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TIP PROJECT: B-4982

CONTRACT: C203956

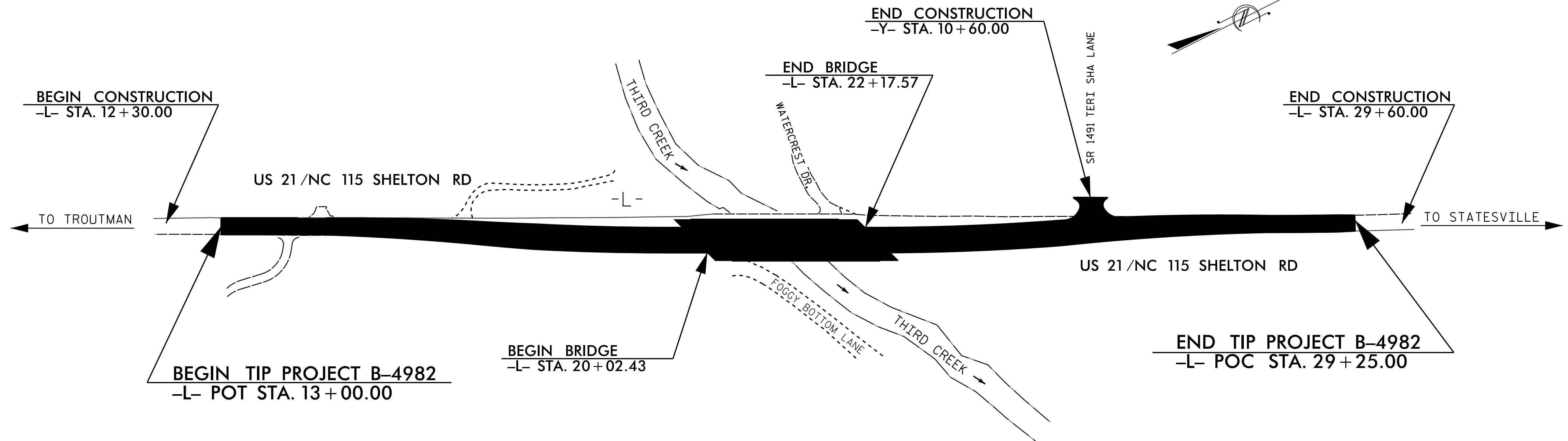
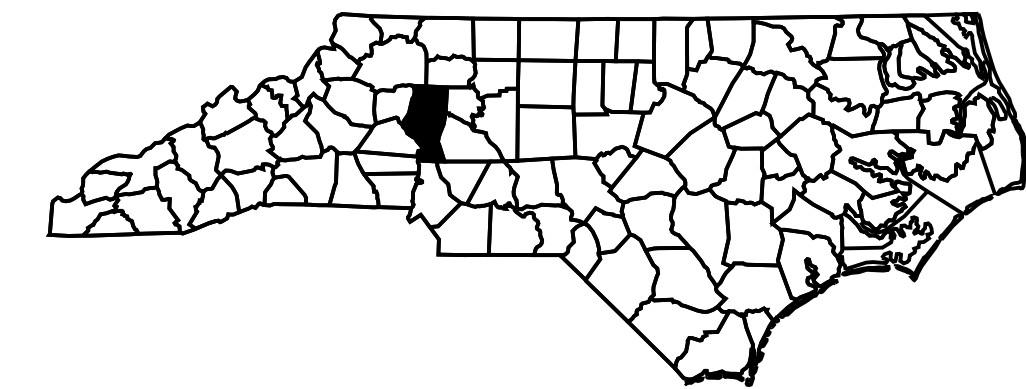
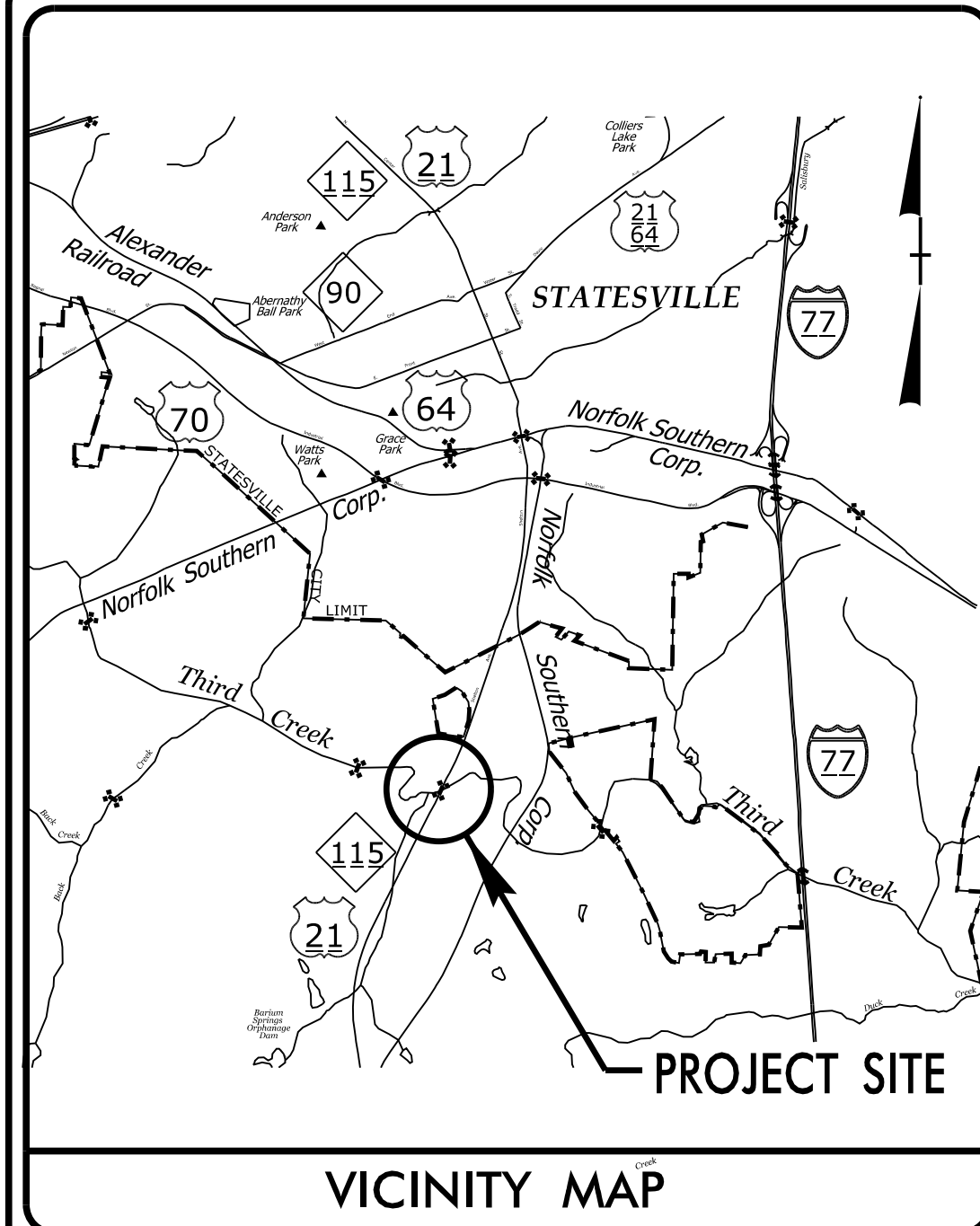
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

IREDELL COUNTY

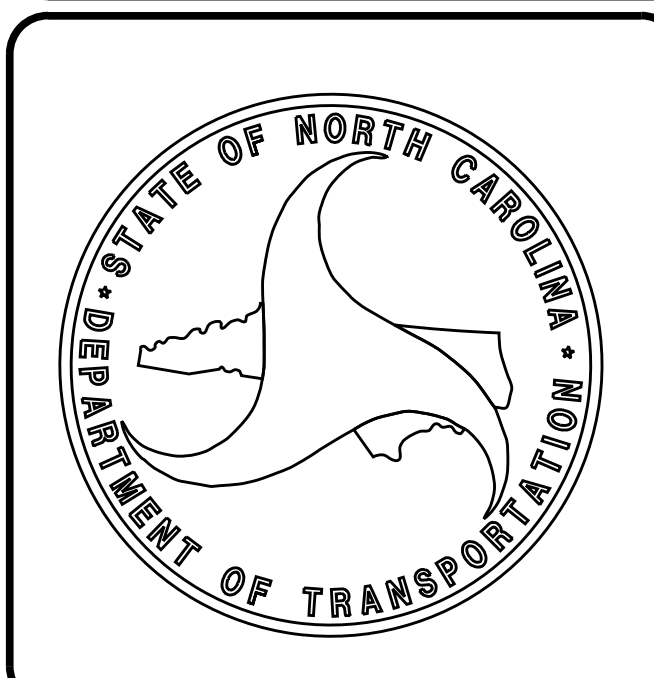
**LOCATION: REPLACE BRIDGE NO. 38 ON US 21-NC 115
(SHELTON RD.) OVER THIRD CREEK**

TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4982		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
40159.1.1	BRSTP-0021(15)	PE	
40159.3.1		CONSTR.	



STRUCTURES



DESIGN DATA

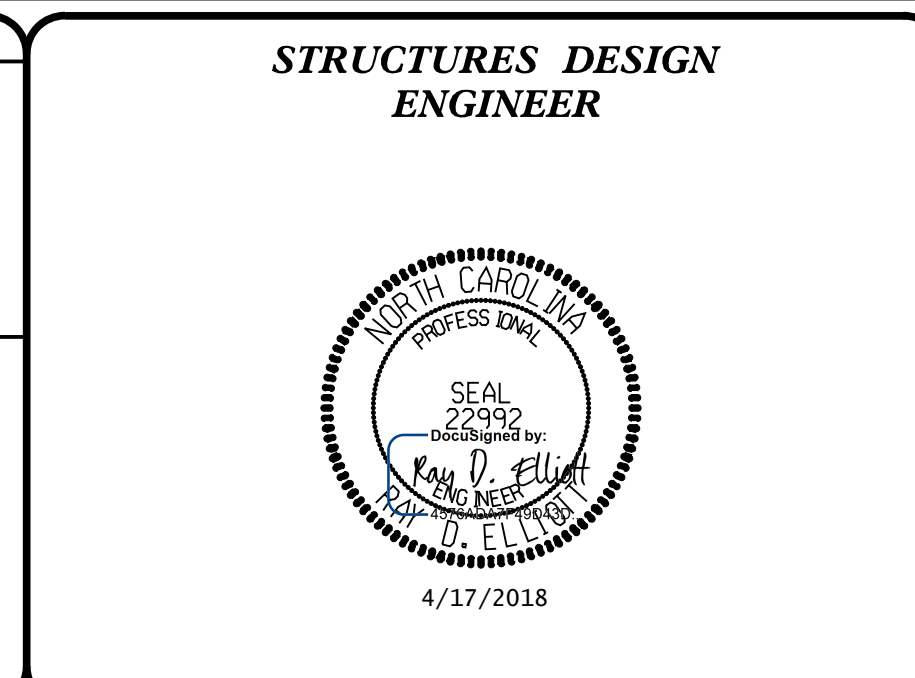
ADT 2017 =	12700
ADT 2037 =	21300
K =	9 %
D =	55 %
T =	5 %
V =	50 MPH
* TTST = 1% DUAL 4%	
FUNC CLASS =	
MINOR ARTERIAL	
REGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4982 =	0.267 MILES
LENGTH STRUCTURES TIP PROJECT B-4982 =	0.041 MILES
TOTAL LENGTH TIP PROJECT B-4982 =	0.308 MILES

PLANS PREPARED BY:	PLANS PREPARED FOR:
 TGS ENGINEERS 804-C N. LAFAYETTE ST. SHELBY, NC 28150 PH (704) 476-0003	NCDOT DIVISION 12
2018 STANDARD SPECIFICATIONS	
LETTING DATE: JUNE 19, 2018	RAY ELLIOTT, PE STRUCTURES DESIGN ENGINEER

STRUCTURES DESIGN ENGINEER



19+50 20+00 20+50 21+00 21+50 22+00 22+50 23+00

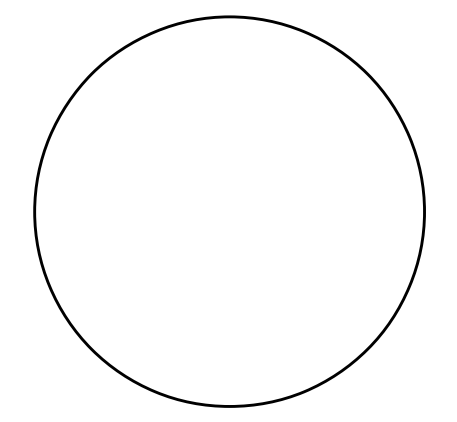
LOW CHORD
STA. 19+80.50
EL. 791.30

LOW CHORD
STA. 21+82.89
EL. 792.80

GRADE DATA

(+) 0.7200 % (+) 4.9014 %
PI STA. = 24+25.00 -L-
EL. = 799.80
L = 340'

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



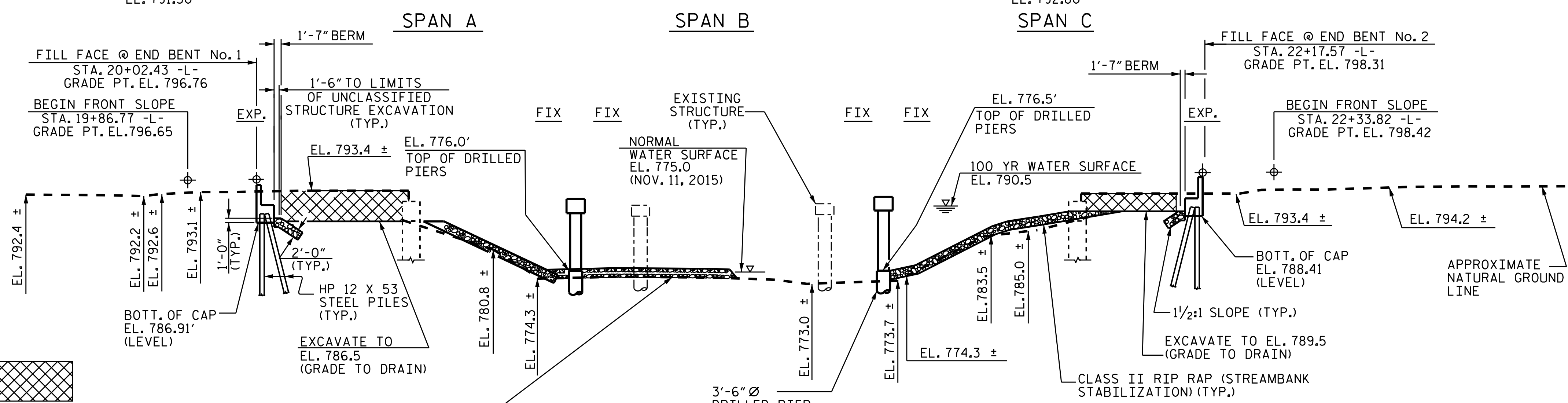
SEAL

HYDRAULIC DATA:

DESIGN DISCHARGE	7,000 CFS
FREQUENCY OF DESIGN DISCHARGE	50 YRS.
DESIGN HIGH WATER ELEVATION	789.70'
DRAINAGE AREA	43 SQ. MI.
BASE DISCHARGE	7,900 CFS
FREQUENCY OF BASE DISCHARGE	100 YRS.
BASE HIGH WATER ELEVATION	790.49'

OVERTOPPING FLOOD DATA:

OVERTOPPING DISCHARGE	18,000 CFS
FREQUENCY OF OVERTOPPING FLOOD	500+ YRS.
OVERTOPPING FLOOD ELEVATION	794.70'

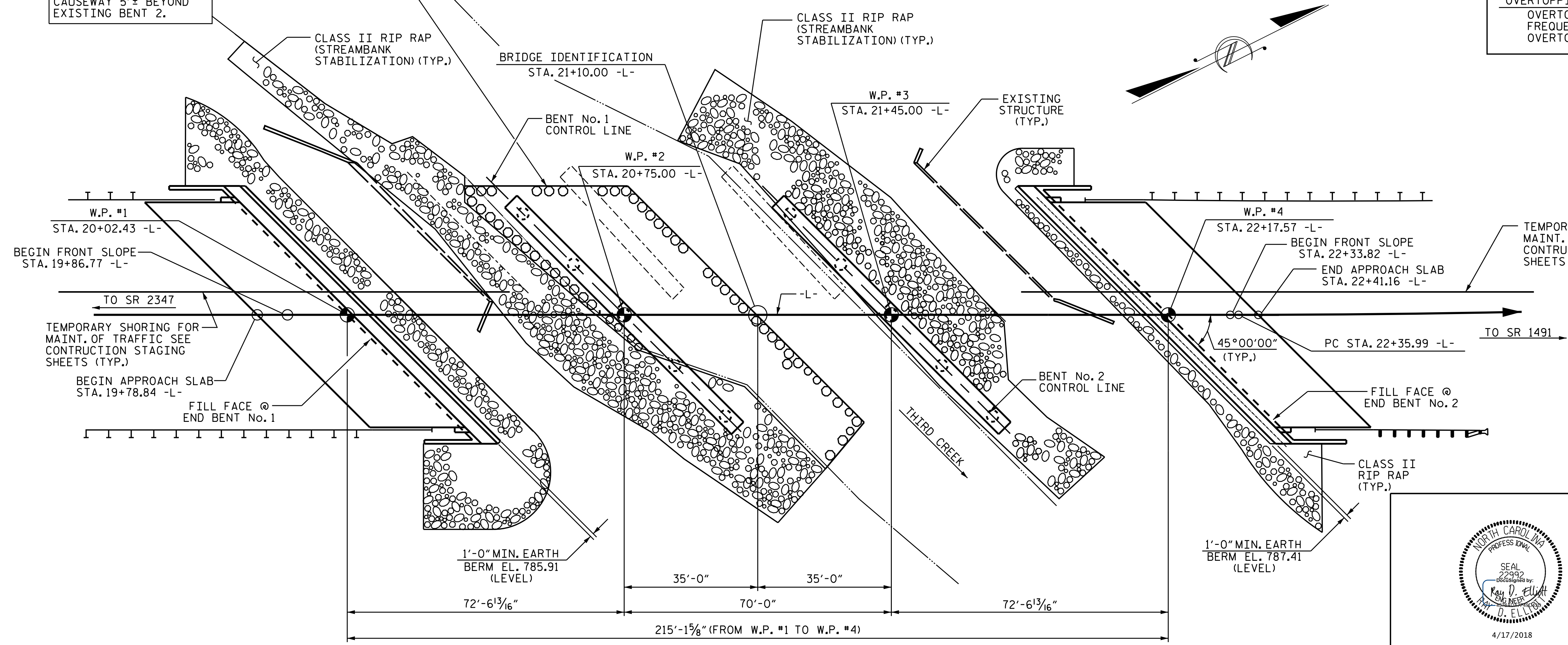


END BENT No. 1 BENT No. 1 BENT No. 2 END BENT No. 2

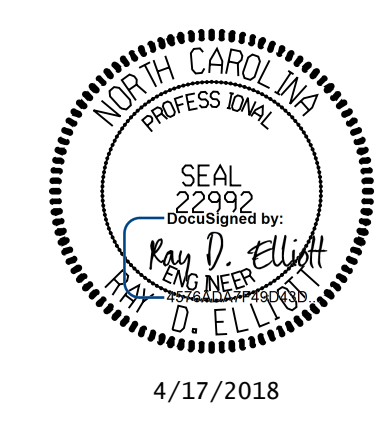
SECTION ALONG -L-

SECTION THRU END BENTS & BENTS ARE AT RIGHT ANGLES

TEMPORARY CAUSEWAY FOR REMOVING EXISTING SUBSTRUCTURE, EXTEND CAUSEWAY 5'± BEYOND EXISTING BENT 2.



PROJECT NO. B-4982
IREDELL COUNTY
STATION: 21+10.00-L-
SHEET 1 OF 4 REPLACES BRIDGE #38



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER THIRD CREEK
ON US 21/NC 115 BETWEEN
SR 2347 & SR 1491

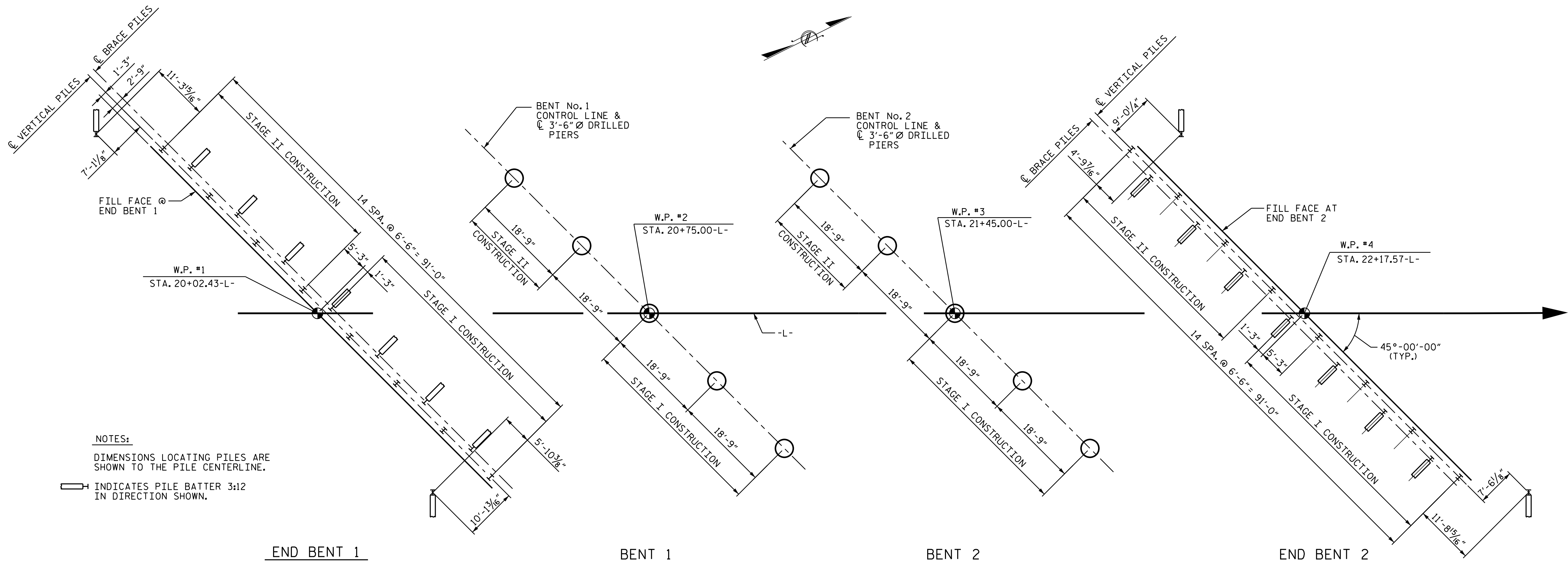
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			69

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

DRAWN BY : RTJ DATE : 2/17
CHECKED BY : RDE DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

PLAN
PILES NOT SHOWN IN PLAN VIEW



NOTES:
 DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.

INDICATES PILE BATTER 3:12 IN DIRECTION SHOWN.

FOUNDATION LAYOUT PLAN

ALL PILES ARE HPI2x53 STEEL PILES.

FOUNDATION NOTES

- 1) FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- 2) PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.
- 3) DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 167 TONS PER PILE.
- 4) FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- 5) DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 415 TONS/PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30 TSF.
- 6) INSTALL DRILLED PIERS AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 746 FT. (*1) 748 FT. (*2), 751 FT. (*3), 754 FT. (*4), 755 FT. (*5), SATISFY THE REQUIRED TIP RESISTANCE AND HAVE A PENETRATION OF AT LEAST 7 FT. INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS..
- 7) PERMANENT STEEL CASINGS WILL BE REQUIRED FOR DRILLED PIERS AT BENT NO. 1. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 765 FT. WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
- 8) THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS 758 FT. (LT) AND 762 FT. (RT). THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- 9) DRILLED PIERS AT BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 415 TONS/PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30 TSF.
- 10) INSTALL DRILLED PIERS AT BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN 752 FT. (*1) 754 FT. (*2), 756 FT. (*3), 760 FT. (*4), 763 FT. (*5), SATISFY THE REQUIRED TIP RESISTANCE AND HAVE A PENETRATION OF AT LEAST 7 FT. INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS..

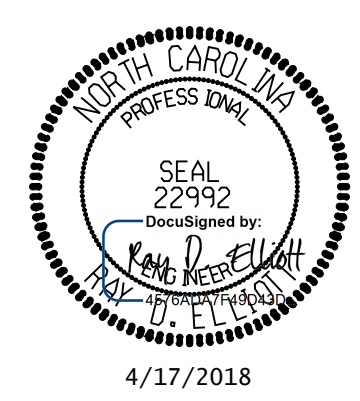
- 11) PERMANENT STEEL CASINGS WILL BE REQUIRED FOR DRILLED PIERS AT BENT NO. 2. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 762 FT. (LT) AND 772 FT. (RT) WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
- 12) THE SCOUR CRITICAL ELEVATION FOR BENT NO. 2 IS 762 FT. (LT) AND 770 FT. (RT). THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- 13) CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- 14) PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.
- 15) DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 167 TONS PER PILE.
- 16) PILE EXCAVATION IS REQUIRED TO INSTALL THE 11 PILES ON THE RIGHT SIDE AT END BENT 2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION NO HIGHER THAN 778.9 FT. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATION.
- 17) CONCRETE IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT NO. 2.

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 2 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING

FOR BRIDGE OVER THIRD CREEK
 ON US 21/NC 115 BETWEEN
 SR 2347 & SR 1491

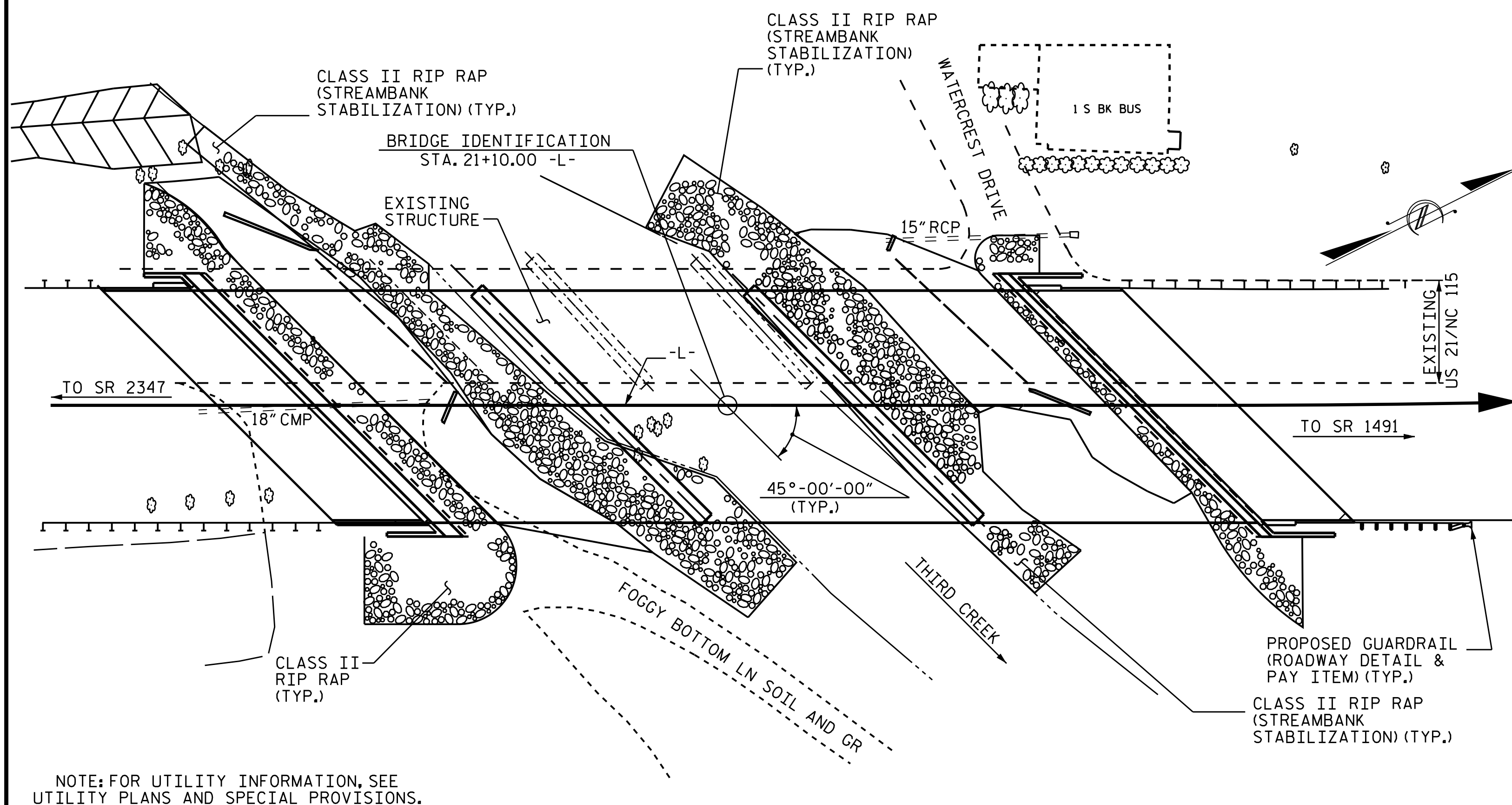
DRAWN BY : RTJ DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

DOCUMENT NOT CONSIDERED FINAL
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TGS ENGINEERS
 804-C N. LAFAYETTE ST
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			69

BENCHMARK #2 : RAILROAD SPIKE SET IN BASE OF 24" OAK TREE ON SOUTHEAST SIDE OF THIRD CREEK, 206.7' RT. OF STA. 22+04.00 -L-, EL. 782.82'



LOCATION SKETCH

TOTAL BILL OF MATERIAL

ITEM	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	3'-6" DIA. DRILLED PIERS IN SOIL	3'-6" DIA. DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-6" DIA. DRILLED PIERS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EA.	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.
SUPERSTRUCTURE											13,068	14,524	
END BENT 1													90.6
BENT 1						83	43	55					95.9
BENT 2						52.5	45	50					95.9
END BENT 2				70	40								89.4
TOTALS	LUMP SUM	LUMP SUM	LUMP SUM	70	40	135.5	88	105	1	LUMP SUM	13,068	14,524	371.8

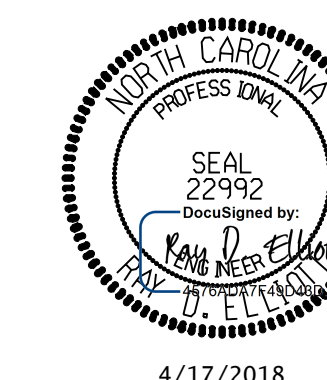
ITEM	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	45" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP12 x 53 STEEL PILES	HP12 x 53 STEEL PILES	TWO BAR METAL RAIL	1'-2" x 3'-3" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	LUMP SUM	LBS.	LBS.	NO. LIN. FT.	EA.	NO. LIN. FT.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE				24 1,660			406.8	441.4				
END BENT 1		11,013			17	17	510		189	210		
BENT 1		23,999	3,818						315	350		
BENT 2		22,486	3,227						293	325		
END BENT 2		11,132			17	17	295		90	100		
TOTALS	LUMP SUM	68,630	7,045	24 1,660	34	34	805	441.4	887	985	LUMP SUM	LUMP SUM

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 3 OF 4



4/17/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER THIRD CREEK
ON US 21/NC 115 BETWEEN
SR 2347 & SR 1491

DRAWN BY : NMW DATE : 2/17
CHECKED BY : RDE DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

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804-C N. LAFAYETTE ST
SHELBY, NC 28150
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			69

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION, SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 21+10.00-L-.

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 21+10.00-L-."

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 40 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.

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.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF THREE SPAN 2 @ 41'-9" & 1 @ 42'-4" WITH REINFORCED CONCRETE DECK SLAB SUPPORTED BY STEEL AND CONCRETE GIRDERS ON CONCRETE BENTS AND CONCRETE VERTICAL ABUTMENTS AND LOCATED 22'-0"± UPSTREAM SHALL BE REMOVED. BRIDGE IS PRESENTLY POSTED FOR LOAD LIMITS OF 30 TO 32 TONS. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE THE LIFE OF THE PROJECT.

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

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

THE SCOUR CRITICAL ELEVATION FOR BENT(S) NO. 1 IS ELEVATION 758 FT. (LT.) AND 762 FT. (RT.). SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

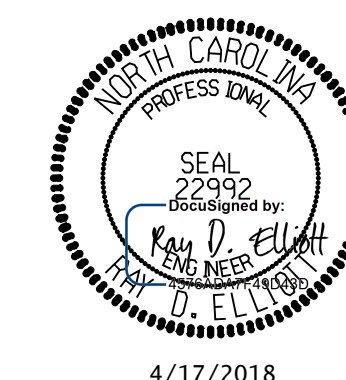
THE SCOUR CRITICAL ELEVATION FOR BENT(S) NO. 2 IS ELEVATION 762 FT. (LT.) AND 770 FT. (RT.). SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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.

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

PROJECT NO. B-4982
IREDELL COUNTY
 STATION: 21+10.00-L-

SHEET 4 OF 4



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 SHELBY, NC 28150
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER THIRD CREEK
 ON US 21/NC 115 BETWEEN
 SR 2347 & SR 1491

DRAWN BY : NMW DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			69

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	1.40	--	1.75	0.69	1.40	A	ER	61.6	1.06	2.15	A	I	40.8	0.80	0.67	1.79	A	I	27.0	1-5	
	HL-93 (OPERATING)	N/A		1.81	--	1.35	0.69	1.81	A	ER	61.6	1.06	2.71	A	I	40.8	N/A	--	--	--	--	--	1-5	
	HS-20 (INVENTORY)	36.000	②	2.36	84.9	1.75	0.69	2.56	A	ER	61.6	1.06	2.44	A	I	40.8	0.80	0.67	2.36	A	I	27.0	1-5	
	HS-20 (OPERATING)	36.000		3.09	111.2	1.35	0.69	3.32	A	ER	61.6	1.06	3.09	A	I	40.8	N/A	--	--	--	--	--	1-5	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.28	71.2	1.40	0.69	8.09	A	ER	61.6	1.06	6.02	A	I	40.8	0.80	0.67	5.28	A	I	27.0	1-5
		SNGARBS2	20.000		3.91	78.2	1.40	0.69	5.53	A	ER	61.6	1.06	4.59	A	I	40.8	0.80	0.67	3.91	A	I	27.0	1-5
		SNAGRIS2	22.000		3.69	81.1	1.40	0.69	5.04	A	ER	61.6	1.06	4.35	A	I	40.8	0.80	0.67	3.69	A	I	27.0	1-5
		SNCOTTS3	27.250		2.59	70.5	1.40	0.69	3.92	A	ER	61.6	1.06	3.24	A	I	40.8	0.80	0.67	2.59	A	I	27.0	1-5
		SNAGGRS4	34.925		2.17	75.7	1.40	0.69	3.13	A	ER	61.6	1.06	2.82	A	I	40.8	0.80	0.67	2.17	A	I	27.0	1-5
		SNS5A	35.550		2.13	75.7	1.40	0.69	3.09	A	ER	61.6	1.06	2.91	A	I	40.8	0.80	0.67	2.13	A	I	27.0	1-5
		SNS6A	39.950		1.98	79.1	1.40	0.69	2.79	A	ER	61.6	1.06	2.72	A	I	40.8	0.80	0.67	1.98	A	I	27.0	1-5
		SNS7B	42.000		1.88	78.9	1.40	0.69	2.66	A	ER	61.6	1.06	2.73	A	I	40.8	0.80	0.67	1.88	A	I	27.0	1-5
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.41	79.5	1.40	0.69	3.38	A	ER	61.6	1.06	3.20	A	I	40.8	0.80	0.67	2.41	A	I	27.0	1-5
		TNT4A	33.075		2.43	80.3	1.40	0.69	3.39	A	ER	61.6	1.06	3.06	A	I	40.8	0.80	0.67	2.43	A	I	33.9	1-5
		TNT6A	41.600		1.97	81.9	1.40	0.69	2.76	A	ER	61.6	1.06	2.95	A	I	40.8	0.80	0.67	1.97	A	I	27.0	1-5
		TNT7A	42.000		1.99	83.5	1.40	0.69	2.74	A	ER	61.6	1.06	2.80	A	I	40.8	0.80	0.67	1.99	A	I	27.0	1-5
		TNT7B	42.000		2.04	85.6	1.40	0.69	2.78	A	ER	61.6	1.06	2.62	A	I	40.8	0.80	0.67	2.04	A	I	27.0	1-5
		TNAGRIT4	43.000		1.96	84.2	1.40	0.69	2.64	A	ER	61.6	1.06	2.57	A	I	40.8	0.80	0.67	1.96	A	I	27.0	1-5
		TNAGT5A	45.000		1.85	83.2	1.40	0.69	2.54	A	ER	61.6	1.06	2.63	A	I	40.8	0.80	0.67	1.85	A	I	27.0	1-5
TNAGT5B	45.000	③	1.82	81.9	1.40	0.69	2.49	A	ER	61.6	1.06	2.47	A	I	40.8	0.80	0.67	1.82	A	I	27.0	1-5		

NOTES:

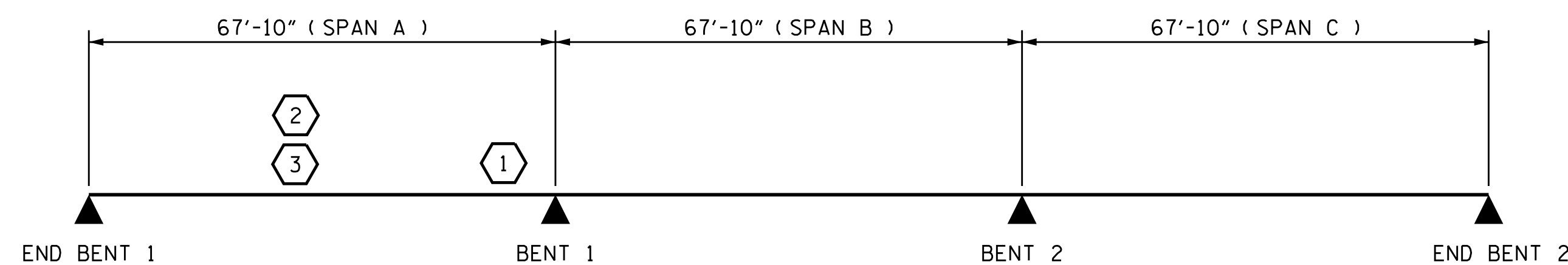
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:

- GIRDER DESIGNED WITH CONSPAN USING MULTI-SPAN CONTINUOUS OPTION.
- DESIGN PRODUCES POSITIVE AND NEGATIVE MOMENTS FOR LIVE LOAD AND COMPOSITE DEAD LOADS.
- STRENGTH I MOMENT CONTROLLED BY GIRDER #8 IN SPAN A FOR FINAL TYPICAL SECTION WITHOUT SIDEWALK.
- STRENGTH I SHEAR CONTROLLED BY GIRDER #7 IN SPAN A FOR FINAL TYPICAL SECTION WITH SIDEWALK.
- SERVICE III TENSION CONTROLLED BY GIRDER #7 IN SPAN A FOR FINAL TYPICAL SECTION WITH SIDEWALK.

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

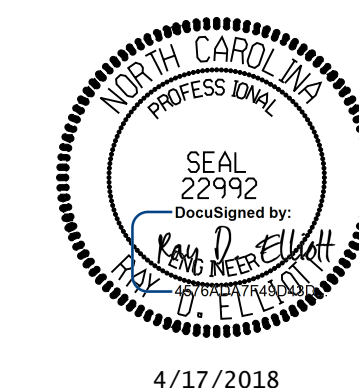


LRFR SUMMARY

(SPAN LENGTHS SHOWN @ C BEARING TO C BEARING)

PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00-L-

ASSEMBLED BY : NMW DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17
 DRAWN BY : MAA 1/08 REV. 11/2/08RR MAA/GM
 CHECKED BY : GM/DI 2/08 REV. 10/1/11 MAA/GM

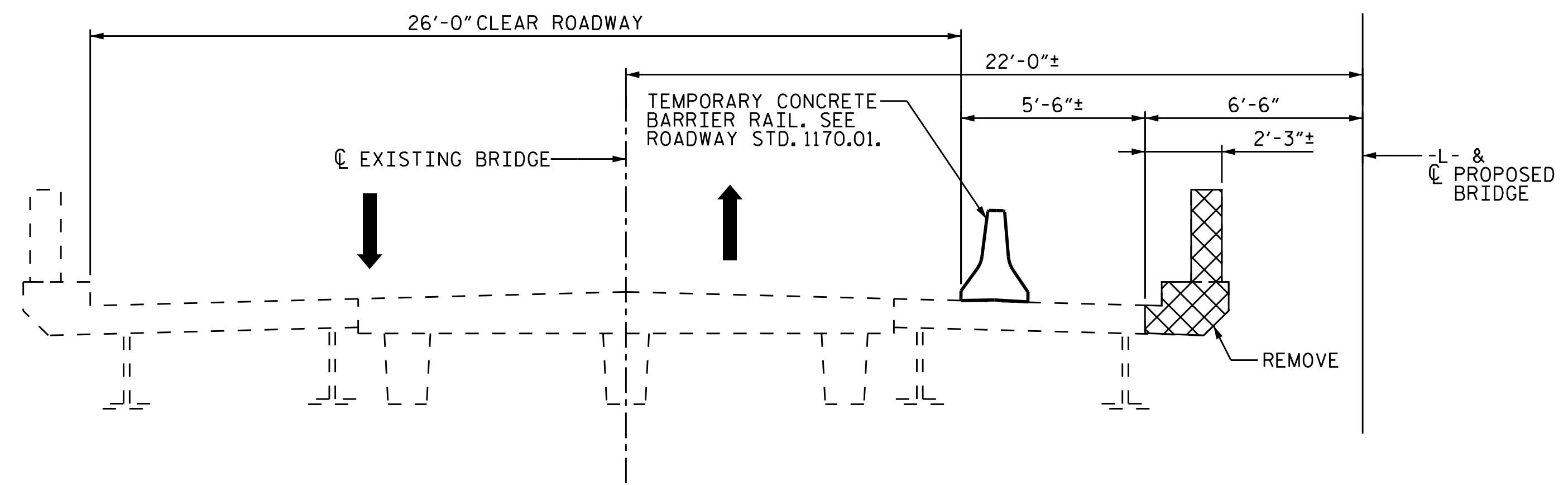


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
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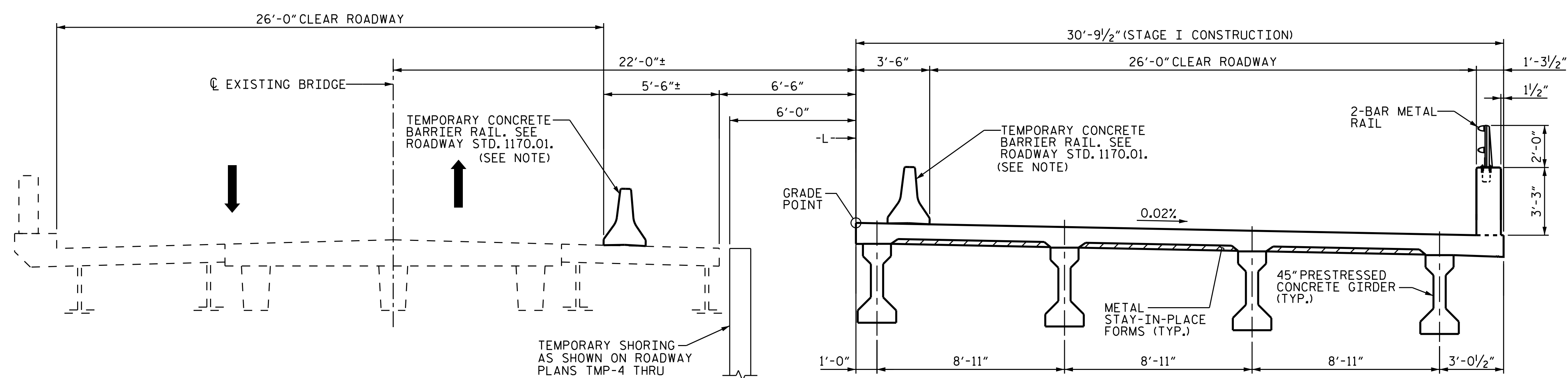
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE GIRDERS
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-5
1			3			TOTAL SHEETS
2			4			69

NOTE:
 CONTRACTOR SHALL DEVISE A PLAN FOR ATTACHING THE TEMPORARY BARRIER RAIL TO THE EXISTING BRIDGE AND PROPOSED BRIDGE DECK.
 SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE ANCHORED PORTABLE CONCRETE BARRIER.



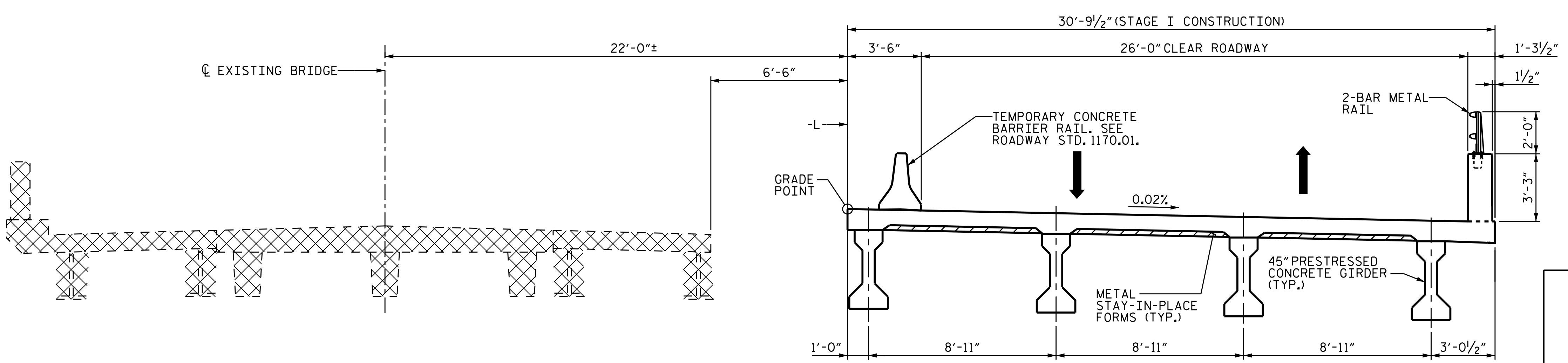
EXISTING BRIDGE - PART REMOVAL



EXISTING BRIDGE

STAGE I CONSTRUCTION

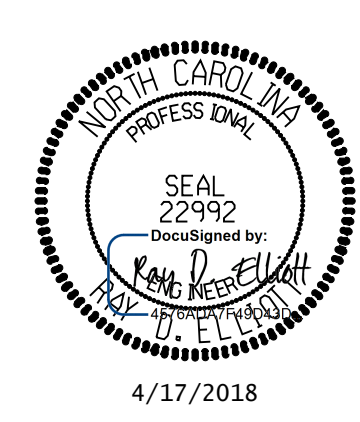
TEMPORARY SHORING AS SHOWN ON ROADWAY PLANS TMP-4 THRU TMP-4B TO RETAIN EXISTING BRIDGE FILL AND EXISTING ABUTMENT AND TEMP. ROAD FILL AS NECESSARY



EXISTING BRIDGE DEMOLITION

STAGE I TRAFFIC SHIFT

PROJECT NO. B-4982
IREDELL COUNTY
 STATION: 21+10.00-L-
 SHEET 1 OF 2



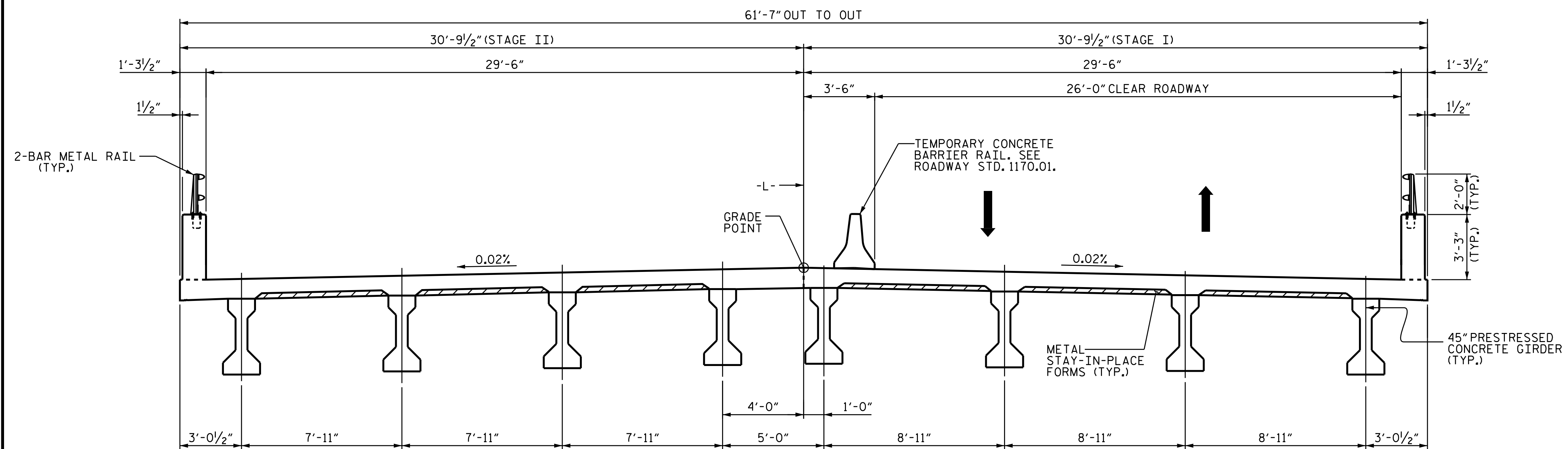
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
CONSTRUCTION SEQUENCE
 FOR
 BRIDGE OVER THIRD CREEK
 ON US 21/NC 115 BETWEEN
 SR 2347 & SR 1491

DRAWN BY : RTJ DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

DOCUMENT NOT CONSIDERED FINAL
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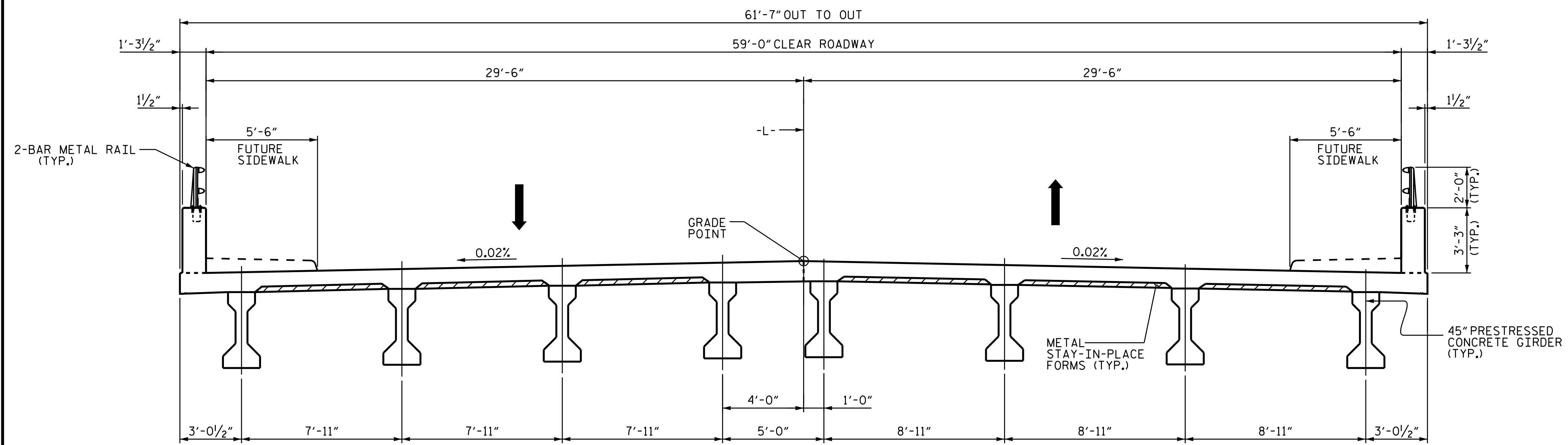
TGS ENGINEERS
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 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			69



STAGE II CONSTRUCTION

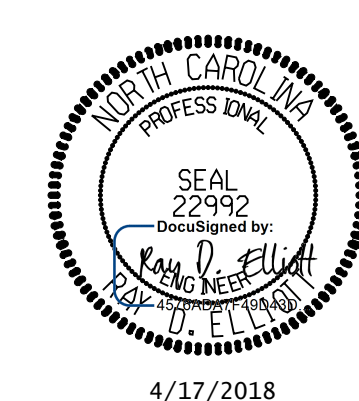
STAGE I TRAFFIC



FINAL TYPICAL SECTION

PROJECT NO. B-4982
IREDELL COUNTY
 STATION: 21+10.00-L-

SHEET 2 OF 2



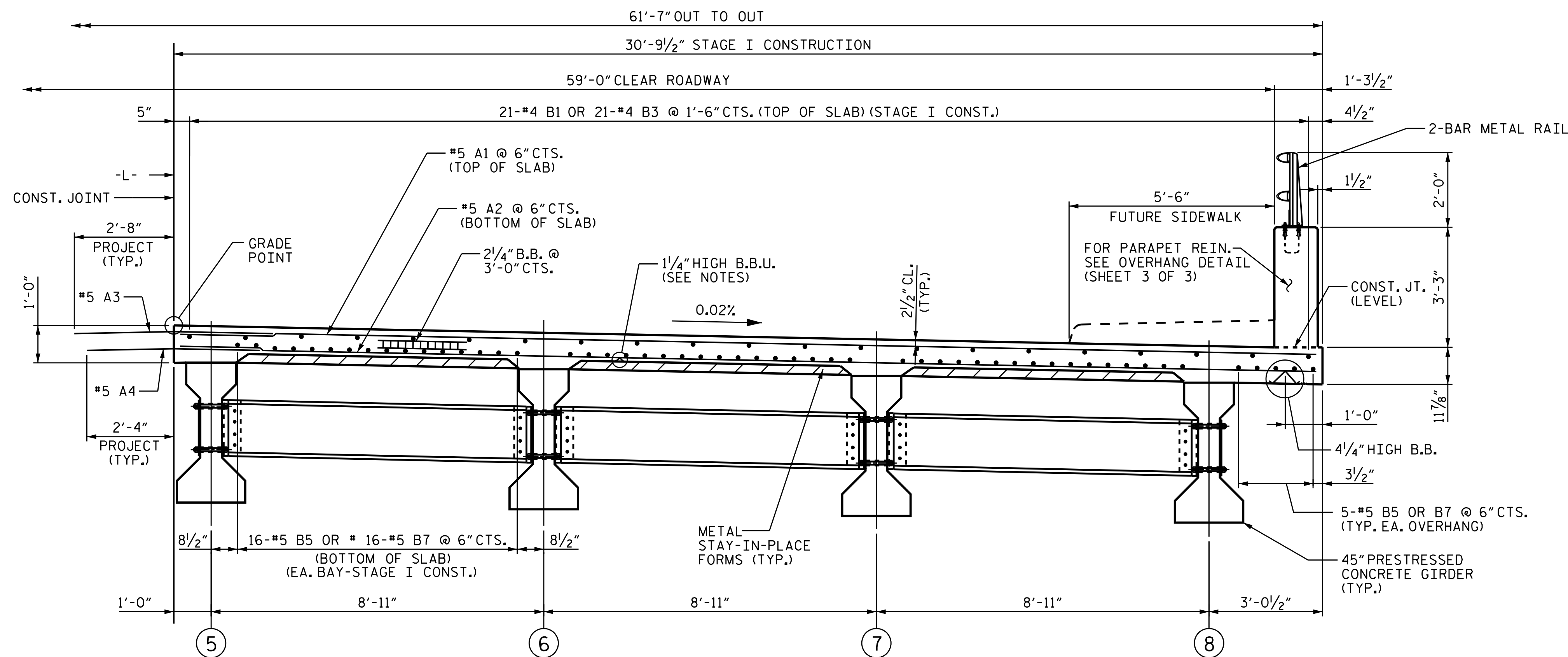
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
CONSTRUCTION SEQUENCE
 FOR
 BRIDGE OVER THIRD CREEK
 ON US 21/NC 115 BETWEEN
 SR 2347 & SR 1491

DRAWN BY : RTJ DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

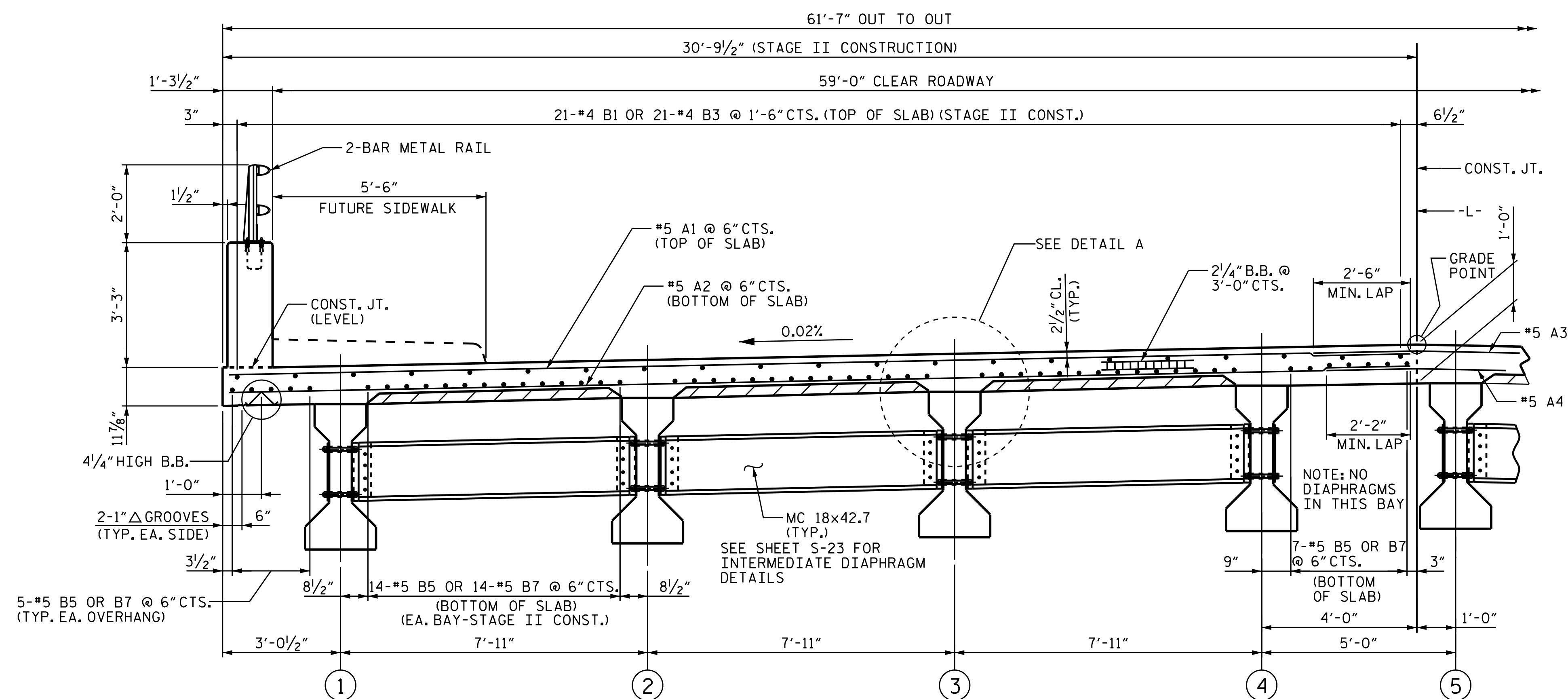
DOCUMENT NOT CONSIDERED FINAL
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 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			69



TYPICAL SECTION AT INTERMEDIATE DIAPHRAGMS
STAGE I CONSTRUCTION



TYPICAL SECTION AT INTERMEDIATE DIAPHRAGMS
STAGE II CONSTRUCTION

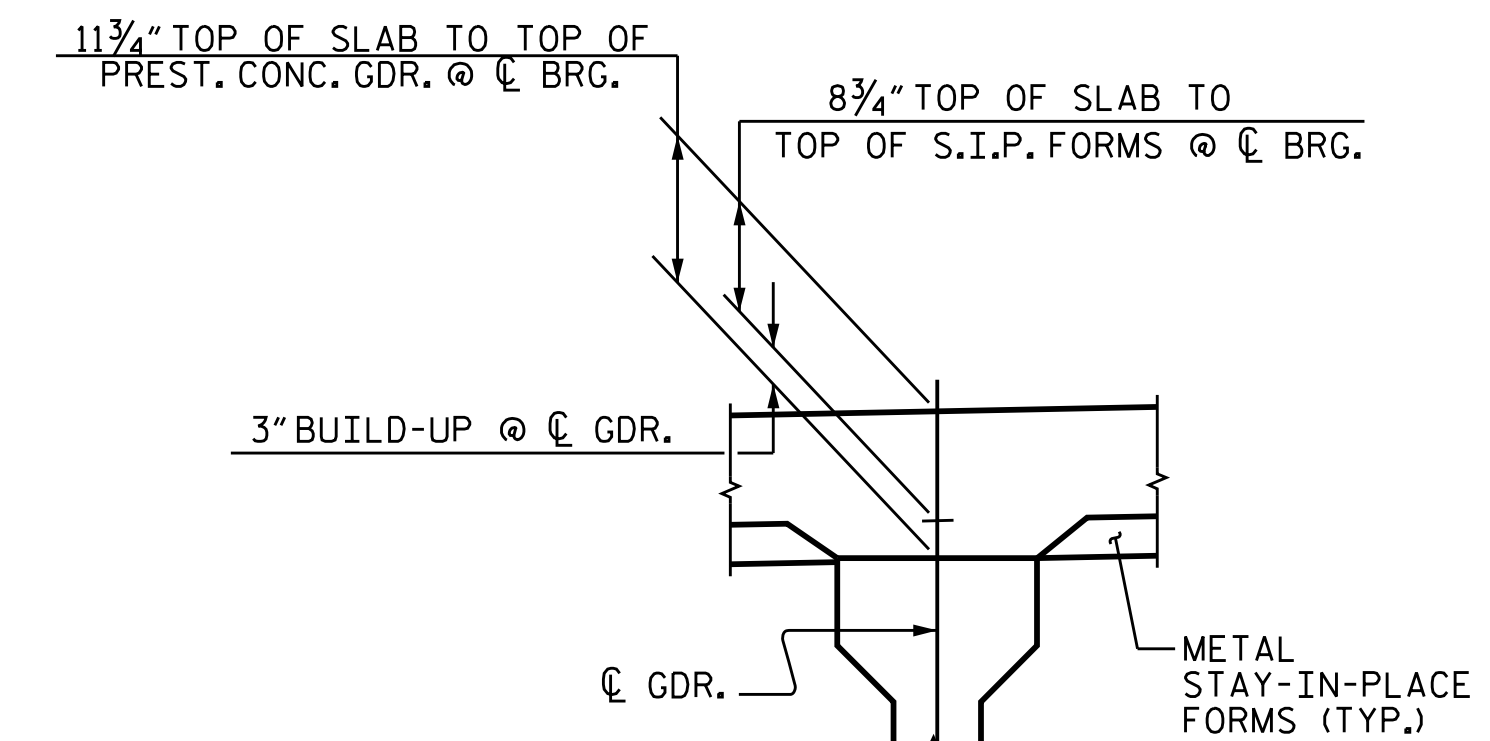
NOTES:

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

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

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

PARAPET IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A COMPRESSIVE STRENGTH OF 3000 PSI.



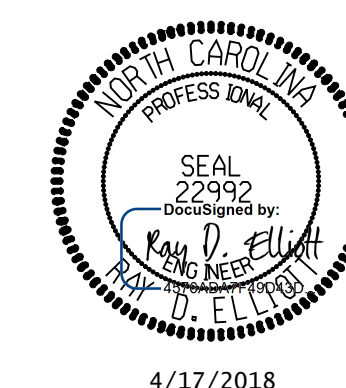
DETAIL "A"

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 1 OF 3

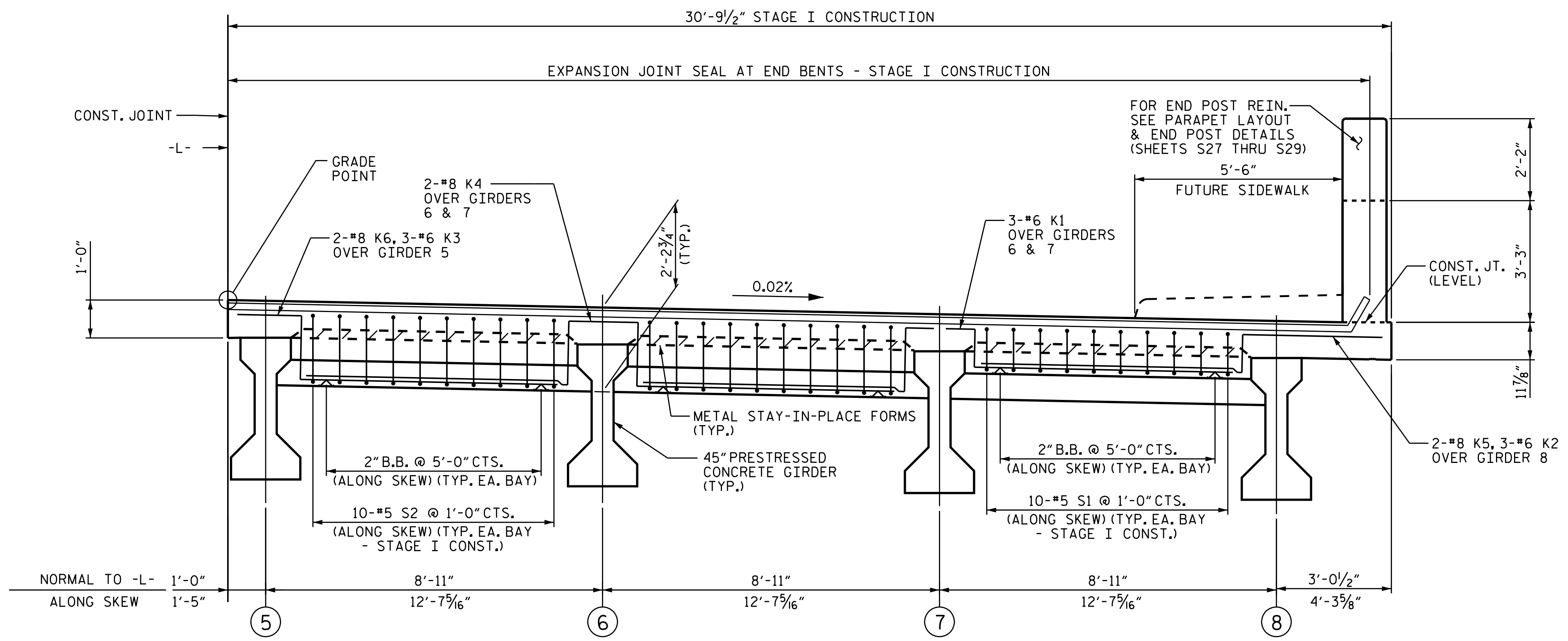


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
TYPICAL SECTIONS

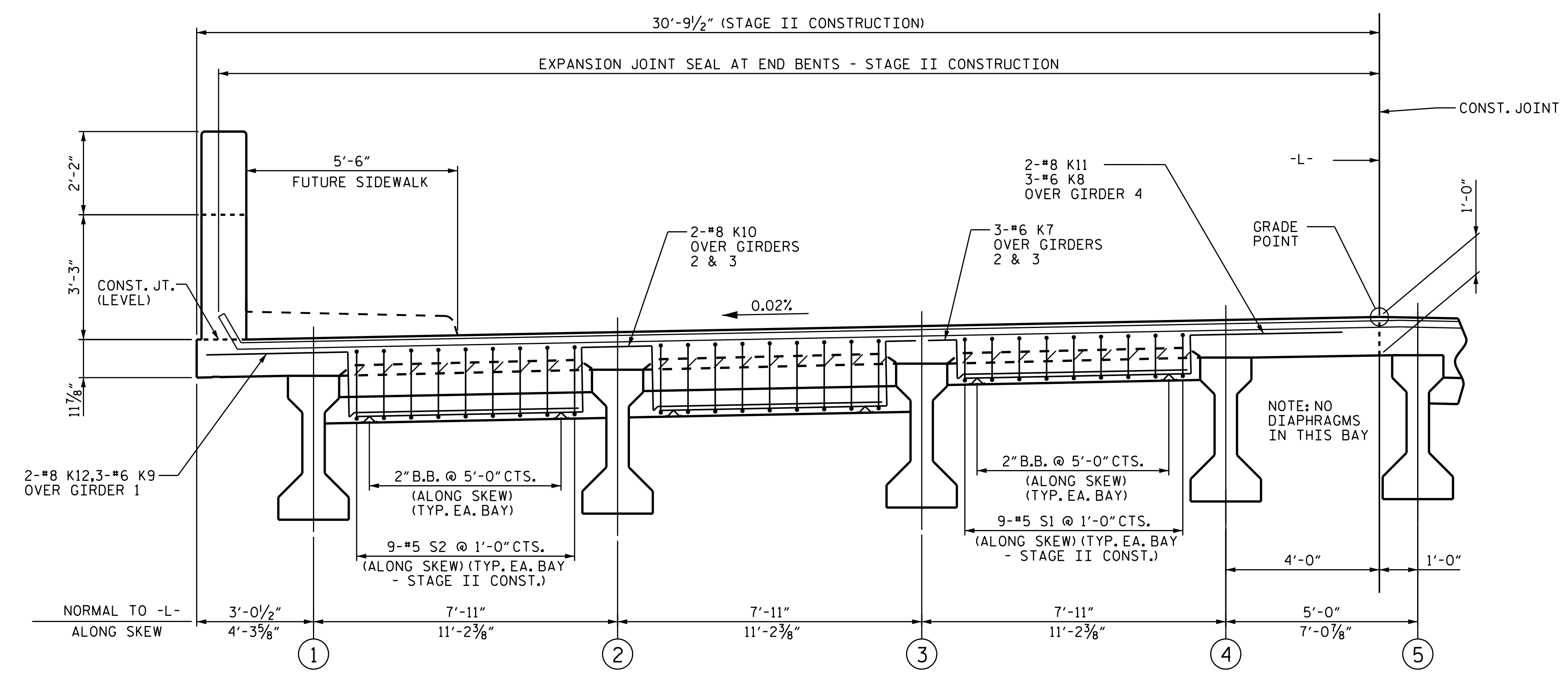
DRAWN BY : RTJ DATE : 2/17
CHECKED BY : RDE DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

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NO.	BY	DATE	NO.	BY	DATE				
1			3			S-8			
2			4			TOTAL SHEETS 69			

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TYPICAL SECTION AT END BENT DIAPHRAGMS - SPANS A & C
STAGE I CONSTRUCTION



TYPICAL SECTION AT END BENT DIAPHRAGMS - SPANS A & C
STAGE II CONSTRUCTION

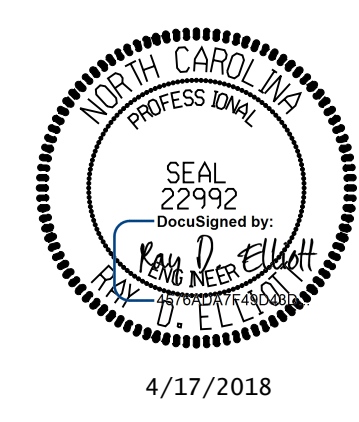
PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00-L-
 SHEET 2 OF 3

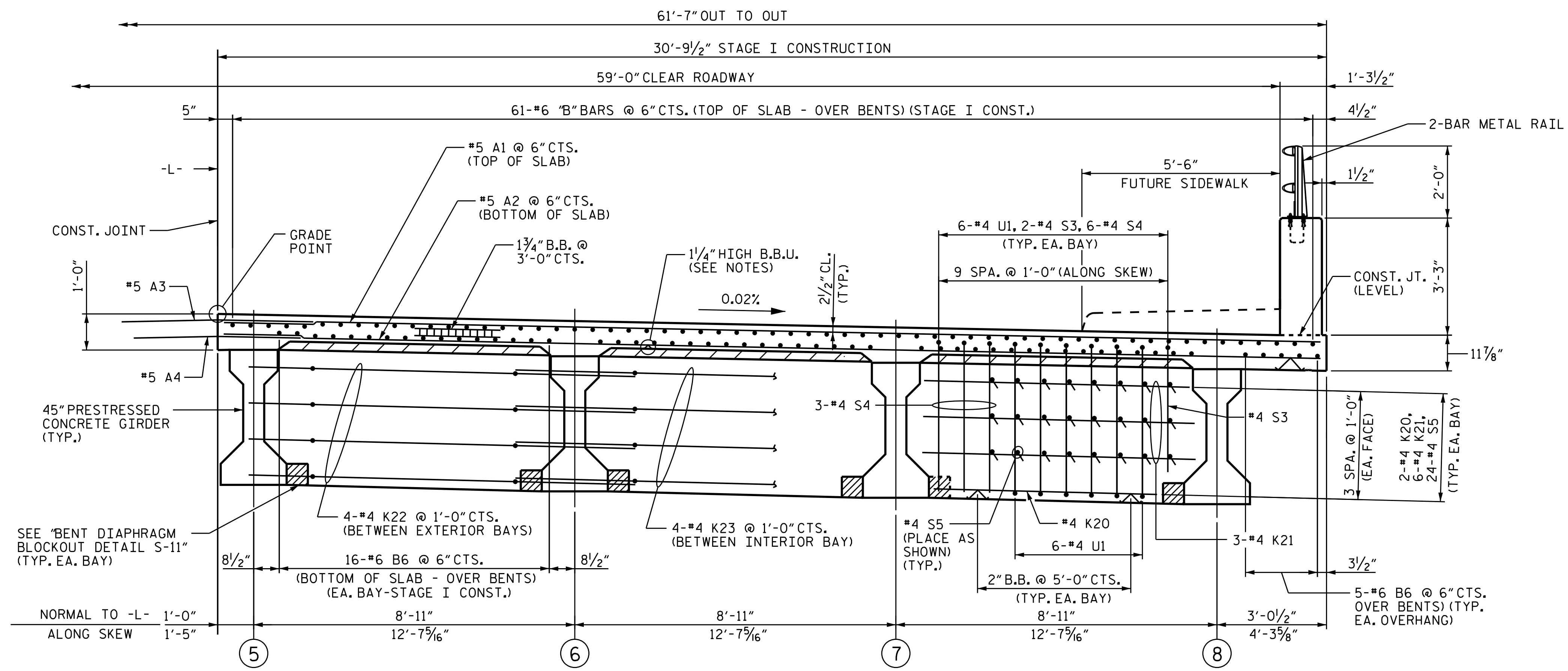
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
SUPERSTRUCTURE TYPICAL SECTIONS						S-9
REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	69
1			3			
2			4			

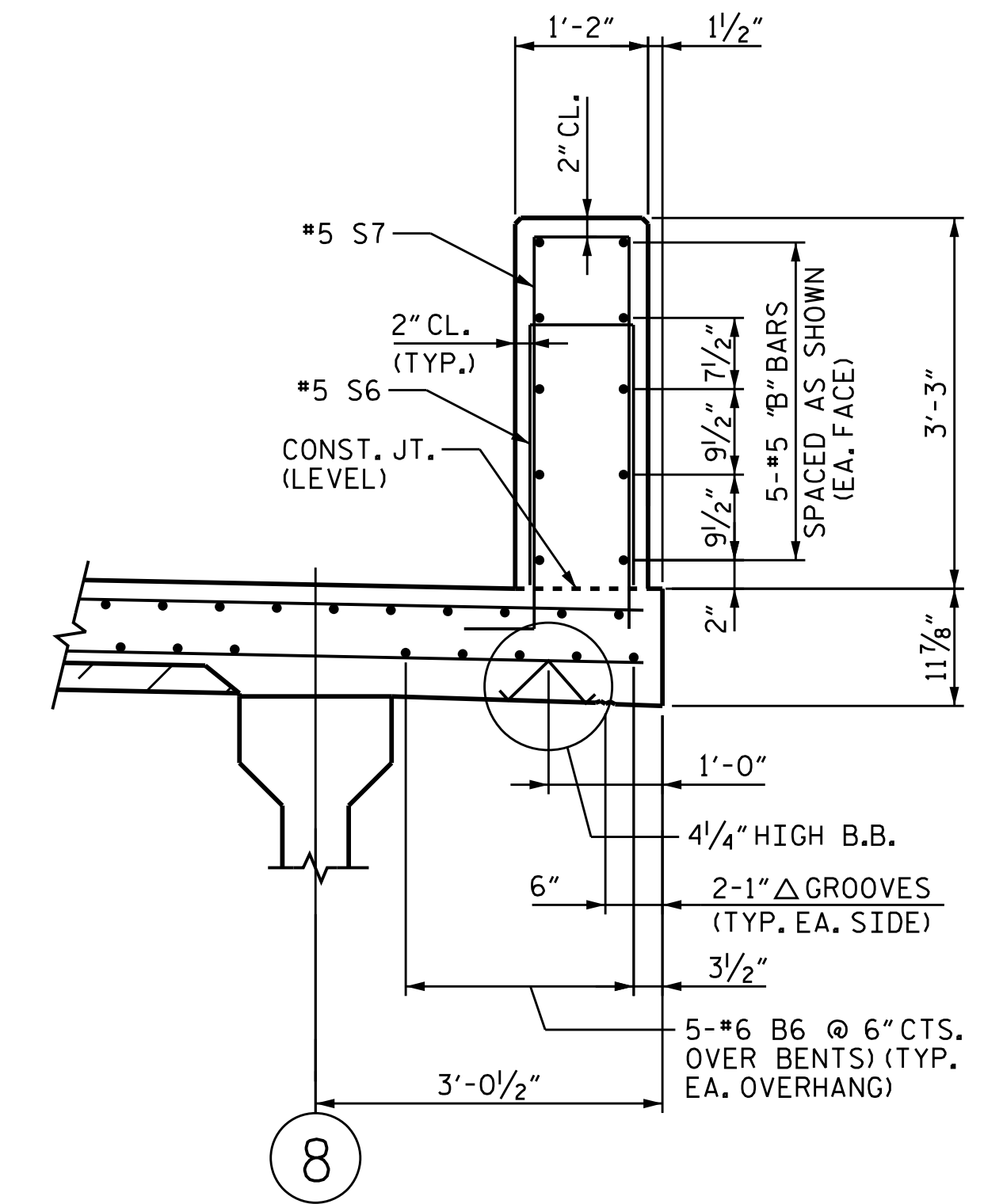
DRAWN BY : RTJ DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17



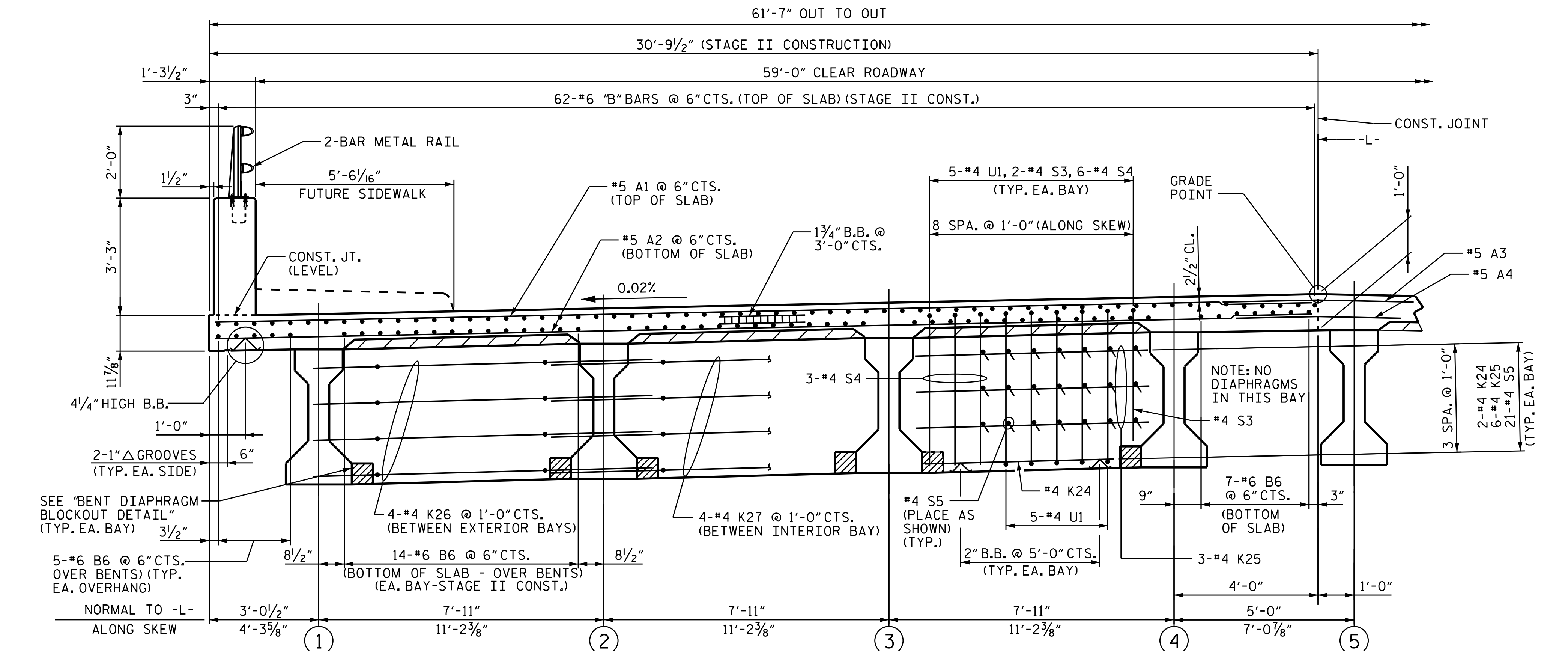


TYPICAL SECTION AT CONTINUOUS BENT DIAPHRAGMS
STAGE I CONSTRUCTION

(FOR "B" BAR PLACEMENT,
SEE "PLAN OF SPANS" SHEETS.)

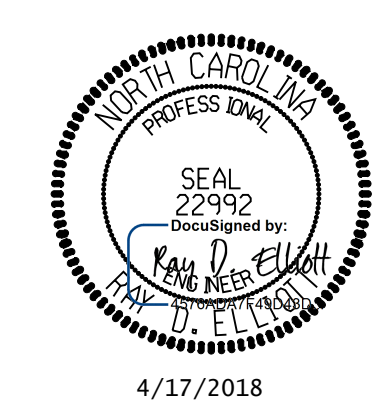


OVERHANG DETAIL



TYPICAL SECTION AT CONTINUOUS BENT DIAPHRAGMS
STAGE II CONSTRUCTION

PROJECT NO. B-4982
IREDELL COUNTY
STATION: 21+10.00-L-
SHEET 3 OF 3

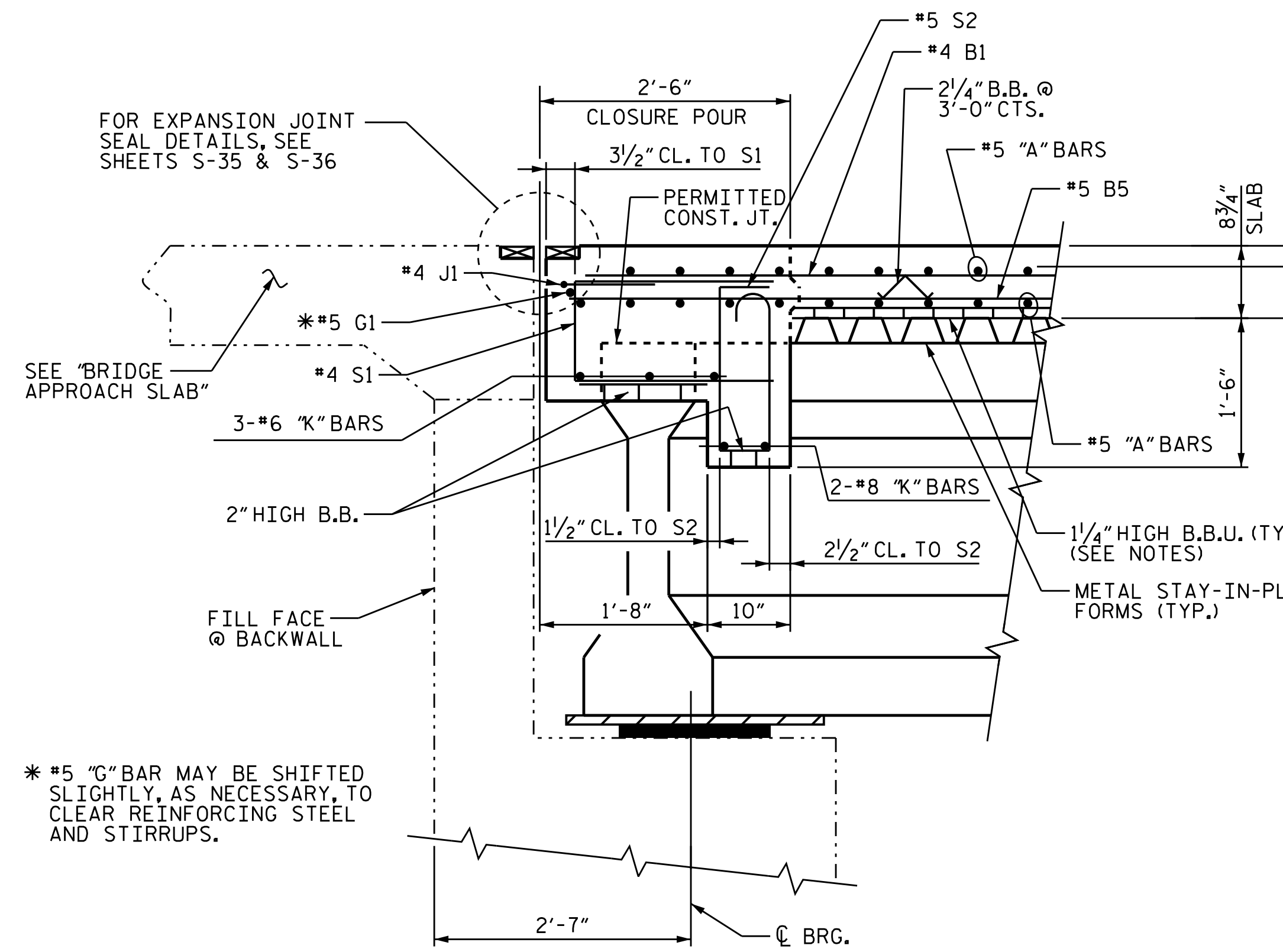


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
TYPICAL SECTIONS

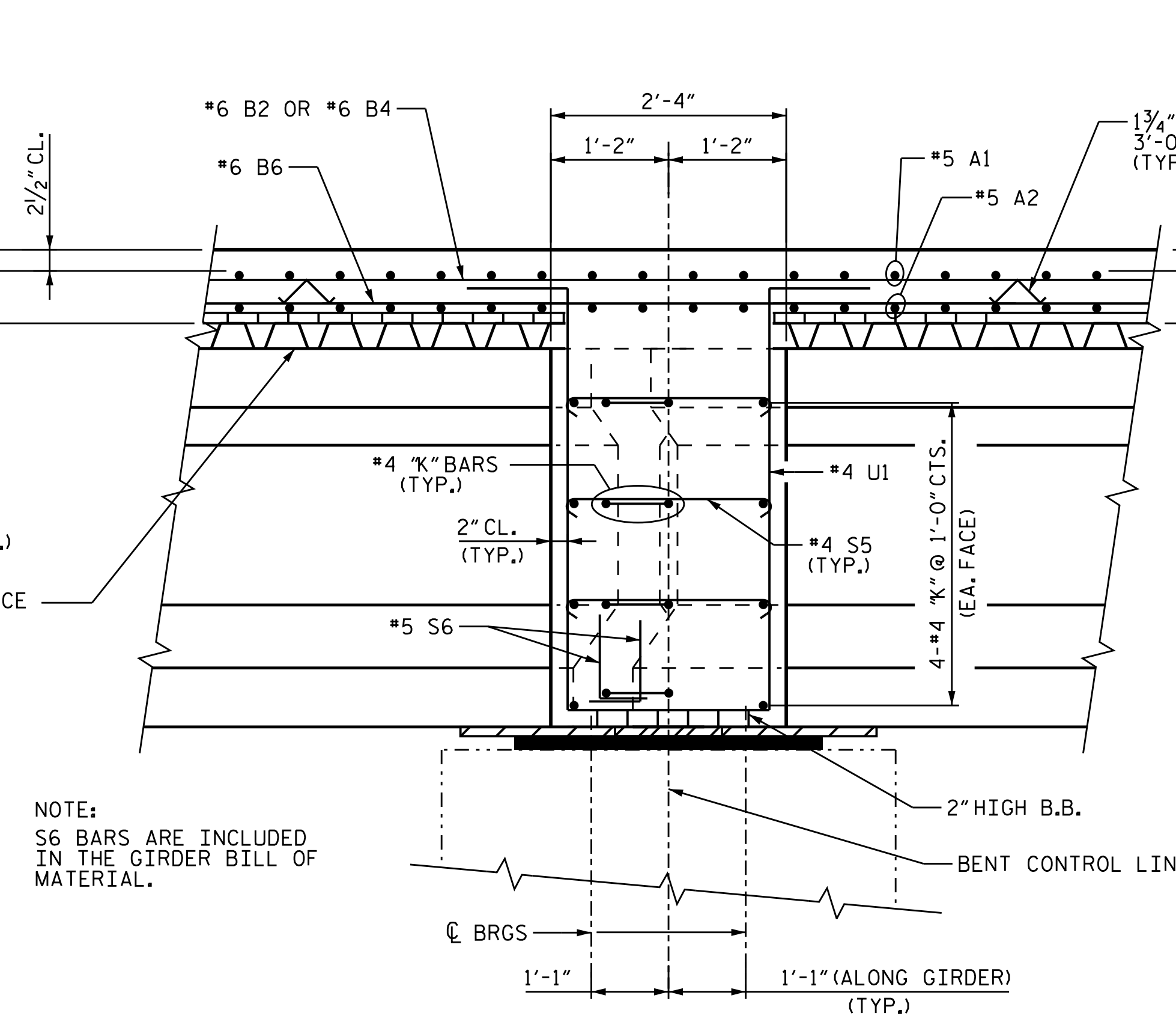
DRAWN BY : RTJ DATE : 2/17
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DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						REVISIONS			SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:				
1			3			S-10			
2			4			TOTAL SHEETS 69			

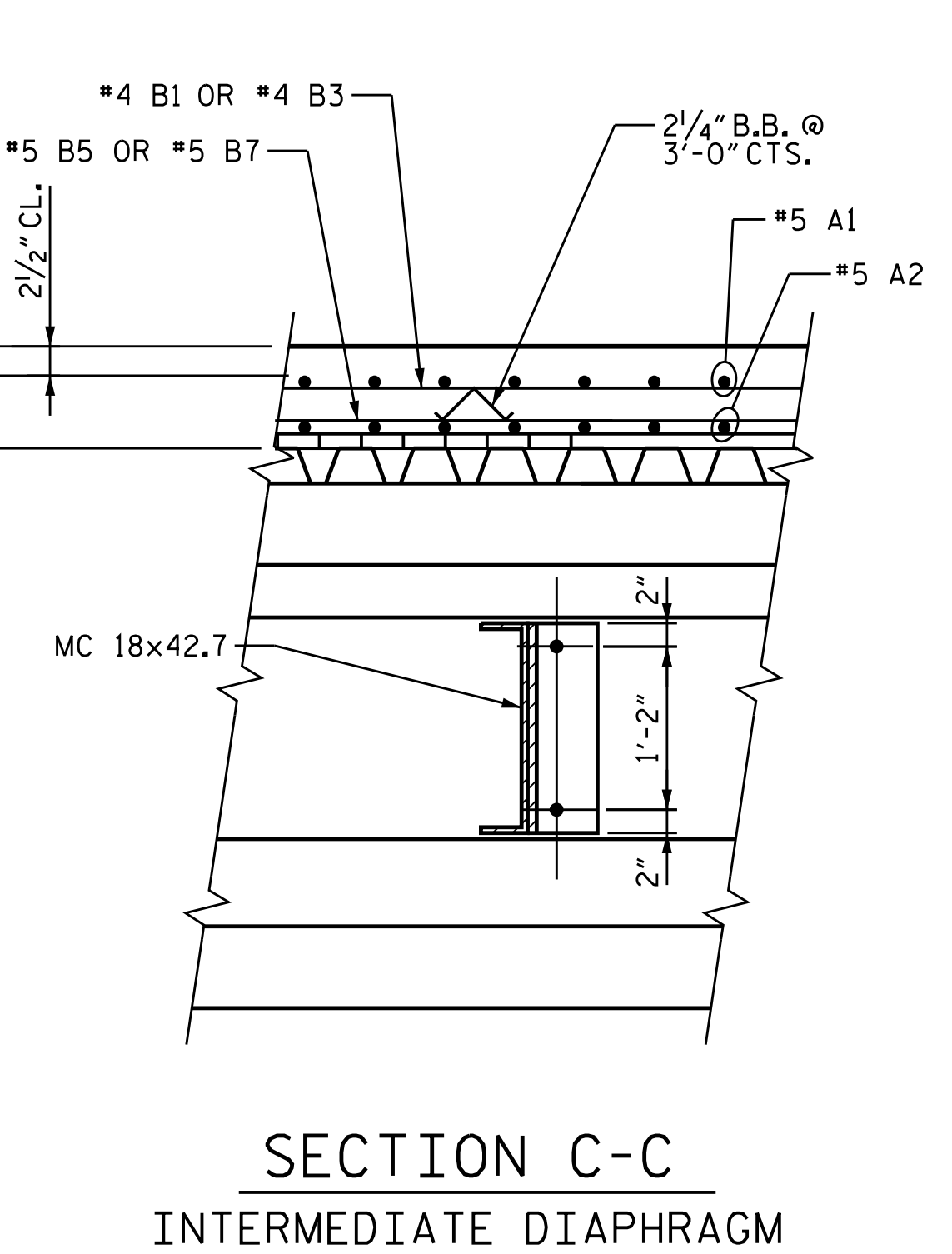
TGS ENGINEERS
804-C N. LAFAYETTE ST
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CORP. LICENSE NO.: C-0275



