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09_08/2019

TIP PROJECT: BR-0044

CONTRACT: C204393

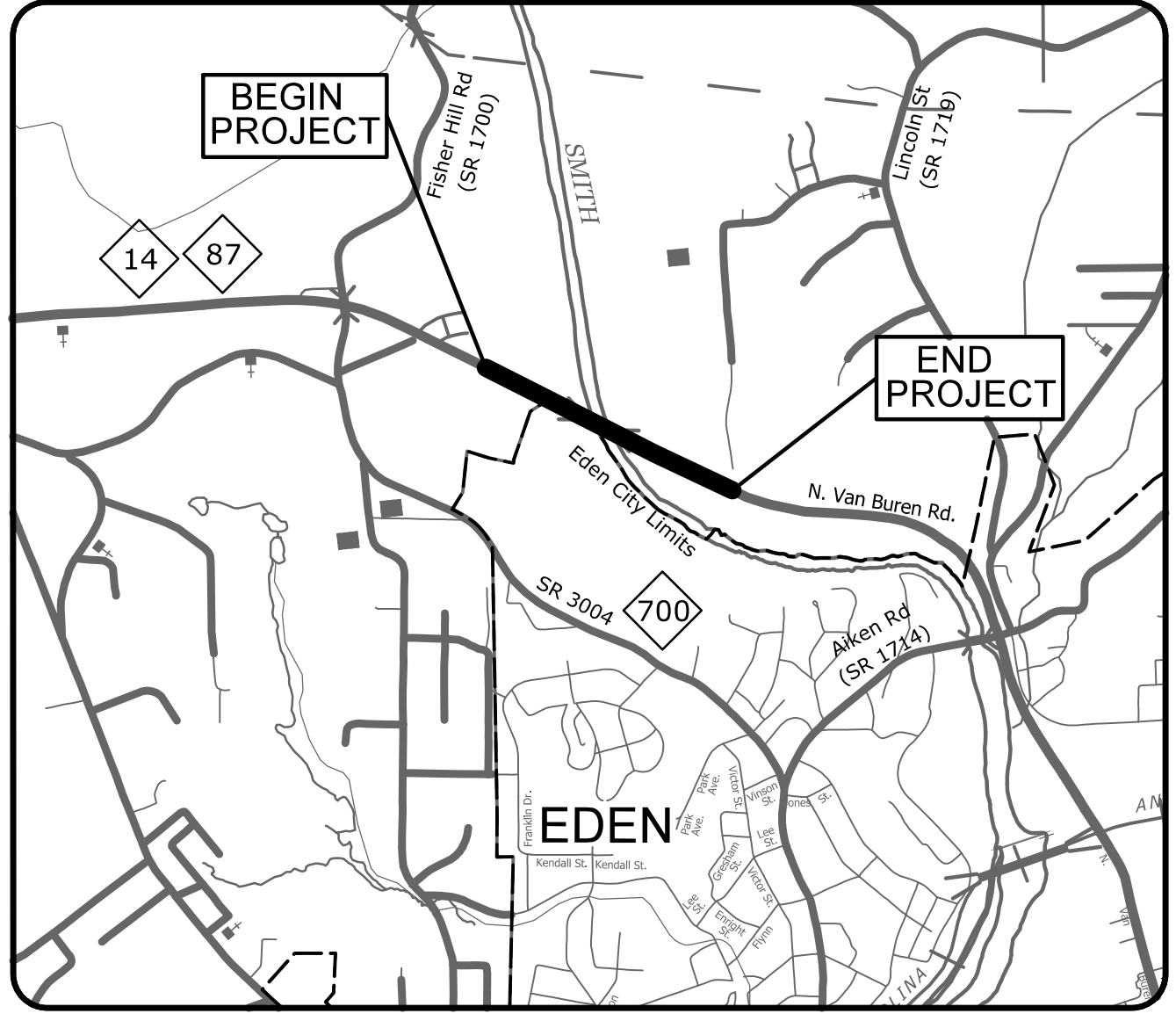
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROCKINGHAM COUNTY

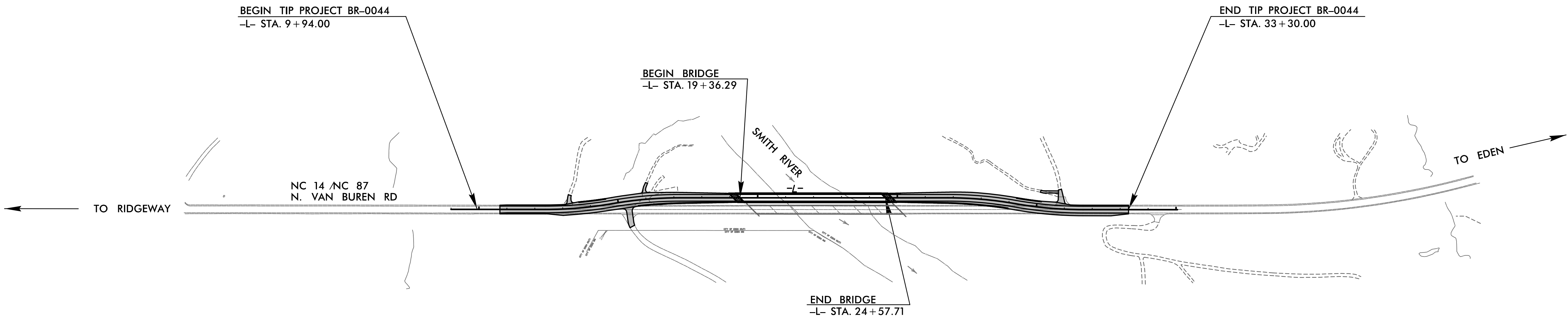
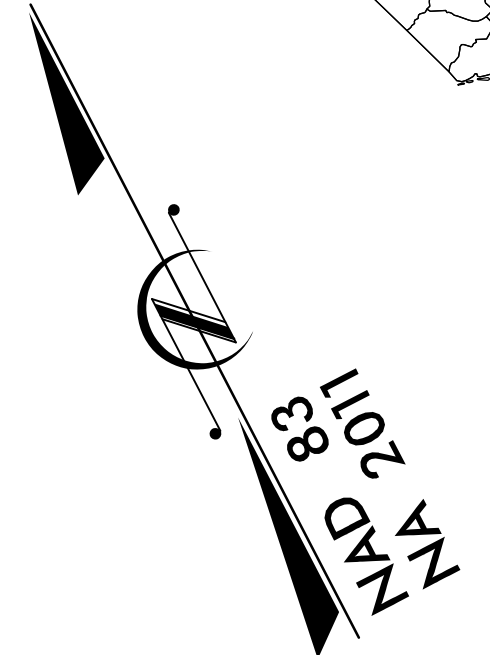
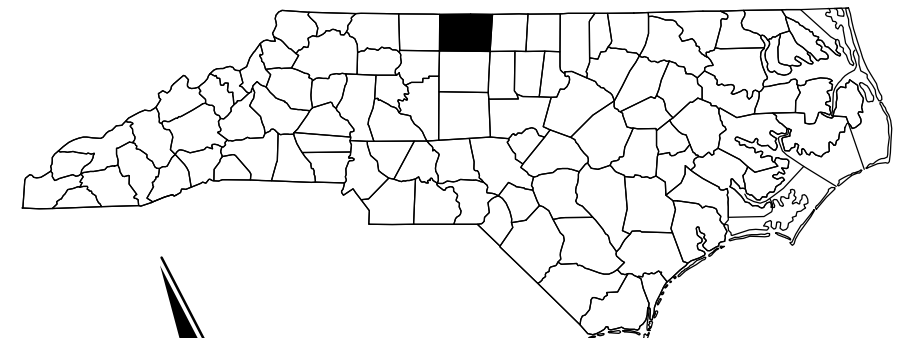
**LOCATION: BRIDGE NO. 168 ON NC 14/NC 87
(N. VAN BUREN RD) OVER
SMITH RIVER**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING,
AND STRUCTURE**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0044	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
49077.1.1		PE	
49077.2.1		ROW & UTIL	
49077.3.1		CONST.	



VICINITY MAP
NOT TO SCALE



STRUCTURES

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2020 =	8,080
ADT 2040 =	8,400
K =	9 %
D =	55 %
T =	12 % *
V =	60 MPH
* (TTST 10%+DUAL 2%)	
FUNC CLASS=PRINCIPAL ARTERIAL	
REGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0044 =	0.343 MI
LENGTH STRUCTURE TIP PROJECT BR-0044 =	0.099 MI
TOTAL LENGTH TIP PROJECT BR-0044 =	0.442 MI

AECOM
NC FIRM LICENSE No: F-0342
5438 Wade Park Boulevard, Suite 200
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

2018 STANDARD SPECIFICATIONS

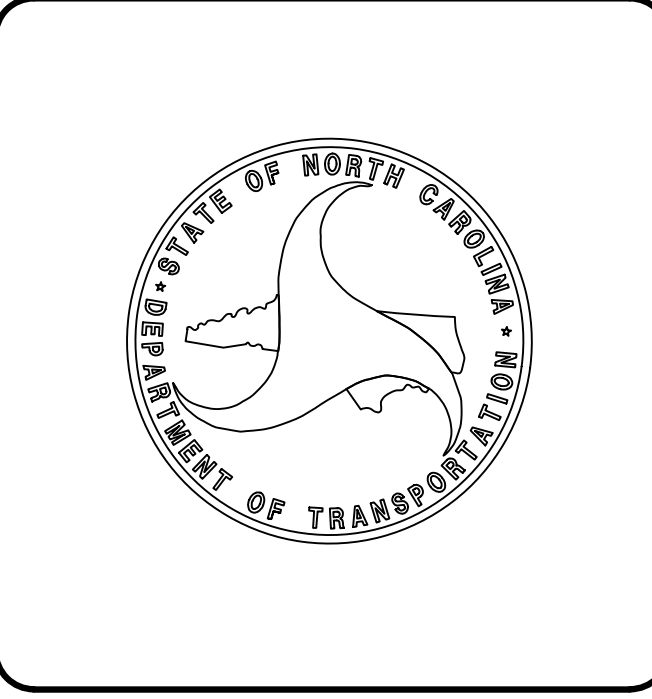
RIGHT OF WAY DATE:
JUNE 17, 2019

LETTING DATE:
JULY 19, 2022

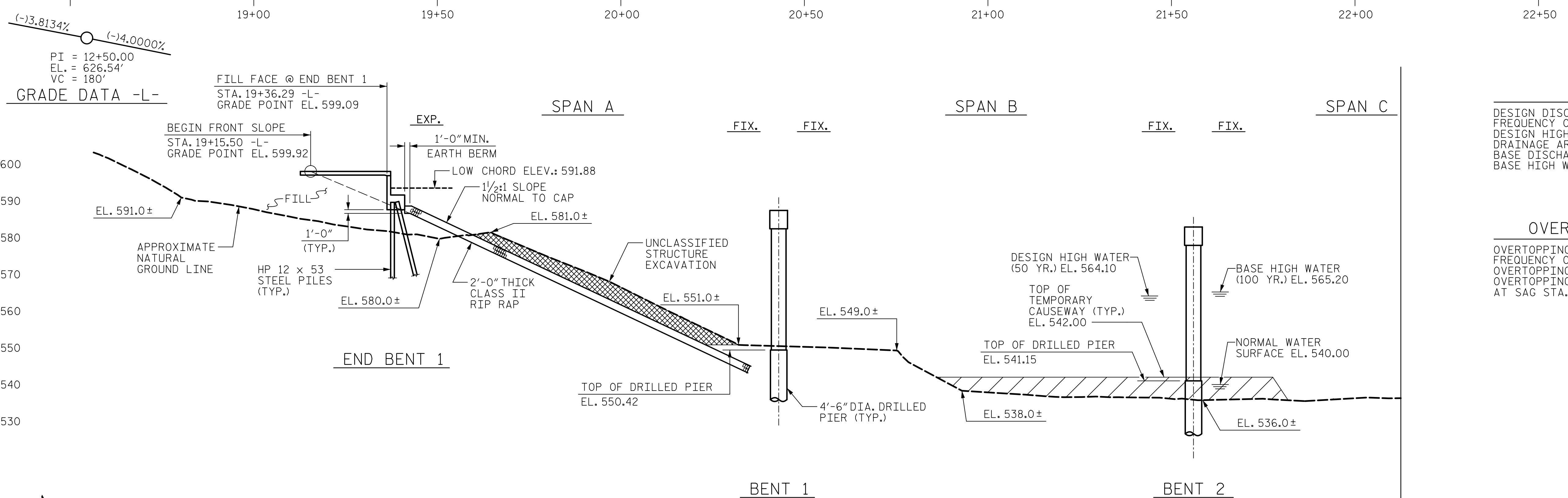
GREGORY R. COLS, PE PROJECT ENGINEER
NEIL J. DEAN, PE PROJECT DESIGN ENGINEER
DAVID STUTTS, P.E. NCDOT PROJECT MANAGER

STRUCTURE DESIGN ENGINEER

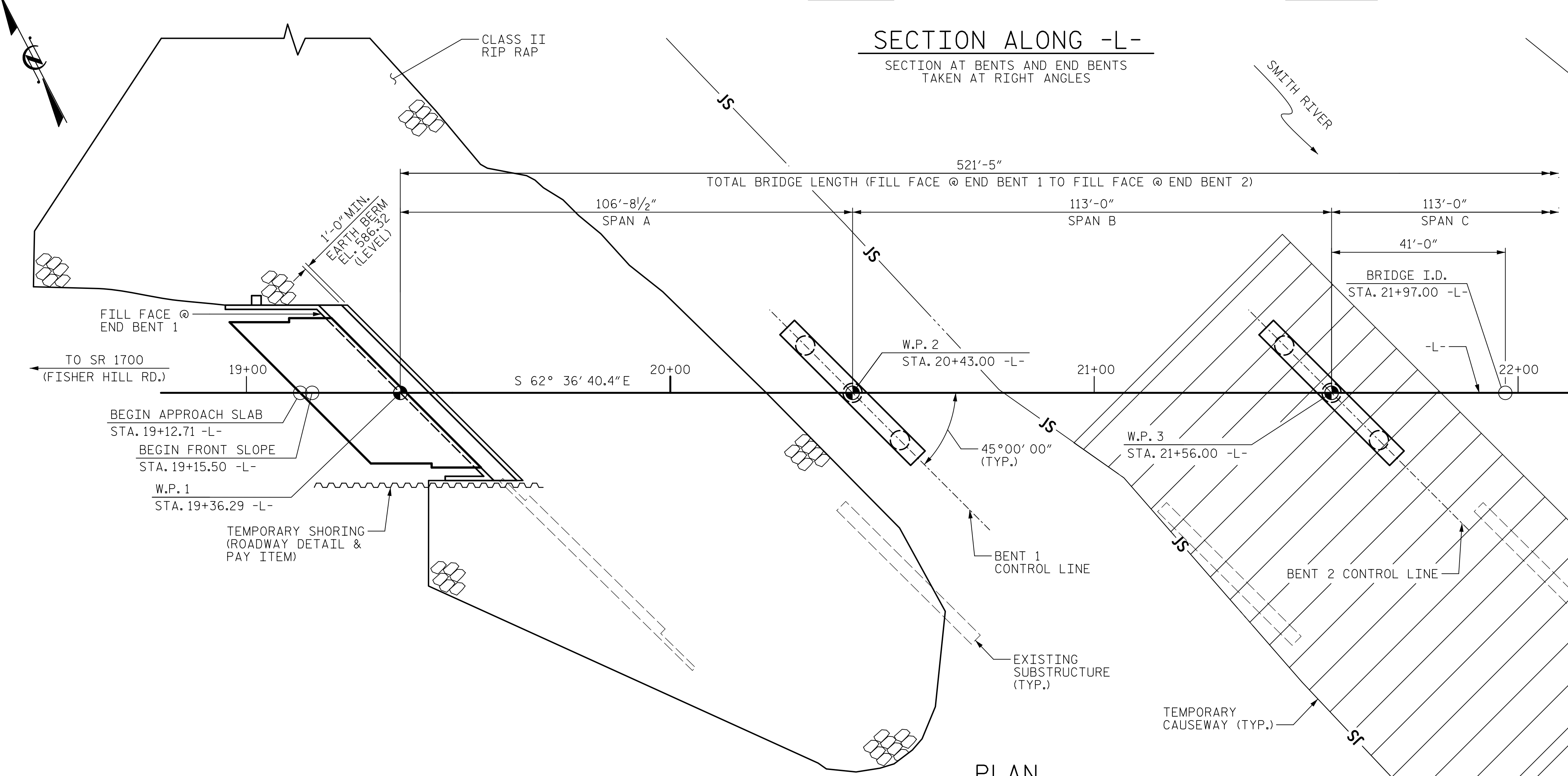
GREGORY R. COLS, P.E.
SIGNATURE:



3/29/2022
R:\Structures\04 Drawings\400_001_BR0044_SMU_TSH.dgn
Benjamin D. Hodack



SECTION ALONG -L-
 SECTION AT BENTS AND END BENTS
 TAKEN AT RIGHT ANGLES



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -L-

SHEET 1 OF 4 REPLACES BRIDGE No. 168



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

**FOR BRIDGE ON NC 14/87
 OVER SMITH RIVER
 BETWEEN SR 1700
 AND SR 1714**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-01
1			3			TOTAL SHEETS
2			4			39

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : T.B. STUMP DATE : 03/2019
 CHECKED BY : G.R. COLS DATE : 03/2019
 DESIGNED BY : S. NATARAJAN DATE : 03/2019
 DESIGN CHECKED BY : G.R. COLS DATE : 03/2019

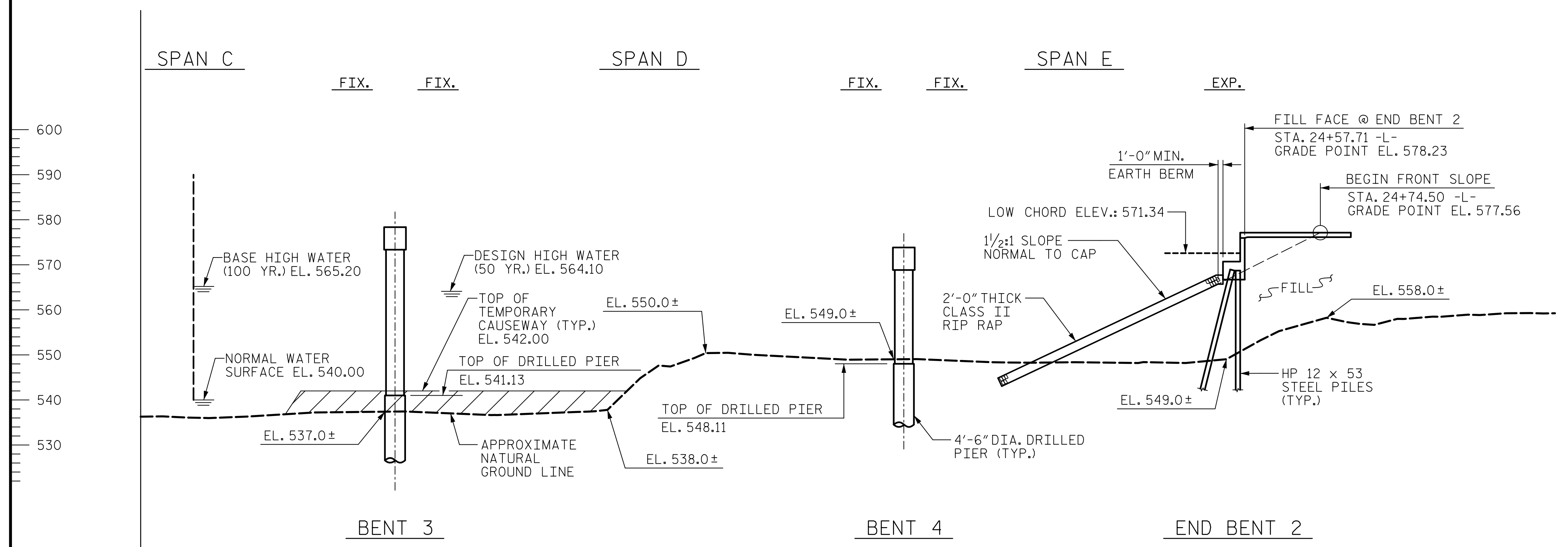
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MATCHLINE - SEE SHEET 2 OF 4

22+50 23+00 23+50 24+00 24+50 25+00 25+50 26+00

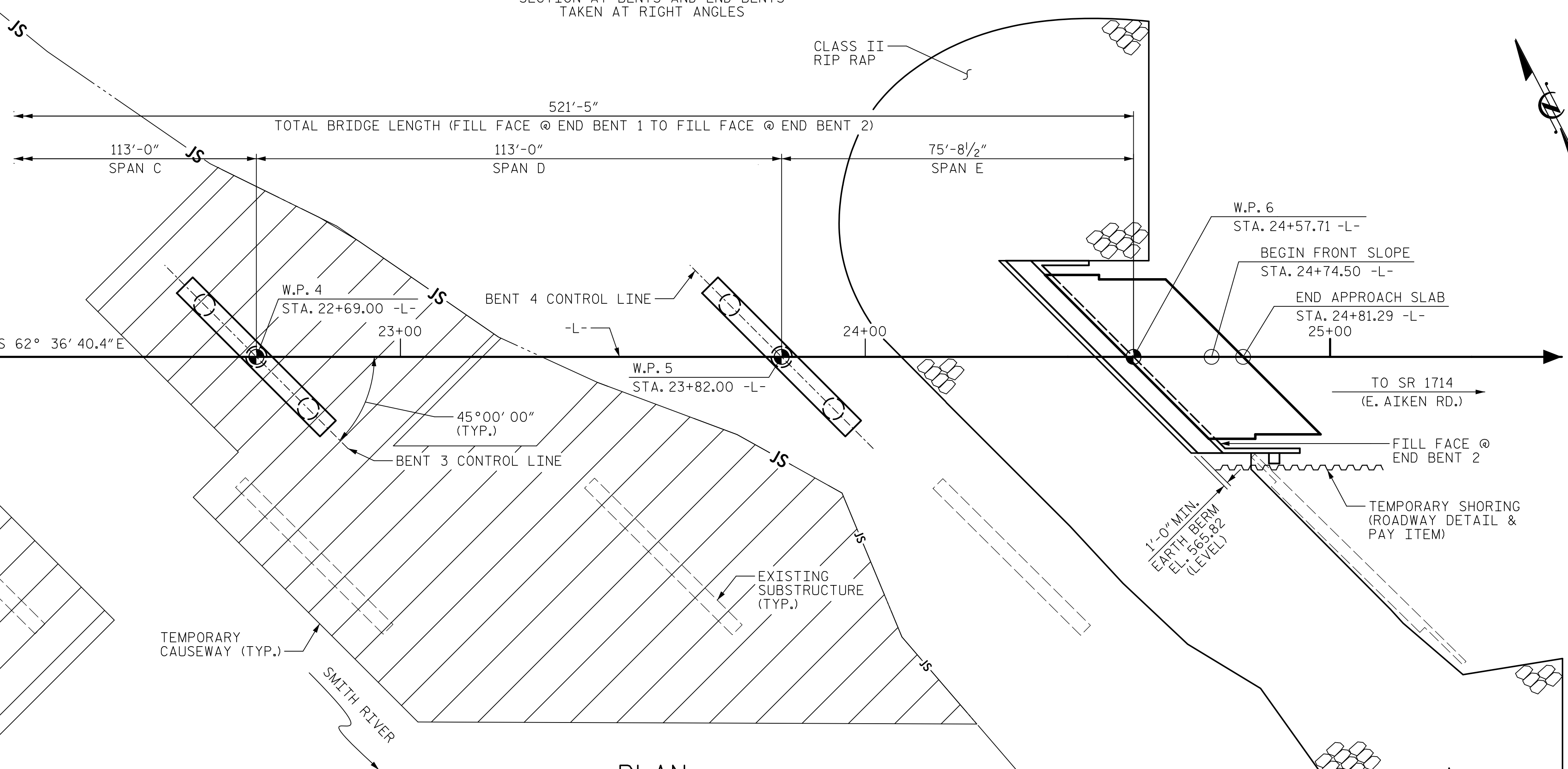
(-)-4.0000% (+)0.7396%
PI = 27+70.00
EL. = 565.74'
VC = 550'

GRADE DATA -L-



SECTION AT BENTS AND END BENTS
TAKEN AT RIGHT ANGLES

MATCHLINE - SEE SHEET 1 OF 4



PLAN

(DRILLED PIERS AND
PILES NOT SHOWN
FOR CLARITY)

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -L-

SHEET 2 OF 4

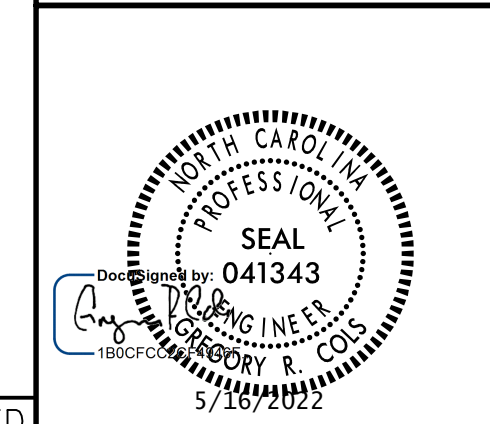


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON NC 14/87
OVER SMITH RIVER
BETWEEN SR 1700
AND SR 1714

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-02
1			3			TOTAL SHEETS
2			4			39



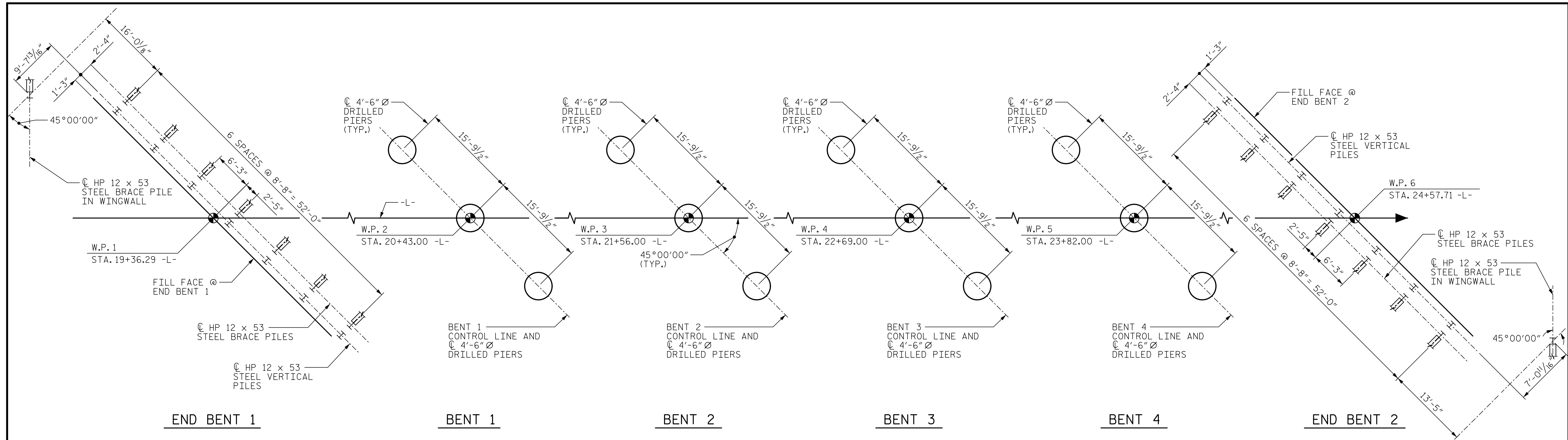
DRAWN BY : T.B. STUMP
CHECKED BY : G.R. COLS
DESIGNED BY : S. NATARAJAN
DESIGN CHECKED BY : G.R. COLS
DATE : 03/2019
DATE : 03/2019
DATE : 03/2019
DATE : 03/2019

DATE: 3/29/2019
TIME: 2:55:59 PM

USER: Bin (m) Chitrack
DN: F:\051705 - BR-0044\B01_CAD_GIS\B01_CAD\DOCC\DOT_TIP\Structures\4 Drawings\01_CAD_BR0044_S1U_6002.dgn

DATE: 3/29/2019
TIME: 2:45:29 PM

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DN: F:\60571095 -- BR-0044\BROU_CAD_GIS\9160_CAD\70_NCDDT_TIP\Structures\4 Drawings\01_005_BR0044_SMU_6003.dgn



FOUNDATION LAYOUT

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

FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 95 TONS PER PILE.

PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 80 TONS PER PILE.

DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE.

DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 140 TONS PER PILE.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

OBSERVE A ONE MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO THE BOTTOM OF CAP ELEVATION BEFORE BEGINNING END BENT CONSTRUCTION AT END BENTS NO.1 AND NO.2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 675 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 25 TSF.

INSTALL DRILLED PIERS AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 519.0 FEET WITH THE REQUIRED TIP RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.1 IS ELEVATION 532.3 FEET. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.1. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 536.0 FEET WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

DRILLED PIERS AT BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 675 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 10 TSF.

INSTALL DRILLED PIERS AT BENT NO.2 TO A TIP ELEVATION NO HIGHER THAN 519.0 FEET WITH THE REQUIRED TIP RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.2 IS ELEVATION 529.2 FEET. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT NO.2. DO NOT EXTEND PERMANENT CASING BELOW ELEVATION 533.0 FEET WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

DRILLED PIERS AT BENT NO.3 ARE DESIGNED FOR A FACTORED RESISTANCE OF 675 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 25 TSF.

INSTALL DRILLED PIERS AT BENT NO.3 TO A TIP ELEVATION NO HIGHER THAN 522.0 FEET WITH THE REQUIRED TIP RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.3 IS ELEVATION 533.0 FEET. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT NO.3. DO NOT EXTEND PERMANENT CASING BELOW ELEVATION 536.0 FEET WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

DRILLED PIERS AT BENT NO.4 ARE DESIGNED FOR A FACTORED RESISTANCE OF 675 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 10 TSF.

INSTALL DRILLED PIERS AT BENT NO.4 TO A TIP ELEVATION NO HIGHER THAN 506.0 FEET WITH THE REQUIRED TIP RESISTANCE.

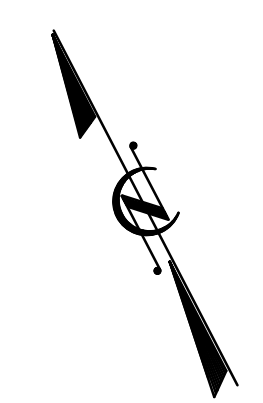
THE SCOUR CRITICAL ELEVATION FOR BENT NO.4 IS ELEVATION 527.8 FEET. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.4. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 531.0 FEET WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

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

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

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



PROJECT NO. BR-0044
ROCKINGHAM COUNTY
 STATION: 21+97.00 -L-

SHEET 3 OF 4

DRAWN BY : D.R. DRUM	DATE : 10/2019
CHECKED BY : G.R. COLS	DATE : 10/2019
DESIGNED BY : S. NATARAJAN	DATE : 07/2019
DESIGN CHECKED BY : G.R. COLS	DATE : 07/2019

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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

Professional Engineer Seal:
 SEAL
 No. 041343
 GARY R. COLS
 CIVIL ENGINEER
 5/15/2022

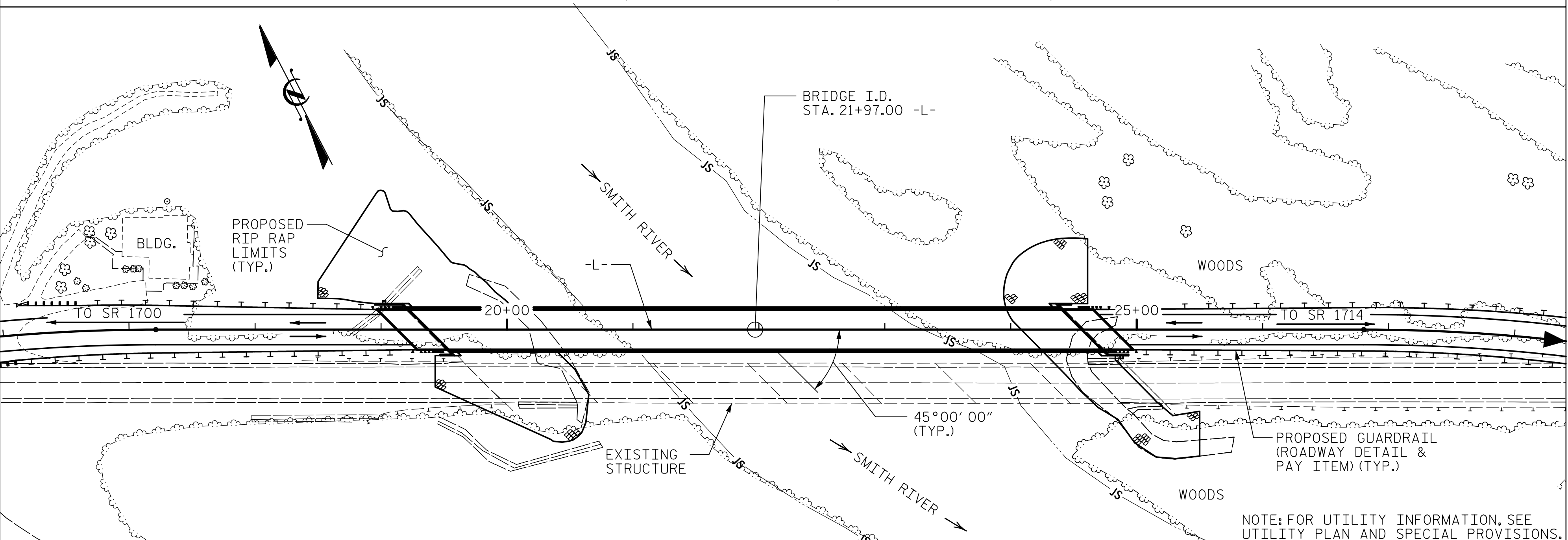
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON NC 14/87
 OVER SMITH RIVER
 BETWEEN SR 1700
 AND SR 1714

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-03
1			3			TOTAL SHEETS
2			4			39

B.M. #2: CHISELED SQUARE ON A CONCRETE SIGN BASE, -L- STA. 31+02.44, OFFSET 78.93' LT., N 1011660' E 1775161' EL. 572.78'



LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
 REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
 AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF SEVEN SPANS (7 @ 75') WITH ASPHALT WEARING SURFACE ON REINFORCED CONCRETE DECK AND STEEL I-BEAMS AND A CLEAR ROADWAY WIDTH OF 32'-0" ON REINFORCED CONCRETE SPILL-THRU ABUTMENTS AND CONCRETE BENT CAPS ON CONCRETE COLUMNS AND SPREAD FOOTINGS, AND LOCATED APPROX. 40 FT. DOWNSTREAM FROM PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
 THE SUBSTRUCTURE OF THE EXISTING BRIDGES INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
 REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
 THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEETS S-01 & S-02 SHALL BE EXCAVATED FOR A DISTANCE OF 18 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD FOR THE EXISTING STRUCTURE, 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 21+97.00 -L-".

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18 - EVALUATING SCOUR AT BRIDGES." FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS INCLUDED ON THE PLANS OR APPROVED BY THE ENGINEER.
 FOR FOUNDATION NOTES, SEE "FOUNDATION LAYOUT" SHEET.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 21+97.00 -L-.

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.

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 SCOUR CRITICAL ELEVATION FOR BENTS NO. 1, 2, 3, 4 ARE ELEVATIONS 532.3, 529.2, 533.0, AND 527.8, RESPECTIVELY. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE CONTRACTORS ATTENTION SHALL BE DRAWN TO THE FACT THAT ONLY 50% OF THE CHANNEL WILL BE ALLOWED TO BE BLOCKED AT ANY TIME. NO MORE THAN ONE TEMPORARY ACCESS CAUSEWAY MAY BE INSTALLED AT ANY ONE TIME. DEWATERING FOR REMOVAL OF EXISTING STRUCTURE IS PERMITTED ONLY WITHIN THE TEMPORARY ACCESS LIMITS SHOWN.

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

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
 STATION: 21+97.00 -L-

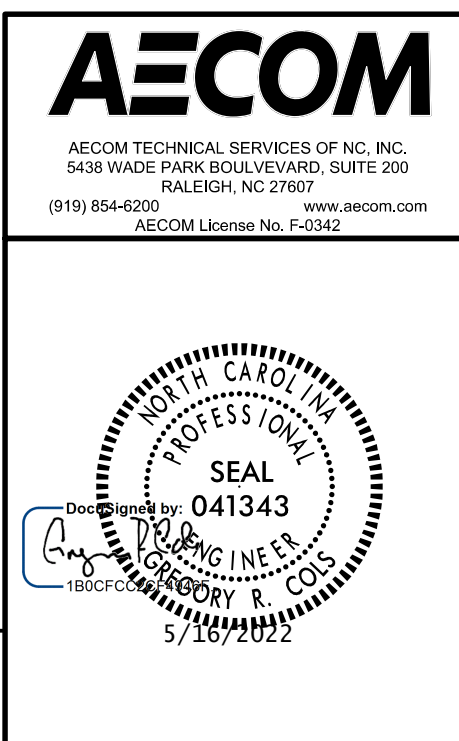
SHEET 4 OF 4

TOTAL BILL OF MATERIAL												
	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STA. 21+97.00 -L-	REMOVAL OF EXISTING STRUCTURE AT STA. 21+97.00 -L-	ASBESTOS ASSESSMENT	4'-6" Ø DRILLED PIERS IN SOIL	4'-6" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 4'-6" Ø DRILLED PIER	PDA TESTING	SID INSPECTION	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	EACH	LUMP SUM	SQ. FT.
SUPERSTRUCTURE												18,270
END BENT 1												
BENT 1				69.5	25	46.5						
BENT 2				26.8	40	24.4						
BENT 3				15.8	42	15.4						
BENT 4				96.8	30	54.0						
END BENT 2												
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	208.9	137	140.3	2	4	4	4	LUMP SUM	18,270

TOTAL BILL OF MATERIAL													
	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDER	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	HP 12x53 STEEL PILES	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	STRIP SEAL EXPANSION JOINTS
	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO. LIN. FT.	EACH	NO. LIN. FT.	LIN. FT.	TON	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	16,363					20 2,056.38			1,076.6			LUMP SUM	LUMP SUM
END BENT 1		78.7		8,936			15	15 615		1,946	2,162		
BENT 1		84.5		17,784	5,741								
BENT 2		91.5		17,050	5,406								
BENT 3		85.5		15,826	4,738								
BENT 4		69.5		17,702	5,657								
END BENT 2		75.4		9,009			15	15 615		1,075	1,194		
TOTAL	16,363	485.1	LUMP SUM	86,307	21,542	20 2,056.38	30	30 1,230	1,076.6	3,021	3,356	LUMP SUM	LUMP SUM

DRAWN BY : D.R. DRUM DATE : 12/2019
 CHECKED BY : G.R. COLS DATE : 12/2019
 DESIGNED BY : D.R. DRUM DATE : 12/2019
 DESIGN CHECKED BY : G.R. COLS DATE : 12/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON NC 14/87
 OVER SMITH RIVER
 BETWEEN SR 1700
 AND SR 1714

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-04
1			3			TOTAL SHEETS
2			4			39

DATE: 4/15/2022 TIME: 3:44:57 PM
 USER: gregcolby DON: 12/2019 - BR-0044-800-CAD-GIS-9160-CAD-DY-NCDDT_TIP-Structures-04 Drawings-01_DOT_BROOK-L-SMU-GOOD-04gm

LOAD FACTORS:

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

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE										COMMENT NUMBER
						MOMENT					SHEAR					MOMENT										
						LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)				
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.19	--	1.75	0.774	1.33	A	E	51.0	1.039	1.30	E	I	50.0	0.80	0.774	1.19	A	E	51.0				
	HL-93 (OPERATING)	N/A		1.72	--	1.35	0.774	1.72	A	E	51.0	1.039	2.09	A	I	82.0	N/A	--	--	--	--	--				
	HS-20 (INVENTORY)	36.000	②	1.69	60.84	1.75	0.774	1.86	E	E	35.5	1.039	2.13	A	I	82.0	0.80	0.774	1.69	A	E	51.0				
	HS-20 (OPERATING)	36.000		2.41	86.76	1.35	0.774	2.41	E	E	35.5	1.039	2.80	A	I	82.0	N/A	--	--	--	--	--				
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.12	55.62	1.40	0.774	5.31	E	E	35.5	1.039	6.82	A	I	82.0	0.80	0.774	4.12	A	E	51.0			
		SNGARBS2	20.000		2.92	58.40	1.40	0.774	3.94	E	E	35.5	1.039	4.74	A	I	82.0	0.80	0.774	2.92	A	E	51.0			
		SNAGRIS2	22.000		2.71	59.62	1.40	0.774	3.68	E	E	35.5	1.039	4.37	A	I	82.0	0.80	0.774	2.71	A	E	51.0			
		SNCOTTS3	27.250		2.01	54.77	1.40	0.774	2.63	E	E	35.5	1.039	3.33	A	I	82.0	0.80	0.774	2.01	A	E	51.0			
		SNAGGRS4	34.925		1.64	57.28	1.40	0.774	2.19	E	E	35.5	1.039	2.69	A	I	82.0	0.80	0.774	1.64	A	E	51.0			
		SNS5A	35.550		1.61	57.24	1.40	0.774	2.15	E	E	35.5	1.039	2.70	A	I	82.0	0.80	0.774	1.61	A	E	51.0			
		SNS6A	39.950		1.47	58.73	1.40	0.774	1.96	E	E	35.5	1.039	2.44	A	I	82.0	0.80	0.774	1.47	A	E	51.0			
		SNS7B	42.000		1.39	58.38	1.40	0.774	1.87	E	E	35.5	1.039	2.37	A	I	82.0	0.80	0.774	1.39	A	E	51.0			
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.77	58.41	1.40	0.774	2.39	E	E	35.5	1.039	2.94	A	I	82.0	0.80	0.774	1.77	A	E	51.0			
		TNT4A	33.075		1.78	58.87	1.40	0.774	2.39	E	E	35.5	1.039	2.88	A	I	82.0	0.80	0.774	1.78	A	E	51.0			
		TNT6A	41.600		1.44	59.90	1.40	0.774	1.95	E	E	35.5	1.039	2.49	A	I	82.0	0.80	0.774	1.44	A	E	51.0			
		TNT7A	42.000		1.44	60.48	1.40	0.774	1.96	E	E	35.5	1.039	2.45	A	I	82.0	0.80	0.774	1.44	A	E	51.0			
		TNT7B	42.000		1.46	61.32	1.40	0.774	2.01	E	E	35.5	1.039	2.33	A	I	82.0	0.80	0.774	1.46	A	E	51.0			
		TNAGRIT4	43.000		1.41	60.63	1.40	0.774	1.93	E	E	35.5	1.039	2.25	A	I	82.0	0.80	0.774	1.41	A	E	51.0			
		TNAGT5A	45.000		1.34	60.30	1.40	0.774	1.82	E	E	35.5	1.039	2.21	A	I	82.0	0.80	0.774	1.34	A	E	51.0			
TNAGT5B	45.000		③	1.33	59.85	1.40	0.774	1.80	E	E	35.5	1.039	2.14	A	I	82.0	0.80	0.774	1.33	A	E	51.0				

NOTES:

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

COMMENTS:

1. FUTURE WEARING SURFACE IS NOT INCLUDED

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

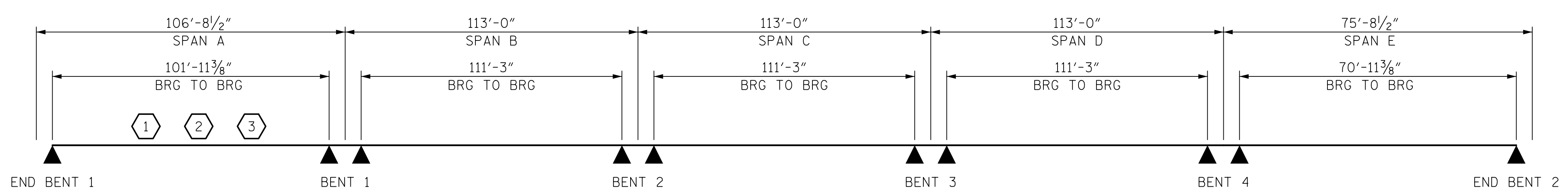
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
E - EXTERIOR GIRDER



LRFR SUMMARY

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS

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

SHEET NO. S-05
TOTAL SHEETS 39

5/15/2022

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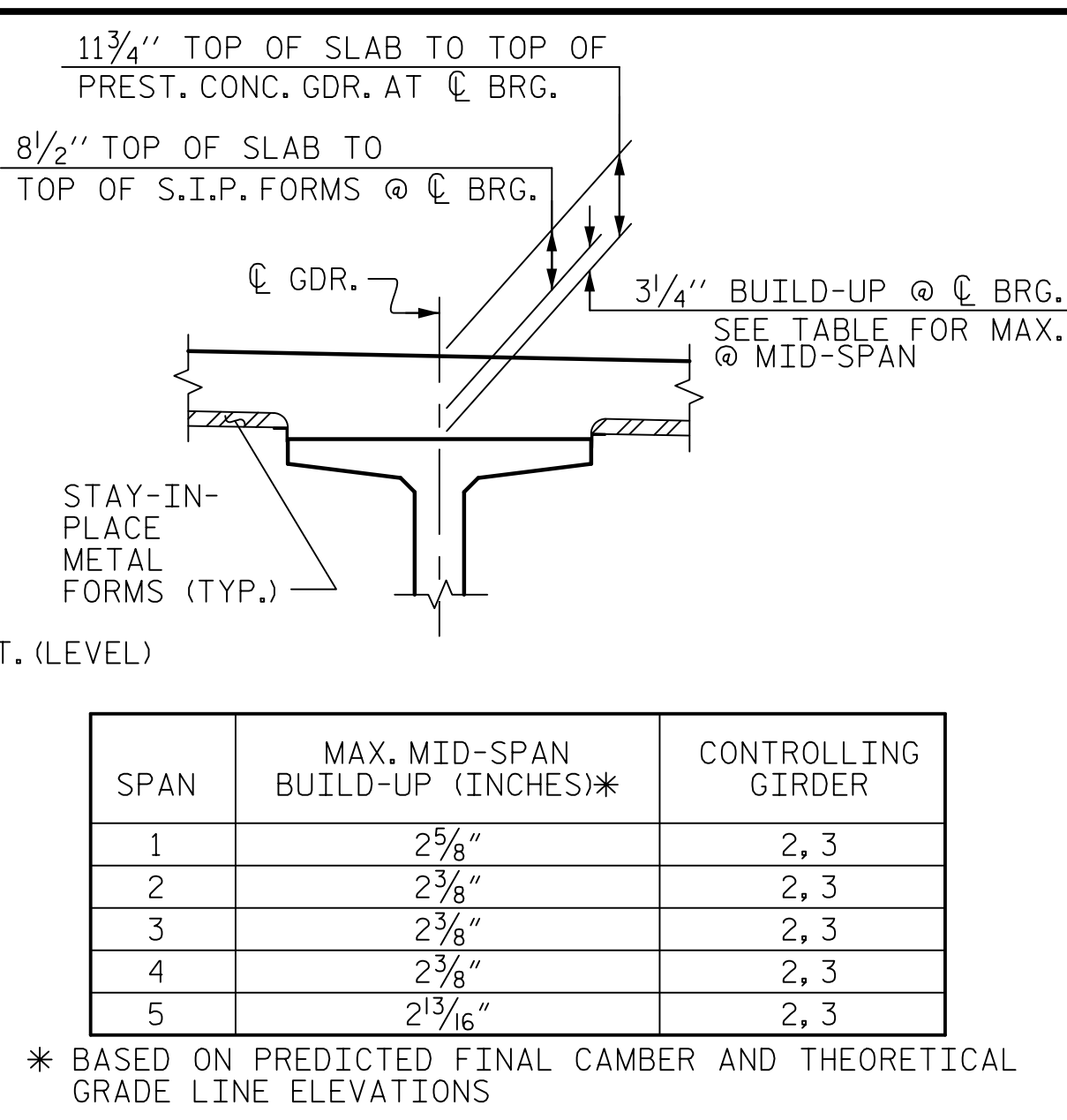
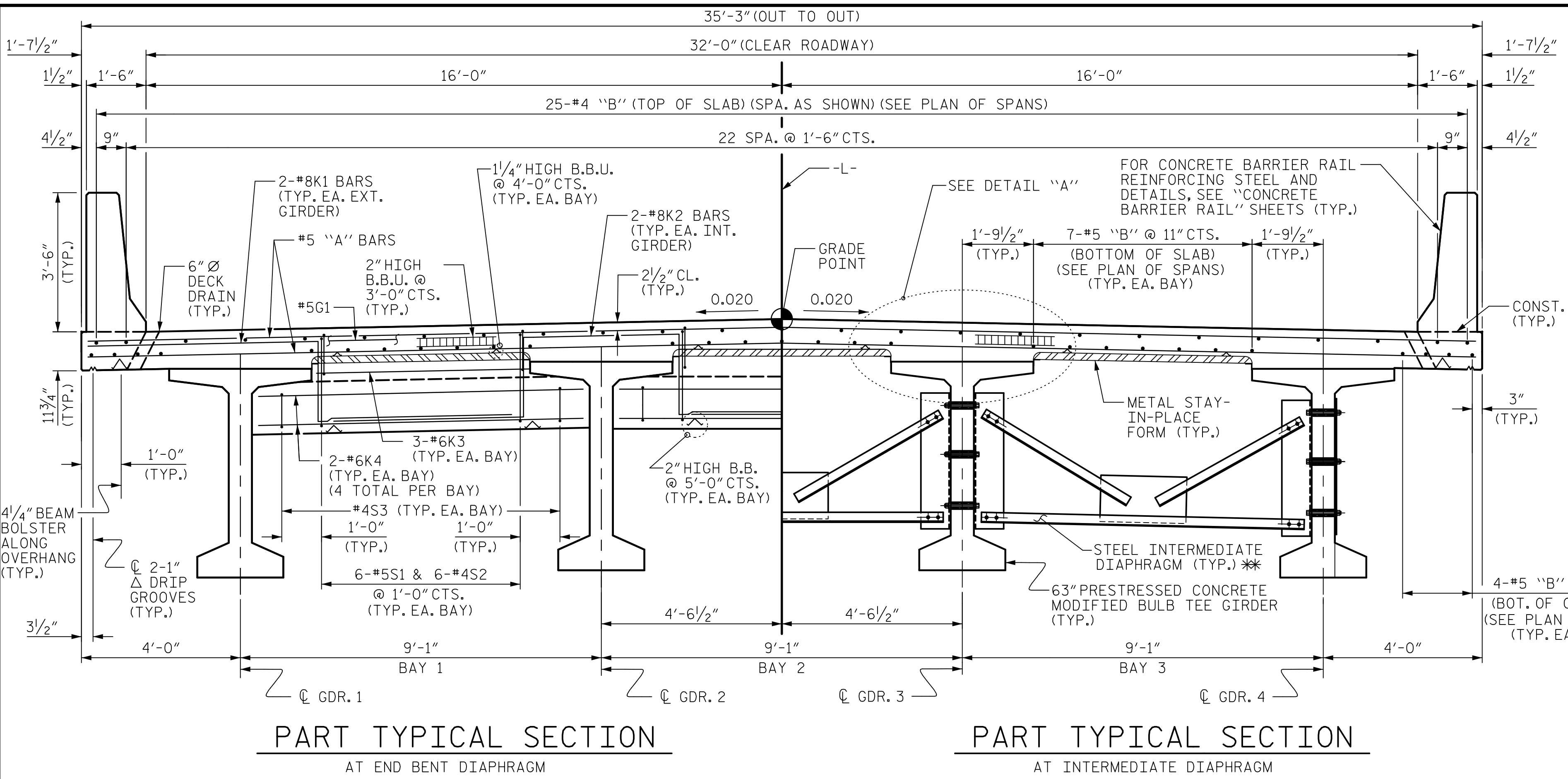
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ASSEMBLED BY : D.R. DRUM	DATE : 02/2022
CHECKED BY : S. NATARAJAN	DATE : 03/2022
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

DATE: 3/29/2022
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DGN: F:\60571055 - BR-0044\BROU_CAD_GIS\9160_CAD\070_ICDOT_TIP\Structures\4 Drawings\401_D001_BROU44_SMT_S01.dgn



DETAIL "A"

NOTES:

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

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

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

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

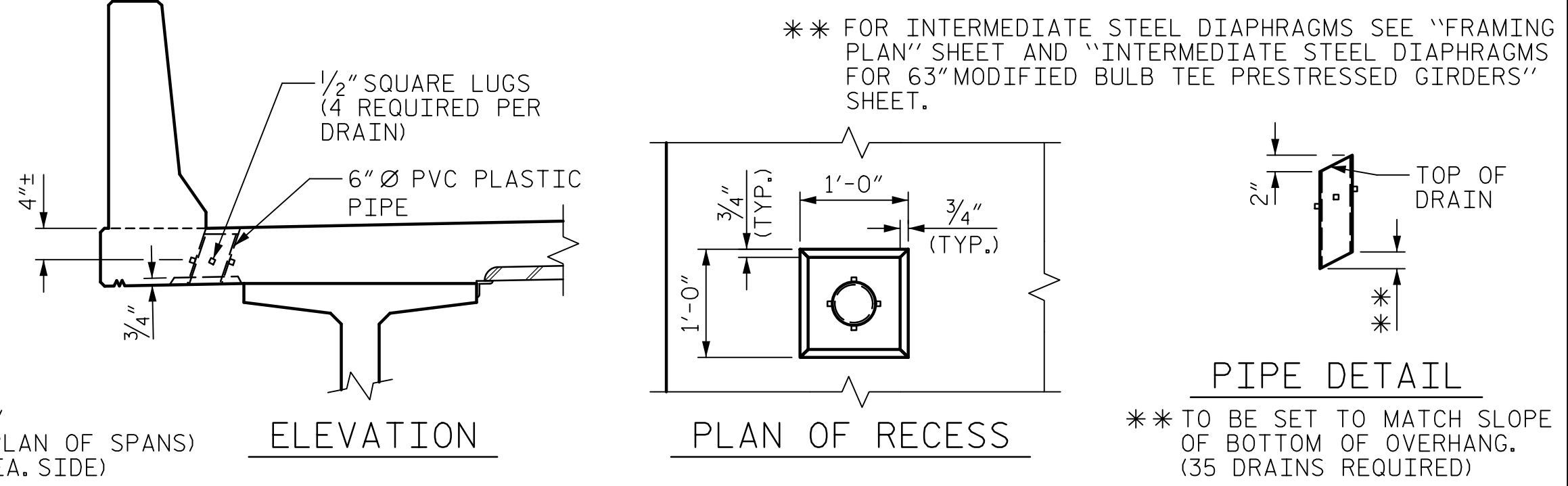
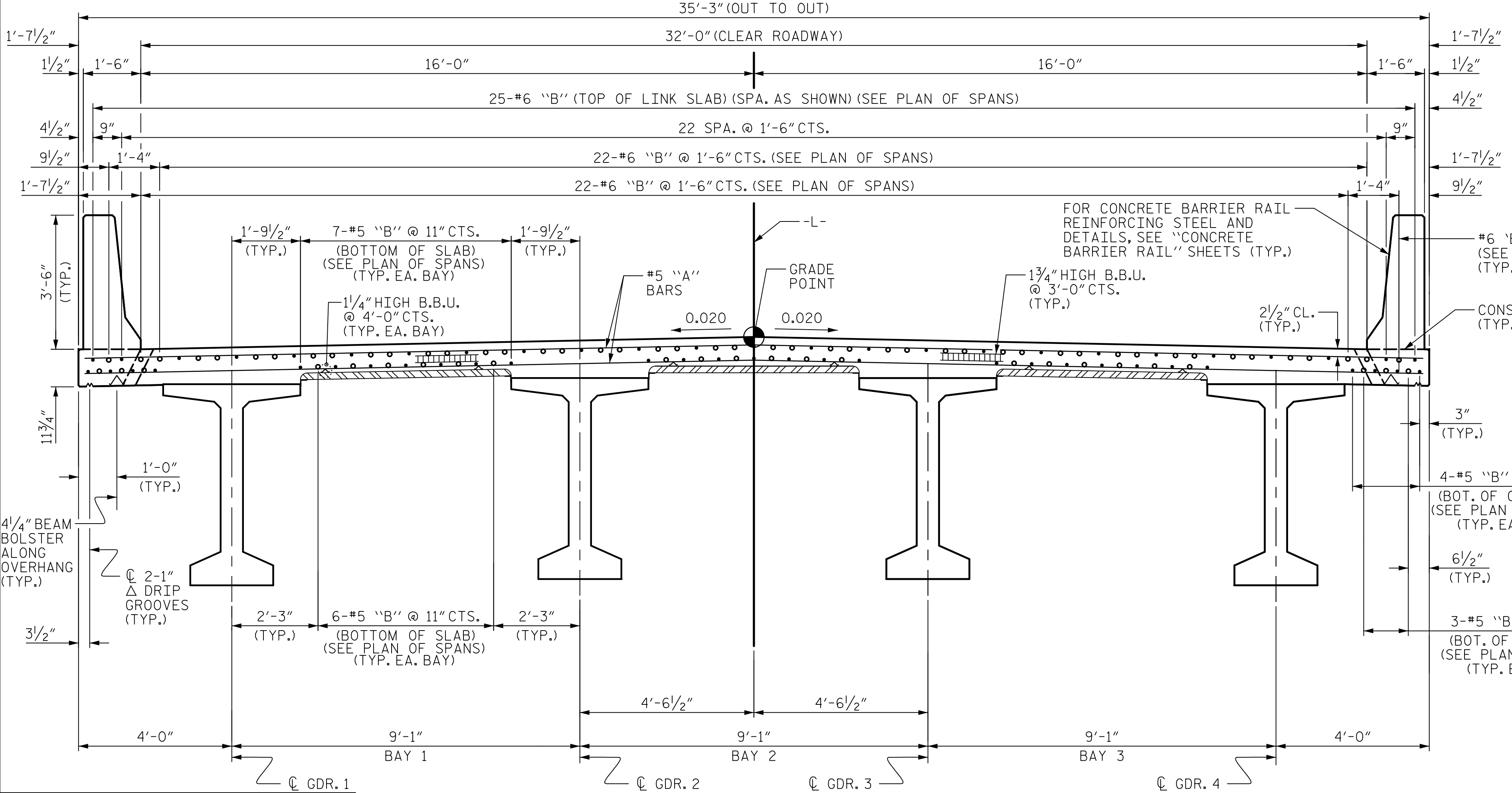
FOR CONCRETE BARRIER RAIL REINFORCING AND DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.

FOR STRIP SEAL EXPANSION JOINTS, SEE SPECIAL PROVISIONS.

ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED.

FOR 6" Ø DECK DRAINS, SEE DETAIL THIS SHEET. FOR LOCATIONS AND SPACING OF DECK DRAINS, SEE "PLAN OF SPANS" SHEETS.

REINFORCING STEEL MAY BE SHIFTED, AS NECESSARY, TO AVOID INTERFERENCE WITH DECK DRAINS. AT THE CONTRACTORS OPTION, WITHIN THE DECK POUR OVER THE BENTS WHERE 7 #5 "B" BARS ARE PRESENT IN THE BOTTOM OF EACH OVERHANG, A MAXIMUM OF 1 BOTTOM "B" BAR IN EACH OVERHANG MAY BE CUT AROUND THE DRAIN. SPLICE EQUIVALENT SUPPLEMENTAL REINFORCING WITHIN THE OVERHANG AT EACH CUT LOCATION AT THE MINIMUM SPLICE LENGTHS REQUIRED ON THE PLANS. CUTTING AND SPLICING SUPPLEMENTAL REINFORCING SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE "REINFORCED CONCRETE SLAB".



DRAIN DETAILS

TOP OF FLOOR DRAINS TO BE SET 3/8" BELOW SURFACE OF SLAB.

4 - 1/2" SQUARE LUGS TO BE GLUED TO THE P.V.C. PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.

