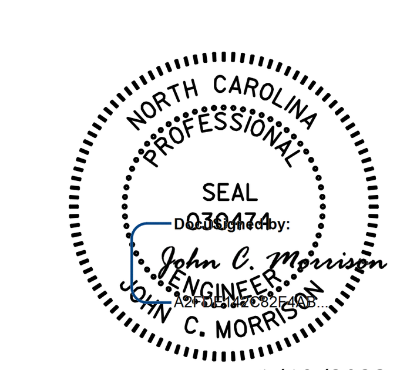

1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
LINK SLAB
(SPAN A, GIRDERS 5 & 6)

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ASSEMBLED BY : K. MUENCH	DATE : 05/2022
CHECKED BY : J.C. MORRISON	DATE : 05/2022
DRAWN BY : BNB 09/21	REV. --- ---/---
CHECKED BY : AAI 09/21	REV. --- ---/---
	REV. --- ---/---

REVISIONS						
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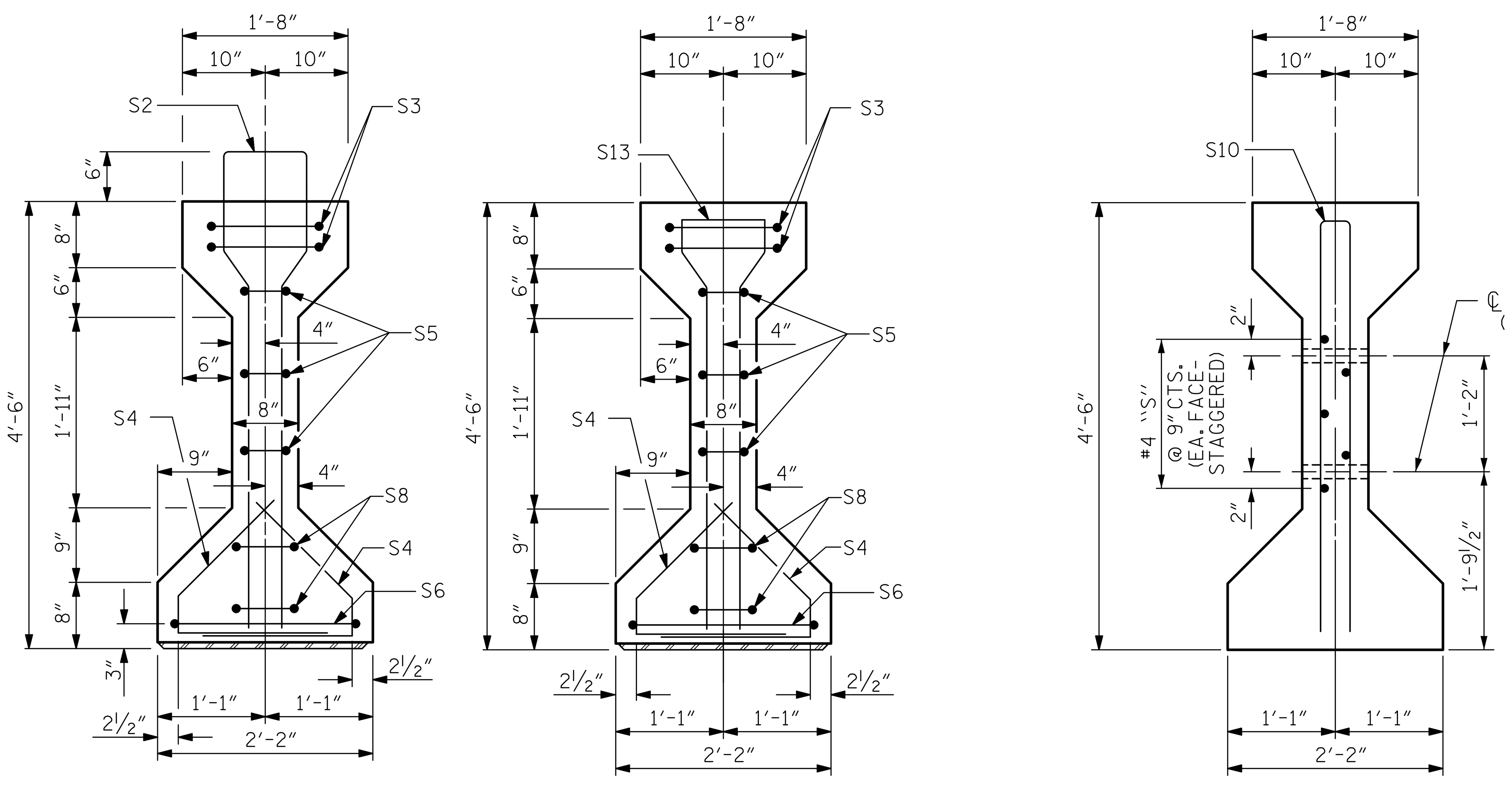
1			3			
2			4			

SHEET NO. S-14
TOTAL SHEETS 49

STD. NO. PCG6



SECTION A-A

SECTION B-B

SECTION C-C

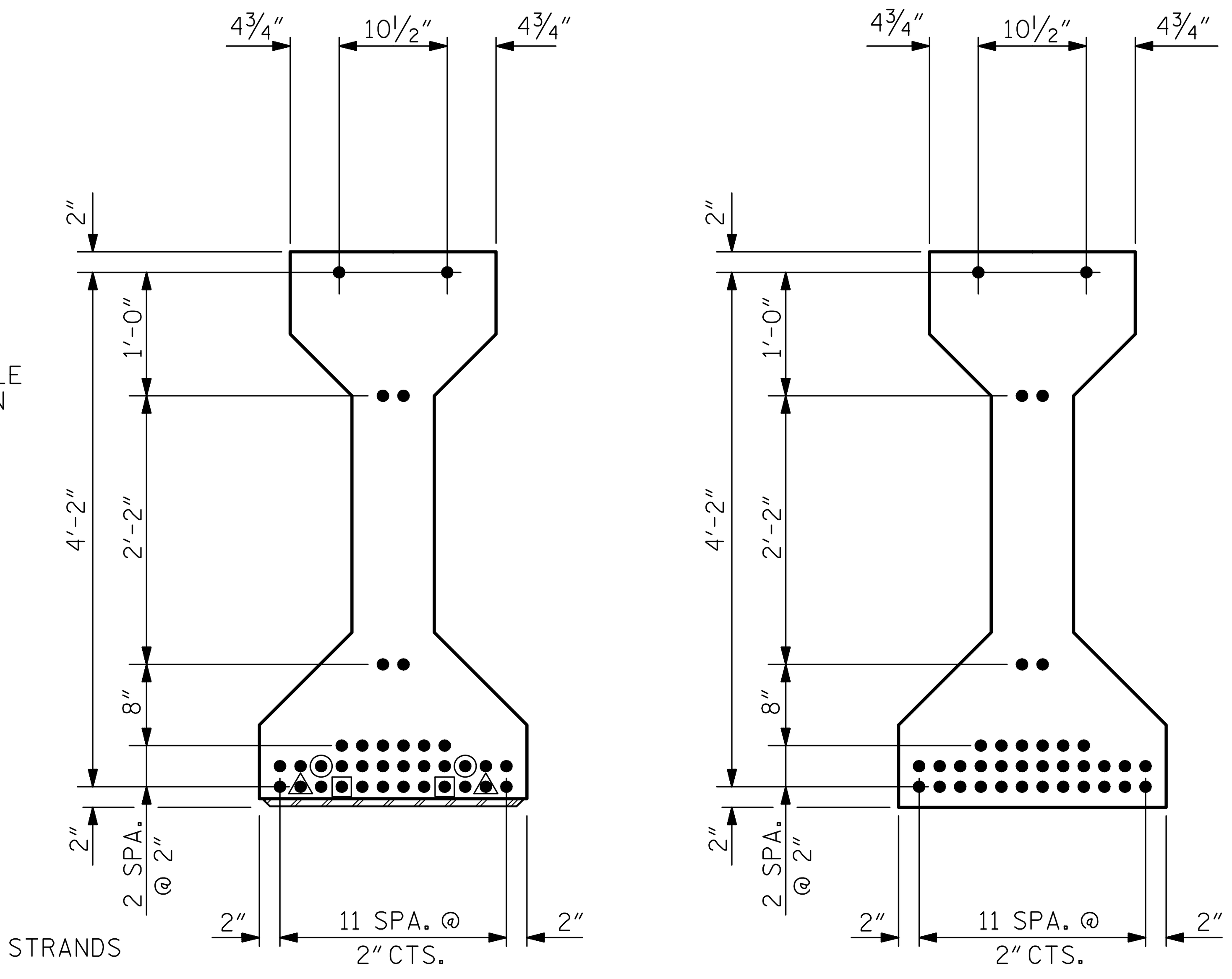
(S1 BARS NOT SHOWN)

• FULLY BONDED STRANDS

▣ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER

◬ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER

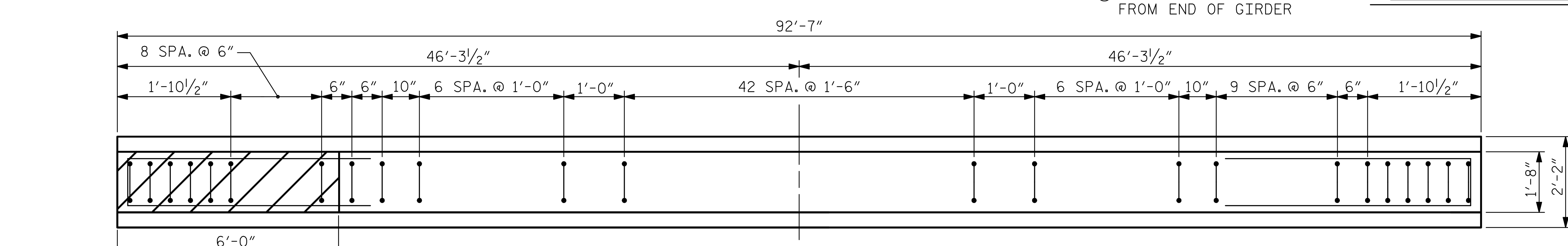
◉ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER



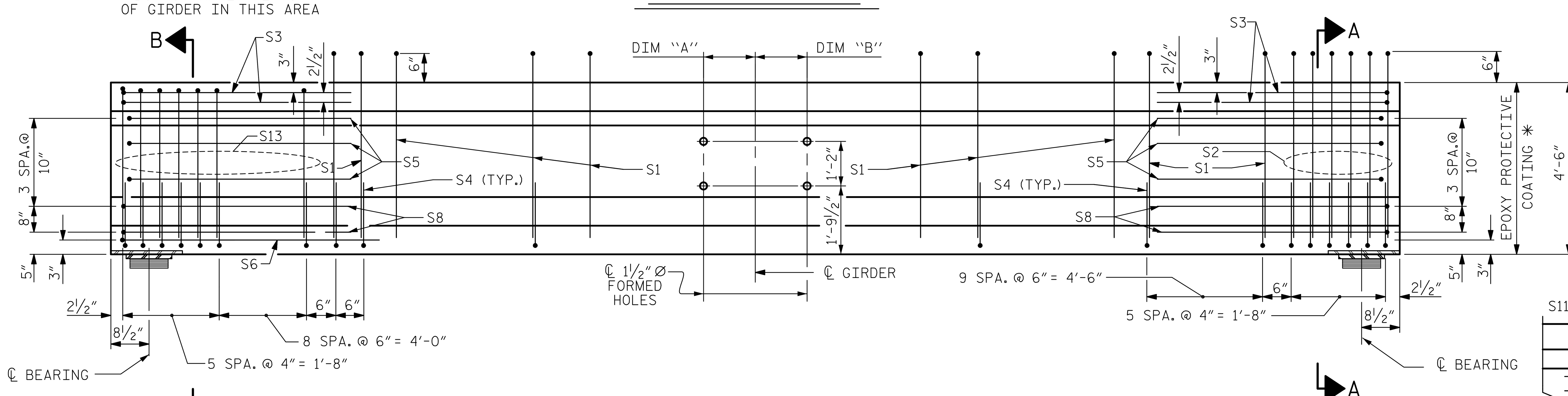
AT END OF GIRDER

AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT



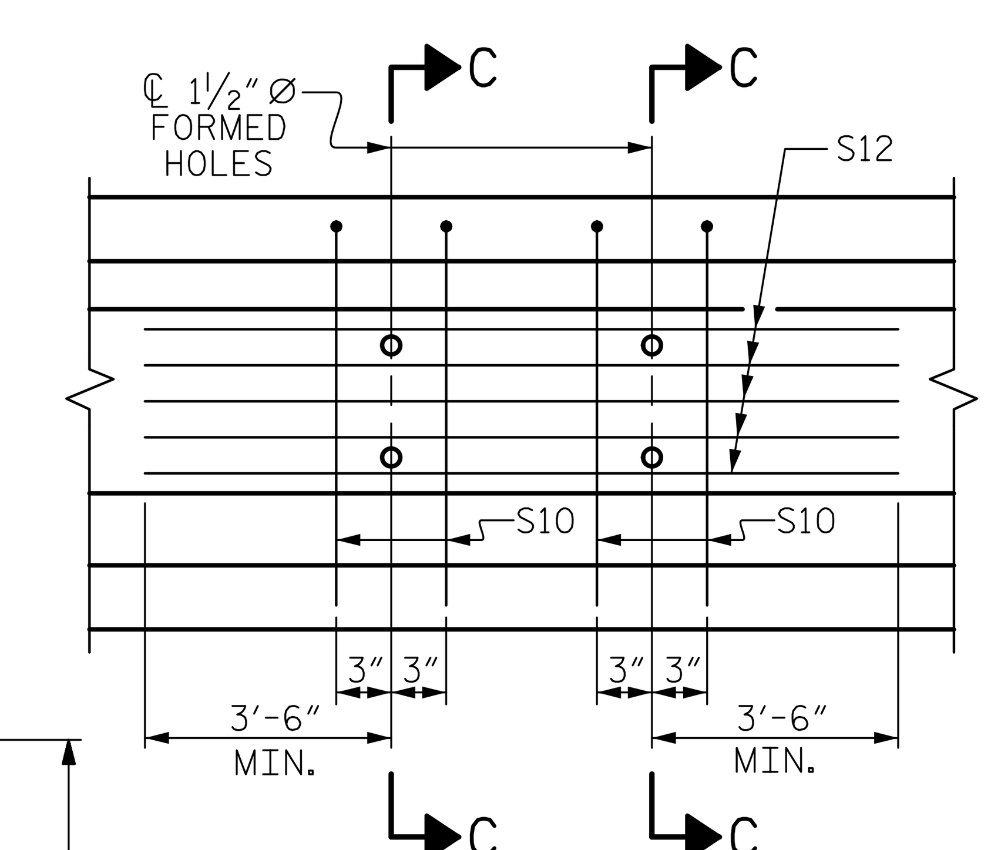
PLAN OF GIRDER



ELEVATION OF GIRDER

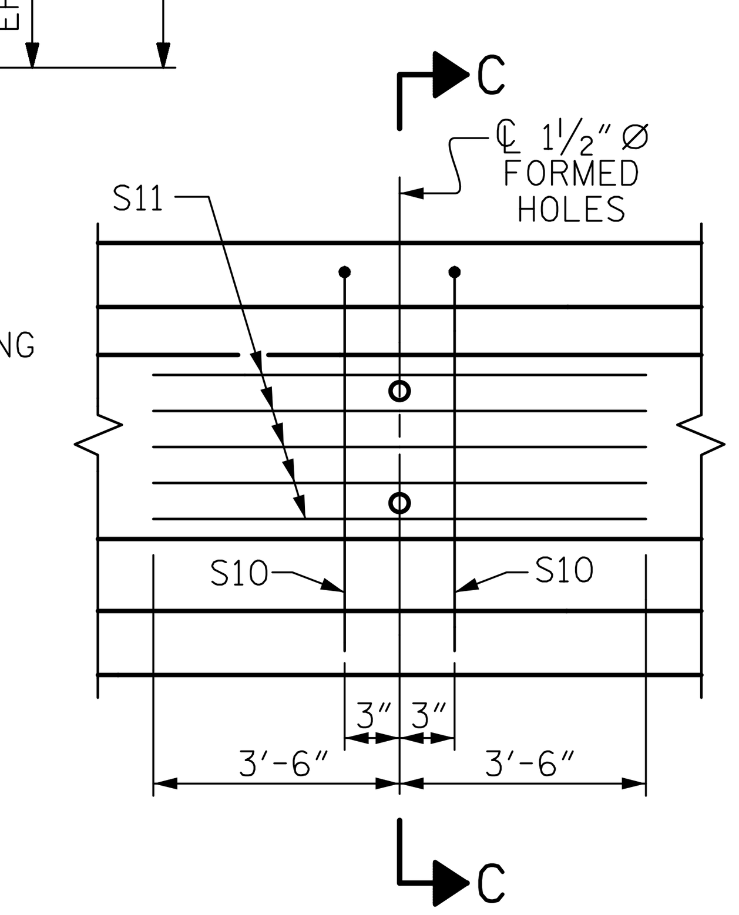
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

✱ TYPICAL BOTH ENDS



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 2-4



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 & 7

1½" FORMED HOLE LOCATIONS		
	DIM "A"	DIM "B"
GDR. 1	3'-0⅞"	-
GDR. 2, 3 & 4	3'-0⅞"	3'-0⅞"
GDR. 7	-	3'-0⅞"

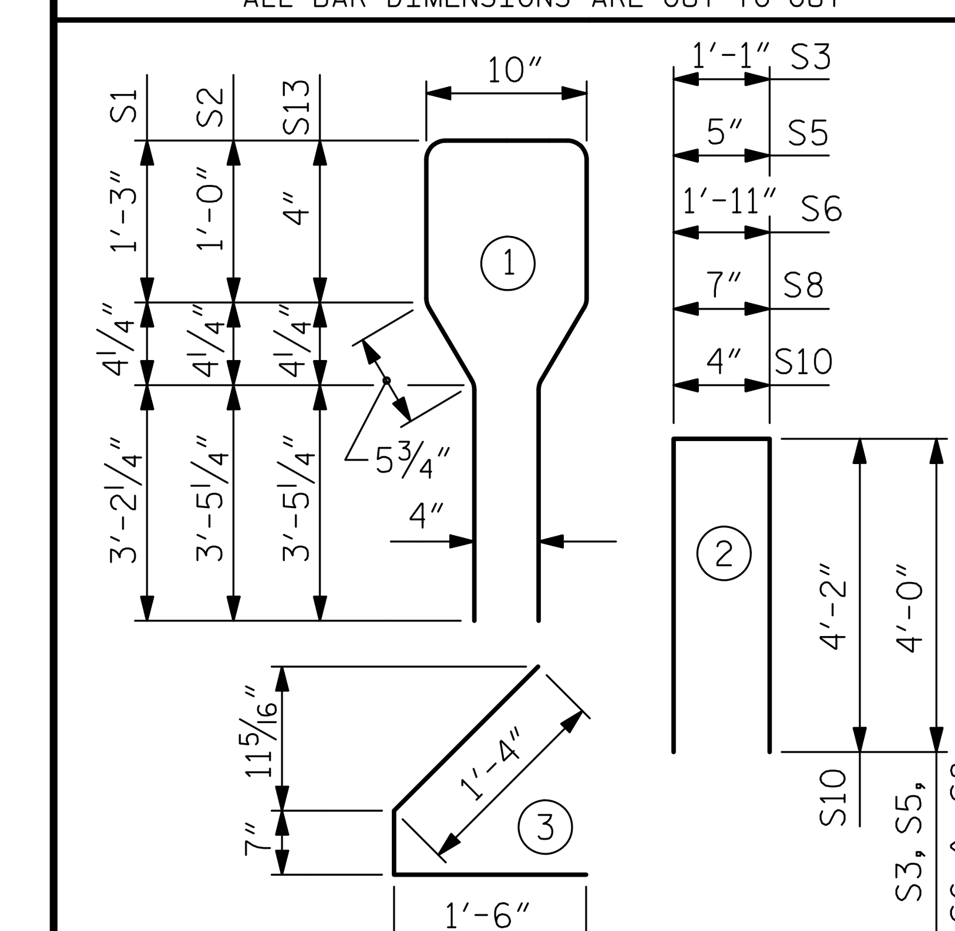
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	69	#4	1	10'-8"	492
	S2	6	#6	1	10'-8"	96
	S3	4	#4	2	9'-1"	24
	S4	64	#4	3	3'-5"	146
	S5	6	#4	2	8'-5"	34
	S6	2	#4	2	9'-11"	13
	S8	4	#4	2	8'-7"	23
GDR. 1, 7	S10	2	#5	2	8'-8"	18
GDR. 2-4	S10	4	#5	2	8'-8"	36
GDR. 1, 7	S11	5	#4	STR	7'-0"	23
GDR. 2-4	S12	5	#4	STR	13'-2"	44
	S13	14	#6	1	9'-4"	196

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	7000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
GDR. 1 & 7	1065	18.8	36
GDR. 2-4	1104	18.8	36

GIRDERS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
STAGE I	4	92'-7"	370'-4"
STAGE II	1	92'-7"	92'-7"
TOTAL	5	-	462'-11"

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
LINK SLAB
(SPAN B, GIRDERS 1-4 & 7)

SEAL 030474 — NORTH CAROLINA PROFESSIONAL ENGINEER — JOHN C. MORRISON

1/19/2023

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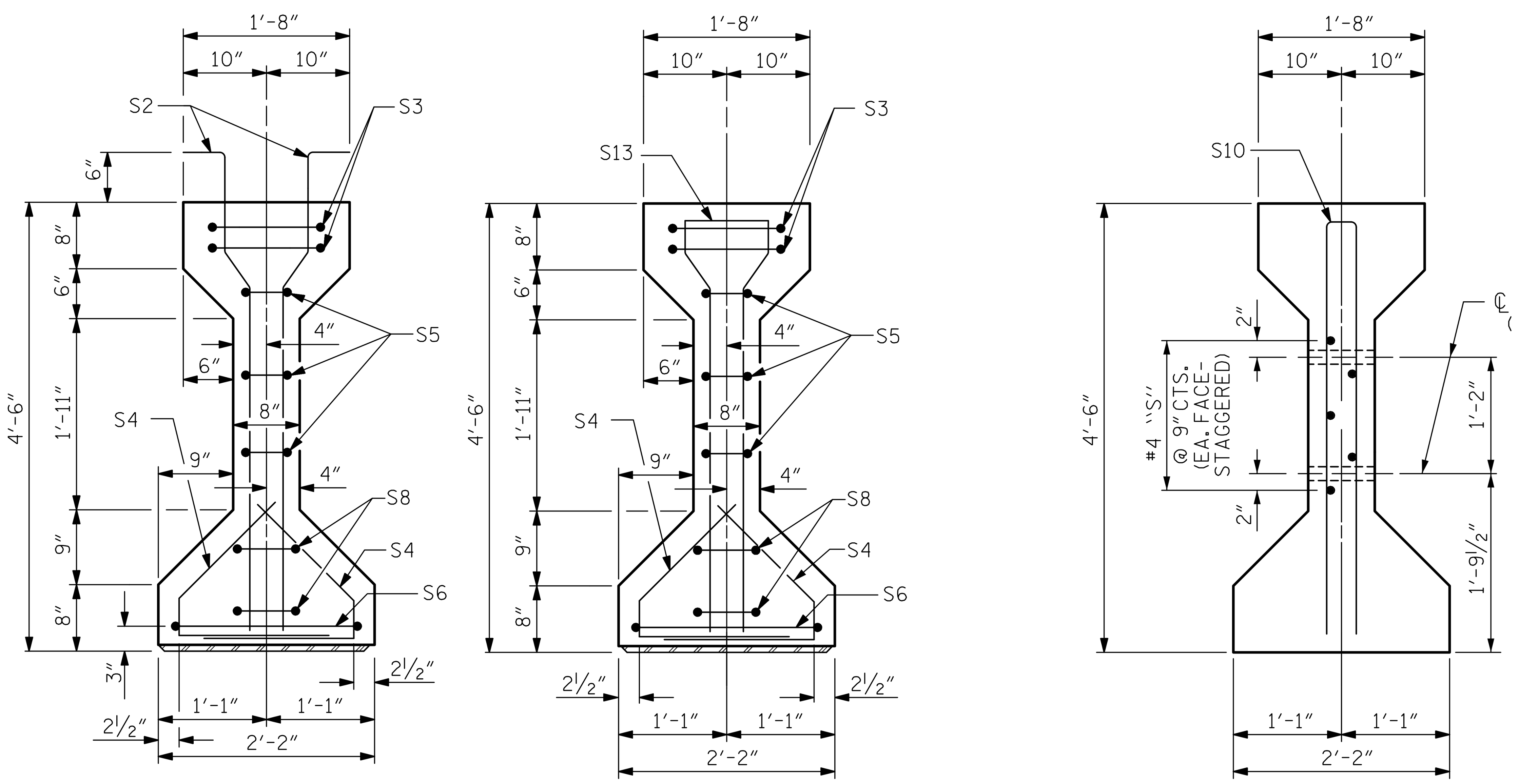
ASSEMBLED BY : K. MUENCH	DATE : 05/2022
CHECKED BY : J.C. MORRISON	DATE : 05/2022
DRAWN BY : BNB 09/21	REV. --- ---/---
CHECKED BY : AAI 09/21	REV. --- ---/--- REV. --- ---/---

REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO. S-15
1			3			TOTAL SHEETS 49
2			4			

STD. NO. PCG6

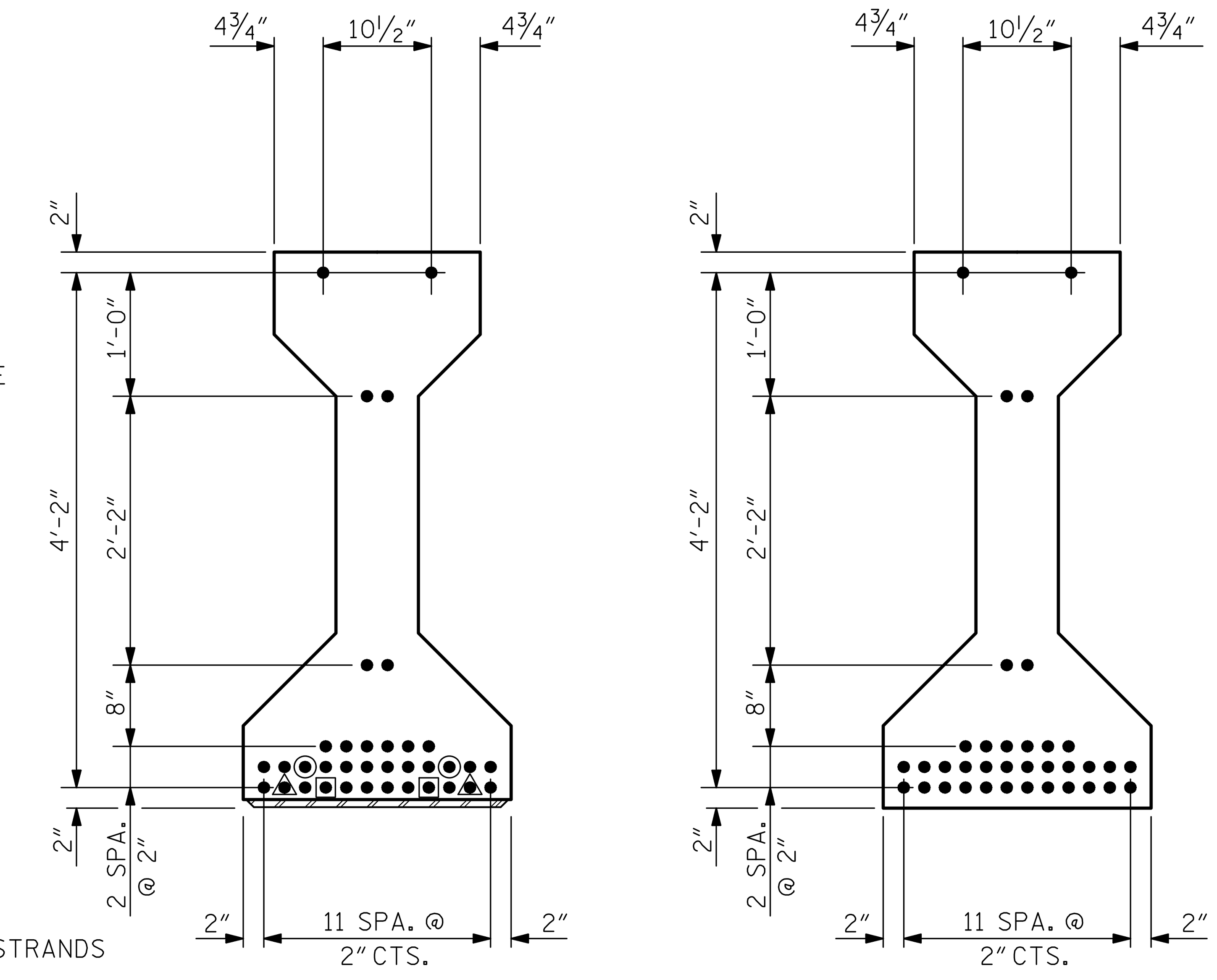


SECTION A-A

SECTION B-B

SECTION C-C

(S1 BARS NOT SHOWN)

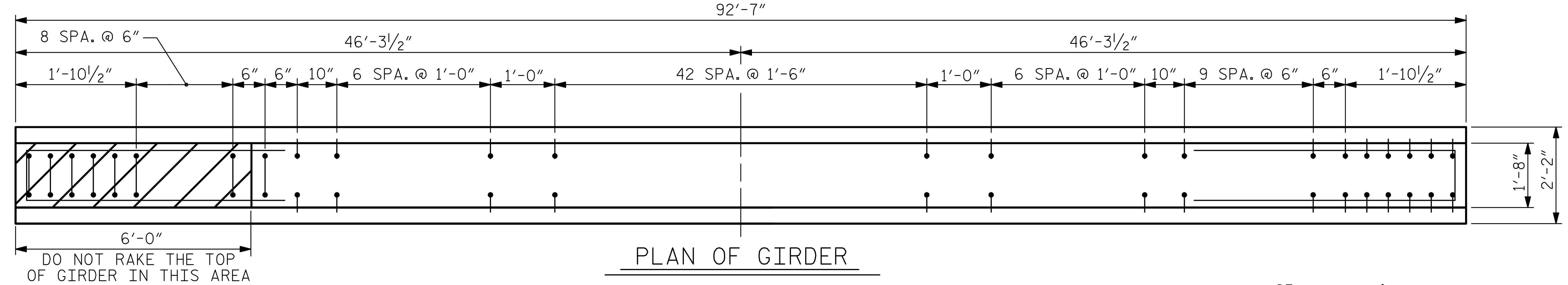


AT END OF GIRDER

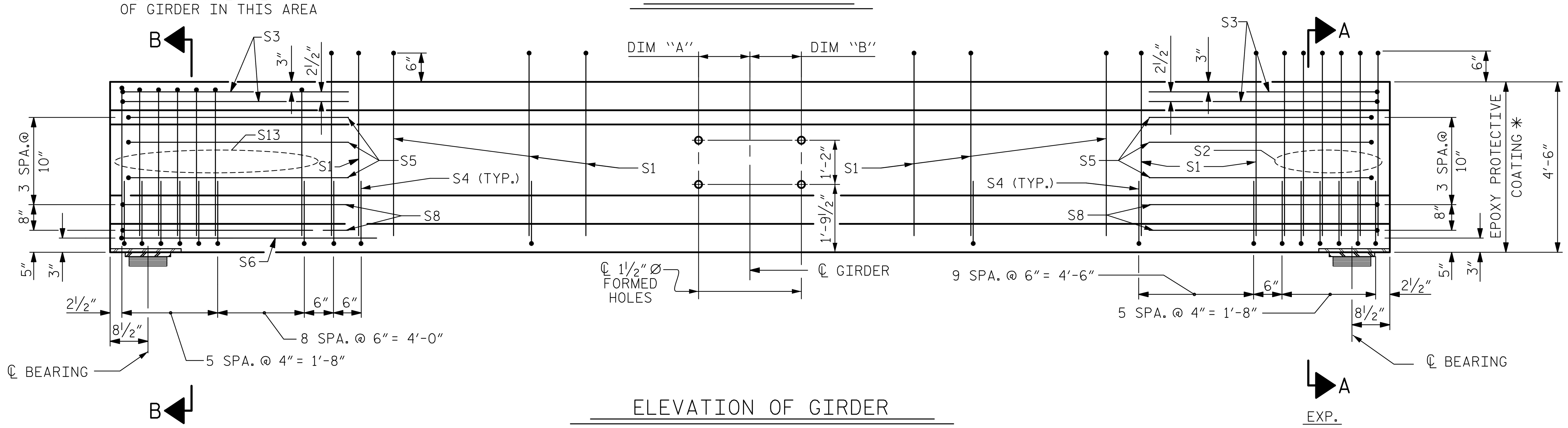
AT ℄ OF GIRDER

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT



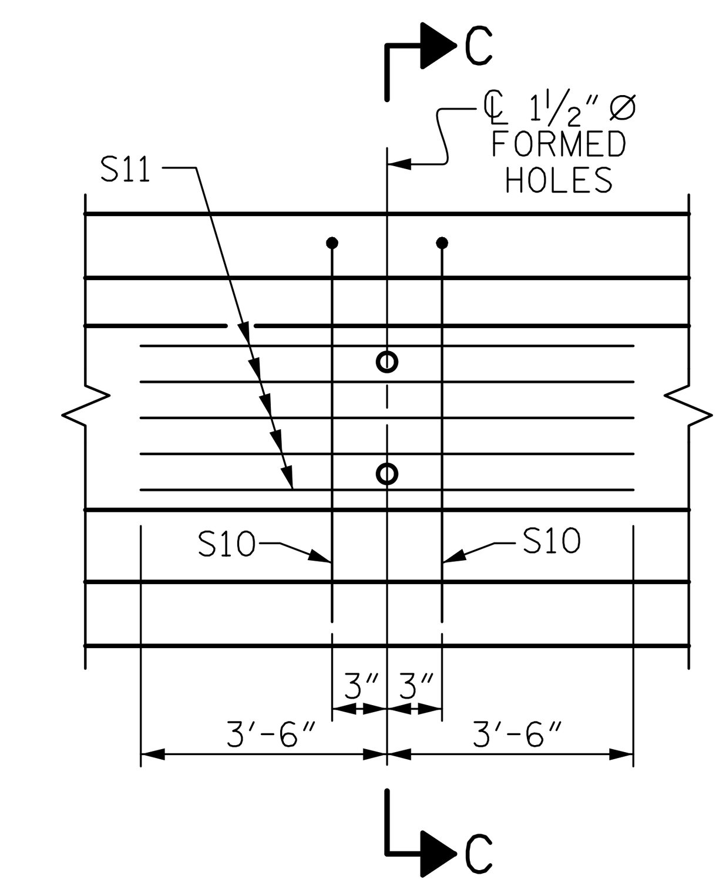
PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

* TYPICAL BOTH ENDS



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 5 & 6

1½" FORMED HOLE LOCATIONS		
	DIM "A"	DIM "B"
GDR. 5	-	3'-0 7/16"
GDR. 6	3'-0 7/16"	-

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

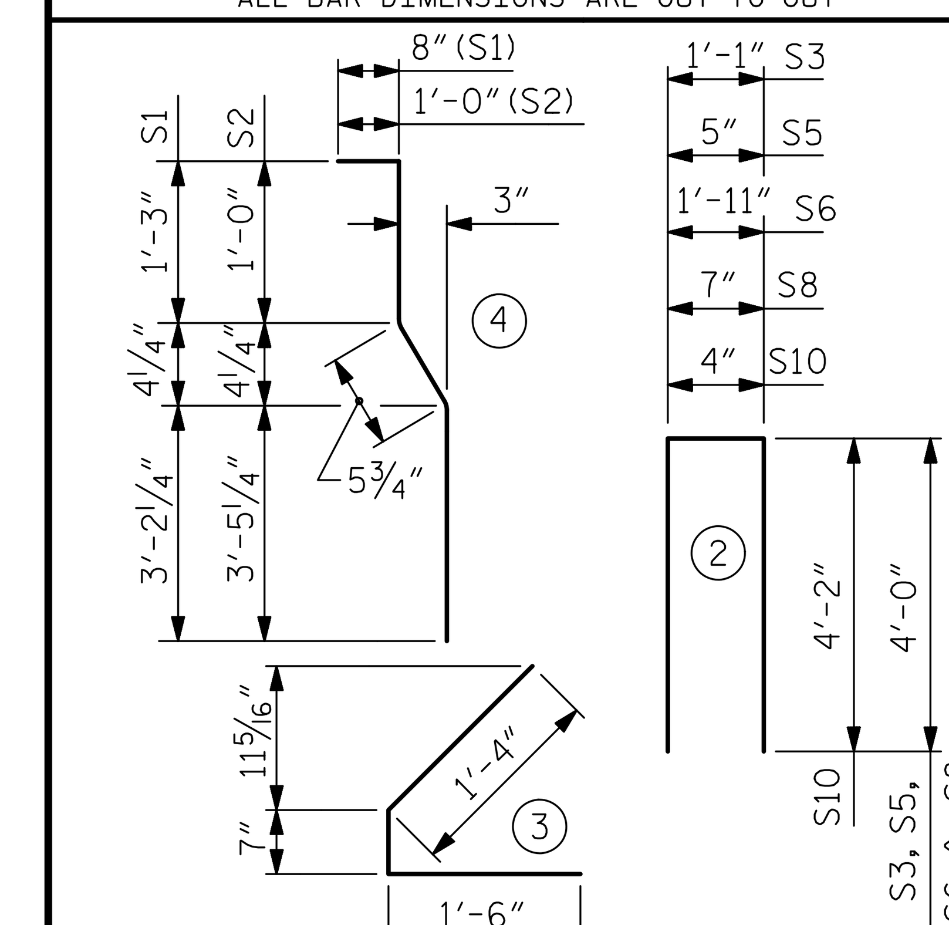
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	138	#4	4	5'-7"	485
S2	12	#6	4	5'-11"	107
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	2	#4	2	9'-11"	13
S8	4	#4	2	8'-7"	23
S10	2	#5	2	8'-8"	18
S10	4	#5	2	8'-8"	36
S11	5	#4	STR	7'-0"	23
S12	5	#4	STR	13'-2"	44
S13	14	#6	1 **	9'-4"	196

** FOR S13 BEND DIAGRAM, SEE SHEET S-13

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	7000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
GDR. 5 & 6	1055	18.8	36

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
2	92'-7"	185'-2"

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 3 OF 5

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NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON

1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
LINK SLAB
(SPAN B, GIRDERS 5 & 6)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			49

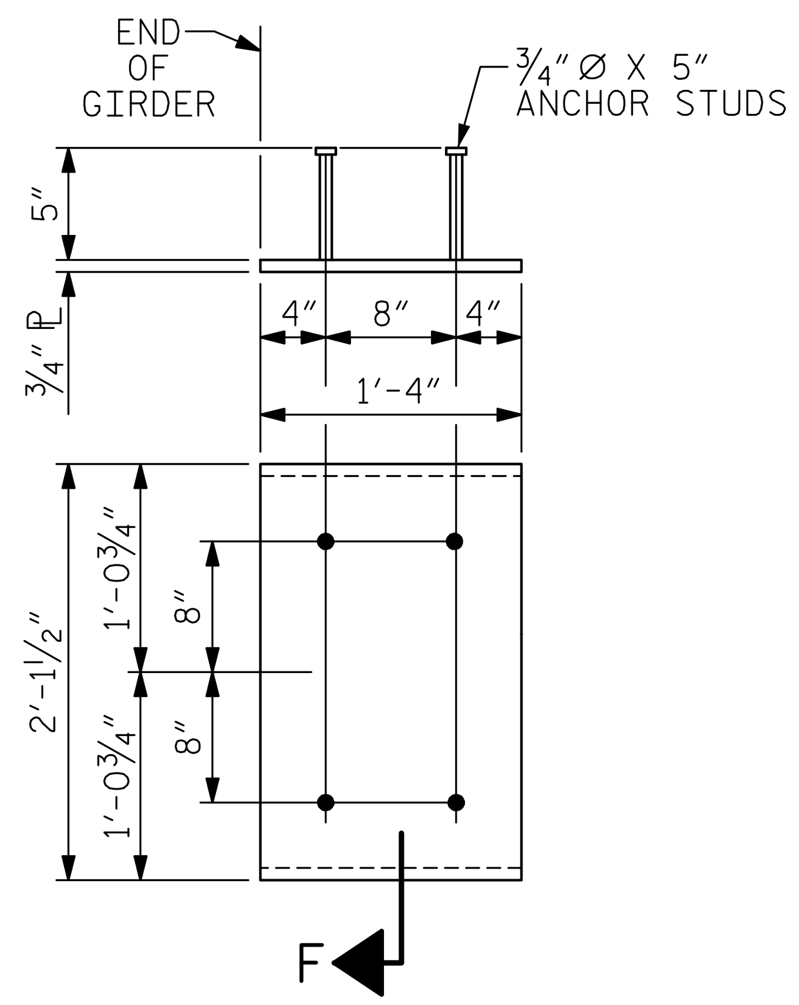
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : K. MUENCH	DATE : 05/2022	
CHECKED BY : J.C. MORRISON	DATE : 05/2022	
DRAWN BY : BNB 09/21	REV. ---	---/---
CHECKED BY : AAI 09/21	REV. ---	---/---
	REV. ---	---/---

STD. NO. PCG6

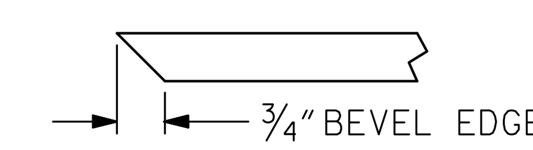
DATE: 1/19/2023 TIME: 9:30:47 AM

USER: muenckk DGN: \\na.aecomnet.com\lfs\AMER\Raleigh-USRAL3\Legacy\Projects\60439195-B-4654\900_Work\90_CAD\70_NCDOT_TIP\Structures\04 Drawings\2022 Updates\400_3l_S16_B4654_SMU_PCG4.dgn



EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER

(2 REQ'D PER GIRDER)



SECTION "F"

(SEE NOTES)

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.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

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 5500 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″ AND THE SHADED AREA NEAR BENTS, SHALL BE RAKED TO A DEPTH OF ¼″.