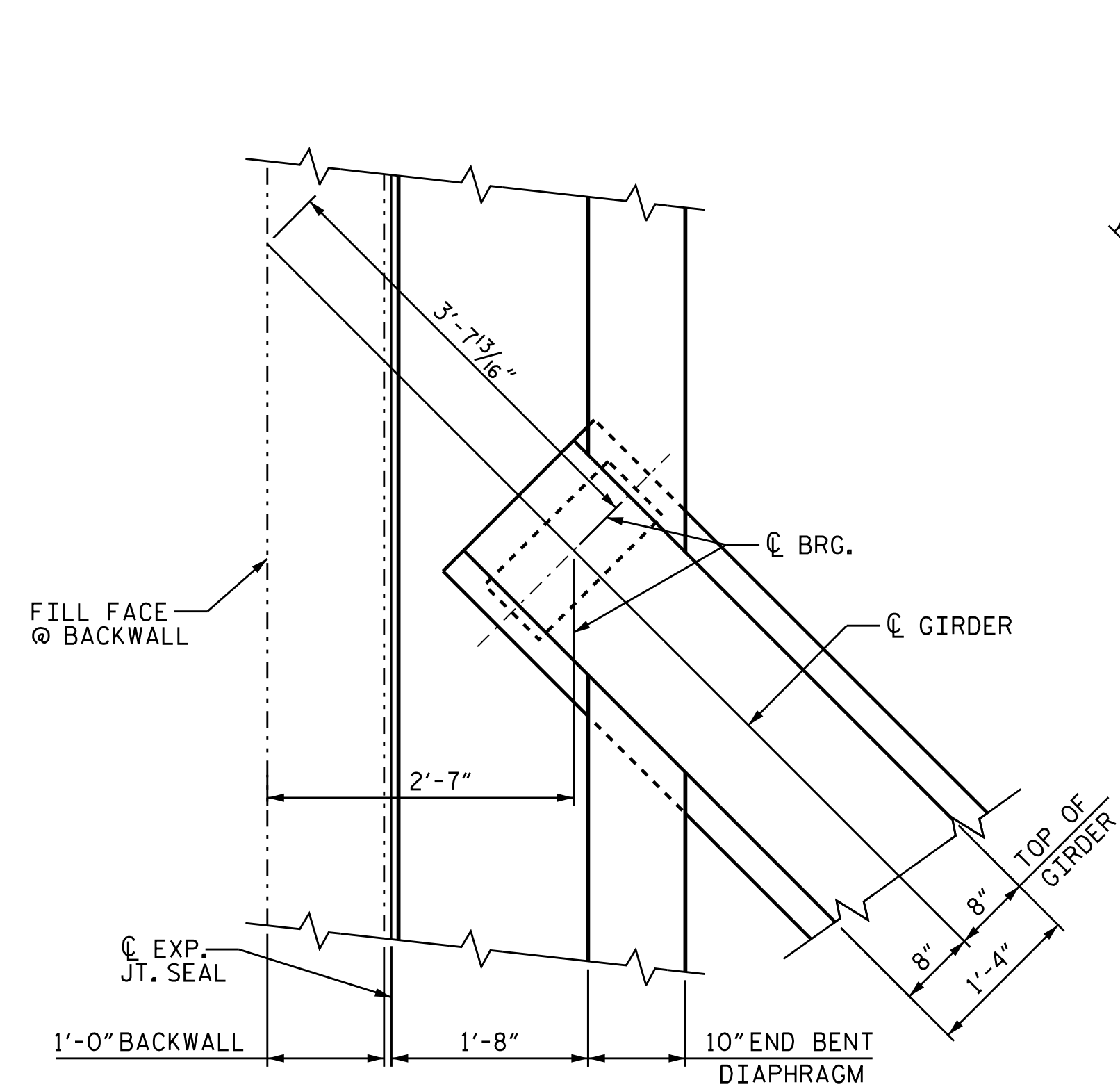
SECTION A-A
END BENT DIAPHRAGM



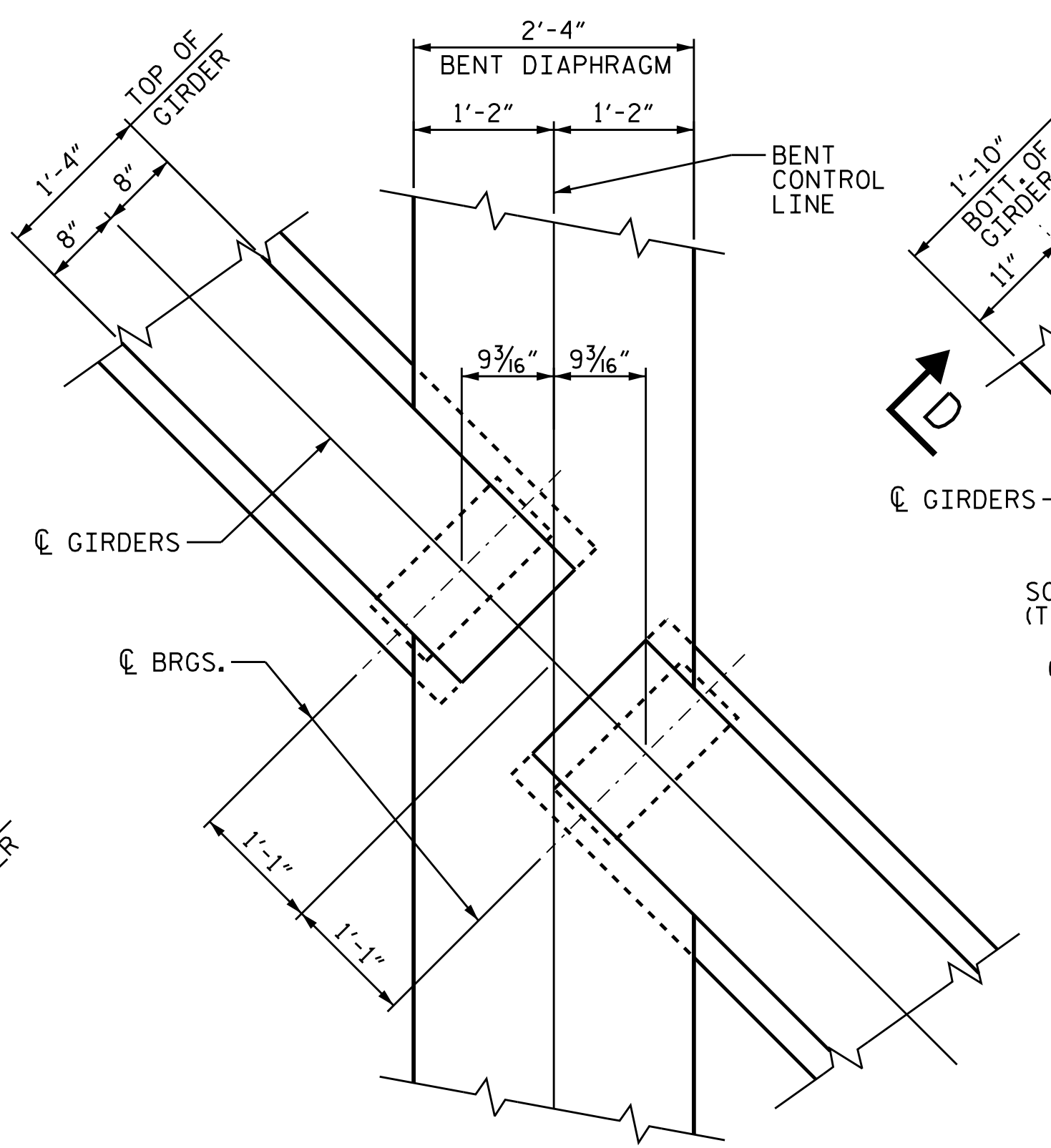
SECTION B-B
BENT DIAPHRAGM



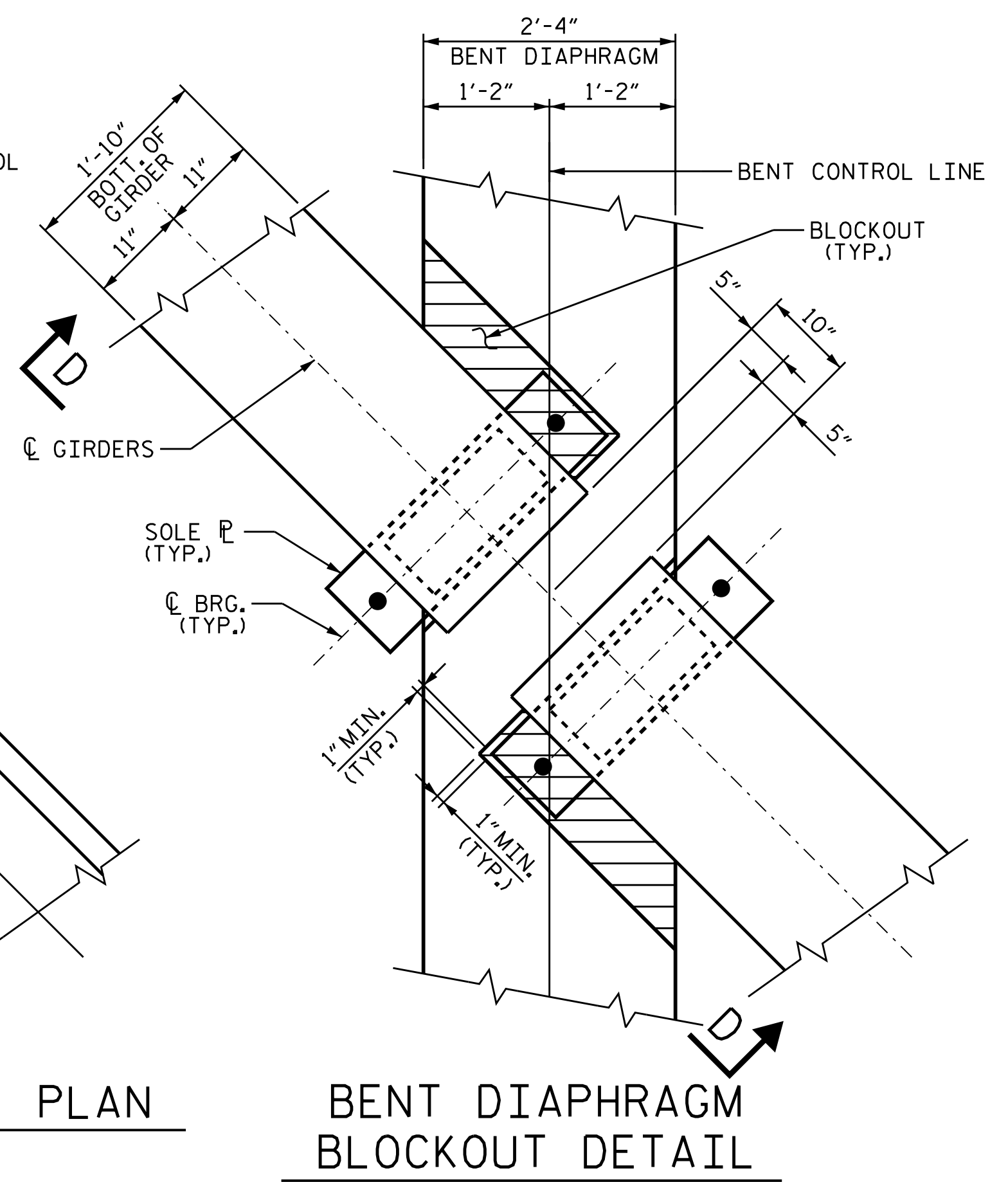
SECTION C-C
INTERMEDIATE DIAPHRAGM



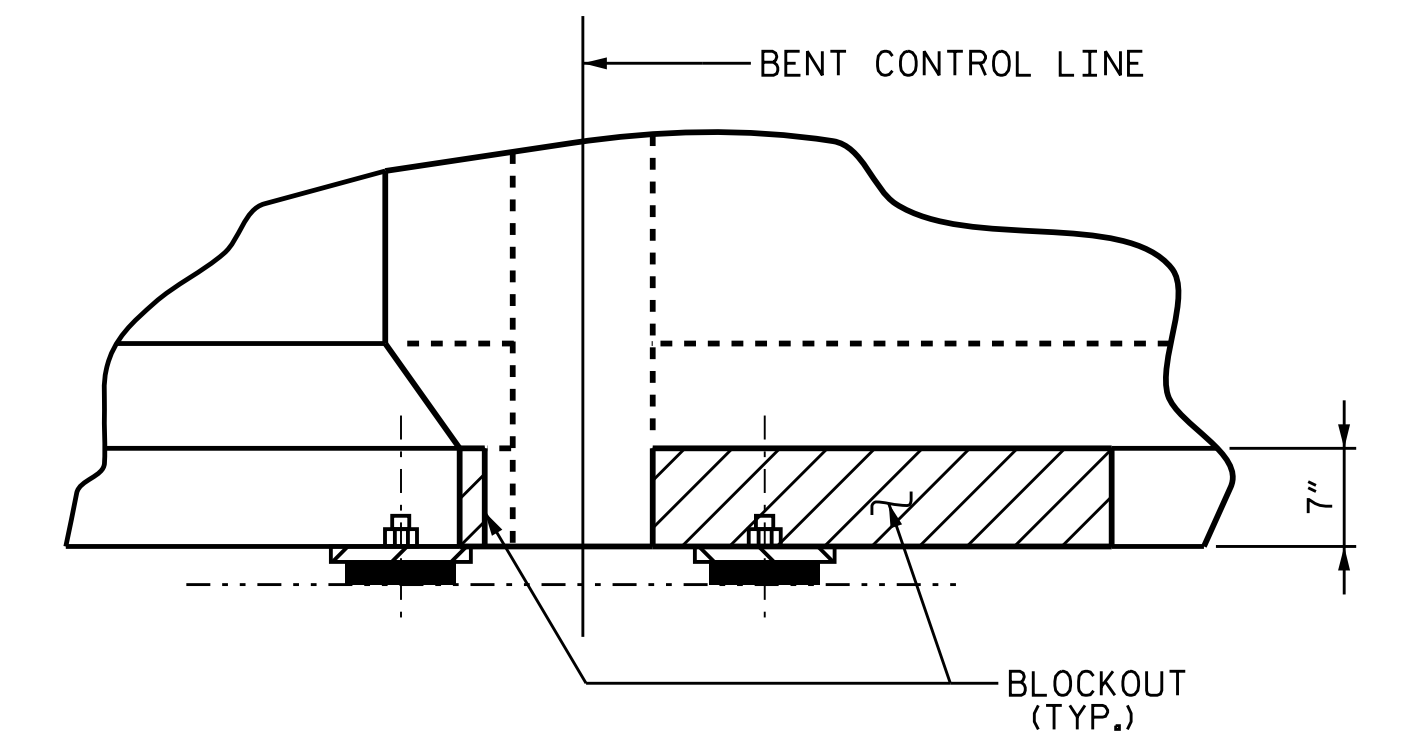
END BENT DIAPHRAGM PLAN



CONTINUOUS BENT DIAPHRAGM PLAN

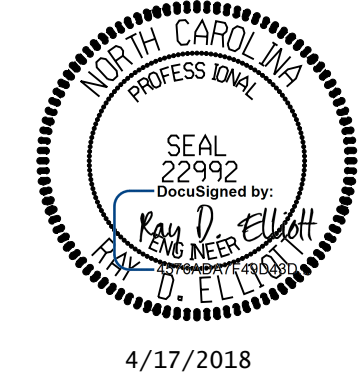


BENT DIAPHRAGM
BLOCKOUT DETAIL



SECTION D-D

PROJECT NO. B-4982
IREDELL COUNTY
STATION: 21+10.00-L-



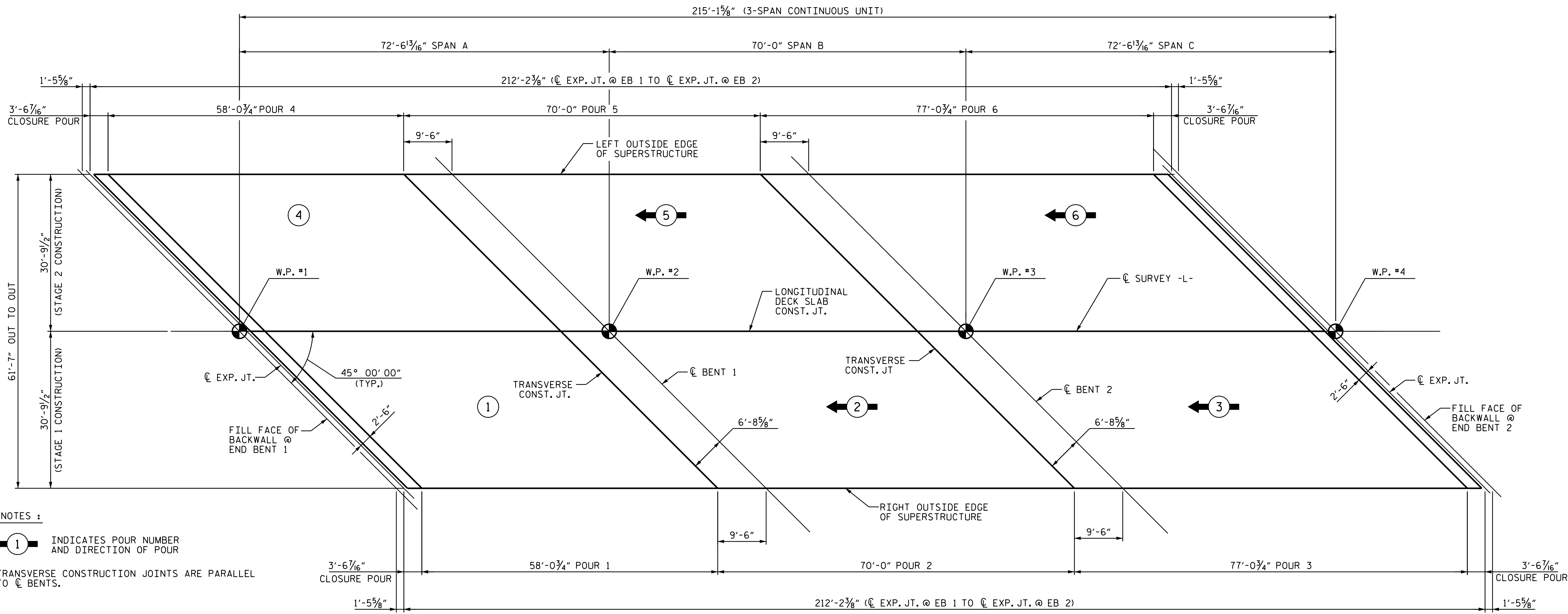
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
DETAILS

DRAWN BY: RTJ DATE: 2/17
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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-11
1			3			TOTAL SHEETS
2			4			69

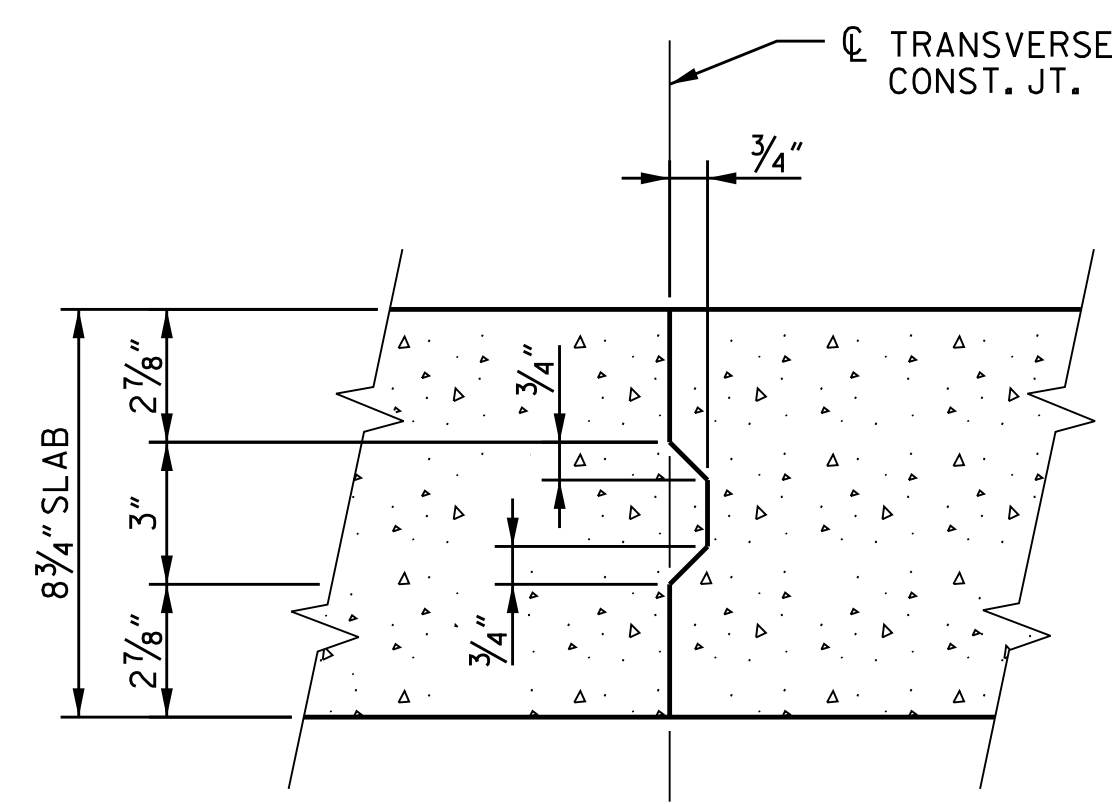


NOTES :

① INDICATES POUR NUMBER AND DIRECTION OF POUR

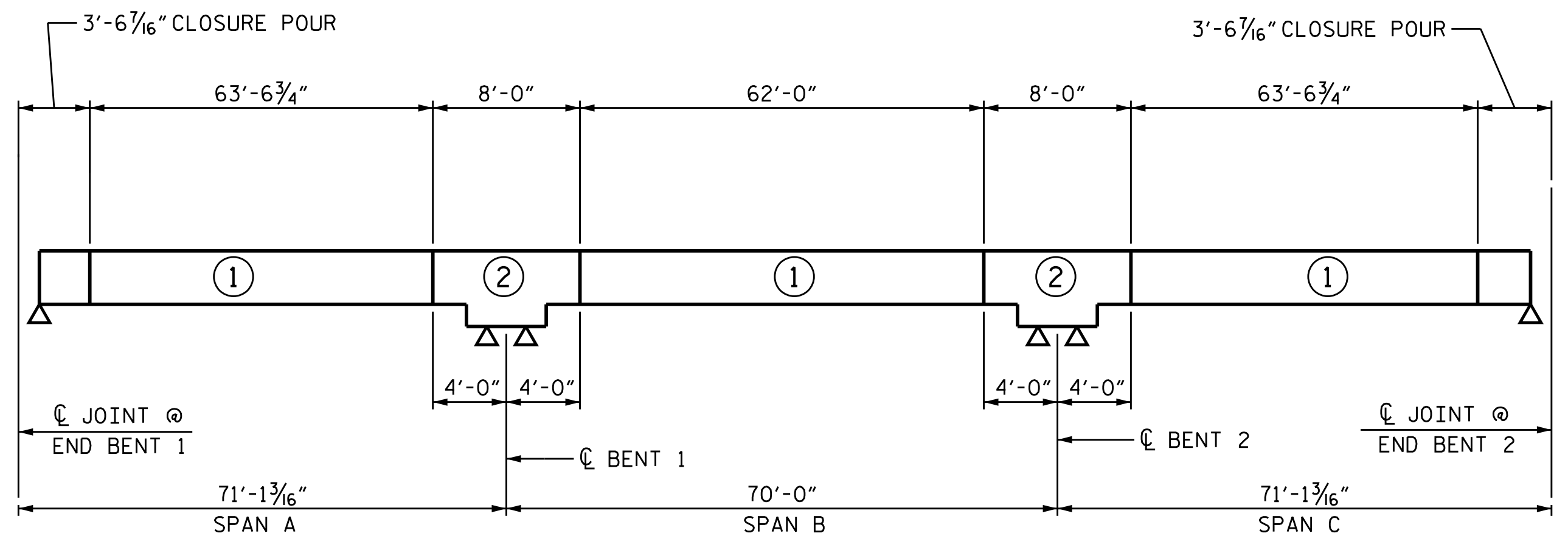
TRANSVERSE CONSTRUCTION JOINTS ARE PARALLEL TO CL BENTS.

DECK SLAB POURING SEQUENCE STAGES 1 & 2



TRANSVERSE CONSTRUCTION JOINT DETAIL

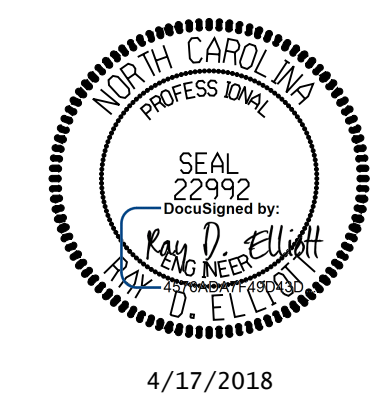
NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT.



OPTIONAL POURING SEQUENCE STAGES 1 & 2

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

PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00-L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 POURING SEQUENCE
 FOR DECK

DRAWN BY : NMW DATE : 2/17
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 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

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1			3			S-12			
2			4			69			

TGS ENGINEERS
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 CORP. LICENSE NO.: C-0275

215'-1 5/8" (FROM WORK POINT #1 TO WORK POINT #4)

212'-2 3/8" (C EXP. JT. @ EB 1 TO C EXP. JT. @ EB 2)

72'-6 13/16" (SPAN A - WORK POINT 1 TO WORK POINT 2)

70'-0" (SPAN B - FROM WORK POINT #2 TO WORK POINT #3)

414 #5 A3 BARS (TOP OF SLAB)
414 #5 A4 BARS (BOTTOM OF SLAB)

60'-0" LENGTH OF #6 B2 OR B6 BARS

43'-9 3/4"

16'-2 1/4"

PROJ. A3 BARS 2'-8" TOP OF SLAB
PROJ. A4 BARS 2'-4" BOTT. OF SLAB
(MAY FIELD BEND AS NECESSARY FOR PROPER CLEARANCES.)

25'-0" LENGTH OF #6 B4 BARS

12'-6"

12'-6"

WORK PT. 1

WORK PT. 2

3'-0" MIN. SPLICE (TYP.)

C -L- & LONGITUDINAL DECK SLAB CONST. JT.

C TYPE III PRESTRESSED CONC. GIRDERS

#5 A128 BARS OR #5 A228 BARS

#5 A3 OR #5 A4

#4 B1

#6 B2

#6 B4

45° 00' 00" (TYP.)

SEE DETAIL A THIS SHEET

CONSTRUCTION JOINT FOR 2'-6" CLOSURE POUR

#5 A101 OR #5 A201

#5 A1 OR #5 A2

MC 18 x 42.7 STEEL INTERMEDIATE DIAPHRAGM (TYP.)

C TRANSVERSE CONST. JT. "A"

C BENT 1

#5 G1 BAR

10" END BENT DIAPHRAGM

FILL FACE OF BACKWALL AT END BENT 1

SEE DETAIL "B" THIS SHEET

8 1/2"

8 1/2"

8 1/2"

8 1/2"

16 #5 B5 BARS @ 6" CTS. (BOTT. OF SLAB) (TYP. EACH BAY)

16 #6 B6 BARS @ 6" CTS. (BOTT. OF SLAB) (TYP. EACH BAY)

SPLICE #6B6 W/ #5 B7

2'-4" BENT DIAPHRAGM

#6 B4

1'-0"

11"

5"

8'-11"

8'-11"

8'-11"

8'-11"

3'-0 1/2"

10 1/2"

4 1/2"

40 #6 B4 BARS SPACED @ 6" CTS. BETWEEN #6 B2 BARS (TOP OF SLAB)

21 #6 B2 BARS @ 1'-6" CTS. (TOP OF SLAB)

61'-7" OUT TO OUT

30'-9 1/2" STAGE 1 CONSTRUCTION

59'-0" CLEAR ROADWAY

21 #4 B1 BARS @ 1'-6" CTS. (TOP OF SLAB) SPLICE W/ #6 B2 BARS

42 #4 J1 BARS @ 1'-0" CTS. ALONG SKEW (SEE "EXPANSION JT. SEAL DETAILS" SHEET)

SEE DETAIL A THIS SHEET

1'-3 1/2"

4 1/2"

#5 A128 THRU A101 @ 6" CTS. 2-BARS/MARK (TOP OF SLAB)

#5 A228 THRU A201 @ 6" CTS. 2-BARS/MARK (BOTTOM OF SLAB)

32'-5 9/16"

6"

6"

5 #5 B5 BARS @ 6" CTS. (BOTT. OF SLAB) AT OVERHANG

5 #6 B6 BARS @ 6" CTS. (BOTT. OF SLAB) AT OVERHANG

363 #5 A1 BARS @ 6" CTS. (TOP OF SLAB)

363 #5 A2 BARS @ 6" CTS. (BOTTOM OF SLAB)

58'-0 3/4" POUR 1

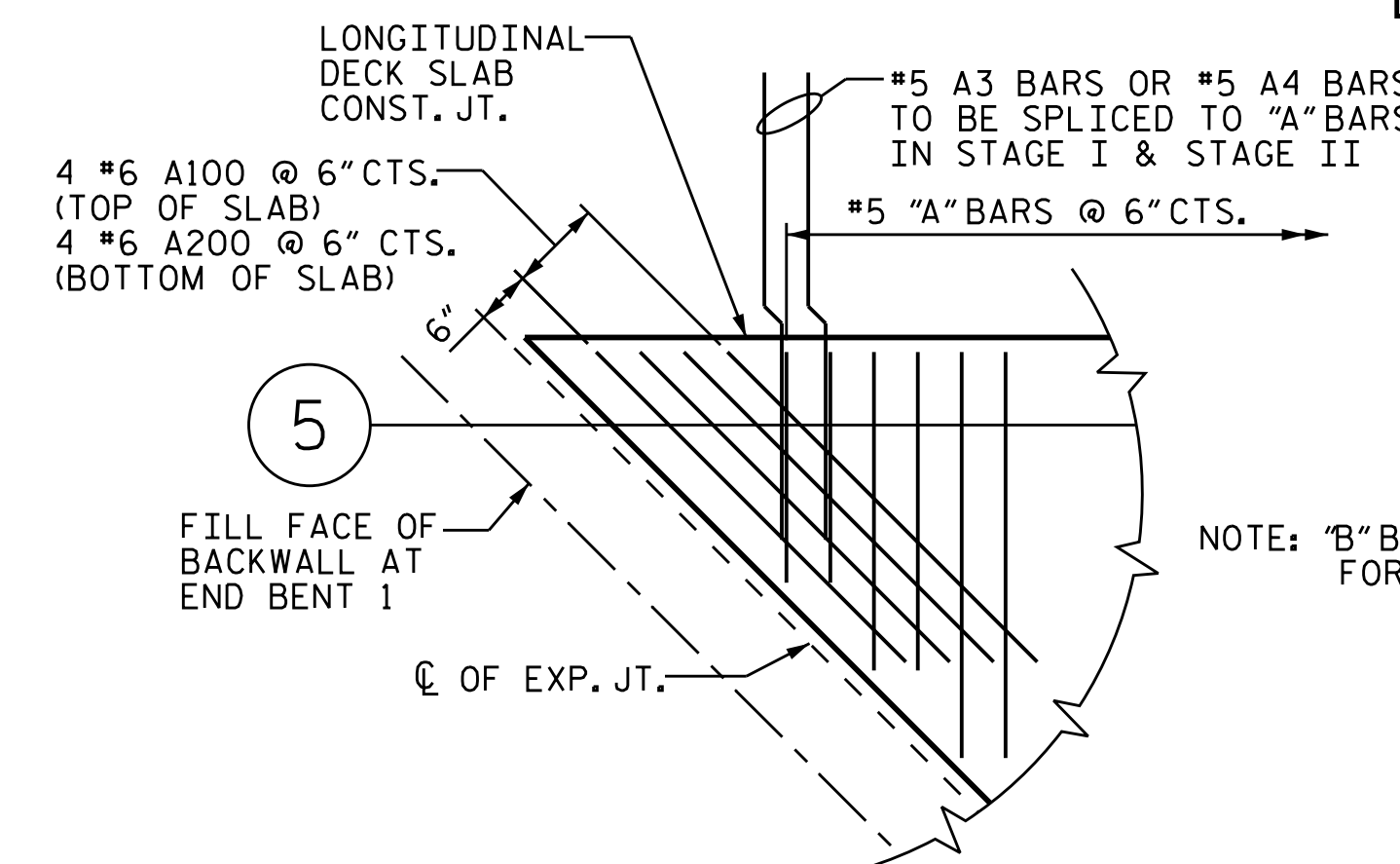
70'-0" POUR 2

REINFORCING STEEL & JOINT SPACING FOR PARAPETS NOT SHOWN FOR CLARITY. SEE PARAPET LAYOUT SHEETS.

PLAN OF SPAN A STAGE 1

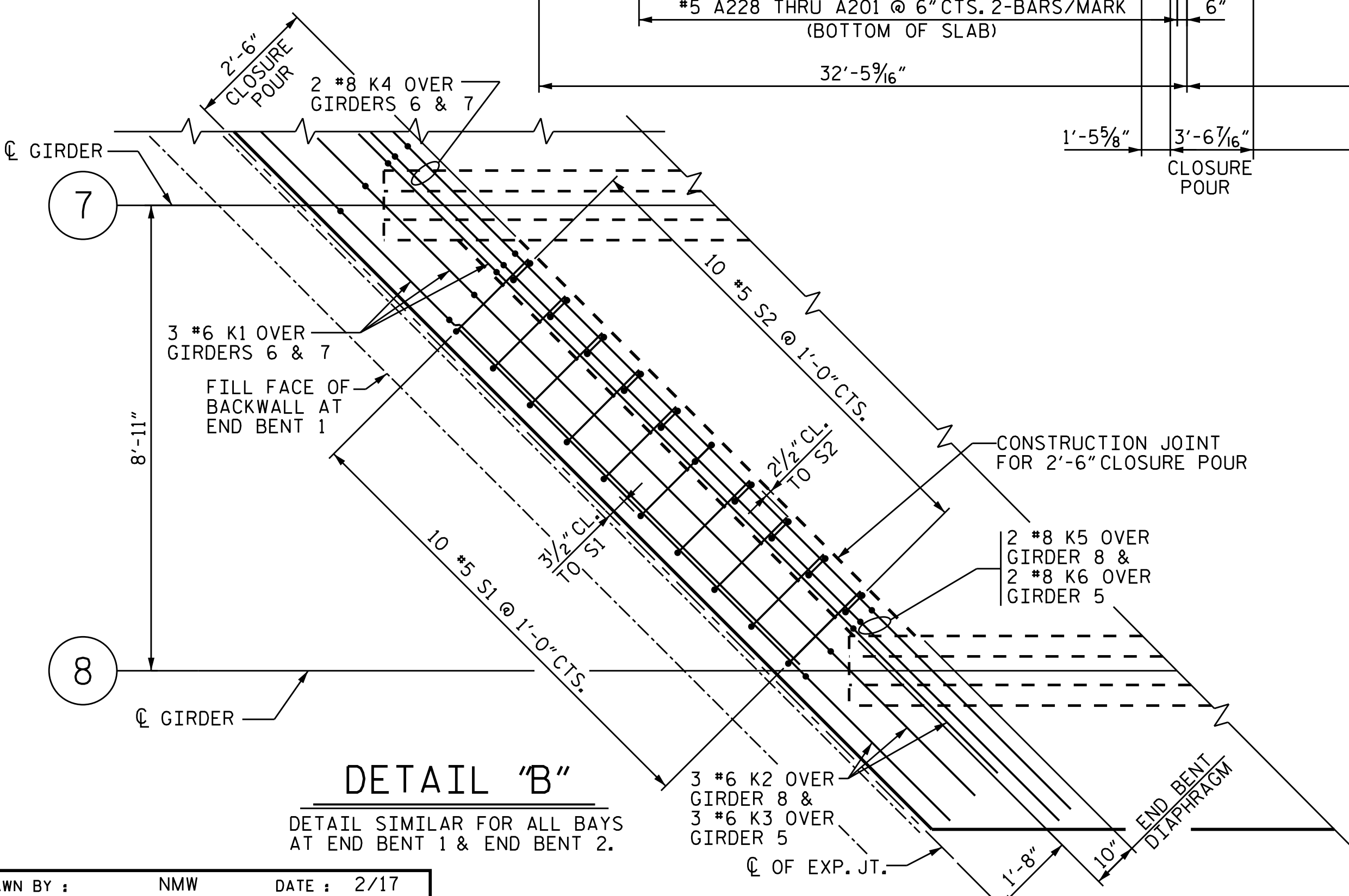
FOR TRANSVERSE CONSTRUCTION JOINT SEE "POURING SEQUENCE FOR DECK" SHEET.

NOTE:
FOR ADDITIONAL INFORMATION ON "B" BAR LAYOUT SEE "B-BAR LAYOUT DIAGRAM" ON SHEET 1 OF 2 OF THE SUPERSTRUCTURE BILL OF MATERIAL STAGE 1 CONSTRUCTION



DETAIL "A"

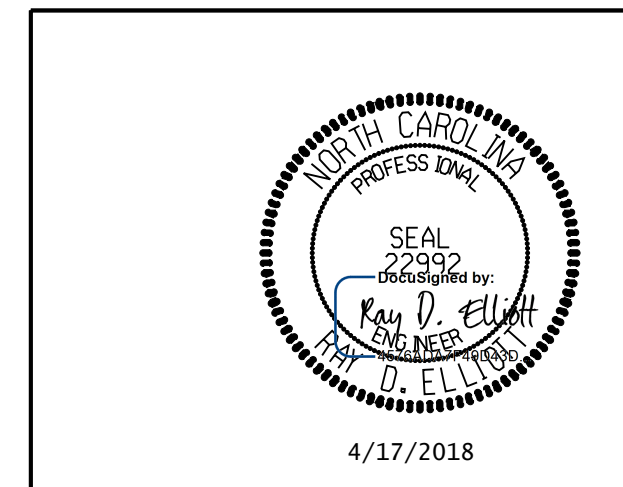
DETAIL SIMILAR AT ACUTE CORNER AT SPAN C.



DETAIL "B"

DETAIL SIMILAR FOR ALL BAYS AT END BENT 1 & END BENT 2.

DRAWN BY : NMW DATE : 2/17
CHECKED BY : RDE DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17



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804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT NO. B-4982
IREDELL COUNTY
STATION: 21+10.00-L-

SHEET 1 OF 6
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PLAN OF SPAN A
(STAGE I CONSTRUCTION)

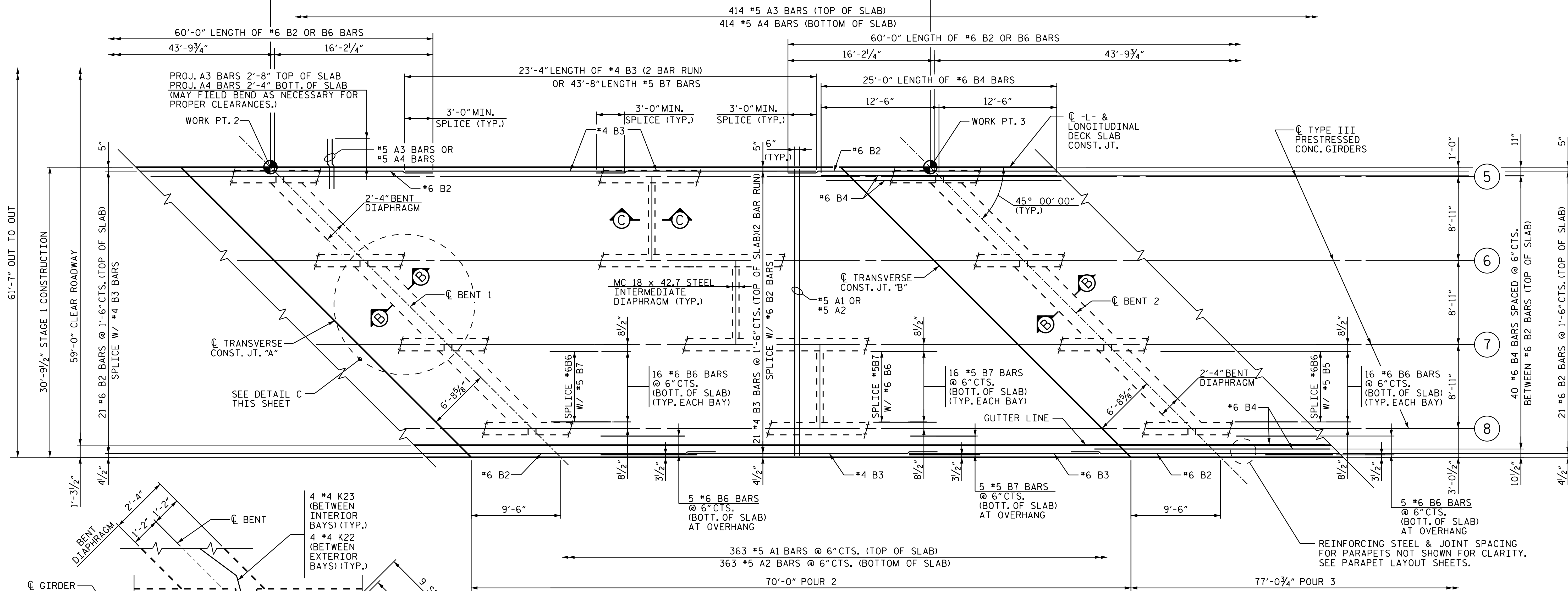
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			69

215'-1 5/8" (FROM WORK POINT #1 TO WORK POINT #4)

212'-2 3/8" (C EXP. JT. @ EB 1 TO C EXP. JT. @ EB 2)

70'-0" (SPAN B - WORK POINT 2 TO WORK POINT 3)

72'-6 13/16" (SPAN C - FROM WORK POINT #3 TO WORK POINT #4)

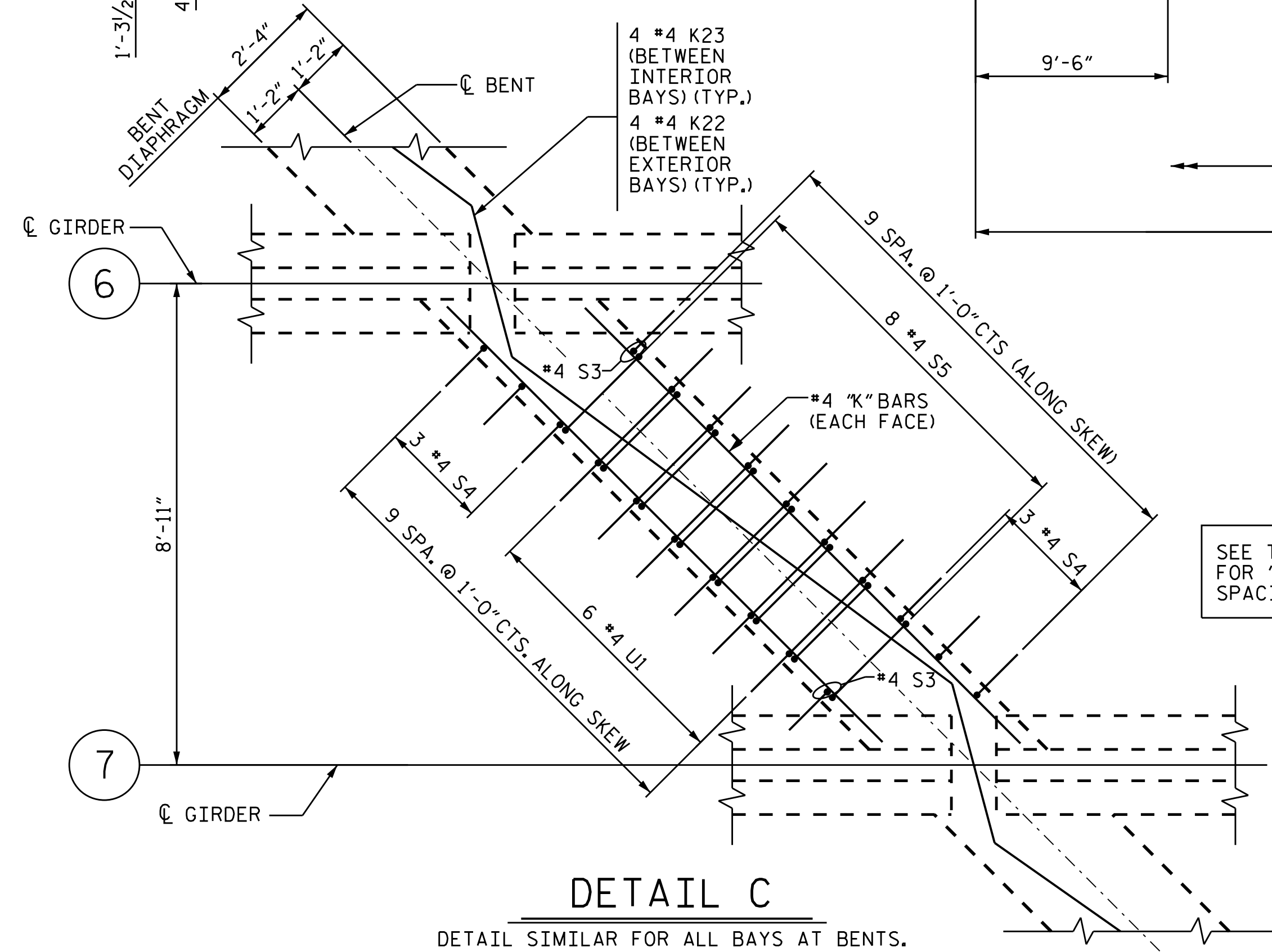


PLAN OF SPAN B STAGE 1

FOR TRANSVERSE CONSTRUCTION JOINT SEE "POURING SEQUENCE FOR DECK" SHEET.

NOTE:
FOR ADDITIONAL INFORMATION ON "B" BAR LAYOUT SEE "B-BAR LAYOUT DIAGRAM" ON SHEET 1 OF 2 OF THE SUPERSTRUCTURE BILL OF MATERIAL STAGE 1 CONSTRUCTION

SEE TYPICAL SECTION FOR "S" BAR AND "K" BAR SPACING

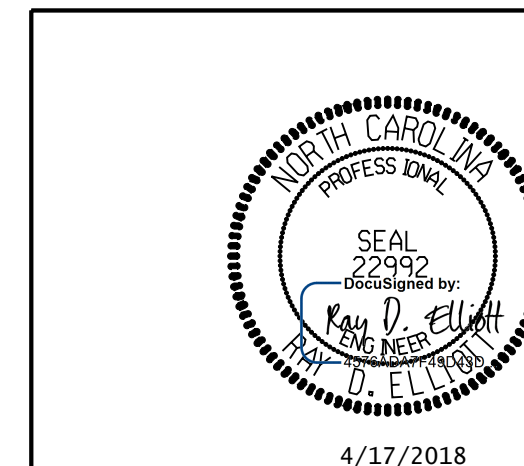


PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 2 OF 6



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

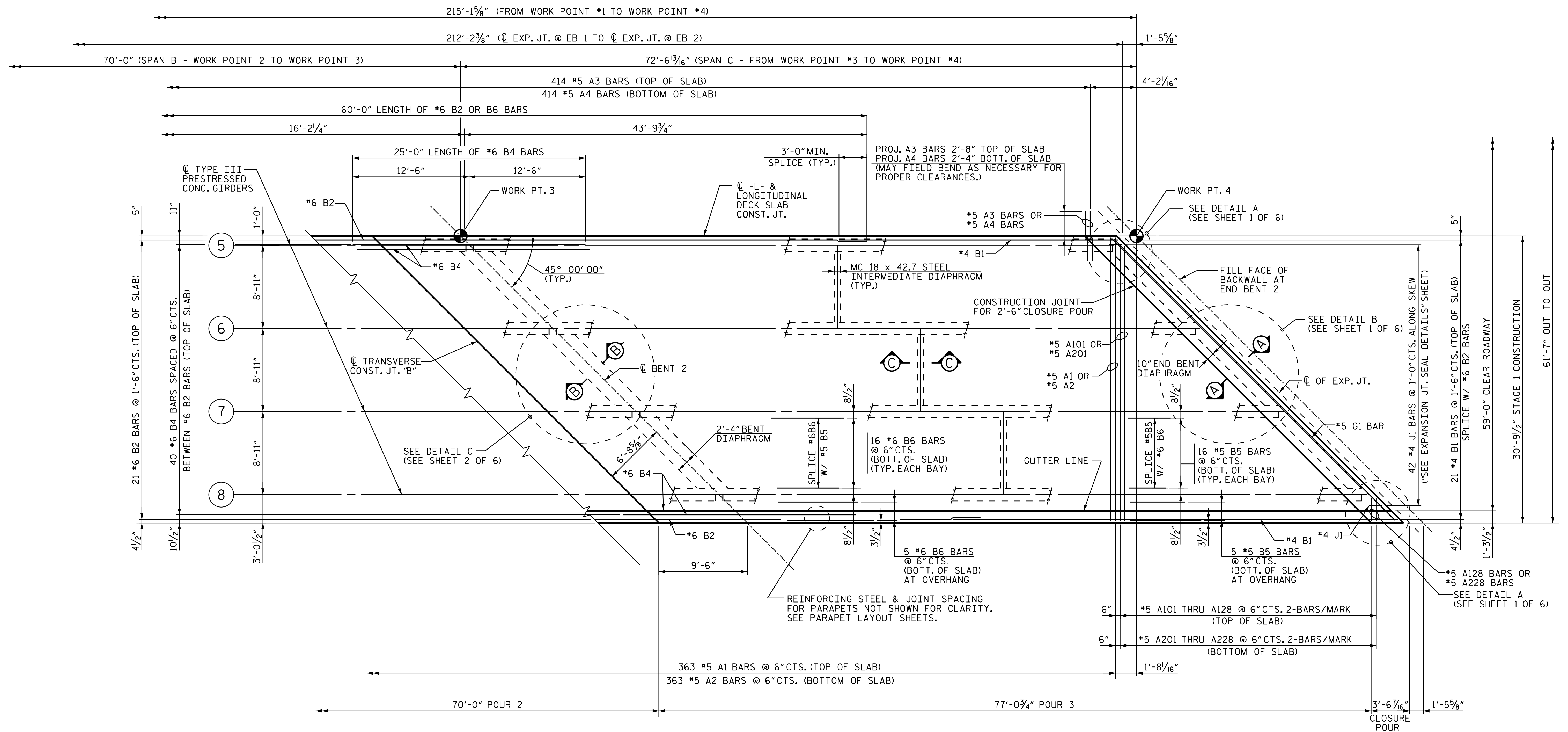
PLAN OF SPAN B (STAGE I CONSTRUCTION)

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DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-14
1			3			TOTAL SHEETS
2			4			69



NOTE:
 FOR ADDITIONAL INFORMATION ON "B" BAR LAYOUT
 SEE "B-BAR LAYOUT DIAGRAM" ON SHEET 1 OF 2 OF THE
 SUPERSTRUCTURE BILL OF MATERIAL STAGE 1 CONSTRUCTION

PLAN OF SPAN C STAGE 1

FOR TRANSVERSE CONSTRUCTION JOINT SEE
 "POURING SEQUENCE FOR DECK" SHEET.

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN C
(STAGE I CONSTRUCTION)

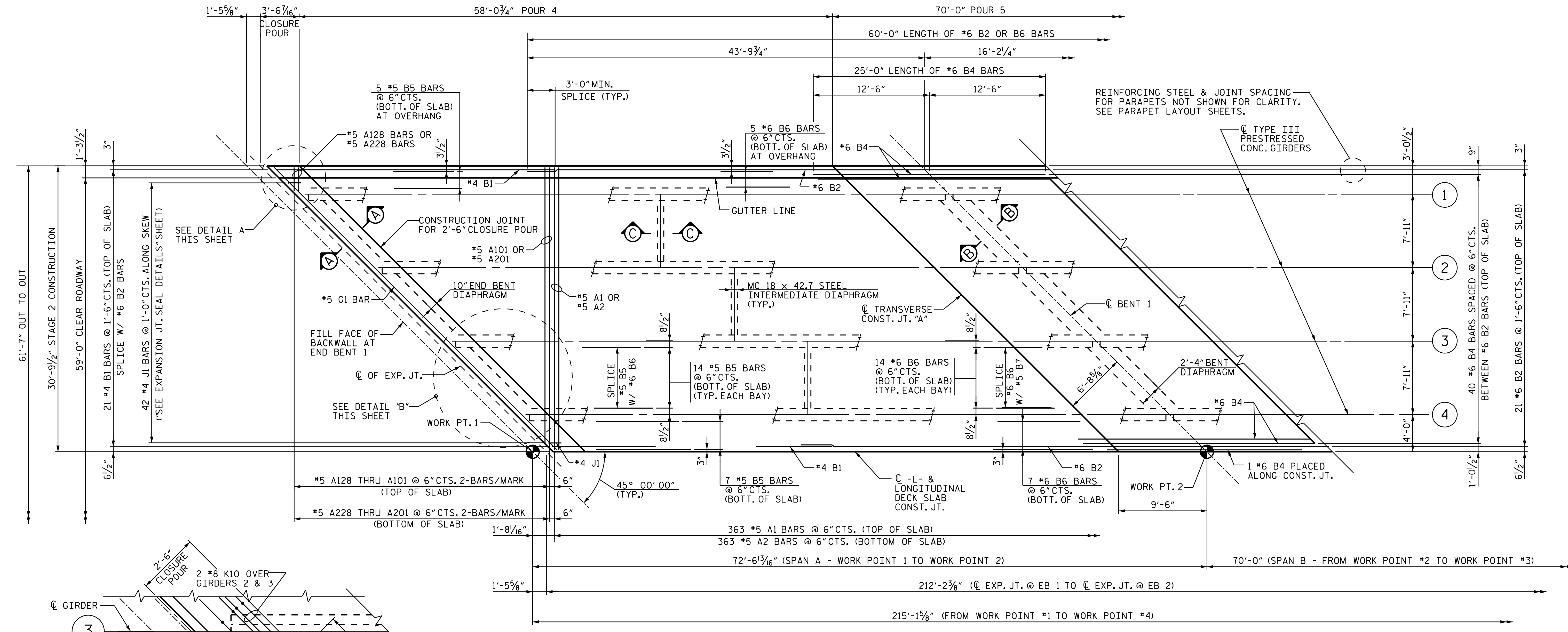
4/17/2018

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			69

DRAWN BY : NMW DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17



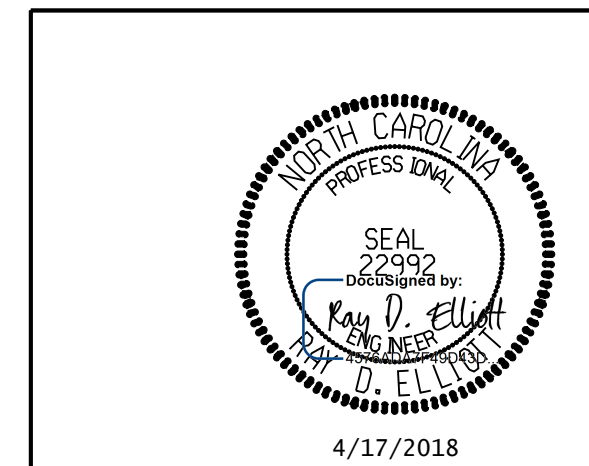
PLAN OF SPAN A STAGE 2

FOR TRANSVERSE CONSTRUCTION JOINT SEE "POURING SEQUENCE FOR DECK" SHEET.

NOTE:
FOR ADDITIONAL INFORMATION ON "B" BAR LAYOUT SEE "B" BAR LAYOUT DIAGRAM" ON SHEET 1 OF 2 OF THE SUPERSTRUCTURE BILL OF MATERIAL STAGE 1 CONSTRUCTION

PROJECT NO. B-4982
IREDELL COUNTY
 STATION: 21+10.00-L-
 SHEET 4 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
 PLAN OF SPAN A
 (STAGE II CONSTRUCTION)



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

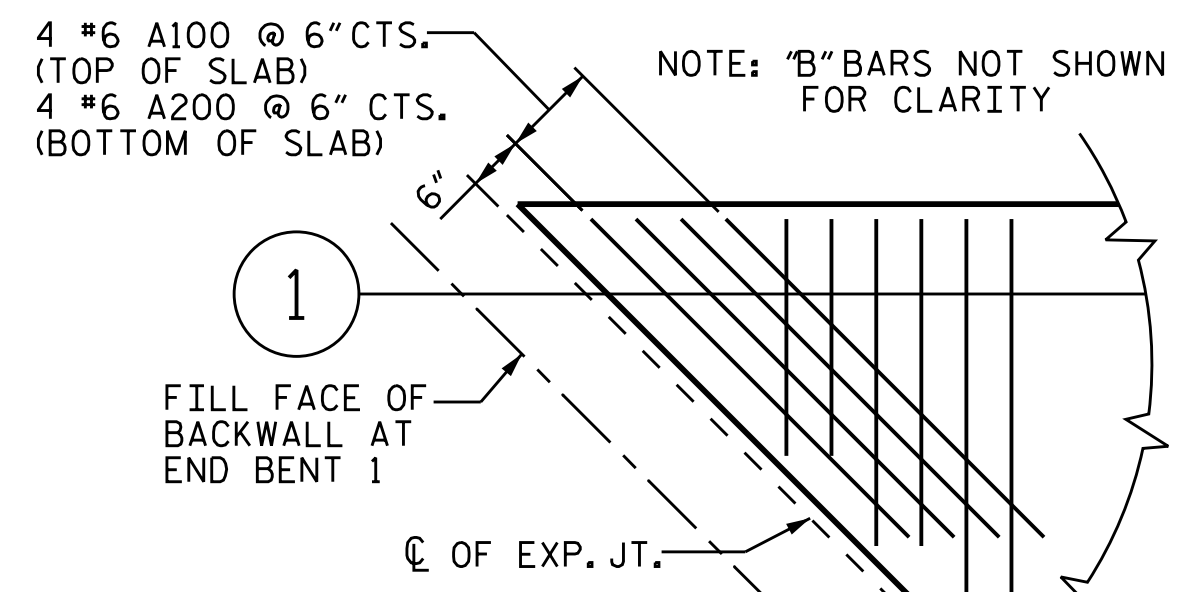
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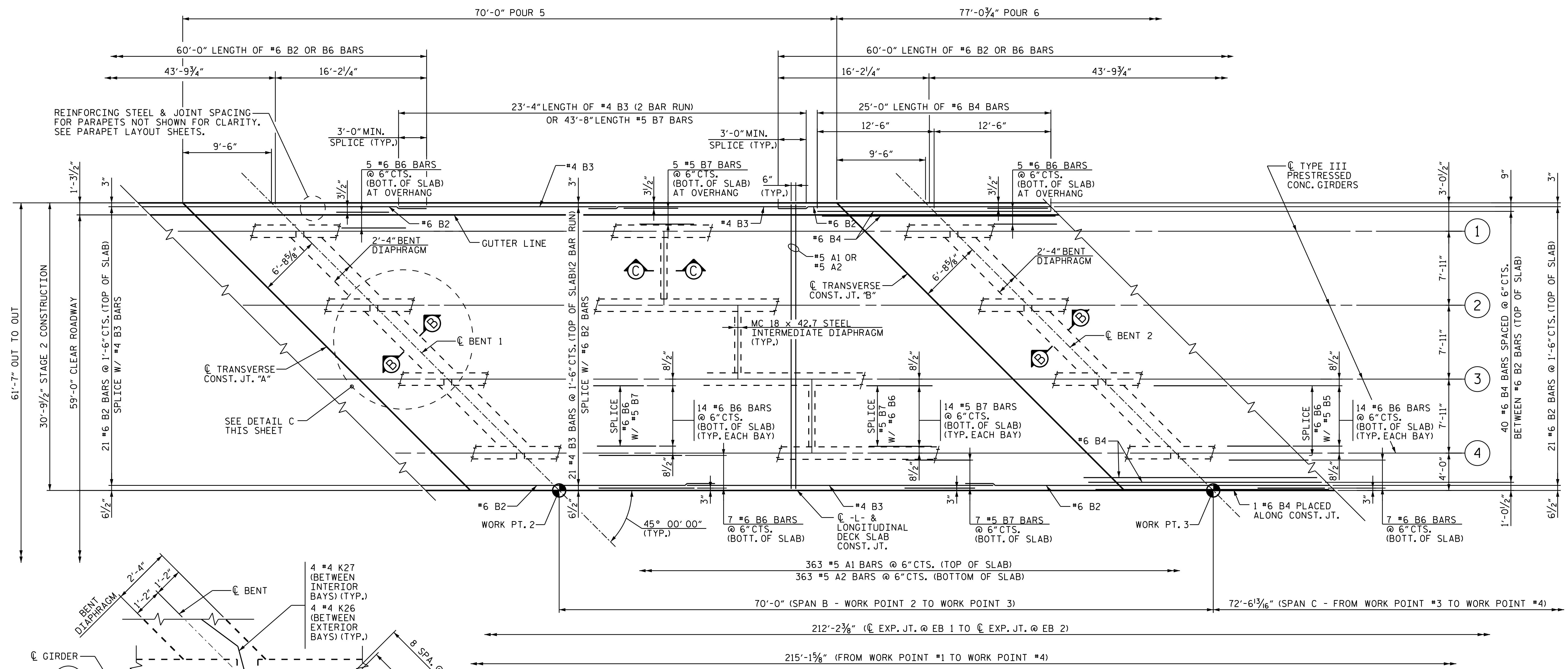
DETAIL SIMILAR FOR ALL BAYS AT END BENT 1 & END BENT 2.

DRAWN BY : NMW DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

DETAIL "A"

DETAIL SIMILAR AT ACUTE CORNER AT SPAN C.



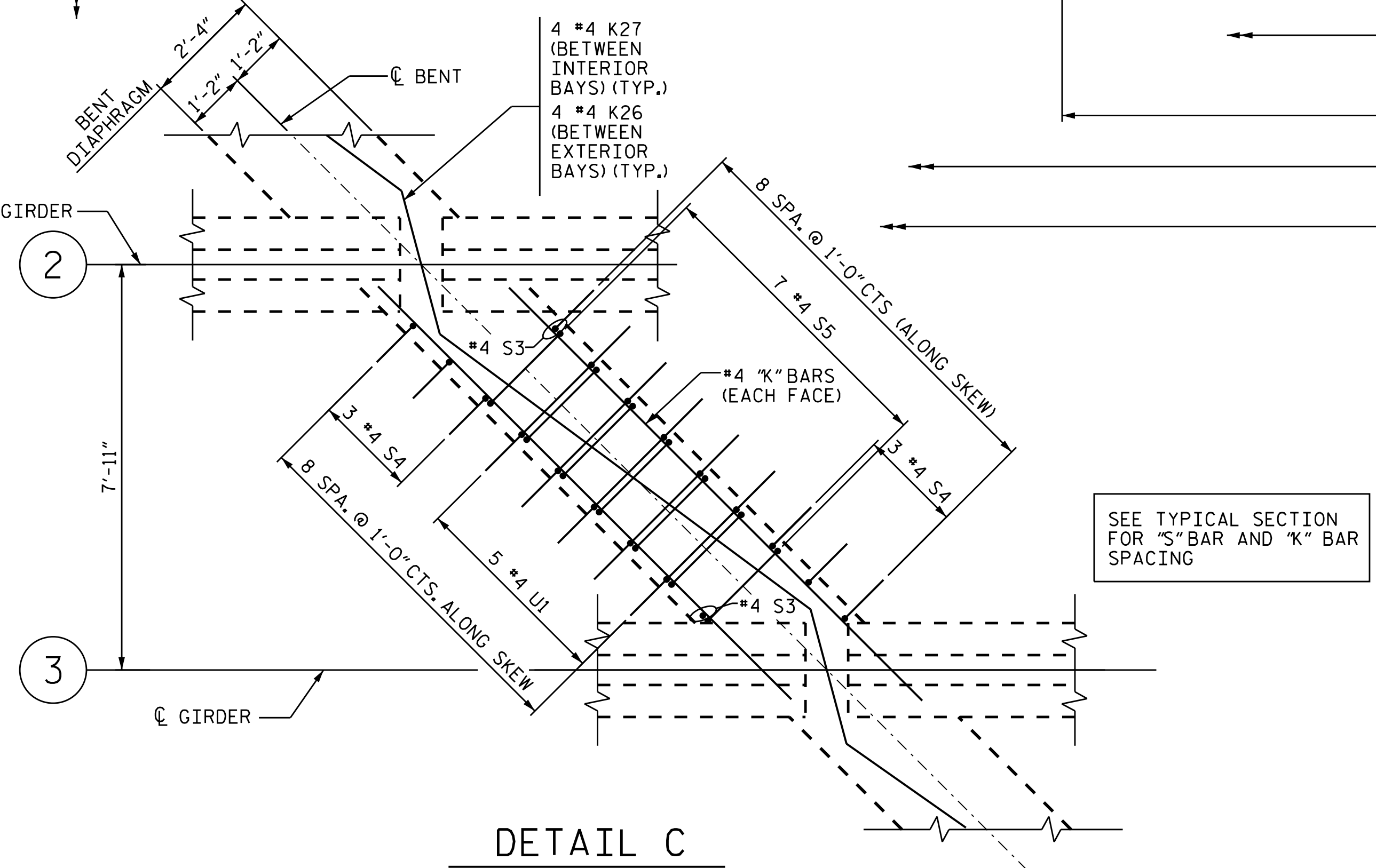


PLAN OF SPAN B STAGE 2

FOR TRANSVERSE CONSTRUCTION JOINT SEE "POURING SEQUENCE FOR DECK" SHEET.

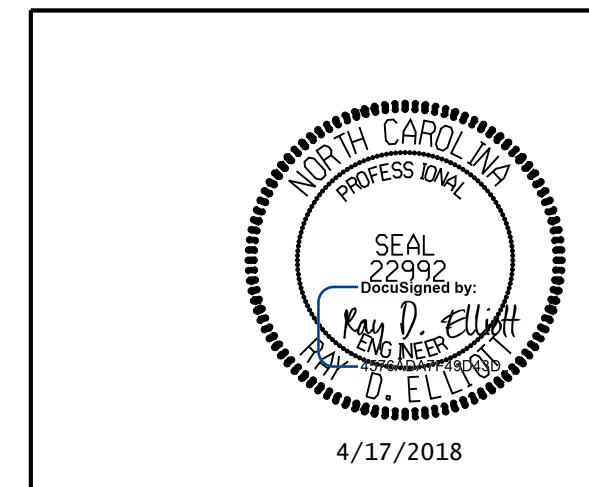
NOTE:
 FOR ADDITIONAL INFORMATION ON "B" BAR LAYOUT SEE "B-BAR LAYOUT DIAGRAM" ON SHEET 1 OF 2 OF THE SUPERSTRUCTURE BILL OF MATERIAL STAGE I CONSTRUCTION

PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00-L-
 SHEET 5 OF 6



DETAIL C
 DETAIL SIMILAR FOR ALL BAYS AT BENTS.

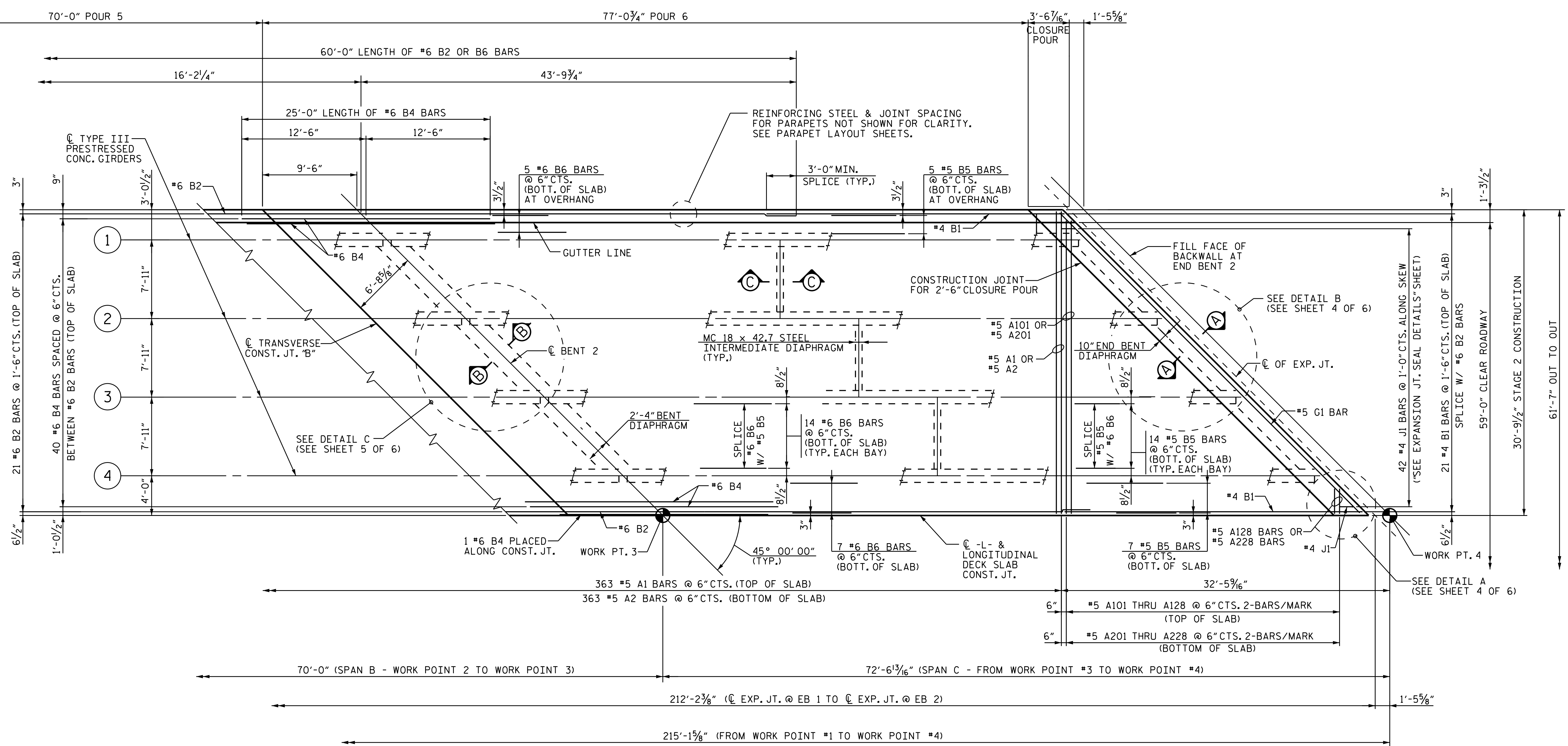
DRAWN BY : NMW DATE : 2/17
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
 PLAN OF SPAN B
 (STAGE II CONSTRUCTION)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						REVISIONS			SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:				
1			3			S-17			
2			4			TOTAL SHEETS 69			

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PLAN OF SPAN C STAGE 2

FOR TRANSVERSE CONSTRUCTION JOINT SEE
"POURING SEQUENCE FOR DECK" SHEET.

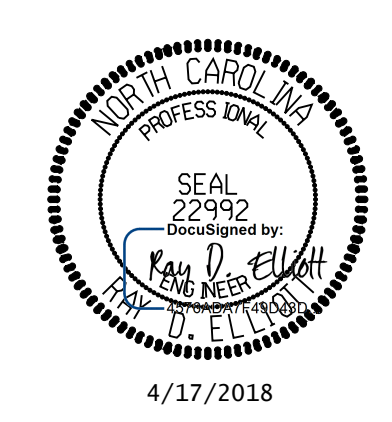
NOTE:
FOR ADDITIONAL INFORMATION ON "B" BAR LAYOUT
SEE "B-BAR LAYOUT DIAGRAM" ON SHEET 1 OF 2 OF THE
SUPERSTRUCTURE BILL OF MATERIAL STAGE 1 CONSTRUCTION

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 6 OF 6



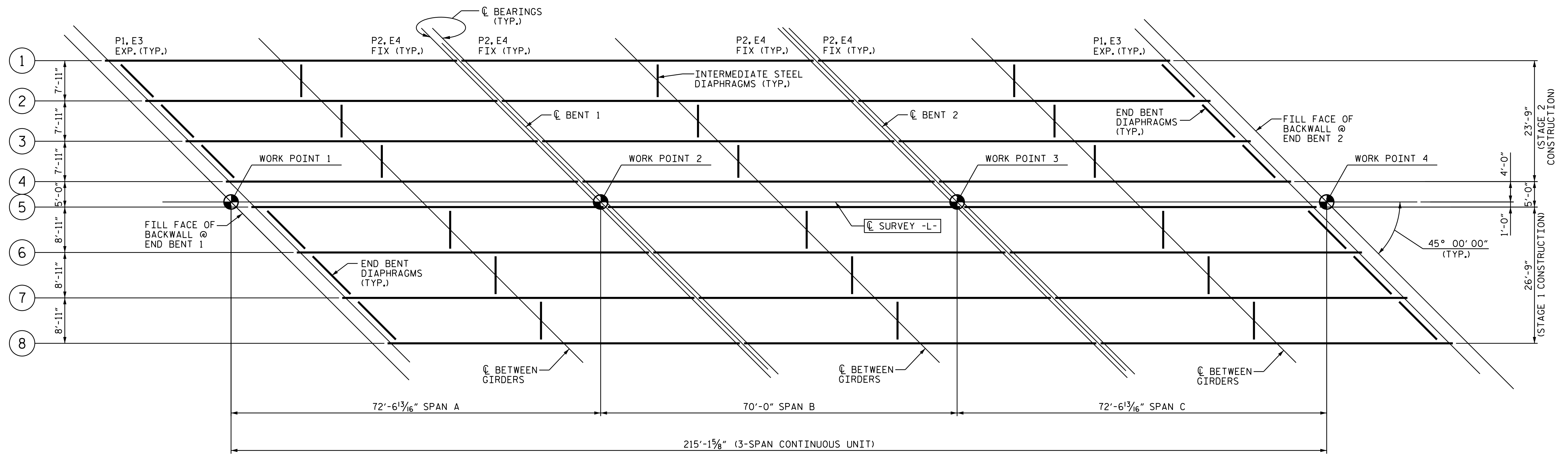
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PLAN OF SPAN C
(STAGE II CONSTRUCTION)

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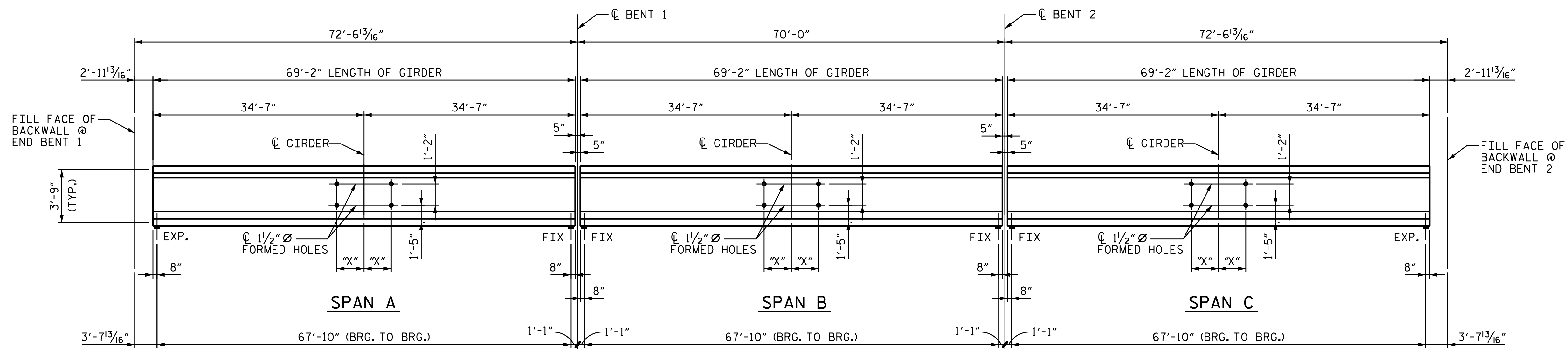
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			69



PLAN - GIRDER LAYOUT FOR STAGES 1 & 2 CONSTRUCTION



ELEVATION - GIRDERS 1 THRU 8

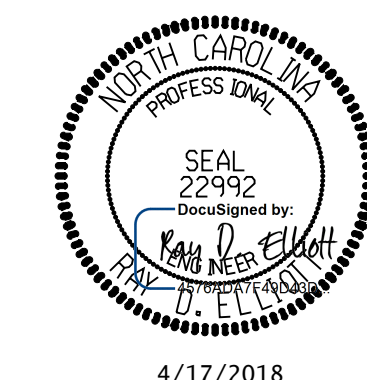
PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00-L-

DIMENSIONS - ALL SPANS		
GIRDER	"X"	"Y"
1	---	3'-11 1/2"
2	3'-11 1/2"	3'-11 1/2"
3	3'-11 1/2"	3'-11 1/2"
4	3'-11 1/2"	---
5	---	4'-5 1/2"
6	4'-5 1/2"	4'-5 1/2"
7	4'-5 1/2"	4'-5 1/2"
8	4'-5 1/2"	---

DRAWN BY : NMW DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

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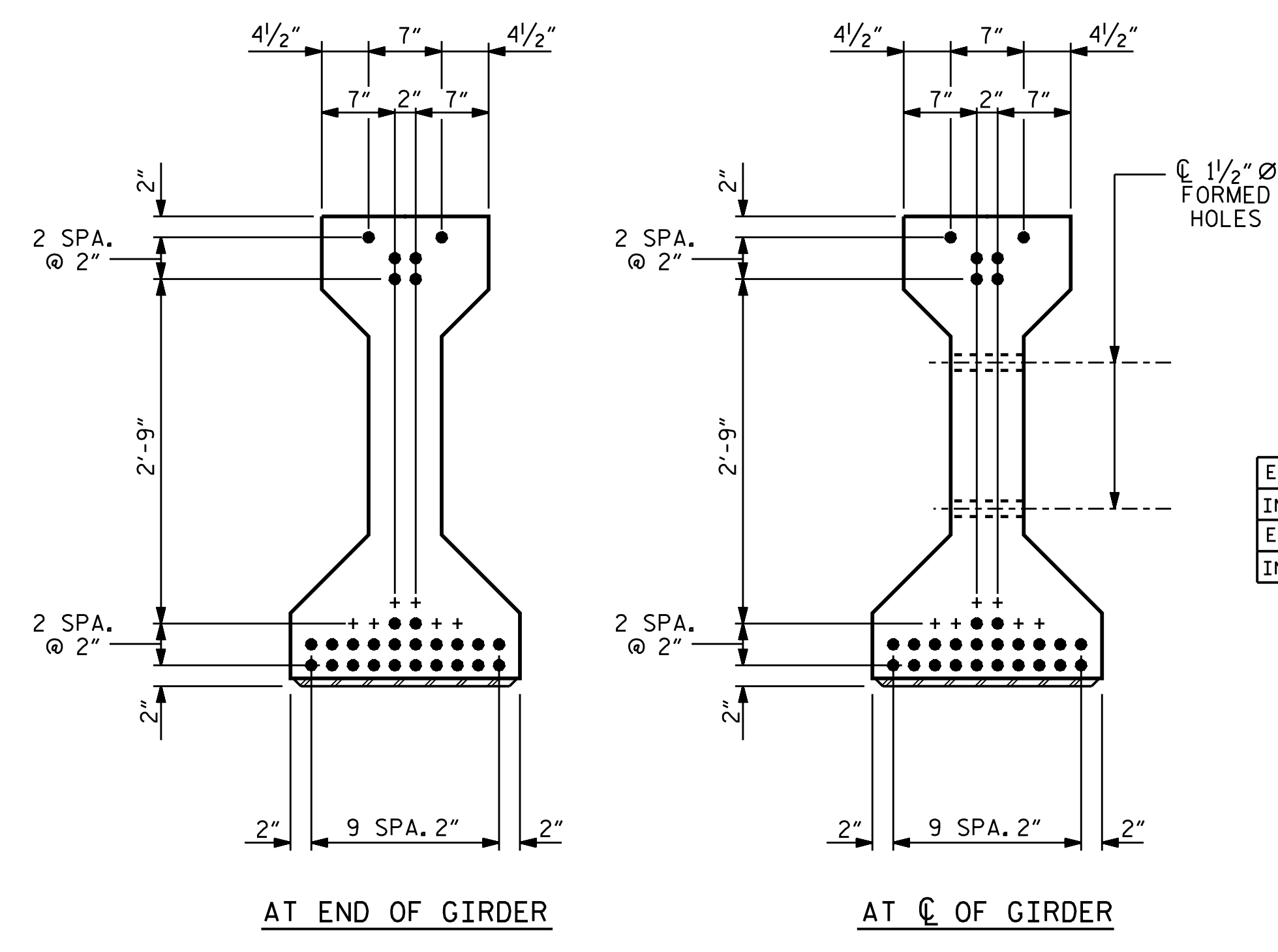
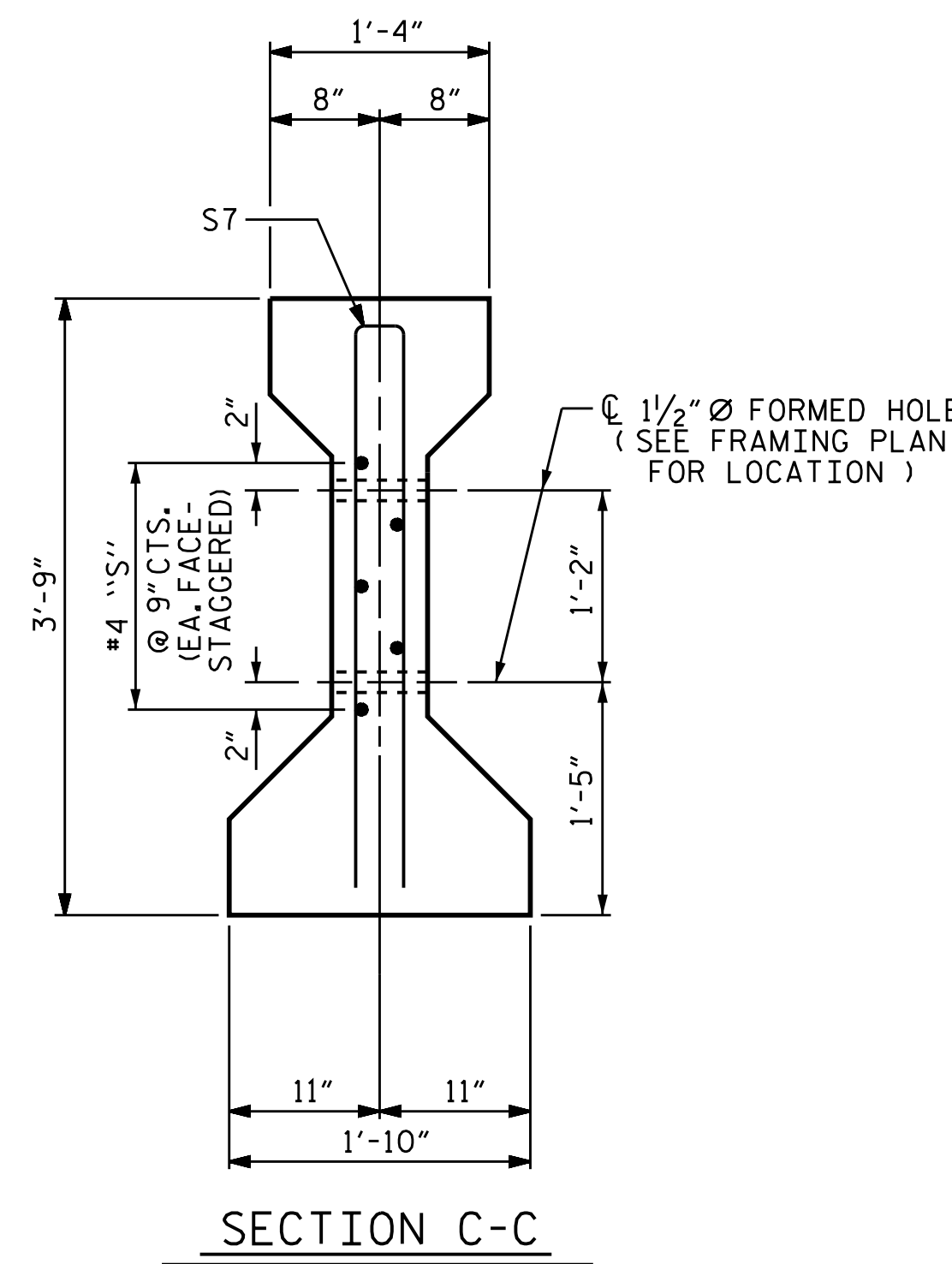
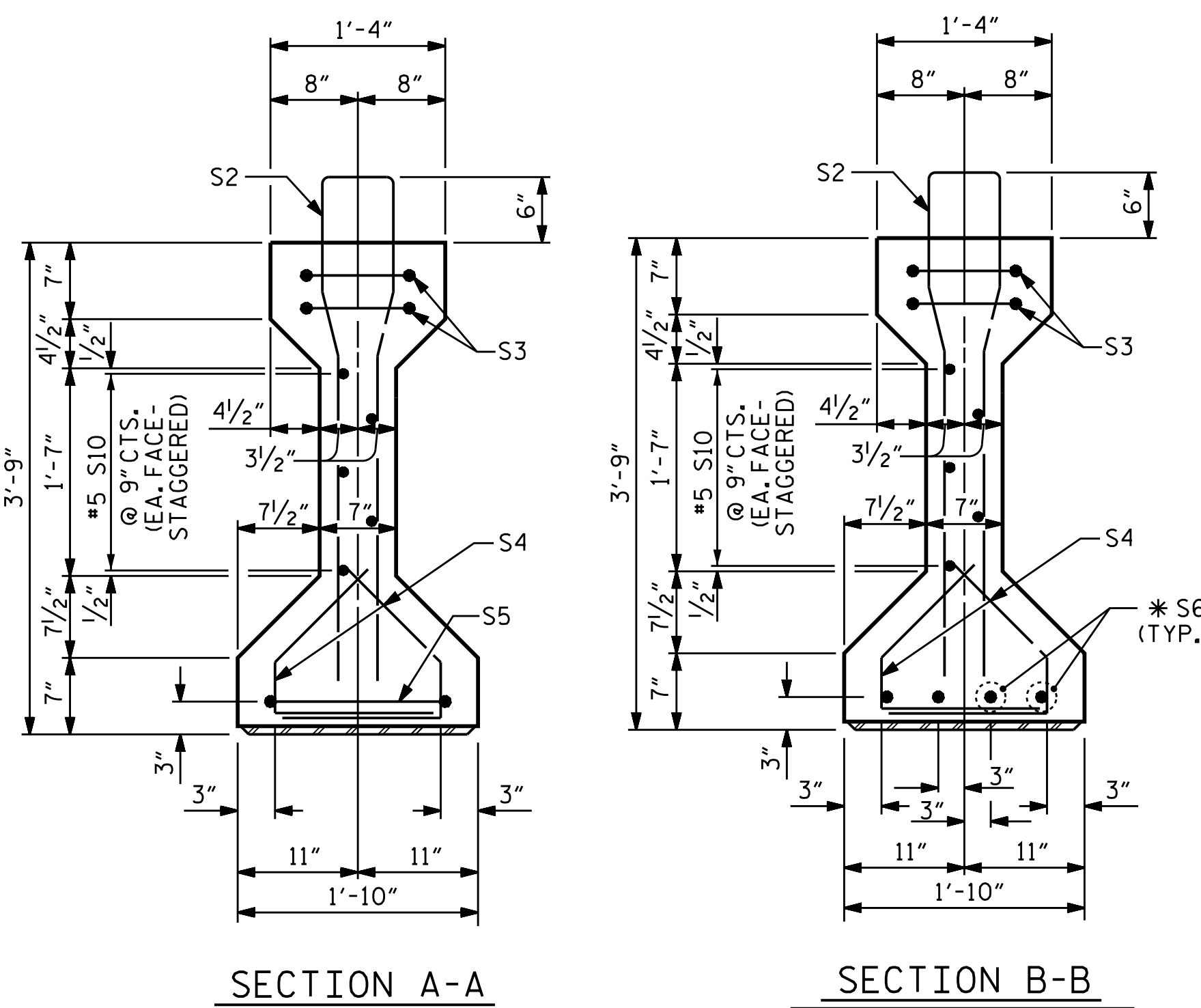
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

TYPE III
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 GIRDER LAYOUT

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			S-19
2			4			TOTAL SHEETS 69

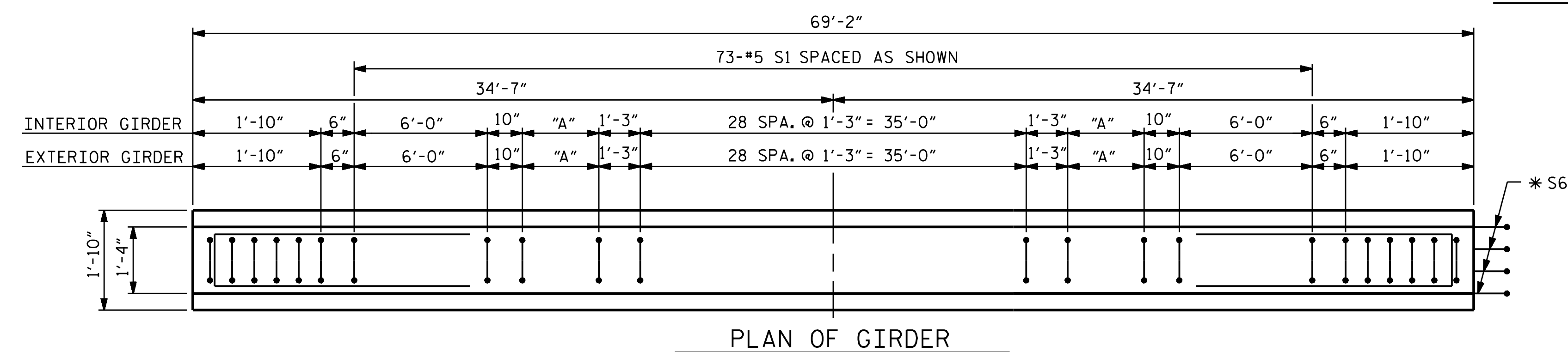
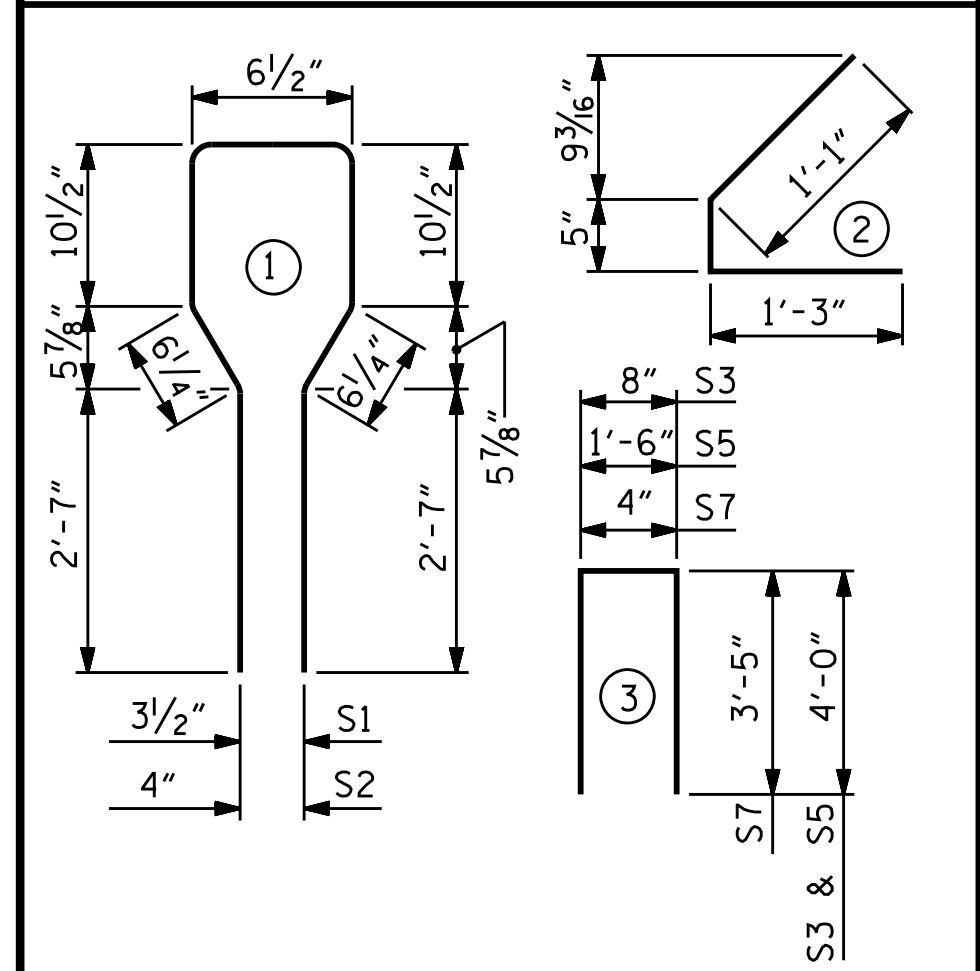


0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

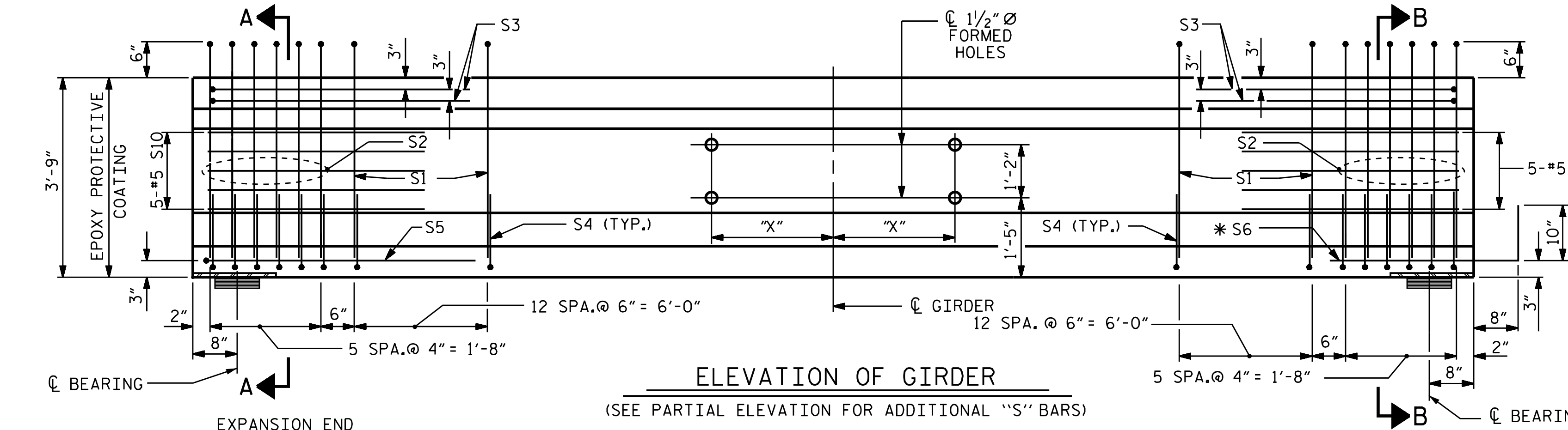
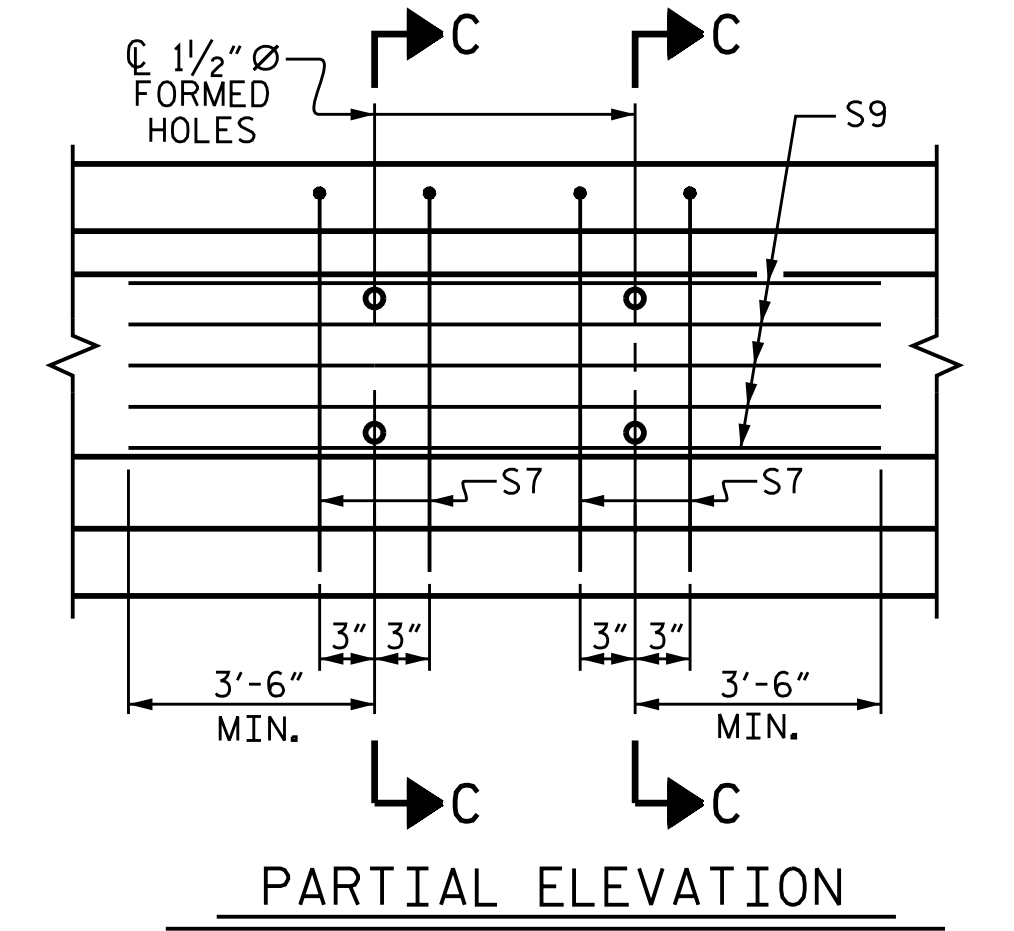
REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	73	#5	1	8'-6"	647
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	76	#4	2	2'-9"	140
S5	1	#4	3	9'-6"	6
* S6	4	#5	STR	3'-8"	15
EXTERIOR GDR. S7	2	#5	3	7'-2"	15
INTERIOR GDR. S7	4	#5	3	7'-2"	30
EXTERIOR GDR. S8	5	#4	STR	7'-0"	23
INTERIOR GDR. S9	5	#4	STR	15'-11"	53
S10	10	#5	STR	4'-0"	42

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

BAR TYPES
ALL BAR DIMENSIONS ARE OUT-TO-OUT



* S6
"A" = 8 SPA. @ 10" = 6'-8"

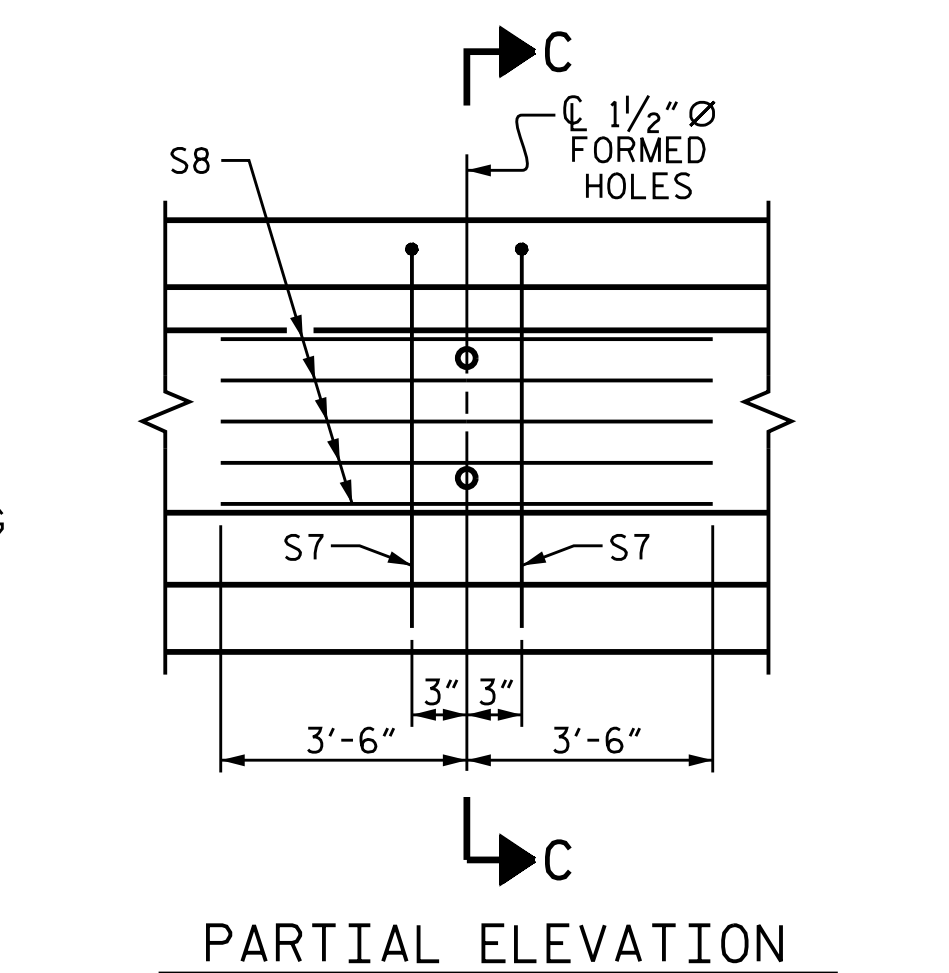


EXPANSION END (END BENT 1 AND END BENT 2)

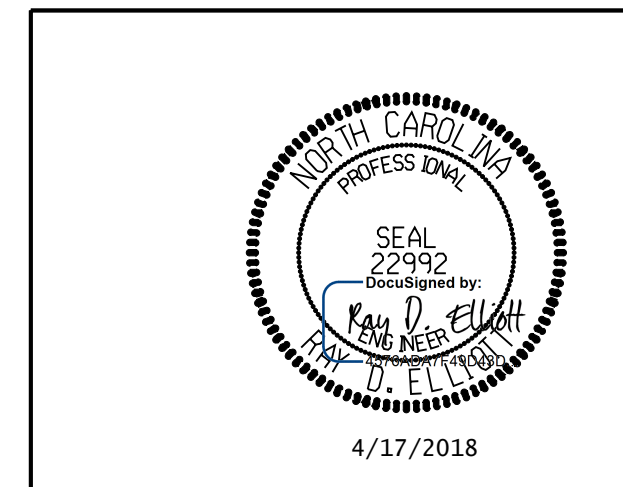
FIXED END (BENT 1 END @ SPAN "A") (BENT 2 END @ SPAN "C")

DIMENSIONS - ALL SPANS		
GIRDER	"X"	"Y"
1	---	3'-11 1/2"
2	3'-11 1/2"	3'-11 1/2"
3	3'-11 1/2"	3'-11 1/2"
4	3'-11 1/2"	---
5	---	4'-5 1/2"
6	4'-5 1/2"	4'-5 1/2"
7	4'-5 1/2"	4'-5 1/2"
8	4'-5 1/2"	---

DRAWN BY : RTJ DATE : 2/17
CHECKED BY : RDE DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17



SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1,4,5 & 8



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TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL (LB.)	8,000 PSI CONCRETE (C.Y.)	0.6" Ø L. R. STRANDS (No.)
EXTERIOR GIRDER	1,064	10	28
INTERIOR GIRDER	1,109	10	28

