

09/28/14

TIP PROJECT: B-4162

CONTRACT: C202843

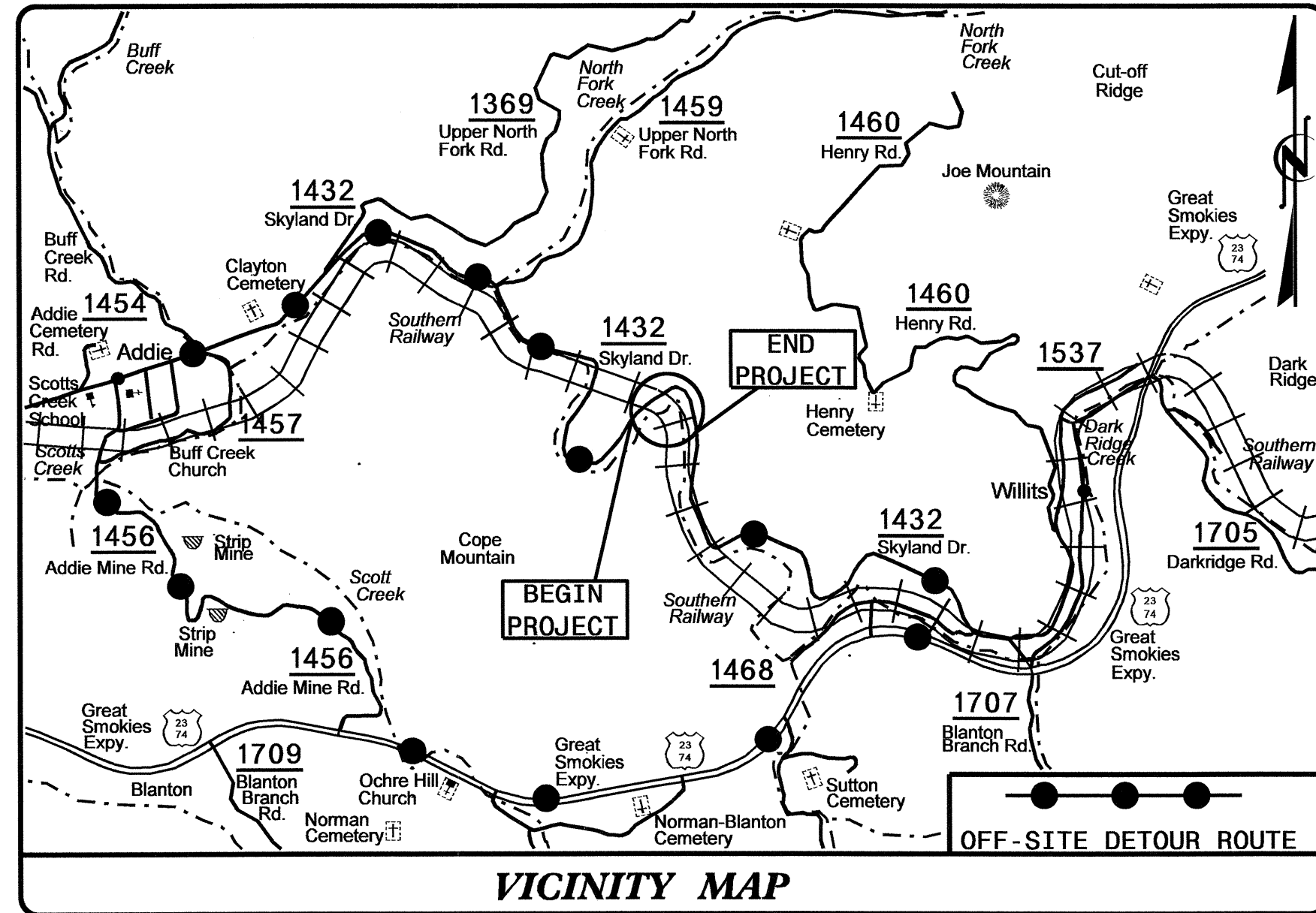
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

JACKSON COUNTY

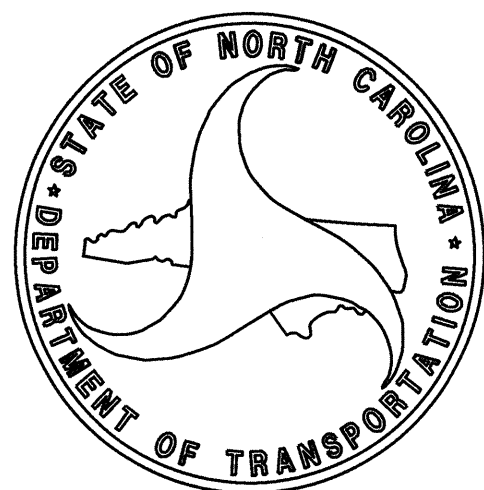
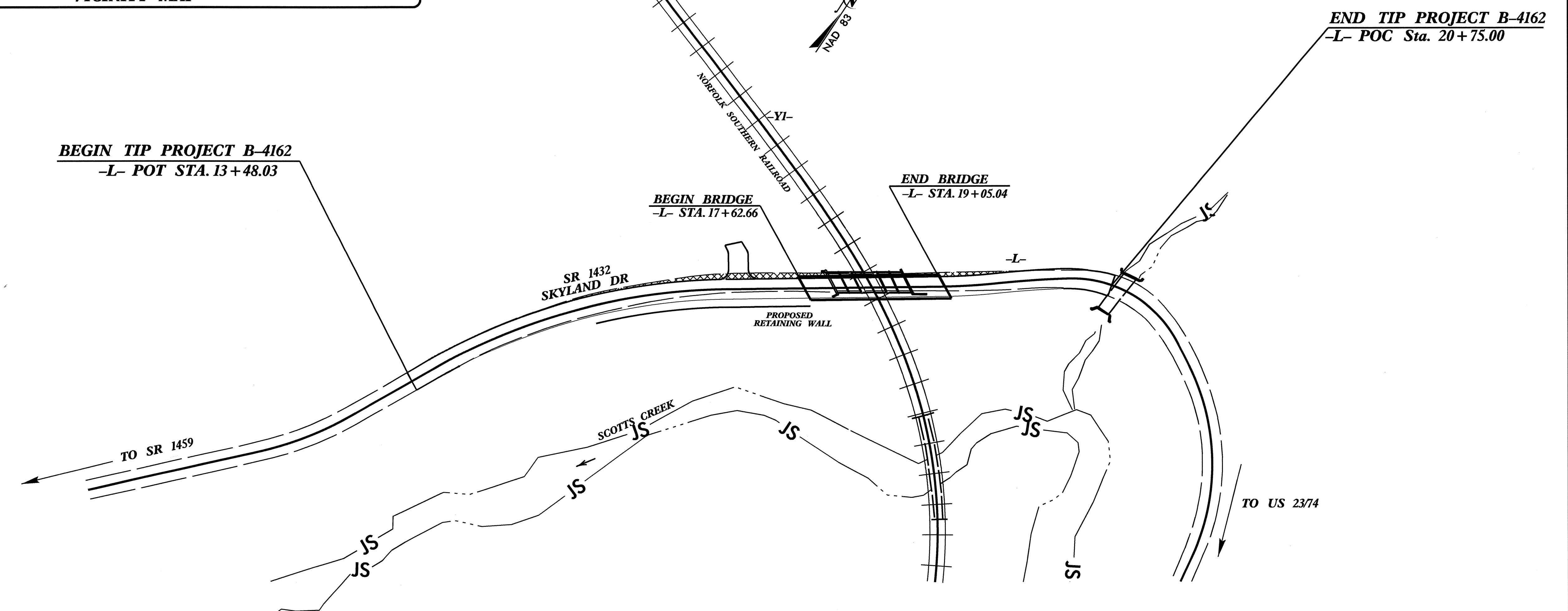
LOCATION: BRIDGE NO. 320 OVER NORFOLK SOUTHERN
RAILROAD ON SR 1432 (SKYLAND DRIVE)

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4162		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33510.1.1	BRZ-1432(2)	PE	
33510.2.1	BRZ-1432(2)	UTIL. & RW	
33510.3.1	BRZ-1432(2)	CONST.	



STRUCTURES



DESIGN DATA

ADT 2012 =	315
ADT 2035 =	400
DHV =	14 %
D =	60 %
T =	9 % *
V =	35 MPH
* TTST 1% DUAL 8%	
CLASSIFICATION =	RURAL LOCAL
SUBREGIONAL TIER DESIGN	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4162 = 0.111 MILES
 LENGTH STRUCTURE TIP PROJECT B-4162 = 0.027 MILES
 TOTAL LENGTH TIP PROJECT B-4162 = 0.138 MILES

Prepared in the Office of:
DIVISION OF HIGHWAYS
 1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE:
JULY 17, 2012

Q. H. NGUYEN, PE
PROJECT ENGINEER

J. R. DUGGINS, JR., PE
PROJECT DESIGN ENGINEER

STRUCTURES MANAGEMENT UNIT
 1000 BIRCH RIDGE DRIVE
 RALEIGH, NC 27610

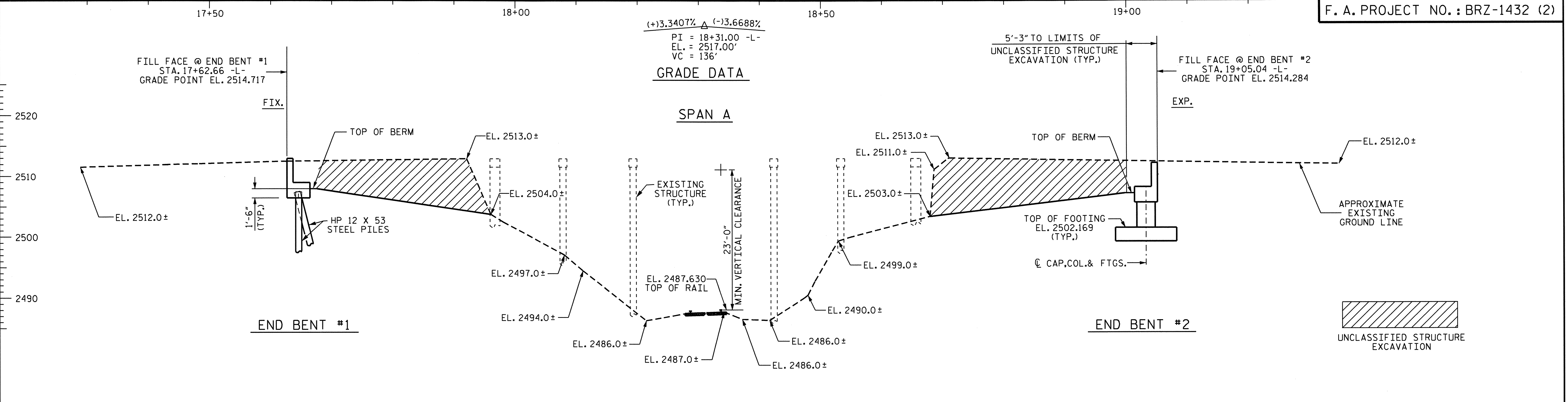
DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED DIVISION ADMINISTRATOR P.E.

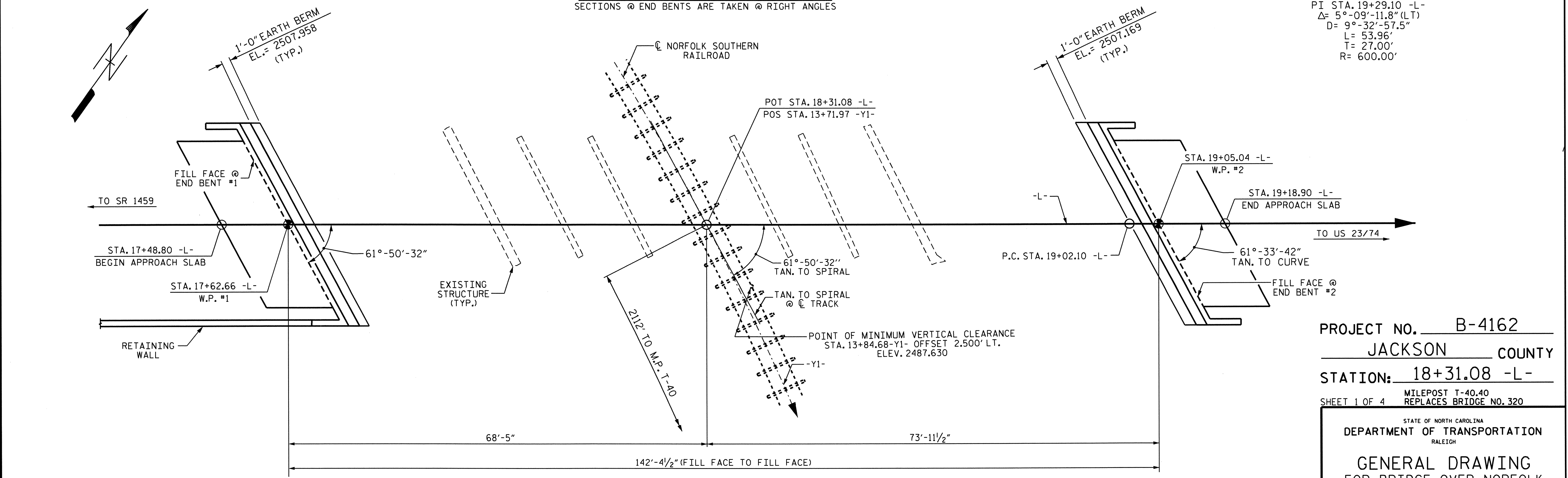
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SECTION ALONG -L-
 SECTIONS @ END BENTS ARE TAKEN @ RIGHT ANGLES

HORIZONTAL CURVE DATA

PI STA. 19+29.10 -L-
 Δ = 5°-09'-11.8" (LT)
 D = 9°-32'-57.5"
 L = 53.96'
 T = 27.00'
 R = 600.00'



PLAN

PILES AND FOOTINGS ARE NOT SHOWN FOR CLARITY

PROJECT NO. B-4162
 JACKSON COUNTY
 STATION: 18+31.08 -L-
 MILEPOST T-40.40
 SHEET 1 OF 4 REPLACES BRIDGE NO. 320

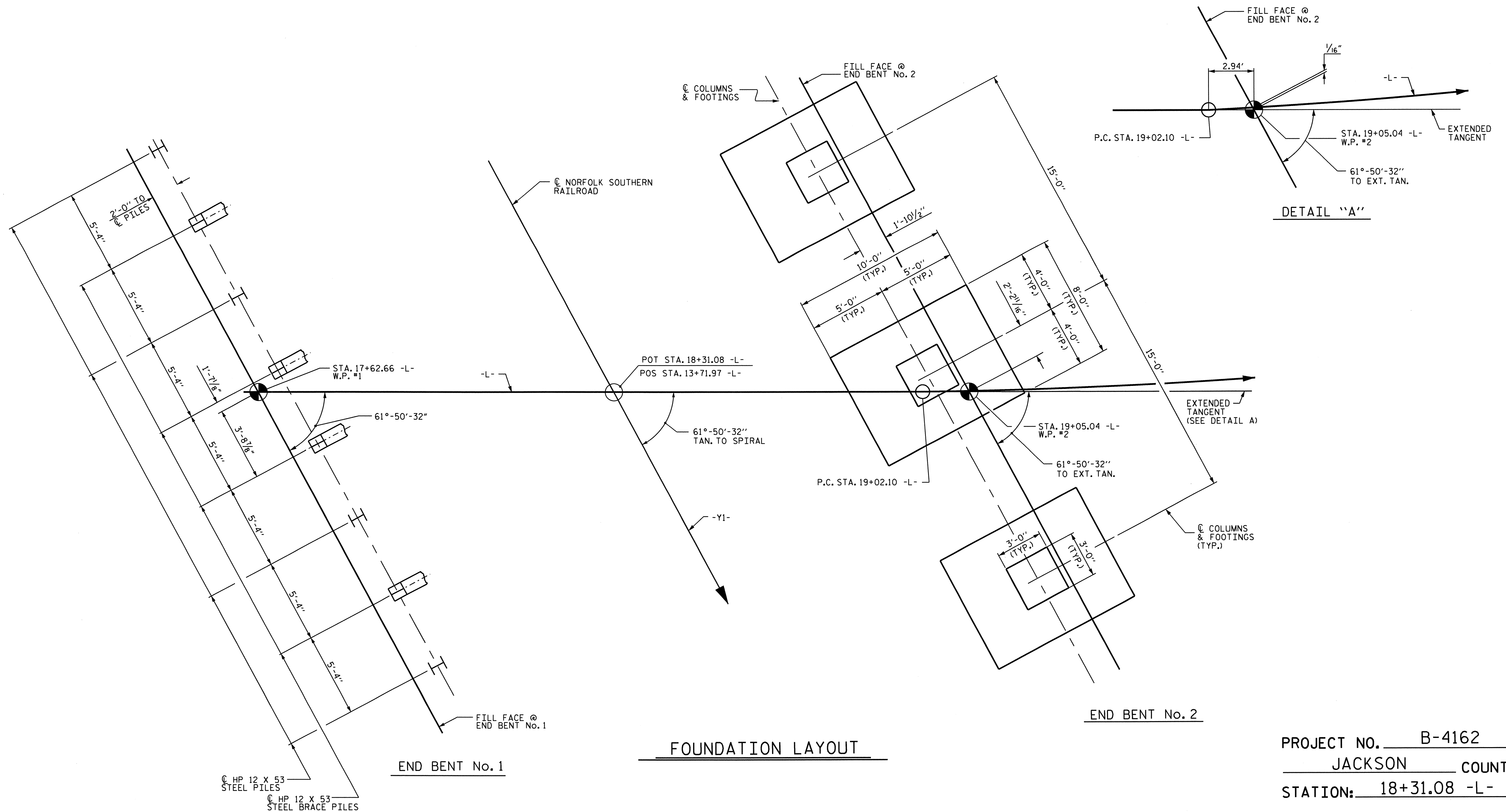
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER NORFOLK
 SOUTHERN RAILROAD ON
 SR 1459 AND US 23/74

Quang H. Nguyen 5-1-12
 NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 13014
 NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15779
 JOHN R. DUGGINS, JR.

DRAWN BY : A. SORSENGINH DATE : 7/17/09
 CHECKED BY : H.P. KIM DATE : 1/3/11

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



FOUNDATION LAYOUT

NOTES

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF THE CAP
 BRACE PILES AT END BENTS ARE BATTERED 3 : 12
 FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
 PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 80 TONS PER PILE
 DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 133 TONS PER PILE.
 THE SPREAD FOOTINGS AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 10 TSF.
 CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE OF 20 TSF JUST BEFORE PLACING CONCRETE.
 KEY SPREAD FOOTINGS AT END BENT NO. 2 AT LEAST 12" INTO ROCK,
 WITH A MINIMUM THICKNESS AS SHOWN ON PLANS.
 FOR BLASTING ADJACENT TO HIGHWAY STRUCTURES, SEE ARTICLE 410-9 OF THE STANDARD SPECIFICATIONS.

DRAWN BY : M. POOLE DATE : 10-11
 CHECKED BY : S. PEARCE DATE : 1-12

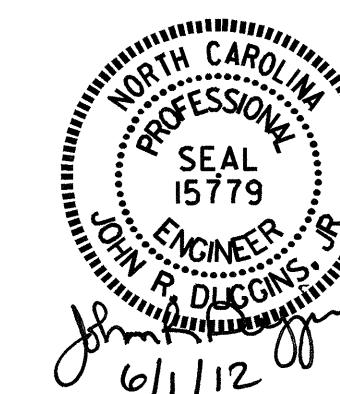
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PROJECT NO. B-4162
JACKSON COUNTY
 STATION: 18+31.08 -L-

SHEET 2 OF 4

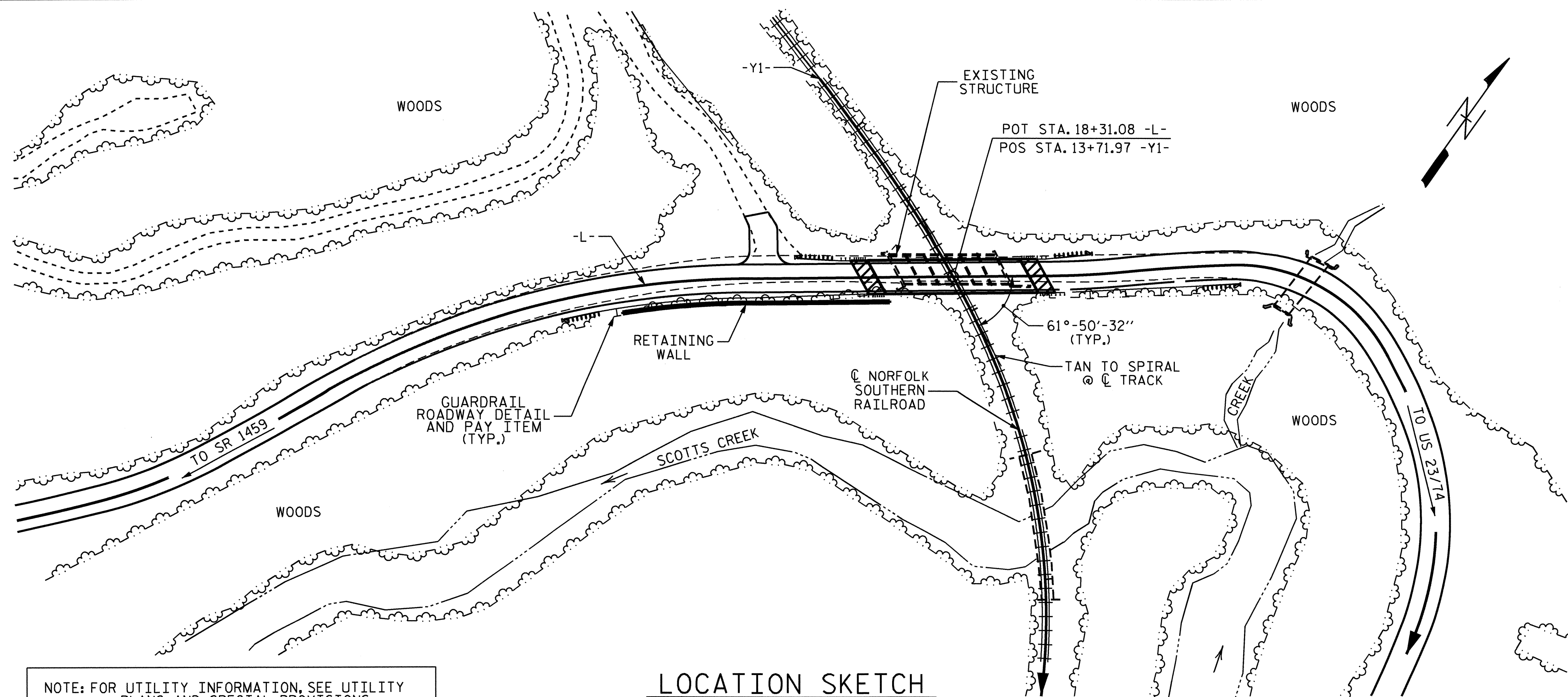
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER NORFOLK
 SOUTHERN RAILROAD ON
 SR 1432 BETWEEN
 SR 1459 AND US 23/74



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

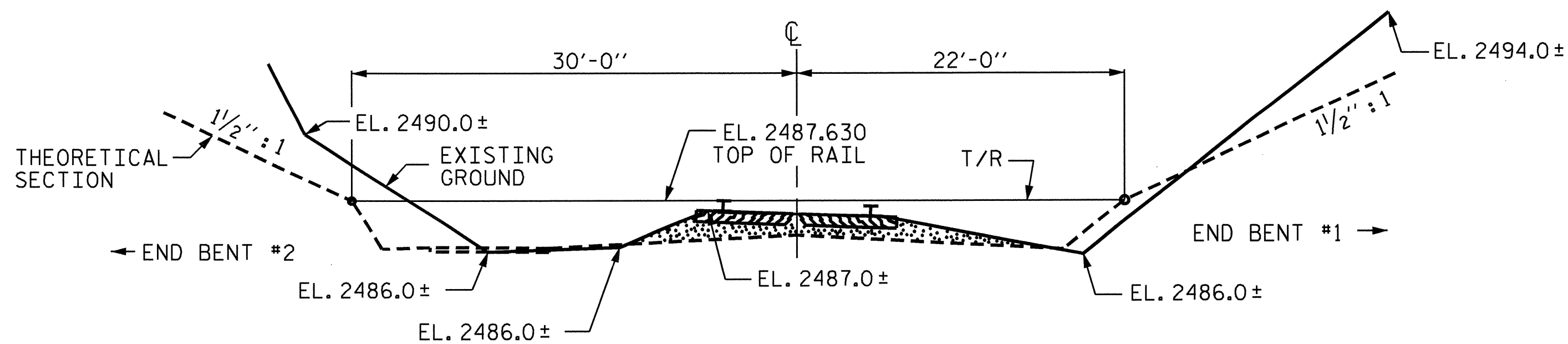
BENCH MARK #2: 8" SPIKE IN BASE OF 18" POPLAR, STA. 16+78.13, 100.0' LT., ELEV. 2522.16



NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

TOP OF RAIL ELEVATIONS		
TRACK STA. @ -Y1-	LEFT RAIL	RIGHT RAIL
12+19.53	2486.652	2486.691
12+19.55		2486.691
12+71.52	2487.293	
12+71.48		2487.208
13+19.80	2487.666	
13+19.58		2487.554
13+64.19	2487.698	
13+63.98		2487.548
14+14.36	2487.528	
14+14.12		2487.421
14+59.53	2487.213	
14+59.38		2487.097
15+08.87	2486.904	
15+08.89		2486.781

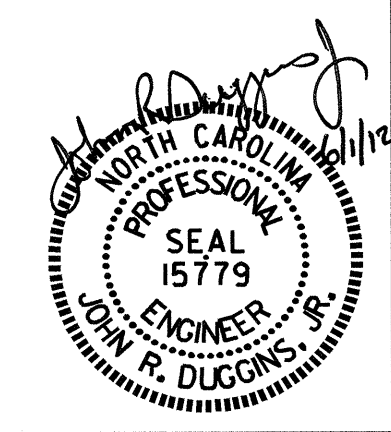


HORIZONTAL CLEARANCE - RAILROAD
LOOKING AHEAD IN DIRECTION OF INCREASING STATIONS ON RAILROAD.
(SPAN LENGTH BASED ON THIS THEORETICAL SECTION)

PROJECT NO. B-4162
JACKSON COUNTY
 STATION: 18+31.08 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE OVER NORFOLK
 SOUTHERN RAILROAD ON
 SR 1432 BETWEEN
 SR 1459 AND US 23/74



DRAWN BY : S.W. PEARCE DATE : 1/17/12
 CHECKED BY : J.R. DUGGINS DATE : 1/17/12

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

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
 FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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

THE EXISTING STRUCTURE CONSISTING OF 5- SPANS, 1 @ 13'-8", 1 @ 12'-4", 1 @ 15'-9", 1 @ 12'-5" AND 1 @ 14'-6" WITH A TIMBER FLOOR ON I-BEAMS AND TIMBER JOISTS SUPERSTRUCTURE WITH A CLEAR ROADWAY WIDTH OF 20'-8" ON A SUBSTRUCTURE CONSISTING OF REINFORCED CONCRETE ABUTMENT END BENTS AND BENTS WITH TIMBER CAPS ON TIMBER POST AND CONCRETE PEDESTALS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 20 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

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 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.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 18+31.08 -L-."

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

THE RAILROAD TRACK TOP OF RAIL ELEVATIONS SHOWN ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS AND REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

TOTAL BILL OF MATERIAL

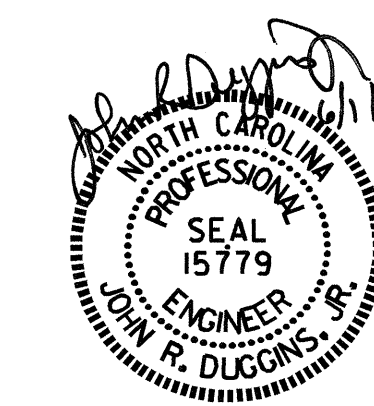
	REMOVAL OF EXISTING STRUCTURE	FOUNDATION EXCAVATION	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL	HP 12 X 53 STEEL PILES	CONCRETE BARRIER RAIL	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	
	LUMP SUM	LUMP SUM	LUMP SUM	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	APPROX.LBS.	NO.	LIN.FT.	LIN.FT.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM			3815	3485		LUMP SUM		192,700		279.83	LUMP SUM	LUMP SUM	
END BENT No. 1			LUMP SUM			30.1		3500		8	160			
END BENT No. 2		LUMP SUM	LUMP SUM			54.1		8913						
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	3815	3485	84.2	LUMP SUM	12413	192,700	8	160	279.83	LUMP SUM	LUMP SUM

PROJECT NO. B-4162
JACKSON COUNTY
 STATION: 18+31.08 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER NORFOLK
 SOUTHERN RAILROAD ON
 SR 1432 BETWEEN
 SR 1459 AND US 23/74



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

DRAWN BY : S.W. PEARCE DATE : 1/17/12
 CHECKED BY : J.R. DUGGINS DATE : 3/12

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{oc}	γ_{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 (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.14	--	1.75	0.673	1.14	A	EXT.	68.49	0.793	2.97	A	INT.	0	1.30	0.673	1.52	A	EXT.	68.49		
	HL-93 (OPERATING)	N/A		1.48	--	1.35	0.673	1.48	A	EXT.	68.49	0.793	3.85	A	INT.	0	1.00	0.673	1.98	A	EXT.	68.49		
	HS-20 (INVENTORY)	36.00	②	1.74	62.64	1.35	0.673	1.74	A	EXT.	68.49	0.793	4.43	A	INT.	136.99	1.30	0.673	2.48	A	EXT.	68.49		
	HS-20 (OPERATING)	36.00		2.25	81.00	1.35	0.673	2.25	A	EXT.	68.49	0.793	5.75	A	INT.	136.99	1.00	0.673	3.22	A	EXT.	68.49		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.50		5.33	71.96	1.40	0.673	5.33	A	EXT.	68.49	0.793	9.99	A	INT.	0	1.30	0.673	5.66	A	EXT.	68.49	
		SNGARBS2	20.00		3.78	75.60	1.40	0.673	3.78	A	EXT.	68.49	0.793	9.7	A	INT.	0	1.30	0.673	4.02	A	EXT.	68.49	
		SNAGRIS2	22.00		3.51	77.22	1.40	0.673	3.51	A	EXT.	68.49	0.793	8.9	A	INT.	0	1.30	0.673	3.72	A	EXT.	68.49	
		SNCOTTS3	27.25		2.65	72.21	1.40	0.673	2.65	A	EXT.	68.49	0.793	6.98	A	INT.	136.99	1.30	0.673	2.81	A	EXT.	68.49	
		SNAGGRS4	34.93		2.14	74.75	1.40	0.673	2.14	A	EXT.	68.49	0.793	5.60	A	INT.	136.99	1.30	0.673	2.27	A	EXT.	68.49	
		SNS5A	35.55		2.10	74.66	1.40	0.673	2.10	A	EXT.	68.49	0.793	5.57	A	INT.	0	1.30	0.673	2.23	A	EXT.	68.49	
		SNS6A	39.95		1.89	75.51	1.40	0.673	1.89	A	EXT.	68.49	0.793	5.02	A	INT.	136.99	1.30	0.673	2.01	A	EXT.	68.49	
	SNS7B	42.00		1.80	75.60	1.40	0.673	1.80	A	EXT.	68.49	0.793	4.84	A	INT.	136.99	1.30	0.673	1.91	A	EXT.	68.49		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.00		2.30	75.90	1.40	0.673	2.30	A	EXT.	68.49	0.793	6.03	A	INT.	0	1.30	0.673	2.44	A	EXT.	68.49	
		TNT4A	33.08		2.30	76.08	1.40	0.673	2.30	A	EXT.	68.49	0.793	5.95	A	INT.	0	1.30	0.673	2.44	A	EXT.	68.49	
		TNT6A	41.60		1.86	77.38	1.40	0.673	1.86	A	EXT.	68.49	0.793	5.00	A	INT.	0	1.30	0.673	1.97	A	EXT.	68.49	
		TNT7A	42.00		1.85	77.70	1.40	0.673	1.85	A	EXT.	68.49	0.793	4.93	A	INT.	0	1.30	0.673	1.96	A	EXT.	68.49	
		TNT7B	42.00		1.88	78.96	1.40	0.673	1.88	A	EXT.	68.49	0.793	4.79	A	INT.	0	1.30	0.673	2.00	A	EXT.	68.49	
		TNAGRIT4	43.00		1.81	77.83	1.40	0.673	1.81	A	EXT.	68.49	0.793	4.66	A	INT.	0	1.30	0.673	1.93	A	EXT.	68.49	
TNAGT5A		45.00		1.72	77.40	1.40	0.673	1.72	A	EXT.	68.49	0.793	4.53	A	INT.	136.99	1.30	0.673	1.83	A	EXT.	68.49		
TNAGT5B	45.00		③	1.71	76.95	1.40	0.673	1.71	A	EXT.	68.49	0.793	4.44	A	INT.	0	1.30	0.673	1.82	A	EXT.	68.49		
FATIGUE	HL-93 (INVENTORY)	$\gamma_{LL}=0.75$	--	--																				

NOTES:

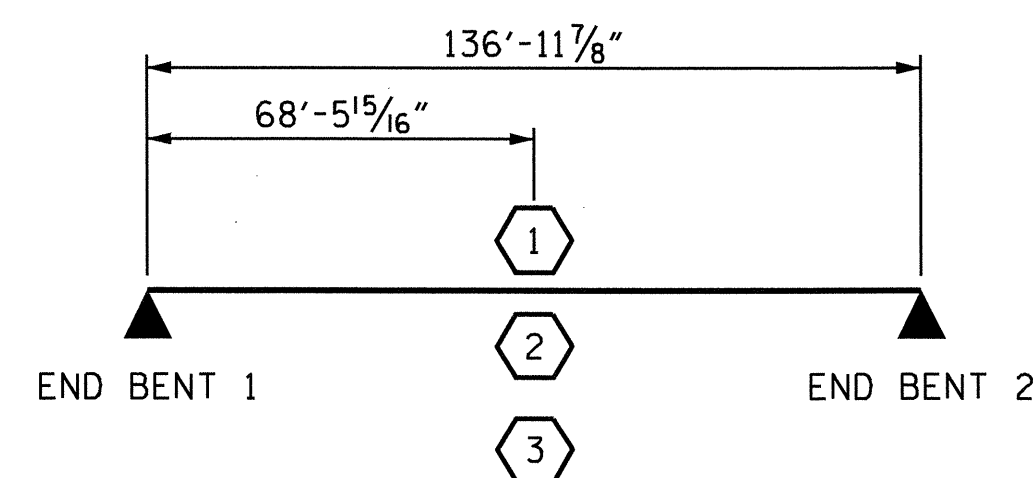
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE II LIMIT STATES.

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

COMMENTS:

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

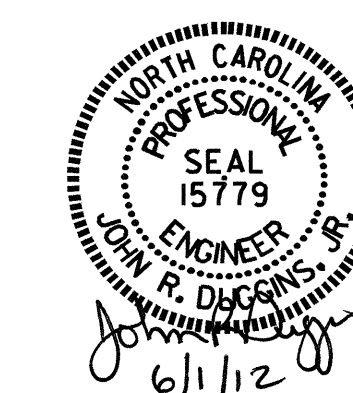
#	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93) **
②	DESIGN LOAD RATING (HS-20) **
③	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
INT. - INTERIOR GIRDER	
EXT. - EXTERIOR GIRDER	



LRFR SUMMARY

PROJECT NO. B-4162
JACKSON COUNTY
 STATION: 18+31.08 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
LRFR SUMMARY FOR STEEL GIRDERS (NON-INTERSTATE TRAFFIC)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-5
					TOTAL SHEETS 24



ASSEMBLED BY : S.W. PEARCE DATE : 3/11
 CHECKED BY : J.R. DUGGINS DATE : 3/12
 DRAWN BY : MAA 1/08 REV. 11/12/08R MAA/GM
 CHECKED BY : GM/DI 2/08

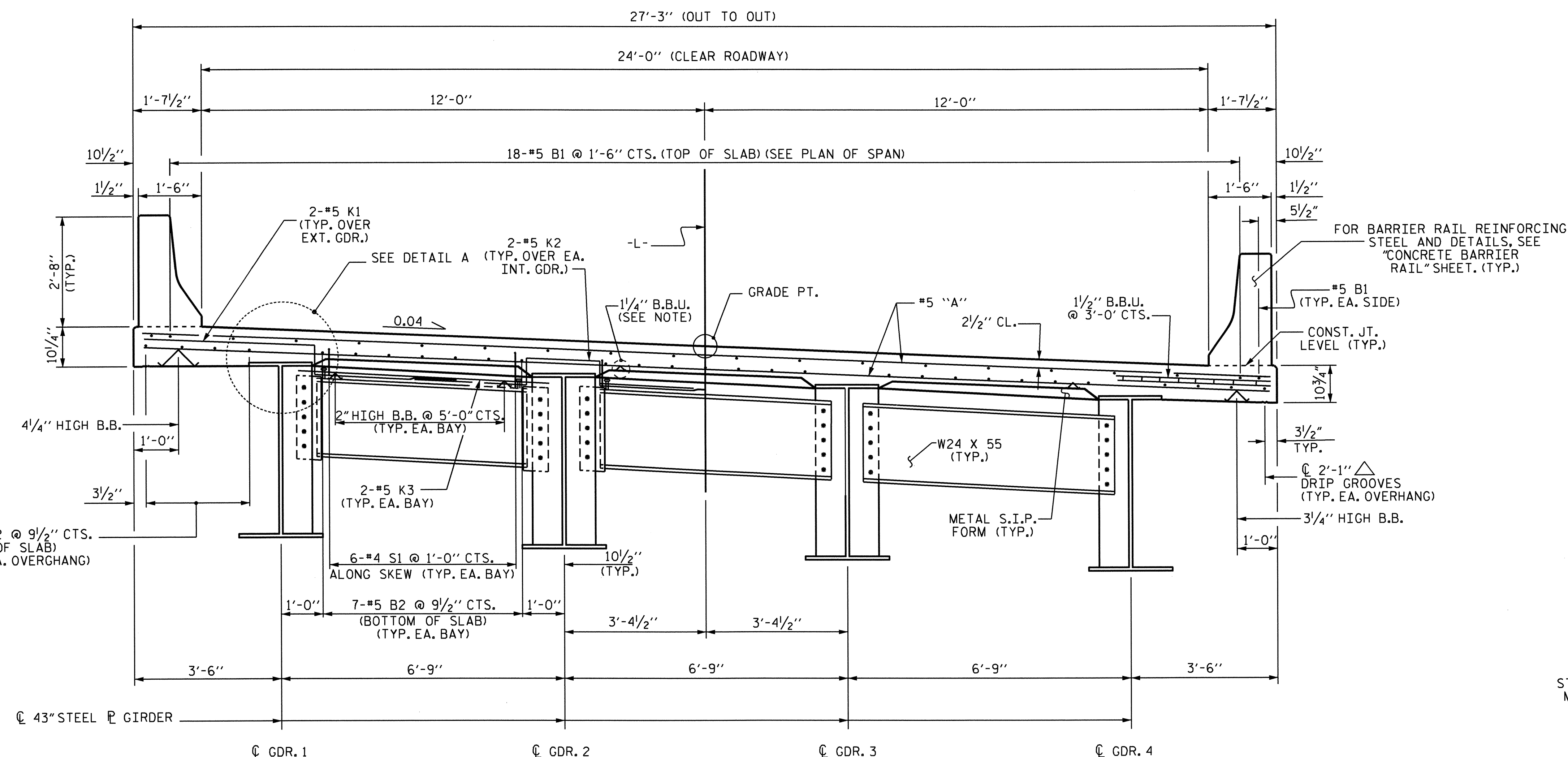
NOTES

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.

