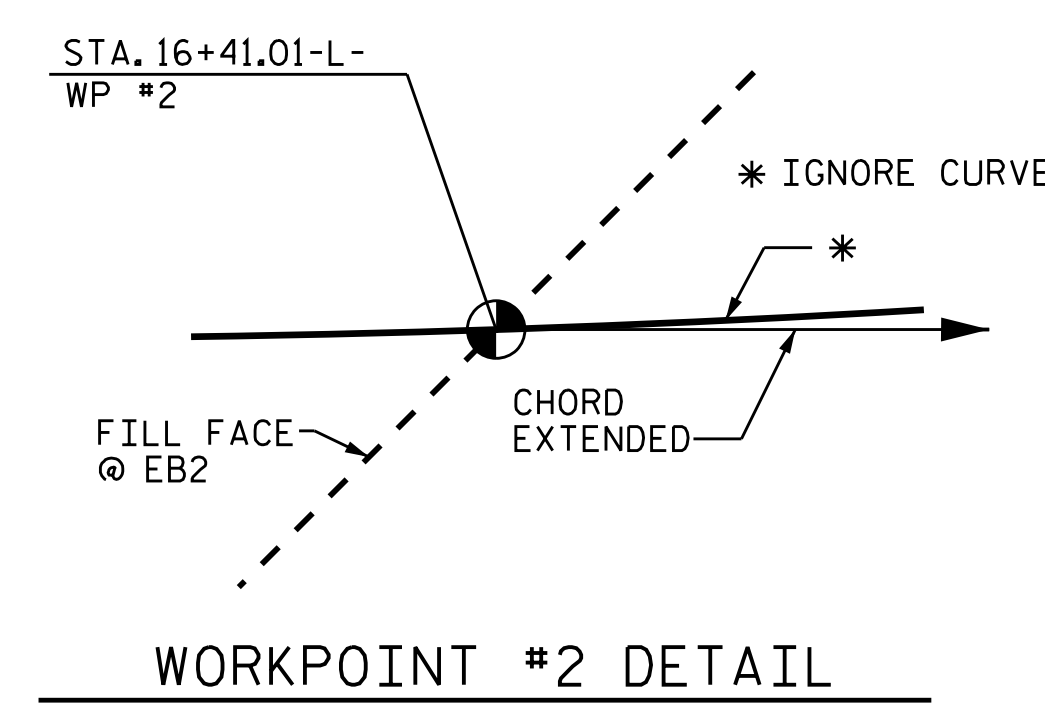
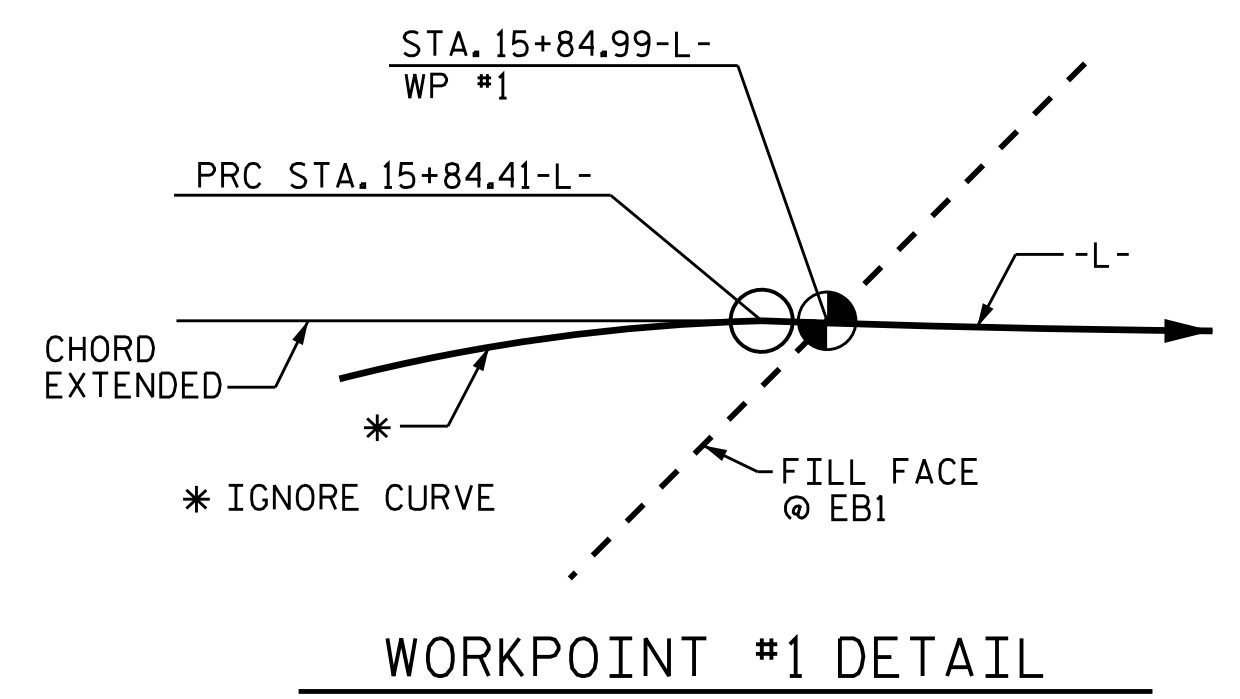
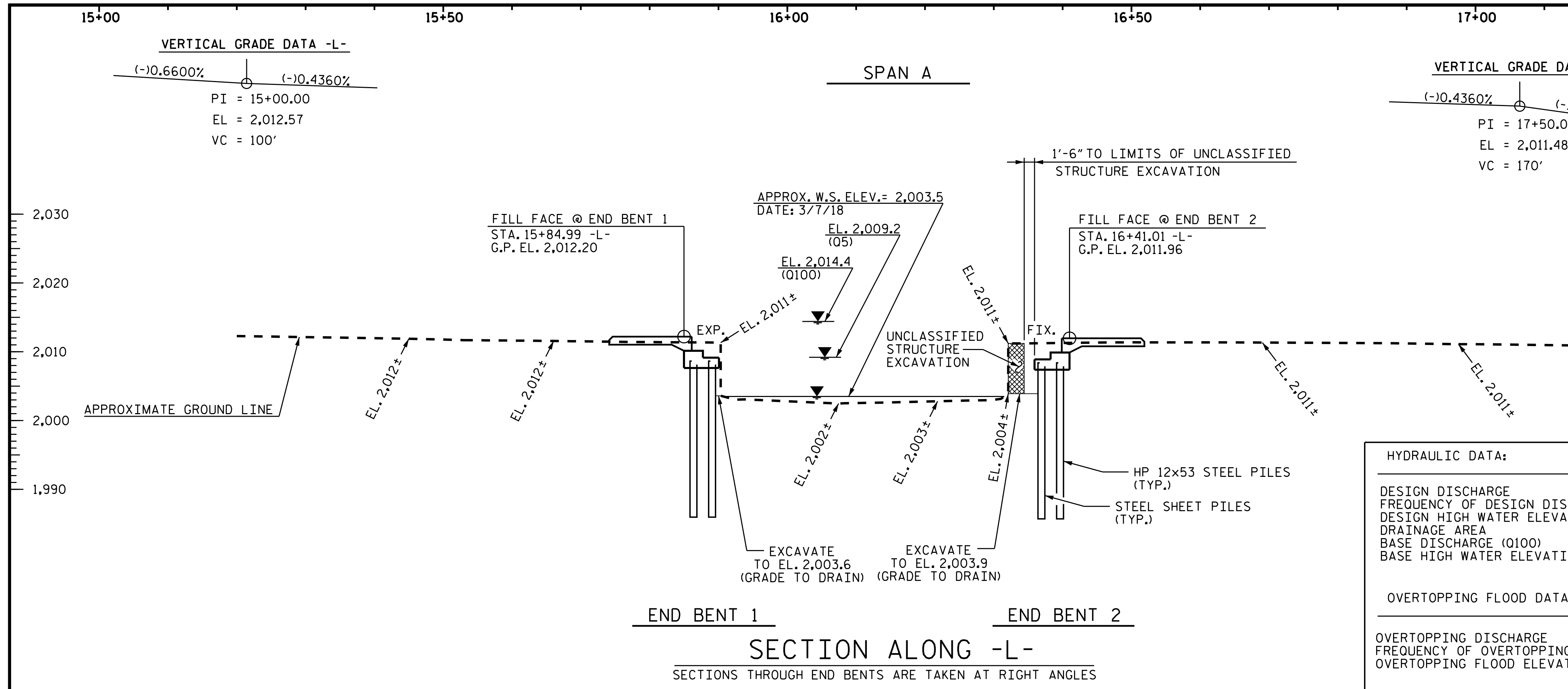


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**LOW CHORD ELEVATIONS**

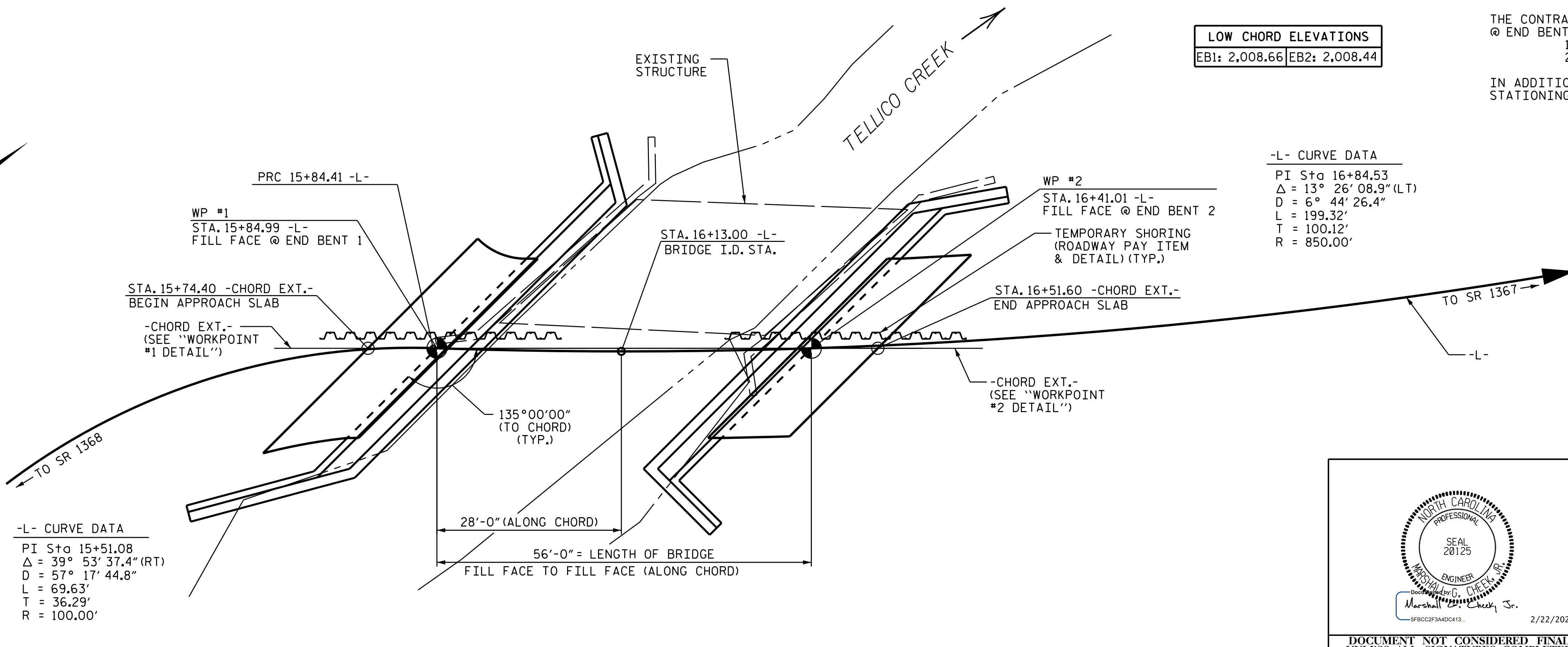
EB1: 2,008.66	EB2: 2,008.44
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**-L- CURVE DATA**

PI Sta	16+84.53
Δ	13° 26' 08.9" (LT)
D	6° 44' 26.4"
L	199.32'
T	100.12'
R	850.00'

**-L- CURVE DATA**

PI Sta	15+51.08
Δ	39° 53' 37.4" (RT)
D	57° 17' 44.8"
L	69.63'
T	36.29'
R	100.00'



PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 1 OF 4 REPLACES BR. NO. 550079

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE OVER  
 TELlico CREEK  
 ON SR 1369  
 BETWEEN SR 1368 AND SR 1367

2/22/2021

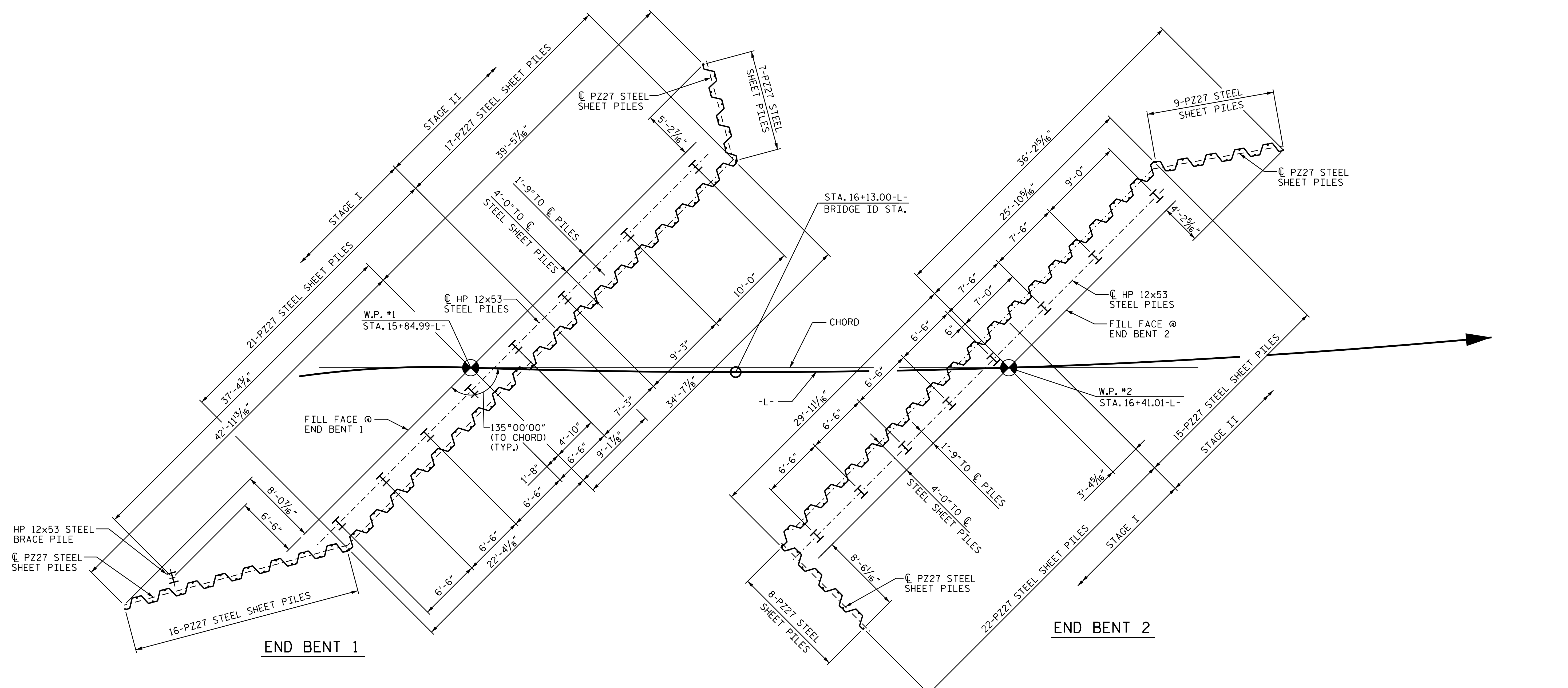
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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-1
1			3			TOTAL SHEETS
2			4			43

DRAWN BY : CCC DATE : 1/19  
 CHECKED BY : MGC DATE : 7/19  
 DESIGN ENGINEER OF RECORD : MGC DATE : 7/19

PILES & SHEET PILES NOT SHOWN IN PLAN VIEW FOR CLARITY



**FOUNDATION LAYOUT**  
 DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE PILE.

**FOUNDATION RECOMMENDATION NOTES**

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT No.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 60 TONS PER PILE.

DRIVE PILES AT END BENT No.1 TO A REQUIRED DRIVING RESISTANCE OF 100 TONS PER PILE.

DRILLED-IN PILES ARE REQUIRED FOR END BENT No.1. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 1991.3 FT. OR A MINIMUM OF 5 FT. INTO ROCK. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT No.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 60 TONS PER PILE.

DRIVE PILES AT END BENT No.2 TO A REQUIRED DRIVING RESISTANCE OF 100 TONS PER PILE.

DRILLED-IN PILES ARE REQUIRED FOR END BENT 2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 1993.2 FT. OR A MINIMUM OF 5 FT. INTO ROCK. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

CONCRETE IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT NO.1 AND END BENT NO. 2.

PZ27 STEEL SHEET PILES ARE TO BE DRIVEN IN FRONT (STREAM SIDE) OF HP 12x53 STEEL PILES AT EACH END BENT AS SHOWN. SOME EXCAVATION MAY BE REQUIRED DUE TO BOULDERS.

SHEET PILES SHOULD BE DRIVEN TO REFUSAL AND AT MINIMUM ELEVATION OF 1996.3 FT. FOR END BENT No.1 AND AT 1998.2 FT. FOR END BENT No. 2.

IF REFUSAL IS ENCOUNTERED ABOVE THE MINIMUM ELEVATIONS SPECIFIED, THE RESIDENT ENGINEER WILL NEED TO CONTACT THE GEOTECHNICAL OPERATIONS PERSON TO REVIEW AND MAKE RECOMMENDATIONS.

THE SCOUR CRITICAL ELEVATION FOR THE SHEET PILES AT END BENT No.1 IS 1996 FT. AND END BENT No.2 IS 1998 FT. RESPECTIVELY. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PROJECT NO. 17BP.14.R.211  
MACON COUNTY  
 STATION: 16+13.00-L-

SHEET 2 OF 4

SEAL 20125  
 ENGINEER  
 G. CHEEK, JR.  
 2/22/2021

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

**GENERAL DRAWING**  
 FOR BRIDGE OVER  
 TELlico CREEK  
 ON SR 1369  
 BETWEEN SR 1368 AND SR 1367

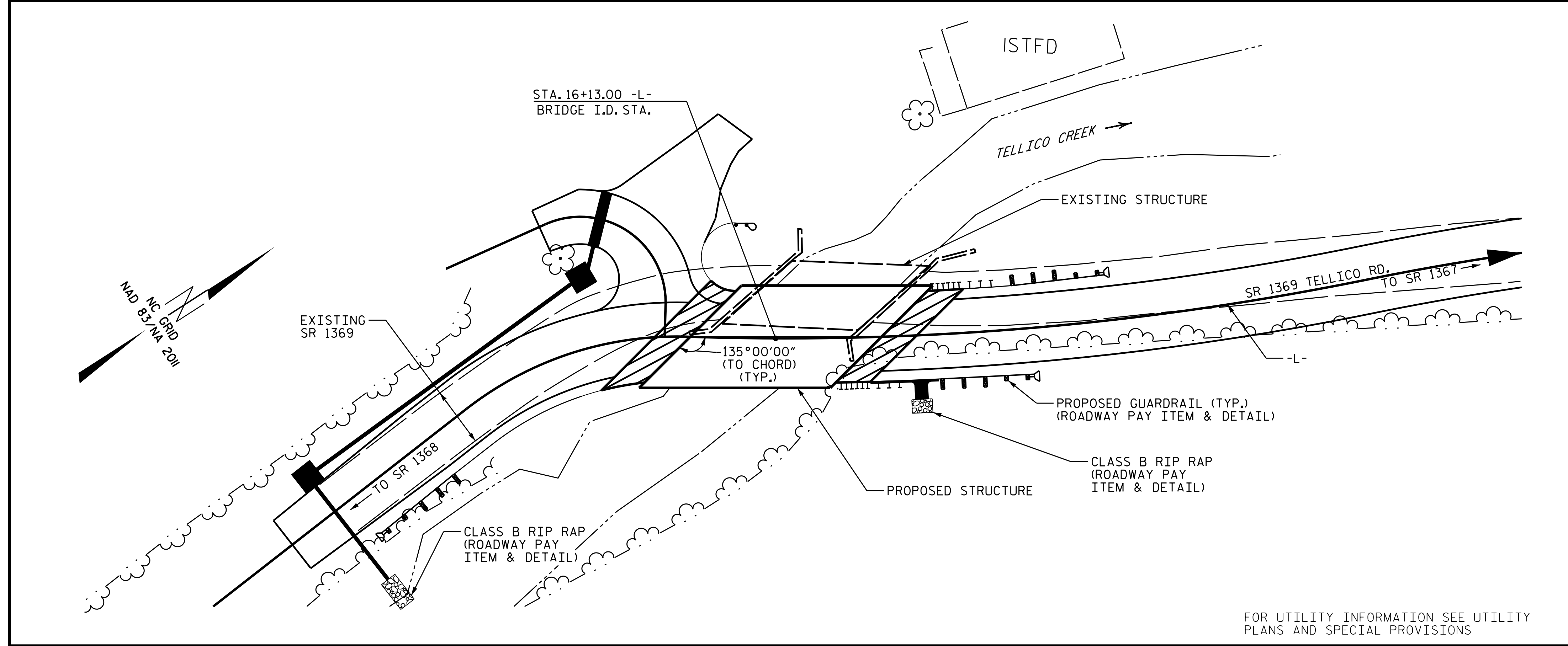
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-2
2			4			TOTAL SHEETS 43

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

DRAWN BY : NMW DATE : 2/19  
 CHECKED BY : MGC DATE : 8/19  
 DESIGN ENGINEER OF RECORD : MGC DATE : 8/19

BM#1: SPIKE IN BASE OF 20" TREE, -L- STA. 14+31.00, 27.5' LT, ELEV. 2017.42'



LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.  
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.  
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.  
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE NOTES SHEET S-43.  
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.  
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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 THE 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."

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR THE DISTANCE OF 30 FT. EACH SIDE OF THE CENTERLINE OF THE BRIDGE 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.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING 1 SPAN STRUCTURE (1 @ 40'-6") CONSISTING OF A TIMBER FLOOR ON STEEL I-BEAMS, WITH A CLEAR ROADWAY WIDTH OF 19'-0 1/4" AND A 1" ASPHALT WEARING SURFACE; AND A SUBSTRUCTURE CONSISTING OF TIMBER POST AND BEAM ABUTMENTS, AND LOCATED AT THE SITE OF THE PROPOSED BRIDGE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THIS LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, 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.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 AND PAINTED IN ACCORDANCE WITH SYSTEM 2 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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

TEMPORARY SHORING WILL BE REQUIRED IN THE AREA INDICATED IN THE PLAN VIEW, SHEET 1 OF 4.

FOR THE 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.

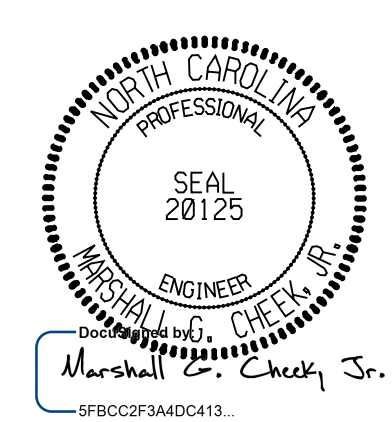
REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

FOR 18" GALVANIZED STEEL SHEET PILES, SEE SPECIAL PROVISIONS.

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY

STATION: 16+13.00-L-

SHEET 3 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR BRIDGE OVER  
 TELLICO CREEK  
 ON SR 1369  
 BETWEEN SR 1368 AND SR 1367

DRAWN BY : CCC DATE : 1/19  
 CHECKED BY : MGC DATE : 1/19  
 DESIGN ENGINEER OF RECORD : MGC DATE : 7/19

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-3
1			3			TOTAL SHEETS
2			4			43

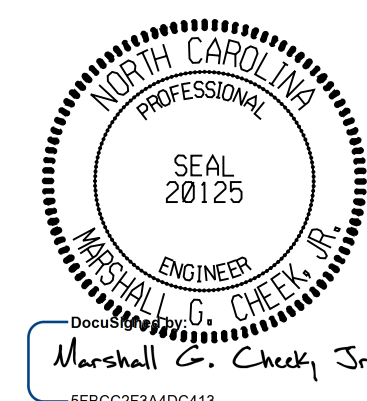
**TOTAL BILL OF MATERIAL**

ITEM	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE (BRIDGE)	BRIDGE APPROACH SLABS	REINFORCING STEEL (BRIDGE)	APPROXIMATE 42,700 LBS. STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES	HP 12x53 STEEL PILES		32" ALASKA RAIL	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	18" GALVANIZED STEEL SHEET PILES
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LUMP SUM	EA.	NO.	LIN. FT.	LIN. FT.	LUMP SUM	LUMP SUM	SQ. FT.
SUPERSTRUCTURE						1592	1750								87.71			
END BENT 1			89.00	45.00				44.6		5647		9	9	144				951
END BENT 2			62.00	40.00				40.3		5095		8	8	112				673
TOTALS	LUMP SUM	LUMP SUM	151.00	85.00	LUMP SUM	1592	1750	84.9	LUMP SUM	10,742	LUMP SUM	17	17	256	87.71	LUMP SUM	LUMP SUM	1624

( 75 CY )

PROJECT NO. 17BP.14.R.211  
MACON COUNTY  
 STATION: 16+13.00-L-

SHEET 4 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR BRIDGE OVER  
 TELlico CREEK  
 ON SR 1369  
 BETWEEN SR 1368 AND SR 1367

DRAWN BY : NMW DATE : 2/19  
 CHECKED BY : MGC DATE : 8/19  
 DESIGN ENGINEER OF RECORD : MGC DATE : 8/19

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

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

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

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS ( $\gamma_{LL}$ )	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 ( $\gamma_{LL}$ )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.78	--	1.75	.608	1.91	A	INT.	24.75	.698	3.59	A	INT.	49.50	1.30	.608	1.78	A	INT.	24.75		
	HL-93 (OPERATING)	N/A		2.31	--	1.35	.608	2.47	A	INT.	24.75	.698	4.66	A	INT.	49.50	1.00	.608	2.31	A	INT.	24.75		
	HS-20 (INVENTORY)	36.00	②	2.20	79.20	1.75	.608	2.37	A	INT.	24.75	.698	4.32	A	INT.	49.50	1.30	.608	2.20	A	INT.	24.75		
	HS-20 (OPERATING)	36.00		2.87	103.32	1.35	.608	3.07	A	INT.	24.75	.698	5.60	A	INT.	49.50	1.00	.608	2.87	A	INT.	24.75		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.85	78.98	1.40	.608	6.04	A	INT.	24.75	.698	12.34	A	INT.	49.50	1.30	.608	5.85	A	INT.	24.75	
		SNGARBS2	20.000		4.61	92.20	1.40	.608	4.76	A	INT.	24.75	.698	8.94	A	INT.	49.50	1.30	.608	4.61	A	INT.	24.75	
		SNAGRIS2	22.000		4.45	97.90	1.40	.608	4.57	A	INT.	29.70	.698	8.36	A	INT.	49.50	1.30	.608	4.45	A	INT.	19.80	
		SNCOTTS3	27.250		2.92	79.57	1.40	.608	3.02	A	INT.	24.75	.698	6.18	A	INT.	49.50	1.30	.608	2.92	A	INT.	24.75	
		SNAGGRS4	34.925		2.54	88.71	1.40	.608	2.62	A	INT.	24.75	.698	5.24	A	INT.	49.50	1.30	.608	2.54	A	INT.	24.75	
		SNS5A	35.550		2.47	87.81	1.40	.608	2.55	A	INT.	24.75	.698	5.37	A	INT.	49.50	1.30	.608	2.47	A	INT.	24.75	
		SNS6A	39.950		2.31	92.28	1.40	.608	2.39	A	INT.	24.75	.698	4.95	A	INT.	49.50	1.30	.608	2.31	A	INT.	24.75	
		SNS7B	42.000		2.20	92.40	1.40	.608	2.27	A	INT.	24.75	.698	4.93	A	INT.	49.50	1.30	.608	2.20	A	INT.	24.75	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.83	93.39	1.40	.608	2.92	A	INT.	24.75	.698	5.85	A	INT.	49.50	1.30	.608	2.83	A	INT.	24.75	
		TNT4A	33.075		2.85	94.26	1.40	.608	2.95	A	INT.	24.75	.698	5.65	A	INT.	49.50	1.30	.608	2.85	A	INT.	24.75	
		TNT6A	41.600		2.38	99.01	1.40	.608	2.45	A	INT.	24.75	.698	5.37	A	INT.	49.50	1.30	.608	2.38	A	INT.	24.75	
		TNT7A	42.000		2.41	101.22	1.40	.608	2.49	A	INT.	24.75	.698	5.05	A	INT.	49.50	1.30	.608	2.41	A	INT.	24.75	
		TNT7B	42.000		2.51	105.42	1.40	.608	2.60	A	INT.	24.75	.698	4.76	A	INT.	49.50	1.30	.608	2.51	A	INT.	24.75	
		TNAGRIT4	43.000		2.38	102.34	1.40	.608	2.46	A	INT.	24.75	.698	4.59	A	INT.	49.50	1.30	.608	2.38	A	INT.	24.75	
		TNAGT5A	45.000		2.23	100.35	1.40	.608	2.30	A	INT.	24.75	.698	4.64	A	INT.	49.50	1.30	.608	2.23	A	INT.	24.75	
TNAGT5B	45.000	③	2.18	98.10	1.40	.608	2.26	A	INT.	24.75	.698	4.36	A	INT.	49.50	1.30	.608	2.18	A	INT.	24.75			
FATIGUE	HL-93 (INVENTORY)	$\gamma_{LL}=0.75$																						

NOTES:

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

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

- 1.
- 2.
- 3.
- 4.

# CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93) \*\*

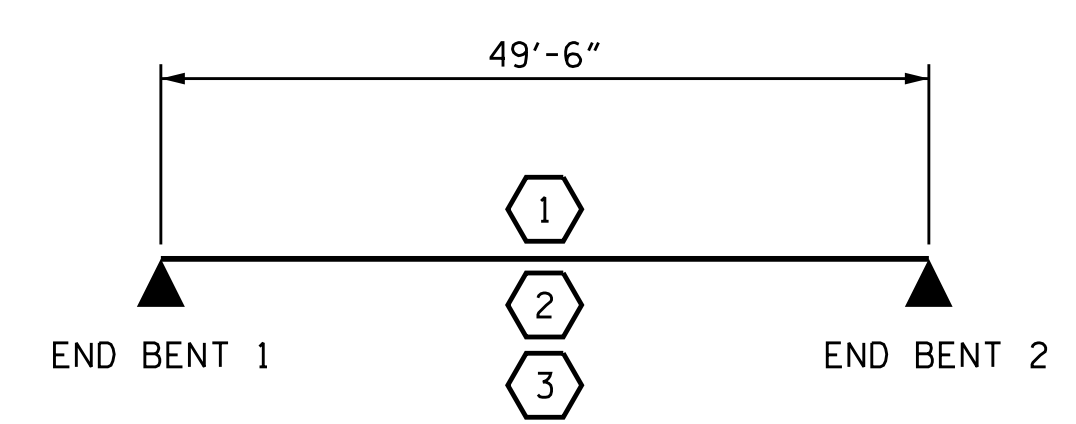
② DESIGN LOAD RATING (HS-20) \*\*

③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER  
EL - EXTERIOR LEFT GIRDER  
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-

ASSEMBLED BY : NMW/ZCS	DATE : 7/19
CHECKED BY : MGC	DATE : 7/19
DESIGN ENGINEER OF RECORD : MGC	DATE : 7/19
DRAWN BY : MAA 1/08	REV. 11/2/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

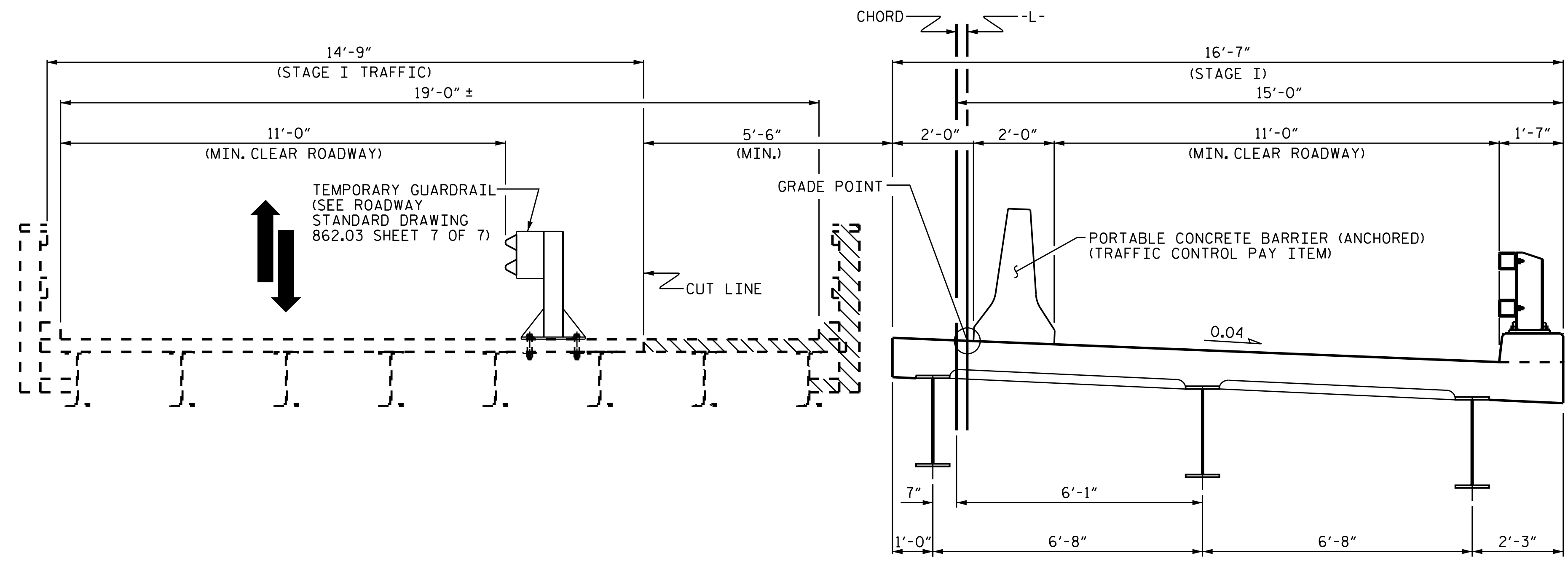
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 LRFR SUMMARY FOR STEEL GIRDERS (NON-INTERSTATE TRAFFIC)

2/22/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

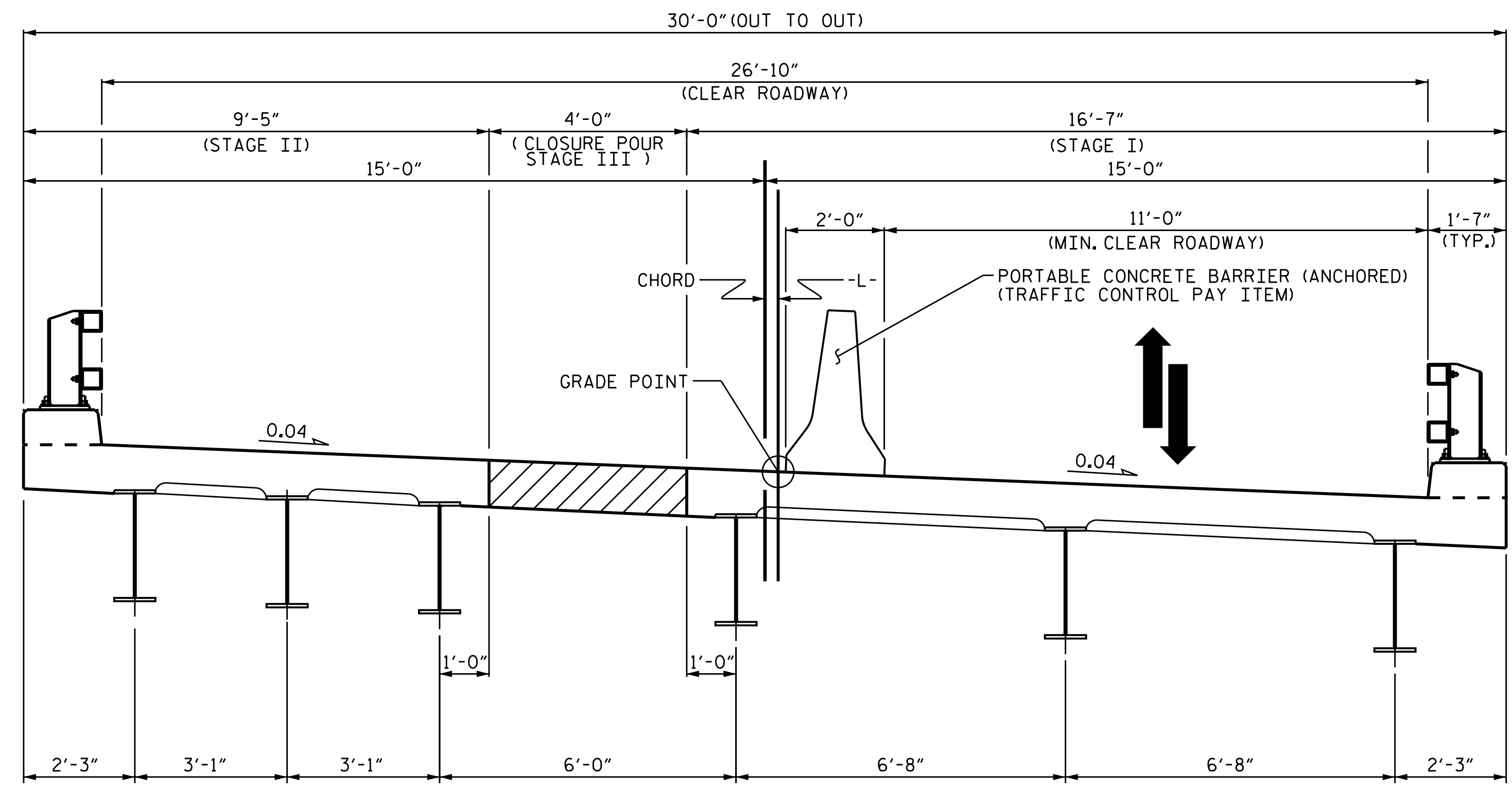
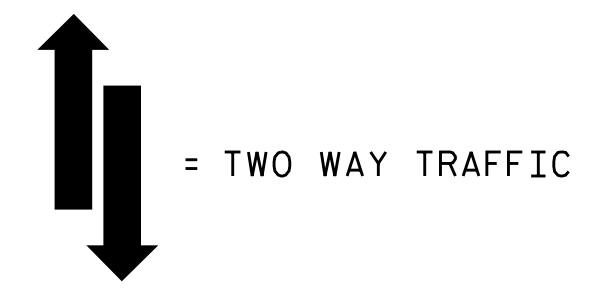
TGS ENGINEERS  
 804-C N. LAFAYETTE ST  
 SHELBY, NC 28150  
 PH (704) 476-0003  
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-5
1			3			TOTAL SHEETS
2			4			43



STAGE I

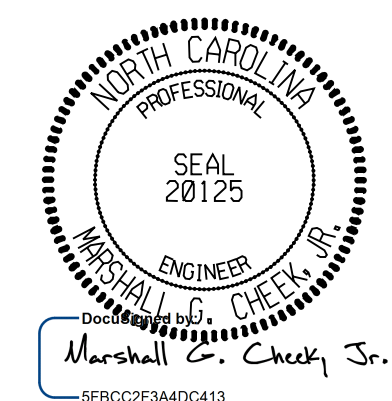
**NOTE:**  
 FOR TRAFFIC PHASING, SEE TRAFFIC CONTROL PLANS.  
 FOR TEMPORARY GUARDRAIL DETAILS AND PAY ITEM, SEE ROADWAY PLANS.  
 SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE ANCHORED PORTABLE CONCRETE BARRIER.



STAGE II / STAGE III

CONSTRUCTION STAGING

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-



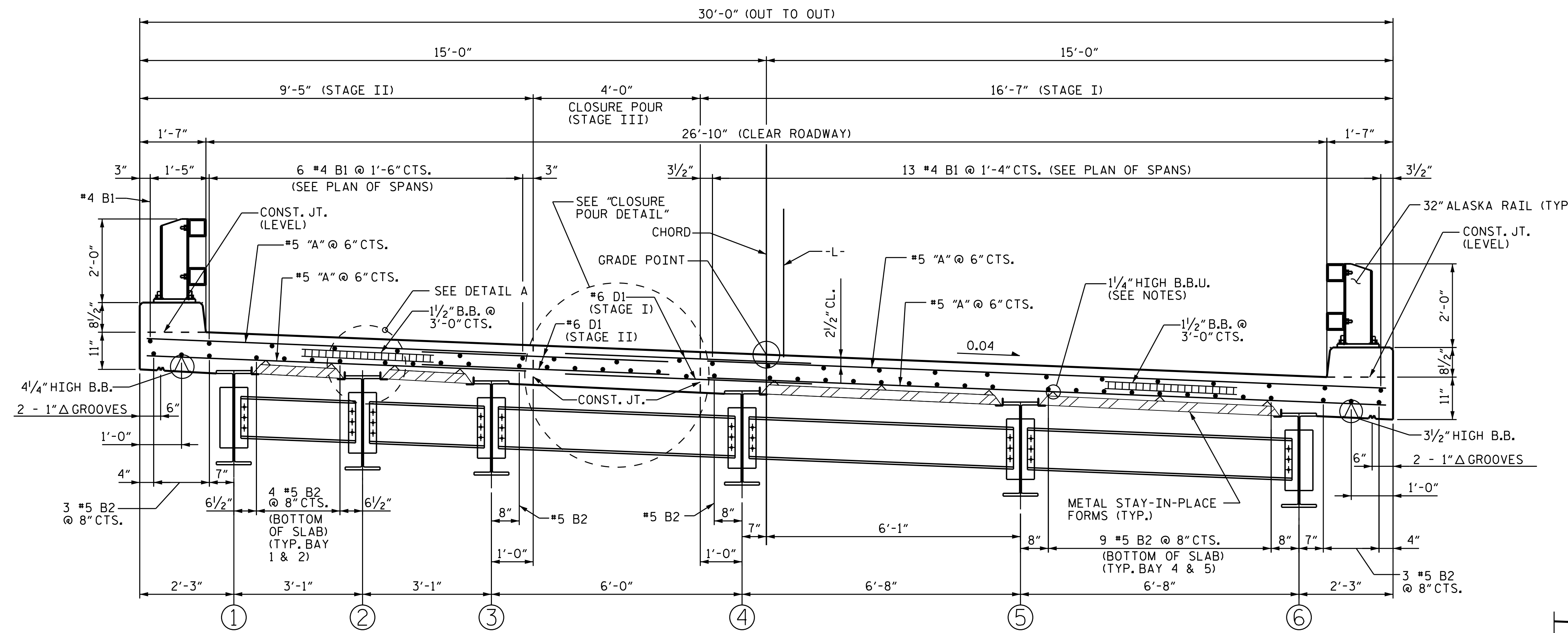
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 CONSTRUCTION STAGING  
 SEQUENCE

DRAWN BY : SBW DATE : 12/18  
 CHECKED BY : MGC DATE : 7/19  
 DESIGN ENGINEER OF RECORD : MGC DATE : 7/19

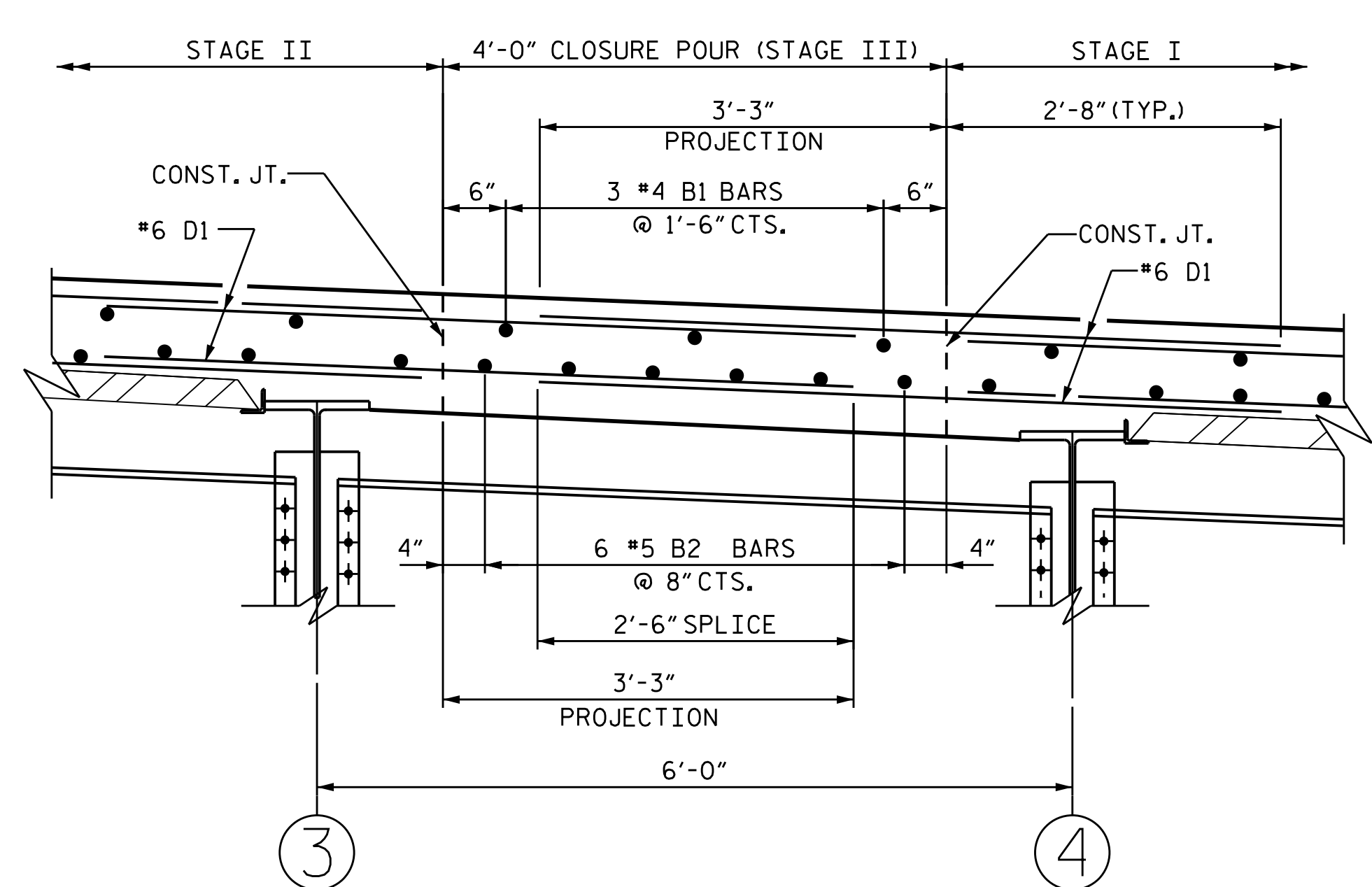
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			43
2			4			



TYPICAL SECTION AT INTERMEDIATE DIAPHRAGMS



CLOSURE POUR DETAIL

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

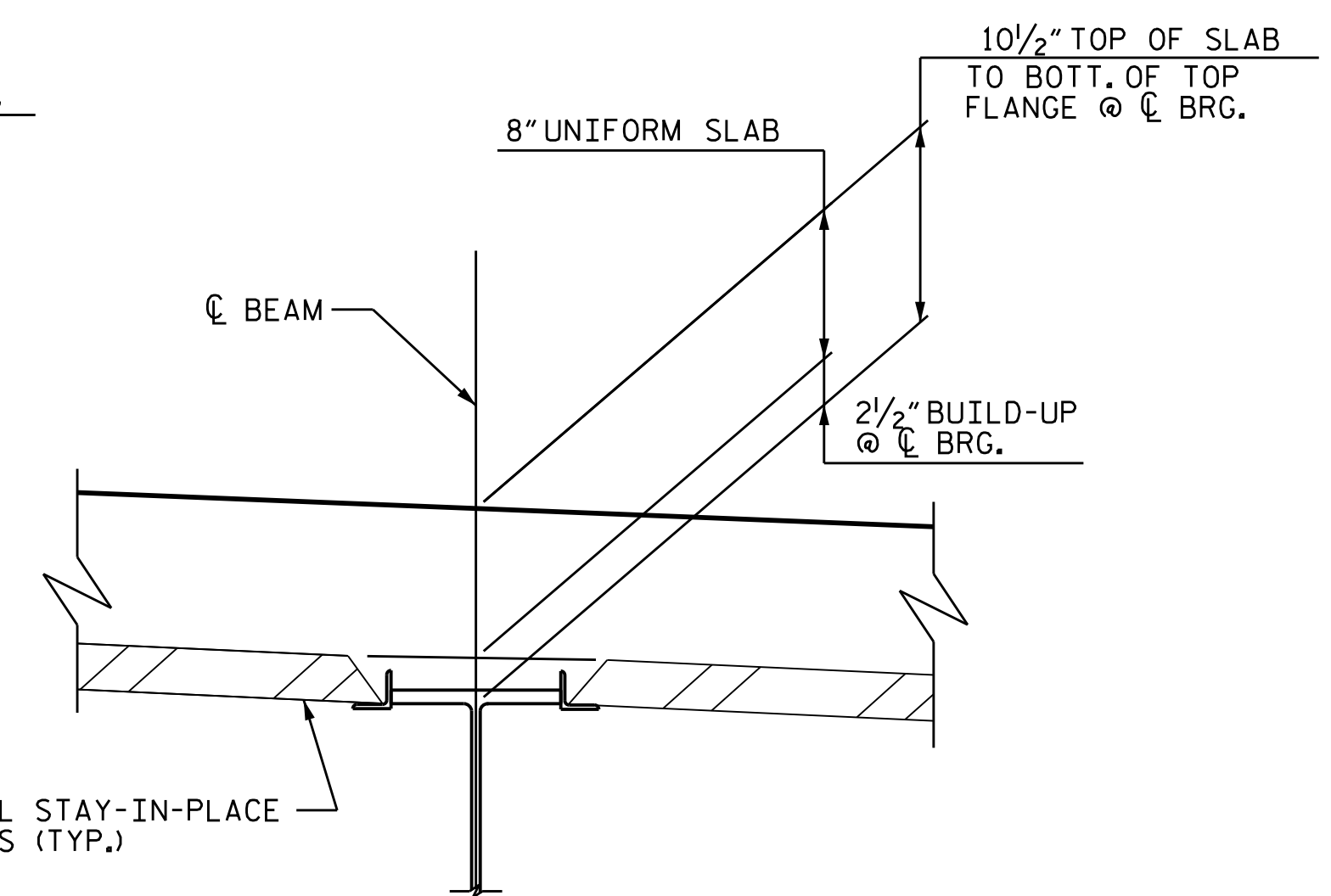
**NOTES:**

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

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.

THE CURB AND END POST SHALL NOT BE CAST UNTIL ALL CONCRETE IN THE SLAB HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

DIRECTION OF CASTING DECK CONCRETE SHALL BE FROM THE FIXED BEARING END TOWARD THE EXPANSION BEARING END OF THE SPAN.



DETAIL A

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
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 SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 TYPICAL SECTIONS

Professional Engineer Seal: Marshall G. Cheek, Jr., No. 20125, dated 2/22/2021.

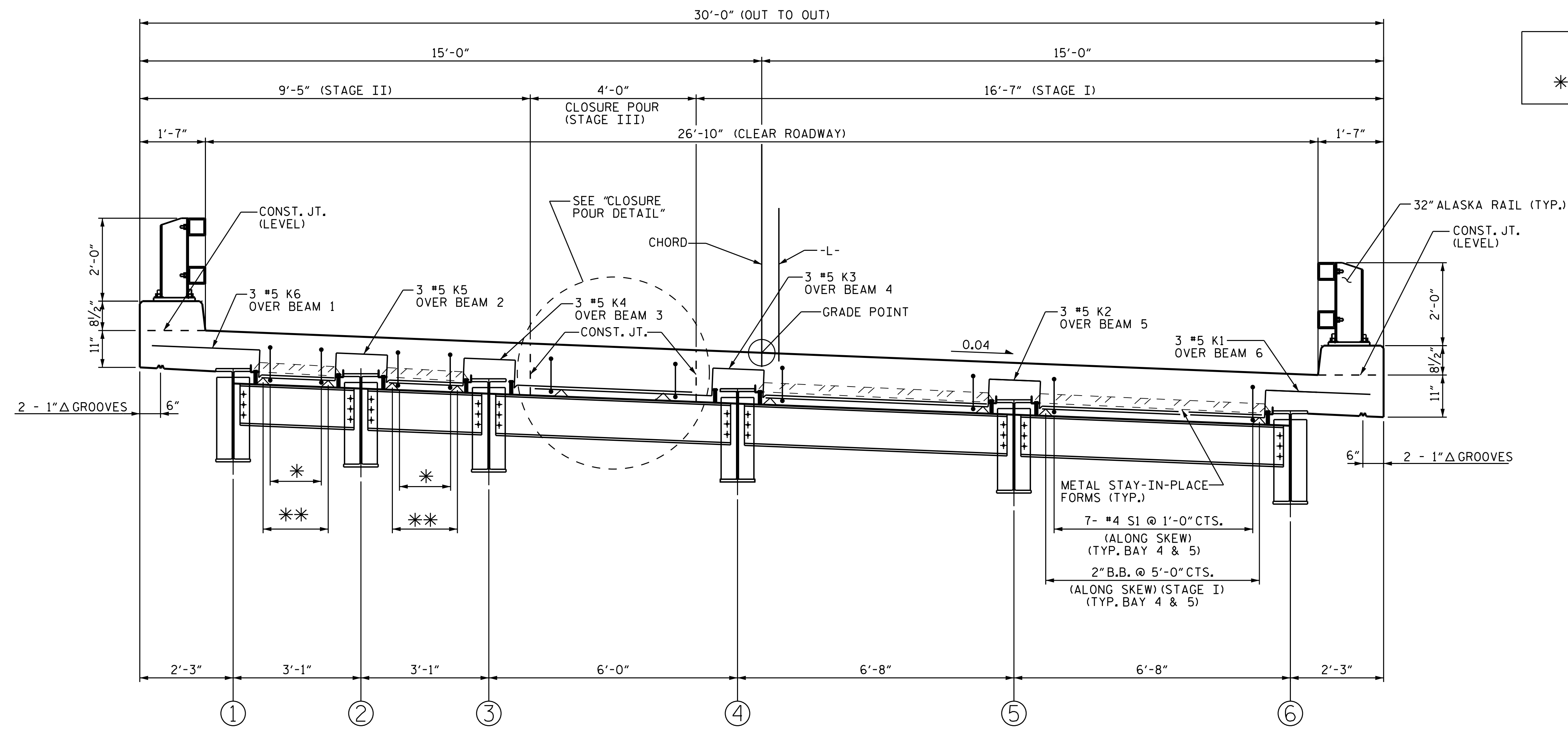
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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-7
1			3			TOTAL SHEETS
2			4			43

DRAWN BY : NMW DATE : 2/19  
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 DESIGN ENGINEER OF RECORD : MGC DATE : 7/19

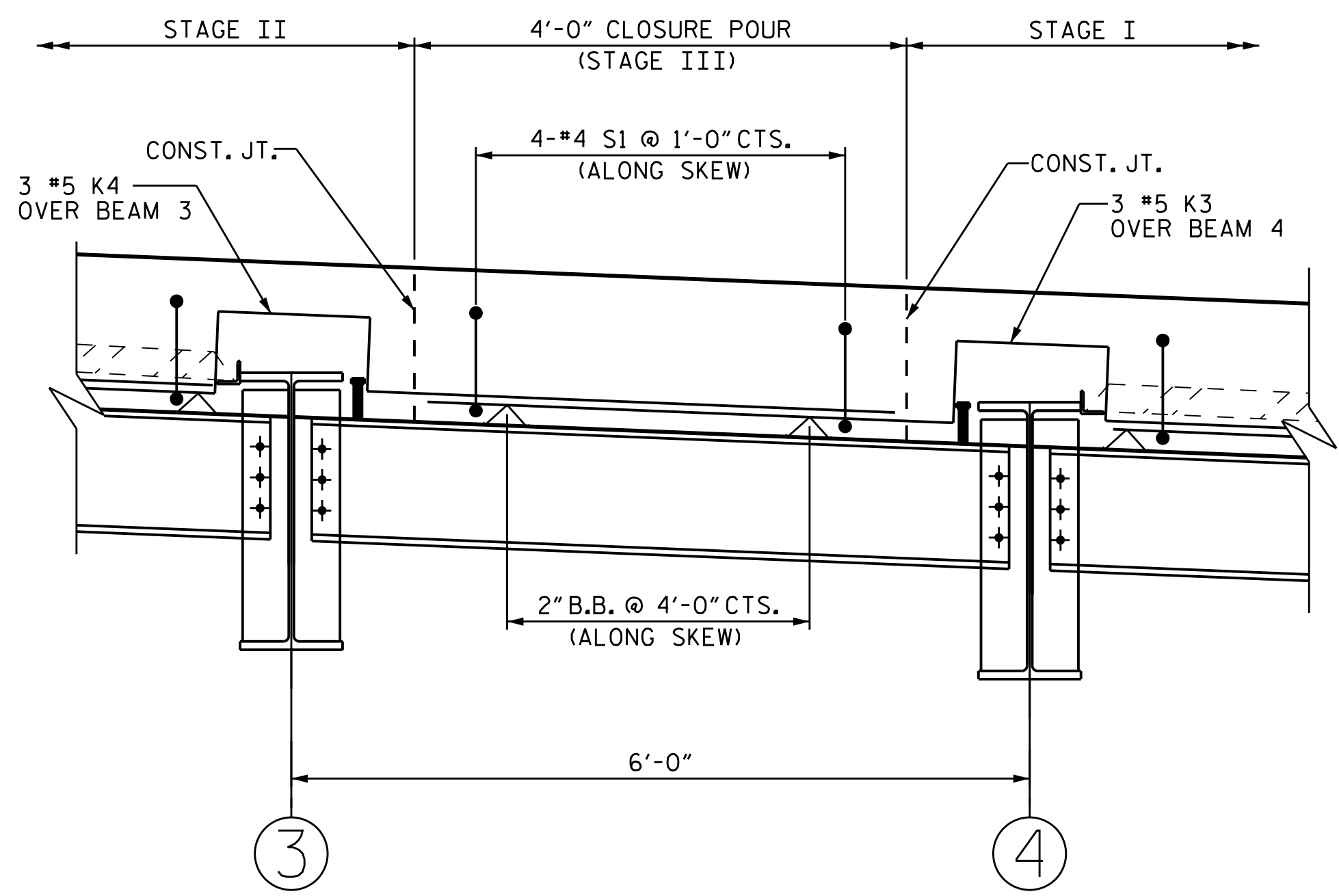




\* 3-#4 S1 @ EQUAL SPACES (ALONG SKEW)  
 \*\* 2" B.B. @ 2'-0" CTS.

**TYPICAL SECTION AT END BENT DIAPHRAGMS**

FOR DECK SLAB REINFORCING, SEE "TYPICAL SECTION AT INTERMEDIATE DIAPHRAGMS", SHEET 1 OF 3.