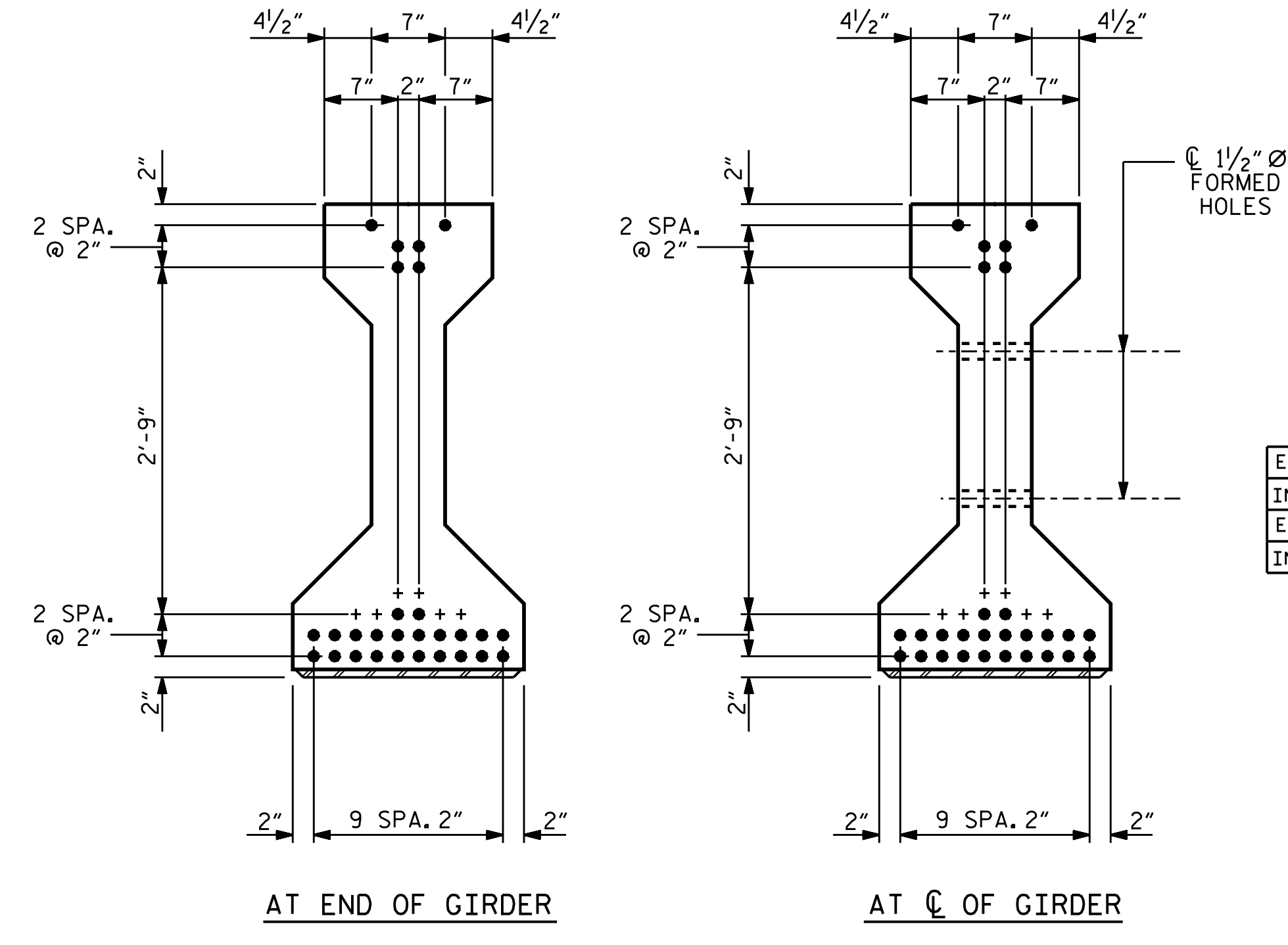
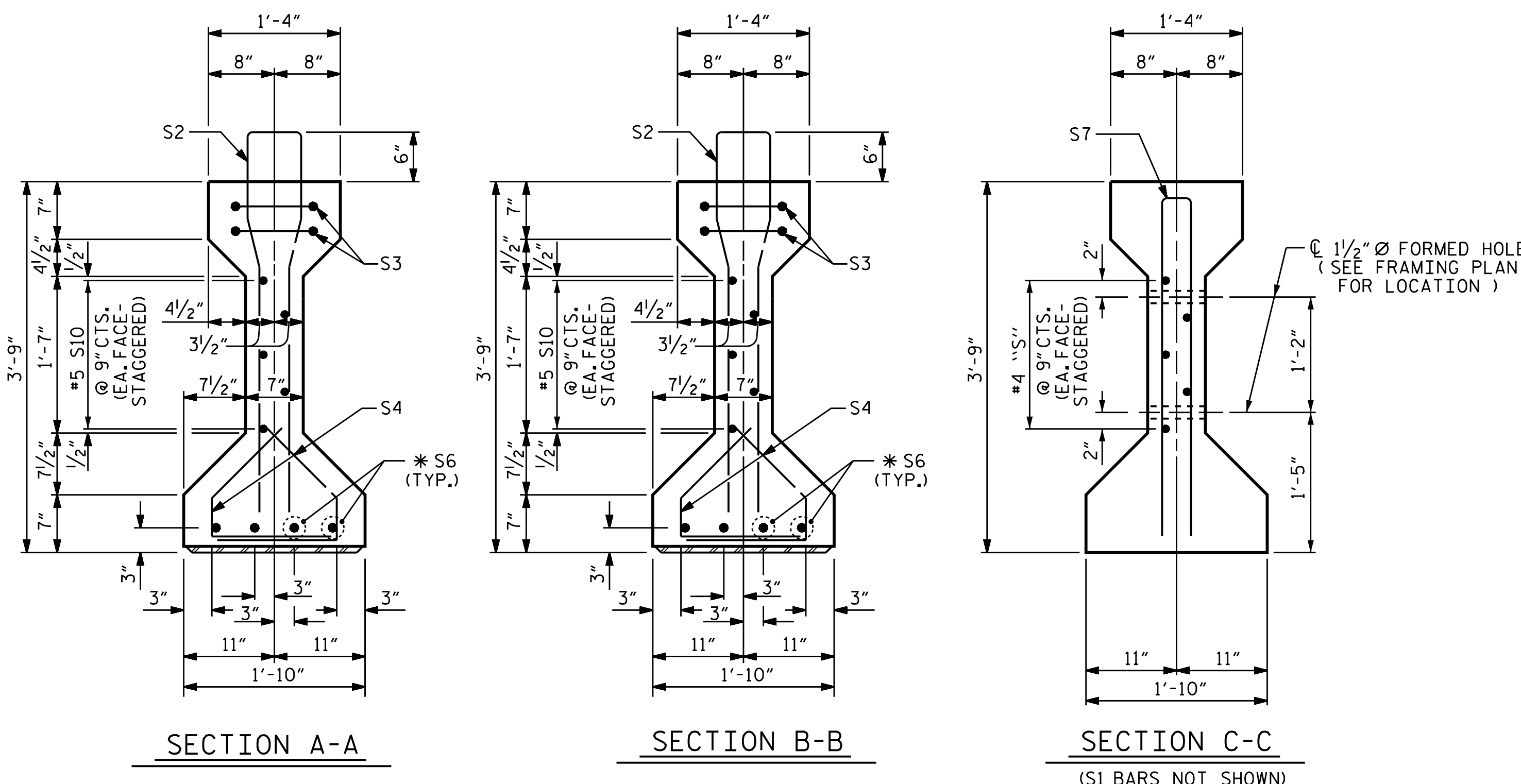
GIRDERS REQUIRED- SPAN A AND C		
NUMBER	LENGTH	TOTAL LENGTH
16	69'-2"	1106'-8"

PROJECT NO. B-4982
IREDELL COUNTY
STATION: 21+10.00-L-
SHEET 1 OF 3

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

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-20
1			3			TOTAL SHEETS 69
2			4			

STD. NO. PCG5

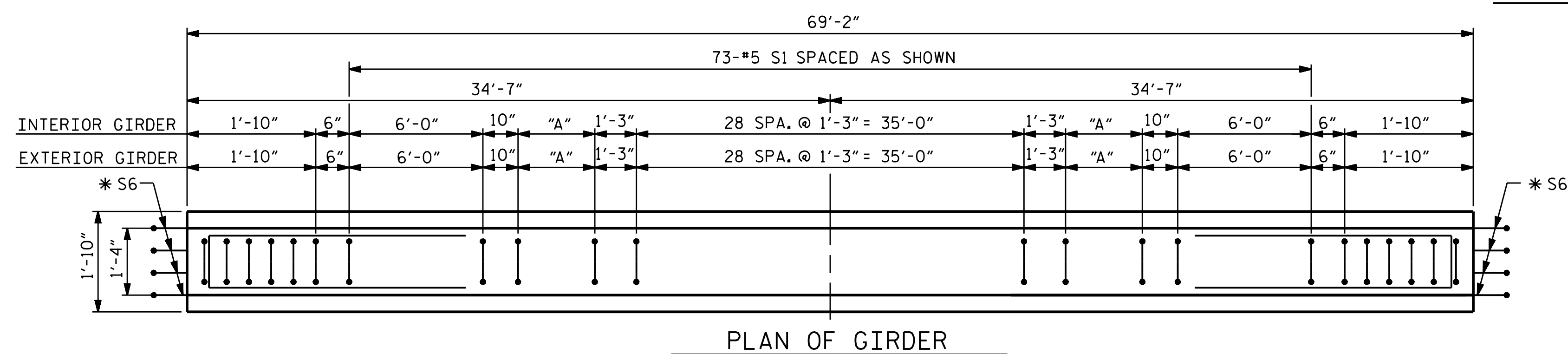
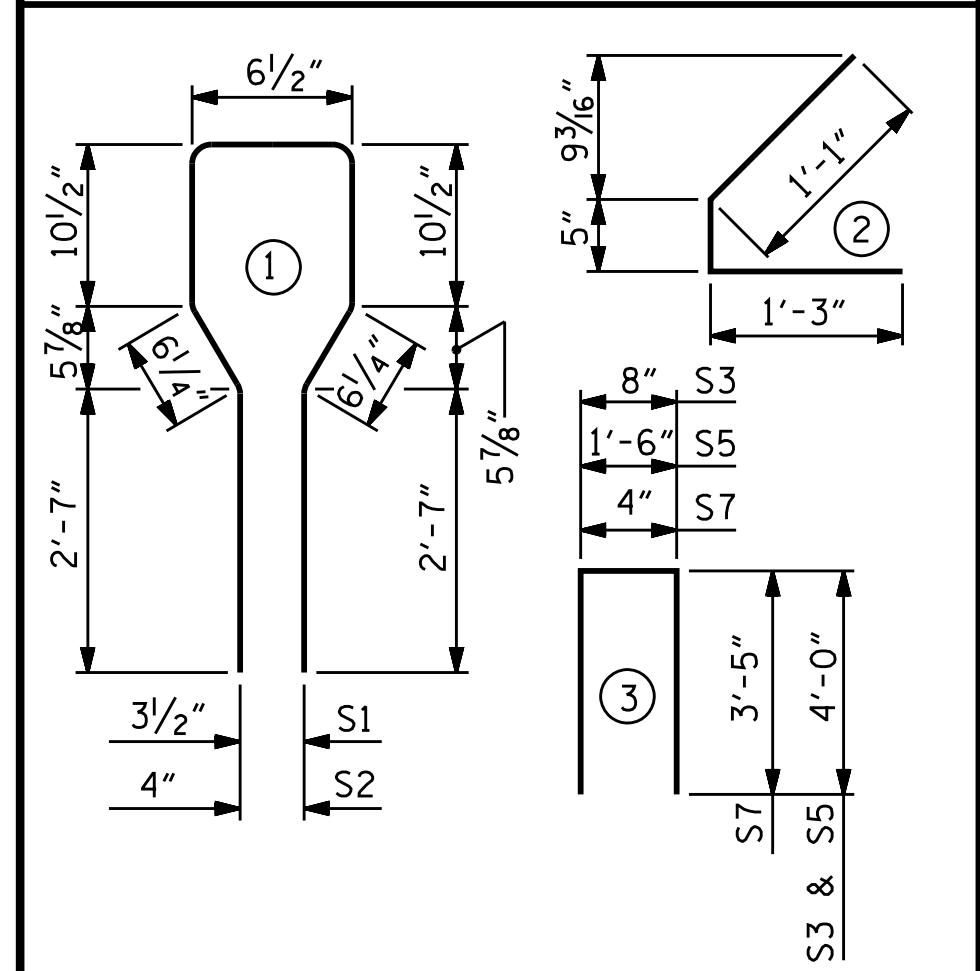


0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

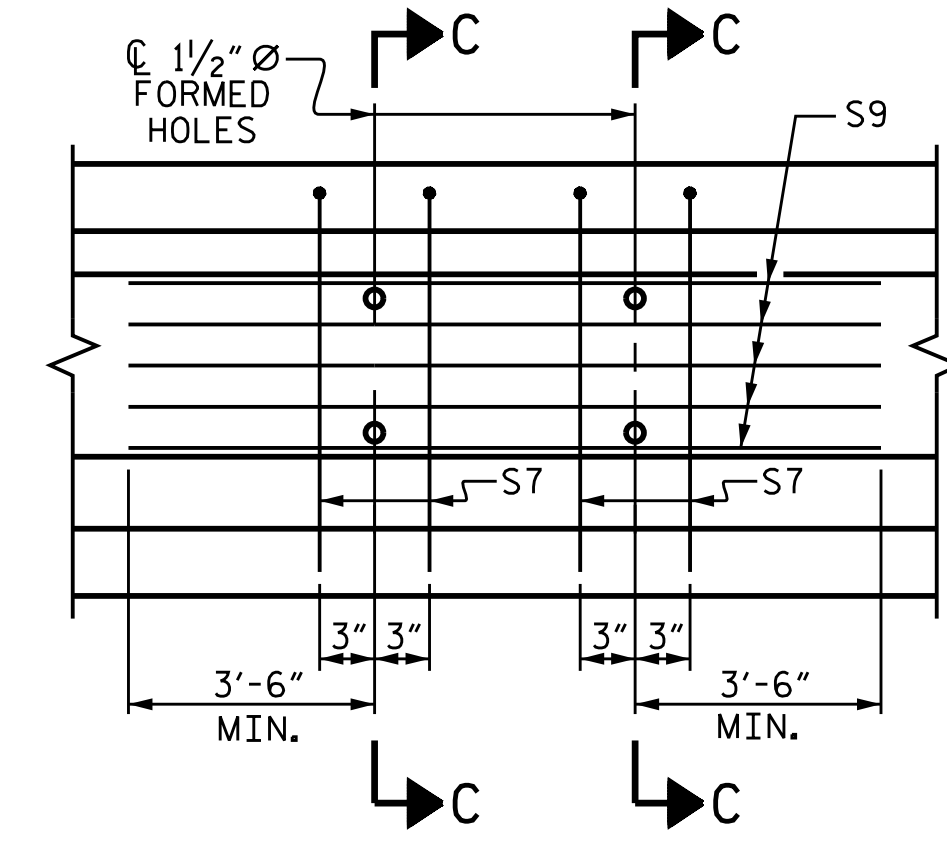
REINFORCING STEEL FOR ONE GIRDER						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	73	#5	1	8'-6"	647	
S2	12	#6	1	8'-6"	153	
S3	4	#4	3	8'-8"	23	
S4	76	#4	2	2'-9"	140	
*S6	8	#5	STR	3'-8"	31	
EXTERIOR GDR.	S7	2	#5	3	7'-2"	15
INTERIOR GDR.	S7	4	#5	3	7'-2"	30
EXTERIOR GDR.	S8	5	#4	STR	7'-0"	23
INTERIOR GDR.	S9	5	#4	STR	15'-11"	53
	S10	10	#5	STR	4'-0"	42

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

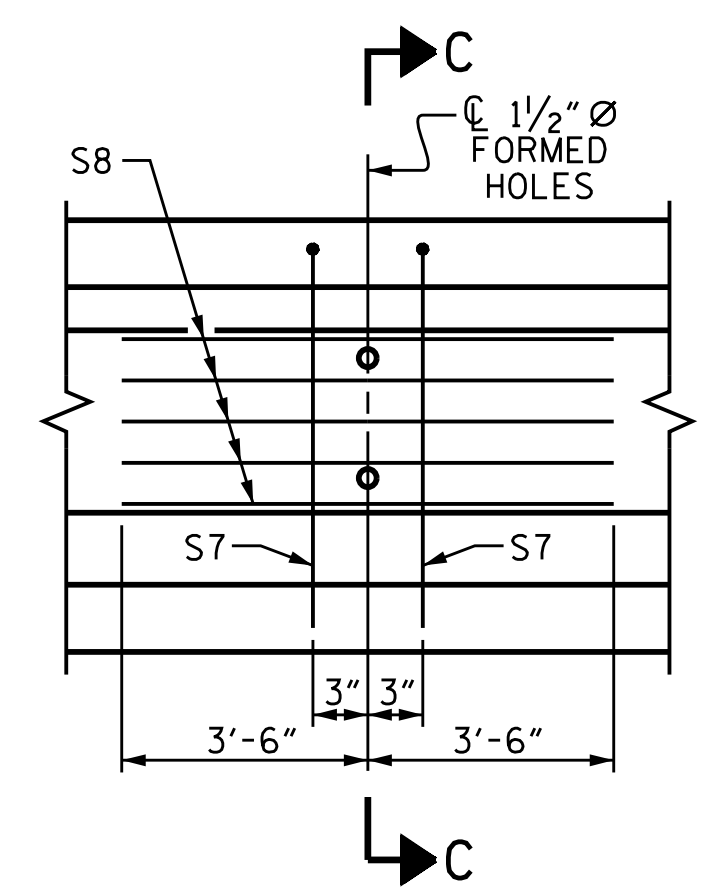
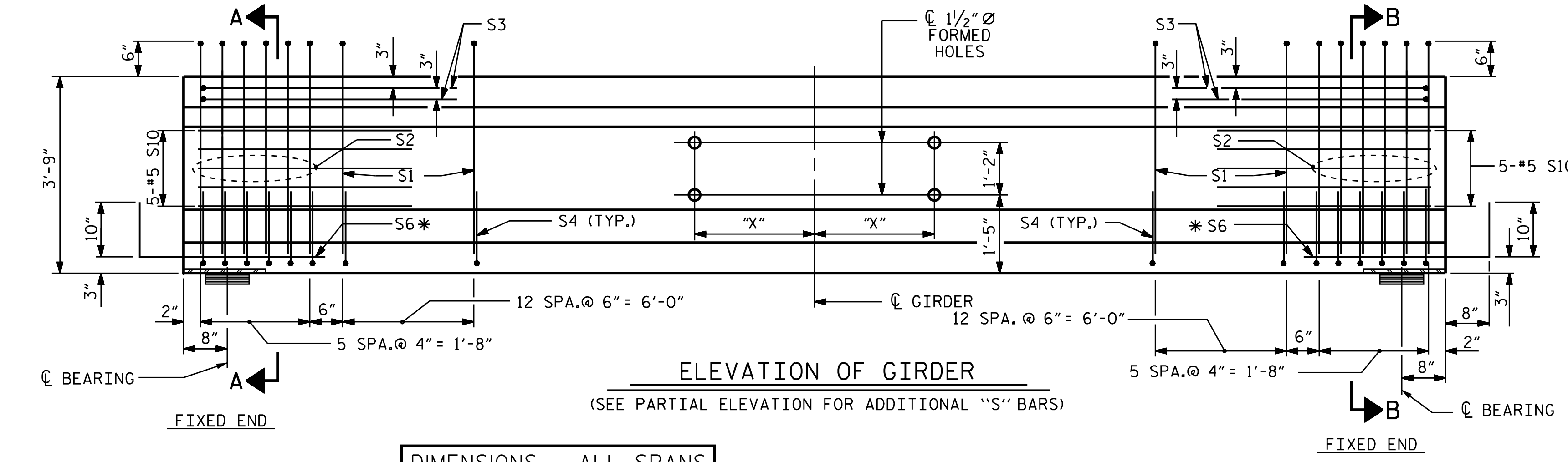
BAR TYPES
ALL BAR DIMENSIONS ARE OUT-TO-OUT



"A" = 8 SPA.
@ 10" = 6'-8"



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 2, 3, 6 & 7



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1, 4, 5 & 8

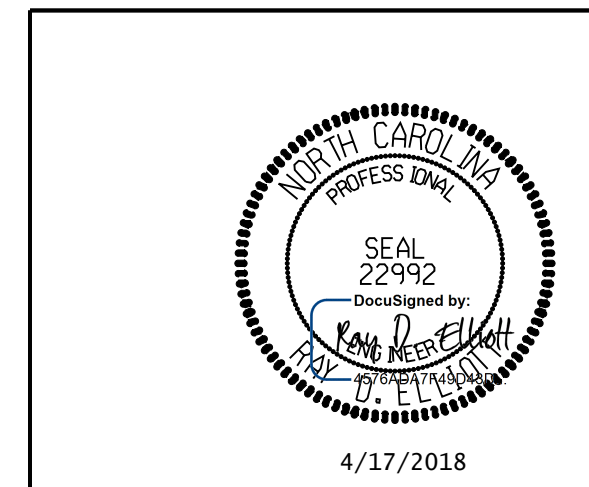
DIMENSIONS - ALL SPANS		
GIRDER	"X"	"Y"
1	---	3'-11 1/2"
2	3'-11 1/2"	3'-11 1/2"
3	3'-11 1/2"	3'-11 1/2"
4	3'-11 1/2"	---
5	---	4'-5 1/2"
6	4'-5 1/2"	4'-5 1/2"
7	4'-5 1/2"	4'-5 1/2"
8	4'-5 1/2"	---

QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL LB.	8,000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
EXTERIOR GIRDER	1,074	10	28
INTERIOR GIRDER	1,119	10	28

GIRDERS REQUIRED - SPAN B		
NUMBER	LENGTH	TOTAL LENGTH
8	69'-2"	553'-4"

PROJECT NO. B-4982
IREDELL COUNTY
STATION: 21+10.00-L-
SHEET 2 OF 3

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



DOCUMENT NOT CONSIDERED FINAL
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REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
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SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

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

STD. NO. PCG5

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.

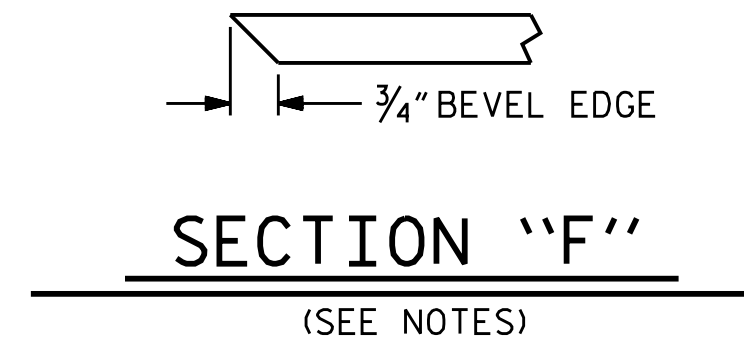
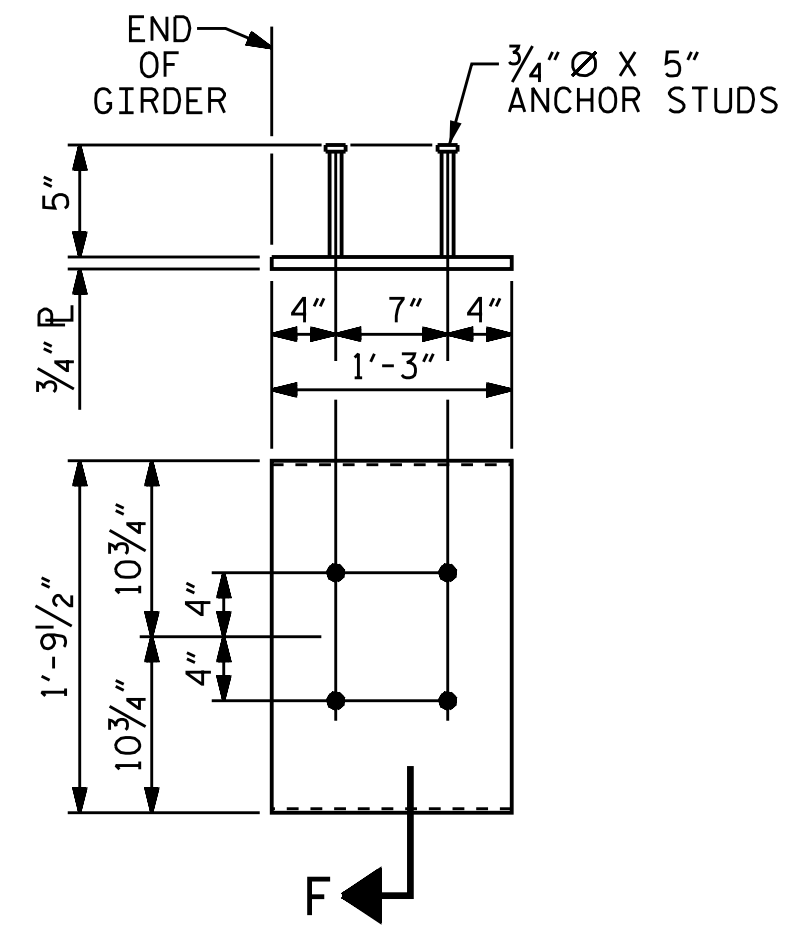
ALL PRESTRESSED STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,000 PSI.

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

THE TOP SURFACE OF THE GIRDER, SHALL BE RAKED TO A DEPTH OF 1/4" EXCEPT IN THE AREA BETWEEN THE STIRRUP AND THE EDGE OF THE GIRDER.

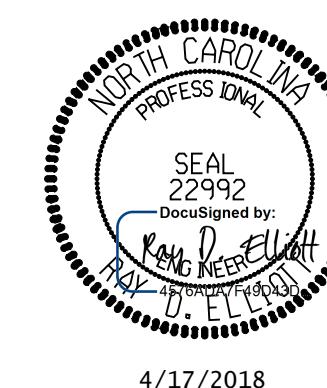
THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 LBS.



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

PROJECT NO. B-4982
IREDELL COUNTY
STATION: 21+10.00-L-

SHEET 3 OF 3



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

ASSEMBLED BY : NMW DATE : 2/17
CHECKED BY : RDE DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

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

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-22
2			4			TOTAL SHEETS 69

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

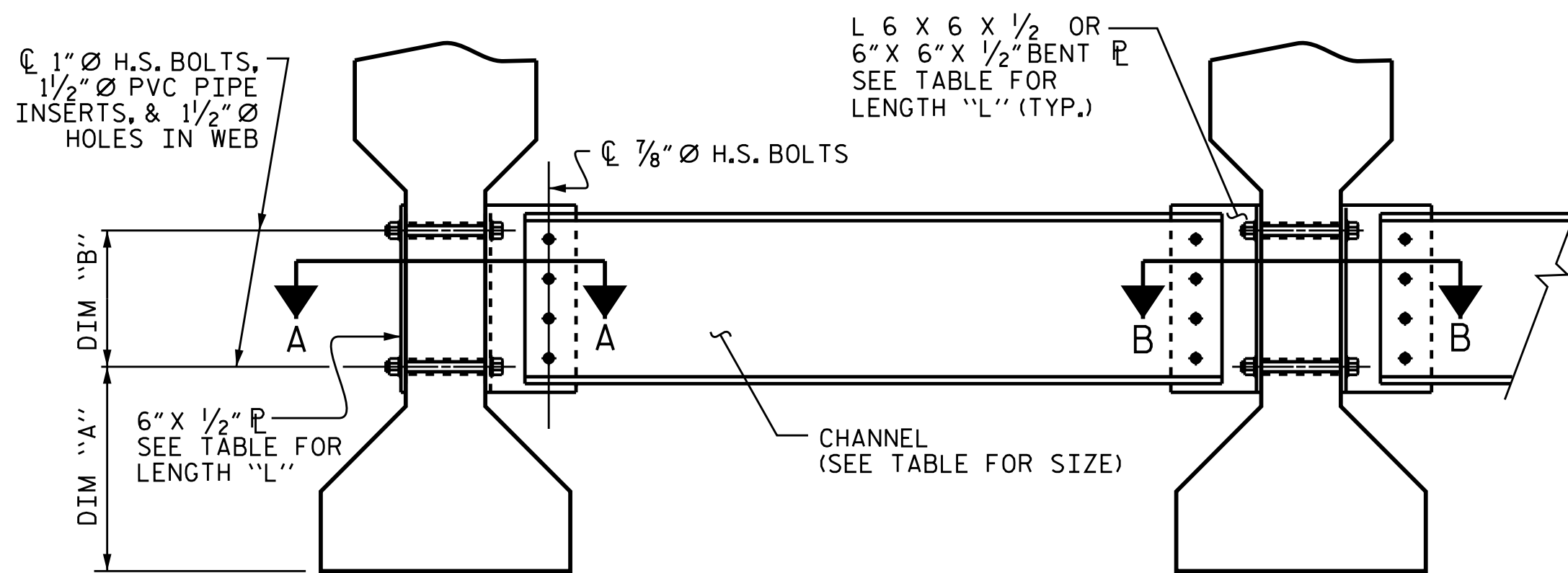
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

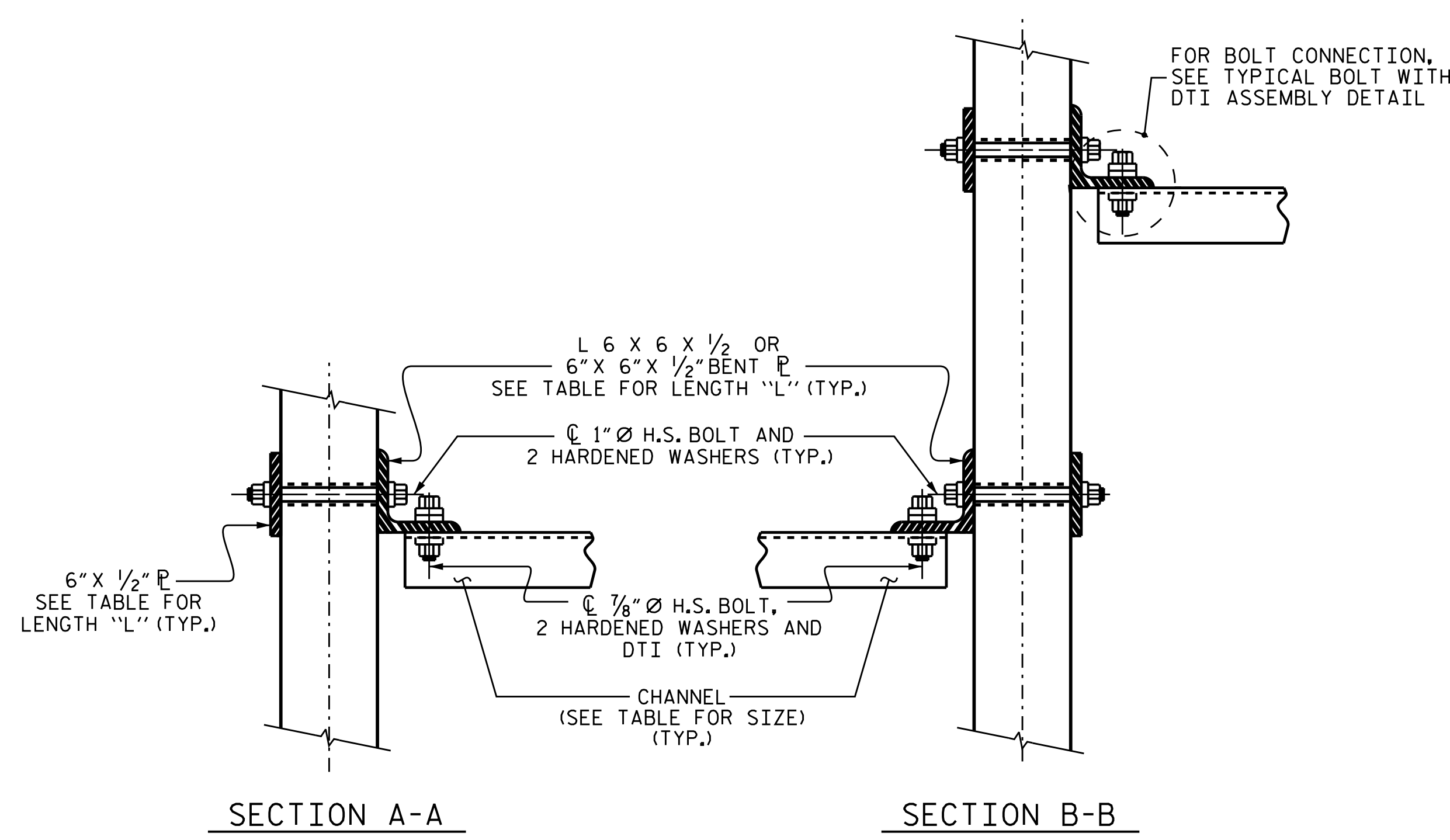
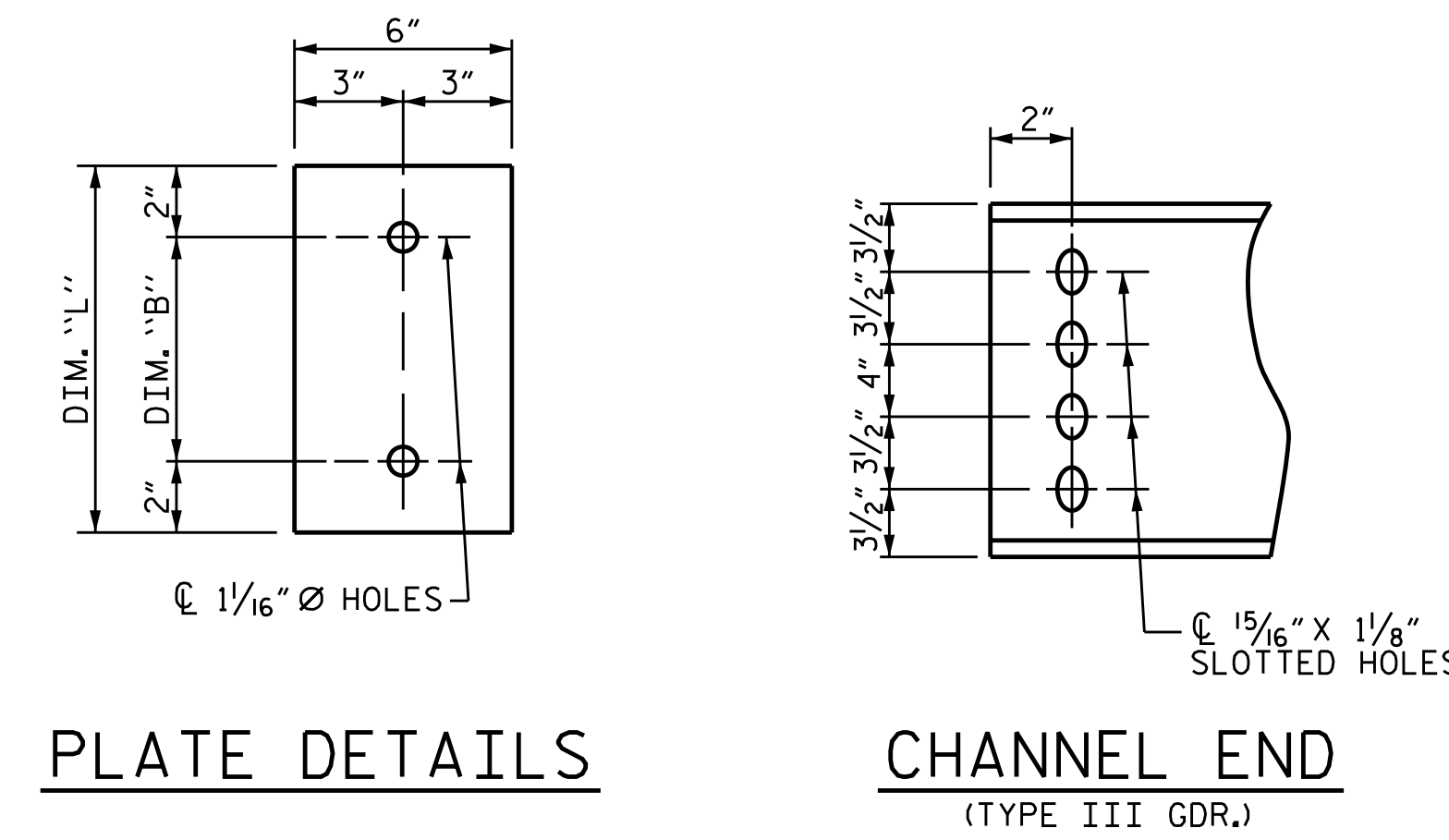
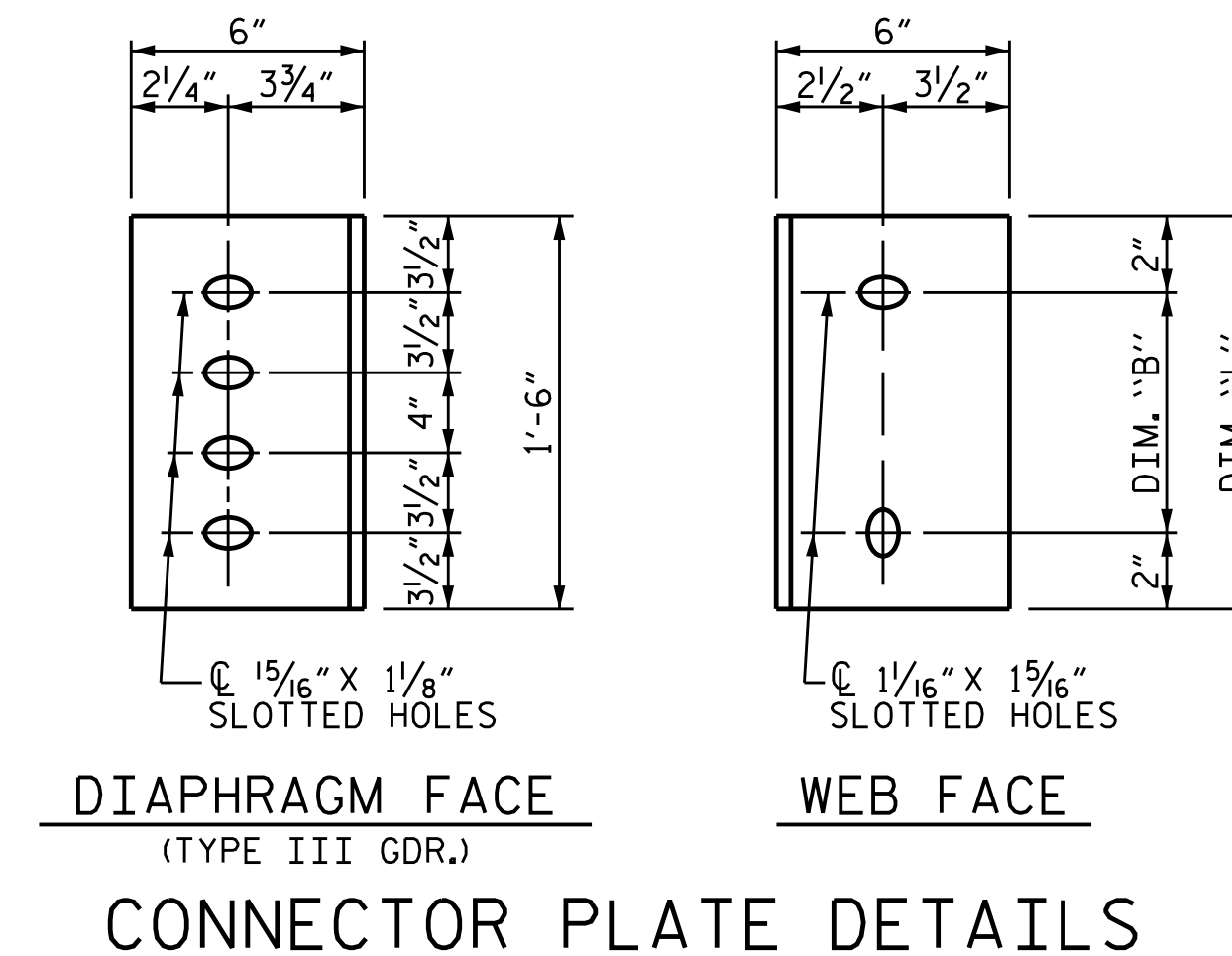
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

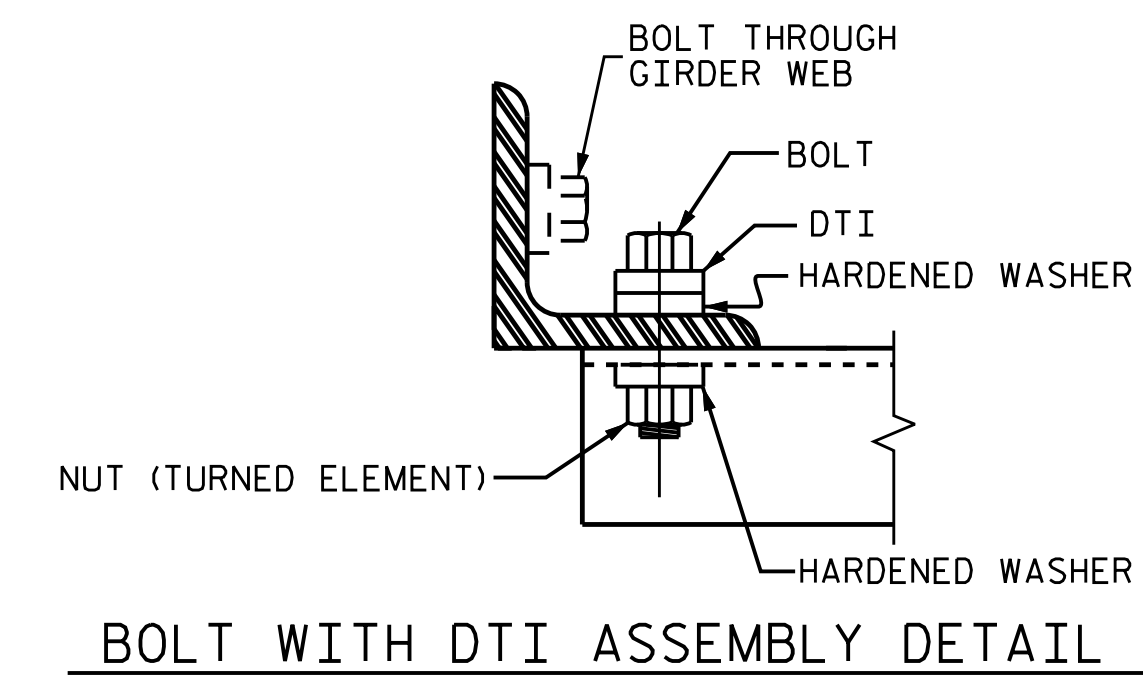
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



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



SECTION A-A SECTION B-B
CONNECTION DETAILS
(SKEW < 70° SHOWN)



BOLT WITH DTI ASSEMBLY DETAIL

TABLE

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

PROJECT NO. B-4982
IREDELL COUNTY
STATION: 21+10.00-L-

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
INTERMEDIATE
STEEL DIAPHRAGMS
FOR TYPE III
PRESTRESSED CONCRETE
GIRDERS

SHEET NO. S-23
TOTAL SHEETS 69

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

ASSEMBLED BY : RTJ	DATE : 2/17
CHECKED BY : RDE	DATE : 2/17
DRAWN BY : TLA 6/05	ADDED 10/21/05
CHECKED BY : VC 6/05	REV. 5/1/06RRR KMM/GM
	REV. 10/1/11 MAA/GM

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.

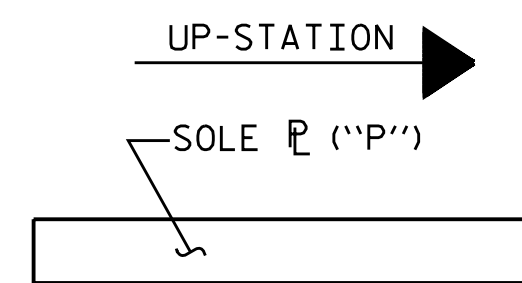
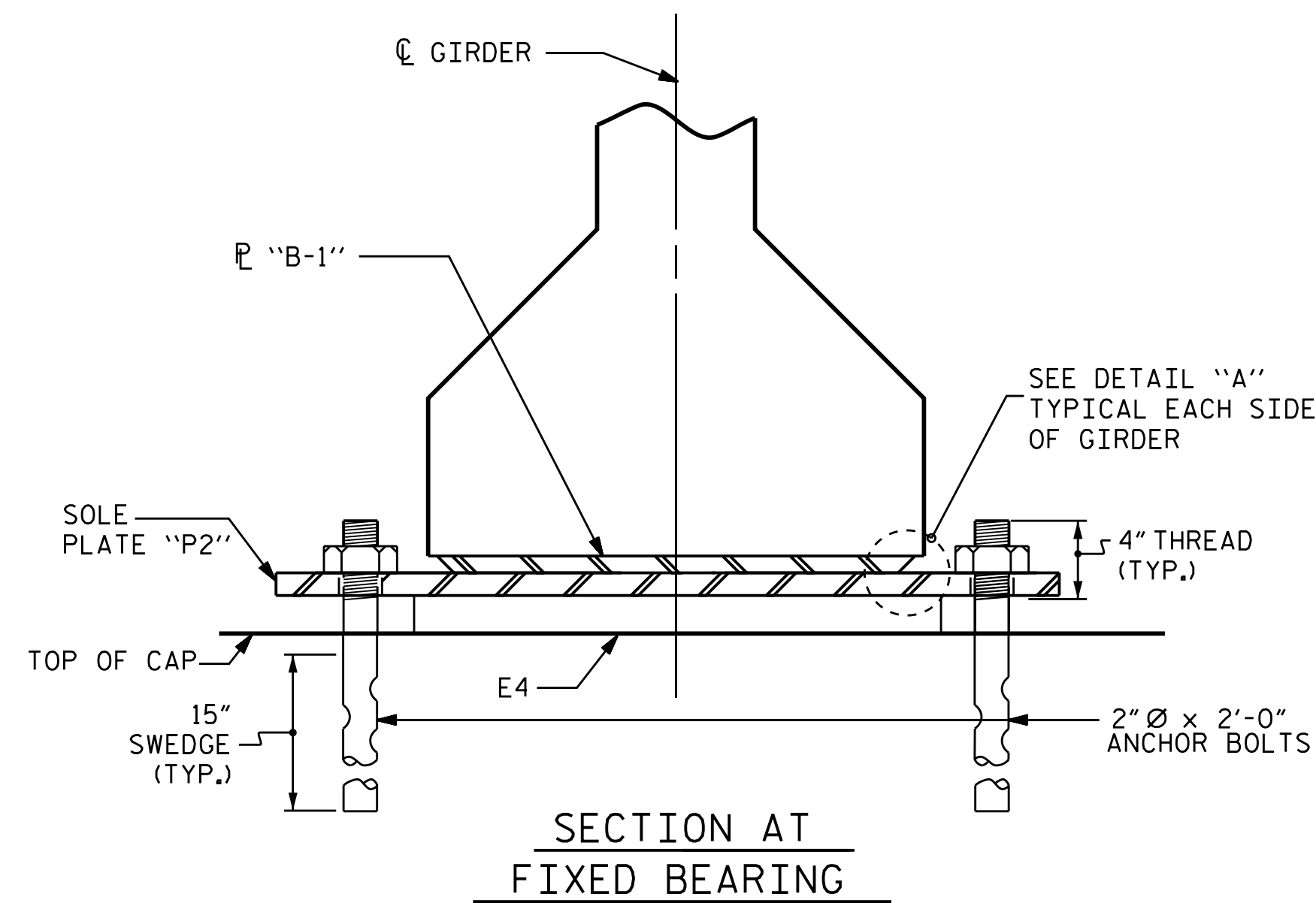
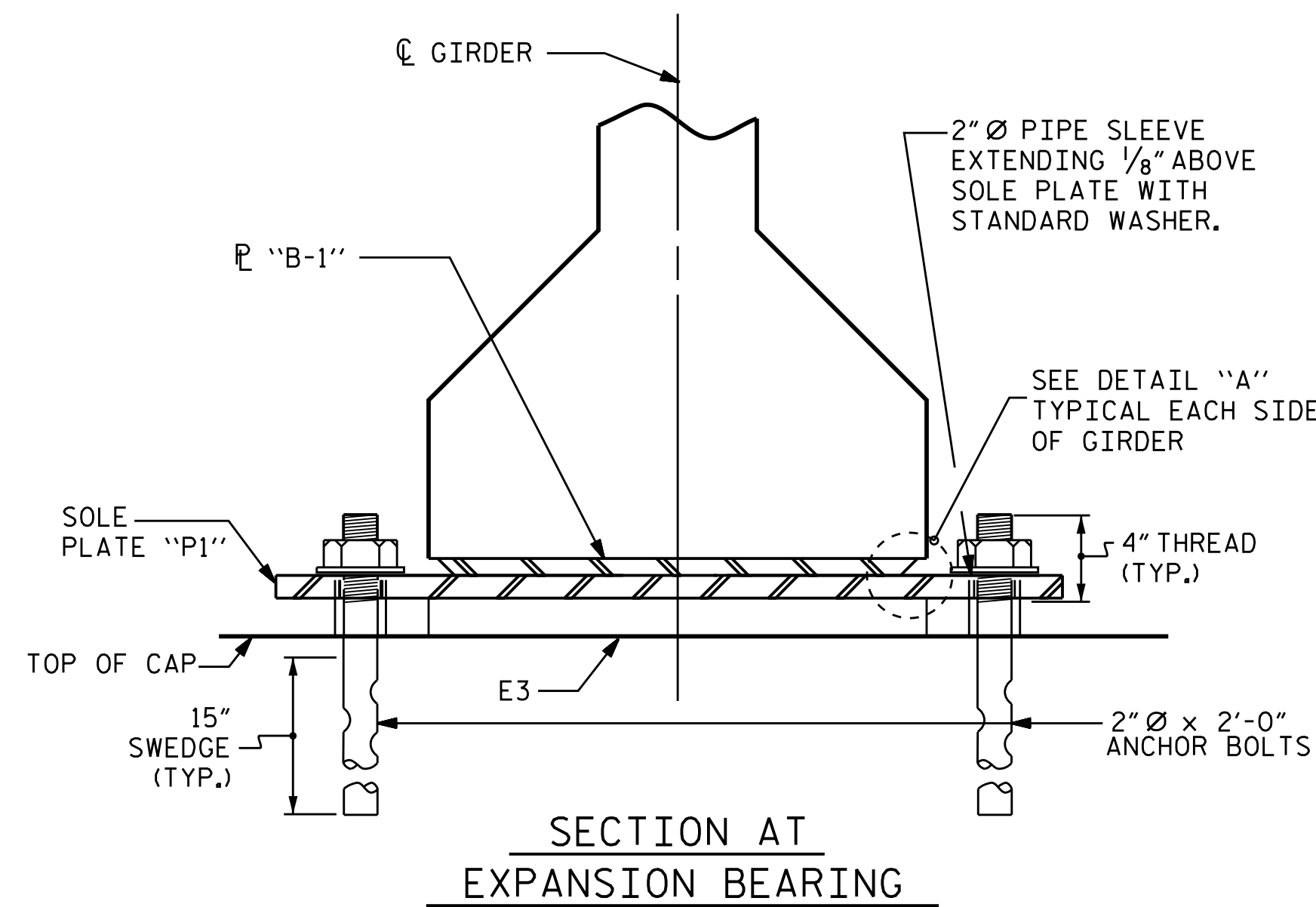
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

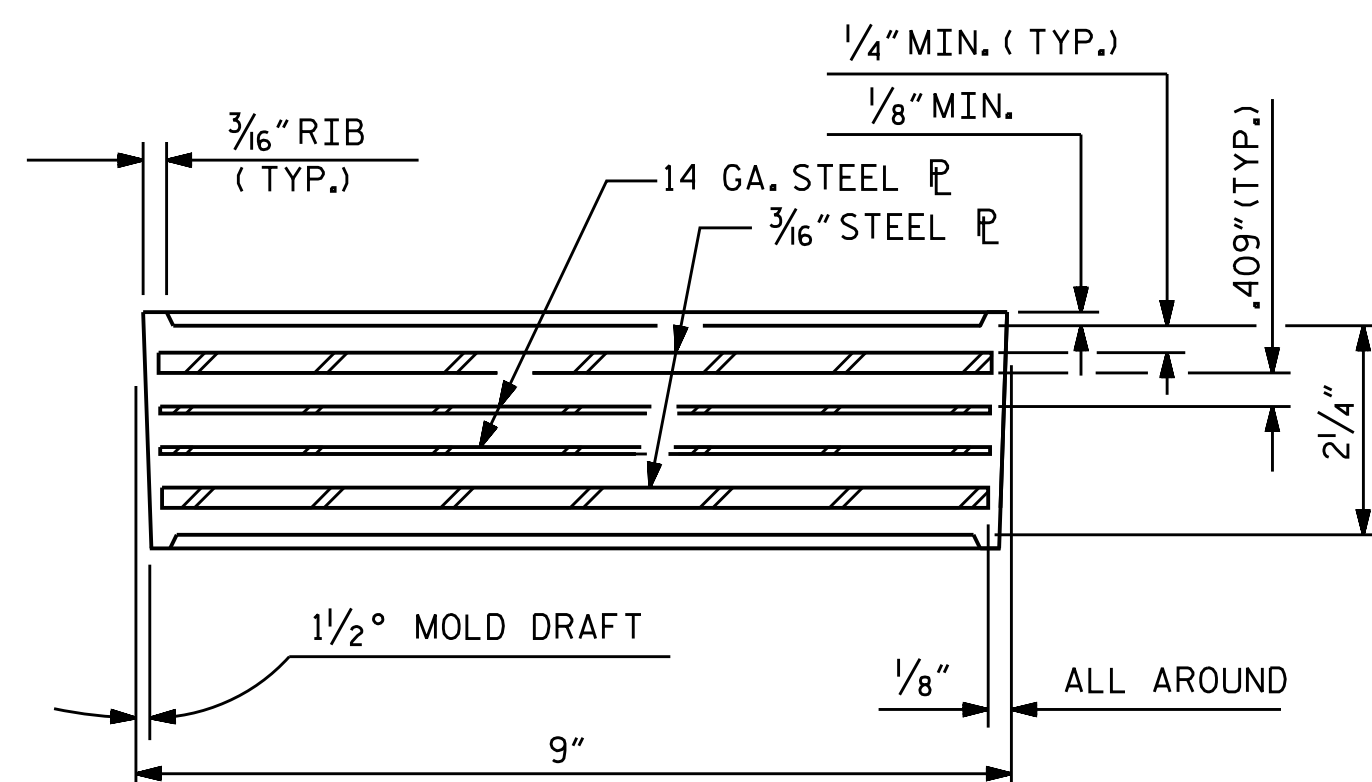
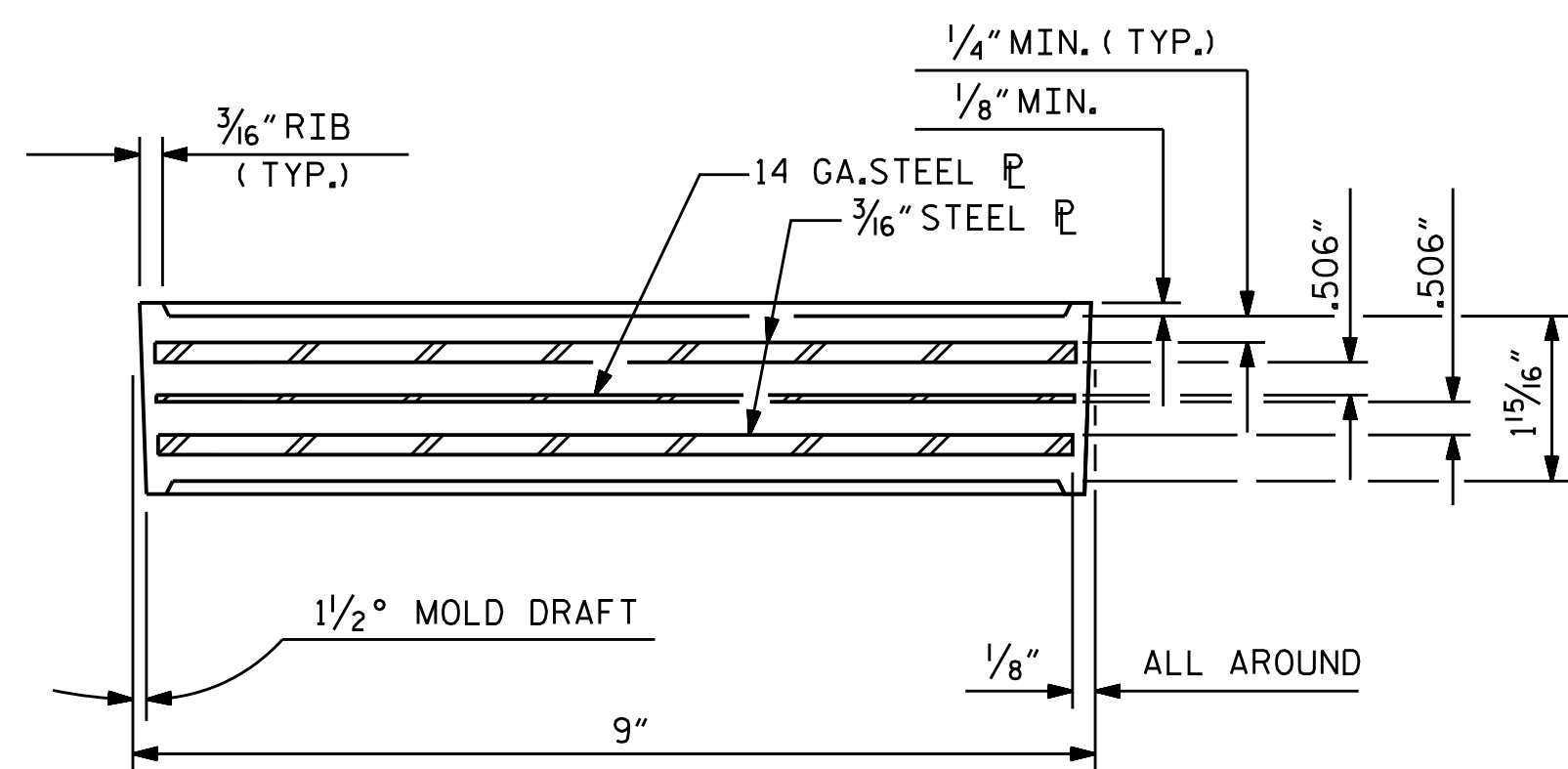
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

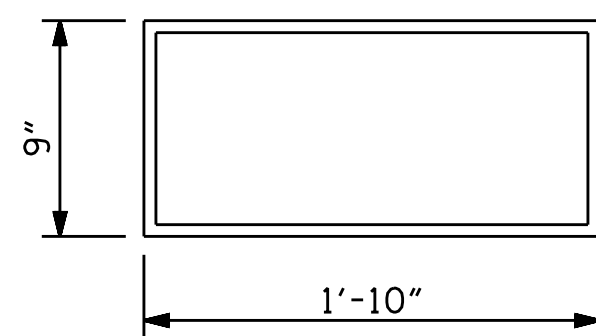


SOLE P PLACEMENT DETAIL



TYPICAL SECTION OF ELASTOMERIC BEARINGS

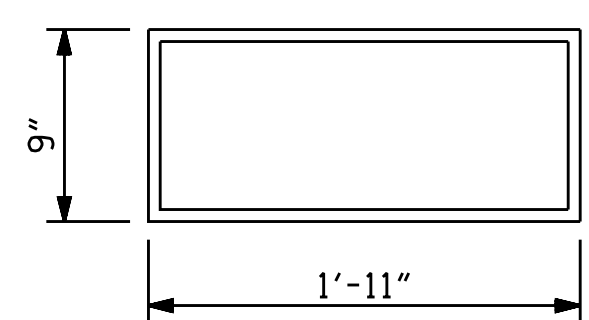
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E3 (16 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

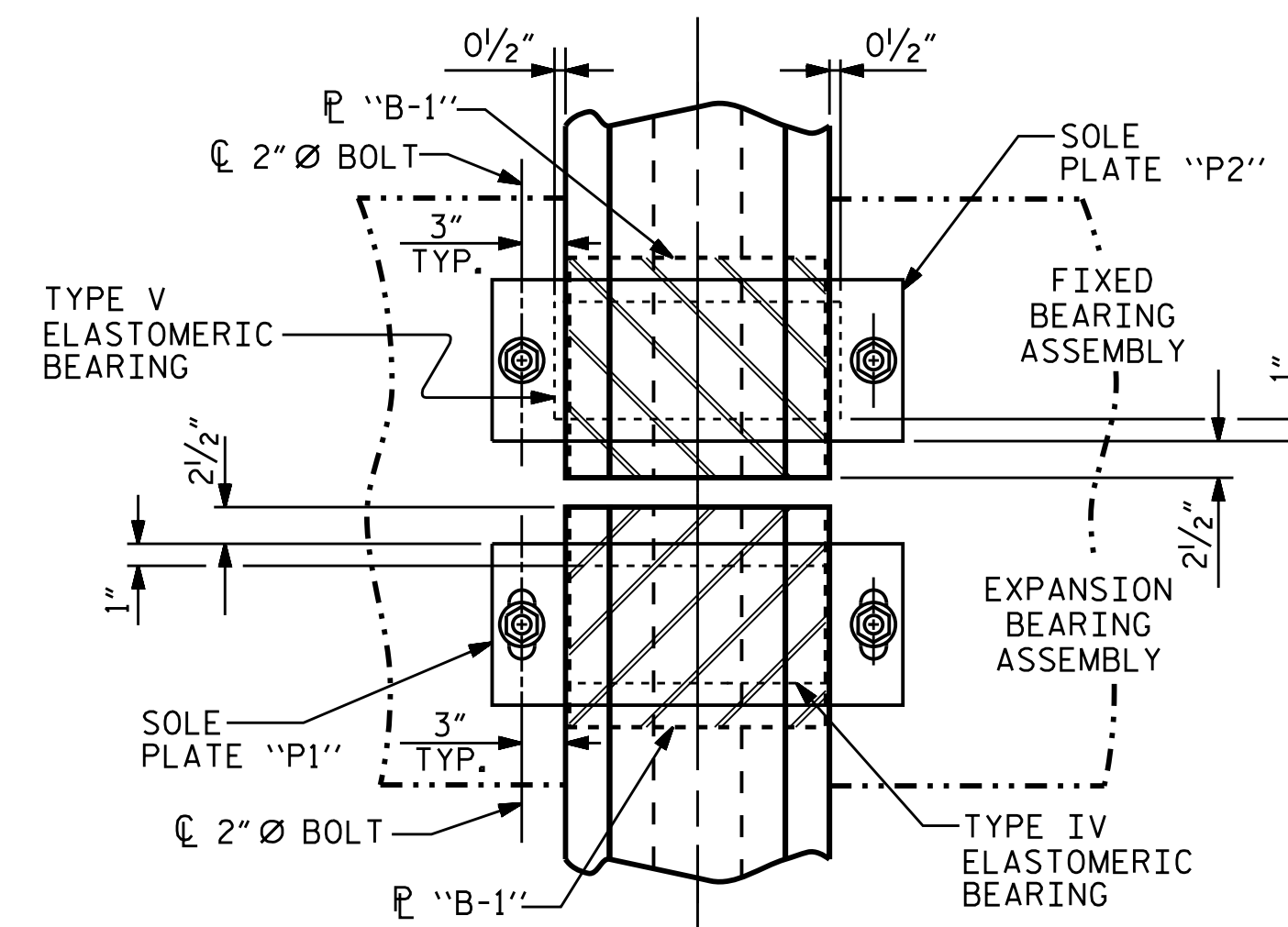
TYPE IV



E4 (32 REQ'D)

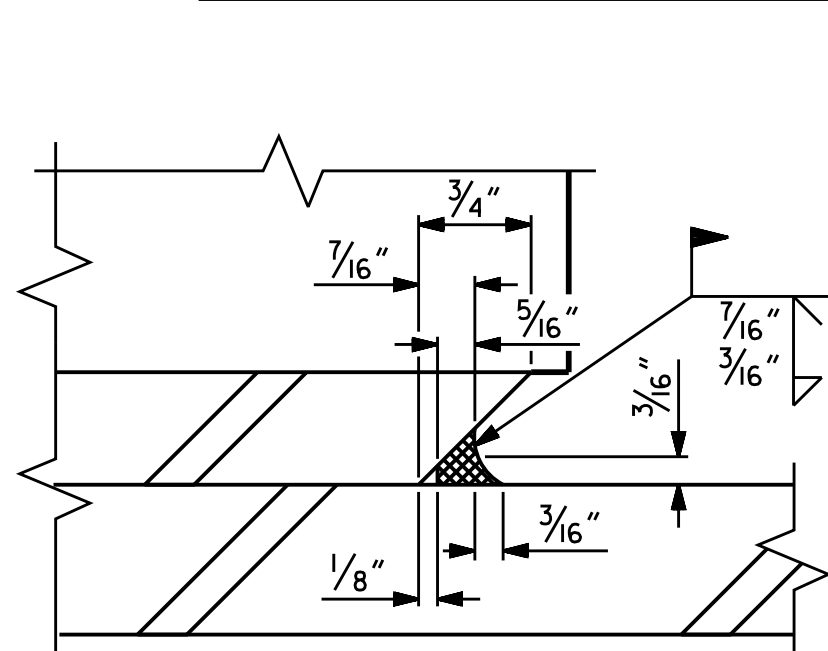
PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

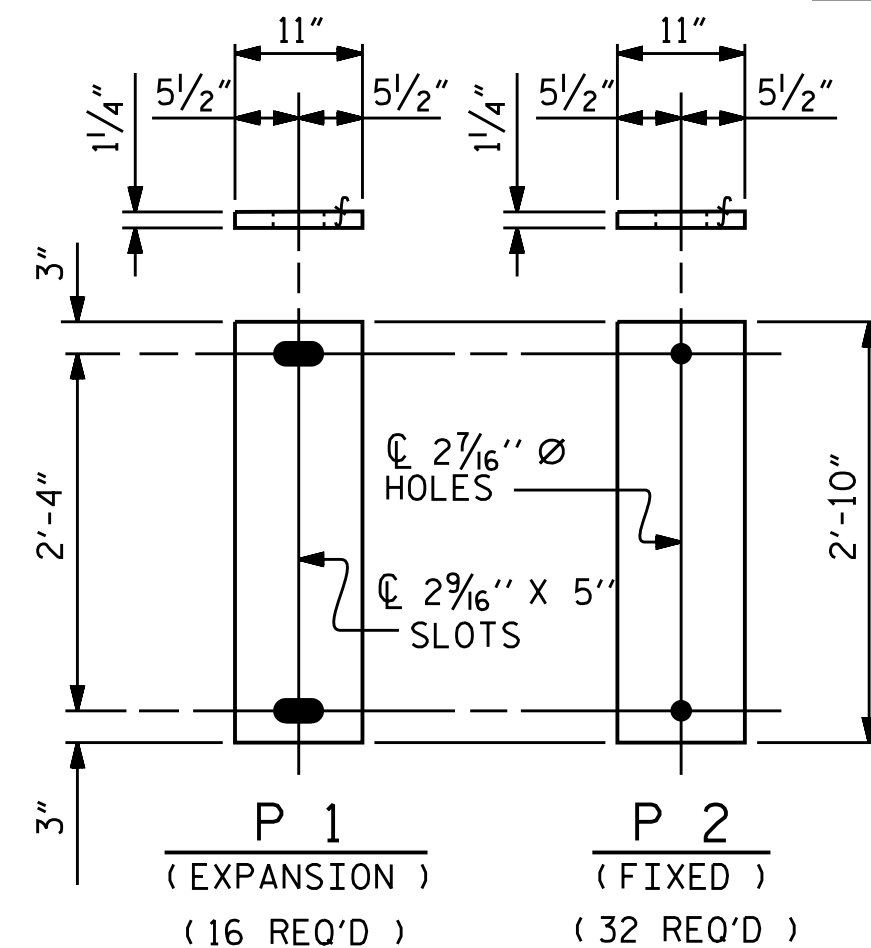


BEARING PLAN

PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00-L-



DETAIL "A"



P1 (EXPANSION) (16 REQ'D)

P2 (FIXED) (32 REQ'D)

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
 804-C N. LAFAYETTE ST
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

SEAL 22992
 DocuSigned by:
 RANDY REDELL
 RANDY D. REDELL
 4/17/2018

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			69

DRAWN BY: NMW DATE: 2/17
 CHECKED BY: RDE DATE: 2/17
 DESIGN ENGINEER OF RECORD: RDE DATE: 4/17

STAGE I DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION STRANDS	SPAN A GIRDER 5										SPAN B GIRDER 5										SPAN C GIRDER 5									
TENTH POINTS		.1	.2	.3	.4	.5	.6	.7	.8	.9		.1	.2	.3	.4	.5	.6	.7	.8	.9		.1	.2	.3	.4	.5	.6	.7	.8	.9
CAMBER (GIRDER ALONE IN PLACE)	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	.013	.026	.035	.041	.043	.041	.034	.025	.012	↓	.011	.023	.032	.037	.040	.037	.032	.023	.011	↓	.012	.025	.034	.041	.043	.041	.035	.026	.013
FINAL CAMBER	↑	1/4"	1/2"	11/16"	13/16"	7/8"	7/8"	3/4"	9/16"	5/16"	↑	5/16"	9/16"	3/4"	7/8"	15/16"	7/8"	3/4"	9/16"	5/16"	↑	5/16"	9/16"	3/4"	7/8"	7/8"	13/16"	11/16"	1/2"	1/4"

0.6" Ø LOW RELAXATION STRANDS	SPAN A GIRDERS 6 & 7										SPAN B GIRDERS 6 & 7										SPAN C GIRDERS 6 & 7									
TENTH POINTS		.1	.2	.3	.4	.5	.6	.7	.8	.9		.1	.2	.3	.4	.5	.6	.7	.8	.9		.1	.2	.3	.4	.5	.6	.7	.8	.9
CAMBER (GIRDER ALONE IN PLACE)	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	.020	.039	.053	.063	.066	.062	.053	.038	.019	↓	.018	.036	.050	.059	.063	.059	.050	.036	.018	↓	.019	.038	.053	.062	.066	.063	.053	.039	.020
FINAL CAMBER	↑	3/16"	3/8"	1/2"	9/16"	5/8"	9/16"	1/2"	3/8"	3/16"	↑	1/4"	3/8"	9/16"	5/8"	5/8"	5/8"	9/16"	3/8"	1/4"	↑	3/16"	3/8"	1/2"	9/16"	5/8"	9/16"	1/2"	3/8"	3/16"

0.6" Ø LOW RELAXATION STRANDS	SPAN A GIRDER 8										SPAN B GIRDER 8										SPAN C GIRDER 8									
TENTH POINTS		.1	.2	.3	.4	.5	.6	.7	.8	.9		.1	.2	.3	.4	.5	.6	.7	.8	.9		.1	.2	.3	.4	.5	.6	.7	.8	.9
CAMBER (GIRDER ALONE IN PLACE)	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	.017	.033	.045	.053	.056	.053	.045	.032	.016	↓	.015	.030	.042	.050	.052	.050	.042	.030	.015	↓	.016	.032	.045	.053	.056	.053	.045	.033	.017
FINAL CAMBER	↑	1/4"	7/16"	5/8"	11/16"	3/4"	11/16"	5/8"	7/16"	1/4"	↑	1/4"	1/2"	5/8"	3/4"	3/4"	3/4"	5/8"	1/2"	1/4"	↑	1/4"	7/16"	5/8"	11/16"	3/4"	11/16"	5/8"	7/16"	1/4"

FINAL DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION STRANDS	SPAN A GIRDER 1										SPAN B GIRDER 1										SPAN C GIRDER 1									
TENTH POINTS		.1	.2	.3	.4	.5	.6	.7	.8	.9		.1	.2	.3	.4	.5	.6	.7	.8	.9		.1	.2	.3	.4	.5	.6	.7	.8	.9
CAMBER (GIRDER ALONE IN PLACE)	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	.019	.036	.049	.056	.059	.055	.046	.033	.016	↓	.014	.028	.039	.046	.049	.046	.039	.028	.014	↓	.016	.033	.046	.055	.059	.056	.049	.036	.019
FINAL CAMBER	↑	3/16"	3/8"	9/16"	11/16"	11/16"	9/16"	7/16"	1/4"	↑	1/4"	1/2"	11/16"	3/4"	13/16"	3/4"	11/16"	1/2"	1/4"	↑	1/4"	7/16"	9/16"	11/16"	11/16"	11/16"	9/16"	3/8"	3/16"	

0.6" Ø LOW RELAXATION STRANDS	SPAN A GIRDER 2										SPAN B GIRDER 2										SPAN C GIRDER 2									
TENTH POINTS		.1	.2	.3	.4	.5	.6	.7	.8	.9		.1	.2	.3	.4	.5	.6	.7	.8	.9		.1	.2	.3	.4	.5	.6	.7	.8	.9
CAMBER (GIRDER ALONE IN PLACE)	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	.020	.039	.053	.062	.064	.060	.051	.036	.018	↓	.016	.032	.045	.053	.056	.053	.045	.032	.016	↓	.018	.036	.051	.060	.064	.062	.053	.039	.020
FINAL CAMBER	↑	3/16"	3/8"	1/2"	5/8"	5/8"	5/8"	1/2"	3/8"	1/4"	↑	1/4"	7/16"	5/8"	11/16"	3/4"	11/16"	5/8"	7/16"	1/4"	↑	1/4"	3/8"	1/2"	5/8"	5/8"	5/8"	1/2"	3/8"	3/16"

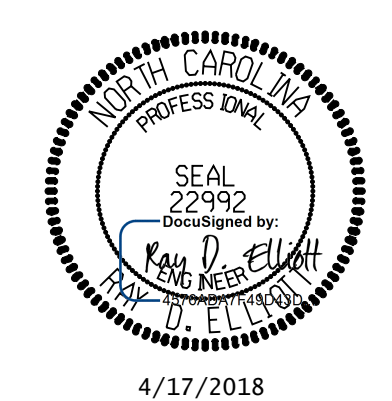
0.6" Ø LOW RELAXATION STRANDS	SPAN A GIRDER 3										SPAN B GIRDER 3										SPAN C GIRDER 3									
TENTH POINTS		.1	.2	.3	.4	.5	.6	.7	.8	.9		.1	.2	.3	.4	.5	.6	.7	.8	.9		.1	.2	.3	.4	.5	.6	.7	.8	.9
CAMBER (GIRDER ALONE IN PLACE)	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	.020	.038	.051	.060	.063	.059	.050	.035	.018	↓	.016	.032	.045	.053	.056	.053	.045	.032	.016	↓	.015	.029	.040	.047	.049	.046	.039	.027	.013
FINAL CAMBER	↑	3/16"	3/8"	1/2"	5/8"	5/8"	5/8"	9/16"	7/16"	1/4"	↑	1/4"	7/16"	5/8"	11/16"	3/4"	11/16"	5/8"	7/16"	1/4"	↑	1/4"	1/2"	5/8"	3/4"	13/16"	13/16"	11/16"	1/2"	5/16"

0.6" Ø LOW RELAXATION STRANDS	SPAN A GIRDER 4										SPAN B GIRDER 4										SPAN C GIRDER 4									
TENTH POINTS		.1	.2	.3	.4	.5	.6	.7	.8	.9		.1	.2	.3	.4	.5	.6	.7	.8	.9		.1	.2	.3	.4	.5	.6	.7	.8	.9
CAMBER (GIRDER ALONE IN PLACE)	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	.015	.029	.040	.046	.049	.046	.039	.028	.014	↓	.013	.026	.037	.044	.046	.044	.037	.026	.013	↓	.014	.028	.039	.046	.049	.046	.040	.029	.016
FINAL CAMBER	↑	1/4"	1/2"	11/16"	3/4"	13/16"	13/16"	11/16"	1/2"	1/4"	↑	5/16"	1/2"	11/16"	13/16"	7/8"	13/16"	11/16"	1/2"	5/16"	↑	1/4"	1/2"	11/16"	13/16"	13/16"	3/4"	11/16"	1/2"	1/4"

* INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET, EXCEPT "FINAL CAMBER" WHICH IS SHOWN IN INCHES.

PROJECT NO. B-4982
IREDELL COUNTY
STATION: 21+10.00-L-

SHEET 1 OF 2



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUPERSTRUCTURE
DEAD LOAD
DEFLECTIONS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-25
2			4			TOTAL SHEETS 69

DRAWN BY : RTJ DATE : 2/17
CHECKED BY : RDE DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

FINAL DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION STRANDS		SPAN A GIRDER 5									SPAN B GIRDER 5									SPAN C GIRDER 5											
TENTH POINTS		.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9			
CAMBER (GIRDER ALONE IN PLACE)		↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037
* DEFLECTION DUE TO SUPERIMPOSED D.L.		↓	.016	.031	.042	.050	.052	.049	.042	.030	.015	↓	.014	.028	.040	.047	.049	.047	.040	.028	.014	↓	.015	.030	.042	.049	.052	.050	.042	.031	.016
FINAL CAMBER		↑	1/4"	7/16"	5/8"	3/4"	3/4"	3/4"	5/8"	1/2"	1/4"	↑	1/4"	1/2"	11/16"	3/4"	13/16"	3/4"	11/16"	1/2"	1/4"	↑	1/4"	1/2"	5/8"	3/4"	3/4"	3/4"	5/8"	7/16"	1/4"

0.6" Ø LOW RELAXATION STRANDS		SPAN A GIRDER 6									SPAN B GIRDER 6									SPAN C GIRDER 6											
TENTH POINTS		.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9			
CAMBER (GIRDER ALONE IN PLACE)		↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037
* DEFLECTION DUE TO SUPERIMPOSED D.L.		↓	.022	.042	.057	.067	.070	.066	.055	.039	.020	↓	.018	.036	.050	.059	.063	.059	.050	.036	.018	↓	.017	.033	.046	.053	.055	.052	.044	.031	.015
FINAL CAMBER		↑	3/16"	5/16"	7/16"	9/16"	9/16"	9/16"	1/2"	3/8"	3/16"	↑	1/4"	3/8"	9/16"	5/8"	5/8"	5/8"	9/16"	133"	1/4"	↑	1/4"	7/16"	5/8"	11/16"	3/4"	11/16"	5/8"	7/16"	1/4"

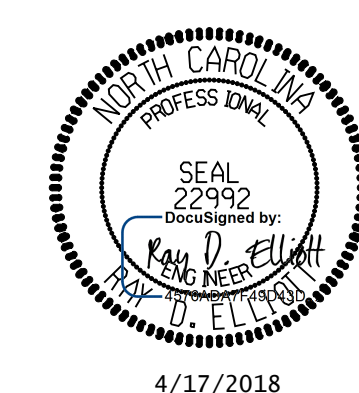
0.6" Ø LOW RELAXATION STRANDS		SPAN A GIRDER 7									SPAN B GIRDER 7									SPAN C GIRDER 7											
TENTH POINTS		.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9			
CAMBER (GIRDER ALONE IN PLACE)		↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037
* DEFLECTION DUE TO SUPERIMPOSED D.L.		↓	.022	.043	.058	.068	.071	.067	.056	.040	.020	↓	.017	.036	.050	.059	.063	.059	.050	.036	.017	↓	.020	.040	.056	.067	.071	.068	.058	.043	.022
FINAL CAMBER		↑	3/16"	5/16"	7/16"	1/2"	9/16"	9/16"	7/16"	3/8"	3/16"	↑	1/4"	3/8"	9/16"	5/8"	5/8"	5/8"	9/16"	3/8"	1/4"	↑	3/16"	3/8"	7/16"	9/16"	9/16"	1/2"	7/16"	5/16"	3/16"

0.6" Ø LOW RELAXATION STRANDS		SPAN A GIRDER 8									SPAN B GIRDER 8									SPAN C GIRDER 8											
TENTH POINTS		.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9			
CAMBER (GIRDER ALONE IN PLACE)		↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037	↑	.037	.069	.095	.111	.117	.111	.095	.069	.037
* DEFLECTION DUE TO SUPERIMPOSED D.L.		↓	.020	.038	.051	.060	.062	.058	.049	.035	.017	↓	.015	.030	.042	.050	.051	.050	.042	.030	.015	↓	.017	.035	.049	.058	.062	.060	.051	.038	.020
FINAL CAMBER		↑	3/16"	3/8"	1/2"	5/8"	11/16"	5/8"	9/16"	7/16"	1/4"	↑	5/16"	1/2"	5/8"	3/4"	13/16"	3/4"	5/8"	1/2"	1/4"	↑	1/4"	7/16"	9/16"	5/8"	11/16"	5/8"	1/2"	3/8"	3/16"

* INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET, EXCEPT "FINAL CAMBER" WHICH IS SHOWN IN INCHES.

PROJECT NO. B-4982
IREDELL COUNTY
STATION: 21+10.00-L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

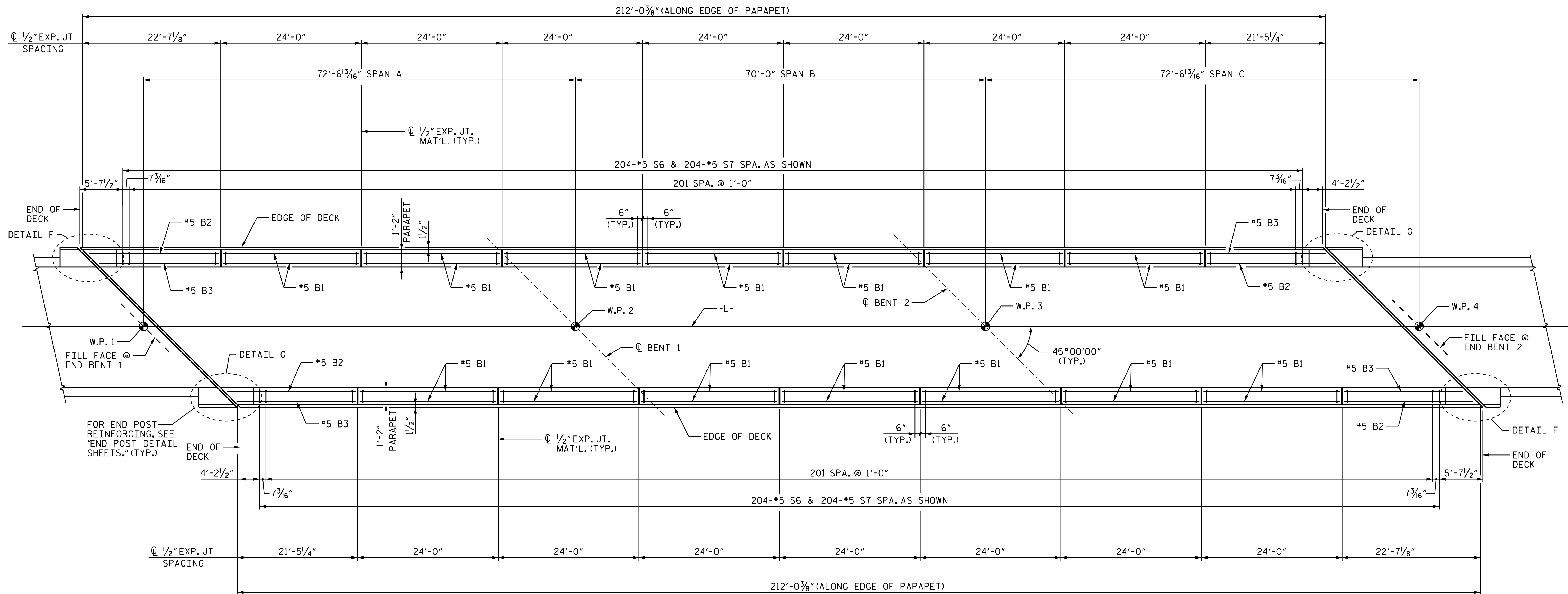
SUPERSTRUCTURE
DEAD LOAD
DEFLECTIONS

DRAWN BY : RTJ DATE : 2/17
CHECKED BY : RDE DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

DOCUMENT NOT CONSIDERED FINAL
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TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			69



PARAPET LAYOUT

NOTES

ALL REINFORCING STEEL IN THE PARAPET SHALL BE EPOXY COATED.

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

THE #5 "S" BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL.

PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00-L-

SHEET 1 OF 3

4/17/2018

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

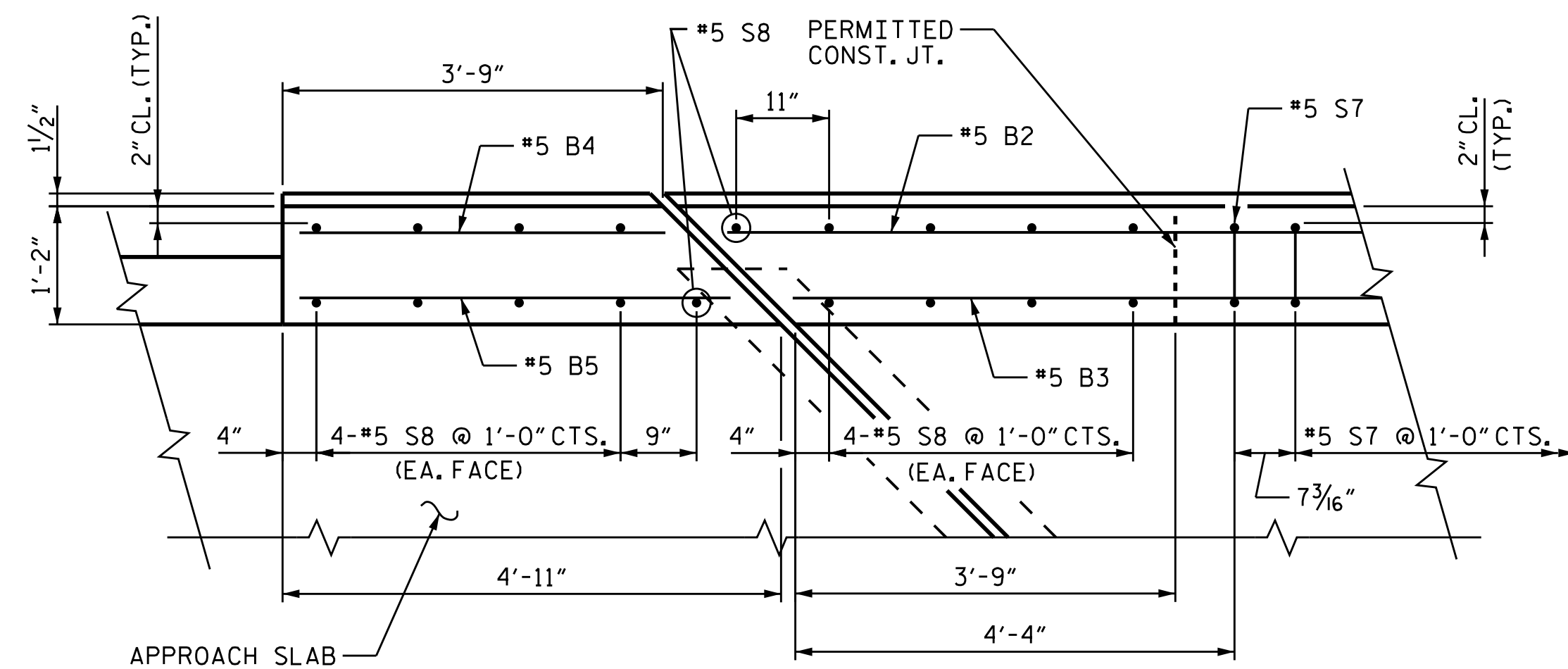
SUPERSTRUCTURE
 PARAPET
 LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-27
2			4			TOTAL SHEETS 69

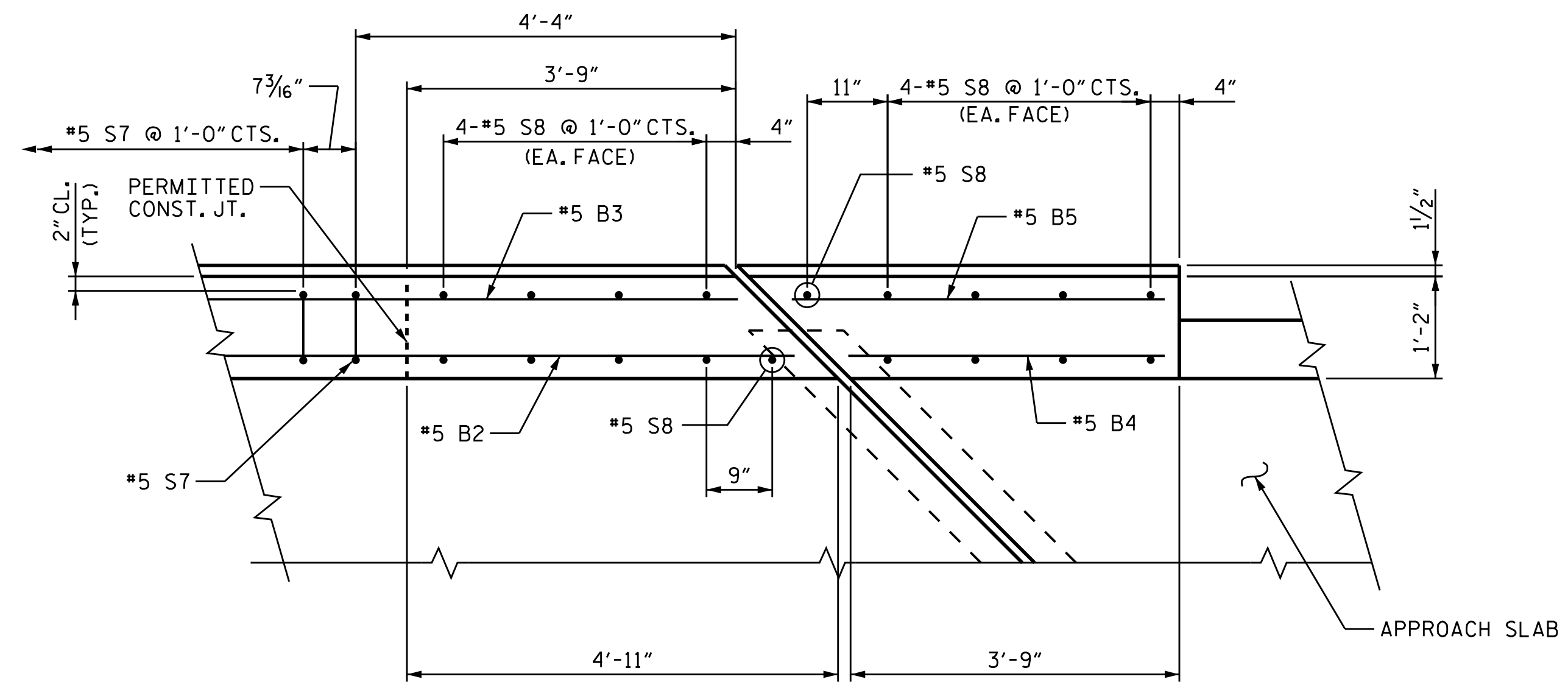
DRAWN BY : RTJ DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

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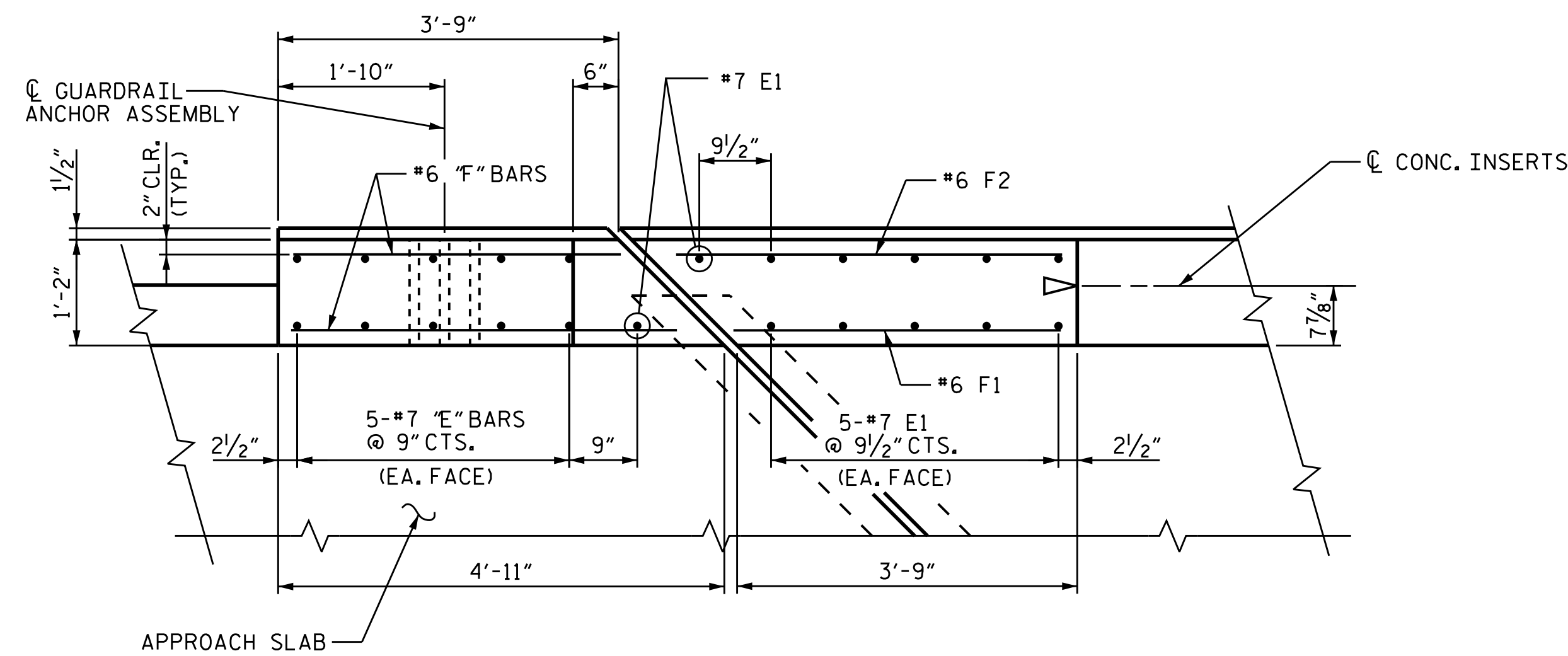
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 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275



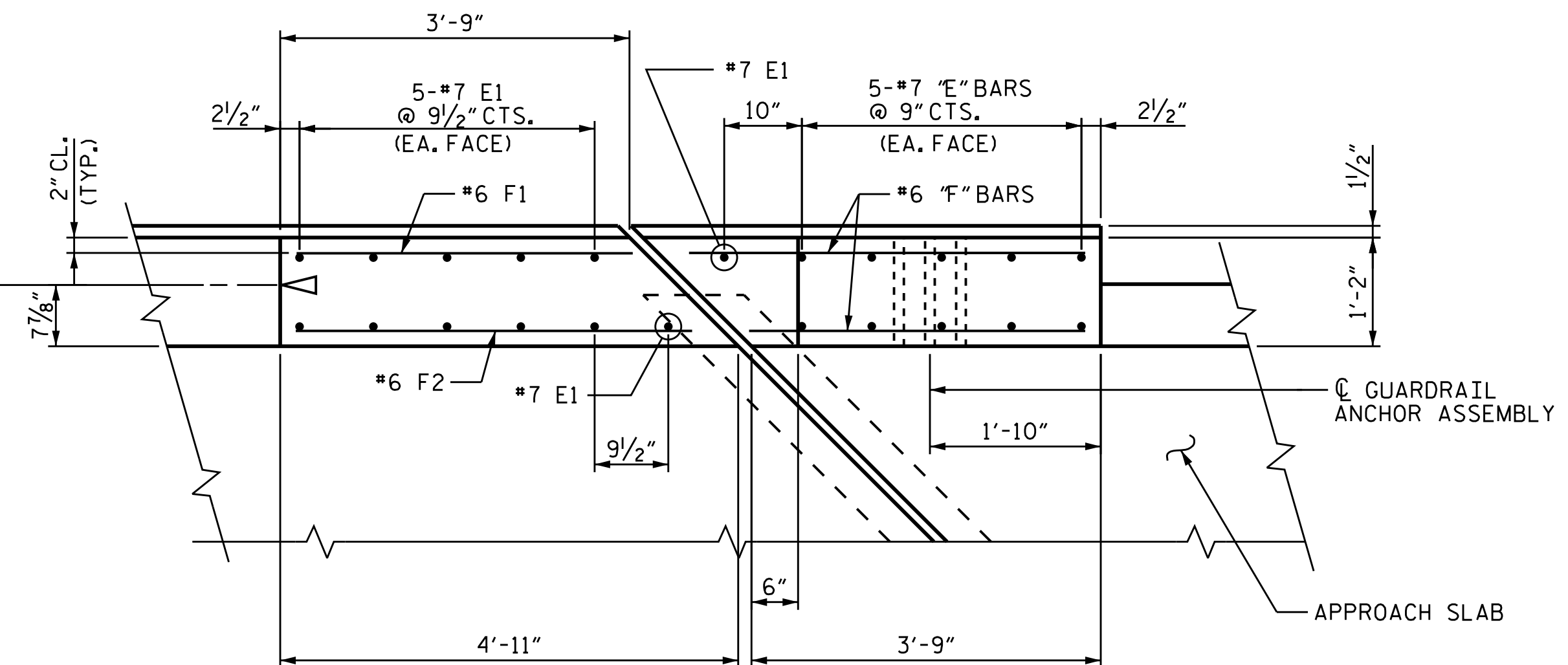
DETAIL F
PLAN OF END PARAPET



DETAIL G
PLAN OF END PARAPET



DETAIL F
PLAN OF END POST



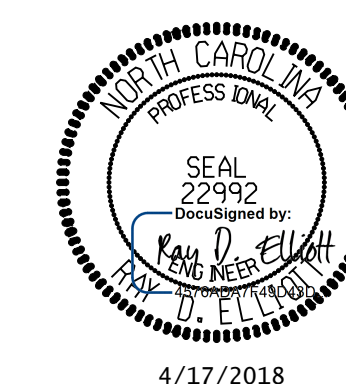
DETAIL G
PLAN OF END POST

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 2 OF 3



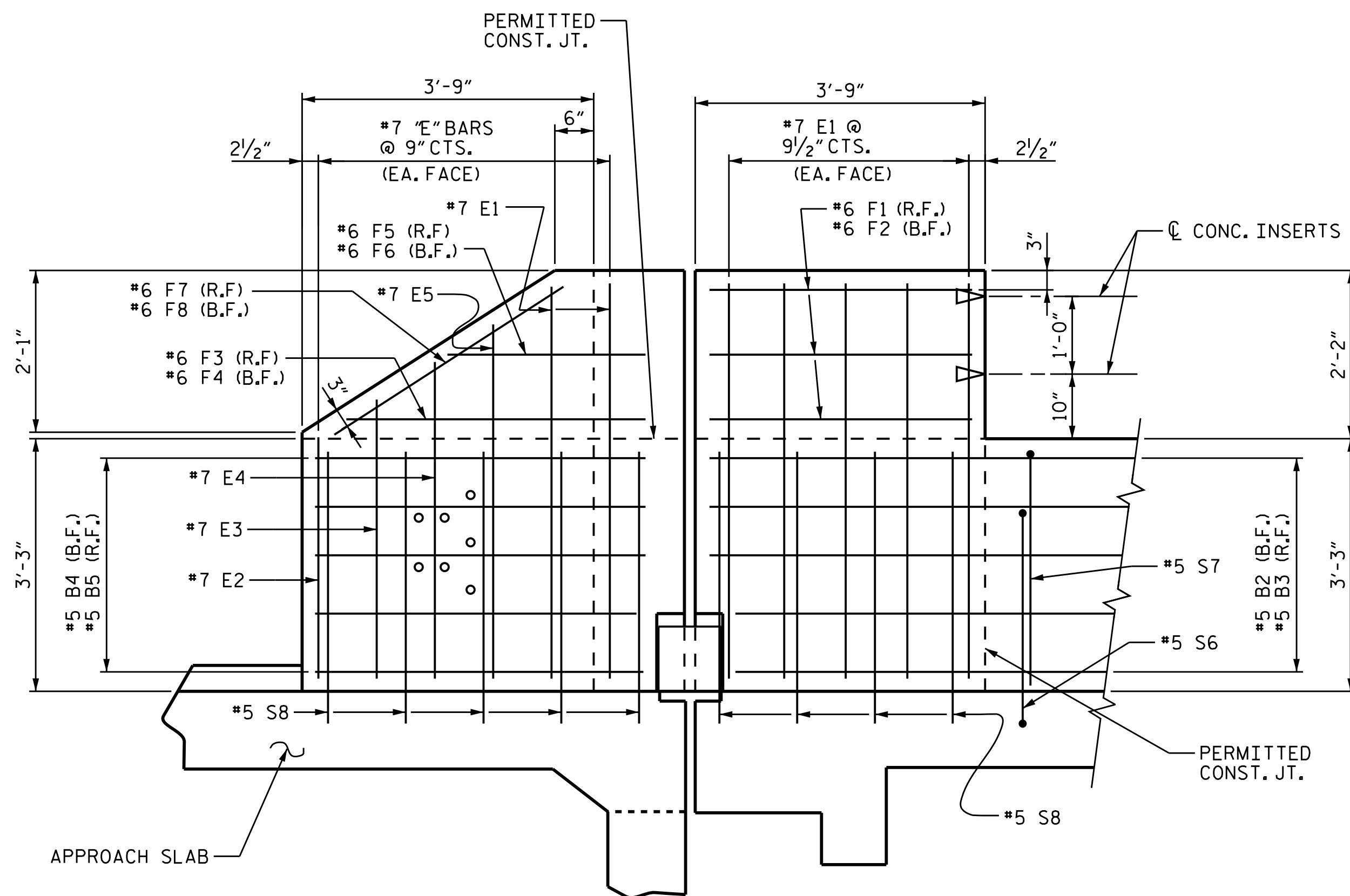
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PARAPET & MODIFIED
END POST DETAILS
FOR 2-BAR METAL RAIL