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

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

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



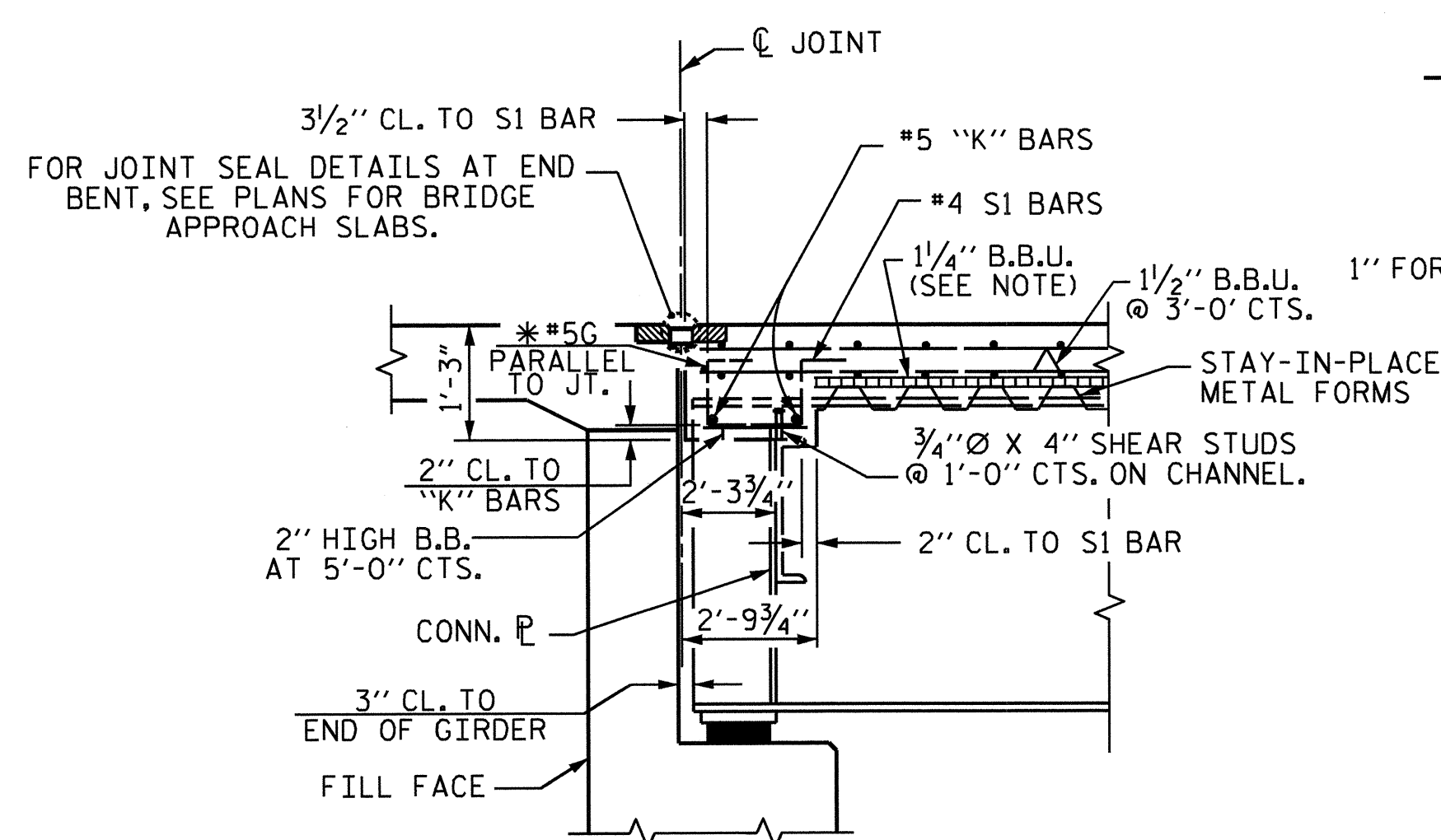
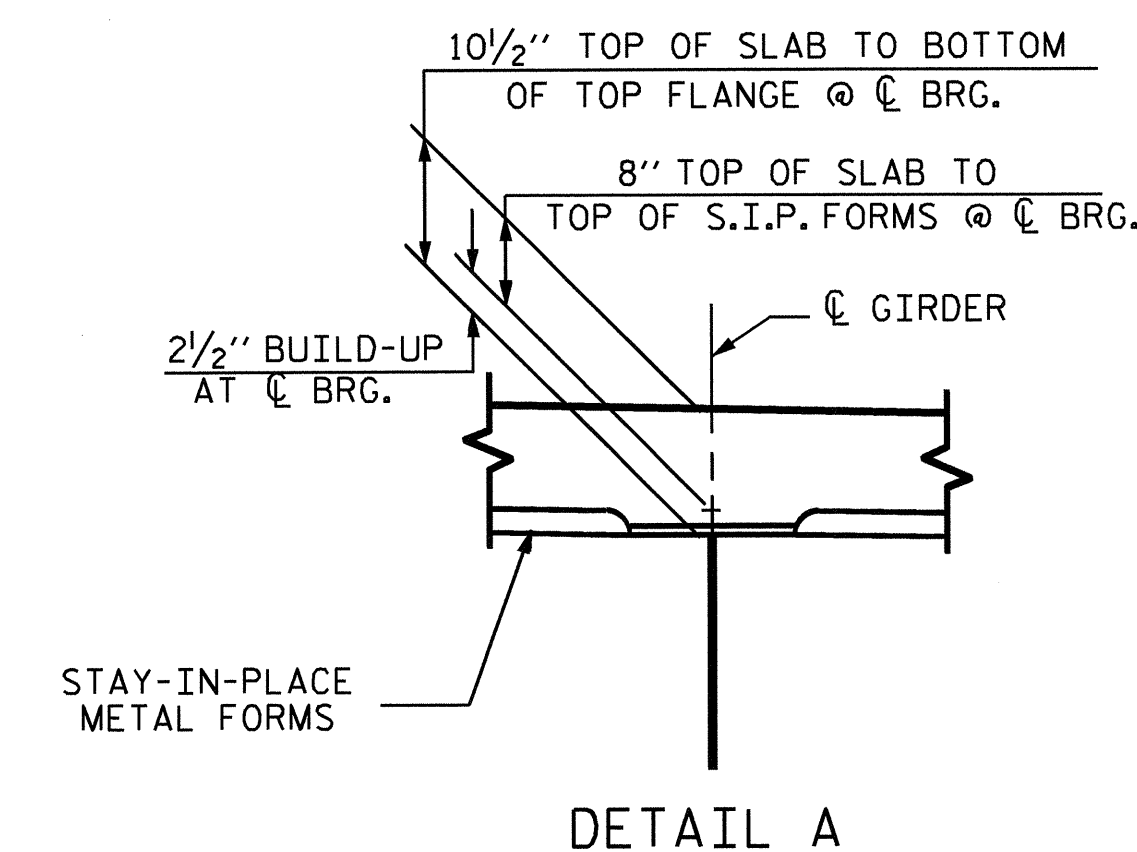
HALF TYPICAL SECTION

SHOWING END BENT DIAPHRAGMS

HALF TYPICAL SECTION

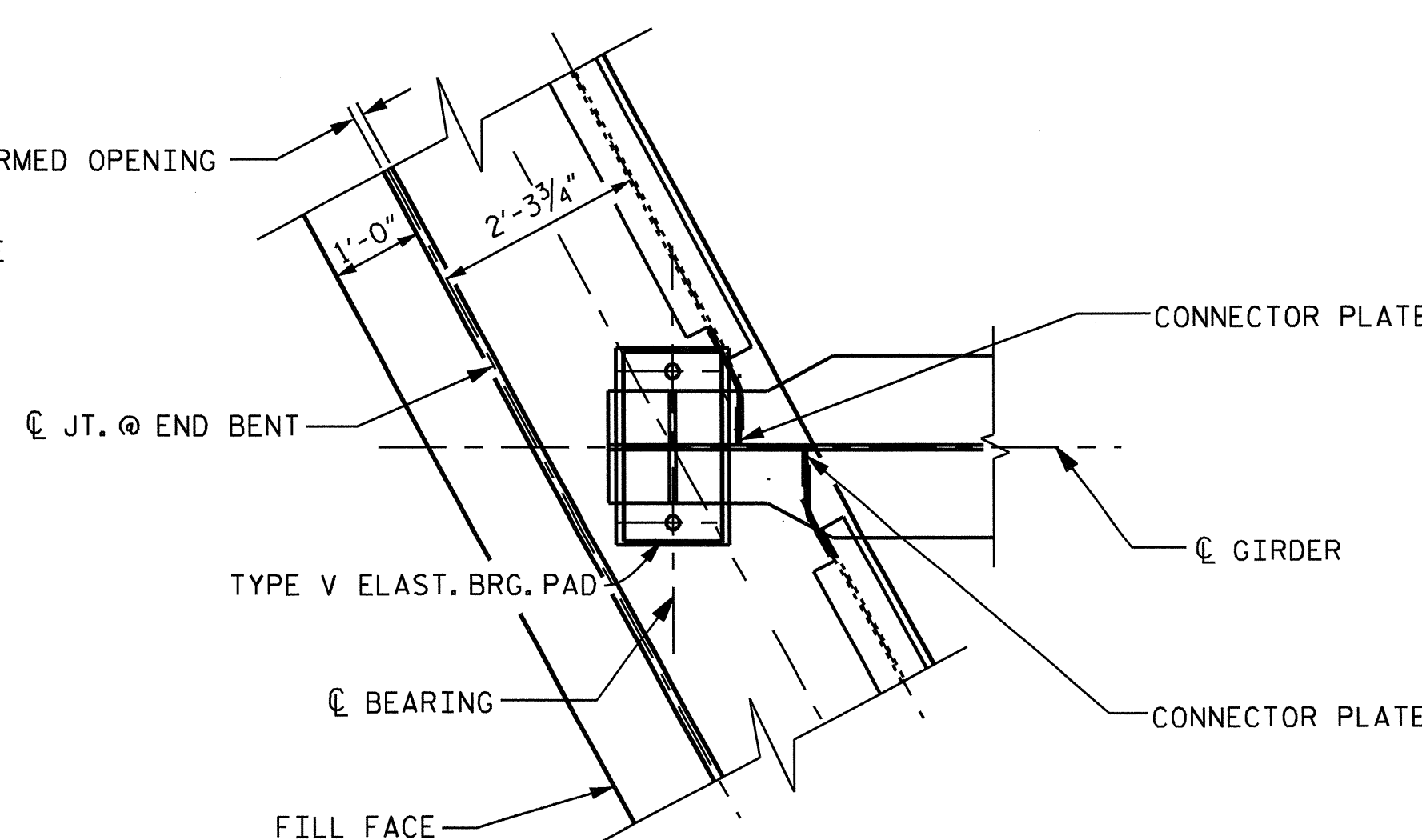
SHOWING INTERMEDIATE DIAPHRAGMS

TYPICAL SECTION

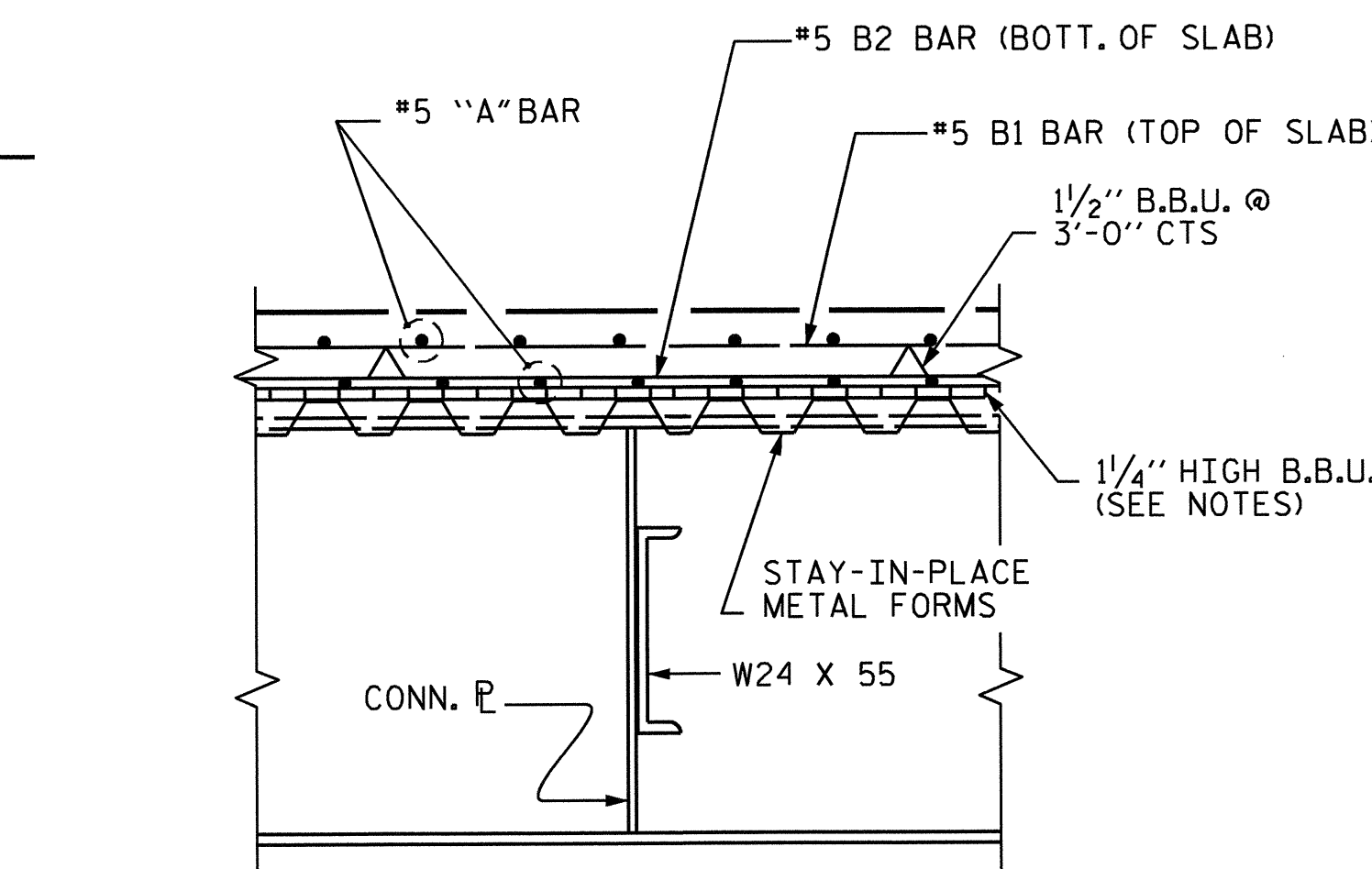


END OF GIRDER DETAIL AT END BENT

* #5G BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL & STIRRUPS. DIAPHRAGM DIMENSIONS BASED ON 1" JOINT



PLAN OF GIRDER AT END BENT JOINT

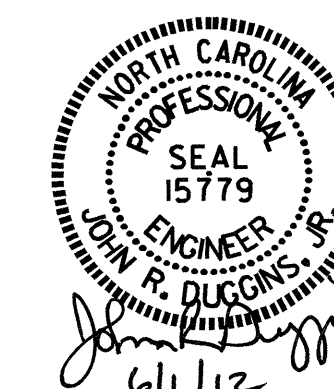


SECTION THRU INTERMEDIATE DIAPHRAGM

PROJECT NO. B-4162
JACKSON COUNTY
 STATION: 18+31.08 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

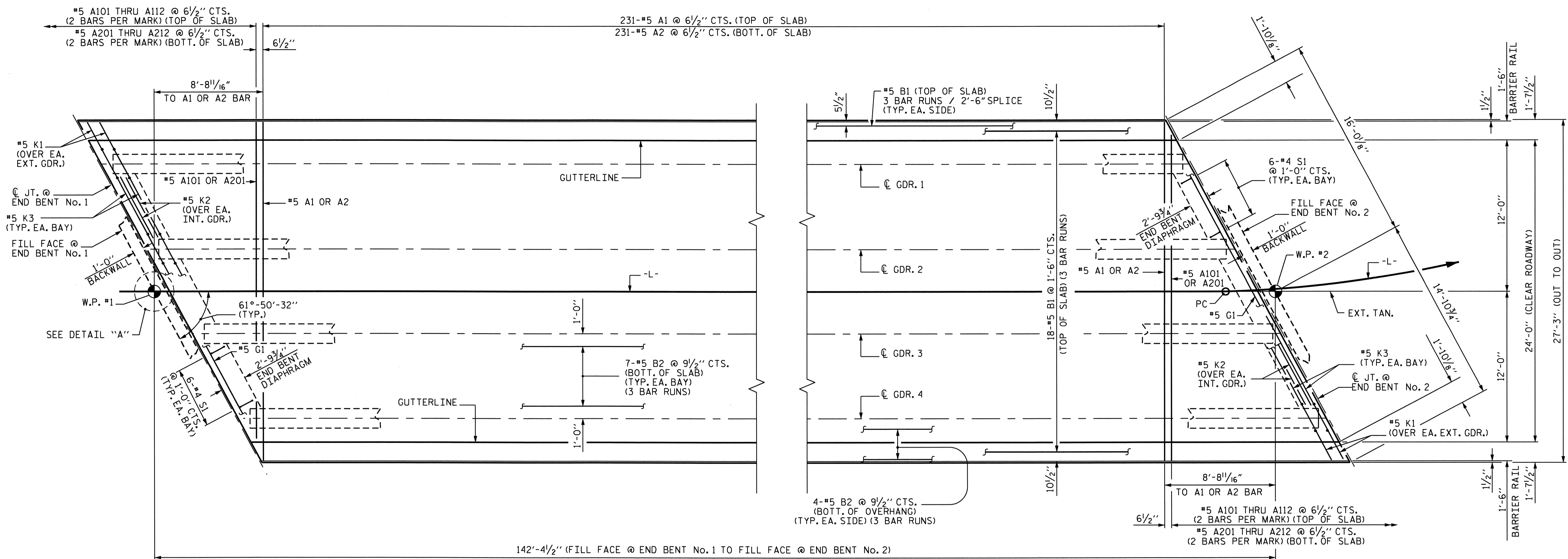
SUPERSTRUCTURE TYPICAL SECTION



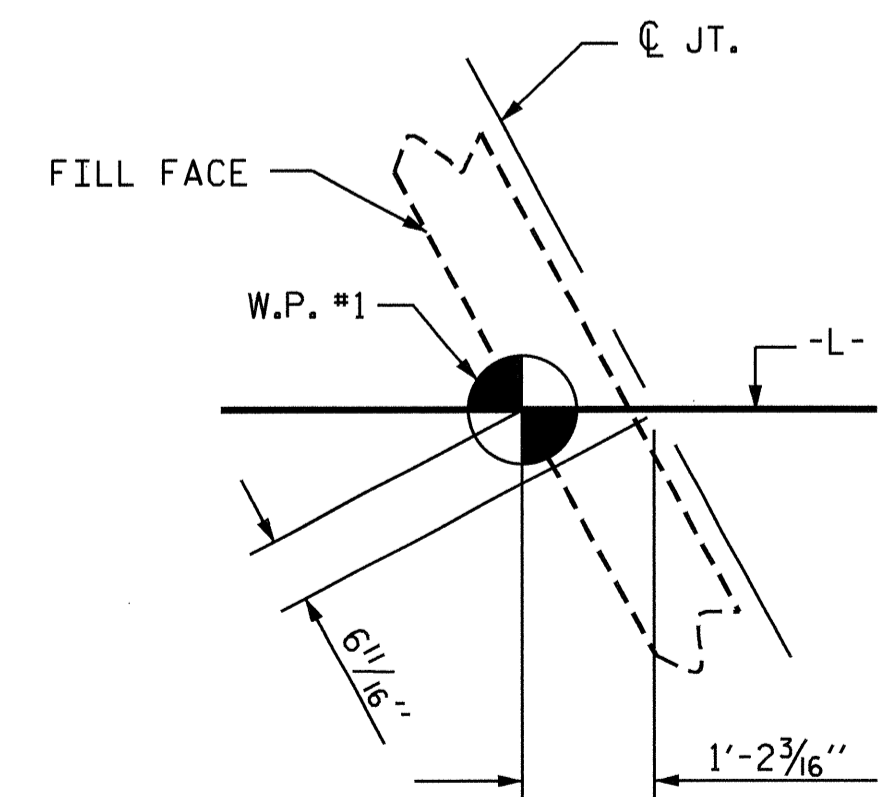
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			24
2			4			

DRAWN BY: M. POOLE DATE: 02/10
 CHECKED BY: A. SORSENGINH DATE: 07/11

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PLAN OF SPAN

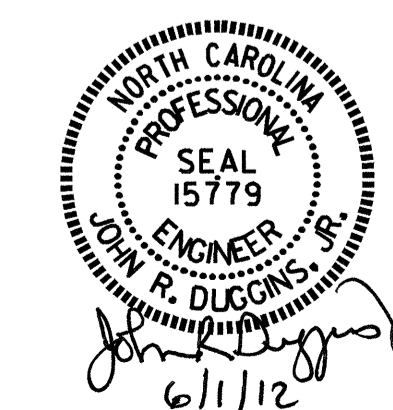


DETAIL "A"

(END BENT #2 SIMILAR, DIMENSION TO EXT. TAN.)

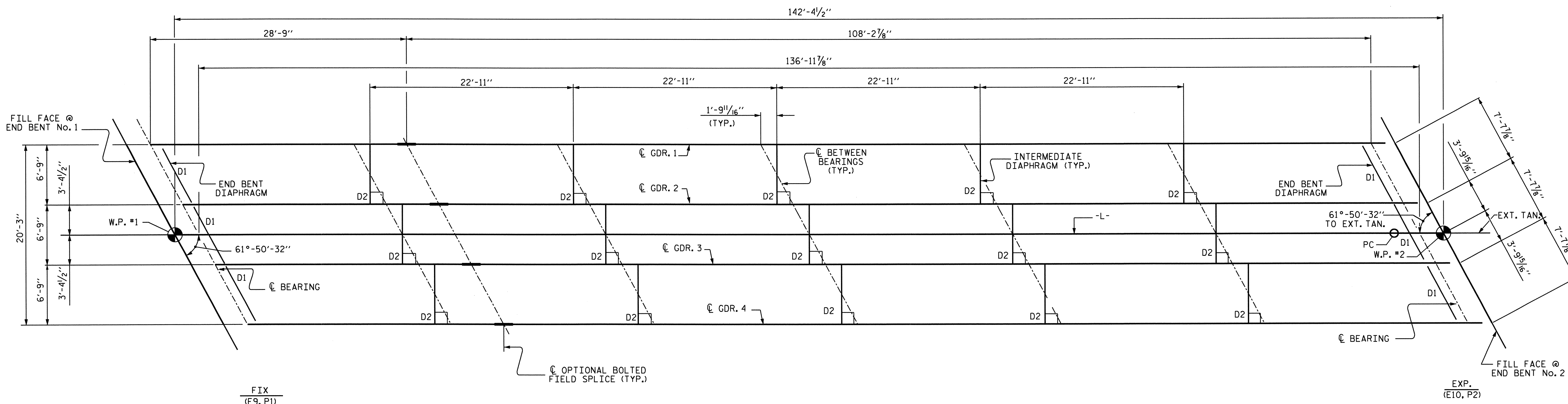
PROJECT NO. B-4162
JACKSON COUNTY
 STATION: 18+31.08 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-7
TOTAL SHEETS					24



DRAWN BY : M. POOLE DATE : 2/11
 CHECKED BY : A. SORSENGINH DATE : 7/11

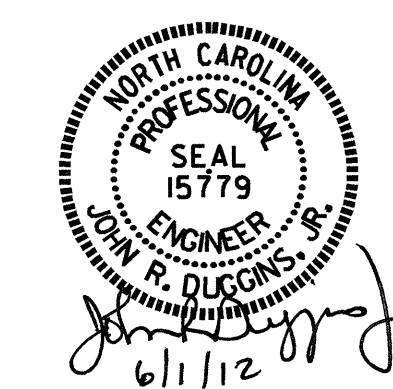
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FRAMING PLAN

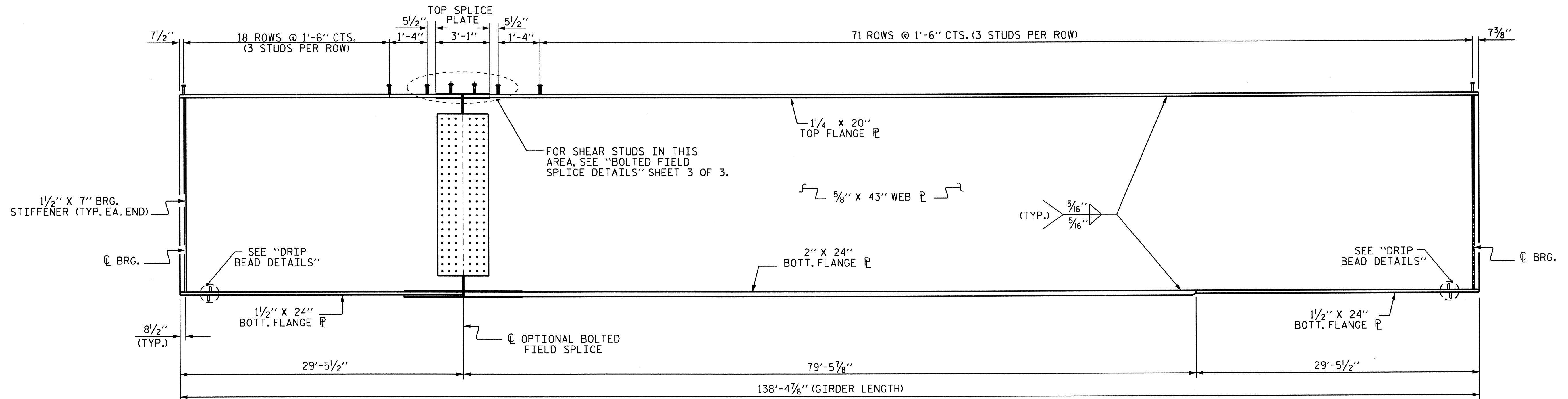
PROJECT NO. B-4162
JACKSON COUNTY
 STATION: 18+31.08-L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE FRAMING PLAN					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					24



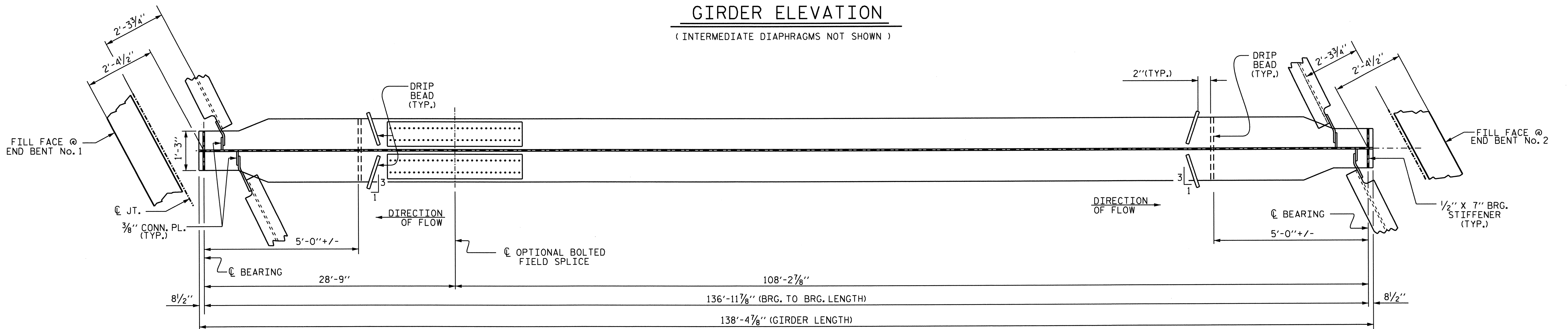
DRAWN BY : M. POOLE DATE : 3/11
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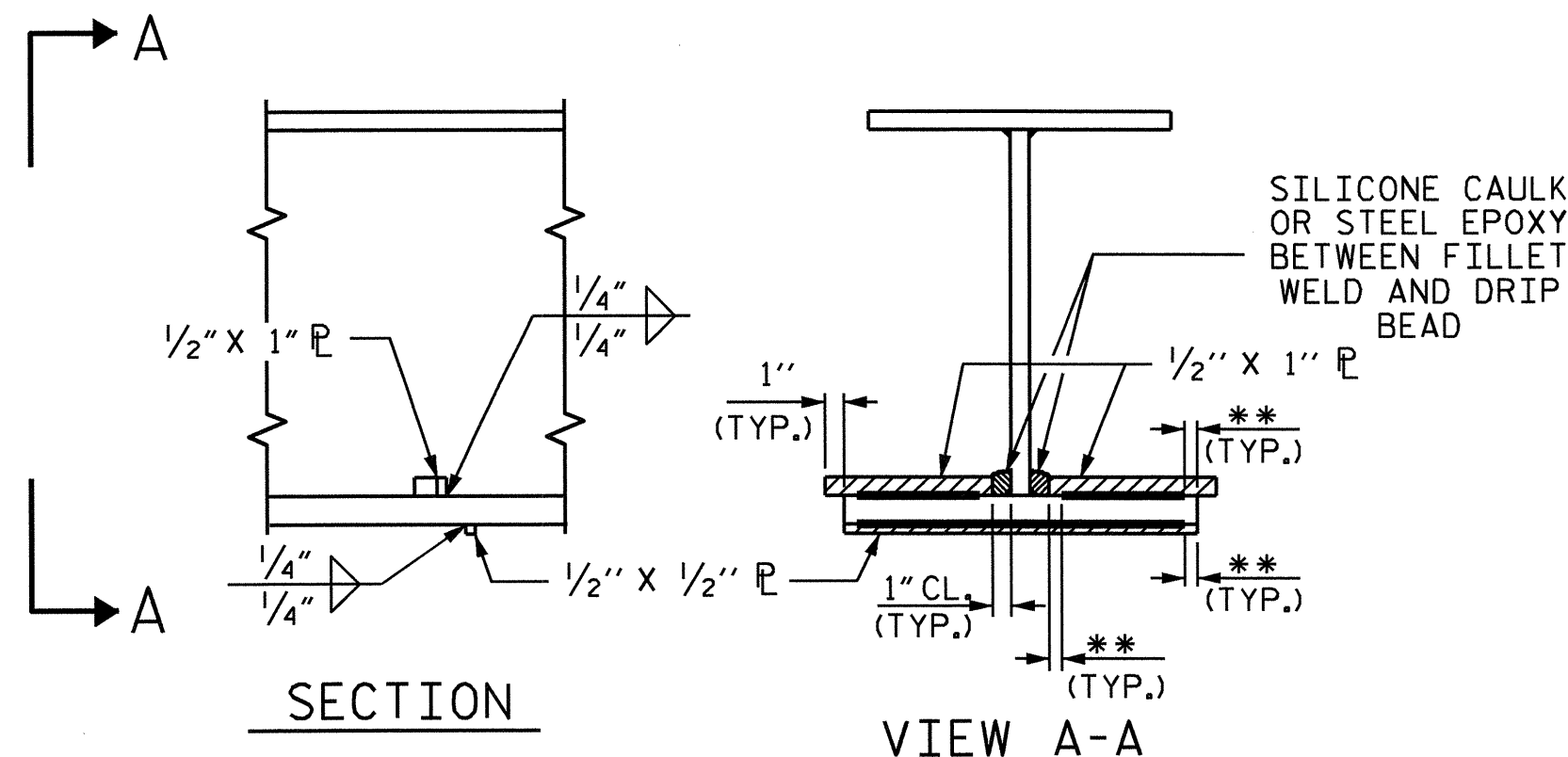


GIRDER ELEVATION

(INTERMEDIATE DIAPHRAGMS NOT SHOWN)

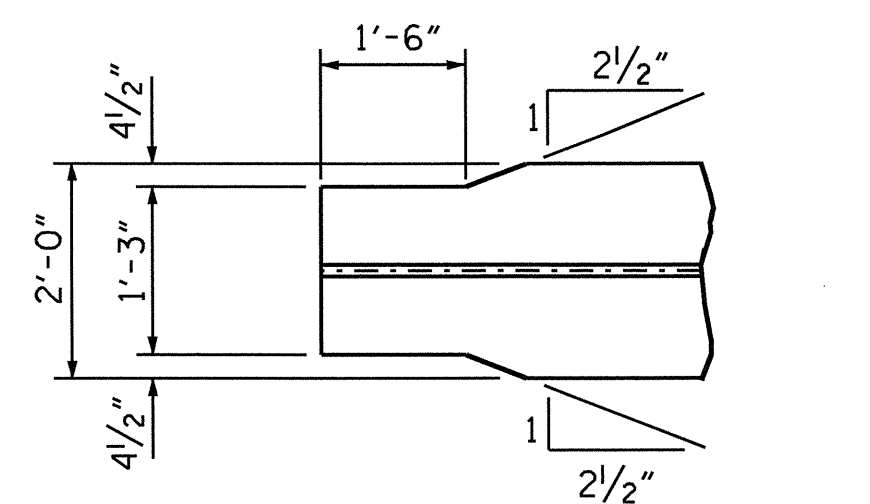


BOTTOM OF FLANGE DETAIL



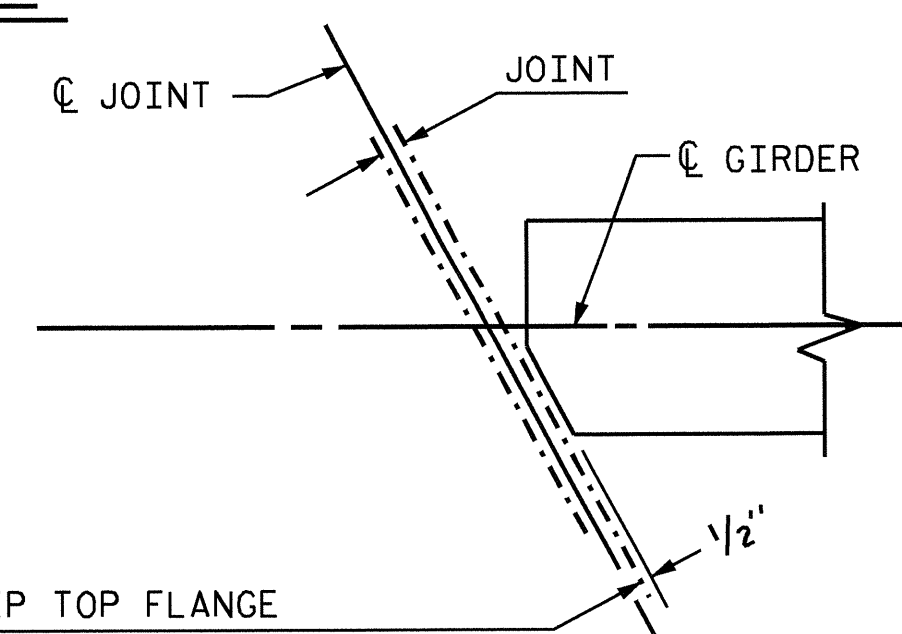
DRIP BEAD DETAILS

** SEE WELD TERMINATION DETAILS **



END OF GIRDER DETAIL

(BOTTOM FLANGE ONLY)



CLIP TOP FLANGE
MAKE ENDS OF WEB PLUMB

TOP FLANGE AT EXPANSION JOINT

PROJECT NO. B-4162
JACKSON COUNTY
 STATION: 18+31.08 -L-

SHEET 1 OF 3

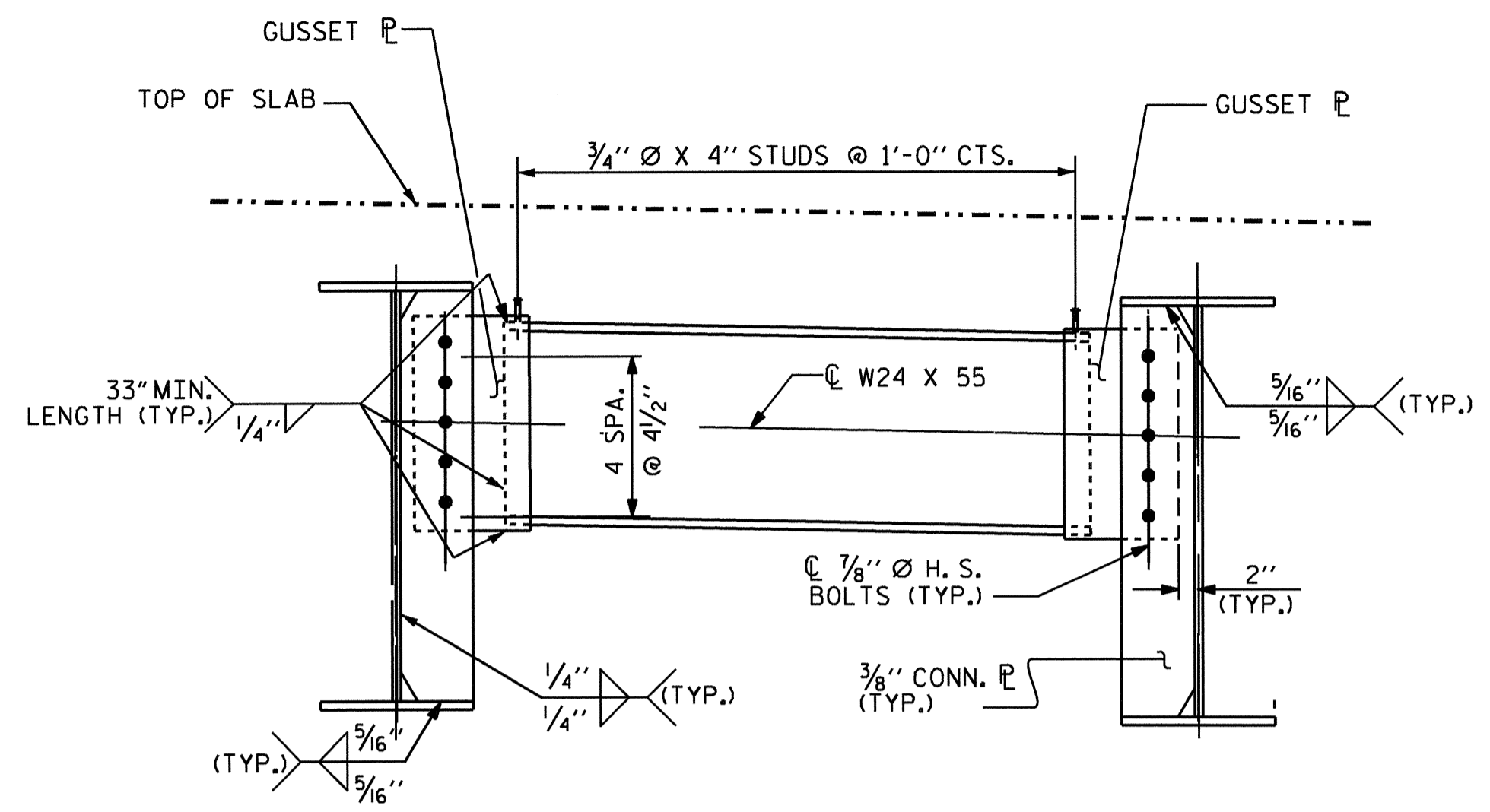
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS



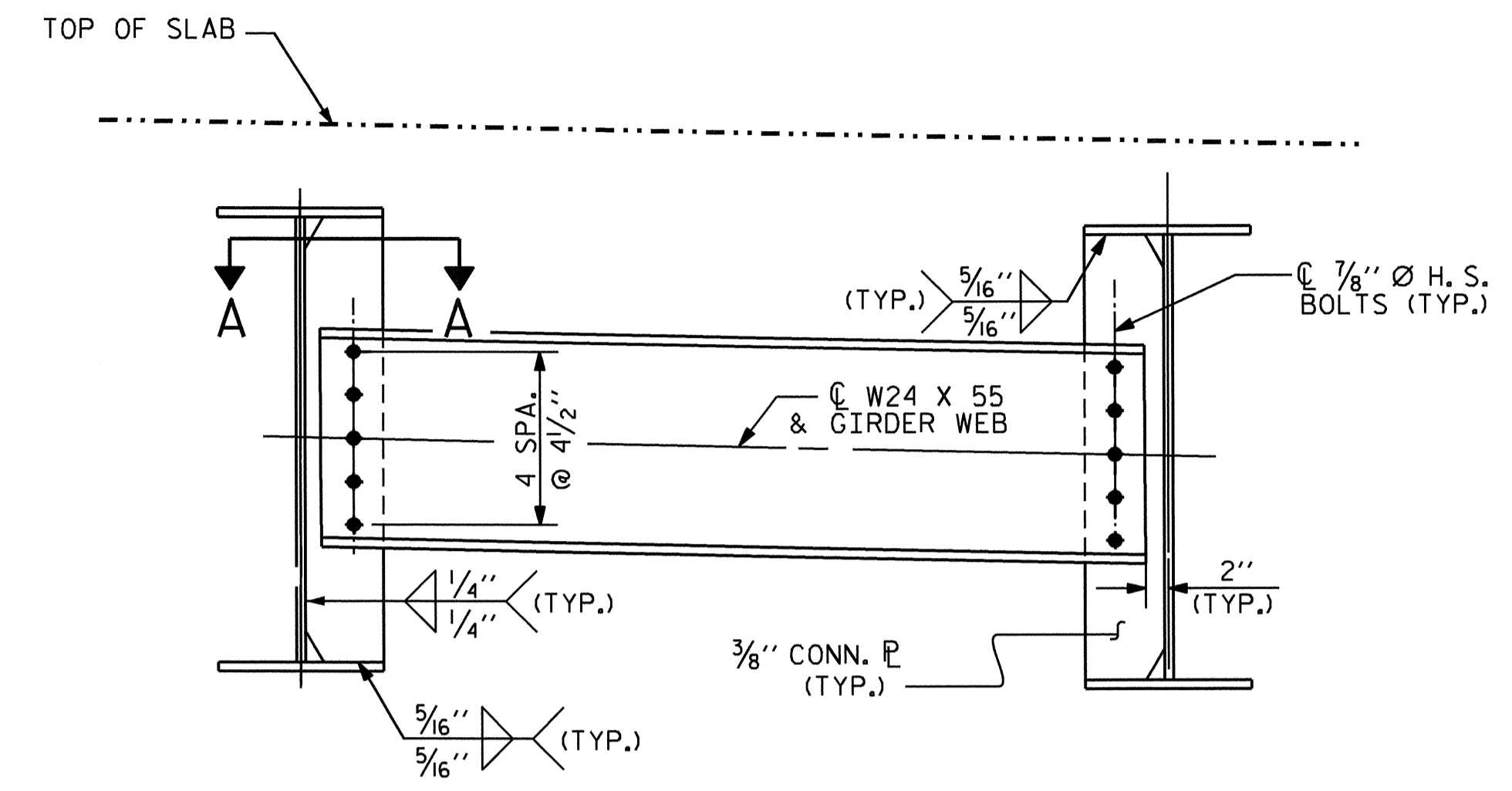
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-9
2			4			24

DRAWN BY : M. POOLE DATE : 03/2011
 CHECKED BY : A. SORSENGINH DATE : 07/2011

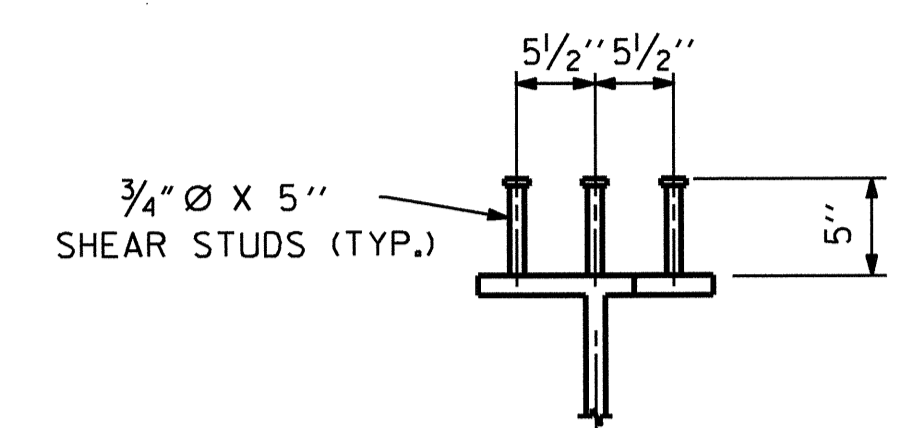
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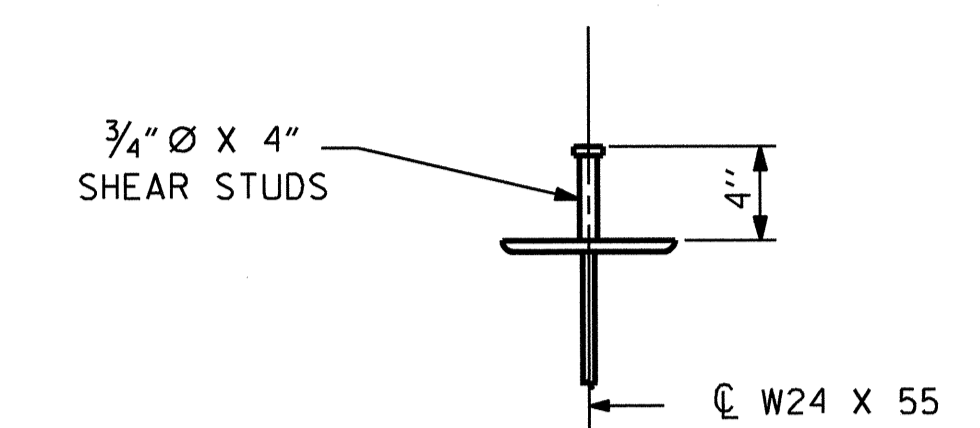
TYPICAL END BENT DIAPHRAGM (D1)



INTERMEDIATE DIAPHRAGM (D2)

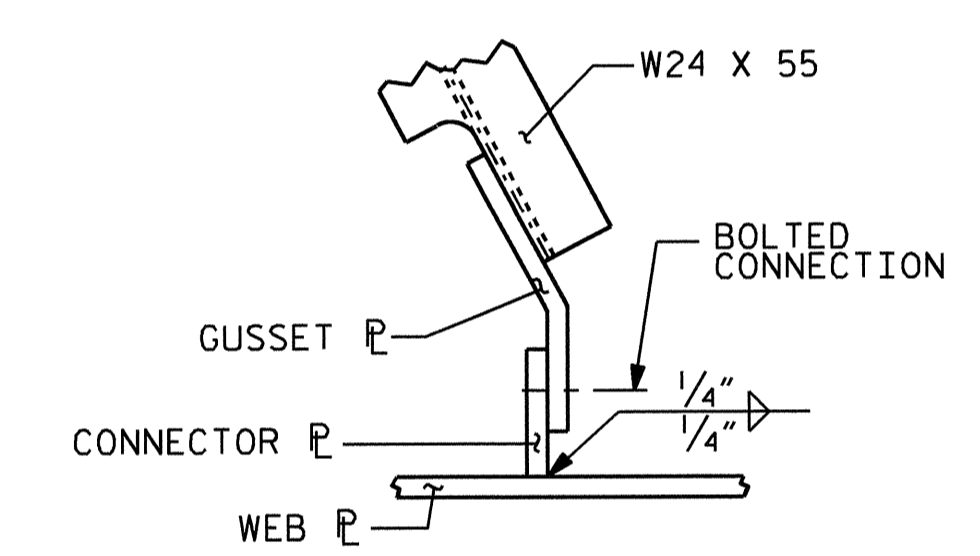


STUDS ON GIRDERS

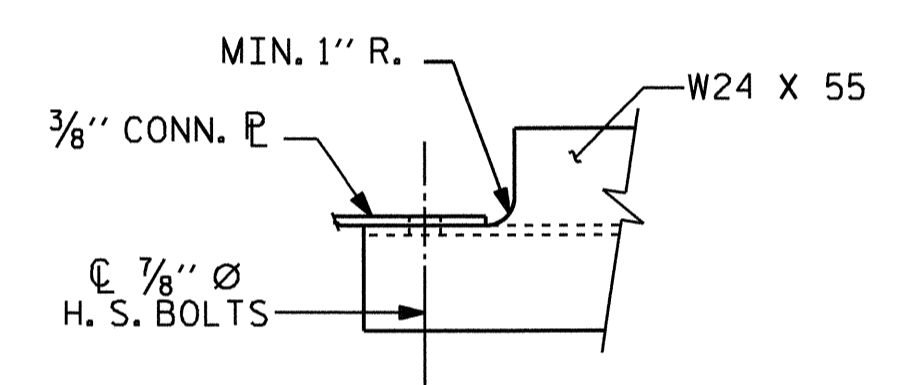


STUDS ON DIAPHRAGMS
(END BENT ONLY)