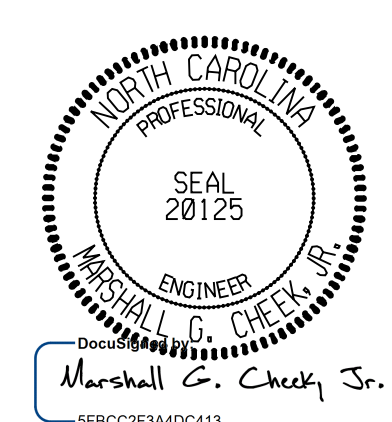
**CLOSURE POUR DETAIL**

PROJECT NO. 17BP.14.R.211

MACON COUNTY

STATION: 16+13.00-L-

SHEET 2 OF 3



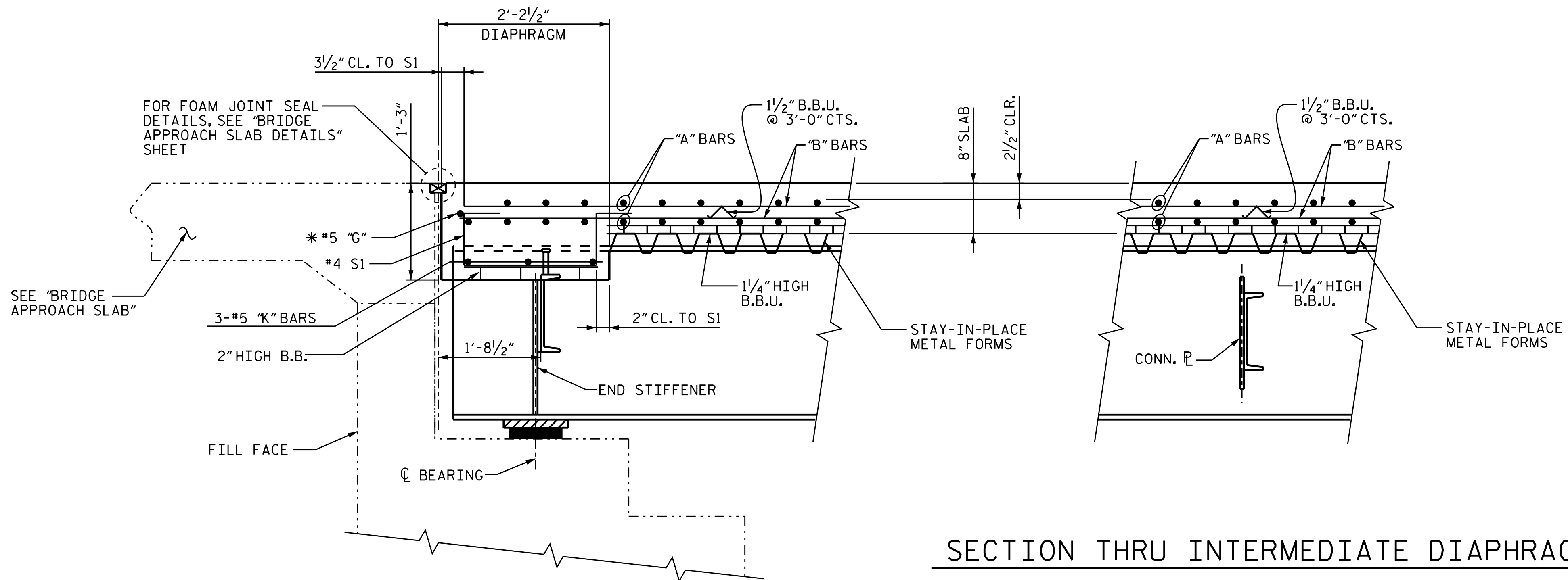
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTIONS

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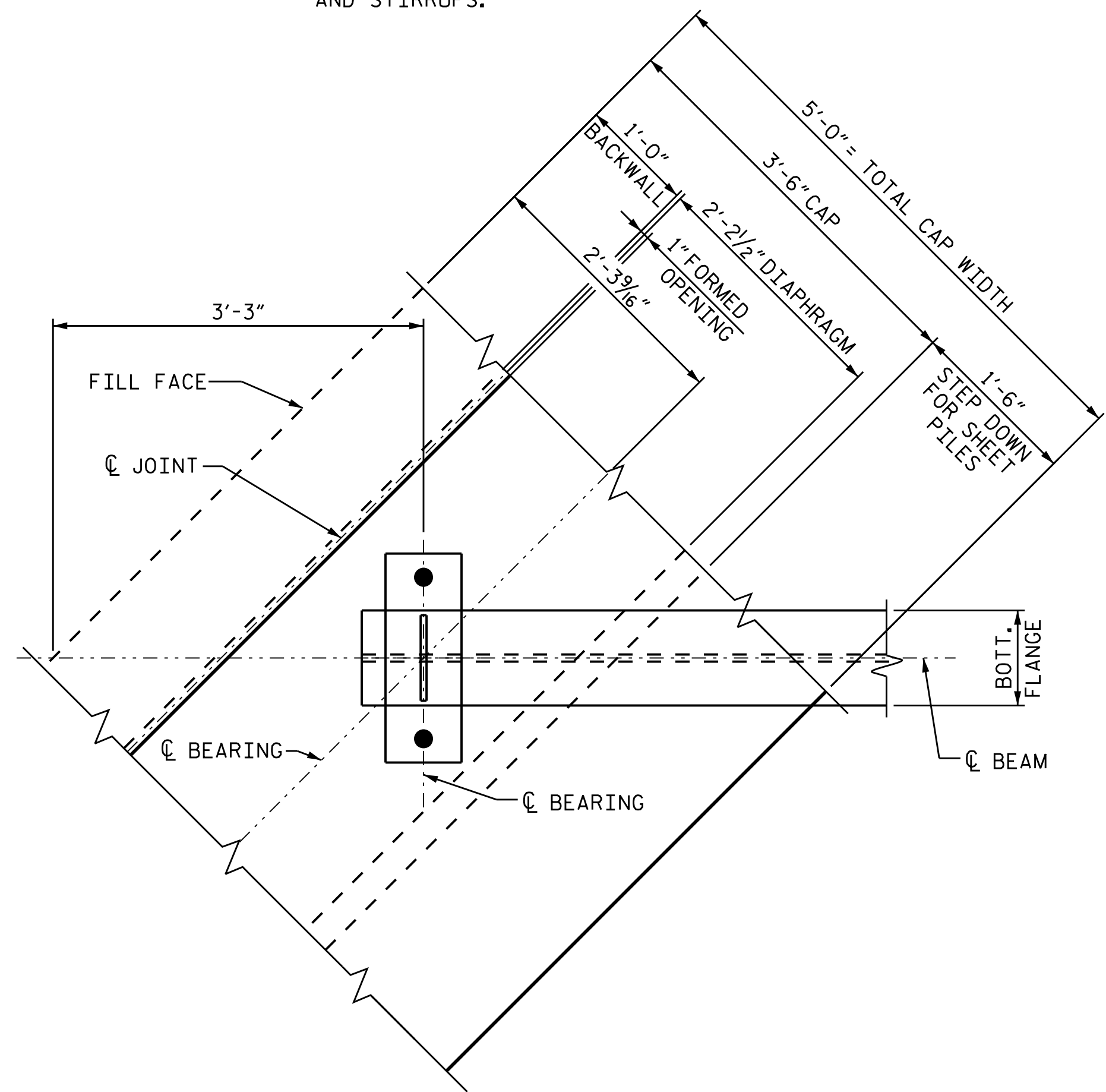
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			43



SECTION THRU INTERMEDIATE DIAPHRAGM

SECTION THRU END BENT DIAPHRAGM

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



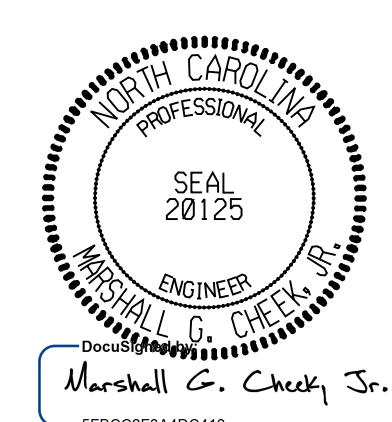
END BENT DIAPHRAGM PLAN

PROJECT NO. 17BP.14.R.211

MACON COUNTY

STATION: 16+13.00-L-

SHEET 3 OF 3



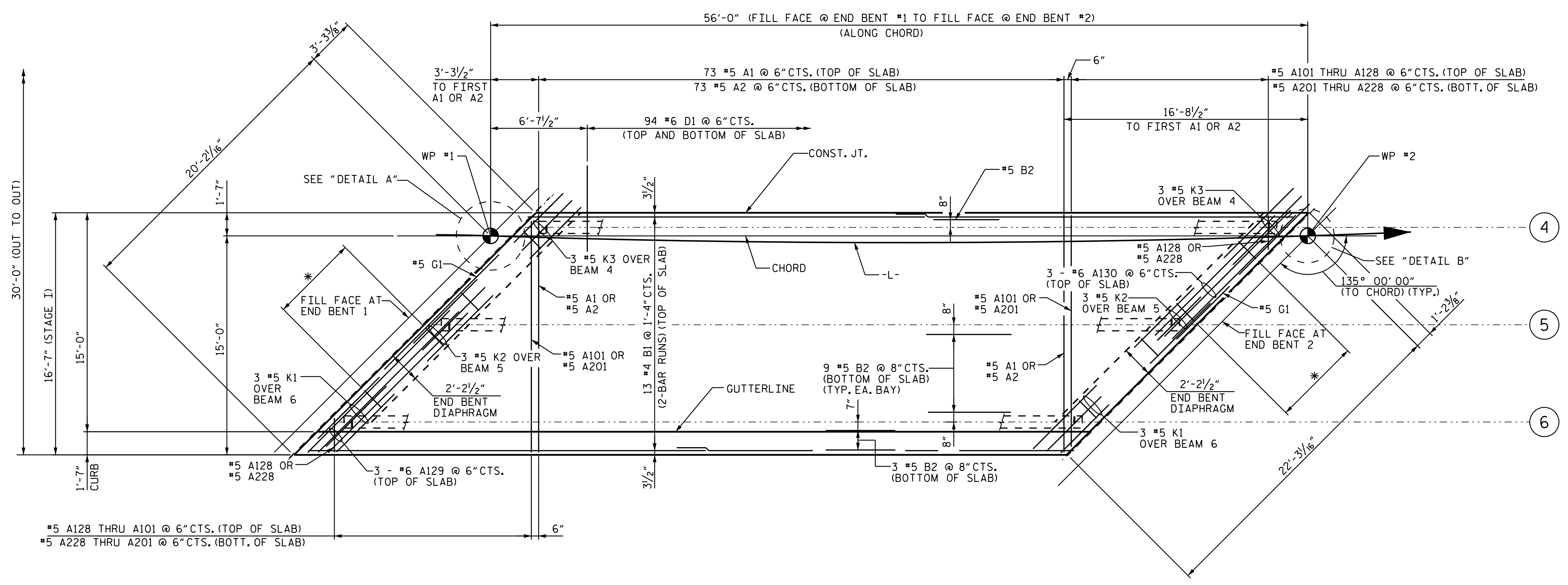
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
TYPICAL SECTION  
DETAILS

DRAWN BY : NMW DATE : 2/19  
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NO.	BY:	DATE:	NO.	BY:	DATE:				
1			3			S-9			
2			4			TOTAL SHEETS 43			

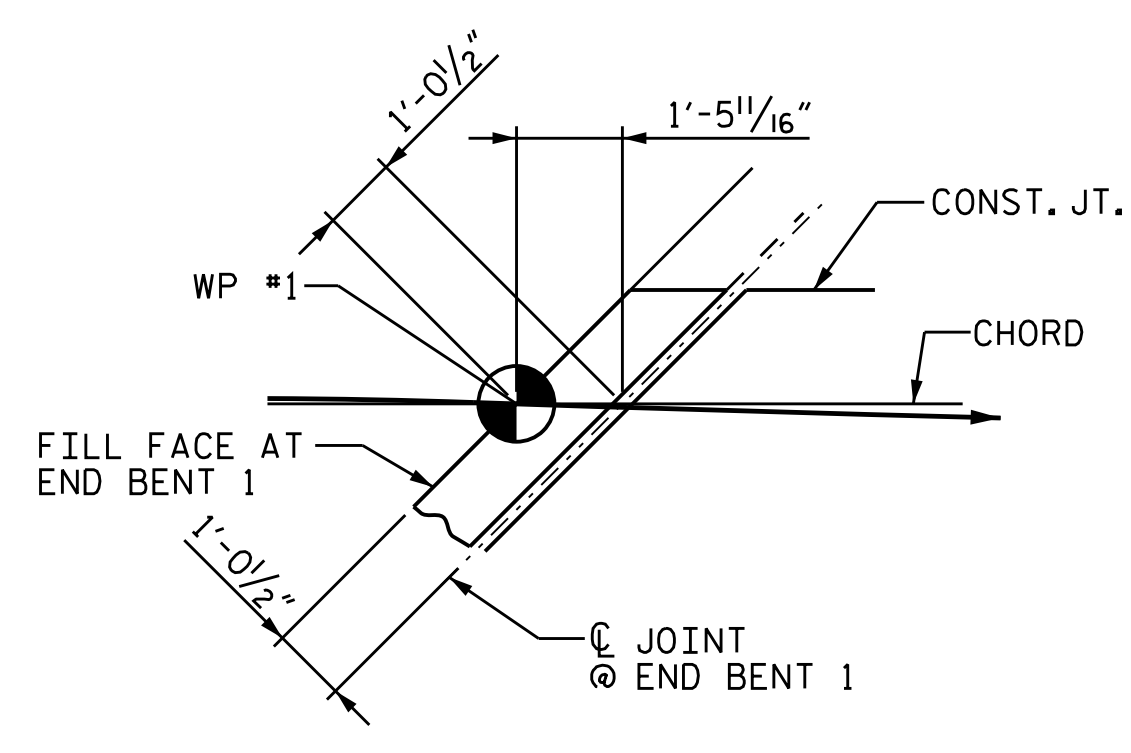
TGS ENGINEERS  
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SHELBY, NC 28150  
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CORP. LICENSE NO.: C-0275

\* 7- #4 S1 @ 1'-0" CTS. (ALONG SKEW) (TYP. INTERIOR BAYS)

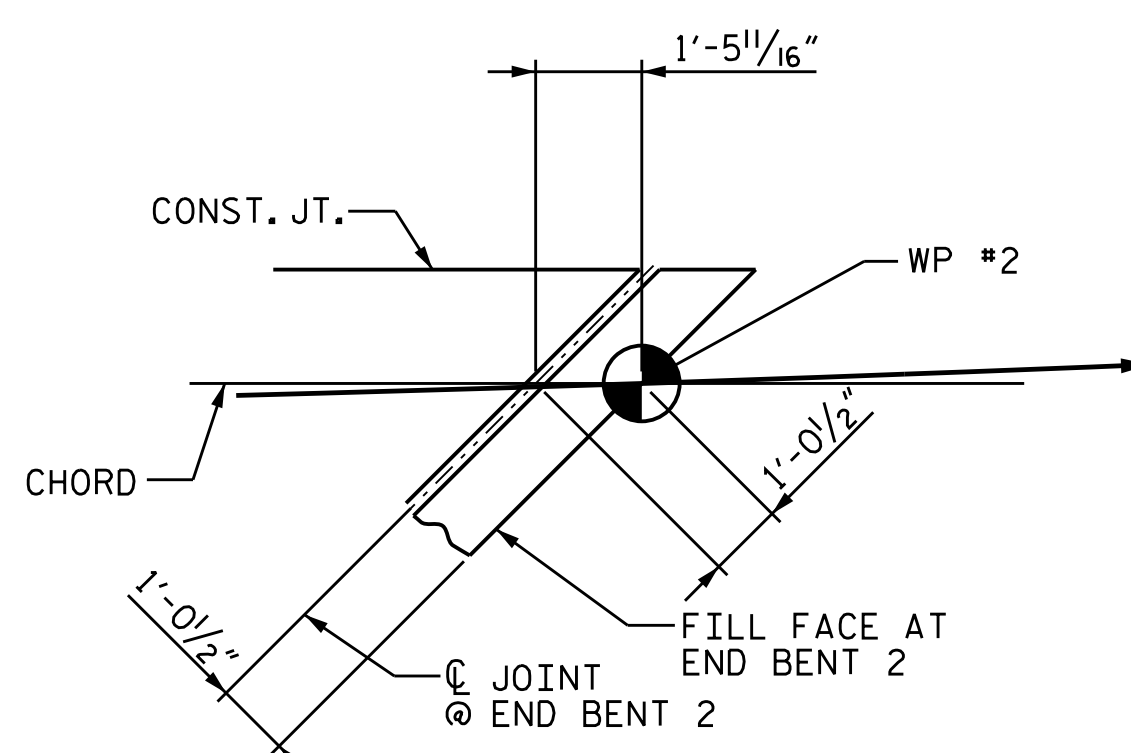


### PLAN OF SPAN A STAGE I

FOR ADDITIONAL STEEL REINFORCING AND ANCHOR ASSEMBLIES, SEE "PLAN OF PARAPET FOR 32" ALASKA RAIL" SHEET.

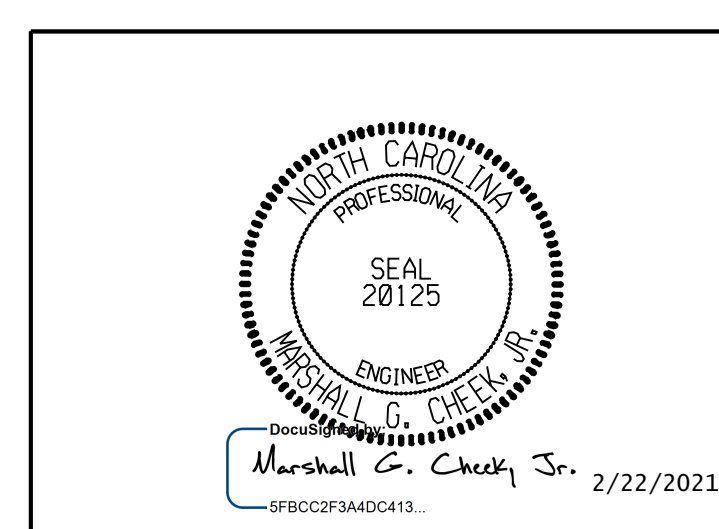


#### DETAIL A



#### DETAIL B

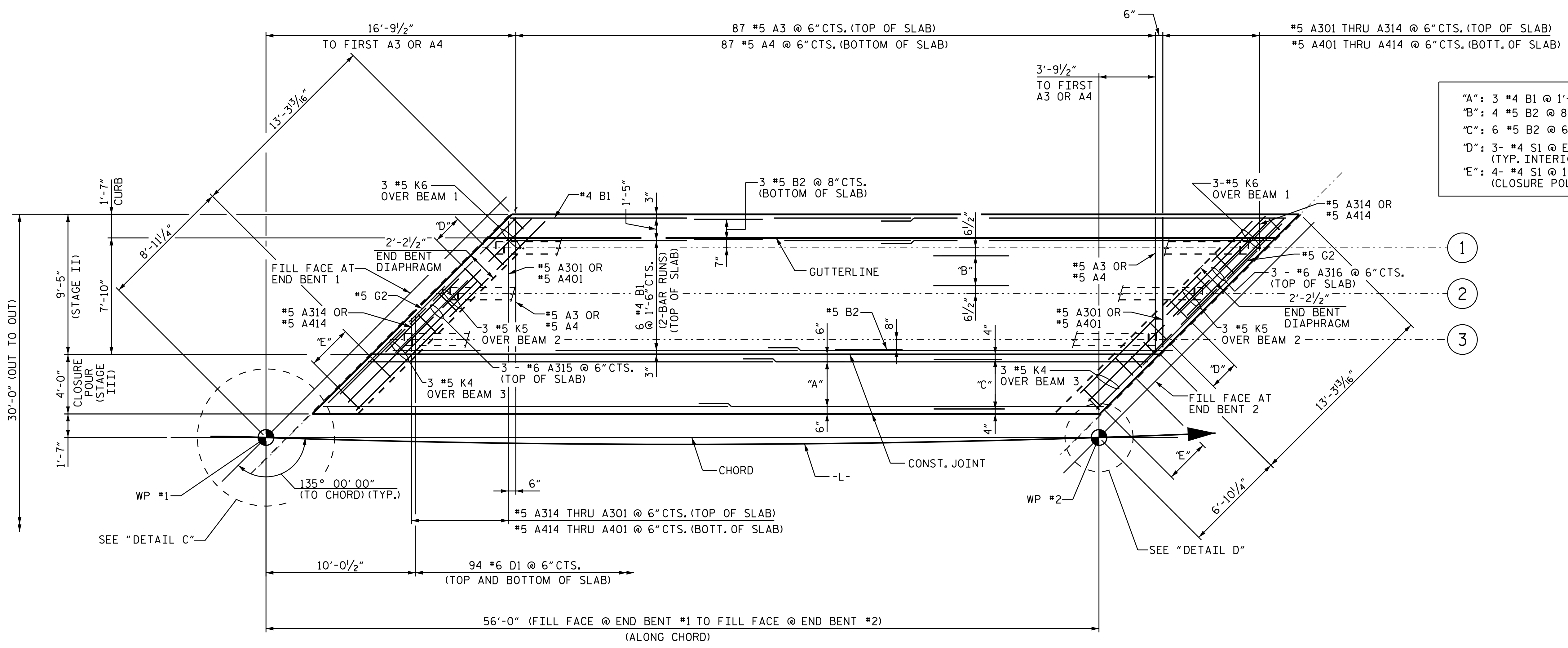
PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 1 OF 2



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

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			43

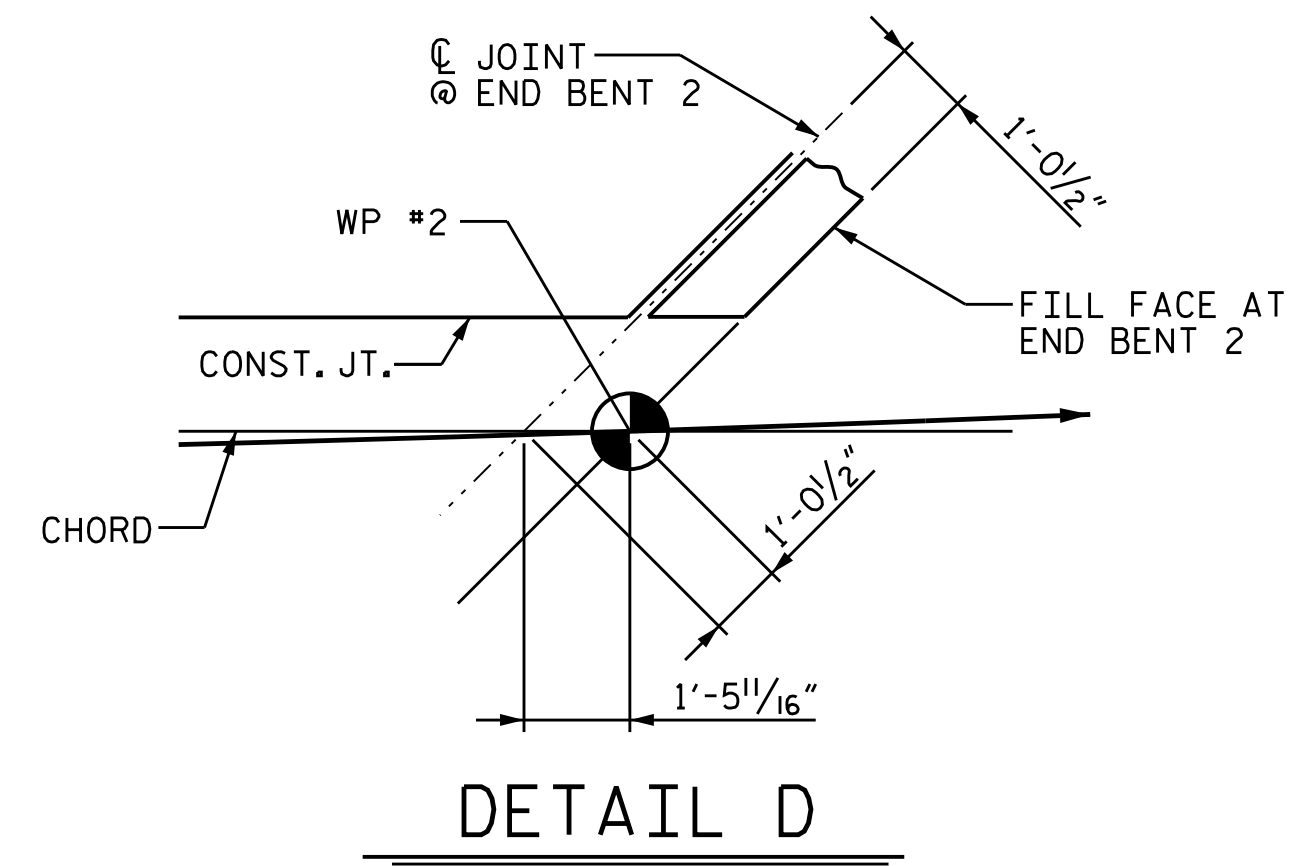
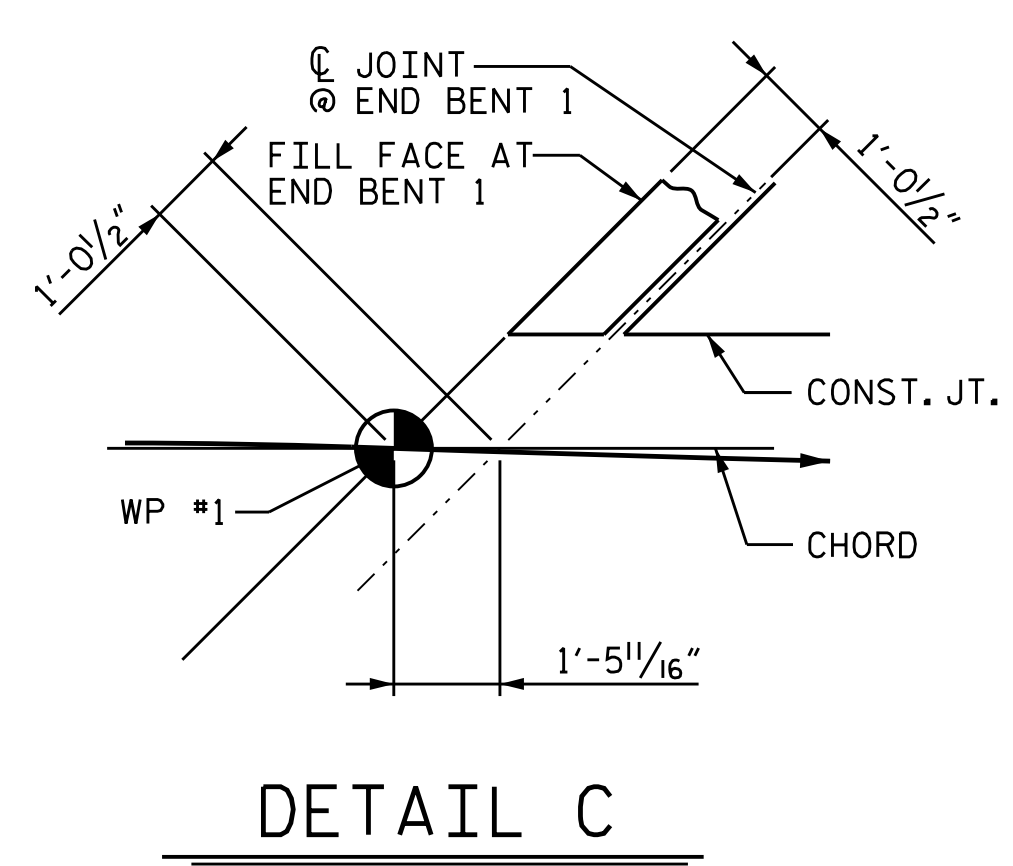
DRAWN BY : NMW DATE : 7/19  
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 DESIGN ENGINEER OF RECORD : MGC DATE : 7/19



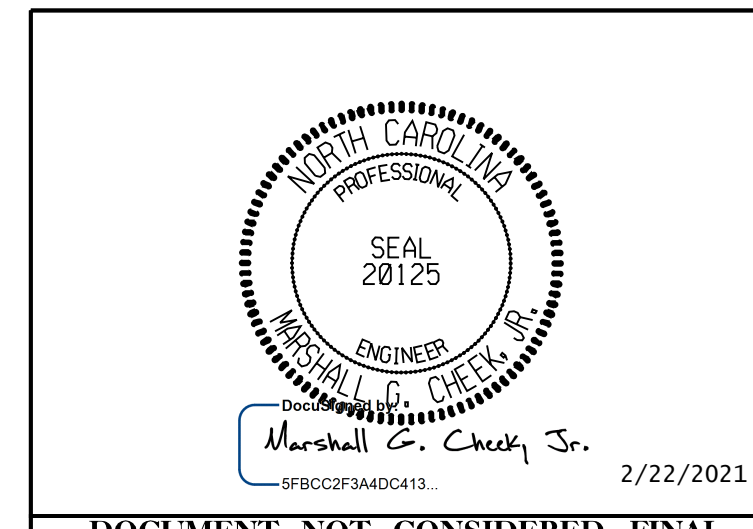
- "A": 3 #4 B1 @ 1'-6" CTS (2-BAR RUNS) (TOP OF SLAB)
- "B": 4 #5 B2 @ 8" CTS (BOTT. OF SLAB) (BAY 1 & 2)
- "C": 6 #5 B2 @ 6" CTS (BOTT. OF SLAB)
- "D": 3- #4 S1 @ EQUAL SPACINGS (ALONG SKEW) (TYP. INTERIOR BAYS)
- "E": 4- #4 S1 @ 1'-0" CTS. (ALONG SKEW) (CLOSURE POUR)

### PLAN OF SPAN A STAGE II

FOR ADDITIONAL STEEL REINFORCING AND ANCHOR ASSEMBLIES, SEE "PLAN OF PARAPET FOR 32" ALASKA RAIL" SHEET.



PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 2 OF 2

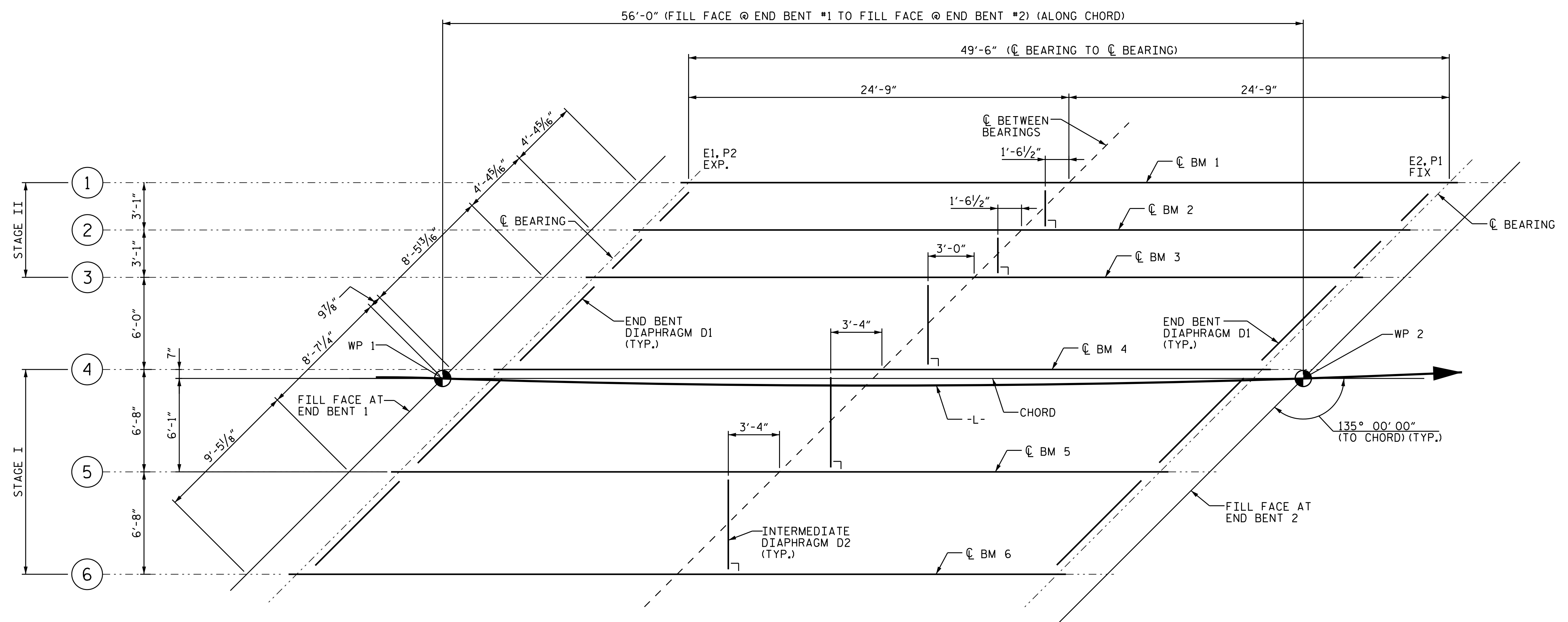


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPAN A  
 STAGE II

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 DESIGN ENGINEER OF RECORD : MGC DATE : 7/19

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

SHEET NO.	S-11
TOTAL SHEETS	43



FRAMING PLAN

PROJECT NO. 17BP.14.R.211  
MACON COUNTY  
 STATION: 16+13.00-L-

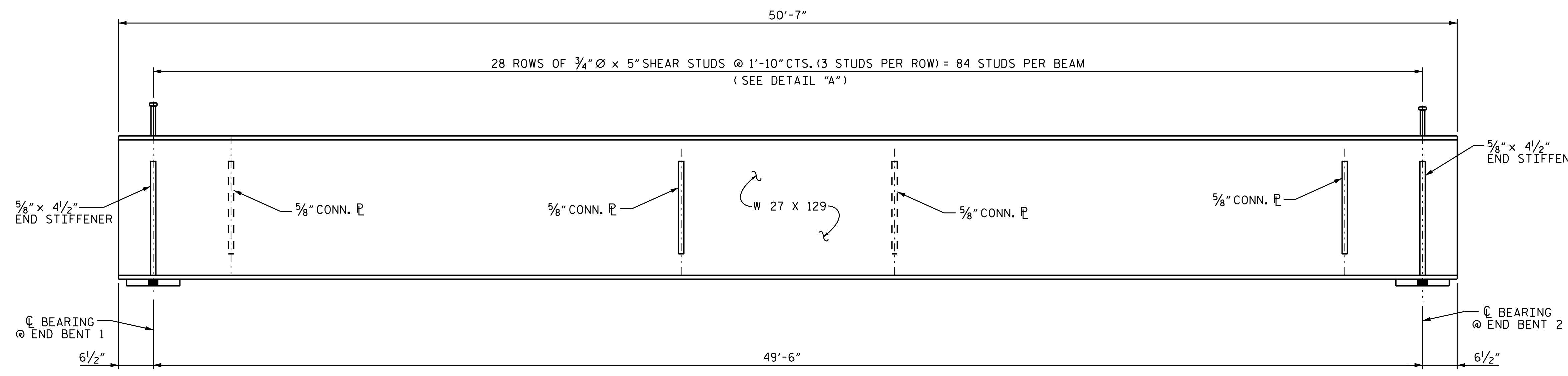
DRAWN BY : NMW DATE : 3/19  
 CHECKED BY : MGC DATE : 7/19  
 DESIGN ENGINEER OF RECORD : MGC DATE : 7/19

Marshall G. Cheek, Jr.  
 2/22/2021

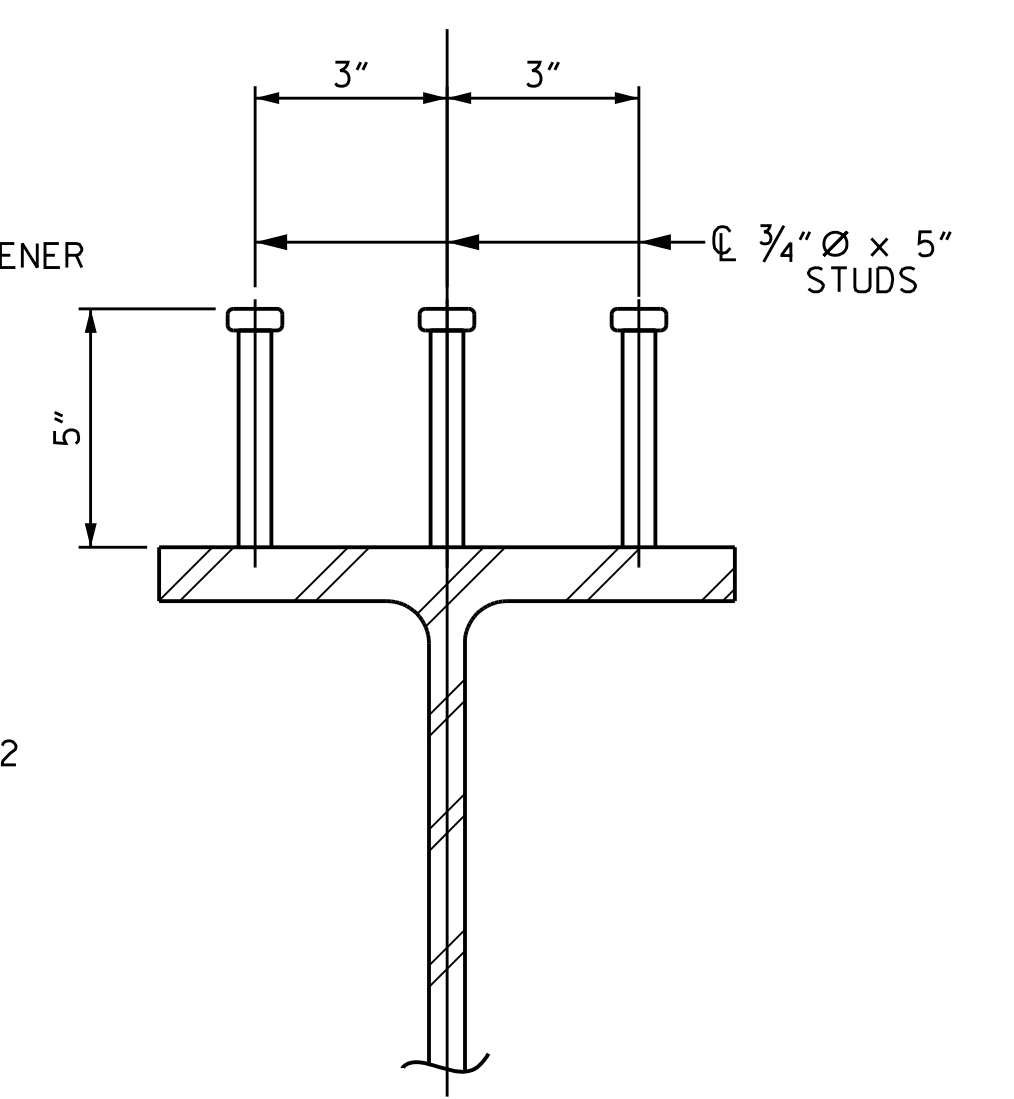
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**TGS ENGINEERS**  
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 CORP. LICENSE NO.: C-0275

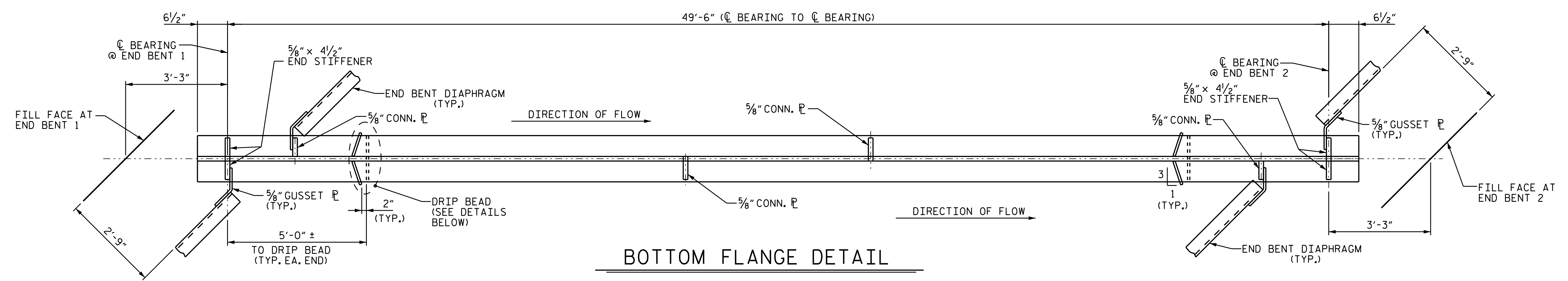
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
FRAMING PLAN					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-12
					TOTAL SHEETS 43



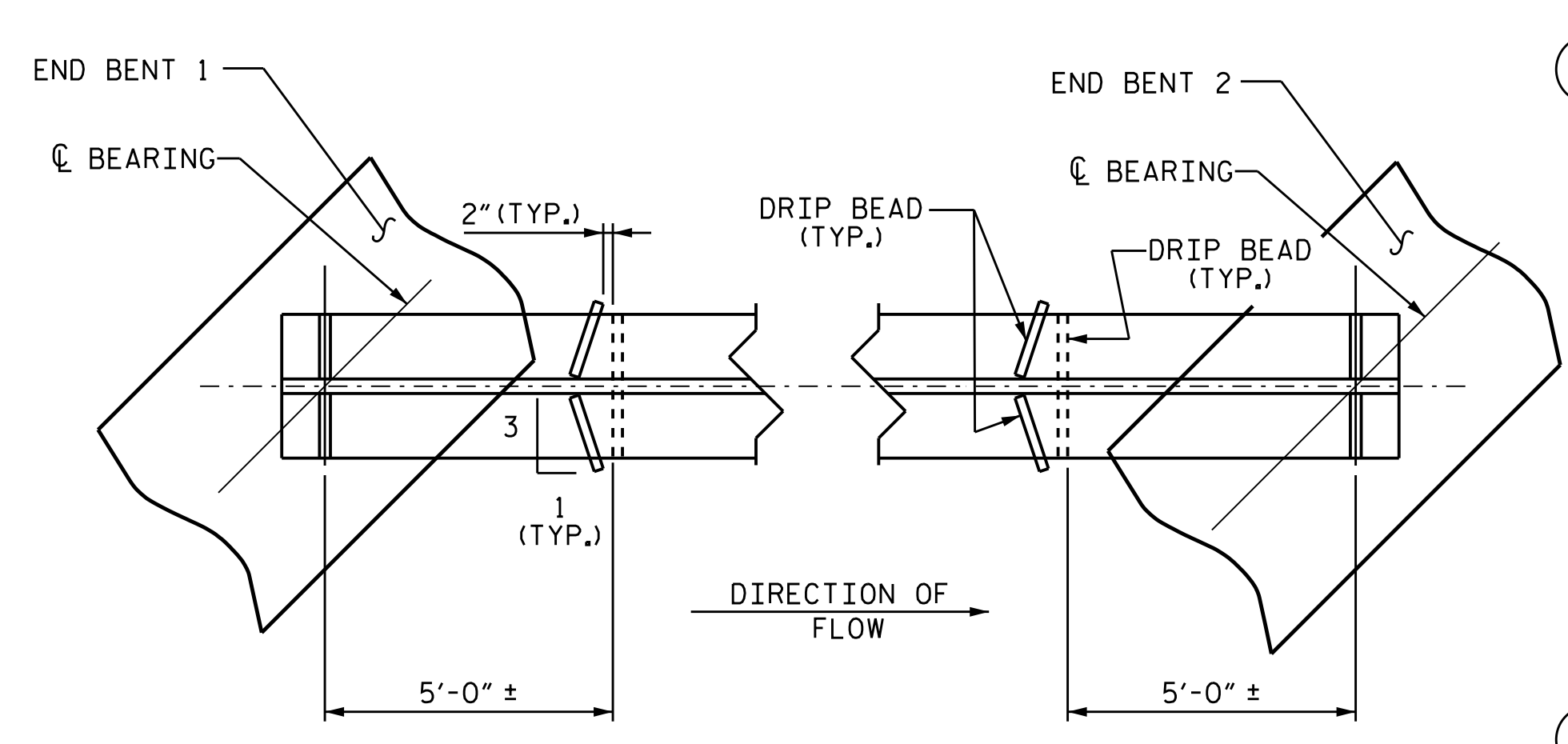
**BEAM ELEVATION W/ SHEAR STUD SPACING & STIFF. DETAILS**



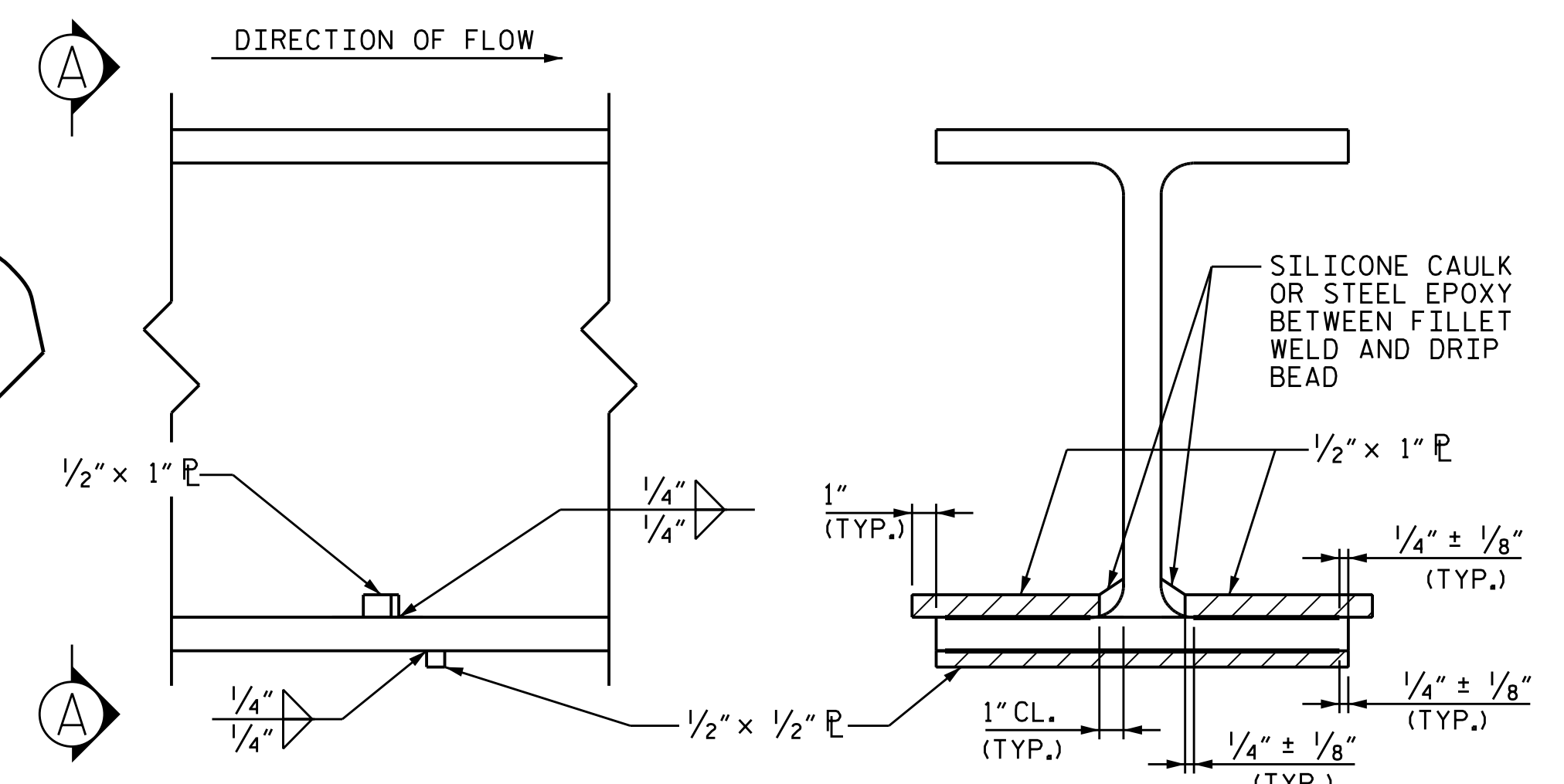
**DETAIL A**



**BOTTOM FLANGE DETAIL**



**PART PLAN - BOTTOM FLANGE**



**SECTION**

**VIEW A-A**

**DRIP BEAD DETAILS**

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
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 SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL

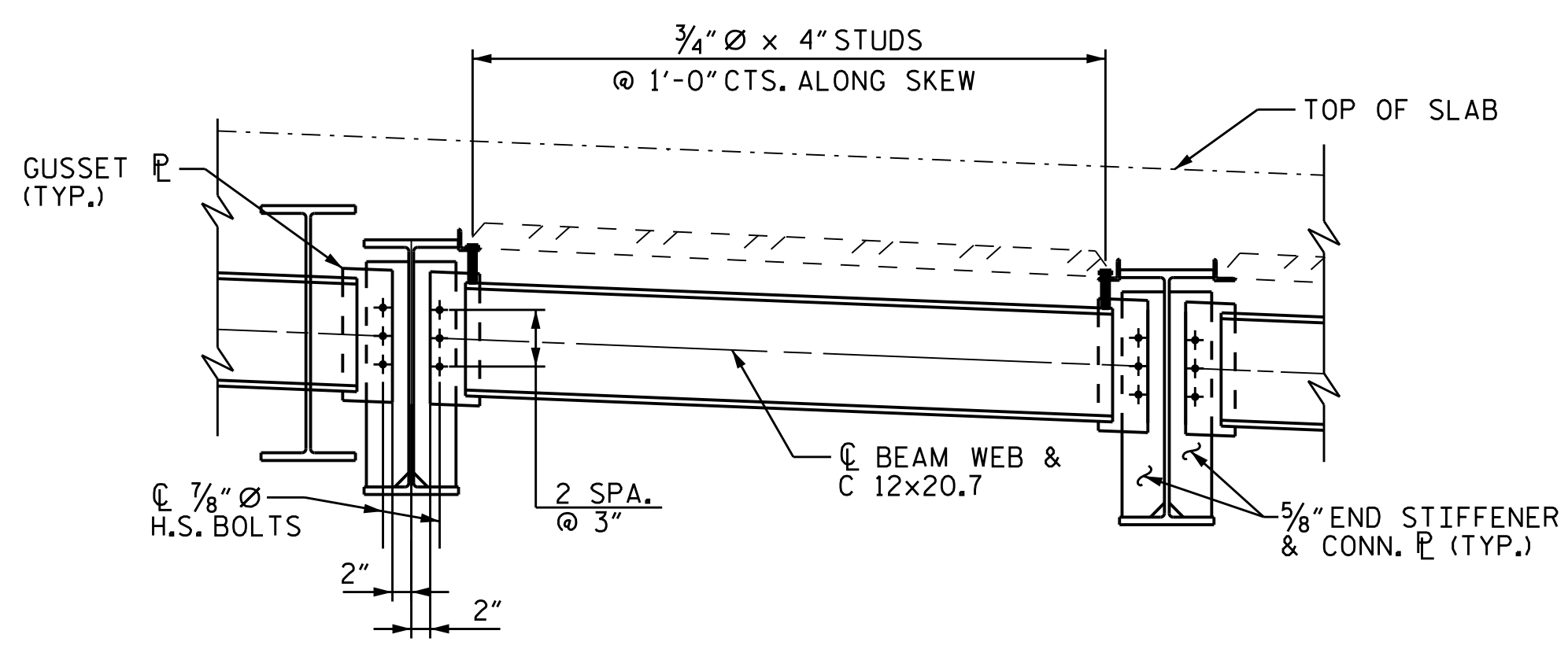
2/22/2021

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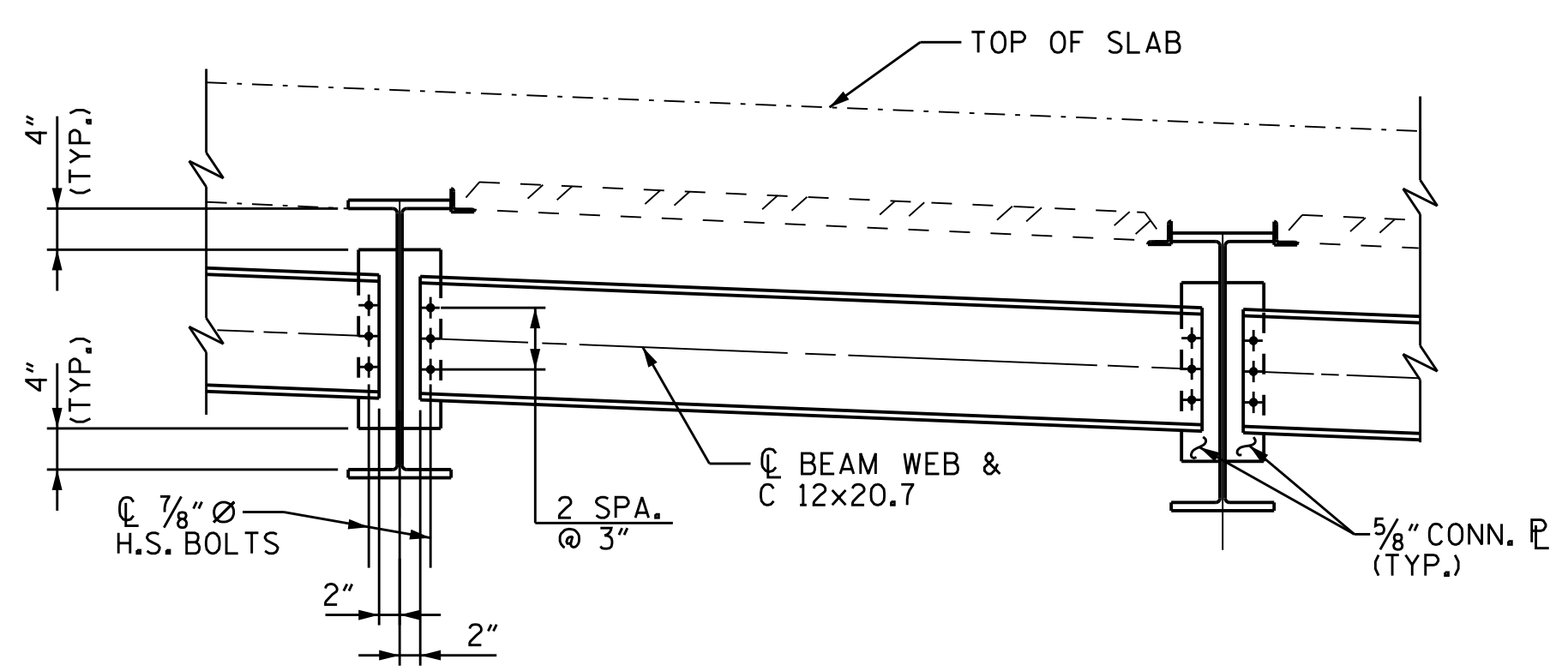
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 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
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**MARK D1 - END BENT DIAPHRAGM**



**MARK D2 - INTERMEDIATE DIAPHRAGM**

**STRUCTURAL STEEL NOTES :**  
 ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 AND PAINTED IN ACCORDANCE WITH SYSTEM 2 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

END STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE BEAM AND SHALL BE PLUMB.

TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

ENDS OF BEAMS SHALL BE PLUMB.

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.

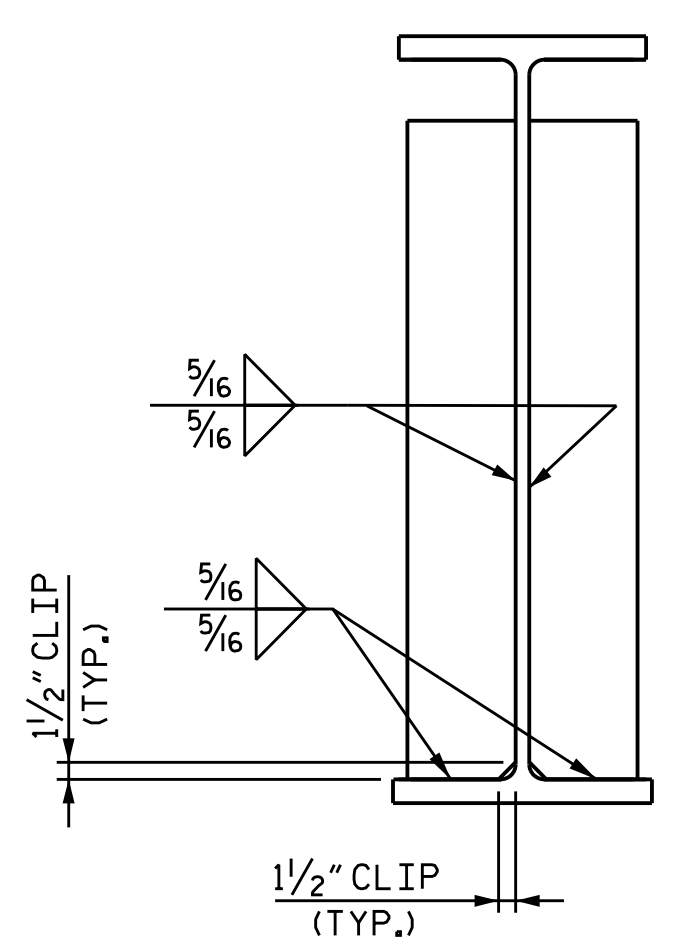
A CHARPY V-NOTCH TEST IS REQUIRED ON ALL BEAM SECTIONS IN ACCORDANCE WITH ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

NUTS AND BOLTS FOR CONNECTING CLOSURE BAY DIAPHRAGMS TO CONNECTOR PLATES SHALL BE LEFT LOOSE FOR PURPOSE OF ADJUSTMENT UNTIL BOTH STAGES HAVE BEEN POURED.

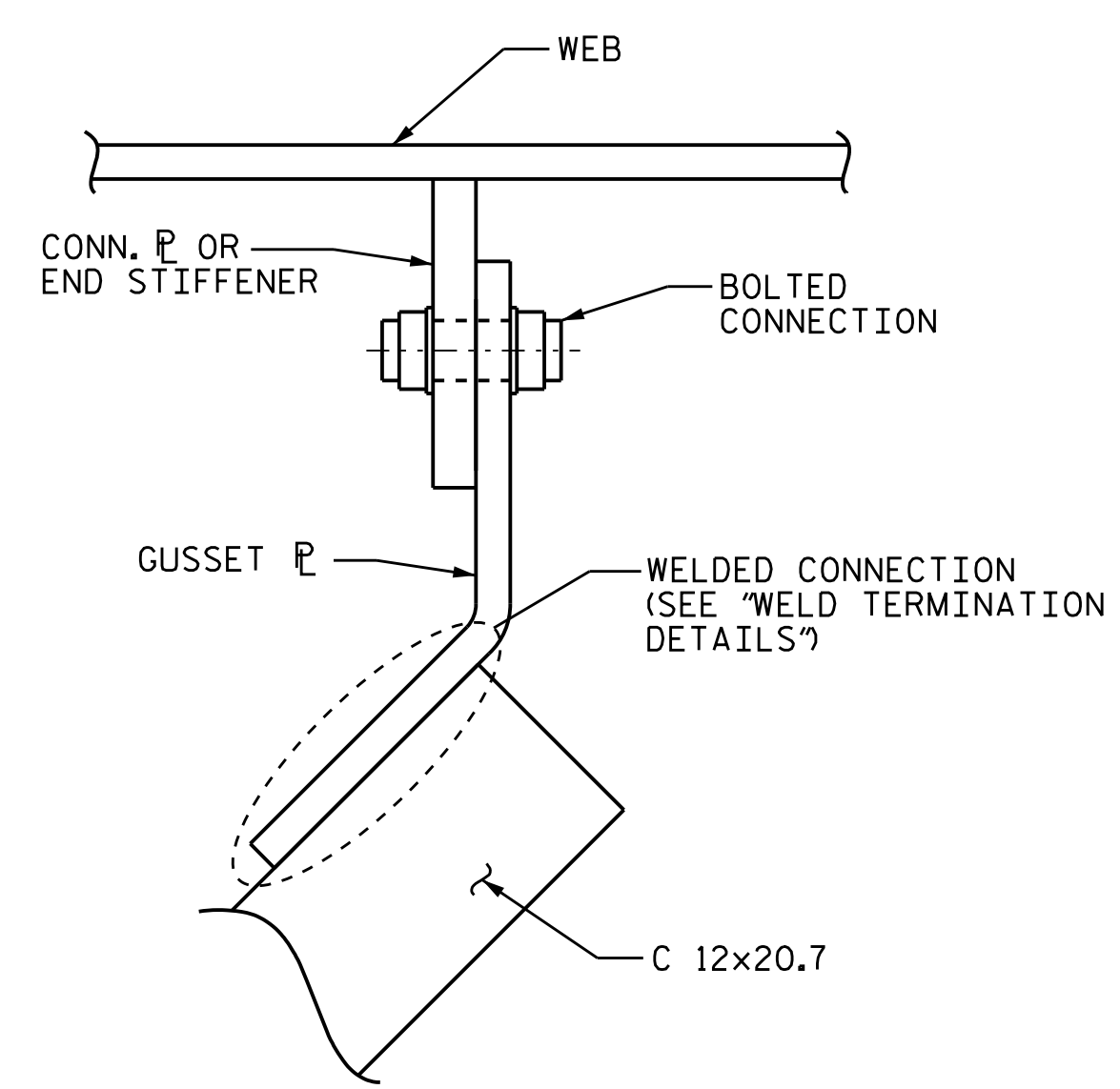
END STIFFENERS ARE NOT REQUIRED ON THE OUTSIDE OF THE EXTERIOR BEAMS.

NEEDLE BEAM TYPE SUPPORTS ARE REQUIRED FOR THE OVERHANG FALSEWORK.

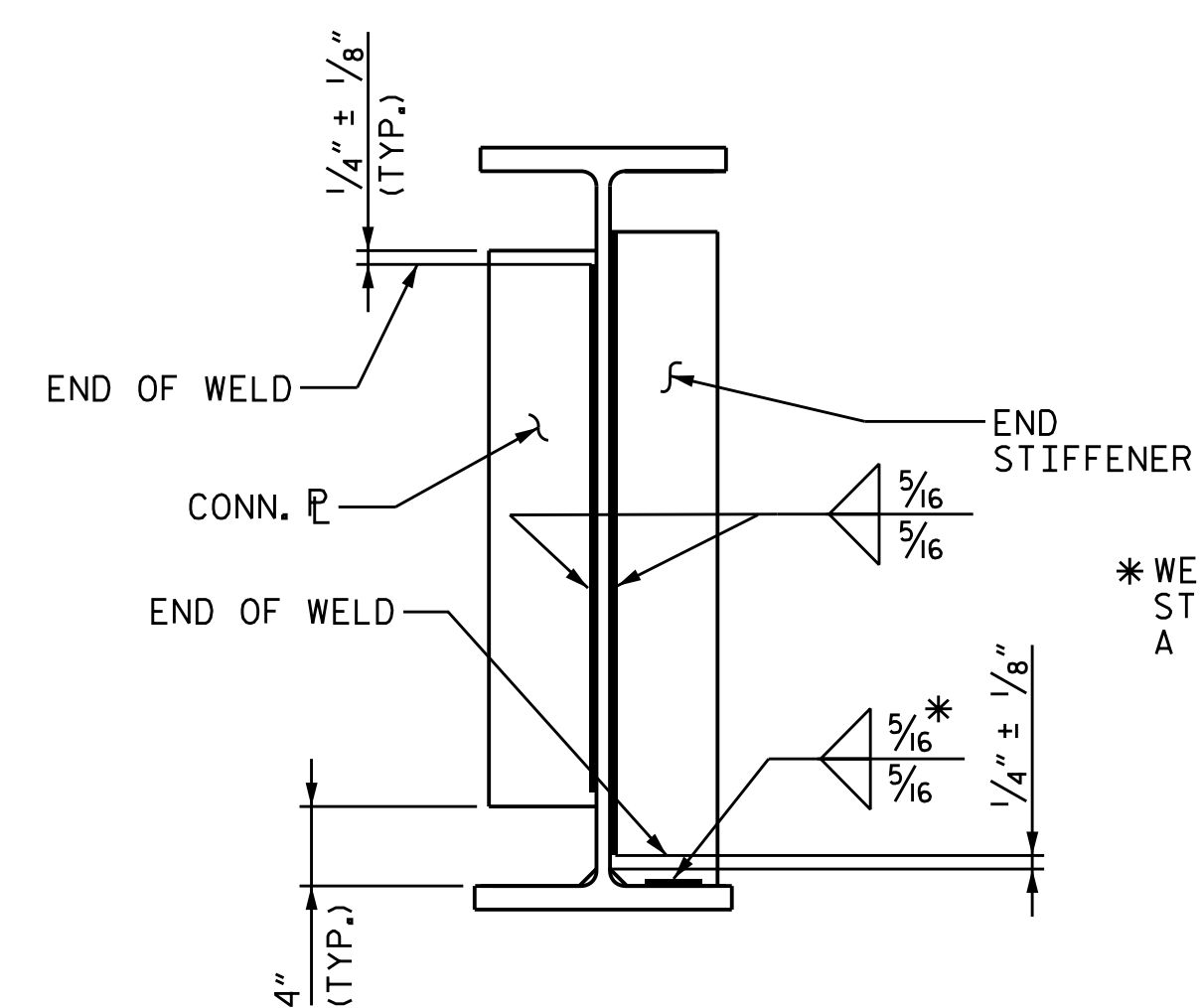
FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. BEAMS SHALL BE PLUMB AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.



**END STIFFENER**



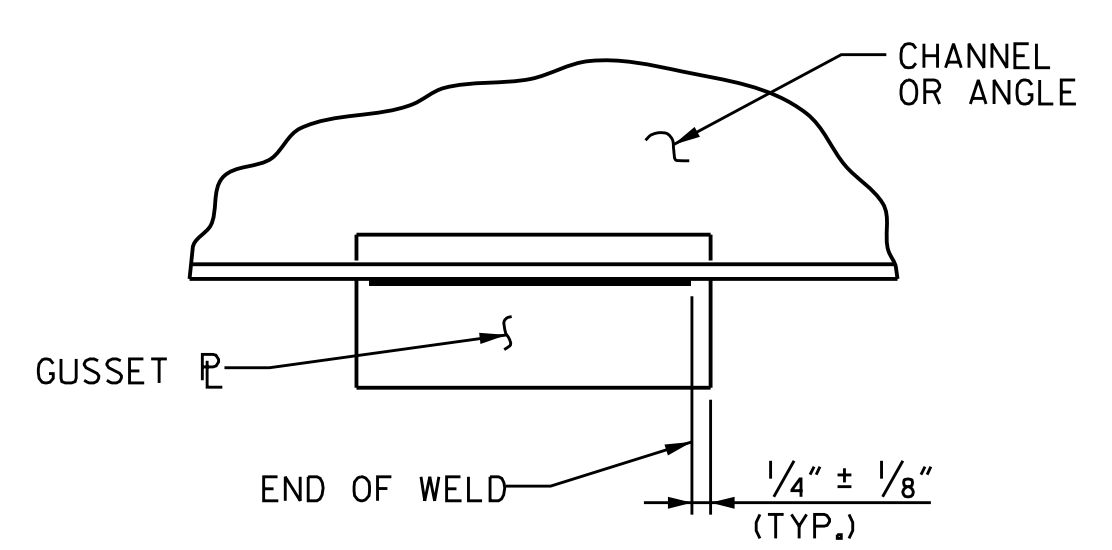
**STIFFENER/CONNECTOR PLATE WELD DETAILS**



**TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS**

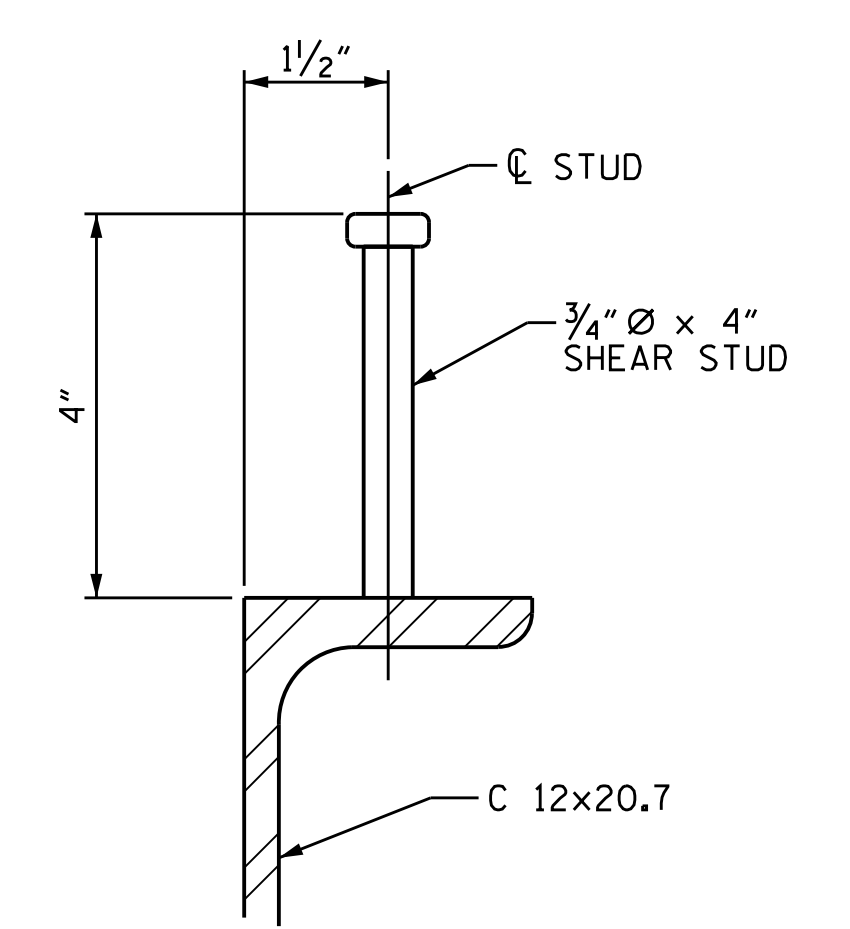
**WELD TERMINATION DETAIL**

\* WELD ONLY WHEN STIFFENER IS USED AS A CONNECTOR PLATE



**TYPICAL GUSSET PLATE CONNECTION**

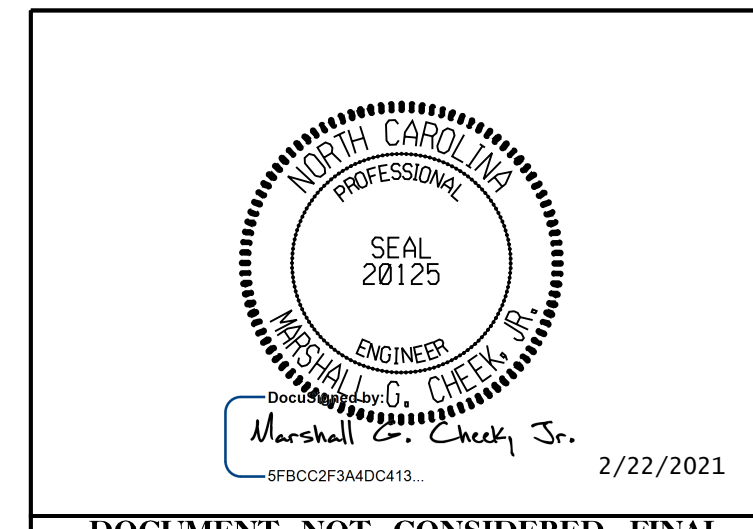
**WELD TERMINATION DETAILS**



**SHEAR STUD DETAIL**

(TYP. EACH END BENT DIAPHRAGM)

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 2 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS

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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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DEAD LOAD DEFLECTIONS																						
BEAM 1	SPAN A																					
TWENTIETH POINTS	℄ BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	℄ BRG.	
DEFLECTION DUE TO WEIGHT OF BEAM	↓	0.000	0.002	0.004	0.005	0.007	0.008	0.009	0.010	0.011	0.011	0.012	0.011	0.011	0.010	0.009	0.008	0.007	0.005	0.004	0.002	0.000
DEFLECTION DUE TO WEIGHT OF SLAB*	↓	0.000	0.008	0.016	0.023	0.030	0.036	0.041	0.045	0.048	0.050	0.050	0.050	0.048	0.045	0.041	0.036	0.030	0.023	0.016	0.008	0.000
DEFLECTION DUE TO WEIGHT OF ALASKA RAIL	↓	0.000	0.001	0.001	0.002	0.002	0.003	0.003	0.004	0.004	0.005	0.004	0.004	0.004	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.011	0.021	0.030	0.039	0.047	0.053	0.059	0.063	0.066	0.066	0.065	0.063	0.059	0.053	0.047	0.039	0.030	0.021	0.011	0.000
REQUIRED CAMBER	↑	0	1/8"	1/4"	3/8"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	13/16"	13/16"	3/4"	11/16"	5/8"	9/16"	1/2"	3/8"	1/4"	1/8"	0

\* INCLUDES SLAB, BUILD-UP AND STAY-IN-PLACE FORMS.  
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM) EXCEPT "REQUIRED CAMBER", WHICH IS SHOWN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTIONS																						
BEAM 2	SPAN A																					
TWENTIETH POINTS	℄ BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	℄ BRG.	
DEFLECTION DUE TO WEIGHT OF BEAM	↓	0.000	0.004	0.008	0.012	0.015	0.018	0.020	0.023	0.024	0.025	0.025	0.024	0.023	0.020	0.018	0.015	0.012	0.008	0.004	0.000	0.000
DEFLECTION DUE TO WEIGHT OF SLAB*	↓	0.000	0.001	0.001	0.002	0.002	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.000	0.000
DEFLECTION DUE TO WEIGHT OF ALASKA RAIL	↓	0.000	0.001	0.001	0.002	0.002	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.006	0.010	0.016	0.019	0.024	0.026	0.031	0.032	0.033	0.033	0.032	0.031	0.026	0.024	0.019	0.016	0.010	0.006	0.000	0.000
REQUIRED CAMBER	↑	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**

\* INCLUDES SLAB, BUILD-UP AND STAY-IN-PLACE FORMS.  
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM) EXCEPT "REQUIRED CAMBER", WHICH IS SHOWN IN INCHES (FRACTION FORM).  
 \*\* NO SHOP CAMBER REQUIRED, TURN NATURAL MILL CAMBER UP.