DRAWN BY : RTJ DATE : 2/17
CHECKED BY : RDE DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

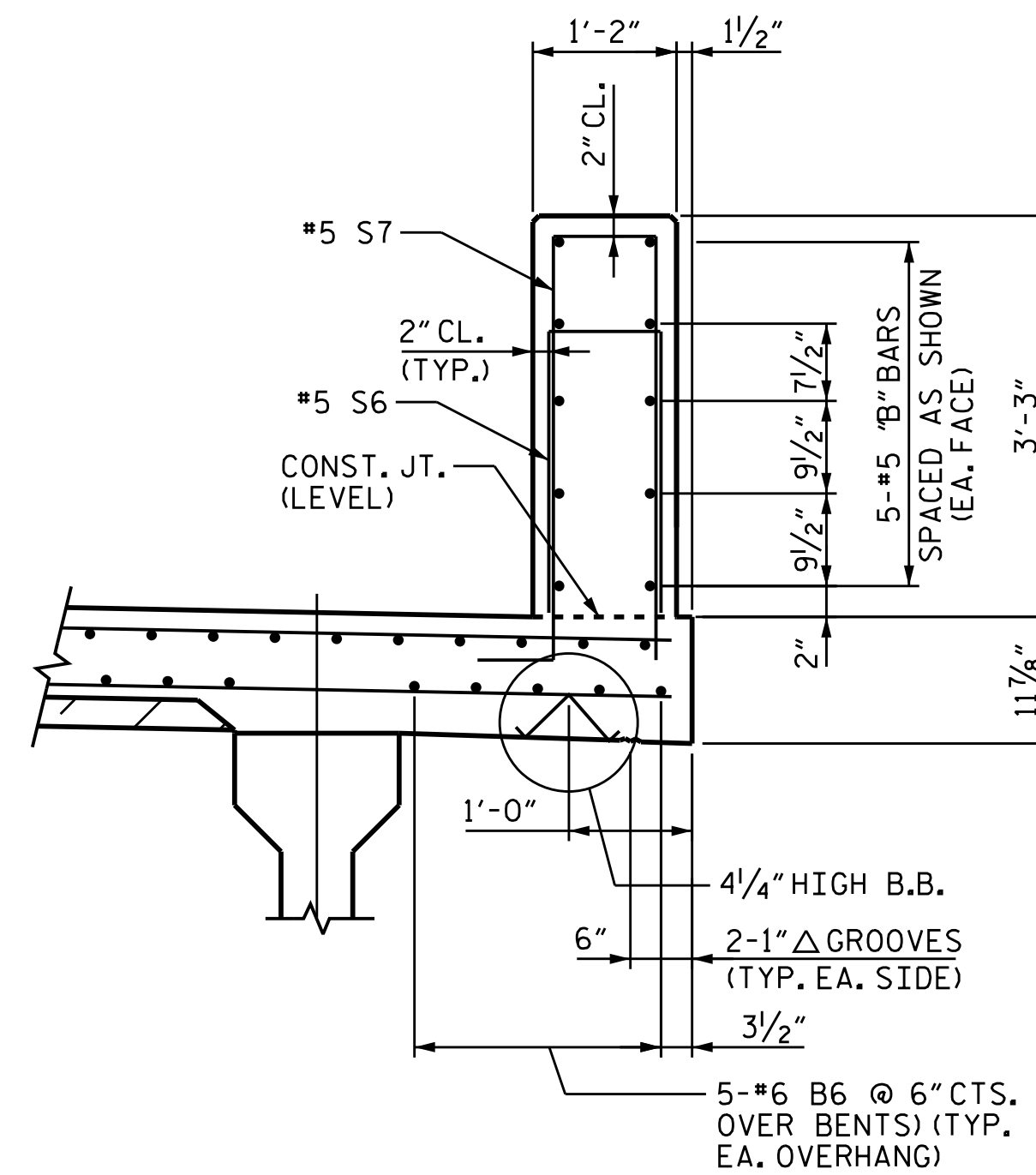
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CORP. LICENSE NO.: C-0275

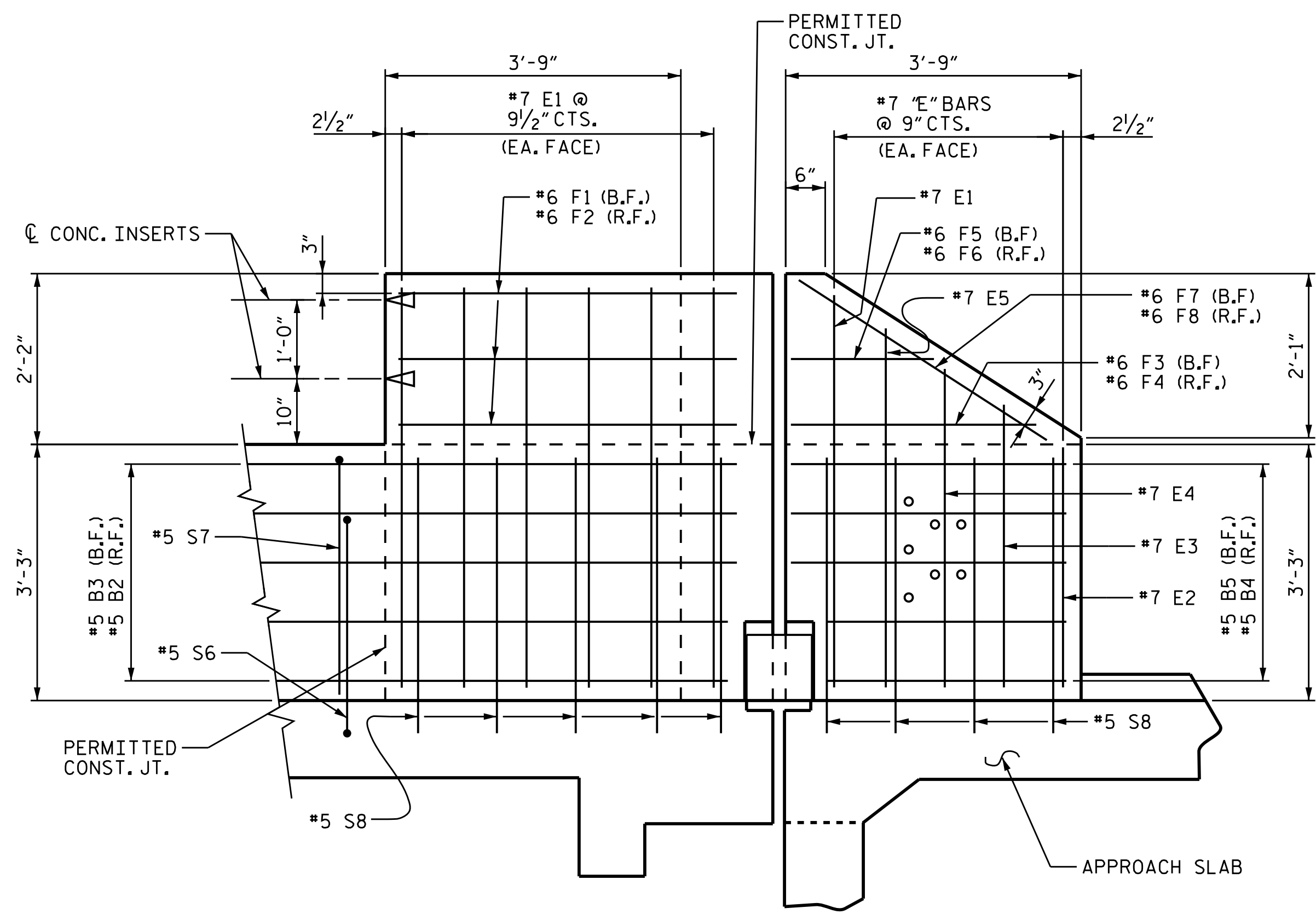
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			69



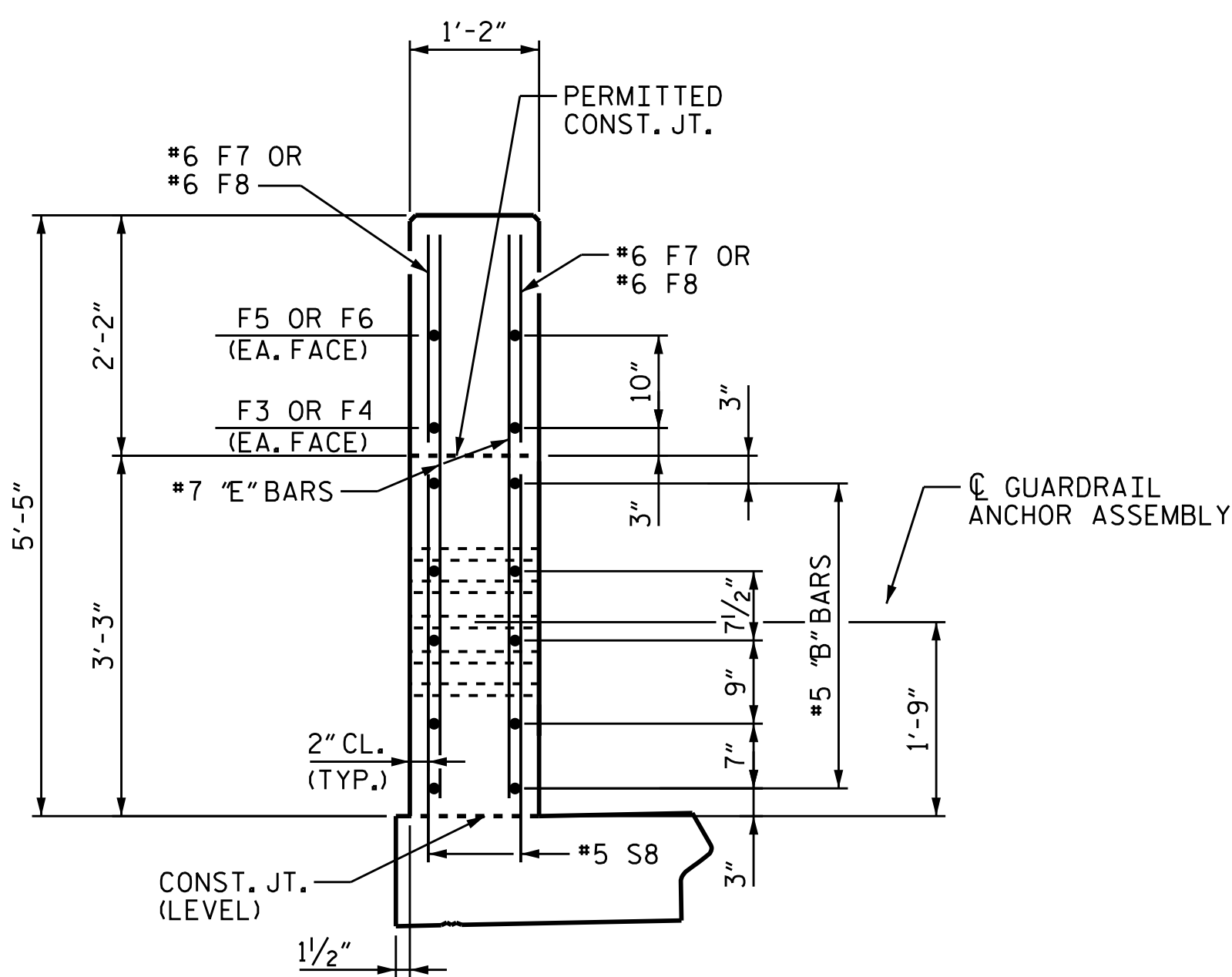
DETAIL F
ELEVATION OF END POST
(ROADWAY FACE)



PARAPET DETAIL

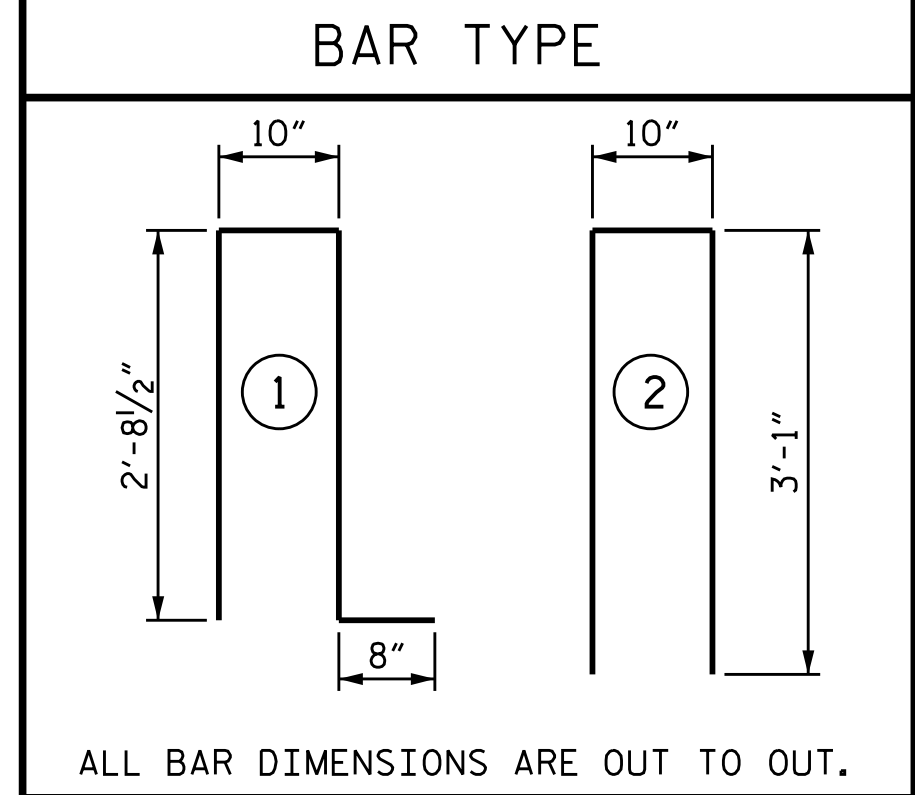


DETAIL G
ELEVATION OF END POST
(ROADWAY FACE)



END ELEVATION

TWO BAR METAL RAIL					
BILL OF MATERIAL FOR PARAPET AND FOUR END POSTS (MODIFIED)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	140	#5	STR.	23'-7"	3444
B2	20	#5	STR.	21'-11"	457
B3	20	#5	STR.	21'-3"	443
B4	20	#5	STR.	3'-6"	73
B5	20	#5	STR.	4'-3"	89
E1	56	#7	STR.	5'-1"	582
E2	8	#7	STR.	3'-0"	49
E3	8	#7	STR.	3'-7"	59
E4	8	#7	STR.	4'-0"	65
E5	8	#7	STR.	4'-6"	74
F1	12	#6	STR.	3'-6"	63
F2	12	#6	STR.	4'-3"	77
F3	4	#6	STR.	3'-10"	23
F4	4	#6	STR.	3'-1"	19
F5	4	#6	STR.	2'-6"	15
F6	4	#6	STR.	2'-0"	12
F7	4	#6	STR.	3'-8"	22
F8	4	#6	STR.	3'-6"	21
S6	408	#5	1	6'-11"	2943
S7	408	#5	2	7'-0"	2979
S8	72	#5	STR.	3'-9"	282
TOTAL EPOXY-COATED REINFORCING STEEL				11,791 LBS.	
CLASS AA CONCRETE				64.6 C.Y.	
1'-2" x 3'-3" CONCRETE PARAPET				441.40 L.F.	



PROJECT NO. B-4982
IREDELL COUNTY
 STATION: 21+10.00-L-
 SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SEAL
 22992
 Documented by:
 R. D. ELLIOTT
 P.E.
 4/17/2018

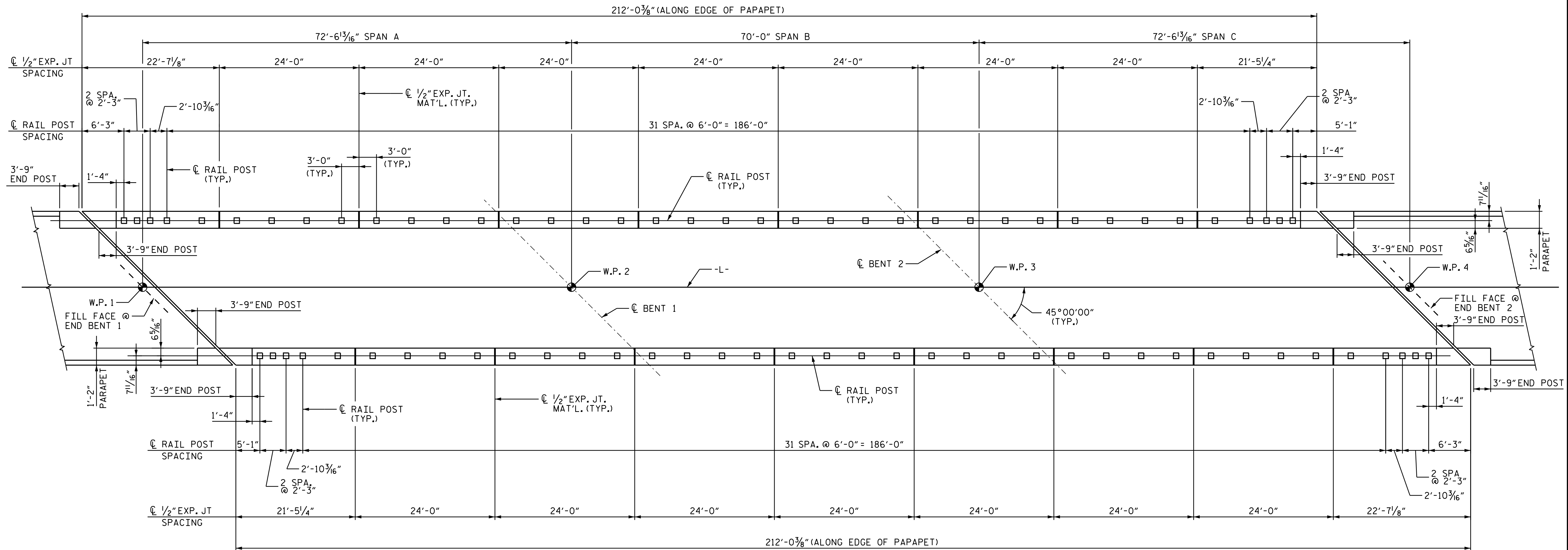
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 SHELBY, NC 28150
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 CORP. LICENSE NO.: C-0275

SUPERSTRUCTURE PARAPET & MODIFIED END POST DETAILS FOR 2-BAR METAL RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.	S-29
TOTAL SHEETS	69

DRAWN BY : RTJ DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17



PLAN OF RAIL POST SPACING

NOTES:
 PROVIDE GROOVED CONTRACTION JOINTS IN PARAPET AT EACH THIRD POINT BETWEEN 1/2" EXPANSION JOINTS.
 EDGE OF DECK NOT SHOWN FOR CLARITY.

PROJECT NO. B-4982
IREDELL COUNTY
 STATION: 21+10.00-L-
 SHEET 1 OF 4

DRAWN BY : RTJ DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

4/17/2018

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 RAIL POST
 SPACING**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			S-30
2			4			TOTAL SHEETS 69

NOTES

STRUCTURAL CONCRETE INSERT

- THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1/2".
 - B. 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
 - C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 3/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

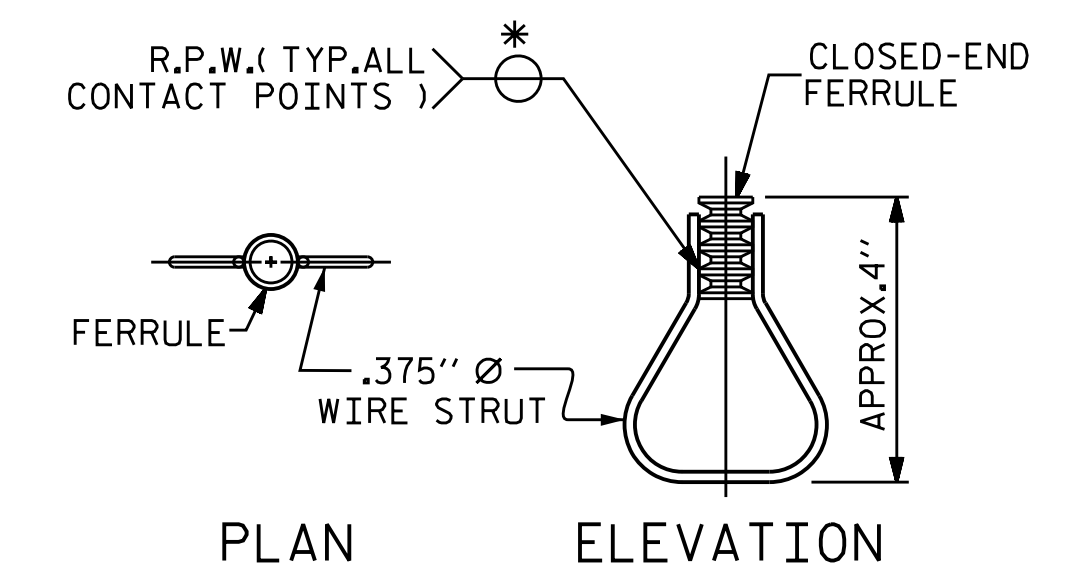
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N. C. THREADS.
 - C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.
 - D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
 - E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



PLAN ELEVATION
STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-4982

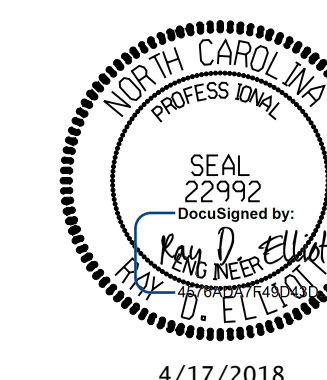
IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

END OF RAIL DETAILS
FOR TWO BAR METAL RAILS

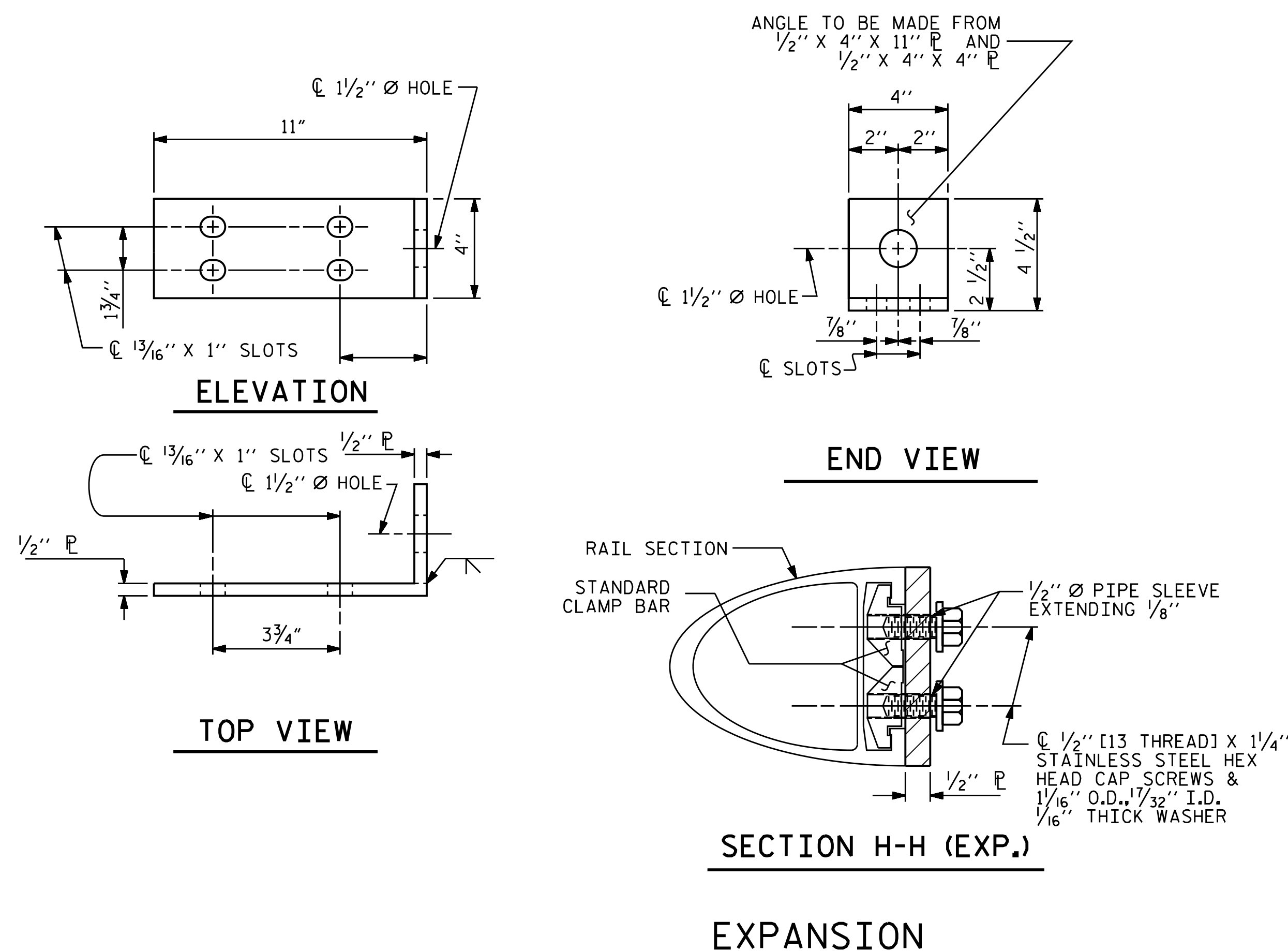


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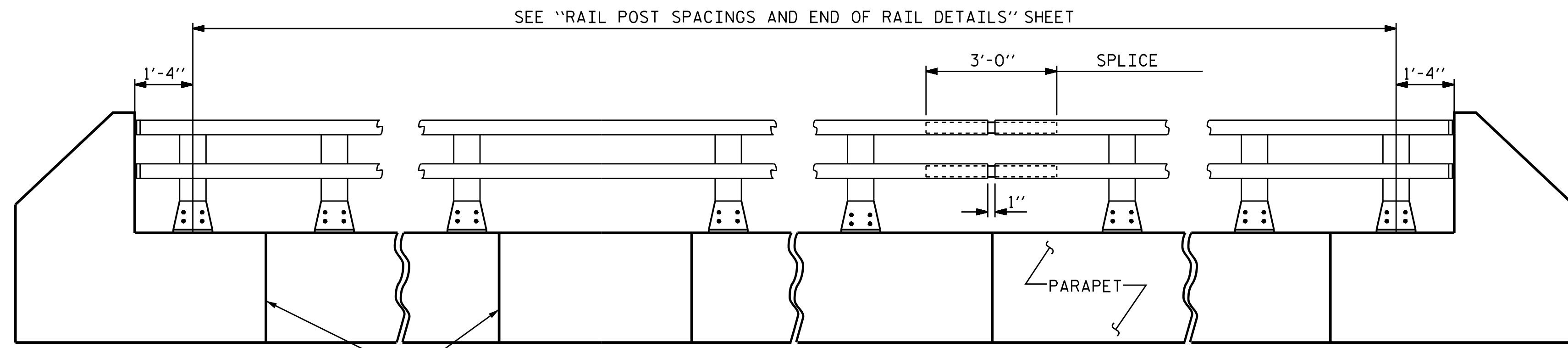
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			69

STD. NO. BMR2



DETAILS FOR ATTACHING METAL RAIL TO END POST

ASSEMBLED BY : NMW	DATE : 2/17
CHECKED BY : RDE	DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE	DATE : 4/17
DRAWN BY : FCJ 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM



SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET

ELEVATION
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.

NOTES

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

UNLESS OTHERWISE REQUIRED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR HAS THE OPTION TO USE AN ALTERNATE TO THE 2 BAR METAL RAIL. THE ALTERNATE RAIL SHALL MEET THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST (APL) UNDER "2 BAR METAL RAIL ALTERNATE". ADJUSTMENTS TO THE CONCRETE PARAPET WILL NOT BE ALLOWED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

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

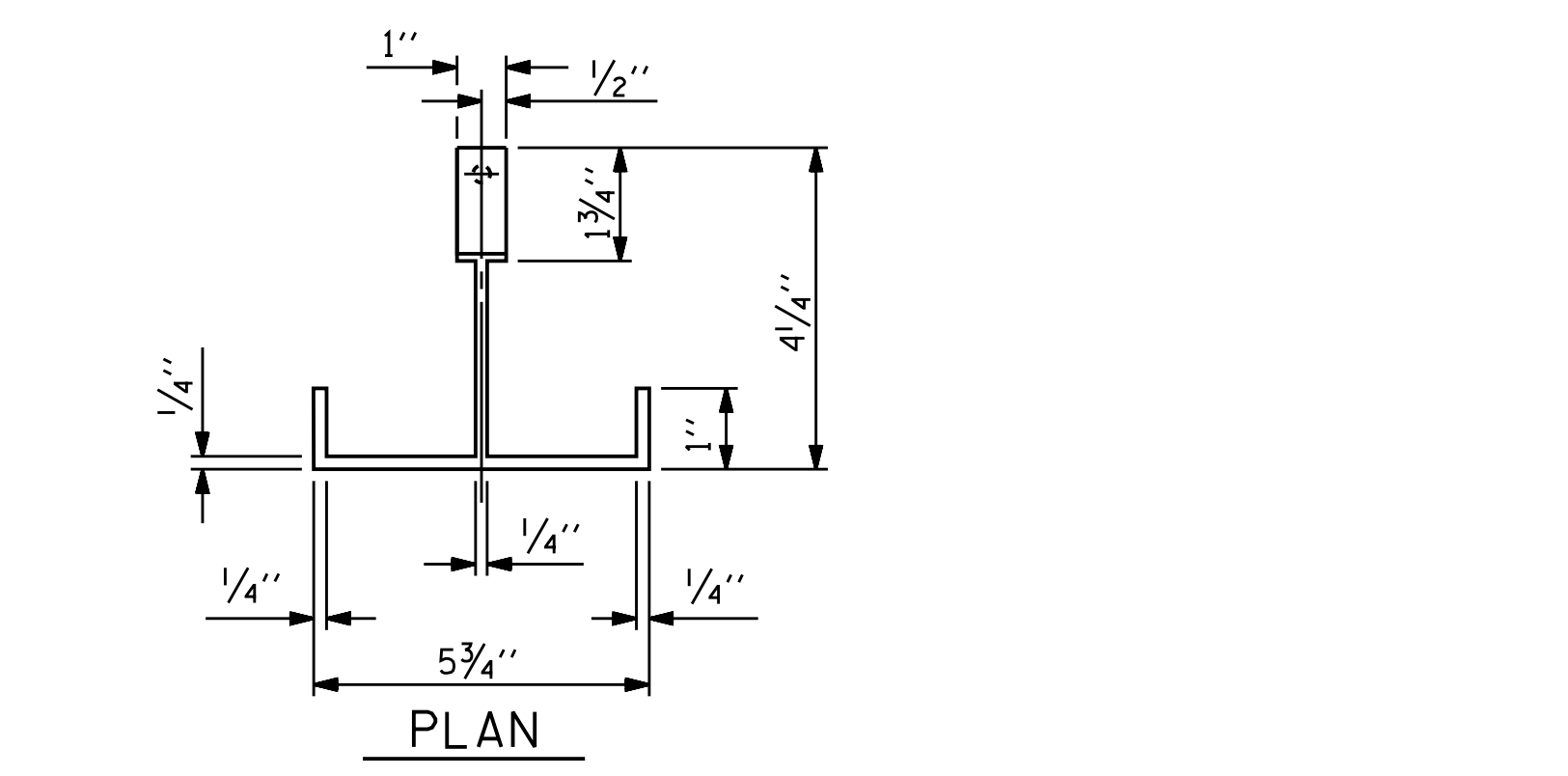
SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

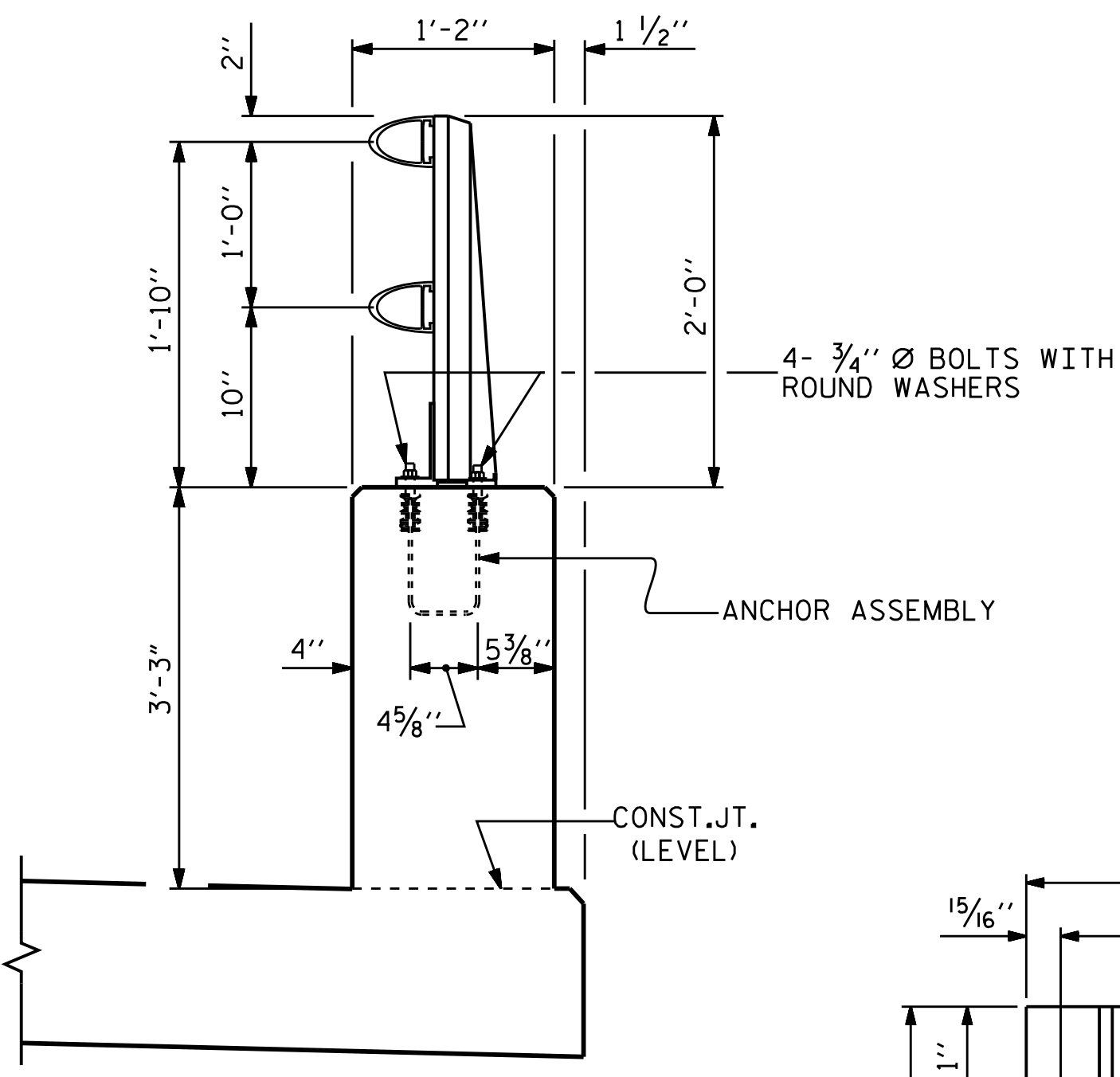
MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

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

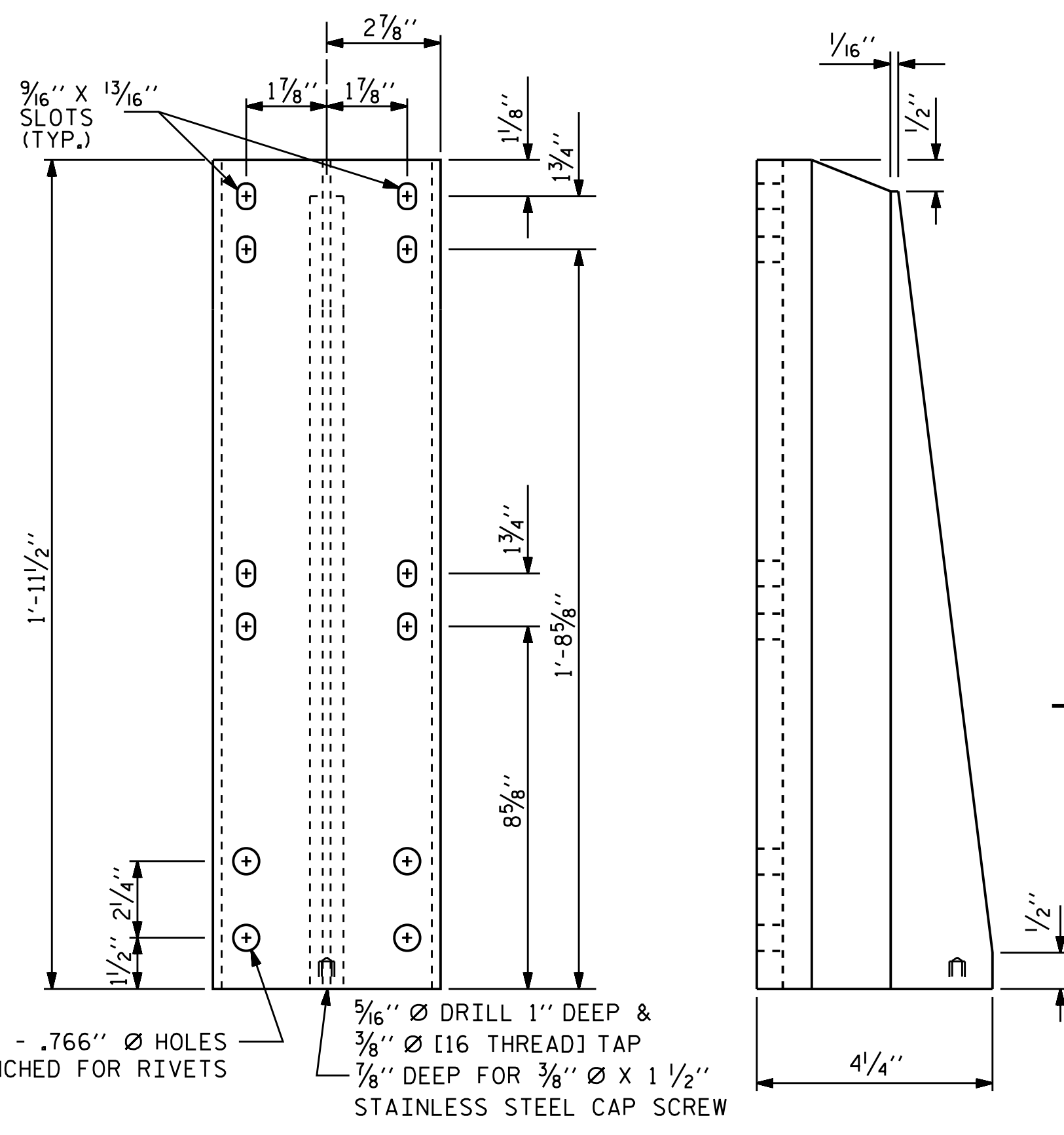
PAY LENGTH = 406.8 LIN. FT.



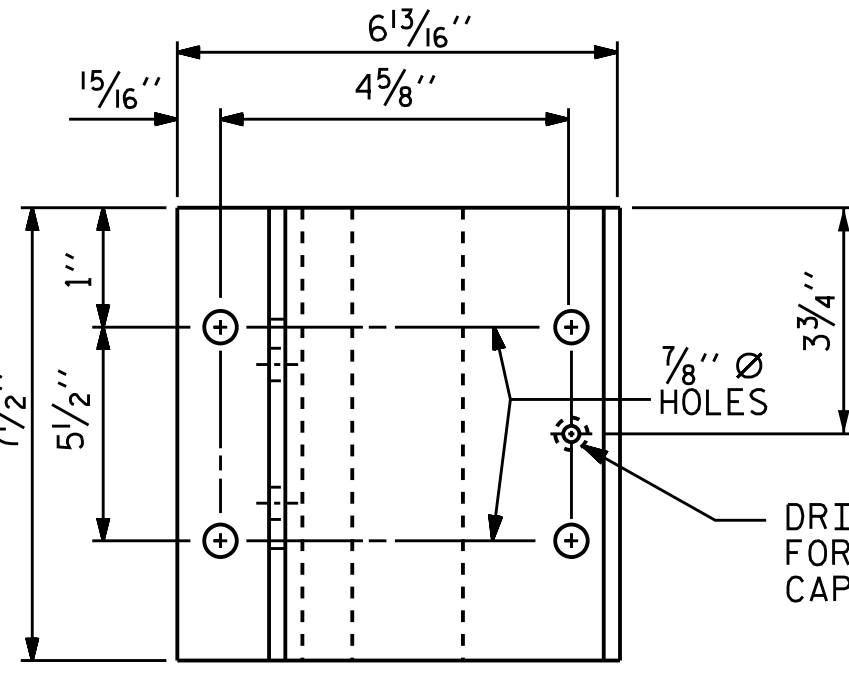
PLAN



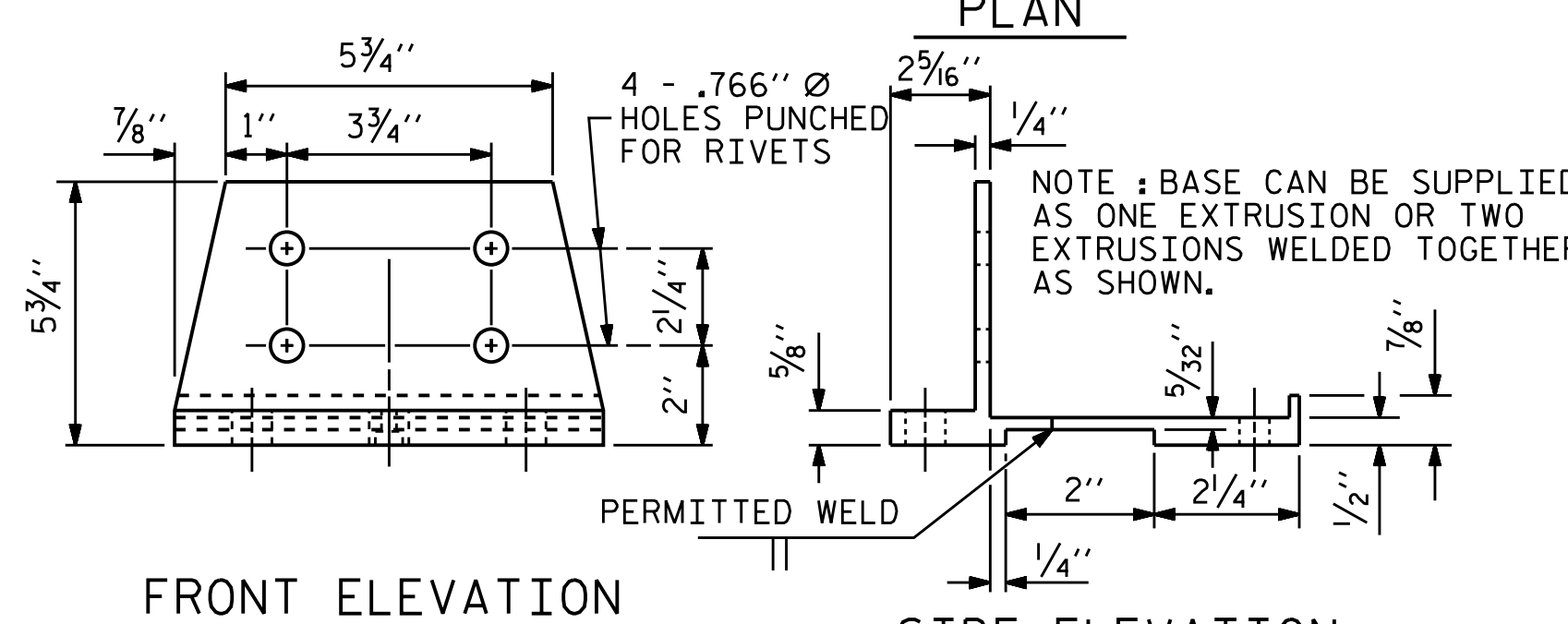
SECTION THRU PARAPET AND RAIL



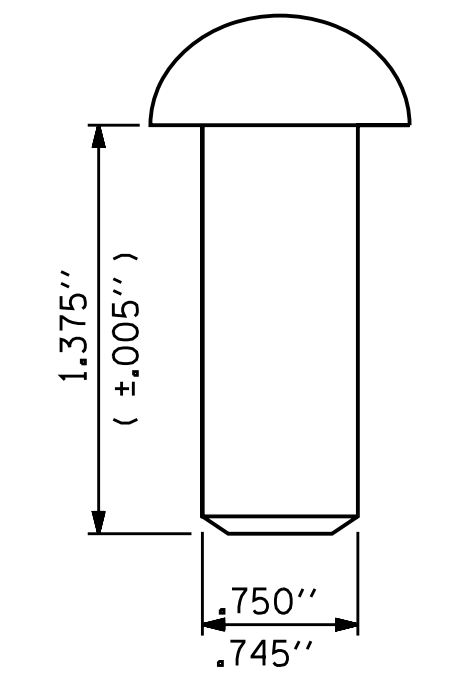
FRONT ELEVATION **SIDE ELEVATION**
DETAILS OF POST



PLAN



FRONT ELEVATION **SIDE ELEVATION**
POST BASE DETAILS



RIVET DETAIL

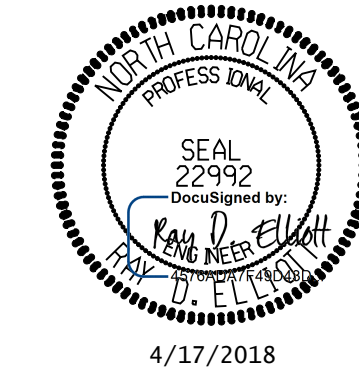
PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
2 BAR METAL RAIL



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			S-32
2			4			TOTAL SHEETS 69

ASSEMBLED BY : NMW	DATE : 2/17
CHECKED BY : RDE	DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE	DATE : 4/17
DRAWN BY : EEM 6/94	REV. 5/1/06 TLA/GM
CHECKED BY : RGW 6/94	REV. 10/1/11 MAA/GM
	REV. 6/13 MAA/GM

NOTES

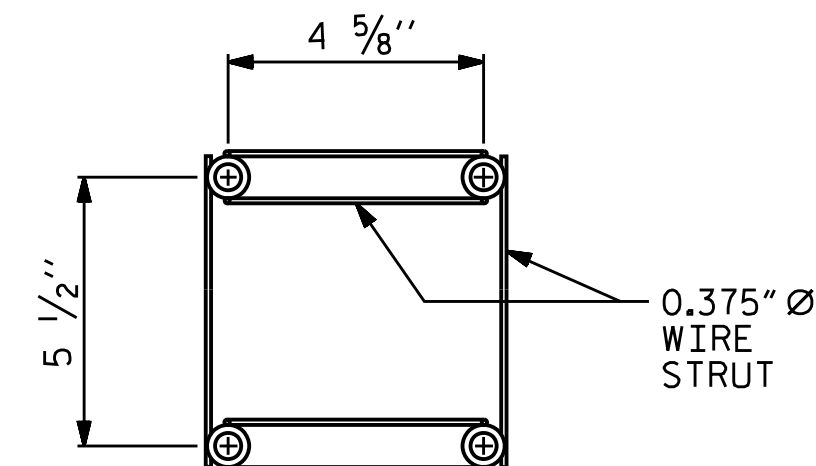
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :

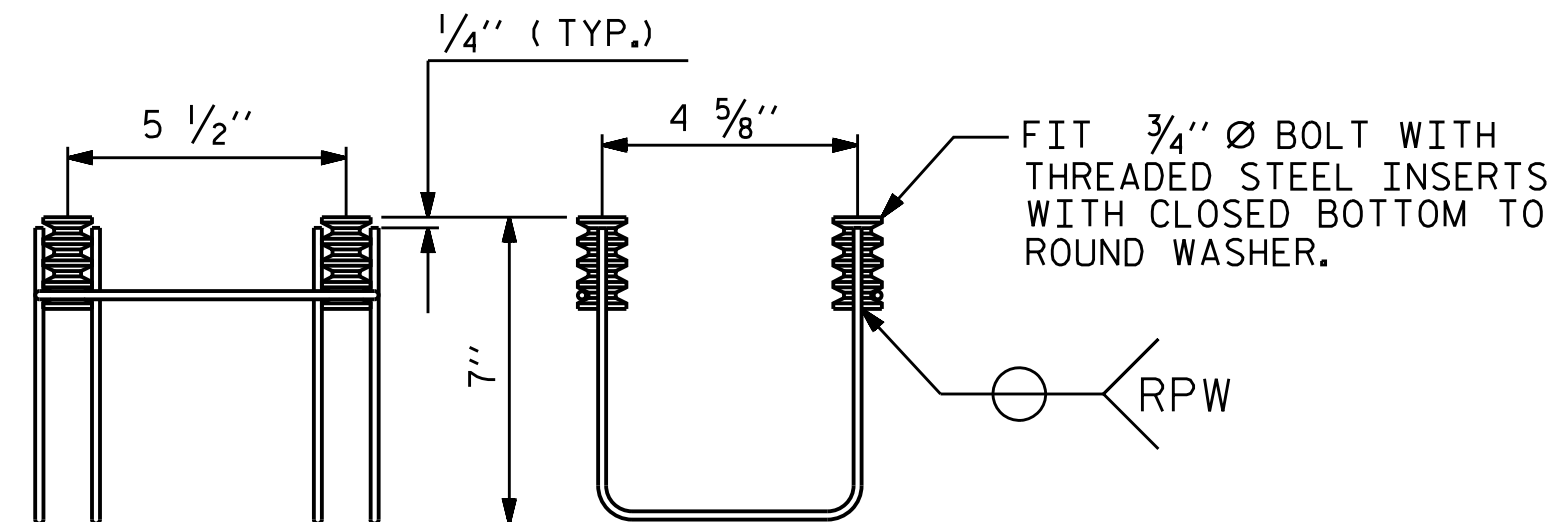
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS 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.
- C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.



PLAN

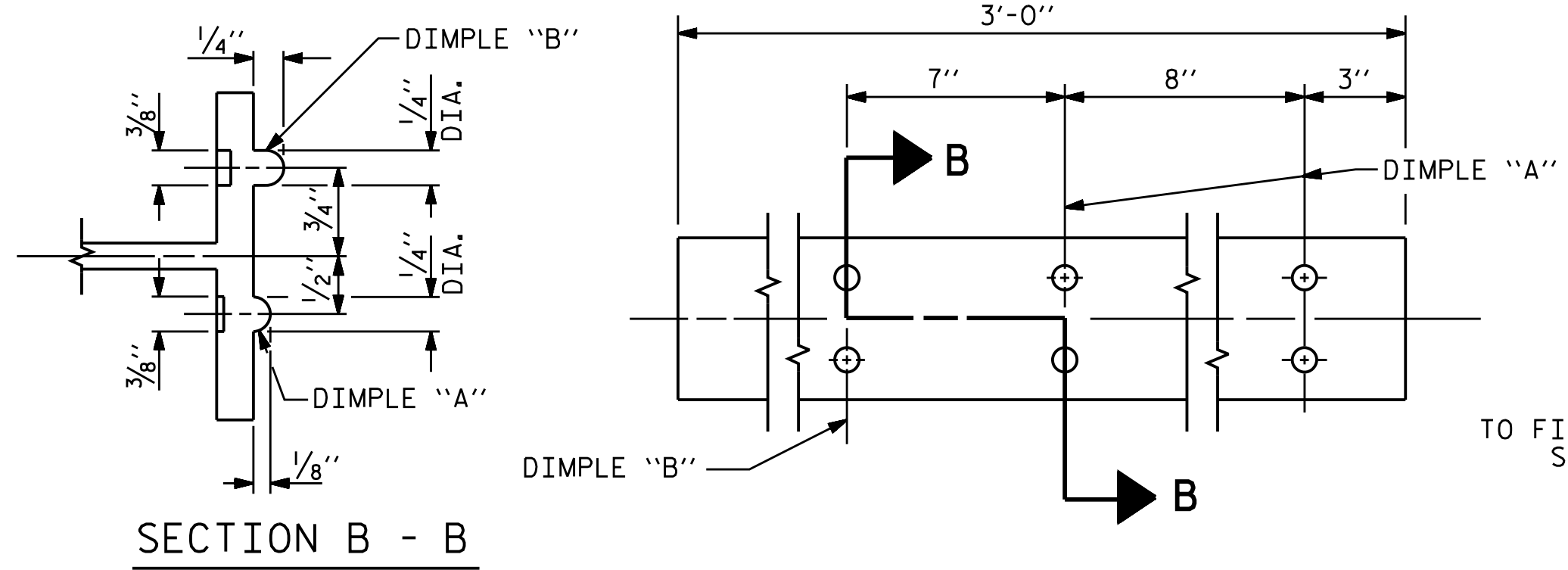


SIDE VIEW

ELEVATION

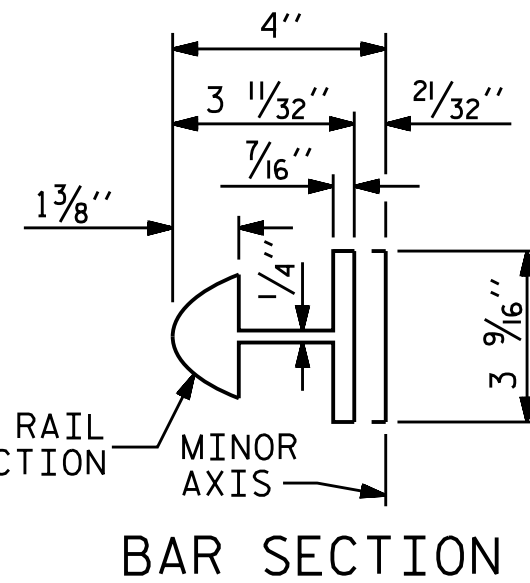
4-BOLT METAL RAIL ANCHOR ASSEMBLY

(76 ASSEMBLIES REQUIRED)

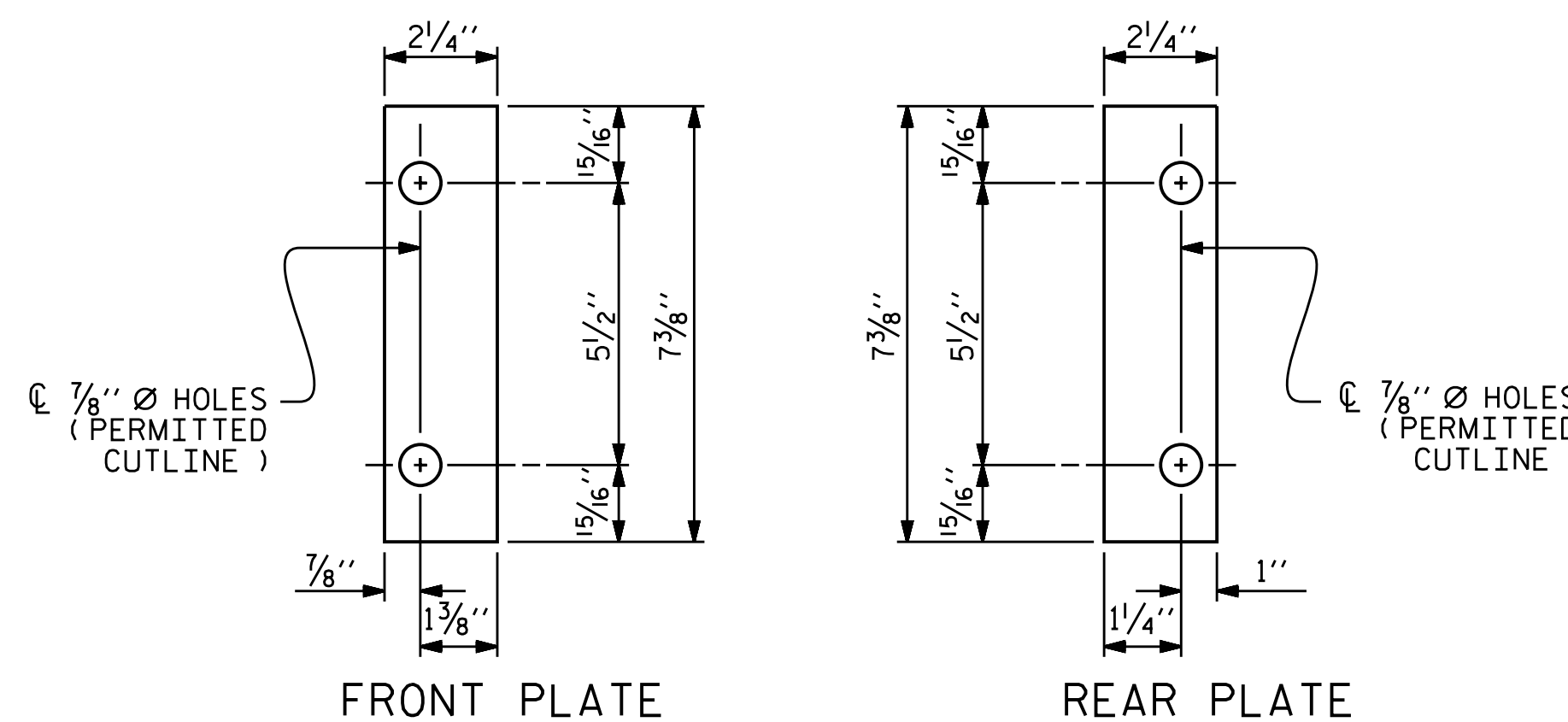


SECTION B - B

EXPANSION BAR DETAILS



BAR SECTION

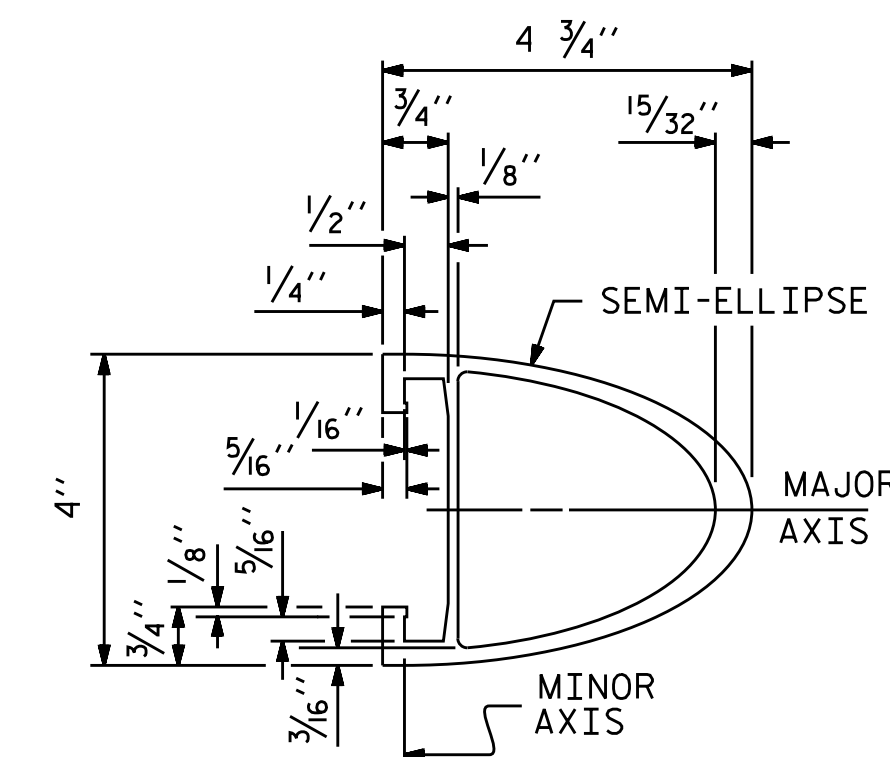


FRONT PLATE

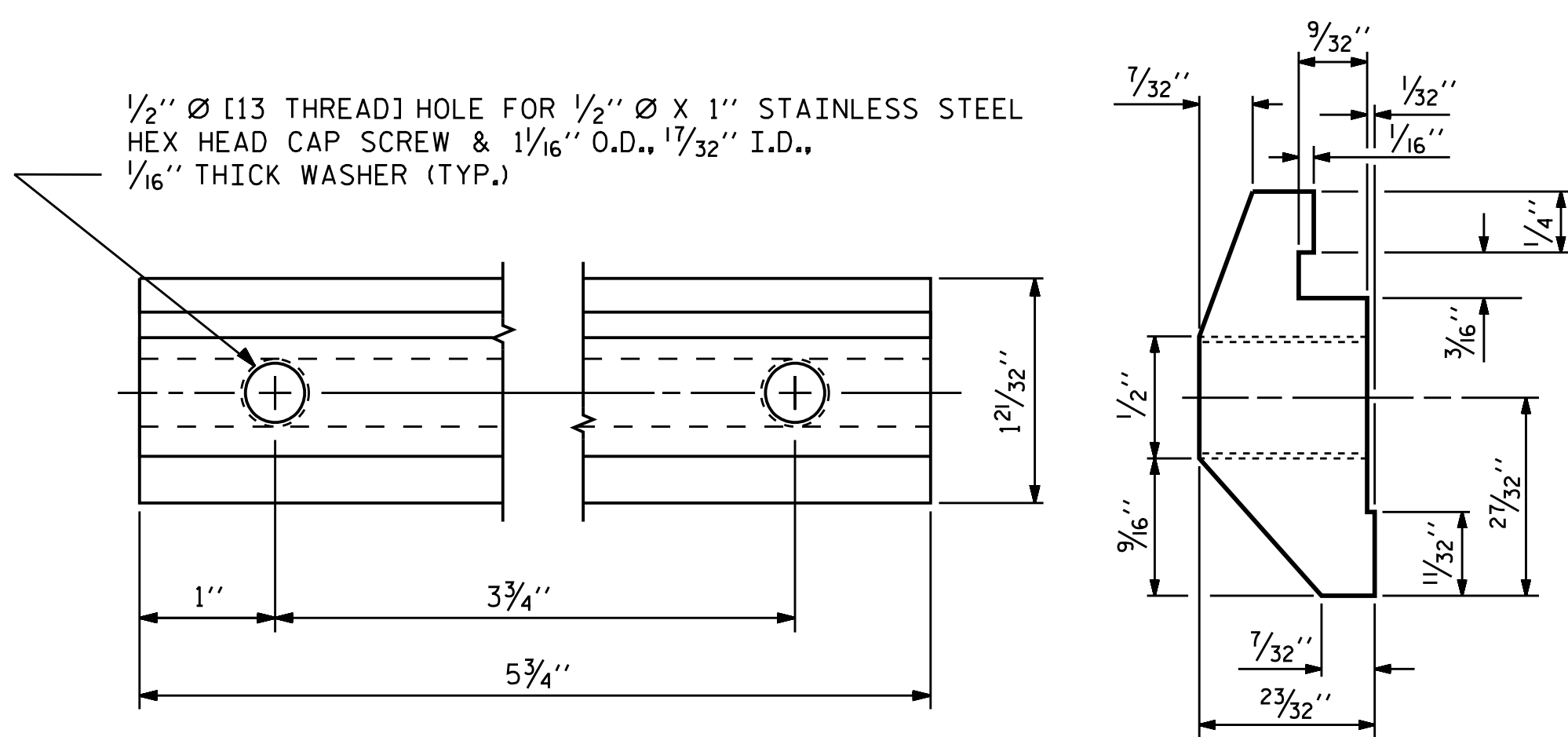
REAR PLATE

SHIM DETAILS

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

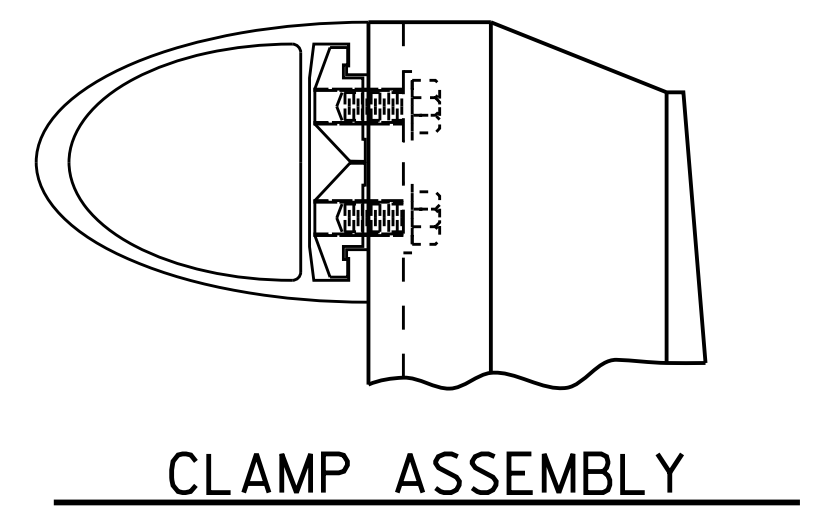


RAIL SECTION

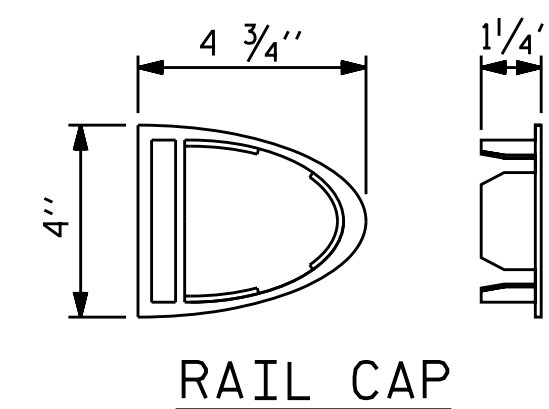


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



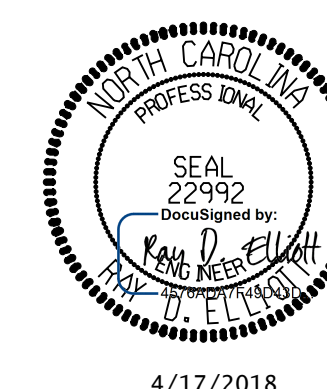
RAIL CAP

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 4 OF 4



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

ASSEMBLED BY : NMW	DATE : 2/17
CHECKED BY : RDE	DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE	DATE : 4/17
DRAWN BY : EEM 6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RGW 6/94	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED					
TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275					

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-33
2			4			69

STD. NO. BMR4

NOTES

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

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO 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 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

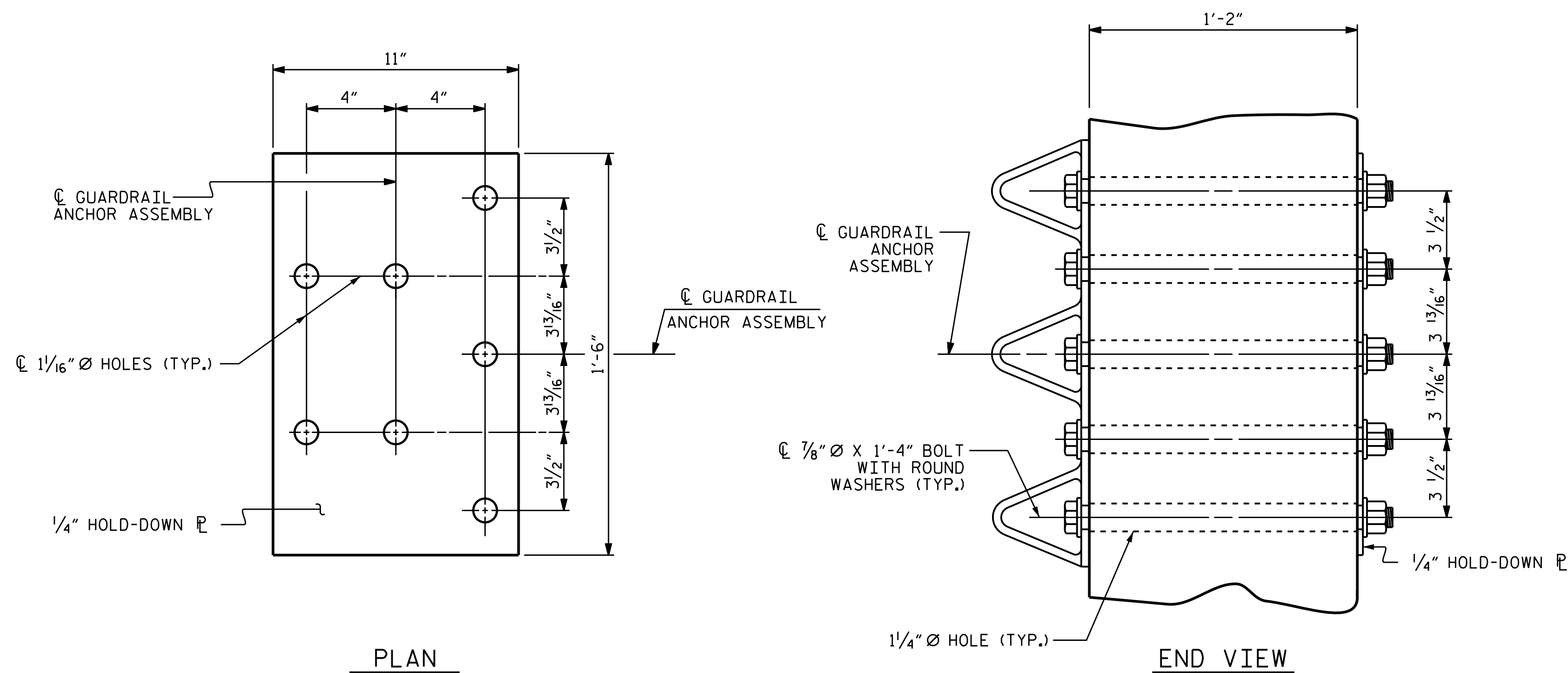
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

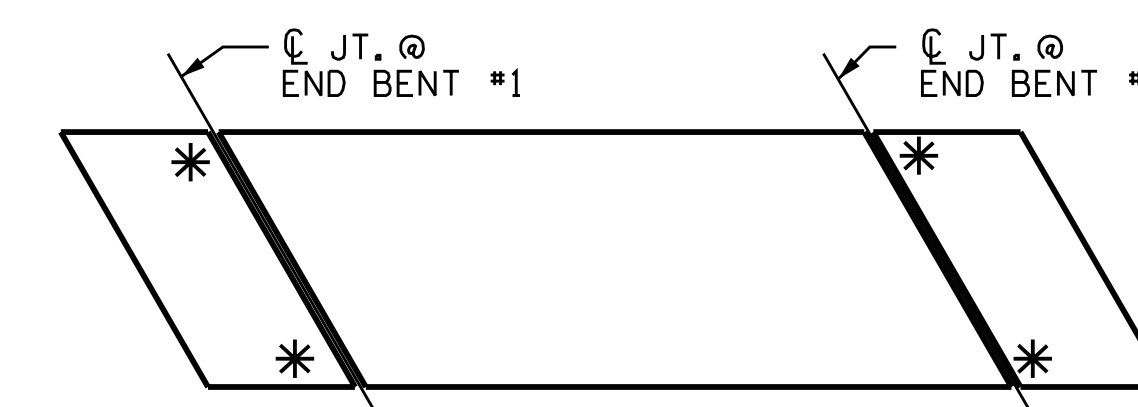
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



PLAN

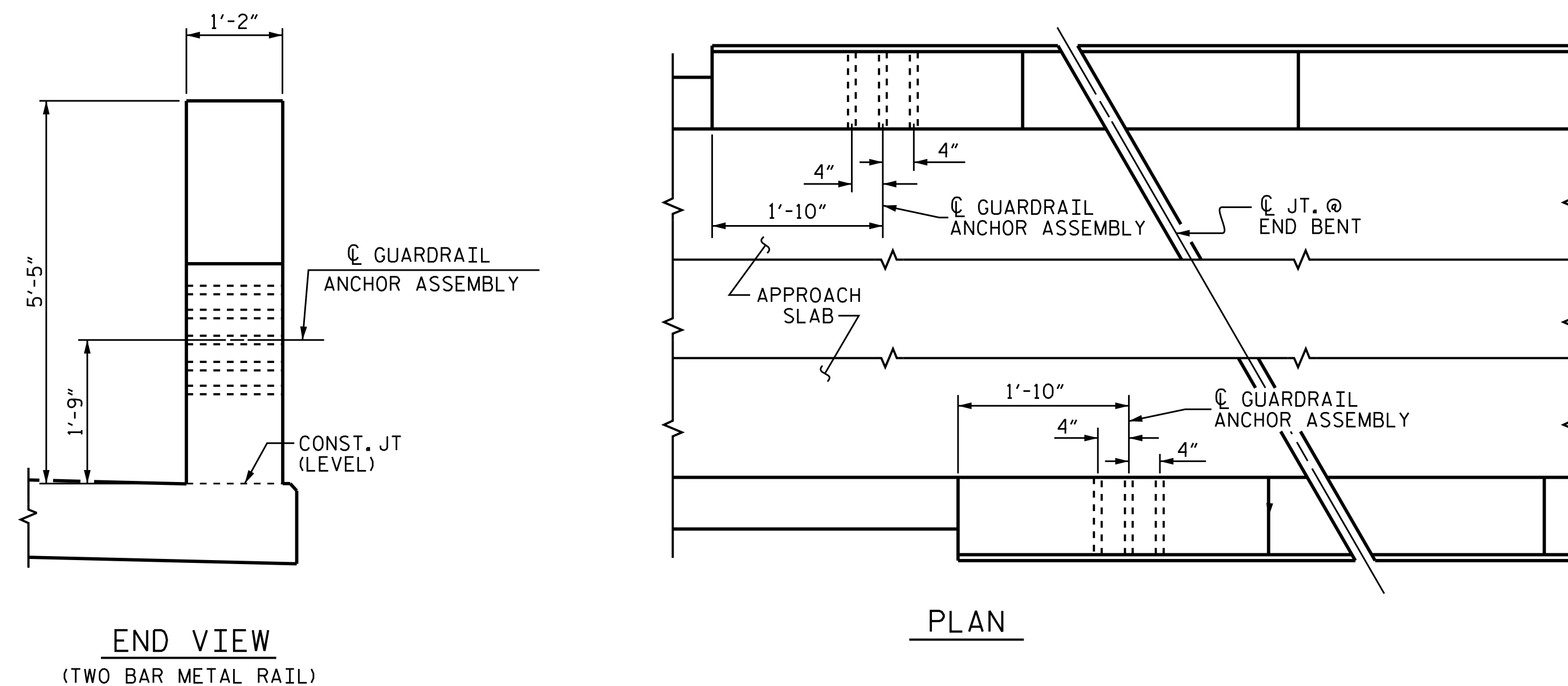
END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
(TWO BAR METAL RAIL)

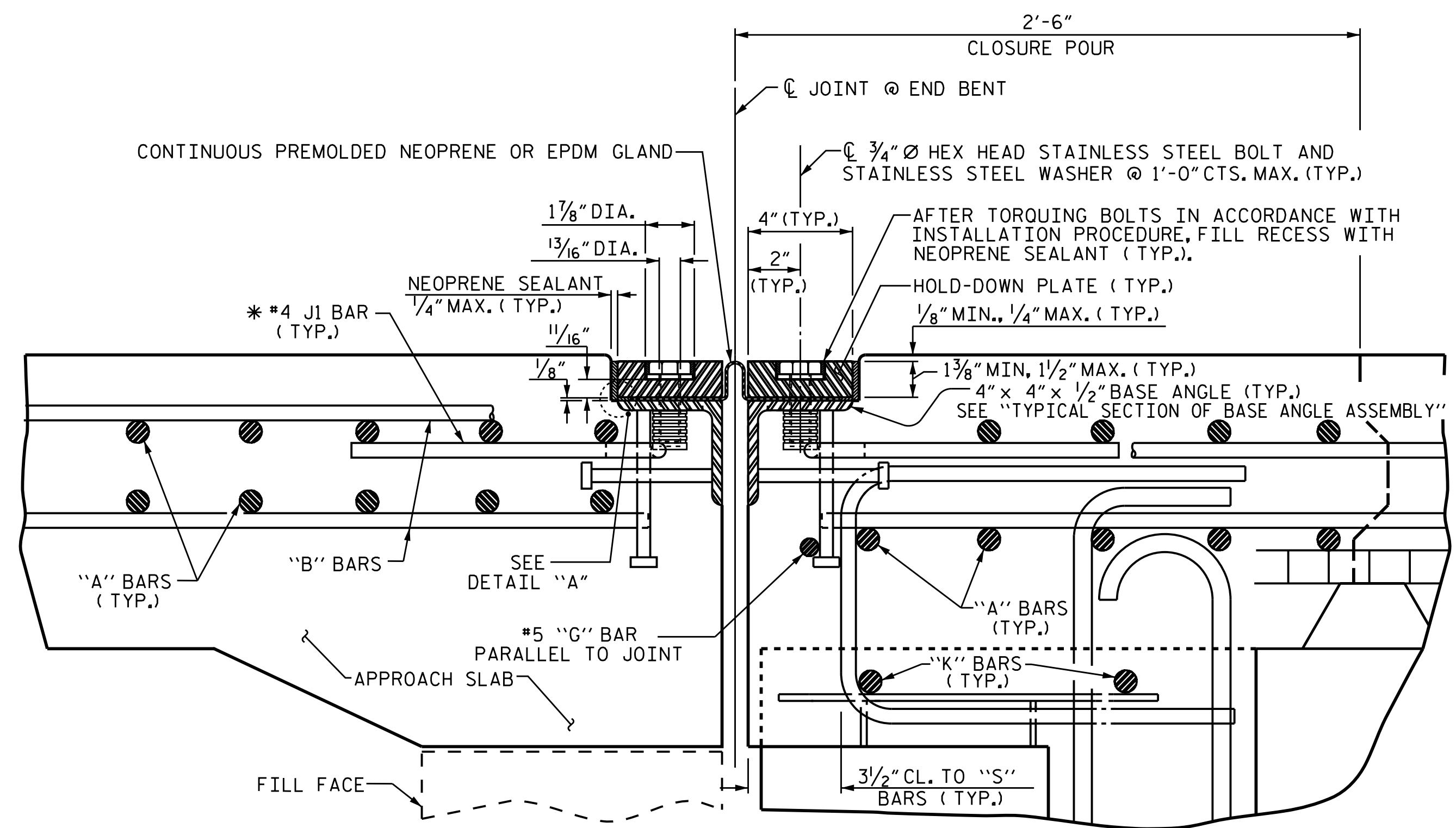
PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4982
IREDELL COUNTY
STATION: 21+10.00-L-

ASSEMBLED BY : NMW	DATE : 2/17
CHECKED BY : RDE	DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE	DATE : 4/17
DRAWN BY : MAA 5/10	REV. 12/5/11
CHECKED BY : GM 5/10	REV. 6/13
	REV. 1/15

		STATE OF NORTH CAROLINA		SHEET NO.	
		DEPARTMENT OF TRANSPORTATION			S-34
TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275		RALEIGH		TOTAL SHEETS 69	
STANDARD GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS		REVISIONS			
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

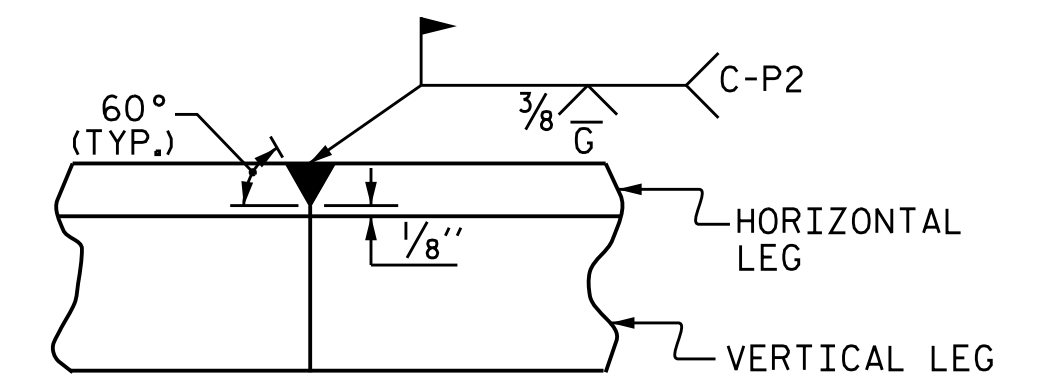
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4/8" TO 4/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" x 4" x 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE, THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH", PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

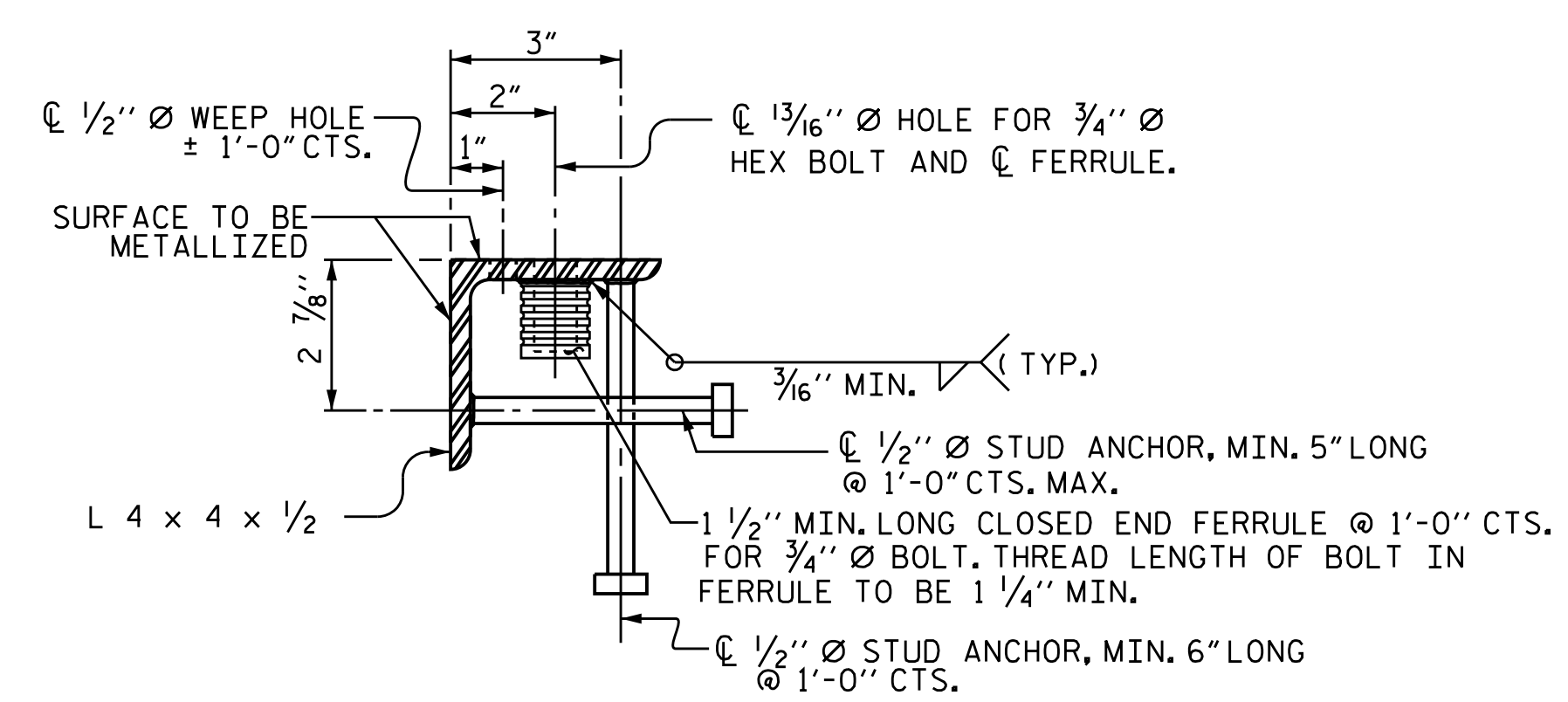
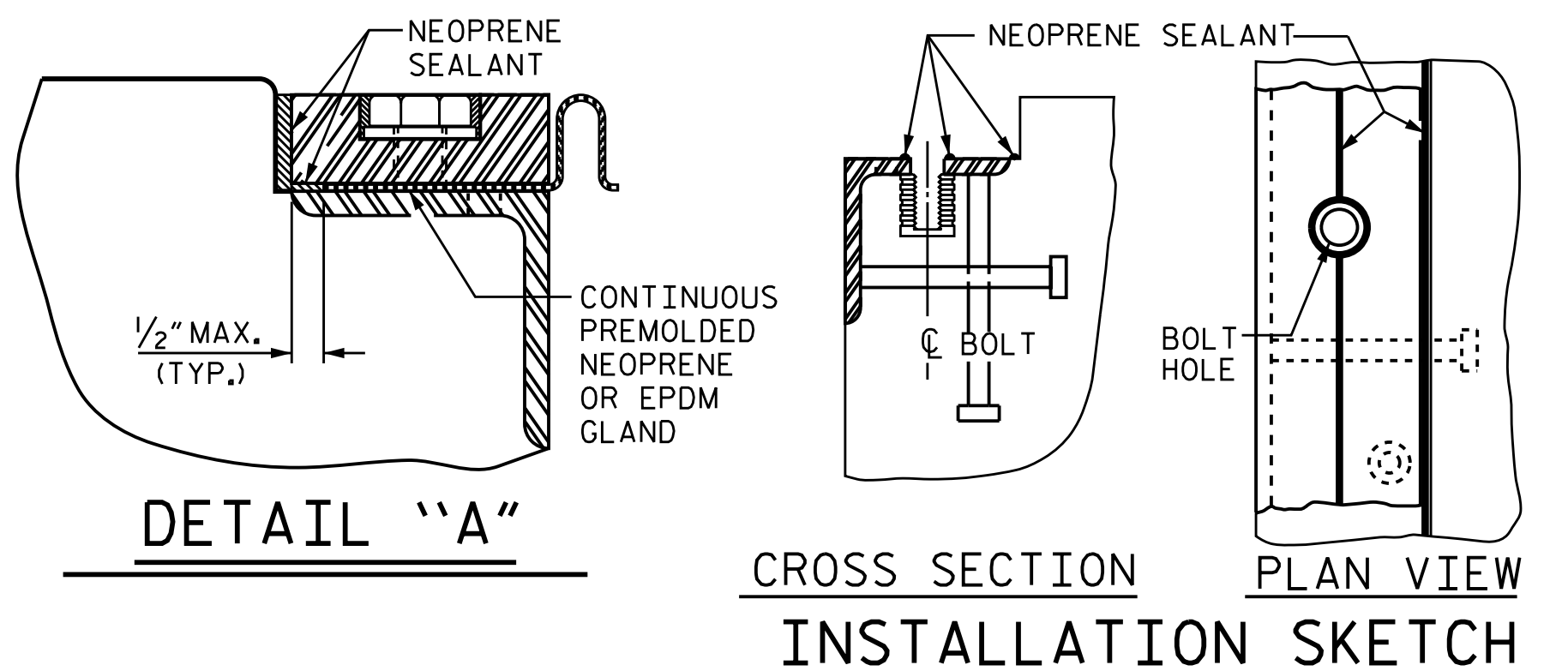
GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS 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.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
7. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
8. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
9. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
10. 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.