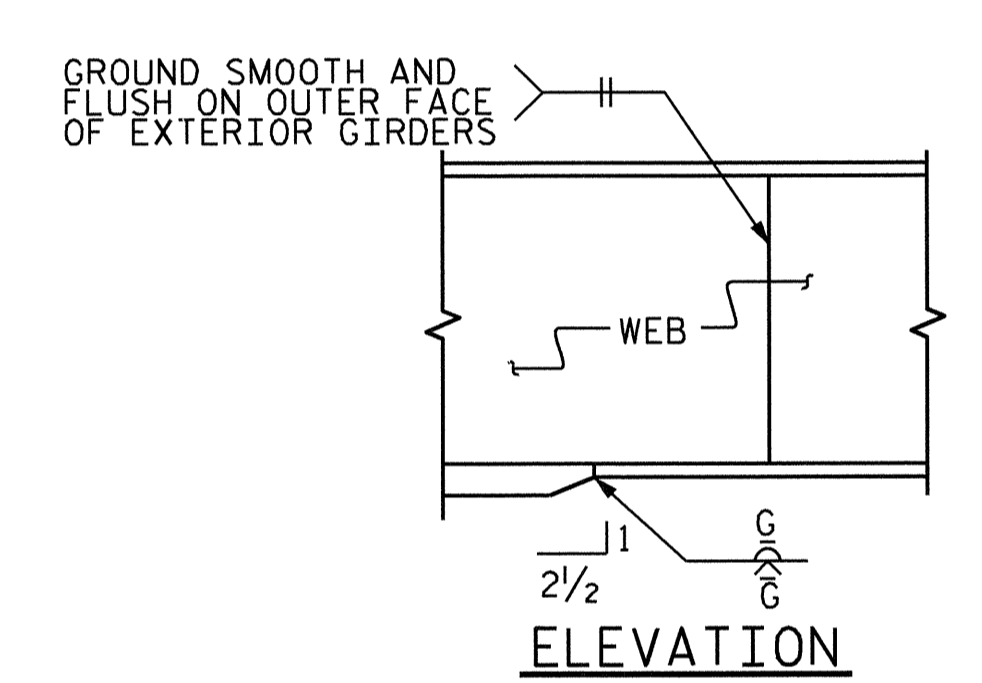
SHEAR STUD DETAILS



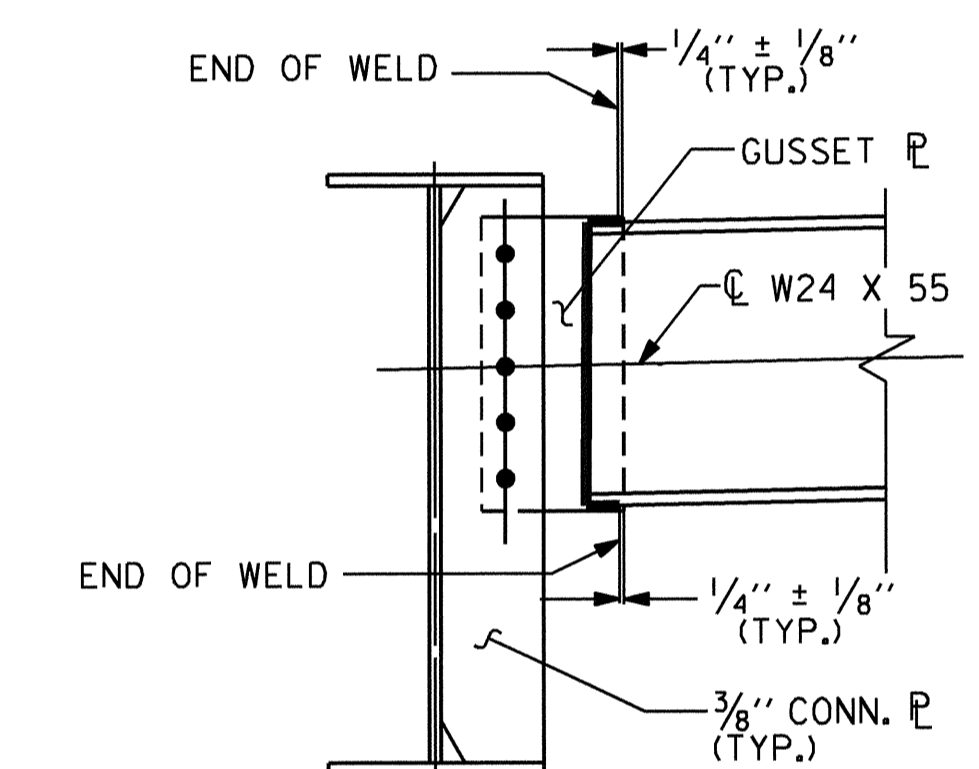
END BENT GUSSET PLATE DETAIL



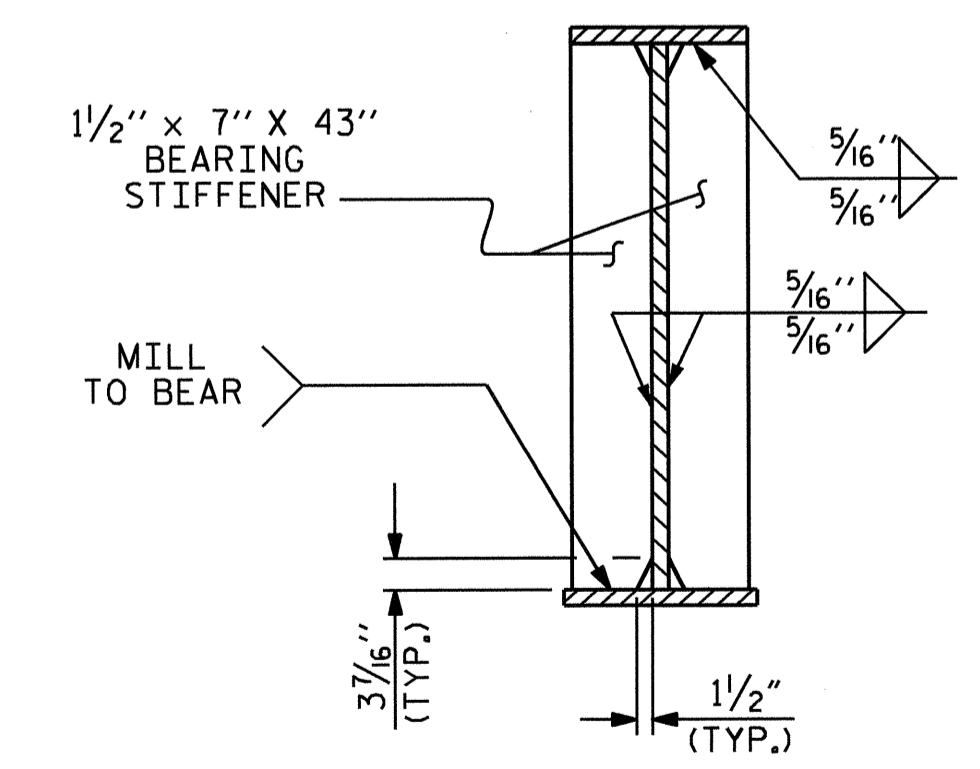
SECTION A-A



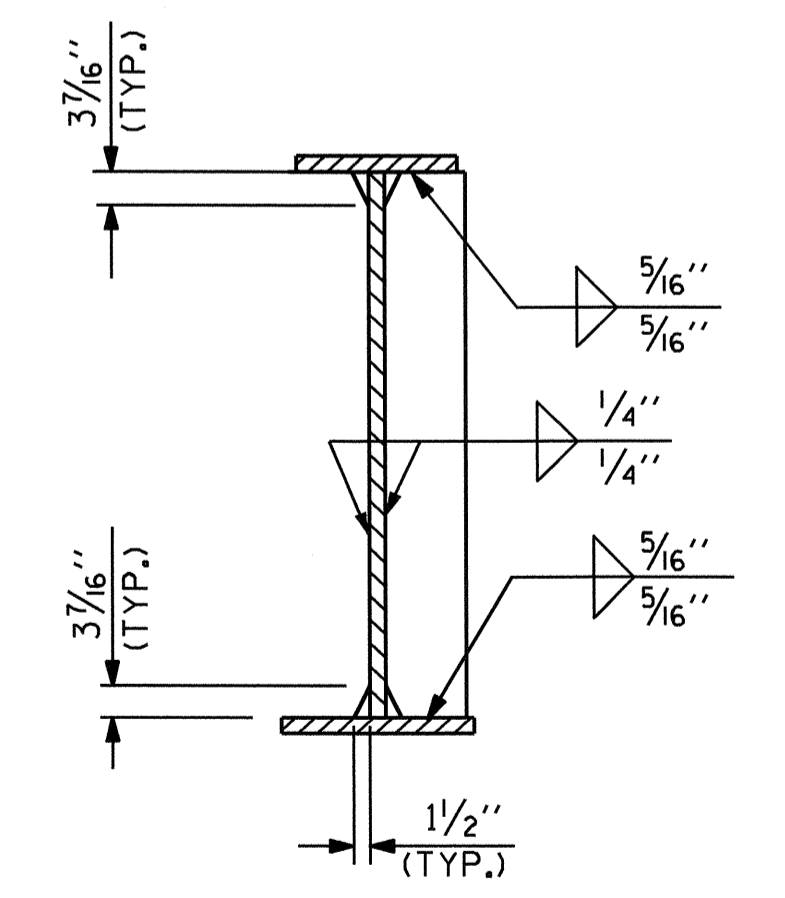
TYPICAL FLANGE AND WEB BUTT JOINTS



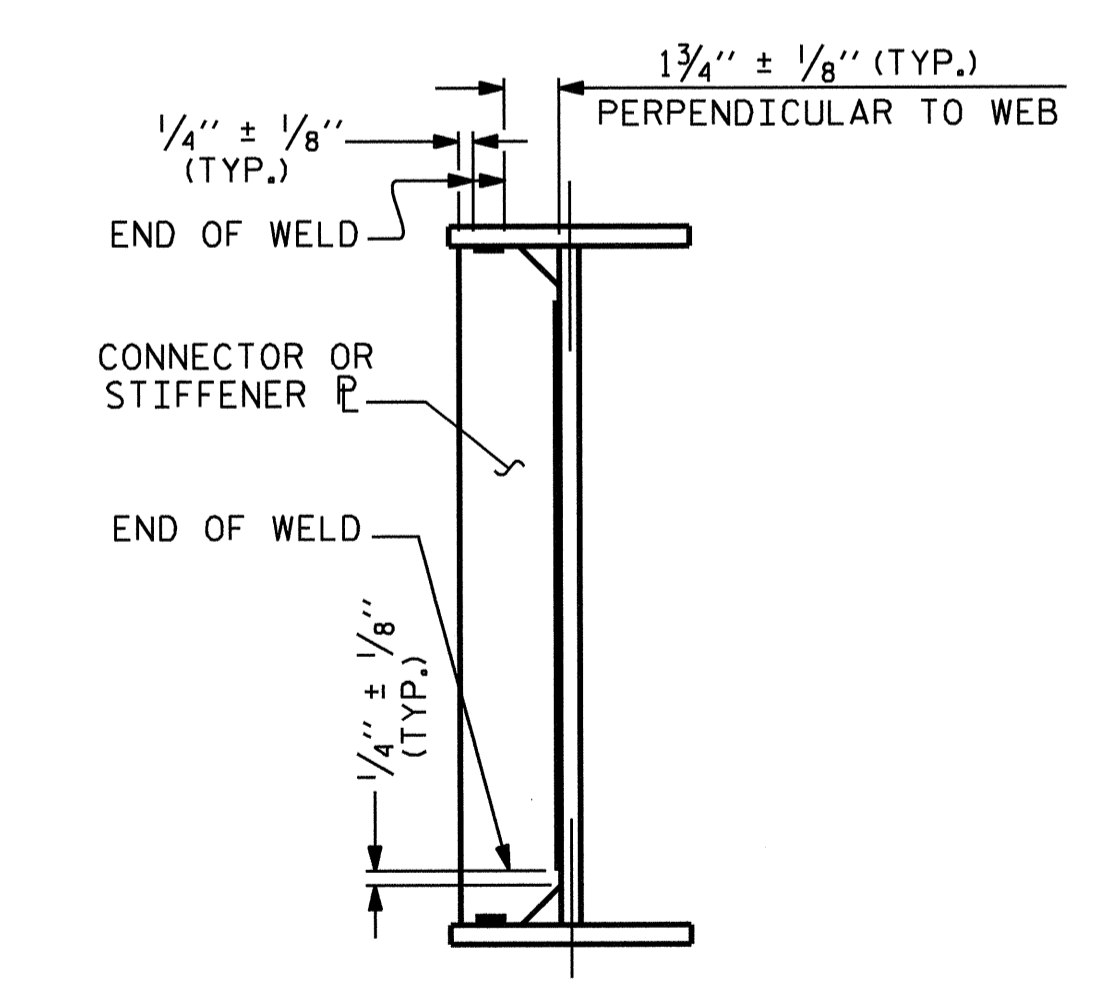
TYPICAL END BENT
CONNECTOR PLATE CONNECTIONS
WELD TERMINATION DETAILS



BEARING STIFFENER DETAILS



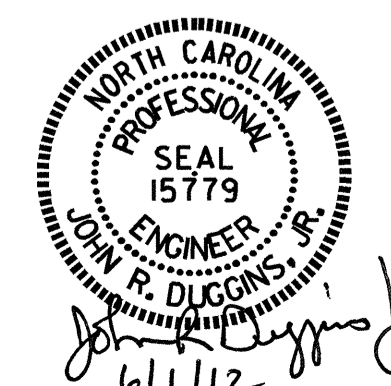
CONNECTOR PLATE DETAILS



TYPICAL STIFFENER OR
CONNECTOR PLATE CONNECTIONS
WELD TERMINATION DETAILS

PROJECT NO. B-4162
JACKSON COUNTY
 STATION: 18+31.08 -L-

SHEET 2 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS



DRAWN BY: M. POOLE DATE: 2/10
 CHECKED BY: A. SORSENGINH DATE: 7/11

REVISIONS						SHEET NO. S-10
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 24
2			4			

NOTES

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 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.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

A CHARPY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, BOTTOM FLANGE PLATES, BOTTOM FLANGE SPLICE PLATES AND WEB SPLICE PLATES FOR ALL GIRDERS AND IN ACCORDANCE WITH ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

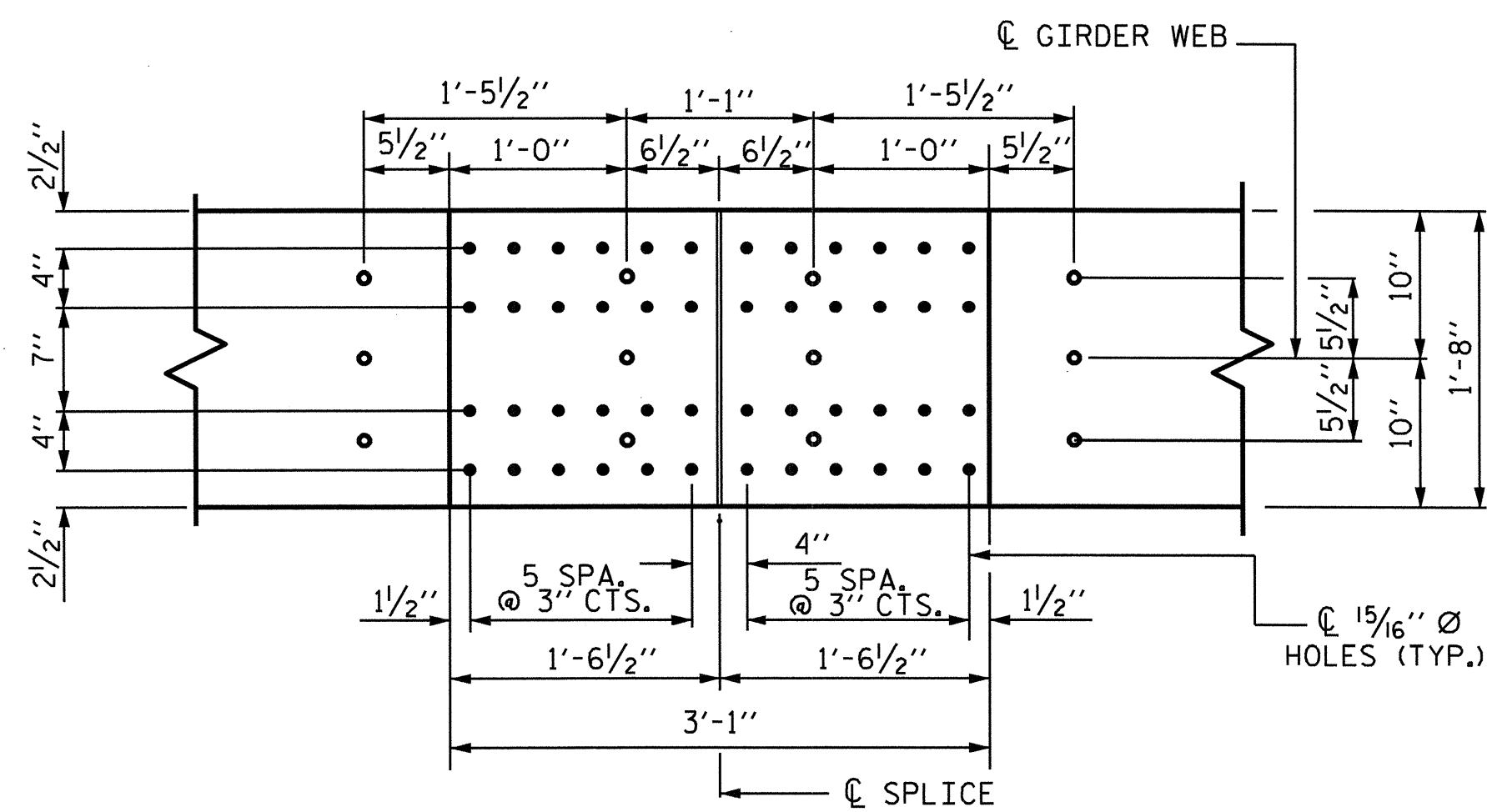
PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

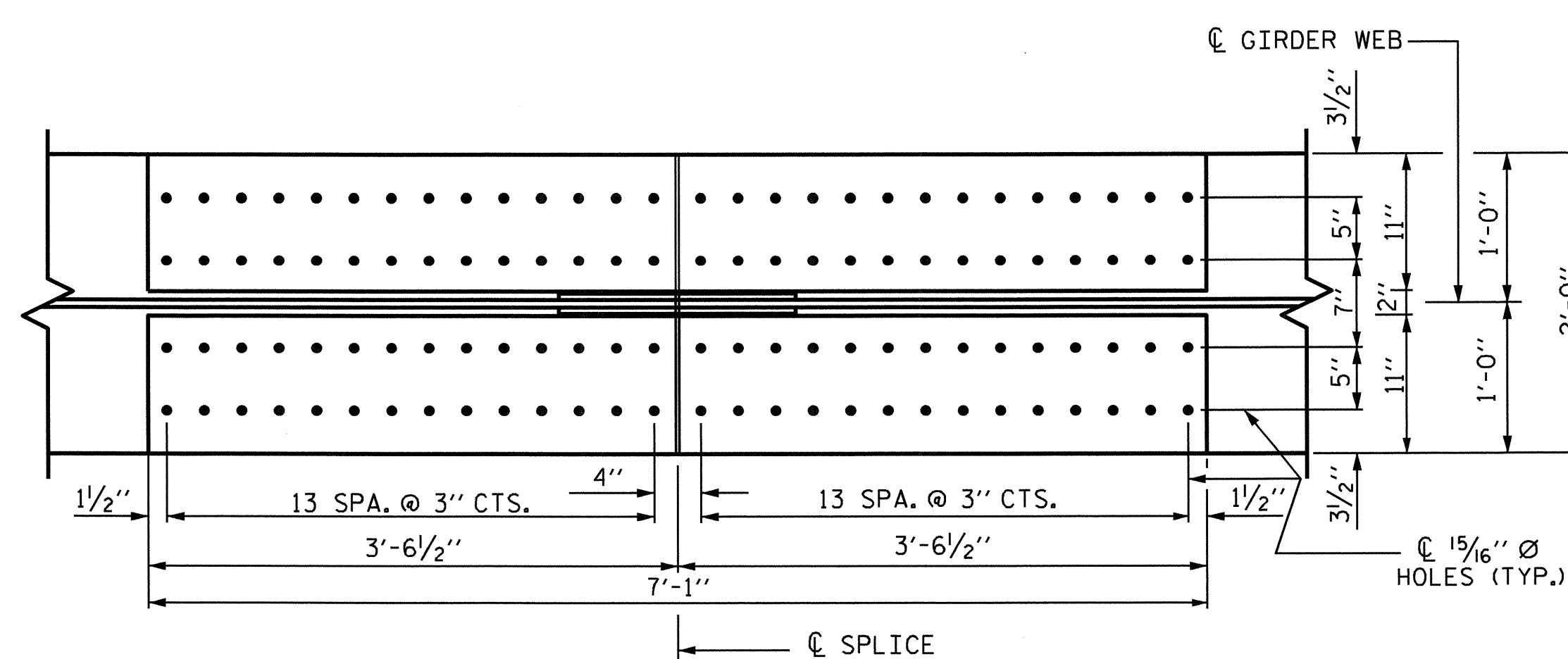
TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

END OF GIRDERS SHALL BE PLUMB.

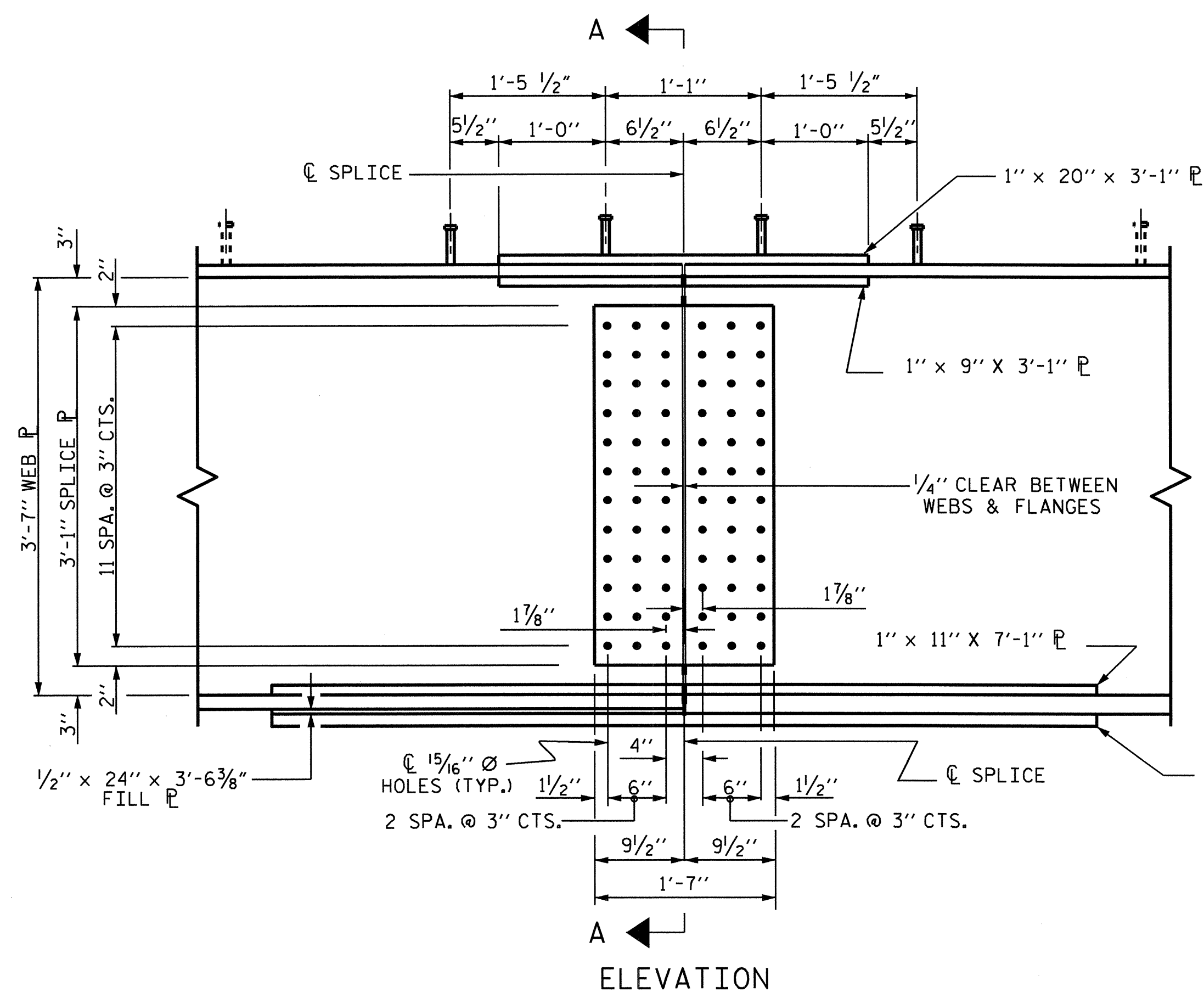
SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY.



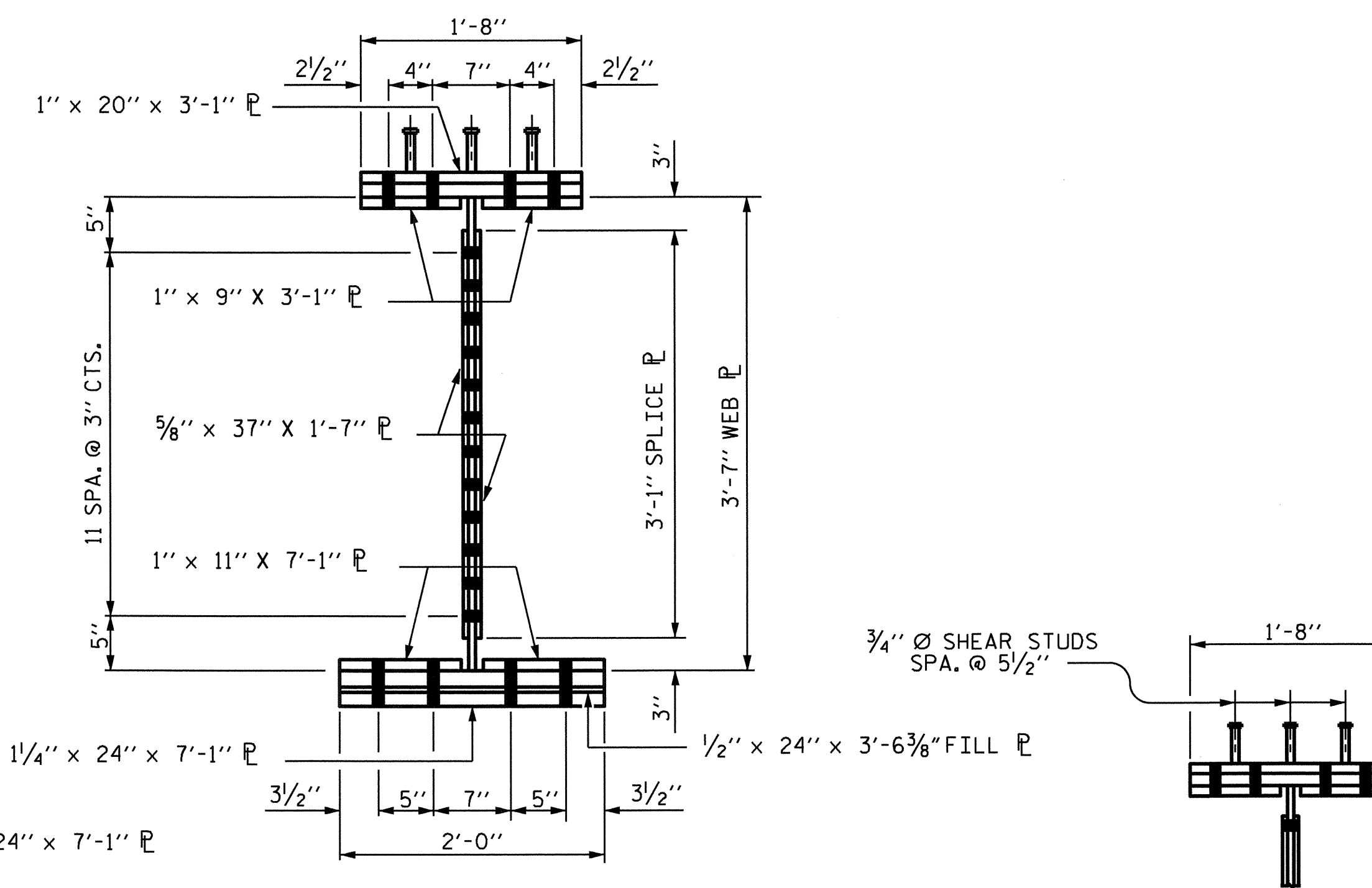
PLAN (TOP OF TOP FLANGE)



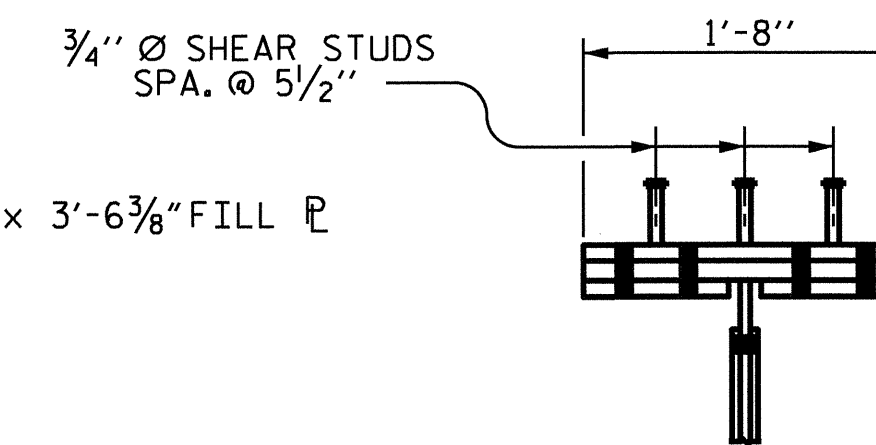
PLAN (TOP OF BOTTOM FLANGE)



ELEVATION



SECTION A-A



SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

OPTIONAL BOLTED FIELD SPLICE DETAILS

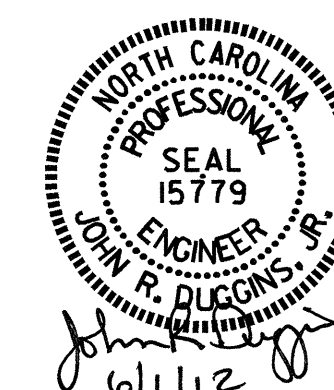
(TYPICAL EACH FIELD SPLICE)

PROJECT NO. B-4162
JACKSON COUNTY
 STATION: 18+31.08-L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS

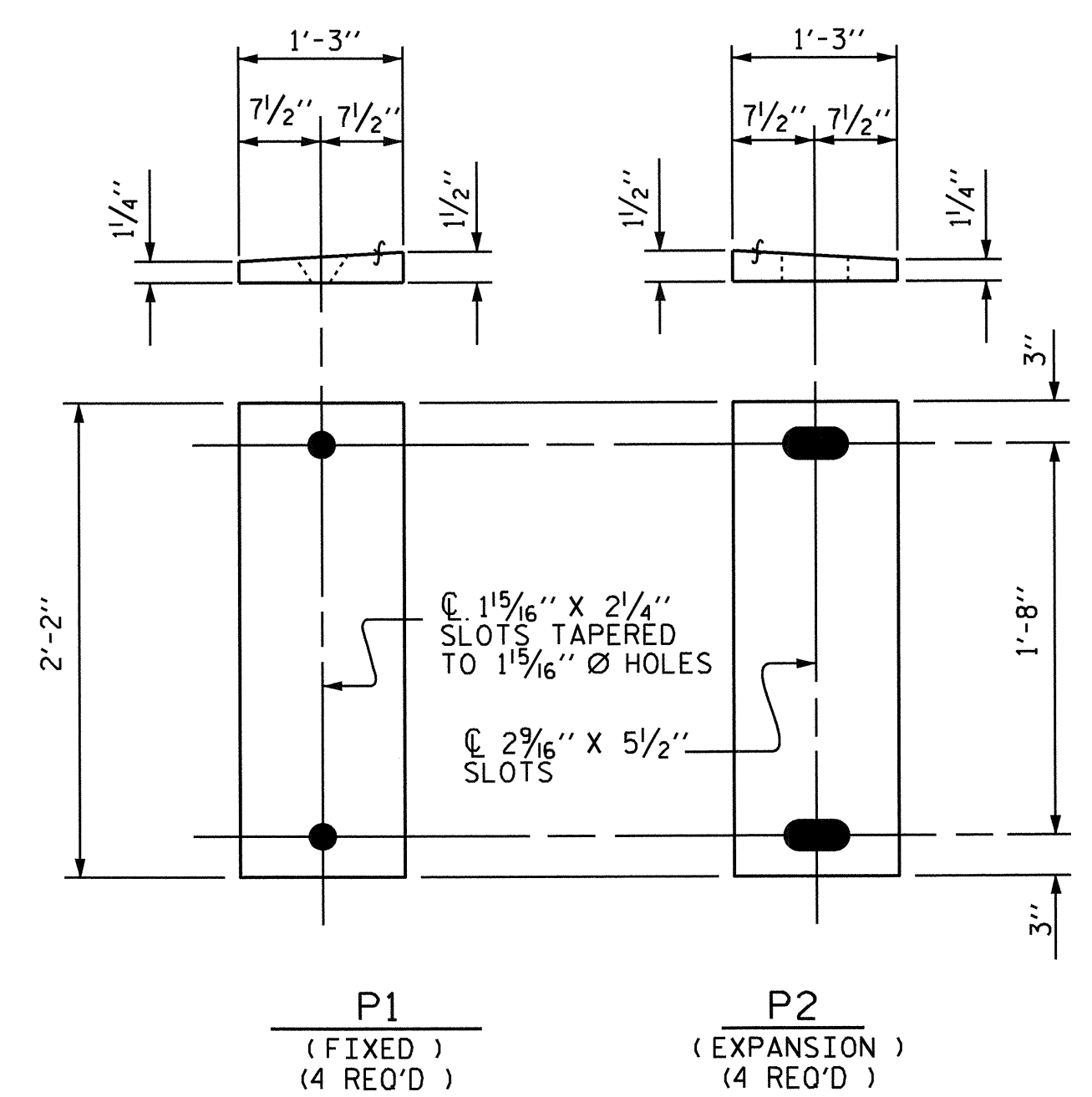
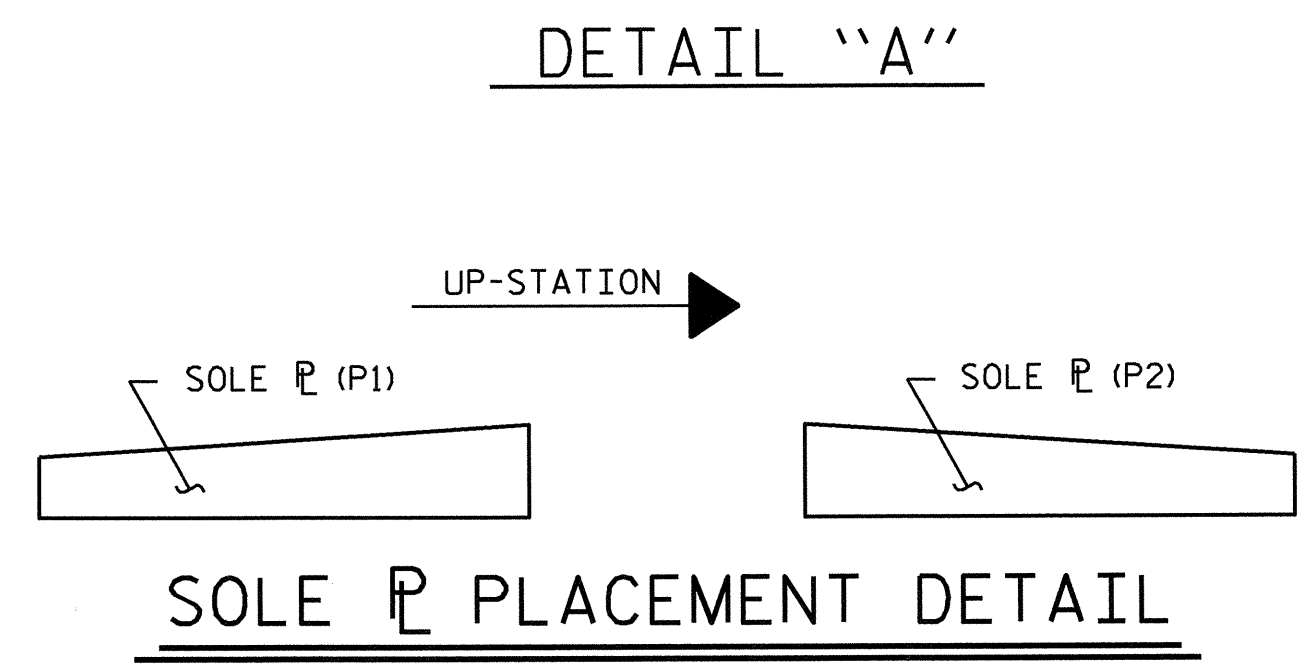
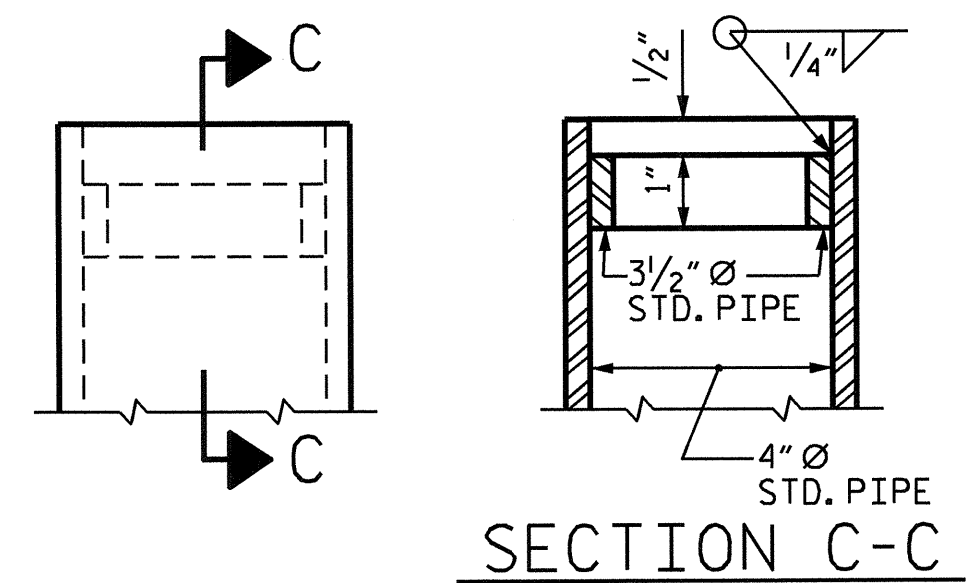
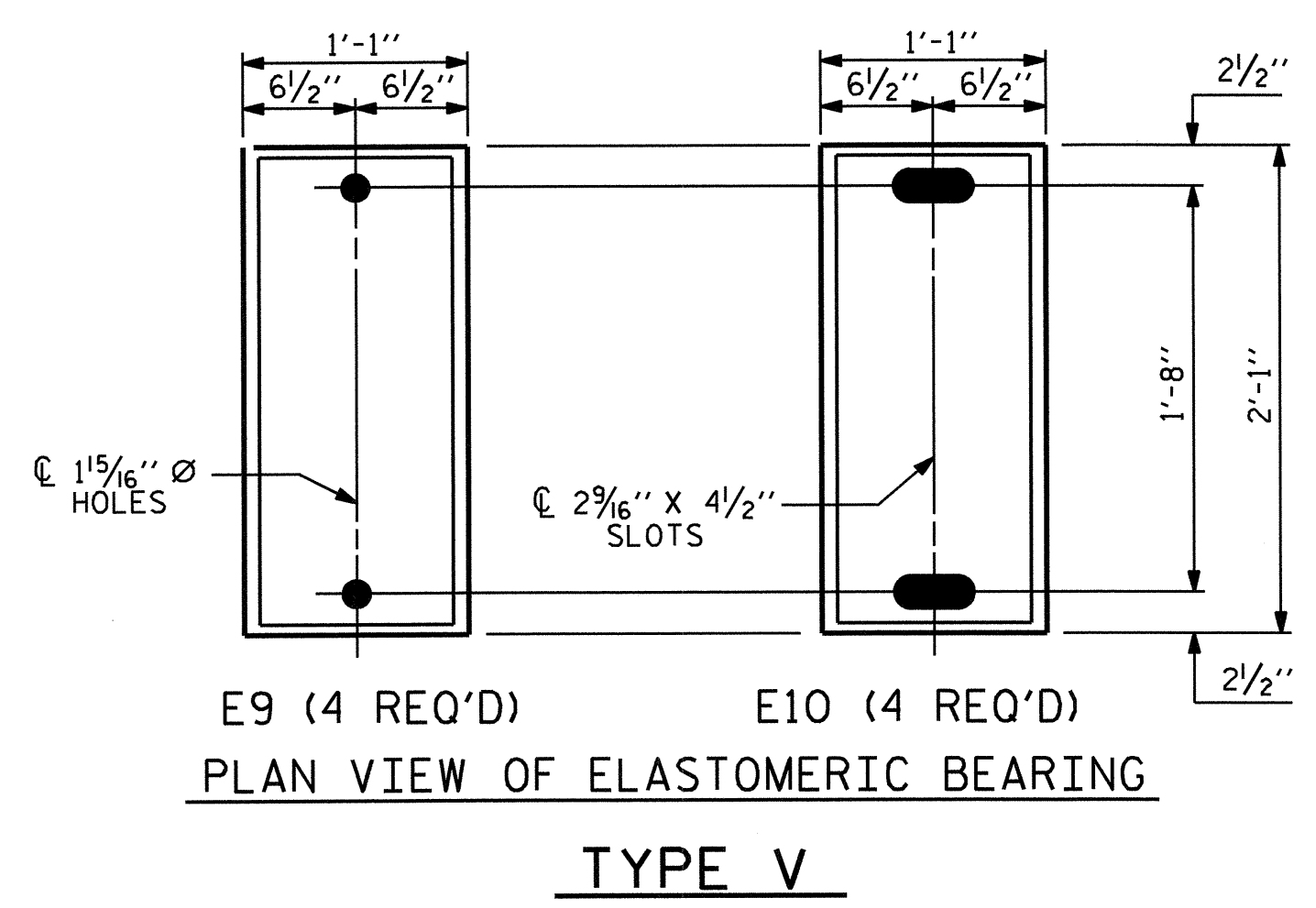
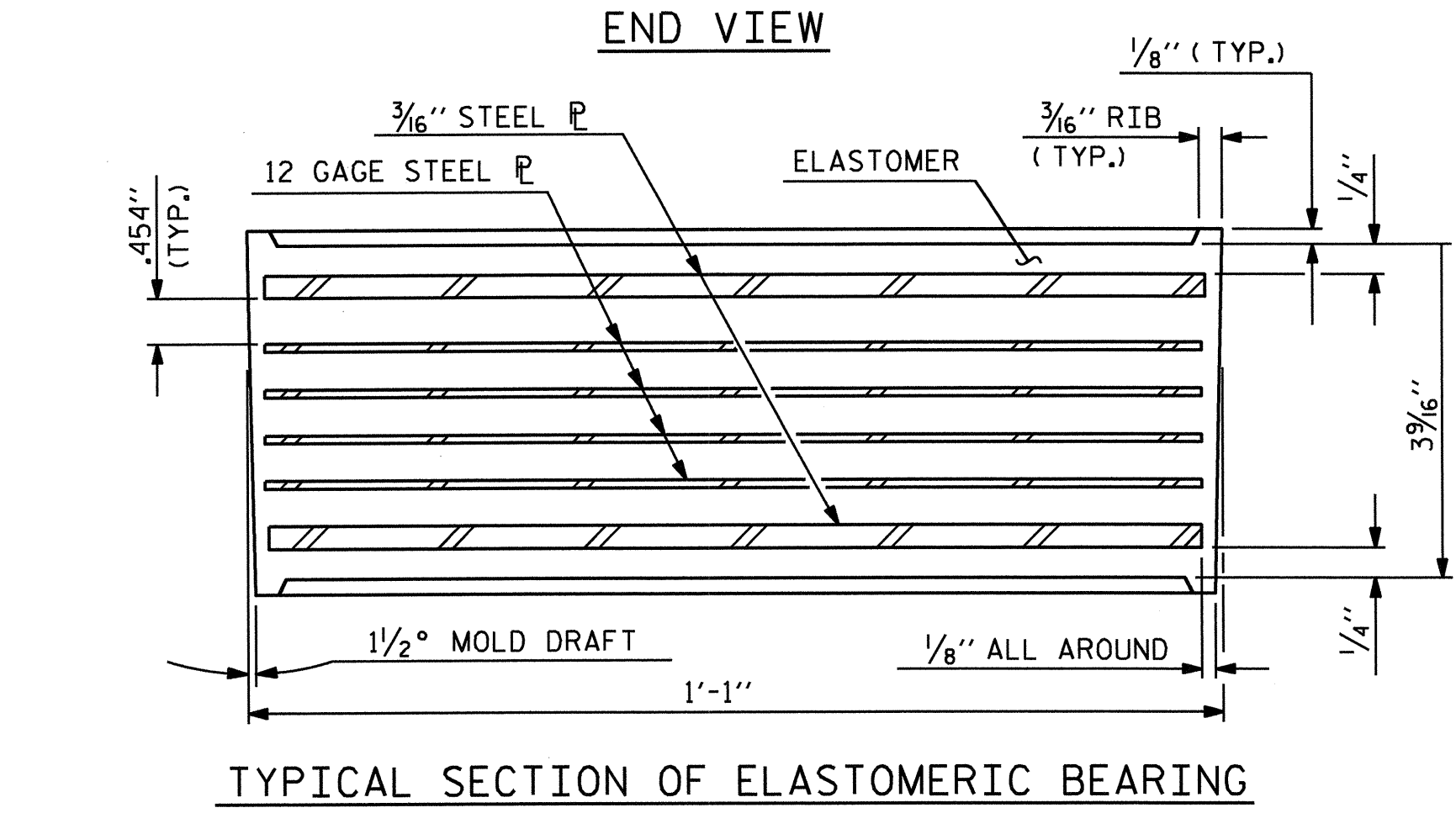
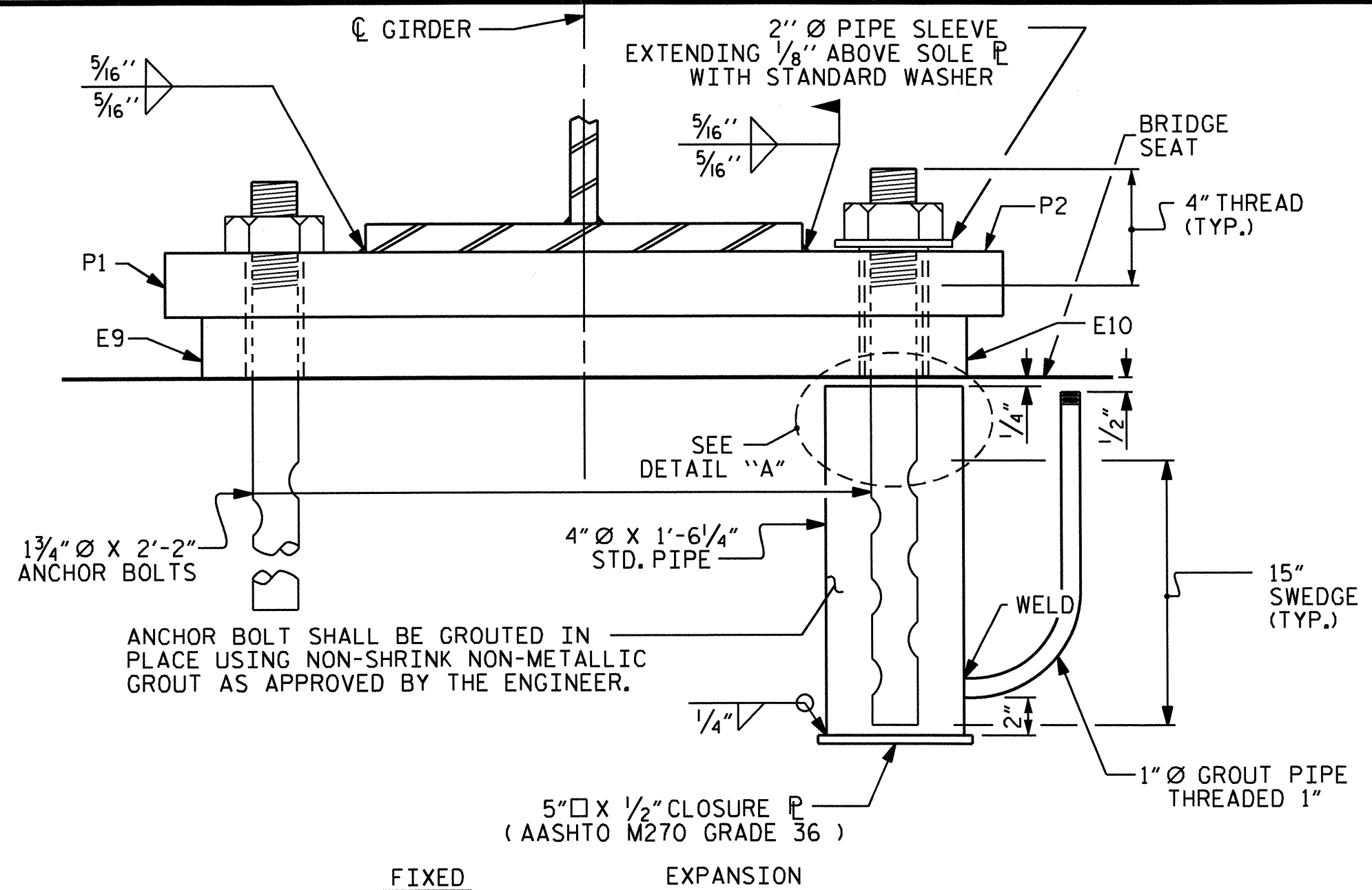


DRAWN BY: M. POOLE DATE: 03/2011
 CHECKED BY: A. SORSENGINH DATE: 07/2011

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-11
2			4			TOTAL SHEETS 24

NC005 STR. #1



SOLE PLATE DETAILS ("P")

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 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W 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 GIRDER 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 CLOSURE PLATE, GROUT PIPE AND STANDARD PIPE FOR THE EXPANSION ASSEMBLY NEED NOT BE GALVANIZED.