DEAD LOAD DEFLECTIONS																						
BEAM 3	SPAN A																					
TWENTIETH POINTS	℄ BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	℄ BRG.	
DEFLECTION DUE TO WEIGHT OF BEAM	↓	0.000	0.003	0.007	0.010	0.012	0.015	0.017	0.019	0.020	0.021	0.021	0.020	0.019	0.017	0.015	0.012	0.010	0.007	0.003	0.000	0.000
DEFLECTION DUE TO WEIGHT OF SLAB*	↓	0.000	0.001	0.001	0.002	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.002	0.001	0.001	0.000	0.000
DEFLECTION DUE TO WEIGHT OF ALASKA RAIL	↓	0.000	0.001	0.001	0.002	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.002	0.001	0.001	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.005	0.009	0.014	0.018	0.021	0.023	0.027	0.029	0.029	0.029	0.028	0.027	0.023	0.021	0.018	0.014	0.009	0.005	0.000	0.000
REQUIRED CAMBER	↑	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**

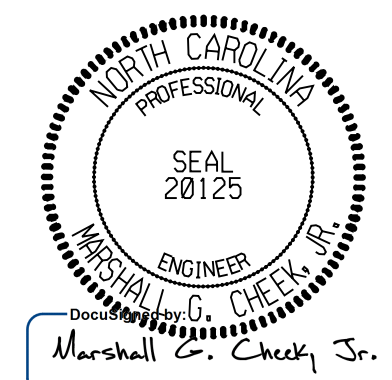
\* INCLUDES SLAB, BUILD-UP AND STAY-IN-PLACE FORMS.  
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM) EXCEPT "REQUIRED CAMBER", WHICH IS SHOWN IN INCHES (FRACTION FORM).  
 \*\* NO SHOP CAMBER REQUIRED, TURN NATURAL MILL CAMBER UP.

PROJECT NO. 17BP.14.R.211

MACON COUNTY

STATION: 16+13.00-L-

SHEET 1 OF 2

 MARSHALL G. CHEEK, JR. ENGINEER 2/22/2021	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SHEET NO. S-15
	SUPERSTRUCTURE DEAD LOAD DEFLECTIONS		TOTAL SHEETS 43
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		REVISIONS	
TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275		NO. 1 BY: [ ] DATE: [ ]	NO. 3 BY: [ ] DATE: [ ]
TGS ENGINEERS		NO. 2 BY: [ ] DATE: [ ]	NO. 4 BY: [ ] DATE: [ ]

DRAWN BY : NMW      DATE : 3/19  
 CHECKED BY : MGC      DATE : 2/21  
 DESIGN ENGINEER OF RECORD : MGC      DATE : 2/21



DEAD LOAD DEFLECTIONS																						
BEAM 4	SPAN A																					
TWENTIETH POINTS	CL BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	CL BRG.	
DEFLECTION DUE TO WEIGHT OF BEAM	↓	0.000	0.002	0.004	0.005	0.007	0.008	0.009	0.010	0.011	0.011	0.012	0.011	0.011	0.010	0.009	0.008	0.007	0.005	0.004	0.002	0.000
DEFLECTION DUE TO WEIGHT OF SLAB*	↓	0.000	0.009	0.018	0.026	0.034	0.040	0.046	0.051	0.054	0.056	0.057	0.056	0.054	0.051	0.046	0.040	0.034	0.026	0.018	0.009	0.000
DEFLECTION DUE TO WEIGHT OF ALASKA RAIL	↓	0.000	0.002	0.003	0.005	0.006	0.007	0.008	0.009	0.010	0.010	0.010	0.010	0.010	0.009	0.008	0.007	0.006	0.005	0.003	0.002	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.013	0.025	0.036	0.047	0.055	0.063	0.070	0.075	0.077	0.079	0.077	0.075	0.070	0.063	0.055	0.047	0.036	0.025	0.013	0.000
REQUIRED CAMBER	↑	0	1/8"	5/16"	7/16"	9/16"	11/16"	3/4"	13/16"	7/8"	15/16"	15/16"	15/16"	7/8"	13/16"	3/4"	11/16"	9/16"	7/16"	5/16"	1/8"	0

\* INCLUDES SLAB, BUILD-UP AND STAY-IN-PLACE FORMS.  
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM) EXCEPT "REQUIRED CAMBER", WHICH IS SHOWN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTIONS																						
BEAM 5	SPAN A																					
TWENTIETH POINTS	CL BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	CL BRG.	
DEFLECTION DUE TO WEIGHT OF BEAM	↓	0.000	0.002	0.004	0.005	0.007	0.008	0.009	0.010	0.011	0.011	0.012	0.011	0.011	0.010	0.009	0.008	0.007	0.005	0.004	0.002	0.000
DEFLECTION DUE TO WEIGHT OF SLAB*	↓	0.000	0.013	0.025	0.036	0.047	0.056	0.064	0.070	0.075	0.078	0.079	0.078	0.075	0.070	0.064	0.056	0.047	0.036	0.025	0.013	0.000
DEFLECTION DUE TO WEIGHT OF ALASKA RAIL	↓	0.000	0.001	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.009	0.009	0.009	0.009	0.008	0.007	0.006	0.005	0.004	0.003	0.001	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.016	0.032	0.045	0.059	0.070	0.080	0.088	0.095	0.098	0.100	0.098	0.095	0.088	0.080	0.070	0.059	0.045	0.032	0.016	0.000
REQUIRED CAMBER	↑	0	3/16"	3/8"	9/16"	11/16"	7/8"	1"	11/16"	11/8"	13/16"	13/16"	13/16"	11/8"	11/16"	1"	7/8"	11/16"	9/16"	3/8"	3/16"	0

\* INCLUDES SLAB, BUILD-UP AND STAY-IN-PLACE FORMS.  
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM) EXCEPT "REQUIRED CAMBER", WHICH IS SHOWN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTIONS																						
BEAM 6	SPAN A																					
TWENTIETH POINTS	CL BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	CL BRG.	
DEFLECTION DUE TO WEIGHT OF BEAM	↓	0.000	0.002	0.004	0.005	0.007	0.008	0.009	0.010	0.011	0.011	0.012	0.011	0.011	0.010	0.009	0.008	0.007	0.005	0.004	0.002	0.000
DEFLECTION DUE TO WEIGHT OF SLAB*	↓	0.000	0.011	0.021	0.031	0.040	0.048	0.055	0.060	0.064	0.067	0.067	0.067	0.064	0.060	0.055	0.048	0.040	0.031	0.021	0.011	0.000
DEFLECTION DUE TO WEIGHT OF ALASKA RAIL	↓	0.000	0.002	0.003	0.004	0.006	0.007	0.008	0.009	0.009	0.009	0.010	0.009	0.009	0.009	0.008	0.007	0.006	0.004	0.003	0.002	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.015	0.028	0.040	0.053	0.063	0.072	0.079	0.083	0.087	0.089	0.087	0.083	0.079	0.072	0.063	0.053	0.040	0.028	0.015	0.000
REQUIRED CAMBER	↑	0	3/16"	5/16"	1/2"	5/8"	3/4"	7/8"	15/16"	1"	11/16"	11/16"	11/16"	1"	15/16"	7/8"	3/4"	5/8"	1/2"	5/16"	3/16"	0

\* INCLUDES SLAB, BUILD-UP AND STAY-IN-PLACE FORMS.  
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM) EXCEPT "REQUIRED CAMBER", WHICH IS SHOWN IN INCHES (FRACTION FORM).

PROJECT NO. 17BP.14.R.211  
 \_\_\_\_\_  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 \_\_\_\_\_

SHEET 2 OF 2

	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SUPERSTRUCTURE DEAD LOAD DEFLECTIONS		SHEET NO. S-16
	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED				TOTAL SHEETS 43
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		

DRAWN BY : NMW DATE : 3/19  
 CHECKED BY : MGC DATE : 2/21  
 DESIGN ENGINEER OF RECORD : MGC DATE : 2/21

### 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.

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR AASHTO M270 GRADE 50 STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50 AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

WHEN FIELD WELDING THE SOLE PLATE TO THE BEAM FLANGE, 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.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

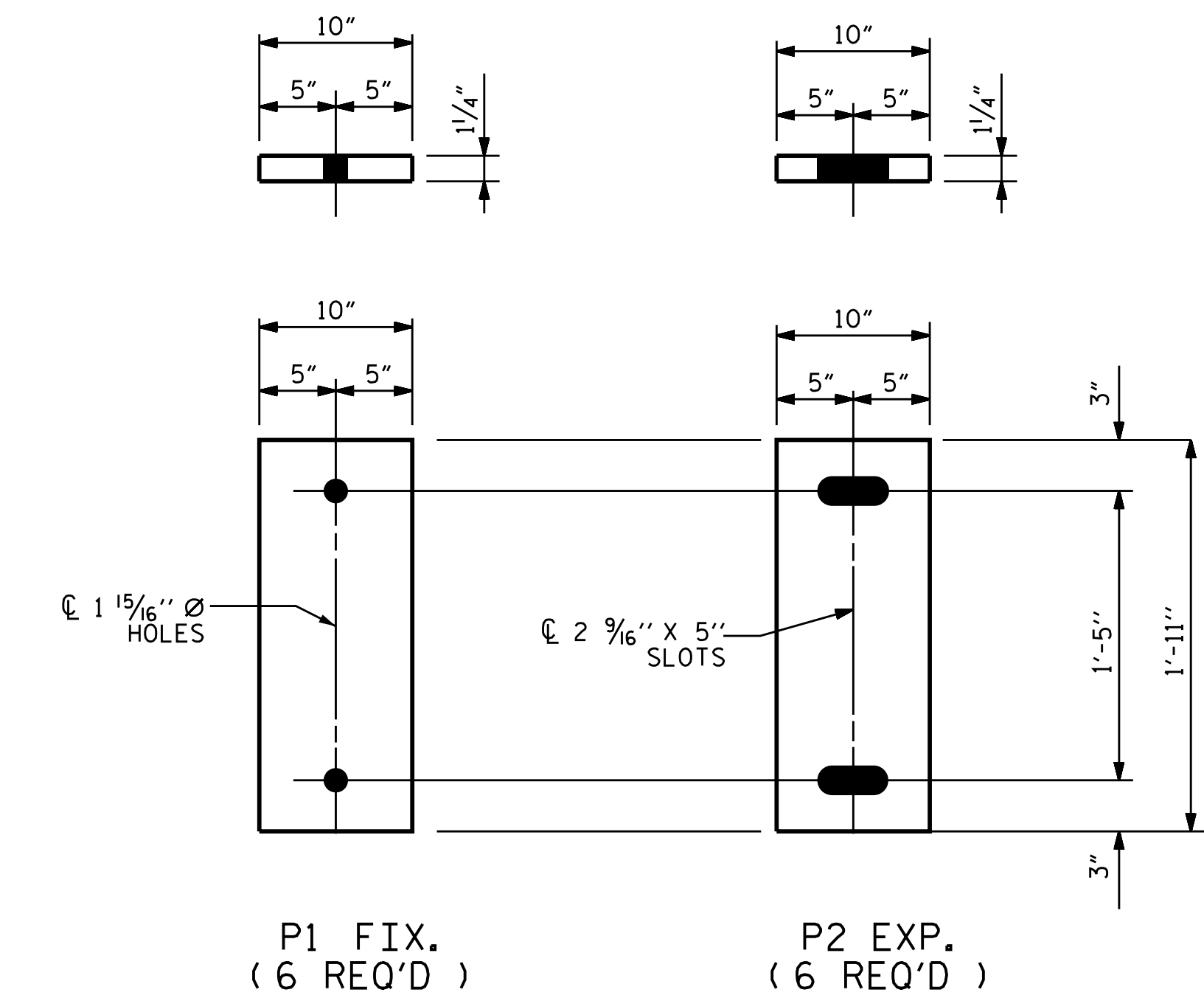
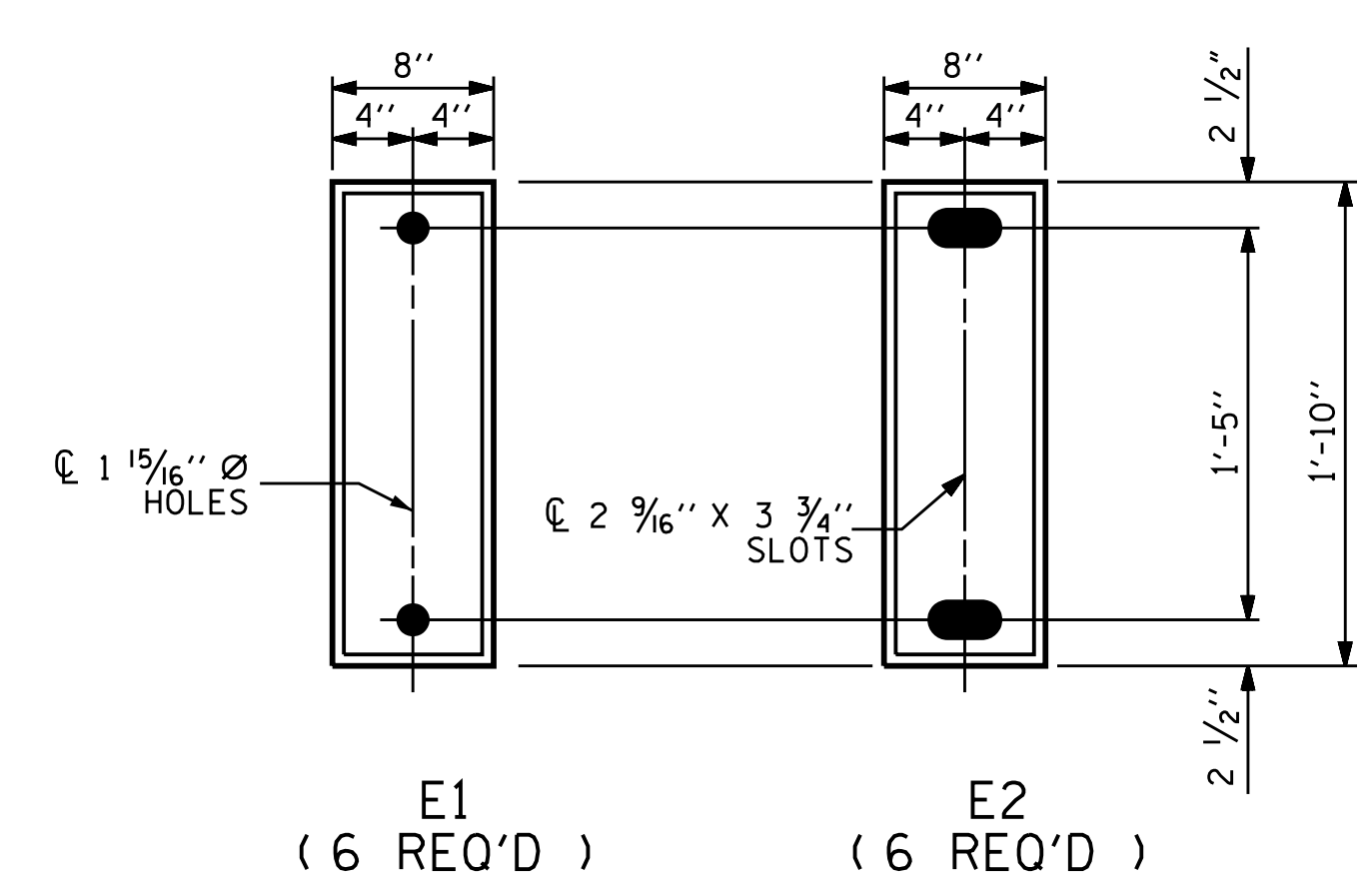
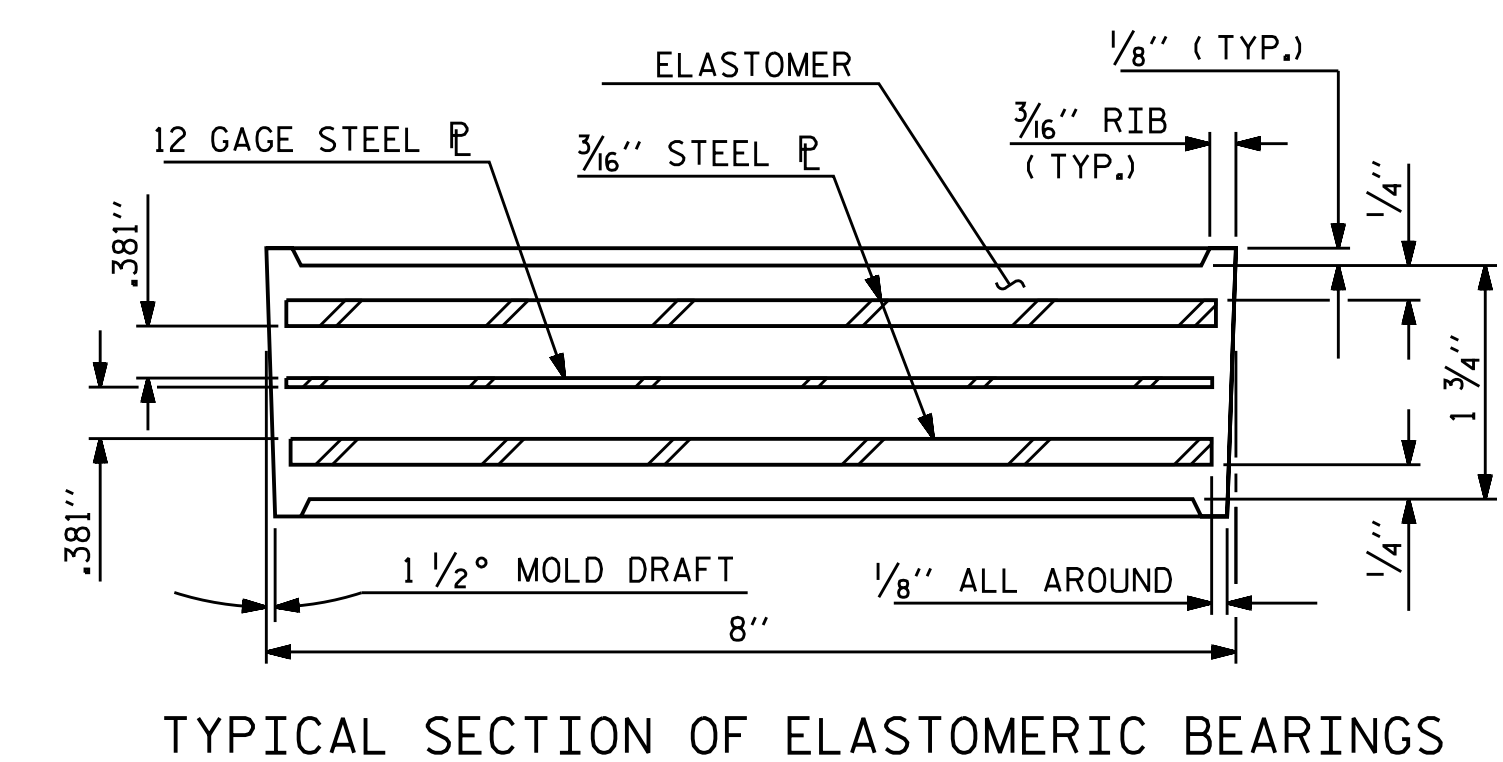
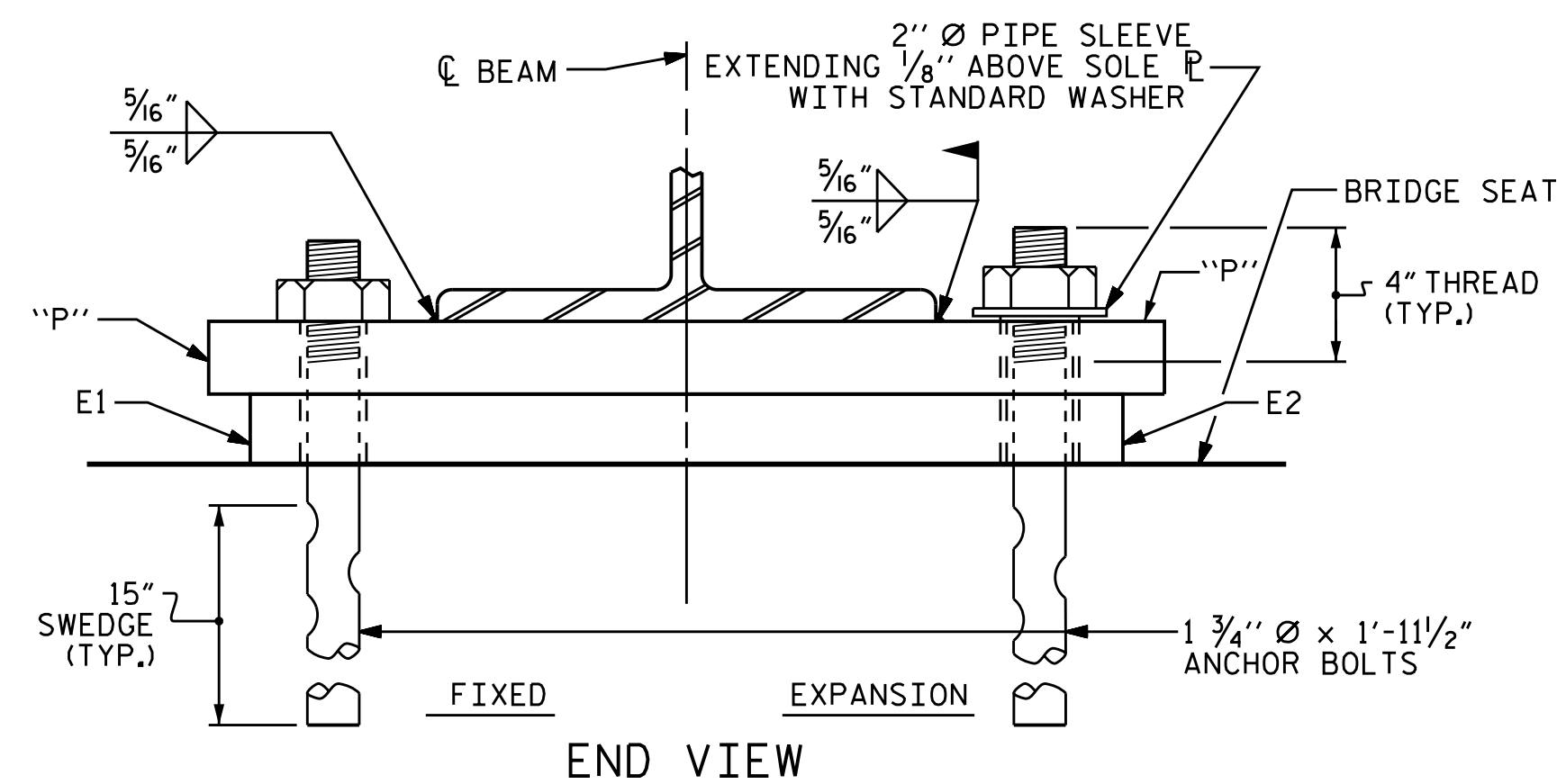
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURE, WHICH MAY BE REQUIRED BY THE ENGINEER, TO RESET ELASTOMERIC BEARINGS DUE TO GIRDER TRANSLATION AND END ROTATION:

- ONCE THE DECK HAS CURED, THE BEAMS SHALL BE JACKED AND THE ELASTOMERIC BEARING SLOTS CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60° F.

THE CONTRACTOR MAY PROPOSE ALTERNATE METHODS, PROVIDED DETAILS ARE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.



SOLE PLATE DETAILS ("P")

PLAN VIEW OF ELASTOMERIC BEARING

TYPE I

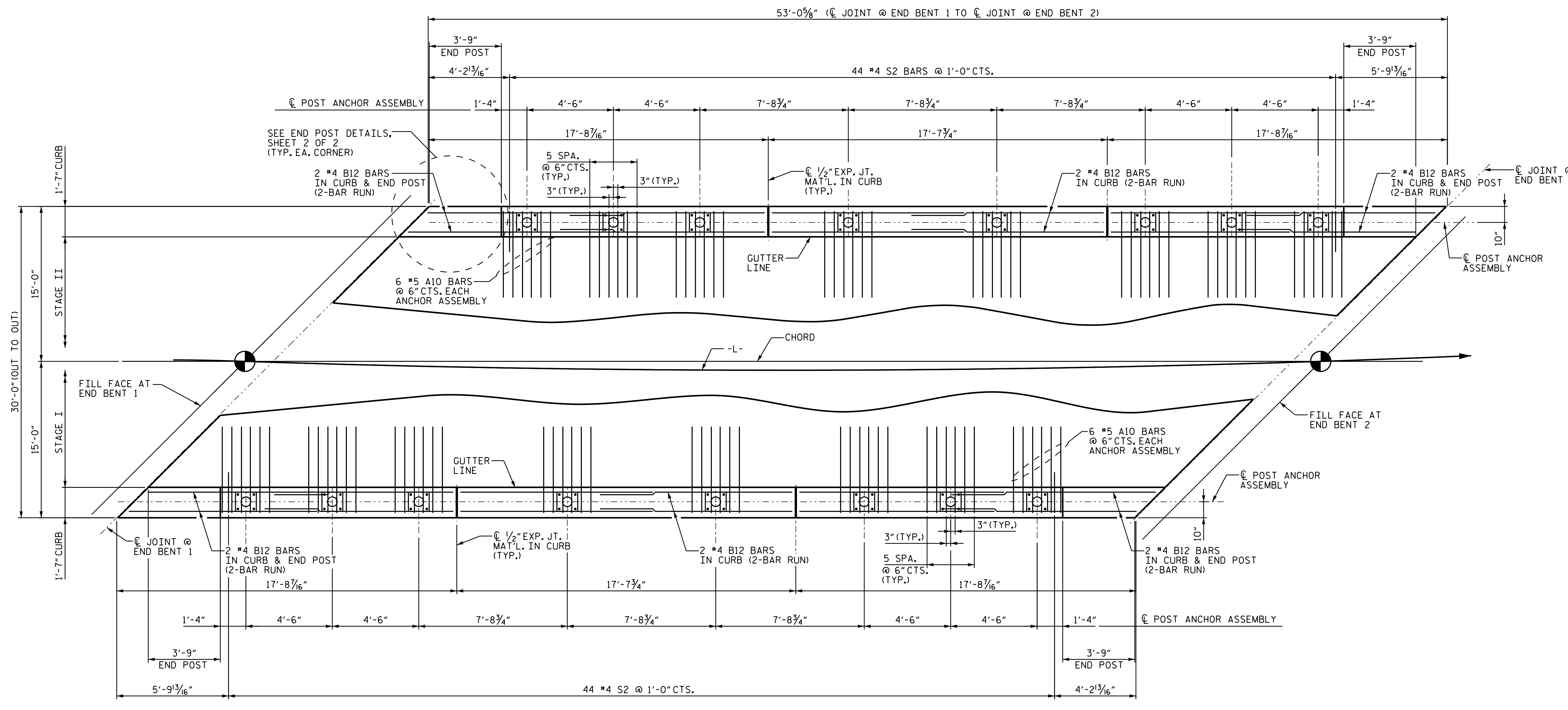
MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE I	105 k

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-

ASSEMBLED BY : NMW	DATE : 3/19
CHECKED BY : MGC	DATE : 7/19
DRAWN BY : JMB 11/87	REV. 10/1/11 MAA/GM
CHECKED BY : ARB 11/87	REV. 6/13 AAC/MAA
	REV. 12/17 MAA/THC

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 ELASTOMERIC BEARING DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-17
					TOTAL SHEETS 43



### PLAN OF CURB FOR 32" ALASKA RAIL

NOTE: #4 S2, #4 S3, & #5 A10 BARS ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIAL

PROJECT NO. 17BP.14.R.211

MACON COUNTY

STATION: 16+13.00-L-

SHEET 1 OF 2

DRAWN BY : NMW DATE : 3/19  
 CHECKED BY : MGC DATE : 7/19  
 DESIGN ENGINEER OF RECORD : MGC DATE : 7/19

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

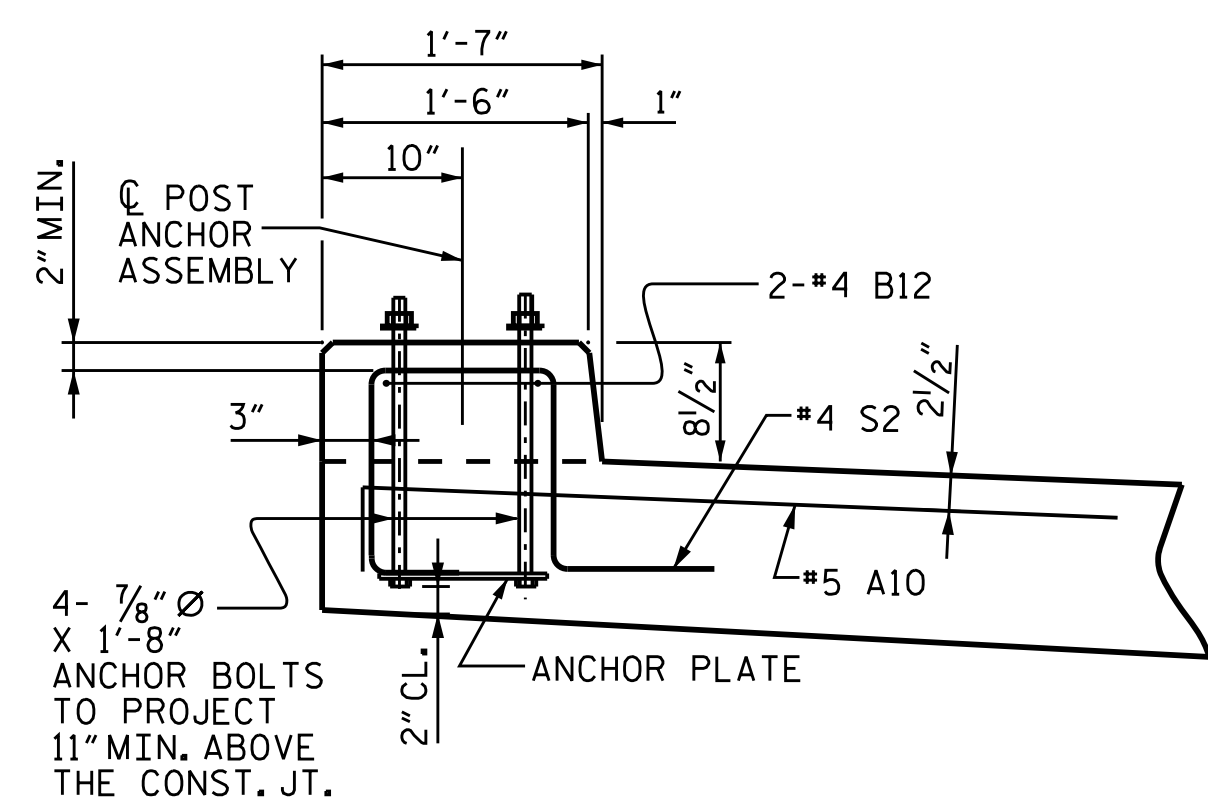
SUPERSTRUCTURE  
 PLAN OF CURB FOR  
 32" ALASKA RAIL

SEAL 20125  
 MARSHALL G. CHECK, JR.  
 ENGINEER  
 2/22/2021

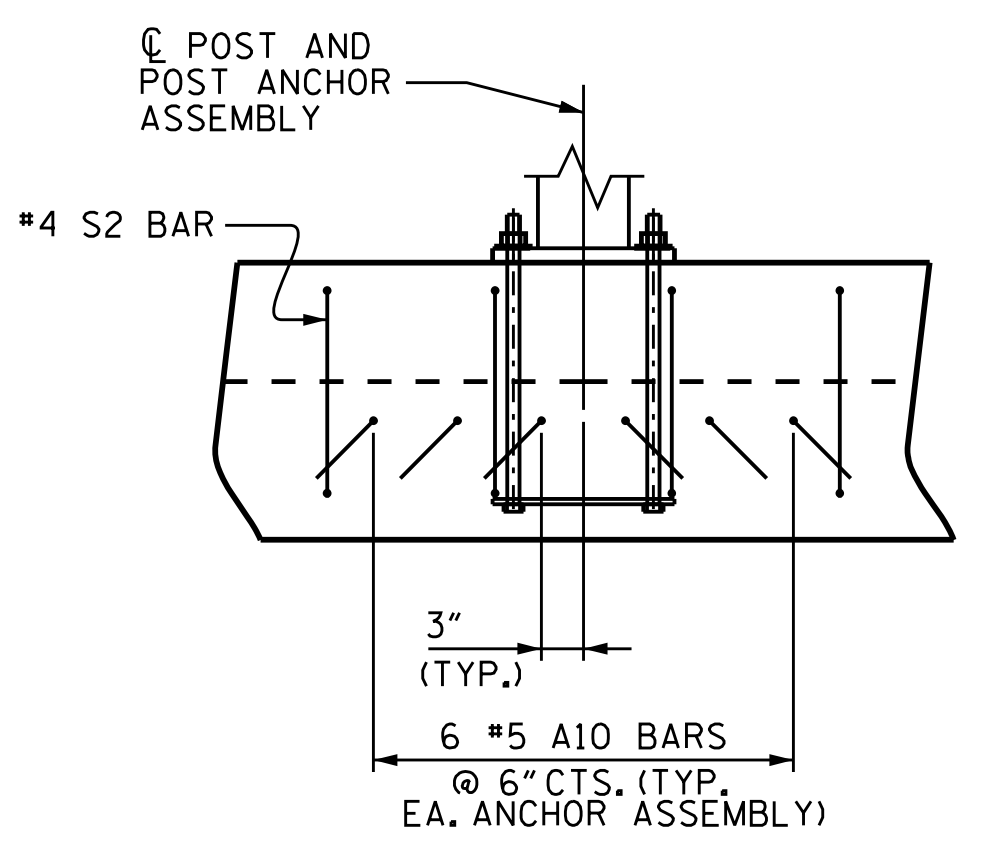
DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

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-18
1			3			TOTAL SHEETS
2			4			43



**ALASKA RAIL CURB SECTION**



**SIDE VIEW AT POST LOCATION**

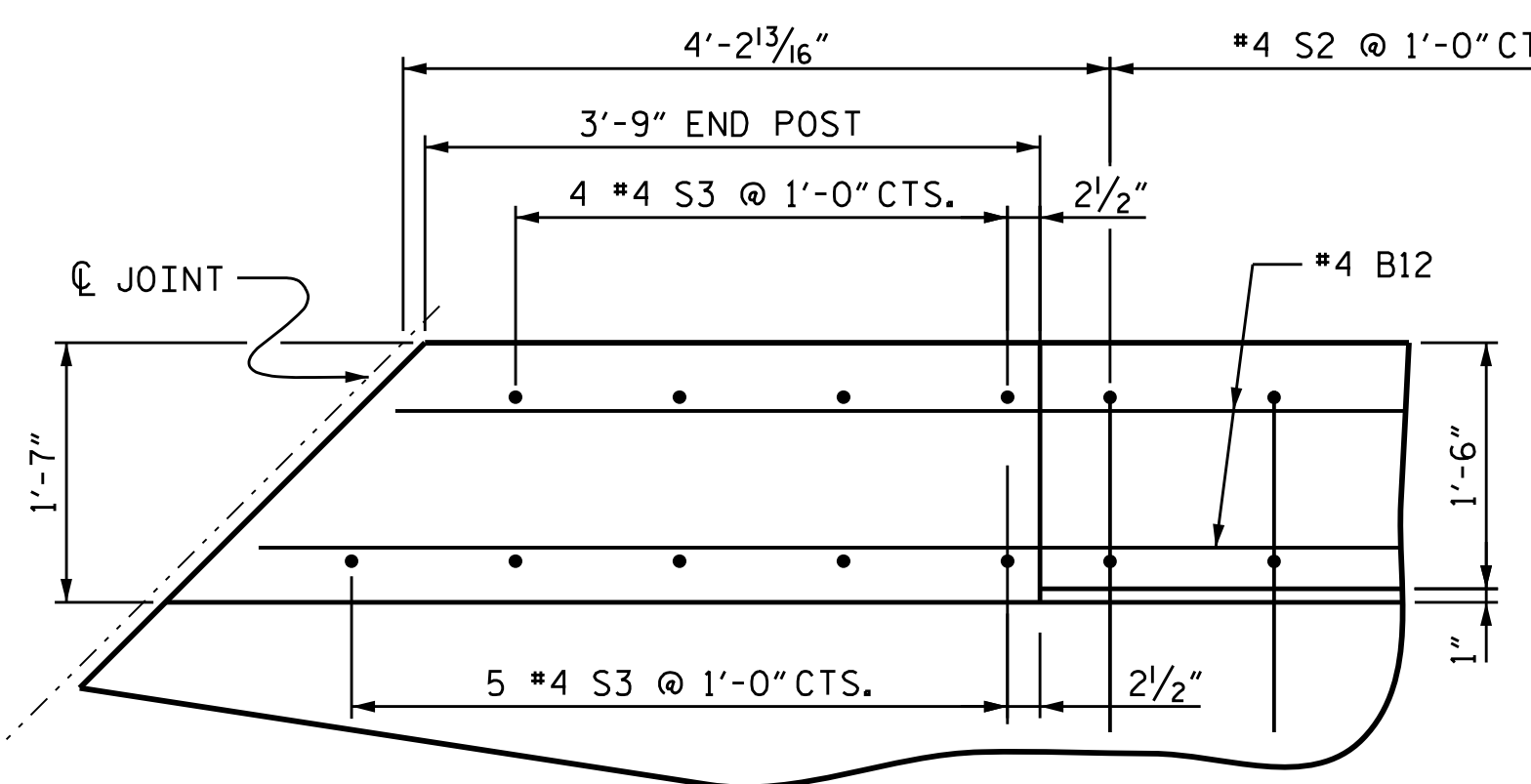
(SHOWING ADDITIONAL A10 BARS AT EACH POST ASSEMBLY)

**BILL OF MATERIAL FOR END POSTS AND CURB STAGE I**

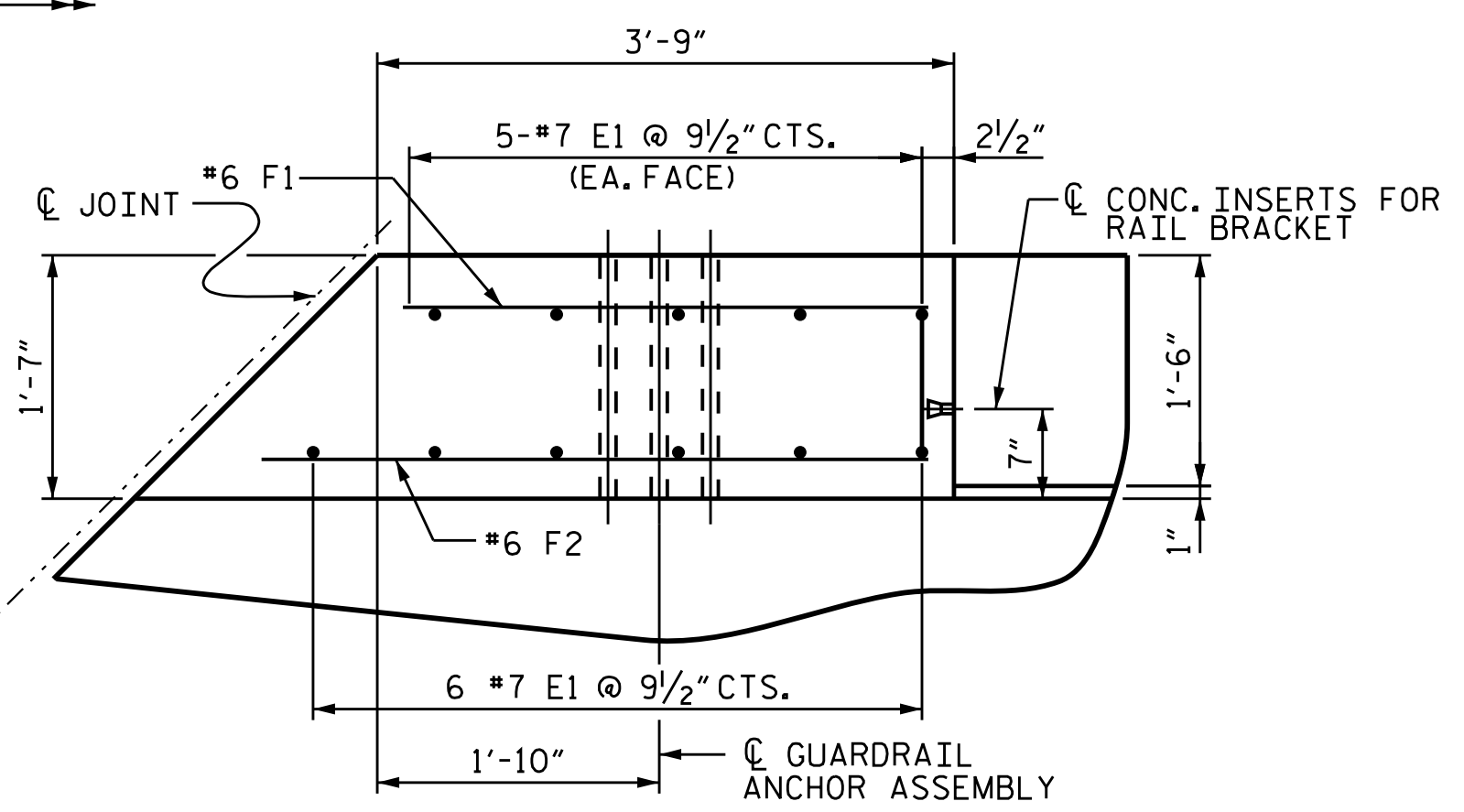
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
*B12	12	#4	STR	10'-8"	86
*E1	22	#7	STR	2'-8"	120
*F1	8	#6	STR	3'-7"	43
*F2	8	#6	STR	4'-10"	58
*EPOXY COATED REINFORCING STEEL					307 LBS
CLASS AA CONCRETE					3.7 CY

**BILL OF MATERIAL FOR END POSTS AND CURB STAGE II**

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
*B12	12	#4	STR	10'-8"	86
*E1	22	#7	STR	2'-8"	120
*F1	8	#6	STR	3'-7"	43
*F2	8	#6	STR	4'-10"	58
*EPOXY COATED REINFORCING STEEL					307 LBS
CLASS AA CONCRETE					3.7 CY

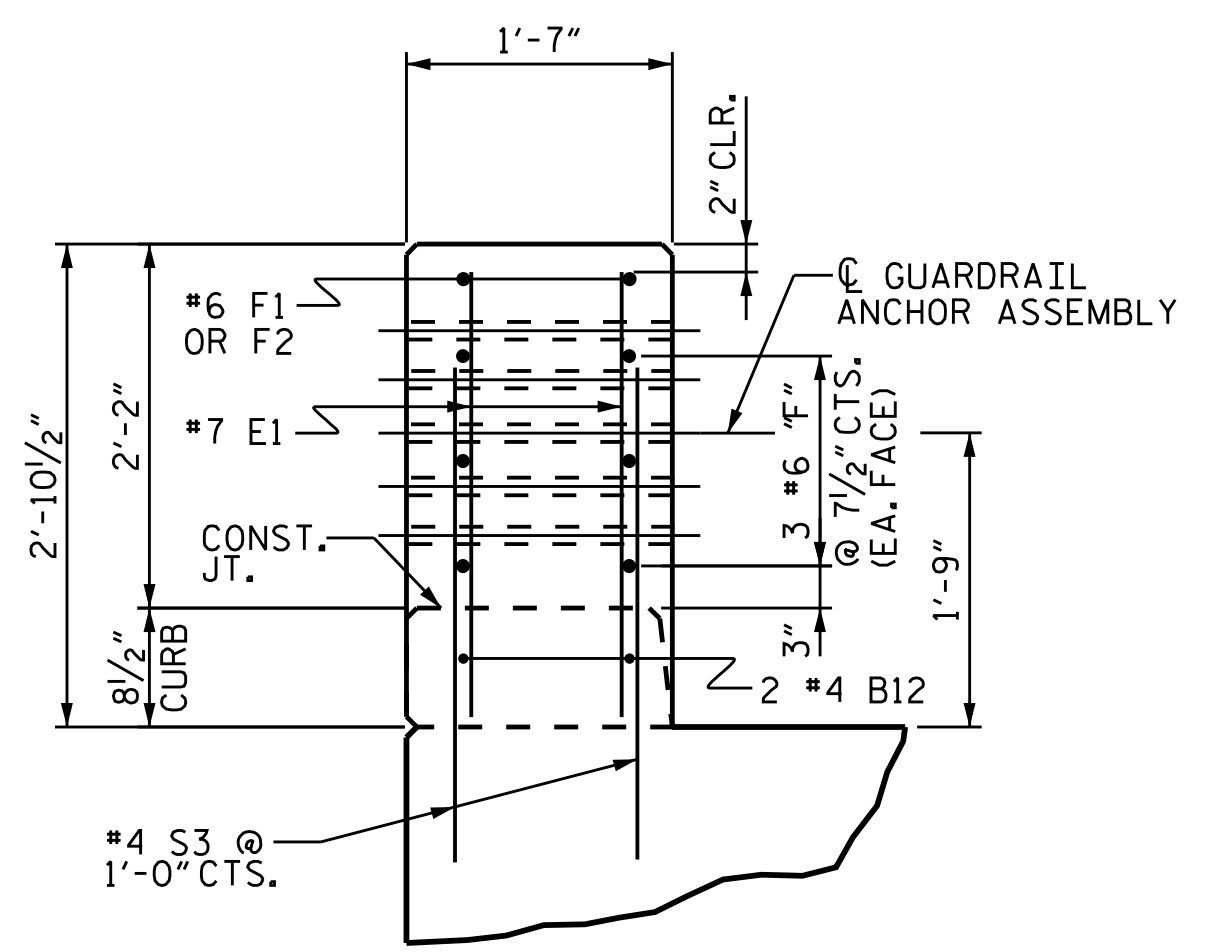


**PLAN OF CURB**

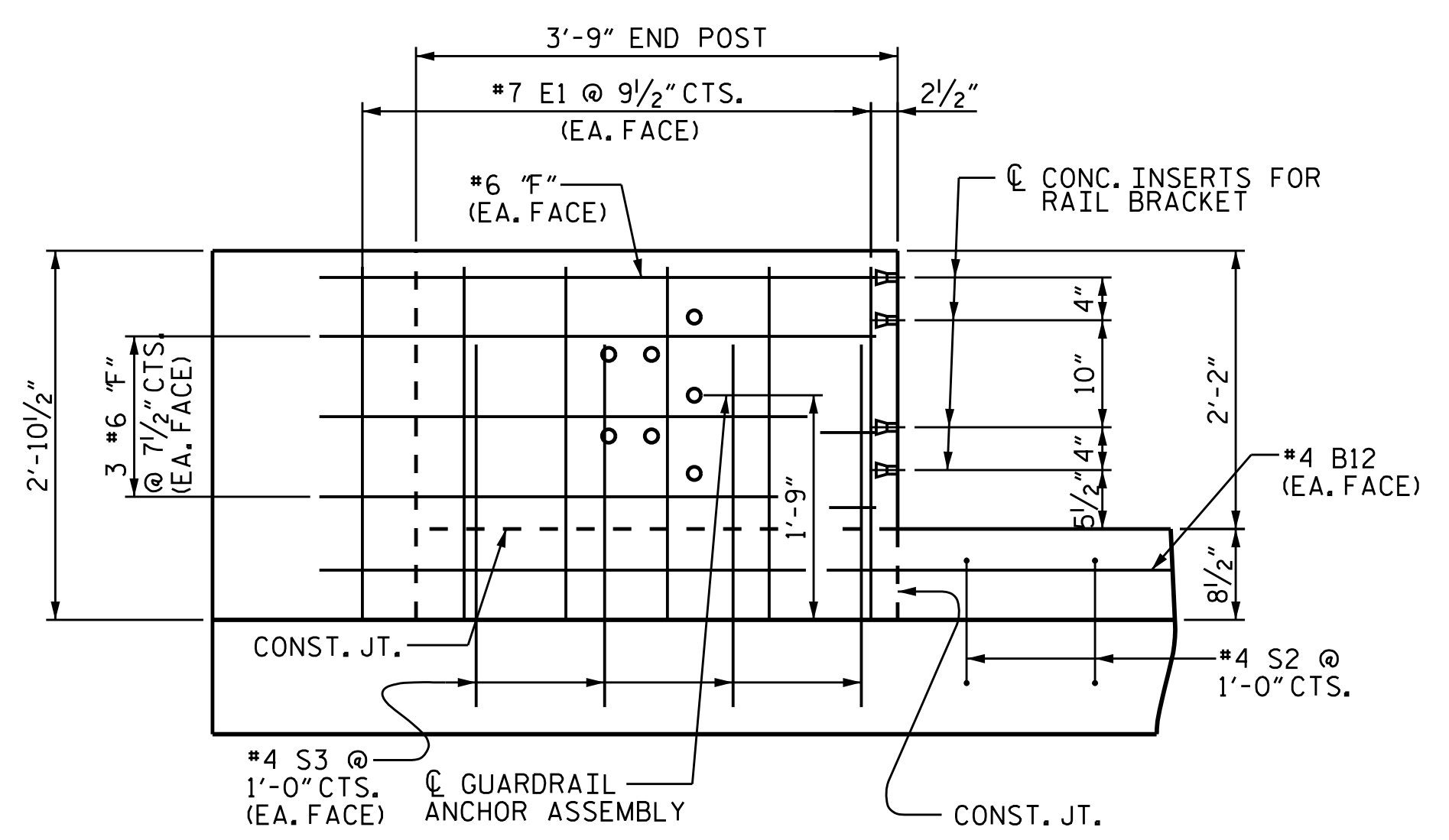


**PLAN OF END POST**

REINFORCING STEEL IN END POST MAYBE SHIFTED SLIGHTLY TO AVOID GUARDRAIL ANCHOR ASSEMBLY.



**END VIEW**



**ELEVATION**

**CURB AND END POST FOR 32" ALASKA RAIL**

**NOTES**

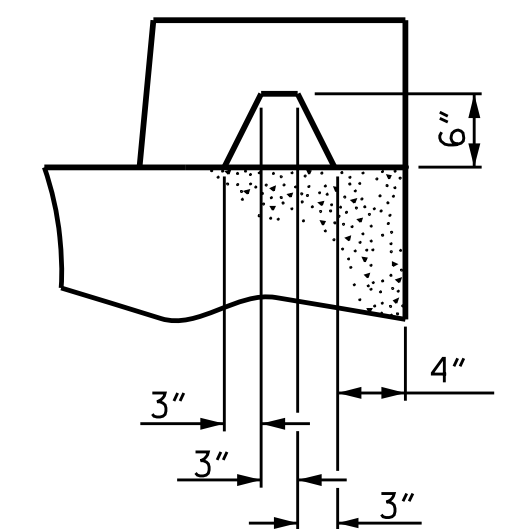
THE CURB AND END POST SHALL NOT BE CAST UNTILL ALL CONCRETE IN THE SLAB HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

THE JOINT IN THE DECK SHALL BE SAWS PRIOR TO THE CASTING OF THE CURB.

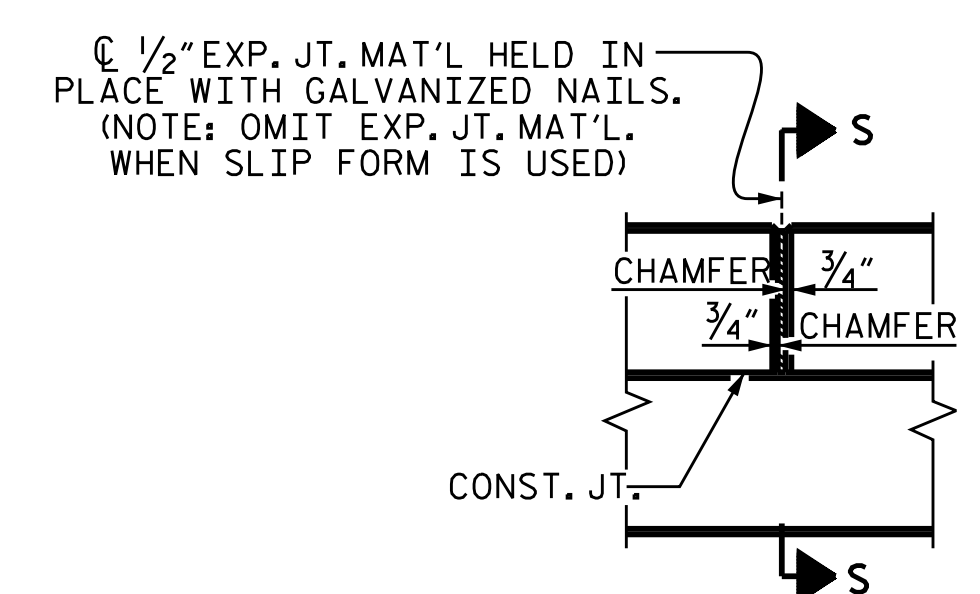
ALL REINFORCING IN THE CURB AND END POSTS SHALL BE EPOXY COATED.

THE #4 S3 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #4 S3 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

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

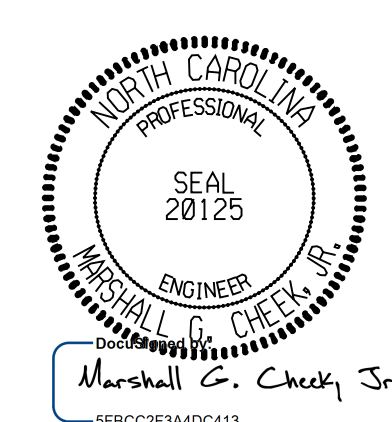


**SECTION S-S**  
AT DAM IN OPEN JOINT  
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



**ELEVATION AT EXPANSION JOINTS IN CURB**

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 2 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**CURB AND END POST DETAILS FOR 32" ALASKA RAIL**

DRAWN BY : NMW DATE : 4/19  
 CHECKED BY : MGC DATE : 7/19  
 DESIGN ENGINEER OF RECORD : MGC DATE : 7/19

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			43



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

NOTES

METAL RAIL SHALL BE GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS. ALUMINUM RAIL WILL NOT BE AN OPTION.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:  
 POST, POST BASES, ANCHOR PLATES AND RAIL SPLICE TUBES: AASHTO M270 GRADE 36 STRUCTURAL STEEL-GALVANIZED TO AASHTO M111.

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.

RAILS: ASTM A500 GRADE B - GALVANIZED TO AASHTO M111.

WELDED RAIL STUDS: ASTM A108-GALVANIZED TO AASHTO M111.

HIGH STRENGTH ANCHOR BOLTS SHALL CONFORM TO ASTM F1554 GRADE 105. HEAVY HEX NUTS SHALL CONFORM TO ASTM A563 DH, AND WASHERS TO ASTM F436, TYPE 1. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED TO 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. BMR9.

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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.

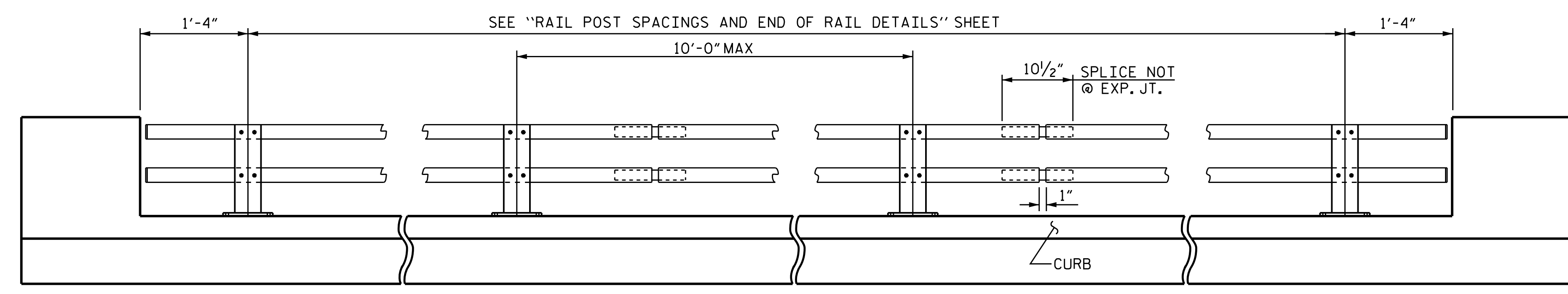
SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

THE RAIL SECTIONS SHALL BE ATTACHED TO THE POSTS BY TWO THREADED 3/4" Ø WELDED STUDS, PLATE WASHERS, LOCKWASHERS, AND NUTS.

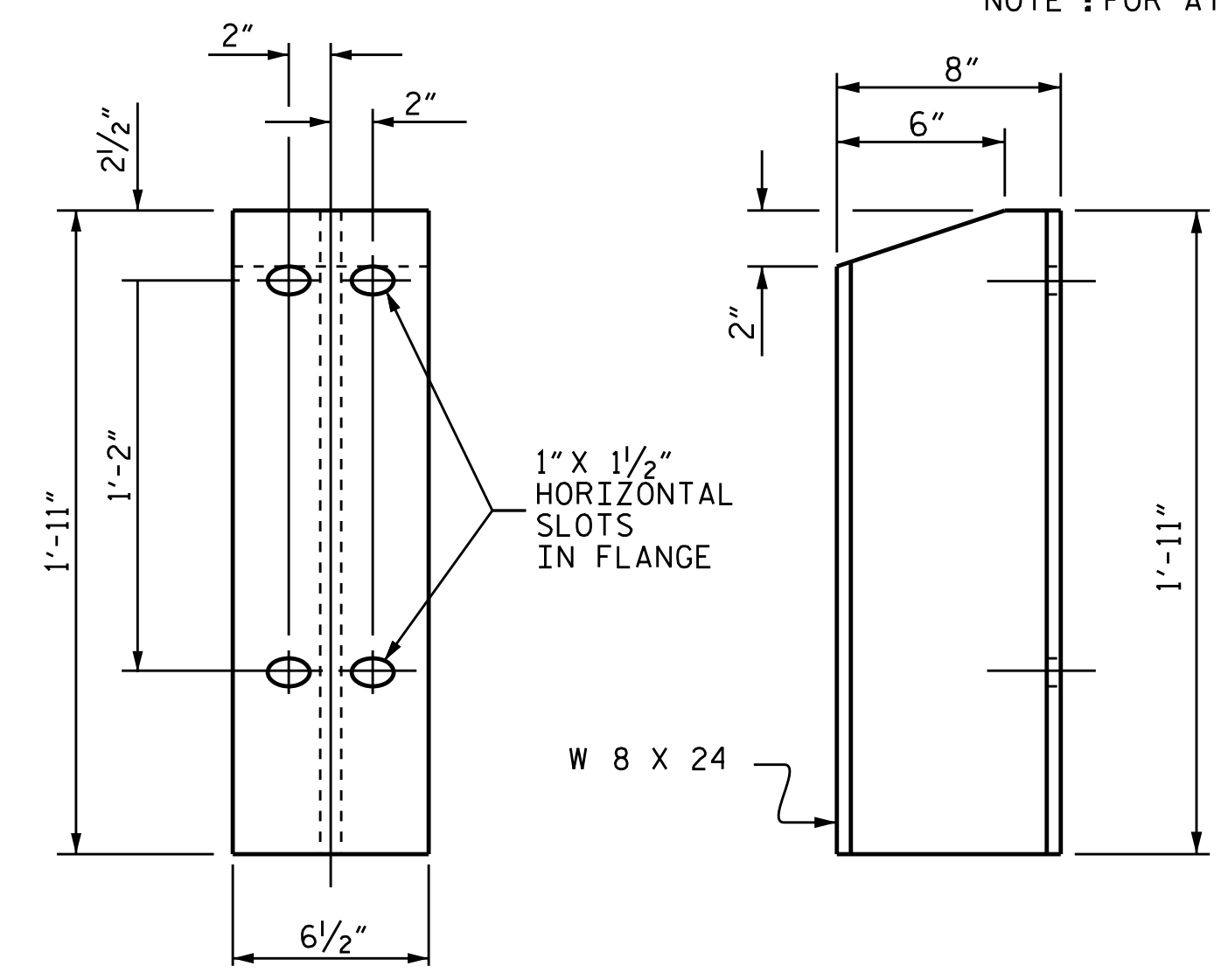
FOR 32" ALASKA RAIL, SEE THE STANDARD SPECIFICATIONS.

METAL RAIL LENGTH 87.71 LIN. FT.



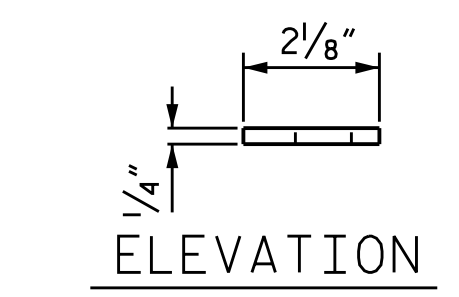
ELEVATION

NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR9.