DETAIL - FIELD WELD SPLICE OF BASE ANGLE

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
EB 1	45°00'00"	5/8"	1 5/16"	1 1/4"	1 1/16"
EB 2	45°00'00"	5/8"	1 5/16"	1 1/4"	1 1/16"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

PROJECT NO. B-4982
IREDELL COUNTY
 STATION: 21+10.00-L-
 SHEET 1 OF 2

ASSEMBLED BY : JLA DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17
 DRAWN BY : REK 9/87 REV. 5/7/03R RWW/JTE
 CHECKED BY : CRK 10/87 REV. 5/1/06R TLA/GM
 REV. 10/1/11 MAA/GM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
 804-C N. LAFAYETTE ST
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

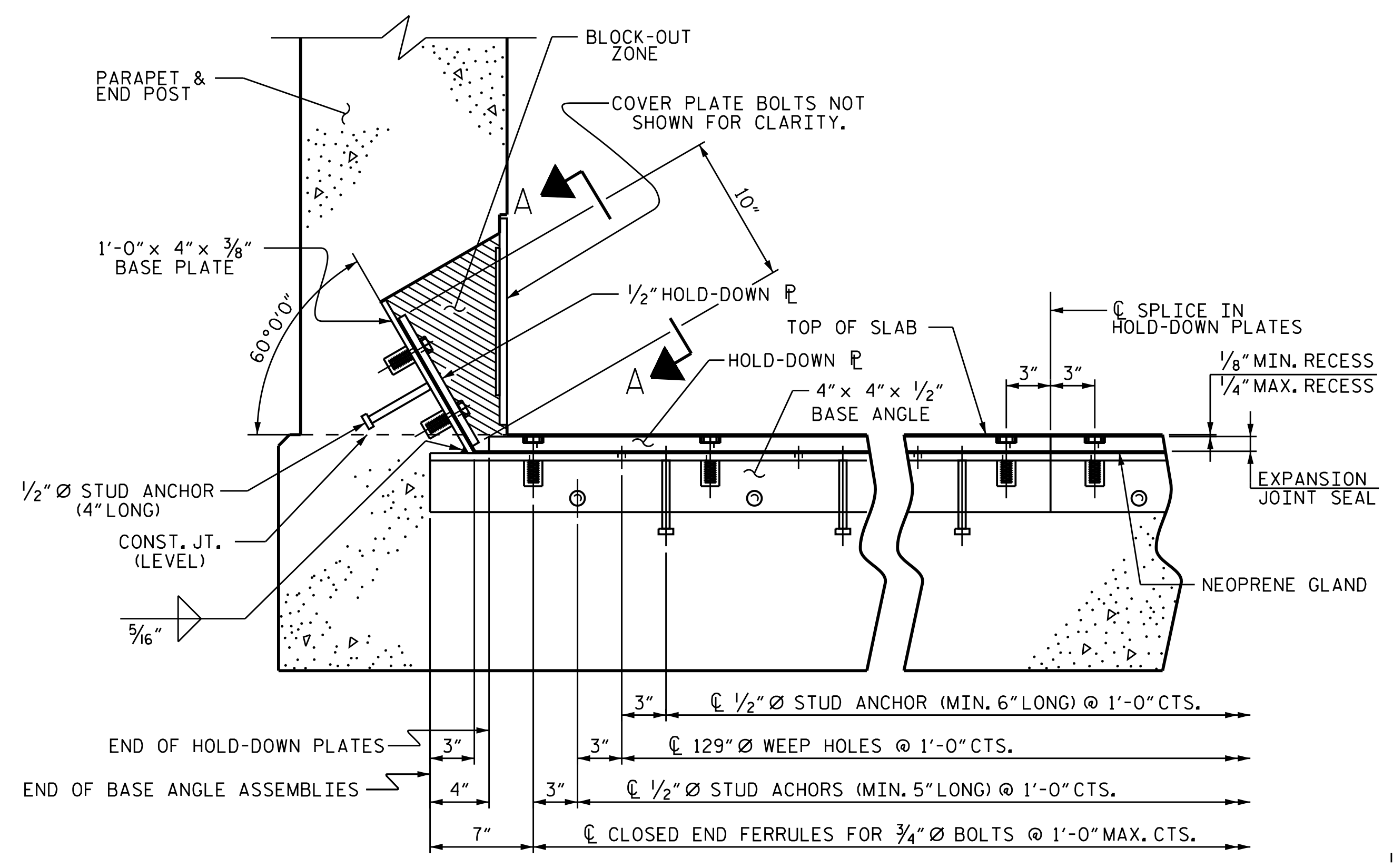
4/17/2018

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

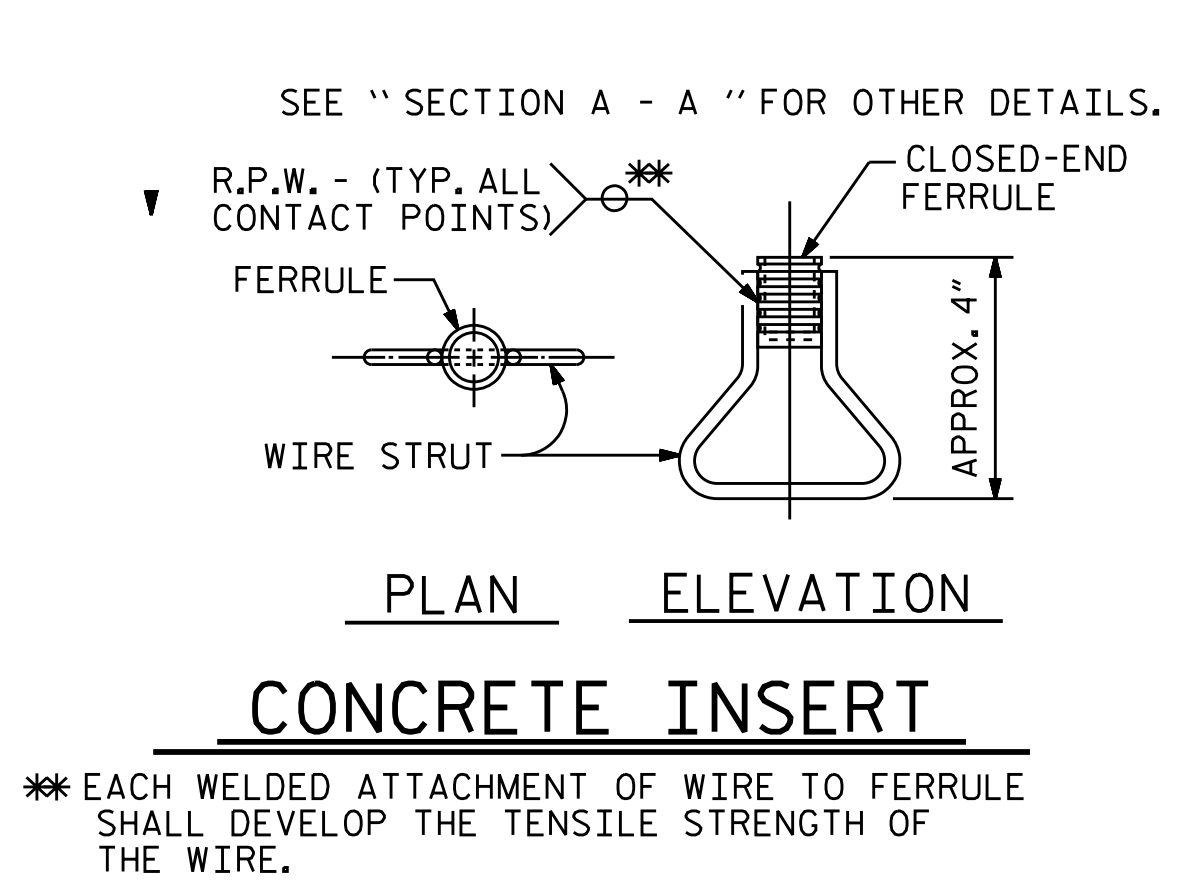
STANDARD
 EXPANSION JOINT
 SEAL DETAILS

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

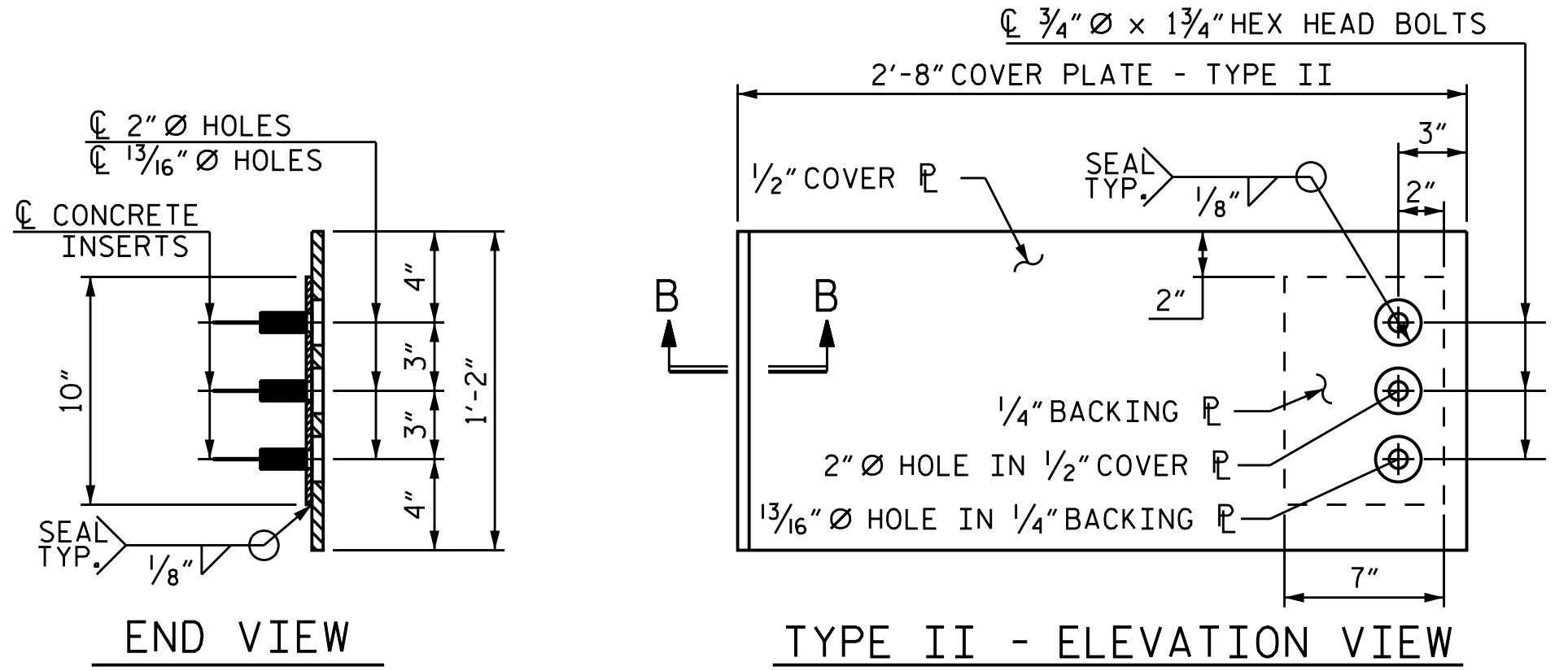
SHEET NO. S-35
 TOTAL SHEETS 69



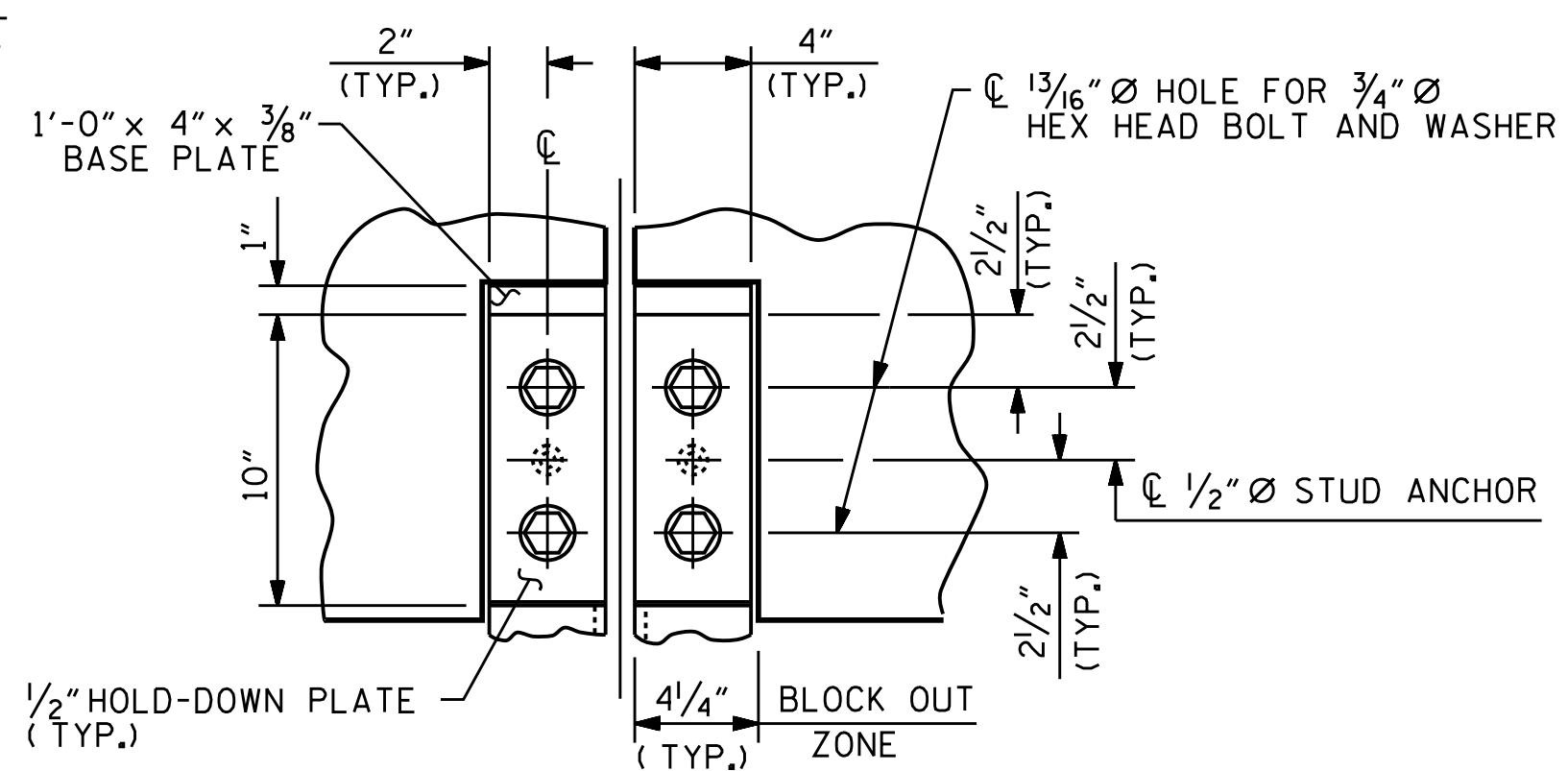
SECTION THRU RAIL NORMAL TO JOINT



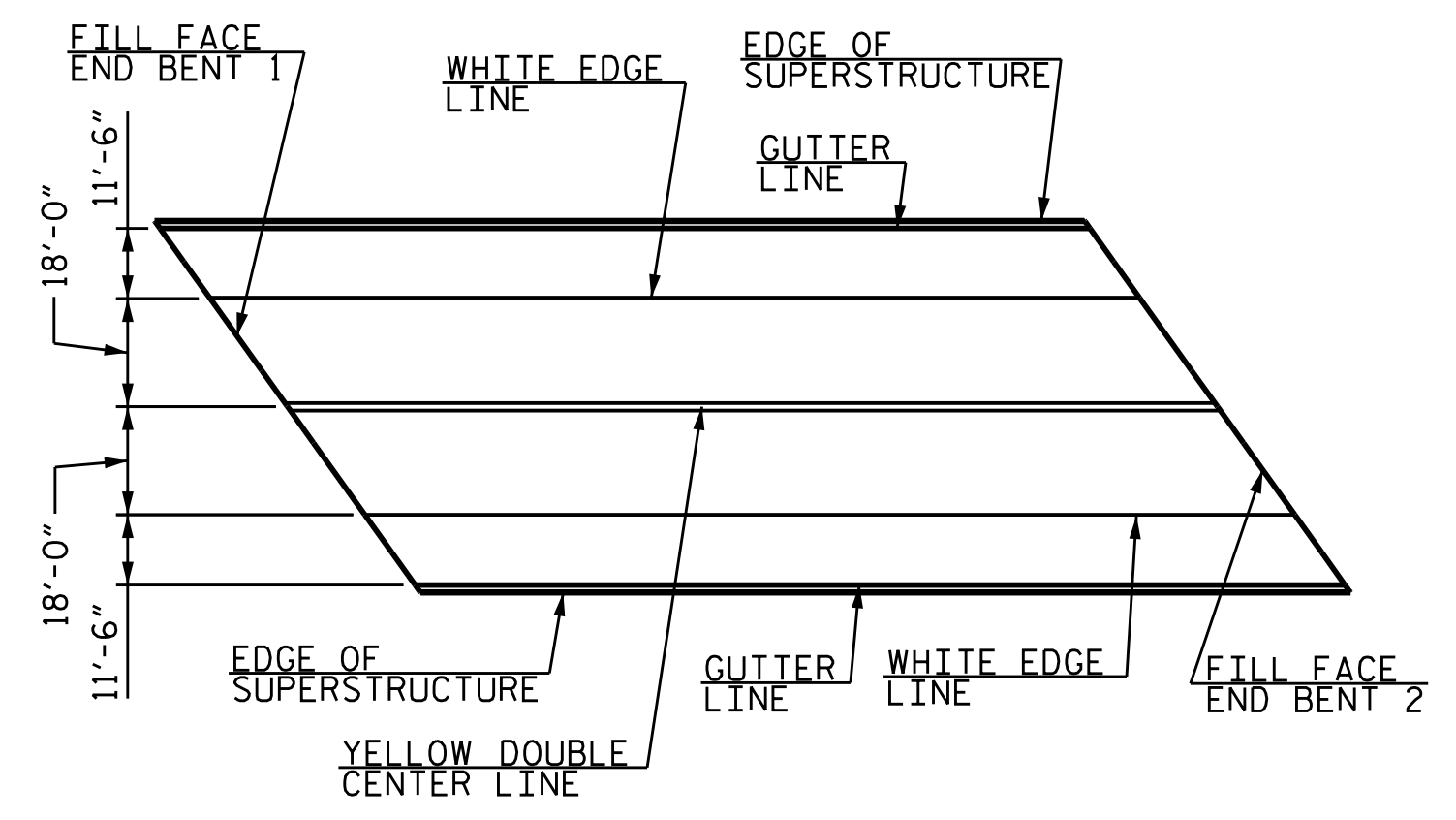
CONCRETE INSERT



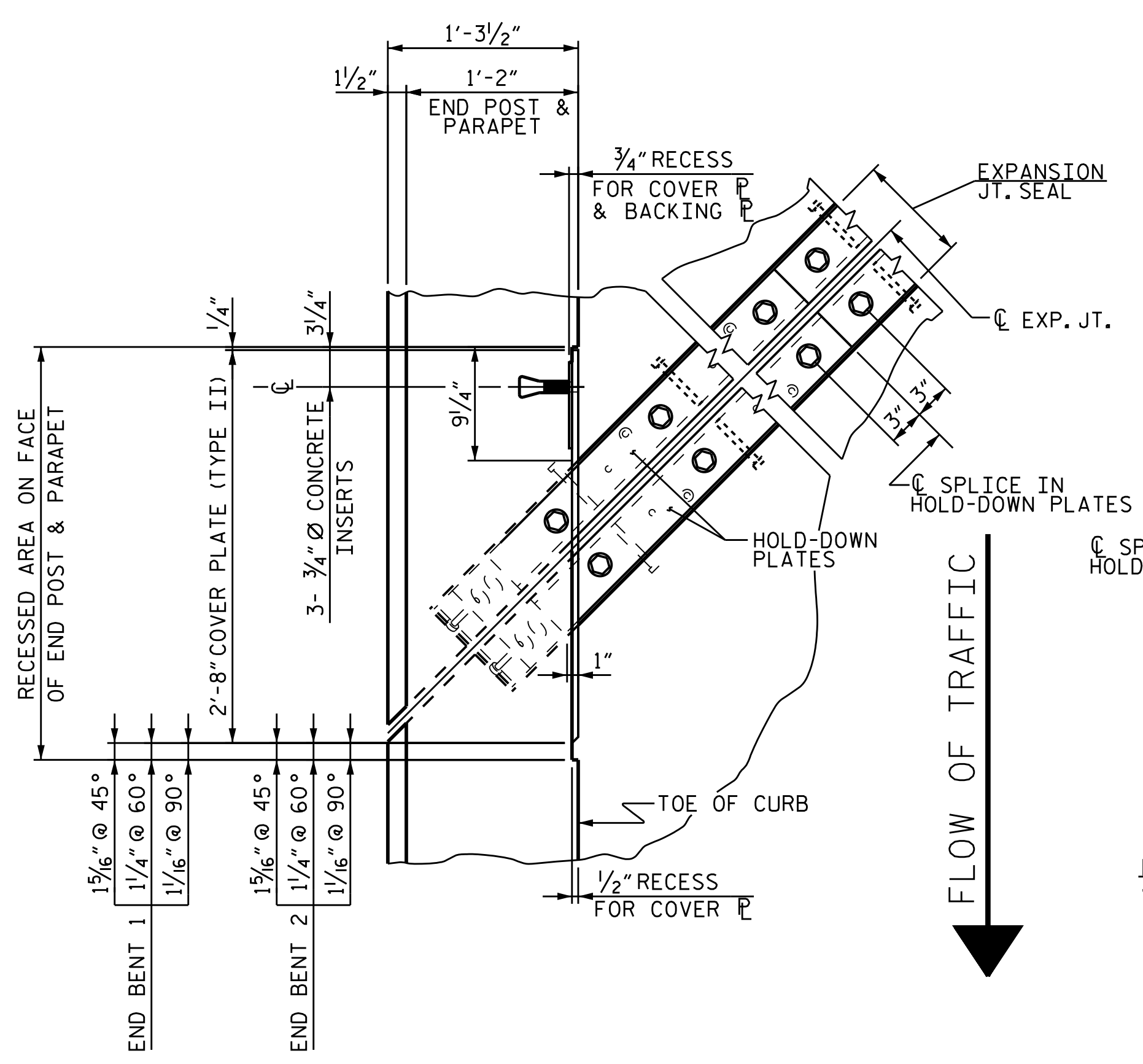
COVER PLATE DETAILS



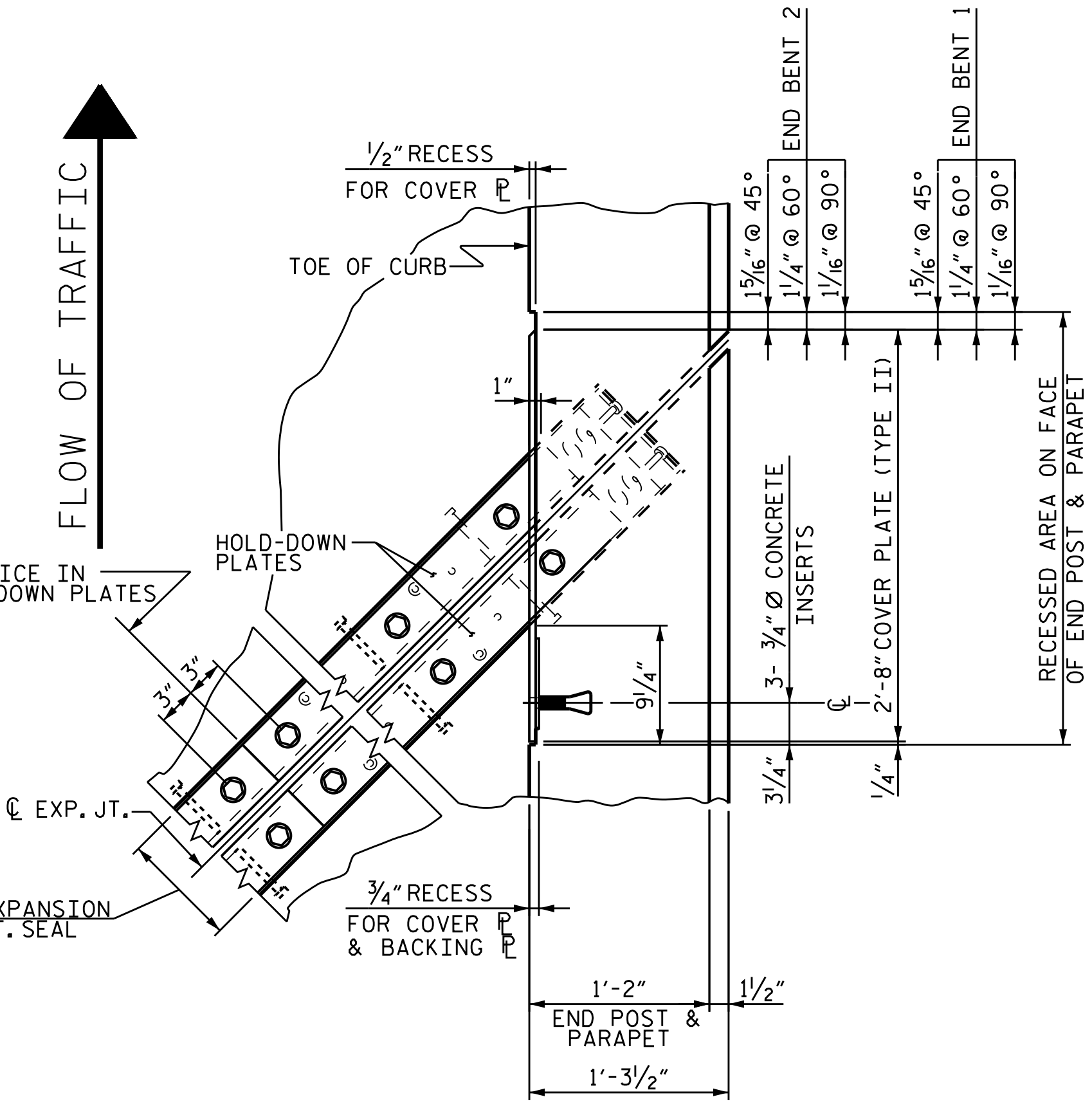
SECTION A - A



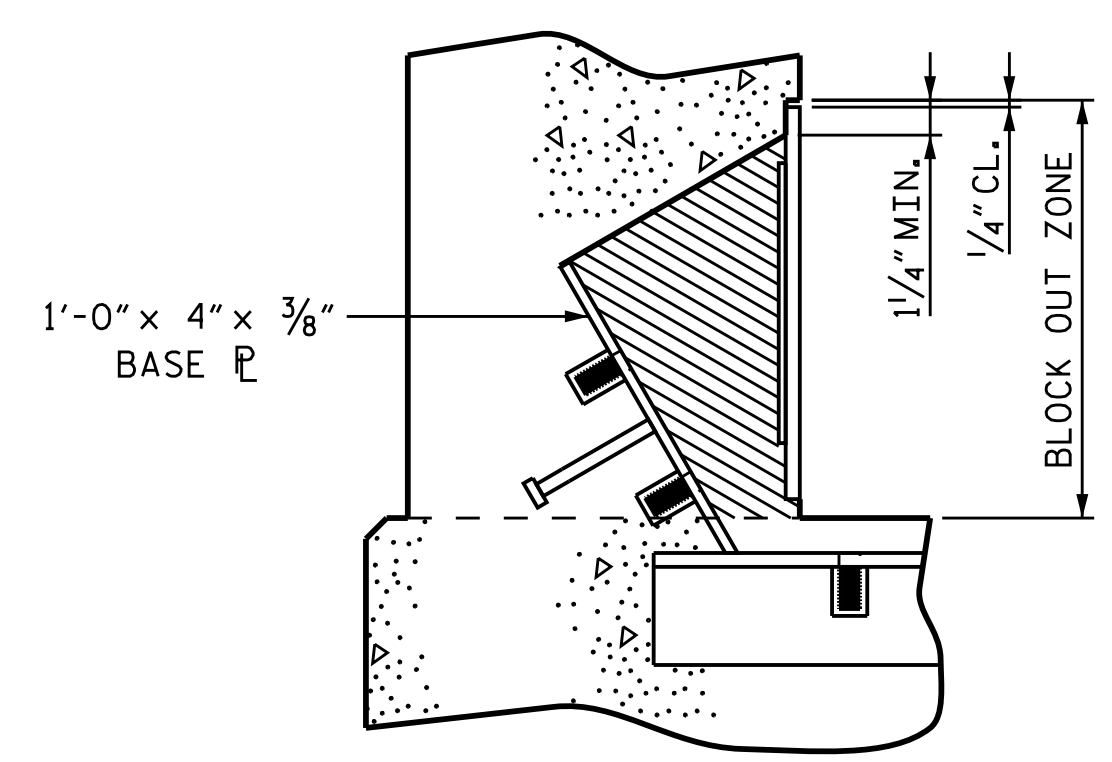
PAVEMENT MARKING ALIGNMENT



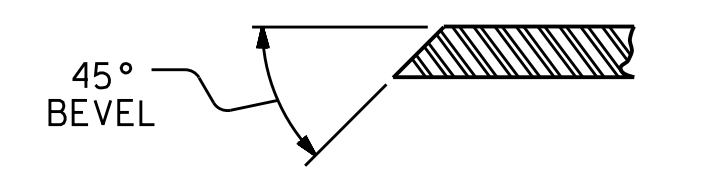
PLAN OF EXPANSION JOINT SEAL - LEFT SIDE



PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE



BLOCK OUT DETAIL



SECTION B - B

PROJECT NO. B-4982
IREDELL COUNTY
 STATION: 21+10.00-L-
 SHEET 2 OF 2

ASSEMBLED BY : JLA DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17
 DRAWN BY : REK 9/87 REV. 10/1/11 MAA/GM
 CHECKED BY : CRK 10/87 REV. 7/12 MAA/GM
 REV. 6/13 MAA/GM

PLAN OF EXPANSION JOINT SEAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
 804-C N. LAFAYETTE ST
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 EXPANSION JOINT
 SEAL DETAILS
 FOR PARAPET AND
 ENDPOST

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

SHEET NO. S-36
 TOTAL SHEETS 69

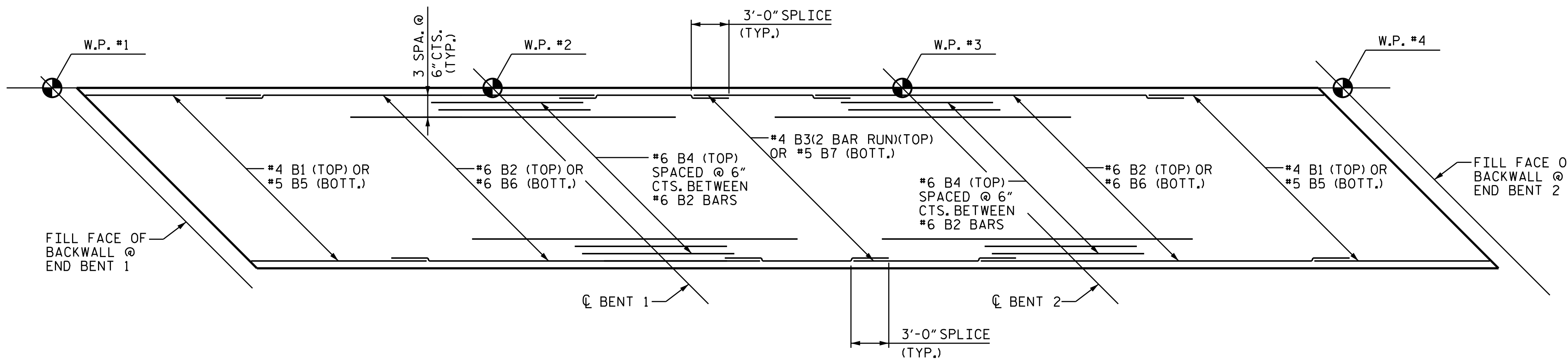
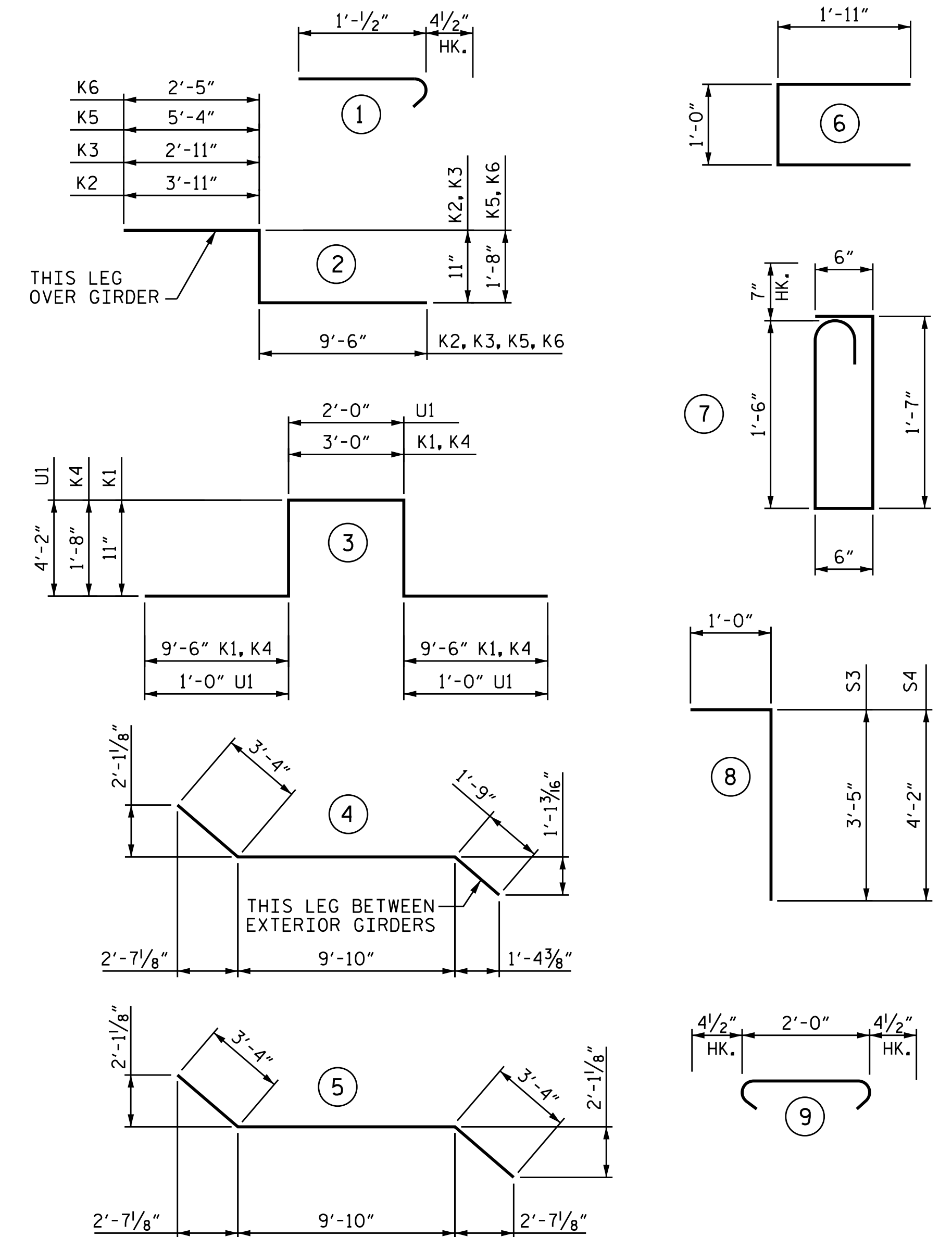
REINFORCING BAR SCHEDULE

DECK SLAB - THREE SPAN CONTINUOUS UNIT STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	363	#5	STR.	30'-5"	11,516	A200	8	#6	STR.	5'-0"	60	* B1	42	#4	STR.	30'-0"	842
A2	363	#5	STR.	30'-5"	11,516	A201	4	#5	STR.	29'-6"	123	* B2	42	#6	STR.	60'-0"	3,785
* A3	414	#5	STR.	5'-4"	2,303	A202	4	#5	STR.	28'-6"	119	* B3	42	#4	STR.	23'-4"	655
A4	414	#5	STR.	4'-8"	2,015	A203	4	#5	STR.	27'-6"	115	* B4	80	#6	STR.	25'-0"	3,004
* A100	8	#6	STR.	5'-0"	60	A204	4	#5	STR.	26'-6"	111	B5	106	#5	STR.	30'-0"	3,317
* A101	4	#5	STR.	29'-6"	123	A205	4	#5	STR.	25'-6"	106	B6	106	#6	STR.	60'-0"	9,553
* A102	4	#5	STR.	28'-6"	119	A206	4	#5	STR.	24'-6"	102	B7	53	#5	STR.	43'-8"	2,414
* A103	4	#5	STR.	27'-6"	115	A207	4	#5	STR.	23'-6"	98						
* A104	4	#5	STR.	26'-6"	111	A208	4	#5	STR.	22'-6"	94	* G1	2	#5	STR.	43'-0"	90
* A105	4	#5	STR.	25'-6"	106	A209	4	#5	STR.	21'-6"	90						
* A106	4	#5	STR.	24'-6"	102	A210	4	#5	STR.	20'-6"	86	* J1	84	#4	1	1'-5"	79
* A107	4	#5	STR.	23'-6"	98	A211	4	#5	STR.	19'-6"	81						
* A108	4	#5	STR.	22'-6"	94	A212	4	#5	STR.	18'-6"	77	* K1	12	#6	3	23'-10"	430
* A109	4	#5	STR.	21'-6"	90	A213	4	#5	STR.	17'-6"	73	* K2	6	#6	2	14'-4"	129
* A110	4	#5	STR.	20'-6"	86	A214	4	#5	STR.	16'-6"	69	* K3	6	#6	2	13'-4"	120
* A111	4	#5	STR.	19'-6"	81	A215	4	#5	STR.	15'-6"	65	* K4	8	#8	3	25'-4"	541
* A112	4	#5	STR.	18'-6"	77	A216	4	#5	STR.	14'-6"	60	* K5	4	#8	2	16'-6"	176
* A113	4	#5	STR.	17'-6"	73	A217	4	#5	STR.	13'-6"	56	* K6	4	#8	2	13'-7"	145
* A114	4	#5	STR.	16'-6"	69	A218	4	#5	STR.	12'-6"	52	* K20	12	#4	STR.	8'-10"	71
* A115	4	#5	STR.	15'-6"	65	A219	4	#5	STR.	11'-6"	48	* K21	36	#4	STR.	10'-0"	240
* A116	4	#5	STR.	14'-6"	60	A220	4	#5	STR.	10'-6"	44	* K22	16	#4	4	14'-11"	159
* A117	4	#5	STR.	13'-6"	56	A221	4	#5	STR.	9'-6"	40	* K23	8	#4	5	16'-6"	88
* A118	4	#5	STR.	12'-6"	52	A222	4	#5	STR.	8'-6"	35						
* A119	4	#5	STR.	11'-6"	48	A223	4	#5	STR.	7'-6"	31	* S1	60	#5	6	4'-10"	302
* A120	4	#5	STR.	10'-6"	44	A224	4	#5	STR.	6'-6"	27	* S2	60	#5	7	4'-8"	292
* A121	4	#5	STR.	9'-6"	40	A225	4	#5	STR.	5'-6"	23	* S3	12	#4	8	4'-5"	35
* A122	4	#5	STR.	8'-6"	35	A226	4	#5	STR.	4'-6"	19	* S4	36	#4	8	5'-2"	124
* A123	4	#5	STR.	7'-6"	31	A227	4	#5	STR.	3'-6"	15	* S5	144	#4	9	2'-9"	265
* A124	4	#5	STR.	6'-6"	27	A228	4	#5	STR.	2'-6"	10						
* A125	4	#5	STR.	5'-6"	23							* U1	36	#4	3	12'-4"	297
* A126	4	#5	STR.	4'-6"	19												
* A127	4	#5	STR.	3'-6"	15												
* A128	4	#5	STR.	2'-6"	10												
TOTAL REINFORCING STEEL:																30,744 LBS	
TOTAL EPOXY-COATED REIN. STEEL:																27,617 LBS	

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT



"B" BAR LAYOUT STAGE I & II

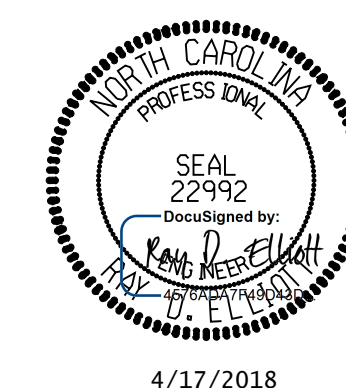
(STAGE 1 SHOWN STAGE 2 SIMILAR.)

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 1 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

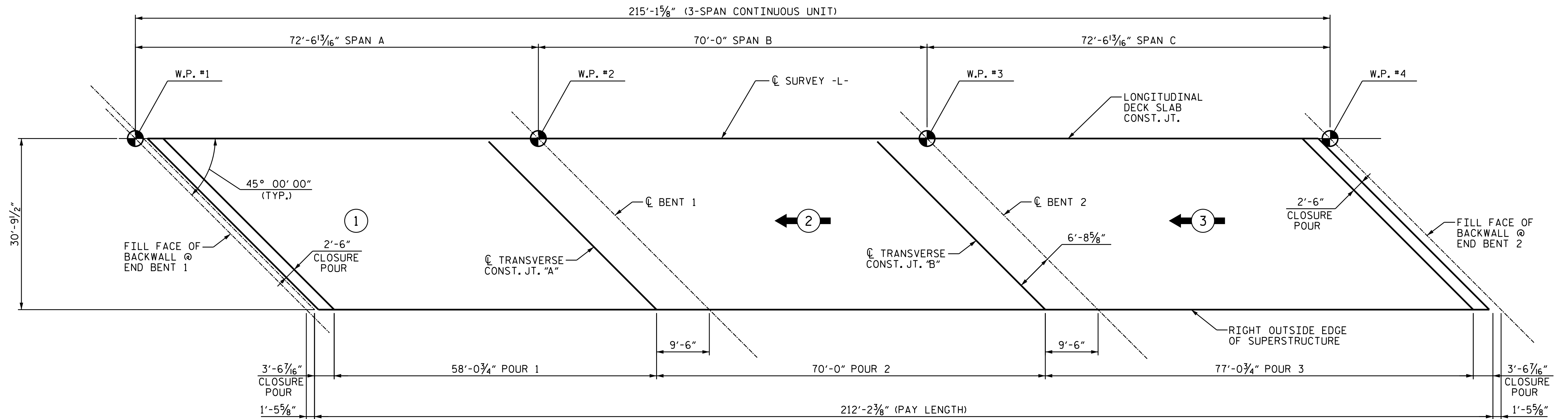
SUPERSTRUCTURE
BILL OF MATERIAL
STAGE 1 CONSTRUCTION

DRAWN BY : NMW DATE : 2/17
CHECKED BY : RDE DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

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TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			69



LAYOUT FOR COMPUTING AREA
REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 6,534)

STAGE 1 SUPERSTRUCTURE QUANTITIES	
REINFORCING STEEL	30,744 LBS
EPOXY COATED REINFORCING STEEL	33,209 LBS
REINFORCED CONCRETE DECK SLAB	6,534 SF
CLASS AA CONCRETE	265.3 CY
GROOVING BRIDGE FLOORS	7,262 SF
2-BAR METAL RAIL	203.4 LF

REINFORCING STEEL SUMMARY		
	REINFORCING STEEL (LBS.)	EPOXY-COATED REINFORCING STEEL (LBS.)
DECK SLAB	30,744	27,617
PARAPET & END POSTS		5,592
TOTAL	30,744	33,209

GROOVING BRIDGE FLOORS	
BRIDGE DECK	5,902 SQ. FEET
APPROACH SLAB	1,360 SQ. FEET
TOTAL	7,262 SQ. FEET

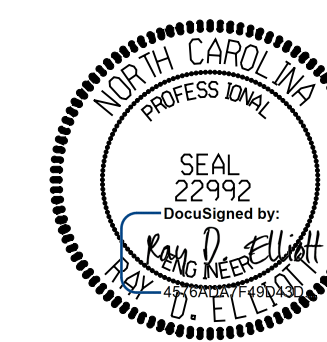
CLASS AA CONCRETE SUMMARY	
	CUBIC YDS.
DECK SLAB (POUR 1)	56.8
(POUR 2)	78.8
(POUR 3)	85.7
(CLOSURE POUR)	12.9
SUB-TOTAL	234.2
PARAPET & END POSTS	31.1
TOTAL	265.3

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BILL OF MATERIAL
STAGE 1 CONSTRUCTION

DRAWN BY : NMW DATE : 2/17
CHECKED BY : RDE DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

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TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-38
1			3			TOTAL SHEETS
2			4			69

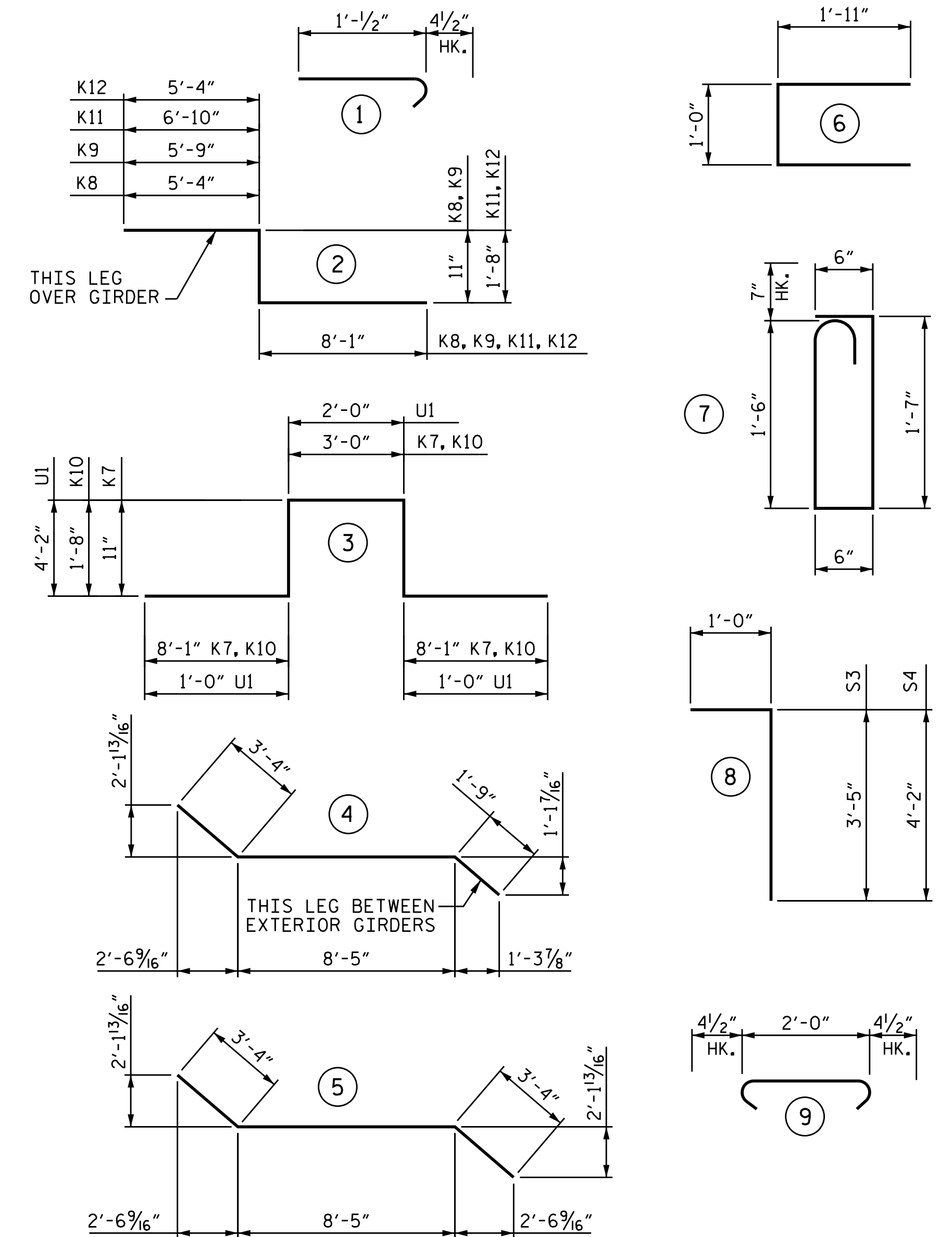
REINFORCING BAR SCHEDULE

DECK SLAB - THREE SPAN CONTINUOUS UNIT STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	363	#5	STR.	30'-5"	11,516	A200	8	#6	STR.	5'-0"	60	* B1	42	#4	STR.	30'-0"	842
A2	363	#5	STR.	30'-5"	11,516	A201	4	#5	STR.	29'-6"	123	* B2	42	#6	STR.	60'-0"	3,785
* A3	414	#5	STR.	5'-4"	2,303	A202	4	#5	STR.	28'-6"	119	* B3	42	#4	STR.	23'-4"	655
A4	414	#5	STR.	4'-8"	2,015	A203	4	#5	STR.	27'-6"	115	* B4	80	#6	STR.	25'-0"	3,004
* A100	8	#6	STR.	5'-0"	60	A204	4	#5	STR.	26'-6"	111	B5	108	#5	STR.	30'-0"	33,79
* A101	4	#5	STR.	29'-6"	123	A205	4	#5	STR.	25'-6"	106	B6	108	#6	STR.	60'-0"	9,733
* A102	4	#5	STR.	28'-6"	119	A206	4	#5	STR.	24'-6"	102	B7	54	#5	STR.	43'-8"	2,459
* A103	4	#5	STR.	27'-6"	115	A207	4	#5	STR.	23'-6"	98						
* A104	4	#5	STR.	26'-6"	111	A208	4	#5	STR.	22'-6"	94	* G1	2	#5	STR.	43'-0"	90
* A105	4	#5	STR.	25'-6"	106	A209	4	#5	STR.	21'-6"	90						
* A106	4	#5	STR.	24'-6"	102	A210	4	#5	STR.	20'-6"	86	* J1	84	#4	1	1'-5"	79
* A107	4	#5	STR.	23'-6"	98	A211	4	#5	STR.	19'-6"	81						
* A108	4	#5	STR.	22'-6"	94	A212	4	#5	STR.	18'-6"	77	* K7	12	#6	3	21'-0"	379
* A109	4	#5	STR.	21'-6"	90	A213	4	#5	STR.	17'-6"	73	* K8	6	#6	2	14'-4"	129
* A110	4	#5	STR.	20'-6"	86	A214	4	#5	STR.	16'-6"	69	* K9	6	#6	2	14'-9"	133
* A111	4	#5	STR.	19'-6"	81	A215	4	#5	STR.	15'-6"	65	* K10	8	#8	3	22'-6"	481
* A112	4	#5	STR.	18'-6"	77	A216	4	#5	STR.	14'-6"	60	* K11	4	#8	2	16'-7"	177
* A113	4	#5	STR.	17'-6"	73	A217	4	#5	STR.	13'-6"	56	* K12	4	#8	2	15'-1"	161
* A114	4	#5	STR.	16'-6"	69	A218	4	#5	STR.	12'-6"	52	* K24	12	#4	STR.	7'-4"	59
* A115	4	#5	STR.	15'-6"	65	A219	4	#5	STR.	11'-6"	48	* K25	36	#4	STR.	8'-7"	206
* A116	4	#5	STR.	14'-6"	60	A220	4	#5	STR.	10'-6"	44	* K26	16	#4	4	13'-6"	144
* A117	4	#5	STR.	13'-6"	56	A221	4	#5	STR.	9'-6"	40	* K27	8	#4	5	15'-1"	81
* A118	4	#5	STR.	12'-6"	52	A222	4	#5	STR.	8'-6"	35						
* A119	4	#5	STR.	11'-6"	48	A223	4	#5	STR.	7'-6"	31	* S1	54	#5	6	4'-10"	272
* A120	4	#5	STR.	10'-6"	44	A224	4	#5	STR.	6'-6"	27	* S2	54	#5	7	4'-8"	263
* A121	4	#5	STR.	9'-6"	40	A225	4	#5	STR.	5'-6"	23	* S3	12	#4	8	4'-5"	35
* A122	4	#5	STR.	8'-6"	35	A226	4	#5	STR.	4'-6"	19	* S4	36	#4	8	5'-2"	124
* A123	4	#5	STR.	7'-6"	31	A227	4	#5	STR.	3'-6"	15	* S5	126	#4	9	2'-9"	231
* A124	4	#5	STR.	6'-6"	27	A228	4	#5	STR.	2'-6"	10						
* A125	4	#5	STR.	5'-6"	23							* U1	30	#4	3	12'-4"	247
* A126	4	#5	STR.	4'-6"	19												
* A127	4	#5	STR.	3'-6"	15												
* A128	4	#5	STR.	2'-6"	10												
TOTAL REINFORCING STEEL:																30,991 LBS	
TOTAL EPOXY-COATED REIN. STEEL:																27,285 LBS	

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT



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

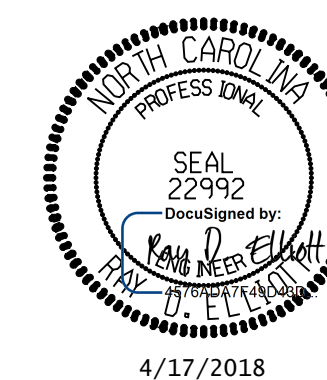
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 1 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

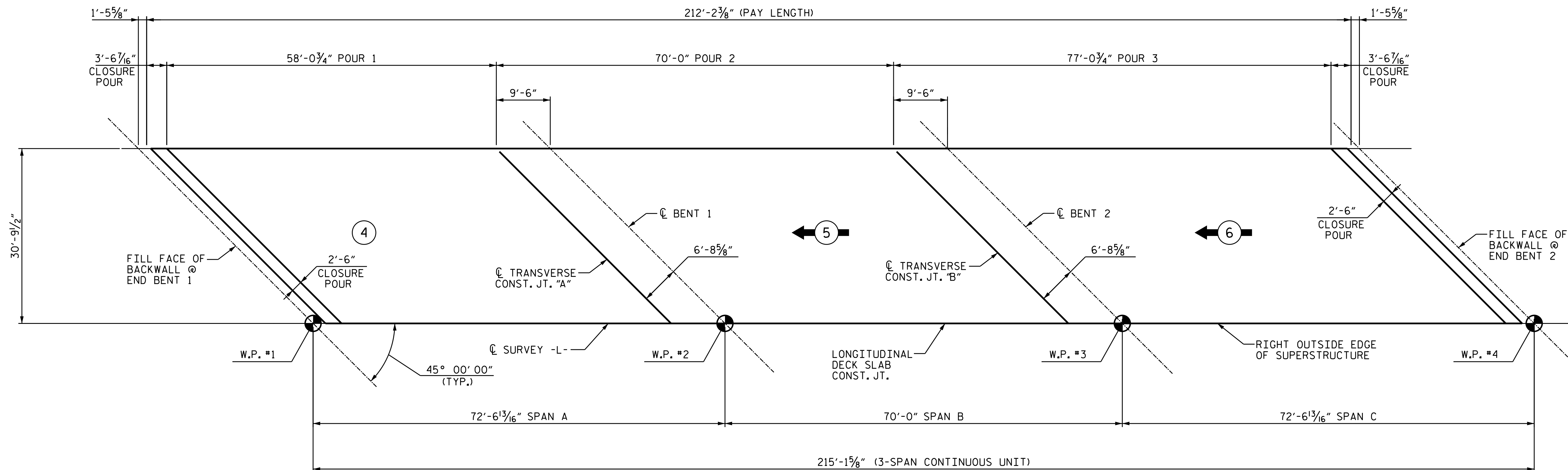
SUPERSTRUCTURE
BILL OF MATERIAL
STAGE 2 CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
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CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			69

DRAWN BY : NMW DATE : 2/17
CHECKED BY : RDE DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17



LAYOUT FOR COMPUTING AREA
REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 6,534)

STAGE 2 SUPERSTRUCTURE QUANTITIES	
REINFORCING STEEL	30,991 LBS
EPOXY COATED REINFORCING STEEL	32,877 LBS
REINFORCED CONCRETE DECK SLAB	6,534 SF
CLASS AA CONCRETE	270.2 CY
GROOVING BRIDGE FLOORS	7,262 SF
2-BAR METAL RAIL	203.4 LF

REINFORCING STEEL SUMMARY		
	REINFORCING STEEL (LBS.)	EPOXY-COATED REINFORCING STEEL (LBS.)
DECK SLAB	30,991	27,285
PARAPET & END POSTS		5,592
TOTAL	30,991	32,877

GROOVING BRIDGE FLOORS	
BRIDGE DECK	5,902 SQ. FEET
APPROACH SLAB	1,360 SQ. FEET
TOTAL	7,262 SQ. FEET

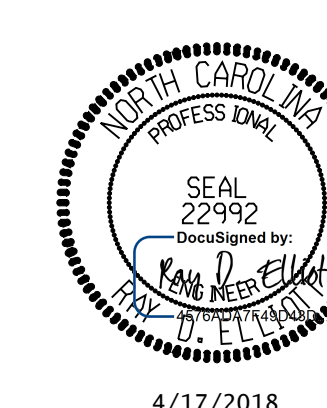
CLASS AA CONCRETE SUMMARY	
	CUBIC YDS.
DECK SLAB (POUR 1)	57.8
(POUR 2)	80.7
(POUR 3)	87.5
(CLOSURE POUR)	13.1
SUB-TOTAL	239.1
PARAPET & END POSTS	31.1
TOTAL	270.2

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

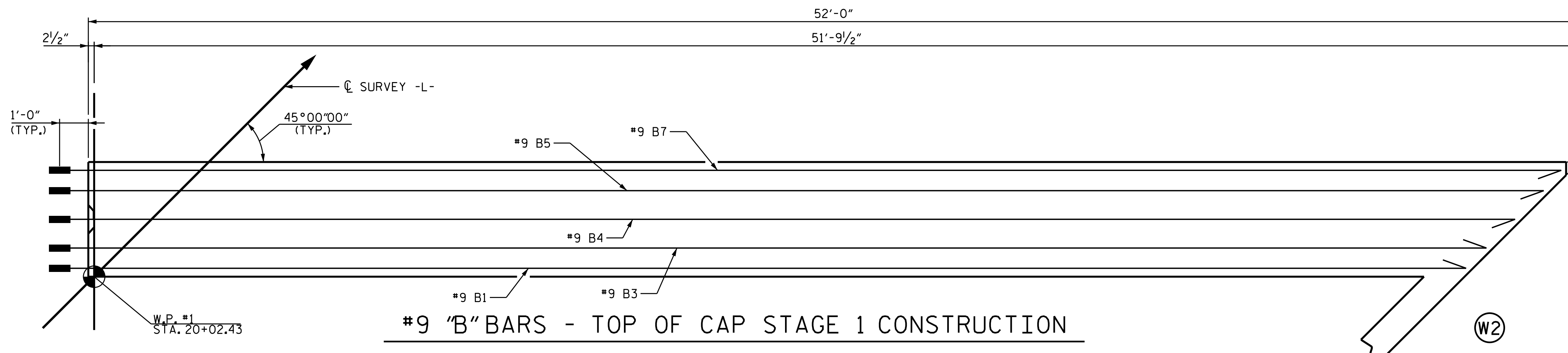
SUPERSTRUCTURE
BILL OF MATERIAL
STAGE 2 CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

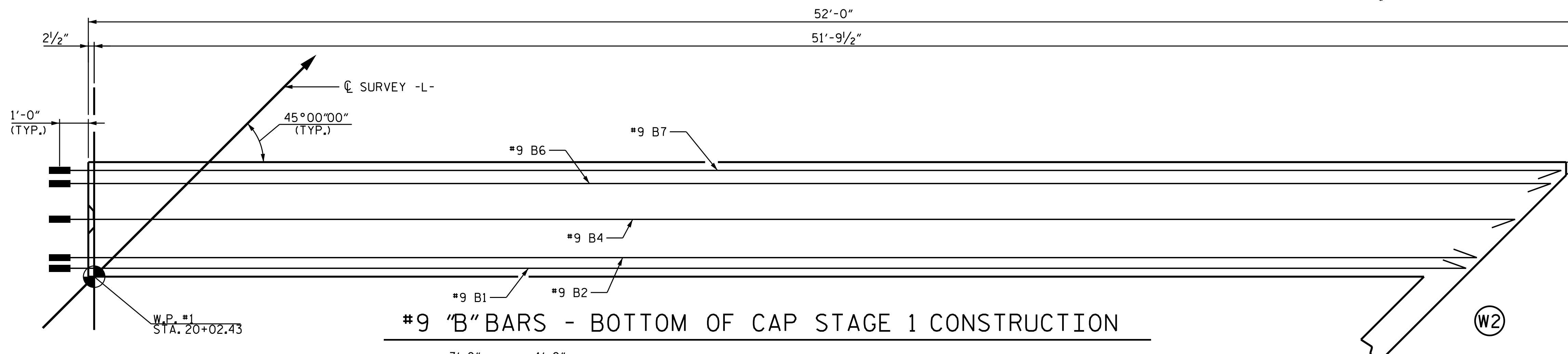
TGS ENGINEERS
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SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-40
1			3			TOTAL SHEETS
2			4			69

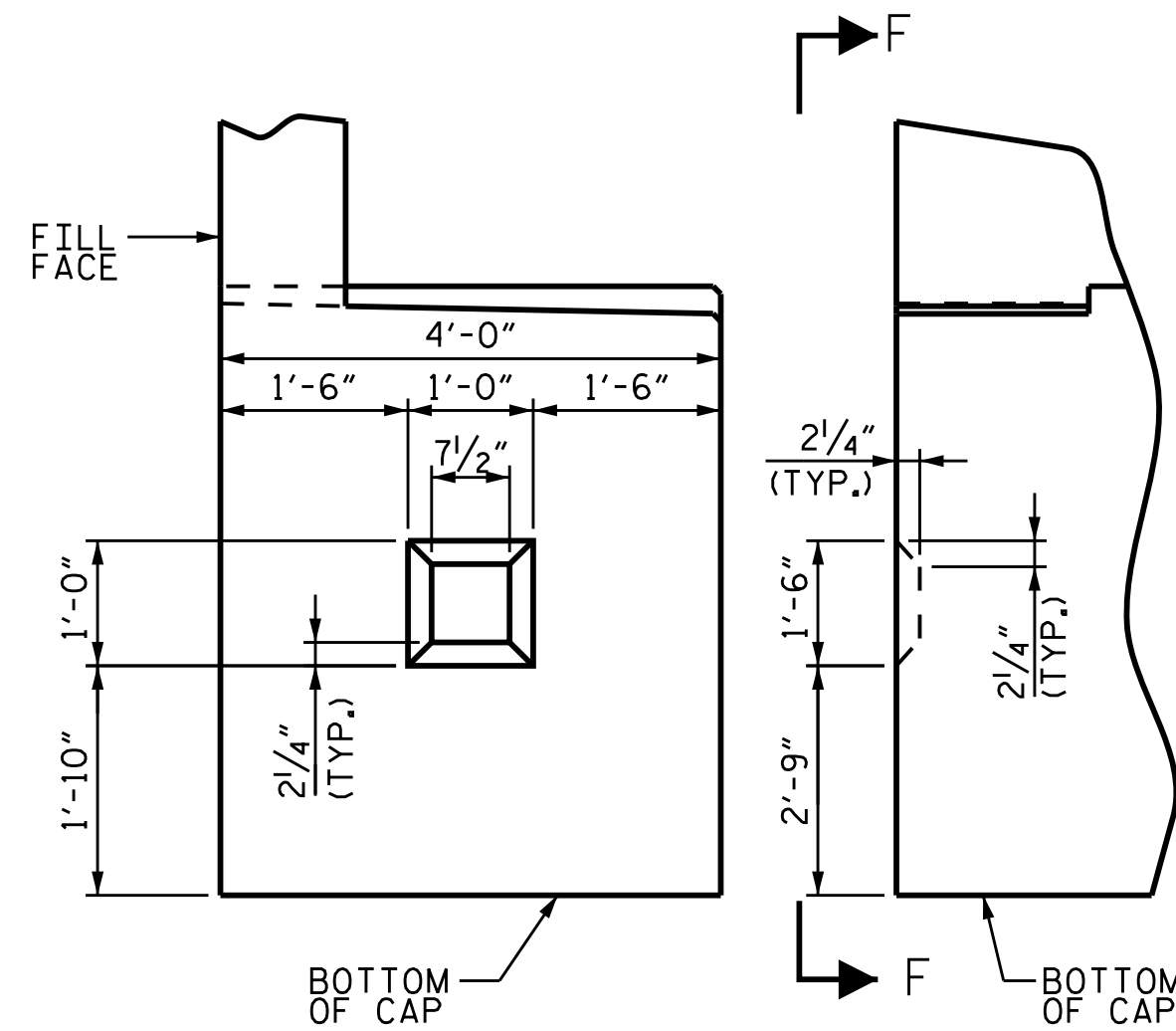
DRAWN BY : NMW DATE : 2/17
CHECKED BY : RDE DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17



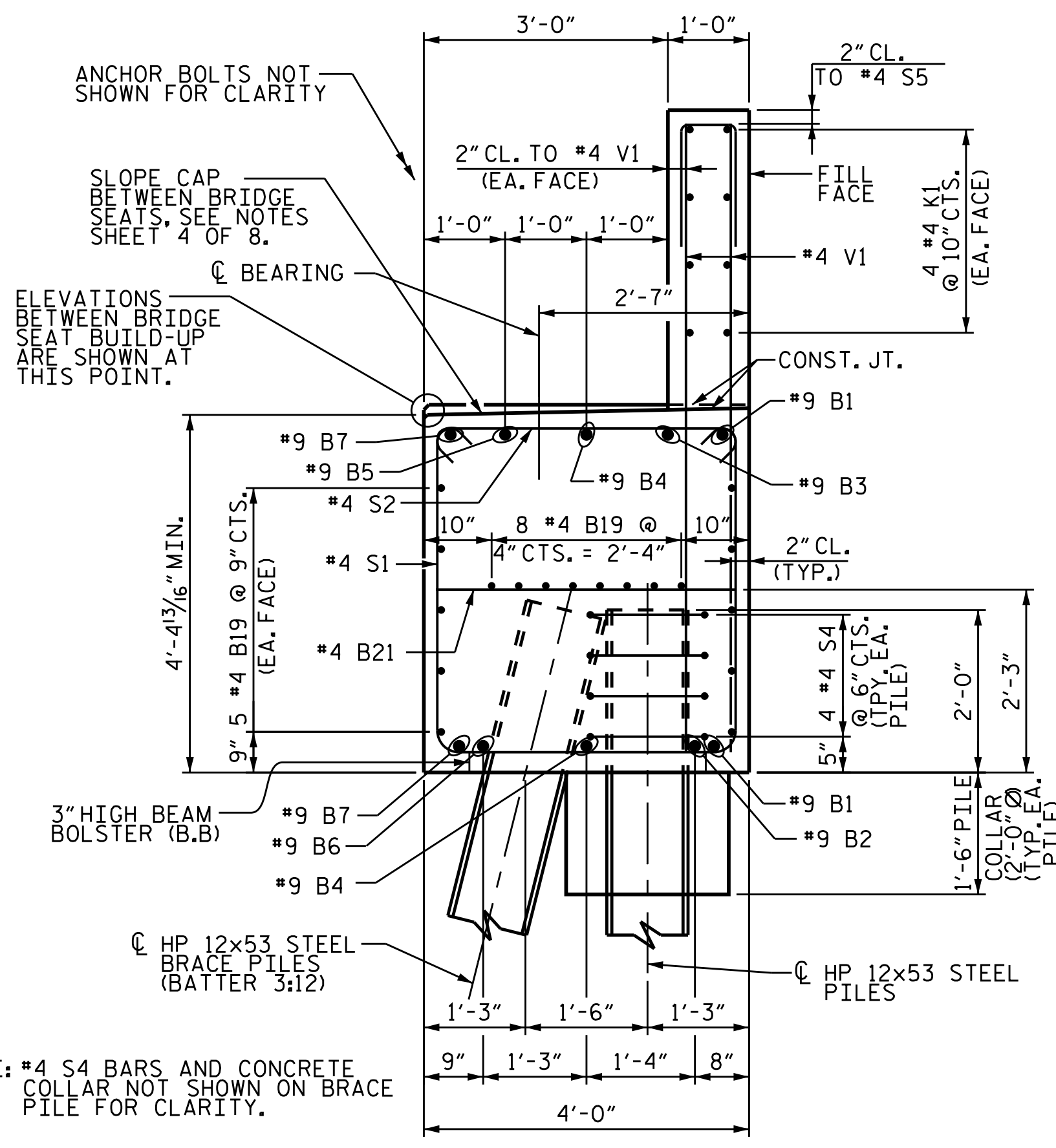
#9 "B" BARS - TOP OF CAP STAGE 1 CONSTRUCTION



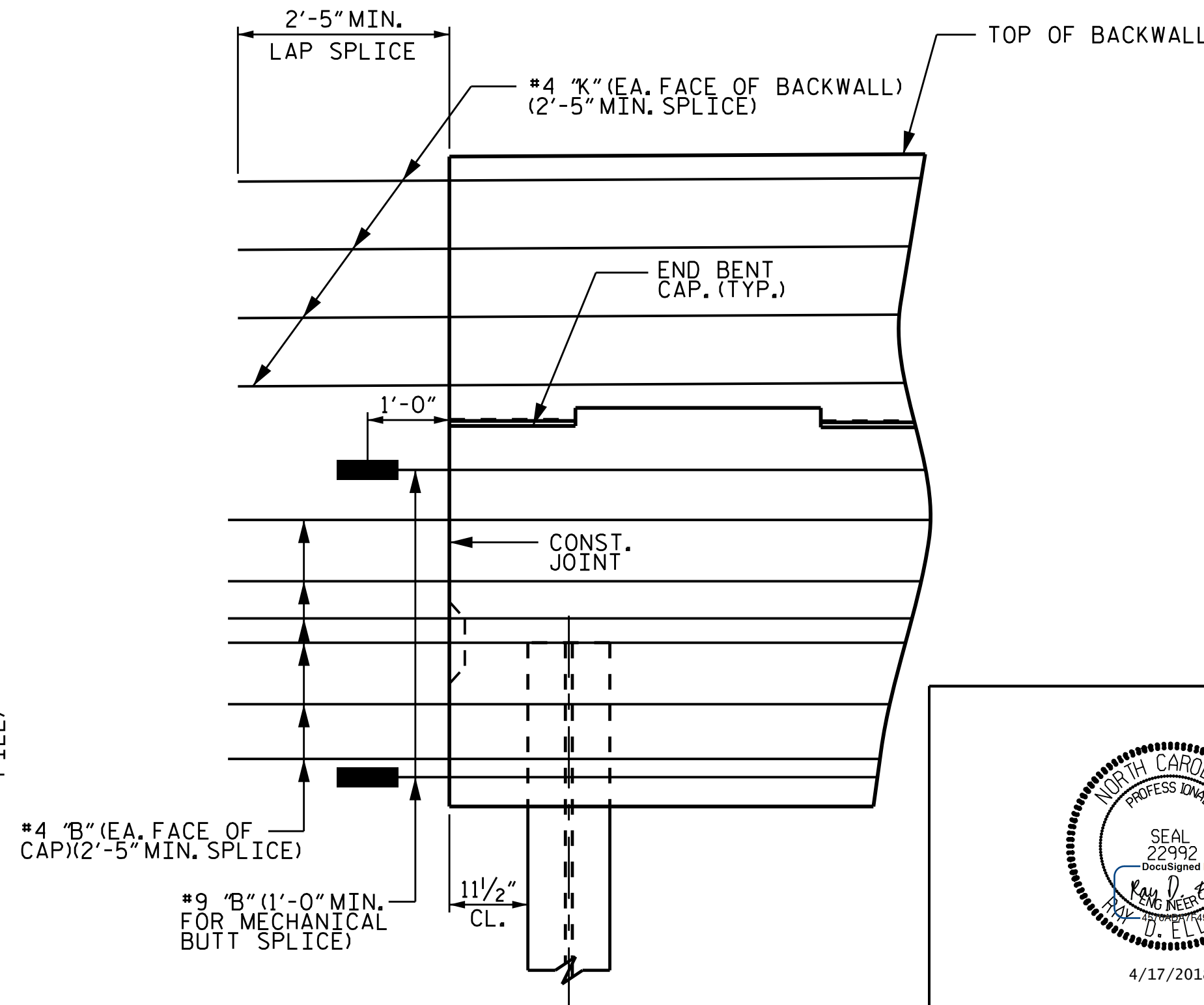
#9 "B" BARS - BOTTOM OF CAP STAGE 1 CONSTRUCTION



SECTION F-F
SHEAR KEY DETAIL



SECTION A-A



DETAIL "B"

PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00 -L-
 SHEET 2 OF 8

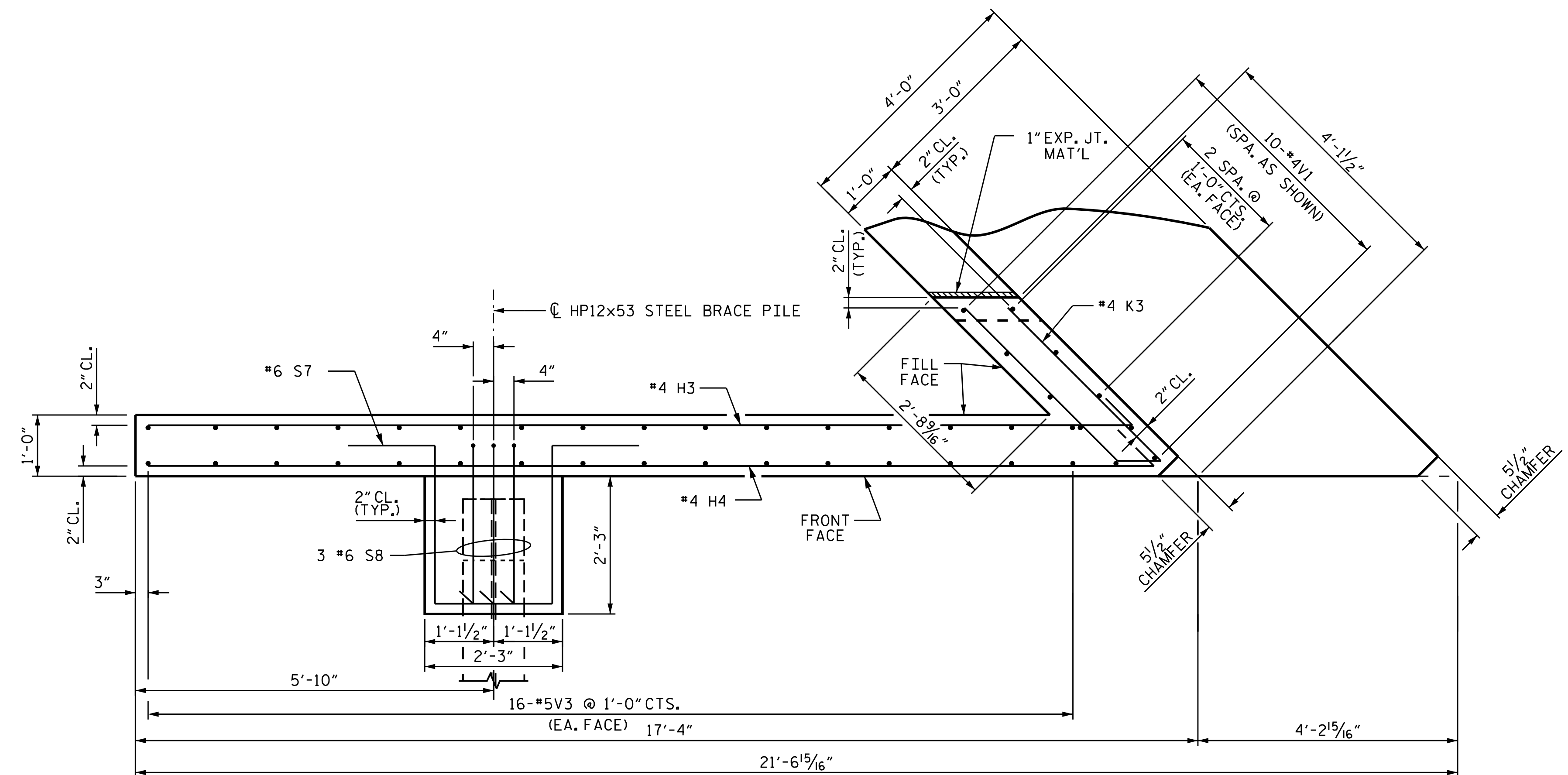


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 1
 STAGE 1 CONSTRUCTION
 DETAILS

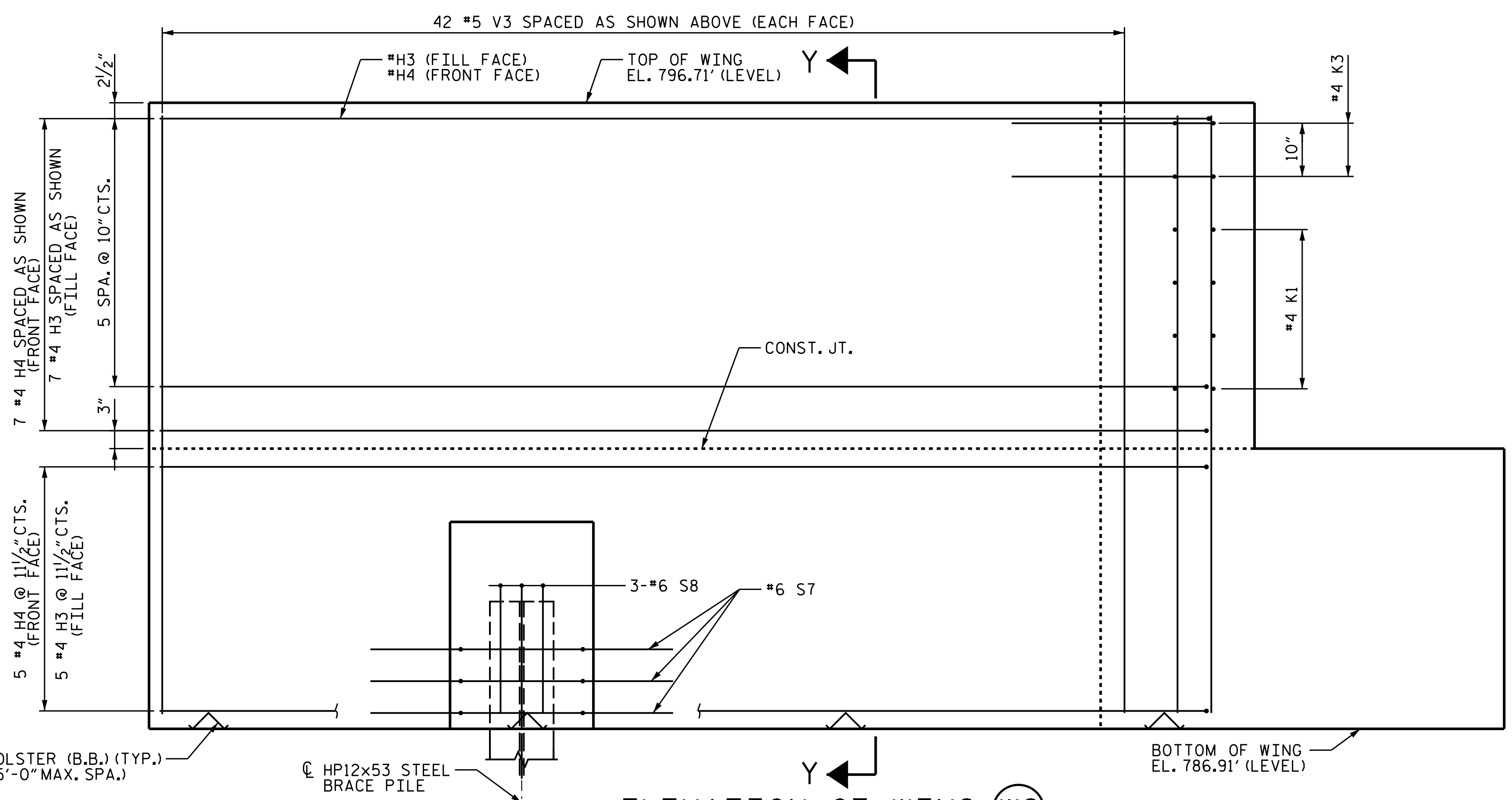
DRAWN BY : CCC DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						REVISIONS			SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:				
1			3			S-42			
2			4			TOTAL SHEETS 69			

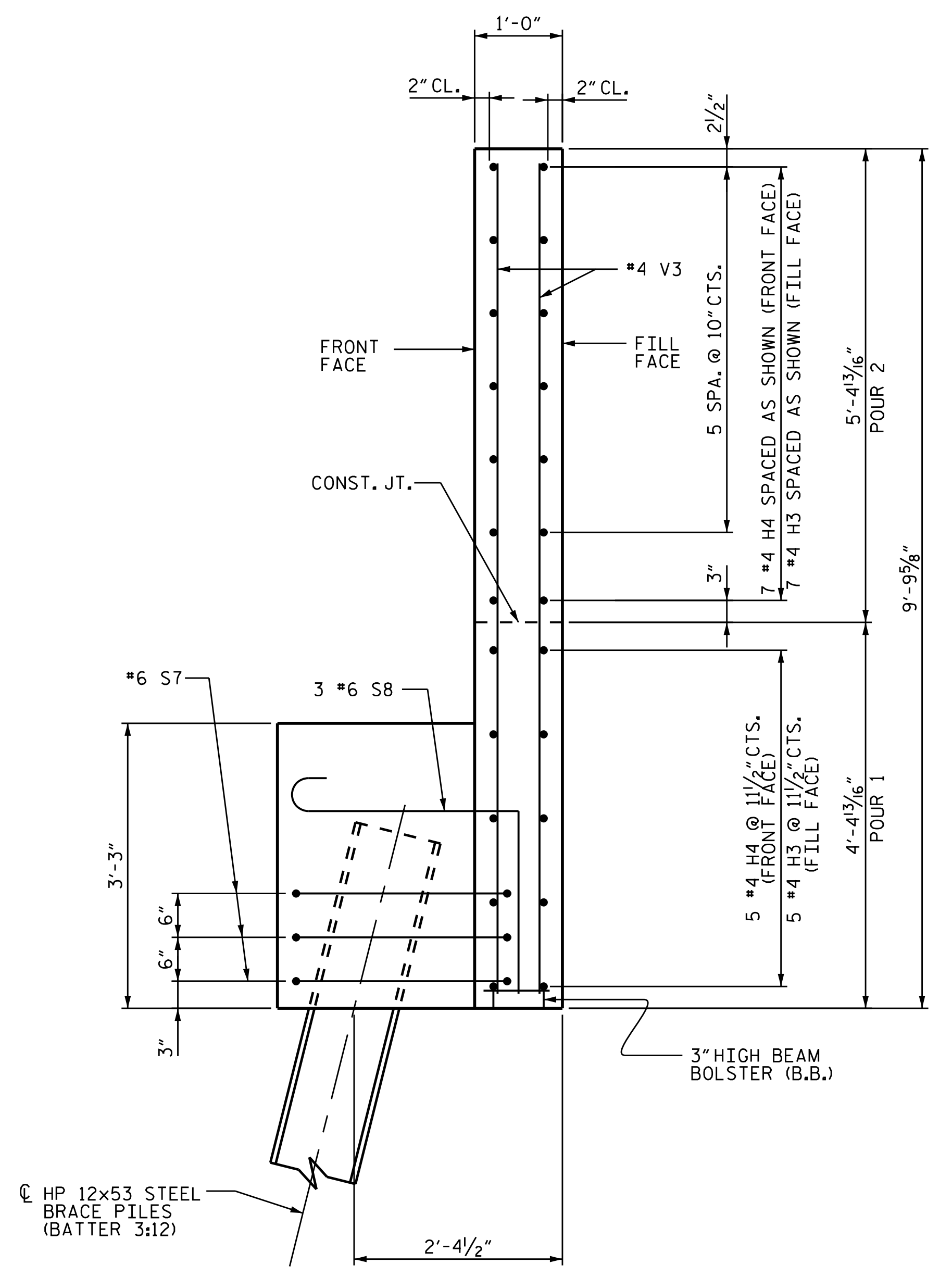
TGS ENGINEERS
 804-C N. LAFAYETTE ST
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275



PLAN OF WING (W2)



ELEVATION OF WING (W2)



SECTION Y-Y

PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00 -L-
 SHEET 3 OF 8

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SEAL
 22992
 REGISTERED BY
 KIM D. ELLIOTT
 CIVIL ENGINEER
 4/17/2018

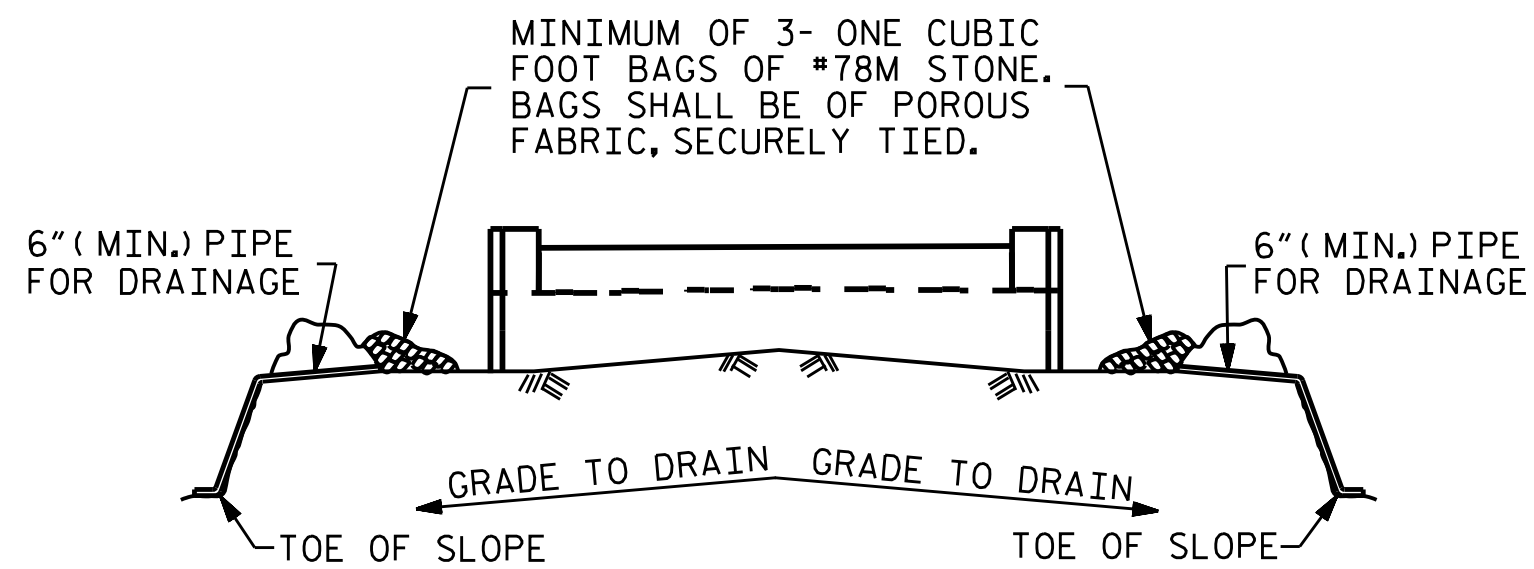
DOCUMENT NOT CONSIDERED FINAL
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TGS ENGINEERS
 804-C N. LAFAYETTE ST
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

SUBSTRUCTURE
 END BENT No. 1
 STAGE 1 CONSTRUCTION
 WING DETAILS

REVISIONS						SHEET NO. S-43
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 69
2			4			

DRAWN BY : CCC DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

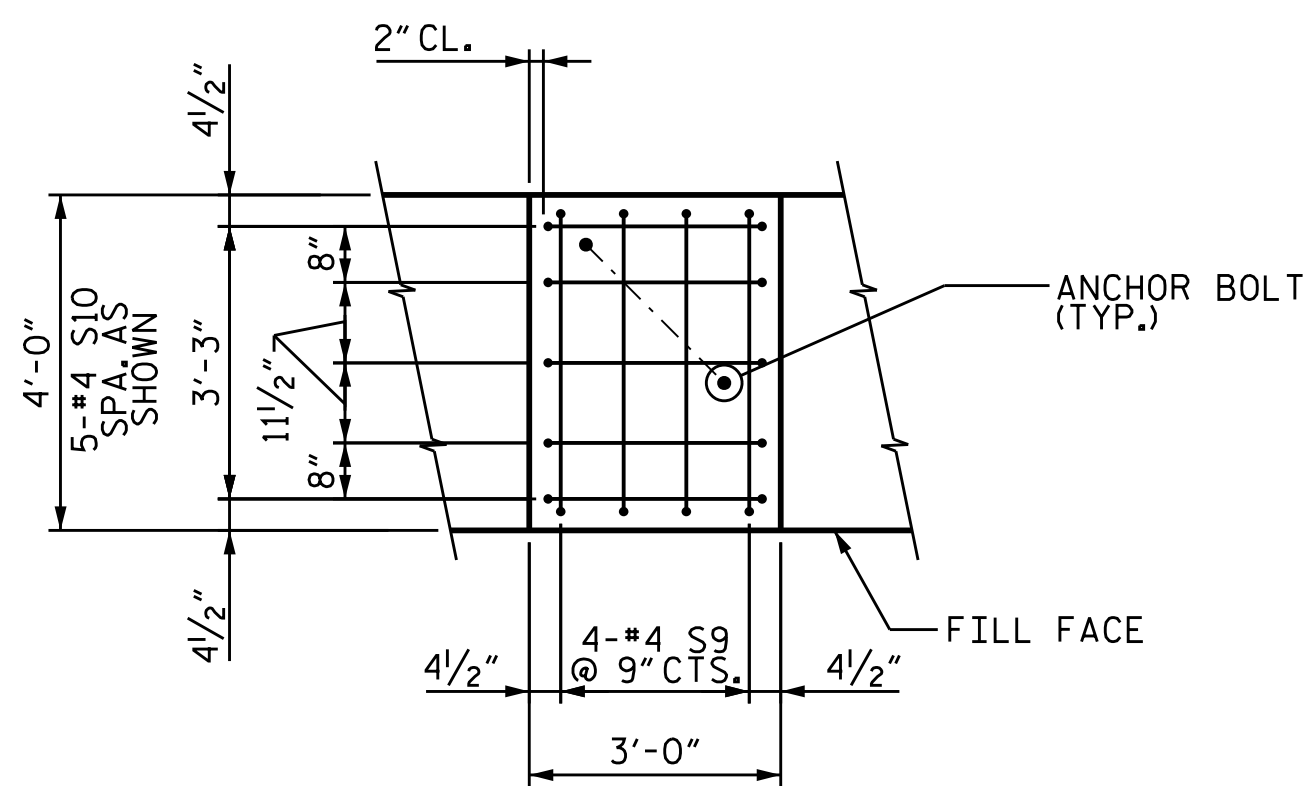


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

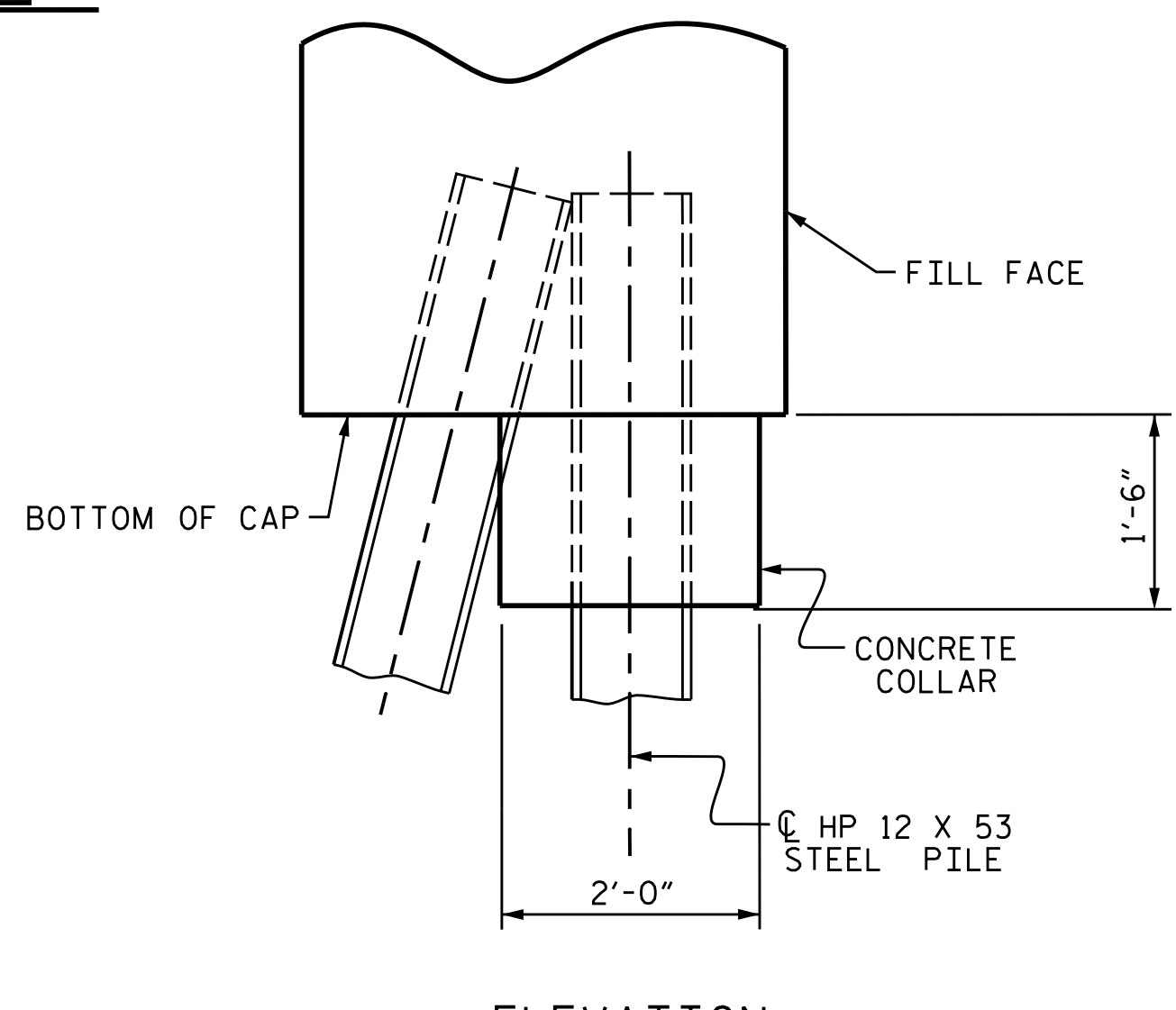
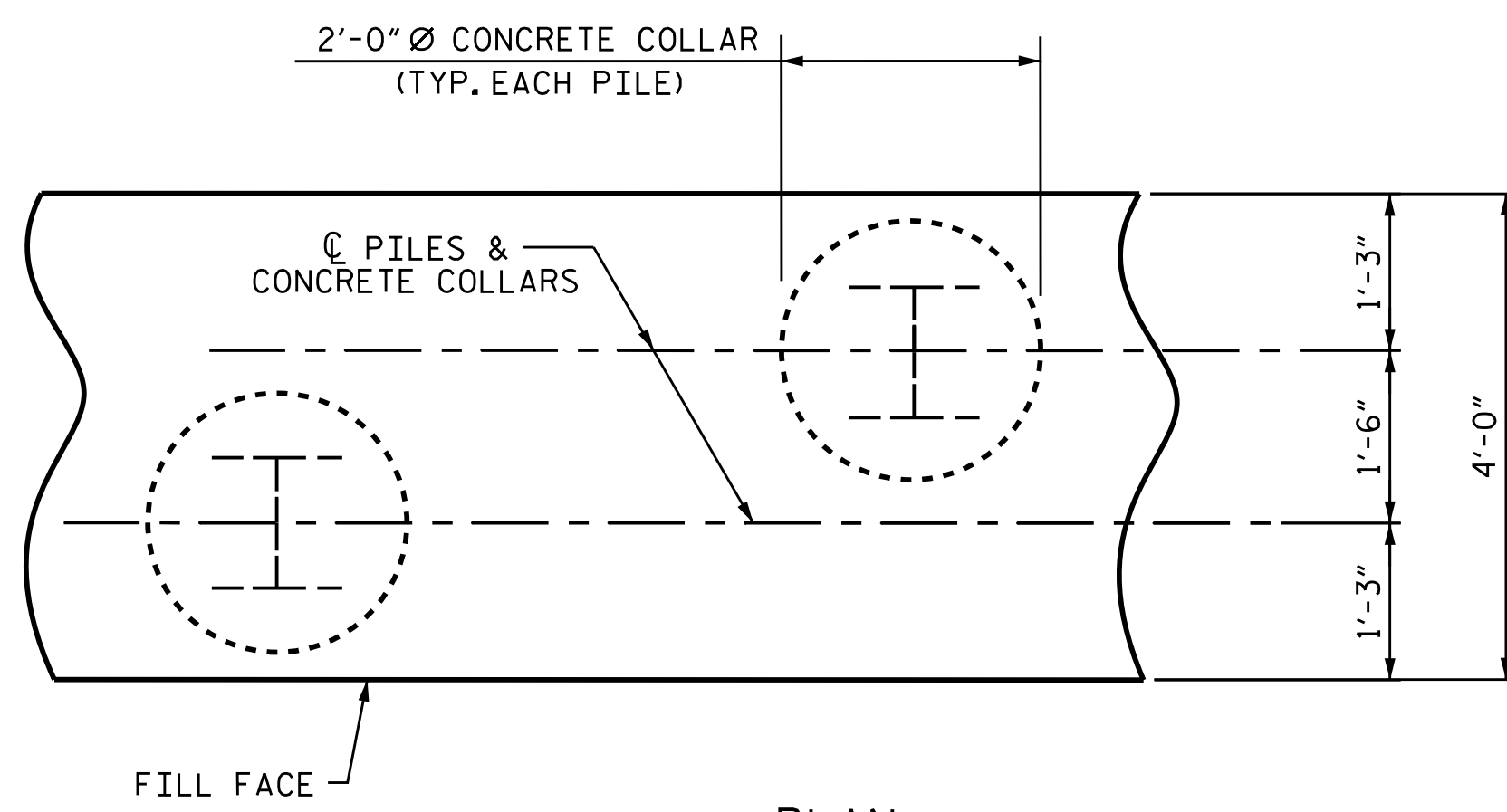
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

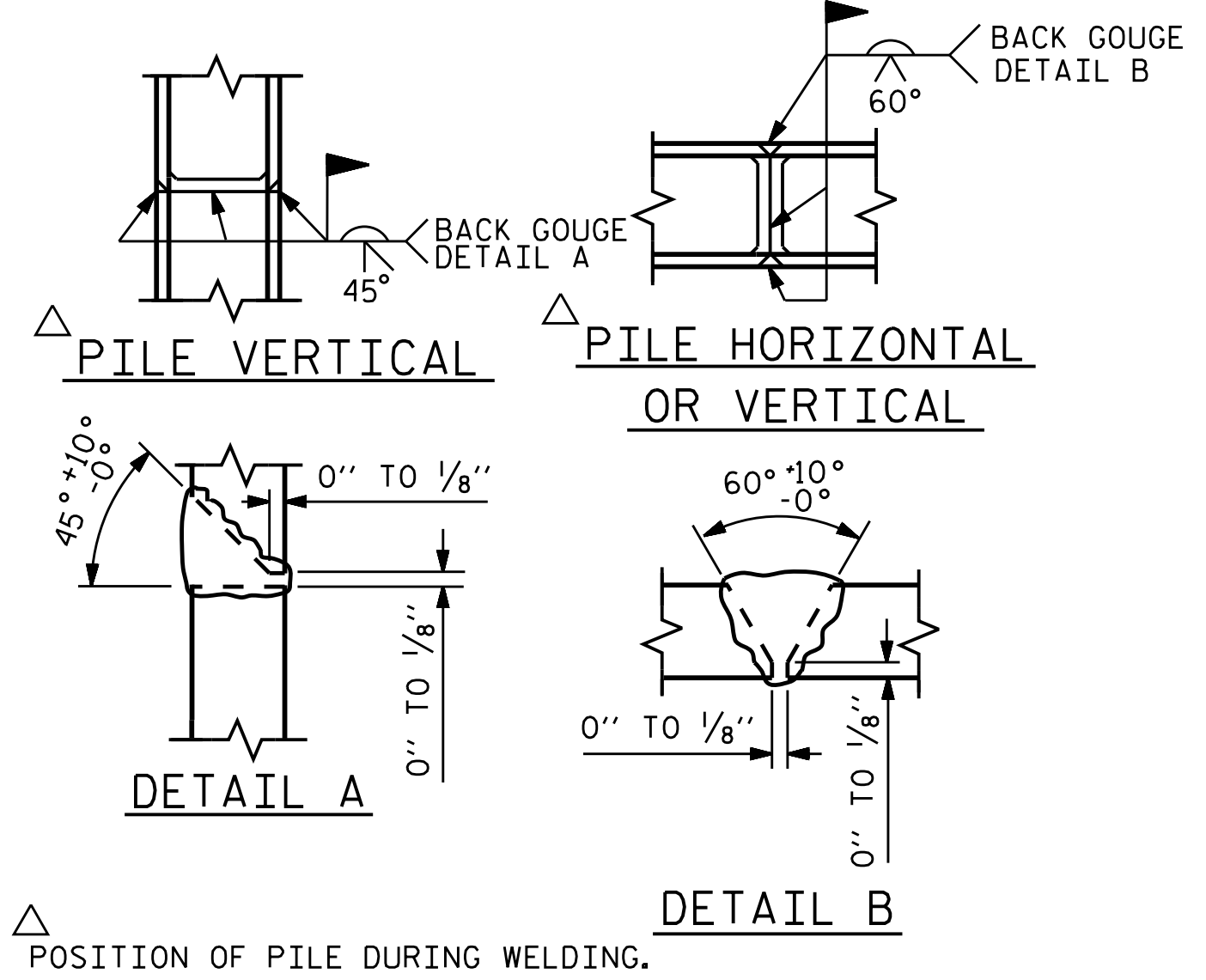


BRIDGE SEAT REINFORCING DETAIL

(TYPICAL FOR GIRDERS 5, 6 & 7 SEATS)



CORROSION PROTECTION FOR STEEL PILES DETAIL



PILE SPLICE DETAILS

NOTES:

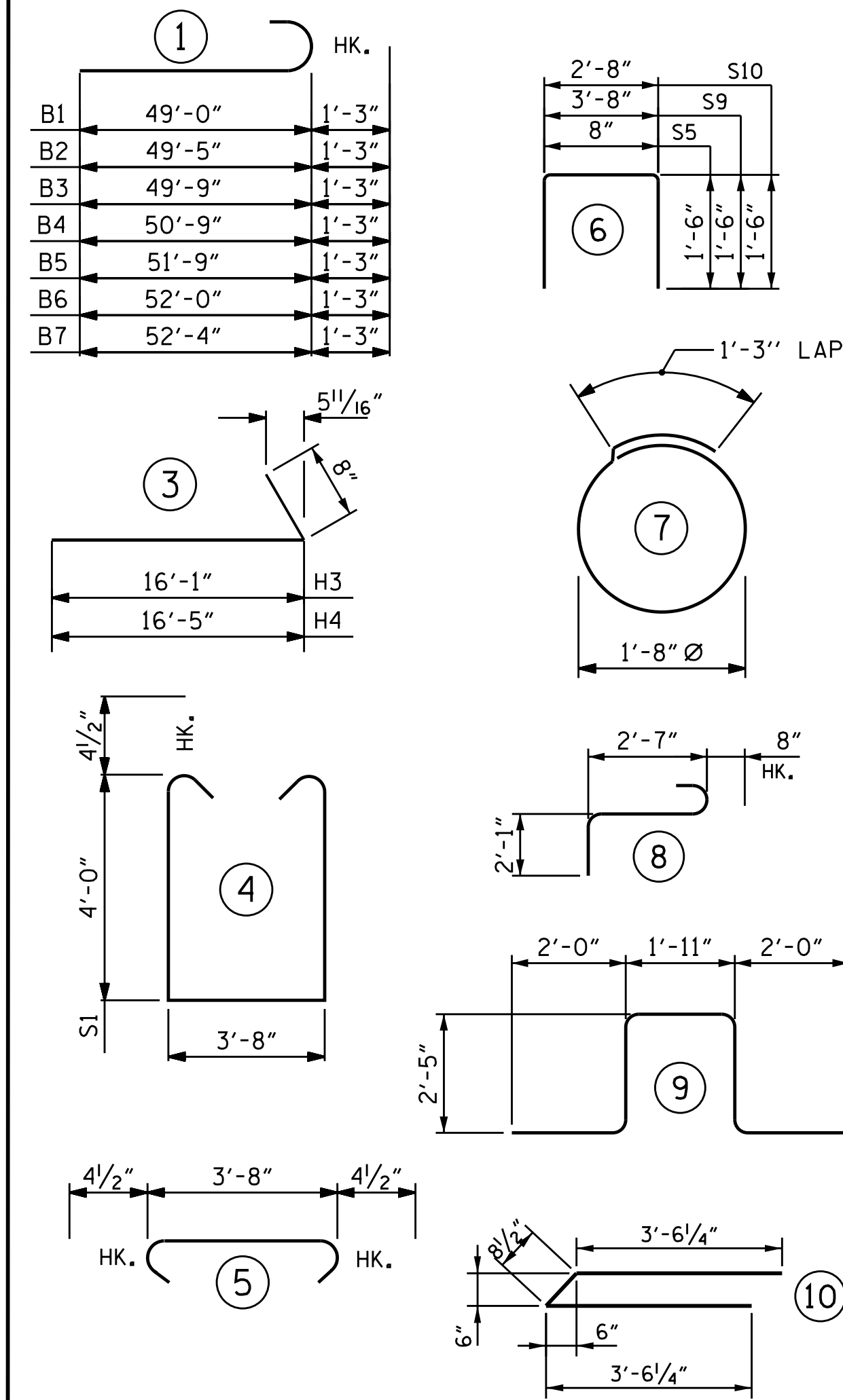
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 1 STAGE 1
HP 12 X 53 STEEL PILES
NO: 9 LIN. FT. = 270

PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES
EACH = 9

BILL OF MATERIAL

END BENT 1 STAGE 1

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	2	#9	1	50'-3"	342
B2	1	#9	1	50'-8"	172
B3	1	#9	1	51'-0"	173
B4	2	#9	1	52'-0"	354
B5	1	#9	1	53'-0"	180
B6	1	#9	1	53'-3"	181
B7	2	#9	1	53'-7"	364
B19	36	#4	STR	28'-2"	677
B21	13	#4	STR	3'-8"	32
H3	12	#4	3	16'-9"	134
H4	12	#4	3	17'-1"	137
K1	16	#4	STR	26'-9"	286
K3	2	#4	10	7'-9"	10
S1	130	#4	4	12'-5"	1078
S2	130	#4	5	4'-5"	384
S4	32	#4	7	6'-6"	139
S5	44	#4	6	3'-8"	108
S7	3	#6	9	10'-9"	48
S8	3	#6	8	5'-4"	24
S9	12	#4	6	6'-8"	53
S10	15	#4	6	5'-8"	57
V1	88	#4	STR	7'-3"	426
V3	42	#4	STR	9'-5"	264

REINFORCING STEEL (STAGE 1) 5,623 LBS.

CLASS A CONCRETE BREAKDOWN (FOR END BENT 1 STAGE 1)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS (STAGE 1 CONST.) 38.6 C.Y.

POUR #2 BACKWALL AND UPPER PART OF WINGS (STAGE 1 CONST.) 9.5 C.Y.

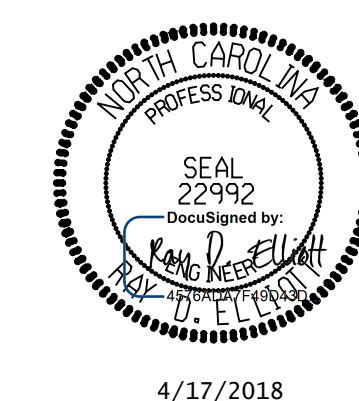
TOTAL CLASS A CONCRETE 48.1 C.Y.