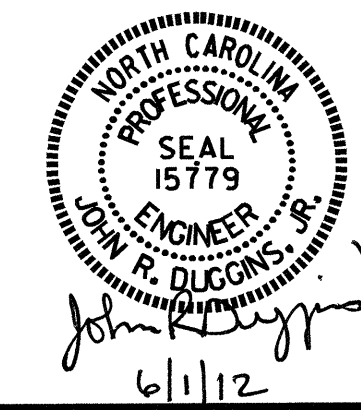
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURE, WHICH MAY BE REQUIRED BY THE ENGINEER, TO RESET ELASTOMERIC BEARINGS DUE TO GIRDER TRANSLATION AND END ROTATION:

1. ONCE THE DECK HAS CURED, THE GIRDERS SHALL BE JACKED AND THE ANCHOR BOLTS, SOLE PLATE, AND ELASTOMERIC BEARING SLOTS SHALL BE CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60° F.
2. AFTER CENTERING THE SLOTS AND ANCHOR BOLTS, THE SOLE PLATES SHALL BE FIELD WELDED TO THE GIRDER FLANGES AND ANCHOR BOLTS GROUTED.

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

-LOAD RATINGS-	
	MAX.D.L.+ L.L.
TYPE V	200 K

PROJECT NO. B-4162
JACKSON COUNTY
 STATION: 18+31.08 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
ELASTOMERIC BEARING DETAILS (STEEL SUPERSTRUCTURE)						5-12
REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	24
1			3			
2			4			

ASSEMBLED BY : M. POOLE DATE : 02/11
 CHECKED BY : A. SORSENGINH DATE : 7/11
 DRAWN BY : EEM 10/95 REV. 7/10/01 LES/RDR
 CHECKED BY : PEK 10/95 REV. 5/1/06 TLA/GM
 REV. 10/1/11 MAA/GM

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A																				
	GIRDERS 1 & 4																				
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.034	0.067	0.098	0.126	0.151	0.171	0.188	0.200	0.208	0.210	0.208	0.200	0.188	0.171	0.151	0.126	0.098	0.067	0.034	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.088	0.158	0.225	0.285	0.338	0.382	0.418	0.444	0.460	0.466	0.460	0.444	0.418	0.382	0.338	0.285	0.225	0.158	0.088	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.012	0.025	0.036	0.046	0.055	0.063	0.069	0.073	0.076	0.077	0.076	0.073	0.069	0.063	0.055	0.046	0.036	0.025	0.012	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.134	0.250	0.359	0.457	0.544	0.616	0.675	0.717	0.744	0.753	0.744	0.717	0.675	0.616	0.544	0.457	0.359	0.250	0.134	0.000
VERTICAL CURVE ORDINATE	0.000	0.227	0.433	0.615	0.772	0.905	1.014	1.099	1.159	1.196	1.208	1.196	1.159	1.099	1.014	0.905	0.772	0.615	0.433	0.227	0.000
REQUIRED CAMBER	0	4 ⁵ / ₁₆ "	8 ³ / ₁₆ "	11 ¹¹ / ₁₆ "	1'-2 ³ / ₄ "	1'-5 ³ / ₈ "	1'-7 ⁷ / ₁₆ "	1'-9 ⁹ / ₁₆ "	1'-10 ¹ / ₂ "	1'-11 ¹ / ₄ "	1'-11 ¹ / ₂ "	1'-11 ¹ / ₄ "	1'-10 ¹ / ₂ "	1'-9 ⁹ / ₁₆ "	1'-7 ⁷ / ₁₆ "	1'-5 ³ / ₈ "	1'-2 ³ / ₄ "	11 ¹¹ / ₁₆ "	8 ³ / ₁₆ "	4 ⁵ / ₁₆ "	0

* ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES (FRACTION FORM).
INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.

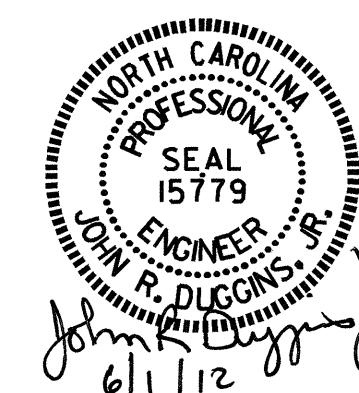
DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A																				
	GIRDERS 2 & 3																				
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.035	0.069	0.101	0.129	0.155	0.176	0.193	0.206	0.213	0.216	0.213	0.206	0.193	0.176	0.155	0.129	0.101	0.069	0.035	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.088	0.158	0.224	0.284	0.337	0.381	0.417	0.443	0.459	0.464	0.459	0.443	0.417	0.381	0.337	0.284	0.224	0.158	0.088	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.012	0.025	0.036	0.046	0.055	0.063	0.069	0.073	0.076	0.077	0.076	0.073	0.069	0.063	0.055	0.046	0.036	0.025	0.012	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.135	0.252	0.361	0.459	0.547	0.620	0.679	0.722	0.748	0.757	0.748	0.722	0.679	0.620	0.547	0.459	0.361	0.252	0.135	0.000
VERTICAL CURVE ORDINATE	0.000	0.230	0.435	0.617	0.774	0.905	1.015	1.100	1.160	1.197	1.209	1.197	1.160	1.100	1.015	0.905	0.774	0.617	0.435	0.230	0.000
REQUIRED CAMBER	0	4 ³ / ₈ "	8 ¹ / ₄ "	11 ³ / ₄ "	1'-2 ¹³ / ₁₆ "	1'-5 ⁷ / ₁₆ "	1'-7 ⁵ / ₈ "	1'-9 ³ / ₈ "	1'-10 ⁹ / ₁₆ "	1'-11 ⁵ / ₁₆ "	1'-11 ⁹ / ₁₆ "	1'-11 ⁵ / ₁₆ "	1'-10 ⁹ / ₁₆ "	1'-9 ³ / ₈ "	1'-7 ⁵ / ₈ "	1'-5 ⁷ / ₁₆ "	1'-2 ¹³ / ₁₆ "	11 ³ / ₄ "	8 ¹ / ₄ "	4 ³ / ₈ "	0

* ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES (FRACTION FORM).
INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.

PROJECT NO. B-4162
JACKSON COUNTY
 STATION: 18+31.08 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS
 DEAD LOAD
 DEFLECTION TABLES



DRAWN BY : M. POOLE DATE : 03/11
 CHECKED BY : S. PEARCE DATE : 1/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			3-13
2			4			24

NOTES

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

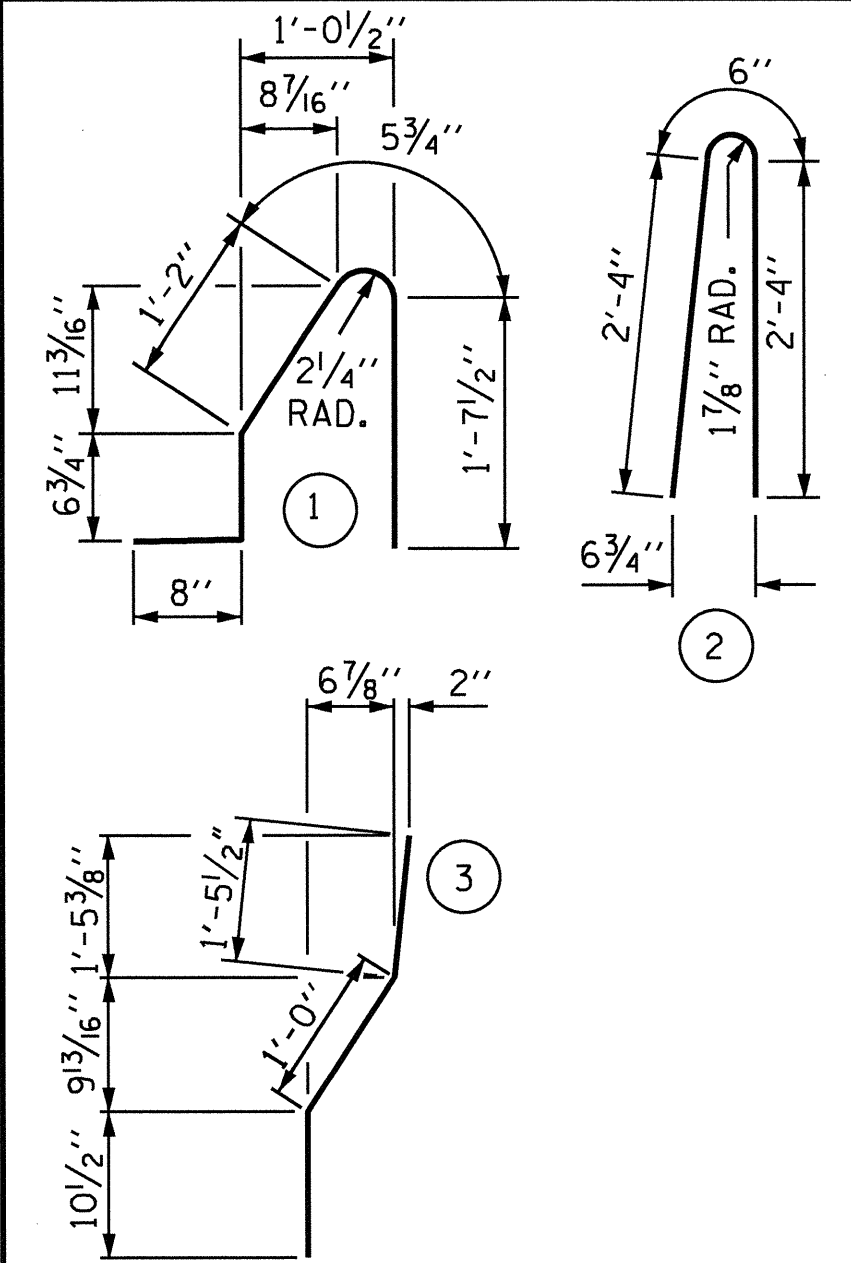
WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3 AND #5 S4 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3 AND #5 S4 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

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

BAR TYPES



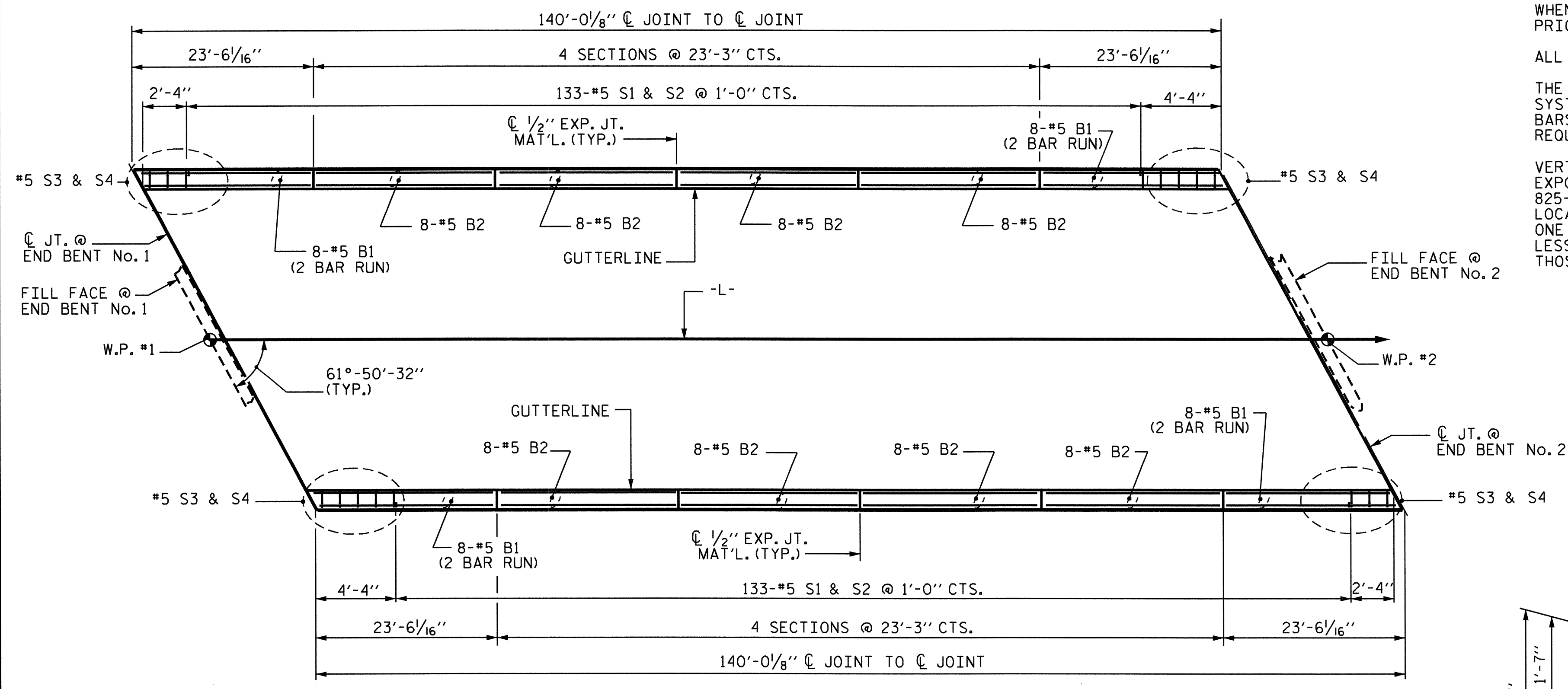
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

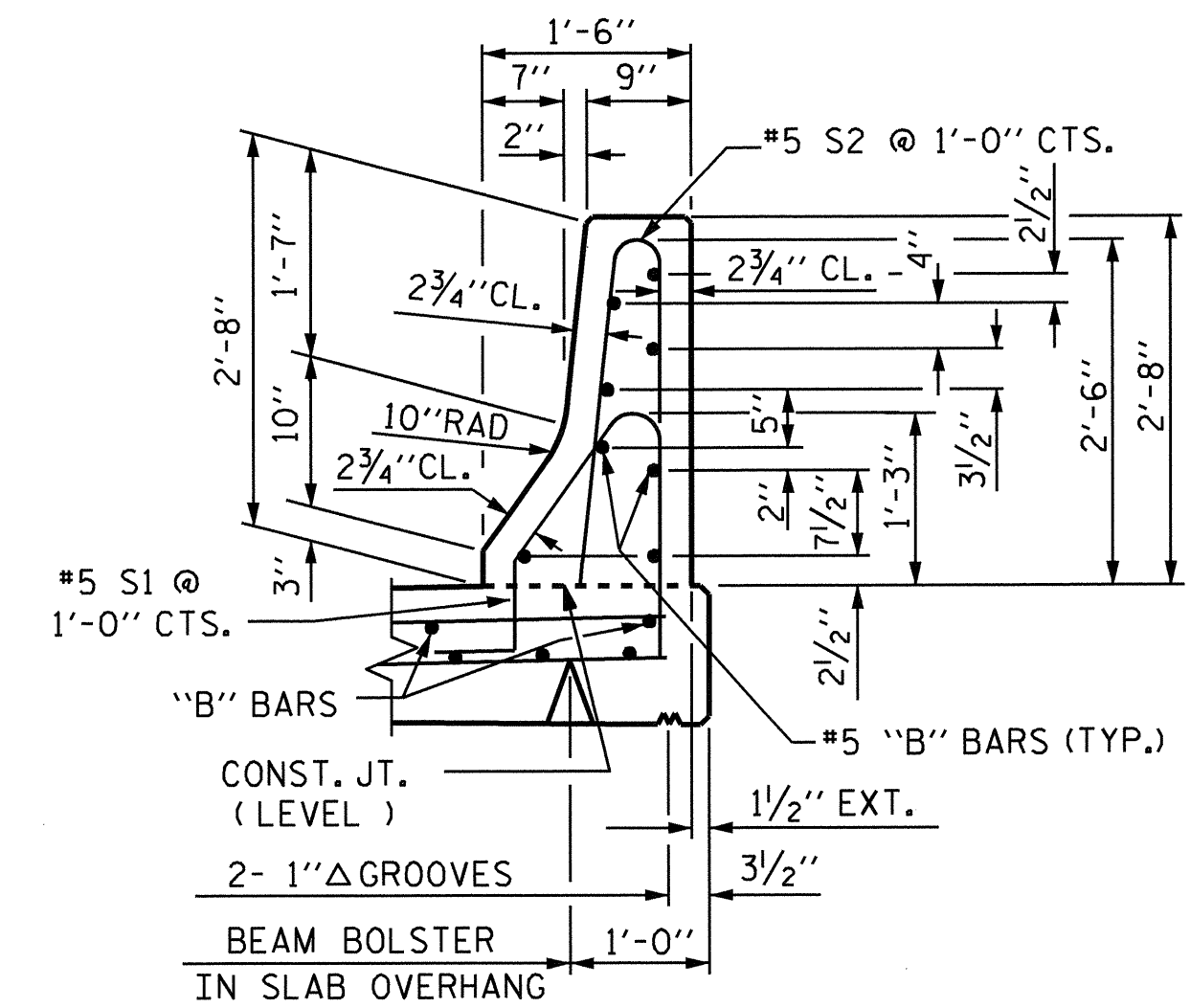
FOR CONCRETE BARRIER RAIL ONLY

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	#5	STR	13'-7"	907
* B2	#5	STR	22'-10"	1524
* S1	#5	1	4'-6"	1248
* S2	#5	2	5'-2"	1433
* S3	#5	3	3'-4"	42
* S4	#5	STR	3'-2"	40
* EPOXY COATED REINFORCING STEEL				5194 LBS.
CLASS AA CONCRETE				28.0 CU. YDS.
CONCRETE BARRIER RAIL				279.83 LIN. FT.

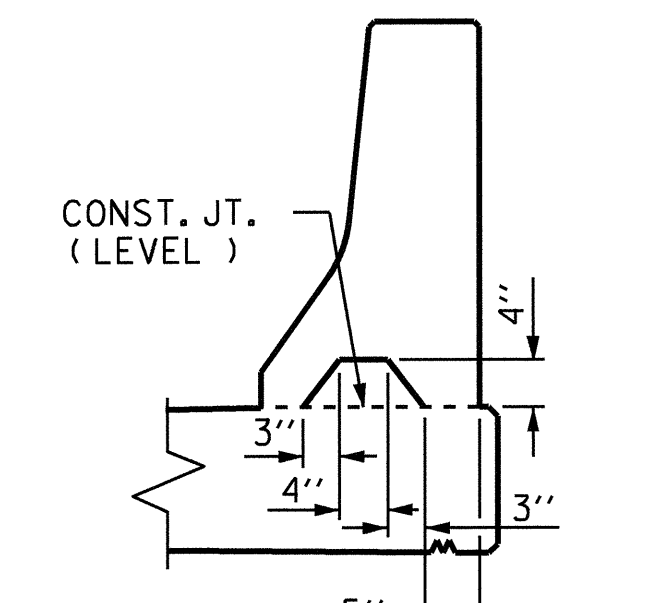
* THESE BARS ARE EPOXY COATED



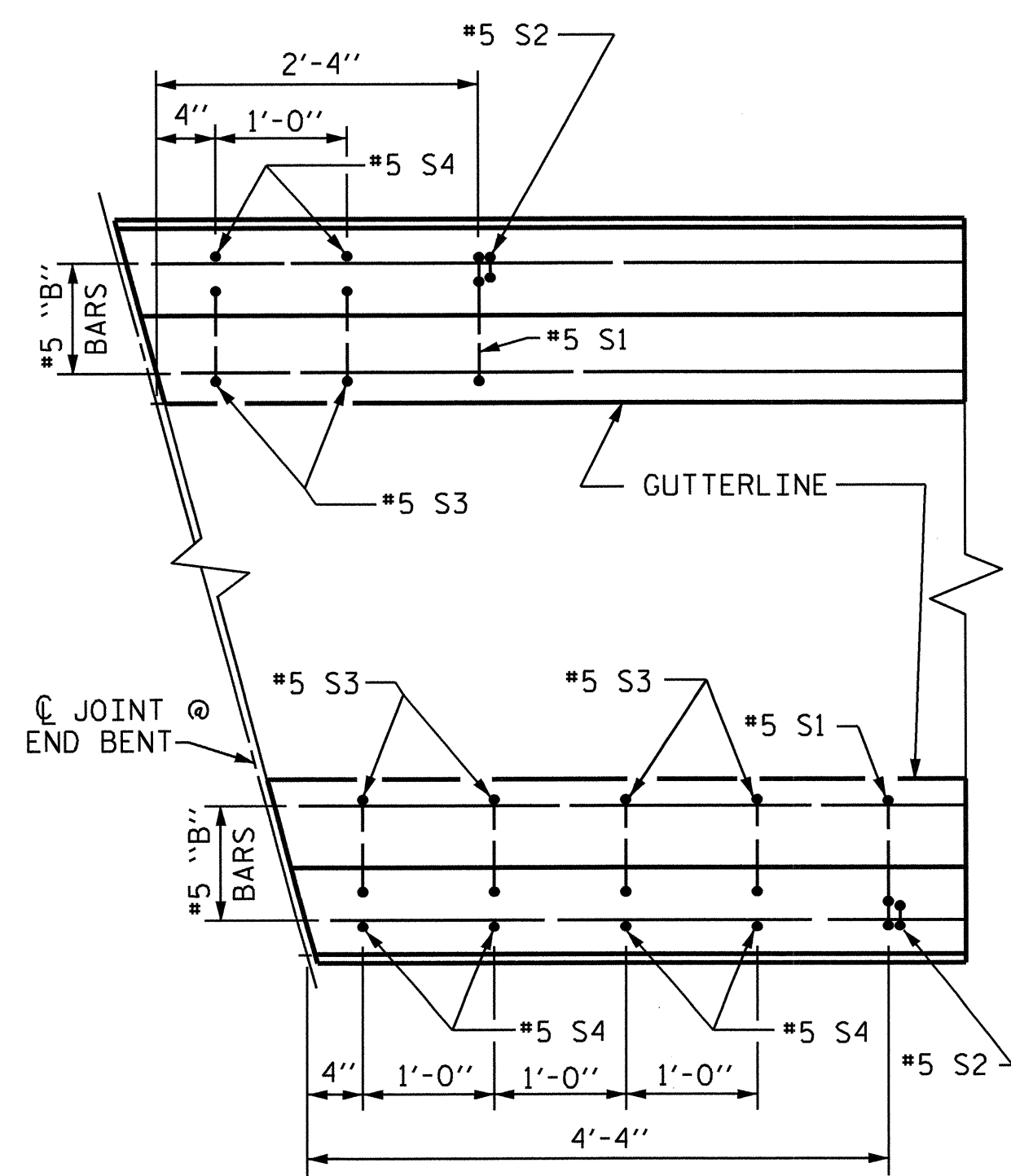
PLAN



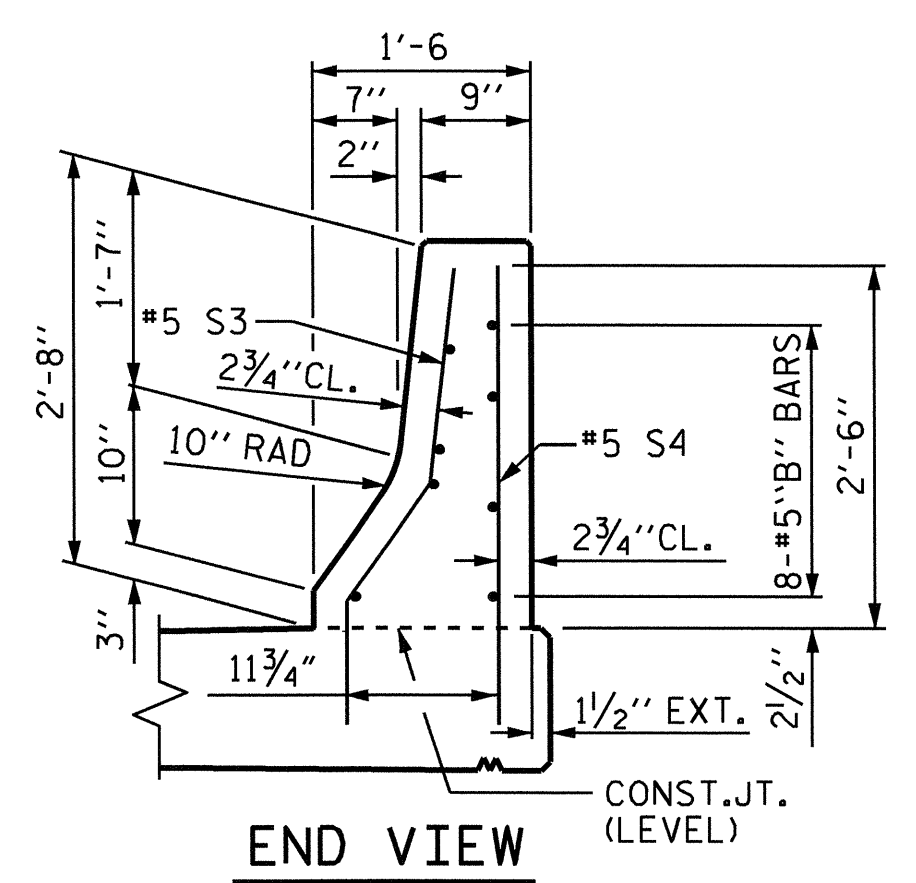
SECTION THRU RAIL



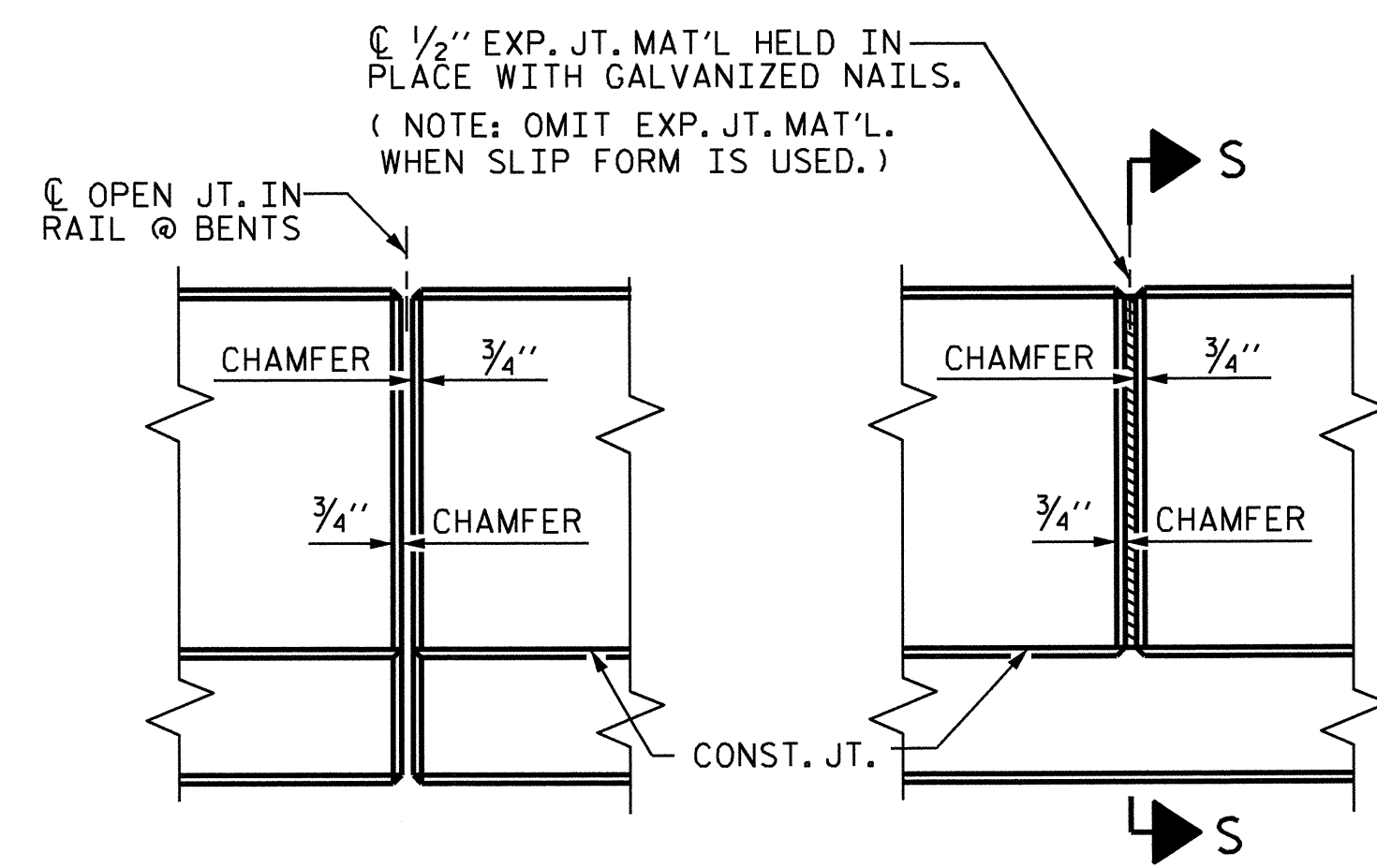
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



PLAN



END VIEW

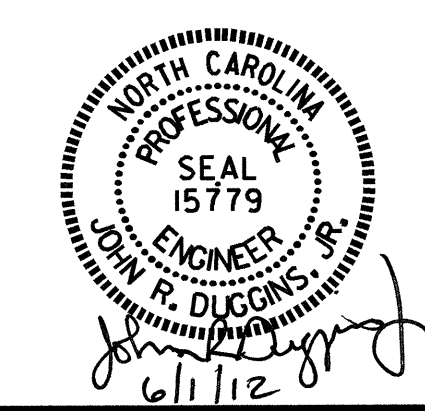


ELEVATION AT EXPANSION JOINTS
BARRIER RAIL DETAILS

ASSEMBLED BY : M. POOLE DATE : 2/11
 CHECKED BY : A. SORSENGIN DATE : 7/11
 DRAWN BY : ARB 5/87 RWW/LES
 CHECKED BY : SJD 9/87 REV. 5/7/03R RWW/JTE
 REV. 5/1/06 TLA/GM

END OF RAIL DETAILS
FOR ADHESIVE ANCHORING AT SAWED JOINTS

01-JUN-2012 11:30
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 dahodge



PROJECT NO. B-4162
 JACKSON COUNTY
 STATION: 18+31.08 -L-

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	8-14
1			3			TOTAL SHEETS
2			4			24

STD. NO. CBR1 STR. #1

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD-DOWN PLATE AND 4 - 3/8" Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

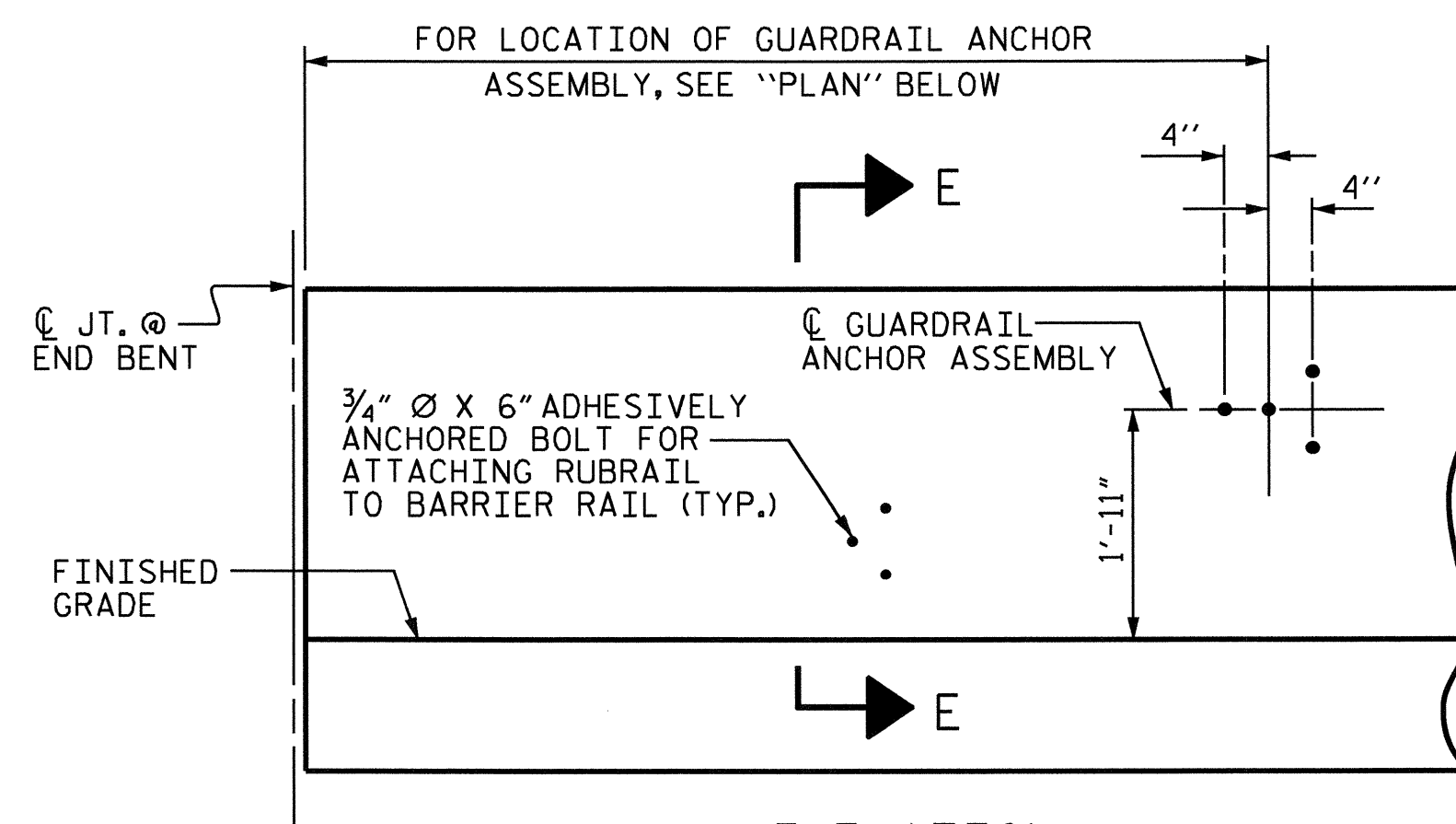
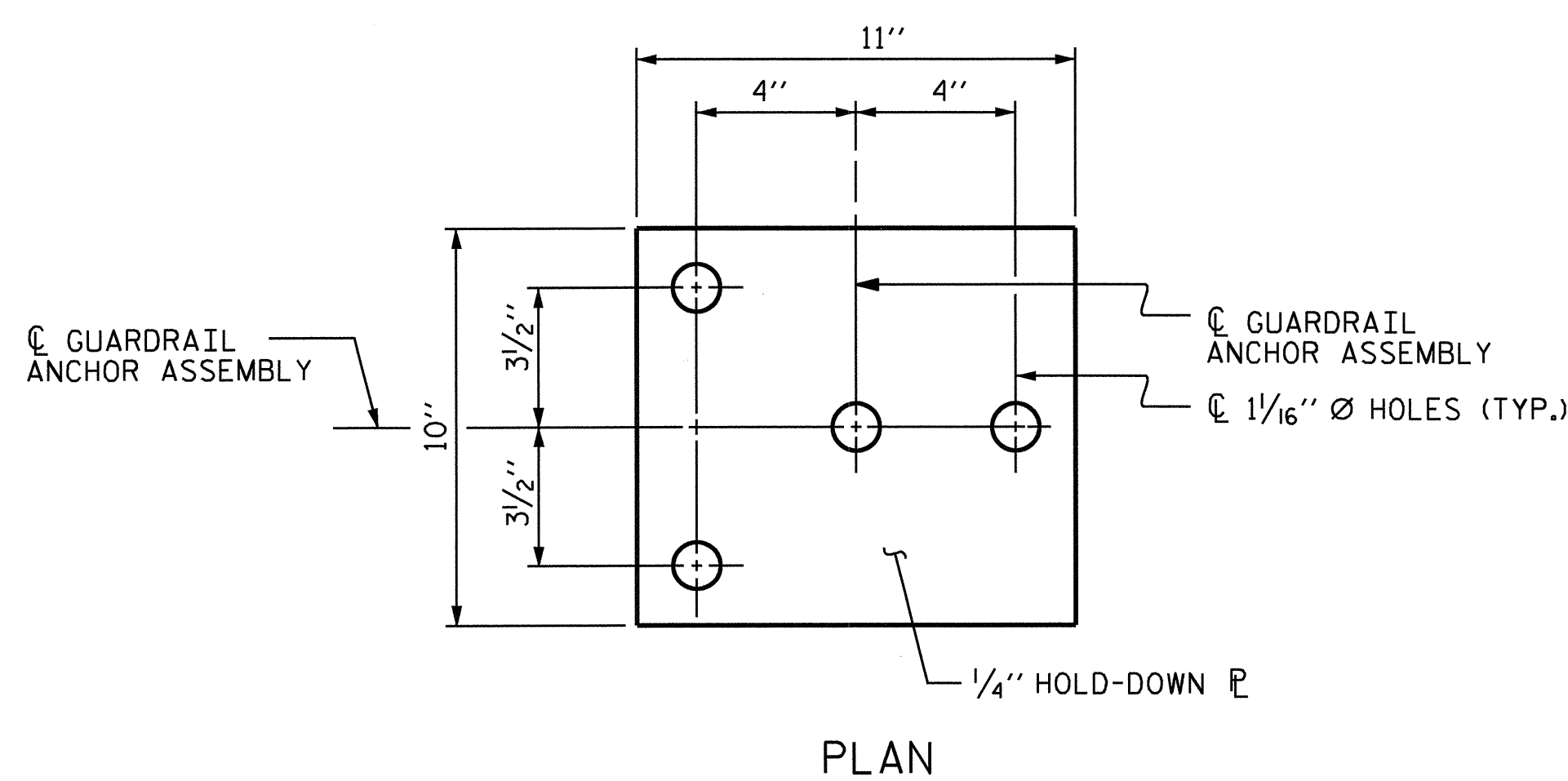
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

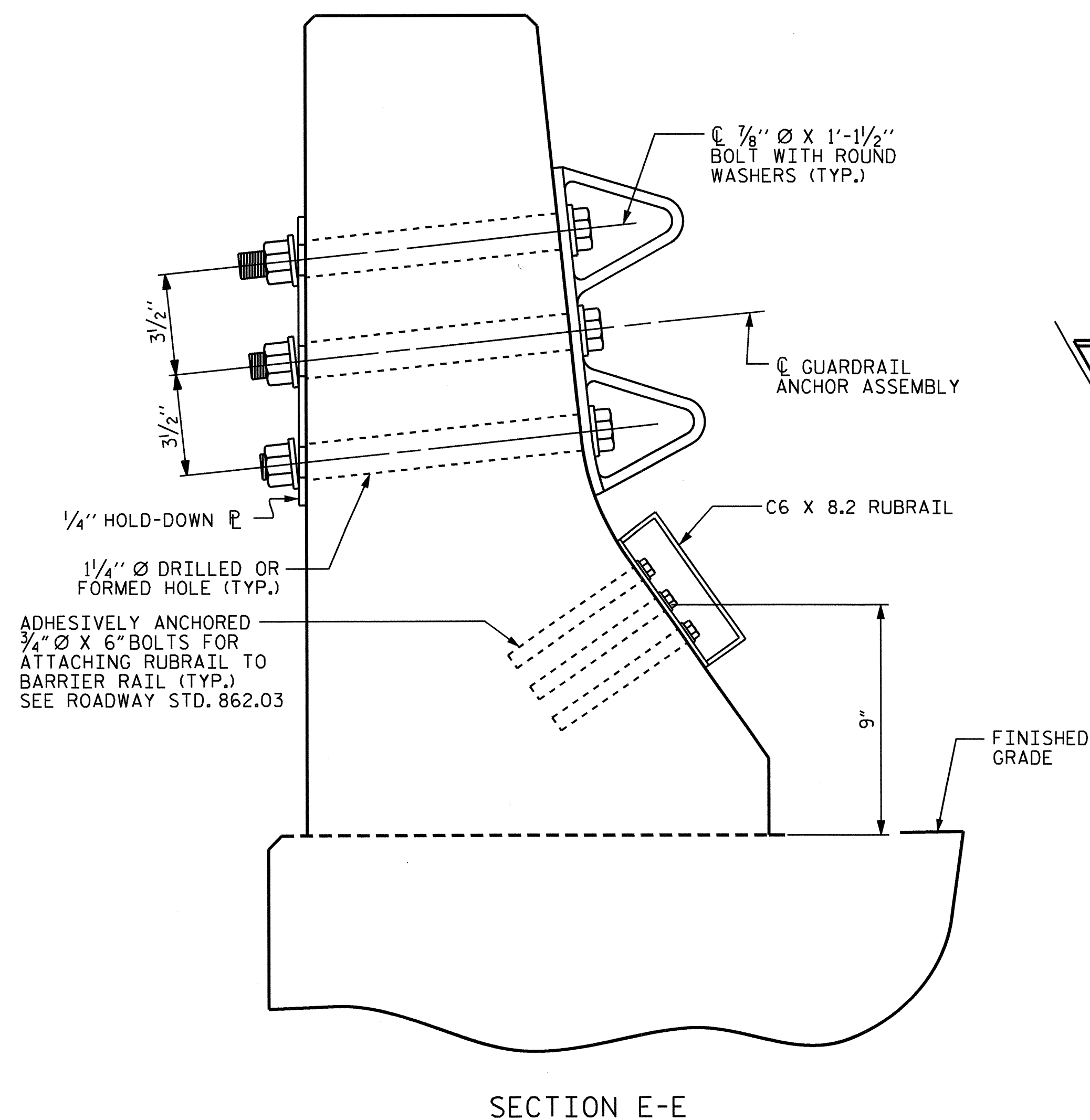
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