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.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS OF SPAN A

0.6″ DIA. LOW-RELAXATION	GIRDERS 1 & 7																				
TWENTIETH 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	0.023	0.045	0.066	0.085	0.102	0.117	0.129	0.137	0.142	0.144	0.142	0.137	0.129	0.117	0.102	0.085	0.066	0.045	0.023	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.013	0.026	0.038	0.051	0.061	0.070	0.077	0.083	0.085	0.087	0.085	0.083	0.077	0.070	0.061	0.051	0.038	0.026	0.013	0.000
FINAL CAMBER ↑	0	1/8	1/4	5/16	7/16	1/2	9/16	5/8	5/8	11/16	11/16	11/16	5/8	5/8	9/16	1/2	7/16	5/16	1/4	1/8	0
0.6″ DIA. LOW-RELAXATION	GIRDERS 2, 3 & 4																				
TWENTIETH 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	0.023	0.045	0.066	0.085	0.102	0.117	0.129	0.137	0.142	0.144	0.142	0.137	0.129	0.117	0.102	0.085	0.066	0.045	0.023	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.014	0.029	0.043	0.057	0.068	0.079	0.086	0.093	0.096	0.098	0.096	0.093	0.086	0.079	0.068	0.057	0.043	0.029	0.014	0.000
FINAL CAMBER ↑	0	1/8	3/16	1/4	5/16	7/16	7/16	1/2	1/2	9/16	9/16	9/16	1/2	1/2	7/16	7/16	5/16	1/4	3/16	1/8	0
0.6″ DIA. LOW-RELAXATION	GIRDERS 5 & 6																				
TWENTIETH 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	0.023	0.045	0.066	0.085	0.102	0.117	0.129	0.137	0.142	0.144	0.142	0.137	0.129	0.117	0.102	0.085	0.066	0.045	0.023	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.011	0.022	0.033	0.044	0.053	0.061	0.067	0.072	0.074	0.076	0.074	0.072	0.067	0.061	0.053	0.044	0.033	0.022	0.011	0.000
FINAL CAMBER ↑	0	1/8	1/4	3/8	1/2	5/8	11/16	3/4	3/4	13/16	13/16	13/16	3/4	3/4	11/16	5/8	1/2	3/8	1/4	1/8	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS OF SPAN B

0.6″ DIA. LOW-RELAXATION	GIRDERS 1 & 7																				
TWENTIETH 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	0.023	0.045	0.066	0.085	0.102	0.117	0.129	0.137	0.142	0.144	0.142	0.137	0.129	0.117	0.102	0.085	0.066	0.045	0.023	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.018	0.035	0.053	0.070	0.083	0.097	0.105	0.114	0.117	0.120	0.117	0.114	0.105	0.097	0.083	0.070	0.053	0.035	0.018	0.000
FINAL CAMBER ↑	0	1/16	1/8	3/16	3/16	1/4	1/4	1/4	1/4	5/16	5/16	5/16	1/4	1/4	1/4	1/4	3/16	3/16	1/8	1/16	0
0.6″ DIA. LOW-RELAXATION	GIRDERS 2, 3 & 4																				
TWENTIETH 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	0.023	0.045	0.066	0.085	0.102	0.117	0.129	0.137	0.142	0.144	0.142	0.137	0.129	0.117	0.102	0.085	0.066	0.045	0.023	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.020	0.040	0.059	0.078	0.078	0.109	0.118	0.128	0.131	0.134	0.131	0.128	0.118	0.109	0.093	0.078	0.059	0.040	0.020	0.000
FINAL CAMBER ↑	0	1/16	1/16	1/16	1/16	1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/16	1/16	1/16	1/16	0
0.6″ DIA. LOW-RELAXATION	GIRDERS 5 & 6																				
TWENTIETH 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	0.023	0.045	0.066	0.085	0.102	0.117	0.129	0.137	0.142	0.144	0.142	0.137	0.129	0.117	0.102	0.085	0.066	0.045	0.023	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.016	0.032	0.047	0.063	0.075	0.087	0.095	0.103	0.105	0.108	0.105	0.103	0.095	0.087	0.075	0.063	0.047	0.032	0.016	0.000
FINAL CAMBER ↑	0	1/16	3/16	1/4	1/4	5/16	3/8	3/8	7/16	7/16	7/16	7/16	7/16	3/8	3/8	5/16	1/4	1/4	3/16	1/16	0

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

PROJECT NO. B-4654
WAKE COUNTY
STATION: 22+71.80 -L-
SHEET 3 OF 3

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030474 JOHN C. MORRISON
John C. Morrison
1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PRESTRESSED CONCRETE GIRDER DETAILS AND DEAD LOAD DEFLECTIONS

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

SHEET NO. S-17
TOTAL SHEETS 49

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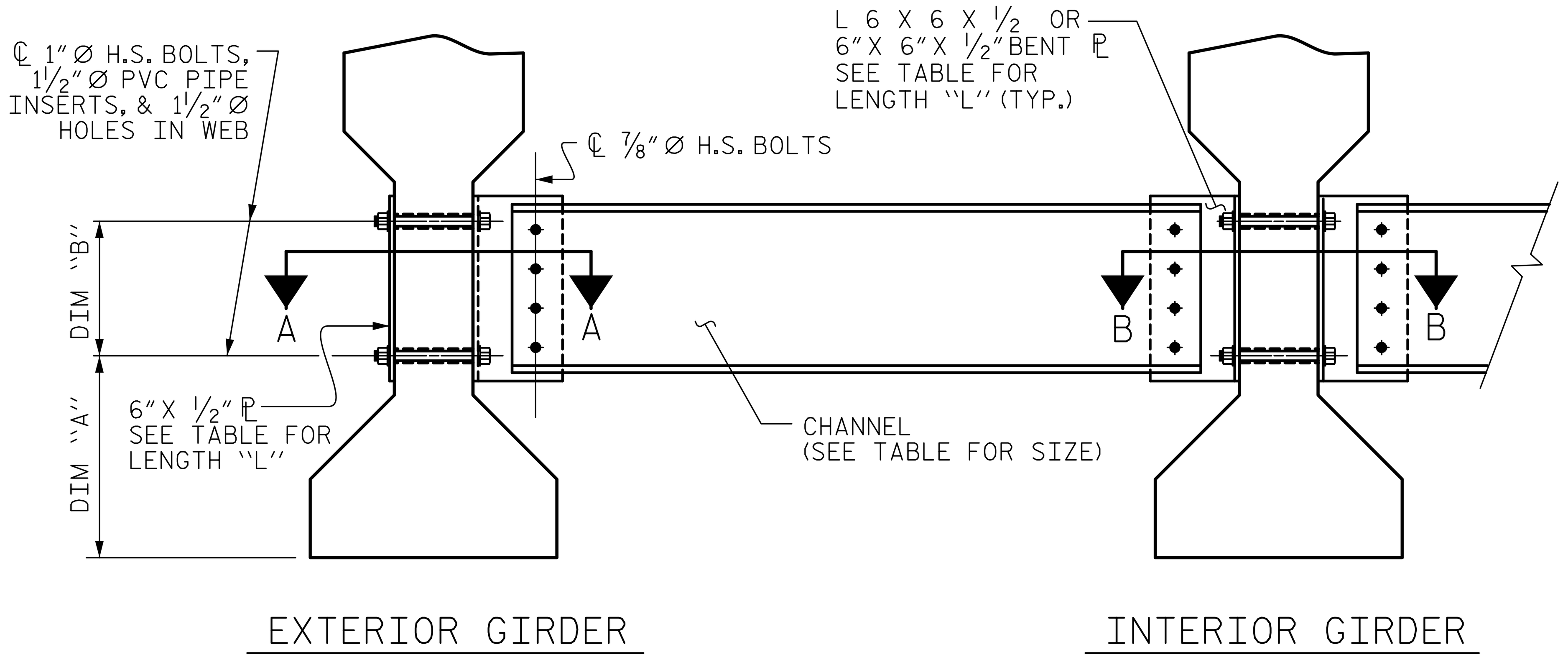
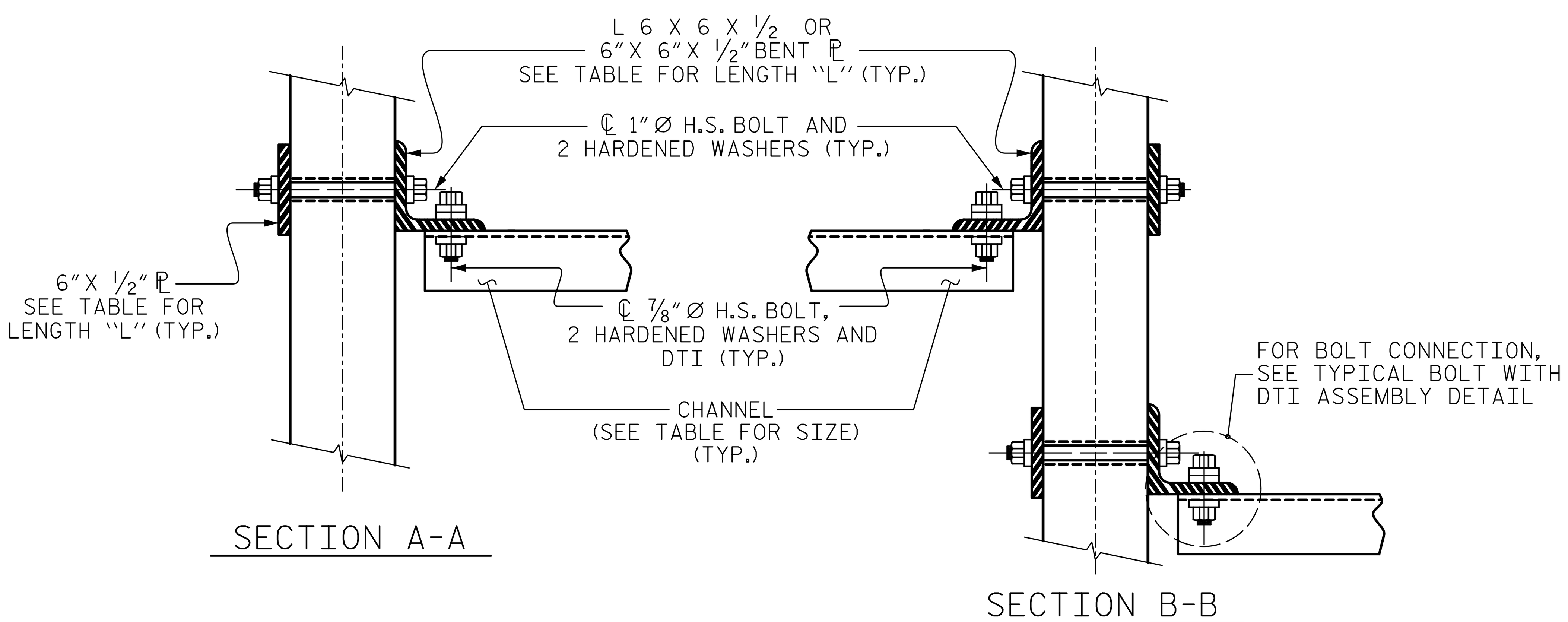
ASSEMBLED BY : K. MUENCH DATE : 05/2022
CHECKED BY : J.C. MORRISON DATE : 05/2022
DRAWN BY : ELR 11/91
CHECKED BY : GRP 11/91
REV. 1/15 MAA/TMG
REV. 2/15 MAA/TMG
REV. 12/17 MAA/THC

STD. NO. PCG9



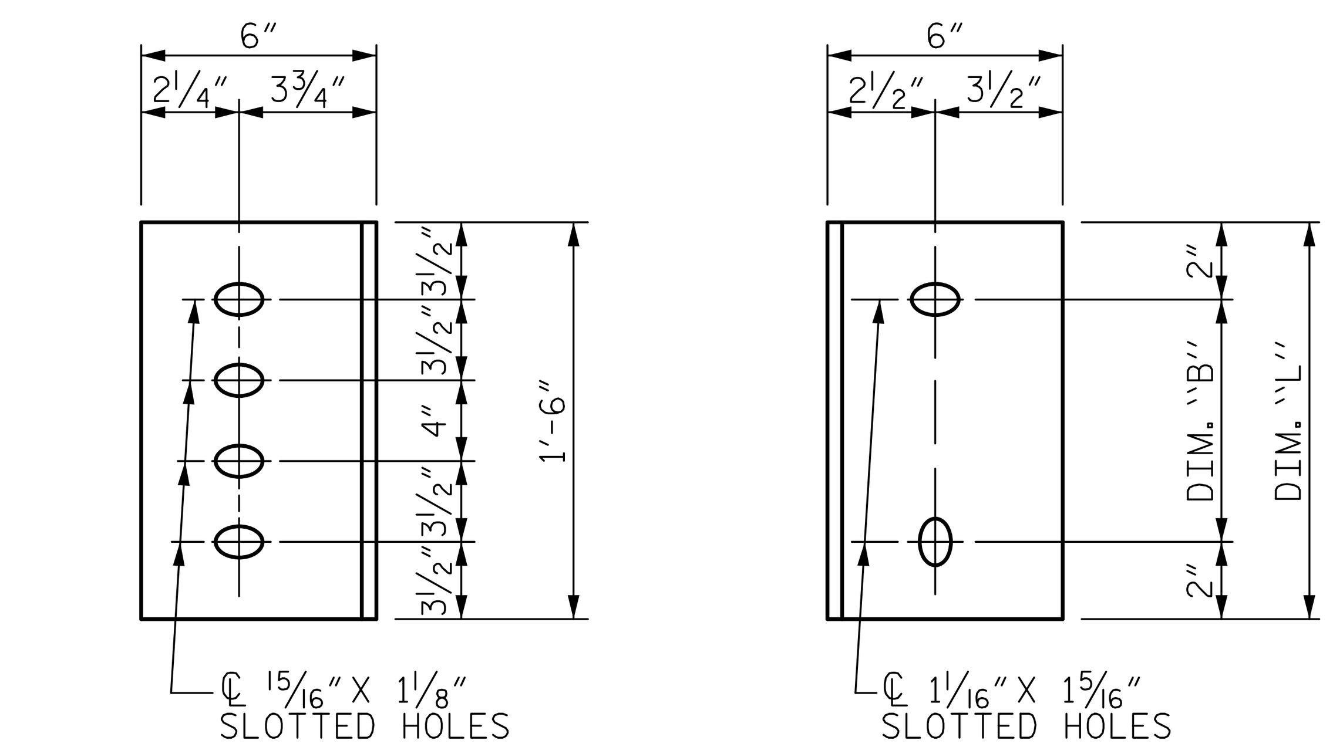
PART SECTION AT INTERMEDIATE DIAPHRAGM

(TYPE IV GIRDER)



CONNECTION DETAILS

(FOR SKEW < 70° OR SKEW > 110°)



CONNECTOR PLATE DETAILS

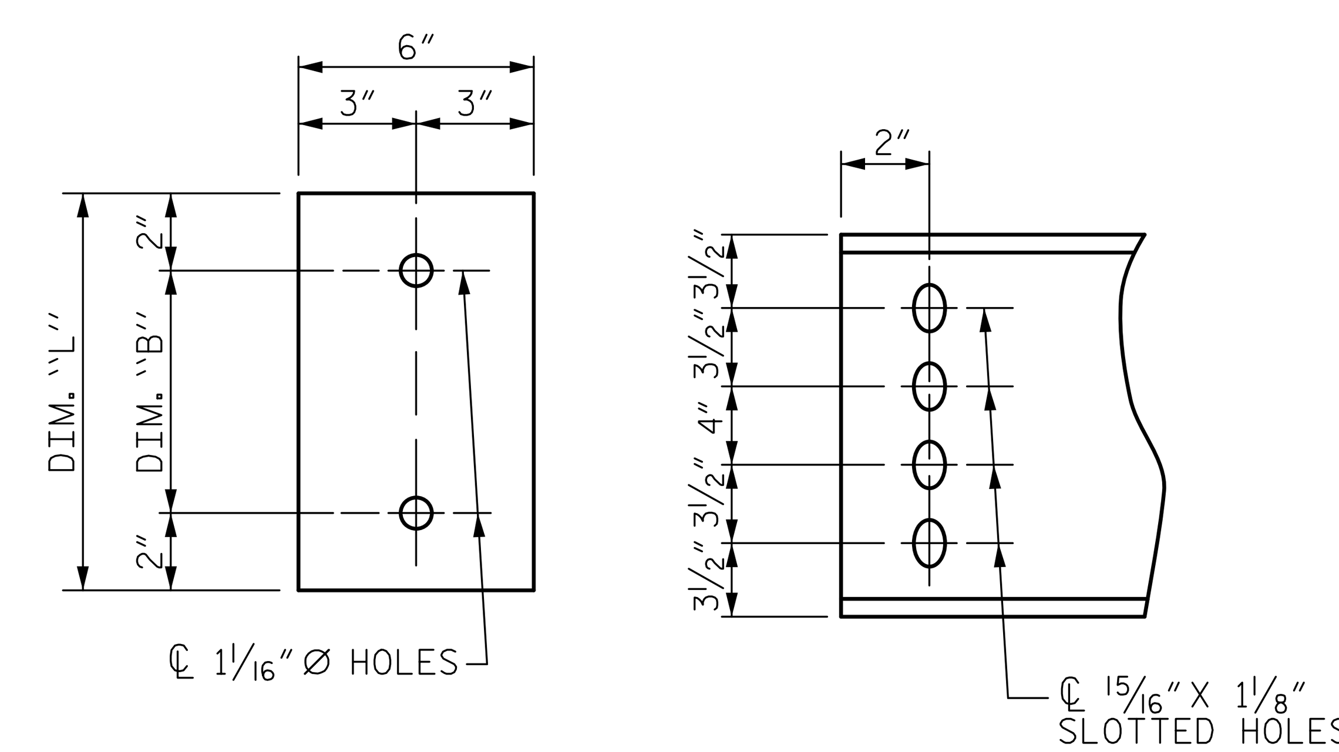
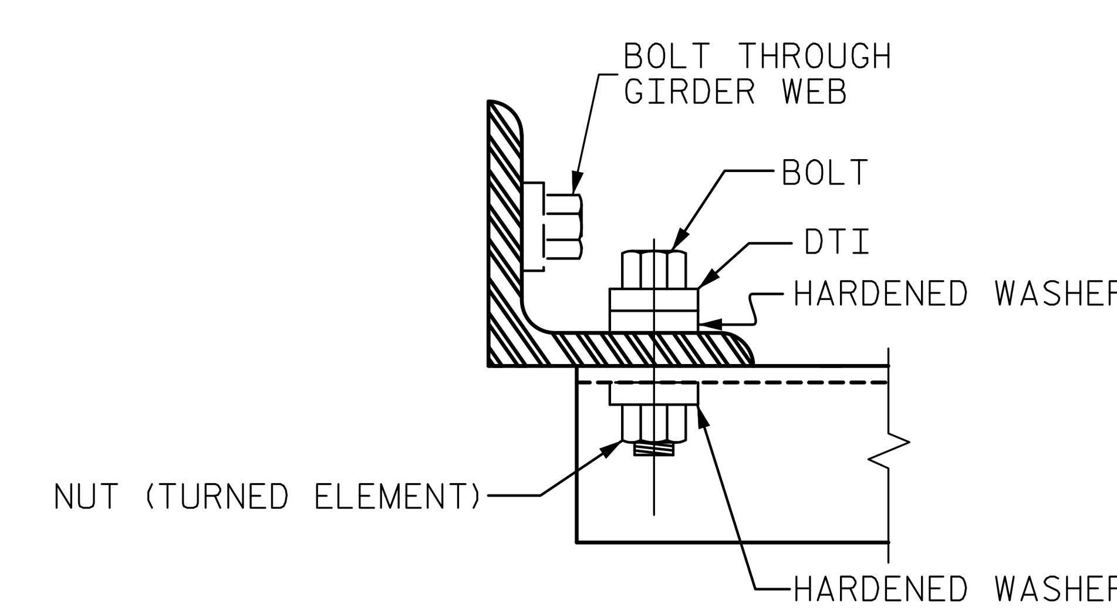


PLATE DETAILS

CHANNEL END

(TYPE IV GDR.)



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 CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL ¼ TURN.

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

FOR METALLIZATION, APPLY 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 ¼″ 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.

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1′-9½″	1′-2″	1′-6″

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030474 JOHN C. MORRISON

1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

INTERMEDIATE STEEL DIAPHRAGMS FOR IV PRESTRESSED CONCRETE GIRDERS

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

SHEET NO. S-18

TOTAL SHEETS 49

STD. NO. PCG10

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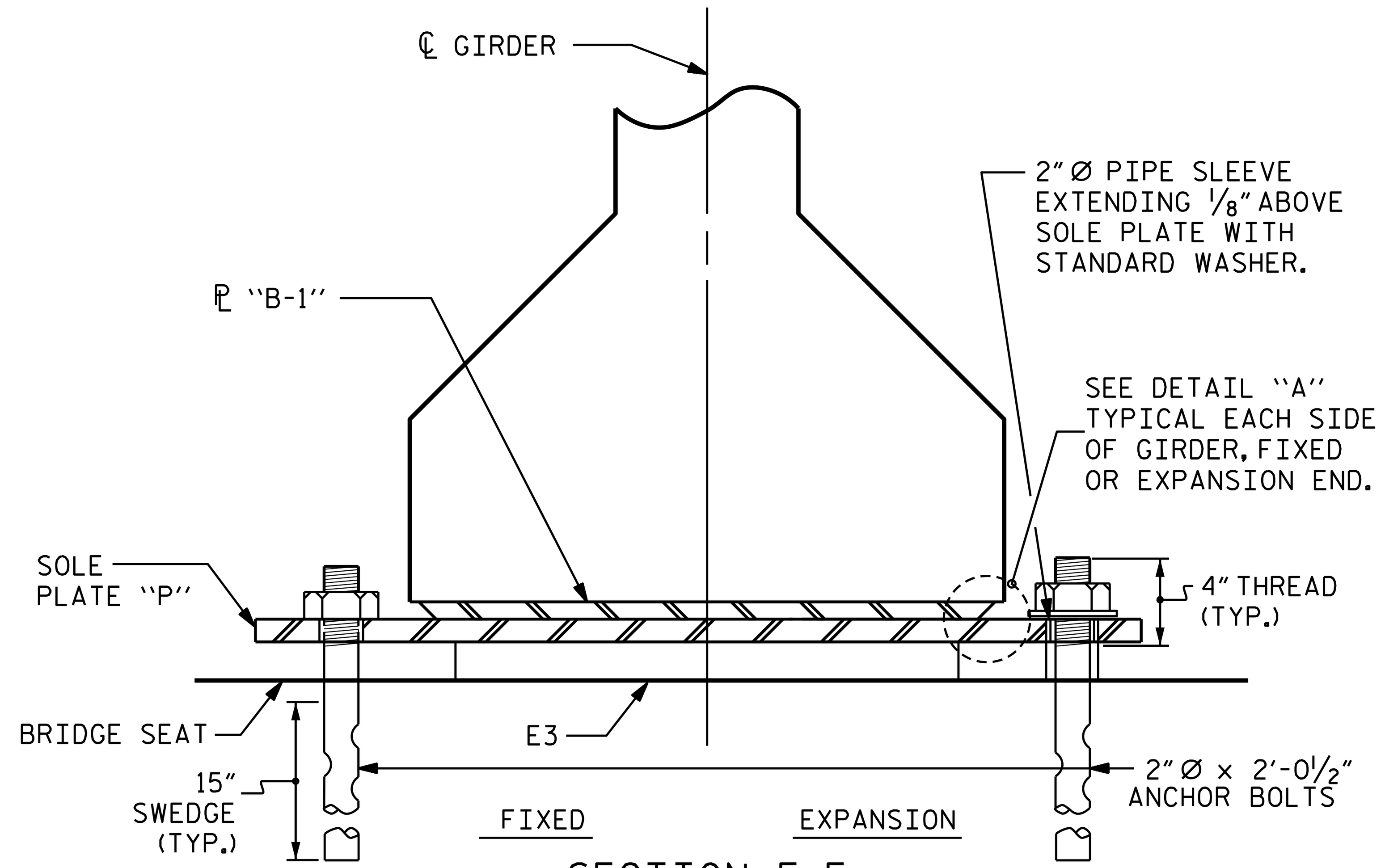
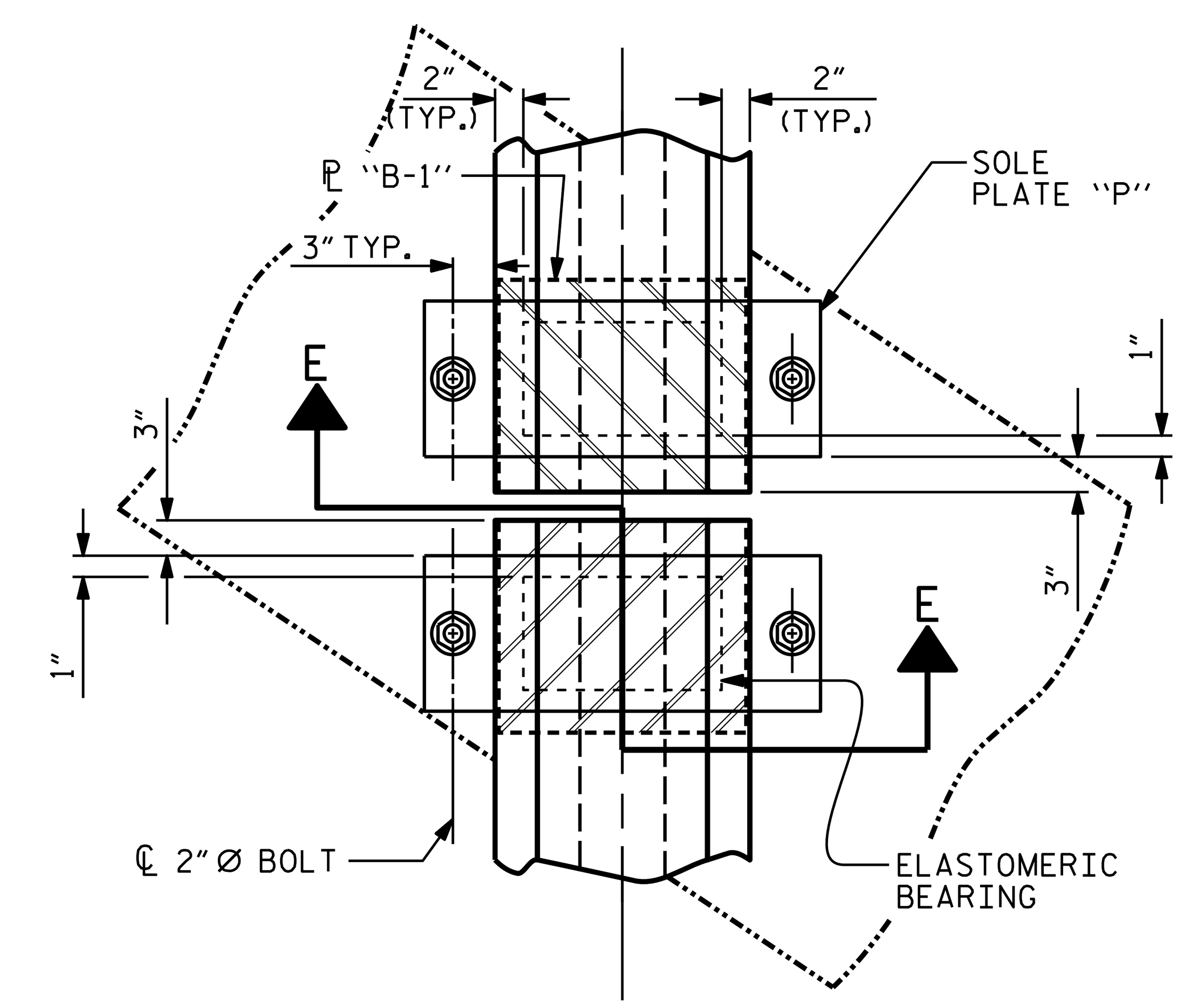
ASSEMBLED BY : T.B. STUMP	DATE : 11/2018
CHECKED BY : J.C. MORRISON	DATE : 11/2018
DRAWN BY : TLA 6/05	REV. 5/1/06RRR KMM/GM
CHECKED BY : VC 6/05	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

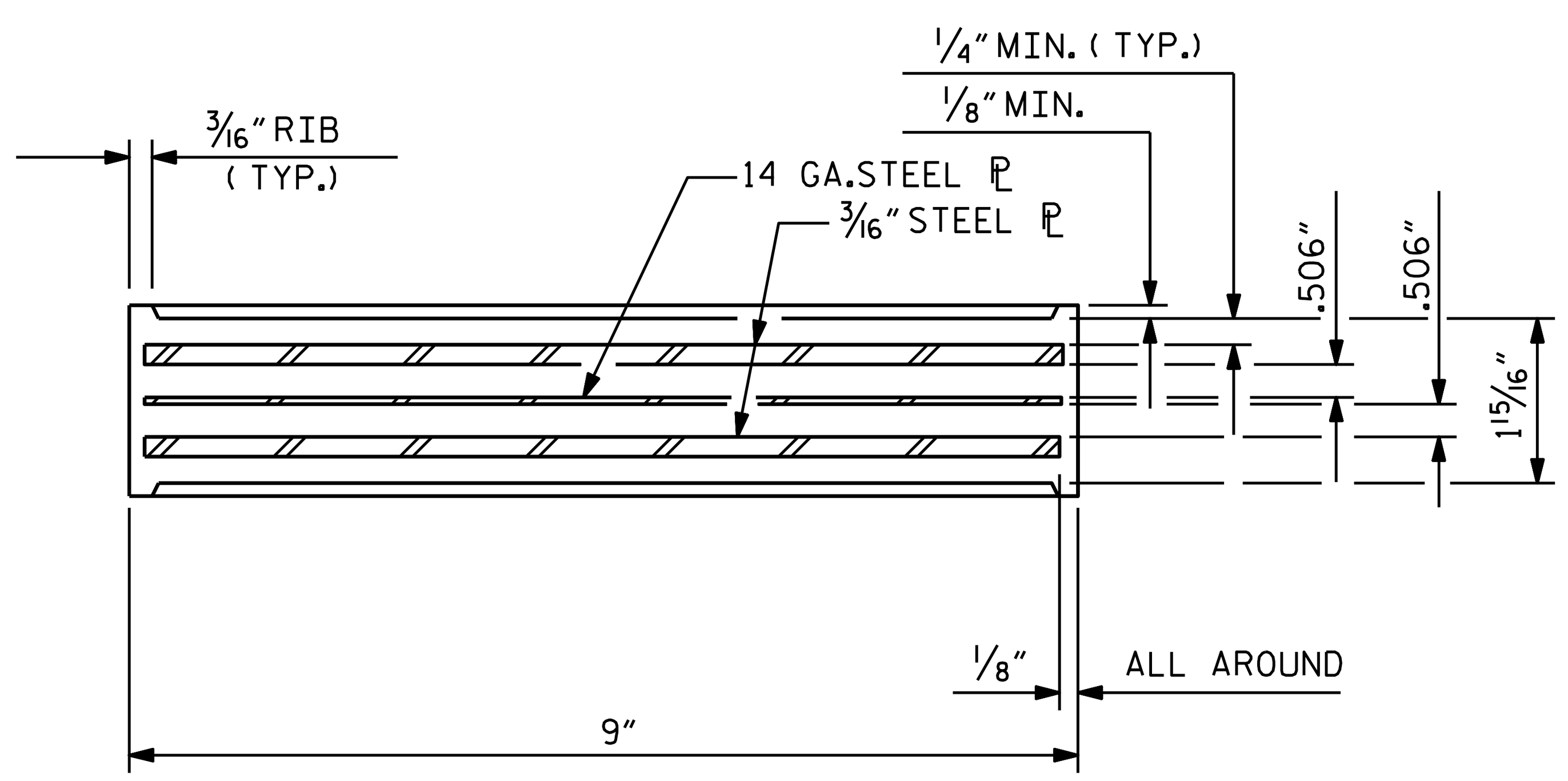


SECTION E-E

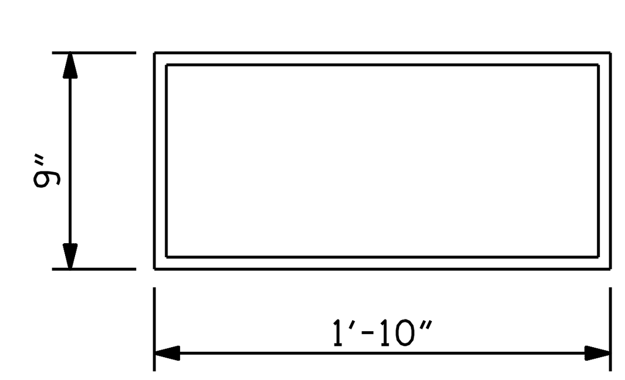


BEARING PLAN AT BENT

(SHOWING SIMPLE SPAN BENT)



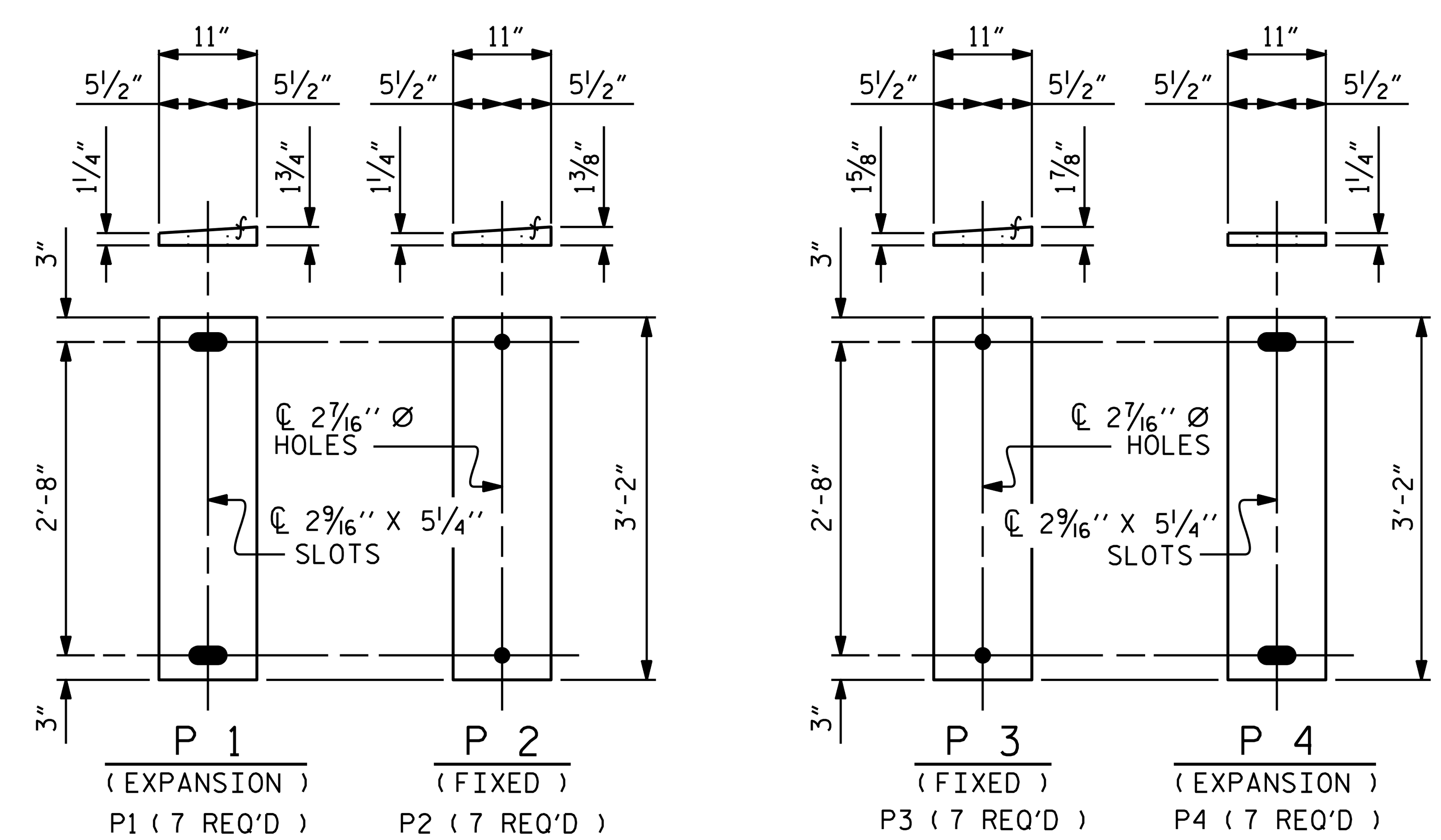
TYPICAL SECTION OF ELASTOMERIC BEARINGS

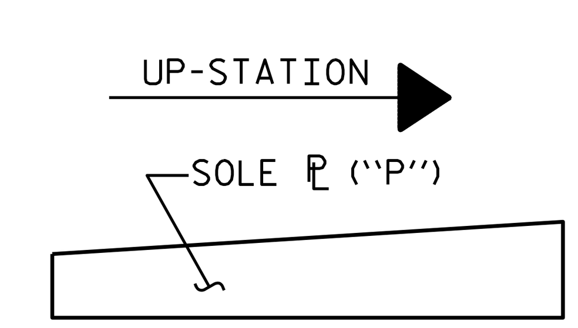


E3 (28 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV





SOLE ℄ PLACEMENT DETAIL

SOLE PLATE DETAILS ("P")

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

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.

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

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, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

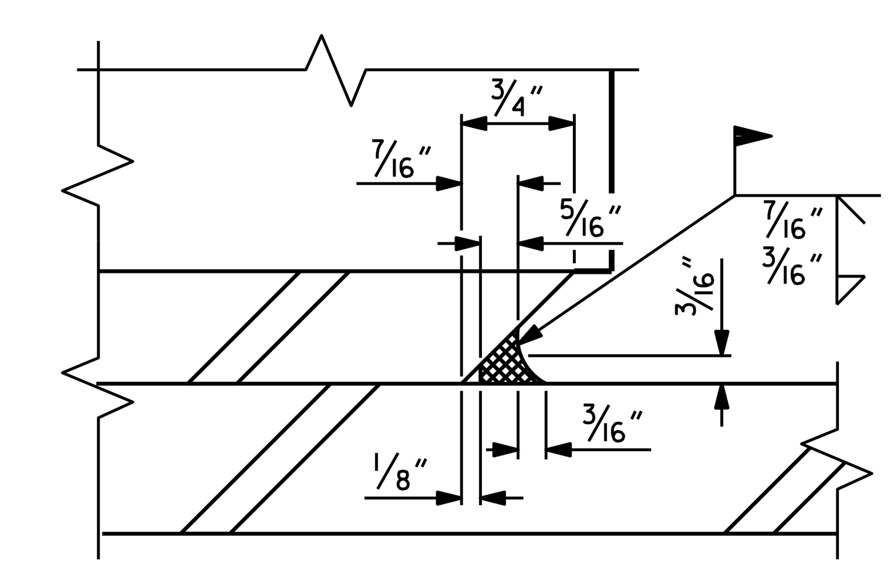
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

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 STANDARD SPECIFICATIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



DETAIL "A"

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030474 JOHN C. MORRISON

1/11/2024

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-19
1			3					TOTAL SHEETS
2			4					49

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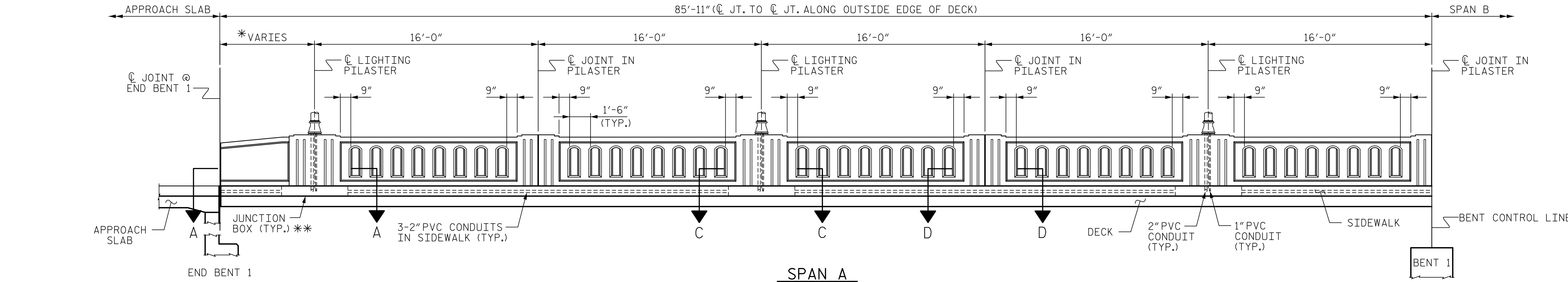
ASSEMBLED BY : K. MUENCH	DATE : 05/2022
CHECKED BY : J.C. MORRISON	DATE : 05/2022
DRAWN BY : WJH 8/89	REV. 6/13 AAC/MAA; REV. 1/15 MAA/TMG; REV. 12/17 MAA/THC
CHECKED BY : CRK 8/89	

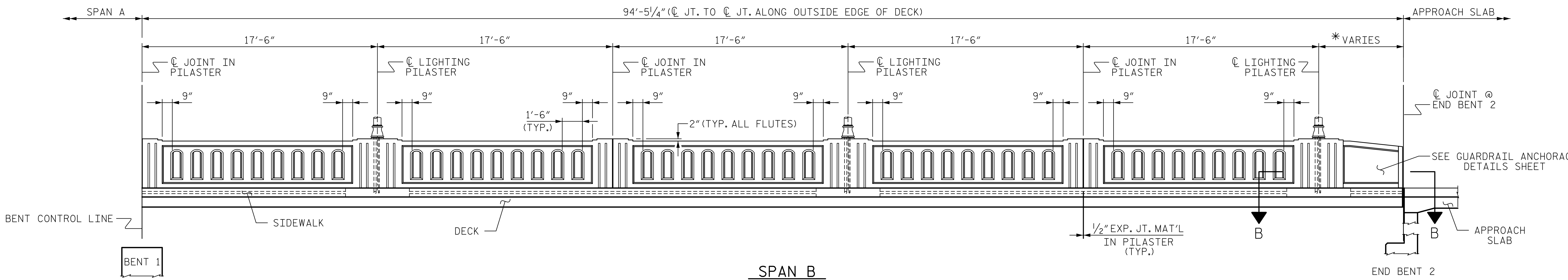
STD. NO. EB3

NOTE:
FOR SECTIONS, SEE SHEET 5 OF 7, 6 OF 7, AND 7 OF 7.



SPAN A

** FOR JUNCTION BOX DETAILS SEE SHEET 7 OF 7.



SPAN B

ROADWAY ELEVATION OF RAIL

(LEFT RAIL INTERIOR SHOWN, RIGHT RAIL SIMILAR)

* SEE SHEET 3 OF 7 AND 4 OF 7.

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 1 OF 7

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030474 JOHN C. MORRISON

1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CLASSIC CONCRETE BRIDGE RAIL DETAILS

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

SHEET NO. S-20

TOTAL SHEETS 49

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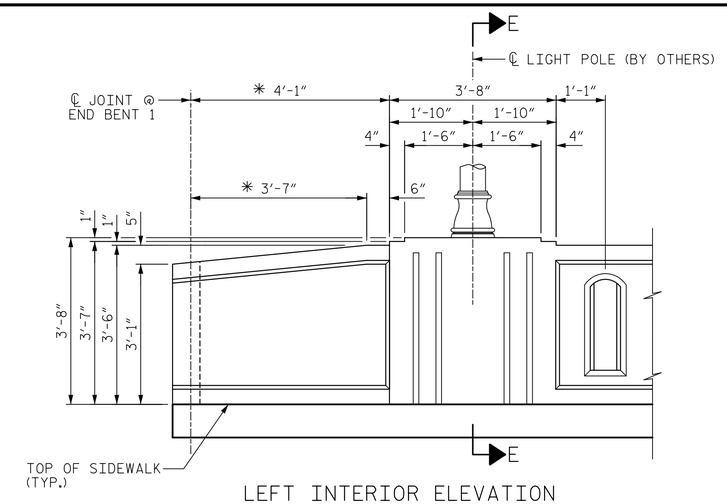
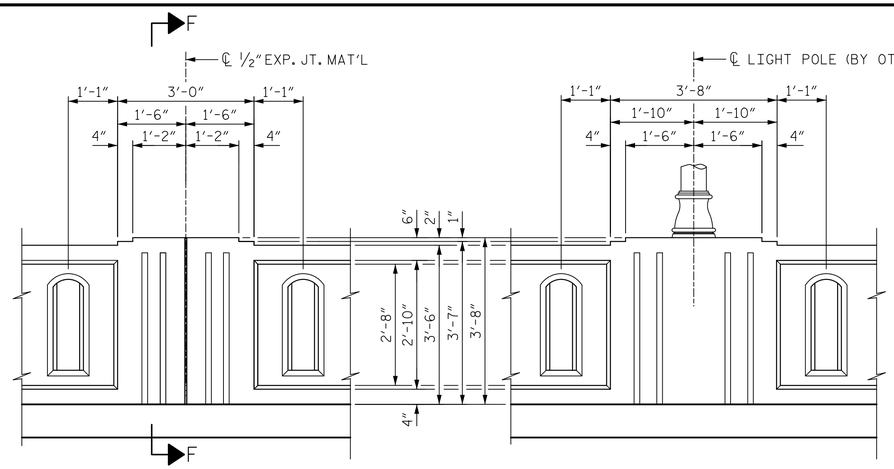
CHECKED BY :	J.C. MORRISON	DATE :	10/2022
DESIGNED BY :	K. MUENCH	DATE :	10/2022
DESIGN CHECKED BY :	J.C. MORRISON	DATE :	10/2022

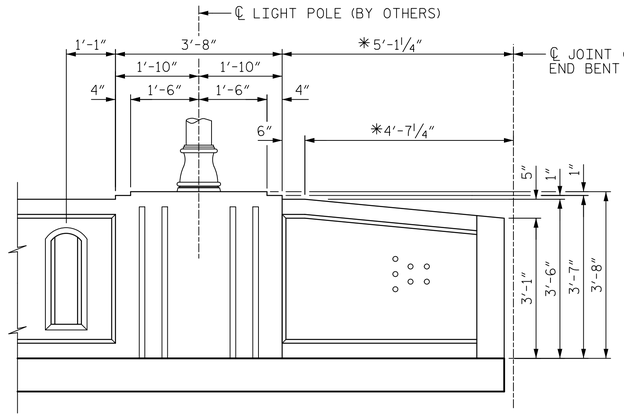


LEFT INTERIOR ELEVATION



LEFT INTERIOR ELEVATION

LEFT INTERIOR ELEVATION



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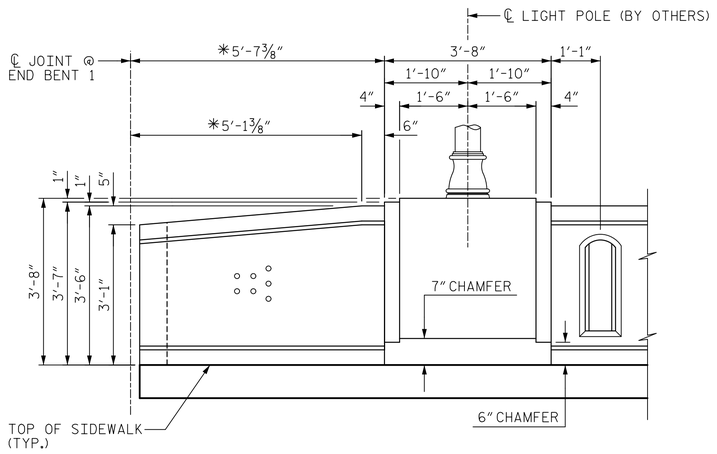
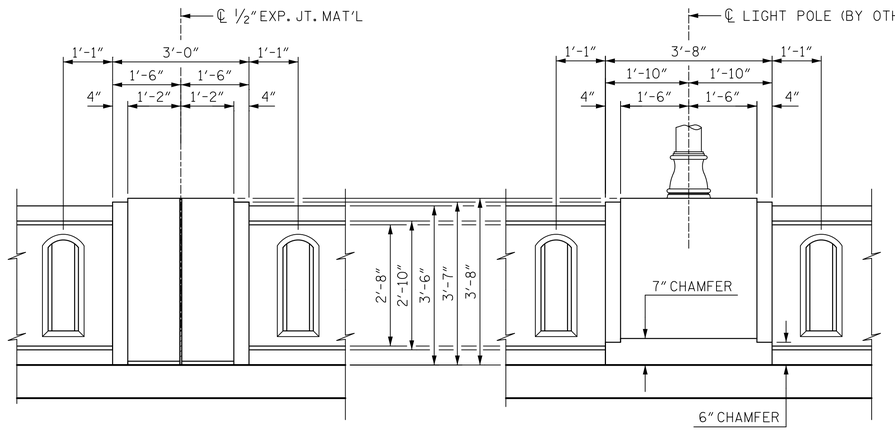


RIGHT EXTERIOR ELEVATION

END BENT 1 PILASTER

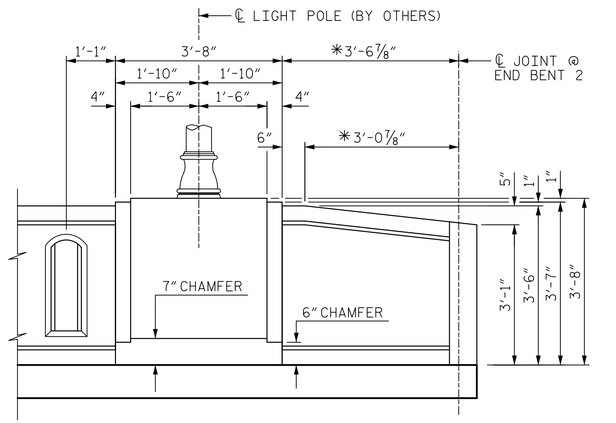


RIGHT EXTERIOR ELEVATION

JOINT PILASTER

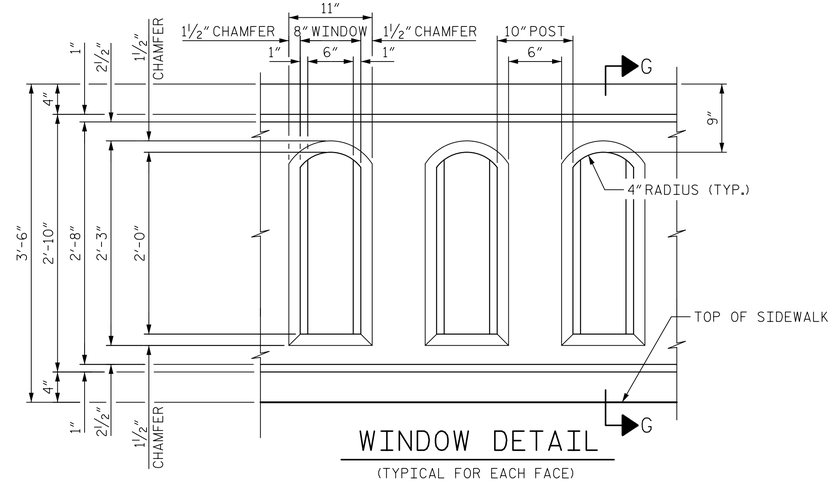
RIGHT EXTERIOR ELEVATION

LIGHTING PILASTER



RIGHT EXTERIOR ELEVATION

END BENT 2 PILASTER



WINDOW DETAIL

(TYPICAL FOR EACH FACE)

✳ MEASURED ALONG OUTSIDE OF DECK

NOTE:
1. FOR SECTIONS, SEE SHEET 5 OF 7, SHEET 6 OF 7 AND SHEET 7 OF 7.
2. PVC CONDUIT FOR BRIDGE LIGHTING NOT SHOWN FOR CLARITY

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 2 OF 7

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NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON
1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CLASSIC CONCRETE BRIDGE RAIL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			49

DRAWN BY : K. MUENCH DATE : 10/2022
CHECKED BY : J.C. MORRISON DATE : 10/2022
DESIGNED BY : K. MUENCH DATE : 10/2022
DESIGN CHECKED BY : J.C. MORRISON DATE : 10/2022

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DATE: 1/19/2023
TIME: 9:43:51 AM

USER: muenck
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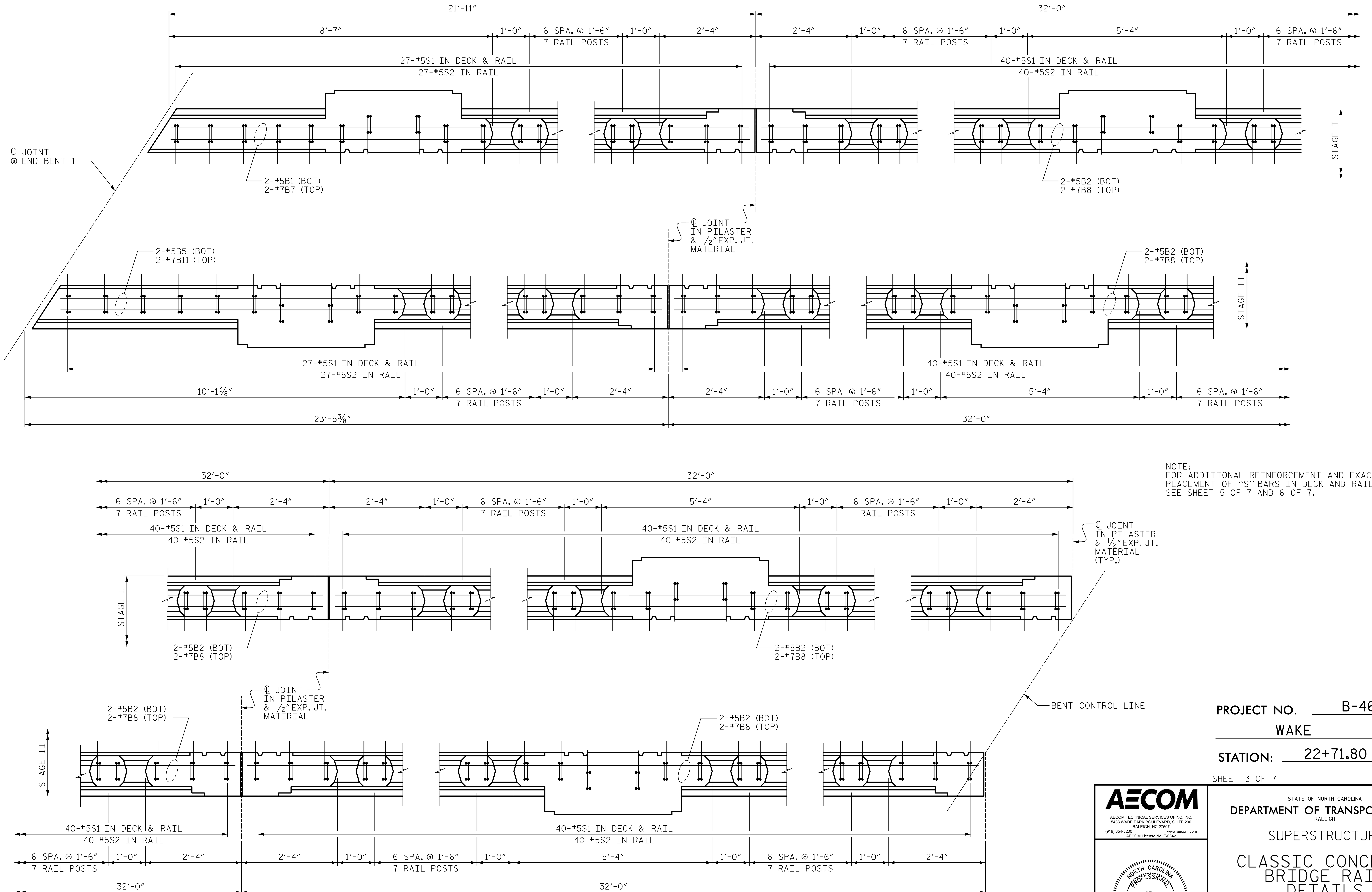

NOTE:
FOR ADDITIONAL REINFORCEMENT AND EXACT PLACEMENT OF "S" BARS IN DECK AND RAIL, SEE SHEET 5 OF 7 AND 6 OF 7.