THE 6" Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
 STATION: 21+97.00 -L-

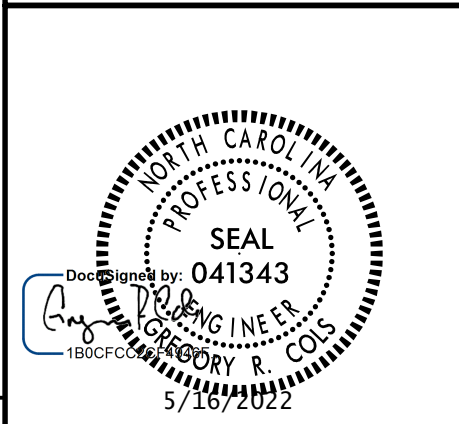
SHEET 1 OF 2

DRAWN BY : B.D. HODACK
 CHECKED BY : G.R. COLS
 DESIGNED BY : B.D. HODACK
 DESIGN CHECKED BY : G.R. COLS

DATE : 02/2022
 DATE : 03/2022
 DATE : 02/2022
 DATE : 03/2022

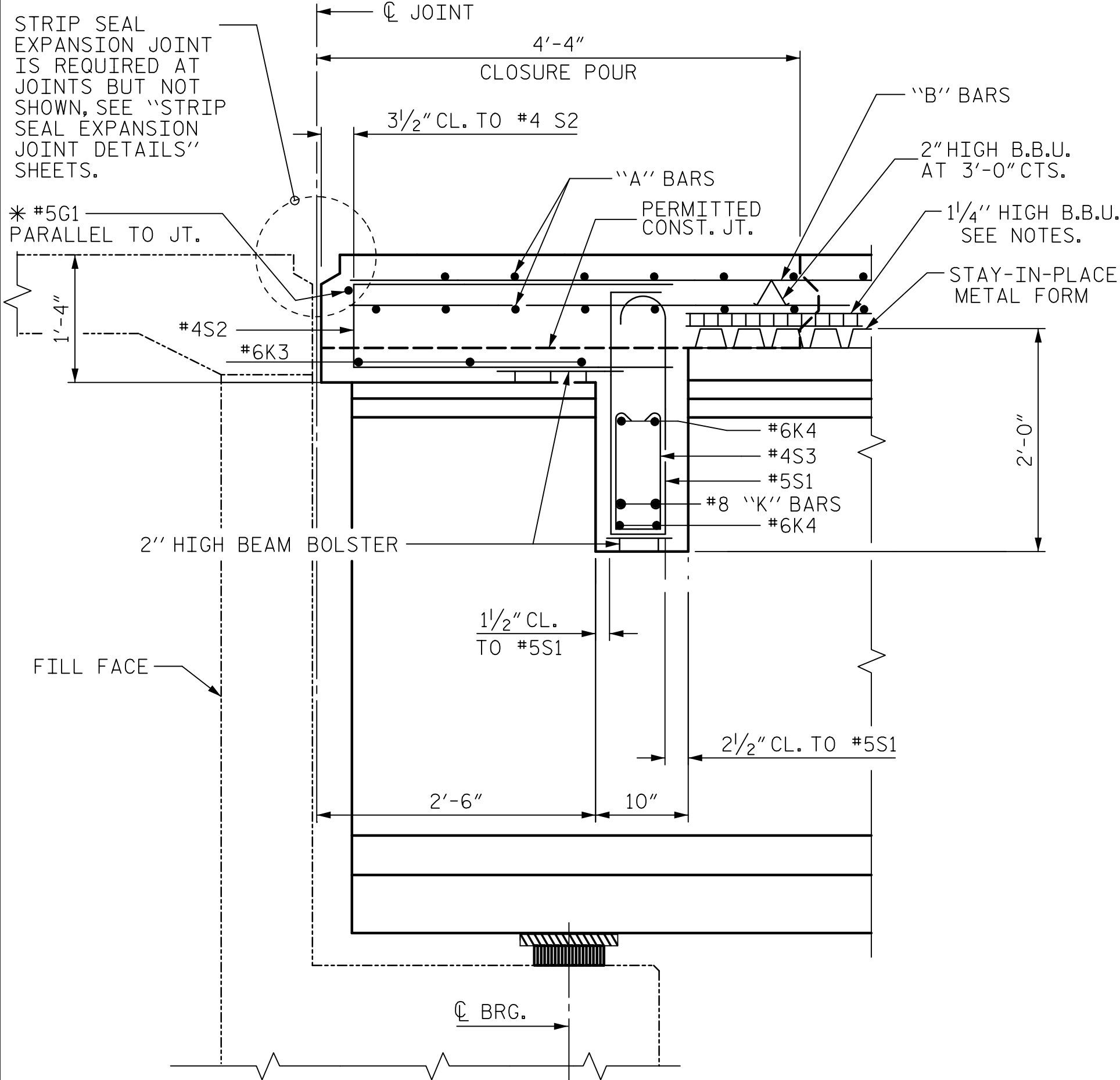
TYPICAL SECTION
 LINK SLAB AT BENTS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



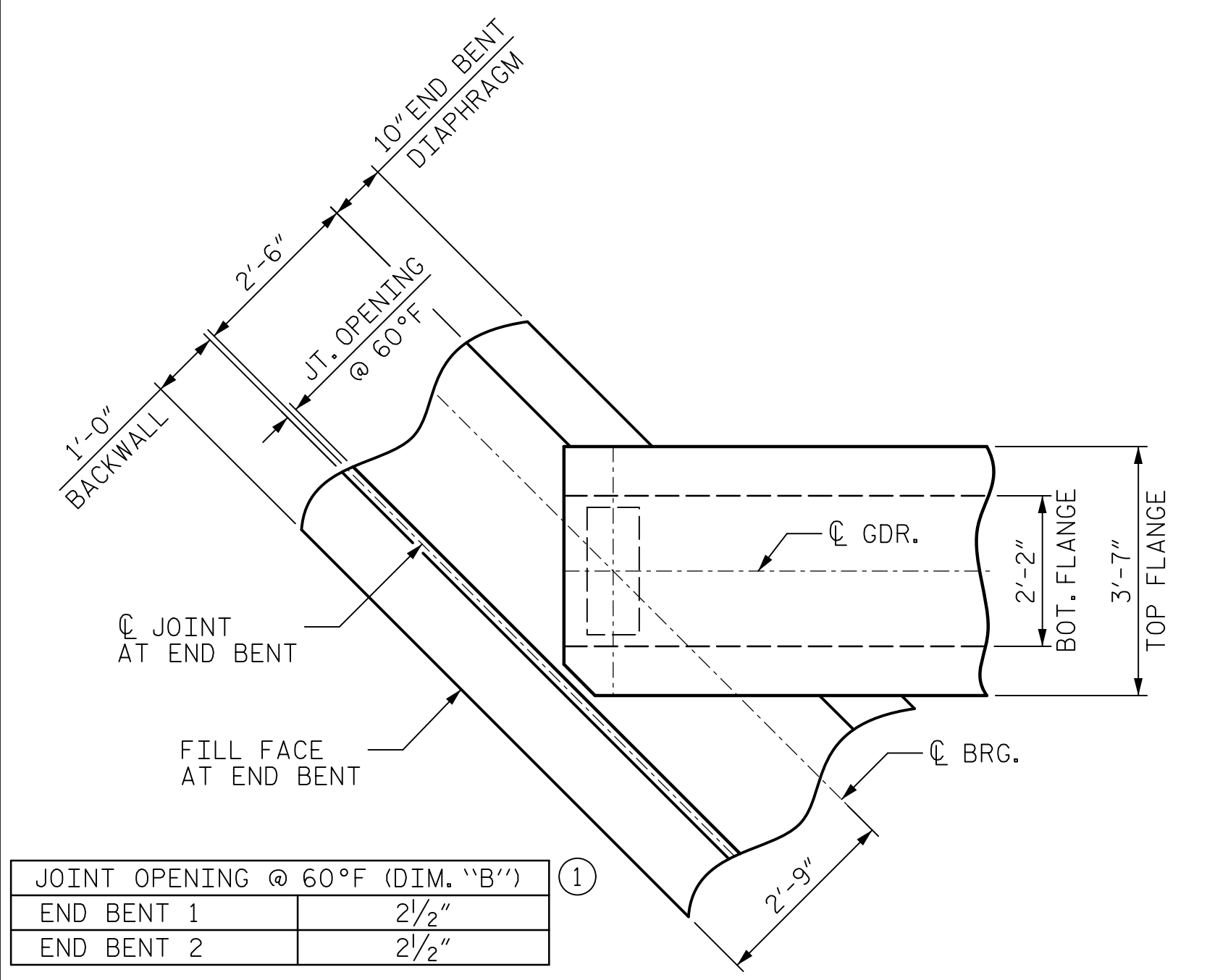
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
TYPICAL SECTION & DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-06
 TOTAL SHEETS 39



SECTION THRU END BENT DIAPHRAGMS
(SECTION NORMAL TO END BENT)

* #5G1 MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS.

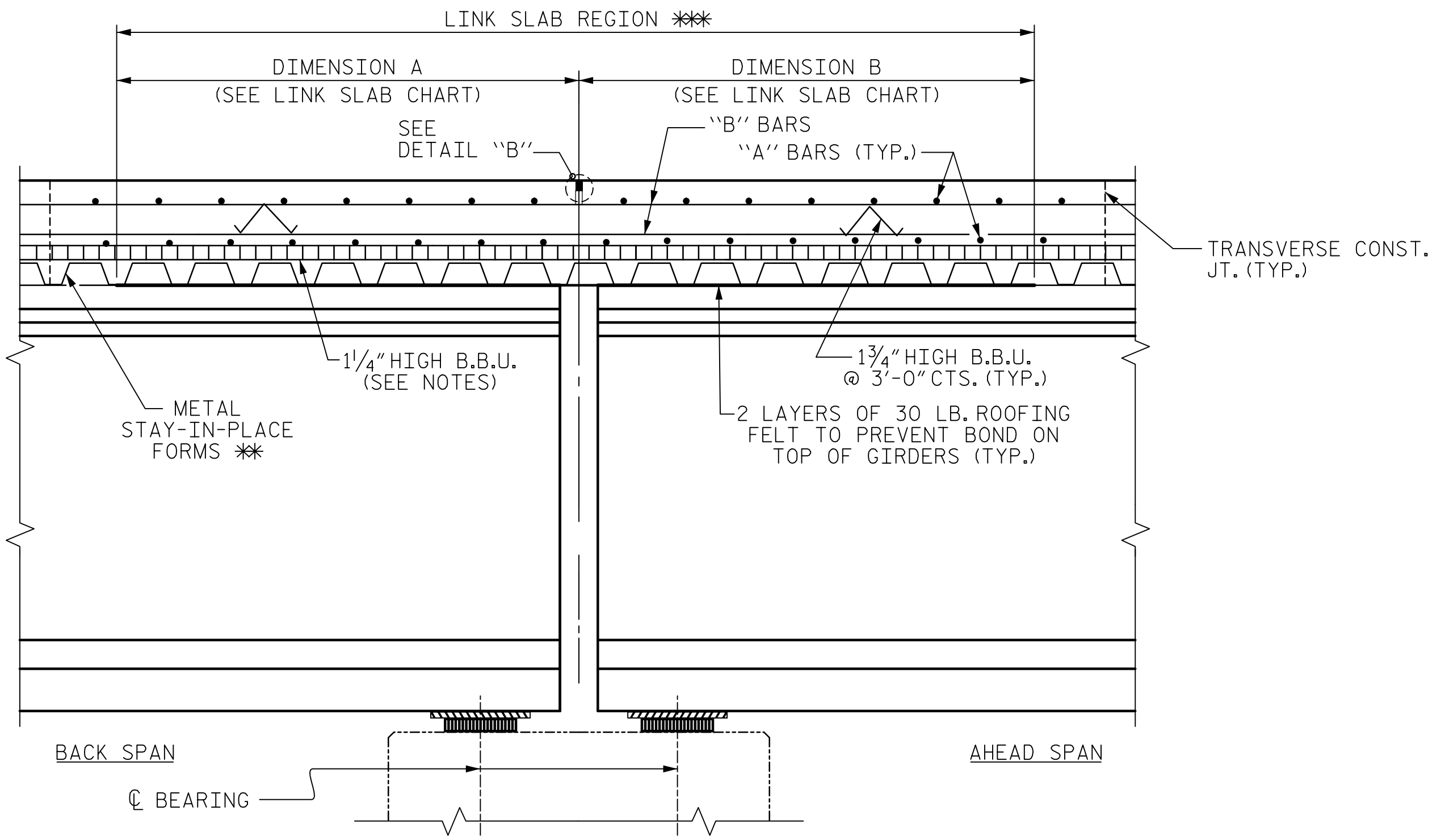


JOINT OPENING @ 60°F (DIM. "B")	
END BENT 1	2 1/2"
END BENT 2	2 1/2"

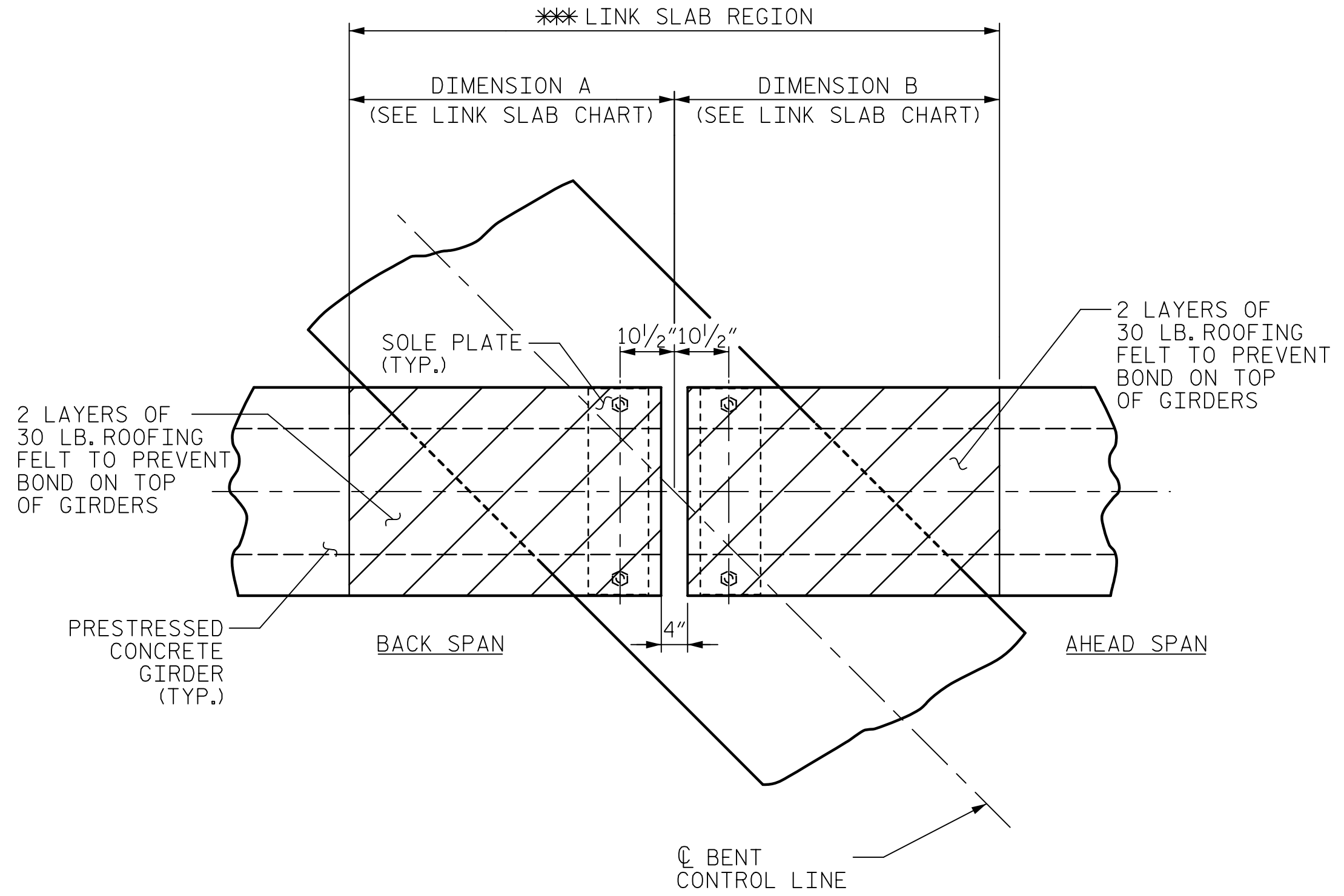
PLAN OF GIRDER AT END BENT

① SEE "STRIP SEAL EXPANSION JOINT DETAILS" SHEETS FOR DIM "B"

DRAWN BY : B.D. HODACK	DATE : 02/2022
CHECKED BY : G.R. COLS	DATE : 03/2022
DESIGNED BY : B.D. HODACK	DATE : 02/2022
DESIGN CHECKED BY : G.R. COLS	DATE : 03/2022



SECTION @ LINK SLAB
SECTION SHOWN ALONG GIRDER

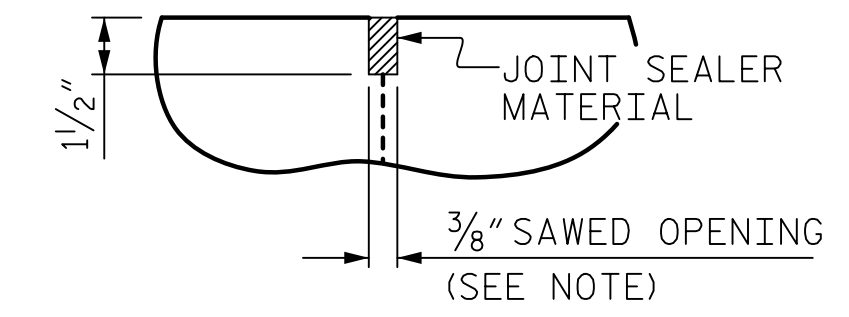


***: THE TOP OF GIRDER IN THE REGION OF THE LINK SLAB SHALL BE SMOOTH (NOT RAKED) AND FREE OF STIRRUPS, ANCHOR STUDS, DECK FORMWORK ATTACHMENTS, AND OVERHANG FALSEWORK/FORMWORK ATTACHMENTS.

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

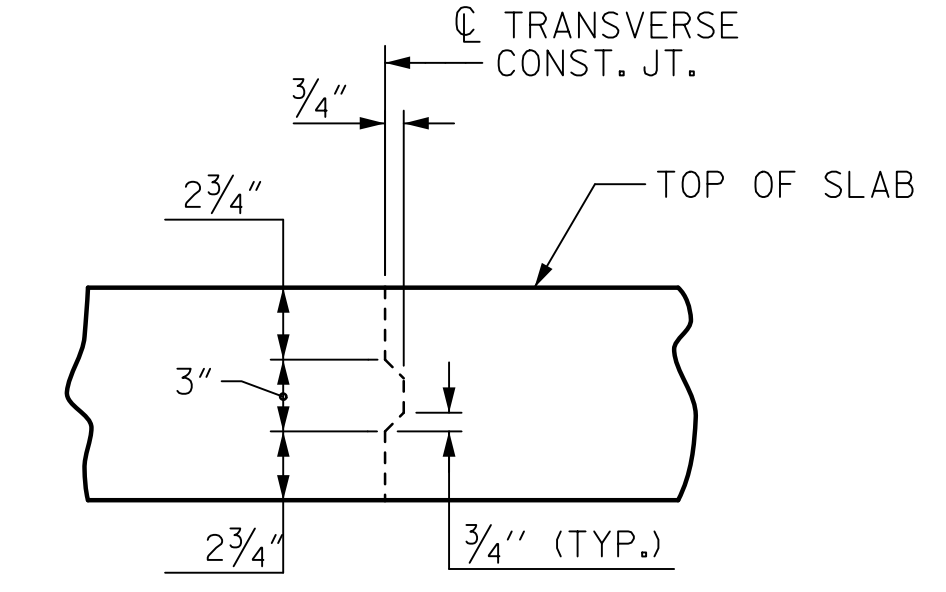
PLAN @ BENT

LINK SLAB CHART		
BENT No.	A	B
1	6'-2"	6'-2"
2	6'-2"	6'-2"
3	6'-2"	6'-2"
4	6'-2"	4'-2"



A 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"

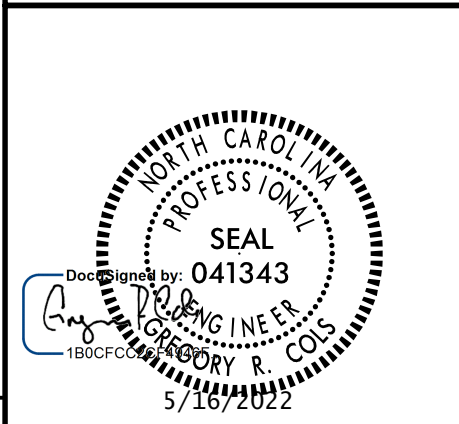


TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

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

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-07
1			3			TOTAL SHEETS
2			4			39

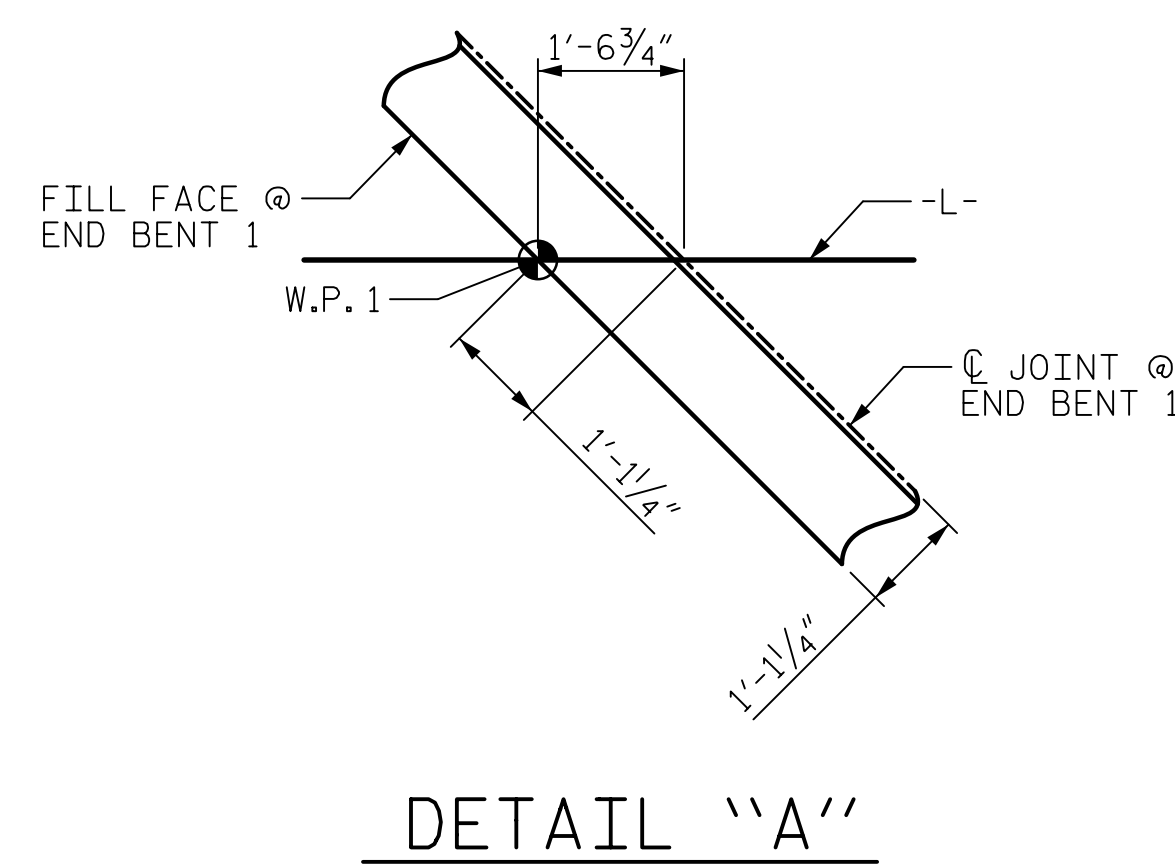
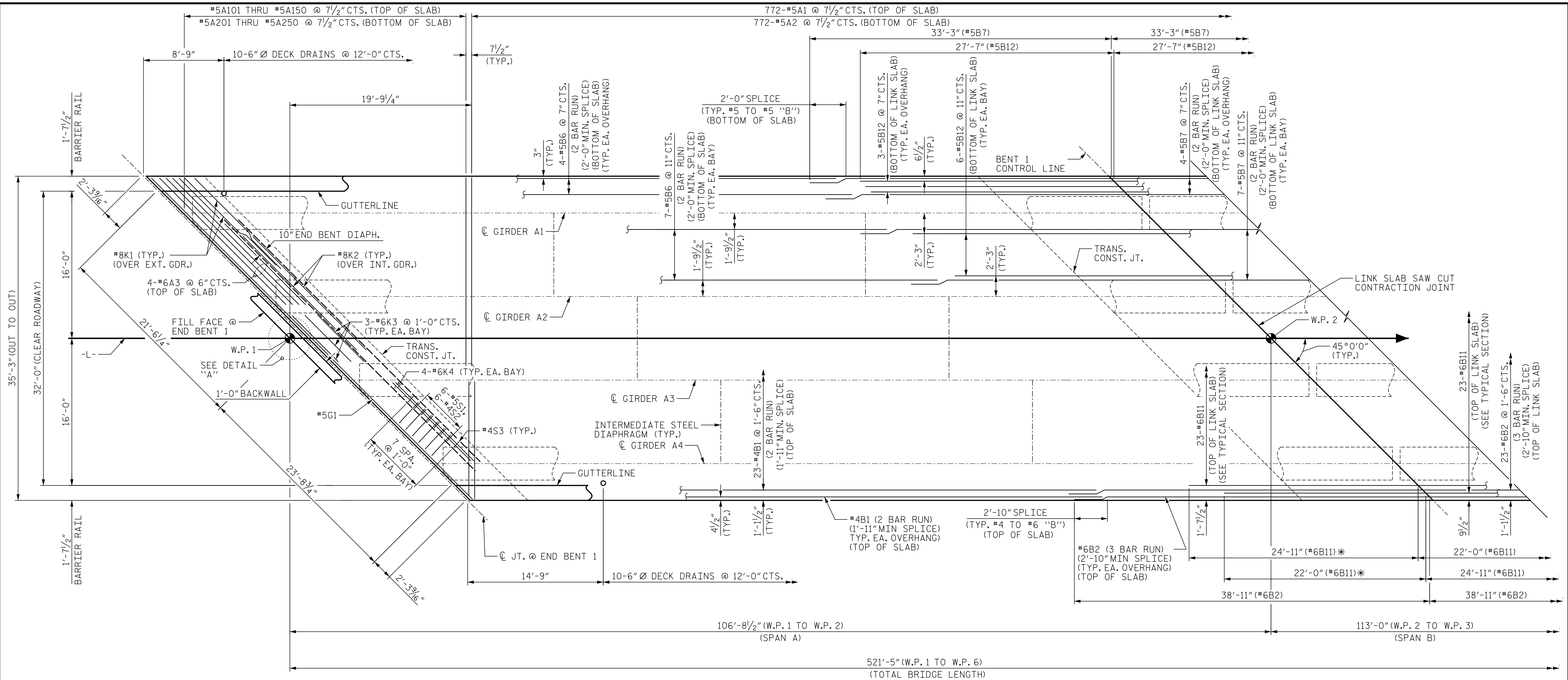
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- NOTES:**
- FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.
 - FOR SECTION VIEWS, SEE "TYPICAL & SECTION DETAILS" SHEET.
 - FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.
 - FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET.
 - FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "POURING SEQUENCE" ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEETS.
 - FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "TYPICAL SECTION DETAILS" SHEET.
 - LINK SLAB SAW CUT CONTRACTION JOINTS EXTEND TO THE EDGE OF DECK ON BOTH SIDES.

* STAGGER ALTERNATING RUNS OF #6B11 BY 2'-11" AS SHOWN

DRAWN BY :	B.D. HODACK	DATE :	02/2022
CHECKED BY :	G.R. COLS	DATE :	03/2022
DESIGNED BY :	B.D. HODACK	DATE :	02/2022
DESIGN CHECKED BY :	G.R. COLS	DATE :	03/2022

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

Professional Engineer Seal
Seal No. 041343
Date: 5/15/2022

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

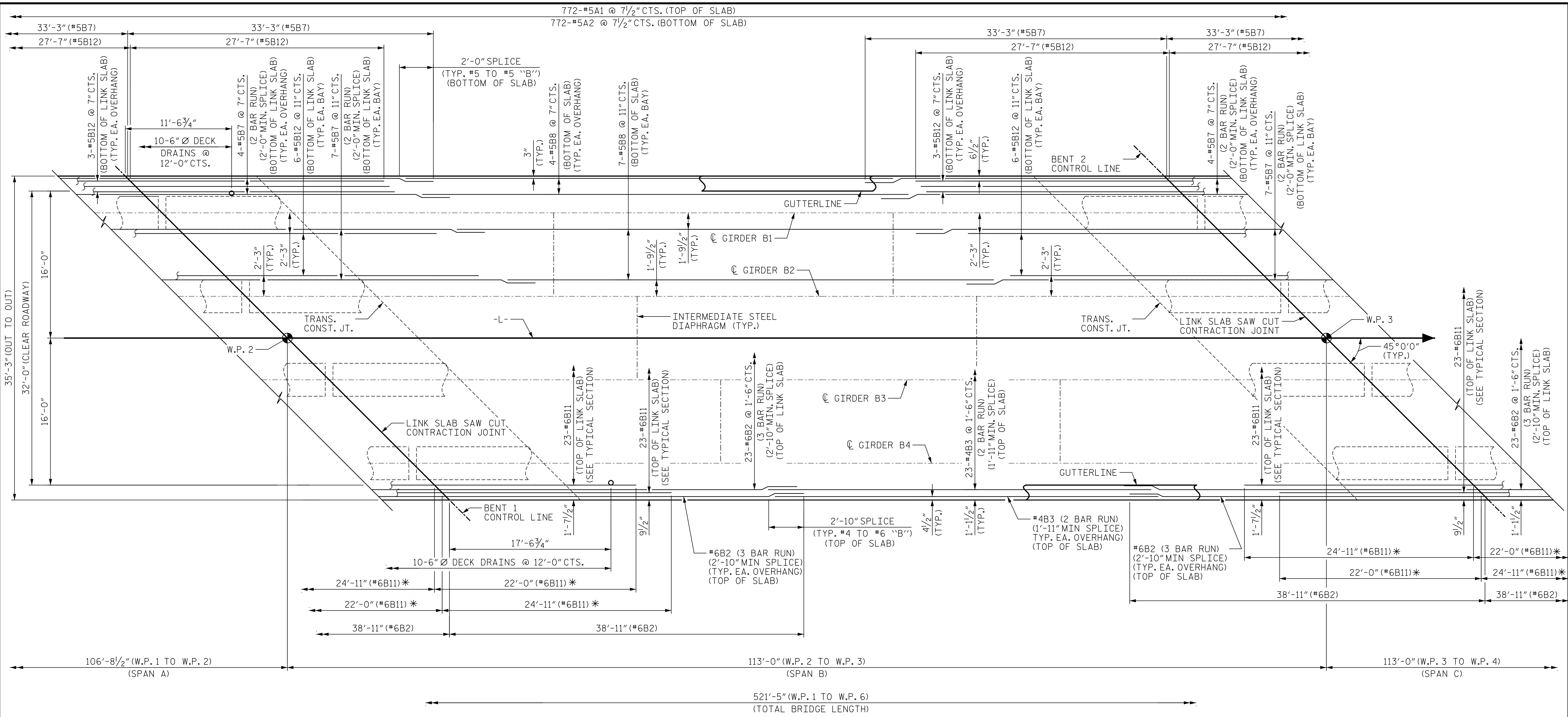
SUPERSTRUCTURE
**PLAN OF SPANS
SPAN A**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-08
1			3			TOTAL SHEETS
2			4			39

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TIME: 2:46:35 PM

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PLAN OF SPAN B

* STAGGER ALTERNATING RUNS OF #6B11 BY 2'-11", AS SHOWN.

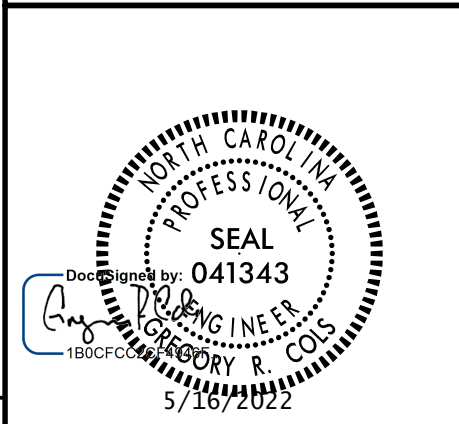
NOTES:

- FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.
- FOR SECTION VIEWS, SEE "TYPICAL & SECTION DETAILS" SHEET.
- FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.
- FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET.
- FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "POURING SEQUENCE" ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEETS.
- FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "TYPICAL SECTION DETAILS" SHEET.
- LINK SLAB SAW CUT CONTRACTION JOINTS EXTEND TO THE EDGE OF DECK ON BOTH SIDES.

PROJECT NO. BR-0044
 ROCKINGHAM COUNTY
 STATION: 21+97.00 -L-

SHEET 2 OF 5

DRAWN BY : B.D. HODACK	DATE : 02/2022
CHECKED BY : G.R. COLS	DATE : 03/2022
DESIGNED BY : B.D. HODACK	DATE : 02/2022
DESIGN CHECKED BY : G.R. COLS	DATE : 03/2022

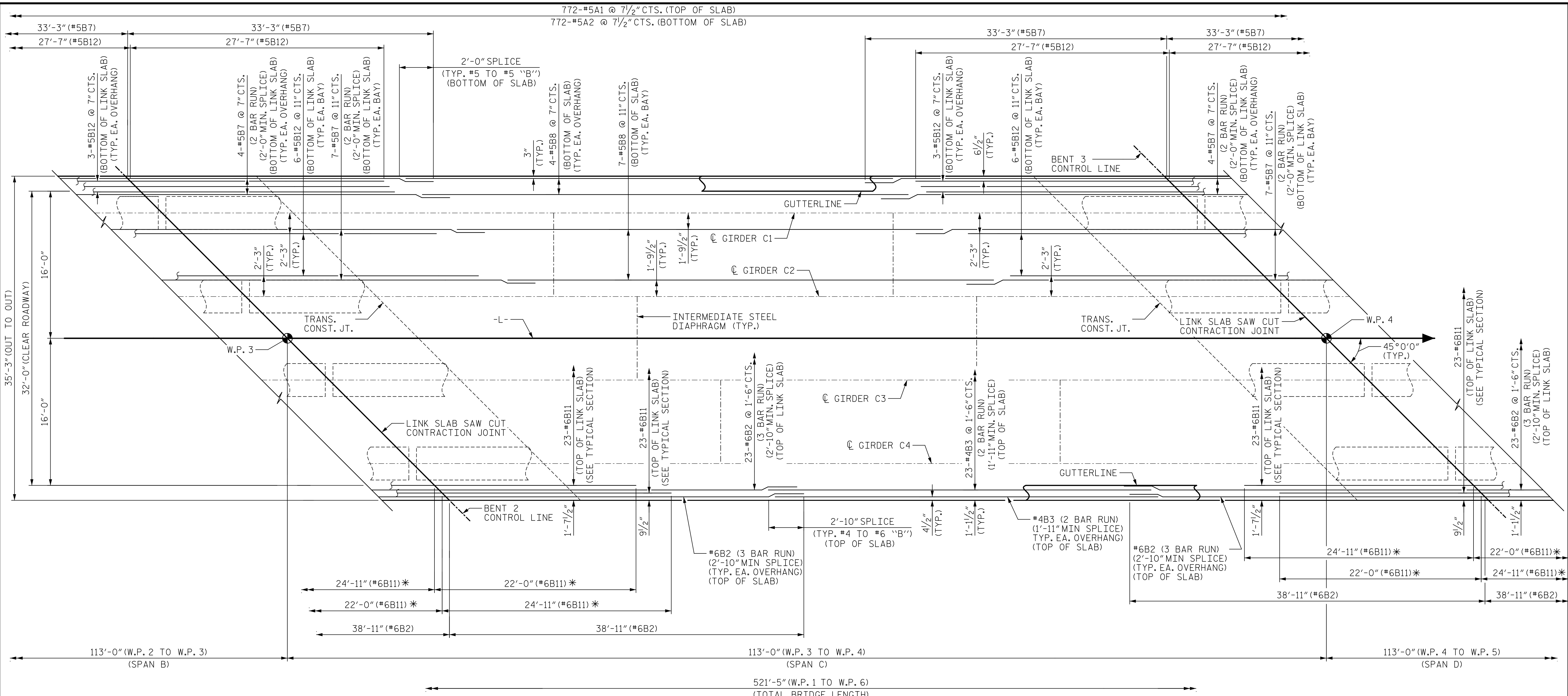


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
PLAN OF SPANS SPAN B					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-09
TOTAL SHEETS					39

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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PLAN OF SPAN C

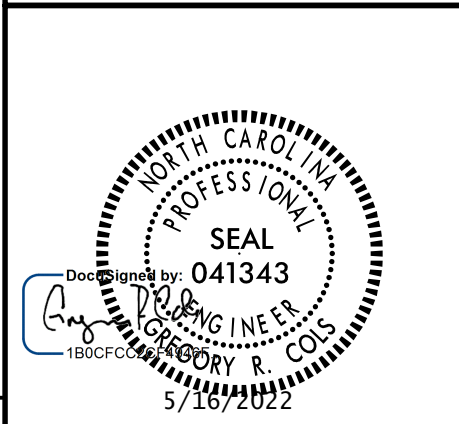
* STAGGER ALTERNATING RUNS OF #6B11 BY 2'-11", AS SHOWN.

NOTES:

- FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.
- FOR SECTION VIEWS, SEE "TYPICAL & SECTION DETAILS" SHEET.
- FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.
- FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET.
- FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "POURING SEQUENCE" ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEETS.
- FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "TYPICAL SECTION DETAILS" SHEET.
- LINK SLAB SAW CUT CONTRACTION JOINTS EXTEND TO THE EDGE OF DECK ON BOTH SIDES.

PROJECT NO. BR-0044
 ROCKINGHAM COUNTY
 STATION: 21+97.00 -L-

SHEET 3 OF 5



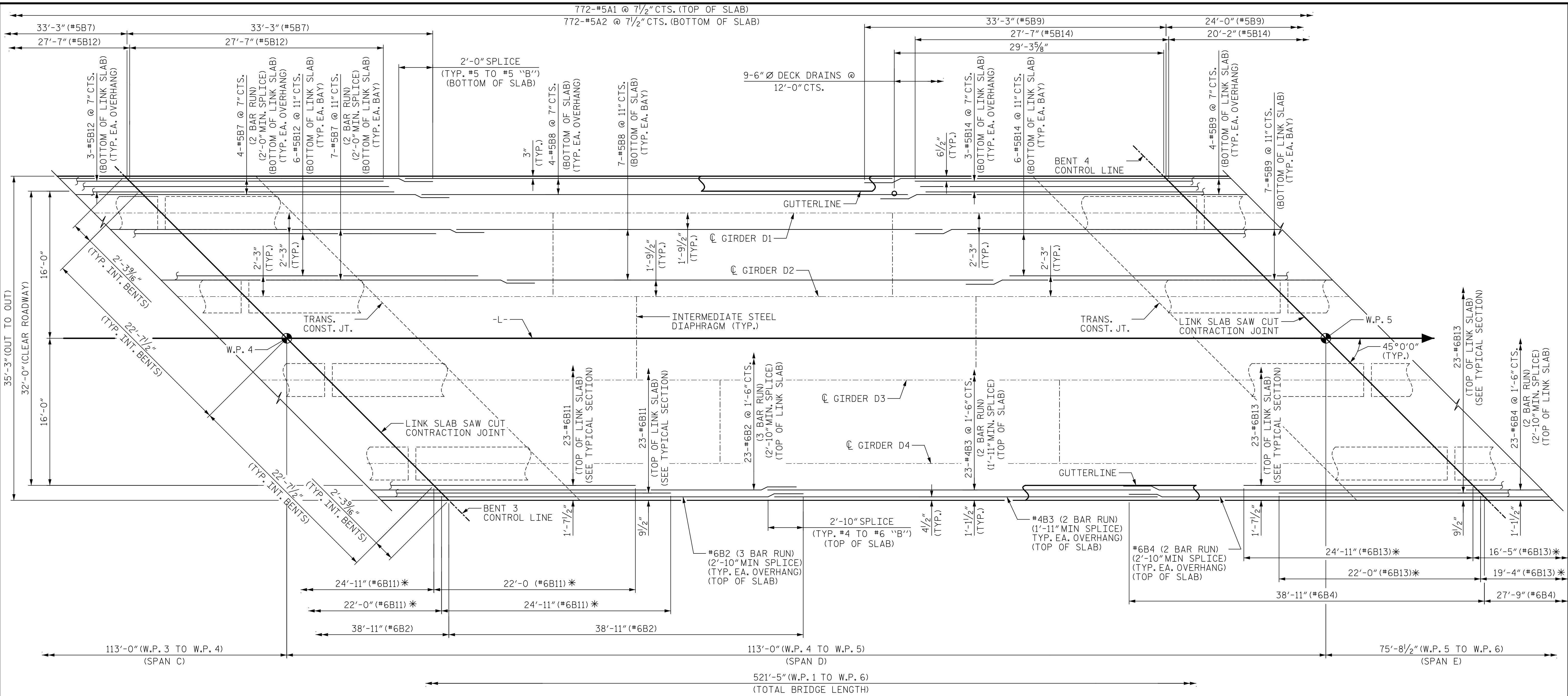
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
PLAN OF SPANS SPAN C					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-10
TOTAL SHEETS					39

DRAWN BY : B.D. HODACK	DATE : 02/2022
CHECKED BY : G.R. COLS	DATE : 03/2022
DESIGNED BY : B.D. HODACK	DATE : 02/2022
DESIGN CHECKED BY : G.R. COLS	DATE : 03/2022

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DATE: 3/29/2022
TIME: 2:58:17 PM

USER: BinJamo.C@hcdock
DIR: R:\Structures\04 Drawings\01_0201_LBR0044_SML_S04.dgn



PLAN OF SPAN D

* STAGGER ALTERNATING RUNS OF #6B13 OR #6B11 BY 2'-11", AS SHOWN.

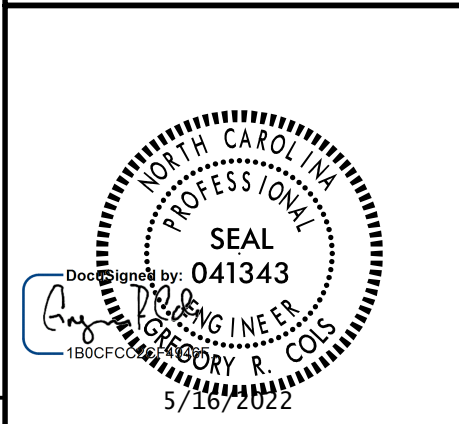
NOTES:

- FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.
- FOR SECTION VIEWS, SEE "TYPICAL & SECTION DETAILS" SHEET.
- FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.
- FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET.
- FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "POURING SEQUENCE" ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEETS.
- FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "TYPICAL SECTION DETAILS" SHEET.
- LINK SLAB SAW CUT CONTRACTION JOINTS EXTEND TO THE EDGE OF DECK ON BOTH SIDES.

PROJECT NO. BR-0044
 ROCKINGHAM COUNTY
 STATION: 21+97.00 -L-

SHEET 4 OF 5

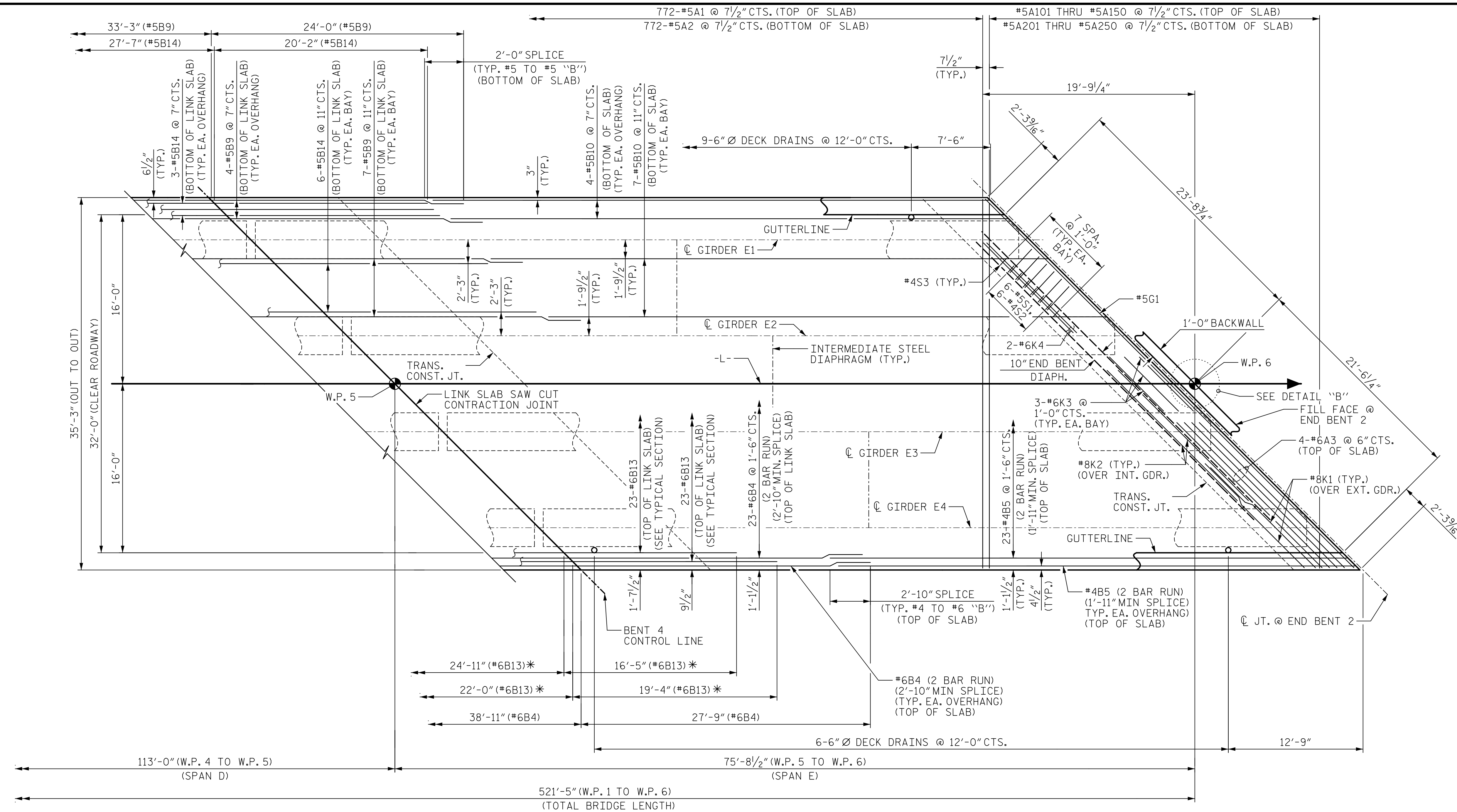
DRAWN BY : B.D. HODACK DATE : 02/2022
 CHECKED BY : G.R. COLS DATE : 03/2022
 DESIGNED BY : B.D. HODACK DATE : 02/2022
 DESIGN CHECKED BY : G.R. COLS DATE : 03/2022



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
PLAN OF SPANS SPAN D					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-11
TOTAL SHEETS					39

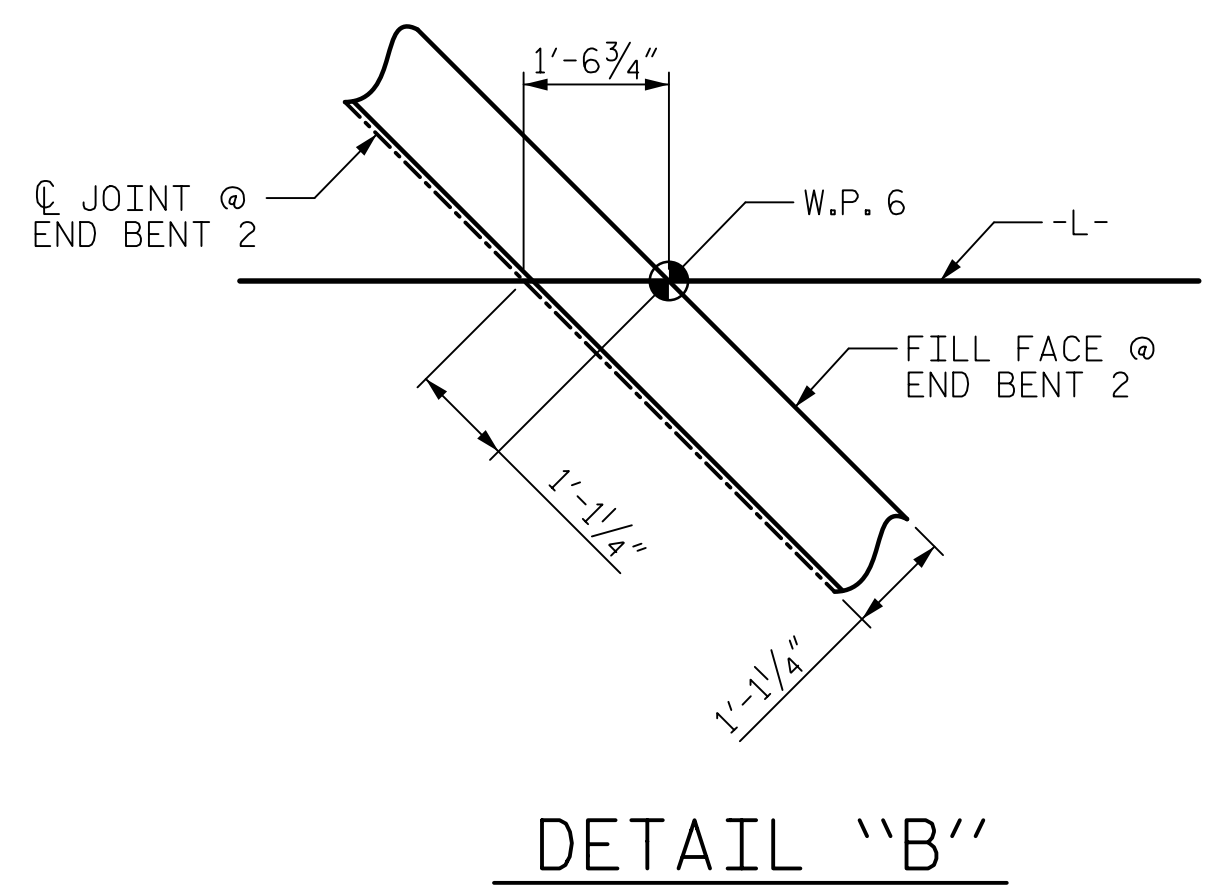
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DATE: 3/29/2022
TIME: 2:58:59 PM



* STAGGER ALTERNATING RUNS OF #6B13 BY 2'-11", AS SHOWN.

PLAN OF SPAN E



DETAIL "B"

NOTES:

- FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.
- FOR SECTION VIEWS, SEE "TYPICAL SECTION & DETAILS" SHEET.
- FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.
- FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET.
- FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "POURING SEQUENCE" ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEETS.
- FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "TYPICAL SECTION DETAILS" SHEET.
- LINK SLAB SAW CUT CONTRACTION JOINTS EXTEND TO THE EDGE OF DECK ON BOTH SIDES.

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -L-

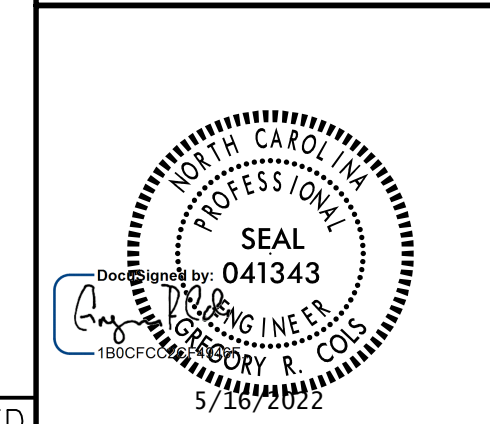
SHEET 5 OF 5



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS
SPAN E



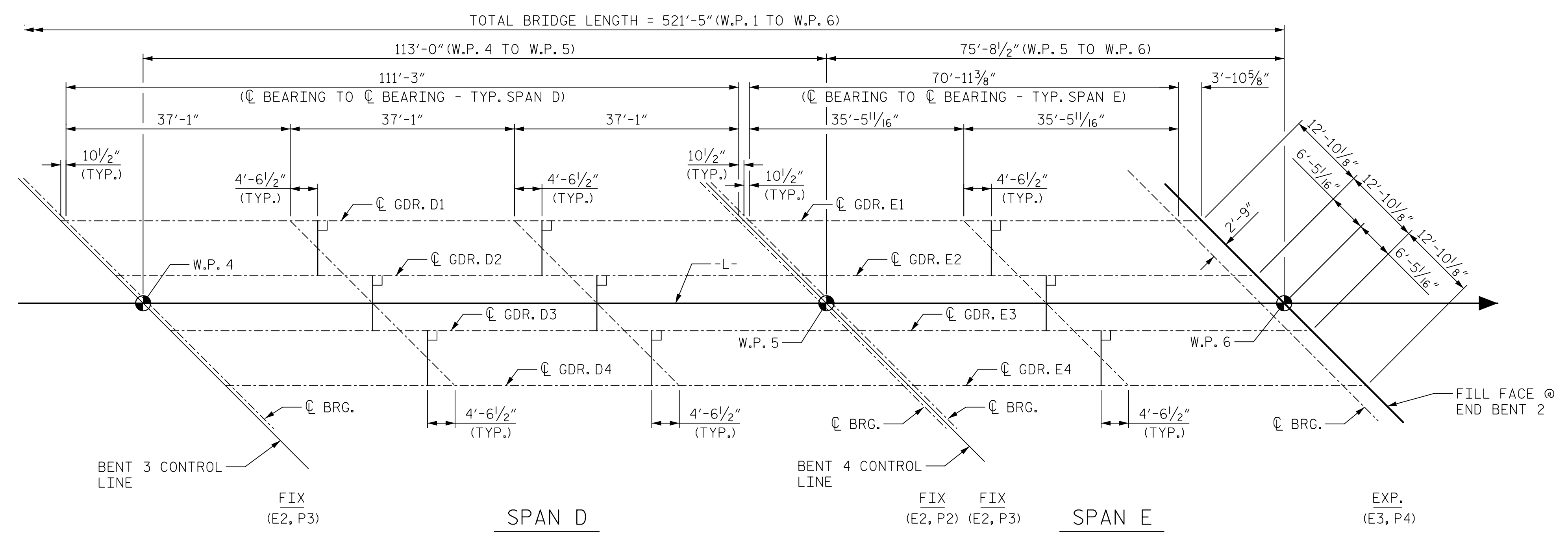
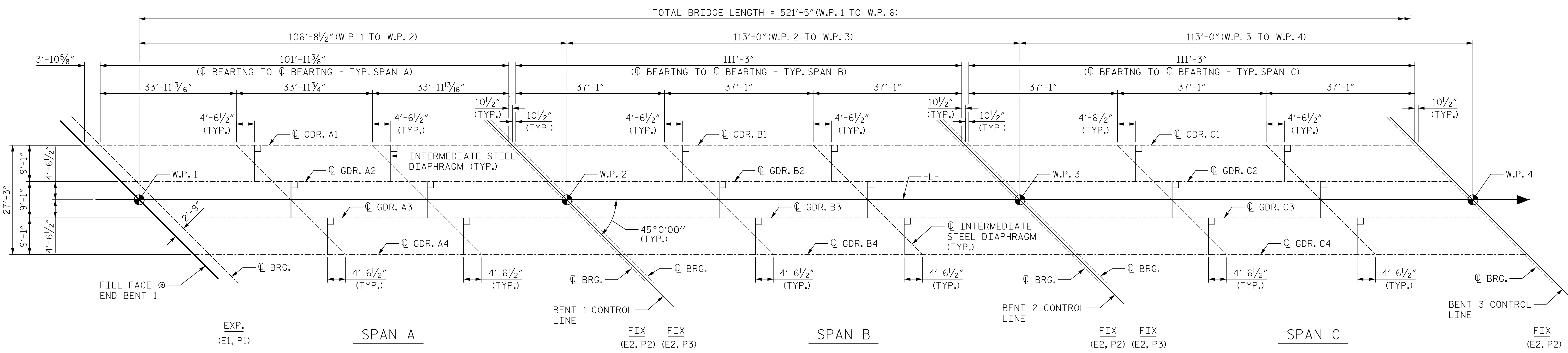
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			39

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DRAWN BY : B.D. HODACK DATE : 02/2022
CHECKED BY : G.R. COLS DATE : 03/2022
DESIGNED BY : B.D. HODACK DATE : 02/2022
DESIGN CHECKED BY : G.R. COLS DATE : 03/2022

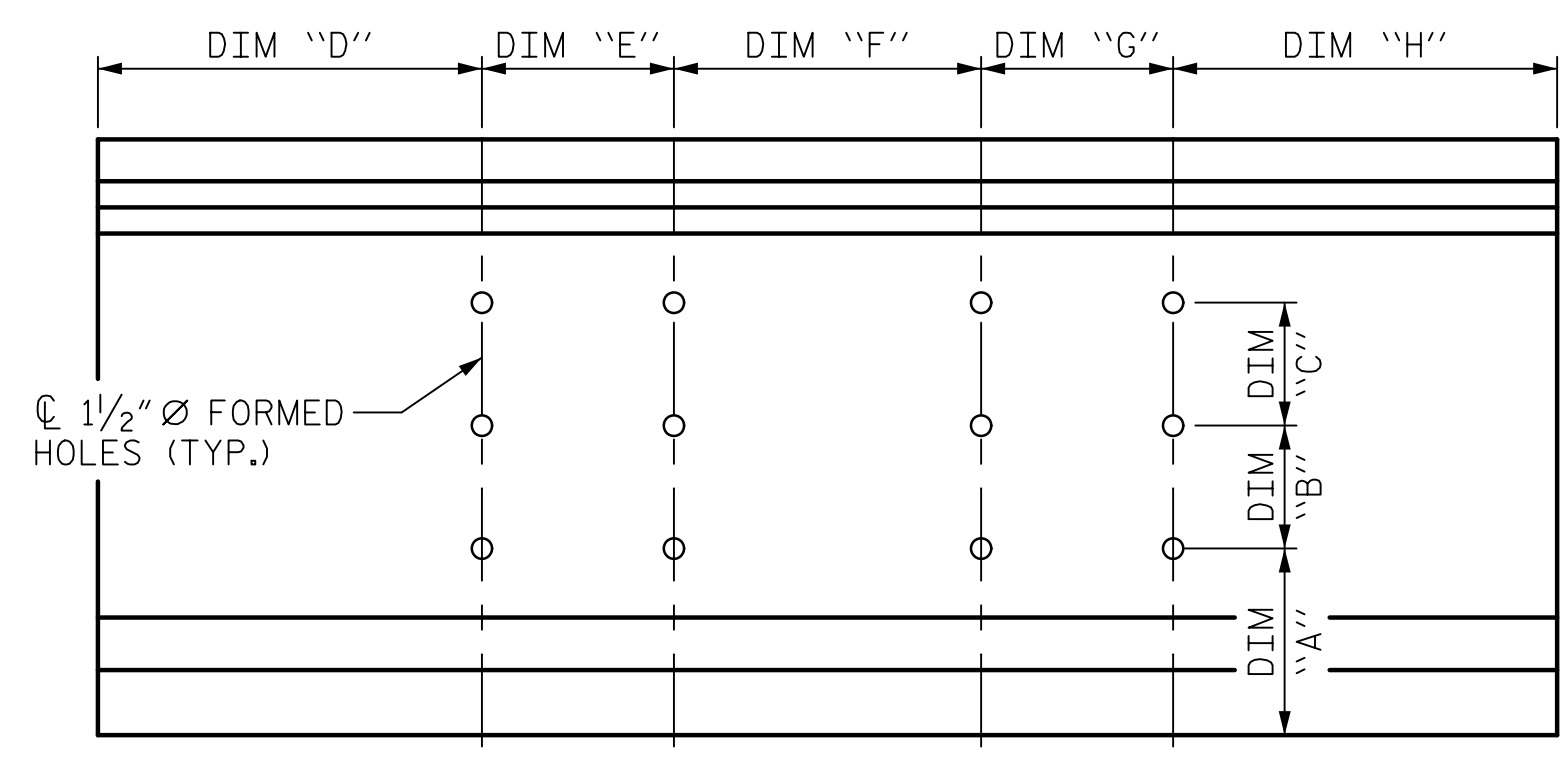
USER: BinJambouhachek
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DATE: 3/29/2022
TIME: 2:55:57 PM



FRAMING PLAN

DIMENSIONS SHOWN ALONG HORIZONTAL PROJECTION



FOR DIMENSIONS "A", "B", AND "C",
SEE GIRDER SHEET 6 OF 6.