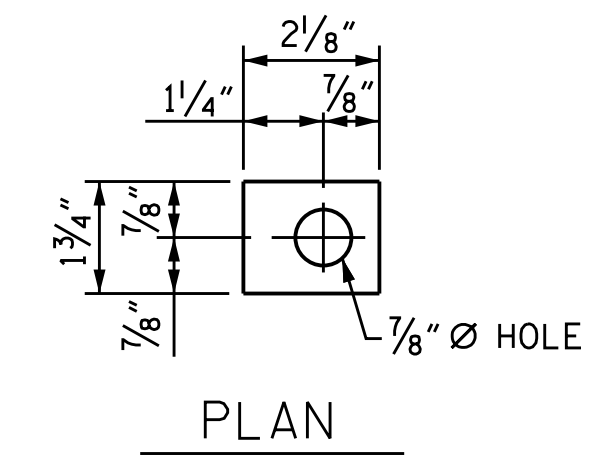


FRONT ELEVATION SIDE ELEVATION

DETAILS OF POST

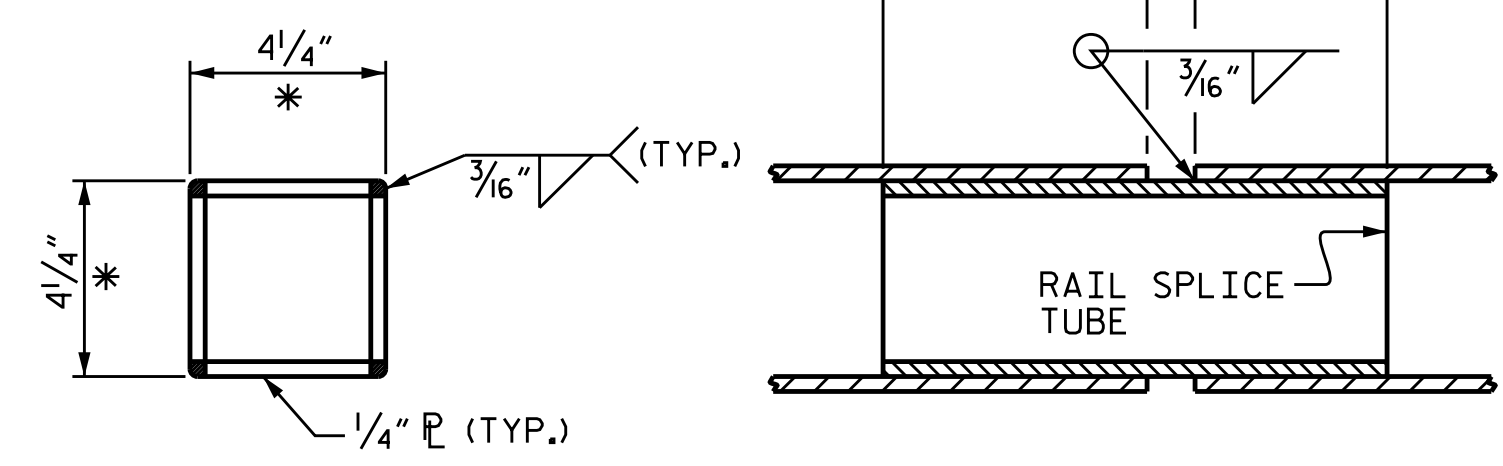


ELEVATION



PLAN

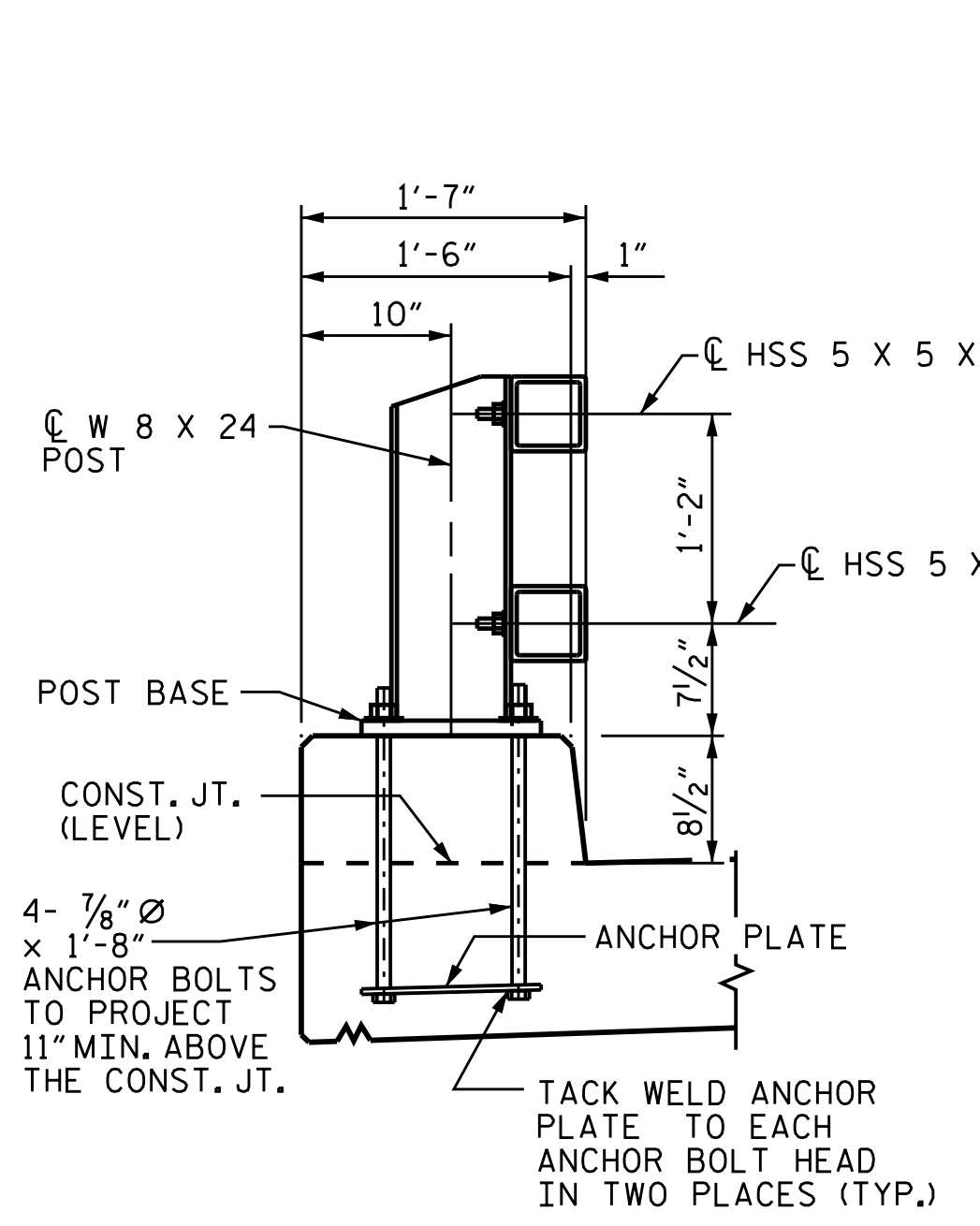
PLATE WASHER



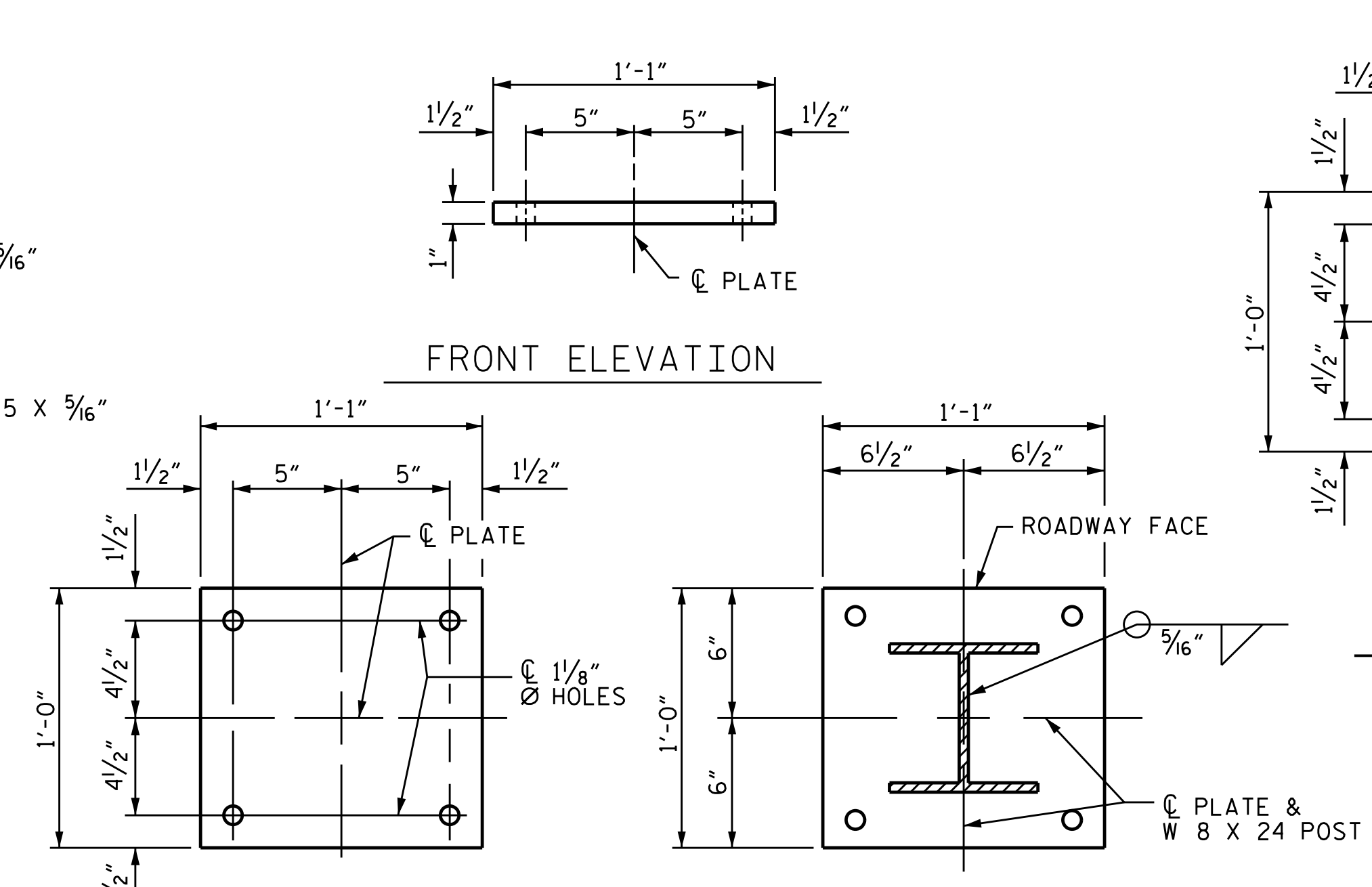
RAIL SPLICE DETAILS

\* - DIMENSION AFTER GRINDING RADIUS ON CORNERS TO MATCH INSIDE OF METAL RAIL. GRIND ALL EDGES PRIOR TO GALVANIZING TO ASSURE FIT.

\*\* - 1" FOR SPLICE NOT AT EXPANSION JOINT.



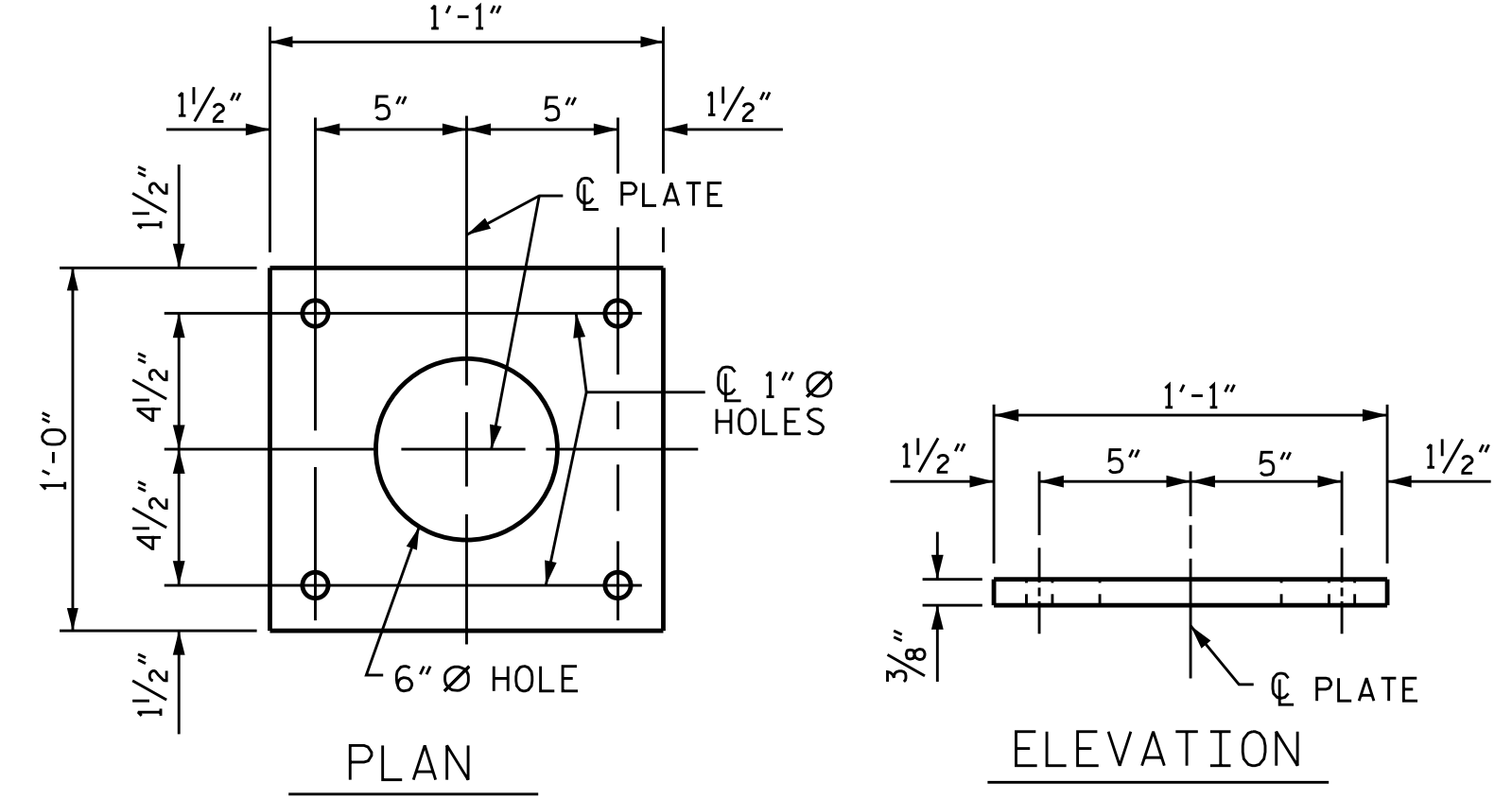
SECTION THRU RAIL



PLAN

POST ATTACHMENT DETAIL

POST BASE DETAILS



ANCHOR PLATE DETAILS

ASSEMBLED BY : NMW	DATE : 4/19
CHECKED BY : MGC	DATE : 7/19
DRAWN BY : RWW 7/14	REV. 12/17 MAA/THC
CHECKED BY : TMG 7/14	REV. 5/18 MAA/THC

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

2/22/2021

PROJECT NO. 17BP.14.R.211  
MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
32" ALASKA RAIL					
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
				S-20	
				TOTAL SHEETS 43	

**NOTES**

**STRUCTURAL CONCRETE INSERT**

- EACH STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. FERRULE 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 STRUCTURAL CONCRETE INSERT DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/6" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

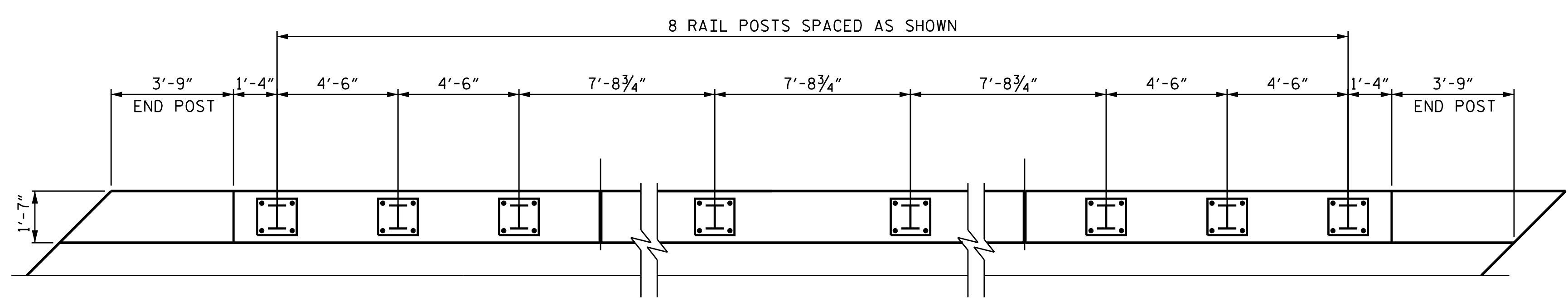
**NOTES**

**METAL RAIL TO END POST CONNECTION**

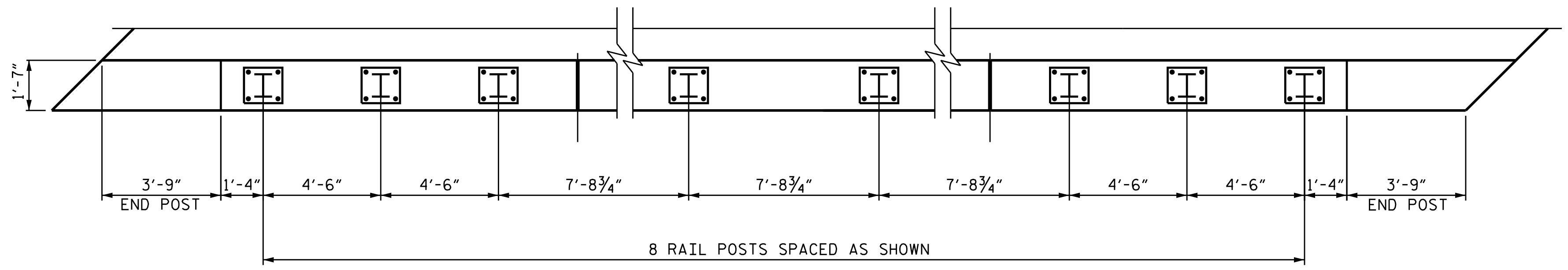
- EACH METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" METAL BRACKET PLATE AND 1/4" METAL RAIL INSERT TUBE SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION TO AASHTO M111.
  - B. 3/4" STRUCTURAL CONCRETE INSERTS SHALL HAVE A WORKING 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.

THE 3/4" STRUCTURAL CONCRETE INSERTS WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP.  
 THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT, THE 1/2" BRACKET PLATES, AND THE RAIL INSERT TUBES 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" BOLTS WITH WASHERS SHALL BE REPLACED WITH 3/4" Ø X 6 1/2" BOLTS AND 2" O.D. WASHERS. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLTS SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLTS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

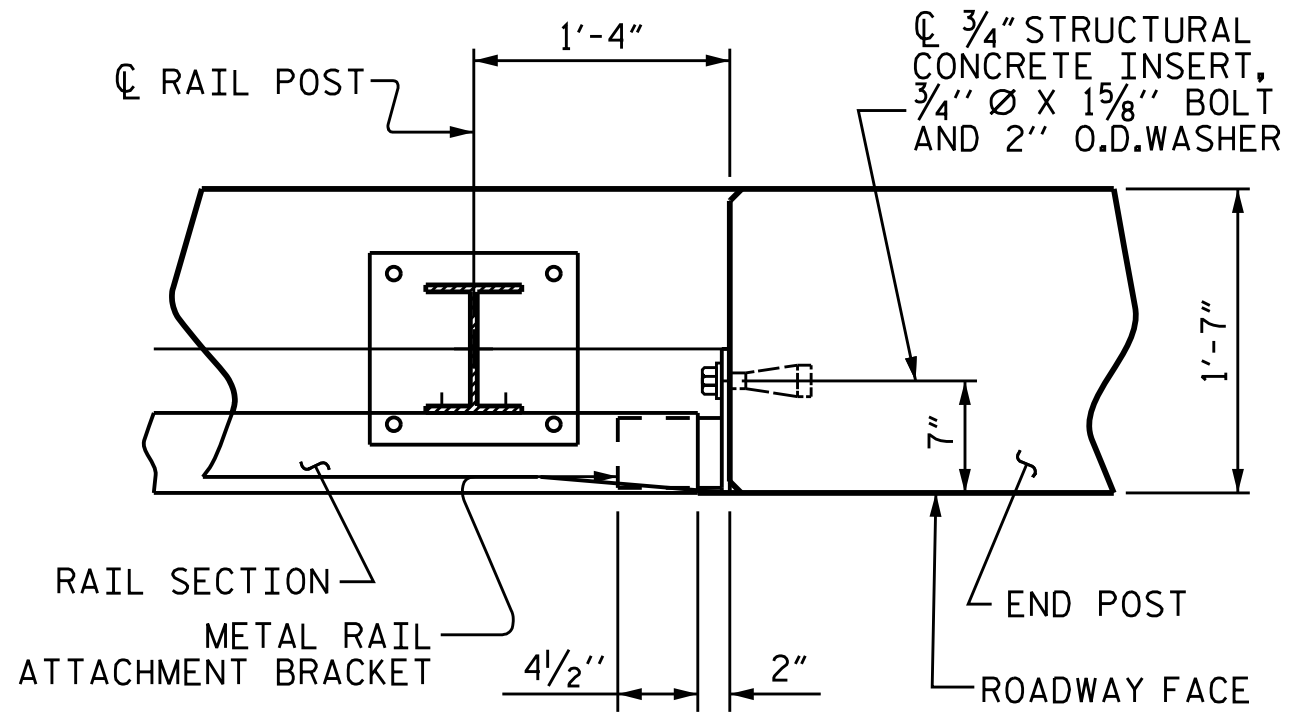


**LEFT SIDE (STAGE II)**

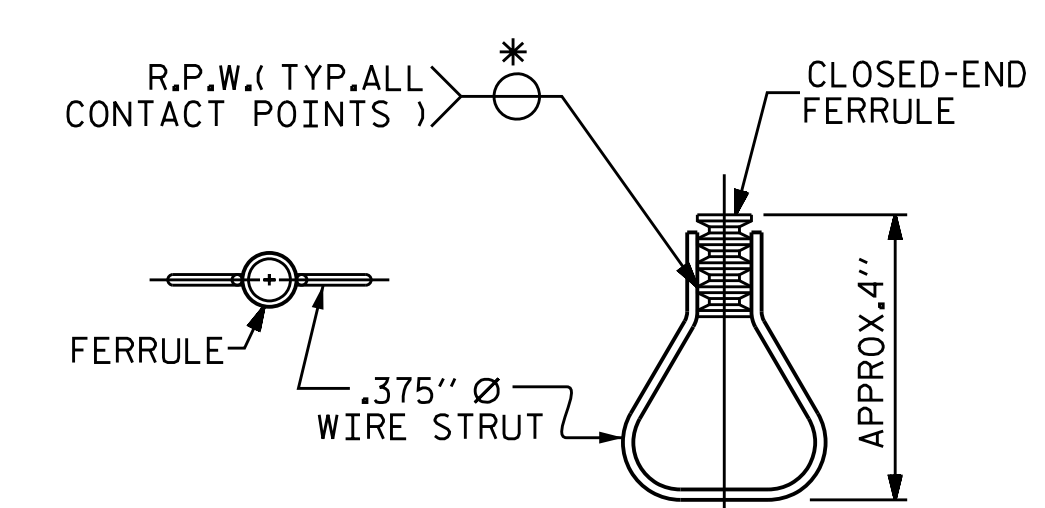


**RIGHT SIDE (STAGE I)**

**PLAN OF RAIL POST SPACINGS**



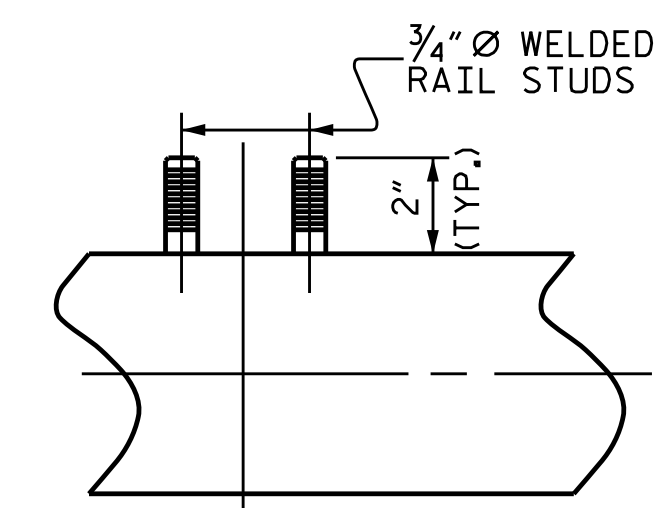
**PLAN - RAILS AND END POST**



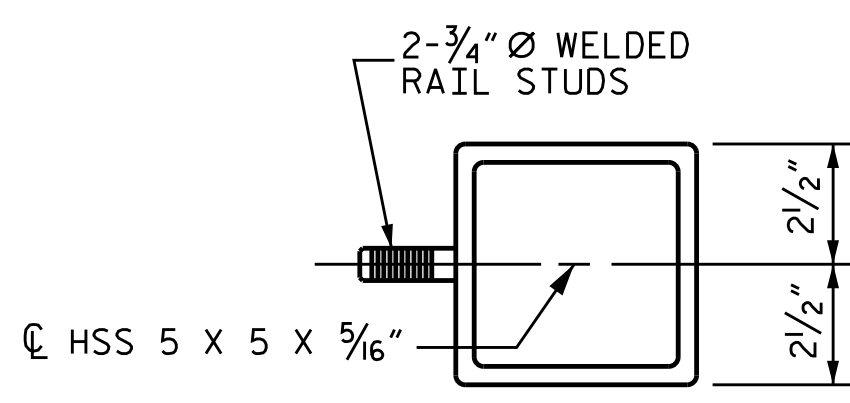
**PLAN ELEVATION**

**STRUCTURAL CONCRETE INSERT**

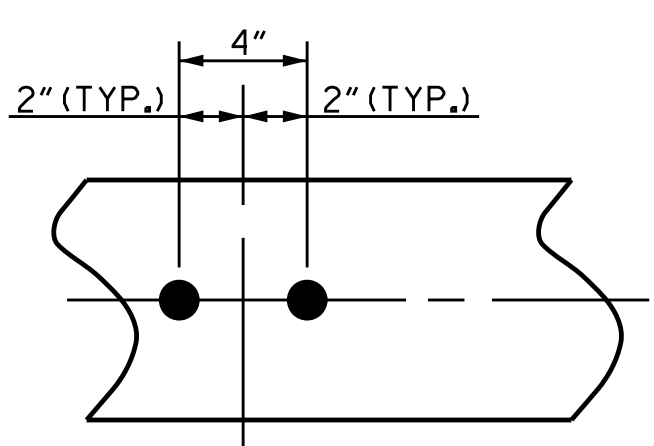
\* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



**PLAN**

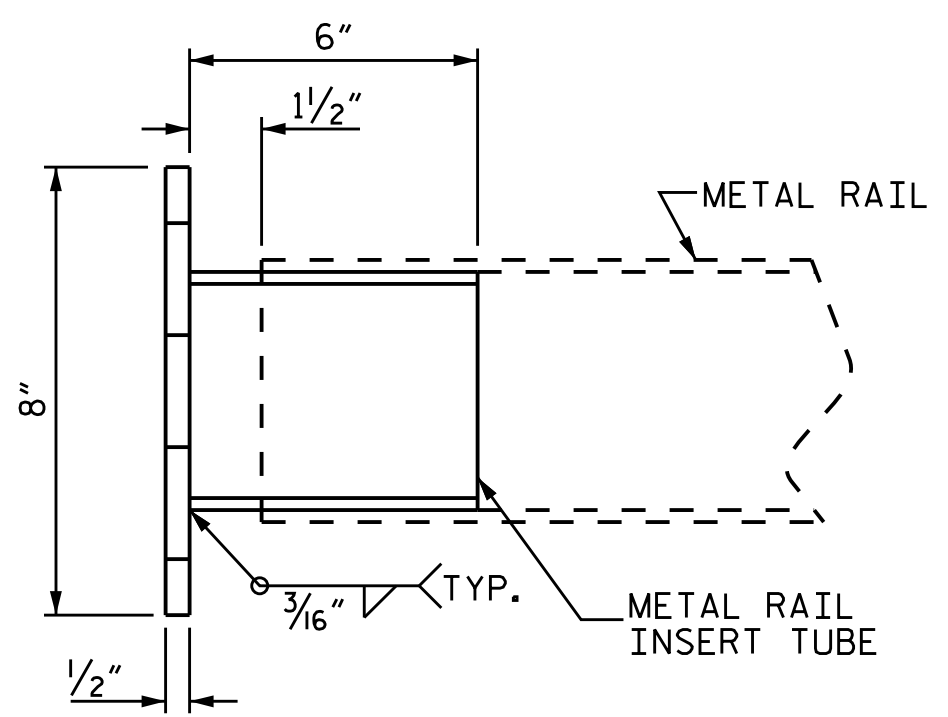


**RAIL SECTION**



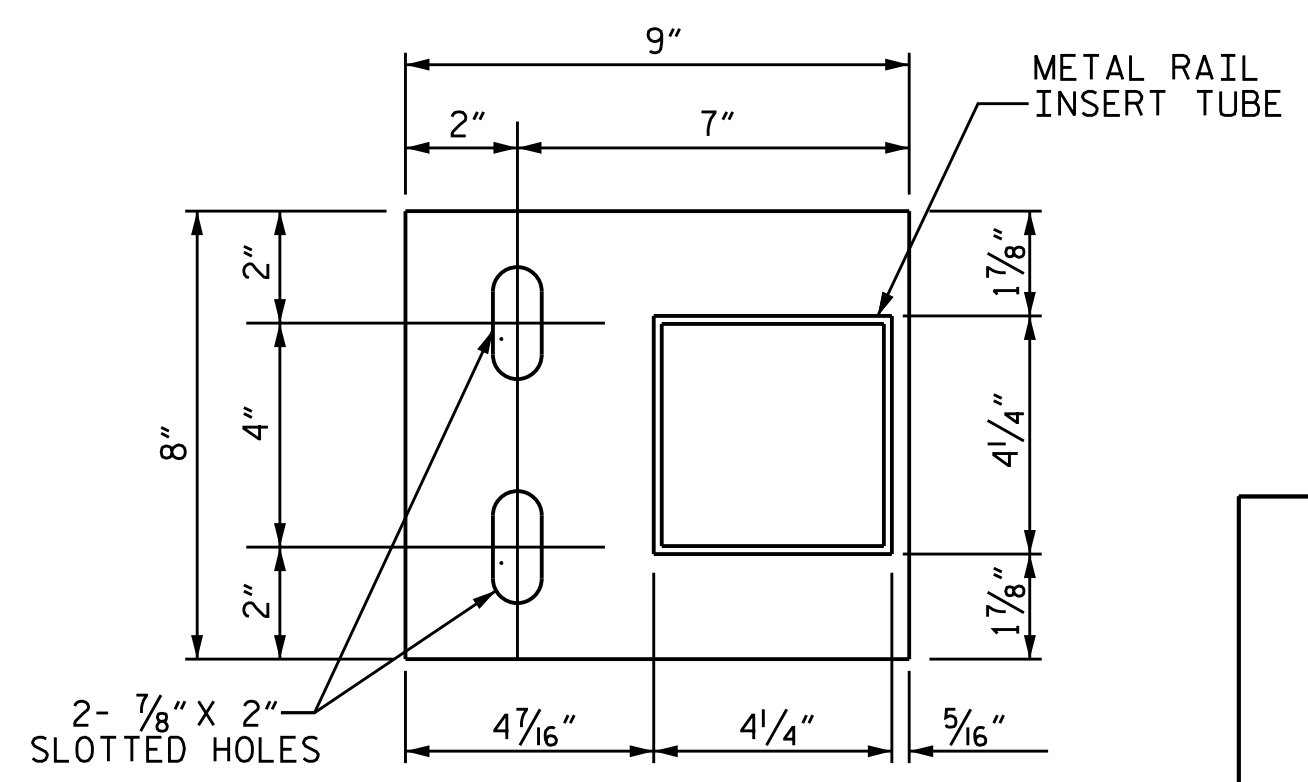
**ELEVATION**

**RAIL STUD DETAILS**



**METAL RAIL ATTACHMENT BRACKET**

THE METAL RAIL INSERT TUBE SHALL BE FABRICATED FROM 1/4" PLATES.



PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-

SHEET 2 OF 2

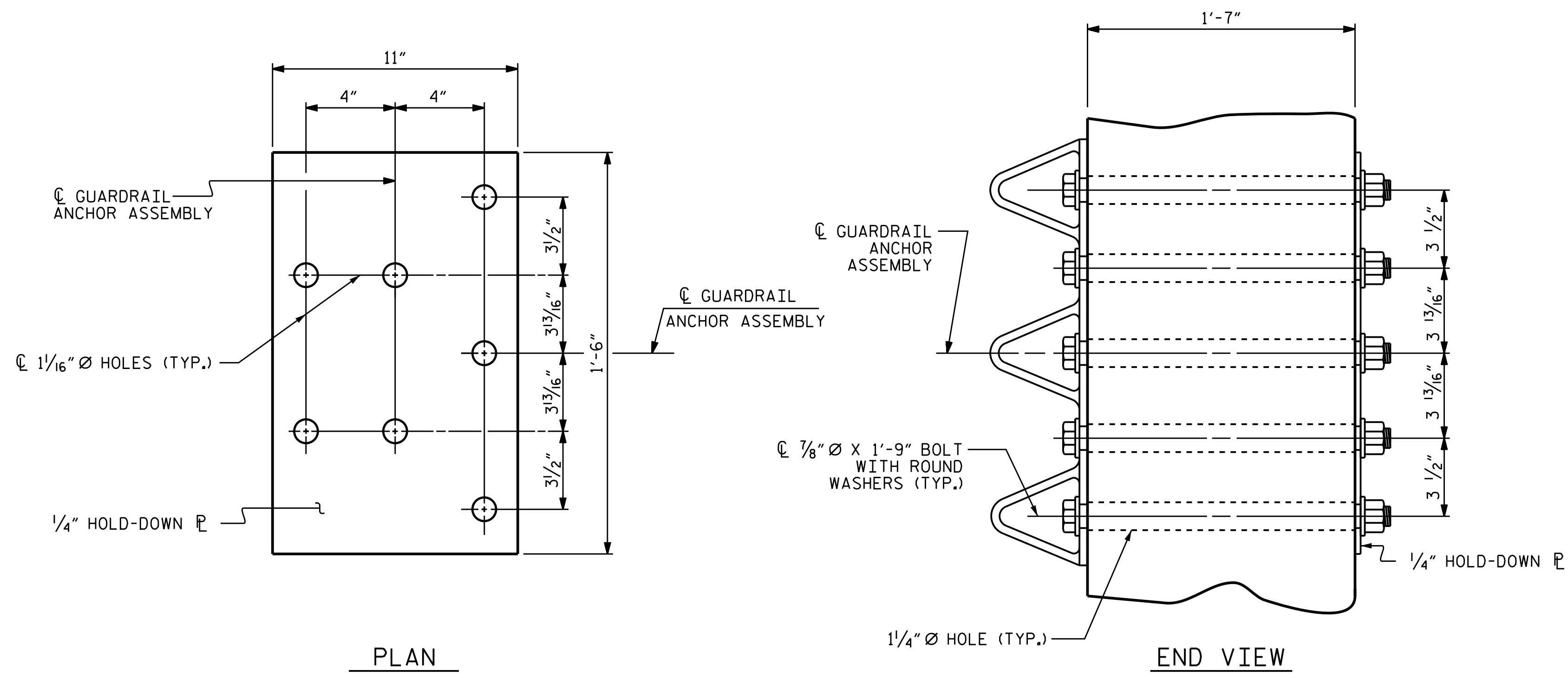
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 RAIL POST SPACINGS  
 AND  
 END OF RAIL DETAILS  
 FOR 32" ALASKA RAIL

Professional Engineer Seal: NORTH CAROLINA PROFESSIONAL ENGINEER, SEAL 20125, Marshall C. Cheek Jr., 2/22/2021, SFBCCP340C413.

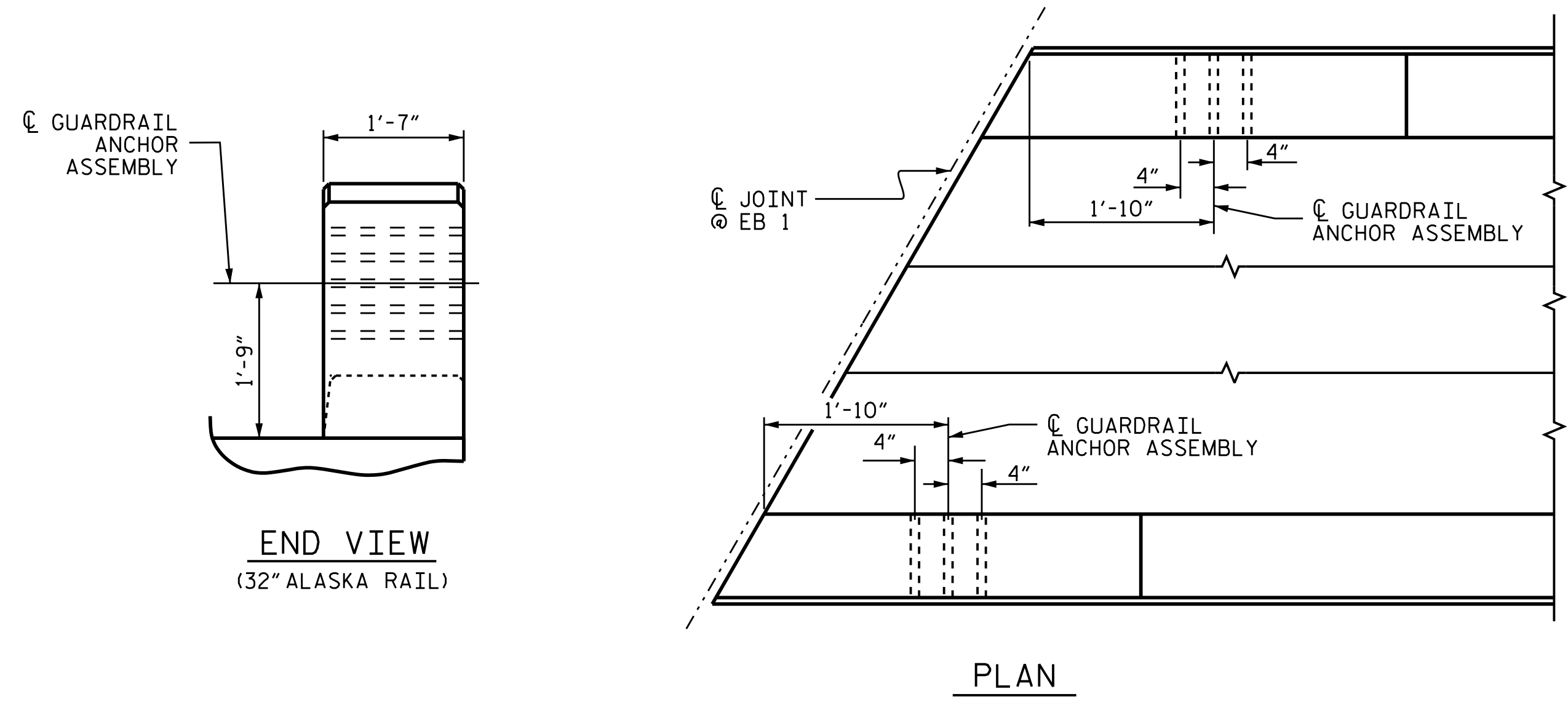
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED  
 TGS ENGINEERS  
 804-C N. LAFAYETTE ST  
 SHELBY, NC 28150  
 PH (704) 476-0003  
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			43

ASSEMBLED BY : NMW	DATE : 4/19
CHECKED BY : MGC	DATE : 7/19
DRAWN BY : RWW 7/14	REV. 12/17 MAA/THC
CHECKED BY : TMG 7/14	REV. 5/18 MAA/THC



GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF GUARDRAIL ANCHOR AT END POST  
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

**NOTES**

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

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

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

THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF 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.



SKETCH SHOWING POINTS OF ATTACHMENT

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-

ASSEMBLED BY : NMW	DATE : 4/19
CHECKED BY : MGC	DATE : 6/19
DRAWN BY : MAA 5/10	REV. 1/15 MAA/TMG
CHECKED BY : GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 GUARDRAIL ANCHORAGE  
 DETAILS  
 FOR METAL RAILS

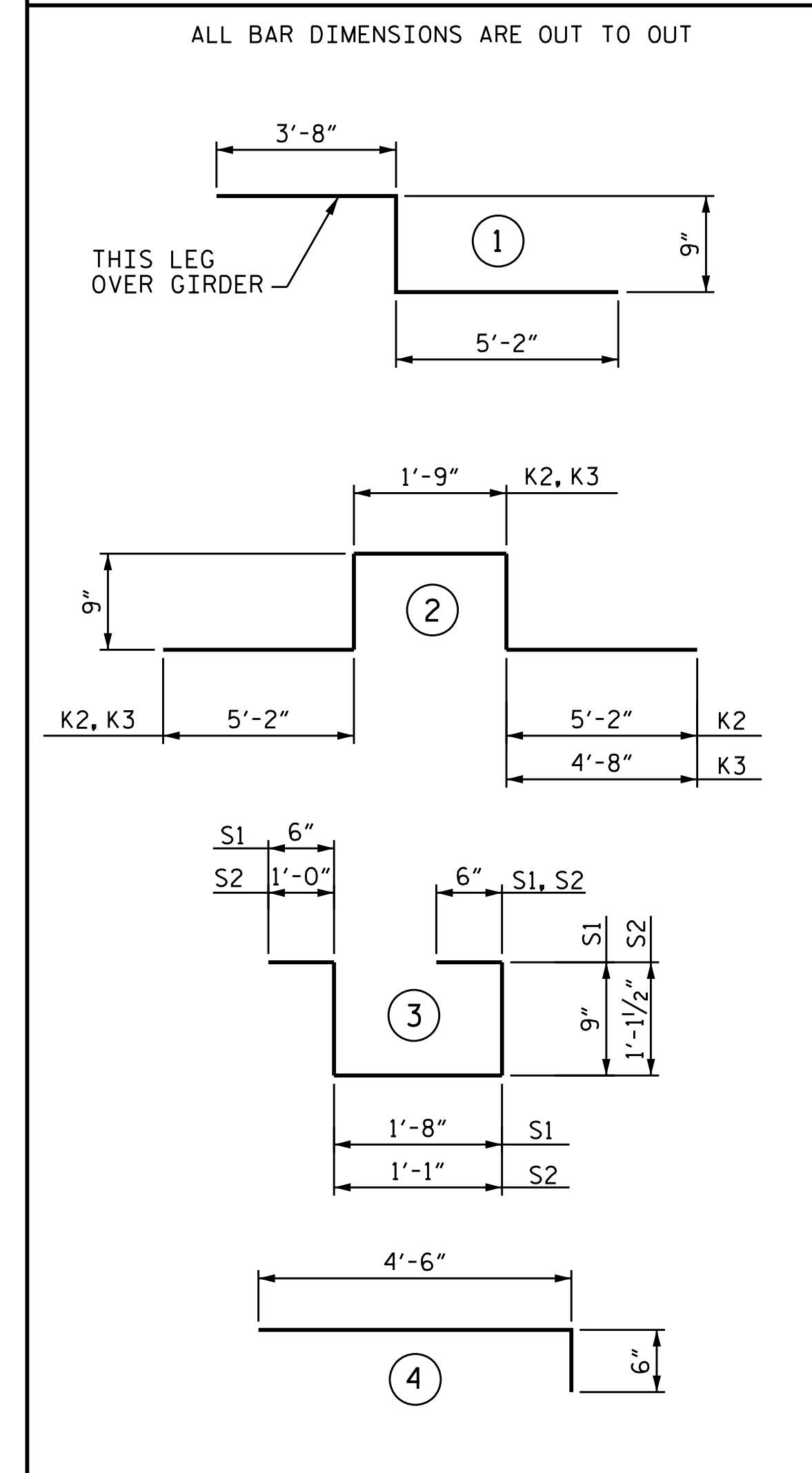
SEAL 20125  
 ENGINEER  
 MARSHALL G. CHECK, JR.  
 2/22/2021

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-22
2			4			43

**BAR TYPES**



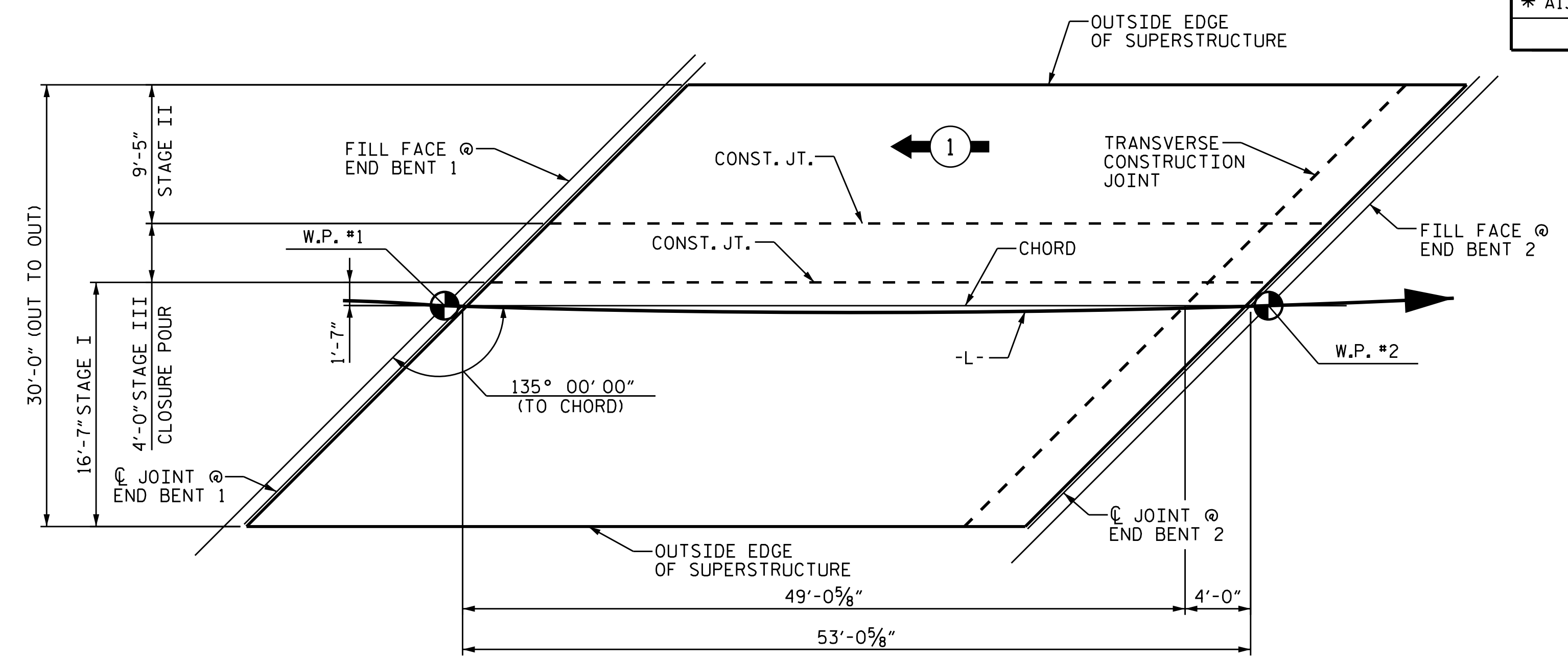
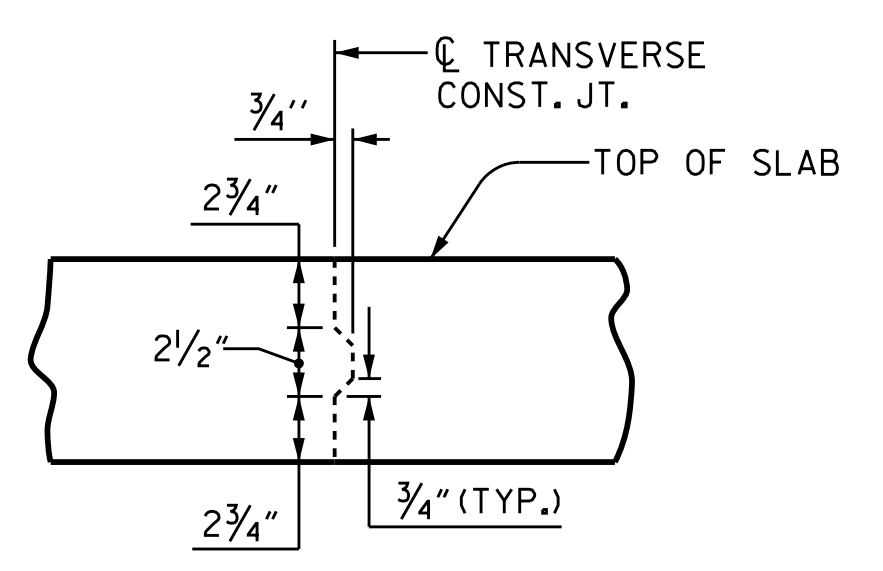
**STAGE I REINFORCING BAR SCHEDULE**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	73	#5	STR.	16'-3"	1,237	A201	2	#5	STR.	15'-10"	33	* B1	26	#4	STR.	27'-3"	473
A2	73	#5	STR.	16'-3"	1,237	A202	2	#5	STR.	15'-4"	32	B2	22	#5	STR.	52'-5"	1,203
* A10	48	#5	4	5'-0"	250	A203	2	#5	STR.	14'-10"	31						
* A101	2	#5	STR.	15'-10"	33	A204	2	#5	STR.	14'-4"	30	* D1	188	#6	STR.	5'-11"	1,671
* A102	2	#5	STR.	15'-4"	32	A205	2	#5	STR.	13'-10"	29						
* A103	2	#5	STR.	14'-10"	31	A206	2	#5	STR.	13'-4"	28	* G1	2	#5	STR.	22'-11"	48
* A104	2	#5	STR.	14'-4"	30	A207	2	#5	STR.	12'-10"	27						
* A105	2	#5	STR.	13'-10"	29	A208	2	#5	STR.	12'-4"	26	* K1	6	#5	1	9'-7"	60
* A106	2	#5	STR.	13'-4"	28	A209	2	#5	STR.	11'-10"	25	* K2	6	#5	2	13'-7"	85
* A107	2	#5	STR.	12'-10"	27	A210	2	#5	STR.	11'-4"	24	* K3	6	#5	2	13'-1"	82
* A108	2	#5	STR.	12'-4"	26	A211	2	#5	STR.	10'-10"	23						
* A109	2	#5	STR.	11'-10"	25	A212	2	#5	STR.	10'-4"	22	* S1	28	#4	3	4'-2"	78
* A110	2	#5	STR.	11'-4"	24	A213	2	#5	STR.	9'-10"	21	* S2	44	#4	3	4'-10"	142
* A111	2	#5	STR.	10'-10"	23	A214	2	#5	STR.	9'-4"	19	* S3	18	#4	STR.	2'-6"	30
* A112	2	#5	STR.	10'-4"	22	A215	2	#5	STR.	8'-10"	18						
* A113	2	#5	STR.	9'-10"	21	A216	2	#5	STR.	8'-4"	17						
* A114	2	#5	STR.	9'-4"	19	A217	2	#5	STR.	7'-10"	16						
* A115	2	#5	STR.	8'-10"	18	A218	2	#5	STR.	7'-4"	15						
* A116	2	#5	STR.	8'-4"	17	A219	2	#5	STR.	6'-10"	14						
* A117	2	#5	STR.	7'-10"	16	A220	2	#5	STR.	6'-4"	13						
* A118	2	#5	STR.	7'-4"	15	A221	2	#5	STR.	5'-10"	12						
* A119	2	#5	STR.	6'-10"	14	A222	2	#5	STR.	5'-4"	11						
* A120	2	#5	STR.	6'-4"	13	A223	2	#5	STR.	4'-10"	10						
* A121	2	#5	STR.	5'-10"	12	A224	2	#5	STR.	4'-4"	9						
* A122	2	#5	STR.	5'-4"	11	A225	2	#5	STR.	3'-10"	8						
* A123	2	#5	STR.	4'-10"	10	A226	2	#5	STR.	3'-4"	7						
* A124	2	#5	STR.	4'-4"	9	A227	2	#5	STR.	2'-10"	6						
* A125	2	#5	STR.	3'-10"	8	A228	2	#5	STR.	2'-4"	5						
* A126	2	#5	STR.	3'-4"	7												
* A127	2	#5	STR.	2'-10"	6												
* A128	2	#5	STR.	2'-4"	5												
* A129	3	#6	STR.	13'-9"	62												
* A130	3	#6	STR.	12'-0"	54												

TOTAL REINFORCING STEEL: 2,971 LBS.  
 \*TOTAL EPOXY-COATED REIN. STEEL: 4,833 LBS.

**TRANSVERSE CONSTRUCTION JOINT DETAIL**

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



**LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB**  
 (TOTAL SQ. FT. = 1,592)

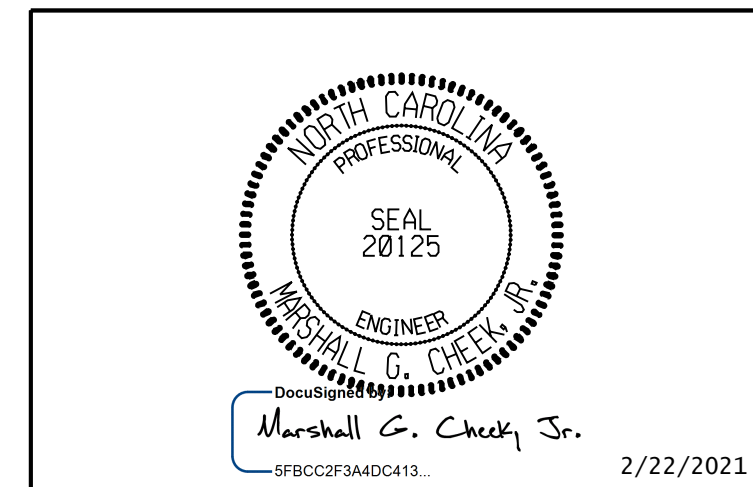
DRAWN BY : NMW DATE : 6/19  
 CHECKED BY : MGC DATE : 7/19  
 DESIGN ENGINEER OF RECORD : MGC DATE : 7/19

(STAGE I = 880 SQ. FT.)  
 (STAGE II = 500 SQ. FT.)  
 (STAGE III = 212 SQ. FT.)

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

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPETS, AND BARRIER RAILS		APPROACH SLABS		PARAPETS AND BARRIER RAILS
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"
#7	4'-2"	2'-9"			
#8	4'-9"	3'-2"			

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 1 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUPERSTRUCTURE**  
 BILL OF MATERIAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-23
1			3			TOTAL SHEETS 43
2			4			

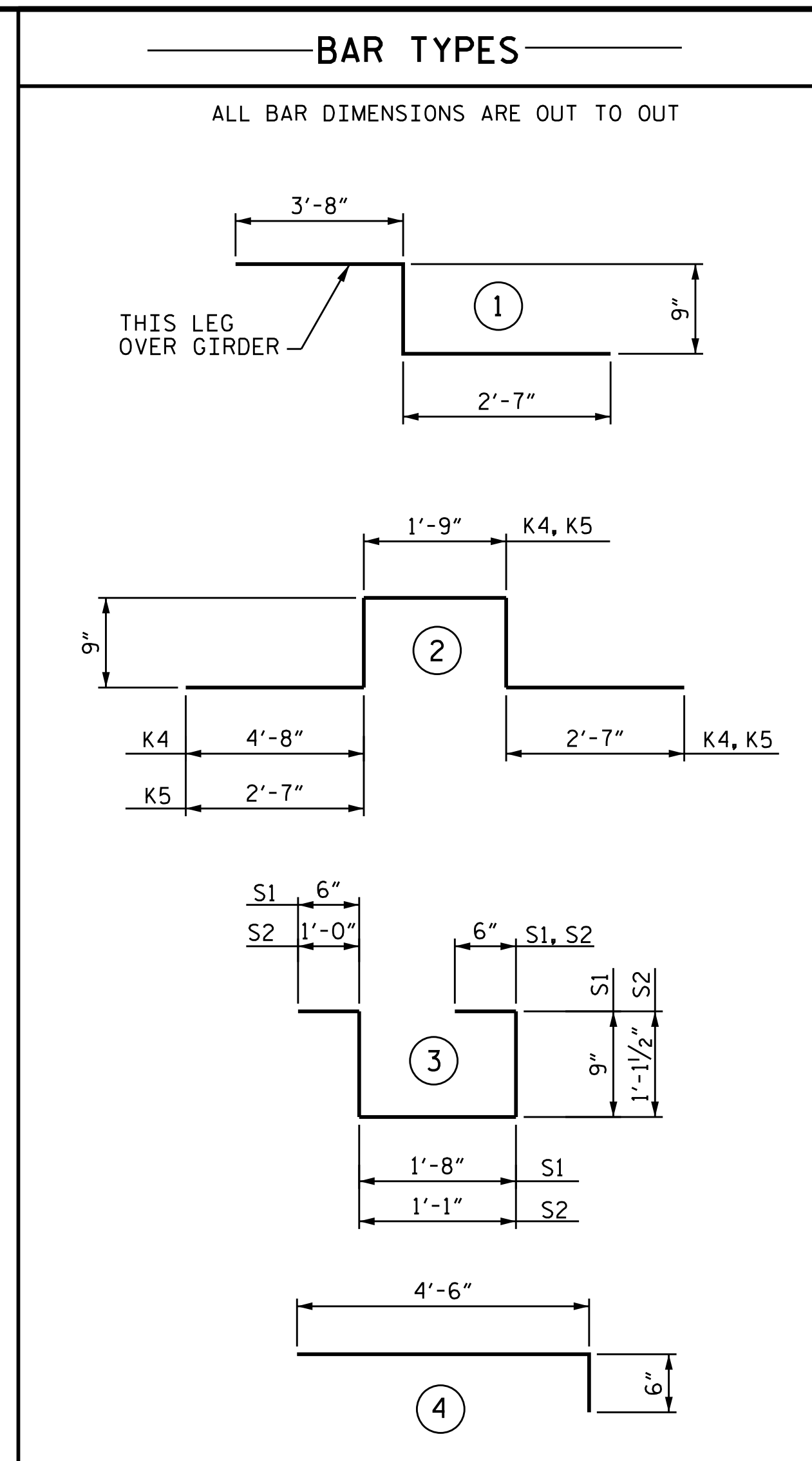
TGS ENGINEERS  
 804-C N. LAFAYETTE ST  
 SHELBY, NC 28150  
 PH (704) 476-0003  
 CORP. LICENSE NO.: C-0275



SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
STAGE I	27.5	2,971	4,833
STAGE II	18.2	1,641	3,652
STAGE III	7.6	328	131
TOTAL	53.3	4,940	8,616

QUANTITIES FOR CURB AND END POSTS ARE NOT INCLUDED.  
 QUANTITIES FOR CLOSURE POUR ARE INCLUDED IN STAGE III

GROOVING BRIDGE FLOORS		
BRIDGE DECK	STAGE I	707 SQ. FT.
	STAGE II & STAGE III	541 SQ. FT.
APPROACH SLABS	STAGE I	317 SQ. FT.
	STAGE II	185 SQ. FT.
	TOTAL	1,750 SQ. FT.



REINFORCING BAR SCHEDULE												STAGE III					
STAGE II						STAGE III											
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	87	#5	STR.	9'-1"	824	* B1	14	#4	STR.	27'-3"	255	* B1	6	#4	STR.	27'-3"	109
A4	87	#5	STR.	9'-1"	824	B2	12	#5	STR.	52'-5"	656	B2	6	#5	STR.	52'-5"	328
* A10	48	#5	4	5'-0"	250												
* A301	2	#5	STR.	8'-9"	18	* D1	188	#6	STR.	5'-11"	1,671	* S1	8	#4	3	4'-2"	22
* A302	2	#5	STR.	8'-3"	17												
* A303	2	#5	STR.	7'-9"	16	* G2	2	#5	STR.	12'-10"	27						
* A304	2	#5	STR.	7'-3"	15												
* A305	2	#5	STR.	6'-9"	14	* K4	6	#5	2	10'-6"	66	TOTAL REINFORCING STEEL: 328 LBS.					
* A306	2	#5	STR.	6'-3"	13	* K5	6	#5	2	8'-5"	53	*TOTAL EPOXY COATED REIN. STEEL: 131 LBS.					
* A307	2	#5	STR.	5'-9"	12	* K6	6	#5	1	7'-0"	44						
* A308	2	#5	STR.	5'-3"	11												
* A309	2	#5	STR.	4'-9"	10	* S1	12	#4	3	4'-2"	33						
* A310	2	#5	STR.	4'-3"	9	* S2	44	#4	3	4'-10"	142						
* A311	2	#5	STR.	3'-9"	8	* S3	18	#4	STR.	2'-6"	30						
* A312	2	#5	STR.	3'-3"	7												
* A313	2	#5	STR.	2'-9"	6												
* A314	2	#5	STR.	2'-3"	5												
* A315	3	#6	STR.	7'-0"	32												
* A316	3	#6	STR.	8'-9"	39												
A401	2	#5	STR.	8'-9"	18												
A402	2	#5	STR.	8'-3"	17												
A403	2	#5	STR.	7'-9"	16												
A404	2	#5	STR.	7'-3"	15												
A405	2	#5	STR.	6'-9"	14												
A406	2	#5	STR.	6'-3"	13												
A407	2	#5	STR.	5'-9"	12												
A408	2	#5	STR.	5'-3"	11												
A409	2	#5	STR.	4'-9"	10												
A410	2	#5	STR.	4'-3"	9												
A411	2	#5	STR.	3'-9"	8												
A412	2	#5	STR.	3'-3"	7												
A413	2	#5	STR.	2'-9"	6												
A414	2	#5	STR.	2'-3"	5												
											TOTAL REINFORCING STEEL:		1,641 LBS.				
											*TOTAL EPOXY COATED REIN. STEEL:		3,652 LBS.				

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

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPETS, AND BARRIER RAILS		APPROACH SLABS		PARAPETS AND BARRIER RAILS
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"
#7	4'-2"	2'-9"			
#8	4'-9"	3'-2"			

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 2 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  
 BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-24
1			3			TOTAL SHEETS 43
2			4			

DRAWN BY : NMW DATE : 6/19  
 CHECKED BY : MGC DATE : 7/19  
 DESIGN ENGINEER OF RECORD : MGC DATE : 7/19

NOTES

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

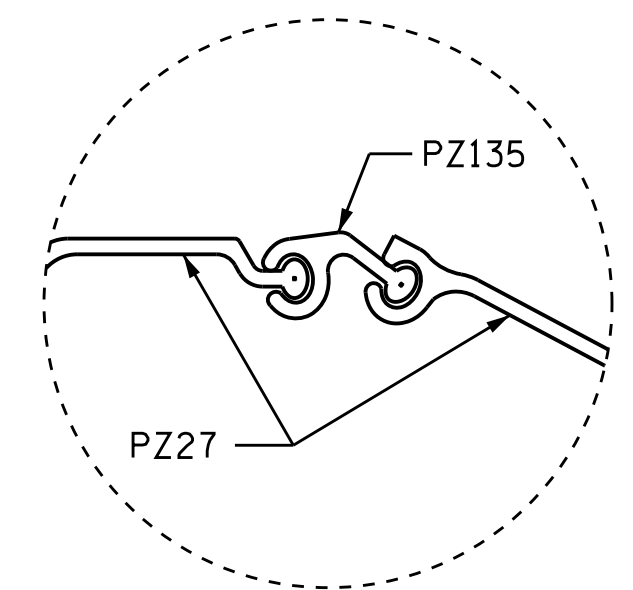
THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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%.

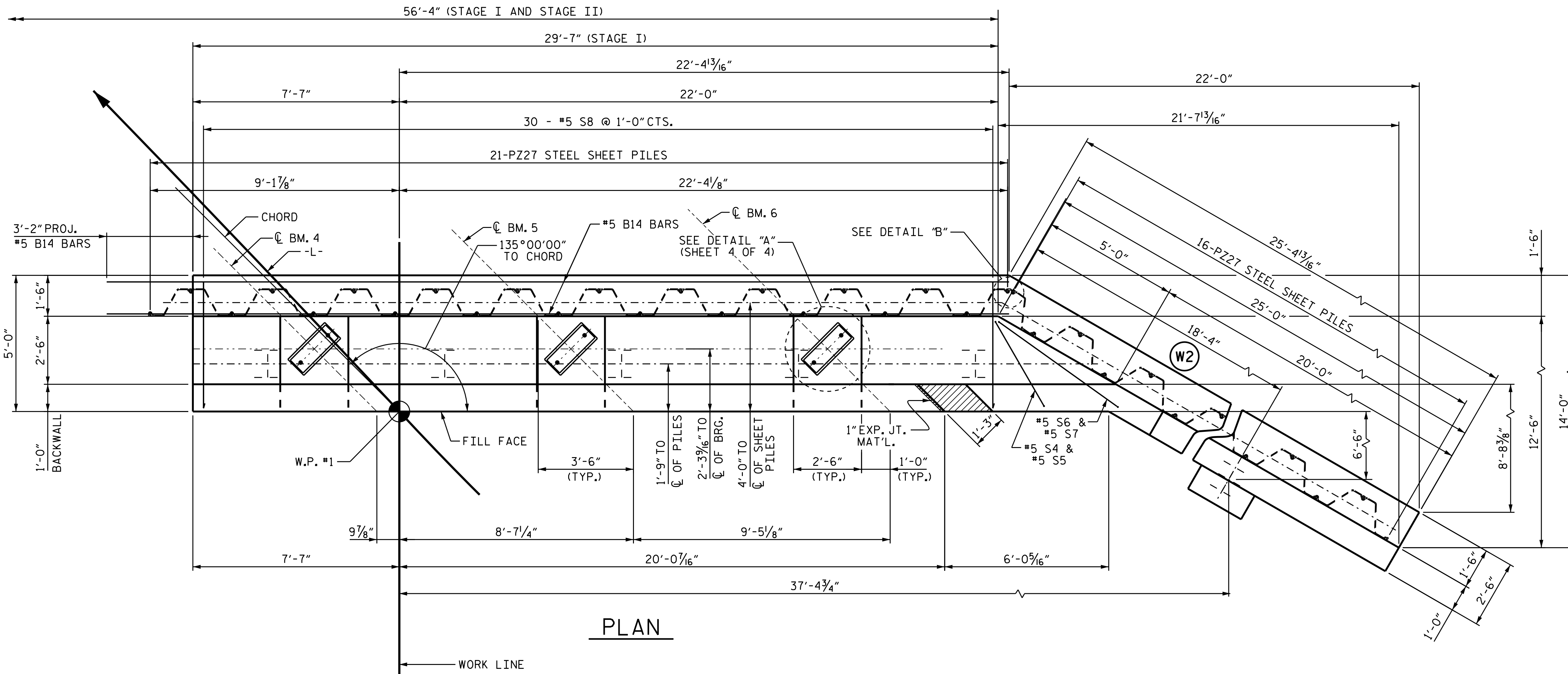
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE CURB IS CAST IF SLIP FORMING IS USED.

EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.

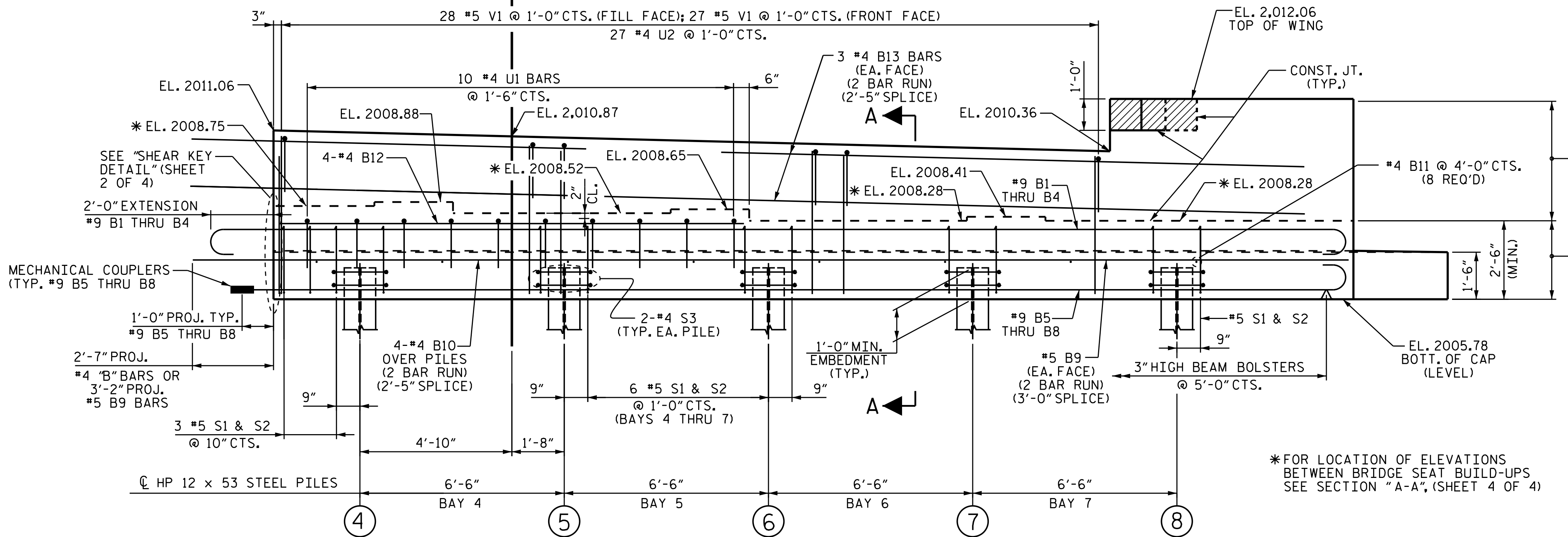
FOR WING DETAILS, SEE SHEET 3 OF 4.



DETAIL "B"

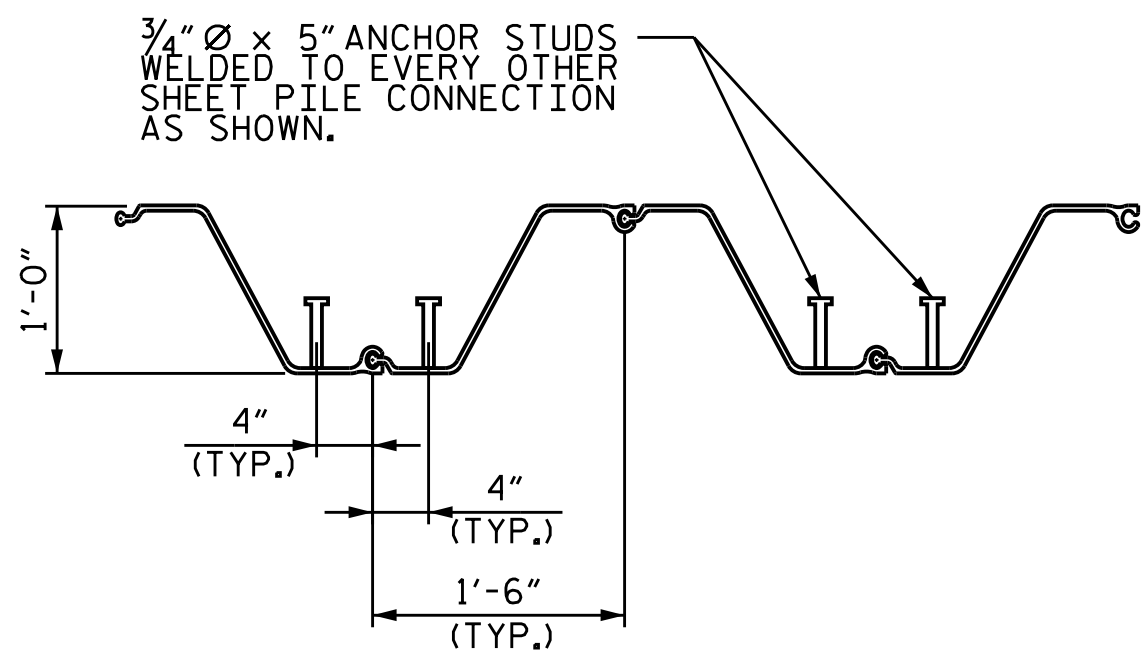


PLAN



ELEVATION

WING & SHEET PILES NOT SHOWN FOR CLARITY. FOR SECTION A-A, SEE SHEET 4 OF 4. CONCRETE COLLARS FOR STEEL PILES NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.



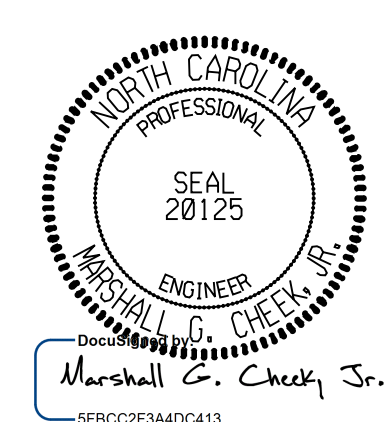
ANCHOR STUD DETAIL

PROJECT NO. 17BP.14.R.211  
MACON COUNTY  
STATION: 16+13.00-L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

END BENT 1  
STAGE I

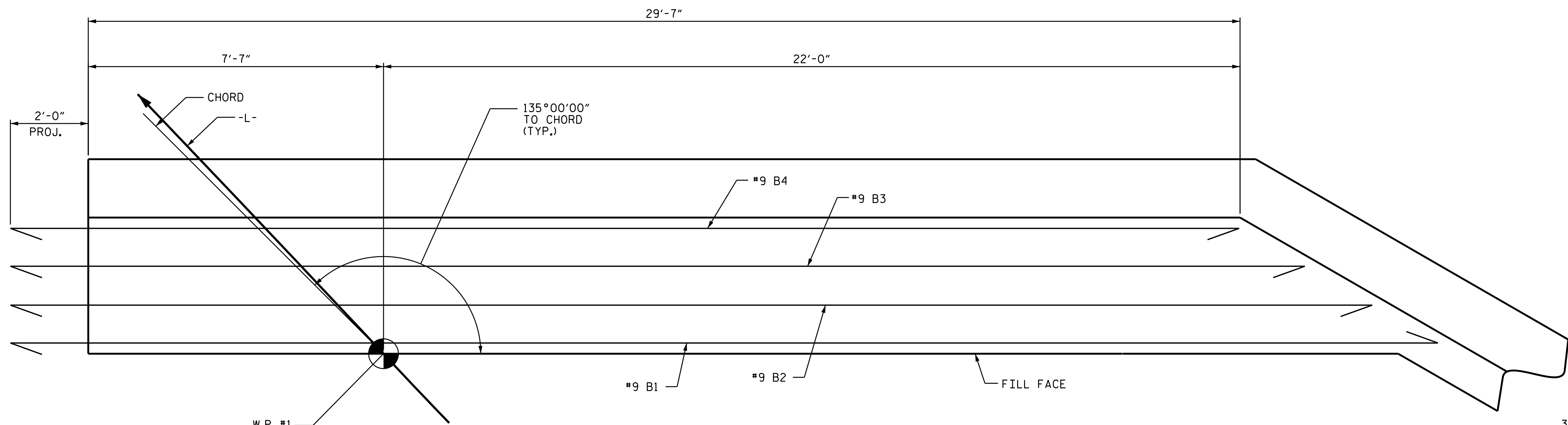


TGS ENGINEERS  
804-C N. LAFAYETTE ST  
SHELBY, NC 28150  
PH (704) 476-0003  
CORP. LICENSE NO.: C-0275

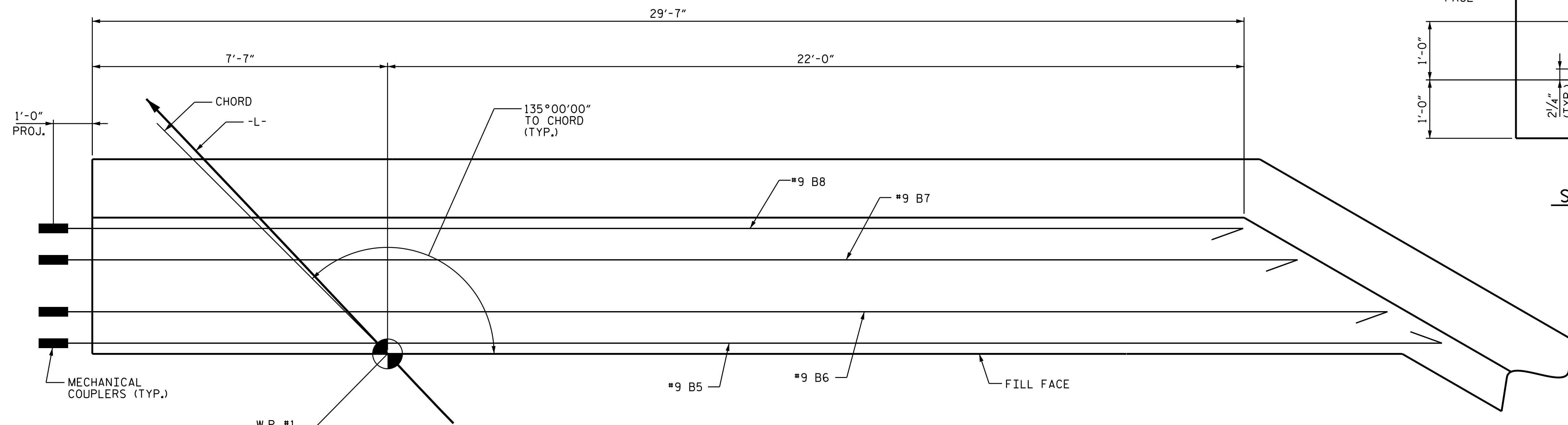
Table with 2 columns: NO., DATE, BY, and 2 columns: NO., DATE, BY. Includes sheet number S-25 and total sheets 43.

DRAWN BY : NMW DATE : 7/19  
CHECKED BY : MCC DATE : 8/19  
DESIGN ENGINEER OF RECORD : TBE DATE : 8/19

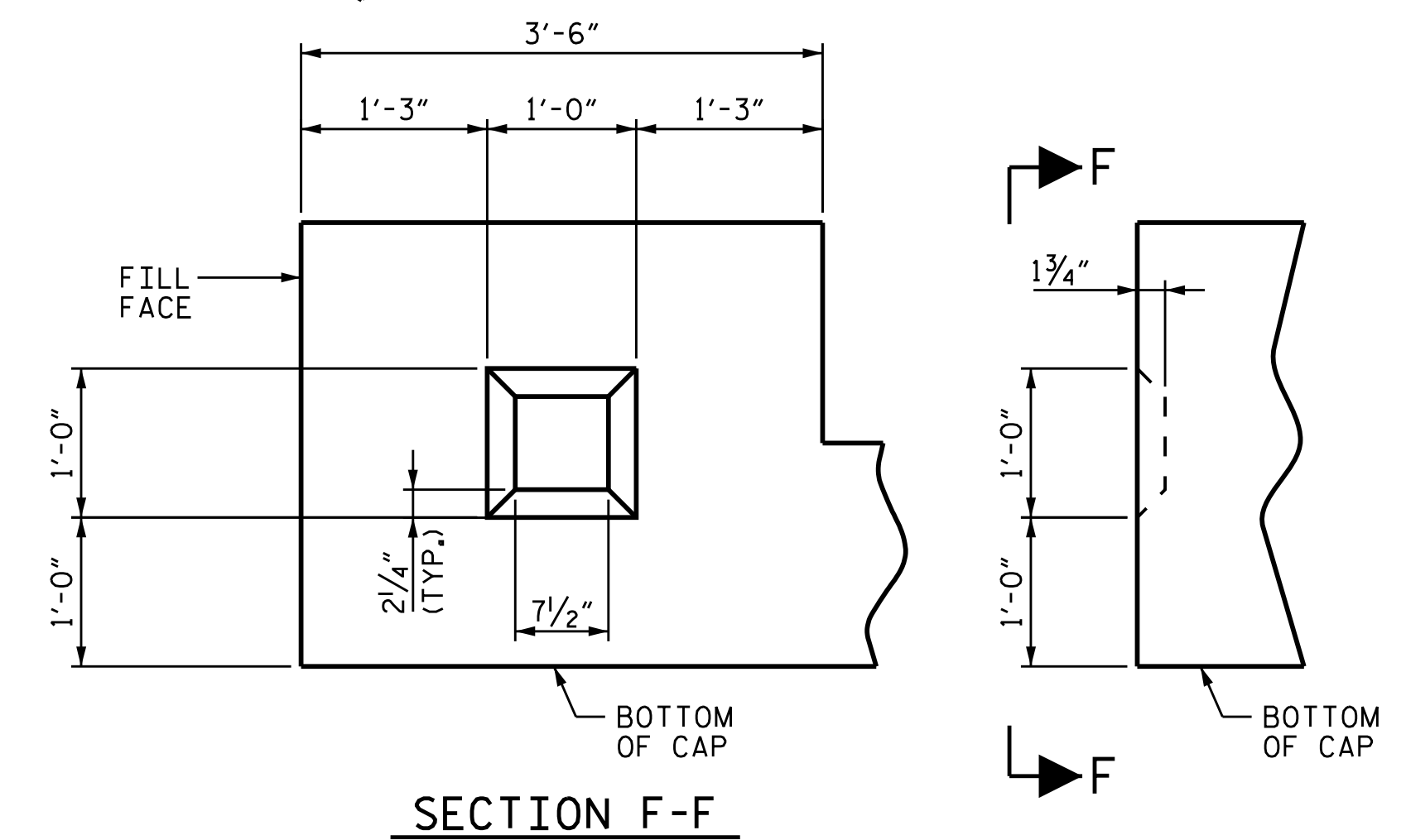
\*FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS SEE SECTION "A-A", (SHEET 4 OF 4)



#9 'B' BARS - TOP OF CAP



#9 'B' BARS - BOTTOM OF CAP



SHEAR KEY DETAIL

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-

SHEET 2 OF 4

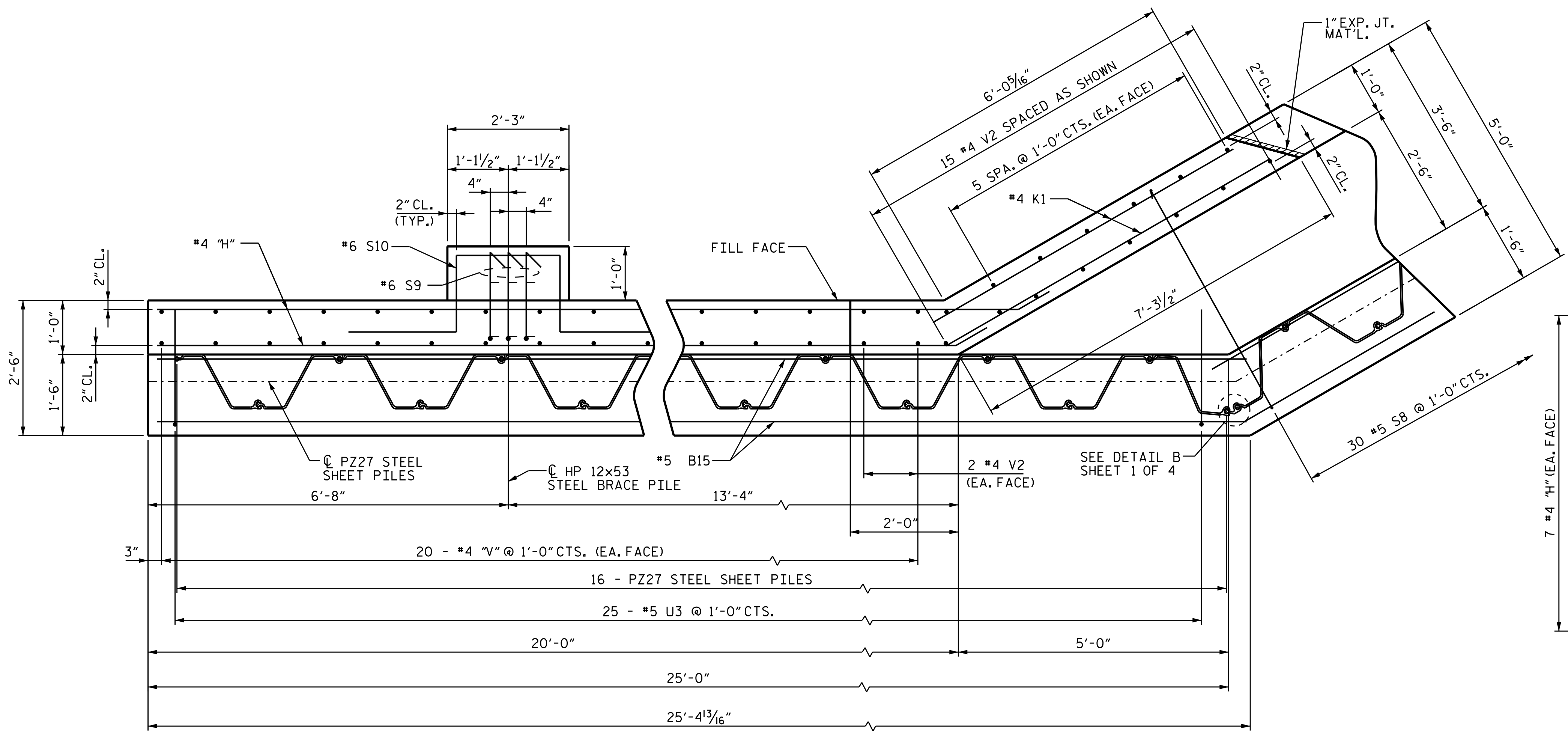
DRAWN BY : NMW DATE : 7/19  
 CHECKED BY : MCC DATE : 8/19  
 DESIGN ENGINEER OF RECORD : TBE DATE : 8/19

Professional Engineer Seal for Marshall G. Check, Jr., State of North Carolina, License No. 28150, dated 2/22/2021.

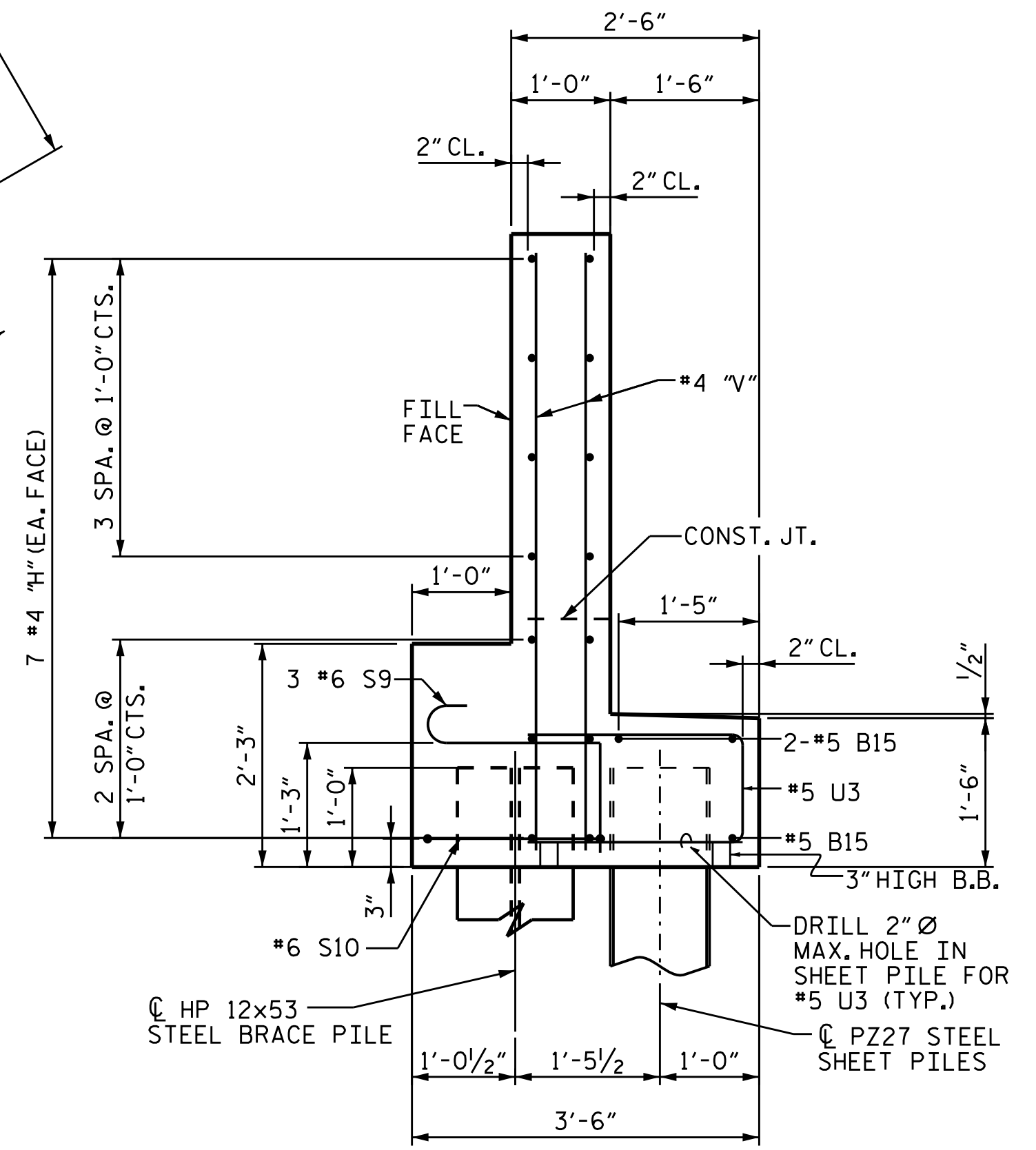
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

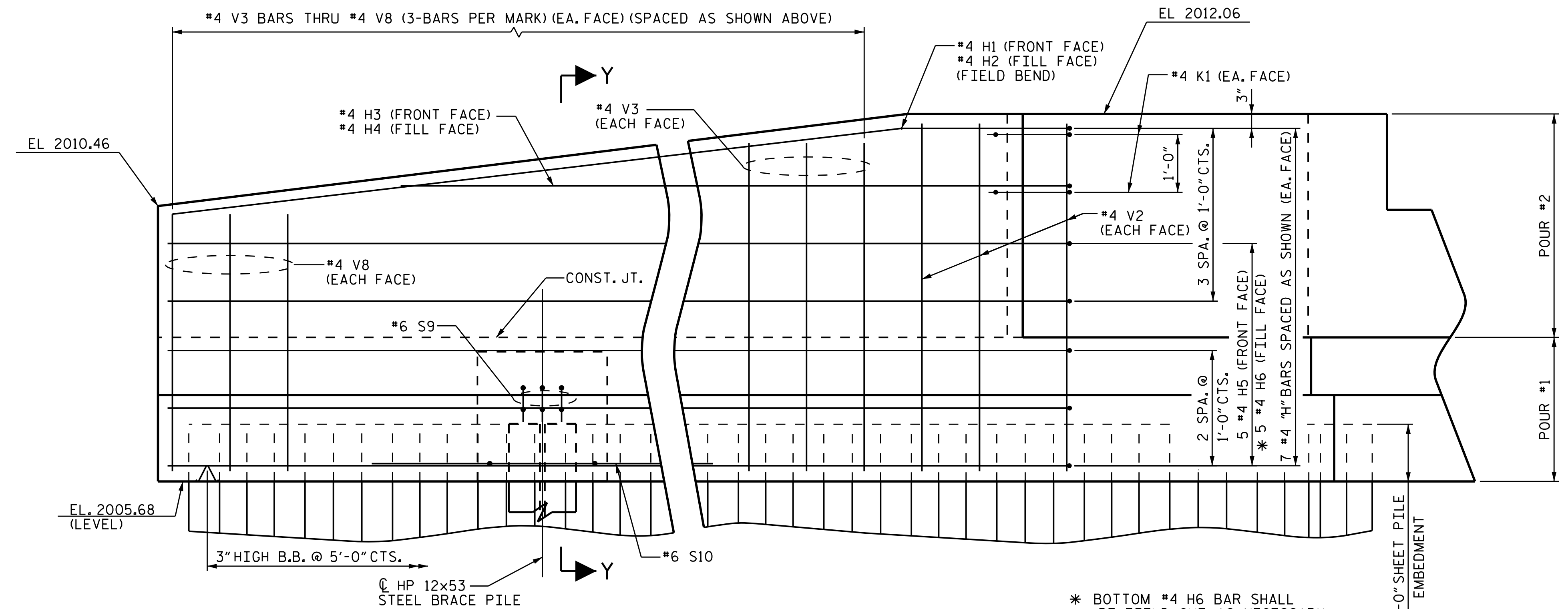
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-26
END BENT 1 STAGE I DETAILS						TOTAL SHEETS 43
REVISIONS						NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			



PLAN OF WING (W2)



SECTION Y-Y



ELEVATION OF WING (W2)

WING DETAILS

\* BOTTOM #4 H6 BAR SHALL BE FIELD CUT AS NECESSARY TO FIT AROUND STEEL PILE.

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**END BENT 1  
 STAGE I  
 WING DETAILS**

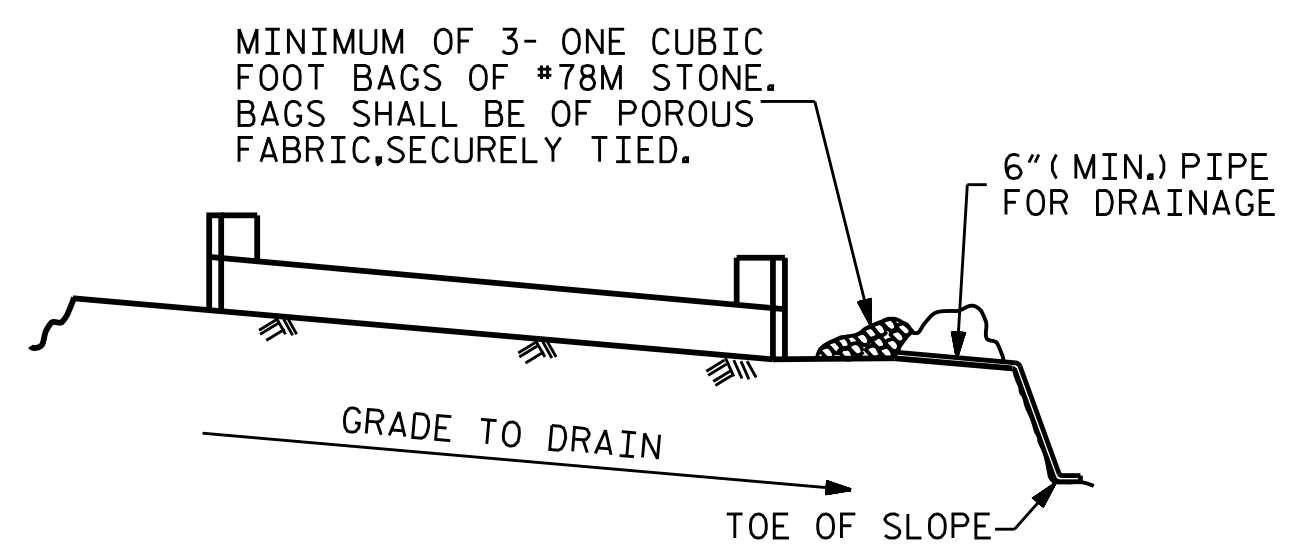
SHEET NO.  
S-27  
TOTAL SHEETS  
43

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

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

DRAWN BY : NMW      DATE : 7/19  
 CHECKED BY : MCC      DATE : 8/19  
 DESIGN ENGINEER OF RECORD : TBE      DATE : 8/19

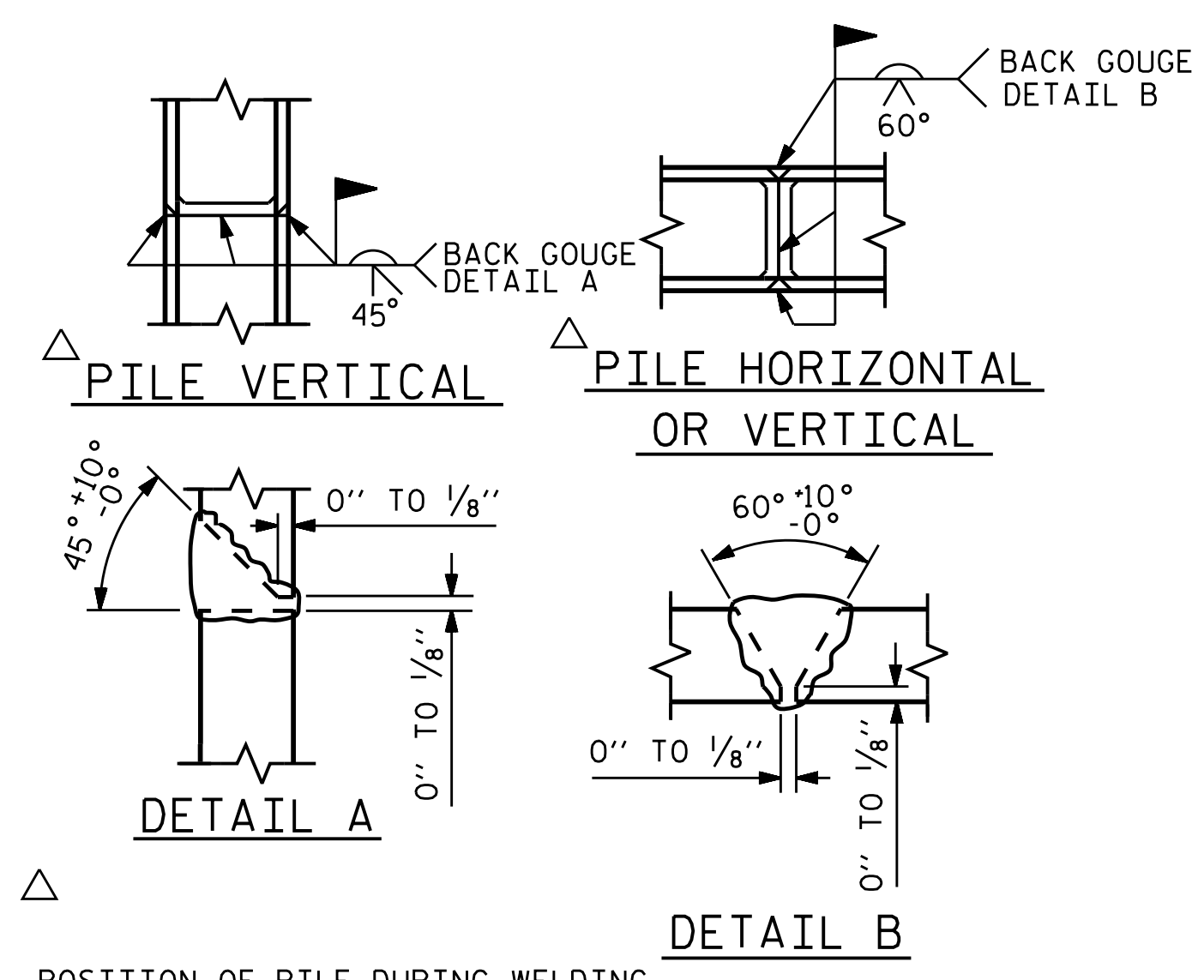


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

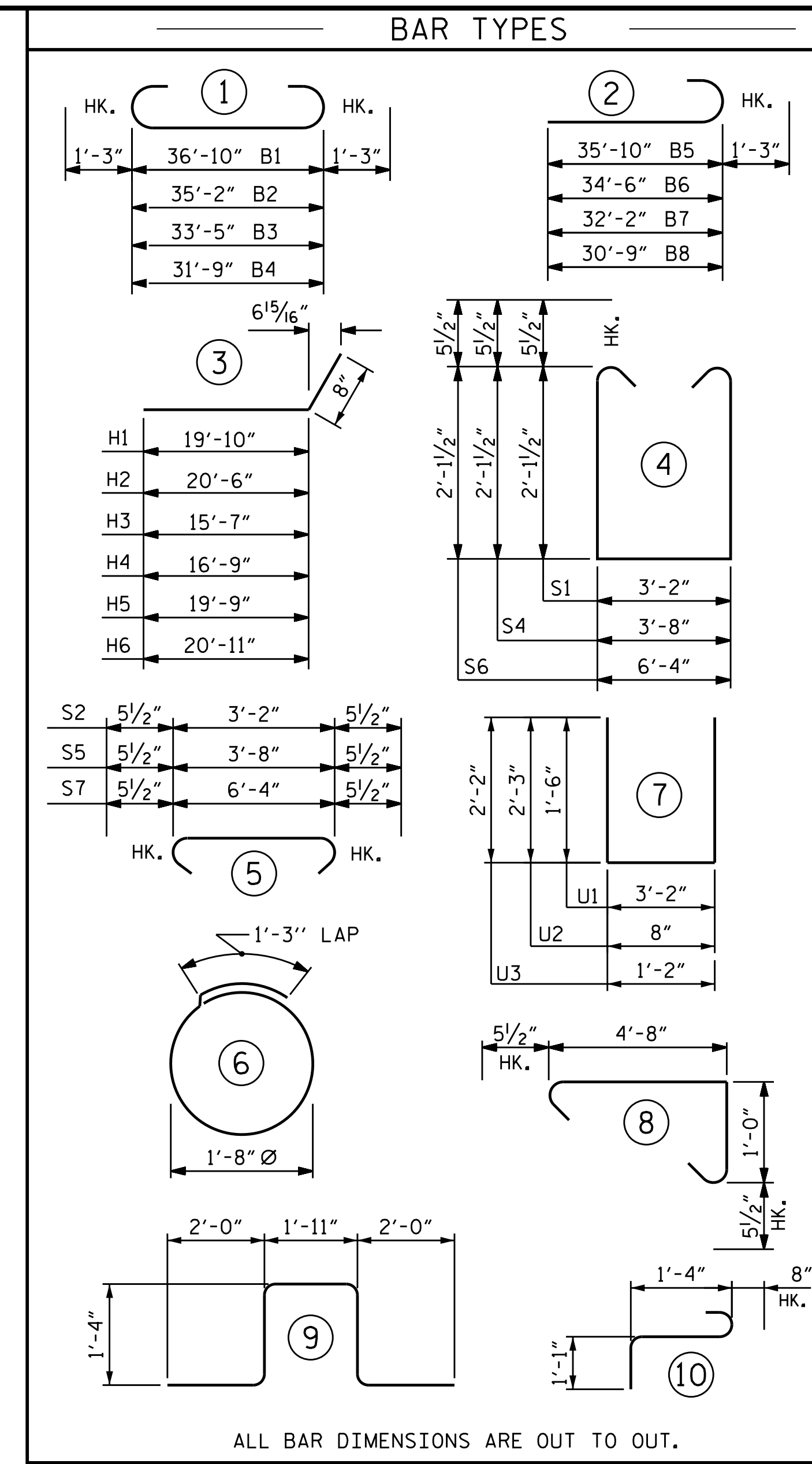
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

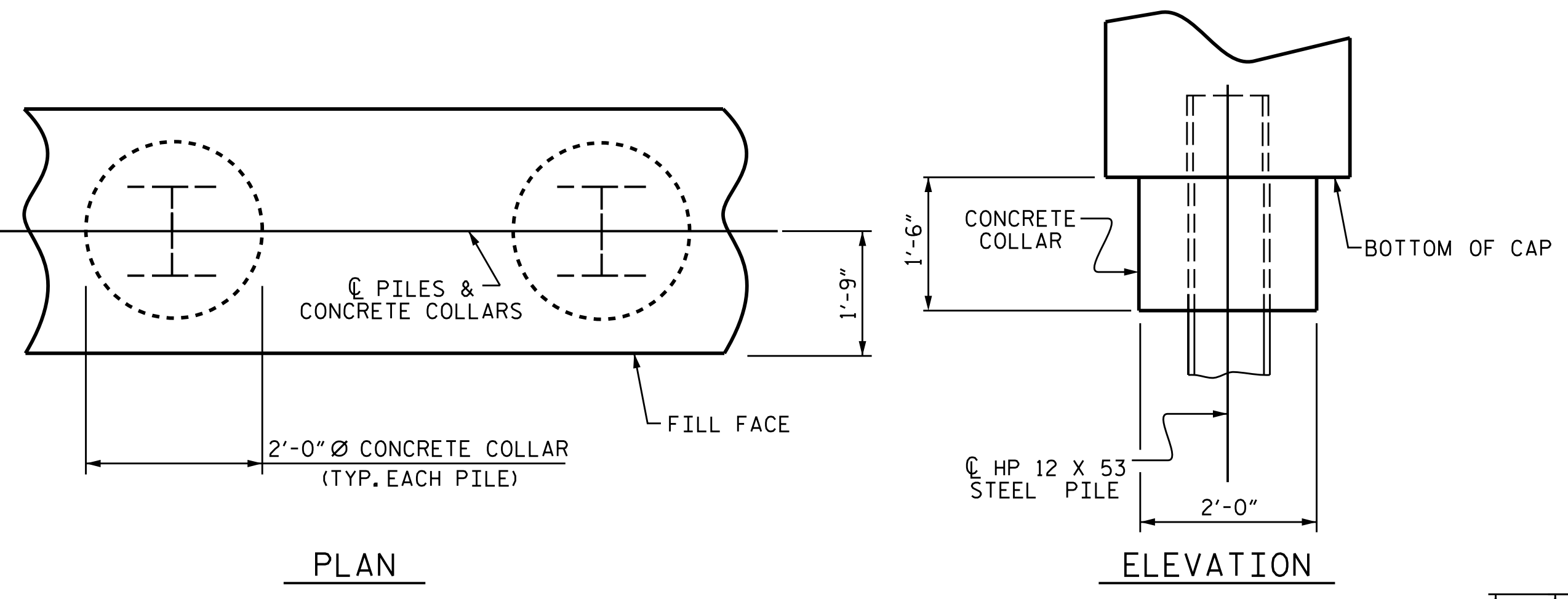
### TEMPORARY DRAINAGE AT END BENT



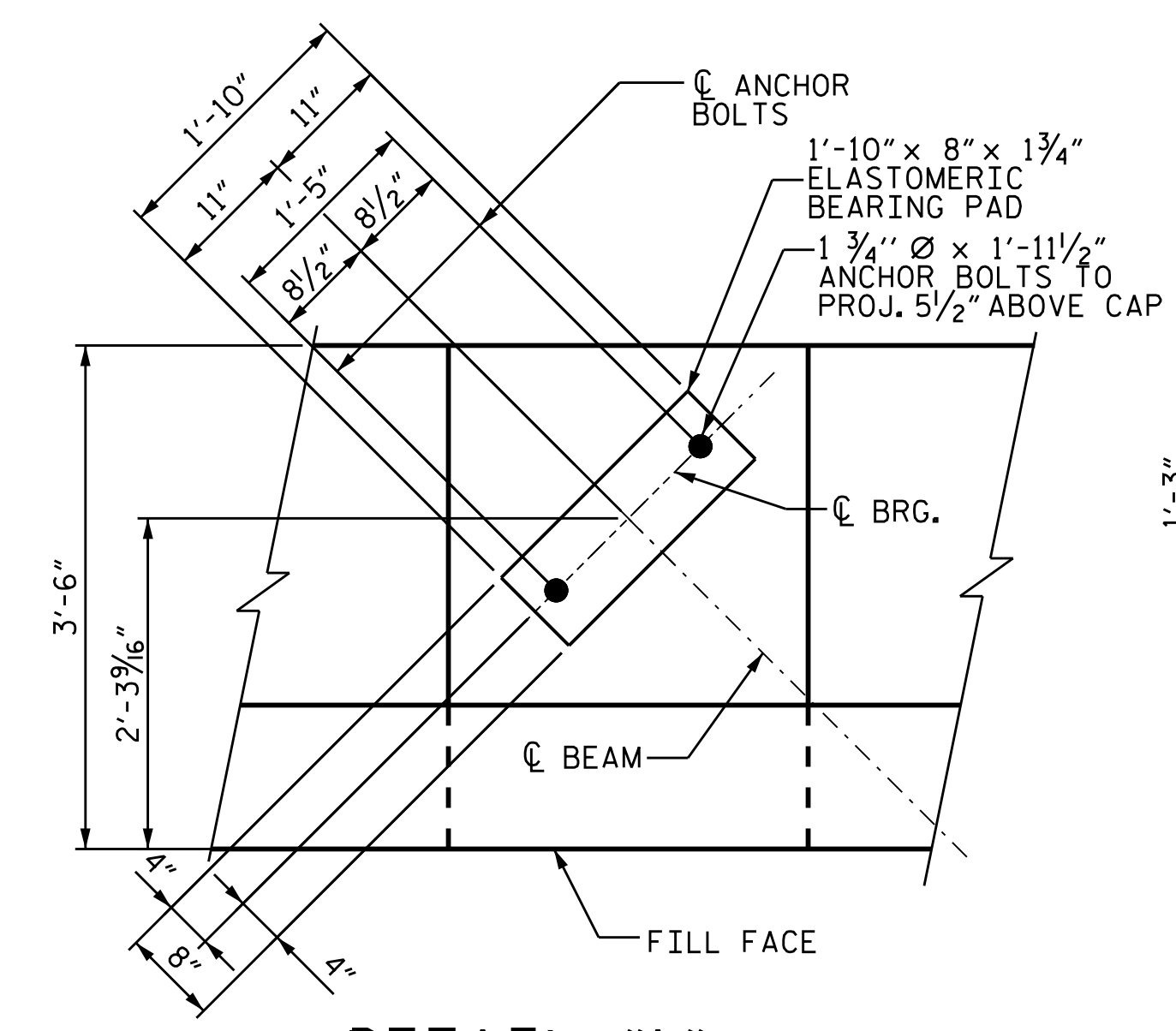
### PILE SPLICE DETAILS



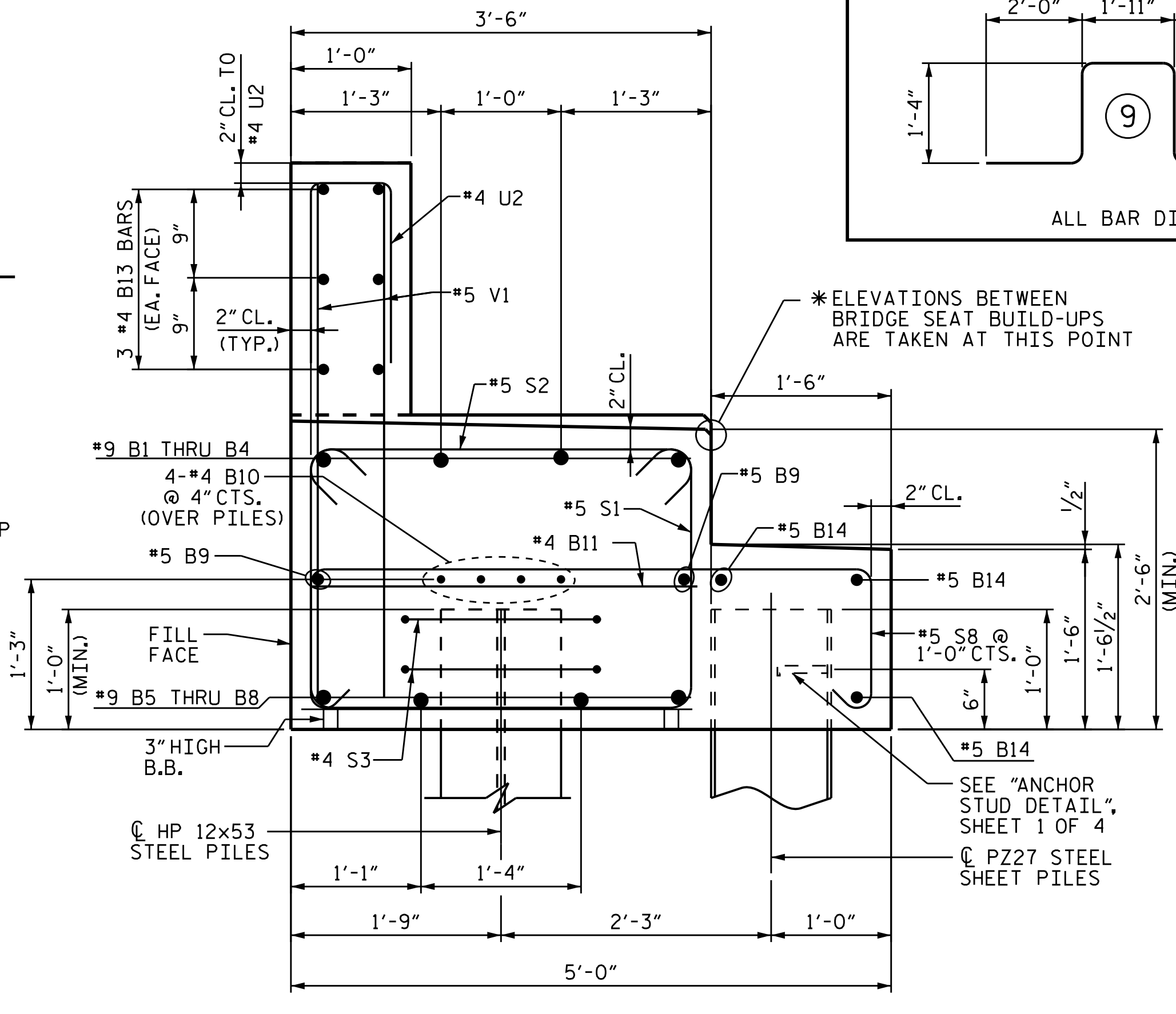
BILL OF MATERIAL					
END BENT 1 STAGE I					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	1	#9	1	39'-4"	134
B2	1	#9	1	37'-8"	128
B3	1	#9	1	35'-11"	122
B4	1	#9	1	34'-3"	116
B5	1	#9	2	37'-1"	126
B6	1	#9	2	35'-9"	122
B7	1	#9	2	33'-5"	114
B8	1	#9	2	32'-0"	109
B9	4	#5	STR.	20'-8"	86
B10	8	#4	STR.	19'-2"	102
B11	8	#4	STR.	3'-2"	17
B12	4	#4	STR.	14'-9"	39
B13	12	#4	STR.	20'-2"	162
B14	3	#5	STR.	32'-9"	102
B15	3	#5	STR.	25'-2"	79
H1	1	#4	3	20'-6"	14
H2	1	#4	3	21'-2"	14
H3	1	#4	3	16'-3"	11
H4	1	#4	3	17'-5"	12
H5	5	#4	3	20'-5"	68
H6	5	#4	3	21'-7"	72
K1	4	#4	STR.	6'-11"	18
S1	28	#5	4	8'-4"	243
S2	28	#5	5	4'-1"	119
S3	10	#4	6	6'-6"	43
S4	1	#5	4	8'-10"	9
S5	1	#5	5	4'-7"	5
S6	1	#5	4	11'-6"	12
S7	1	#5	5	7'-3"	8
S8	30	#5	8	6'-7"	206
S9	3	#6	10	3'-1"	14
S10	1	#6	9	8'-7"	13
U1	10	#4	7	6'-2"	41
U2	27	#4	7	5'-2"	93
U3	25	#5	7	5'-6"	143
V1	55	#5	STR.	4'-4"	249
V2	19	#4	STR.	6'-0"	76
V3	6	#4	STR.	5'-9"	23
V4	6	#4	STR.	5'-6"	22
V5	6	#4	STR.	5'-3"	21
V6	6	#4	STR.	5'-0"	20
V7	6	#4	STR.	4'-8"	19
V8	6	#4	STR.	4'-5"	18



### CORROSION PROTECTION FOR STEEL PILES DETAIL



### DETAIL "A"

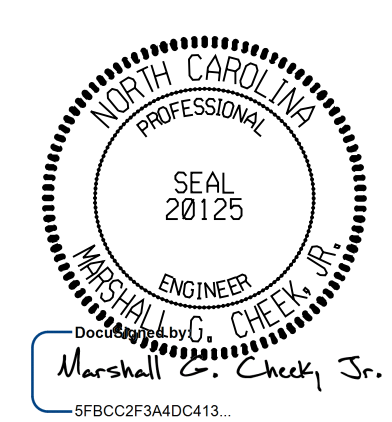


### SECTION A-A

HP 12 X 53 STEEL PILES NO: 6	96 LIN. FT.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	NO: 6 EA.
PILE EXCAVATION IN SOIL	59.33 LIN. FT.
PILE EXCAVATION NOT IN SOIL	30.00 LIN. FT.
18" GALV. STEEL SHEET PILES	576 SQ. FT.

REINFORCING STEEL	3,164 LBS.
CLASS A CONCRETE BREAKDOWN	
POUR #1 CAP, COLLAR, LOWER PART OF WING & COPING	18.2 C.Y.
POUR #2 BACKWALL & UPPER PART OF WING	5.4 C.Y.
TOTAL CLASS A CONCRETE	23.6 C.Y.

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 4 OF 4



## END BENT 1 STAGE I DETAILS

DRAWN BY : NMW DATE : 7/19  
 CHECKED BY : MCC DATE : 8/19  
 DESIGN ENGINEER OF RECORD : TBE DATE : 8/19

DOCUMENT NOT CONSIDERED FINAL  
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TGS ENGINEERS  
 804-C N. LAFAYETTE ST  
 SHELBY, NC 28150  
 PH (704) 475-0003  
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS 43
2			4			

# NOTES

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

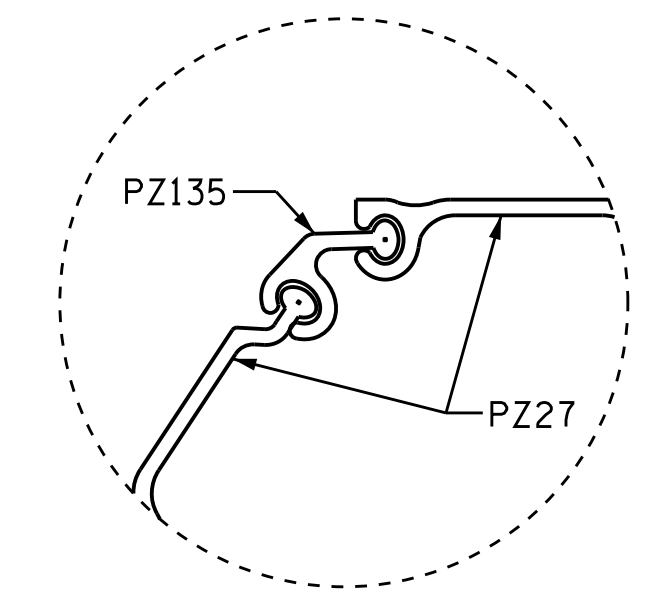
THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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%.

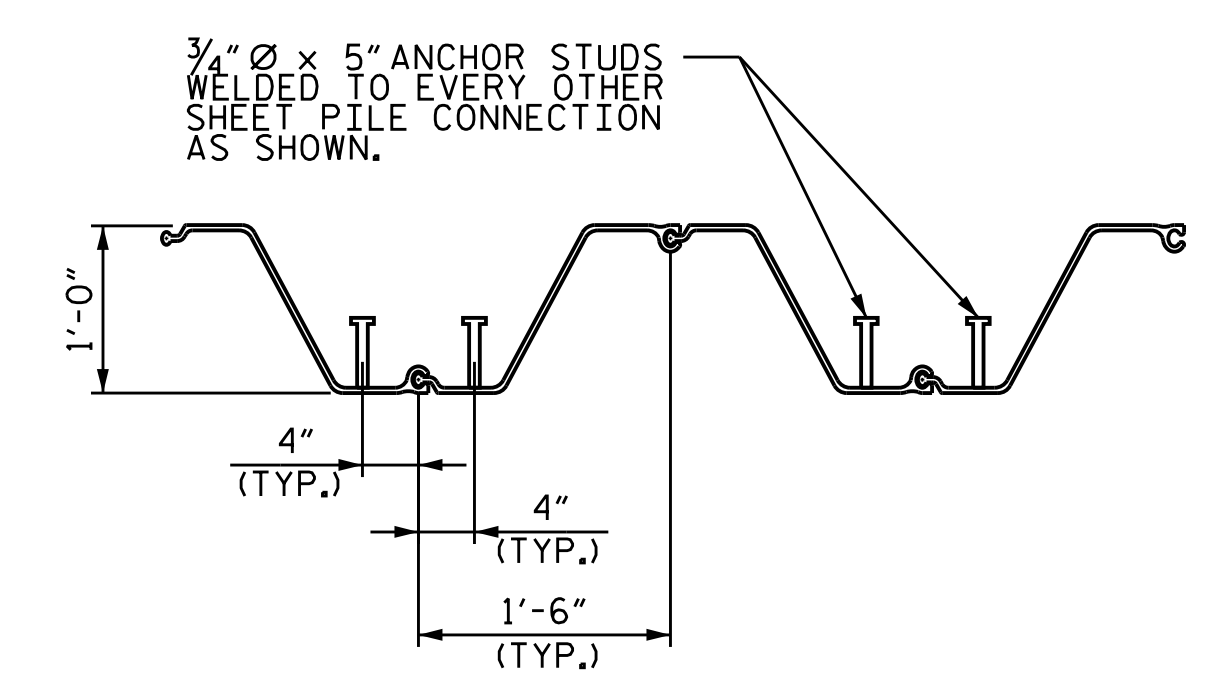
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE CURB IS CAST IF SLIP FORMING IS USED.

EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.

FOR WING DETAILS, SEE SHEET 3 OF 4.



### DETAIL "C"



### ANCHOR STUD DETAIL

PROJECT NO. 17BP.14.R.211

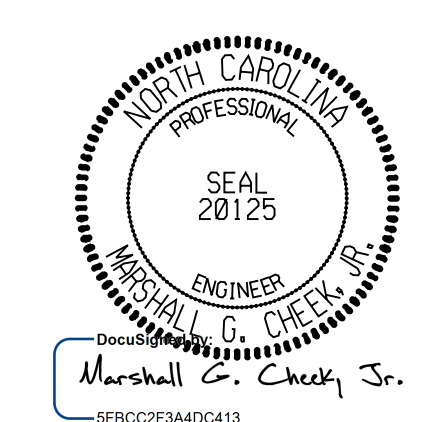
MACON COUNTY

STATION: 16+13.00-L-

SHEET 1 OF 4

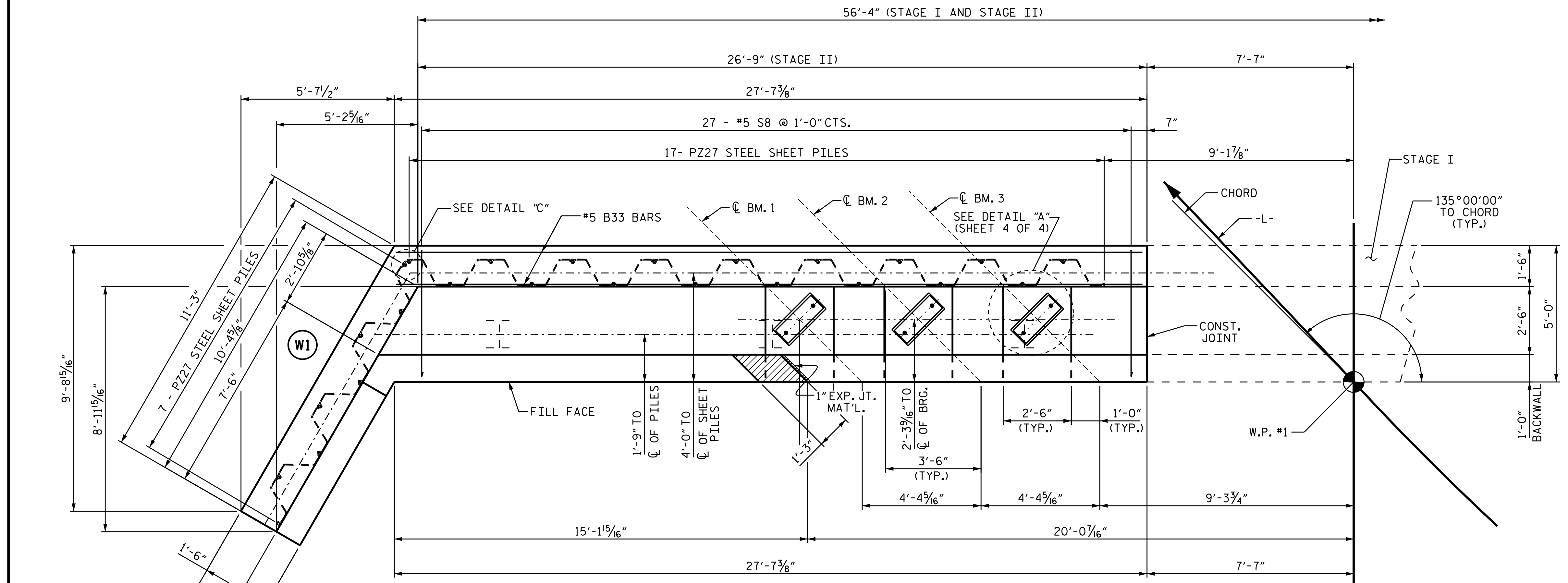
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

## END BENT 1 STAGE II

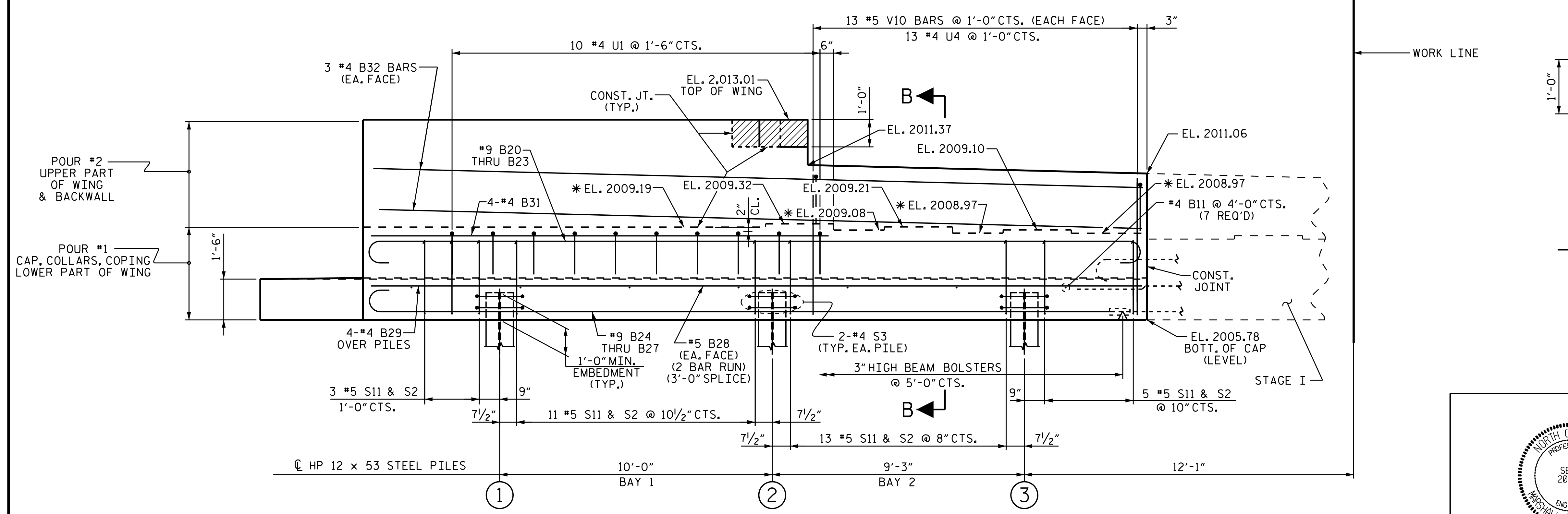


Marshall G. Cheek Jr.  
2/22/2021  
TGS ENGINEERS  
804-C N. LAFAYETTE ST  
SHELBY, NC 28150  
PH (704) 476-0003  
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			43
2			4			



### PLAN

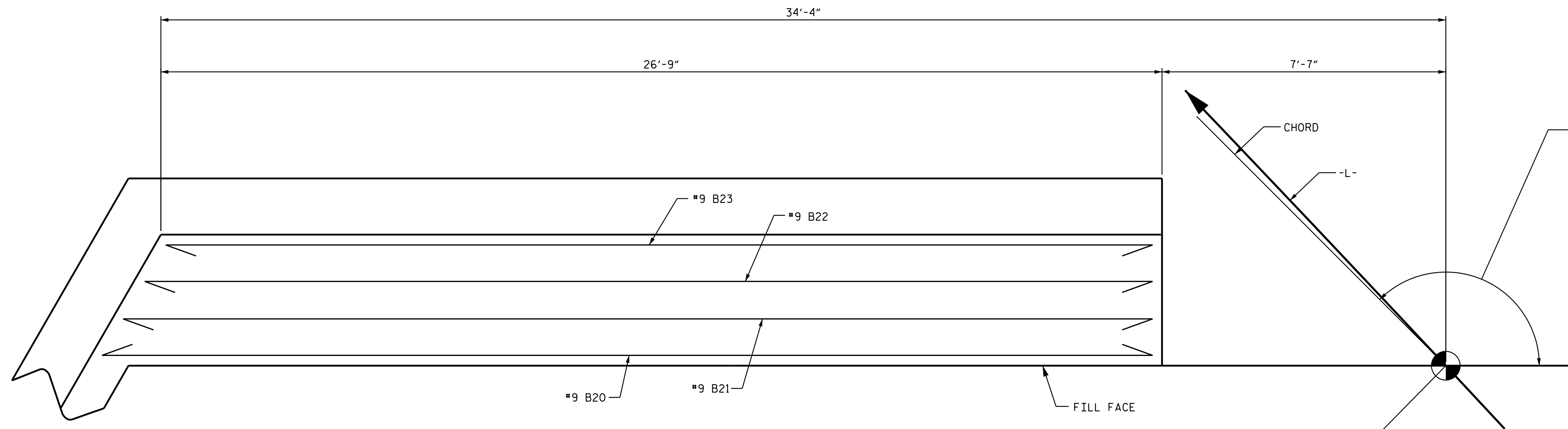


### ELEVATION

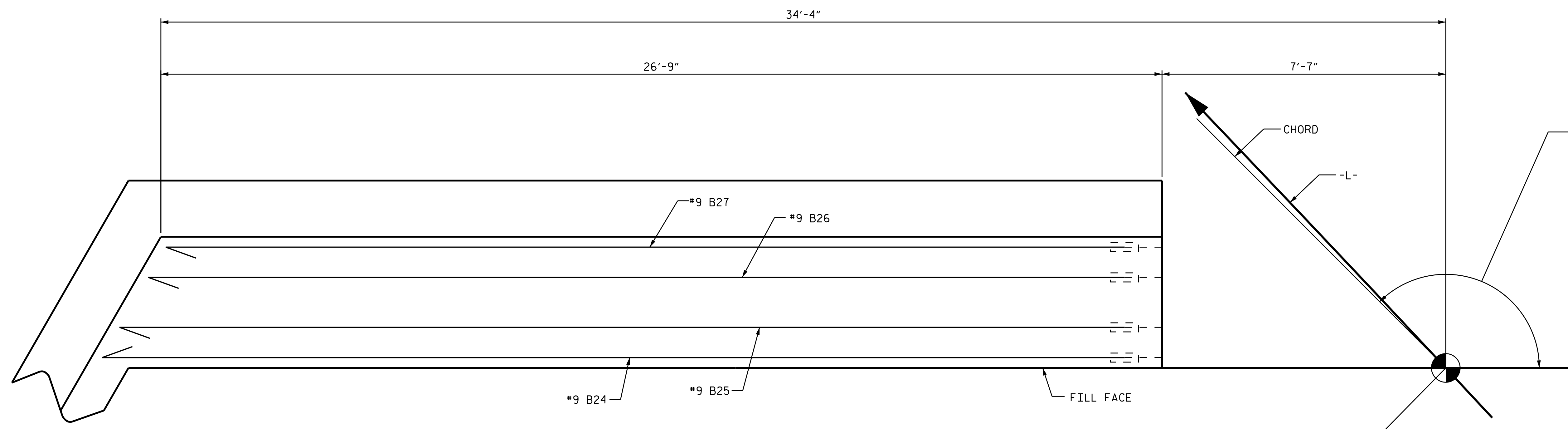
WING & SHEET PILES NOT SHOWN FOR CLARITY. FOR SECTION B-B, SEE SHEET 4 OF 4. CONCRETE COLLARS FOR STEEL PILES NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