PLAN OF SPAN "A"

PROJECT NO. B-4654
WAKE COUNTY
STATION: 22+71.80 -L-

SHEET 3 OF 7

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RALEIGH

SUPERSTRUCTURE

CLASSIC CONCRETE BRIDGE RAIL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON
John C. Morrison
1/19/2023

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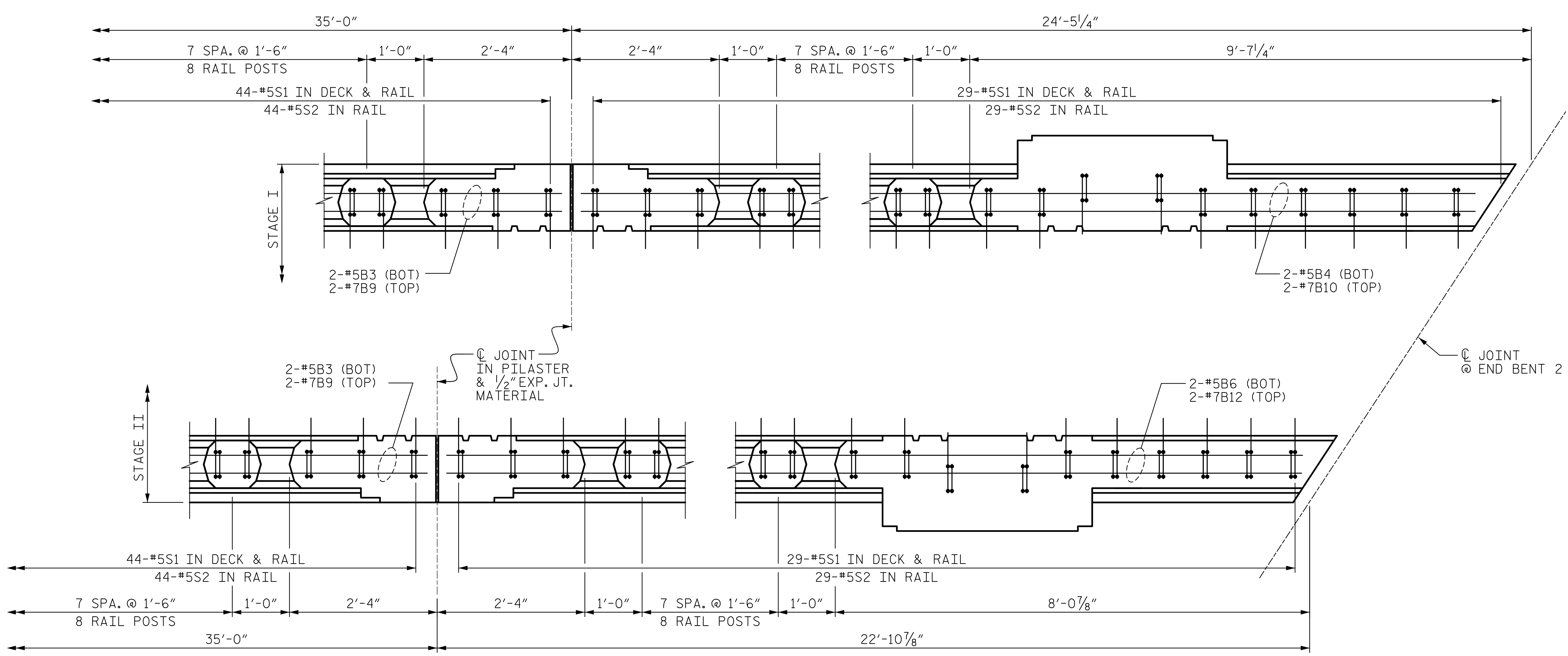
DESIGN CHECKED BY : J.C. MORRISON	DATE : 10/2022

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

SHEET NO. S-22
TOTAL SHEETS 49



PLAN OF SPAN "B"

NOTE:
FOR ADDITIONAL REINFORCEMENT AND EXACT PLACEMENT OF "S" BARS IN DECK & RAIL, SEE SHEET 5 OF 7 AND 6 OF 7.

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 4 OF 7

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SUPERSTRUCTURE

CLASSIC CONCRETE BRIDGE RAIL DETAILS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030474 JOHN C. MORRISON
1/19/2023

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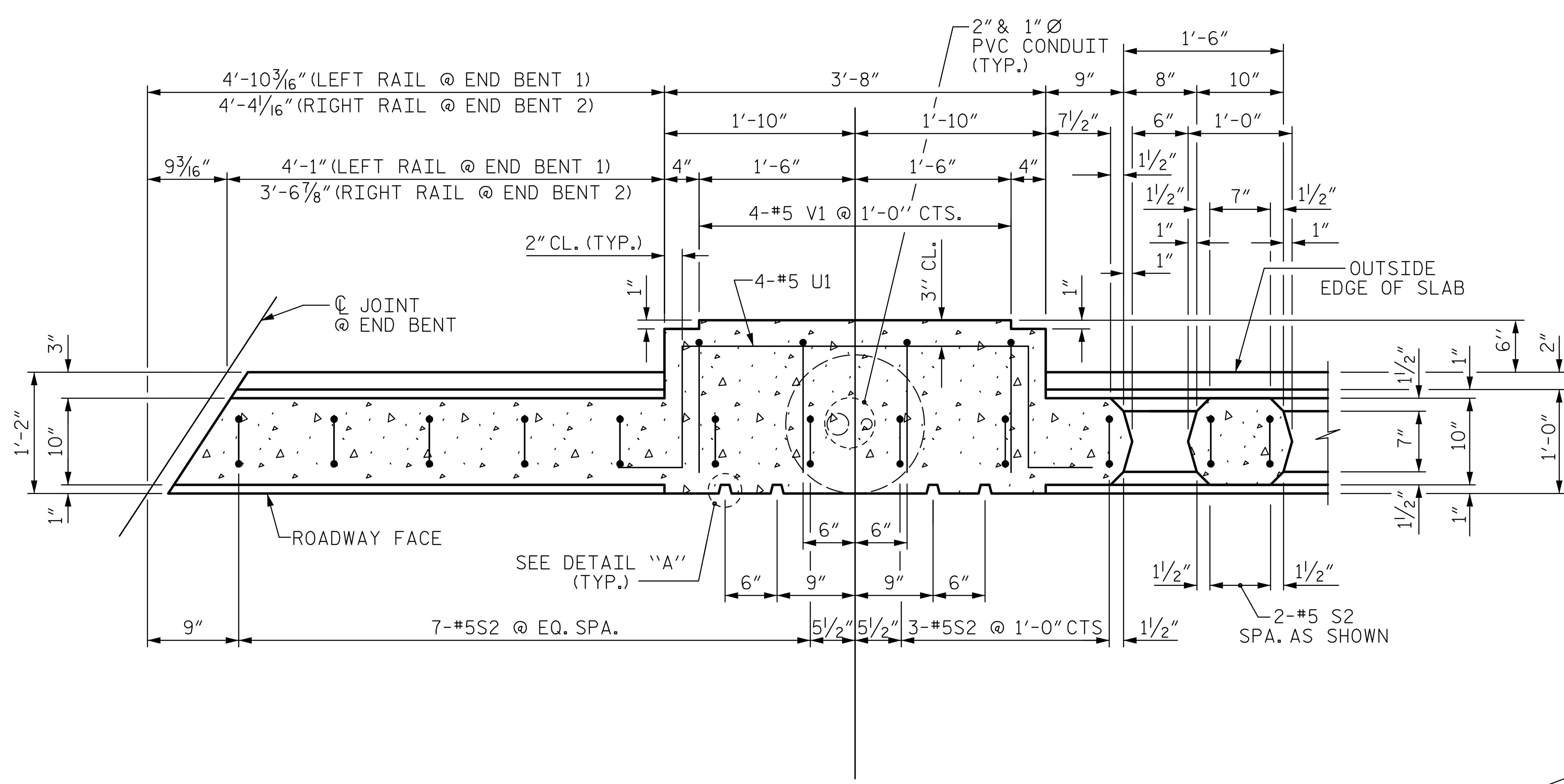
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

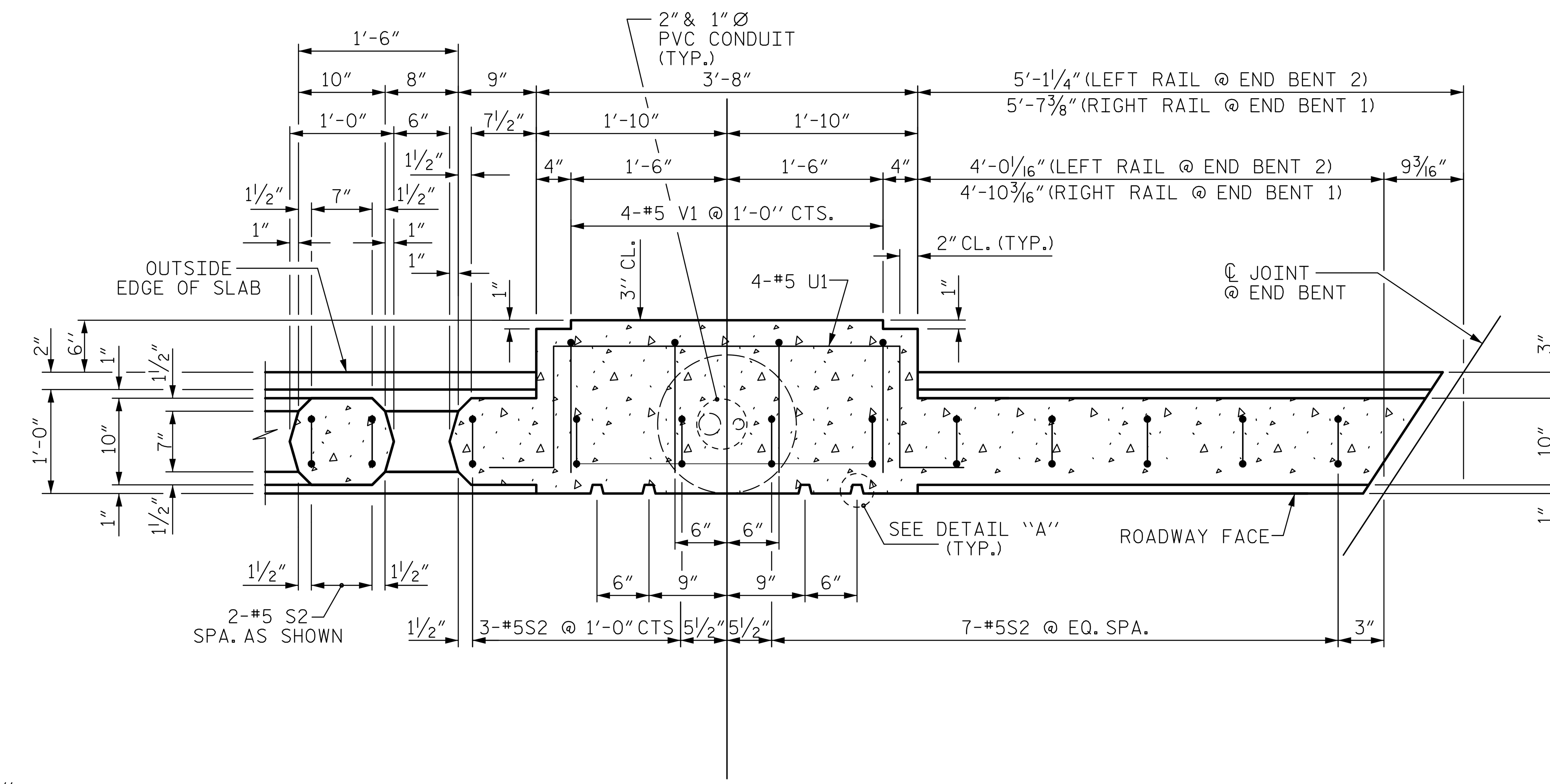
SHEET NO. S-23

TOTAL SHEETS 49



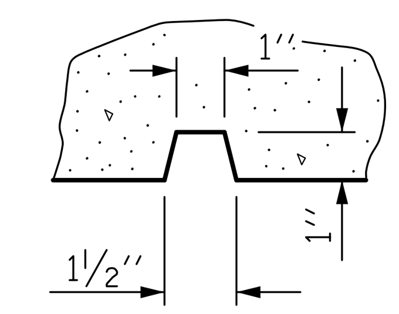
SECTION A-A

SHOWING LIGHTING PILASTER AT END BENT



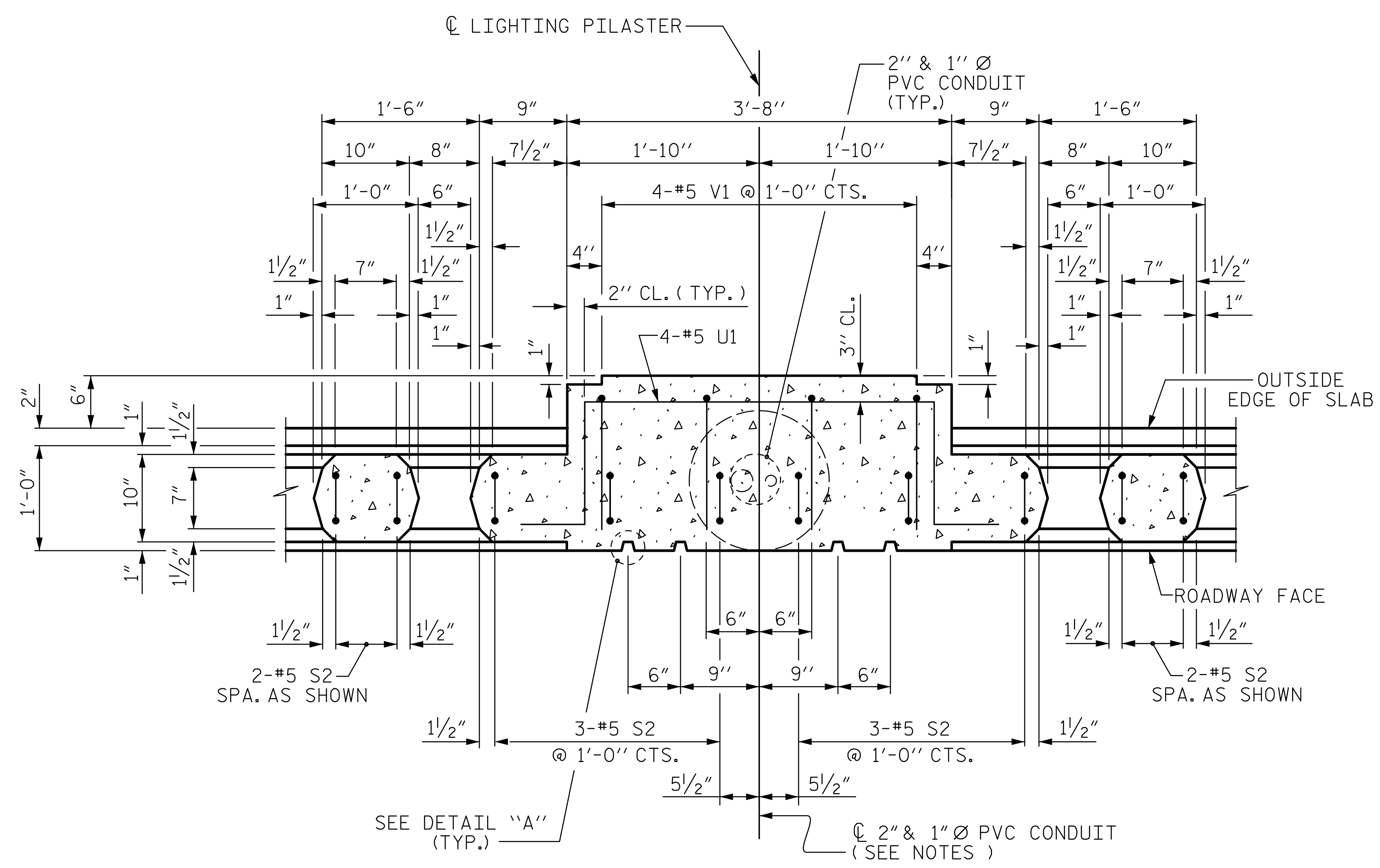
SECTION B-B

SHOWING LIGHTING PILASTER AT END BENT



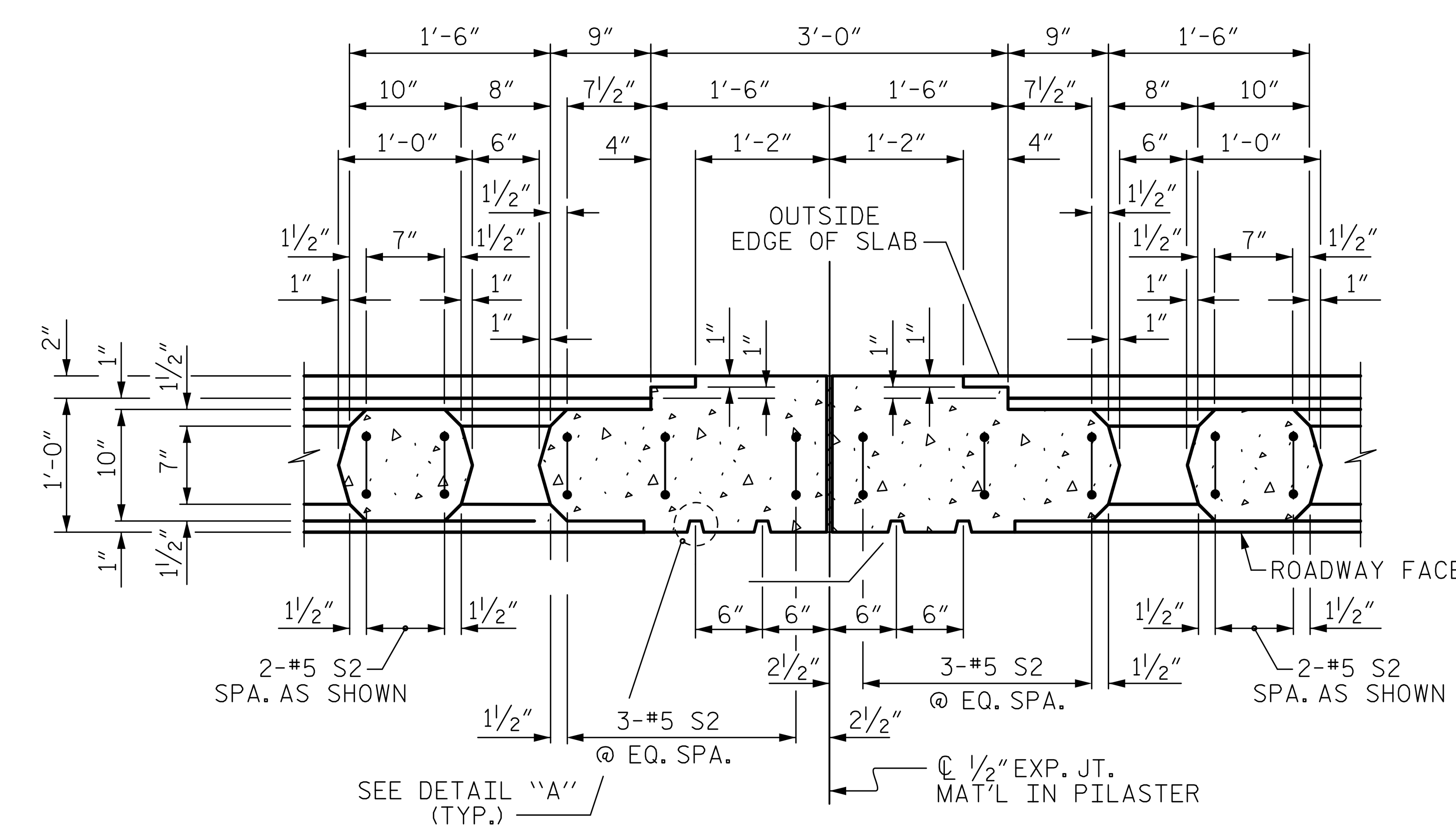
DETAIL "A"

TYPICAL FLUTE



SECTION C-C

SHOWING LIGHTING PILASTER



SECTION D-D

SHOWING JOINT IN PILASTER

NOTES:

#5S1 BARS NOT SHOWN FOR CLARITY.
#5S2 BARS ARE PAIRED WITH #5S1 BARS.

FOR CONDUIT AND JUNCTION BOX DETAILS, SEE "ELECTRICAL CONDUIT SYSTEM" PLAN SHEET.

ANCHOR BOLTS FOR LIGHT POLE ARE REQUIRED IN LIGHTING PILASTER.

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 5 OF 7

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CLASSIC CONCRETE BRIDGE RAIL DETAILS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030474 JOHN C. MORRISON

1/19/2023

REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S-24
1			3			TOTAL SHEETS	49
2			4				

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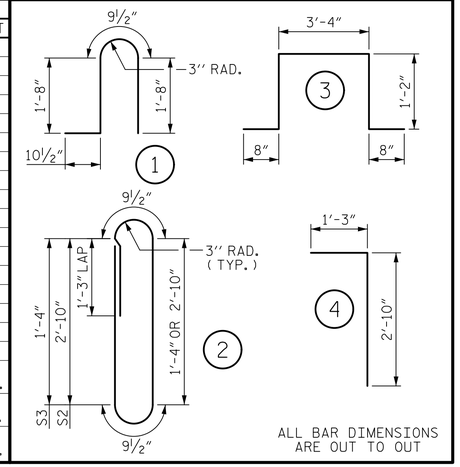
CHECKED BY : J.C. MORRISON DATE : 10/2022
DESIGNED BY : K. MUENCH DATE : 10/2022
DESIGN CHECKED BY : J.C. MORRISON DATE : 10/2022

DATE: 1/19/2023 TIME: 9:50:04 AM

BILL OF MATERIAL

STAGE I						STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	2	5	STR	21′-8″	45	✳B2	4	5	STR	31′-8″	132
✳B2	4	5	STR	31′-8″	132	✳B3	4	5	STR	34′-8″	145
✳B3	4	5	STR	34′-8″	145	✳B5	2	5	STR	22′-4″	47
✳B4	2	5	STR	23′-4″	49	✳B6	2	5	STR	22′-7″	47
✳B7	2	7	STR	21′-8″	89	✳B8	4	7	STR	31′-8″	129
✳B8	4	7	STR	31′-8″	259	✳B9	4	7	STR	34′-8″	283
✳B9	4	7	STR	34′-8″	283	✳B11	2	7	STR	22′-4″	183
✳B10	2	7	STR	23′-4″	95	✳B12	2	7	STR	22′-7″	92
✳S1	224	4	1	5′-0″	748	✳S1	224	4	1	5′-0″	748
✳S2	224	4	2	8′-6″	1272	✳S2	224	4	2	8′-6″	1272
✳S3	12	4	2	5′-6″	44	✳S3	12	4	2	5′-6″	44
✳U1	24	4	3	7′-0″	112	✳U1	24	4	3	7′-0″	112
✳V1	24	4	4	4′-1″	65	✳V1	24	4	4	4′-1″	65
✳EPOXY COATED REINF. STEEL					3,338 LBS.	✳EPOXY COATED REINF. STEEL					3,299 LBS.
CLASS AA CONCRETE					25.7 CU. YDS.	CLASS AA CONCRETE					25.7 CU. YDS.
CLASSIC CONCRETE BRIDGE RAIL					180.35 LIN. FT.	CLASSIC CONCRETE BRIDGE RAIL					180.35 LIN. FT.

BAR TYPES



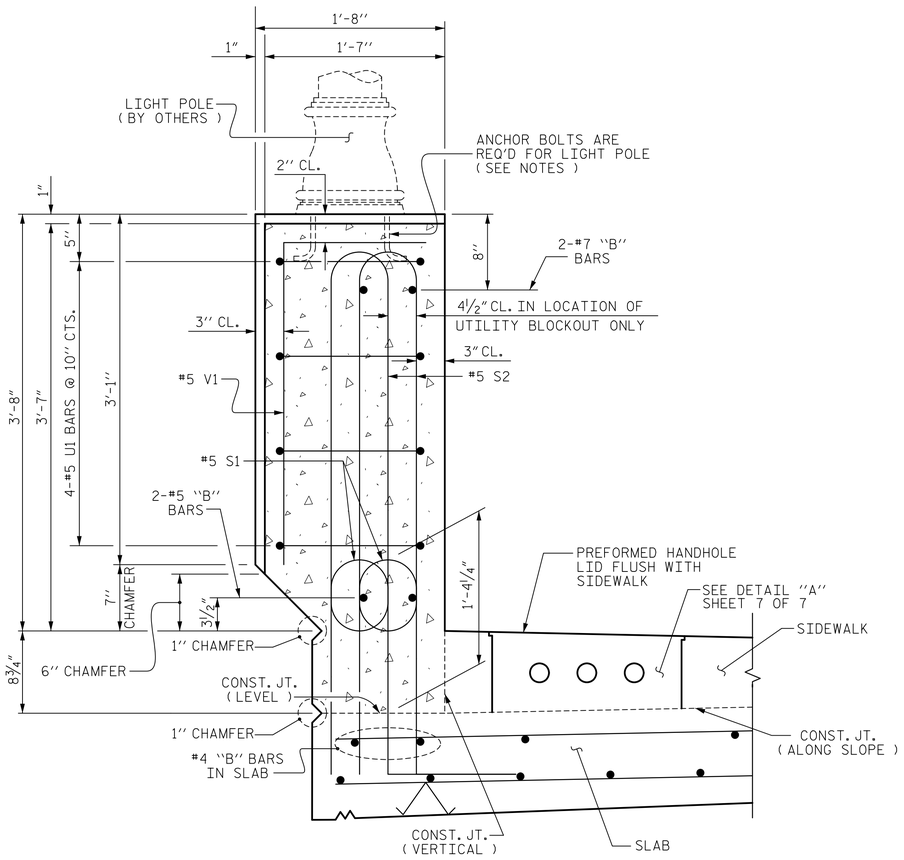
ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES:

COORDINATE WITH TOWN OF GARNER FOR INSTALLATION OF ANCHOR BOLTS. ANCHOR BOLT SIZE AND LOCATION ARE TO BE AS SPECIFIED BY LIGHT POLE MANUFACTURER.

FOR LOCATION OF SECTIONS, SEE SHEET 2 OF 7.

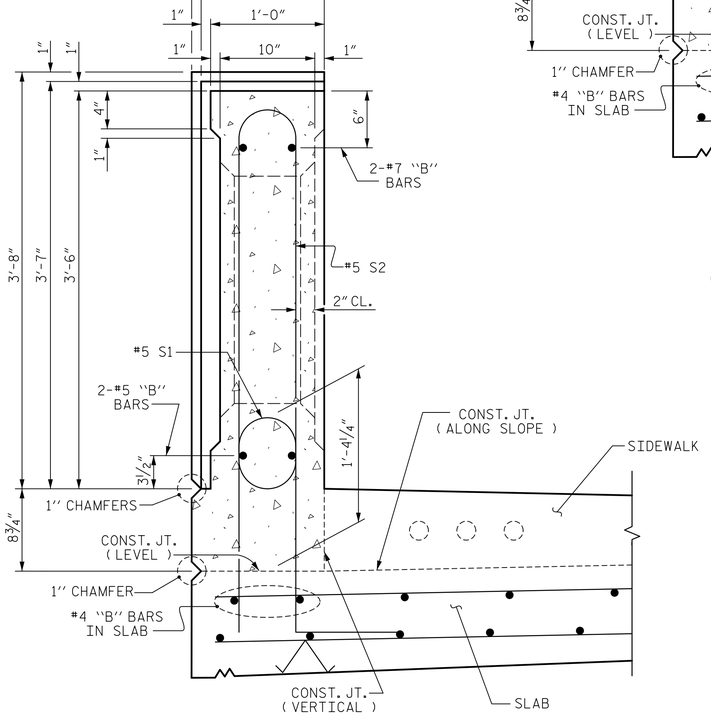
FOR LOCATION OF #4S3 BARS, SEE SHEET 7 OF 7.



SECTION E-E

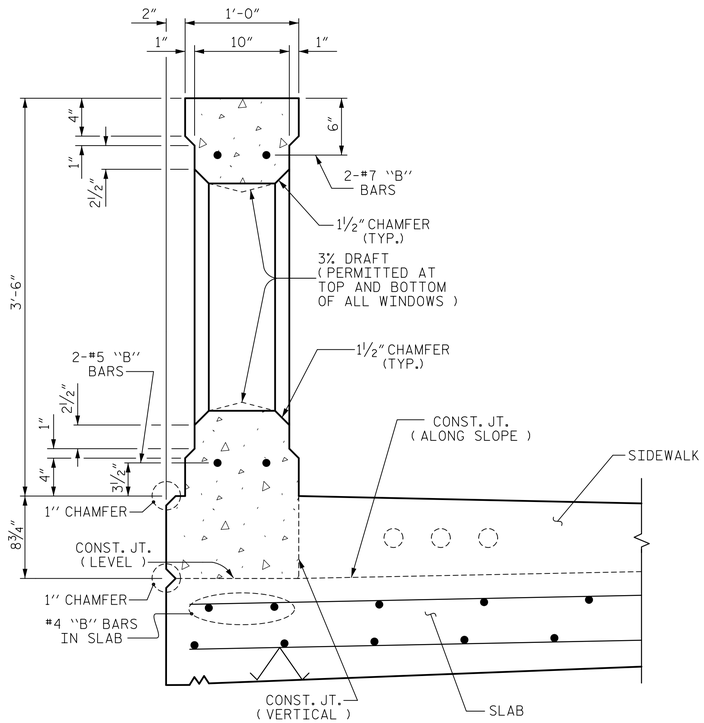
(SHOWING LIGHTING PILASTER)
(FOR LOCATION OF CONDUIT, SEE SHEET 7 OF 7)
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)

✳SHOWN IN LEFT RAIL, COORDINATE LOCATION WITH ELECTRICAL PLANS.



SECTION F-F

(SHOWING JOINT IN PILASTER)
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)



SECTION G-G

(SHOWING WINDOW OF RAIL)
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 6 OF 7

DRAWN BY : K. MUENCH DATE : 10/2022
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DESIGNED BY : K. MUENCH DATE : 10/2022
DESIGN CHECKED BY : J.C. MORRISON DATE : 10/2022

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1/19/2023

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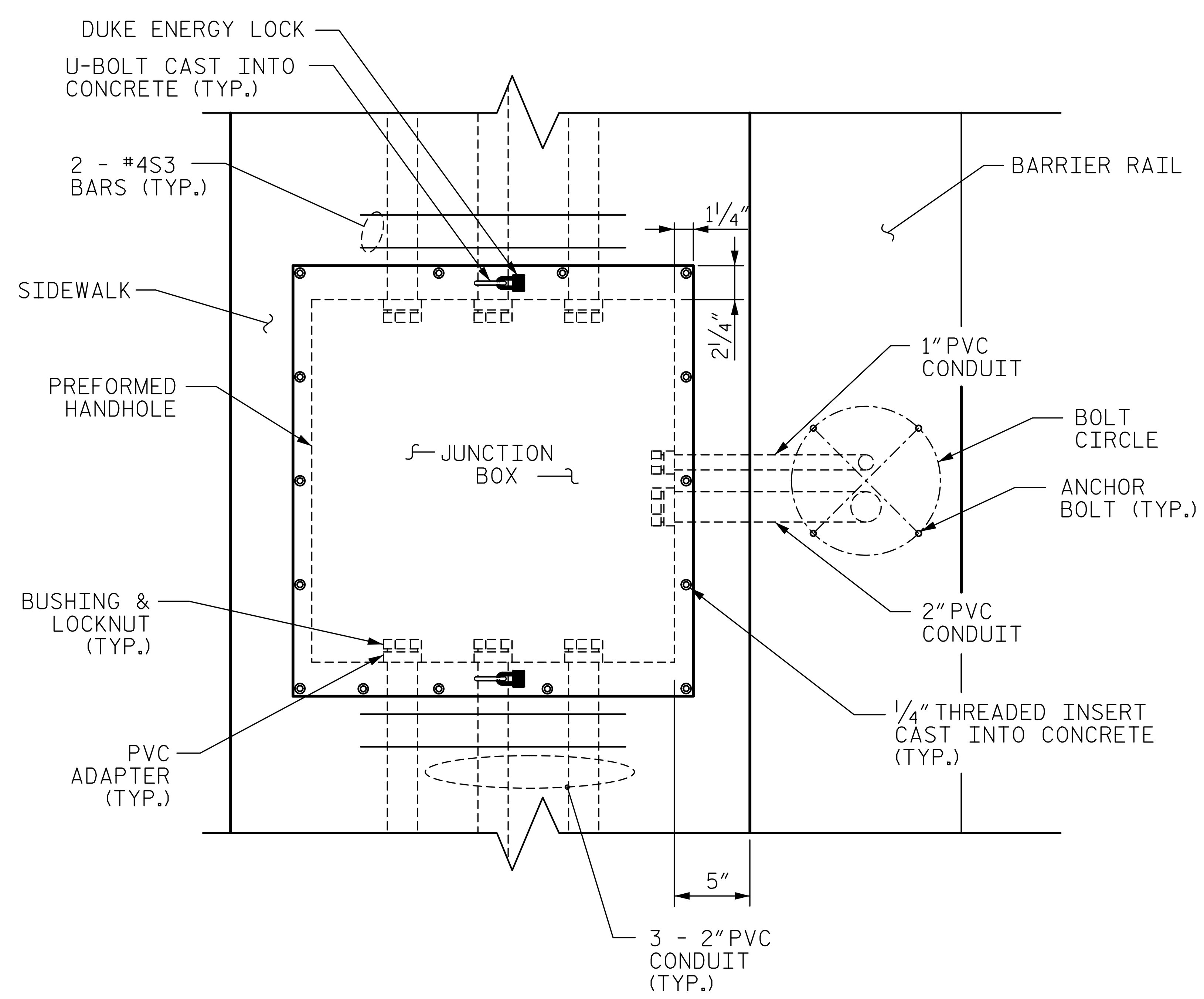
SUPERSTRUCTURE

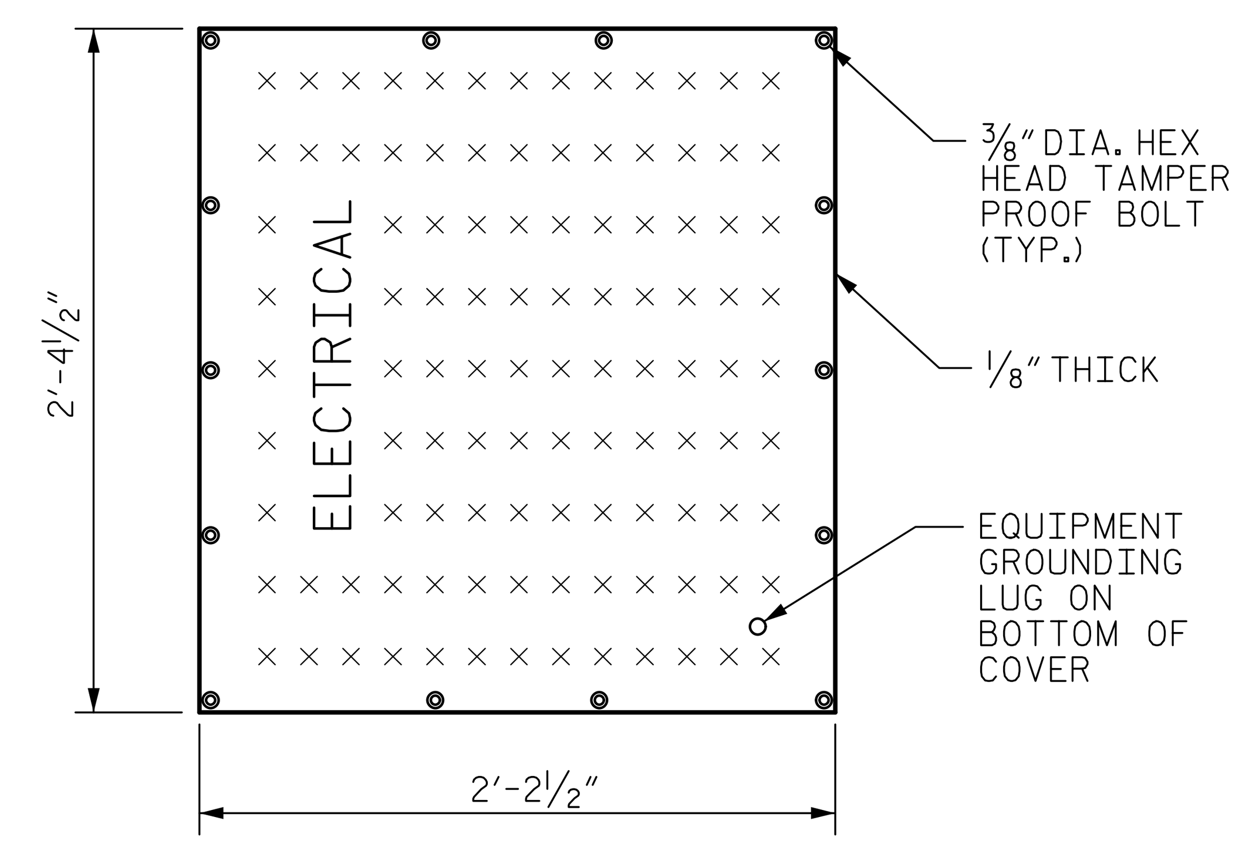
CLASSIC CONCRETE BRIDGE RAIL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			49



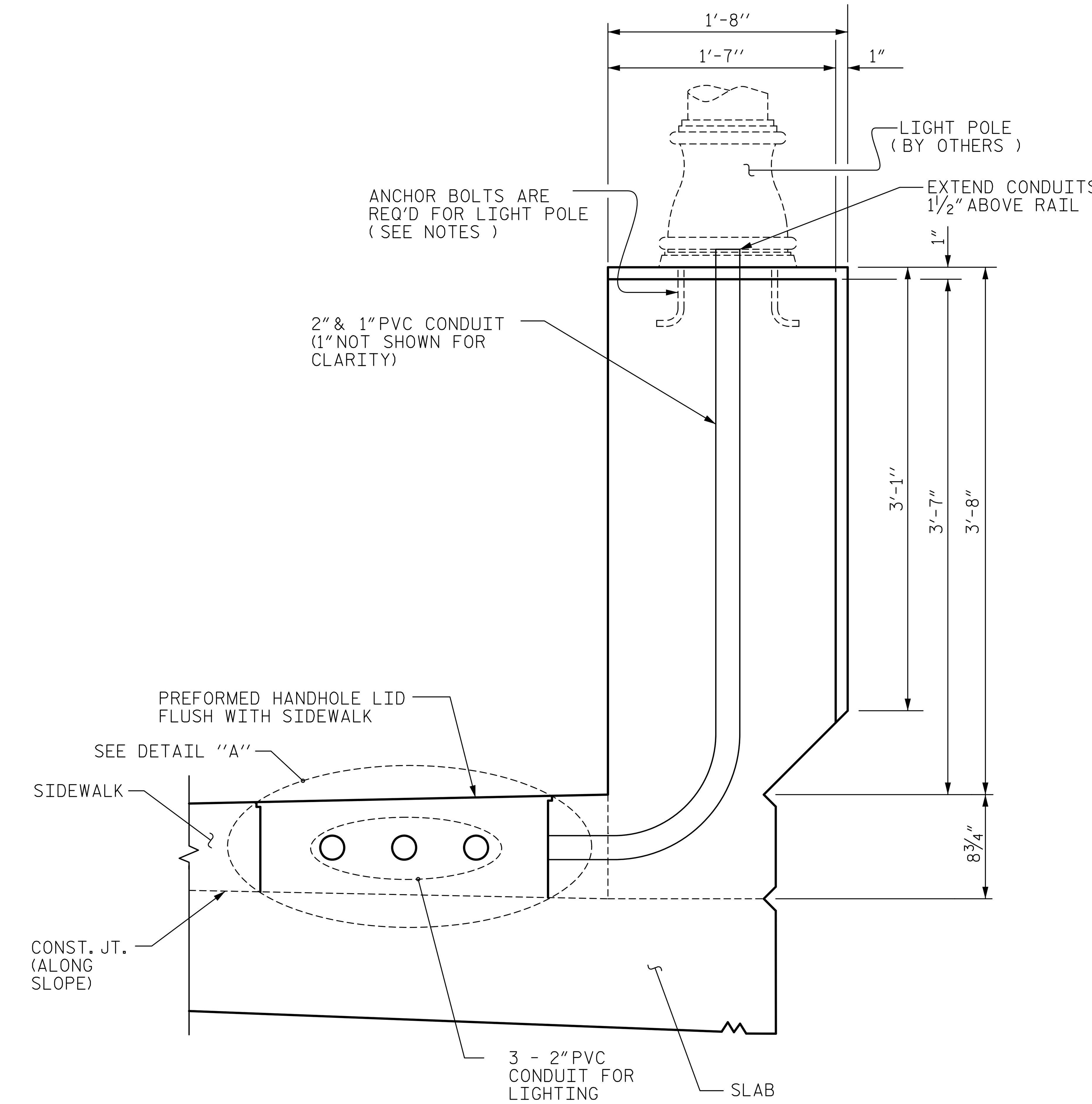
PREFORMED HANDHOLE PLAN

(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)



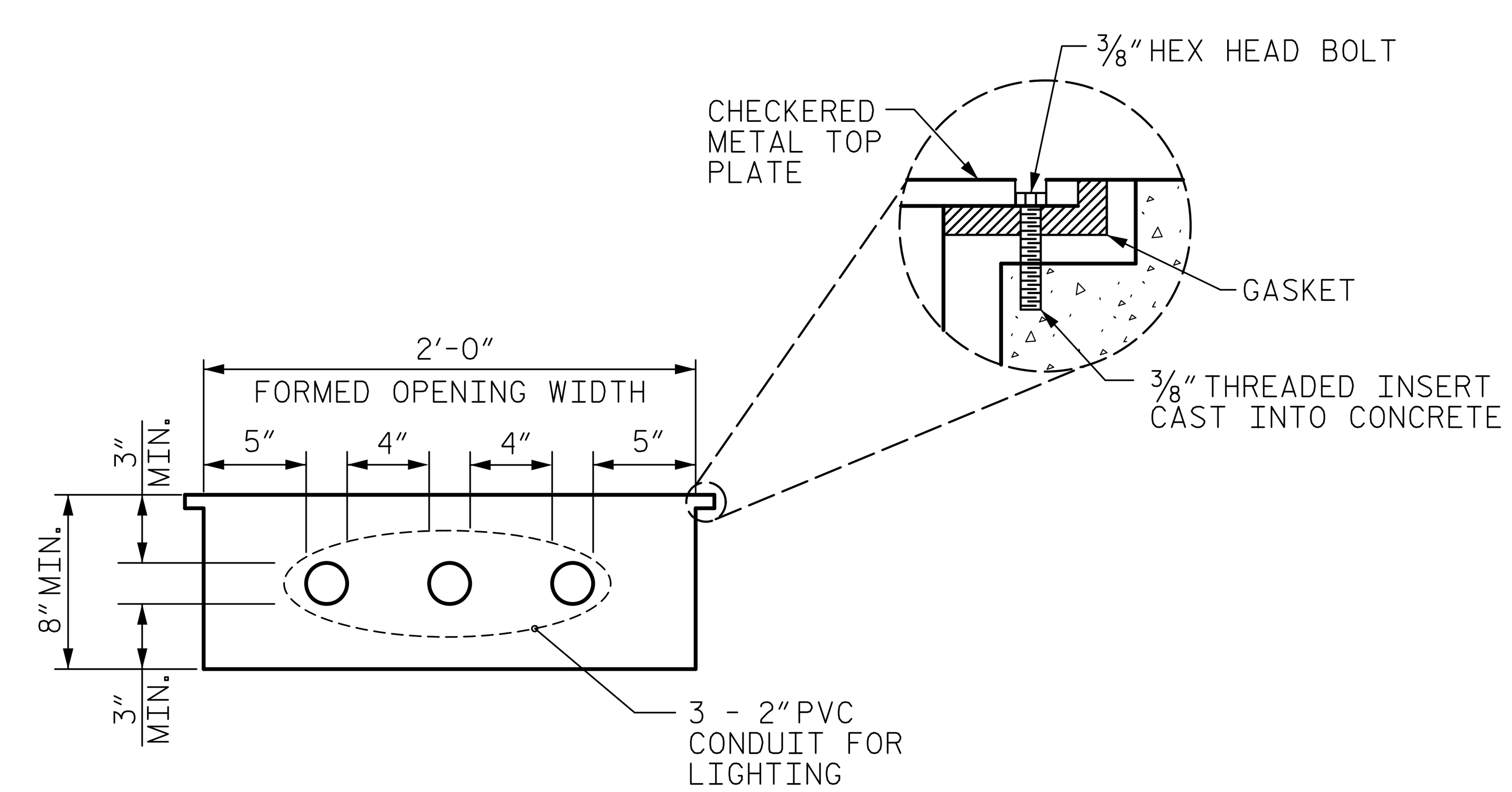
HANDHOLE LID

(CHECKERED METAL)



SECTION AT CONDUIT JUNCTION BOX

(SLAB REINFORCEMENT NOT SHOWN FOR CLARITY)
(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)



DETAIL ″A″

JUNCTION BOX NEMA 4 WATER TIGHT (24″ X 24″ X 8″) IN SIDEWALK WITH CHECKERED TOP PLATE

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 7 OF 7

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030474 JOHN C. MORRISON

John C. Morrison 10/5/2023

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RALEIGH

SUPERSTRUCTURE

CLASSIC CONCRETE BRIDGE RAIL DETAILS

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REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S-26
1			3			TOTAL SHEETS	49
2			4				

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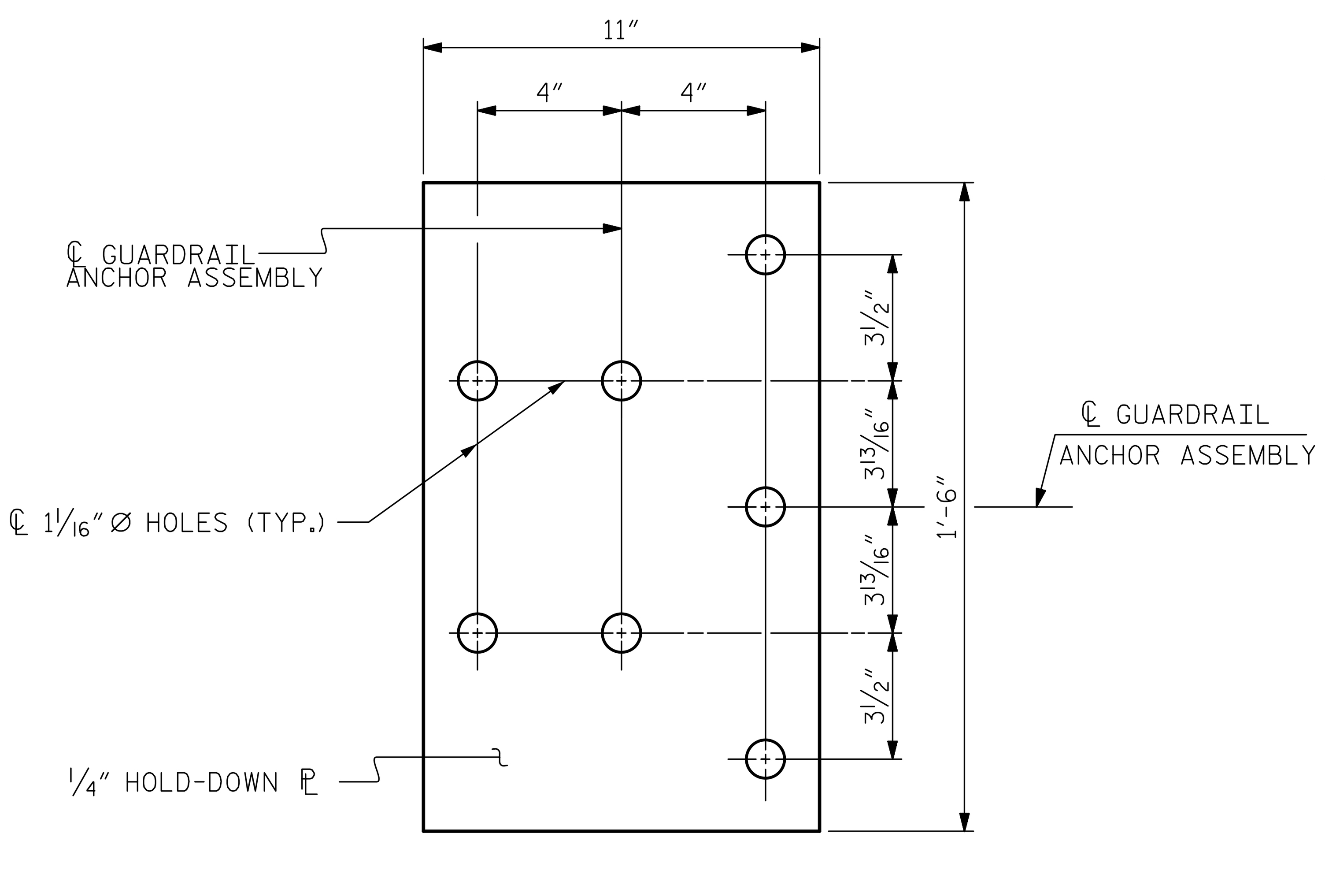
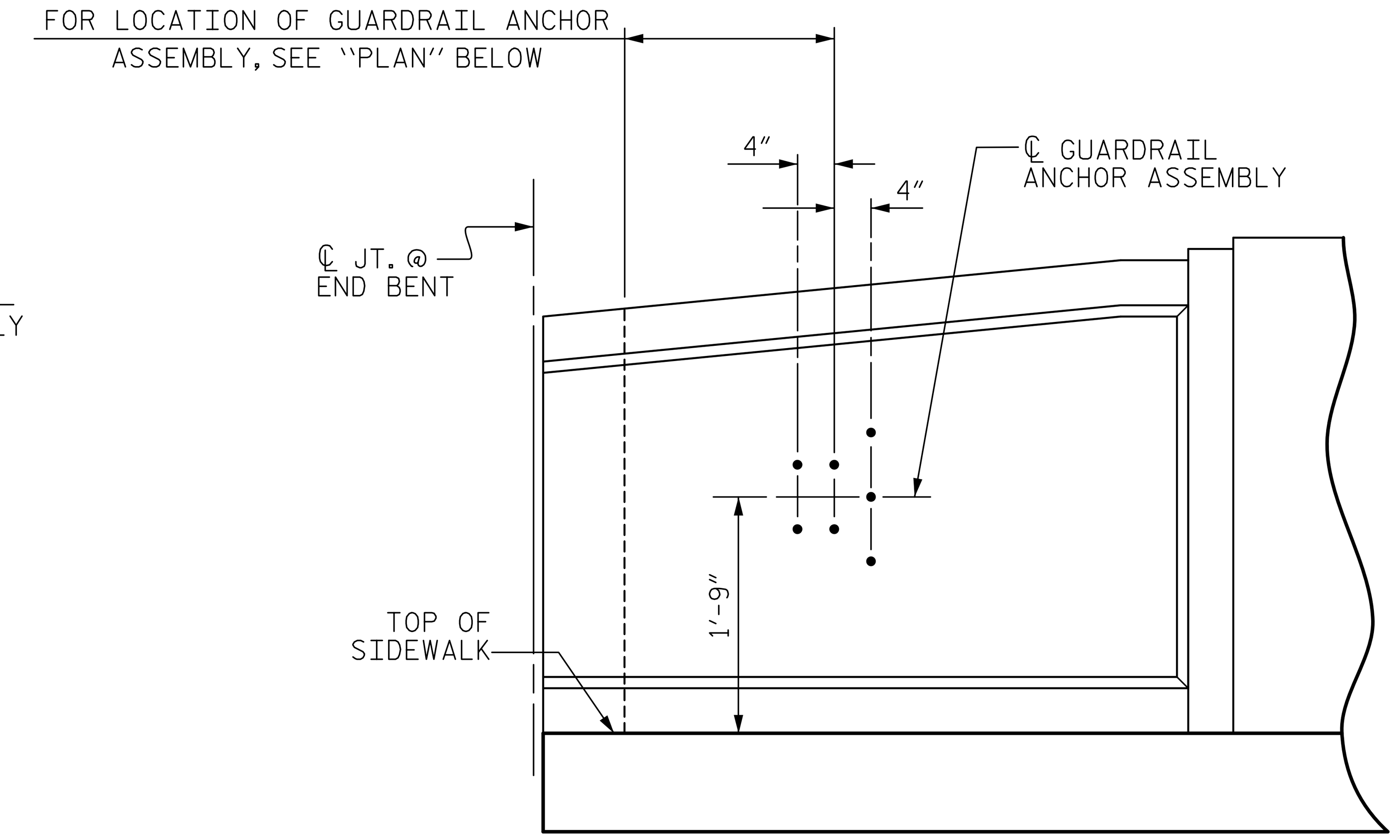


PLAN



ELEVATION

NOTES

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

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

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

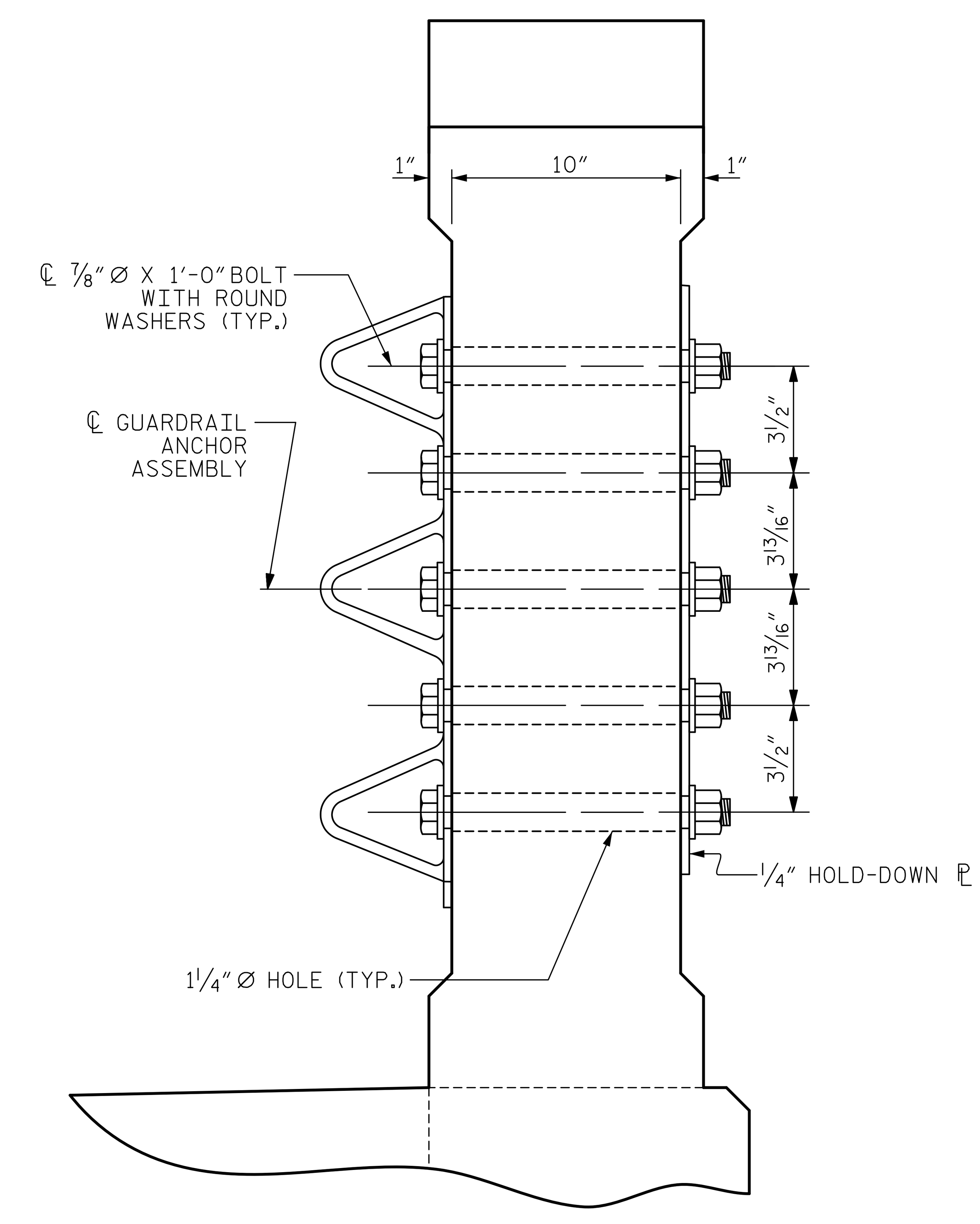
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

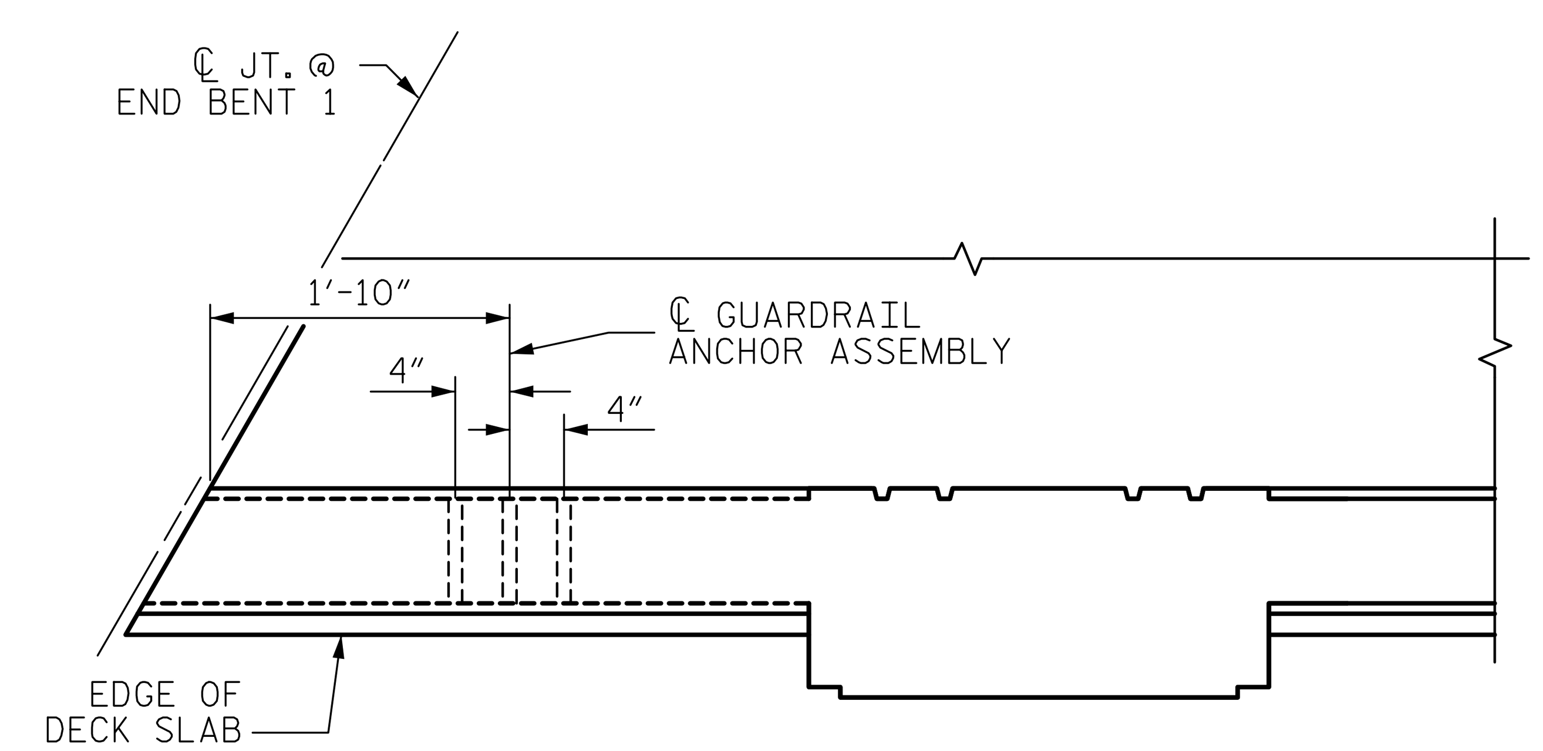
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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



END VIEW

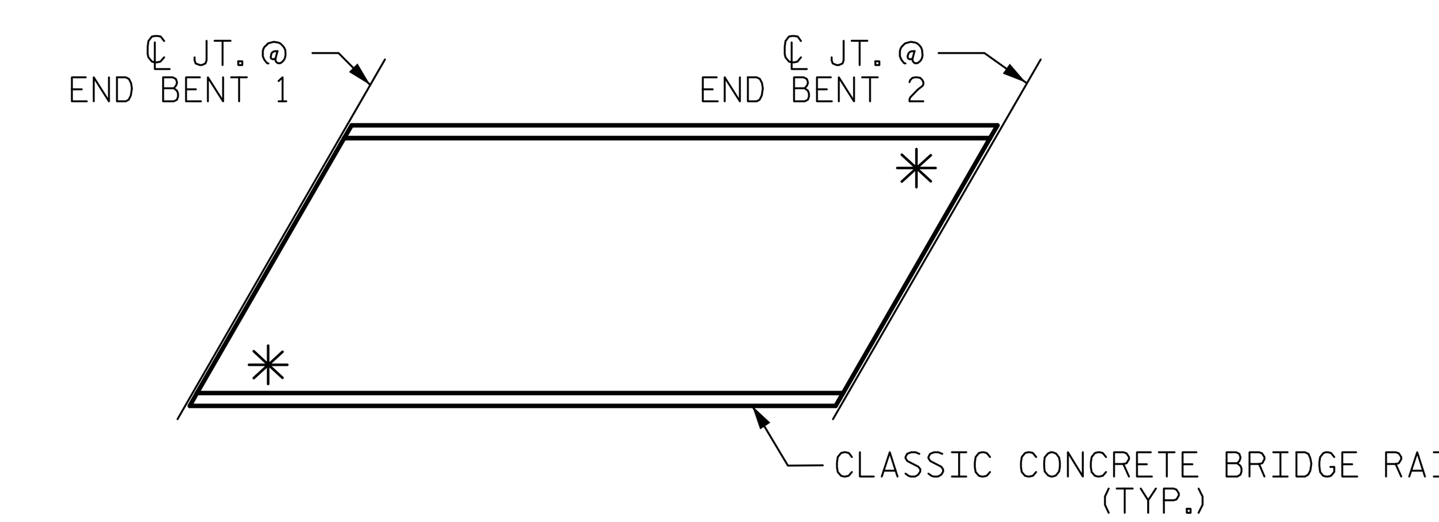
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

RIGHT RAIL AT END BENT 1 SHOWN, LEFT RAIL AT END BENT 2 SIMILAR



SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GUARDRAIL ANCHORAGE DETAILS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030474 JOHN C. MORRISON
1/19/2023

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S-27
1			3					TOTAL SHEETS
2			4					49

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DRAWN BY :	H.T. ROSEMOND	DATE :	12/2018
CHECKED BY :	J.C. MORRISON	DATE :	12/2018
DESIGNED BY :	H.T. ROSEMOND	DATE :	12/2018
DESIGN CHECKED BY :	J.C. MORRISON	DATE :	12/2018

DATE: 1/19/2023
TIME: 9:55:47 AM

JOINT INSTALLATION PROCEDURE:

1. INSTALL THE STRIP SEAL EXPANSION JOINT AS RECOMMENDED BY THE MANUFACTURER.
2. A MANUFACTURER'S REPRESENTATIVE SHALL BE PRESENT DURING INSTALLATION OF THE JOINT.
3. PLACE STEEL RETAINER RAILS IN JOINT OPENING. PROPERLY ALIGN THE RAILS BOTH HORIZONTALLY AND VERTICALLY. DO NOT WELD SUPPORT SYSTEM TO THE METALLIZED SURFACES OF THE STEEL RETAINER RAILS.
4. CONFLICTING REINFORCING STEEL MAY BE SHIFTED SLIGHTLY WHEN NECESSARY.
5. DECK SLAB CONCRETE PLACEMENT OPERATIONS SHALL COMMENCE PER THE POURING SEQUENCE AFTER FINAL JOINT ALIGNMENT IS SET.
6. PROTECT THE STEEL RETAINER RAILS FROM BEING FOULED BY CONCRETE SPILLOVER DURING THE DECK POUR.
7. LOOSEN THE STEEL RETAINER RAIL SUPPORT SYSTEM TO ALLOW MOVEMENT WHILE CONCRETE CURES.
8. RE-LEVEL AND RE-ALIGN STEEL RETAINER RAIL AS REQUIRED ON OPPOSITE SIDE OF JOINT.
9. PLACE APPROACH/DECK SLAB CONCRETE.
10. ONCE THE CONCRETE HAS HARDENED SUFFICIENTLY ON BOTH SIDES OF JOINT, STEEL RETAINER RAILS SHALL BE CLEANED THOROUGHLY AND SEAL CHANNELS SHALL BE INSPECTED TO ASCERTAIN THE ABSENCE OF CONCRETE AND DEBRIS.
11. COAT THE STRIP SEAL LUGS WITH LUBRICANT-ADHESIVE AND INSTALL THE NEOPRENE STRIP SEAL GLAND AS RECOMMENDED BY THE STRIP SEAL EXPANSION JOINT MANUFACTURER.
12. A TEMPORARY GLAND IS REQUIRED FOR STAGE I. NO SEPARATE PAYMENT WILL BE MADE FOR THE TEMPORARY GLANDS.

GENERAL NOTES

FOR STRIP SEAL EXPANSION JOINTS, SEE SPECIAL PROVISIONS.

STEEL RETAINER RAILS AND COVER PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR GRADE 50 STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.

ONLY STEEL RETAINER RAILS OF ONE-PIECE CONSTRUCTION ARE PERMITTED. STEEL RETAINER RAILS CONSISTING OF TWO OR MORE COMPONENTS WELDED TOGETHER TO OBTAIN THEIR FINAL CROSS-SECTIONAL SHAPE ARE NOT PERMITTED.

STUD ANCHORS SHALL BE SHOP WELDED AND SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.

SURFACES COMING IN CONTACT WITH STRIP SEAL GLAND SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.

UPON COMPLETION OF SHOP FABRICATION, THE STEEL RETAINER RAILS SHALL BE METALLIZED AS SHOWN IN THE "METALLIZING DETAIL". SEE SPECIAL PROVISIONS FOR THERMAL SPRAYED COATINGS (METALLIZATION).

INSTALLED STEEL RETAINER RAILS SHALL FOLLOW THE ROADWAY SLOPE.

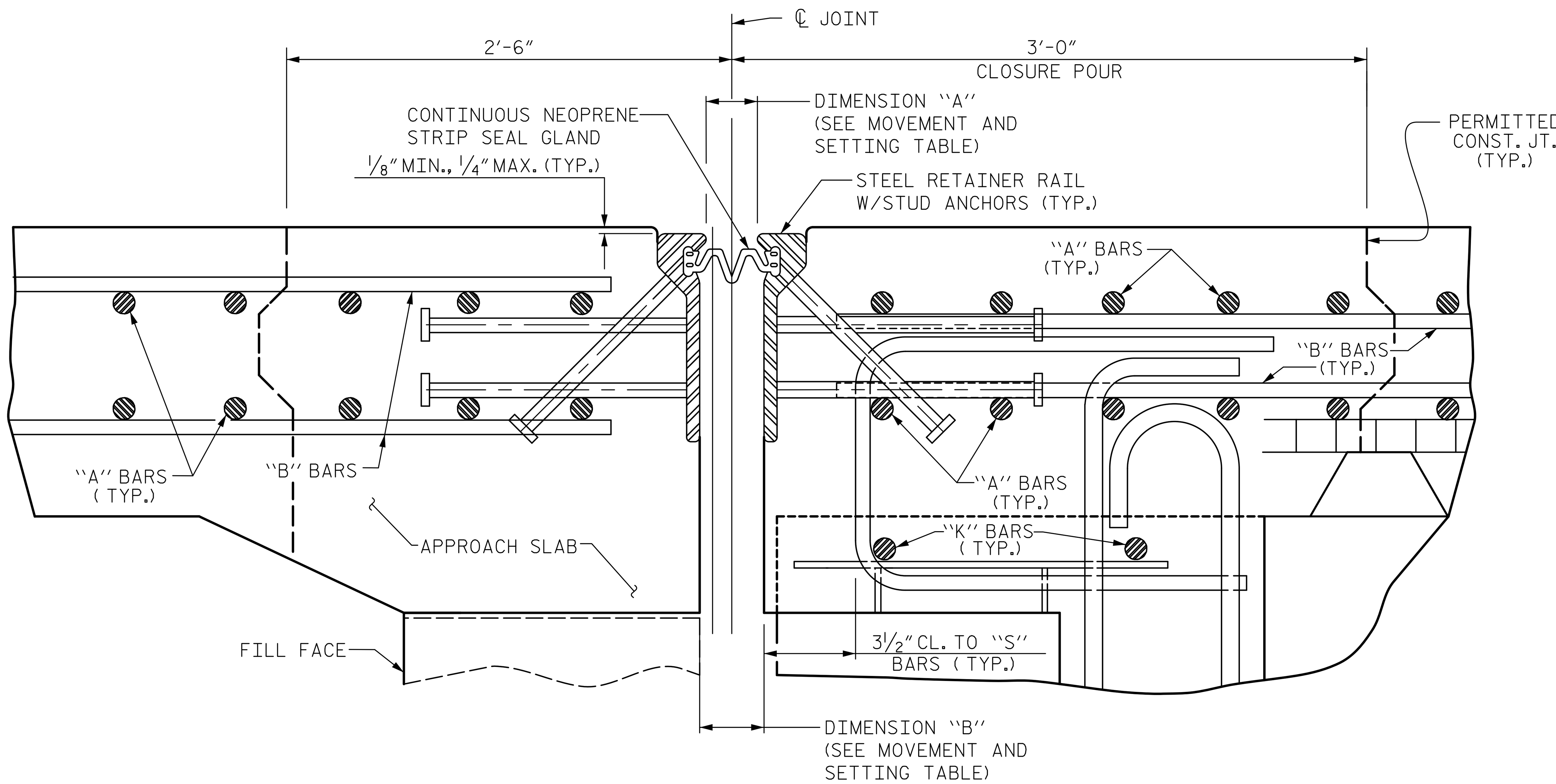
FIELD SPLICES OF THE RETAINER RAILS SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. FINISHED WELDS SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

NEOPRENE STRIP SEAL GLAND SHALL BE CONTINUOUS THROUGHOUT THE JOINT AND SHALL BE COMPATIBLE WITH THE STEEL RETAINER RAILS. FIELD SPLICING THE GLAND IS NOT PERMITTED.

NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.

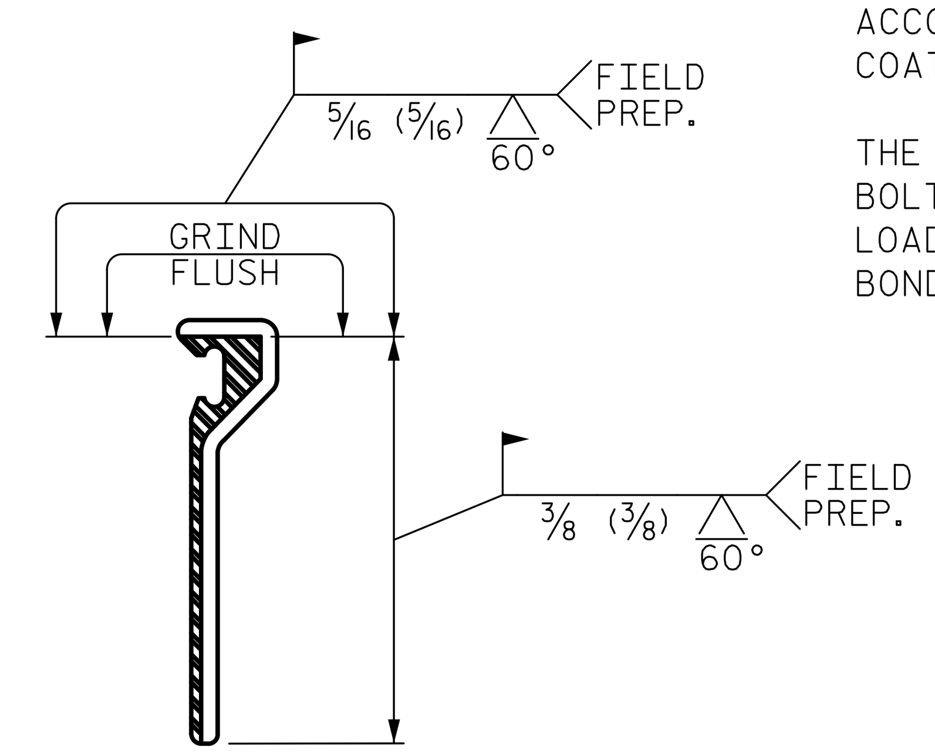
THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

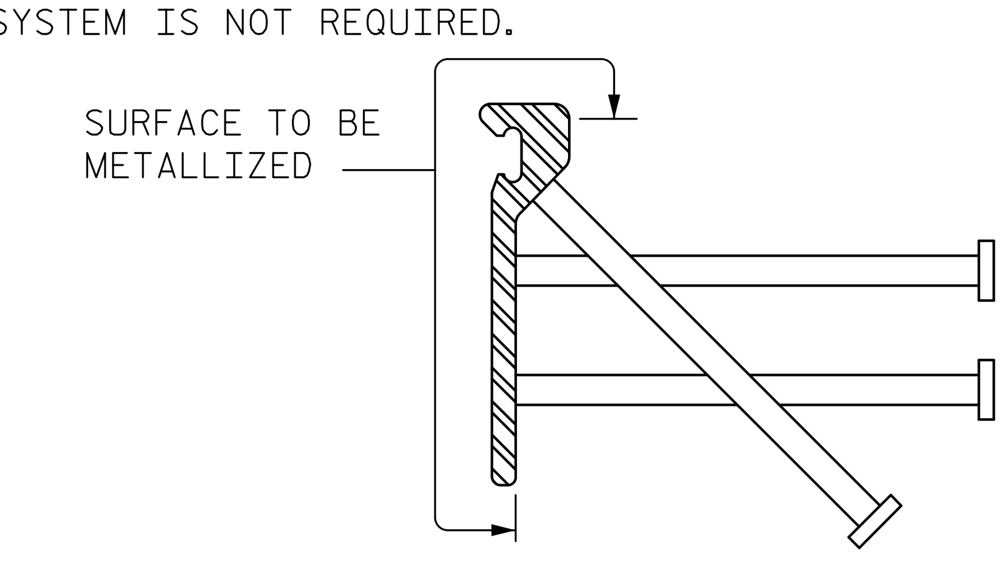


STRIP SEAL EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

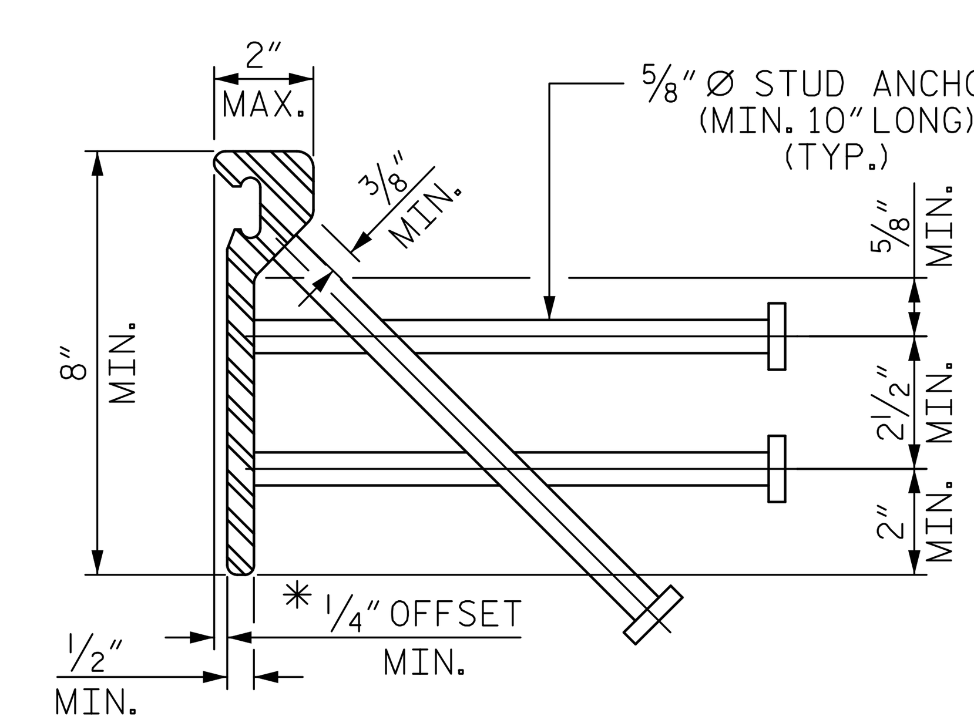


STEEL RETAINER RAIL (FIELD SPLICE DETAIL)



METALLIZING DETAIL

MOVEMENT AND SETTING AT JOINT								
LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	DIMENSION "A"			DIMENSION "B"		
			PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	123°16'56"	1/4"	2 1/16"	2"	1 15/16"	2 9/16"	2 1/2"	2 7/16"
END BENT 2	123°16'56"	1/4"	2 1/16"	2"	1 15/16"	2 9/16"	2 1/2"	2 7/16"



TYPICAL SECTION STEEL RETAINER RAIL

*DIMENSION "B" BASED ON STEEL RETAINER RAIL TOP OFFSET TO FACE OF RAIL OF 1/4" MINIMUM. IF ACTUAL OFFSET IS GREATER ADJUST DIMENSION "B" AS REQUIRED.

PROJECT NO. B-4654
WAKE COUNTY
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SHEET 1 OF 3

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030474 JOHN C. MORRISON
1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STRIP SEAL EXPANSION JOINT DETAILS

REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S-28
1			3			TOTAL SHEETS	49
2			4				

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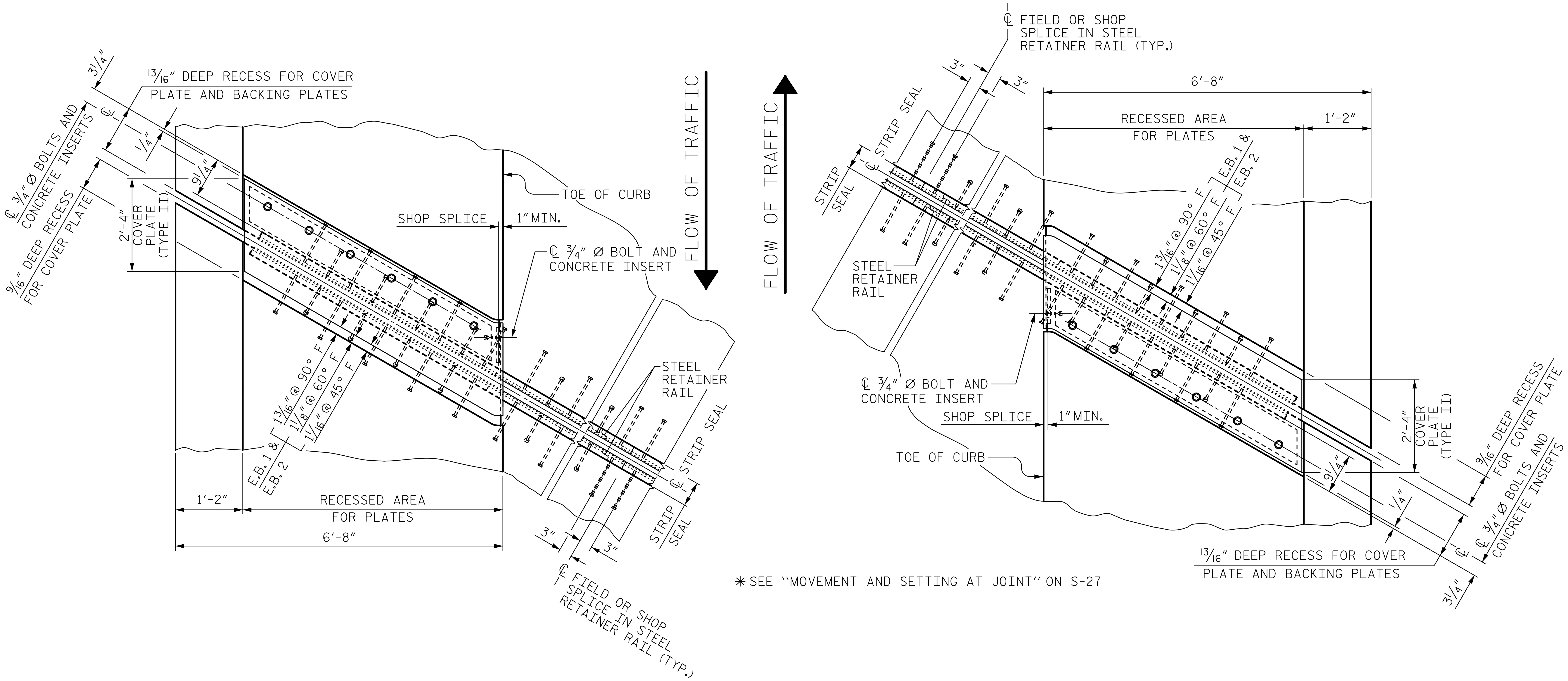
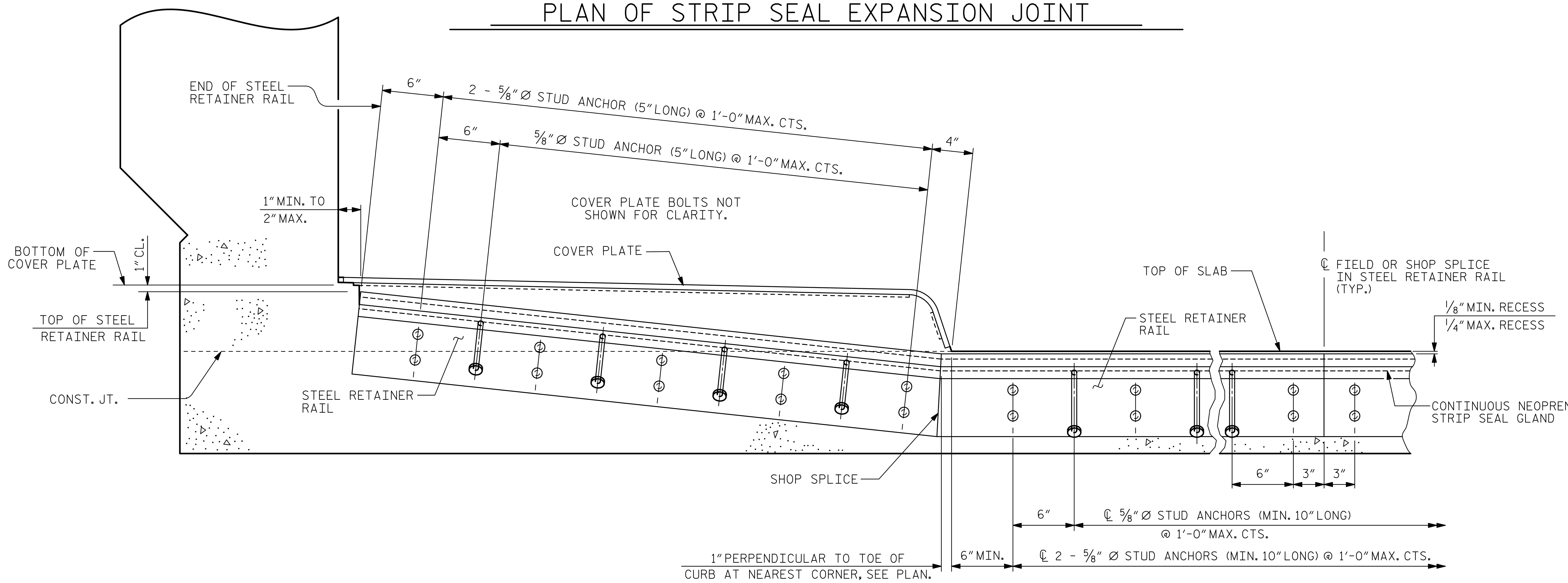
ASSEMBLED BY : K. MUENCH DATE : 05/2022
CHECKED BY : J.C. MORRISON DATE : 05/2022
DRAWN BY : MAA 6/20
CHECKED BY : BNB 6/20
REV. -/- --/--

STD. NO. SSEJ1



PLAN OF STRIP SEAL EXPANSION JOINT



SECTION THRU SIDEWALK NORMAL TO JOINT

PROJECT NO. B-4654

WAKE COUNTY

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SHEET 2 OF 3

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STRIP SEAL EXPANSION JOINT DETAILS FOR SIDEWALK

NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON — John C. Morrison 1/19/2023

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REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S-29
1			3			TOTAL SHEETS	49
2			4				

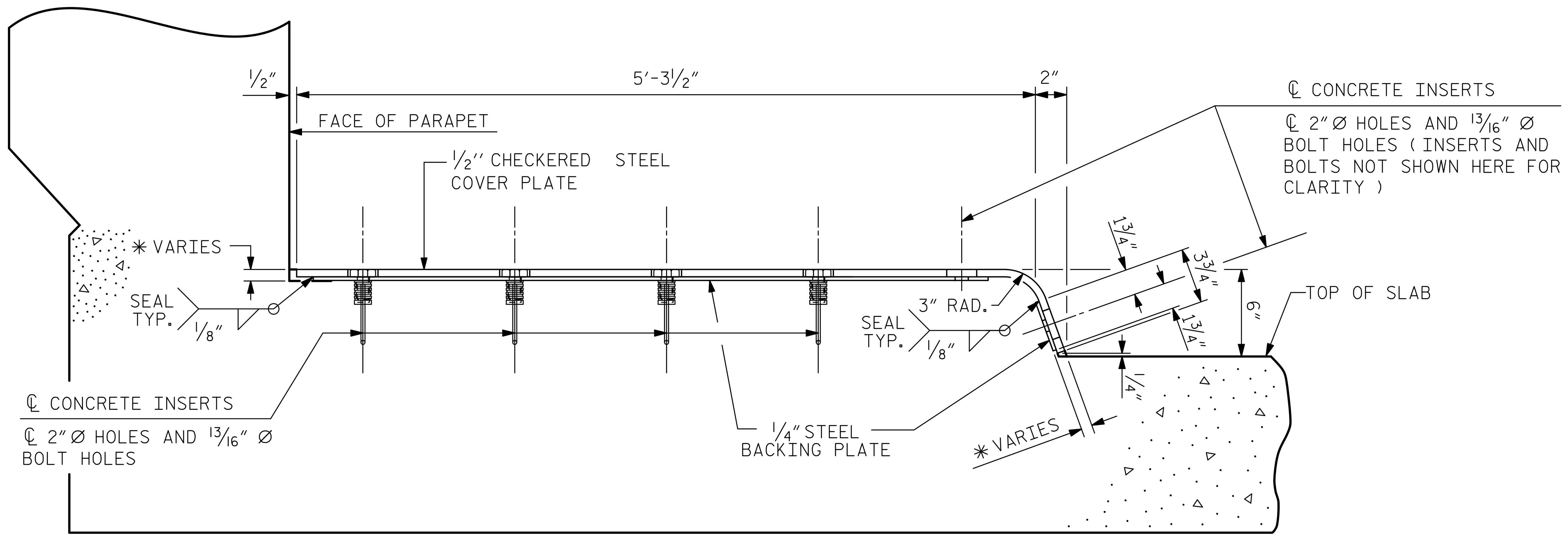
ASSEMBLED BY : K. MUENCH	DATE : 05/2022
CHECKED BY : J.C. MORRISON	DATE : 05/2022

DRAWN BY : REK 10/87	REV. 2/6/97 EEM/RGW
CHECKED BY : CRK 1/88	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

STD. NO. SSEJ3

DATE: 1/19/2023 TIME: 10:05:57 AM

USER: muenchk



END VIEW
(NORMAL TO SIDEWALK)

∗ CONCRETE RECESS DIMENSIONS:

13/16" FOR THE SIDE OF THE JOINT HAVING THE 1/2" COVER PLATE WITH A 1/4" BACKING PLATE.

9/16" FOR THE SIDE OF THE JOINT HAVING ONLY THE 1/2" COVER PLATE.

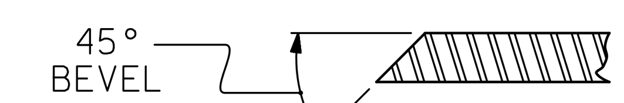
NOTES:

THE STEEL PLATES CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL. AFTER FABRICATION, THE PLATE SHALL BE COMMERCIALLY BLAST CLEANED AND COATED WITH A MINIMUM THICKNESS OF 4 MILS (DRY) OF ZINC RICH PAINT, GALVANIZED OR METALLIZED TO A MINIMUM THICKNESS OF 6 MILS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

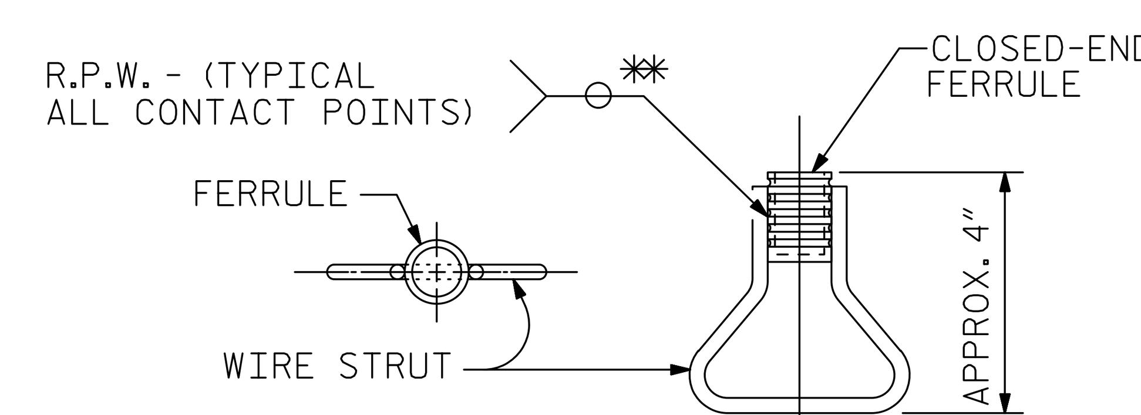
THE 3/4" DIAMETER HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

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

NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATES. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR EXPANSION JOINT SEALS.