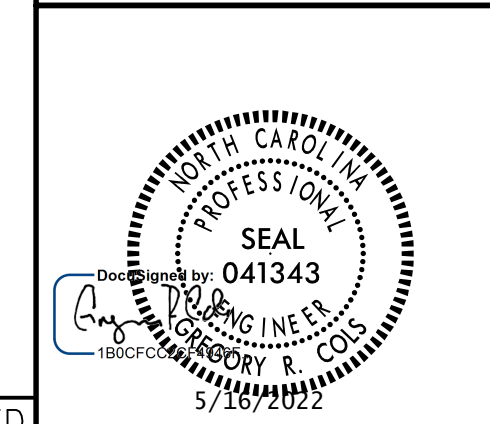
FORMED HOLE LOCATION					
GIRDER	DIM "D"	DIM "E"	DIM "F"	DIM "G"	DIM "H"
A1	39'-3 3/16"	-	34'-0 1/16"	-	30'-2 1/8"
A2, A3	30'-2 1/8"	9'-1 1/16"	24'-11"	9'-1 1/16"	30'-2 1/8"
A4	30'-2 1/8"	-	34'-0 1/16"	-	39'-3 3/16"
B1, C1, D1	42'-4 7/16"	-	37'-1 3/8"	-	33'-3 5/16"
B2, B3, C2, C3, D2, D3	33'-3 5/16"	9'-1 1/16"	28'-0 3/8"	9'-1 1/16"	33'-3 5/16"
B4, C4, D4	33'-3 5/16"	-	37'-1 3/8"	-	42'-4 7/16"
E1	40'-8 11/16"	-	-	-	31'-7 11/16"
E2, E3	31'-7 11/16"	9'-1"	-	-	31'-7 11/16"
E4	31'-7 11/16"	-	-	-	40'-8 11/16"

DIMENSIONS PROVIDED ARE CONSISTENT WITH
SLOPED OR HORIZONTAL PROJECTION DIMENSIONS
SHOWN ON GIRDER ELEVATION SHEETS 1-3

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -L-

DRAWN BY : D.R. DRUM DATE : 02/2022
CHECKED BY : G.R. COLS DATE : 02/2022
DESIGNED BY : D.R. DRUM DATE : 02/2022
DESIGN CHECKED BY : G.R. COLS DATE : 02/2022

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

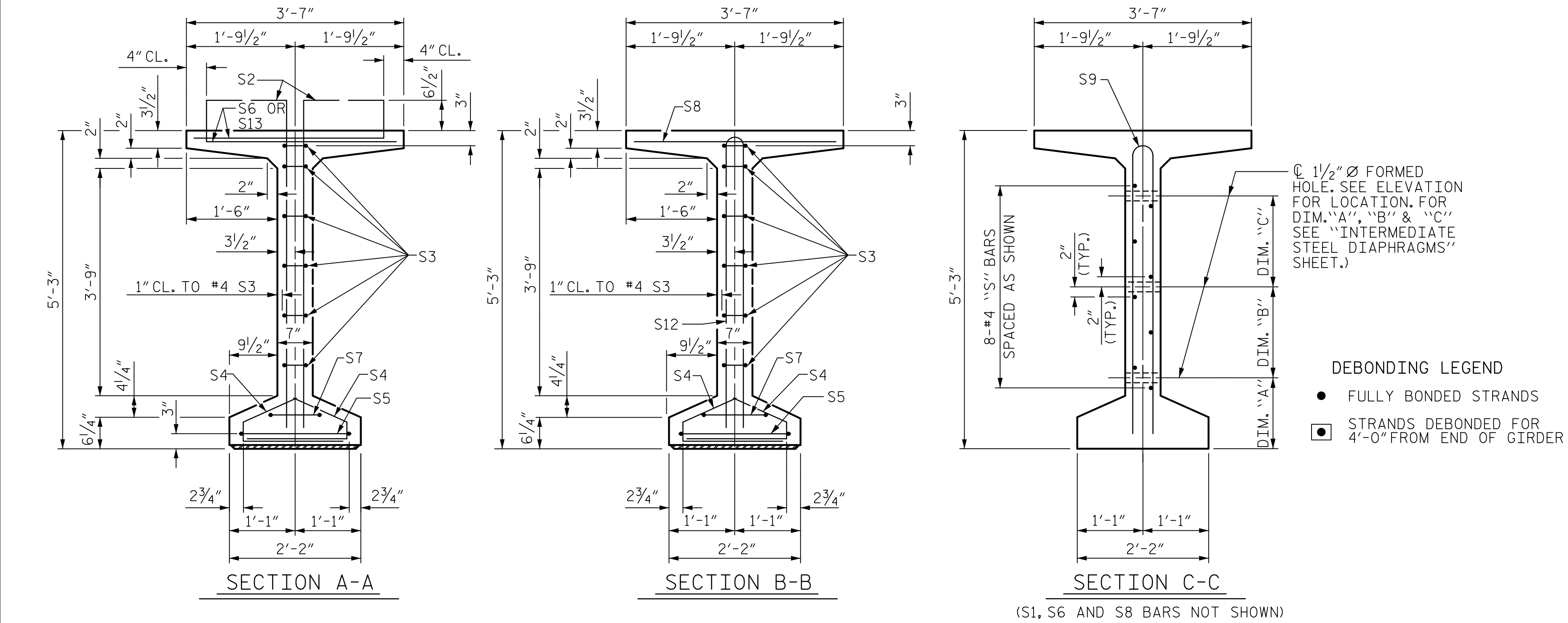
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.
S-13
TOTAL SHEETS
39

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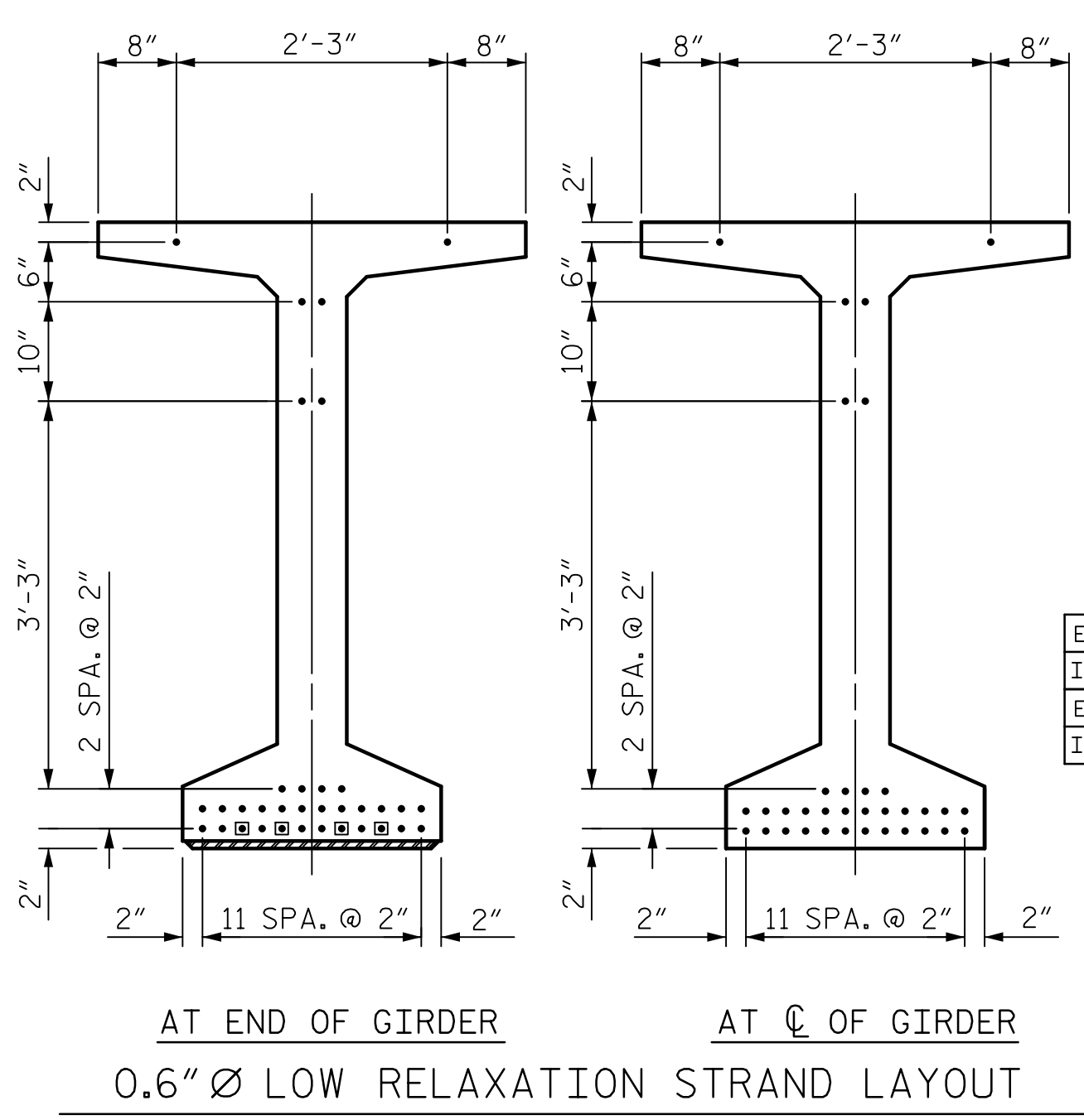
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1/2" Ø FORMED HOLE. SEE ELEVATION FOR LOCATION. FOR DIM. 'A', 'B' & 'C' SEE "INTERMEDIATE STEEL DIAPHRAGMS" SHEET.)

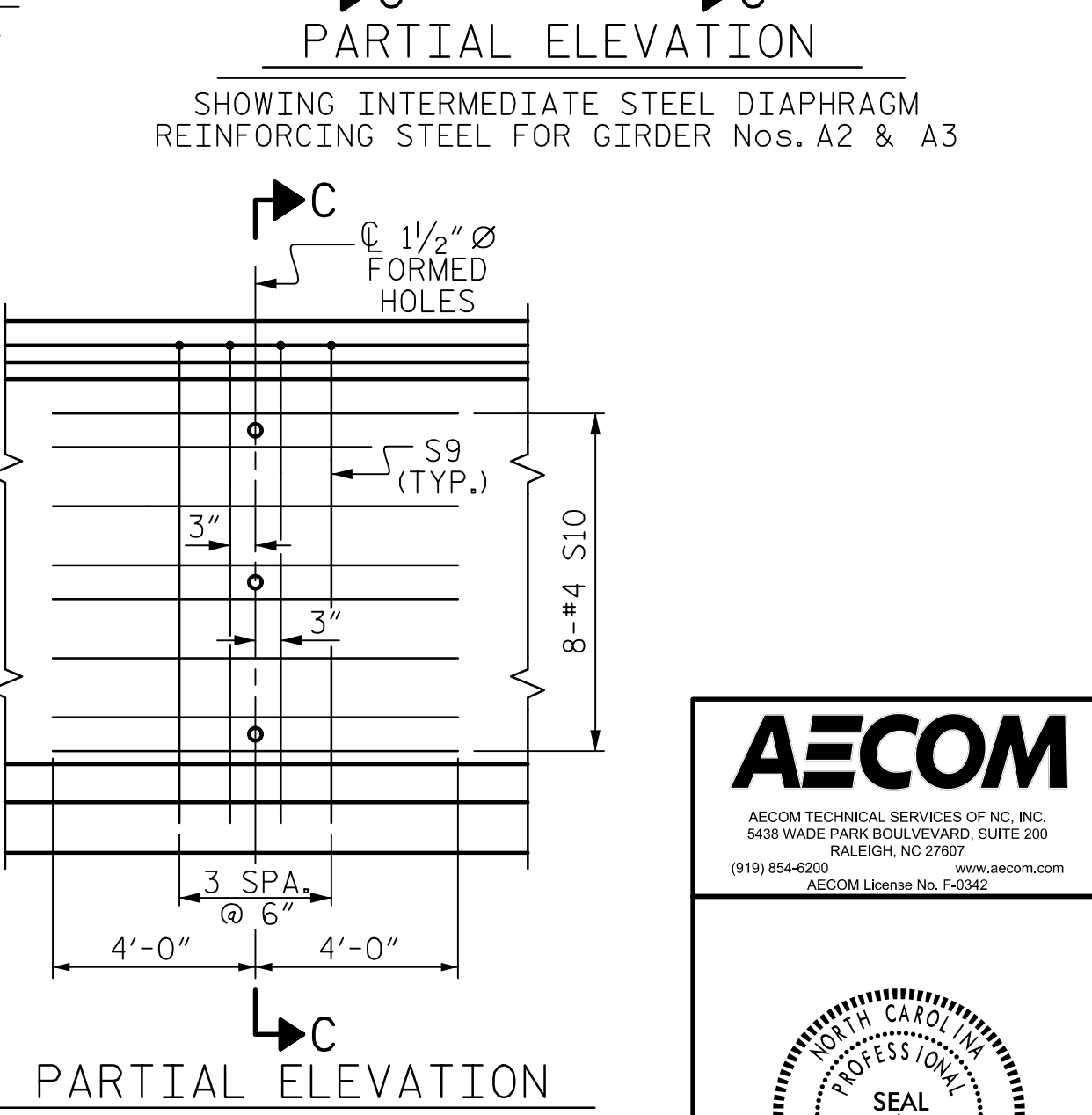
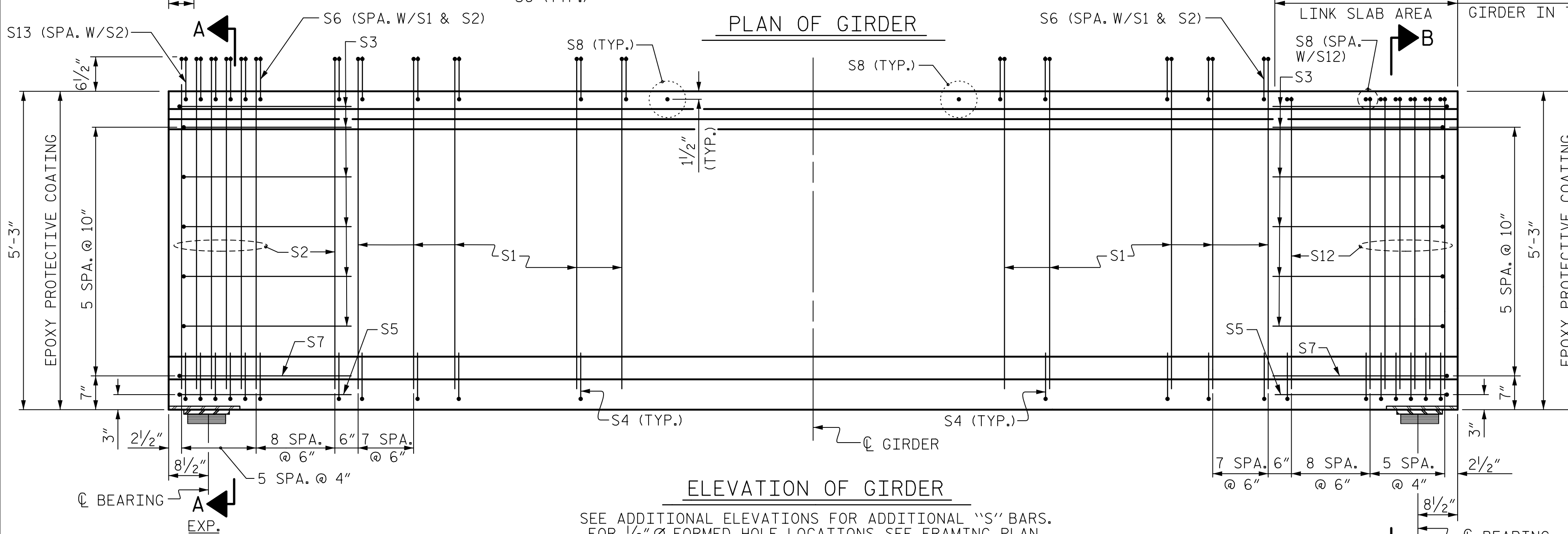
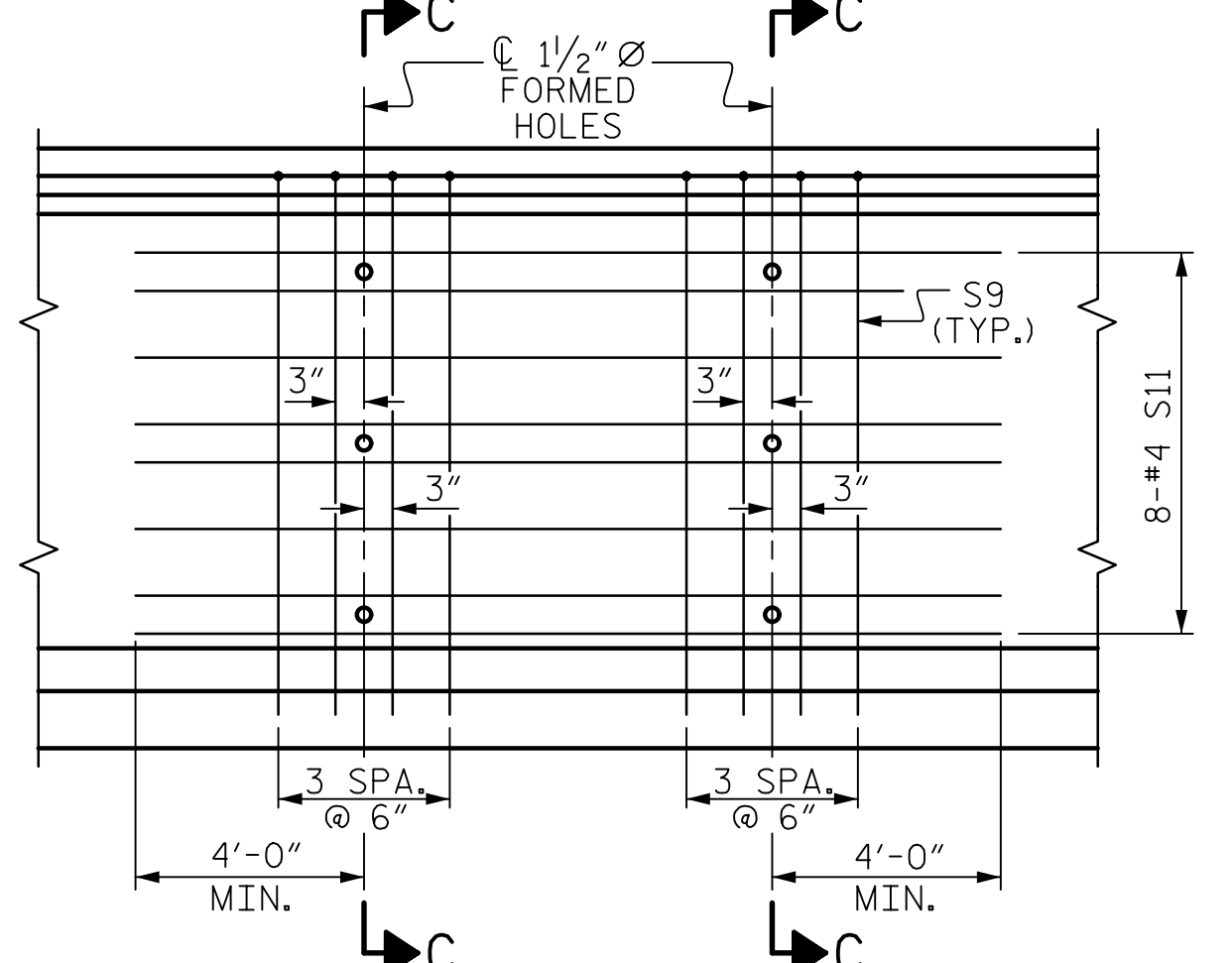
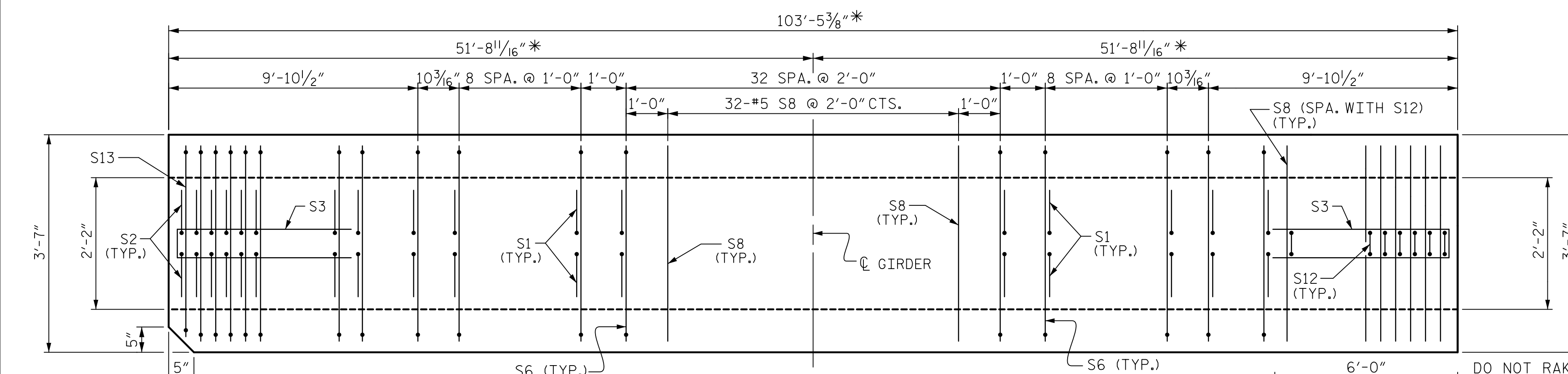
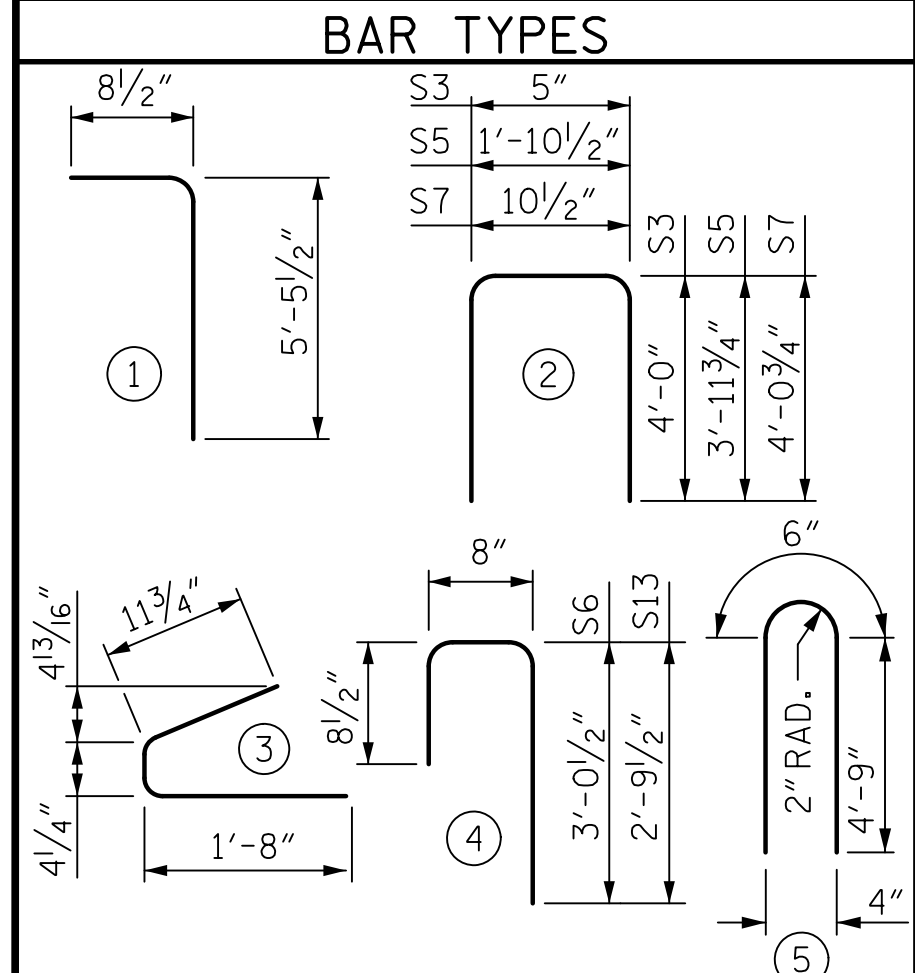
DEBONDING LEGEND

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



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

REINFORCING STEEL FOR ONE GDR						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	134	#5	1	6'-2"	862	
S2	28	#6	1	6'-2"	259	
S3	12	#4	2	8'-5"	67	
S4	124	#4	3	3'-0"	248	
S5	2	#5	2	9'-10"	21	
S6	160	#5	4	4'-5"	737	
S7	2	#5	2	9'-0"	19	
S8	46	#5	STR	3'-3"	156	
EXTERIOR GDR.	S9	8	#5	5	10'-0"	83
INTERIOR GDR.	S9	16	#5	5	10'-0"	167
EXTERIOR GDR.	S10	16	#4	STR	8'-0"	86
INTERIOR GDR.	S11	16	#4	STR	17'-2"	183
	S12	14	#6	5	10'-0"	210
	S13	2	#5	4	4'-2"	9



QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	8,500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	2757	20.5	34
INTERIOR GIRDER	2938	20.5	34

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	103'-5 3/8"	413'-9 1/2"

PROJECT NO. BR-0044
 ROCKINGHAM COUNTY
 STATION: 21+97.00 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 63" PRESTRESSED CONCRETE
 MODIFIED BULB TEE
 LINK SLAB

SPAN A



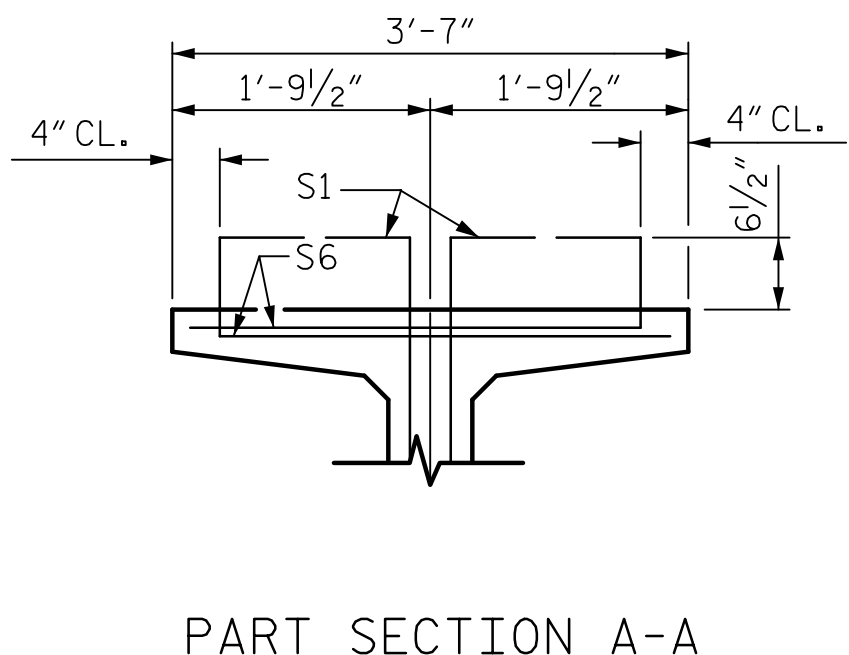
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CHECKED BY : G.R. COLS	DATE : 2/2022	
DESIGNED BY : D.R. DRUM	DATE : 2/2022	
DESIGN CHECKED BY : G.R. COLS	DATE : 2/2022	
DRAWN BY : EEM 2/6/97	REV. 6/13	MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15	MAA/TMG
	REV. 12/17	MAA/THC

* DIMENSIONS ALONG SLOPE OF GIRDER

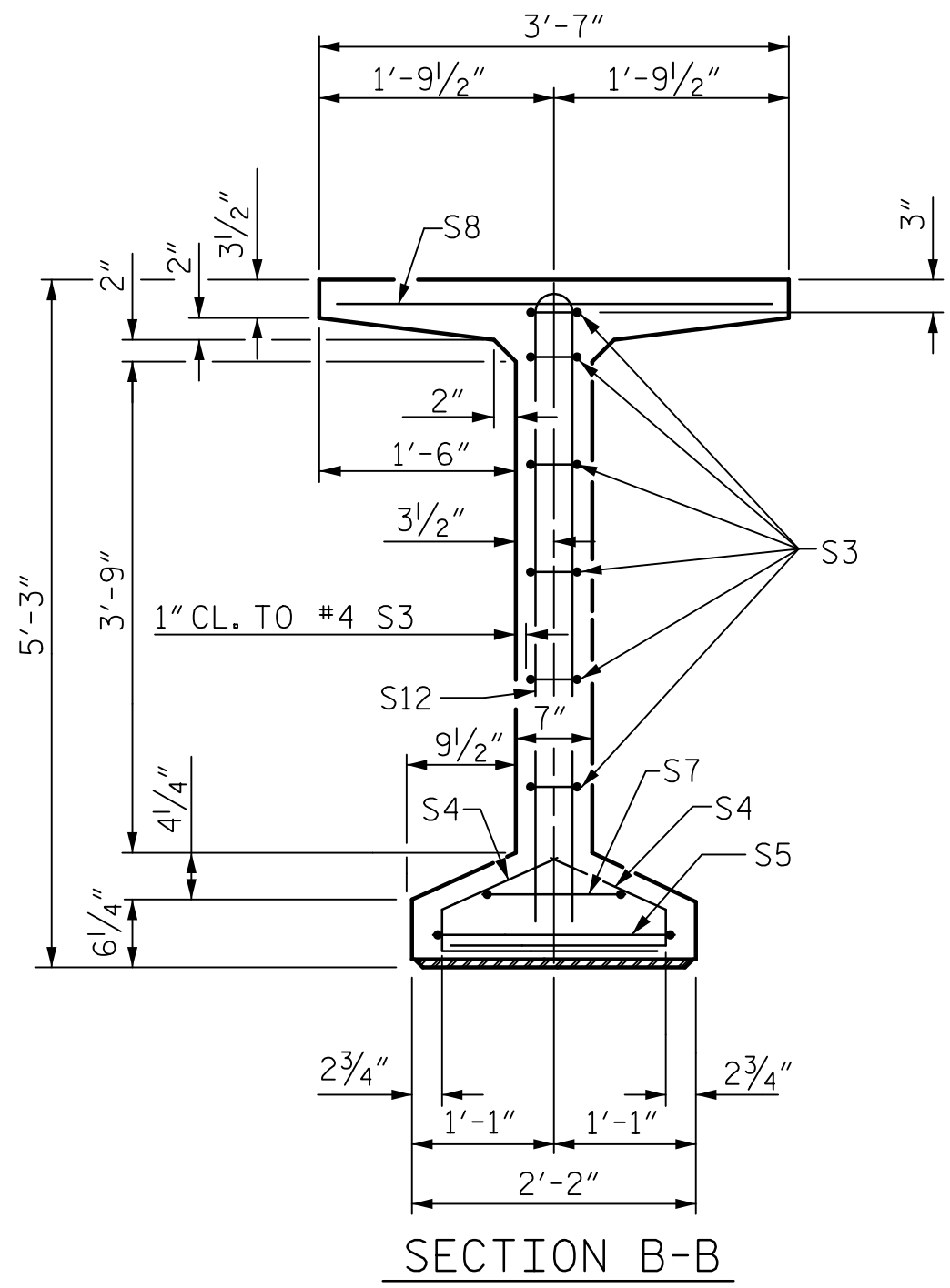
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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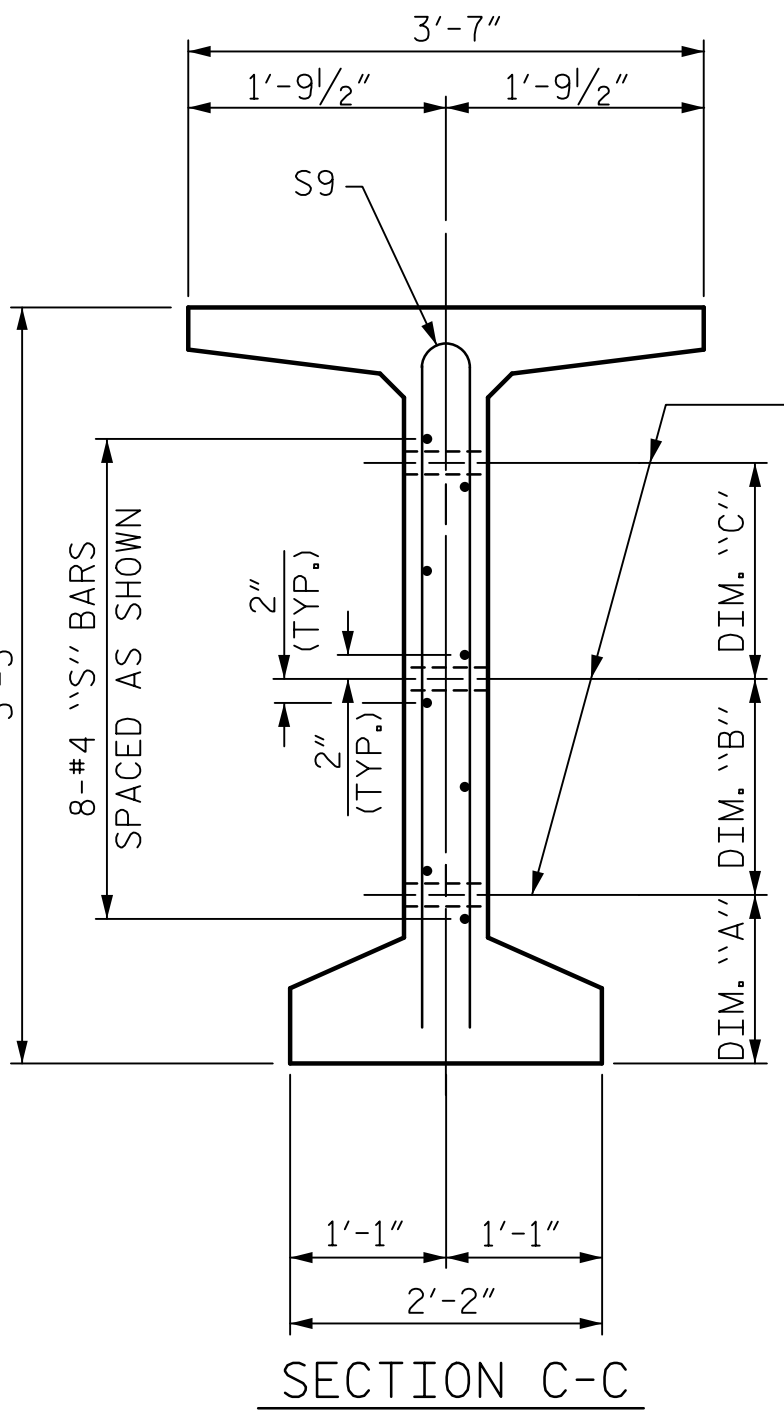
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PART SECTION A-A



SECTION B-B



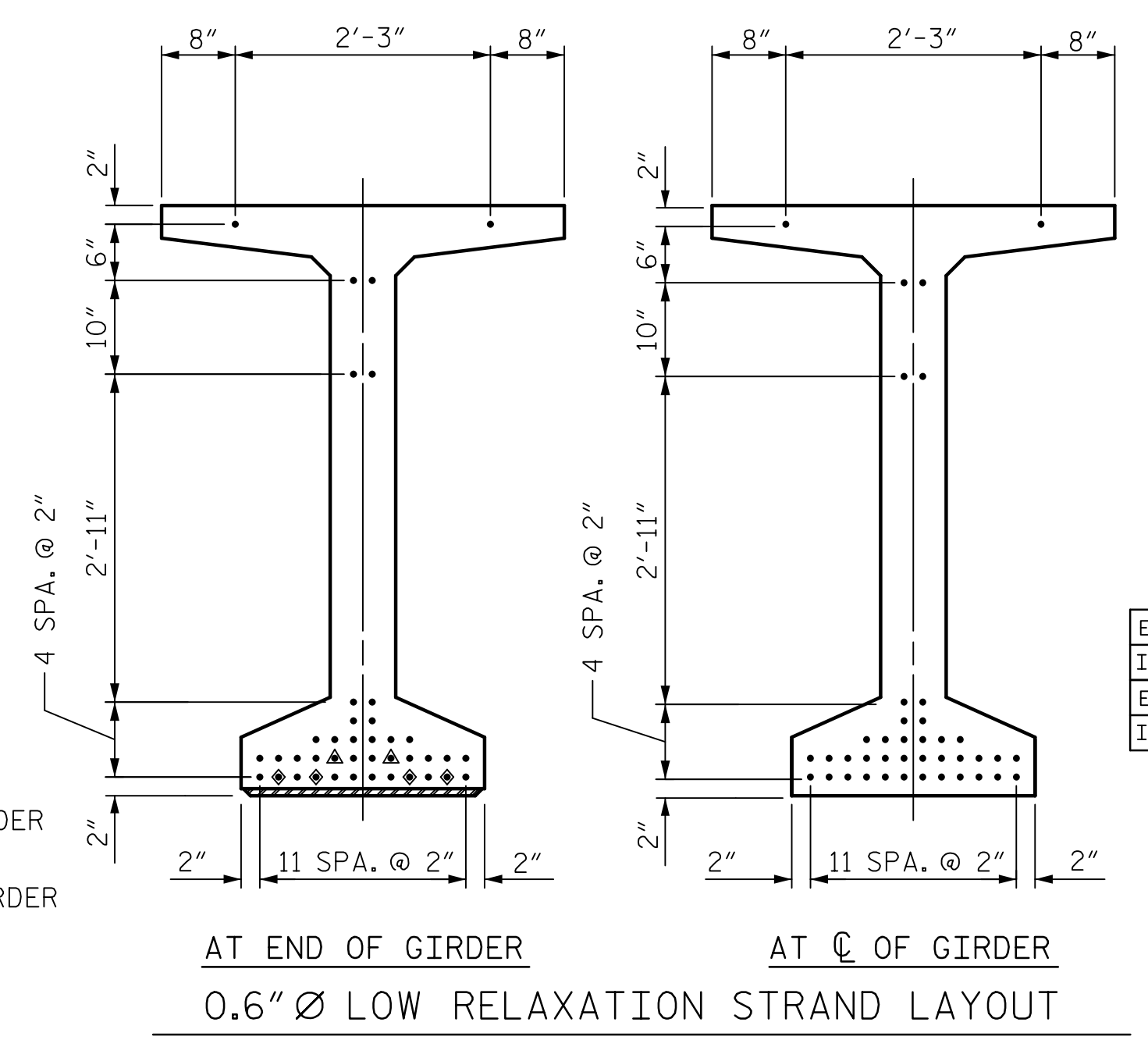
SECTION C-C

(S1, S6 AND S8 BARS NOT SHOWN)

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

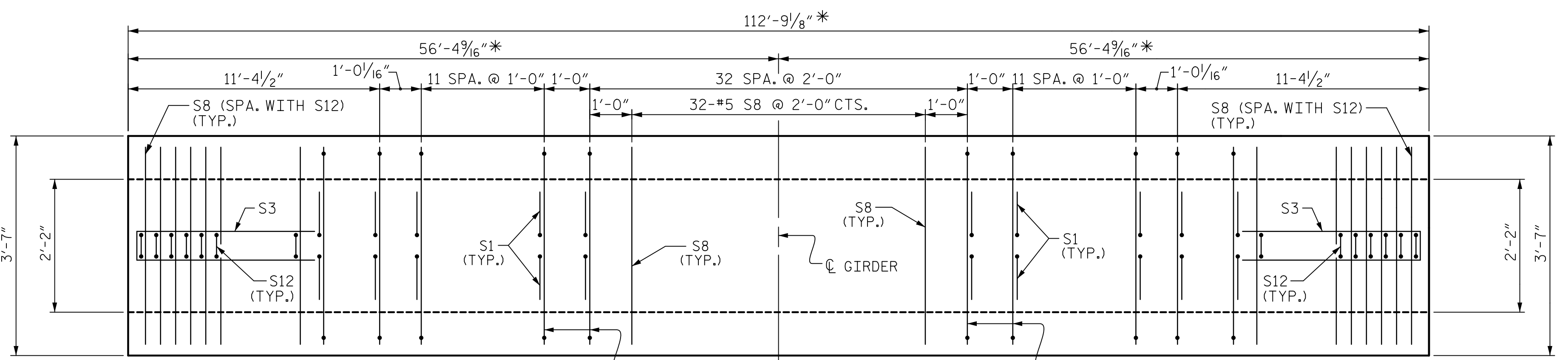
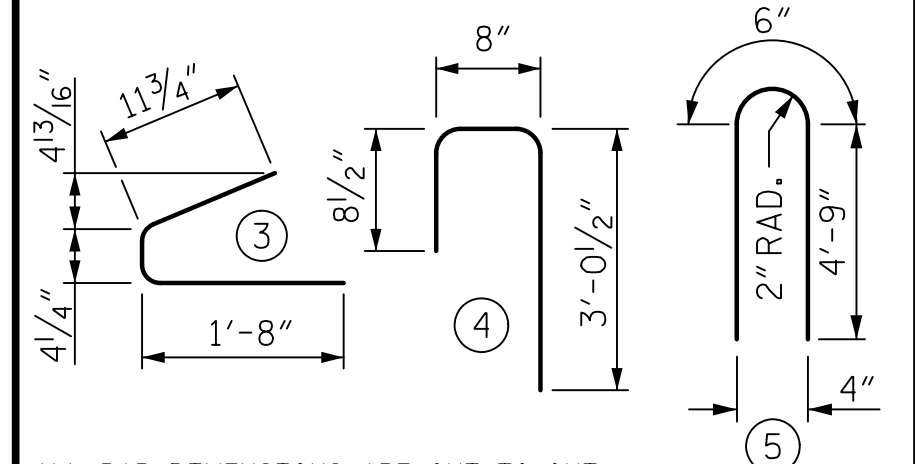
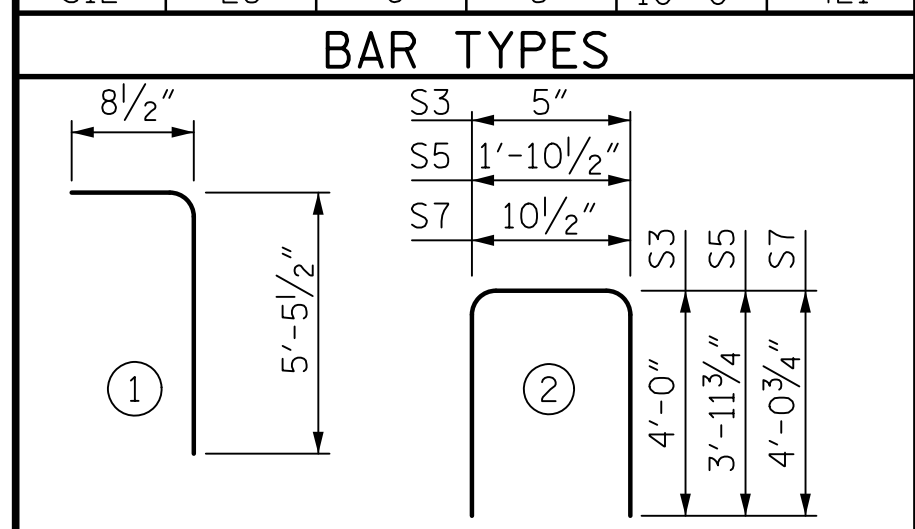
DEBONDING LEGEND

- FULLY BONDED STRANDS
- ▲ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◆ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER

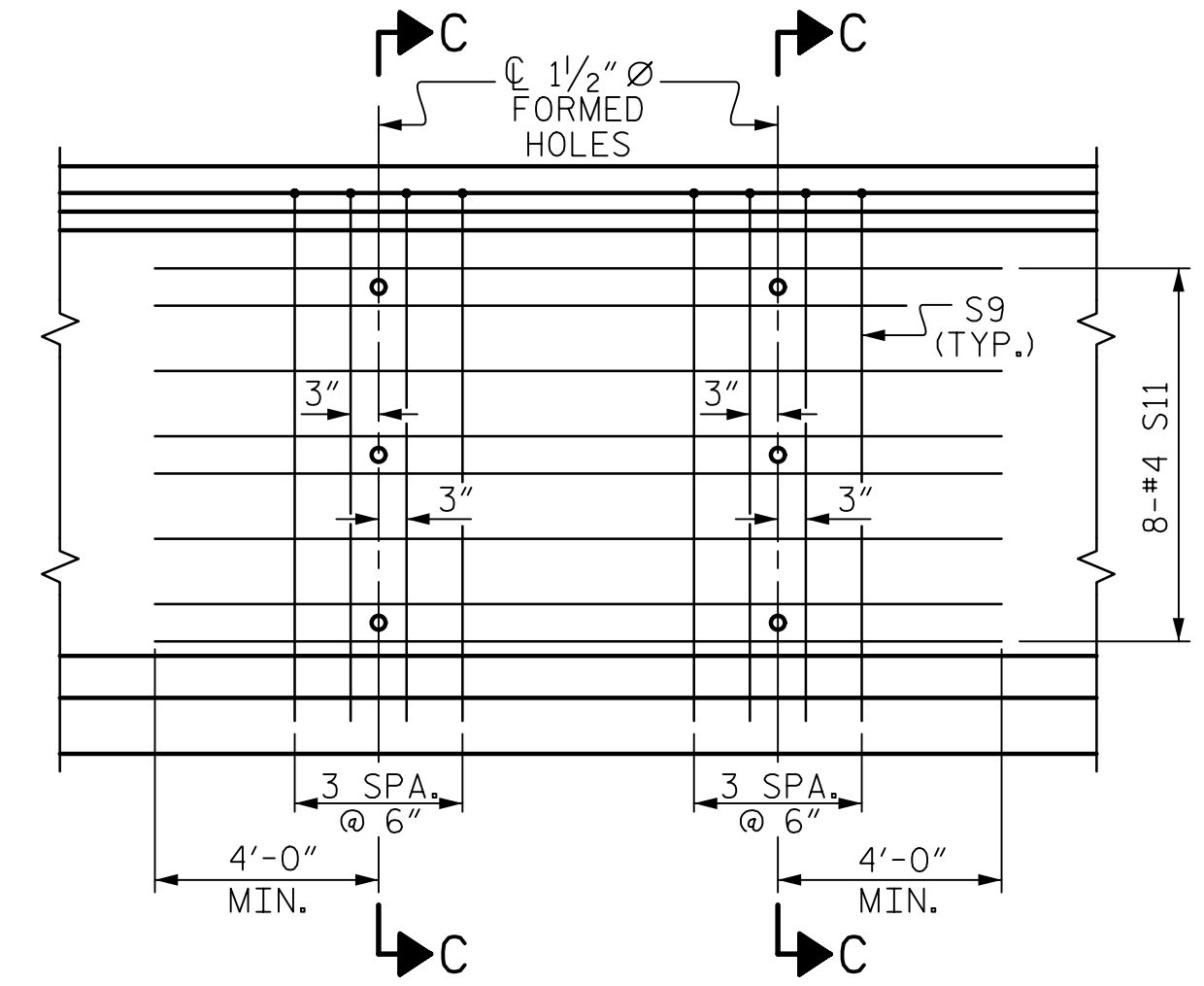


AT END OF GIRDER
0.6" Ø LOW RELAXATION STRAND LAYOUT

EXTERIOR GDR.	S9	8	#5	5	10'-0"	83
INTERIOR GDR.	S9	16	#5	5	10'-0"	167
EXTERIOR GDR.	S10	16	#4	STR	8'-0"	86
INTERIOR GDR.	S11	16	#4	STR	17'-2"	183
	S12	28	#6	5	10'-0"	421

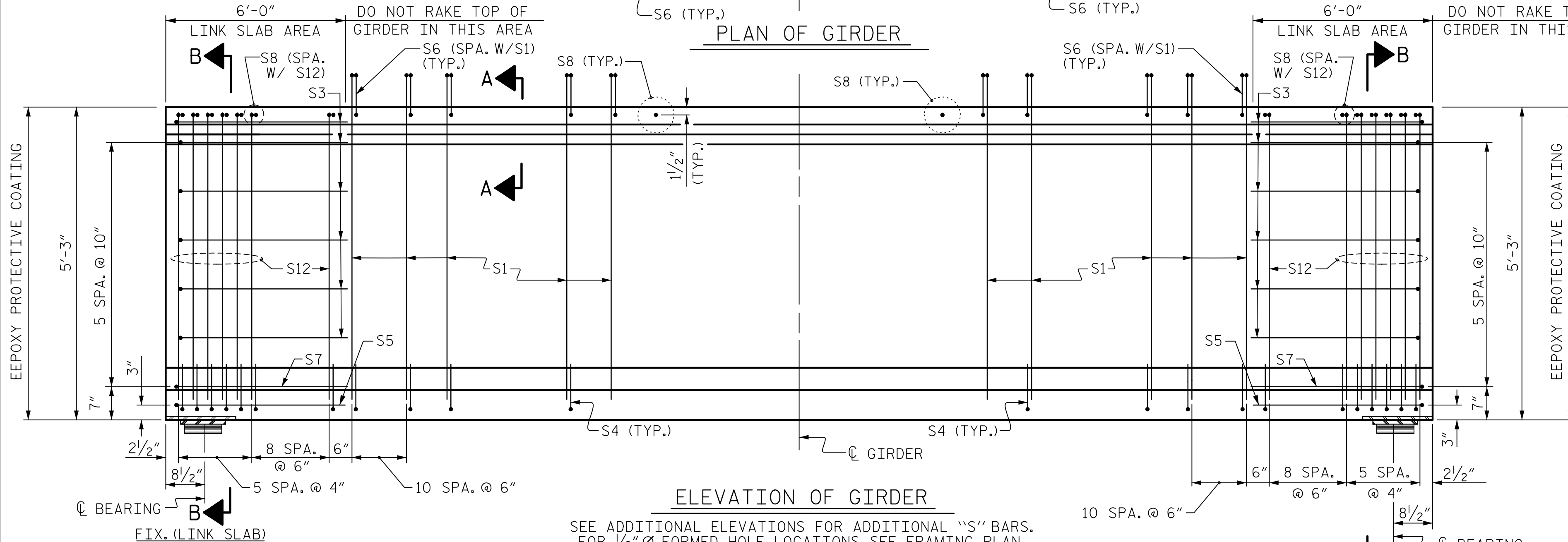


PLAN OF GIRDER



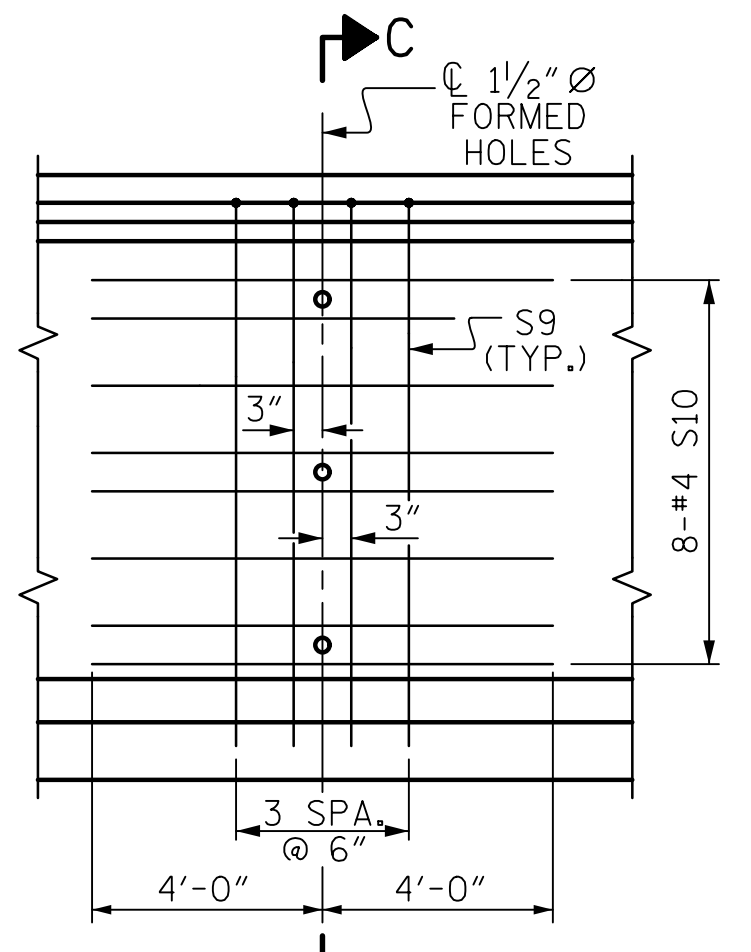
PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. B2, B3, C2, C3, D2, D3



ELEVATION OF GIRDER

SEE ADDITIONAL ELEVATIONS FOR ADDITIONAL "S" BARS. FOR 1/2" Ø FORMED HOLE LOCATIONS, SEE FRAMING PLAN.

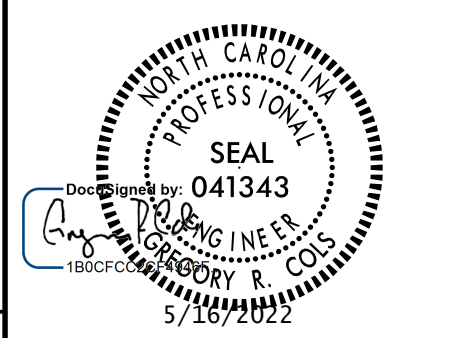


PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. B1, B4, C1, C4, D1, D4

ASSEMBLED BY : D.R. DRUM	DATE : 2/2022
CHECKED BY : G.R. COLS	DATE : 2/2022
DESIGNED BY : D.R. DRUM	DATE : 2/2022
DESIGN CHECKED BY : G.R. COLS	DATE : 2/2022
DRAWN BY : EEM 2/6/97	REV. 6/13 MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

* DIMENSIONS ALONG SLOPE OF GIRDER



PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
63" PRESTRESSED CONCRETE
MODIFIED BULB TEE
LINK SLAB

SPANS B-D

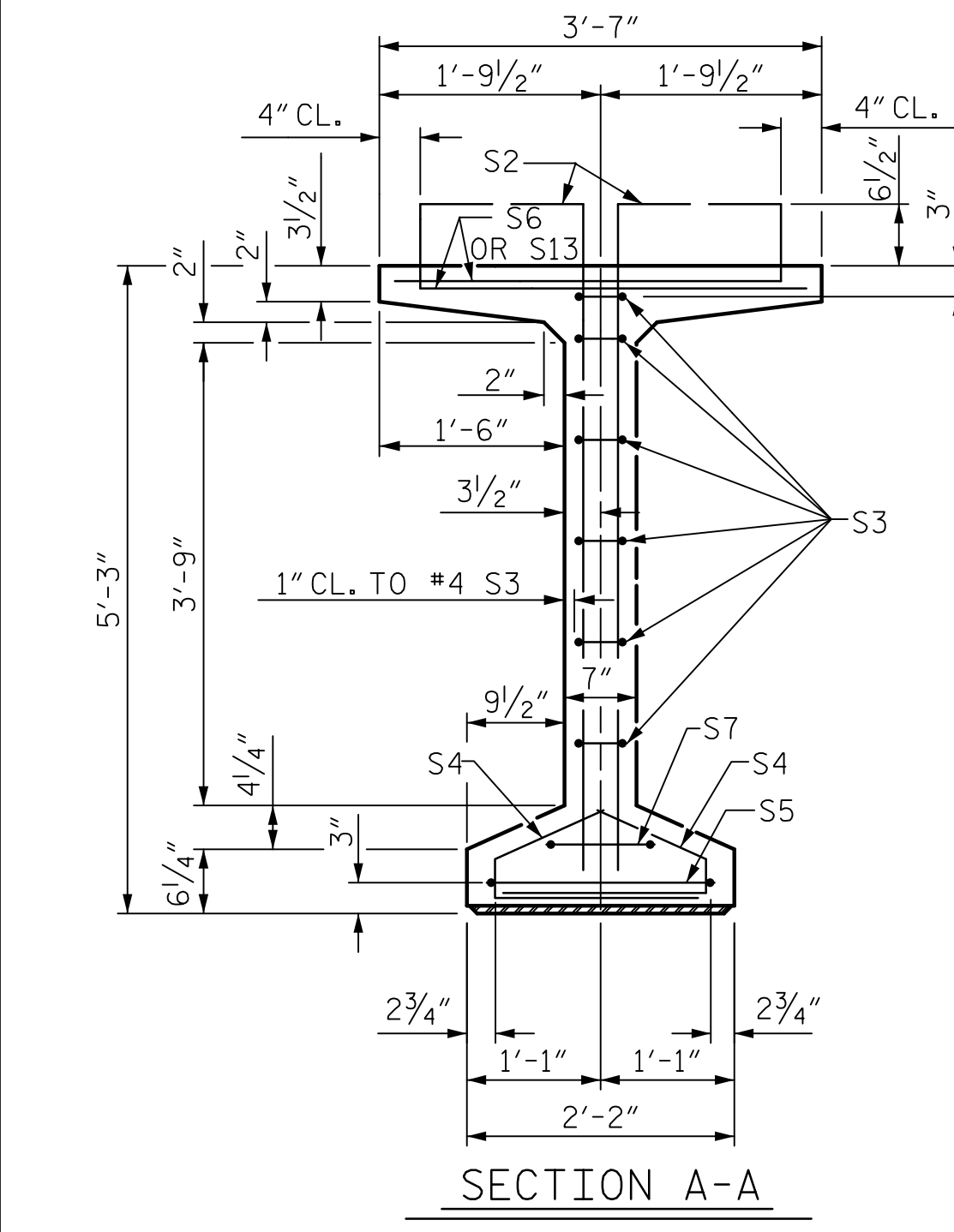
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS 39
2			4			

STD. NO. PCG7

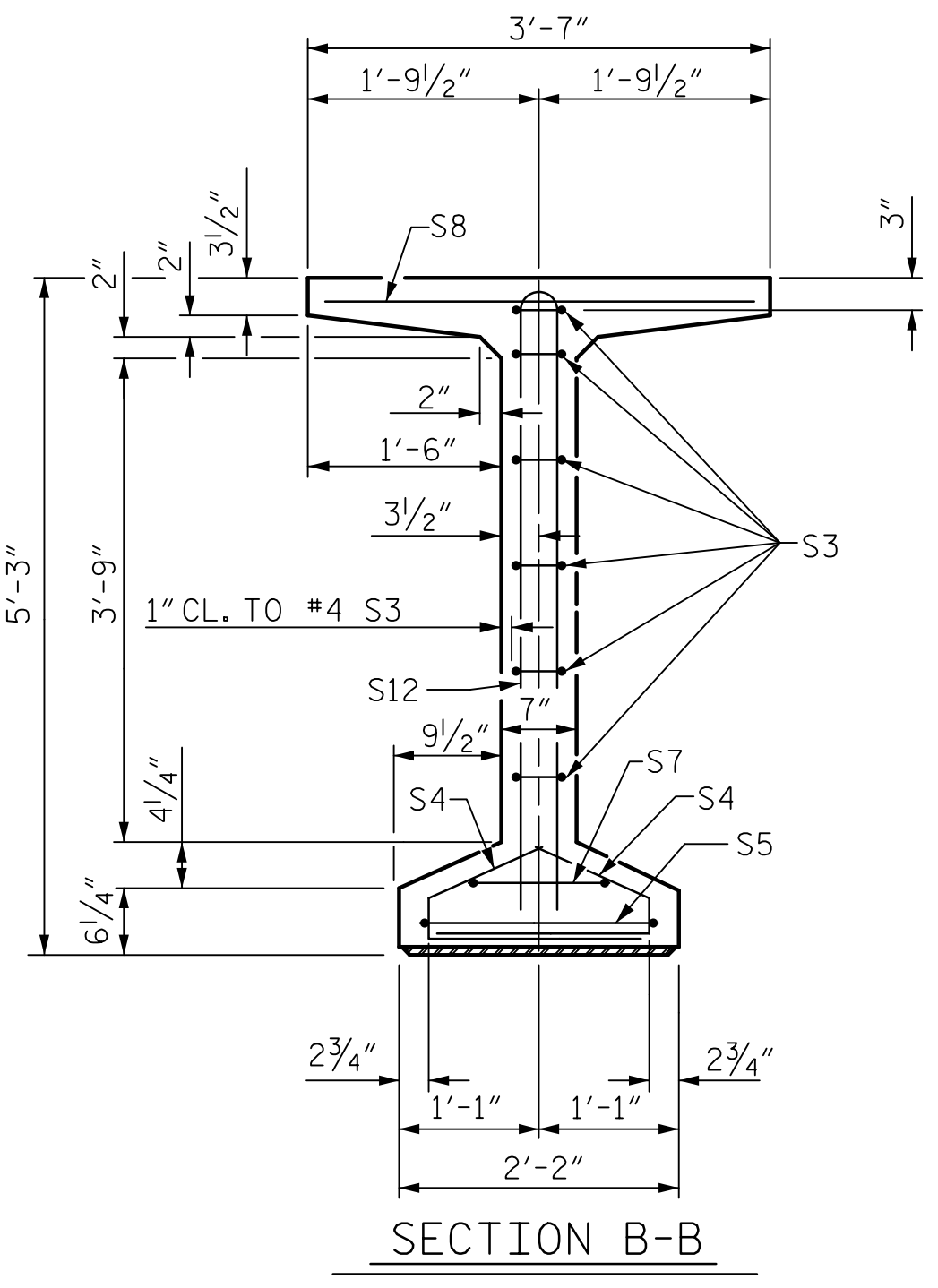
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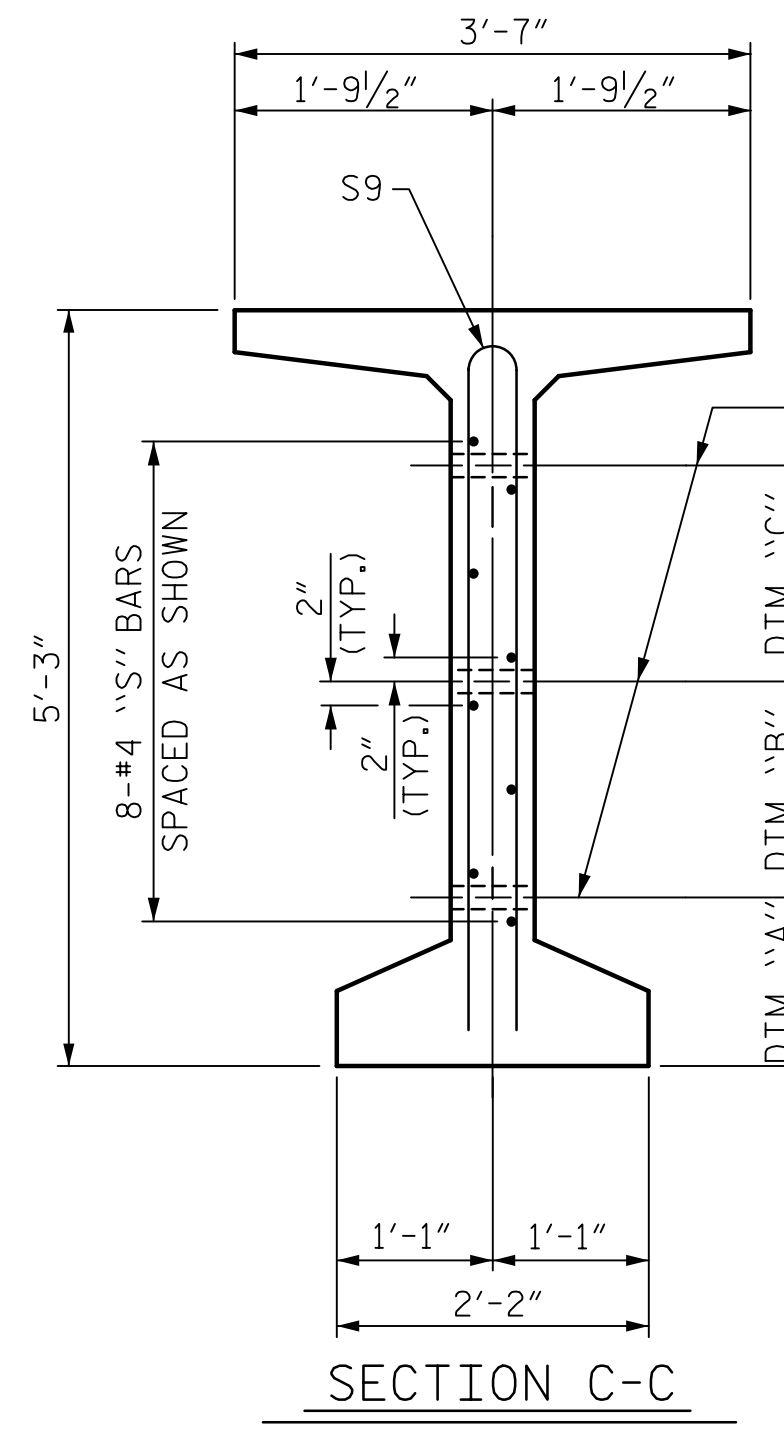
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SECTION A-A



SECTION B-B

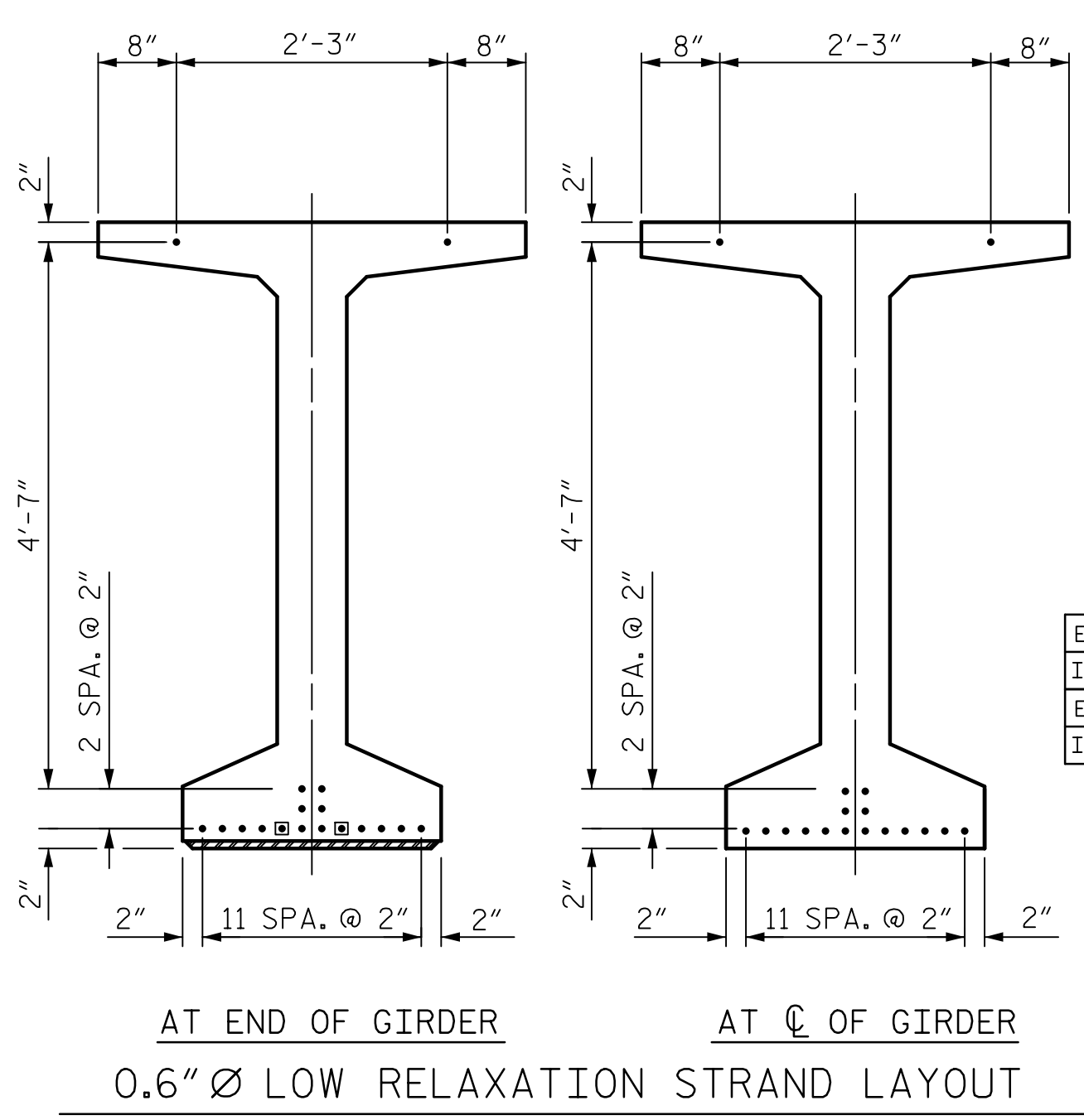


SECTION C-C

(S1, S6 AND S8 BARS NOT SHOWN)

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

DEBONDING LEGEND
 ● FULLY BONDED STRANDS
 ◻ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER

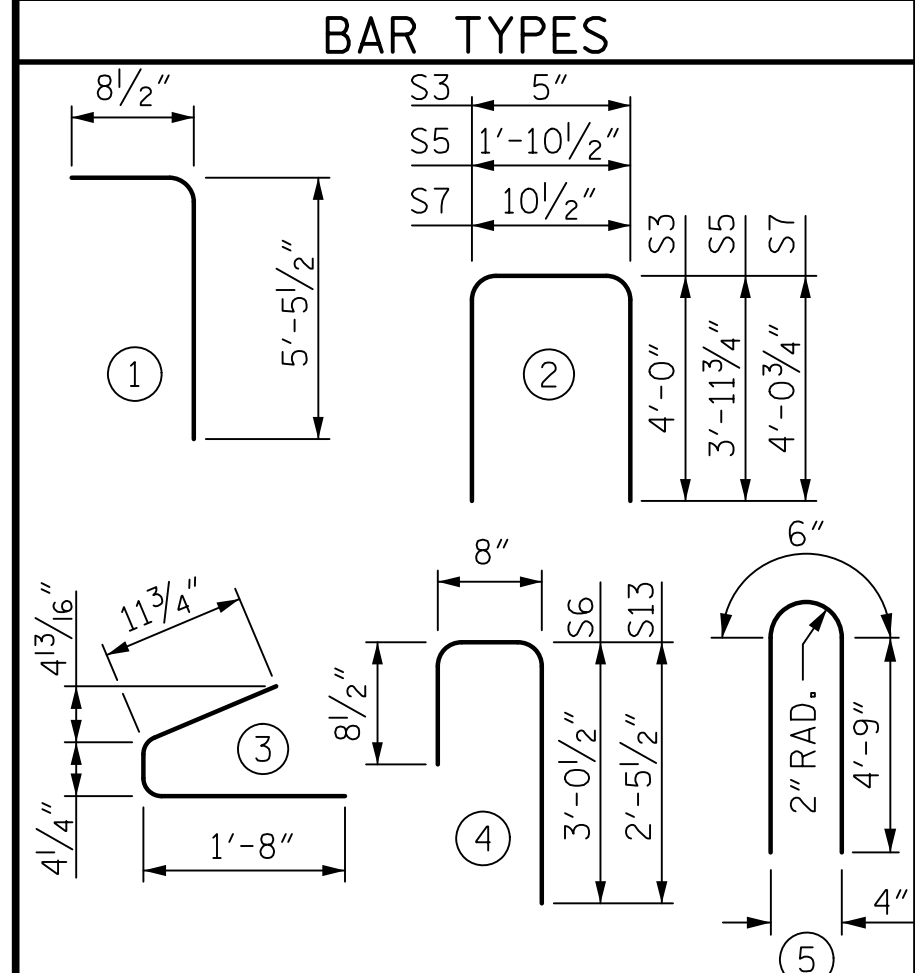


AT END OF GIRDER AT CL OF GIRDER
0.6" Ø LOW RELAXATION STRAND LAYOUT

EXTERIOR GDR. S9 4 #5 5 10'-0" 42
 INTERIOR GDR. S9 8 #5 5 10'-0" 83
 EXTERIOR GDR. S10 8 #4 STR 8'-0" 43
 INTERIOR GDR. S11 8 #4 STR 17'-2" 92
 S12 10 #5 5 17'-0" 104
 S13 4 #5 4 3'-10" 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

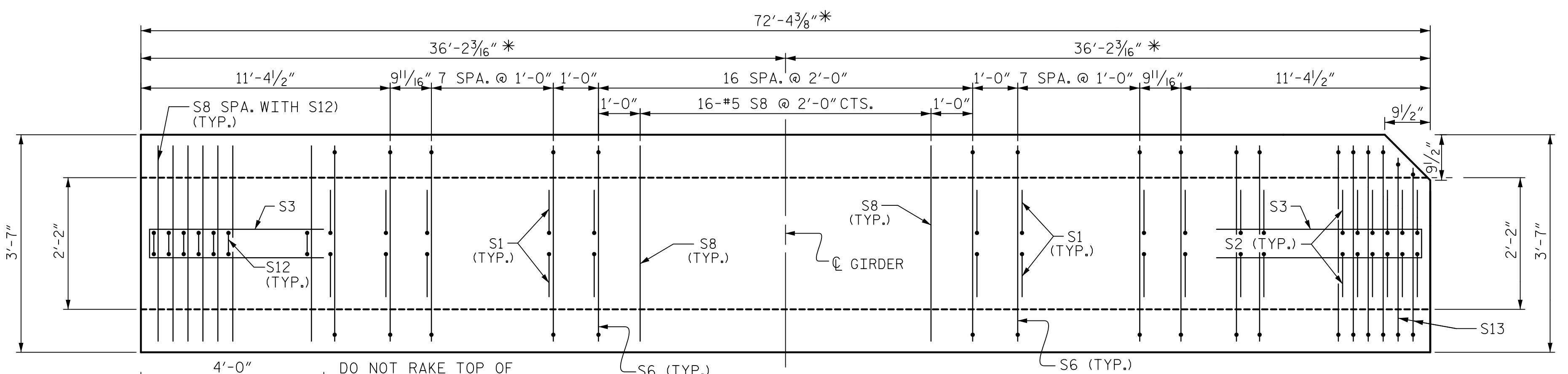
REINFORCING STEEL FOR ONE GDR					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	126	#4	1	6'-2"	519
S2	20	#5	1	6'-2"	129
S3	12	#4	2	8'-5"	67
S4	132	#4	3	3'-0"	265
S5	2	#5	2	9'-10"	21
S6	142	#5	4	4'-5"	654
S7	2	#5	2	9'-0"	19
S8	26	#5	STR	3'-3"	88
S9	4	#5	5	10'-0"	42
S10	8	#5	5	10'-0"	83
S11	8	#4	STR	8'-0"	43
S12	10	#5	5	17'-0"	104
S13	4	#5	4	3'-10"	16



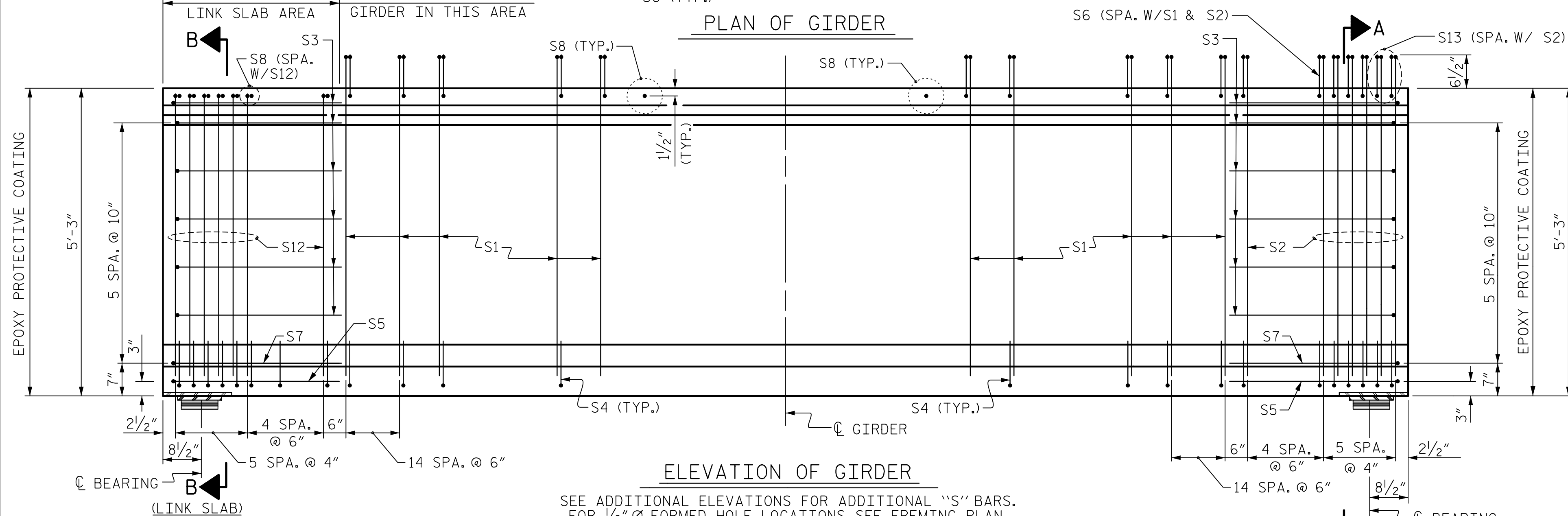
ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	8,500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	1967	14.3	18
INTERIOR GIRDER	2057	14.3	18

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	72'-4 3/8"	289'-5 1/2"

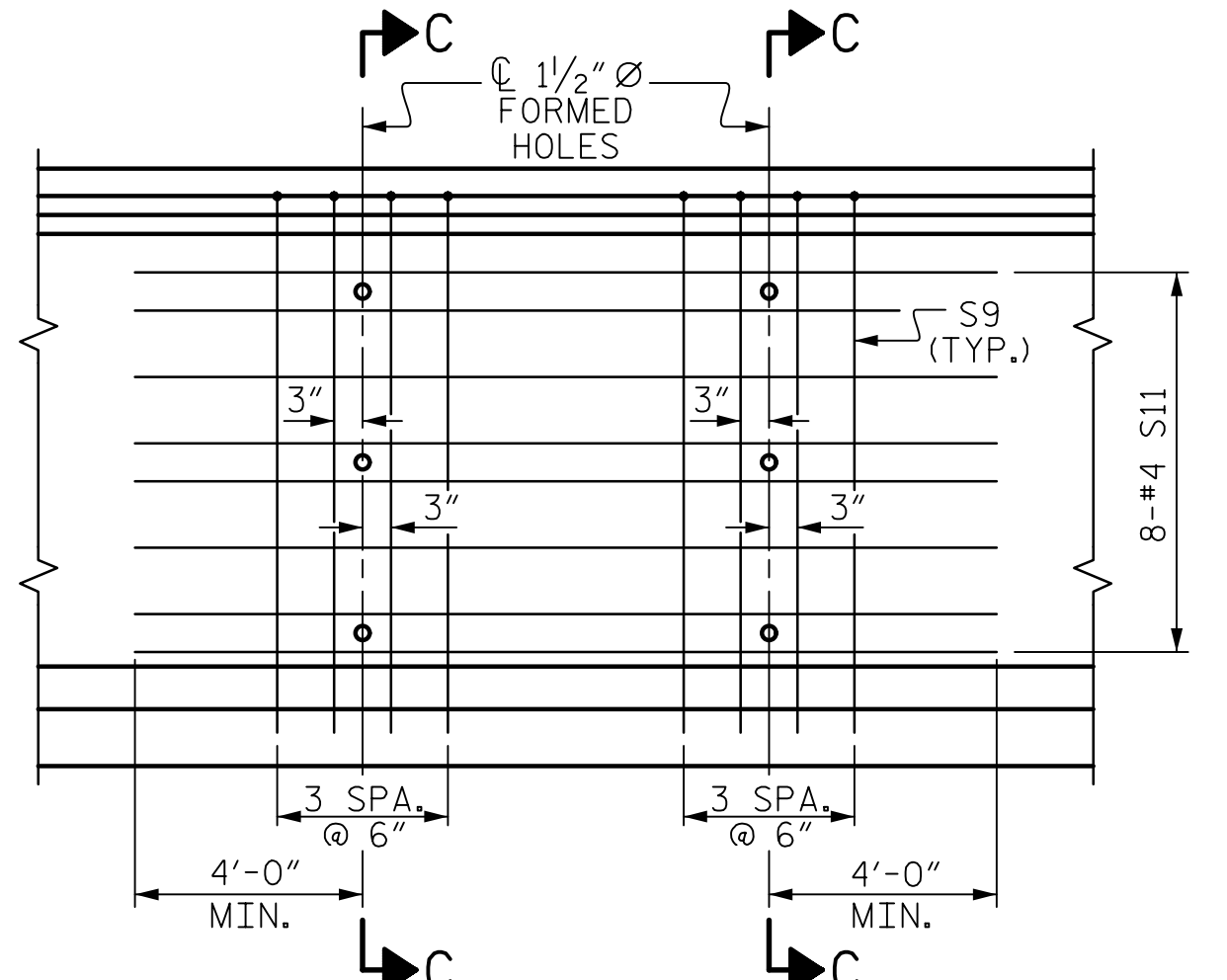


PLAN OF GIRDER



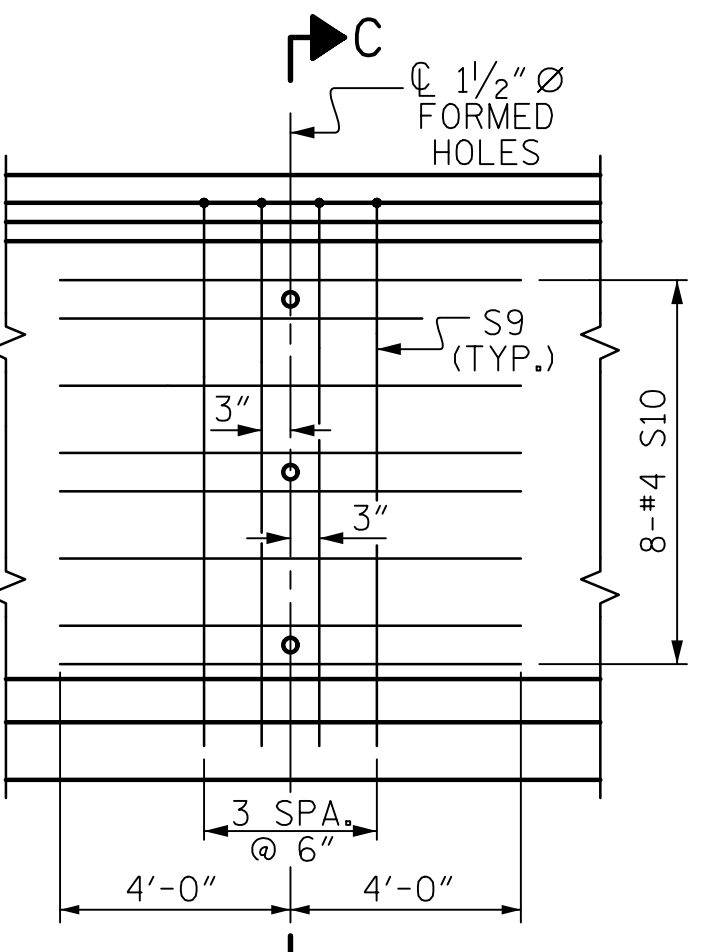
ELEVATION OF GIRDER

SEE ADDITIONAL ELEVATIONS FOR ADDITIONAL "S" BARS. FOR 1/2" Ø FORMED HOLE LOCATIONS, SEE FREEMING PLAN.



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. E2 & E3



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. E1 & E4

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ASSEMBLED BY : D.R. DRUM	DATE : 2/2022
CHECKED BY : G.R. COLS	DATE : 2/2022
DESIGNED BY : D.R. DRUM	DATE : 2/2022
DESIGN CHECKED BY : G.R. COLS	DATE : 2/2022
DRAWN BY : EEM 2/6/97	REV. 6/13 MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

* DIMENSIONS SHOWN ON HORIZONTAL PROJECTION

PROJECT NO. BR-0044
 ROCKINGHAM COUNTY
 STATION: 21+97.00 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 63" PRESTRESSED CONCRETE
 MODIFIED BULB TEE
 LINK SLAB

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

STD. NO. PCG7

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" DIA. LOW-RELAXATION STRANDS	SPAN A																				
	GIRDERS 1 & 4																				
	FOURTIETH POINTS	BRG	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.015	0.030	0.044	0.058	0.072	0.086	0.098	0.110	0.122	0.133	0.142	0.151	0.159	0.166	0.172	0.177	0.181	0.184	0.186	0.186
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.011	0.021	0.032	0.043	0.052	0.062	0.071	0.080	0.088	0.096	0.103	0.110	0.115	0.120	0.124	0.128	0.131	0.133	0.134	0.134
FINAL CAMBER ↑	0	1/16"	1/8"	1/8"	3/16"	1/4"	5/16"	5/16"	3/8"	7/16"	7/16"	1/2"	1/2"	9/16"	9/16"	9/16"	9/16"	5/8"	5/8"	5/8"	5/8"
0.6" DIA. LOW-RELAXATION STRANDS	SPAN A																				
	GIRDERS 1 & 4																				
	FOURTIETH POINTS	BRG	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475
CAMBER (GIRDER ALONE IN PLACE) ↑	0.186	0.186	0.184	0.181	0.177	0.172	0.166	0.159	0.151	0.142	0.133	0.122	0.111	0.098	0.086	0.072	0.058	0.044	0.030	0.015	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.134	0.134	0.133	0.130	0.128	0.124	0.120	0.115	0.108	0.103	0.096	0.088	0.078	0.071	0.062	0.052	0.040	0.032	0.021	0.011	0.000
FINAL CAMBER ↑	5/8"	5/8"	5/8"	5/8"	5/8"	9/16"	9/16"	9/16"	1/2"	1/2"	7/16"	7/16"	3/8"	5/16"	5/16"	1/4"	3/16"	1/8"	1/8"	1/16"	0
0.6" DIA. LOW-RELAXATION STRANDS	SPAN A																				
	GIRDERS 2 & 3																				
	FOURTIETH POINTS	BRG	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.015	0.030	0.044	0.058	0.072	0.086	0.098	0.110	0.122	0.133	0.142	0.151	0.159	0.166	0.172	0.177	0.181	0.184	0.186	0.186
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.011	0.022	0.032	0.043	0.053	0.063	0.072	0.081	0.089	0.097	0.104	0.111	0.116	0.122	0.126	0.130	0.132	0.134	0.136	0.136
FINAL CAMBER ↑	0	1/16"	1/8"	1/8"	3/16"	1/4"	1/4"	5/16"	3/8"	3/8"	7/16"	7/16"	1/2"	1/2"	9/16"	9/16"	9/16"	9/16"	5/8"	5/8"	5/8"
0.6" DIA. LOW-RELAXATION STRANDS	SPAN A																				
	GIRDERS 2 & 3																				
	FOURTIETH POINTS	BRG	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475
CAMBER (GIRDER ALONE IN PLACE) ↑	0.186	0.186	0.184	0.181	0.177	0.172	0.166	0.159	0.151	0.142	0.133	0.122	0.111	0.098	0.086	0.072	0.058	0.044	0.030	0.015	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.136	0.136	0.134	0.132	0.129	0.126	0.122	0.116	0.110	0.104	0.097	0.089	0.079	0.072	0.063	0.053	0.041	0.032	0.022	0.011	0.000
FINAL CAMBER ↑	5/8"	5/8"	5/8"	9/16"	9/16"	9/16"	9/16"	1/2"	1/2"	7/16"	7/16"	3/8"	3/8"	5/16"	1/4"	1/4"	3/16"	1/8"	1/8"	1/16"	0
0.6" DIA. LOW-RELAXATION STRANDS	SPANS B-D																				
	GIRDERS 1 & 4																				
	FOURTIETH POINTS	BRG	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.021	0.041	0.062	0.082	0.101	0.120	0.137	0.153	0.170	0.185	0.199	0.211	0.222	0.232	0.241	0.247	0.253	0.257	0.259	0.260
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.015	0.030	0.044	0.056	0.072	0.086	0.098	0.109	0.122	0.133	0.142	0.151	0.159	0.166	0.172	0.177	0.181	0.184	0.186	0.186
FINAL CAMBER ↑	0	1/16"	1/8"	3/16"	5/16"	5/16"	7/16"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	3/4"	13/16"	13/16"	13/16"	7/8"	7/8"	7/8"	7/8"
0.6" DIA. LOW-RELAXATION STRANDS	SPANS B-D																				
	GIRDERS 1 & 4																				
	FOURTIETH POINTS	BRG	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475
CAMBER (GIRDER ALONE IN PLACE) ↑	0.260	0.259	0.257	0.252	0.247	0.241	0.232	0.222	0.211	0.199	0.185	0.170	0.154	0.137	0.120	0.101	0.082	0.062	0.041	0.021	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.186	0.186	0.184	0.181	0.177	0.172	0.166	0.159	0.151	0.142	0.133	0.122	0.109	0.098	0.086	0.072	0.056	0.044	0.030	0.015	0.000
FINAL CAMBER ↑	7/8"	7/8"	7/8"	7/8"	13/16"	13/16"	13/16"	3/4"	3/4"	11/16"	5/8"	9/16"	9/16"	7/16"	7/16"	5/16"	5/16"	3/16"	1/8"	1/16"	0
0.6" DIA. LOW-RELAXATION STRANDS	SPANS B-D																				
	GIRDERS 2 & 3																				
	FOURTIETH POINTS	BRG	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475
CAMBER (GIRDER ALONE IN PLACE) ↑	0.260	0.259	0.257	0.252	0.247	0.241	0.232	0.222	0.211	0.199	0.185	0.170	0.154	0.137	0.120	0.101	0.082	0.062	0.041	0.021	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.188	0.188	0.186	0.183	0.179	0.174	0.168	0.161	0.152	0.144	0.134	0.123	0.110	0.100	0.087	0.073	0.057	0.045	0.030	0.015	0.000
FINAL CAMBER ↑	7/8"	7/8"	7/8"	13/16"	13/16"	13/16"	3/4"	3/4"	11/16"	11/16"	5/8"	9/16"	1/2"	7/16"	3/8"	5/16"	5/16"	3/16"	1/8"	1/16"	0

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS SHOWN IN INCHES (FRACTION FORM).

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
 STATION: 21+97.00 -L-

SHEET 4 OF 6

DRAWN BY : D.R. DRUM	DATE : 02/2022
CHECKED BY : G.R. COLS	DATE : 02/2022
DESIGNED BY : D.R. DRUM	DATE : 02/2022
DESIGN CHECKED BY : G.R. COLS	DATE : 02/2022

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NORTH CAROLINA
 PROFESSIONAL
 SEAL
 041343
 GREGORY R. COLS
 5/15/2022

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

PRESTRESSED CONCRETE GIRDER
 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			39

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DATE: 3/29/2022
TIME: 2:21:27 PM

USER: Bin.Tam.C.Hegedus
DIR: R:\Structures\04 Drawings\01_0035_BR0044_LSMU_005.dgn

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6" DIA. LOW-RELAXATION STRANDS		SPAN E																				
		GIRDERS 1 & 4																				
TWENTIETH POINTS		BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑		0.000	0.011	0.021	0.031	0.040	0.048	0.055	0.061	0.064	0.067	0.068	0.067	0.064	0.061	0.055	0.048	0.040	0.031	0.021	0.011	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.000	0.005	0.009	0.015	0.019	0.023	0.026	0.029	0.030	0.032	0.032	0.032	0.031	0.029	0.026	0.023	0.019	0.015	0.010	0.005	0.000
FINAL CAMBER ↑		0	1/16"	1/8"	3/16"	1/4"	5/16"	3/8"	3/8"	7/16"	7/16"	7/16"	7/16"	3/8"	3/8"	5/16"	5/16"	1/4"	3/16"	1/8"	1/16"	0

0.6" DIA. LOW-RELAXATION STRANDS		SPAN E																				
		GIRDERS 2 & 3																				
TWENTIETH POINTS		BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑		0.000	0.011	0.021	0.031	0.040	0.048	0.055	0.061	0.064	0.067	0.068	0.067	0.064	0.061	0.055	0.048	0.040	0.031	0.021	0.011	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.000	0.005	0.010	0.015	0.019	0.023	0.026	0.029	0.031	0.032	0.032	0.032	0.031	0.029	0.027	0.023	0.019	0.015	0.010	0.005	0.000
FINAL CAMBER ↑		0	1/16"	1/8"	3/16"	1/4"	5/16"	3/8"	3/8"	3/8"	7/16"	7/16"	7/16"	3/8"	3/8"	5/16"	5/16"	1/4"	3/16"	1/8"	1/16"	0

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS SHOWN IN INCHES (FRACTION FORM).

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.

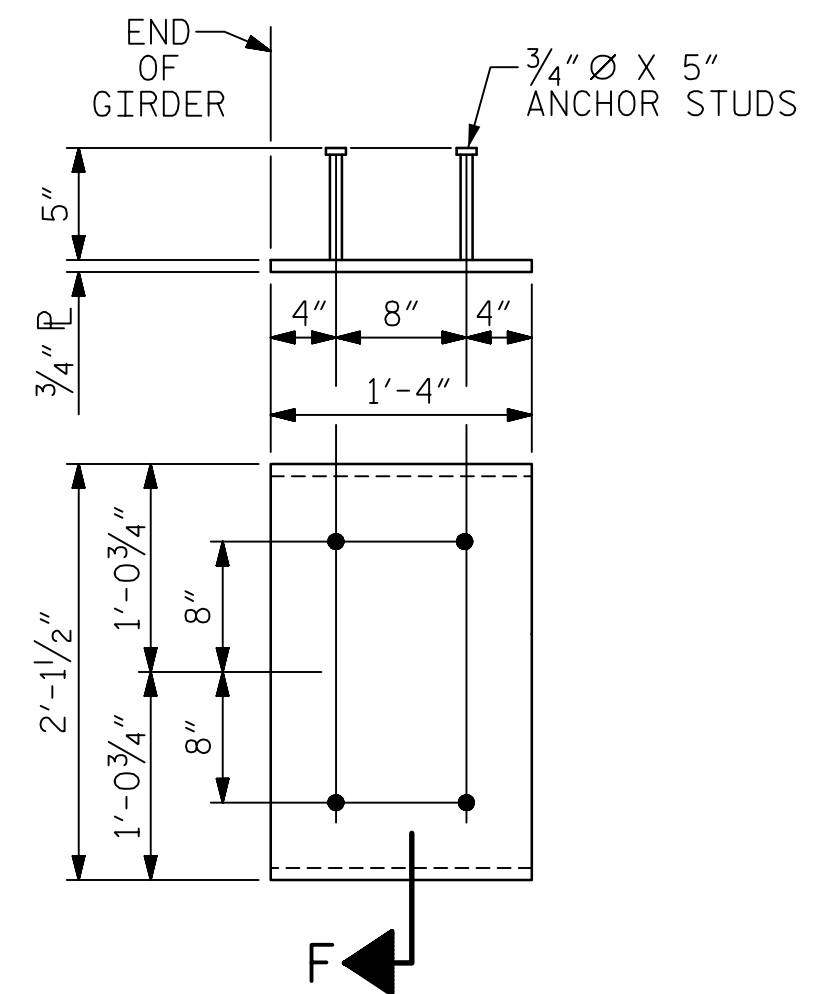
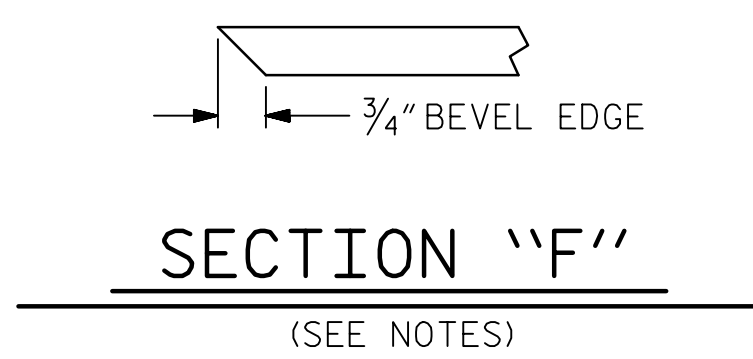
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,800 PSI. MIN.

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

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4". THE TOP OF GIRDER IN THE REGION OF THE LINK SLAB SHALL BE SMOOTH (NOT RAKED) AND FREE OF STIRRUPS/STUDS, ANCHOR STUDS, DECK FORMWORK ATTACHMENTS, AND OVERHANG FALSEWORK/FORMWORK ATTACHMENTS.

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" AND 72" MODIFIED BULB TEES ONLY.

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



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

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -L-

SHEET 5 OF 6

DRAWN BY : D.R. DRUM	DATE : 02/2022
CHECKED BY : G.R. COLS	DATE : 02/2022
DESIGNED BY : D.R. DRUM	DATE : 02/2022
DESIGN CHECKED BY : G.R. COLS	DATE : 02/2022

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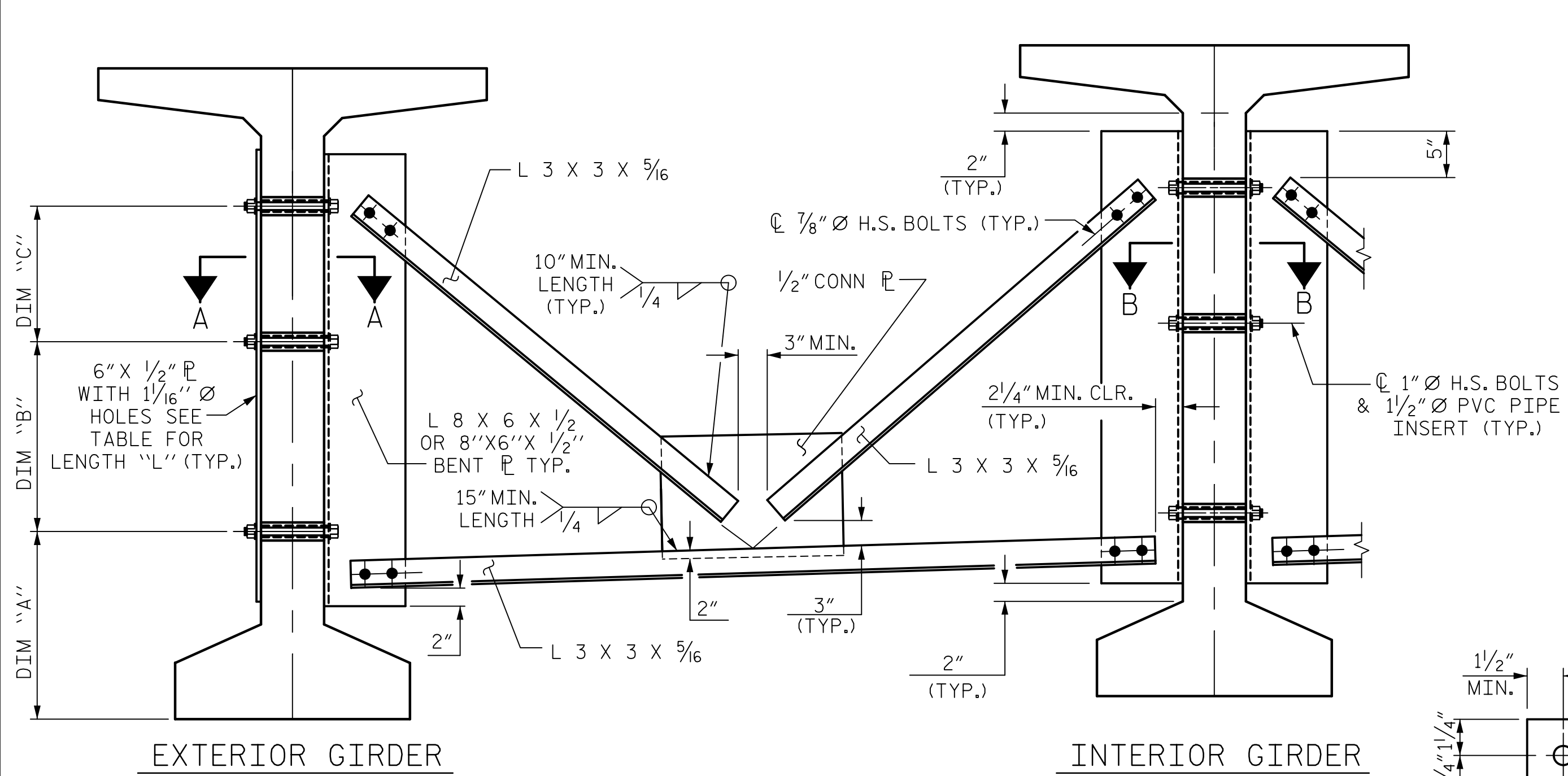
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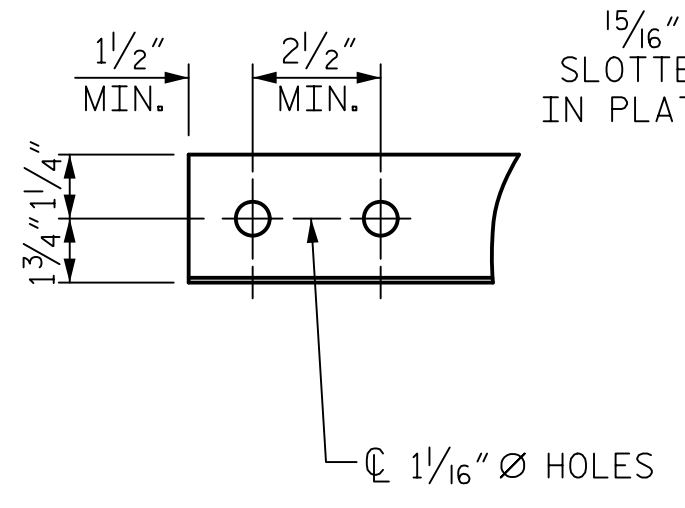
NORTH CAROLINA
PROFESSIONAL
SEAL
041343
GREGORY R. COLS
REGISTERED PROFESSIONAL ENGINEER
5/15/2022

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			39

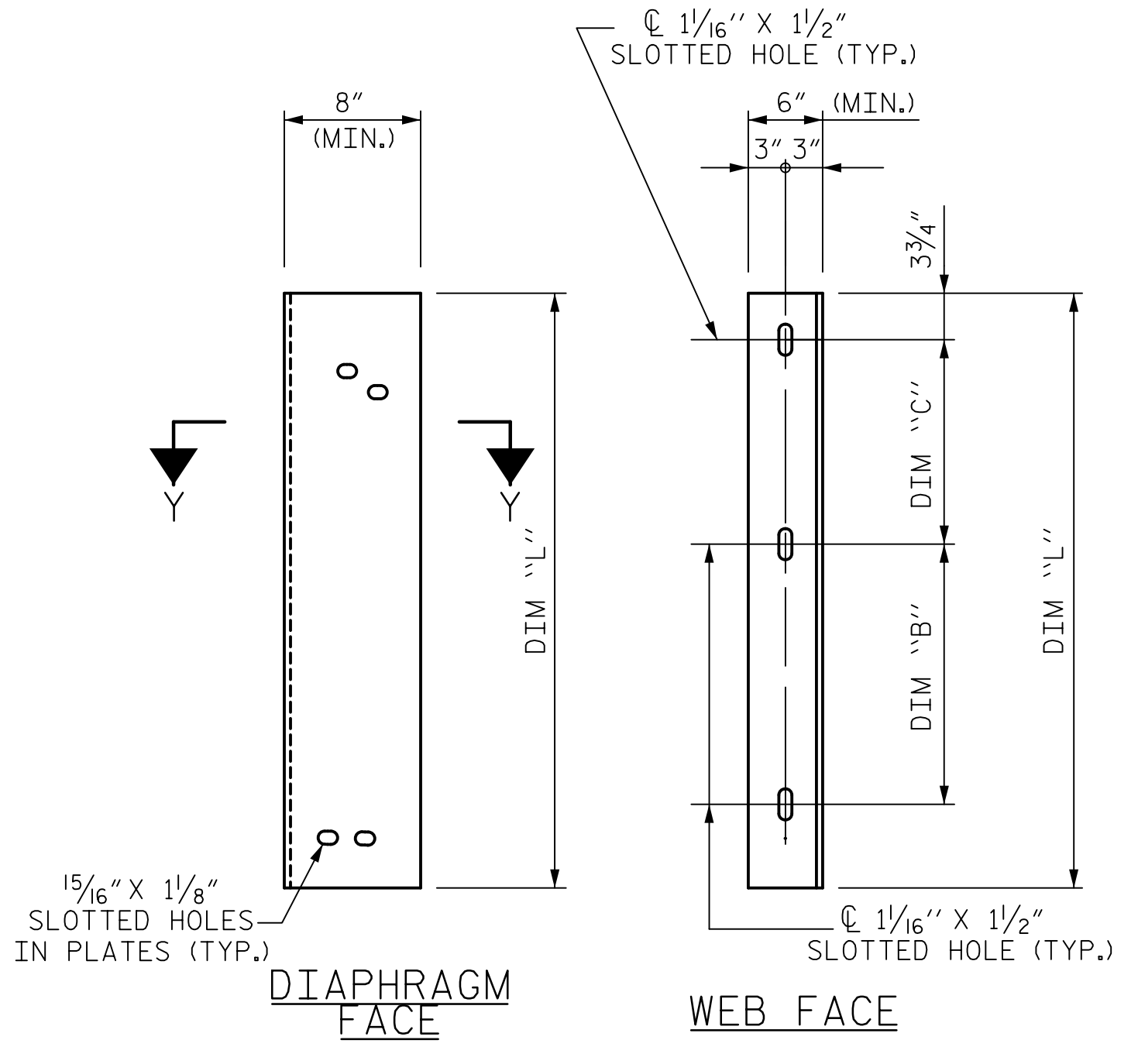
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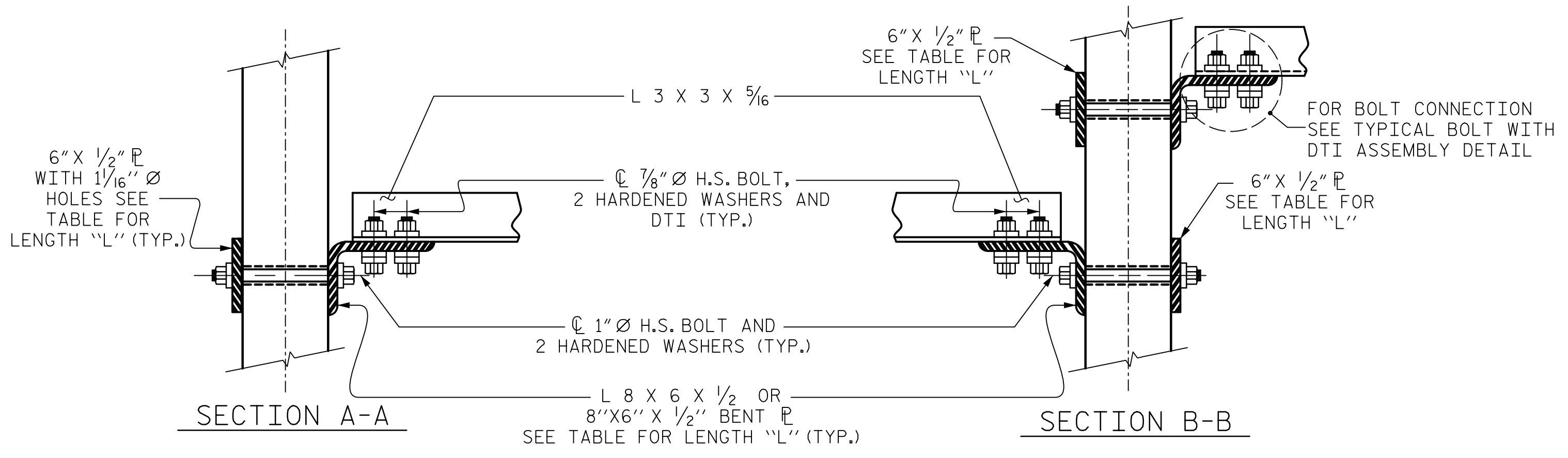
PART SECTION AT INTERMEDIATE DIAPHRAGM
(63" BULB TEE GIRDER)



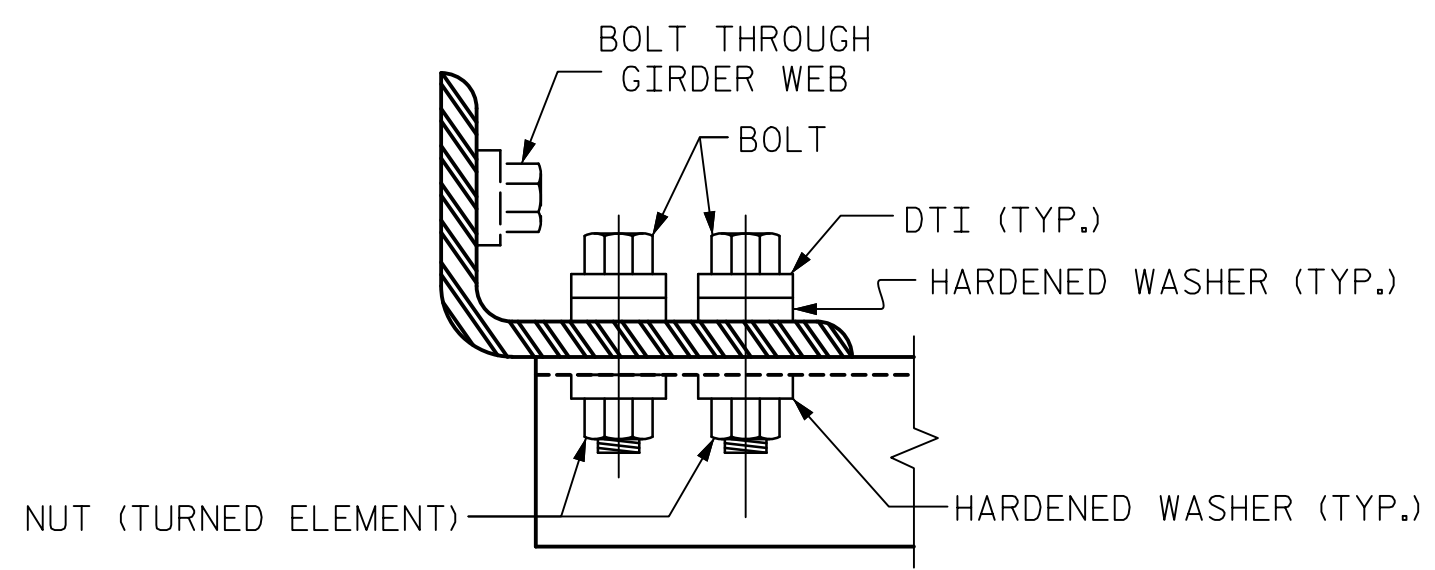
ANGLE END
(L 3 X 3 X 5/16)



CONNECTOR PLATE DETAIL



CONNECTION DETAILS
(SKEW < 70°)



BOLT WITH DTI ASSEMBLY DETAIL

STRUCTURAL STEEL NOTES

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

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

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

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

FOR METALLIZATION, APPLY A THERMAL SPRAYED COATING WITH A SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM, THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

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

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

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

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

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

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

TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" BULB TEE	1'-7 1/2"	1'-3 1/2"	1'-2 3/4"	3'-5"

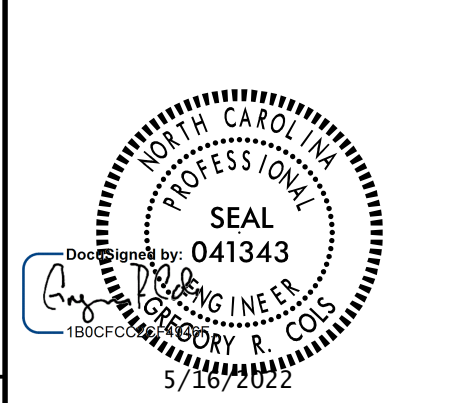
PROJECT NO. BR-0044
ROCKINGHAM COUNTY
 STATION: 21+97.00 -L-

SHEET 6 OF 6



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
 RALEIGH

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



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			39

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USER: R:\Structures\04 Drawings\01_0037_BR0044_LSMU_G06.dgn

ASSEMBLED BY : A. JIANG	DATE : 6/2019	
CHECKED BY : G.R. COLS	DATE : 6/2019	
DESIGNED BY : S. NATARAJAN	DATE : 6/2019	
DESIGN CHECKED BY : G.R. COLS	DATE : 6/2019	
DRAWN BY : RWW 11/09	REV. 10/11	MAA/GM
CHECKED BY : GM 11/09	REV. 12/17	MAA/THC

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.

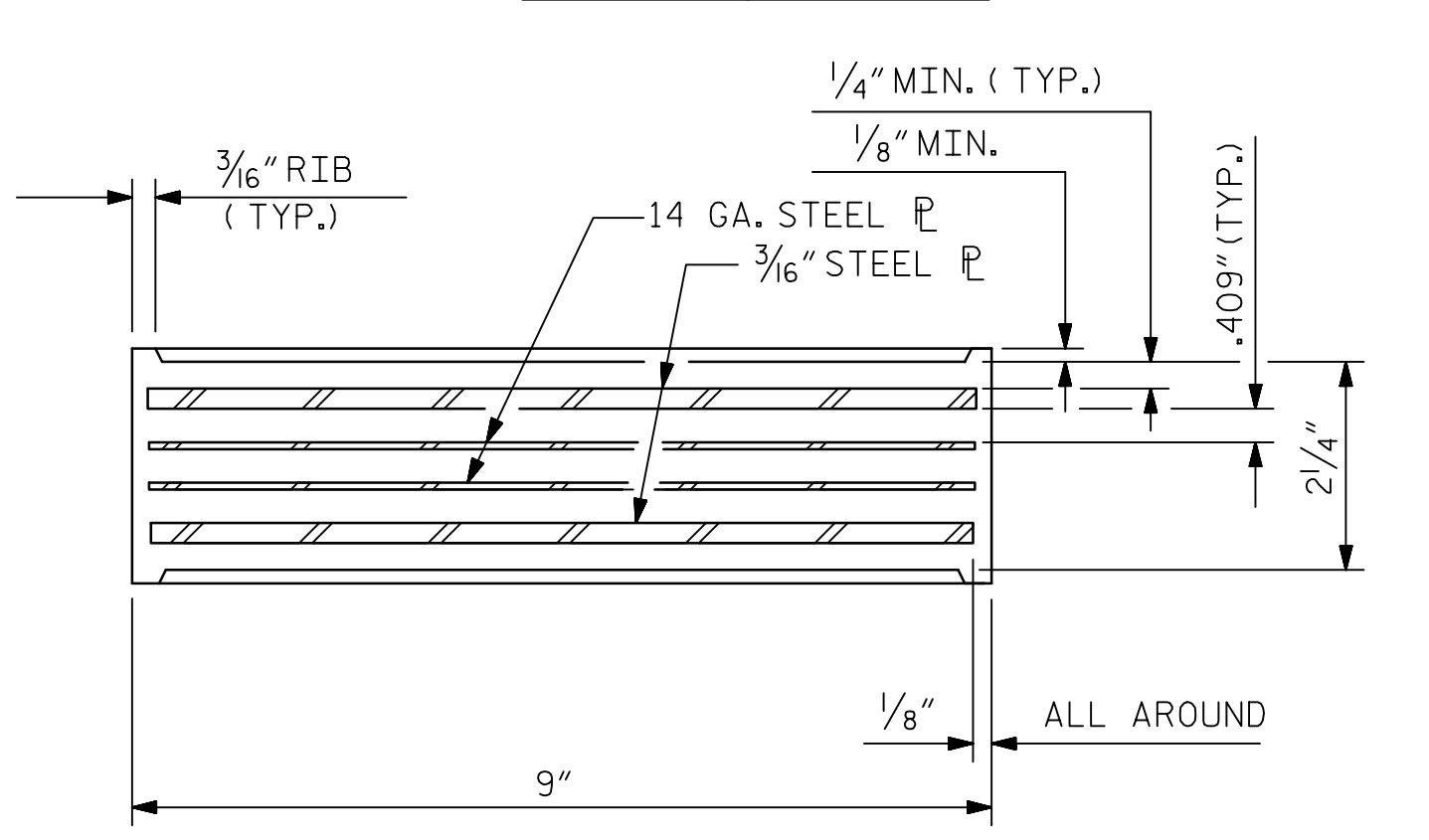
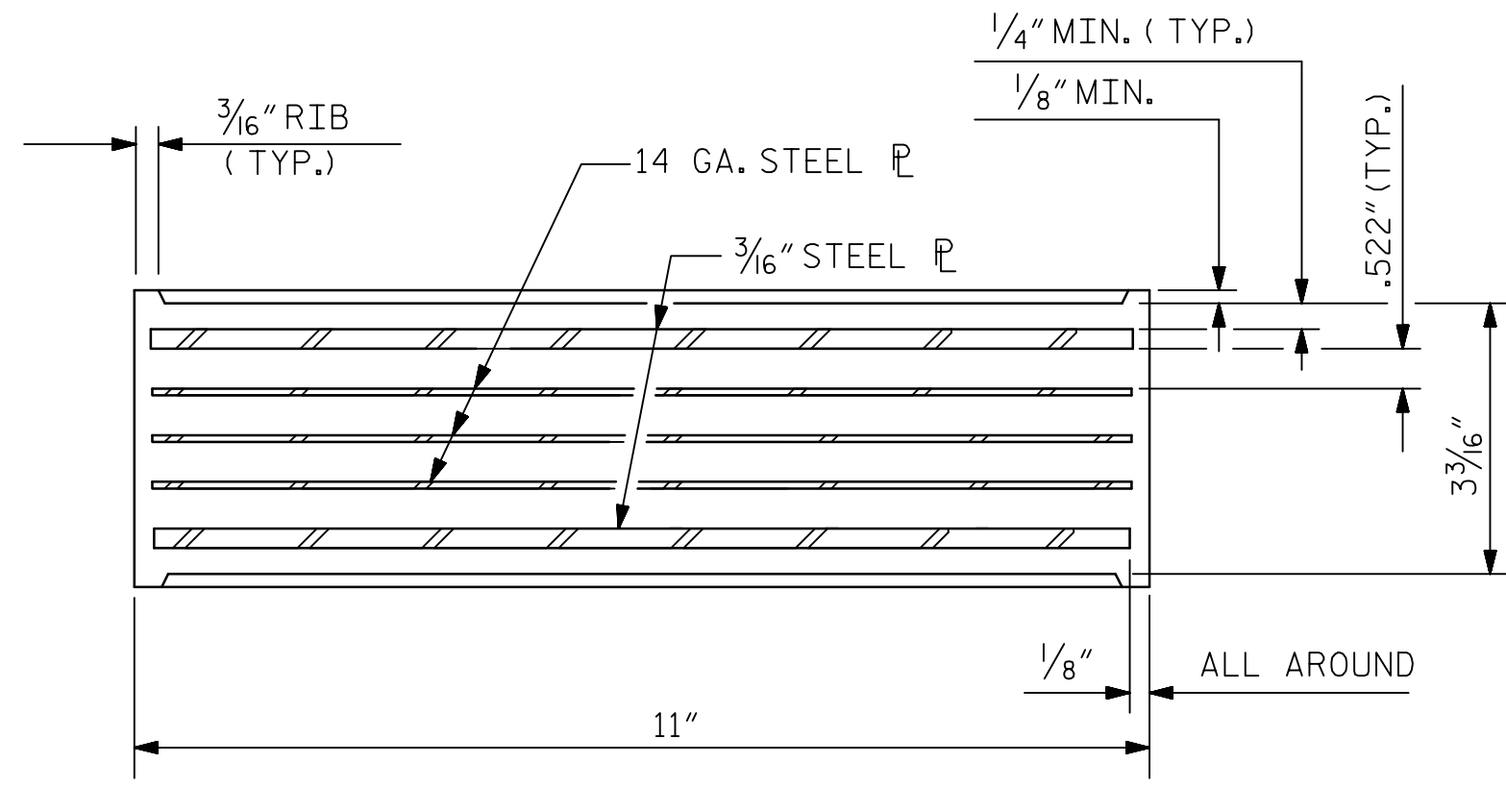
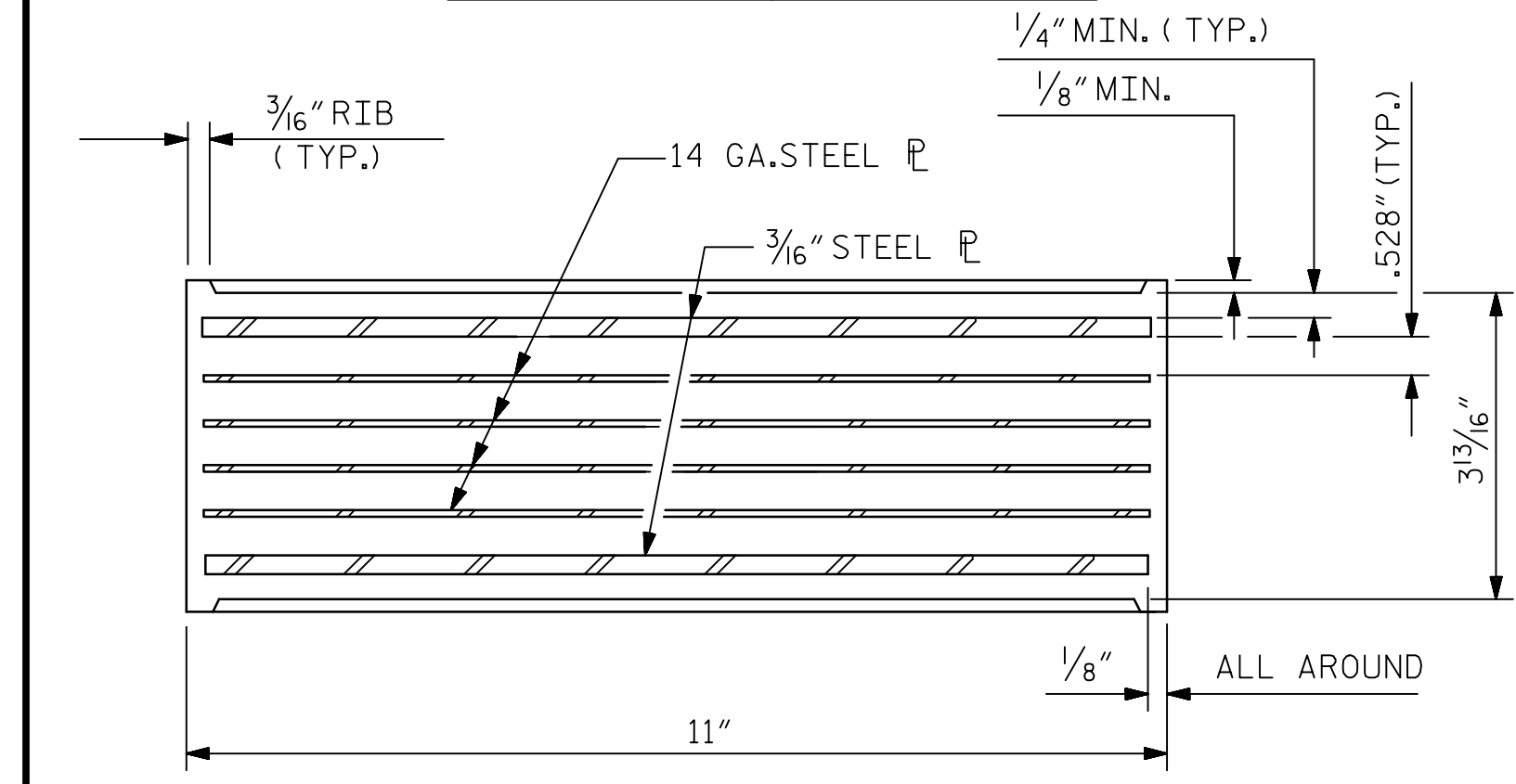
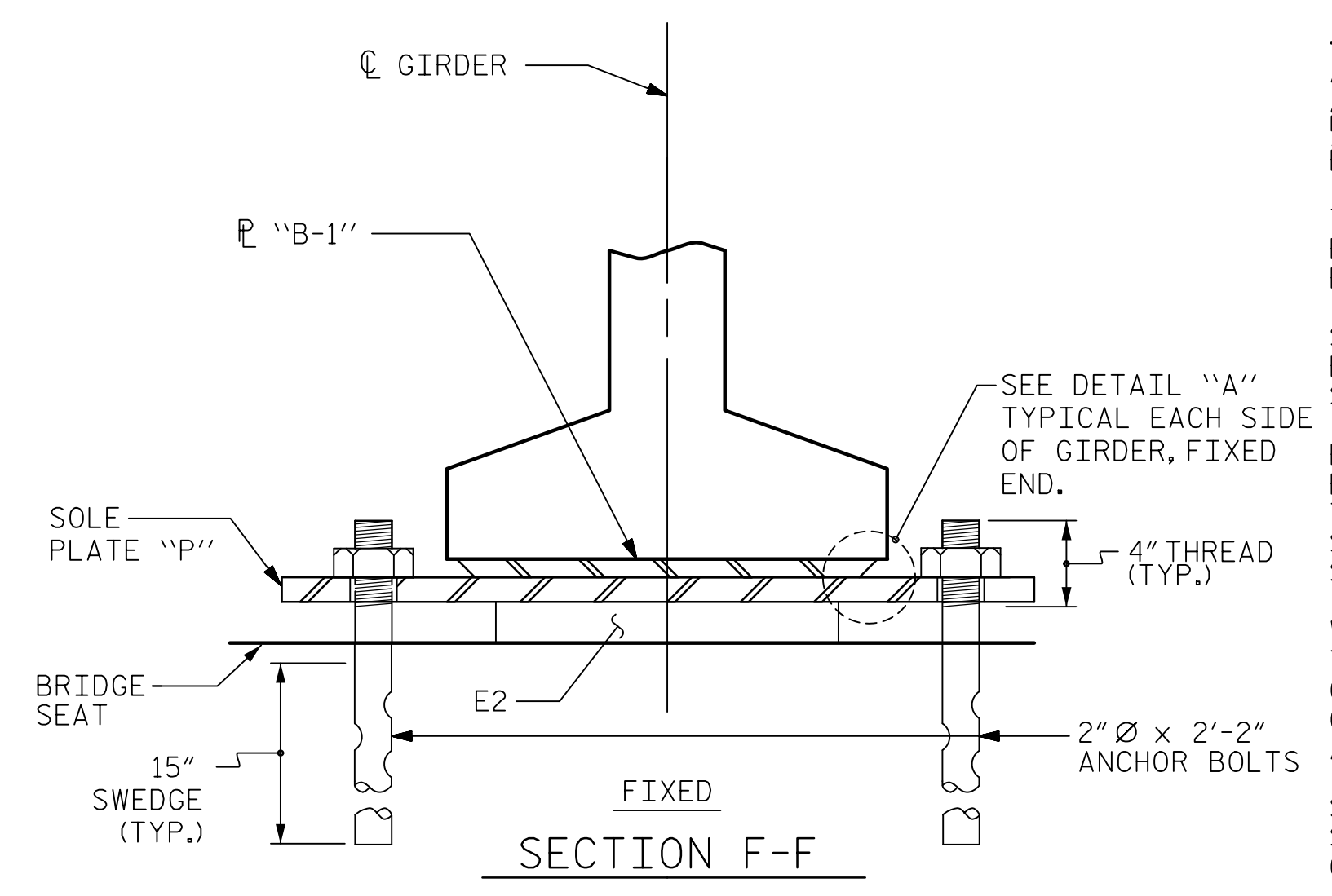
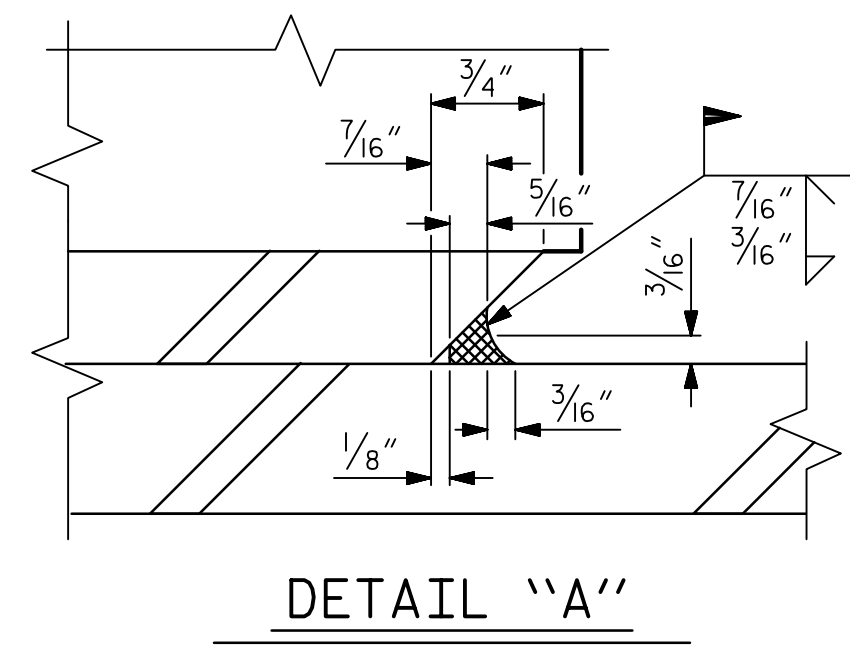
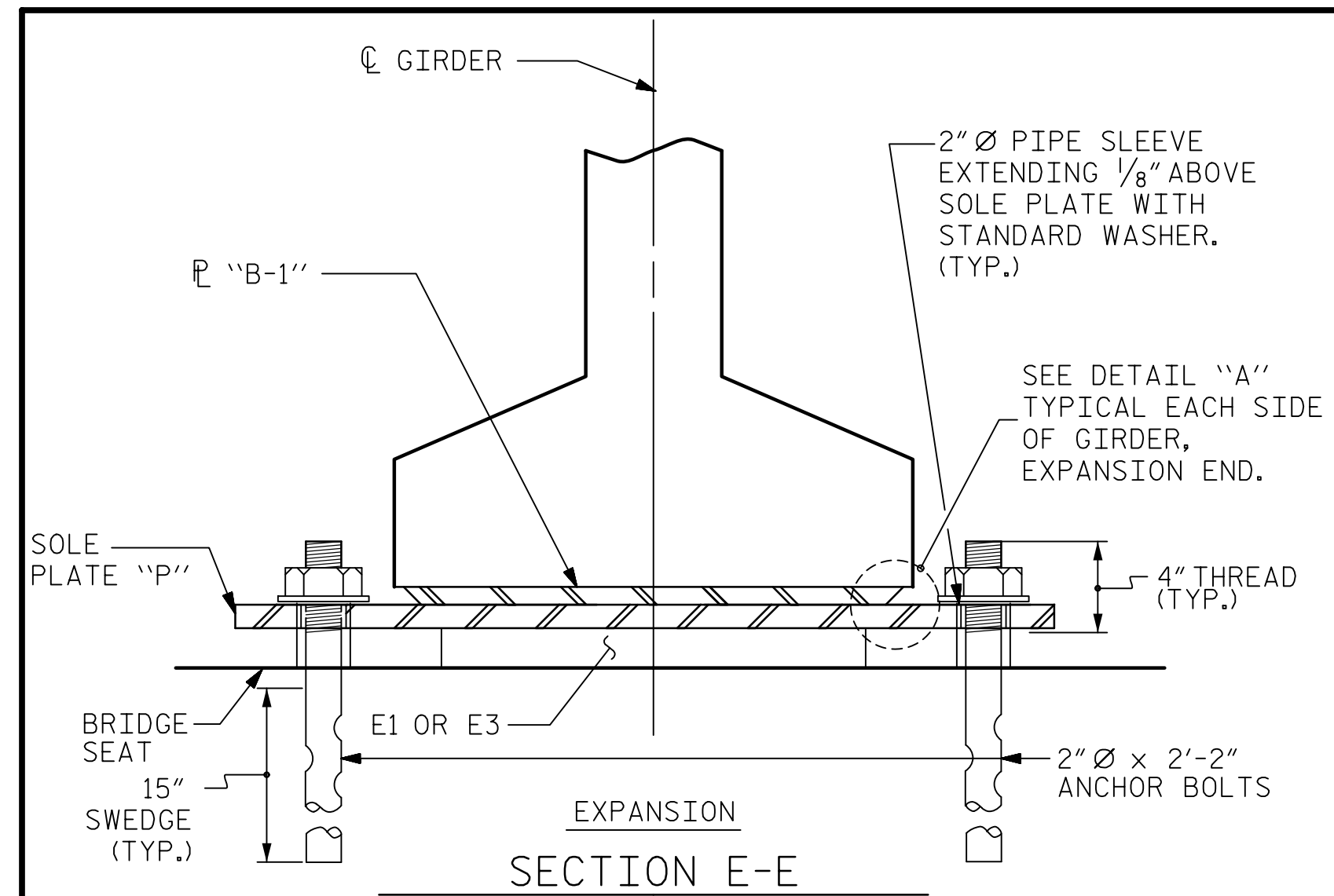
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