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00 -L-

SHEET 4 OF 8



DEPARTMENT OF TRANSPORTATION
RALEIGH

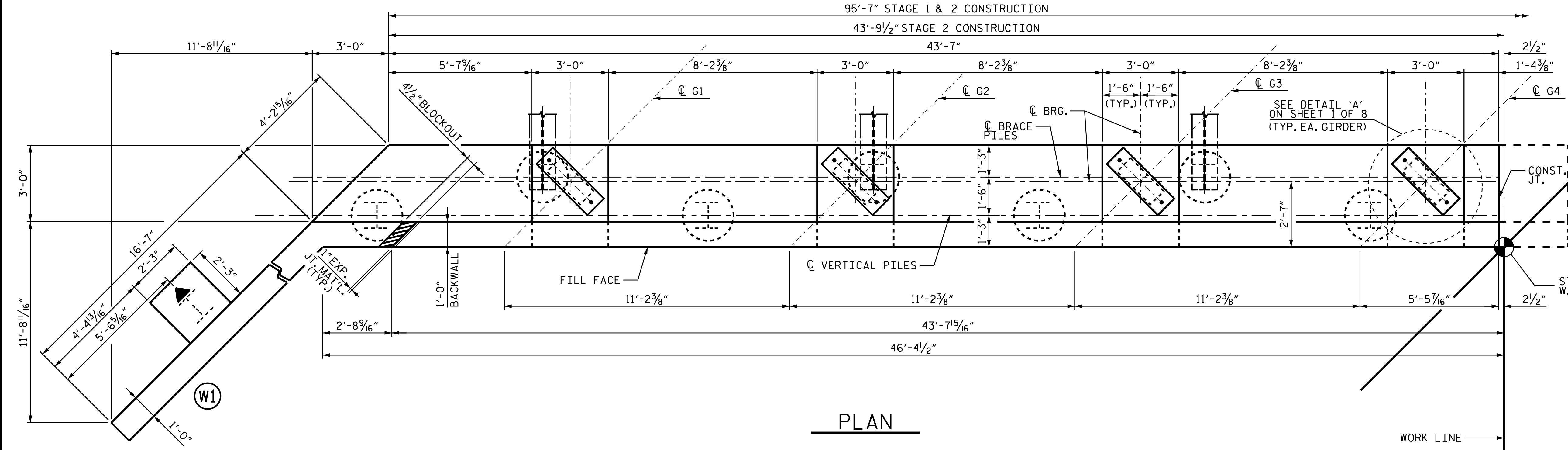
SUBSTRUCTURE
END BENT No. 1
STAGE 1 CONSTRUCTION
DETAILS

DRAWN BY : CCC DATE : 2/17
CHECKED BY : RDE DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

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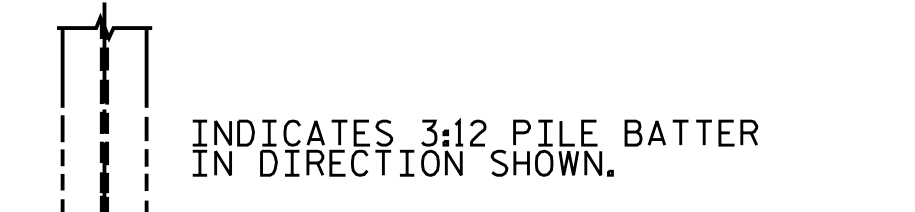
TGS ENGINEERS
804-C N. LAFAYETTE ST
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PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			69

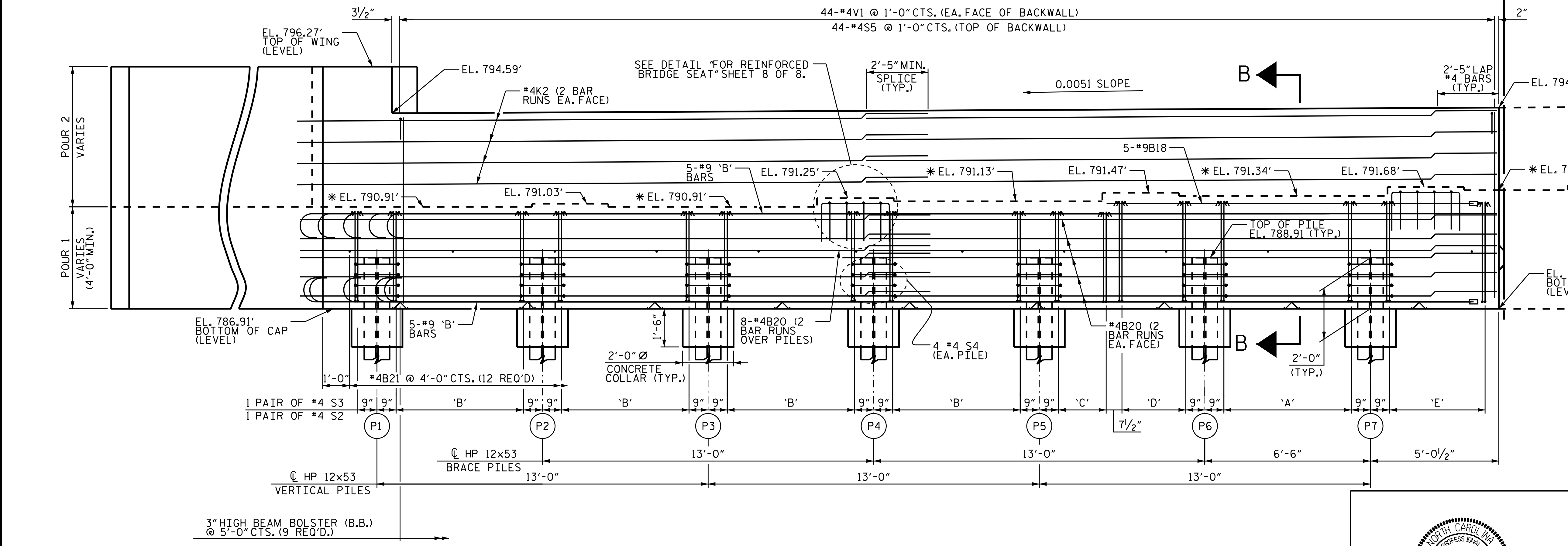


PLAN

NOTES:
 FOR NOTES AND PILE SPLICE DETAILS, SEE SHEET 8 OF 8.
 FOR WING DETAILS, SEE SHEET 7 OF 8.
 FOR SECTION B-B, SEE SHEET 6 OF 8.



- 'A' = 9 PAIRS OF #4 S1 @ 7 1/2" CTS.
9 PAIRS OF #4 S2 @ 7 1/2" CTS.
- 'B' = 9 PAIRS OF #4 S3 @ 7 1/2" CTS.
9 PAIRS OF #4 S2 @ 7 1/2" CTS.
- 'C' = 4 PAIRS OF #4 S3 @ 7 1/2" CTS.
4 PAIRS OF #4 S2 @ 7 1/2" CTS.
- 'D' = 5 PAIRS OF #4 S1 @ 7 1/2" CTS.
5 PAIRS OF #4 S2 @ 7 1/2" CTS.
- 'E' = 7 PAIRS OF #4 S1 @ 7 1/2" CTS.
7 PAIRS OF #4 S2 @ 7 1/2" CTS.

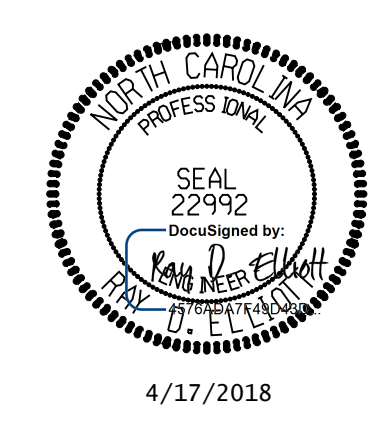


ELEVATION

PROJECT NO. B-4982
IREDELL COUNTY
 STATION: 21+10.00 -L-
 SHEET 5 OF 8

* FOR ELEVATION BETWEEN BRIDGE SEATS, SEE SECTION A-A ON SHEET 6 OF 8.

DRAWN BY : CCC DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
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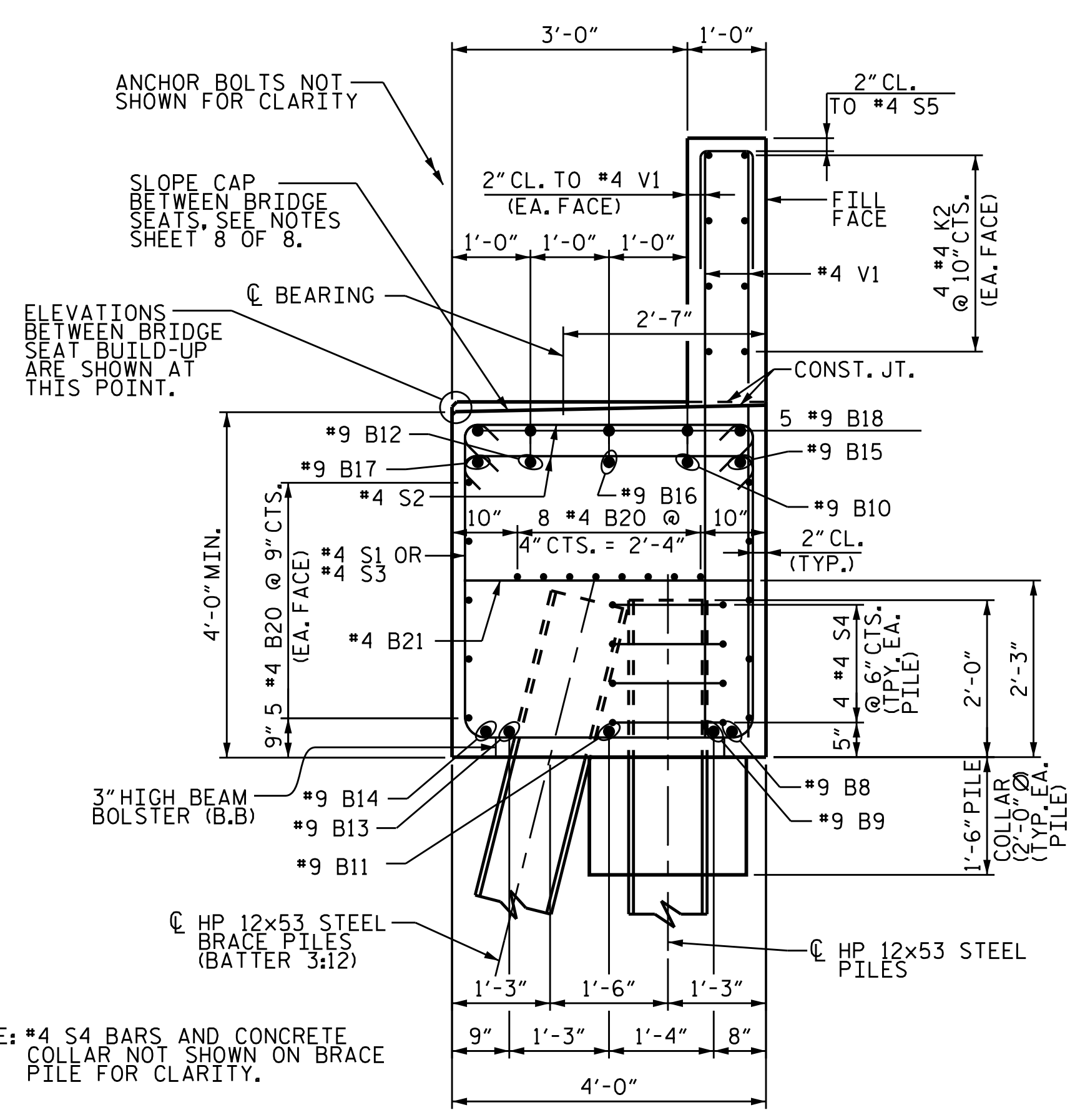
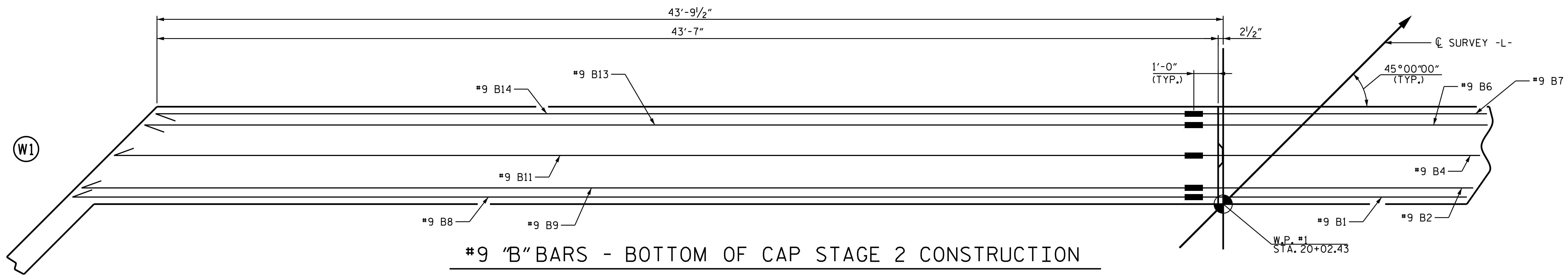
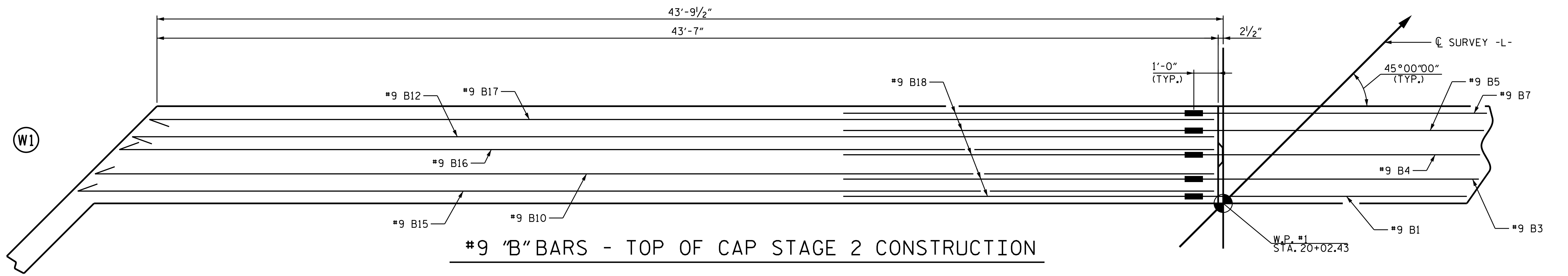


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 1
 PART-PLAN & PART ELEVATION
 STAGE 2 CONSTRUCTION

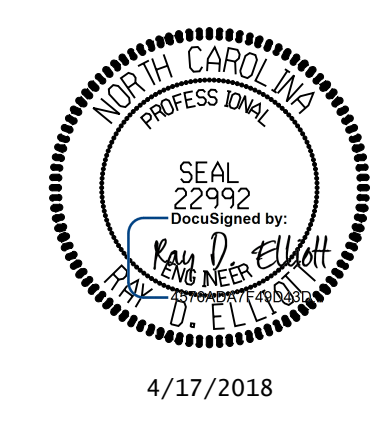
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						REVISIONS			SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45			
1			3			TOTAL SHEETS			
2			4			69			

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NOTE: #4 S4 BARS AND CONCRETE COLLAR NOT SHOWN ON BRACE PILE FOR CLARITY.

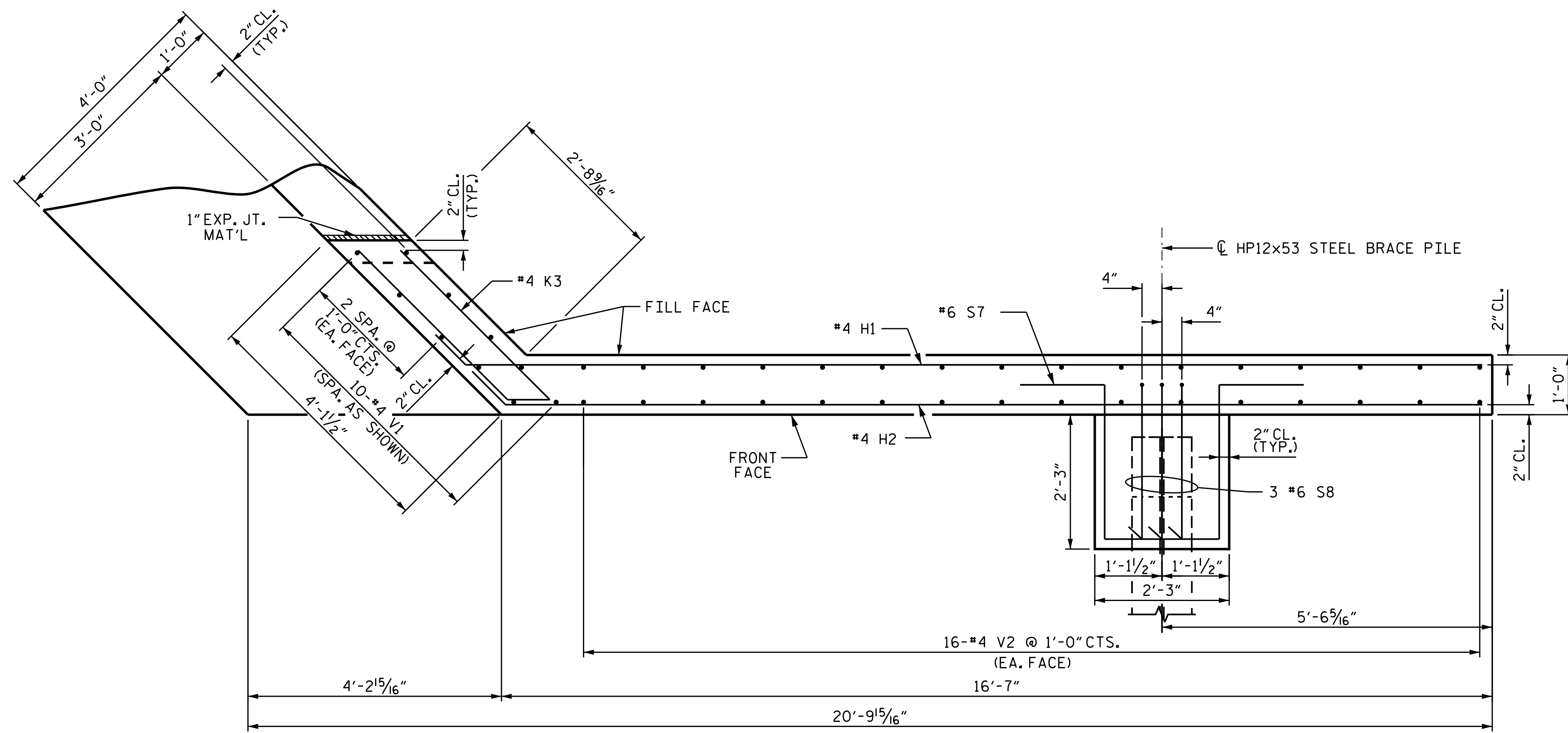
PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00 -L-
 SHEET 6 OF 8



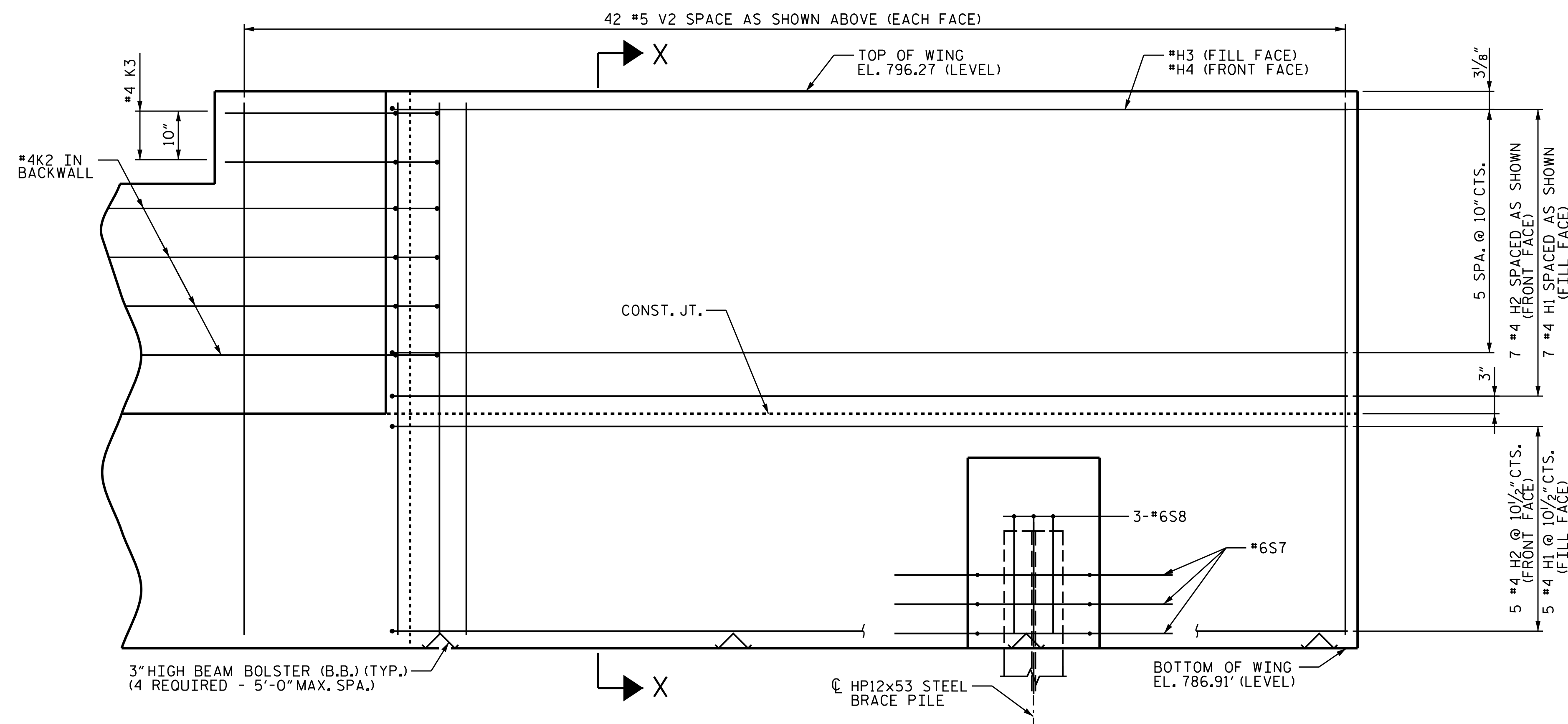
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 1
 STAGE 2 CONSTRUCTION
 DETAILS

DRAWN BY : CCC DATE : 2/17
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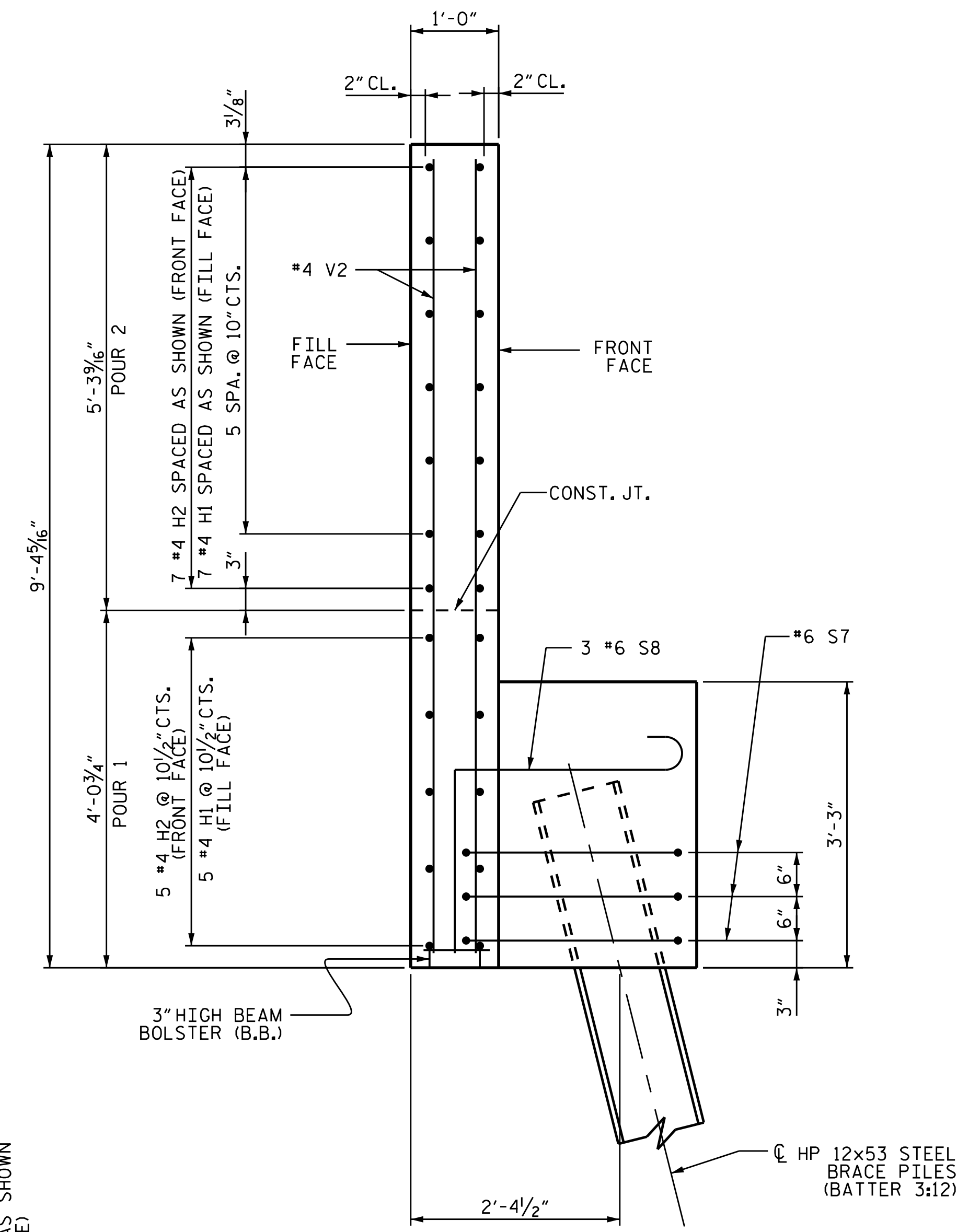
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TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275						NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
						1			3			TOTAL SHEETS
						2			4			69



PLAN OF WING (W1)



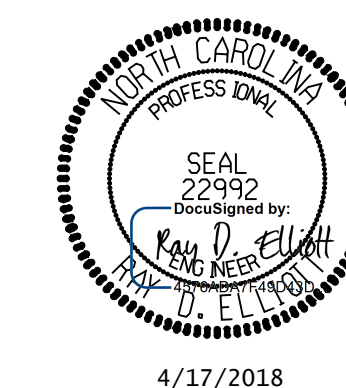
ELEVATION OF WING (W1)



SECTION X-X

PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00 -L-

SHEET 7 OF 8



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

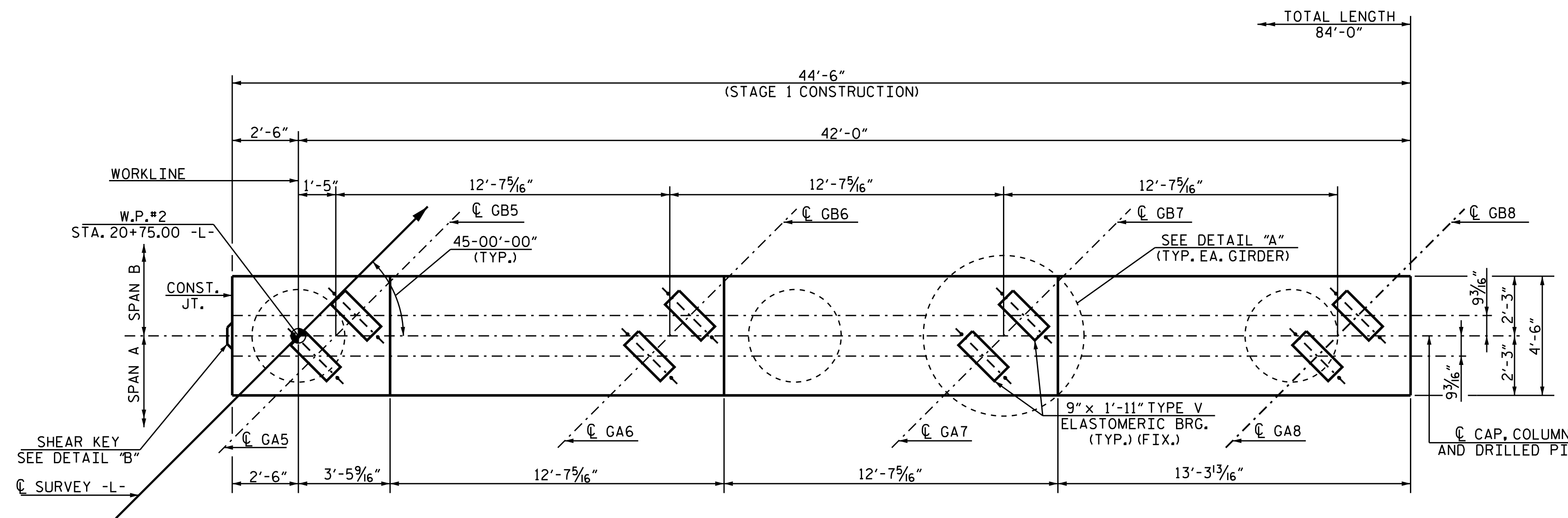
SUBSTRUCTURE
 END BENT No. 1
 STAGE 2 CONSTRUCTION
 WING DETAILS

DRAWN BY : CCC DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

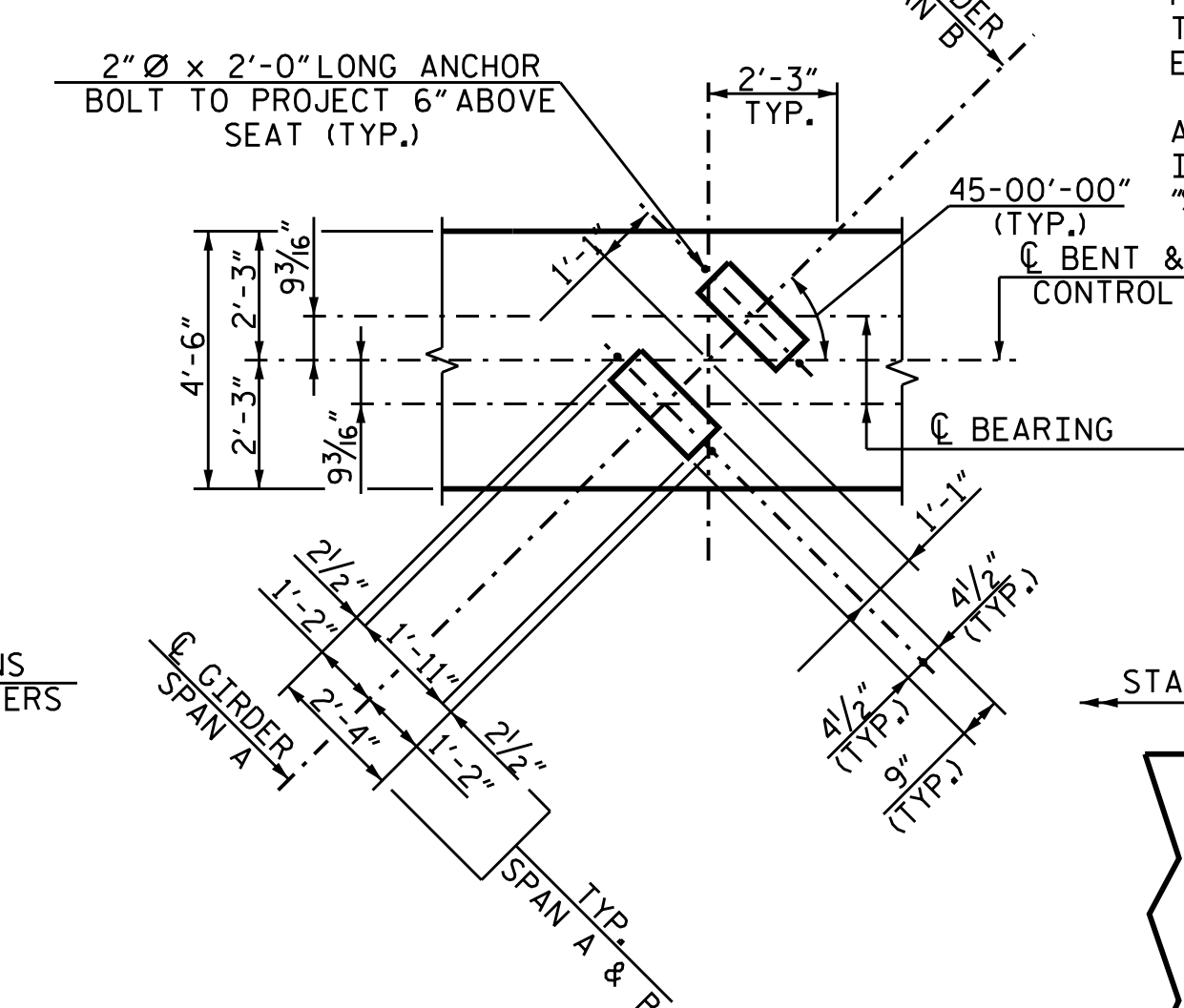
DOCUMENT NOT CONSIDERED FINAL
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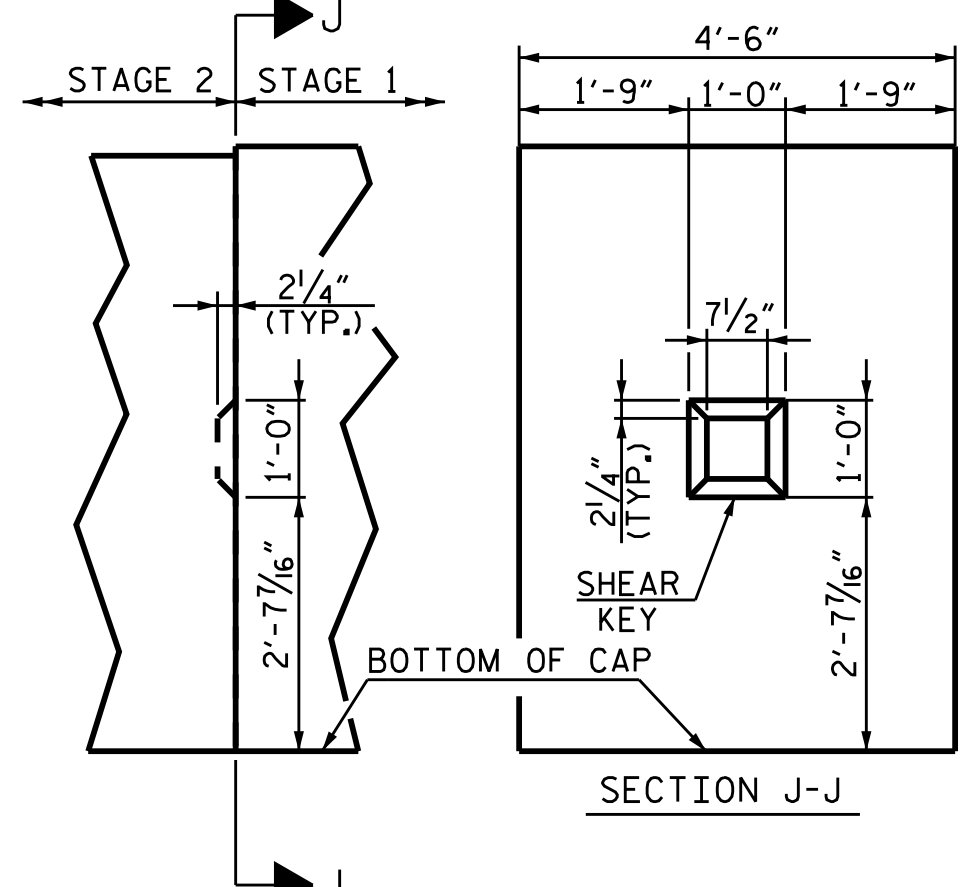
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 69
2			4			



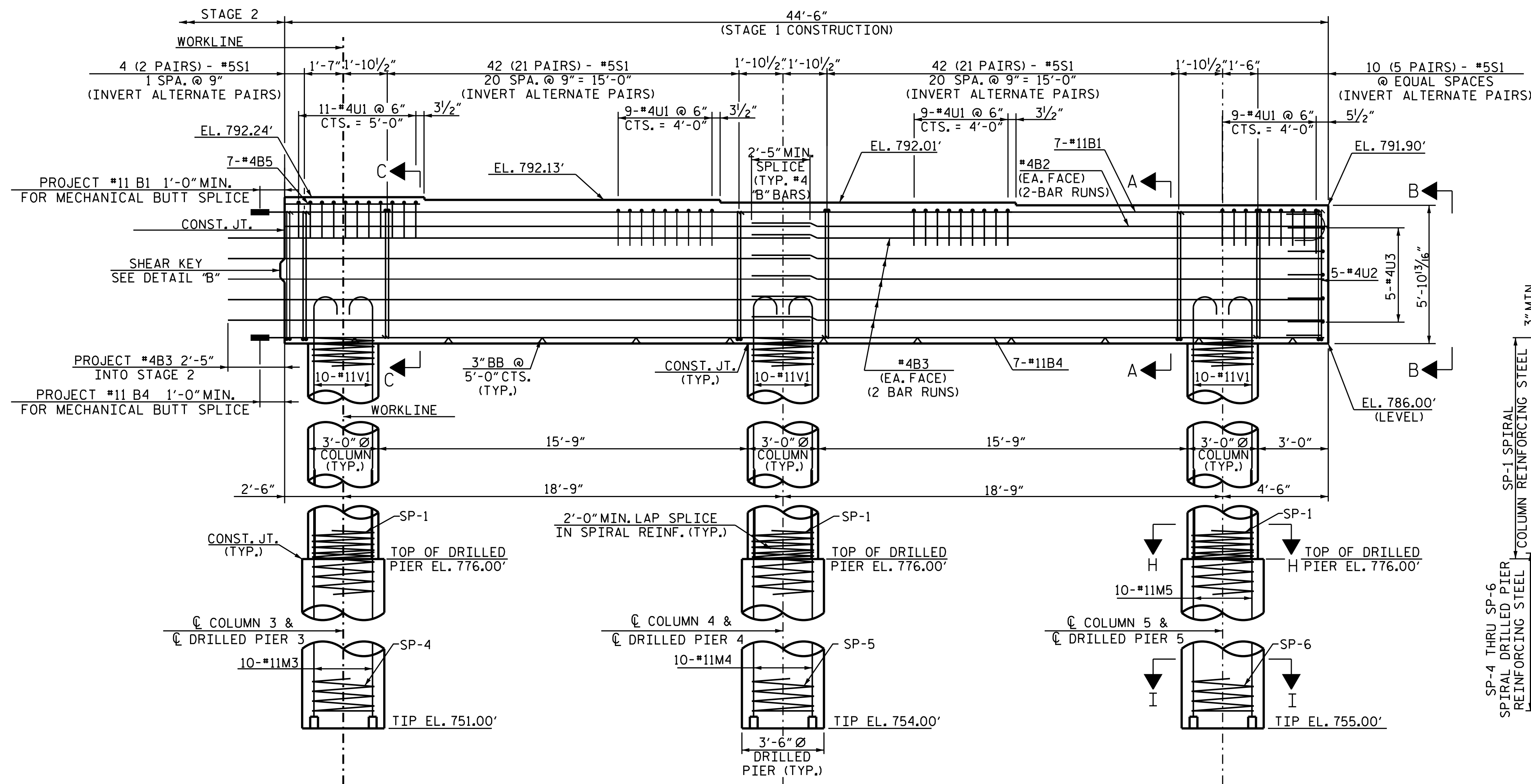
PLAN



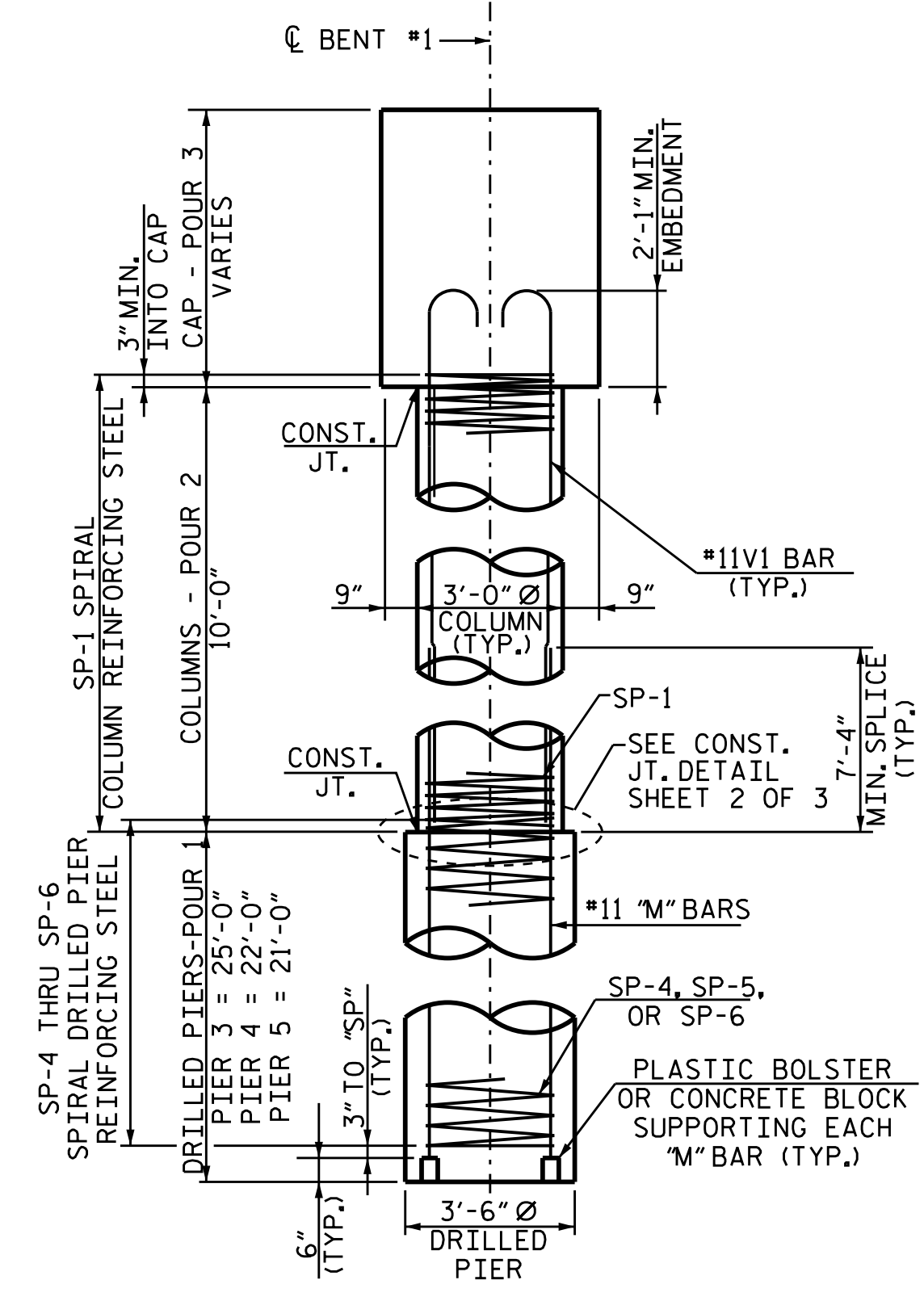
DETAIL "A"



DETAIL "B"
SHEAR KEY DETAIL



ELEVATION



END VIEW

NOTES:
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

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

4/17/2018

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TGS ENGINEERS
804-C N. LAFAYETTE ST
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CORP. LICENSE NO.: C-0275

PROJECT NO. B-4982
IREDELL COUNTY
STATION: 21+10.00-L-
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUBSTRUCTURE
BENT No. 1
STAGE 1 CONSTRUCTION
DETAILS**

DRAWN BY : T.B.ENNIS DATE : 2/17
CHECKED BY : R.A.RAYNOR JR DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			69

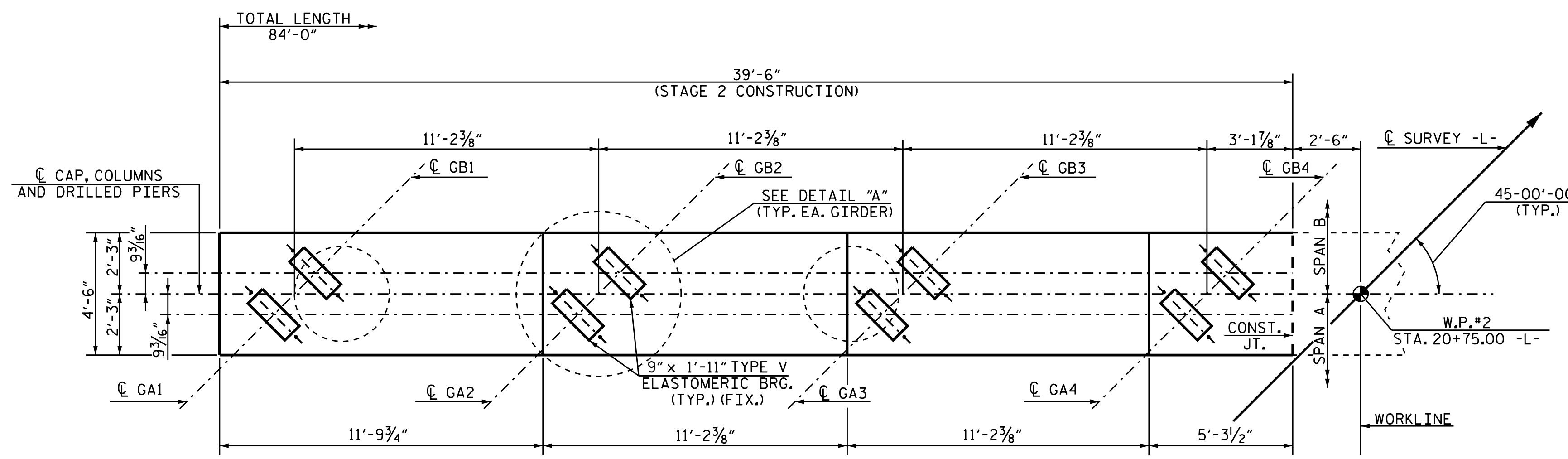
NOTES:

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

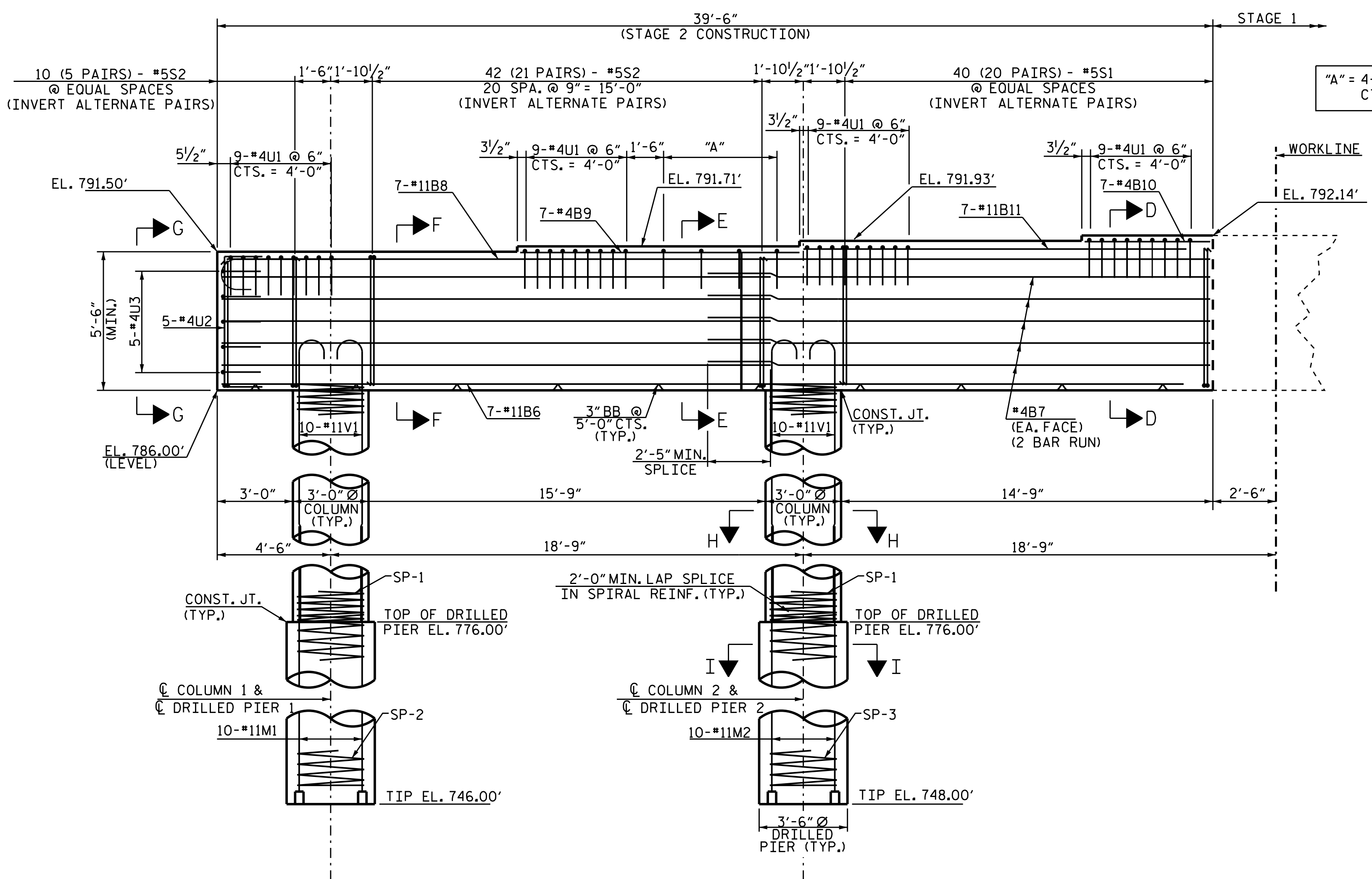
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

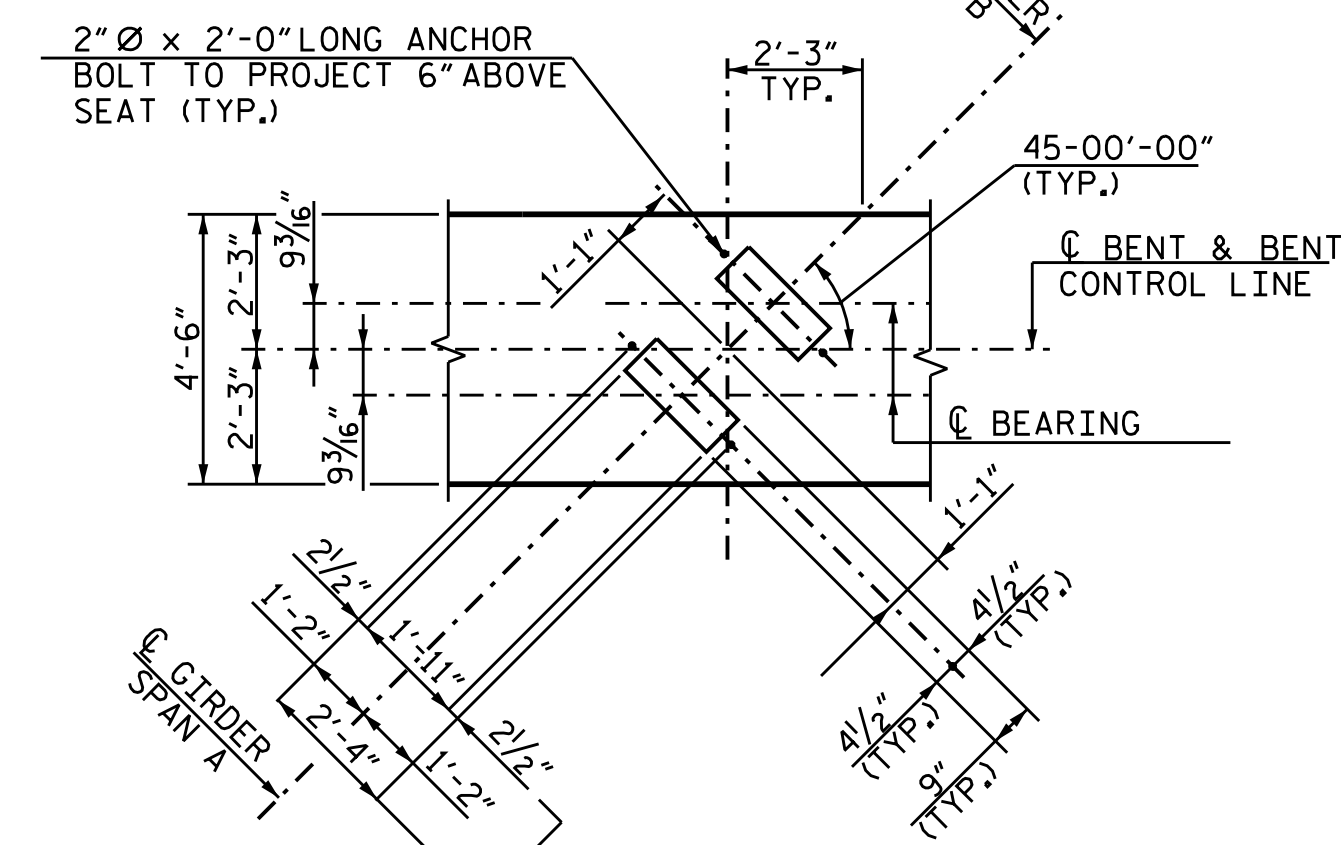
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".



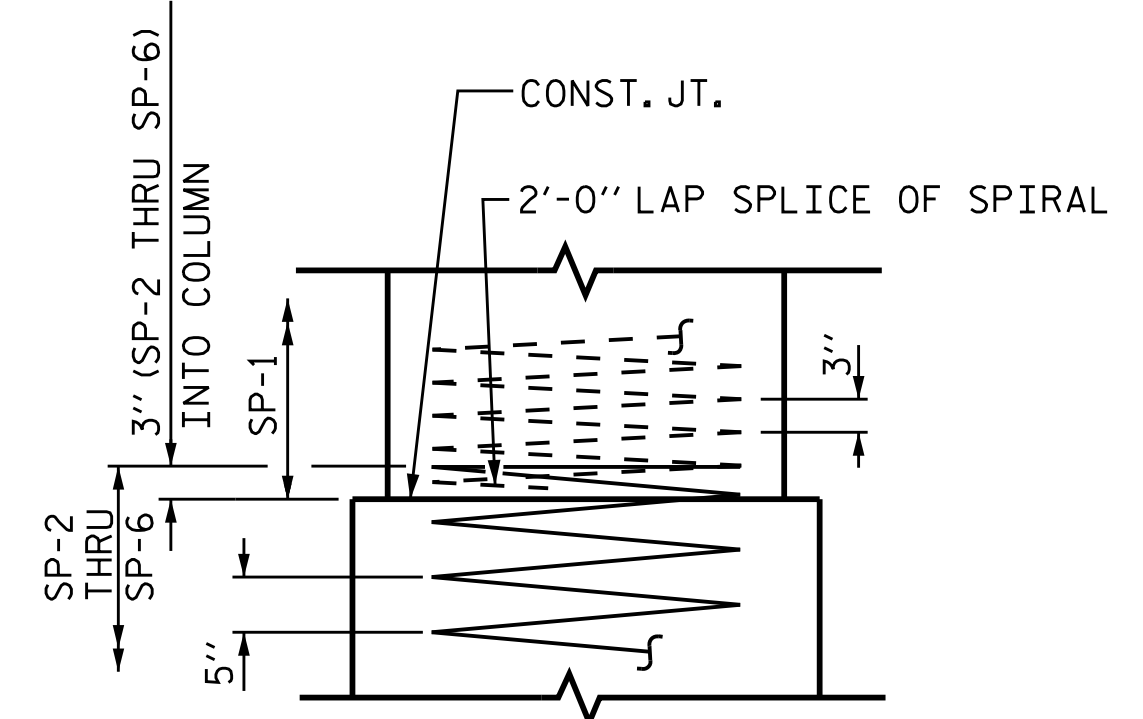
PLAN



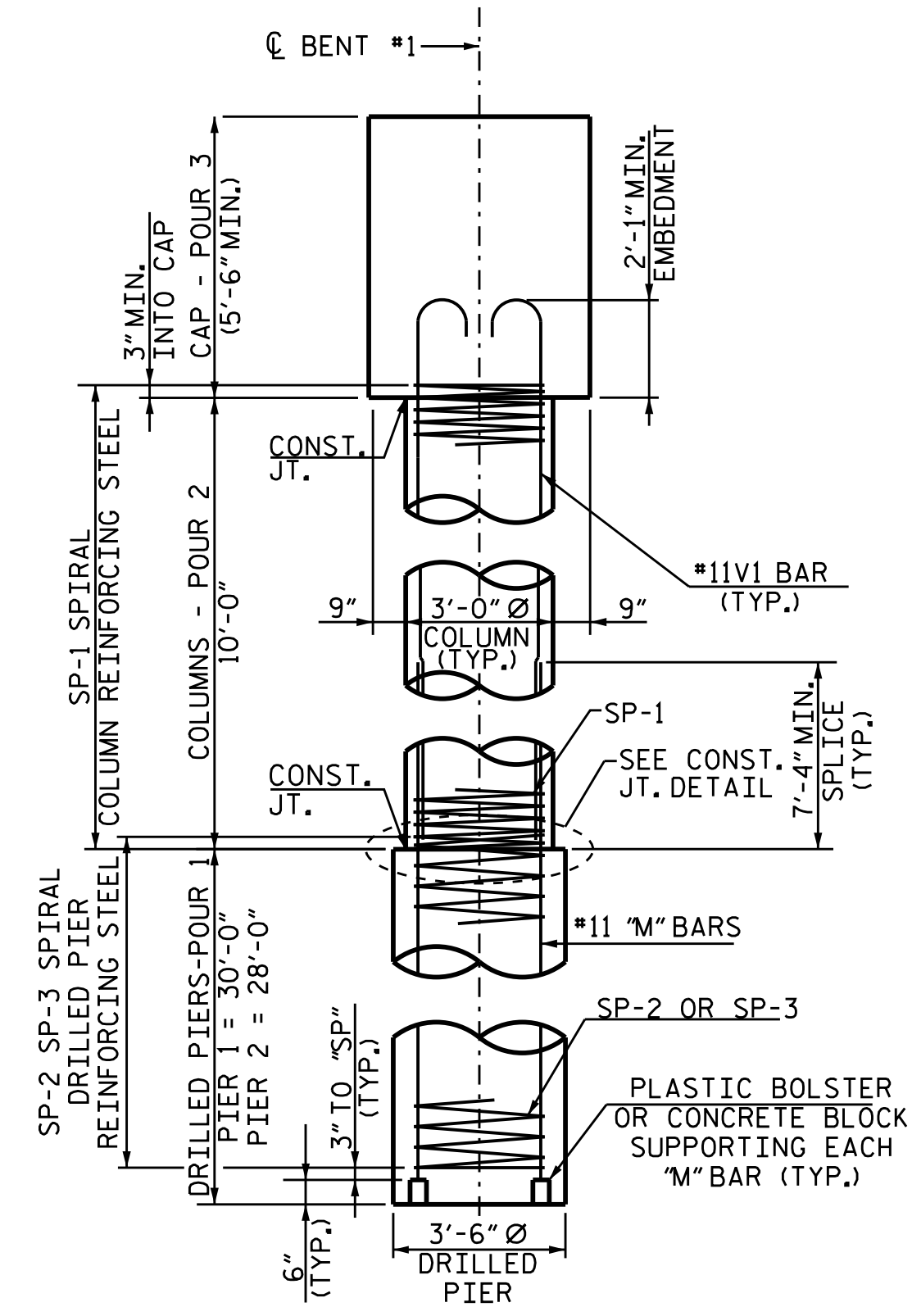
ELEVATION



DETAIL "A"

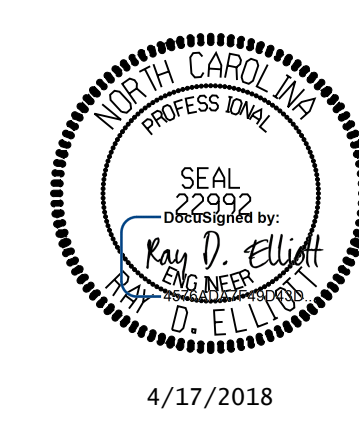


CONSTRUCTION JOINT DETAIL



END VIEW

PROJECT NO. B-4982
IREDELL COUNTY
 STATION: 21+10.00-L-
 SHEET 2 OF 4



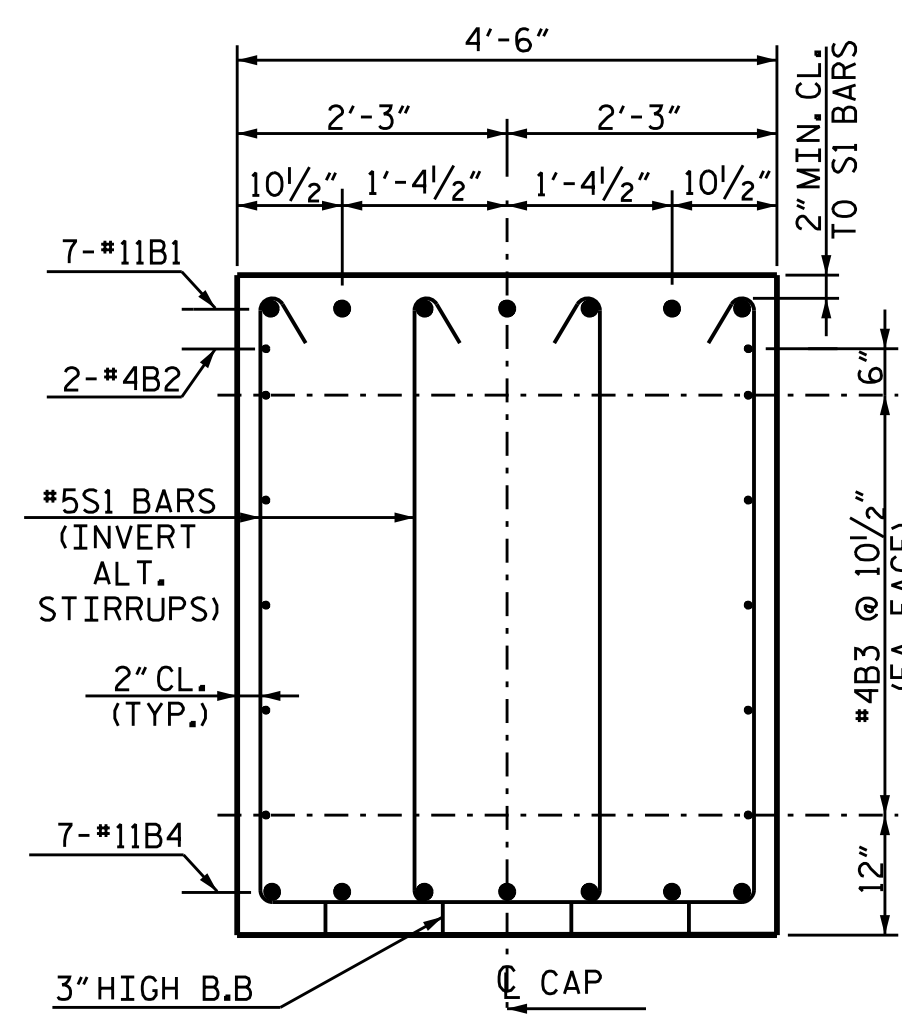
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT No. 1
 STAGE 2 CONSTRUCTION
 DETAILS

DRAWN BY : T.B.ENNIS DATE : 2/17
 CHECKED BY : R.A.RAYNOR JR DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

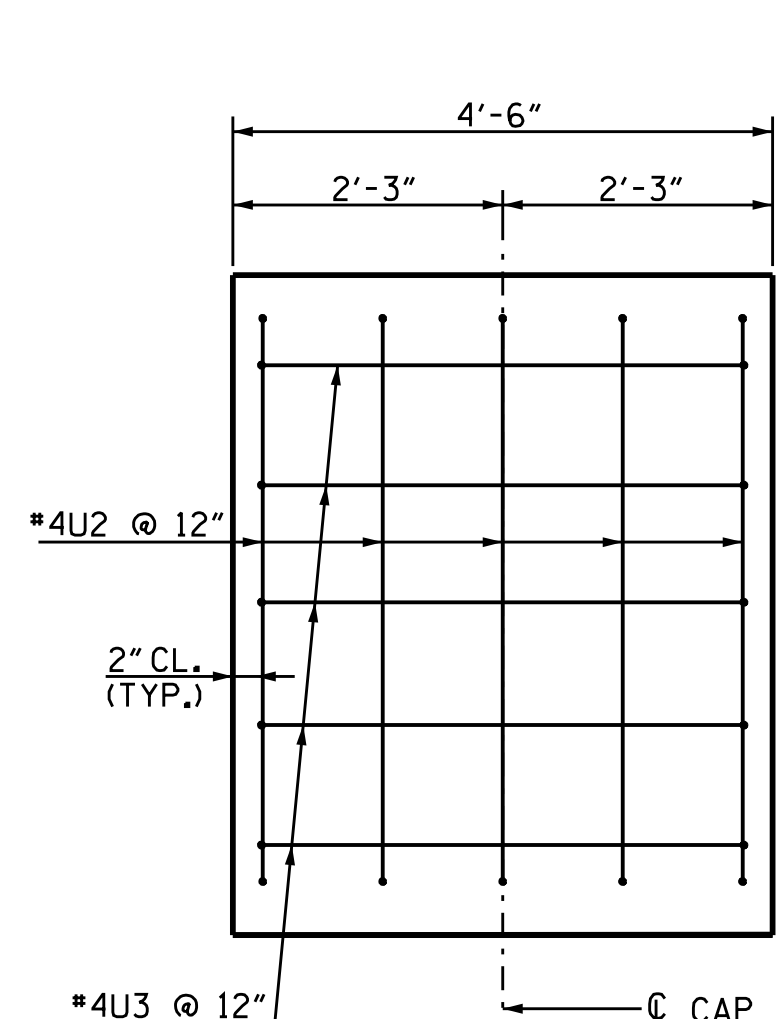
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			5-50
2			4			69

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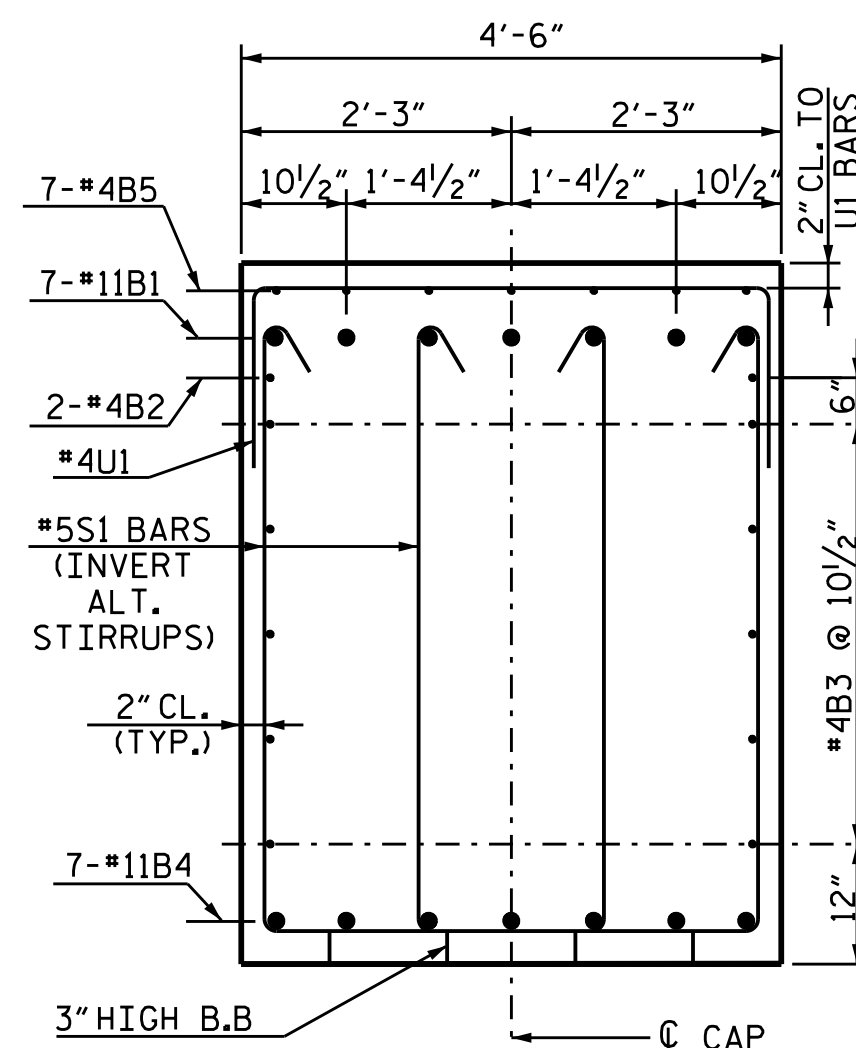
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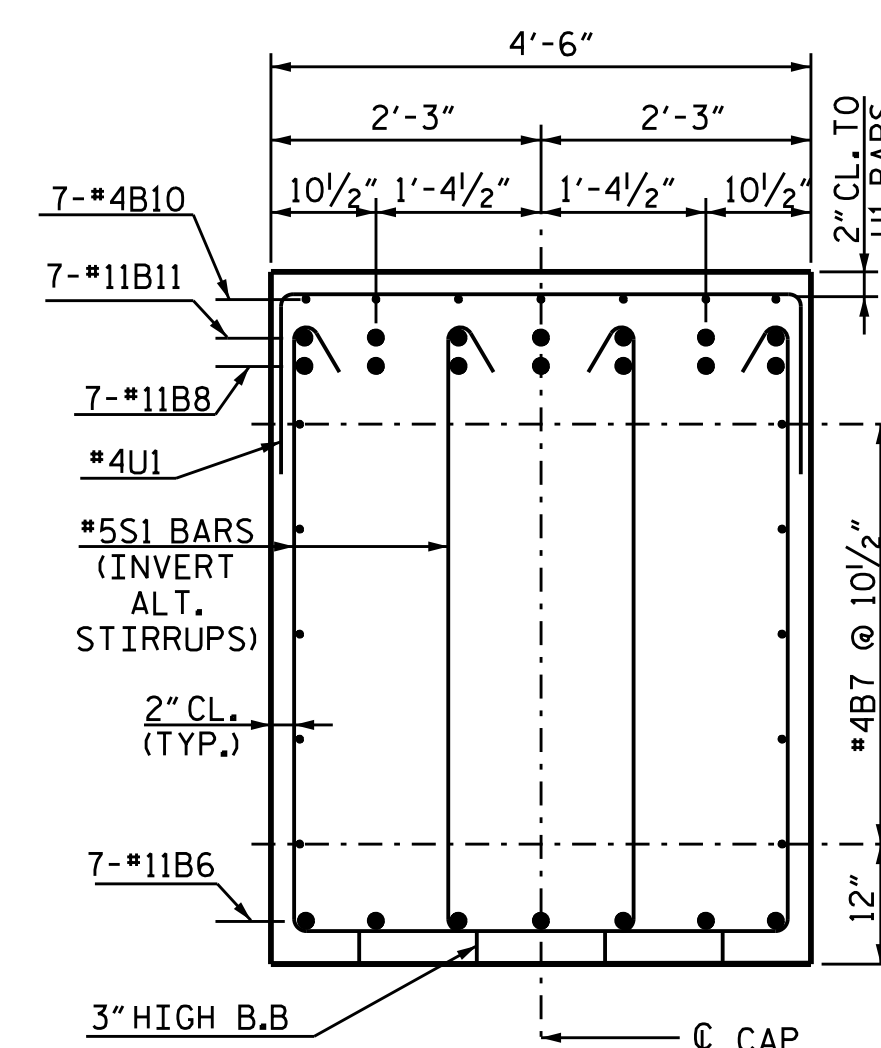
SECTION A-A



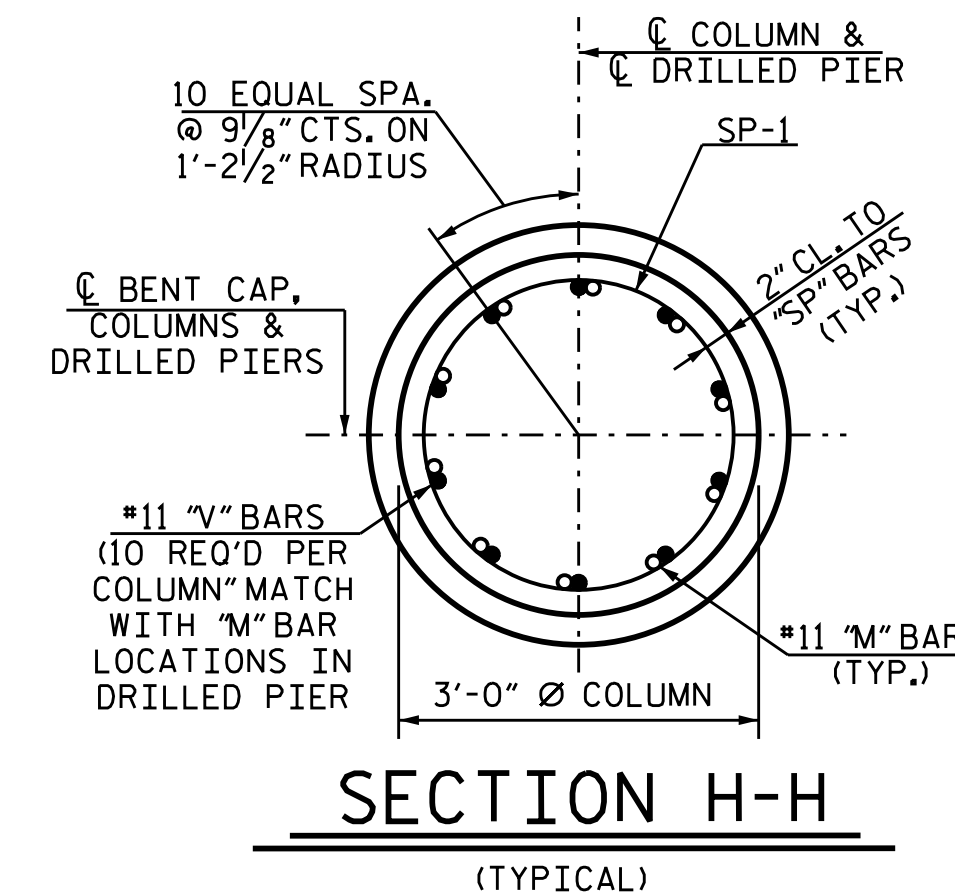
SECTION B-B



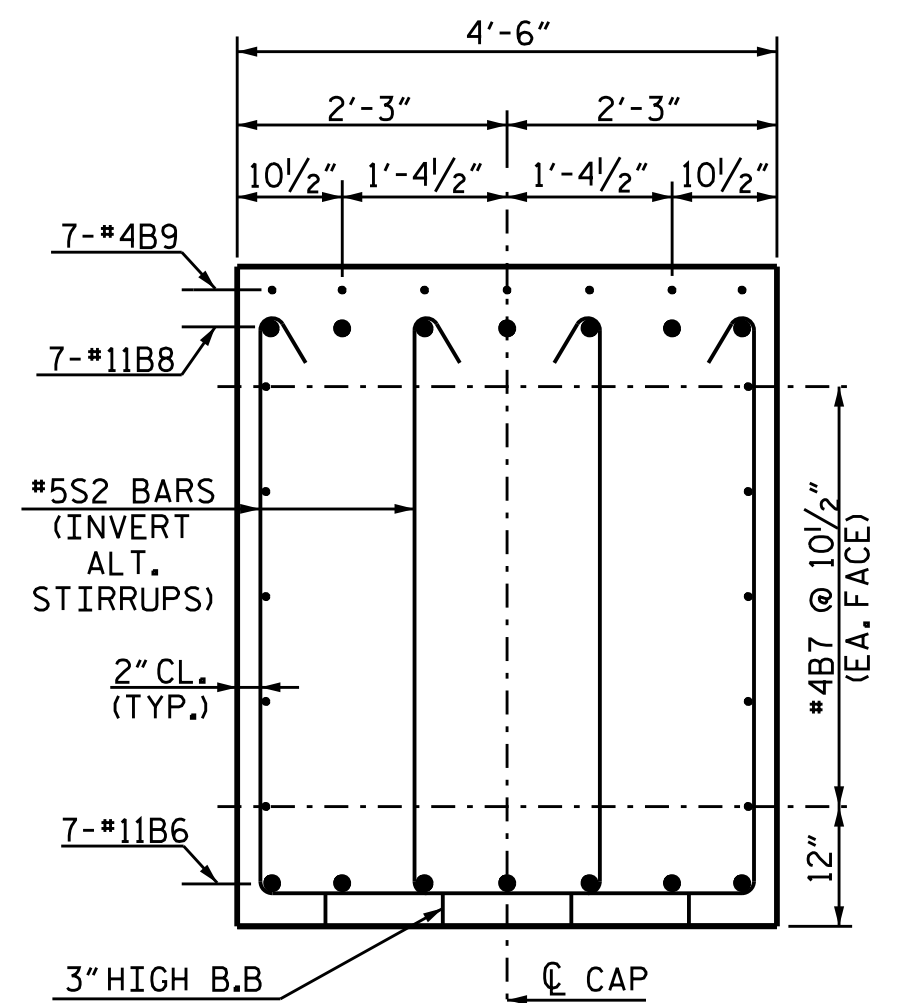
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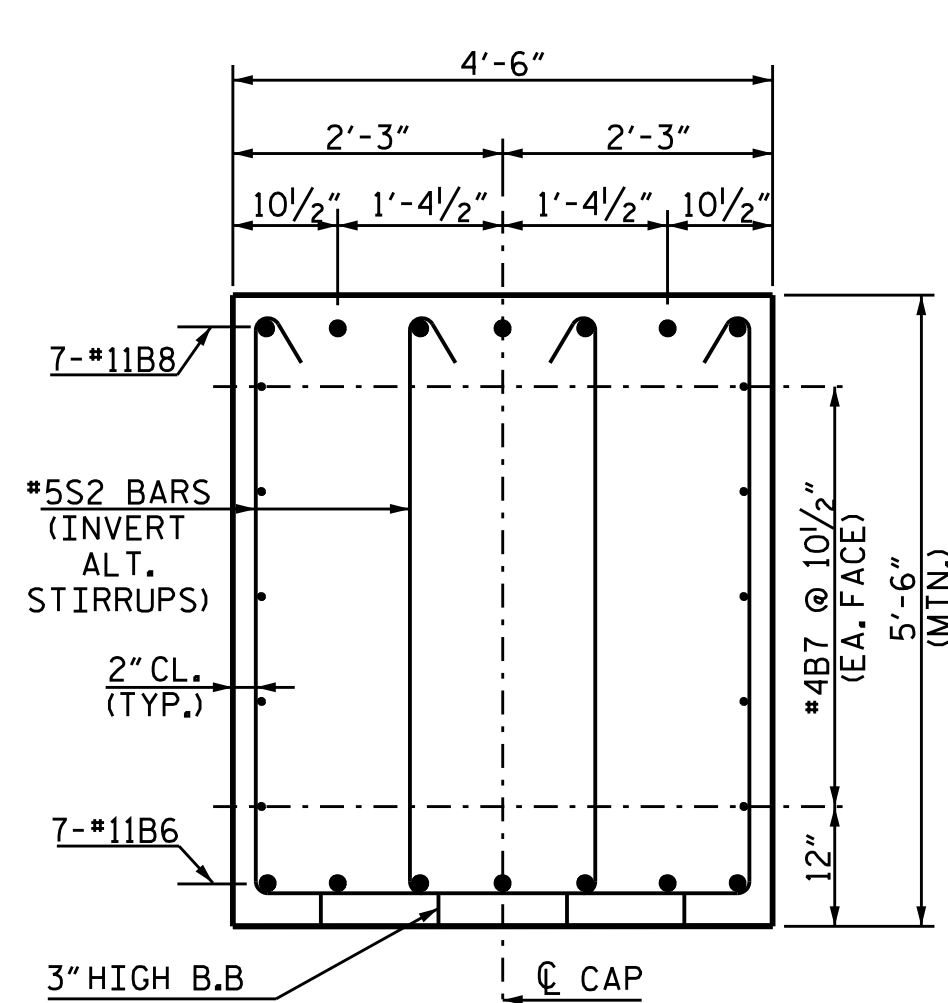
SECTION D-D



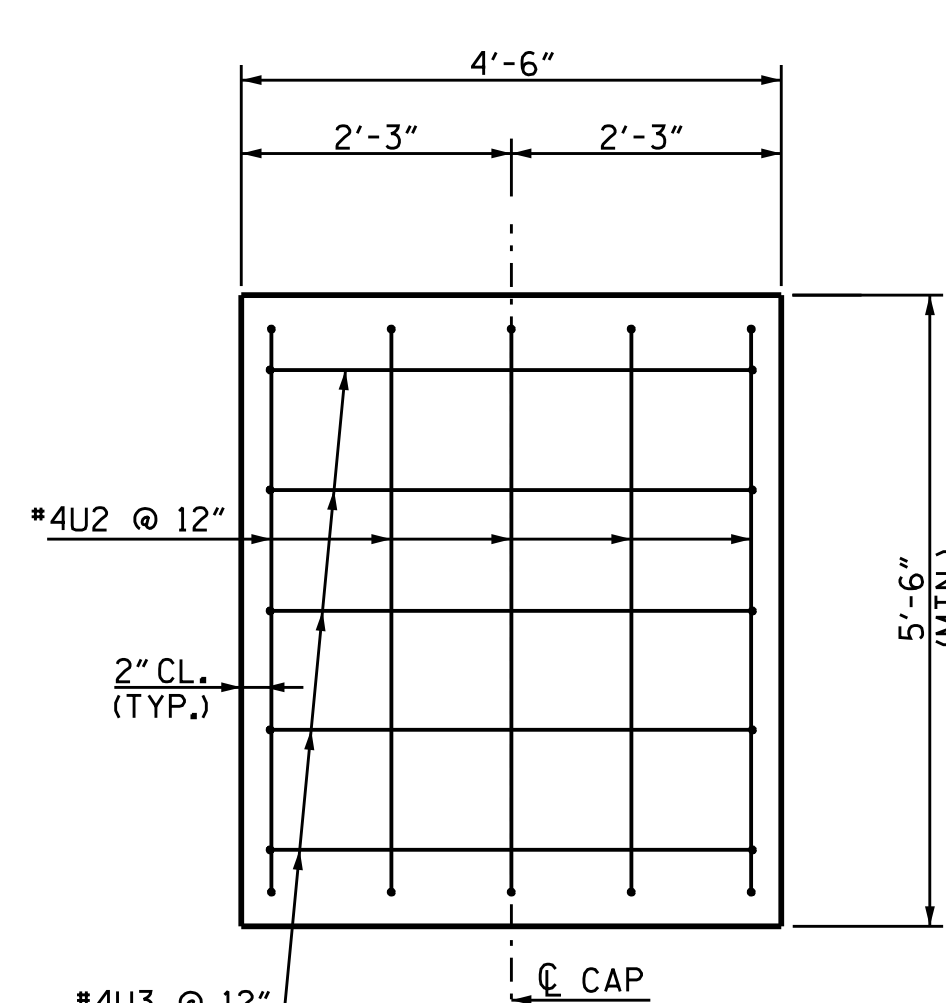
SECTION H-H
(TYPICAL)



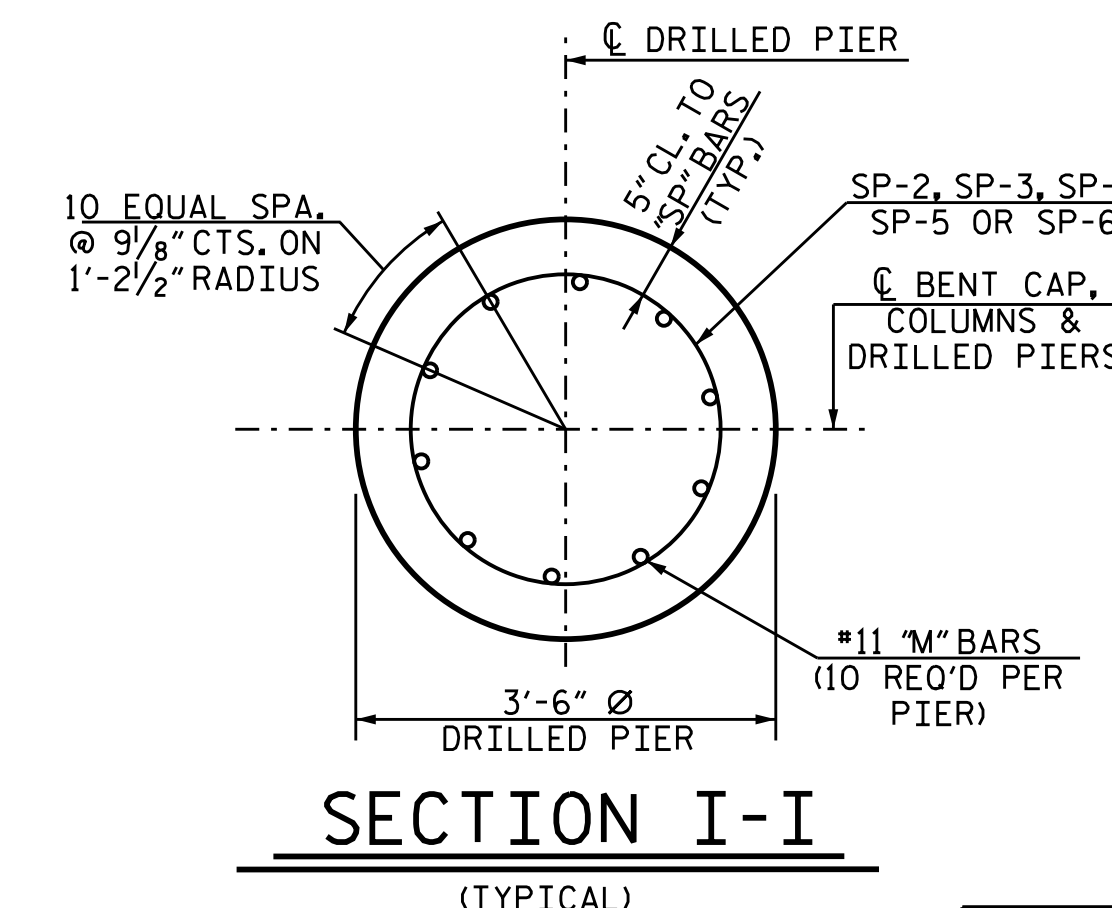
SECTION E-E



SECTION F-F



SECTION G-G



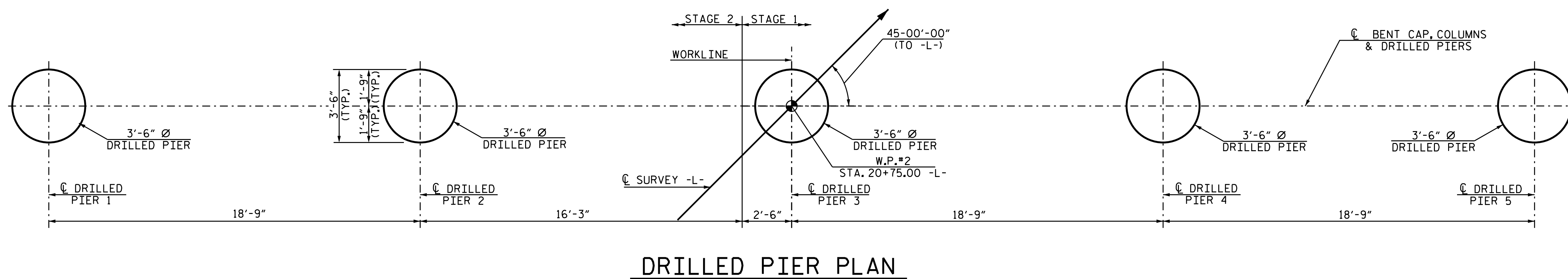
SECTION I-I
(TYPICAL)

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PROJECT NO. B-4982
IREDELL COUNTY
 STATION: 21+10.00-L-
 SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT No. 1
 DETAILS

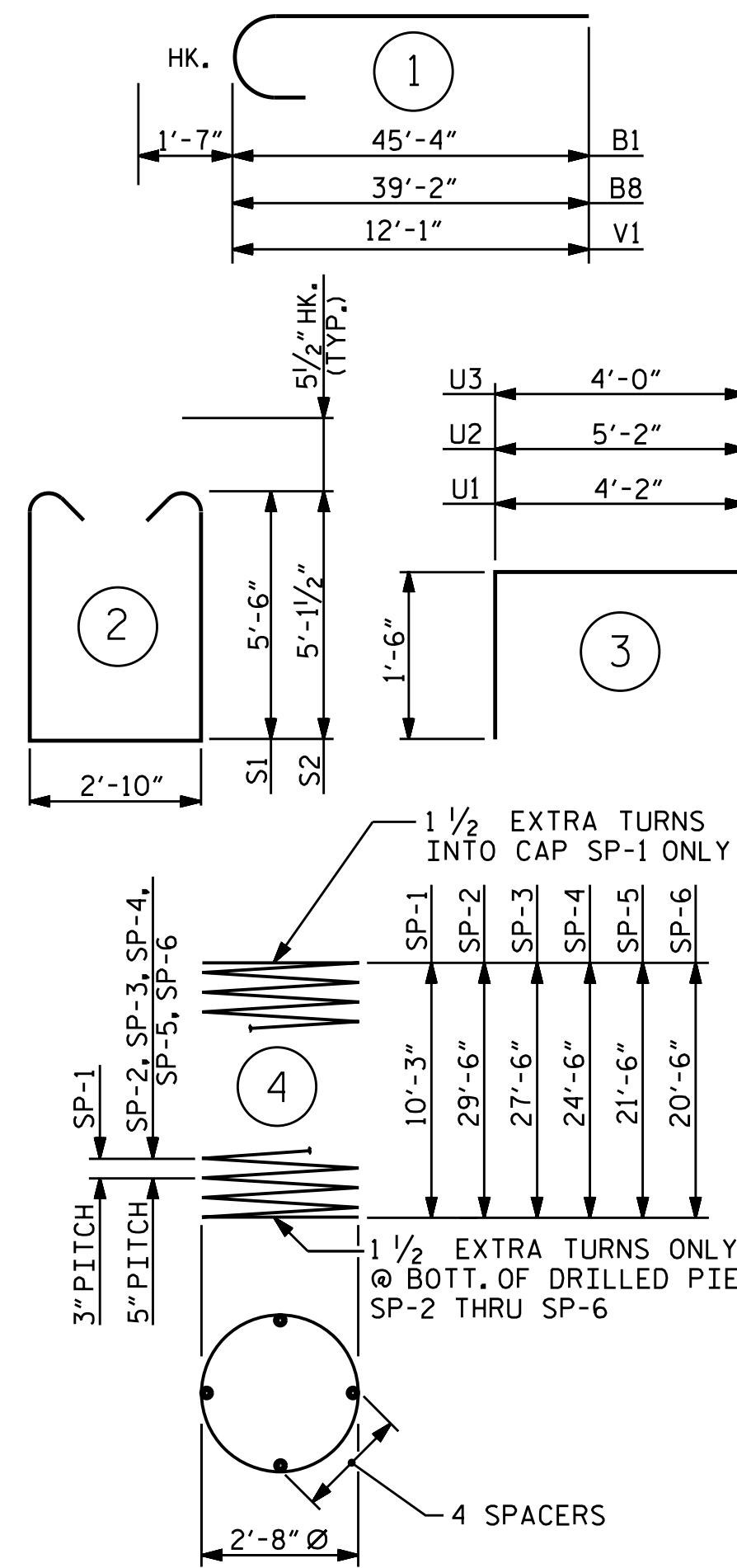
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-51
1			3			TOTAL SHEETS
2			4			69



DRILLED PIER PLAN

DRAWN BY : T.B.ENNIS DATE : 2/17
 CHECKED BY : R.A.RAYNOR JR DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

- * THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.
- ** THE SP-2, SP-3, SP-4, SP-5, AND SP-6 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL

BENT 1 STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	11		46'-11"	1,745
B2	4	4	STR.	23'-3"	62
B3	20	4	STR.	24'-7"	328
B4	7	11	STR.	45'-4"	1,686
B5	7	4	STR.	5'-7"	26
M3	10	11	STR.	34'-10"	1,851
M4	10	11	STR.	31'-10"	1,691
M5	10	11	STR.	30'-10"	1,638
S1	98	5	2	14'-9"	1,508
U1	38	4	3	7'-2"	182
U2	5	4	3	8'-2"	27
U3	5	4	3	7'-0"	23
V1	30	11	1	13'-8"	2,178
SP-1	3	*	4	354'-10"	711
SP-4	1	**	4	501'-9"	523
SP-5	1	**	4	444'-2"	463
SP-6	1	**	4	419'-6"	438

BILL OF MATERIAL

BENT 1 STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B6	7	11	STR.	38'-4"	1,426
B7	20	4	STR.	20'-10"	278
B8	7	11	1	40'-9"	1,516
B9	7	4	STR.	10'-10"	51
B10	7	4	STR.	4'-11"	23
B11	7	11	STR.	15'-3"	567
M1	10	11	STR.	39'-10"	2,116
M2	10	11	STR.	37'-10"	2,010
S1	40	5	2	14'-9"	615
S2	52	5	2	14'-0"	759
U1	40	4	3	7'-2"	191
U2	5	4	3	8'-2"	27
U3	5	4	3	7'-0"	23
V1	20	11	1	13'-8"	1,452
SP-1	2	*	4	354'-10"	474
SP-2	1	**	4	600'-5"	626
SP-3	1	**	4	559'-4"	583

QUANTITIES

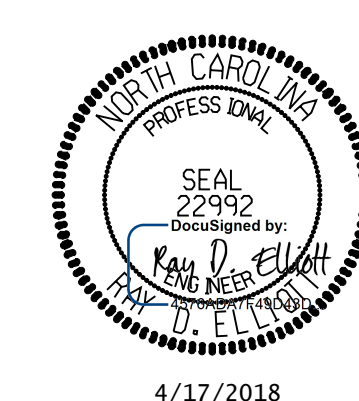
REINFORCING STEEL	LBS.	12,945
SPIRAL COLUMN REINFORCING STEEL	LBS.	2,135
CLASS A CONCRETE		
POUR #2 COLUMNS	CU. YDS.	7.9
POUR #3 CAP	CU. YDS.	44.8
TOTAL	CU. YDS.	52.7
POUR #1 DRILLED PIERS	CU. YDS.	24.2
3'-6" Ø DRILLED PIERS, IN SOIL	L.F.	42.2
3'-6" Ø DRILLED PIERS, NOT IN SOIL	L.F.	25.8
CSL TUBES	L.F.	290
PERMANENT STEEL CASING	L.F.	33

QUANTITIES

REINFORCING STEEL	LBS.	11,054
SPIRAL COLUMN REINFORCING STEEL	LBS.	1,683
CLASS A CONCRETE		
POUR #2 COLUMNS	CU. YDS.	5.2
POUR #3 CAP	CU. YDS.	38.0
TOTAL	CU. YDS.	43.2
POUR #1 DRILLED PIERS	CU. YDS.	20.7
3'-6" Ø DRILLED PIERS, IN SOIL	L.F.	40.8
3'-6" Ø DRILLED PIERS, NOT IN SOIL	L.F.	17.2
CSL TUBES	L.F.	244
PERMANENT STEEL CASING	L.F.	22

PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00-L-

SHEET 4 OF 4



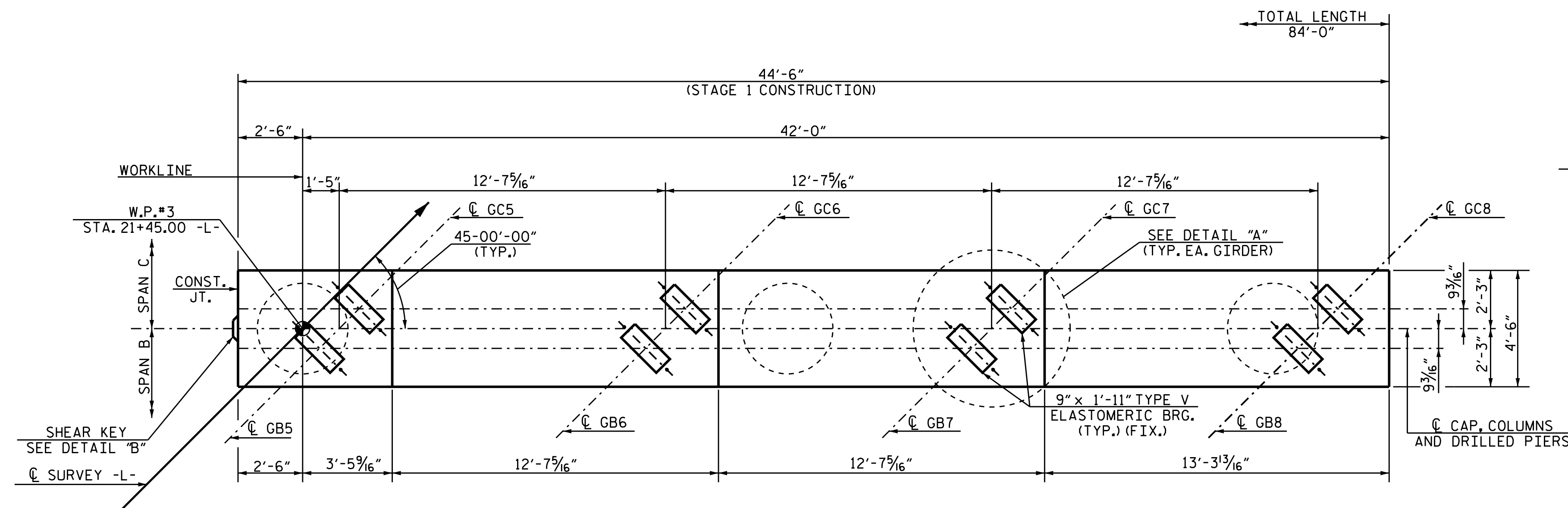
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT No. 1
 DETAILS

DOCUMENT NOT CONSIDERED FINAL
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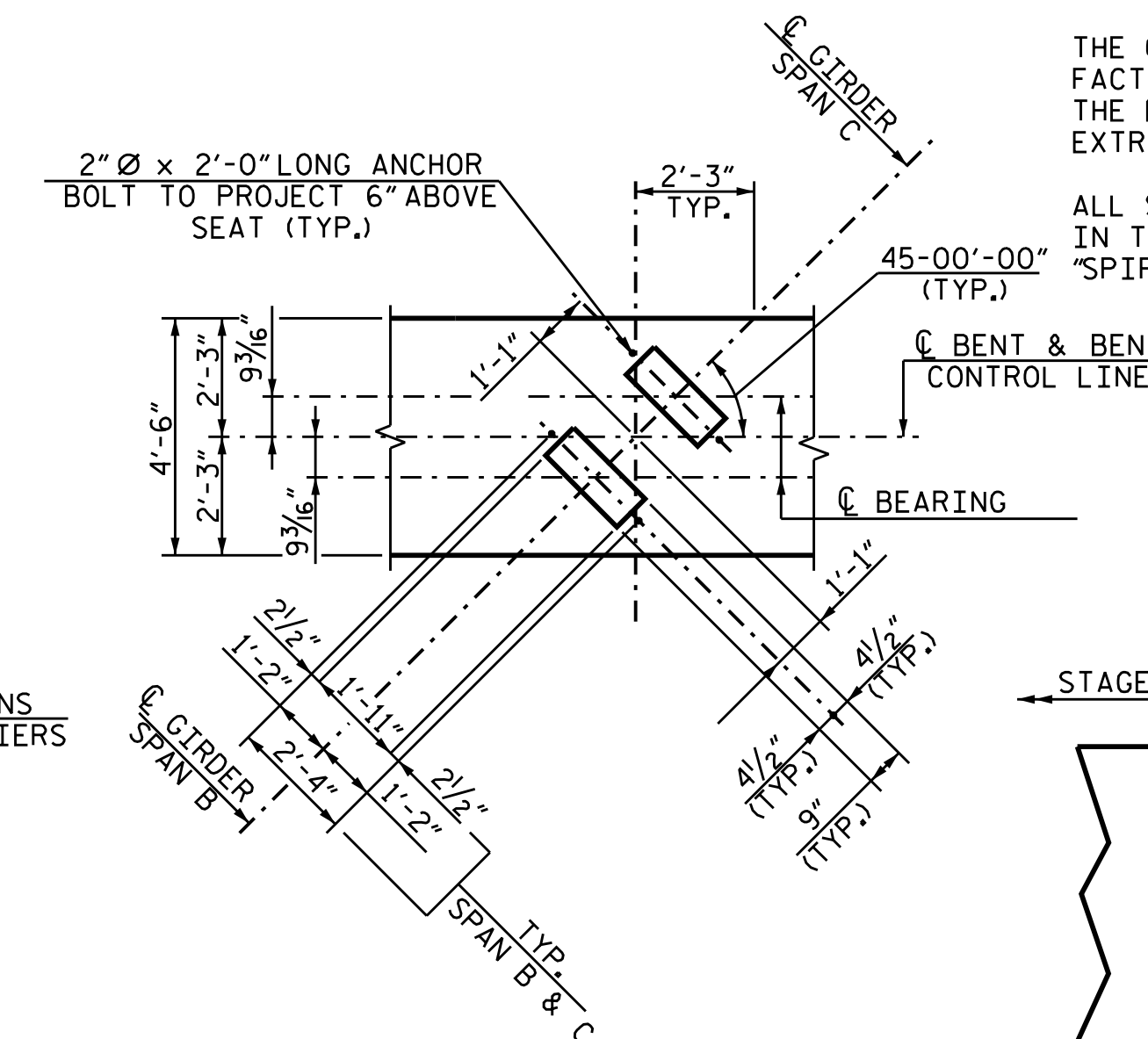
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 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-52
1			3			TOTAL SHEETS
2			4			69