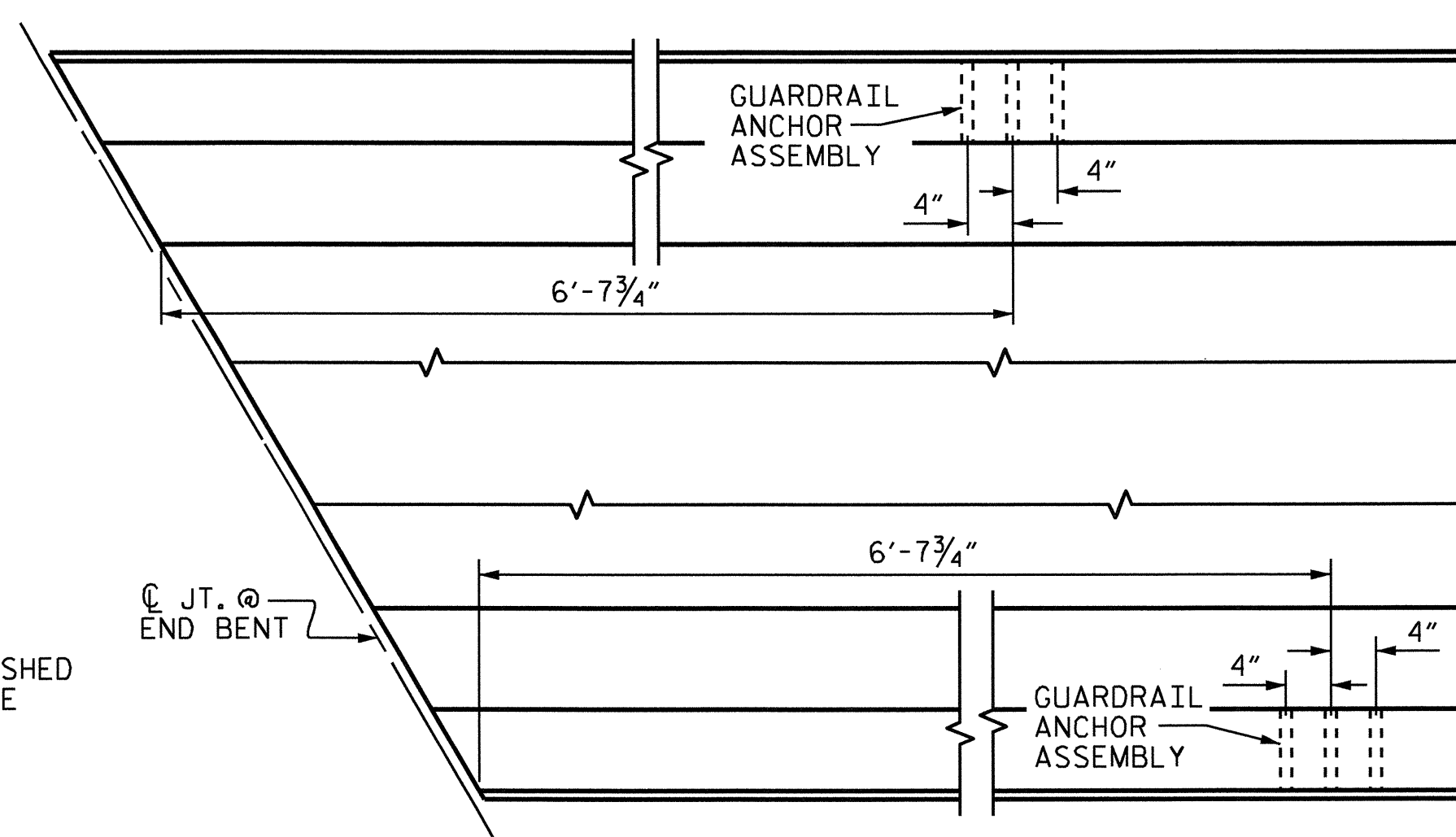
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



ELEVATION
FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03

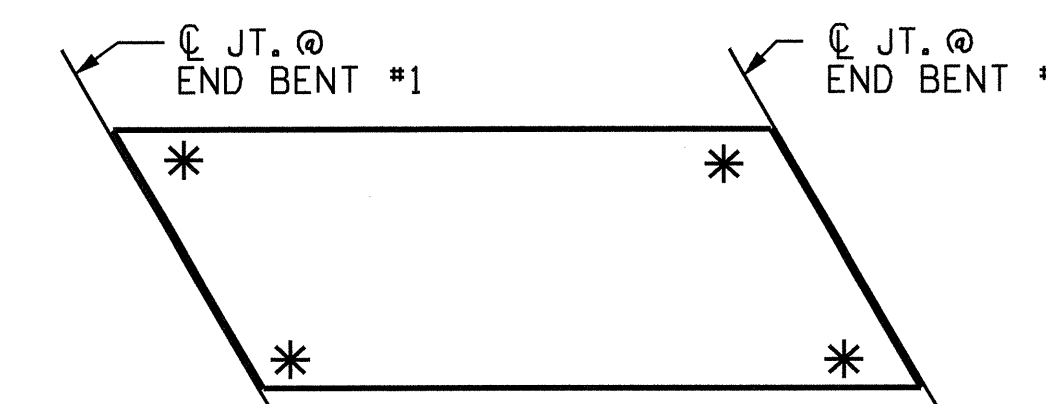


SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN
LOCATION OF ANCHORS FOR GUARDRAIL

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

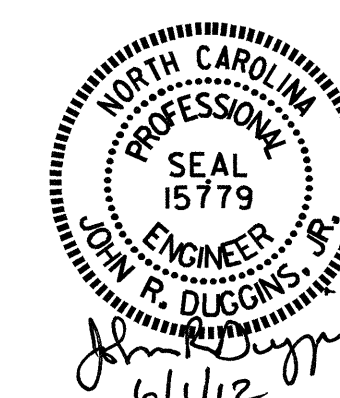


SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4162
JACKSON COUNTY
 STATION: 18+31.08 -L-

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



ASSEMBLED BY : S. PEARCE	DATE : 2/12
CHECKED BY : J.R. DUGGINS	DATE : 3/12
DRAWN BY : TLA 5/06	ADDED 5/1/06RR KMM/GM
CHECKED BY : GM 5/06	REV. 10/1/11 MAA/GM

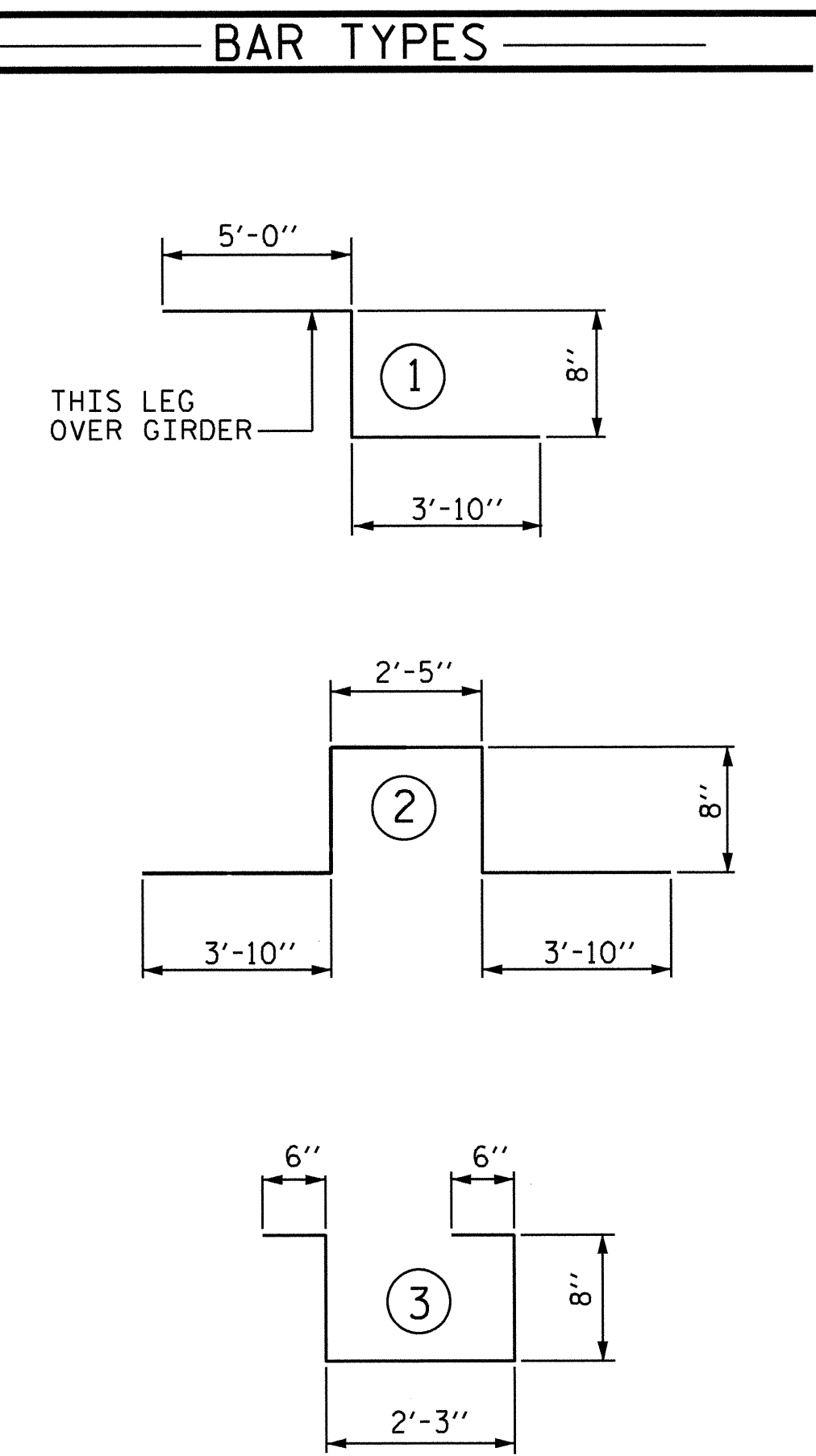
REVISIONS						SHEET NO. S-15
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 24
2			4			

REINFORCING BAR SCHEDULE					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	231	#5	STR	26'-11"	6485
A2	231	#5	STR	26'-11"	6485
* A101	4	#5	STR	25'-4"	106
* A102	4	#5	STR	23'-4"	97
* A103	4	#5	STR	21'-4"	89
* A104	4	#5	STR	19'-4"	81
* A105	4	#5	STR	17'-3"	72
* A106	4	#5	STR	15'-3"	64
* A107	4	#5	STR	13'-3"	55
* A108	4	#5	STR	11'-2"	47
* A109	4	#5	STR	9'-2"	38
* A110	4	#5	STR	7'-2"	30
* A111	4	#5	STR	5'-1"	21
* A112	4	#5	STR	3'-1"	13
A201	4	#5	STR	25'-4"	106
A202	4	#5	STR	23'-4"	97
A203	4	#5	STR	21'-4"	89
A204	4	#5	STR	19'-4"	81
A205	4	#5	STR	17'-3"	72
A206	4	#5	STR	15'-3"	64
A207	4	#5	STR	13'-3"	55
A208	4	#5	STR	11'-2"	47
A209	4	#5	STR	9'-2"	38
A210	4	#5	STR	7'-2"	30
A211	4	#5	STR	5'-1"	21
A212	4	#5	STR	3'-1"	13
* B1	60	#5	STR	48'-4"	3025
B2	87	#5	STR	48'-1"	4363
* K1	8	#5	1	9'-6"	79
* K2	8	#5	2	11'-5"	95
* K3	12	#5	STR	7'-3"	91
* G1	2	#5	STR	30'-6"	64
* S1	36	#4	3	4'-7"	110
REINFORCING STEEL =				11561 LBS	
* EPOXY COATED REINF. STEEL =				10662 LBS	

* THESE BARS ARE EPOXY COATED

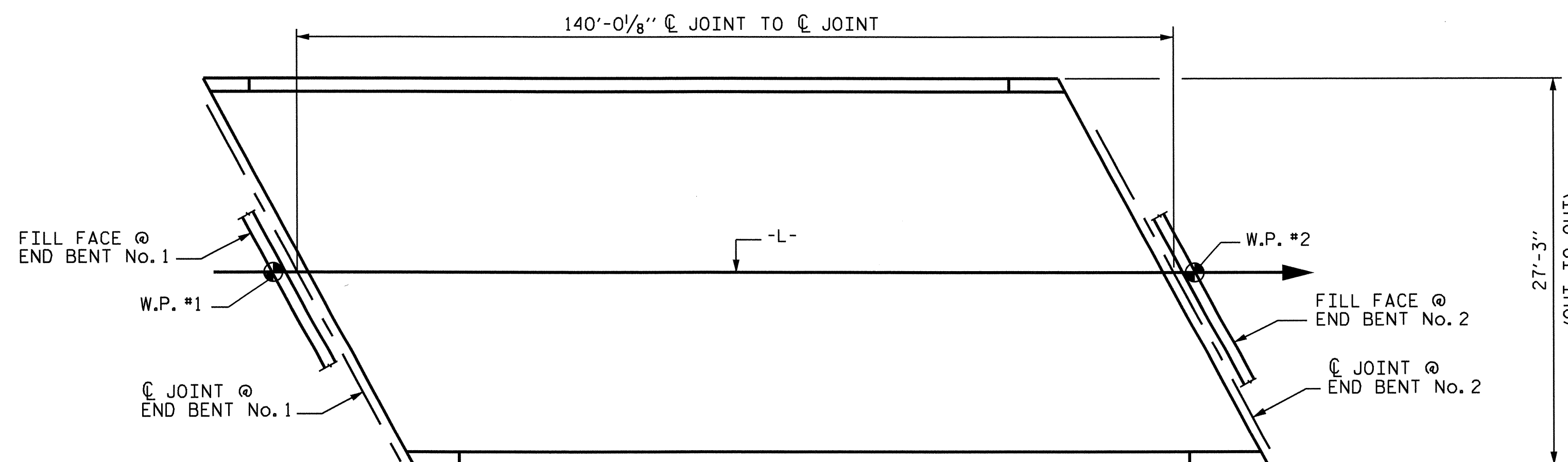
GROOVING BRIDGE FLOORS	
BRIDGE DECK	2909 SQ. FEET
APPROACH SLAB	576 SQ. FEET
TOTAL	3485 SQ. FEET

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			



ALL BAR DIMENSIONS ARE OUT TO OUT

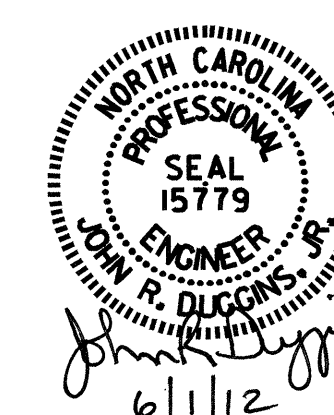
SUPERSTRUCTURE BILL OF MATERIAL			
SPAN A	CLASS AA CONCRETE (CU.YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
	116.9	11561	10359
TOTALS	116.9	11561	10359



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

TOTAL = 3815 SQ. FEET

PROJECT NO. B-4162
 JACKSON COUNTY
 STATION: 18+31.08 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE BILL OF MATERIAL					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. S-16
 TOTAL SHEETS 24

DRAWN BY: M. POOLE DATE: 10/10
 CHECKED BY: A. SORSENGIN DATE: 7/11

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NOTES

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

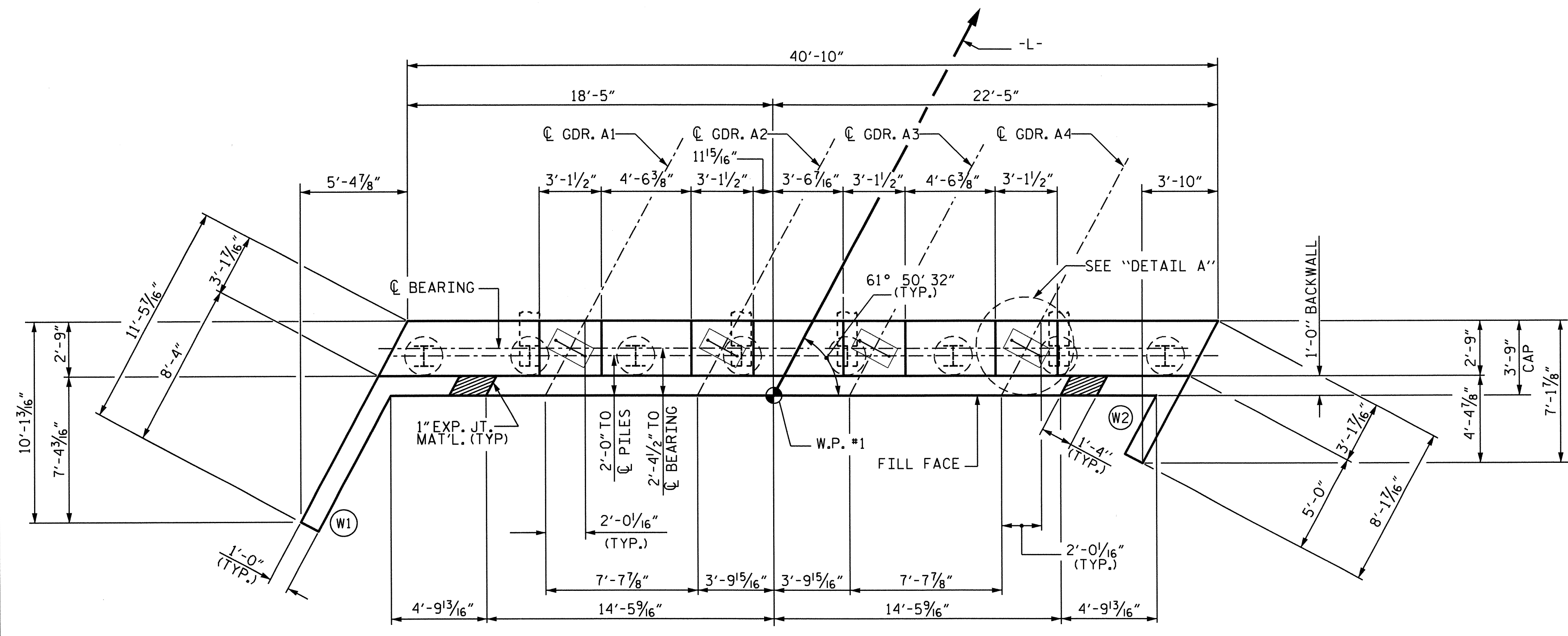
FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

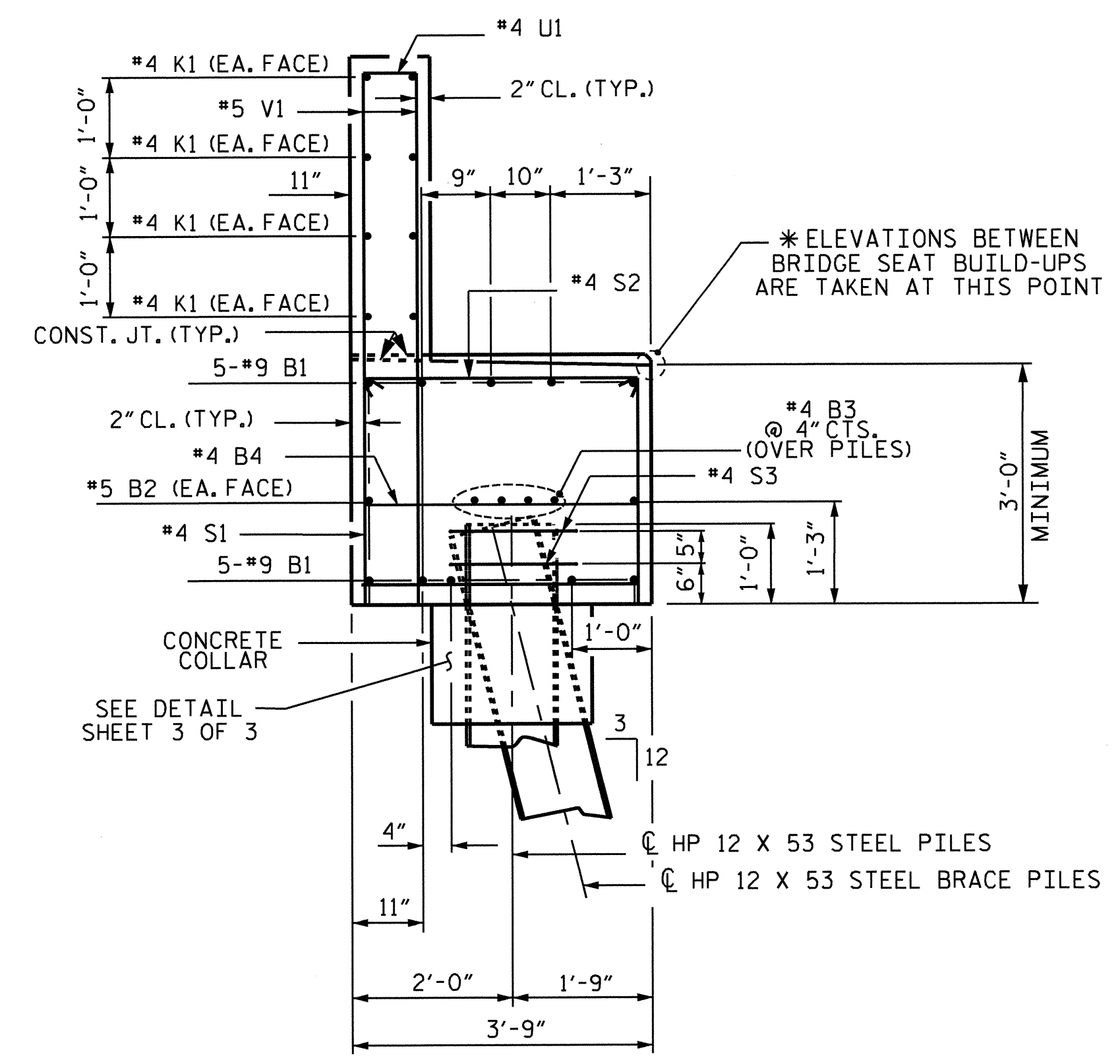
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.

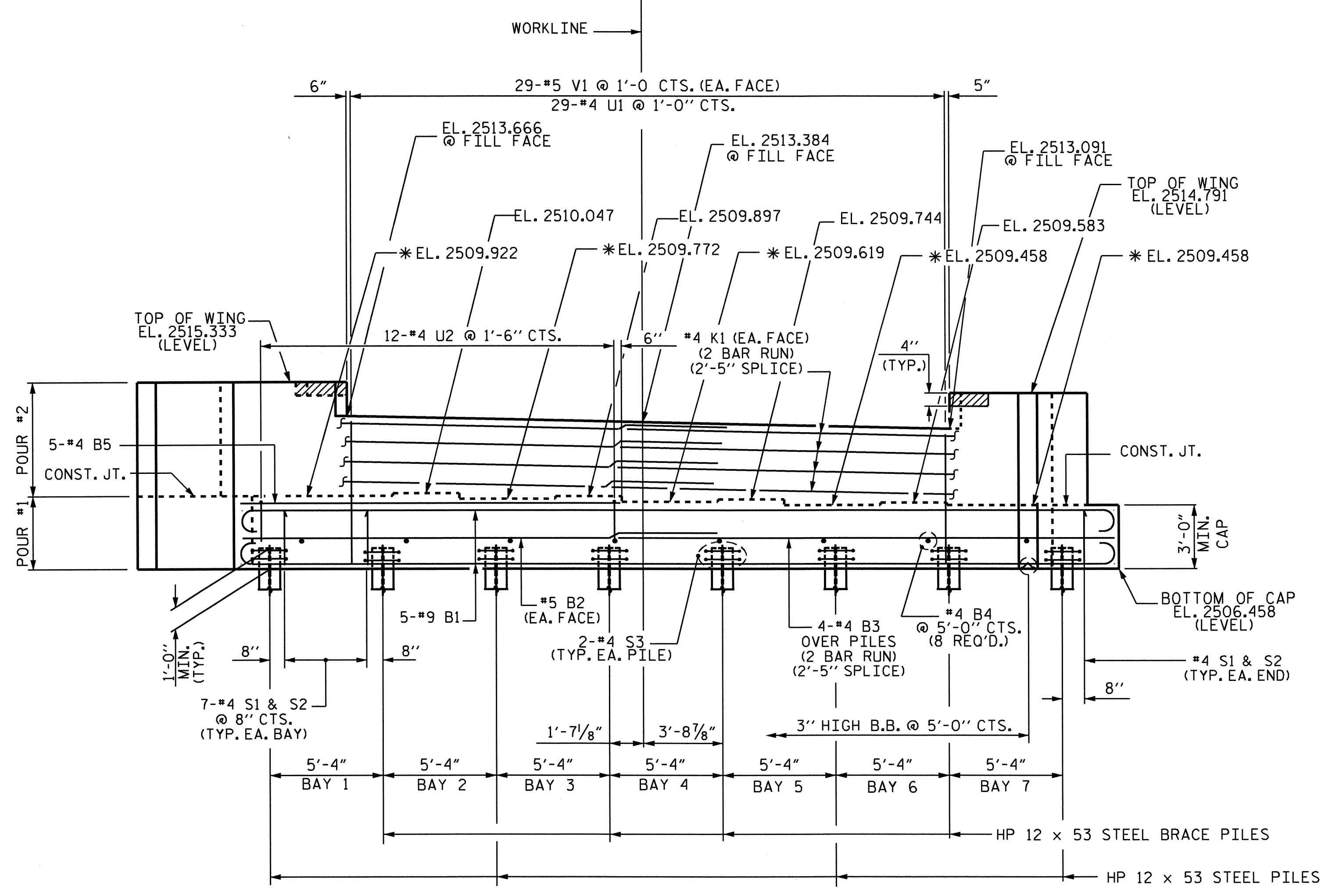
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.



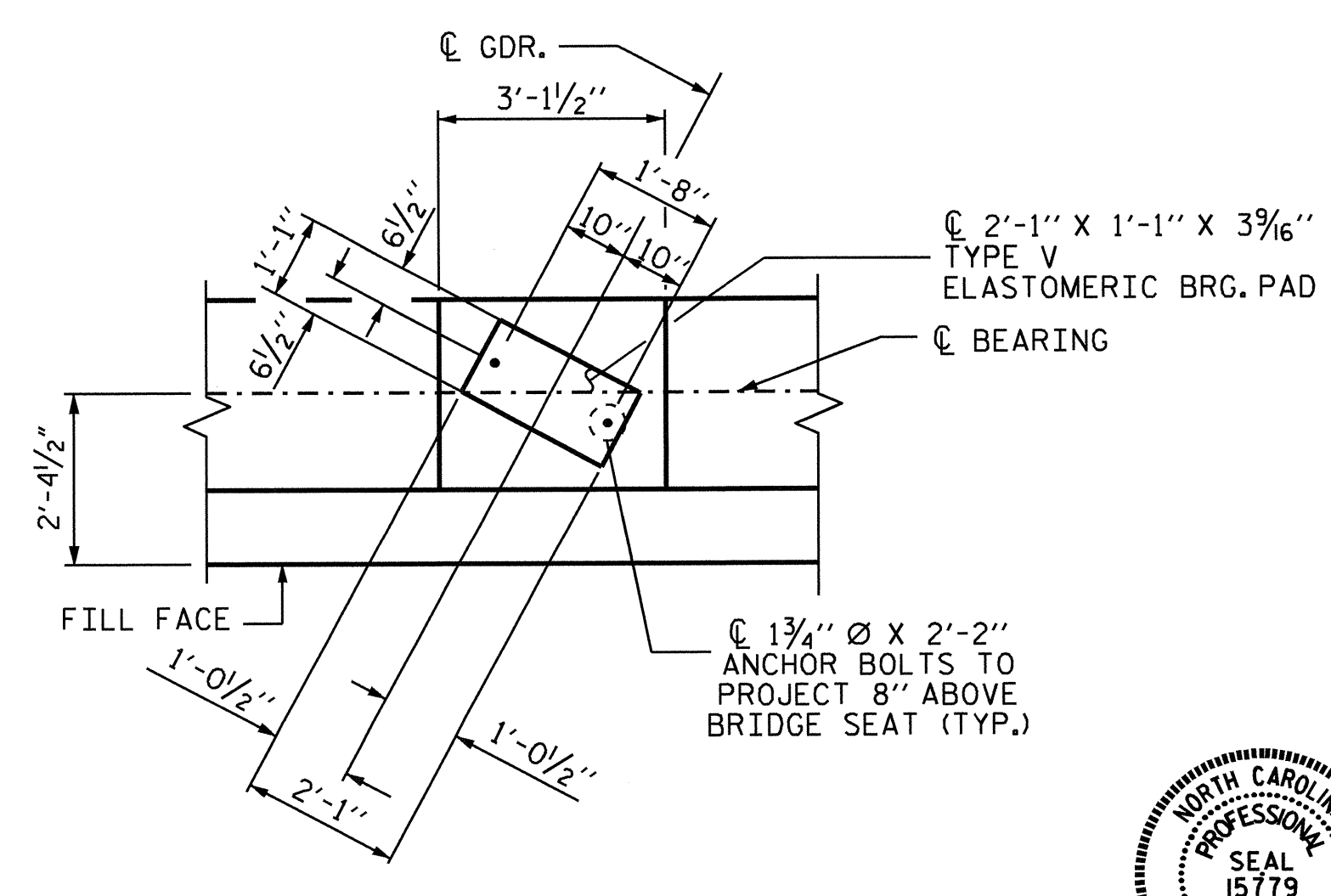
PLAN



SECTION THRU CAP



ELEVATION



DETAIL A

PROJECT NO. B-4162
JACKSON COUNTY
 STATION: 18+31.08-L-

SHEET 1 OF 3

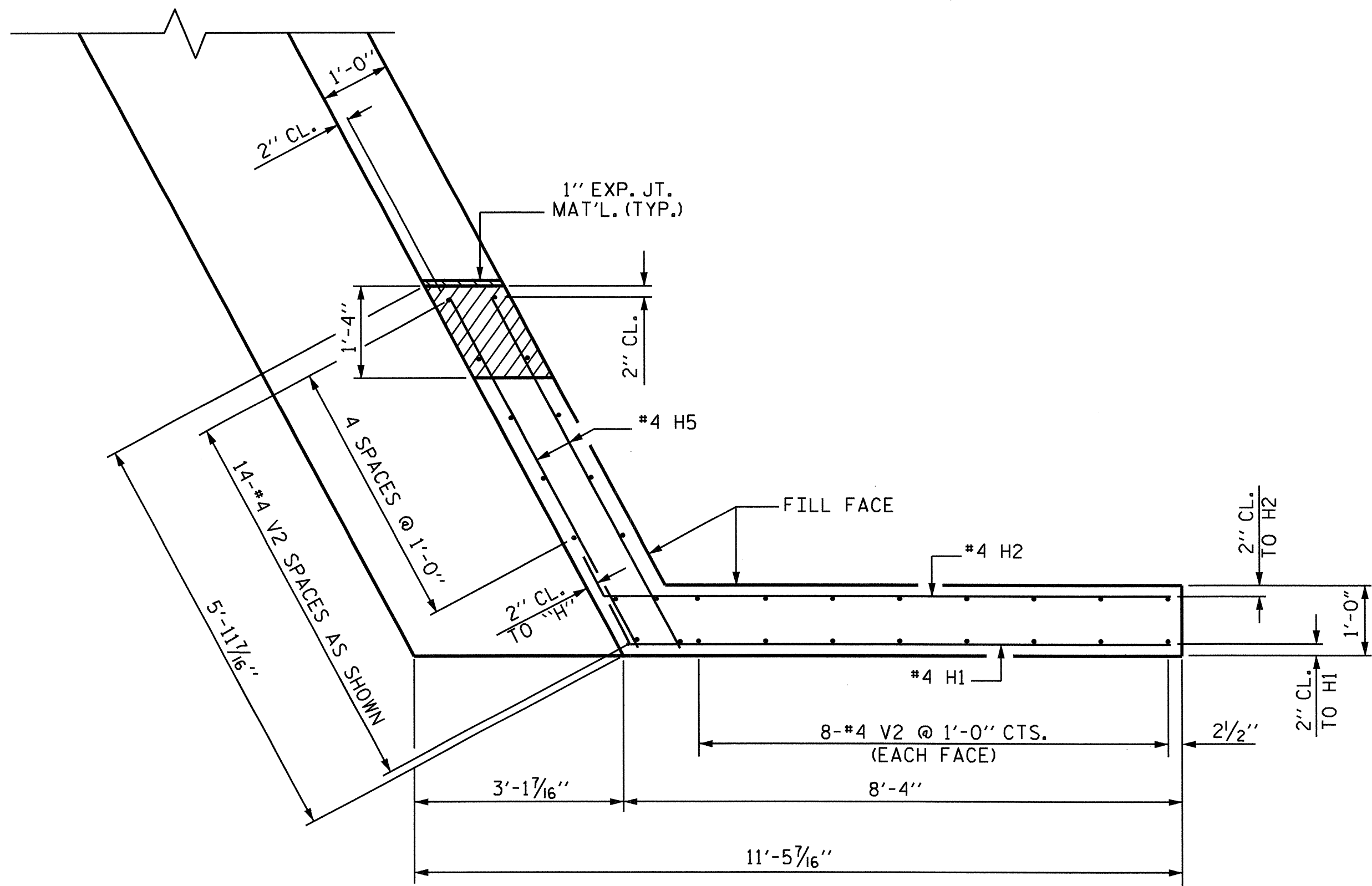
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT No. 1**

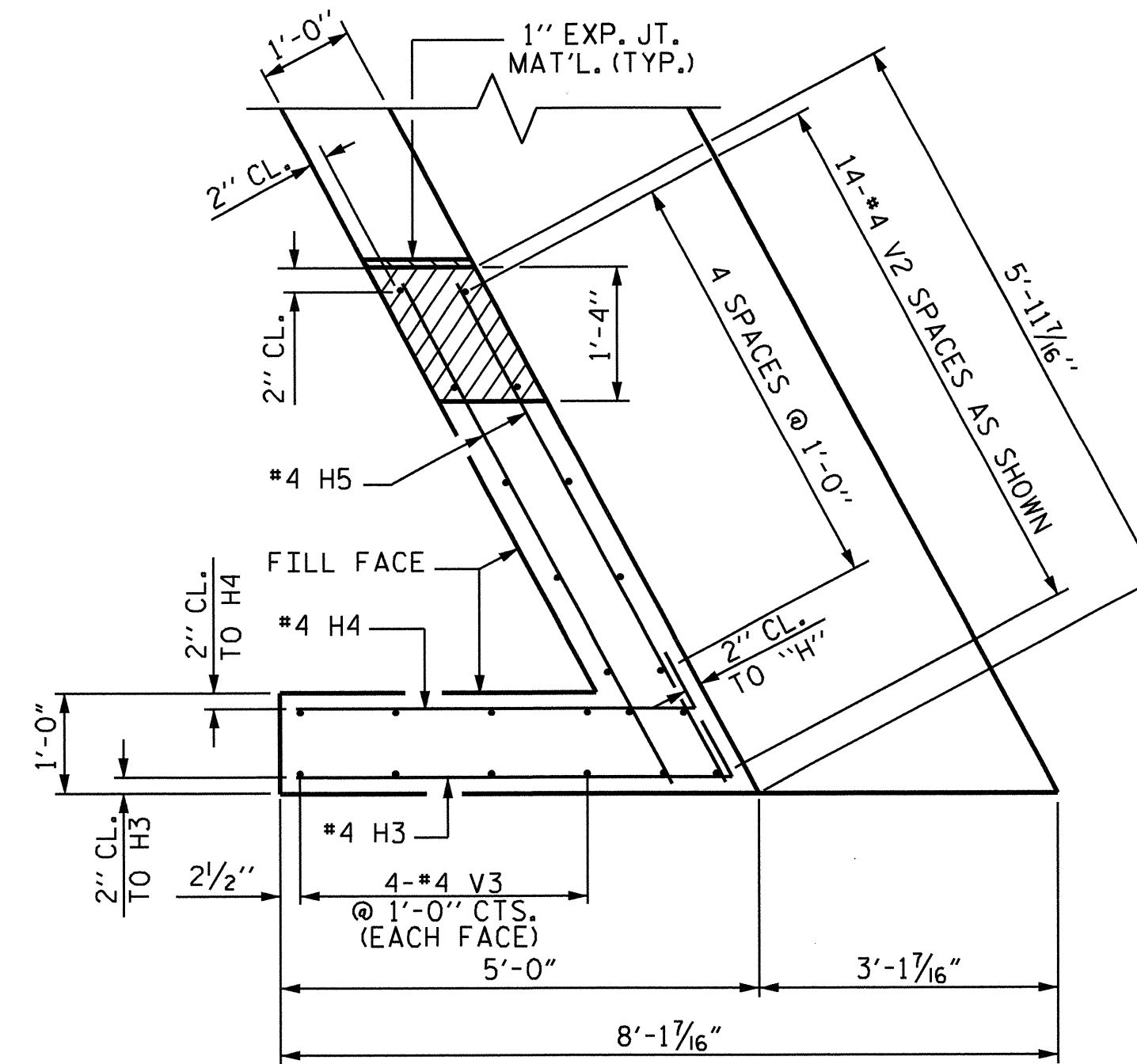
DRAWN BY: M. POOLE DATE: 6/11
 CHECKED BY: S.W. PEARCE DATE: 7/11

CONCRETE COLLARS AROUND PILES NOT SHOWN FOR CLARITY

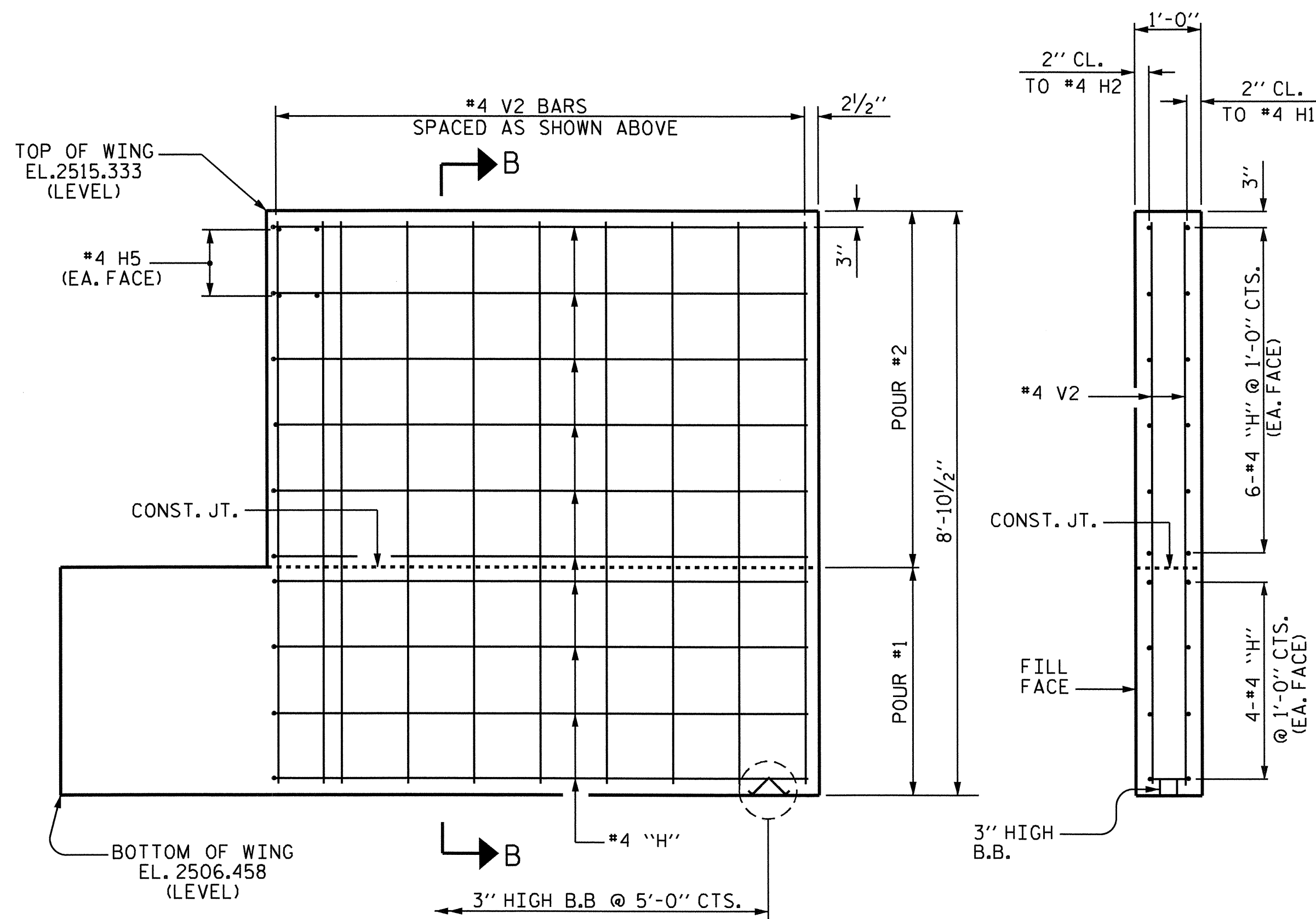
REVISIONS						SHEET NO. S-17
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 24
2			4			



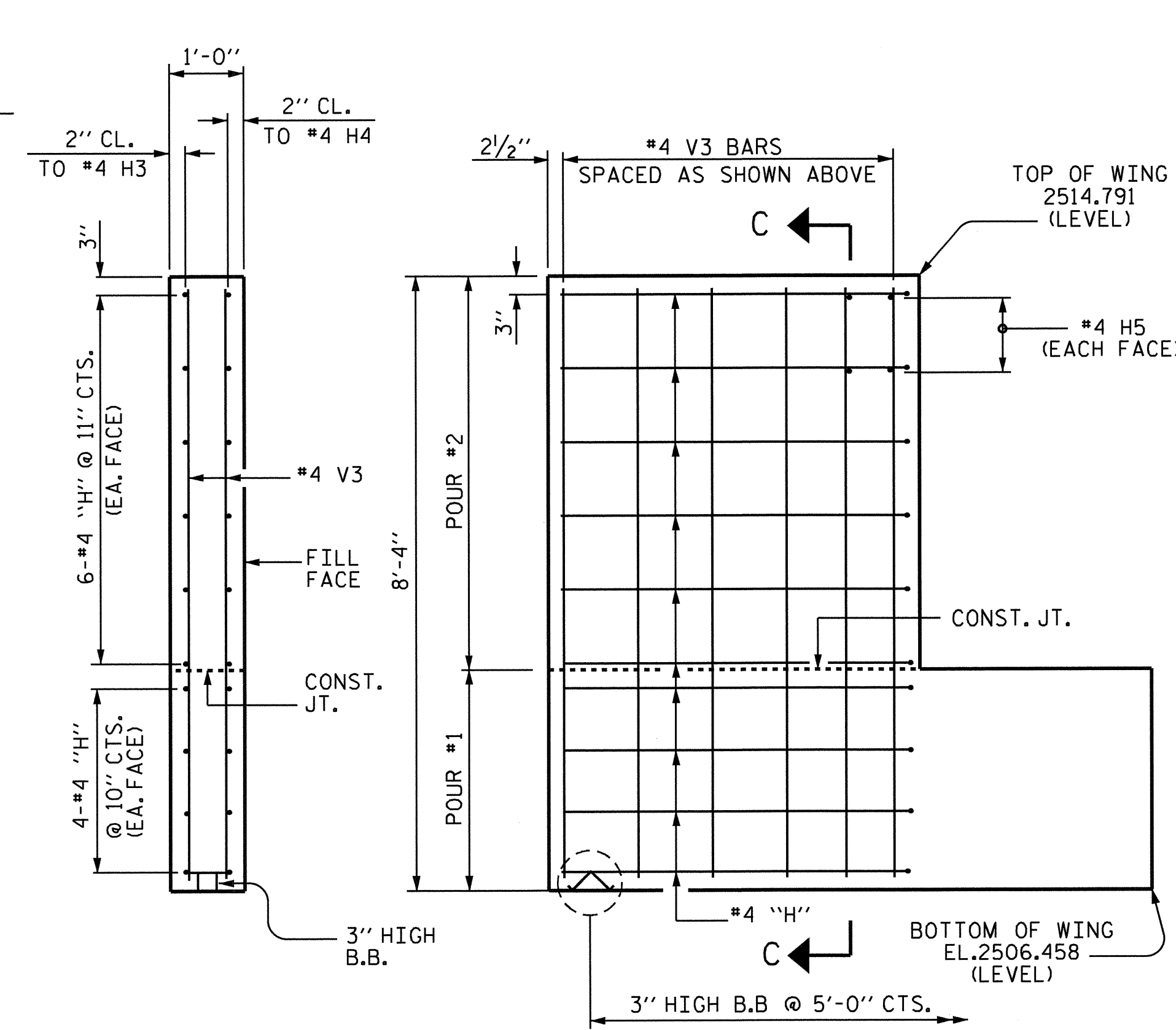
PLAN OF WING (W1)



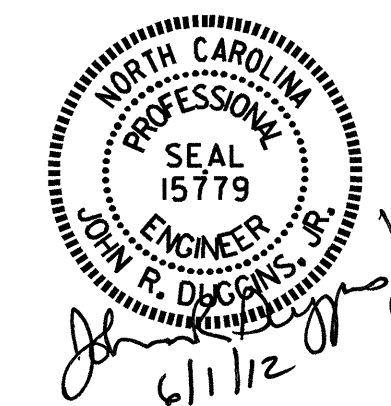
PLAN OF WING (W2)