SECTION B - B

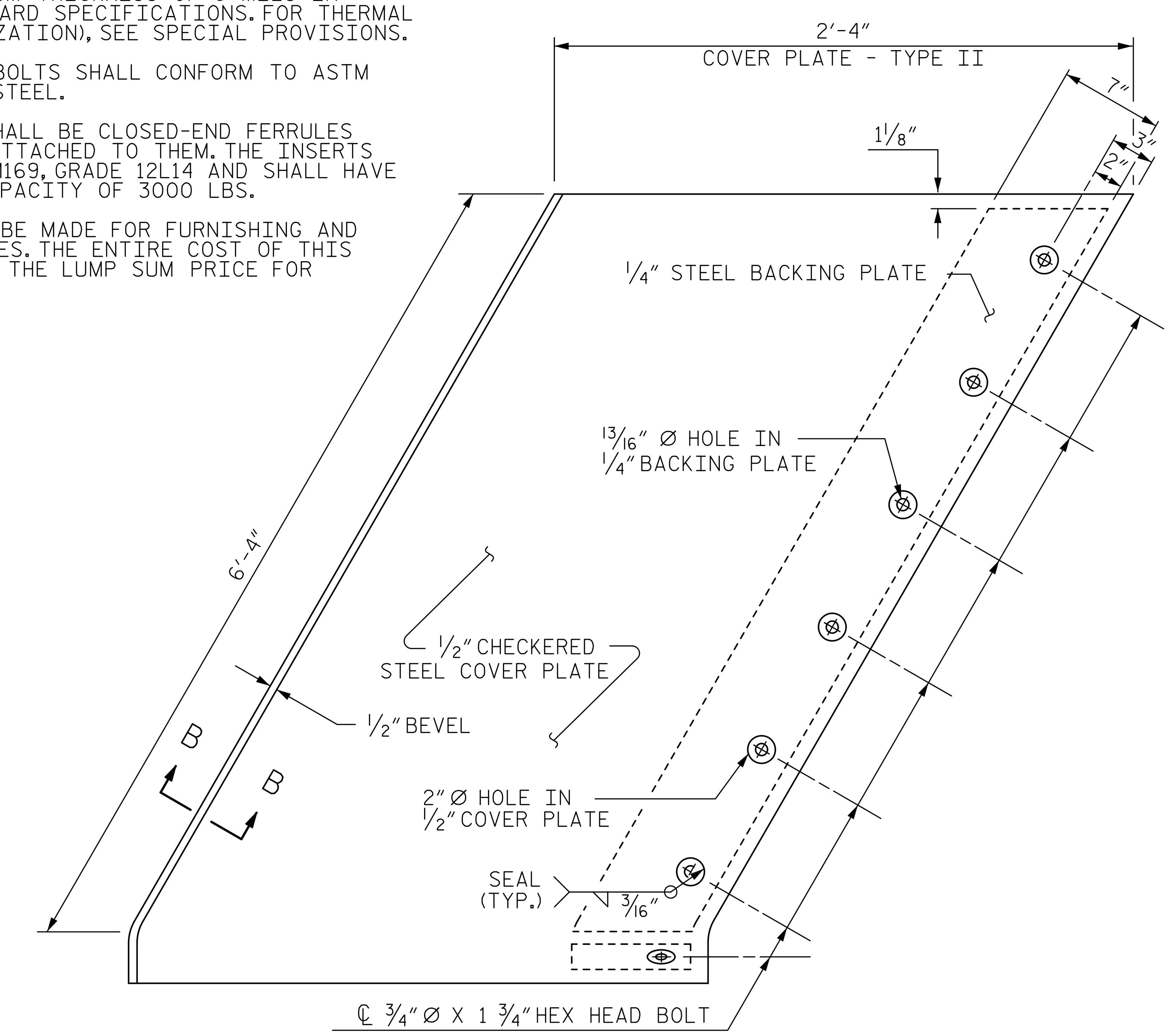


PLAN

ELEVATION

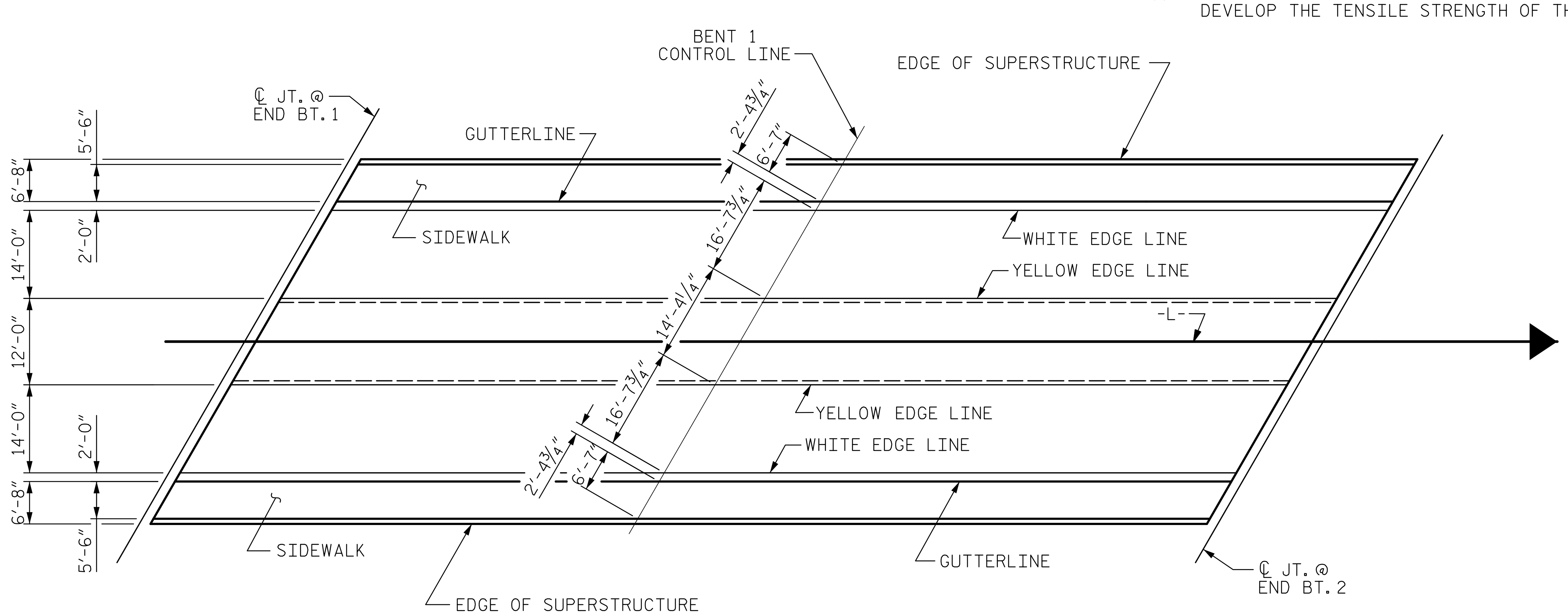
CONCRETE INSERT

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



TYPE II - PLAN VIEW

COVER PLATE DETAILS



PAVEMENT MARKING ALIGNMENT

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 3 OF 3

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NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON
John C. Morrison
1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STRIP SEAL EXPANSION JOINT DETAILS FOR SIDEWALK

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S-30
1			3				TOTAL SHEETS
2			4				49

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ASSEMBLED BY : K. MUENCH	DATE : 05/2022
CHECKED BY : J.C. MORRISON	DATE : 05/2022
DRAWN BY : MAA 6/20	REV. -/- --/--
CHECKED BY : BNB 6/20	

STD. NO. SSEJ4

REINFORCING BAR SCHEDULE

STAGE I												STAGE II					
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT	BAR	No.	SIZE	TYPE	LENGTH	WEIGHT	BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
* A1	284	5	STR	39'-10"	11799	A216	2	5	STR	14'-0"	29	* A3	318	5	STR	12'-1"	4008
A2	284	5	STR	39'-10"	11799	A217	2	5	STR	14'-10"	31	A4	318	5	STR	12'-1"	4008
* A5	6	6	STR	14'-4"	129	A218	2	5	STR	15'-8"	33	* A5	3	6	STR	14'-4"	65
						A219	2	5	STR	16'-6"	34						
* A101	2	5	STR	1'-9"	4	A220	2	5	STR	17'-4"	36	* A301	2	5	STR	1'-6"	3
* A102	2	5	STR	2'-7"	5	A221	2	5	STR	18'-1"	38	* A302	2	5	STR	2'-4"	5
* A103	2	5	STR	3'-5"	7	A222	2	5	STR	18'-11"	39	* A303	2	5	STR	3'-2"	7
* A104	2	5	STR	4'-3"	9	A223	2	5	STR	19'-9"	41	* A304	2	5	STR	4'-0"	8
* A105	2	5	STR	5'-1"	11	A224	2	5	STR	20'-7"	43	* A305	2	5	STR	4'-10"	10
* A106	2	5	STR	5'-10"	12	A225	2	5	STR	21'-5"	45	* A306	2	5	STR	5'-8"	12
* A107	2	5	STR	6'-8"	14	A226	2	5	STR	22'-2"	46	* A307	2	5	STR	6'-5"	13
* A108	2	5	STR	7'-6"	16	A227	2	5	STR	23'-0"	48	* A308	2	5	STR	7'-3"	15
* A109	2	5	STR	8'-4"	17	A228	2	5	STR	23'-10"	50	* A309	2	5	STR	8'-1"	17
* A110	2	5	STR	9'-2"	19	A229	2	5	STR	24'-8"	51	* A310	2	5	STR	8'-11"	19
* A111	2	5	STR	9'-11"	21	A230	2	5	STR	25'-6"	53	* A311	2	5	STR	9'-9"	20
* A112	2	5	STR	10'-9"	22	A231	2	5	STR	26'-3"	55	* A312	2	5	STR	10'-7"	22
* A113	2	5	STR	11'-7"	24	A232	2	5	STR	27'-1"	56	* A313	2	5	STR	11'-5"	24
* A114	2	5	STR	12'-5"	26	A233	2	5	STR	27'-11"	58	* A314	6	5	STR	3'-6"	22
* A115	2	5	STR	13'-3"	28	A234	2	5	STR	28'-9"	60						
* A116	2	5	STR	14'-0"	29	A235	2	5	STR	29'-7"	62	A401	2	5	STR	1'-6"	3
* A117	2	5	STR	14'-10"	31	A236	2	5	STR	30'-4"	63	A402	2	5	STR	2'-4"	5
* A118	2	5	STR	15'-8"	33	A237	2	5	STR	31'-2"	65	A403	2	5	STR	3'-2"	7
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* A120	2	5	STR	17'-4"	36	A239	2	5	STR	32'-10"	68	A405	2	5	STR	4'-10"	10
* A121	2	5	STR	18'-1"	38	A240	2	5	STR	33'-8"	70	A406	2	5	STR	5'-8"	12
* A122	2	5	STR	18'-11"	39	A241	2	5	STR	34'-5"	72	A407	2	5	STR	6'-5"	13
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* A124	2	5	STR	20'-7"	43	A243	2	5	STR	36'-1"	75	A409	2	5	STR	8'-1"	17
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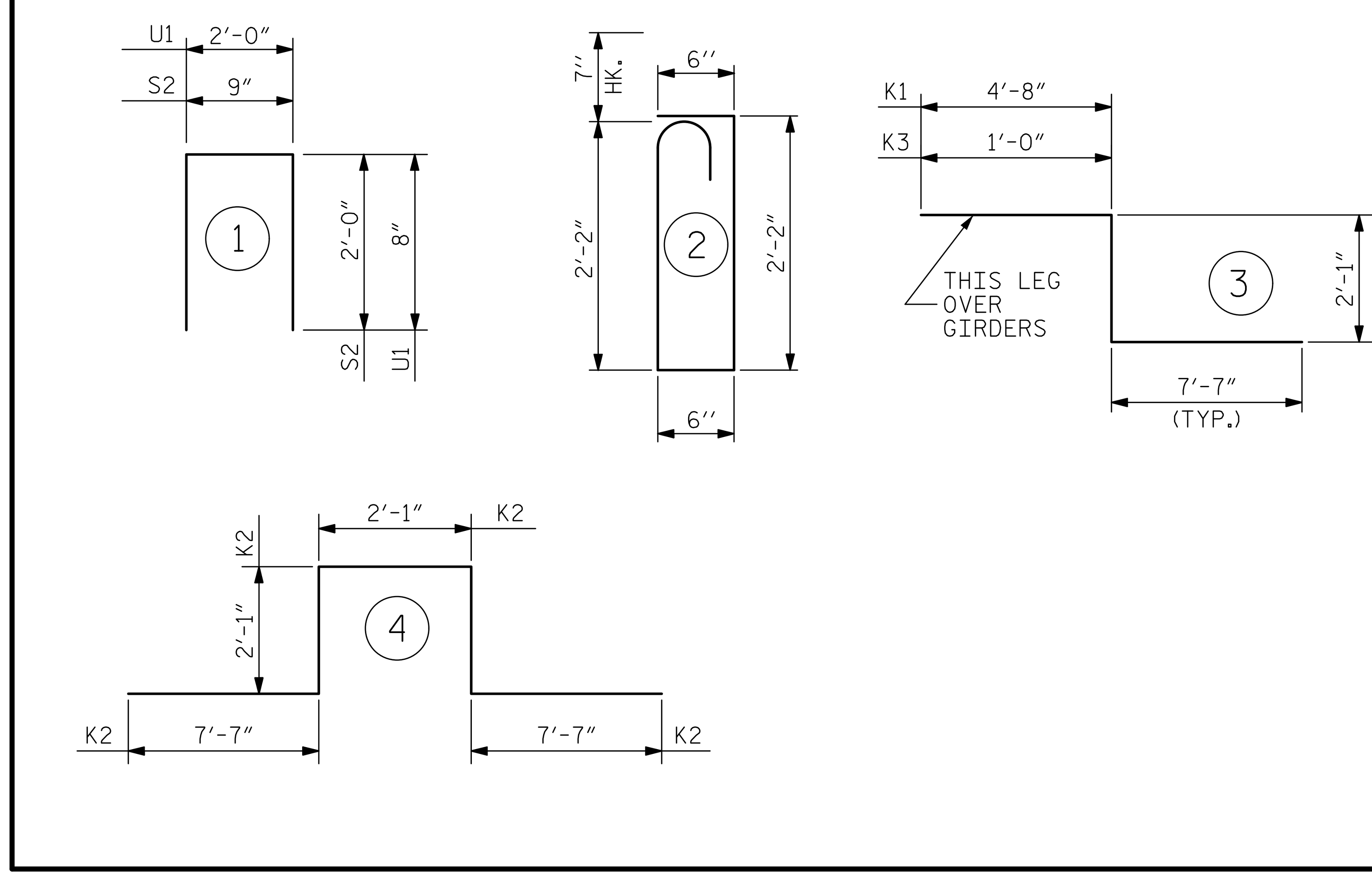
* A130	2	5	STR	25'-6"	53	* B1	56	4	STR	29'-3"	1094						
* A131	2	5	STR	26'-3"	55	* B2	56	4	STR	32'-3"	1206	* B1	26	4	STR	29'-3"	508
* A132	2	5	STR	27'-1"	56	* B3	84	5	STR	23'-6"	2059	* B2	26	4	STR	32'-3"	560
* A133	2	5	STR	27'-11"	58	* B4	79	5	STR	40'-6"	3337	* B3	39	5	STR	23'-6"	959
* A134	2	5	STR	28'-9"	60	B5	176	5	STR	46'-9"	8582	* B4	32	5	STR	40'-6"	1352
* A135	2	5	STR	29'-7"	62	B6	16	5	STR	46'-3"	1881	B5	76	5	STR	46'-9"	3706
* A136	2	5	STR	30'-4"	63	* B7	35	4	STR	27'-6"	643	B6	16	5	STR	46'-3"	772
* A137	2	5	STR	31'-2"	65							* B7	35	4	STR	27'-6"	643
* A138	2	5	STR	32'-0"	67	* D1	328	5	STR	6'-8"	2281						
* A139	2	5	STR	32'-10"	68	D2	328	5	STR	6'-4"	2167	* D1	327	5	STR	6'-8"	2274
* A140	2	5	STR	33'-8"	70							D2	327	5	STR	6'-4"	2160
* A141	2	5	STR	34'-5"	72	* G1	2	5	STR	47'-8"	99						
* A142	2	5	STR	35'-3"	74	* G4	176	4	STR	5'-1"	598	* G2	2	5	STR	14'-6"	30
* A143	2	5	STR	36'-1"	75	* G5	6	4	STR	5'-4"	21	* G3	2	5	STR	5'-4"	11
* A144	2	5	STR	36'-11"	77							* G4	176	4	STR	5'-1"	598
* A145	2	5	STR	37'-9"	79	* K1	4	8	3	14'-4"	153	* G5	6	4	STR	5'-4"	21
* A146	2	5	STR	38'-7"	80	* K2	12	8	4	22'-1"	708						
* A147	2	5	STR	39'-5"	82	* K3	4	8	3	10'-8"	114						
						K4	24	6	STR	8'-4"	300	* K1	4	8	3	14'-4"	153
A201	2	5	STR	1'-9"	4							* K3	4	8	3	10'-8"	114
A202	2	5	STR	2'-7"	5	S1	64	5	2	5'-11"	395	K4	6	6	STR	8'-4"	75
A203	2	5	STR	3'-5"	7	S2	64	4	1	4'-9"	203	K5	4	8	STR	3'-4"	36
A204	2	5	STR	4'-3"	9							K6	6	6	STR	3'-4"	30
A205	2	5	STR	5'-1"	11	* U1	52	4	1	3'-4"	116						
A206	2	5	STR	5'-10"	12							S1	22	5	2	5'-11"	136
A207	2	5	STR	6'-8"	14							S2	22	4	1	4'-9"	70
A208	2	5	STR	7'-6"	16												
A209	2	5	STR	8'-4"	17							* U1	52	4	1	3'-4"	116
A210	2	5	STR	9'-2"	19												
A211	2	5	STR	9'-11"	21												
A212	2	5	STR	10'-9"	22												
A213	2	5	STR	11'-7"	24												
A214	2	5	STR	12'-5"	26												
A215	2	5	STR	13'-3"	28												

STAGE I: TOTAL REINFORCING STEEL LBS. 26,523
* TOTAL EPOXY COATED REINFORCING STEEL LBS. 27,763

STAGE II: TOTAL REINFORCING STEEL LBS. 11,262
* TOTAL EPOXY COATED REINFORCING STEEL LBS. 12,189

BAR TYPES



SUPERSTRUCTURE BILL OF MATERIAL

		CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
		(CU. YDS.)	(LBS.)	(LBS.)
STAGE I	POUR #1	204.8	---	---
	POUR #2	26.3	---	---
	POUR #3	9.0	---	---
	* SIDEWALK	22.2	---	---
	TOTAL	262.3	26,523	27,763
STAGE II	POUR #4	65.4	---	---
	POUR #5	8.4	---	---
	POUR #6	31.7	---	---
	POUR #7	3.4	---	---
	* SIDEWALK	22.2	---	---
	TOTAL	131.1	11,262	12,189
TOTALS**		393.4	37,785	39,952

* ONLY SIDEWALK QUANTITIES FOR SIDEWALK ON BRIDGE DECK INCLUDED.

** QUANTITIES FOR CLASSIC CONCRETE BRIDGE 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	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"
#7	4'-2"	2'-9"			
#8	4'-9"	3'-2"			

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 1 OF 2

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL
JOHN C. MORRISON
1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S-31
1			3			TOTAL SHEETS	49
2			4				

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DRAWN BY : K. MUENCH DATE : 05/2022
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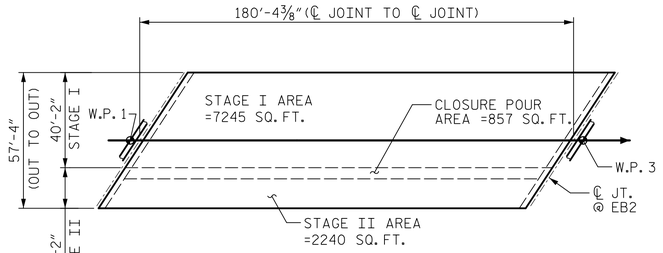
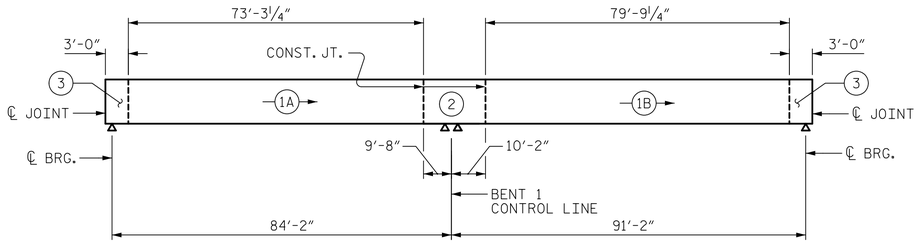
DESIGNED BY : D. RITACCO DATE : 05/2022
DESIGN CHECKED BY : J.C. MORRISON DATE : 05/2022



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

(SQ. FT. =10,341)

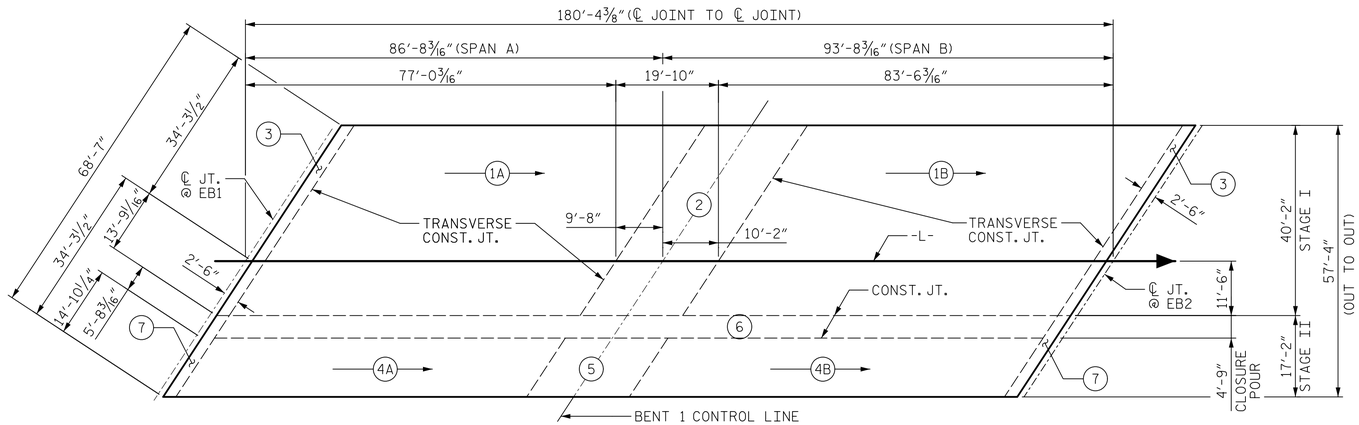


POURING SEQUENCE - ELEVATION

(STAGE I SHOWN, STAGE II SIMILAR)

ALL DIMENSIONS MEASURED ALONG -L-

(#) INDICATES POUR NUMBER AND DIRECTION



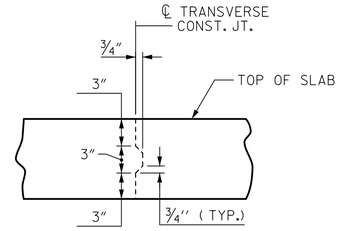
POURING SEQUENCE - PLAN

(POUR #2 CANNOT BE STARTED UNTIL BOTH ADJACENT POURS LABLED POUR #1 REACH A MINIMUM OF 3000 PSI.)

ALL DIMENSIONS MEASURED ALONG -L-

(#) INDICATES POUR NUMBER AND DIRECTION

NOTE: SIDEWALKS AND CLASSIC CONCRETE BRIDGE RAILS SHALL NOT BE POURED PRIOR TO COMPLETION OF ENTIRE DECK POUR FOR EACH STAGE.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

GROOVING BRIDGE FLOORS	
STAGE I	
APPROACH SLABS	1,593 SQ.FT.
BRIDGE DECK	5,763 SQ.FT.
TOTAL	7,355 SQ.FT.
STAGE II	
APPROACH SLABS	448 SQ.FT.
BRIDGE DECK	1,622 SQ.FT.
TOTAL	2,070 SQ.FT.
TOTAL	
APPROACH SLABS	2,041 SQ.FT.
BRIDGE DECK	7,385 SQ.FT.
TOTAL	9,425 SQ.FT.

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 2 OF 2

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NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON
John C. Morrison
1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			49

DRAWN BY : K. MUENCH DATE : 05/2022
CHECKED BY : J.C. MORRISON DATE : 05/2022
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DESIGN CHECKED BY : J.C. MORRISON DATE : 05/2022

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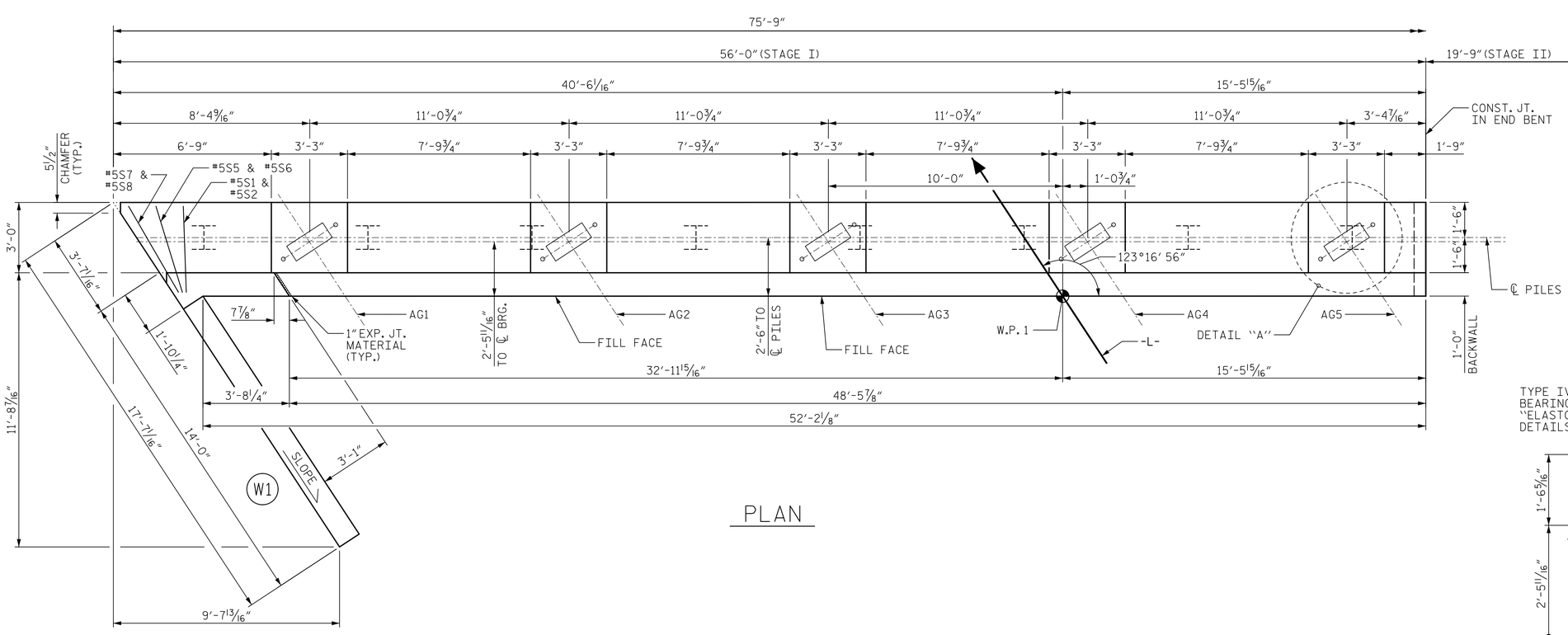
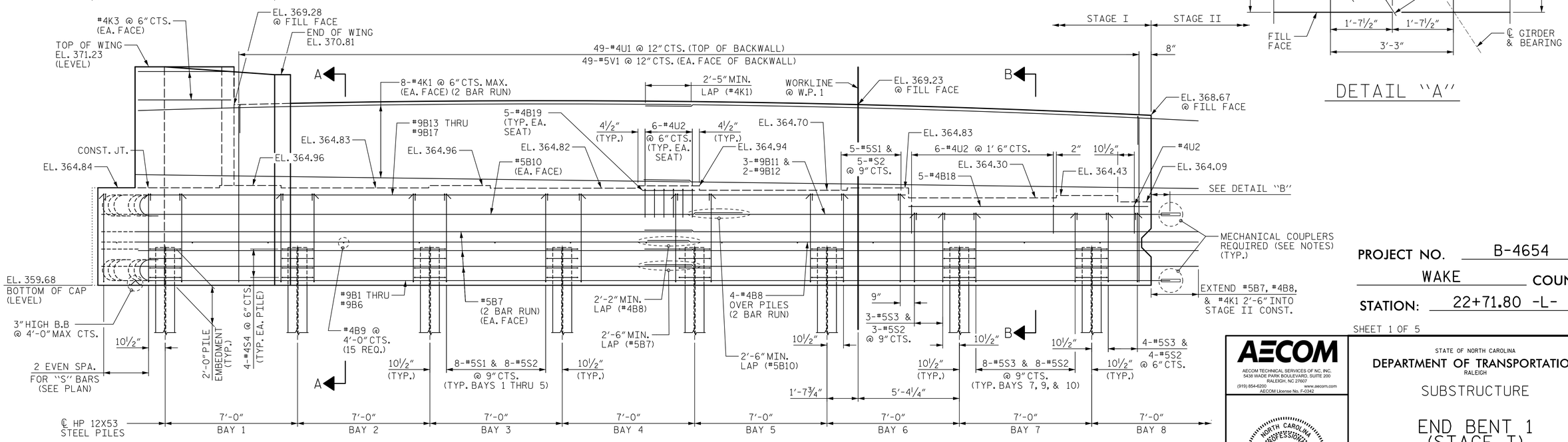
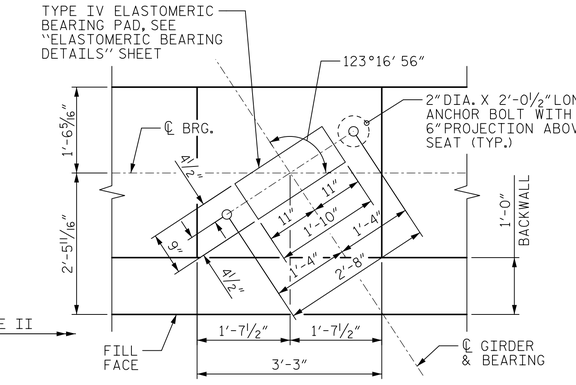
USER: muenchk
DGN: \\nzdcomnet.com\fs\AMER\Raleigh-USRAL3\Legacy\Projects\60436195-B-4654\900_Work\90_CADD\0_NCDOT_TIP\Structures\04 Drawings\2022 Updates\400_S3_S32_B4654_SMU_BMOF.dgn



PLAN



ELEVATION



DETAIL "A"

NOTES:

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHORS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING

THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.

THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #9 "B" BARS IN STAGE I WITH THE #9 "B" BARS IN STAGE II.

FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICE FOR REINFORCING STEEL IN STANDARD SPECIFICATIONS.

CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #9 "B" BARS AT THE STAGE CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL CUT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 1 OF 5

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1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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SUBSTRUCTURE

END BENT 1 (STAGE I)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			49

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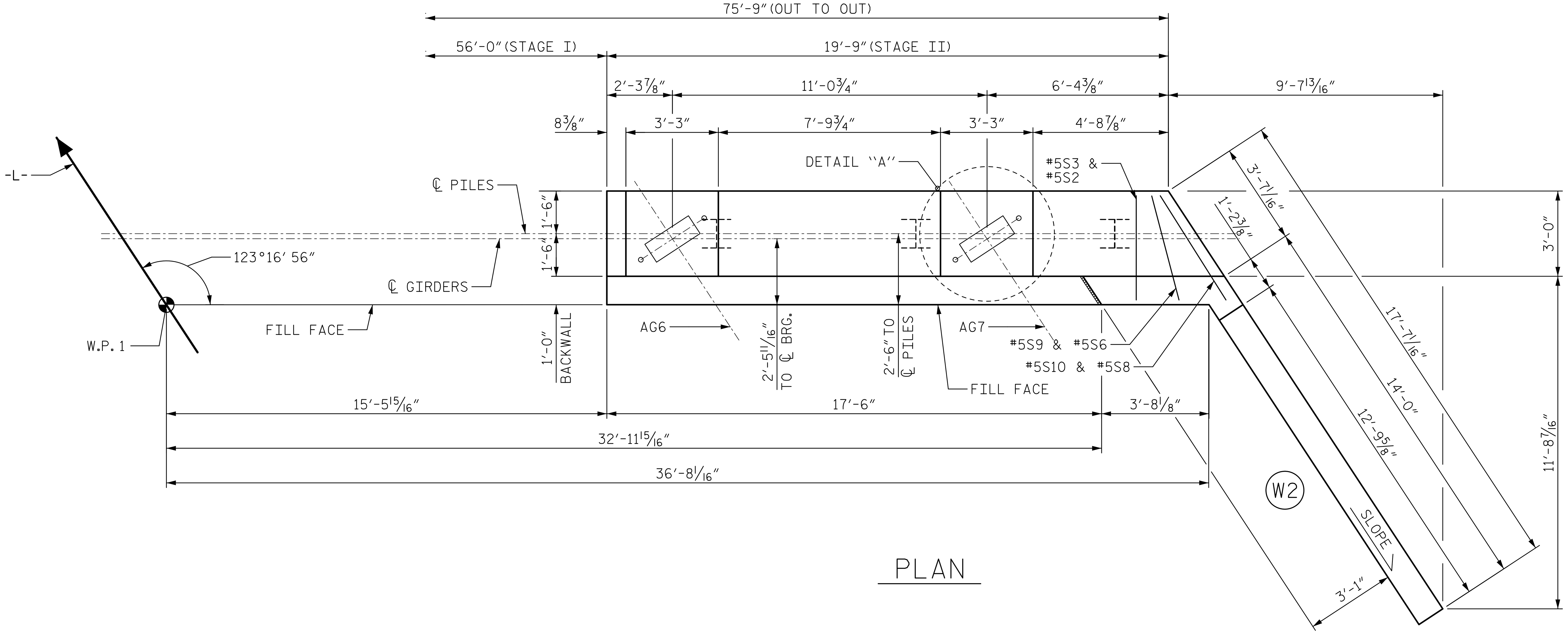
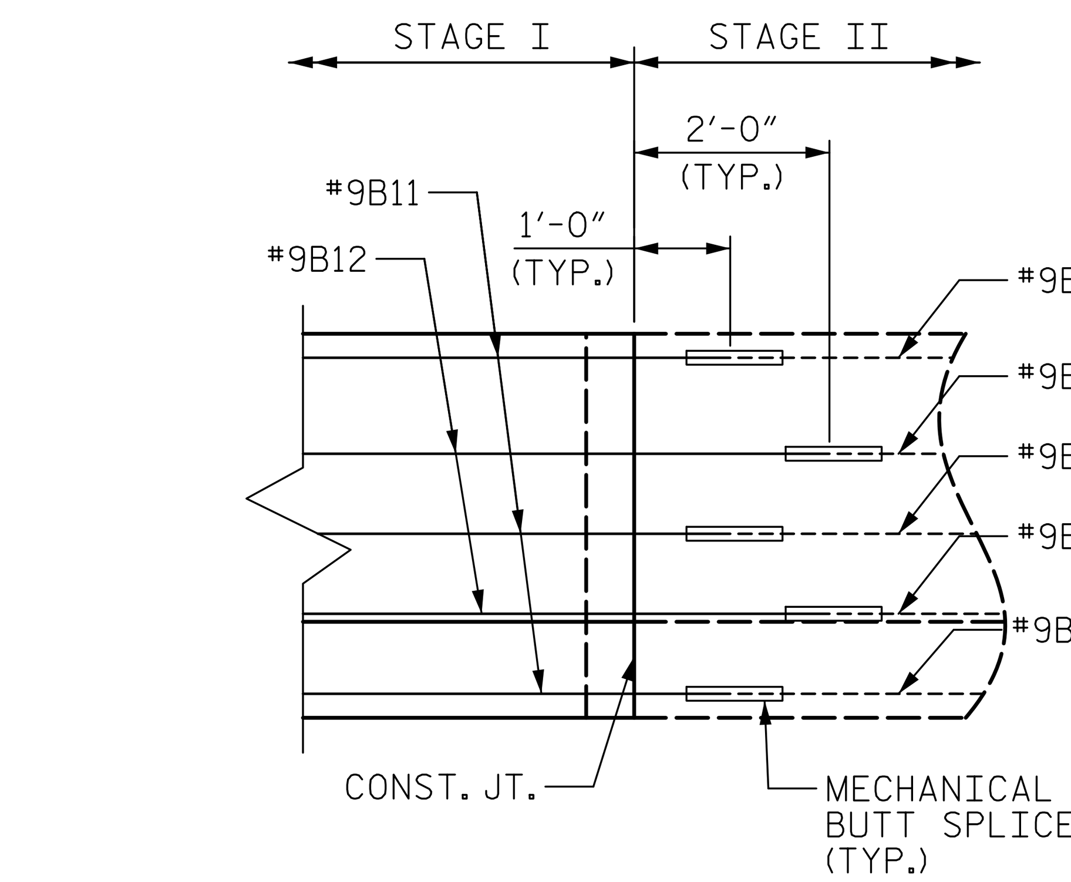
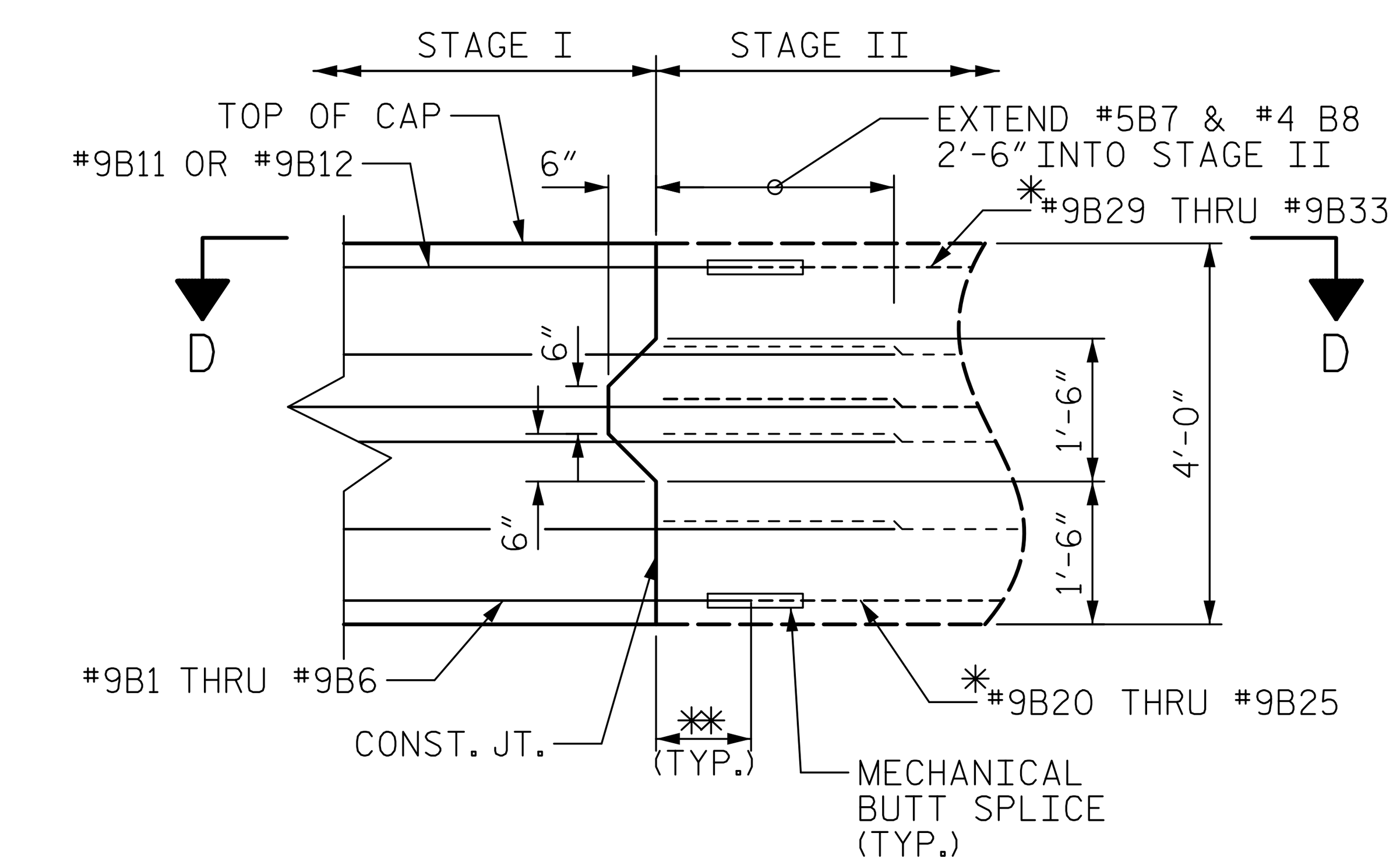
NOTES:
FOR NOTES, SEE SHEET 1 OF 5.



PLAN



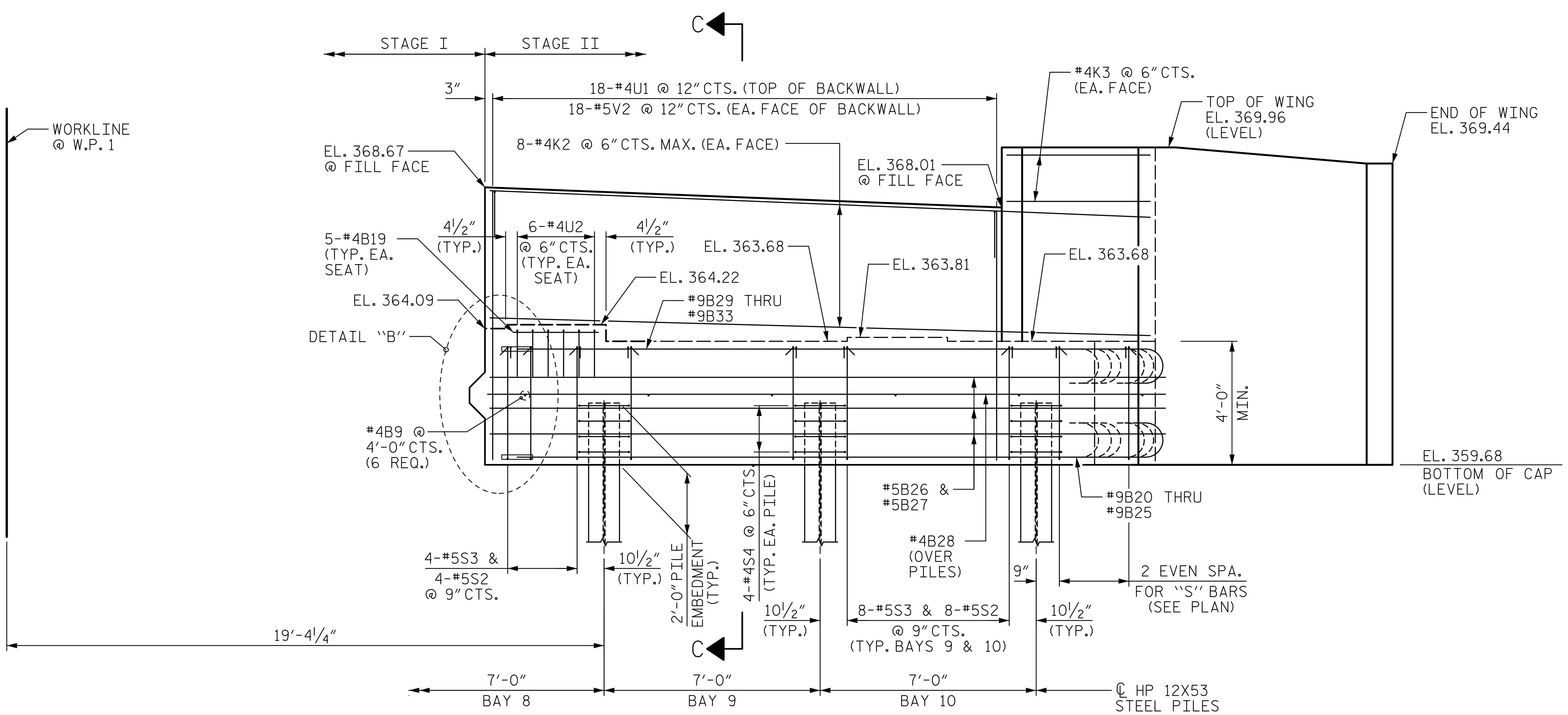
SECTION D-D
(TOP BARS SHOWN)



** STAGE I TOP AND BOTTOM "B" BARS ARE DETAILED WITH STAGGERED 1'-0" AND 2'-0" EXTENSIONS BEYOND CONSTRUCTION JOINT.

* PLACE ALL BARS IN STAGE II AT OR NEAR THE END OF BARS EXTENDING FROM STAGE I.

DETAIL "B"



ELEVATION

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 2 OF 5

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1/19/2023

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SUBSTRUCTURE

END BENT 1
(STAGE II)

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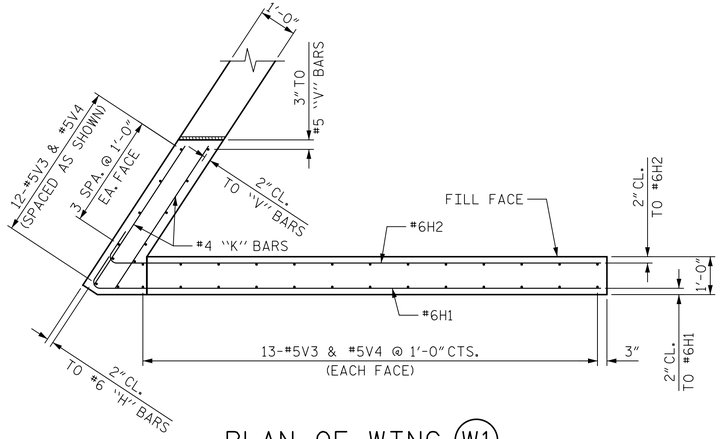
DESIGN CHECKED BY : J.C. MORRISON	DATE : 01/2019

REVISIONS

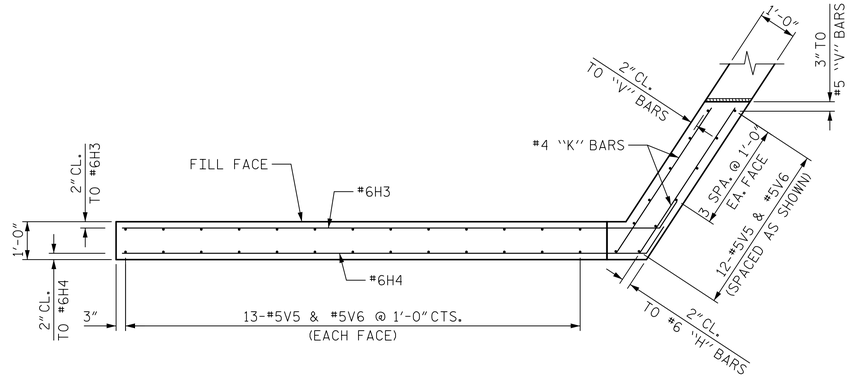
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-34

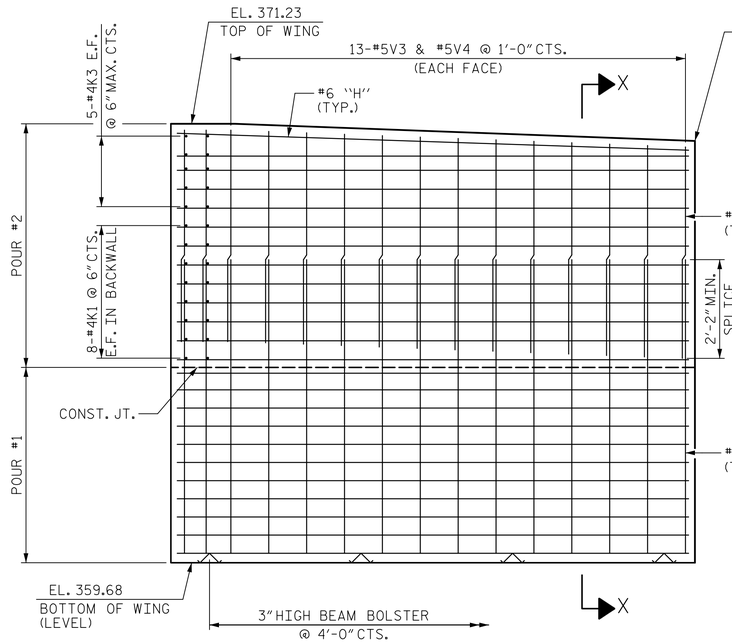
TOTAL SHEETS 49



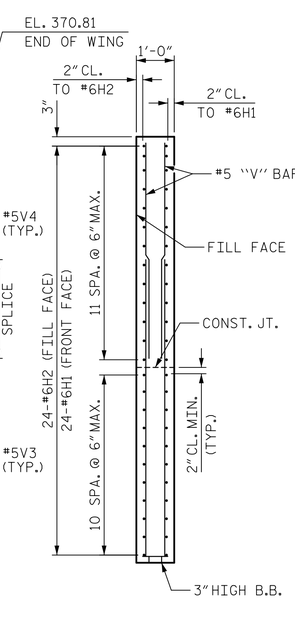
PLAN OF WING (W1)



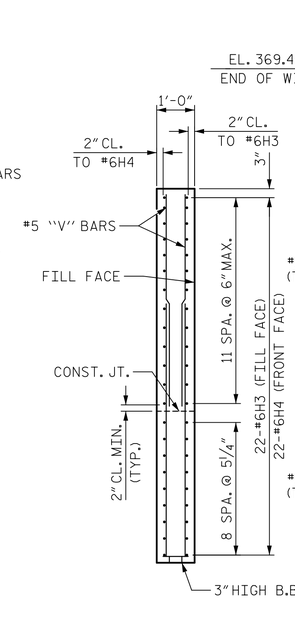
PLAN OF WING (W2)



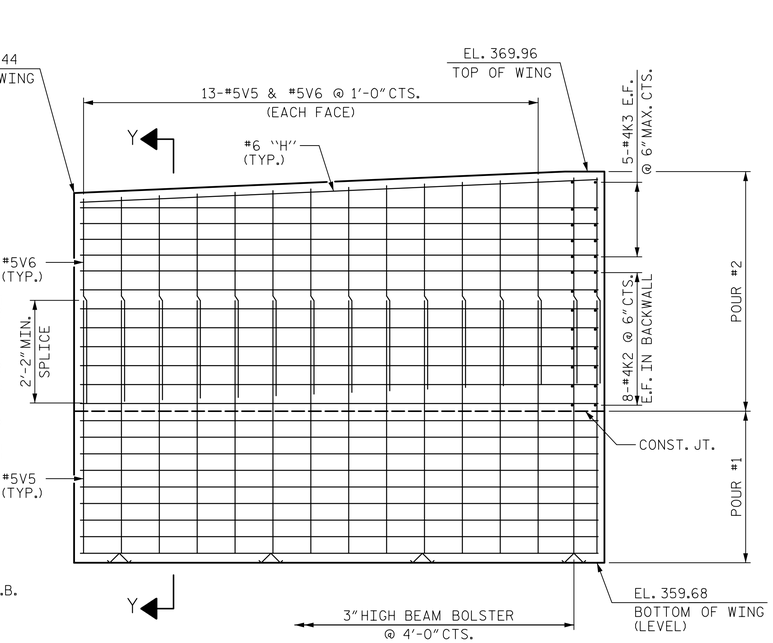
ELEVATION OF WING (W1)
(STAGE I)



SECTION X-X
(STAGE I)



SECTION Y-Y
(STAGE II)



ELEVATION OF WING (W2)
(STAGE II)

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 3 OF 5

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NORTH CAROLINA PROFESSIONAL SEAL 030414 ENGINEER JOHN C. MORRISON
John C. Morrison
1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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SUBSTRUCTURE

END BENT 1
WING WALLS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			49

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DESIGN CHECKED BY :	J.C. MORRISON	DATE :	01/2019

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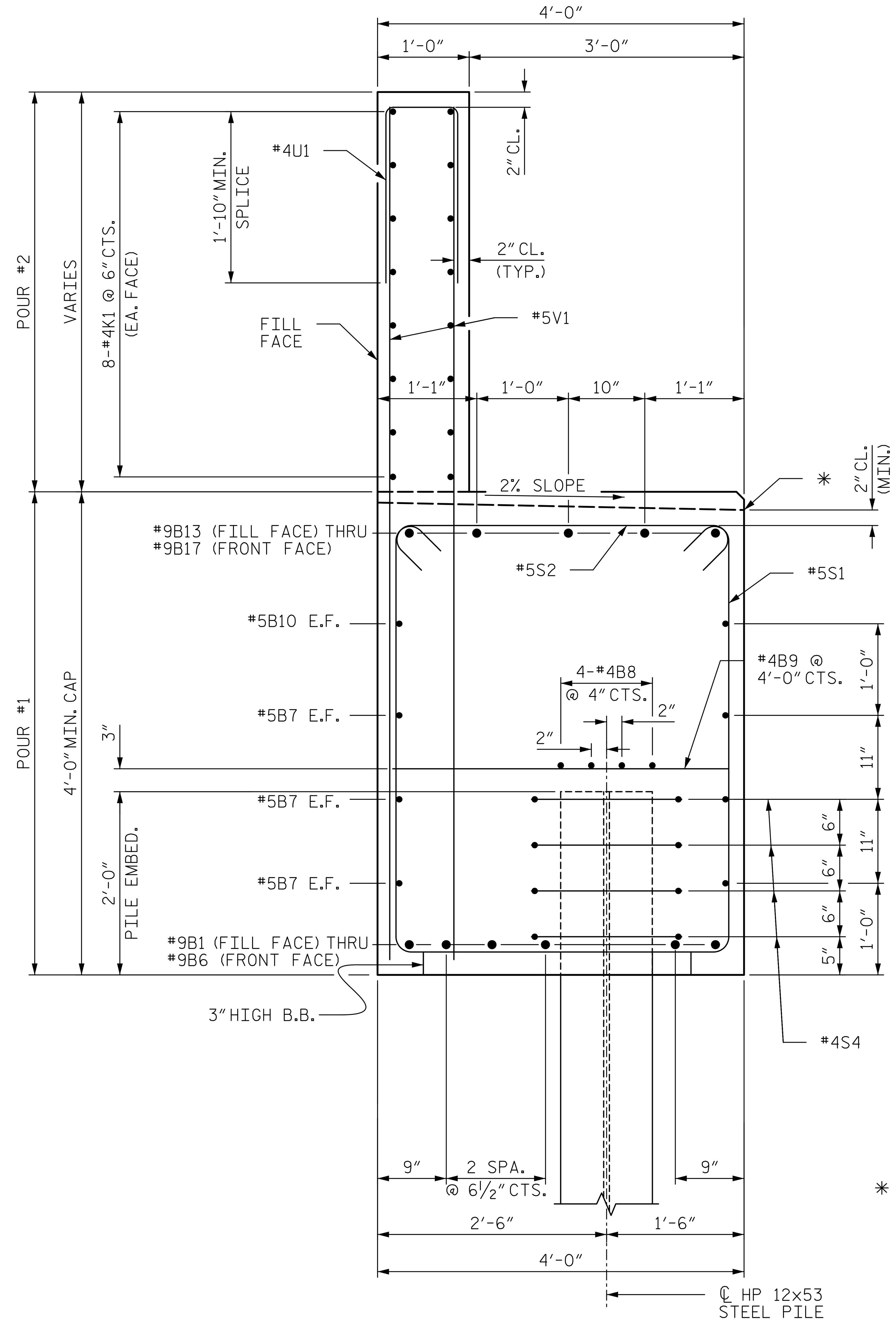
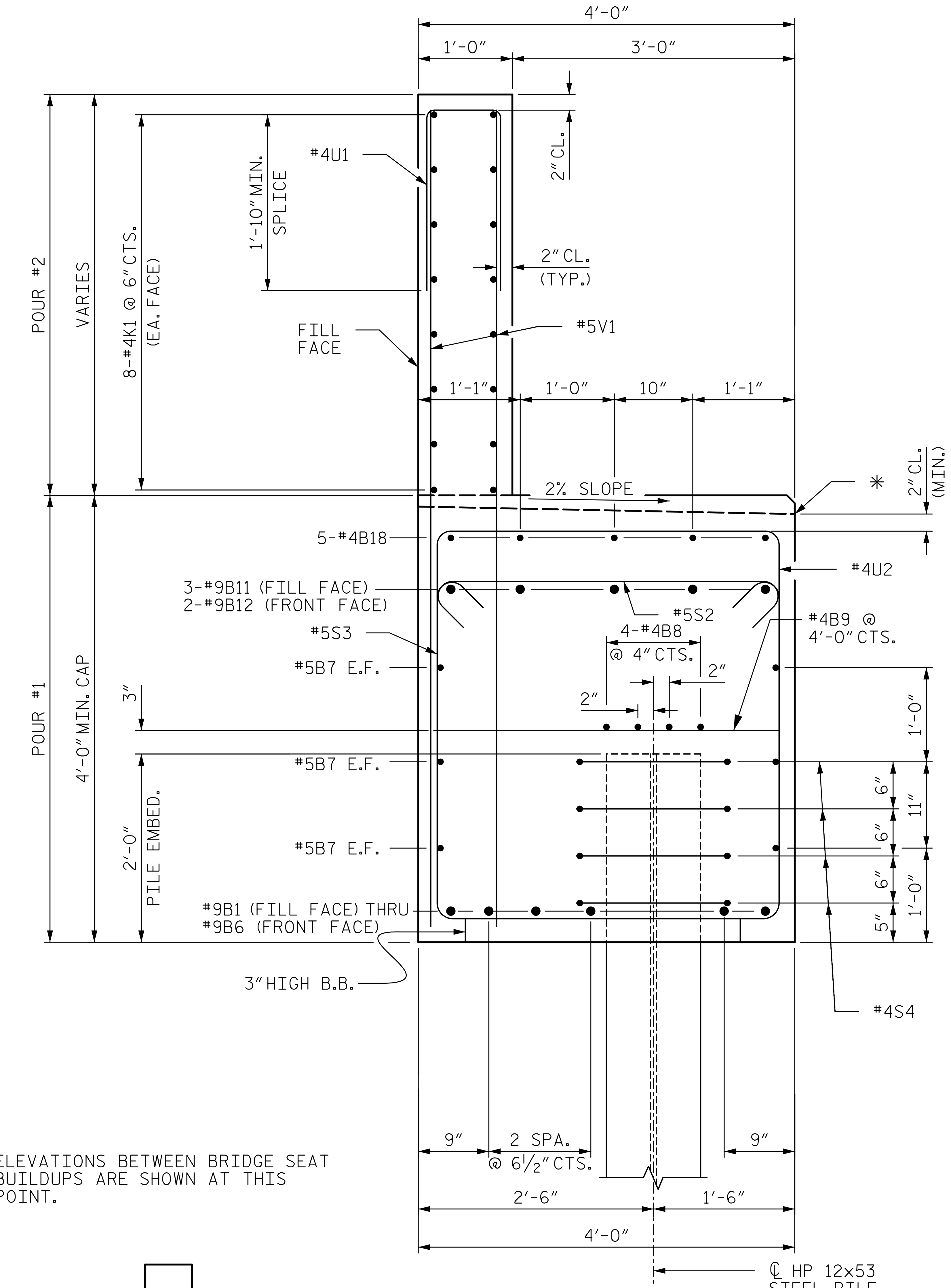
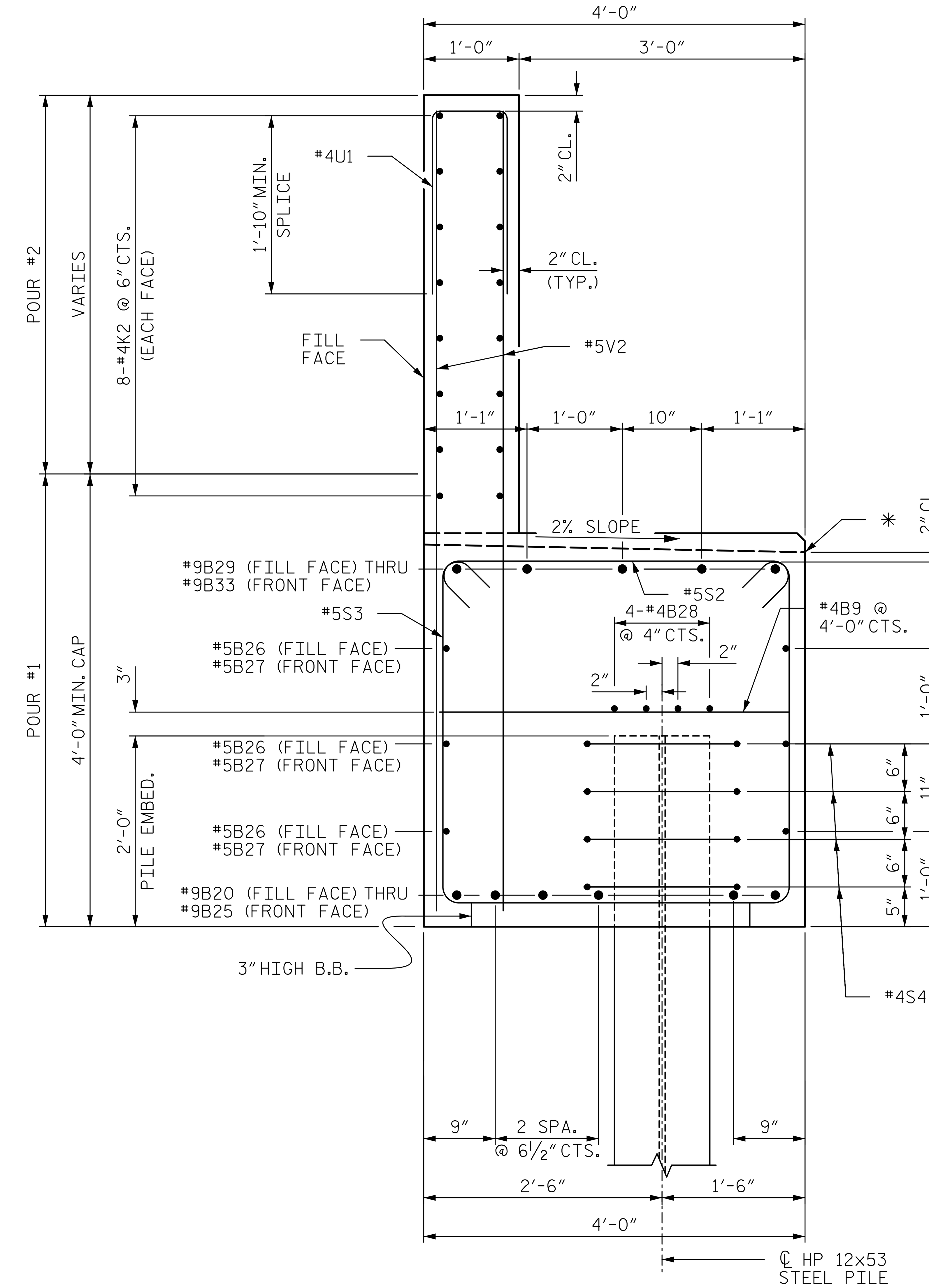
DGN: \\autocomnet.com\fs\AMER\Raleigh-USRAL1\Legacy Projects\60436195 - B-4654\900_Work\90_CADD\70_NCDOT_TIP\Structures\04 Drawings\2022 Updates\400_69_535_B4654_SMU_EBI_3.dgn



SECTION A-A



SECTION B-B

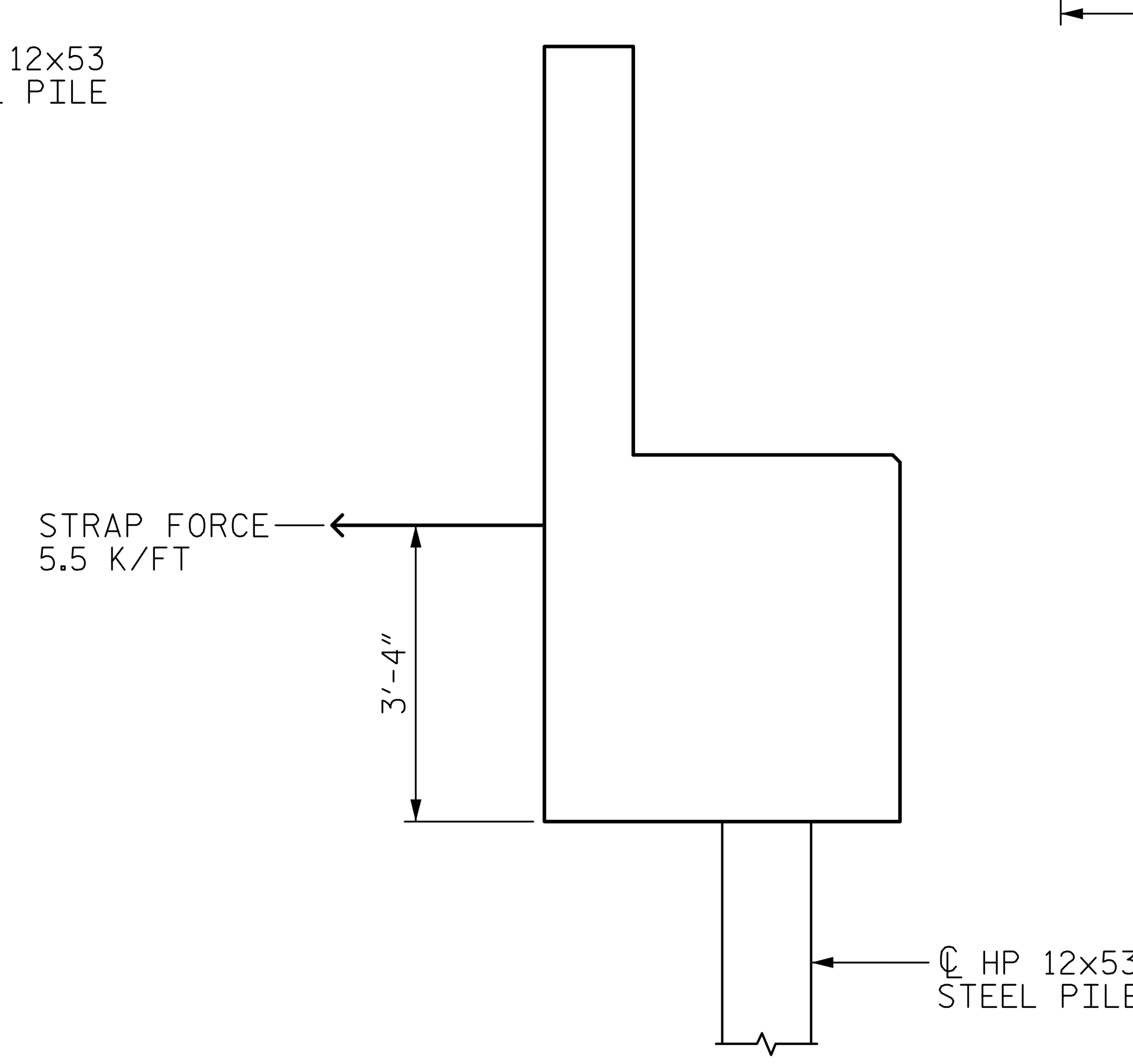


SECTION C-C

* ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS ARE SHOWN AT THIS POINT.

NOTES:

THE TOP SURFACE OF THE CAP, EXCEPT THE BRIDGE SEAT BUILD-UPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.



STRAP FORCE

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 4 OF 5

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RALEIGH

SUBSTRUCTURE

END BENT 1
SECTION AND DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON
1/19/2023

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NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S-36
1			3			TOTAL SHEETS	49
2			4				

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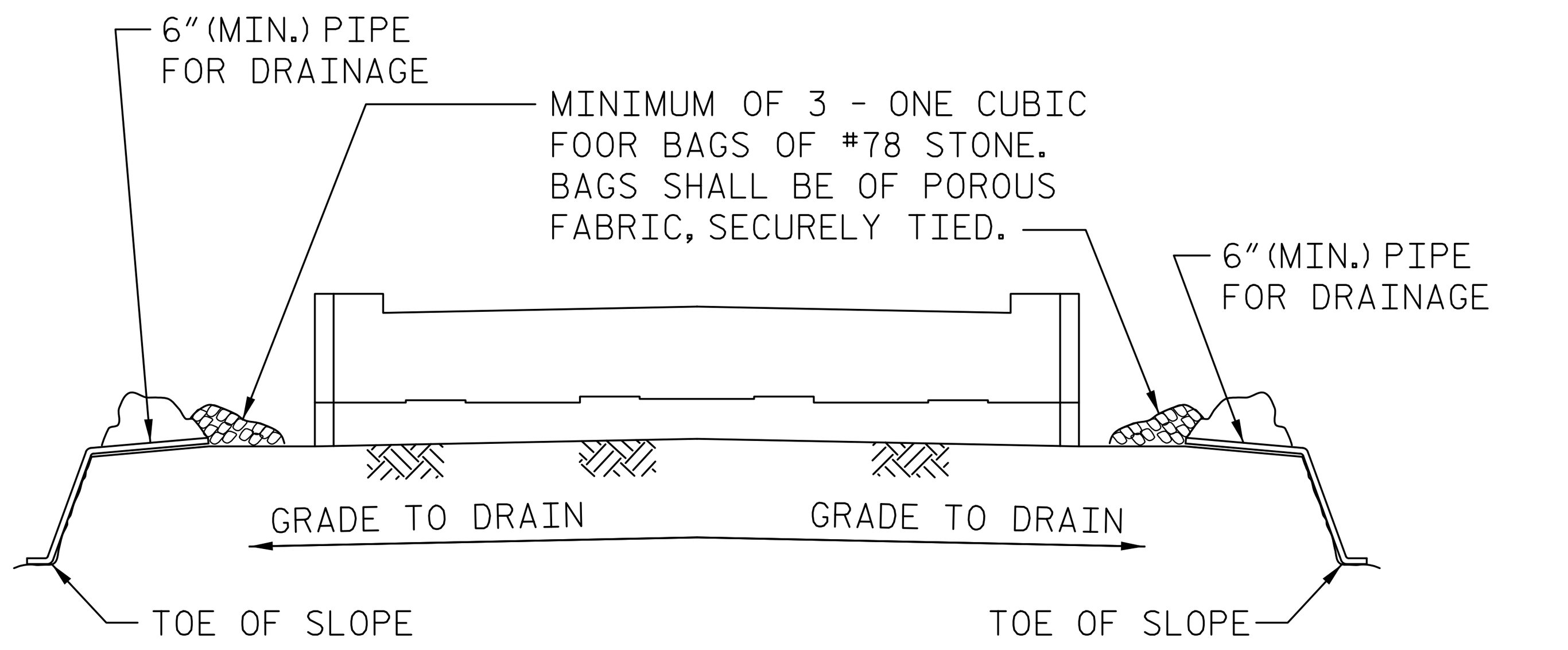
CHECKED BY :	J.C. MORRISON	DATE :	01/2019
DESIGNED BY :	T.B. STUMP	DATE :	01/2019
DESIGN CHECKED BY :	J.C. MORRISON	DATE :	01/2019

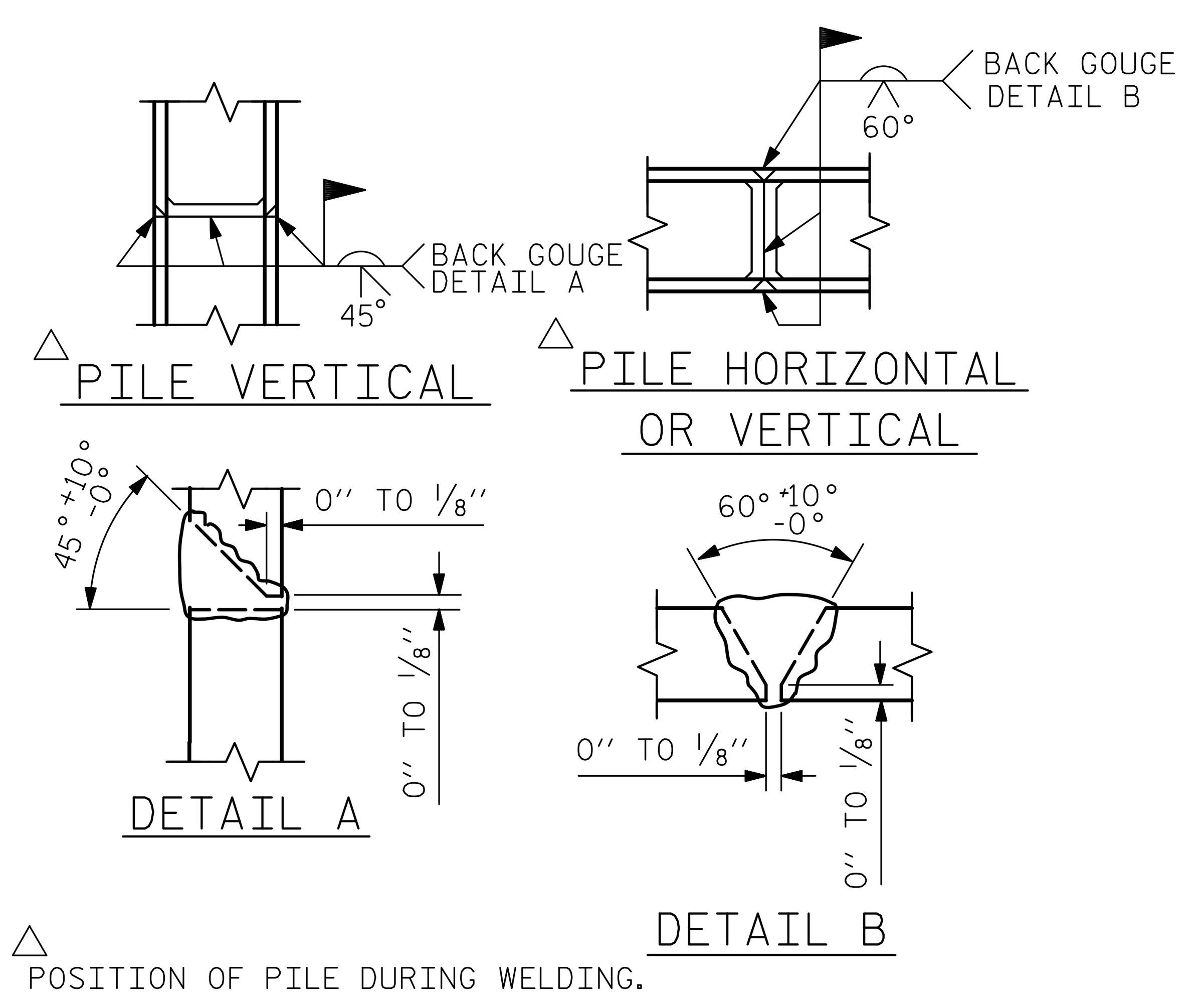


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

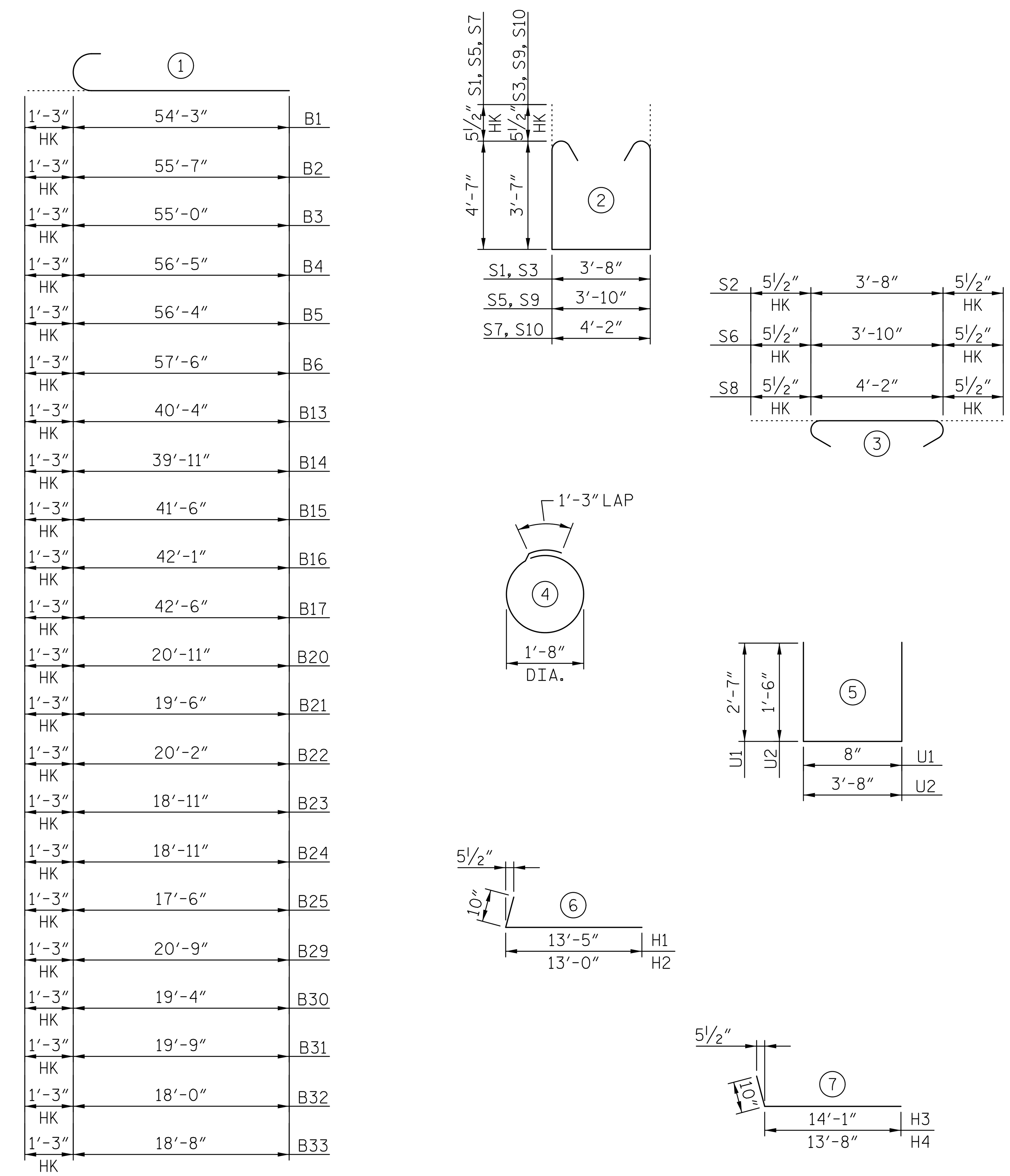
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL — END BENT 1 (STAGE I)

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	1	9	1	55′-6″	189
B2	1	9	1	56′-10″	193
B3	1	9	1	56′-3″	191
B4	1	9	1	57′-8″	196
B5	1	9	1	57′-7″	196
B6	1	9	1	58′-9″	200
B7	12	5	STR	30′-5″	381
B8	8	4	STR	29′-11″	160
B9	15	4	STR	3′-8″	37
B10	2	5	STR	31′-11″	67
B11	3	9	STR	26′-6″	270
B12	2	9	STR	27′-10″	189
B13	1	9	1	41′-2″	140
B14	1	9	1	42′-3″	144
B15	1	9	1	42′-9″	145
B16	1	9	1	43′-4″	147
B17	1	9	1	43′-9″	149
B18	5	4	STR	12′-8″	42
B19	25	4	STR	2′-9″	46
S1	46	5	2	13′-9″	660
S2	61	5	3	4′-7″	292
S3	15	5	2	11′-9″	184
S4	32	4	4	6′-6″	139
S5	1	5	2	13′-11″	15
S6	1	5	3	4′-9″	5
S7	1	5	2	14′-3″	15
S8	1	5	3	5′-1″	5
U1	49	4	5	5′-10″	191
U2	37	4	5	6′-8″	165
V1	98	4	STR	8′-6″	556
V3	38	5	STR	7′-9″	307
V4	38	5	STR	5′-7″	221
K1	32	4	STR	29′-4″	627
K4	10	4	STR	4′-5″	30
H1	24	6	6	14′-3″	514
H2	24	6	6	13′-10″	499

TOTAL REINFORCING STEEL 7,507 LBS.

CLASS A CONCRETE
POUR #1 (CAP, & LOWER WINGWALLS) 44.1 C.Y.
POUR #2 (BACKWALL & UPPER WINGWALL) 12.2 C.Y.
TOTAL = 56.3 C.Y.

HP 12x53 STEEL PILES:
NO. = 8 LIN. FT. = 600
PILE REDRIVES 4 EA.

BILL OF MATERIAL — END BENT 1 (STAGE II)

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B19	10	4	STR	3′-8″	24
B20	1	9	1	22′-2″	75
B21	1	9	1	20′-7″	70
B22	1	9	1	21′-3″	72
B23	1	9	1	19′-11″	68
B24	1	9	1	20′-3″	69
B25	1	9	1	18′-9″	64
B26	3	5	STR	21′-10″	68
B27	3	5	STR	19′-6″	61
B28	4	4	STR	20′-2″	54
B29	1	9	1	20′-7″	70
B30	1	9	1	20′-11″	71
B31	1	9	1	19′-4″	66
B32	1	9	1	19′-9″	67
B33	1	9	1	20′-3″	69
S2	21	5	3	4′-7″	100
S3	21	5	2	11′-9″	257
S4	12	4	4	6′-6″	52
S6	1	5	3	4′-9″	5
S8	1	5	3	5′-1″	5
S9	1	5	2	11′-11″	12
S10	1	5	2	12′-3″	13
U1	18	4	5	5′-10″	70
U2	12	4	5	6′-8″	53
V2	36	4	STR	8′-6″	204
V5	38	5	STR	6′-8″	264
V6	38	5	STR	5′-5″	215
K2	16	4	STR	22′-7″	241
K4	10	4	STR	4′-5″	30
H3	22	6	7	14′-11″	493
H4	22	6	7	14′-6″	479

TOTAL REINFORCING STEEL 3,437 LBS.

CLASS A CONCRETE
POUR #1 (CAP, & LOWER WINGWALLS) 15.7 C.Y.
POUR #2 (BACKWALL & UPPER WINGWALL) 7.2 C.Y.
TOTAL = 22.9 C.Y.

HP 12x53 STEEL PILES:
NO. = 3 LIN. FT. = 225
PILE REDRIVES 2 EA.

PROJECT NO. B-4654
WAKE COUNTY
STATION: 22+71.80 -L-

SHEET 5 OF 5

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1/19/2023

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

END BENT 1 SECTION AND DETAILS

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

SHEET NO. S-37
TOTAL SHEETS 49

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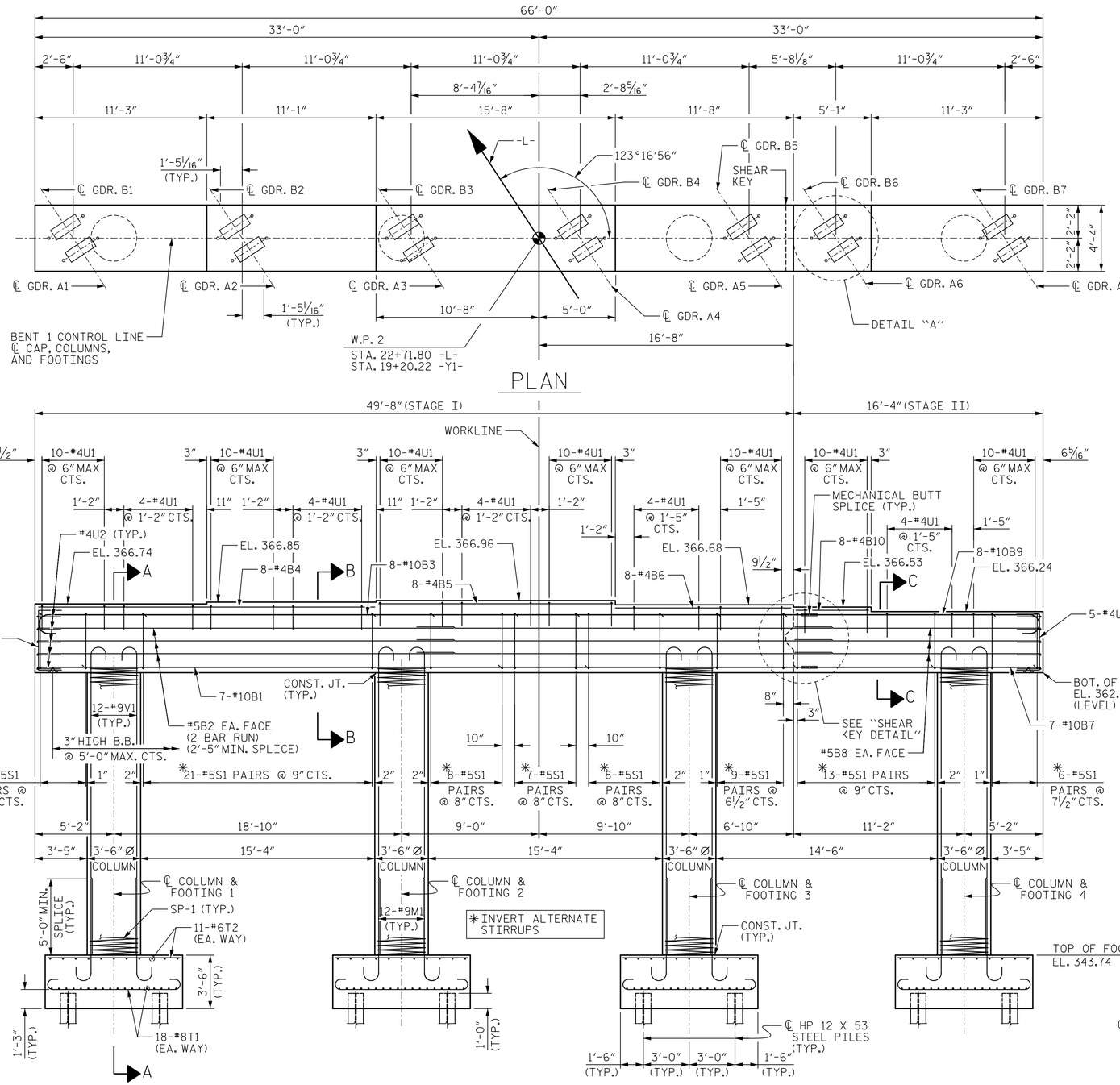
CHECKED BY : J.C. MORRISON DATE : 01/2019
DESIGNED BY : T.B. STUMP DATE : 01/2019
DESIGN CHECKED BY : J.C. MORRISON DATE : 01/2019



PLAN

SPAN B

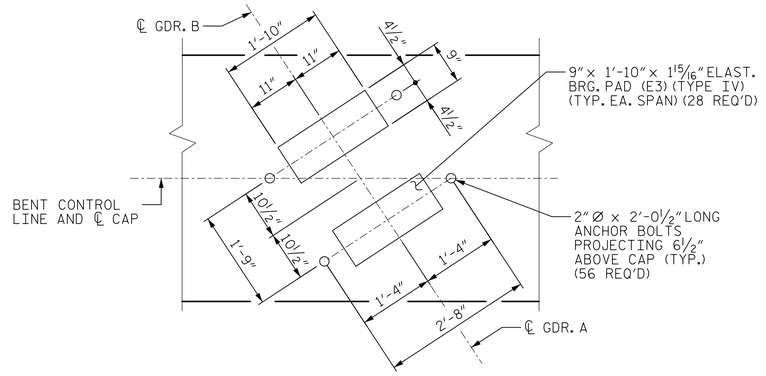
SPAN A

NOTES:

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

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

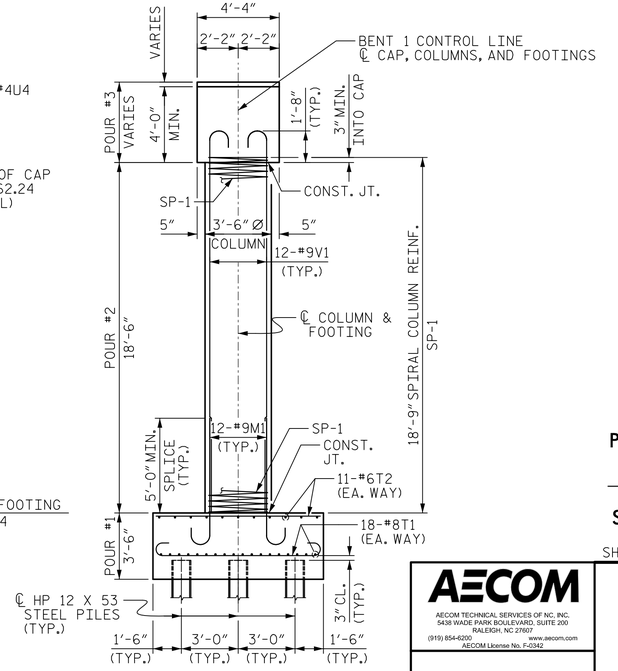
FOR ADDITIONAL SECTIONS AND DETAILS, SEE SHEET 2 OF 3.



DETAIL ''A''

(TYPICAL EACH GIRDER)

ELEVATION



SECTION A-A

(SEE SHEET 2 OF 3 FOR CAP REINFORCING)

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 1 OF 3

DRAWN BY : K. MUENCH	DATE : 05/2022
CHECKED BY : J.C. MORRISON	DATE : 05/2022
DESIGNED BY : D. RITACCO	DATE : 05/2022
DESIGN CHECKED BY : J.C. MORRISON	DATE : 05/2022

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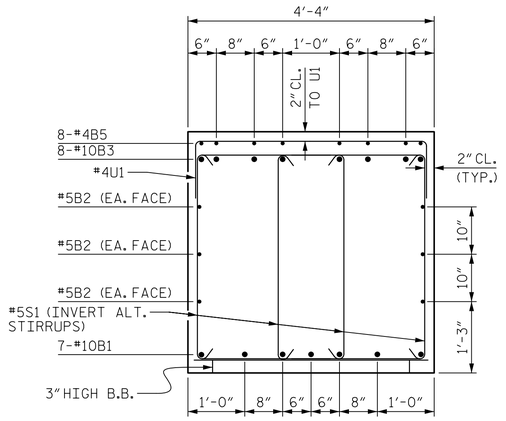
1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

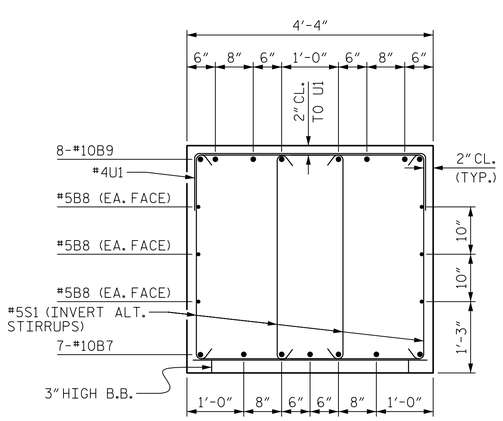
SUBSTRUCTURE

BENT 1

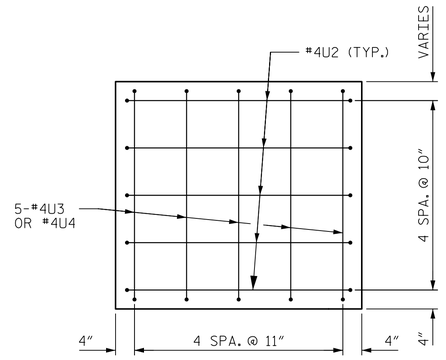
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			49



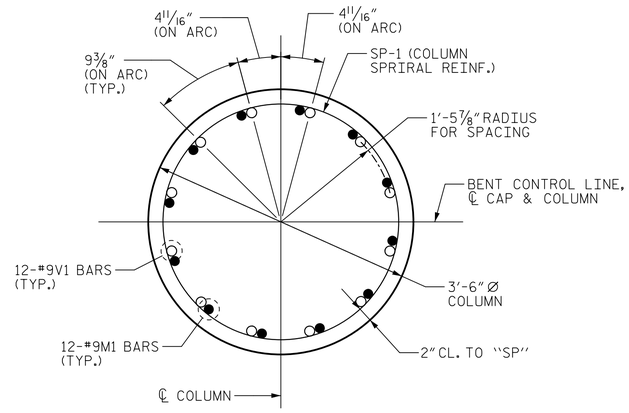
SECTION B-B



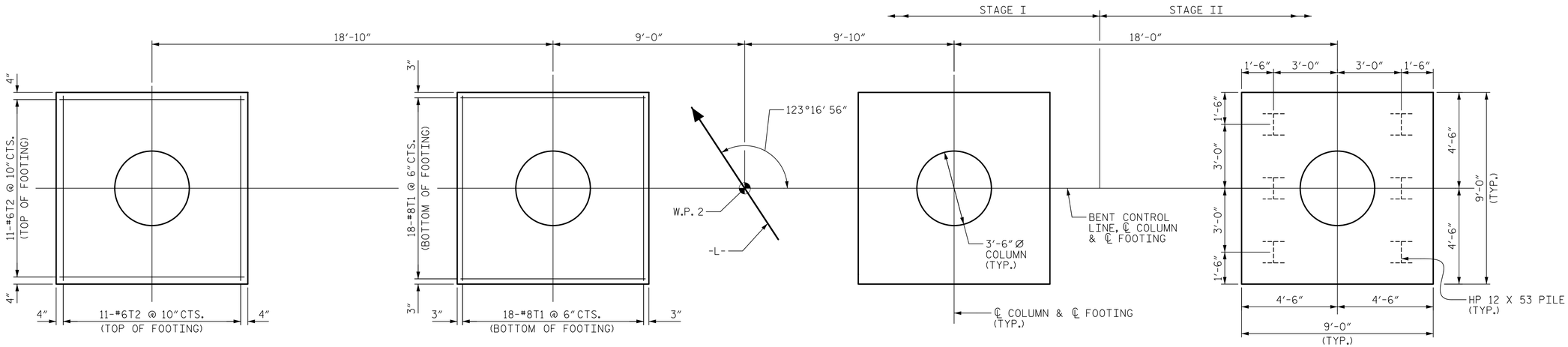
SECTION C-C



CAP END VIEW

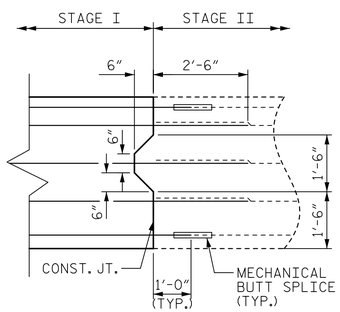


SECTION THRU COLUMN



PLAN OF FOOTINGS & COLUMNS

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



SHEAR KEY DETAIL

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 2 OF 3

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON
1/19/2023

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			49

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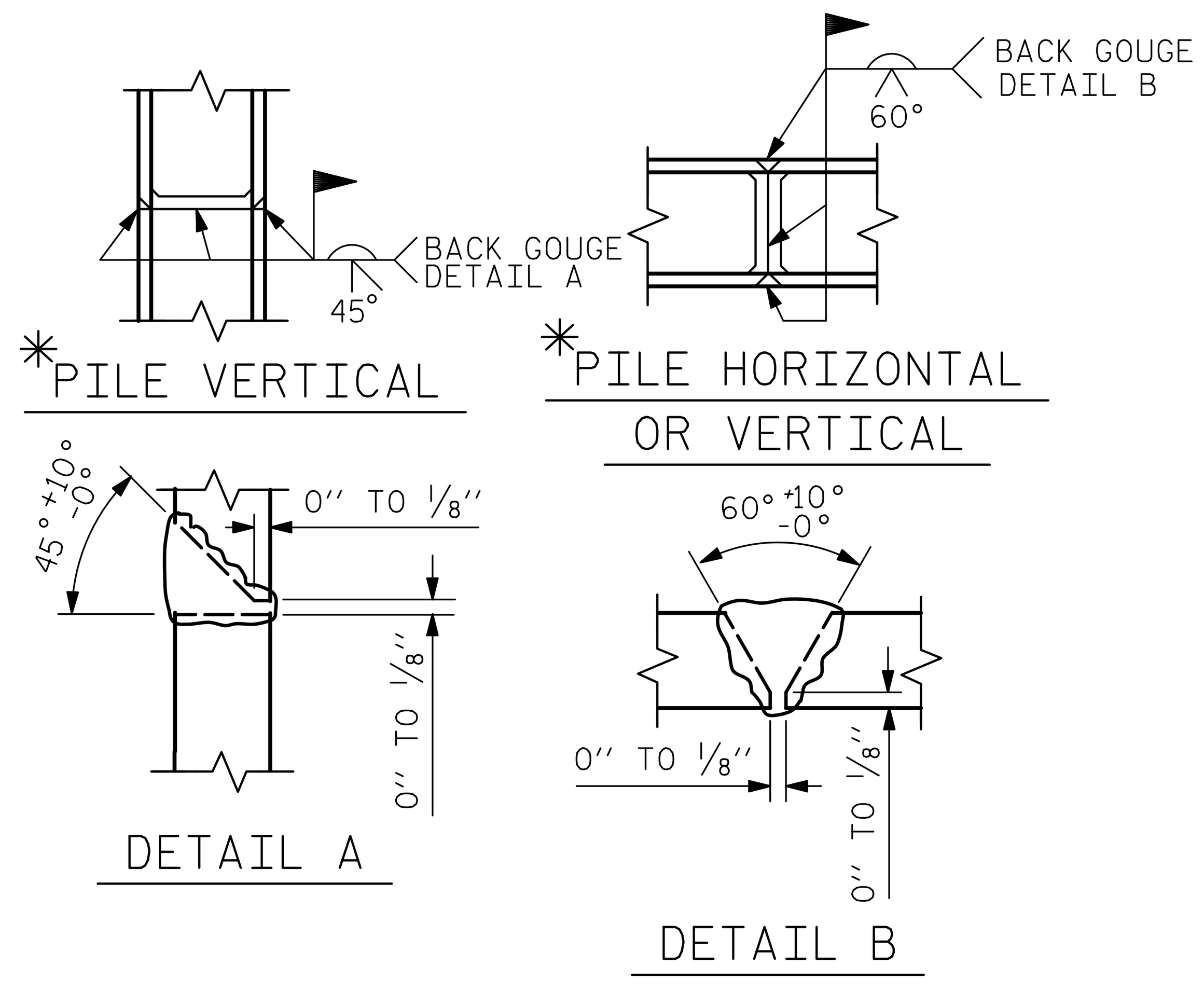
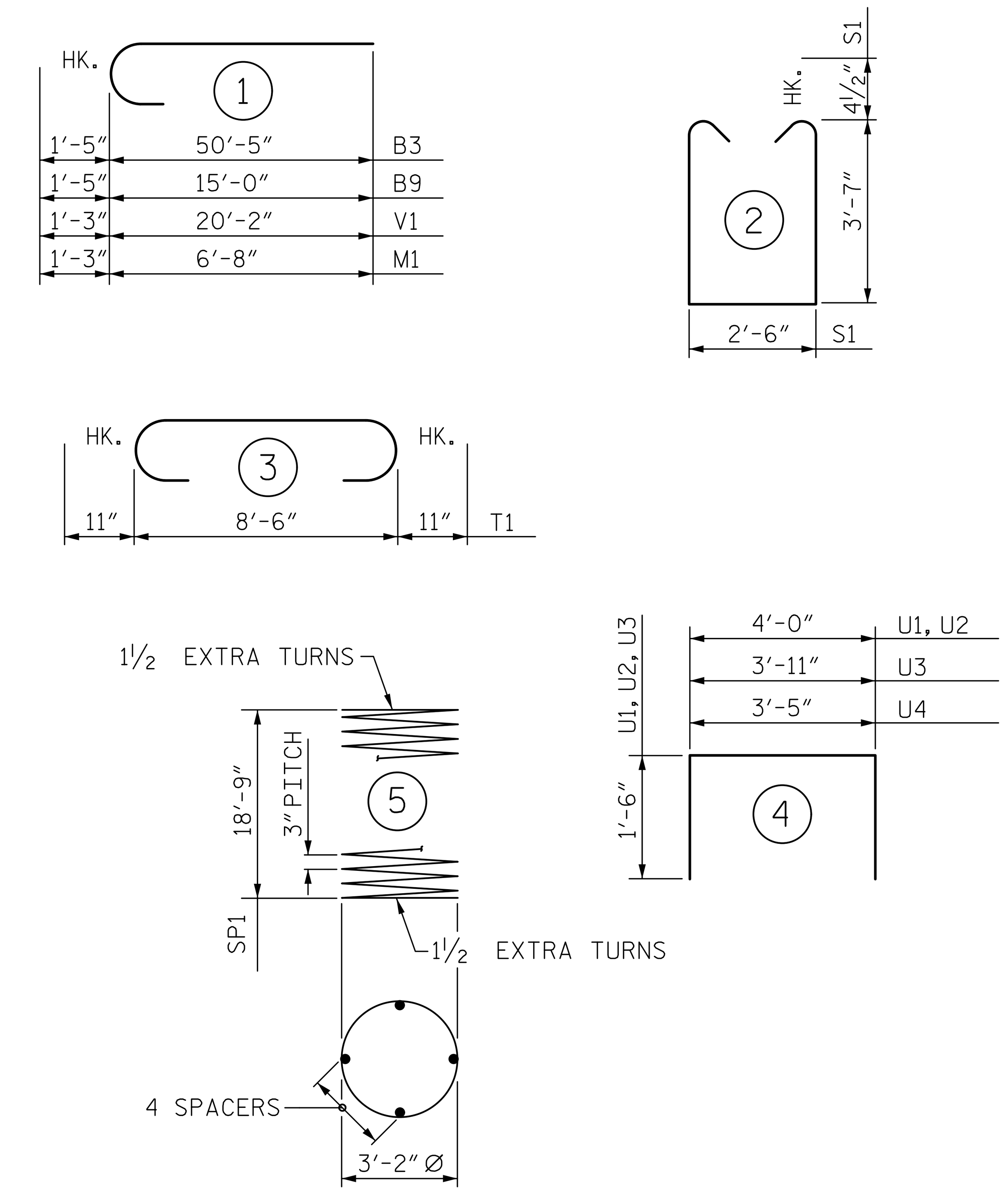
DRAWN BY :	K. MUENCH	DATE : 05/2022
CHECKED BY :	J.C. MORRISON	DATE : 05/2022
DESIGNED BY :	D. RITACCO	DATE : 05/2022
DESIGN CHECKED BY :	J.C. MORRISON	DATE : 05/2022



PILE SPLICE DETAILS

* POSITION OF PILE DURING WELDING.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL — STAGE 1

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	10	STR	50′-5″	1519
B2	12	5	STR	27′-2″	341
B3	8	10	1	51′-10″	1784
B4	8	4	STR	21′-4″	114
B5	8	4	STR	15′-4″	82
B6	8	4	STR	11′-6″	61
M1	36	9	1	7′-11″	969
S1	118	5	2	10′-7″	1249
T1	108	8	3	10′-4″	2980
T2	66	6	STR	8′-6″	843
U1	66	4	4	7′-0″	309
U2	5	4	4	7′-0″	23
U4	5	4	4	6′-11″	23
V1	36	9	1	21′-5″	2621
REINFORCING STEEL					12,918 LBS.
SP-1	3	*	5	766′-0″	1535
SPIRAL COLUMN REINFORCING STEEL					1535 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)	19.8 C.Y.
POUR #3 (CAP)	36.8 C.Y.
TOTAL CLASS A CONCRETE	88.1 C.Y.

HP 12 X 53 STEEL PILES	
NO. = 18	1080 LIN. FT.
STEEL PILE POINTS	18 EA.
PILE REDRIVES	9 EA.

BILL OF MATERIAL — STAGE 2

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B7	7	10	STR	15′-1″	454
B8	6	5	STR	16′-1″	101
B9	8	10	1	17′-6″	602
B10	8	4	STR	4′-10″	26
M1	12	9	1	7′-11″	323
S1	38	5	2	10′-7′	402
T1	36	8	3	10′-4″	993
T2	22	6	STR	8′-6″	281
U1	24	4	4	7′-0″	112
U2	5	4	4	7′-0″	23
U3	5	4	4	6′-5″	21
V1	12	9	1	21′-5″	874
REINFORCING STEEL					4,212 LBS.
SP-1	1	*	5	766′-0″	512
SPIRAL COLUMN REINFORCING STEEL					512 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)	10.5 C.Y.
POUR #2 (COLUMNS)	6.6 C.Y.
POUR #3 (CAP)	10.9 C.Y.
TOTAL CLASS A CONCRETE	28.0

HP 12 X 53 STEEL PILES	
NO. = 6	360 LIN. FT.
STEEL PILE POINTS	6 EA.
PILE REDRIVES	3 EA.

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 3 OF 3

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1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

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

SHEET NO. S-40

TOTAL SHEETS 49

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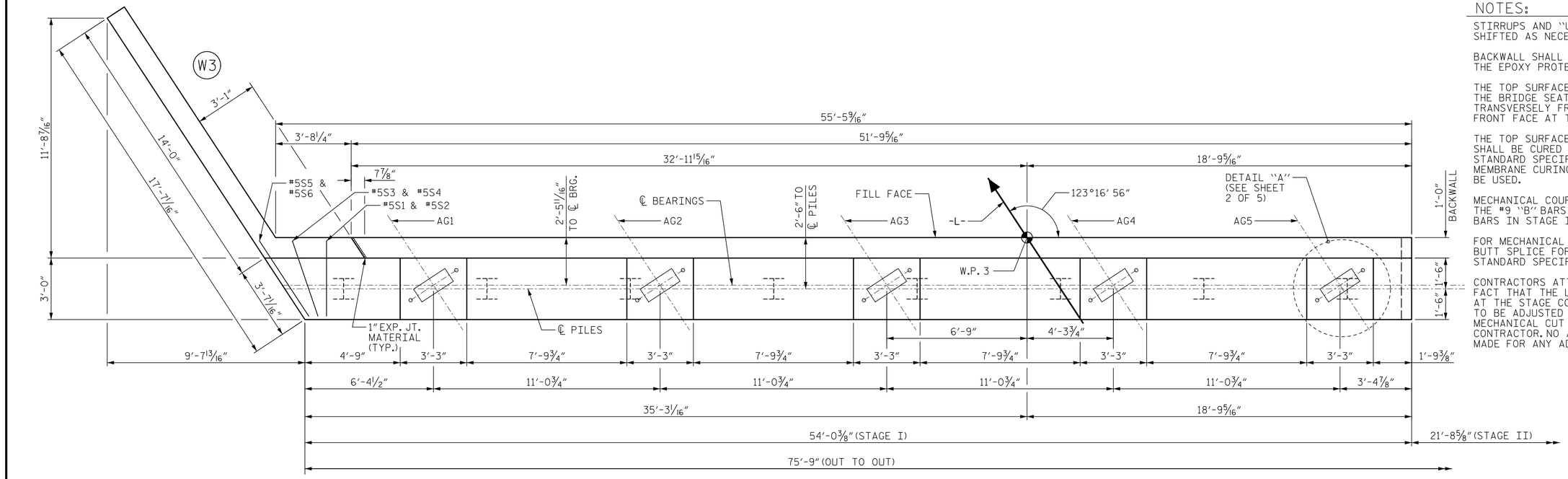
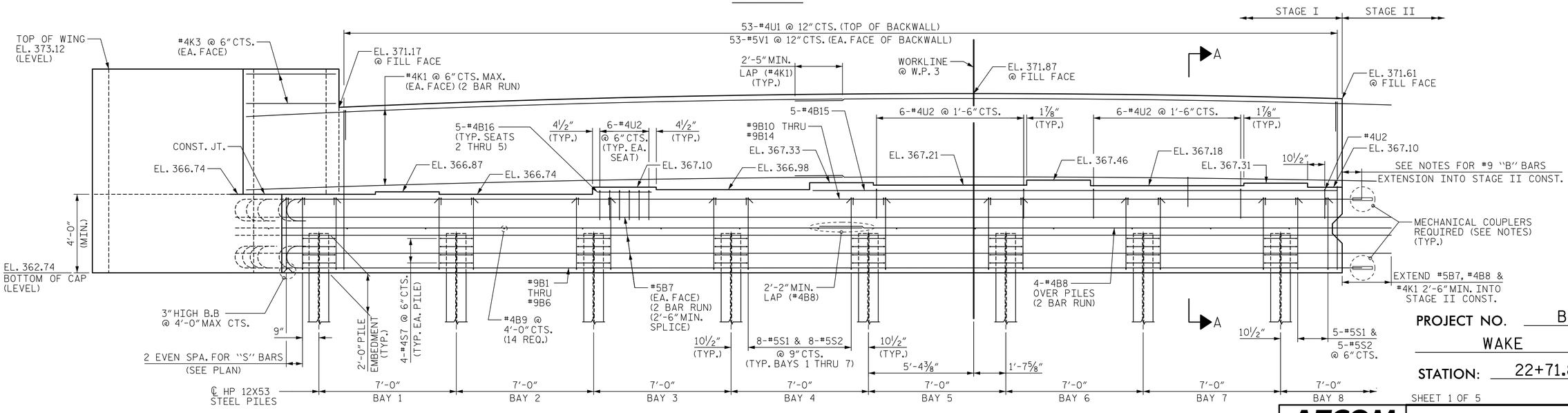
DRAWN BY :	T.B. STUMP	DATE :	12/2018
CHECKED BY :	J.C. MORRISON	DATE :	12/2018
DESIGNED BY :	T.B. STUMP	DATE :	12/2018
DESIGN CHECKED BY :	J.C. MORRISON	DATE :	12/2018



PLAN



ELEVATION

NOTES:

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHORS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING

THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.

THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #9 "B" BARS IN STAGE I WITH THE #9 "B" BARS IN STAGE II.

FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICE FOR REINFORCING STEEL IN STANDARD SPECIFICATIONS.

CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #9 "B" BARS AT THE STAGE CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL CUT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 1 OF 5

DRAWN BY : T.B. STUMP DATE : 01/2019
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DESIGNED BY : D. RITACCO DATE : 01/2019
DESIGN CHECKED BY : J.C. MORRISON DATE : 01/2019

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1/19/2023

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SUBSTRUCTURE

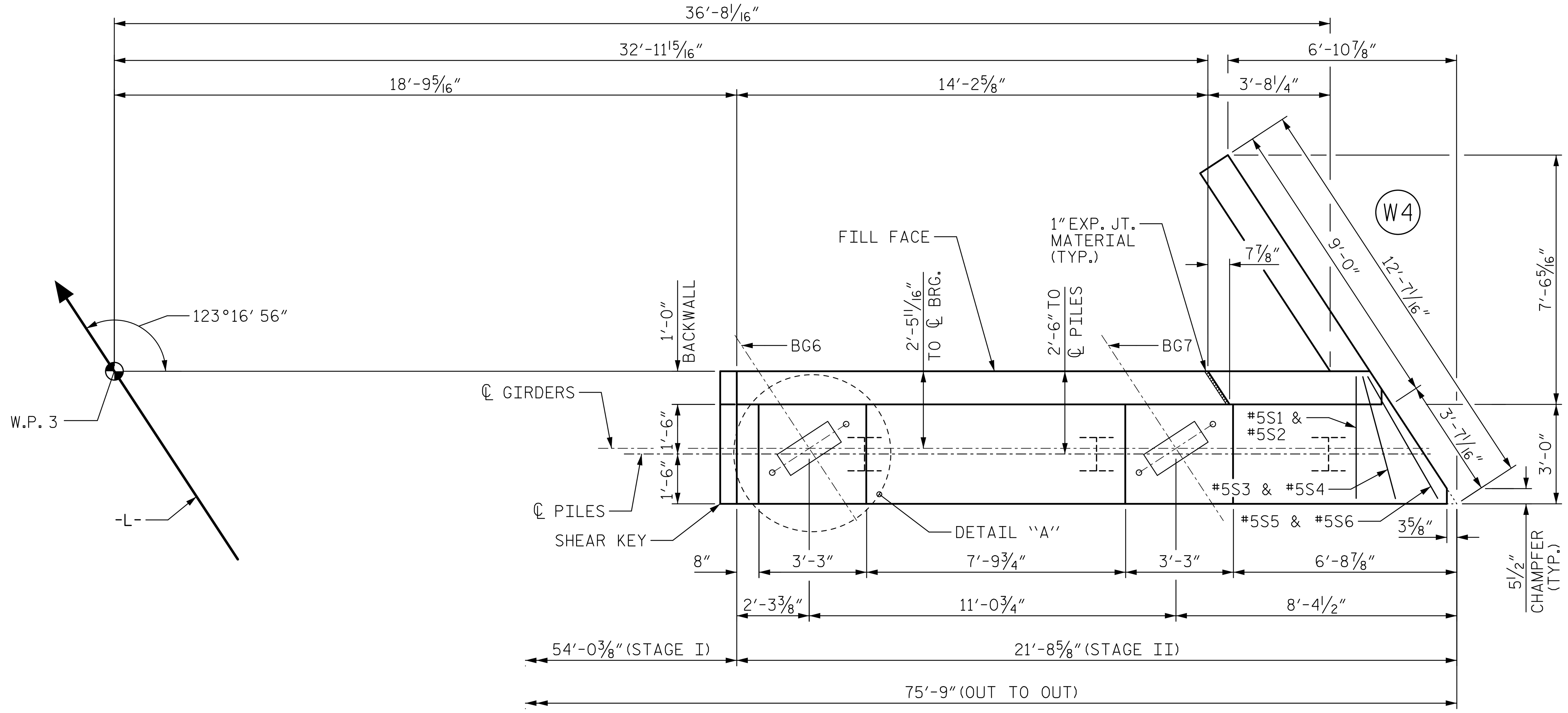
END BENT 2 (STAGE I)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			49

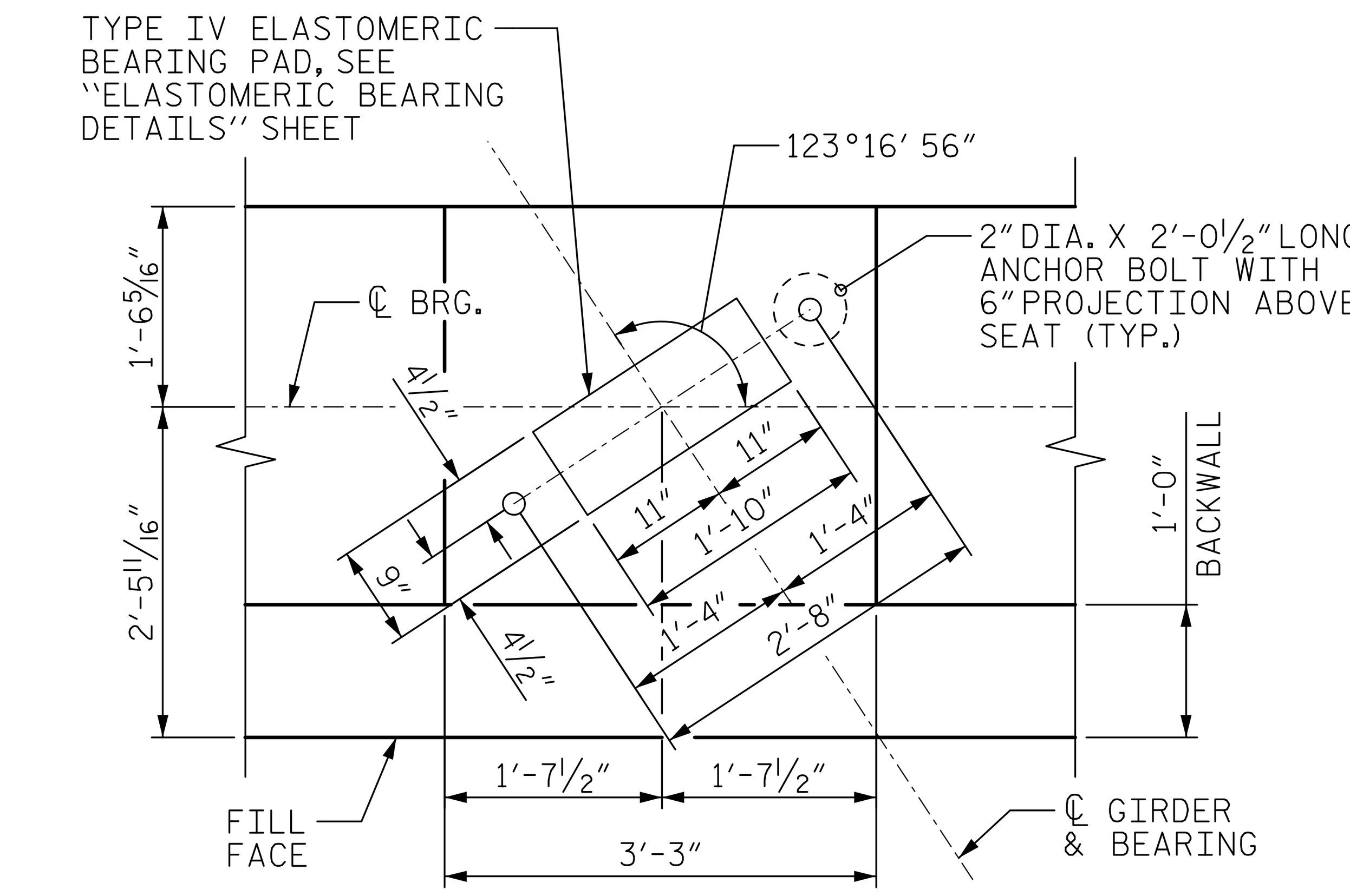
DATE: 1/19/2023
TIME: 10:37:07 AM

USER: mstenck
DGN: \\tzdcomnet.com\fs\AMER\Raleigh-USRAL3\Legacy\Proj\eots\60435695-B-4654\900_Work\010_CADD\D_NCDOT_T1\PSStructures\04 Drawings\2022 Updates\400_BI_S4_B4654_SMU_EB2.dgn

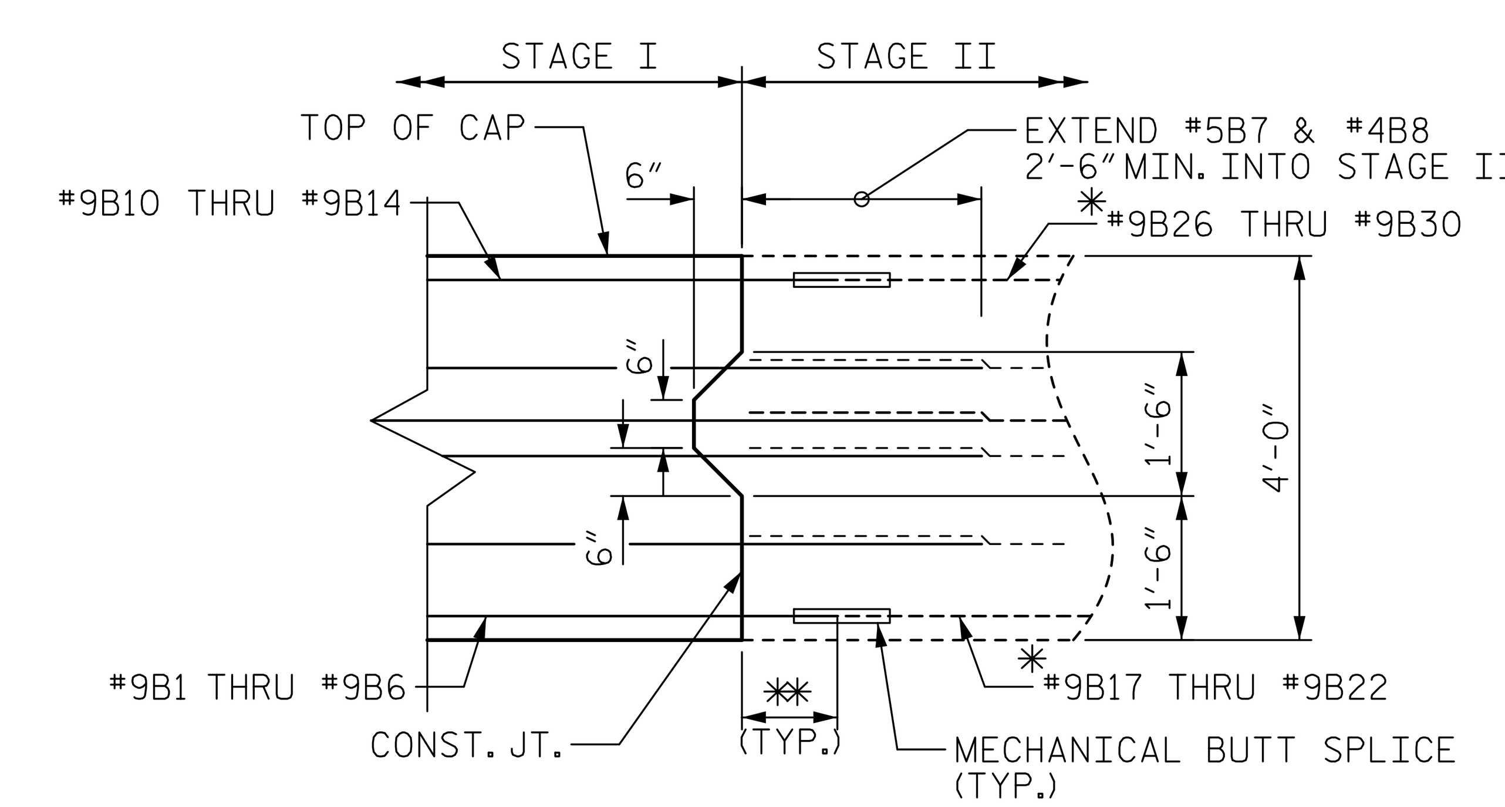
NOTES:
FOR NOTES, SEE SHEET 1 OF 5.



PLAN



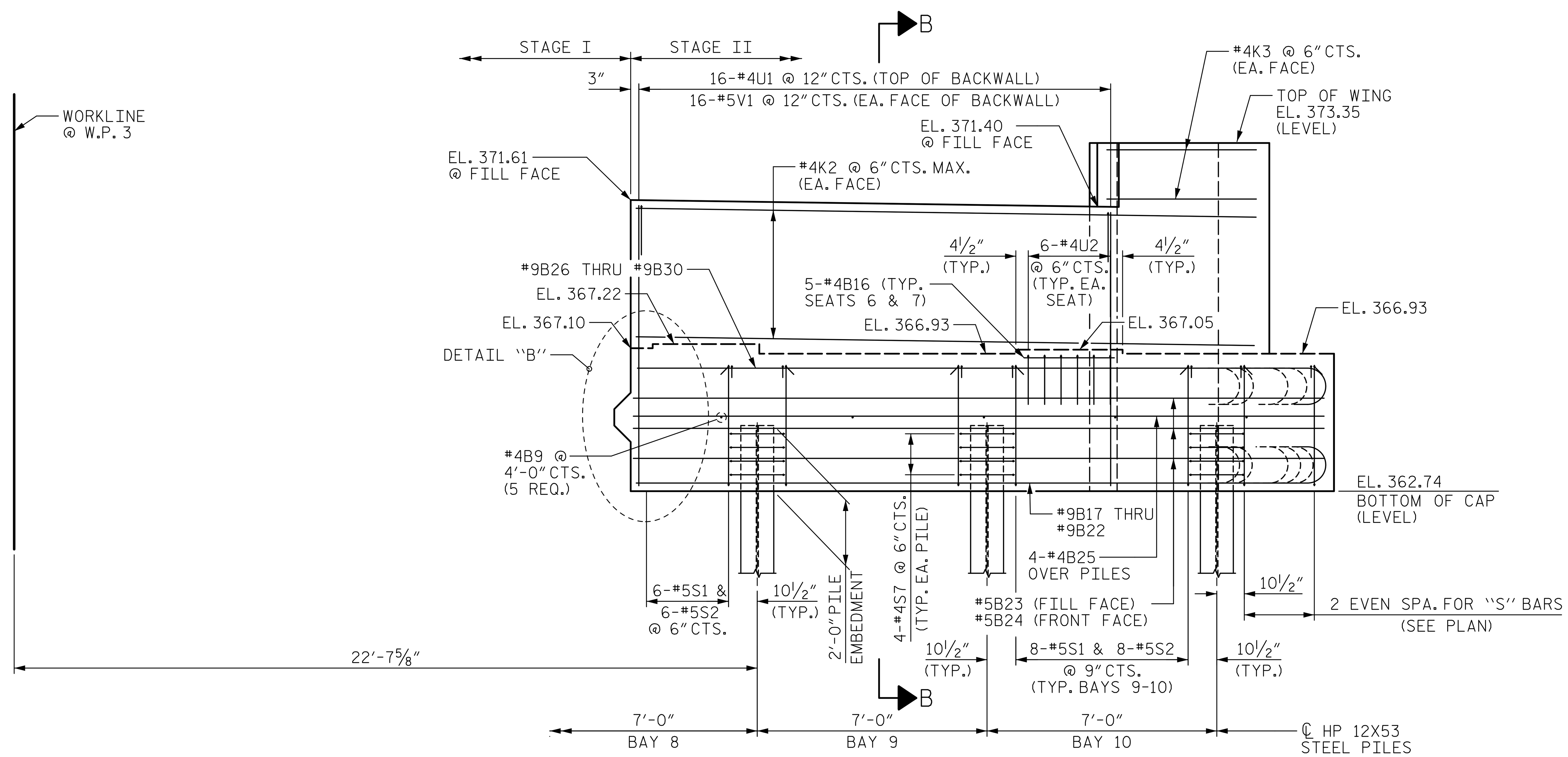
DETAIL "A"



✱✱ STAGE I TOP AND BOTTOM "B" BARS ARE DETAILED WITH STAGGERED 1'-0" AND 2'-0" EXTENSIONS BEYOND CONSTRUCTION JOINT.

✱ PLACE ALL BARS IN STAGE II AT OR NEAR THE END OF BARS EXTENDING FROM STAGE I.

DETAIL "B"



ELEVATION

PROJECT NO. B-4654
WAKE COUNTY
STATION: 22+71.80 -L-

SHEET 2 OF 5

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SUBSTRUCTURE

END BENT 2
(STAGE II)

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030474 JOHN C. MORRISON
1/19/2023

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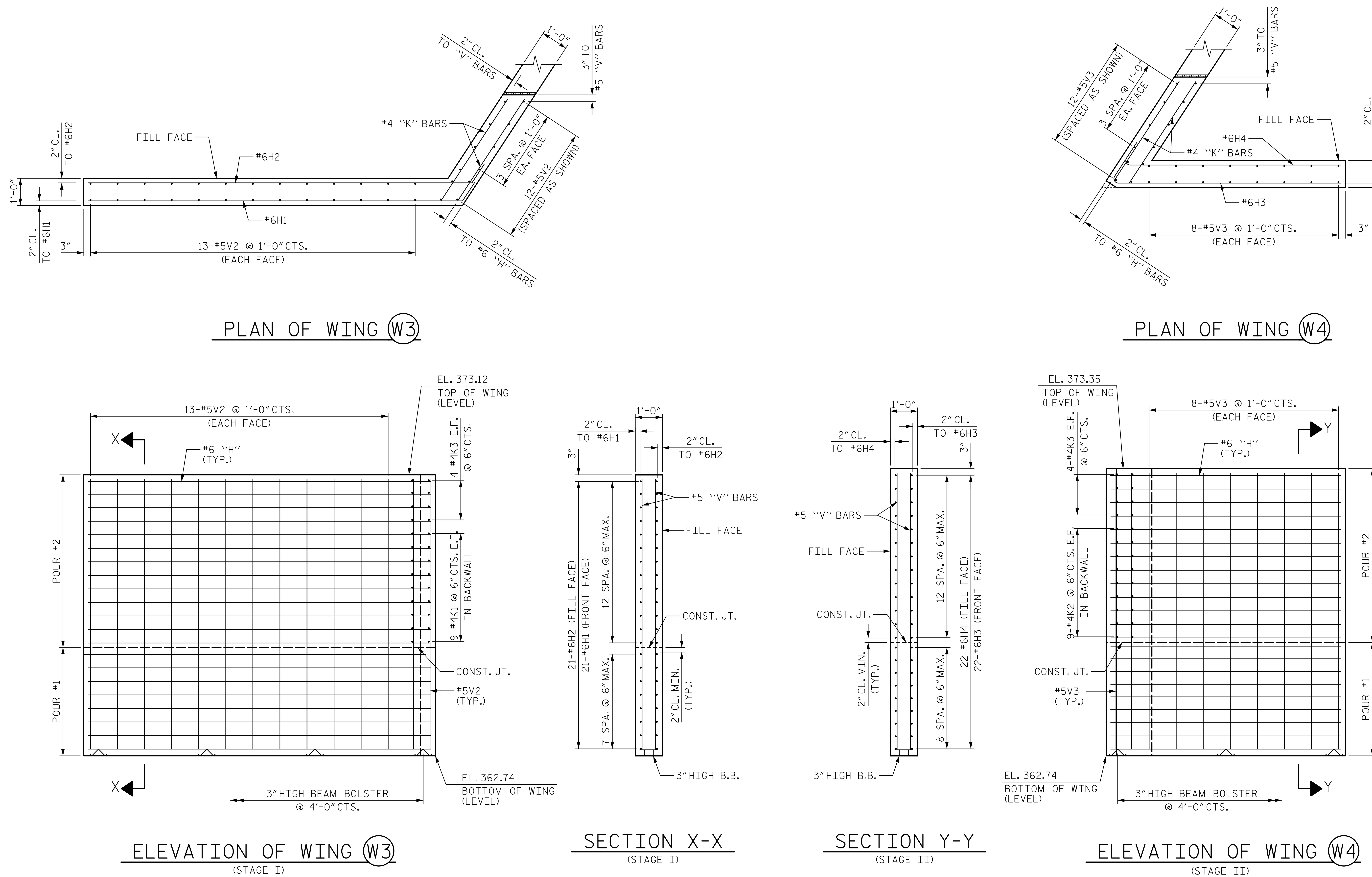
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			49

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



PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 3 OF 5

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SUBSTRUCTURE

END BENT 2
WING WALLS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030474 JOHN C. MORRISON
1/19/2023

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DESIGNED BY : D. RITACCO	DATE : 02/2019
DESIGN CHECKED BY : J.C. MORRISON	DATE : 02/2019

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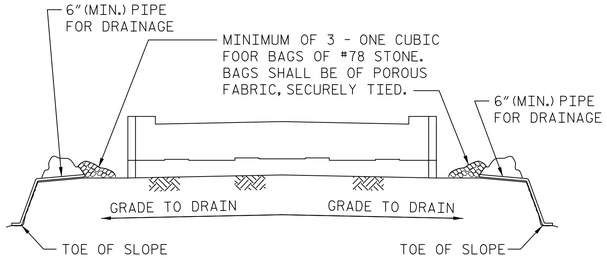
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			49

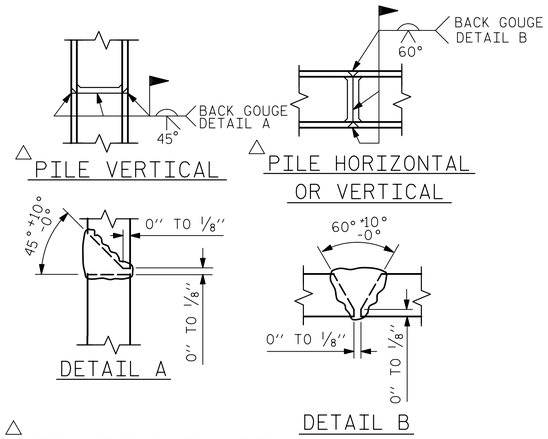


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

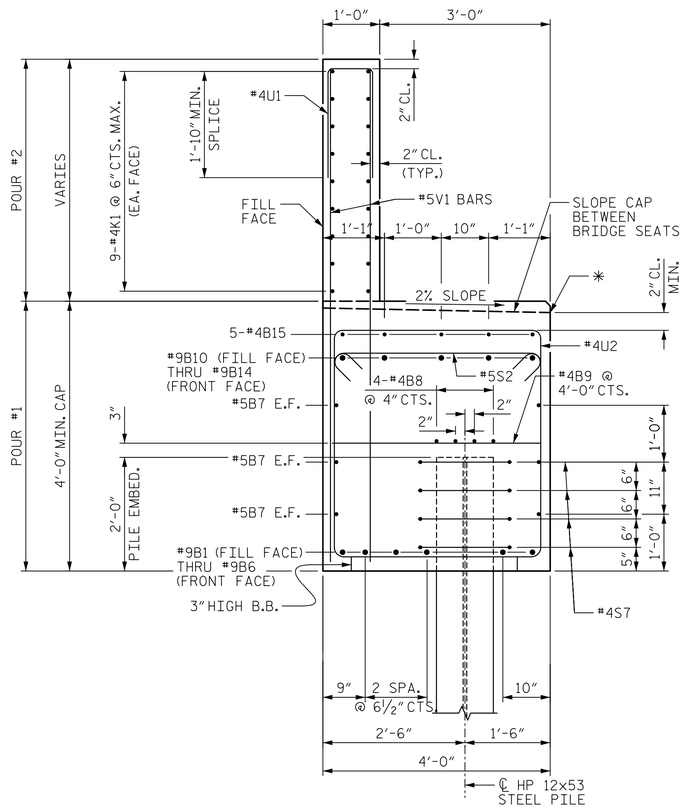


△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

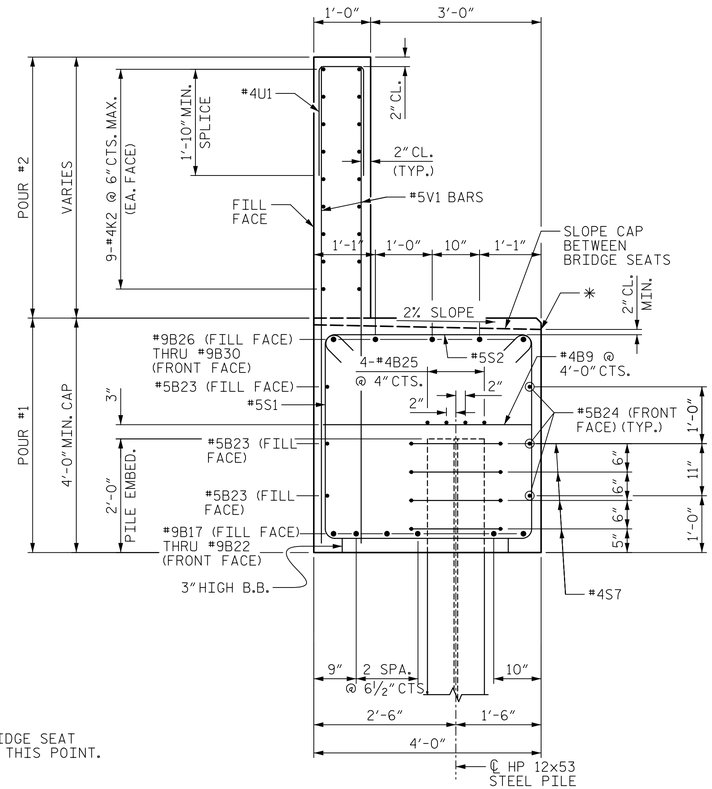
NOTES:

THE TOP SURFACE OF THE CAP, EXCEPT THE BRIDGE SEAT BUILD-UPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.



SECTION A-A

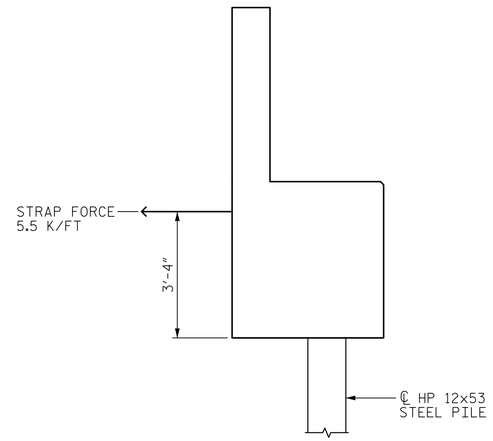
(STAGE I)



SECTION B-B

(STAGE II)

* ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS ARE SHOWN AT THIS POINT.



STRAP FORCE

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 4 OF 5

DRAWN BY :	T.B. STUMP — DATE : 01/2019
CHECKED BY :	J.C. MORRISON — DATE : 01/2019
DESIGNED BY :	T.B. STUMP — DATE : 01/2019
DESIGN CHECKED BY :	J.C. MORRISON — DATE : 01/2019

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RALEIGH, NC 27607
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AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON
John C. Morrison
1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 SECTION AND DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			49

DATE: 1/19/2023
TIME: 10:45:38 AM

USER: mutenik
DGN: \\nzuscomet.com\fs\AMER\Raleigh-USRAL3\Legacy\Projects\60436195-B-4654\900_Work\910_CADD\10_NCDOT_TIP\Structures\04 Drawings\2022 Updates\400_BT_S44_B4654_SMU_EB2.dgn

BILL OF MATERIAL — END BENT 2 (STAGE I)

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	1	9	1	58′-7″	199
B2	1	9	1	59′-3″	201
B3	1	9	1	57′-11″	197
B4	1	9	1	58′-6″	199
B5	1	9	1	56′-7″	192
B6	1	9	1	57′-2″	194
B7	12	5	STR	30′-8″	384
B8	8	4	STR	29′-11″	160
B9	14	4	STR	3′-8″	37
B10	1	9	1	58′-7″	199
B11	1	9	1	59′-2″	201
B12	1	9	1	57′-6″	196
B13	1	9	1	57′-11″	197
B14	1	9	1	56′-2″	191
B15	5	4	STR	26′-9″	89
B16	20	4	STR	2′-9″	34
S1	62	5	2	11′-9″	760
S2	62	5	3	4′-7″	296
S3	1	5	2	12′-0″	13
S4	1	5	3	4′-10″	5
S5	1	5	2	12′-3″	13
S6	1	5	3	5′-1″	5
S7	32	4	4	6′-6″	139
U1	53	4	5	5′-10″	207
U2	43	4	5	6′-8″	191
V1	106	5	STR	8′-0″	884
V2	38	5	STR	9′-11″	393
K1	36	4	STR	33′-0″	794
K3	8	4	STR	4′-6″	24
H1	21	6	7	14′-6″	457
H2	21	6	7	15′-0″	473

TOTAL REINFORCING STEEL 7,524 LBS.

CLASS A CONCRETE

POUR #1 (CAP, COLLARS & LOWER WINGWALLS) 38.5 C.Y.

POUR #2 (BACKWALL & UPPER WINGWALL) 12.9 C.Y.

TOTAL = 51.4 C.Y.

HP 12x53 STEEL PILES:

NO. = 8 LIN. FT. = 640

PILE REDRIVES 4 EA.

BILL OF MATERIAL — END BENT 2 (STAGE II)

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B9	5	4	STR	3′-8″	12
B16	10	4	STR	2′-9″	18
B17	1	9	1	19′-1″	65
B18	1	9	1	18′-5″	63
B19	1	9	1	19′-9″	67
B20	1	9	1	19′-2″	65
B21	1	9	1	21′-1″	72
B22	1	9	1	20′-6″	70
B23	3	5	STR	18′-10″	59
B24	3	5	STR	21′-2″	66
B25	4	4	STR	20′-2″	54
B26	1	9	1	19′-1″	65
B27	1	9	1	18′-5″	63
B28	1	9	1	20′-3″	69
B29	1	9	1	19′-9″	67
B30	1	9	1	21′-6″	73
S1	23	5	2	11′-9″	282
S2	23	5	3	4′-7″	110
S3	1	5	2	12′-0″	13
S4	1	5	3	4′-10″	5
S5	1	5	2	12′-3″	13
S6	1	5	3	5′-1″	5
S7	12	4	4	6′-6″	52
U1	16	4	5	5′-10″	62
U2	12	4	5	6′-8″	53
V1	32	5	STR	8′-0″	267
V3	28	5	STR	10′-2″	297
K2	18	4	STR	18′-10″	226
K3	8	4	STR	4′-6″	24
H3	22	6	6	9′-4″	308
H4	22	6	6	8′-11″	295

TOTAL REINFORCING STEEL 2,960 LBS.

CLASS A CONCRETE

POUR #1 (CAP, COLLARS & LOWER WINGWALLS) 14.9 C.Y.

POUR #2 (BACKWALL & UPPER WINGWALL) 5.4 C.Y.

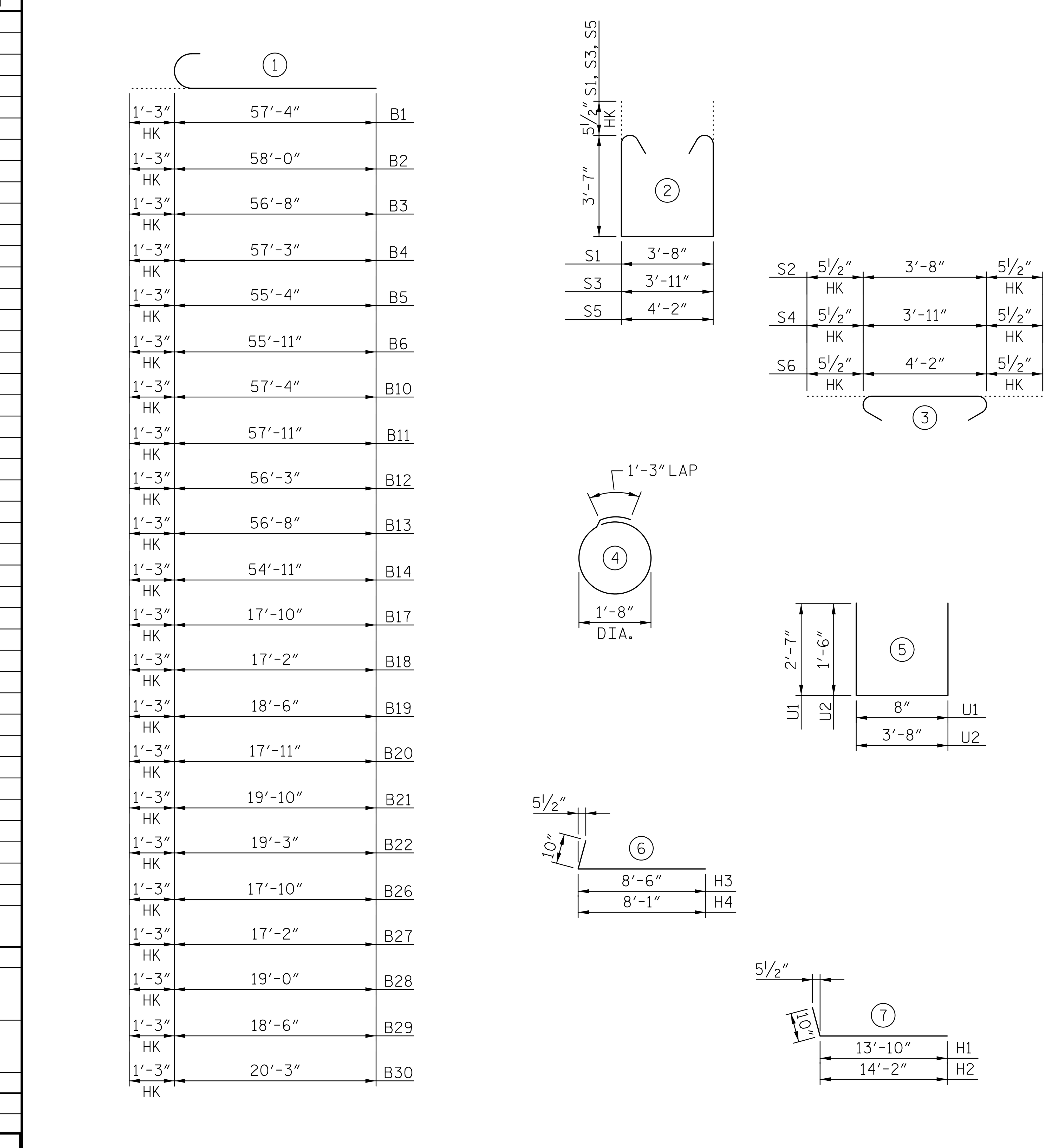
TOTAL = 20.2 C.Y.

HP 12x53 STEEL PILES:

NO. = 3 LIN. FT. = 240

PILE REDRIVES 2 EA.

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

SHEET 5 OF 5

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030474 JOHN C. MORRISON
1/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
SECTION AND DETAILS

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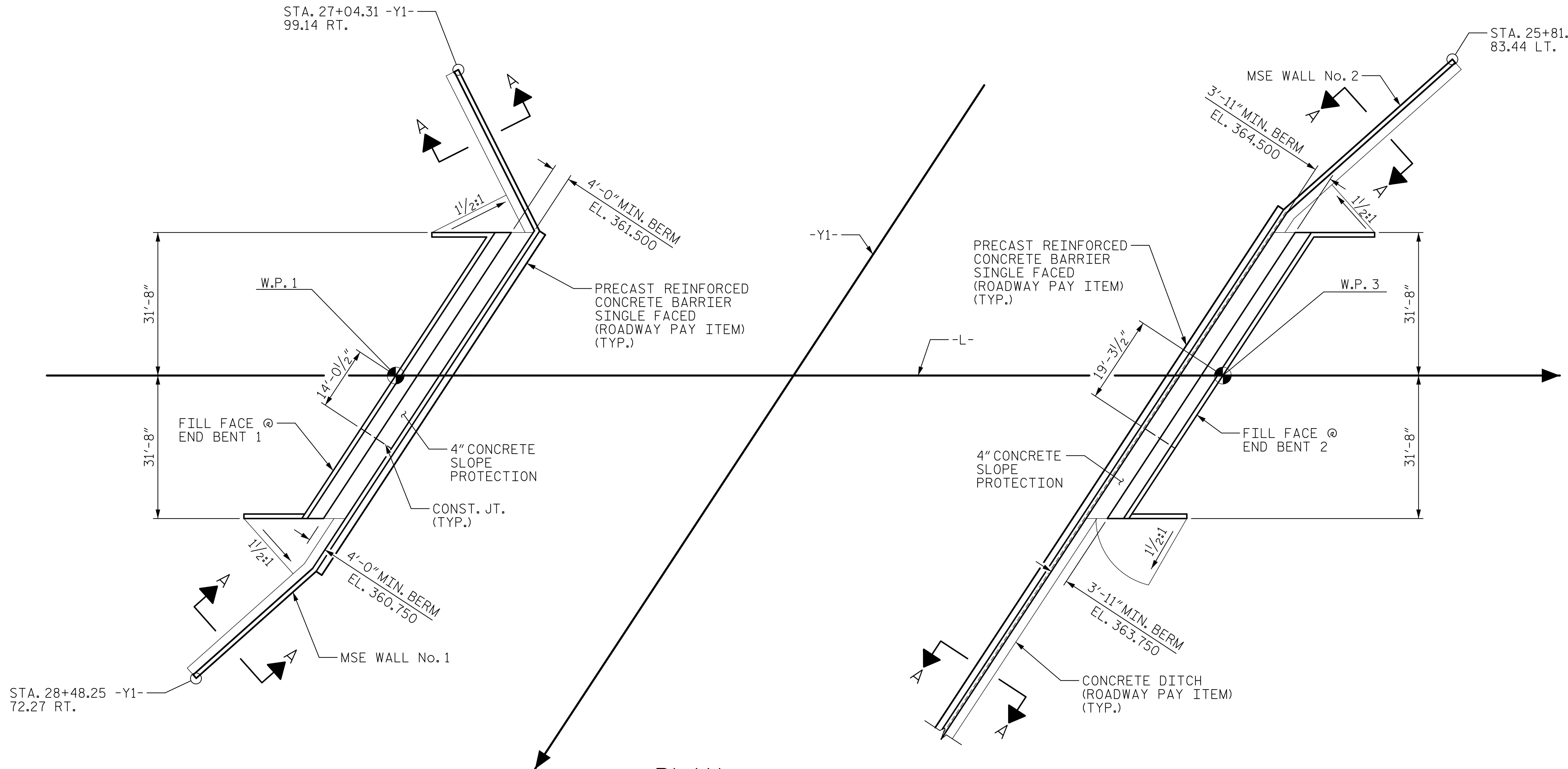
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			49

DRAWN BY : T.B. STUMP DATE : 01/2019
CHECKED BY : J.C. MORRISON DATE : 01/2019
DESIGNED BY : T.B. STUMP DATE : 01/2019
DESIGN CHECKED BY : J.C. MORRISON DATE : 01/2019



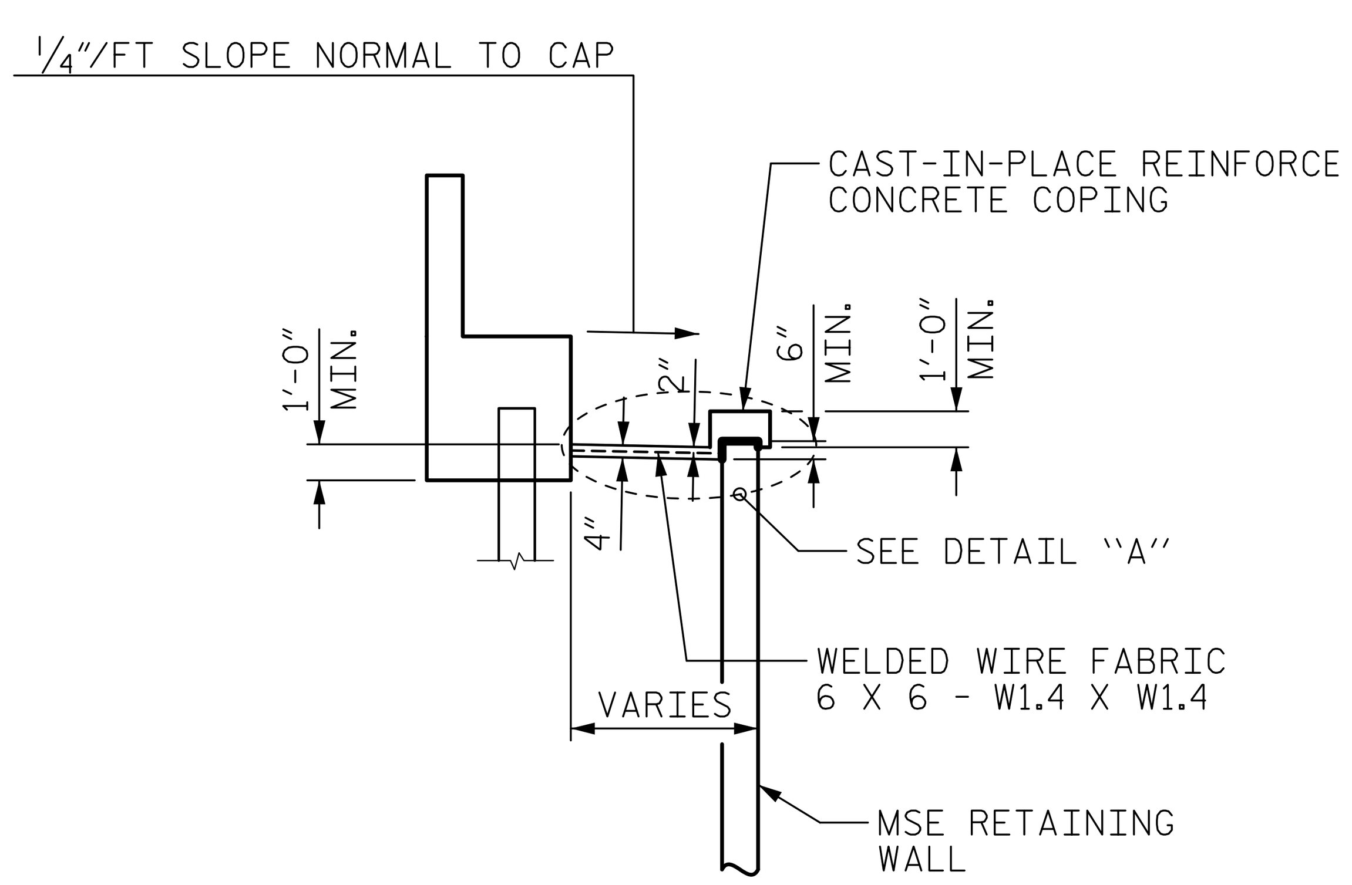
PLAN

NOTES:

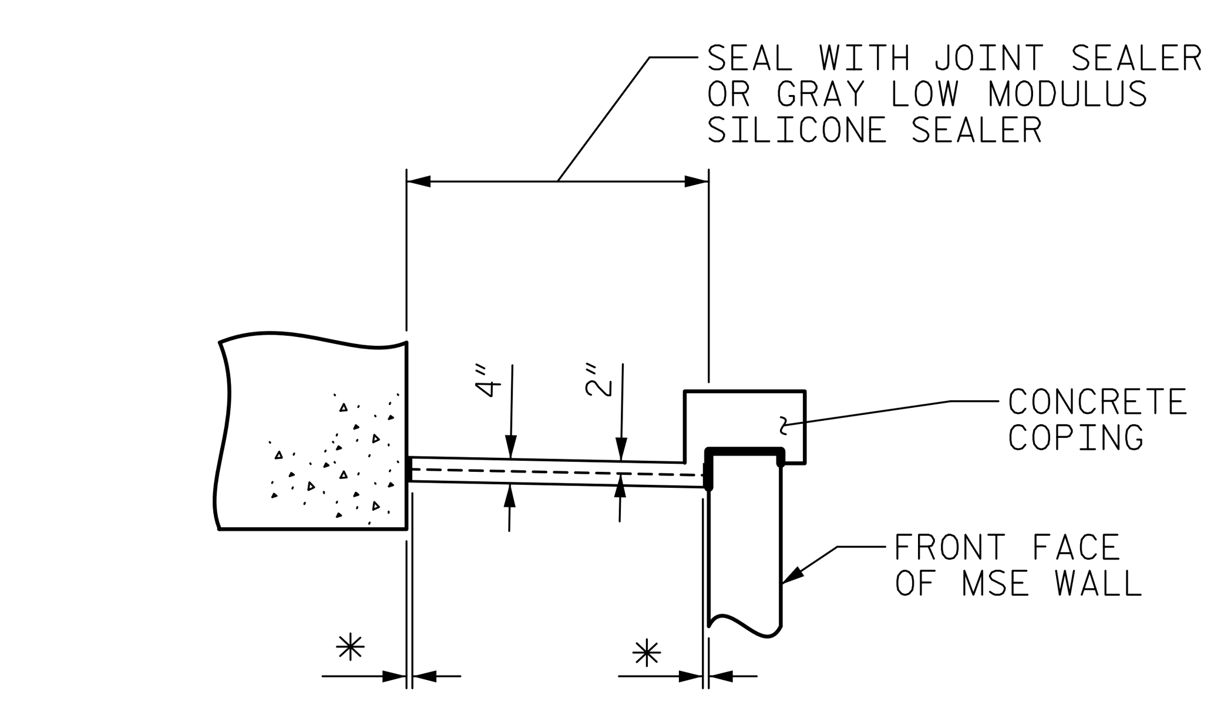
SLOPE PROTECTION SHALL BE PLACES UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FINISHED TO THE SATISFACTION OF THE ENGINEER. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 20" WIDE. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 22+71.80 -L-	4" SLOPE PROTECTION	WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	61.2	136
END BENT 2	57.0	124
TOTAL	118.2	260

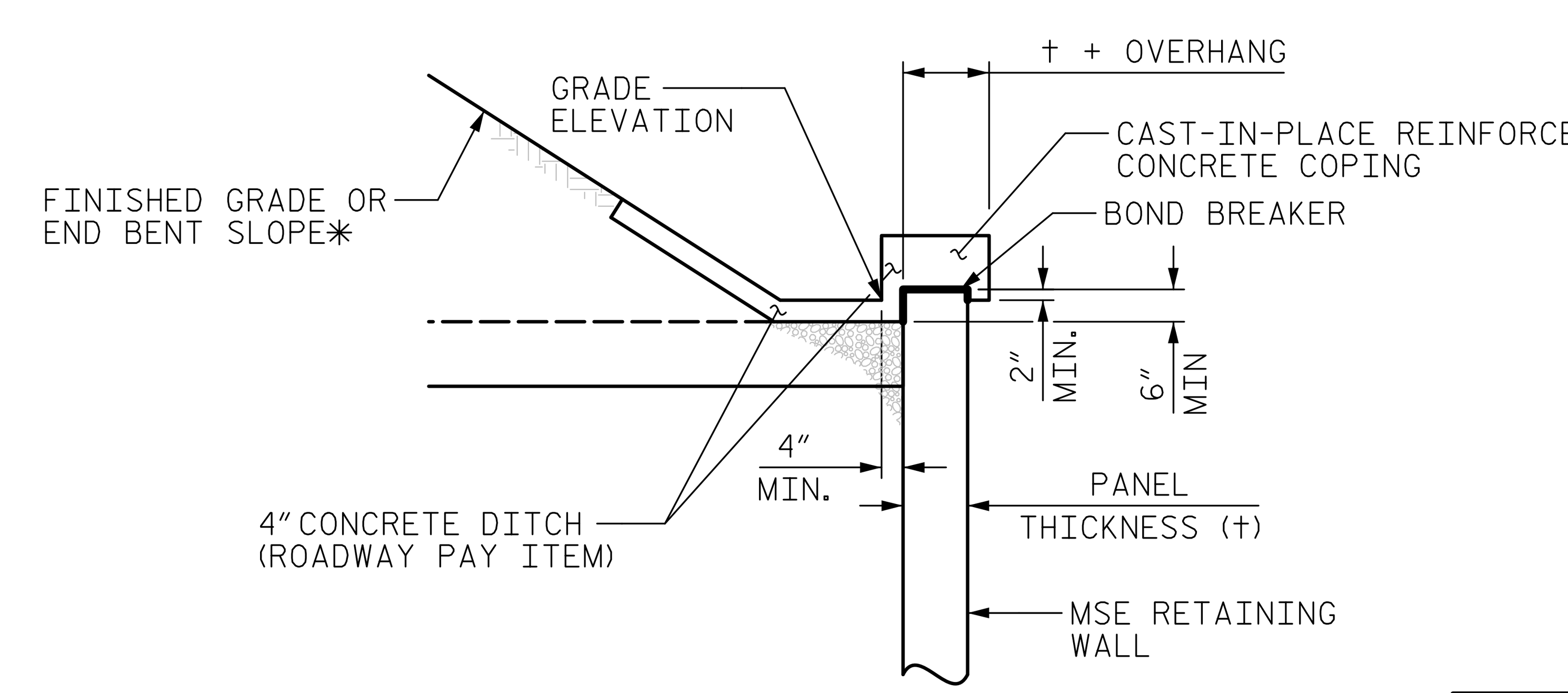


SECTION ALONG ℄ ROADWAY



* 1" EXP. JT. MAT'L.
(PLACE DEBONDING TAPE ON TOP OF EXP. JT. MAT'L.)

DETAIL "A"



SECTION A-A

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

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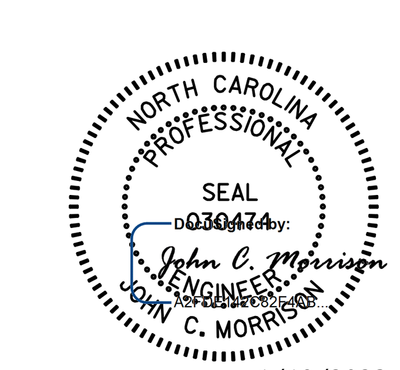
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

SLOPE PROTECTION DETAILS



1/19/2023

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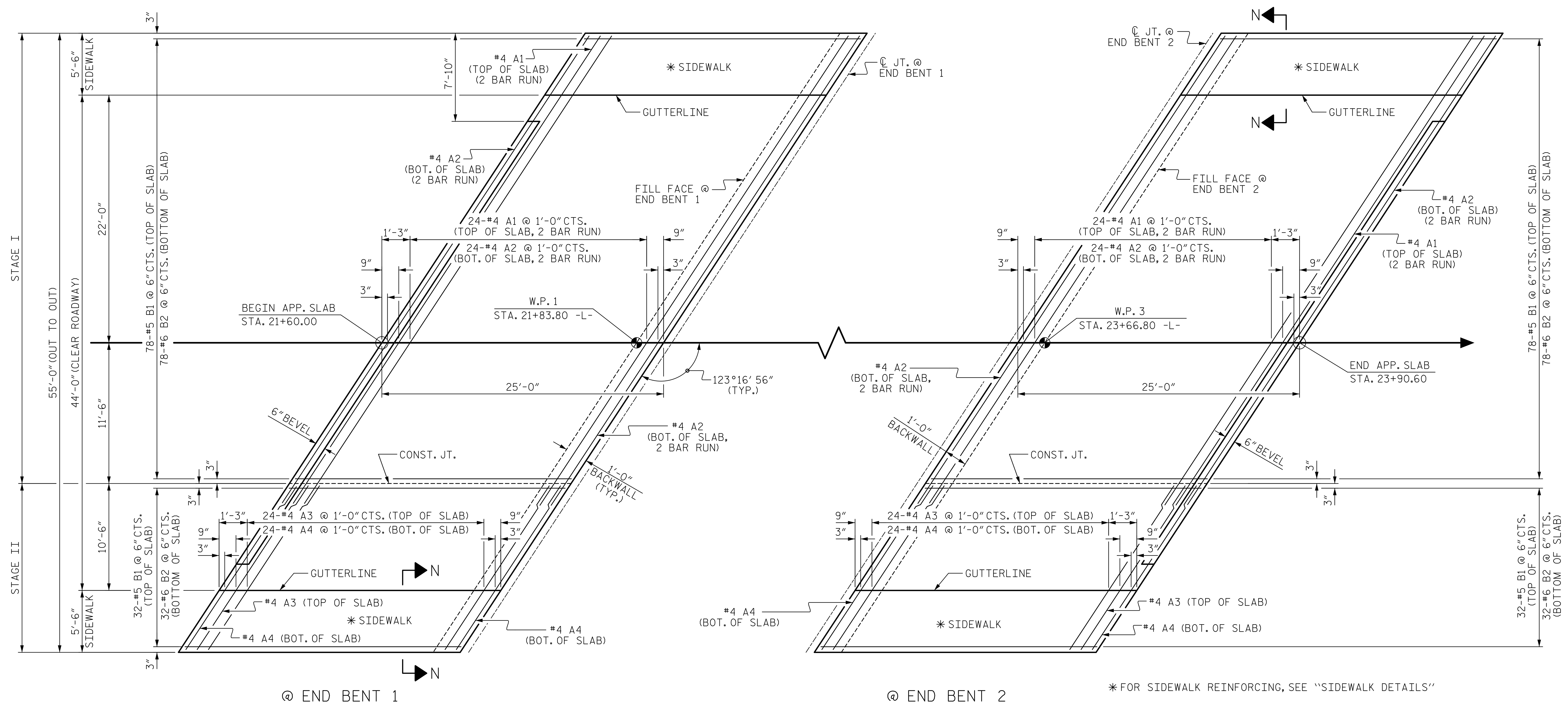
DRAWN BY : T.B. STUMP	DATE : 01/2019
CHECKED BY : J.C. MORRISON	DATE : 01/2019
DESIGNED BY : T.B. STUMP	DATE : 01/2019
DESIGN CHECKED BY : J.C. MORRISON	DATE : 01/2019

REVISIONS

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

SHEET NO. S-46

TOTAL SHEETS 49



*FOR SIDEWALK REINFORCING, SEE "SIDEWALK DETAILS"

PLAN

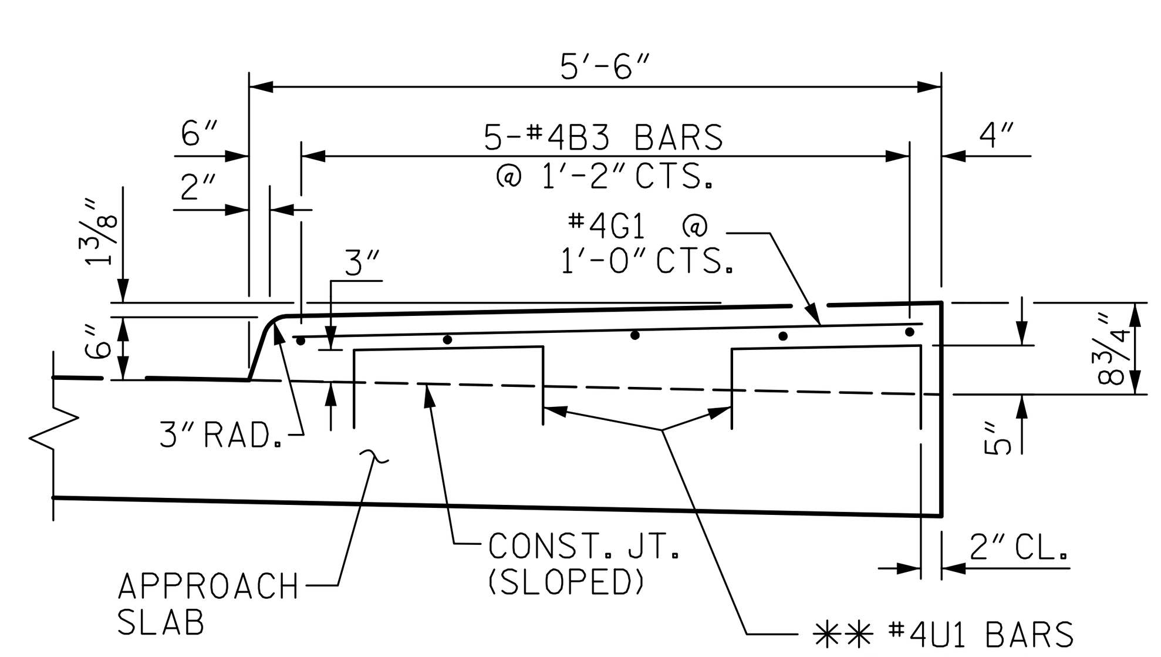
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS.
REINFORCING STEEL IN SIDEWALK NOT SHOWN FOR CLARITY.

NOTES:

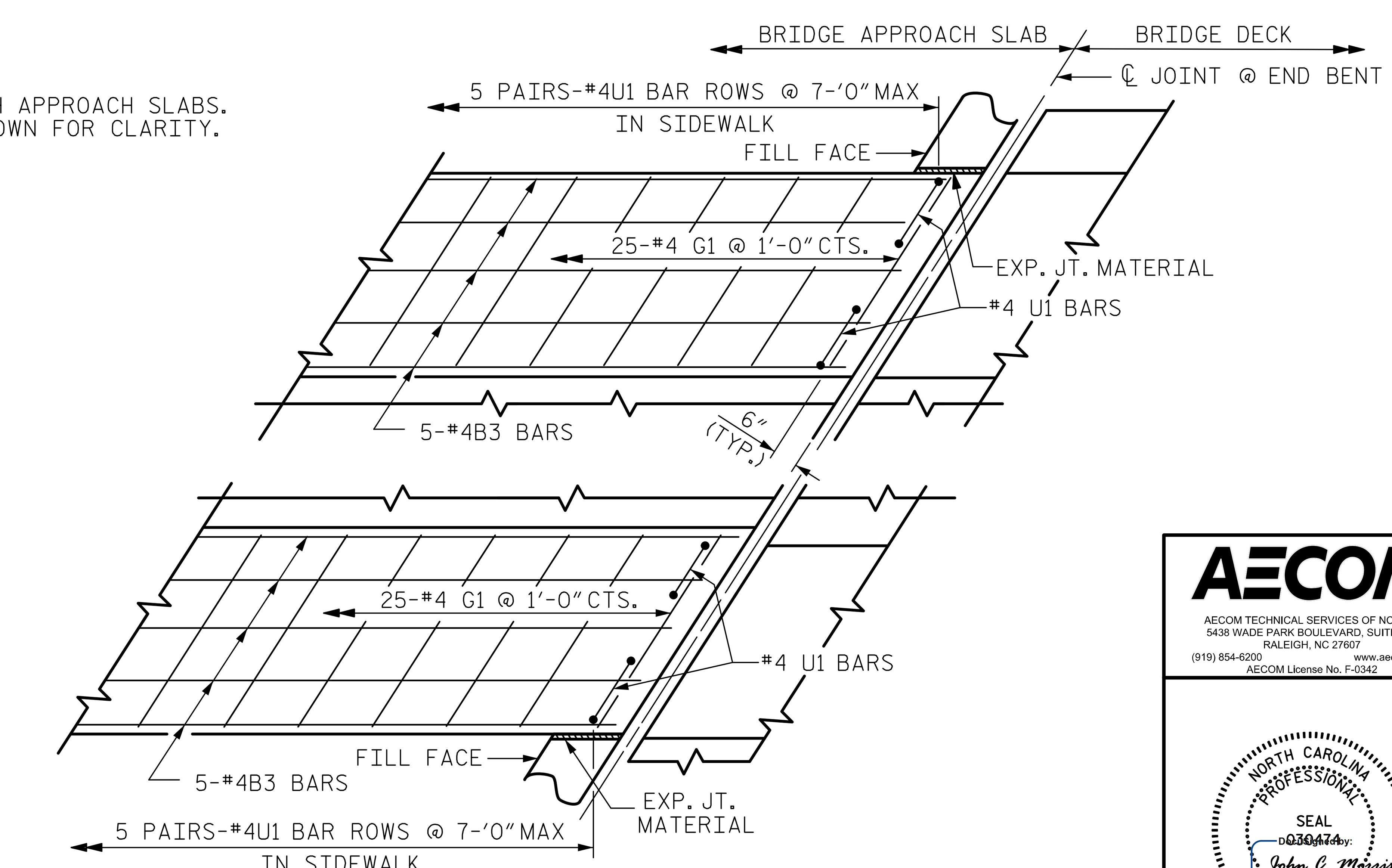
THE SIDEWALK SHALL NOT BE CAST UNTIL APPROACH SLAB CONCRETE HAS BEEN CAST AND REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

ALL REINFORCING STEEL IN THE SIDEWALKS SHALL BE EPOXY COATED

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



SECTION N-N



PLAN

SIDEWALK DETAILS

PROJECT NO. B-4654
WAKE COUNTY
STATION: 22+71.80 -L-
SHEET 1 OF 2

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1/19/2023

STATE OF NORTH CAROLINA
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RALEIGH

BRIDGE APPROACH SLAB

REVISIONS								SHEET NO. S-47
NO.	BY:	DATE:	NO.	BY:	DATE:			TOTAL SHEETS 49
1			3					
2			4					

DRAWN BY: H.T. ROSEMOND DATE: 12/2018
CHECKED BY: J.C. MORRISON DATE: 12/2018
DESIGNED BY: H.T. ROSEMOND DATE: 12/2018
DESIGN CHECKED BY: J.C. MORRISON DATE: 12/2018

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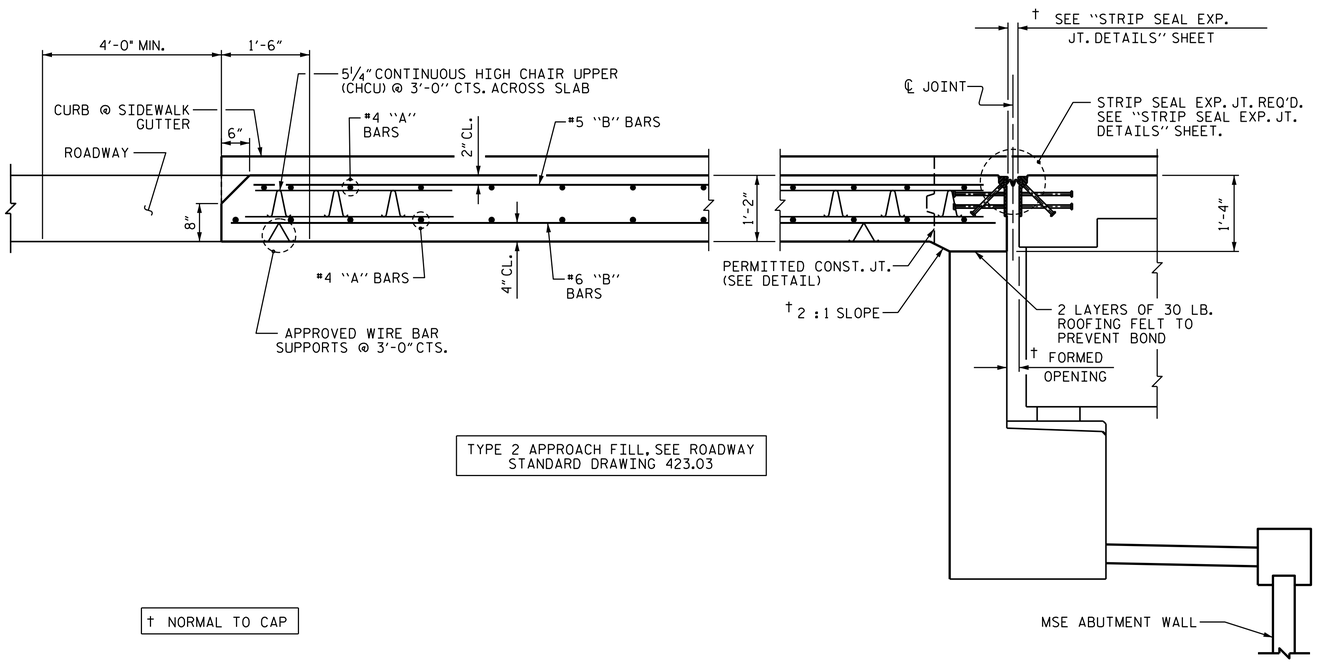
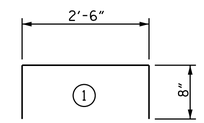


TYPE 2 APPROACH FILL. SEE ROADWAY STANDARD DRAWING 423.03

† NORMAL TO CAP

SECTION THRU SLAB

BAR TYPES



BAR DIMENSIONS ARE OUT TO OUT

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, MSE WALL REINFORCEMENT AND BACKFILL MATERIAL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

FOR STRIP SEAL EXPANSION JOINT, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQUIRED)

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	50	#4	STR	25'-4"	846
A2	52	#4	STR	25'-1"	871
✳B1	78	#5	STR	24'-2"	1966
B2	78	#6	STR	24'-8"	2890
✳B3	5	#4	STR	24'-8"	82
✳G1	25	#4	STR	5'-1"	85
✳U1	10	#4	1	3'-10"	26

REINFORCING STEEL	LBS.	3761
✳EPOXY COATED REINFORCING STEEL	LBS.	3005
POUR #1 (SLAB)		42.4
POUR #2 (SIDEWALK)		3.1
CLASS AA CONCRETE	C. Y.	45.5

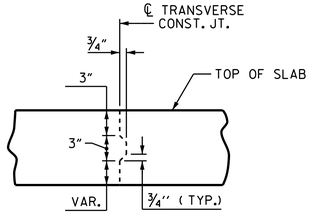
STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A3	25	#4	STR	18'-9"	313
A4	26	#4	STR	18'-9"	326
✳B1	32	#5	STR	24'-2"	807
B2	32	#6	STR	24'-8"	1186
✳B3	5	#4	STR	24'-8"	82
✳G1	25	#4	STR	5'-1"	85
✳U1	10	#4	1	3'-10"	26

REINFORCING STEEL	LBS.	1512
✳EPOXY COATED REINFORCING STEEL	LBS.	1313
POUR #1 (SLAB)		18.1
POUR #2 (SIDEWALK)		3.1
CLASS AA CONCRETE	C. Y.	21.2

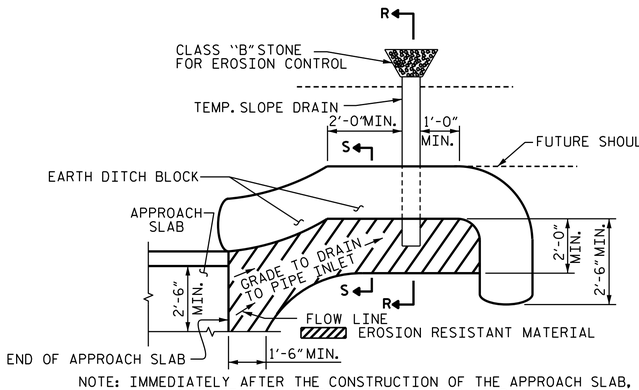
SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"



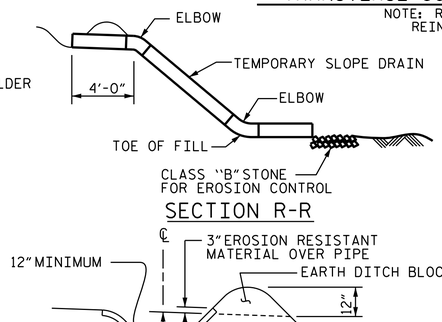
TRANSVERSE CONSTRUCTION JOINT IN APPROACH SLAB DETAIL

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

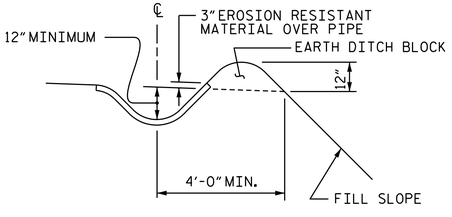


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

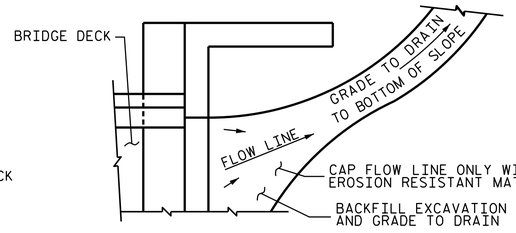
PLAN VIEW



SECTION R-R



SECTION S-S



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

TEMPORARY DRAINAGE DETAIL

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

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AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030474 JOHN C. MORRISON
Document signed by: John C. Morrison
9F23075CFC91480...
9/7/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			49

DRAWN BY :	K. MUENCH	DATE :	05/2022
CHECKED BY :	J.C. MORRISON	DATE :	05/2022
DESIGNED BY :	D. RITACCO	DATE :	05/2022
DESIGN CHECKED BY :	J.C. MORRISON	DATE :	05/2022

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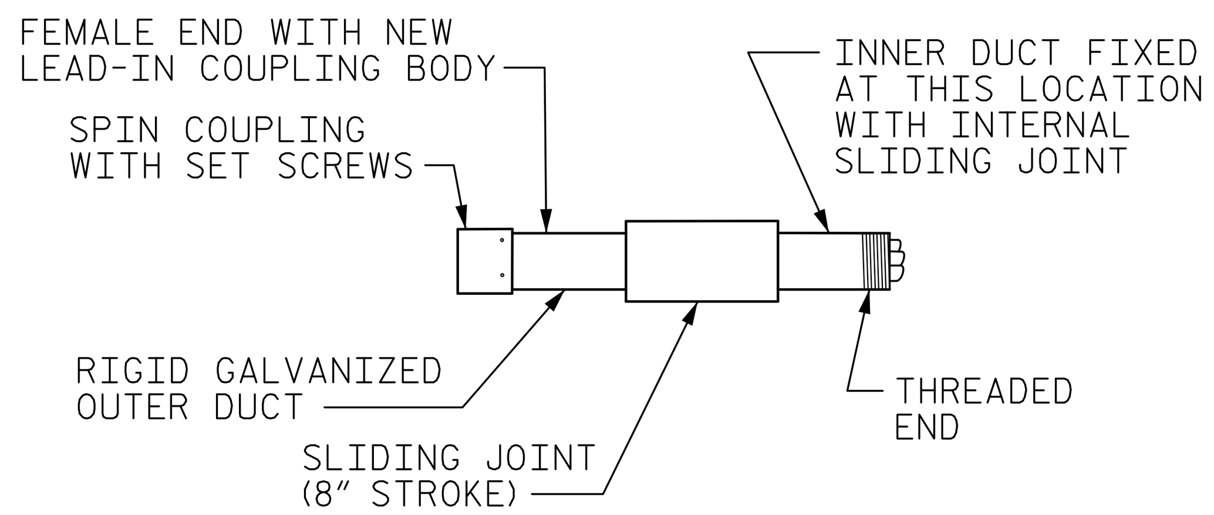
STD. NO. BAS2



EXPANSION JOINT FITTING

DETAIL "A"

NOTES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE TOTAL QUANTITY OF CONDUIT NEEDED TO COMPLETE THE WORK AND THAT THE CONDUIT(S) ARE PLACED AT THE NOTED DIMENSION AND ABOVE THE BOTTOM OF THE GIRDER.

THE INSTALLATION OF THE CONDUIT SYSTEM SHALL BE PAID FOR AS LUMP SUM. THE PRICE SHALL INCLUDE ALL CONDUIT, 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 POSTS.

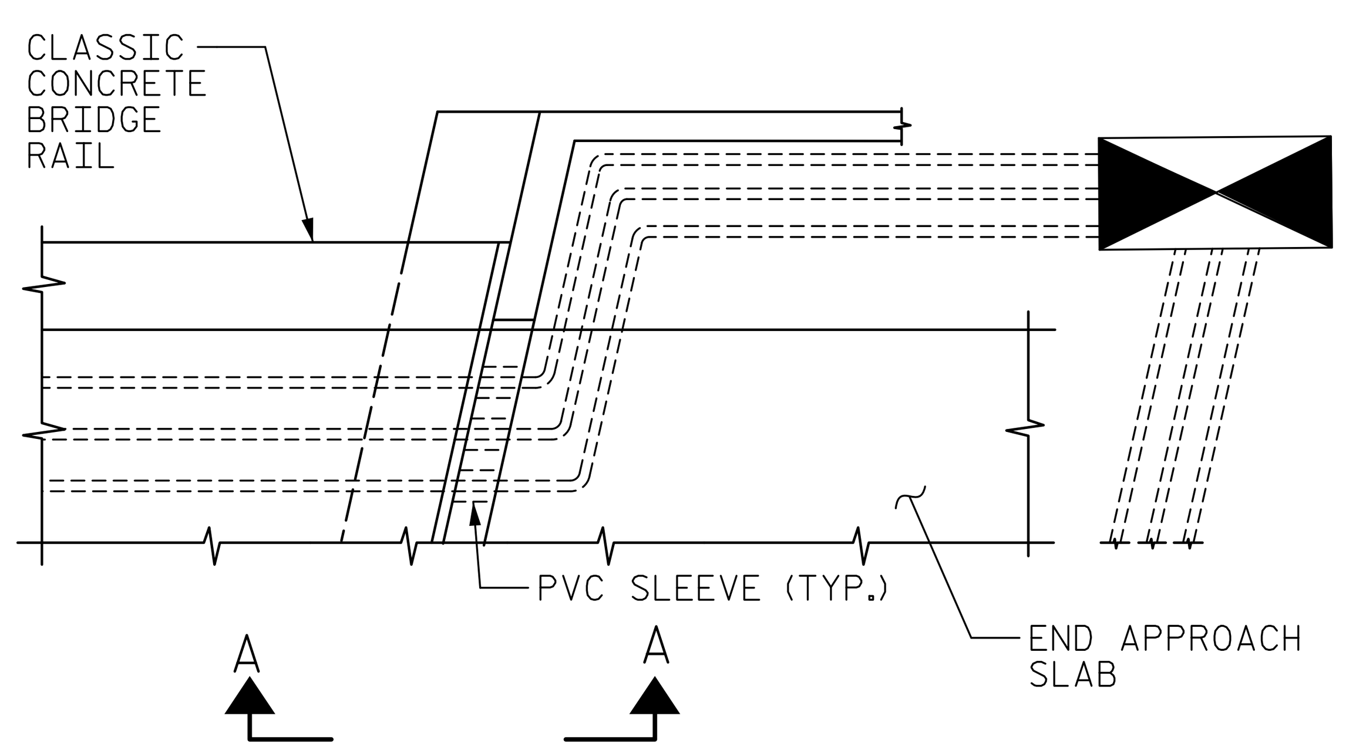
INSTALL SLEEVES PARALLEL TO GIRDERS. SEE DETAIL "B" FOR SLEEVE INSTALLATION.

PROVIDE TRANSITION ADAPTOR (AND EXPANSION JOINT) FOR CONDUIT AT END BENT 1 (AND END BENT 2).

INSTALL EXPANSION JOINTS AT END BENT #1 AND END BENT #2.

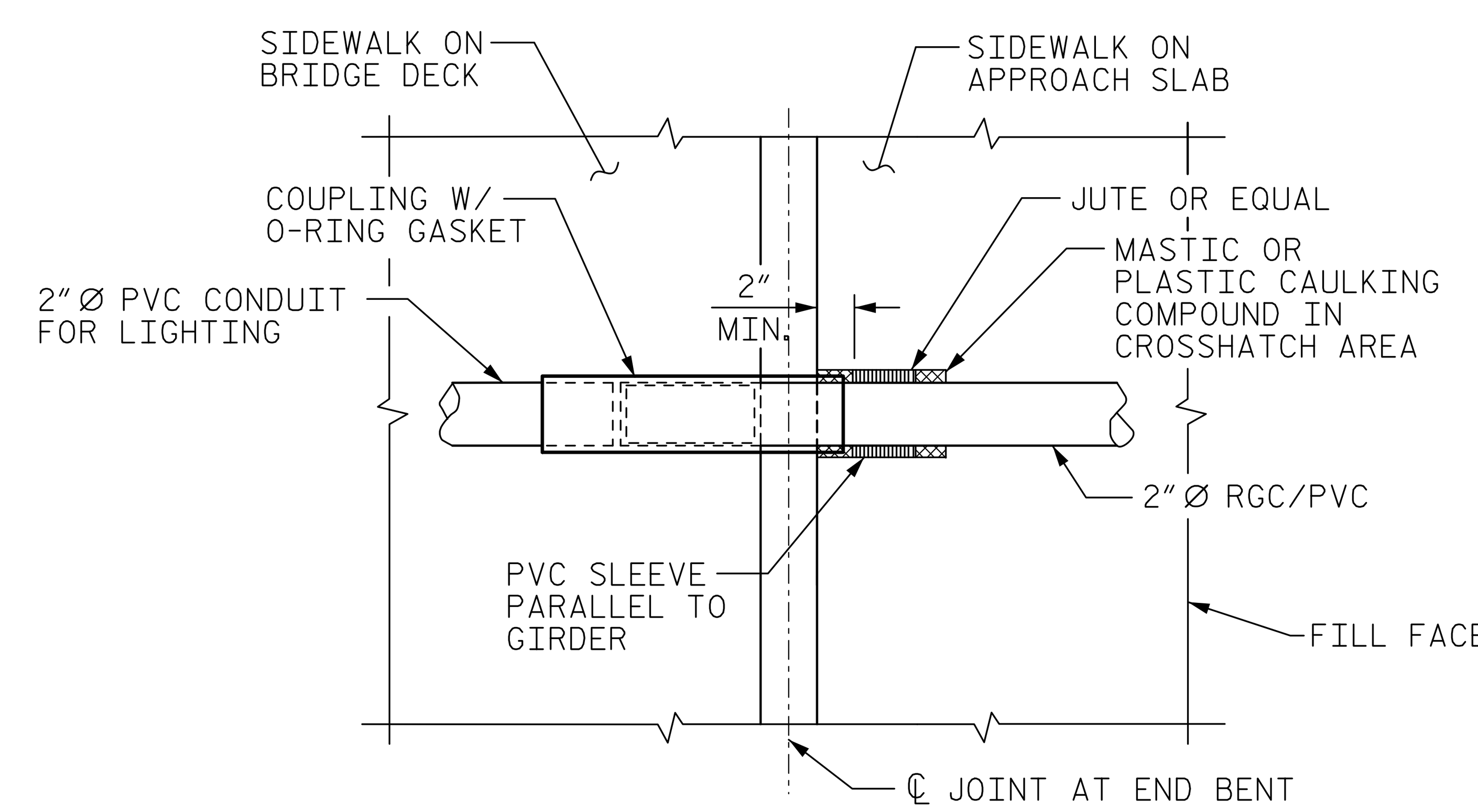
THE CONCRETE SCREW INSERT SHALL HAVE A ROD SIZE OF 5/8" AND A PULL FORCE OF 1260 lbs.

SEE LIGHTING PLANS, SHEETS L1 THRU L3 FOR ADDITIONAL INFORMATION.



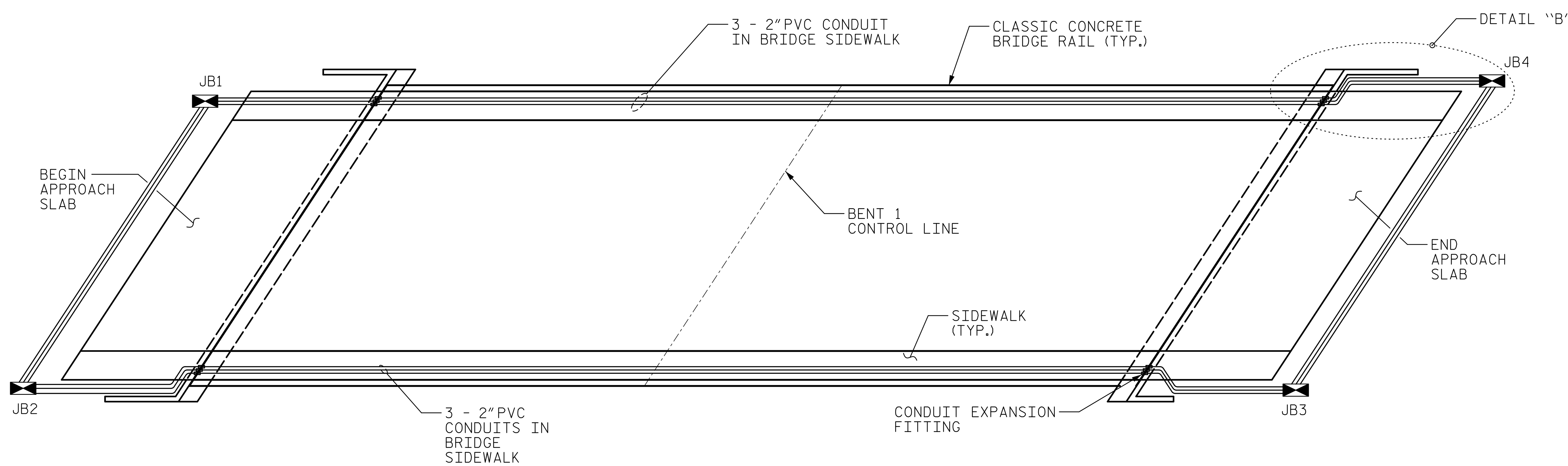
DETAIL "B"

TERMINATION OF CONDUIT AT WING WALL.



VIEW "A-A"

PVC SLEEVE INSTALLATION & RGC/PVC ADAPTOR AT EXPANSION JOINT.



CONDUIT LAYOUT

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

ASSEMBLED BY : KJM		DATE : 11/22	
CHECKED BY : JCM		DATE : 11/22	
DRAWN BY : RWW	2-4-03	REV. 5/1/06	TLA/GM
CHECKED BY : DBM	2-4-03	REV. 10/1/11	MAA/GM
		REV. 12/17	MAA/THC

ELECTRICAL CONDUIT DETAILS

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NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON

John C. Morrison 10/5/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELECTRICAL CONDUIT SYSTEM FOR LIGHTING

REVISIONS

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

SHEET NO. S-49

TOTAL SHEETS 49

STD. NO. ECS1

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 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 ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" 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 ¼" 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 ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. 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

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