\*FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS SEE SECTION "B-B", (SHEET 4 OF 4)

DRAWN BY : NMW DATE : 7/19  
CHECKED BY : MCC DATE : 8/19  
DESIGN ENGINEER OF RECORD : TBE DATE : 8/19



#9 "B" BARS - TOP OF CAP

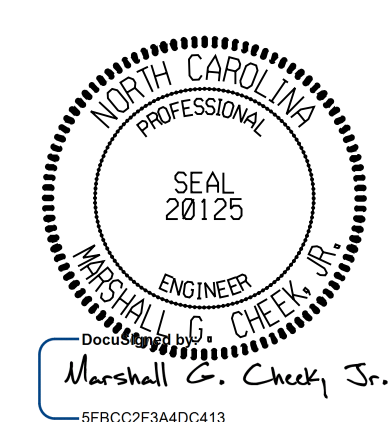


#9 "B" BARS - BOTTOM OF CAP

PROJECT NO. 17BP.14.R.211  
MACON COUNTY  
 STATION: 16+13.00-L-

SHEET 2 OF 4

DRAWN BY : NMW DATE : 7/19  
 CHECKED BY : MCC DATE : 8/19  
 DESIGN ENGINEER OF RECORD : TBE DATE : 8/19



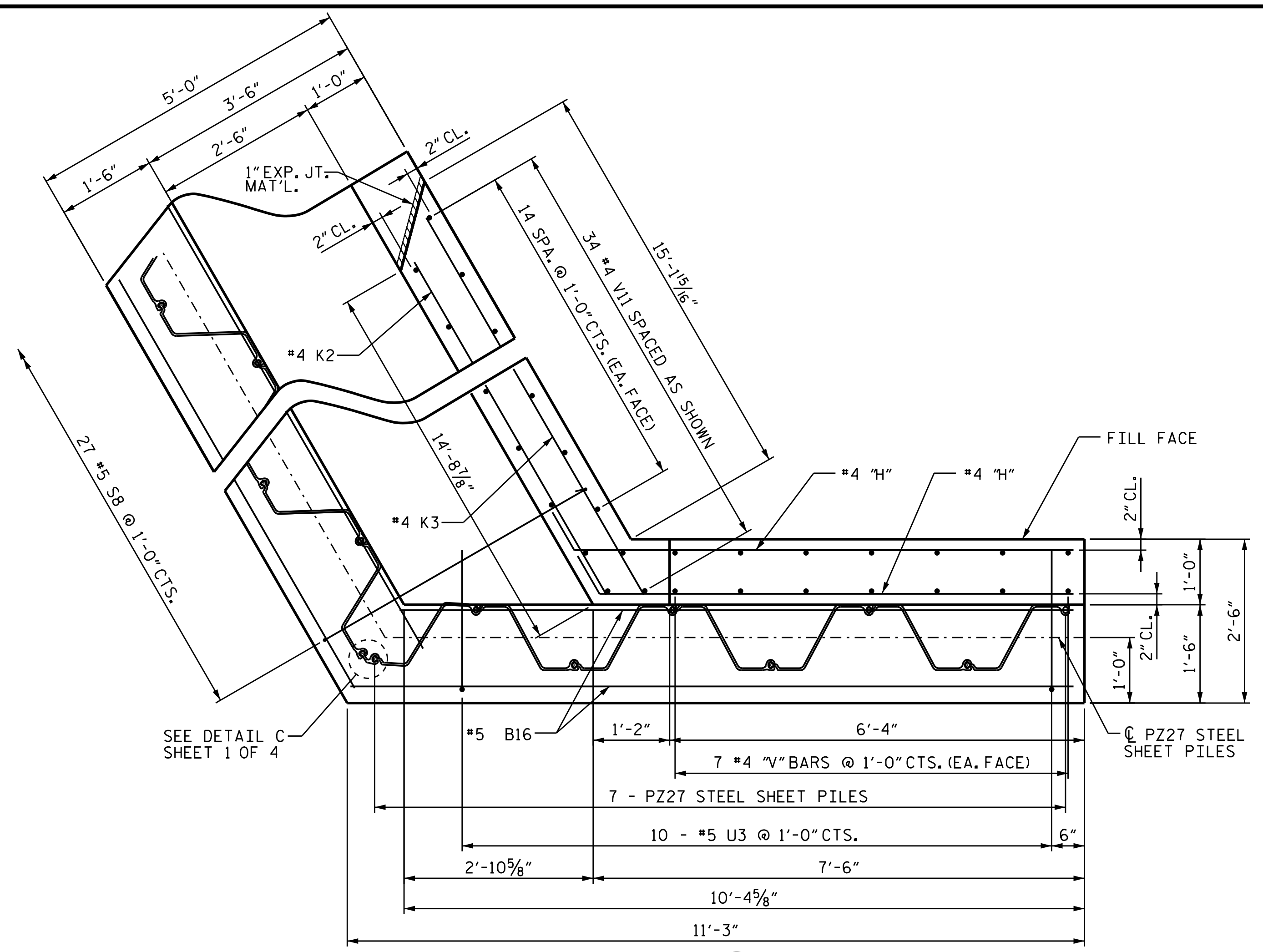
DOCUMENT NOT CONSIDERED FINAL  
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**TGS ENGINEERS**  
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 SHELBY, NC 28150  
 PH (704) 476-0003  
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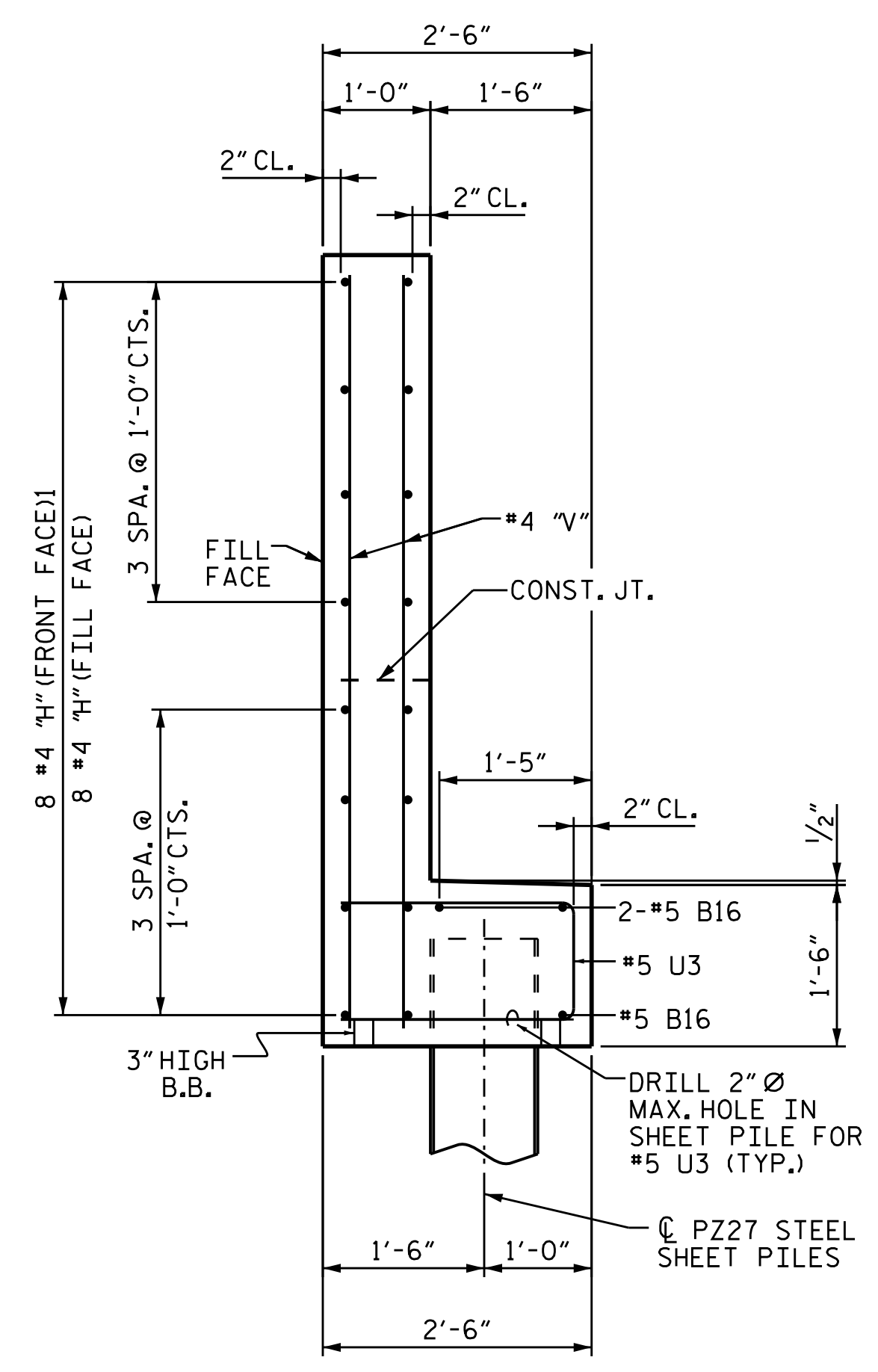
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**END BENT 1  
 STAGE II DETAILS**

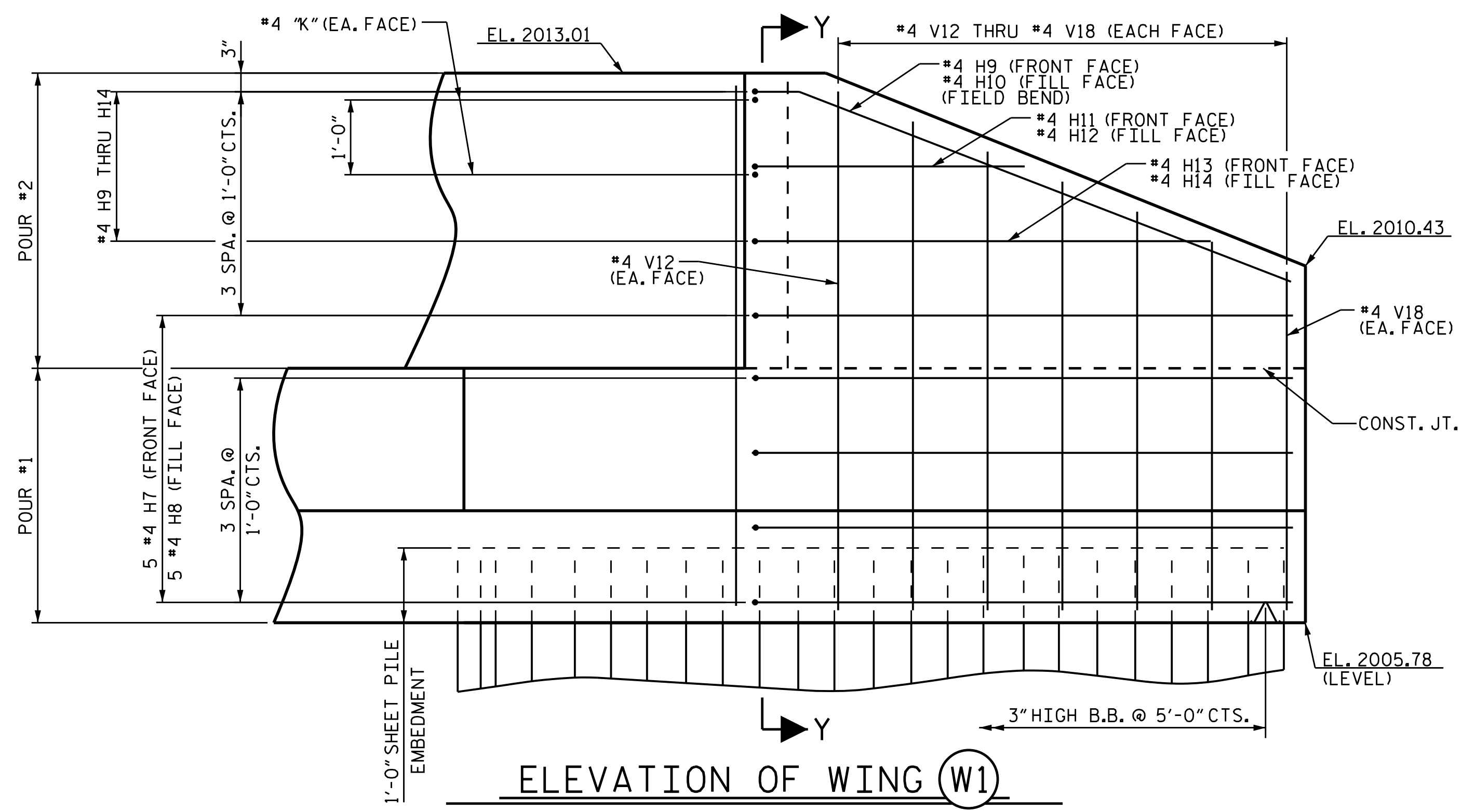
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			43



PLAN OF WING (W1)



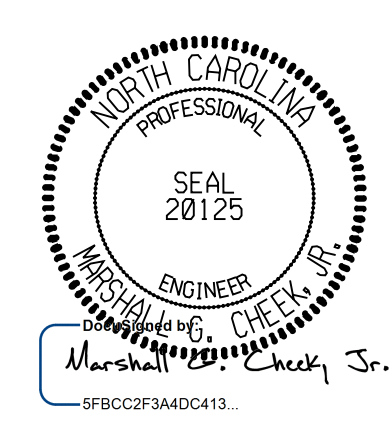
SECTION Y-Y



ELEVATION OF WING (W1)

WING DETAILS

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 3 OF 4

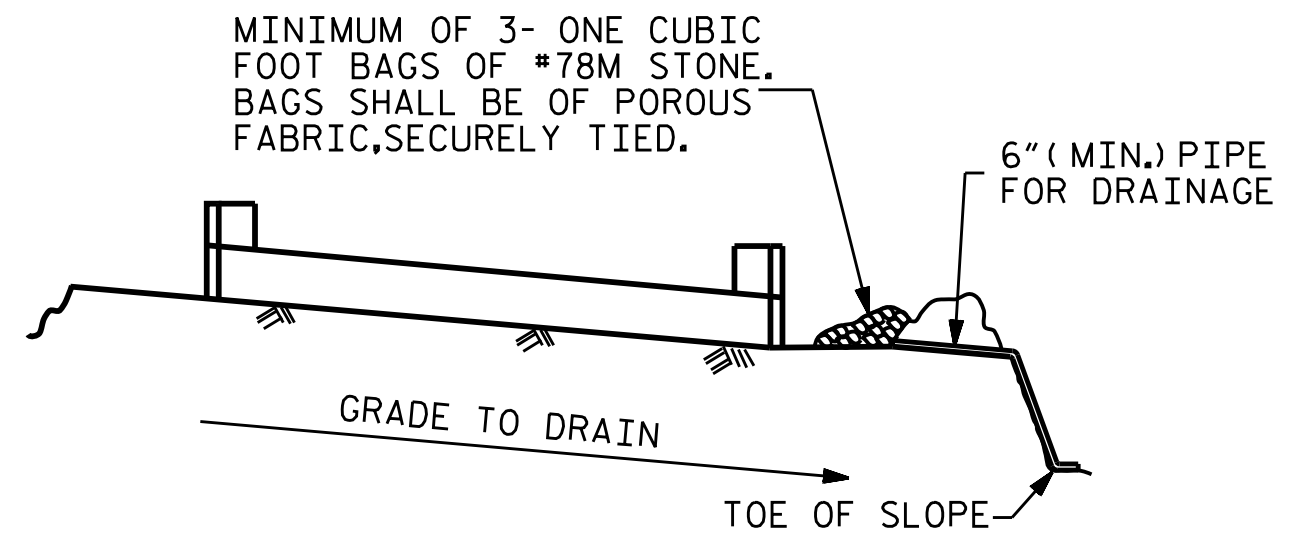


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 END BENT 1  
 STAGE II  
 WING DETAILS

DRAWN BY : NMW DATE : 7/19  
 CHECKED BY : MCC DATE : 8/19  
 DESIGN ENGINEER OF RECORD : TBE DATE : 8/19

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						REVISIONS		SHEET NO.				
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-31
						1			3			TOTAL SHEETS
						2			4			43



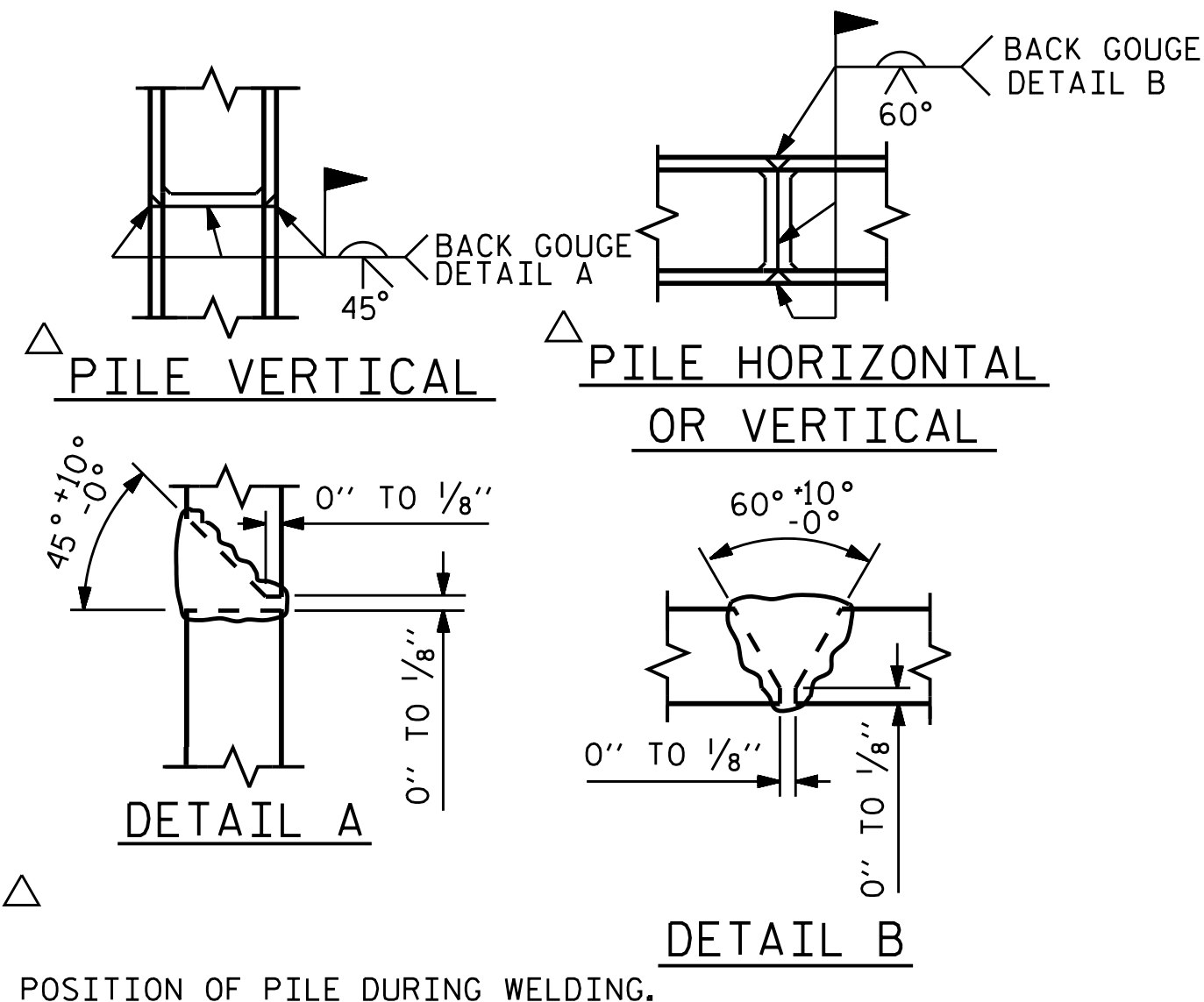


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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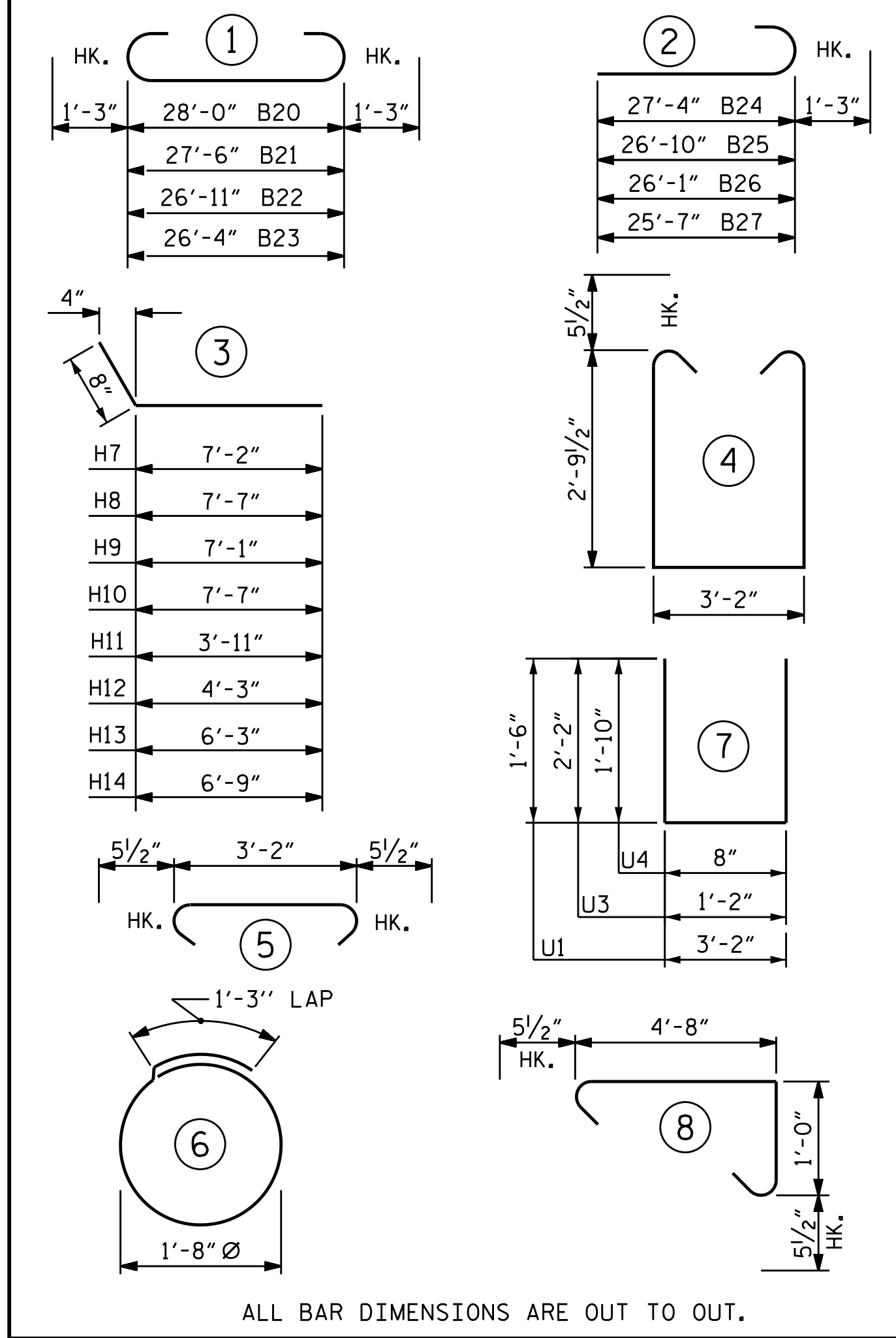
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

**TEMPORARY DRAINAGE AT END BENT**



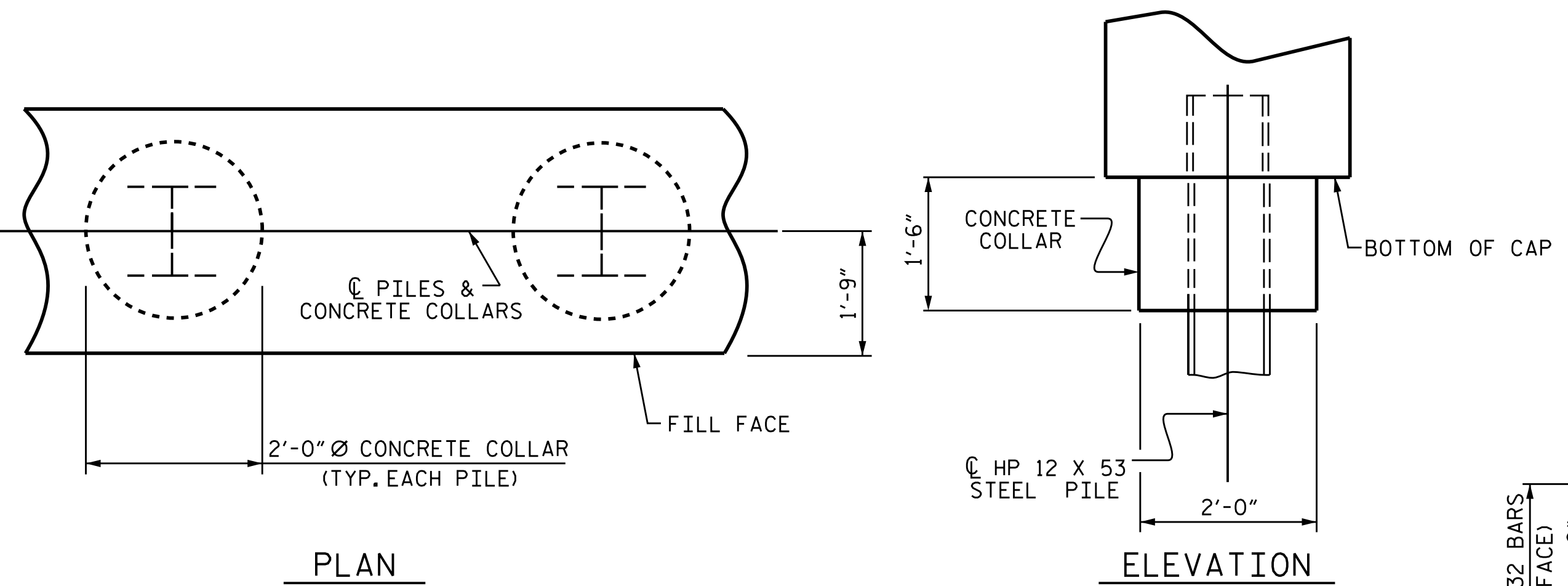
**PILE SPLICE DETAILS**

**BAR TYPES**

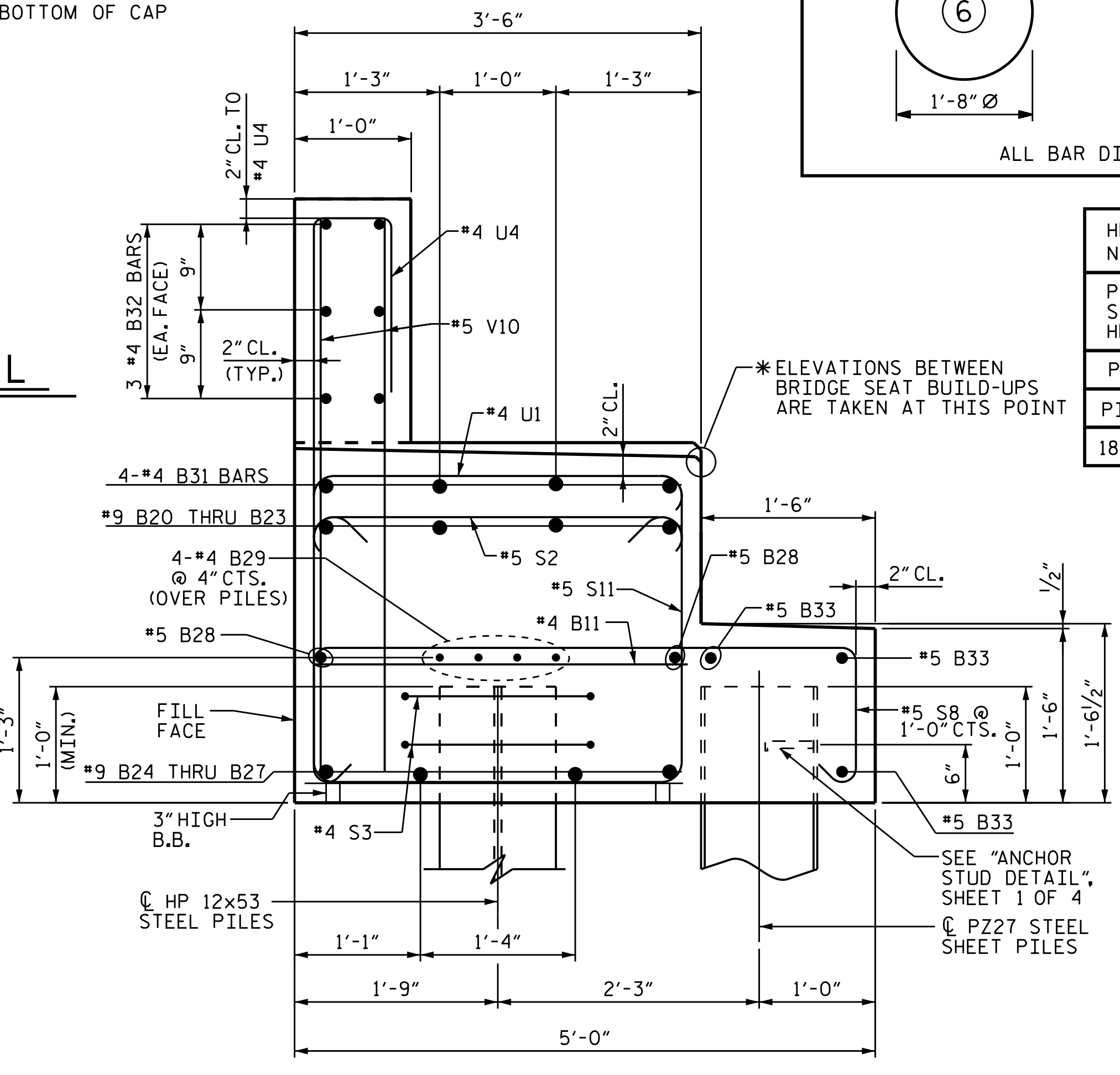


**BILL OF MATERIAL**

END BENT 1 STAGE II					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B11	#4	STR.	3'-2"	15	
B16	#5	STR.	11'-0"	34	
B20	#9	1	30'-6"	104	
B21	#9	1	30'-0"	102	
B22	#9	1	29'-5"	100	
B23	#9	1	28'-10"	98	
B24	#9	2	28'-7"	97	
B25	#9	2	28'-1"	95	
B26	#9	2	27'-4"	93	
B27	#9	2	26'-10"	91	
B28	#5	STR.	15'-8"	65	
B29	#4	STR.	27'-8"	74	
B31	#4	STR.	14'-11"	40	
B32	#4	STR.	27'-11"	112	
B33	#5	STR.	27'-4"	86	
H7	#4	3	7'-10"	26	
H8	#4	3	8'-3"	28	
H9	#4	3	7'-9"	5	
H10	#4	3	8'-3"	6	
H11	#4	3	4'-7"	3	
H12	#4	3	4'-11"	3	
H13	#4	3	6'-11"	5	
H14	#4	3	7'-5"	5	
K2	#4	STR.	14'-8"	20	
K3	#4	STR.	15'-6"	21	
S2	#5	5	4'-1"	136	
S3	#4	6	6'-6"	26	
S8	#5	8	6'-7"	185	
S11	#5	4	9'-8"	323	
U1	#4	7	6'-2"	41	
U3	#5	7	5'-6"	57	
U4	#4	7	4'-4"	38	
V10	#5	STR.	5'-0"	136	
V11	#4	STR.	7'-0"	159	
V12	#4	STR.	6'-11"	9	
V13	#4	STR.	6'-6"	9	
V14	#4	STR.	6'-1"	8	
V15	#4	STR.	5'-8"	8	
V16	#4	STR.	5'-4"	7	
V17	#4	STR.	4'-11"	7	
V18	#4	STR.	4'-6"	6	



**CORROSION PROTECTION FOR STEEL PILES DETAIL**



HP 12 X 53 STEEL PILES	NO: 3	48 LIN. FT.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	NO: 3 EA.	
PILE EXCAVATION IN SOIL	29.67 LIN. FT.	
PILE EXCAVATION NOT IN SOIL	15.00 LIN. FT.	
18" GALV. STEEL SHEET PILES	375 SQ. FT.	

REINFORCING STEEL 2,483 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, COLLARS, LOWER PART OF WING & COPING 16.8 C.Y.

POUR #2 BACKWALL & UPPER PART OF WING 4.2 C.Y.

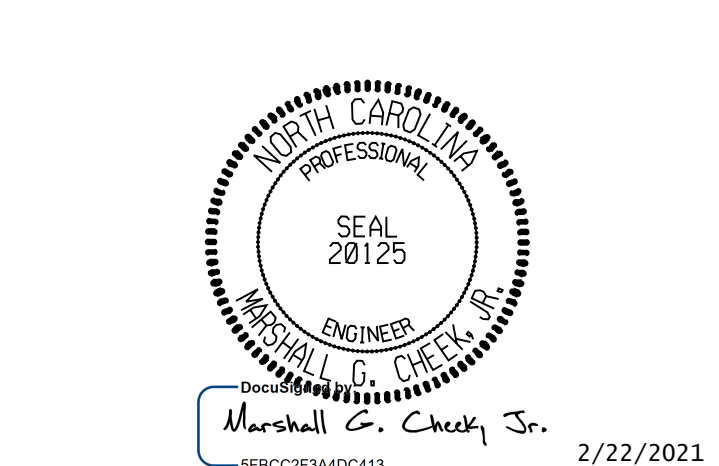
TOTAL CLASS A CONCRETE 21.0 C.Y.

PROJECT NO. 17BP.14.R.211

MACON COUNTY

STATION: 16+13.00-L-

SHEET 4 OF 4



DRAWN BY : NMW DATE : 7/19

CHECKED BY : MCC DATE : 8/19

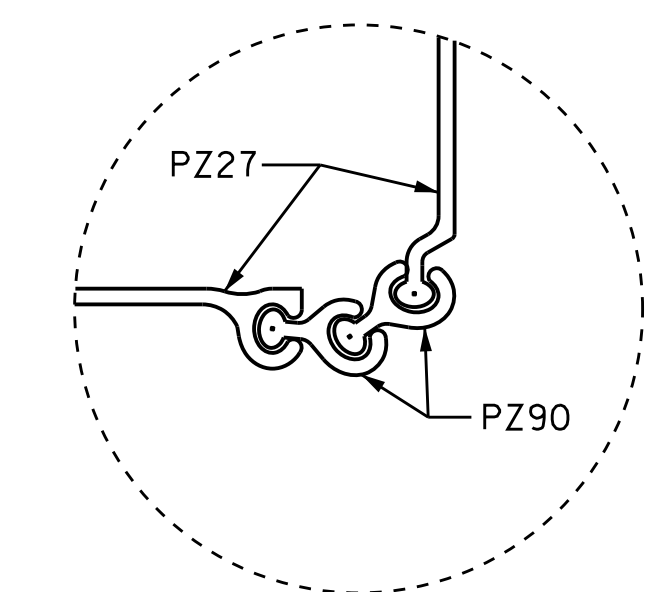
DESIGN ENGINEER OF RECORD : TBE DATE : 8/19

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

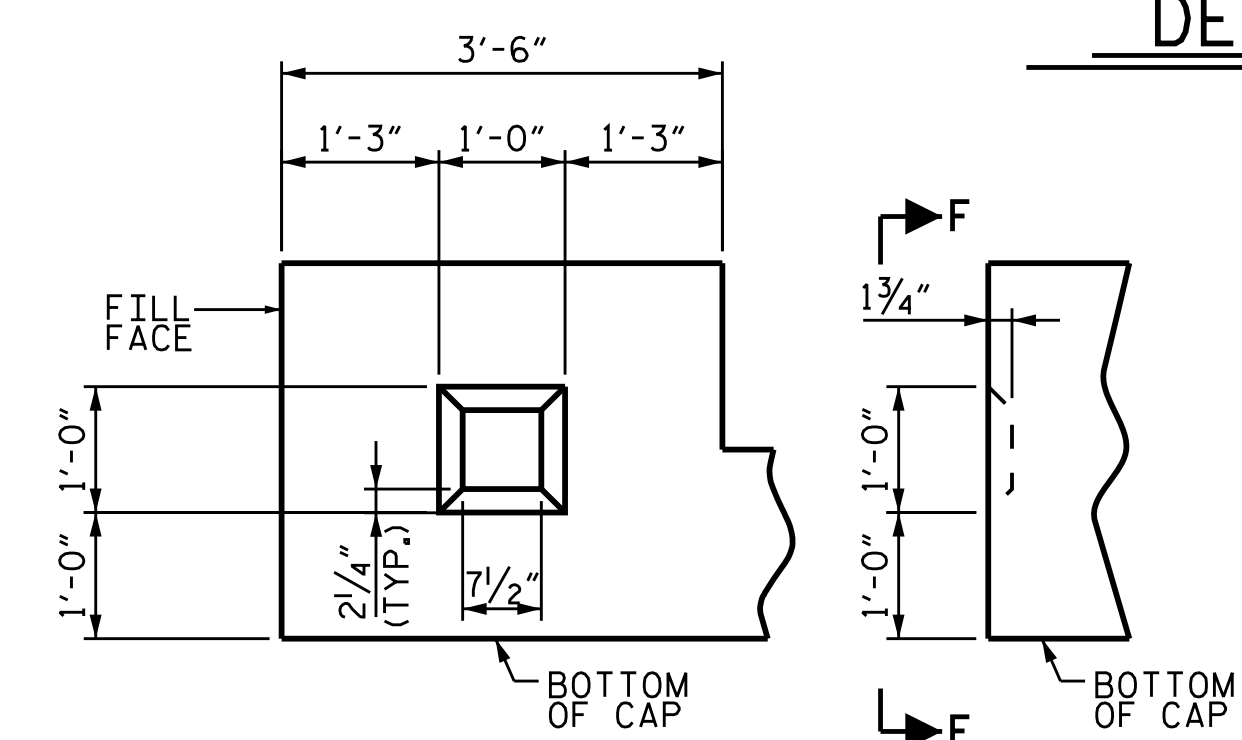
SHEET NO.	S-32
TOTAL SHEETS	43

### NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- 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%.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE CURB IS CAST IF SLIP FORMING IS USED.
- FOR WING DETAILS, SEE SHEET 2 OF 3.



DETAIL "B"

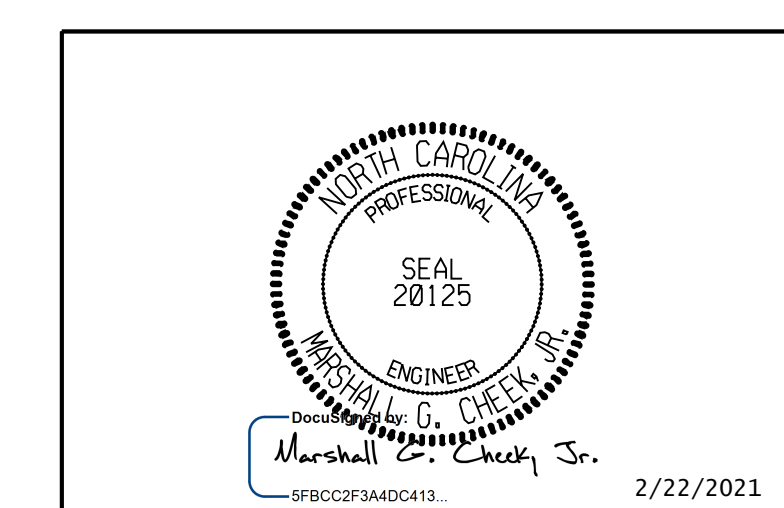


SECTION F-F

### SHEAR KEY DETAIL

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-

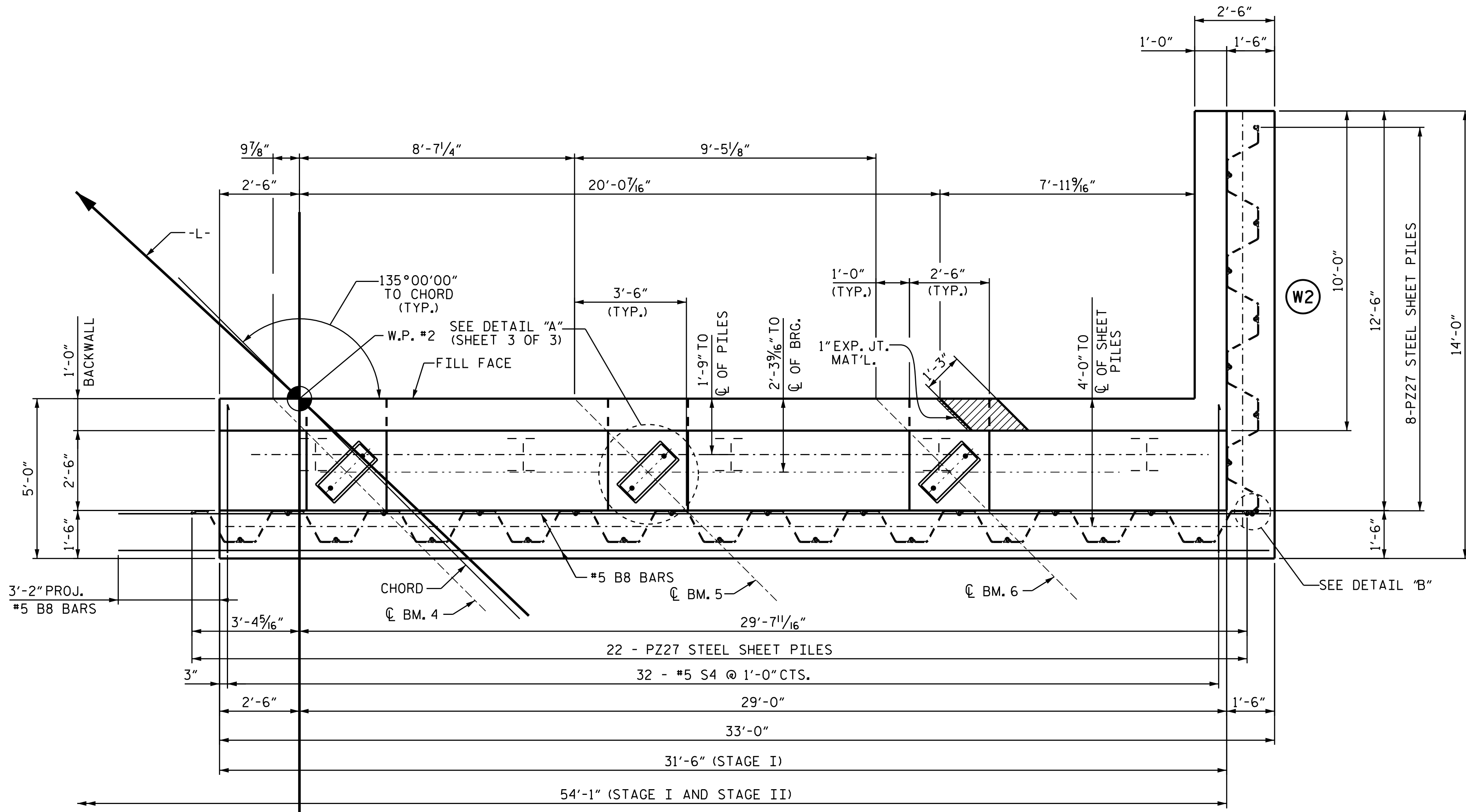
SHEET 1 OF 3



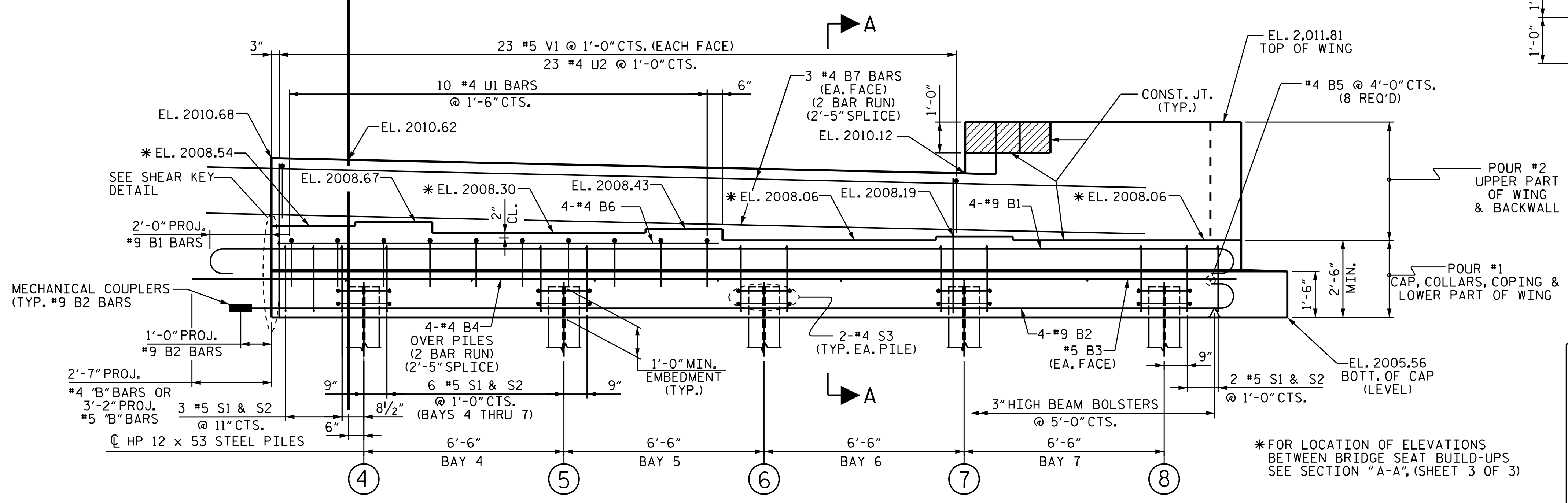
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

### END BENT 2 STAGE I

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-33
1			3			TOTAL SHEETS
2			4			43



PLAN



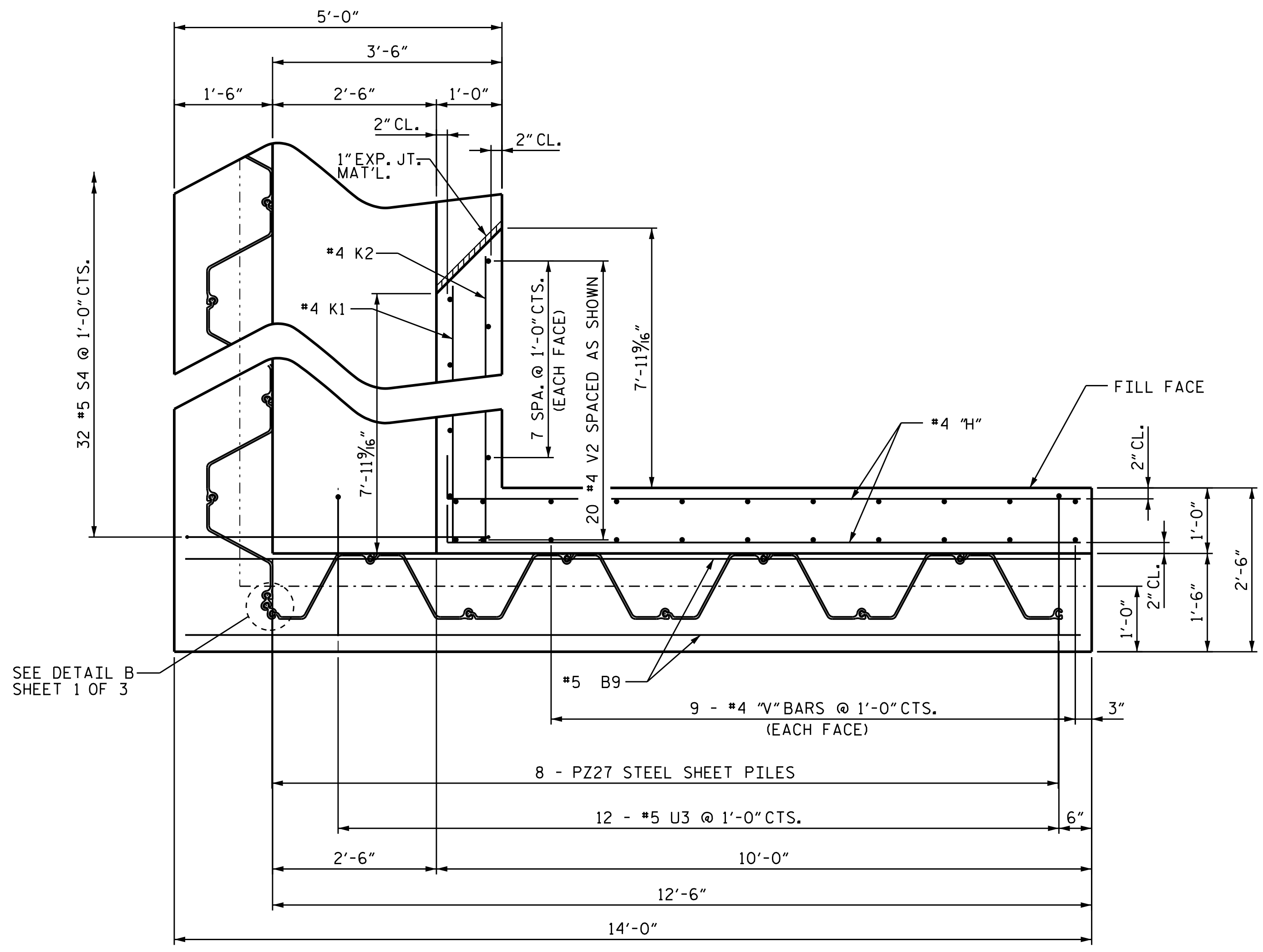
ELEVATION

WING & SHEET PILES NOT SHOWN FOR CLARITY.  
 FOR SECTION A-A, SEE SHEET 3 OF 3.  
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN FOR CLARITY, SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 3 OF 3.

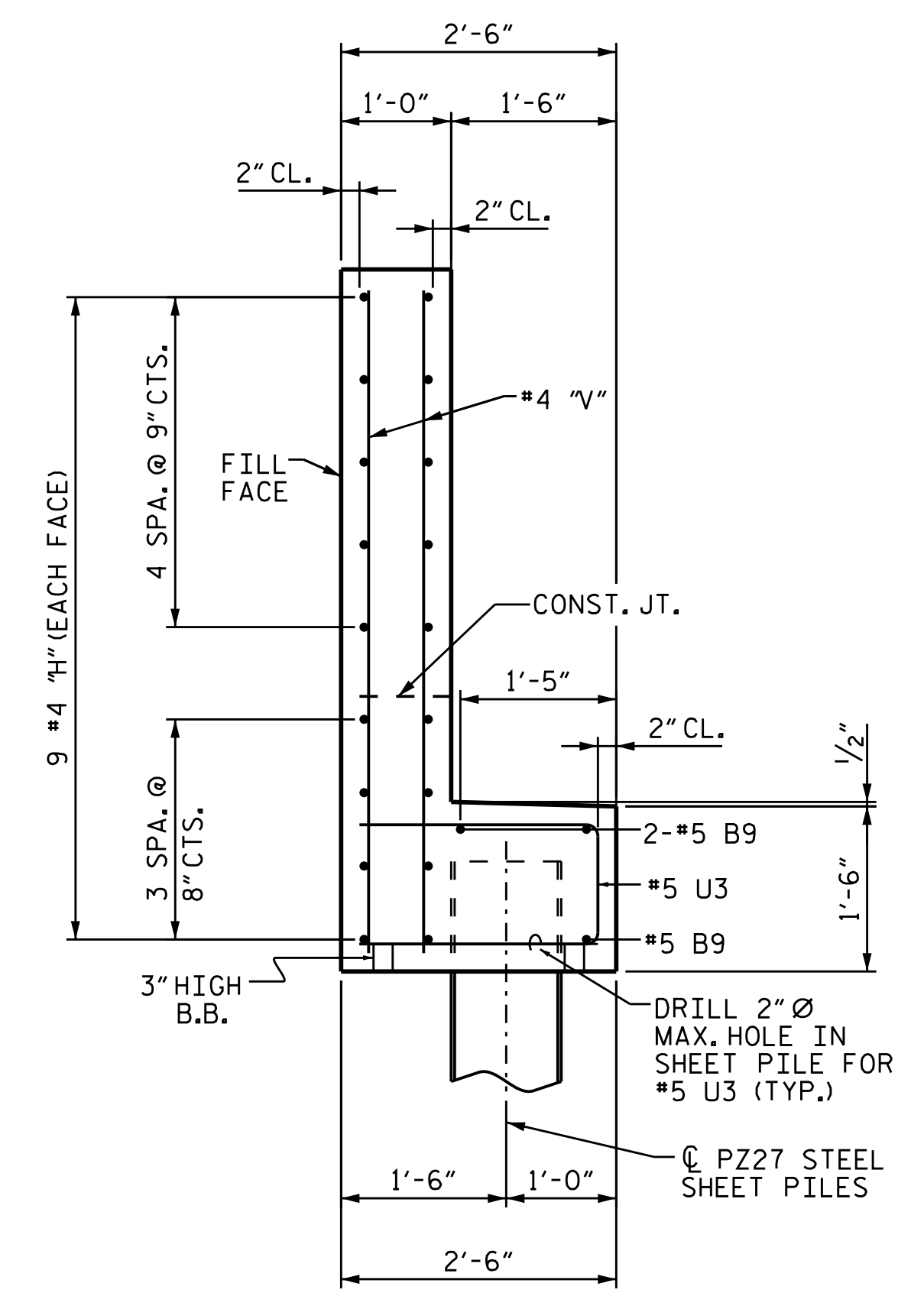
DRAWN BY : NMW DATE : 7/19  
 CHECKED BY : MCC DATE : 8/19  
 DESIGN ENGINEER OF RECORD : TBE DATE : 8/19

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

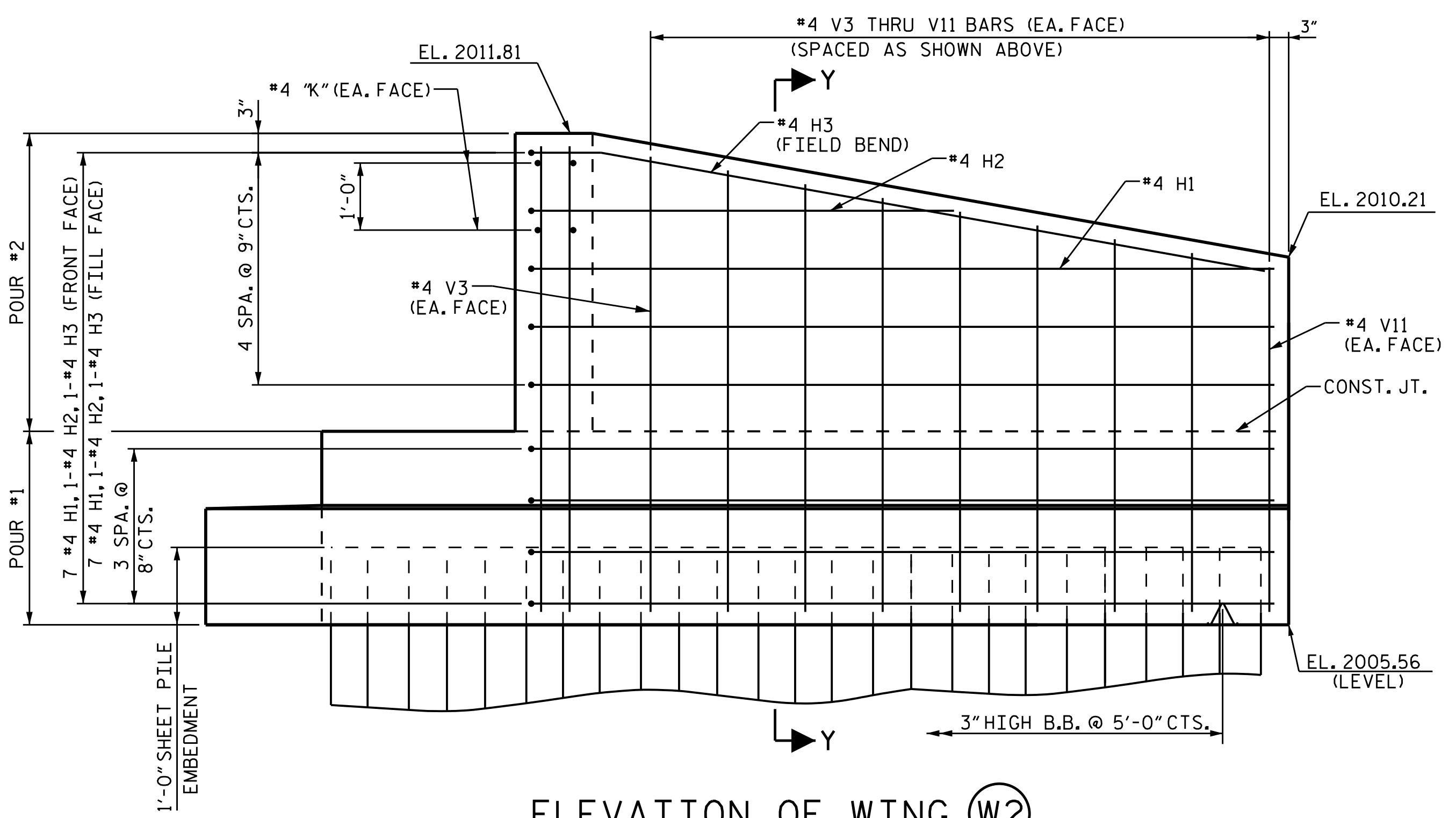
TGS ENGINEERS  
 804-C N. LAFAYETTE ST  
 SHELBY, NC 28150  
 PH (704) 476-0003  
 CORP. LICENSE NO.: C-0275



PLAN OF WING (W2)

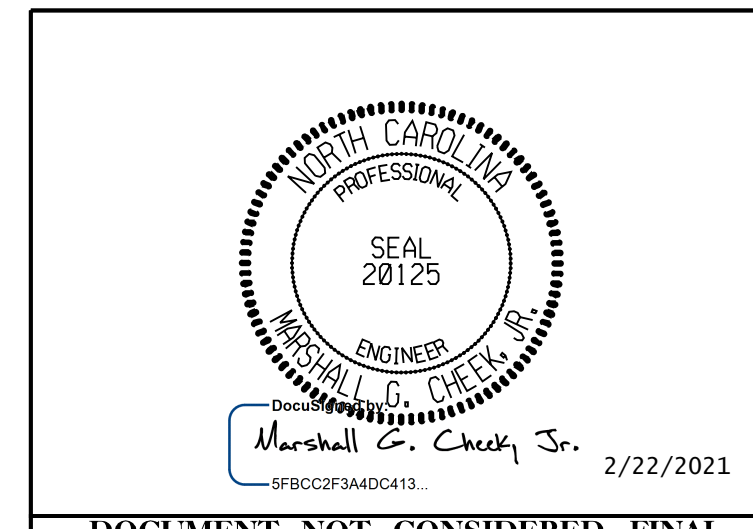


SECTION Y-Y



ELEVATION OF WING (W2)  
WING DETAILS

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 2 OF 3

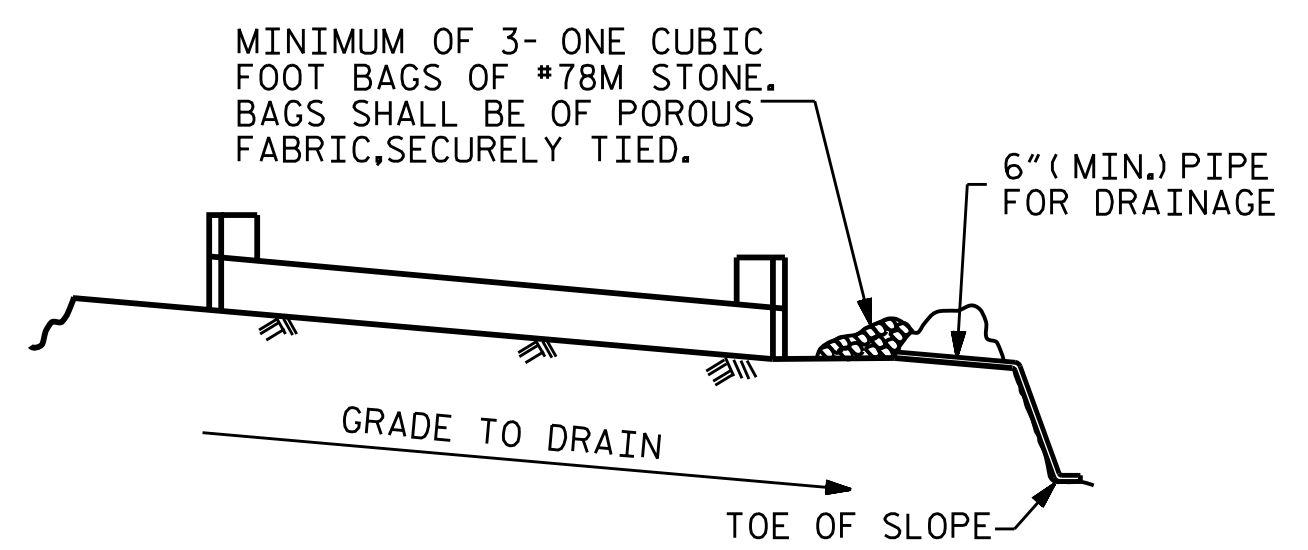


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 END BENT 2  
 STAGE I  
 WING DETAILS

DRAWN BY: NMW DATE: 8/19  
 CHECKED BY: MCC DATE: 8/19  
 DESIGN ENGINEER OF RECORD: TBE DATE: 8/19

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						REVISIONS			SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-34			
1			3			TOTAL SHEETS			
2			4			43			

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

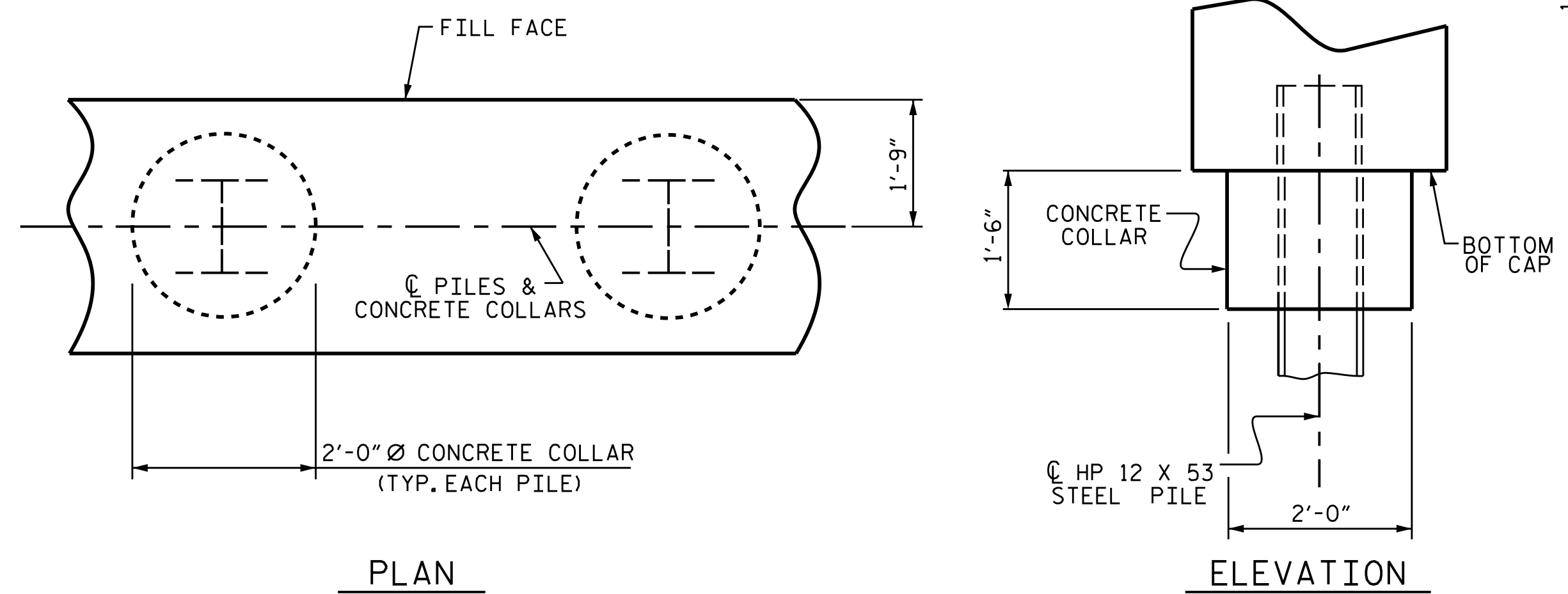


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

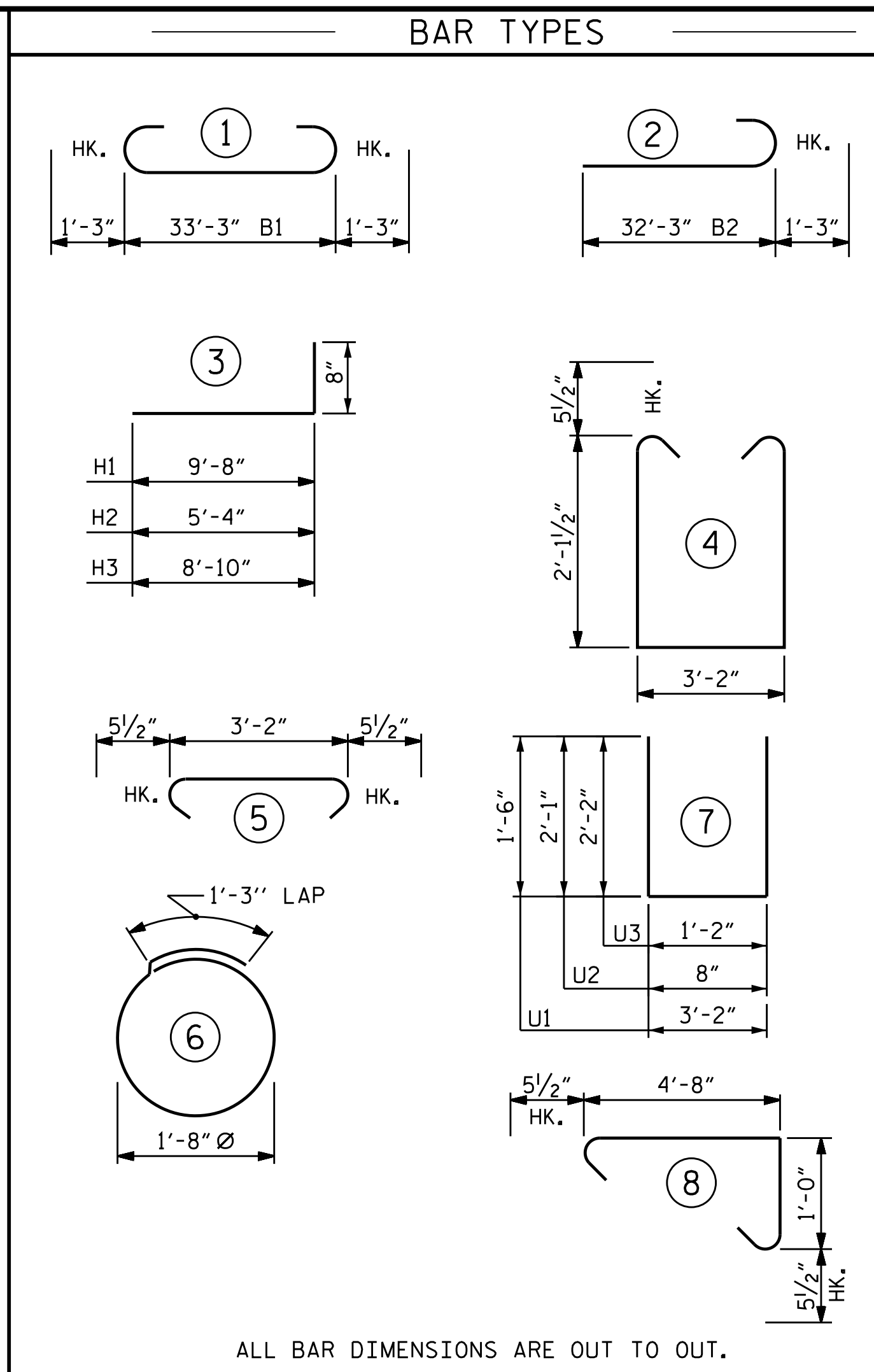
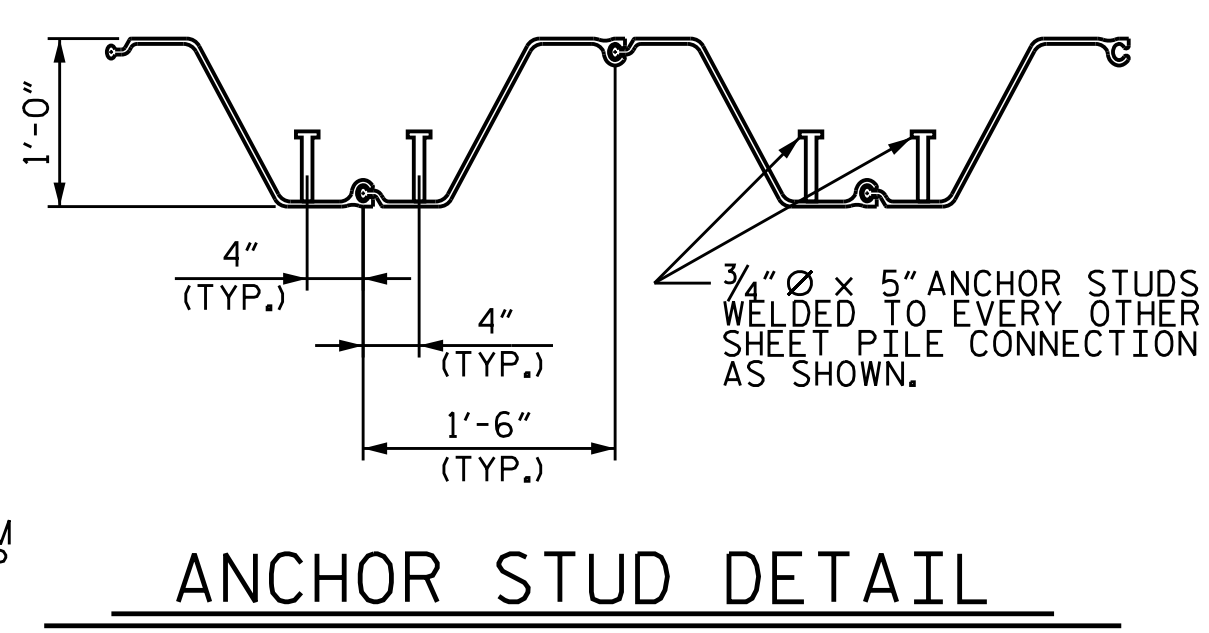
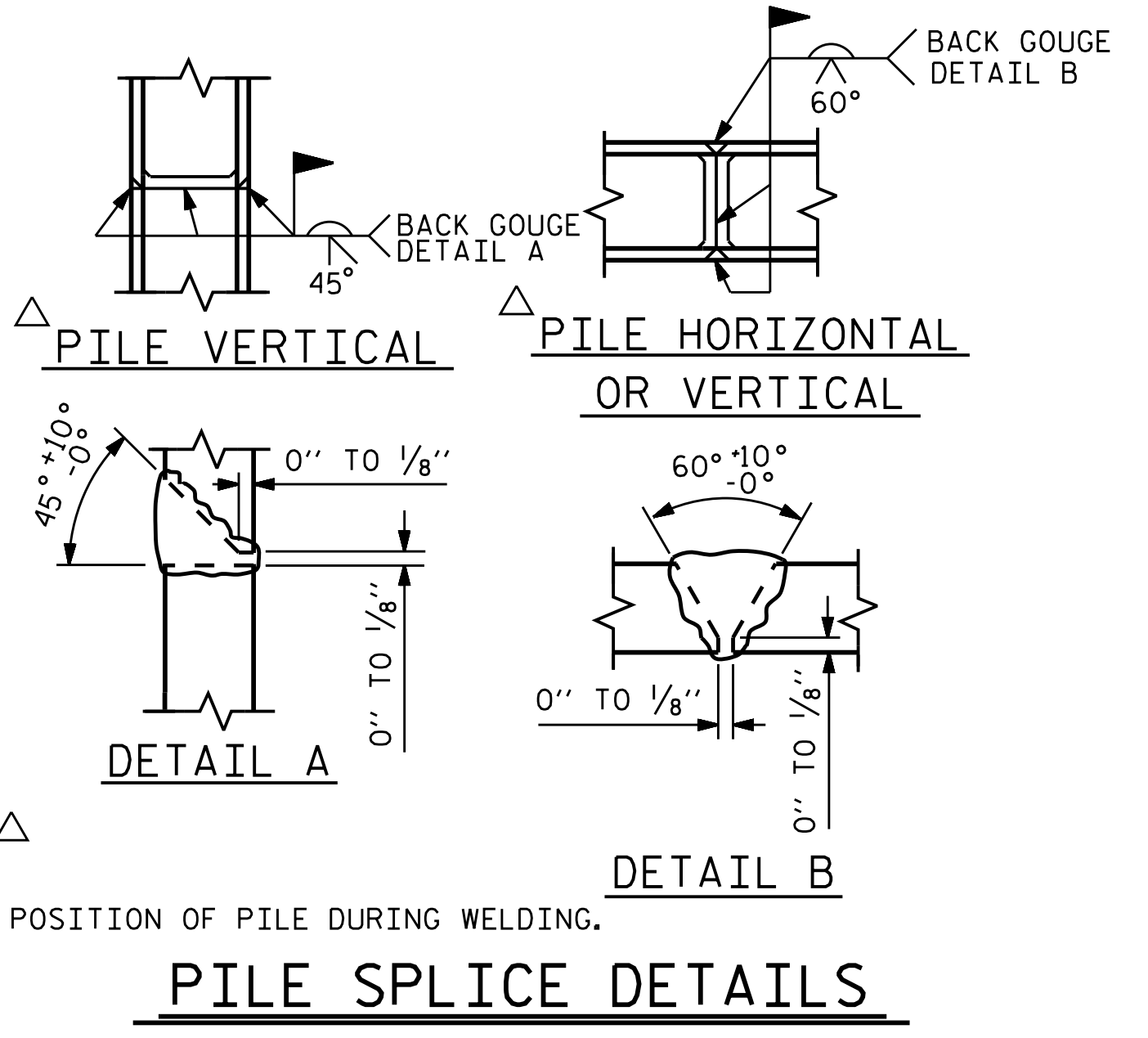
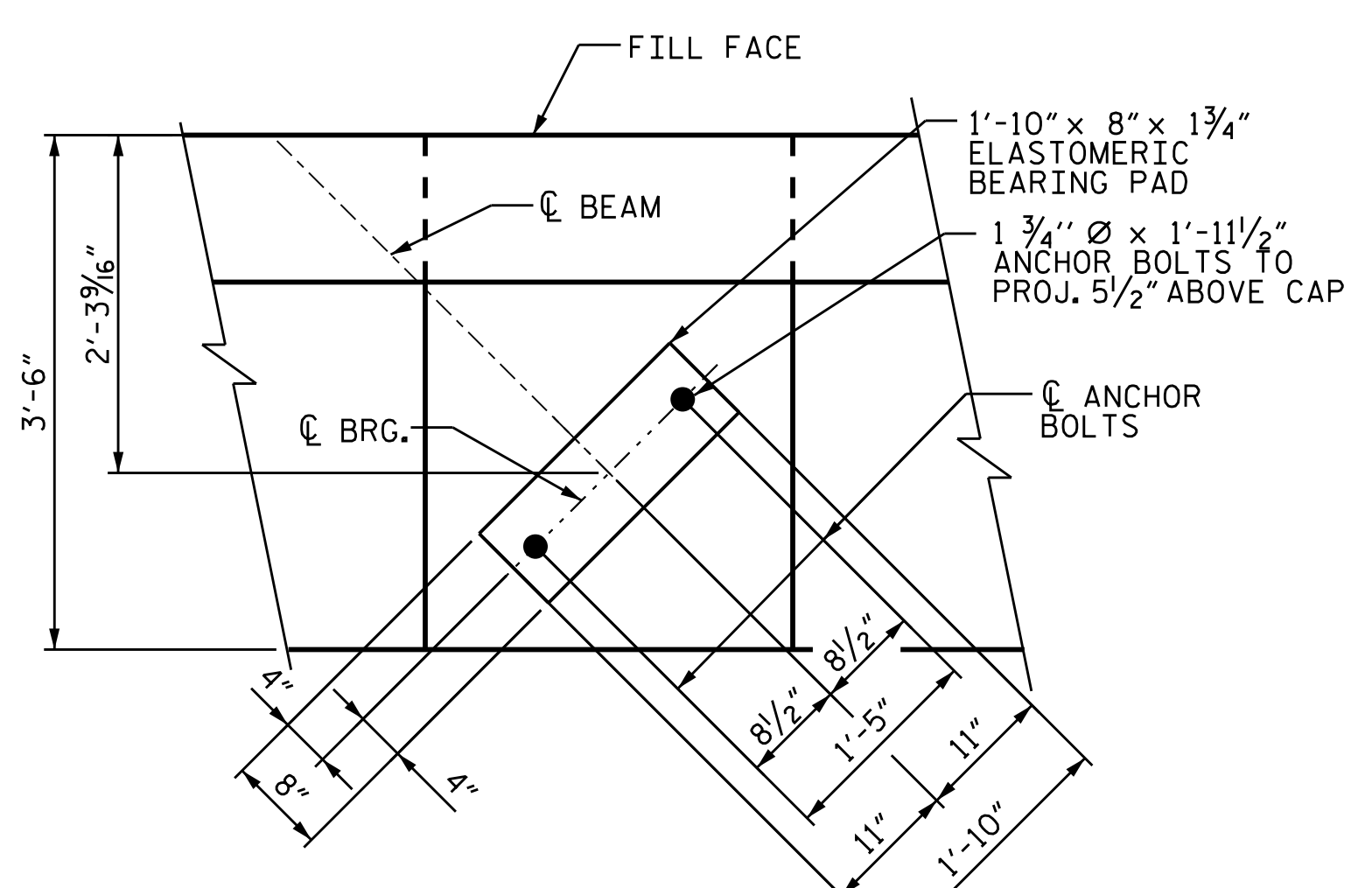
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



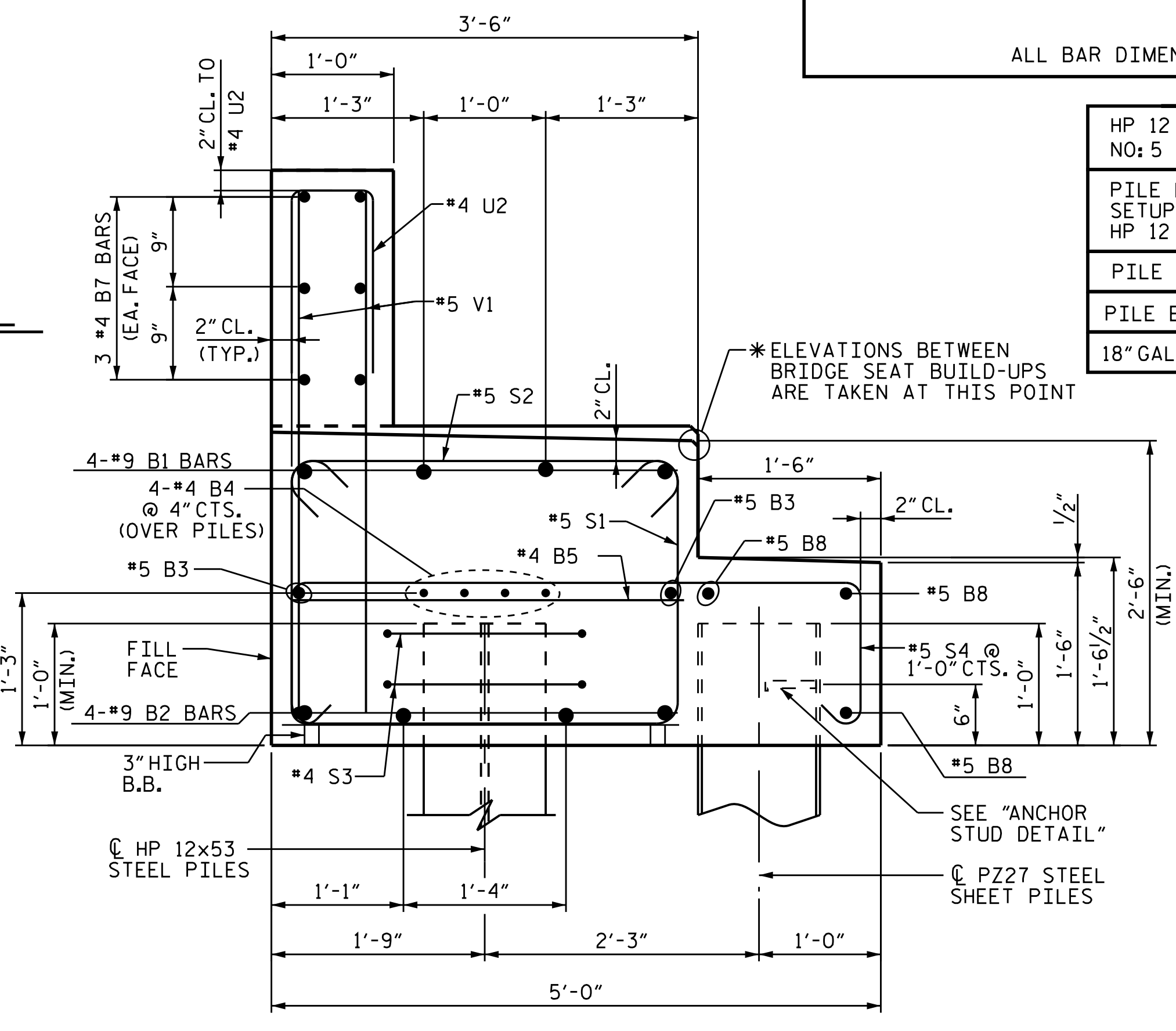
**CORROSION PROTECTION FOR STEEL PILES DETAIL**



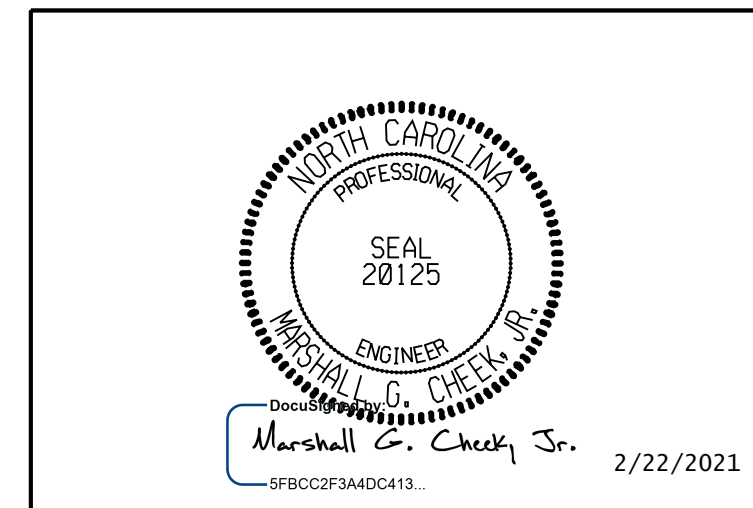
HP 12 X 53 STEEL PILES NO: 5	70 LIN. FT.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	NO: 5 EA.
PILE EXCAVATION IN SOIL	38.75 LIN. FT.
PILE EXCAVATION NOT IN SOIL	25.00 LIN. FT.
18" GALV. STEEL SHEET PILES	375 SQ. FT.

BILL OF MATERIAL					
END BENT 2 STAGE I					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#4	#9	1	35'-9"	486
B2	4	#9	2	33'-6"	456
B3	2	#5	STR.	34'-6"	72
B4	8	#4	STR.	18'-3"	98
B5	8	#4	STR.	3'-2"	17
B6	4	#4	STR.	14'-3"	38
B7	12	#4	STR.	18'-2"	146
B8	3	#5	STR.	36'-0"	113
B9	3	#5	STR.	13'-8"	43
H1	14	#4	3	10'-4"	97
H2	2	#4	3	6'-0"	8
H3	2	#4	3	9'-6"	13
K1	2	#4	STR.	7'-9"	10
K2	2	#4	STR.	8'-3"	11
S1	29	#5	4	8'-4"	252
S2	29	#5	5	4'-1"	124
S3	10	#4	6	6'-6"	43
S4	32	#5	8	6'-7"	220
U1	10	#4	7	6'-2"	41
U2	23	#4	7	4'-10"	74
U3	12	#5	7	5'-6"	69
V1	46	#5	STR.	4'-3"	204
V2	20	#4	STR.	6'-0"	80
V3	2	#4	STR.	5'-10"	8
V4	2	#4	STR.	5'-7"	7
V5	2	#4	STR.	5'-5"	7
V6	2	#4	STR.	5'-3"	7
V7	2	#4	STR.	5'-1"	7
V8	2	#4	STR.	4'-11"	7
V9	2	#4	STR.	4'-9"	6
V10	2	#4	STR.	4'-7"	6
V11	2	#4	STR.	4'-5"	6
REINFORCING STEEL				2,776 LBS.	

CLASS A CONCRETE BREAKDOWN	
POUR #1 CAP, COLLARS, LOWER PART OF WING & COPING	16.5 C.Y.
POUR #2 BACKWALL & UPPER PART OF WING	4.2 C.Y.
<b>TOTAL CLASS A CONCRETE</b>	<b>20.7 C.Y.</b>



DRAWN BY : NMW DATE : 7/19  
 CHECKED BY : MCC DATE : 8/19  
 DESIGN ENGINEER OF RECORD : TBE DATE : 8/19



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

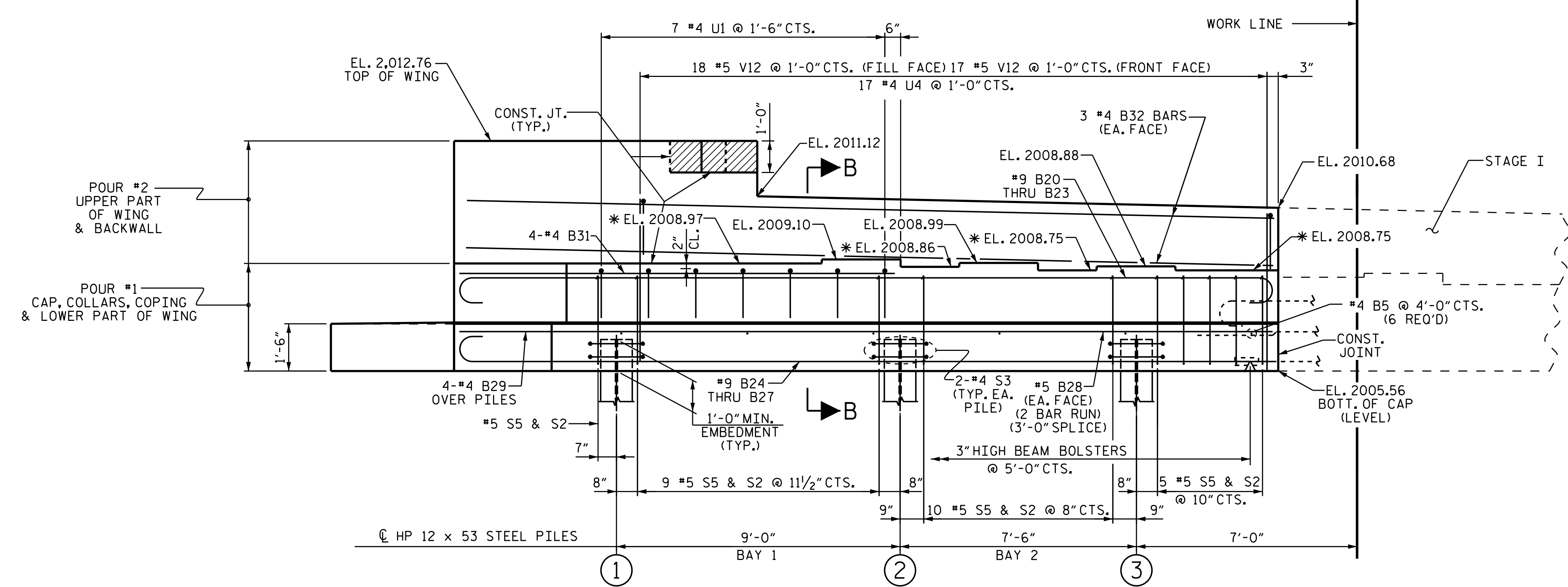
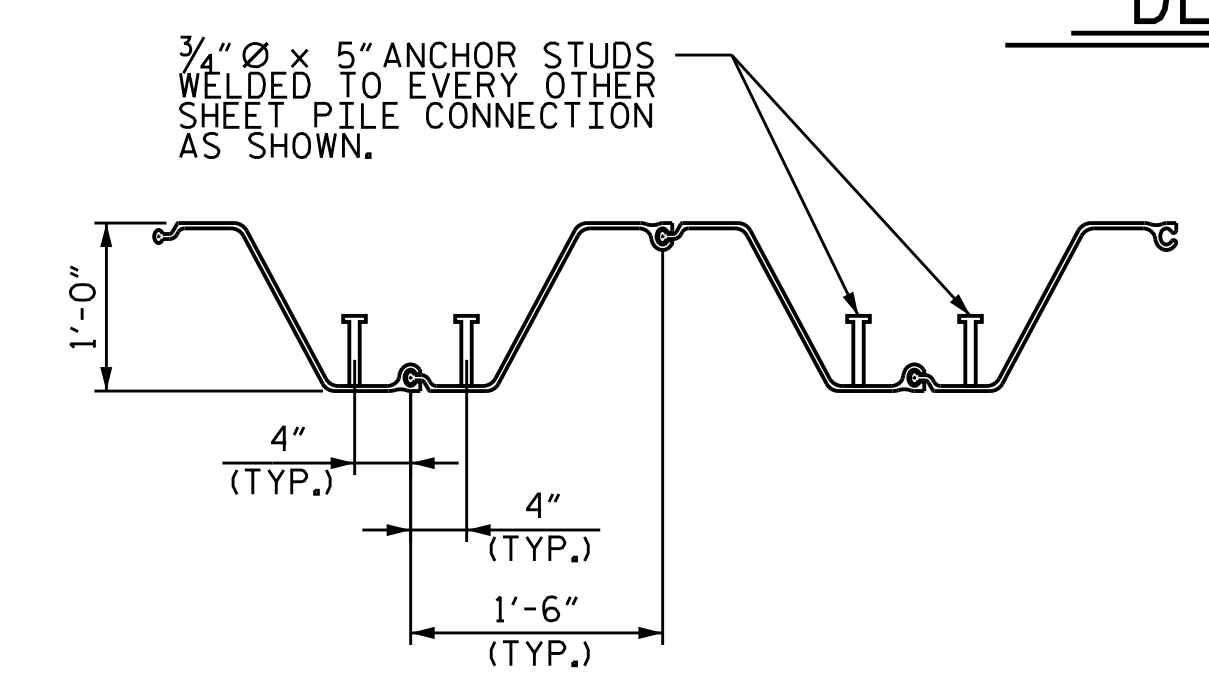
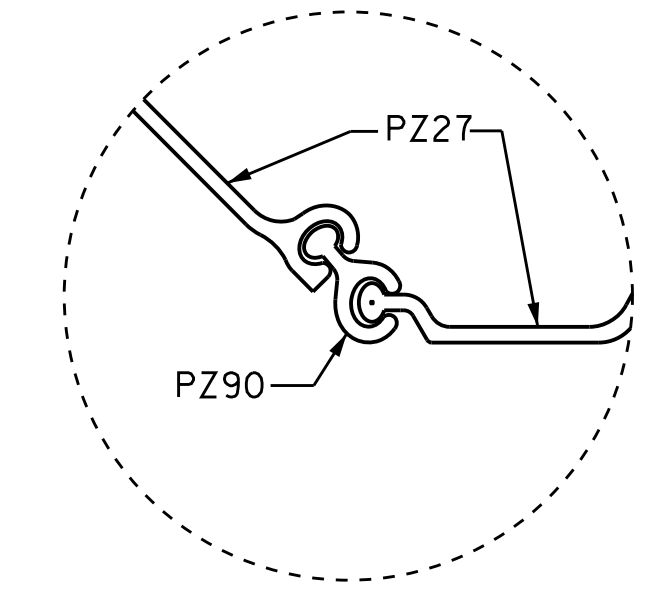
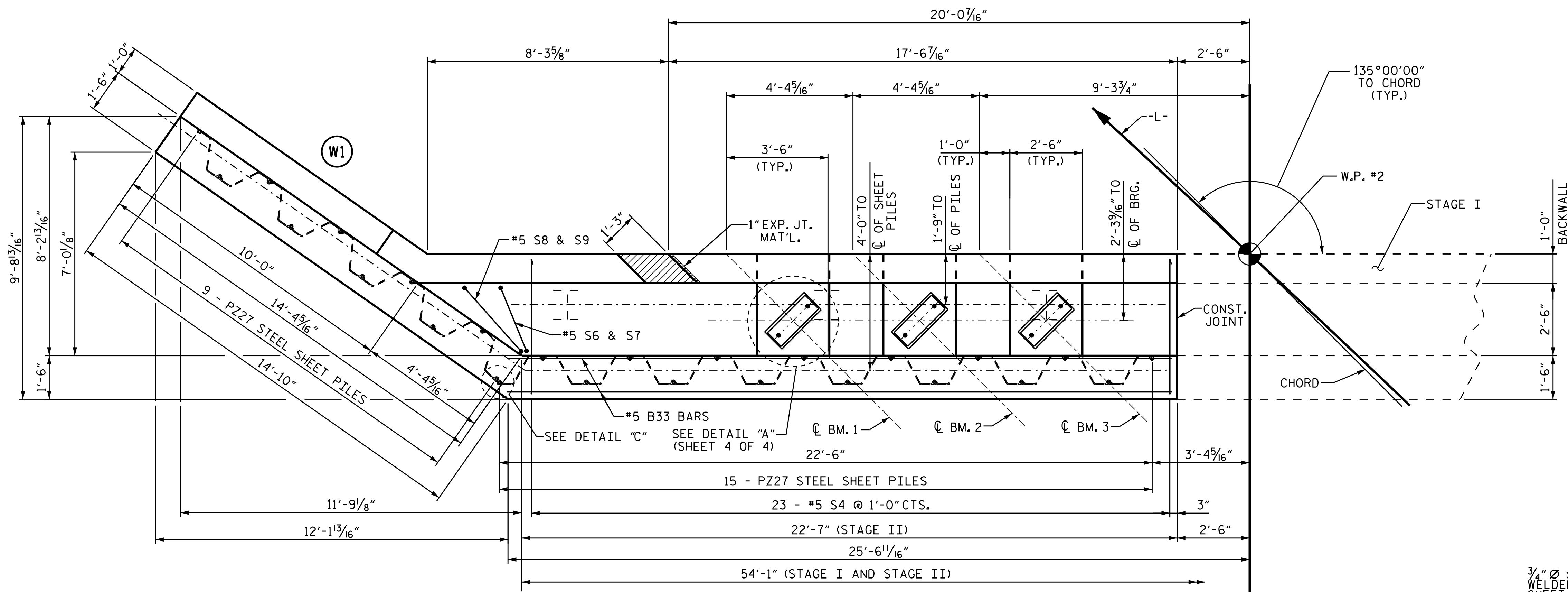
TGS ENGINEERS  
 804-C N. LAFAYETTE ST  
 SHELBY, NC 28150  
 PH (704) 476-0003  
 CORP. LICENSE NO.: C-0275

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
END BENT 2 STAGE I DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-35					TOTAL SHEETS 43

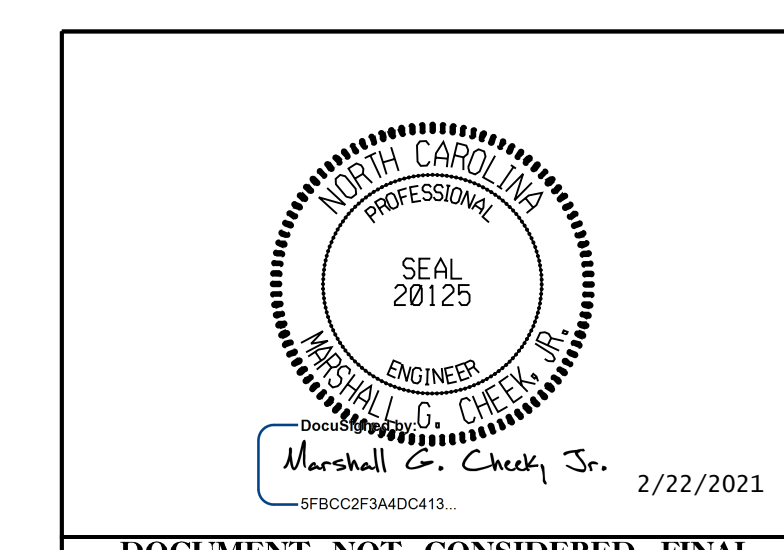
### NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- 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%.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE CURB IS CAST IF SLIP FORMING IS USED.
- FOR WING DETAILS, SEE SHEET 3 OF 4.



\*FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS SEE SECTION "B-B", (SHEET 4 OF 4)

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 1 OF 4



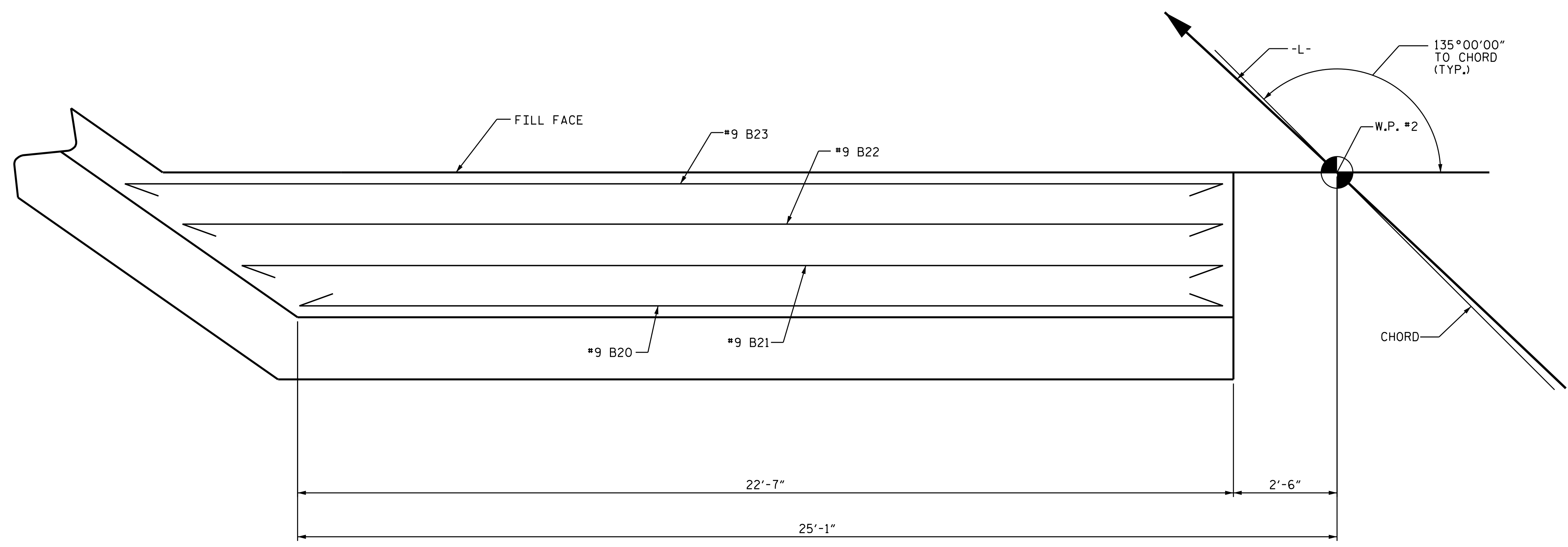
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**END BENT 2  
 STAGE II**

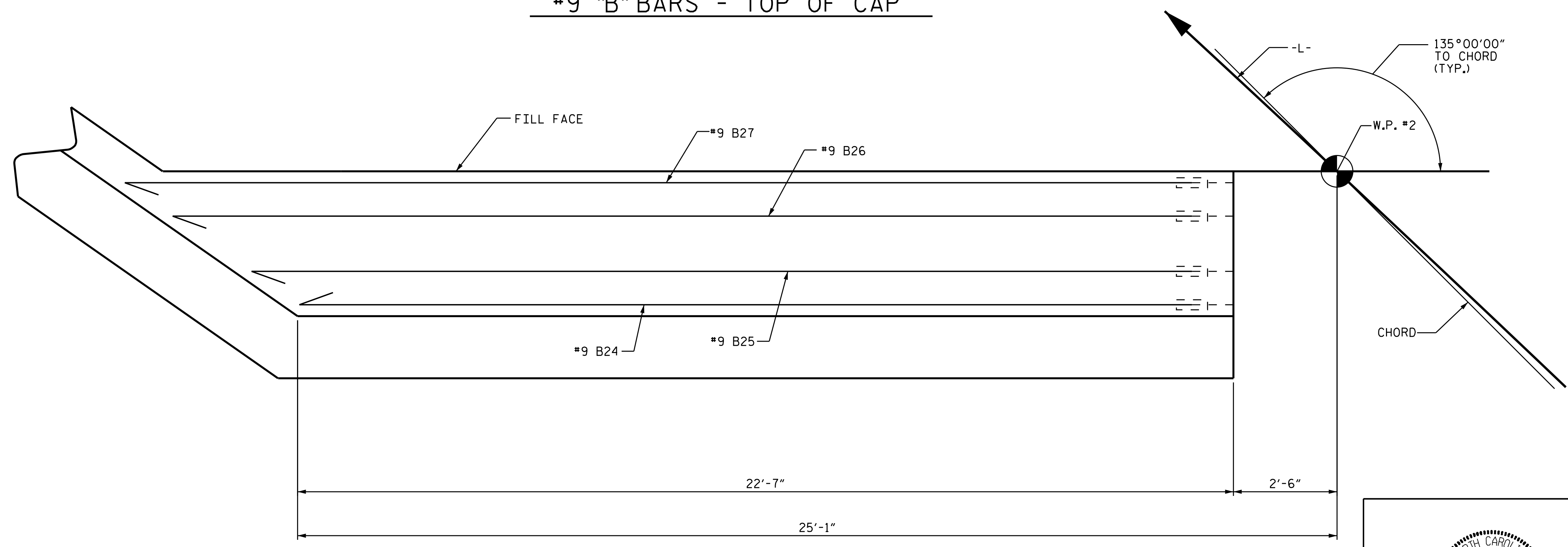
DRAWN BY : NMW DATE : 7/19  
 CHECKED BY : MCC DATE : 8/19  
 DESIGN ENGINEER OF RECORD : TBE DATE : 8/19

WING & SHEET PILES NOT SHOWN FOR CLARITY. FOR SECTION B-B, SEE SHEET 4 OF 4. CONCRETE COLLARS FOR STEEL PILES NOT SHOWN FOR CLARITY, SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						REVISIONS			SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-36			
1			3			TOTAL SHEETS 43			
2			4						



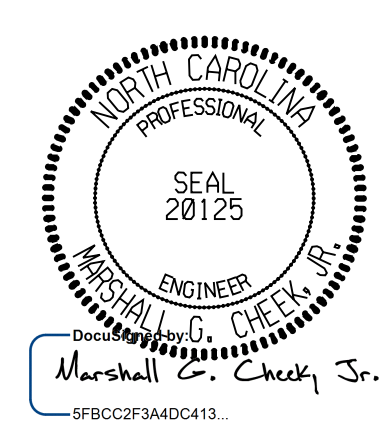
#9 "B" BARS - TOP OF CAP



#9 "B" BARS - BOTTOM OF CAP

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-

SHEET 2 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

END BENT 2  
 STAGE II DETAILS

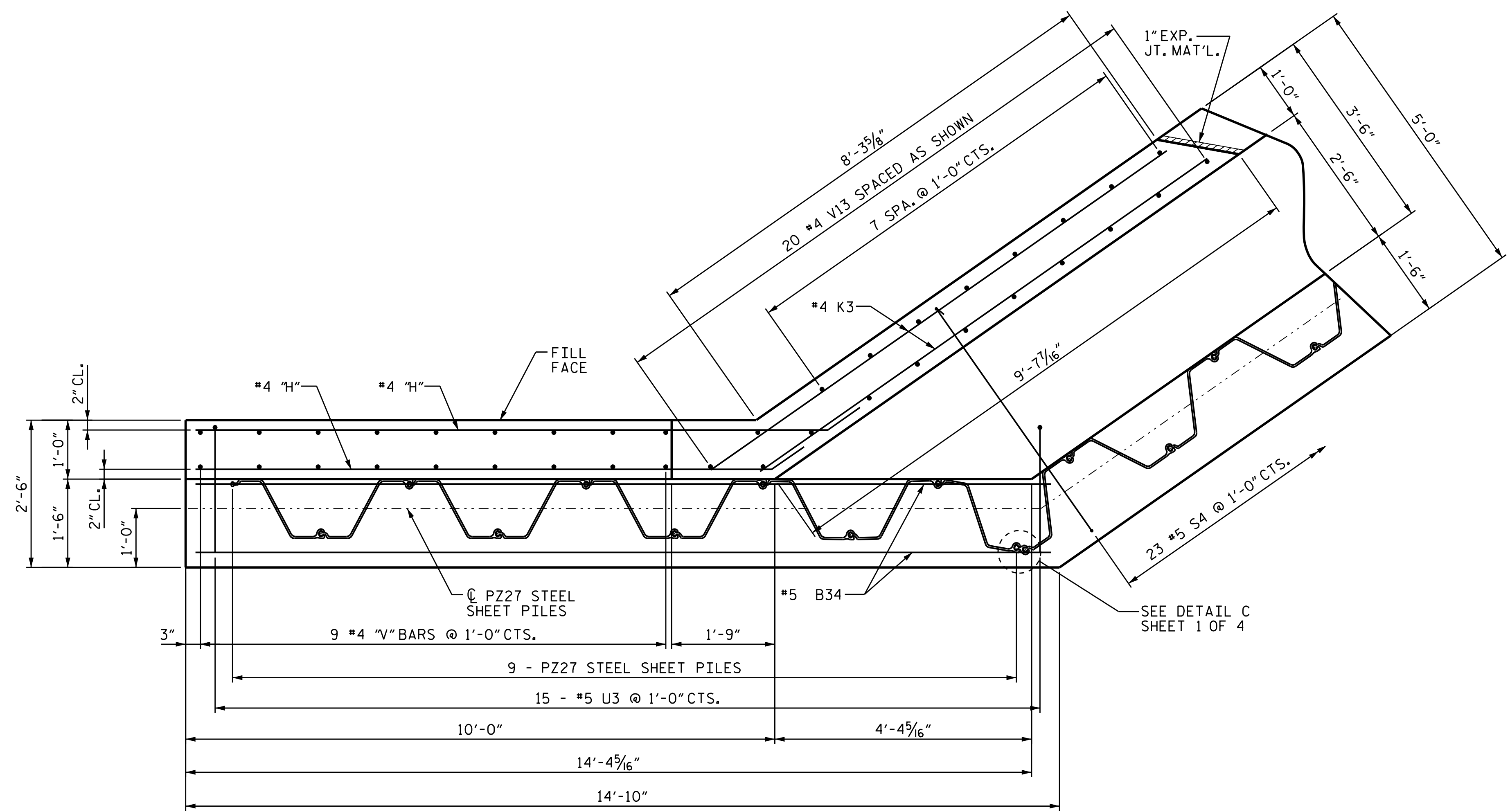
DRAWN BY : NMW DATE : 7/19  
 CHECKED BY : MCC DATE : 8/19  
 DESIGN ENGINEER OF RECORD : TBE DATE : 8/19

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

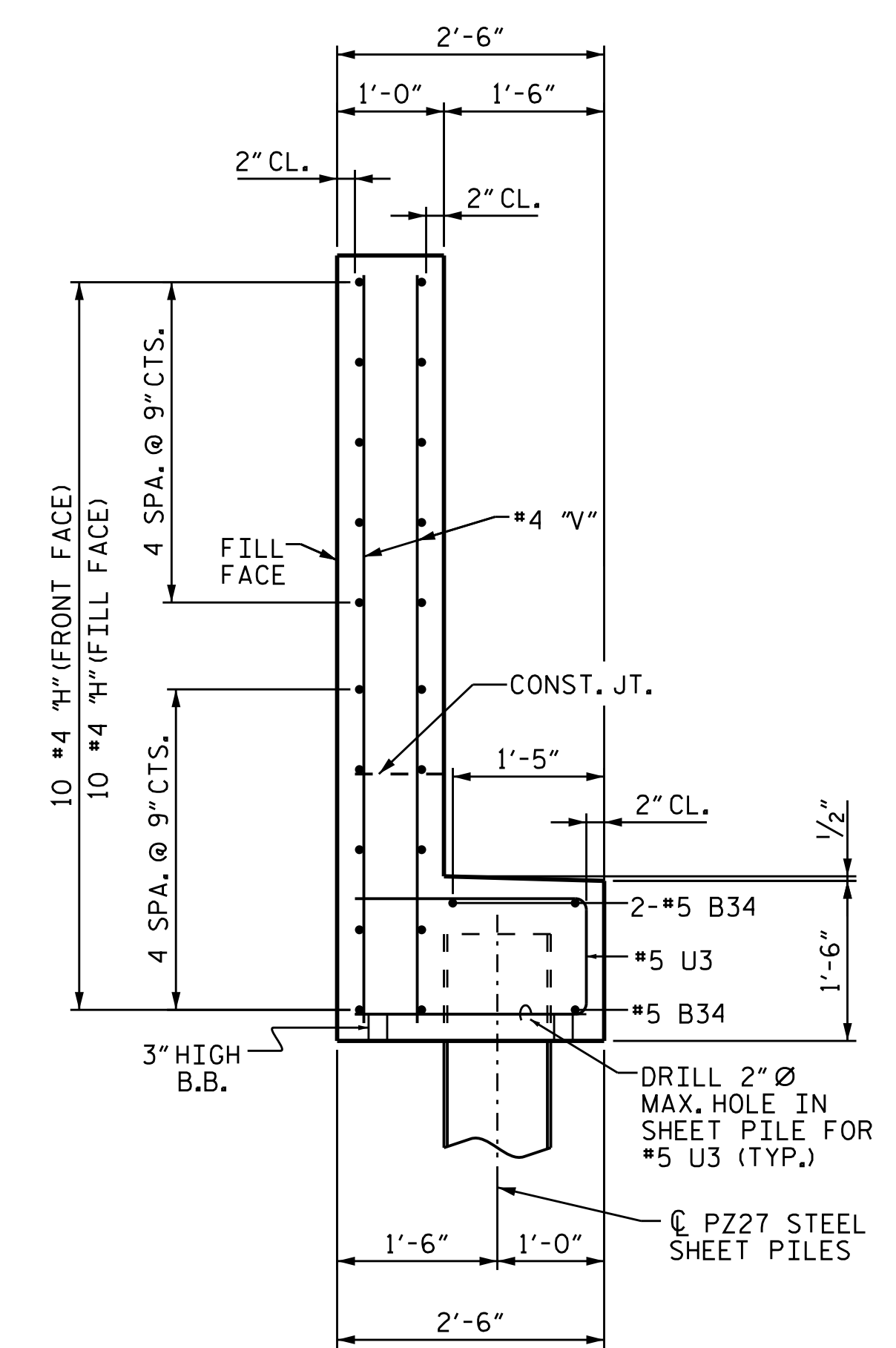
TGS ENGINEERS  
 804-C N. LAFAYETTE ST  
 SHELBY, NC 28150  
 PH (704) 476-0003  
 CORP. LICENSE NO.: C-0275

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

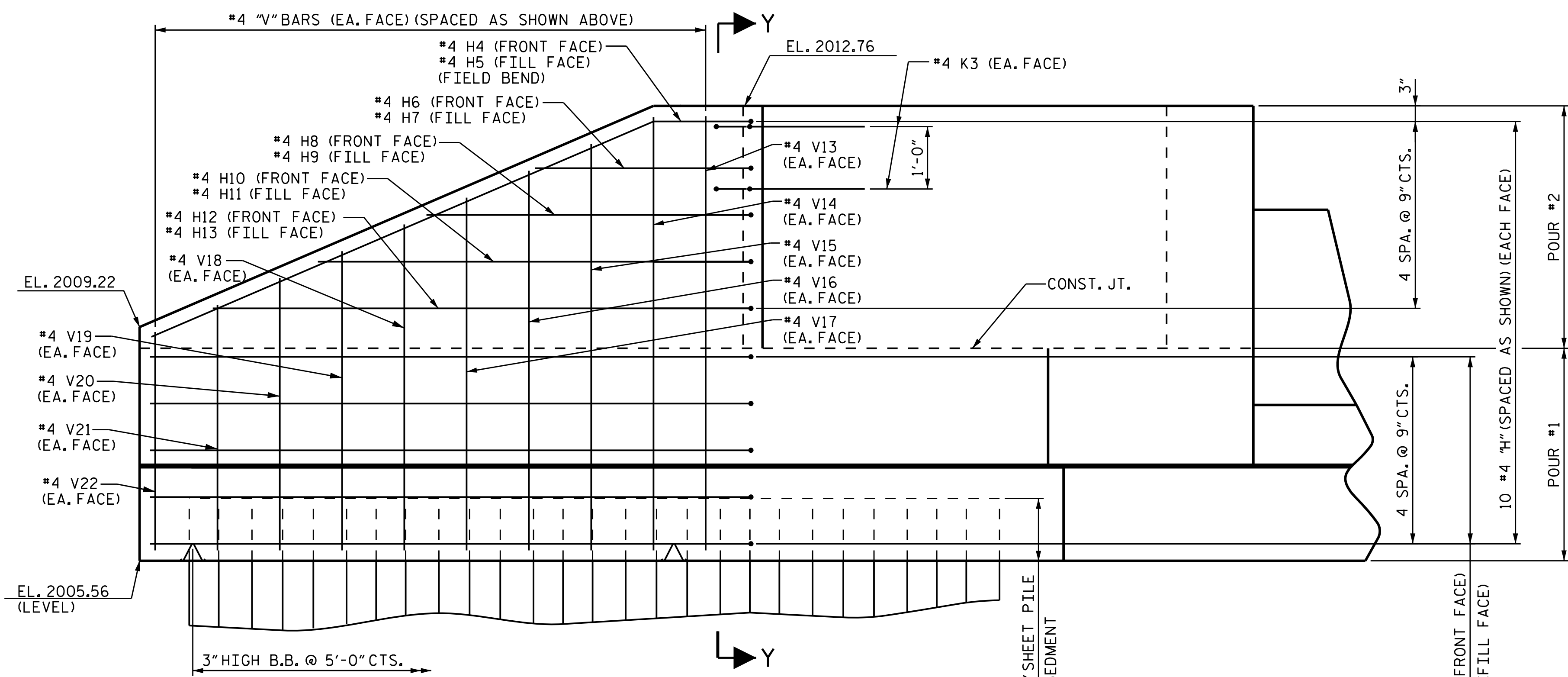
SHEET NO.  
 S-37  
 TOTAL SHEETS  
 43



PLAN OF WING (W1)



SECTION Y-Y



ELEVATION OF WING (W1)

WING DETAILS

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

END BENT 2  
 STAGE II  
 WING DETAILS

2/22/2021

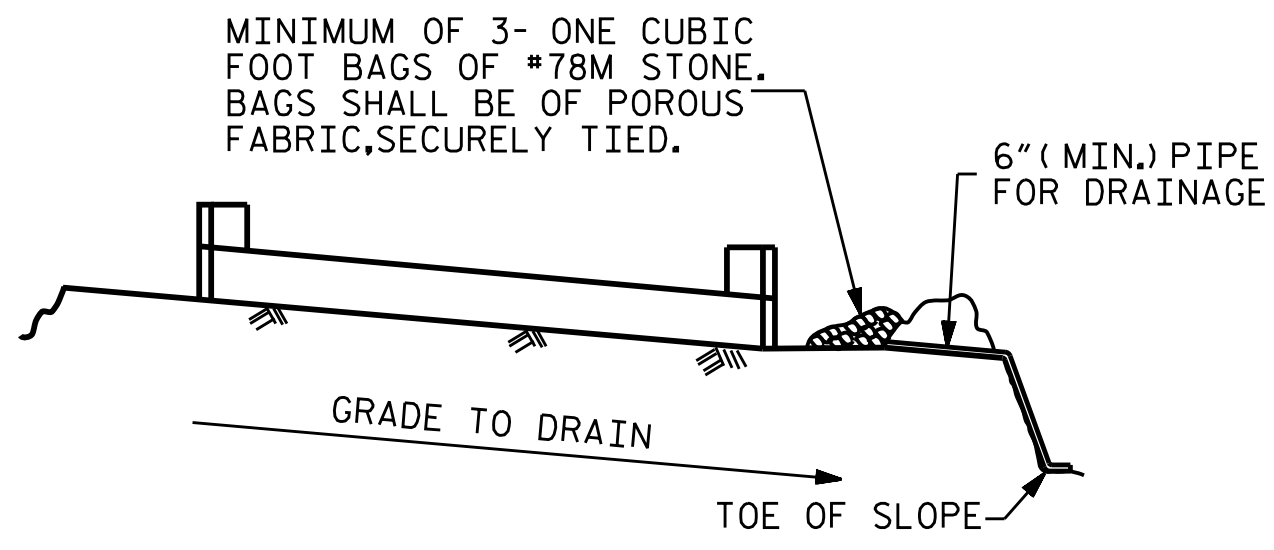
DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

REVISIONS

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

SHEET NO. S-38  
 TOTAL SHEETS 43

DRAWN BY : NMW DATE : 8/19  
 CHECKED BY : MGC DATE : 8/19  
 DESIGN ENGINEER OF RECORD : TBE DATE : 8/19

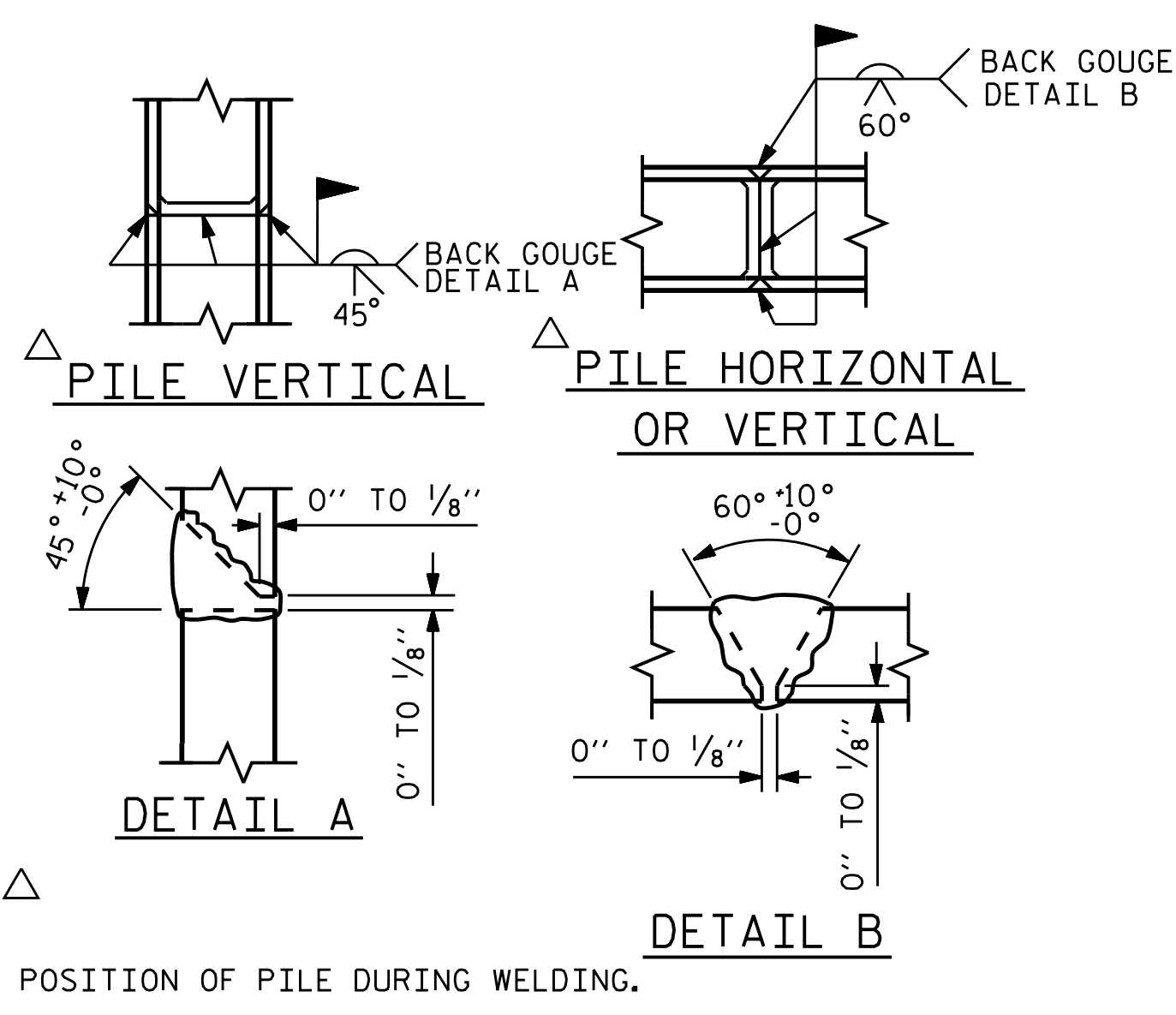


MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

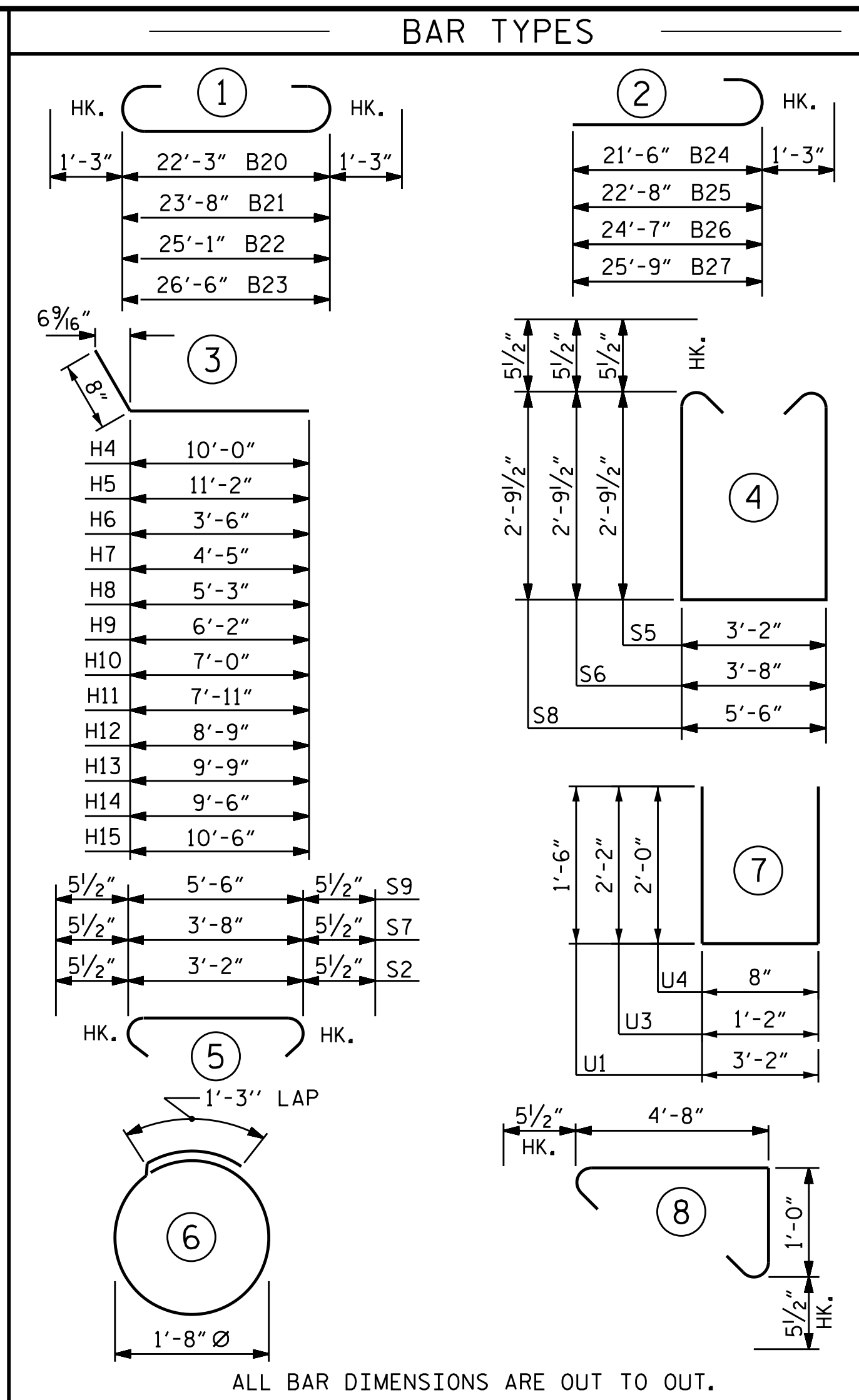
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

### TEMPORARY DRAINAGE AT END BENT

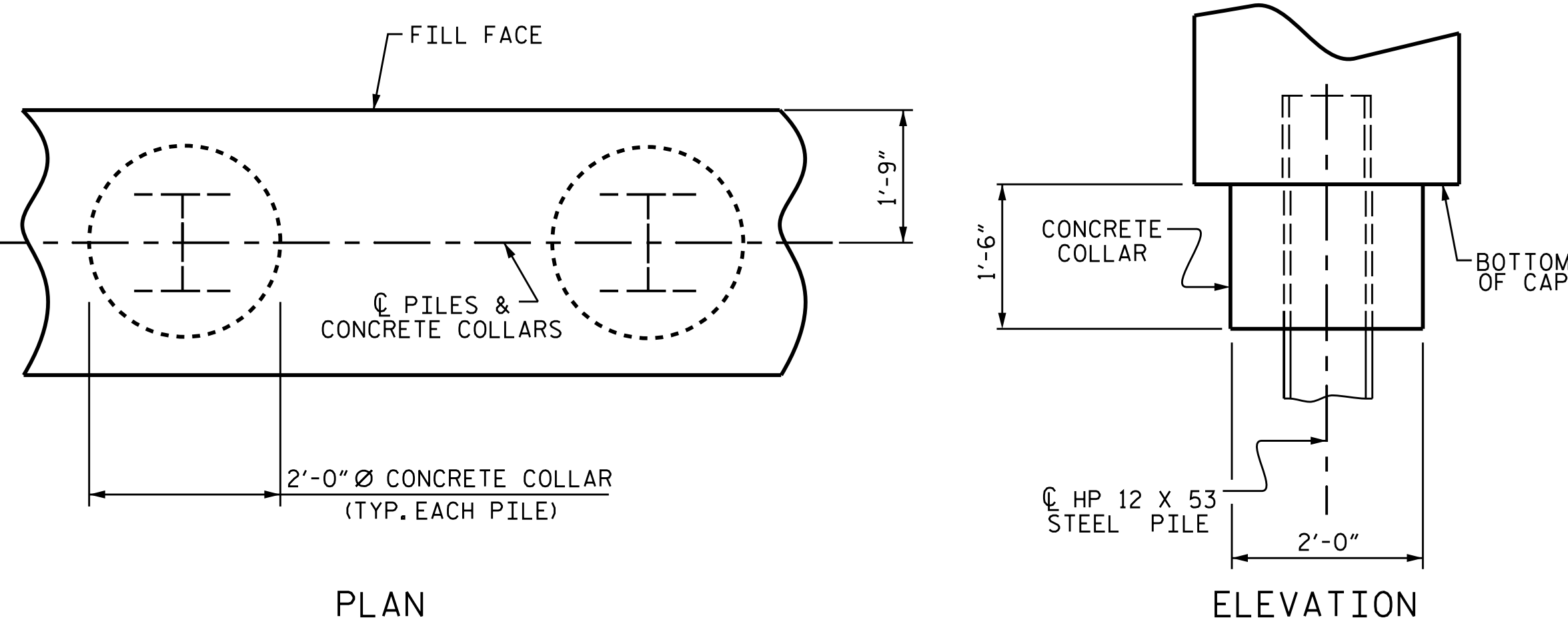


### PILE SPLICE DETAILS

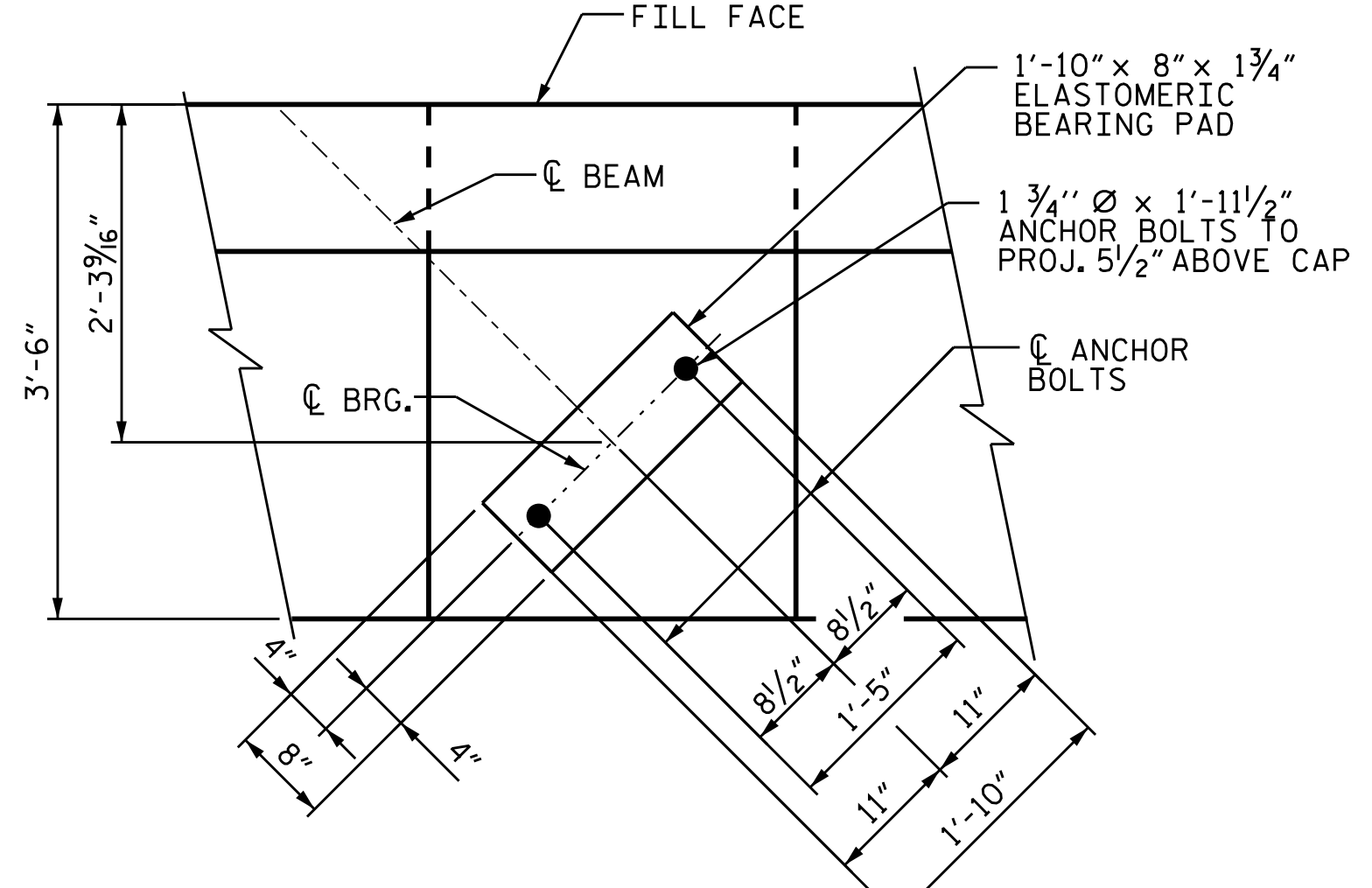


ALL BAR DIMENSIONS ARE OUT TO OUT.

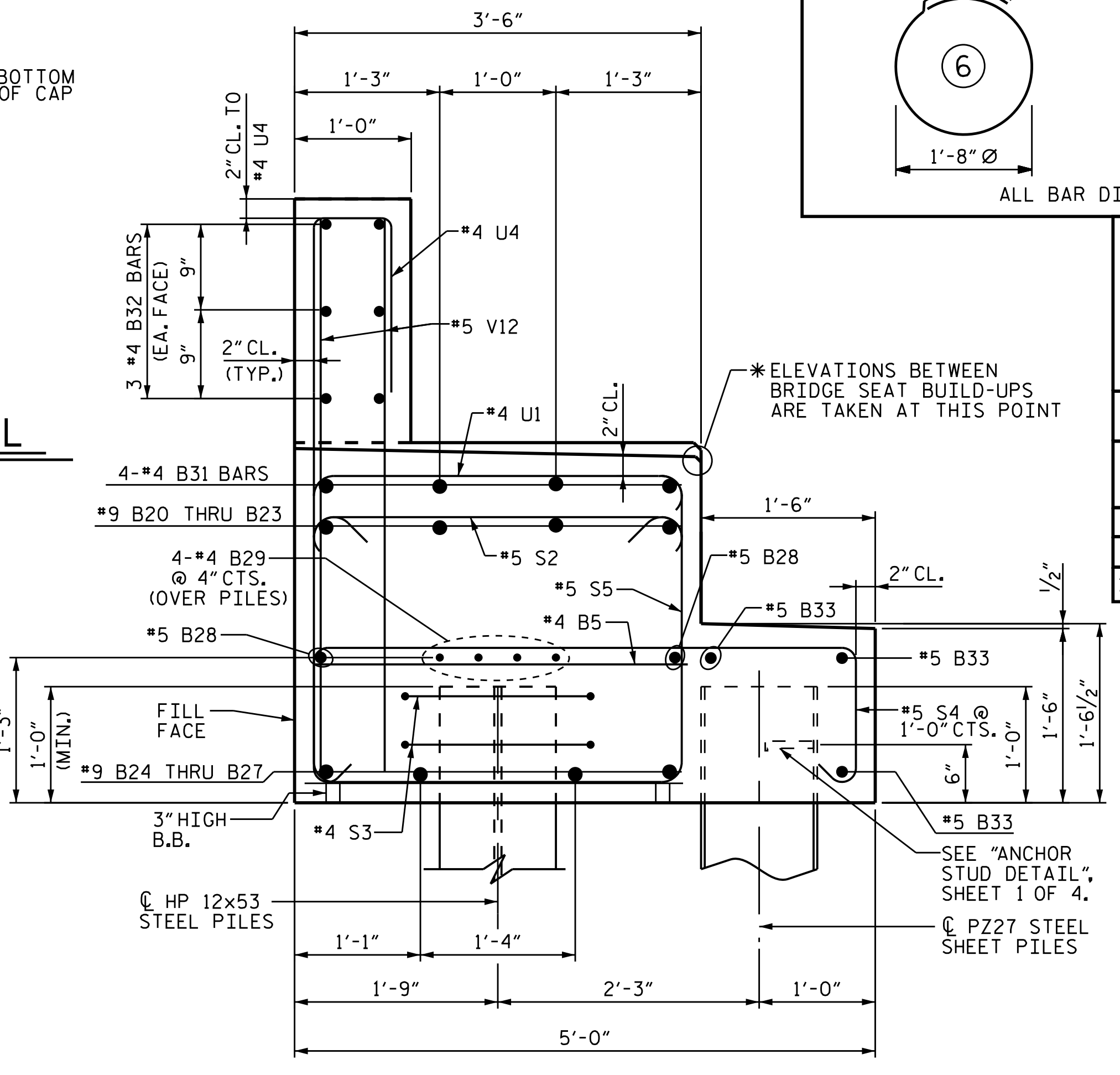
BILL OF MATERIAL					
END BENT 2 STAGE II					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B5	#4	STR.	3'-2"	13	
B20	#9	1	24'-9"	84	
B21	#9	1	26'-2"	89	
B22	#9	1	27'-7"	94	
B23	#9	1	29'-0"	99	
B24	#9	2	22'-9"	77	
B25	#9	2	23'-11"	81	
B26	#9	2	25'-10"	88	
B27	#9	2	27'-0"	92	
B28	#5	STR.	15'-0"	63	
B29	#4	STR.	24'-0"	64	
B31	#4	STR.	10'-6"	28	
B32	#4	STR.	26'-2"	105	
B33	#5	STR.	22'-11"	72	
B34	#5	STR.	14'-6"	45	
H4	#4	3	10'-8"	7	
H5	#4	3	11'-10"	8	
H6	#4	3	4'-2"	3	
H7	#4	3	5'-1"	3	
H8	#4	3	5'-11"	4	
H9	#4	3	6'-10"	5	
H10	#4	3	7'-8"	5	
H11	#4	3	8'-7"	6	
H12	#4	3	9'-5"	6	
H13	#4	3	10'-5"	7	
H14	#4	3	10'-2"	34	
H15	#4	3	11'-2"	37	
K3	#4	STR.	9'-3"	25	
S2	#5	5	4'-1"	106	
S3	#4	6	6'-6"	26	
S4	#5	8	6'-7"	158	
S5	#5	4	9'-8"	252	
S6	#5	4	10'-2"	11	
S7	#5	5	4'-7"	5	
S8	#5	4	12'-0"	13	
S9	#5	5	6'-5"	7	
U1	#4	7	6'-2"	29	
U3	#5	7	5'-6"	86	
U4	#4	7	4'-8"	53	
V12	#5	STR.	4'-10"	176	
V13	#4	STR.	6'-11"	92	
V14	#4	STR.	6'-9"	9	
V15	#4	STR.	6'-4"	8	
V16	#4	STR.	5'-11"	8	
V17	#4	STR.	5'-6"	7	
V18	#4	STR.	5'-1"	7	
V19	#4	STR.	4'-8"	6	
V20	#4	STR.	4'-3"	6	
V21	#4	STR.	3'-11"	5	
V22	#4	STR.	3'-6"	5	
REINFORCING STEEL				2,319	LBS.



### CORROSION PROTECTION FOR STEEL PILES DETAIL



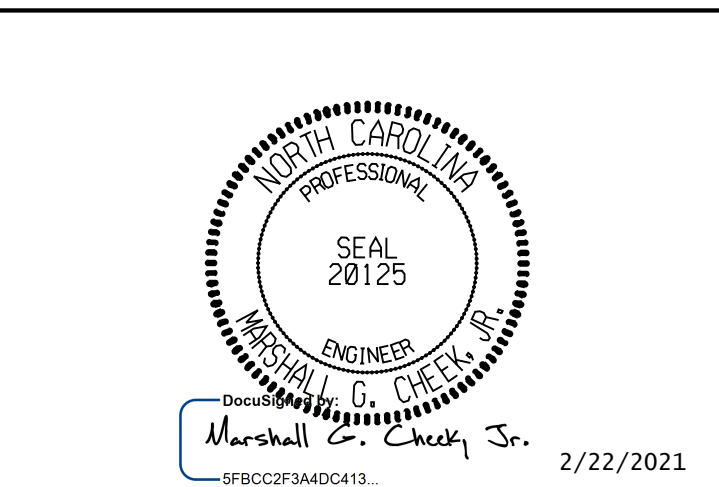
### DETAIL "A"



### SECTION B-B

CLASS A CONCRETE BREAKDOWN	
POUR #1 CAP, COLLARS, LOWER PART OF WING & COPING	15.8 C.Y.
POUR #2 BACKWALL & UPPER PART OF WING	3.8 C.Y.
TOTAL CLASS A CONCRETE	19.6 C.Y.
HP 12 X 53 STEEL PILES NO: 3	42 LIN. FT.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	NO: 3 EA.
PILE EXCAVATION IN SOIL	23.25 LIN. FT.
PILE EXCAVATION NOT IN SOIL	15.00 LIN. FT.
18" GALV. STEEL SHEET PILES	298 SO. FT.

PROJECT NO. 17BP.14.R.211  
MACON COUNTY  
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SHEET 4 OF 4



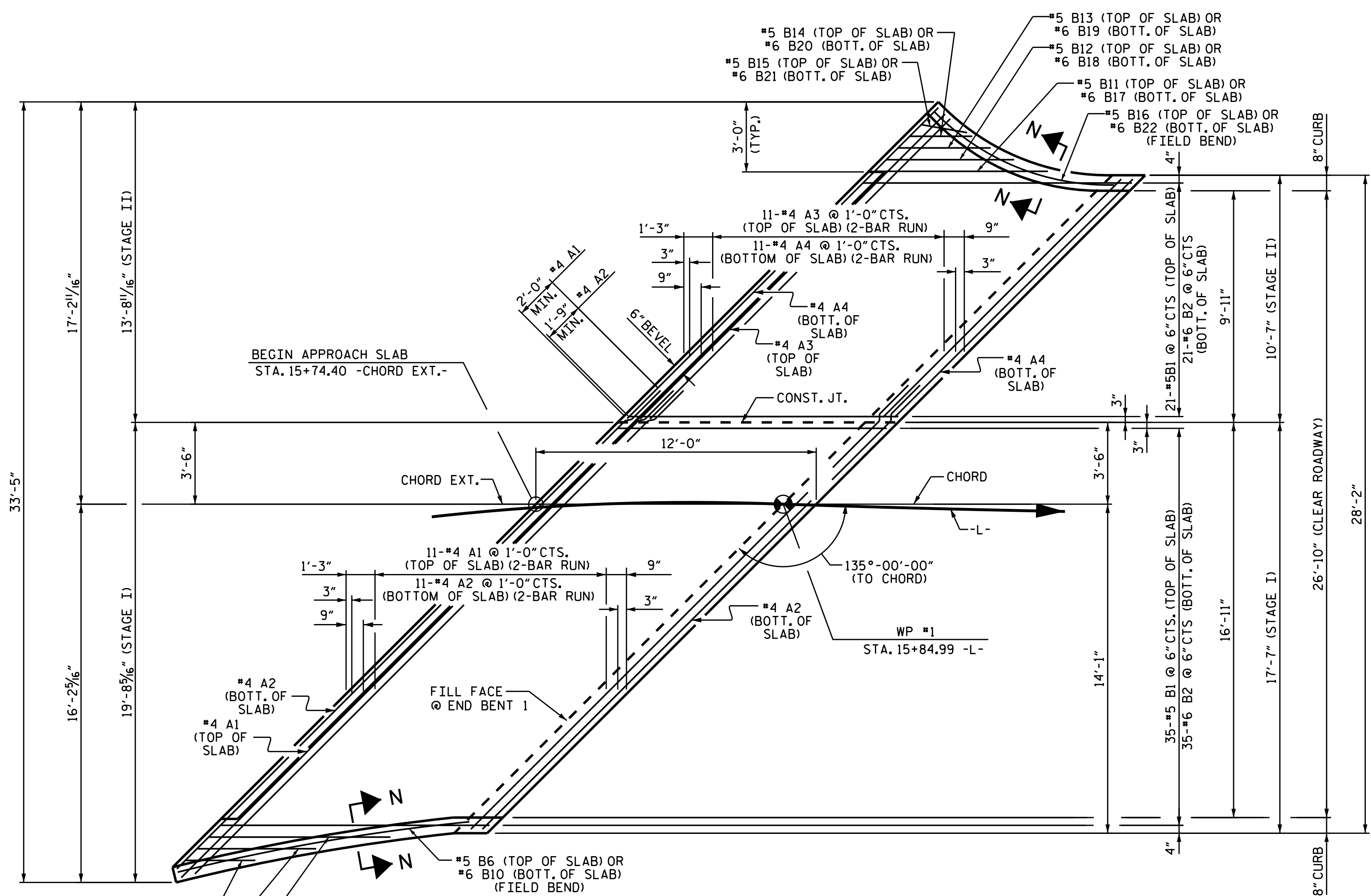
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
END BENT 2  
STAGE II DETAILS

DRAWN BY : NMW DATE : 7/19  
CHECKED BY : MCC DATE : 8/19  
DESIGN ENGINEER OF RECORD : TBE DATE : 8/19

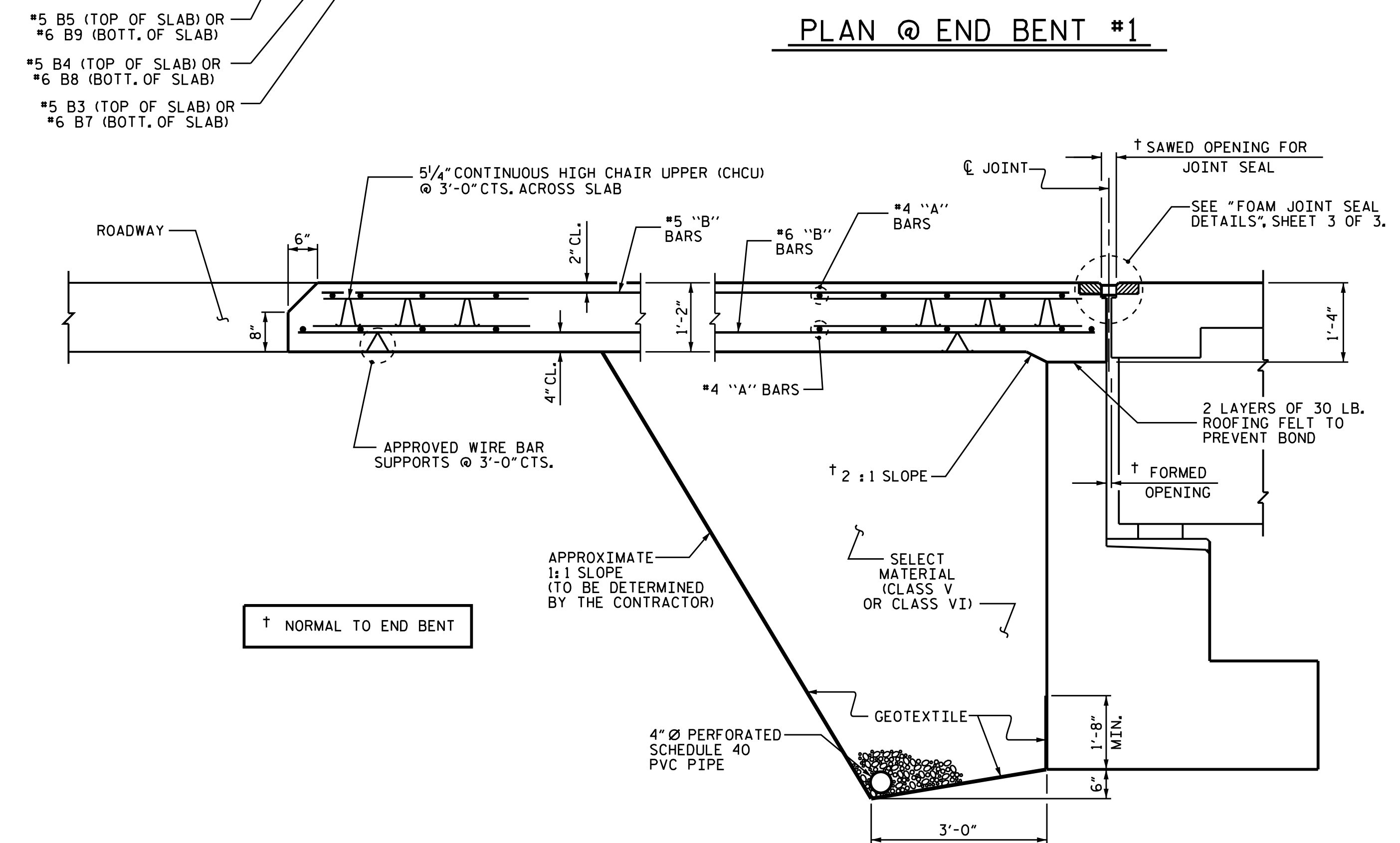
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED  
TGS ENGINEERS  
804-C N. LAFAYETTE ST  
SHELBY, NC 28150  
PH (704) 476-0003  
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS 43
2			4			





**PLAN @ END BENT #1**



**SECTION THRU SLAB**  
(TYPE II - MODIFIED APPROACH FILL)

**NOTES**

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE I 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.

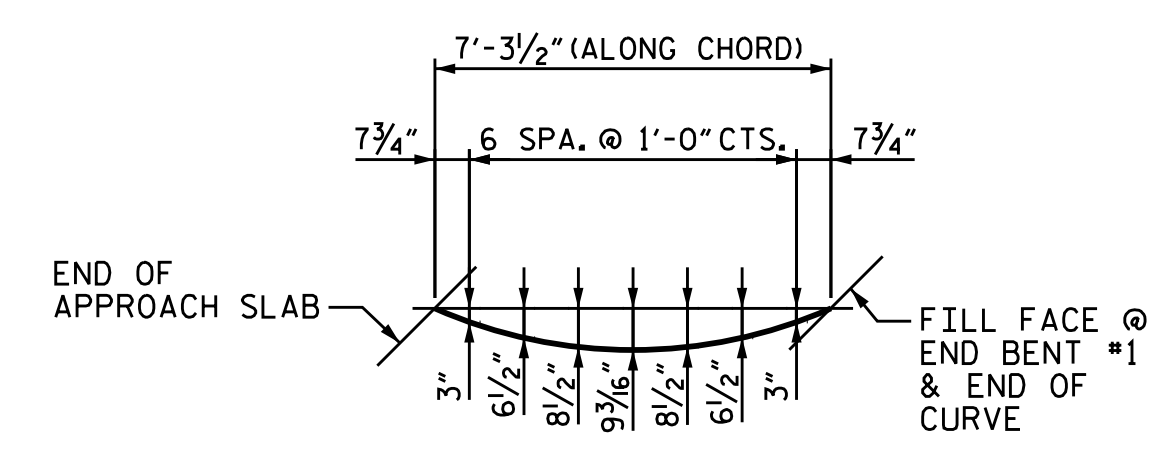
THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE CURB.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

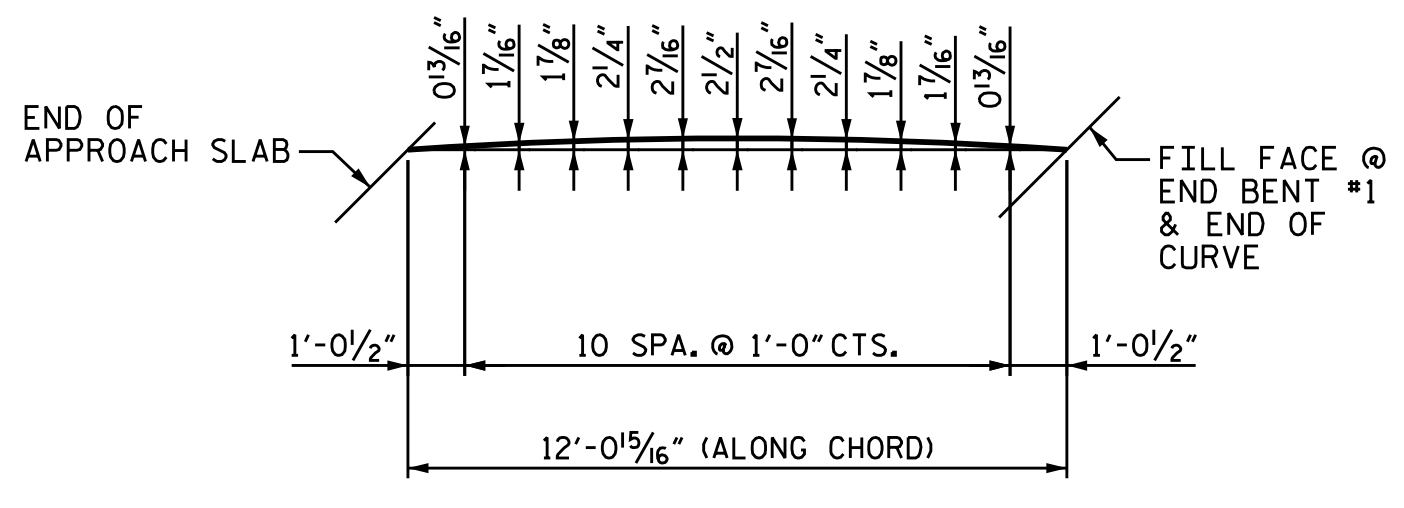
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED, SEE ROADWAY PLANS.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

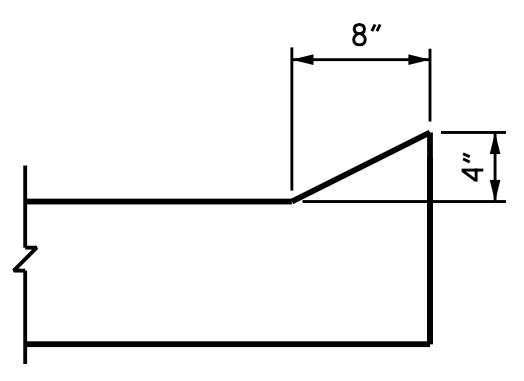
THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2".



**ARC OFFSETS - LEFT SIDE**



**ARC OFFSETS - RIGHT SIDE**



**SECTION N-N**  
**CURB DETAILS**

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
STAGE I					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	24	#4	STR	16'-2"	259
A2	26	#4	STR	15'-11"	276
*B1	35	#5	STR	10'-2"	371
B2	35	#6	STR	11'-6"	605
*B3	1	#5	STR	7'-9"	8
*B4	1	#5	STR	5'-1"	5
*B5	1	#5	STR	3'-0"	3
*B6	1	#5	STR	12'-8"	13
B7	1	#6	STR	7'-9"	12
B8	1	#6	STR	5'-1"	8
B9	1	#6	STR	3'-0"	5
B10	1	#6	STR	12'-8"	19
REINFORCING STEEL				LBS.	925
* EPOXY COATED REINFORCING STEEL				LBS.	659
CLASS AA CONCRETE				C. Y.	9.8
APPROACH SLAB AT EB #1					
STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A3	24	#4	STR	10'-5"	167
A4	24	#4	STR	10'-3"	178
*B1	21	#5	STR	10'-2"	223
B2	21	#6	STR	11'-6"	363
*B11	1	#5	STR	7'-5"	8
*B12	1	#5	STR	5'-5"	6
*B13	1	#5	STR	3'-11"	4
*B14	1	#5	STR	2'-8"	3
*B15	1	#5	STR	2'-0"	2
*B16	1	#5	STR	8'-6"	9
B17	1	#6	STR	7'-5"	11
B18	1	#6	STR	5'-5"	8
B19	1	#6	STR	3'-11"	6
B20	1	#6	STR	2'-8"	4
B21	1	#6	STR	2'-0"	3
B22	1	#6	STR	8'-6"	13
REINFORCING STEEL				LBS.	586
* EPOXY COATED REINFORCING STEEL				LBS.	422
CLASS AA CONCRETE				C. Y.	6.3

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

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**BRIDGE APPROACH SLAB AT END BENT #1**  
**STAGE I & STAGE II**

Professional Engineer Seal: NORTH CAROLINA PROFESSIONAL ENGINEER, SEAL 20125, MRS. SHARON G. CHECK, JR., ENGINEER, 2/22/2021, SFBC02F34DC413.

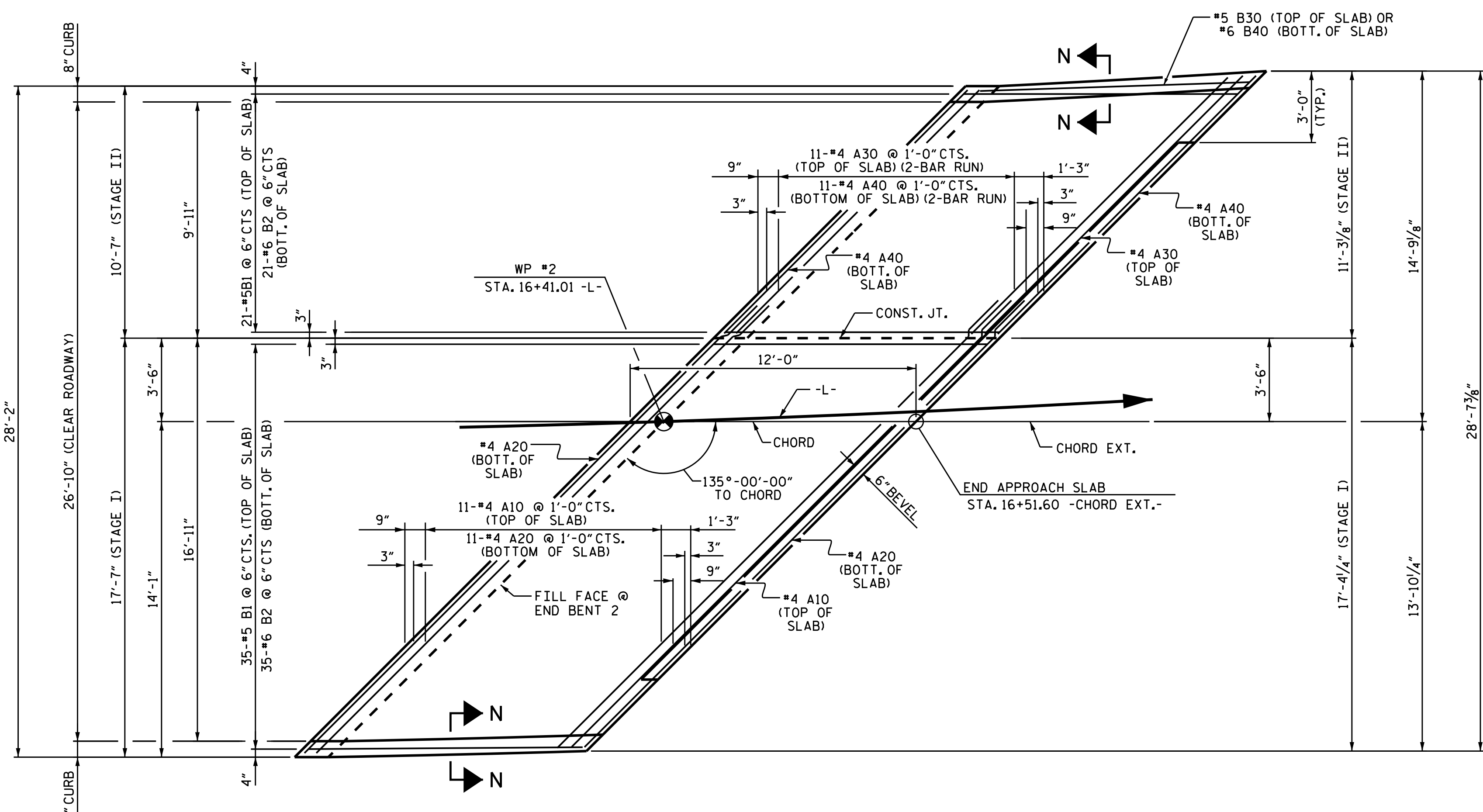
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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-40  
 TOTAL SHEETS 43

DRAWN BY : NMW DATE : 5/19  
 CHECKED BY : SBW DATE : 8/19  
 DESIGN ENGINEER OF RECORD : MGC DATE : 8/19



**NOTES**

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" 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.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE CURB.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2".

**BILL OF MATERIAL**

**APPROACH SLAB AT EB #2 STAGE I**

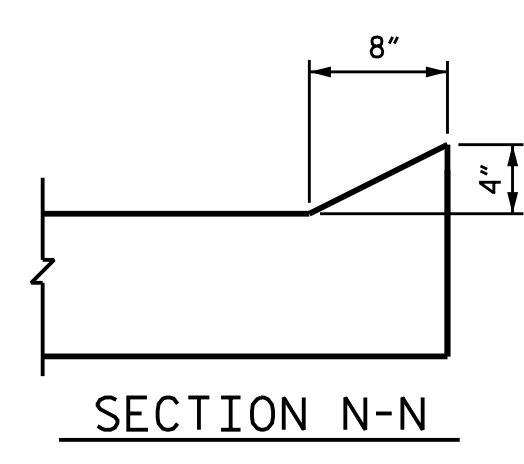
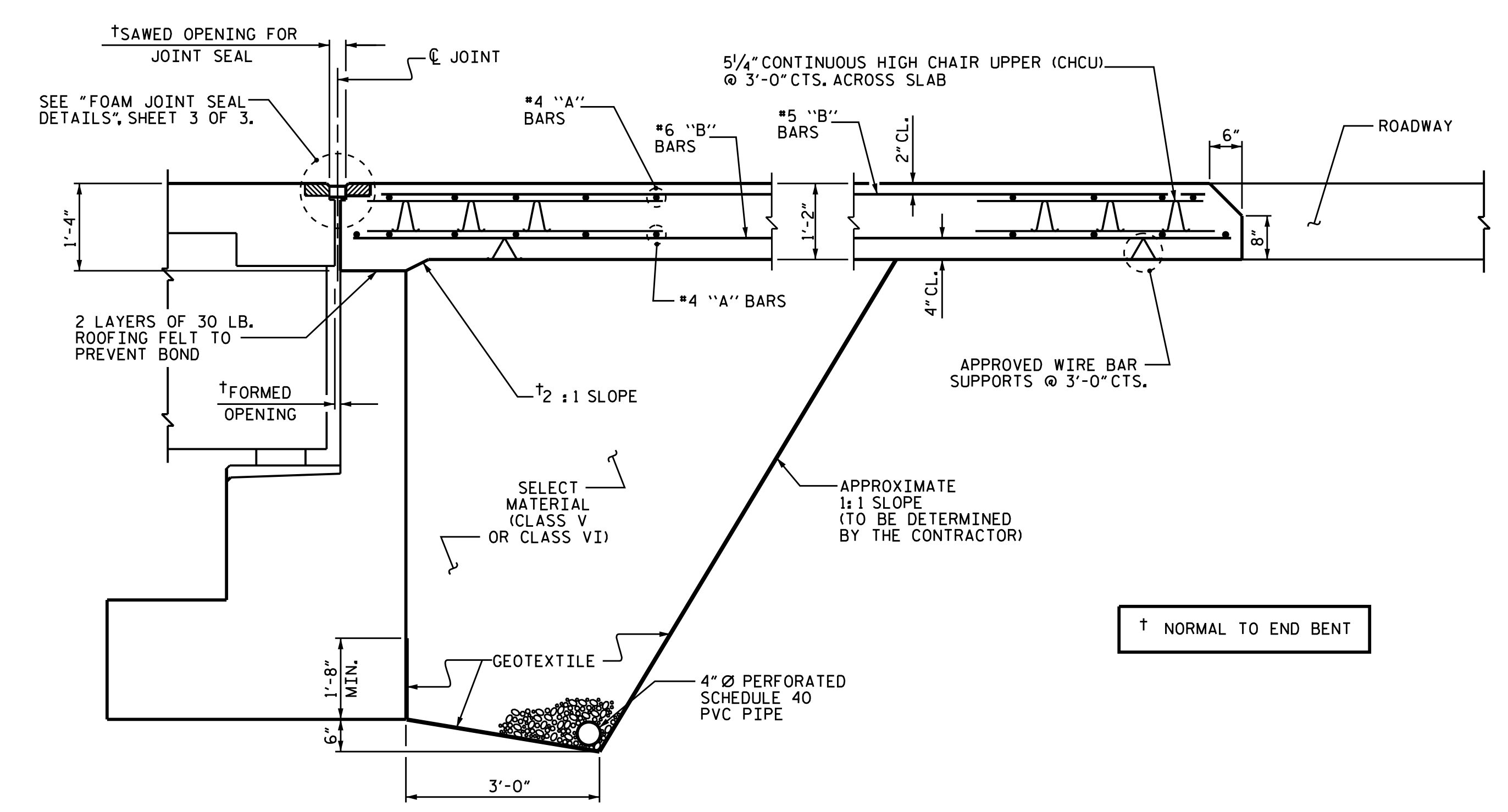
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A10	12	#4	STR	26'-11"	216
A20	13	#4	STR	26'-8"	232
* B1	35	#5	STR	10'-2"	371
B2	35	#6	STR	11'-6"	605
REINFORCING STEEL				LBS.	837
* EPOXY COATED REINFORCING STEEL				LBS.	587
CLASS AA CONCRETE				C. Y.	9.1

**APPROACH SLAB AT EB #2 STAGE II**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A30	24	#4	STR	8'-9"	140
A40	26	#4	STR	8'-7"	149
* B1	21	#5	STR	10'-2"	223
B2	21	#6	STR	11'-6"	363
* B30	1	#5	STR	11'-3"	12
B40	1	#6	STR	11'-3"	17
REINFORCING STEEL				LBS.	529
* EPOXY COATED REINFORCING STEEL				LBS.	375
CLASS AA CONCRETE				C. Y.	5.7

**SPLICE LENGTHS**

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



PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**BRIDGE APPROACH SLAB AT END BENT #2 STAGE I & STAGE II**

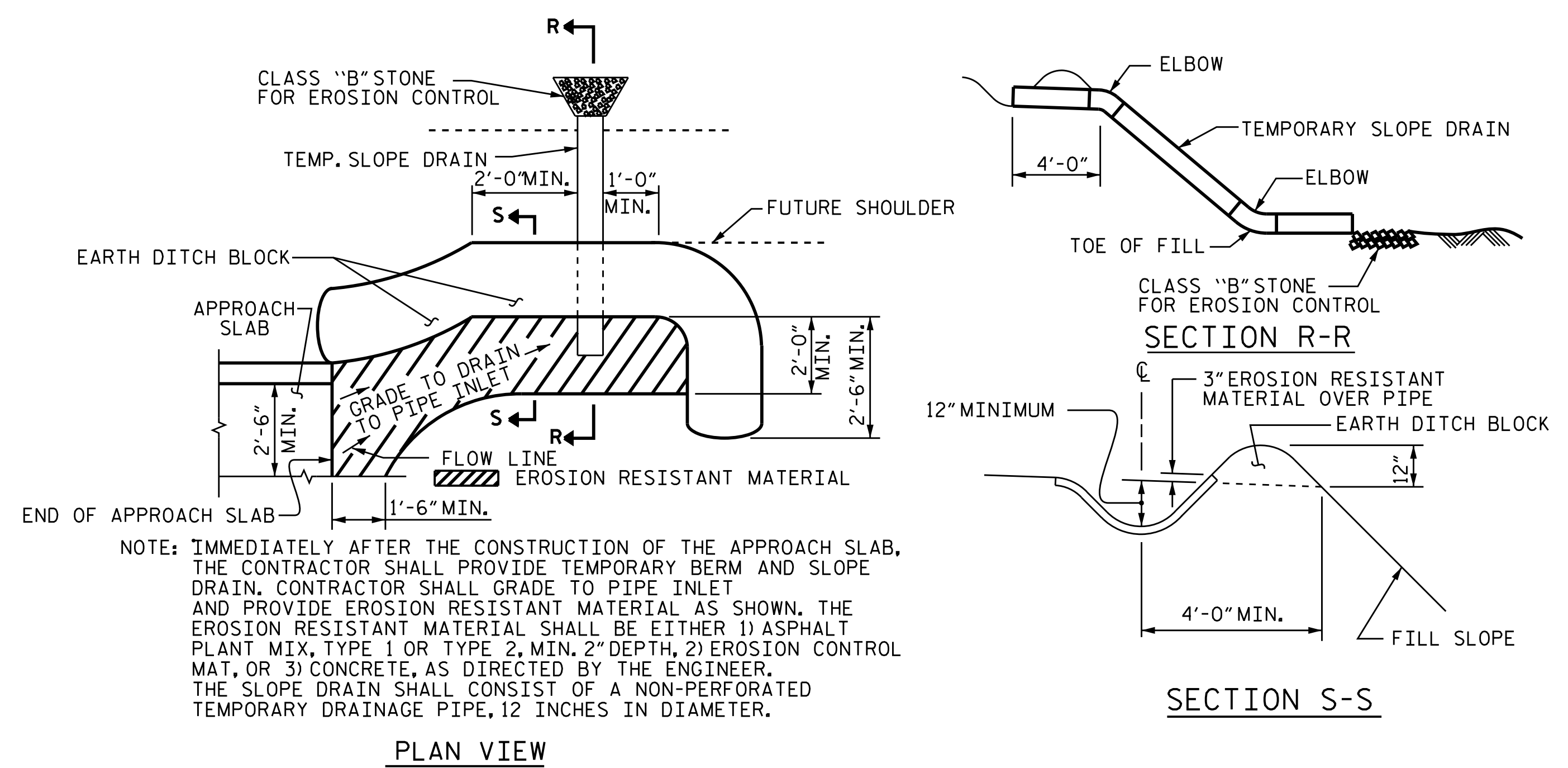
Professional Engineer Seal: Marshall C. Cheek Jr., 2/22/2021

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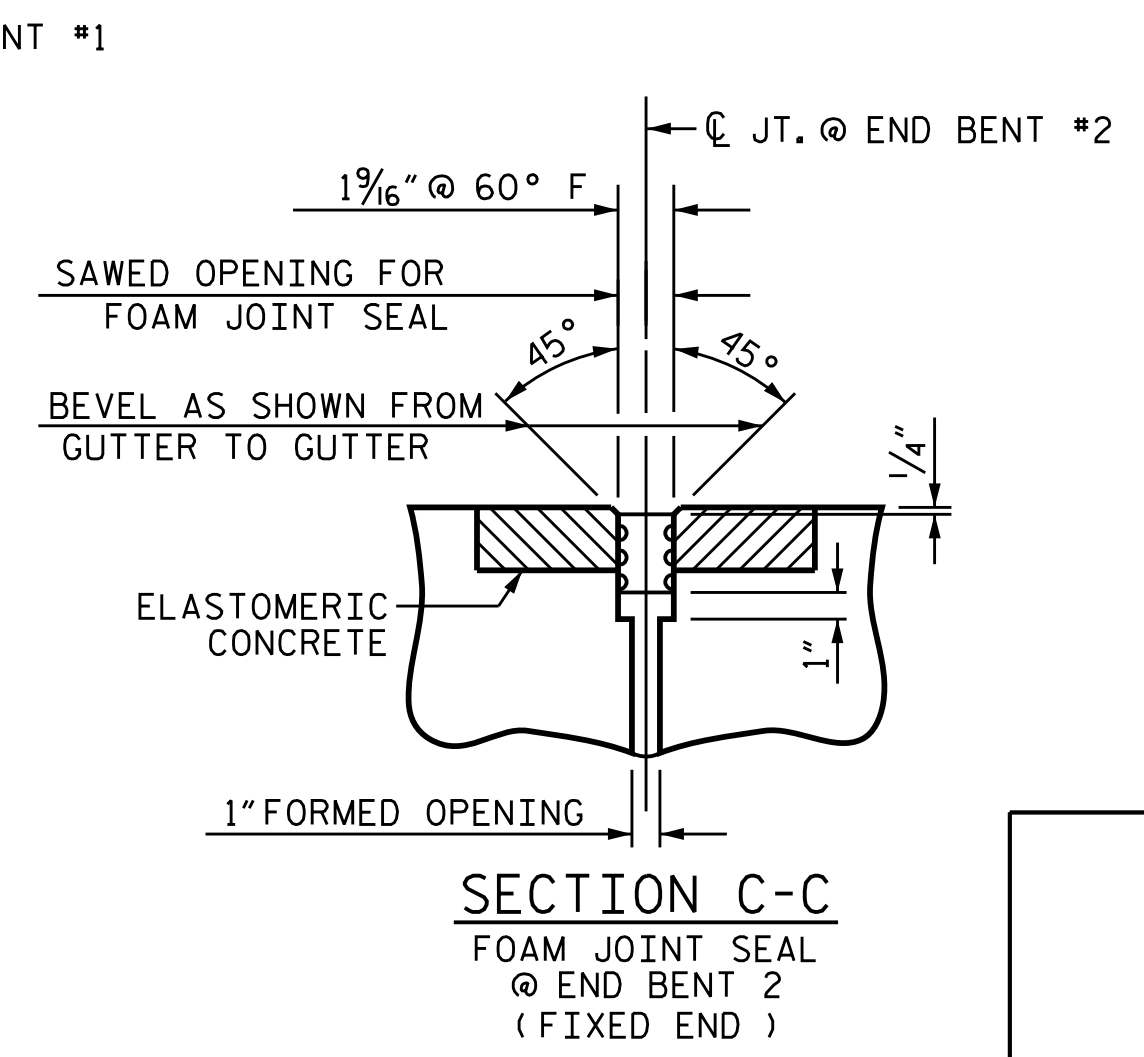
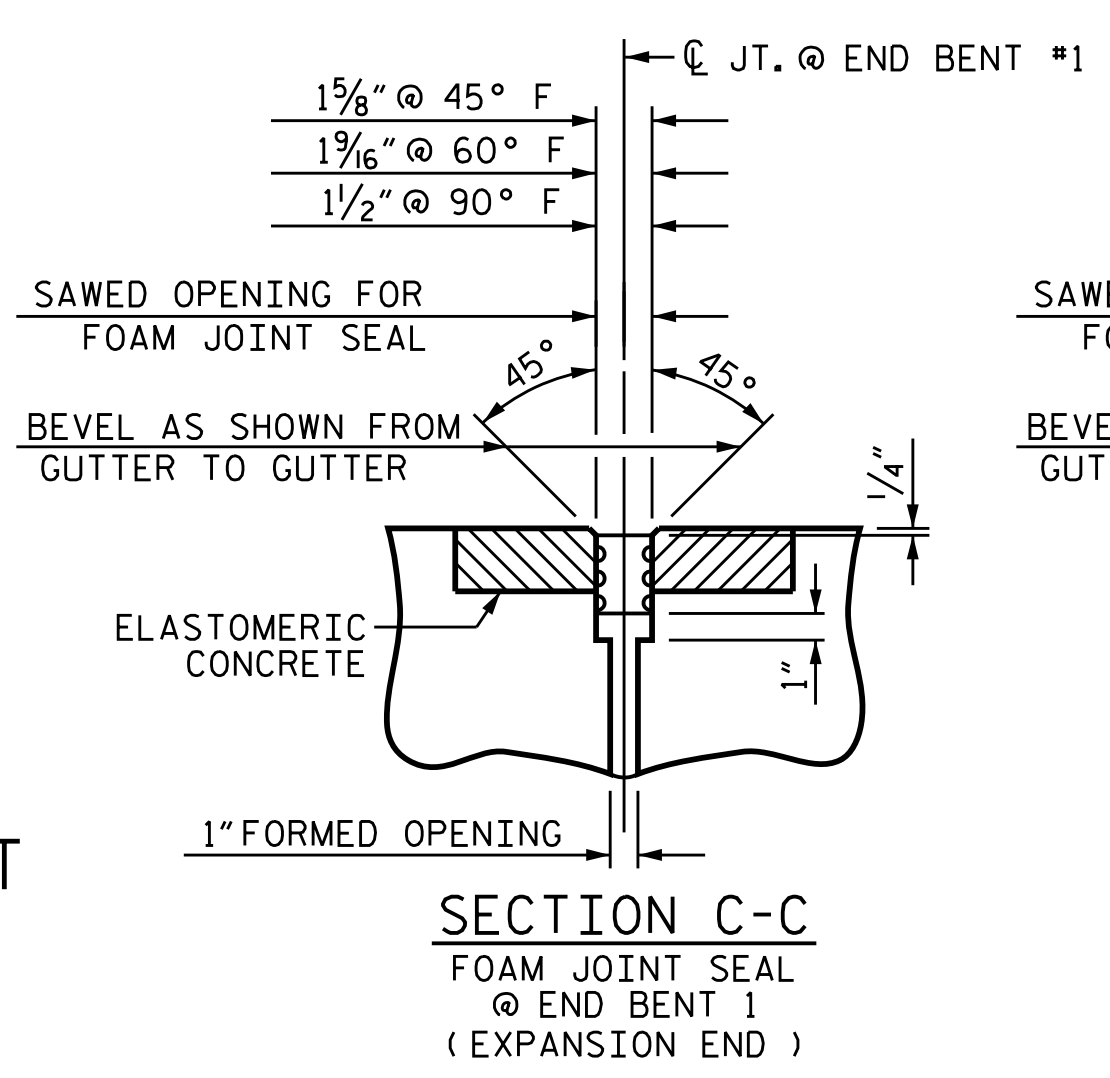
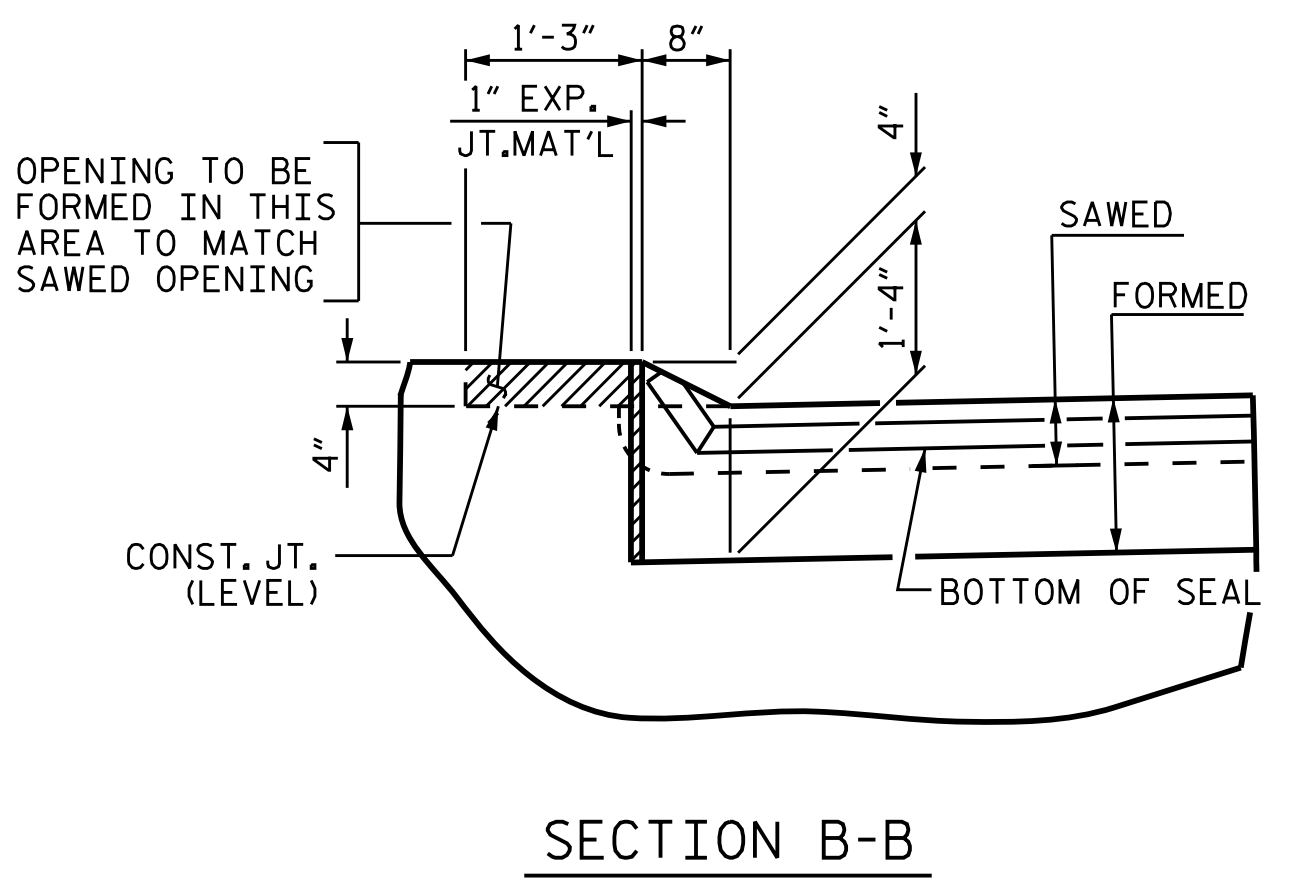
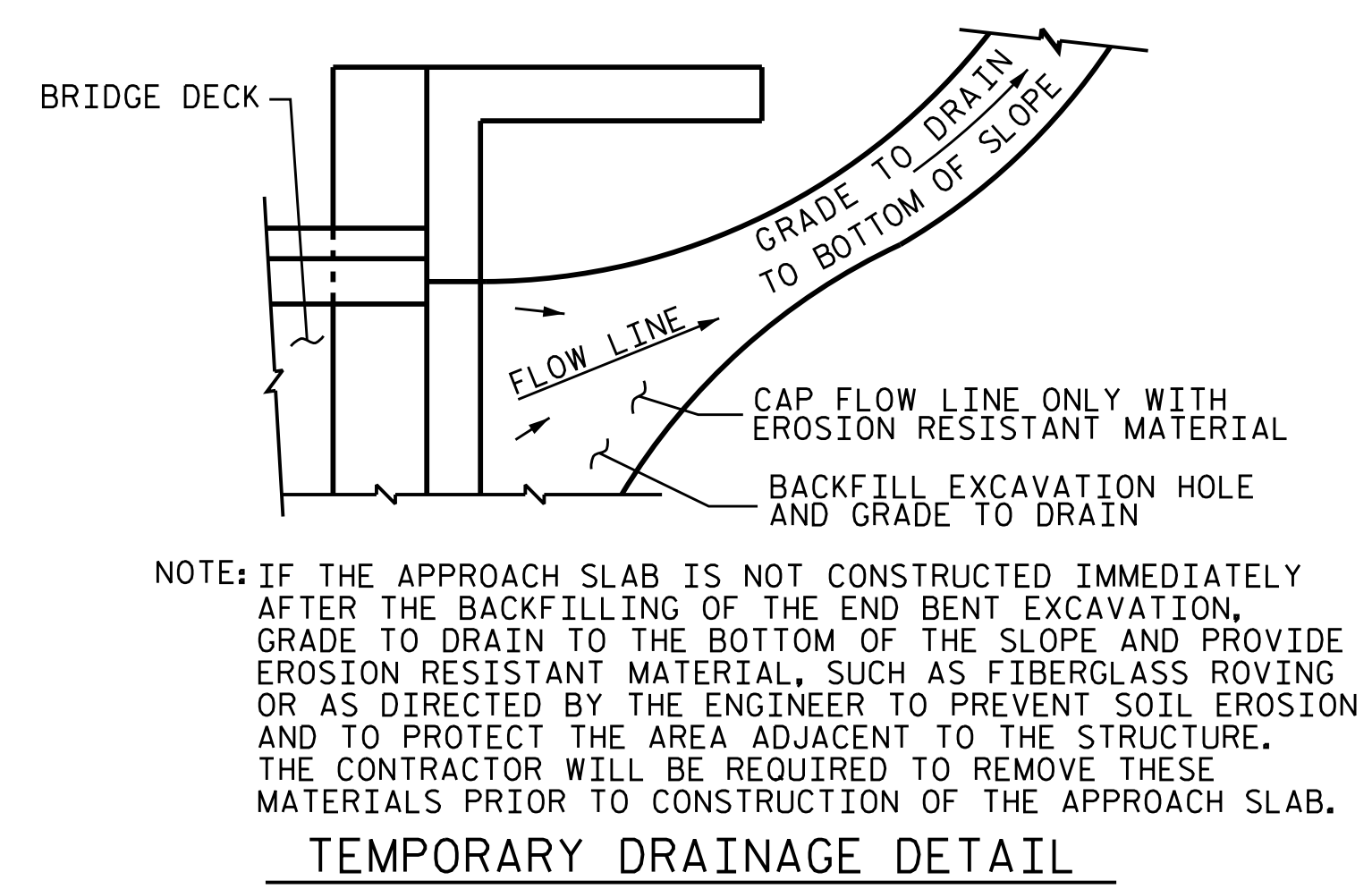
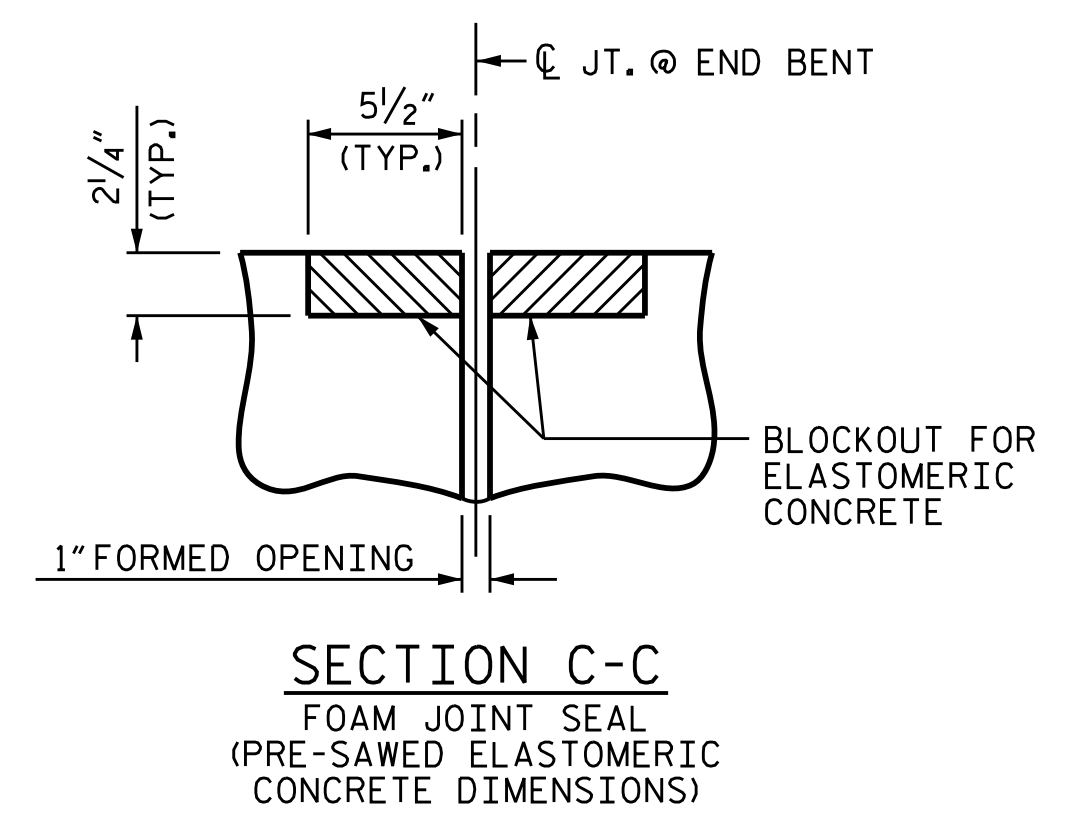
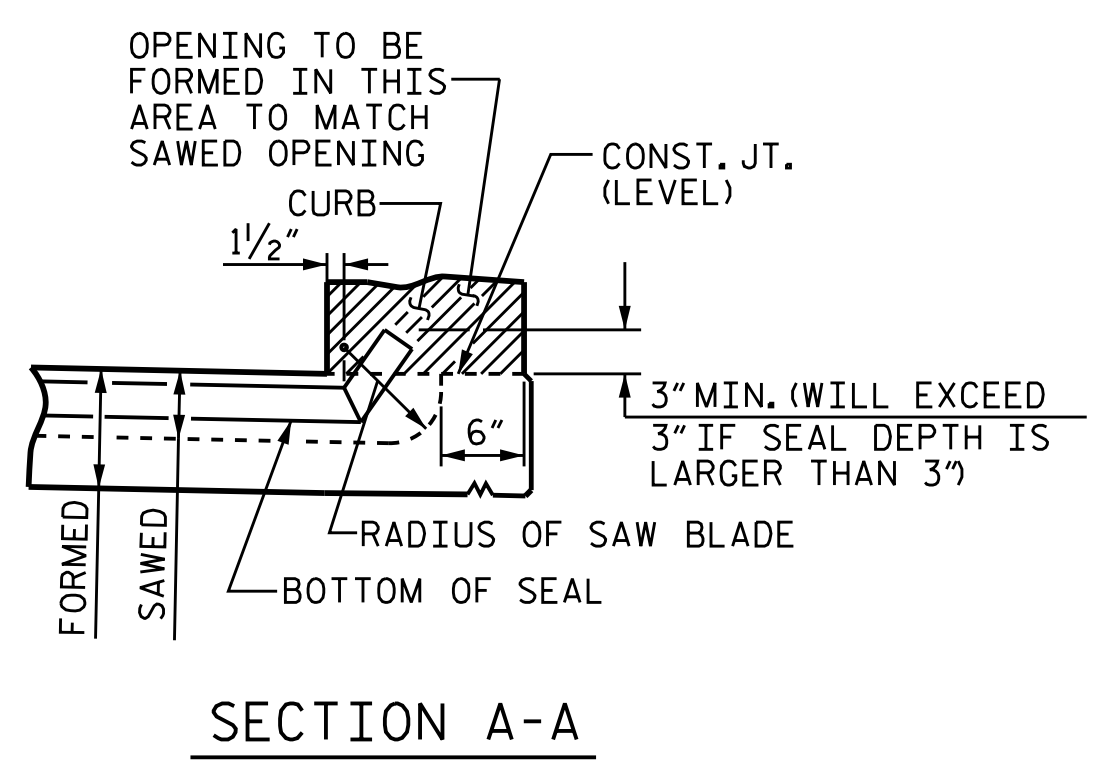
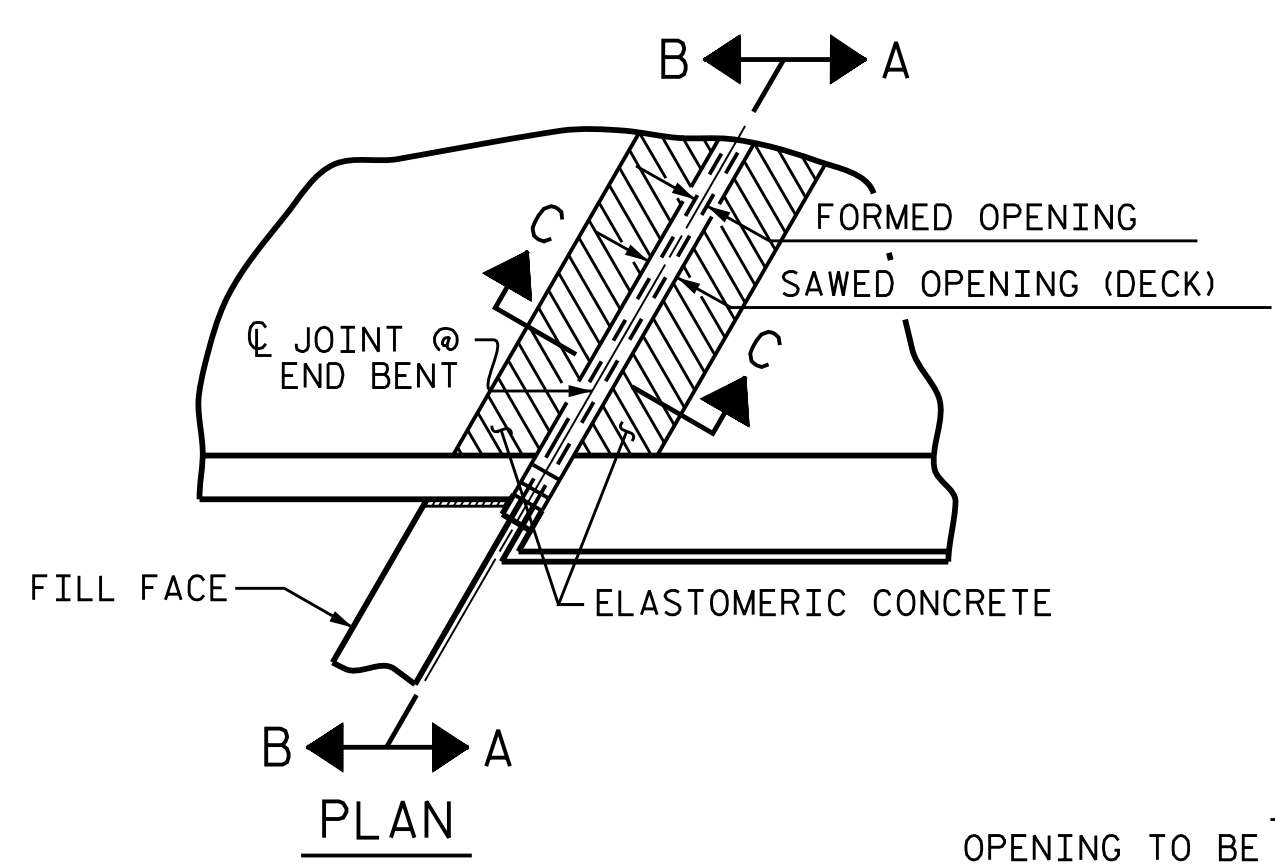
TGS ENGINEERS  
 804-C N. LAFAYETTE ST  
 SHELBY, NC 28150  
 PH (704) 476-0003  
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			43

DRAWN BY : NMW DATE : 5/19  
 CHECKED BY : SBW DATE : 8/19  
 DESIGN ENGINEER OF RECORD : MCC DATE : 8/19



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



**FOAM JOINT SEAL DETAILS @ END BENT**

FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE CURB.

ELASTOMERIC CONCRETE	
	ELASTOMERIC CONCRETE * (CU. FT.)
END BENT 1 STAGE I	4.3
END BENT 1 STAGE II	2.6
END BENT 2 STAGE I	4.3
END BENT 2 STAGE II	2.6
TOTAL	13.8

\* BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. 17BP.14.R.211  
 MACON COUNTY  
 STATION: 16+13.00-L-  
 SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH  
 SLAB DETAILS

2/22/2021

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			43
2			4			

ASSEMBLED BY : NMW	DATE : 5/19
CHECKED BY : SBW	DATE : 8/19
DRAWN BY : FCJ 11/88	REV. 6/13 MAA/GM
CHECKED BY : ARB 11/88	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

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

### DOWELS:

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

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.  
 ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.  
 IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.  
 DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

### REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.  
 WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

### STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".  
 EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.  
 WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

### HANDRAILS AND POSTS:

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

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

### SPECIAL NOTES:

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

PROJECT NO. 17BP.14.R.211  
   MACON    COUNTY  
 STATION: 16+13.00-L-

STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
<h2 style="margin: 0;">STANDARD NOTES</h2>					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-43
					TOTAL SHEETS 43

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