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



PROJECT NO. B-4162
 JACKSON COUNTY
 STATION: 18+31.08 -L-

SHEET 2 OF 3

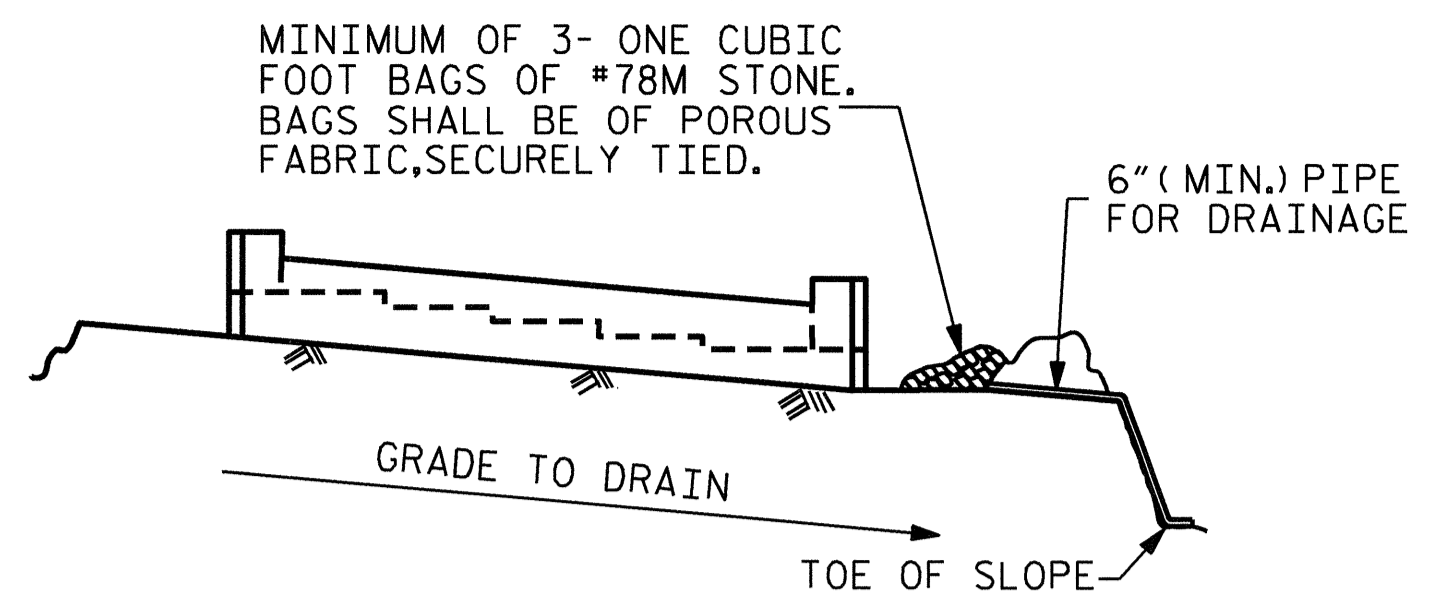
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 1

DRAWN BY : M. POOLE DATE : 07/11
 CHECKED BY : S.W. PEARCE DATE : 07/11

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-10
2			4			24



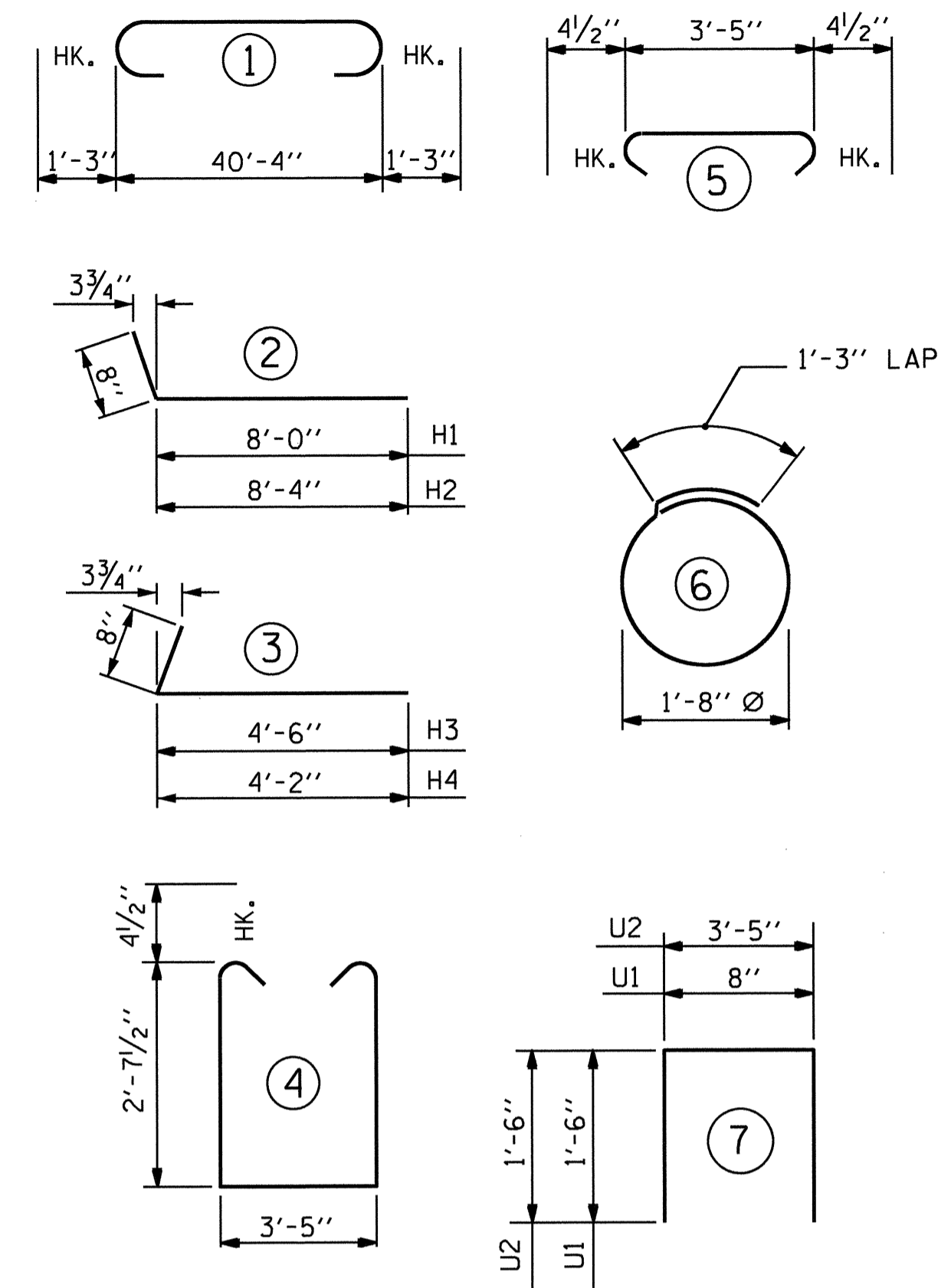
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

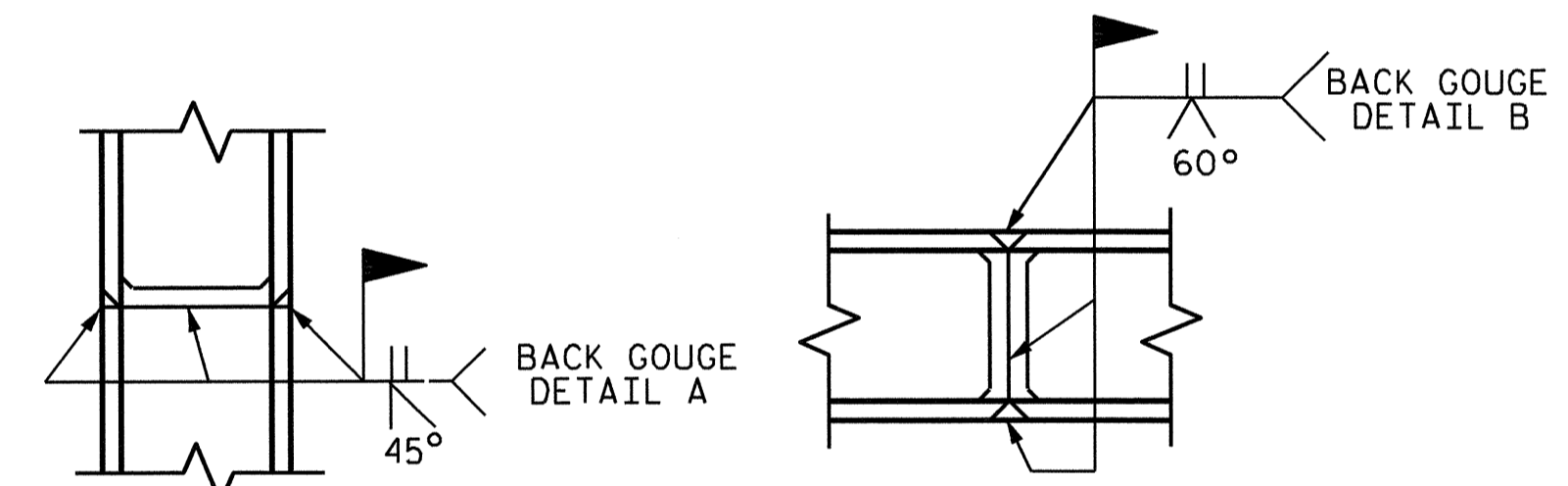
TEMPORARY DRAINAGE AT END BENT

BAR TYPES

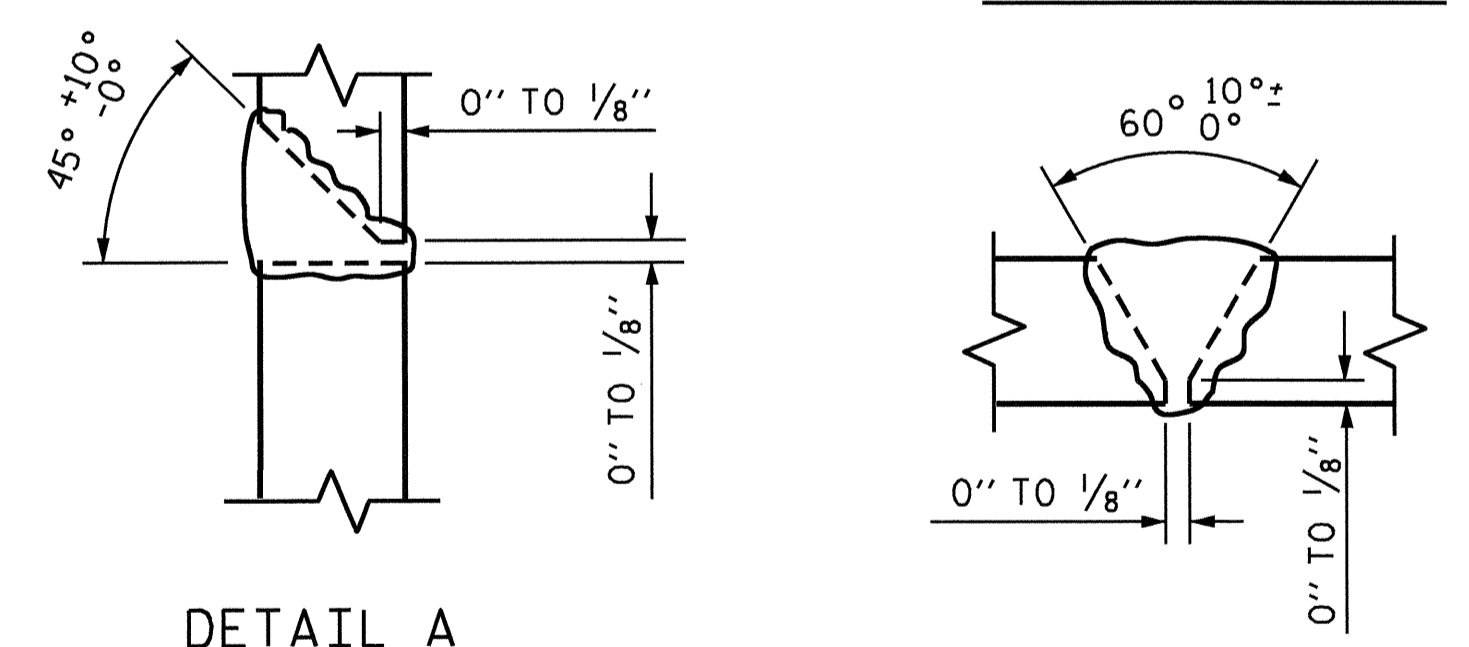


BILL OF MATERIAL

END BENT No. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	42'-10"	1456
B2	2	#5	STR	40'-6"	84
B3	8	#4	STR	21'-6"	115
B4	8	#4	STR	3'-5"	18
B5	5	#4	STR	17'-1"	57
H1	10	#4	2	8'-8"	58
H2	10	#4	2	9'-0"	60
H3	10	#4	3	5'-2"	35
H4	10	#4	3	4'-10"	32
H5	8	#4	STR	5'-8"	30
K1	16	#4	STR	21'-6"	230
S1	51	#4	4	9'-5"	321
S2	51	#4	5	4'-2"	142
S3	16	#4	6	6'-6"	69
U1	29	#4	7	3'-8"	71
U2	12	#4	7	6'-5"	51
V1	58	#5	STR	6'-4"	383
V2	30	#4	STR	8'-6"	170
V3	22	#4	STR	8'-0"	118
REINFORCING STEEL					3500 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR 1 (CAP, LOWER WINGS & COLLARS)					21.6 C.Y.
POUR 2 (BACKWALL & UPPER WINGS)					8.5 C.Y.
TOTAL					30.1 C.Y.
HP 12 x 53 STEEL PILES NO. 8					160 LIN FT.

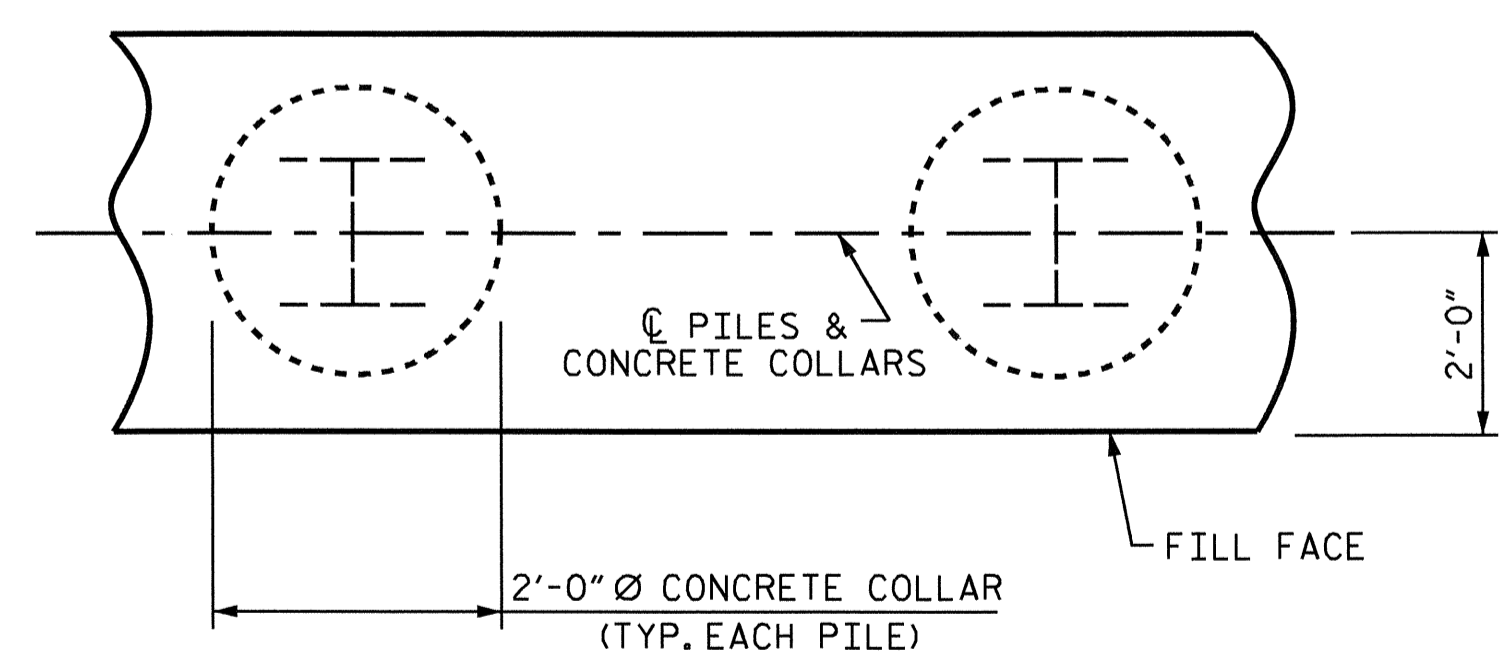


* PILE VERTICAL * PILE HORIZONTAL OR VERTICAL

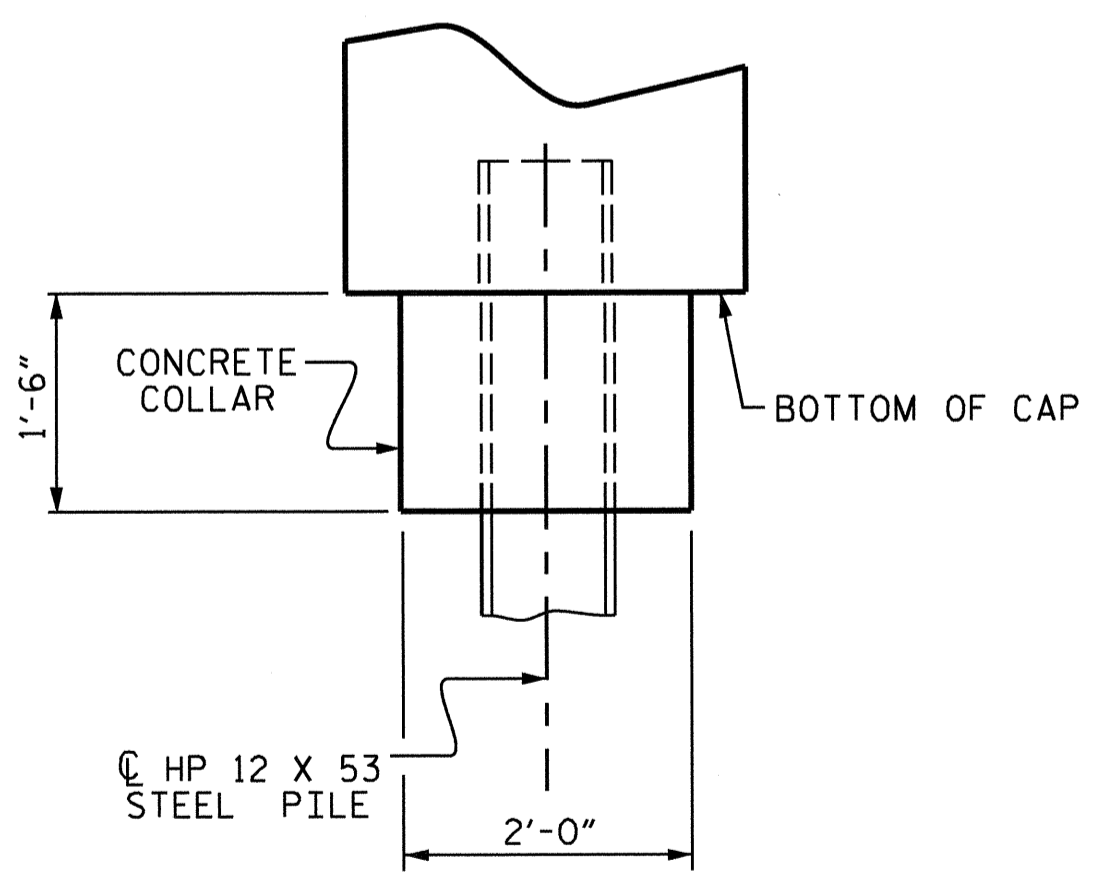


* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



PLAN



ELEVATION

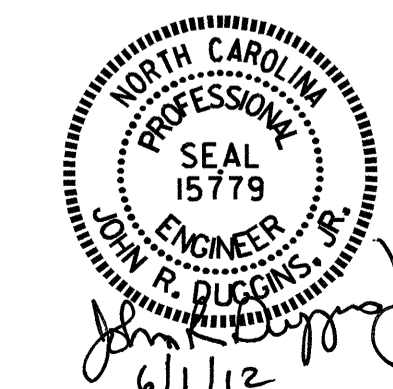
CORROSION PROTECTION FOR STEEL PILES DETAIL

PROJECT NO. B-4162
JACKSON COUNTY
 STATION: 18+31.08 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

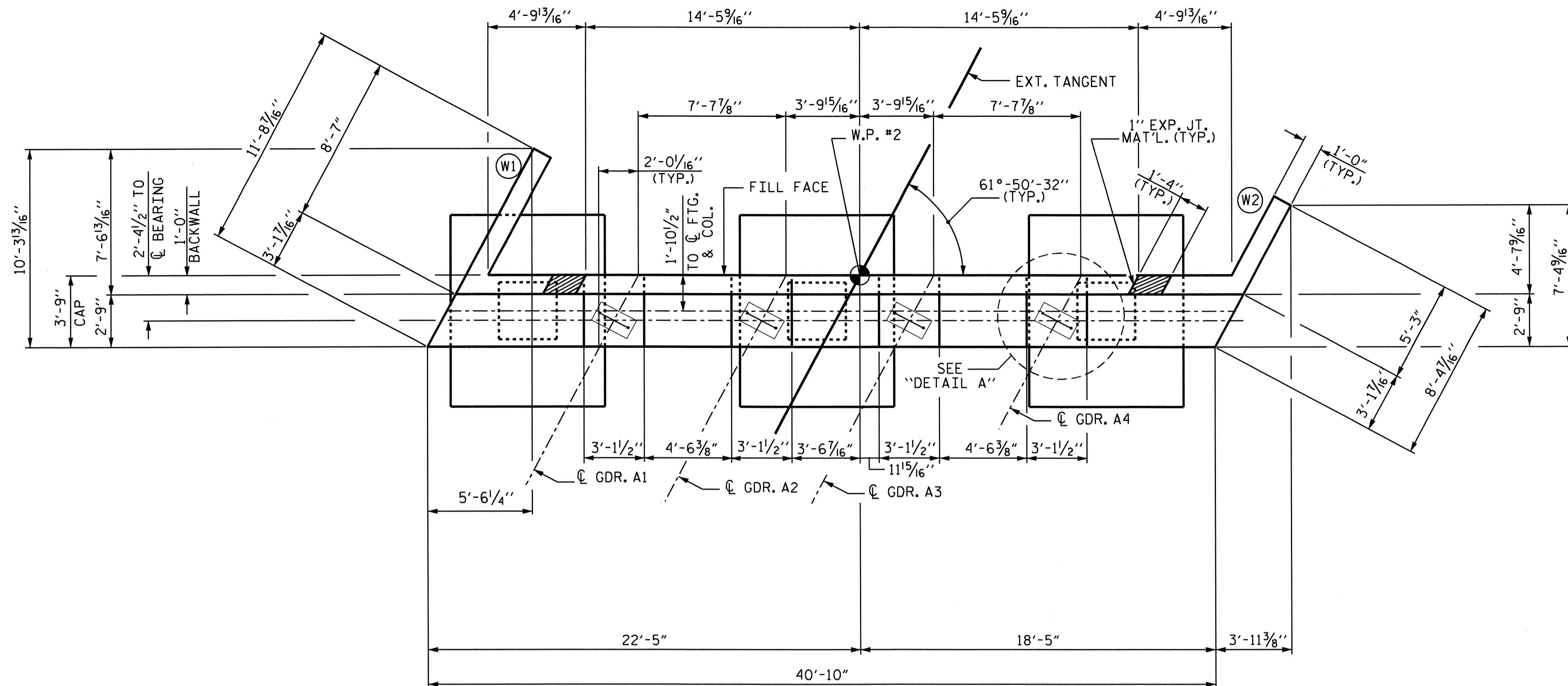
SUBSTRUCTURE
 END BENT No. 1



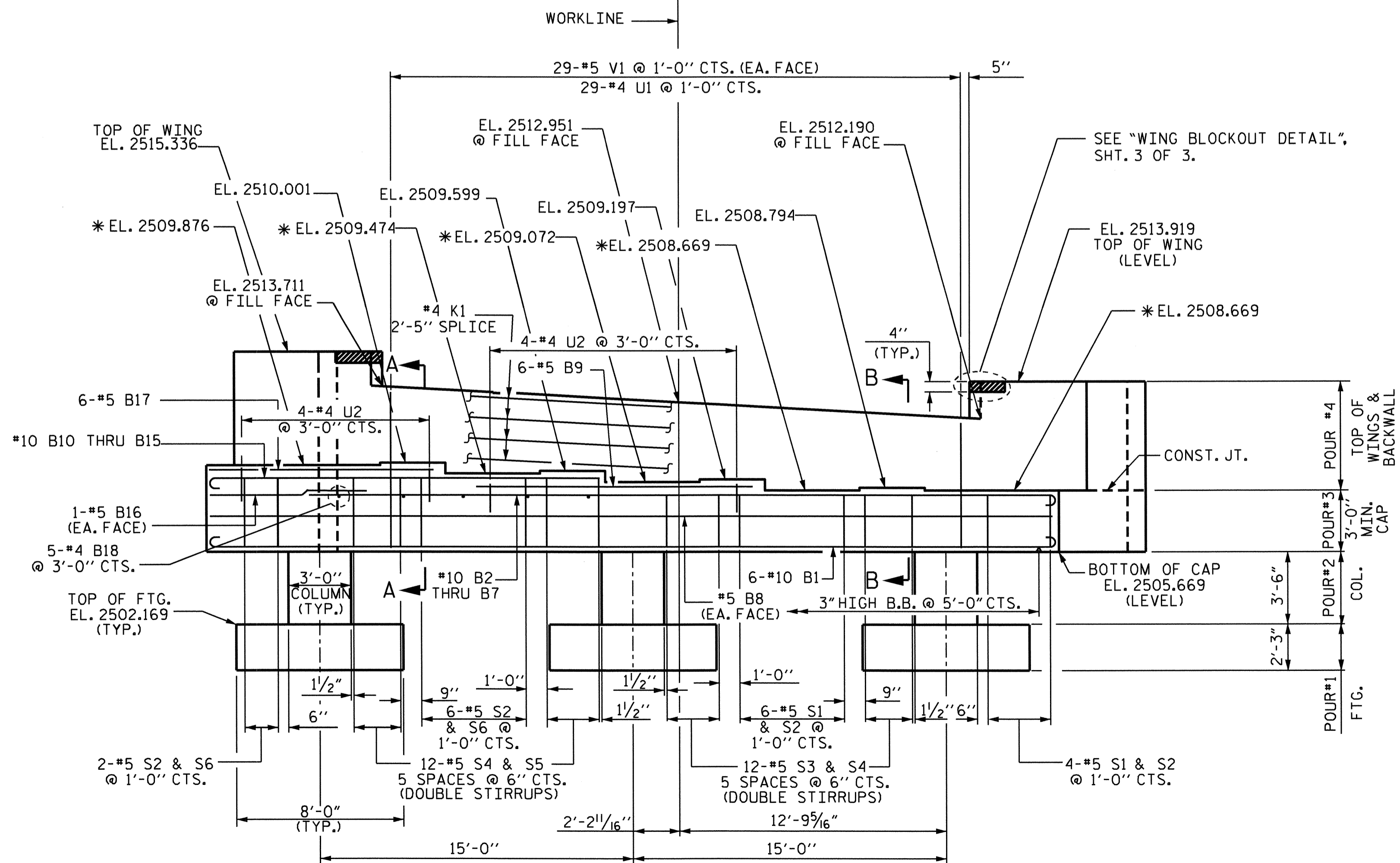
DRAWN BY : M. POOLE DATE : 07/11
 CHECKED BY : S.W. PEARCE DATE : 07/11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-19
2			4			24

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 gahodge



PLAN



ELEVATION

FOR REINFORCING STEEL IN COLUMN & FOOTING, SEE SHEET 3 OF 3.

NOTES

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

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

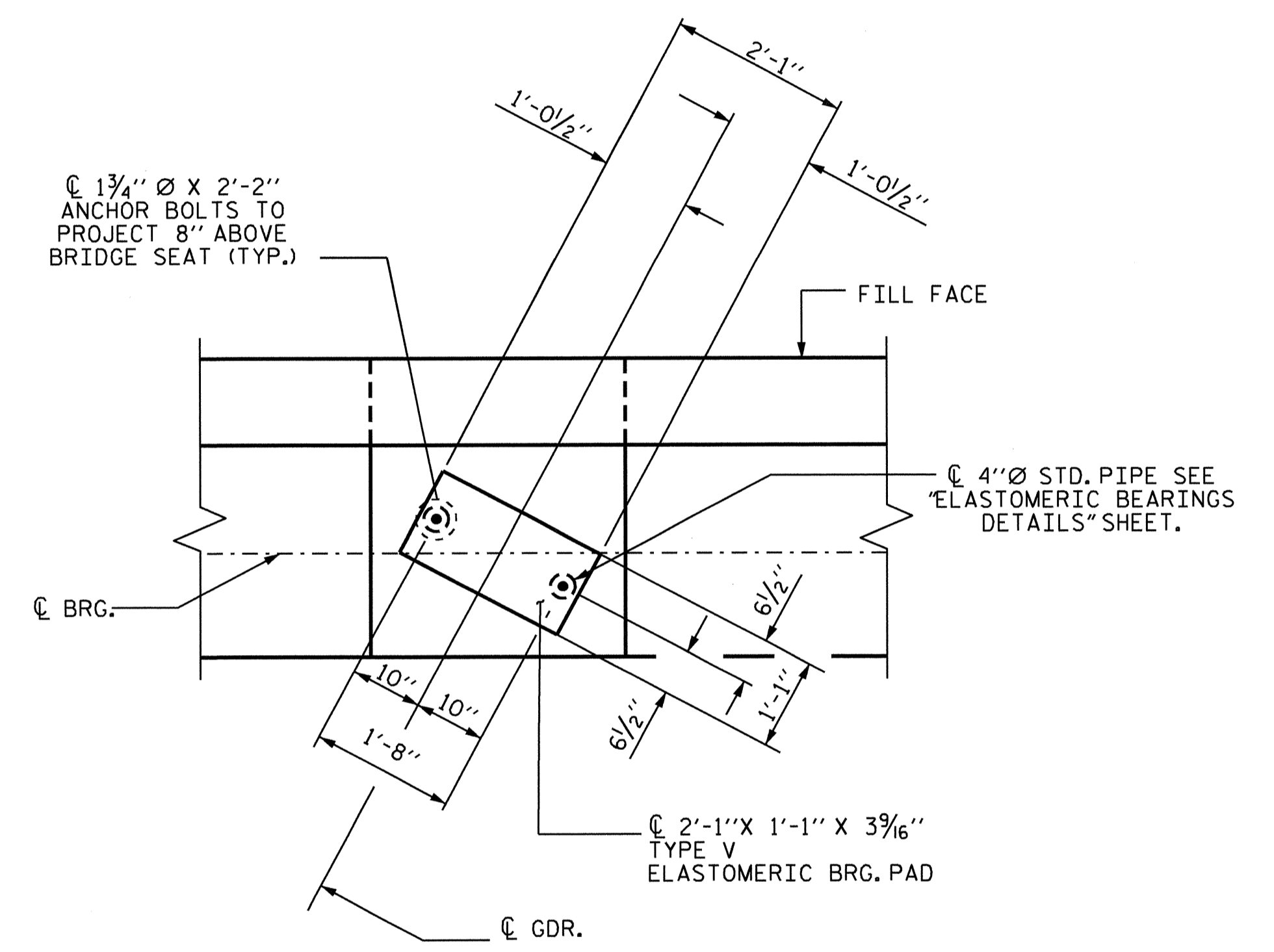
EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO THE BEARINGS AND ANCHOR BOLTS ARE GROUTED.

THE CONCRETE IN THE SHADED AREA OF THE DECK SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.

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

FOR PIPE INSERT DETAILS, SEE BEARINGS SHEET.

FOR SECTION VIEW A-A & B-B, SEE SHEET 3 OF 3

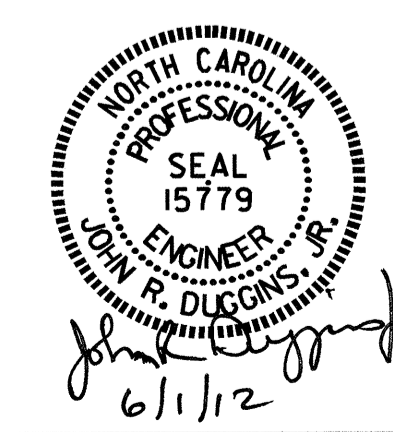


DETAIL A

PROJECT NO. B-4162
JACKSON COUNTY
 STATION: 18+31.08-L-

SHEET 1 OF 3

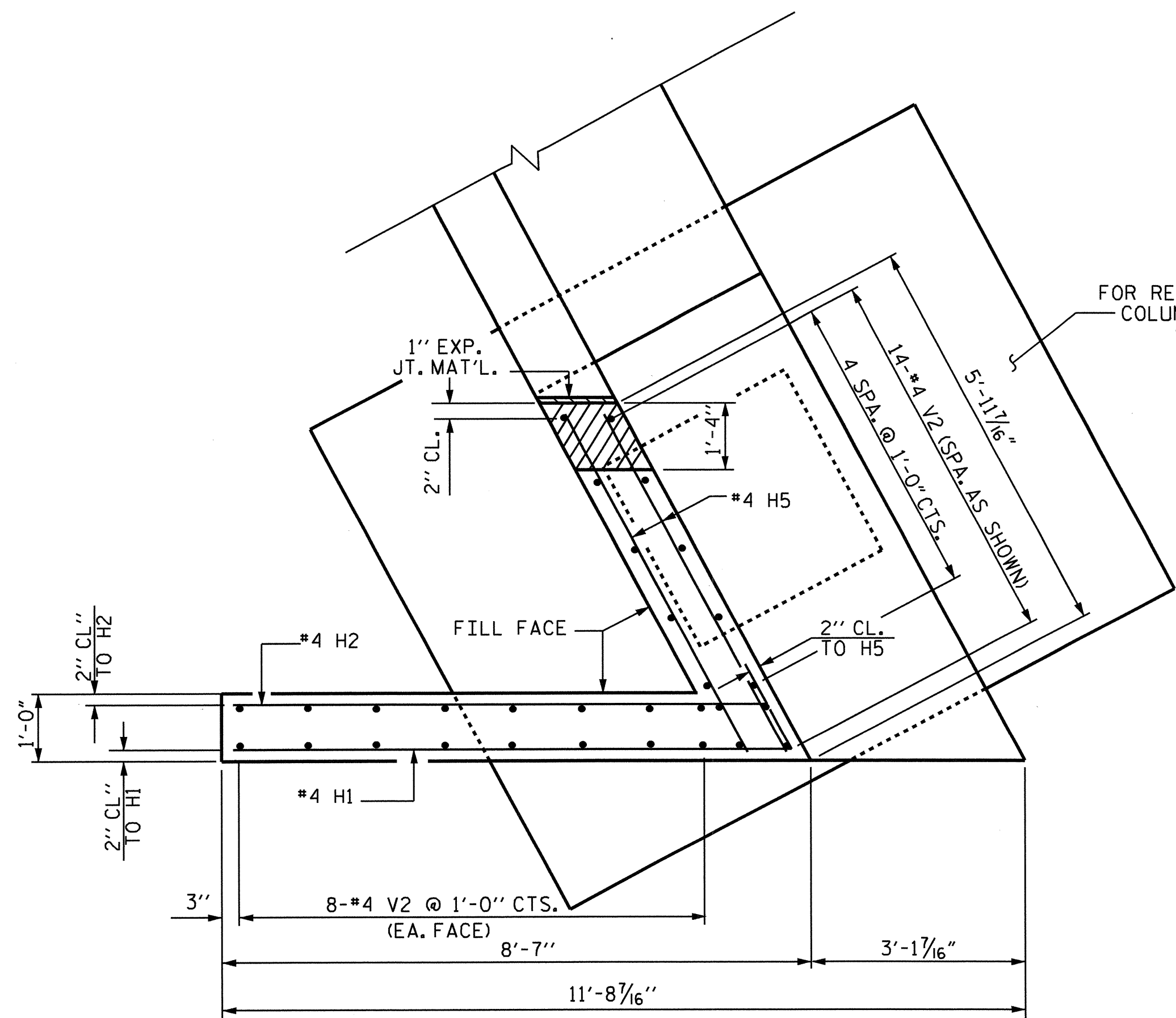
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			5-20
2			4			24



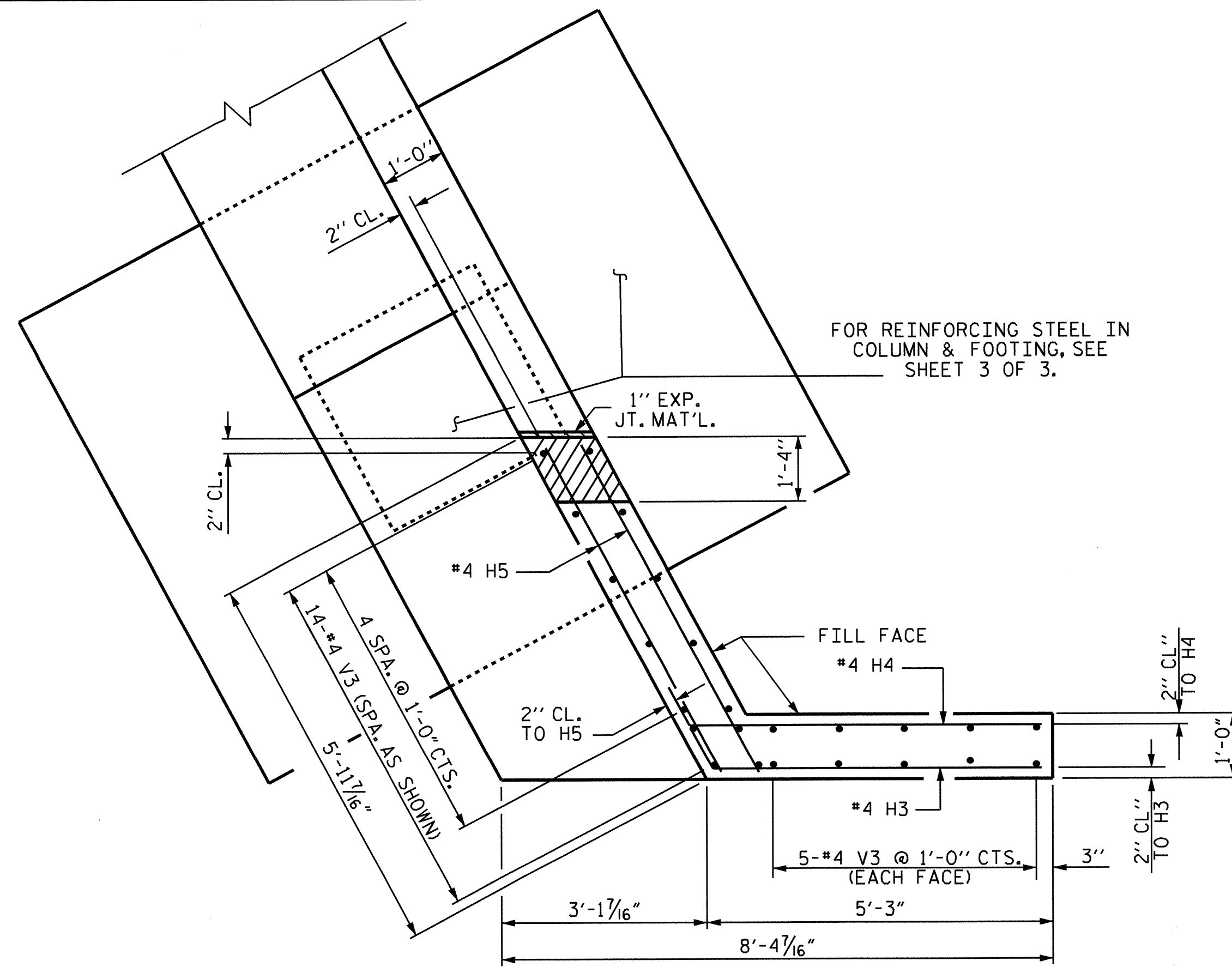
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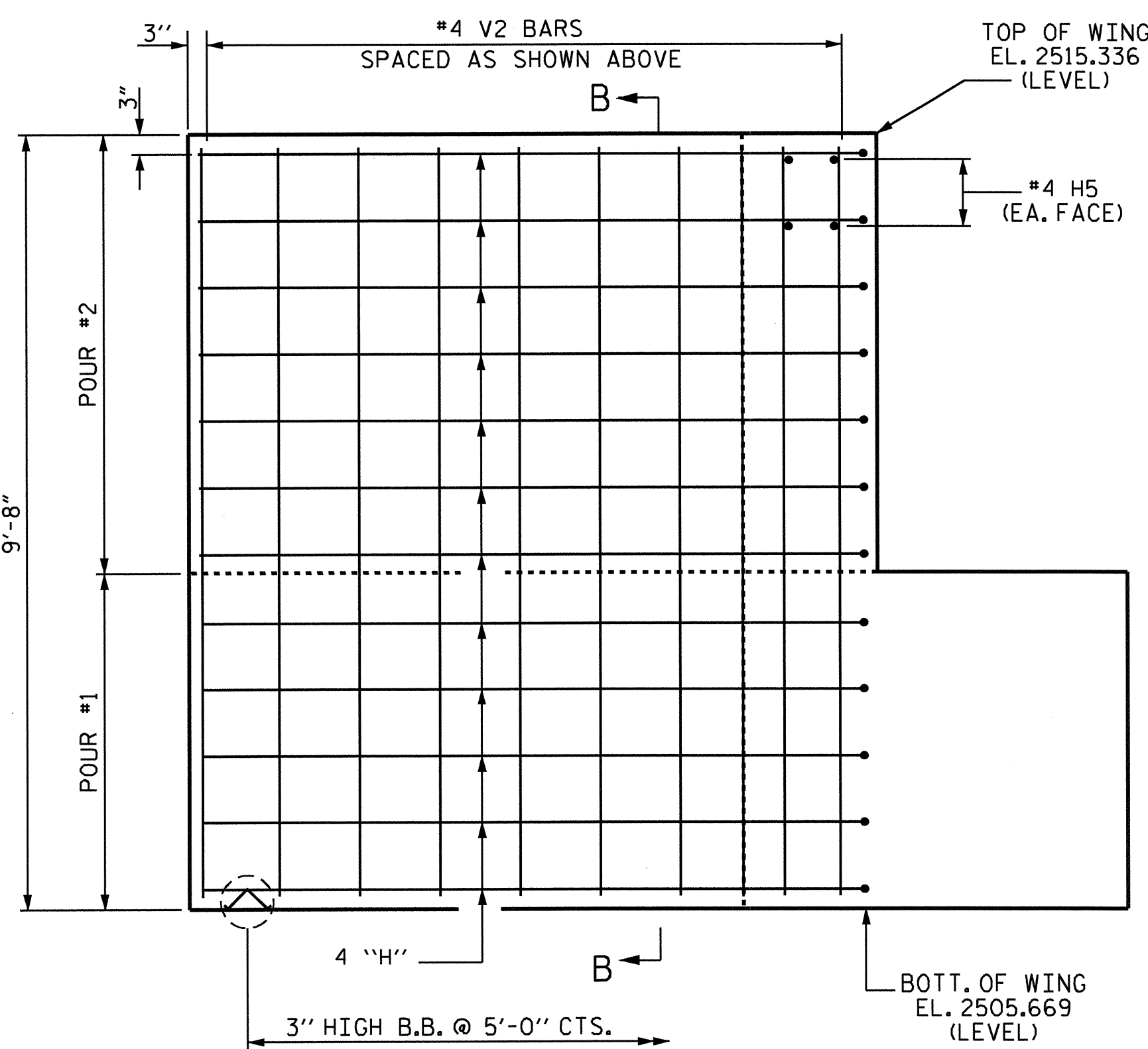
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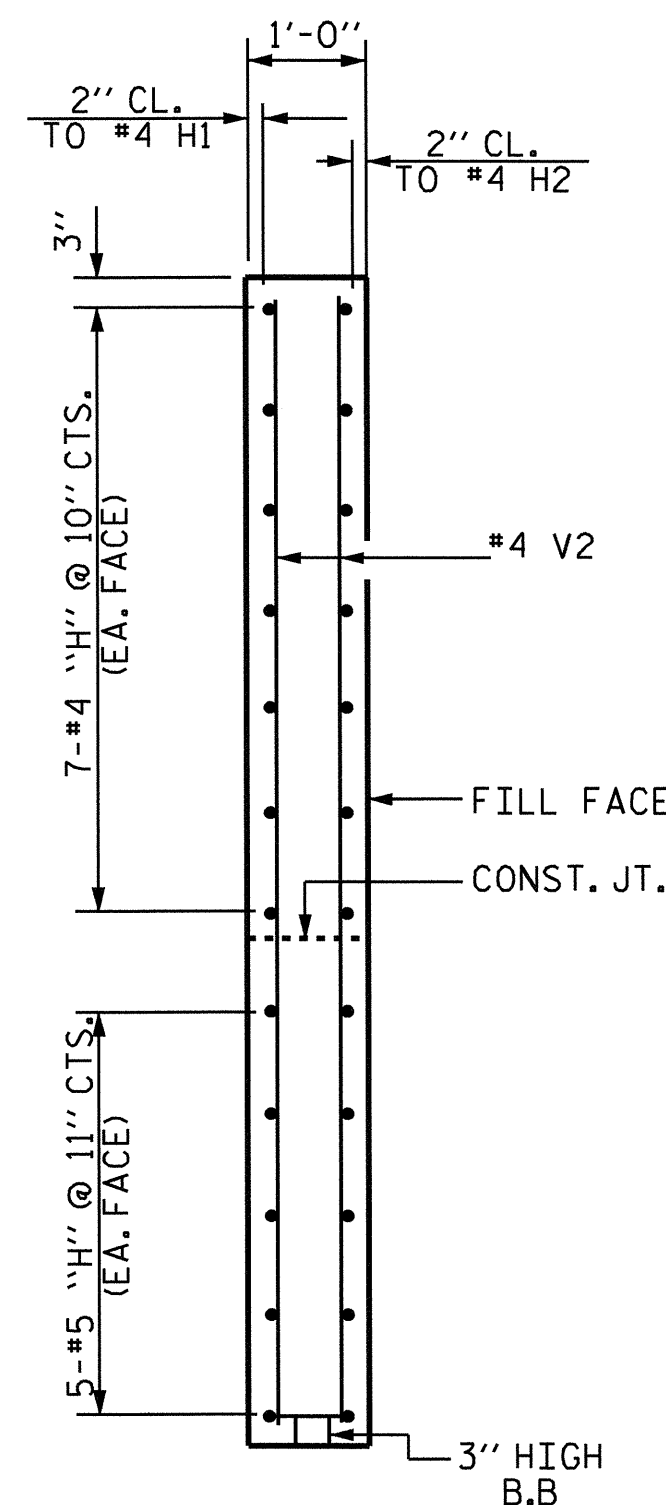
PLAN OF WING (W1)