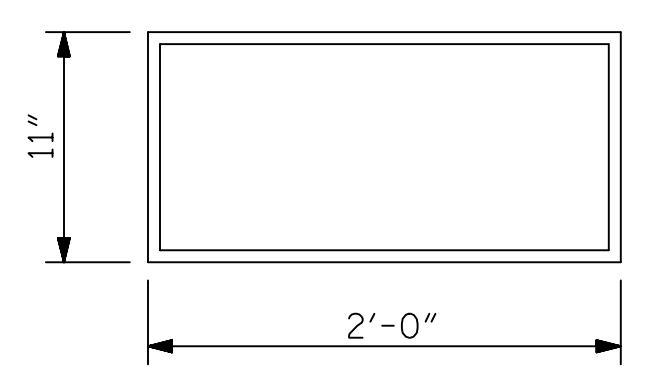
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



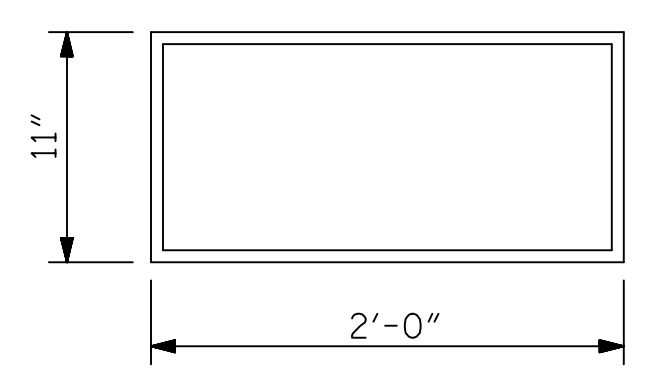
TYPICAL SECTION OF ELASTOMERIC BEARINGS

TYPICAL SECTION OF ELASTOMERIC BEARINGS

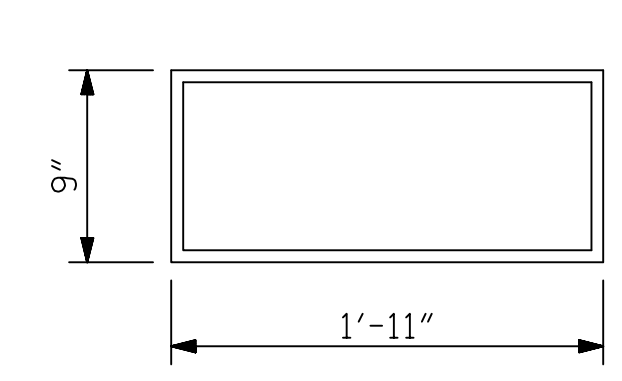
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E1 (4 REQ'D)



E3 (4 REQ'D)



E2 (32 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

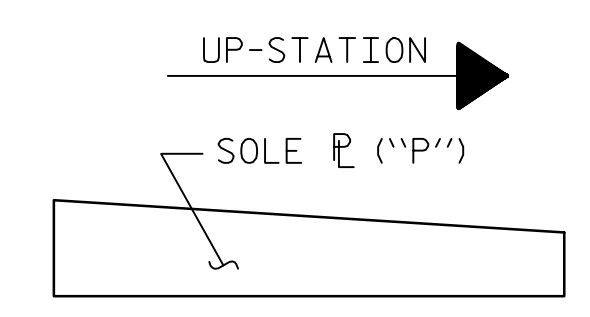
PLAN VIEW OF ELASTOMERIC BEARING

PLAN VIEW OF ELASTOMERIC BEARING

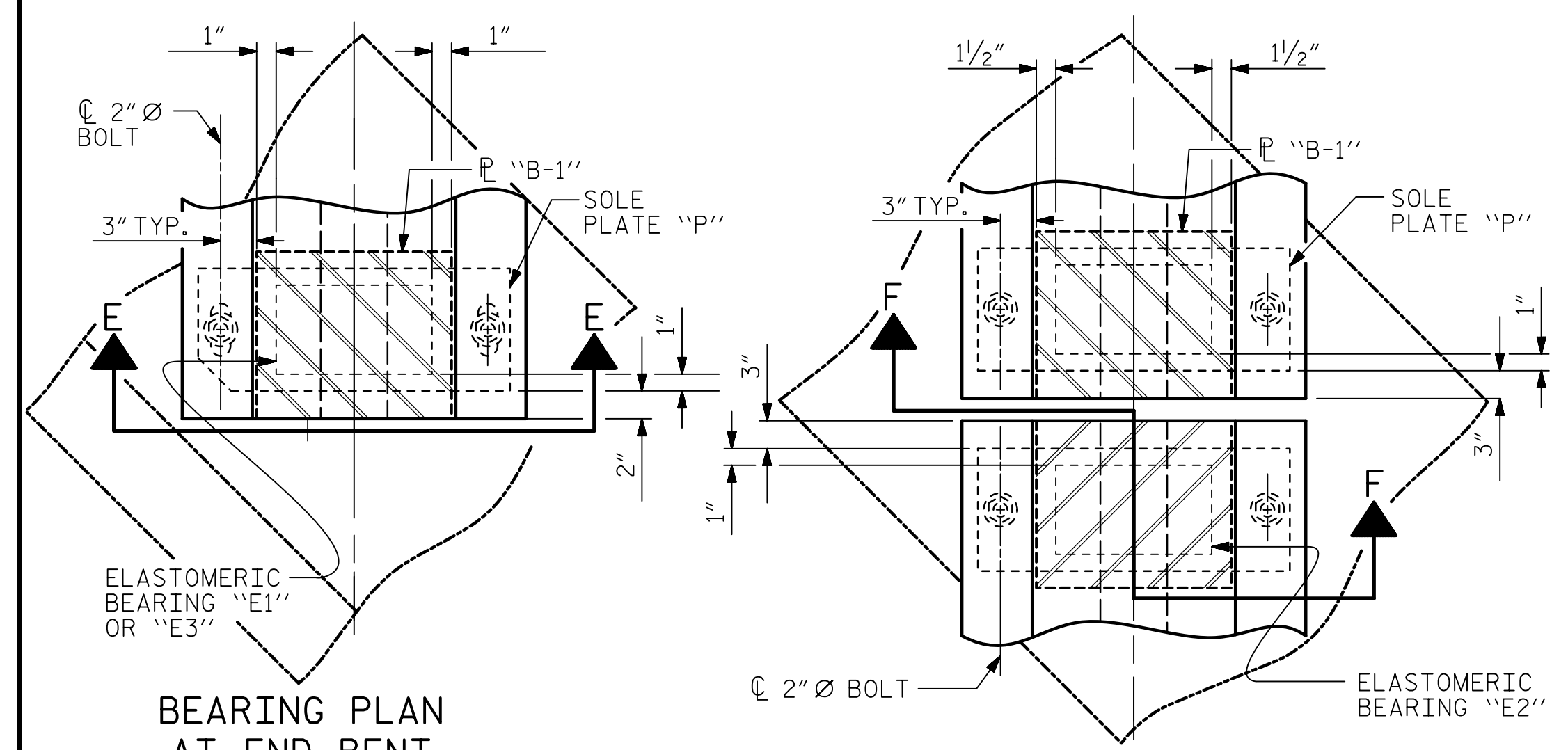
CUSTOM TYPE BEARINGS

TYPE V

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
CUSTOM (E1)	240 k
TYPE V	365 k
CUSTOM (E3)	200 k

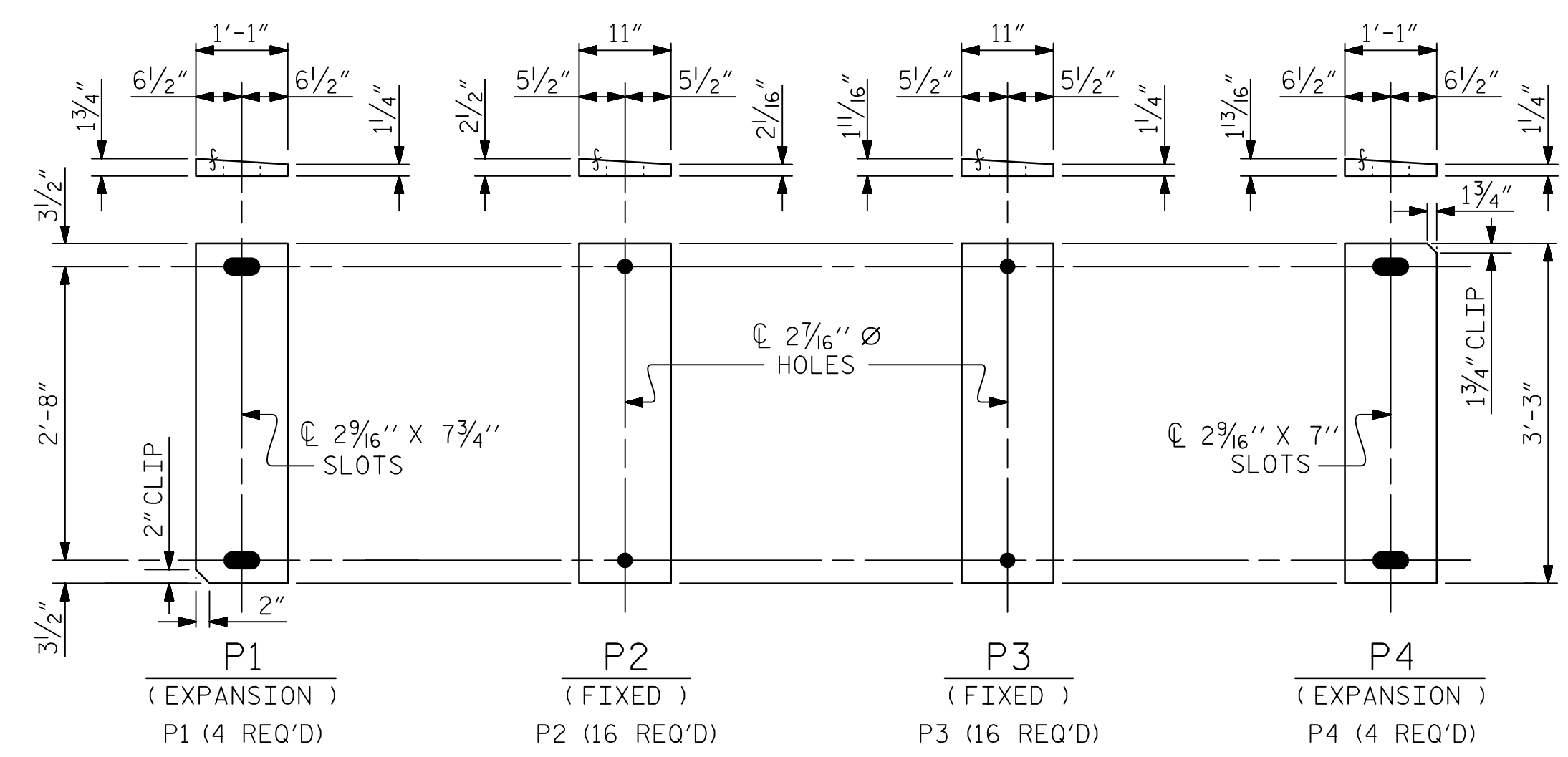


SOLE P PLACEMENT DETAIL



BEARING PLAN AT END BENT

BEARING PLAN AT BENTS (SHOWING CONTINUOUS BENT)



SOLE PLATE DETAILS ("P")

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. BR-0044
 ROCKINGHAM COUNTY
 STATION: 21+97.00 -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

Professional Engineer Seal:
 STATE OF NORTH CAROLINA
 SEAL
 041343
 GEORGE R. COX
 5/15/2012

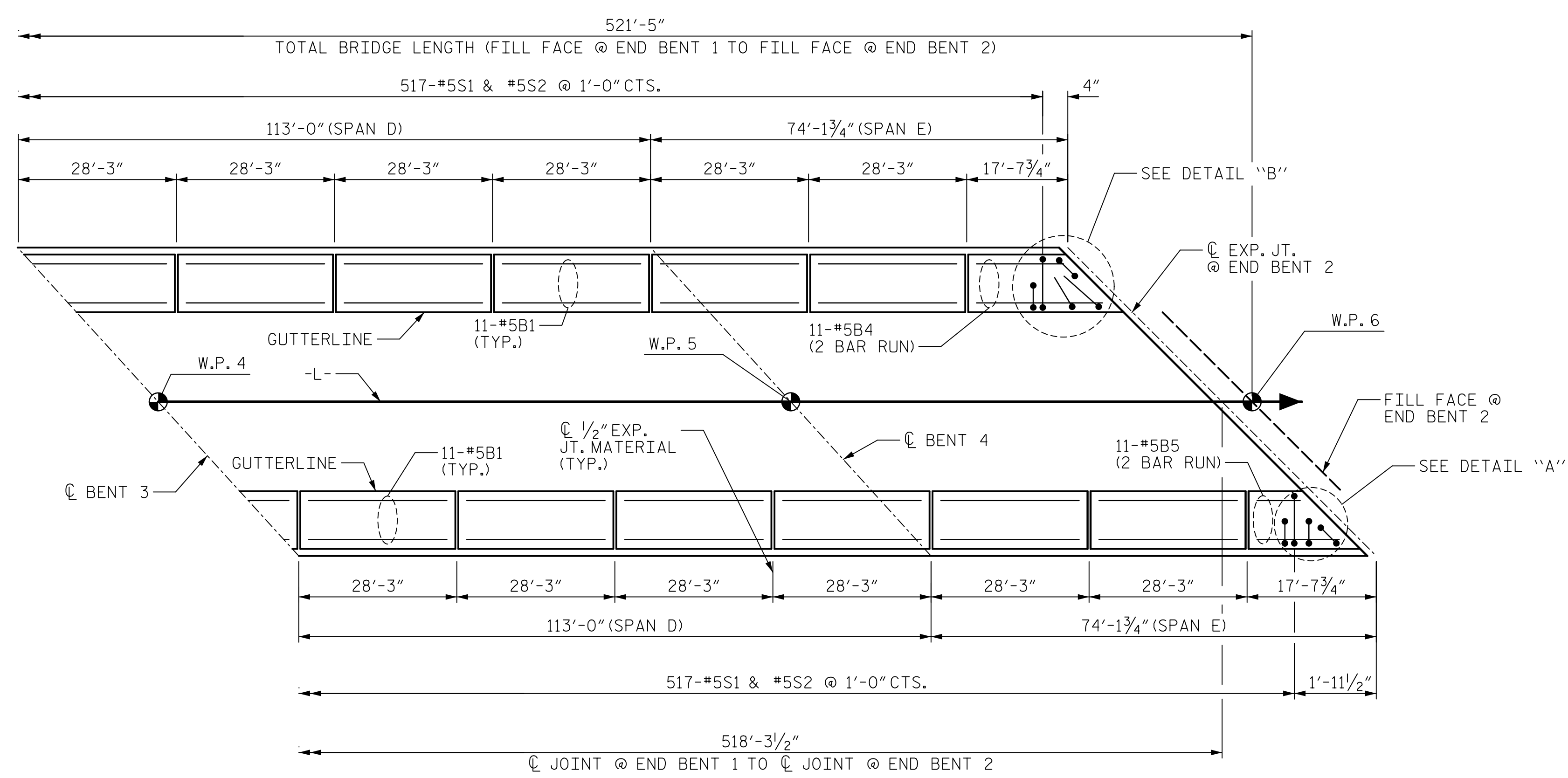
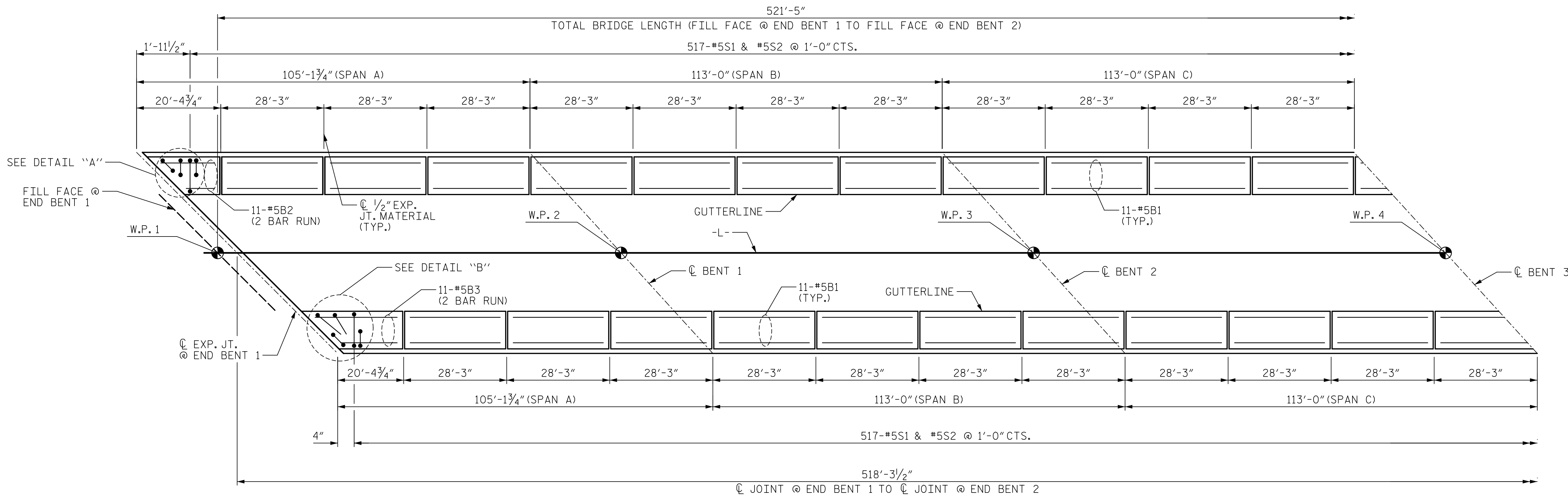
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
ELASTOMERIC BEARING DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-20
					TOTAL SHEETS 39

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 CHECKED BY : G. COLS DATE : 06/2019
 DESIGNED BY : S. NATARAJAN DATE : 06/2019
 DESIGN CHECKED BY : G. COLS DATE : 06/2019

DATE: 3/29/2022
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USER: Bin.Tam.C@hgtck.com
DRAWING: R:\Structures\04 Drawings\01_0041_BR0044_SML\GBR01.dwg

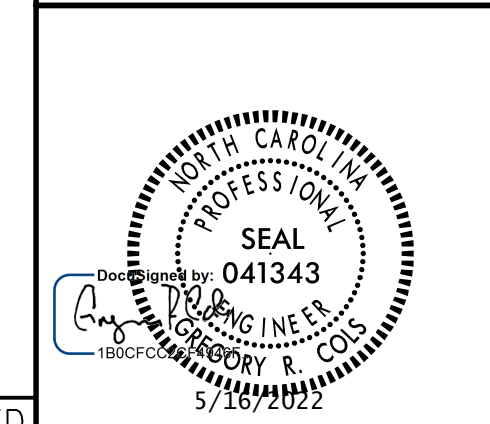


PLAN

FOR DETAILS "A" AND "B", SEE SHEET 2
DIMENSIONS SHOWN ALONG OUTSIDE OF DECK

DRAWN BY : D.R. DRUM	DATE : 03/2022
CHECKED BY : G.R. COLS	DATE : 03/2022
DESIGNED BY : D.R. DRUM	DATE : 03/2022
DESIGN CHECKED BY : G.R. COLS	DATE : 03/2022

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PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE CONCRETE BARRIER RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-21
					TOTAL SHEETS 39

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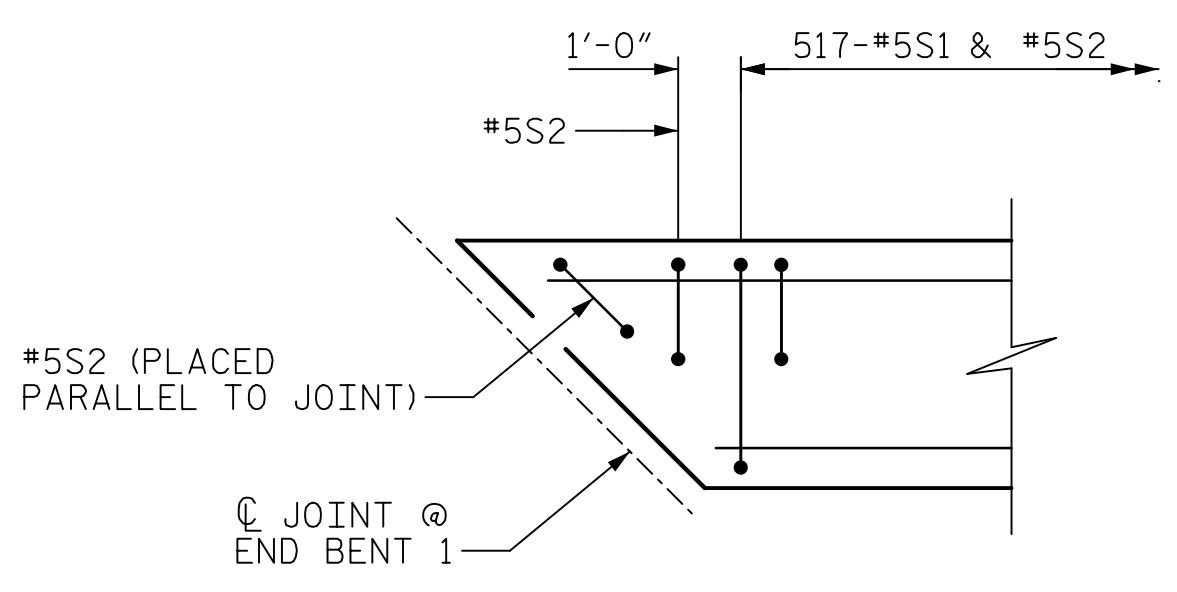
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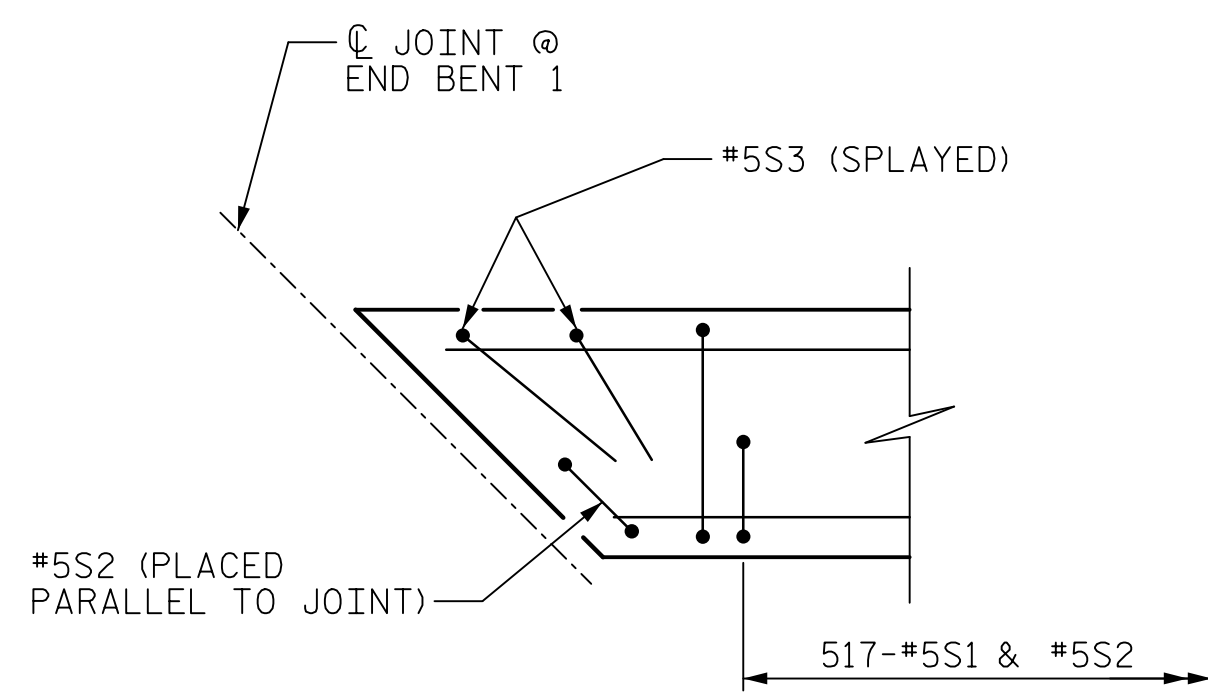
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

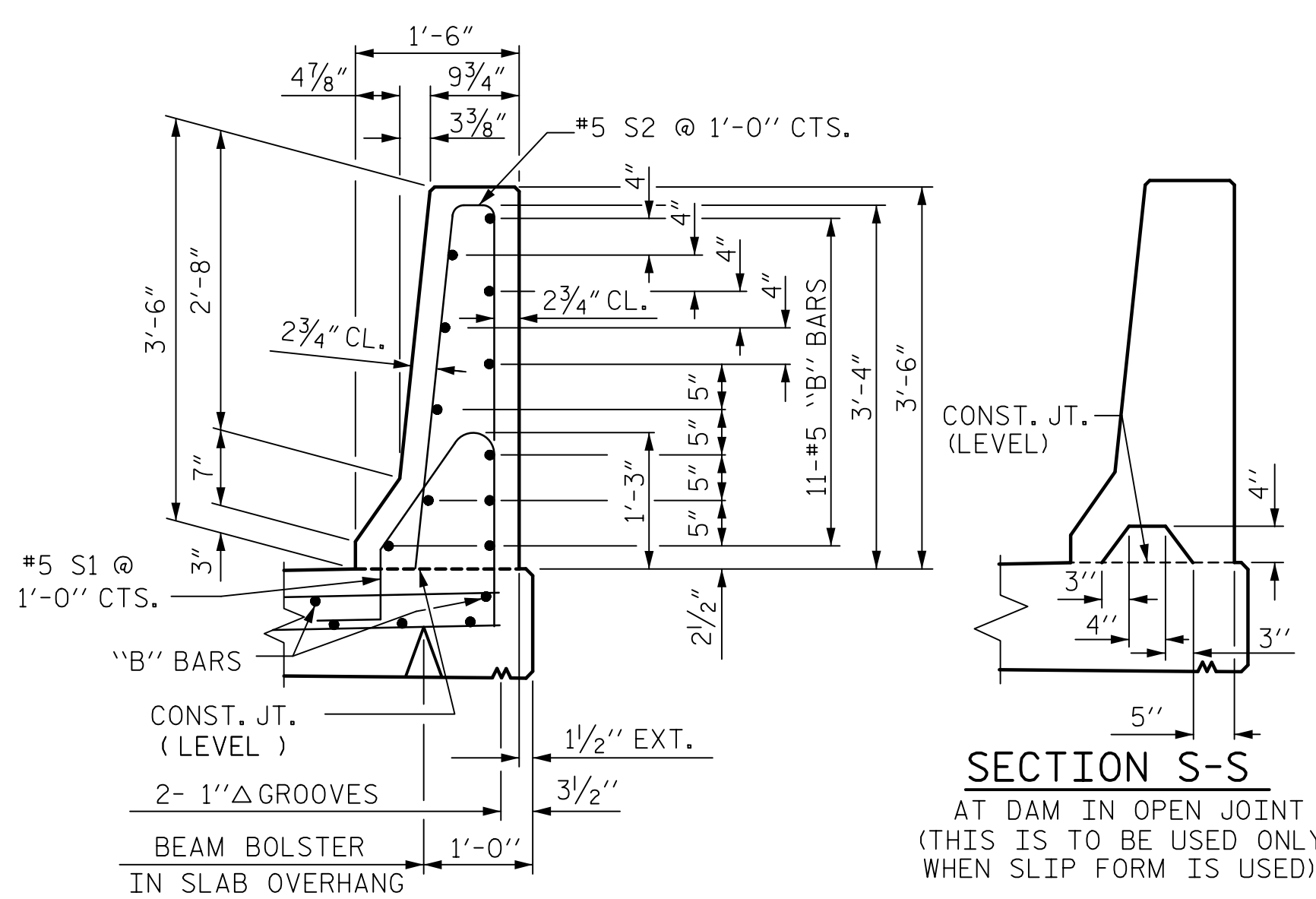
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS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



DETAIL "A"
END BENT 2 SIMILAR BY ROTATION

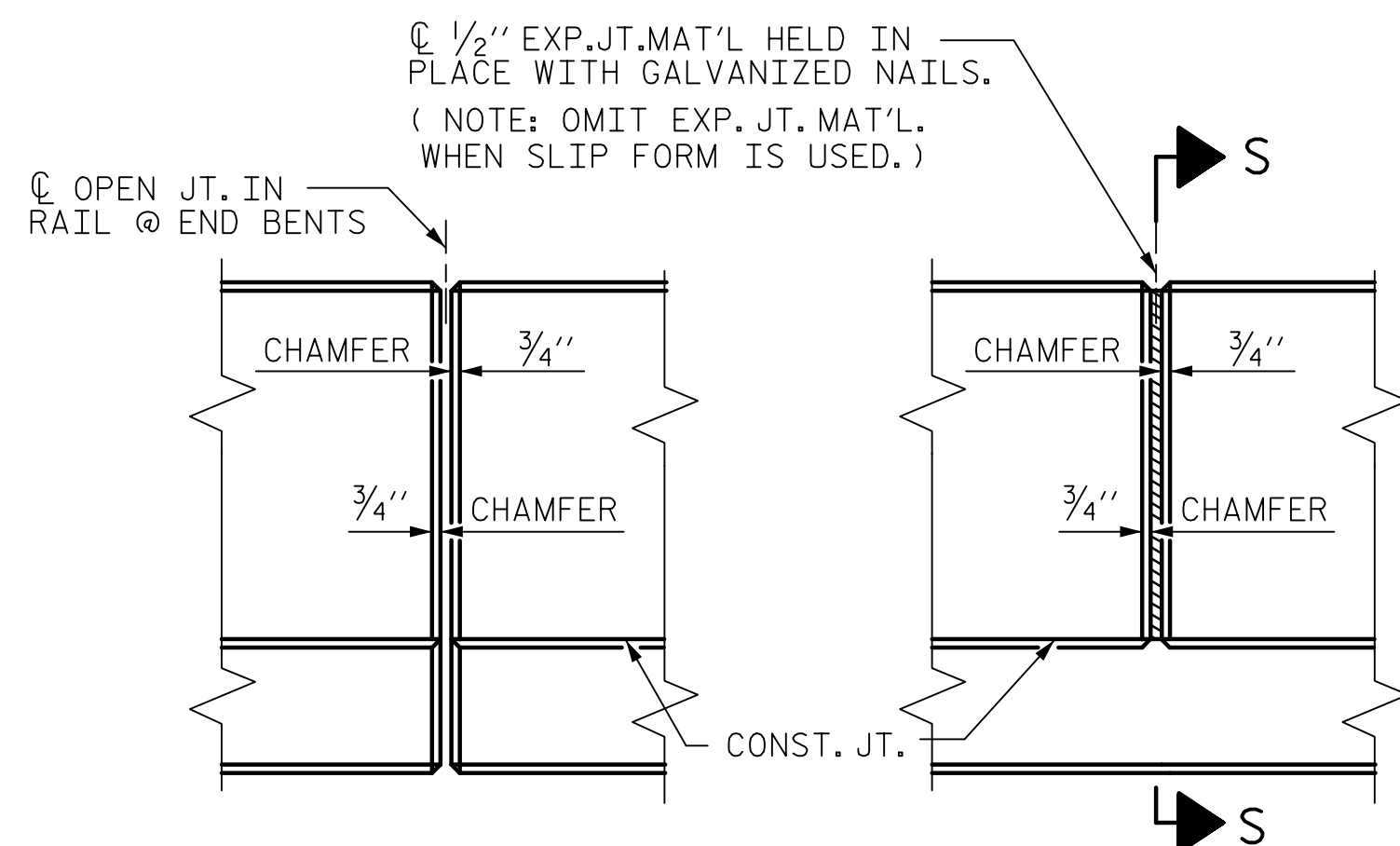


DETAIL "B"
END BENT 2 SIMILAR BY ROTATION

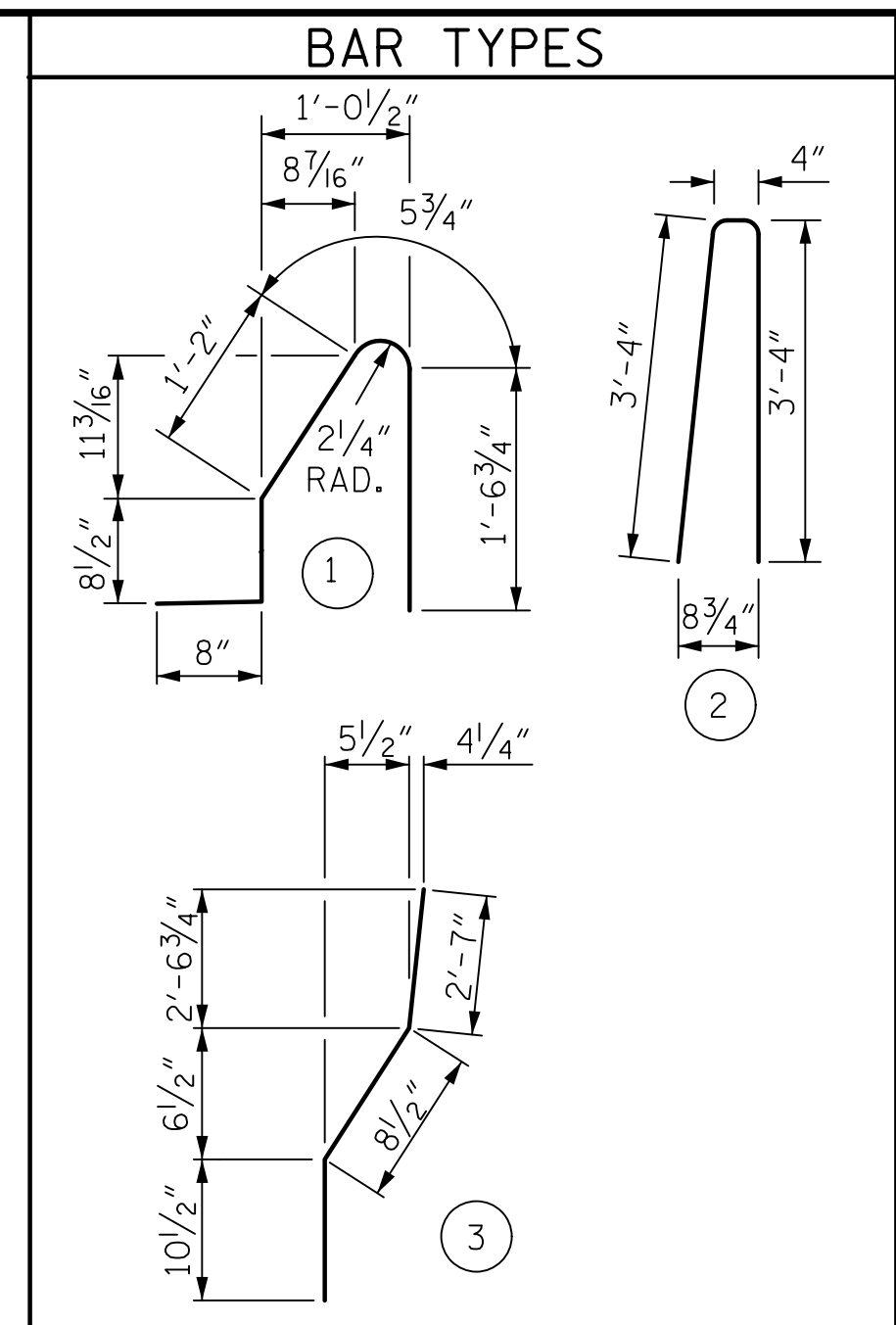


SECTION THRU RAIL

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



ELEVATION AT EXPANSION JOINTS
BARRIER RAIL DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	374	#5	STR	27'-10"	10,857
* B2	22	#5	STR	11'-6"	264
* B3	22	#5	STR	12'-4"	283
* B4	22	#5	STR	11'-0"	252
* B5	22	#5	STR	10'-2"	233
* S1	1034	#5	1	4'-7"	4943
* S2	1040	#5	2	7'-0"	7593
* S3	4	#5	3	4'-2"	17
* EPOXY COATED REINFORCING STEEL					24,442 LBS.
CLASS AA CONCRETE					141 CU. YDS.
CONCRETE BARRIER RAIL					1036.6 LIN. FT.

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -L-

SHEET 2 OF 2



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

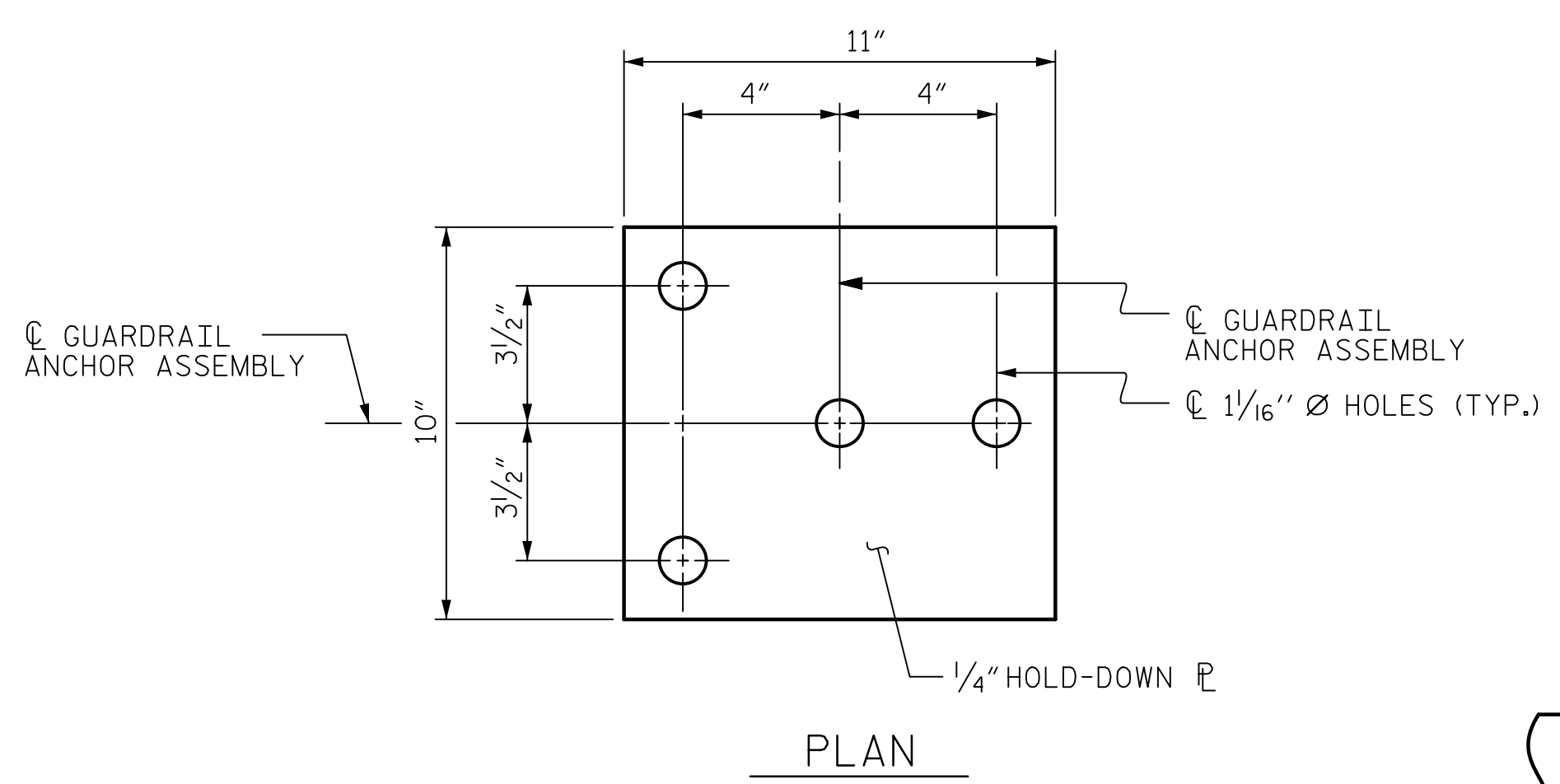
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
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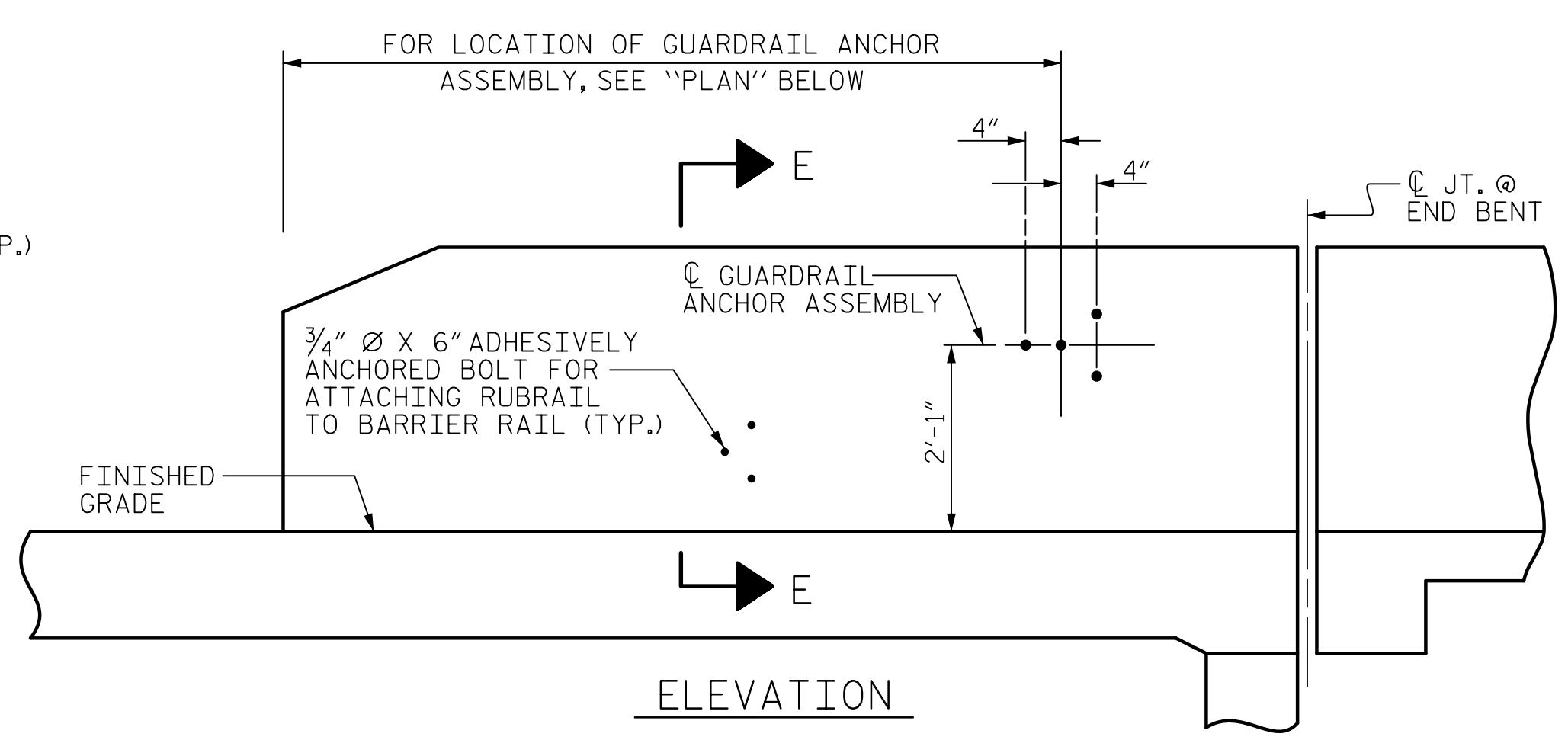
ASSEMBLED BY : A. JIANG	DATE : 6/2019	MAA/GM
CHECKED BY : G.R. COLS	DATE : 6/2019	MAA/GM
DESIGNED BY : A. JIANG	DATE : 6/2019	MAA/THC
DESIGN CHECKED BY : G.R. COLS	DATE : 6/2019	
DRAWN BY : ARB 5/87	REV. 7/12	MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13	MAA/GM
	REV. 12/17	MAA/THC

DATE: 3/29/2019
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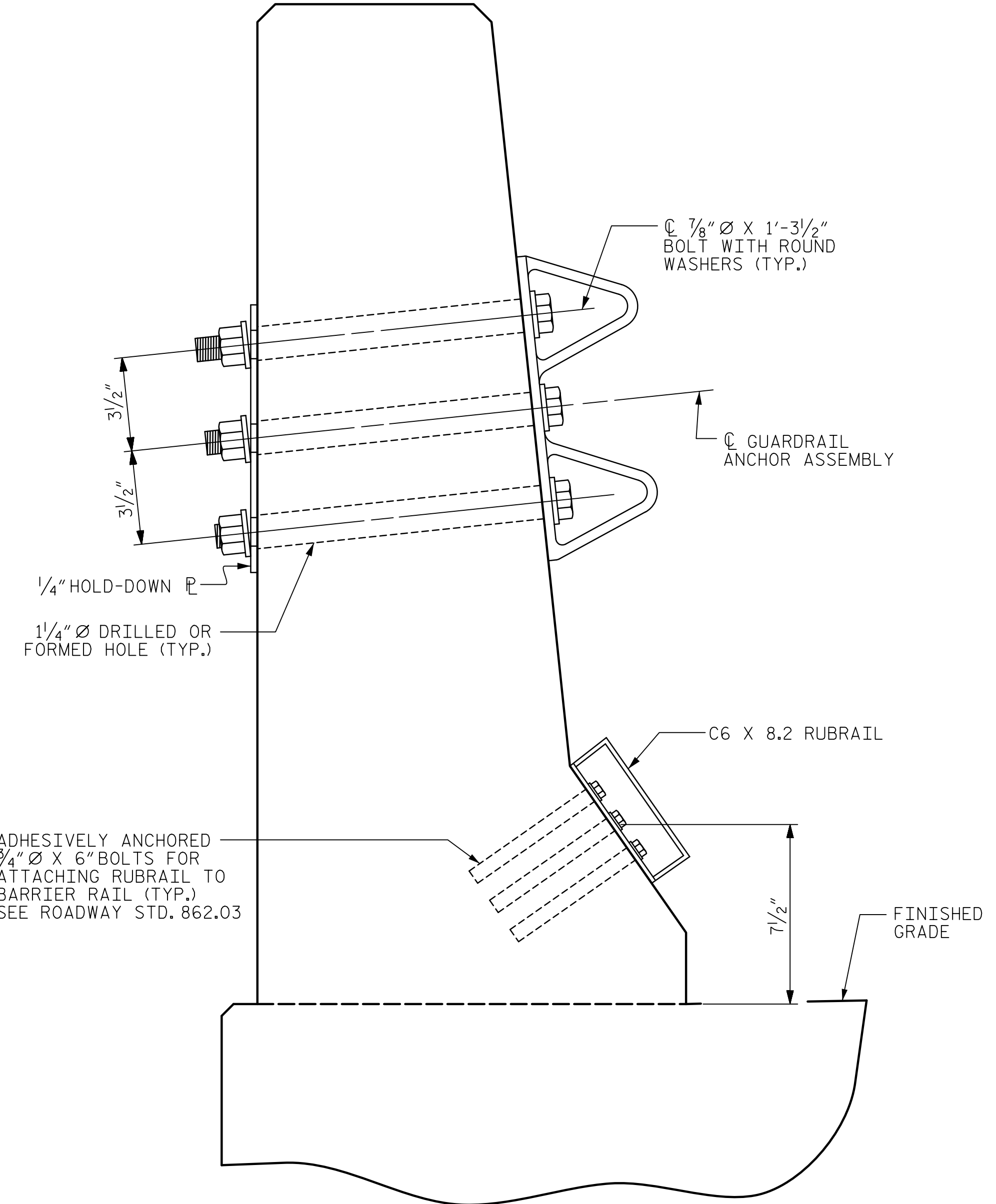
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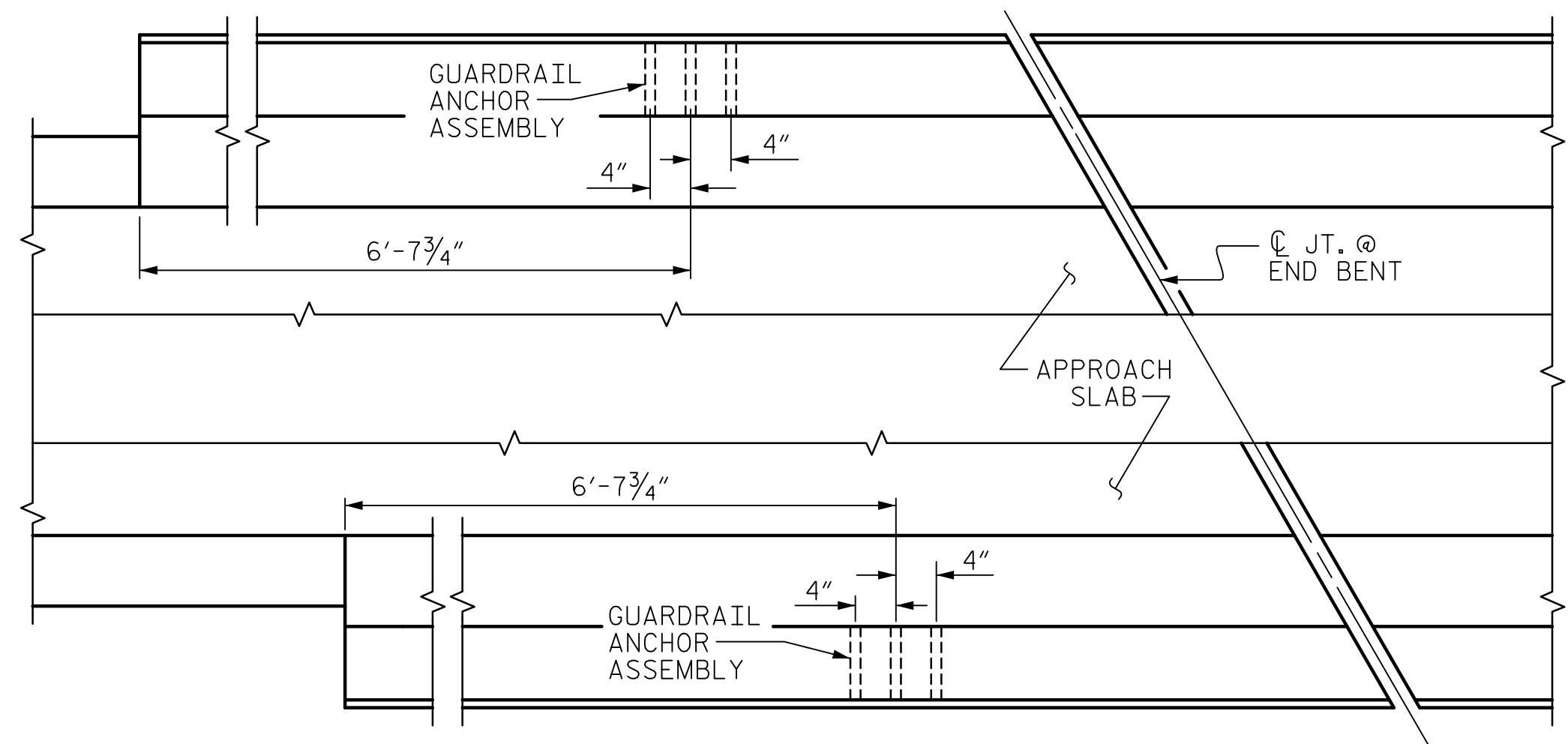
PLAN



ELEVATION



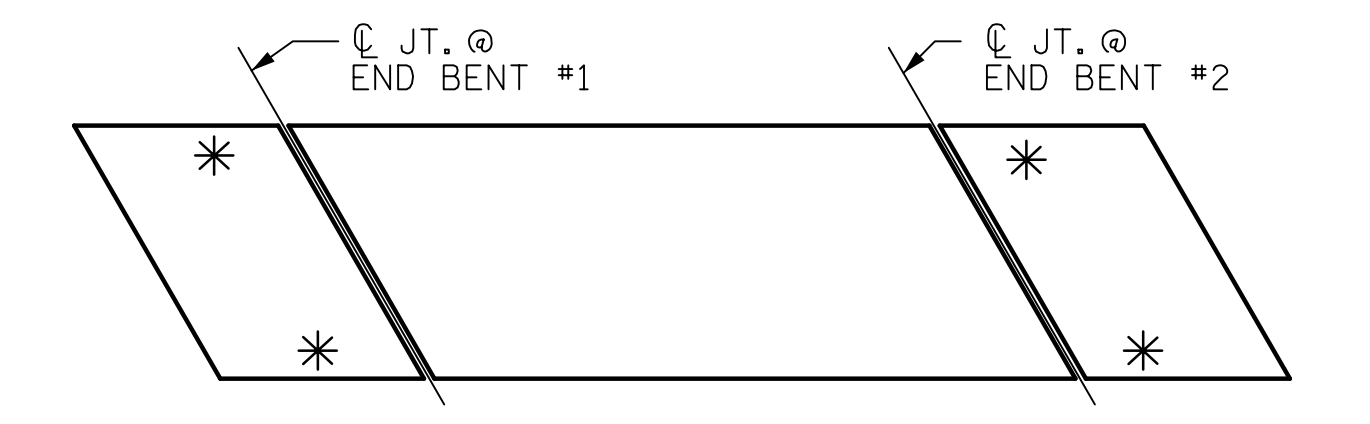
SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR



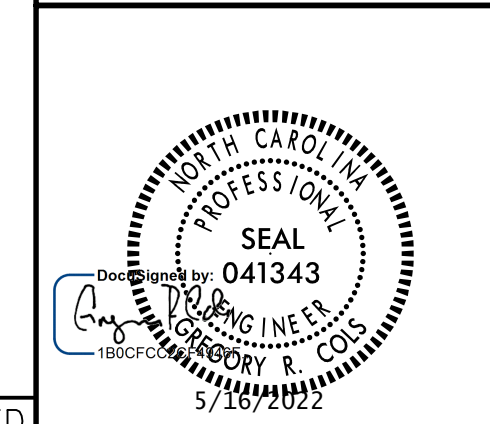
SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

NOTES

- THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD-DOWN PLATE AND 4 - 1/8" Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.
- THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M11.
- 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 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
- THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.
- AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.
- THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.
- THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.
- THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.

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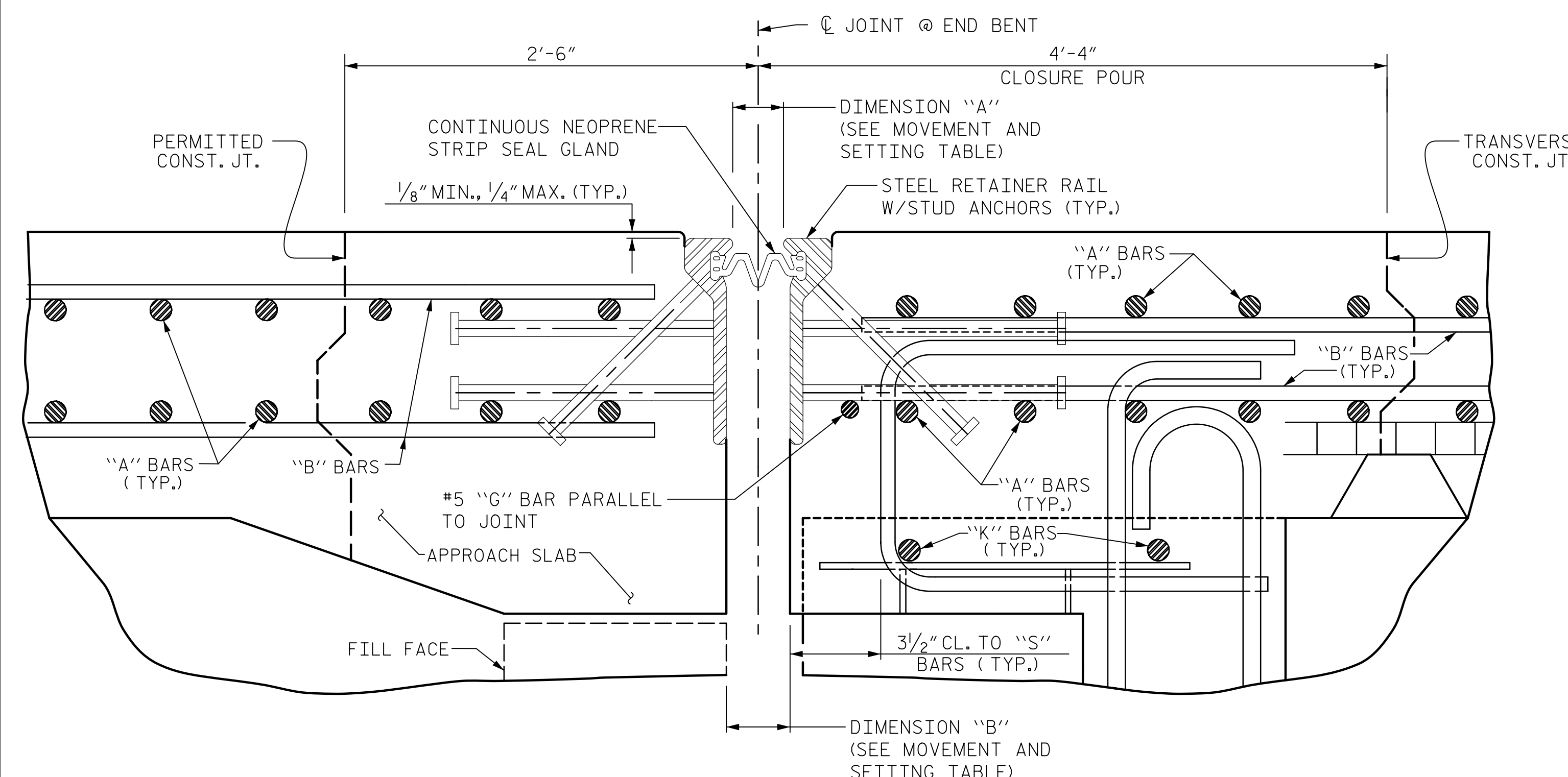
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE
FOR BARRIER RAIL

ASSEMBLED BY : A. JIANG	DATE : 6/2019
CHECKED BY : G.R. COLS	DATE : 6/2019
DESIGNED BY : S. NATARAJAN	DATE : 6/2019
DESIGN CHECKED BY : G.R. COLS	DATE : 6/2019
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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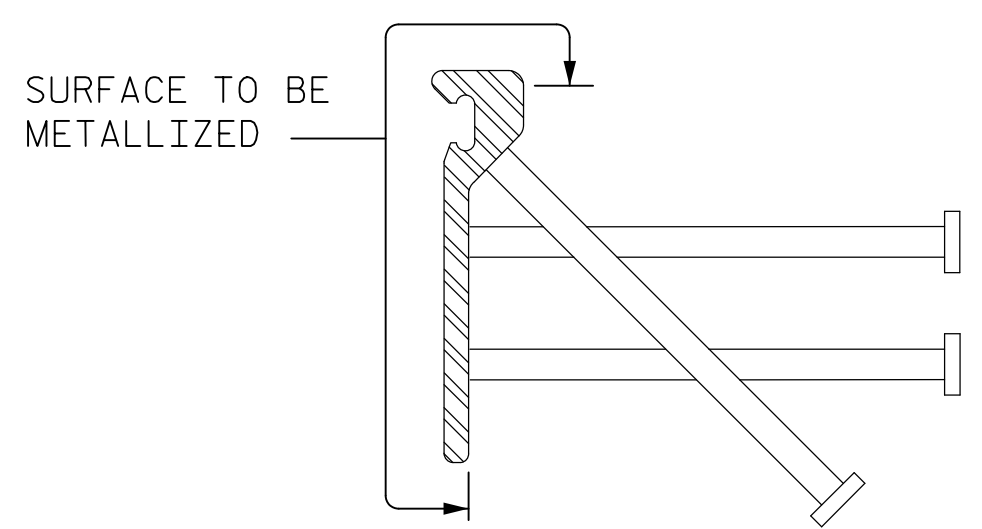
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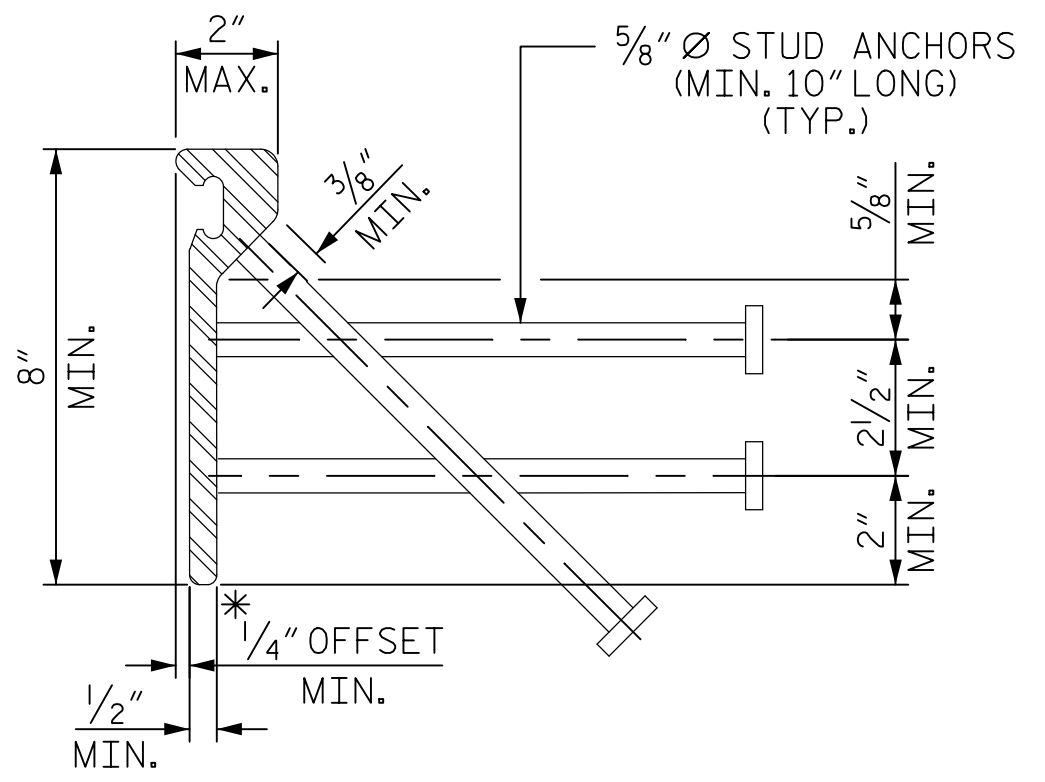


STRIP SEAL EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE



METALLIZING DETAIL



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.

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 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.

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.

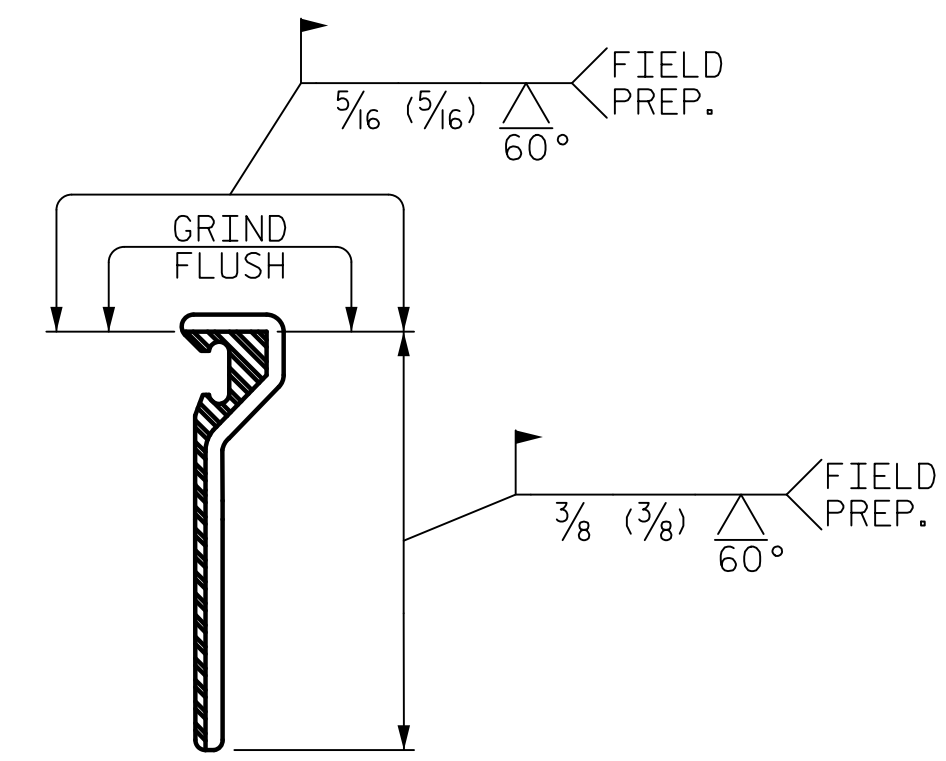
FIELD SPLICES OF THE RETAINER RAILS SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. FINISHED WELDS SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

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.



STEEL RETAINER RAIL (FIELD SPLICE DETAIL)

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
 STATION: 21+97.00 -L-

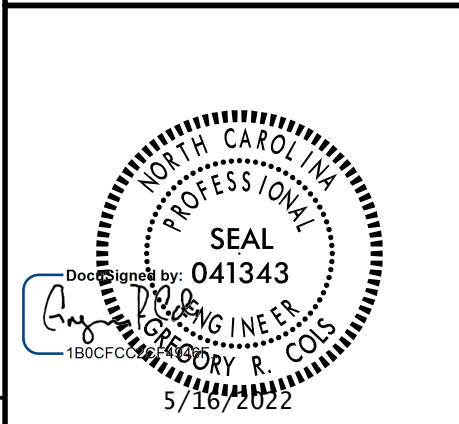
SHEET 1 OF 2

MOVEMENT AND SETTING AT JOINT								
LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG CL 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	45°-00'-00"	2 3/16"	2 1/4"	2"	1 7/16"	2 3/4"	2 1/2"	1 15/16"
END BENT 2	45°-00'-00"	1 9/16"	2 3/16"	2"	1 5/8"	2 1 1/16"	2 1/2"	2 1/8"

ASSEMBLED BY : D.R. DRUM DATE : 03/2022
 CHECKED BY : G.R. COLS DATE : 03/2022
 DESIGNED BY : B.D. HODACK DATE : 02/2022
 DESIGN CHECKED BY : G.R. COLS DATE : 02/2022

DRAWN BY : REK 9/87 REV. 10/1/11 MAA/GM
 CHECKED BY : CRK 10/87 REV. 10/17 MAA/THC
 REV. 6/18 MAA/THC

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD STRIP SEAL EXPANSION JOINT DETAILS

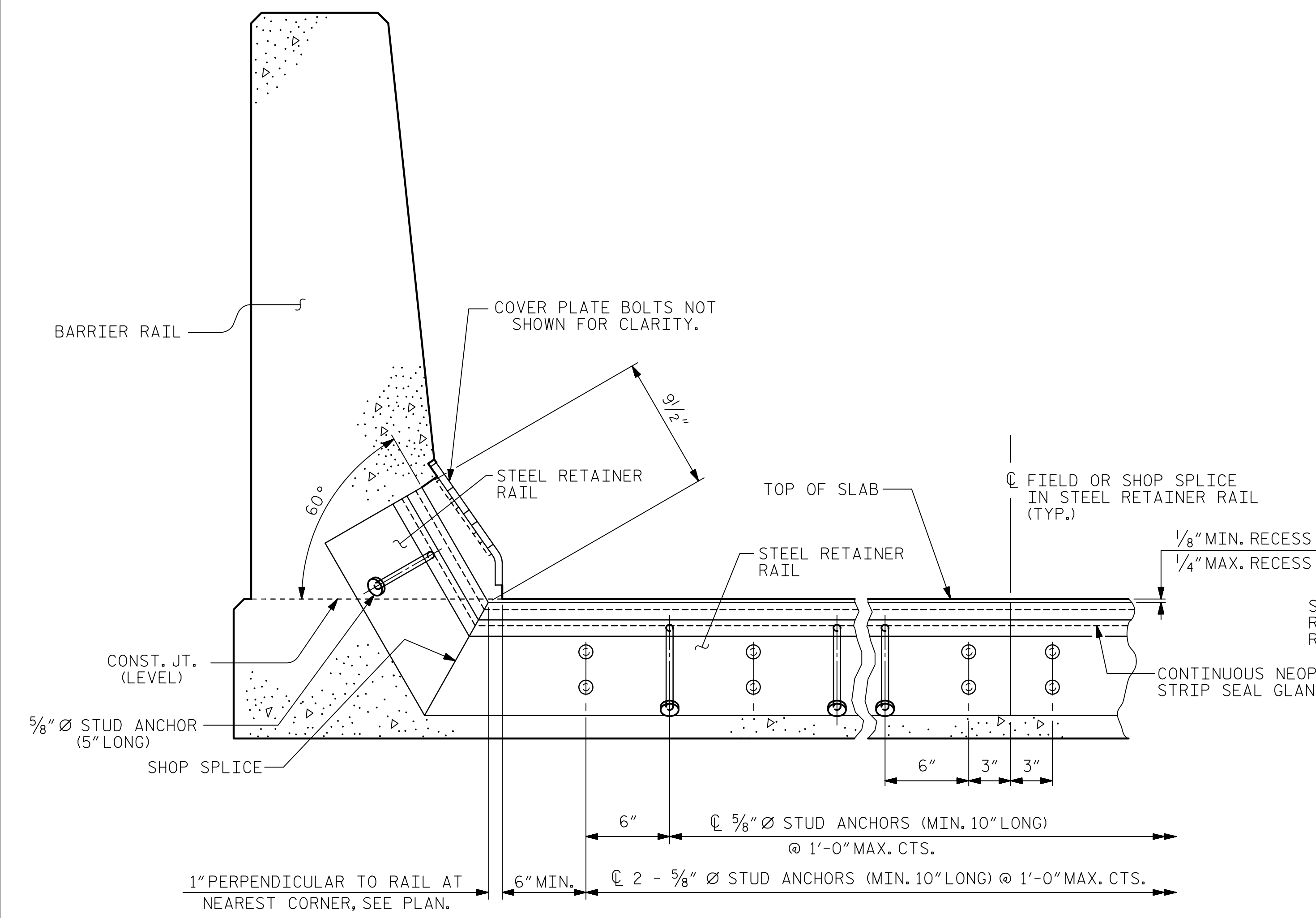
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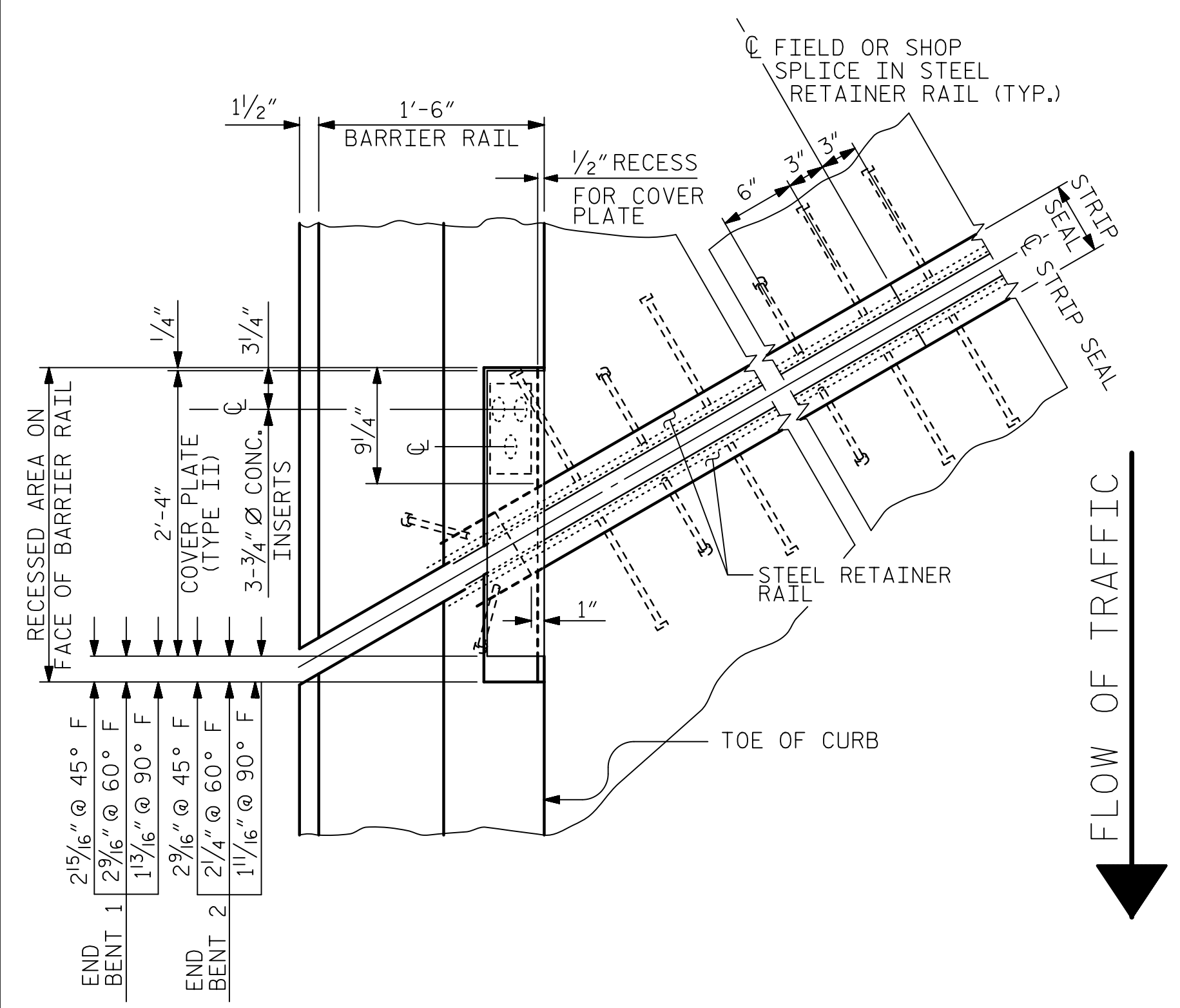
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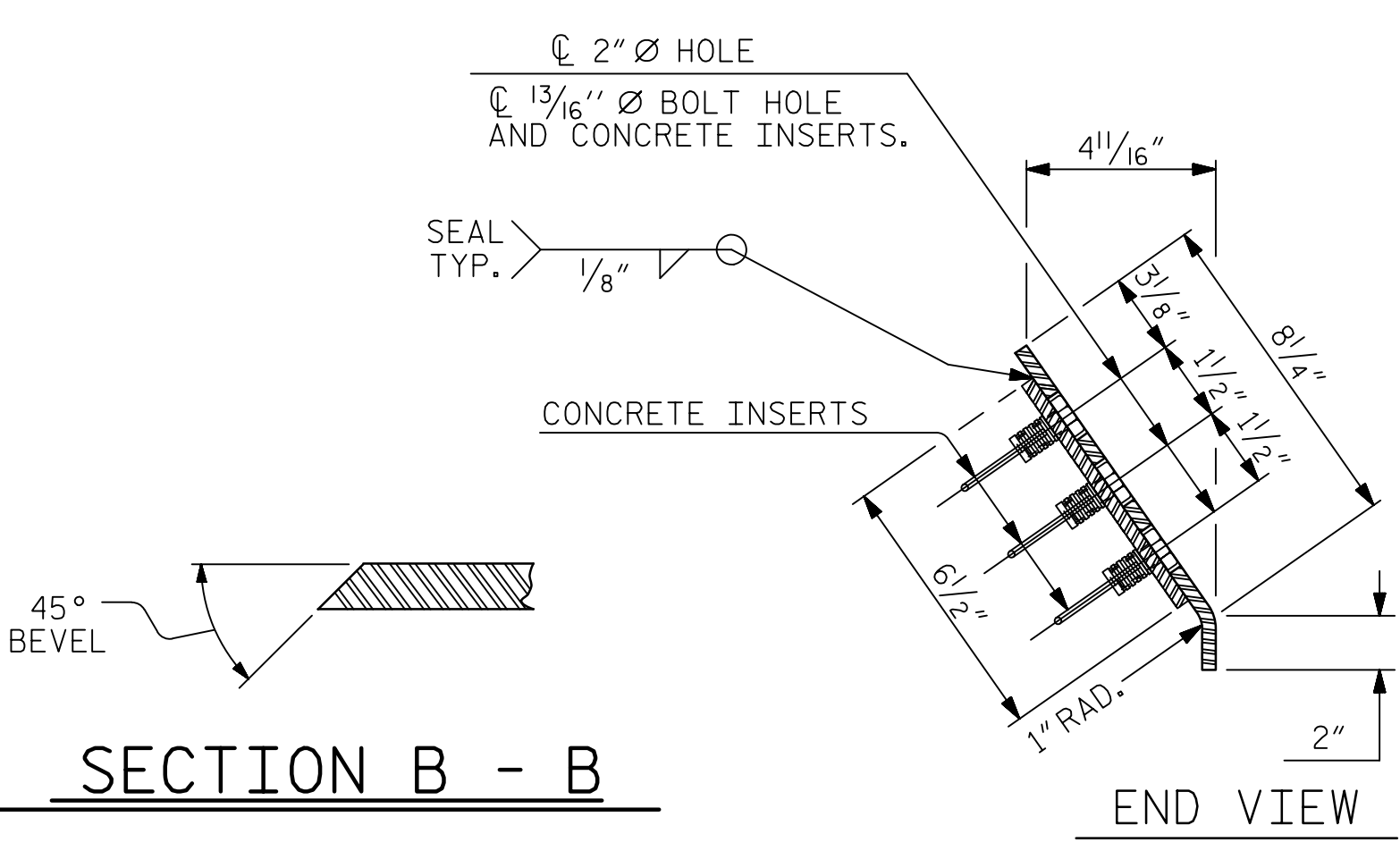


SECTION THRU RAIL NORMAL TO JOINT



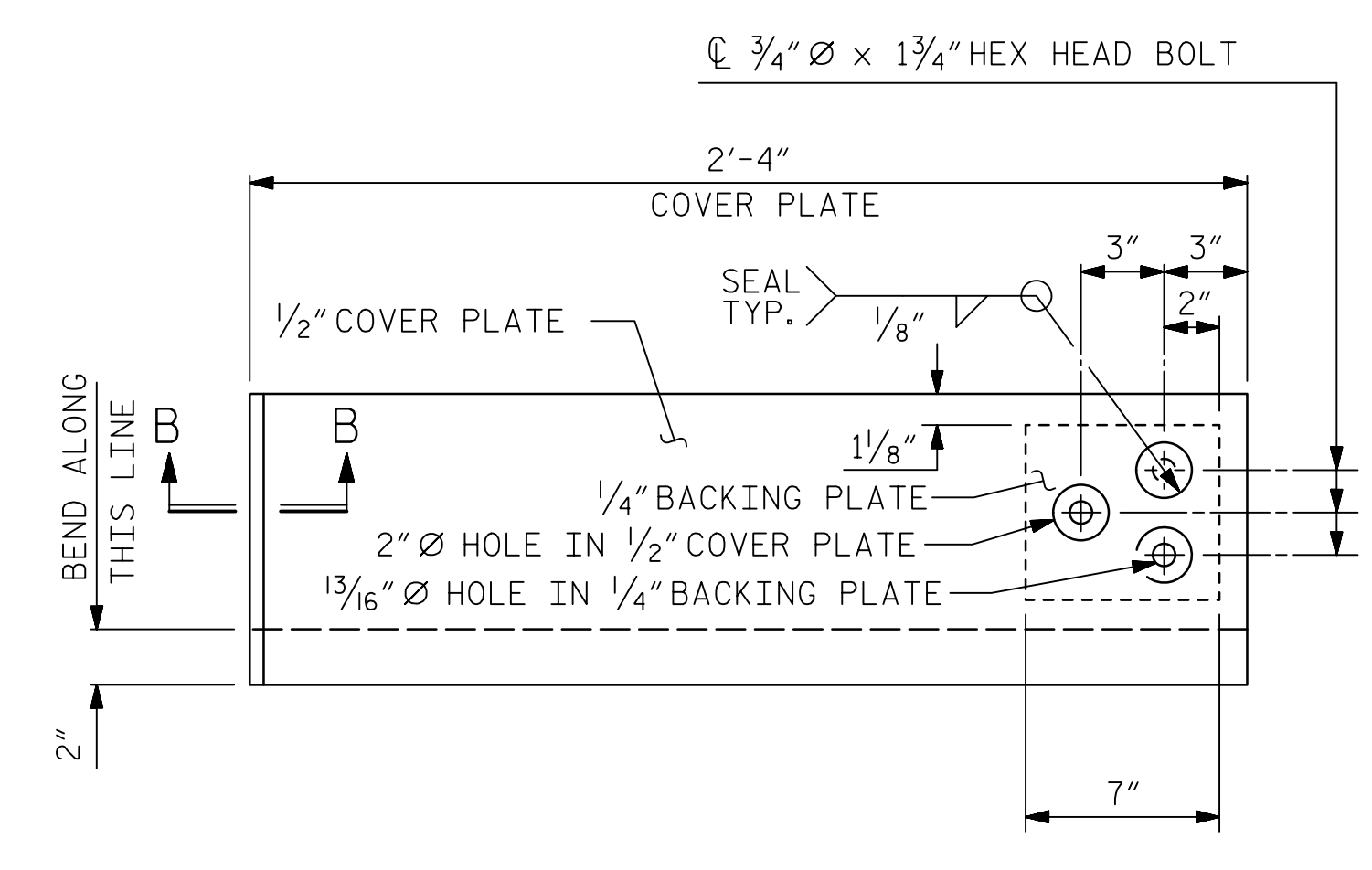
PLAN OF EXPANSION JOINT SEAL

ASSEMBLED BY : D.R. DRUM	DATE : 03/2022	MAA/GM
CHECKED BY : G.R. COLS	DATE : 03/2022	MAA/GM
DESIGNED BY : B.D. HODACK	DATE : 02/2022	MAA/GM
DESIGN CHECKED BY : G.R. COLS	DATE : 02/2022	MAA/THC
DRAWN BY : REK 9/87	REV. 7/12	MAA/GM
CHECKED BY : CRK 10/87	REV. 6/13	MAA/GM
	REV. 12/17	MAA/THC



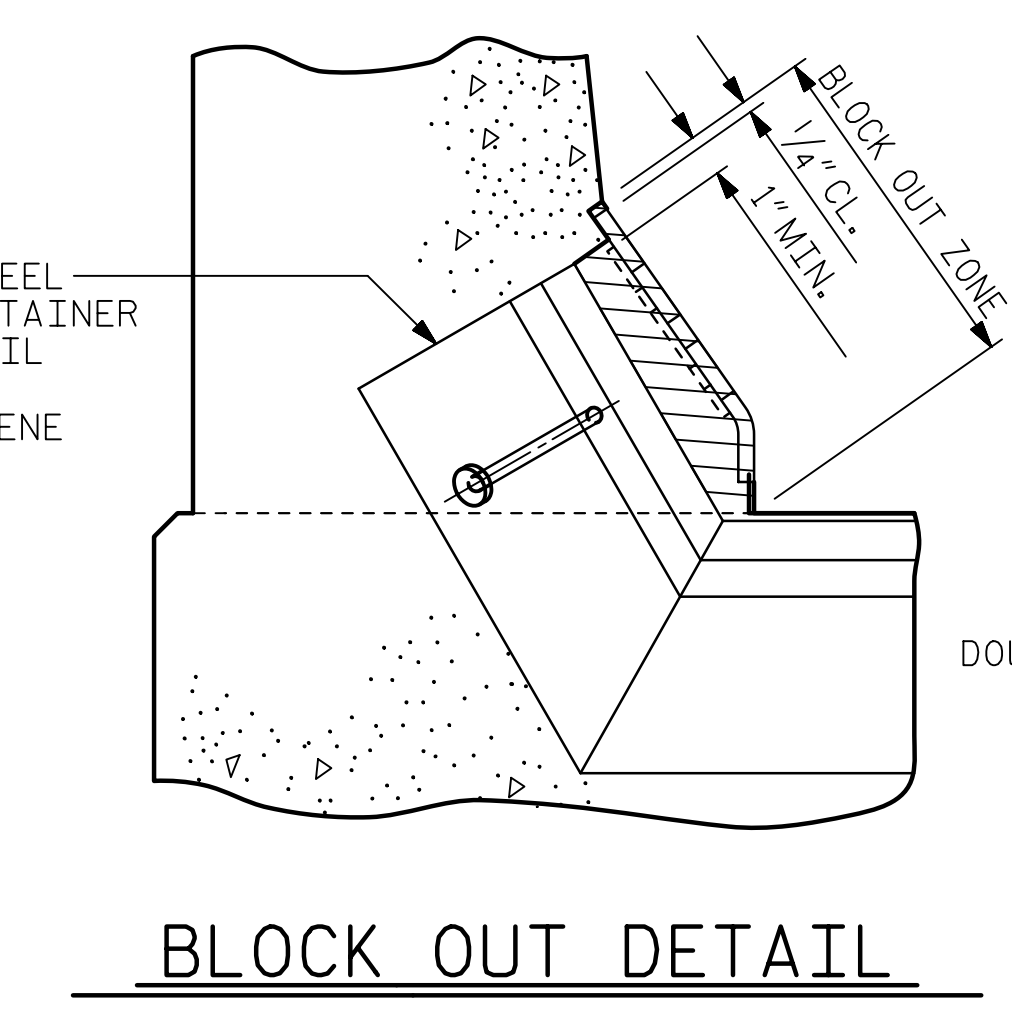
SECTION B - B

END VIEW

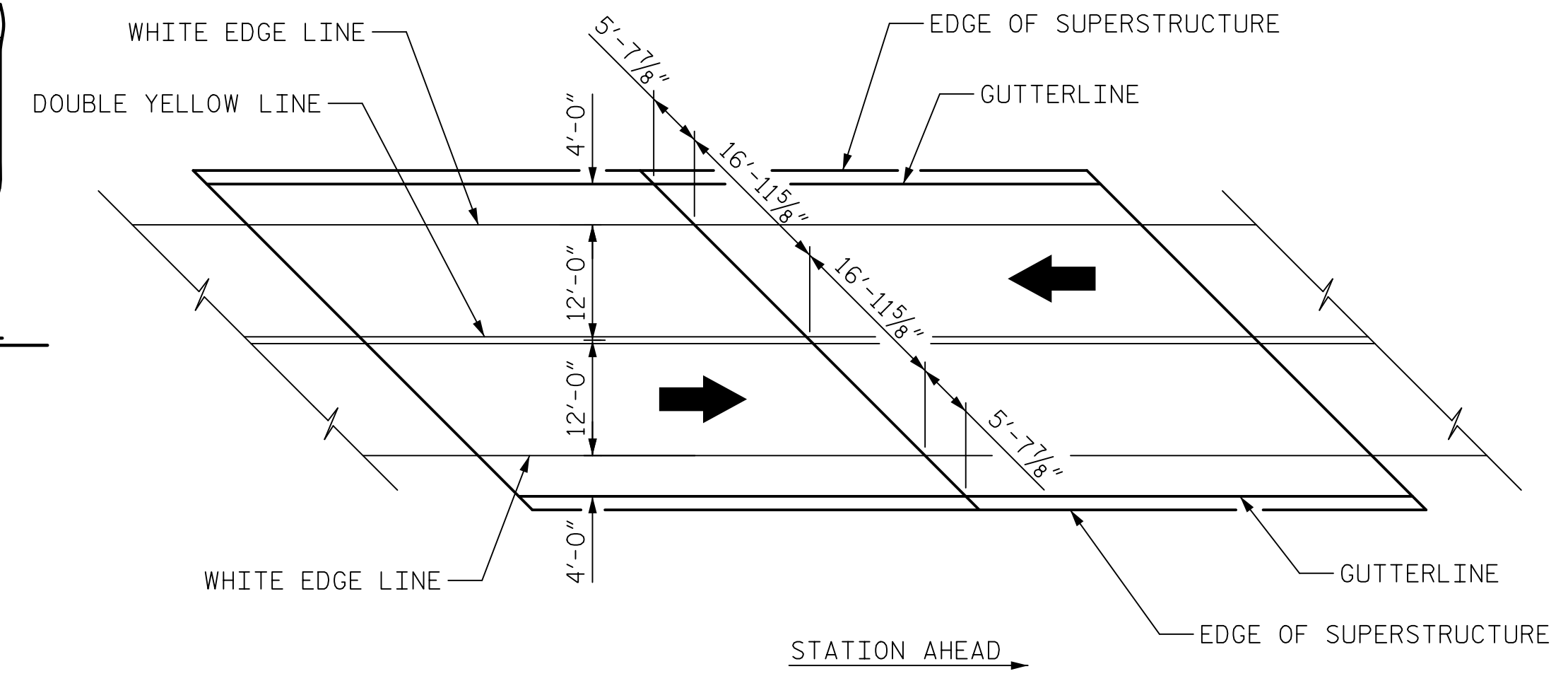


TYPE II - ELEVATION VIEW

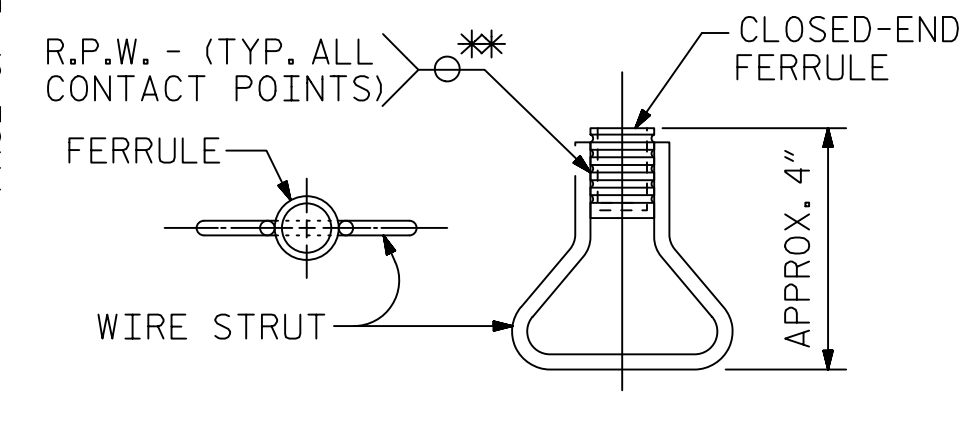
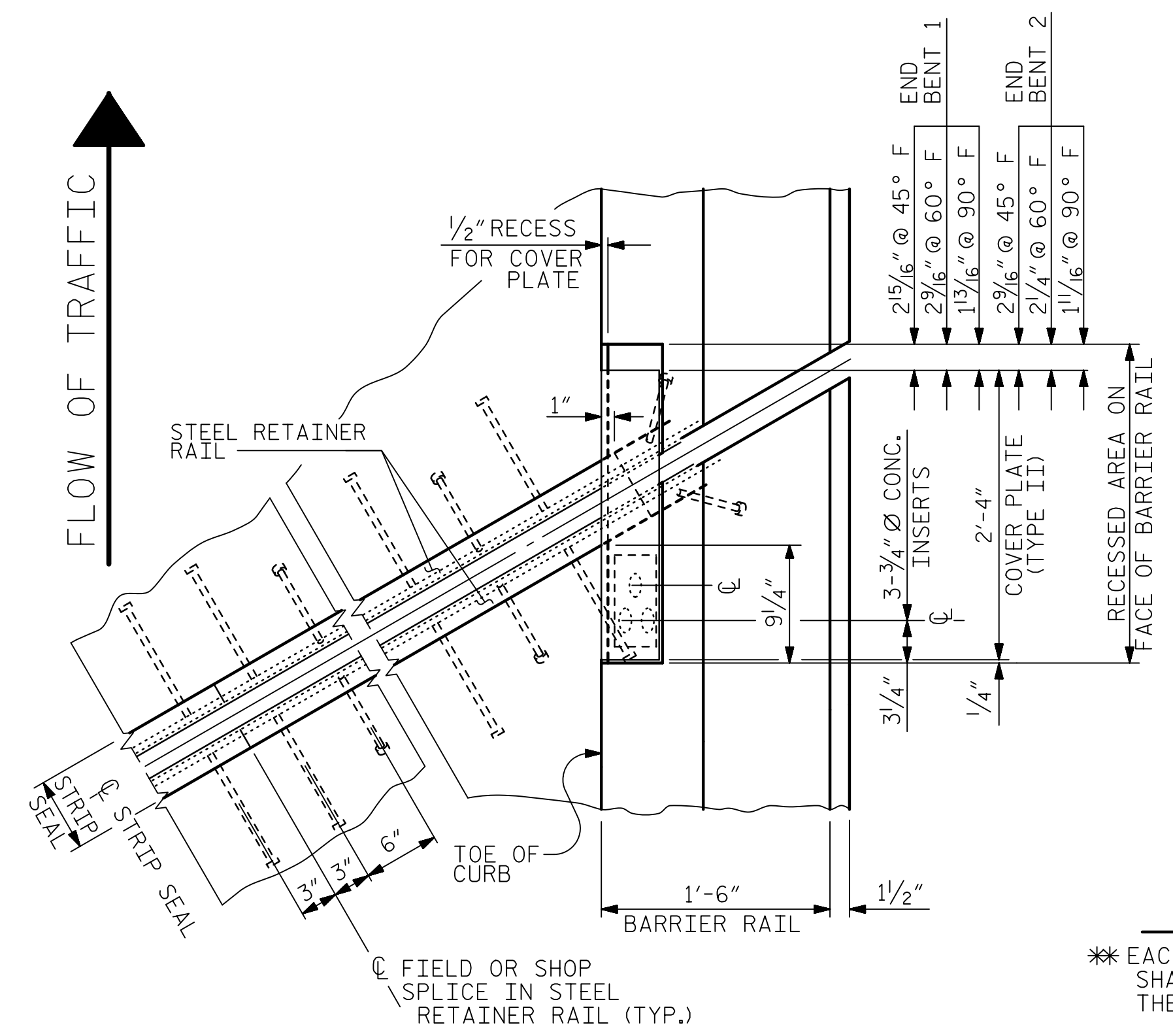
COVER PLATE DETAILS



BLOCK OUT DETAIL



PAVEMENT MARKING ALIGNMENT



PLAN ELEVATION

CONCRETE INSERT

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

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PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -L-

SHEET 2 OF 2



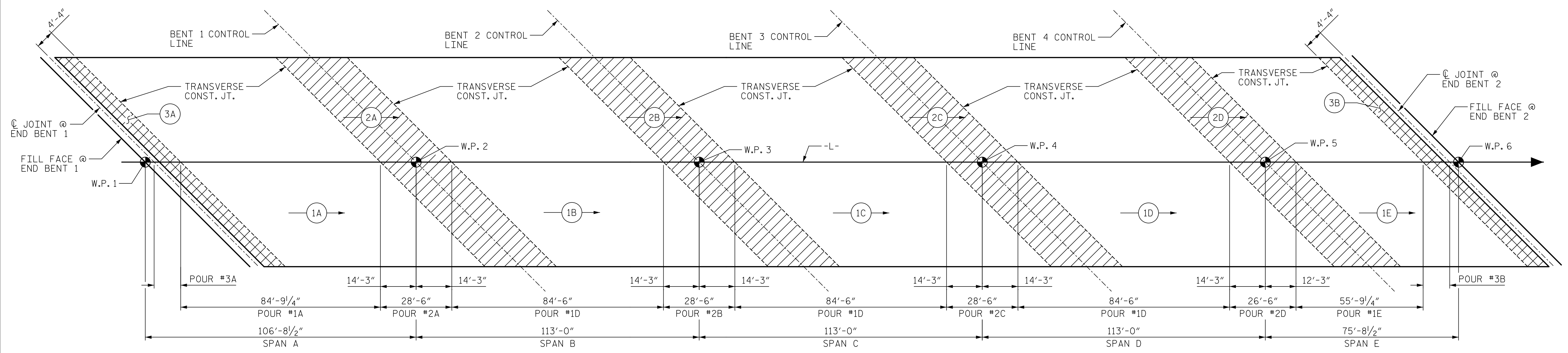
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
STRIP SEAL EXPANSION
JOINT DETAILS
FOR BARRIER RAIL

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

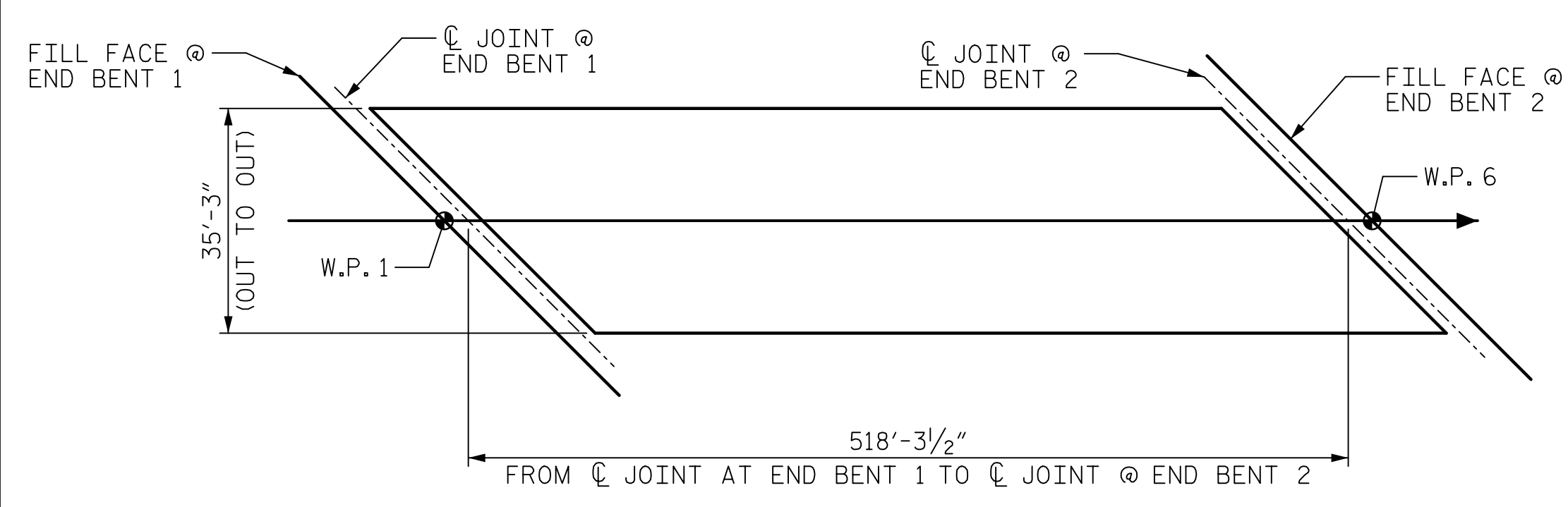
STD. NO. SSEJ2

DATE: 3/29/2022
TIME: 2:26:22 PM



POURING SEQUENCE

⊕ → INDICATES POUR NUMBER AND POUR DIRECTION



LAYOUT FOR COMPUTING AREA
REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 18,270)

—SUPERSTRUCTURE BILL OF MATERIAL—

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
SPANS A-E		52,263	60,757
POUR #1A	88.2	-	-
POUR #1B	87.9	-	-
POUR #1C	87.9	-	-
POUR #1D	87.9	-	-
POUR #1E	58.0	-	-
POUR #2A	29.7	-	-
POUR #2B	29.7	-	-
POUR #2C	29.7	-	-
POUR #2D	27.6	-	-
POUR #3A	13.0	-	-
POUR #3B	13.0	-	-
TOTALS**	552.6	52,263	60,757

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

LEGEND :

- DECK CLOSURE POUR AT LINK SLABS
- DECK CLOSURE POUR AT JOINTS

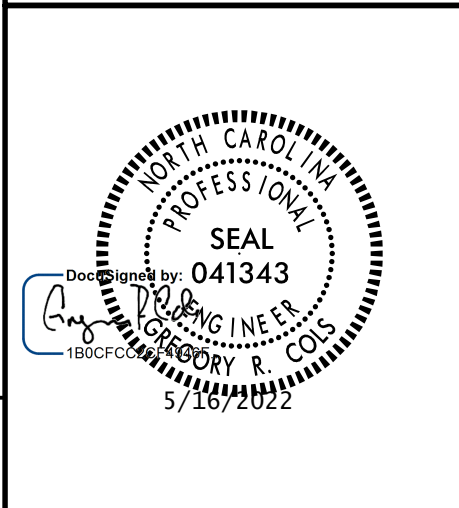
GROOVING BRIDGE FLOORS

APPROACH SLABS	1,368 SQ.FT.
BRIDGE DECK	14,995 SQ.FT.
TOTAL	16,363 SQ.FT.

DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -L-

SHEET 1 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
**SUPERSTRUCTURE
BILL OF MATERIAL**

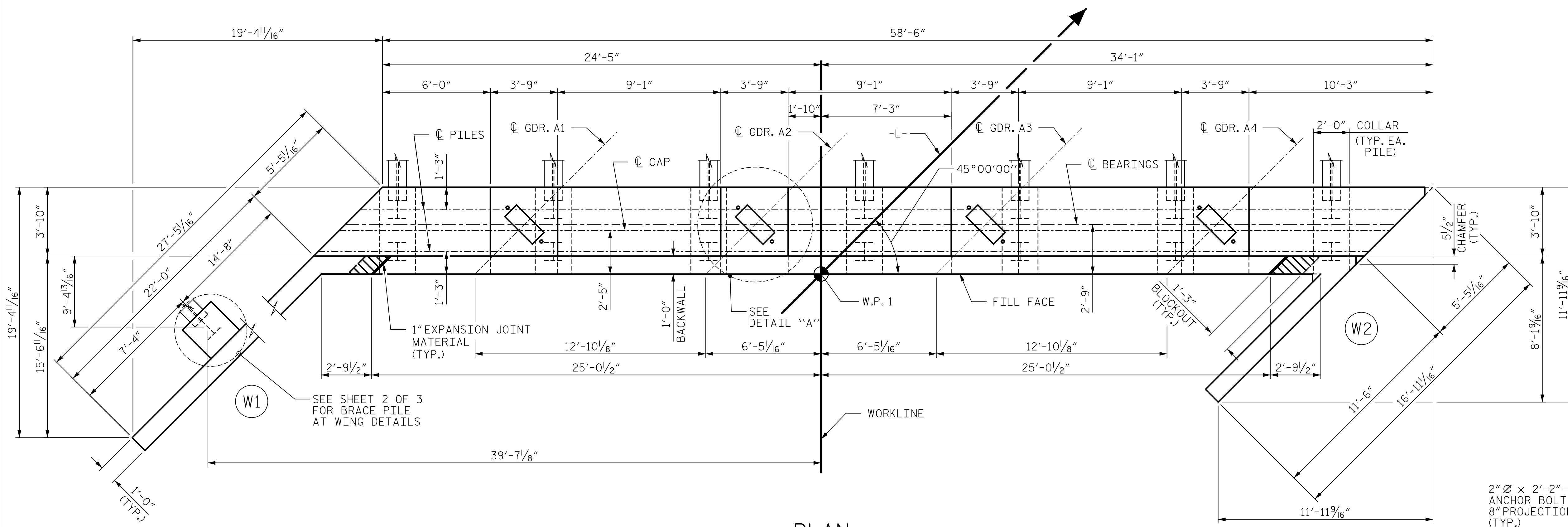
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			39

DRAWN BY : D.R. DRUM DATE : 03/2022
CHECKED BY : G.R. COLS DATE : 03/2022
DESIGNED BY : D.R. DRUM DATE : 03/2022
DESIGN CHECKED BY : G.R. COLS DATE : 03/2022

USER: Bin.Tan.Cheng Drawing: 401_0051_BR0044_SKU_BM01.dgn

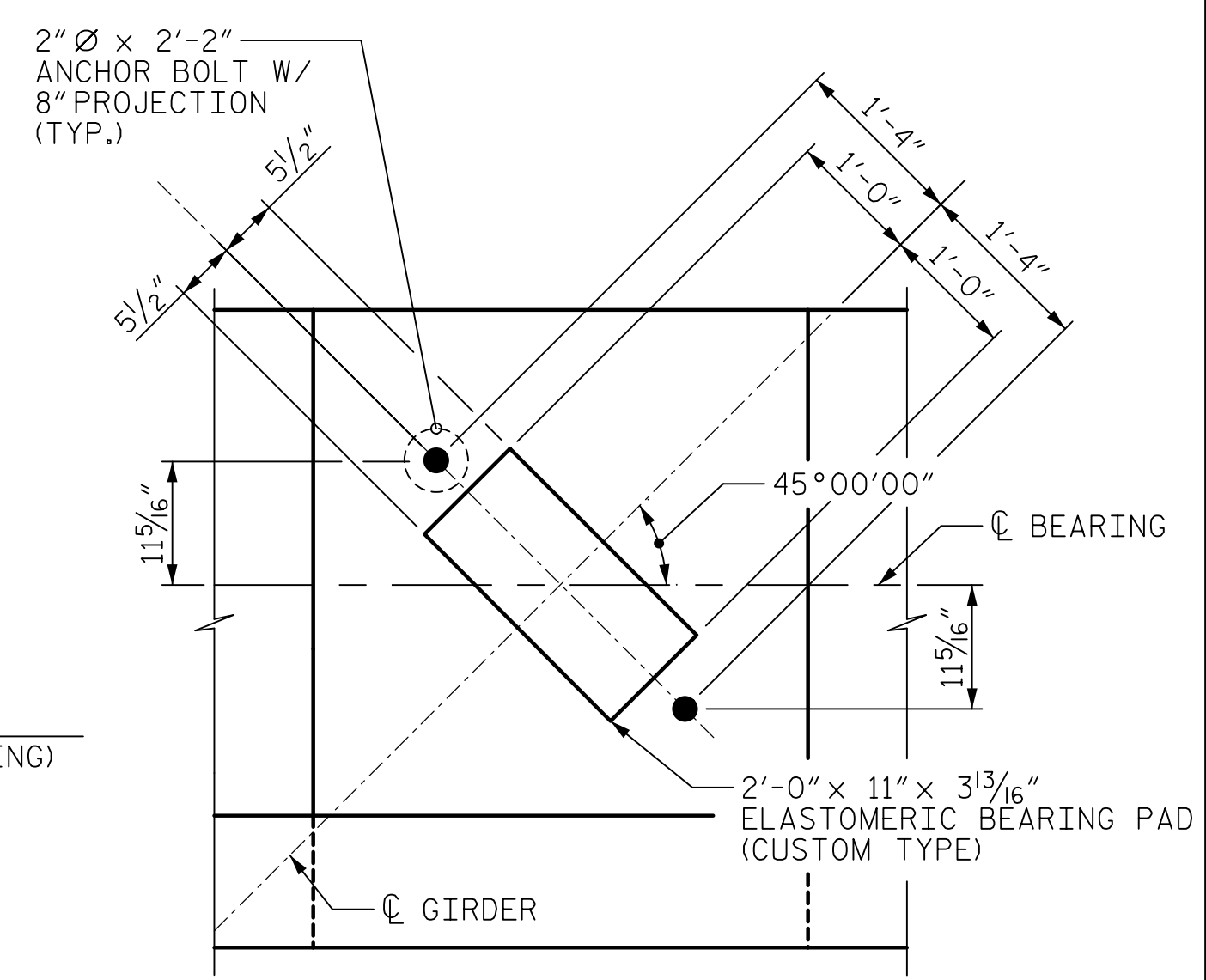
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USER: Binjampal@agc.com
DIR: R:\Structures\04 Drawings\01_0055_BR0044_SLU_LE\01.dgn

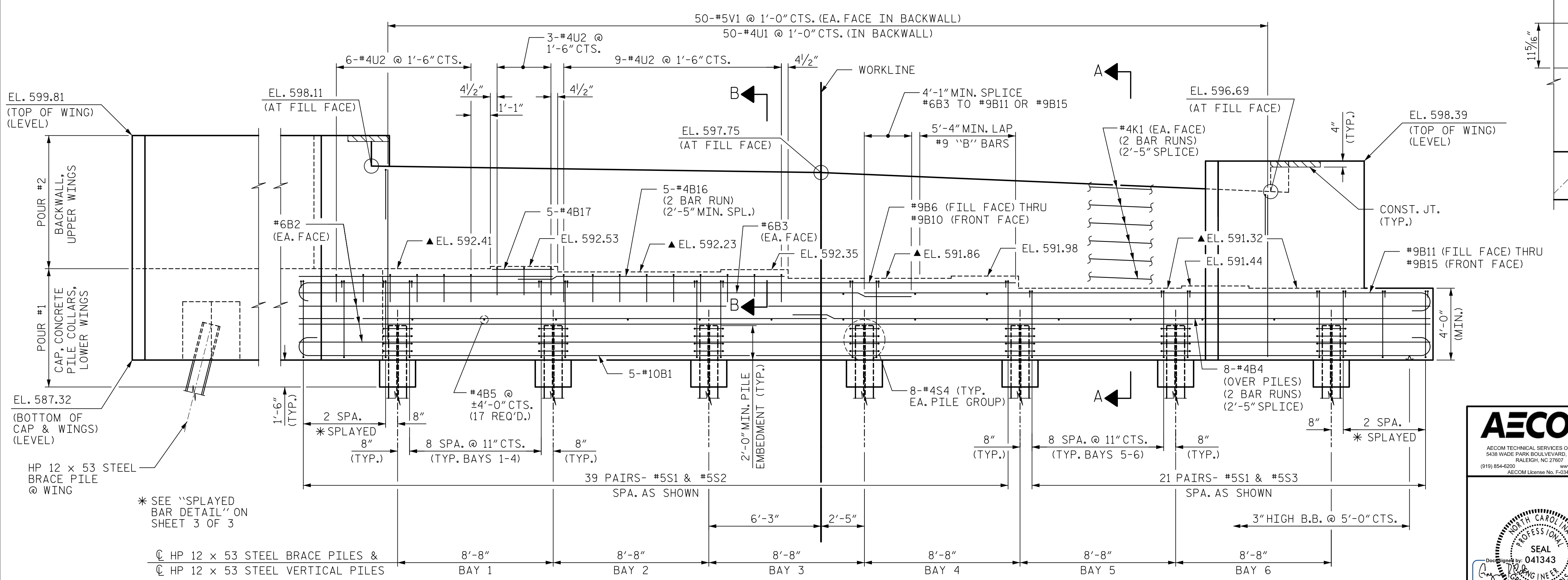


PLAN

NOTES:
 STIRRUPS AND #4 "U" BARS IN CAP MAY BE SHIFTED SLIGHTLY TO CLEAR ANCHOR BOLTS.
 #5V1 BARS SHALL BE PLACED 2" CLEAR FROM THE BOTTOM OF CAP.
 THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
 FOR WING DETAILS, SEE SHEET 2 OF 3.
 BACKWALL SHALL BE PLACED BEFORE APPLYING PROTECTIVE COATING.
 FOR SECTION A-A, SECTION B-B, PILE SPLICE DETAILS, AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 3 OF 3.
 THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
 THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT A RATE OF 2%.



DETAIL "A"



ELEVATION

PROJECT NO. BR-0044
 ROCKINGHAM COUNTY
 STATION: 21+97.00 -L-

SHEET 1 OF 3

DRAWN BY : D.R. DRUM DATE : 10/2019
 CHECKED BY : G.R. COLS DATE : 10/2019
 DESIGNED BY : H.T. ROSEMOND DATE : 10/2019
 DESIGN CHECKED BY : S. NATARAJAN DATE : 10/2019

▲ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 3.

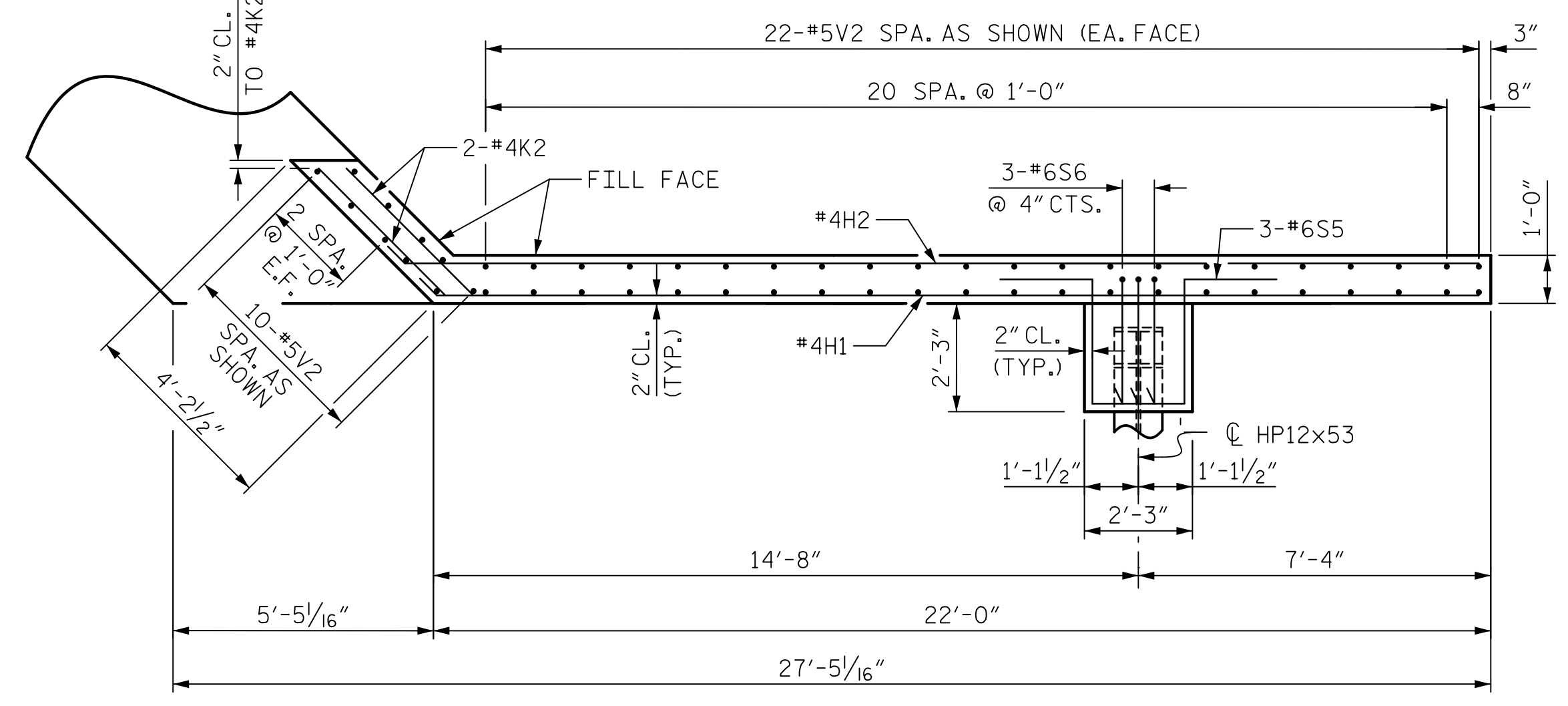
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 AECOM TECHNICAL SERVICES OF NC, INC.
 5438 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F-0342

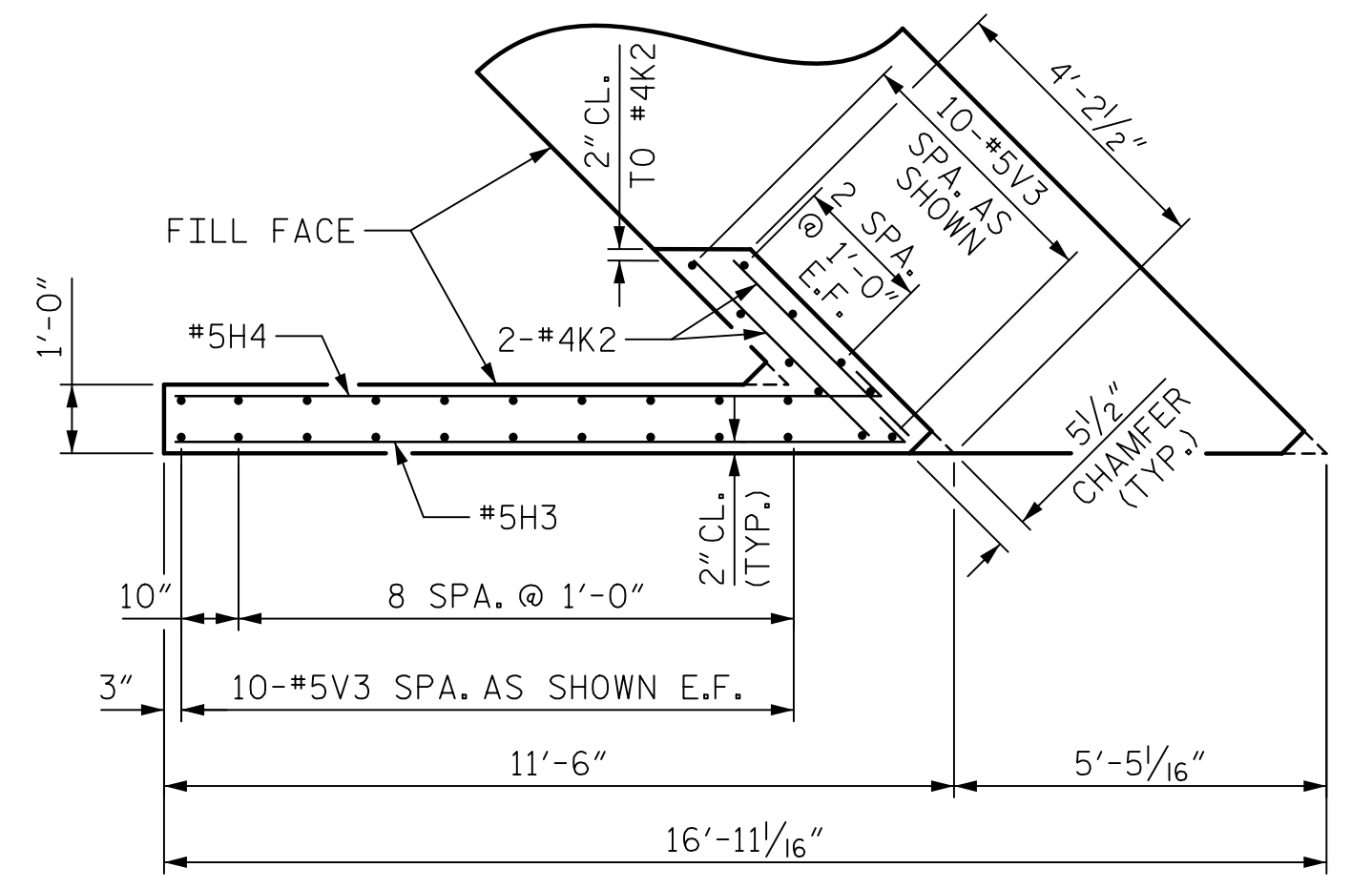
Professional Engineer Seal
 State of North Carolina
 No. 041343
 Gregory R. Colby
 5/15/2022

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-28
TOTAL SHEETS					39

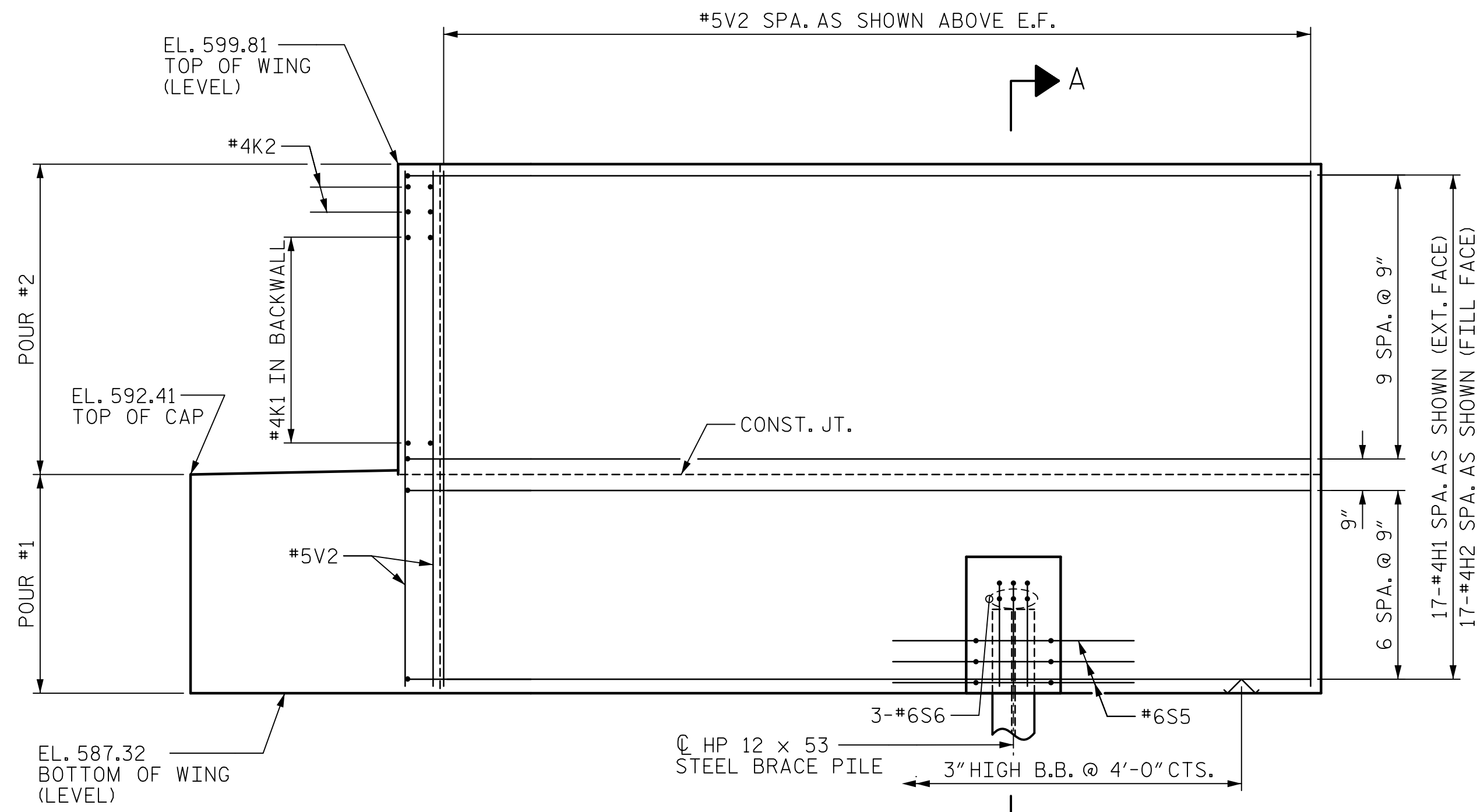
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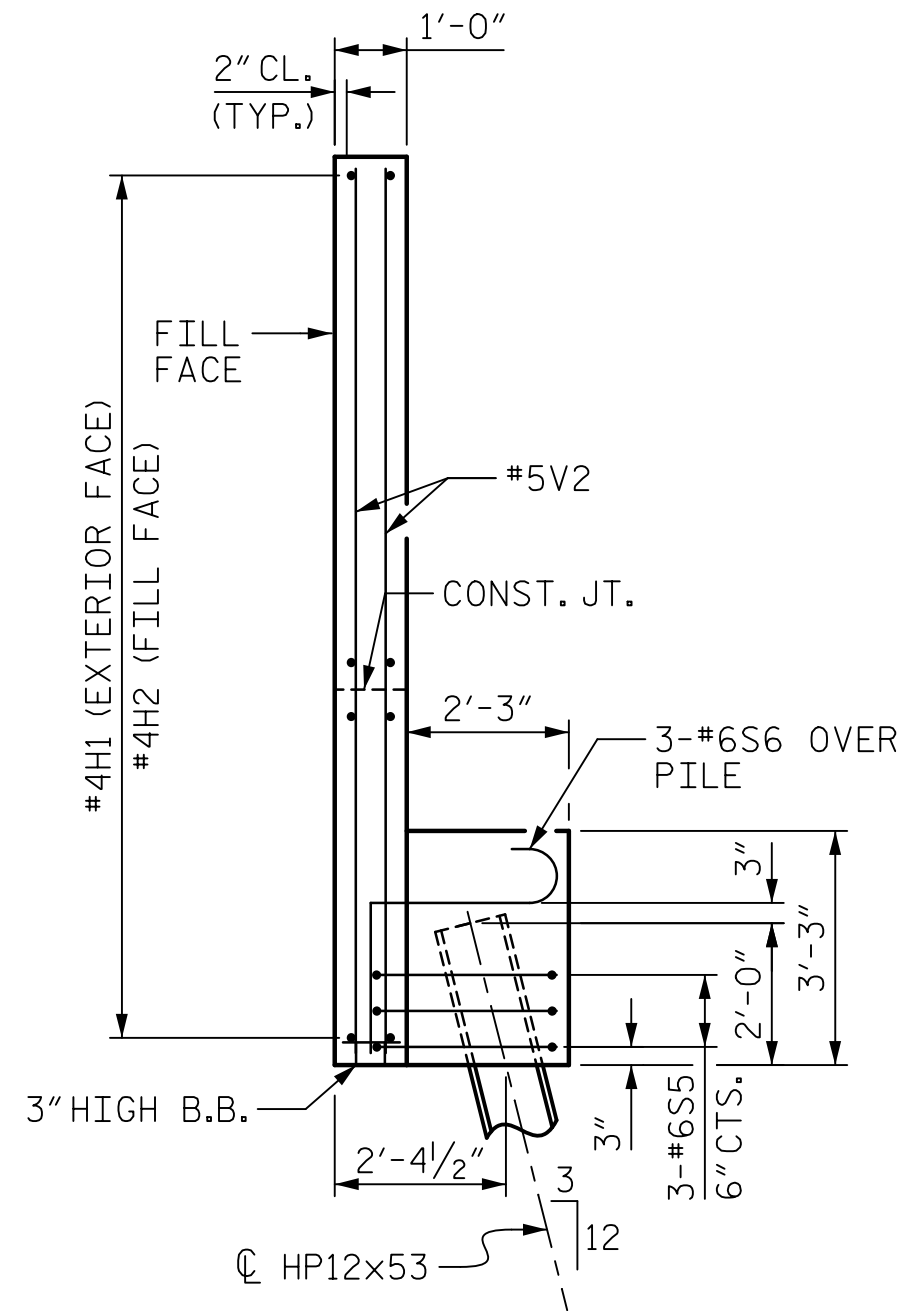
PLAN - WING W1



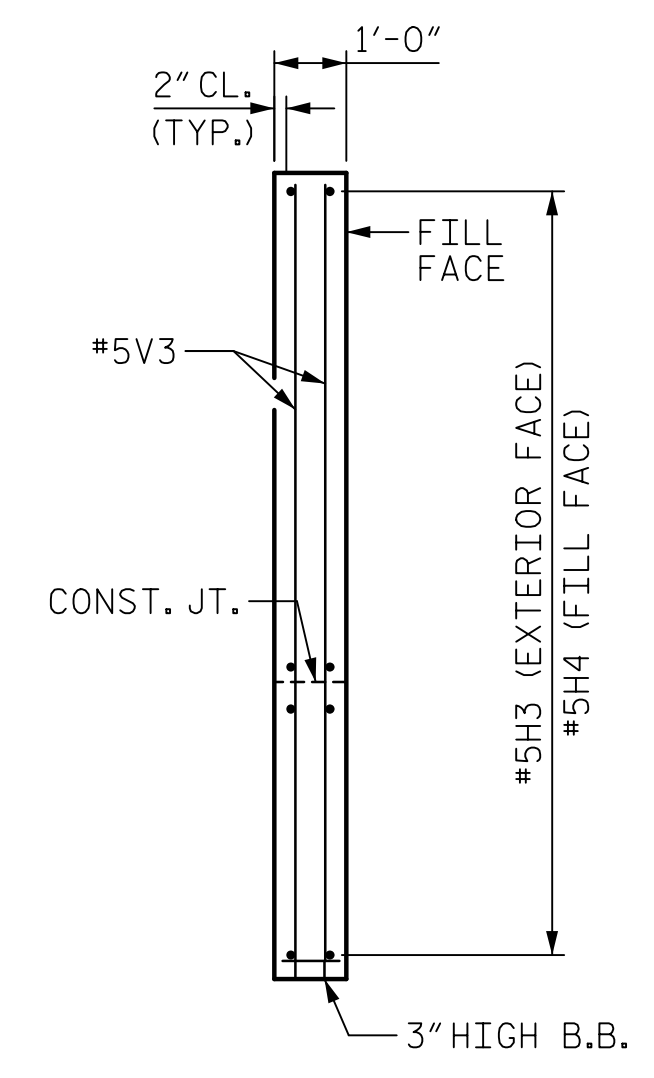
PLAN - WING W2



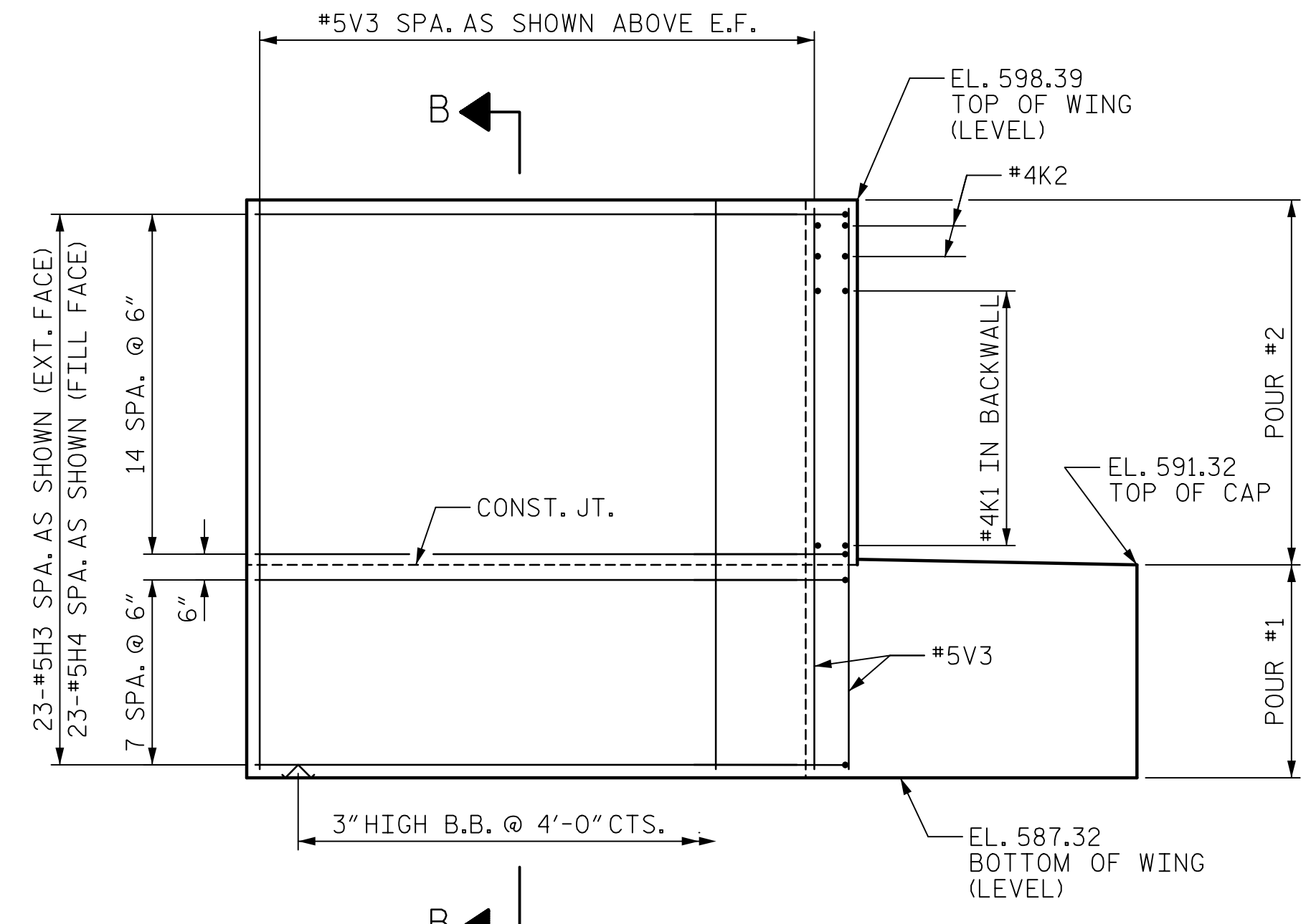
ELEVATION - WING W1



SECTION A-A



SECTION B-B



ELEVATION - WING W2

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -L-

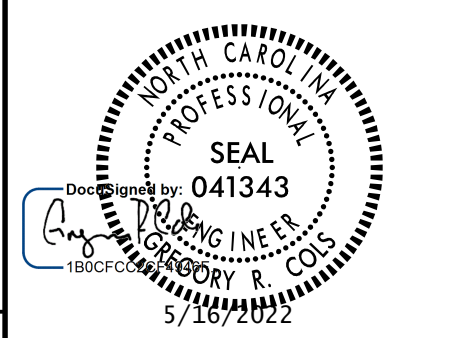
SHEET 2 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1



REVISIONS						SHEET NO. S-29
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1			3			TOTAL SHEETS 39
2			4			

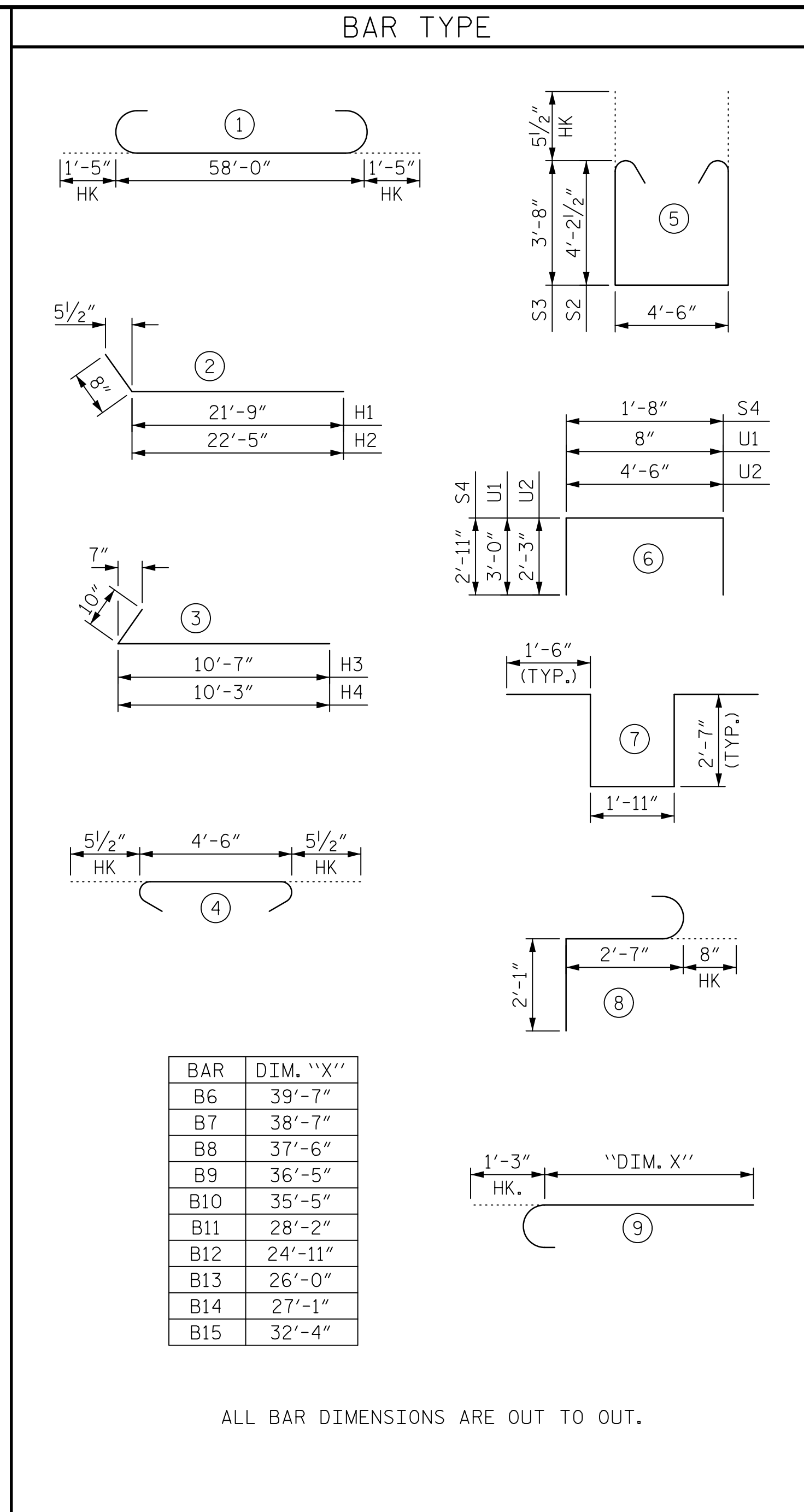
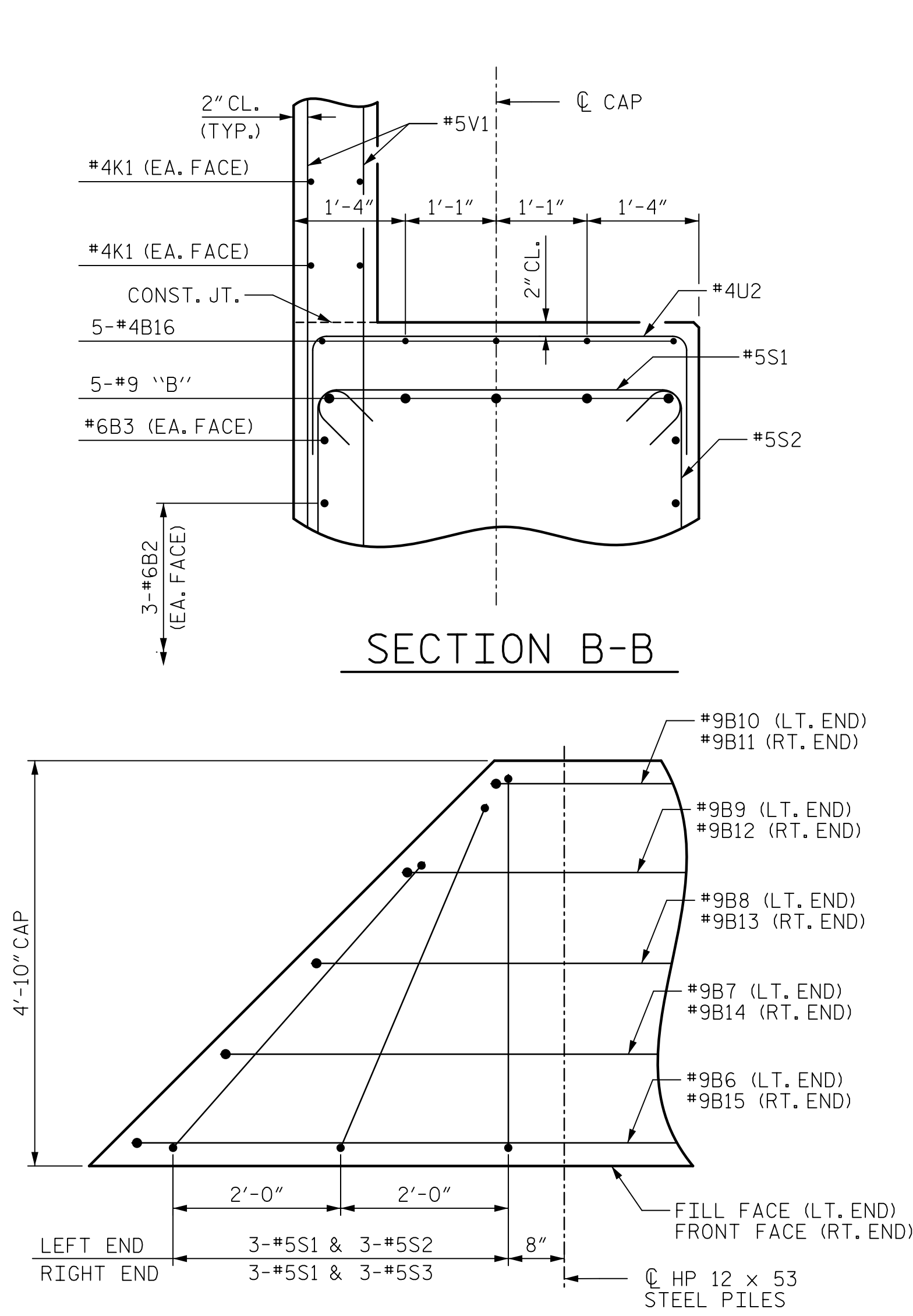
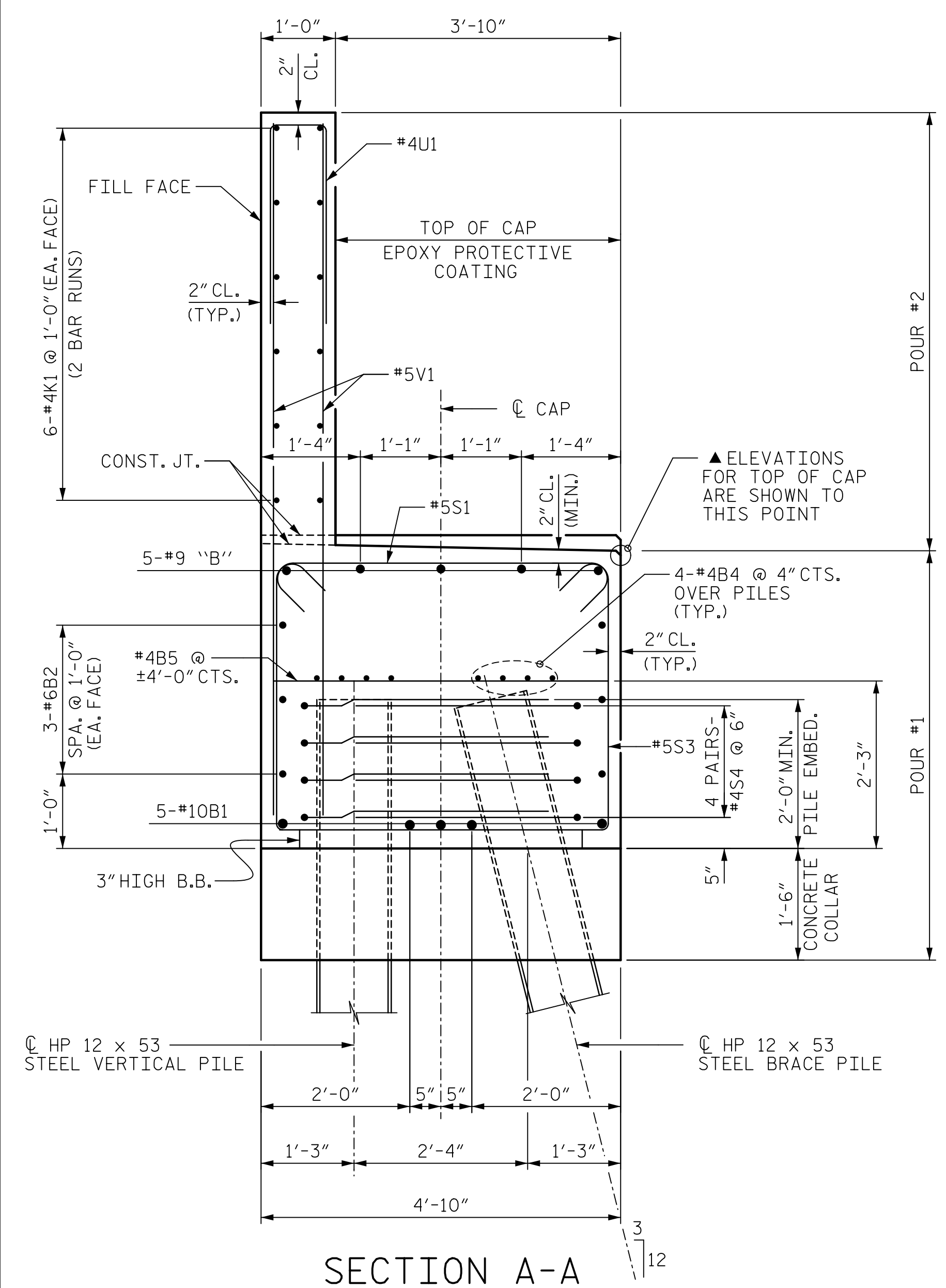
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CHECKED BY : G.R. COLS DATE : 10/2019
DESIGNED BY : H.T. ROSEMOND DATE : 10/2019
DESIGN CHECKED BY : S. NATARAJAN DATE : 10/2019

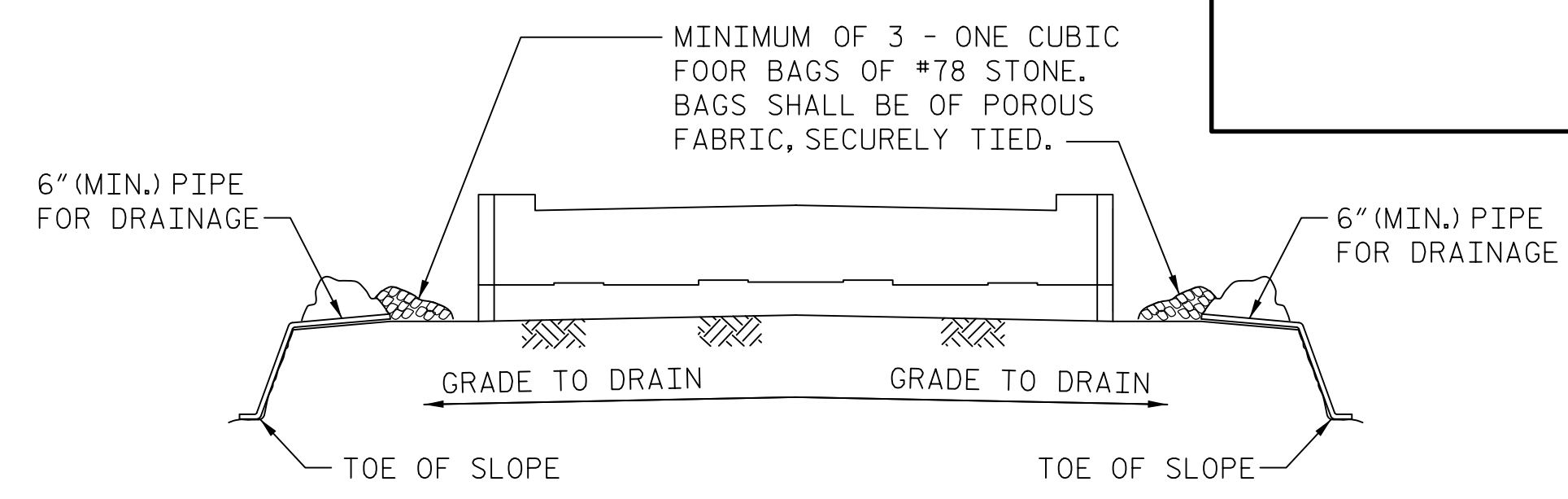
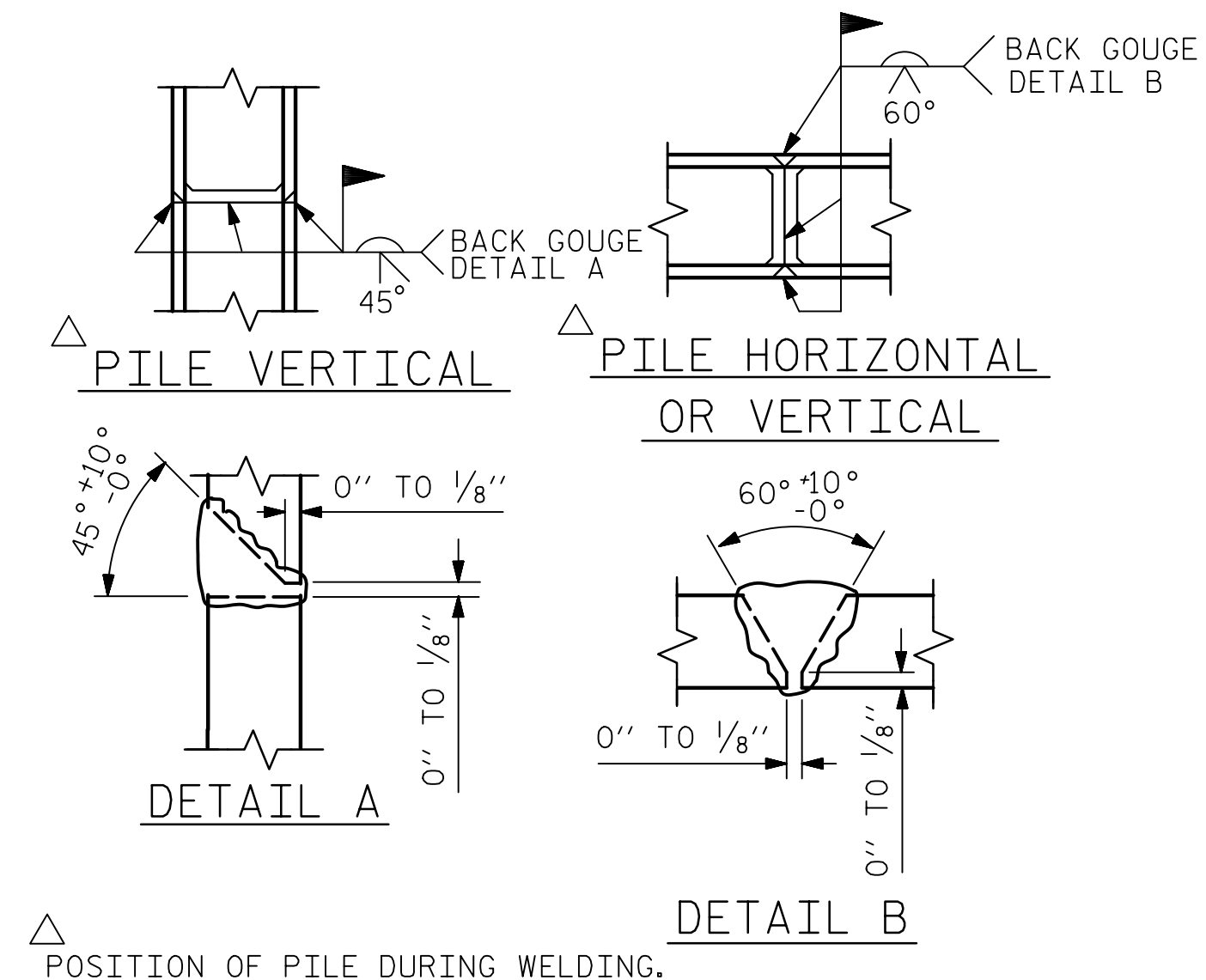
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DATE: 3/29/2019
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BILL OF MATERIAL					
END BENT 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	5	#10	1	60'-10"	1309
B2	6	#6	STR	57'-8"	520
B3	2	#6	STR	34'-3"	103
B4	16	#4	STR	30'-4"	324
B5	17	#4	STR	4'-6"	51
B6	1	#9	9	40'-10"	139
B7	1	#9	9	39'-10"	135
B8	1	#9	9	38'-9"	132
B9	1	#9	9	37'-8"	128
B10	1	#9	9	36'-8"	125
B11	1	#9	9	29'-5"	100
B12	1	#9	9	26'-2"	89
B13	1	#9	9	27'-3"	93
B14	1	#9	9	28'-4"	96
B15	1	#9	9	33'-7"	114
B16	10	#4	STR	14'-7"	97
B17	5	#4	STR	3'-5"	11
H1	17	#4	2	22'-5"	255
H2	17	#4	2	23'-1"	262
H3	23	#5	3	11'-5"	274
H4	23	#5	3	11'-1"	266
K1	24	#4	STR	30'-3"	485
K2	8	#4	STR	3'-8"	20
S1	60	#5	4	5'-5"	339
S2	39	#5	5	13'-10"	563
S3	21	#5	5	12'-9"	279
S4	56	#4	6	7'-6"	281
S5	3	#6	7	10'-1"	45
S6	3	#6	8	5'-4"	24
U1	50	#4	6	6'-8"	223
U2	18	#4	6	9'-0"	108
V1	100	#5	STR	9'-0"	939
V2	54	#5	STR	12'-0"	676
V3	30	#5	STR	10'-7"	331
REINFORCING STEEL				8936 LBS.	
CLASS A CONCRETE					
POUR #1 (CAP, COLLARS & LOWER WINGWALLS)				57.7 C.Y.	
POUR #2 (BACKWALL & UPPER WINGWALL)				21.0 C.Y.	
TOTAL =				78.7 C.Y.	
HP 12x53 STEEL PILES:					
NO. = 15				LIN. FT. = 615	
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES				15 EA.	



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

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PROJECT NO. BR-0044
ROCKINGHAM COUNTY
 STATION: 21+97.00 -L-

SHEET 3 OF 3



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

DRAWN BY : D.R. DRUM
 CHECKED BY : G.R. COLS
 DESIGNED BY : H.T. ROSEMOND
 DESIGN CHECKED BY : S. NATARAJAN

DATE : 10/2019
 DATE : 10/2019
 DATE : 10/2019
 DATE : 10/2019

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			39

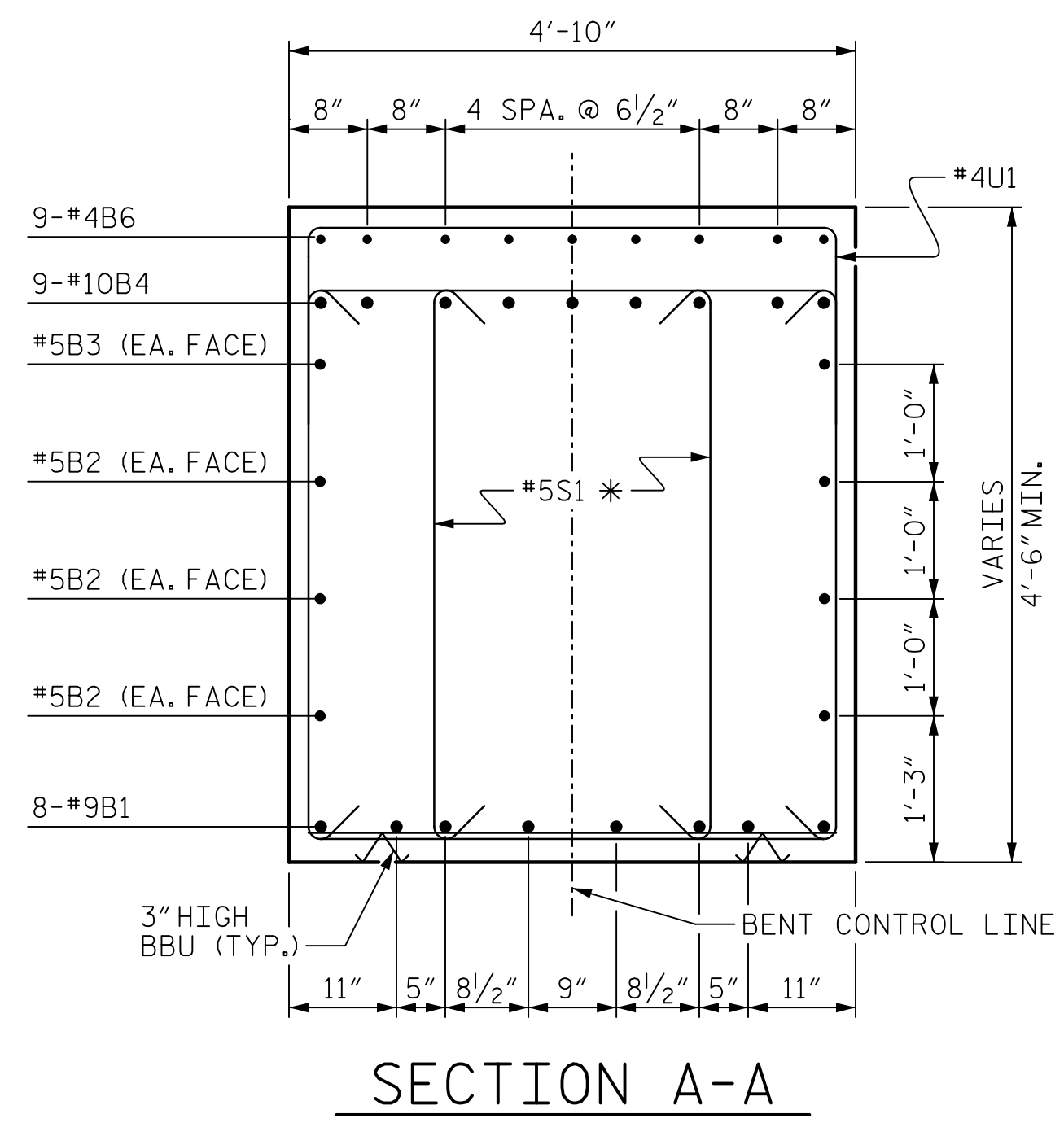
DATE: 4/15/2022
TIME: 3:45:59 PM

ELEVATIONS AT BENTS

BENT	W.P. STATION	BRIDGE SEAT ELEV.				COLUMN AND DRILLED PIER ELEV.		
		ELEV. A	ELEV. B	ELEV. C	ELEV. D	ELEV. E	ELEV. F	ELEV. G
1	20+43.00	588.51	588.33	587.97	587.42	582.92	550.42	518.92
2	21+56.00	583.99	583.81	583.45	582.90	578.40	541.15	518.90
3	22+69.00	579.47	579.29	578.93	578.38	573.88	541.13	521.88
4	23+82.00	574.95	574.77	574.41	573.86	569.36	548.11	505.86

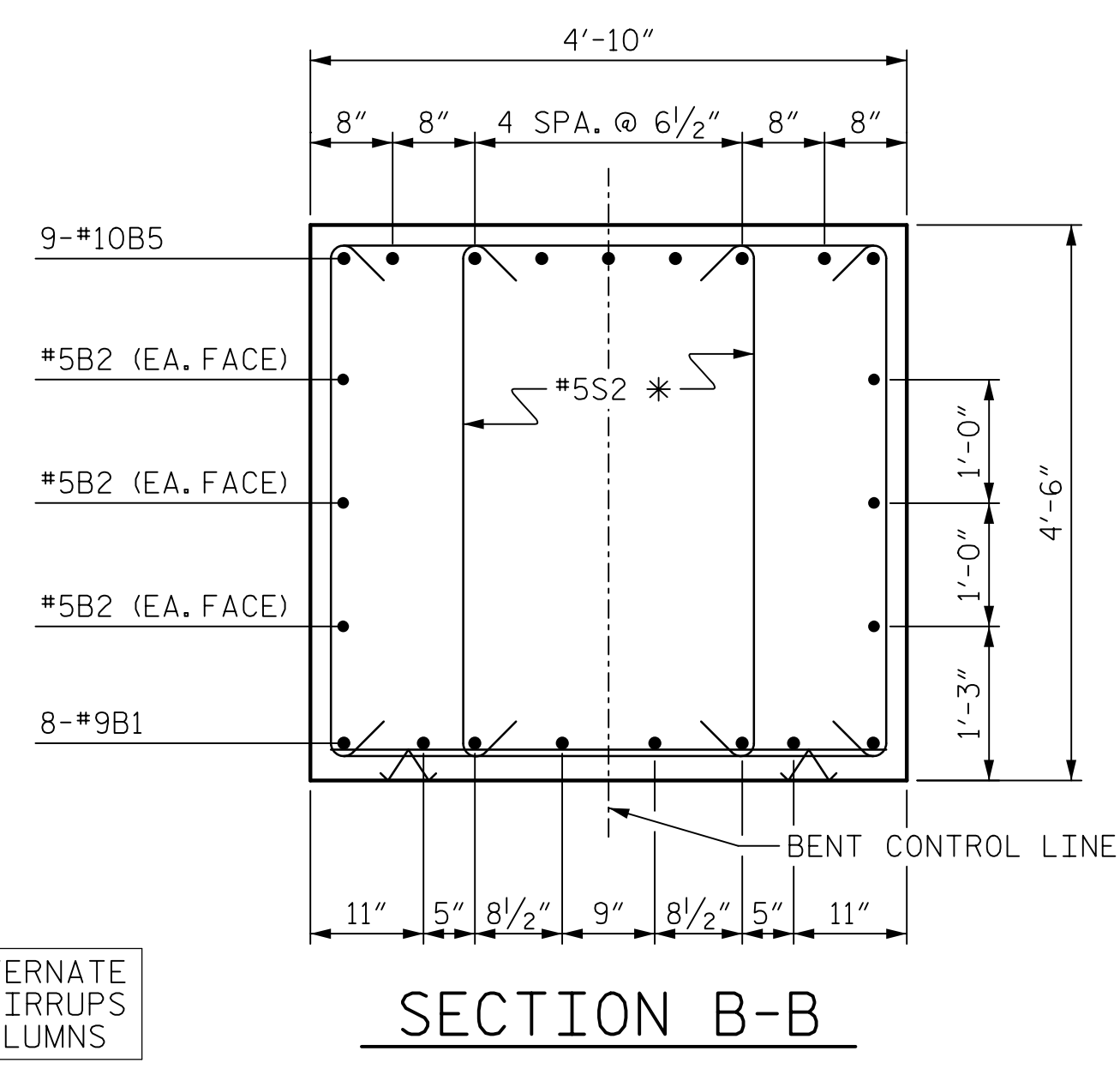
TABLE OF DIMENSIONS

BENT	"A"	"B"	"C"
1	31'-6"	32'-6"	16'-3"
2	22'-3"	37'-3"	18'-9"
3	19'-3"	32'-9"	16'-6"
4	42'-3"	21'-3"	10'-9"

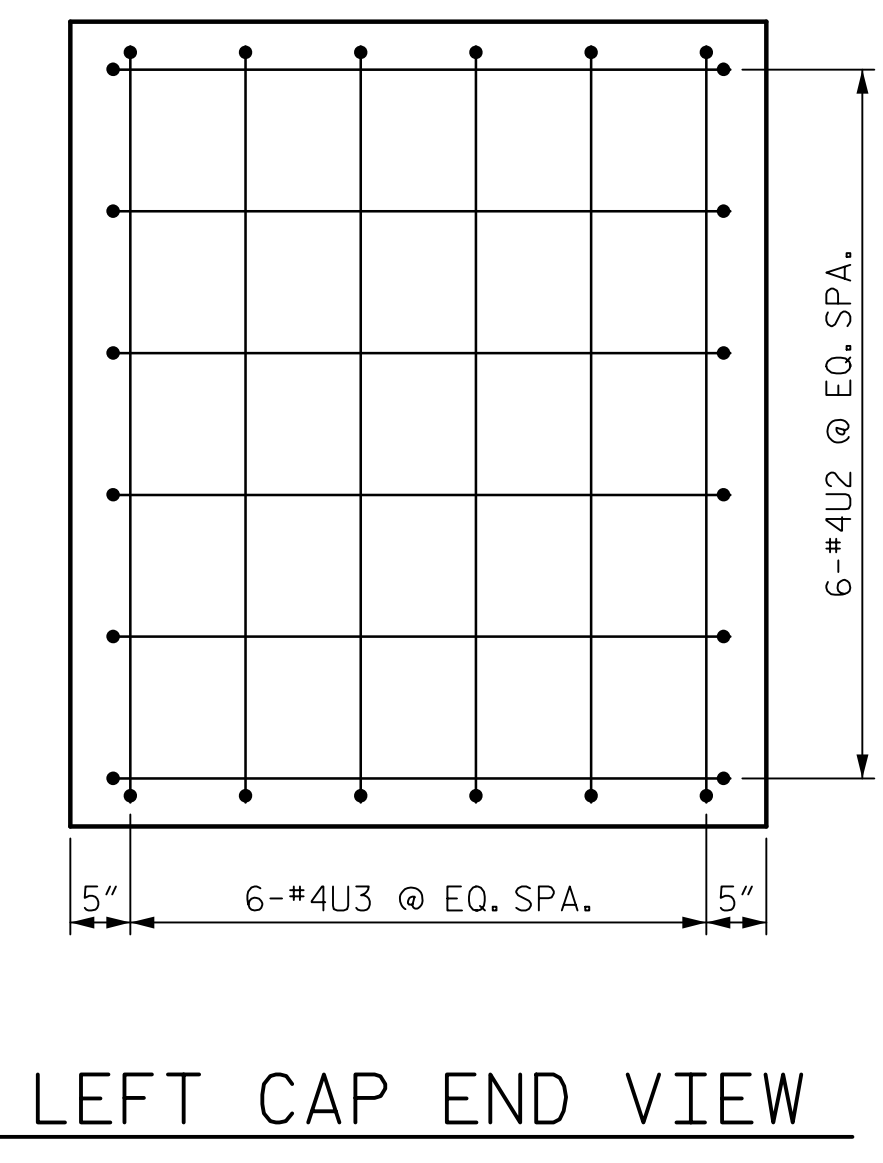


SECTION A-A

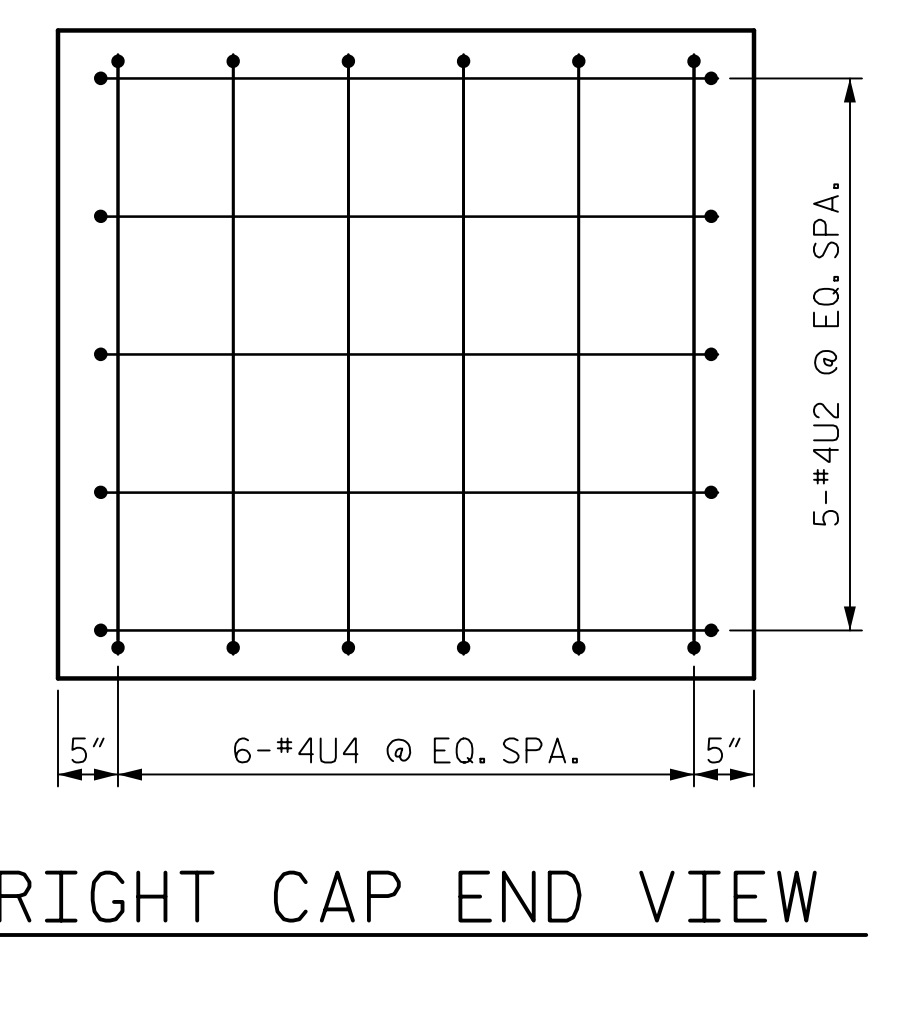
*INVERT ALTERNATE PAIR OF STIRRUPS BETWEEN COLUMNS



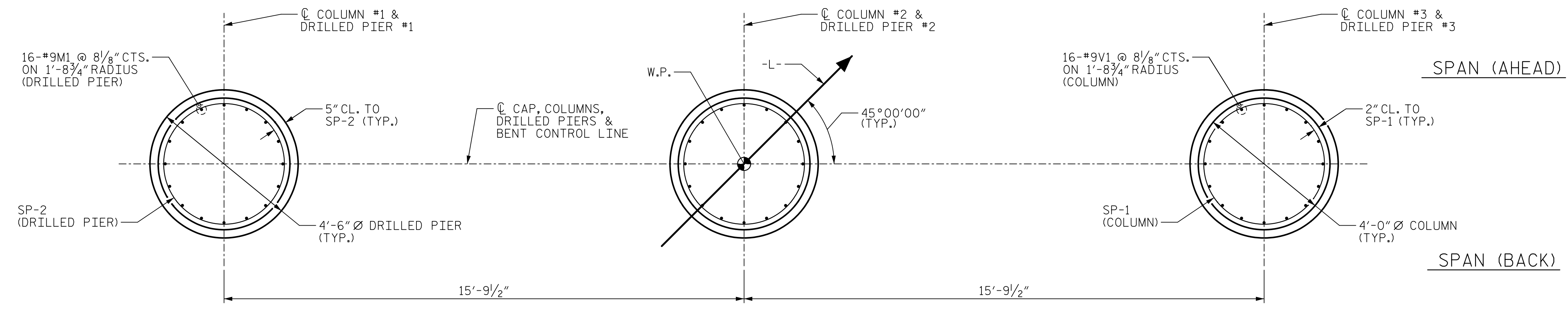
SECTION B-B



LEFT CAP END VIEW



RIGHT CAP END VIEW



PLAN OF COLUMNS AND DRILLED PIERS
DIMENSIONS AND REINFORCEMENT ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -L-

SHEET 2 OF 3

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5438 WADE PARK BOULEVARD, SUITE 200
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Professional Engineer Seal
Seal No. 041343
Gregory R. Cox
5/15/2022

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			39

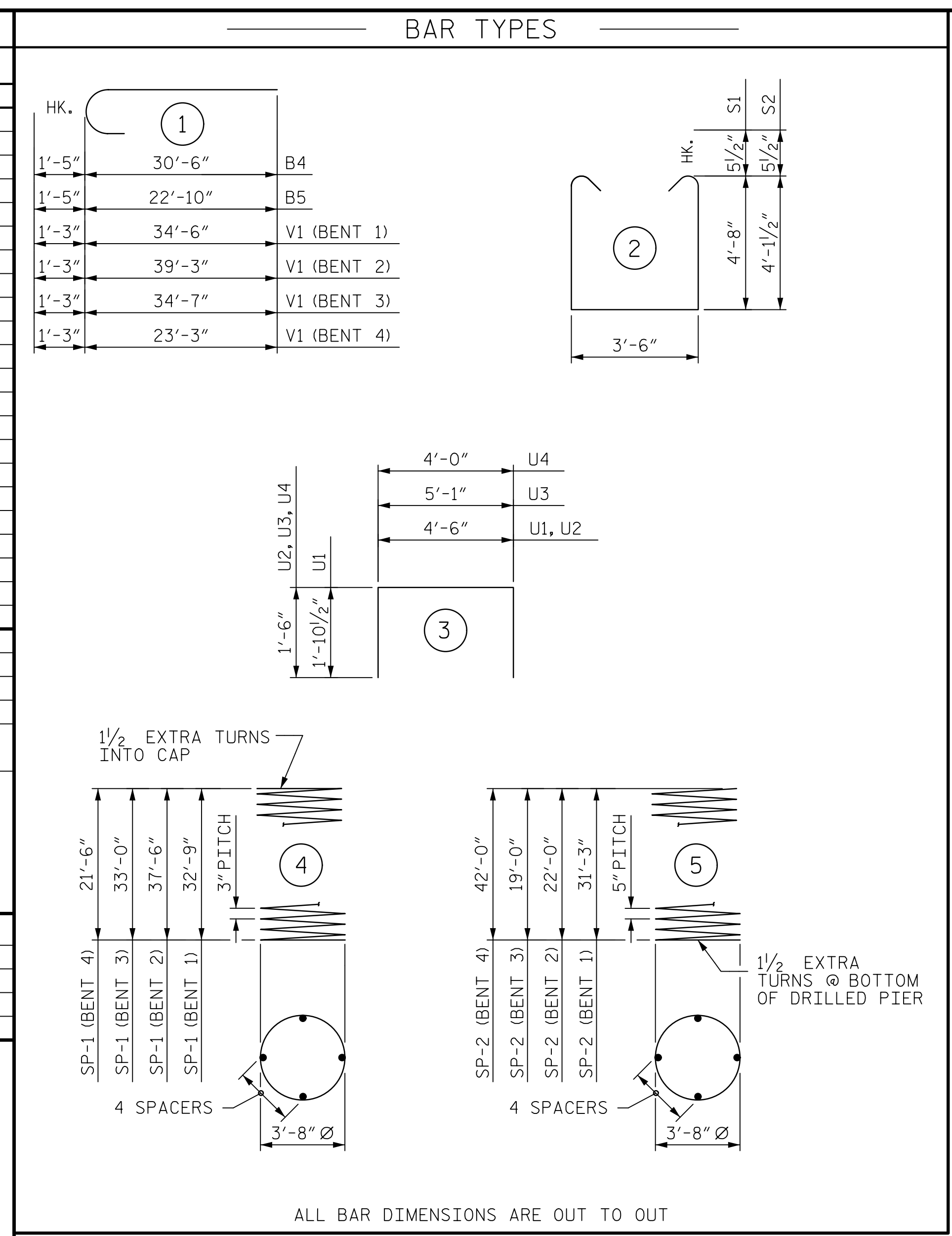
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DRAWN BY: M.K. TOM	DATE: 11/2019
CHECKED BY: G.R. COLS	DATE: 11/2019
DESIGNED BY: S. NATARAJAN	DATE: 11/2019
DESIGN CHECKED BY: G.R. COLS	DATE: 11/2019

DATE: 4/15/2022
TIME: 3:55:55 PM

BILL OF MATERIAL						BILL OF MATERIAL						BILL OF MATERIAL						BILL OF MATERIAL					
BENT 1						BENT 2						BENT 3						BENT 4					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	STR	43'-3"	1176	B1	8	#9	STR	43'-3"	1176	B1	8	#9	STR	43'-3"	1176	B1	8	#9	STR	43'-3"	1176
B2	6	#5	STR	43'-3"	271	B2	6	#5	STR	43'-3"	271	B2	6	#5	STR	43'-3"	271	B2	6	#5	STR	43'-3"	271
B3	2	#5	STR	24'-8"	51	B3	2	#5	STR	24'-8"	51	B3	2	#5	STR	24'-8"	51	B3	2	#5	STR	24'-8"	51
B4	9	#10	1	31'-11"	1236	B4	9	#10	1	31'-11"	1236	B4	9	#10	1	31'-11"	1236	B4	9	#10	1	31'-11"	1236
B5	9	#10	1	24'-3"	939	B5	9	#10	1	24'-3"	939	B5	9	#10	1	24'-3"	939	B5	9	#10	1	24'-3"	939
B6	9	#4	STR	17'-9"	107	B6	9	#4	STR	17'-9"	107	B6	9	#4	STR	17'-9"	107	B6	9	#4	STR	17'-9"	107
B7	3	#4	STR	4'-6"	9	B7	3	#4	STR	4'-6"	9	B7	3	#4	STR	4'-6"	9	B7	3	#4	STR	4'-6"	9
M1	48	#9	STR	38'-4"	6256	M1	48	#9	STR	29'-1"	4746	M1	48	#9	STR	26'-1"	4257	M1	48	#9	STR	49'-1"	8010
S1	72	#5	2	13'-9"	1033	S1	72	#5	2	13'-9"	1033	S1	72	#5	2	13'-9"	1033	S1	72	#5	2	13'-9"	1033
S2	36	#5	2	12'-8"	476	S2	36	#5	2	12'-8"	476	S2	36	#5	2	12'-8"	476	S2	36	#5	2	12'-8"	476
U1	51	#4	3	8'-3"	281	U1	51	#4	3	8'-3"	281	U1	51	#4	3	8'-3"	281	U1	51	#4	3	8'-3"	281
U2	11	#4	3	7'-6"	55	U2	11	#4	3	7'-6"	55	U2	11	#4	3	7'-6"	55	U2	11	#4	3	7'-6"	55
U3	6	#4	3	8'-1"	32	U3	6	#4	3	8'-1"	32	U3	6	#4	3	8'-1"	32	U3	6	#4	3	8'-1"	32
U4	6	#4	3	7'-0"	28	U4	6	#4	3	7'-0"	28	U4	6	#4	3	7'-0"	28	U4	6	#4	3	7'-0"	28
V1	48	#9	1	35'-9"	5834	V1	48	#9	1	40'-6"	6610	V1	48	#9	1	36'-0"	5875	V1	48	#9	1	24'-6"	3998
REINFORCING STEEL 17,784 LBS.						REINFORCING STEEL 17,050 LBS.						REINFORCING STEEL 15,826 LBS.						REINFORCING STEEL 17,702 LBS.					
SP-1	3	*	4	1503'-7"	3013	SP-1	3	*	4	1731'-5"	3470	SP-1	3	*	4	1526'-5"	3059	SP-1	3	*	4	1002'-5"	2009
SP-2	3	**	5	871'-9"	2728	SP-2	3	**	5	618'-10"	1936	SP-2	3	**	5	536'-9"	1679	SP-2	3	**	5	1165'-10"	3648
SPIRAL COLUMN REINFORCING STEEL 5,741 LBS.						SPIRAL COLUMN REINFORCING STEEL 5,406 LBS.						SPIRAL COLUMN REINFORCING STEEL 4,738 LBS.						SPIRAL COLUMN REINFORCING STEEL 5,657 LBS.					
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR						* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR						* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR						* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR						** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR						** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR						** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN						CLASS A CONCRETE BREAKDOWN						CLASS A CONCRETE BREAKDOWN						CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS) 45.0 C.Y.						POUR #2 (COLUMNS) 52.0 C.Y.						POUR #2 (COLUMNS) 46.0 C.Y.						POUR #2 (COLUMNS) 30.0 C.Y.					
POUR #3 (CAP) 39.5 C.Y.						POUR #3 (CAP) 39.5 C.Y.						POUR #3 (CAP) 39.5 C.Y.						POUR #3 (CAP) 39.5 C.Y.					
TOTAL CLASS A CONCRETE 84.5 C.Y.						TOTAL CLASS A CONCRETE 91.5 C.Y.						TOTAL CLASS A CONCRETE 85.5 C.Y.						TOTAL CLASS A CONCRETE 69.5 C.Y.					
DRILLED PIERS:						DRILLED PIERS:						DRILLED PIERS:						DRILLED PIERS:					
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS) 55.7 C.Y.						DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS) 39.3 C.Y.						DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS) 34.0 C.Y.						DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS) 74.7 C.Y.					
4'-6" Ø DRILLED PIERS IN SOIL 69.5 LIN. FT.						4'-6" Ø DRILLED PIERS IN SOIL 26.8 LIN. FT.						4'-6" Ø DRILLED PIERS IN SOIL 15.8 LIN. FT.						4'-6" Ø DRILLED PIERS IN SOIL 96.8 LIN. FT.					
4'-6" Ø DRILLED PIERS NOT IN SOIL 25 LIN. FT.						4'-6" Ø DRILLED PIERS NOT IN SOIL 40 LIN. FT.						4'-6" Ø DRILLED PIERS NOT IN SOIL 42 LIN. FT.						4'-6" Ø DRILLED PIERS NOT IN SOIL 30 LIN. FT.					
CSL TUBES 493.5 LIN. FT.						CSL TUBES 354.0 LIN. FT.						CSL TUBES 309.0 LIN. FT.						CSL TUBES 654.0 LIN. FT.					
PERM. STEEL CASING FOR 54" Ø DRILLED PIER 46.5 LIN. FT.						PERM. STEEL CASING FOR 54" Ø DRILLED PIER 24.4 LIN. FT.						PERM. STEEL CASING FOR 54" Ø DRILLED PIER 15.4 LIN. FT.						PERM. STEEL CASING FOR 54" Ø DRILLED PIER 54.0 LIN. FT.					



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PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -L-

SHEET 3 OF 3

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

Professional Engineer Seal:
Seal No. 041343
G. R. COLS
Professional Engineer
5/15/2022

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

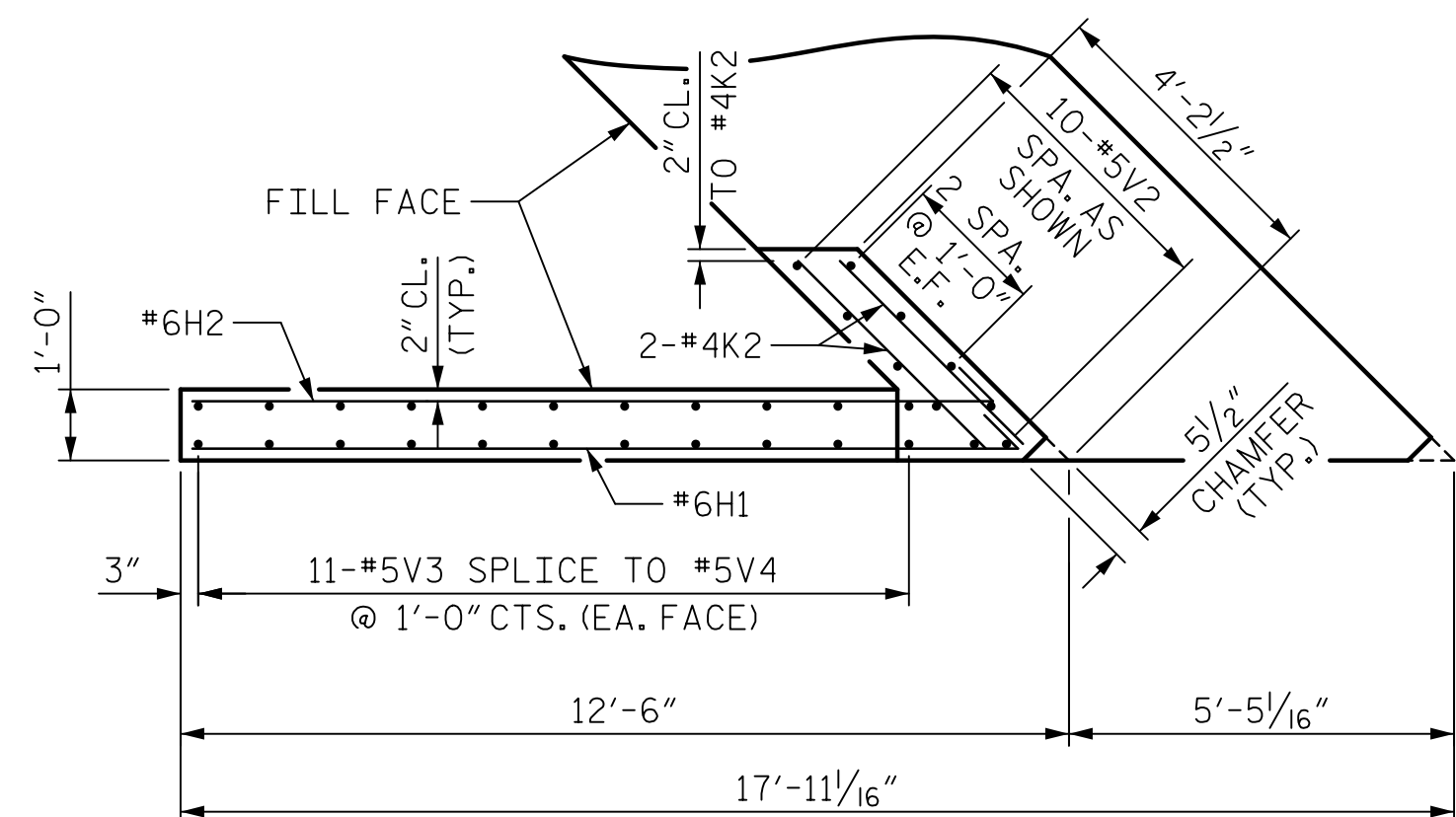
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1			3			TOTAL SHEETS 39
2			4			

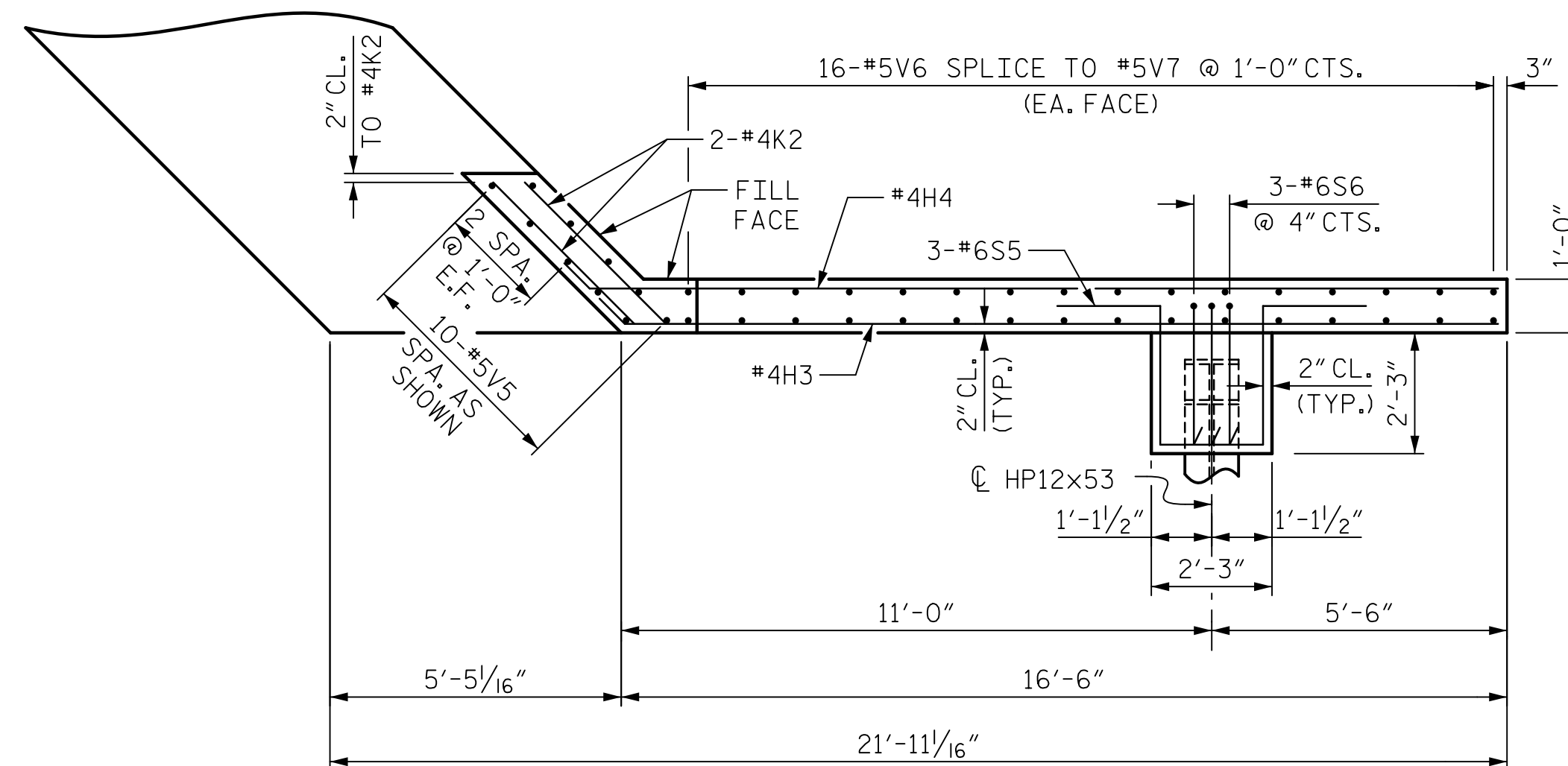
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CHECKED BY: G. R. COLS DATE: 11/2019
DESIGNED BY: S. NATARAJAN DATE: 11/2019
DESIGN CHECKED BY: G. R. COLS DATE: 11/2019

USER: greg@acum
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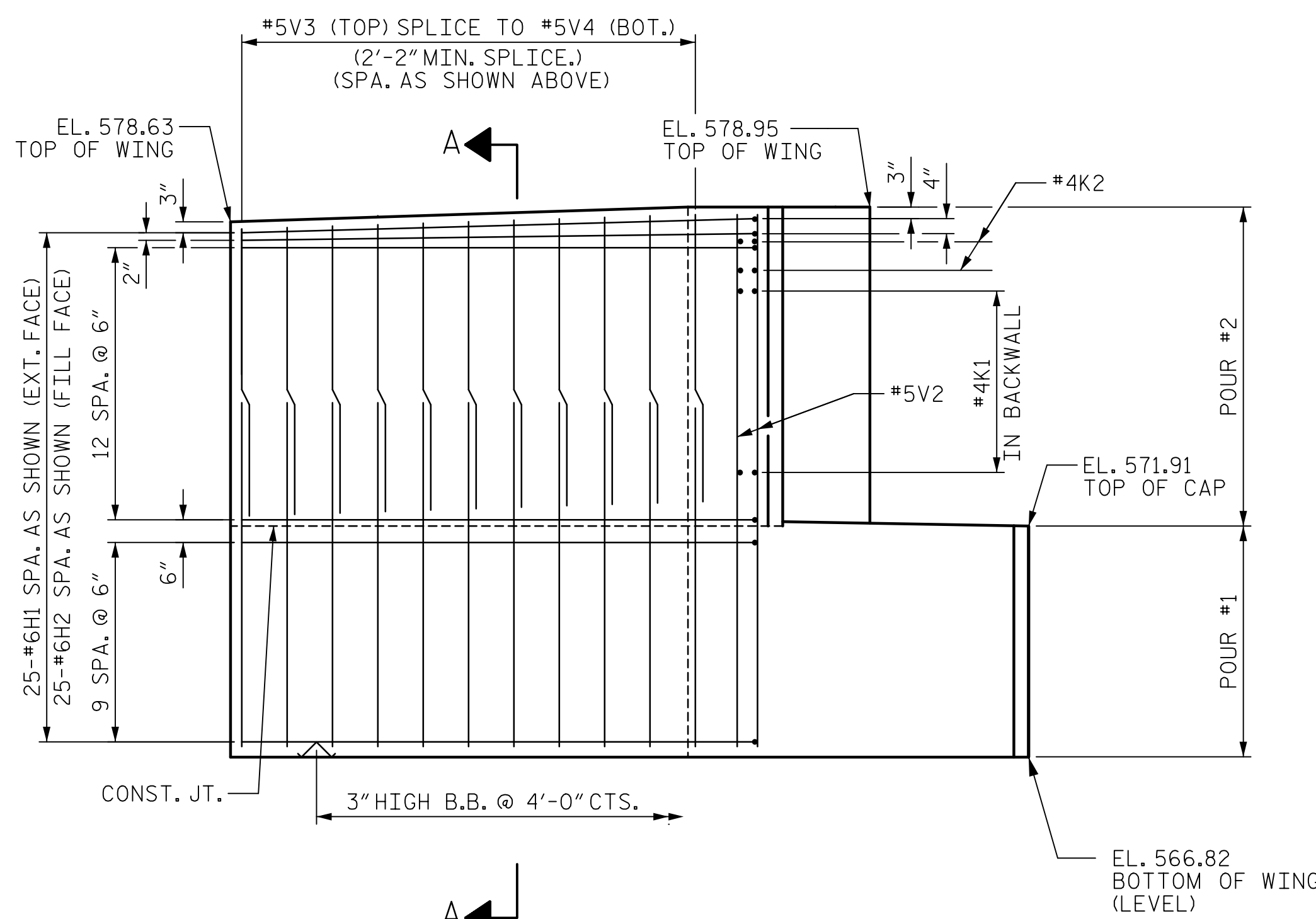
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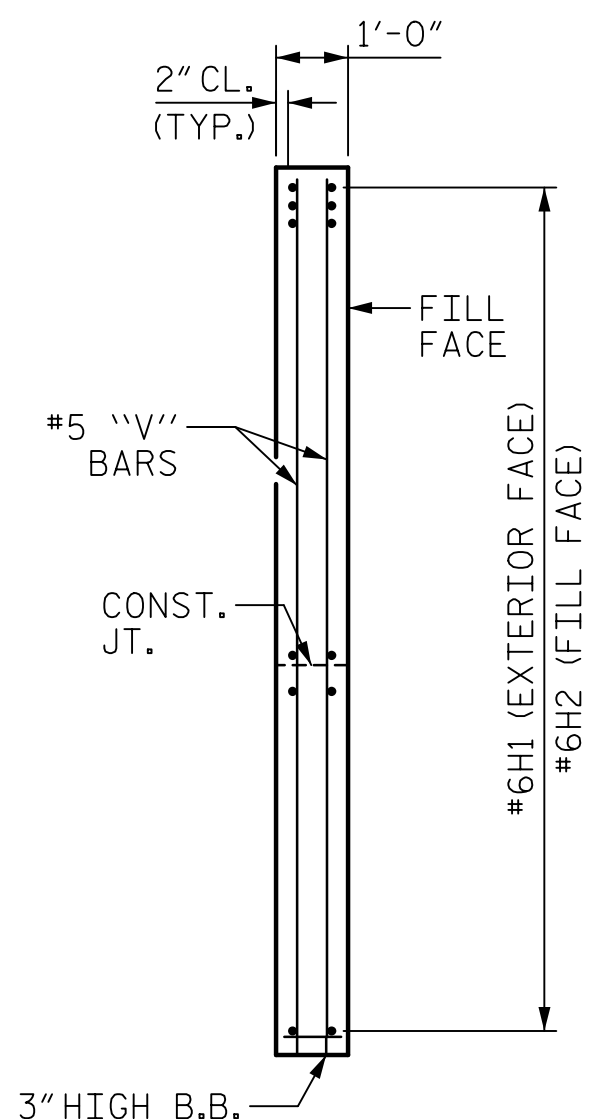
PLAN - WING W1



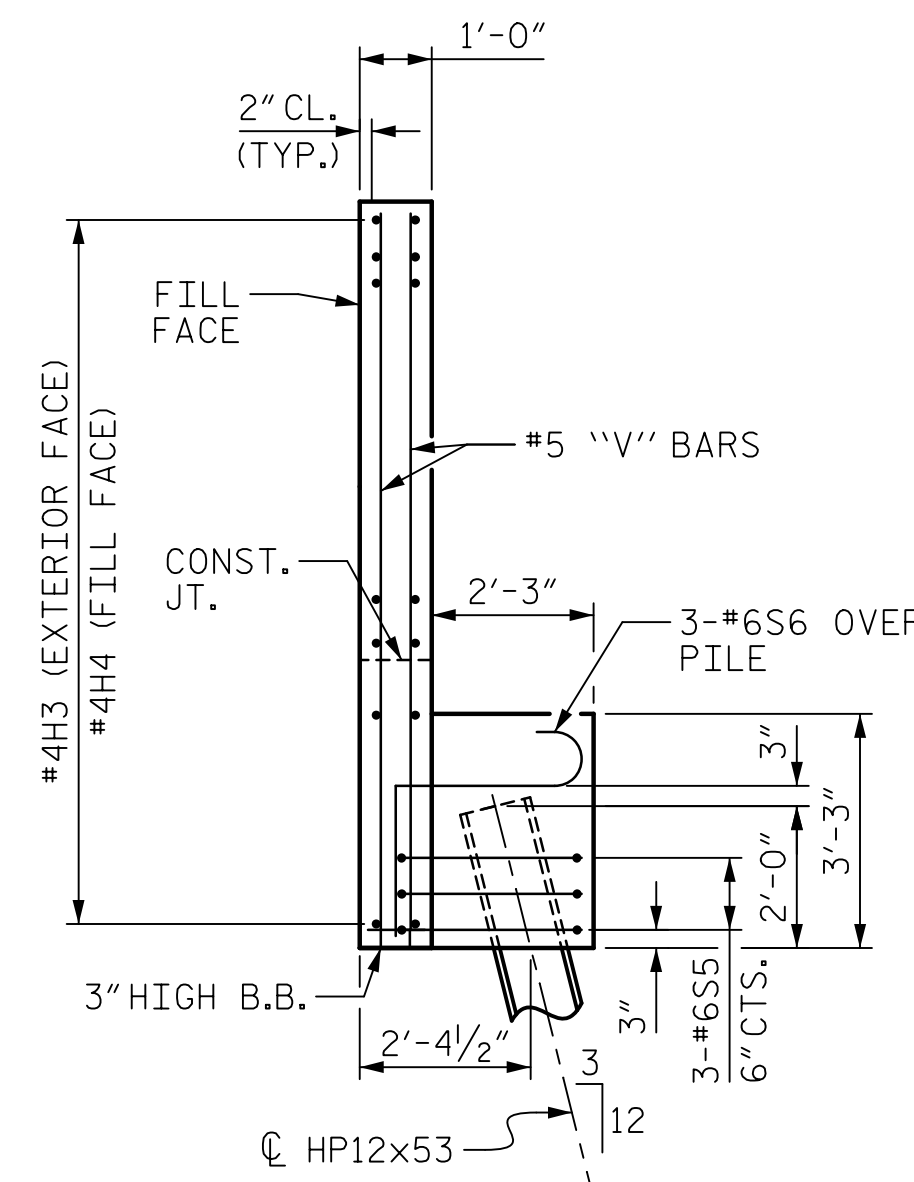
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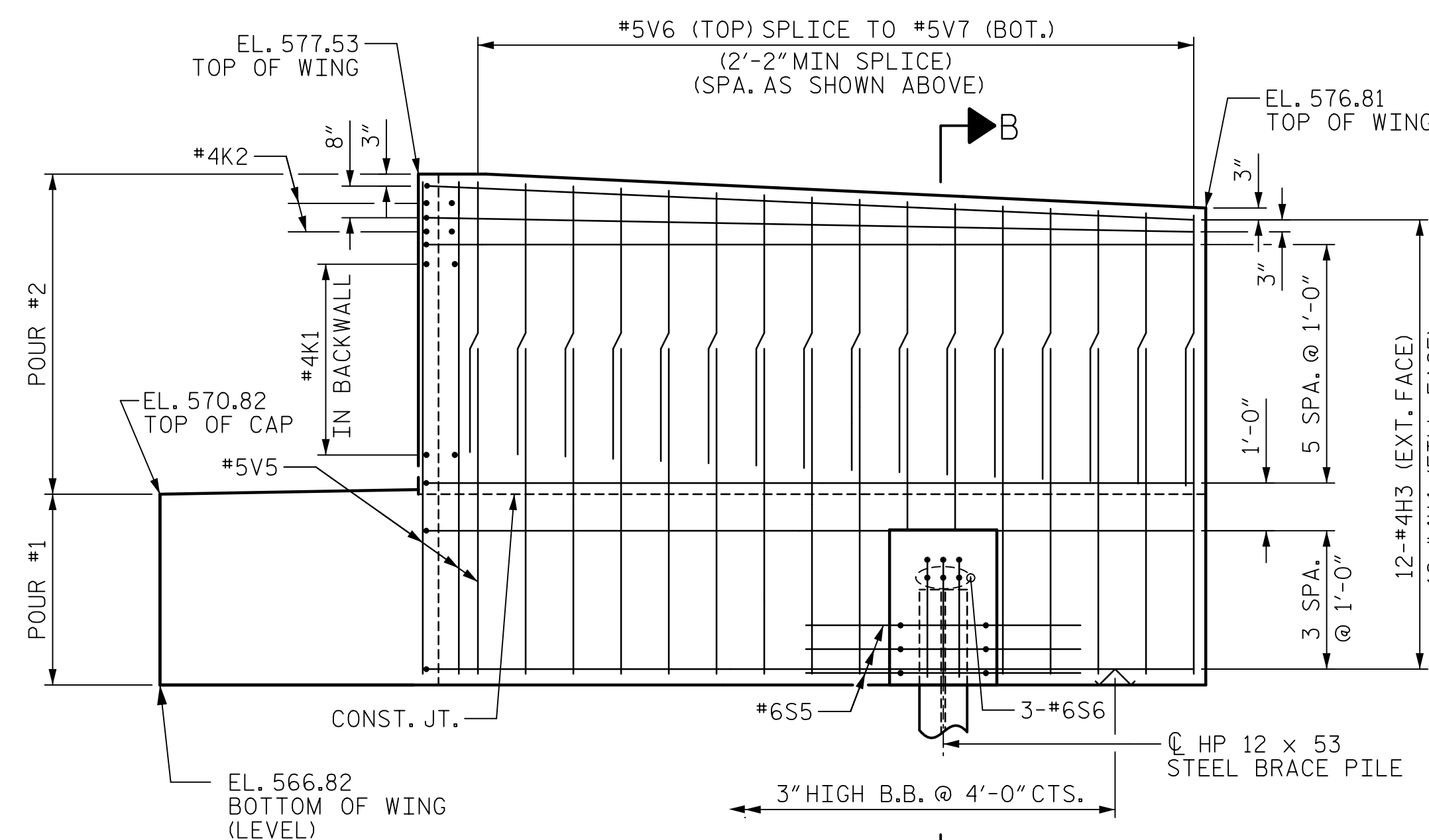
ELEVATION - WING W1



SECTION A-A



SECTION B-B



ELEVATION - WING W2

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
 STATION: 21+97.00 -L-

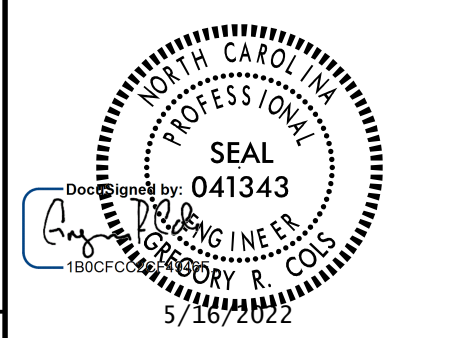
SHEET 2 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

END BENT 2



DRAWN BY : D.R. DRUM DATE : 11/2019
 CHECKED BY : G.R. COLS DATE : 11/2019
 DESIGNED BY : H.T. ROSEMOND DATE : 11/2019
 DESIGN CHECKED BY : S. NATARAJAN DATE : 11/2019

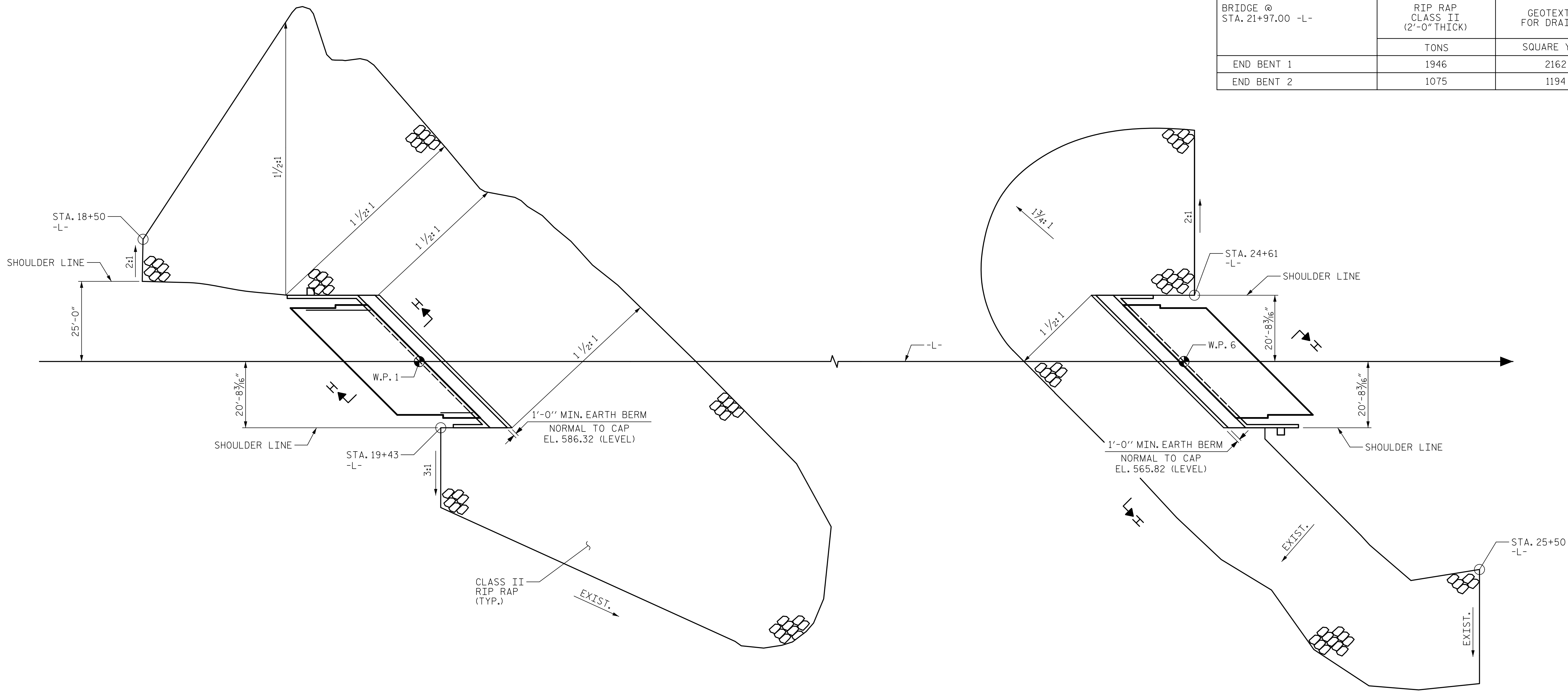
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2			4			

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ESTIMATED QUANTITIES		
BRIDGE @ STA. 21+97.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	1946	2162
END BENT 2	1075	1194

DATE: 3/29/2019
TIME: 2:28:00 PM

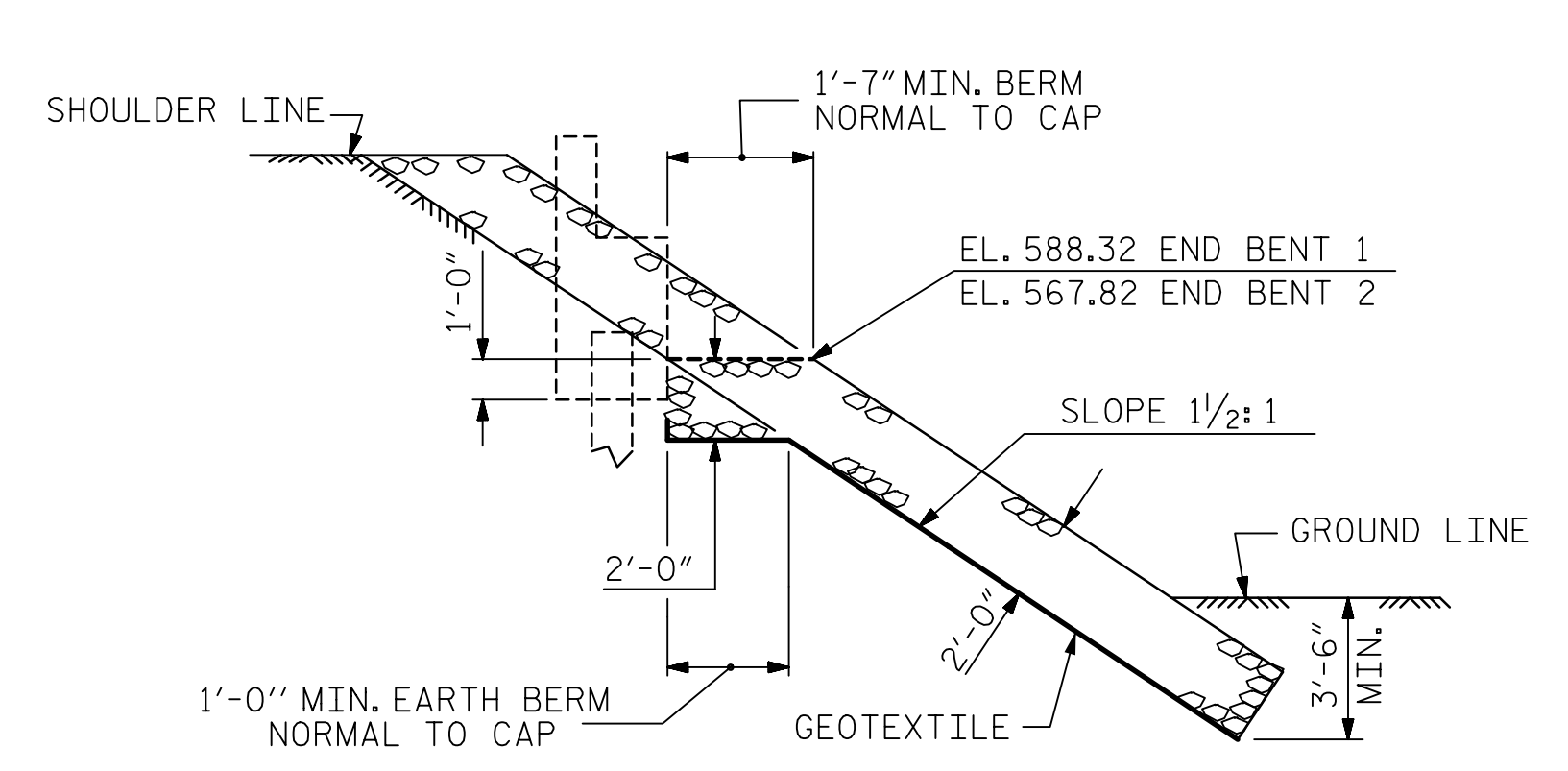


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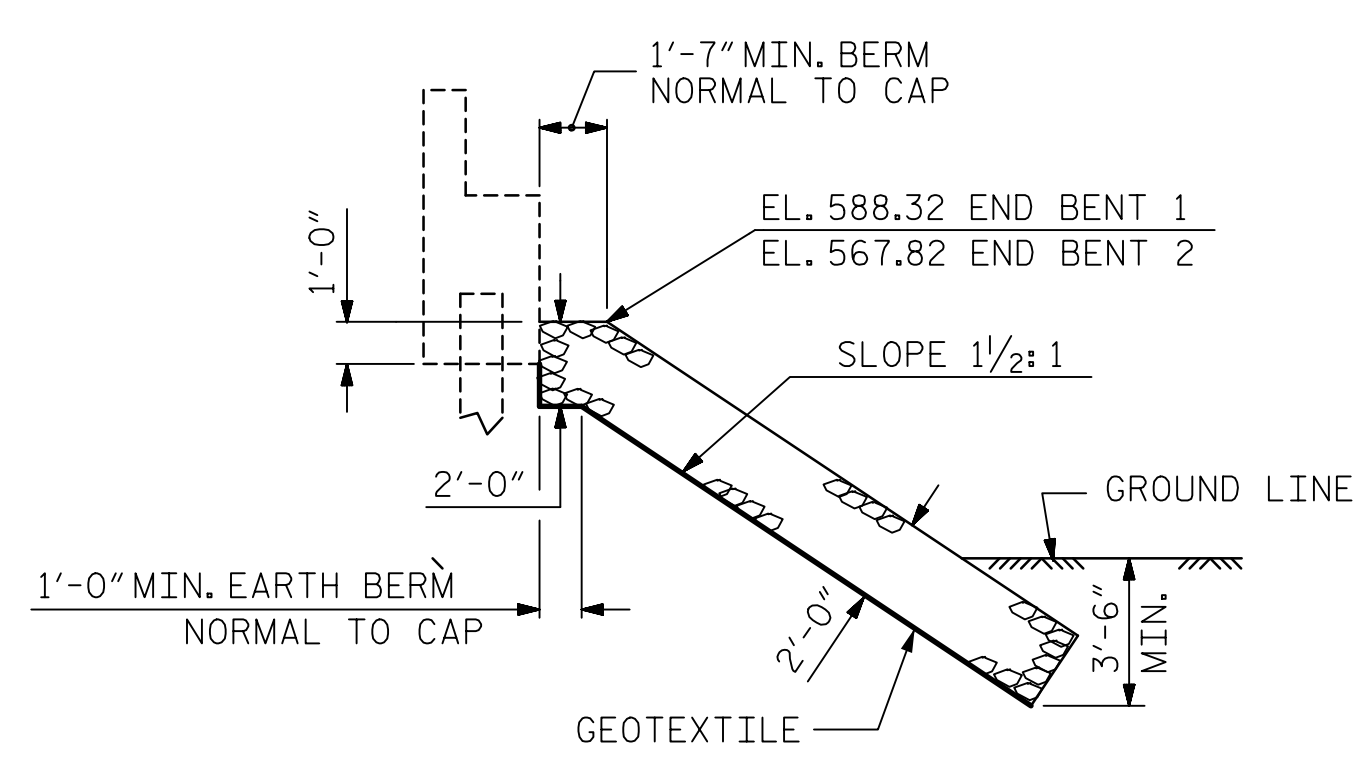
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PLAN

PROJECT NO. BR-0044
 ROCKINGHAM COUNTY
 STATION: 21+97.00 -L-



SECTION H-H



SECTION C-C
 BERM RIP RAPPED

DRAWN BY : A. JIANG	DATE : 11/2019
CHECKED BY : G.R. COLS	DATE : 11/2019
DESIGNED BY : S. NATARAJAN	DATE : 11/2019
DESIGN CHECKED BY : G.R. COLS	DATE : 11/2019

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 5438 WADE PARK BOULEVARD, SUITE 200
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 AECOM License No. F-0342

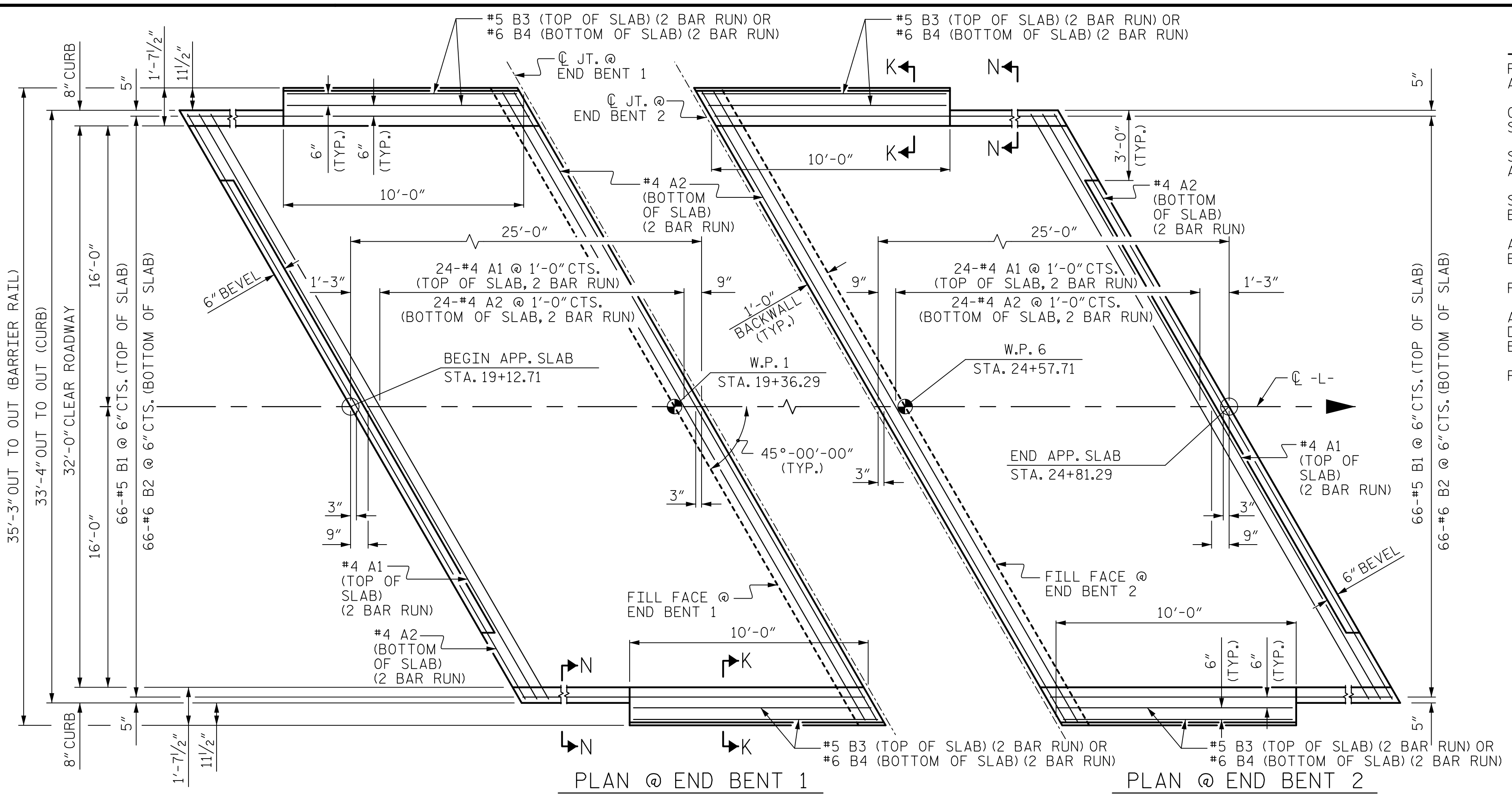
Professional Engineer Seal:
 State of North Carolina
 License No. 041343
 Gregory R. Colby
 5/15/2022

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

USER: Bin.Tan@AECOM.COM
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DATE: 3/31/2022
TIME: 2:46:22 PM

USER: BinJiang.Cheng
DIR: R:\Structures\04 Drawings\401_007\BR0044_SML_ASO.dgn



PLAN @ END BENT 1 PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

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

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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

FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

FOR STRIP SEAL EXPANSION JOINT, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

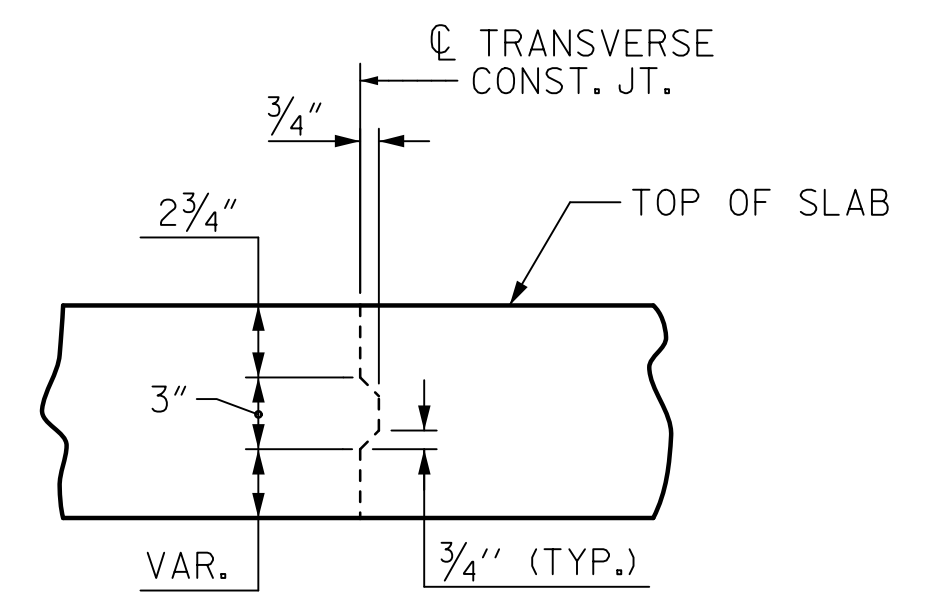
FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	25'-8"	857
A2	52	#4	STR	25'-6"	886
*B1	66	#5	STR	23'-2"	1595
B2	66	#6	STR	24'-4"	2412
*B3	4	#5	STR	6'-6"	27
B4	4	#6	STR	6'-6"	39
REINFORCING STEEL				** LBS.	3337
* EPOXY COATED REINFORCING STEEL				** LBS.	2479
CLASS AA CONCRETE				** C. Y.	37.0

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE SHEET 2 OF 2.

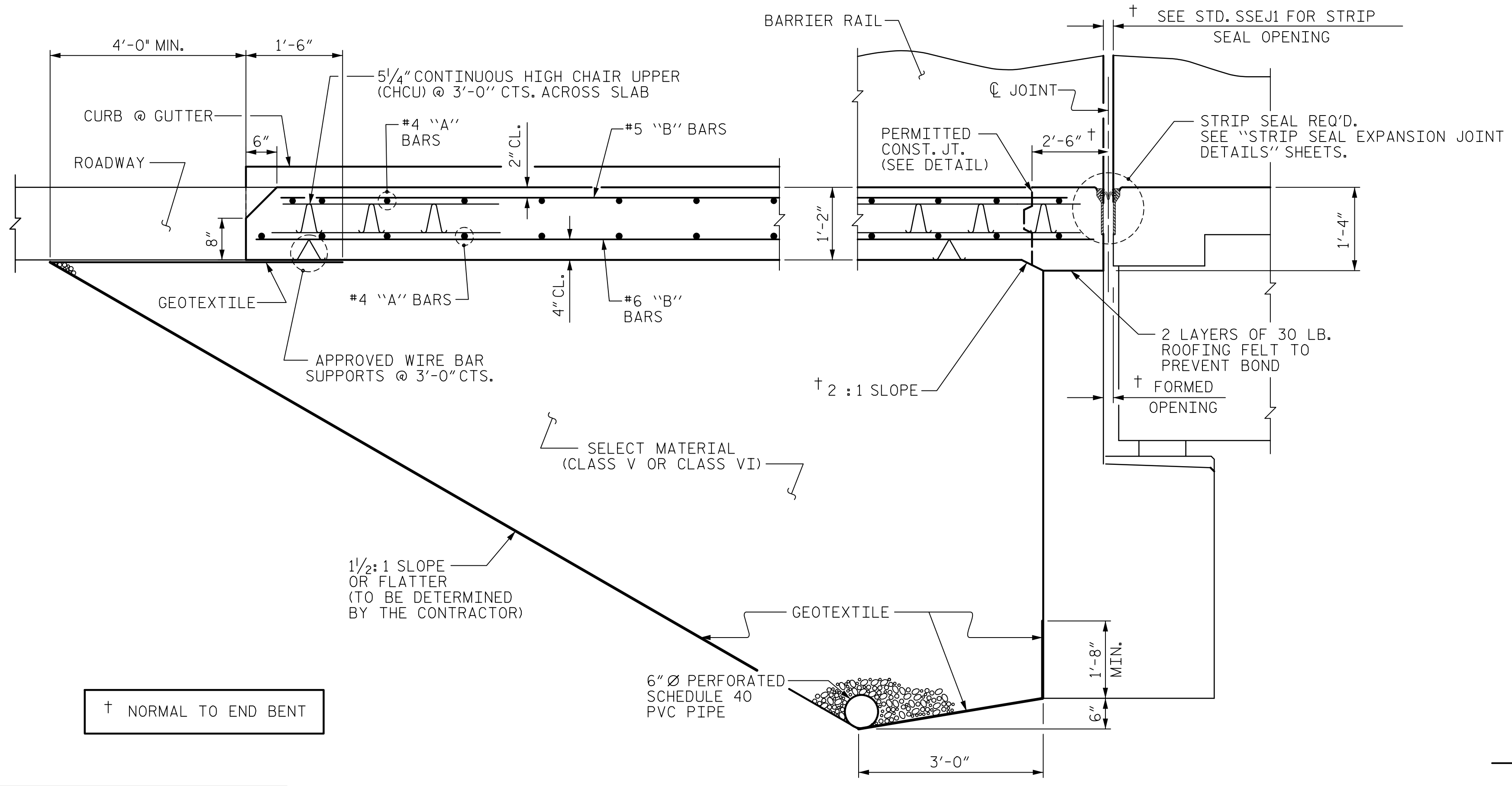
SPLICE LENGTHS

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

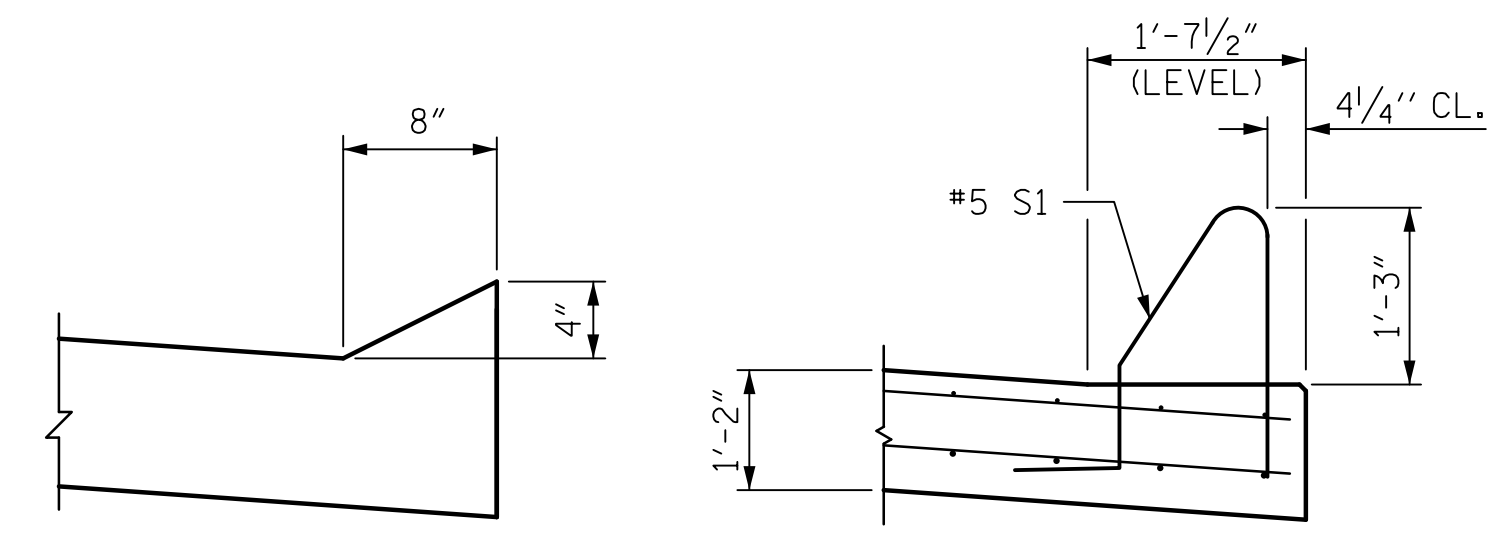


TRANSVERSE CONSTRUCTION JOINT IN APPROACH SLAB

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

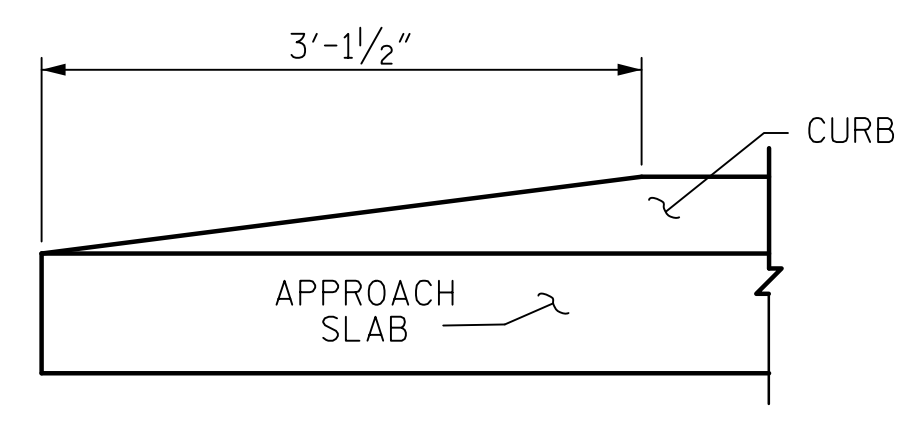


SECTION THRU SLAB (TYPE I - STANDARD APPROACH FILL)



SECTION N-N

SECTION K-K

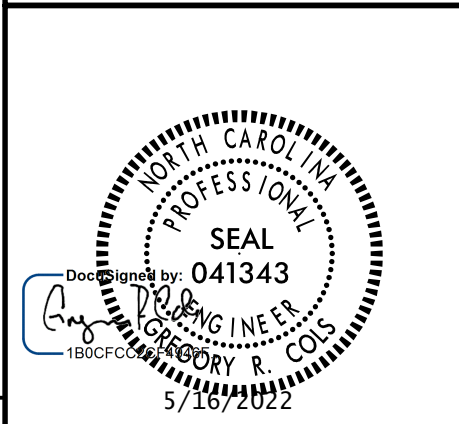


END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -L-

SHEET 1 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH SLAB
FOR FLEXIBLE PAVEMENT

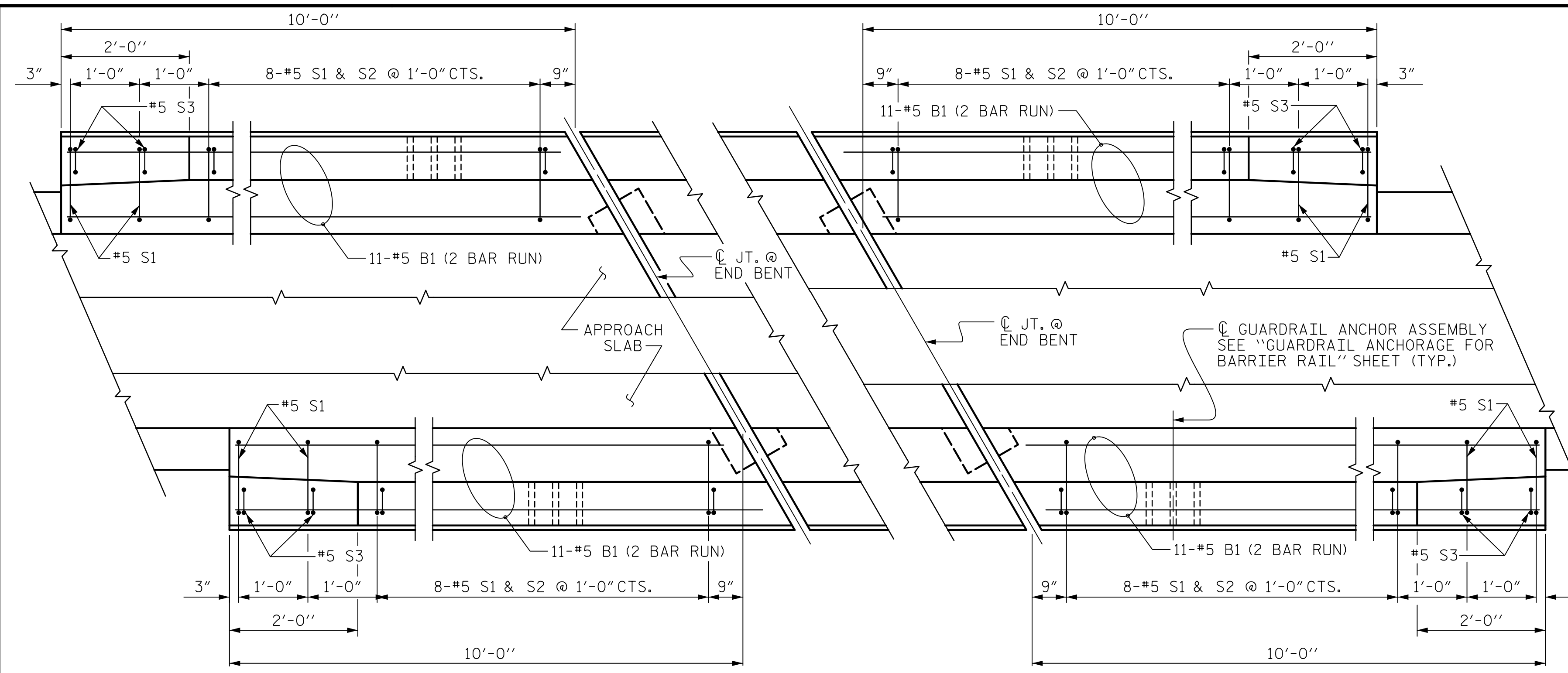
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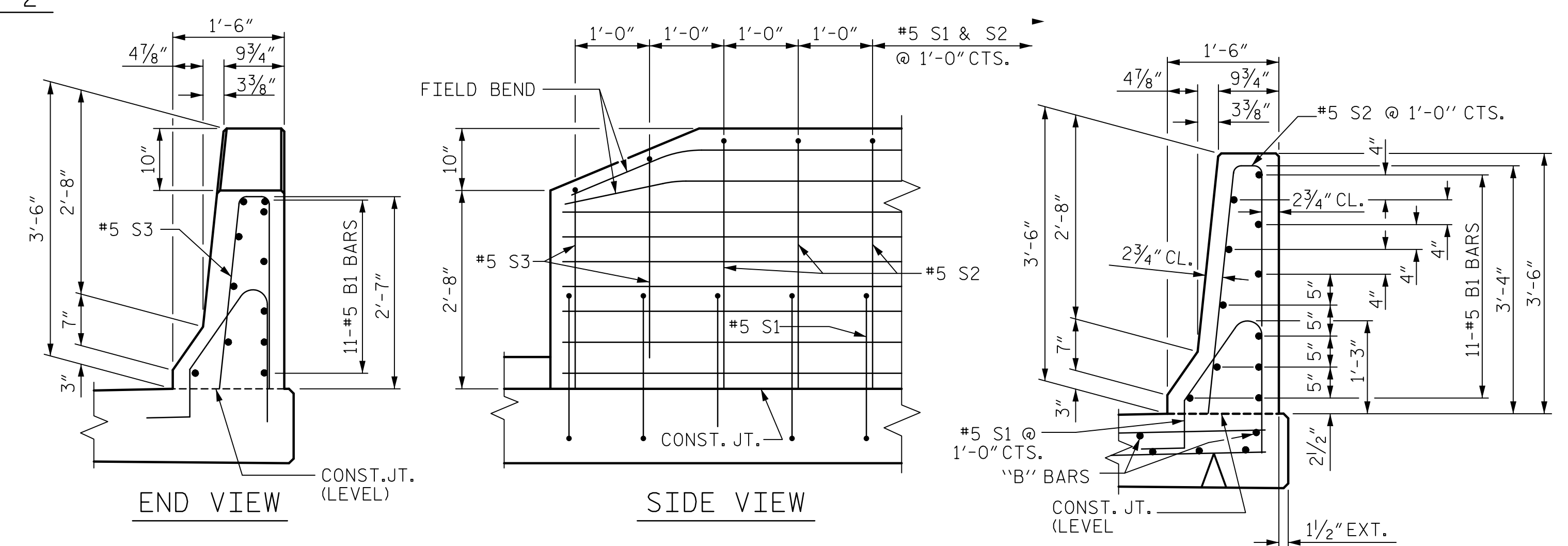
SHEET NO. S-38
TOTAL SHEETS 39

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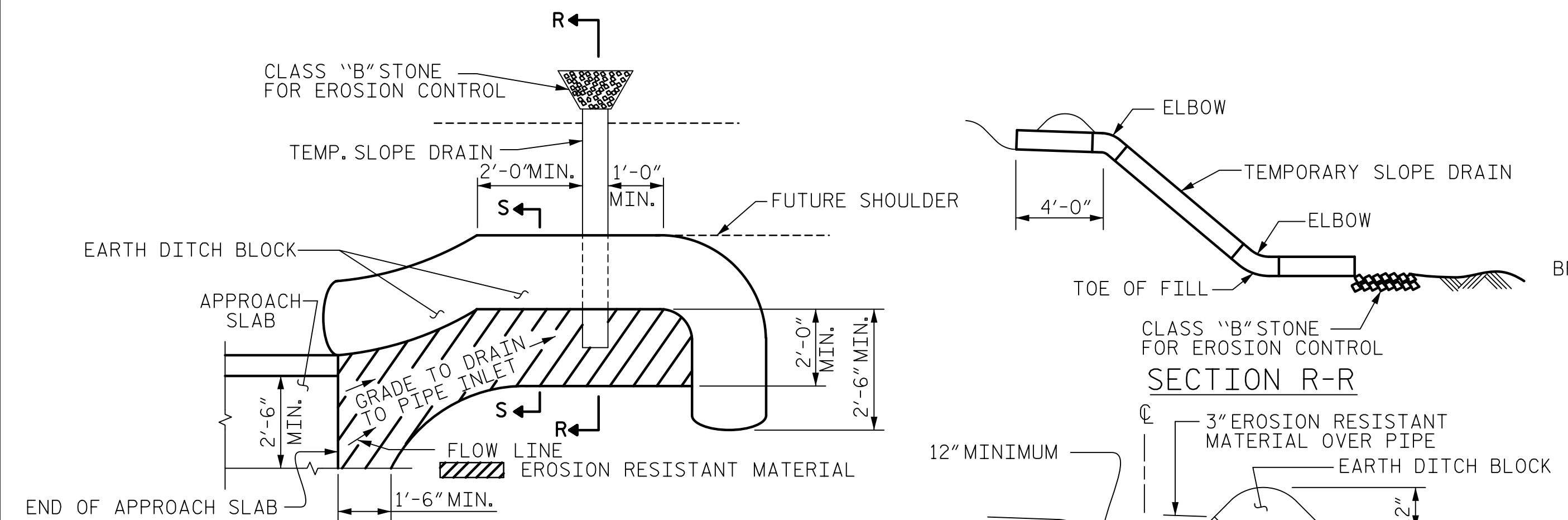
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END BENT 1
END BENT 2
PLAN OF BARRIER RAIL



END VIEW
SIDE VIEW
SECTION THRU RAIL
END OF RAIL DETAILS



PLAN VIEW
SECTION S-S
TEMPORARY BERM AND SLOPE DRAIN DETAILS
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

ASSEMBLED BY : D.R. DRUM	DATE : 06/2019
CHECKED BY : G.R. COLS	DATE : 11/2019
DRAWN BY : FCJ 11/88	REV. 6/13 MAA/GM
CHECKED BY : ARB 11/88	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

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.

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NOTES

THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE BARRIER RAIL".

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

SHIFT, BEND, OR CUT REINFORCING STEEL AS NECESSARY TO CLEAR JOINT BLOCKOUT.

BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	88	#5	STR	7'-1"	650
*S1	40	#5	1	5'-1"	212
*S2	32	#5	2	7'-0"	234
*S3	8	#5	2	5'-6"	46
* EPOXY COATED REINFORCING STEEL				1142	LBS.
CLASS AA CONCRETE				5.7	C. Y.
CONCRETE BARRIER RAIL				40.0	LN. FT.

PROJECT NO. BR-0044
ROCKINGHAM COUNTY
STATION: 21+97.00 -L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH
SLAB DETAILS

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

SHEET NO. S-39
TOTAL SHEETS 39

STD. NO. BAS4

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 $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO $1\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A $\frac{1}{4}$ " FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A $\frac{1}{4}$ " RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE $\frac{7}{8}$ " \emptyset SHEAR STUDS FOR THE $\frac{3}{4}$ " \emptyset STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF $\frac{7}{8}$ " \emptyset STUDS ALONG THE BEAM AS SHOWN FOR $\frac{3}{4}$ " \emptyset STUDS BASED ON THE RATIO OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST $\frac{5}{16}$ " 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 $\frac{1}{16}$ INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

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

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINISHES AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990