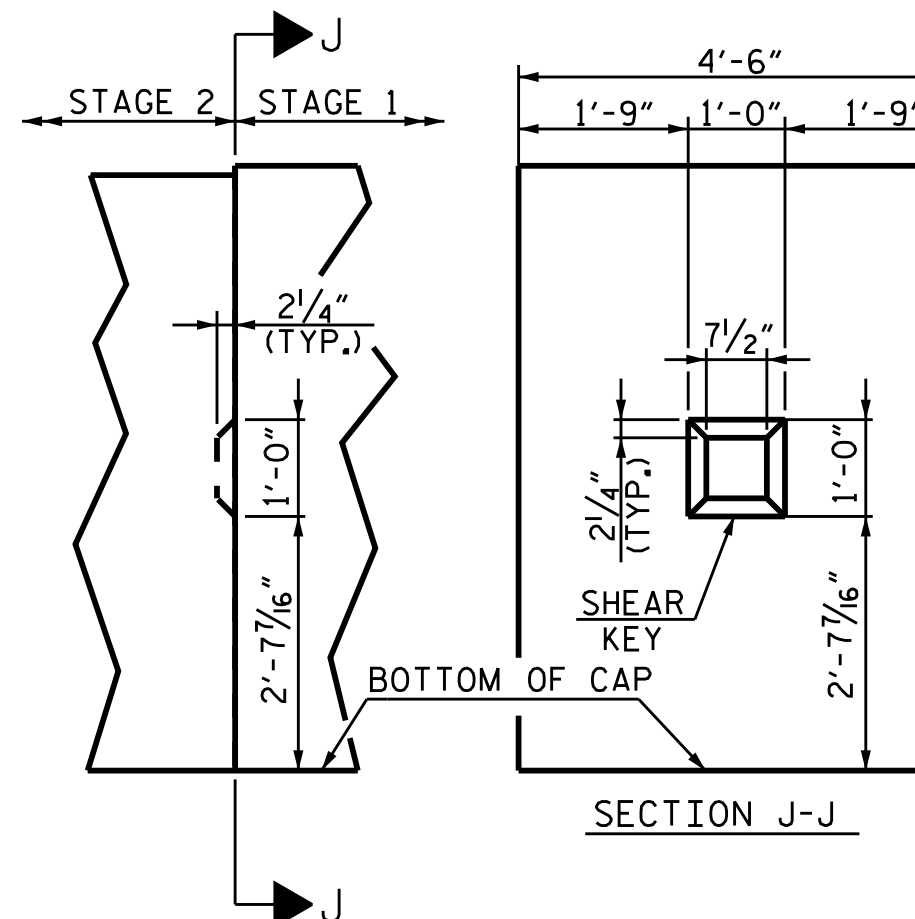
DRAWN BY : T.B.ENNIS DATE : 2/17
 CHECKED BY : R.A.RAYNOR JR DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17



PLAN

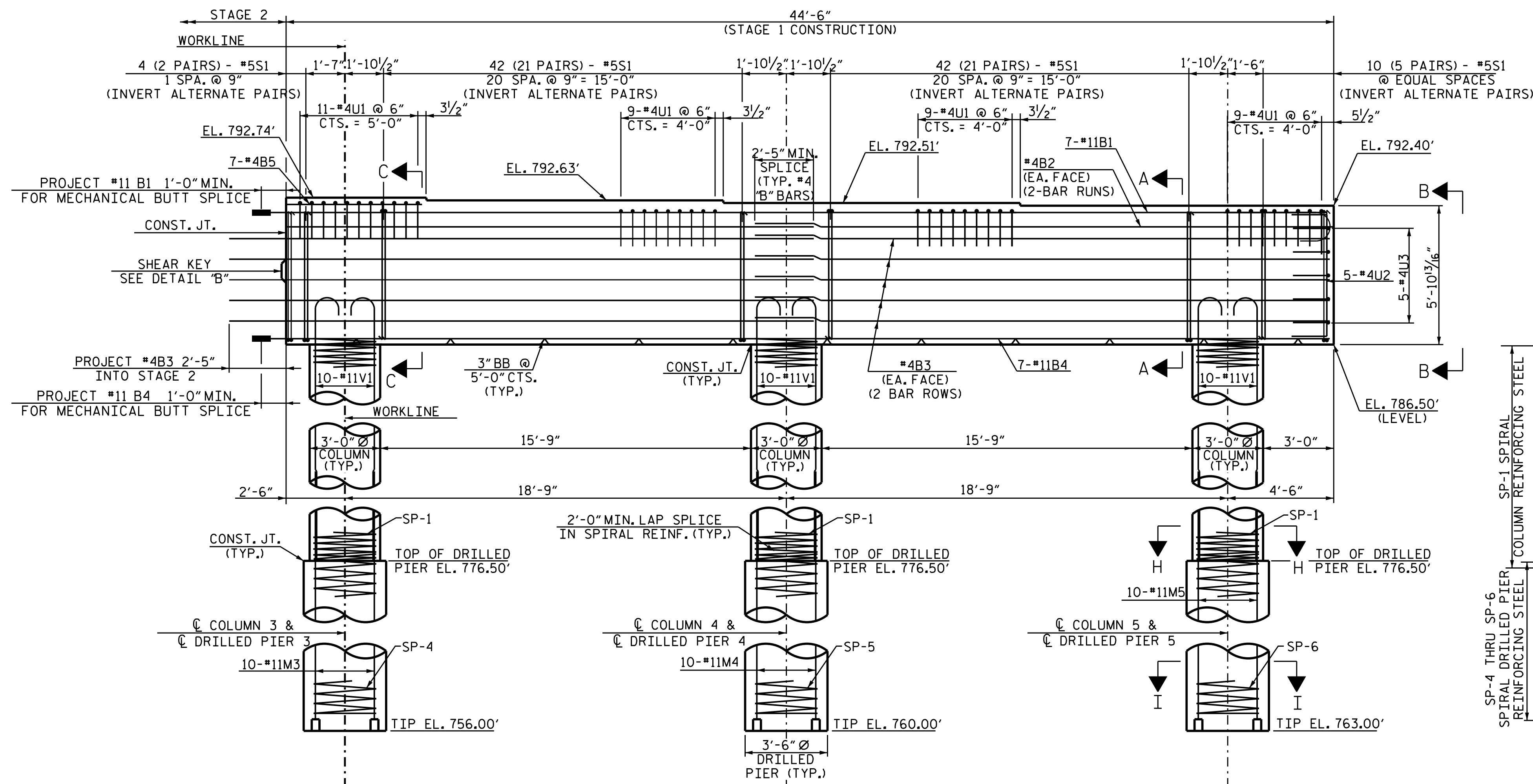


DETAIL "A"

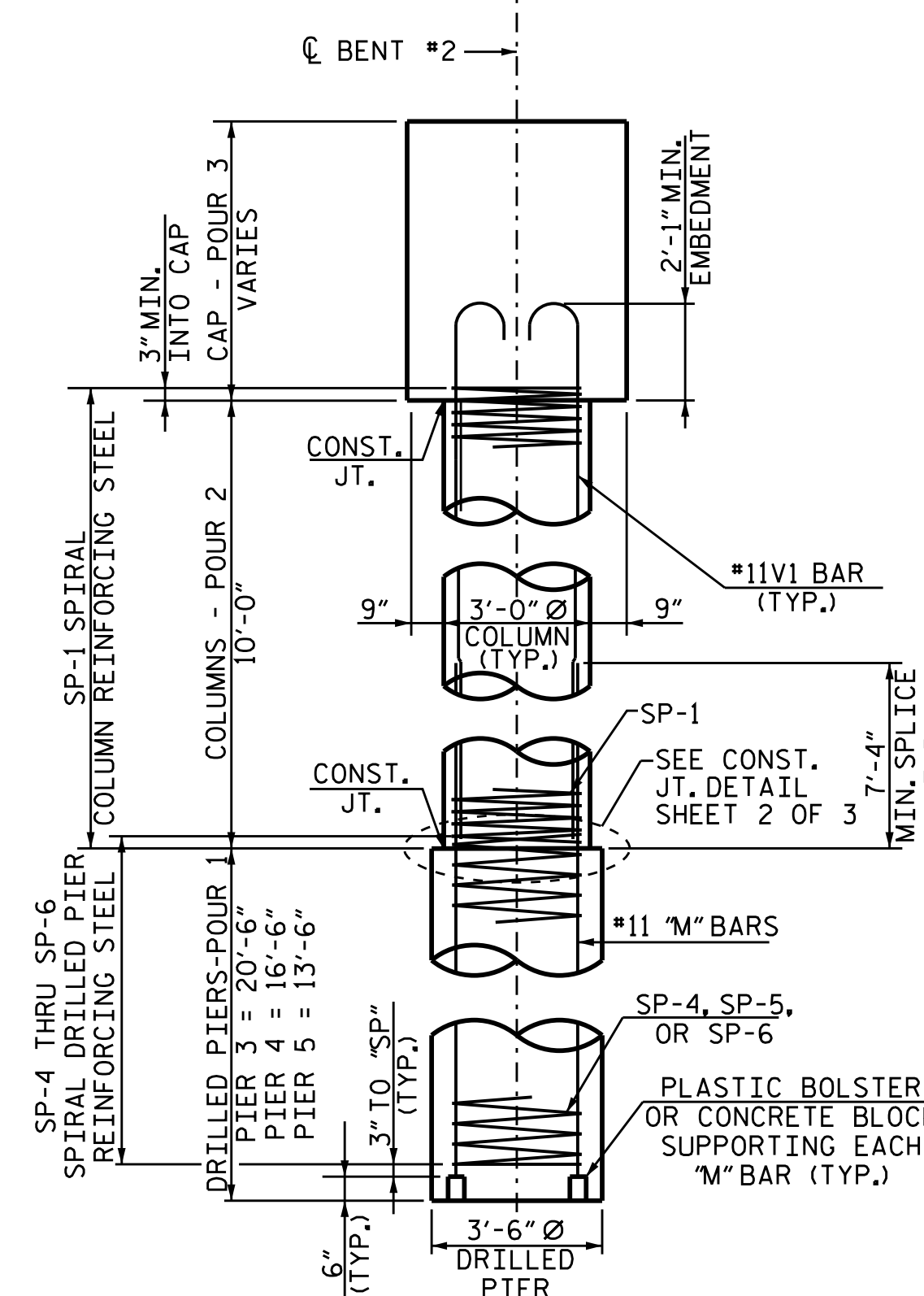


DETAIL "B"

SHEAR KEY DETAIL



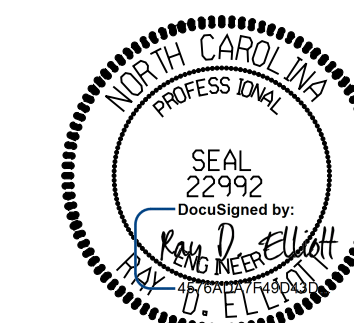
ELEVATION



END VIEW

NOTES:
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

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



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PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00-L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT No. 2
 STAGE 1 CONSTRUCTION
 DETAILS

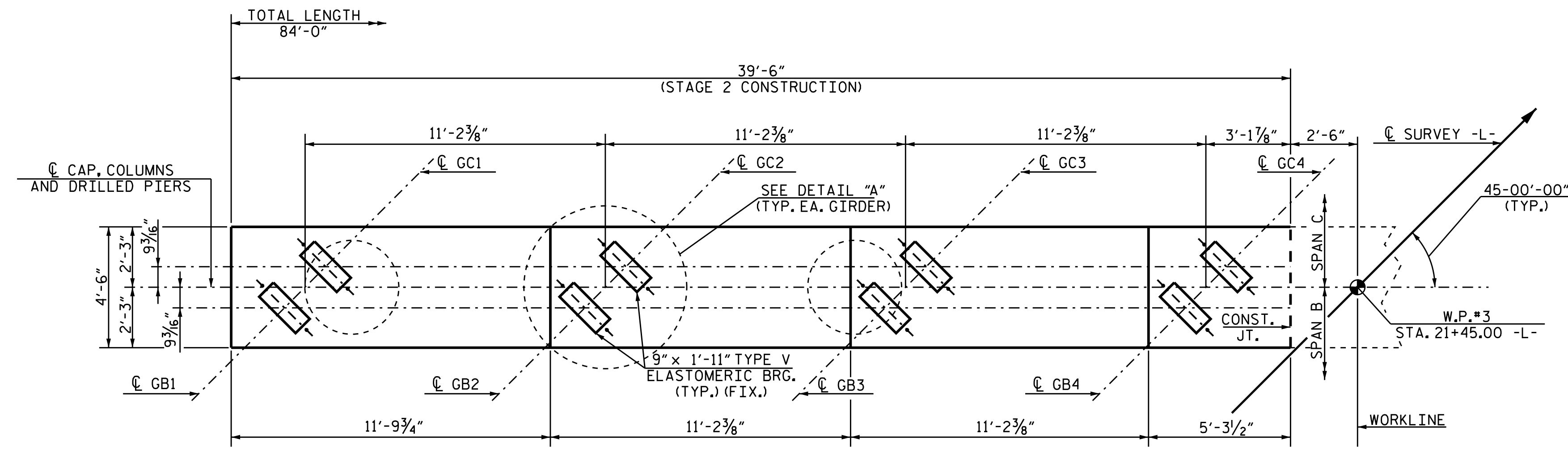
DRAWN BY : T.B.ENNIS DATE : 2/17
 CHECKED BY : R.A.RAYNOR JR DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53
1			3			TOTAL SHEETS
2			4			69

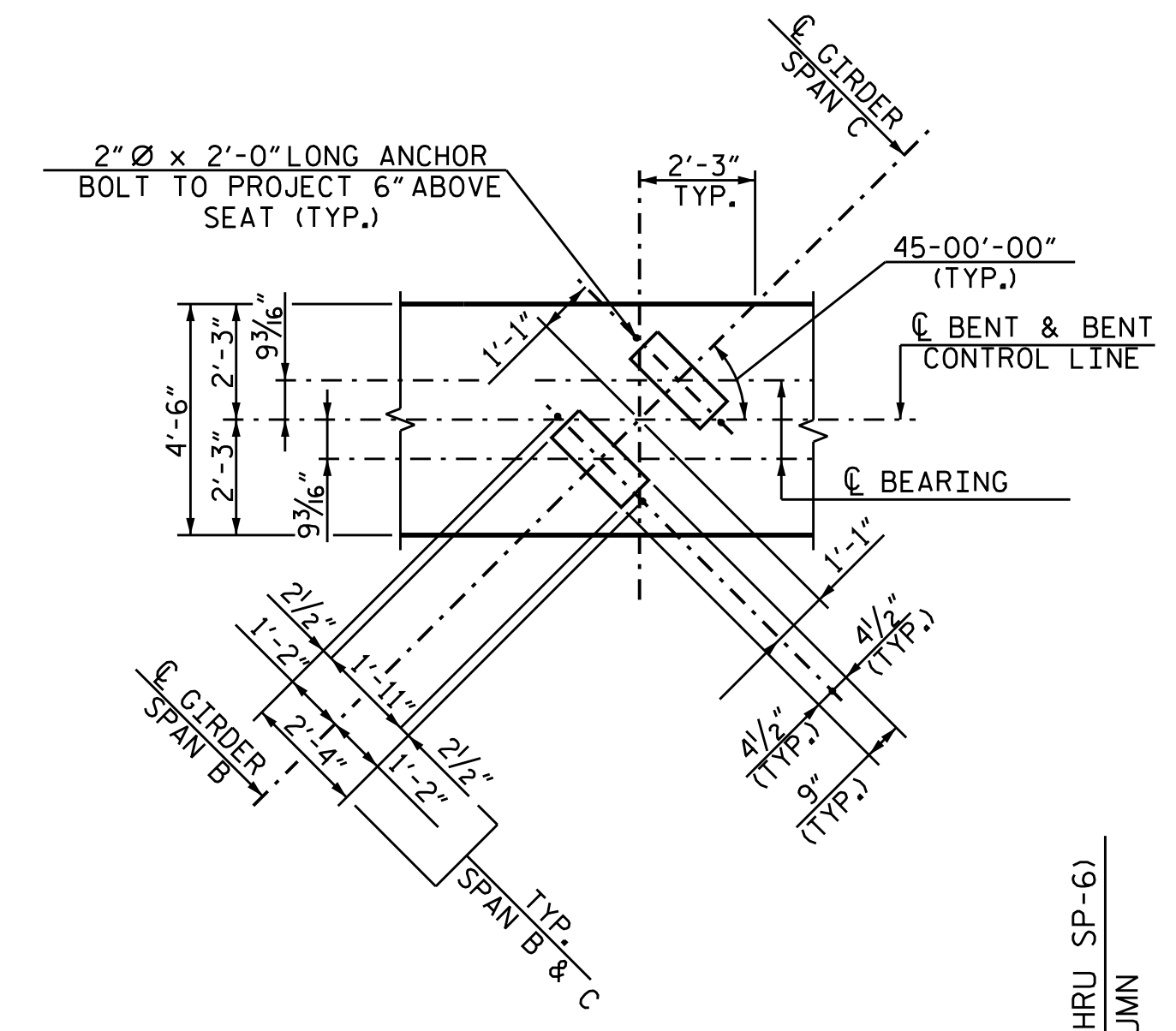
NOTES:
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

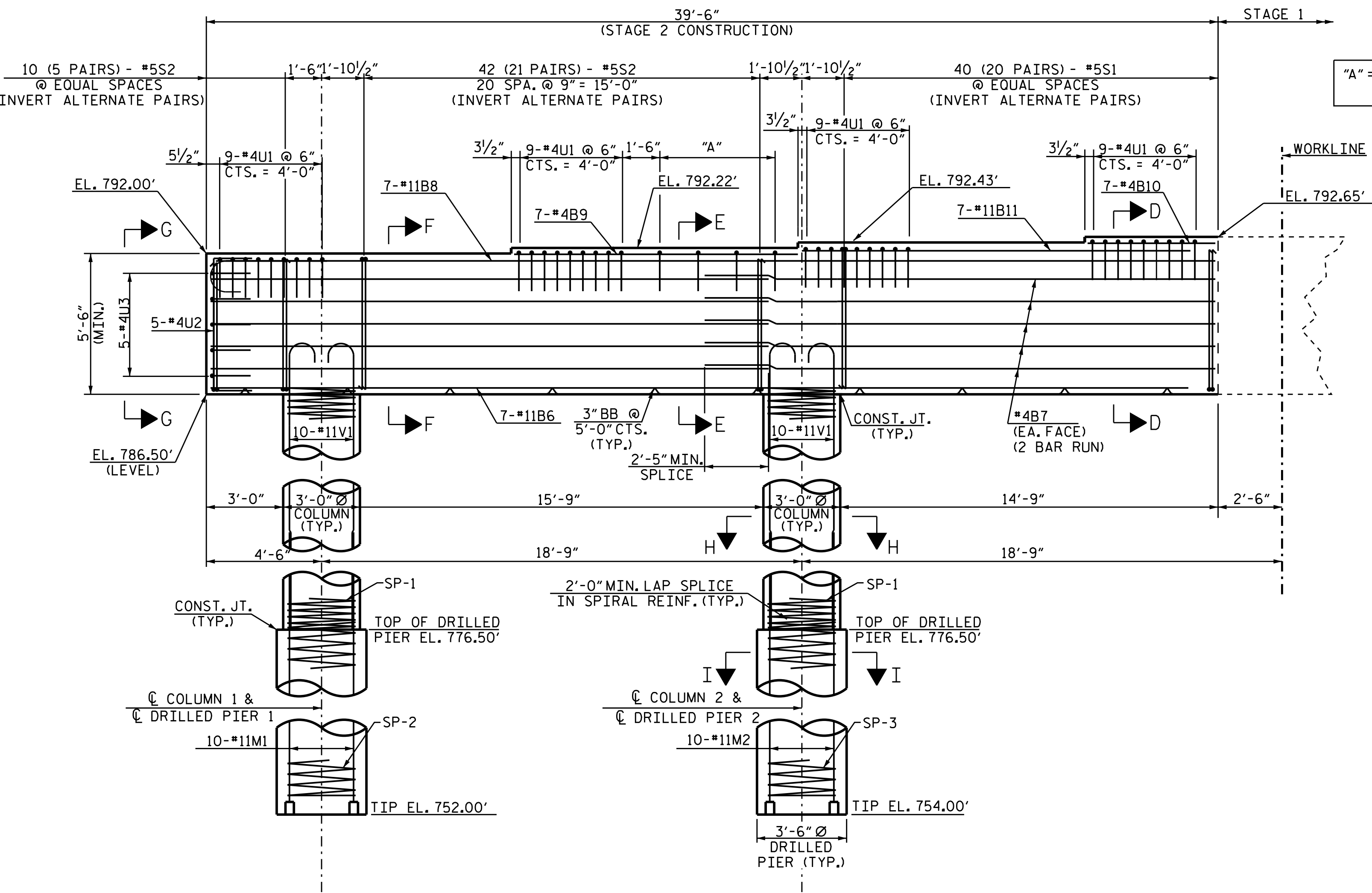
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".



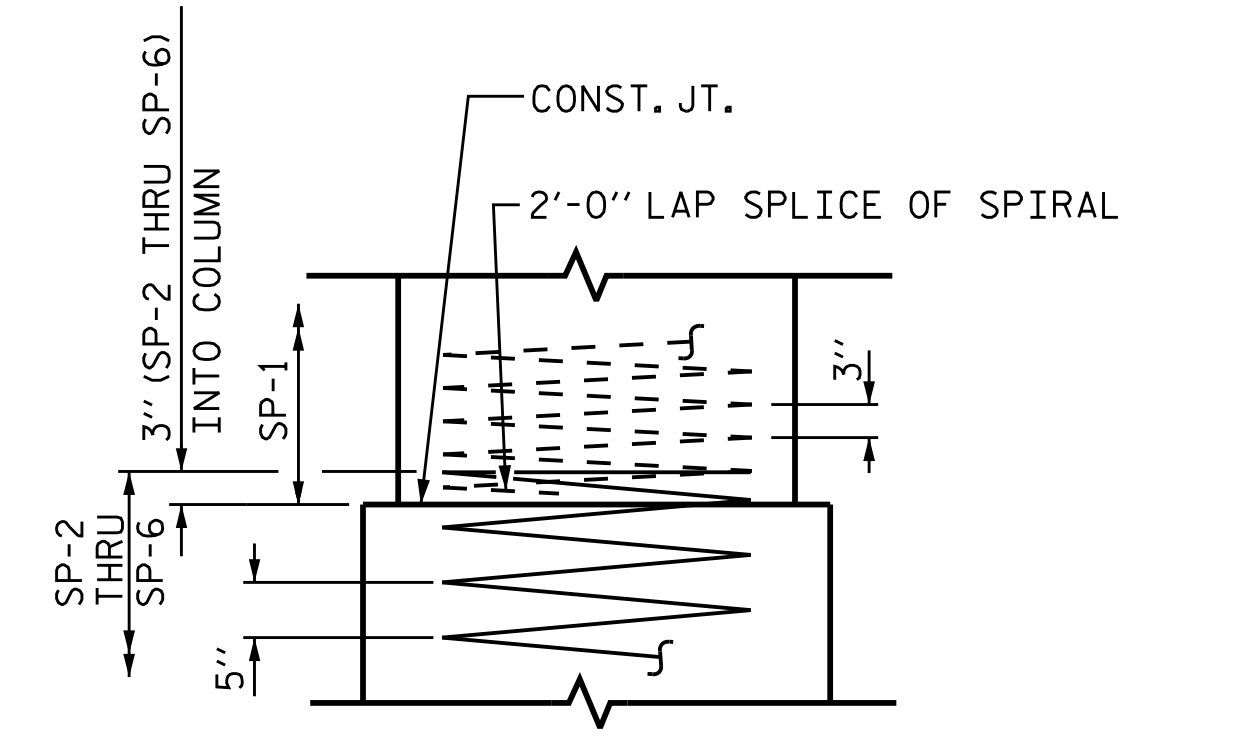
PLAN



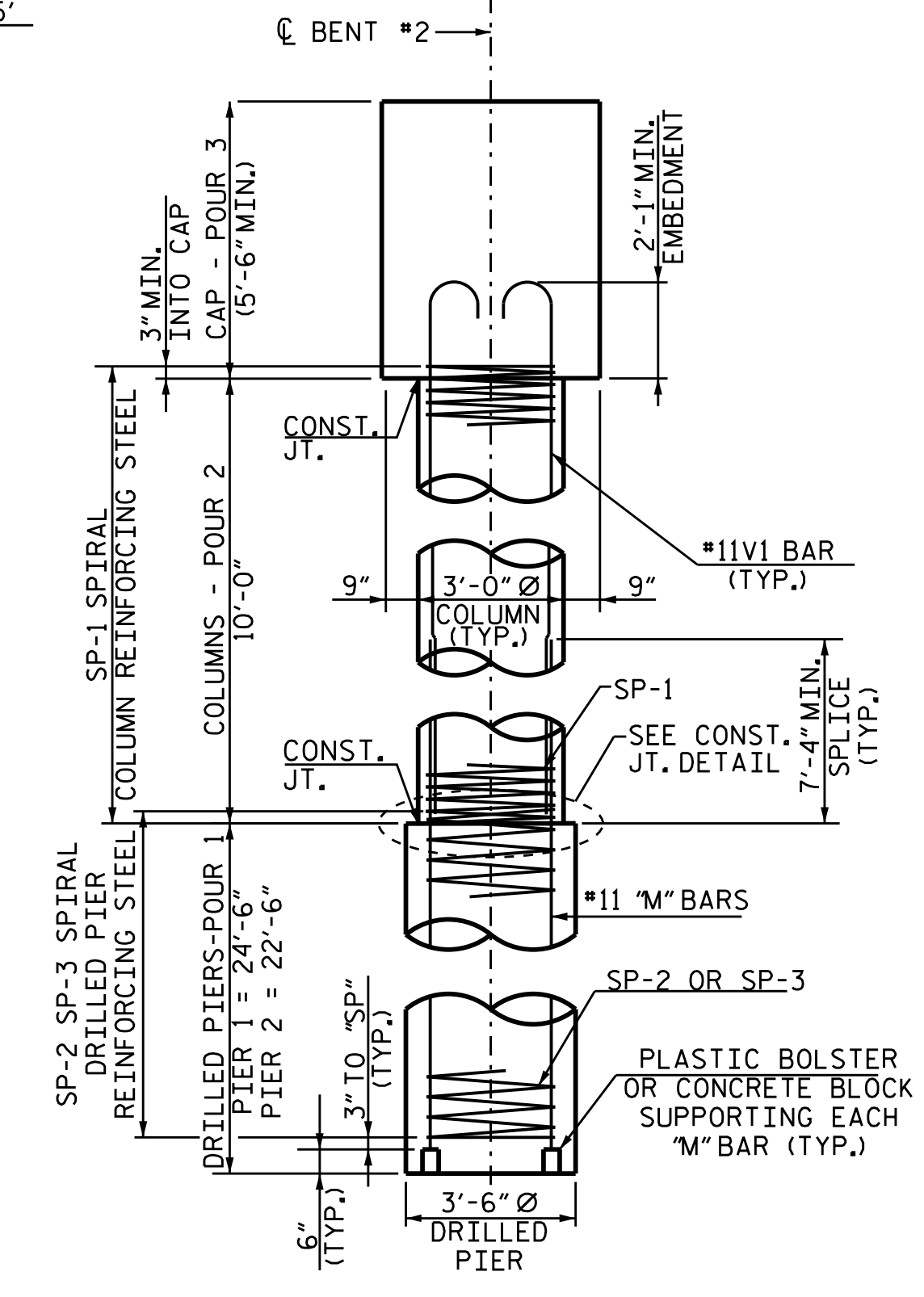
DETAIL "A"



ELEVATION

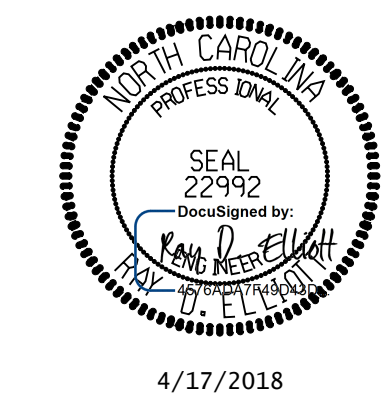


CONSTRUCTION JOINT DETAIL



END VIEW

PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00-L-
 SHEET 2 OF 4

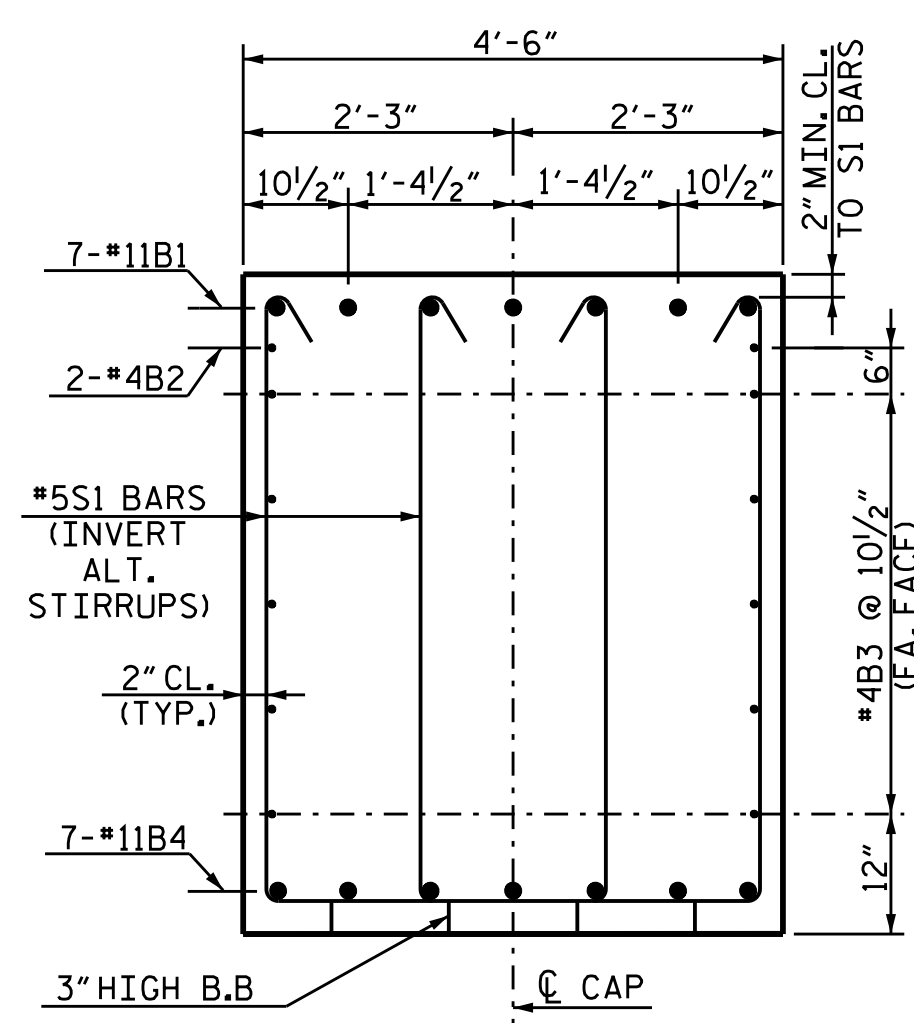


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT No. 2
 STAGE 2 CONSTRUCTION
 DETAILS

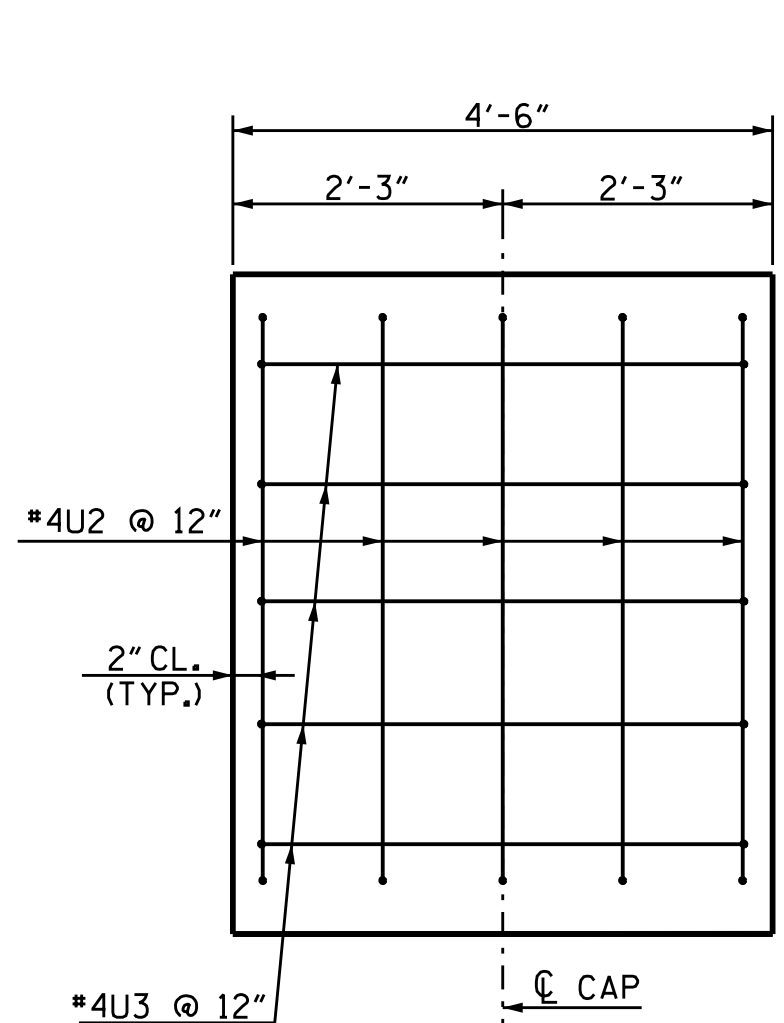
DRAWN BY: T.B.ENNIS DATE: 2/17
 CHECKED BY: R.A.RAYNOR JR DATE: 2/17
 DESIGN ENGINEER OF RECORD: RDE DATE: 4/17

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NO.	BY	DATE	NO.	BY	DATE	S-54			
1			3			TOTAL SHEETS			
2			4			69			

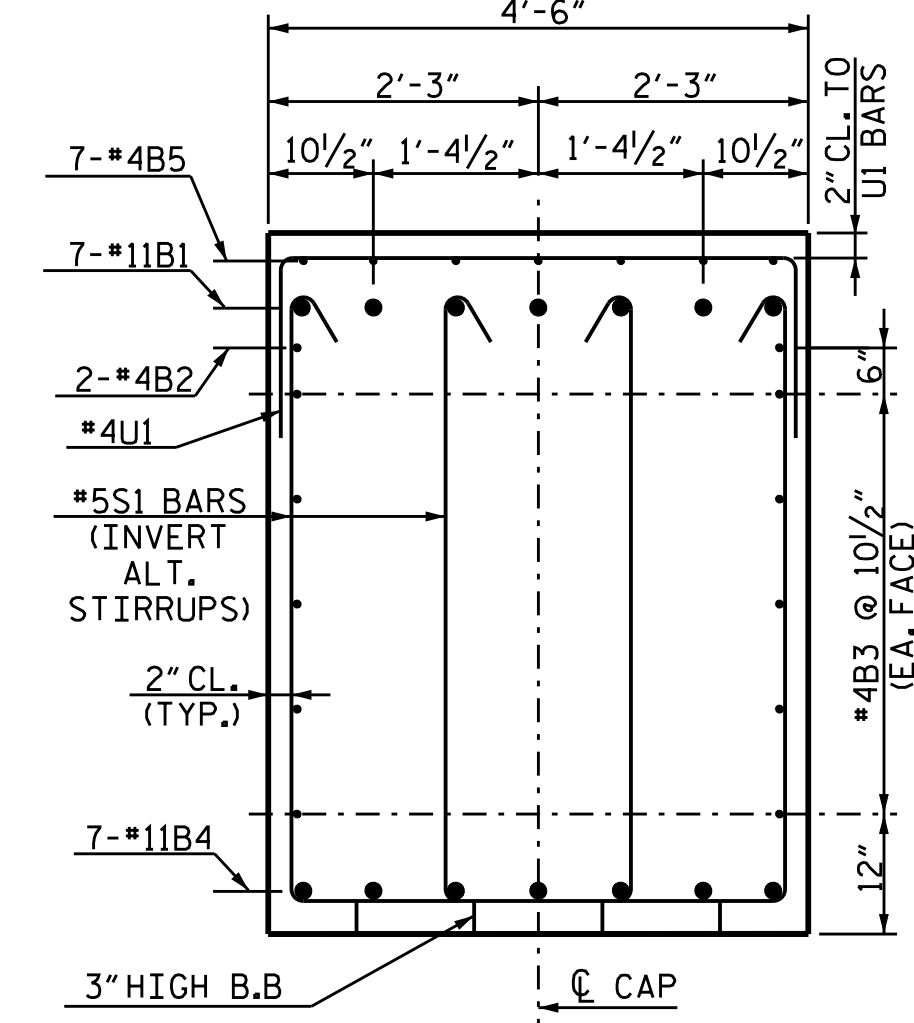
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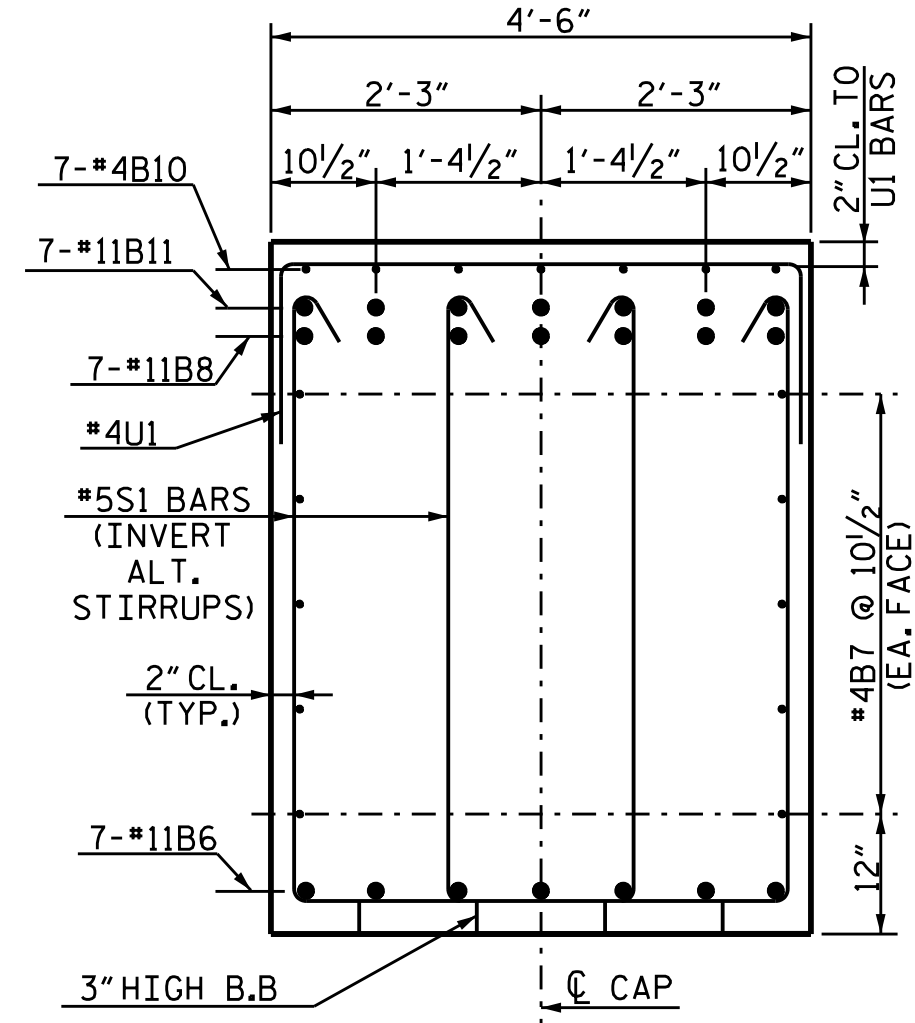
SECTION A-A



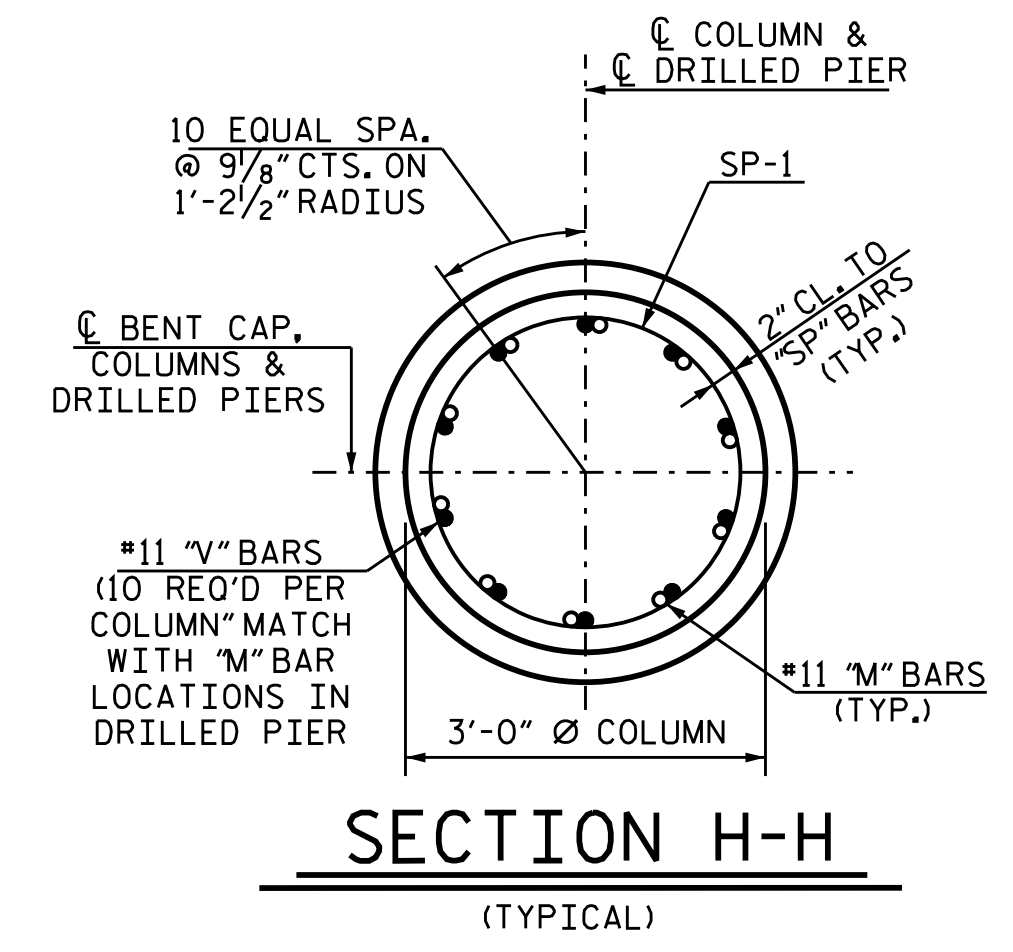
SECTION B-B



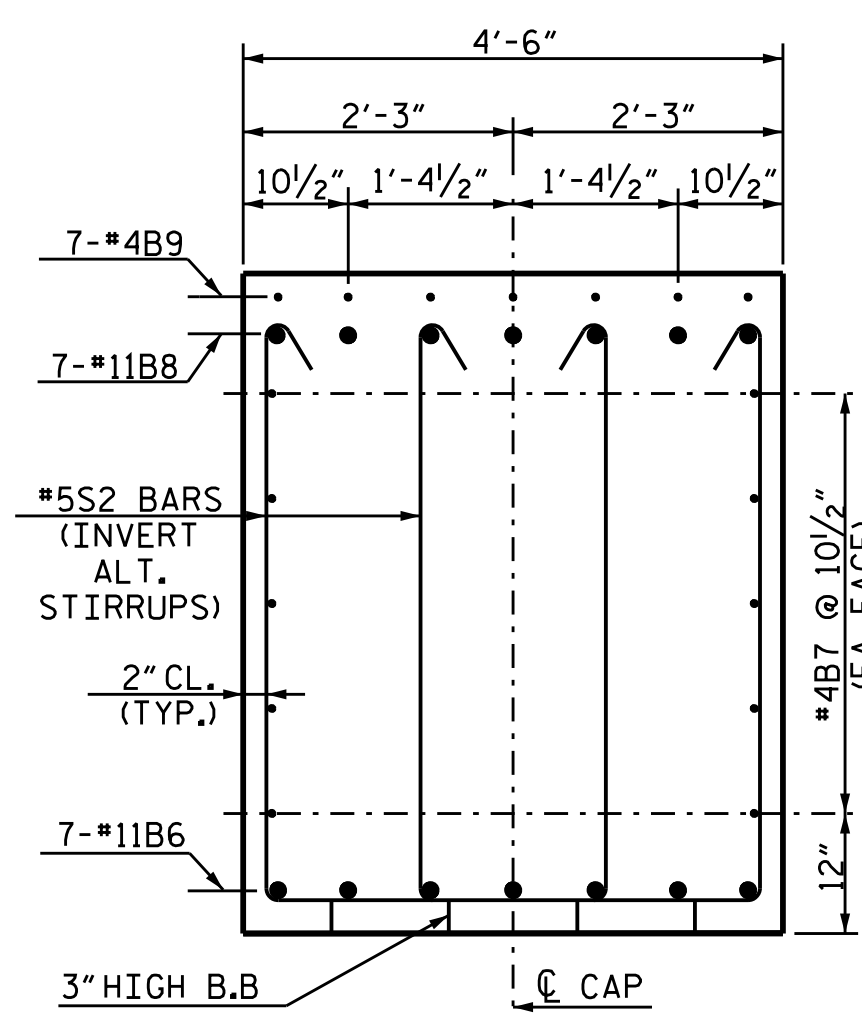
SECTION C-C



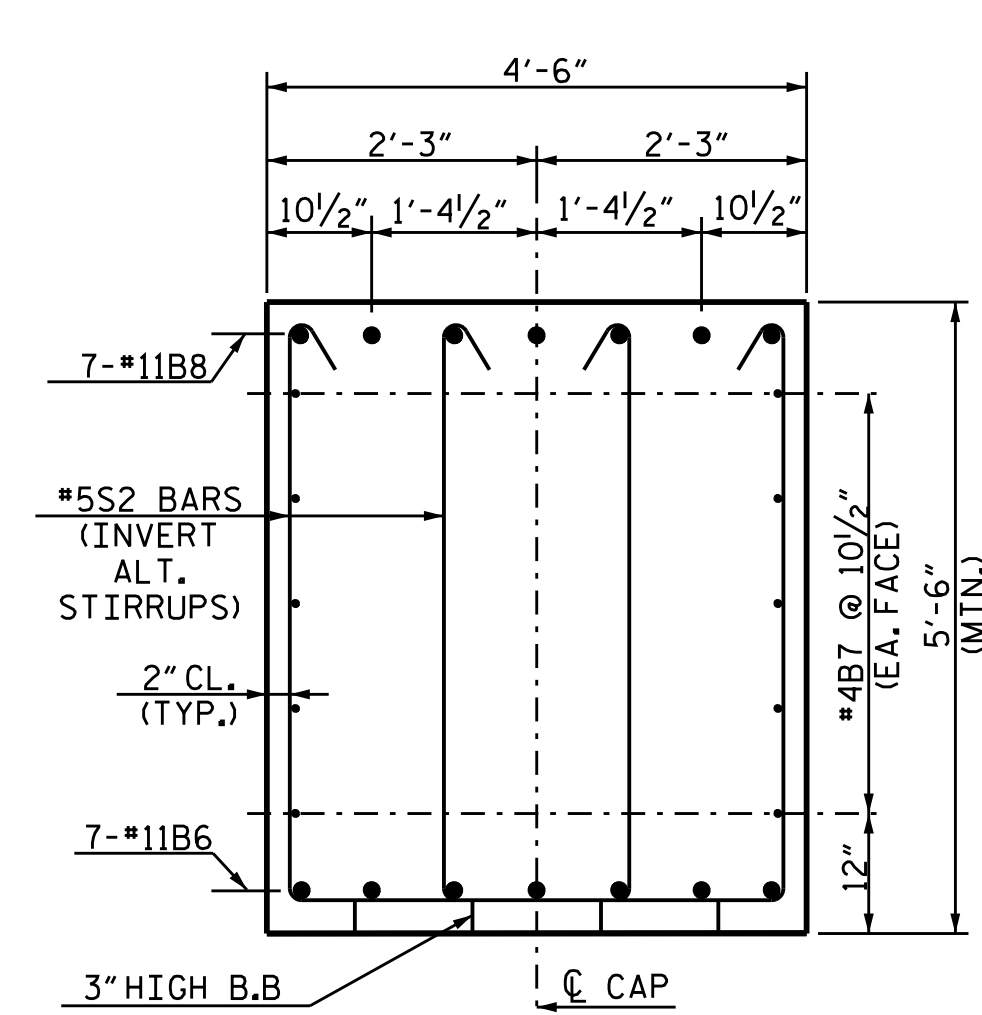
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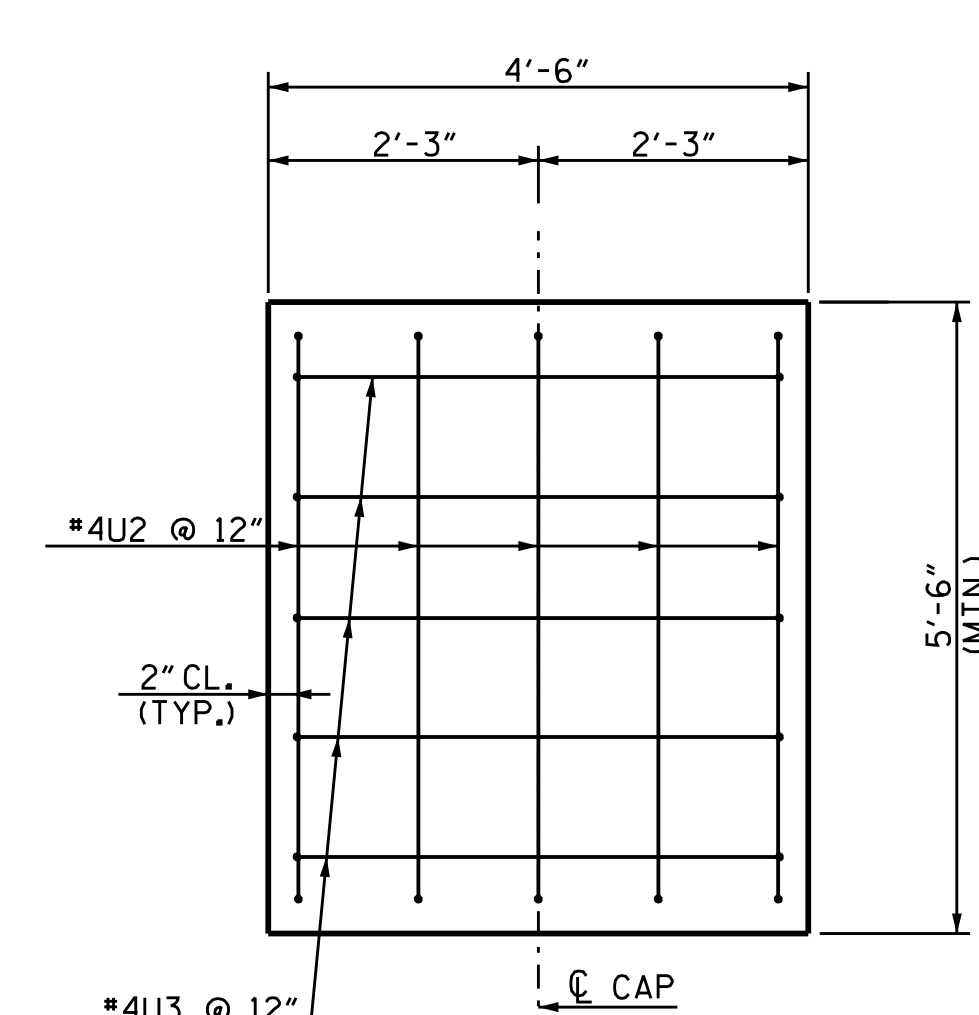
SECTION H-H
(TYPICAL)



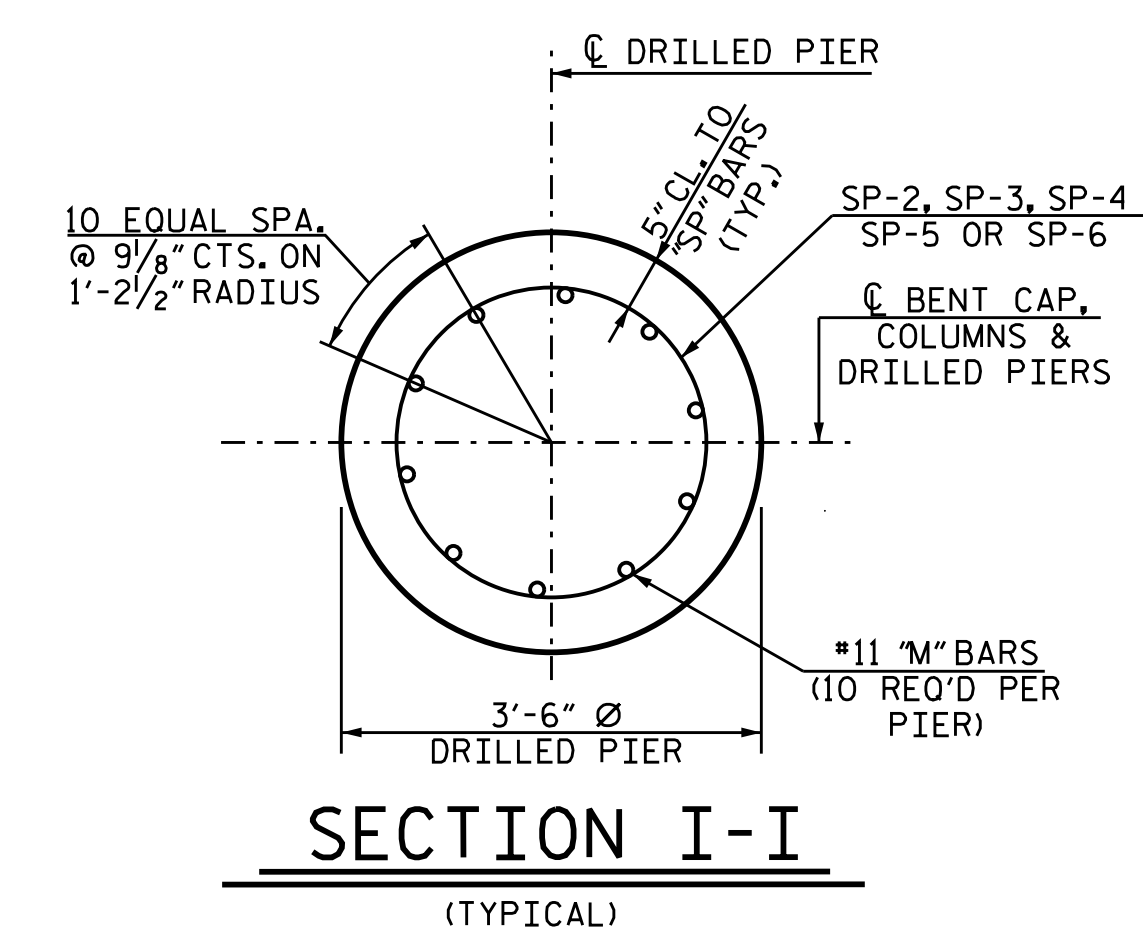
SECTION E-E



SECTION F-F



SECTION G-G



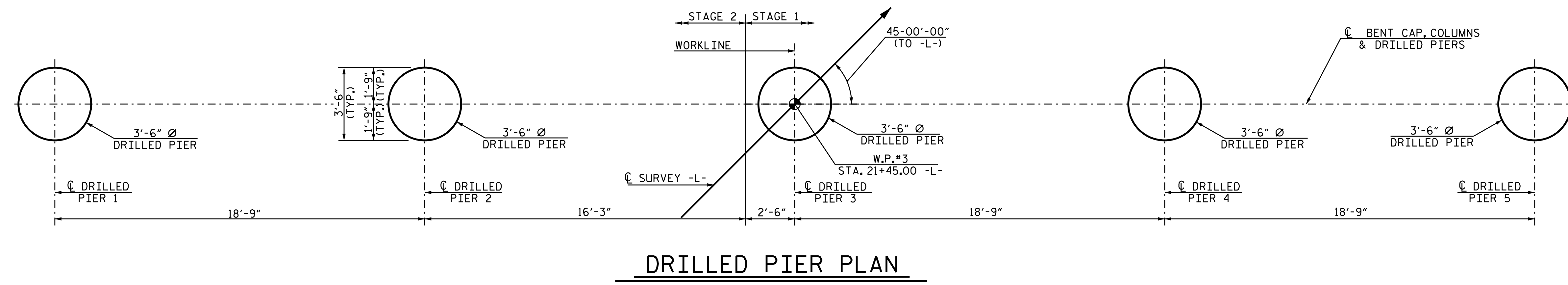
SECTION I-I
(TYPICAL)

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PROJECT NO. B-4982
IREDELL COUNTY
 STATION: 21+10.00-L-
 SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE
BENT No. 2
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-55
1			3			TOTAL SHEETS
2			4			69



DRILLED PIER PLAN

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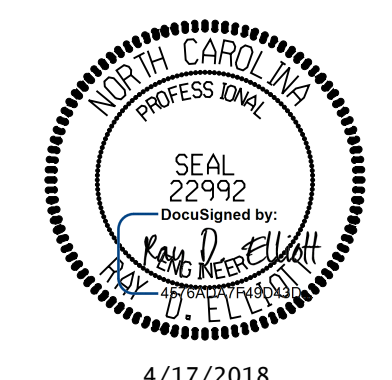
BAR TYPES						BILL OF MATERIAL					BILL OF MATERIAL						
						BENT 2 STAGE 1					BENT 2 STAGE 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	11		46'-11"	1,745	B6	7	11	STR.	38'-4"	1,426	B10	7	4	STR.	4'-11"	23
B2	4	4	STR.	23'-3"	62	B7	20	4	STR.	20'-10"	278	B11	7	11	STR.	15'-3"	567
B3	20	4	STR.	24'-7"	328	B8	7	11									
B4	7	11	STR.	45'-4"	1,686	B9	7	4	STR.	10'-10"	51						
B5	7	4	STR.	5'-7"	26	M3	10	11	STR.	30'-4"	1,612	M1	10	11	STR.	34'-4"	1,824
						M4	10	11	STR.	26'-4"	1,399	M2	10	11	STR.	32'-4"	1,718
						M5	10	11	STR.	23'-4"	1,240						
						S1	98	5	2	14'-9"	1,508	S1	40	5	2	14'-9"	615
						U1	38	4	3	7'-2"	182	S2	52	5	2	14'-0"	759
						U2	5	4	3	8'-2"	27	U1	40	4	3	7'-2"	191
						U3	5	4	3	7'-0"	23	U2	5	4	3	8'-2"	27
						V1	30	11	1	13'-8"	2,178	U3	5	4	3	7'-0"	23
						SP-1	3	*	4	354'-10"	711	V1	20	11	1	13'-8"	1,452
						SP-4	1	**	4	411'-3"	429	SP-1	2	*	4	354'-10"	474
						SP-5	1	**	4	329'-0"	343	SP-2	1	**	4	493'-6"	515
						SP-6	1	**	4	271'-5"	283	SP-3	1	**	4	452'-5"	472

QUANTITIES				QUANTITIES			
REINFORCING STEEL	LBS.	12,016		REINFORCING STEEL	LBS.	10,470	
SPIRAL COLUMN REINFORCING STEEL	LBS.	1,766		SPIRAL COLUMN REINFORCING STEEL	LBS.	1,461	
CLASS A CONCRETE				CLASS A CONCRETE			
POUR #2 COLUMNS	CU. YDS.	7.9		POUR #2 COLUMNS	CU. YDS.	5.2	
POUR #3 CAP	CU. YDS.	44.8		POUR #3 CAP	CU. YDS.	38.0	
TOTAL	CU. YDS.	52.7		TOTAL	CU. YDS.	43.2	
POUR #1 DRILLED PIERS	CU. YDS.	18.0		POUR #1 DRILLED PIERS	CU. YDS.	16.7	
3'-6" Ø DRILLED PIERS, IN SOIL	L.F.	23.5		3'-6" Ø DRILLED PIERS, IN SOIL	L.F.	29	
3'-6" Ø DRILLED PIERS, NOT IN SOIL	L.F.	27		3'-6" Ø DRILLED PIERS, NOT IN SOIL	L.F.	18	
CSL TUBES	L.F.	220		CSL TUBES	L.F.	200	
PERMANENT STEEL CASING	L.F.	30		PERMANENT STEEL CASING	L.F.	20	

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

** THE SP-2, SP-3, SP-4, SP-5, AND SP-6 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

PROJECT NO. B-4982
IREDELL COUNTY
STATION: 21+10.00-L-
SHEET 4 OF 4



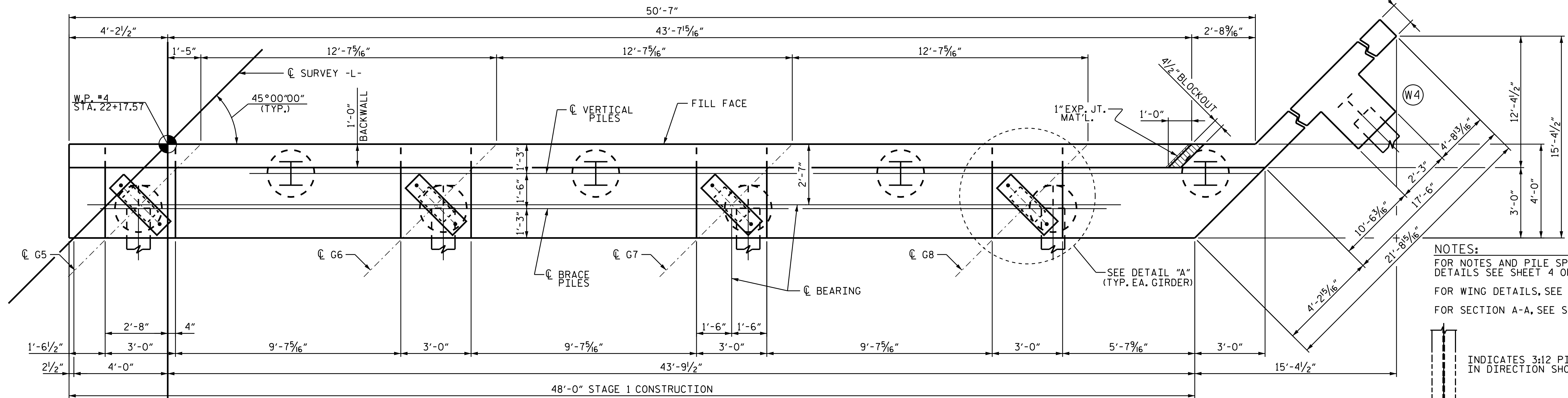
4/17/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

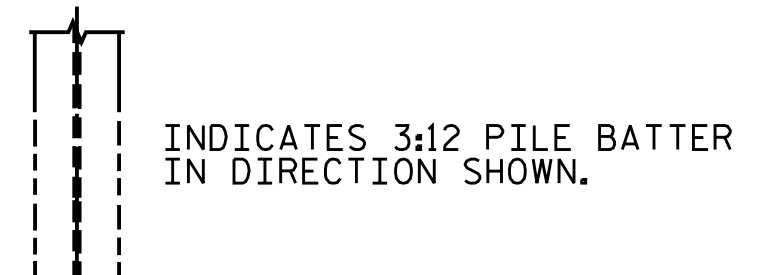
SUBSTRUCTURE
BENT No. 2
DETAILS

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-56			
1			3			TOTAL SHEETS			
2			4			69			

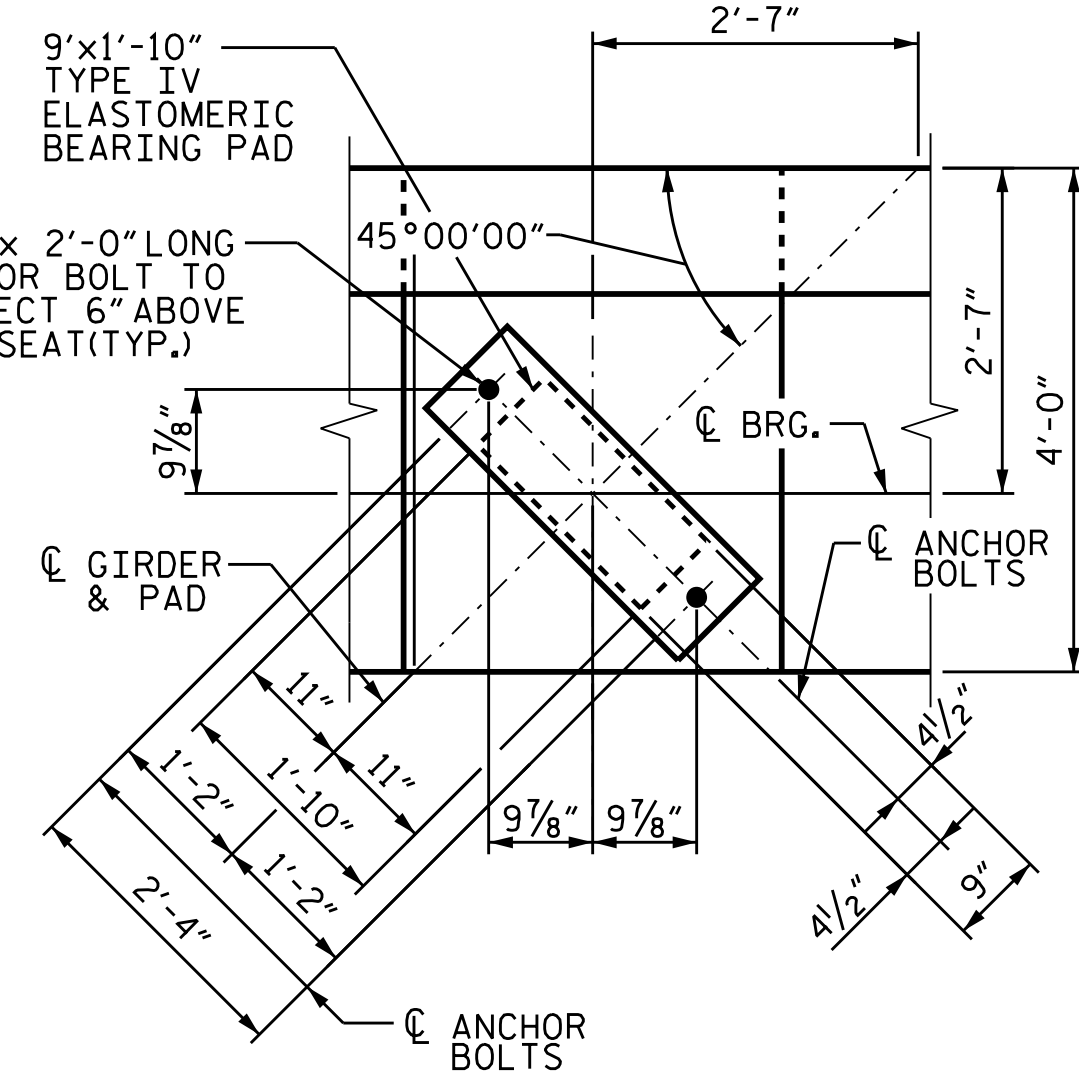
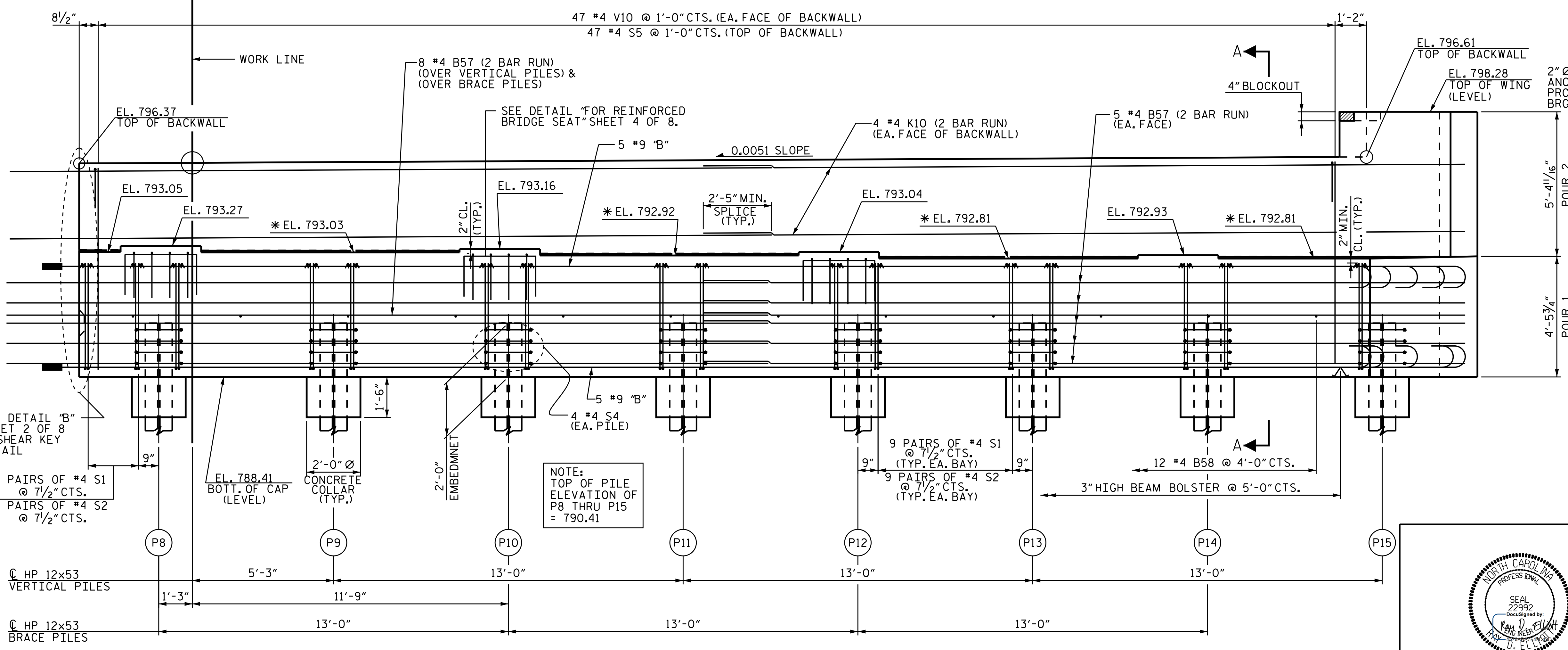
DRAWN BY : T.B.ENNIS DATE : 2/17
CHECKED BY : R.A.RAYNOR JR DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17



NOTES:
 FOR NOTES AND PILE SPLICE DETAILS SEE SHEET 4 OF 8.
 FOR WING DETAILS, SEE SHEET 3 OF 8.
 FOR SECTION A-A, SEE SHEET 2 OF 8.



PLAN



DETAIL A

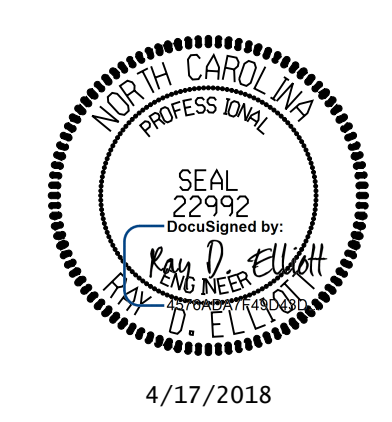
PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00-L-

SHEET 1 OF 8

ELEVATION

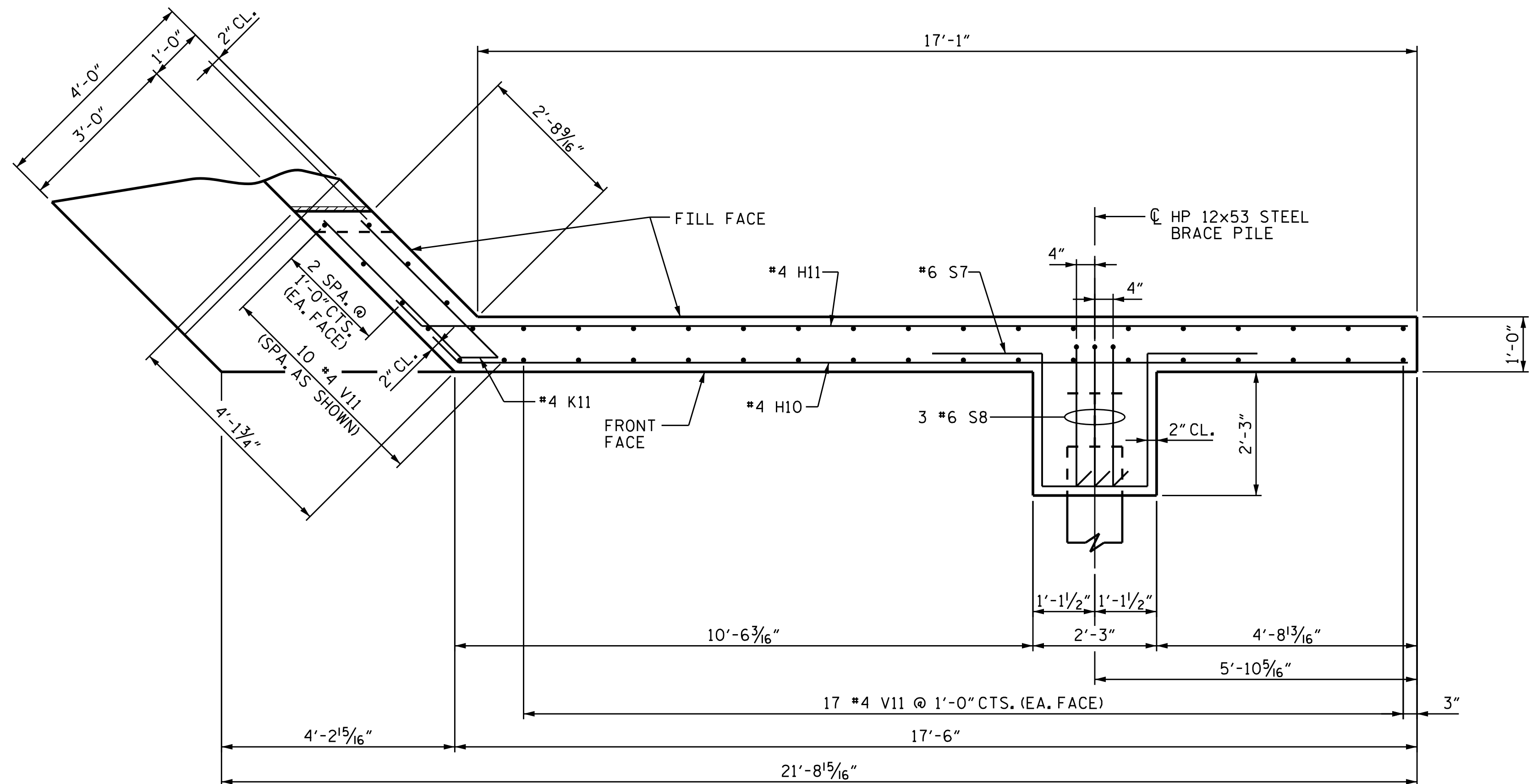
DRAWN BY : JLA DATE : 2/17
 CHECKED BY : RDE DATE : 4/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

* FOR ELEVATION BETWEEN BRIDGE SEATS, SEE SECTION A-A ON SHEET 2 OF 8.

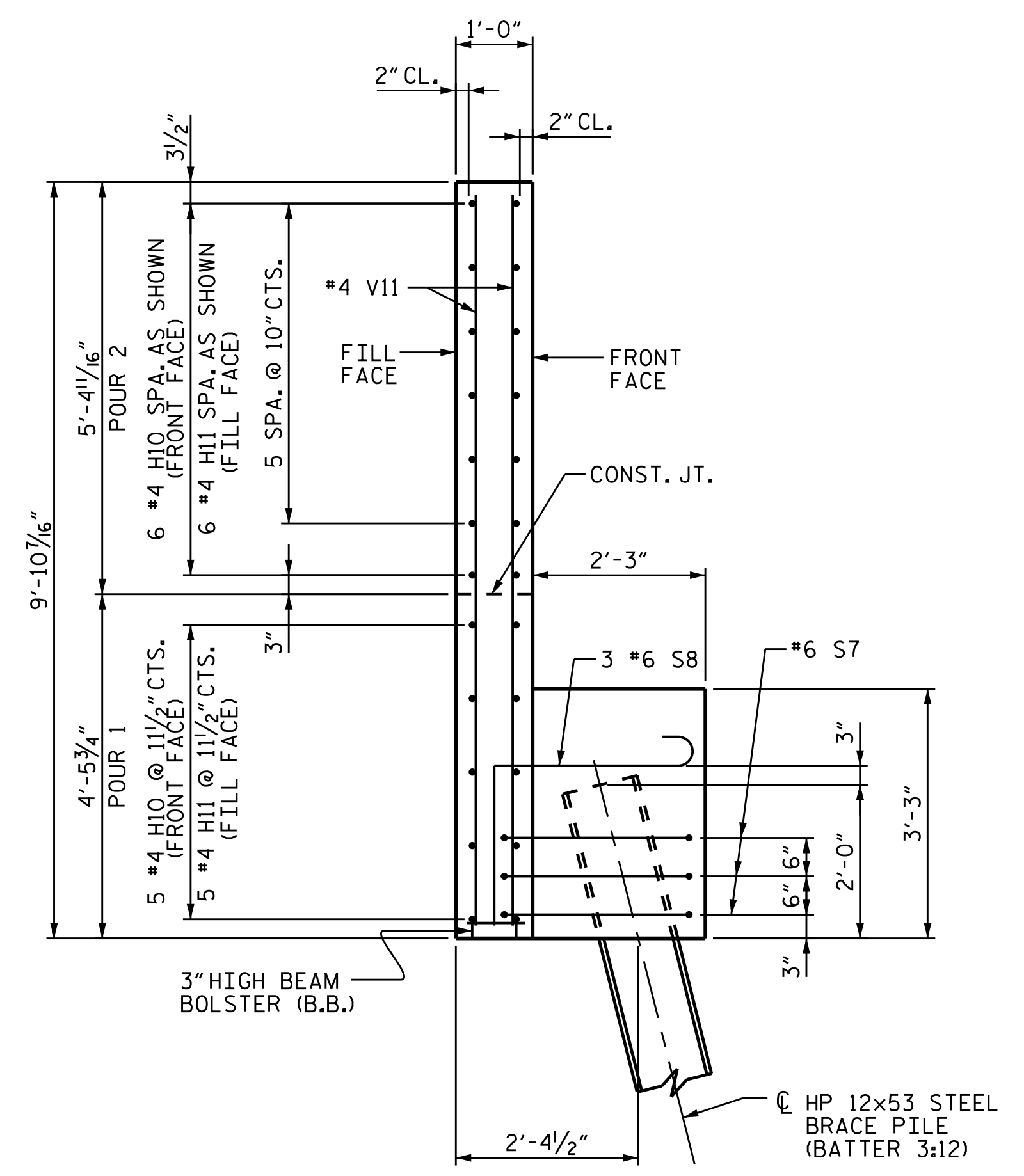


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 2
 PART-PLAN & PART ELEVATION
 STAGE 1 CONSTRUCTION

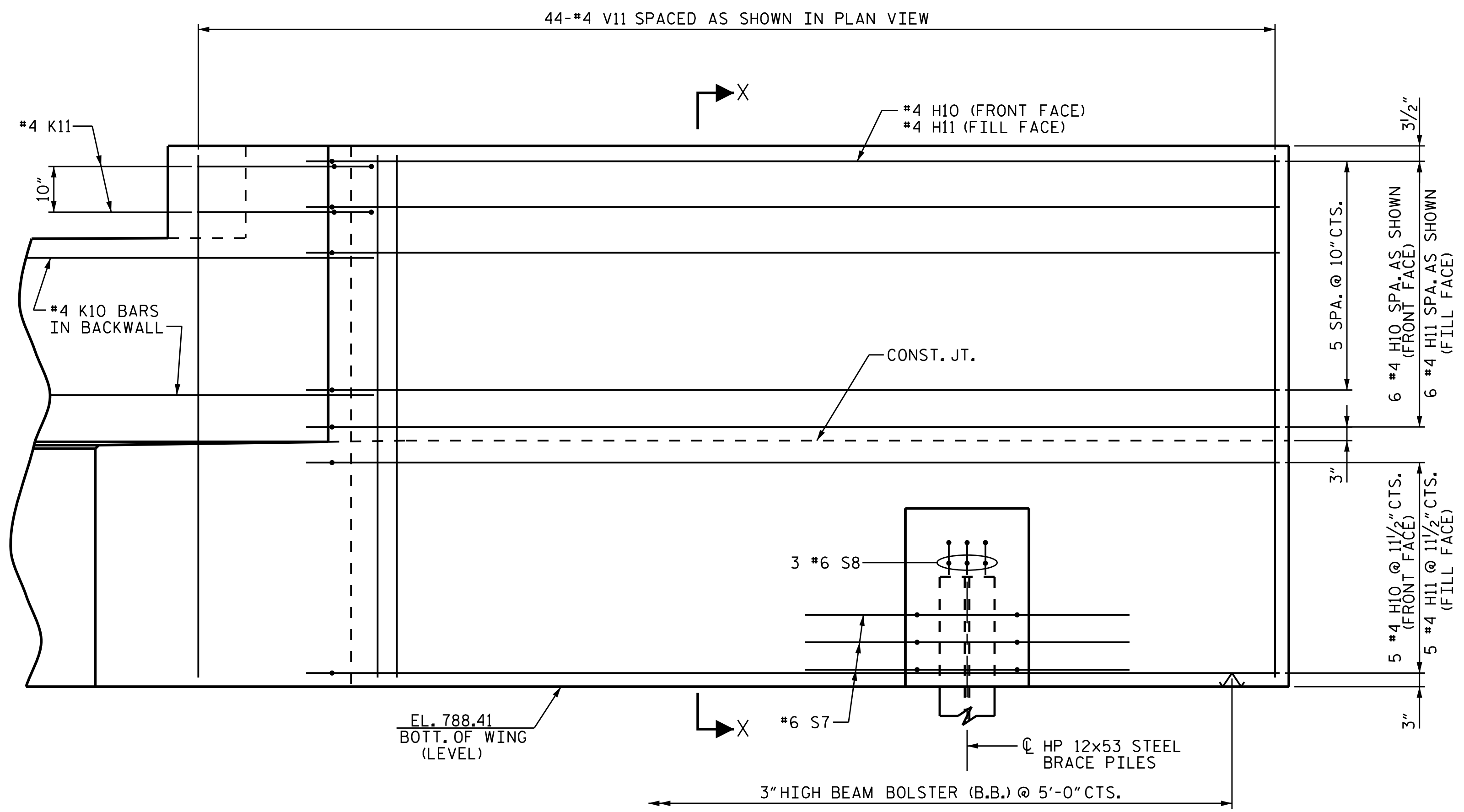
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NO.	BY	DATE	NO.	BY	DATE				
1			3			S-57			
2			4			TOTAL SHEETS 69			



PLAN OF WING (W4)

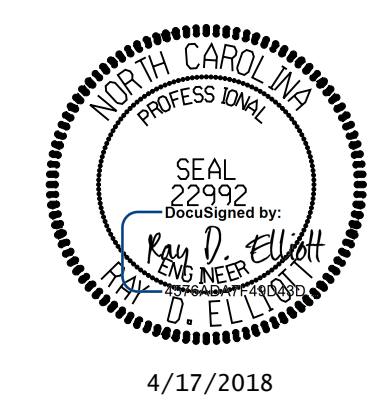


SECTION X-X



ELEVATION OF WING (W4)

PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00-L-
 SHEET 3 OF 8

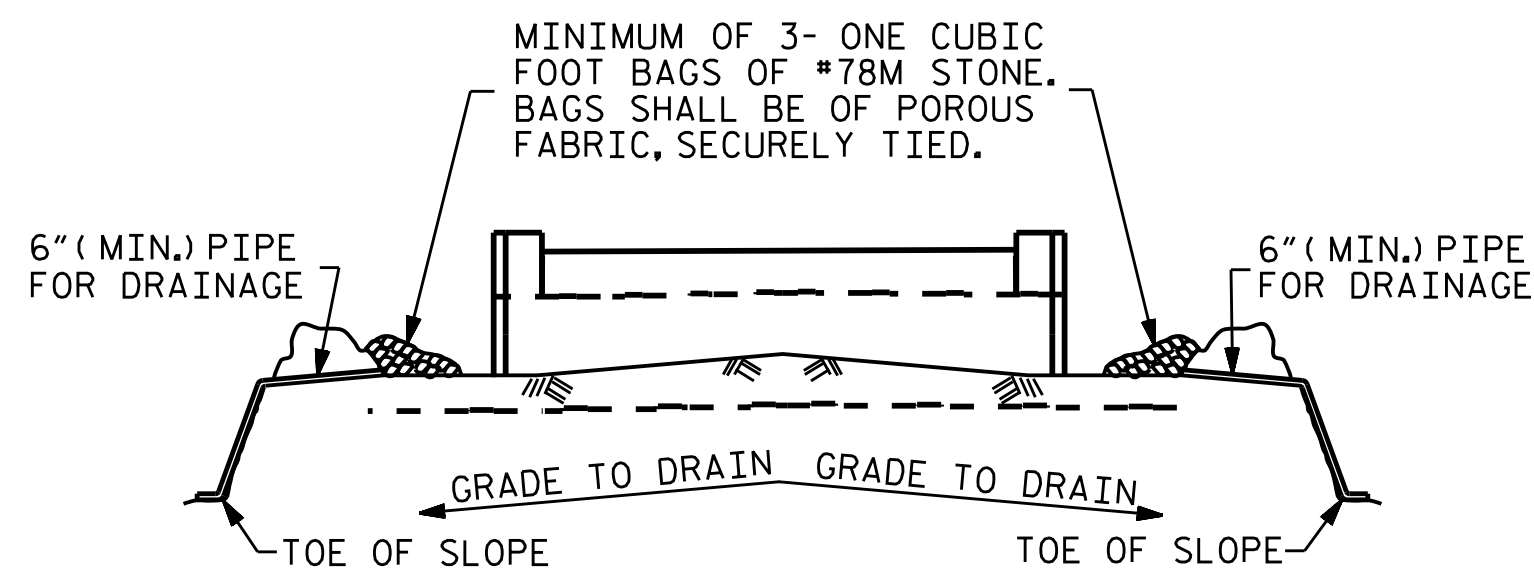


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 2
 STAGE 1 CONSTRUCTION
 WING W4 DETAILS

DRAWN BY : JLA DATE : 2/17
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1			3			S-59			
2			4			TOTAL SHEETS 69			

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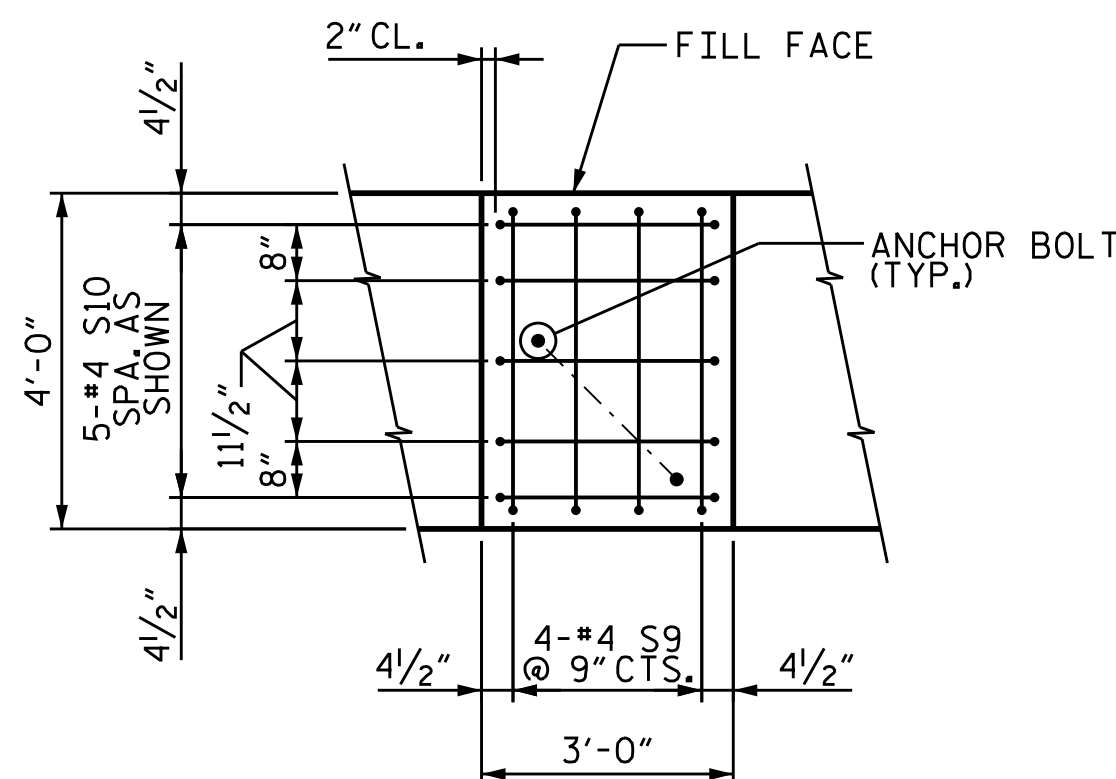


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

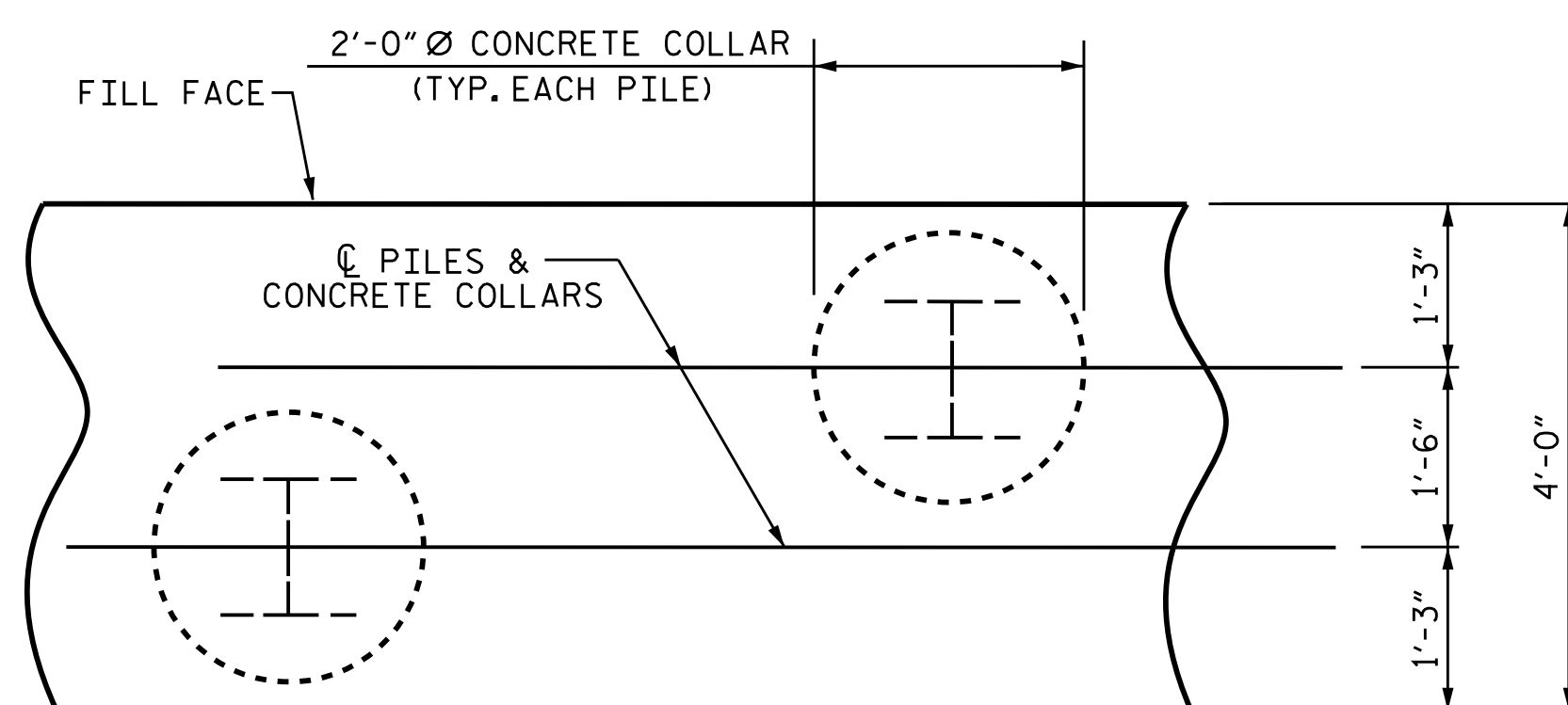
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

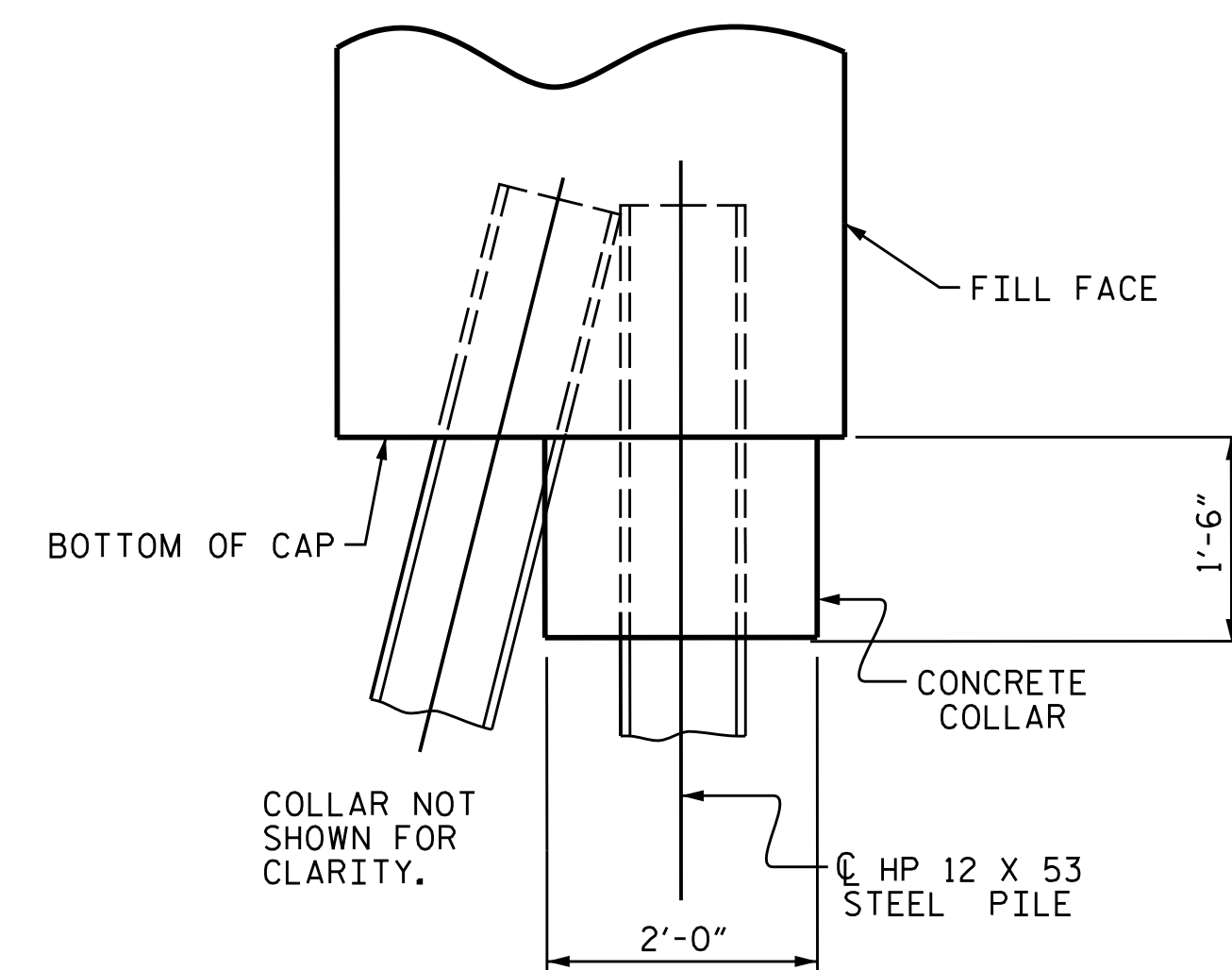


BRIDGE SEAT REINFORCING DETAIL

(TYPICAL FOR GIRDERS 5, 6, 7, 8.)

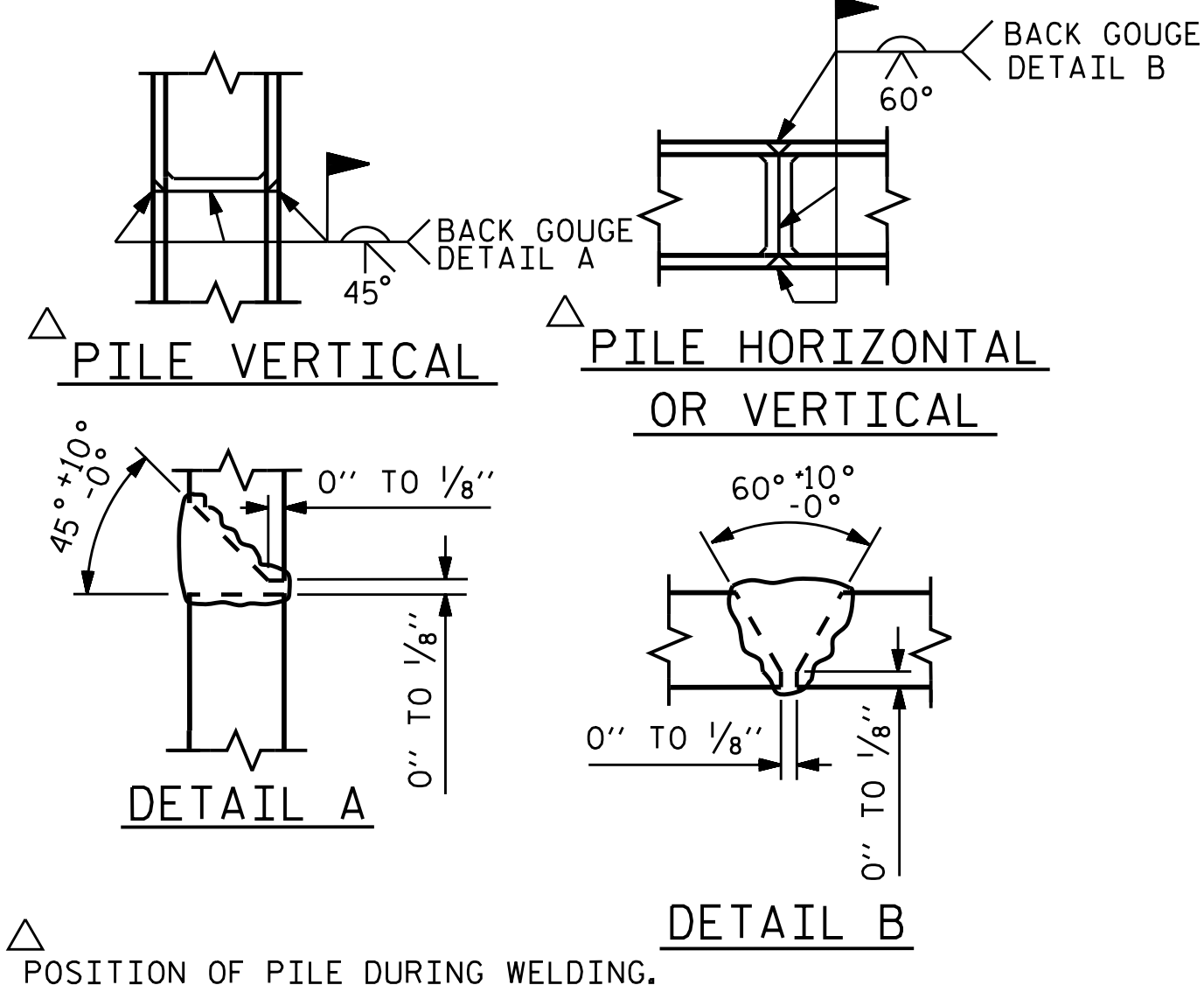


PLAN



ELEVATION

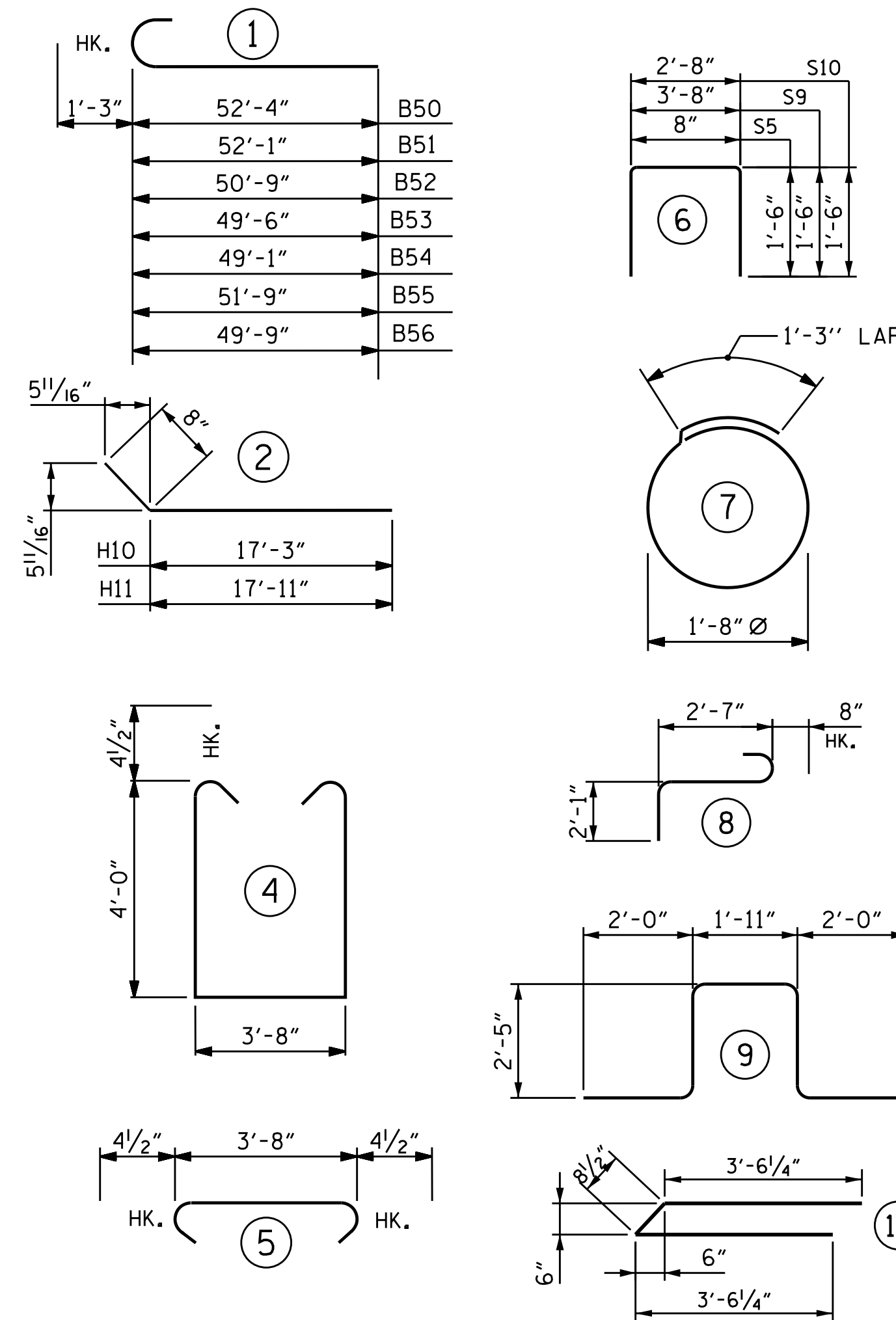
CORROSION PROTECTION FOR STEEL PILES DETAIL



PILE SPLICE DETAILS

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL

END BENT 2 STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B50	2	#9	1	53'-7"	364
B51	1	#9	1	53'-4"	181
B52	2	#9	1	52'-0"	354
B53	1	#9	1	50'-9"	173
B54	2	#9	1	50'-4"	342
B55	1	#9	1	53'-0"	180
B56	1	#9	1	51'-0"	173
B57	36	#4	STR.	28'-3"	679
B58	12	#4	STR.	3'-8"	29
H10	11	#4	2	17'-11"	132
H11	11	#4	2	18'-7"	137
K10	16	#4	STR.	28'-3"	302
K11	2	#4	10	7'-9"	10
S1	134	#4	4	12'-5"	1,111
S2	134	#4	5	4'-5"	395
S4	32	#4	7	6'-6"	139
S5	47	#4	6	3'-8"	115
S7	3	#6	9	10'-9"	48
S8	3	#6	8	5'-4"	24
S9	16	#4	6	6'-8"	71
S10	20	#4	6	5'-8"	76
V10	94	#4	STR.	7'-7"	476
V11	44	#4	STR.	9'-6"	279

REINFORCING STEEL (STAGE 1) 5,790 LBS.

CLASS A CONCRETE BREAKDOWN (FOR END BENT 2 STAGE 1)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS (STAGE 1 CONST.) 39.2 C.Y.

POUR #2 BACKWALL AND UPPER PART OF WINGS (STAGE 1 CONST.) 9.1 C.Y.

TOTAL CLASS A CONCRETE 48.3 C.Y.

END BENT No. 2 STAGE 1

HP 12 X 53 STEEL PILES

NO: 9 LIN. FT. = 135

PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES EACH = 9

NOTES:

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

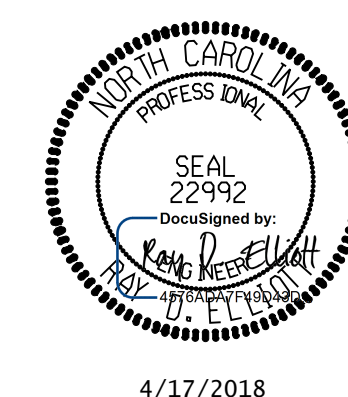
THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPES TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 4 OF 8



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2
STAGE 1 CONSTRUCTION
DETAILS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

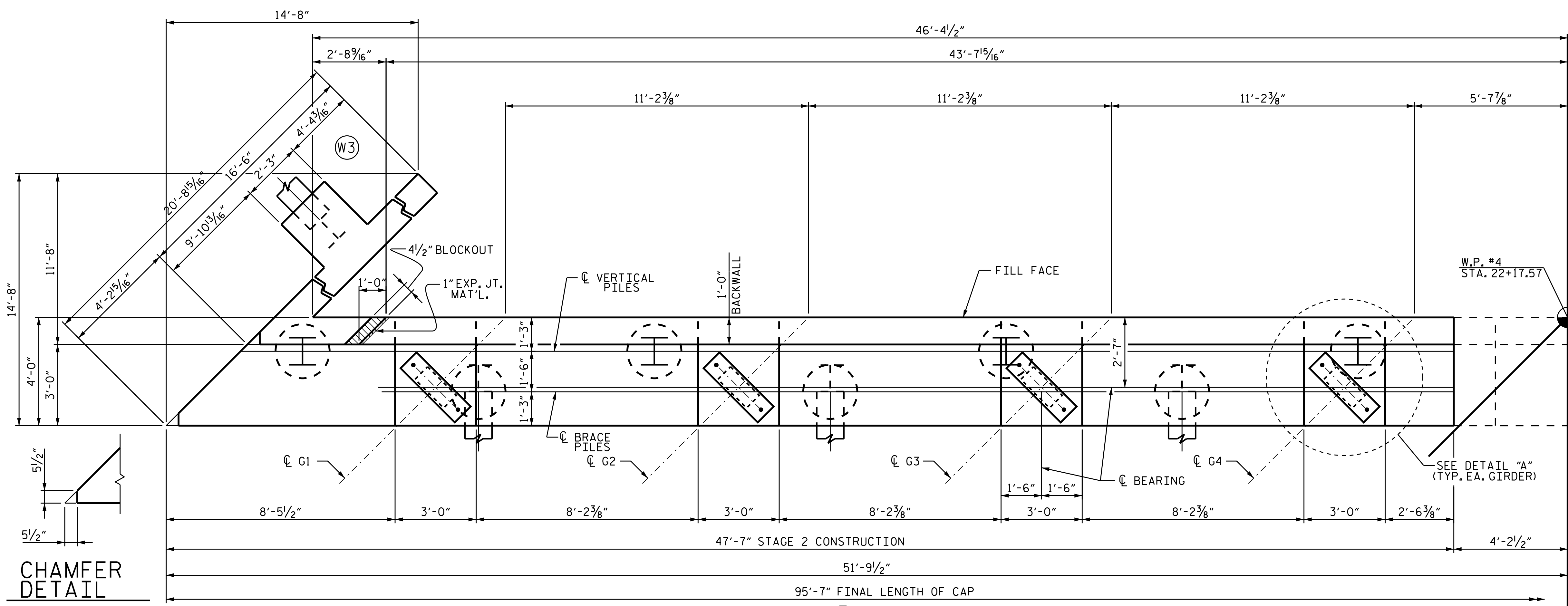
REVISIONS

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

SHEET NO.

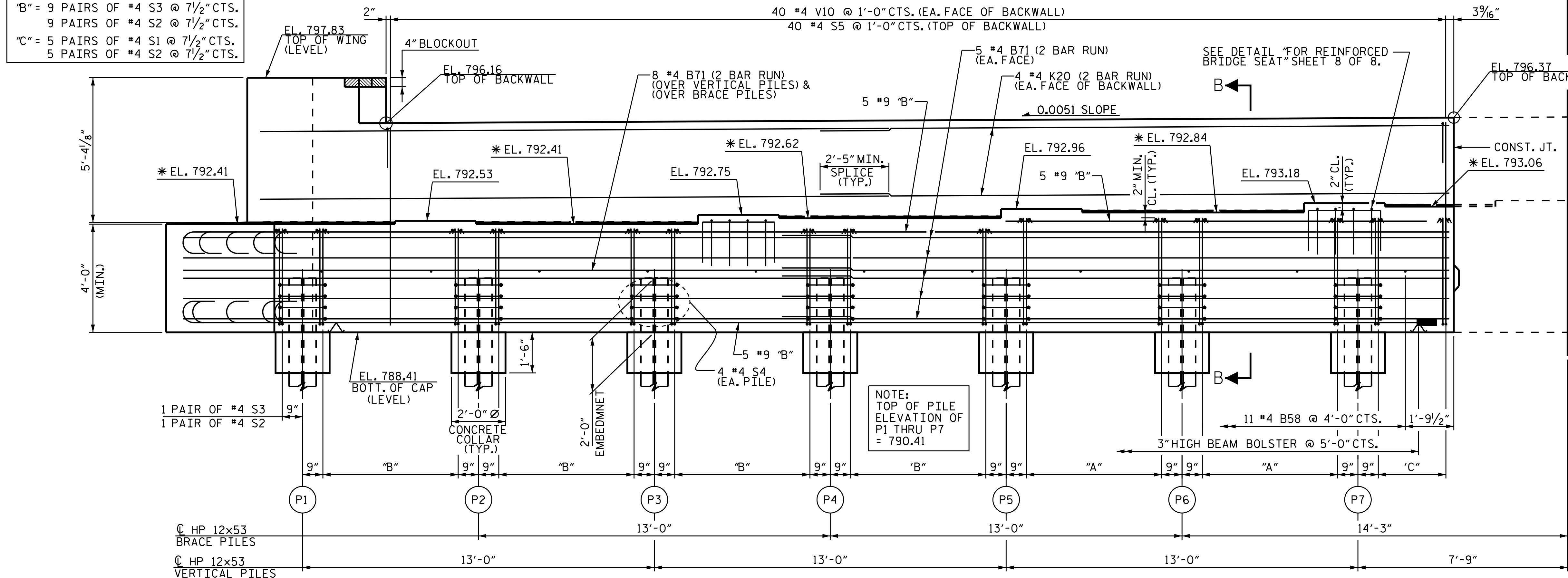
S-60
TOTAL SHEETS
69

DRAWN BY : JLA DATE : 2/17
CHECKED BY : RDE DATE : 4/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17



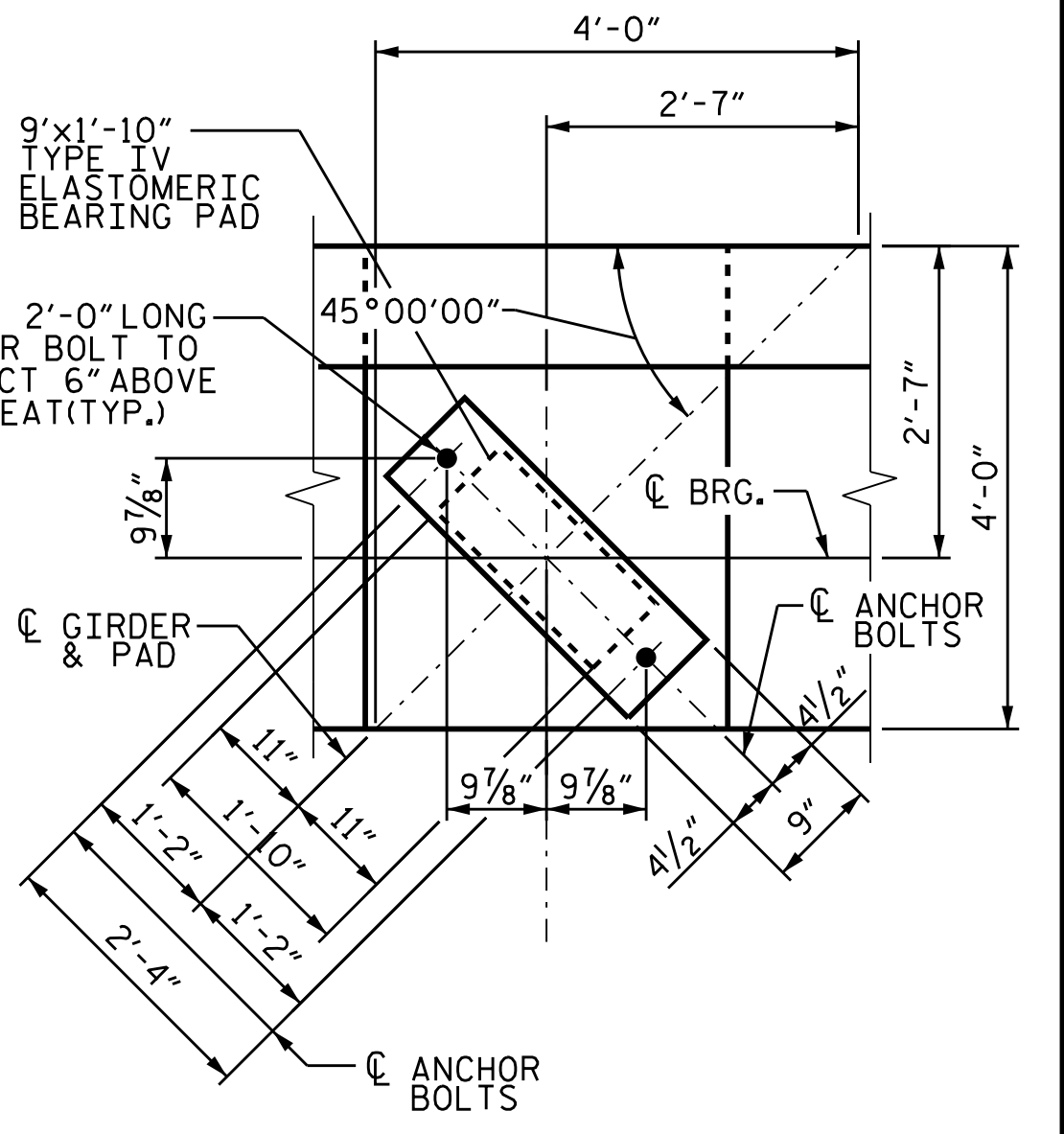
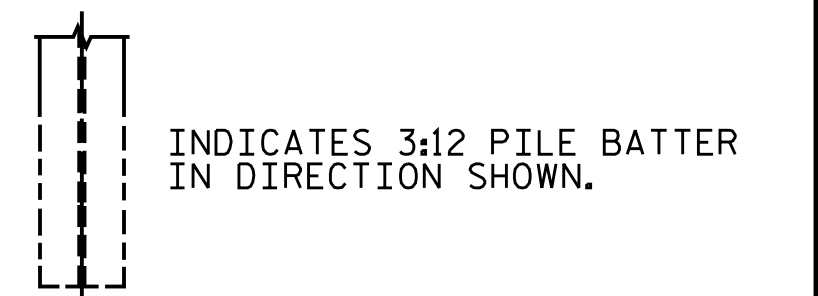
PLAN

- *A = 9 PAIRS OF #4 S1 @ 7 1/2" CTS.
9 PAIRS OF #4 S2 @ 7 1/2" CTS.
- *B = 9 PAIRS OF #4 S3 @ 7 1/2" CTS.
9 PAIRS OF #4 S2 @ 7 1/2" CTS.
- *C = 5 PAIRS OF #4 S1 @ 7 1/2" CTS.
5 PAIRS OF #4 S2 @ 7 1/2" CTS.

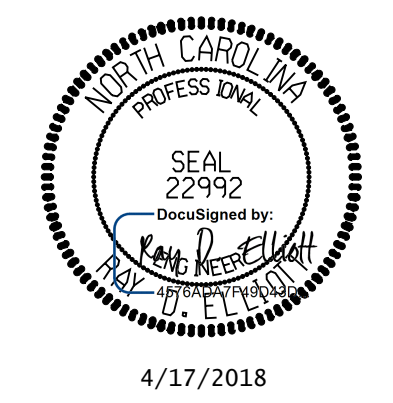


ELEVATION

NOTES:
 FOR NOTES AND PILE SPLICE DETAILS SEE SHEET 8 OF 8.
 FOR WING DETAILS, SEE SHEET 7 OF 8.
 FOR SECTION B-B, SEE SHEET 6 OF 8.



DETAIL A



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

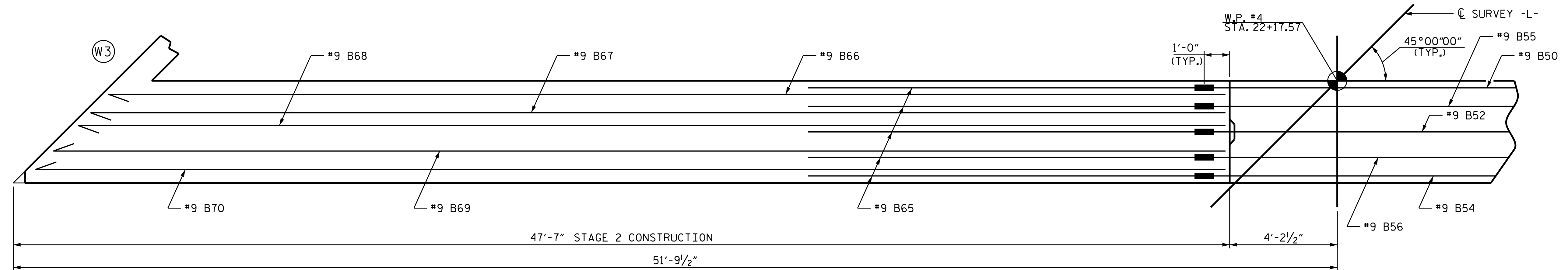
PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00-L-
 SHEET 5 OF 8

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 2
 PART-PLAN & PART ELEVATION
 STAGE 2 CONSTRUCTION

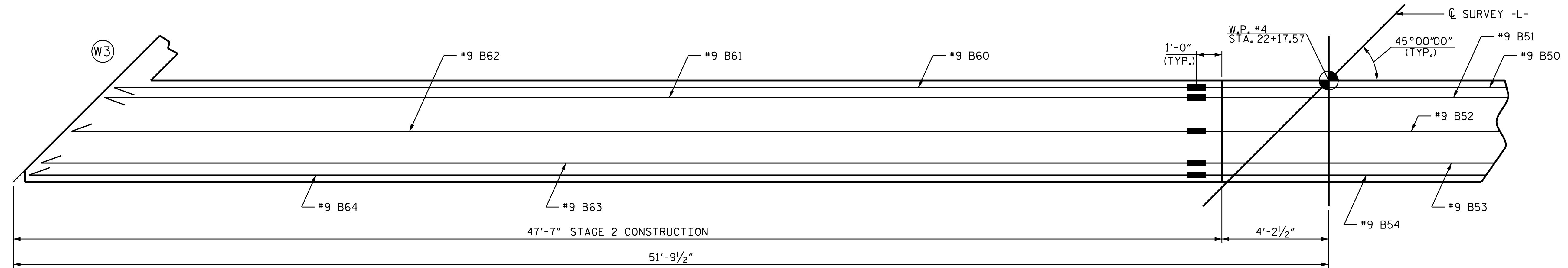
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 CHECKED BY : RDE DATE : 4/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

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 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

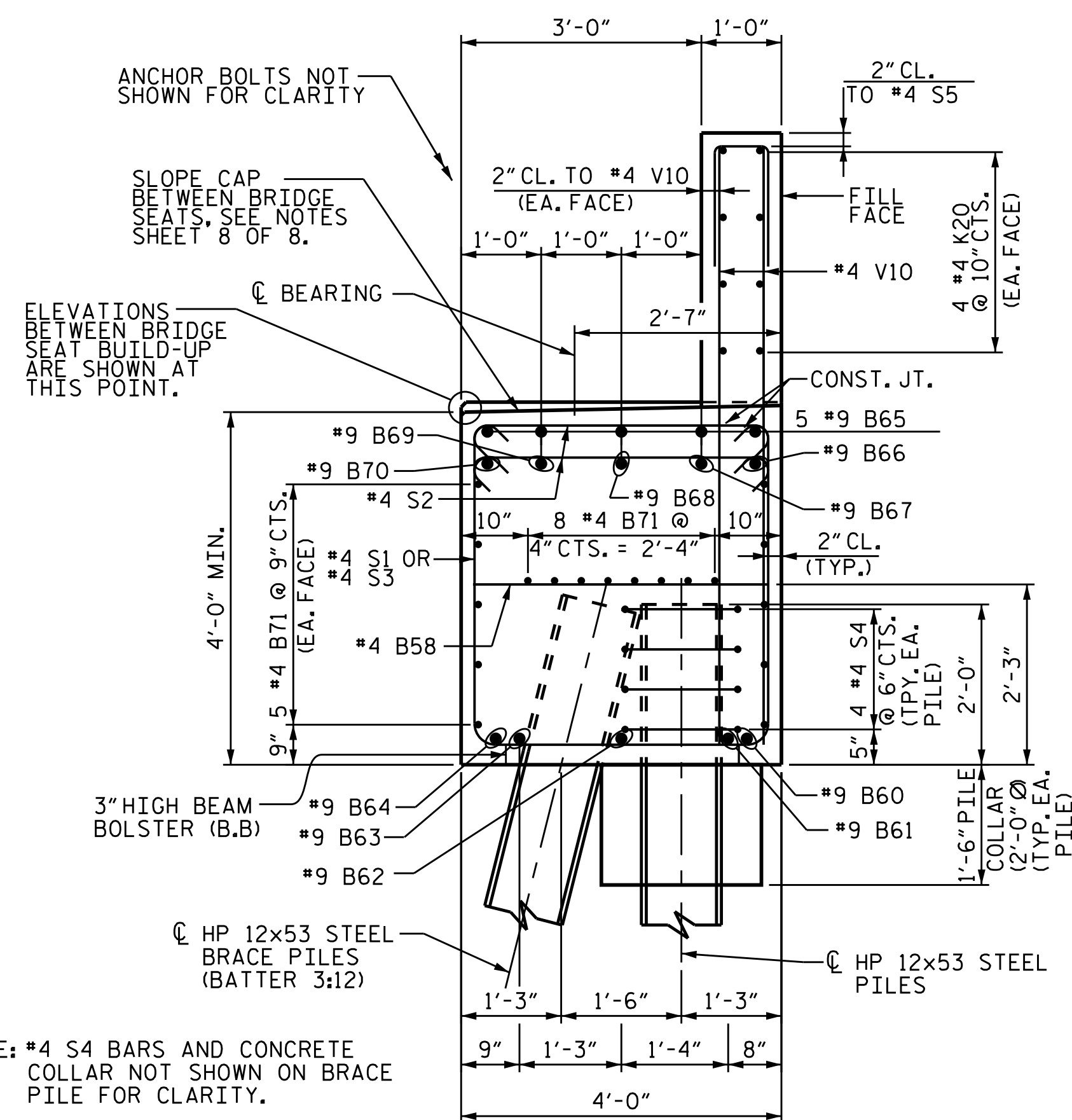
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-61
1			3			TOTAL SHEETS
2			4			69



#9 "B" BARS - TOP OF CAP STAGE 2 CONSTRUCTION



#9 "B" BARS - BOTTOM OF CAP STAGE 2 CONSTRUCTION



NOTE: #4 S4 BARS AND CONCRETE COLLAR NOT SHOWN ON BRACE PILE FOR CLARITY.

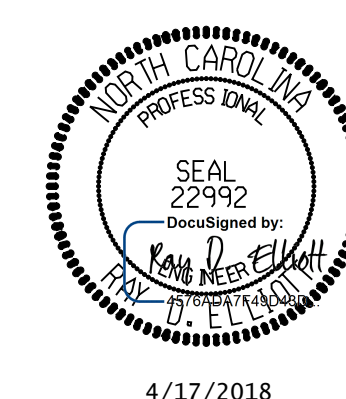
SECTION B-B

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 6 OF 8



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

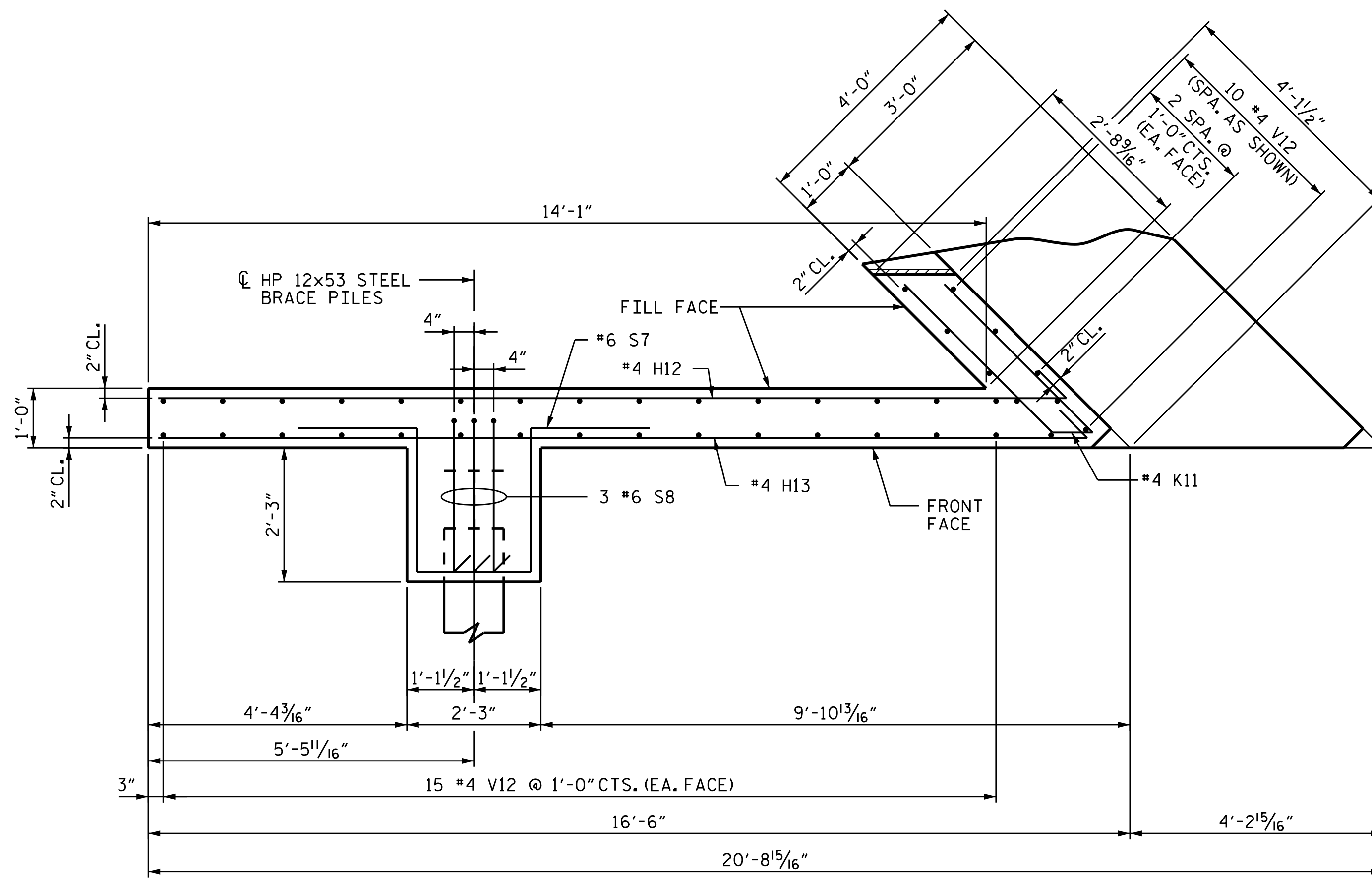
END BENT No. 2
STAGE 2 CONSTRUCTION
DETAILS

DRAWN BY : JLA DATE : 2/17
CHECKED BY : RDE DATE : 4/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

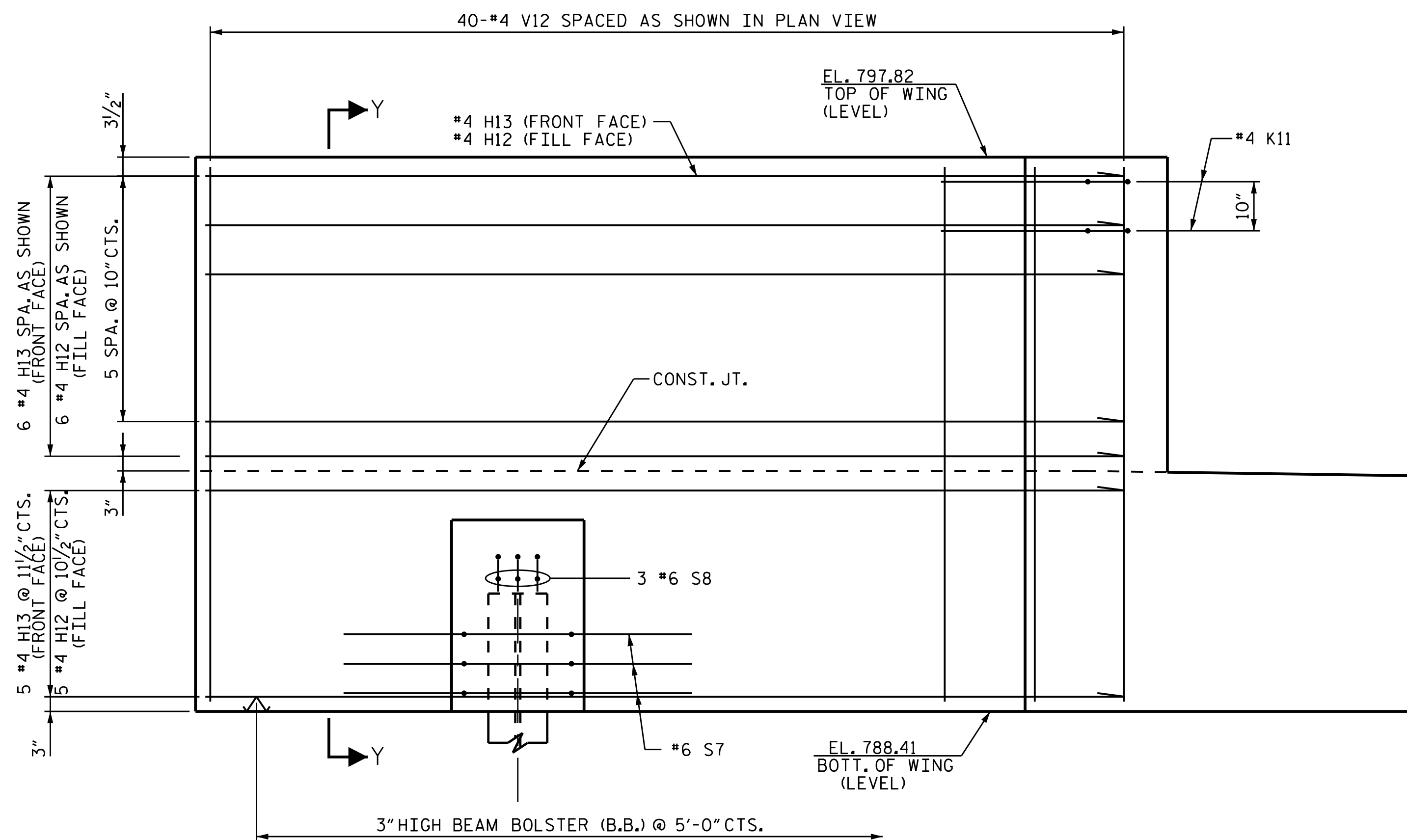
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CORP. LICENSE NO.: C-0275

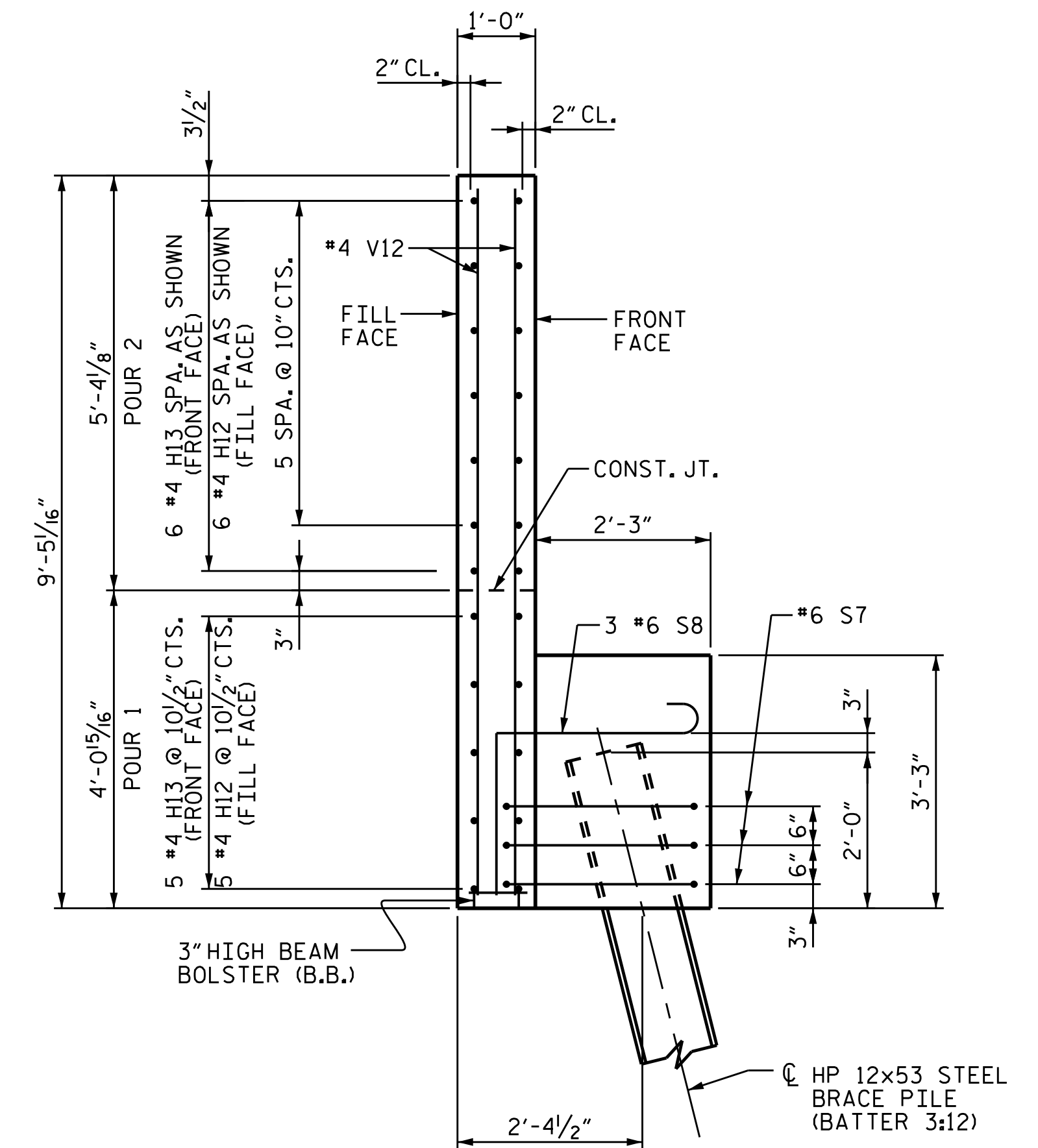
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			5-62
2			4			69



PLAN OF WING (W3)



ELEVATION OF WING (W3)



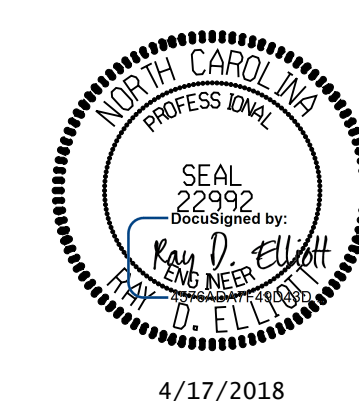
SECTION Y-Y

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 7 OF 8



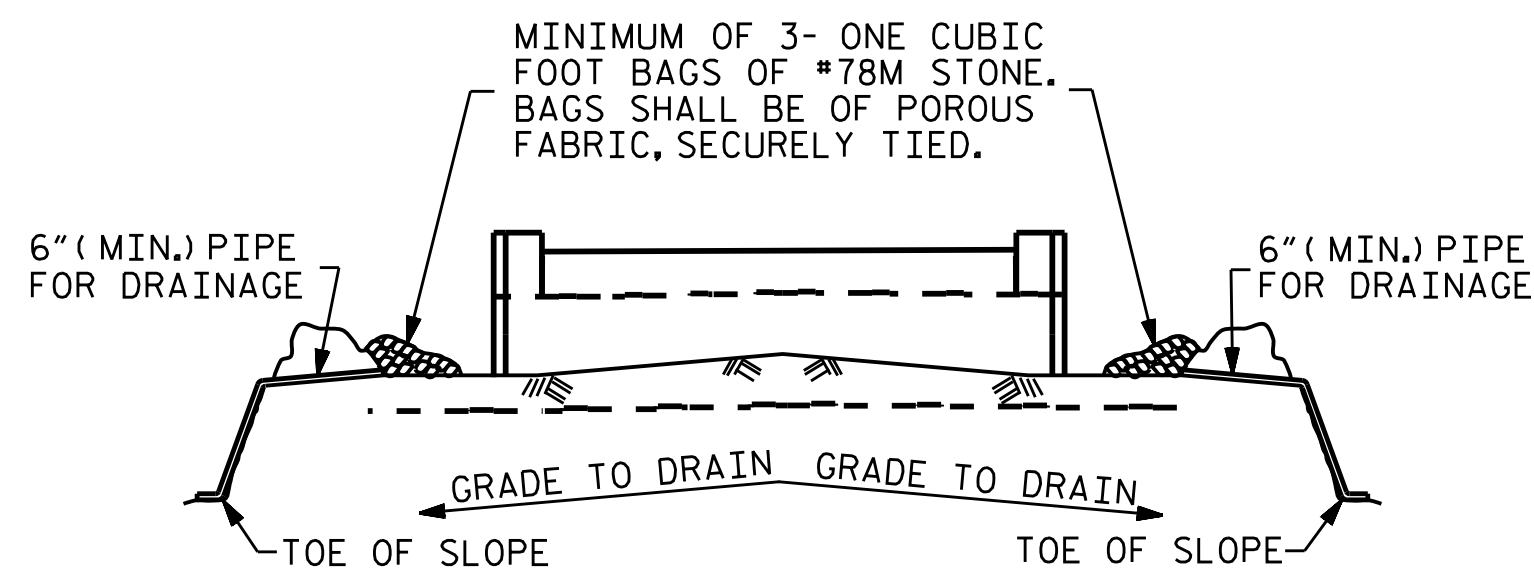
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT No. 2
STAGE 2 CONSTRUCTION
DETAILS

DRAWN BY : JLA DATE : 2/17
CHECKED BY : RDE DATE : 4/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

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TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-63
1			3			TOTAL SHEETS
2			4			69

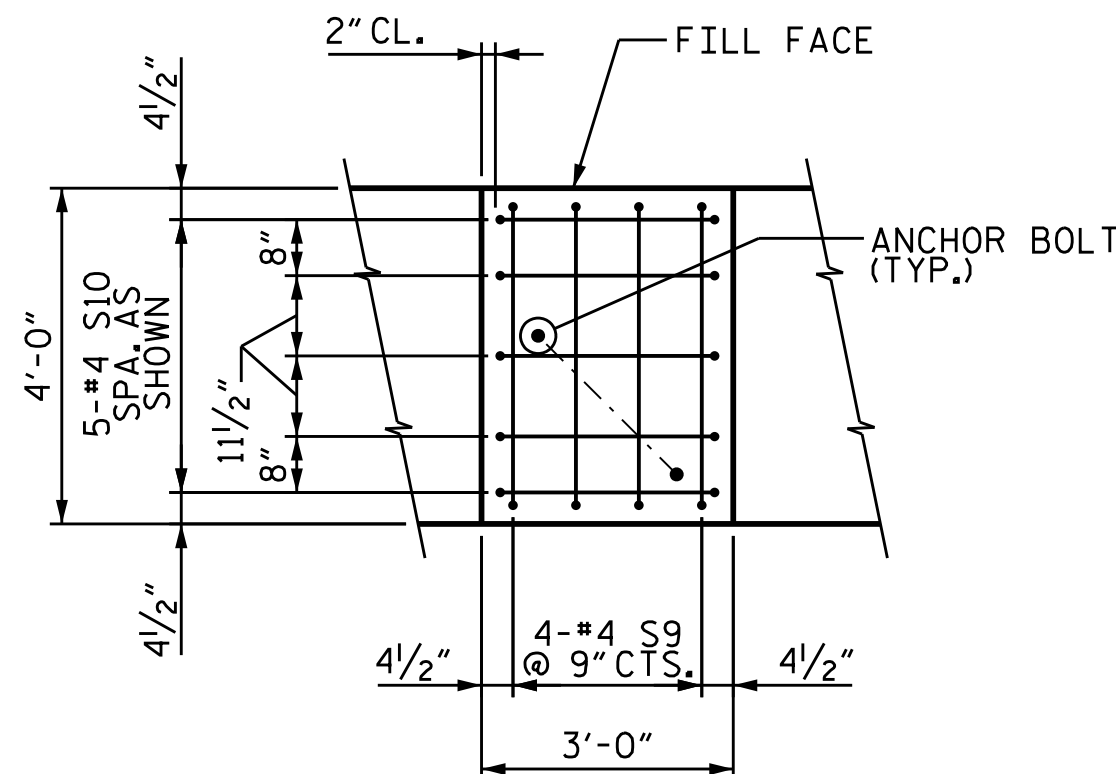


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

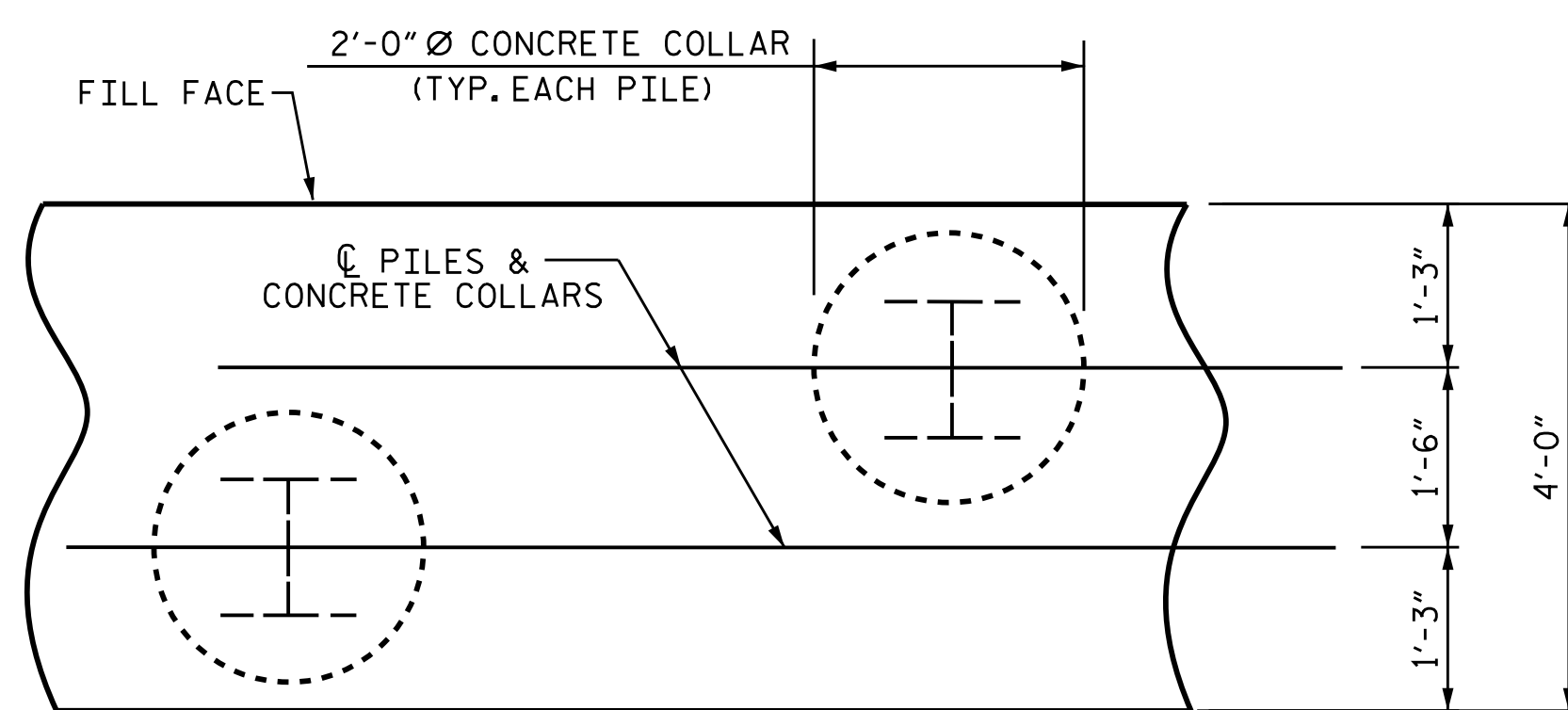
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

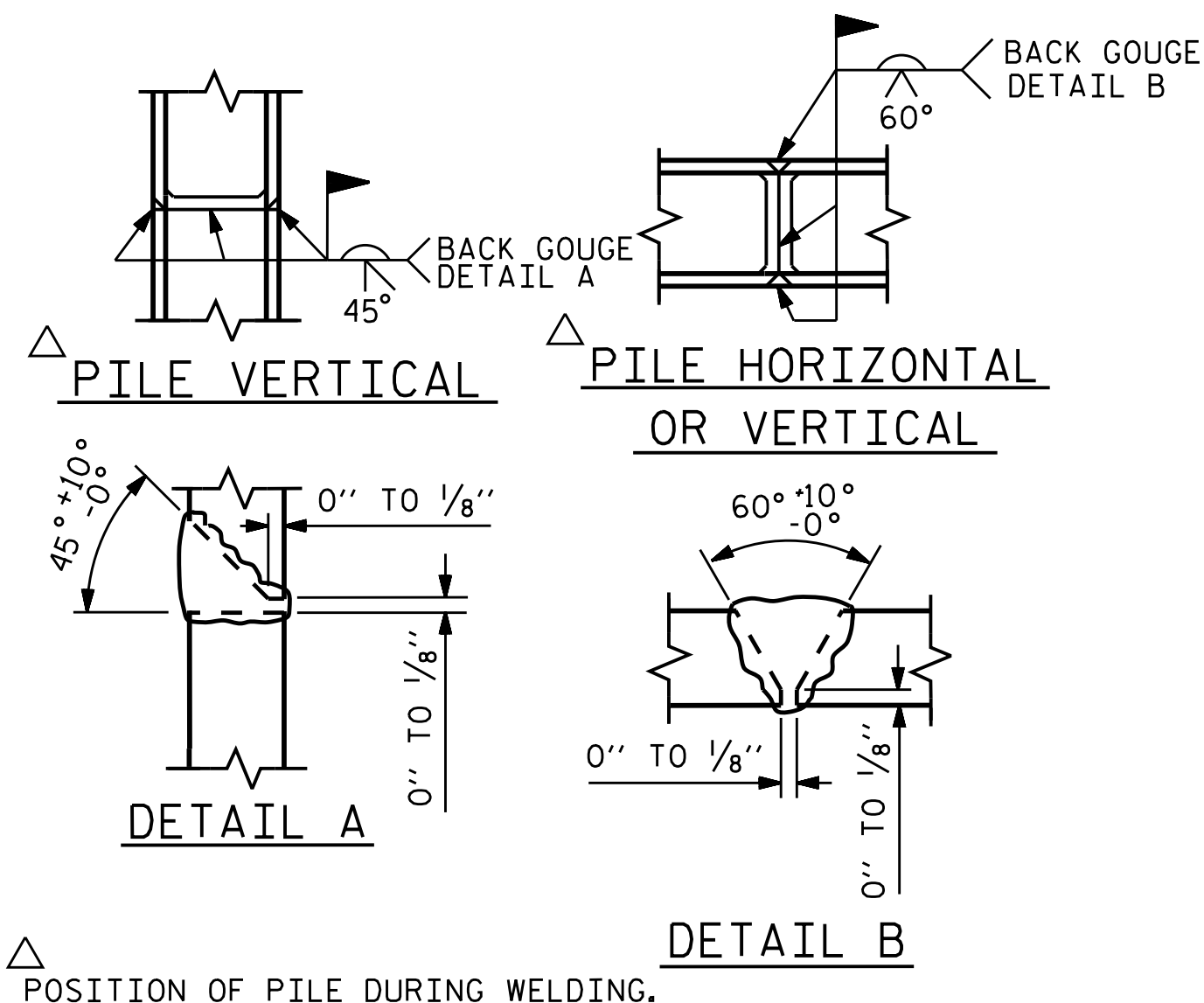


BRIDGE SEAT REINFORCING DETAIL

(TYPICAL GIRDER 2 & 4 SEATS)

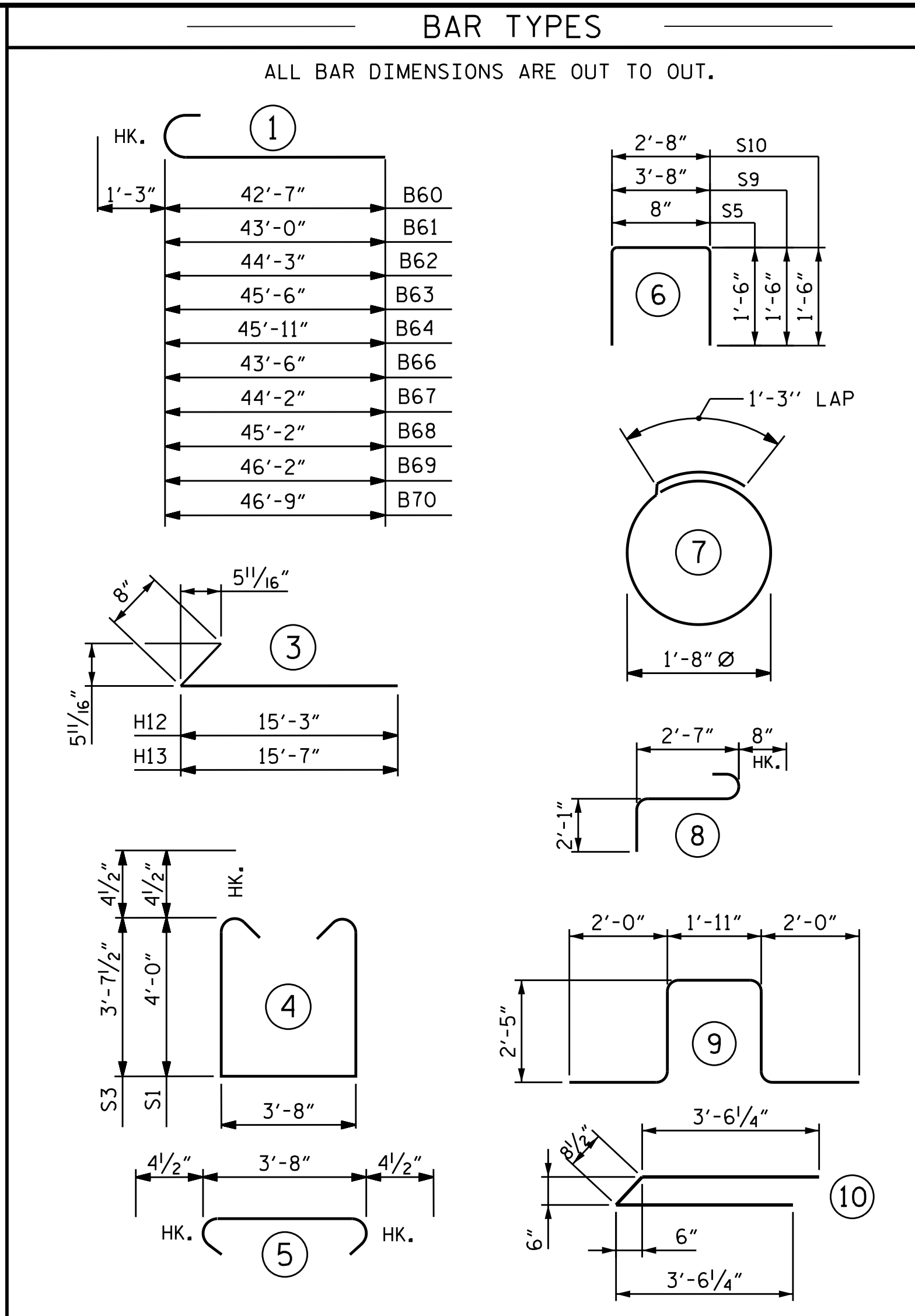


PLAN



PILE SPLICE DETAILS

POSITION OF PILE DURING WELDING.



NOTES:

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

BILL OF MATERIAL					
END BENT 2 STAGE 2					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B58	11	#4	STR.	3'-8"	27
B60	1	#9	1	43'-10"	149
B61	1	#9	1	44'-3"	150
B62	1	#9	1	45'-6"	155
B63	1	#9	1	46'-9"	159
B64	1	#9	1	47'-2"	160
B65	5	#9	STR.	15'-6"	264
B66	1	#9	1	44'-9"	152
B67	1	#9	1	45'-5"	154
B68	1	#9	1	46'-5"	158
B69	1	#9	1	47'-5"	161
B70	1	#9	1	48'-0"	163
B71	36	#4	STR.	24'-10"	597
H12	11	#4	2	15'-11"	117
H13	11	#4	2	16'-3"	119
K20	16	#4	STR.	25'-0"	267
K11	2	#4	10	7'-9"	10
S1	46	#4	4	12'-5"	382
S2	120	#4	5	4'-5"	354
S3	74	#4	4	11'-8"	577
S4	28	#4	7	6'-6"	122
S5	40	#4	6	3'-8"	98
S7	3	#6	9	10'-9"	48
S8	3	#6	8	5'-4"	24
S9	16	#4	6	6'-8"	71
S10	20	#4	6	5'-8"	76
V12	40	#4	STR.	9'-0"	241
V13	80	#4	STR.	7'-3"	387

REINFORCING STEEL (STAGE 2)		5,342 LBS.
CLASS A CONCRETE BREAKDOWN (FOR END BENT 2 STAGE 2)		
POUR #1 CAP, LOWER PART OF WINGS & COLLARS (STAGE 2 CONST.)		32.8 C.Y.
POUR #2 BACKWALL AND UPPER PART OF WINGS (STAGE 2 CONST.)		8.3 C.Y.
TOTAL CLASS A CONCRETE		41.1 C.Y.
END BENT No. 2 STAGE 2		
HP 12 X 53 STEEL PILES		
NO: 8		LIN. FT. = 160
PILE EXCAVATION IN SOIL		70 L.F.
PILE EXCAVATION NOT IN SOIL		40 L.F.
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES		
EACH = 9		

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 8 OF 8

STATE OF NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 22942
 RAJESH K. SINGH
 4/17/2018

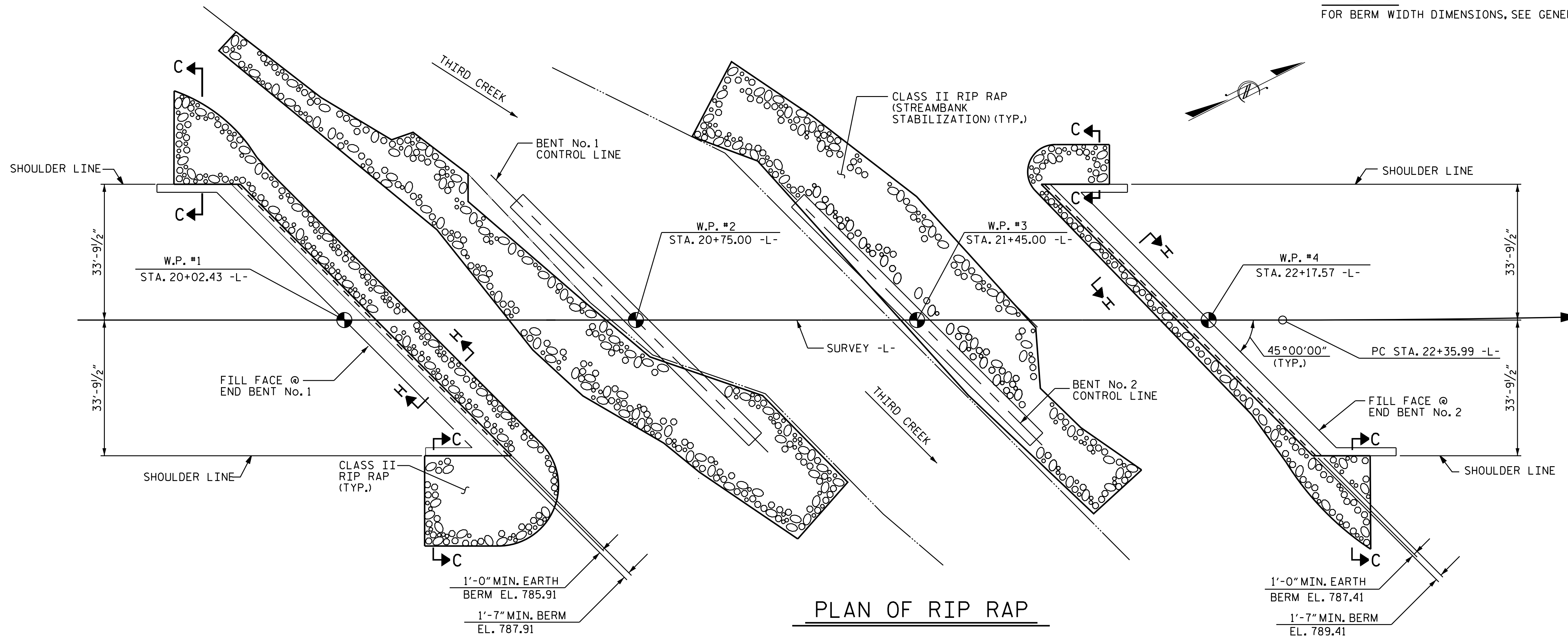
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 SHELBY, NC 28150
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 CORP. LICENSE NO.: C-0275

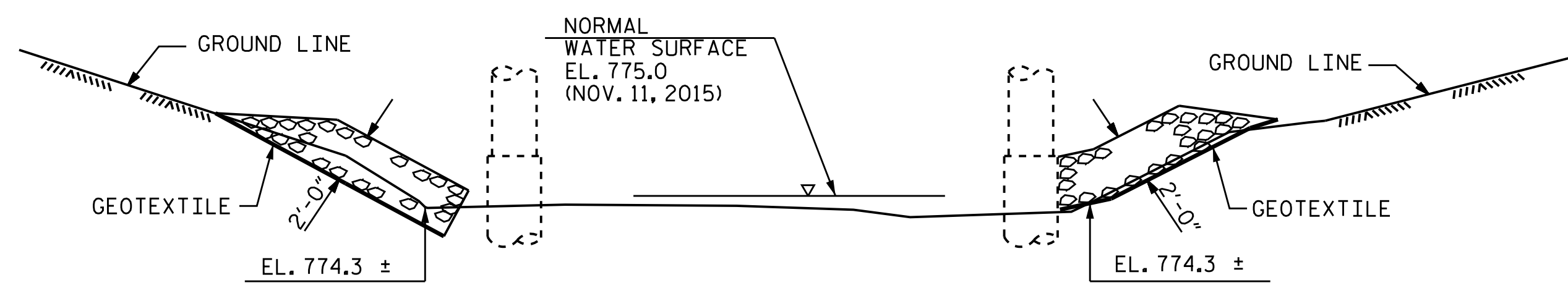
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-64
1			3			TOTAL SHEETS 69
2			4			

DRAWN BY : JLA DATE : 2/17
 CHECKED BY : RDE DATE : 4/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

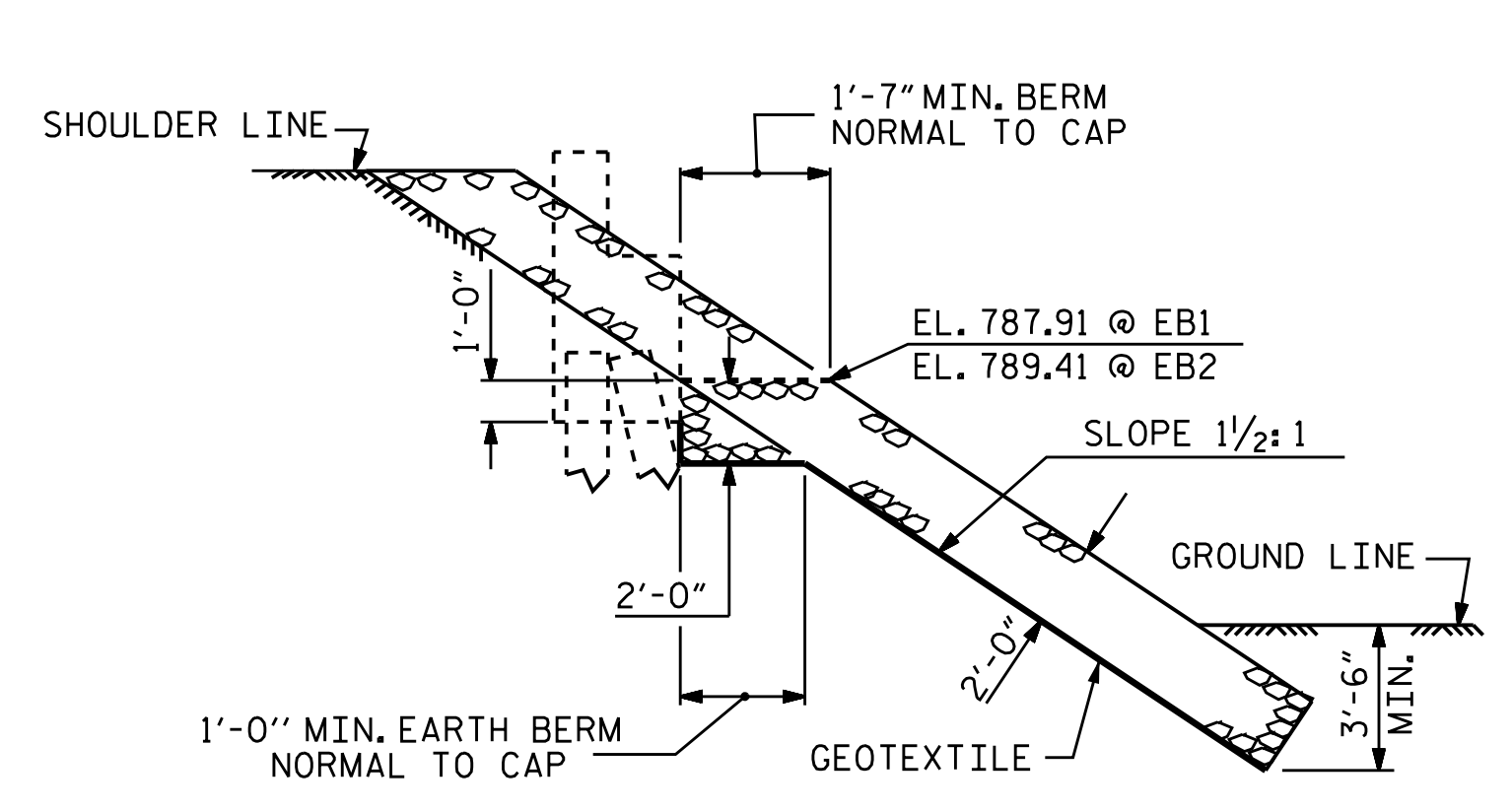


PLAN OF RIP RAP

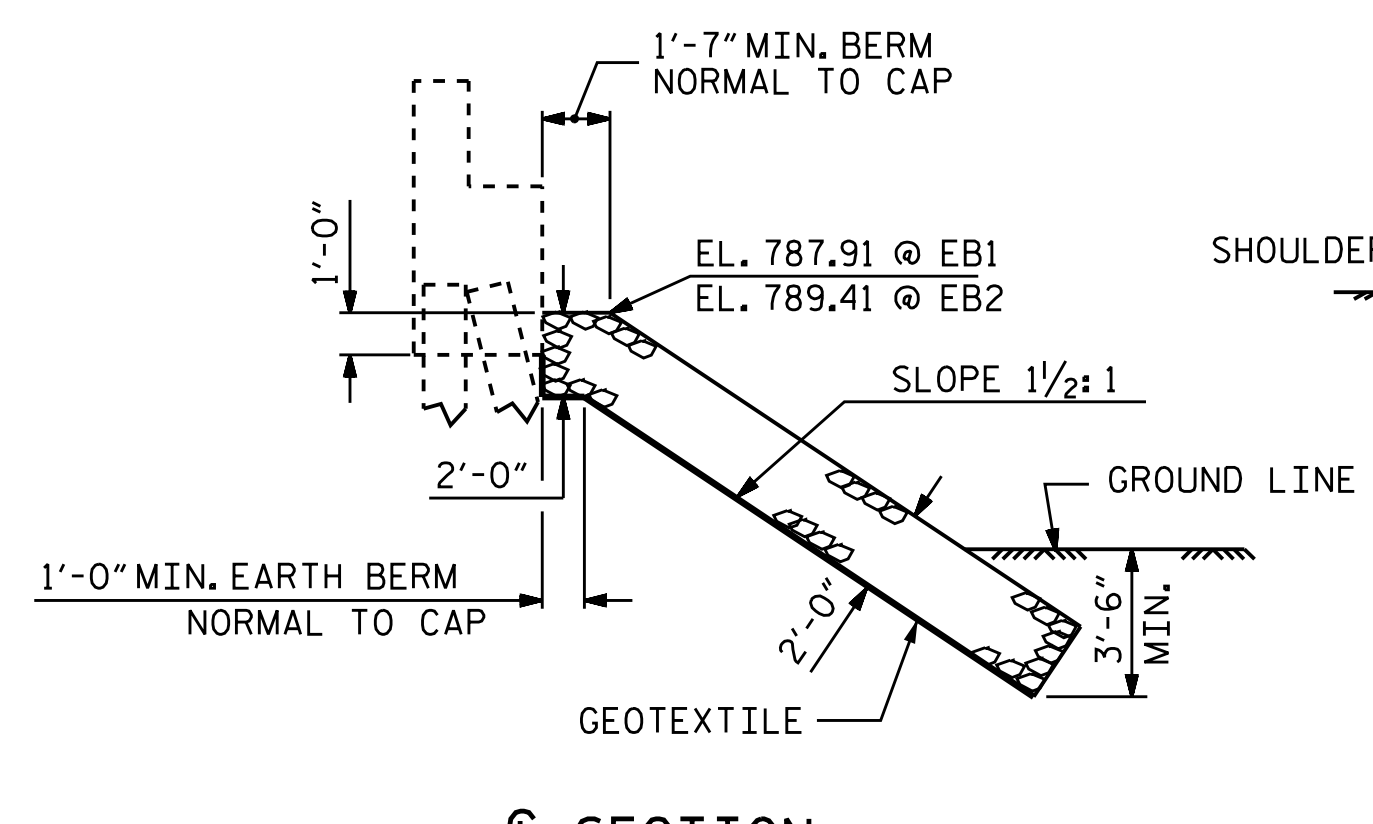


SECTION FOR STREAMBANK STABILIZATION

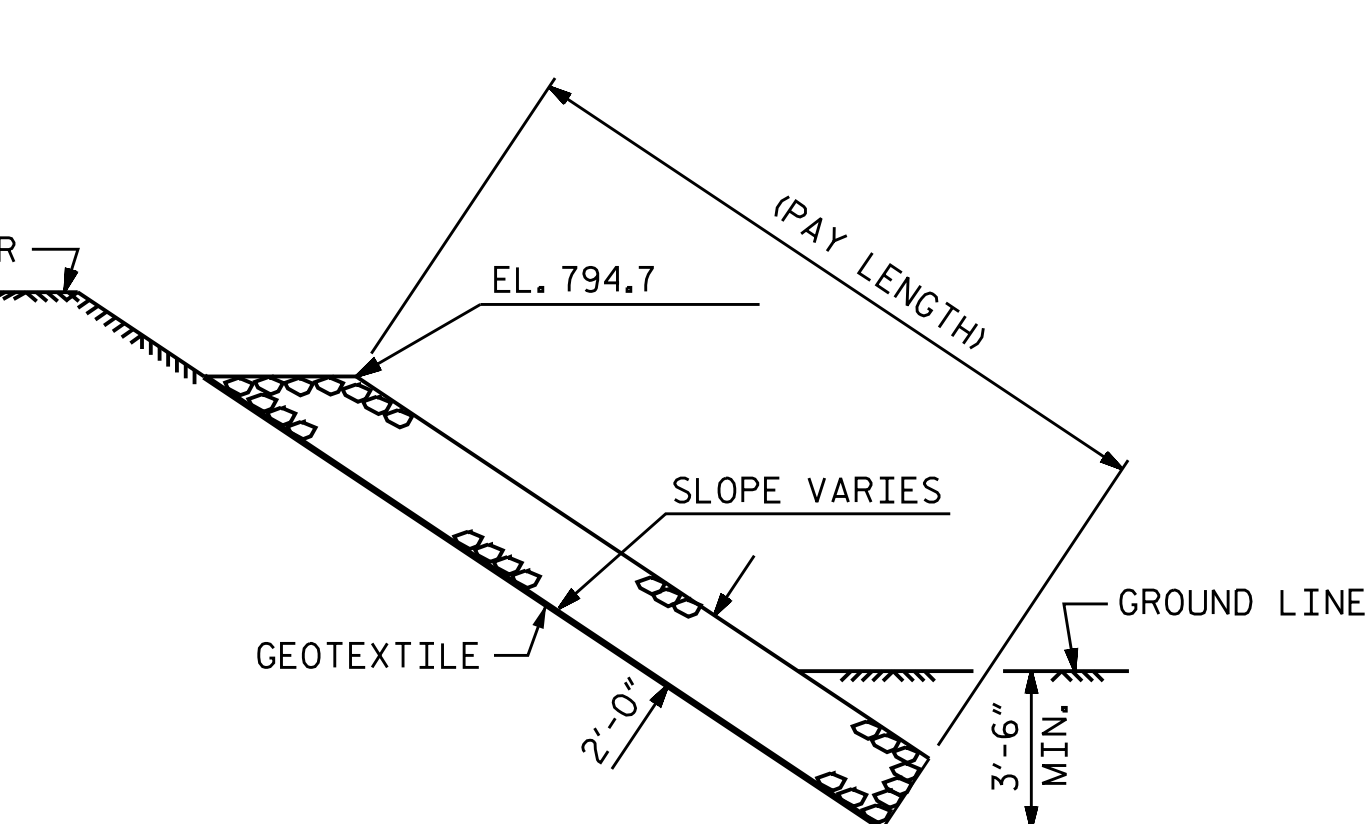
ESTIMATED QUANTITIES		
BRIDGE @ STA. 21+10.00-L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	189	210
BENT 1	315	350
BENT 2	293	325
END BENT 2	90	100



SECTION H-H

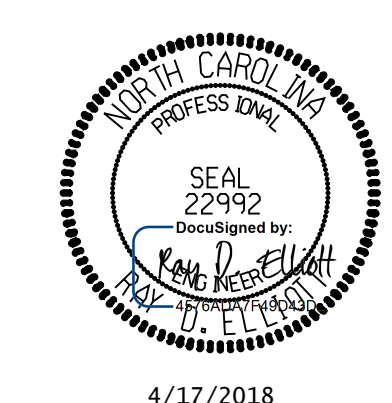


SECTION C-C
BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-4982
IREDELL COUNTY
STATION: 21+10.00-L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

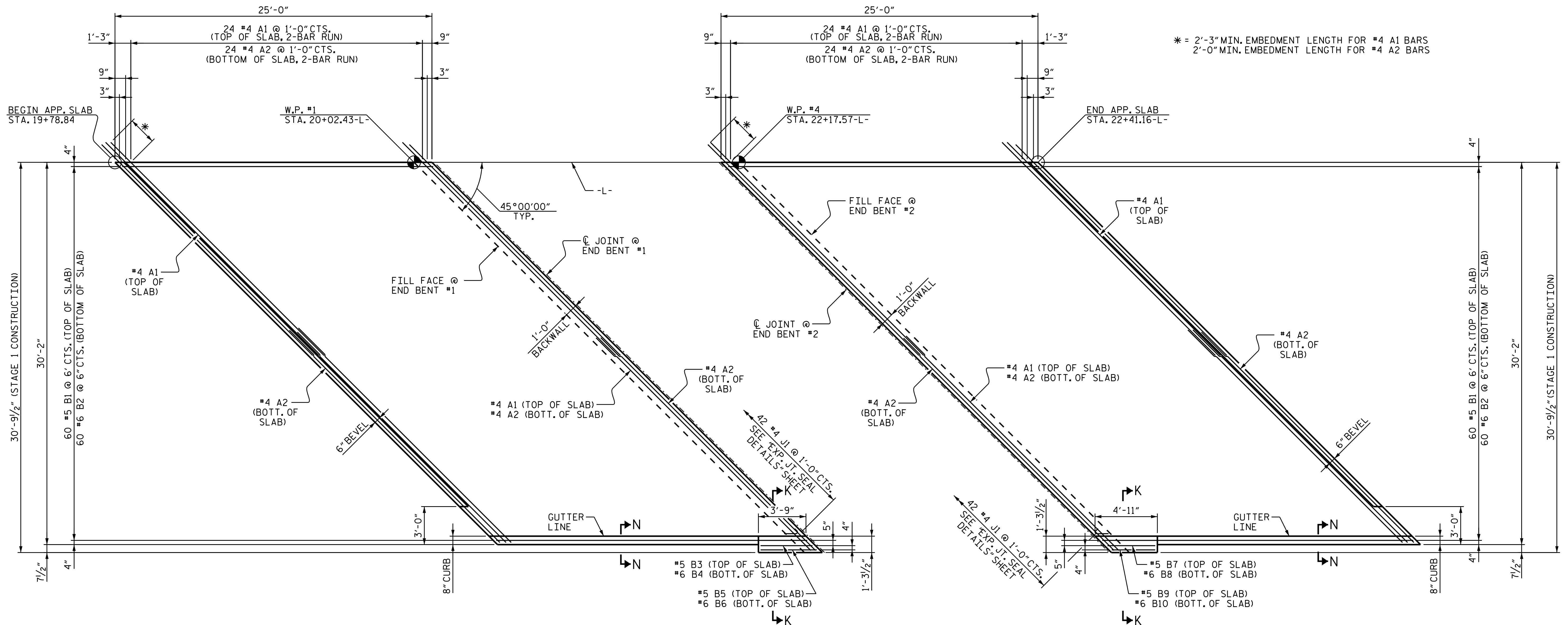
== RIP RAP DETAILS ==

DRAWN BY : NMW DATE : 2/17
CHECKED BY : RDE DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

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TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
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CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO. S-65
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 69
2			4			

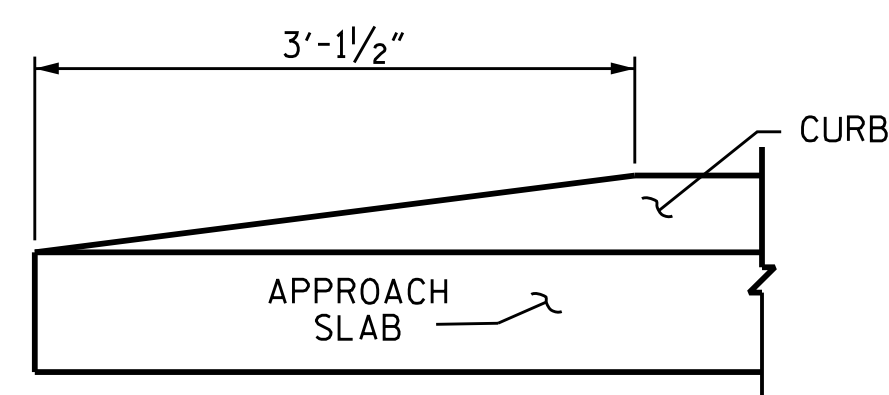


* = 2'-3" MIN. EMBEDMENT LENGTH FOR #4 A1 BARS
 2'-0" MIN. EMBEDMENT LENGTH FOR #4 A2 BARS

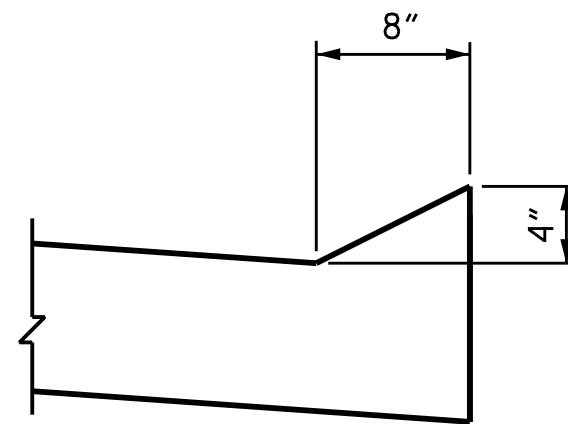
PLAN @ END BENT #1

PLAN @ END BENT #2

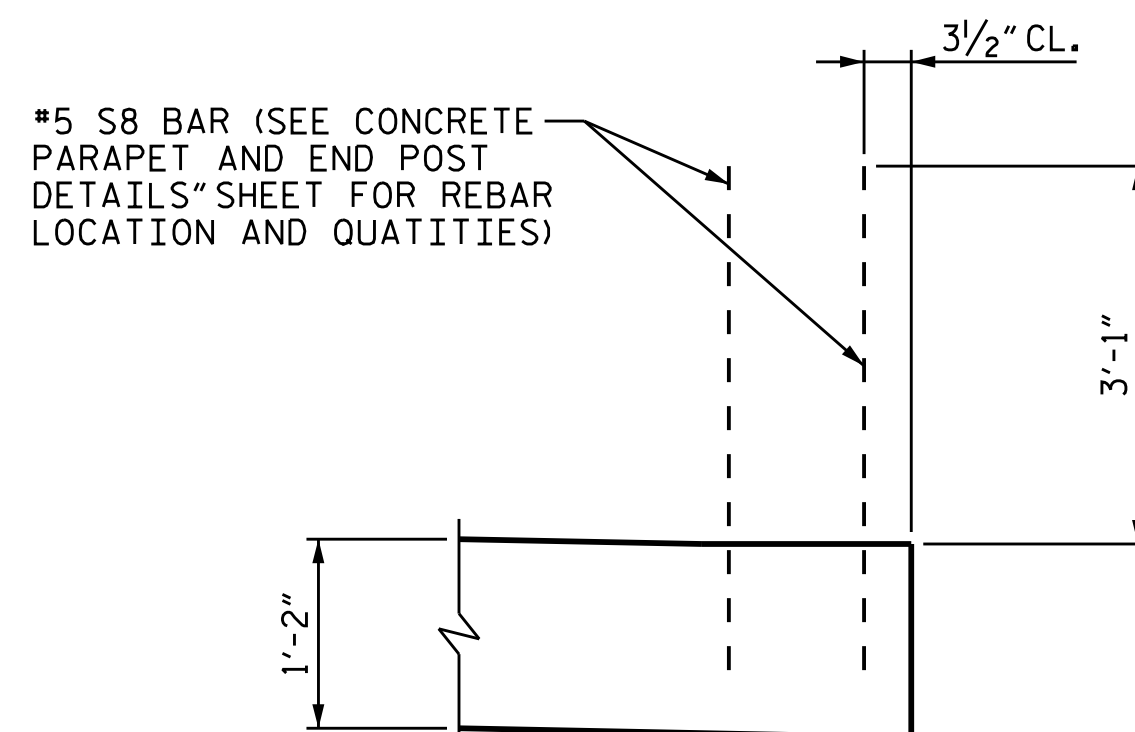
STAGE 1 CONSTRUCTION



END OF CURB WITHOUT SHOULDER BERM GUTTER



SECTION N-N



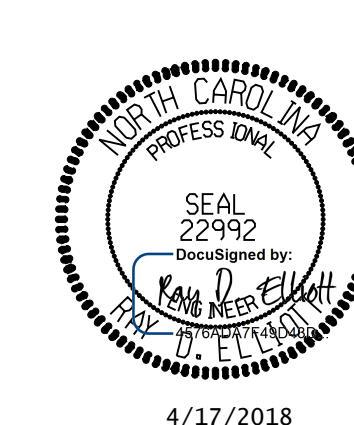
SECTION K-K

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

SHEET 1 OF 3



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

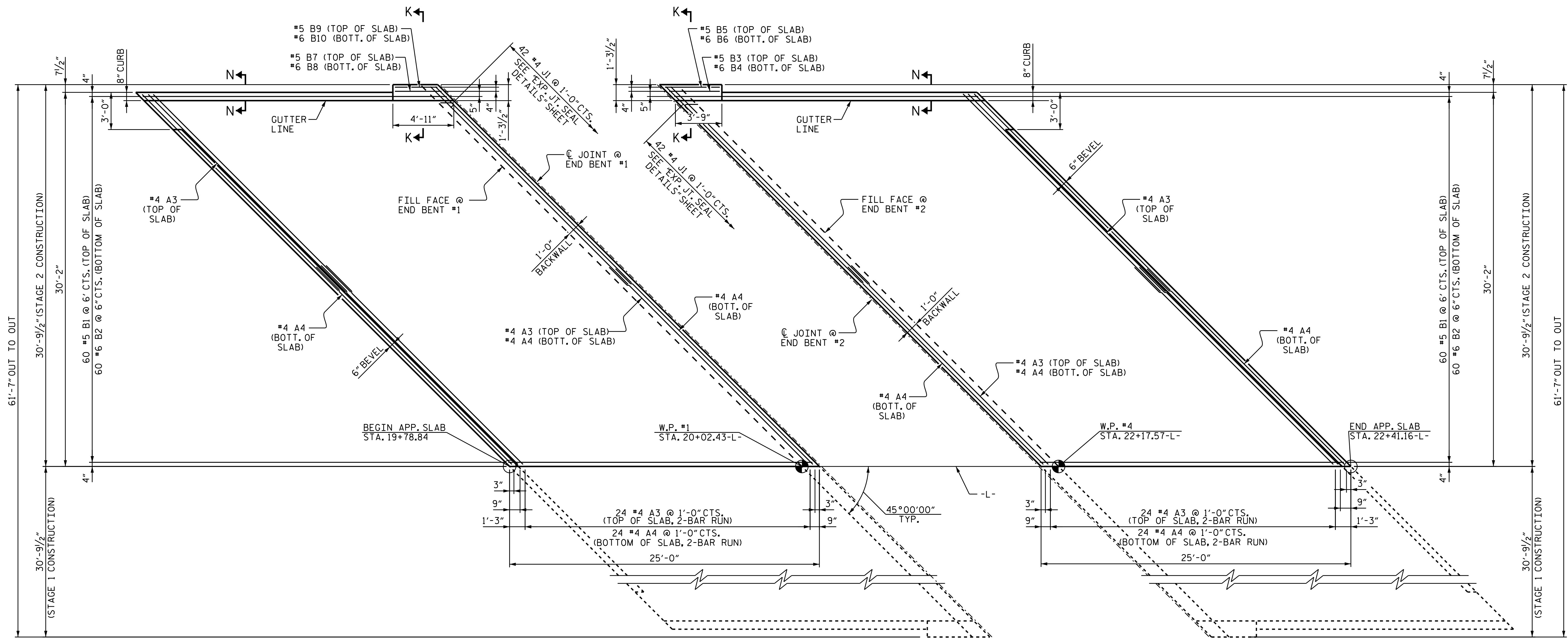
ASSEMBLED BY : JLA	DATE : 2/17
CHECKED BY : RDE	DATE : 2/17
DESIGN ENGINEER OF RECORD : RDE	DATE : 4/17
DRAWN BY : EEM 3/95	REV. 10/1/11 MAA/GM
CHECKED BY : VAP 3/95	REV. 12/21/11 MAA/GM
	REV. 6/13 MAA/GM

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 804-C N. LAFAYETTE ST
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 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			69
2			4			69

STD. NO. BAS2



PLAN @ END BENT #1

PLAN @ END BENT #2

STAGE 2 CONSTRUCTION

PROJECT NO. B-4982

IREDELL COUNTY

STATION: 21+10.00-L-

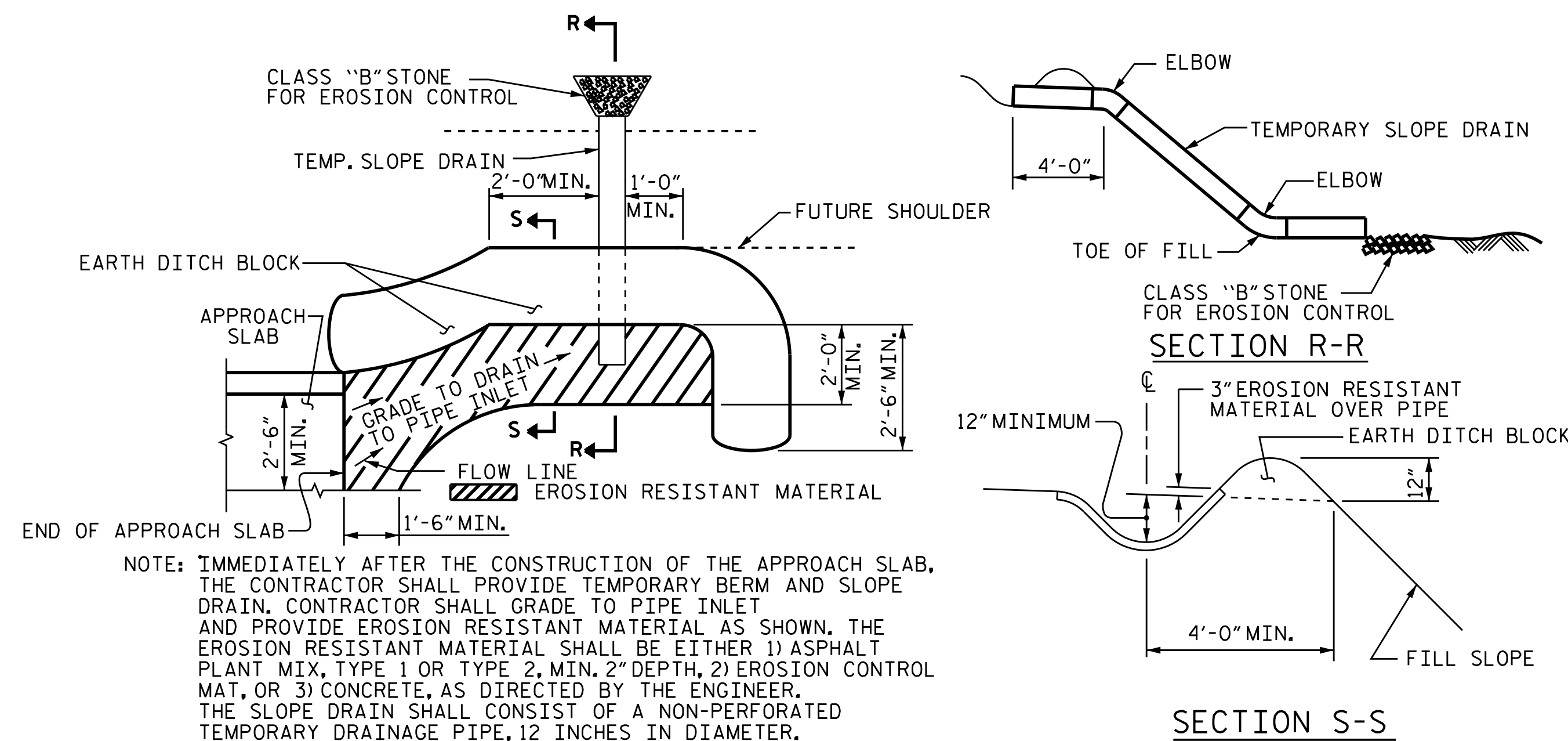
SHEET 2 OF 3

NOTE:
FOR SECTION K-K AND SECTION N-N, SEE "BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT" SHEET 1 OF 3.

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 CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT					
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-67
					TOTAL SHEETS 69

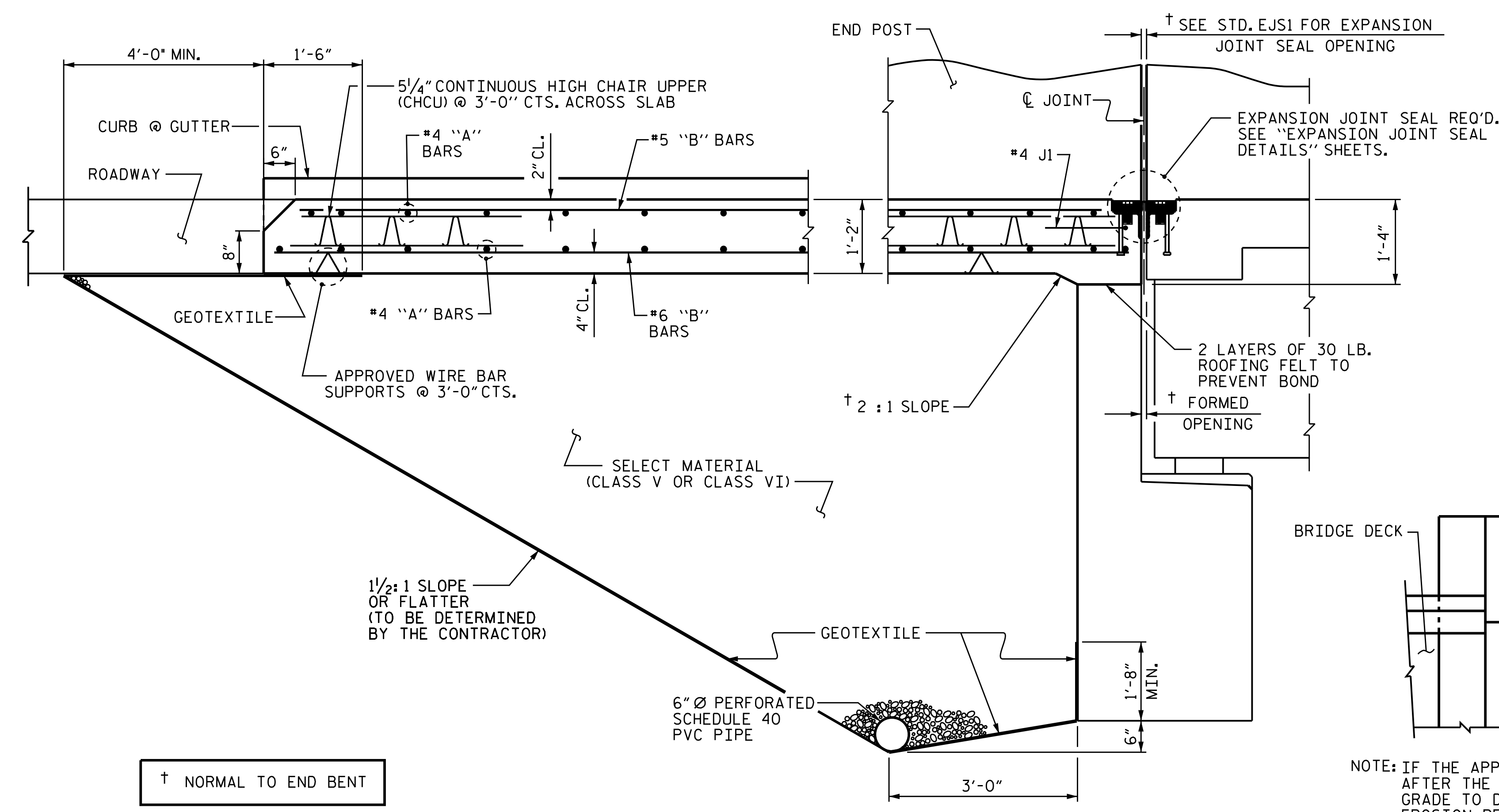
ASSEMBLED BY :	JLA	DATE :	2/17
CHECKED BY :	RDE	DATE :	2/17
DESIGN ENGINEER OF RECORD :	RDE	DATE :	4/17
DRAWN BY :	EEM	3/95	REV. 10/1/11
CHECKED BY :	VAP	3/95	REV. 12/21/11
			REV. 6/13
			MAA/GM
			MAA/GM
			MAA/GM



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

PLAN VIEW

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



SECTION THRU SLAB
(TYPE I - STANDARD APPROACH FILL)

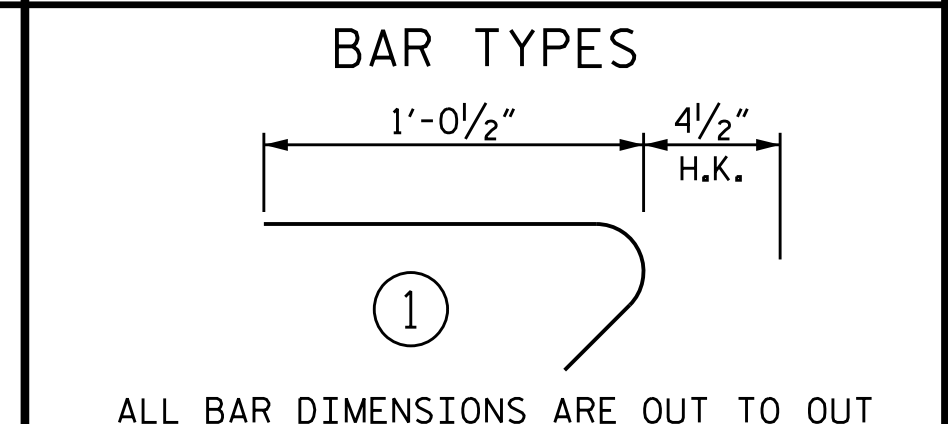
ASSEMBLED BY : JLA DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17
 DRAWN BY : EEM 3/95 REV. 12/21/11 MAA/GM
 CHECKED BY : VAP 3/95 REV. 6/13 MAA/GM
 REV. 12/17 MAA/THC

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 EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
 THE COST OF THE END POST EXTENSION ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT PRICE BID FOR THE "CONCRETE PARAPET".
 THE END POST EXTENSION 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.
 CONCRETE AND REINFORCING STEEL QUANTITIES FOR END POST EXTENSIONS ON APPROACH SLAB ARE TO BE INCLUDED IN THE BILL OF MATERIALS FOR PARAPET AND END POST DETAILS SHEET.

BILL OF MATERIAL FOR STAGE 1 CONSTRUCTION											
APPROACH SLAB AT EB #1						APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	23'-10"	796	*A1	50	#4	STR	23'-10"	796
A2	52	#4	STR	23'-7"	819	A2	52	#4	STR	23'-7"	819
*B1	60	#5	STR	23'-6"	1,471	*B1	60	#5	STR	23'-6"	1,471
B2	60	#6	STR	24'-6"	2,208	B2	60	#6	STR	24'-6"	2,208
*B3	1	#5	STR	4'-1"	4	*B7	1	#5	STR	3'-9"	4
B4	1	#6	STR	4'-1"	6	B8	1	#6	STR	3'-9"	6
*B5	1	#5	STR	4'-5"	5	*B9	1	#5	STR	3'-5"	4
B6	1	#6	STR	4'-5"	7	B10	1	#6	STR	3'-5"	5
*J1	42	#4	1	1'-5"	40	*J1	42	#4	STR	1'-5"	40
REINFORCING STEEL LBS. 3,040						REINFORCING STEEL LBS. 3,038					
* EPOXY COATED REINFORCING STEEL LBS. 2,316						* EPOXY COATED REINFORCING STEEL LBS. 2,315					
CLASS AA CONCRETE C. Y. 33.0						CLASS AA CONCRETE C. Y. 33.0					

BILL OF MATERIAL FOR STAGE 2 CONSTRUCTION											
APPROACH SLAB AT EB #1						APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A3	50	#4	STR	22'-7"	754	*A3	50	#4	STR	22'-7"	754
A4	52	#4	STR	22'-5"	779	A4	52	#4	STR	22'-5"	779
*B1	60	#5	STR	23'-6"	1,471	*B1	60	#5	STR	23'-6"	1,471
B2	60	#6	STR	24'-6"	2,208	B2	60	#6	STR	24'-6"	2,208
*B7	1	#5	STR	3'-9"	4	*B3	1	#5	STR	4'-1"	4
B8	1	#6	STR	3'-9"	6	B4	1	#6	STR	4'-1"	6
*B9	1	#5	STR	3'-5"	4	*B5	1	#5	STR	4'-5"	5
B10	1	#6	STR	3'-5"	5	B6	1	#6	STR	4'-5"	7
*J1	42	#4	STR	1'-5"	40	*J1	42	#4	1	1'-5"	40
REINFORCING STEEL LBS. 2,998						REINFORCING STEEL LBS. 3,000					
* EPOXY COATED REINFORCING STEEL LBS. 2,273						* EPOXY COATED REINFORCING STEEL LBS. 2,274					
CLASS AA CONCRETE C. Y. 33.0						CLASS AA CONCRETE C. Y. 33.0					



ALL BAR DIMENSIONS ARE OUT TO OUT

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

PROJECT NO. B-4982
 IREDELL COUNTY
 STATION: 21+10.00-L-
 SHEET 3 OF 3

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

4/17/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
 804-C N. LAFAYETTE ST
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-68	
1			3			TOTAL SHEETS 69	
2			4				

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

TEMPORARY DRAINAGE DETAIL

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 3/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

HANDRAILS AND POSTS:

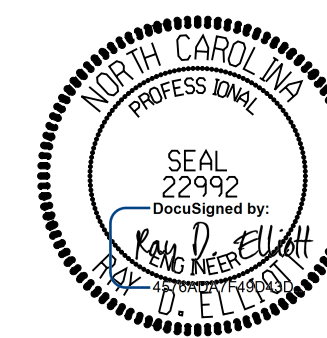
METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

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

SPECIAL NOTES:

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

PROJECT NO. B-4982
IREDELL COUNTY
 STATION: 21+10.00-L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD NOTES

DRAWN BY : NMW DATE : 2/17
 CHECKED BY : RDE DATE : 2/17
 DESIGN ENGINEER OF RECORD : RDE DATE : 4/17

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						REVISIONS	SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
1			3			69	
2			4			69	