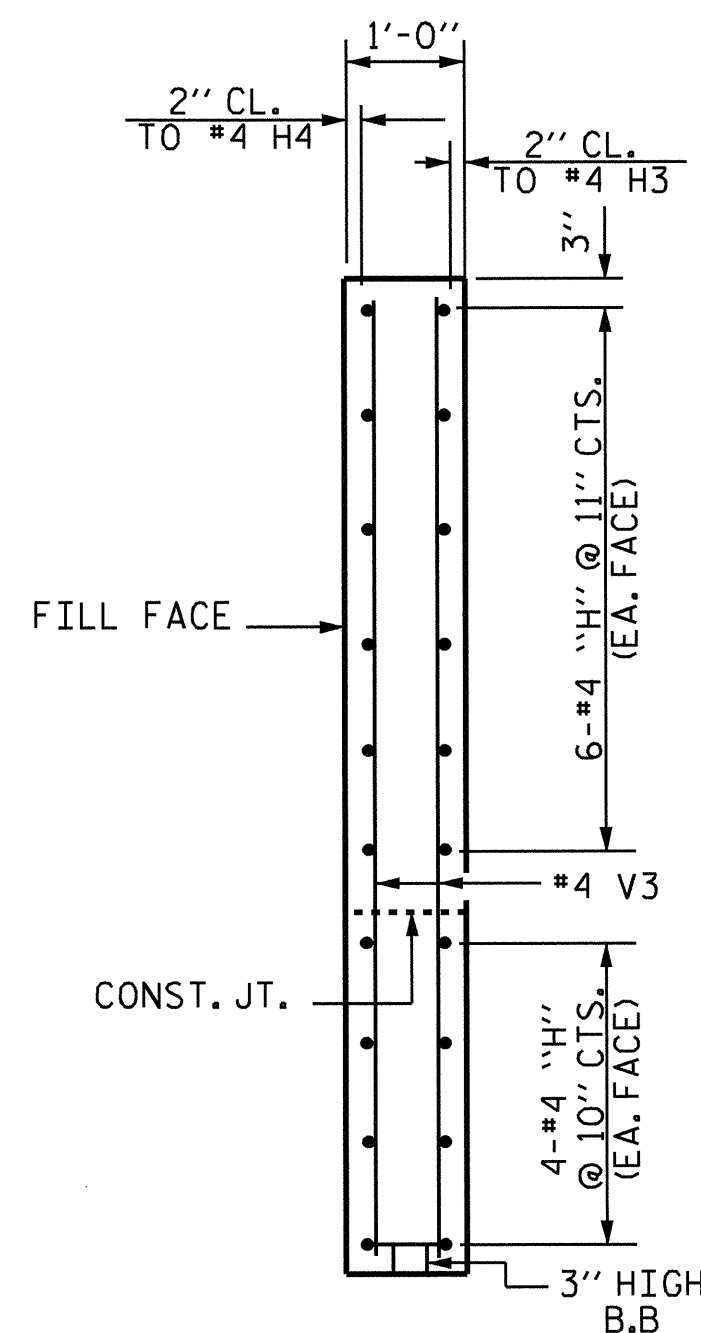
PLAN OF WING (W2)



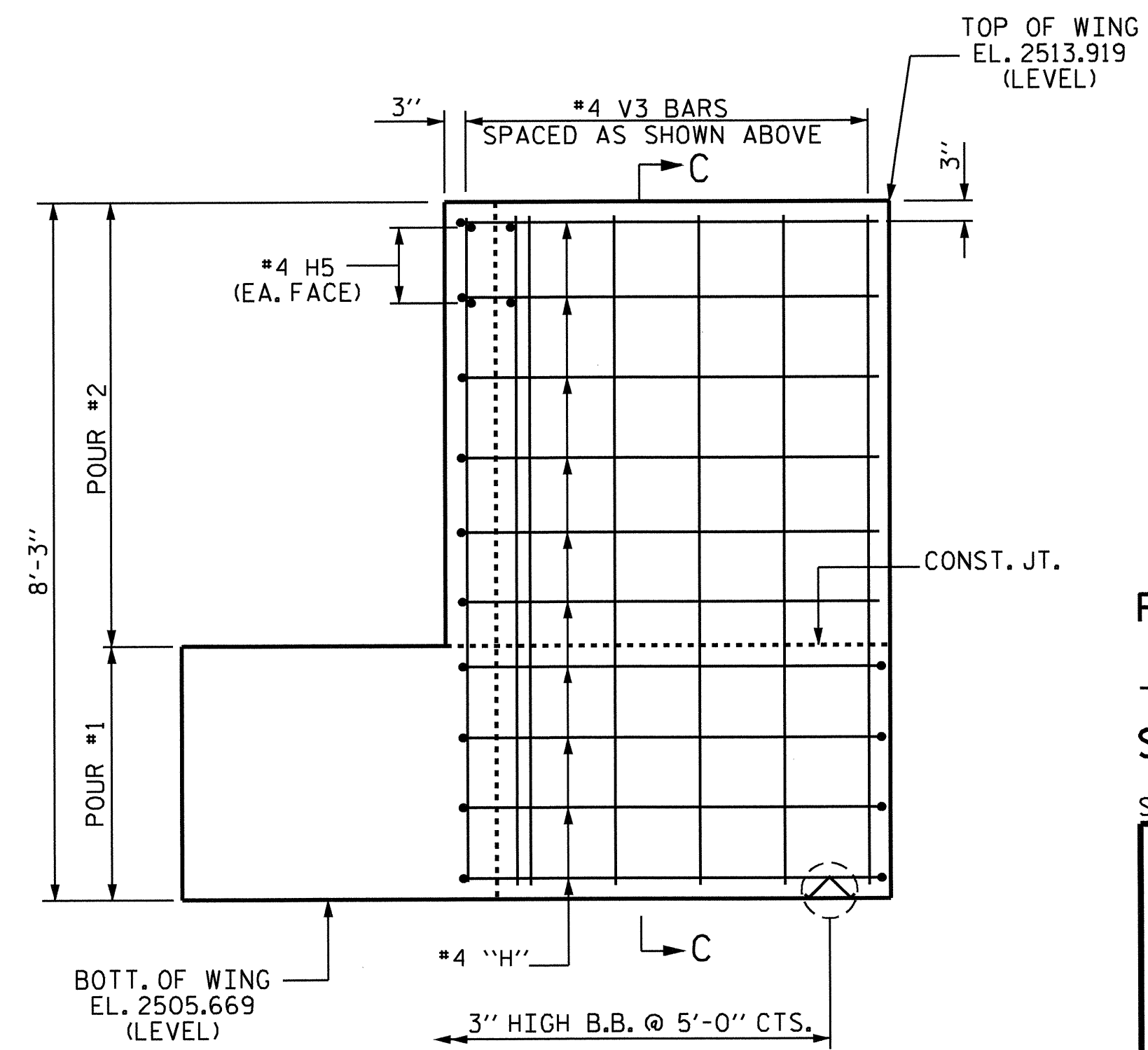
ELEVATION OF WING (W1)



SECTION B-B



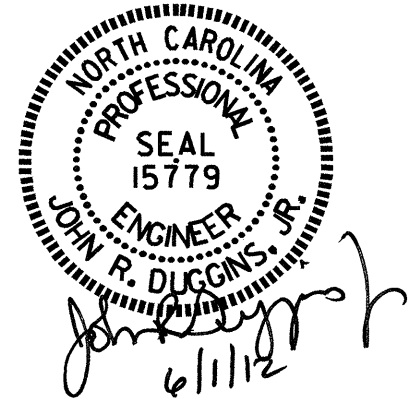
SECTION C-C



ELEVATION OF WING (W2)

DRAWN BY : M. POOLE DATE : 06/11
 CHECKED BY : S.W. PEARCE DATE : 06/11

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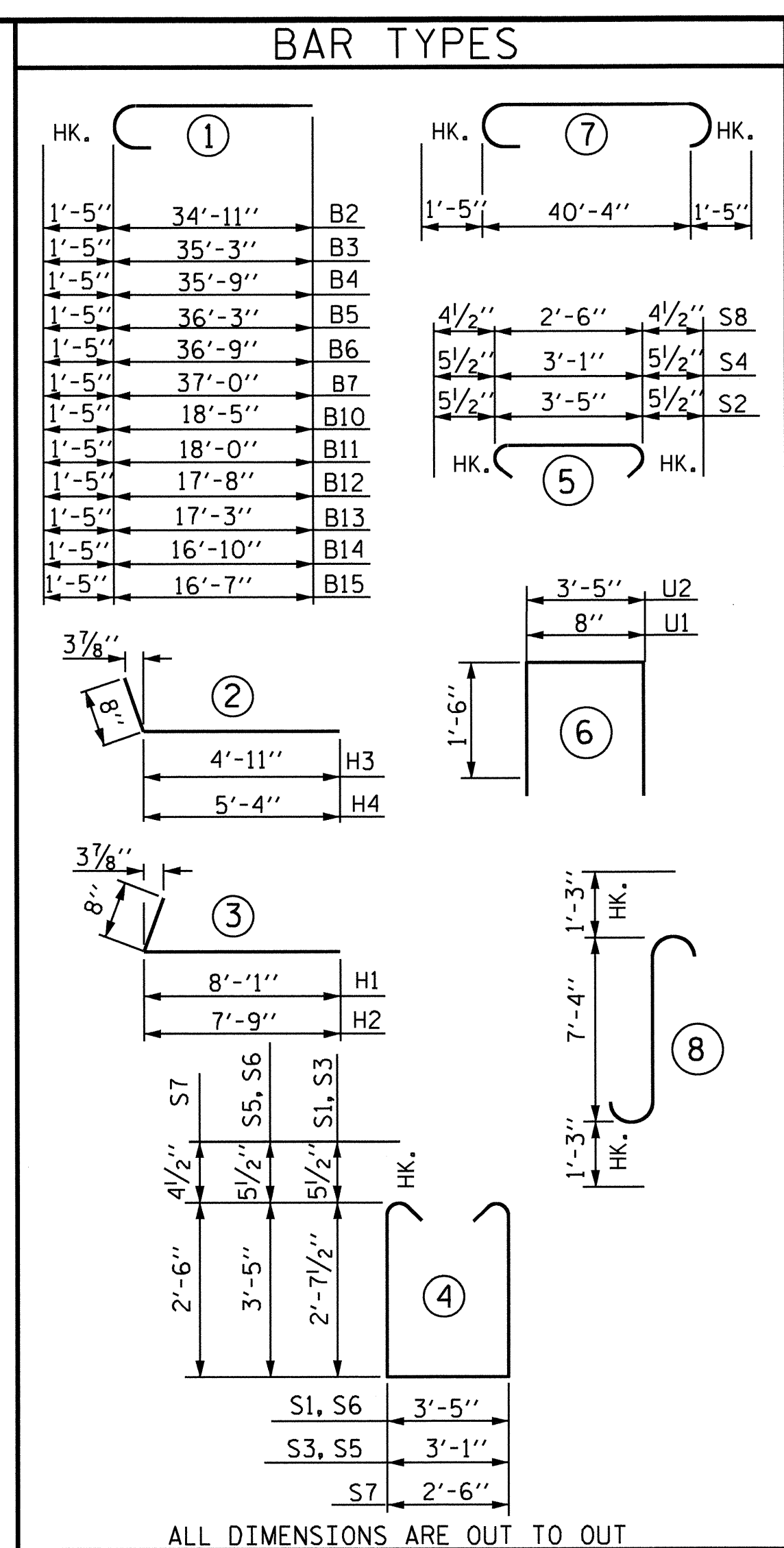
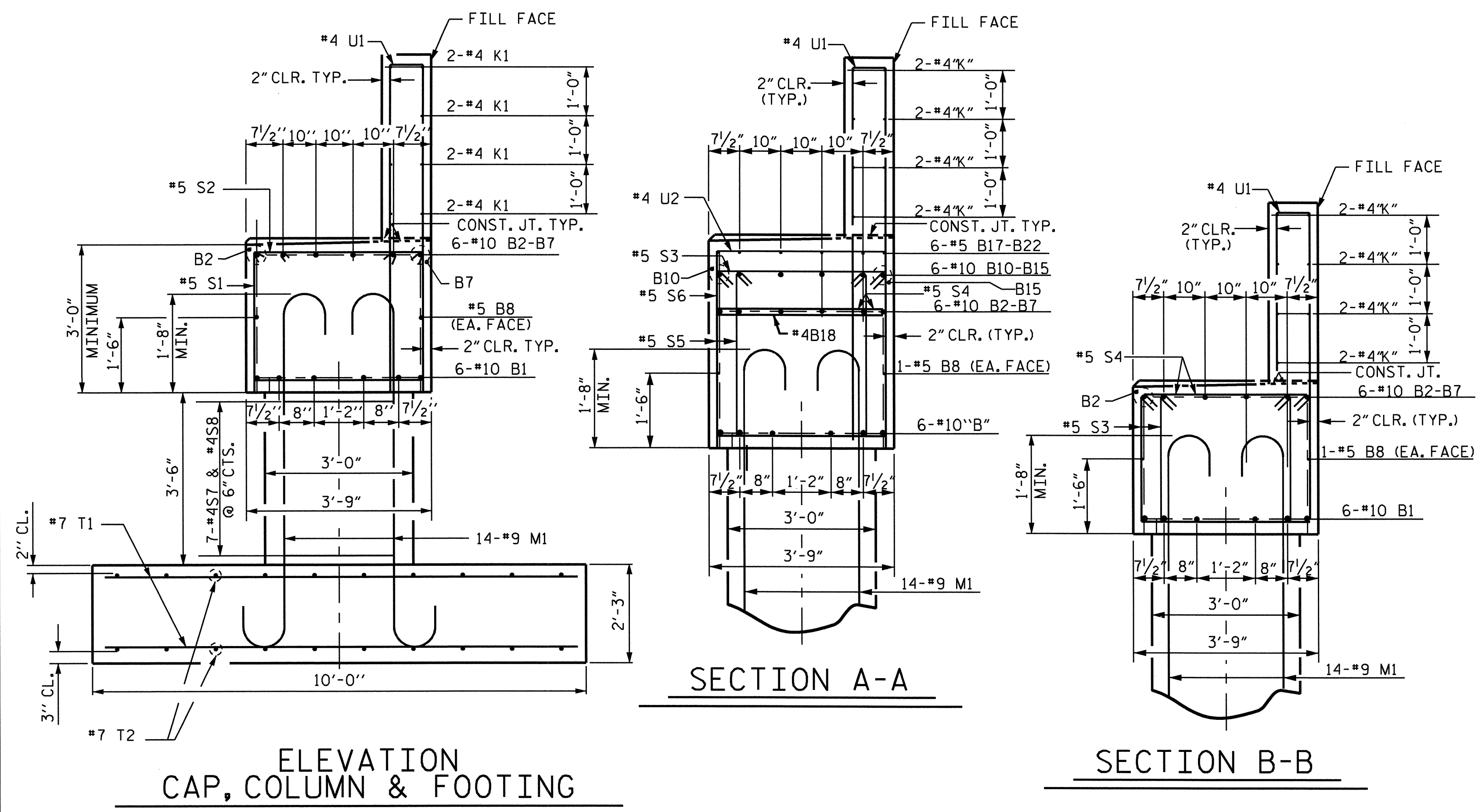
PROJECT NO. B-4162
 JACKSON COUNTY
 STATION: 18+31.08 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

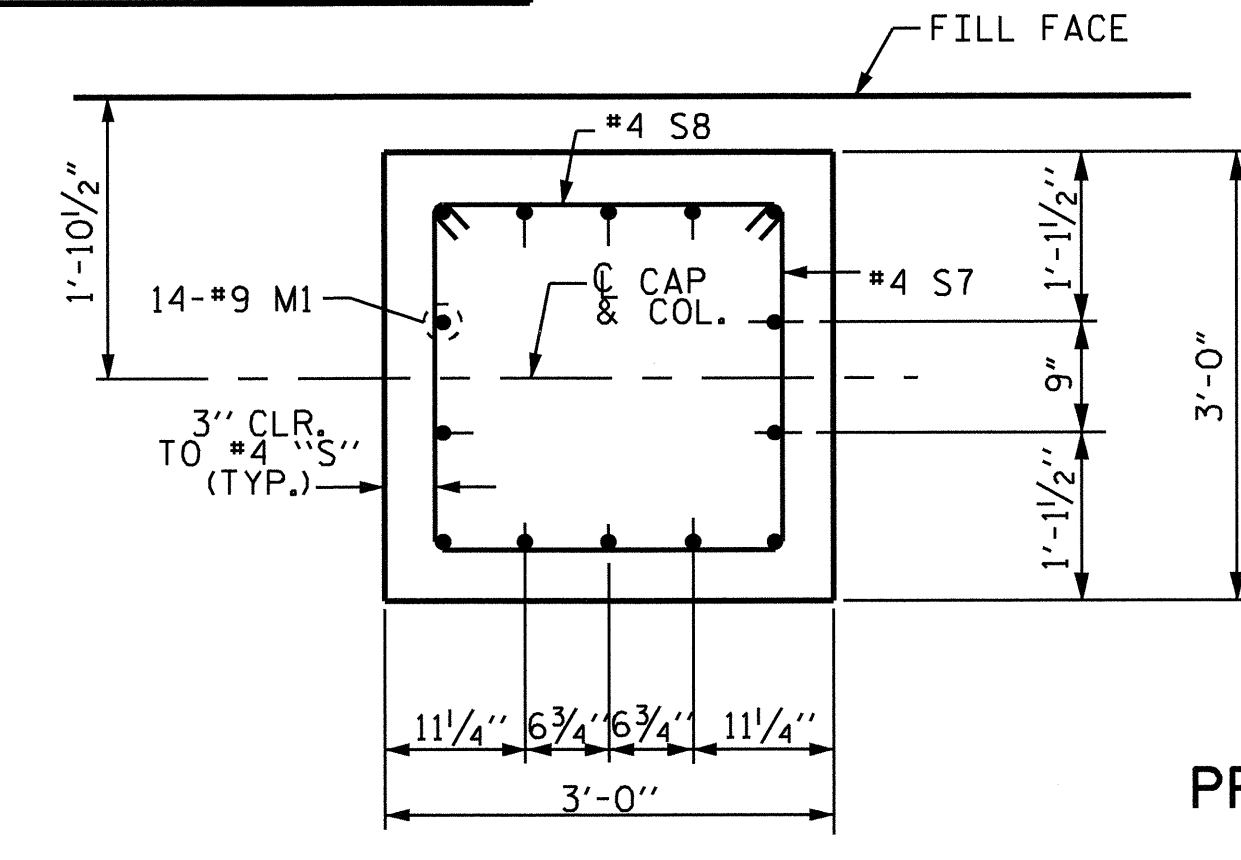
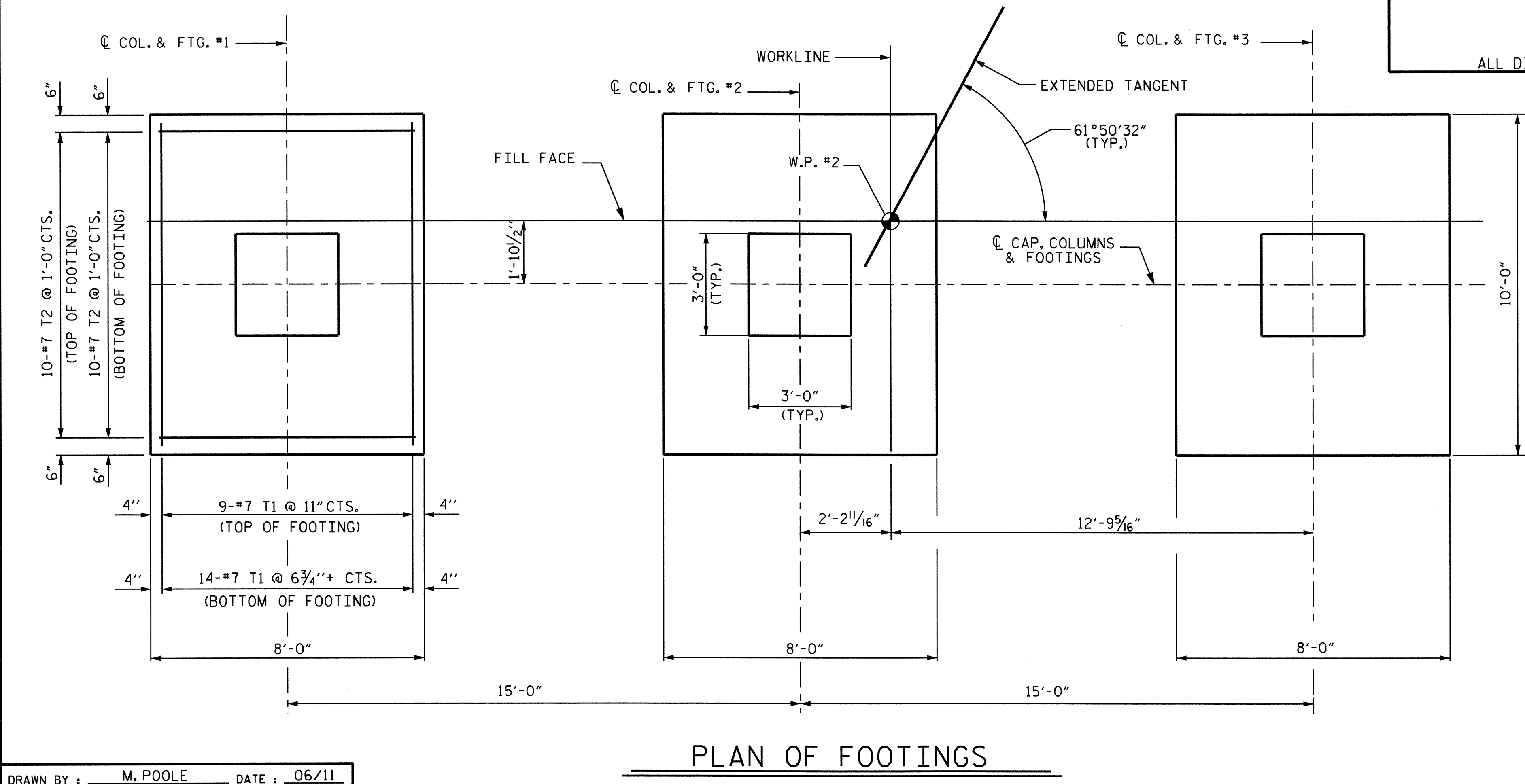
SUBSTRUCTURE
 END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-21
2			4			TOTAL SHEETS 24



BILL OF MATERIAL											
END BENT No. 2											
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	7	43'-2"	1114	S1	10	#5	4	9'-7"	100
B2	1	#10	1	36'-4"	156	S2	18	#5	5	4'-4"	81
B3	1	#10	1	36'-8"	158	S3	24	#5	4	9'-3"	232
B4	1	#10	1	37'-2"	160	S4	48	#5	5	4'-0"	200
B5	1	#10	1	37'-8"	162	S5	24	#5	4	10'-10"	271
B6	1	#10	1	38'-2"	164	S6	8	#5	4	11'-2"	93
B7	1	#10	1	38'-5"	165	S7	21	#4	4	8'-3"	116
B8	2	#5	STR	40'-6"	84	S8	21	#4	5	3'-3"	46
B9	6	#5	STR	10'-8"	67						
B10	1	#10	1	19'-10"	85	T1	69	#7	STR	9'-8"	1363
B11	1	#10	1	19'-5"	84	T2	60	#7	STR	7'-8"	940
B12	1	#10	1	19'-1"	82						
B13	1	#10	1	18'-8"	80	U1	29	#4	6	3'-8"	71
B14	1	#10	1	18'-3"	79	U2	8	#4	6	6'-5"	34
B15	1	#10	1	18'-0"	77						
B16	2	#5	STR	8'-6"	18	V1	58	#5	STR	6'-2"	373
B17	6	#5	STR	8'-11"	56	V2	30	#4	STR	9'-4"	187
B18	5	#4	STR	3'-5"	11	V3	24	#4	STR	7'-11"	127
H1	12	#4	3	8'-9"	70						
H2	12	#4	3	8'-5"	67						
H3	10	#4	2	5'-7"	37						
H4	10	#4	2	6'-0"	40						
H5	8	#4	STR	5'-6"	29						
K1	16	#4	STR	21'-6"	230						
M1	42	#9	8	9'-10"	1404						

REINFORCING STEEL		8913 LBS.
CLASS A CONCRETE BREAKDOWN		
POUR 1 (FOOTINGS)		20.0 C.Y.
POUR 2 (COLUMNS)		3.5 C.Y.
POUR 3 (CAP & LOWER WINGS)		22.0 C.Y.
POUR 4 (BACKWALL & UPPER WINGS)		8.6 C.Y.
TOTAL		54.1 C.Y.
FOUNDATION EXCAVATION		LUMP SUM



PROJECT NO. B-4162
 JACKSON COUNTY
 STATION: 18+31.08 -L-

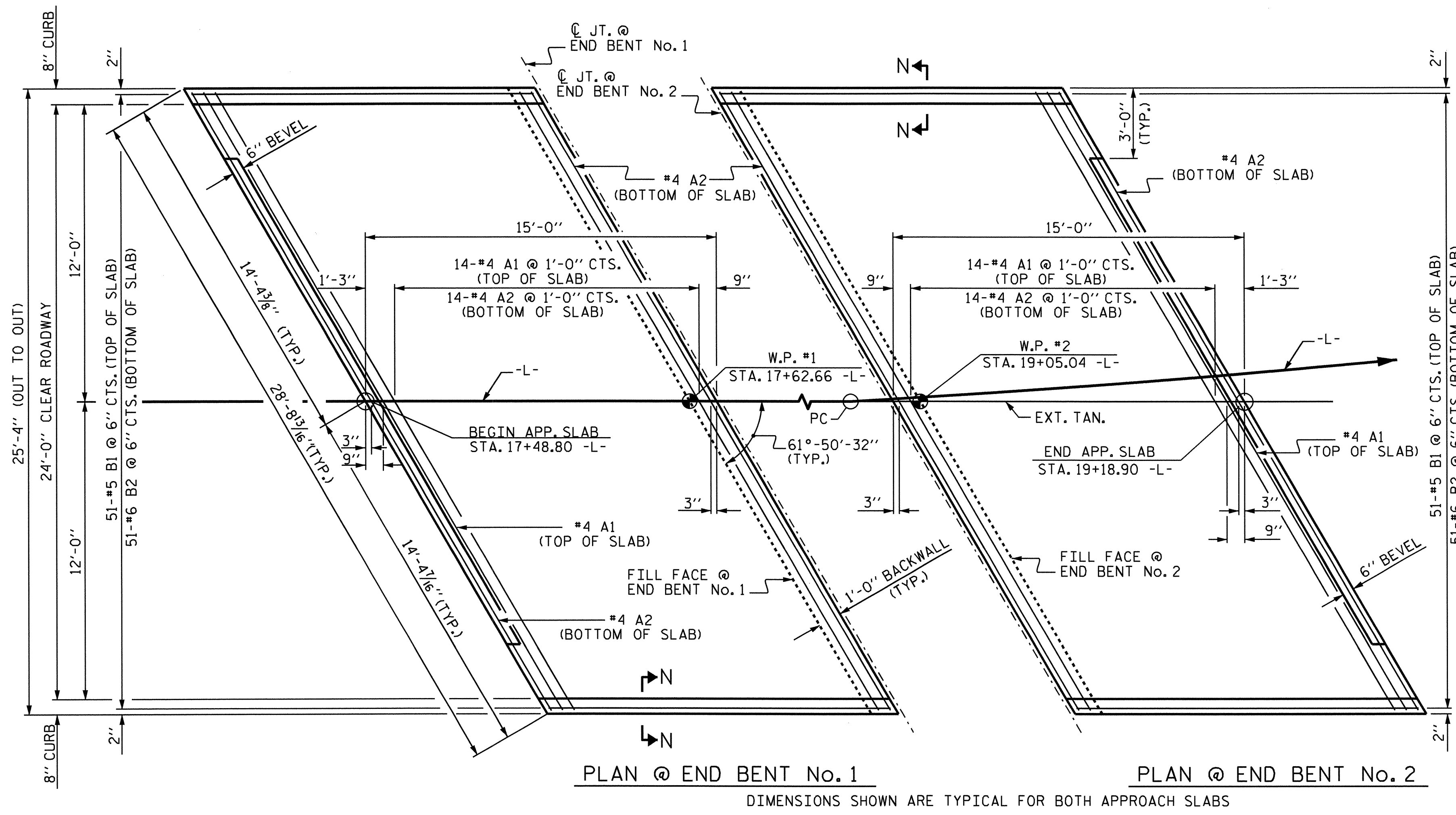
SHEET 3 OF 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			24

DRAWN BY: M. POOLE DATE: 06/11
 CHECKED BY: S.W. PEARCE DATE: 07/11

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NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.

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

#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

#78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

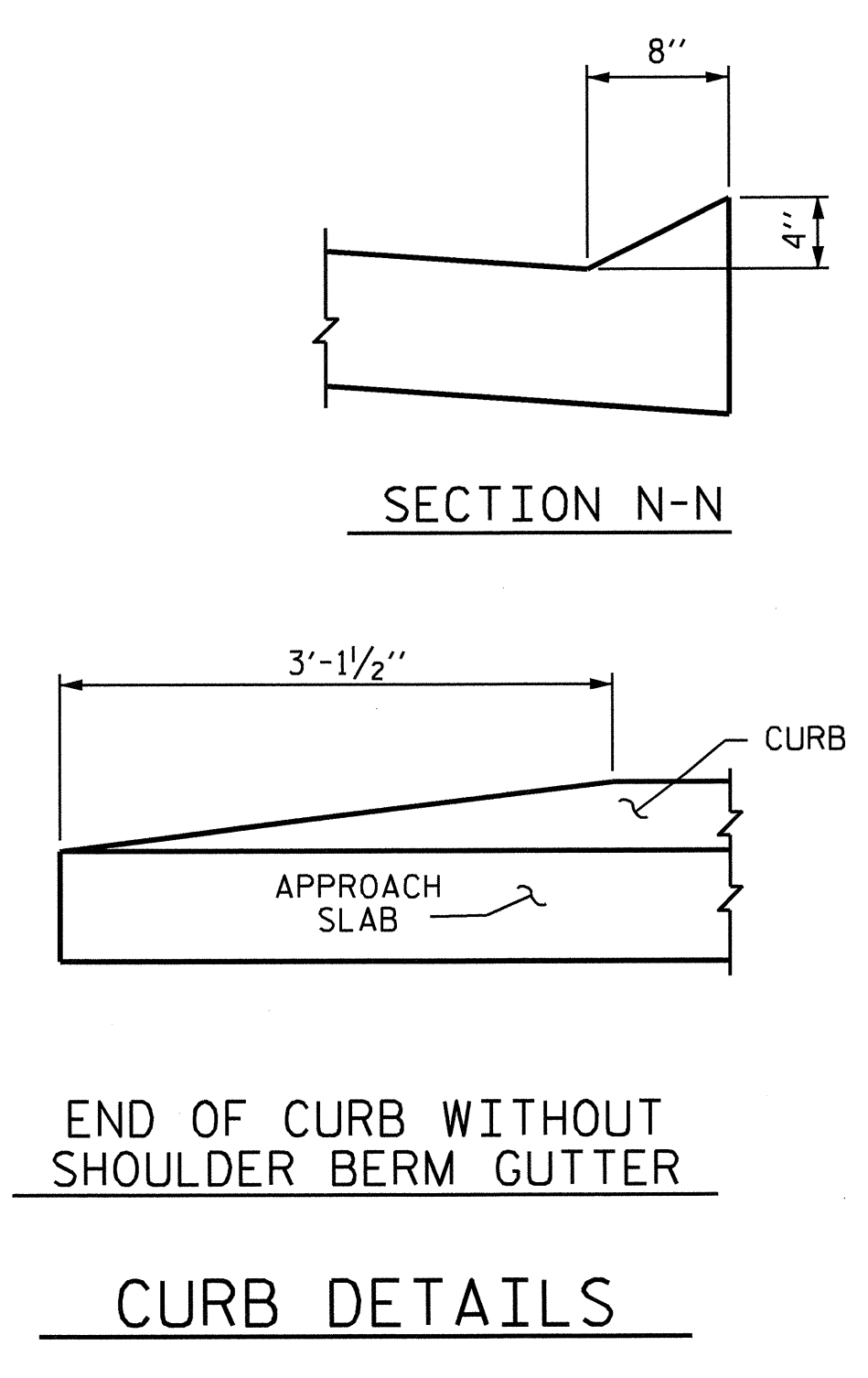
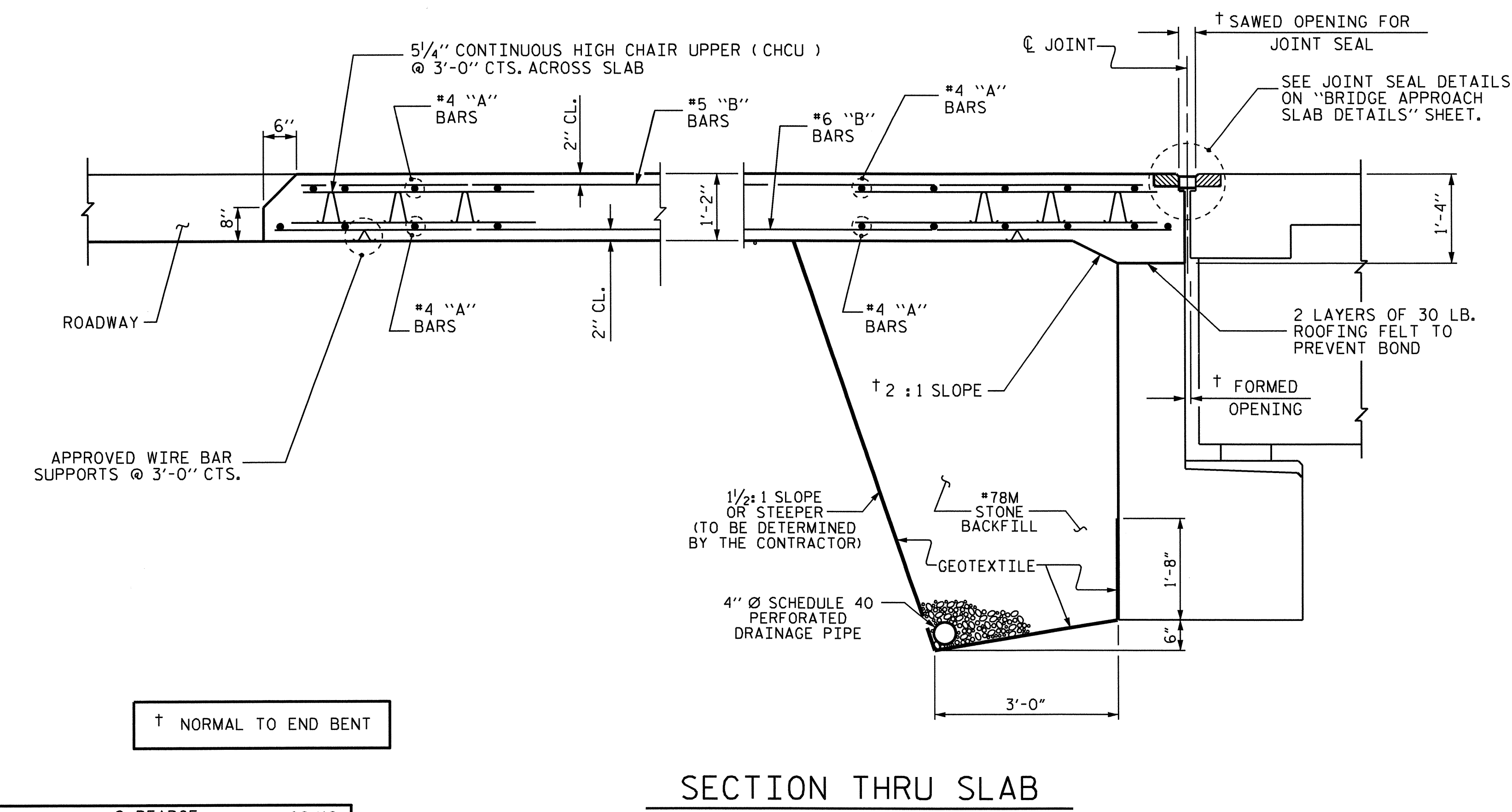
WITH FOAM JOINT SEAL

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2 1/2".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL					
APPROACH SLAB AT EB No. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	15	#4	STR	28'-4"	284
A2	16	#4	STR	28'-4"	303
* B1	51	#5	STR	13'-7"	723
B2	51	#6	STR	14'-7"	1117
REINFORCING STEEL				LBS.	1420
* EPOXY COATED REINFORCING STEEL				LBS.	1007
CLASS AA CONCRETE				C. Y.	16.6
APPROACH SLAB AT EB No. 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	15	#4	STR	28'-4"	284
A2	16	#4	STR	28'-4"	303
* B1	51	#5	STR	13'-7"	723
B2	51	#6	STR	14'-7"	1117
REINFORCING STEEL				LBS.	1420
* EPOXY COATED REINFORCING STEEL				LBS.	1007
CLASS AA CONCRETE				C. Y.	16.6

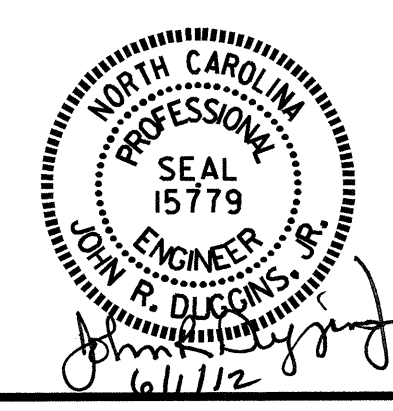


PROJECT NO. B-4162
JACKSON COUNTY
 STATION: 18+31.08 -L-

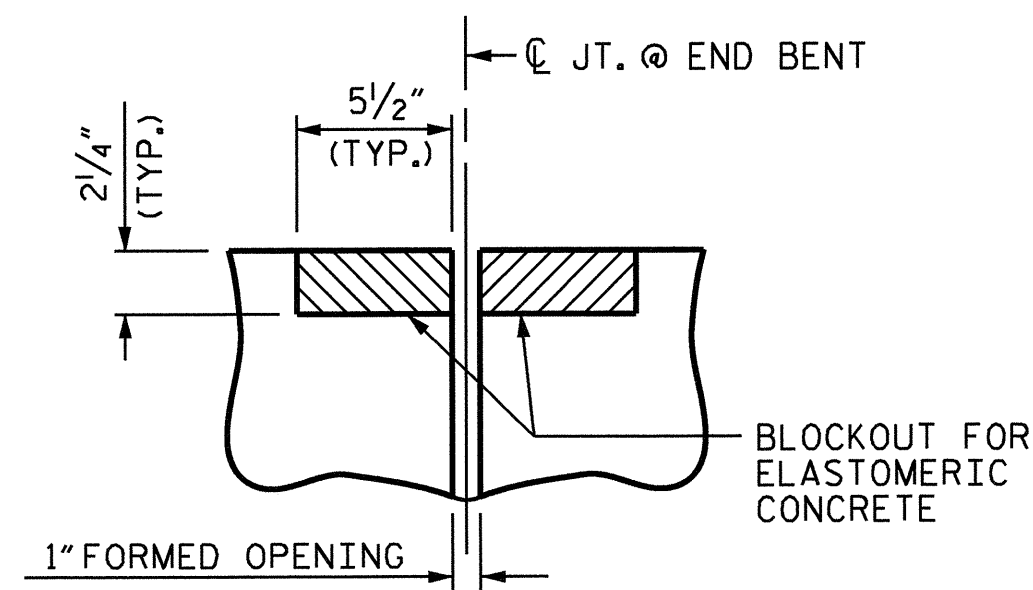
SHEET 1 OF 2

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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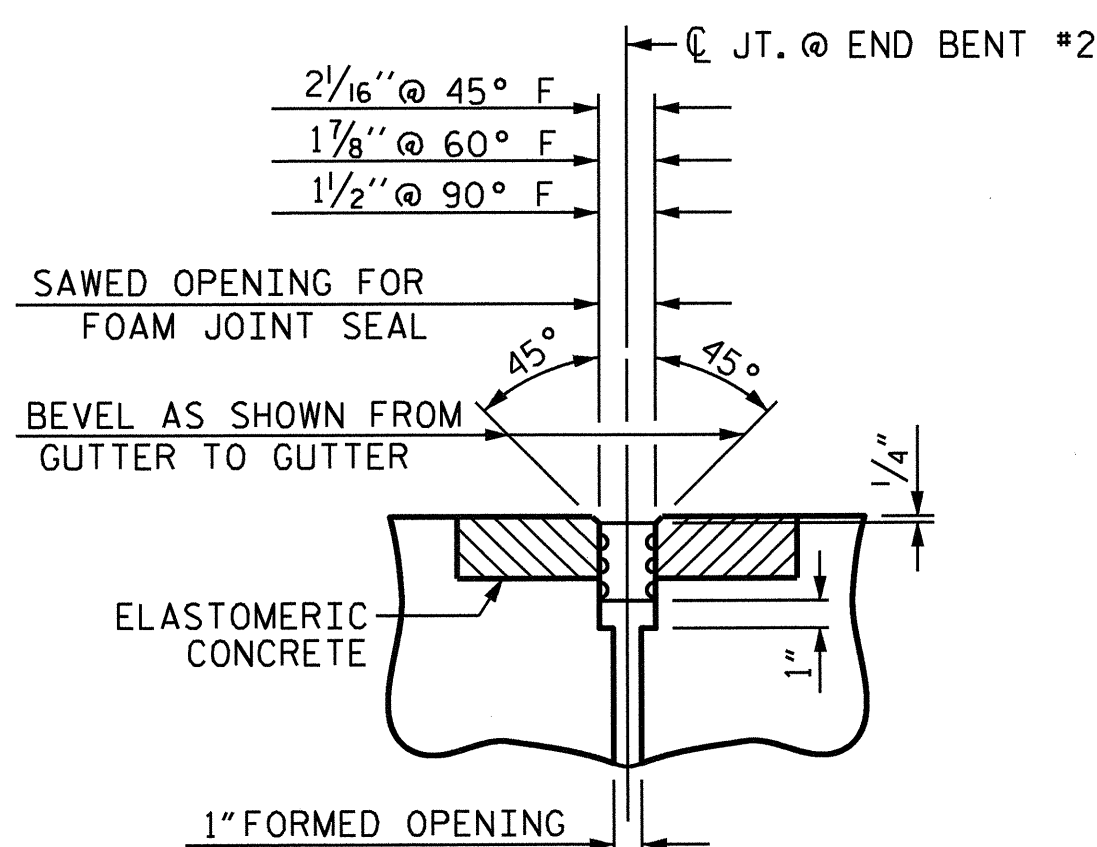
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 TOTAL SHEETS 24



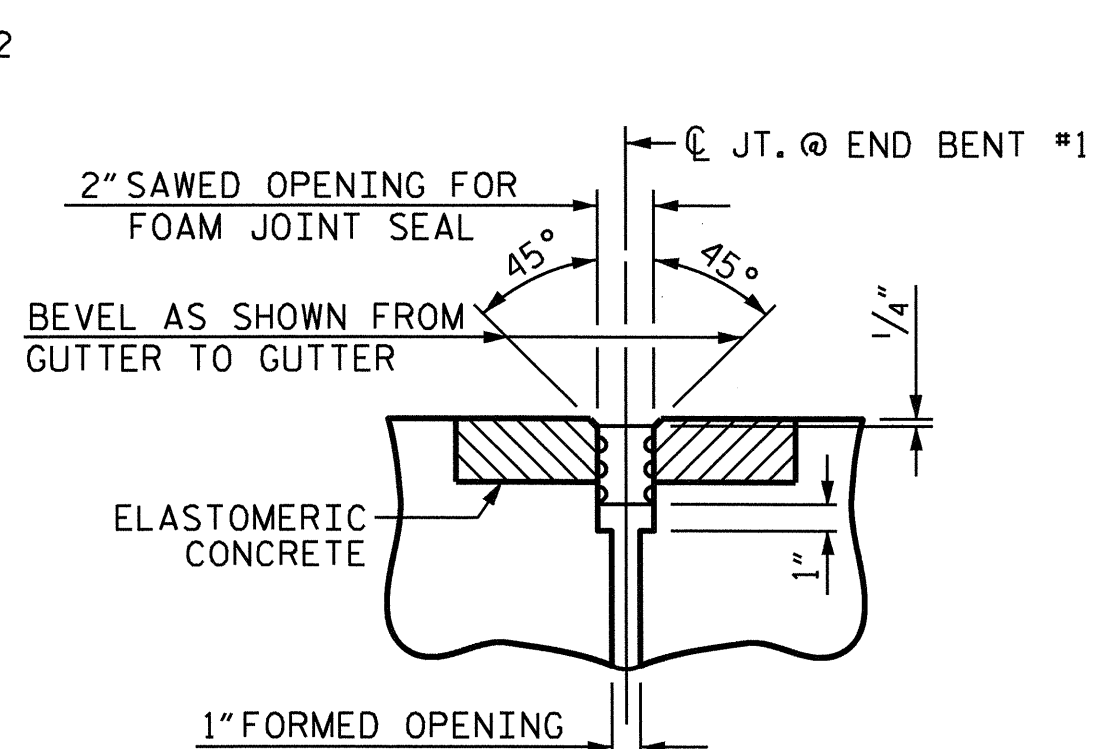
ASSEMBLED BY : S. PEARCE DATE : 02/12
 CHECKED BY : J.R. DUGGINS DATE : 03/12
 DRAWN BY : EEM 3/95 REV. 7/10/01 LES/RDR
 CHECKED BY : VAP 3/95 REV. 5/7/03R RWW/JTE
 REV. 5/1/06R KMM/GM



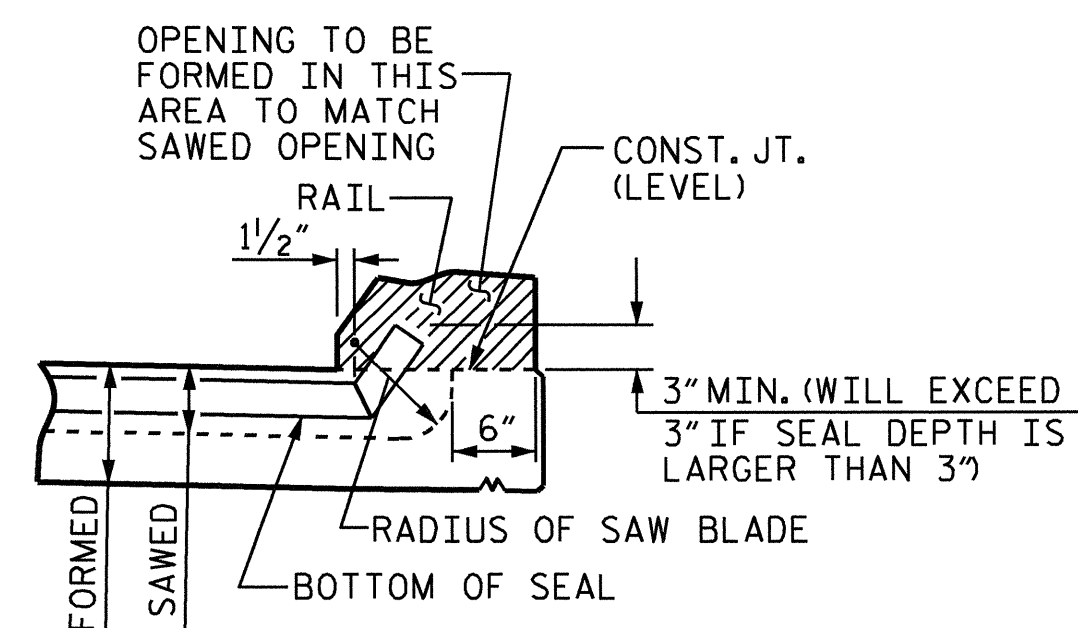
SECTION C-C
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC
CONCRETE DIMENSIONS)



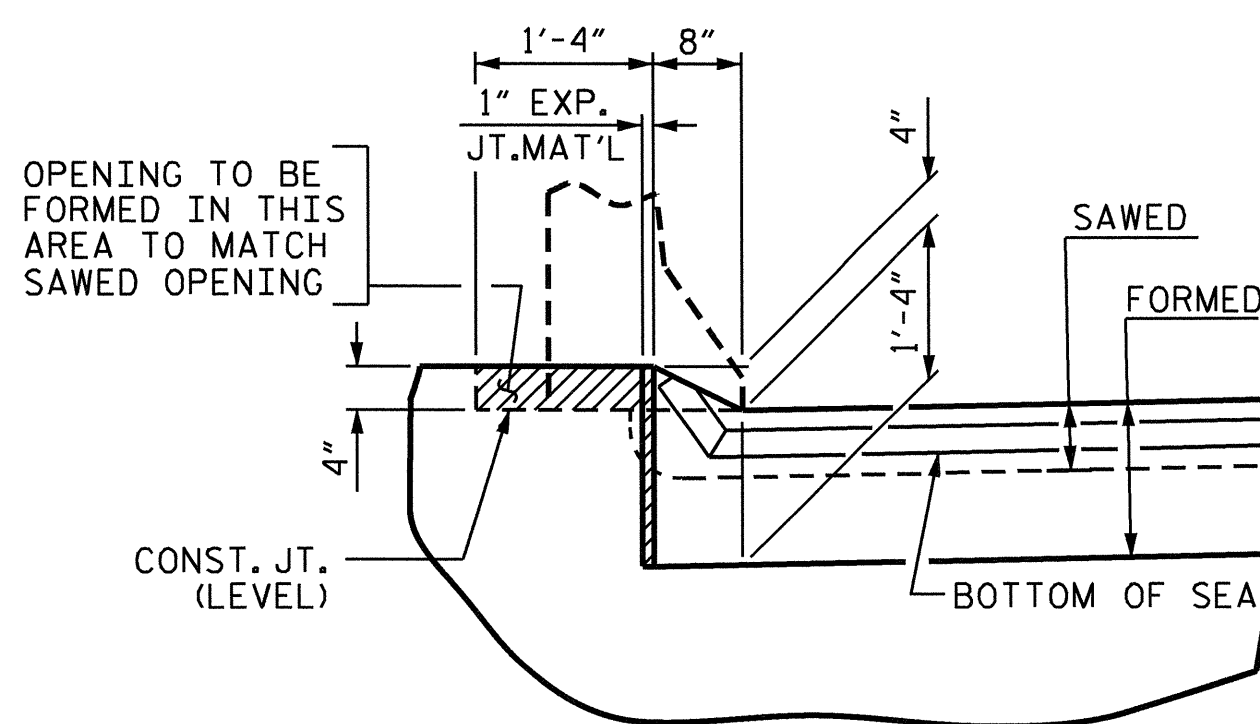
SECTION C-C
FOAM JOINT SEAL
(EXPANSION)



SECTION C-C
FOAM JOINT SEAL
(FIXED)



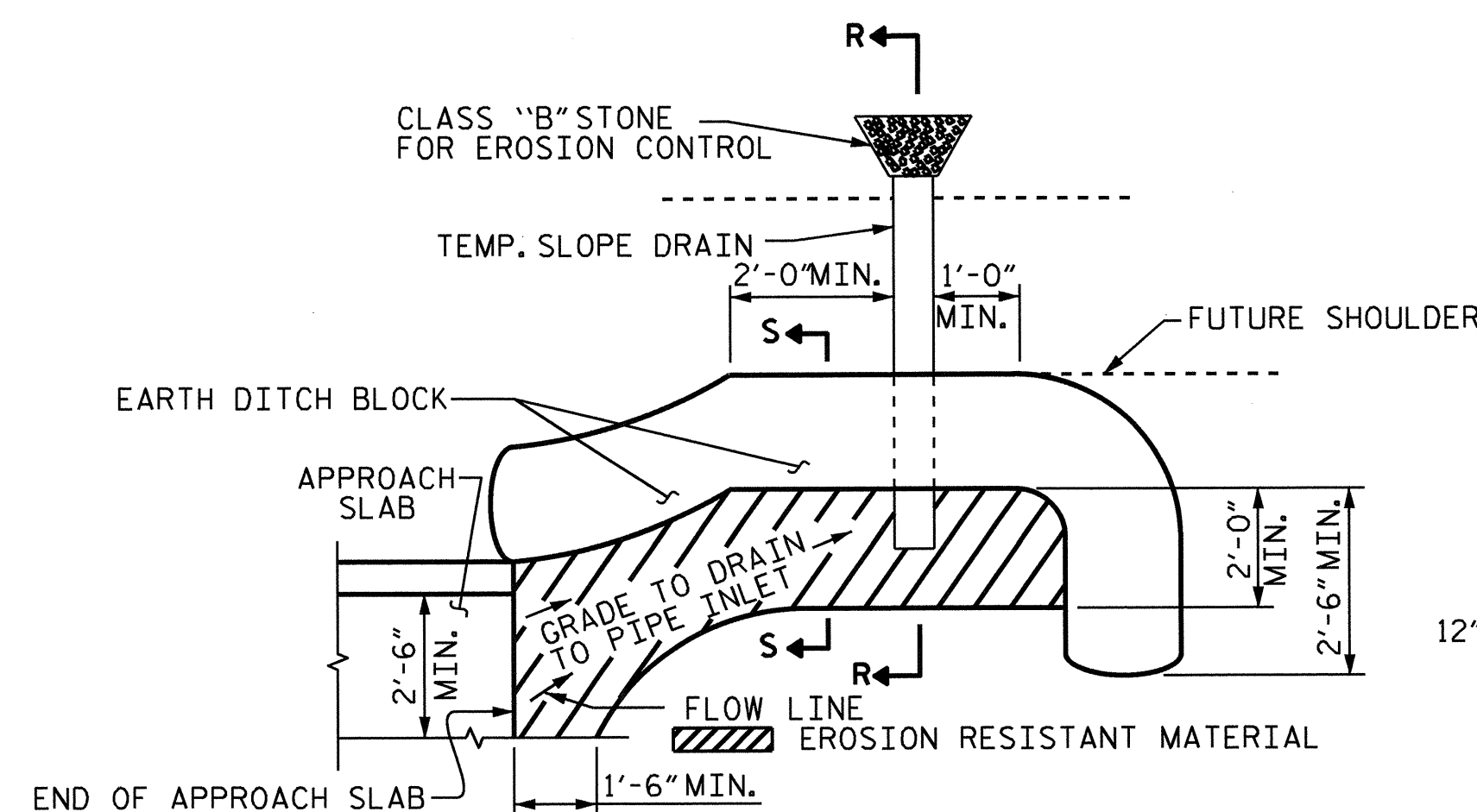
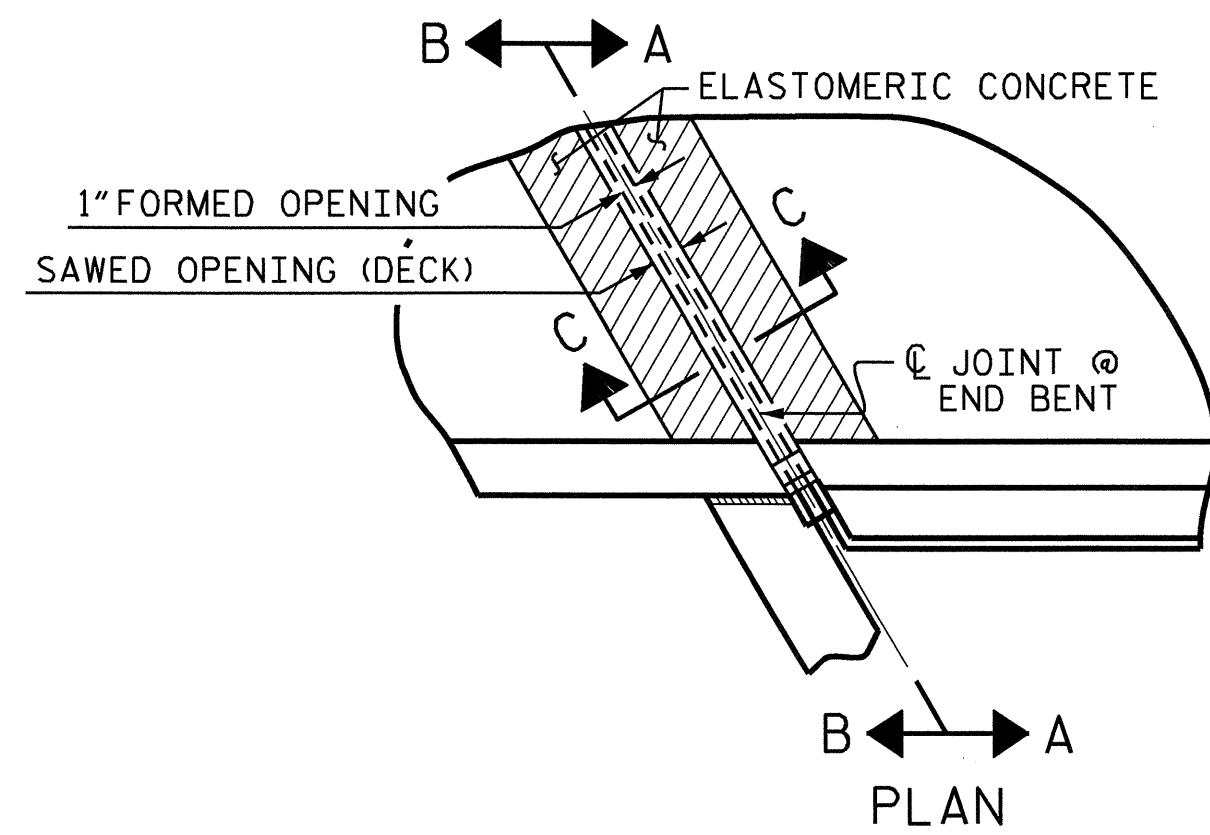
SECTION A-A



SECTION B-B

JOINT SEAL DETAILS @ END BENT

FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.
THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

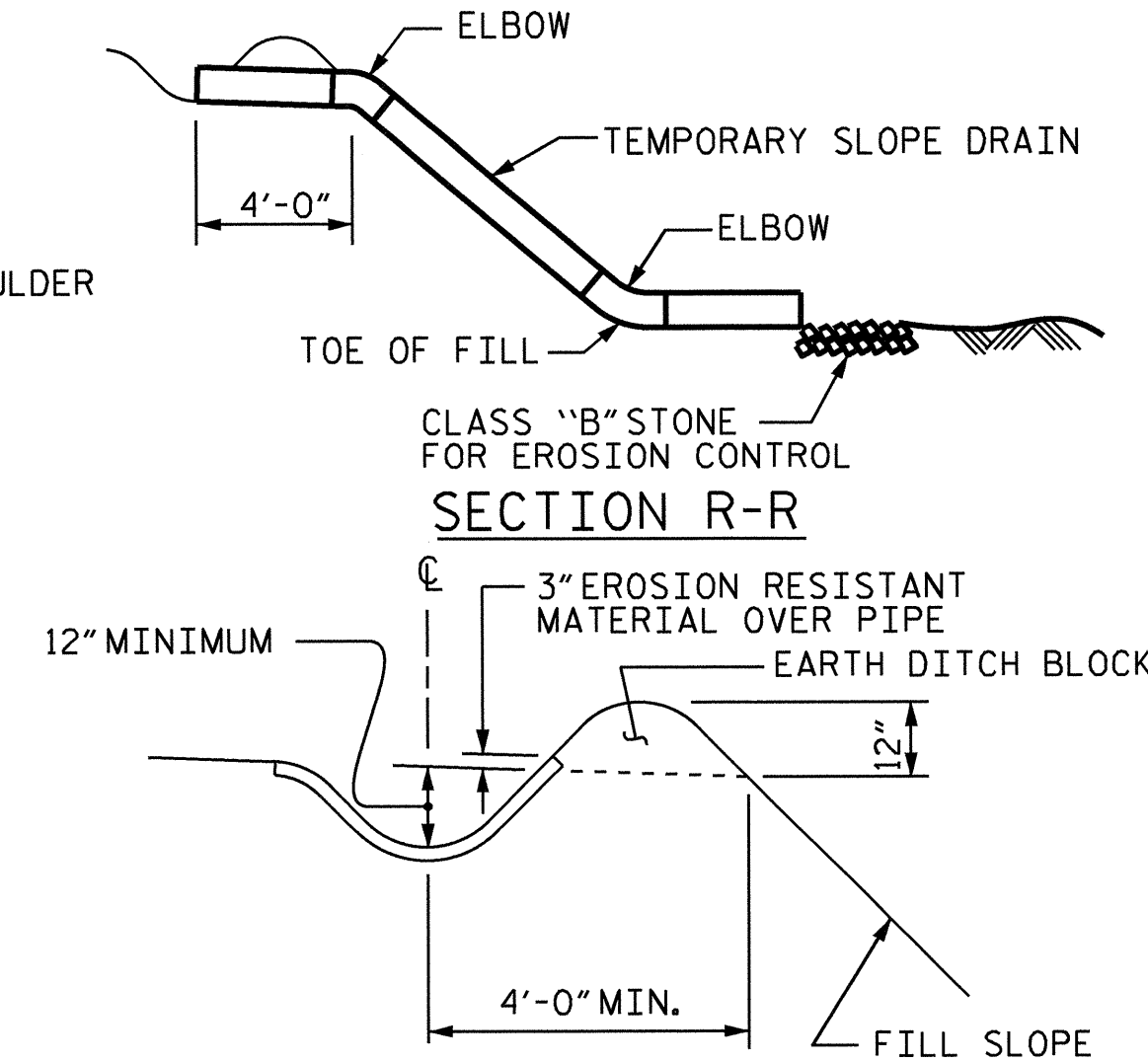


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

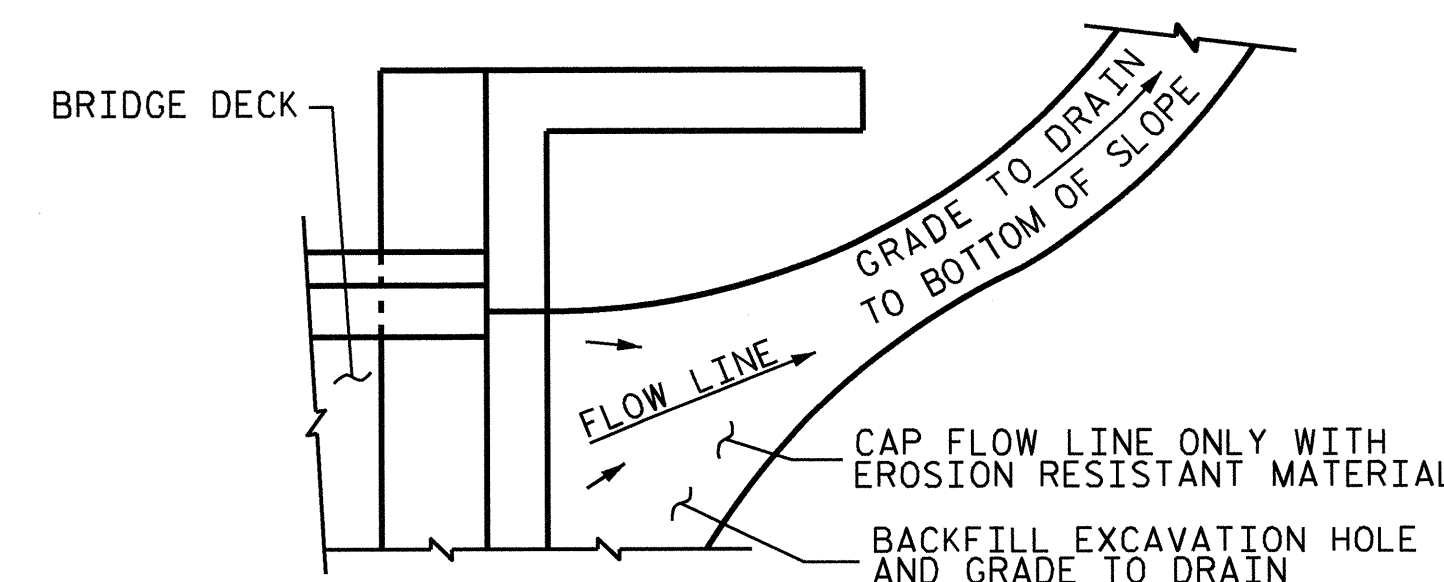
PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION R-R



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

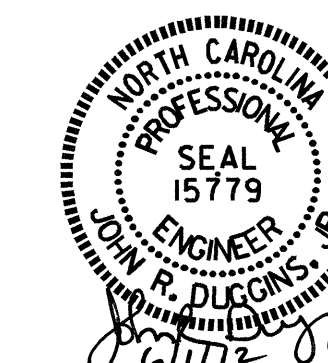
TEMPORARY DRAINAGE DETAIL

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	4.9
2	4.9
TOTAL	9.8

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

ASSEMBLED BY : S. PEARCE DATE : 02/12
CHECKED BY : J.R. DUGGINS DATE : 03/12
DRAWN BY : FCJ 11/88 REV. 5/7/03 RWW/JTE
CHECKED BY : ARB 11/88 REV. 5/1/06RRR MAA/KMM
REV. 10/1/11 MAA/GM

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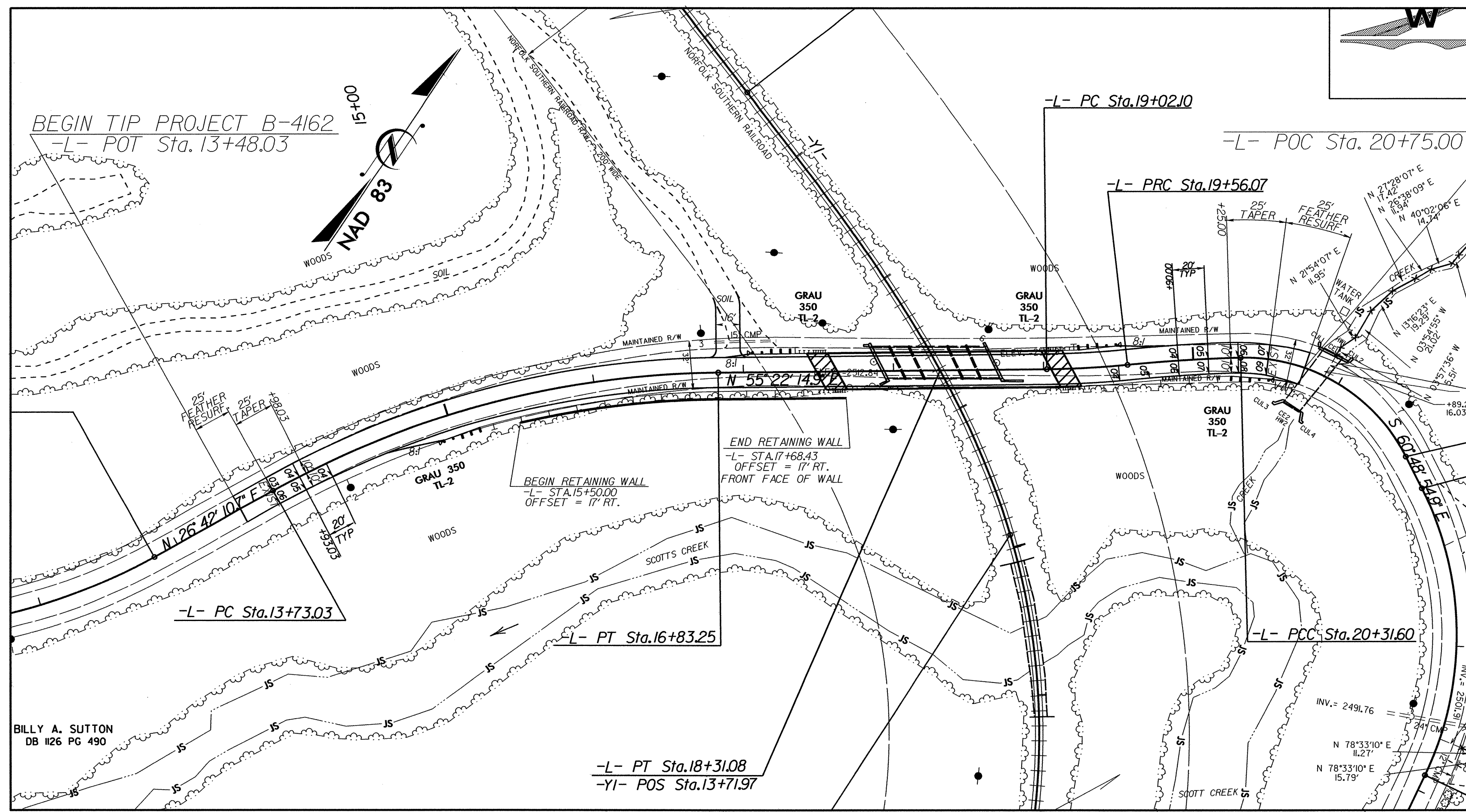


PROJECT NO. **B-4162**
JACKSON COUNTY
STATION: **18+31.08 -L-**

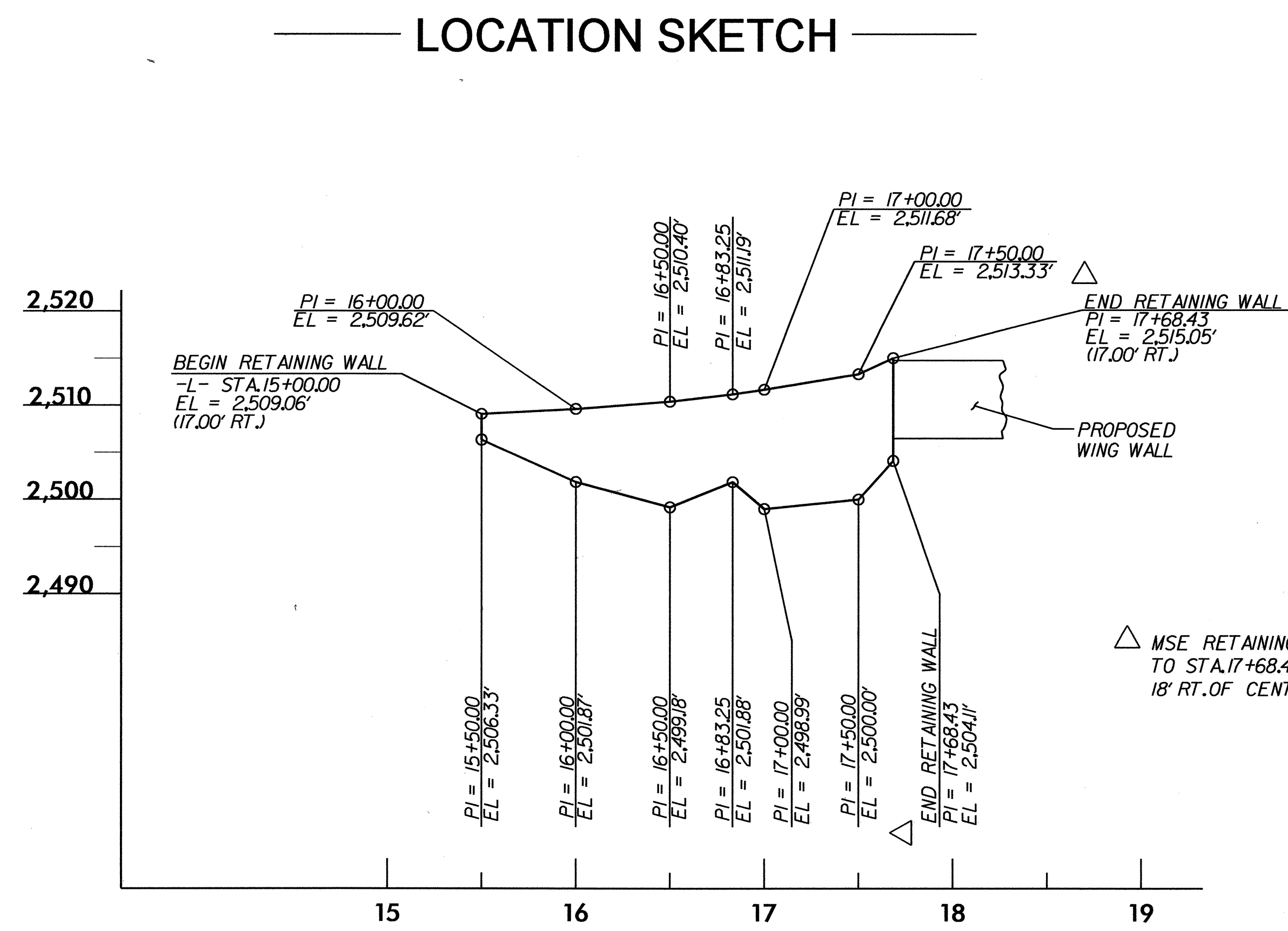
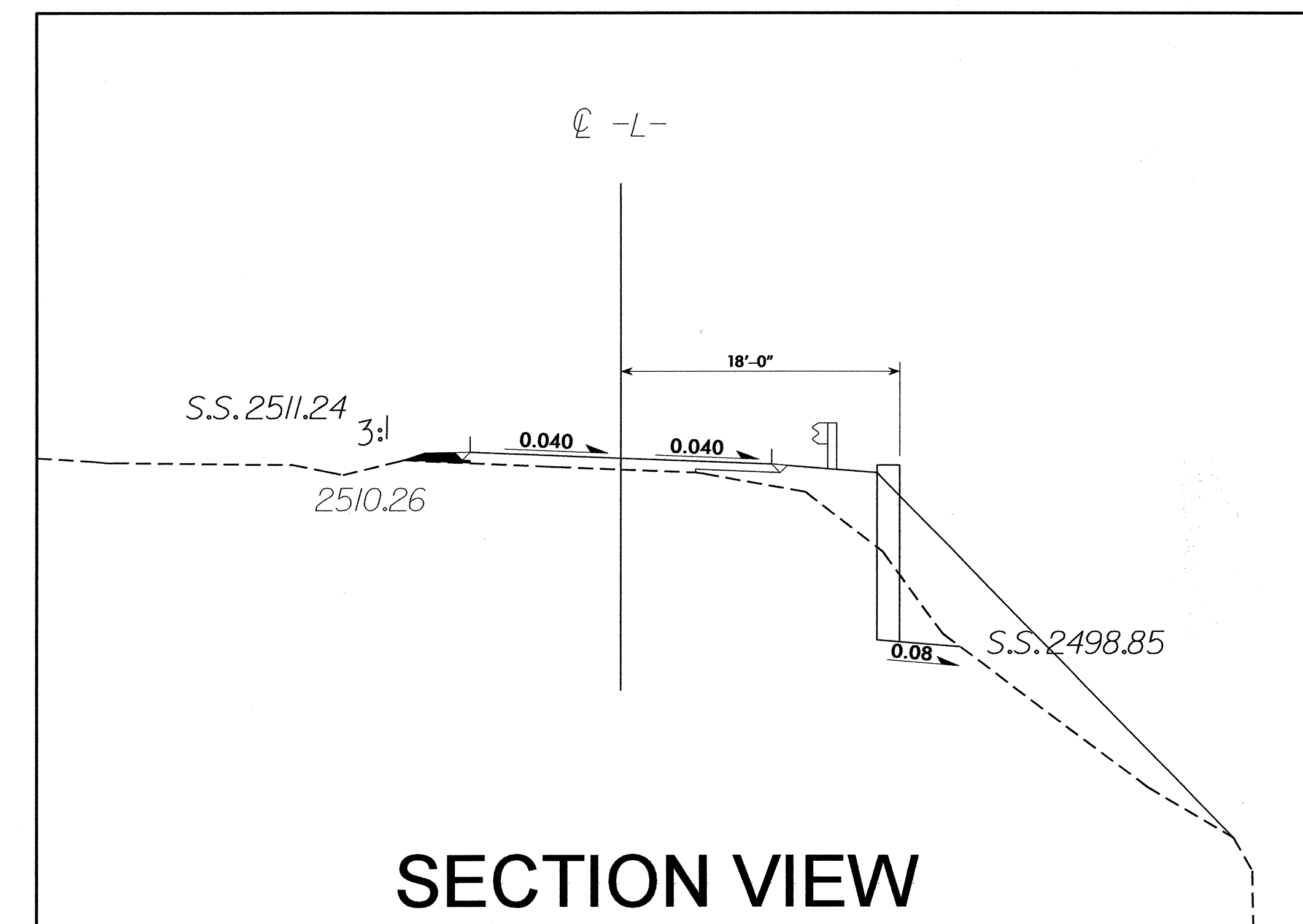
SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						STANDARD BRIDGE APPROACH SLAB DETAILS	
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
1			3			S-24	
2			4			24	

STD. NO. BAS4 (SHT 10)



TOTAL STRUCTURE QUANTITIES
 MSE RETAINING WALL NO. 1 2145 SQ. FT.



△ MSE RETAINING WALL TO EXTEND FROM STA.15+46.42 -L- TO STA.17+68.43 -L- (END OF BRIDGE WING WALL) 18' RT. OF CENTERLINE -L- (FRONT FACE OF MSE WALL)

PROJECT NO.: B-4162
 JACKSON COUNTY
 STATION: 15+50.00 -L- TO 17+68.43 -L-
 SHEET 1 OF 3

MSE RETAINING WALL

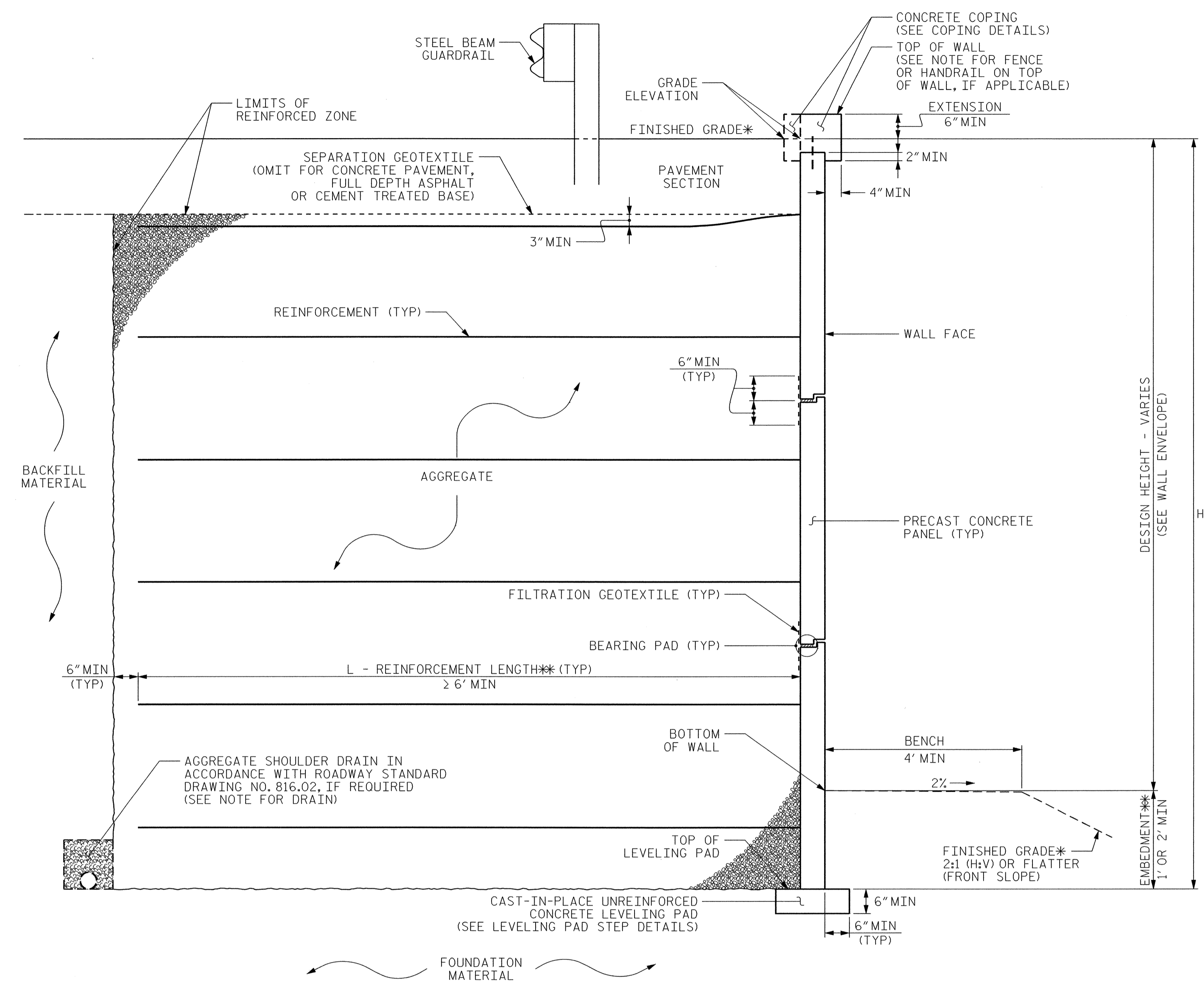
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W=1
1	-	-	3	-	-	TOTAL SHEETS
2	-	-	4	-	-	3

GEOTECHNICAL ENGINEERING UNIT
 EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GEOTECHNICAL ENGINEER

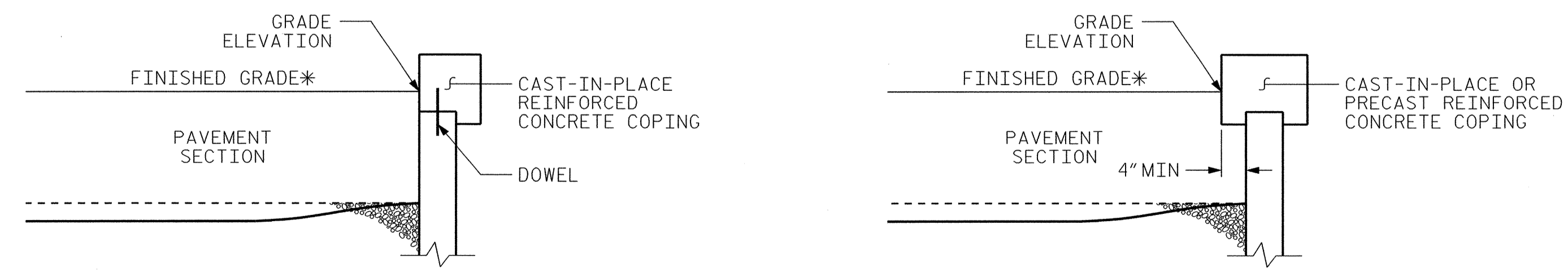
ENGINEER

SEAL 29869
ENGINEER
SHANE C. CLARK
5/2/12
SIGNATURE DATE SIGNATURE DATE



MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
**SEE MSE RETAINING WALLS PROVISION FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.



COPING DETAILS

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS.
*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.

PROJECT NO.: B-4162
JACKSON COUNTY
STATION: 15+50.00 -L- TO 17+68.43 -L-
SHEET 2 OF 3

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

PREPARED BY: EJS DATE: 4/12
REVIEWED BY: SCC DATE: 4/12

NOTES:

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.

FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

USE AN MSE WALL SYSTEM WITH PRECAST CONCRETE PANELS THAT MEET SECTION 1077 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALL.

A ASHLAR ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALL.

A DRAIN IS NOT REQUIRED FOR RETAINING WALL.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALL FOR THE FOLLOWING:

- 1) H = DESIGN HEIGHT + EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 3800 LB/SF
- 4) MINIMUM REINFORCEMENT LENGTH (L) = 11.5 FT
- 5) MINIMUM EMBEDMENT ELEVATION = 2 FT
- 6) AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	125	34	0

*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.

7) IN-SITU ASSUMED MATERIAL PARAMETERS:


MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	120	30	0

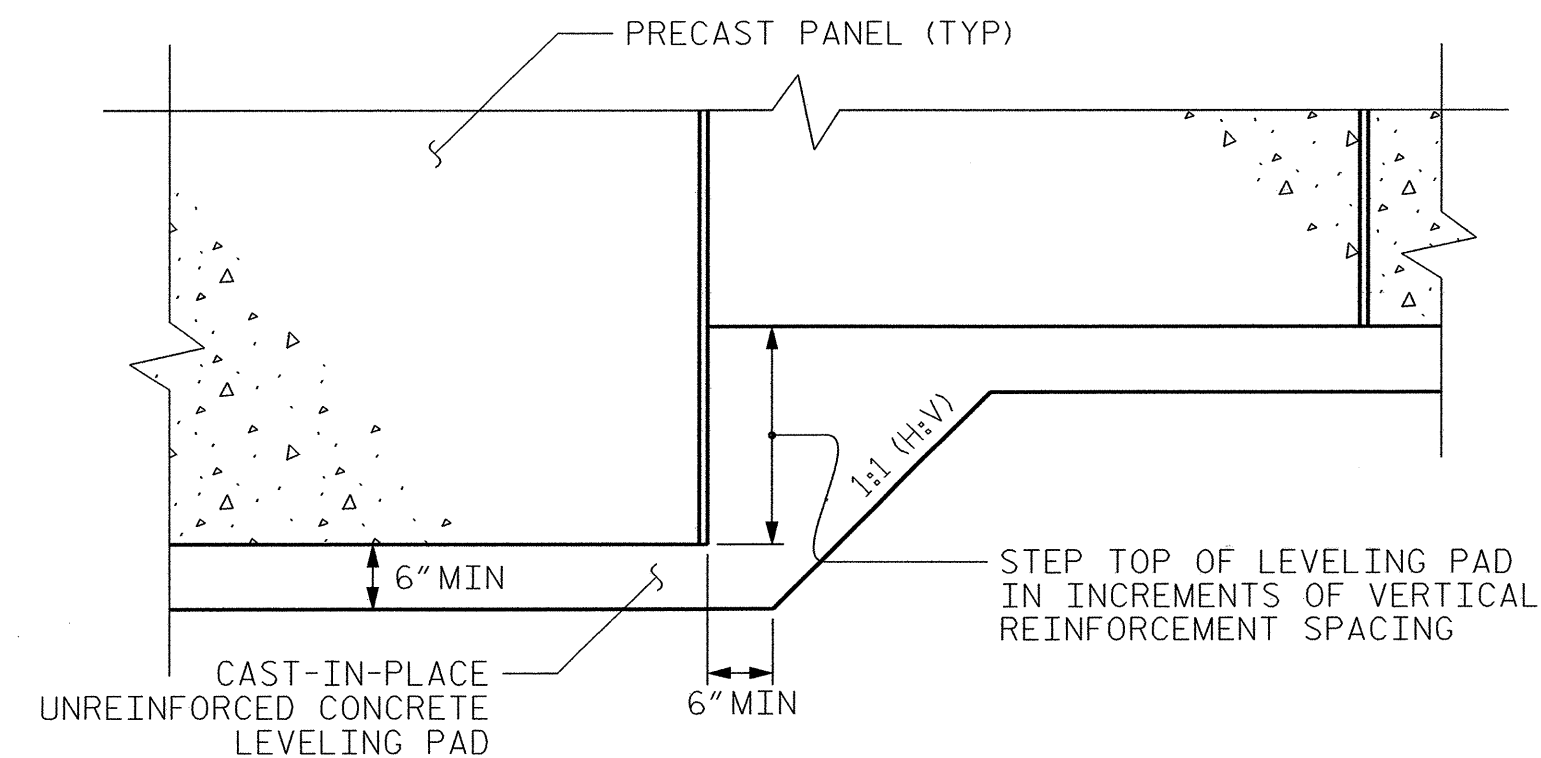
DESIGN RETAINING WALL FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL.

CONSTRUCT RETAINING WALL BEFORE INSTALLING FOUNDATIONS FOR END BENT NO.1 LOCATED AT STATION 17+62.66 -L-.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

GEOTECHNICAL ENGINEER  SIGNATURE: <i>Stanley C. Clark</i> DATE: 4/12/12	ENGINEER SIGNATURE: _____ DATE: _____
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PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

PROJECT NO.: B-4162
JACKSON COUNTY
STATION: 15+50.00 -L- TO 17+68.43 -L-
 SHEET 3 OF 3

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MSE RETAINING WALL						SHEET NO. W-3
REVISIONS						TOTAL SHEETS
NO.	BY	DATE	NO.	BY	DATE	3
1			3			
2			4			

PREPARED BY: EJS	DATE: 4/12
REVIEWED BY: SCC	DATE: 4/12

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 2006 "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. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN