

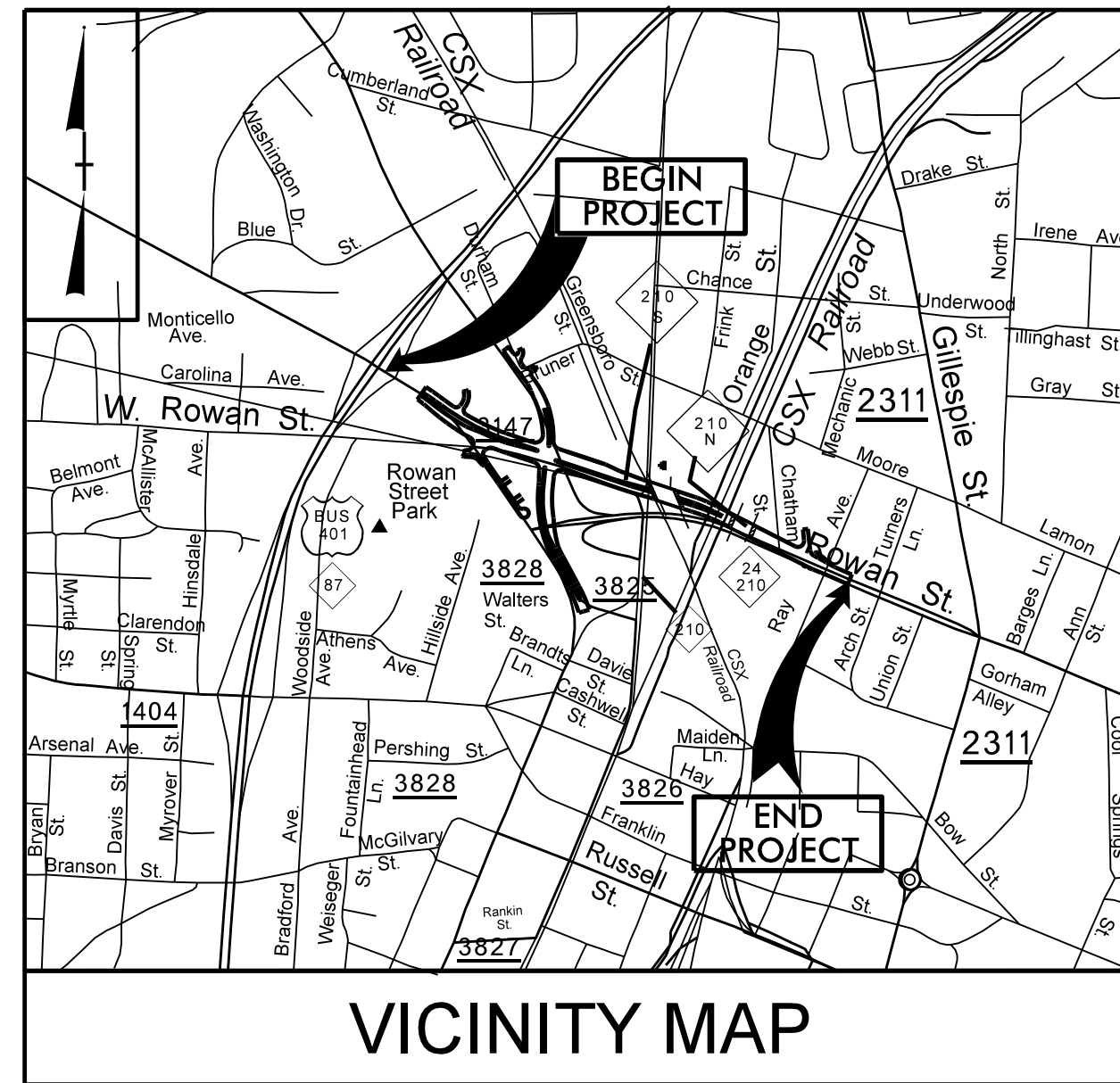
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TIP PROJECT: B-4490

CONTRACT: C203917



VICINITY MAP

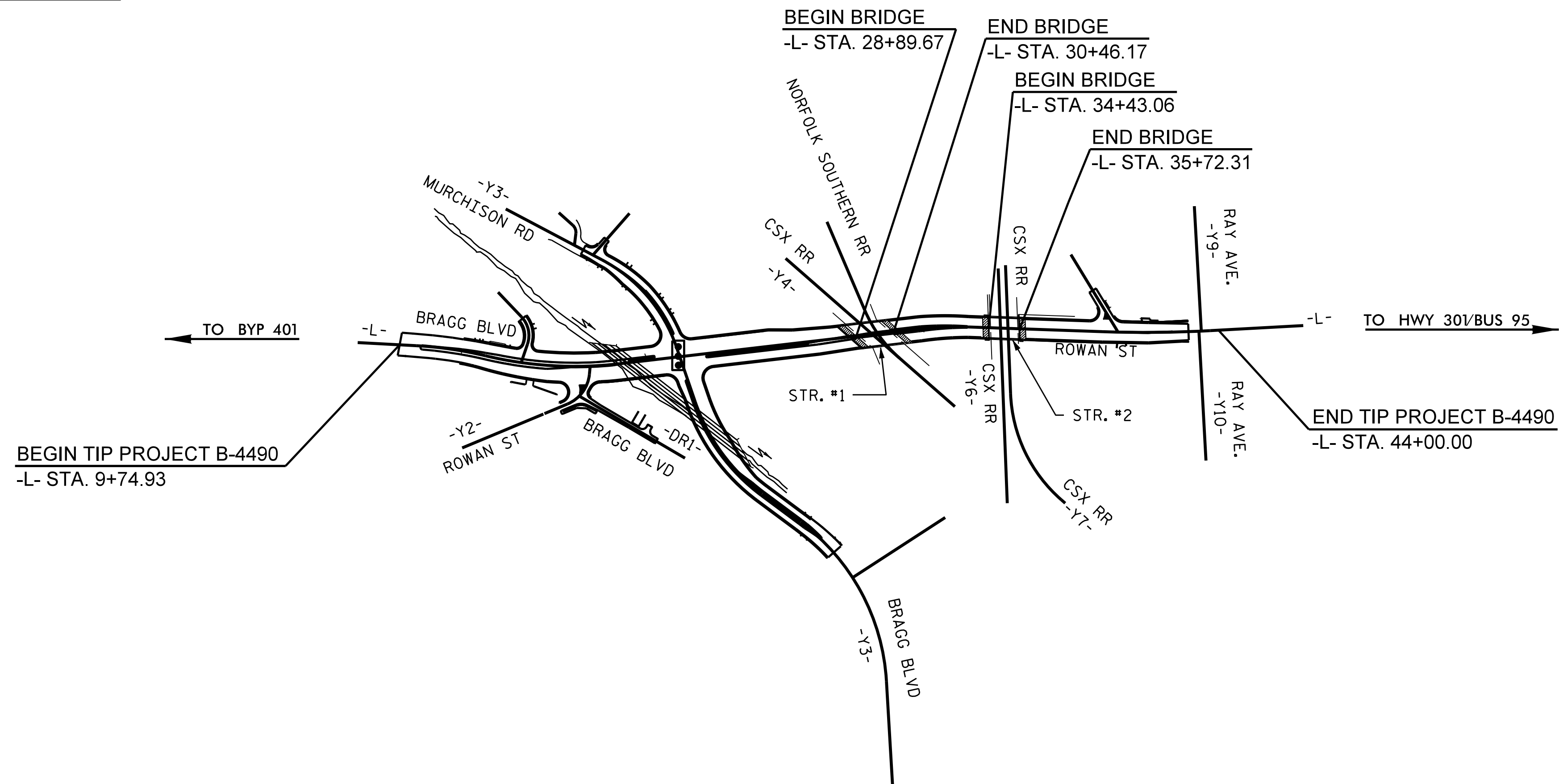
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

**LOCATION: BRIDGE NO. 116 OVER CSX RR, NORFOLK SOUTHERN RR,
AND HILLSBORO STREET ON NC/24-210**

TYPE OF WORK: GRADING, PAVING, DRAINAGE & STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4490		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33727.3.1	BRNHS-0024(24)	P.E.	
33727.3.FS1	BRNHS-0024(24)	CONST.	



STRUCTURES

DESIGN DATA
 ADT 2015 = 34,813
 ADT 2035 = 47,596
 DHV = 10 %
 D = 55 %
 T = 3 % *
 V = 40 MPH
 (* TTST 1% + DUAL 2%)
 FUNC CLASS = URBAN
 PRINCIPAL ARTERIAL
 REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4490 = 0.582 MILES
 LENGTH STRUCTURE TIP PROJECT B-4490 = 0.067 MILES
 TOTAL LENGTH TIP PROJECT B-4490 = 0.649 MILES

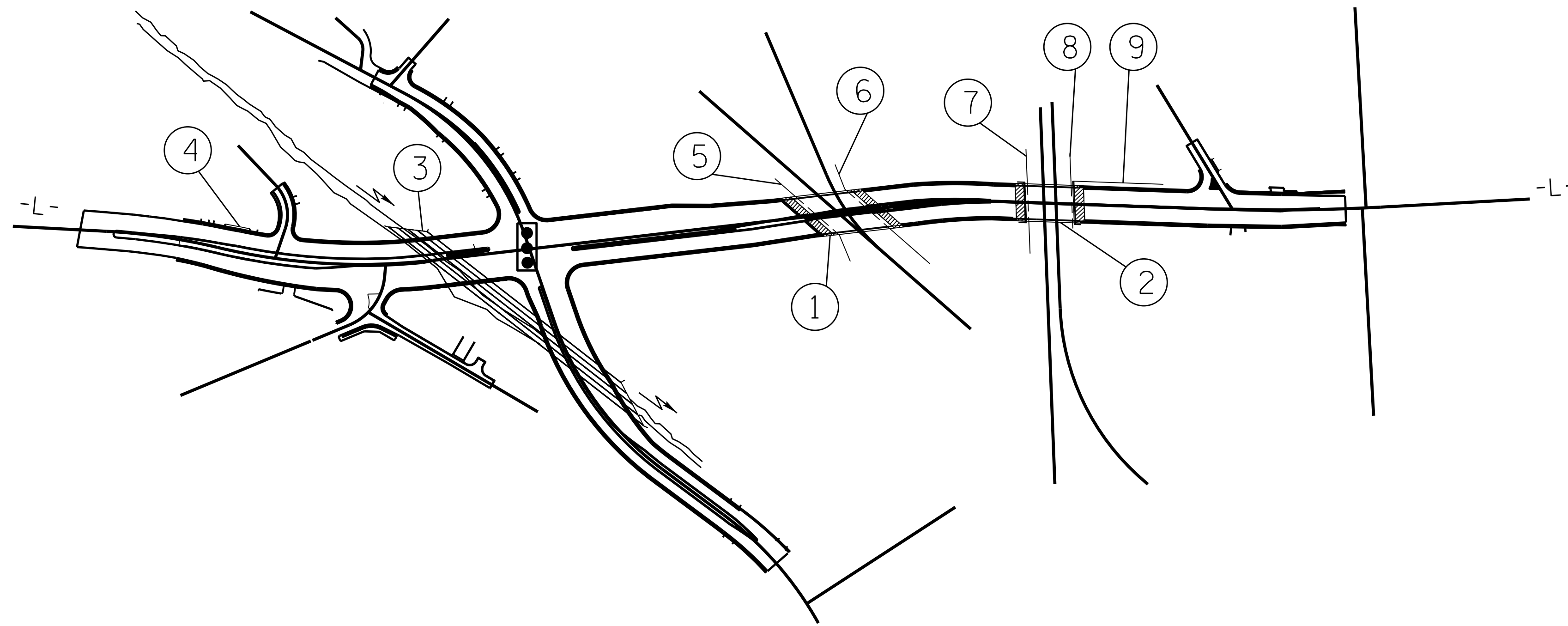
Prepared In the Office of:
DIVISION OF HIGHWAYS
 STRUCTURES MANAGEMENT UNIT
 1000 BIRCH RIDGE DR.
 RALEIGH, N.C. 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE :
 SEPTEMBER 20, 2016

J.M. BAILEY, PE
PROJECT ENGINEER

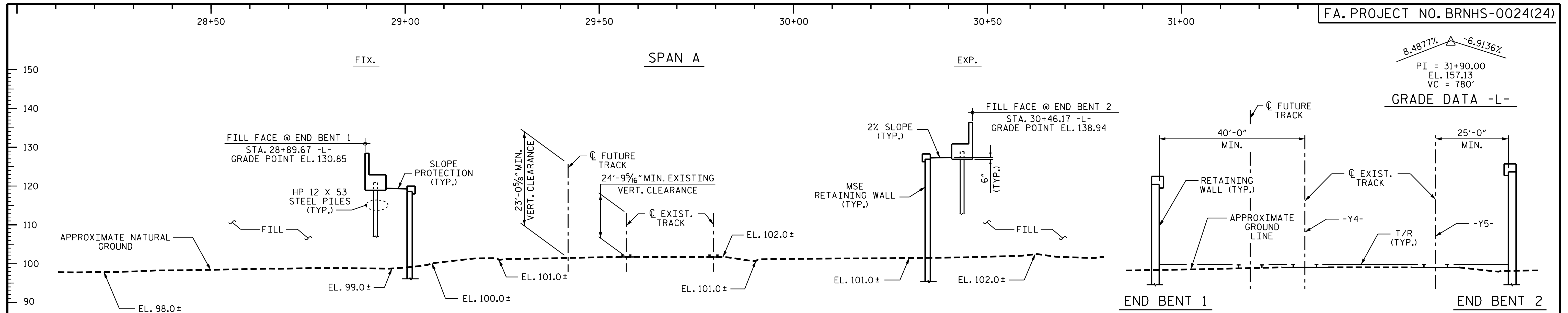
K.W. ALFORD, PE
PROJECT DESIGN ENGINEER



INDEX			
STRUCTURE	STATION	DESCRIPTION	SHEET NUMBERS
1	29+57.01 -L- 14+79.98 -Y4-	NC 24/210 OVER CSX RAILROAD, NORFORK SOUTHERN RAILROAD AND HILLSBORO STREET	S1-S42
2	35+23.40 -L- 12+63.33 -Y7-	NC 24/210 OVER CSX RAILROAD	S43-S84
3	19+26.42 -L-	TRIPLE 14 FT. X 9 FT. CONCRETE BOX CULVERT	C1-C18
4	13+85.00 -L-	RETAINING WALL	W1-W2
5	29+57.01 -L-	RETAINING WALL AT END BENT 1 OF STR. #1	W3, W6
6	29+57.01 -L-	RETAINING WALL AT END BENT 2 OF STR. #1	W3, W6
7	35+23.40 -L-	RETAINING WALL AT END BENT 1 OF STR. #2	W4, W6
8	35+23.40 -L-	RETAINING WALL AT END BENT 2 OF STR. #2	W4, W6
9	36+83.94 -L-	RETAINING WALL	W5-W6

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: _____

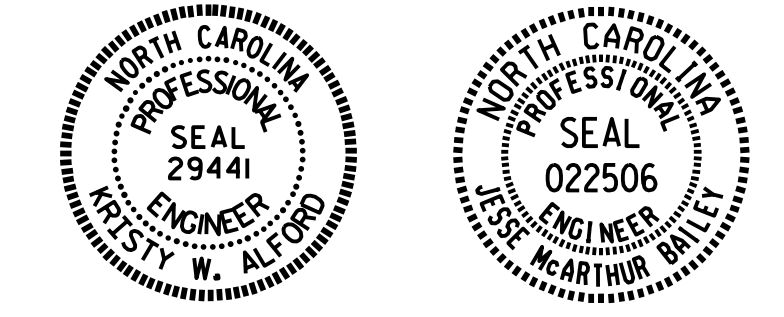
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
INDEX SHEET					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS



MINIMUM CLEARANCE - RAILROAD
(LOOKING DOWN STATION ALONG RAILROAD)
SPAN LENGTH BASED ON THIS SECTION.

TOP OF RAIL ELEVATION					
-Y4- STATION	1 st RAIL	2 nd RAIL	3 rd RAIL	4 th RAIL	
14+00.00	101.70	101.68	101.82	101.89	
14+25.00	101.81	101.78	101.86	101.86	
14+50.00	101.82	101.78	101.86	101.84	
14+75.00	101.81	101.77	101.84	101.81	
15+00.00	101.72	101.70	101.71	101.70	
15+25.00	101.60	101.61	101.51	101.47	
15+50.00	101.42	101.41	101.38	101.31	

NOTE:
TOP OF RAIL ELEVATIONS PROVIDED ARE PERPENDICULAR TO THE -Y4- STATION GIVEN.
THE RAILROAD TRACK TOP 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.



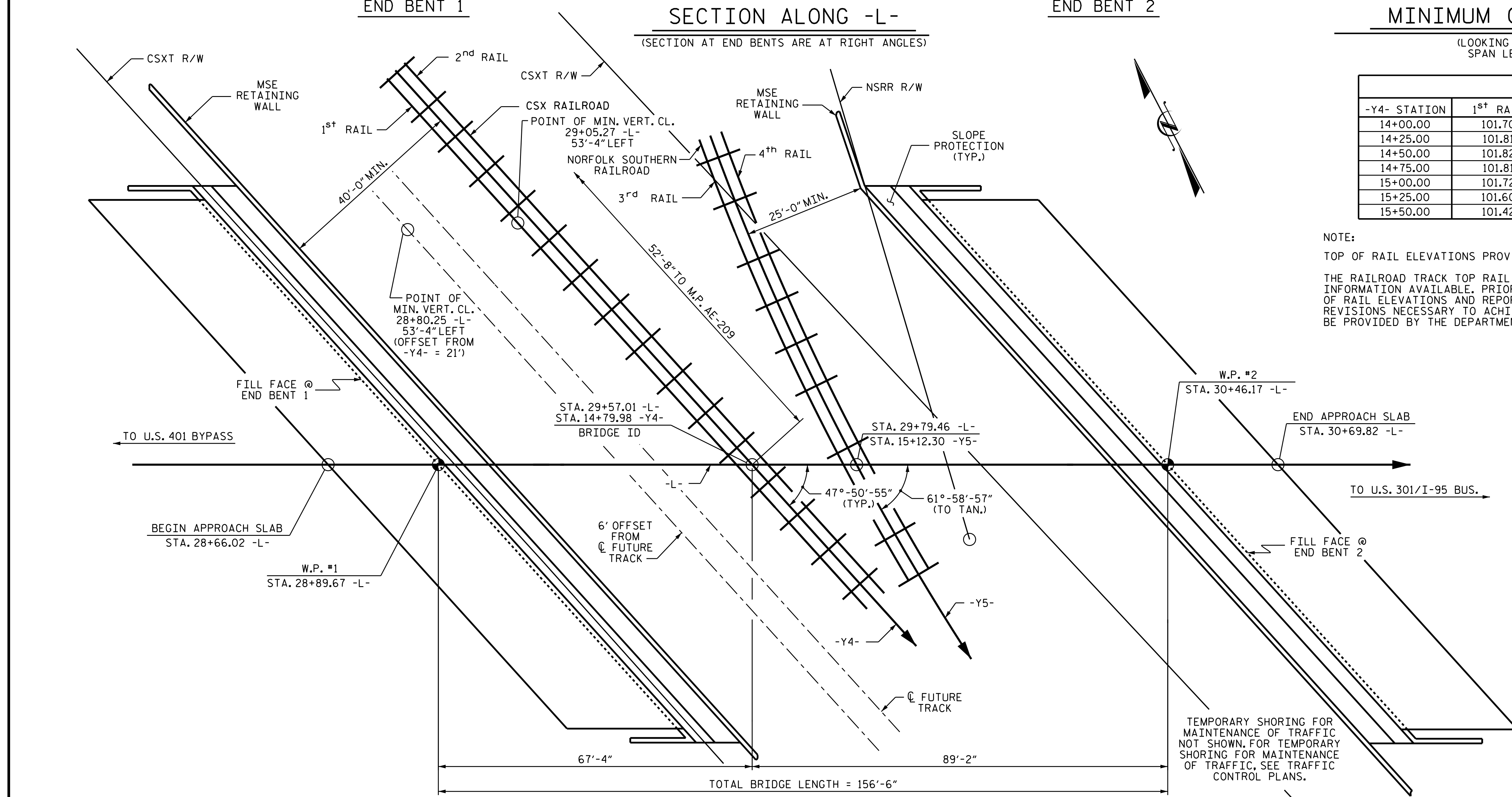
DocuSigned by: *J. M. Bailey* 3/29/2016
DocuSigned by: *J. M. Bailey* 3/29/2016

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 29+57.01 -L-
14+79.98 -Y4-

MILE POST AE-209.01
REPLACES BRIDGE #116
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
FOR BRIDGE ON NC 24-210
OVER CSX RAILROAD,
NORFOLK SOUTHERN RAILROAD

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1	
1			3			TOTAL SHEETS	
2			4			84	



DRAWN BY : J.P. ADAMS DATE : 8/2015
CHECKED BY : T.L. AVERETTE DATE : 8/2015

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
 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.
 FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
 REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

THE RAILROAD TRACK TOP OF RAIL ELEVATIONS 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 CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

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

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH THE "PAINTING OF STRUCTURAL STEEL" SPECIAL PROVISION, UNLESS OTHERWISE NOTED IN THE 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 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 29+57.01 -L-."

THE EXISTING STRUCTURE CONSISTS OF 12 SPANS OF VARIOUS LENGTHS. THE SUPERSTRUCTURE CONSISTS OF VARIOUS SIZED I-BEAMS AND RC DECK GIRDERS WITH A CLEAR ROADWAY WIDTH OF 56 FT WITH A REINFORCED CONCRETE DECK. THE SUBSTRUCTURE CONSISTS OF RC CAP AND TIMBER PILES AT THE END BENTS AND RC POST AND BEAM FOR THE INTERIOR BENTS WITH A STEEL CRUTCH BENT AT BENT 10 AND IS LOCATED AT APPROXIMATELY THE SAME LOCATION AS THE PROPOSED STRUCTURE. THE EXISTING STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE SUBSTRUCTURE OF THE EXISTING 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.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISIONS.

ALL PAVEMENT MARKING WILL BE IN ACCORDANCE WITH THE PAVEMENT MARKING PLANS AND SHALL PROVIDE FOR BICYCLES.

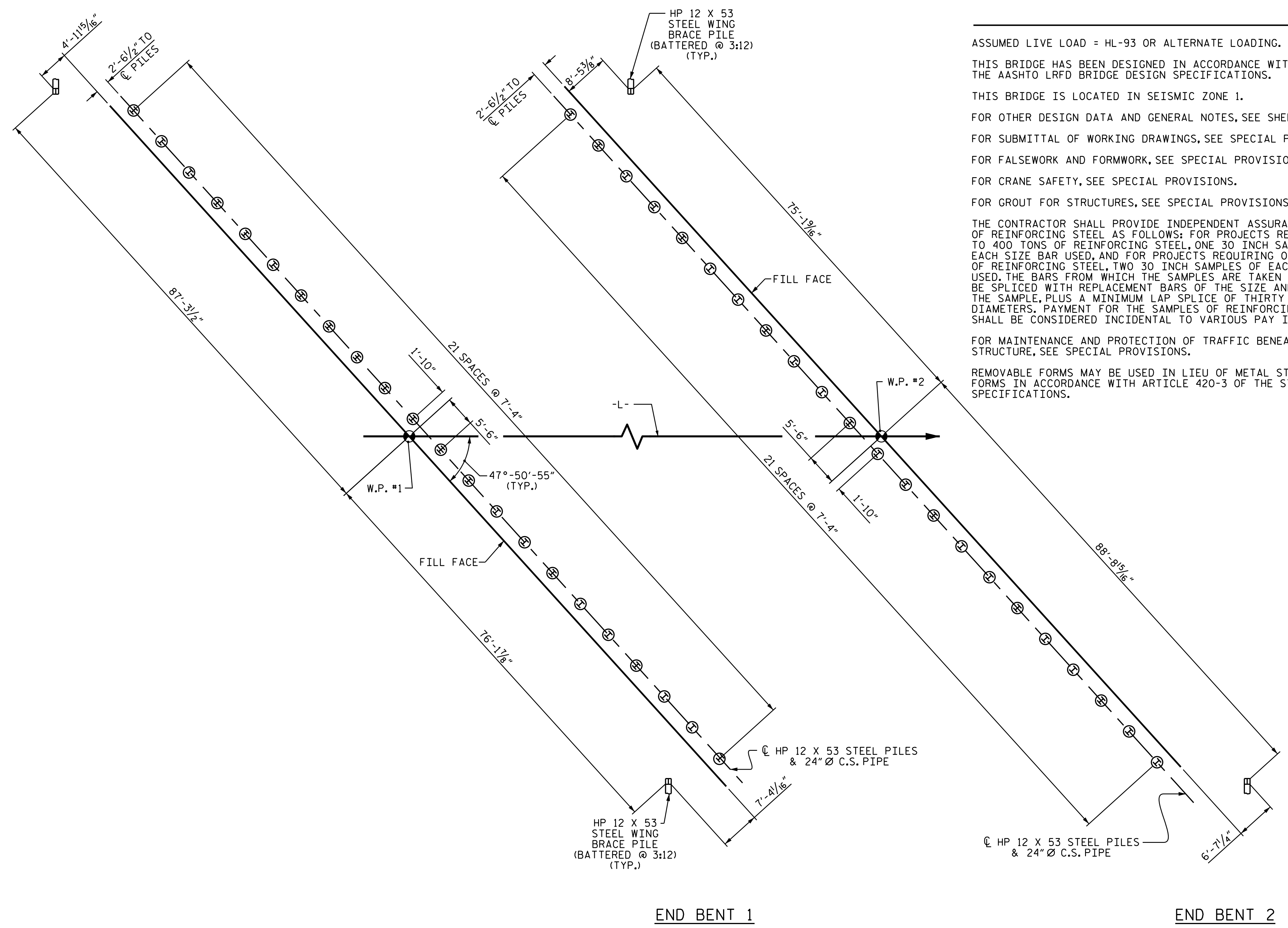
FOR CONCRETE PARAPET AND DECK AESTHETIC DETAILS, SEE SHEET S-22.

FOR APPLICATION OF BRIDGE COATING, SEE SPECIAL PROVISIONS.

FOR RAILROAD PROVISIONS, SEE SPECIAL PROVISIONS.

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

FOR AESTHETICALLY TREATED CONCRETE MEDIAN, SEE SPECIAL PROVISIONS.



FOUNDATION NOTES

FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
 PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.
 DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE.
 TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT 1 AND END BENT 2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
 INSTALL A 16 GAGE 24 INCH DIAMETER CORRUGATED STEEL PIPE FOR EACH END BENT PILE LOCATION THROUGH THE WALL BACKFILL ZONE DURING MSE WALL CONSTRUCTION. DRIVE END BENT PILES AT END BENT 1 AND END BENT 2 THROUGH THE PIPES AFTER COMPLETION OF THE MSE WALLS AND FILL THE PIPES WITH SAND BEFORE END BENT CAP CONSTRUCTION. FOR 16 GAGE 24 INCH DIAMETER CORRUGATED STEEL PIPES, SEE MSE WALL PLANS.

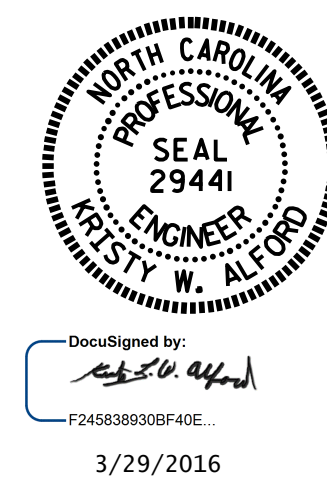
FOUNDATION LAYOUT
 DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF THE END BENT CAP.

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-

SHEET 2 OF 4

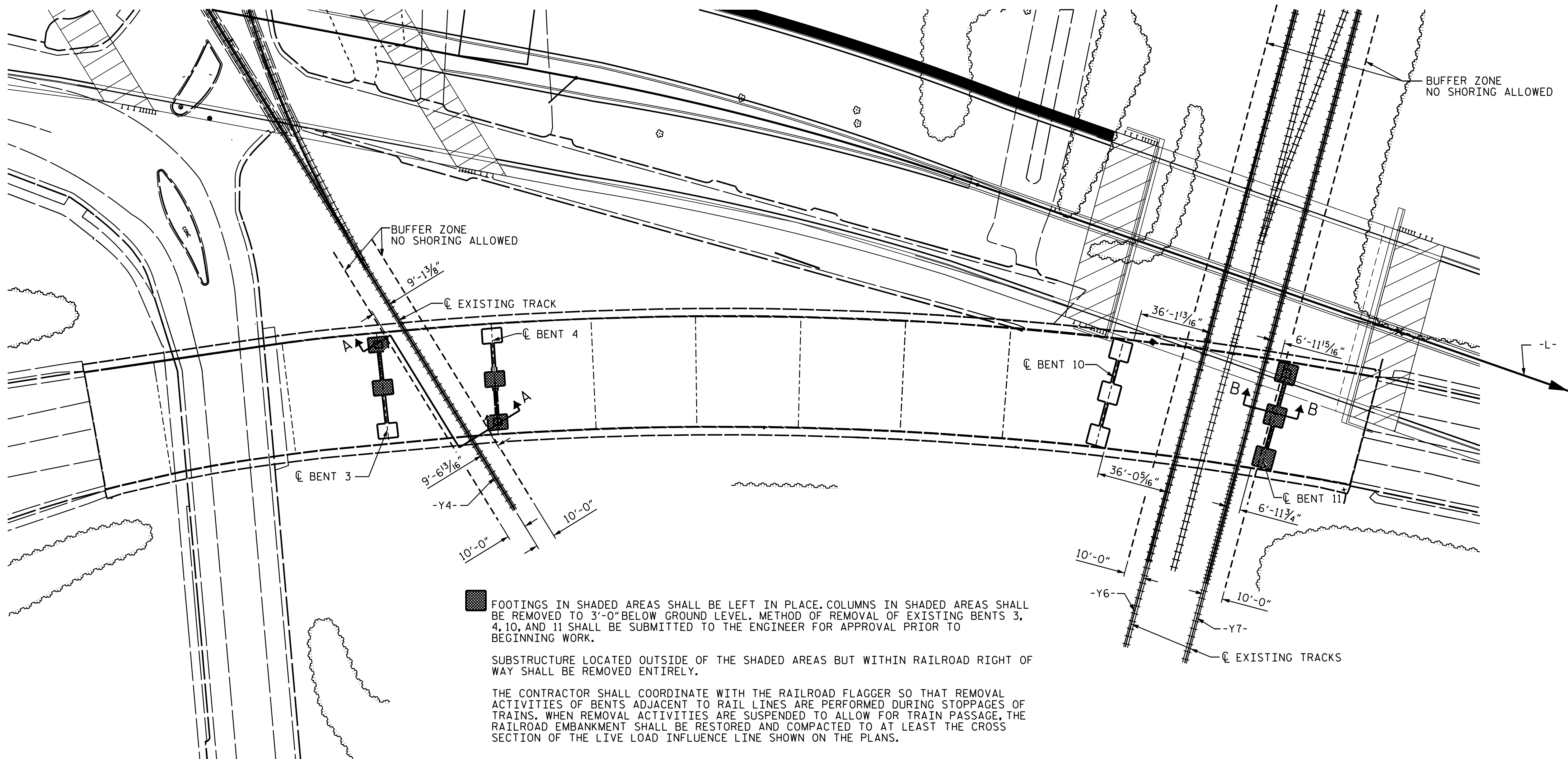
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON NC 24-210
 OVER CSX RAILROAD,
 NORFOLK SOUTHERN RAILROAD



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			84

DRAWN BY : J.P. ADAMS DATE : 8/2015
 CHECKED BY : I.L. AVERETTE DATE : 8/2015

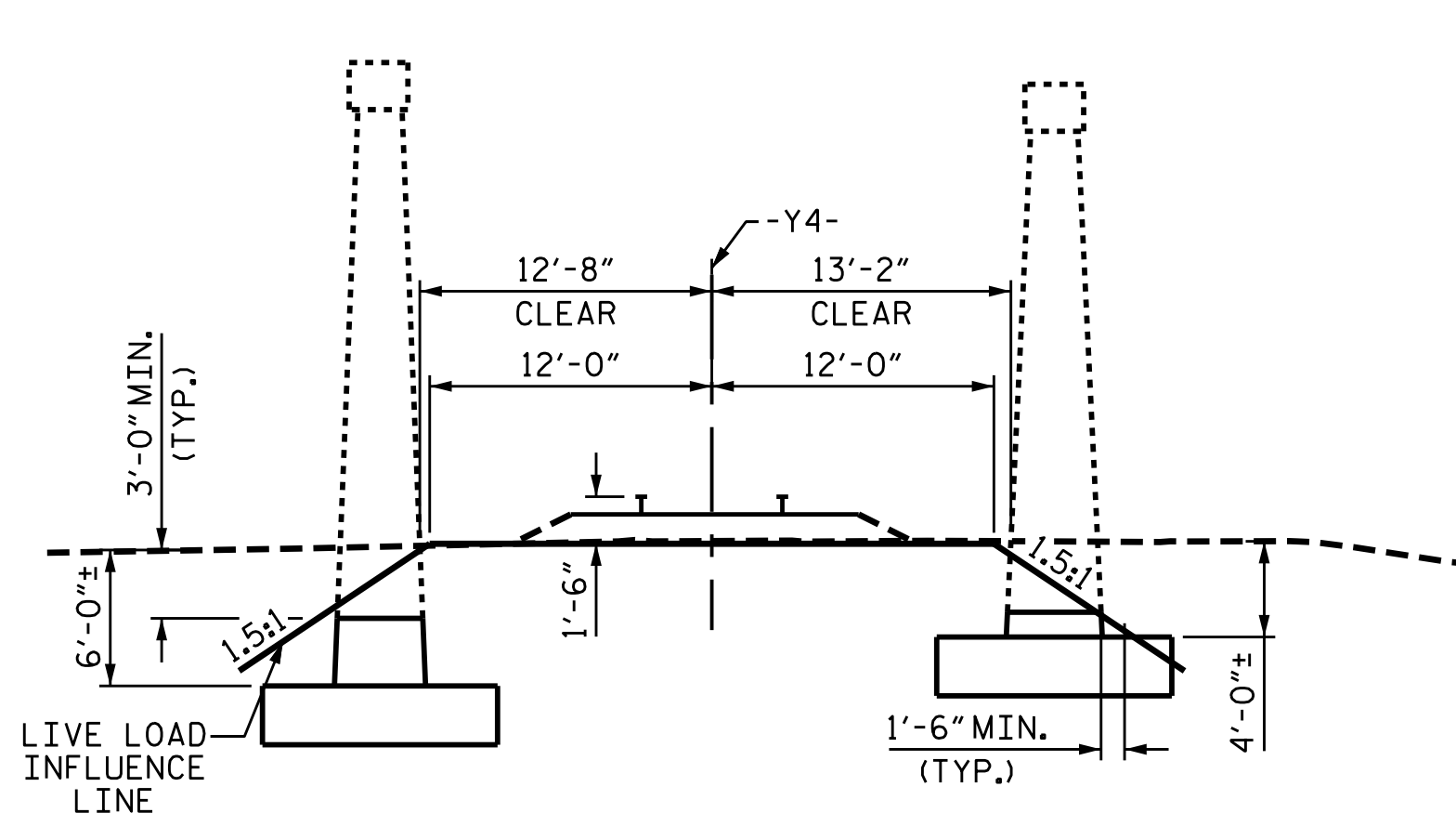


FOOTINGS IN SHADED AREAS SHALL BE LEFT IN PLACE. COLUMNS IN SHADED AREAS SHALL BE REMOVED TO 3'-0" BELOW GROUND LEVEL. METHOD OF REMOVAL OF EXISTING BENTS 3, 4, 10, AND 11 SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO BEGINNING WORK.

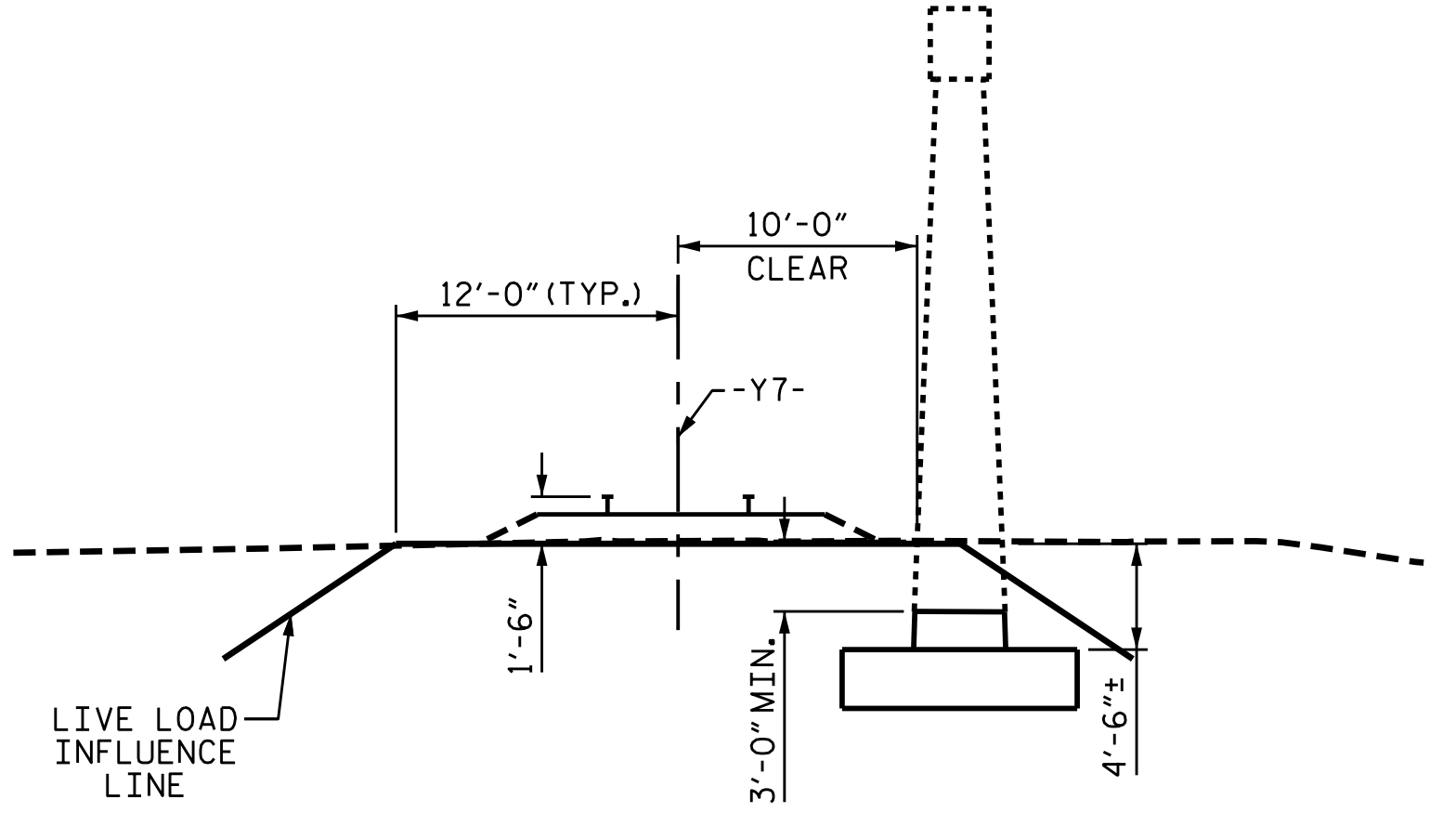
SUBSTRUCTURE LOCATED OUTSIDE OF THE SHADED AREAS BUT WITHIN RAILROAD RIGHT OF WAY SHALL BE REMOVED ENTIRELY.

THE CONTRACTOR SHALL COORDINATE WITH THE RAILROAD FLAGGER SO THAT REMOVAL ACTIVITIES OF BENTS ADJACENT TO RAIL LINES ARE PERFORMED DURING STOPPAGES OF TRAINS. WHEN REMOVAL ACTIVITIES ARE SUSPENDED TO ALLOW FOR TRAIN PASSAGE, THE RAILROAD EMBANKMENT SHALL BE RESTORED AND COMPACTED TO AT LEAST THE CROSS SECTION OF THE LIVE LOAD INFLUENCE LINE SHOWN ON THE PLANS.

PLAN FOR STRUCTURE REMOVAL



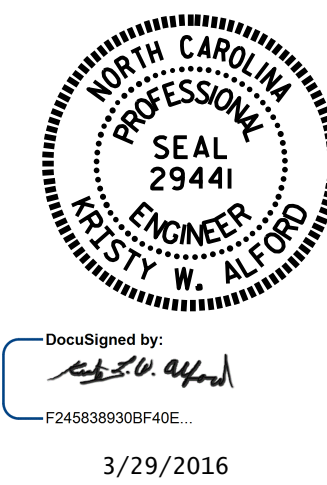
SECTION A-A



SECTION B-B

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-

SHEET 3 OF 4



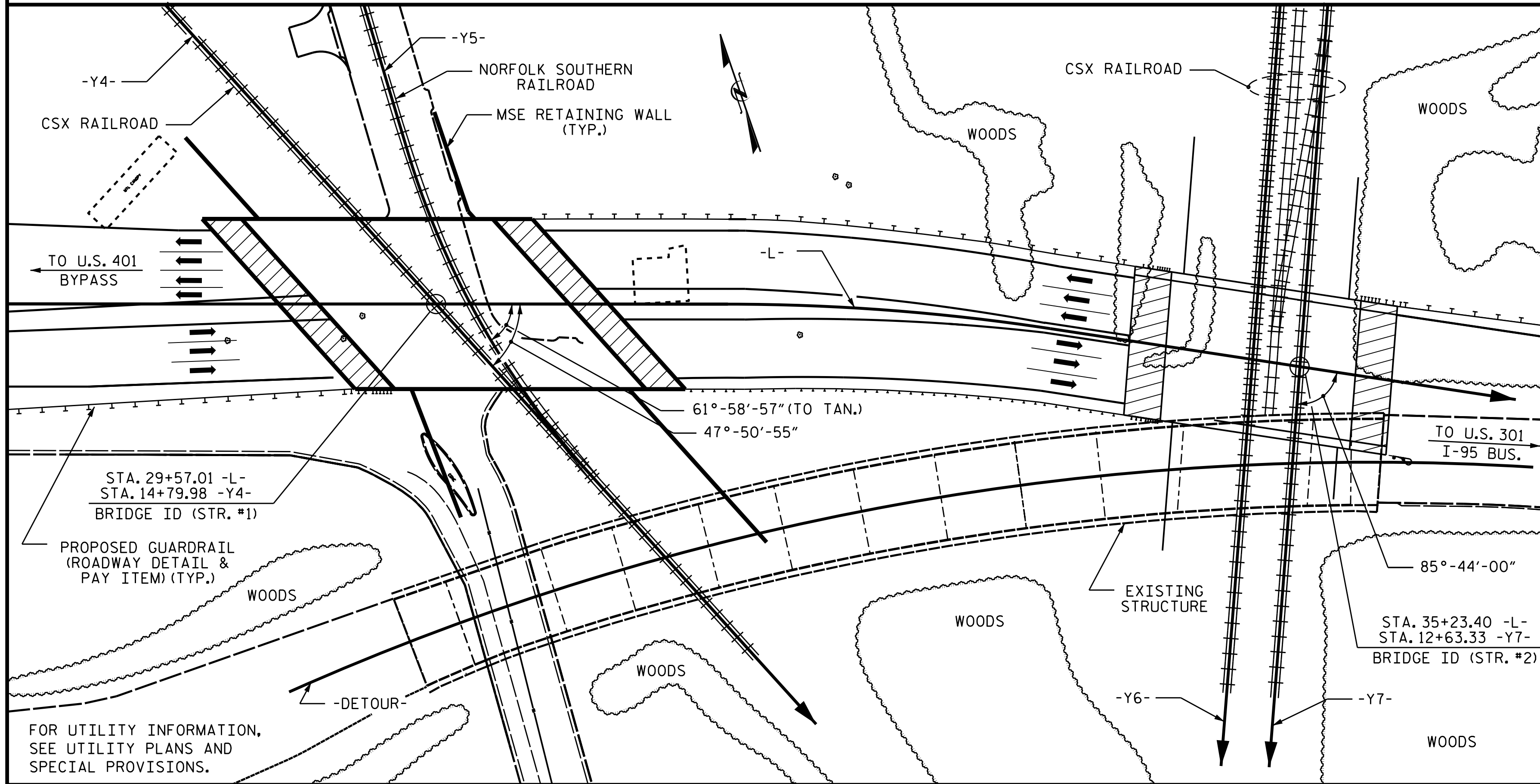
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 EXISTING STRUCTURE
 REMOVAL

DRAWN BY : K.W. ALFORD DATE : 8/2015
 CHECKED BY : I.L. AVERETTE DATE : 9/2015
 DESIGN ENGINEER OF RECORD: K.W. ALFORD DATE : 9/2015

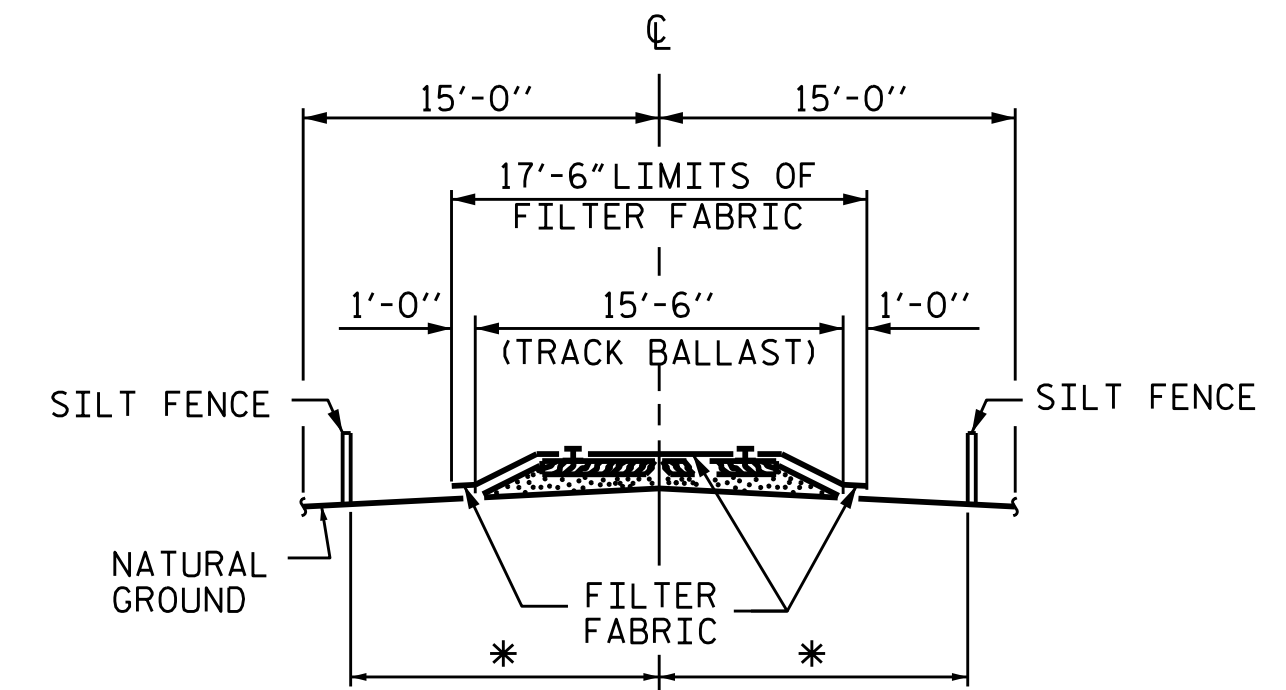
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			84

BENCHMARK 81: RAILROAD SPIKE IN BASE OF 18" HARDWOOD, 55.59' LEFT STATION 39+80.50 -L-, EL. 106.57



LOCATION SKETCH



RAILROAD EROSION CONTROL DETAIL

* TO BE DETERMINED BY THE RESIDENT ENGINEER IN CONSULTATION WITH THE RAILROAD ENGINEER.

NOTES:

RAILROAD EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO PERFORMING ANY WORK IN THE RAILROAD RIGHT-OF-WAY.

ADDITIONAL EROSION CONTROL MEASURES FOR PROTECTION OF RAILROAD DITCHES MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.

NO SEPARATE PAYMENT WILL BE MADE FOR RAILROAD EROSION CONTROL MEASURES.

LIMITS OF SILT FENCE AND FILTER FABRIC PARALLEL TO RAILROAD SHALL EXTEND A MINIMUM OF 25'-0" OUTSIDE EDGE OF SUPERSTRUCTURE OR TOE OF SLOPE ON CONSTRUCTION. A GREATER LENGTH OF SILT FENCE OR FILTER FABRIC MAY BE REQUIRED IF SO DIRECTED BY THE ENGINEER.

FILTER FABRIC TO BE NAILED TO TIMBER RAIL TIES WITH PRIME SOURCE "GRIP CAP" OR EQUIVALENT. FILTER FABRIC ON SHOULDER TO BE SECURED AS DIRECTED BY THE ENGINEER AND RAILROAD.

TOTAL BILL OF MATERIAL															
	REMOVAL OF EXISTING STRUCTURE	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL APPROX. 762500 LBS.	PAINTING OF STRUCTURAL STEEL	HP 12 X 53 STEEL PILES	PILE REDRIVES	TWO BAR METAL RAIL	1'-4" X 3'-0 1/2" CONCRETE PARAPET	1'-4" X 3'-3" CONCRETE PARAPET	
	LUMP SUM	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LUMP SUM	LUMP SUM	No.	LIN. FT.	EACH	LIN. FT.	LIN. FT.	LIN. FT.
SUPERSTRUCTURE	LUMP SUM		17502	15284		LUMP SUM		LUMP SUM	LUMP SUM			289.54	153.48	153.48	
END BENT 1					181.8		21965			24	1320	11			
END BENT 2					182.2		22330			24	1440	11			
TOTAL	LUMP SUM	2	17502	15284	364.0	LUMP SUM	44295	LUMP SUM	LUMP SUM	48	2760	22	289.54	153.48	153.48

TOTAL BILL OF MATERIAL								
	4 INCH SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS	APPLICATION OF BRIDGE COATING	ORNAMENTAL FENCE	ARCHITECTURAL CONCRETE SURFACE TREATMENT	ASBESTOS ASSESSMENT	AESTHETICALLY TREATED CONCRETE MEDIAN
	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	SQ. FT.	LUMP SUM	SQ. FT.
SUPERSTRUCTURE		LUMP SUM	LUMP SUM	LUMP SUM	287.96	987.7		3452.4
END BENT 1	83							
END BENT 2	83							
TOTAL	166	LUMP SUM	LUMP SUM	LUMP SUM	287.96	987.7	LUMP SUM	3452.4

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-

SHEET 4 OF 4



DocuSigned by:
 Kristy W. Alford
 F24583906FA0E
 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOR BRIDGE ON NC 24-210
 OVER CSX RAILROAD,
 NORFOLK SOUTHERN RAILROAD

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS 84
2			4			

DRAWN BY : J.P. ADAMS DATE : 8/2015
 CHECKED BY : T.L. AVERETTE DATE : 8/2015

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LOAD FACTORS:

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

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.

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			
						LIVE-LOAD FACTORS (γ_{LL})	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ_{LL})	MOMENT						
							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)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.03	--	1.75	0.823	1.61	A	ER	74.82	1.148	1.03	A	I	0.00	1.30	0.823	1.66	A	ER	74.82		
	HL-93 (OPERATING)	N/A		1.33	--	1.35	0.823	2.09	A	ER	74.82	1.148	1.33	A	I	0.00	1.00	0.823	2.16	A	ER	74.82		
	HS-20 (INVENTORY)	36.00	②	1.58	56.88	1.75	0.823	2.51	A	ER	74.82	1.148	1.58	A	I	0.00	1.30	0.823	2.59	A	ER	74.82		
	HS-20 (OPERATING)	36.00		2.04	73.44	1.35	0.823	3.26	A	ER	74.82	1.148	2.04	A	I	0.00	1.00	0.823	3.37	A	ER	74.82		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.00	67.50	1.40	0.823	7.76	A	ER	74.82	1.148	5.00	A	I	0.00	1.30	0.823	6.42	A	ER	74.82	
		SNGARBS2	20.000		3.45	69.00	1.40	0.823	5.48	A	ER	74.82	1.148	3.45	A	I	0.00	1.30	0.823	4.53	A	ER	74.82	
		SNAGRIS2	22.000		3.16	69.52	1.40	0.823	5.07	A	ER	74.82	1.148	3.16	A	I	0.00	1.30	0.823	4.19	A	ER	74.82	
		SNCOTTS3	27.250		2.49	67.85	1.40	0.823	3.85	A	ER	74.82	1.148	2.49	A	I	0.00	1.30	0.823	3.19	A	ER	74.82	
		SNAGGRS4	34.925		1.99	69.50	1.40	0.823	3.10	A	ER	74.82	1.148	1.99	A	I	149.64	1.30	0.823	2.57	A	ER	74.82	
		SNS5A	35.550		1.98	70.39	1.40	0.823	3.04	A	ER	74.82	1.148	1.98	A	I	149.64	1.30	0.823	2.51	A	ER	74.82	
		SNS6A	39.950		1.78	71.11	1.40	0.823	2.74	A	ER	74.82	1.148	1.78	A	I	149.64	1.30	0.823	2.27	A	ER	74.82	
		SNS7B	42.000		1.71	71.82	1.40	0.823	2.61	A	ER	74.82	1.148	1.71	A	I	149.64	1.30	0.823	2.16	A	ER	74.82	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.14	70.62	1.40	0.823	3.33	A	ER	74.82	1.148	2.14	A	I	0.00	1.30	0.823	2.76	A	ER	74.82	
		TNT4A	33.075		2.11	69.79	1.40	0.823	3.33	A	ER	74.82	1.148	2.11	A	I	149.64	1.30	0.823	2.76	A	ER	74.82	
		TNT6A	41.600		1.77	73.63	1.40	0.823	2.68	A	ER	74.82	1.148	1.77	A	I	0.00	1.30	0.823	2.22	A	ER	74.82	
		TNT7A	42.000		1.74	73.08	1.40	0.823	2.68	A	ER	74.82	1.148	1.74	A	I	0.00	1.30	0.823	2.21	A	ER	74.82	
		TNT7B	42.000		1.70	71.40	1.40	0.823	2.71	A	ER	74.82	1.148	1.70	A	I	149.64	1.30	0.823	2.24	A	ER	74.82	
		TNAGRIT4	43.000		1.65	70.95	1.40	0.823	2.62	A	ER	74.82	1.148	1.65	A	I	149.64	1.30	0.823	2.17	A	ER	74.82	
		TNAGT5A	45.000		1.60	72.00	1.40	0.823	2.49	A	ER	74.82	1.148	1.60	A	I	0.00	1.30	0.823	2.06	A	ER	74.82	
TNAGT5B	45.000		③	1.58	71.10	1.40	0.823	2.48	A	ER	74.82	1.148	1.58	A	I	149.64	1.30	0.823	2.05	A	ER	74.82		
FATIGUE	HL-93 (INVENTORY)	$\gamma_{LL}=0.75$	--	--																				

③ CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93) **

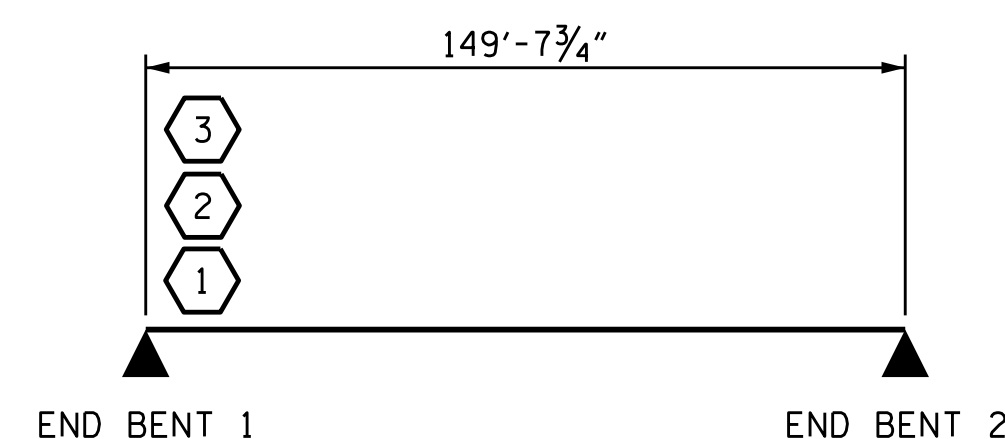
② DESIGN LOAD RATING (HS-20) **

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. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-



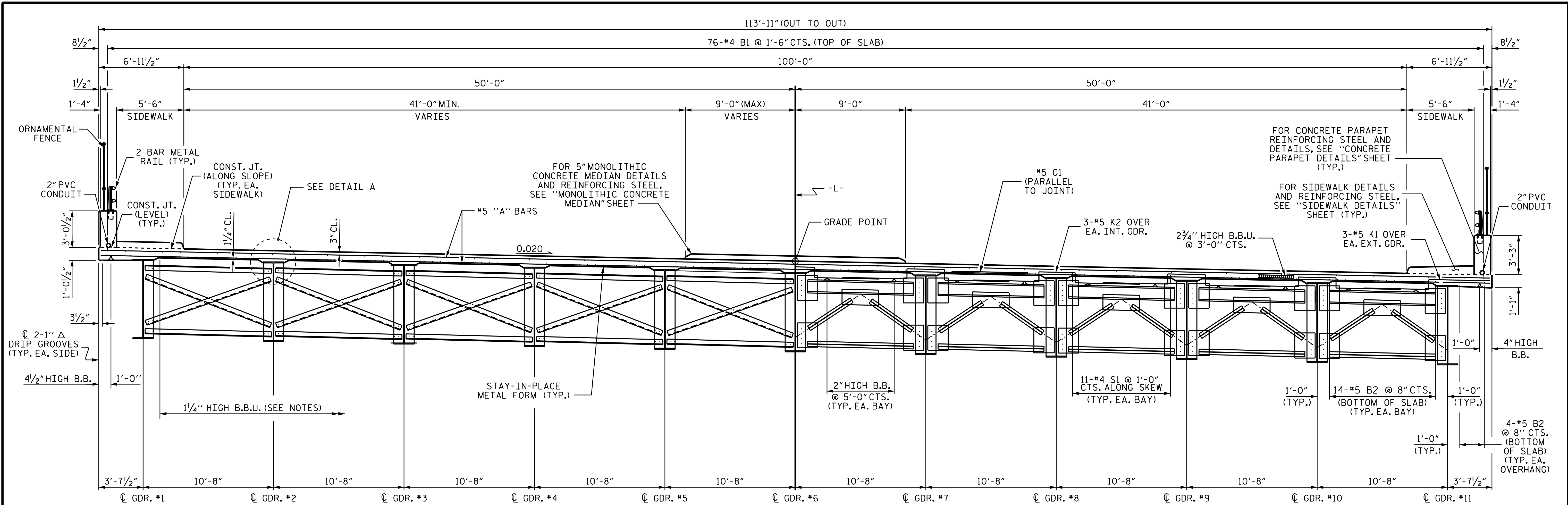
DocuSigned by:
 Kristy W. Alford
 3/29/2016

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

ASSEMBLED BY : A. SORSENGINH DATE : 5/2015
 CHECKED BY : J.P. ADAMS DATE : 6/2015
 DRAWN BY : MAA 1/08 REV. 11/2/08RR MAA/GM
 CHECKED BY : GM/DI 2/08 REV. 10/1/11 MAA/GM

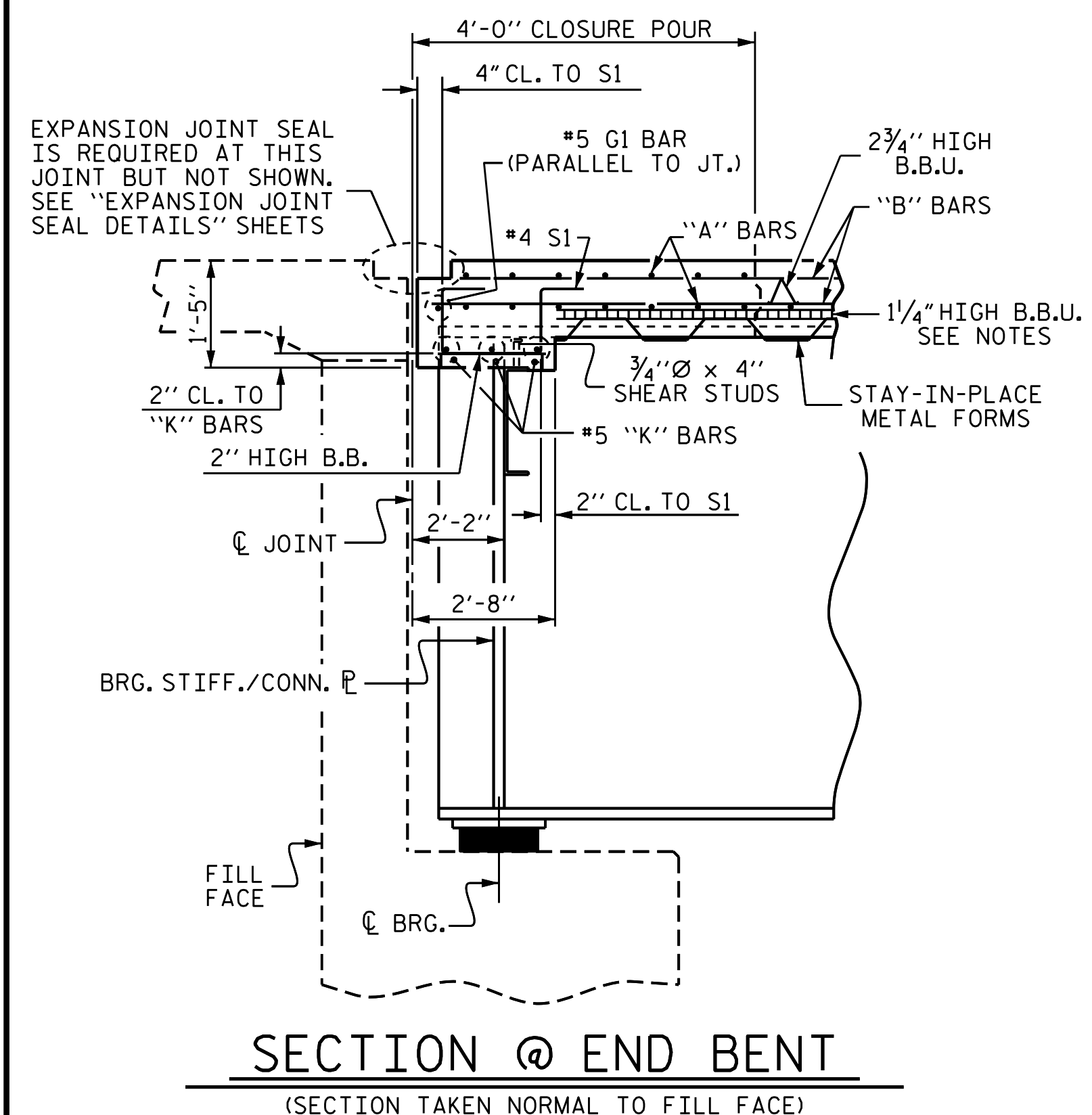
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			84



PARTIAL TYPICAL SECTION
(SHOWING INTERMEDIATE DIAPHRAGMS)

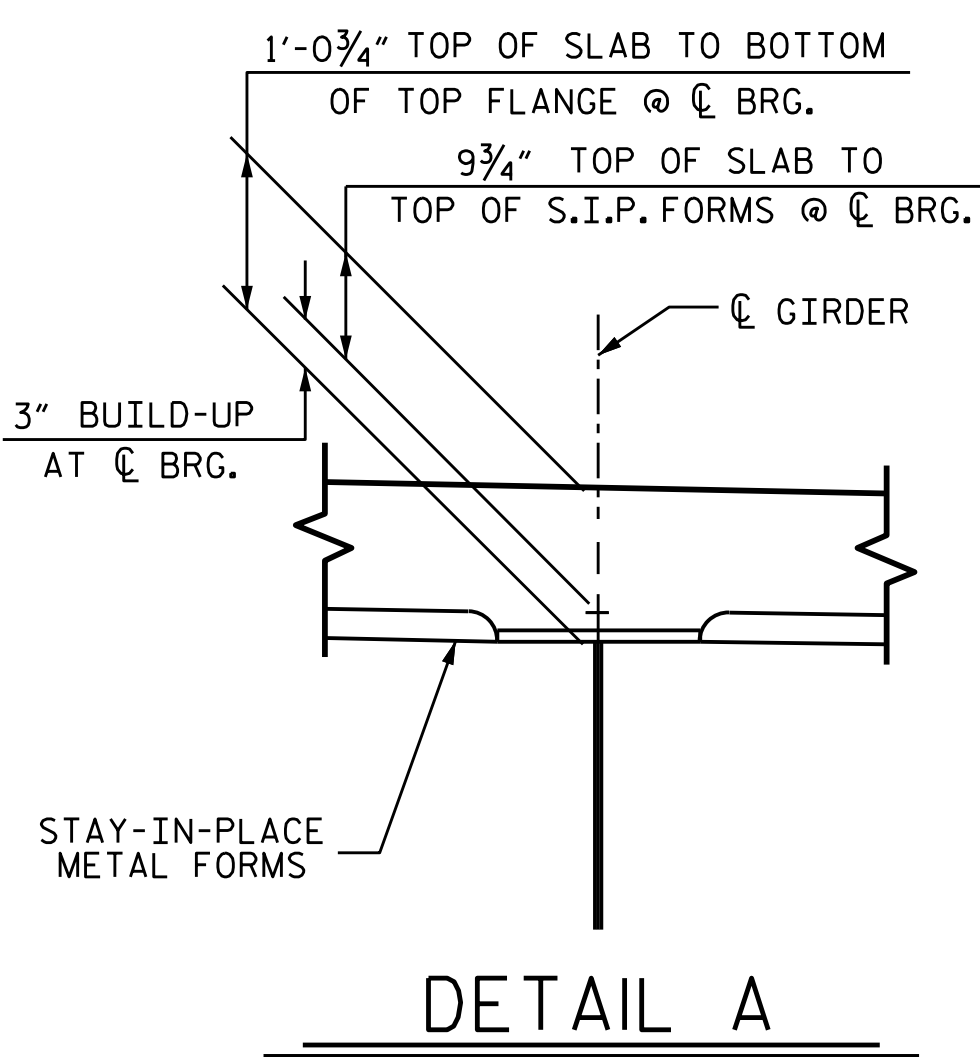
PARTIAL TYPICAL SECTION
(SHOWING END BENT DIAPHRAGMS)



SECTION @ END BENT
(SECTION TAKEN NORMAL TO FILL FACE)

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.
- CONCRETE PARAPET AND SIDEWALK SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
- #5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.
- THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER 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.
- METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.
- PREVIOUSLY CAST CONCRETE IN THE SPAN SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE SPAN.
- ALL REINFORCING STEEL IN PARAPETS, END POSTS, SIDEWALKS AND CONCRETE MEDIAN SHALL BE EPOXY COATED.
- FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
- FOR ORNAMENTAL FENCE, SEE SPECIAL PROVISIONS.

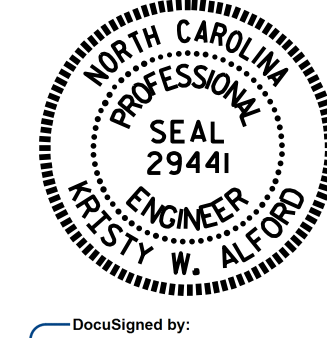


DETAIL A

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

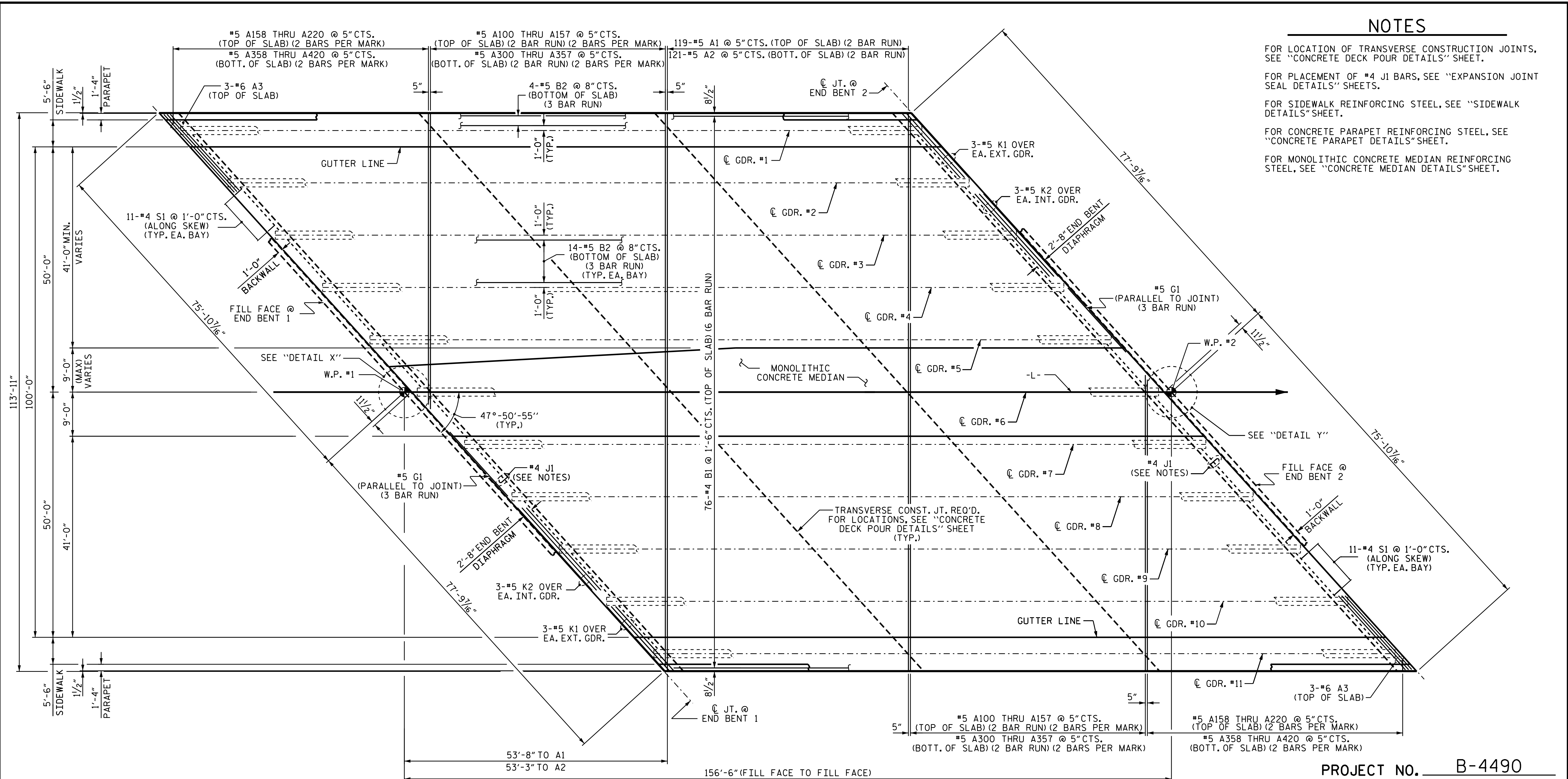
**SUPERSTRUCTURE
 TYPICAL SECTION**



DRAWN BY : A. SORSENGINH DATE : 5/2015
 CHECKED BY : J.P. ADAMS DATE : 6/2015
 DESIGN ENGINEER OF RECORD : A. SORSENGINH DATE : 9/2015

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

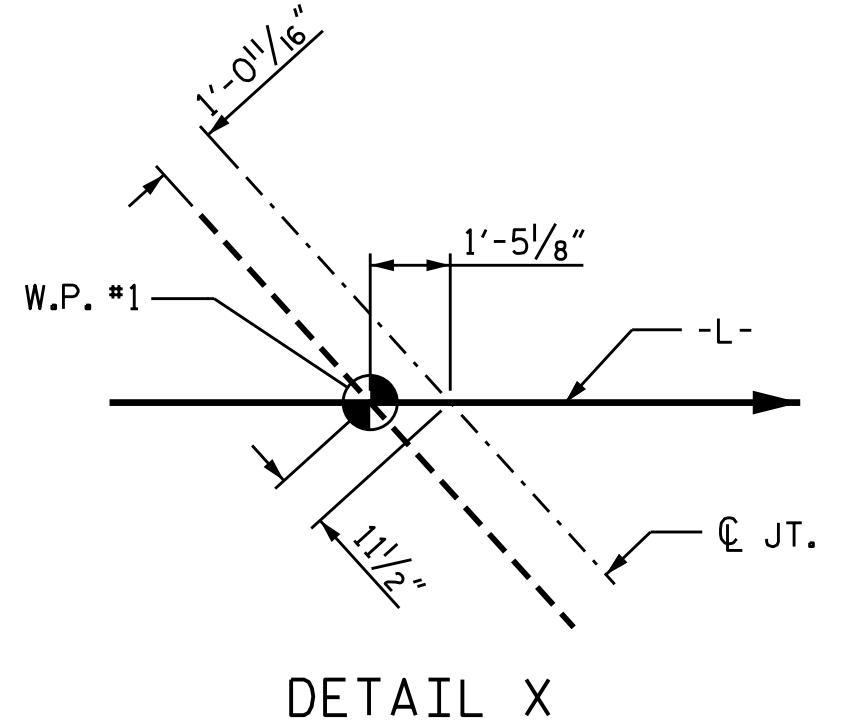
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6	
1			3			TOTAL SHEETS	
2			4			84	



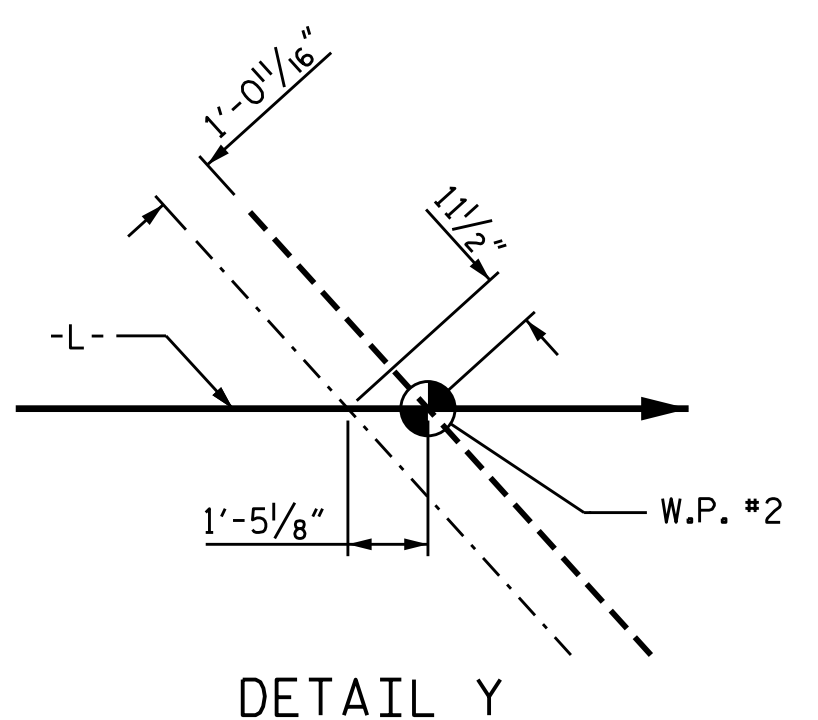
NOTES

FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "CONCRETE DECK POUR DETAILS" SHEET.
 FOR PLACEMENT OF #4 J1 BARS, SEE "EXPANSION JOINT SEAL DETAILS" SHEETS.
 FOR SIDEWALK REINFORCING STEEL, SEE "SIDEWALK DETAILS" SHEET.
 FOR CONCRETE PARAPET REINFORCING STEEL, SEE "CONCRETE PARAPET DETAILS" SHEET.
 FOR MONOLITHIC CONCRETE MEDIAN REINFORCING STEEL, SEE "CONCRETE MEDIAN DETAILS" SHEET.

PLAN OF SPAN A

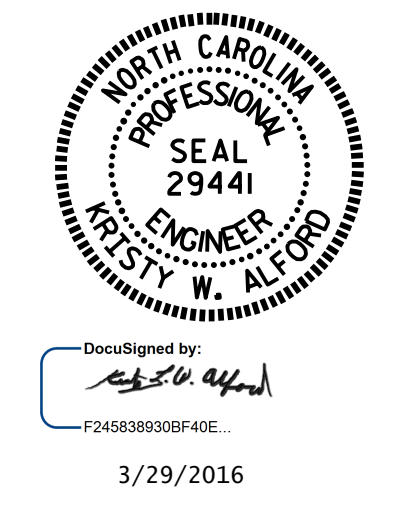


DETAIL X



DETAIL Y

PROJECT NO. B-4490
 CUMBERLAND COUNTY
 STATION: 29+57.01 -L-



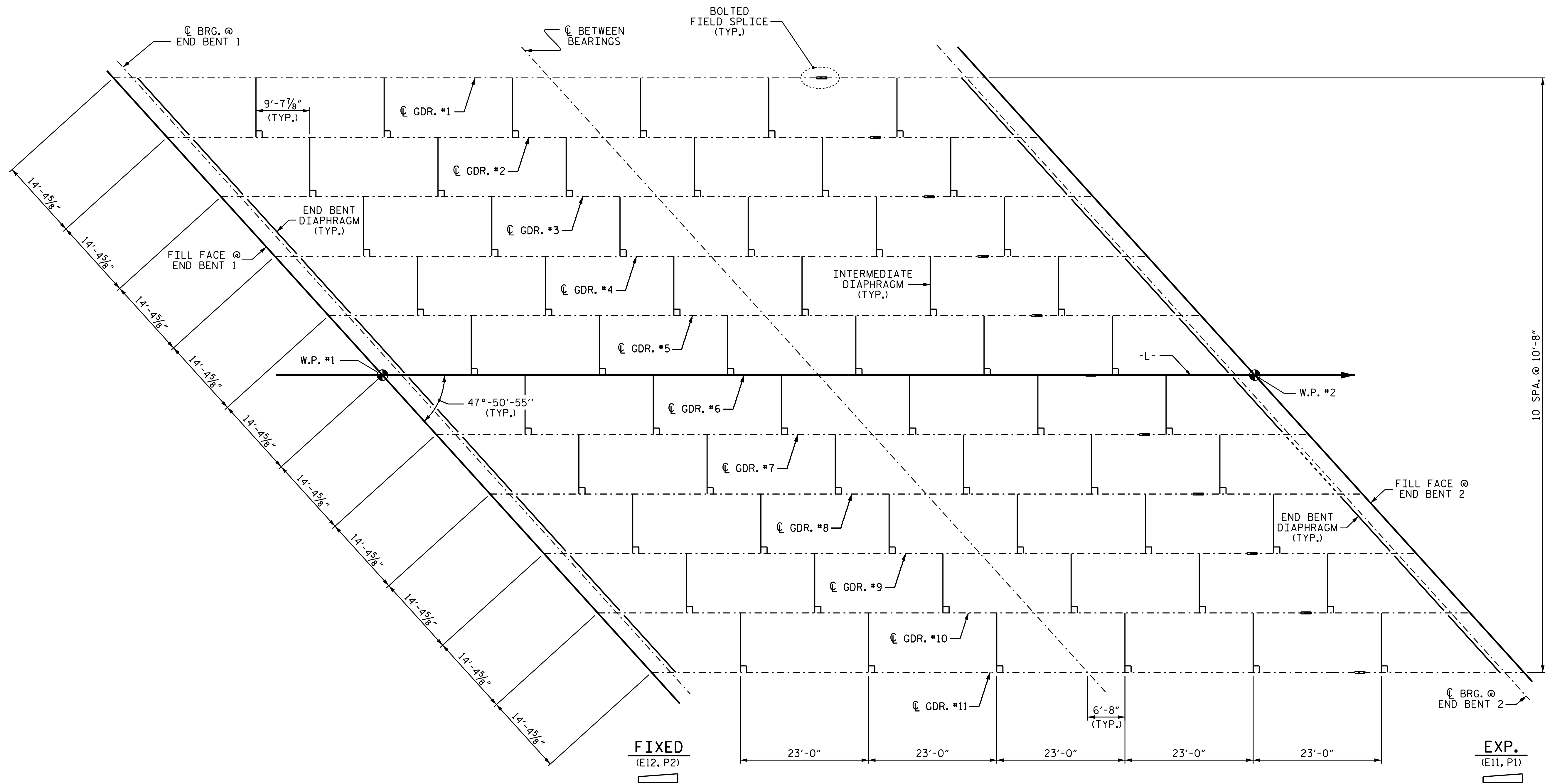
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 PLAN OF SPAN A**

DRAWN BY : A. SORSENGINH DATE : 5/2015
 CHECKED BY : J.P. ADAMS DATE : 6/2015
 DESIGN ENGINEER OF RECORD : A. SORSENGINH DATE : 9/2015

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO. S-7
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 84
2			4			



FRAMING PLAN

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-



DocuSigned by:
 Kusty W. Alford
 3/29/2016

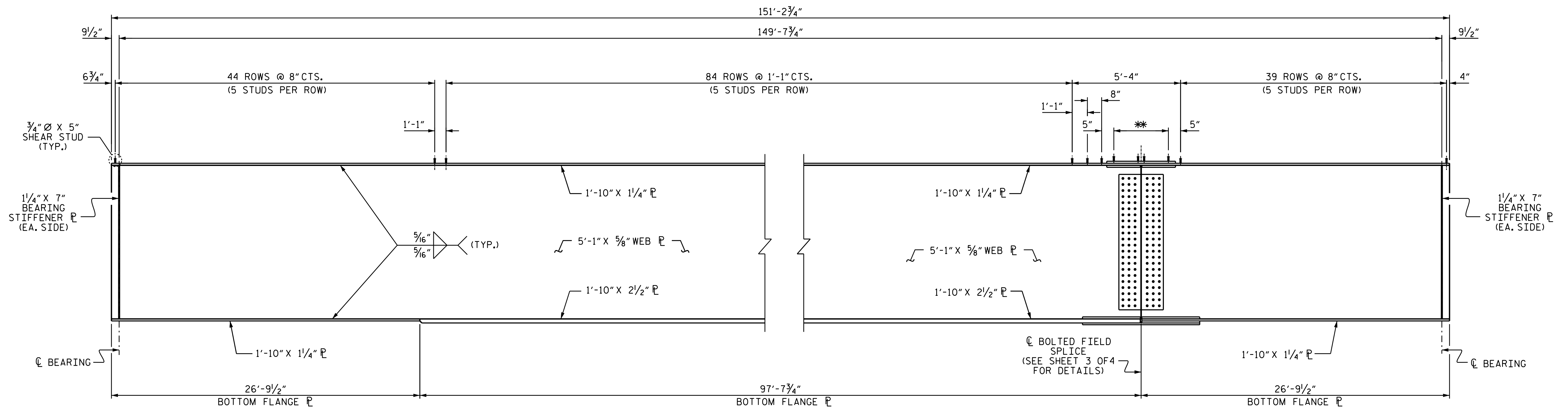
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

 SUPERSTRUCTURE
 FRAMING PLAN

DRAWN BY : A. SORSENGINH DATE : 5/2015
 CHECKED BY : J.P. ADAMS DATE : 6/2015
 DESIGN ENGINEER OF RECORD : A. SORSENGINH DATE : 9/2015

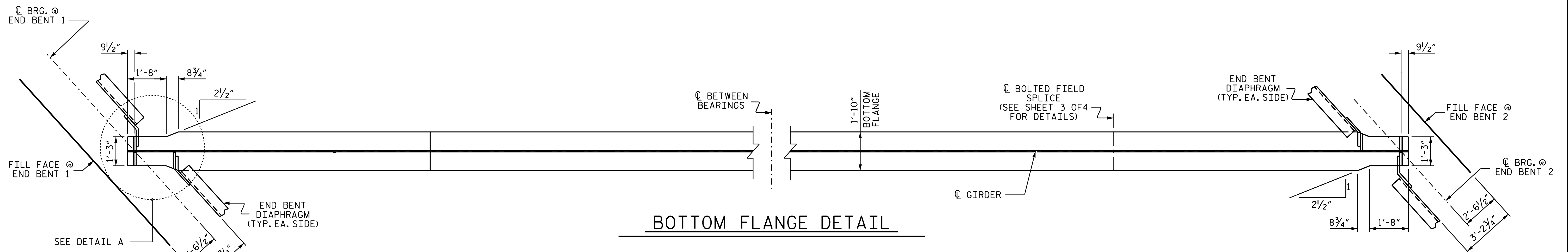
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8	
1			3			TOTAL SHEETS	
2			4			84	

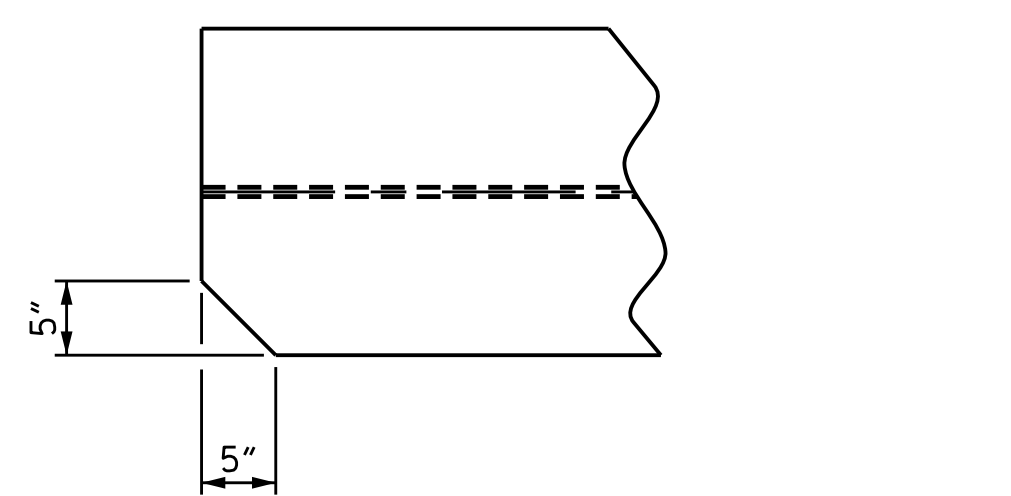


GIRDER ELEVATION

** FOR SHEAR STUDS IN THIS AREA, SEE BOLTED FIELD SPLICE DETAILS, SHEET 3 OF 4.

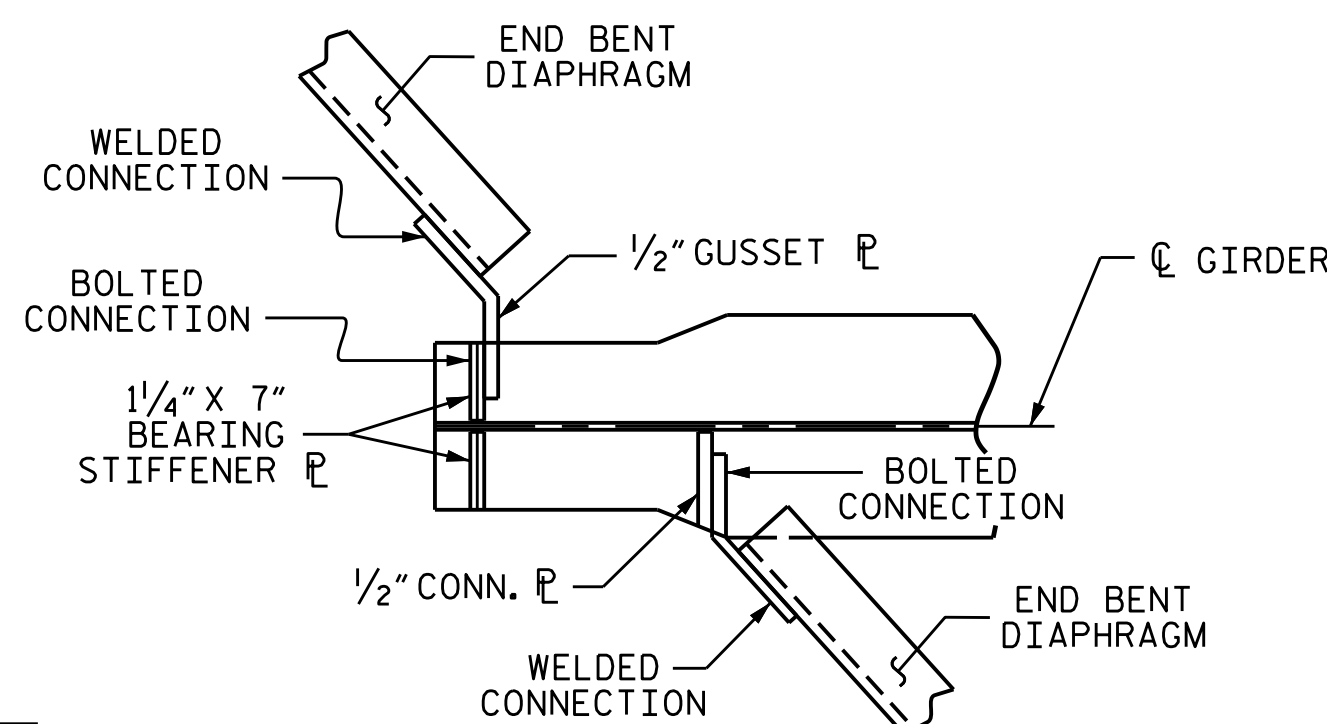


BOTTOM FLANGE DETAIL



TOP FLANGE CLIP DETAIL

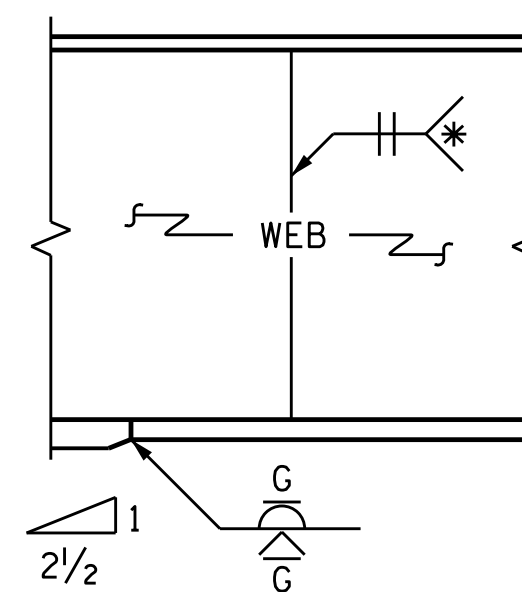
TOP FLANGE @ END BENT 1 SHOWN, OTHER END SIMILAR BY ROTATION



DETAIL A

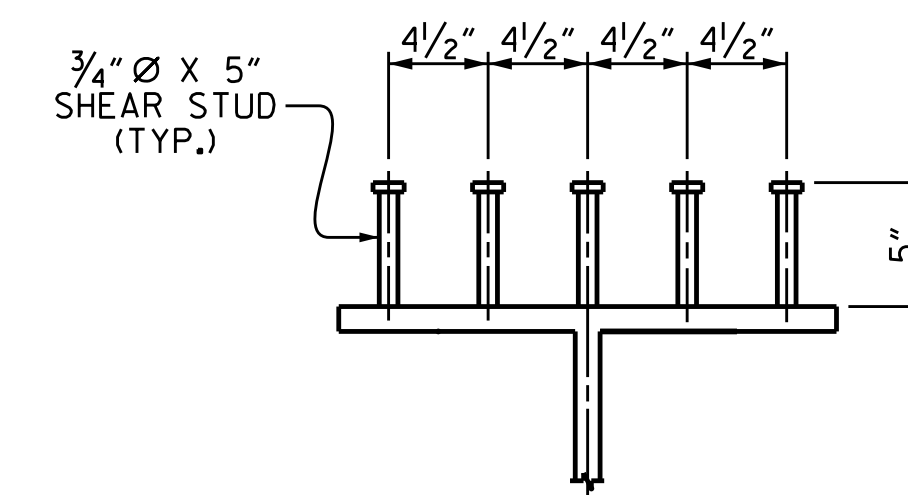
(EACH END SIMILAR)

* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR GIRDERS



ELEVATION

TYPICAL FLANGE AND WEB BUTT JOINT



3/29/2016

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-

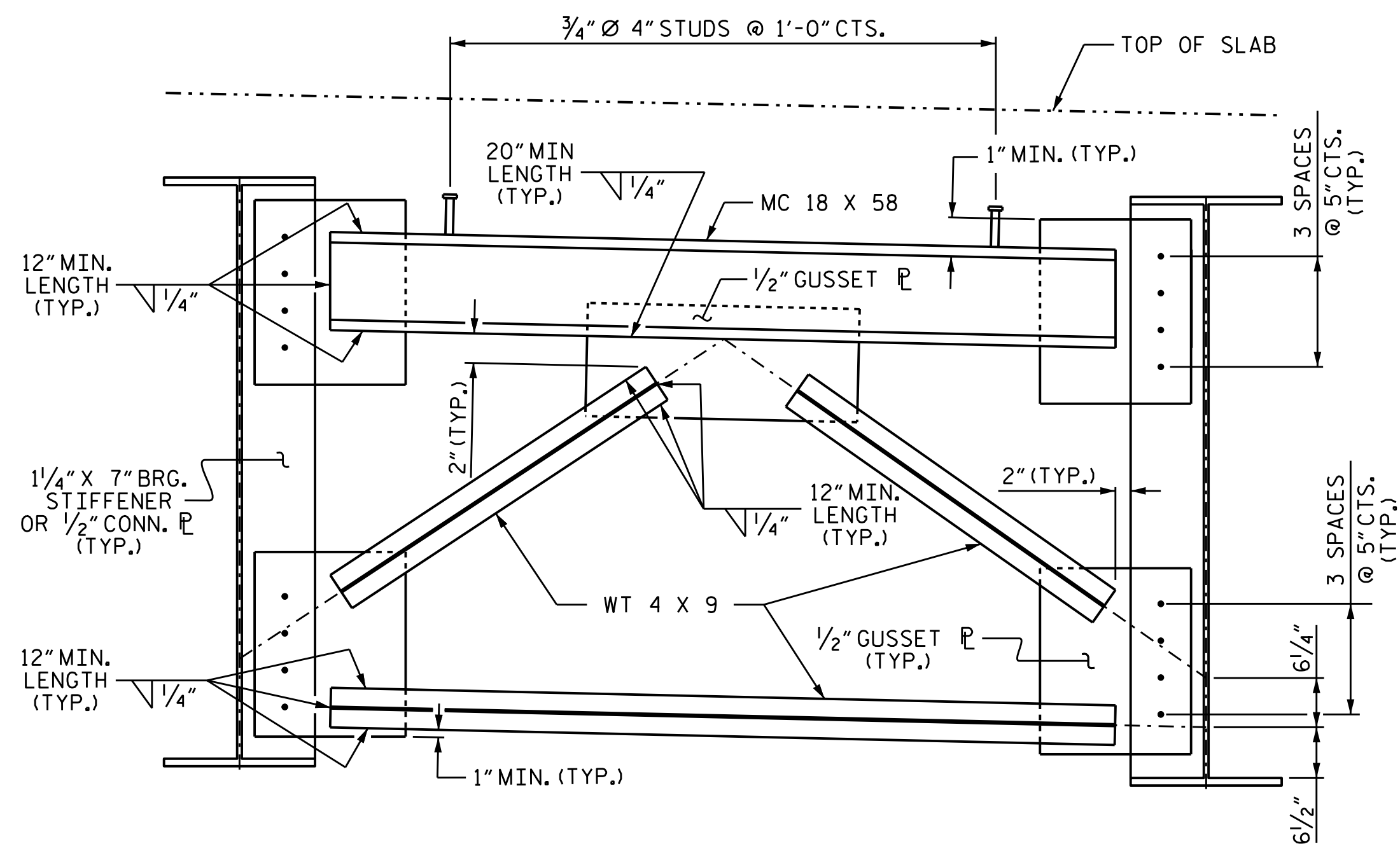
SHEET 1 OF 4

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

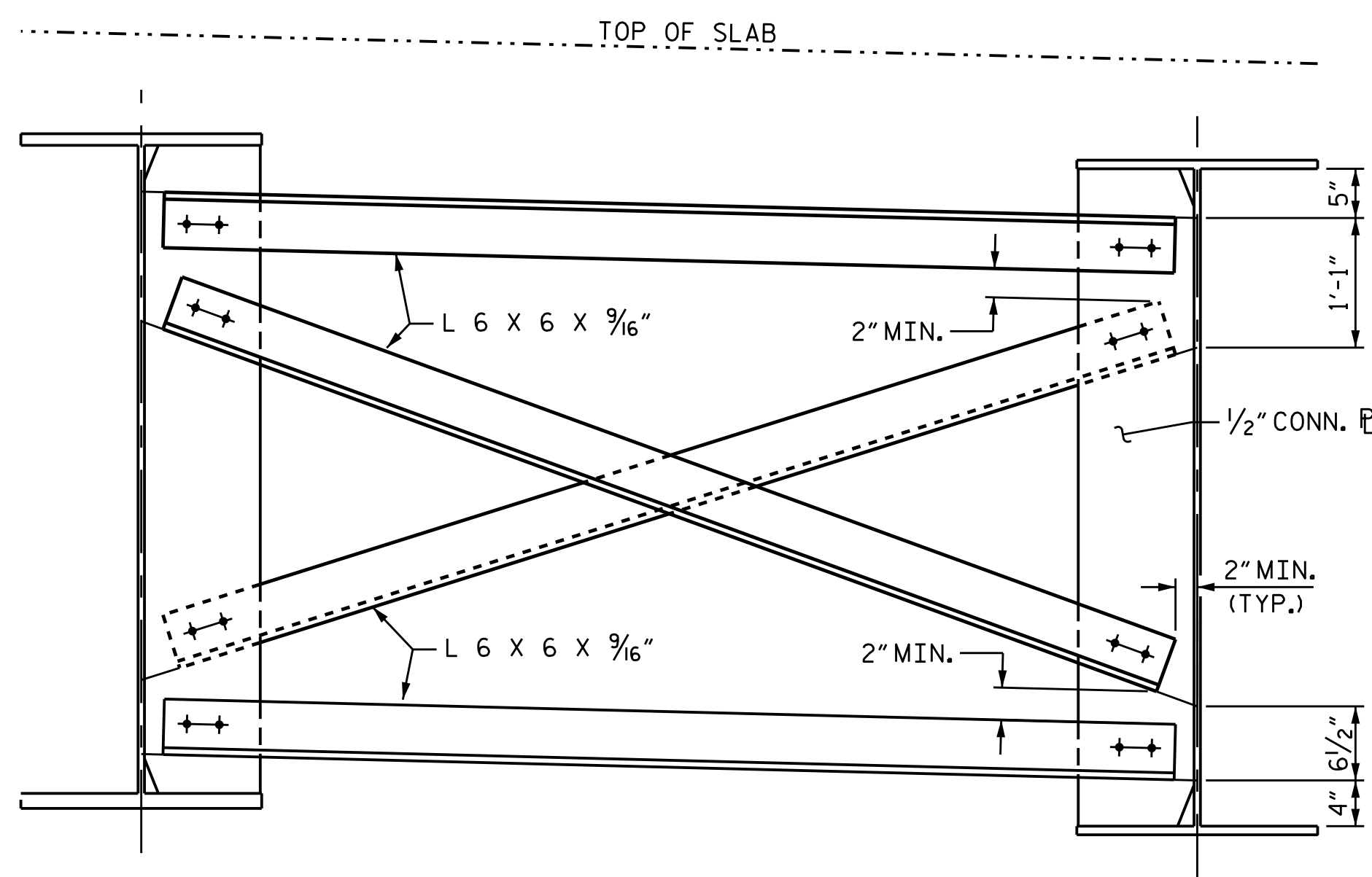
DRAWN BY : A. SORSENGINH DATE : 5/2015
 CHECKED BY : J.P. ADAMS DATE : 6/2015
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 9/2015

DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

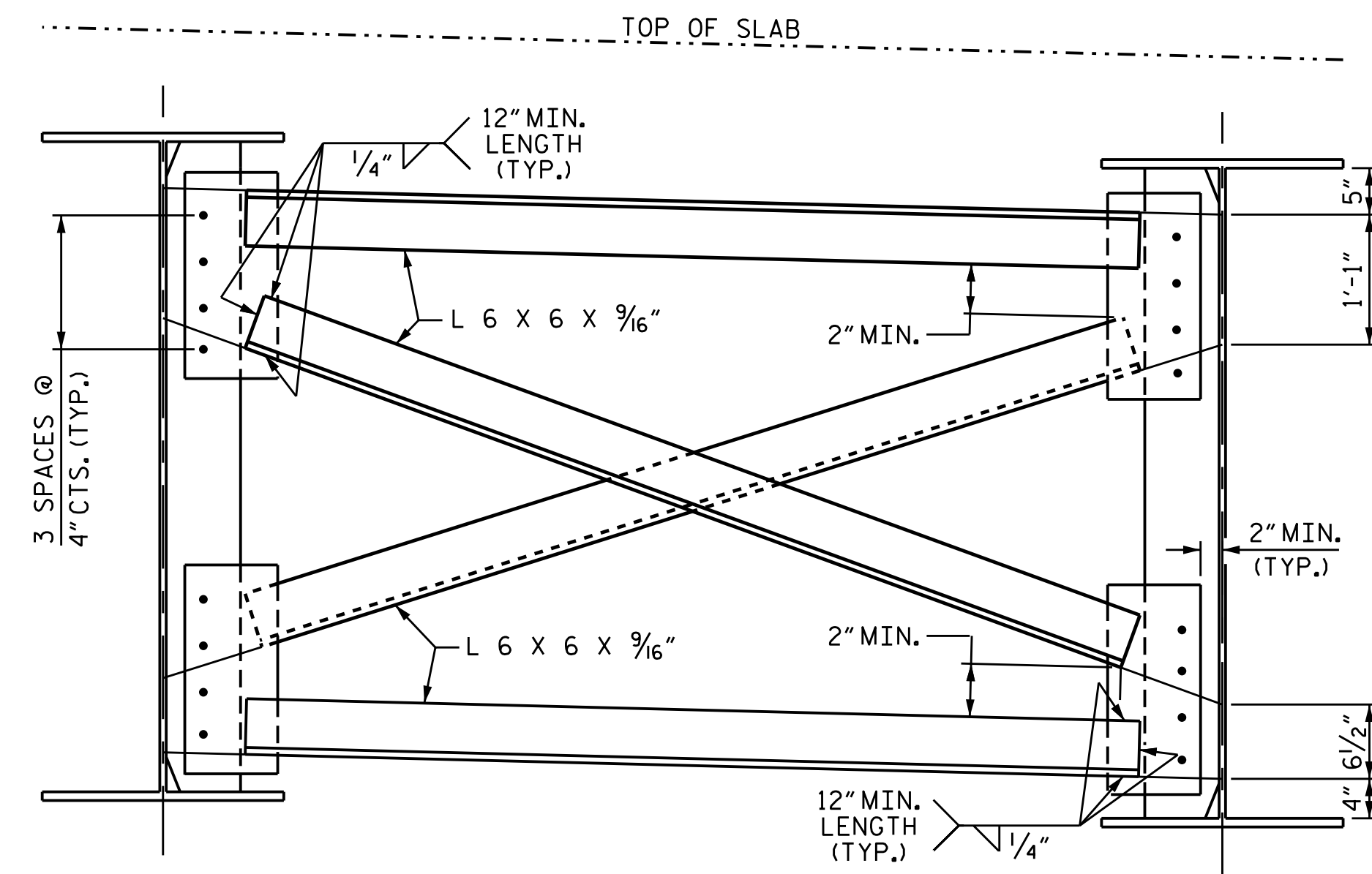
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			84



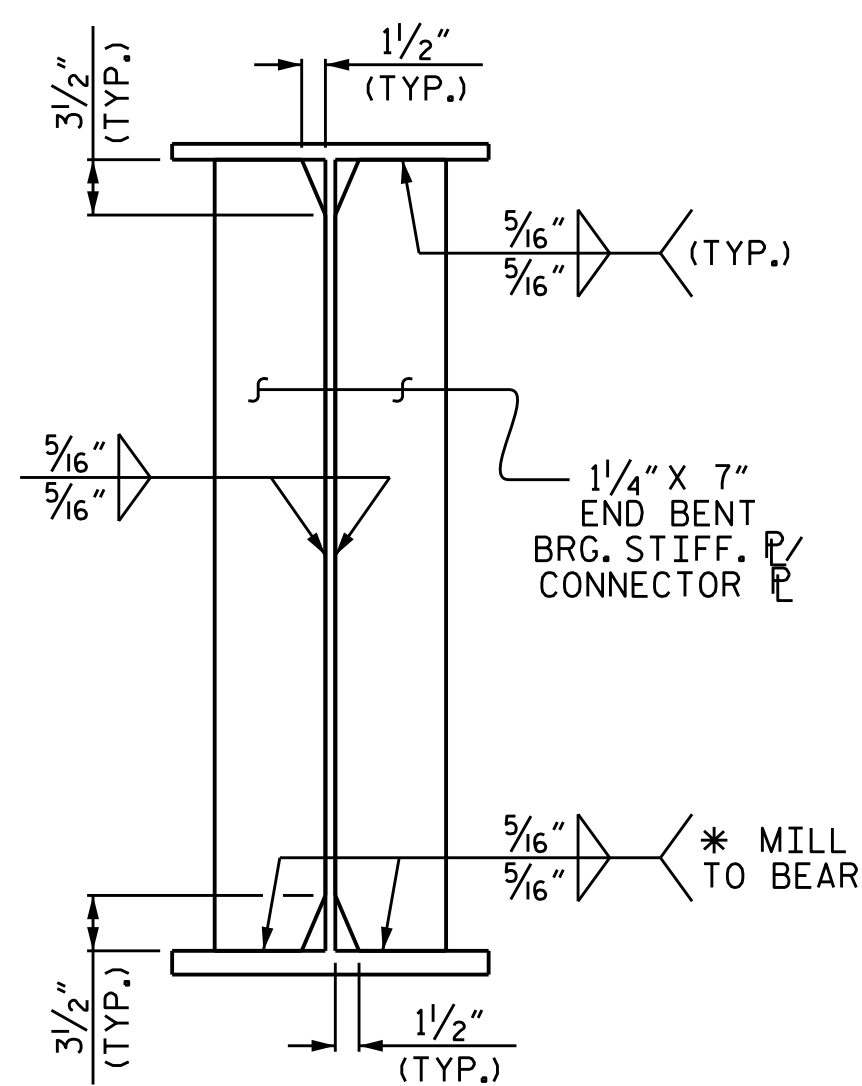
TYPICAL END BENT DIAPHRAGM



TYPICAL INTERMEDIATE DIAPHRAGM

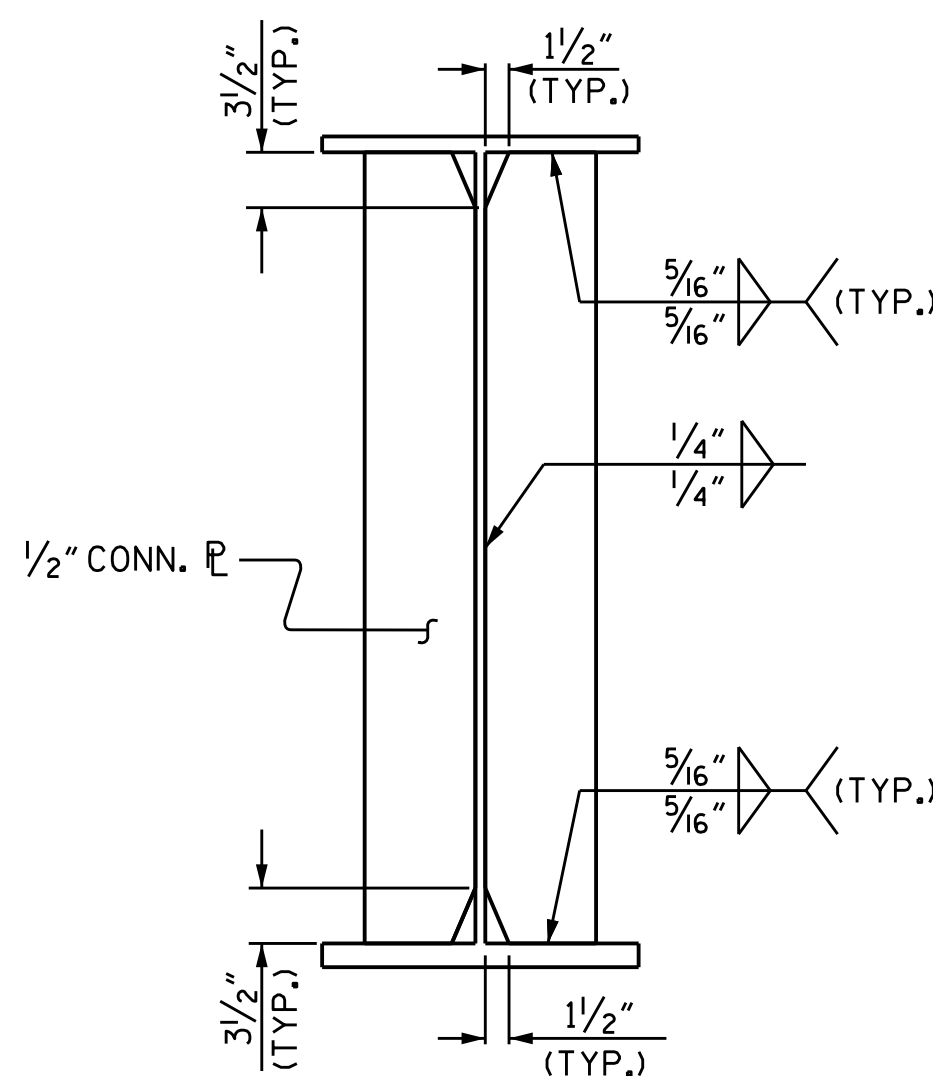


TYPICAL OPTIONAL INTERMEDIATE DIAPHRAGM

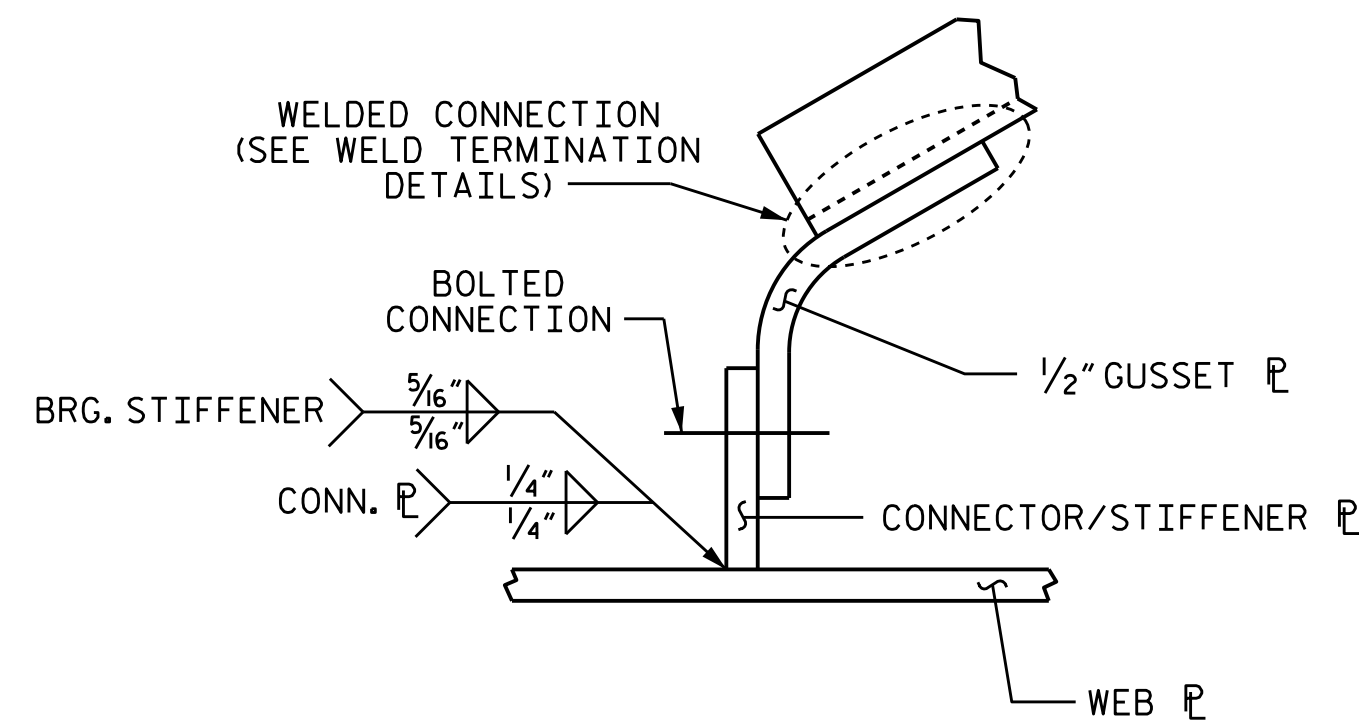


BEARING STIFFENER / CONNECTOR PLATE

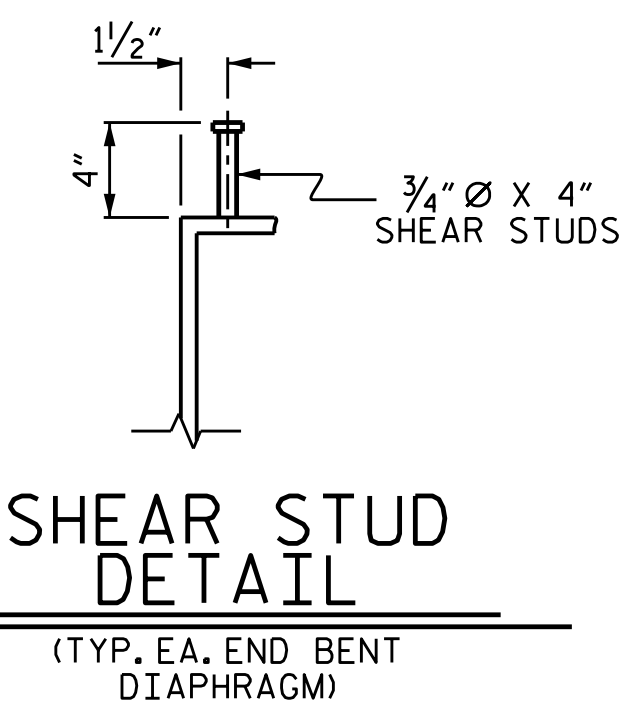
* WELD ONLY WHEN USED AS A CONNECTOR PLATE.



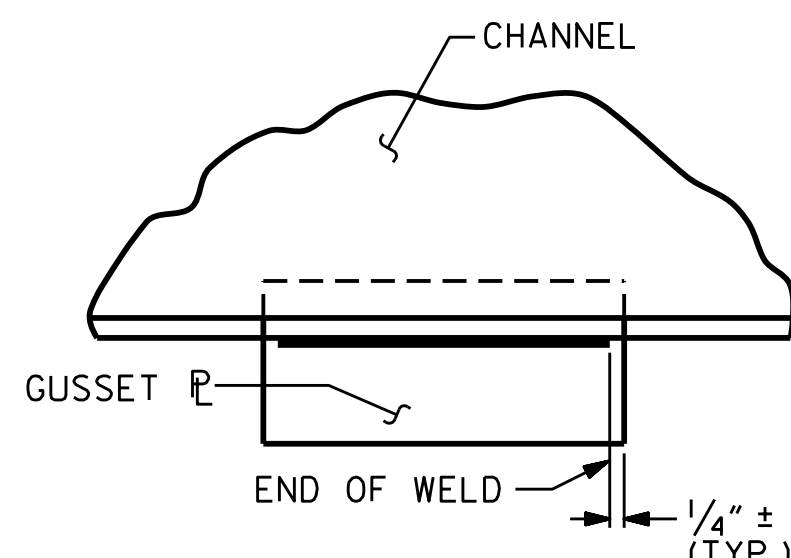
CONNECTOR PLATE DETAIL



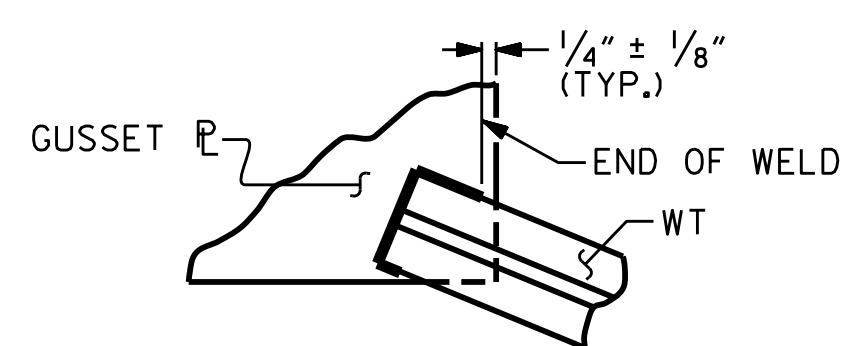
CURVED GUSSET PLATE DETAILS



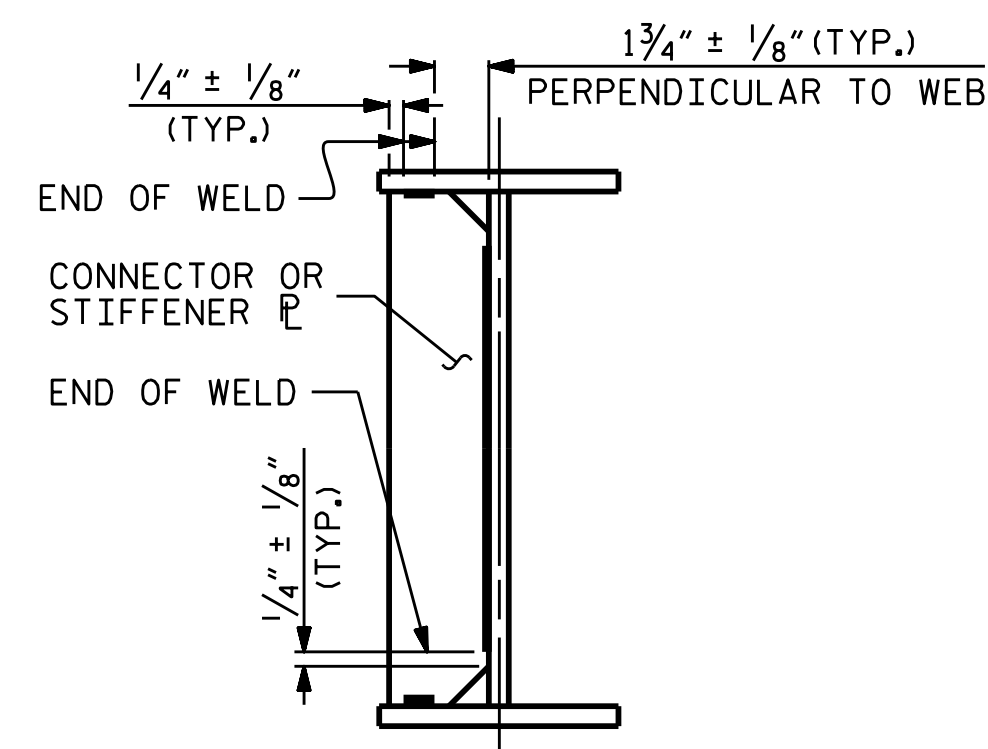
SHEAR STUD DETAIL
(TYP. EA. END BENT DIAPHRAGM)



TYPICAL GUSSET PLATE CONNECTION



TYPICAL "TEE" TO GUSSET PLATE CONNECTION



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

DRAWN BY : A. SORSENGINH DATE : 5/2015
 CHECKED BY : J.P. ADAMS DATE : 6/2015
 DESIGN ENGINEER OF RECORD : A. SORSENGINH DATE : 9/2015

29-MAR-2016 09:19
 R:\Structures\Plans\STR 1\SUPERSTRUCTURE\B4490.SD.SS.1.dgn
 jpadams

WELD TERMINATION DETAILS



PROJECT NO. B-4490
 CUMBERLAND COUNTY
 STATION: 29+57.01 -L-

SHEET 2 OF 4

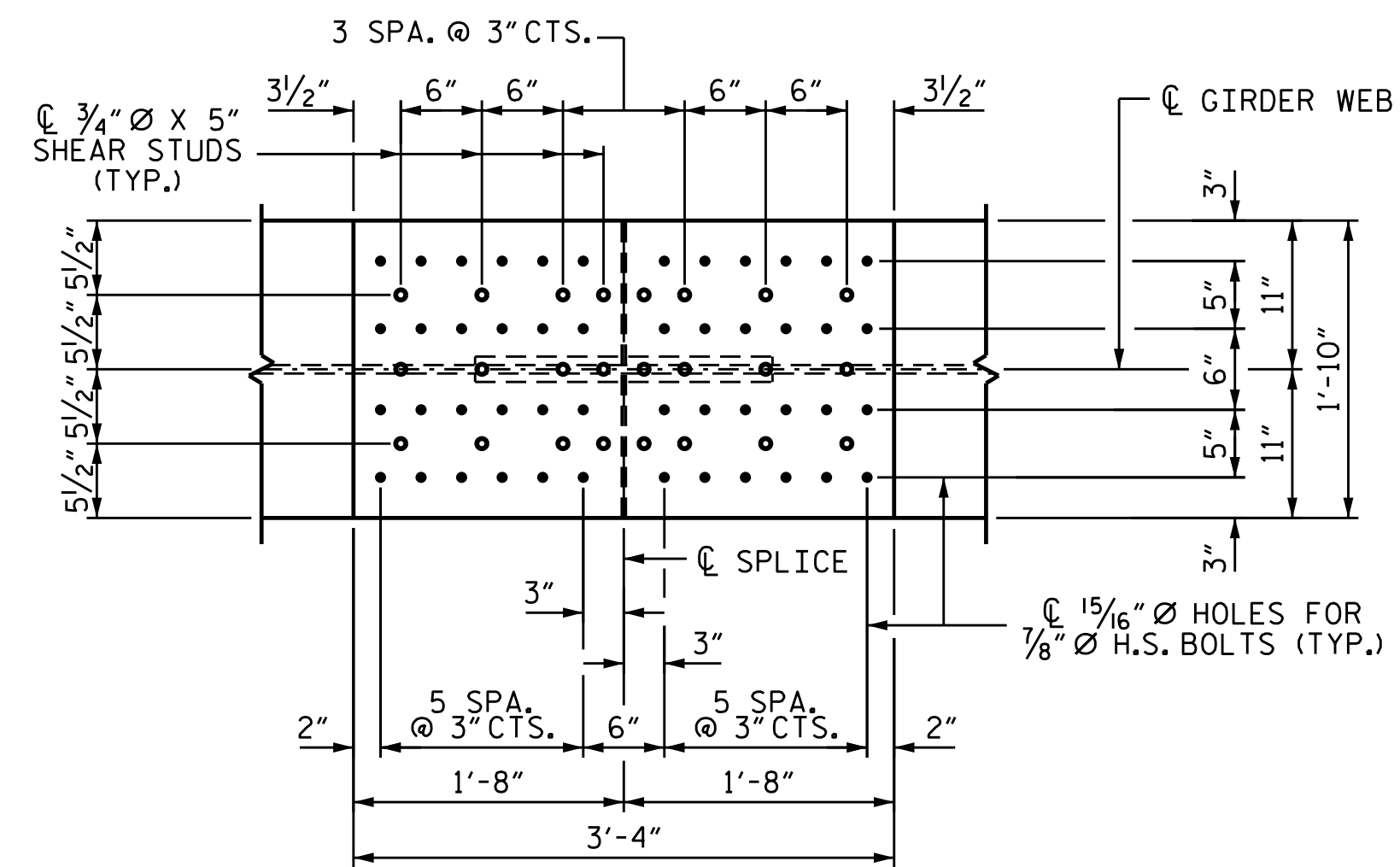
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS

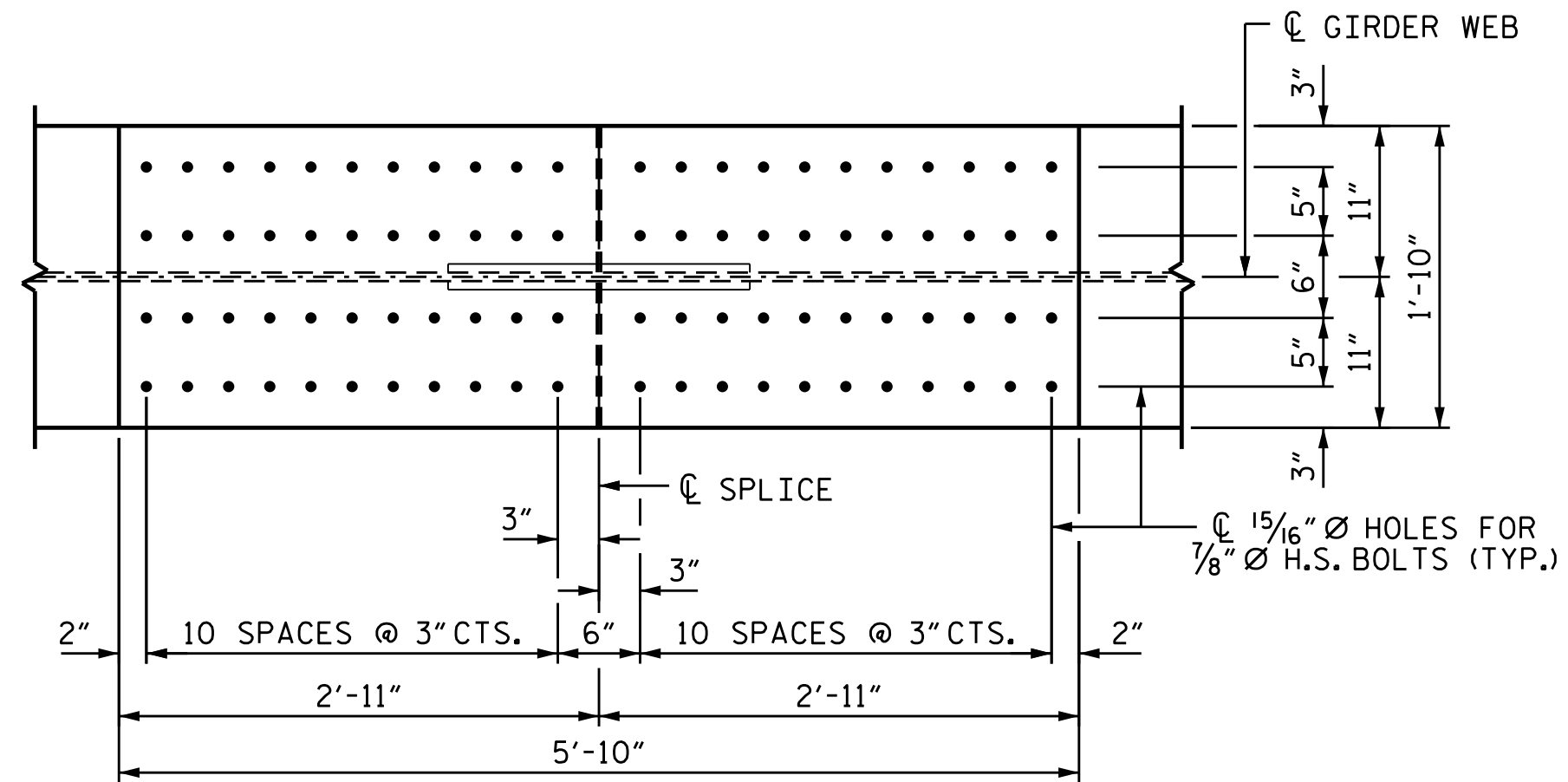
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10	
1			3			TOTAL SHEETS	
2			4			84	

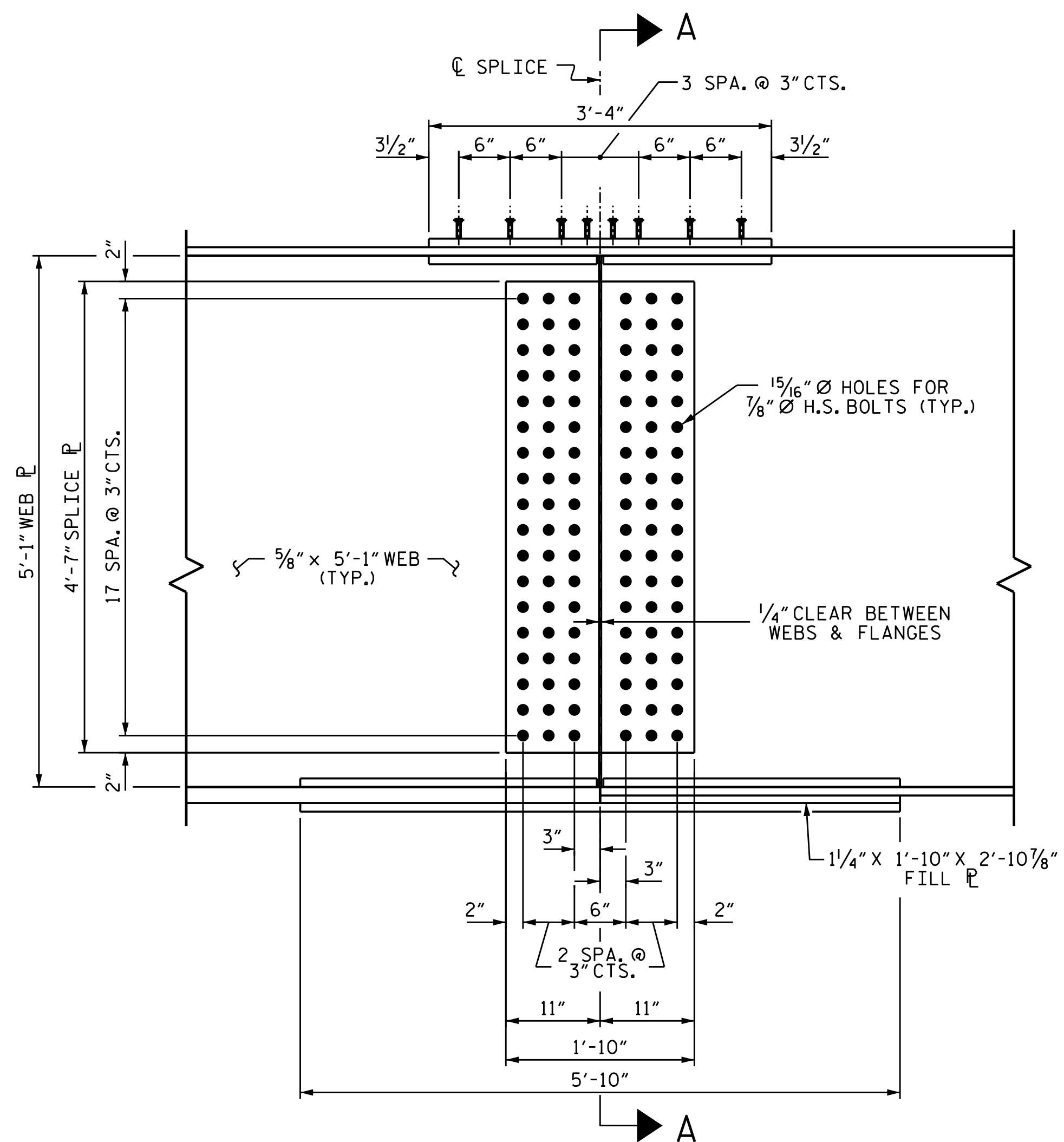
STR. #1



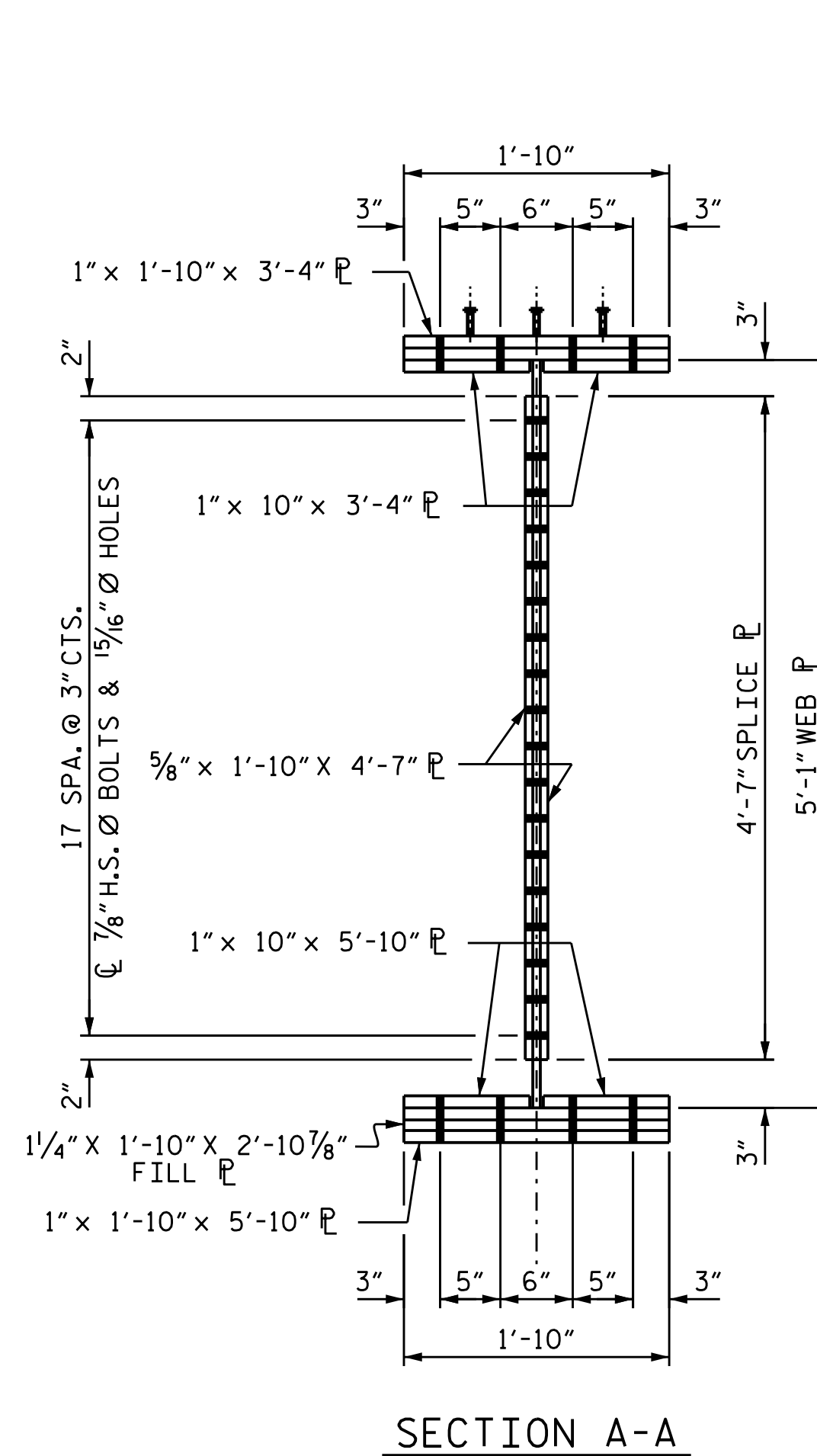
PLAN (TOP OF TOP FLANGE)



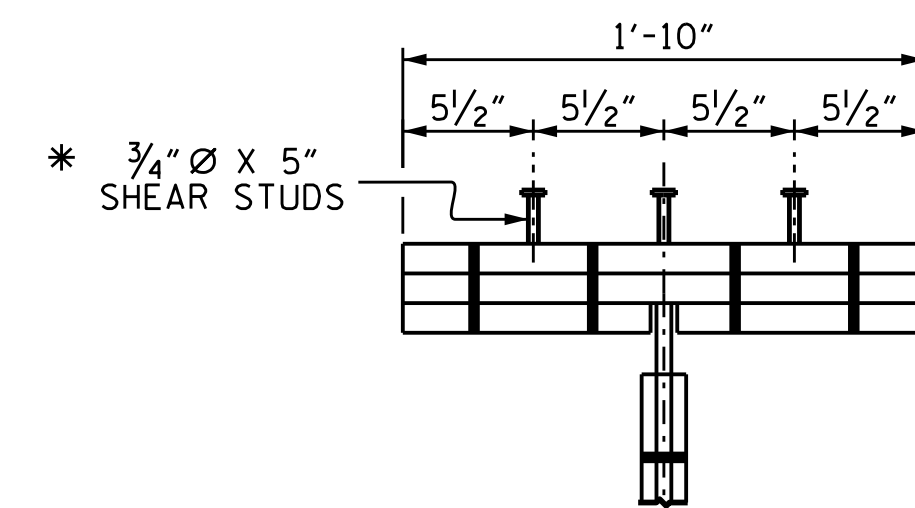
PLAN (TOP OF BOTTOM FLANGE)



ELEVATION



SECTION A-A



SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE
* NOTE: SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY.

BOLTED FIELD SPLICE DETAILS

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-

SHEET 3 OF 4



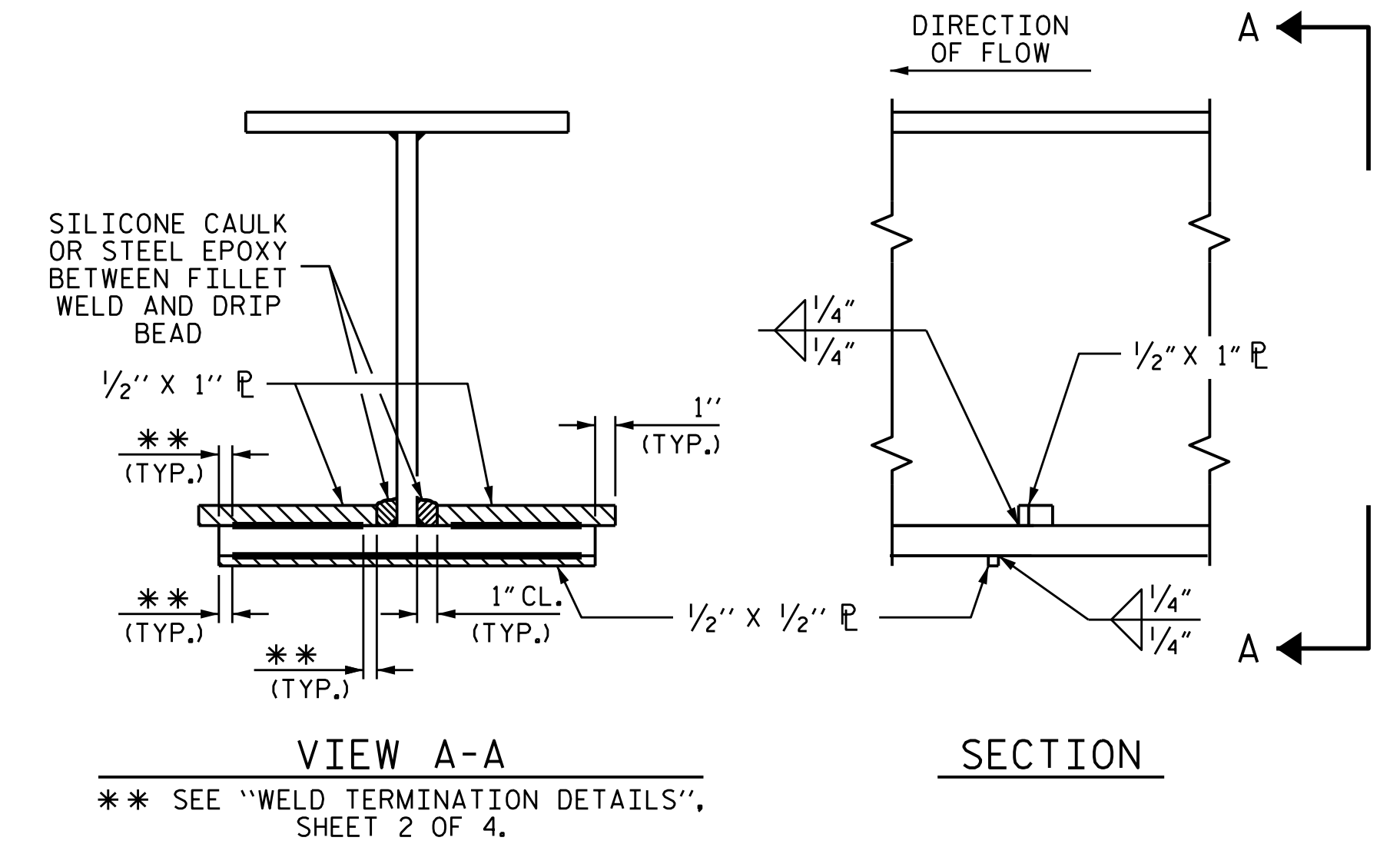
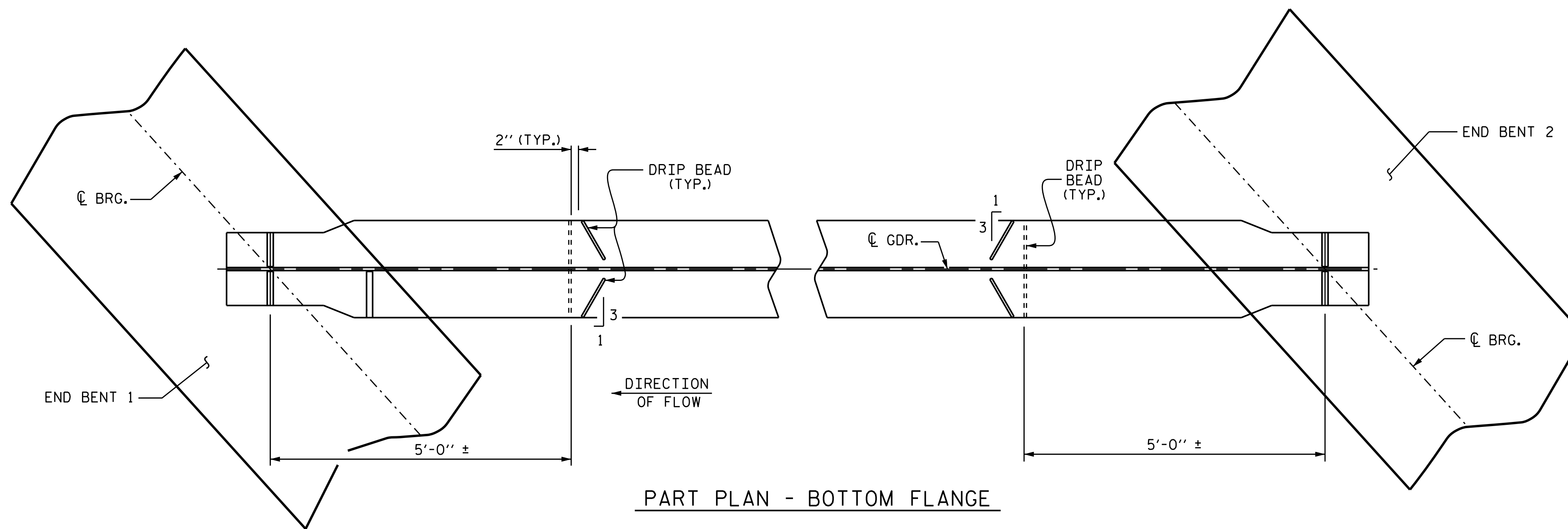
DocuSigned by:
 3/29/2016

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

DRAWN BY : A. SORSENGINH DATE : 5/2015
 CHECKED BY : J.P. ADAMS DATE : 6/2015
 DESIGN ENGINEER OF RECORD : A. SORSENGINH DATE : 9/2015

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			84



DRIP BEAD DETAILS

NOTES

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH THE "PAINTING OF STRUCTURAL STEEL" SPECIAL PROVISION, 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 (IF USED) FOR ALL GIRDERS AND IN ACCORDANCE WITH ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

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

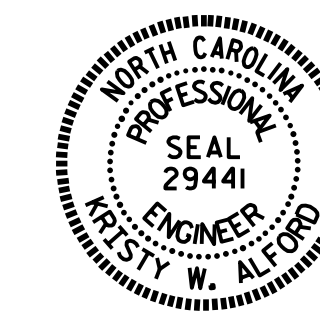
END OF GIRDERS SHALL BE PLUMB.

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR STEEL DEAD LOAD FIT UP.

AT THE CONTRACTOR'S OPTION, THE DIAPHRAGM WITH THE WELDED GUSSET PLATES MAY BE USED IN LIEU OF THE DIAPHRAGM WITH BOLTED ANGLES AT NO ADDITIONAL COST TO THE DEPARTMENT.

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-

SHEET 4 OF 4



DocuSigned by:
 F245838300F40E
 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS**

DRAWN BY : A. SORSENGINH DATE : 5/2015
 CHECKED BY : J.P. ADAMS DATE : 6/2015
 DESIGN ENGINEER OF RECORD : A. SORSENGINH DATE : 9/2015

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			84

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
		GIRDER #1																				
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	0.026	0.051	0.074	0.095	0.113	0.129	0.141	0.150	0.156	0.157	0.156	0.150	0.141	0.129	0.113	0.095	0.074	0.051	0.026	0
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0	0.092	0.172	0.247	0.315	0.374	0.424	0.464	0.494	0.512	0.518	0.512	0.494	0.464	0.424	0.374	0.315	0.247	0.172	0.092	0
DEFLECTION DUE TO WEIGHT OF PARAPET AND SIDEWALK	↓	0	0.017	0.033	0.048	0.061	0.073	0.083	0.091	0.097	0.101	0.102	0.101	0.097	0.091	0.083	0.073	0.061	0.048	0.033	0.017	0
TOTAL DEAD LOAD DEFLECTION	↓	0	0.134	0.256	0.369	0.471	0.560	0.636	0.696	0.741	0.768	0.777	0.768	0.741	0.696	0.636	0.560	0.471	0.369	0.256	0.134	0
VERTICAL CURVE ORDINATE	↑	0	0.105	0.199	0.282	0.354	0.415	0.464	0.503	0.531	0.547	0.553	0.547	0.531	0.503	0.464	0.415	0.354	0.282	0.199	0.105	0
REQUIRED CAMBER	↑	0	2 7/8"	5 1/6"	7 13/16"	9 7/8"	11 11/16"	13 3/8"	14 3/8"	15 1/4"	15 3/4"	15 5/8"	15 3/4"	15 1/4"	14 3/8"	13 3/8"	11 11/16"	9 7/8"	7 13/16"	5 1/6"	2 7/8"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
		GIRDER #2																				
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	0.026	0.051	0.074	0.095	0.113	0.129	0.141	0.150	0.156	0.157	0.156	0.150	0.141	0.129	0.113	0.095	0.074	0.051	0.026	0
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0	0.090	0.168	0.242	0.307	0.365	0.414	0.453	0.482	0.499	0.505	0.499	0.482	0.453	0.414	0.365	0.307	0.242	0.168	0.090	0
DEFLECTION DUE TO WEIGHT OF PARAPET AND SIDEWALK	↓	0	0.012	0.024	0.034	0.044	0.052	0.059	0.065	0.069	0.072	0.072	0.072	0.069	0.065	0.059	0.052	0.044	0.034	0.024	0.012	0
TOTAL DEAD LOAD DEFLECTION	↓	0	0.127	0.243	0.350	0.446	0.530	0.602	0.659	0.701	0.726	0.735	0.726	0.701	0.659	0.602	0.530	0.446	0.350	0.243	0.127	0
VERTICAL CURVE ORDINATE	↑	0	0.105	0.199	0.282	0.354	0.415	0.464	0.503	0.531	0.547	0.553	0.547	0.531	0.503	0.464	0.415	0.354	0.282	0.199	0.105	0
REQUIRED CAMBER	↑	0	2 13/16"	5 5/8"	7 9/16"	9 9/16"	11 5/8"	12 13/16"	13 5/8"	14 3/4"	15 5/8"	15 7/8"	15 5/8"	14 3/4"	13 5/8"	12 13/16"	11 5/8"	9 9/16"	7 9/16"	5 5/8"	2 13/16"	0

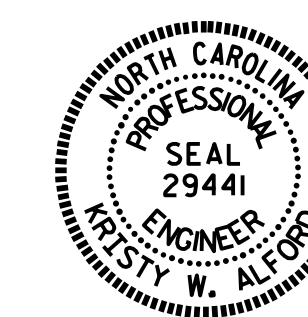
DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
		GIRDER #3																				
TWENTIETH POINTS		0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	0.026	0.051	0.074	0.095	0.113	0.129	0.141	0.150	0.156	0.157	0.156	0.150	0.141	0.129	0.113	0.095	0.074	0.051	0.026	0
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0	0.088	0.164	0.236	0.300	0.356	0.404	0.442	0.470	0.487	0.493	0.487	0.470	0.442	0.404	0.356	0.300	0.236	0.164	0.088	0
DEFLECTION DUE TO WEIGHT OF PARAPET AND SIDEWALK	↓	0	0.008	0.016	0.024	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	0.024	0.016	0.008	0
TOTAL DEAD LOAD DEFLECTION	↓	0	0.122	0.232	0.334	0.425	0.505	0.574	0.628	0.668	0.692	0.700	0.692	0.668	0.628	0.574	0.505	0.425	0.334	0.232	0.122	0
VERTICAL CURVE ORDINATE	↑	0	0.105	0.199	0.282	0.354	0.415	0.464	0.503	0.531	0.547	0.553	0.547	0.531	0.503	0.464	0.415	0.354	0.282	0.199	0.105	0
REQUIRED CAMBER	↑	0	2 3/4"	5 3/8"	7 3/8"	9 5/8"	11 1/8"	12 7/8"	13 9/16"	14 3/8"	14 7/8"	15 1/8"	14 7/8"	14 3/8"	13 9/16"	12 7/8"	11 1/8"	9 5/8"	7 3/8"	5 3/8"	2 3/4"	0

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

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR STEEL DEAD LOAD FIT UP.

DRAWN BY : A. SORSENGINH DATE : 5/2015
CHECKED BY : J.P. ADAMS DATE : 6/2015
DESIGN ENGINEER OF RECORD : A. SORSENGINH DATE : 9/2015

29-MAR-2016 09:19
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jpodams



DocuSigned by:
AUSTY W. ALDRIDGE
3/29/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 29+57.01 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SUPERSTRUCTURE DEAD LOAD DEFLECTIONS		SHEET NO. S-13	
REVISIONS									
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS			
1			3			84			
2			4						

STR. #1

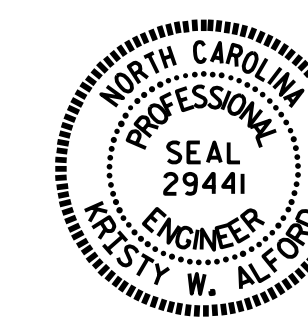
DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
GIRDERS #4 & #8																					
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.026	0.051	0.074	0.095	0.113	0.129	0.141	0.150	0.156	0.157	0.156	0.150	0.141	0.129	0.113	0.095	0.074	0.051	0.026	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.092	0.172	0.247	0.315	0.374	0.424	0.464	0.494	0.512	0.518	0.512	0.494	0.464	0.424	0.374	0.315	0.247	0.172	0.092	
DEFLECTION DUE TO WEIGHT OF PARAPET AND SIDEWALK ↓	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.117	0.223	0.321	0.409	0.487	0.553	0.605	0.644	0.667	0.675	0.667	0.644	0.605	0.553	0.487	0.409	0.321	0.223	0.117	0
VERTICAL CURVE ORDINATE ↑	0	0.105	0.199	0.282	0.354	0.415	0.464	0.503	0.531	0.547	0.553	0.547	0.531	0.503	0.464	0.415	0.354	0.282	0.199	0.105	0
REQUIRED CAMBER ↑	0	2 ¹ / ₁₆ "	5 ¹ / ₁₆ "	7 ¹ / ₄ "	9 ¹ / ₈ "	10 ¹ / ₂ "	12 ³ / ₁₆ "	13 ⁵ / ₁₆ "	14 ¹ / ₁₆ "	14 ⁷ / ₁₆ "	14 ³ / ₄ "	14 ⁷ / ₁₆ "	14 ¹ / ₁₆ "	13 ⁵ / ₁₆ "	12 ³ / ₁₆ "	10 ¹ / ₂ "	9 ¹ / ₈ "	7 ¹ / ₄ "	5 ¹ / ₁₆ "	2 ¹ / ₁₆ "	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
GIRDERS #5, #6 & #7																					
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	0.026	0.051	0.074	0.095	0.113	0.129	0.141	0.150	0.156	0.157	0.156	0.150	0.141	0.129	0.113	0.095	0.074	0.051	0.026	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.090	0.168	0.242	0.307	0.365	0.414	0.453	0.482	0.499	0.505	0.499	0.482	0.453	0.414	0.365	0.307	0.242	0.168	0.090	0
DEFLECTION DUE TO WEIGHT OF PARAPET AND SIDEWALK ↓	0	0.013	0.025	0.036	0.046	0.055	0.062	0.068	0.073	0.076	0.076	0.076	0.073	0.068	0.062	0.055	0.046	0.036	0.025	0.013	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.128	0.244	0.352	0.448	0.533	0.605	0.663	0.705	0.730	0.739	0.730	0.705	0.663	0.605	0.533	0.448	0.352	0.244	0.128	0
VERTICAL CURVE ORDINATE ↑	0	0.105	0.199	0.282	0.354	0.415	0.464	0.503	0.531	0.547	0.553	0.547	0.531	0.503	0.464	0.415	0.354	0.282	0.199	0.105	0
REQUIRED CAMBER ↑	0	2 ¹ / ₁₆ "	5 ¹ / ₁₆ "	7 ⁵ / ₁₆ "	9 ⁵ / ₁₆ "	11 ³ / ₁₆ "	12 ³ / ₁₆ "	14"	14 ¹ / ₁₆ "	15 ¹ / ₁₆ "	15 ¹ / ₂ "	15 ⁵ / ₁₆ "	14 ¹ / ₁₆ "	14"	12 ³ / ₁₆ "	11 ³ / ₁₆ "	9 ⁵ / ₁₆ "	7 ⁵ / ₁₆ "	5 ¹ / ₁₆ "	2 ³ / ₁₆ "	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
GIRDER #9																					
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	0.026	0.051	0.074	0.095	0.113	0.129	0.141	0.150	0.156	0.157	0.156	0.150	0.141	0.129	0.113	0.095	0.074	0.051	0.026	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.088	0.164	0.236	0.300	0.356	0.404	0.442	0.470	0.487	0.493	0.487	0.470	0.442	0.404	0.356	0.300	0.236	0.164	0.088	0
DEFLECTION DUE TO WEIGHT OF PARAPET AND SIDEWALK ↓	0	0.009	0.018	0.027	0.034	0.041	0.046	0.051	0.054	0.056	0.057	0.056	0.054	0.051	0.046	0.041	0.034	0.027	0.018	0.009	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.123	0.234	0.337	0.429	0.510	0.579	0.634	0.674	0.699	0.707	0.699	0.674	0.634	0.579	0.510	0.429	0.337	0.234	0.123	0
VERTICAL CURVE ORDINATE ↑	0	0.105	0.199	0.282	0.354	0.415	0.464	0.503	0.531	0.547	0.553	0.547	0.531	0.503	0.464	0.415	0.354	0.282	0.199	0.105	0
REQUIRED CAMBER ↑	0	2 ³ / ₄ "	5 ³ / ₁₆ "	7 ⁷ / ₁₆ "	9 ³ / ₈ "	11 ¹ / ₁₆ "	12 ¹ / ₂ "	13 ⁵ / ₁₆ "	14 ⁷ / ₁₆ "	14 ¹ / ₂ "	15 ¹ / ₈ "	14 ¹ / ₁₆ "	14 ⁷ / ₁₆ "	13 ⁵ / ₁₆ "	12 ¹ / ₂ "	11 ¹ / ₁₆ "	9 ³ / ₈ "	7 ⁷ / ₁₆ "	5 ³ / ₁₆ "	2 ³ / ₄ "	0

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

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR STEEL DEAD LOAD FIT UP.



DocuSigned by:
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3/29/2016

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 29+57.01 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DEAD LOAD
DEFLECTIONS

DRAWN BY : A. SORSENGINH DATE : 5/2015
CHECKED BY : J.P. ADAMS DATE : 6/2015
DESIGN ENGINEER OF RECORD : A. SORSENGINH DATE : 9/2015

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			84

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
GIRDER #10																					
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	0.026	0.051	0.074	0.095	0.113	0.129	0.141	0.150	0.156	0.157	0.156	0.150	0.141	0.129	0.113	0.095	0.074	0.051	0.026	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.092	0.172	0.247	0.315	0.374	0.424	0.464	0.494	0.512	0.518	0.512	0.494	0.464	0.424	0.374	0.315	0.247	0.172	0.092	0
DEFLECTION DUE TO WEIGHT OF PARAPET AND SIDEWALK ↓	0	0.014	0.026	0.038	0.049	0.059	0.066	0.073	0.078	0.080	0.081	0.080	0.078	0.073	0.066	0.059	0.049	0.038	0.026	0.014	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.131	0.250	0.360	0.458	0.545	0.619	0.678	0.721	0.747	0.756	0.747	0.721	0.678	0.619	0.545	0.458	0.360	0.250	0.131	0
VERTICAL CURVE ORDINATE ↑	0	0.105	0.199	0.282	0.354	0.415	0.464	0.503	0.531	0.547	0.553	0.547	0.531	0.503	0.464	0.415	0.354	0.282	0.199	0.105	0
REQUIRED CAMBER ↑	0	2 ¹³ / ₁₆ "	5 ³ / ₈ "	7 ¹¹ / ₁₆ "	9 ³ / ₄ "	11 ¹ / ₂ "	13"	14 ³ / ₁₆ "	15"	15 ⁹ / ₁₆ "	15 ¹¹ / ₁₆ "	15 ⁹ / ₁₆ "	15"	14 ³ / ₁₆ "	13"	11 ¹ / ₂ "	9 ³ / ₄ "	7 ¹¹ / ₁₆ "	5 ³ / ₈ "	2 ¹³ / ₁₆ "	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
GIRDER #11																					
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	0.026	0.051	0.074	0.095	0.113	0.129	0.141	0.150	0.156	0.157	0.156	0.150	0.141	0.129	0.113	0.095	0.074	0.051	0.026	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.090	0.168	0.242	0.307	0.365	0.414	0.453	0.482	0.499	0.505	0.499	0.482	0.453	0.414	0.365	0.307	0.242	0.168	0.090	0
DEFLECTION DUE TO WEIGHT OF PARAPET AND SIDEWALK ↓	0	0.019	0.037	0.054	0.069	0.082	0.094	0.103	0.109	0.113	0.114	0.113	0.109	0.103	0.094	0.082	0.069	0.054	0.037	0.019	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.134	0.256	0.370	0.471	0.560	0.636	0.697	0.741	0.768	0.777	0.768	0.741	0.697	0.636	0.560	0.471	0.370	0.256	0.134	0
VERTICAL CURVE ORDINATE ↑	0	0.105	0.199	0.282	0.354	0.415	0.464	0.503	0.531	0.547	0.553	0.547	0.531	0.503	0.464	0.415	0.354	0.282	0.199	0.105	0
REQUIRED CAMBER ↑	0	2 ⁷ / ₈ "	5 ⁷ / ₁₆ "	7 ¹³ / ₁₆ "	9 ⁷ / ₈ "	11 ¹¹ / ₁₆ "	13 ³ / ₁₆ "	14 ³ / ₈ "	15 ¹ / ₄ "	15 ³ / ₄ "	15 ⁵ / ₁₆ "	15 ³ / ₄ "	15 ¹ / ₄ "	14 ³ / ₈ "	13 ³ / ₁₆ "	11 ¹¹ / ₁₆ "	9 ⁷ / ₈ "	7 ¹³ / ₁₆ "	5 ⁷ / ₁₆ "	2 ⁷ / ₈ "	0

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

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR STEEL DEAD LOAD FIT UP.

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 29+57.01 -L-

SHEET 3 OF 3



DocuSigned by:
Rusty W. Alford
F2458389300F40E
3/29/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DEAD LOAD
DEFLECTIONS

DRAWN BY : A. SORSENGINH DATE : 5/2015
CHECKED BY : J.P. ADAMS DATE : 6/2015
DESIGN ENGINEER OF RECORD : A. SORSENGINH DATE : 9/2015

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			84

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 PAINTED STRUCTURAL STEEL (EXCLUDING AASHTO M270 GRADE 50W), SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

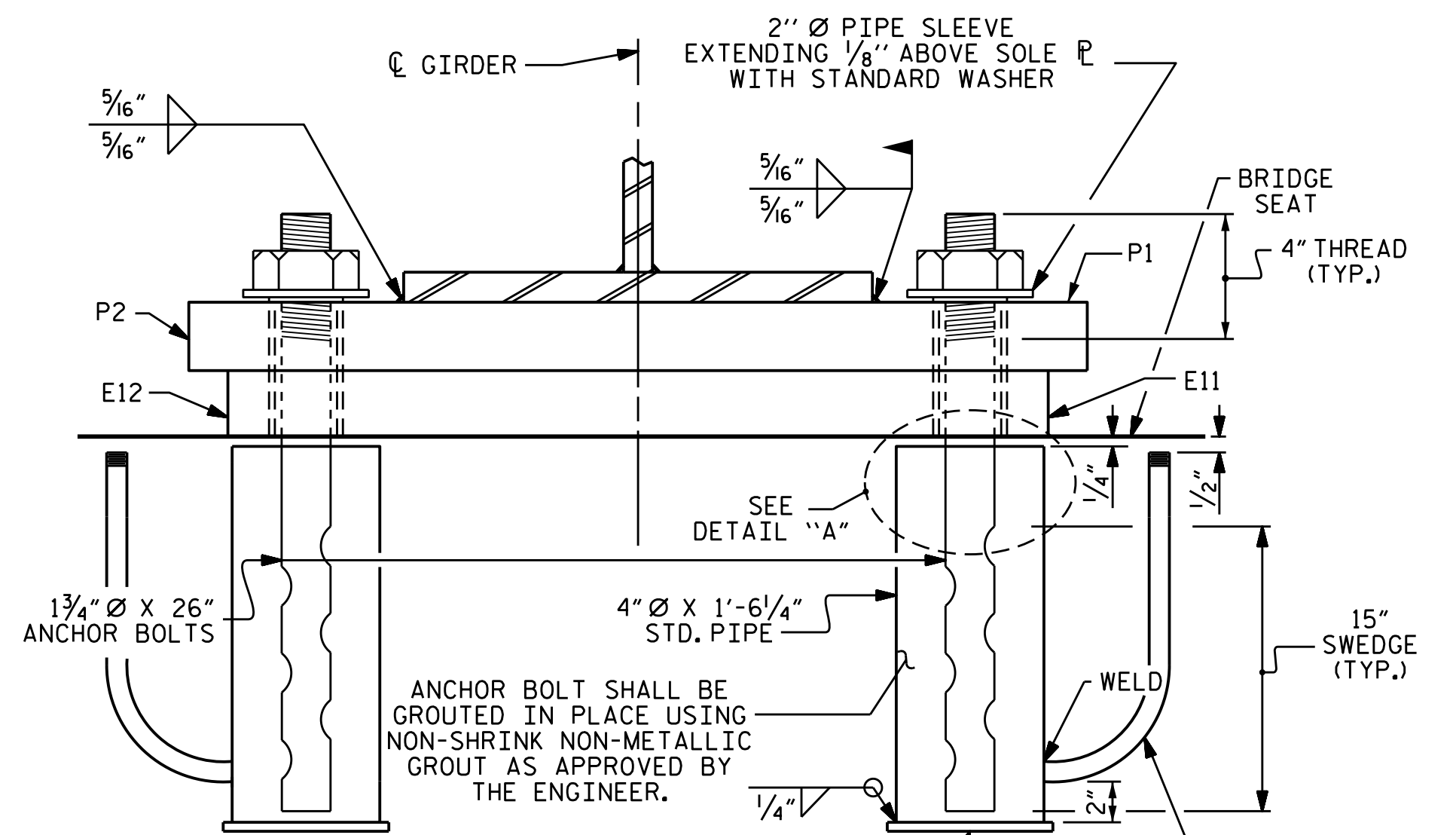
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

THE CLOSURE PLATE, GROUT PIPE AND STANDARD PIPE FOR THE EXPANSION ASSEMBLY NEED NOT BE GALVANIZED.

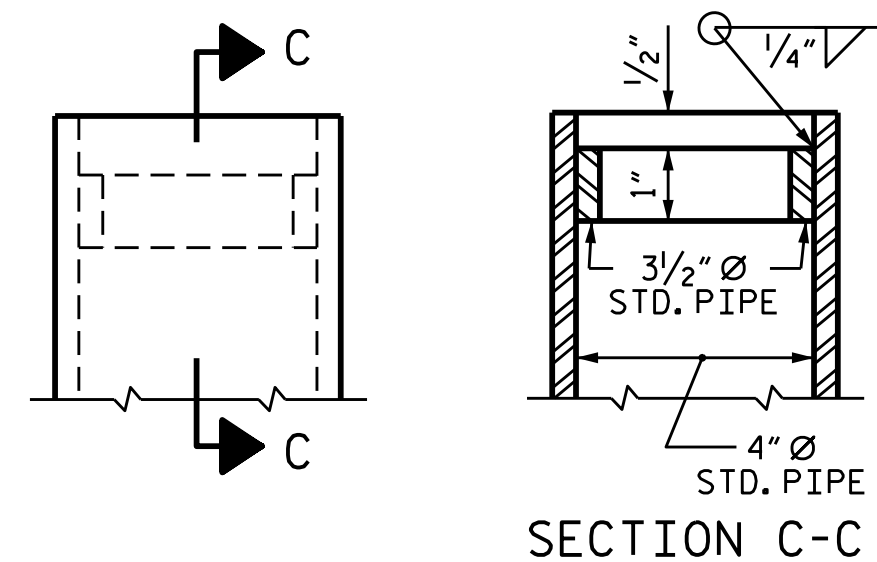
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURE, WHICH MAY BE REQUIRED BY THE ENGINEER, TO RESET ELASTOMERIC BEARINGS DUE TO GIRDER TRANSLATION AND END ROTATION:

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

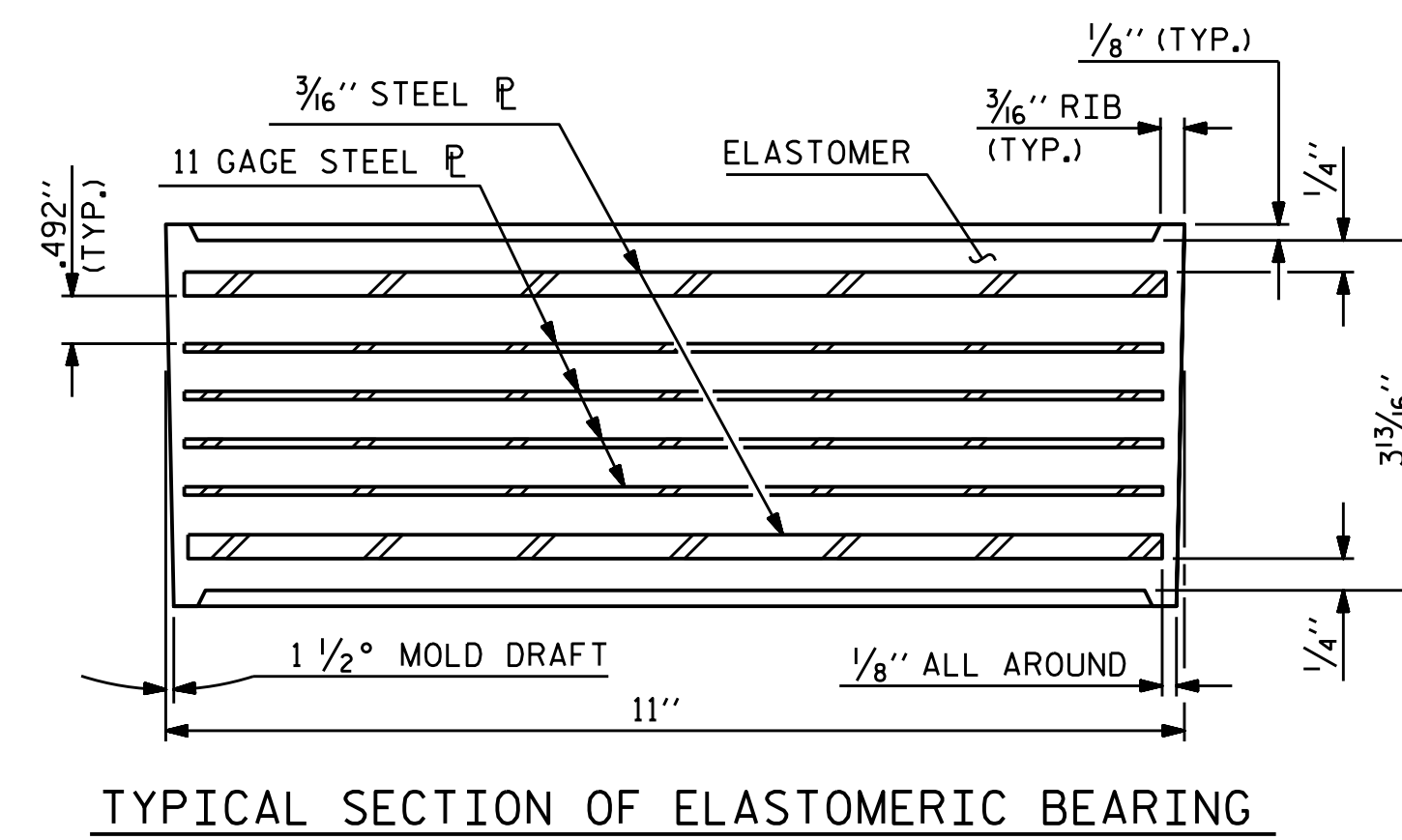
THE CONTRACTOR MAY PROPOSE ALTERNATE METHODS, PROVIDED DETAILS ARE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.



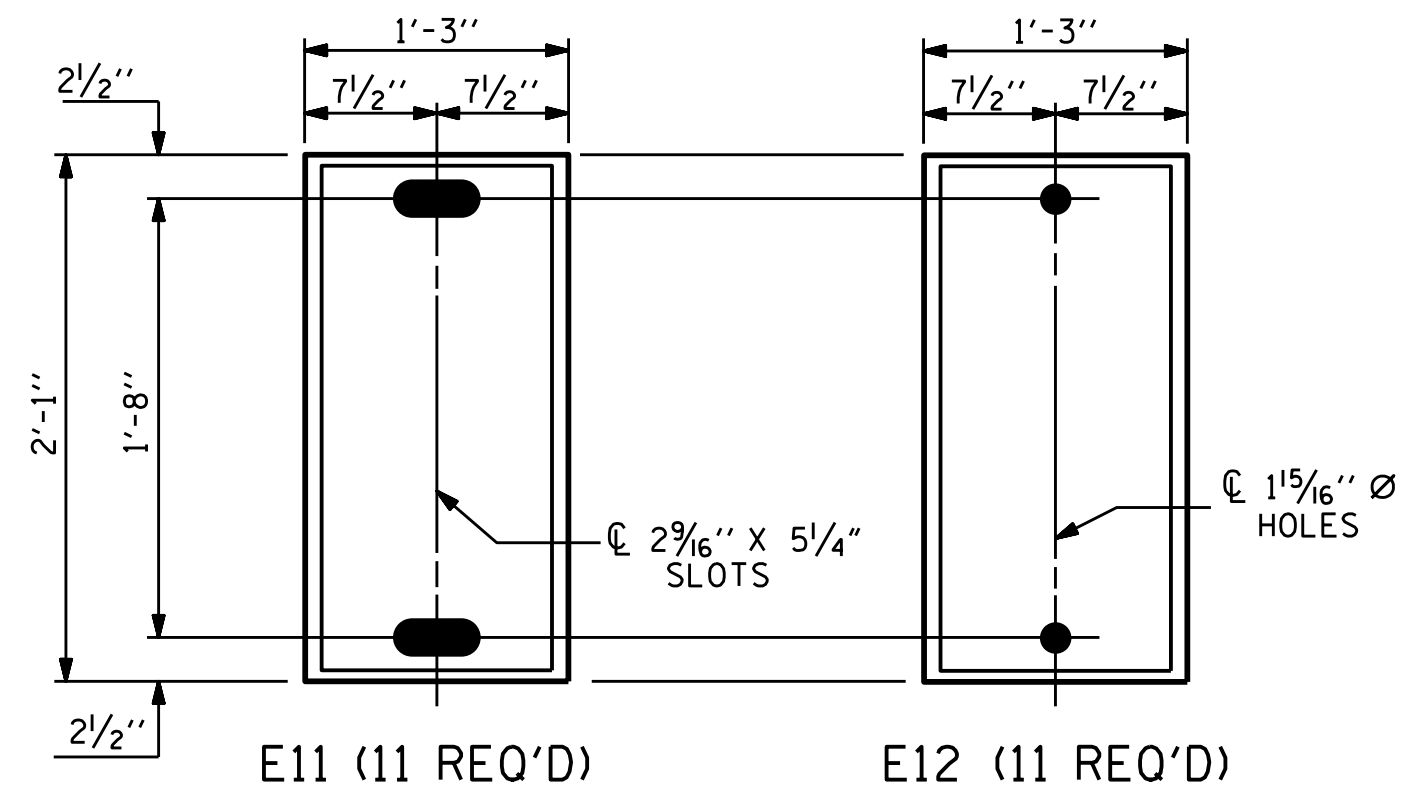
FIXED EXPANSION
END VIEW



DETAIL "A"

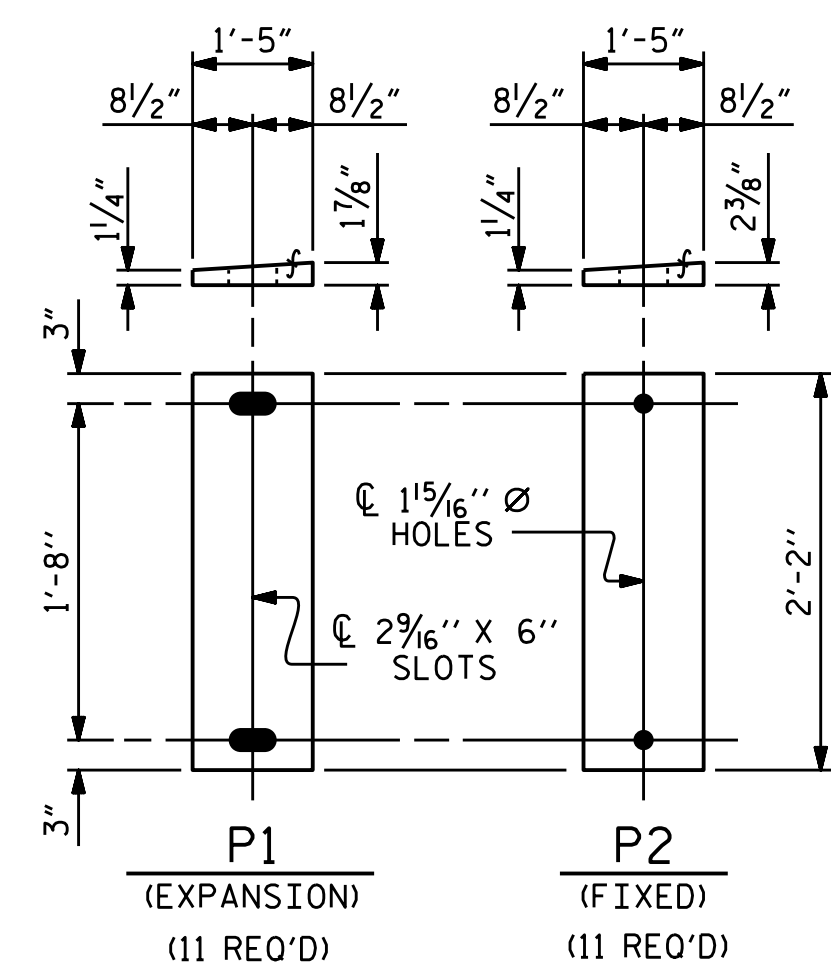


TYPICAL SECTION OF ELASTOMERIC BEARING

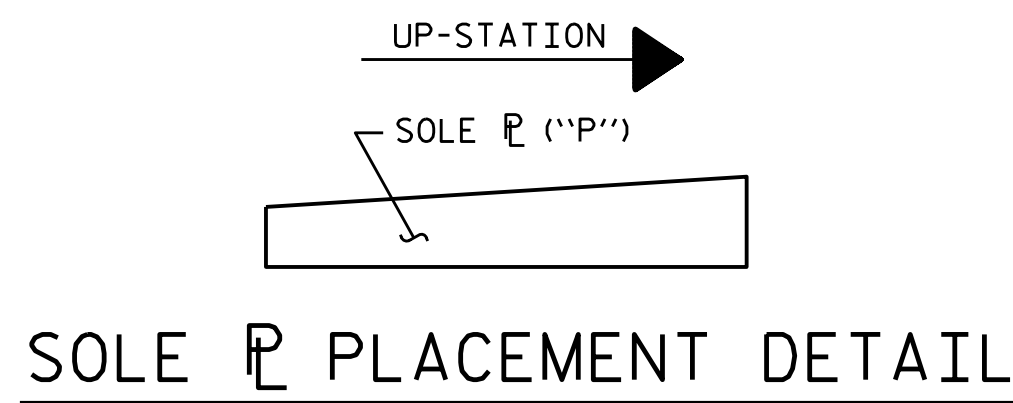


PLAN VIEW OF ELASTOMERIC BEARING
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

TYPE VI



SOLE PLATE DETAILS ("P")



-LOAD RATING-	
TYPE VI	MAX D.L.+L.L. 322 k

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 29+57.01 -L-



DocuSigned by:
Kristy W. Alford
3/29/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
ELASTOMERIC BEARING
DETAILS

ASSEMBLED BY : A. SORSENGINH	DATE : 5/2015
CHECKED BY : J.P. ADAMS	DATE : 6/2015
DRAWN BY : EEM 10/95	REV. 5/1/06 TLA/GM
CHECKED BY : PEK 10/95	REV. 10/1/11 MAA/GM
	REV. 6/13 AAC/MAA

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			84

NOTES

ALUMINUM RAILS

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

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

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

ANODIZING

ALUMINUM FOR POSTS, BASES, RAILS, EXPANSION BARS, RIVETS, CAPS, AND SHIMS SHALL BE ANODIZED. THE CONTRACTOR SHALL SUBMIT THREE (3) SETS OF ASTM B-21 6061-T6 ALUMINUM SAMPLES ANODIZED BLACK TO THE ENGINEER. THE ENGINEER SHALL SELECT THE COLOR FROM THE SAMPLES FURNISHED BY THE CONTRACTOR TO MOST CLOSELY MATCH THE COLOR OF THE ORNAMENTAL FENCE.

ANY DAMAGE TO THE ANODIZED SURFACE OF THE RAIL OR COMPONENTS DURING THE CONSTRUCTION SHALL BE REPAIRED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS AT THE DIRECTION OF THE ENGINEER AND AT THE CONTRACTOR'S EXPENSE.

AFTER A SHADE OF BLACK HAS BEEN SELECTED FOR THE RAILING, THE CONTRACTOR SHALL SUBMIT A SAMPLE OF COMPATIBLE EXTERIOR ACRYLIC HOUSE PAINT TO THE ENGINEER. THIS PAINT SHALL MATCH THE ANODIZED RAIL COLOR AS CLOSELY AS POSSIBLE. AFTER ERECTION OF THE ANODIZED ALUMINUM RAILING, ALL EXPOSED ANCHOR BOLTS, NUTS, WASHERS, MACHINE SCREWS, CAP SCREWS, BOLTS, ATTACHMENT BRACKETS, HOLD-DOWN PLATES, AND BUILT UP ANGLES SHALL BE COATED WITH TWO COATS OF THIS PAINT.

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 SHEET 3 OF 3.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

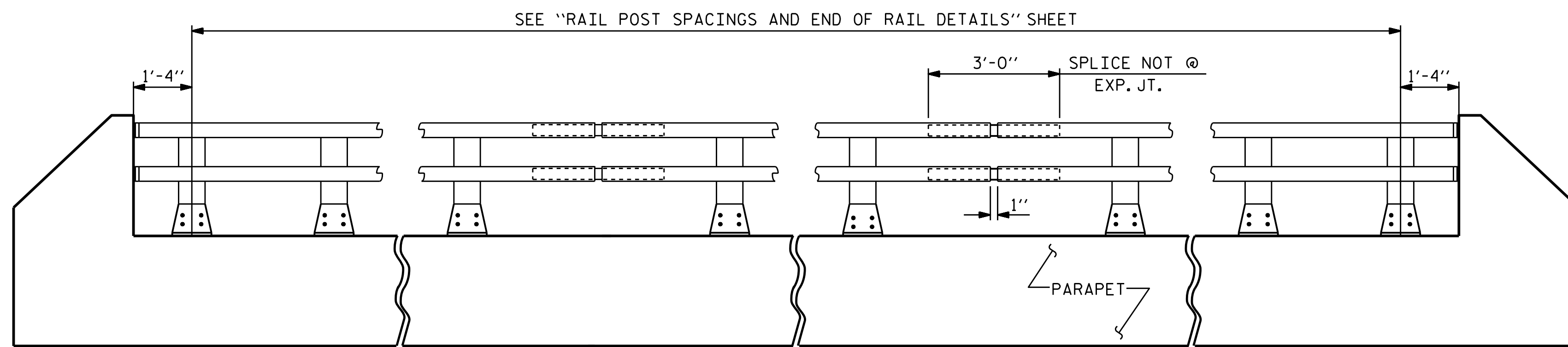
TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

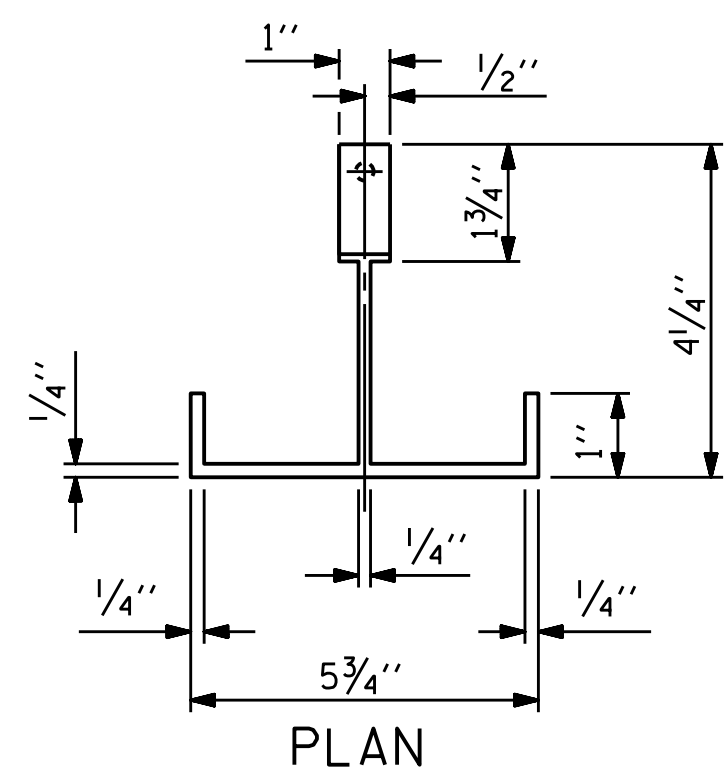
MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

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

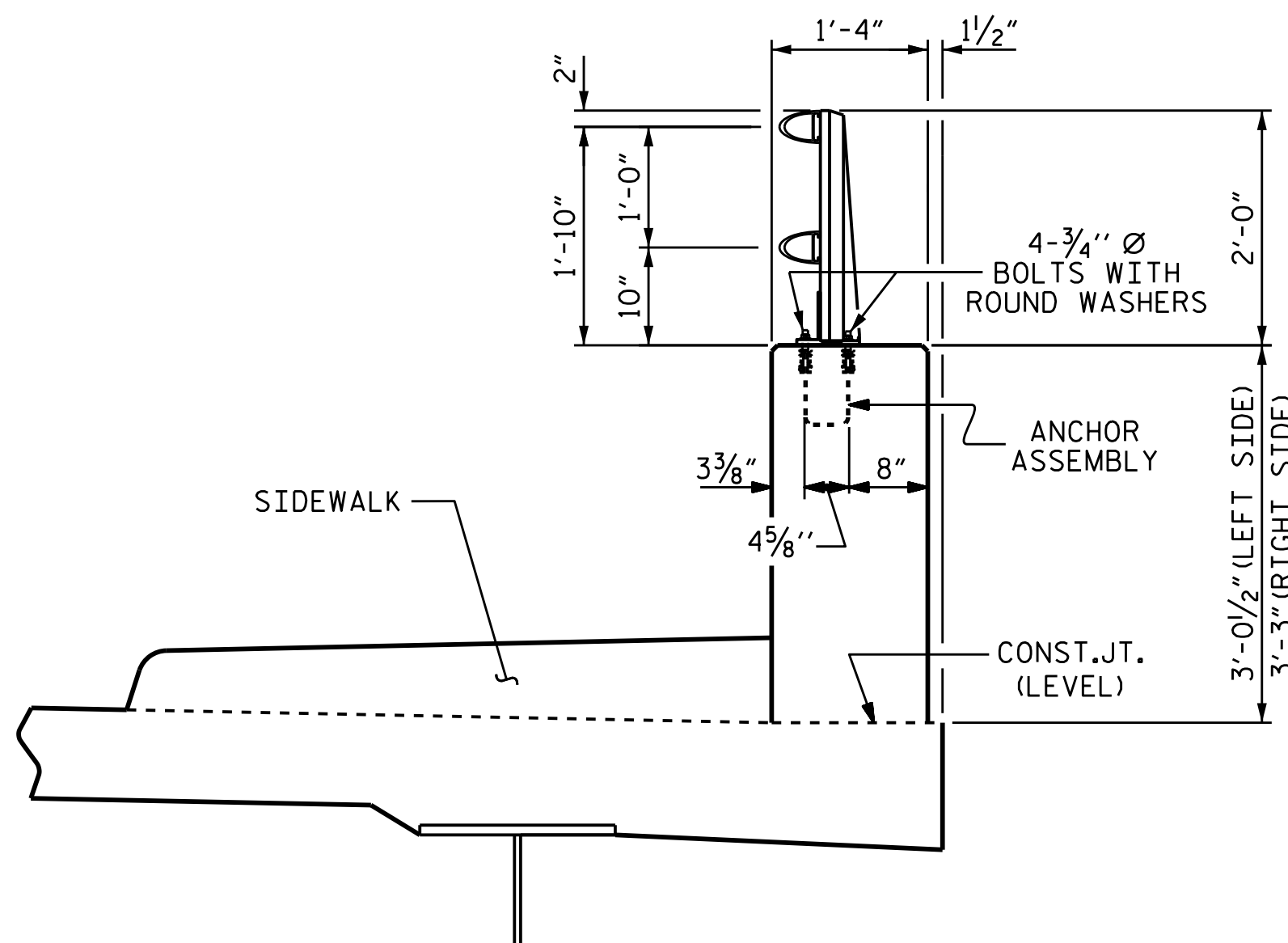


ELEVATION

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

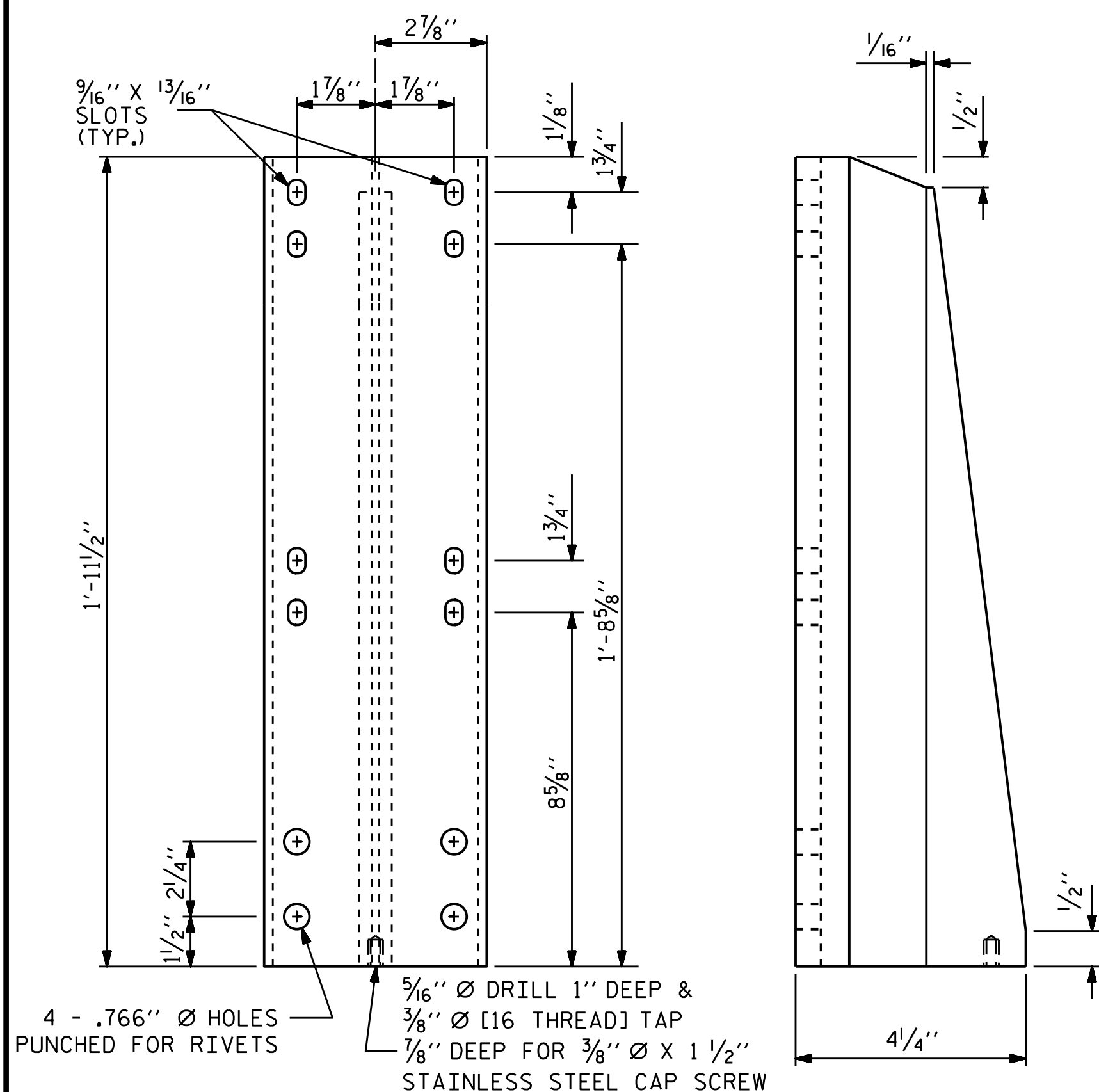


PLAN



SECTION THRU PARAPET AND RAIL

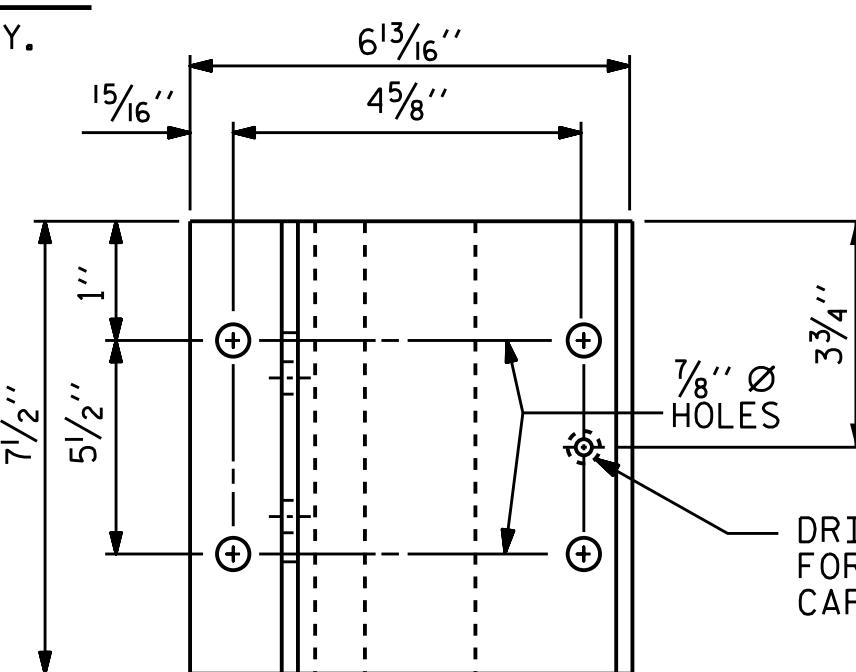
ORNAMENTAL FENCE NOT SHOWN FOR CLARITY. SEE "ORNAMENTAL FENCE DETAILS" SHEET.



FRONT ELEVATION

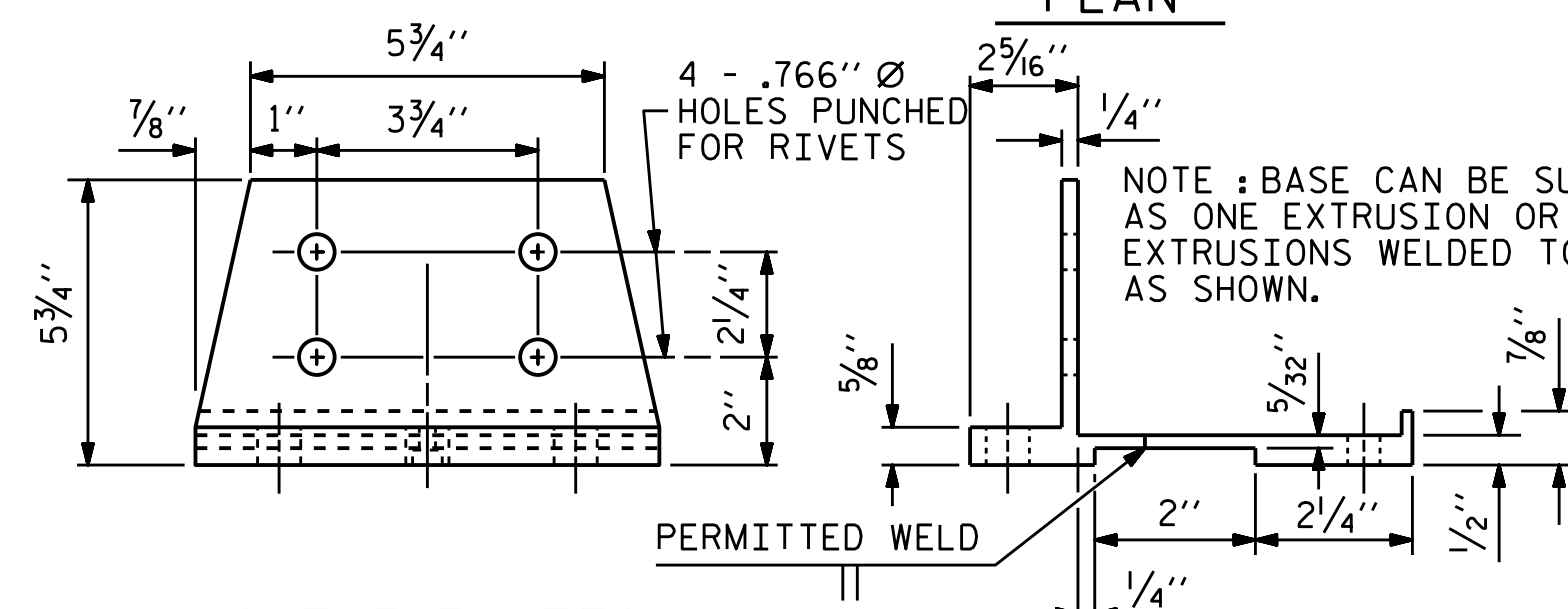
SIDE ELEVATION

DETAILS OF POST



PLAN

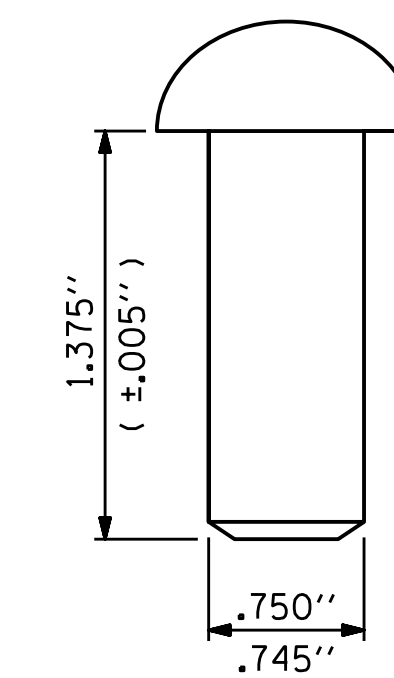
DRILL & COUNTER BORE FOR 3/8" Ø [16 THREAD] CAP SCREW



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

PAY LENGTH = 289.54 LIN. FT.

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 29+57.01 -L-

SHEET 1 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

2 BAR METAL RAIL

ASSEMBLED BY : A. SORSENGINH	DATE : 5/2015
CHECKED BY : J.P. ADAMS	DATE : 6/2014
DRAWN BY : EEM 6/94	REV. 5/1/06 TLA/GM
CHECKED BY : RGW 6/94	REV. 10/1/11 MAA/GM
	REV. 6/13 MAA/GM

29-MAR-2016 09:19
R:\Structures\Plans\STR 1\SUPERSTRUCTURE\B4490_SD_2BMR_1.dgn
jpodams

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS 84
2			4			

STR. #1 STD. NO. BMR3

NOTES

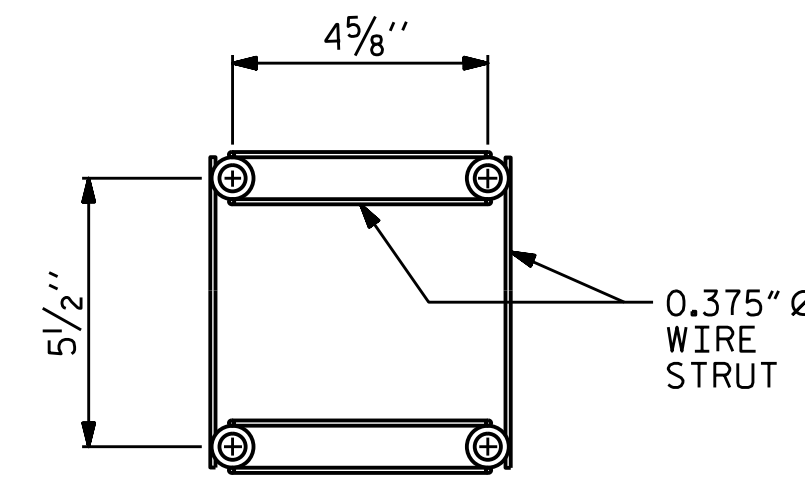
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

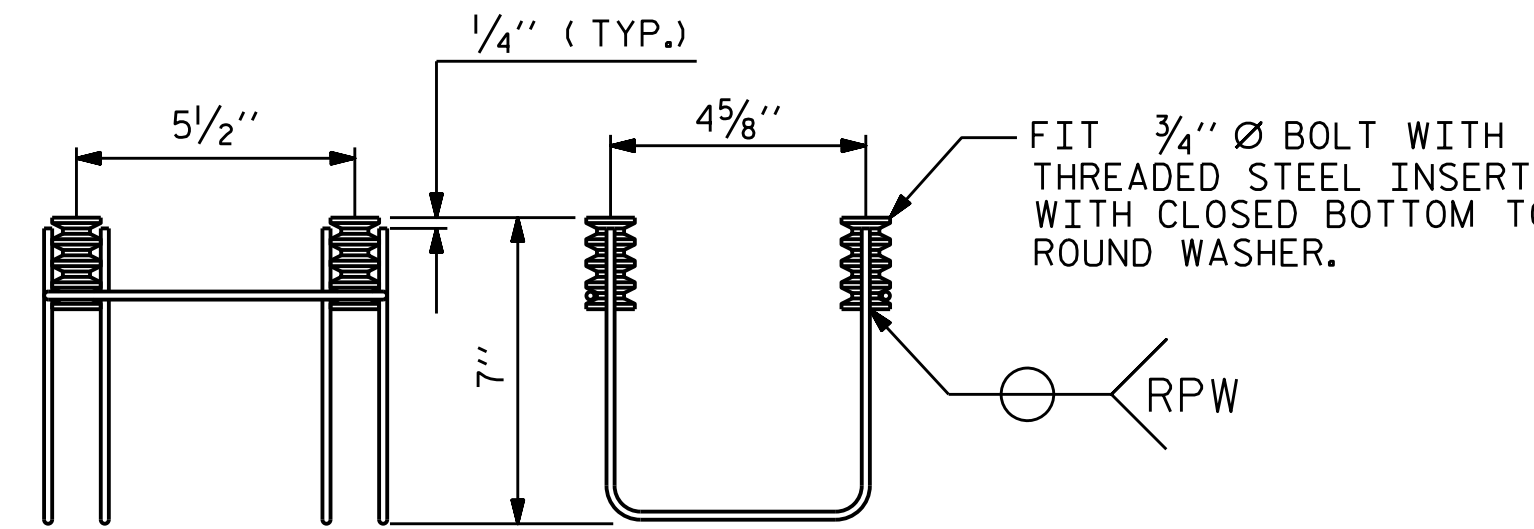
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT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

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

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



PLAN

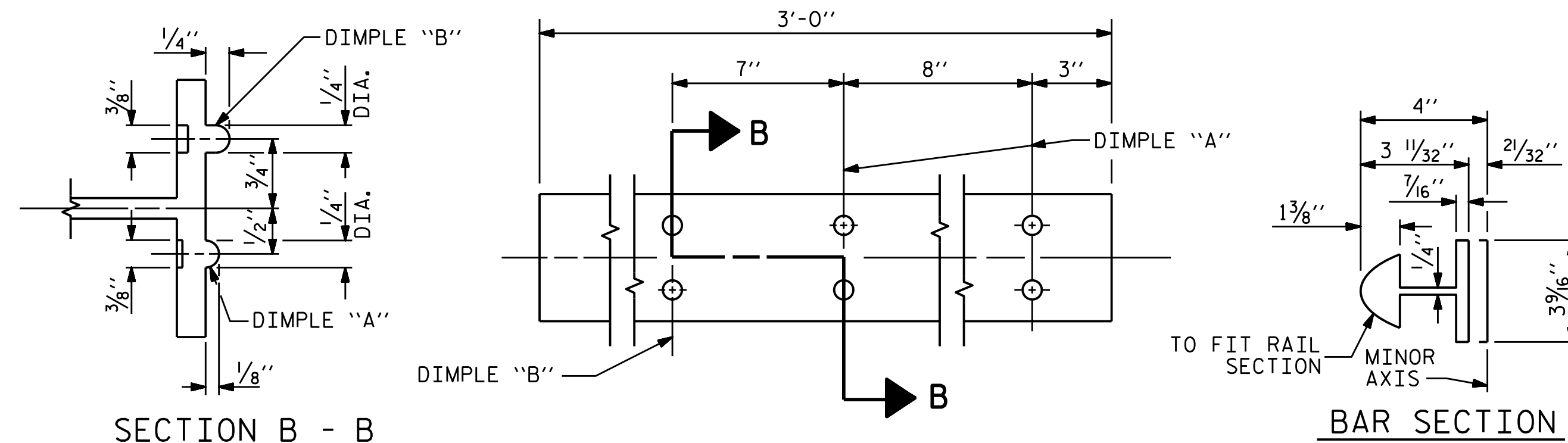


SIDE VIEW

ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

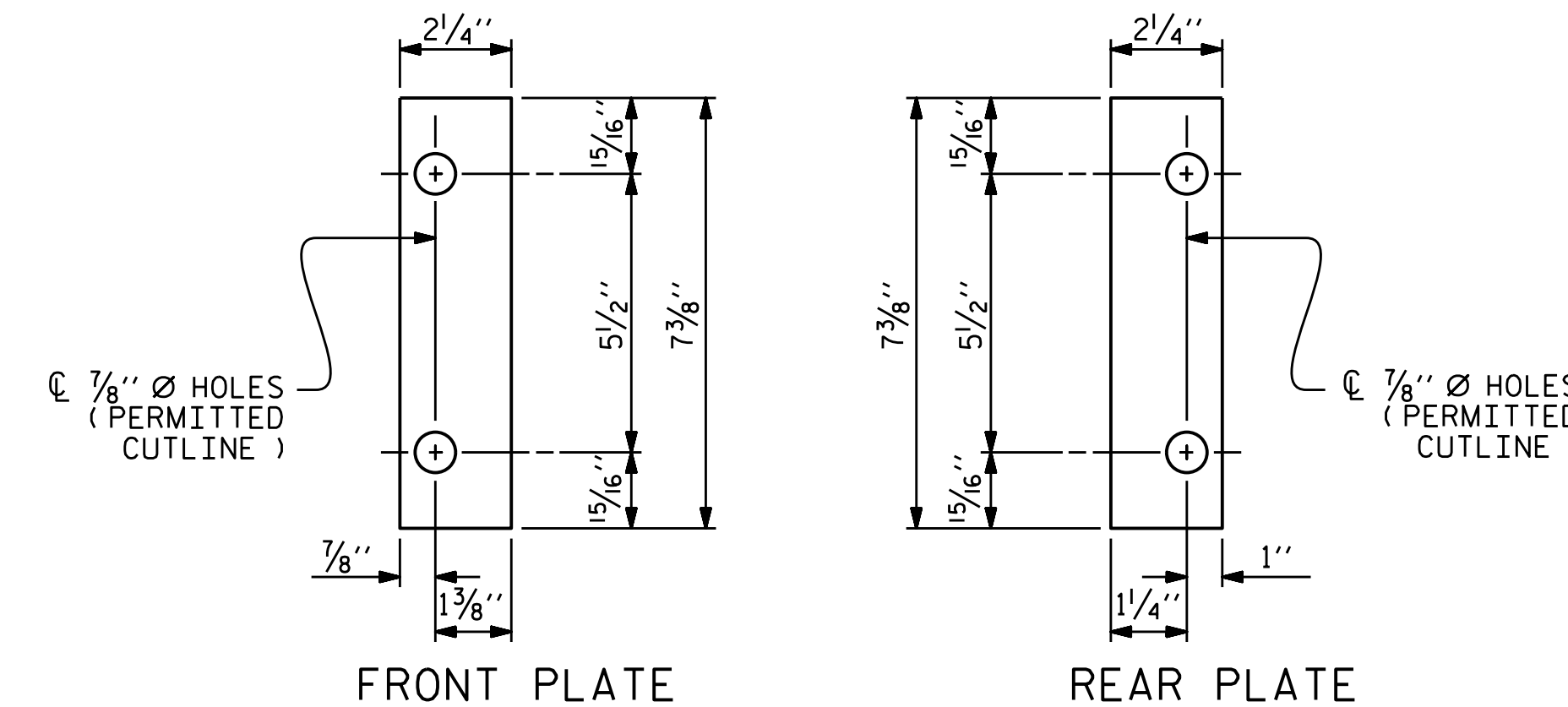
(50 ASSEMBLIES REQUIRED)



SECTION B - B

EXPANSION BAR DETAILS

BAR SECTION

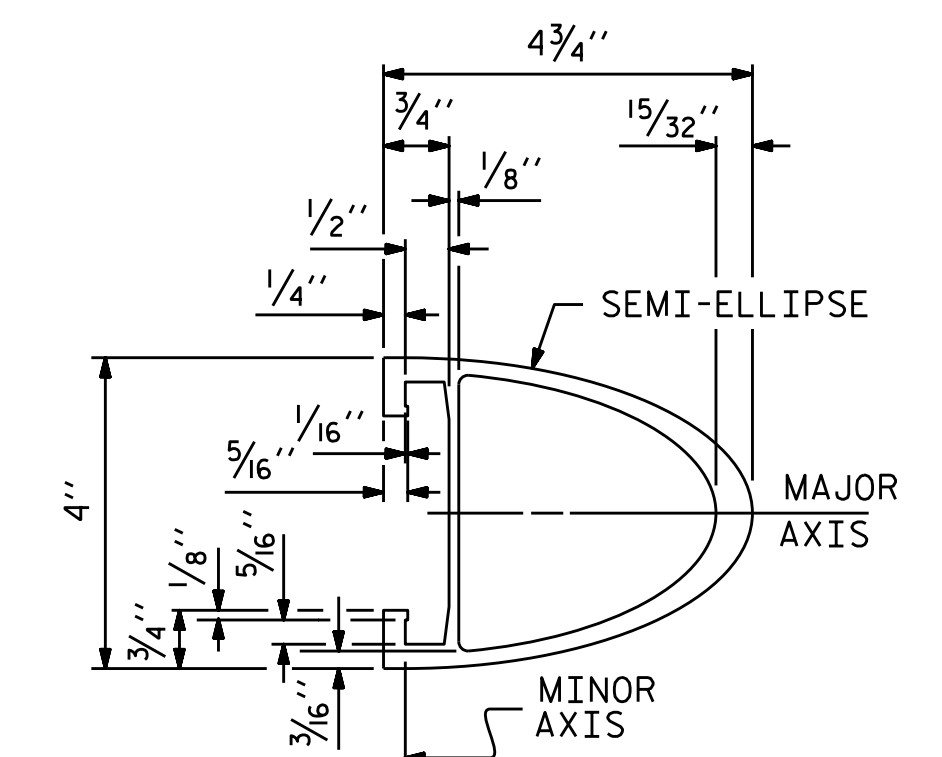


FRONT PLATE

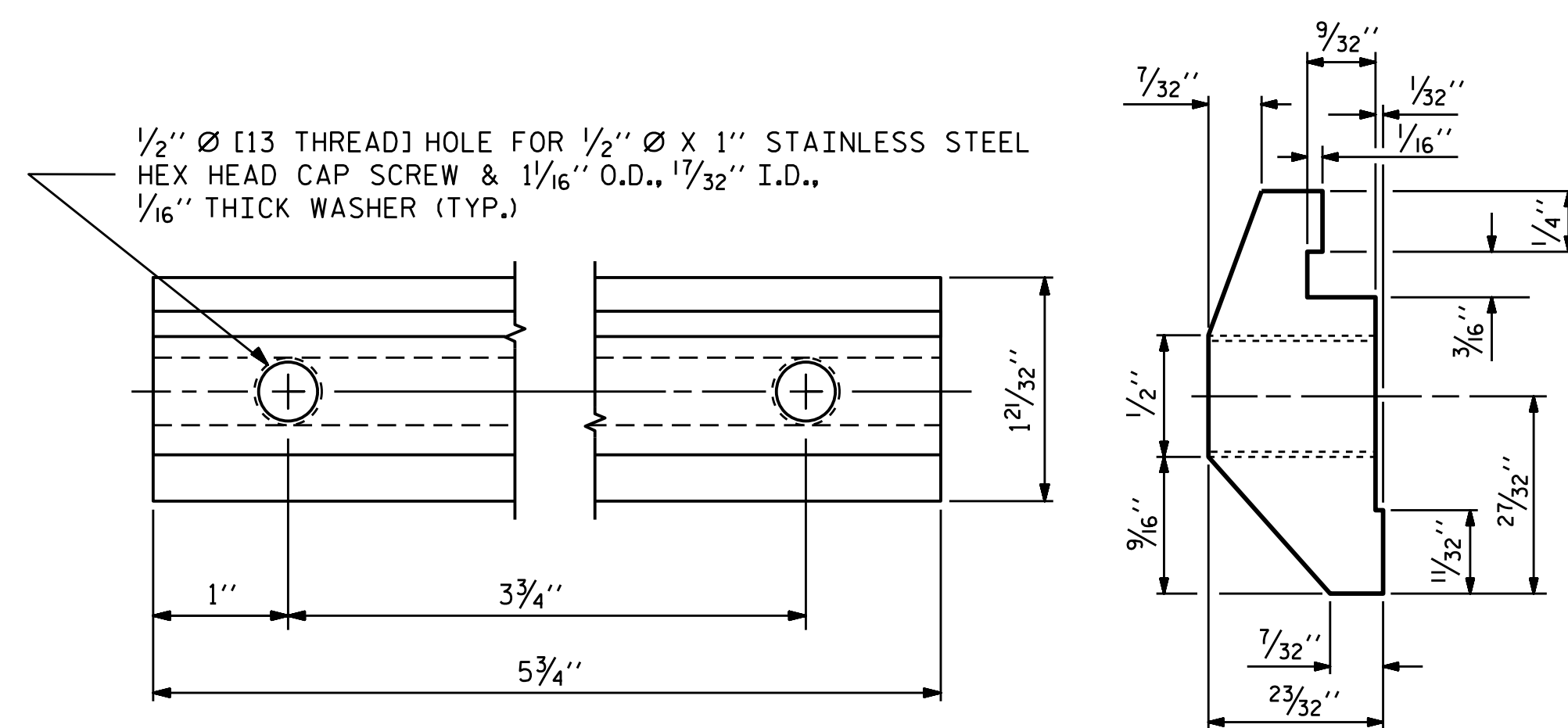
REAR PLATE

SHIM DETAILS

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

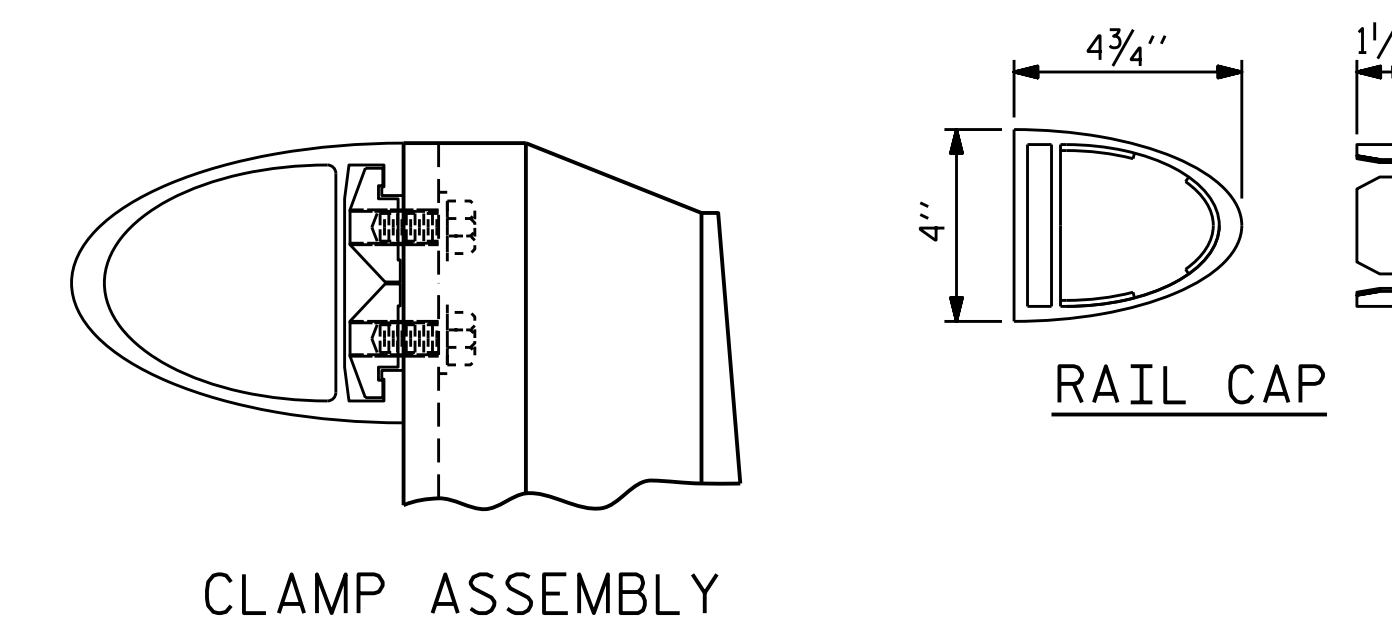


RAIL SECTION



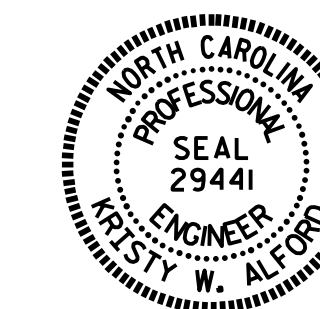
CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY

RAIL CAP



DocuSigned by:
3/29/2016

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 29+57.01 -L-

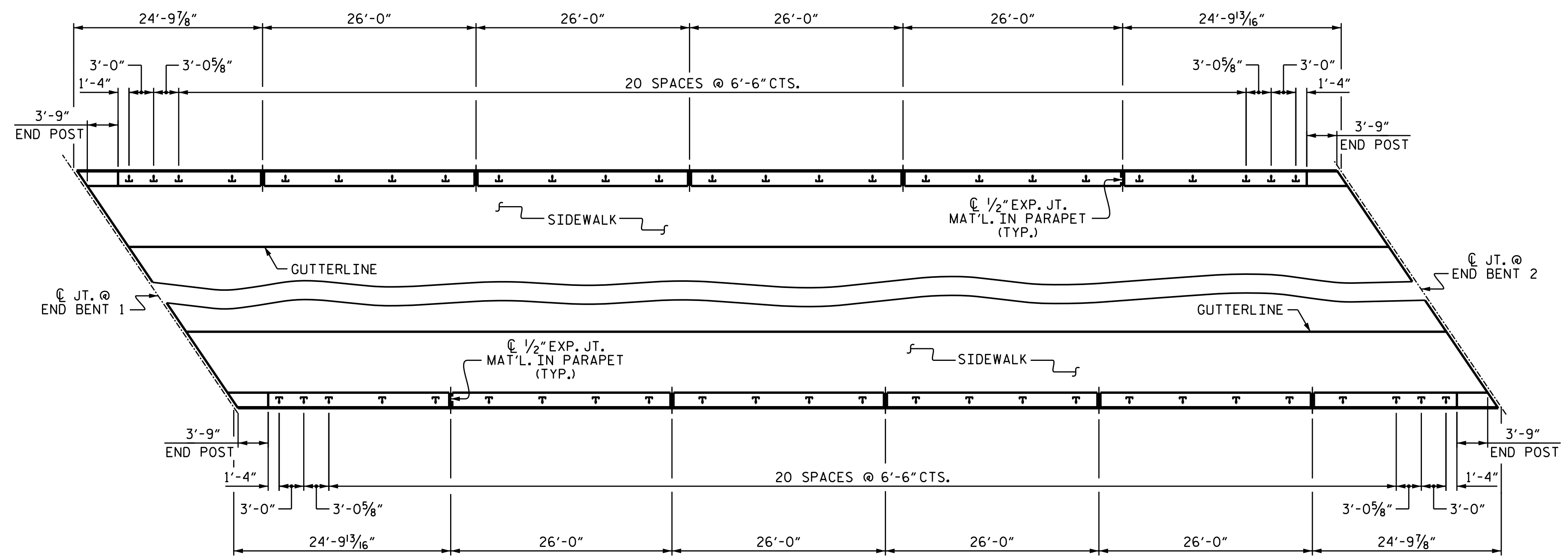
SHEET 2 OF 3

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

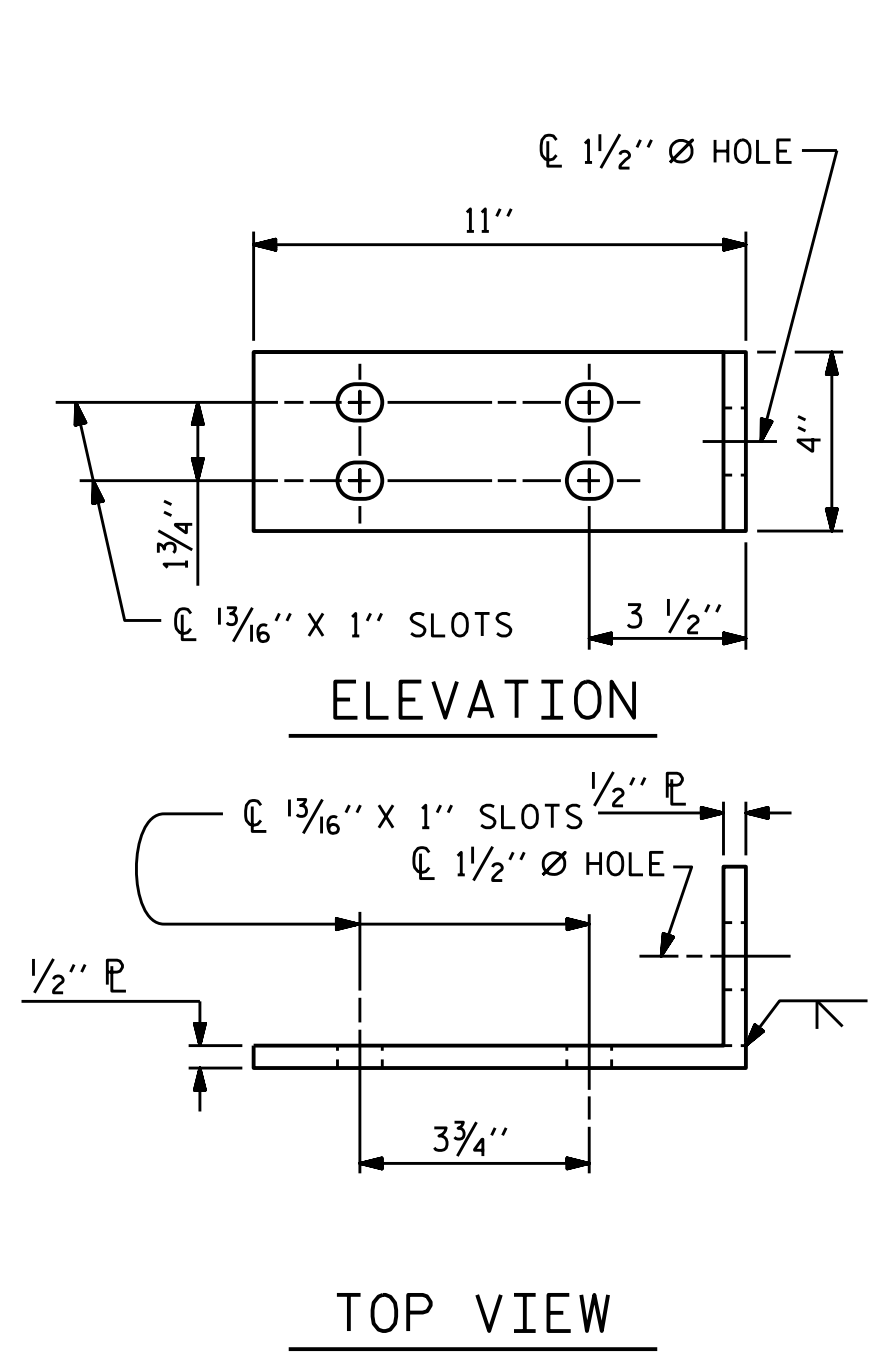
ASSEMBLED BY :	A. SORSENGINH	DATE :	5/2015
CHECKED BY :	J.P. ADAMS	DATE :	6/2014
DRAWN BY :	EEM 6/94	REV. 8/16/99	MAB/LES
CHECKED BY :	RGW 6/94	REV. 5/1/06R	KMM/GM
		REV. 10/1/11	MAA/GM

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FINAL UNLESS ALL
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS 84
2			4			

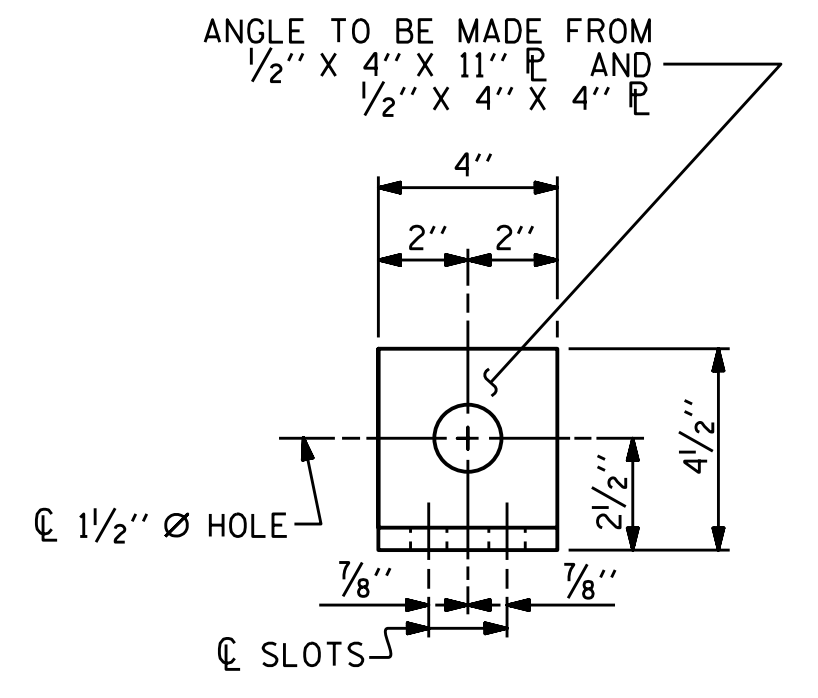


PLAN OF RAIL POST SPACINGS

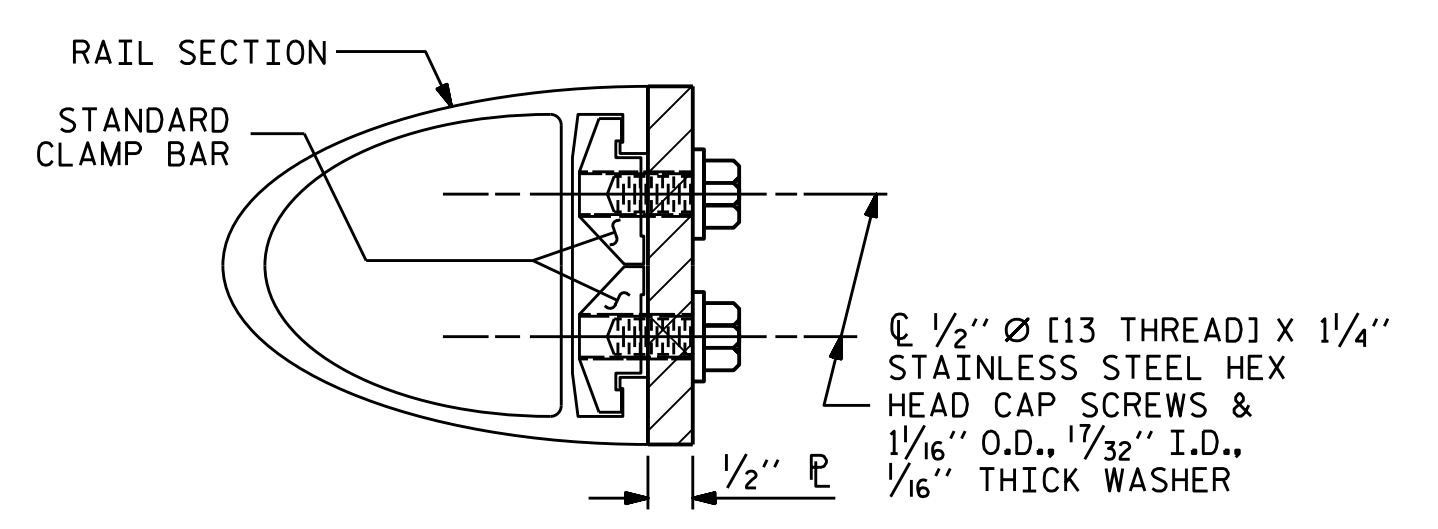


ELEVATION

TOP VIEW

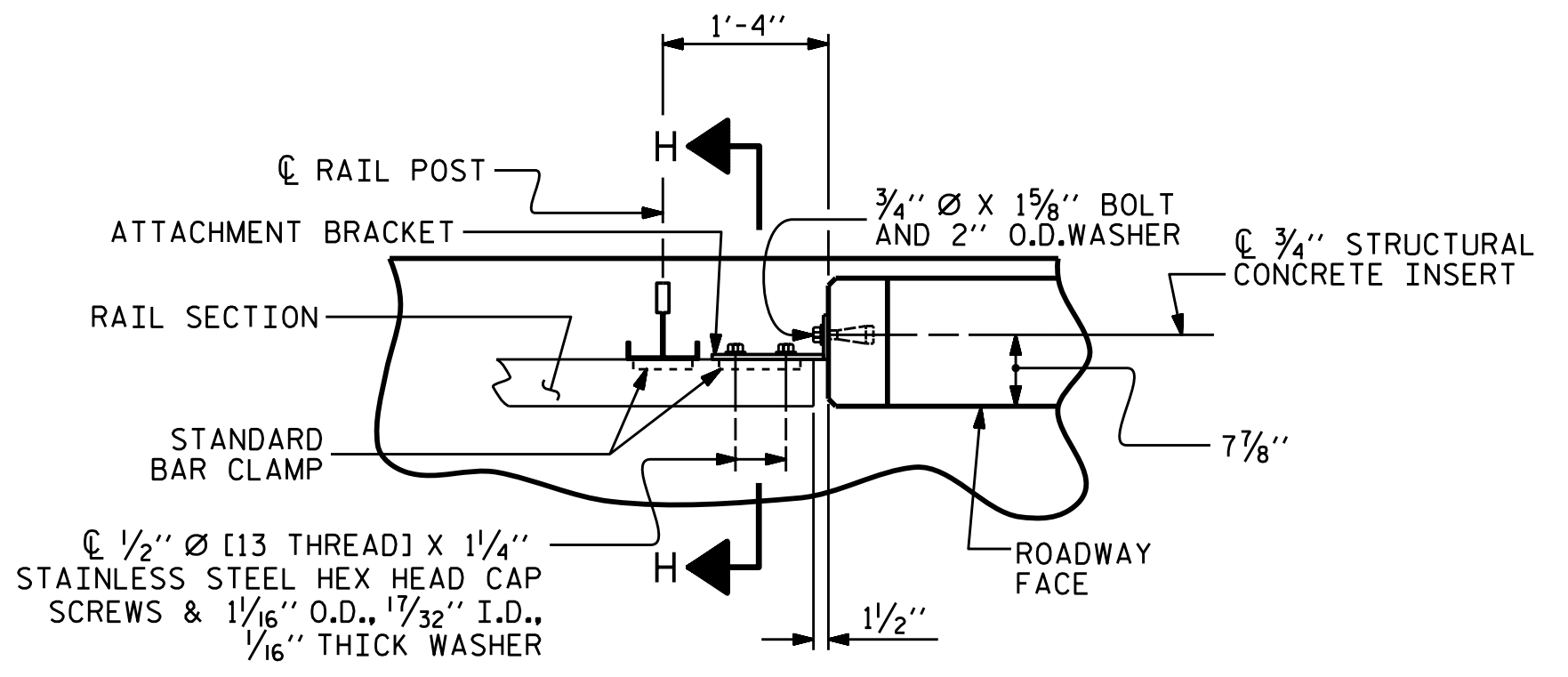


END VIEW

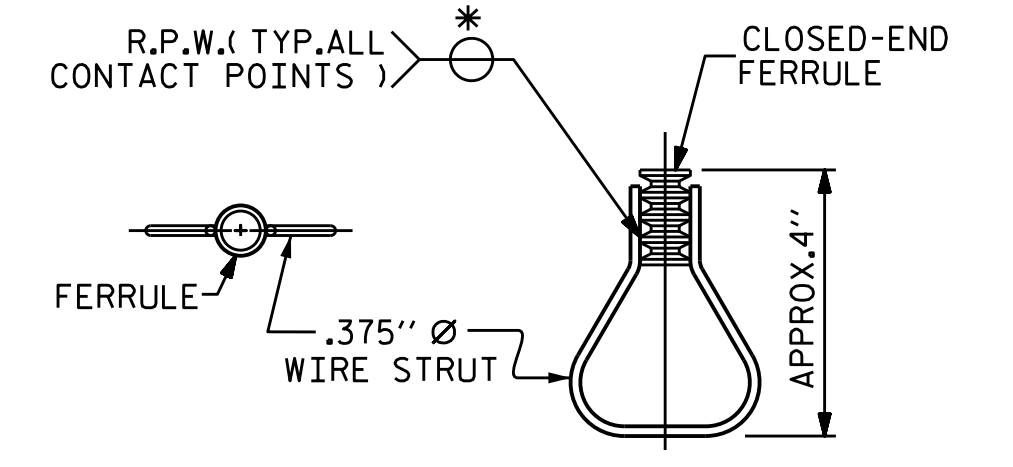


SECTION H-H

DETAILS FOR ATTACHING METAL RAIL TO END POST



PLAN - RAIL AND END POST



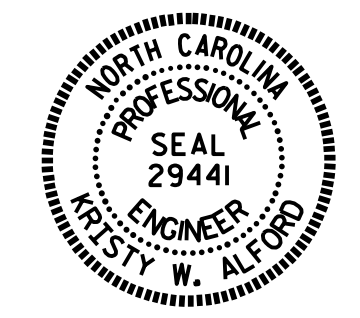
PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-

SHEET 3 OF 3



DocuSigned by:
 F2458389306F40E...
 3/29/2016

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 SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RAIL POST SPACINGS
 AND
 END OF RAIL DETAILS

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19	
1			3			TOTAL SHEETS 84	
2			4				

STR. #1

STD. NO. BMR2

ASSEMBLED BY : A. SORSENGINH	DATE : 5/2015
CHECKED BY : J.P. ADAMS	DATE : 6/2015
DRAWN BY : FCJ 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

NOTES
 STRUCTURAL CONCRETE INSERT

- THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2".
 - 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.)
 - WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

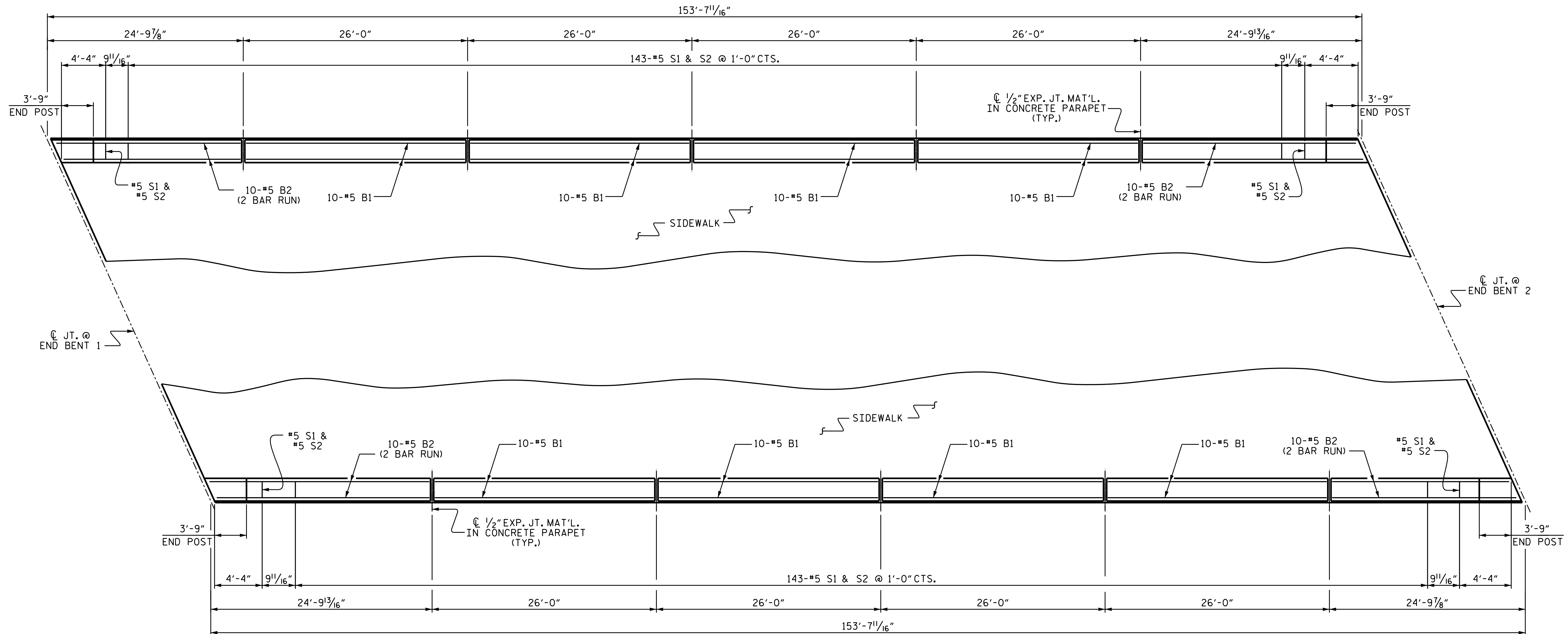
NOTES
 METAL RAIL TO END POST CONNECTION

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

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

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

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



PLAN OF PARAPET

DIMENSIONS ARE GIVEN ALONG THE BACK FACE OF THE PARAPET

NOTES

ALL REINFORCING STEEL IN PARAPETS AND END POSTS SHALL BE EPOXY COATED.

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

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

THE REINFORCING STEEL & CONCRETE IN THE END POSTS IS INCLUDED IN THE UNIT PRICE BID FOR THE CONCRETE PARAPET.

THE COST OF THE 2" PVC CONDUIT SHALL BE CONSIDERED INCIDENTAL TO THE CONCRETE PARAPET.

AESTHETIC DETAILS NOT SHOWN FOR CLARITY. SEE "CONCRETE PARAPET AESTHETIC DETAILS" SHEET.

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-

SHEET 1 OF 2



Designed by: *[Signature]*
 3/29/2016

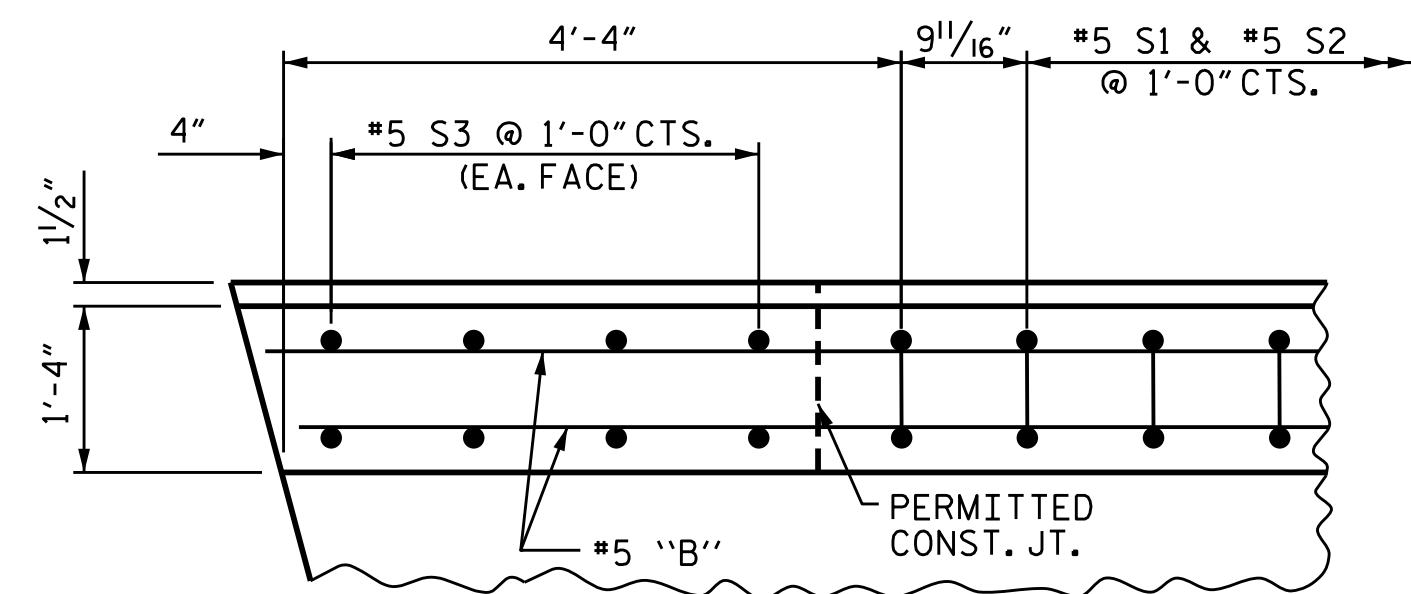
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 CONCRETE PARAPET
 DETAILS**

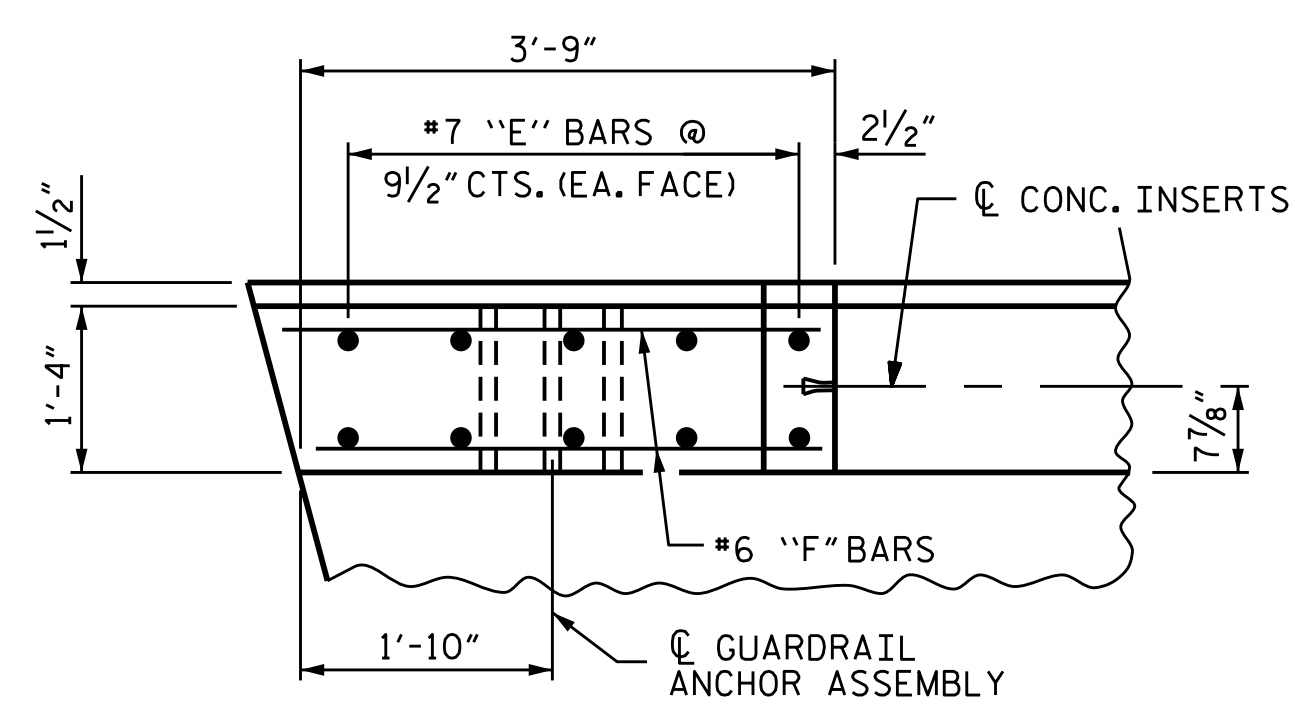
DRAWN BY : A. SORSENGINH DATE : 5/2015
 CHECKED BY : J.P. ADAMS DATE : 6/2015
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 9/2015

DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

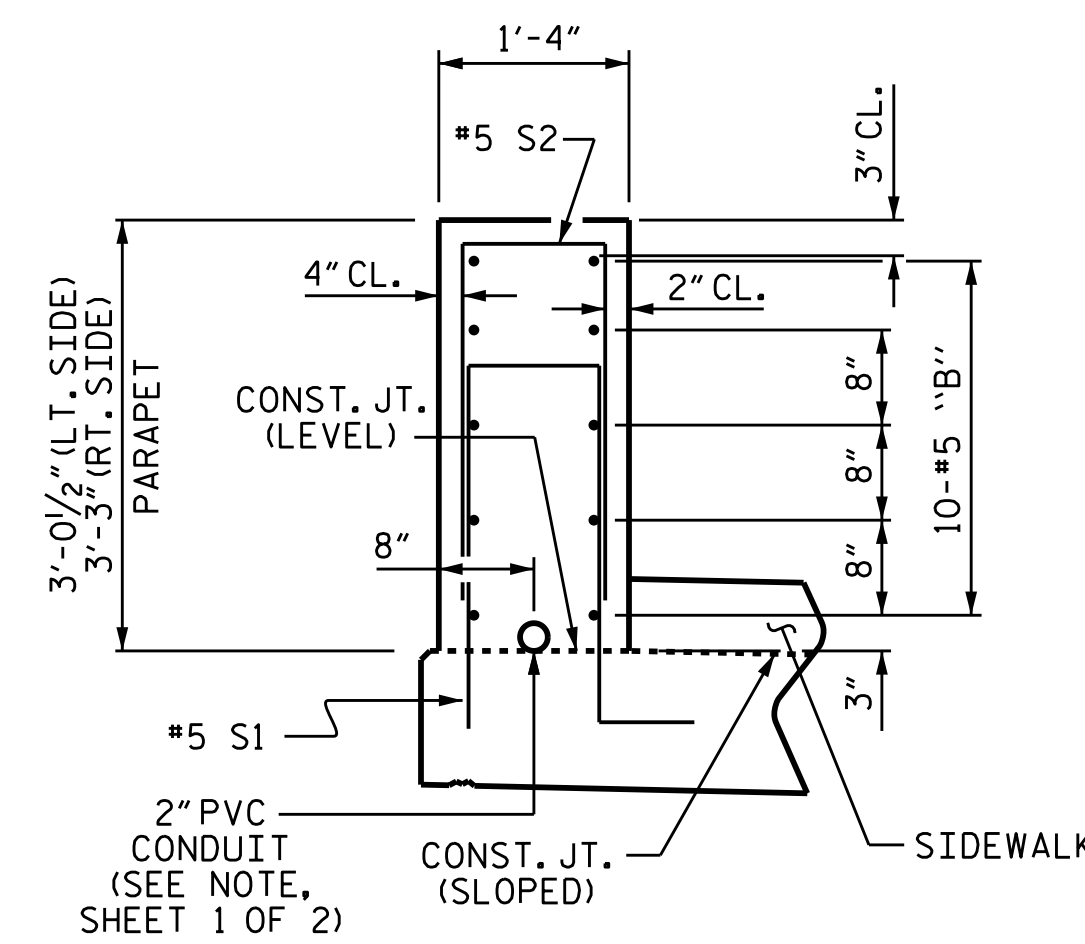
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20	
1			3			TOTAL SHEETS	
2			4			84	



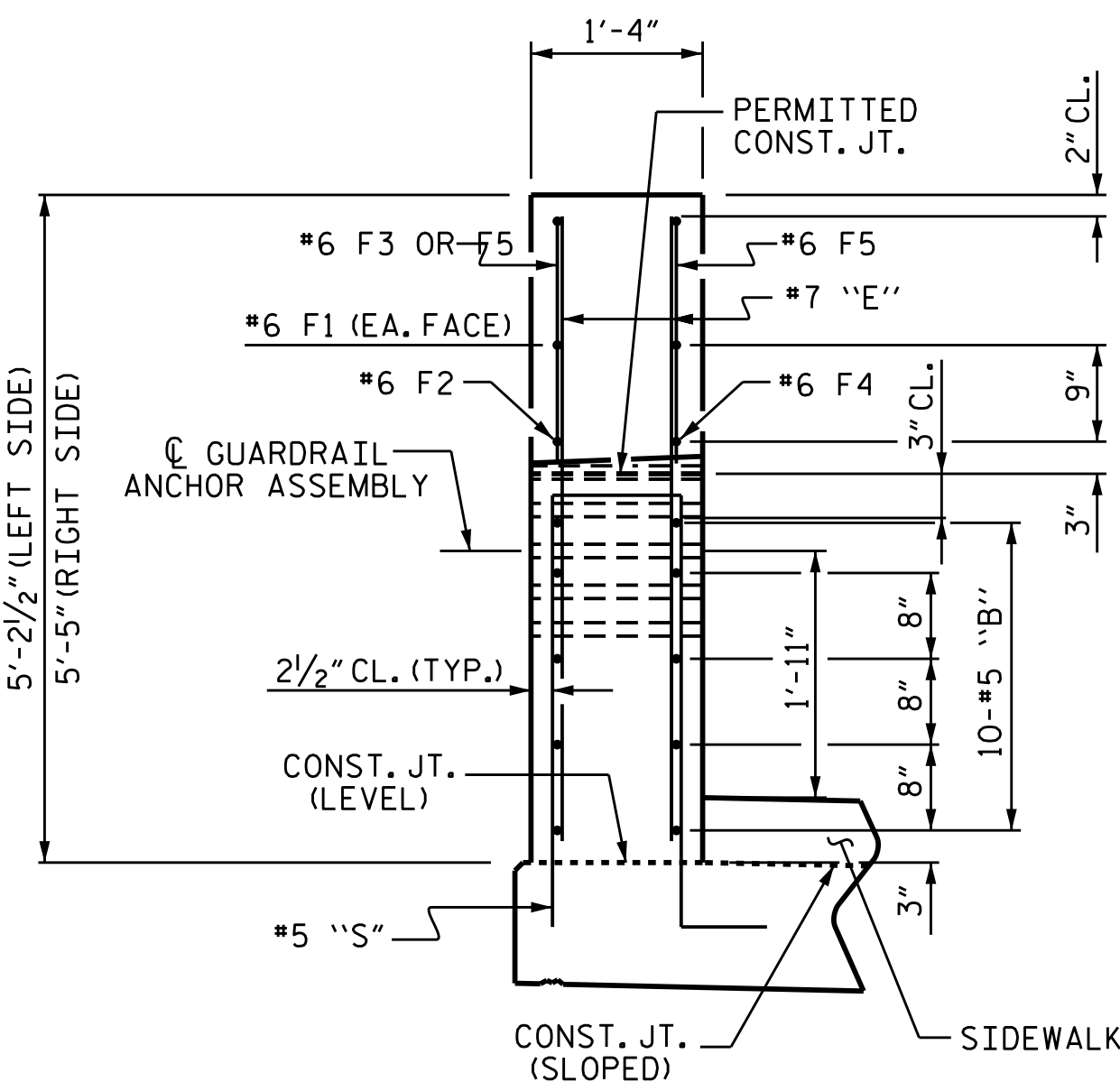
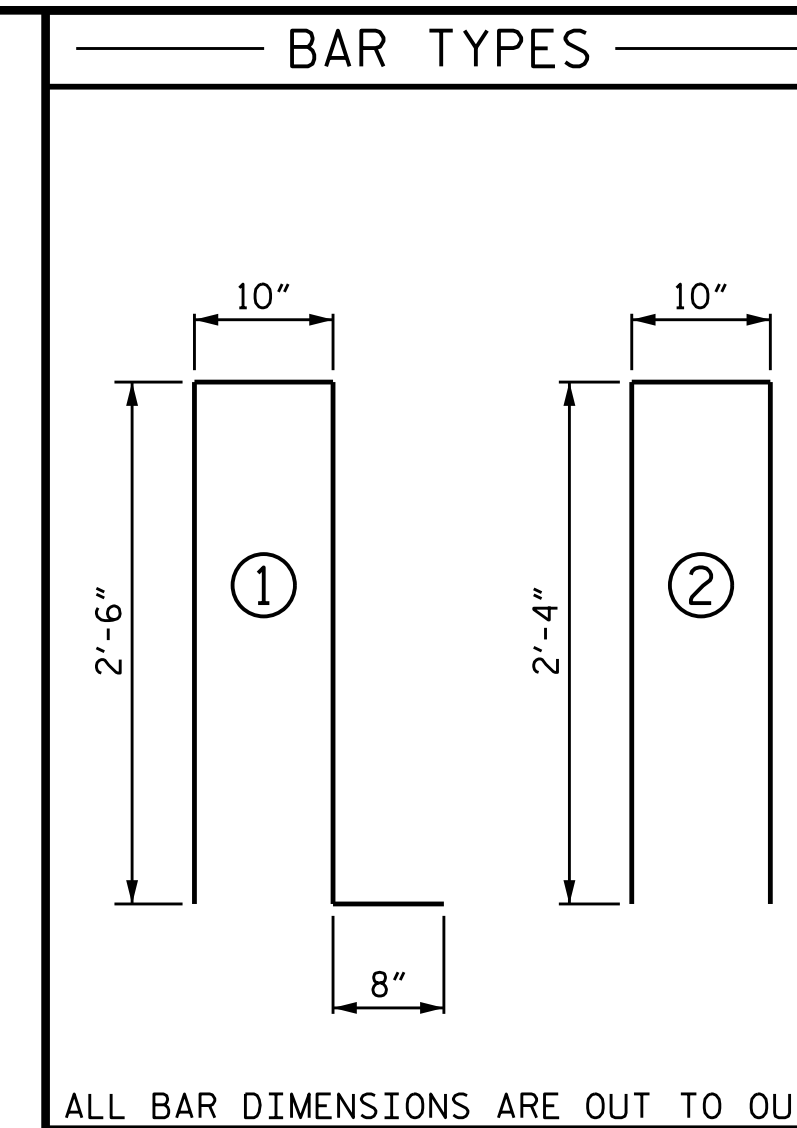
PLAN OF PARAPET



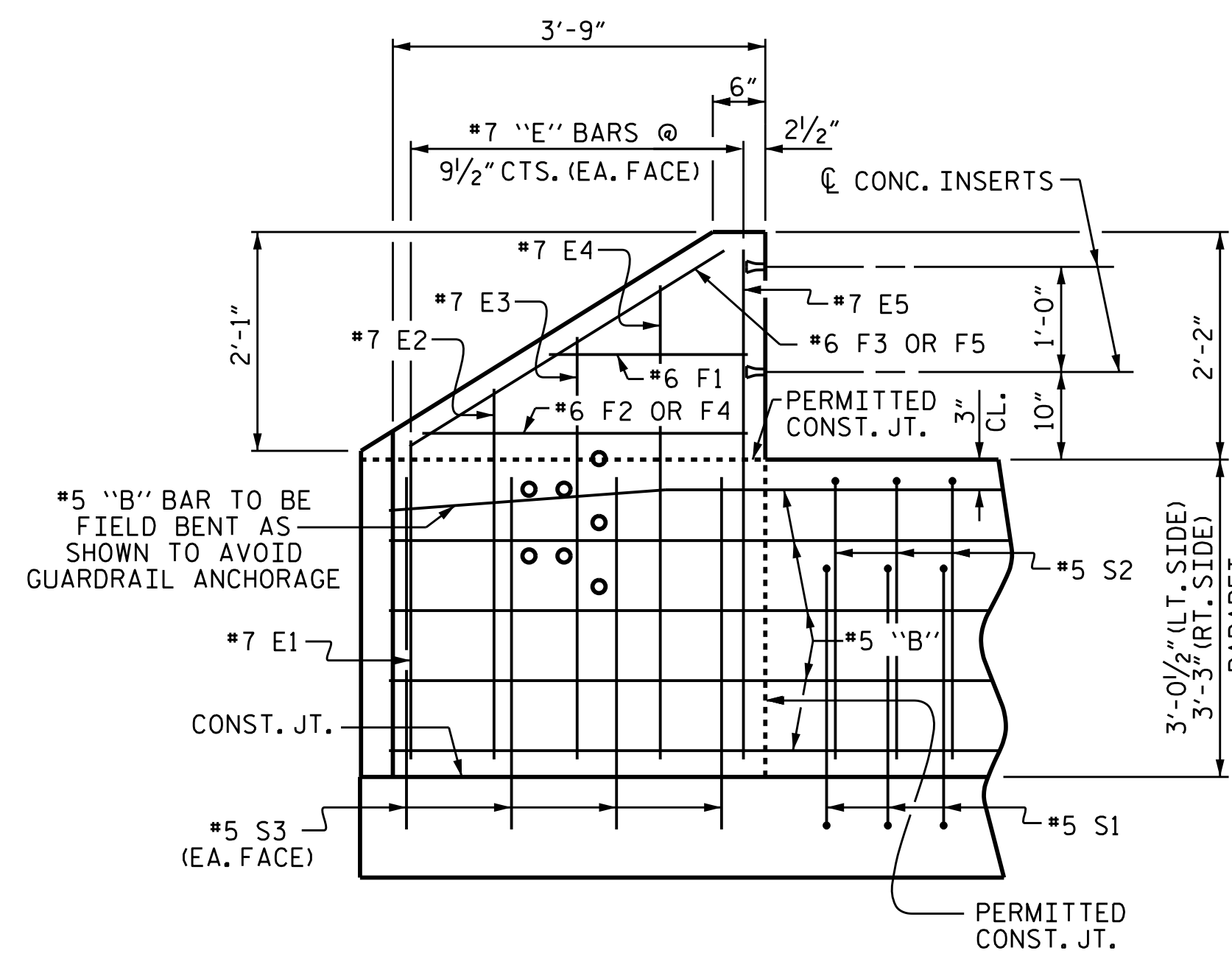
PLAN OF END POST



SECTION THROUGH PARAPET

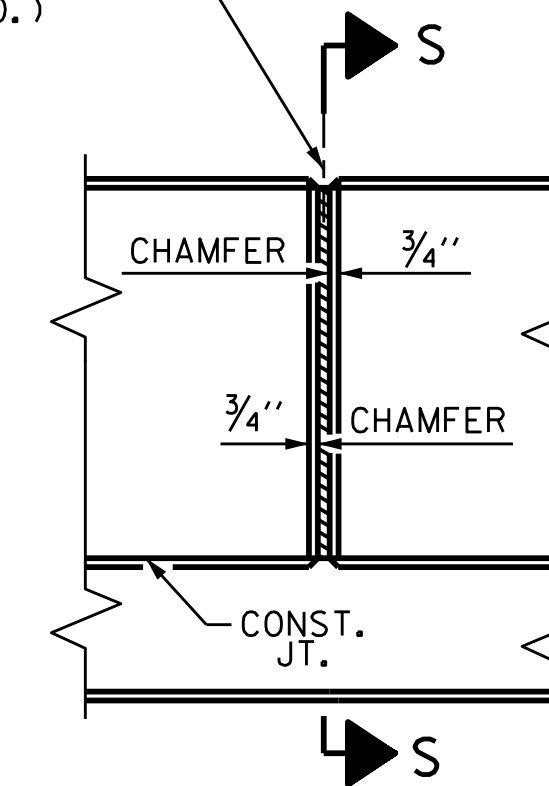


END VIEW

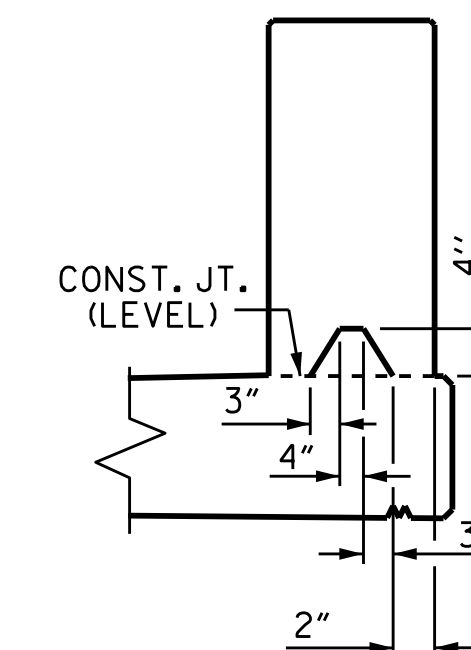


ELEVATION

1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS. (NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)



ELEVATION AT EXPANSION JOINTS
BARRIER RAIL DETAILS



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

BILL OF MATERIAL					
2 PARAPETS AND 4 END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	80	#5	STR	25'-8"	2142
* B2	80	#5	STR	14'-1"	1175
* E1	8	#7	STR	3'-0"	49
* E2	8	#7	STR	3'-6"	57
* E3	8	#7	STR	4'-0"	65
* E4	8	#7	STR	4'-6"	74
* E5	8	#7	STR	4'-10"	79
* F1	8	#6	STR	2'-2"	26
* F2	4	#6	STR	3'-5"	21
* F3	4	#6	STR	3'-2"	19
* F4	4	#6	STR	4'-2"	25
* F5	4	#6	STR	3'-11"	24
* S1	290	#5	1	6'-6"	1966
* S2	290	#5	2	5'-6"	1664
* S3	32	#5	STR	3'-6"	117
* EPOXY COATED REINF. STEEL					7503 LBS.
CLASS AA CONCRETE					49.0 C.Y.
1'-4" X 3'-0 1/2" CONCRETE PARAPET					153.48 L.F.
1'-4" X 3'-3" CONCRETE PARAPET					153.48 L.F.

PARAPET AND END POST FOR TWO BAR RAIL

DRAWN BY : A. SORSENGINH DATE : 5/2015
 CHECKED BY : J.P. ADAMS DATE : 6/2015
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 9/2015

29-MAR-2016 09:19
 R:\Structures\Plans\STR 1\SUPERSTRUCTURE\B4490.SD.PA.1.dgn
 Jpodams



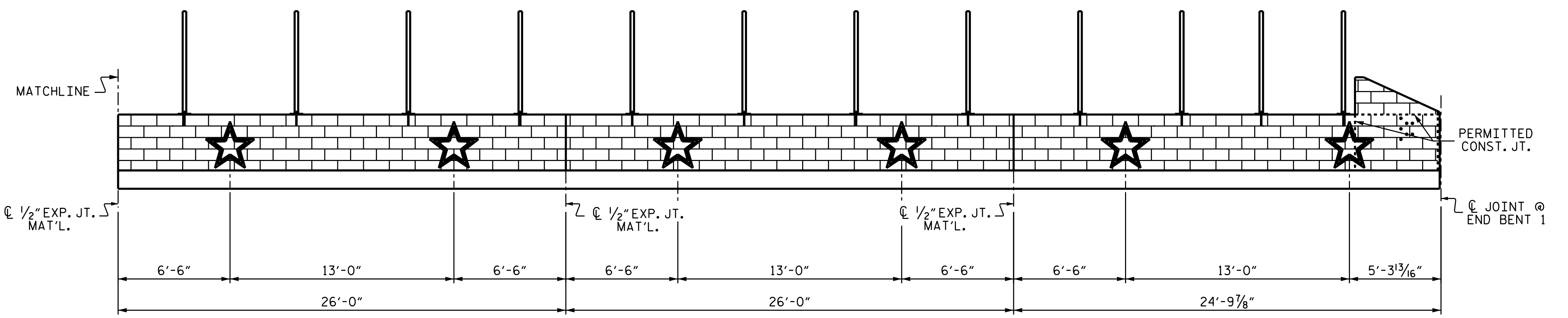
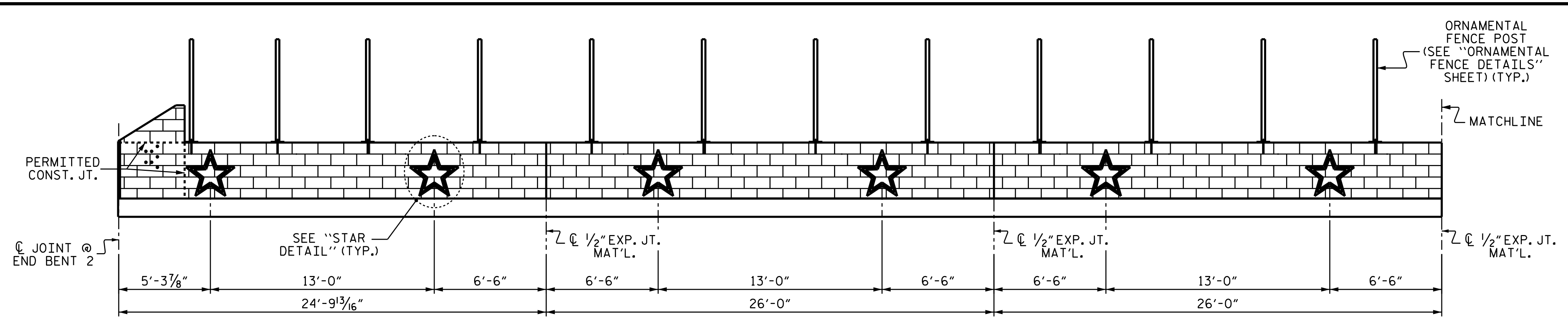
DocuSigned by:
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 3/29/2016

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

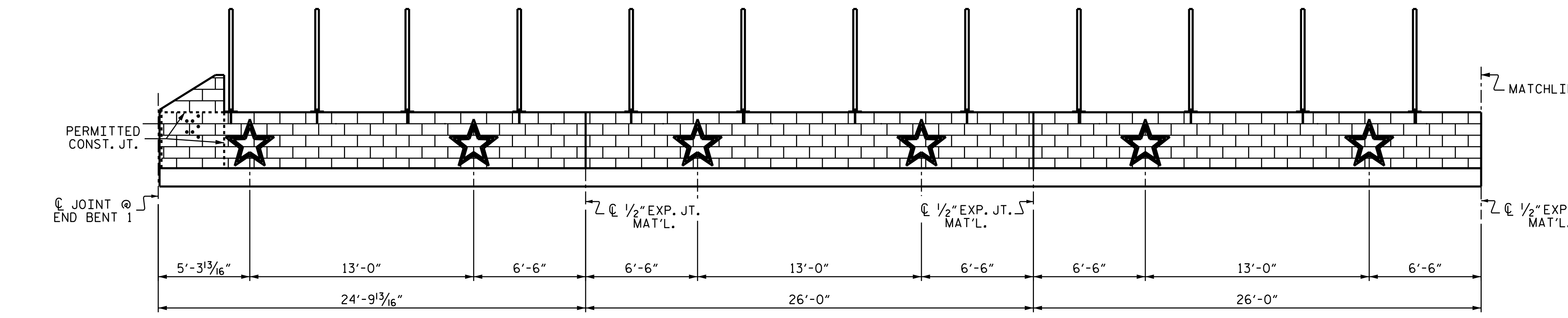
PROJECT NO. B-4490
 CUMBERLAND COUNTY
 STATION: 29+57.01 -L-
 SHEET 2 OF 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS 84
2			4			

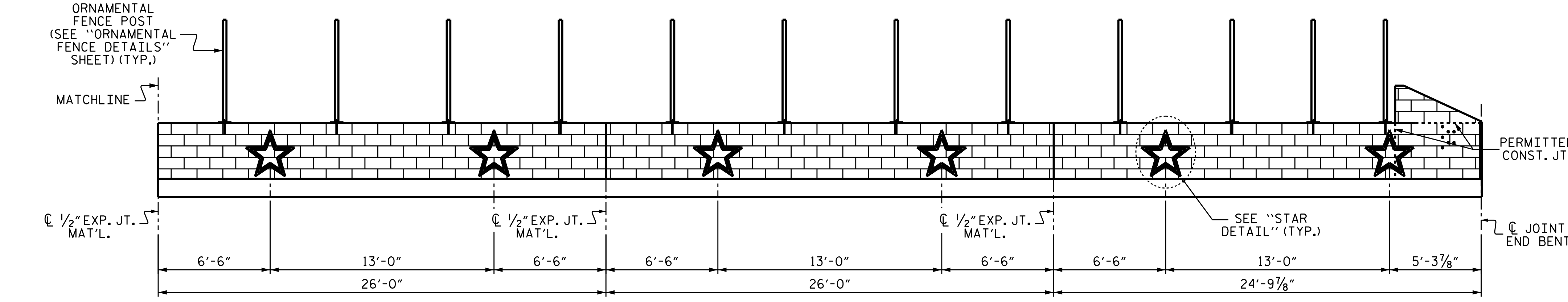
STR. #1



OUTSIDE OF LEFT PARAPET ELEVATION



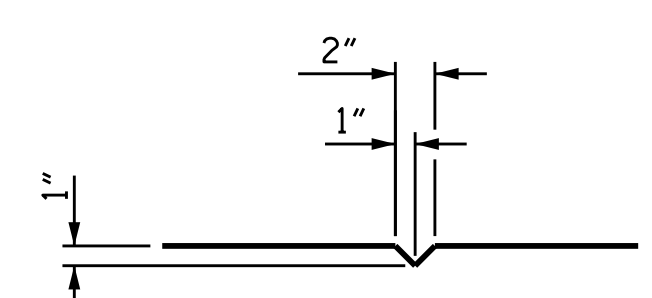
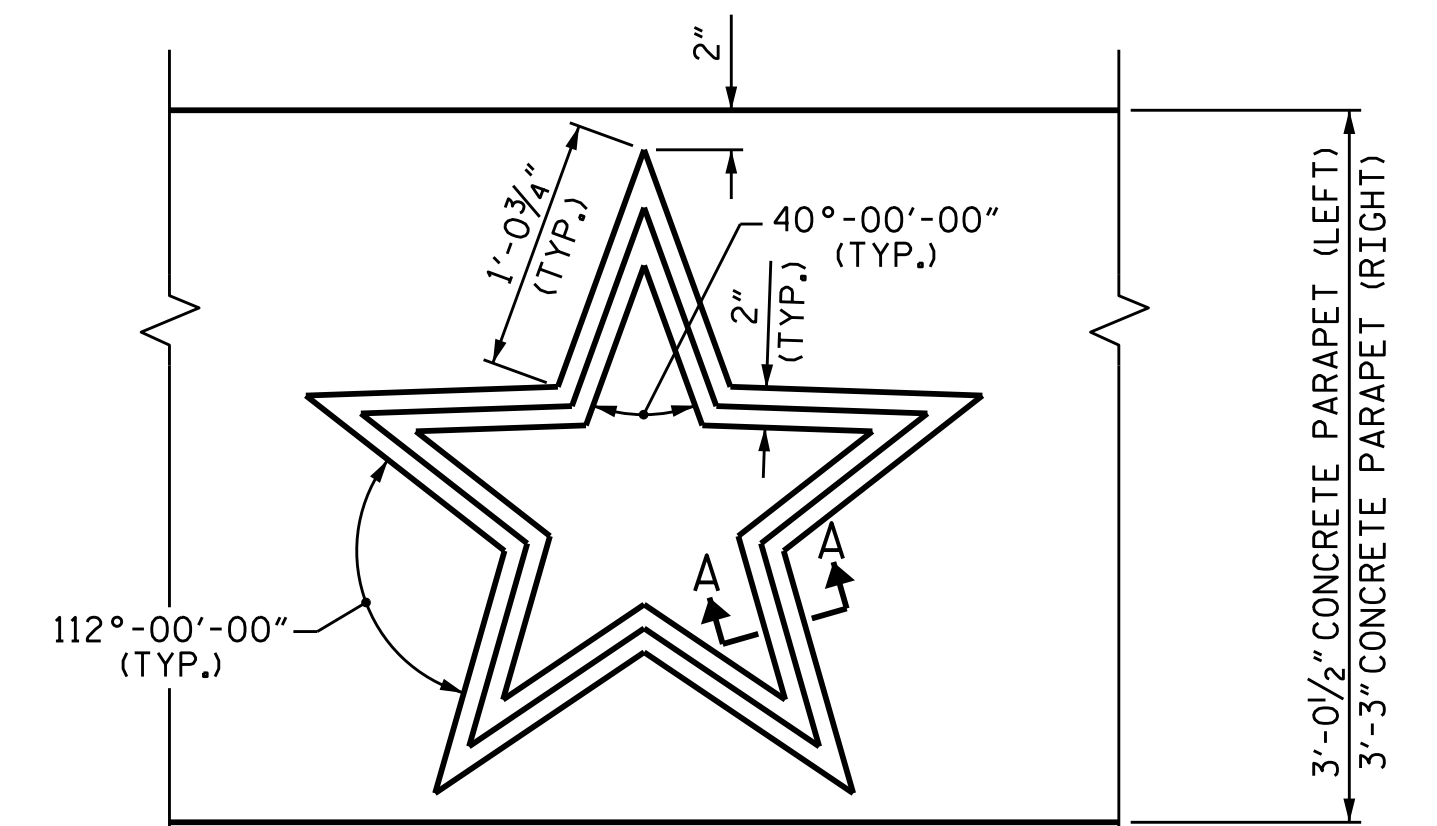
OUTSIDE OF RIGHT PARAPET ELEVATION



NOTES

- STAR RELIEF SHOWN SHALL BE CONSIDERED TO BEGIN AT THE POINT OF MAXIMUM RELIEF ON THE FORM LINER. THE TOTAL DEPTH OF RELIEF SHALL NOT EXCEED 2".
- CONCRETE FORM LINER SHALL BE USED ON THE OUTSIDE FACE OF THE PARAPET ONLY.
- FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISIONS.
- STAR RELIEF SHALL BE COLORED BLACK TO MATCH FS 27038.
- FOR COLORING OF EDGE OF DECK AND STARS, SEE "APPLICATION OF BRIDGE COATING" SPECIAL PROVISION.

ARCHITECTURAL CONCRETE SURFACE TREATMENT = 987.7 SQ. FT.



SECTION A-A

STAR DETAIL

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-



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 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE PARAPET
 AESTHETIC DETAILS

DRAWN BY : A. SORSENGINH DATE : 8/2015
 CHECKED BY : J.P. ADAMS DATE : 8/2015
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 9/2015

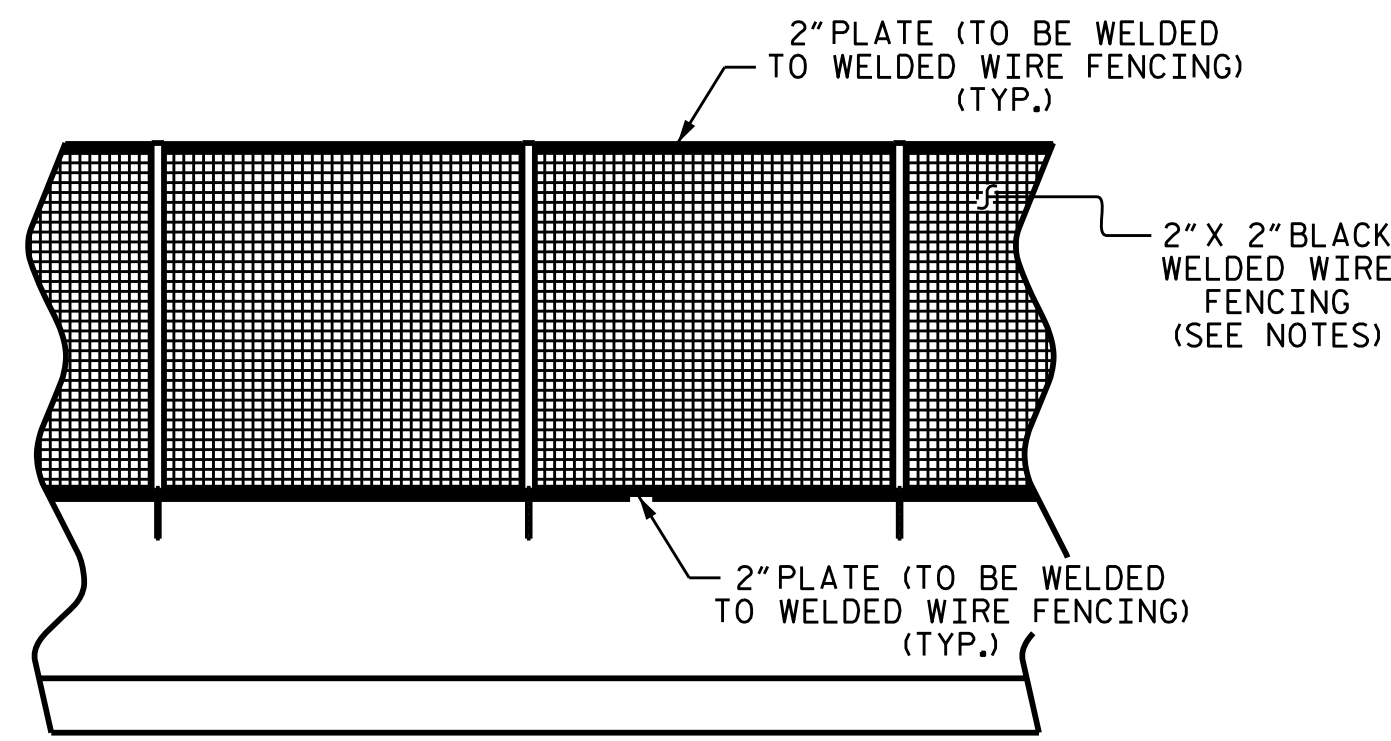
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22	
1			3			TOTAL SHEETS	
2			4			84	

NOTES

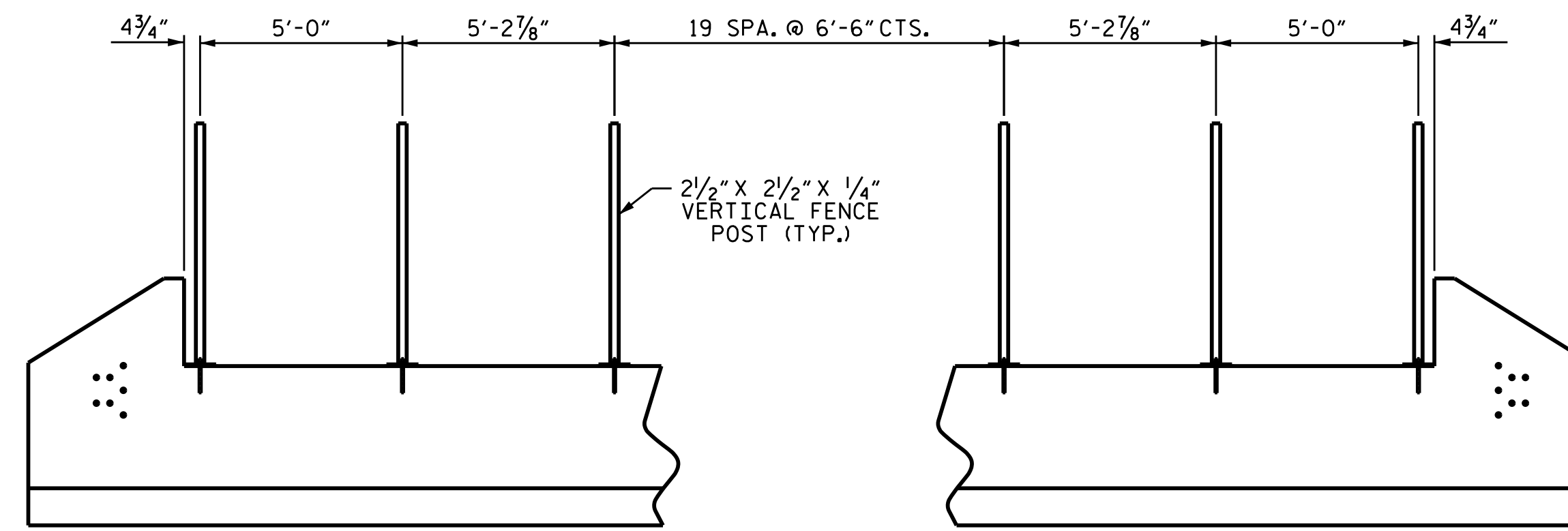
ORNAMENTAL FENCE SHALL BE 2" X 2" BLACK WELDED WIRE OR APPROVED EQUAL.
 ORNAMENTAL FENCE, VERTICAL FENCE POSTS, 2" PLATES, AND BASE PLATES SHALL BE BLACK.
 ALL BOLTS SHALL BE HILTI 7/8" Ø HAS-E HDG ANCHOR ROD WITH HILTI HIT HY 200 (7/8" MIN. EMBEDMENT) OR APPROVED EQUAL.
 POST SHALL BE SPACED TO BE A MINIMUM OF 1'-6" FROM BARRIER RAIL EXPANSION JOINT.
 FOR ORNAMENTAL FENCE, SEE SPECIAL PROVISIONS.
 AFTER A SHADE OF BLACK HAS BEEN SELECTED FOR THE FENCING, THE CONTRACTOR SHALL SUBMIT A SAMPLE OF COMPATIBLE EXTERIOR ACRYLIC HOUSE PAINT TO THE ENGINEER. THIS PAINT SHALL MATCH THE FENCING COLOR AS CLOSELY AS POSSIBLE. AFTER ERECTION OF THE FENCING, ALL EXPOSED ANCHOR BOLTS, NUTS, WASHERS, MACHINE SCREWS, CAP SCREWS, BOLTS, ATTACHMENT BRACKETS, HOLD-DOWN PLATES, AND BUILT UP ANGLES SHALL BE COATED WITH TWO COATS OF THIS PAINT. FENCE COMPONENTS SHALL BE PAINTED AFTER GALVANIZATIONS IN ACCORDANCE WITH SECTION 442 OF THE STANDARD SPECIFICATIONS.
 ADHERE TO THE APPLICABLE REQUIREMENTS OF SECTION 1074 OF THE STANDARD SPECIFICATIONS.
 POSTS, BASE PLATES, AND CONNECTOR PLATES SHALL MEET THE REQUIREMENTS FOR AASHTO M270 GRADE 50 AND SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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 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.
 WIRE MESH FENCE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2453 TYPE 2.
 THE CONTRACTOR SHALL VERIFY THE DIMENSIONS AND POST SPACINGS IN THE FIELD PRIOR TO FABRICATION AND INSTALLATION OF FENCE.



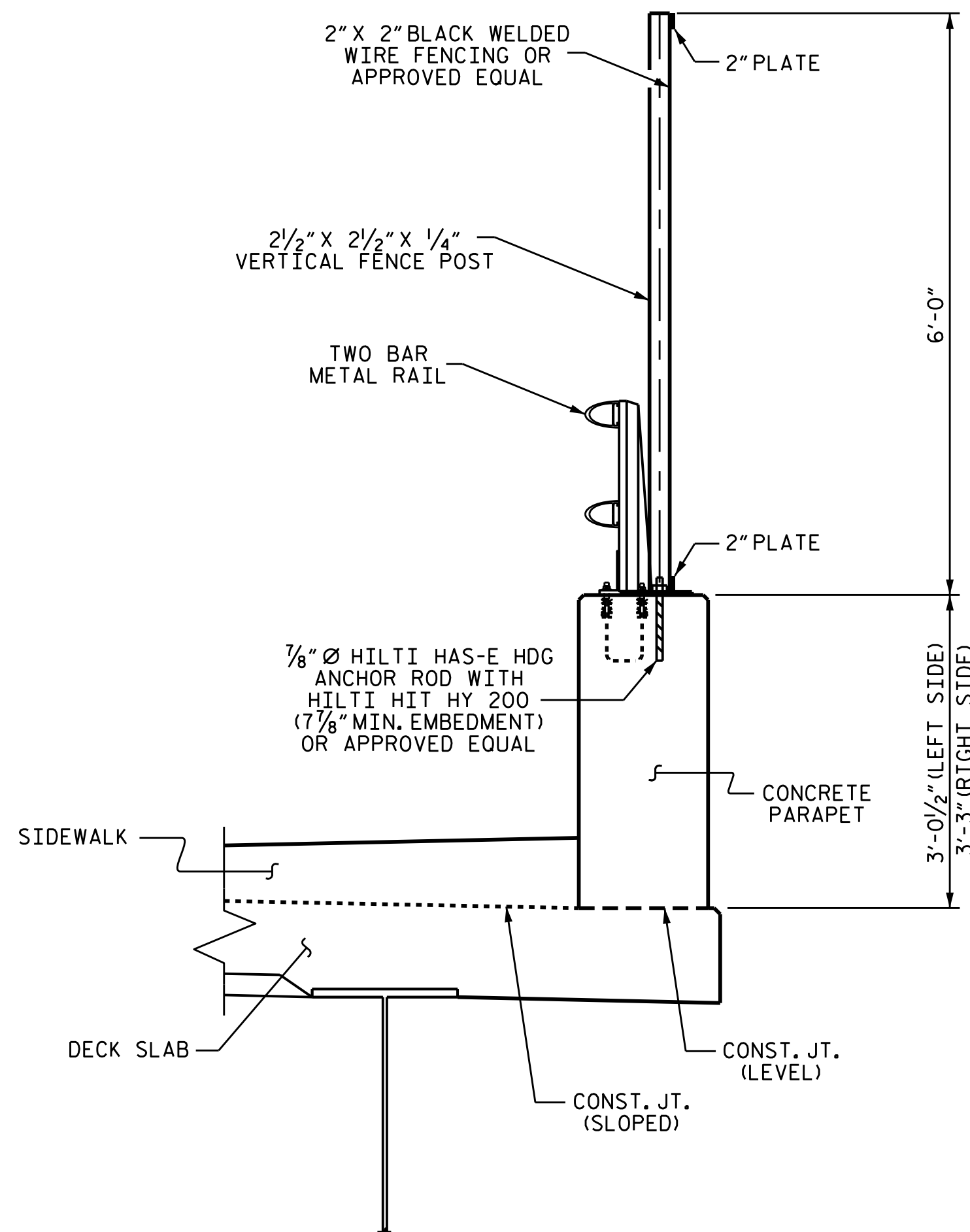
PARTIAL ELEVATION

SHOWING WELDED WIRE FENCE DETAILS
 STAR DETAIL NOT SHOWN FOR CLARITY. FOR STAR DETAIL, SEE "CONCRETE PARAPET STAR DETAIL" SHEET

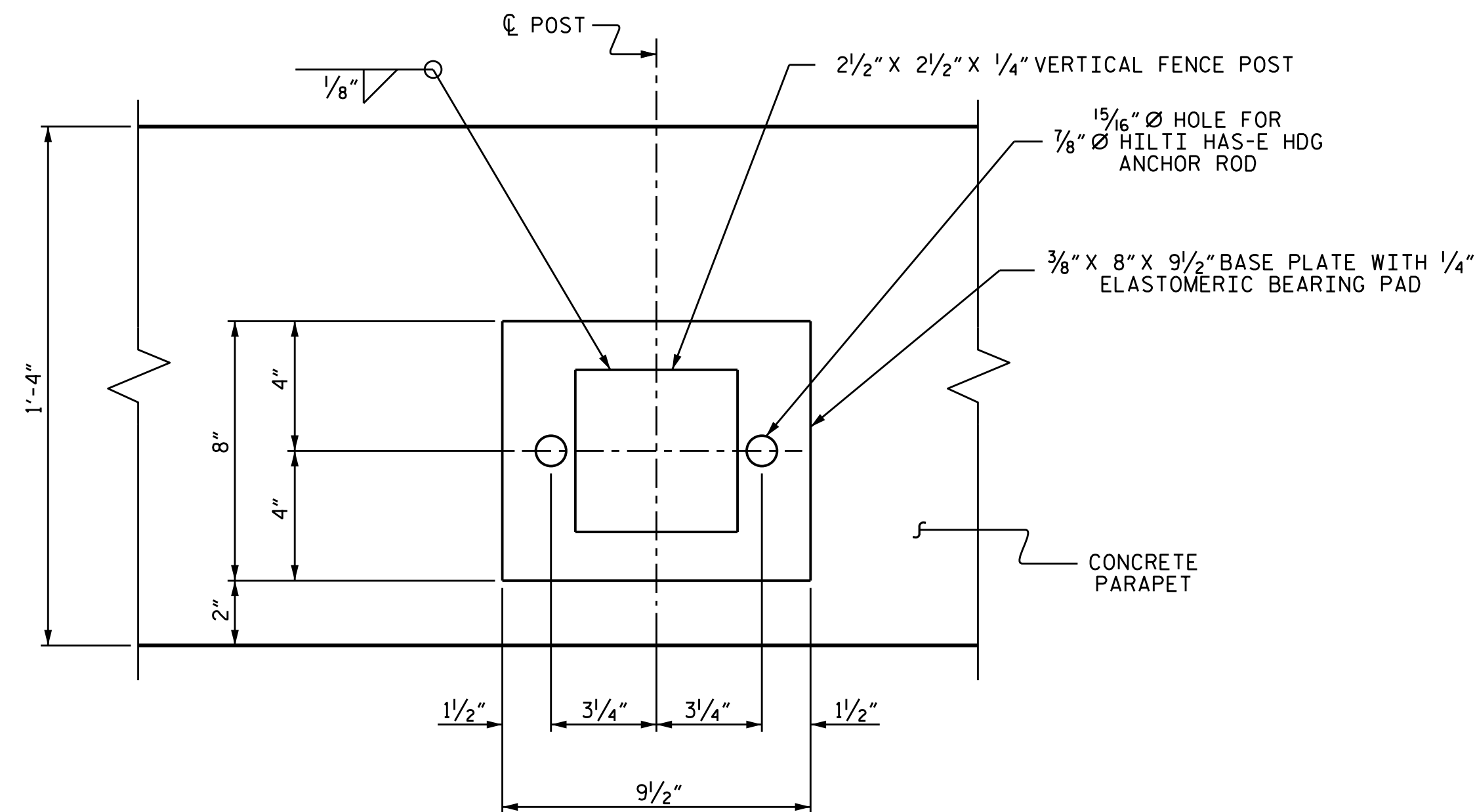


PARTIAL ELEVATION

SHOWING ORNAMENTAL FENCE POST LOCATIONS (WELDED WIRE NOT SHOWN)
 STAR DETAIL NOT SHOWN FOR CLARITY. FOR STAR DETAIL, SEE "CONCRETE PARAPET STAR DETAIL" SHEET



SECTION THRU FENCE



BASE PLATE DETAIL

PAY LENGTH = 287.96 LIN. FT.

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-



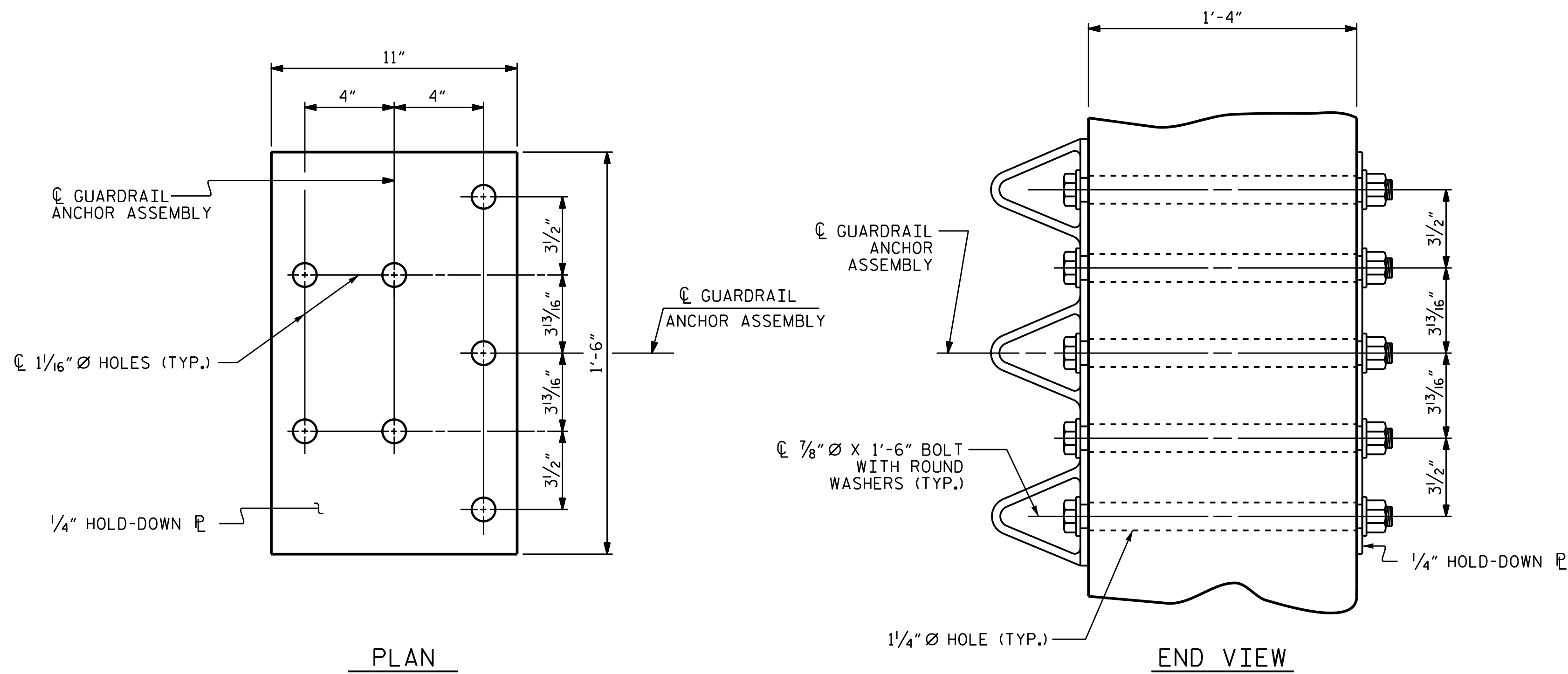
DocuSigned by:
 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 ORNAMENTAL FENCE
 DETAILS

DRAWN BY : A. SORSENGINH DATE : 8/2015
 CHECKED BY : J.P. ADAMS DATE : 8/2015
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 9/2015

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23	
1			3			TOTAL SHEETS	
2			4			84	



PLAN

END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 1/8" 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 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

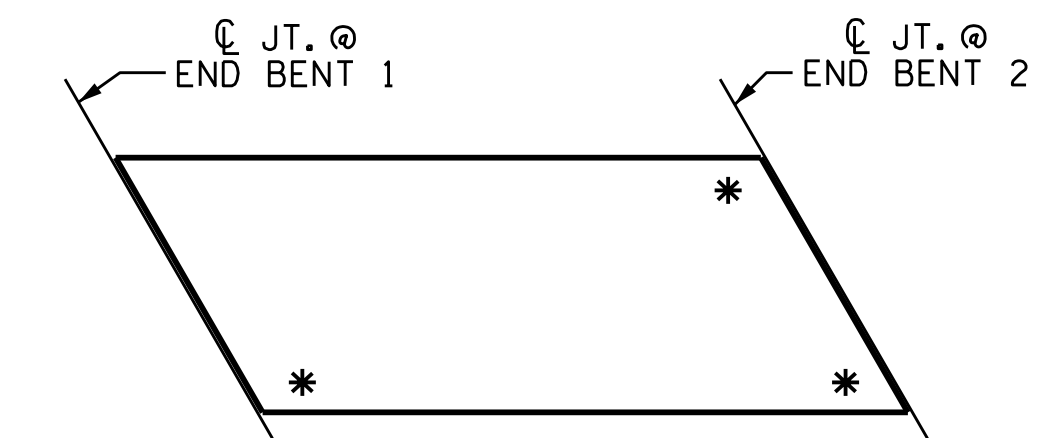
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

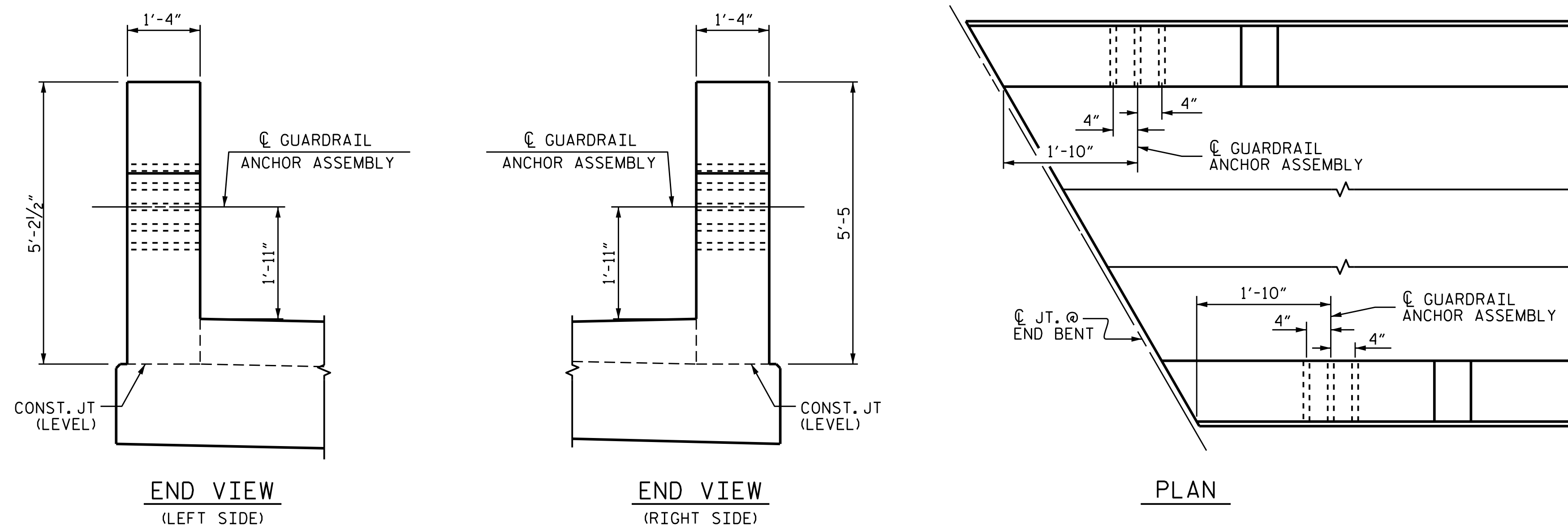
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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

* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW (LEFT SIDE)

END VIEW (RIGHT SIDE)

PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-



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 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 DETAILS
 FOR METAL RAILS

ASSEMBLED BY :	A. SORSENGNH	DATE :	5/2015
CHECKED BY :	J.P. ADAMS	DATE :	6/2015
DRAWN BY :	MAA 5/10	REV. 12/5/11	MAA/GM
CHECKED BY :	GM 5/10	REV. 6/13	MAA/GM
		REV. 1/15	MAA/TMG

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			84

NOTES

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

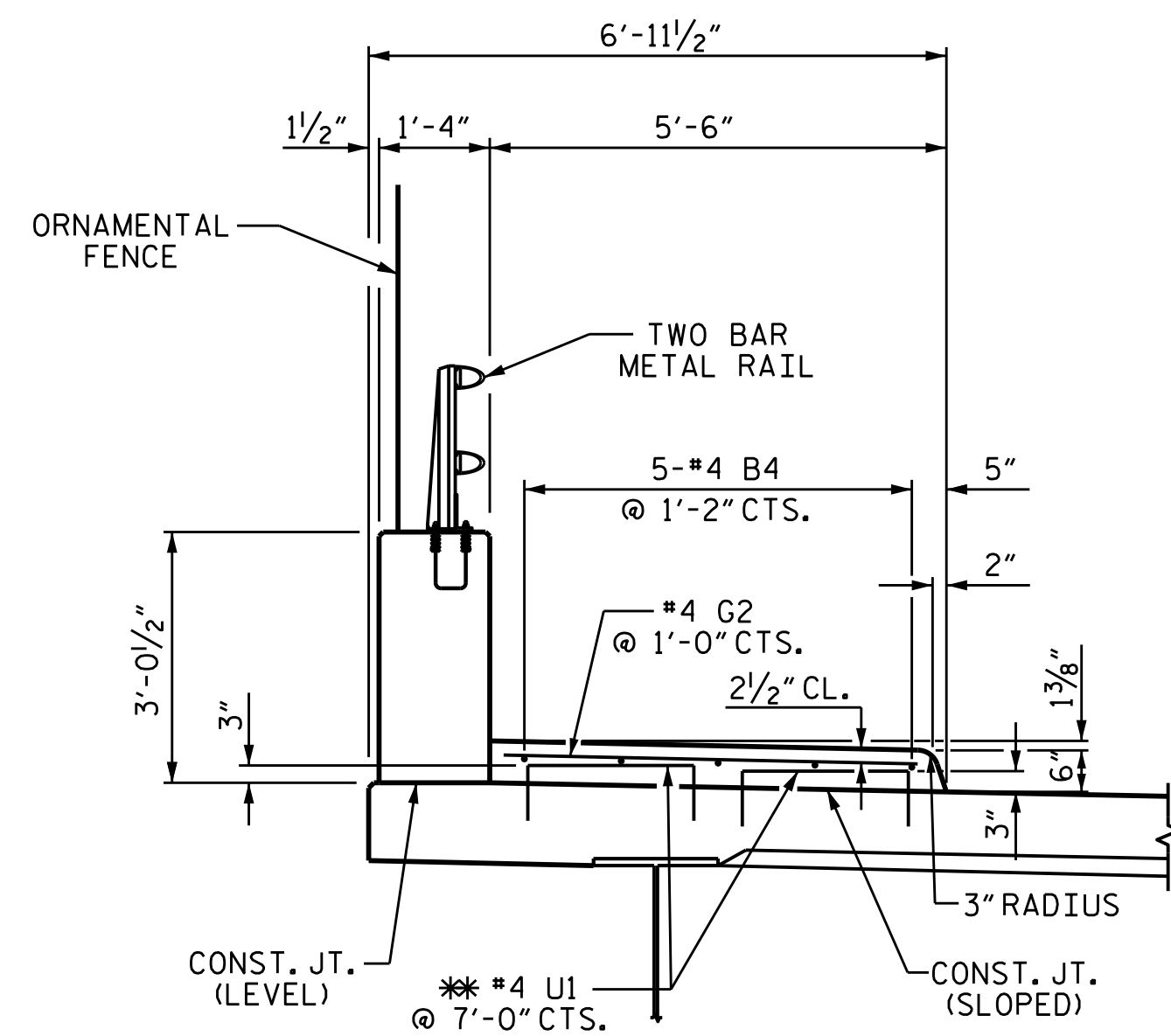
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED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

ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.

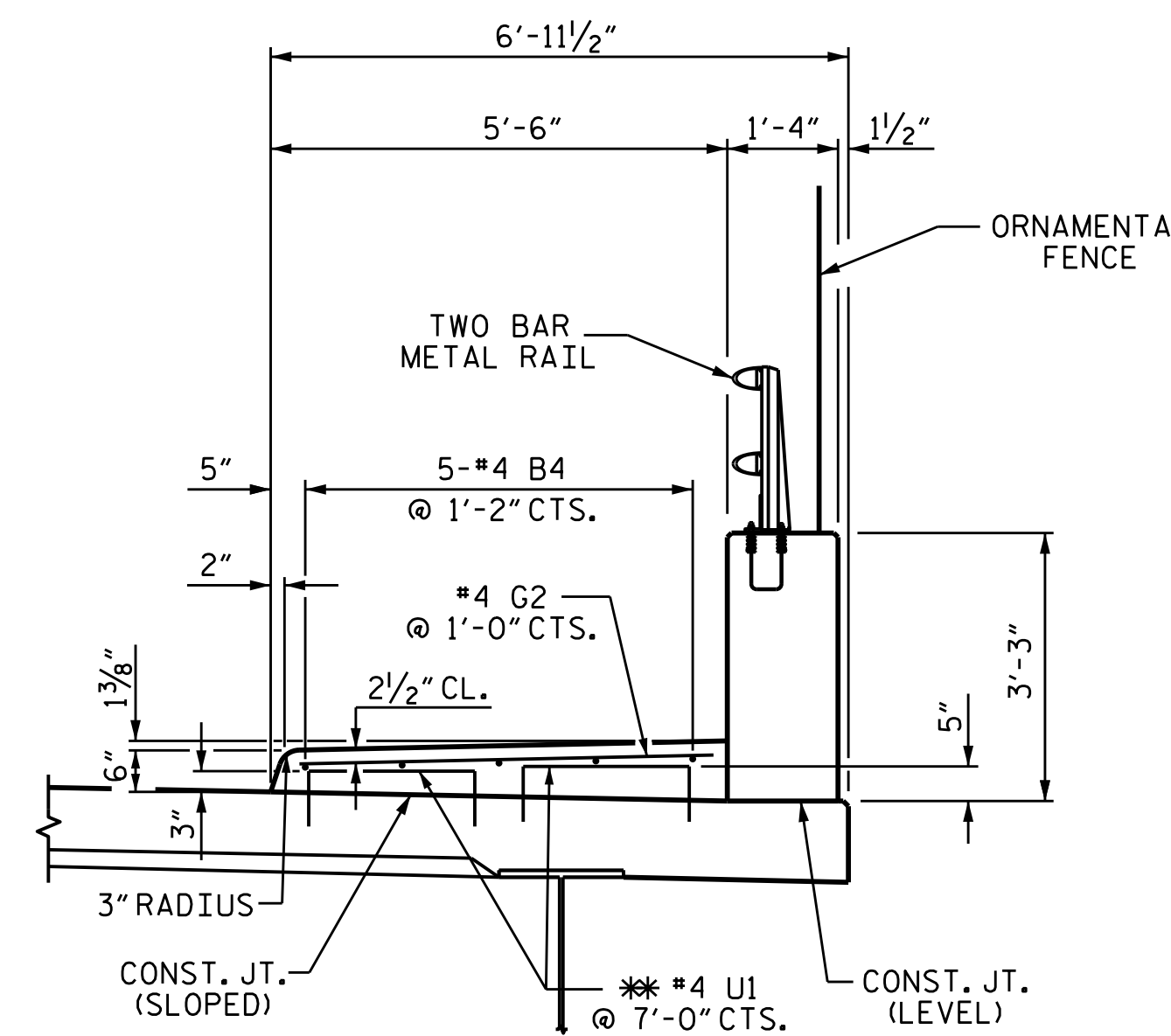
SEE "EXPANSION JOINT SEAL DETAILS FOR SIDEWALK" SHEETS FOR COVER PLATE DETAILS.

FOR SIDEWALK ON APPROACH SLAB, SEE APPROACH SLAB SHEETS.

FOR SIDEWALK REINFORCING STEEL AND CONCRETE QUANTITIES, SEE SUPERSTRUCTURE "BILL OF MATERIAL".

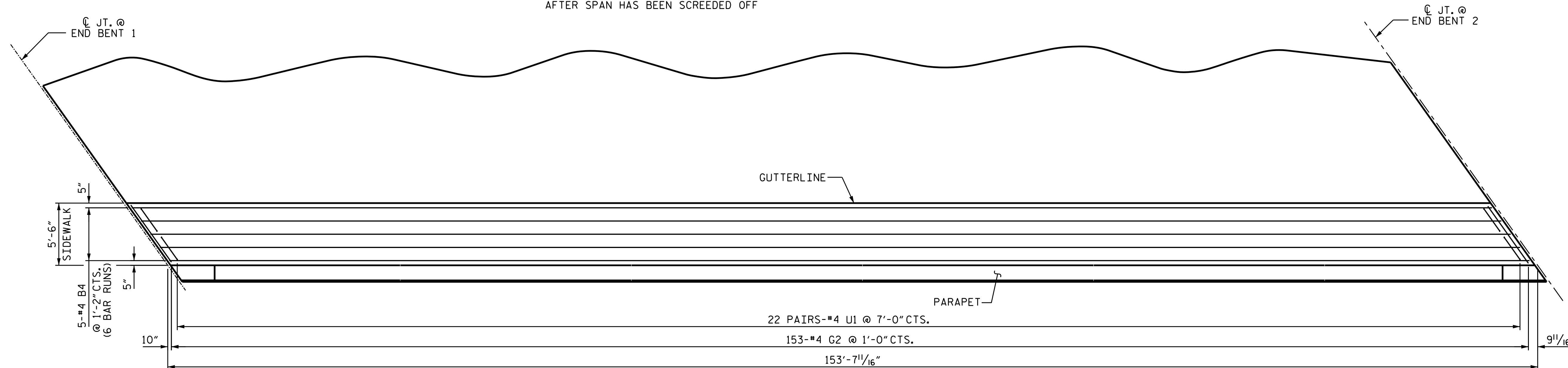


SECTION THRU SIDEWALK
LEFT SIDE



SECTION THRU SIDEWALK
RIGHT SIDE

** #4 U1 MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF



PLAN OF SIDEWALK

RIGHT SIDEWALK SHOWN, LEFT SIDE SIMILAR

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 29+57.01 -L-



DocuSigned by:
Kristy W. Alford
3/29/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUPERSTRUCTURE
SIDEWALK DETAILS**

DRAWN BY : A. SORSENGINH DATE : 5/2015
CHECKED BY : J.P. ADAMS DATE : 6/2015
DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 9/2015

DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25	
1			3			TOTAL SHEETS	84
2			4				

NOTES

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

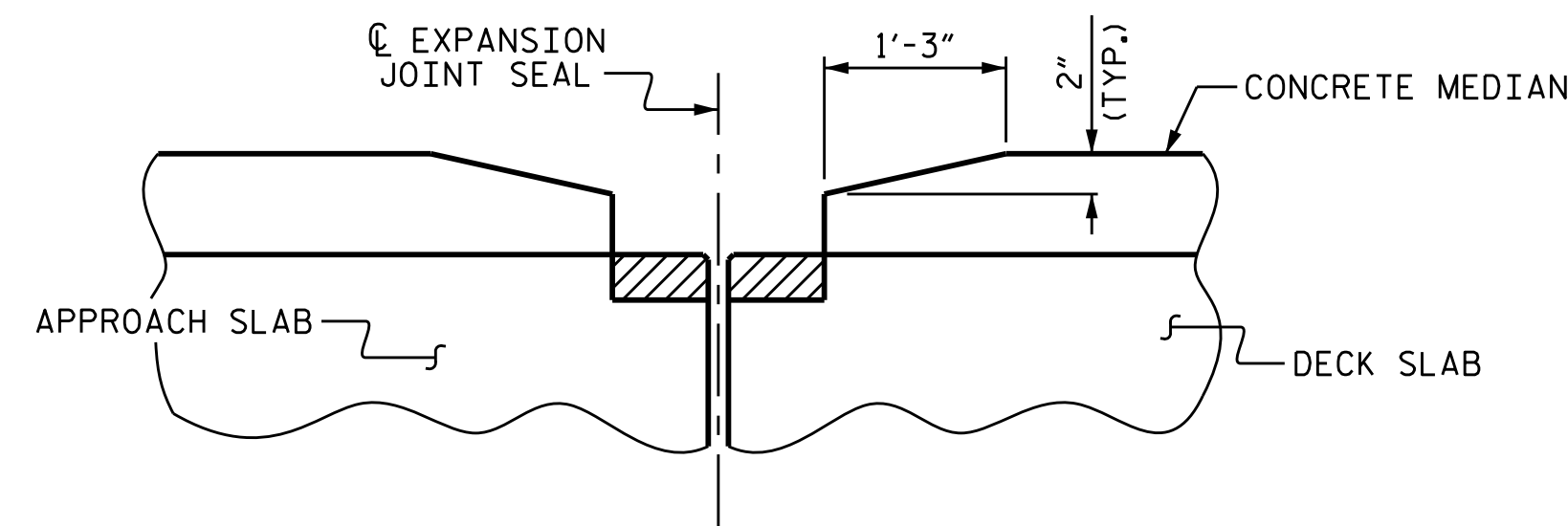
ALL REINFORCING STEEL IN CONCRETE MEDIAN SHALL BE EPOXY COATED.

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

FOR MONOLITHIC CONCRETE MEDIAN ON APPROACH SLAB, SEE APPROACH SLAB SHEETS.

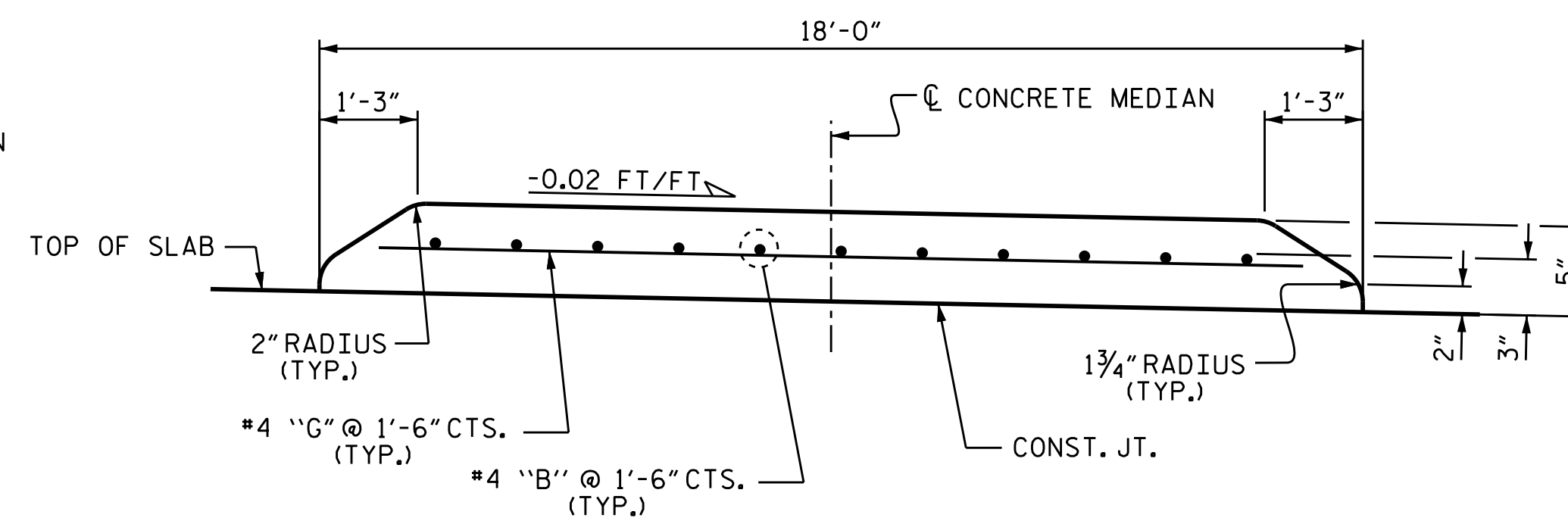
FOR CONCRETE MEDIAN REINFORCING STEEL AND CONCRETE QUANTITIES, SEE SUPERSTRUCTURE "BILL OF MATERIAL".

AESTHETICALLY TREATED CONCRETE MEDIAN = 3452.4 SQ. FT.

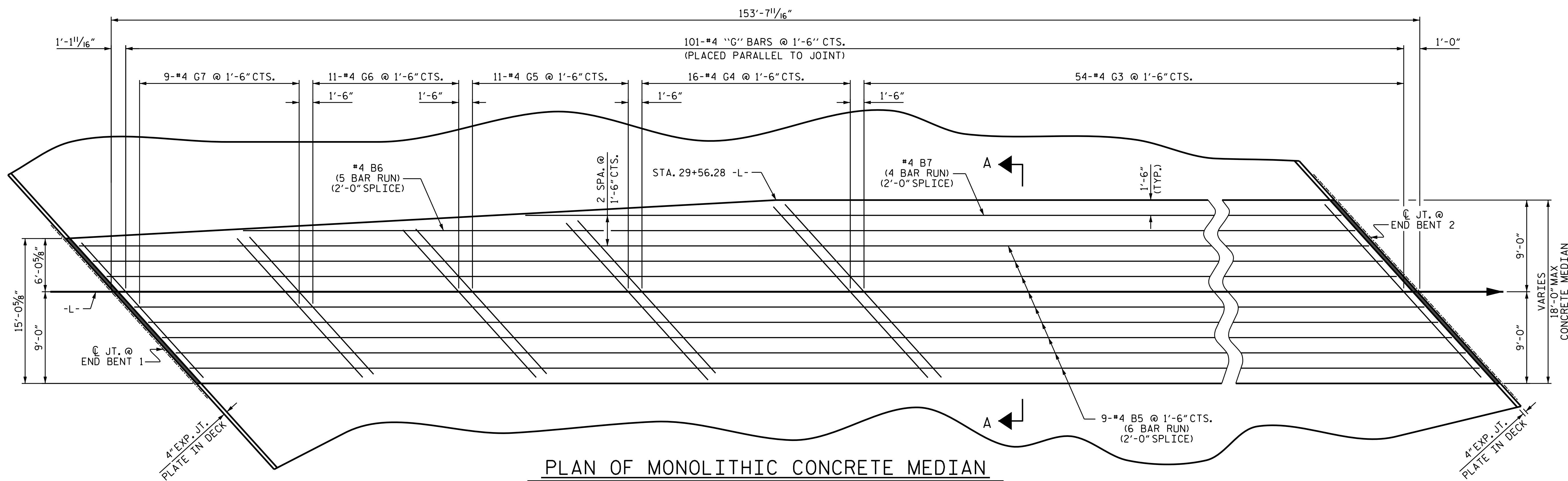


SECTION THRU MEDIAN AT END BENTS

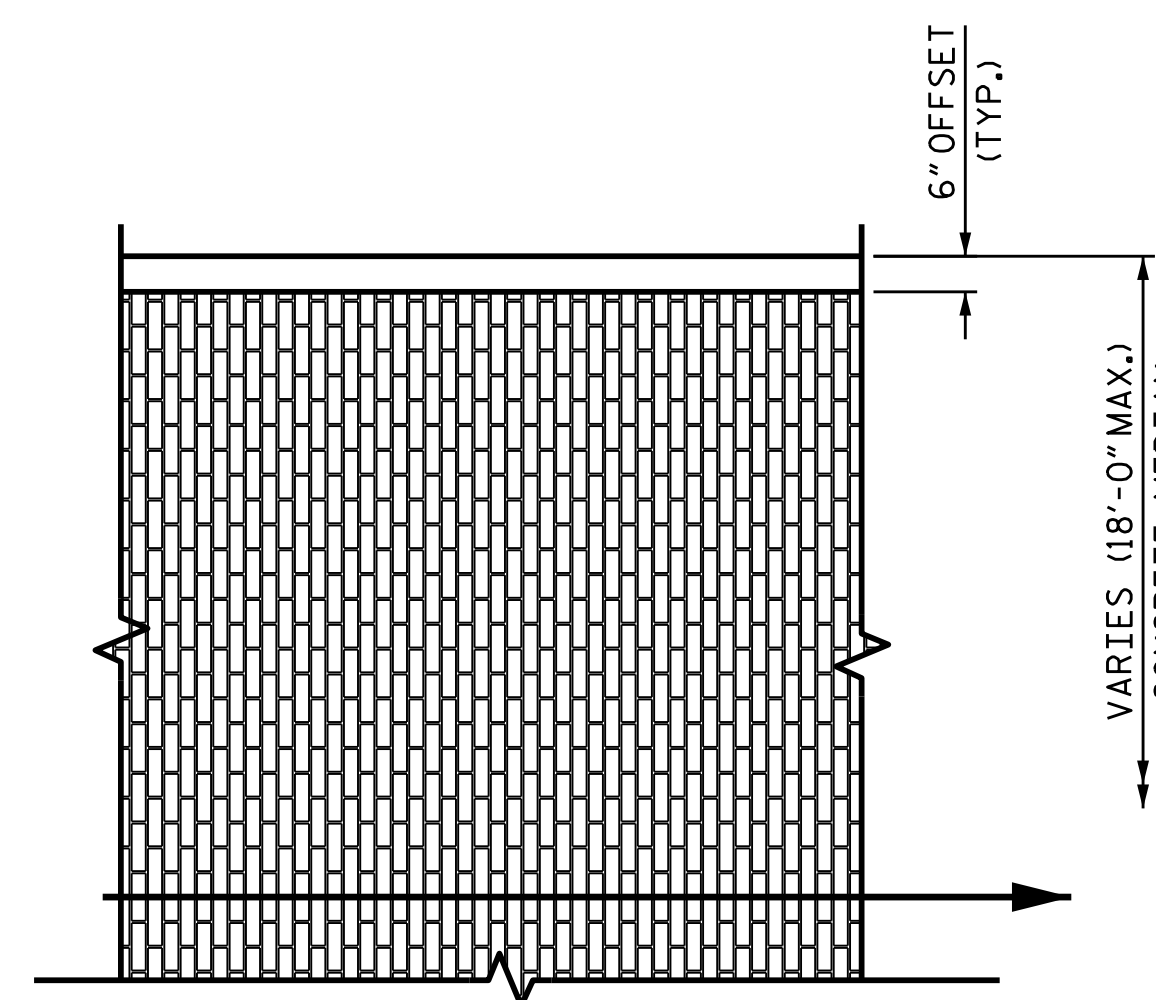
END BENT 1 SHOWN, END BENT 2 SIMILAR



SECTION A-A



PLAN OF MONOLITHIC CONCRETE MEDIAN



PATTERN DETAIL

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-



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 F245838300F40E...

3/29/2016

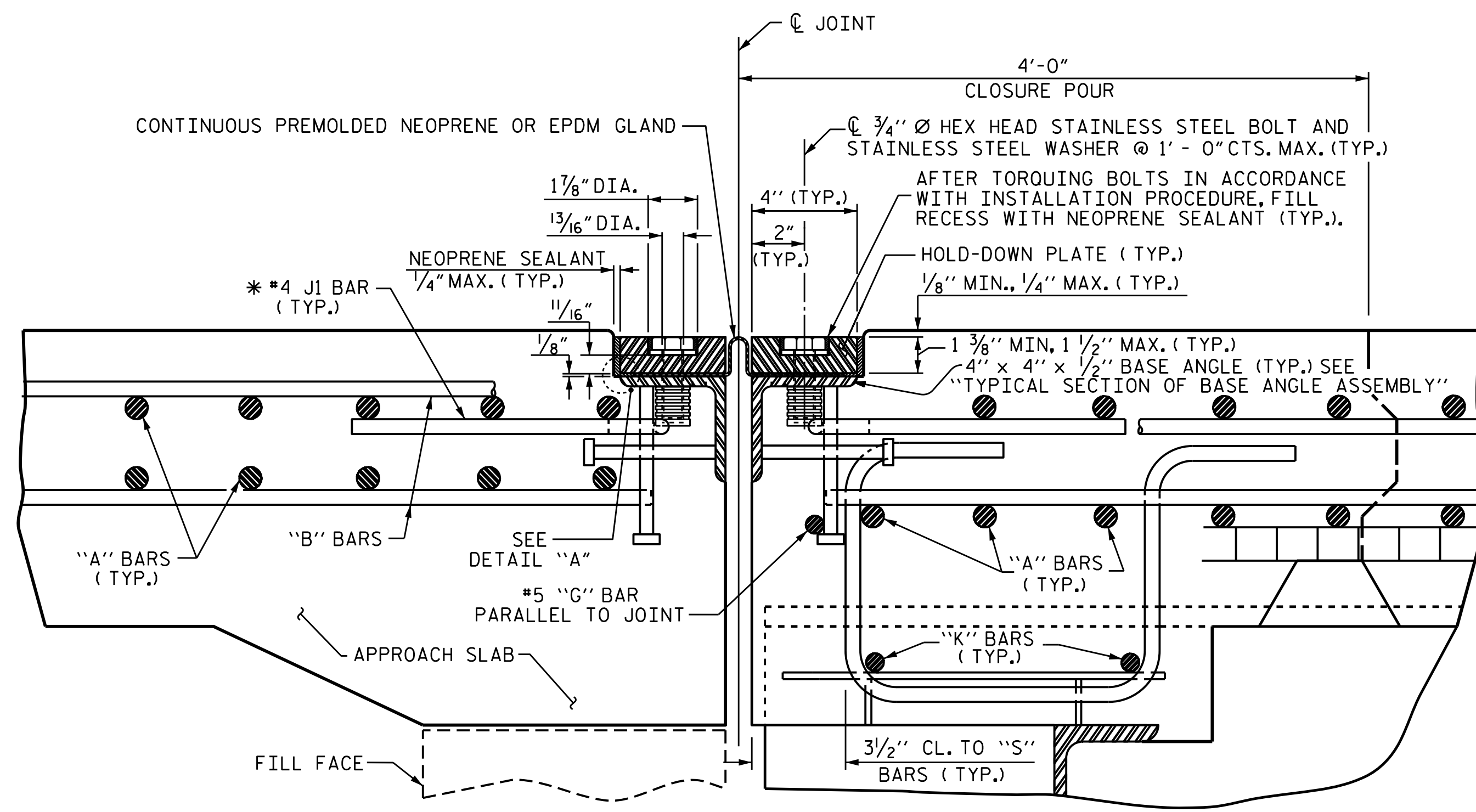
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 MONOLITHIC
 CONCRETE MEDIAN

DRAWN BY : A. SORSENGINH DATE : 5/2015
 CHECKED BY : J.P. ADAMS DATE : 6/2015
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 9/2015

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26	
1			3			TOTAL SHEETS	
2			4			84	

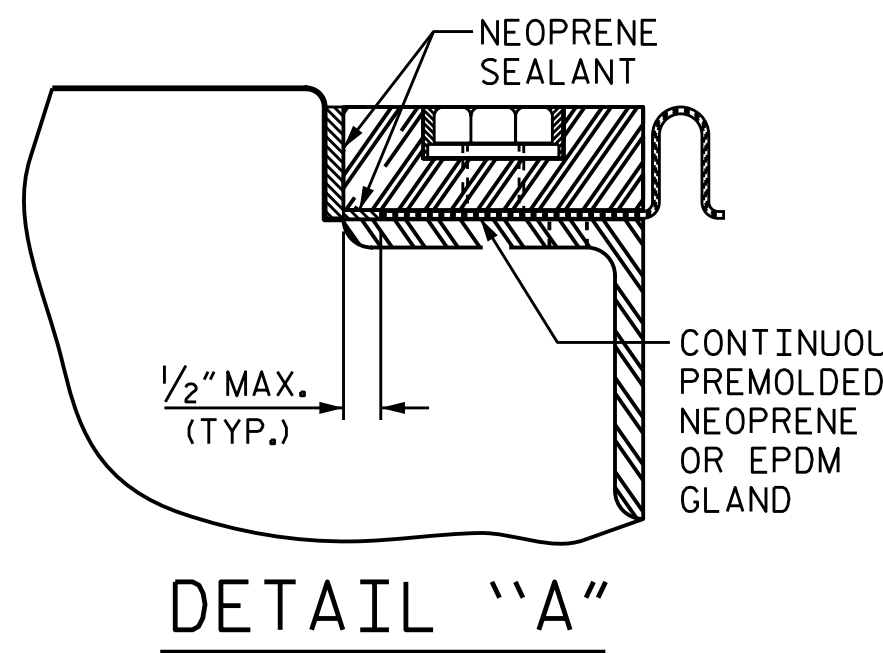


EXPANSION JOINT DETAILS

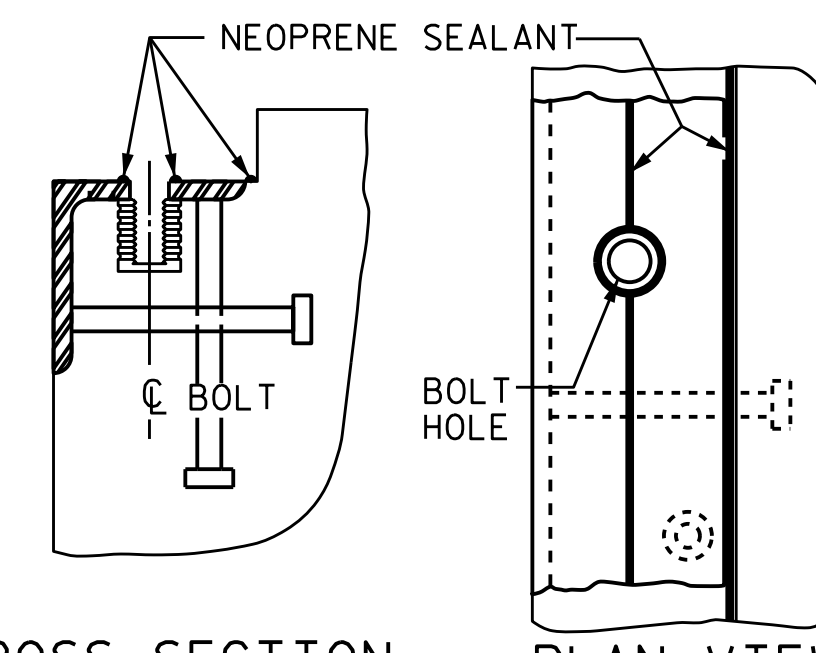
SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

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

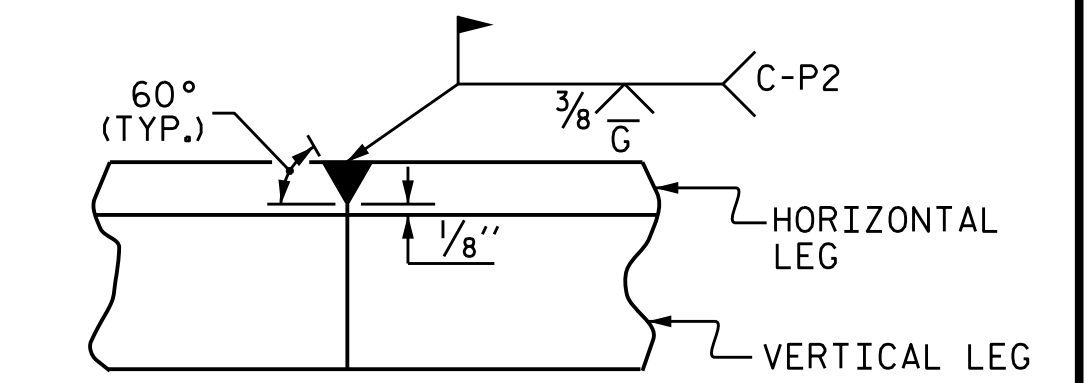
MOVEMENT AND SETTING AT JOINT					
END BENT	SKIEW ANGLE	TOTAL MOVEMENT (ALONG CL RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	47°-50'-55"	0	-	1/16"	-
2	47°-50'-55"	1 3/16"	1 3/16"	1 3/16"	1 3/16"



DETAIL "A"



CROSS SECTION
PLAN VIEW
INSTALLATION SKETCH



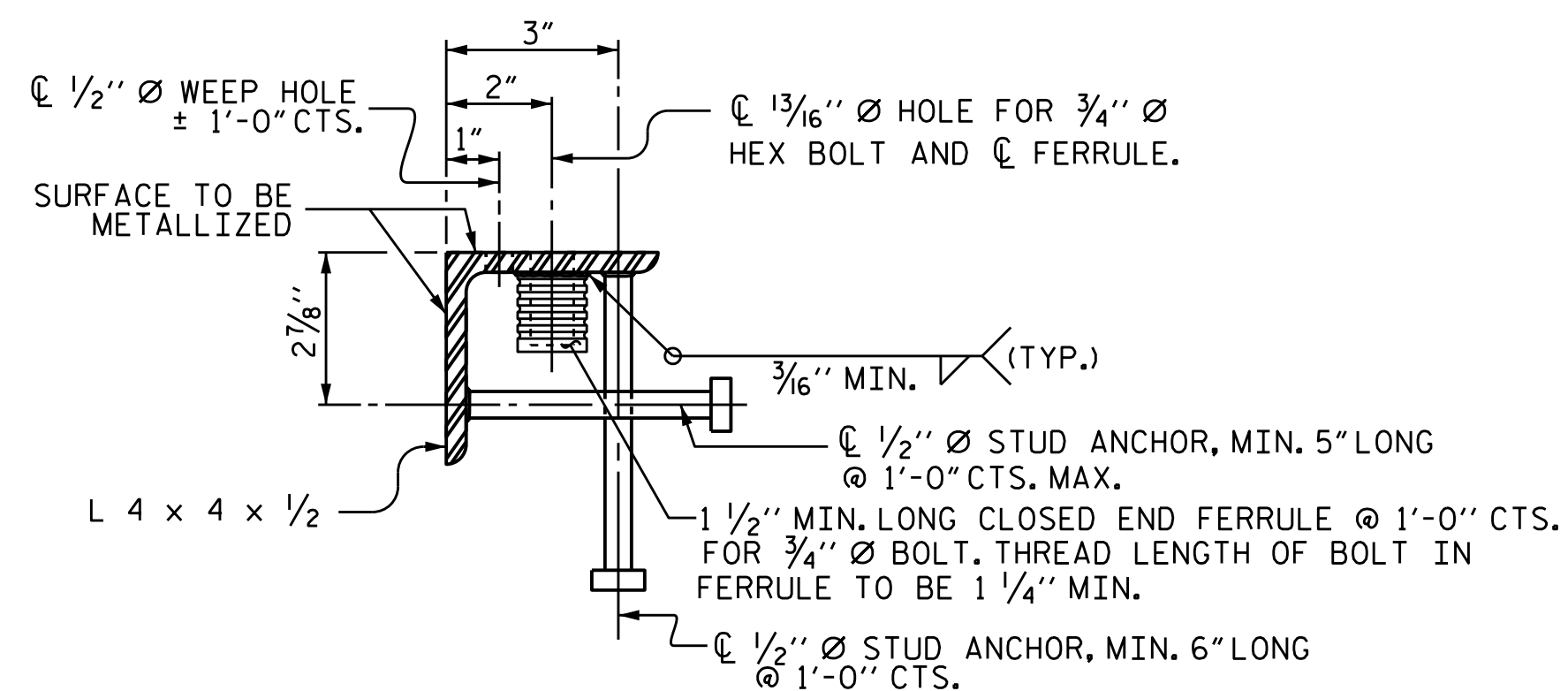
DETAIL- FIELD WELD
SPLICE OF BASE ANGLE

INSTALLATION PROCEDURE

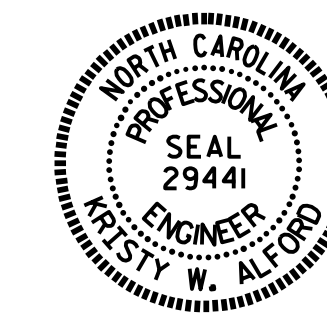
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4 1/8" TO 4 1/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED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

GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
7. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
8. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
9. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
10. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



TYPICAL SECTION OF BASE ANGLE ASSEMBLY



DocuSigned by:
3/29/2016

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 29+57.01 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
EXPANSION JOINT
SEAL DETAILS

ASSEMBLED BY : A. SORSENGINH	DATE : 5/2015
CHECKED BY : J.P. ADAMS	DATE : 6/2015
DRAWN BY : REK 9/87	REV. 5/7/03R RWW/JTE
CHECKED BY : CRK 10/87	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

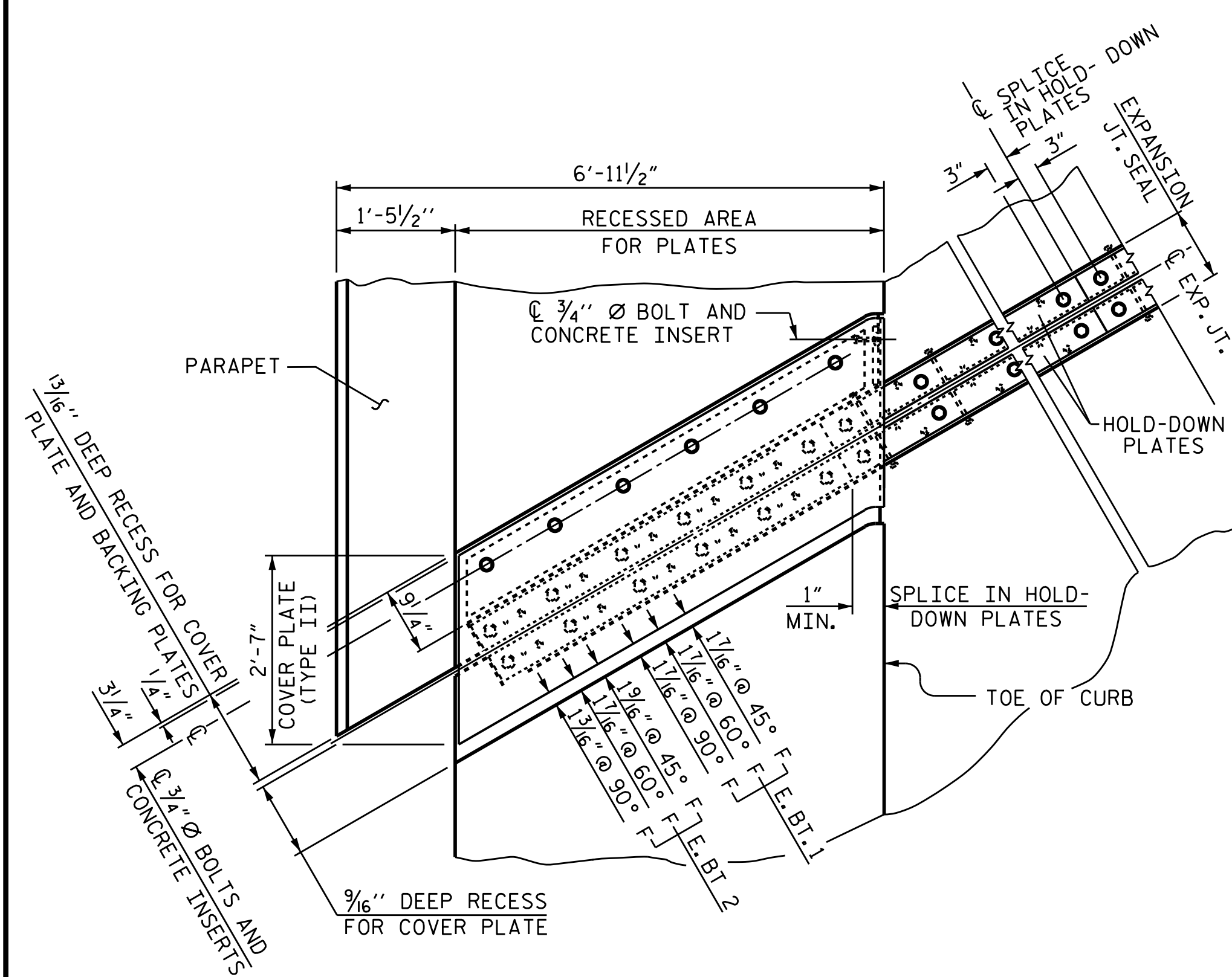
29-MAR-2016 09:19
R:\Structures\Plans\STR 1\SUPERSTRUCTURE\B4490.SD.JS.1.dgn
jpadams

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

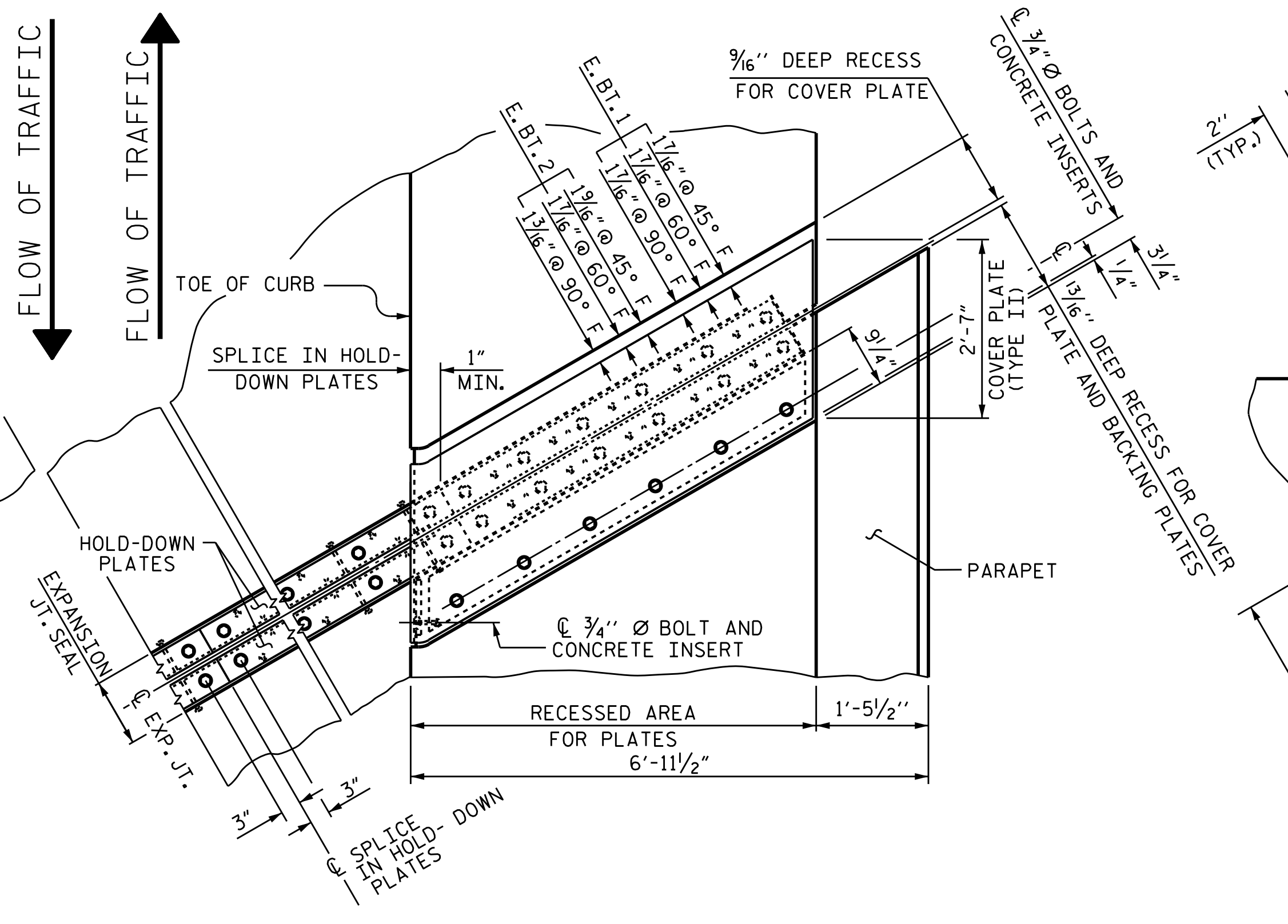
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS 84
2			4			

STR. #1

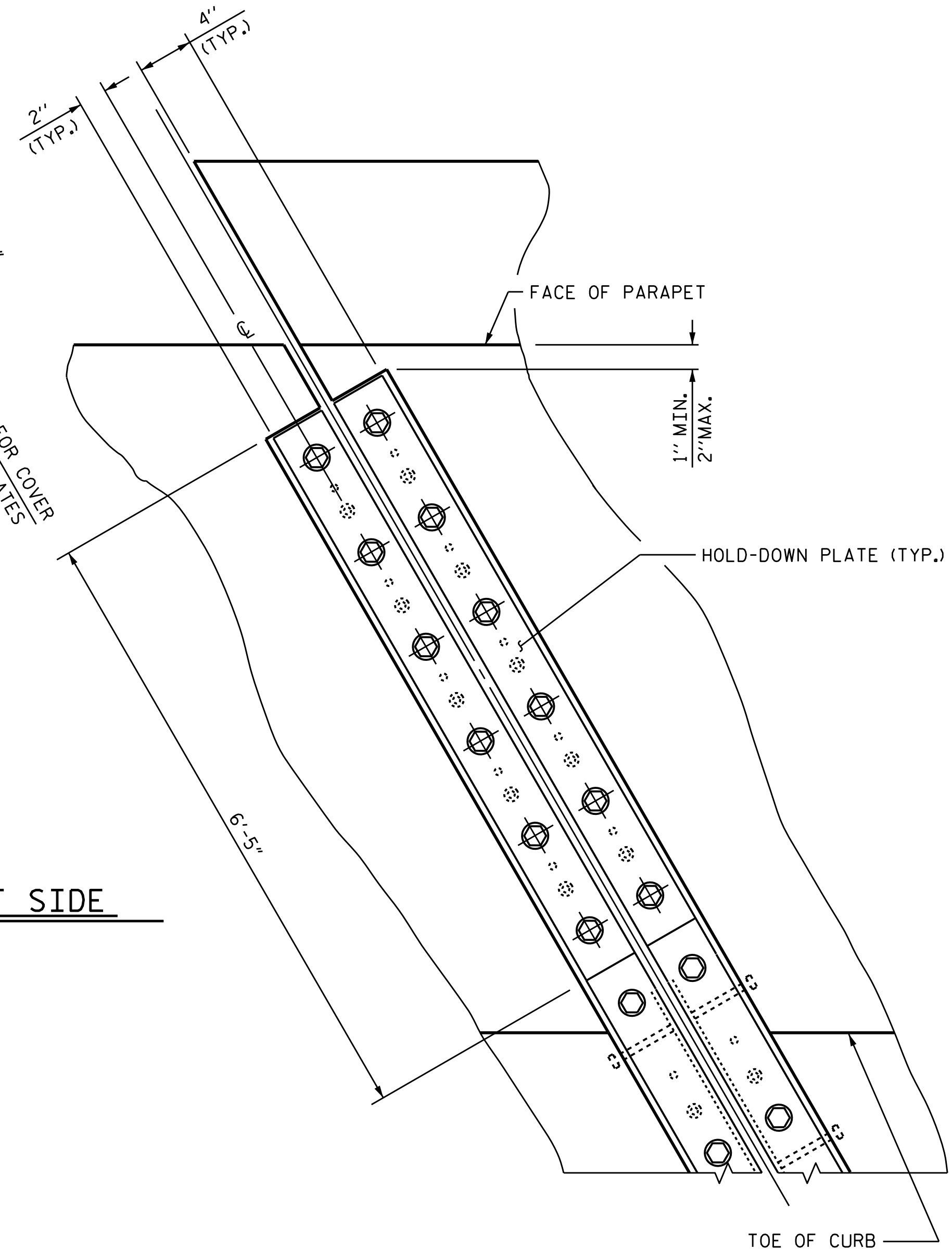
STD. NO. EJS1



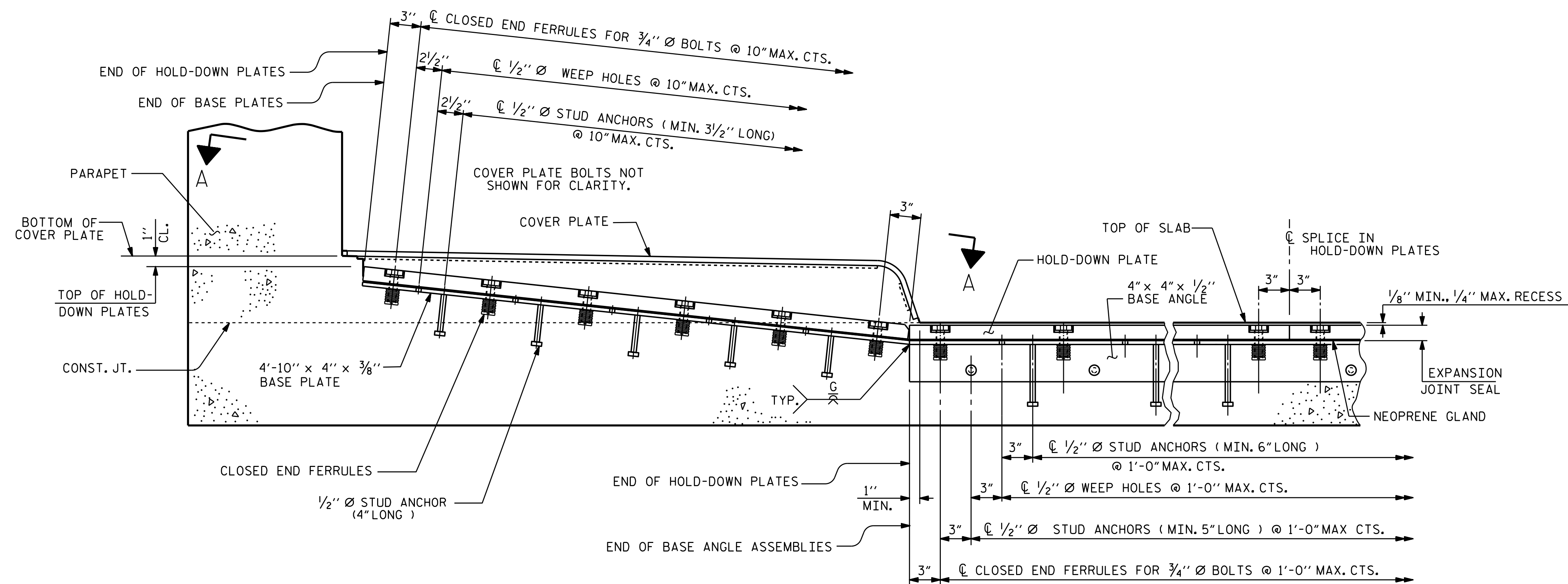
PLAN OF EXPANSION JOINT SEAL - LEFT SIDE



PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE

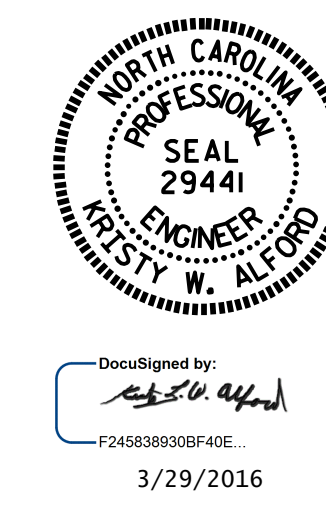


SECTION A - A
EB1 SHOWN, EB2 SIMILIAR



SECTION THRU SIDEWALK NORMAL TO JOINT

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-
 SHEET 2 OF 3

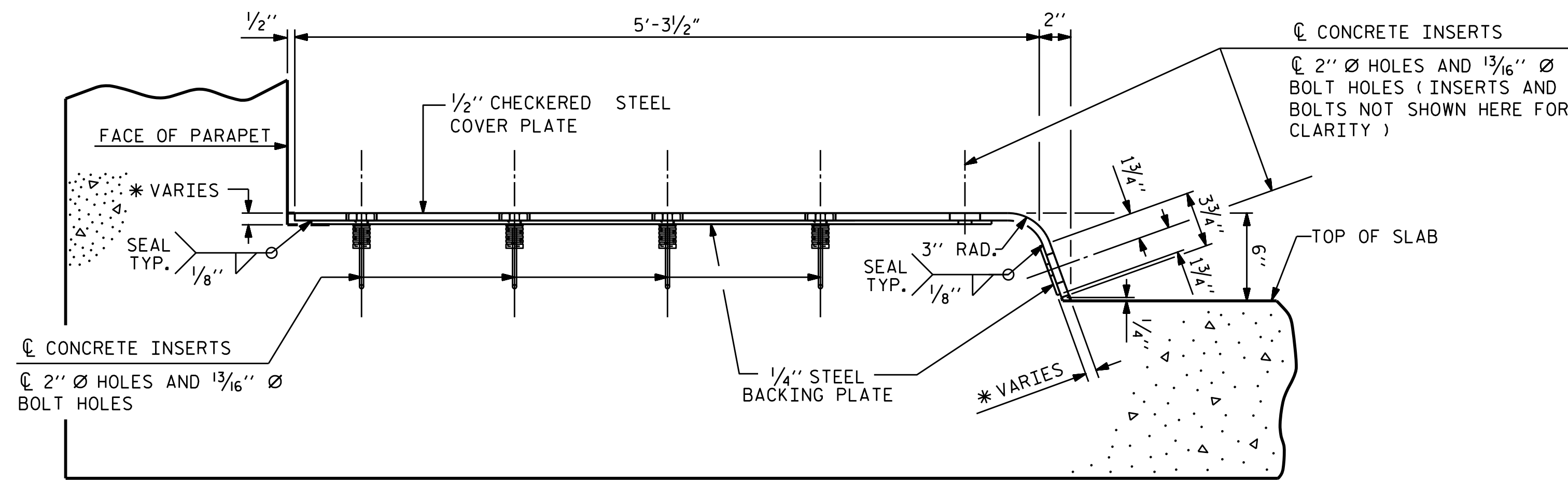


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 EXPANSION JOINT
 SEAL DETAILS
 FOR SIDEWALK

ASSEMBLED BY :	A. SORSENGINH	DATE :	5/2015
CHECKED BY :	J.P. ADAMS	DATE :	6/2015
DRAWN BY :	REK 10/87	REV. 2/6/97	EEM/RGW
CHECKED BY :	CRK 1/88	REV. 5/1/06	TLA/GM
		REV. 10/1/11	MAA/GM

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

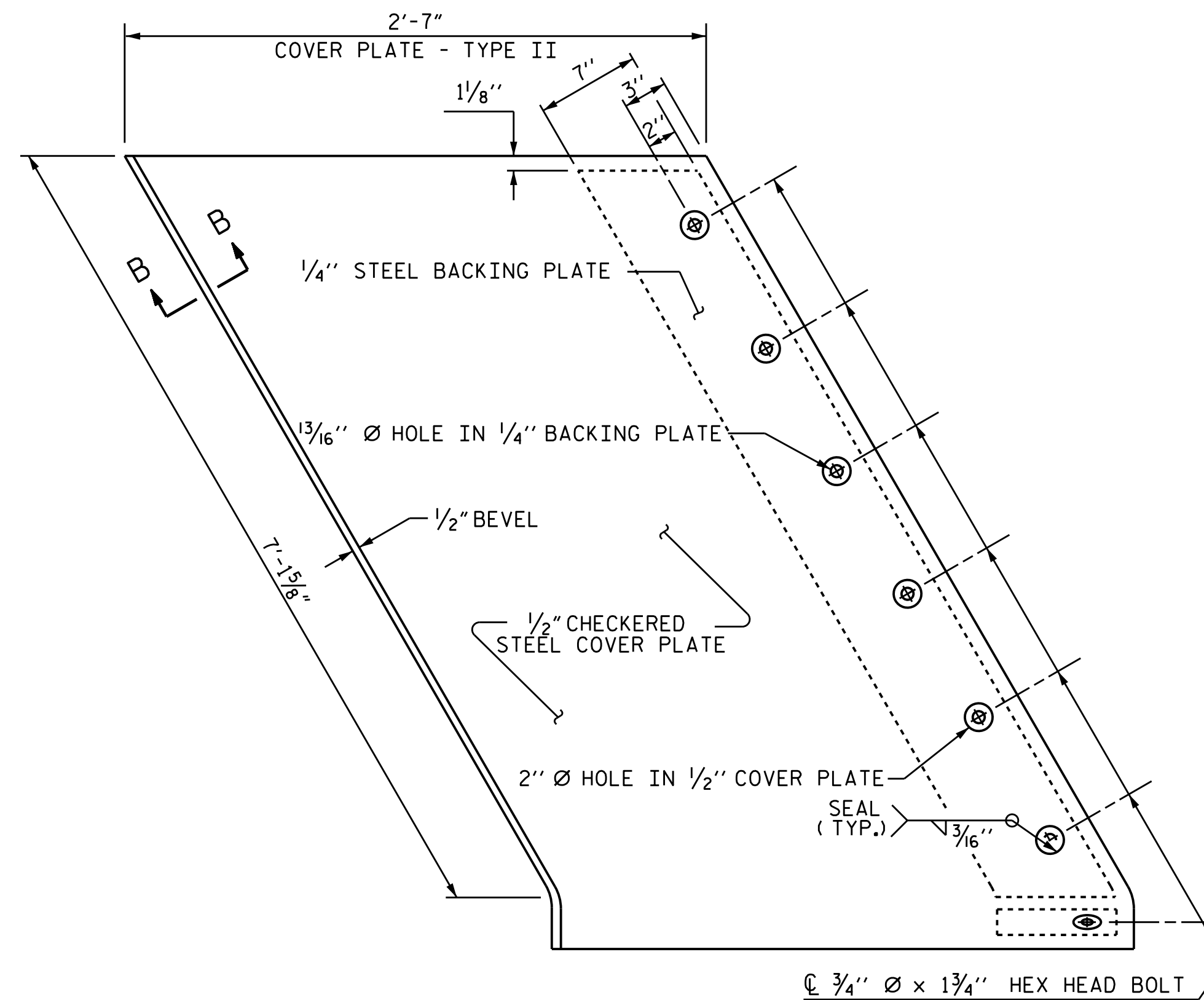
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28	
1			3			TOTAL SHEETS 84	
2			4				



END VIEW
(NORMAL TO SIDEWALK)

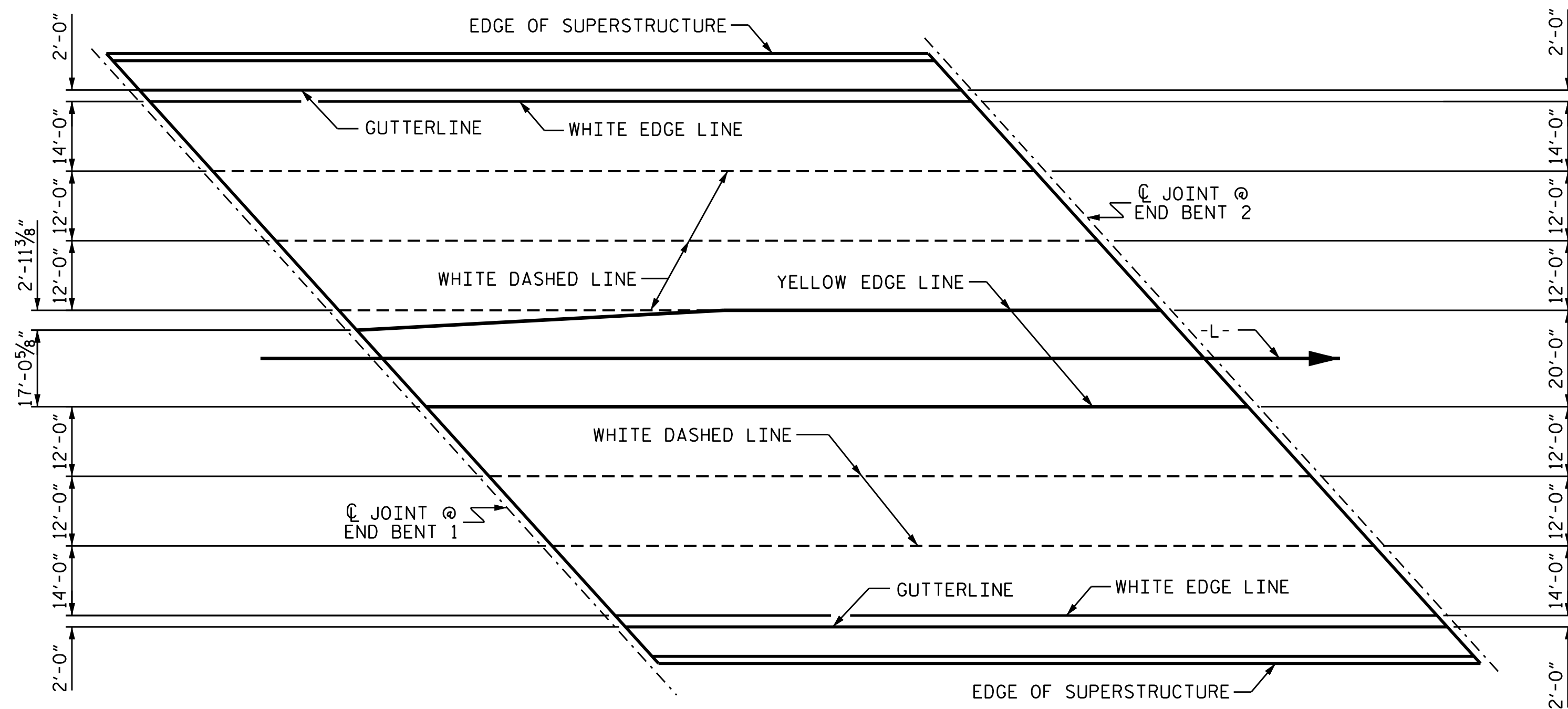
* CONCRETE RECESS DIMENSIONS:

- 13/16" FOR THE SIDE OF THE JOINT HAVING THE 1/2" COVER PLATE WITH A 1/4" BACKING PLATE.
- 9/16" FOR THE SIDE OF THE JOINT HAVING ONLY THE 1/2" COVER PLATE.

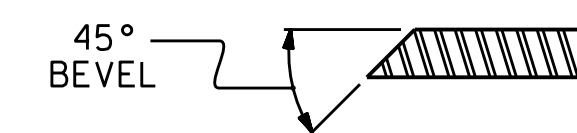


TYPE II - PLAN VIEW

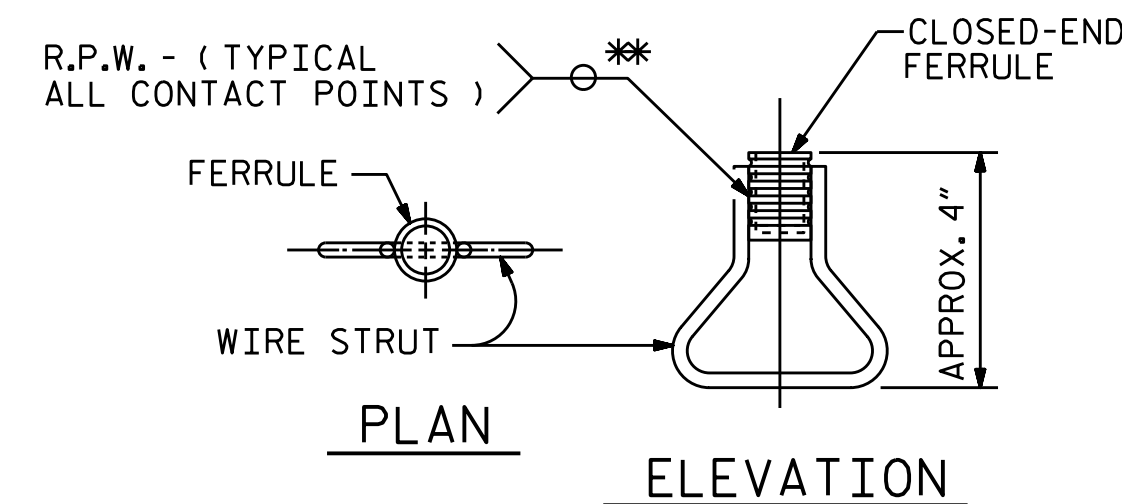
COVER PLATE DETAILS



PAVEMENT MARKING ALIGNMENT



SECTION B - B



CONCRETE INSERT

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



DocuSigned by:
Tristram W. Alford
3/29/2016

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 29+57.01 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
EXPANSION JOINT
SEAL DETAILS
FOR SIDEWALK

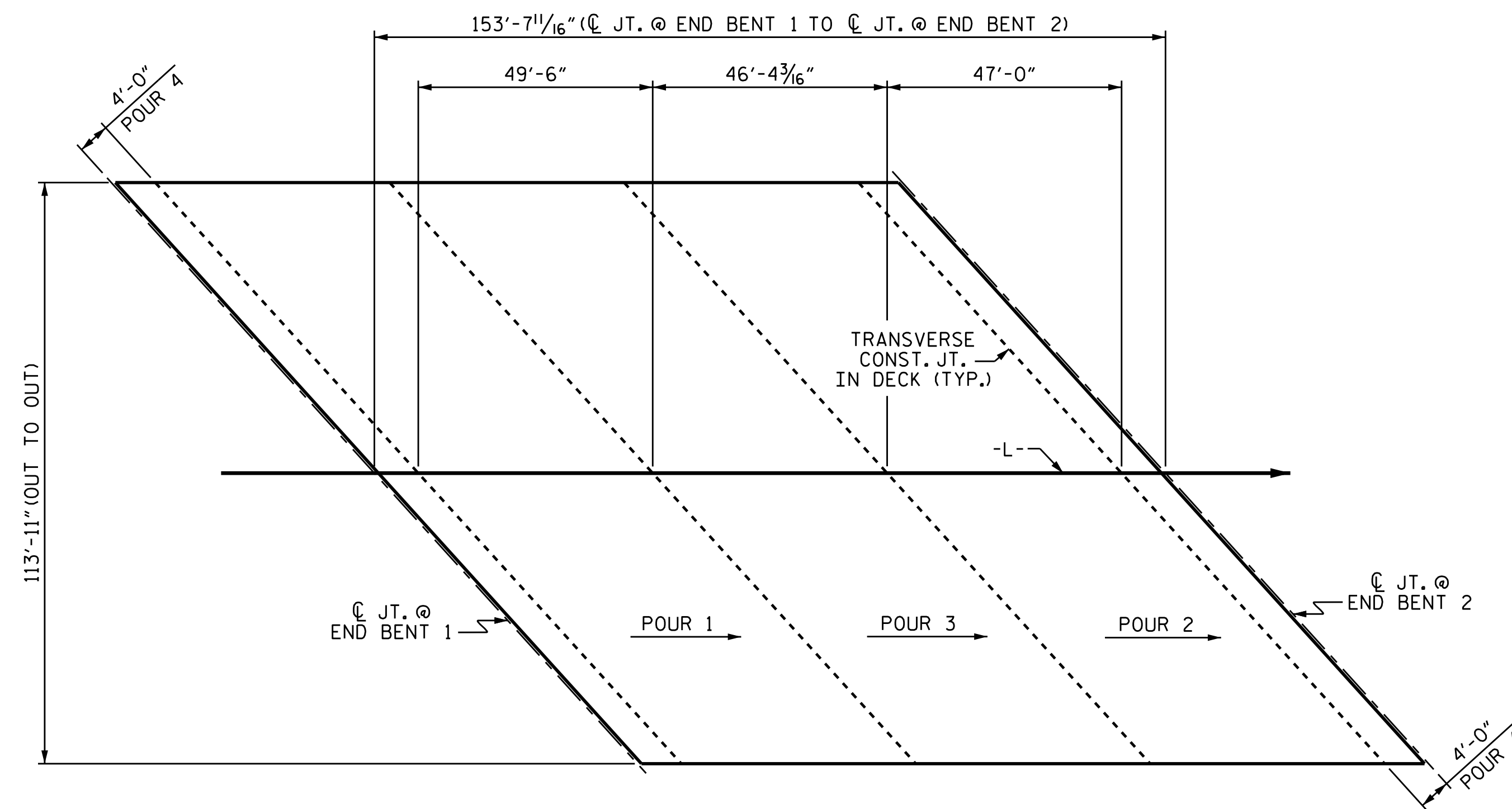
ASSEMBLED BY :	A. SORSENGINH	DATE :	5/2015
CHECKED BY :	J.P. ADAMS	DATE :	6/2015
DRAWN BY :	REK 10/87	REV. 10/17/00	RWW/LES
CHECKED BY :	CRK 1/88	REV. 5/11/06	TLA/GM
		REV. 10/1/11	MAA/GM

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

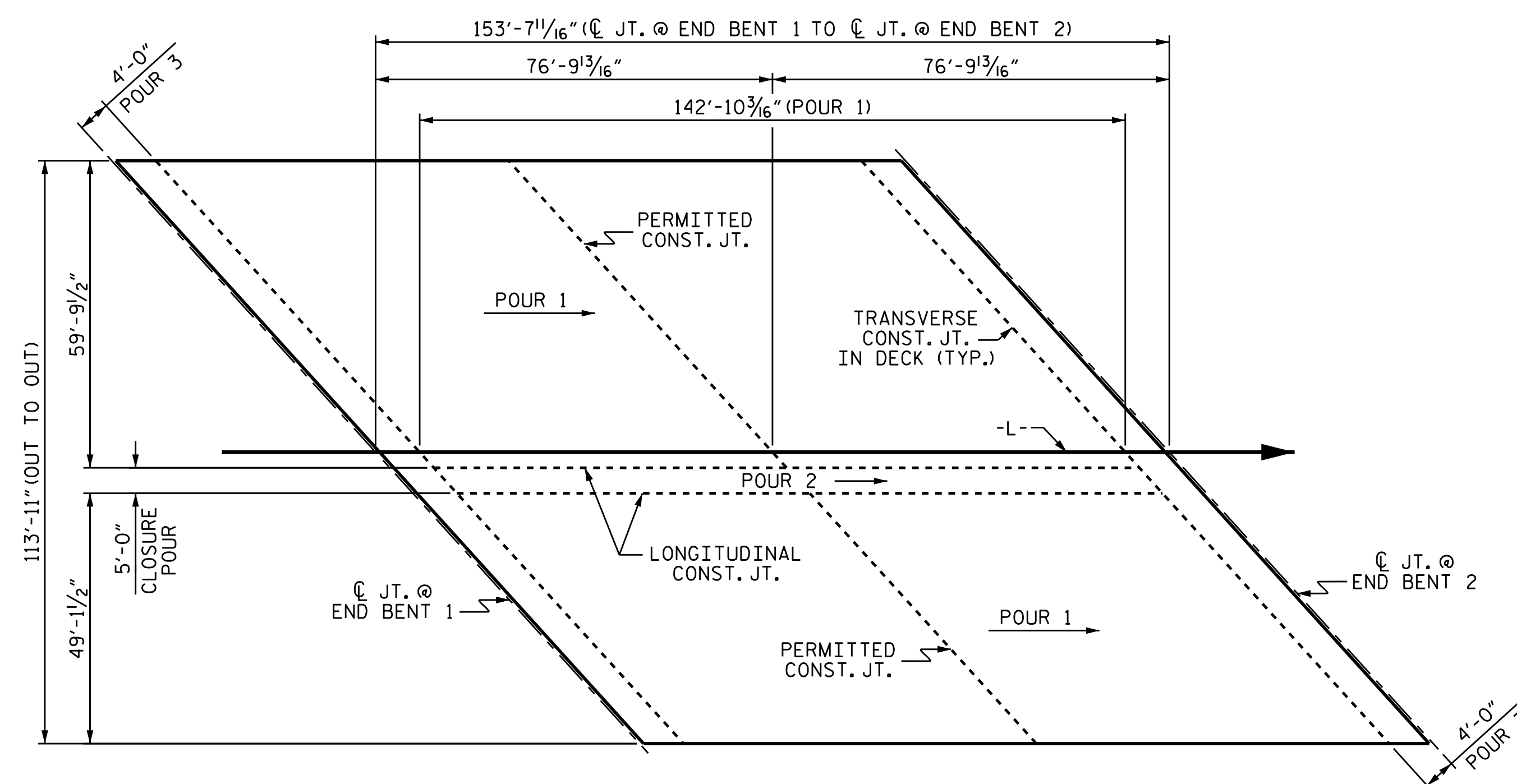
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			84

STR. #1

STD. NO. EJS4

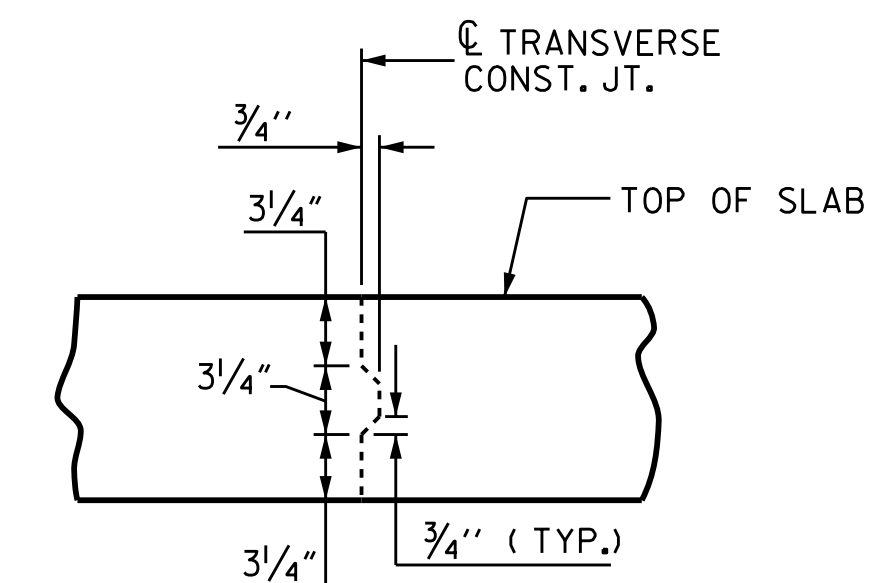


POURING SEQUENCE AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 17,502)



OPTIONAL POURING SEQUENCE

CLASS AA CONCRETE BREAKDOWN	
POUR #1	202.7 CU. YDS.
POUR #2	192.7 CU. YDS.
POUR #3	190.2 CU. YDS.
POUR #4	58.7 CU. YDS.
SIDEWALKS	34.4 CU. YDS.
CONCRETE MEDIAN	39.3 CU. YDS.
TOTAL	718.0 CU. YDS.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-



Designed by
 3/29/2016

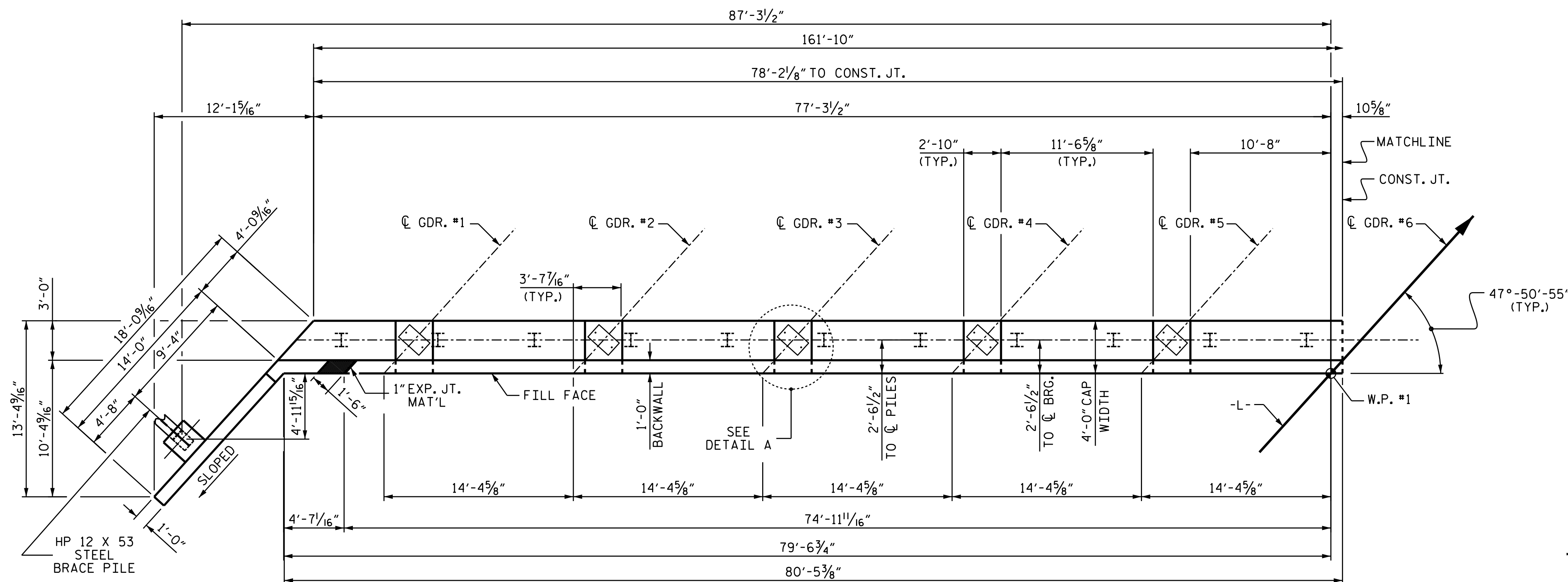
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 CONCRETE DECK
 POUR DETAILS

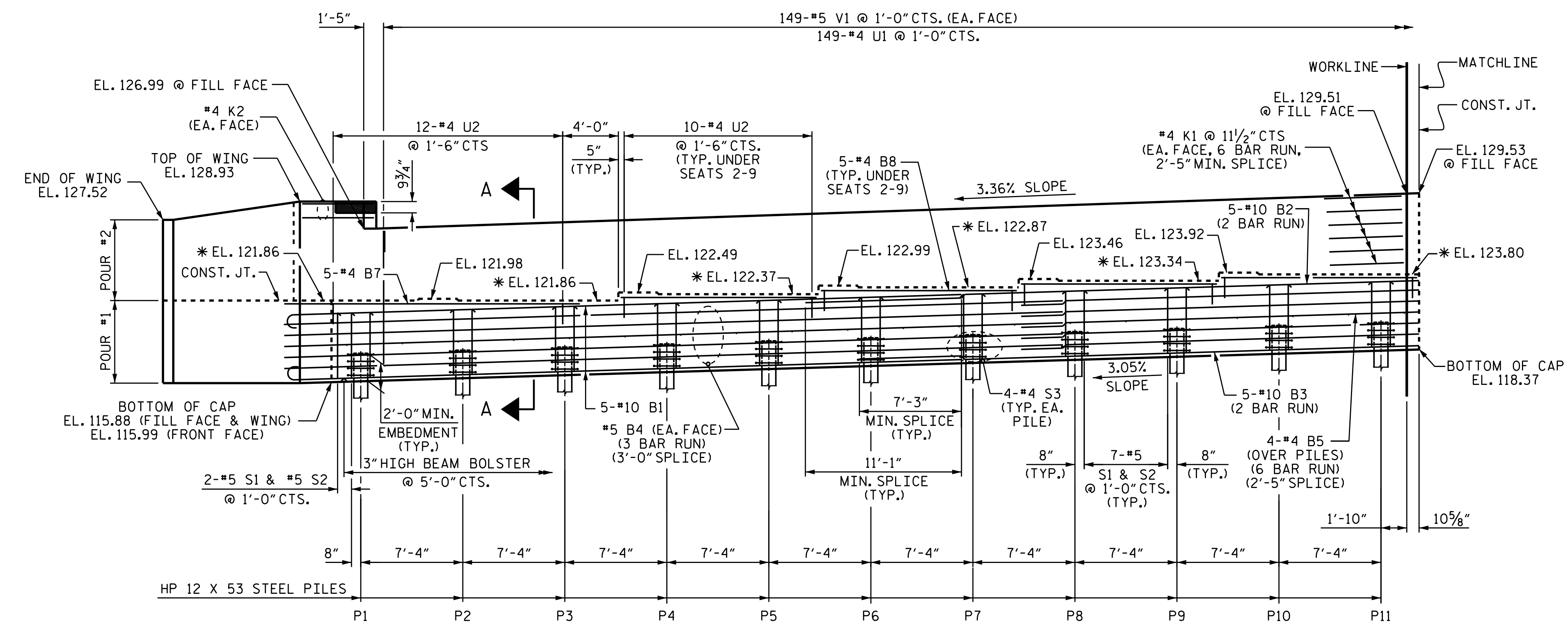
DRAWN BY : A. SORSENGINH DATE : 6/2015
 CHECKED BY : J.P. ADAMS DATE : 6/2015
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 9/2015

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30	
1			3			TOTAL SHEETS 84	
2			4				



PLAN

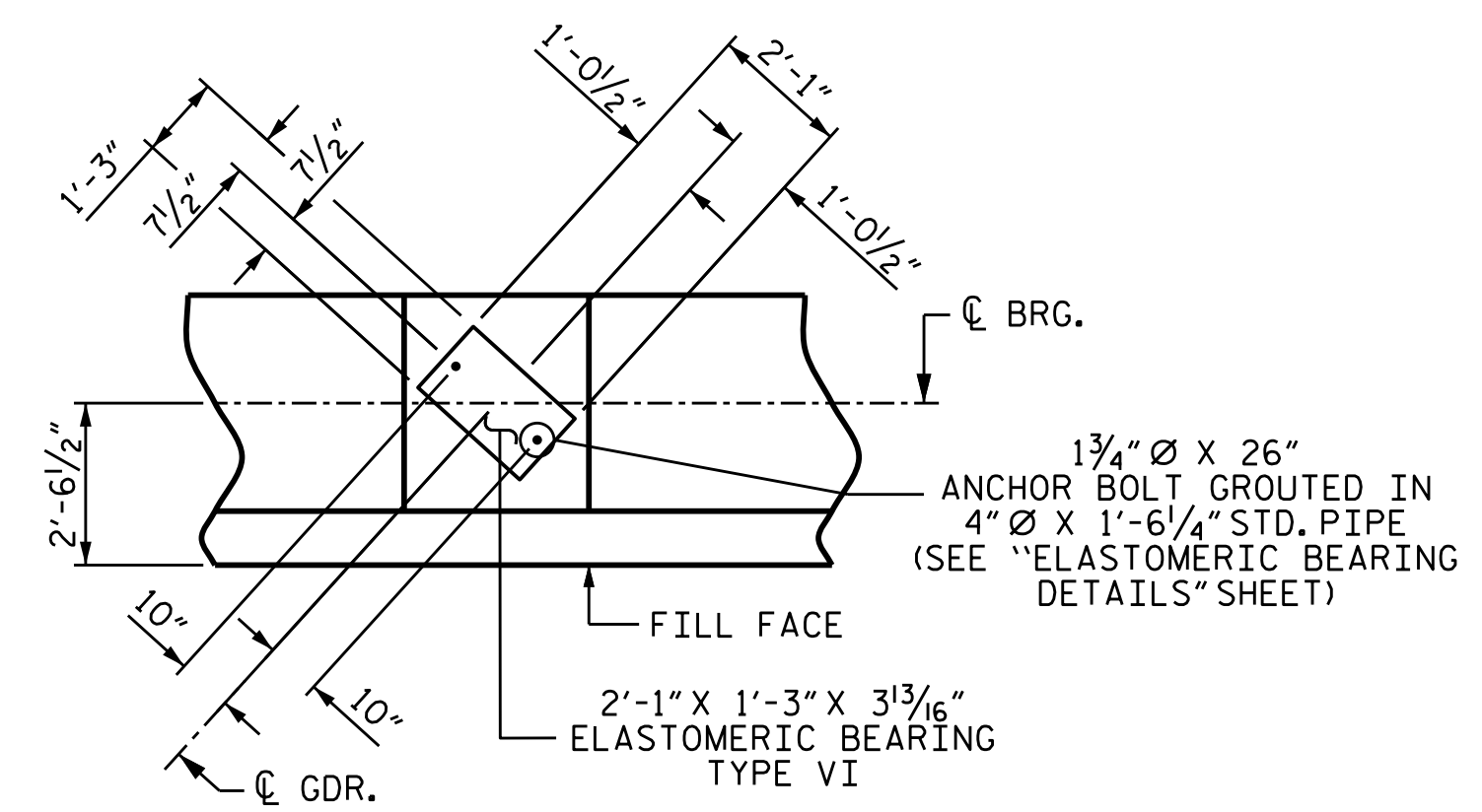


ELEVATION

FOR TOP OF PILE ELEVATIONS, SEE SHEET 2 OF 4
 * FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS, SEE SHEET 4 OF 4.

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- 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.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- 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%.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER PARAPET AND END POSTS ARE CAST IF SLIP FORMING IS USED.
- EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.
- THE #5 "V" BARS SHALL BE PLACED 2" CLEAR FROM THE TOP OF THE BACKWALL.
- FOR PIPE INSERT DETAILS, SEE BEARINGS SHEET.



DETAIL A
(TYP. EA. GIRDER)

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-

SHEET 1 OF 4



DocuSigned by:
 W. Alfano
 F24683939BFA0E
 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

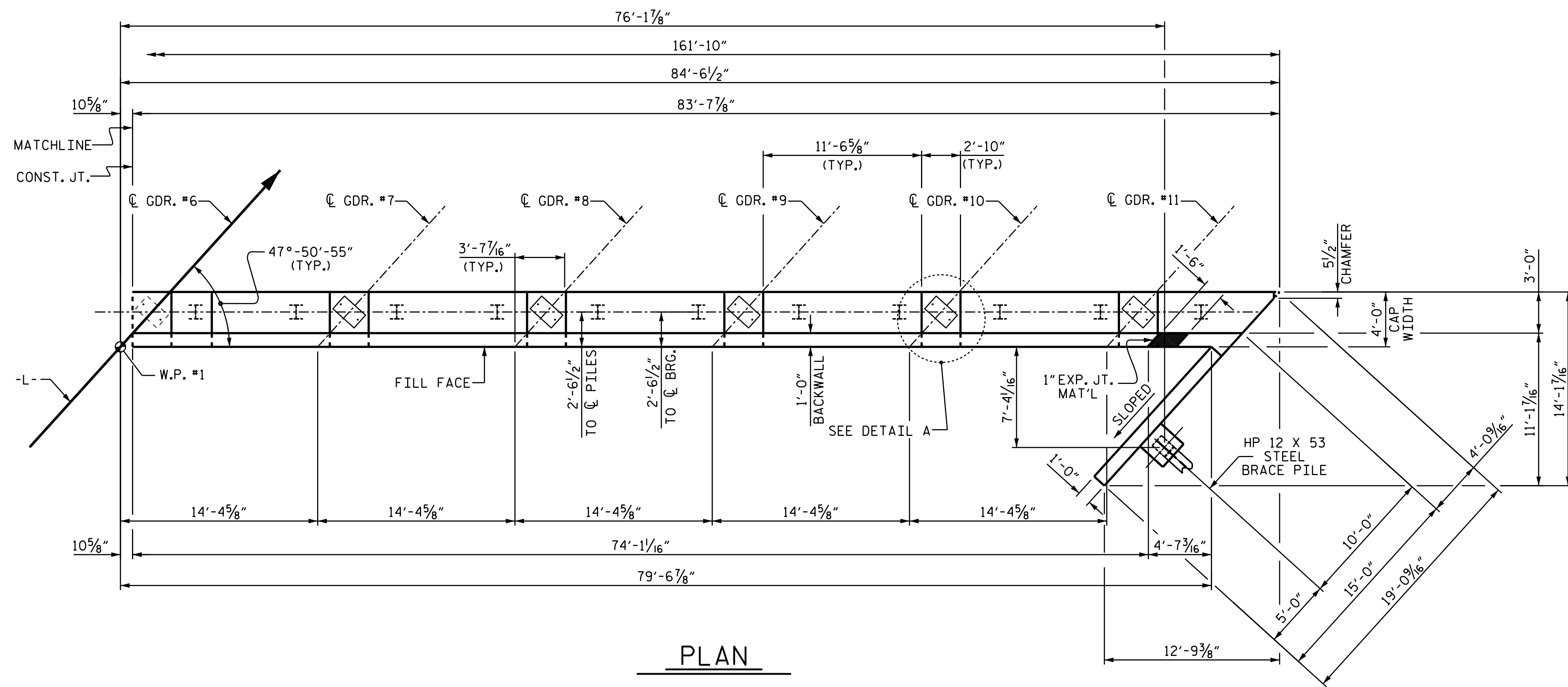
SUBSTRUCTURE
 END BENT 1

DRAWN BY : A. SORSENGINH DATE : 3/2015
 CHECKED BY : J.P. ADAMS DATE : 8/2015
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 9/2015

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

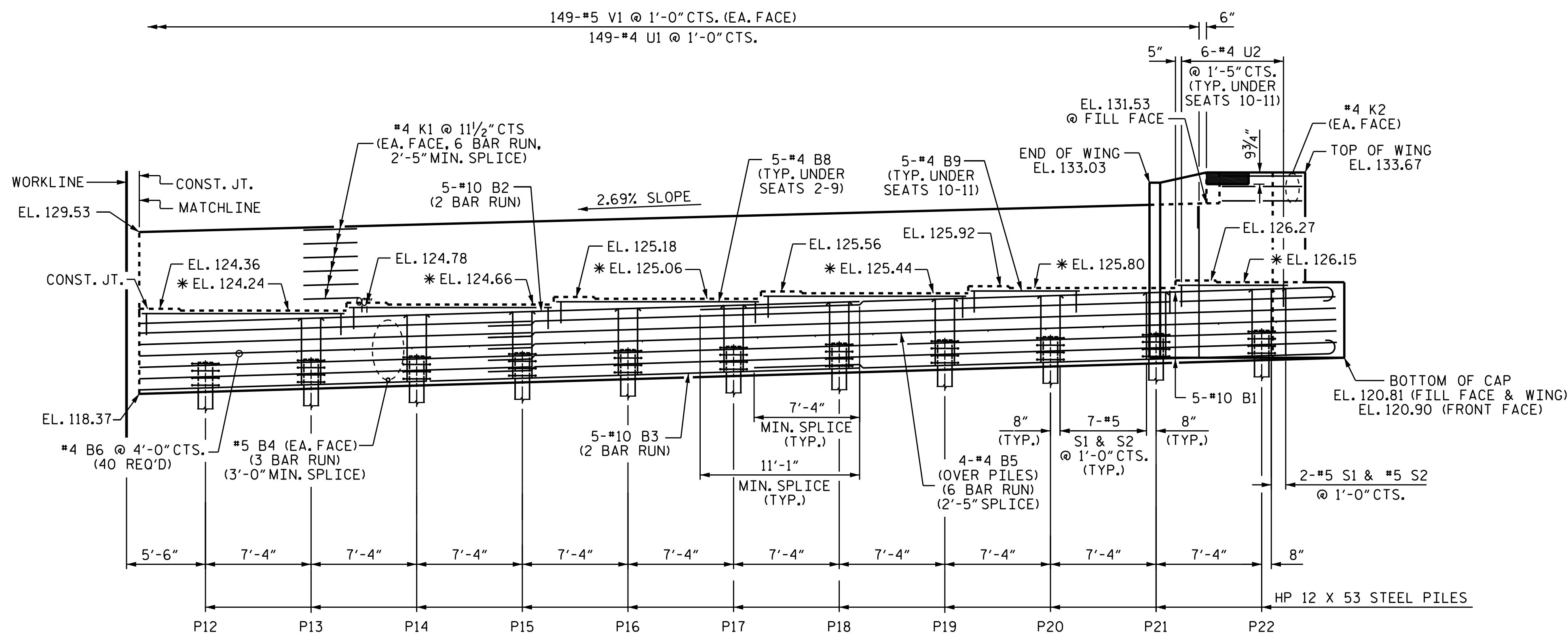
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			84

STR. #1



PLAN

TOP OF PILE ELEVATIONS	
P1	118.05
P2	118.28
P3	118.50
P4	118.72
P5	118.95
P6	119.17
P7	119.39
P8	119.62
P9	119.84
P10	120.06
P11	120.28
P12	120.51
P13	120.73
P14	120.95
P15	121.18
P16	121.40
P17	121.62
P18	121.85
P19	122.07
P20	122.29
P21	122.52
P22	122.74



ELEVATION

* FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS, SEE SHEET 4 OF 4.

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-

SHEET 2 OF 4



DocuSigned by:
 3/29/2016

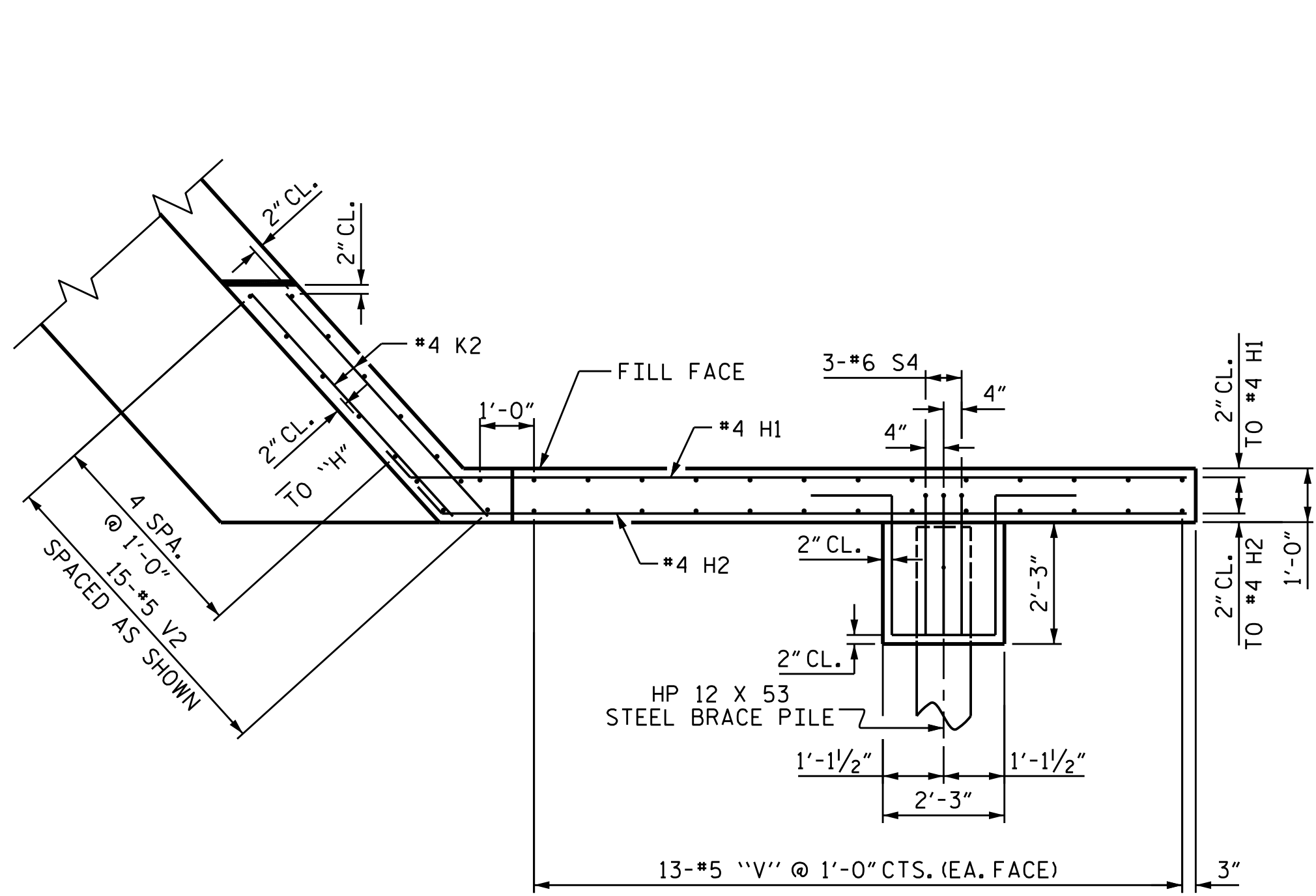
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

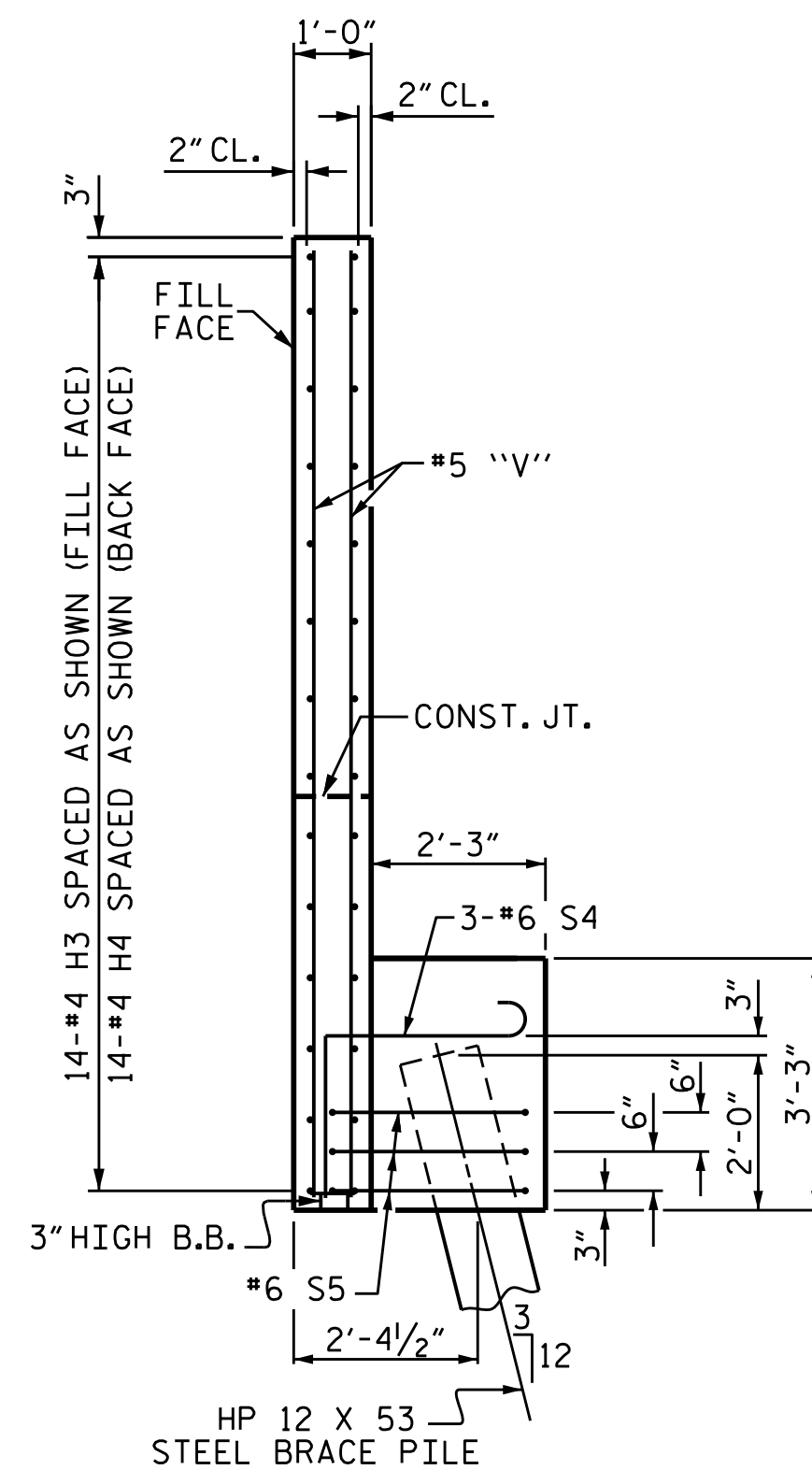
SUBSTRUCTURE
 END BENT 1

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33	
1			3			TOTAL SHEETS 84	
2			4				

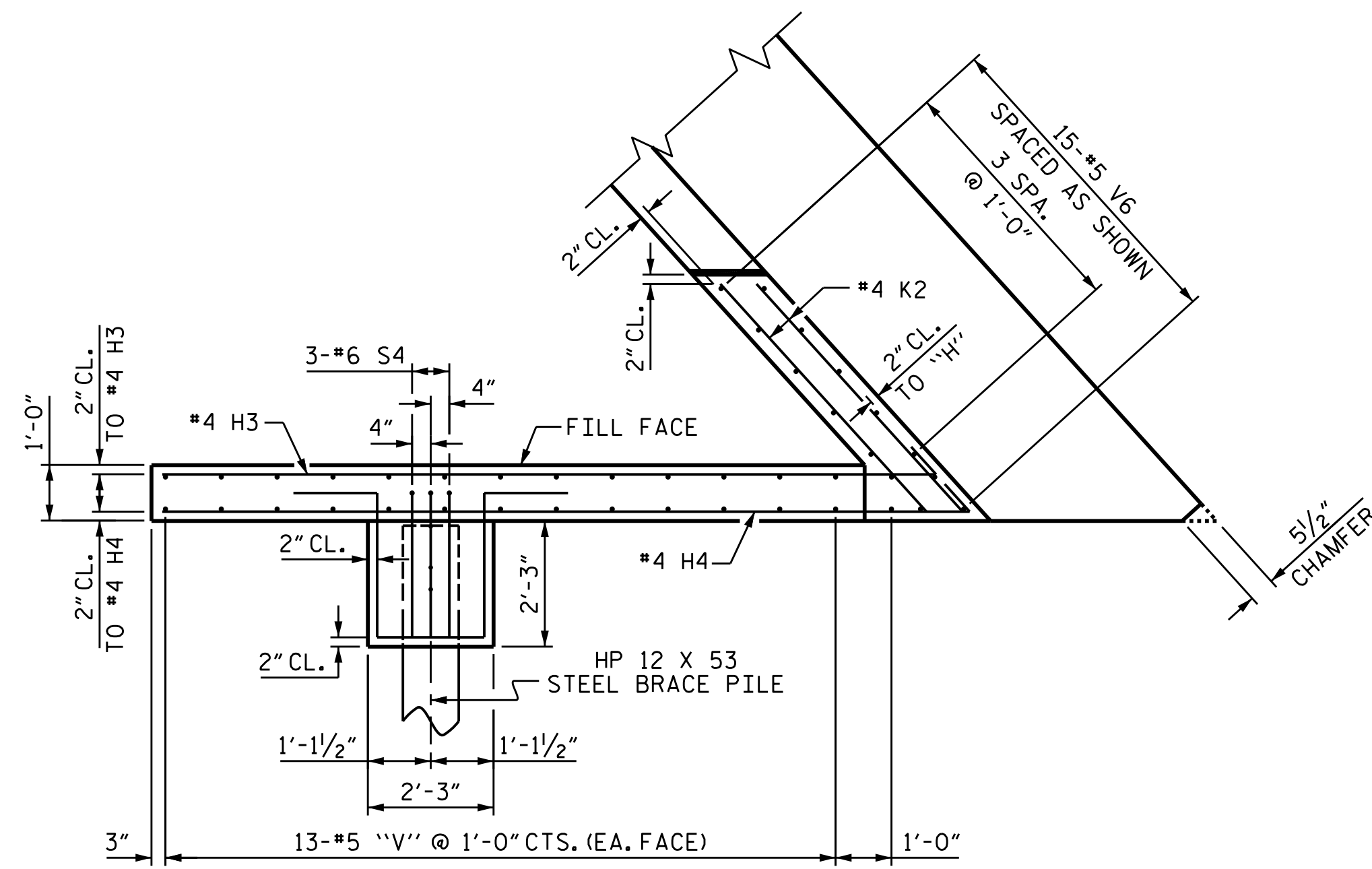
DRAWN BY : A. SORSENGINH DATE : 3/2015
 CHECKED BY : J.P. ADAMS DATE : 8/2015
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 9/2015



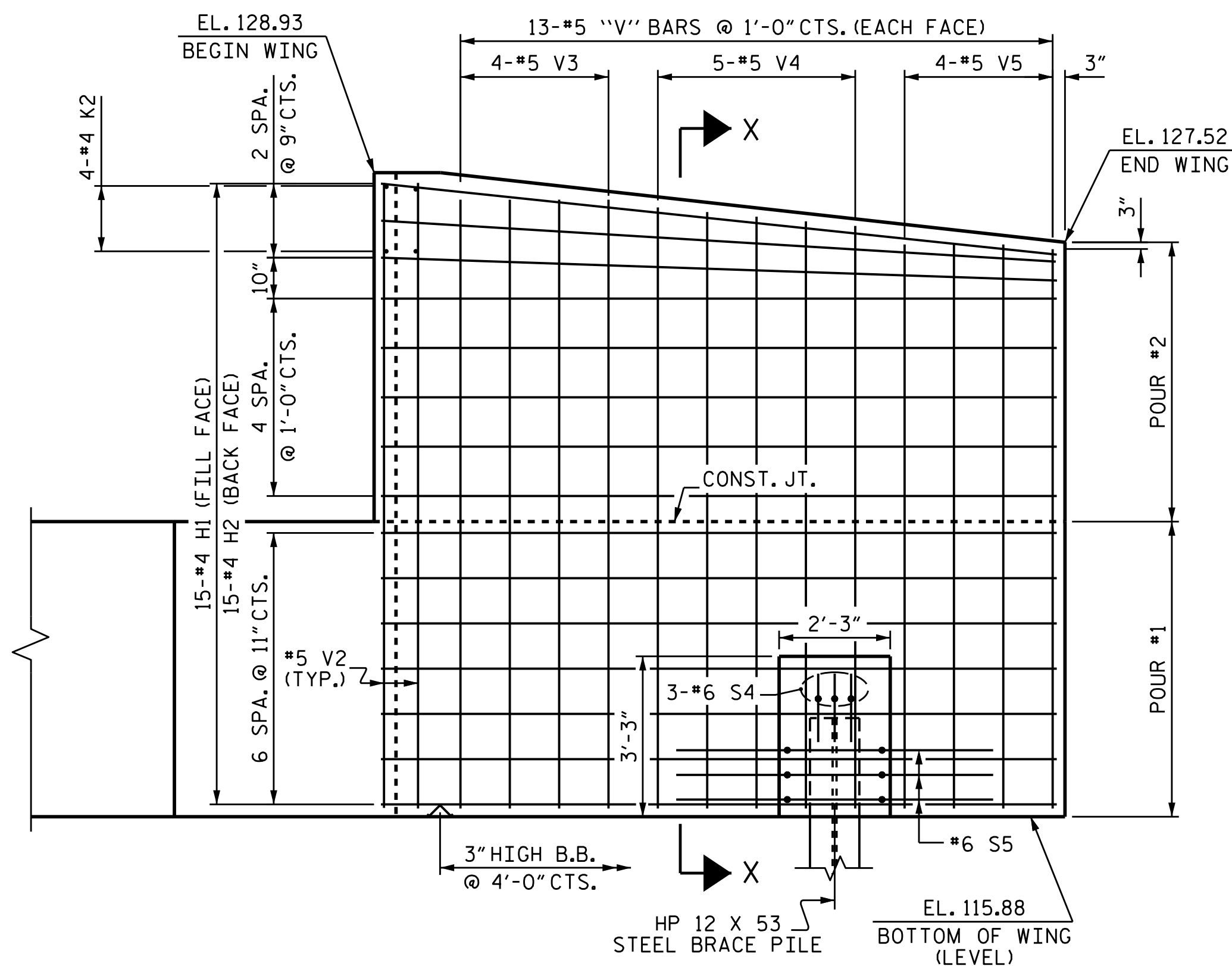
PLAN OF LEFT WING



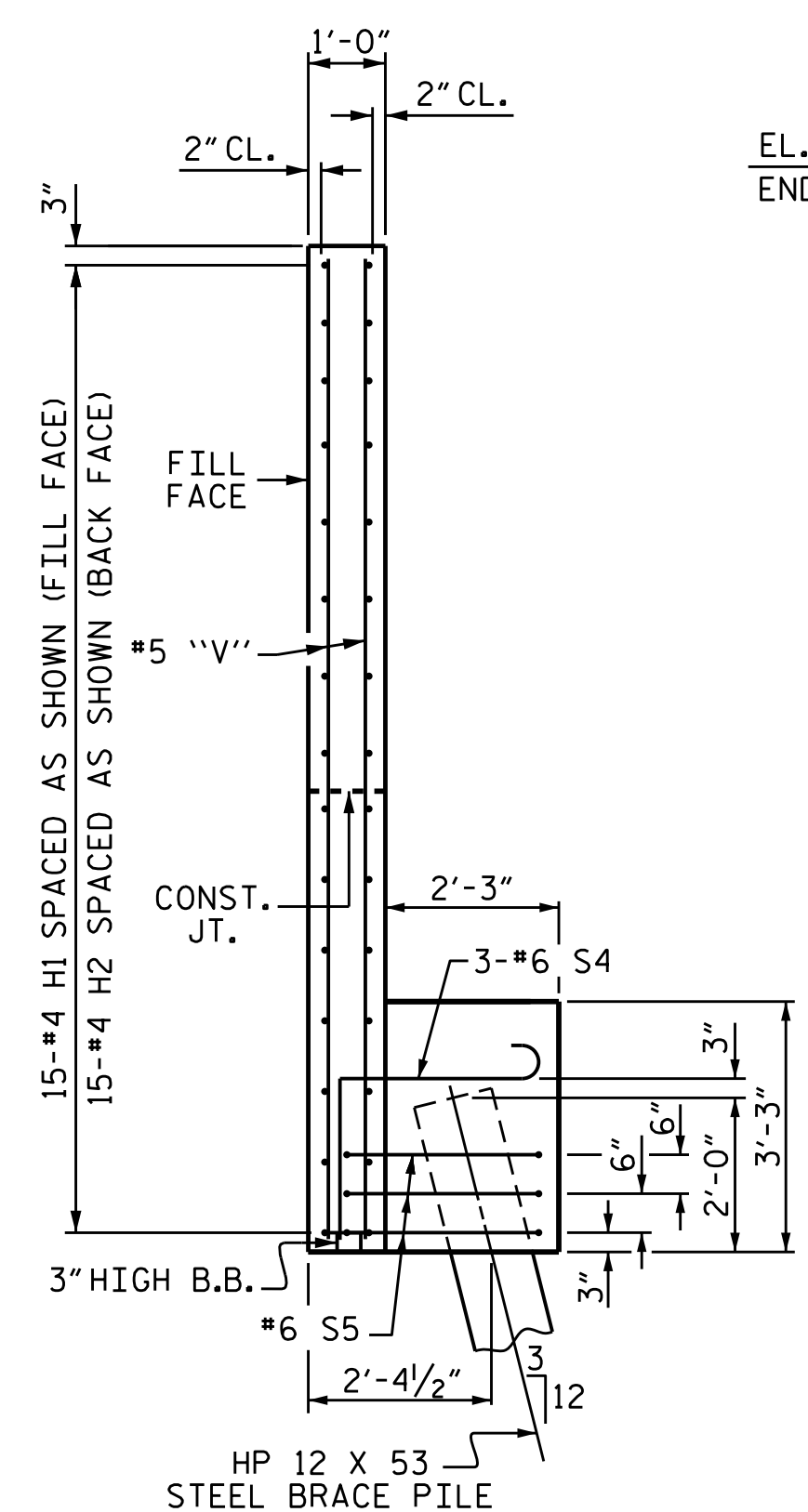
SECTION Y-Y



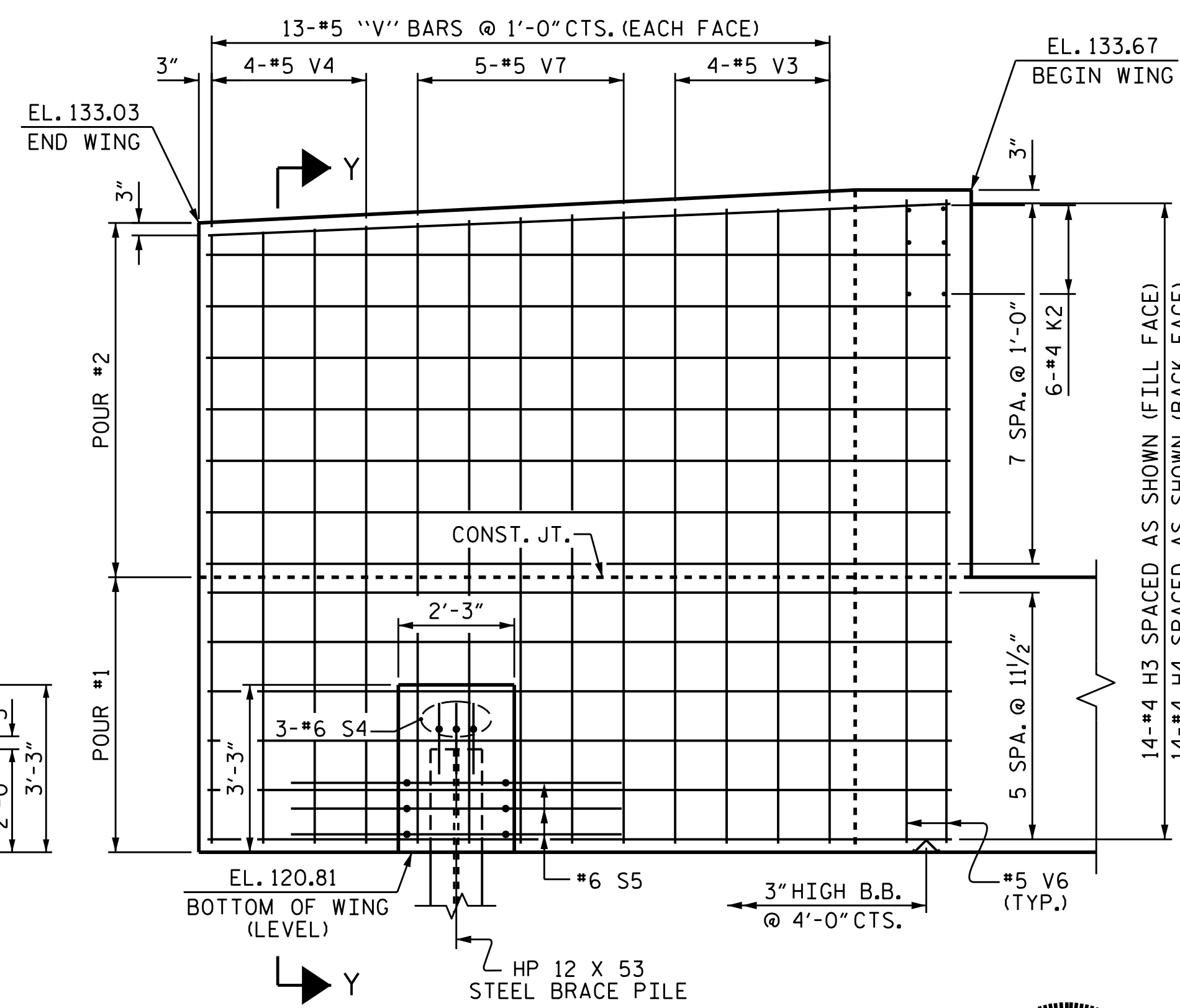
PLAN OF RIGHT WING



ELEVATION OF LEFT WING



SECTION X-X



ELEVATION OF RIGHT WING

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4490
 CUMBERLAND COUNTY
 STATION: 29+57.01 -L-

SHEET 3 OF 4

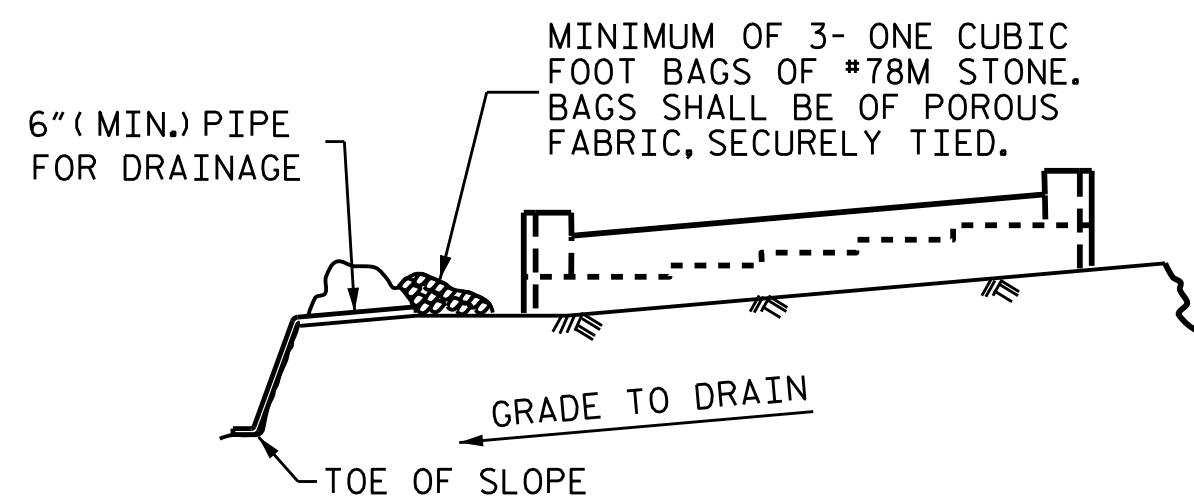
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 1



DRAWN BY: A. SORSENGINH DATE: 3/2015
 CHECKED BY: J.P. ADAMS DATE: 8/2015
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE: 9/2015

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34	
1			3			TOTAL SHEETS 84	
2			4				

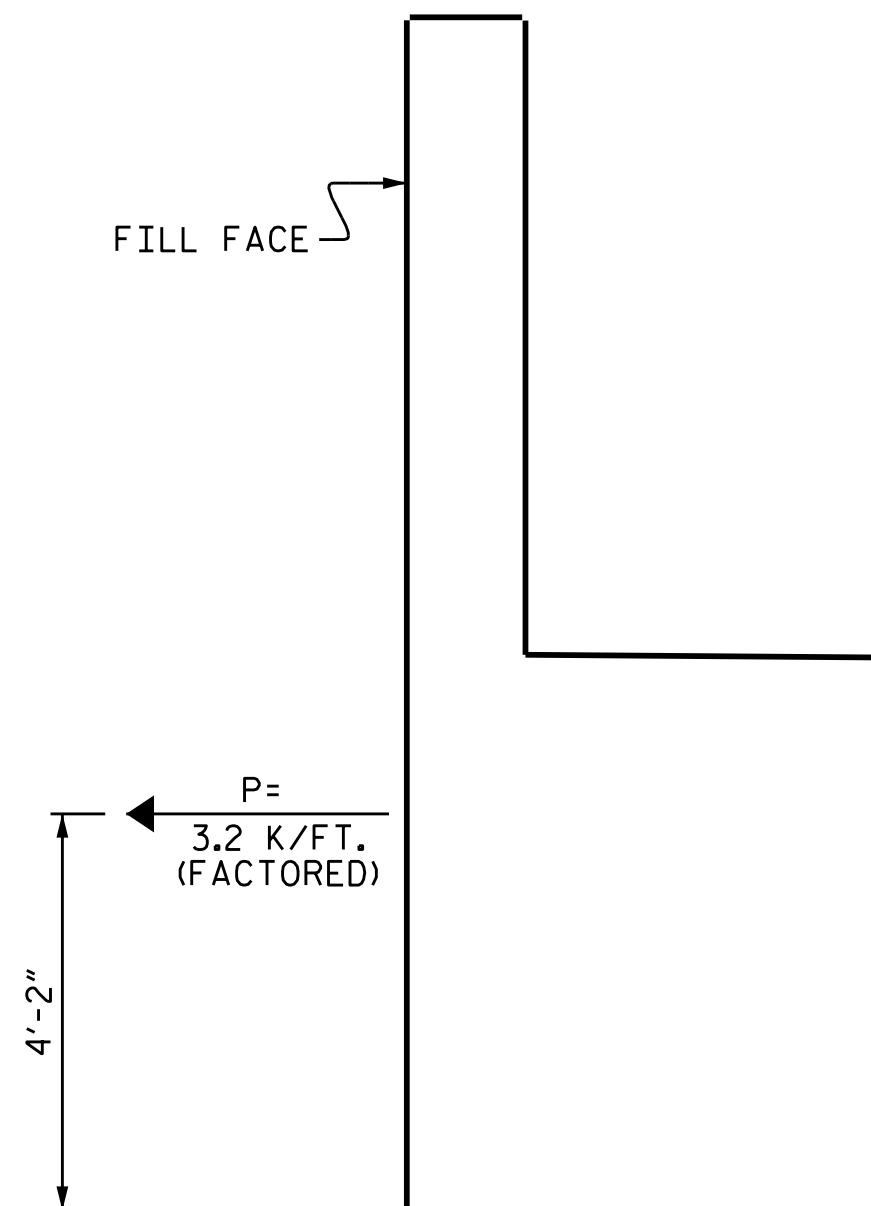


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

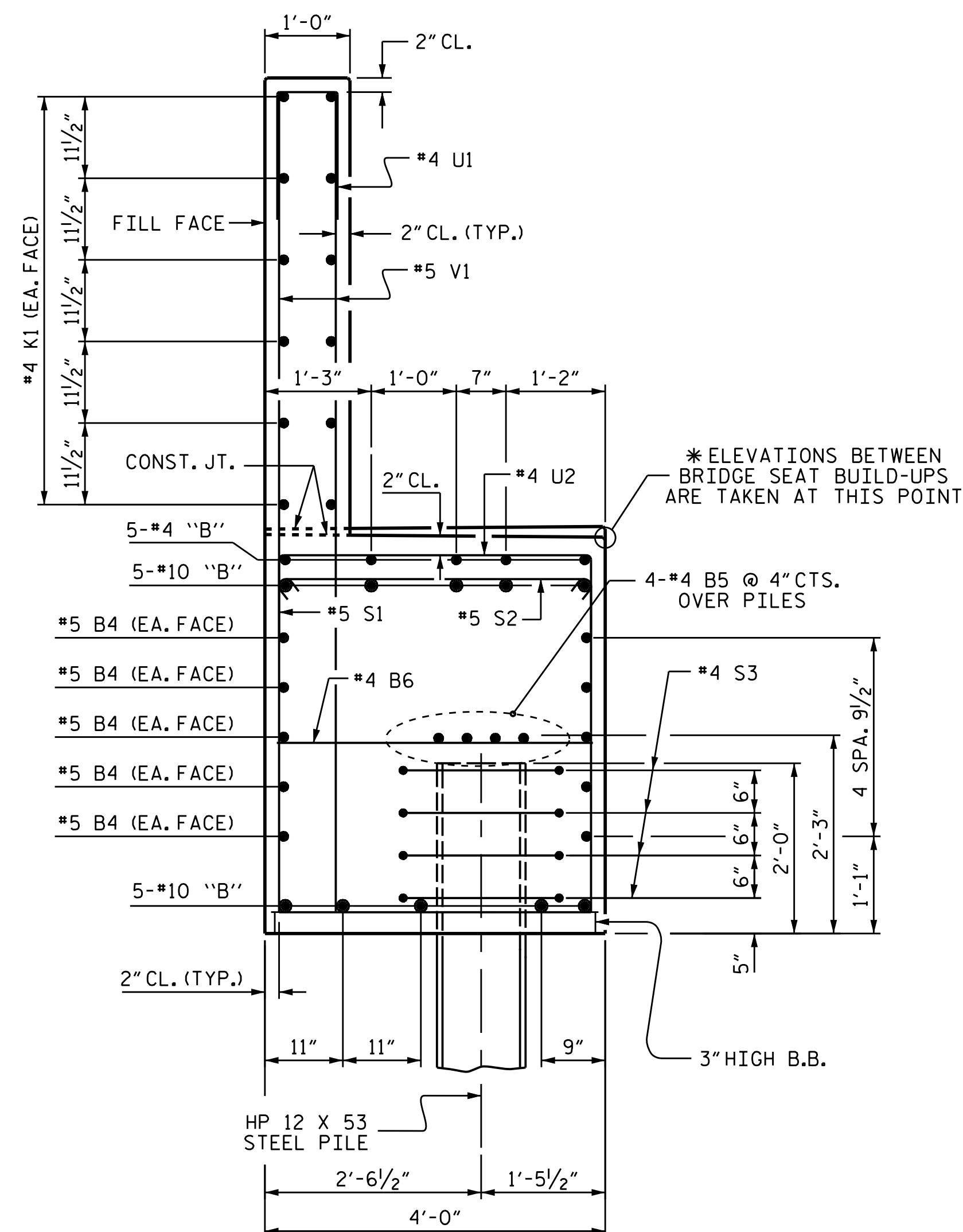
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

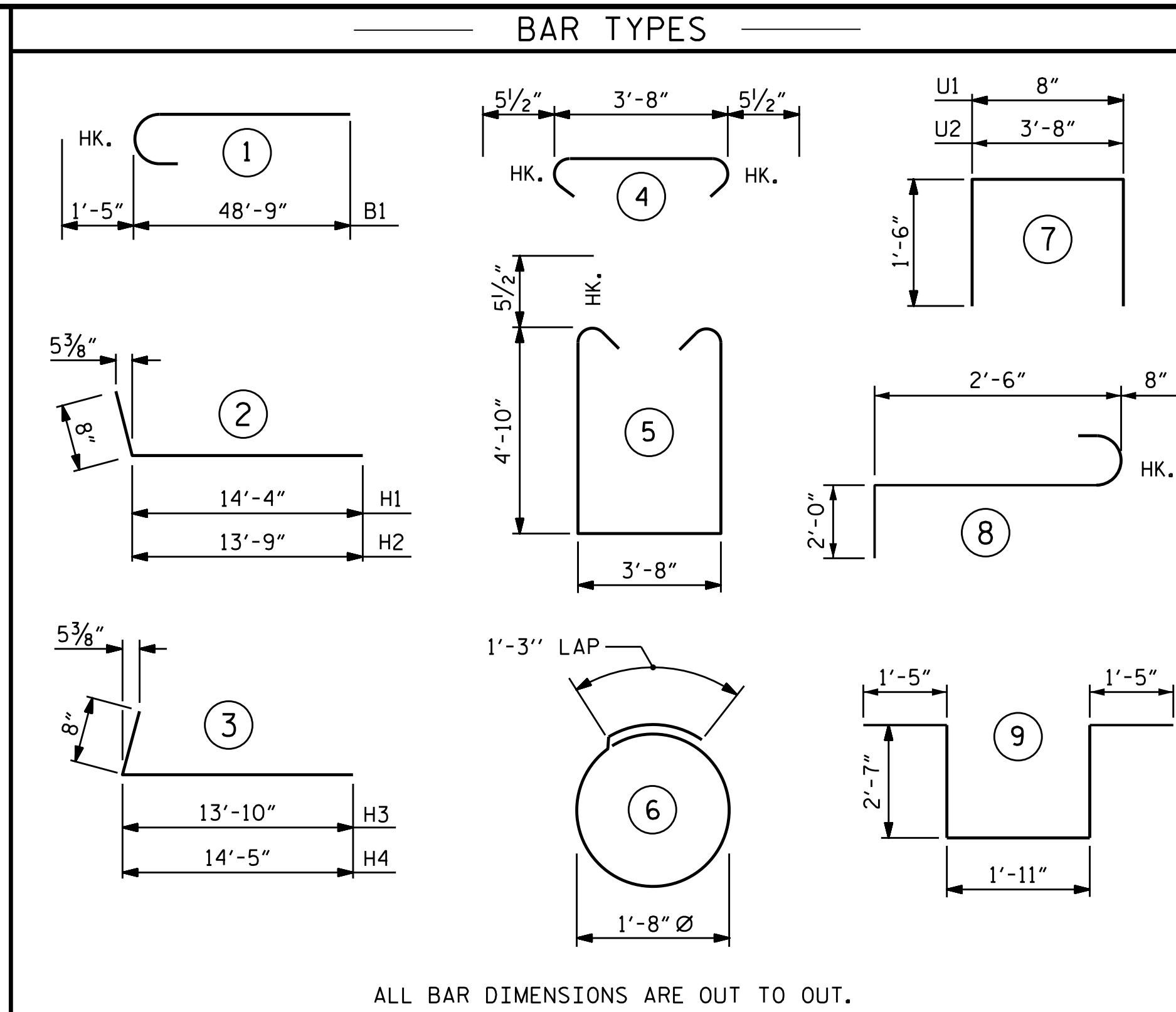


TIE BACK DETAILS

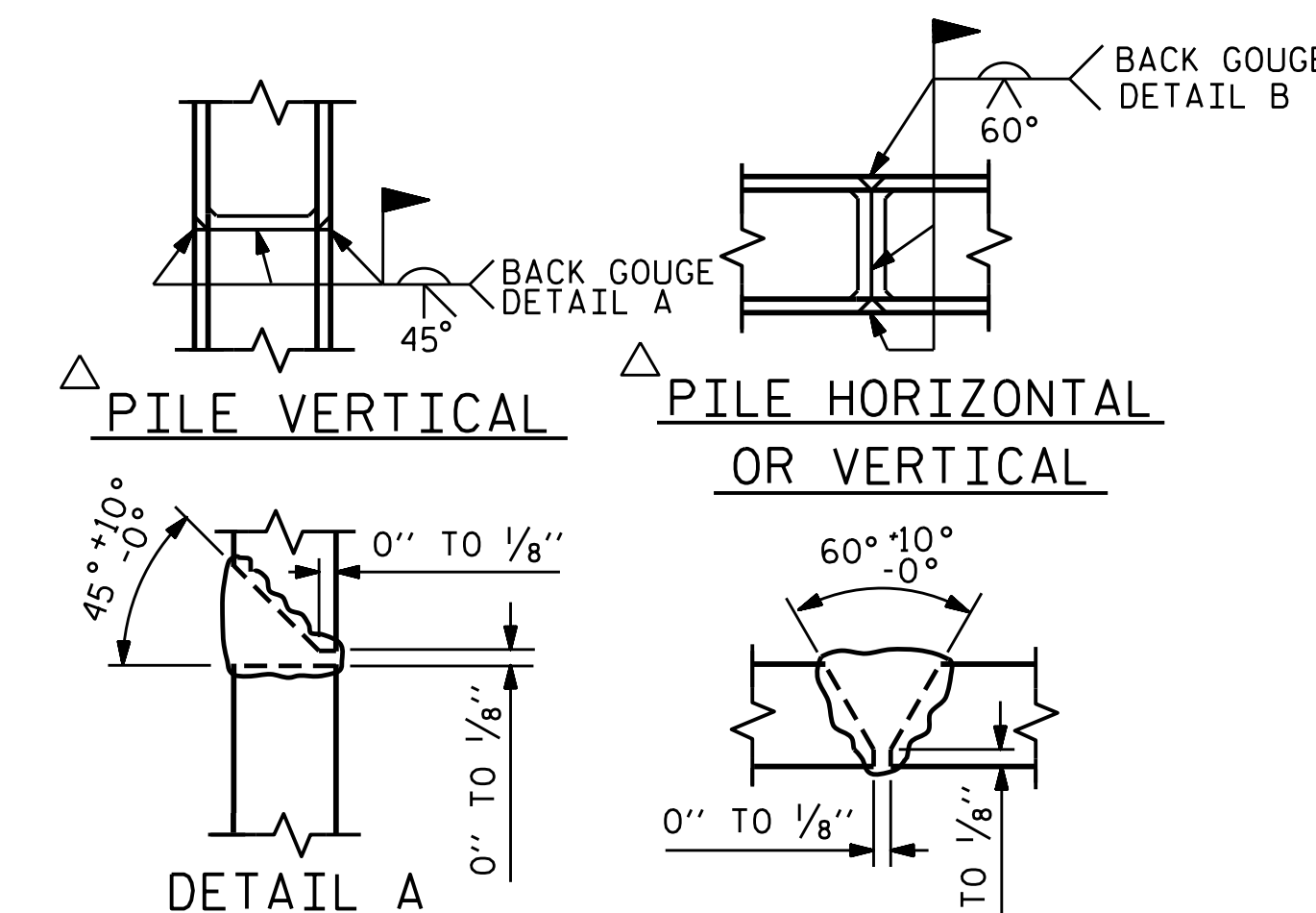
(DETAIL SHOWING TIE BACK RESTRAINT FOR END BENT)



SECTION A-A



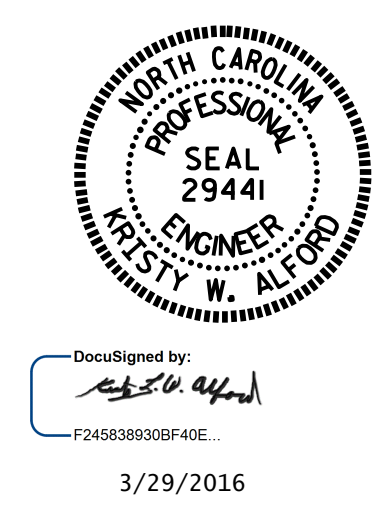
BILL OF MATERIAL					
END BENT 1					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	20	#10	1	50'-2"	4317
B2	10	#10	STR	48'-9"	2098
B3	10	#10	STR	43'-0"	1850
B4	30	#5	STR	55'-10"	1747
B5	24	#4	STR	29'-0"	465
B6	40	#4	STR	3'-8"	98
B7	5	#4	STR	21'-3"	71
B8	40	#4	STR	14'-1"	376
B9	10	#4	STR	7'-7"	51
H1	15	#5	2	15'-0"	235
H2	15	#5	2	14'-5"	226
H3	14	#5	3	14'-6"	212
H4	14	#5	3	15'-1"	220
K1	72	#4	STR	29'-0"	1395
K2	10	#4	STR	5'-5"	36
S1	151	#5	5	14'-3"	2244
S2	151	#5	4	4'-7"	722
S3	88	#4	6	6'-6"	382
S4	6	#6	8	5'-2"	47
S5	6	#6	9	9'-11"	89
U1	149	#4	7	3'-8"	365
U2	104	#4	7	6'-8"	463
V1	298	#5	STR	10'-6"	3264
V2	15	#5	STR	12'-8"	198
V3	16	#5	STR	12'-4"	206
V4	18	#5	STR	11'-9"	141
V5	8	#5	STR	11'-4"	95
V6	15	#5	STR	12'-6"	196
V7	10	#5	STR	12'-0"	125
TOTAL REINFORCING STEEL					LBS. 21,934



PILE SPLICE DETAILS

CLASS A CONCRETE BREAKDOWN			
LEFT SIDE			
POUR #1 (CAP & LOWER PART OF WING)	C.Y.	70.7	
POUR #2 (BACKWALL & UPPER PART OF WING)	C.Y.	20.0	
RIGHT SIDE			
POUR #1 (CAP & LOWER PART OF WING)	C.Y.	71.0	
POUR #2 (BACKWALL & UPPER PART OF WING)	C.Y.	20.1	
CLASS A CONCRETE TOTAL	C.Y.	181.8	
HP 12 X 53 STEEL PILES NO. 24	LIN. FT.	1320	
PILE REDRIVES	EA.	11	

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-
 SHEET 4 OF 4

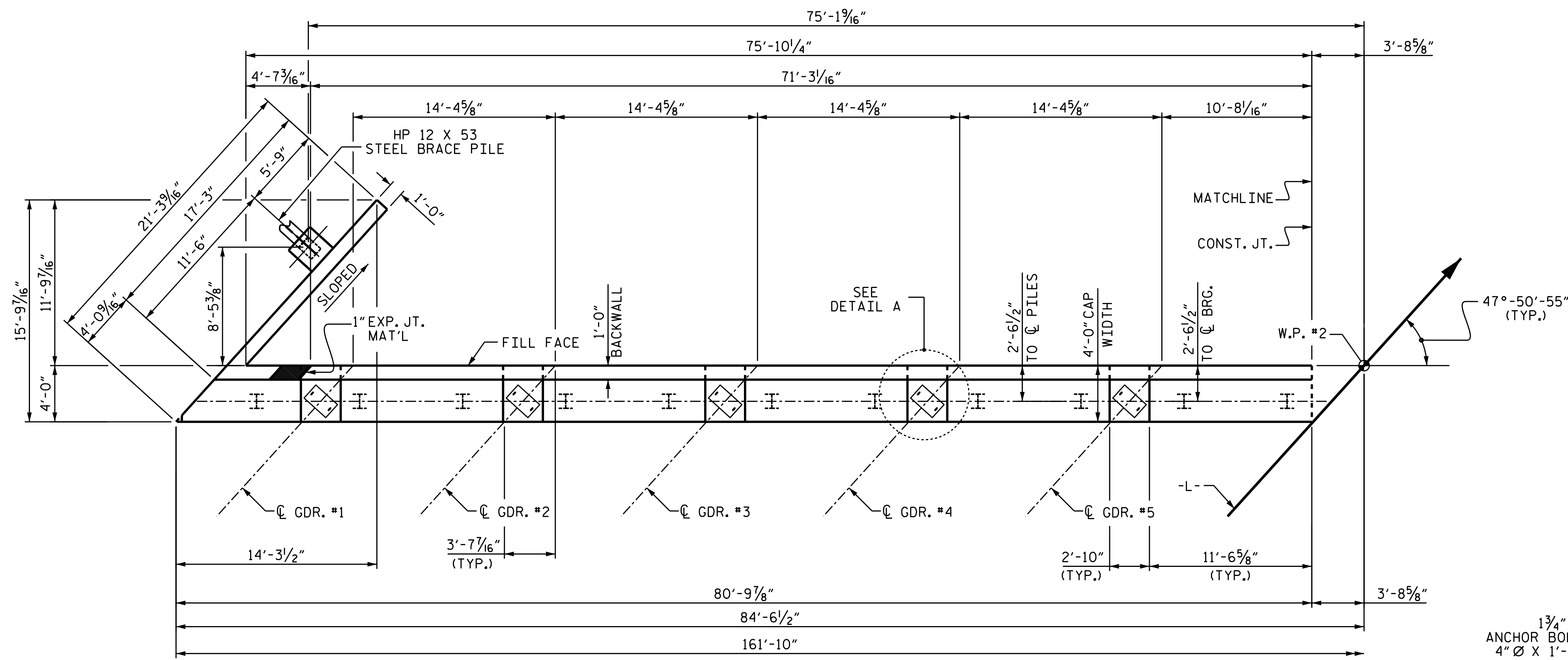


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1

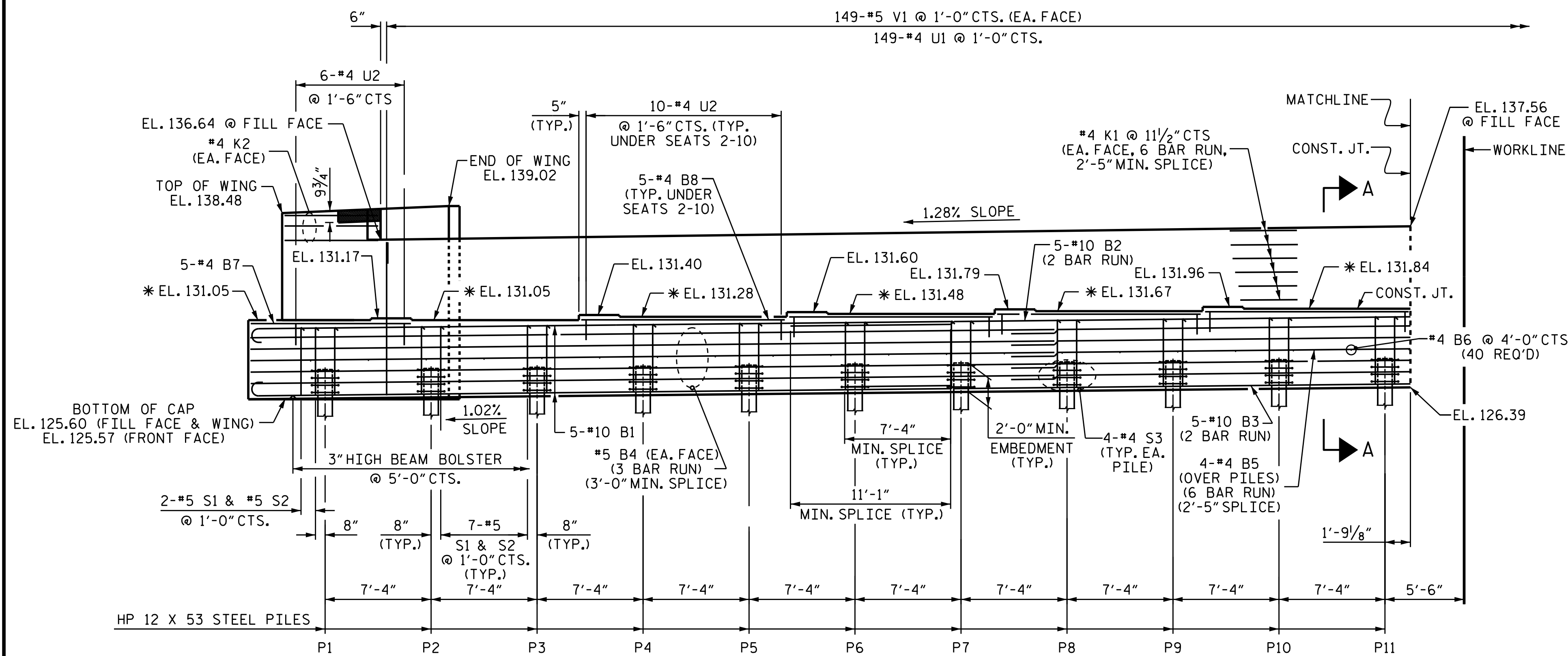
DRAWN BY: A. SORSENGINH DATE: 3/2015
 CHECKED BY: J.P. ADAMS DATE: 8/2015
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE: 9/2015

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35	
1			3			TOTAL SHEETS 84	
2			4				

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PLAN



ELEVATION

FOR TOP OF PILE ELEVATIONS, SEE SHEET 2 OF 4

* FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS, SEE SHEET 4 OF 4.

DRAWN BY : A. SORSENGINH DATE : 3/2015
CHECKED BY : J.P. ADAMS DATE : 8/2015
DESIGN ENGINEER OF RECORD : A. SORSENGINH DATE : 9/2015

29-MAR-2016 09:19
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jpadams

NOTES

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

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.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

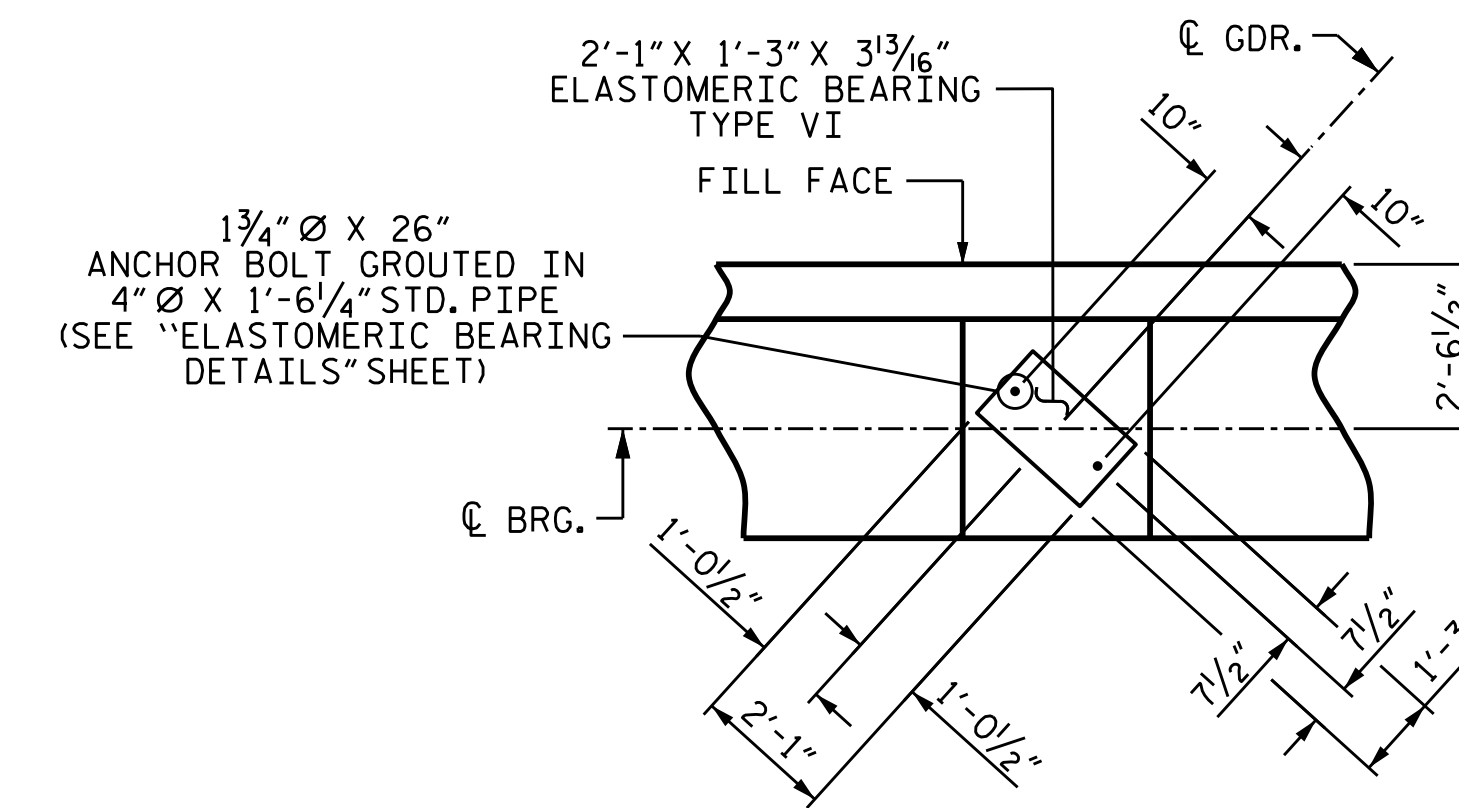
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER PARAPET AND END POSTS ARE CAST IF SLIP FORMING IS USED.

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

THE #5 "V" BARS SHALL BE PLACED 2" CLEAR FROM THE TOP OF THE BACKWALL.

FOR PIPE INSERT DETAILS, SEE BEARINGS SHEET.



DETAIL A
(TYP. EA. GIRDER)

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 29+57.01 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2



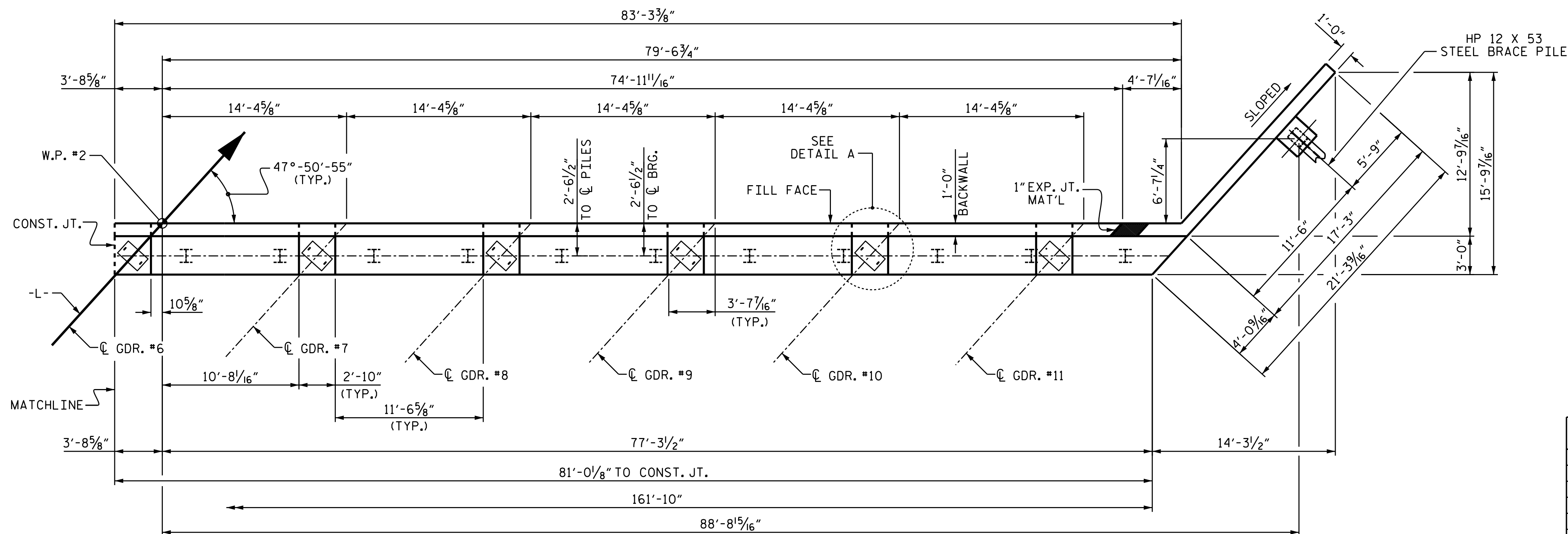
DocuSigned by:
Jeffrey W. Alford

3/29/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

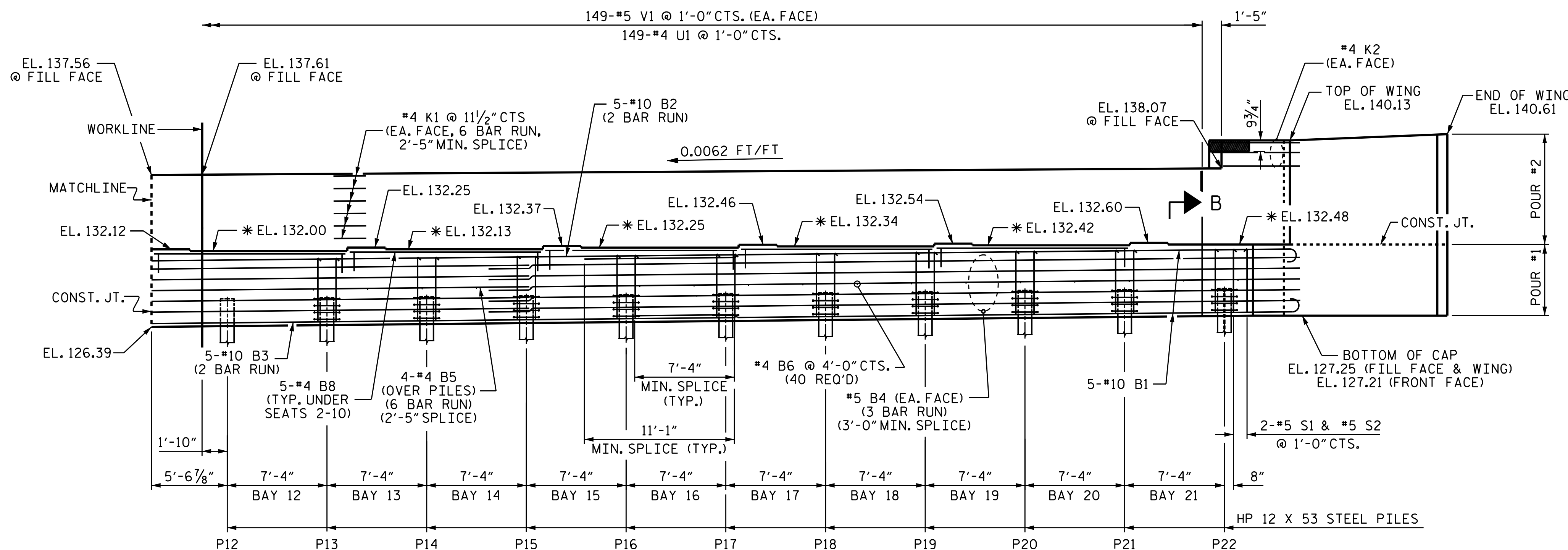
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36	
1			3			TOTAL SHEETS 84	
2			4				

STR. #1



PLAN

TOP OF PILE ELEVATIONS	
P1	127.62
P2	127.70
P3	127.77
P4	127.85
P5	127.92
P6	128.00
P7	128.07
P8	128.15
P9	128.22
P10	128.29
P11	128.37
P12	128.44
P13	128.52
P14	128.59
P15	128.67
P16	128.74
P17	128.82
P18	128.89
P19	128.97
P20	129.04
P21	129.12
P22	129.19



ELEVATION

* FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS, SEE SHEET 4 OF 4.

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-

SHEET 2 OF 4



DocuSigned by:
 W. Alfano
 F245838300F40E

3/29/2016

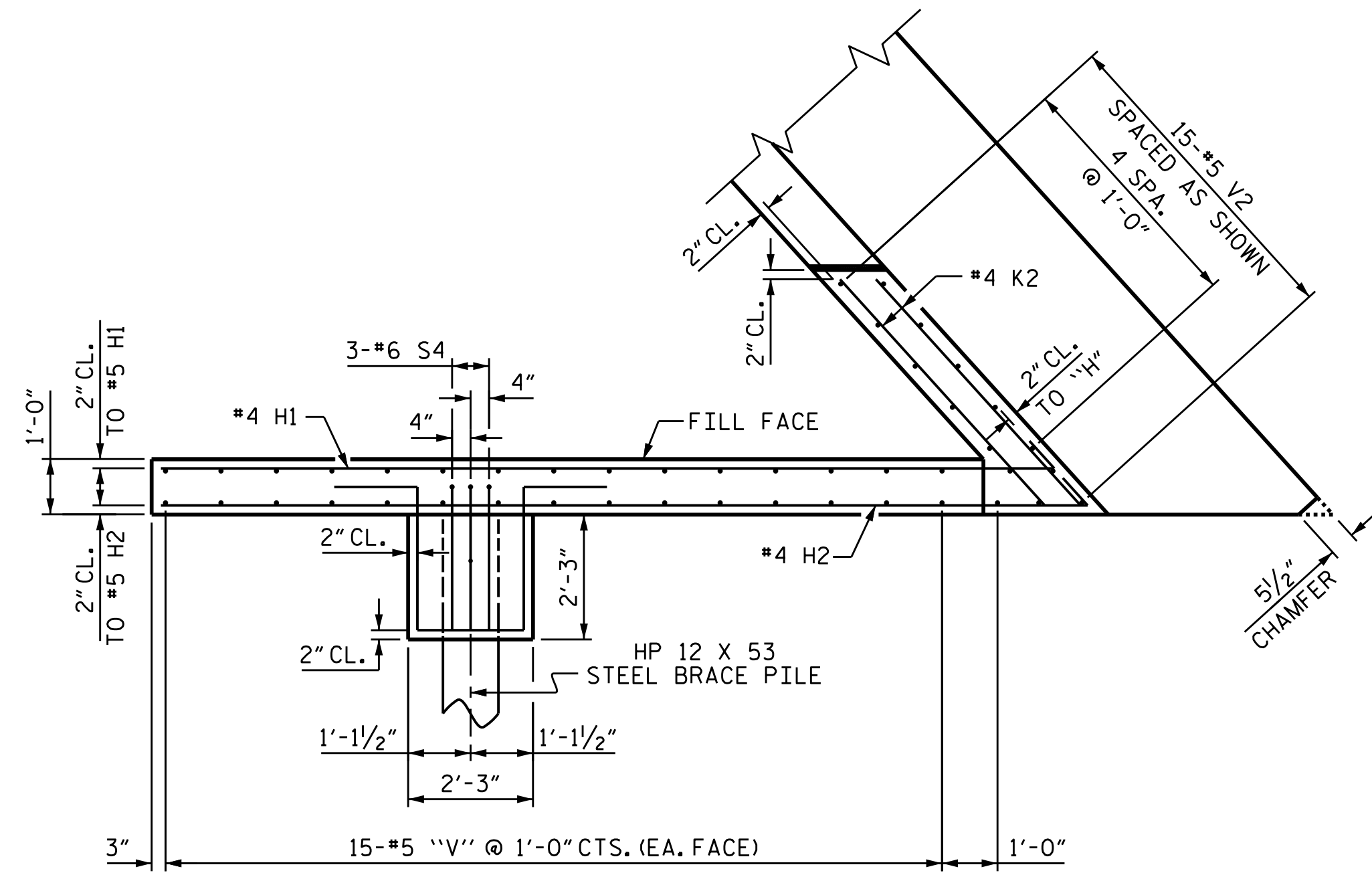
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

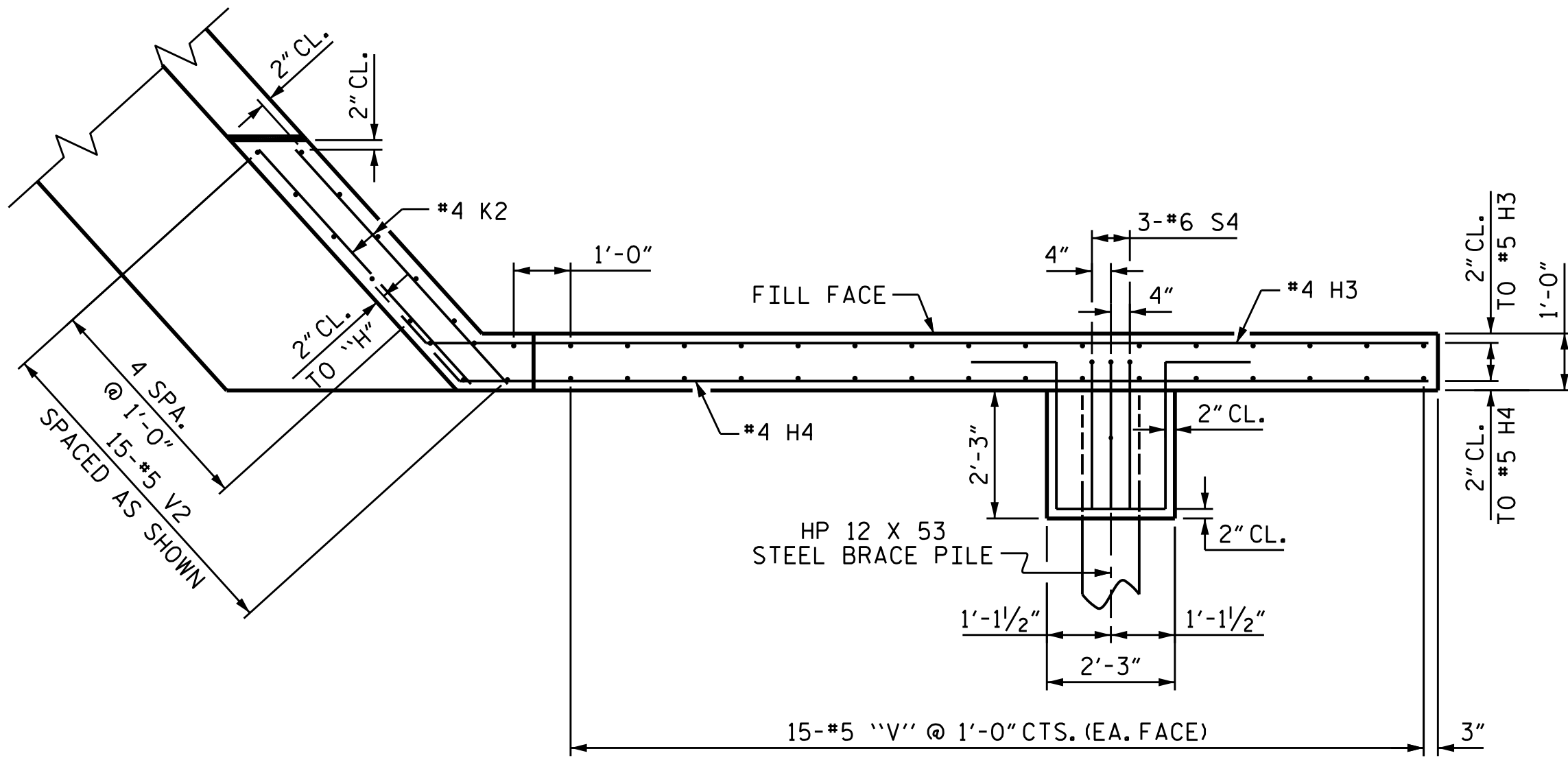
SUBSTRUCTURE
 END BENT 2

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37	
1			3			TOTAL SHEETS 84	
2			4				

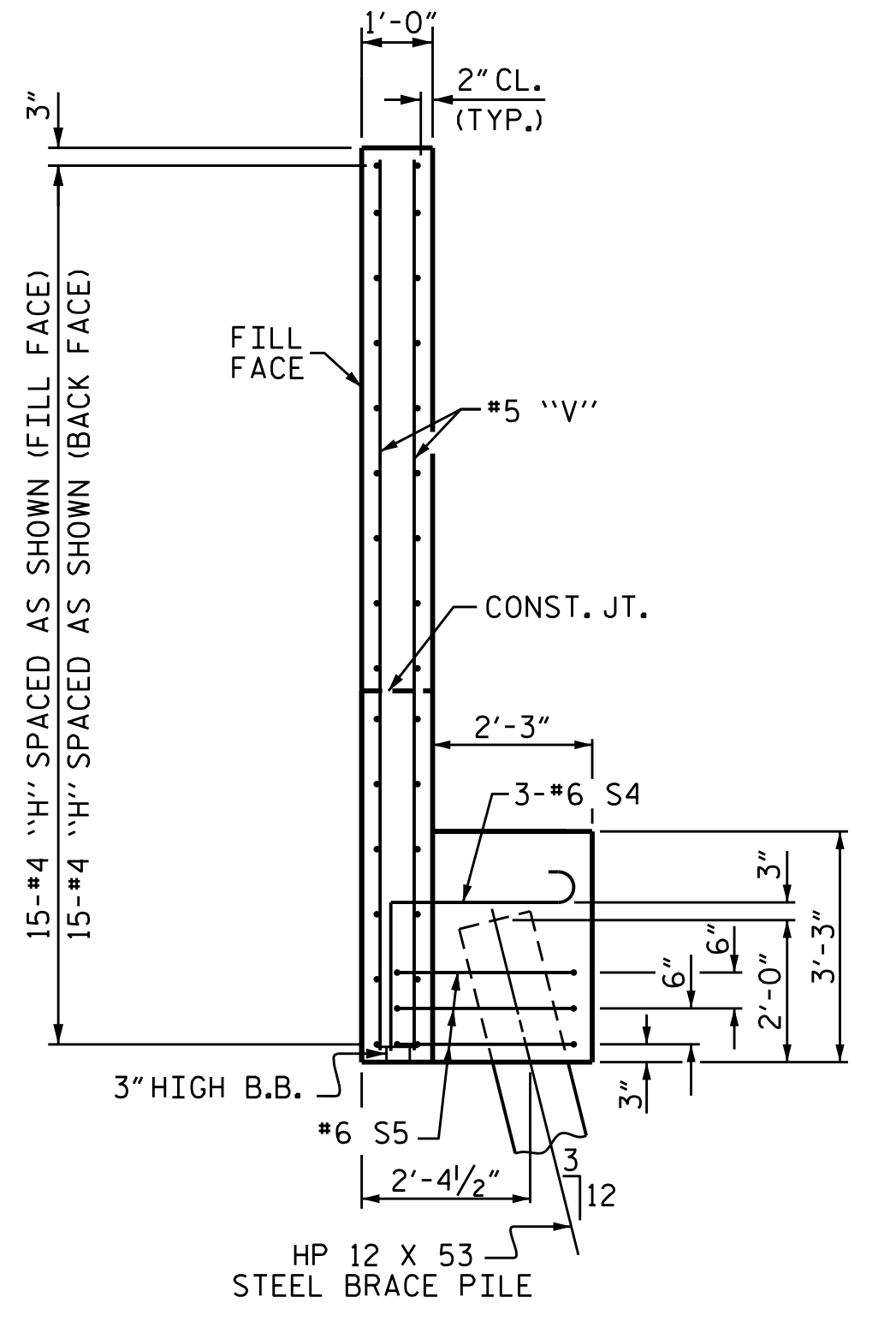
DRAWN BY : A. SORSENGINH DATE : 3/2015
 CHECKED BY : J.P. ADAMS DATE : 8/2015
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 9/2015



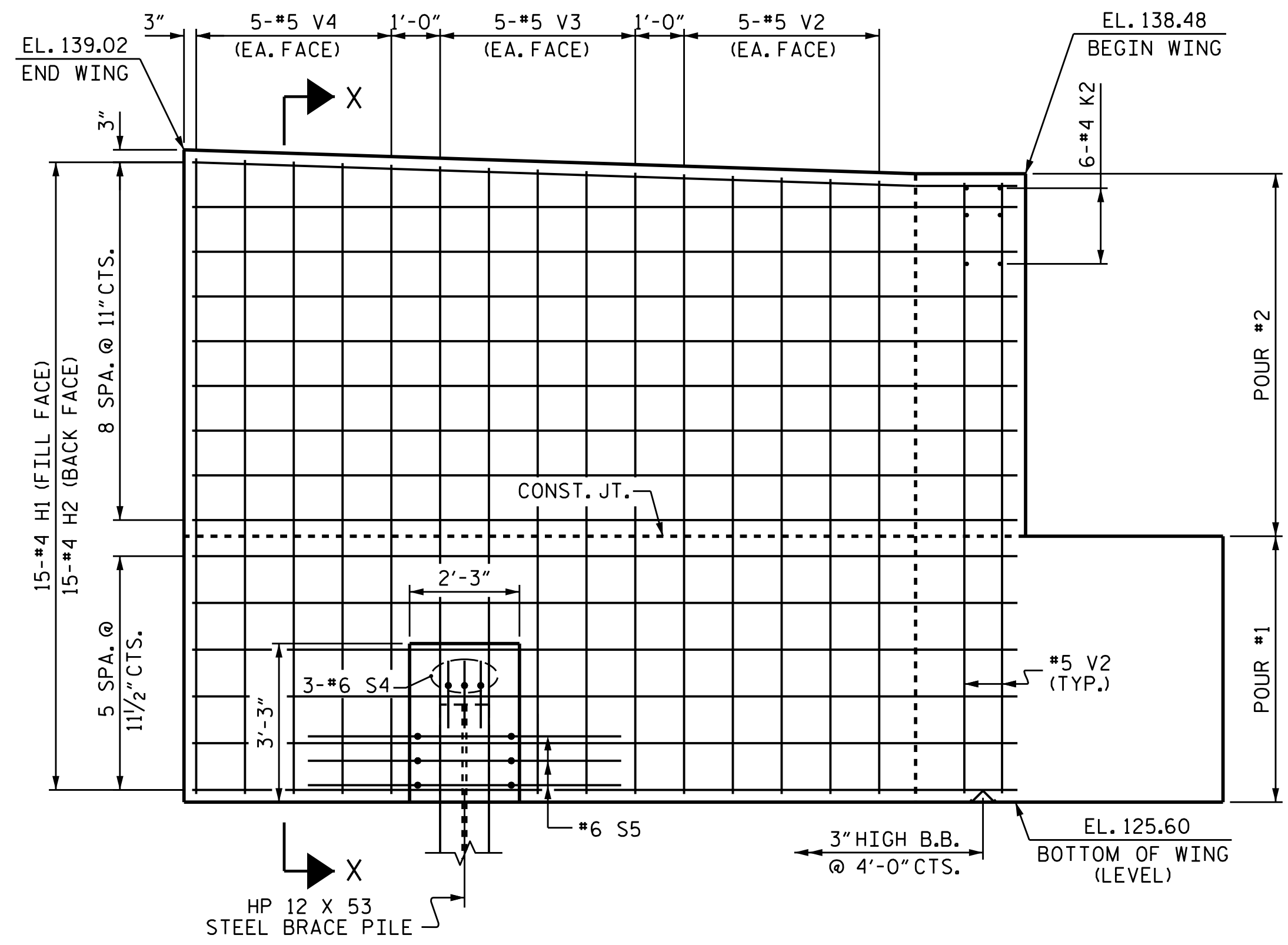
PLAN OF LEFT WING



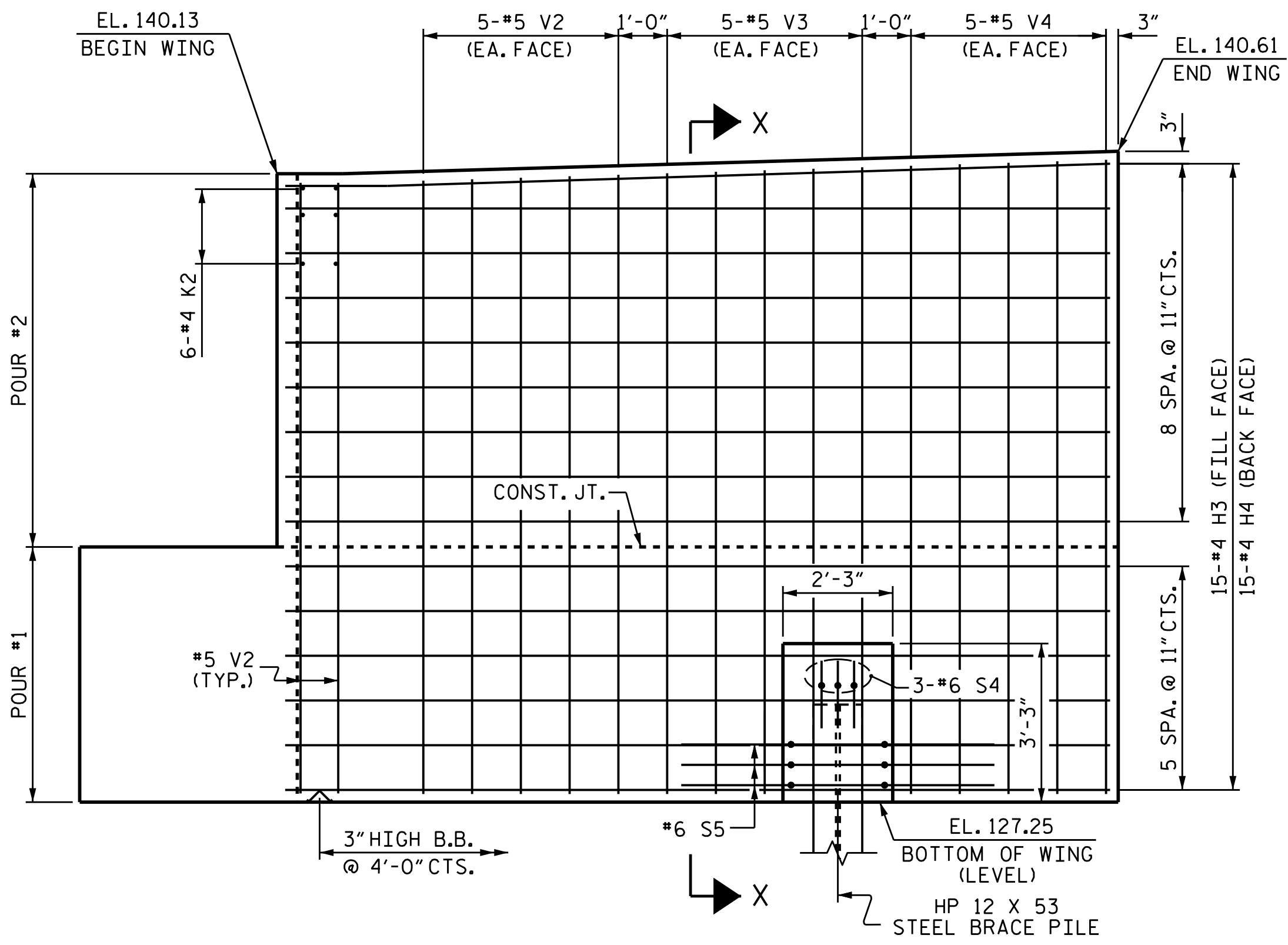
PLAN OF RIGHT WING



SECTION X-X



ELEVATION OF LEFT WING



ELEVATION OF RIGHT WING

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4490
 CUMBERLAND COUNTY
 STATION: 29+57.01 -L-

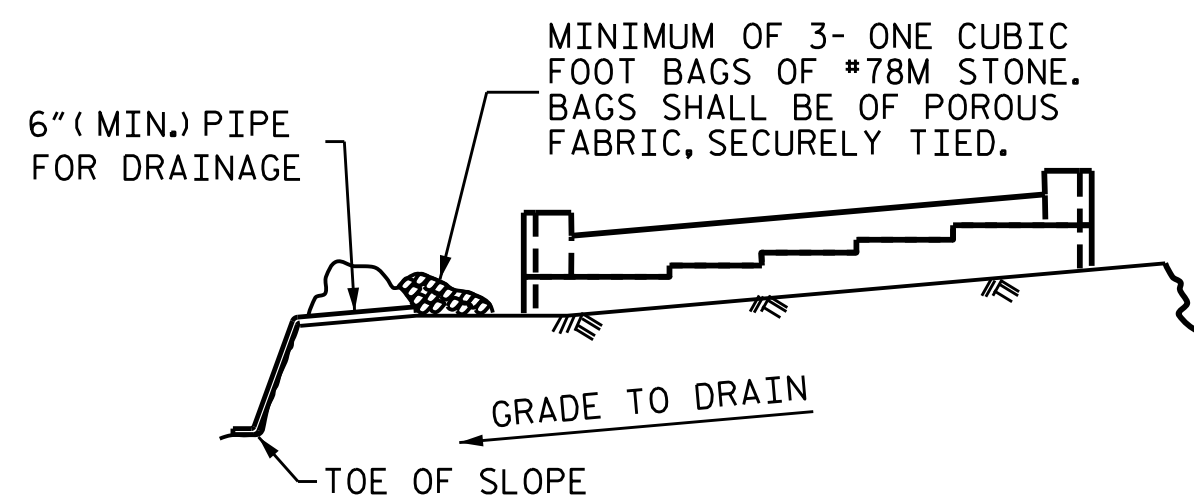
SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 2



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38	
1			3			TOTAL SHEETS 84	
2			4				

DRAWN BY : A. SORSENGINH DATE : 3/2015
 CHECKED BY : J.P. ADAMS DATE : 8/2015
 DESIGN ENGINEER OF RECORD : A. SORSENGINH DATE : 9/2015

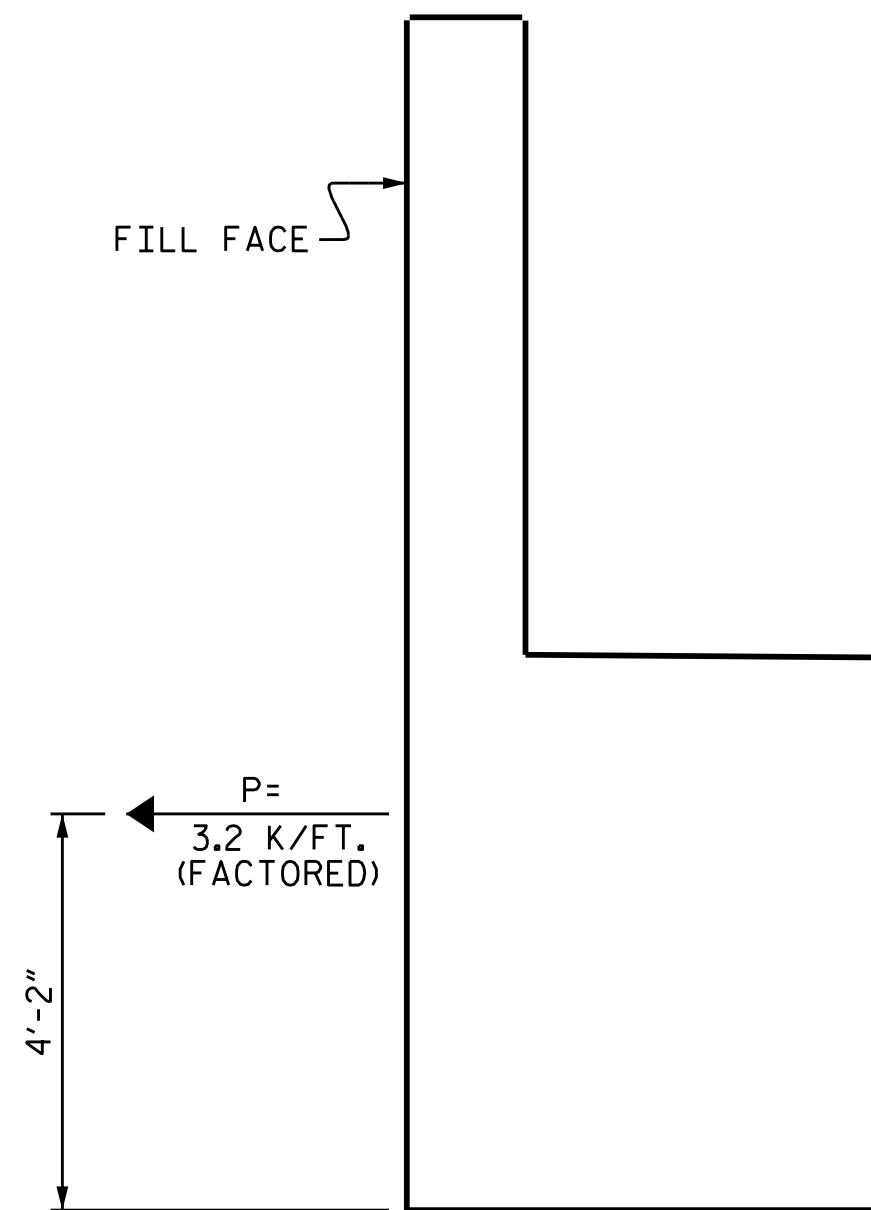


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

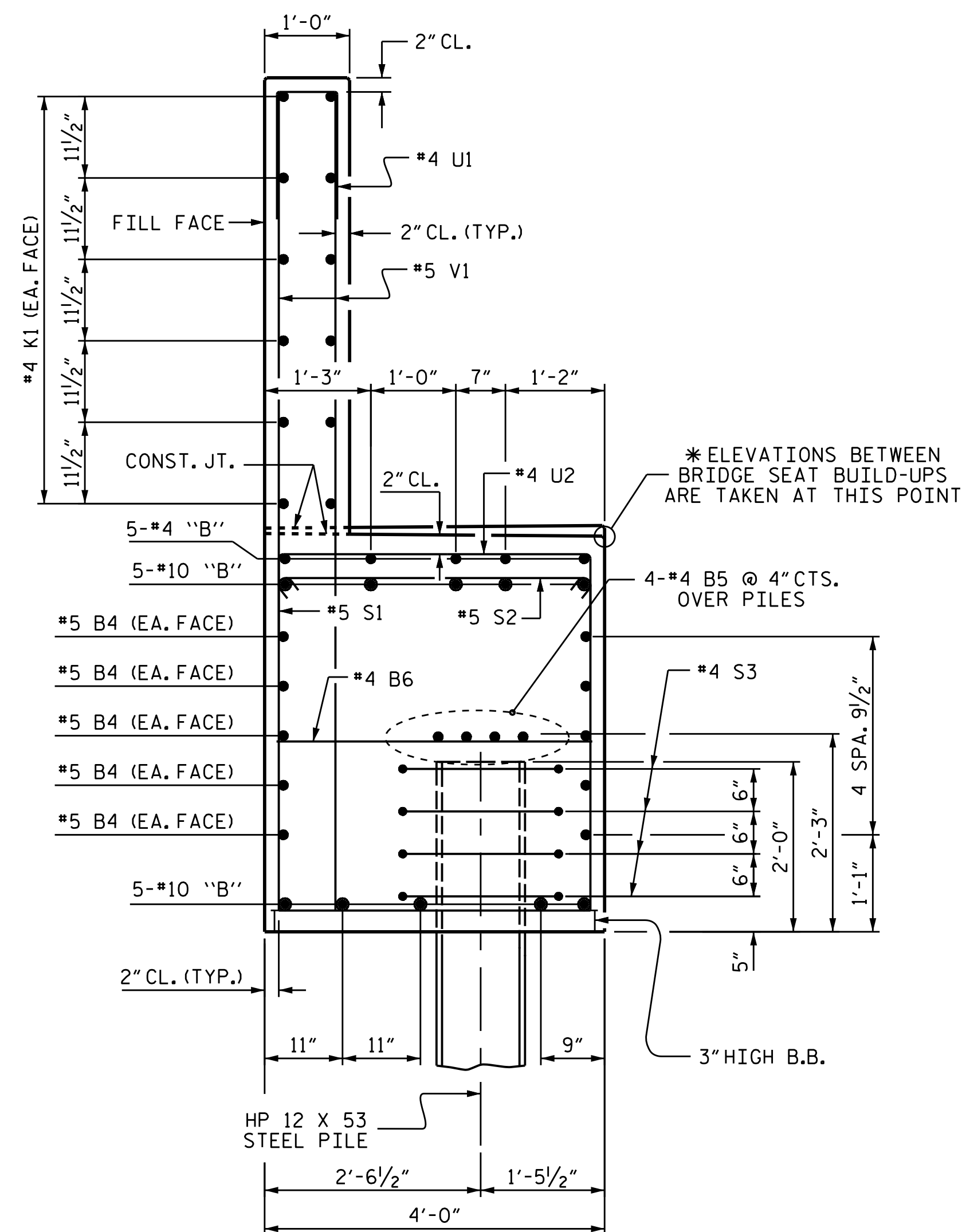
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

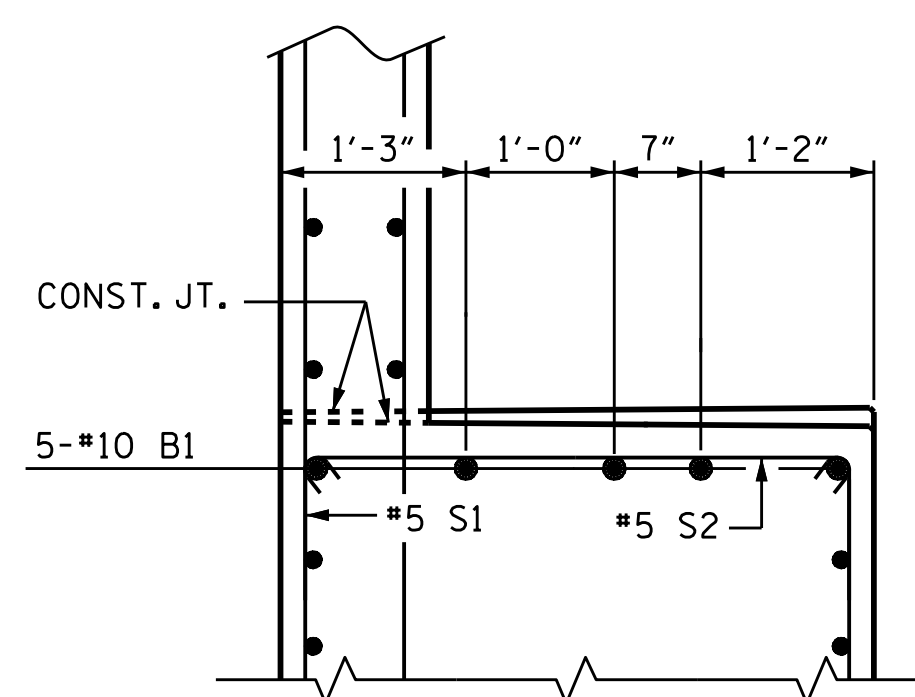


TIE BACK DETAILS

(DETAIL SHOWING TIE BACK RESTRAINT FOR END BENT)

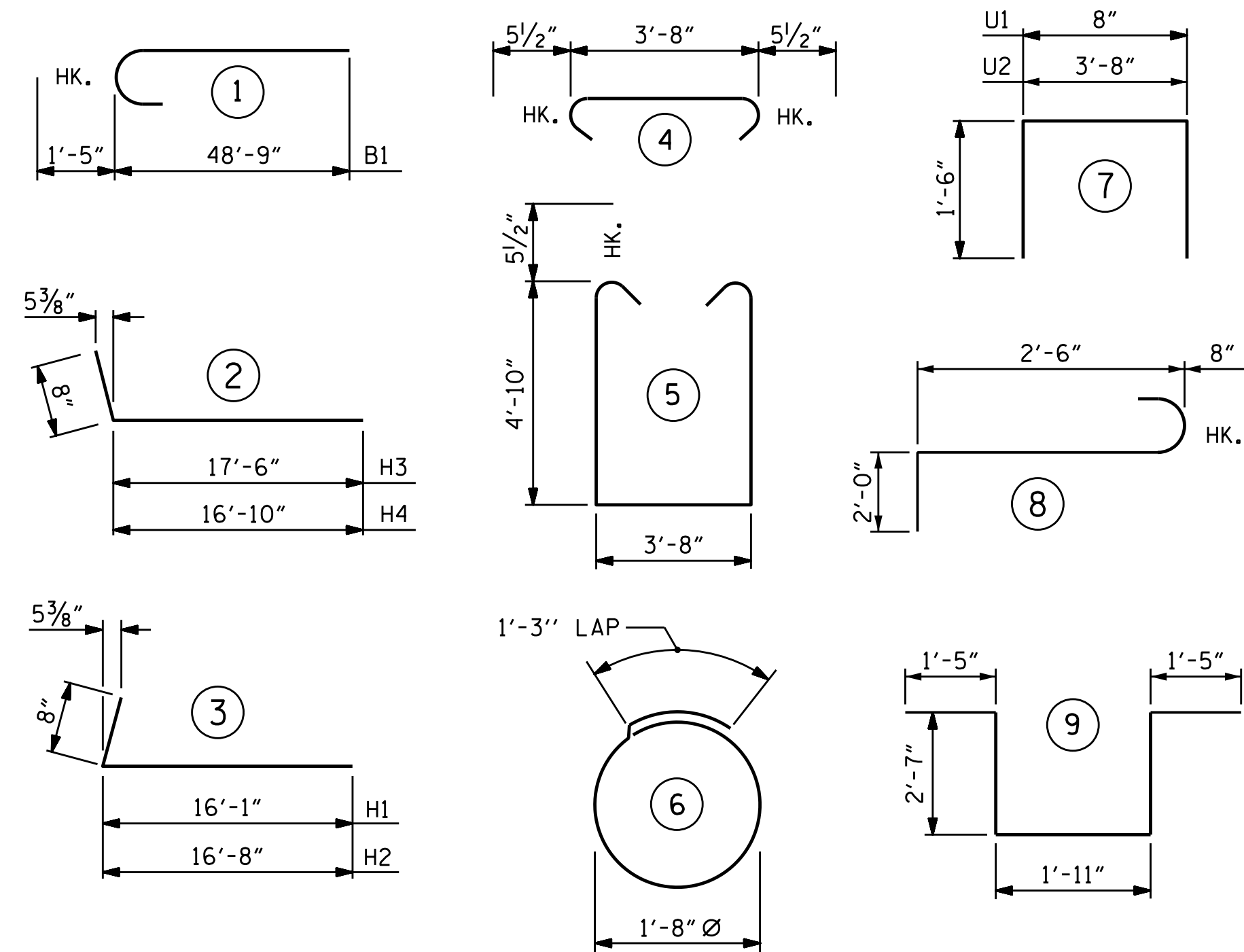


SECTION A-A



PARTIAL SECTION B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

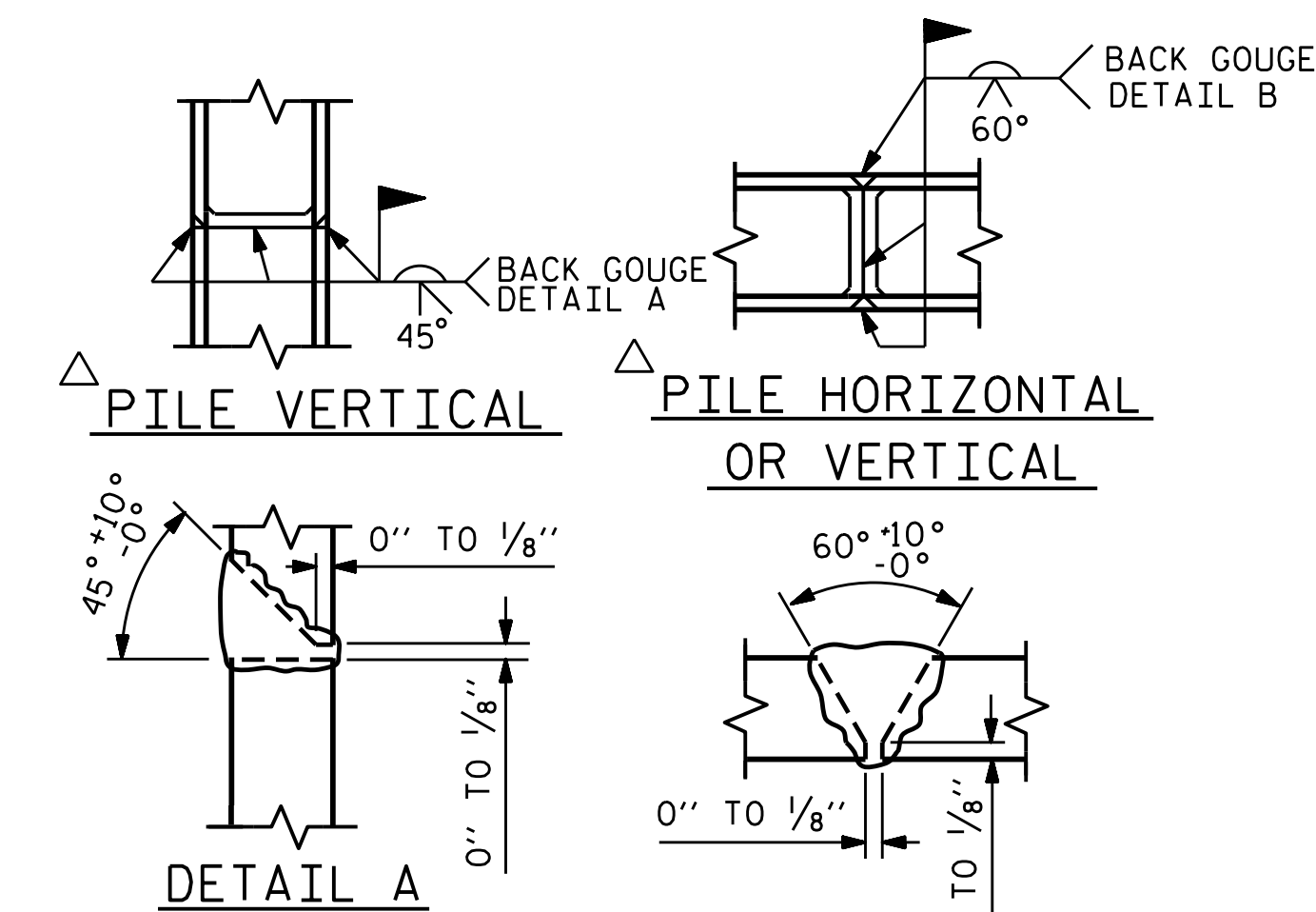
BILL OF MATERIAL

END BENT 2

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	20	#10	1	50'-2"	4317
B2	10	#10	STR	48'-9"	2098
B3	10	#10	STR	43'-0"	1850
B4	30	#5	STR	55'-10"	1747
B5	24	#4	STR	29'-0"	465
B6	40	#4	STR	3'-8"	98
B7	5	#4	STR	11'-1"	37
B8	45	#4	STR	14'-1"	423
H1	15	#5	3	16'-9"	262
H2	15	#5	3	17'-4"	271
H3	15	#5	2	18'-2"	284
H4	15	#5	2	17'-6"	274
K1	72	#4	STR	29'-0"	1435
K2	12	#4	STR	5'-6"	44
S1	151	#5	5	14'-3"	2244
S2	151	#5	4	4'-7"	722
S3	88	#4	6	6'-6"	382
S4	6	#6	8	5'-2"	47
S5	6	#6	9	9'-11"	89
U1	149	#4	7	3'-8"	365
U2	96	#4	7	6'-8"	428
V1	298	#5	STR	10'-6"	3264
V2	50	#5	STR	12'-6"	652
V3	20	#5	STR	12'-8"	264
V4	20	#5	STR	12'-10"	268
TOTAL REINFORCING STEEL					LBS. 22,330

CLASS A CONCRETE BREAKDOWN

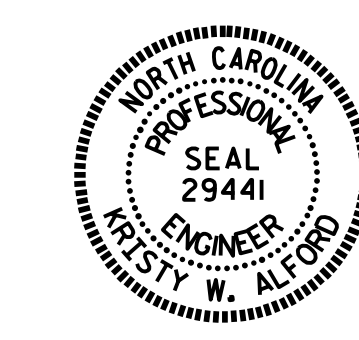
POUR	DESCRIPTION	UNIT	QUANTITY
POUR #1	(CAP & LOWER PART OF WING)	C.Y.	67.7
POUR #2	(BACKWALL & UPPER PART OF WING)	C.Y.	21.0
POUR #1	(CAP & LOWER PART OF WING)	C.Y.	71.0
POUR #2	(BACKWALL & UPPER PART OF WING)	C.Y.	22.5
CLASS A CONCRETE TOTAL			C.Y. 182.2
HP 12 X 53 STEEL PILES	NO. 24	LIN. FT.	1440
PILE REDRIVES	EA.		11



PILE SPLICE DETAILS

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-

SHEET 4 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE END BENT 2

DRAWN BY : A. SORSENGINH DATE : 3/2015
 CHECKED BY : J.P. ADAMS DATE : 8/2015
 DESIGN ENGINEER OF RECORD : A. SORSENGINH DATE : 9/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS 84
2			4			

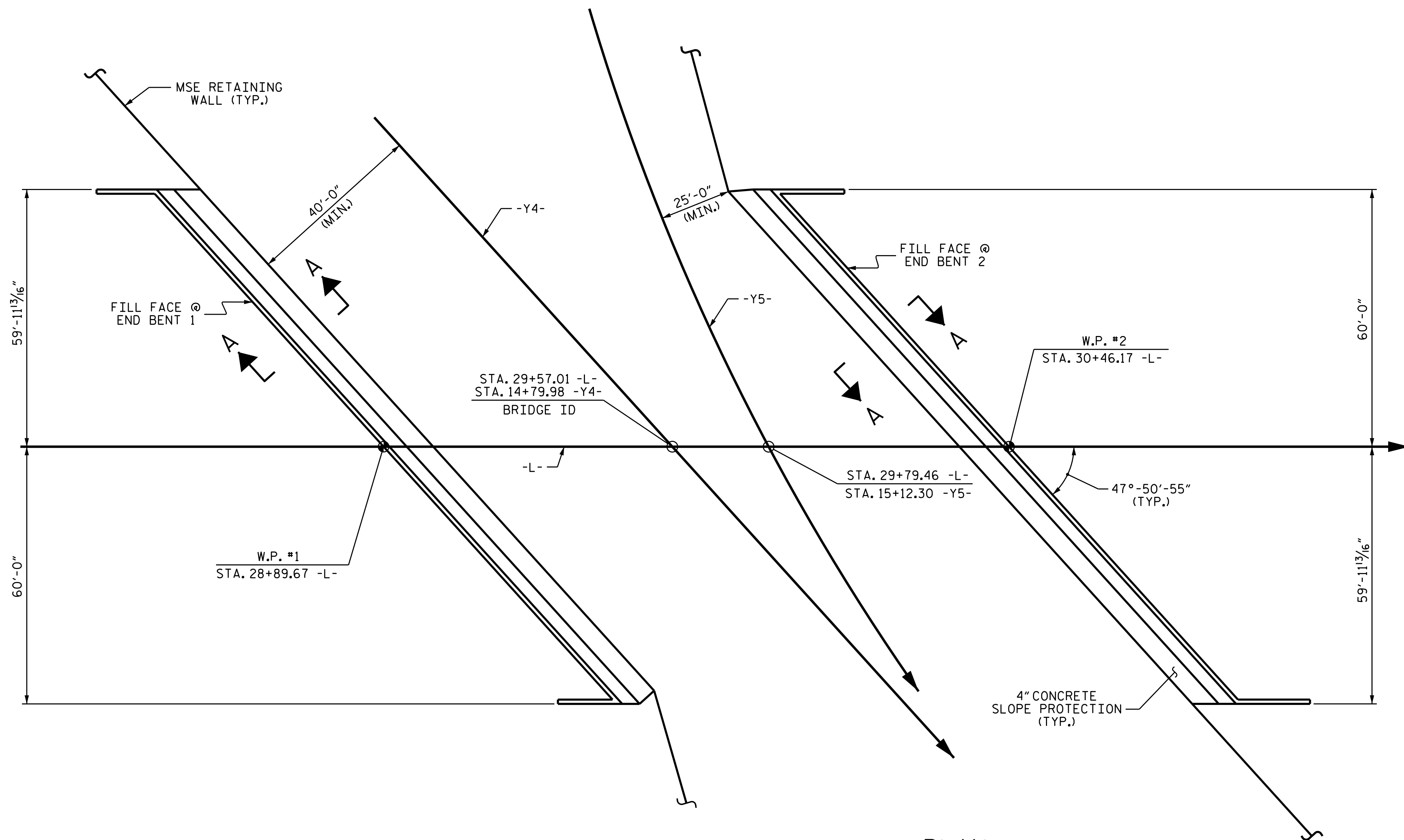
NOTES

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

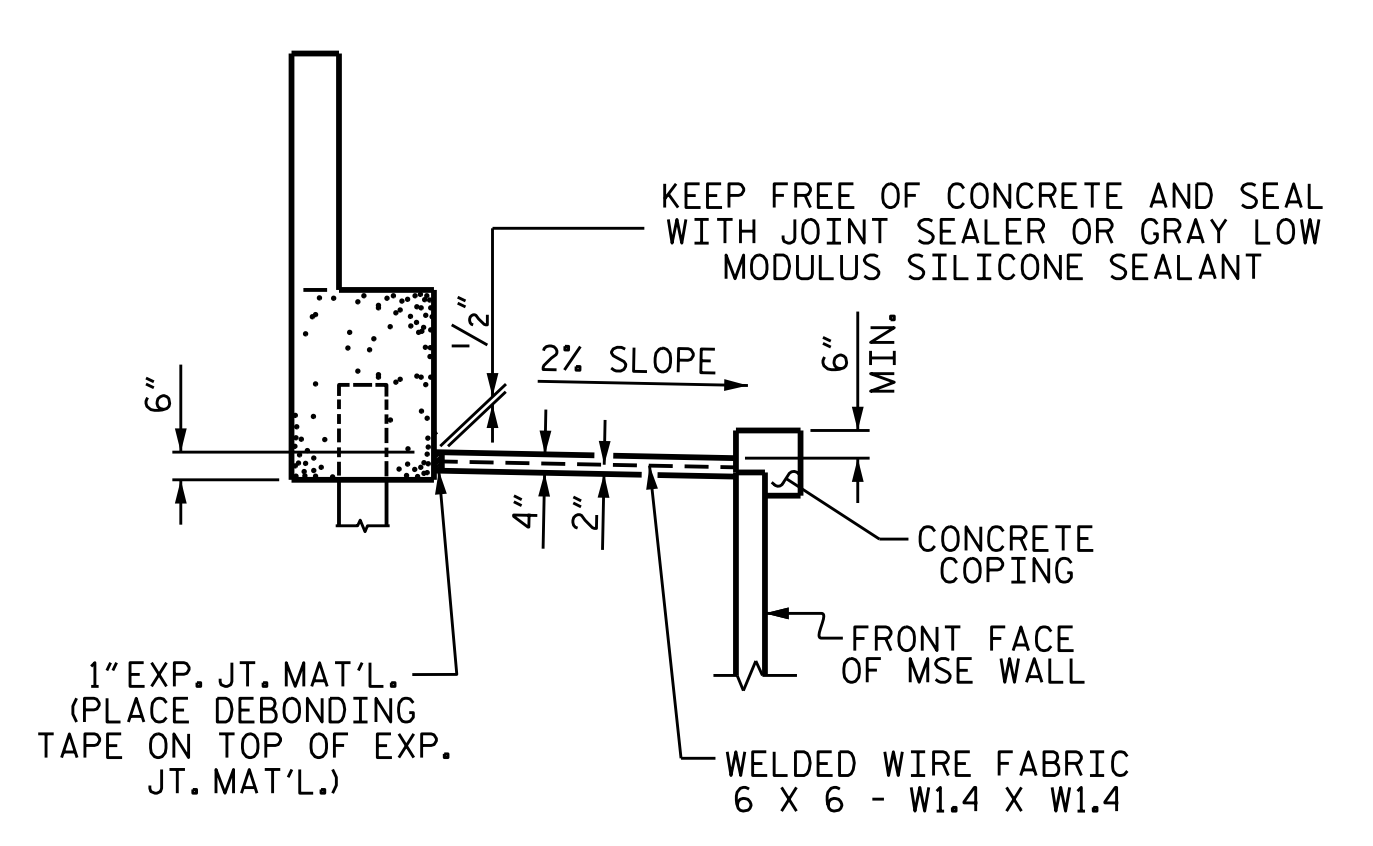
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 25+57.01 -L-	4" SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	83	166
END BENT 2	83	166

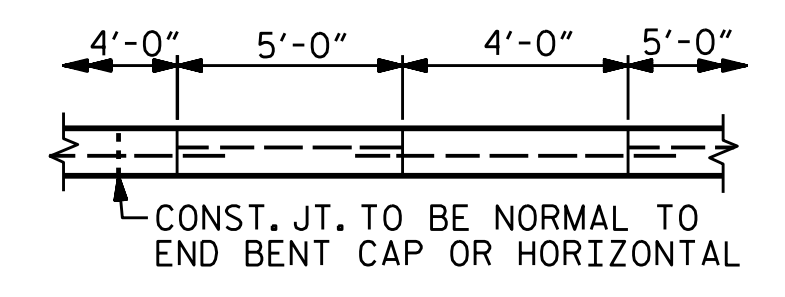
* QUANTITY SHOWN IS BASED ON 5' POURS.



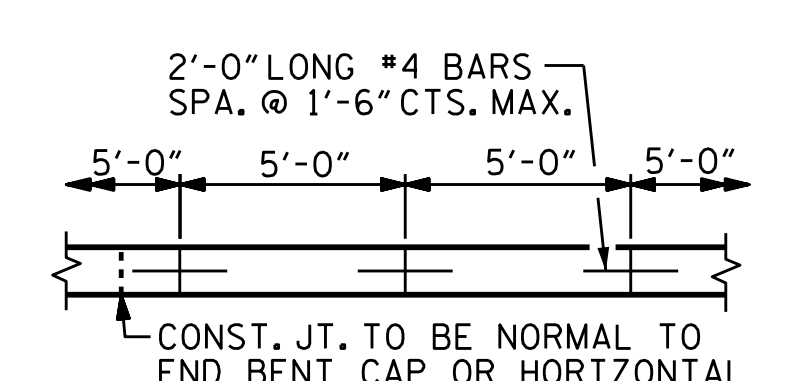
PLAN



SECTION A-A

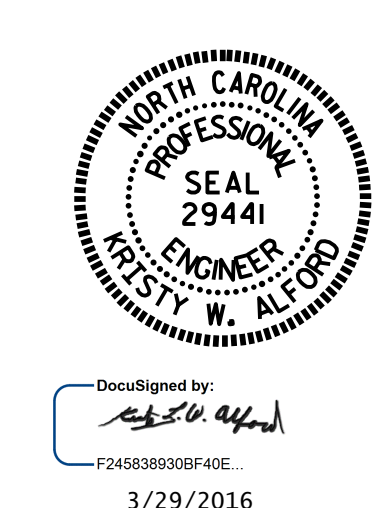


OPTIONAL POURING DETAIL



POURING DETAIL

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 29+57.01 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SLOPE PROTECTION DETAILS

DRAWN BY : J.P. ADAMS DATE : 8/2015
 CHECKED BY : T.L. AVERETTE DATE : 8/2015
 DESIGN ENGINEER OF RECORD : A. SORSENGINH DATE : 9/2015

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			84

NOTES

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

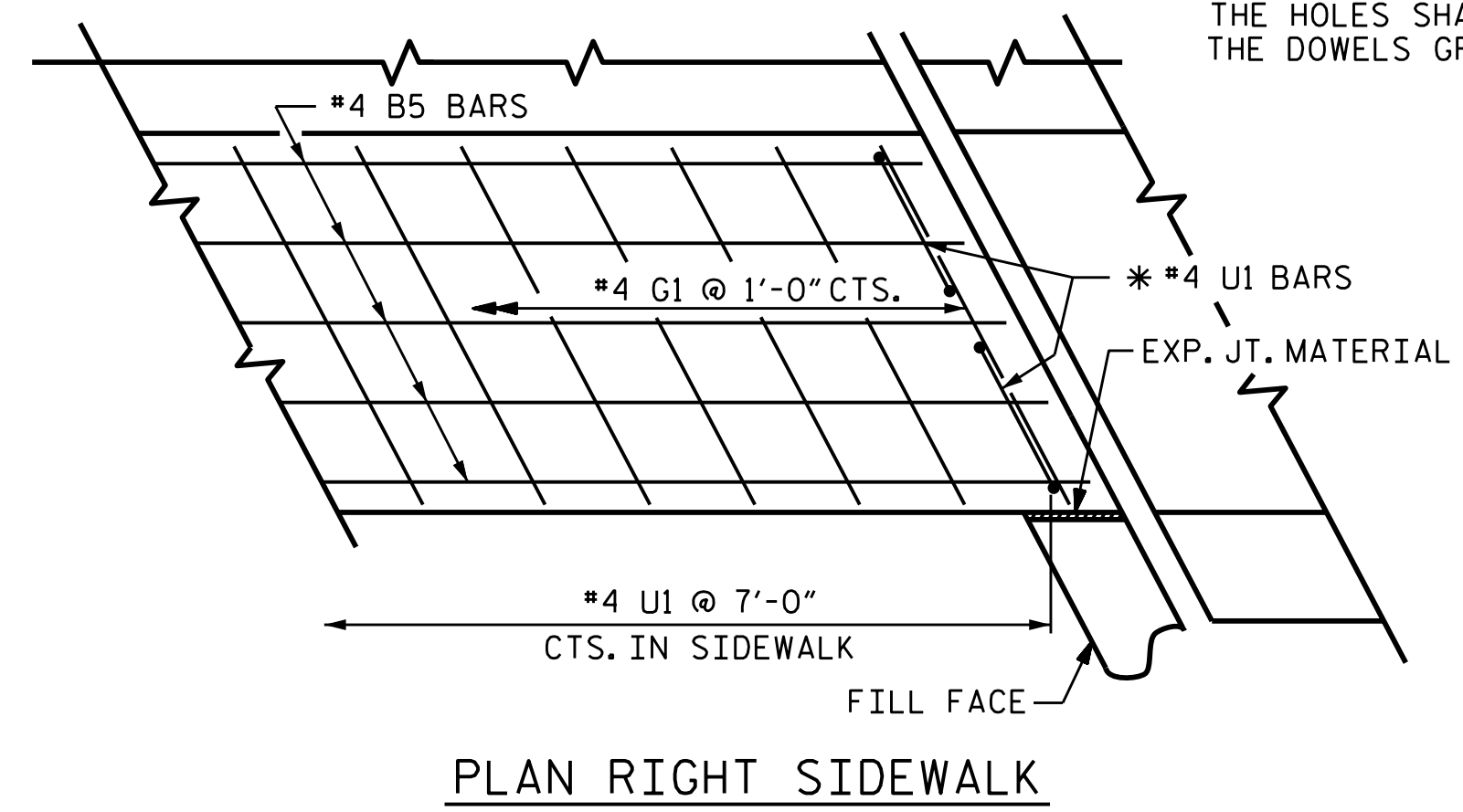
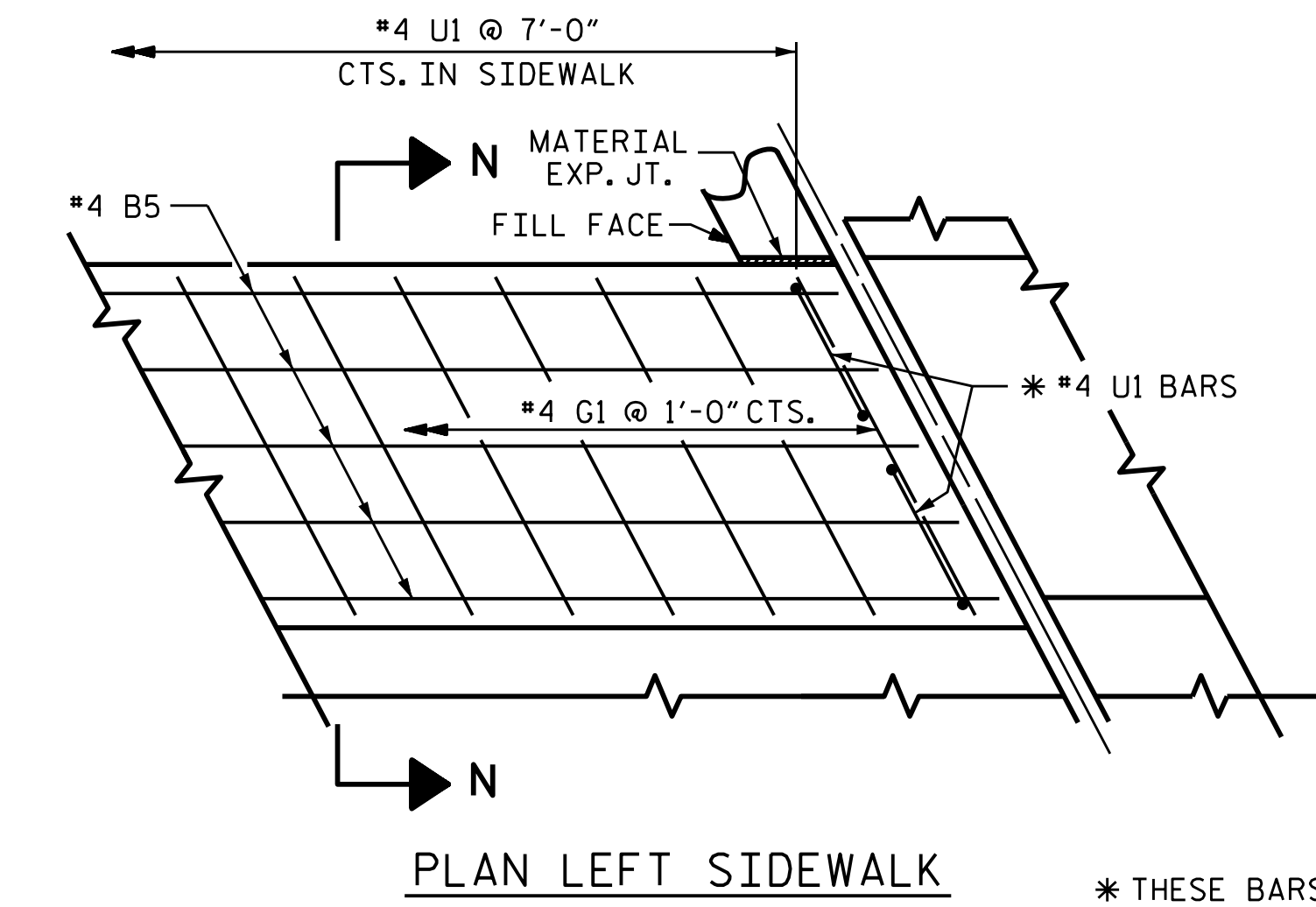
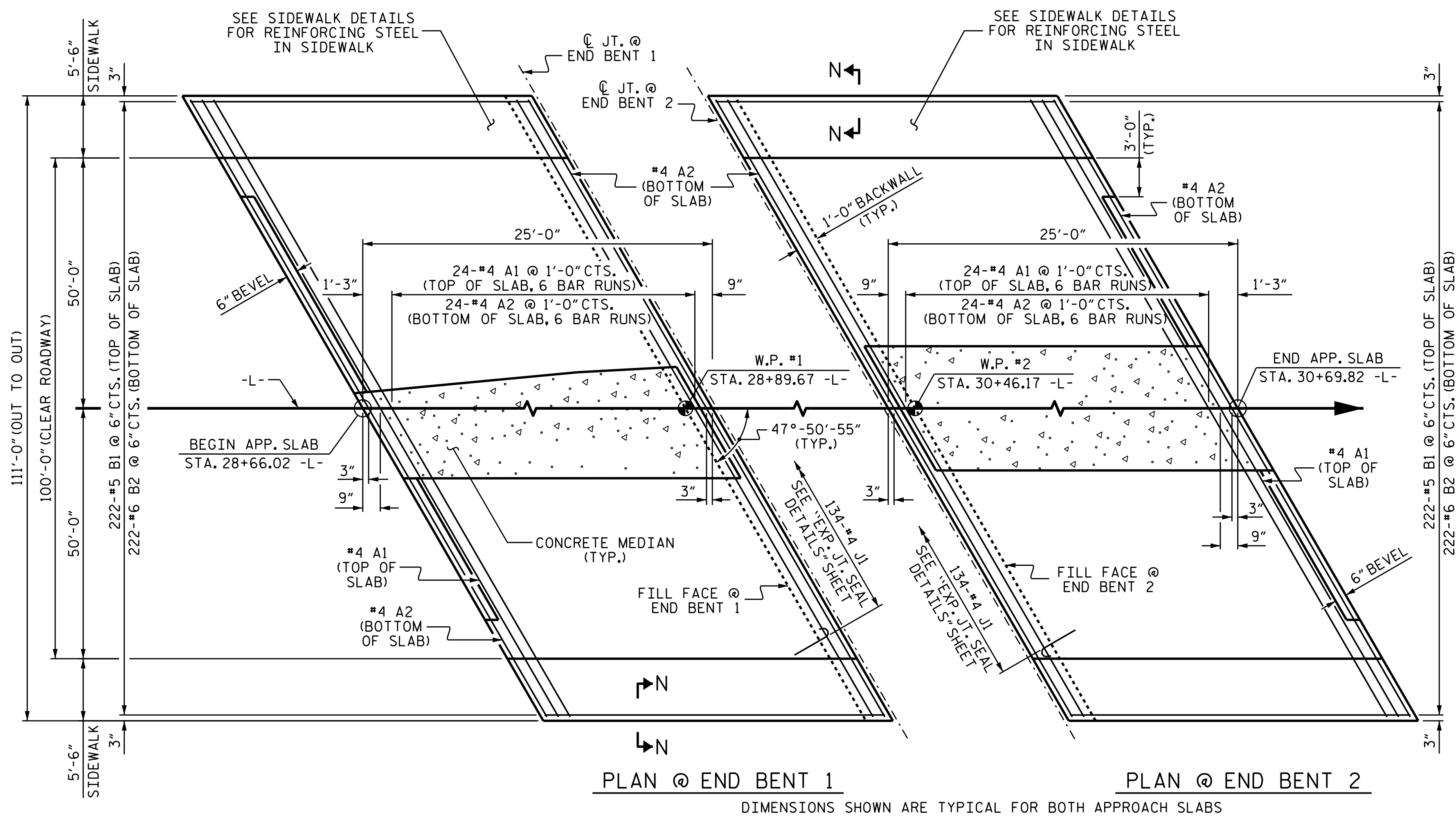
FOR MSE WALL BACKFILL, SEE "MSE RETAINING WALL" PLANS.

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

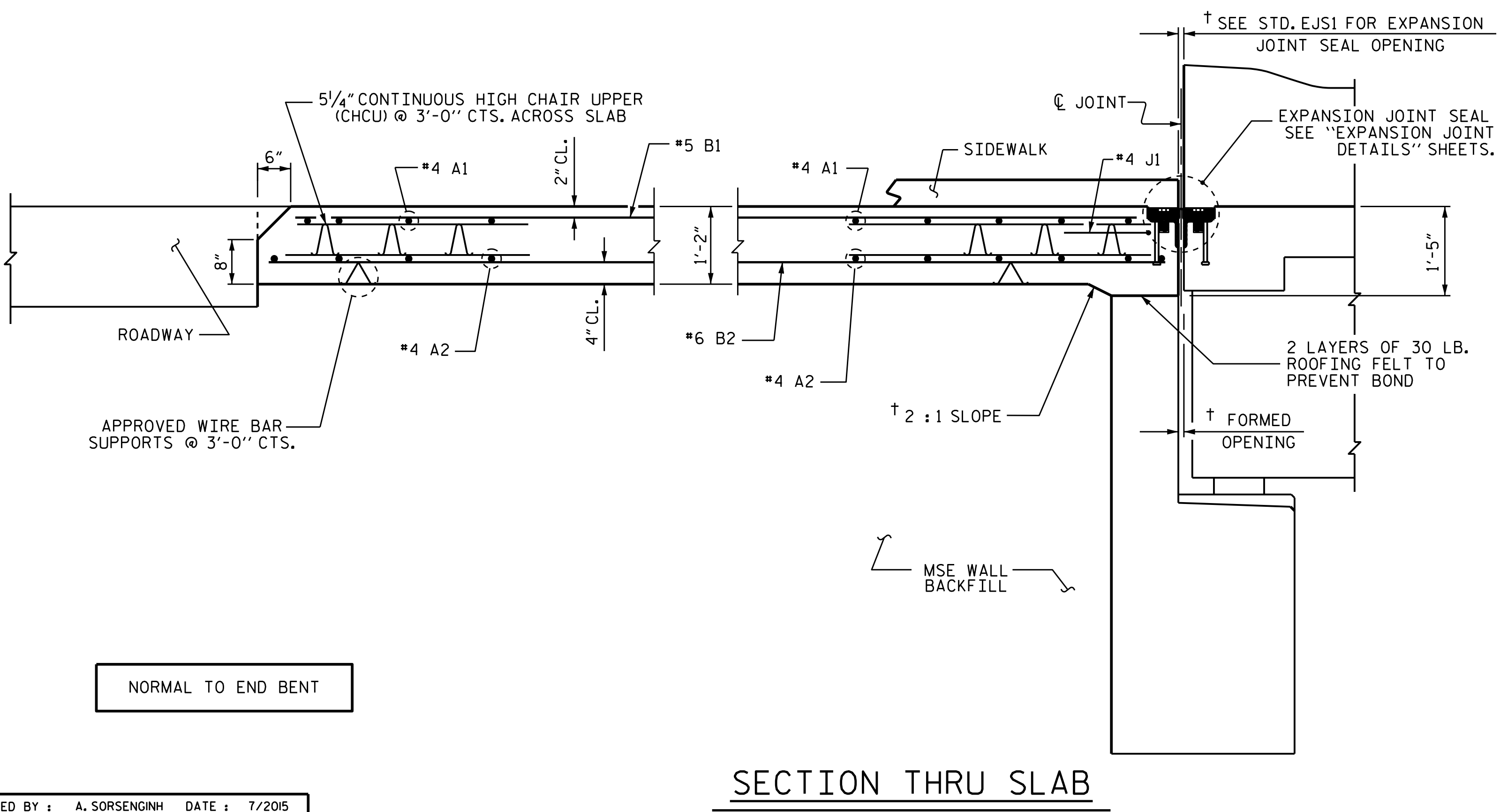
FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

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

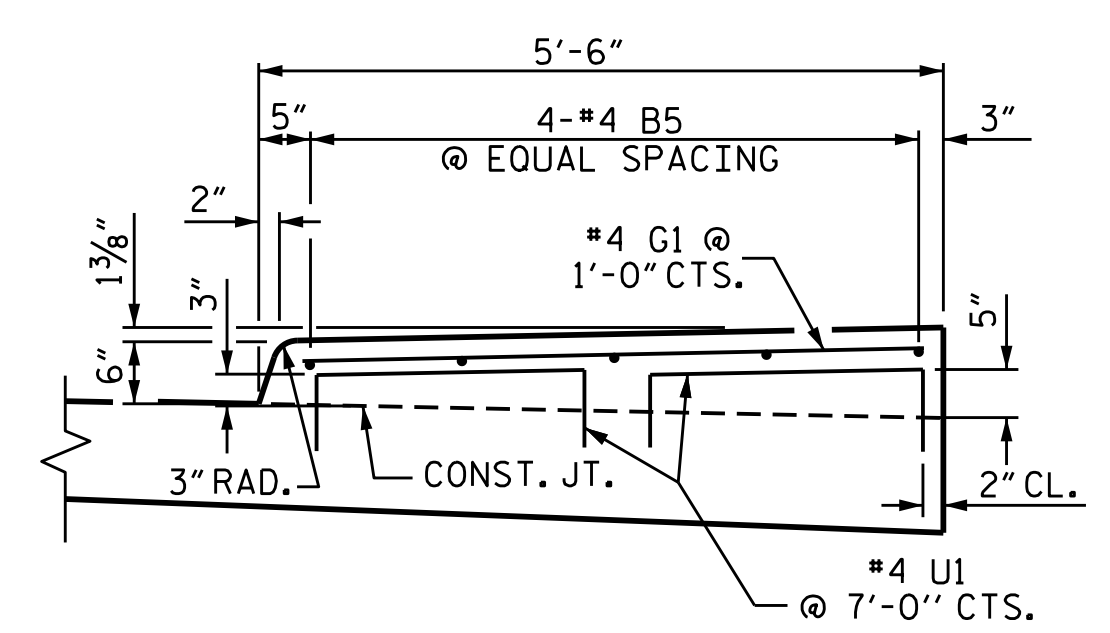
ALL REINFORCING STEEL IN THE CONCRETE MEDIAN AND THE SIDEWALK SHALL BE EPOXY COATED.



* THESE BARS ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE DOWELS GROUTED INTO PLACE.



DETAILS OF SIDEWALK ON APPROACH SLAB



SIDEWALK DETAILS

END BENT 1 SHOWN, END BENT 2 SIMILAR.

PROJECT NO. B-4490
 CUMBERLAND COUNTY
 STATION: 29+57.01 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 BRIDGE APPROACH SLAB
 FOR FLEXIBLE PAVEMENT

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

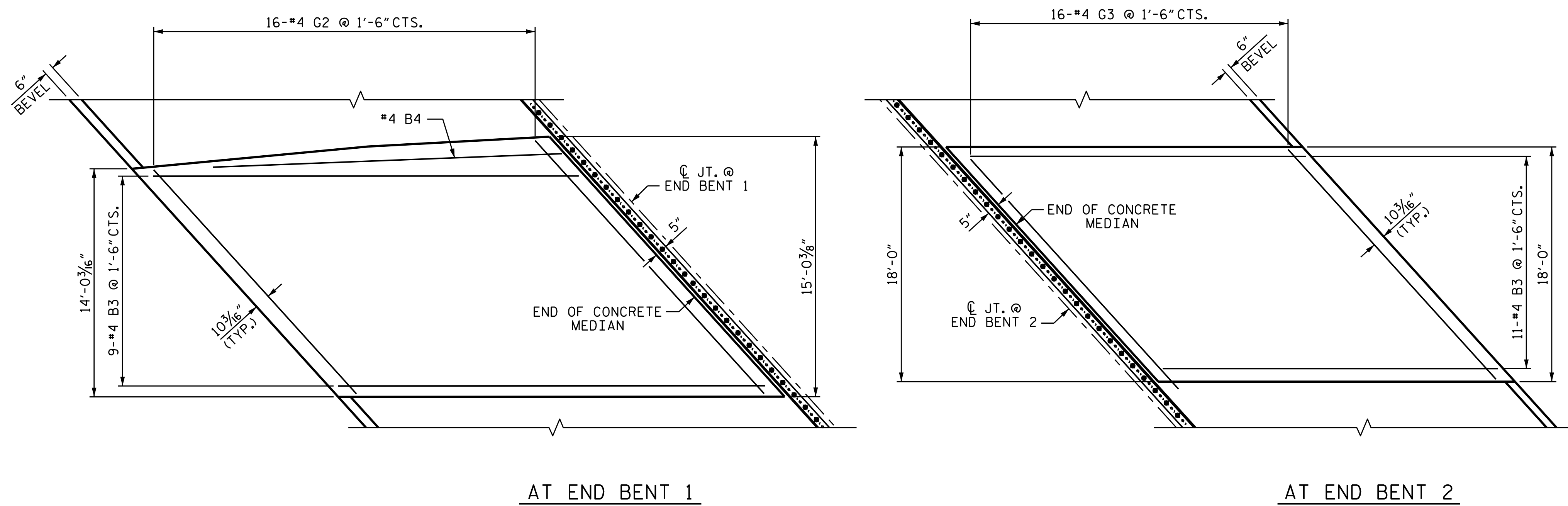
STR. #1

STD. NO. BAS2

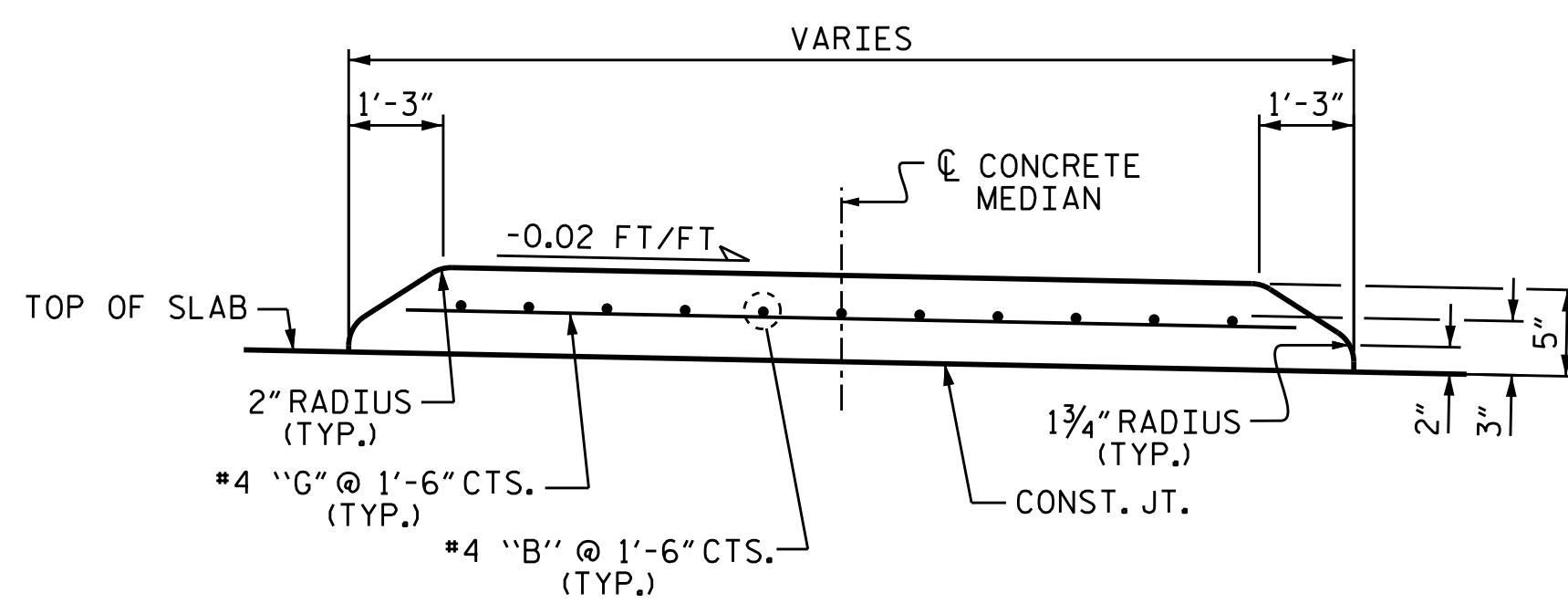


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : A. SORSENGINH	DATE : 7/2015
CHECKED BY : J.P. ADAMS	DATE : 8/2015
DRAWN BY : EEM	3/95
CHECKED BY : VAP	3/95
REV. 10/17/11	MAA/GM
REV. 12/21/11	MAA/GM
REV. 6/13	MAA/GM



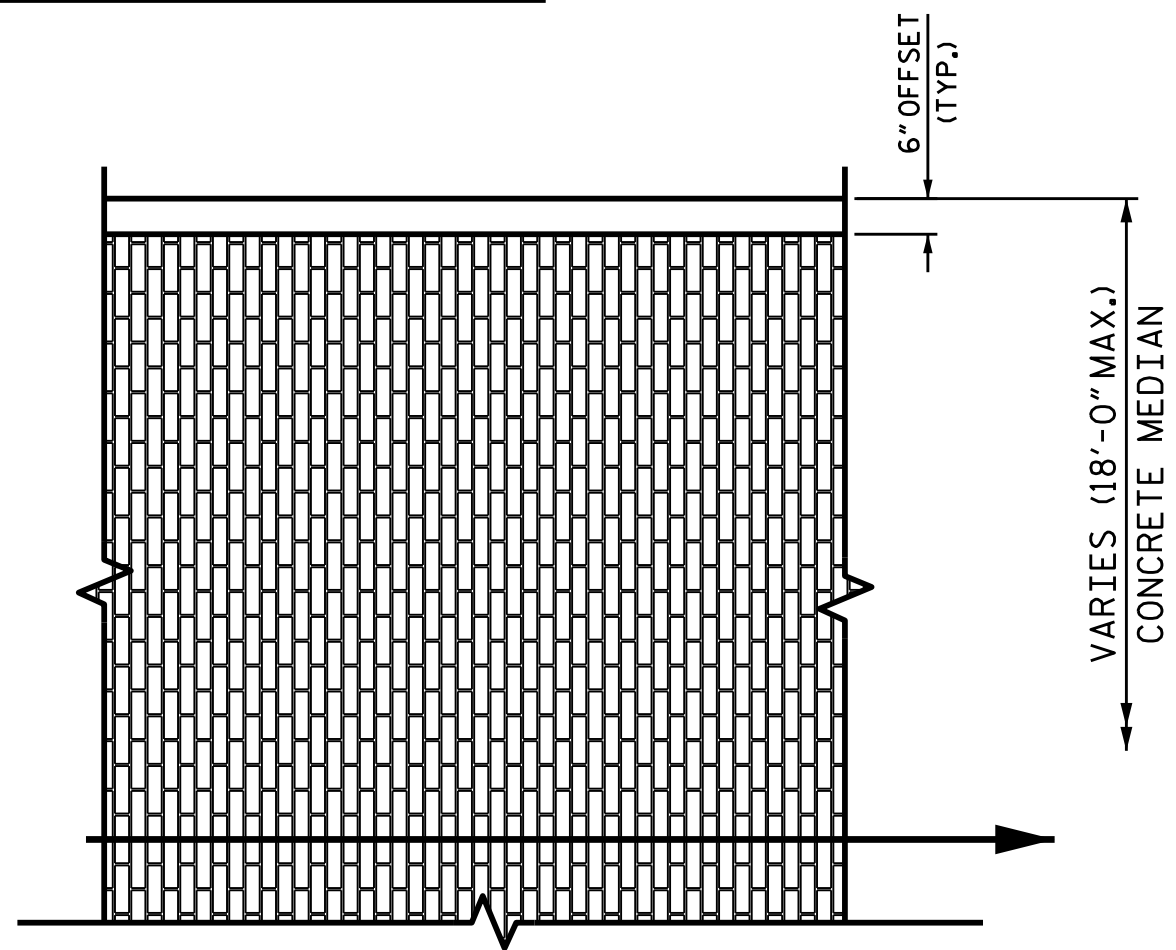
BILL OF MATERIAL					BILL OF MATERIAL								
APPROACH SLAB AT EB 1					APPROACH SLAB AT EB 2								
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT		
*A1	150	#4	STR	26'-7"	2664	*A1	150	#4	STR	26'-7"	2664		
A2	156	#4	STR	26'-5"	2753	A2	156	#4	STR	26'-5"	2753		
*B1	222	#5	STR	23'-7"	5461	*B1	222	#5	STR	23'-7"	5461		
B2	222	#6	STR	24'-6"	8169	B2	222	#6	STR	24'-6"	8169		
*B3	9	#4	STR	24'-2"	145	*B3	11	#4	STR	23'-1"	170		
*B4	1	#4	STR	20'-0"	13	*B5	10	#4	STR	24'-6"	164		
*B5	10	#4	STR	24'-6"	164								
*G1	50	#4	STR	6'-11"	231	*G3	16	#4	STR	23'-1"	247		
*G2	16	#4	STR	17'-8"	189								
*J1	134	#4	2	1'-5"	127	*J1	134	#4	2	1'-5"	127		
*U1	16	#4	1	3'-0"	32	*U1	16	#4	1	3'-0"	32		
REINFORCING STEEL					LBS.	10922	REINFORCING STEEL					LBS.	10922
* EPOXY COATED REINFORCING STEEL					LBS.	9026	* EPOXY COATED REINFORCING STEEL					LBS.	9096
CLASS AA CONCRETE BREAKDOWN							CLASS AA CONCRETE BREAKDOWN						
POUR #1 SLAB					121.1	C. Y.	POUR #1 SLAB					121.2	C. Y.
POUR #2 SIDEWALK & MEDIAN					10.8	C. Y.	POUR #2 SIDEWALK & MEDIAN					12.5	C. Y.
CLASS AA CONCRETE TOTAL					131.9	C. Y.	CLASS AA CONCRETE TOTAL					133.7	C. Y.



SECTION THRU MONOLITHIC CONCRETE MEDIAN
SECTION TAKEN AT END BENT 2, END BENT 1 SIMILAR

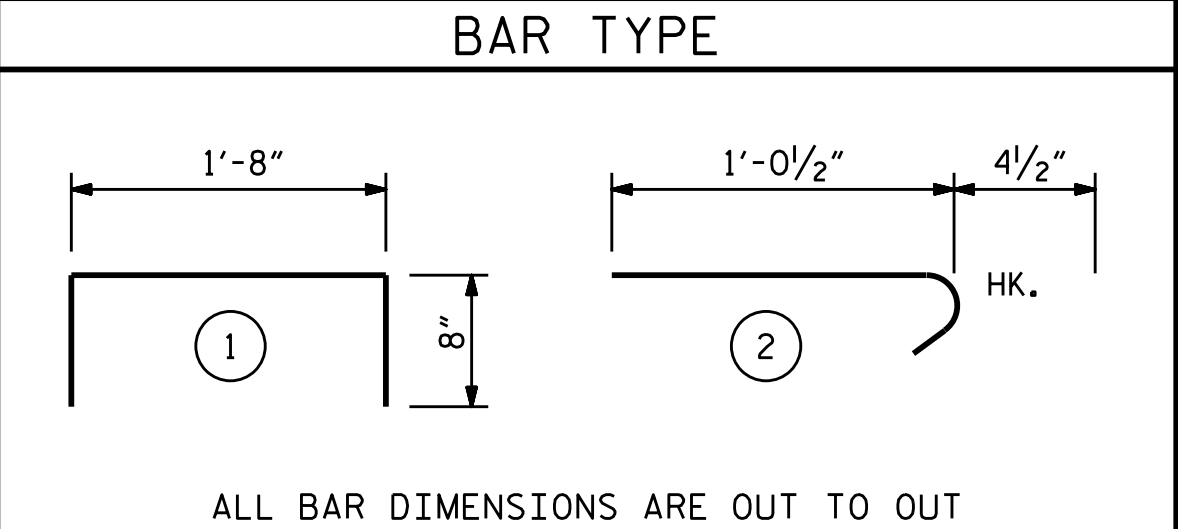
PLAN OF MONOLITHIC CONCRETE MEDIAN

FOR AESTHETICALLY TREATED CONCRETE MEDIAN ON THE APPROACH SLABS, SEE "MONOLITHIC CONCRETE MEDIAN" SHEET.

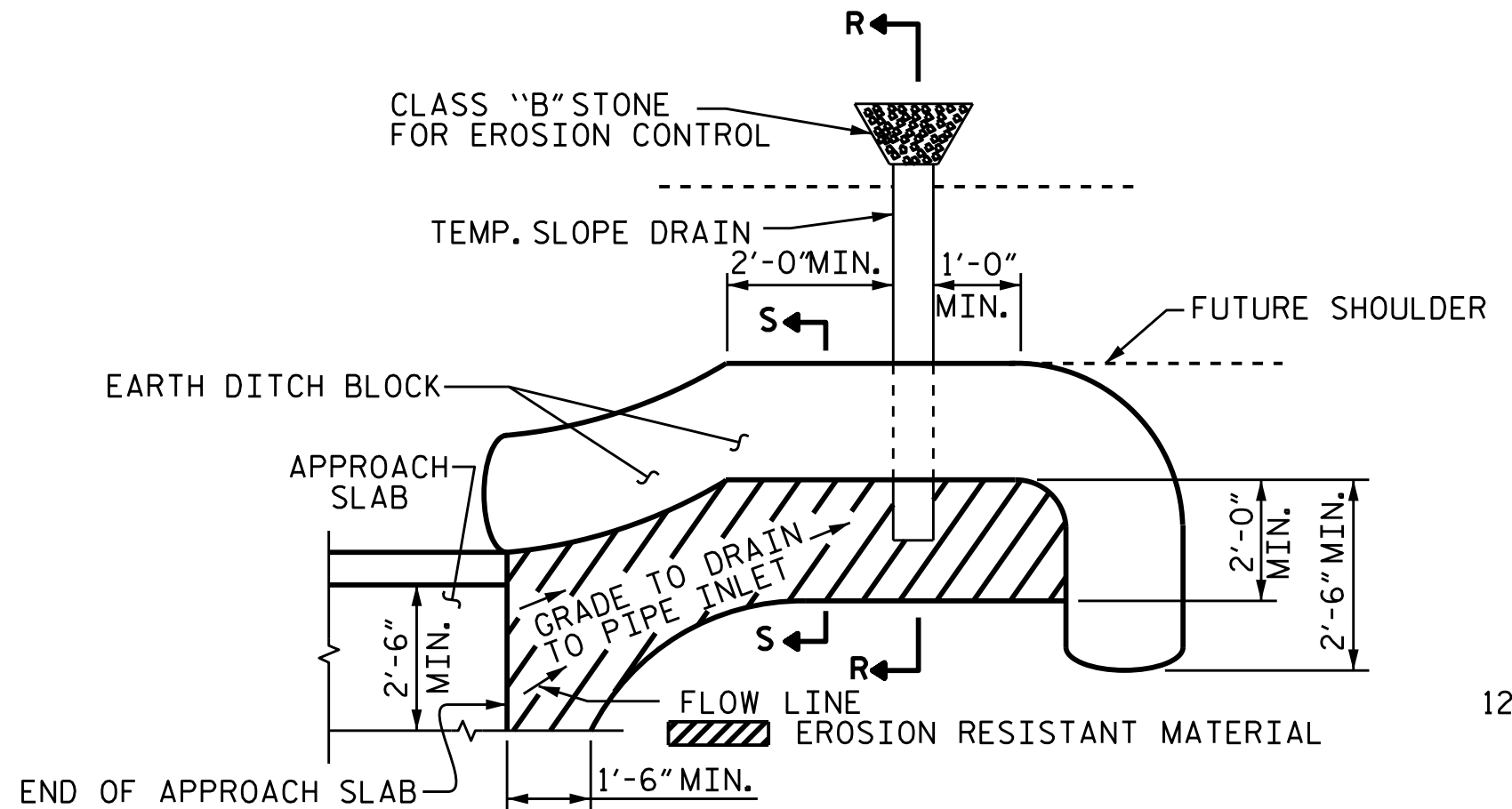


PATTERN DETAIL

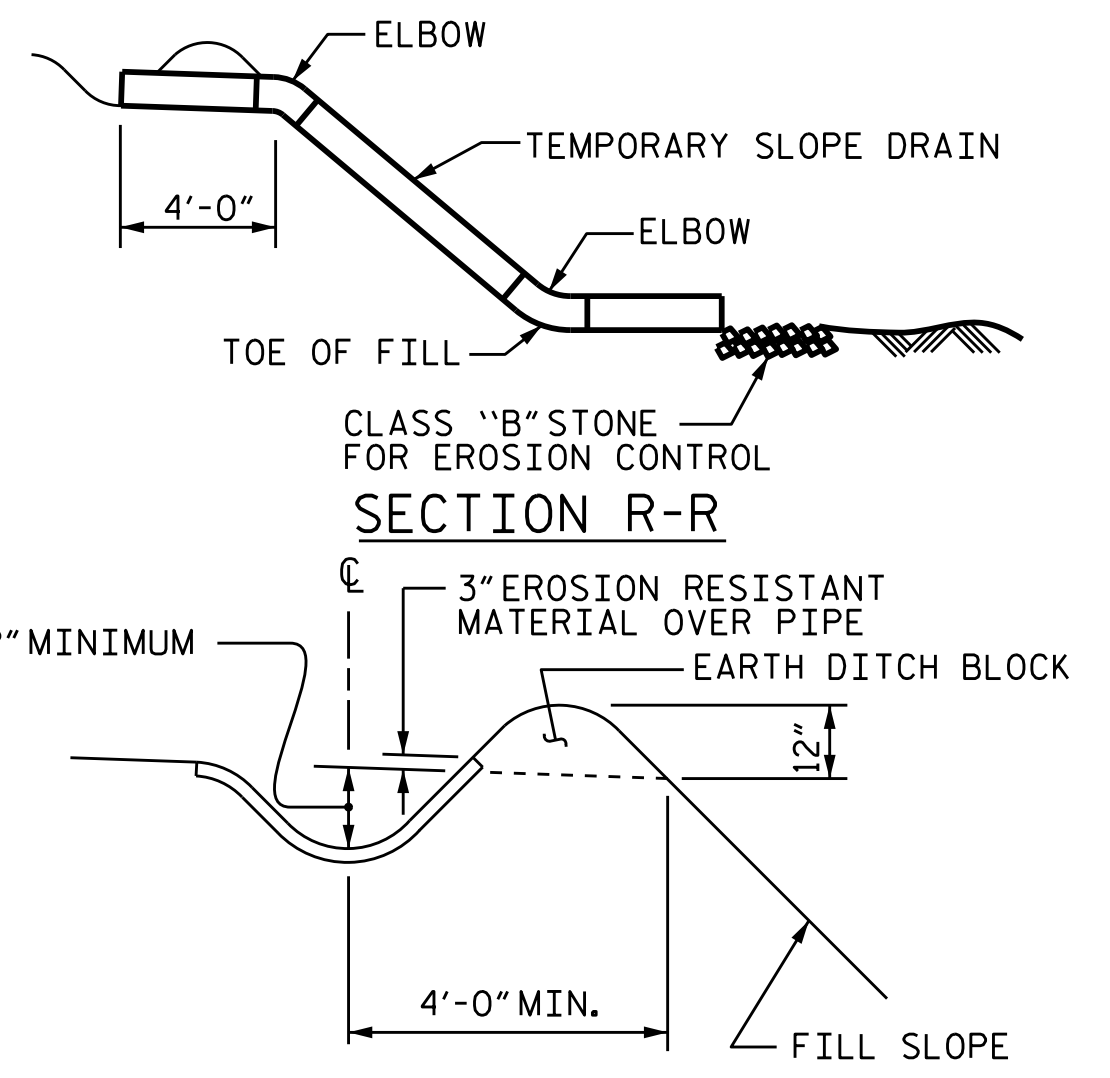
SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"



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



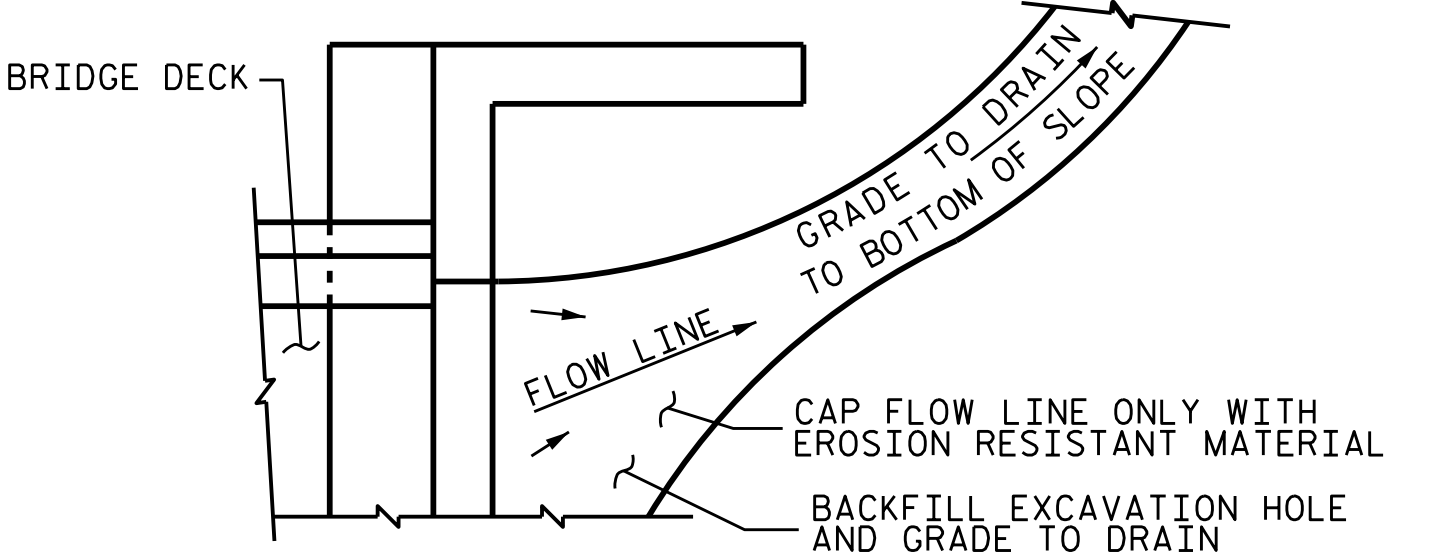
PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



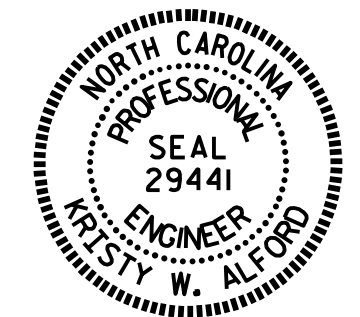
TEMPORARY DRAINAGE DETAIL

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.

ASSEMBLED BY :	A. SORSENGINH	DATE :	8/2015
CHECKED BY :	J.P. ADAMS	DATE :	8/2015
DRAWN BY :	EEM	3/95	REV. 10/1/11
CHECKED BY :	VAP	3/95	REV. 12/21/11
			REV. 6/13

29-MAR-2016 09:19
R:\Structures\Plans\STR 1\MISCELLANEOUS\B4490.SD.AS.1.dgn
jpadams

3/29/2016



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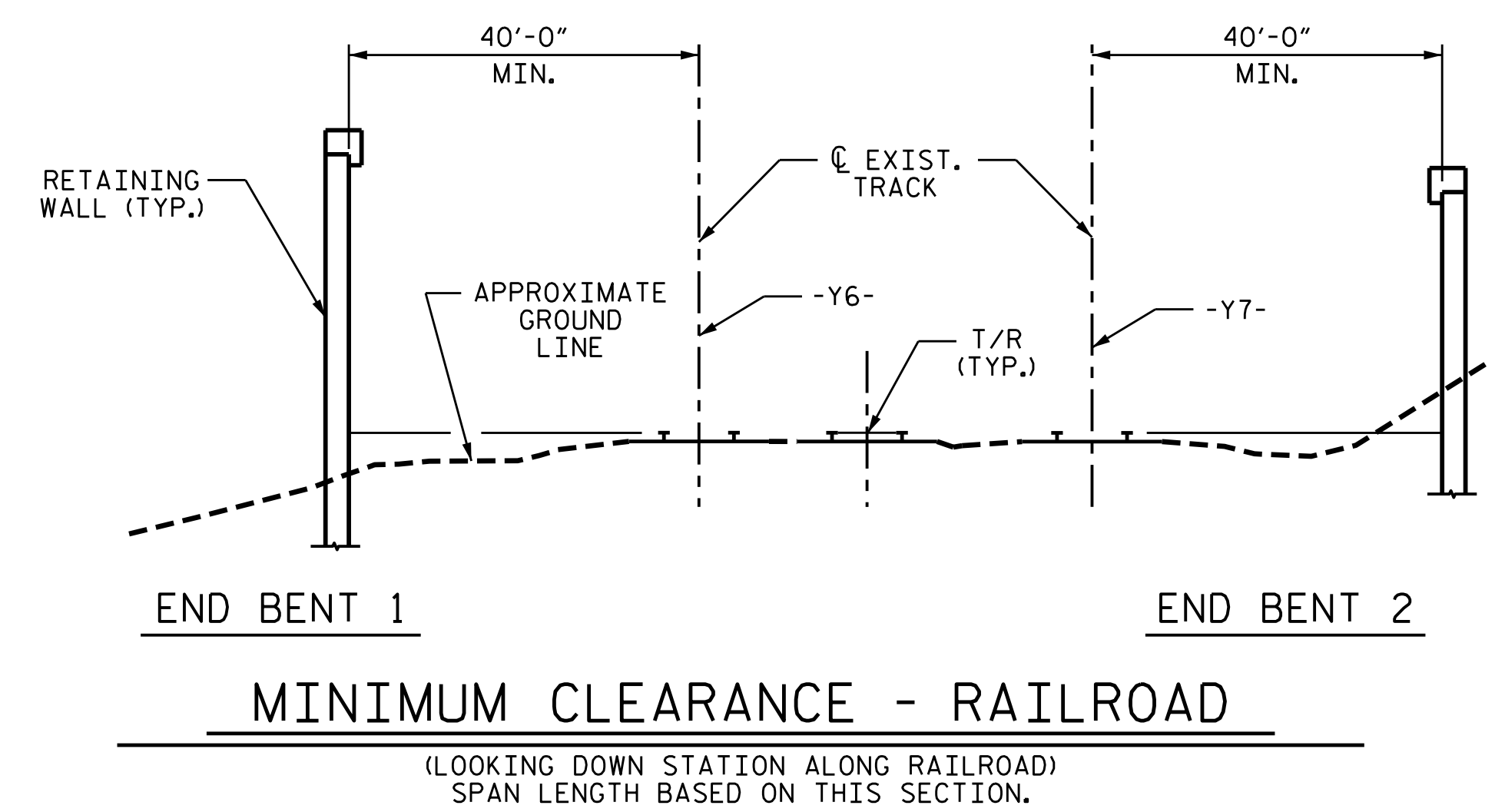
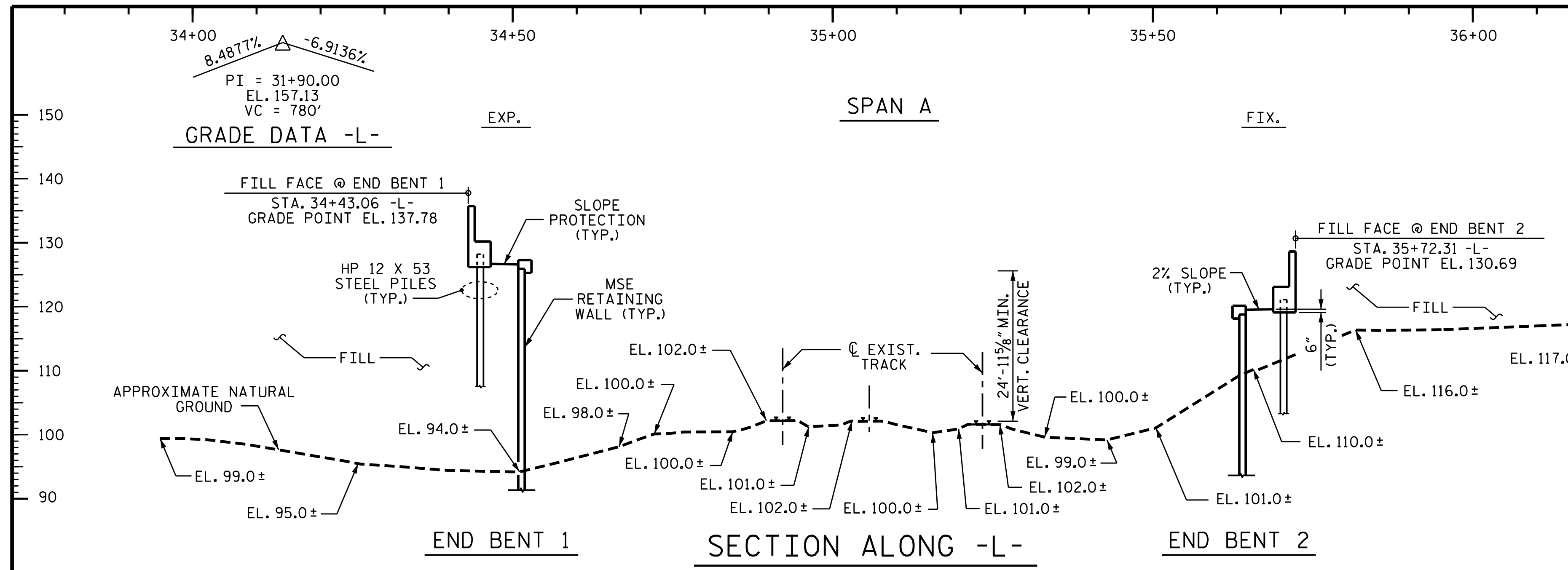
PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 29+57.01 -L-

SHEET 2 OF 2

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS 84
2			4			

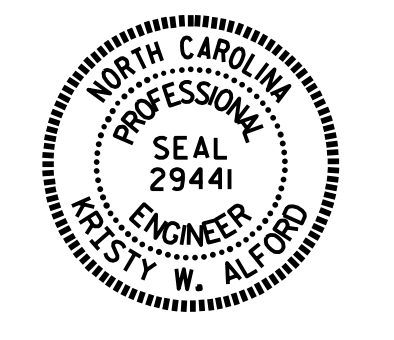
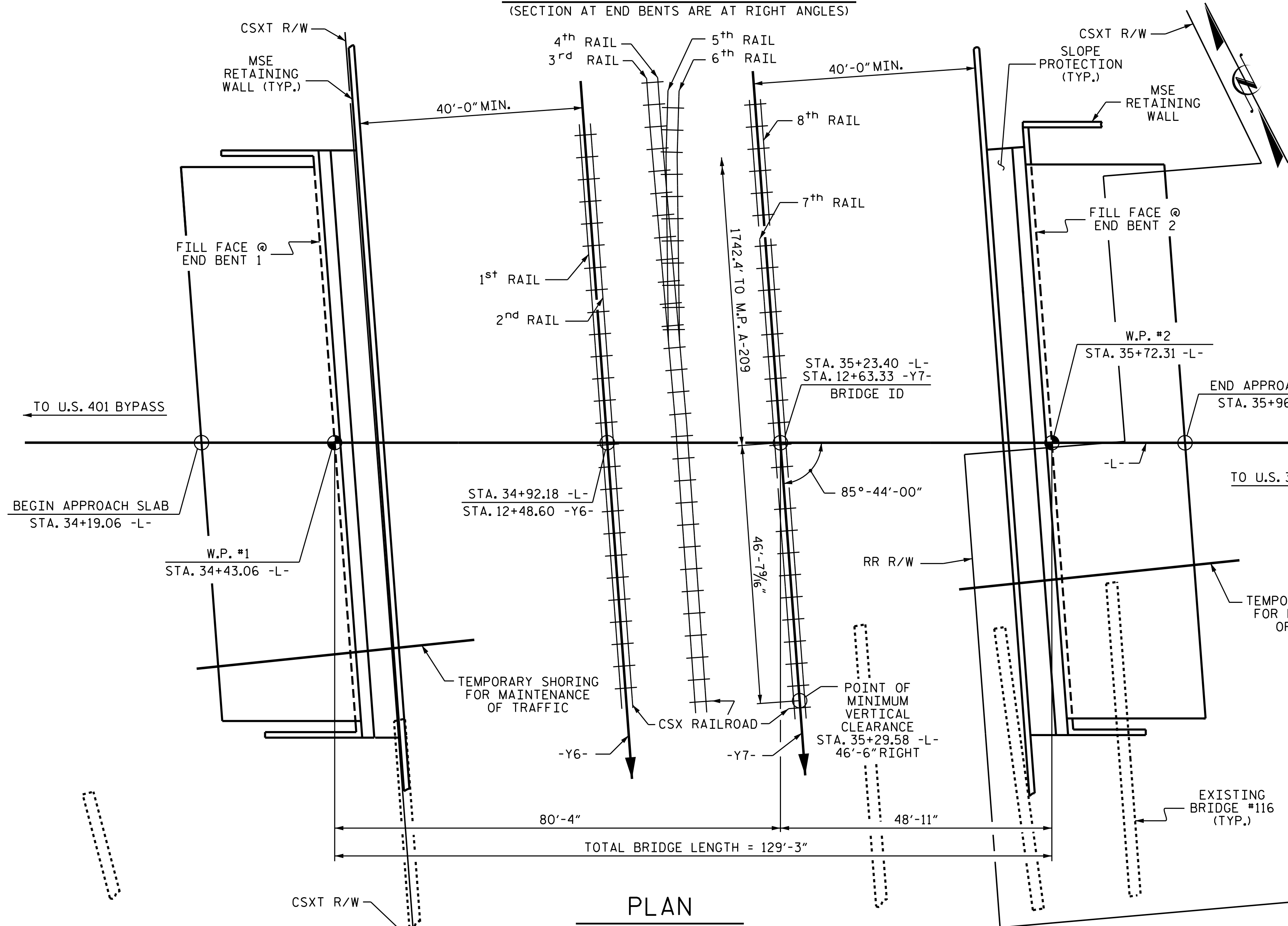
STR. #1 STD. NO. BAS2



TOP OF RAIL ELEVATION

TRACK LOCATION	ALONG -Y6-		BETWEEN -Y6- & -Y7-		CROSSOVER		ALONG -Y7-		
	-Y6- STATION	1 st RAIL	2 nd RAIL	3 rd RAIL	4 th RAIL	5 th RAIL	6 th RAIL	7 th RAIL	8 th RAIL
11+75.00	102.34	102.39	102.53	102.53	102.54	102.59	102.16	102.12	
12+00.00	102.30	102.33	102.39	102.38	102.39	102.41	101.98	101.96	
12+25.00	102.25	102.28	102.27	102.25	102.24	102.24	101.81	101.79	
12+50.00	102.21	102.22	102.17	102.15	N/A	N/A	101.64	101.62	
12+75.00	102.14	102.17	102.07	102.05	N/A	N/A	101.48	101.45	
13+00.00	102.08	102.10	101.97	101.96	N/A	N/A	101.40	101.37	
13+25.00	102.01	102.03	101.88	101.87	N/A	N/A	101.35	101.35	

NOTE:
THE RAILROAD TRACK TOP 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.



PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-
12+63.33 -Y7-
 MILE POST A-209.33
 BRIDGE #437

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON NC 24-210
 OVER CSX RAILROAD

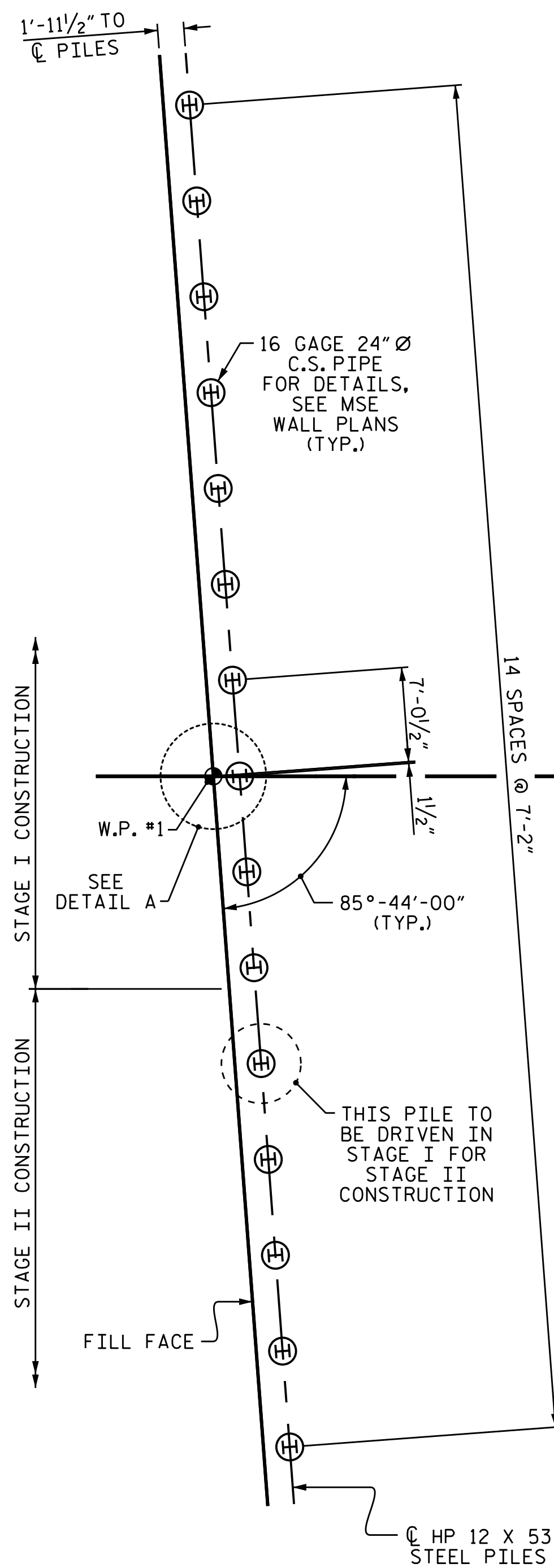
DRAWN BY: J.P. ADAMS DATE: 7/2015
 CHECKED BY: I.L. AVERETTE DATE: 8/2015

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

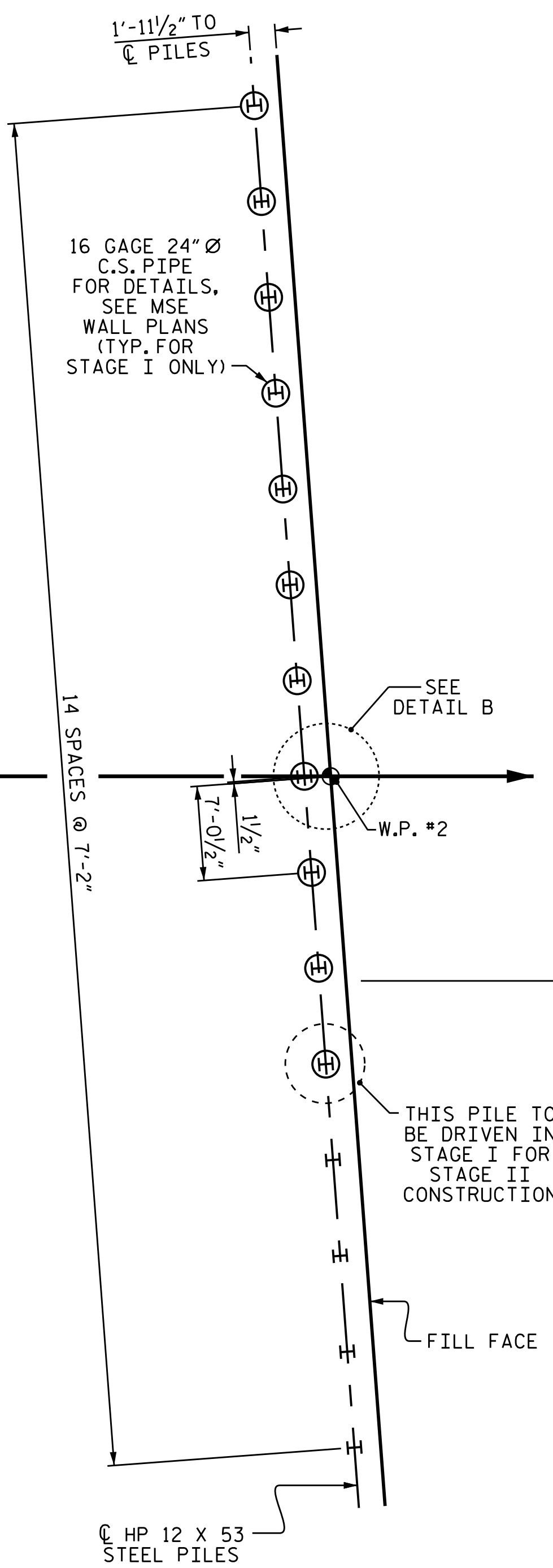
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43	
1			3			TOTAL SHEETS 84	
2			4				

NOTES

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- 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.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- THE RAILROAD TRACK TOP OF RAIL ELEVATIONS 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 CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH THE "PAINTING OF STRUCTURAL STEEL" SPECIAL PROVISION, UNLESS OTHERWISE NOTED ON THE PLANS.
- FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
- FOR REMOVAL OF EXISTING BRIDGE #116 SEE STRUCTURE #1 PLANS.
- 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.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.
- FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISIONS.
- FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.
- DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE.
- TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT 1 AND END BENT 2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- INSTALL A 16 GAGE 24 INCH DIAMETER CORRUGATED STEEL PIPE FOR EACH END BENT 1 PILE LOCATION THROUGH THE WALL BACKFILL ZONE DURING MSE WALL CONSTRUCTION. DRIVE END BENT PILES AT END BENT 1 THROUGH THE PIPES AFTER COMPLETION OF THE MSE WALLS AND FILL THE PIPES WITH SAND BEFORE END BENT CAP CONSTRUCTION. FOR 16 GAGE 24 INCH DIAMETER CORRUGATED STEEL PIPES, SEE MSE WALL PLANS.
- INSTALL A 16 GAGE 24 INCH DIAMETER CORRUGATED STEEL PIPE FOR EACH STAGE 1 END BENT 2 PILE LOCATION THROUGH THE WALL BACKFILL ZONE DURING MSE WALL CONSTRUCTION. DRIVE STAGE 1 END BENT PILES AT END BENT 2 THROUGH THE PIPES AFTER COMPLETION OF THE MSE WALLS AND FILL THE PIPES WITH SAND BEFORE END BENT CAP CONSTRUCTION. FOR 16 GAGE 24 INCH DIAMETER CORRUGATED STEEL PIPES, SEE MSE WALL PLANS.
- DRIVE STAGE 2 END BENT 2 PILES BEFORE CONSTRUCTING STAGE 2 MSE WALL AT END BENT 2.
- ALL PAVEMENT MARKINGS WILL BE IN ACCORDANCE WITH THE PAVEMENT MARKING PLANS AND SHALL PROVIDE FOR BICYCLES.
- FOR CONCRETE PARAPET AND DECK AESTHETIC DETAILS, SEE SHEET S-64.
- FOR APPLICATION OF BRIDGE COATING, SEE SPECIAL PROVISIONS.
- FOR RAILROAD PROVISIONS, SEE SPECIAL PROVISIONS.

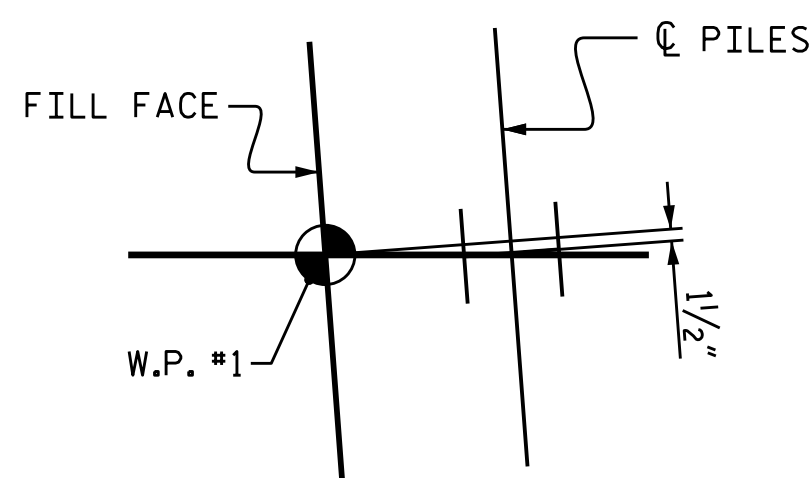


END BENT 1

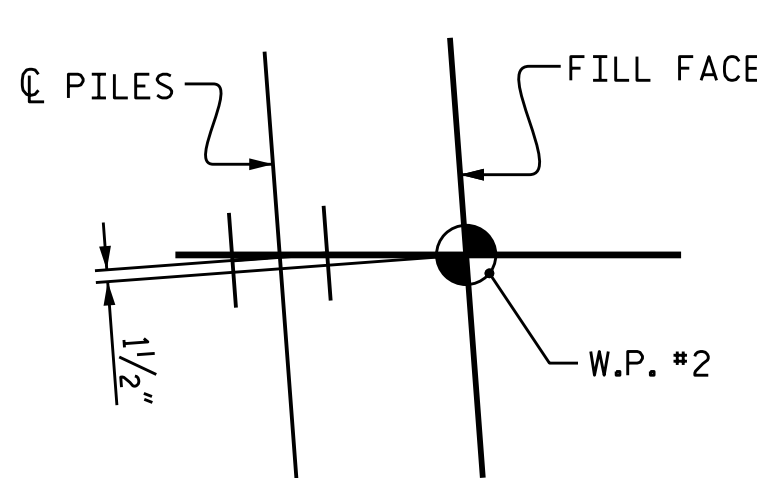


END BENT 2

FOUNDATION LAYOUT
DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF THE END BENT CAP.



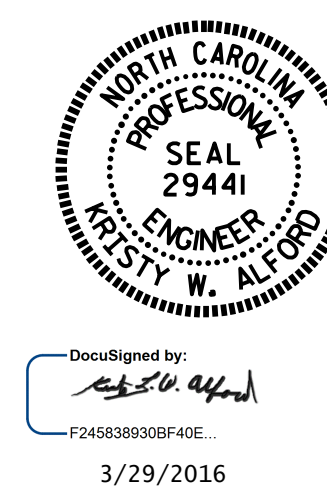
DETAIL A



DETAIL B

DRAWN BY : J.P. ADAMS DATE : 7/2015
CHECKED BY : I.L. AVERETTE DATE : 8/2015

29-MAR-2016 09:19
R:\Structures\Plans\STR 2\GENERAL DRAWING\B-4490.SD_STR2.GD_02.dgn
Jpodams



PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 35+23.40 -L-

SHEET 2 OF 3

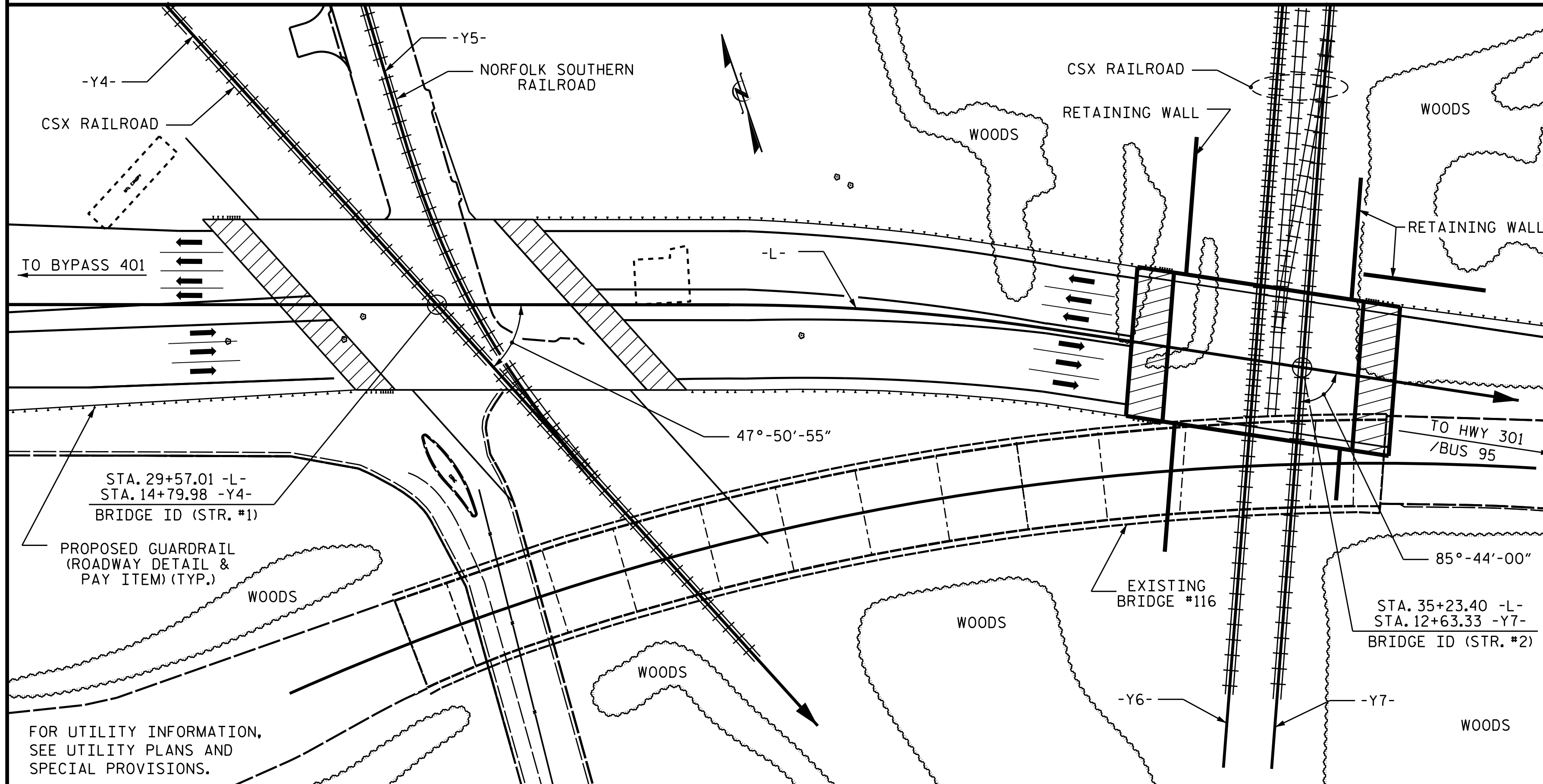
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
FOR BRIDGE ON NC 24-210
OVER CSX RAILROAD

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

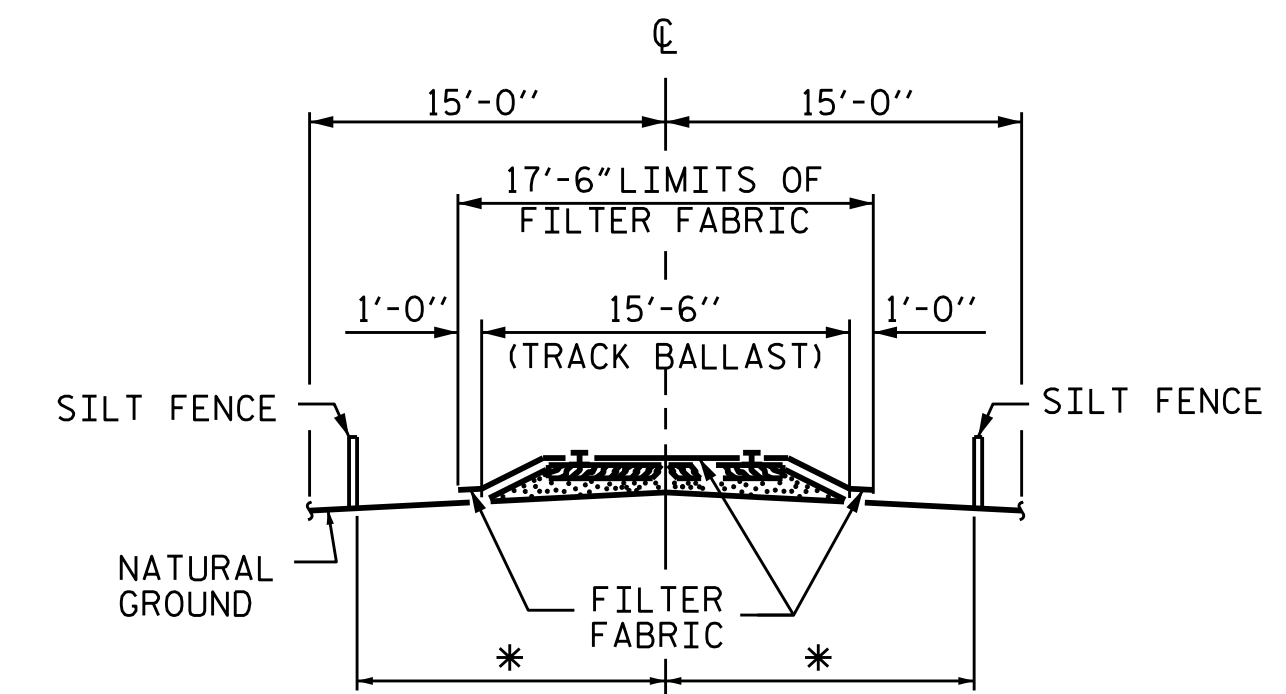
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44	
1			3			TOTAL SHEETS 84	
2			4				

STR. #2

BENCHMARK 81: RAILROAD SPIKE IN BASE OF 18" HARDWOOD, 55.59' LEFT STATION 39+80.50 -L-, EL. 106.57



LOCATION SKETCH



RAILROAD EROSION CONTROL DETAIL

* TO BE DETERMINED BY THE RESIDENT ENGINEER IN CONSULTATION WITH THE RAILROAD ENGINEER.

NOTES:

RAILROAD EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO PERFORMING ANY WORK IN THE RAILROAD RIGHT-OF-WAY.

ADDITIONAL EROSION CONTROL MEASURES FOR PROTECTION OF RAILROAD DITCHES MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.

NO SEPARATE PAYMENT WILL BE MADE FOR RAILROAD EROSION CONTROL MEASURES.

LIMITS OF SILT FENCE AND FILTER FABRIC PARALLEL TO RAILROAD SHALL EXTEND A MINIMUM OF 25'-0" OUTSIDE EDGE OF SUPERSTRUCTURE OR TOE OF SLOPE ON CONSTRUCTION. A GREATER LENGTH OF SILT FENCE OR FILTER FABRIC MAY BE REQUIRED IF SO DIRECTED BY THE ENGINEER.

FILTER FABRIC TO BE NAILED TO TIMBER RAIL TIES WITH PRIME SOURCE "GRIP CAP" OR EQUIVALENT. FILTER FABRIC ON SHOULDER TO BE SECURED AS DIRECTED BY THE ENGINEER AND RAILROAD.

TOTAL BILL OF MATERIAL

	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL APPROX. 427500 LBS.	PAINTING OF STRUCTURAL STEEL	HP 12 X 53 STEEL PILES	PILE REDRIVES	TWO BAR METAL RAIL	1'-4" X 3'-0 1/2" CONCRETE PARAPET	1'-4" X 3'-3" CONCRETE PARAPET	4 INCH SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS	APPLICATION OF BRIDGE COATING	ORNAMENTAL FENCE	ARCHITECTURAL CONCRETE SURFACE TREATMENT
	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LUMP SUM	LUMP SUM	No.	LIN. FT.	EACH	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	SQ. FT.
SUPERSTRUCTURE		12701	14435		LUMP SUM		LUMP SUM	LUMP SUM				127.12	127.12		LUMP SUM	LUMP SUM	LUMP SUM	237.2	819.2
END BENT 1				84.0		12512			15	900	7			53					
END BENT 2				82.6		12039			15	900	7			54					
TOTAL	2	12701	14435	166.6	LUMP SUM	24551	LUMP SUM	LUMP SUM	30	1800	14	238.8	127.12	107	LUMP SUM	LUMP SUM	LUMP SUM	237.2	819.2

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-

SHEET 3 OF 3



DocuSigned by:
 W. ALFORD
 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON NC 24-210
 OVER CSX RAILROAD

DRAWN BY : J.P. ADAMS DATE : 7/2015
 CHECKED BY : I.L. AVERETTE DATE : 8/2015

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS 84
2			4			

LOAD FACTORS:

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

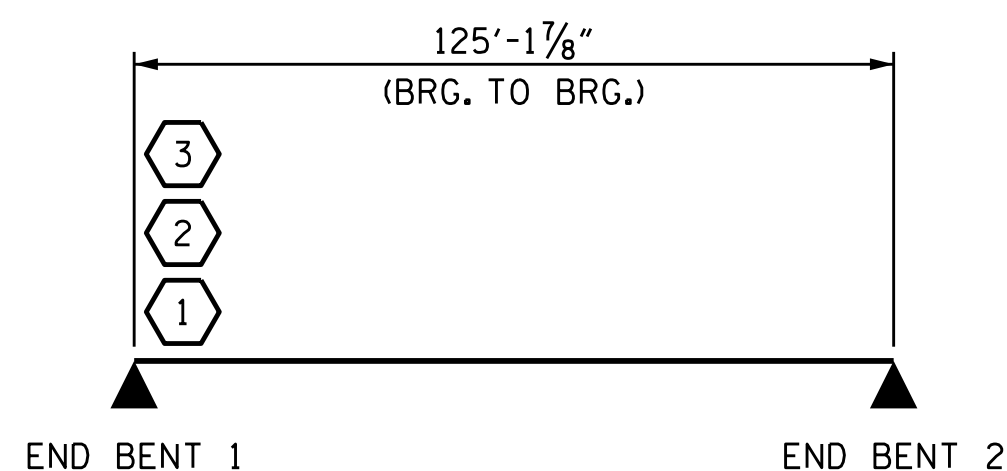
LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

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			
						LIVE-LOAD FACTORS (γ_{LL})	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ_{LL})	MOMENT						
							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)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.13	--	1.75	0.831	1.56	A	EL	62.58	0.947	1.13	A	I	0.00	1.30	0.831	1.56	A	EL	62.58		
	HL-93 (OPERATING)	N/A		1.47	--	1.35	0.831	2.03	A	EL	62.58	0.947	1.47	A	I	0.00	1.00	0.831	2.02	A	EL	62.58		
	HS-20 (INVENTORY)	36.00	②	1.65	59.33	1.75	0.831	2.31	A	EL	62.58	0.947	1.65	A	I	0.00	1.30	0.831	2.30	A	EL	62.58		
	HS-20 (OPERATING)	36.00		2.14	76.91	1.35	0.831	3.00	A	EL	62.58	0.947	2.14	A	I	0.00	1.00	0.831	2.99	A	EL	62.58		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.18	69.93	1.40	0.831	7.03	A	EL	62.58	0.947	5.18	A	I	0.00	1.30	0.831	5.60	A	EL	62.58	
		SNGARBS2	20.000		3.59	71.80	1.40	0.831	5.01	A	EL	62.58	0.947	3.59	A	I	0.00	1.30	0.831	3.99	A	EL	62.58	
		SNAGRIS2	22.000		3.30	72.60	1.40	0.831	4.66	A	EL	62.58	0.947	3.30	A	I	0.00	1.30	0.831	3.71	A	EL	62.58	
		SNCOTTS3	27.250		2.58	70.31	1.40	0.831	3.49	A	EL	62.58	0.947	2.58	A	I	0.00	1.30	0.831	2.78	A	EL	62.58	
		SNAGGRS4	34.925		2.08	72.64	1.40	0.831	2.83	A	EL	62.58	0.947	2.08	A	I	0.00	1.30	0.831	2.25	A	EL	62.58	
		SNS5A	35.550		2.07	73.59	1.40	0.831	2.77	A	EL	62.58	0.947	2.07	A	I	0.00	1.30	0.831	2.21	A	EL	62.58	
		SNS6A	39.950		1.86	74.31	1.40	0.831	2.51	A	EL	62.58	0.947	1.86	A	I	0.00	1.30	0.831	2.00	A	EL	62.58	
		SNS7B	42.000		1.80	75.60	1.40	0.831	2.39	A	EL	62.58	0.947	1.80	A	I	0.00	1.30	0.831	1.90	A	EL	62.58	
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		2.24	73.92	1.40	0.831	3.05	A	EL	62.58	0.947	2.24	A	I	0.00	1.30	0.831	2.43	A	EL	62.58	
		TNT4A	33.075		2.21	73.10	1.40	0.831	3.06	A	EL	62.58	0.947	2.21	A	I	0.00	1.30	0.831	2.43	A	EL	62.58	
		TNT6A	41.600		1.86	77.38	1.40	0.831	2.47	A	EL	62.58	0.947	1.86	A	I	0.00	1.30	0.831	1.96	A	EL	62.58	
		TNT7A	42.000		1.84	77.28	1.40	0.831	2.46	A	EL	62.58	0.947	1.84	A	I	0.00	1.30	0.831	1.96	A	EL	62.58	
		TNT7B	42.000		1.78	74.76	1.40	0.831	2.50	A	EL	62.58	0.947	1.78	A	I	0.00	1.30	0.831	1.99	A	EL	62.58	
		TNAGRIT4	43.000		1.73	74.39	1.40	0.831	2.41	A	EL	62.58	0.947	1.73	A	I	125.16	1.30	0.831	1.92	A	EL	62.58	
		TNAGT5A	45.000		1.69	76.05	1.40	0.831	2.29	A	EL	62.58	0.947	1.69	A	I	0.00	1.30	0.831	1.82	A	EL	62.58	
TNAGT5B	45.000		③	1.65	74.25	1.40	0.831	2.28	A	EL	62.58	0.947	1.65	A	I	0.00	1.30	0.831	1.81	A	EL	62.58		
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.

③	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. B-4490
CUMBERLAND COUNTY
STATION: 35+23.40 -L-



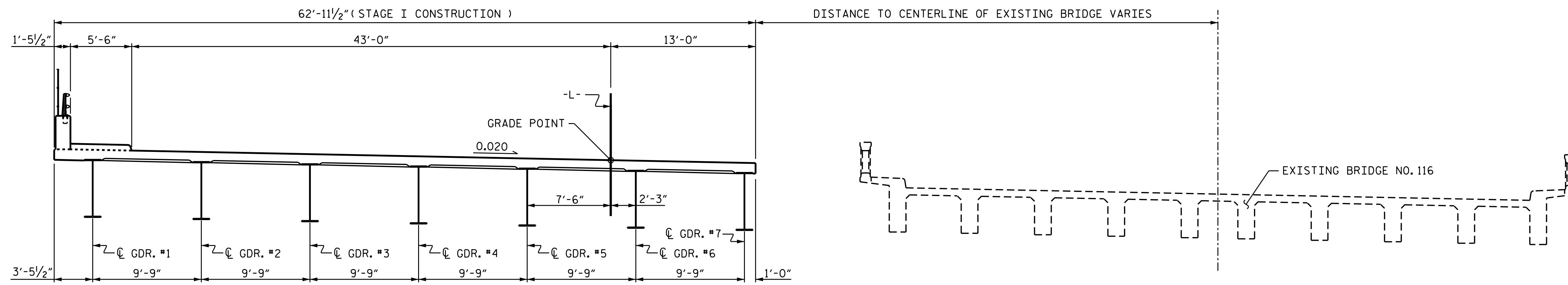
DocuSigned by:
Kristy W. Alford
3/29/2016

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

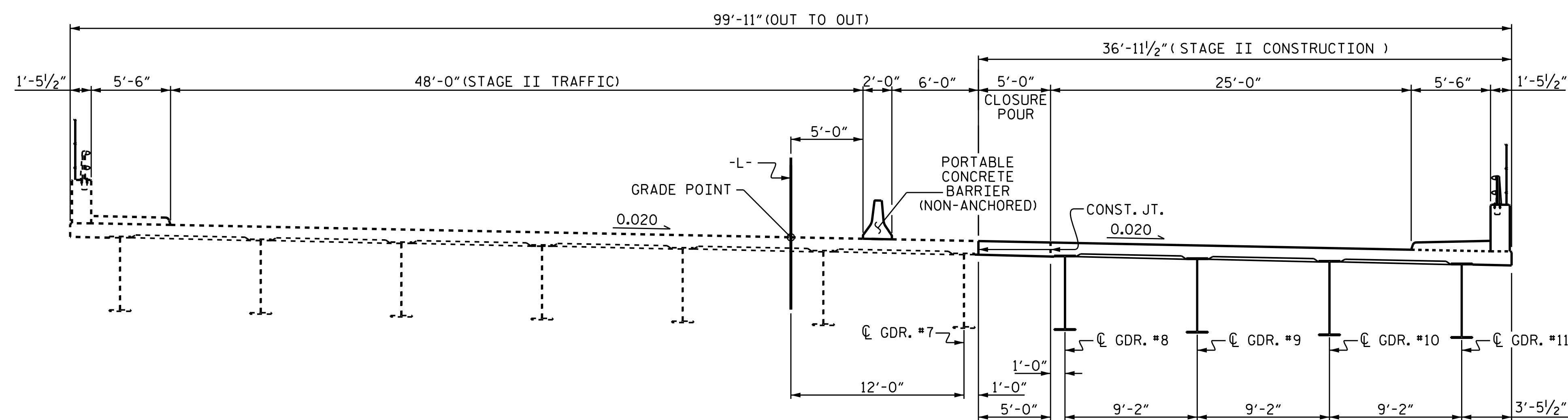
ASSEMBLED BY : T.L. AVERETTE	DATE : 10/14
CHECKED BY : J.P. ADAMS	DATE : 07/15
DRAWN BY : MAA 1/08	REV. 11/2/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
①			③			TOTAL SHEETS
②			④			84

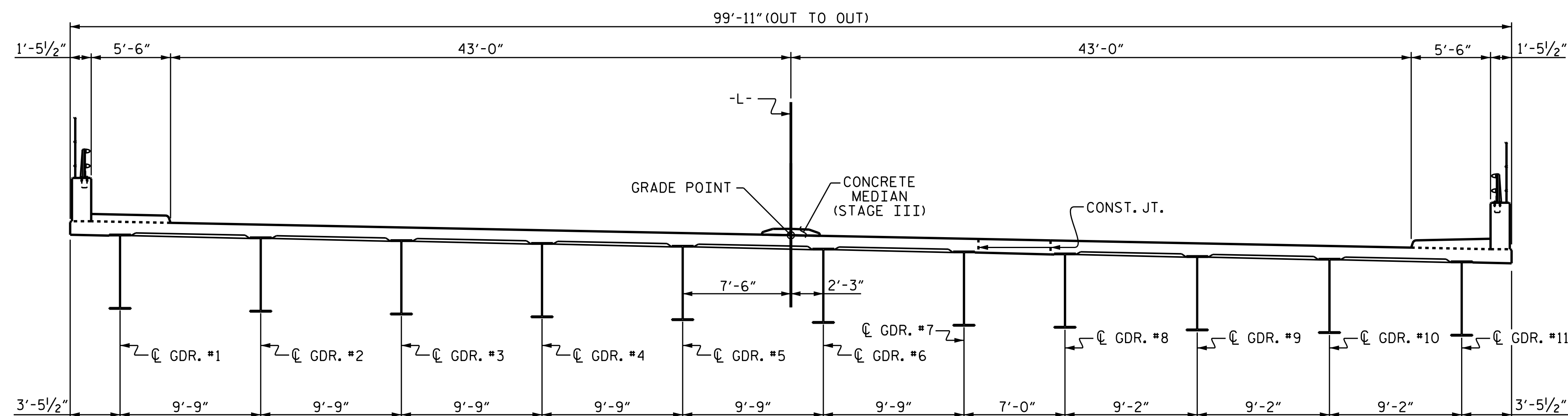


STAGE I CONSTRUCTION



STAGE II CONSTRUCTION

SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE PORTABLE CONCRETE BARRIER.

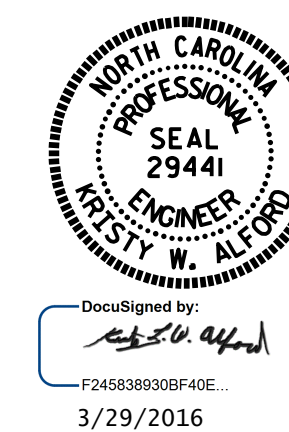


FINAL CONSTRUCTION

DISTANCE TO CENTERLINE OF EXISTING BRIDGE VARIES

EXISTING BRIDGE NO. 116

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-



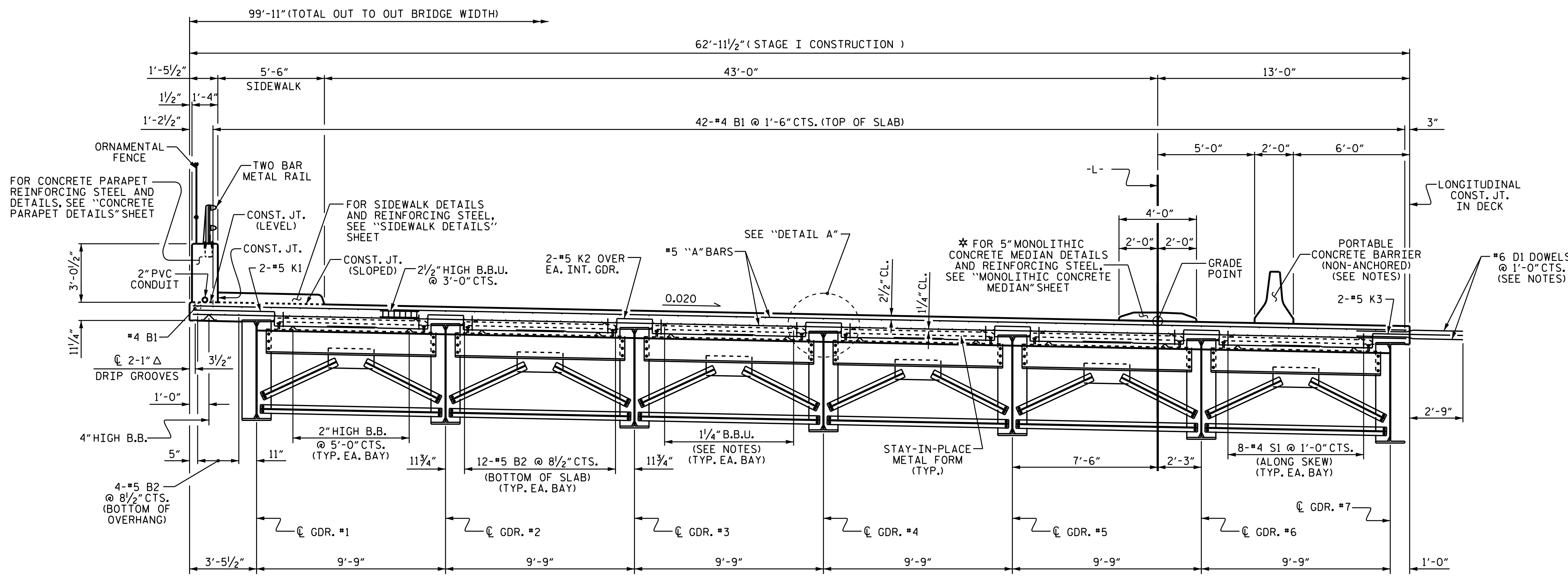
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

CONSTRUCTION SEQUENCE

DRAWN BY : I.L. AVERETTE DATE : 10-14
 CHECKED BY : J.P. ADAMS DATE : 07-15
 DESIGN ENGINEER OF RECORD : I.L. AVERETTE DATE : 09-15

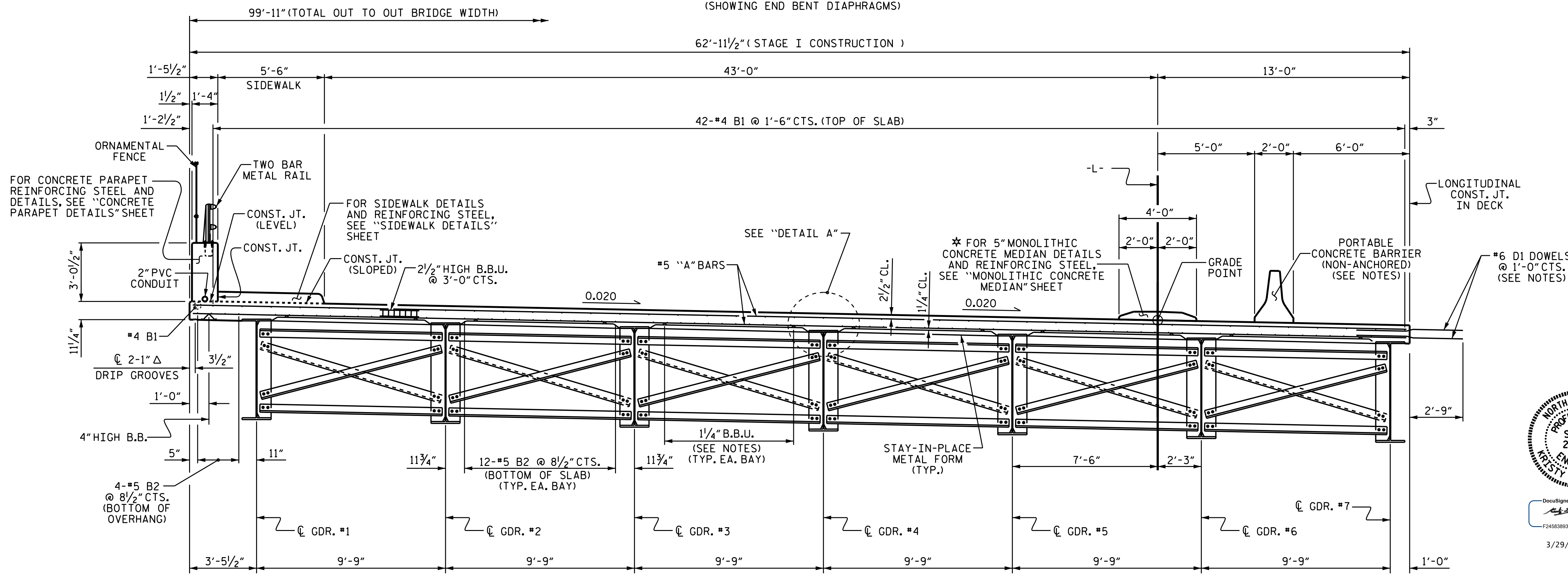
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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
1			3			84	
2			4				



TYPICAL SECTION - STAGE I

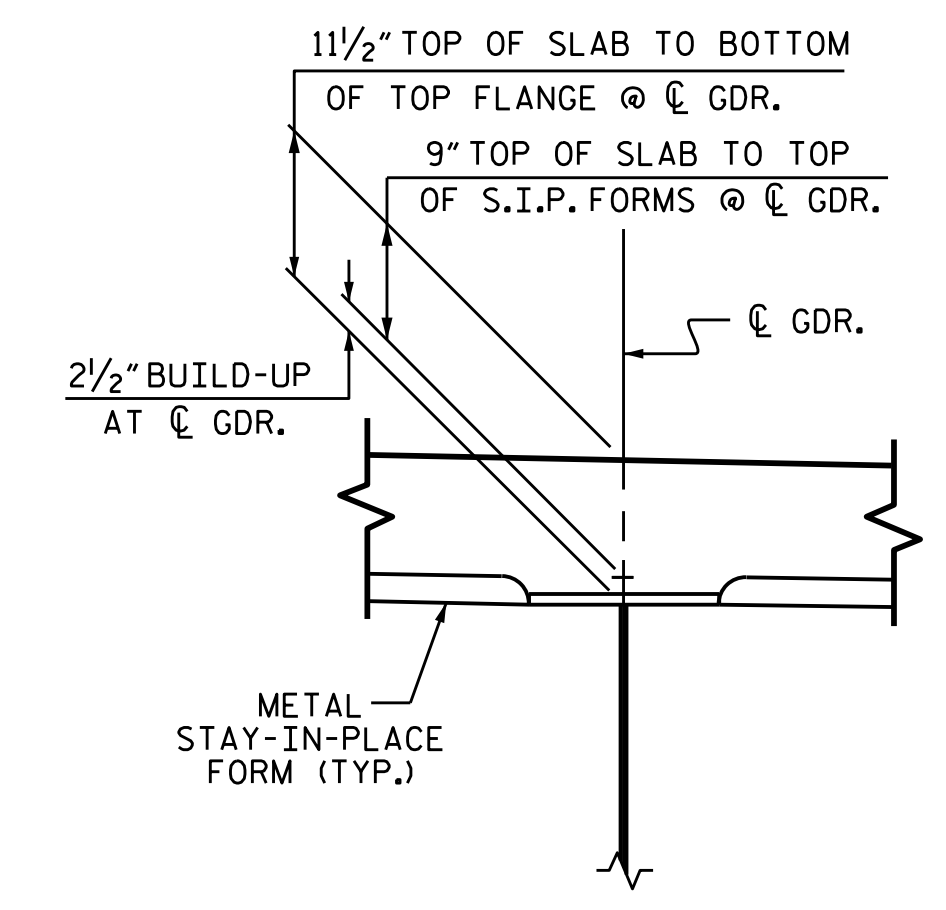
(SHOWING END BENT DIAPHRAGMS)



TYPICAL SECTION - STAGE I

(SHOWING INTERMEDIATE DIAPHRAGMS)

- NOTES**
- PROVIDE 1 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
 - PREVIOUSLY CAST CONCRETE IN THE SPAN SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE SPAN.
 - PARAPET AND SIDEWALK IN THE SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
 - *6 D1 DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM SLAB REINFORCING STEEL.
 - THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER 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 #5 "G" BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL.
 - FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
 - SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE PORTABLE CONCRETE BARRIER.
 - ALL REINFORCING STEEL IN PARAPETS, END POSTS, SIDEWALKS AND CONCRETE MEDIAN SHALL BE EPOXY COATED.
 - FOR ORNAMENTAL FENCE, SEE SPECIAL PROVISIONS.



DETAIL "A"

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-

SHEET 1 OF 2



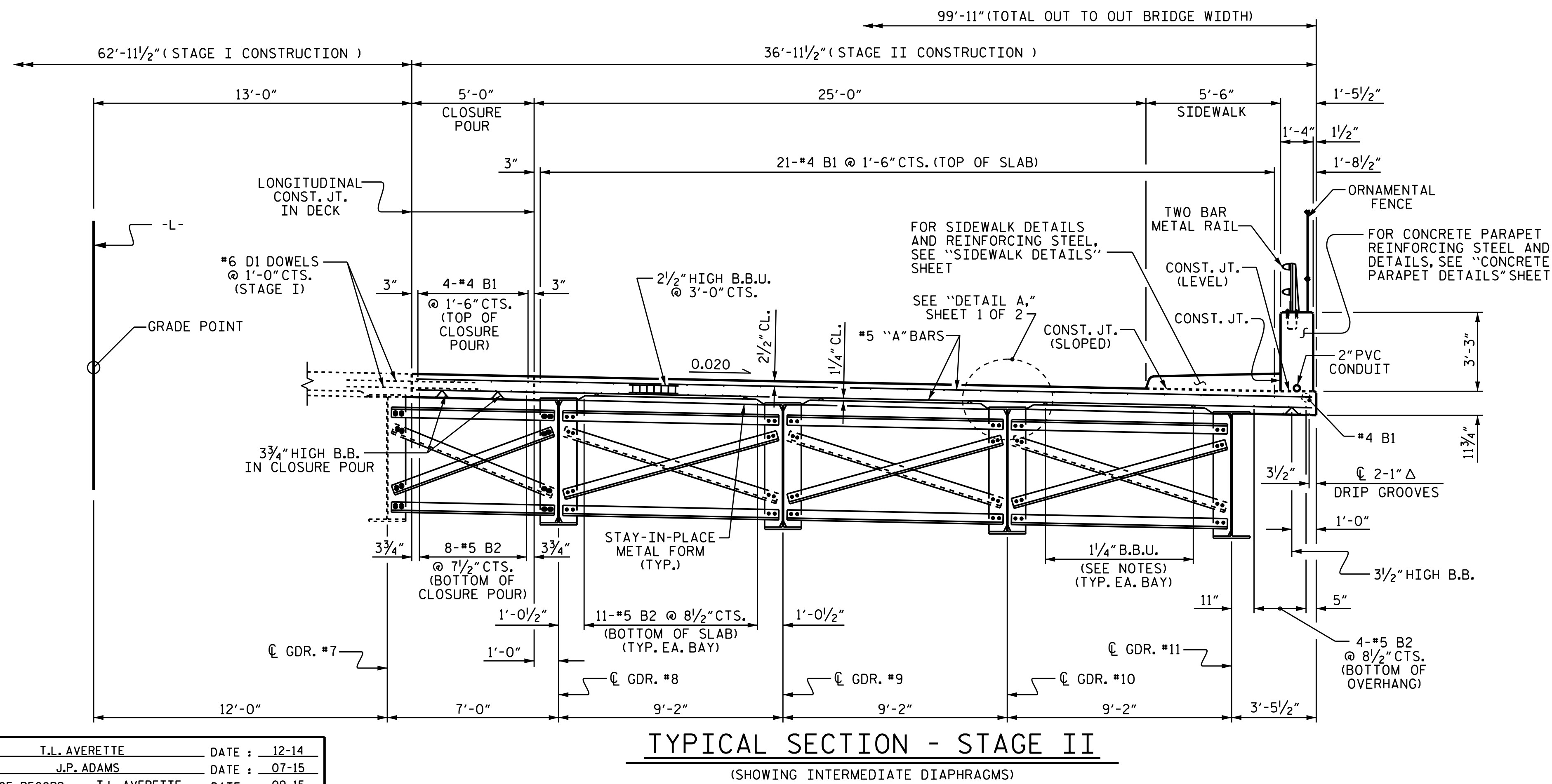
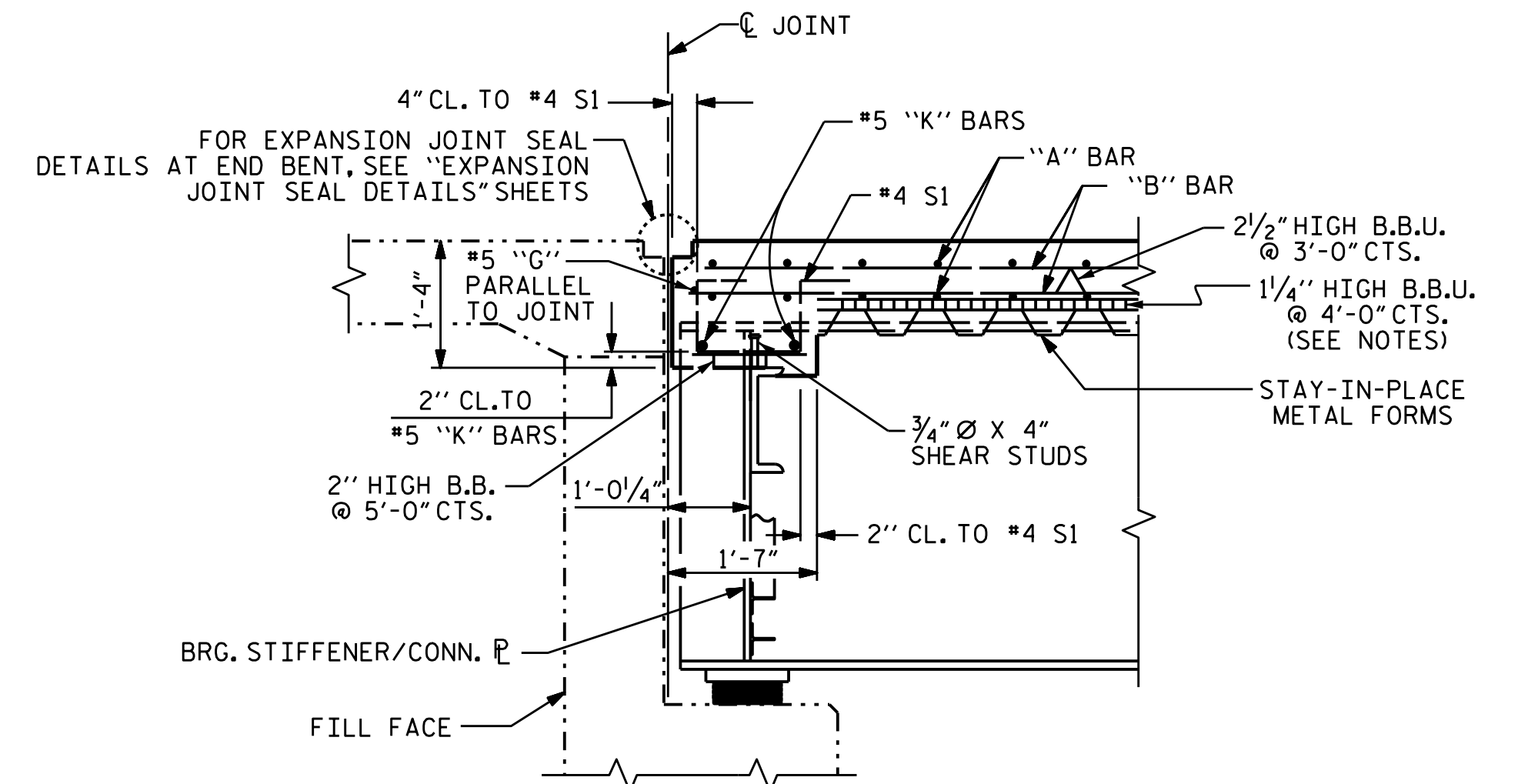
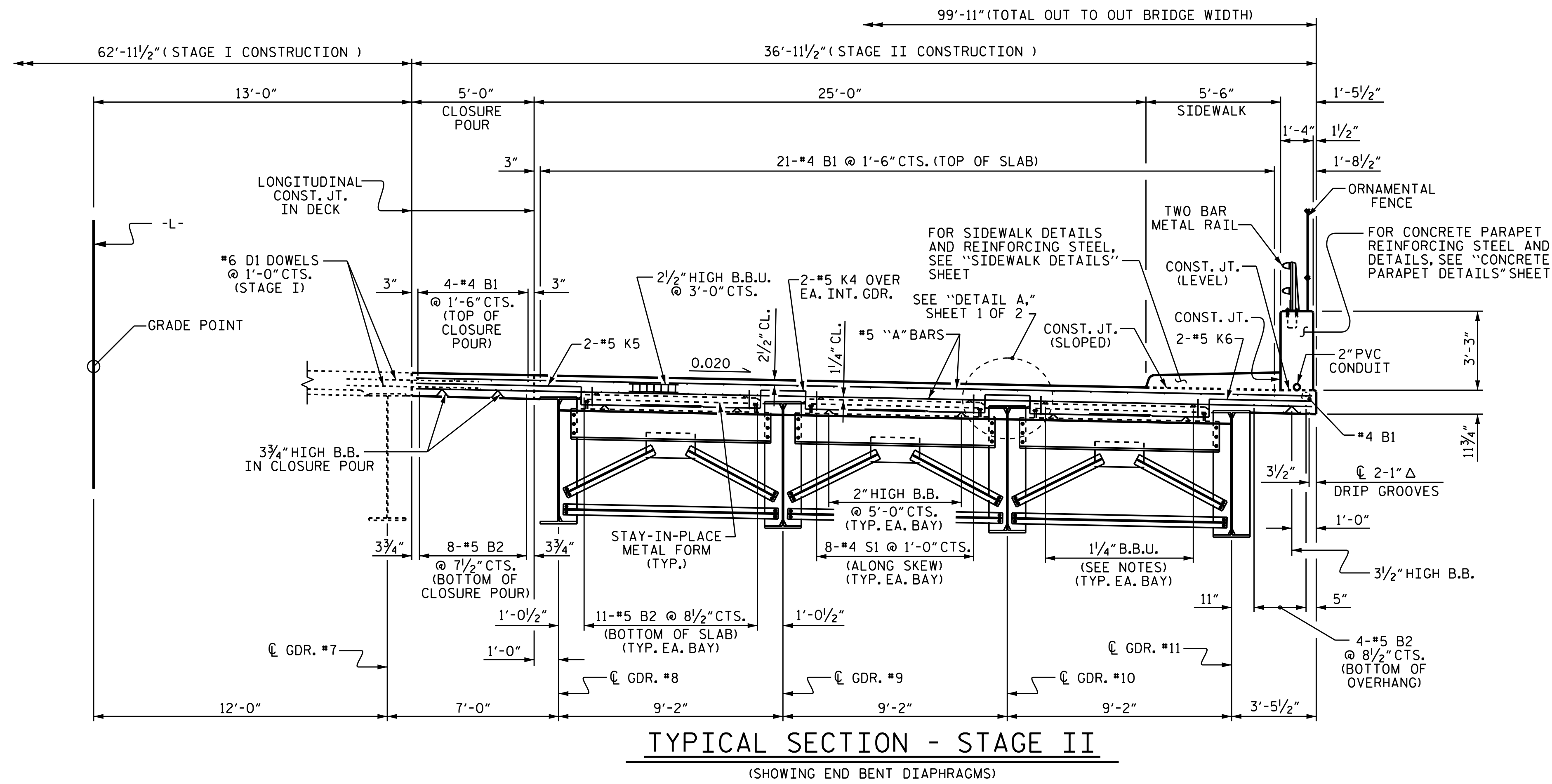
DocuSigned by:
 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION
 STAGE I

DRAWN BY : I.L. AVERETTE DATE : 12-14
 CHECKED BY : J.P. ADAMS DATE : 07-15
 DESIGN ENGINEER OF RECORD : I.L. AVERETTE DATE : 09-15

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			84



PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-
 SHEET 2 OF 2

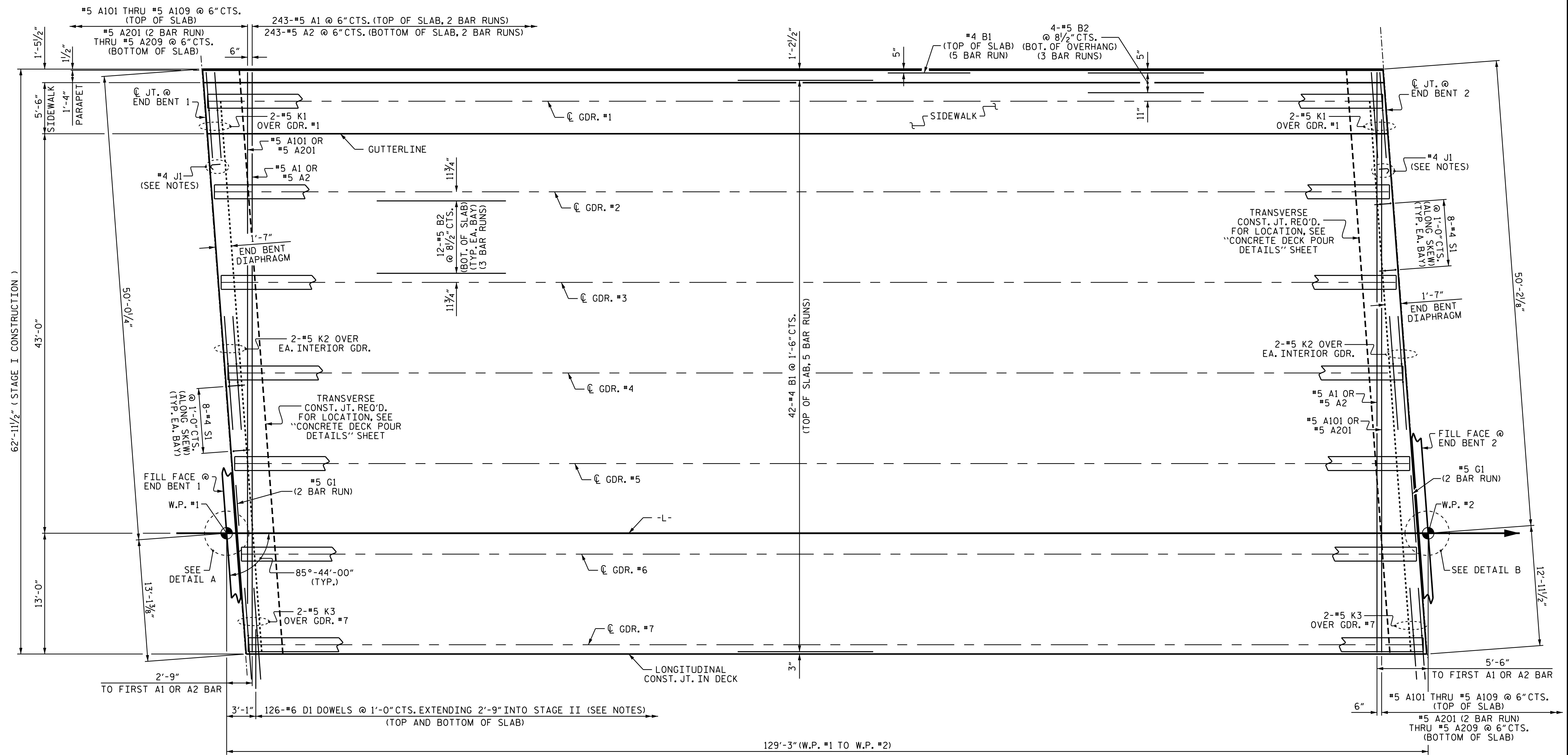


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 3/29/2016

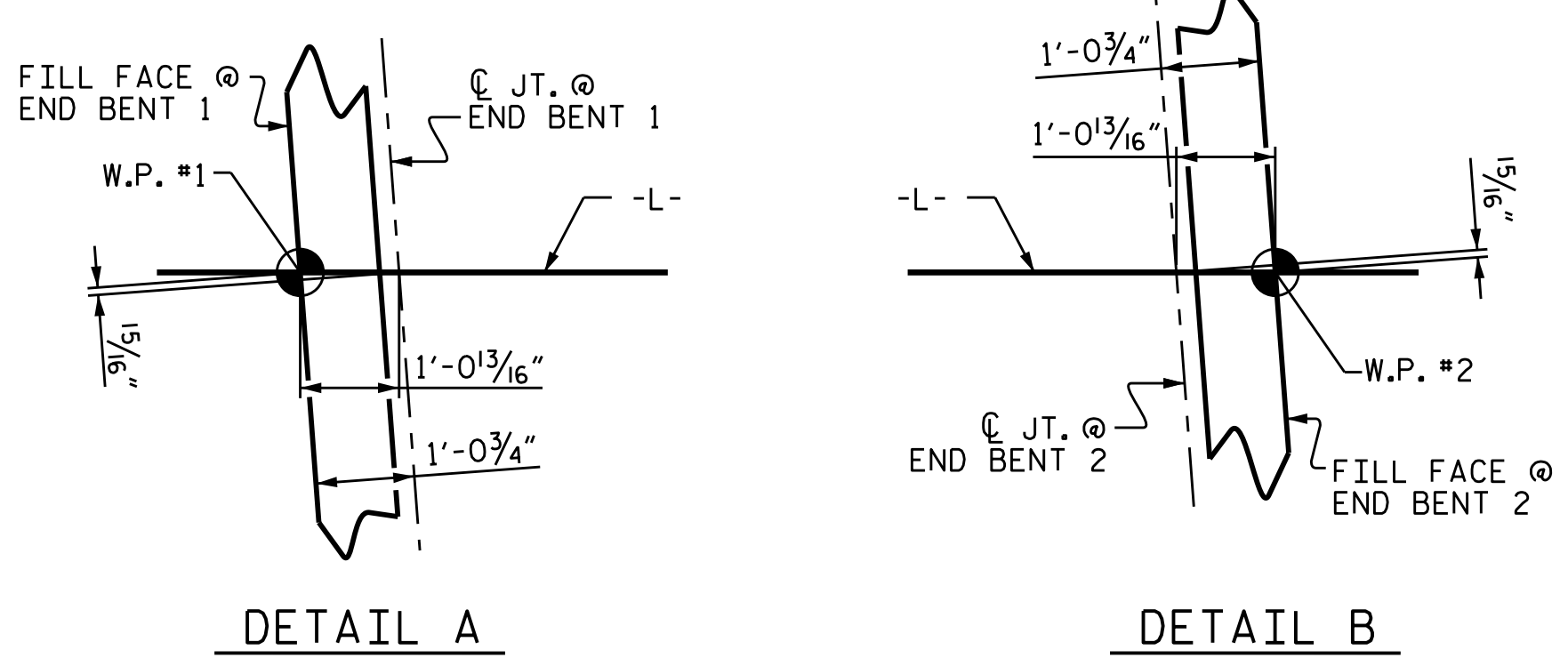
STATE OF NORTH CAROLINA						SHEET NO.
DEPARTMENT OF TRANSPORTATION						S-49
RALEIGH						TOTAL SHEETS
SUPERSTRUCTURE						84
TYPICAL SECTION						
STAGE II						
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DRAWN BY : I.L. AVERETTE DATE : 12-14
 CHECKED BY : J.P. ADAMS DATE : 07-15
 DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

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 FINAL UNLESS ALL
 SIGNATURES COMPLETED



PLAN OF SPAN A - STAGE I



NOTES

- CONCRETE MEDIAN NOT SHOWN FOR CLARITY.
- FOR CONCRETE PARAPET REINFORCING STEEL AND DETAILS, SEE "CONCRETE PARAPET DETAILS" SHEET.
- FOR SIDEWALK REINFORCING STEEL AND DETAILS, SEE "SIDEWALK DETAILS" SHEET.
- PERMITTED CONSTRUCTION JOINT NOT SHOWN. FOR LOCATION, SEE "CONCRETE DECK POUR DETAILS" SHEET.
- *6 D1 DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM REINFORCING STEEL.
- FOR PLACEMENT OF #4 J1 BAR, SEE "EXPANSION JOINT SEAL DETAILS" SHEET.



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3/29/2016

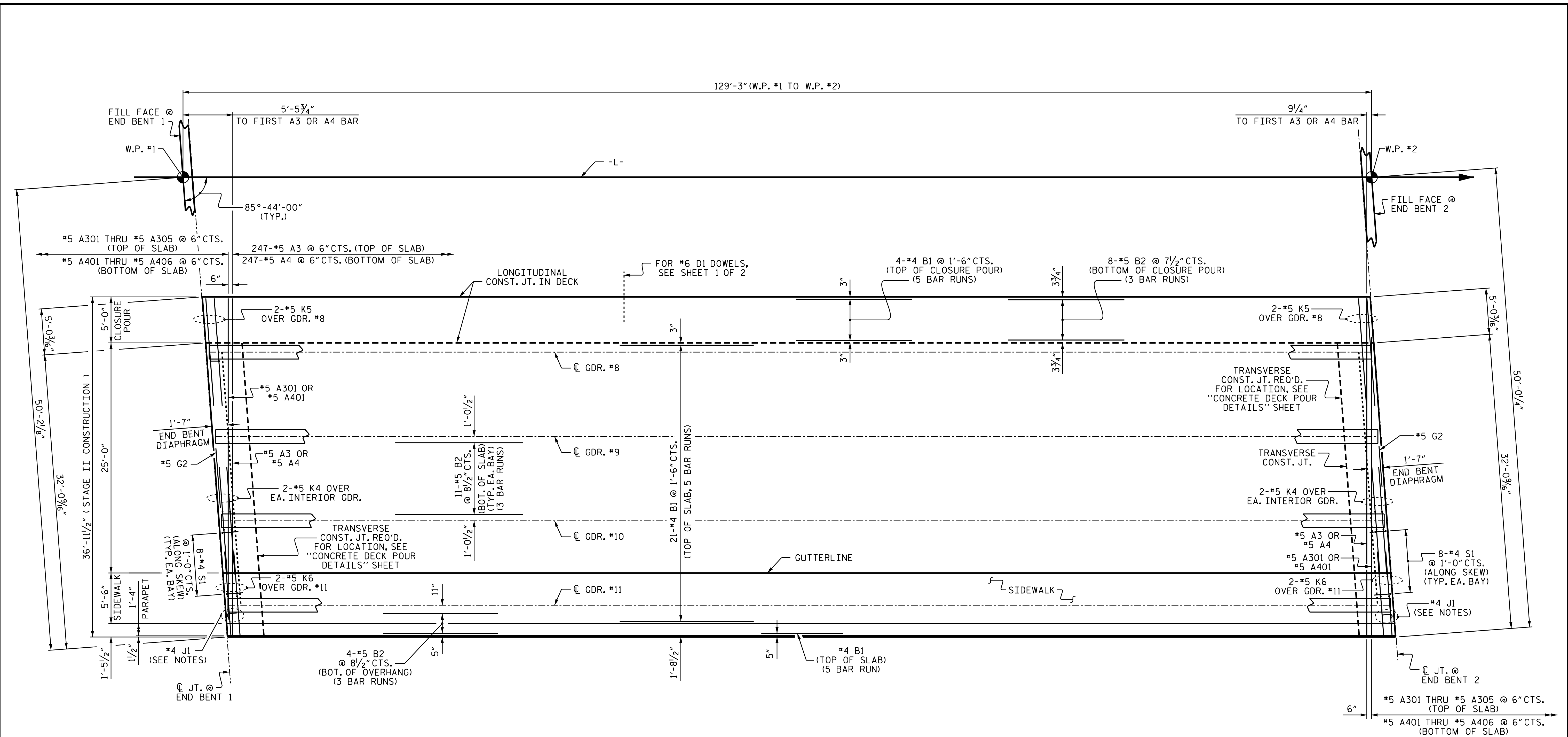
PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-

SHEET 1 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPAN
 STAGE I

DRAWN BY : I.L. AVERETTE DATE : 12-14
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 DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50	
1			3			TOTAL SHEETS	
2			4			84	



PLAN OF SPAN A - STAGE II

NOTES

- FOR CONCRETE PARAPET REINFORCING STEEL AND DETAILS, SEE "CONCRETE PARAPET DETAILS" SHEET.
- FOR SIDEWALK REINFORCING STEEL AND DETAILS, SEE "SIDEWALK DETAILS" SHEET.
- FOR PLACEMENT OF #4 J1 BAR, SEE "EXPANSION JOINT SEAL DETAILS" SHEET.



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CUMBERLAND COUNTY
 STATION: 35+23.40 -L-

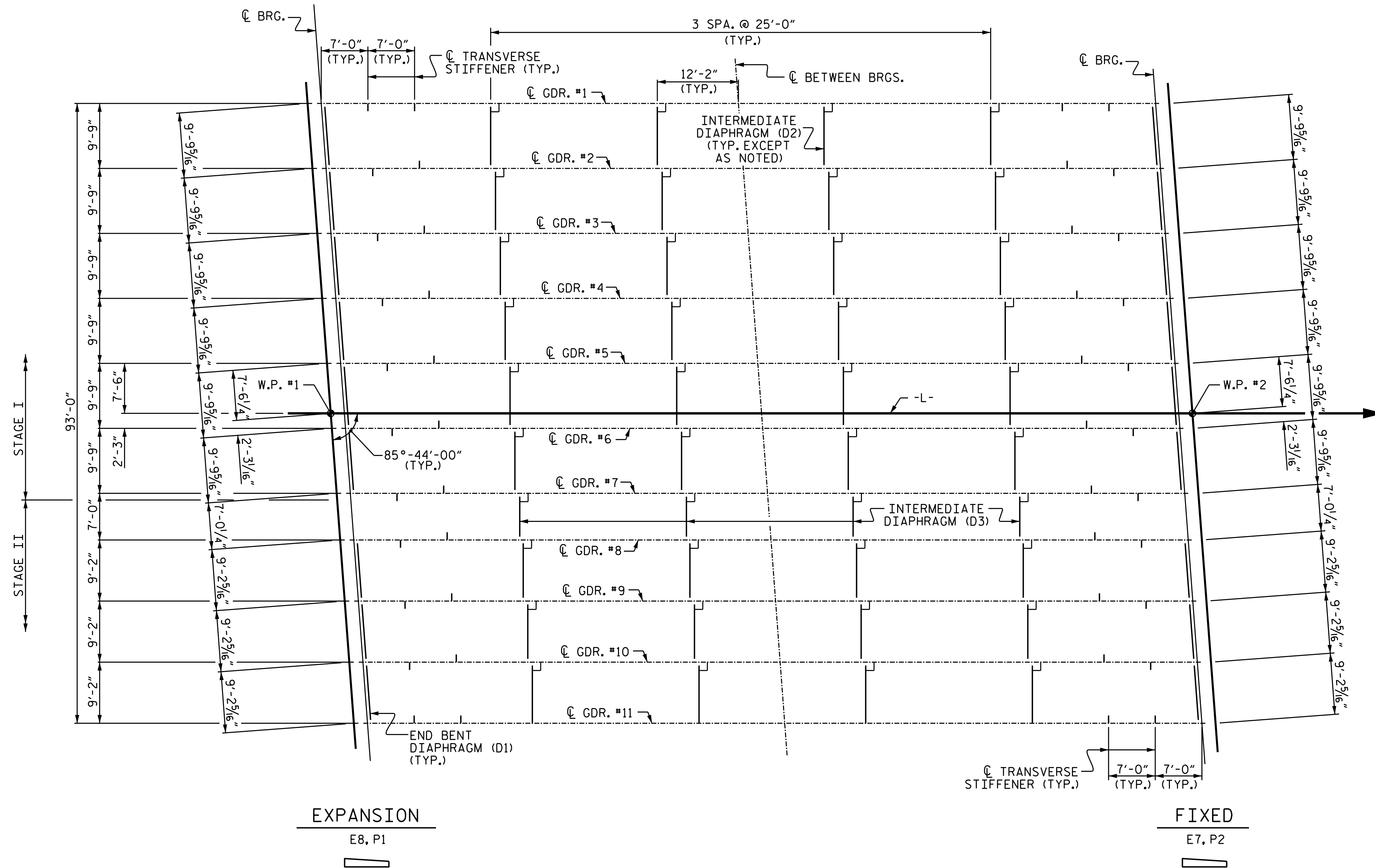
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 PLAN OF SPAN
 STAGE II**

DRAWN BY : I.L. AVERETTE DATE : 12-14
 CHECKED BY : J.P. ADAMS DATE : 07-15
 DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51	
1			3			TOTAL SHEETS	
2			4			84	



FRAMING PLAN

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-



DocuSigned by:
 Kristy W. Alford
 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 FRAMING PLAN**

DRAWN BY : I.L. AVERETTE DATE : 01-15
 CHECKED BY : J.P. ADAMS DATE : 07-15
 DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-52	
1			3			TOTAL SHEETS	
2			4			84	

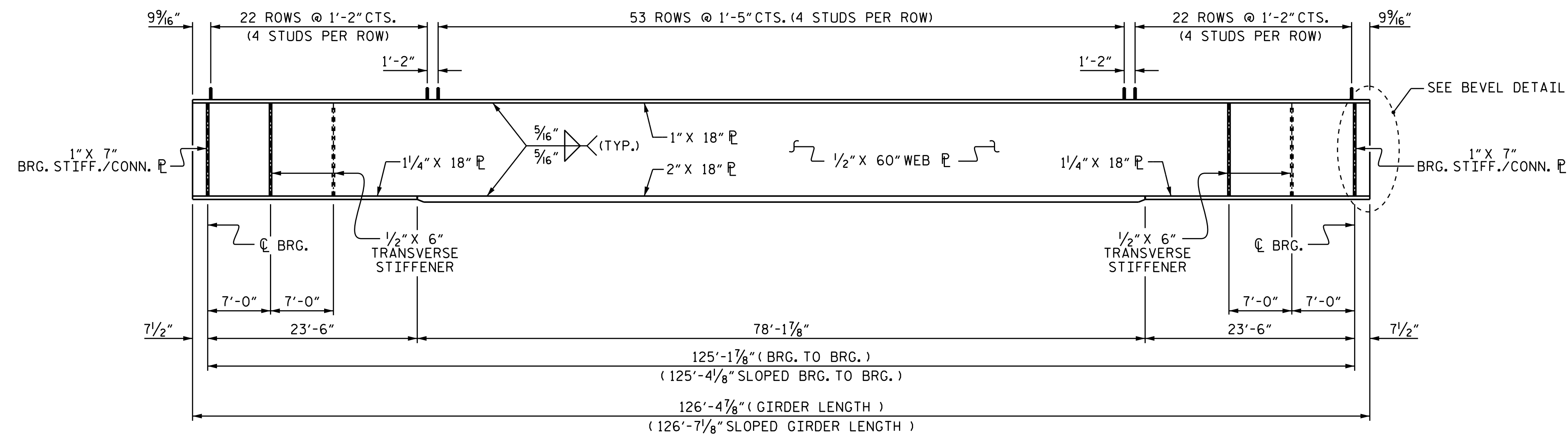
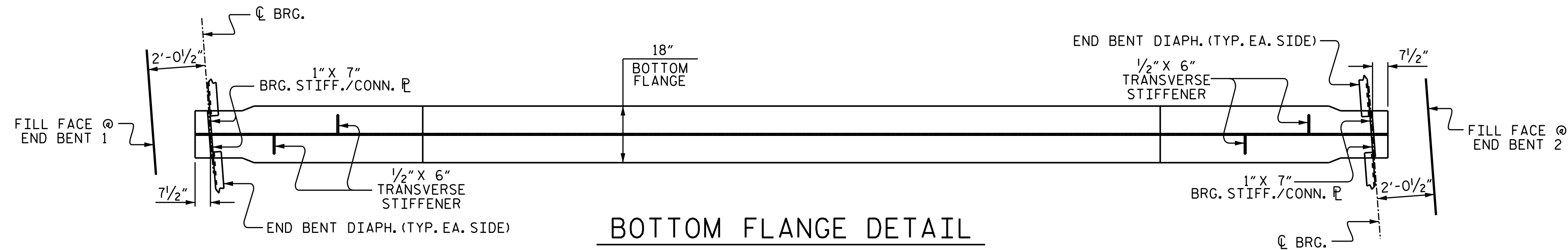
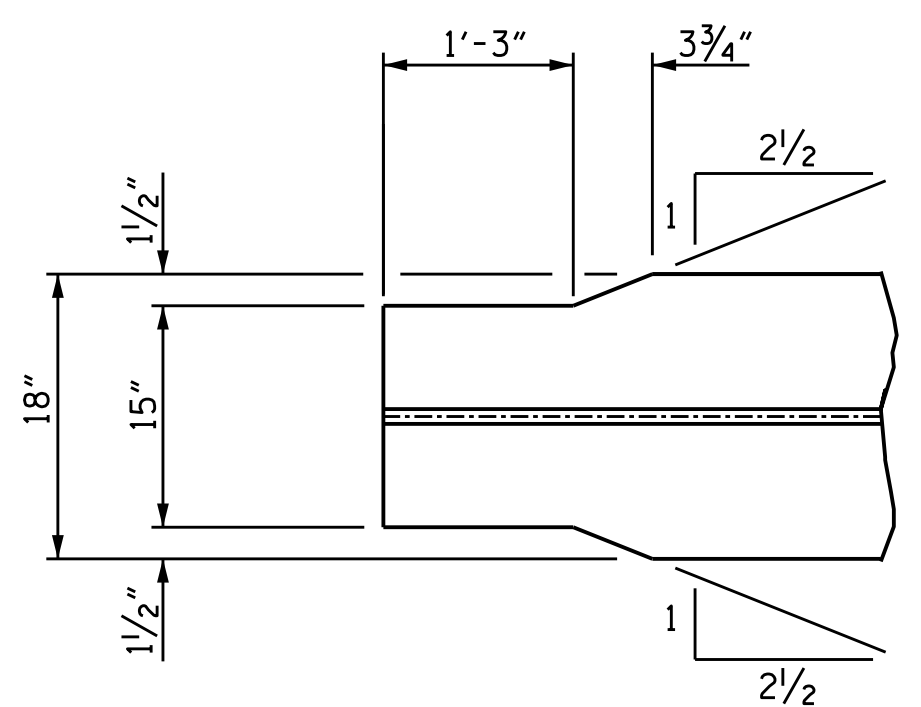


PLATE GIRDER ELEVATION

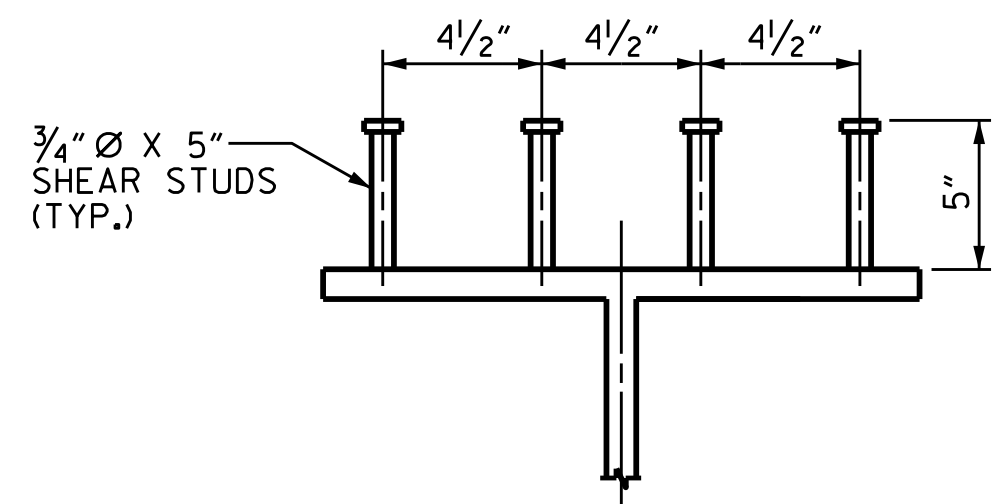


BOTTOM FLANGE DETAIL

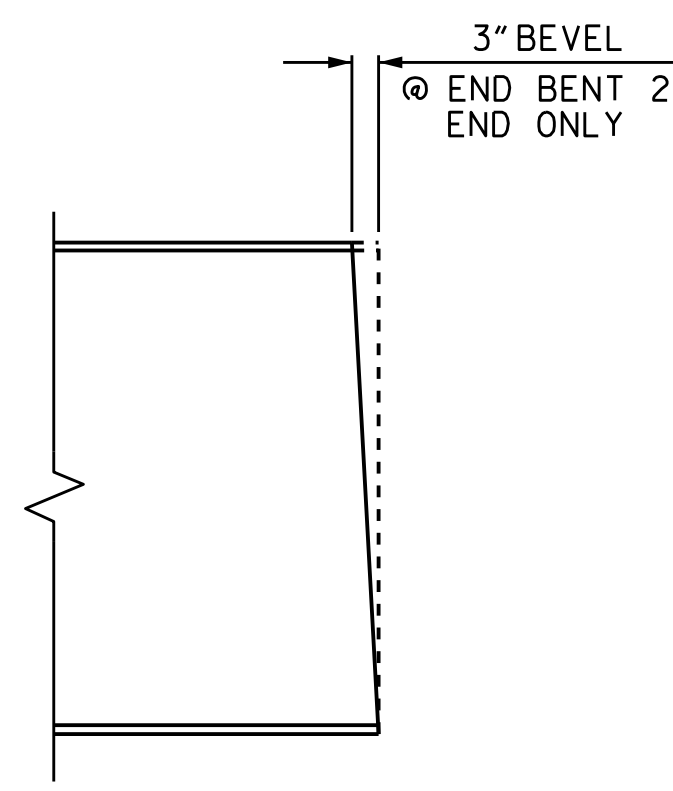
(INTERIOR GIRDER SHOWN, EXTERIOR GIRDER SIMILAR, EXCEPT TRANSVERSE STIFFENERS ON INSIDE OF WEB ONLY)



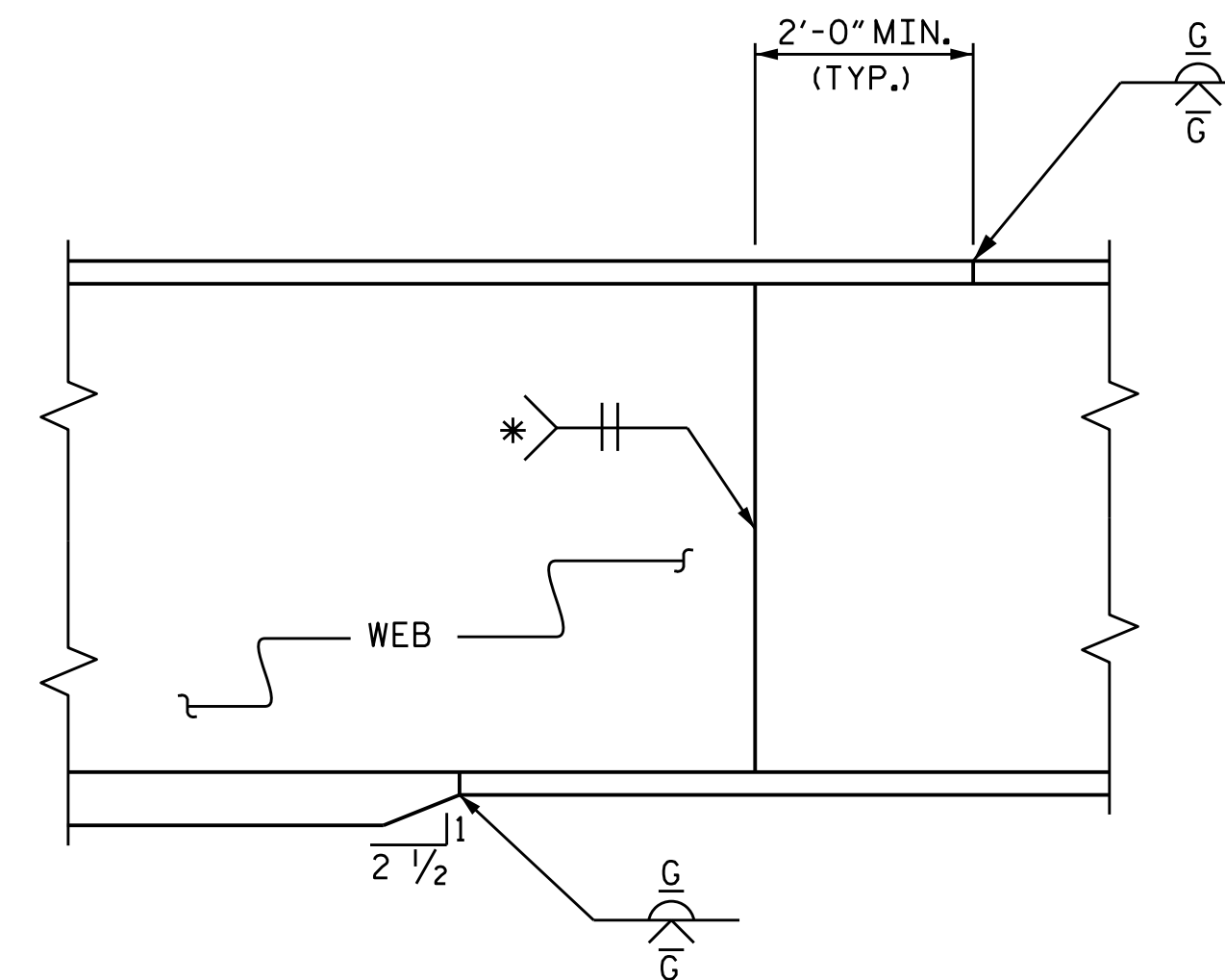
END OF GIRDER DETAIL
(BOTTOM FLANGE ONLY)



SHEAR STUD DETAIL
(ON GIRDERS)



BEVEL DETAIL



PERMISSIBLE SHOP FLANGE & WEB SPLICE

* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR GIRDERS

NOTES

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH THE "PAINTING OF STRUCTURAL STEEL" SPECIAL PROVISION 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 ALONG THE SKEW AND SHALL BE PLUMB.

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

NUTS ON BOLTS FOR CONNECTING DIAPHRAGM TO CONNECTOR PLATE SHALL BE LEFT LOOSE FOR PURPOSE OF ADJUSTMENT UNTIL BOTH SIDES OF SLAB HAVE BEEN POURED.

PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). 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 ASTM A325 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.

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR STEEL DEAD LOAD FIT UP.

AT THE CONTRACTOR'S OPTION, THE DIAPHRAGM WITH THE WELDED GUSSET PLATES MAY BE USED IN LIEU OF THE DIAPHRAGM WITH BOLTED ANGLES AT NO ADDITIONAL COST TO THE DEPARTMENT.

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 35+23.40 -L-

SHEET 1 OF 3



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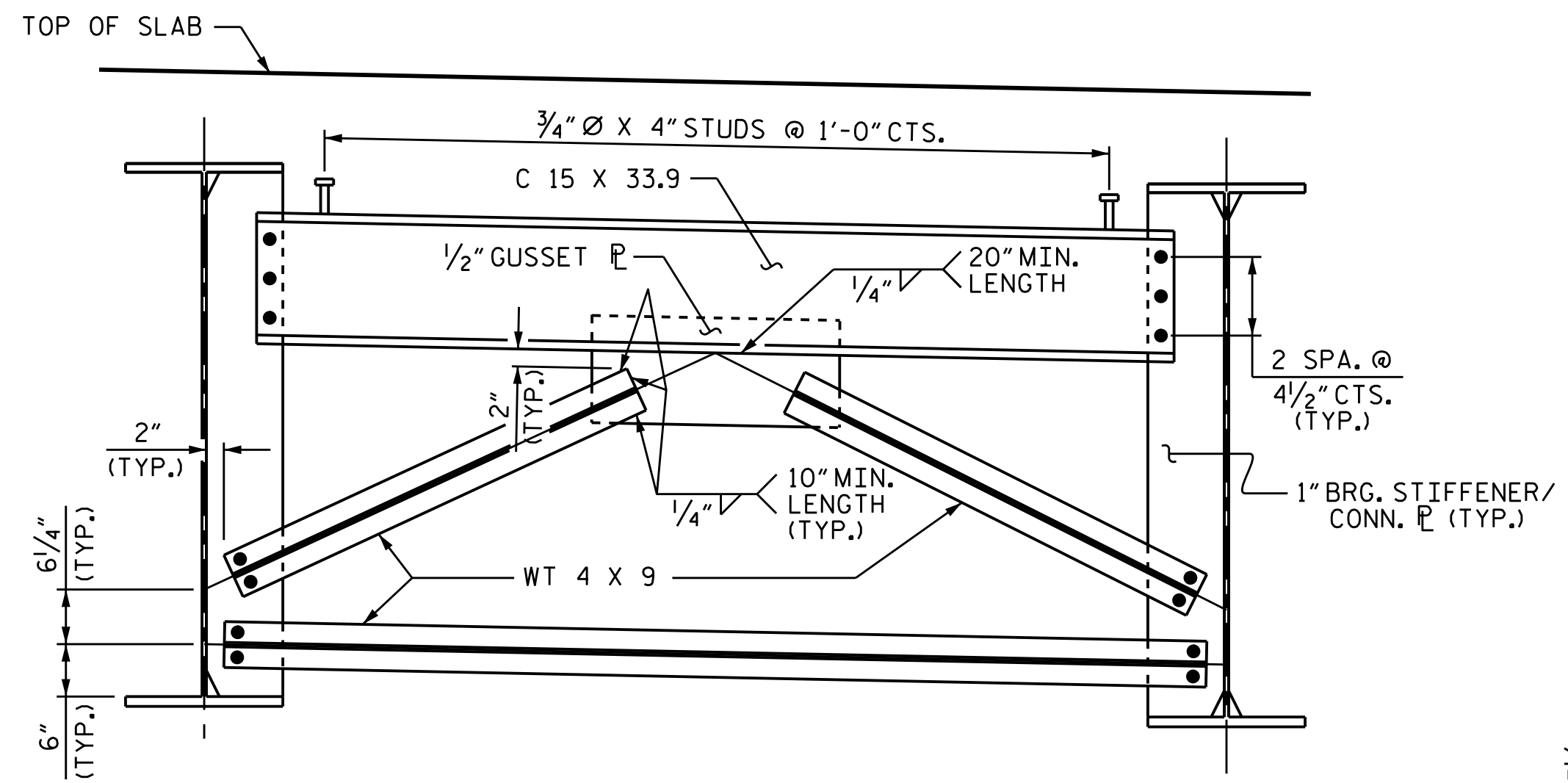
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL
DETAILS

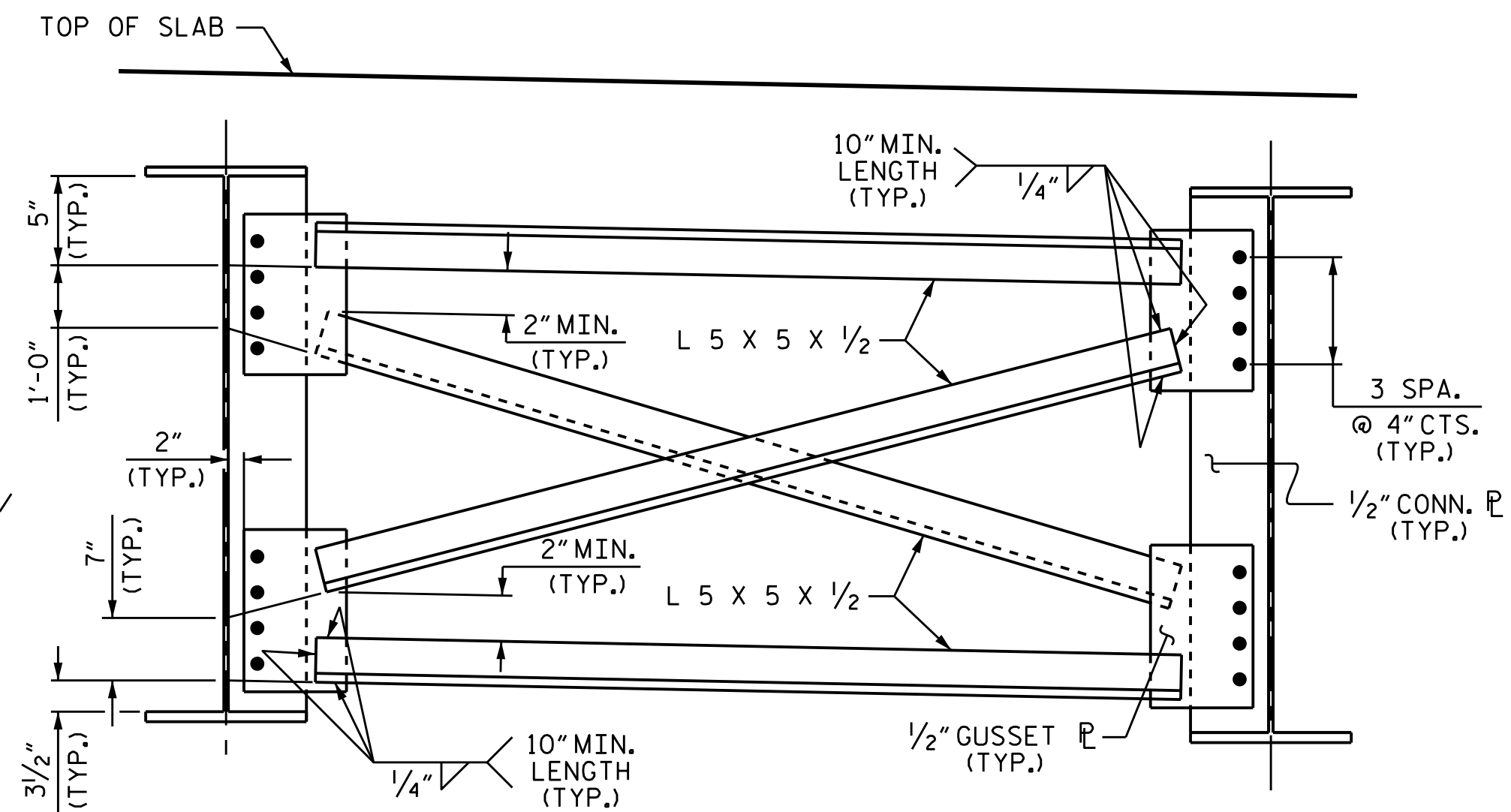
DRAWN BY : I.L. AVERETTE DATE : 01-15
CHECKED BY : J.P. ADAMS DATE : 07-15
DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

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SIGNATURES COMPLETED

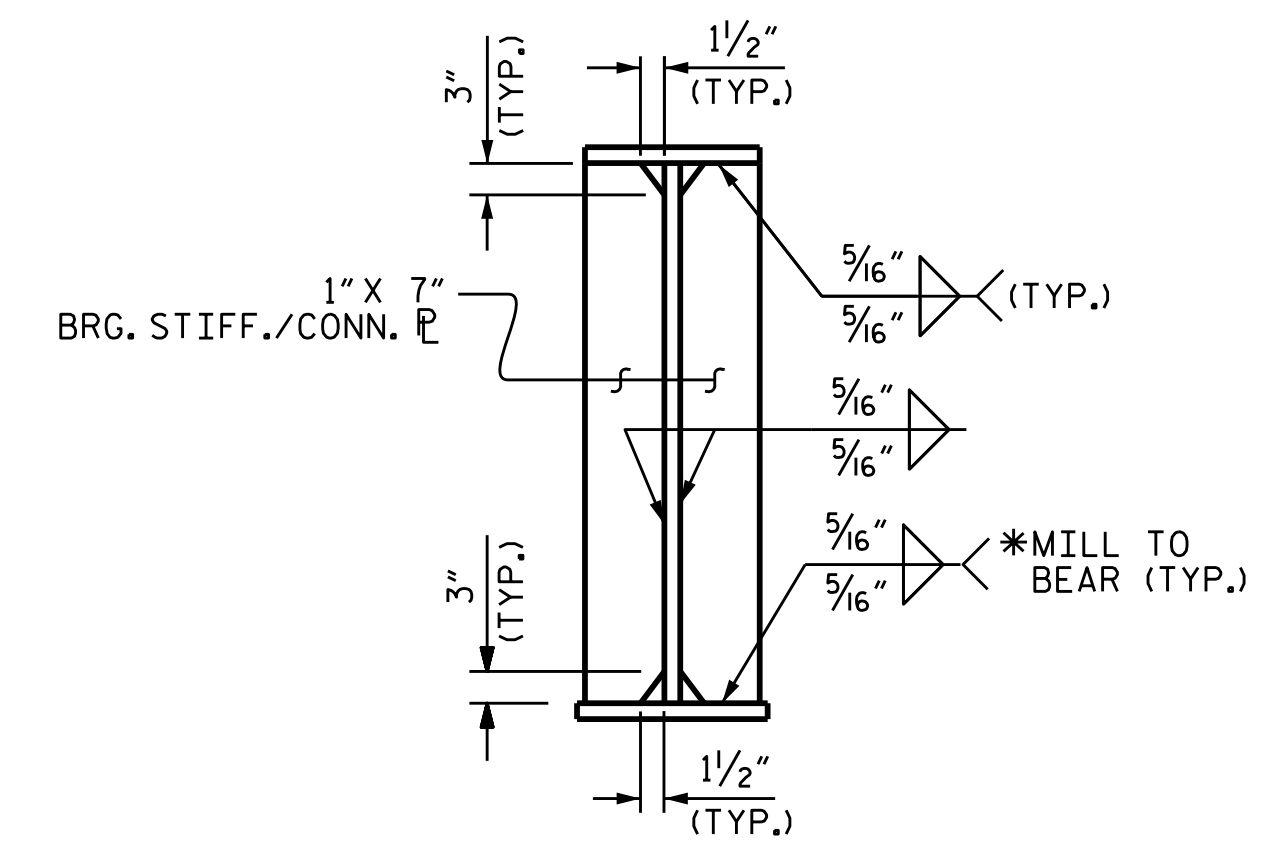
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53
1			3			TOTAL SHEETS
2			4			84



TYPICAL END BENT DIAPHRAGM (D1)

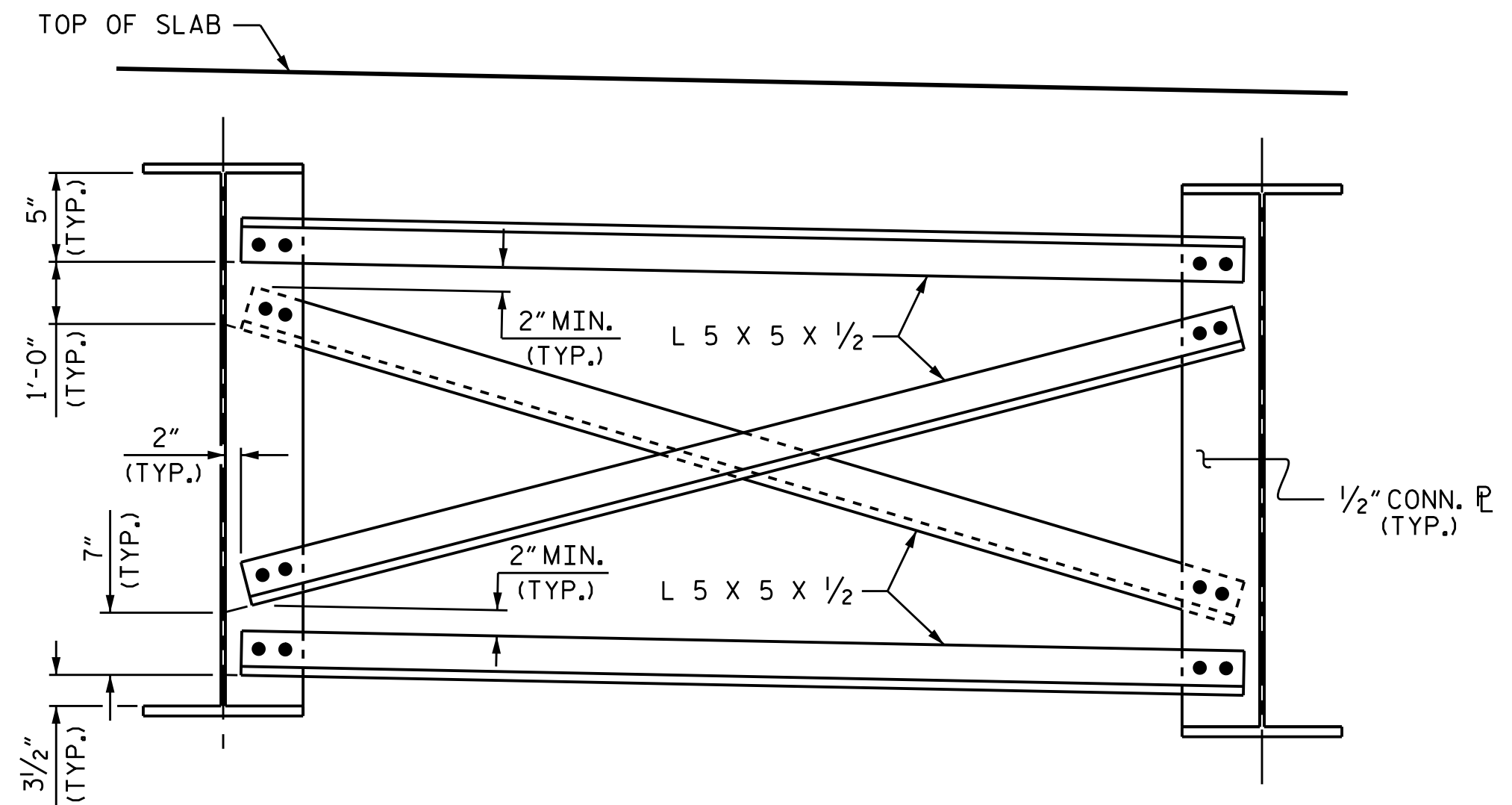


OPTIONAL INTERMEDIATE DIAPHRAGM

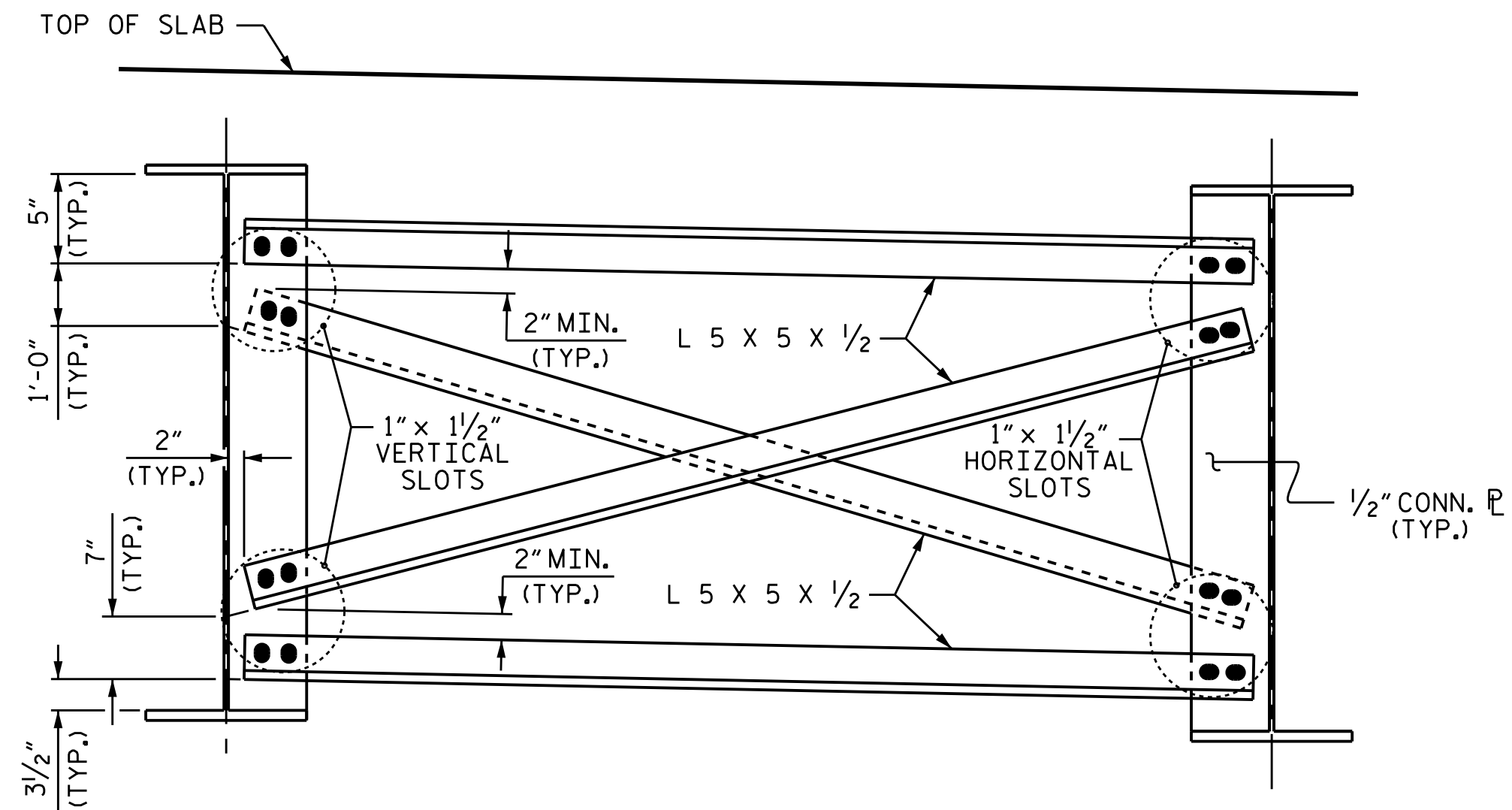


BEARING STIFFENER / CONNECTOR PLATE

(@ END BENT DIAPHRAGMS)
* NOTE: WELD ONLY WHEN USED AS A CONNECTOR PLATE

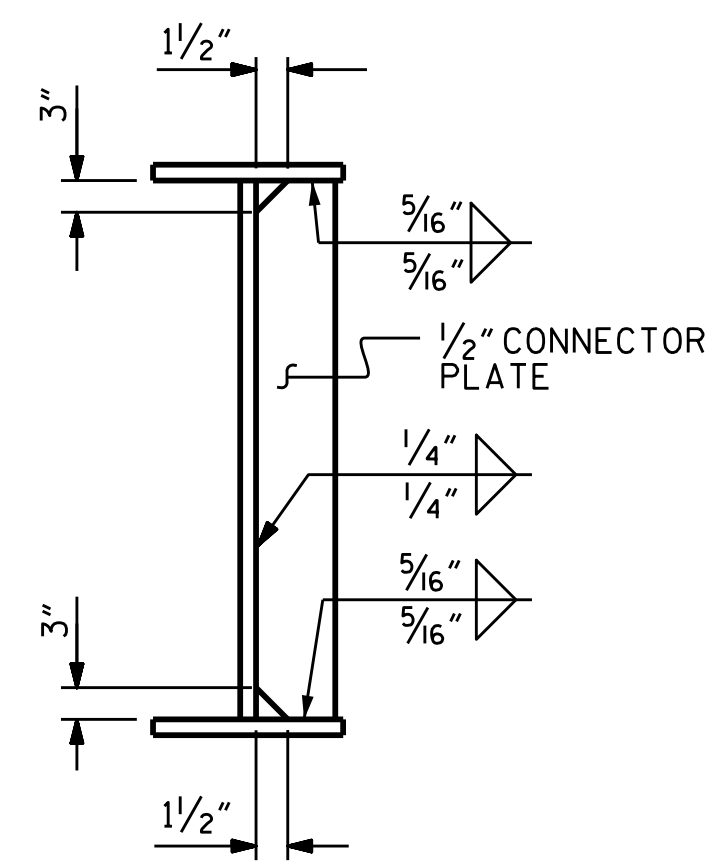


TYPICAL INTERMEDIATE DIAPHRAGM (D2)



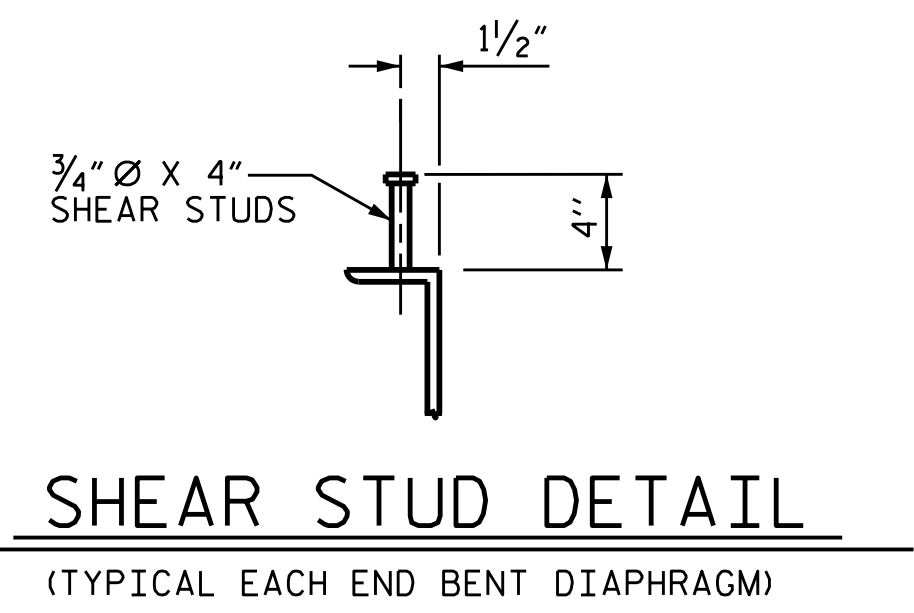
TYPICAL INTERMEDIATE DIAPHRAGM (D3)

NOTE: NUTS ON BOLTS FOR CONNECTING DIAPHRAGM TO CONNECTOR PLATE SHALL BE LEFT LOOSE FOR PURPOSE OF ADJUSTMENT UNTIL BOTH SIDES OF SLAB HAVE BEEN POURED.

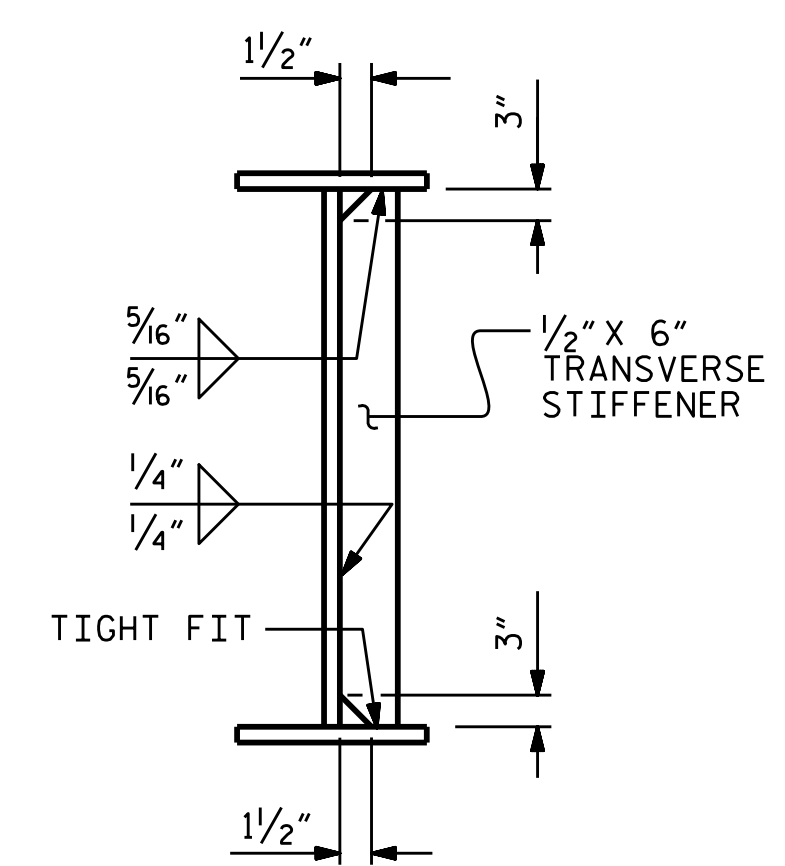


CONNECTOR PLATE

(@ INTERMEDIATE DIAPHRAGMS)



SHEAR STUD DETAIL
(TYPICAL EACH END BENT DIAPHRAGM)



TRANSVERSE STIFFENER



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3/29/2016

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CUMBERLAND COUNTY
STATION: 35+23.40 -L-

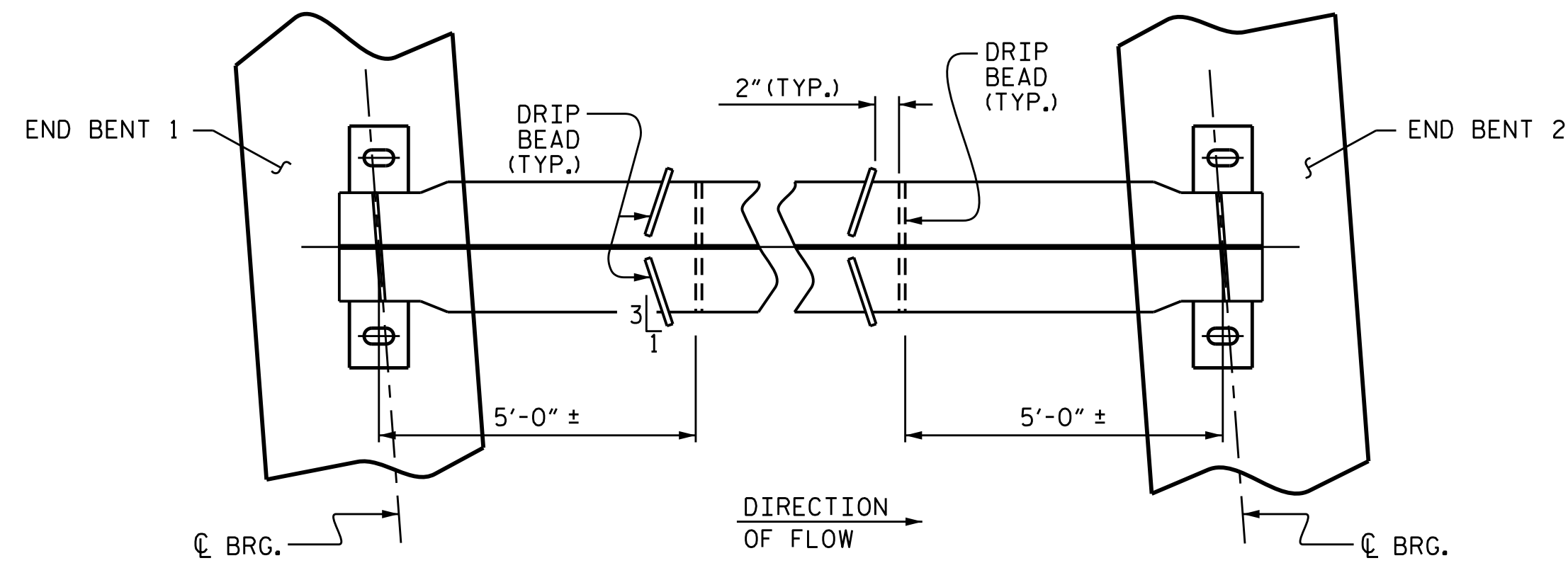
SHEET 2 OF 3

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

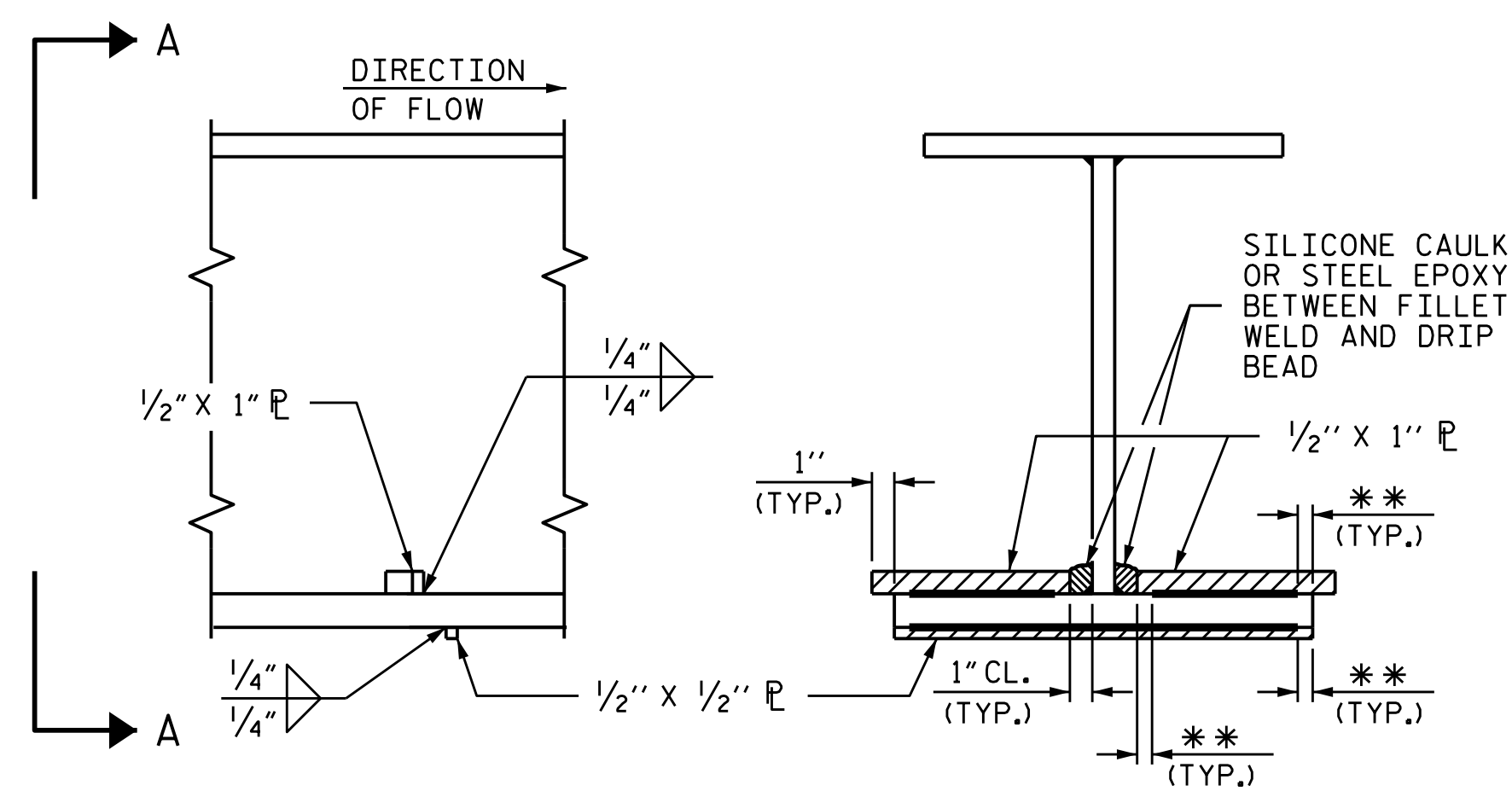
DRAWN BY : I.L. AVERETTE DATE : 01-15
CHECKED BY : J.P. ADAMS DATE : 07-15
DESIGN ENGINEER OF RECORD : I.L. AVERETTE DATE : 09-15

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-54	
1			3			TOTAL	84
2			4				



PART PLAN - BOTTOM FLANGE

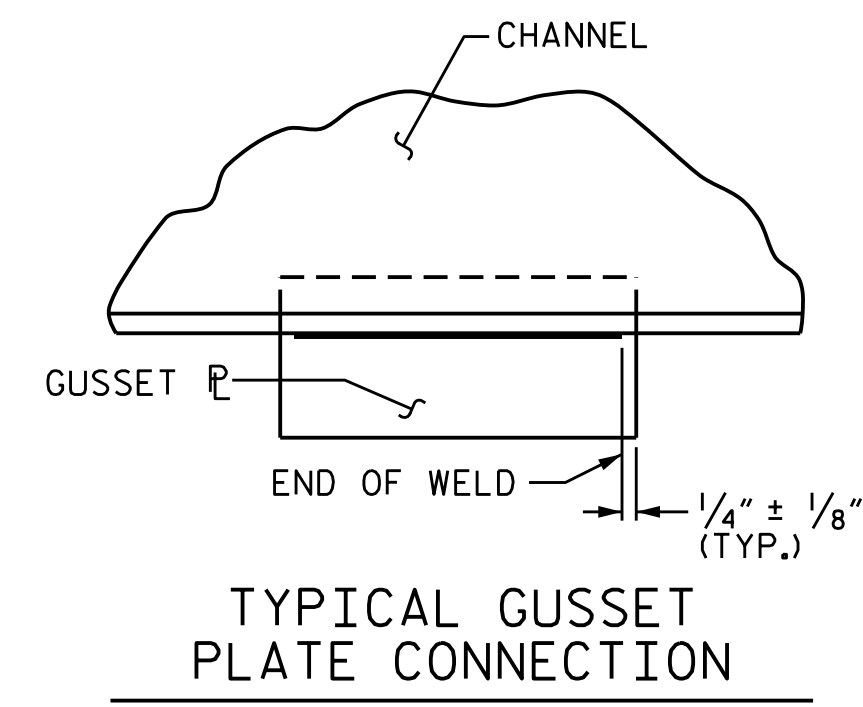


SECTION

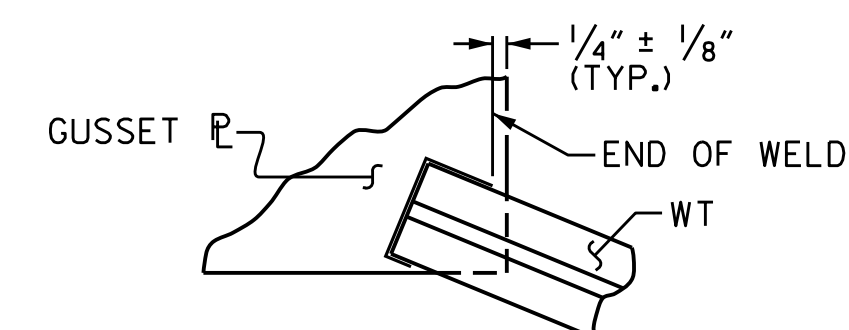
VIEW A-A

**SEE "WELD TERMINATION DETAILS"

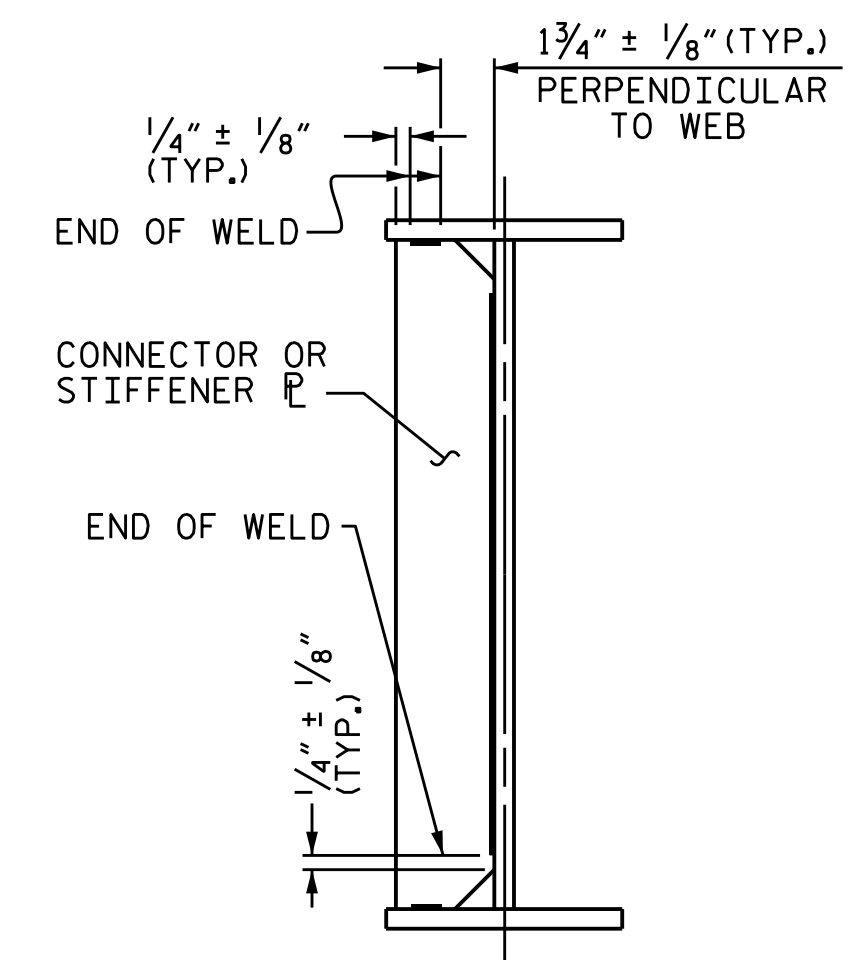
DRIP BEAD DETAILS



TYPICAL GUSSET PLATE CONNECTION



TYPICAL "TEE" TO GUSSET PLATE CONNECTION



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

WELD TERMINATION DETAILS

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-

SHEET 3 OF 3



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 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS

DRAWN BY : I.L. AVERETTE DATE : 11-14
 CHECKED BY : J.P. ADAMS DATE : 07-15
 DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-55
1			3			TOTAL SHEETS
2			4			84

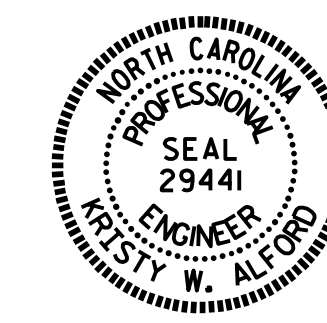
DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A																				
	GIRDERS 1 & 11																				
	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	0.014	0.027	0.039	0.050	0.060	0.068	0.075	0.080	0.083	0.084	0.083	0.080	0.075	0.068	0.060	0.050	0.039	0.027	0.014	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.033	0.090	0.143	0.190	0.232	0.267	0.296	0.317	0.329	0.333	0.329	0.317	0.296	0.267	0.232	0.190	0.143	0.090	0.033	0.000
DEFLECTION DUE TO WEIGHT OF SUPERIMPOSED DEAD LOAD ↓	0.000	0.013	0.025	0.037	0.047	0.056	0.063	0.070	0.074	0.077	0.078	0.077	0.074	0.070	0.063	0.056	0.047	0.037	0.025	0.013	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.060	0.142	0.219	0.287	0.348	0.398	0.441	0.471	0.489	0.495	0.489	0.471	0.441	0.398	0.348	0.287	0.219	0.142	0.060	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.074	0.139	0.197	0.247	0.290	0.325	0.352	0.371	0.383	0.387	0.383	0.371	0.352	0.325	0.290	0.247	0.197	0.139	0.074	0.000
REQUIRED CAMBER ↑	0	1 5/16"	3 3/8"	5"	6 7/16"	7 5/8"	8 11/16"	9 1/2"	10 1/8"	10 7/16"	10 3/16"	10 1/16"	10 1/8"	9 1/2"	8 11/16"	7 5/8"	6 7/16"	5"	3 3/8"	1 5/8"	0
	GIRDER 2																				
	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	0.014	0.027	0.039	0.050	0.060	0.068	0.075	0.080	0.083	0.084	0.083	0.080	0.075	0.068	0.060	0.050	0.039	0.027	0.014	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.013	0.073	0.128	0.178	0.222	0.259	0.289	0.311	0.324	0.328	0.324	0.311	0.289	0.259	0.222	0.178	0.128	0.073	0.013	0.000
DEFLECTION DUE TO WEIGHT OF SUPERIMPOSED DEAD LOAD ↓	0.000	0.009	0.017	0.025	0.031	0.037	0.042	0.047	0.049	0.051	0.052	0.051	0.049	0.047	0.042	0.037	0.031	0.025	0.017	0.009	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.036	0.117	0.192	0.259	0.319	0.369	0.411	0.440	0.458	0.464	0.458	0.440	0.411	0.369	0.319	0.259	0.192	0.117	0.036	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.074	0.139	0.197	0.247	0.290	0.325	0.352	0.371	0.383	0.387	0.383	0.371	0.352	0.325	0.290	0.247	0.197	0.139	0.074	0.000
REQUIRED CAMBER ↑	0	1 5/16"	3 1/16"	4 1/16"	6 1/16"	7 5/16"	8 5/16"	9 1/8"	9 3/4"	10 1/16"	10 3/16"	10 1/16"	9 3/4"	9 1/8"	8 5/16"	7 5/16"	6 1/16"	4 1/16"	3 1/16"	1 5/16"	0
	GIRDERS 3 & 10																				
	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	0.014	0.027	0.039	0.050	0.060	0.068	0.075	0.080	0.083	0.084	0.083	0.080	0.075	0.068	0.060	0.050	0.039	0.027	0.014	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.000	0.050	0.105	0.153	0.196	0.232	0.262	0.283	0.296	0.300	0.296	0.283	0.262	0.232	0.196	0.153	0.105	0.050	0.000	0.000
DEFLECTION DUE TO WEIGHT OF SUPERIMPOSED DEAD LOAD ↓	0.000	0.008	0.016	0.023	0.029	0.034	0.039	0.043	0.046	0.047	0.048	0.047	0.046	0.043	0.039	0.034	0.029	0.023	0.016	0.008	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.022	0.093	0.167	0.232	0.290	0.339	0.380	0.409	0.426	0.432	0.426	0.409	0.380	0.339	0.290	0.232	0.167	0.093	0.022	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.074	0.139	0.197	0.247	0.290	0.325	0.352	0.371	0.383	0.387	0.383	0.371	0.352	0.325	0.290	0.247	0.197	0.139	0.074	0.000
REQUIRED CAMBER ↑	0	1 1/8"	2 13/16"	4 3/8"	5 3/4"	6 15/16"	7 15/16"	8 13/16"	9 3/8"	9 11/16"	9 13/16"	9 11/16"	9 3/8"	8 13/16"	7 15/16"	6 15/16"	5 3/4"	4 3/8"	2 13/16"	1 1/8"	0
	GIRDERS 4 & 5																				
	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	0.014	0.027	0.039	0.050	0.060	0.068	0.075	0.080	0.083	0.084	0.083	0.080	0.075	0.068	0.060	0.050	0.039	0.027	0.014	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.000	0.027	0.085	0.136	0.182	0.221	0.252	0.274	0.288	0.292	0.288	0.274	0.252	0.221	0.182	0.136	0.085	0.027	0.000	0.000
DEFLECTION DUE TO WEIGHT OF SUPERIMPOSED DEAD LOAD ↓	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	0.016	0.057	0.129	0.192	0.249	0.297	0.336	0.364	0.381	0.386	0.381	0.364	0.336	0.297	0.249	0.192	0.129	0.057	0.016	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.074	0.139	0.197	0.247	0.290	0.325	0.352	0.371	0.383	0.387	0.383	0.371	0.352	0.325	0.290	0.247	0.197	0.139	0.074	0.000
REQUIRED CAMBER ↑	0	1 1/16"	2 3/8"	3 15/16"	5 1/4"	6 7/16"	7 7/16"	8 1/4"	8 13/16"	9 3/16"	9 1/4"	9 3/16"	8 13/16"	8 1/4"	7 7/16"	6 7/16"	5 1/4"	3 15/16"	2 3/8"	1 1/16"	0

* INCLUDES SLAB, BUILDUPS, AND STAY-IN-PLACE FORMS.
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS SHOWN IN INCHES (FRACTION FORM).
 FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR STEEL DEAD LOAD FIT UP.

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-

SHEET 1 OF 2



DocuSigned by:
 Kristy W. Alford
 F245889309F40E...
 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 DEAD LOAD
 DEFLECTIONS**

DRAWN BY : I.L. AVERETTE DATE : 01-15
 CHECKED BY : J.P. ADAMS DATE : 07-15
 DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-56
1			3			TOTAL SHEETS
2			4			84

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
SPAN A																						
GIRDERS 6 & 9																						
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	0.014	0.027	0.039	0.050	0.060	0.068	0.075	0.080	0.083	0.084	0.083	0.080	0.075	0.068	0.060	0.050	0.039	0.027	0.014	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.000	0.002	0.058	0.108	0.152	0.190	0.220	0.242	0.255	0.259	0.255	0.242	0.220	0.190	0.152	0.108	0.058	0.002	0.000	0.000
DEFLECTION DUE TO WEIGHT OF SUPERIMPOSED DEAD LOAD	↓	0.000	0.005	0.010	0.015	0.019	0.022	0.025	0.028	0.029	0.030	0.031	0.030	0.029	0.028	0.025	0.022	0.019	0.015	0.010	0.005	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.019	0.039	0.112	0.177	0.234	0.283	0.323	0.351	0.368	0.374	0.368	0.351	0.323	0.283	0.234	0.177	0.112	0.039	0.019	0.000
VERTICAL CURVE ORDINATE	↑	0.000	0.074	0.139	0.197	0.247	0.290	0.325	0.352	0.371	0.383	0.387	0.383	0.371	0.352	0.325	0.290	0.247	0.197	0.139	0.074	0.000
REQUIRED CAMBER	↑	0	1/8"	2/16"	3 1/16"	5/16"	6 5/16"	7 5/16"	8 1/8"	8 11/16"	9"	9 1/8"	9"	8 1/16"	8 1/8"	7 5/16"	6 5/16"	5/16"	3 1/16"	2 1/8"	1 1/8"	0
GIRDER 7																						
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	0.014	0.027	0.039	0.050	0.060	0.068	0.075	0.080	0.083	0.084	0.083	0.080	0.075	0.068	0.060	0.050	0.039	0.027	0.014	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.000	0.000	0.041	0.094	0.142	0.182	0.214	0.238	0.252	0.256	0.252	0.238	0.214	0.182	0.142	0.094	0.041	0.000	0.000	0.000
DEFLECTION DUE TO WEIGHT OF SUPERIMPOSED DEAD LOAD	↓	0.000	0.004	0.008	0.011	0.014	0.017	0.019	0.021	0.023	0.023	0.024	0.023	0.023	0.021	0.019	0.017	0.014	0.011	0.008	0.004	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.018	0.035	0.091	0.158	0.219	0.269	0.310	0.341	0.358	0.364	0.358	0.341	0.310	0.269	0.219	0.158	0.091	0.035	0.018	0.000
VERTICAL CURVE ORDINATE	↑	0.000	0.074	0.139	0.197	0.247	0.290	0.325	0.352	0.371	0.383	0.387	0.383	0.371	0.352	0.325	0.290	0.247	0.197	0.139	0.074	0.000
REQUIRED CAMBER	↑	0	1/8"	2/16"	3 1/16"	4 7/8"	6 1/8"	7 1/8"	7 15/16"	8 9/16"	8 7/8"	9"	8 7/8"	8 9/16"	7 15/16"	7 1/8"	6 1/8"	4 7/8"	3 1/16"	2 1/16"	1 1/8"	0
GIRDER 8																						
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	0.014	0.027	0.039	0.050	0.060	0.068	0.075	0.080	0.083	0.084	0.083	0.080	0.075	0.068	0.060	0.050	0.039	0.027	0.014	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.000	0.000	0.016	0.065	0.107	0.143	0.172	0.193	0.205	0.210	0.205	0.193	0.172	0.143	0.107	0.065	0.016	0.000	0.000	0.000
DEFLECTION DUE TO WEIGHT OF SUPERIMPOSED DEAD LOAD	↓	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.014	0.027	0.055	0.115	0.167	0.211	0.247	0.273	0.288	0.294	0.288	0.273	0.247	0.211	0.167	0.115	0.055	0.027	0.014	0.000
VERTICAL CURVE ORDINATE	↑	0.000	0.074	0.139	0.197	0.247	0.290	0.325	0.352	0.371	0.383	0.387	0.383	0.371	0.352	0.325	0.290	0.247	0.197	0.139	0.074	0.000
REQUIRED CAMBER	↑	0	1/16"	2"	3"	4 3/8"	5 1/2"	6 7/16"	7 3/16"	7 3/4"	8 1/16"	8 3/16"	8 1/16"	7 3/4"	7 3/16"	6 7/16"	5 1/2"	4 3/8"	3"	2"	1 1/16"	0

* INCLUDES SLAB, BUILDUPS, AND STAY-IN-PLACE FORMS.
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS SHOWN IN INCHES (FRACTION FORM).
 FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR STEEL DEAD LOAD FIT UP.

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-

SHEET 2 OF 2



DocuSigned by:
 Kristy W. Alford

3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 DEAD LOAD
 DEFLECTIONS

DRAWN BY : I.L. AVERETTE DATE : 01-15
 CHECKED BY : J.P. ADAMS DATE : 07-15
 DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-57
1			3			TOTAL SHEETS
2			4			84

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 PAINTED STRUCTURAL STEEL (EXCLUDING AASHTO M270 GRADE 50W), SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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 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 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 THEN THE ANCHOR BOLTS AND ELASTOMERIC BEARING SLOTS CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60°F.
2. AFTER CENTERING THE ELASTOMERIC BEARING SLOTS AND ANCHOR BOLTS, THE ANCHOR BOLTS SHALL BE GROUTED.

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

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	310 k

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-



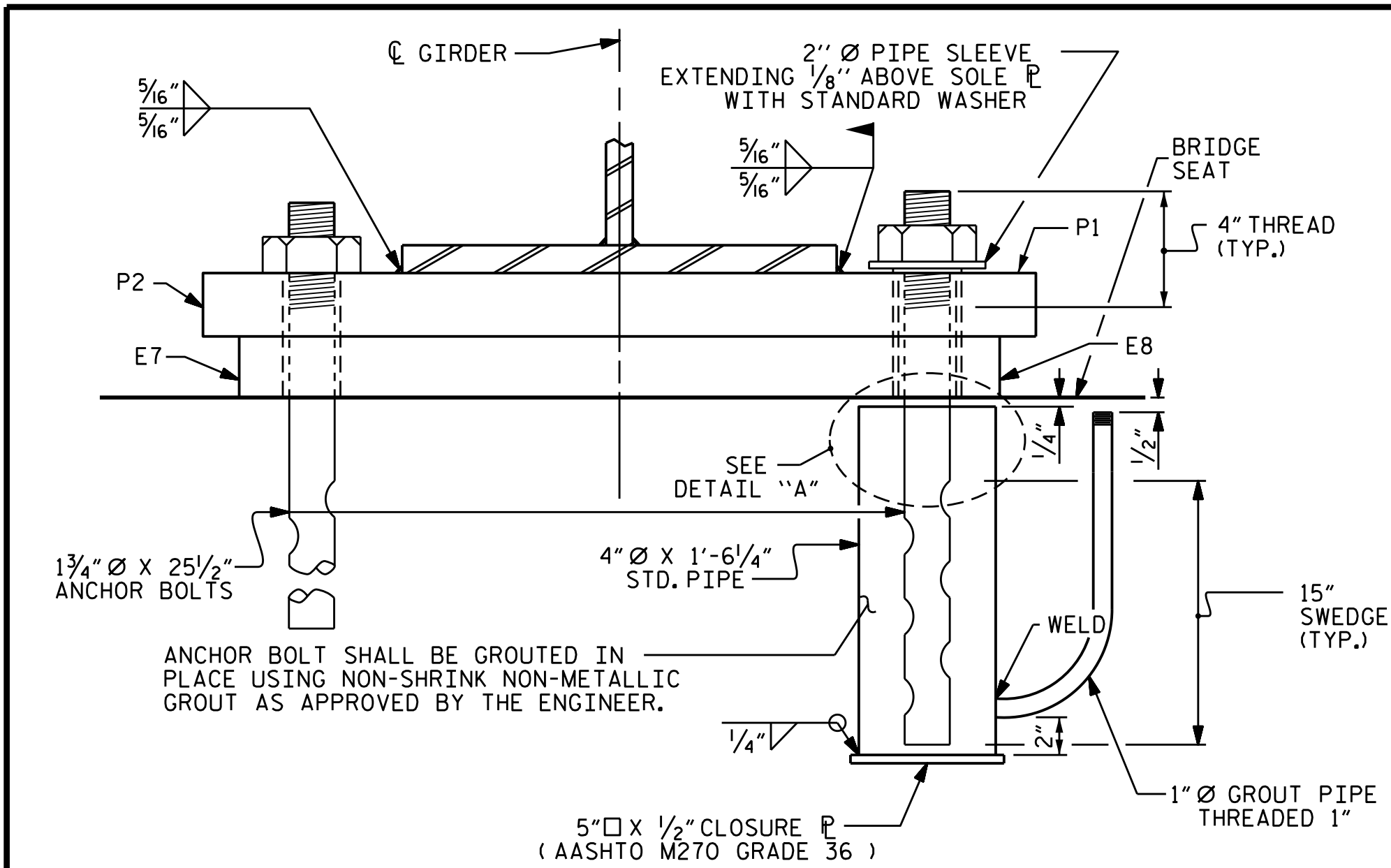
DocuSigned by:
 F24568939BFA0E
 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
ELASTOMERIC BEARING
DETAILS
 (STEEL SUPERSTRUCTURE)

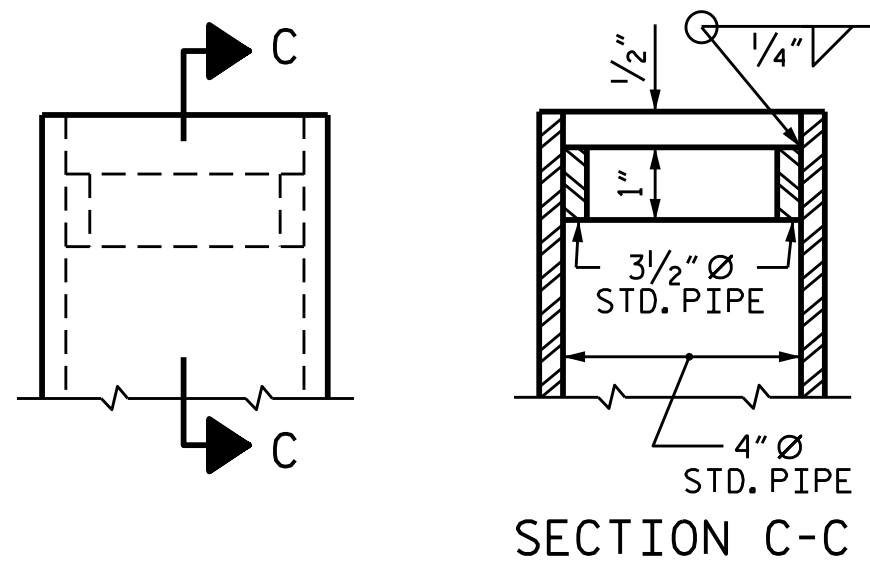
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-58
1			3			TOTAL SHEETS
2			4			84

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

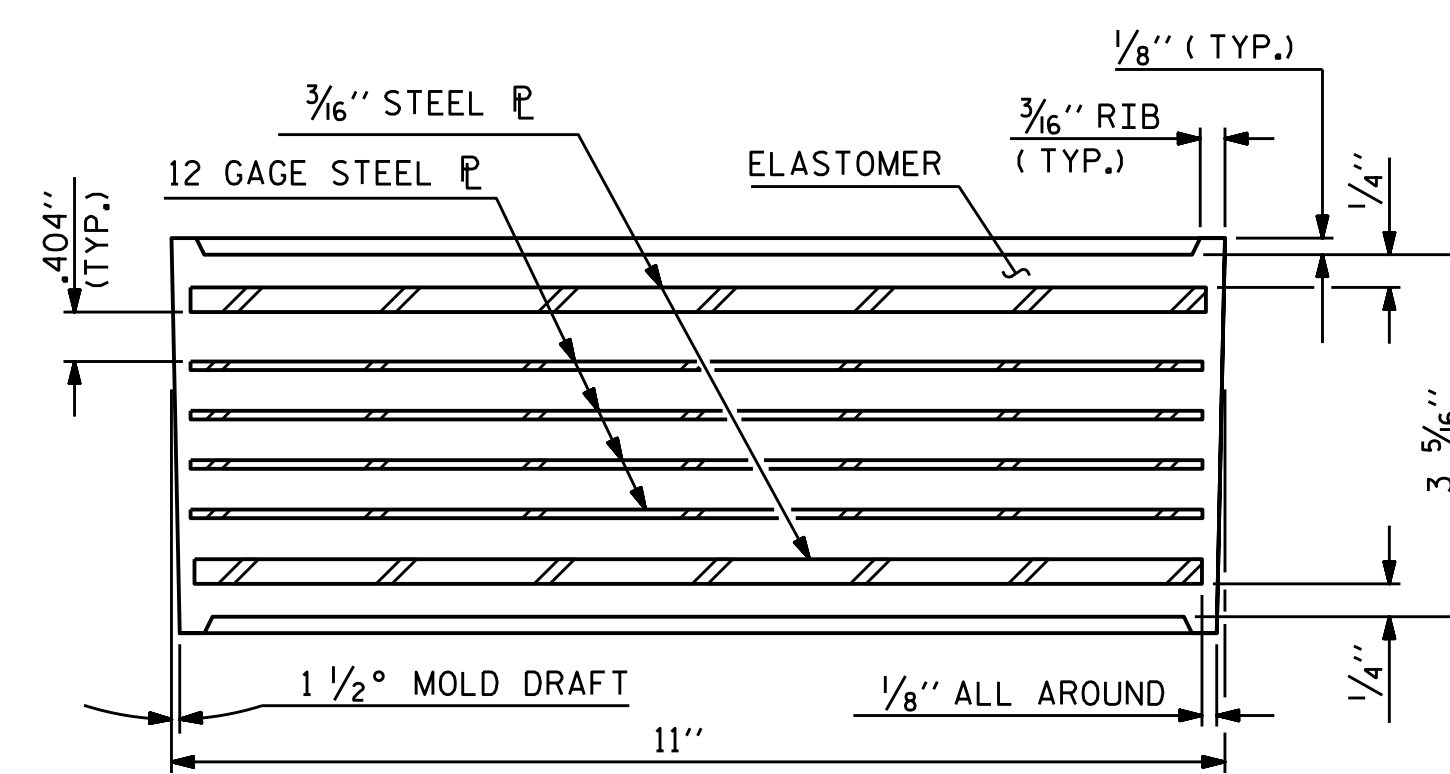
STR. #2 STD. NO. EB2 (SHT 1B)



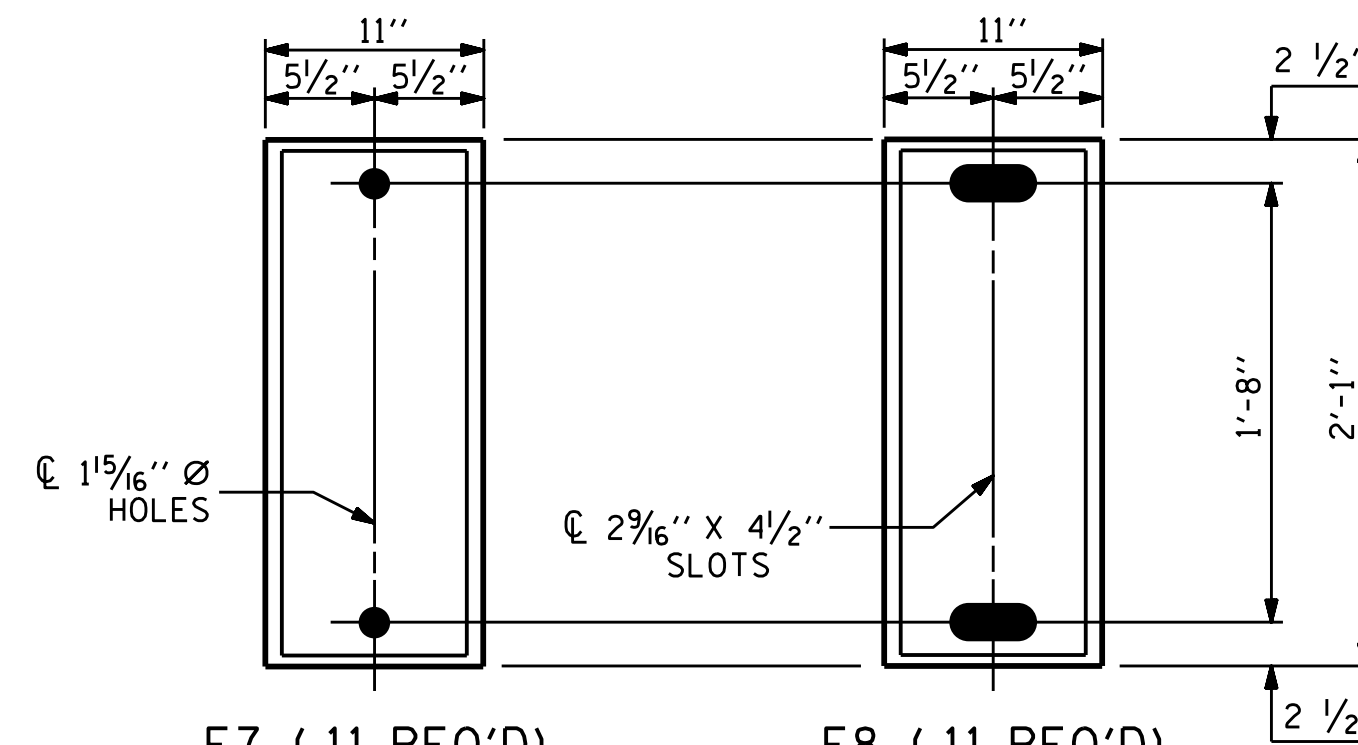
FIXED EXPANSION
 END VIEW



DETAIL "A"

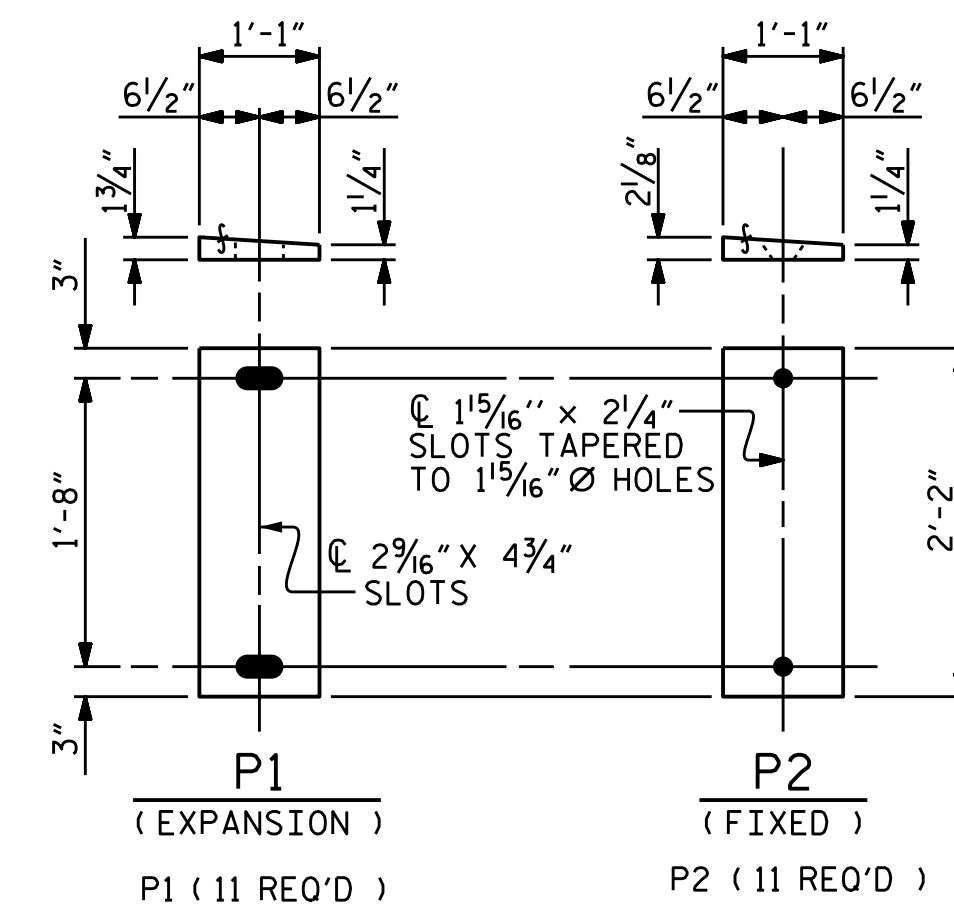


TYPICAL SECTION OF ELASTOMERIC BEARING



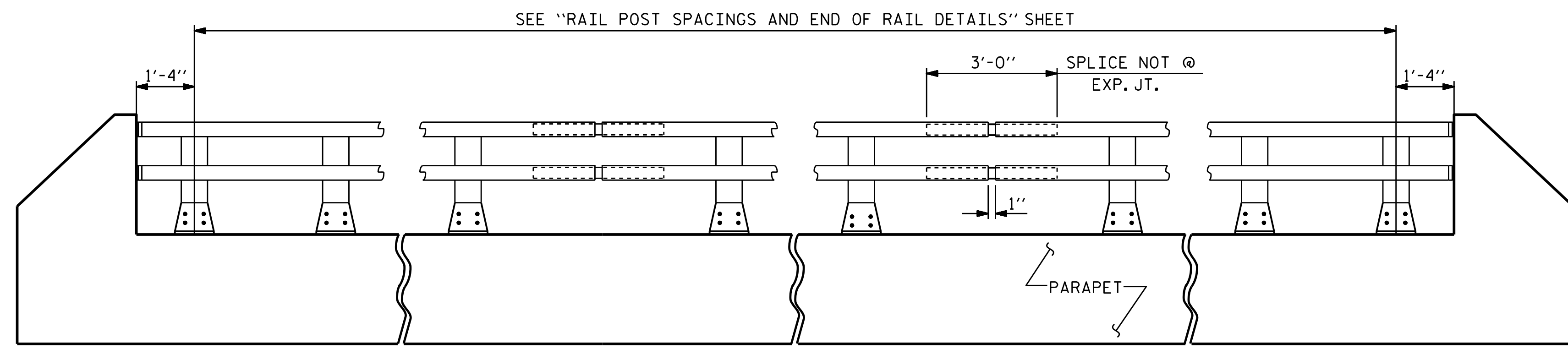
PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV



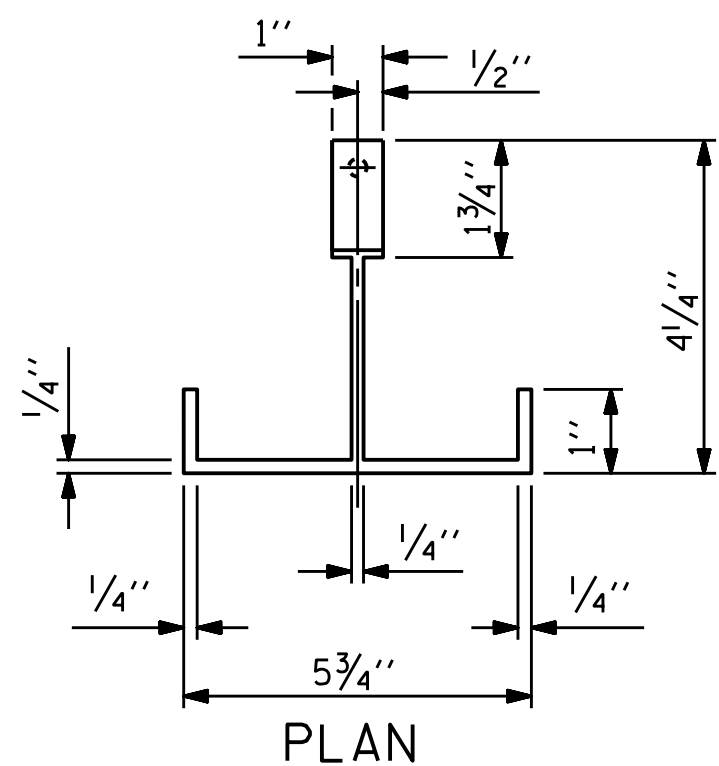
SOLE PLATE DETAILS ("P")

ASSEMBLED BY : T.L. AVERETTE	DATE : 01-15
CHECKED BY : J.P. ADAMS	DATE : 07-15
DRAWN BY : EEM 10/95	REV. 5/1/06 TLA/GM
CHECKED BY : PEK 10/95	REV. 10/1/11 MAA/GM
	REV. 6/13 AAC/MAA

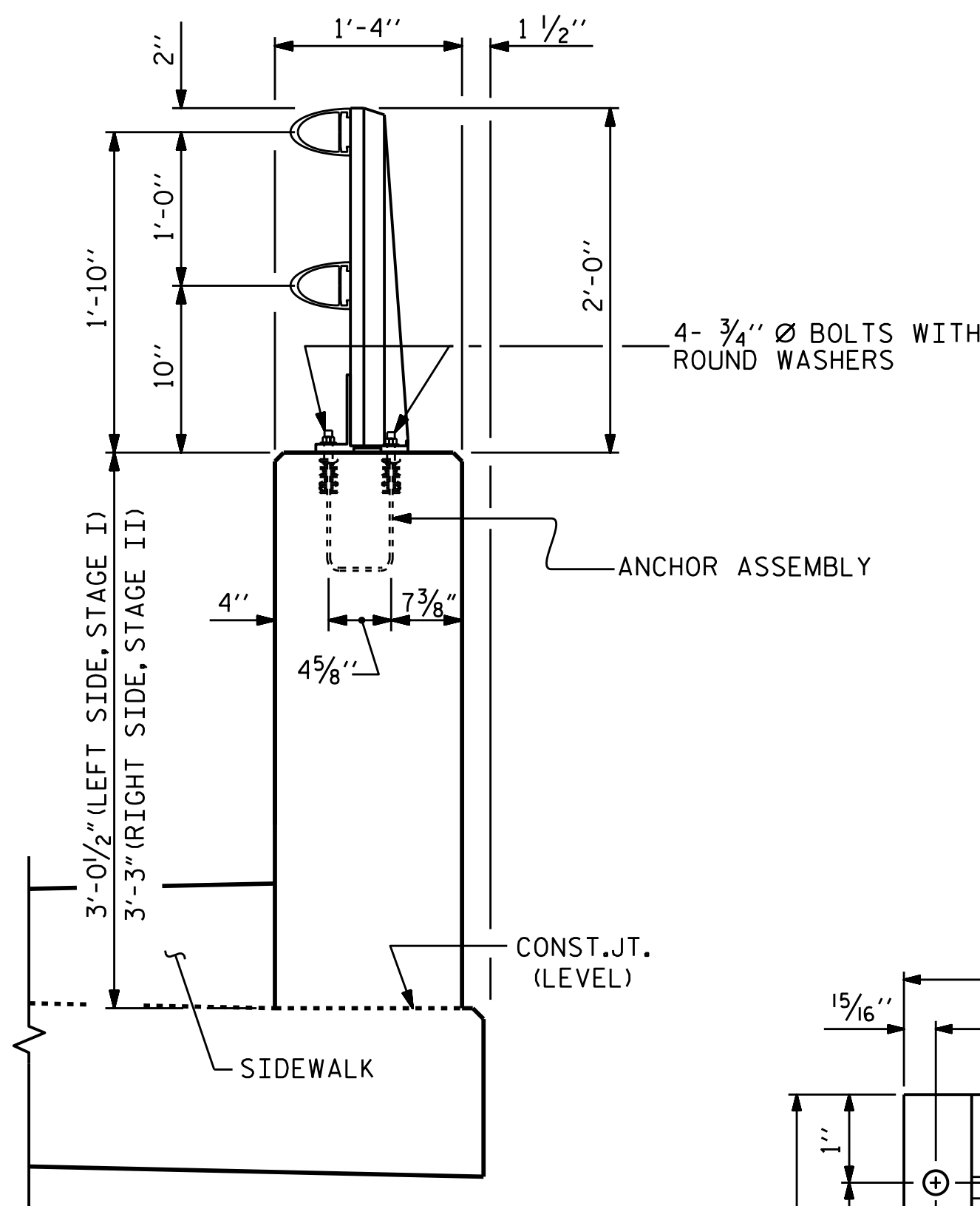


ELEVATION

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

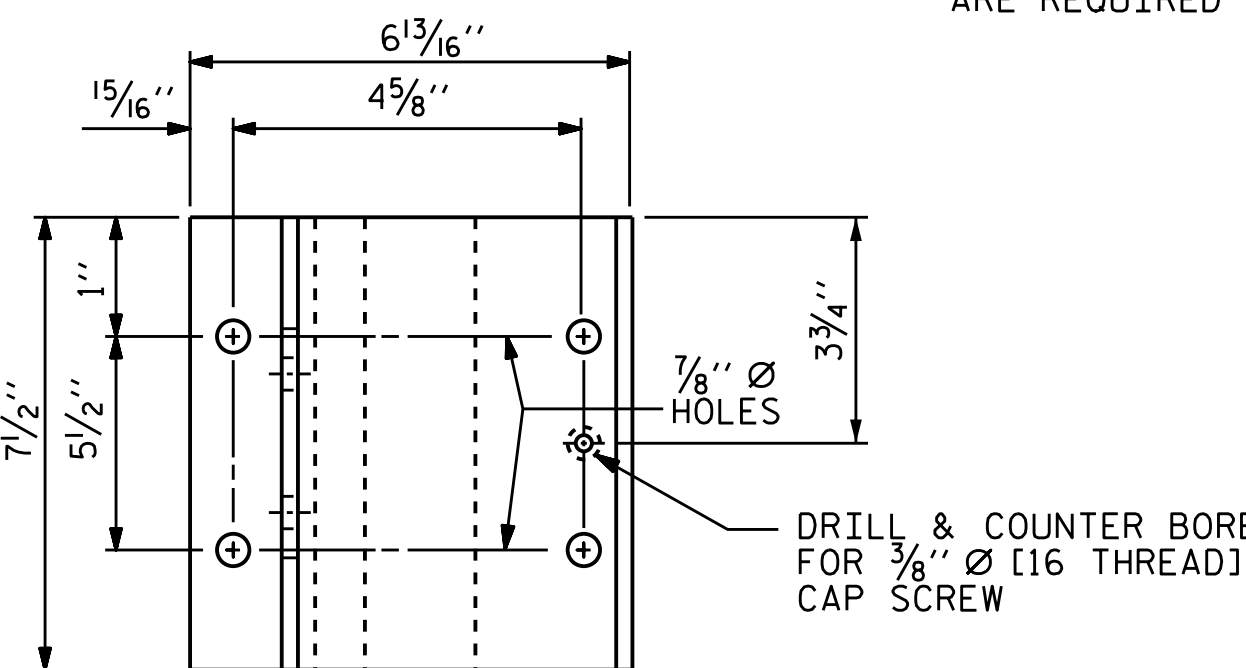


PLAN

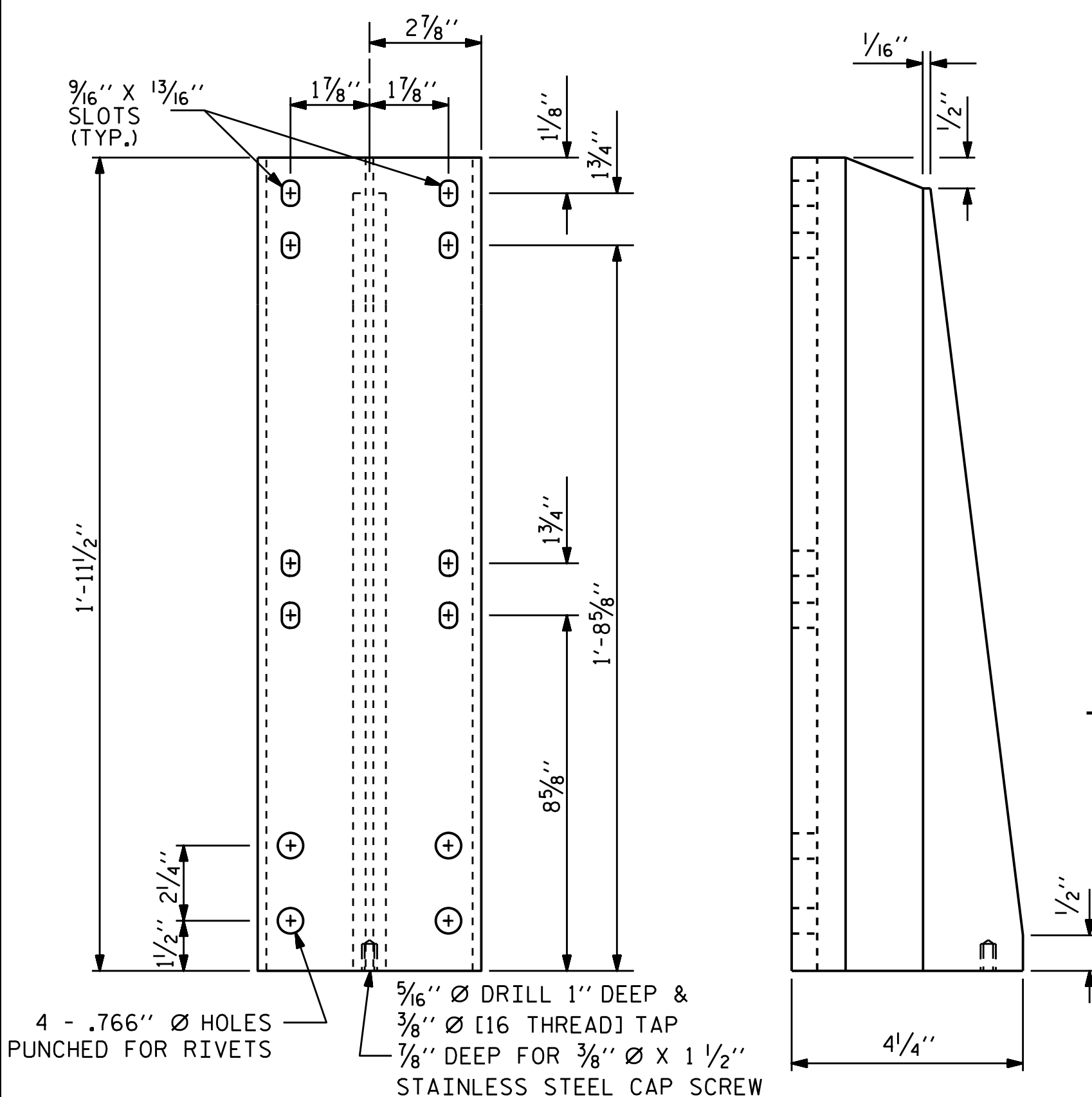


SECTION THRU PARAPET AND RAIL

ORNAMENTAL FENCE NOT SHOWN FOR CLARITY. SEE "ORNAMENTAL FENCE DETAILS" SHEET.



PLAN



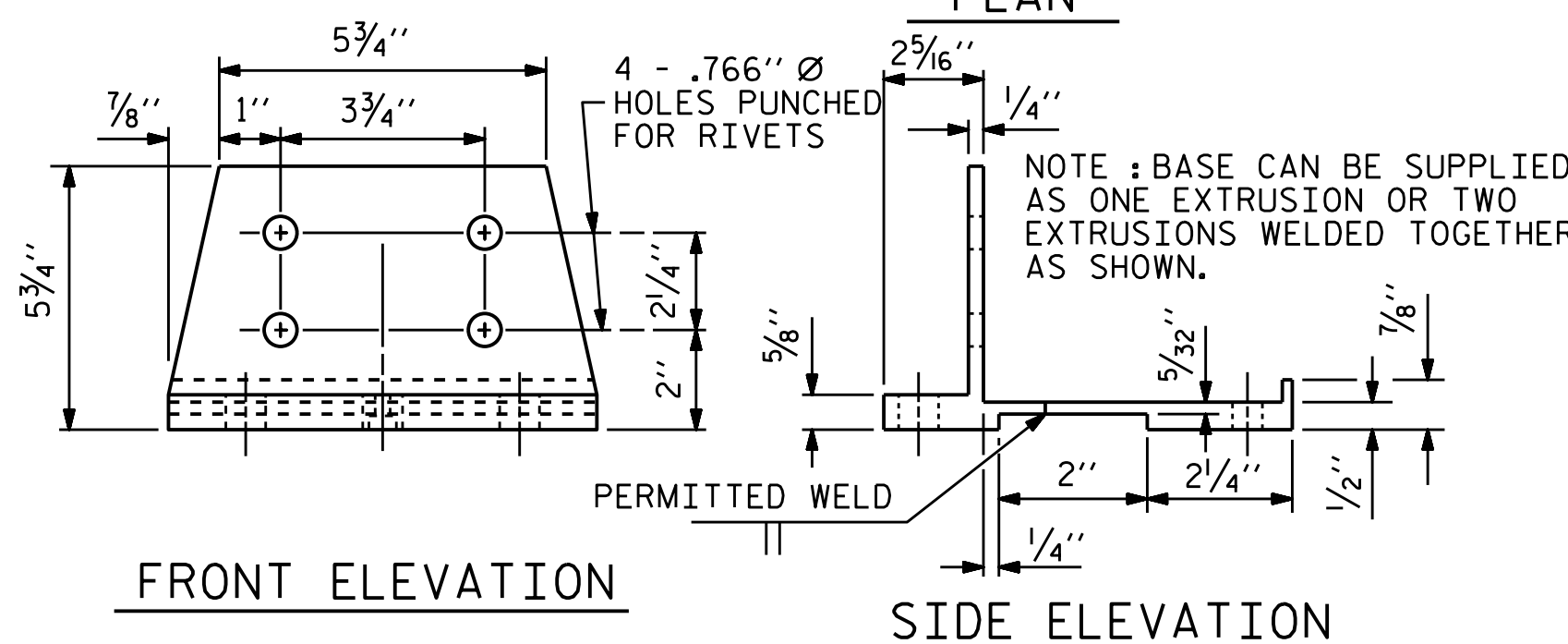
FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST

ASSEMBLED BY : T.L. AVERETTE	DATE : 02/15
CHECKED BY : J.P. ADAMS	DATE : 07/15
DRAWN BY : EEM 6/94	REV. 5/1/06 TLA/GM
CHECKED BY : RGW 6/94	REV. 10/1/11 MAA/GM
	REV. 6/13 MAA/GM

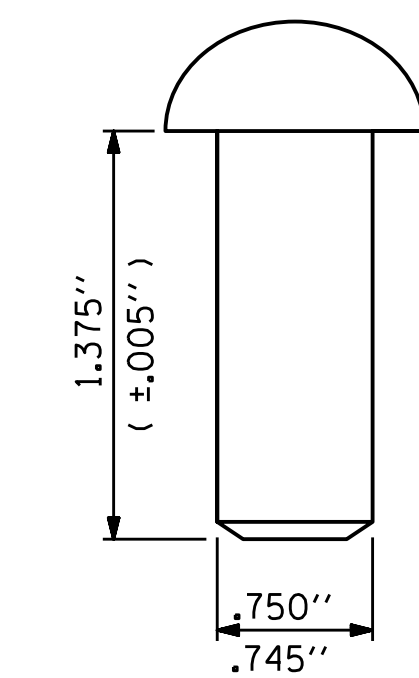
29-MAR-2016 09:20
R:\Structures\Plans\STR 2\SUPERSTRUCTURE\B4490_SD_2MR.dgn
jpodams



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by:
F24583800BF40E...
3/29/2016

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-59	
1			3			TOTAL SHEETS 84	
2			4				

NOTES

ALUMINUM RAILS

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

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

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

ANODIZING

ALUMINUM FOR POSTS, BASES, RAILS, EXPANSION BARS, RIVETS, CAPS, AND SHIMS SHALL BE ANODIZED. THE CONTRACTOR SHALL SUBMIT THREE (3) SETS OF ASTM B-21 6061-T6 ALUMINUM SAMPLES ANODIZED BLACK TO THE ENGINEER. THE ENGINEER SHALL SELECT THE COLOR FROM THE SAMPLES FURNISHED BY THE CONTRACTOR TO MOST CLOSELY MATCH THE COLOR OF THE ORNAMENTAL FENCE.

ANY DAMAGE TO THE ANODIZED SURFACE OF THE RAIL OR COMPONENTS DURING THE CONSTRUCTION SHALL BE REPAIRED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS AT THE DIRECTION OF THE ENGINEER AND AT THE CONTRACTOR'S EXPENSE.

AFTER A SHADE OF BLACK HAS BEEN SELECTED FOR THE RAILING, THE CONTRACTOR SHALL SUBMIT A SAMPLE OF COMPATIBLE EXTERIOR ACRYLIC HOUSE PAINT TO THE ENGINEER. THIS PAINT SHALL MATCH THE ANODIZED RAIL COLOR AS CLOSELY AS POSSIBLE. AFTER ERECTION OF THE ANODIZED ALUMINUM RAILING, ALL EXPOSED ANCHOR BOLTS, NUTS, WASHERS, MACHINE SCREWS, CAP SCREWS, BOLTS, ATTACHMENT BRACKETS, HOLD-DOWN PLATES, AND BUILT UP ANGLES SHALL BE COATED WITH TWO COATS OF THIS PAINT.

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

PAY LENGTH = 238.8 LIN. FT.

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 35+23.40 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

2 BAR METAL RAIL

STR. #2

STD. NO. BMR3

NOTES

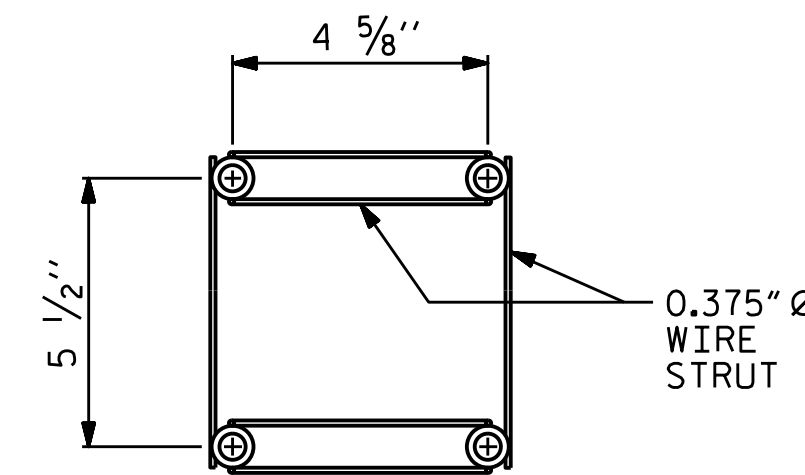
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

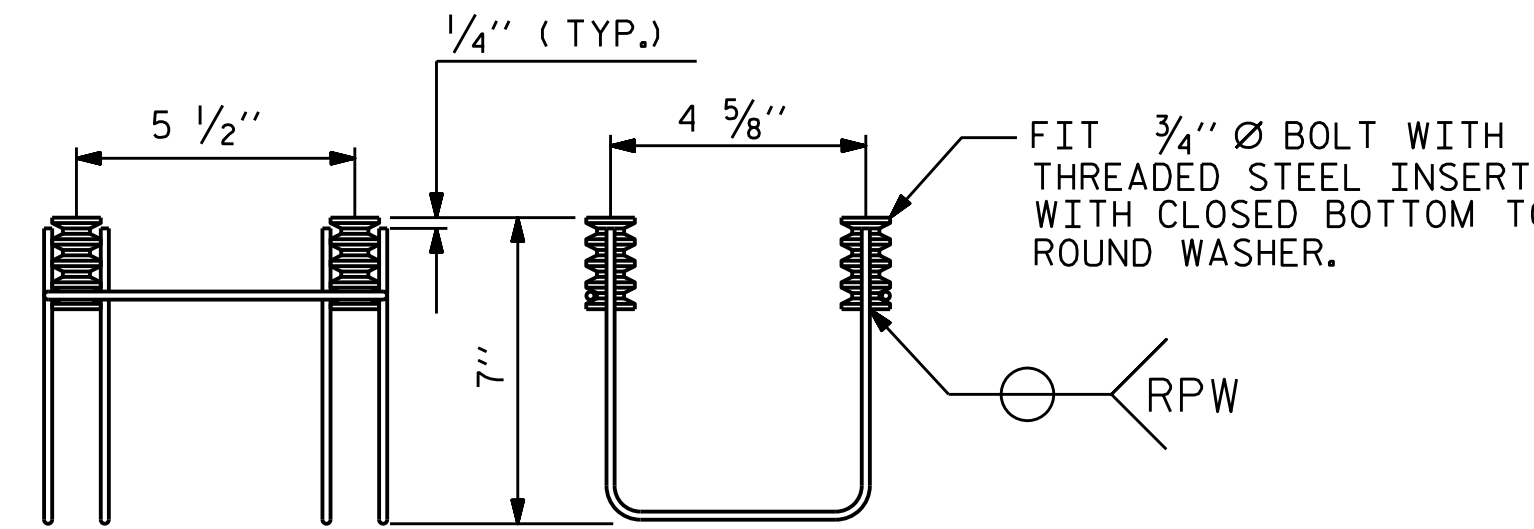
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT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

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

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



PLAN

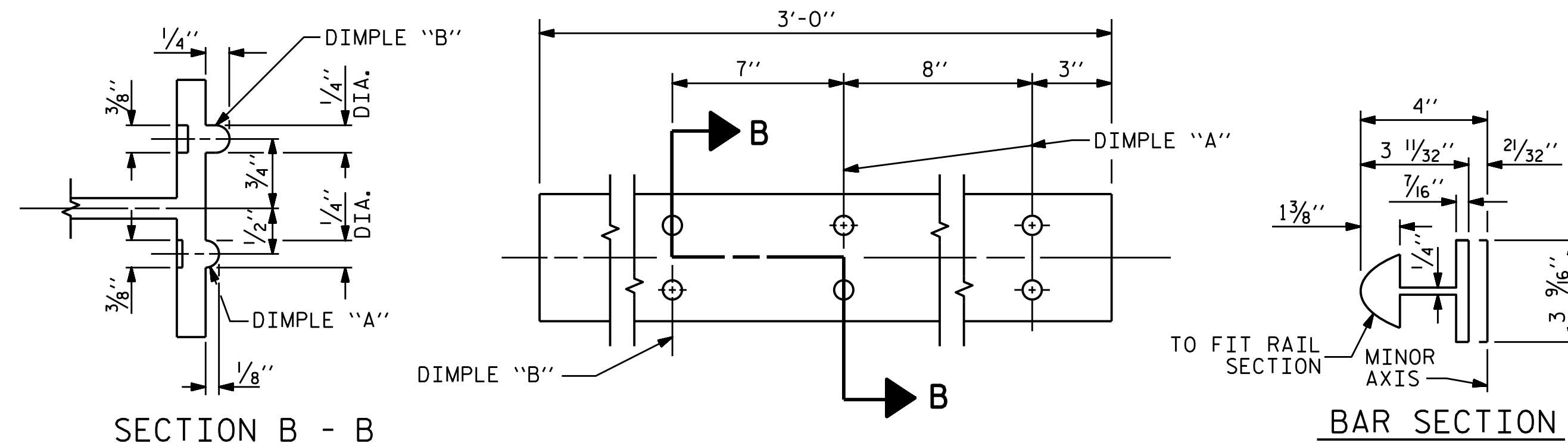


SIDE VIEW

ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

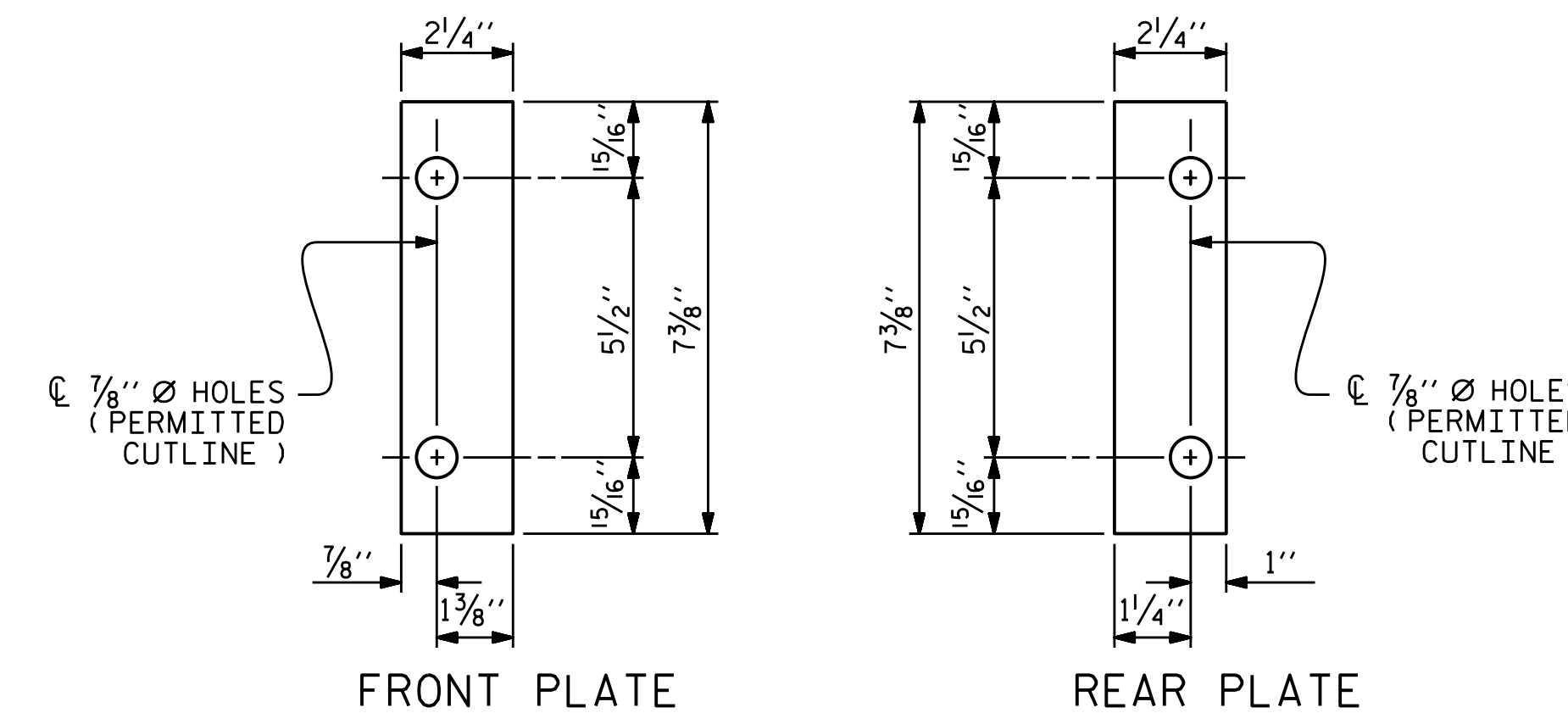
(44 ASSEMBLIES REQUIRED)



SECTION B - B

EXPANSION BAR DETAILS

BAR SECTION

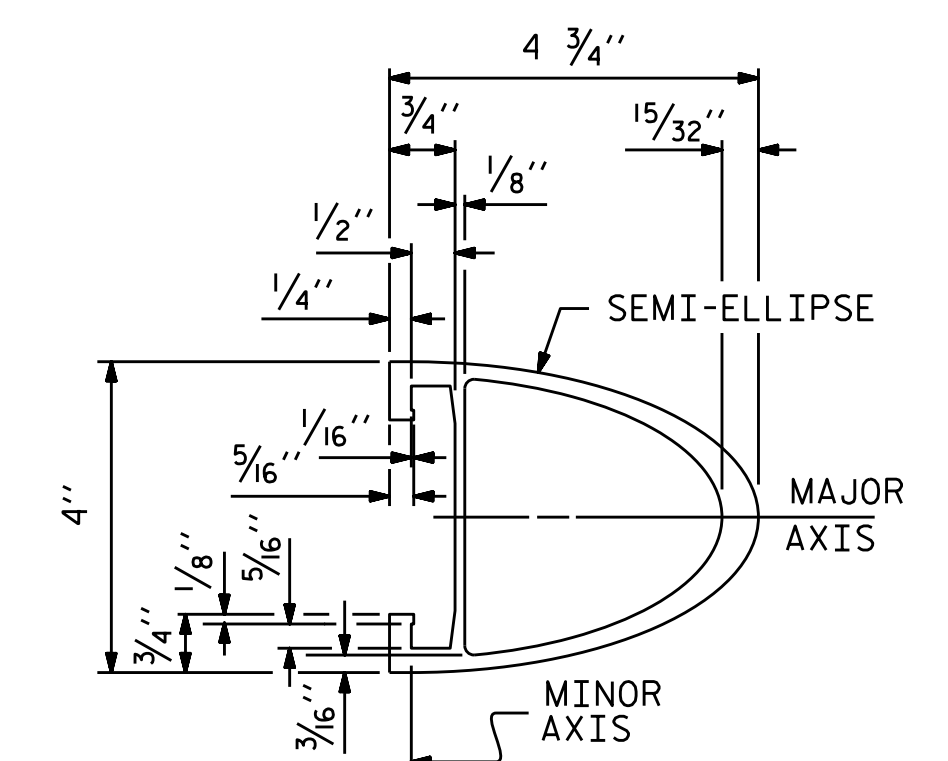


FRONT PLATE

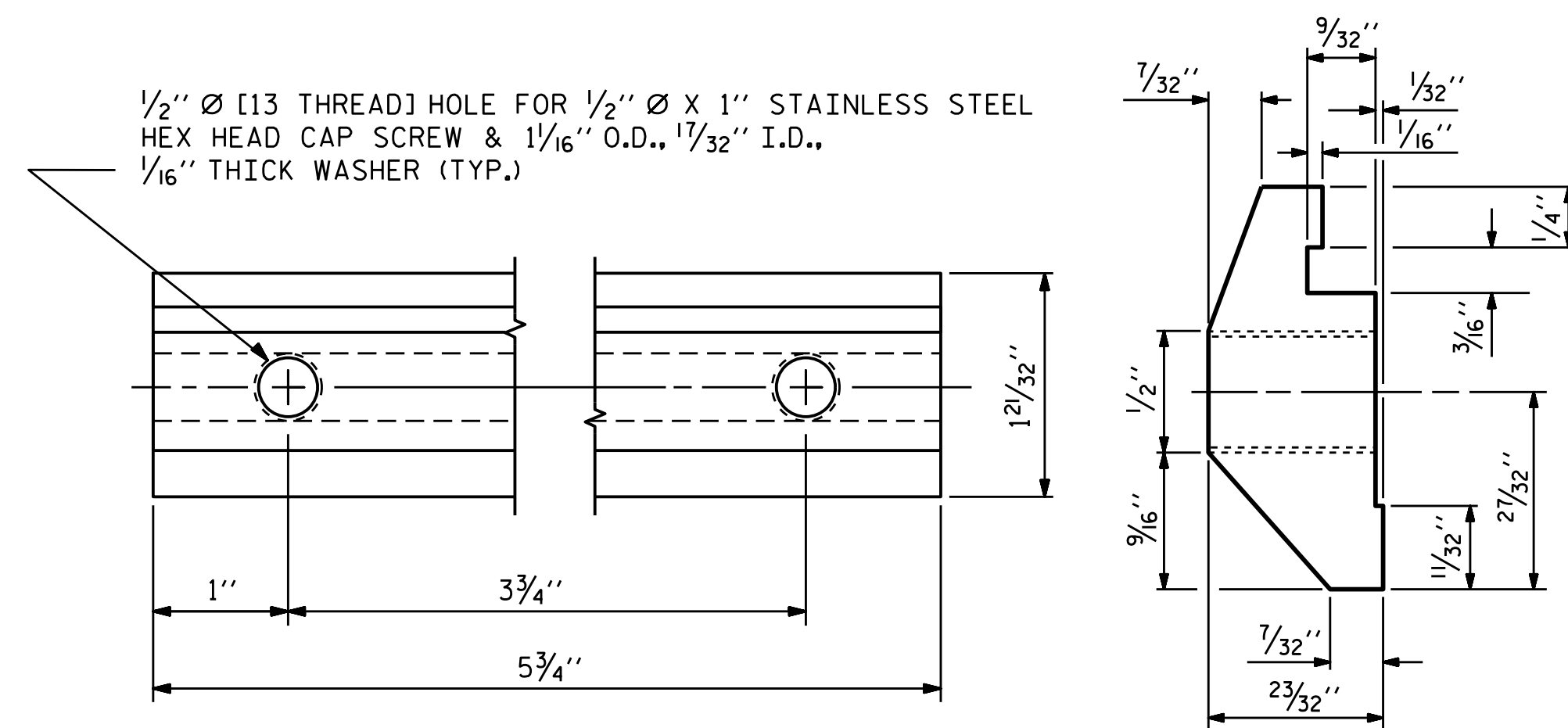
REAR PLATE

SHIM DETAILS

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

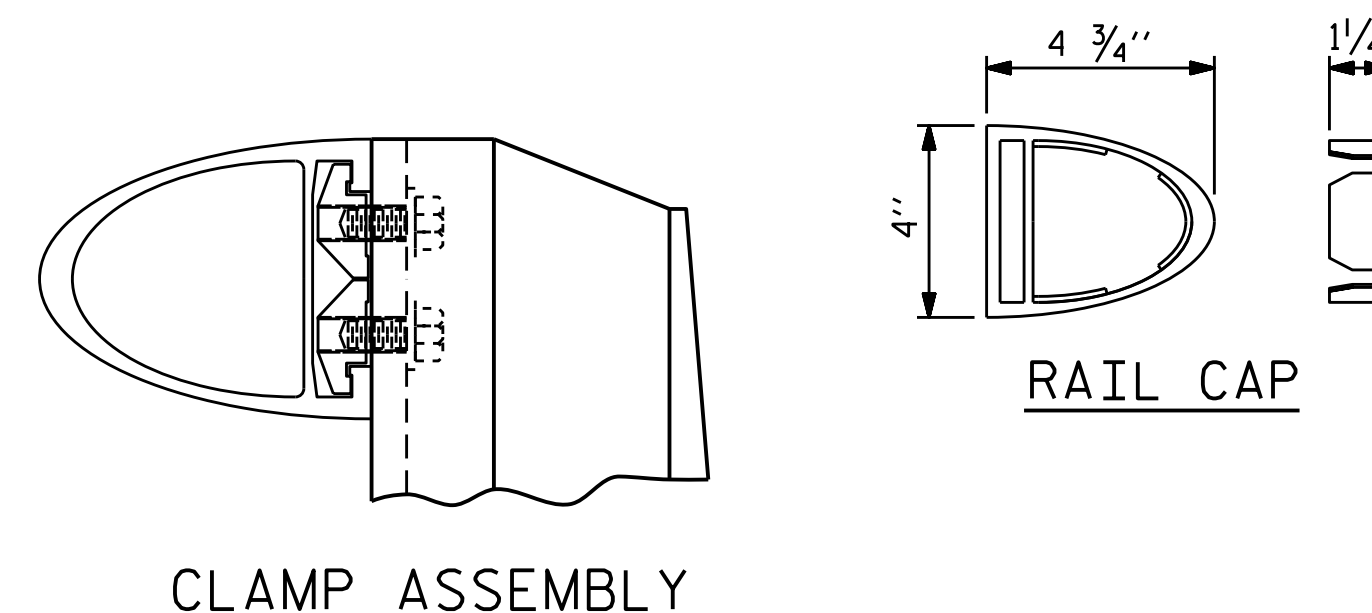


RAIL SECTION



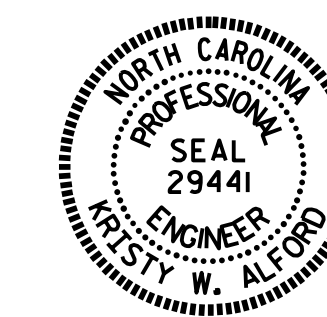
CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY

RAIL CAP



DocuSigned by:
J.P. Adams
F245838930BF40E...
3/29/2016

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 35+23.40 -L-

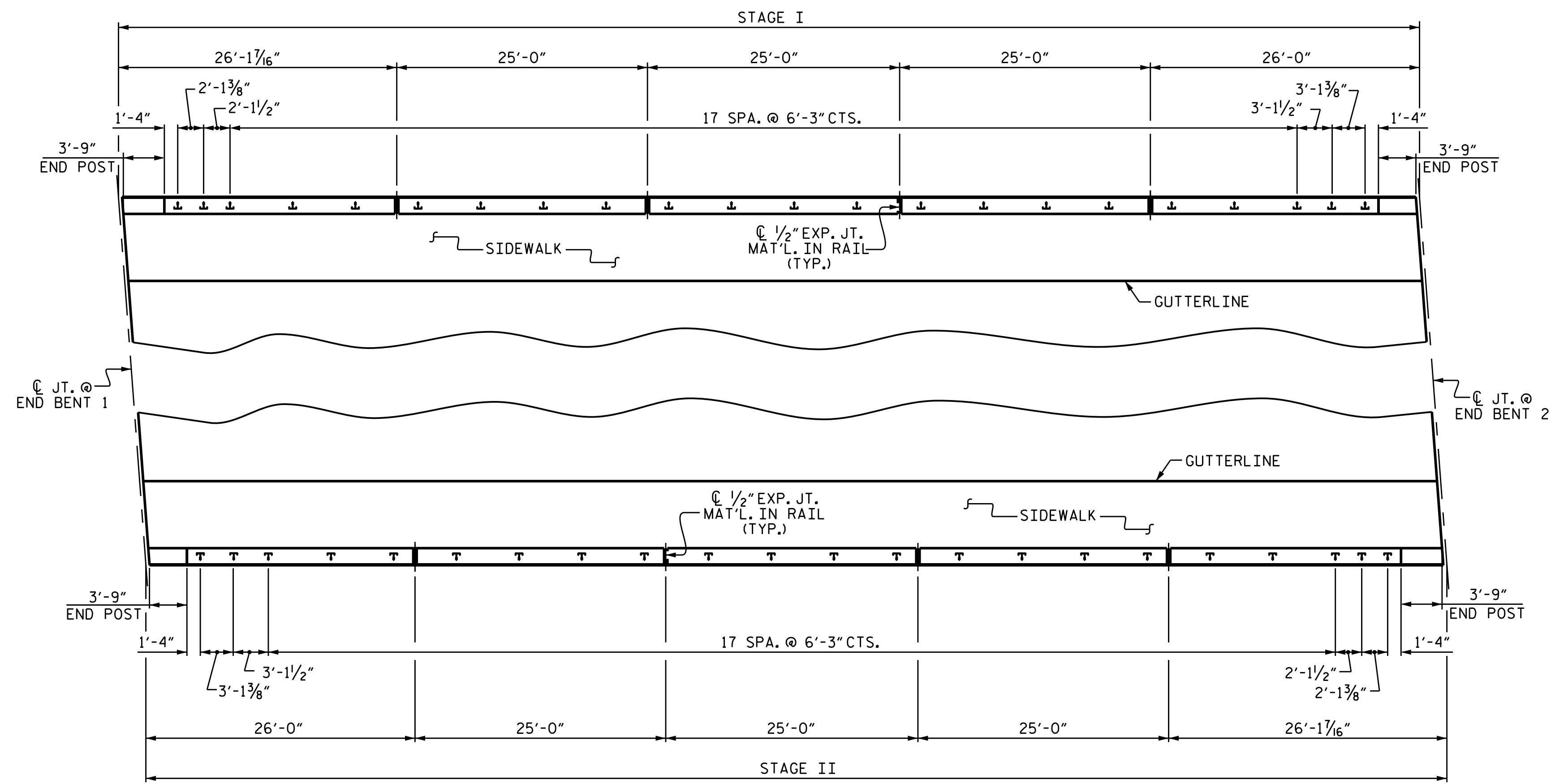
SHEET 2 OF 3

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

ASSEMBLED BY : T.L. AVERETTE	DATE : 02/15
CHECKED BY : J.P. ADAMS	DATE : 07/15
DRAWN BY : EEM 6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RGW 6/94	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-60
1			3			TOTAL SHEETS 84
2			4			



PLAN OF RAIL POST SPACINGS

NOTES

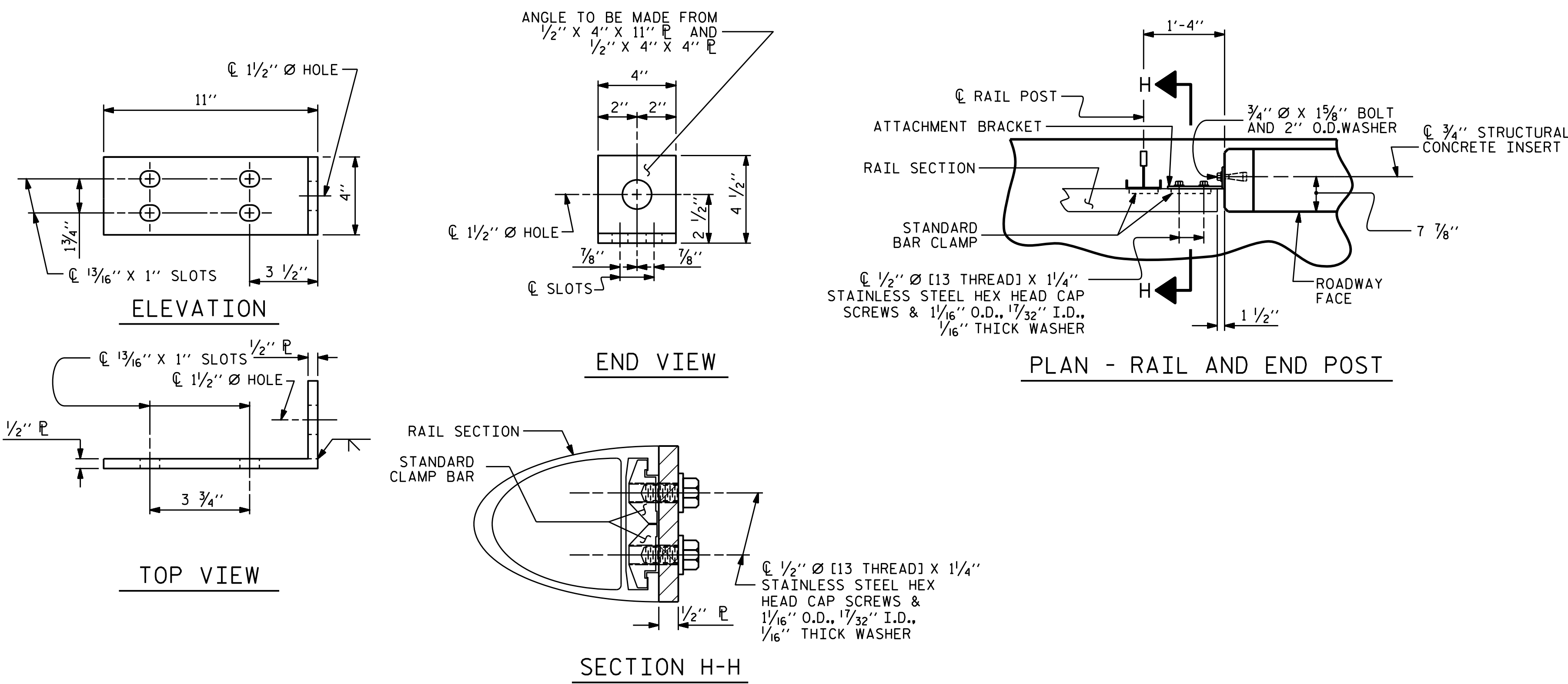
STRUCTURAL CONCRETE INSERT

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

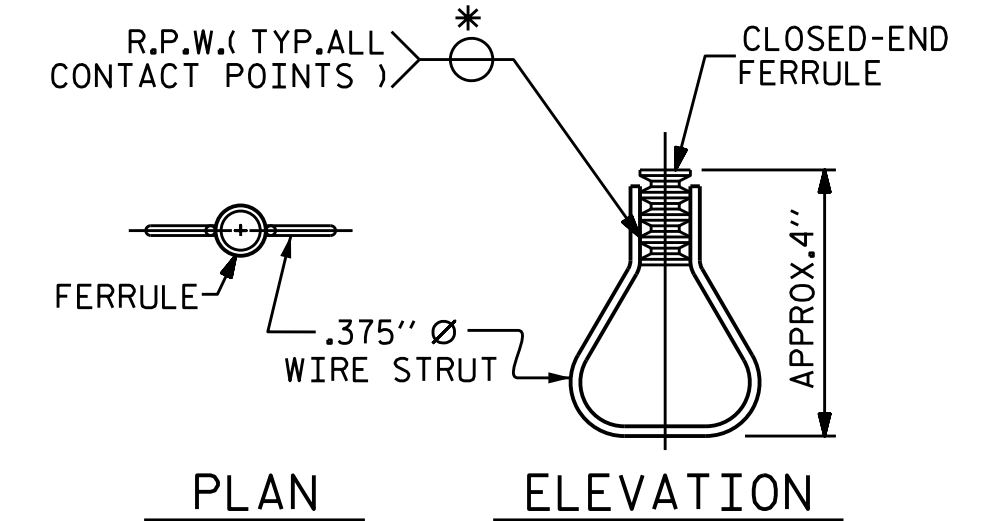
NOTES

METAL RAIL TO END POST CONNECTION

- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 1/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 1/8" BOLT SHALL HAVE N.C. THREADS.
 - C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.
 - D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
 - E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.
- THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 2 BAR METAL RAILS.
- THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.
- THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.
- THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 1/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6/16" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 1/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6/16" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



DETAILS FOR ATTACHING METAL RAIL TO END POST



PLAN ELEVATION
STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-

SHEET 3 OF 3



DocuSigned by:
 F24583930BF4GE
 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RAIL POST SPACINGS
 AND
 END OF RAIL DETAILS
 FOR TWO BAR METAL RAILS

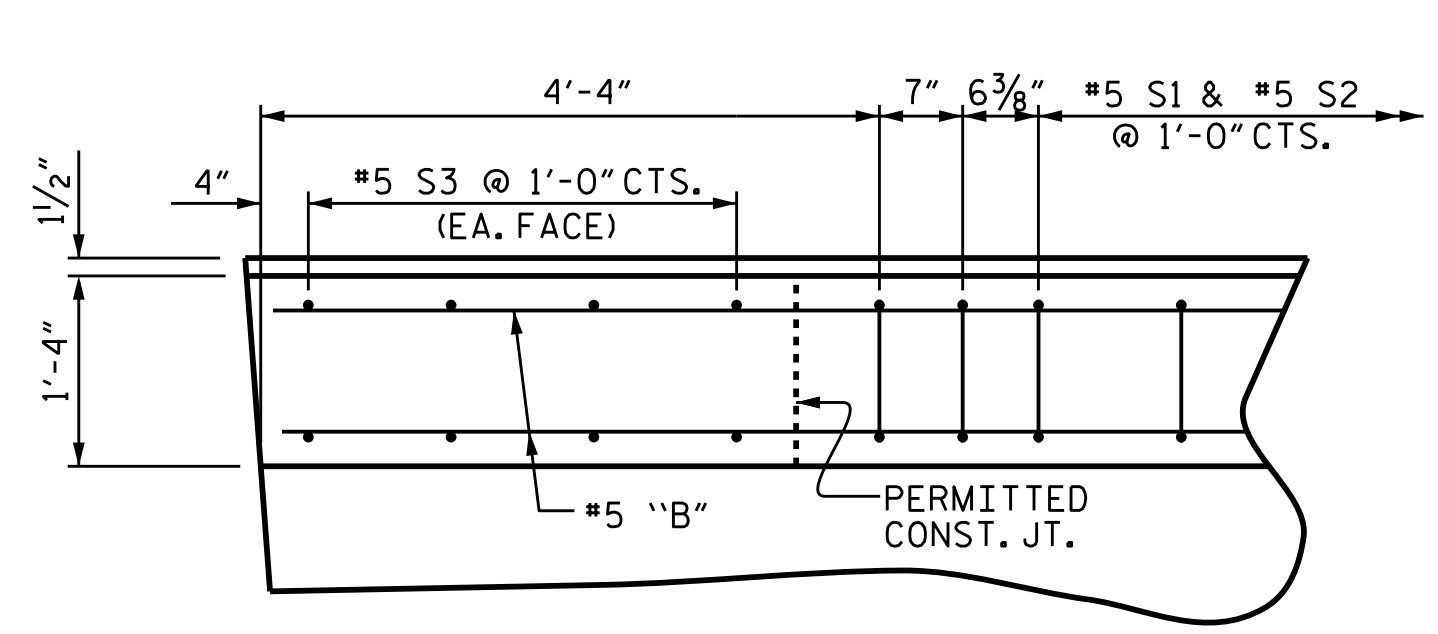
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-61	
1			3			TOTAL SHEETS 84	
2			4				

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

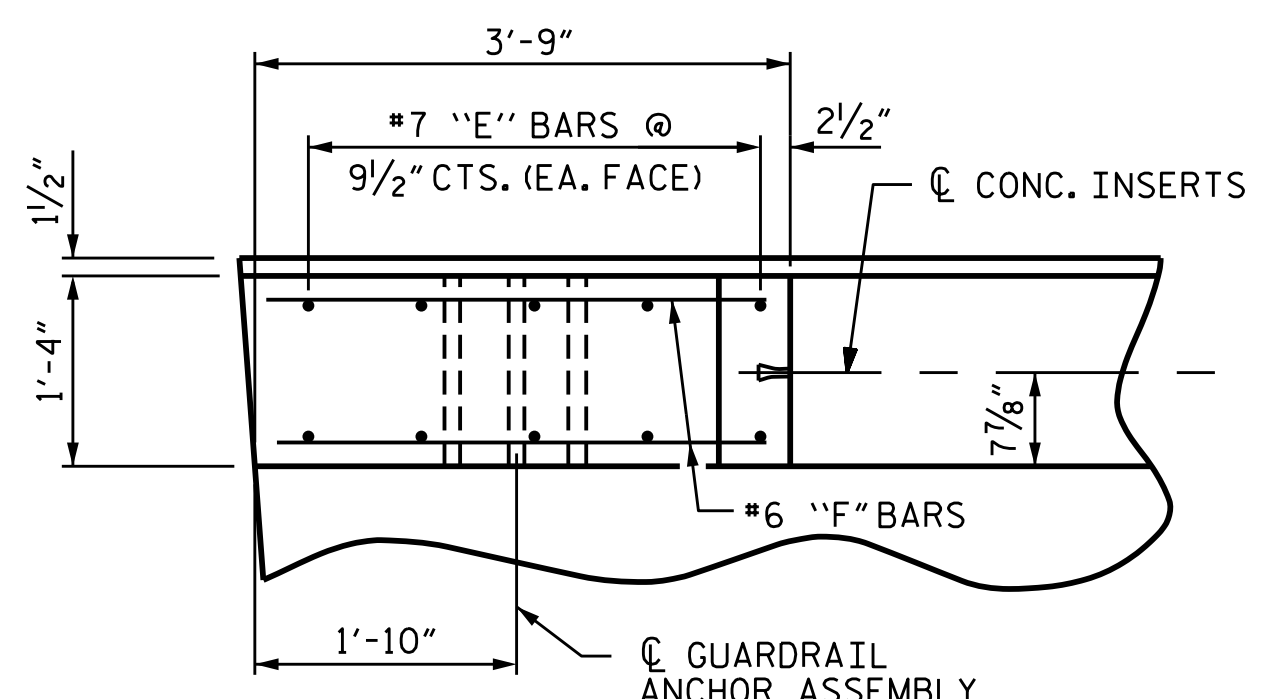
STR. #2

STD. NO. BMR2

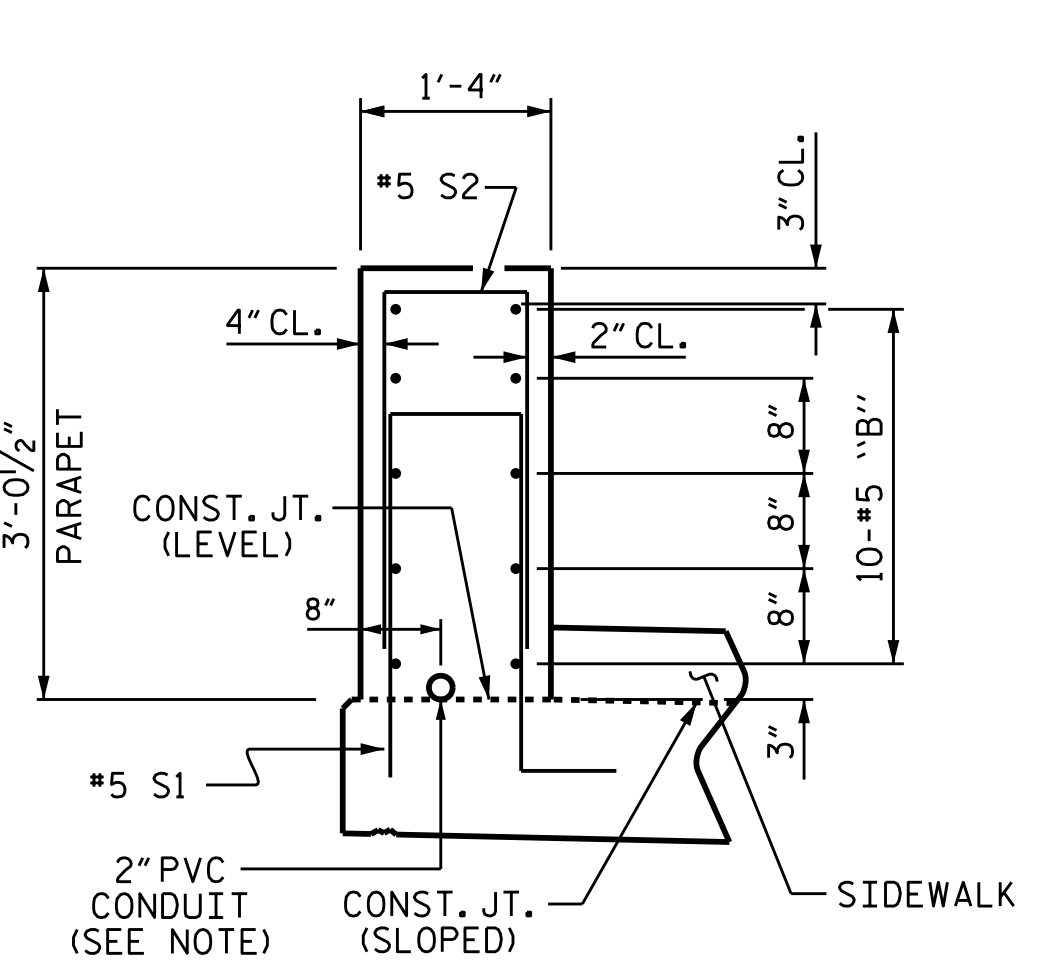
ASSEMBLED BY : T.L. AVERETTE	DATE : 02/15
CHECKED BY : J.P. ADAMS	DATE : 07/15
DRAWN BY : FCJ 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM



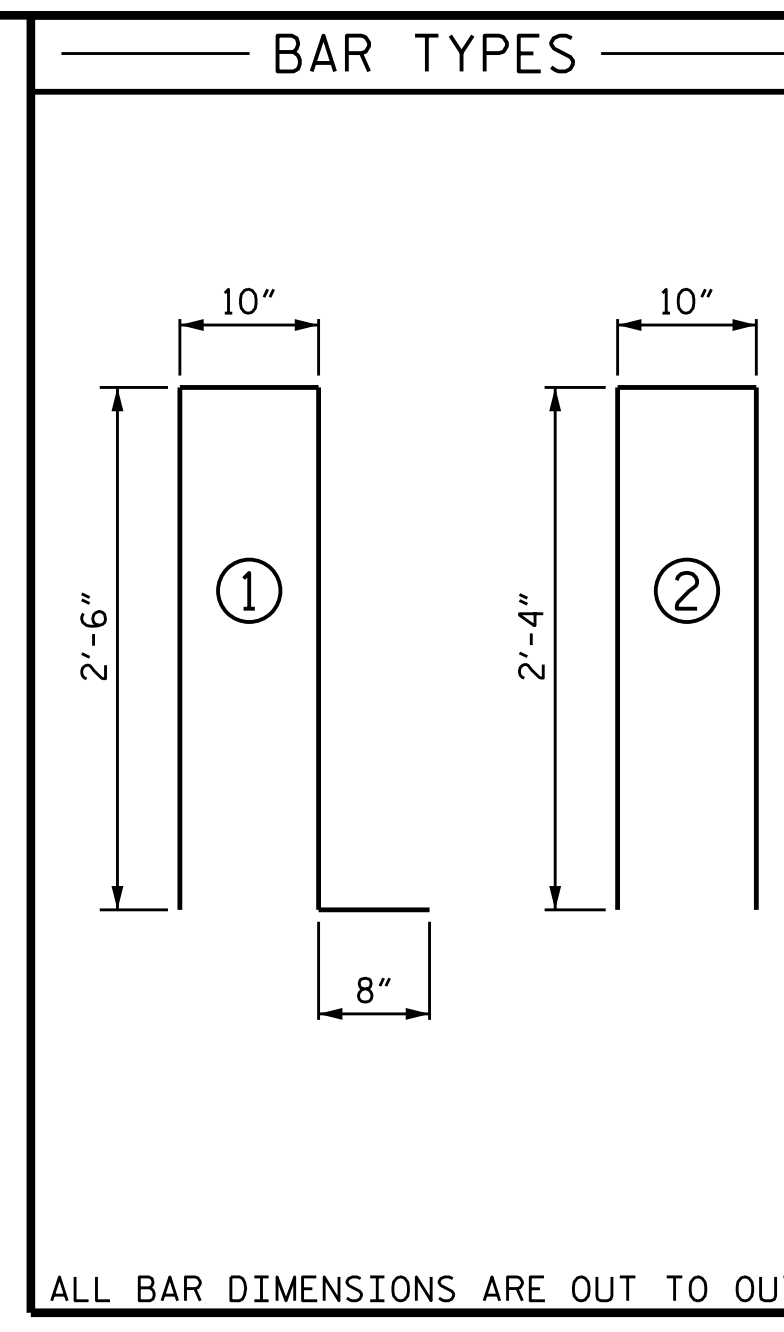
PLAN OF PARAPET



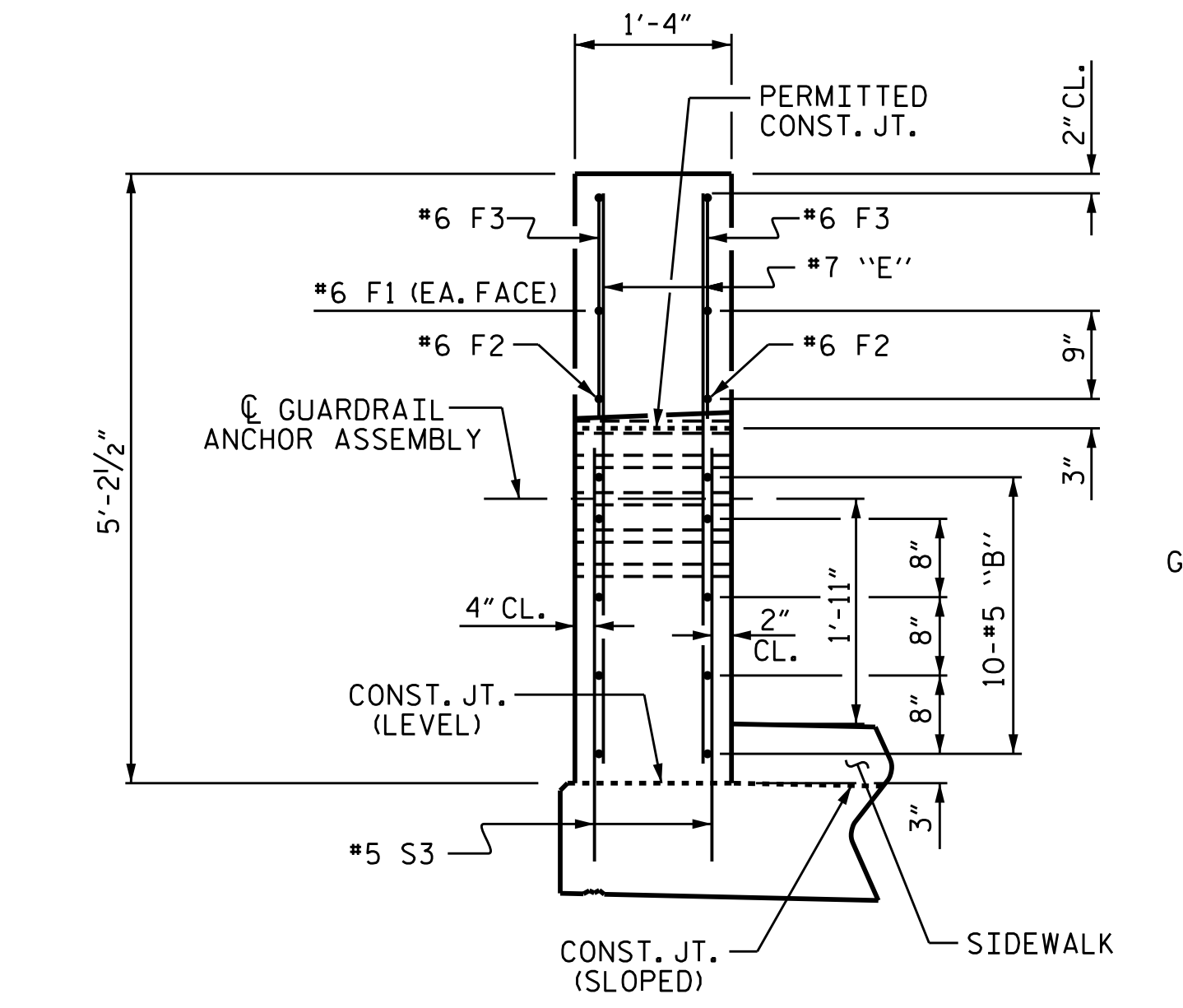
PLAN OF END POST



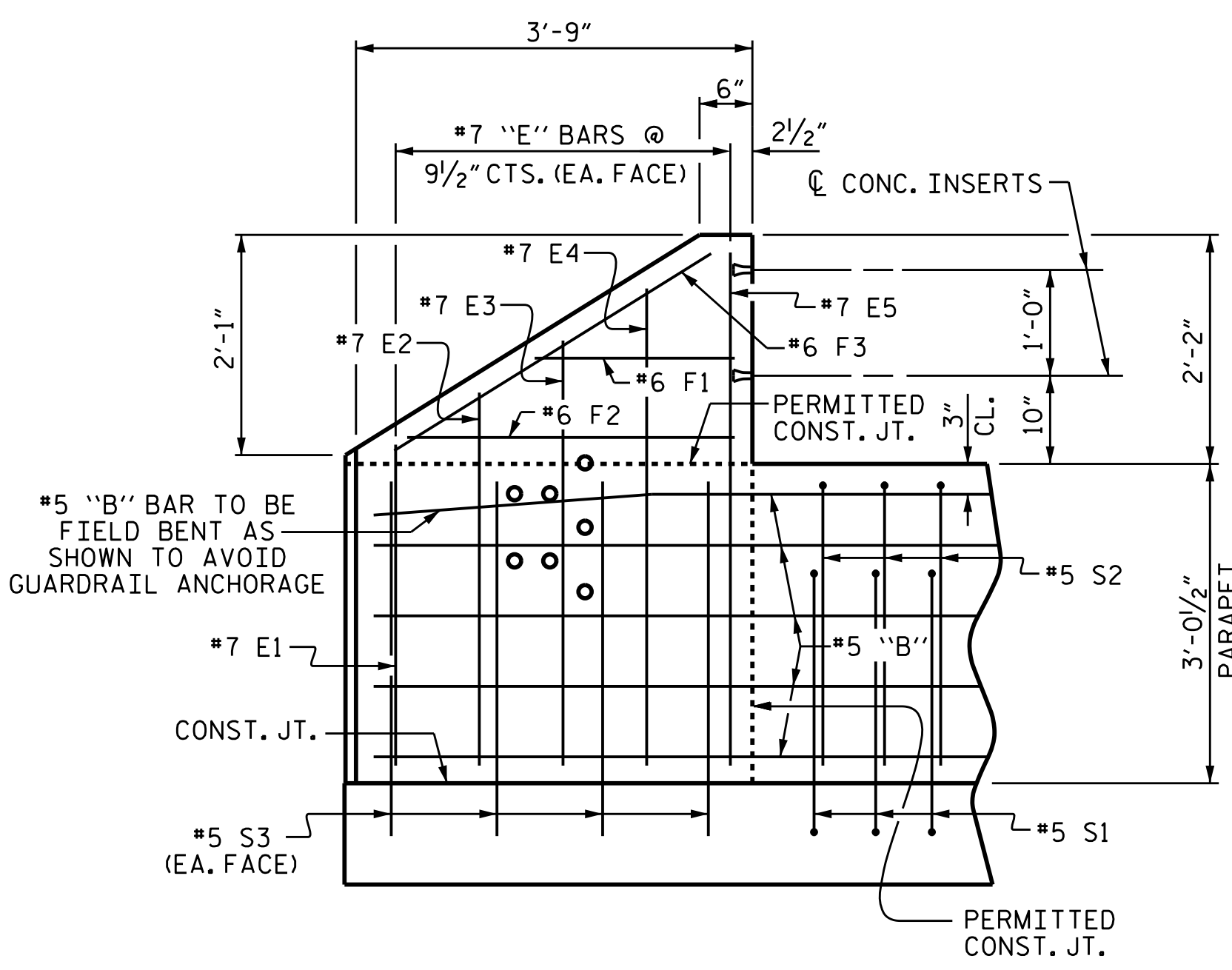
SECTION THROUGH PARAPET



BILL OF MATERIAL-STAGE I					
PARAPET AND 2 END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B3	30	#5	STR	24'-7"	769
* B4	20	#5	STR	25'-7"	534
* E1	4	#7	STR	3'-0"	25
* E2	4	#7	STR	3'-6"	29
* E3	4	#7	STR	4'-0"	33
* E4	4	#7	STR	4'-6"	37
* E5	4	#7	STR	4'-10"	40
* F1	4	#6	STR	1'-10"	11
* F2	4	#6	STR	3'-1"	19
* F3	4	#6	STR	3'-6"	21
* S1	121	#5	1	6'-6"	820
* S2	121	#5	2	5'-6"	694
* S3	16	#5	STR	3'-6"	58
* EPOXY COATED REINF. STEEL					3090 LBS.
CLASS AA CONCRETE					19.6 C.Y.
1'-4" X 3'-0 1/2" CONCRETE PARAPET					127.12 L.F.

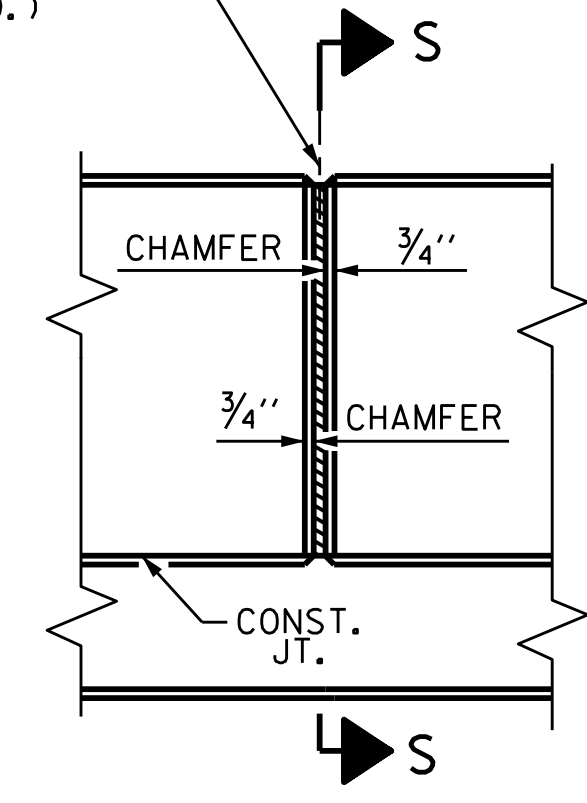


END VIEW

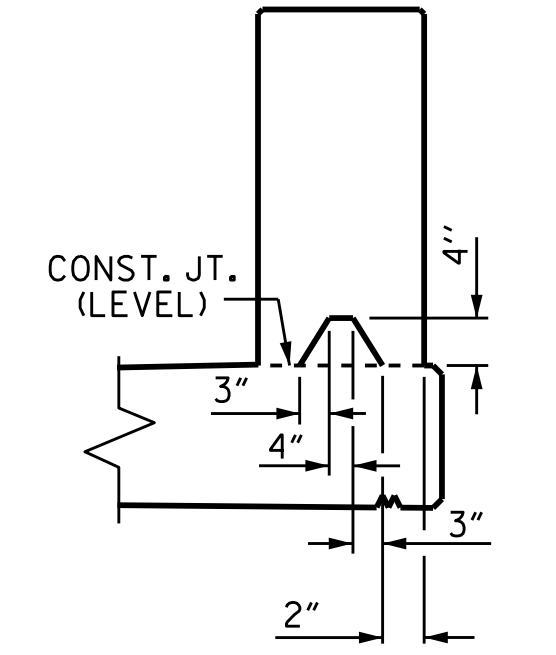


ELEVATION

1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.
(NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)

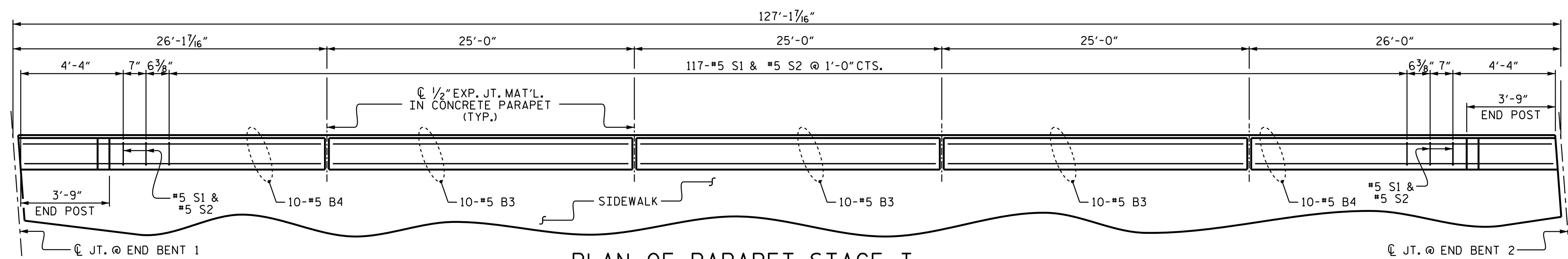


ELEVATION AT EXPANSION JOINTS
BARRIER RAIL DETAILS



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

PARAPET AND END POST FOR TWO BAR METAL RAIL



PLAN OF PARAPET-STAGE I

DIMENSIONS ARE GIVEN ALONG THE BACK FACE OF THE PARAPET

NOTES

ALL REINFORCING STEEL IN PARAPETS AND END POSTS SHALL BE EPOXY COATED.

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

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

PAYMENT FOR THE END POSTS SHALL BE INCLUDED IN THE PAY ITEM FOR "1'-4" X 3'-0 1/2" CONCRETE PARAPET."

AESTHETIC DETAILS NOT SHOWN FOR CLARITY. SEE "CONCRETE PARAPET AESTHETIC DETAILS" SHEET.

THE COST OF THE 2" PVC CONDUIT SHALL BE CONSIDERED INCIDENTAL TO THE CONCRETE PARAPET.



DocuSigned by:
W. ALFORD
F248839306F40E...
3/29/2016

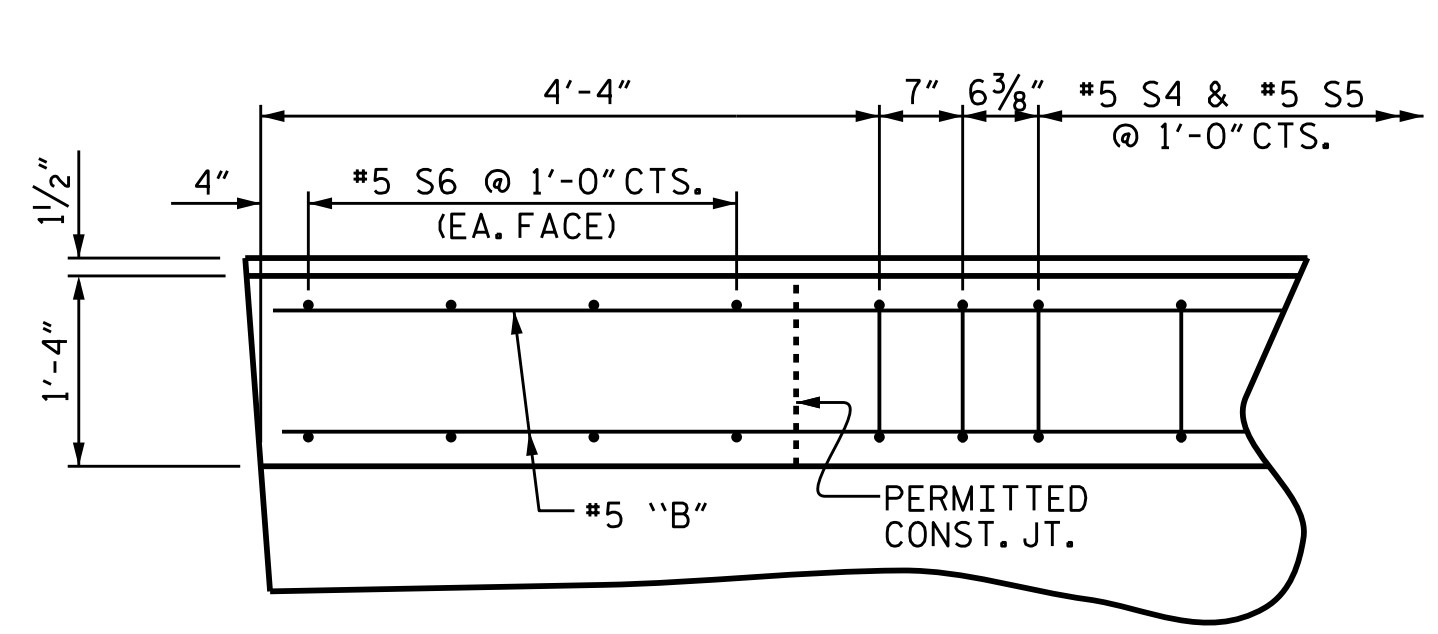
DRAWN BY :	T.L. AVERETTE	DATE :	11-14
CHECKED BY :	J.P. ADAMS	DATE :	07-15
DESIGN ENGINEER OF RECORD :	T.L. AVERETTE	DATE :	09-15

29-MAR-2016 09:20
R:\Structures\Plans\STR 2\SUPERSTRUCTURE\B4490.SD_CP.dgn
Jpodoms

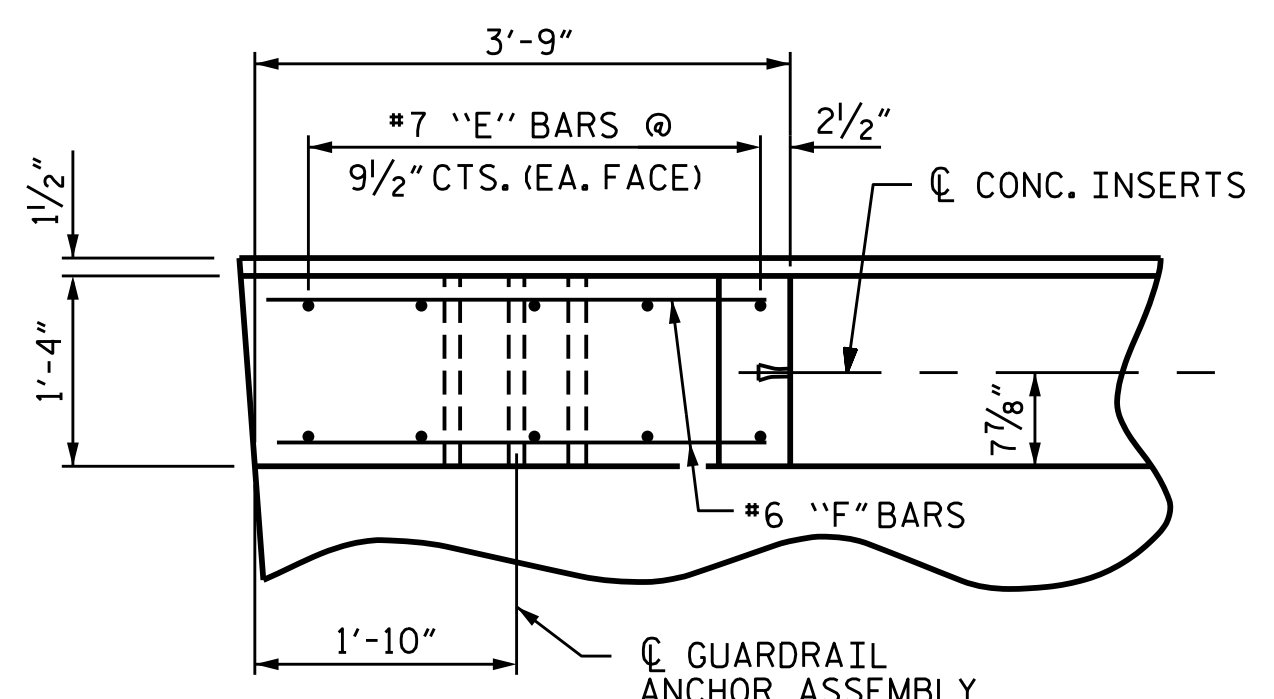
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 35+23.40 -L-
SHEET 1 OF 2

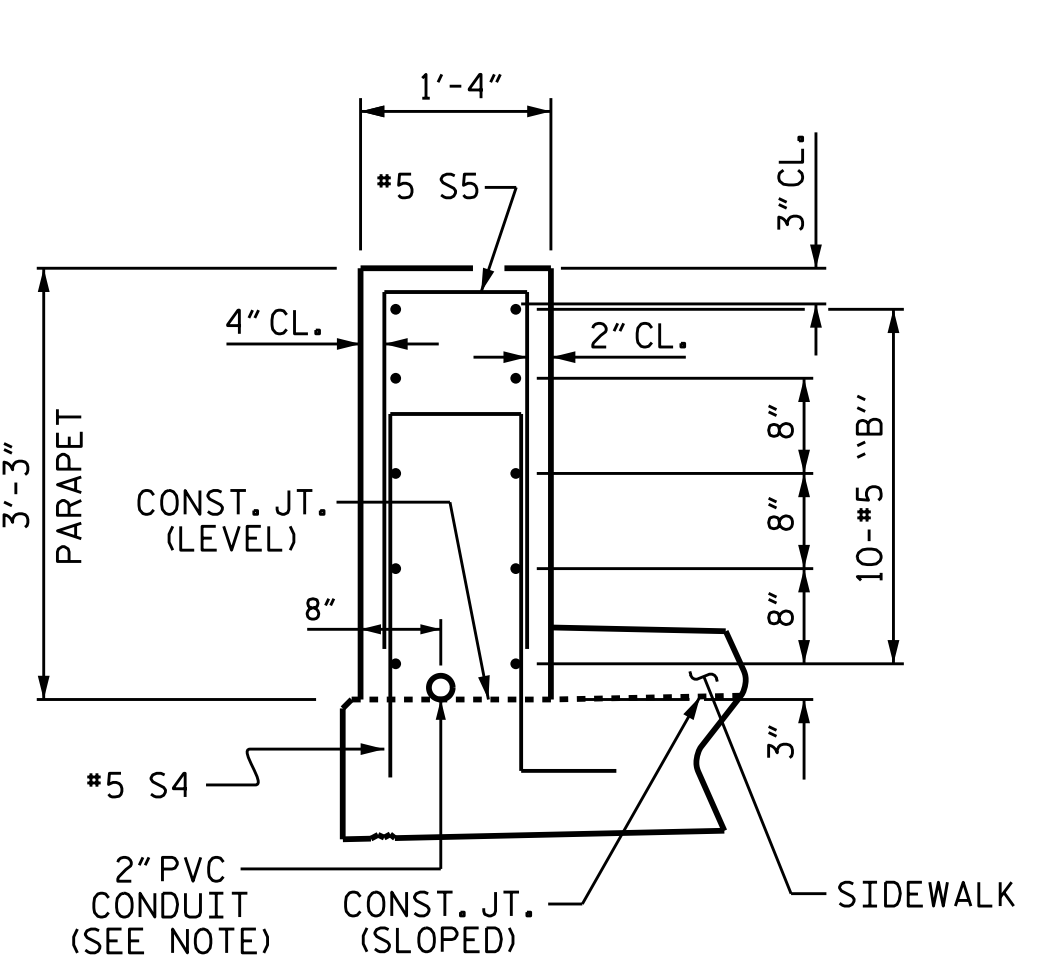
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE CONCRETE PARAPET DETAILS STAGE I					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-62					TOTAL SHEETS 84



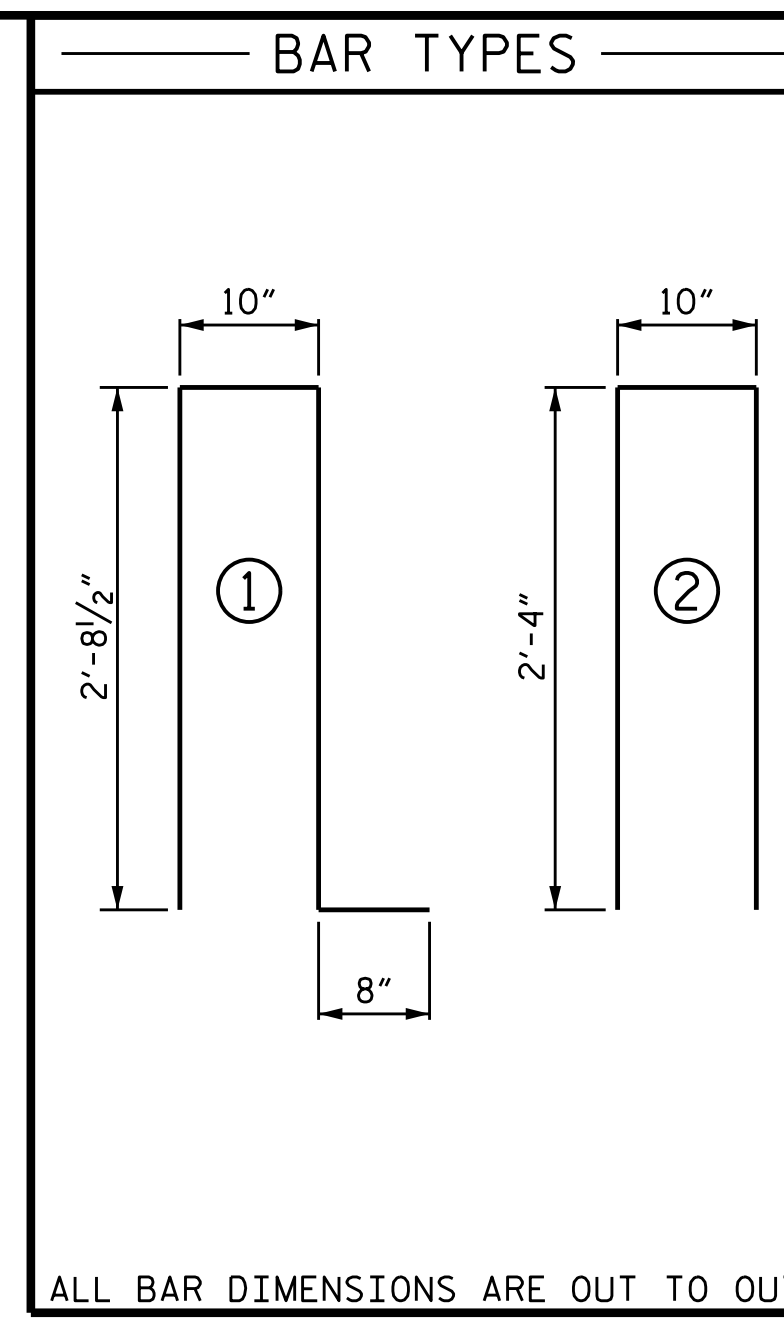
PLAN OF PARAPET



PLAN OF END POST

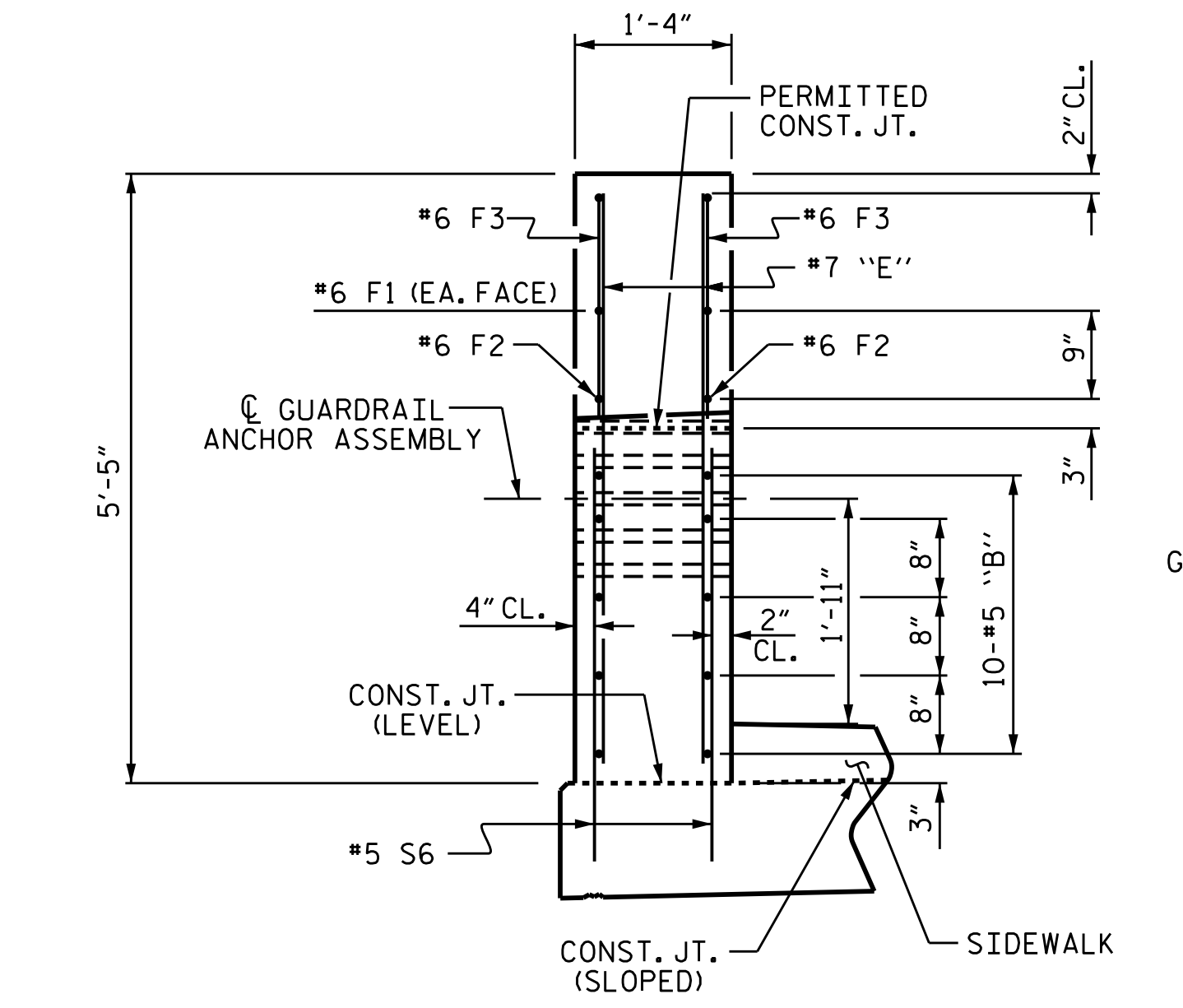


SECTION THROUGH PARAPET

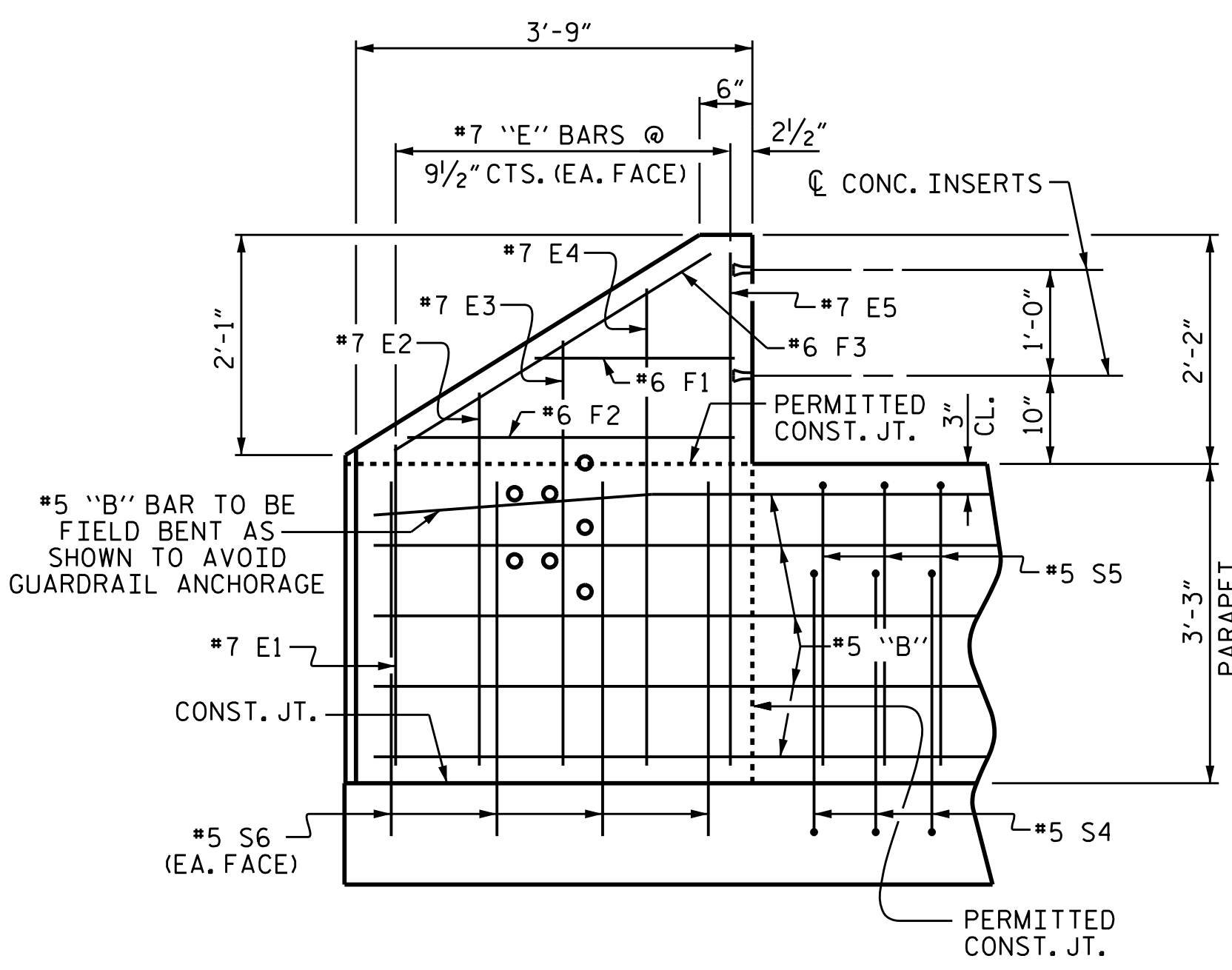


BILL OF MATERIAL-STAGE II					
PARAPET AND 2 END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B3	30	#5	STR	24'-7"	769
* B4	20	#5	STR	25'-7"	534
* E1	4	#7	STR	3'-0"	25
* E2	4	#7	STR	3'-6"	29
* E3	4	#7	STR	4'-0"	33
* E4	4	#7	STR	4'-6"	37
* E5	4	#7	STR	4'-10"	40
* F1	4	#6	STR	1'-10"	11
* F2	4	#6	STR	3'-1"	19
* F3	4	#6	STR	3'-6"	21
* S4	121	#5	1	6'-11"	873
* S5	121	#5	2	5'-6"	694
* S6	16	#5	STR	3'-8"	61
* EPOXY COATED REINF. STEEL					3146 LBS.
CLASS AA CONCRETE					20.9 C.Y.
1'-4" X 3'-3" CONCRETE PARAPET					127.12 L.F.

ALL BAR DIMENSIONS ARE OUT TO OUT

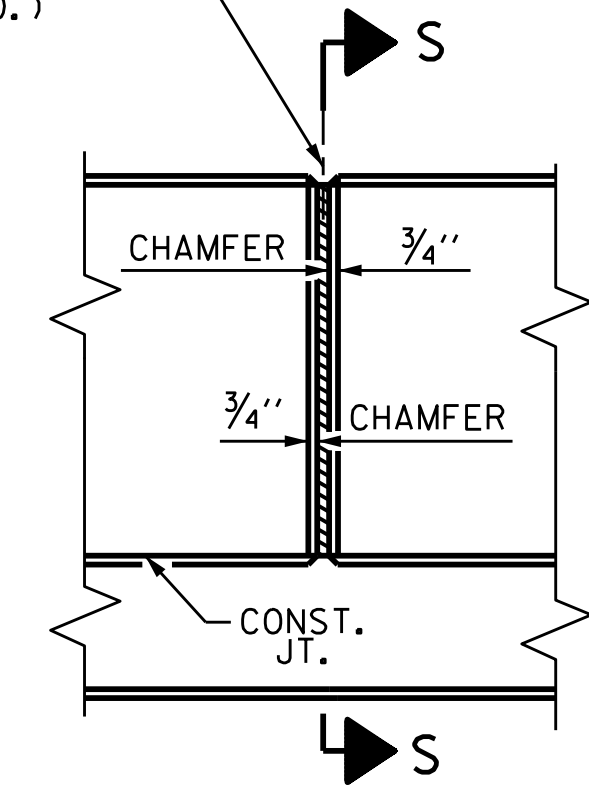


END VIEW

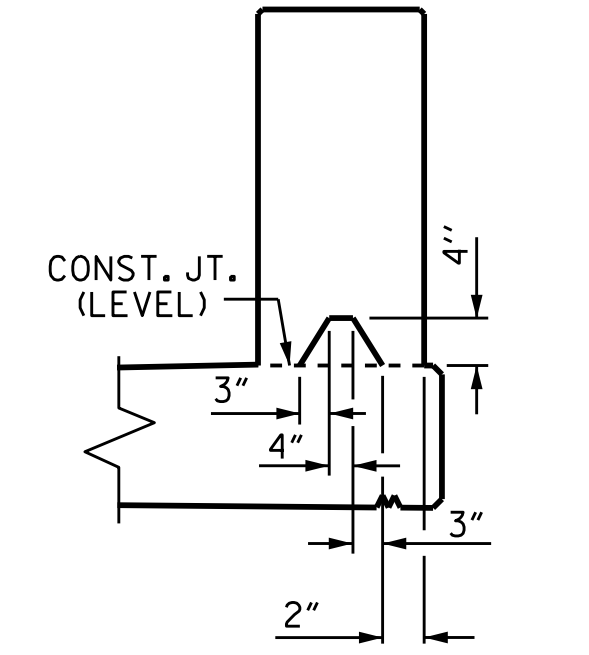


ELEVATION

1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.
(NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)

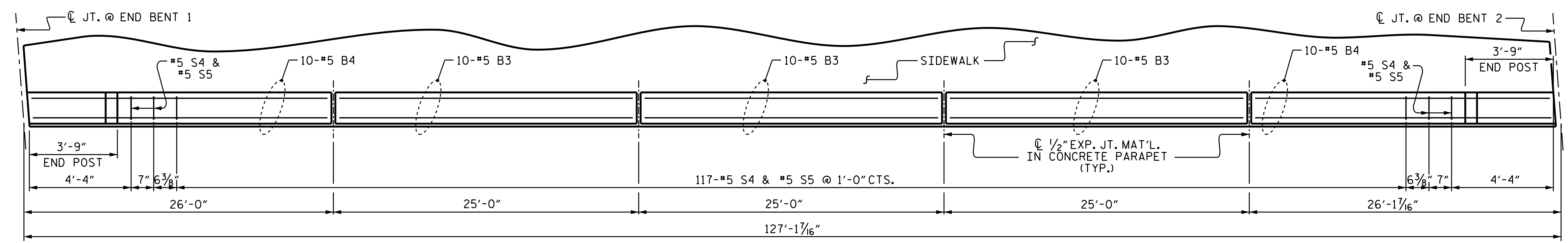


ELEVATION AT EXPANSION JOINTS
BARRIER RAIL DETAILS



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

PARAPET AND END POST FOR TWO BAR METAL RAIL

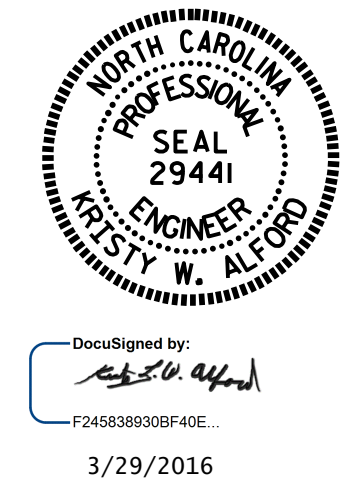


PLAN OF PARAPET-STAGE II

DIMENSIONS ARE GIVEN ALONG THE BACK FACE OF THE PARAPET

NOTES

- ALL REINFORCING STEEL IN PARAPETS AND END POSTS SHALL BE EPOXY COATED.
- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.
- PARAPET IN THE SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
- PAYMENT FOR THE END POSTS SHALL BE INCLUDED IN THE PAY ITEM FOR "1'-4" X 3'-3" CONCRETE PARAPET."
- AESTHETIC DETAILS NOT SHOWN FOR CLARITY. SEE "CONCRETE PARAPET AESTHETIC DETAILS" SHEET.
- THE COST OF THE 2" PVC CONDUIT SHALL BE CONSIDERED INCIDENTAL TO THE CONCRETE PARAPET.



PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 35+23.40 -L-

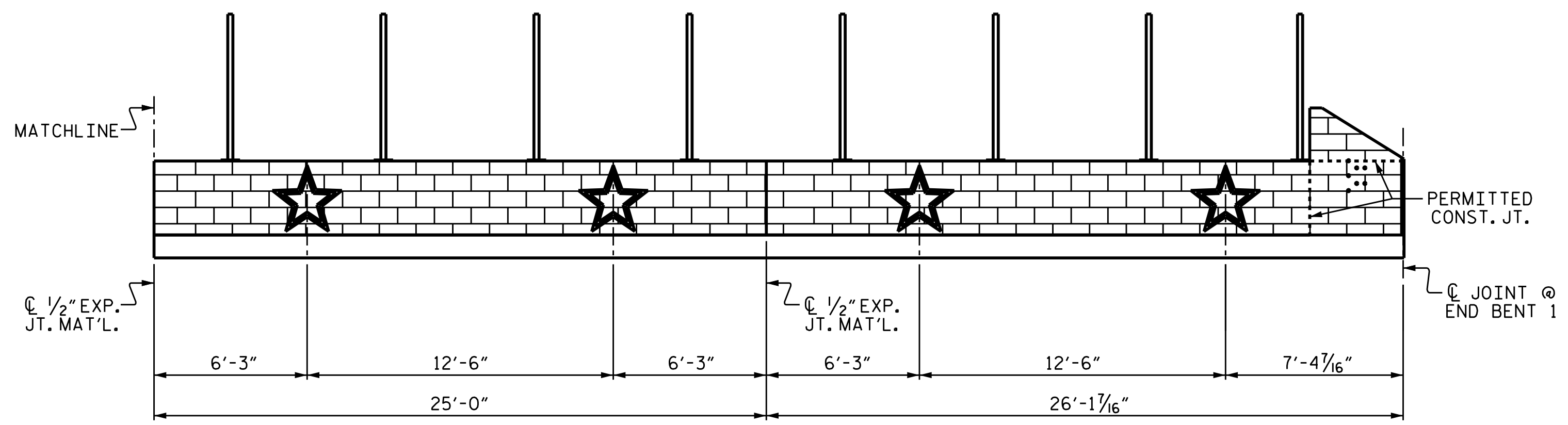
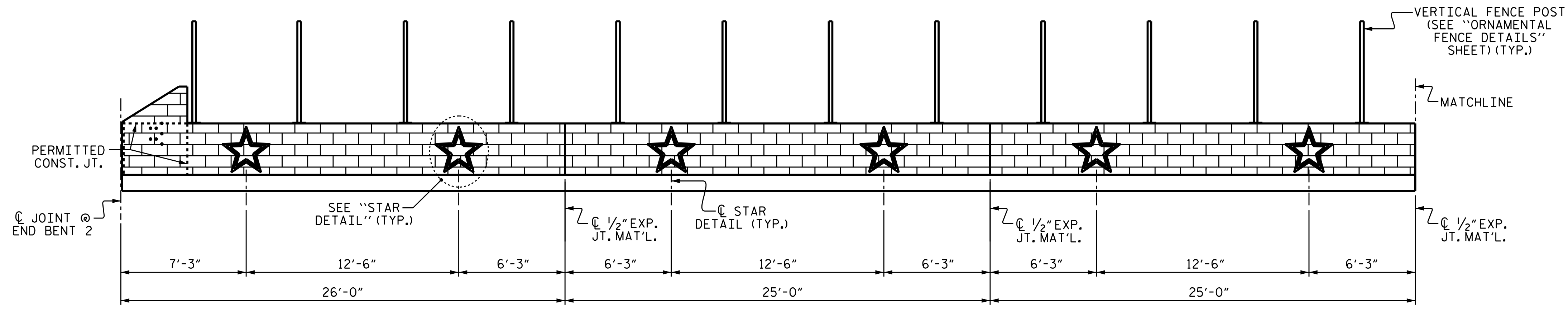
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
CONCRETE PARAPET
DETAILS
STAGE II

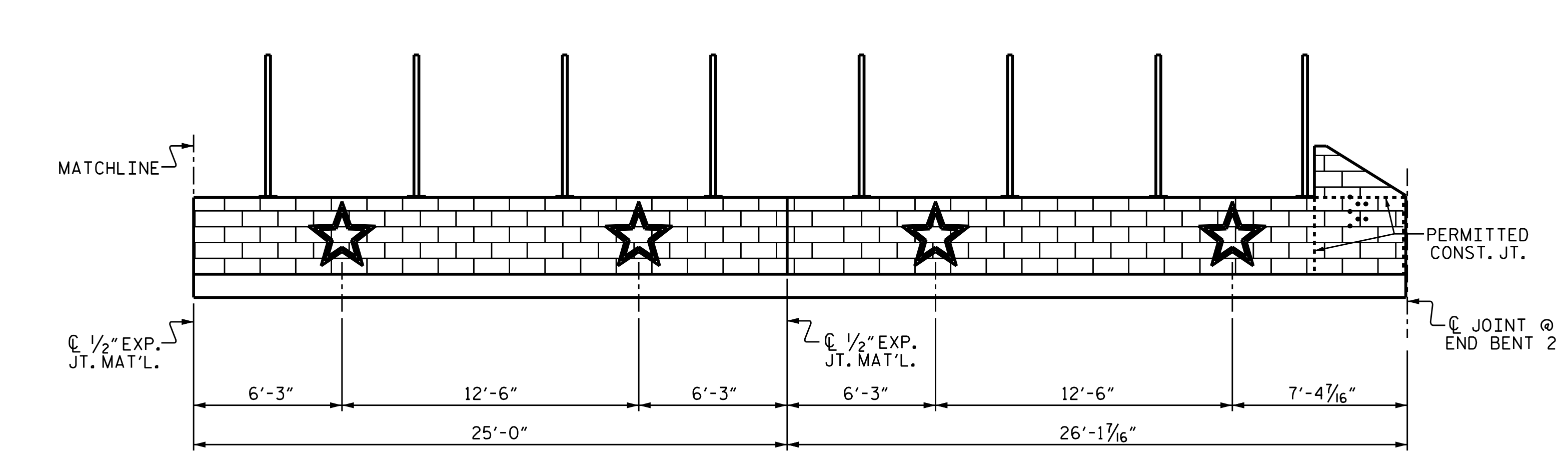
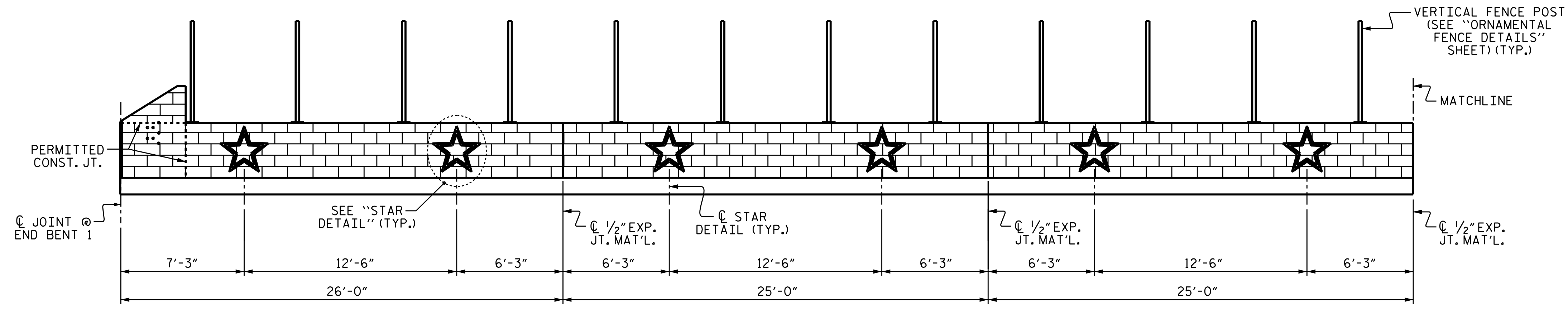
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-63	
1			3			TOTAL SHEETS	
2			4			84	

DRAWN BY : I.L. AVERETTE DATE : 11-14
CHECKED BY : J.P. ADAMS DATE : 07-15
DESIGN ENGINEER OF RECORD : I.L. AVERETTE DATE : 09-15

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



OUTSIDE OF STAGE I PARAPET ELEVATION

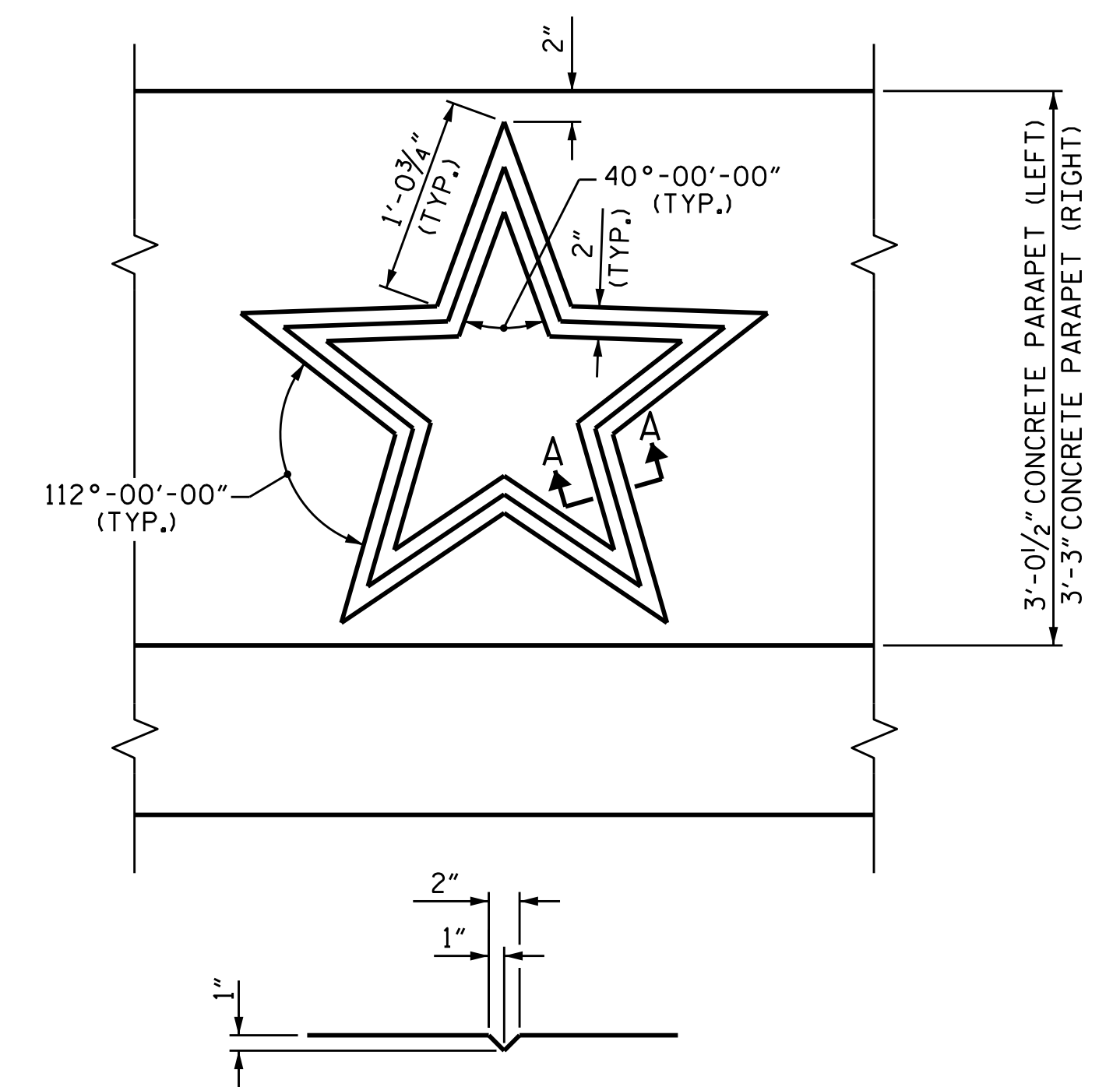


OUTSIDE OF STAGE II PARAPET ELEVATION

NOTES

- STAR RELIEF SHOWN SHALL BE CONSIDERED TO BEGIN AT THE POINT OF MAXIMUM RELIEF ON THE FORM LINER. THE TOTAL DEPTH OF RELIEF SHALL NOT EXCEED 2".
- CONCRETE FORM LINER SHALL BE USED ON THE OUTSIDE FACE OF THE PARAPET ONLY.
- FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISIONS.
- STAR RELIEF SHALL BE COLORED BLACK TO MATCH FS 27038.
- FOR COLORING OF EDGE OF DECK AND STARS, SEE "APPLICATION OF BRIDGE COATING" SPECIAL PROVISION.

ARCHITECTURAL CONCRETE SURFACE TREATMENT = 819.2 SQ. FT.



SECTION A-A

STAR DETAIL

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-



DocuSigned by:
 I.L. AVERETTE
 F2458389308F40E
 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE PARAPET
 AESTHETIC DETAILS

DRAWN BY :	I.L. AVERETTE	DATE :	01-15
CHECKED BY :	J.P. ADAMS	DATE :	07-15
DESIGN ENGINEER OF RECORD:	I.L. AVERETTE	DATE :	09-15

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-64	
1			3			TOTAL	84
2			4				

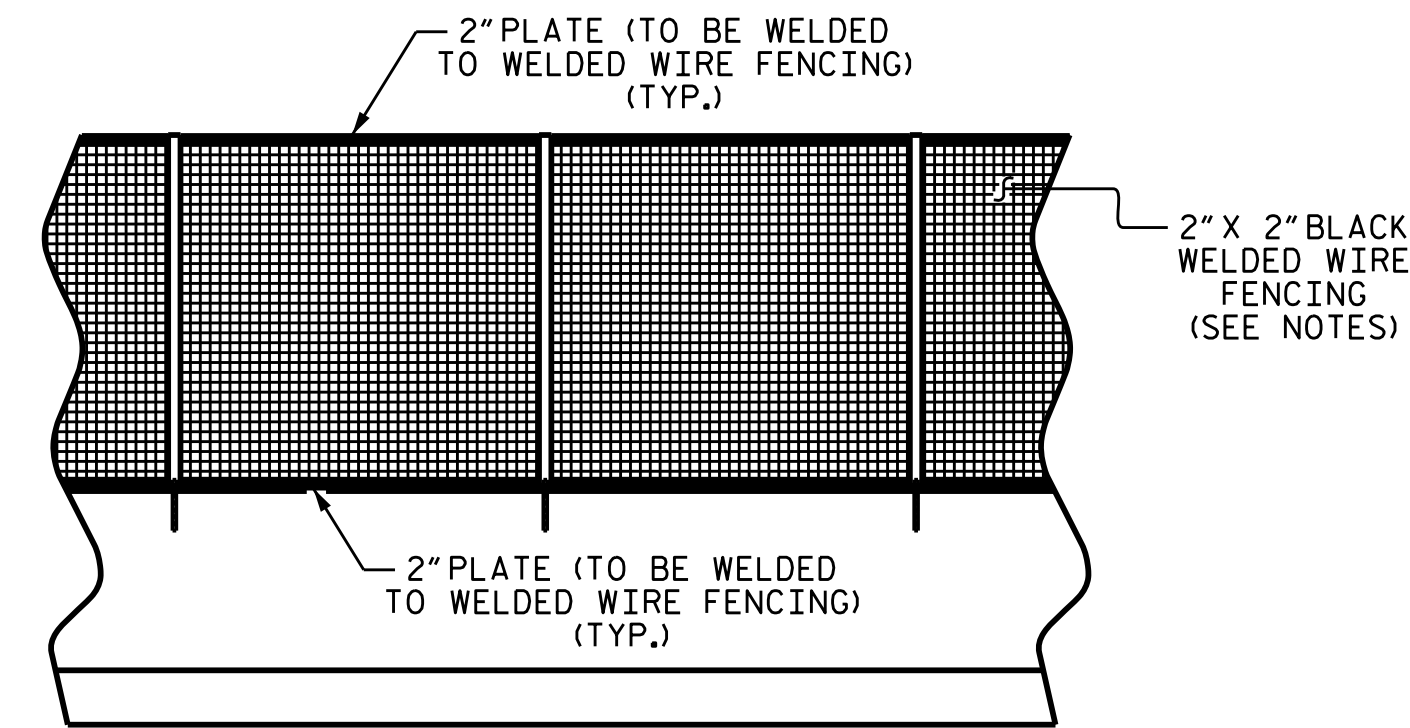
NOTES

ORNAMENTAL FENCE SHALL BE 2" X 2" BLACK WELDED WIRE OR APPROVED EQUAL.
 ORNAMENTAL FENCE, VERTICAL FENCE POSTS, 2" PLATES, AND BASE PLATES SHALL BE BLACK.
 ALL BOLTS SHALL BE HILTI 7/8" Ø HAS-E HDG ANCHOR ROD WITH HILTI HIT HY 200 (7/8" MIN. EMBEDMENT) OR APPROVED EQUAL.
 POST SHALL BE SPACED TO BE A MINIMUM OF 1'-6" FROM BARRIER RAIL EXPANSION JOINT.
 FOR ORNAMENTAL FENCE, SEE SPECIAL PROVISIONS.
 AFTER A SHADE OF BLACK HAS BEEN SELECTED FOR THE FENCING, THE CONTRACTOR SHALL SUBMIT A SAMPLE OF COMPATIBLE EXTERIOR ACRYLIC HOUSE PAINT TO THE ENGINEER. THIS PAINT SHALL MATCH THE FENCING COLOR AS CLOSELY AS POSSIBLE. AFTER ERECTION OF THE FENCING, ALL EXPOSED ANCHOR BOLTS, NUTS, WASHERS, MACHINE SCREWS, CAP SCREWS, BOLTS, ATTACHMENT BRACKETS, HOLD-DOWN PLATES, AND BUILT UP ANGLES SHALL BE COATED WITH TWO COATS OF THIS PAINT. FENCE COMPONENTS SHALL BE PAINTED AFTER GALVANIZATIONS IN ACCORDANCE WITH SECTION 442 OF THE STANDARD SPECIFICATIONS.
 ADHERE TO THE APPLICABLE REQUIREMENTS OF SECTION 1074 OF THE STANDARD SPECIFICATIONS.
 POSTS, BASE PLATES, AND CONNECTOR PLATES SHALL MEET THE REQUIREMENTS FOR AASHTO M270 GRADE 50 AND SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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 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.

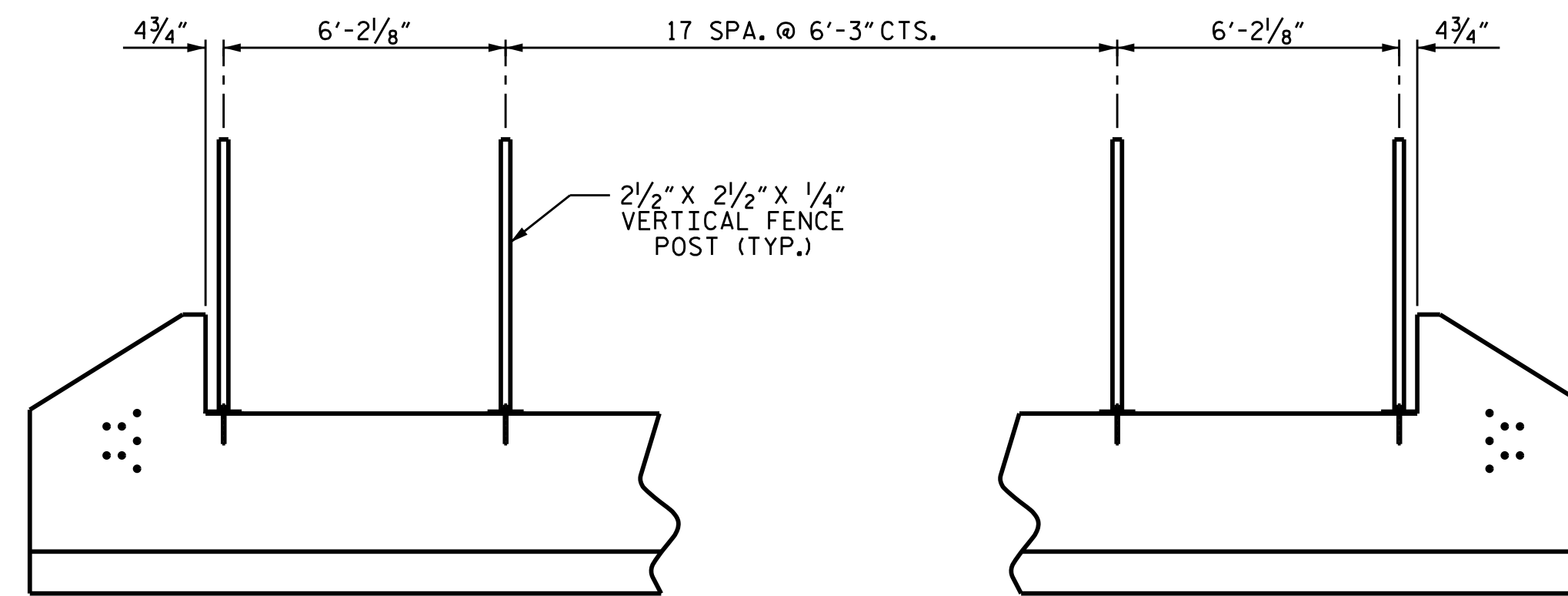
WIRE MESH FENCE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2453 TYPE 2.

THE CONTRACTOR SHALL VERIFY THE DIMENSIONS AND POST SPACINGS IN THE FIELD PRIOR TO FABRICATION AND INSTALLATION OF FENCE.



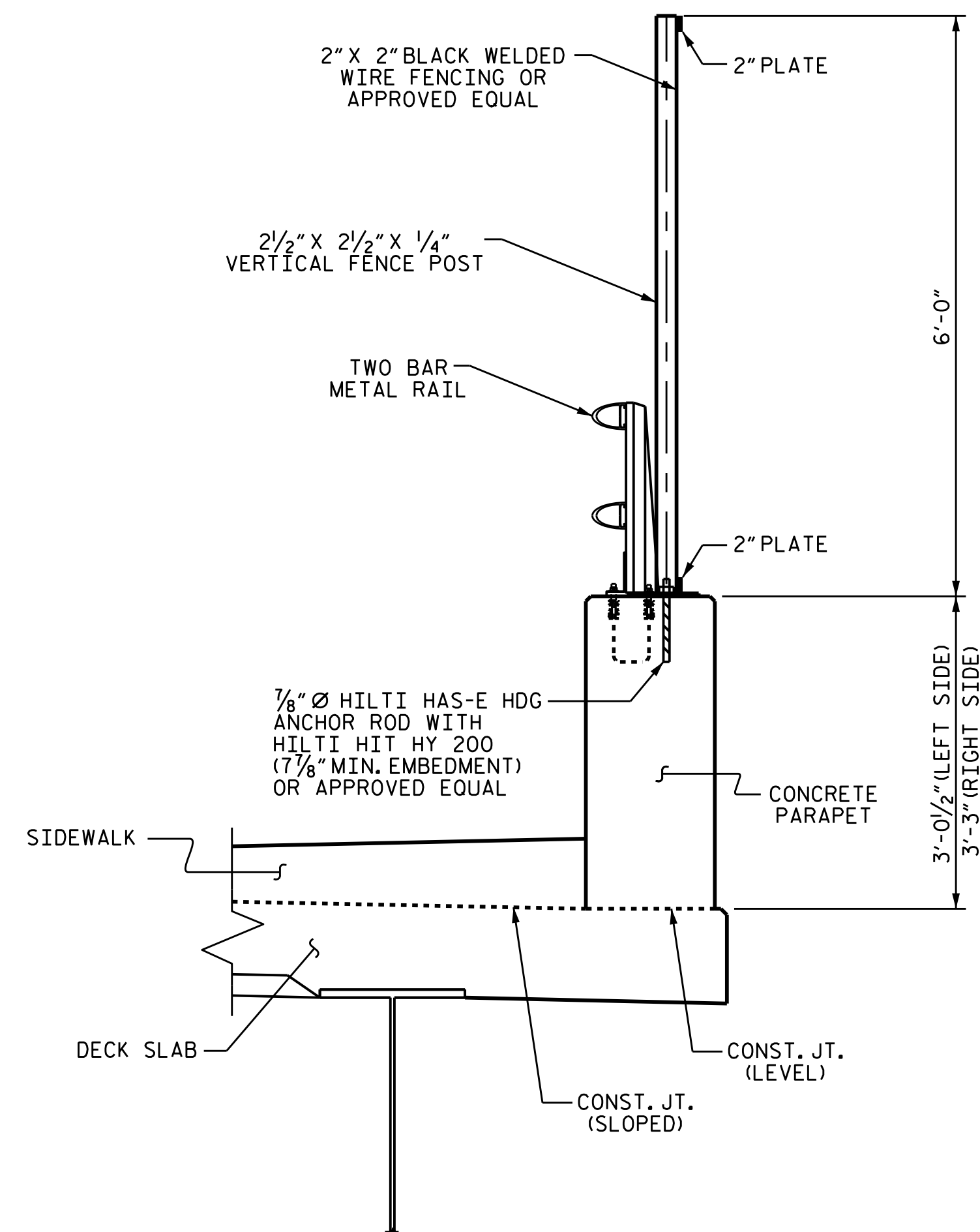
PARTIAL ELEVATION

SHOWING WELDED WIRE FENCE DETAILS
 STAR DETAIL NOT SHOWN FOR CLARITY. FOR STAR DETAIL, SEE "CONCRETE PARAPET STAR DETAIL" SHEET

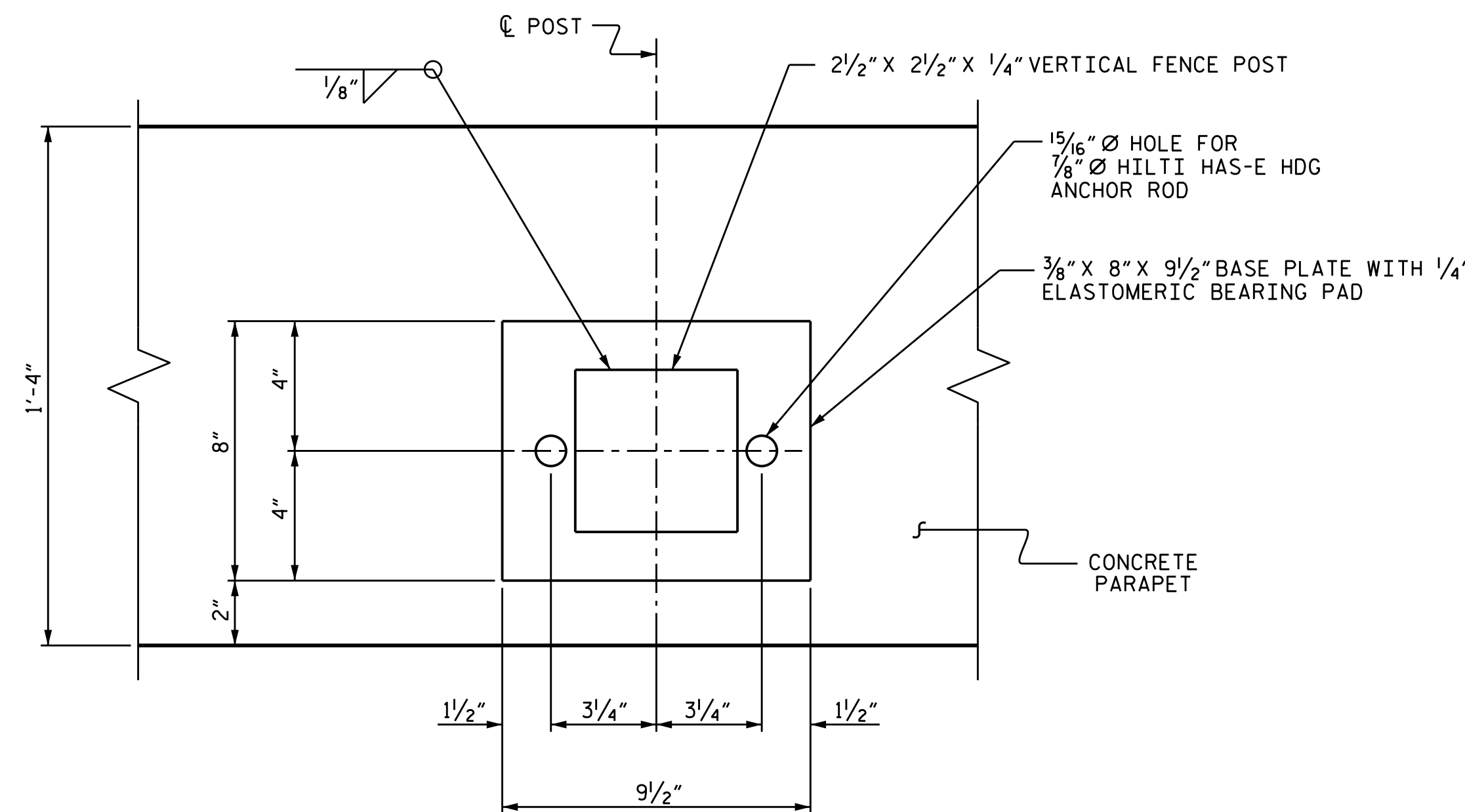


PARTIAL ELEVATION

SHOWING ORNAMENTAL FENCE POST LOCATIONS (WELDED WIRE NOT SHOWN)
 STAR DETAIL NOT SHOWN FOR CLARITY. FOR STAR DETAIL, SEE "CONCRETE PARAPET STAR DETAIL" SHEET



SECTION THRU FENCE



BASE PLATE DETAIL

PAY LENGTH = 237.2 LIN. FT.

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-



DocuSigned by:
 F2458388300F40E
 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 ORNAMENTAL FENCE
 DETAILS

DRAWN BY : I.L. AVERETTE DATE : 06-15
 CHECKED BY : J.P. ADAMS DATE : 07-15
 DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-65	
1			3			TOTAL SHEETS	
2			4			84	

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.

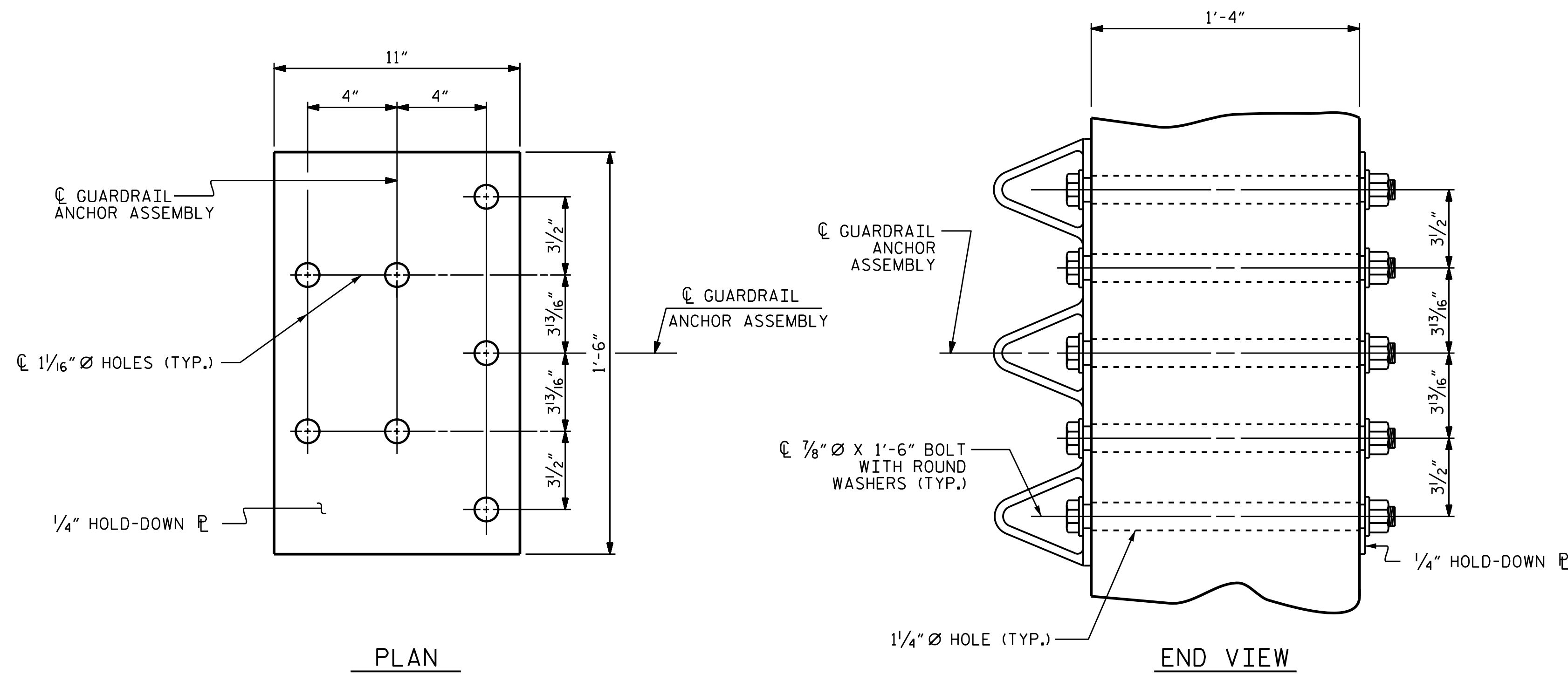
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

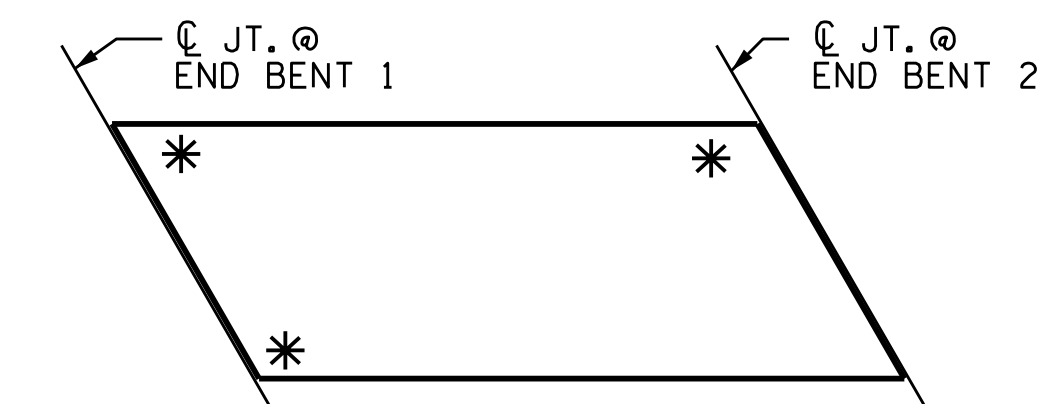
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



PLAN

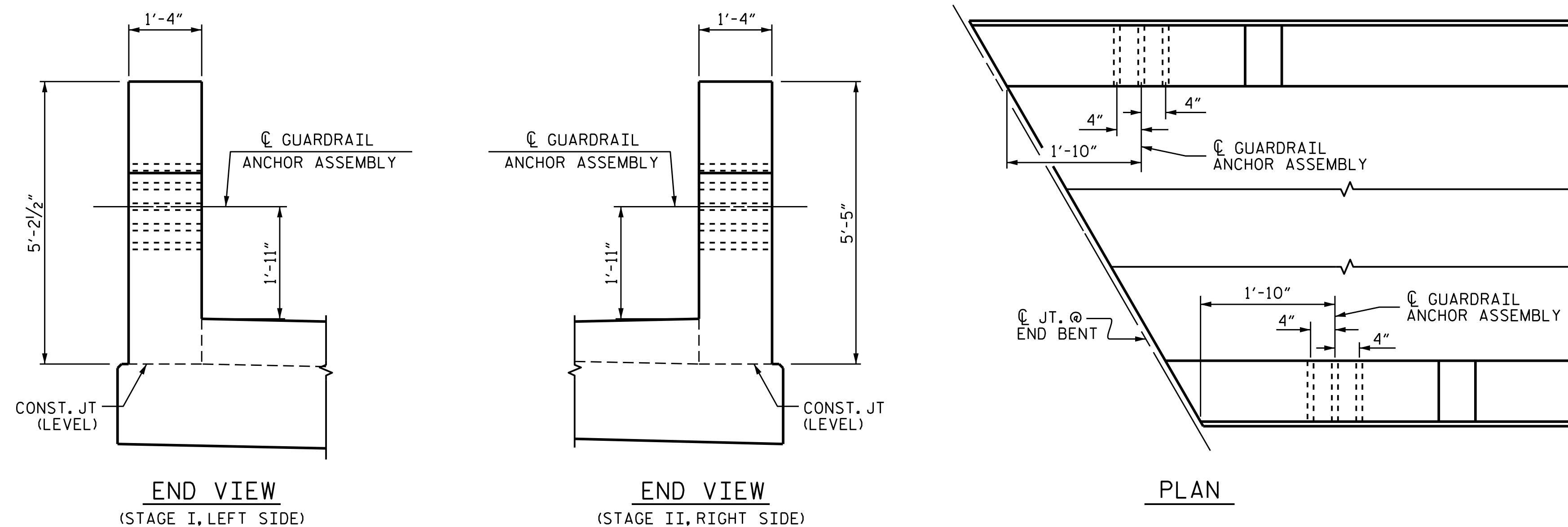
END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW (STAGE I, LEFT SIDE)

END VIEW (STAGE II, RIGHT SIDE)

PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-



DocuSigned by:
 Kristy W. Alford

3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 DETAILS
 FOR METAL RAILS

ASSEMBLED BY : T.L. AVERETTE	DATE : 02/15
CHECKED BY : J.P. ADAMS	DATE : 07/15
DRAWN BY : MAA 5/10	REV. 12/5/11 MAA/GM
CHECKED BY : GM 5/10	REV. 6/13 MAA/GM
	REV. 1/15 MAA/TMG

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-66
2			4			84

NOTES

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

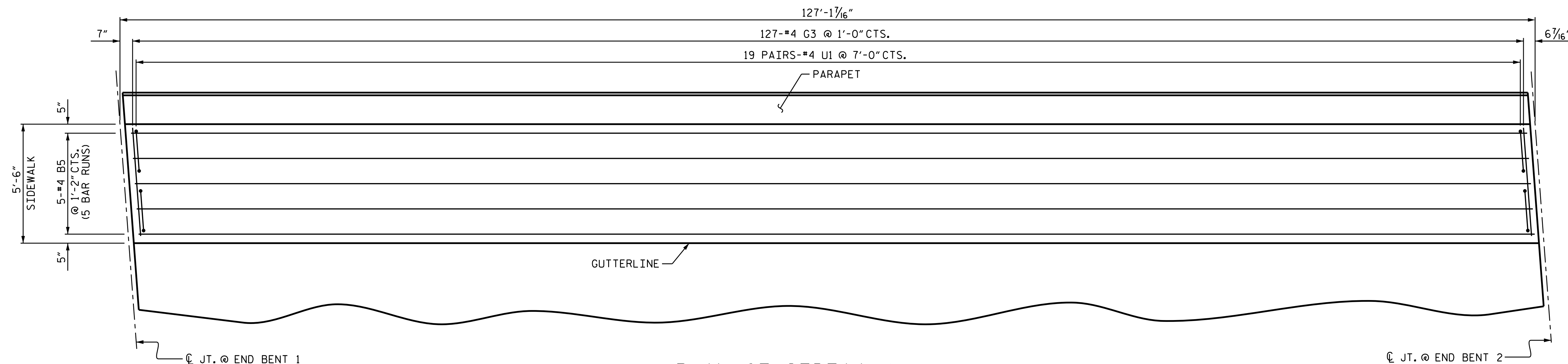
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED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

ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.

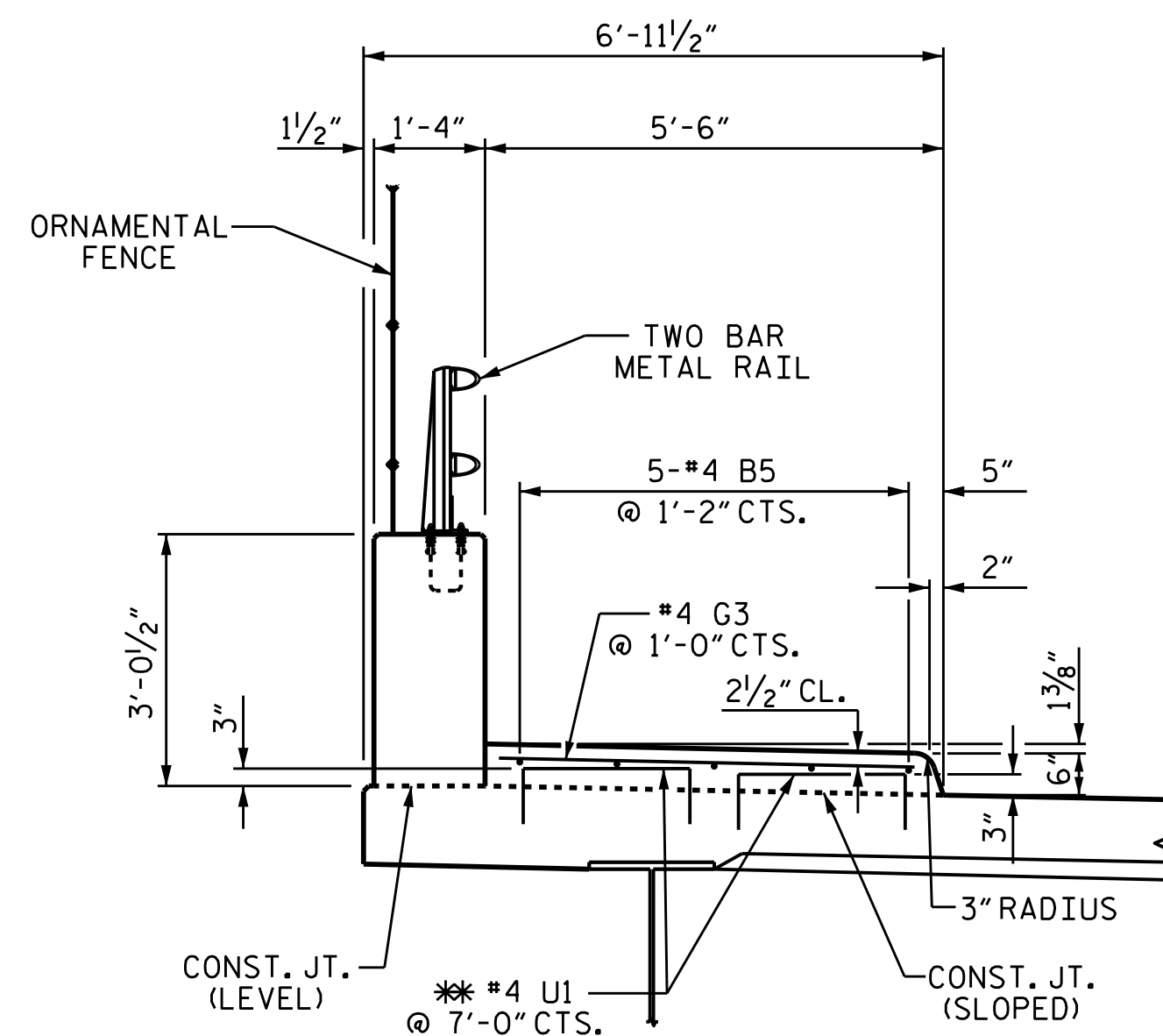
SEE "EXPANSION JOINT SEAL DETAILS FOR SIDEWALK" SHEETS FOR COVER PLATE DETAILS.

FOR SIDEWALK REINFORCING STEEL AND CONCRETE QUANTITIES, SEE SUPERSTRUCTURE "BILL OF MATERIAL."

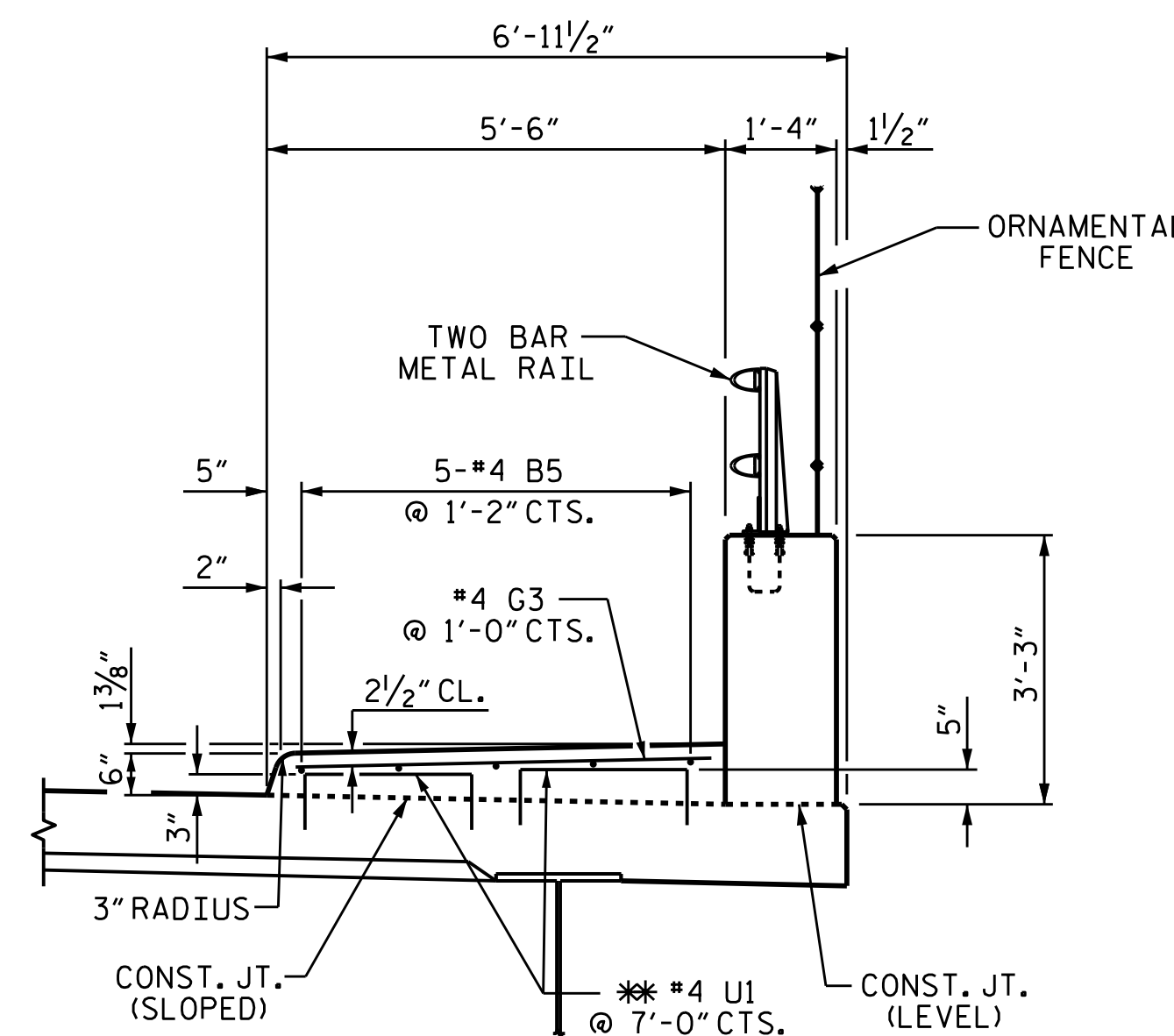
FOR SIDEWALK ON APPROACH SLAB, SEE APPROACH SLAB SHEETS.



PLAN OF SIDEWALK
STAGE I SIDEWALK SHOWN, STAGE II SIMILAR



SECTION THRU SIDEWALK
STAGE I



SECTION THRU SIDEWALK
STAGE II

** #4 U1 MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 35+23.40 -L-



DocuSigned by:
W. Alford

3/29/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
SIDEWALK DETAILS
STAGE I & STAGE II

DRAWN BY : I.L. AVERETTE DATE : 11-14
CHECKED BY : J.P. ADAMS DATE : 07-15
DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-67	
1			3			TOTAL SHEETS	
2			4			84	

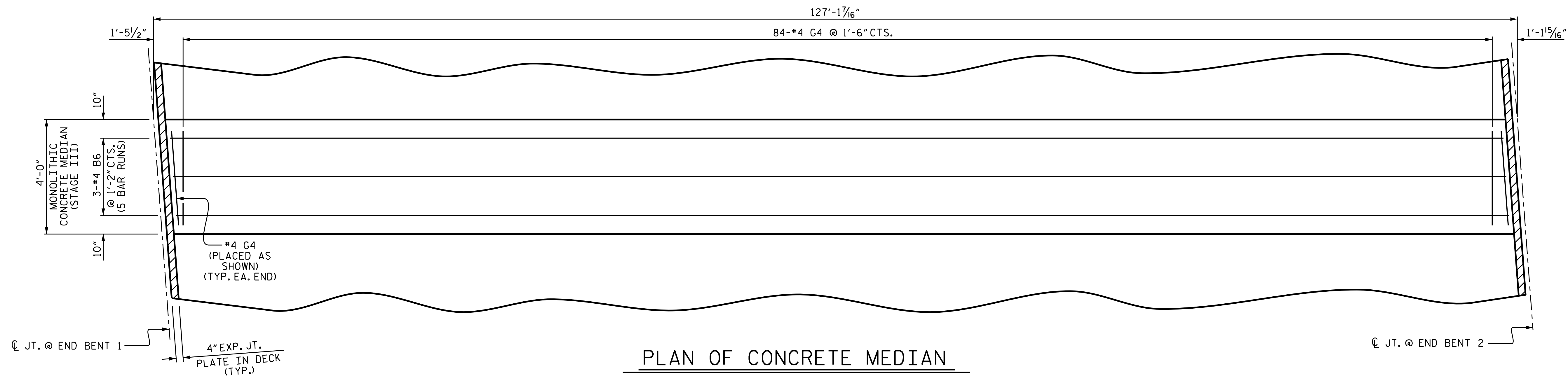
NOTES

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

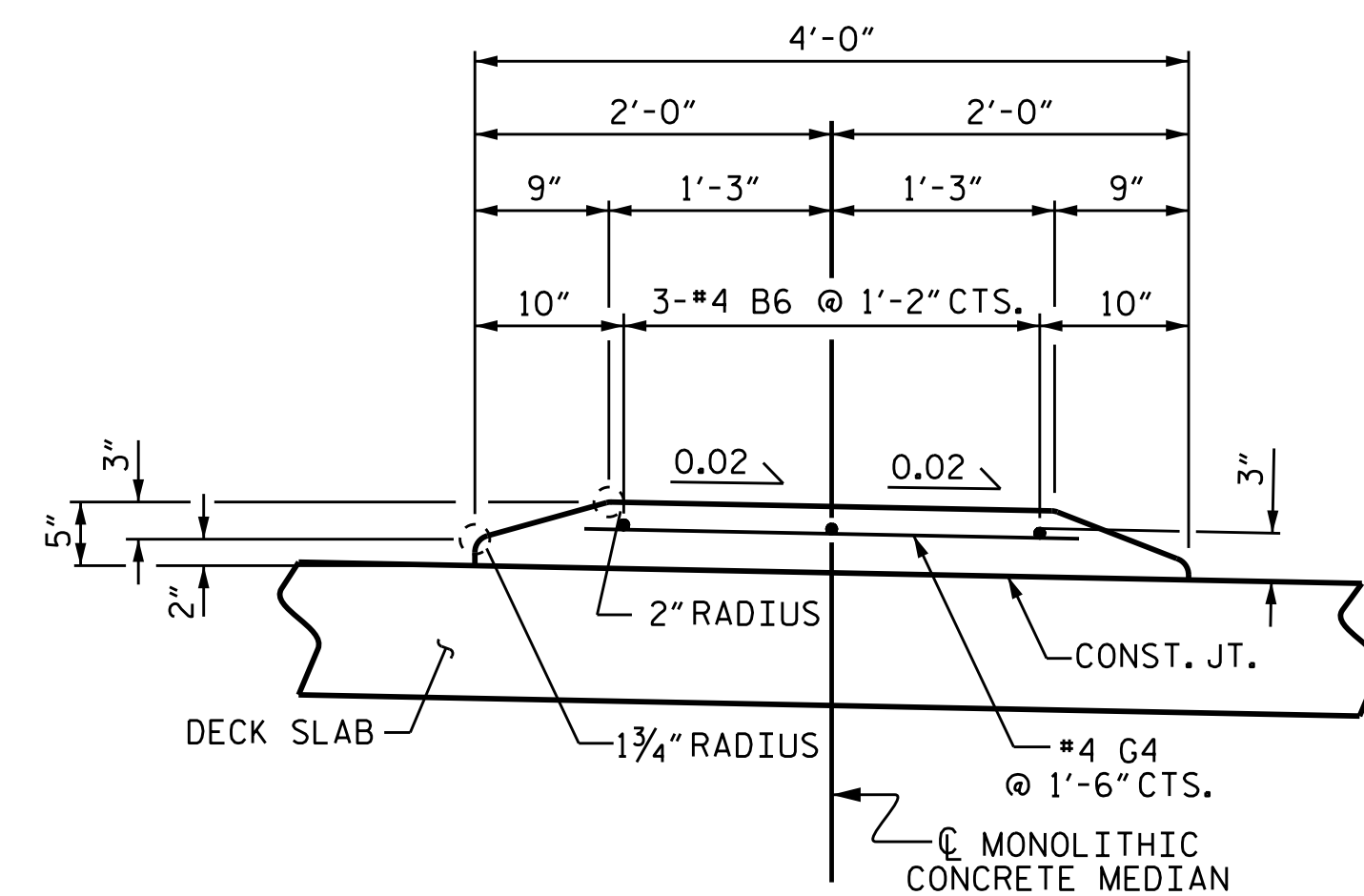
ALL REINFORCING STEEL IN THE CONCRETE MEDIAN SHALL BE EPOXY COATED.

FOR CONCRETE MEDIAN REINFORCING STEEL AND CONCRETE QUANTITIES, SEE SUPERSTRUCTURE "BILL OF MATERIAL."

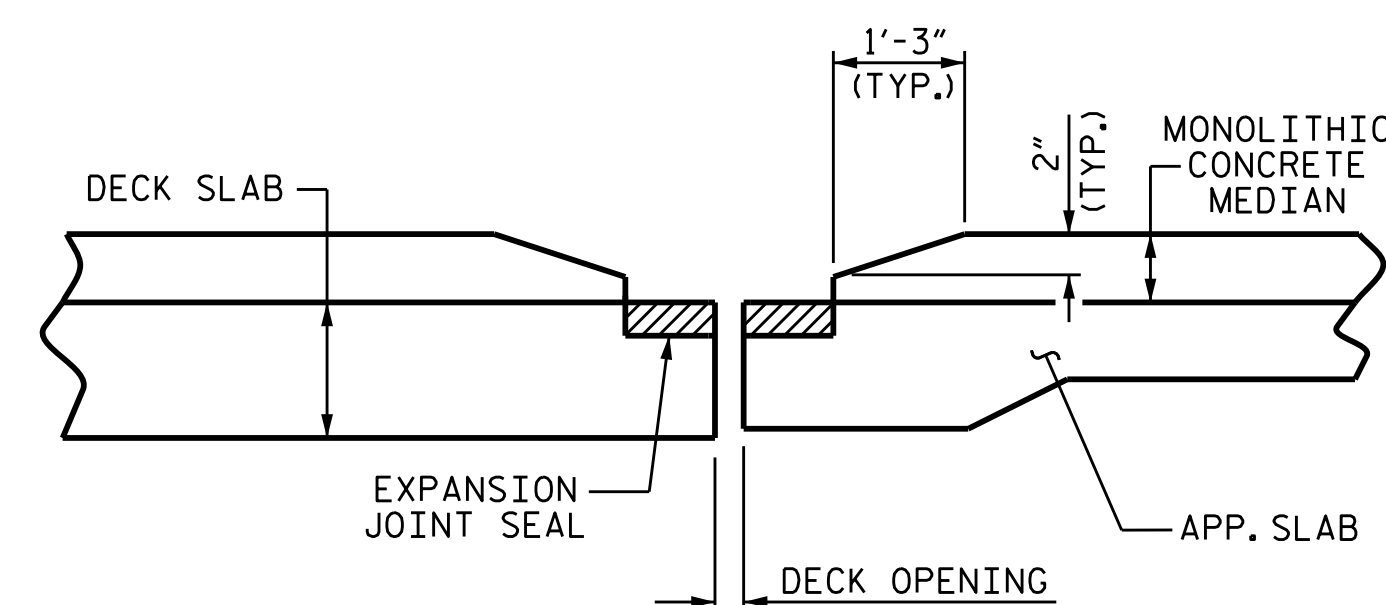
FOR CONCRETE MEDIAN ON APPROACH SLAB, SEE APPROACH SLAB SHEETS.



PLAN OF CONCRETE MEDIAN



REINFORCING STEEL DETAILS



SECTION AT EXPANSION JOINT

PERMANENT CONCRETE MEDIAN DETAILS

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-



DocuSigned by: *[Signature]*
 F2458389308F40E...

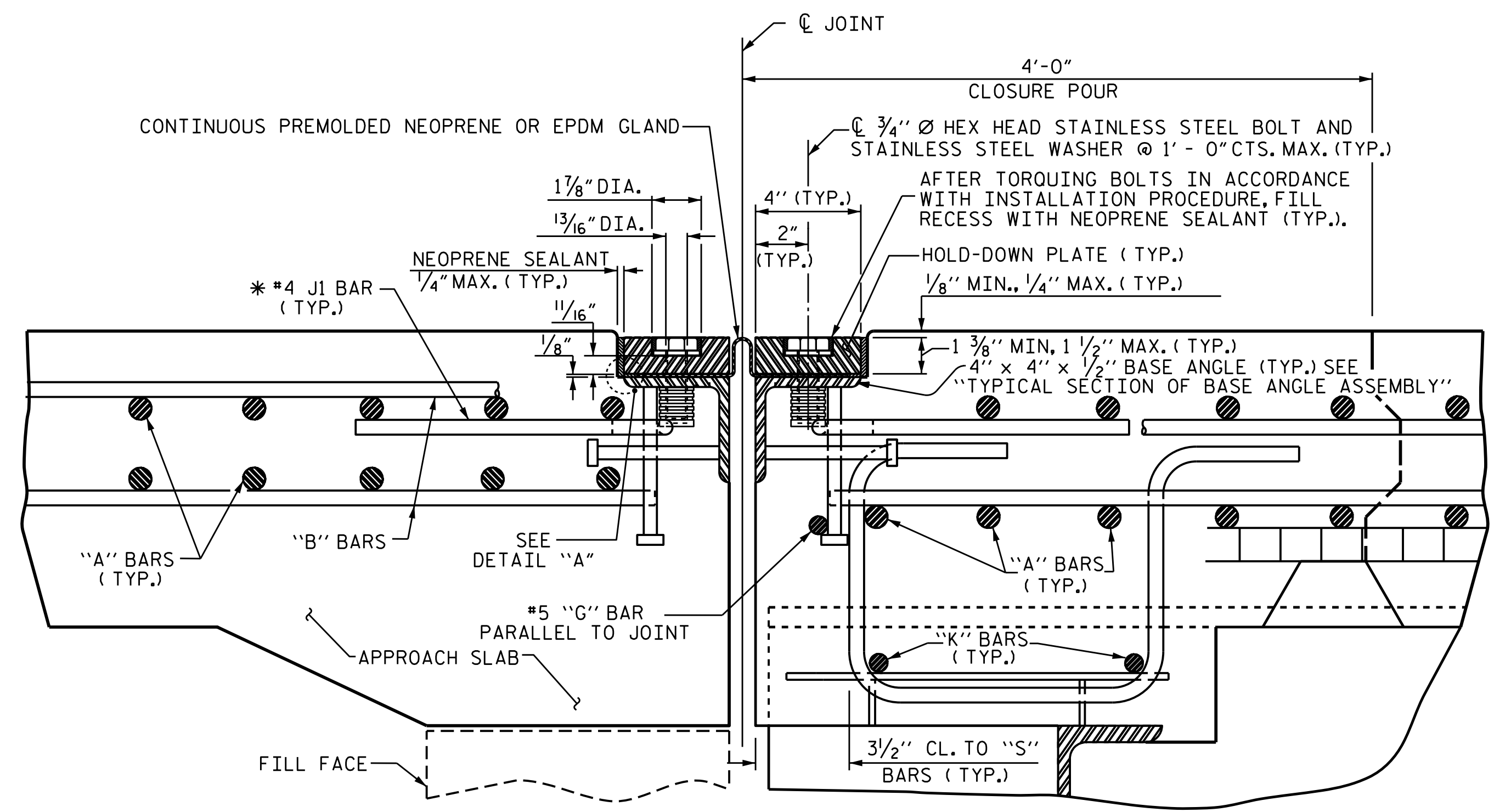
3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 MONOLITHIC
 CONCRETE MEDIAN
 STAGE III

DRAWN BY: I.L. AVERETTE DATE: 11-14
 CHECKED BY: J.P. ADAMS DATE: 07-15
 DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE: 09-15

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-68
1			3			TOTAL SHEETS
2			4			84



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

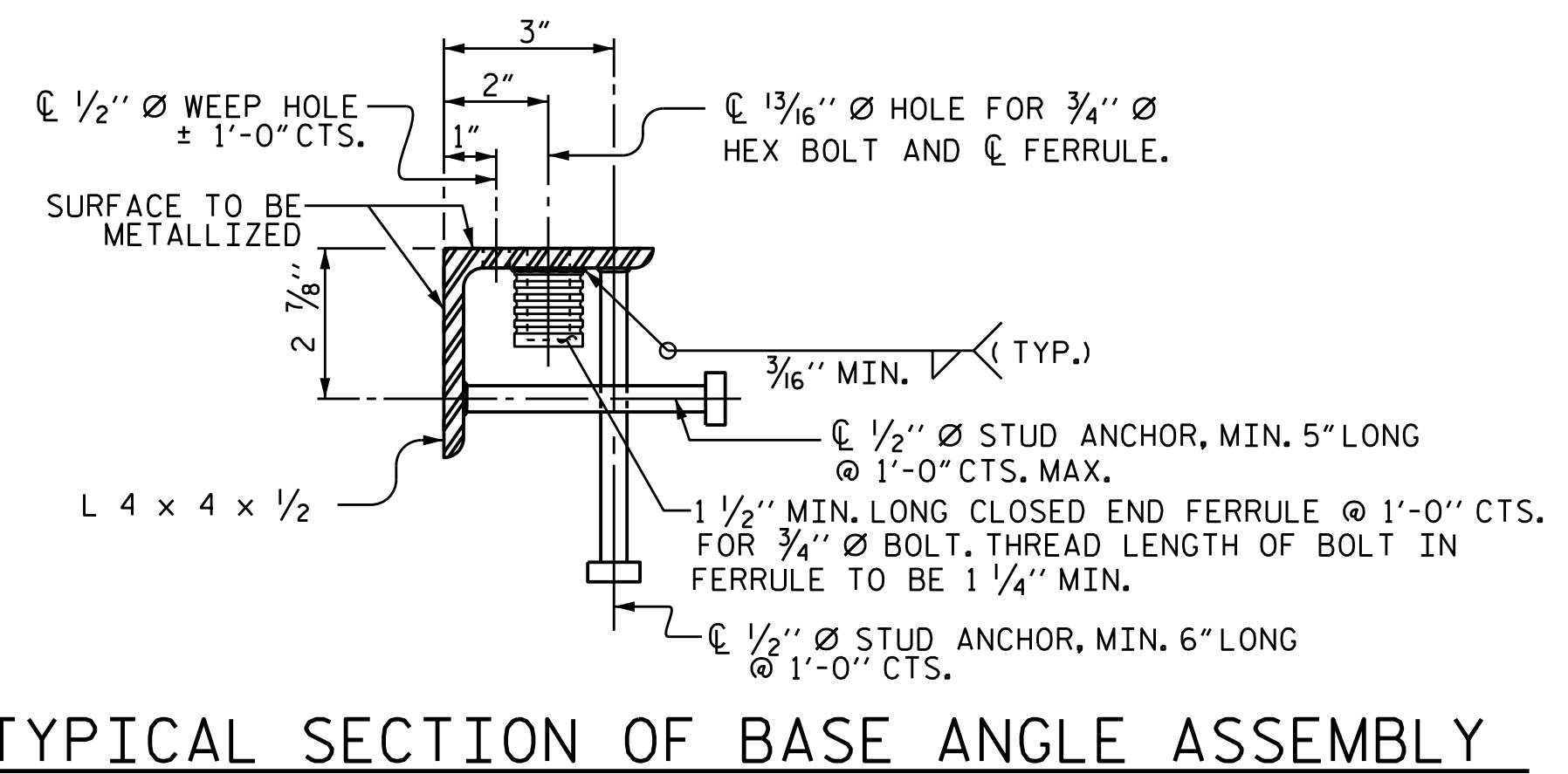
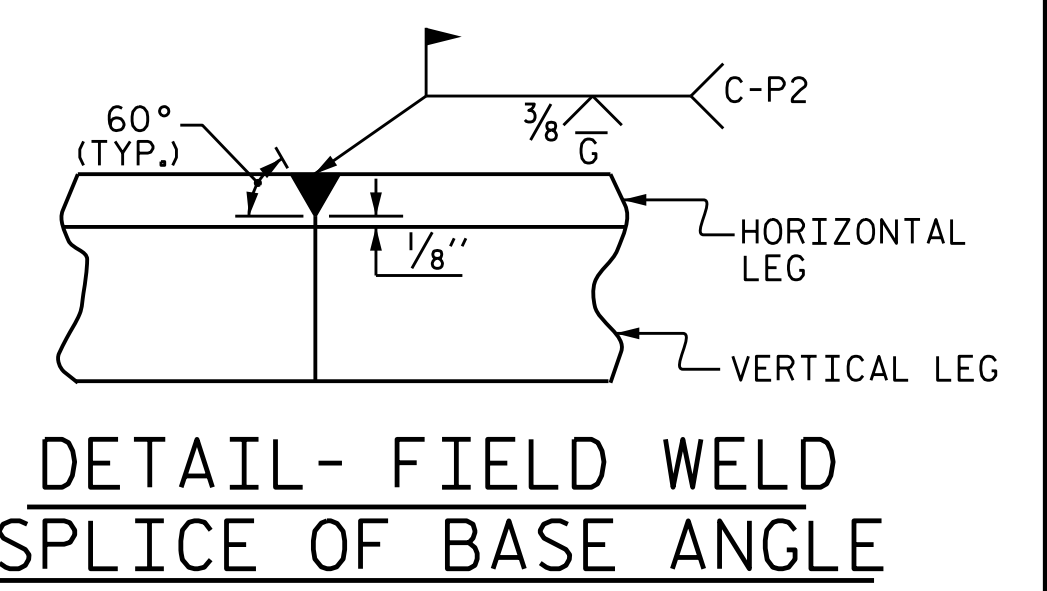
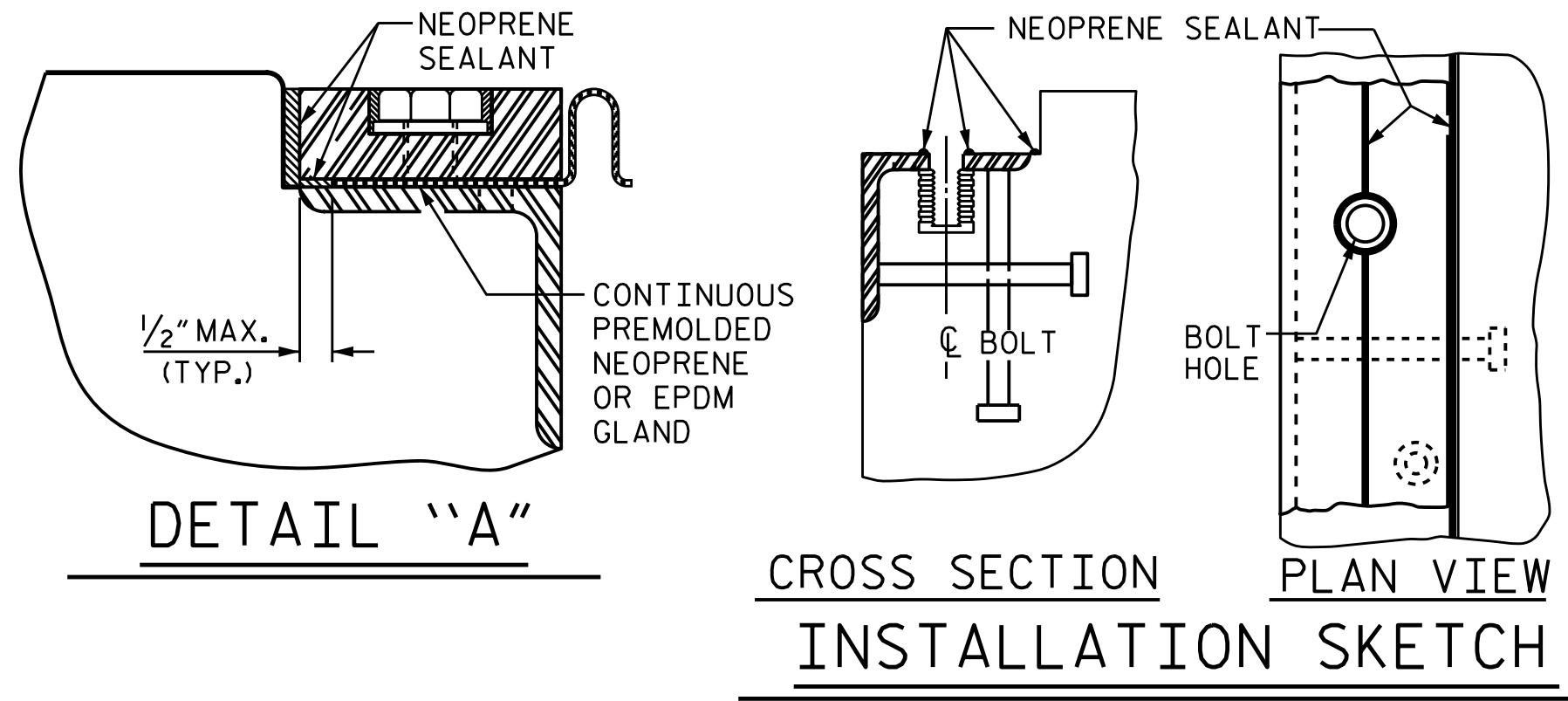
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

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

GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
7. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
8. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
9. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
10. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

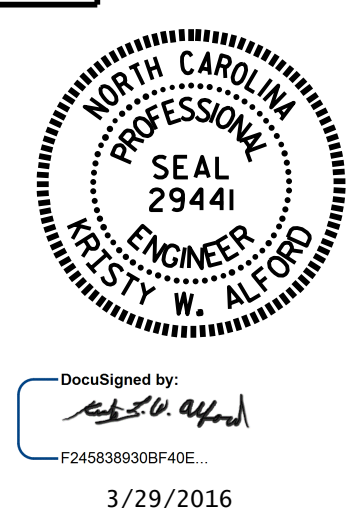


TYPICAL SECTION OF BASE ANGLE ASSEMBLY

MOVEMENT AND SETTING AT JOINT					
END BENT	SKEW ANGLE	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	85°-44'-00"	1"	1 5/8"	1 1/2"	1 3/8"
2	85°-44'-00"	—	1 1/2"	1 1/2"	1 1/2"

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-

SHEET 1 OF 3

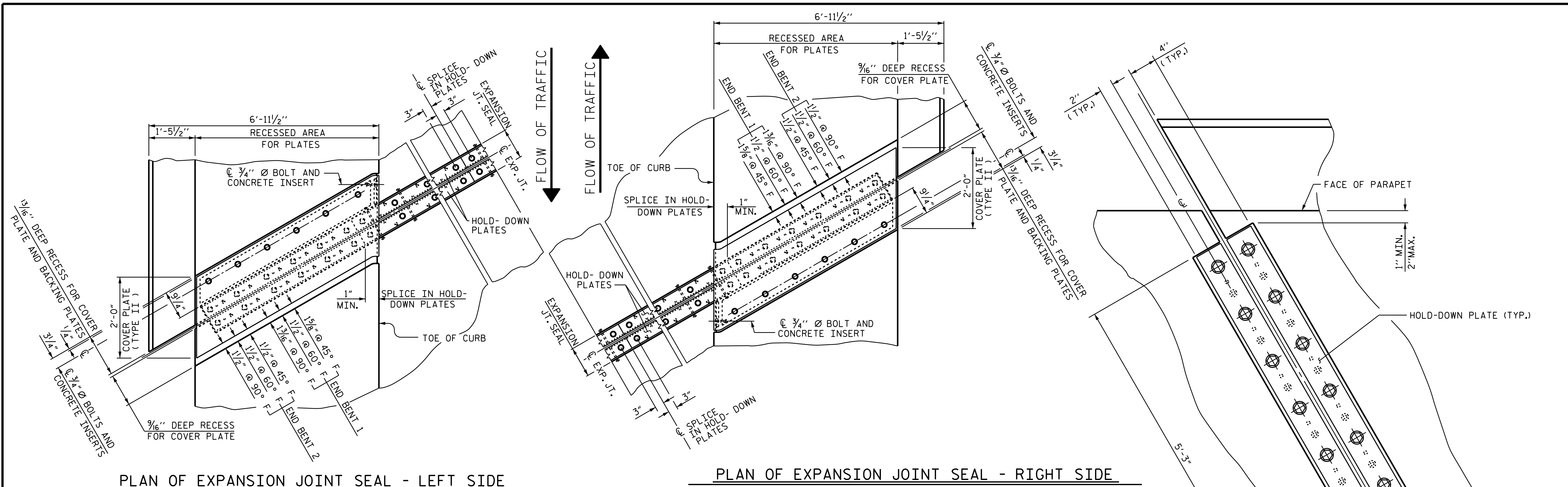


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 EXPANSION JOINT
 SEAL DETAILS

ASSEMBLED BY : T.L. AVERETTE	DATE : 02/15
CHECKED BY : J.P. ADAMS	DATE : 07/15
DRAWN BY : REK 9/87	REV. 5/7/03R RWW/JTE
CHECKED BY : CRK 10/87	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

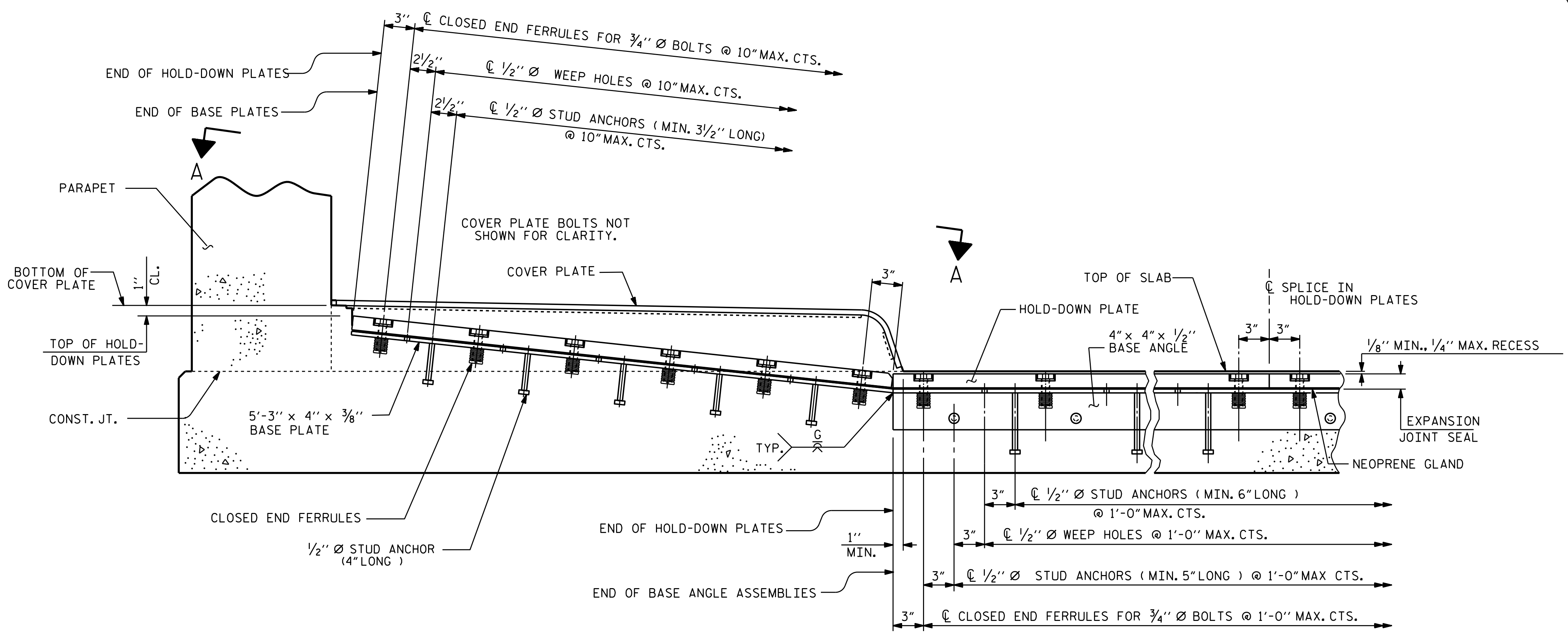
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-69
1			3			TOTAL SHEETS 84
2			4			



PLAN OF EXPANSION JOINT SEAL - LEFT SIDE

PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE



SECTION A - A

SECTION THRU SIDEWALK NORMAL TO JOINT

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-

SHEET 2 OF 3



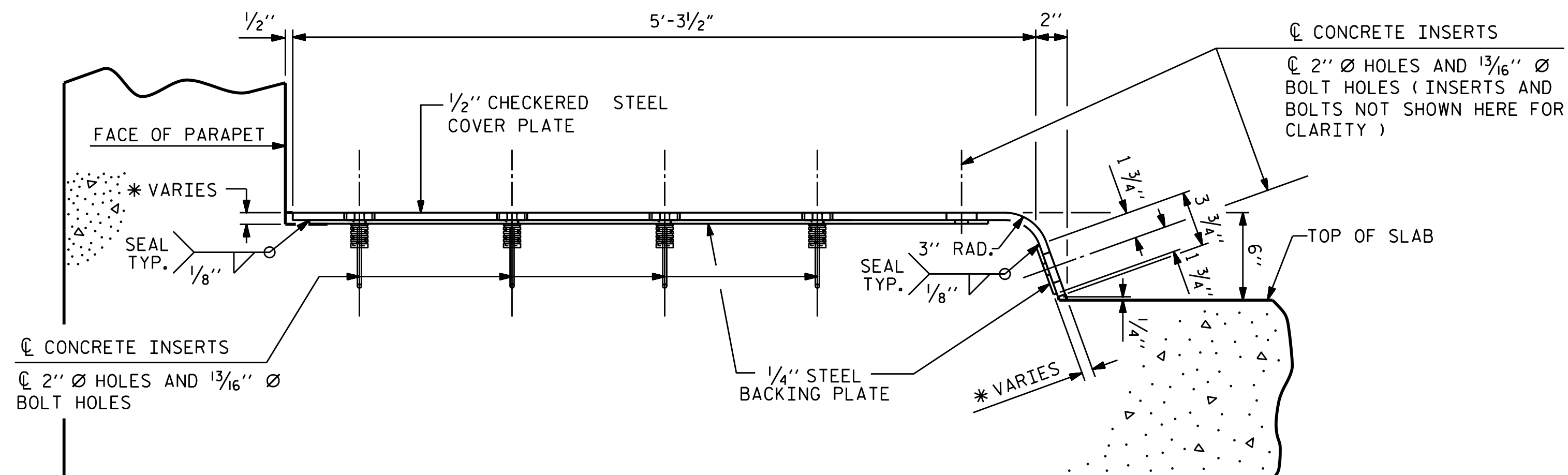
DocuSigned by:
 Kristy W. Alford
 F2458389308F40E
 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 EXPANSION JOINT
 SEAL DETAILS
 FOR SIDEWALK

ASSEMBLED BY : T.L. AVERETTE	DATE : 02/15
CHECKED BY : J.P. ADAMS	DATE : 07/15
DRAWN BY : REK 10/87	REV. 2/6/97 EEM/RGW
CHECKED BY : CRK 1/88	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

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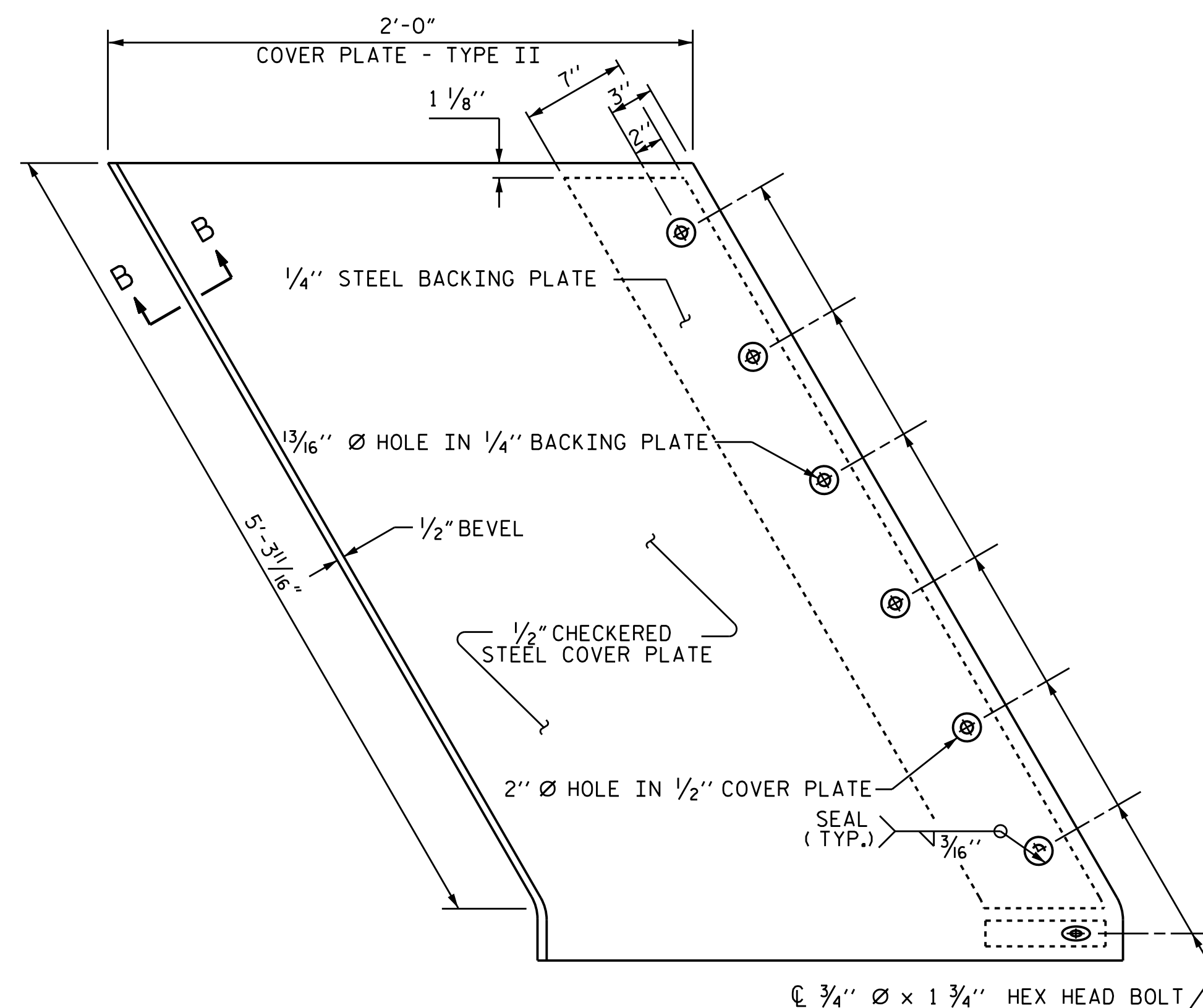
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-70
1			3			TOTAL SHEETS
2			4			84



END VIEW
(NORMAL TO SIDEWALK)

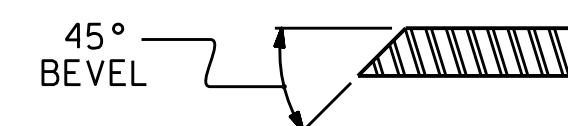
* CONCRETE RECESS DIMENSIONS:

- 1 3/16" FOR THE SIDE OF THE JOINT HAVING THE 1/2" COVER PLATE WITH A 1/4" BACKING PLATE.
- 9/16" FOR THE SIDE OF THE JOINT HAVING ONLY THE 1/2" COVER PLATE.

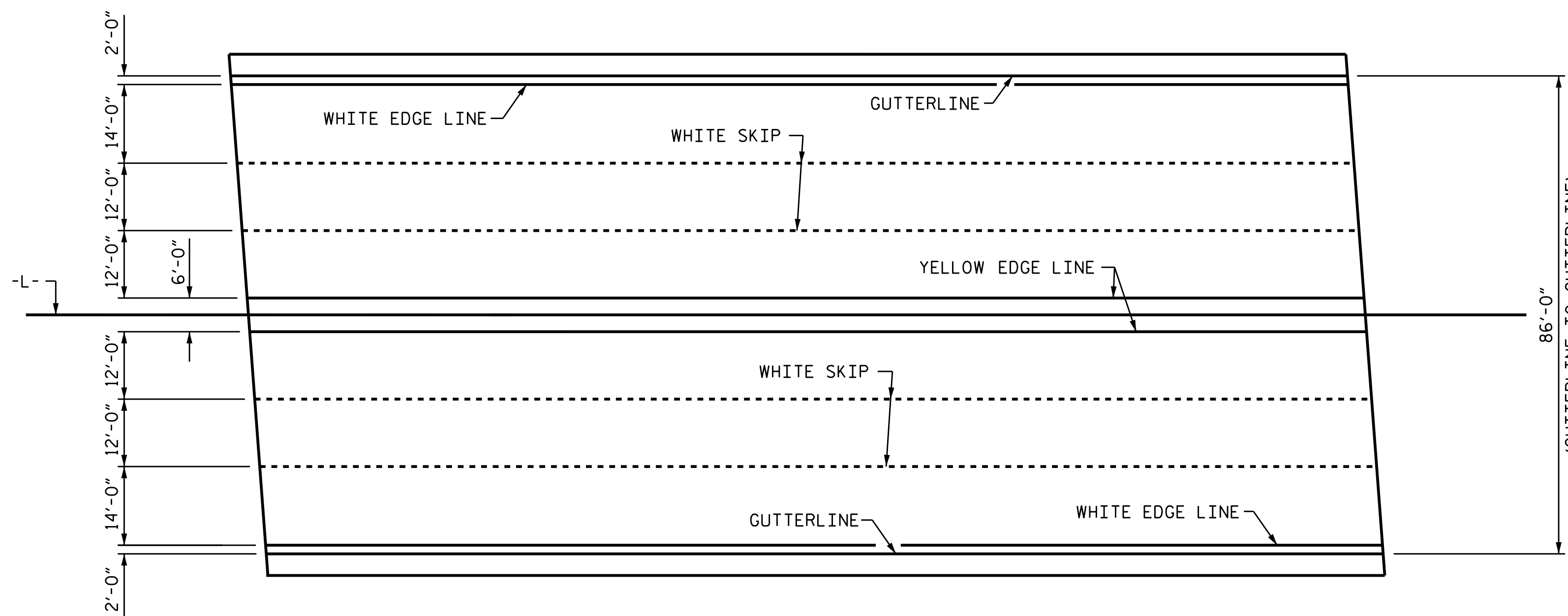


TYPE II - PLAN VIEW

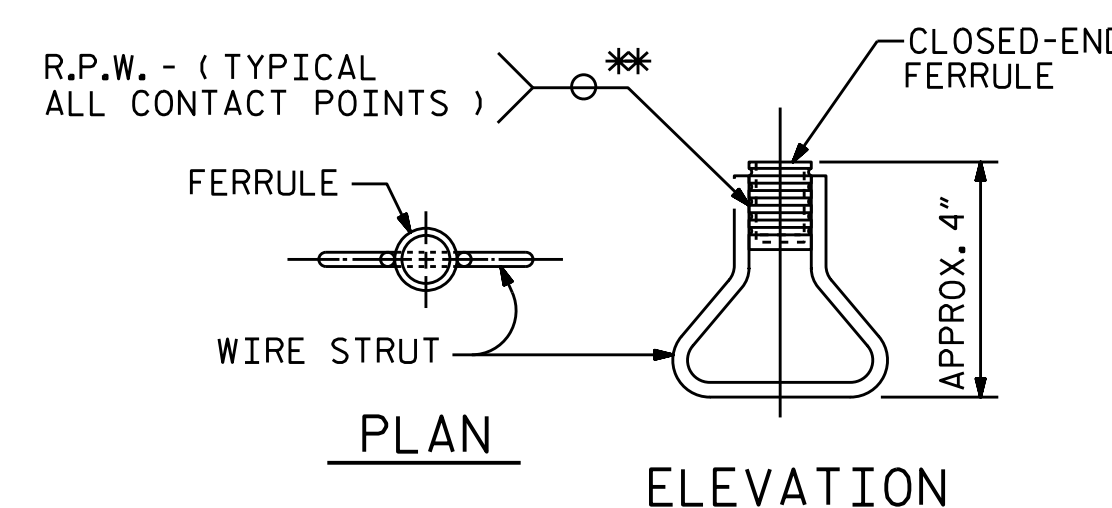
COVER PLATE DETAILS



SECTION B - B



PAVEMENT MARKING ALIGNMENT



CONCRETE INSERT

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



DocuSigned by:
Krsty W. Alford
F245838930BF40E
3/29/2016

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 35+23.40 -L-

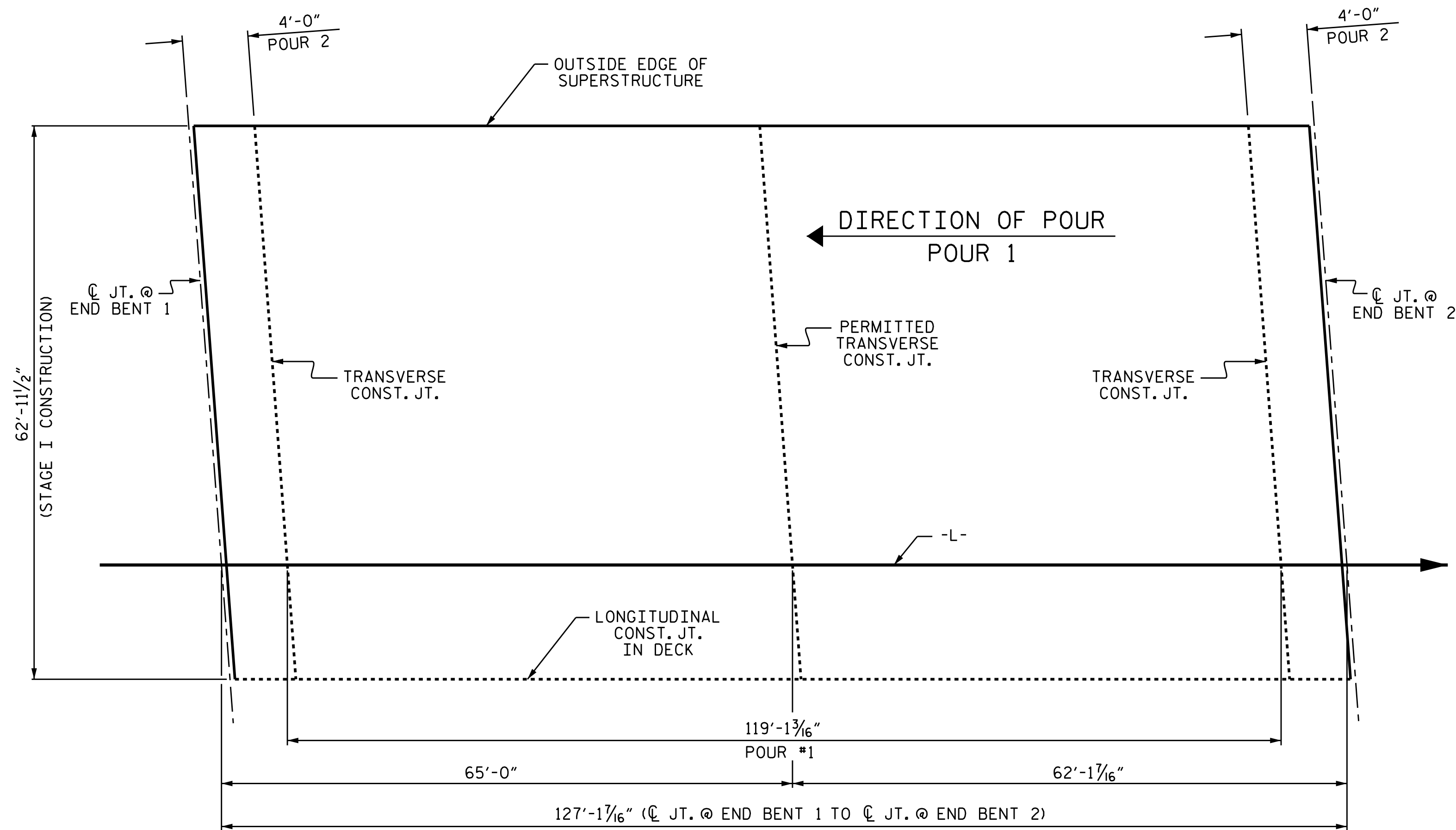
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
EXPANSION JOINT
SEAL DETAILS
FOR SIDEWALK

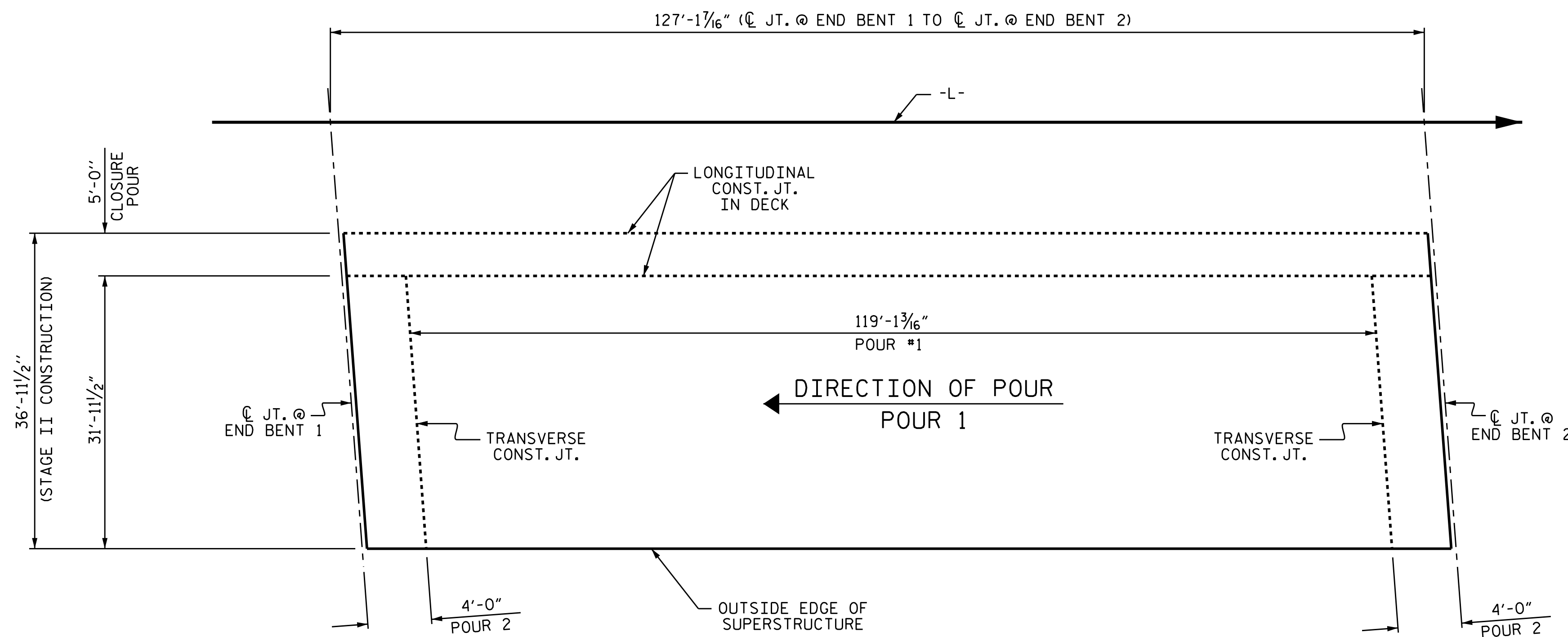
ASSEMBLED BY : T.L. AVERETTE	DATE : 02/15
CHECKED BY : J.P. ADAMS	DATE : 07/15
DRAWN BY : REK 10/87	REV. 10/17/00 RWW/LES
CHECKED BY : CRK 1/88	REV. 5/11/06 TLA/GM
	REV. 10/1/11 MAA/GM

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SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-71
1			3			TOTAL SHEETS
2			4			84

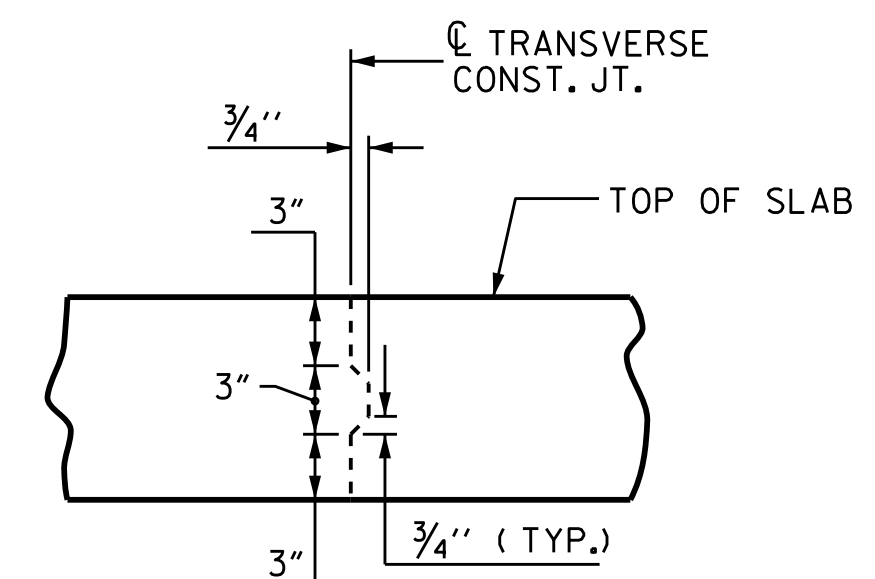


POURING SEQUENCE
(STAGE I)



POURING SEQUENCE
(STAGE II)

CLASS AA CONCRETE BREAKDOWN	
STAGE I	
POUR 1	235.0 C.Y.
POUR 2	19.0 C.Y.
SIDEWALK	12.7 C.Y.
TOTAL	266.7 C.Y.
STAGE II	
POUR 1	120.2 C.Y.
POUR 2	9.5 C.Y.
5'-0" CLOSURE POUR	22.6 C.Y.
SIDEWALK	15.6 C.Y.
TOTAL	167.9 C.Y.
STAGE III	
CONCRETE MEDIAN	7.0 C.Y.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-



DocuSigned by:
 F24583890BF40E
 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE DECK
 POUR DETAILS

DRAWN BY : I.L. AVERETTE DATE : 02-15
 CHECKED BY : J.P. ADAMS DATE : 07-15
 DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

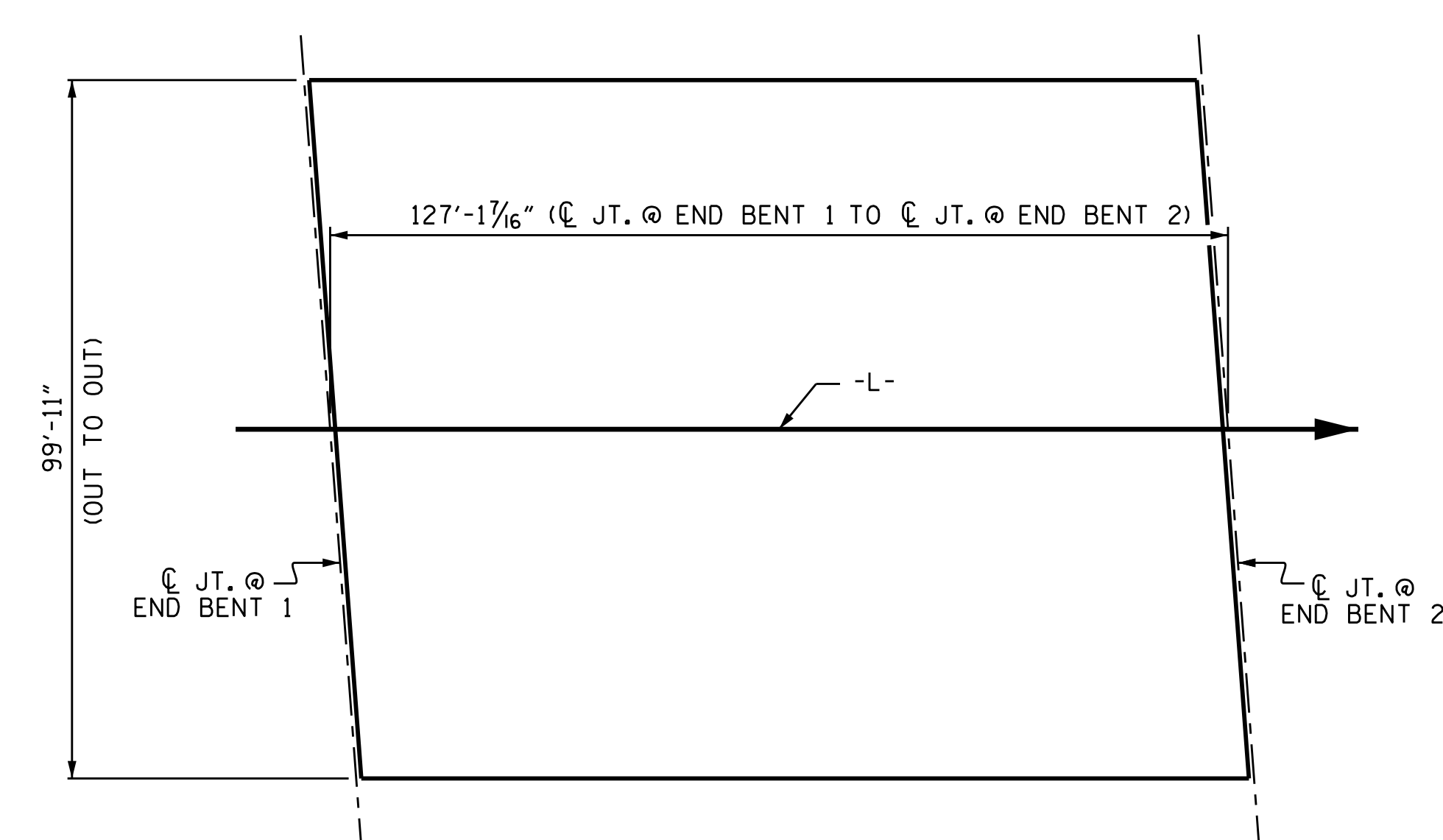
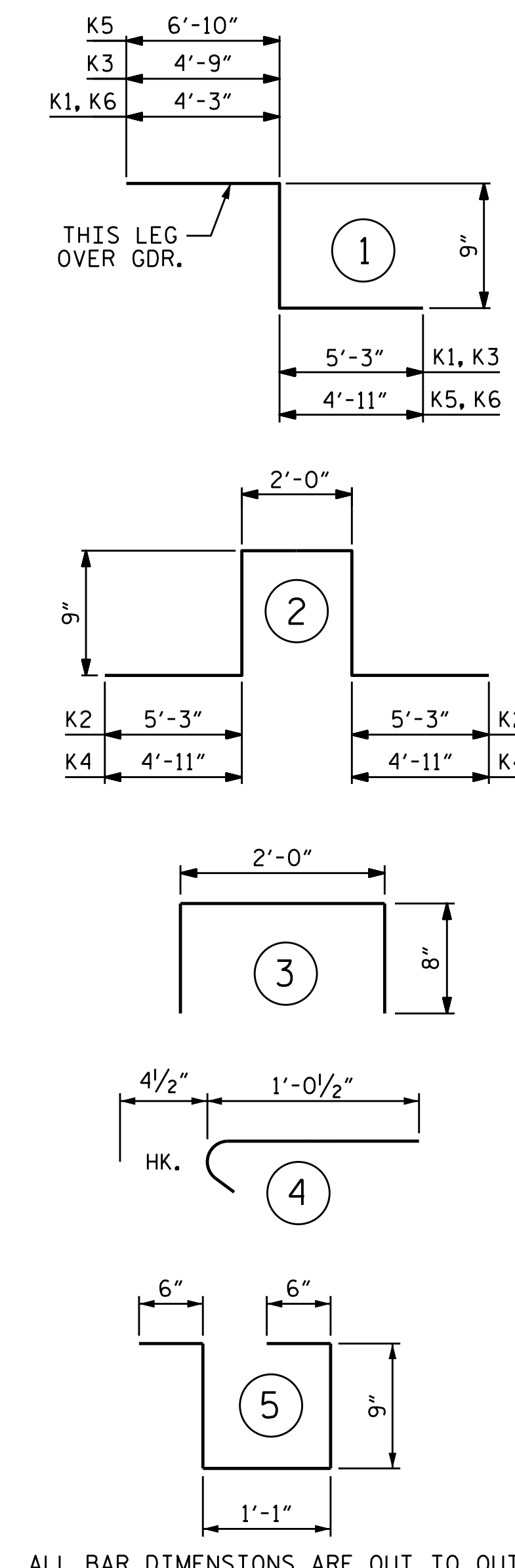
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-72
1			3			TOTAL SHEETS
2			4			84

BILL OF MATERIAL

STAGE I										STAGE II										STAGE III									
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT						
* A1	486	#5	STR	32'-7"	16516	* D1	252	#6	STR	5'-6"	2082	* A3	247	#5	STR	36'-7"	9425	* K5	4	#5	1	12'-6"	52	* B6	15	#4	STR	26'-10"	269
A2	486	#5	STR	32'-5"	16432							A4	247	#5	STR	36'-7"	9425	* K6	4	#5	1	9'-11"	41	* G4	86	#4	STR	2'-8"	153
* A101	2	#5	STR	57'-4"	120	* G1	4	#5	STR	32'-8"	136	* A301	2	#5	STR	30'-11"	64	* S1	48	#4	5	3'-7"	115	* EPOXY COATED REINFORCING STEEL LBS.			422		
* A102	2	#5	STR	50'-8"	106	* G3	127	#4	STR	5'-1"	431	* A302	2	#5	STR	24'-3"	51	REINFORCING STEEL LBS. 15,812											
* A103	2	#5	STR	43'-11"	92	* J1	112	#4	4	1'-5"	106	* A303	2	#5	STR	17'-7"	37	* EPOXY COATED REINFORCING STEEL LBS. 13,373											
* A104	2	#5	STR	37'-3"	78							* A304	2	#5	STR	10'-10"	23												
* A105	2	#5	STR	30'-7"	64	* K1	4	#5	1	10'-3"	43	* A305	2	#5	STR	4'-2"	9												
* A106	2	#5	STR	23'-10"	50	* K2	20	#5	2	14'-0"	292	A401	2	#5	STR	35'-9"	75												
* A107	2	#5	STR	17'-2"	36	* K3	4	#5	1	10'-9"	45	A402	2	#5	STR	29'-0"	60												
* A108	2	#5	STR	10'-5"	22							A403	2	#5	STR	22'-4"	47												
* A109	2	#5	STR	3'-9"	8	* S1	96	#4	5	3'-7"	230	A404	2	#5	STR	15'-7"	33												
A201	4	#5	STR	32'-2"	134	* U1	38	#4	3	3'-4"	85	A405	2	#5	STR	8'-11"	19												
A202	2	#5	STR	55'-5"	116							A406	2	#5	STR	2'-3"	5												
A203	2	#5	STR	48'-9"	102	REINFORCING STEEL LBS. 27,486					* B1	130	#4	STR	27'-0"	2345													
A204	2	#5	STR	42'-0"	88	* EPOXY COATED REINFORCING STEEL LBS. 24,871					B2	135	#5	STR	43'-8"	6148													
A205	2	#5	STR	35'-4"	74							* B5	25	#4	STR	27'-0"	451												
A206	2	#5	STR	28'-7"	60																								
A207	2	#5	STR	21'-11"	46							* G2	2	#5	STR	36'-8"	76												
A208	2	#5	STR	15'-2"	32							* G3	127	#4	STR	5'-1"	431												
A209	2	#5	STR	8'-6"	18							* J1	60	#4	4	1'-5"	57												
* B1	215	#4	STR	27'-0"	3878							* K4	8	#5	2	13'-4"	111												
B2	228	#5	STR	43'-8"	10384																								
* B5	25	#4	STR	27'-0"	451																								

BAR TYPES



LAYOUT FOR COMPUTING AREA
OF REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 12,701)

BAR SIZE	SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS				
	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND SIDEWALK		APPROACH SLABS		PARAPET AND SIDEWALK
	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"			

GROOVING BRIDGE FLOOR	
APPROACH SLABS	3,962 SQ. FT.
BRIDGE DECK	10,473 SQ. FT.
TOTAL	14,435 SQ. FT.

SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	* EPOXY COATED REINFORCING STEEL (LBS.)
STAGE I	266.7	27,486	24,871
STAGE II	167.9	15,812	13,373
STAGE III	7.1	-	422
TOTAL **	441.7	43,298	38,666

** QUANTITIES FOR PARAPET AND END POSTS ARE NOT INCLUDED



DocuSigned by:
F246838930BF40E
3/29/2016

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 35+23.40 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

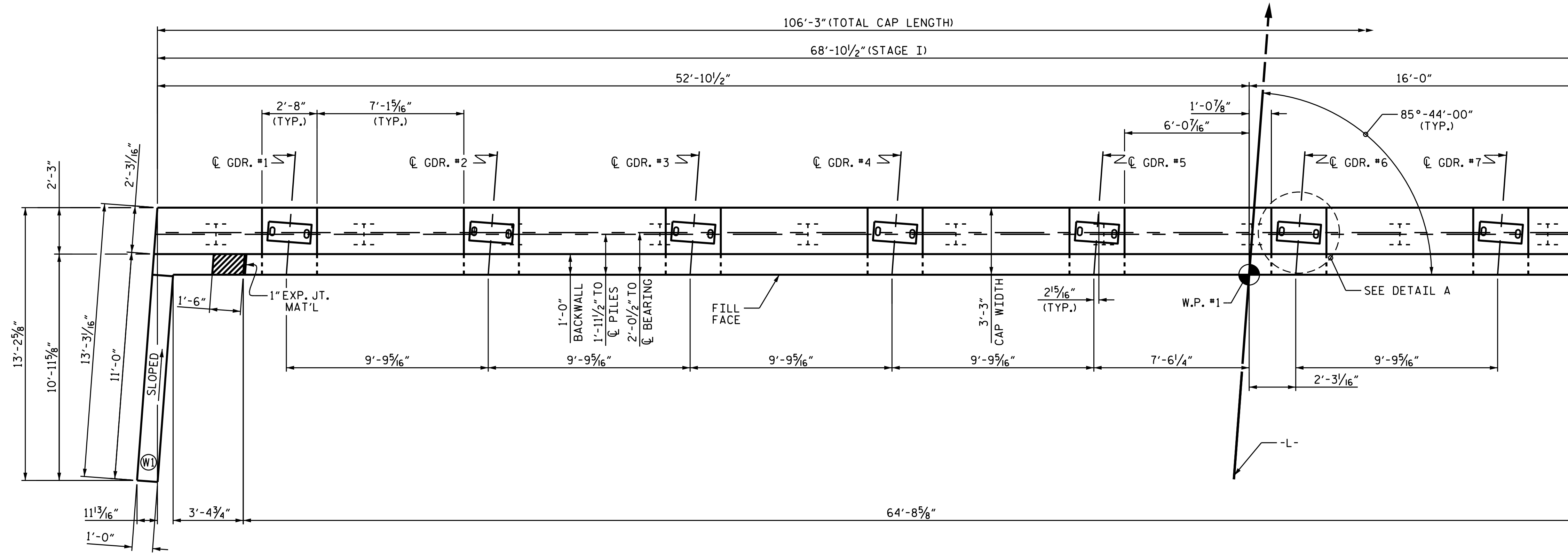
SUPERSTRUCTURE
BILL OF MATERIAL

DRAWN BY : I.L. AVERETTE DATE : 02-15
CHECKED BY : J.P. ADAMS DATE : 07-15
DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

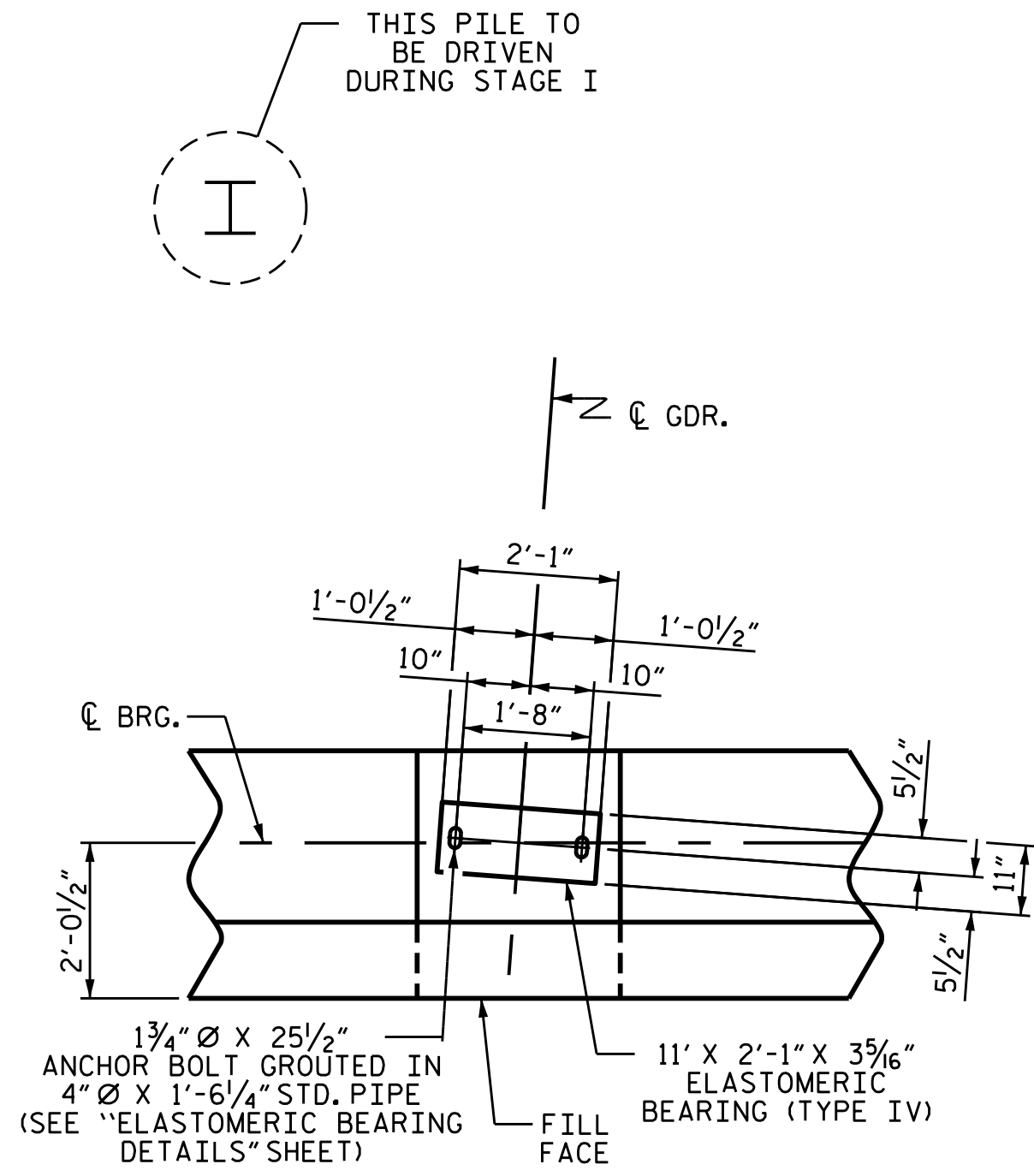
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FINAL UNLESS ALL
SIGNATURES COMPLETED

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-73	
1			3			TOTAL SHEETS 84	
2			4				

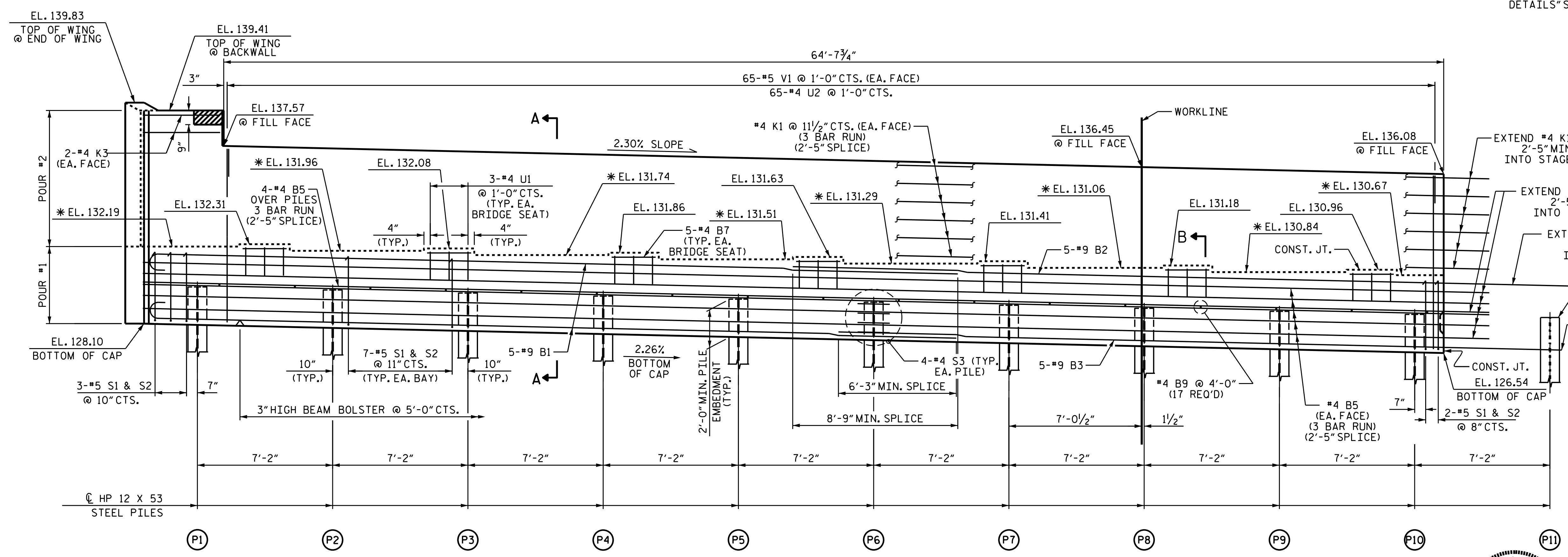
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FINAL UNLESS ALL
SIGNATURES COMPLETED



PLAN



DETAIL A
(TYP. EA. GIRDER)



ELEVATION

* FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS, SEE SHEET 4 OF 4.
FOR TOP OF PILE ELEVATIONS, SEE SHEET 2 OF 4.
FOR SHEAR KEY DETAIL, SEE SHEET 4 OF 4.

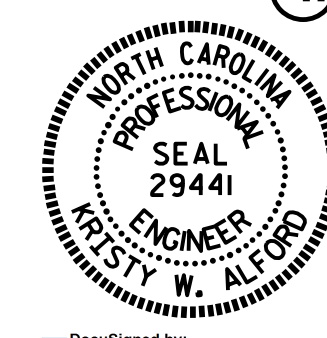
PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 35+23.40 -L-

SHEET 1 OF 4

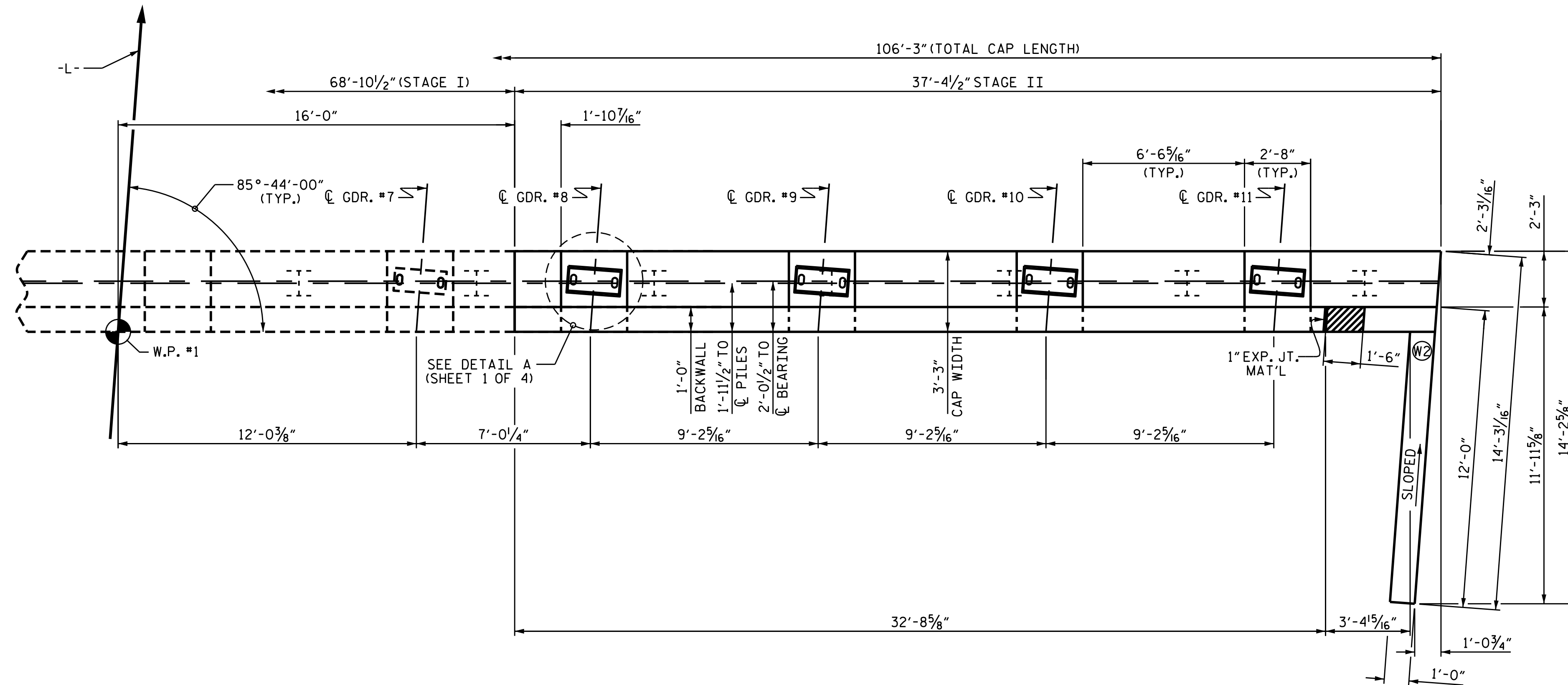
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 1
STAGE I

REVISIONS						SHEET NO.	
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1			3			TOTAL SHEETS	
2			4			84	

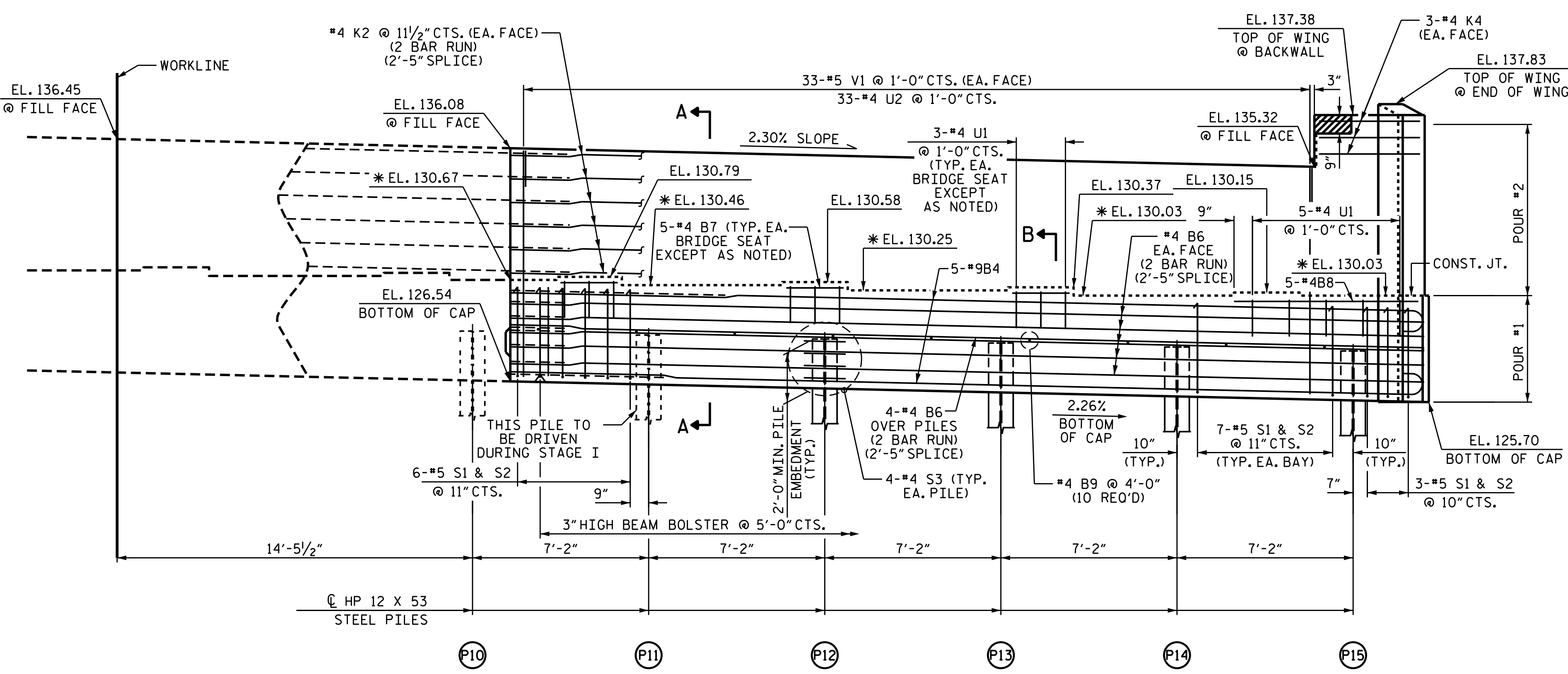
DRAWN BY : D. SHACKELFORD DATE : 02/2015
CHECKED BY : J.P. ADAMS DATE : 07/2015
DESIGN ENGINEER OF RECORD: P.K. NEWTON DATE : 09/2015



DocuSigned by:
Kristy W. Alford
3/29/2016



PLAN



ELEVATION

* FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS, SEE SHEET 4 OF 4.
FOR SHEAR KEY DETAIL, SEE SHEET 4 OF 4.

NOTES

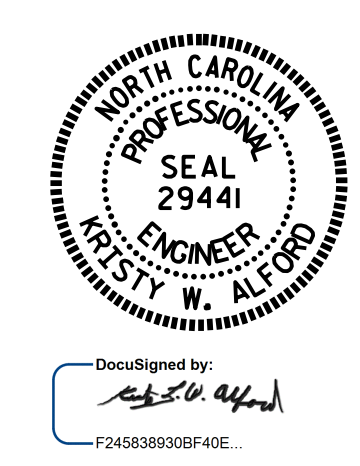
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- 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%.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.
- EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.
- THE #5" V" BARS SHALL BE PLACED 2" CLEAR FROM THE TOP OF THE BACKWALL.
- FOR PIPE INSERT DETAILS, SEE BEARINGS SHEET.

TOP OF PILE ELEVATIONS

P1	130.07
P2	129.89
P3	129.71
P4	129.56
P5	129.40
P6	129.24
P7	129.08
P8	128.92
P9	128.76
P10	128.59
P11	128.43
P12	128.27
P13	128.11
P14	127.94
P15	127.79

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 35+23.40 -L-

SHEET 2 OF 4

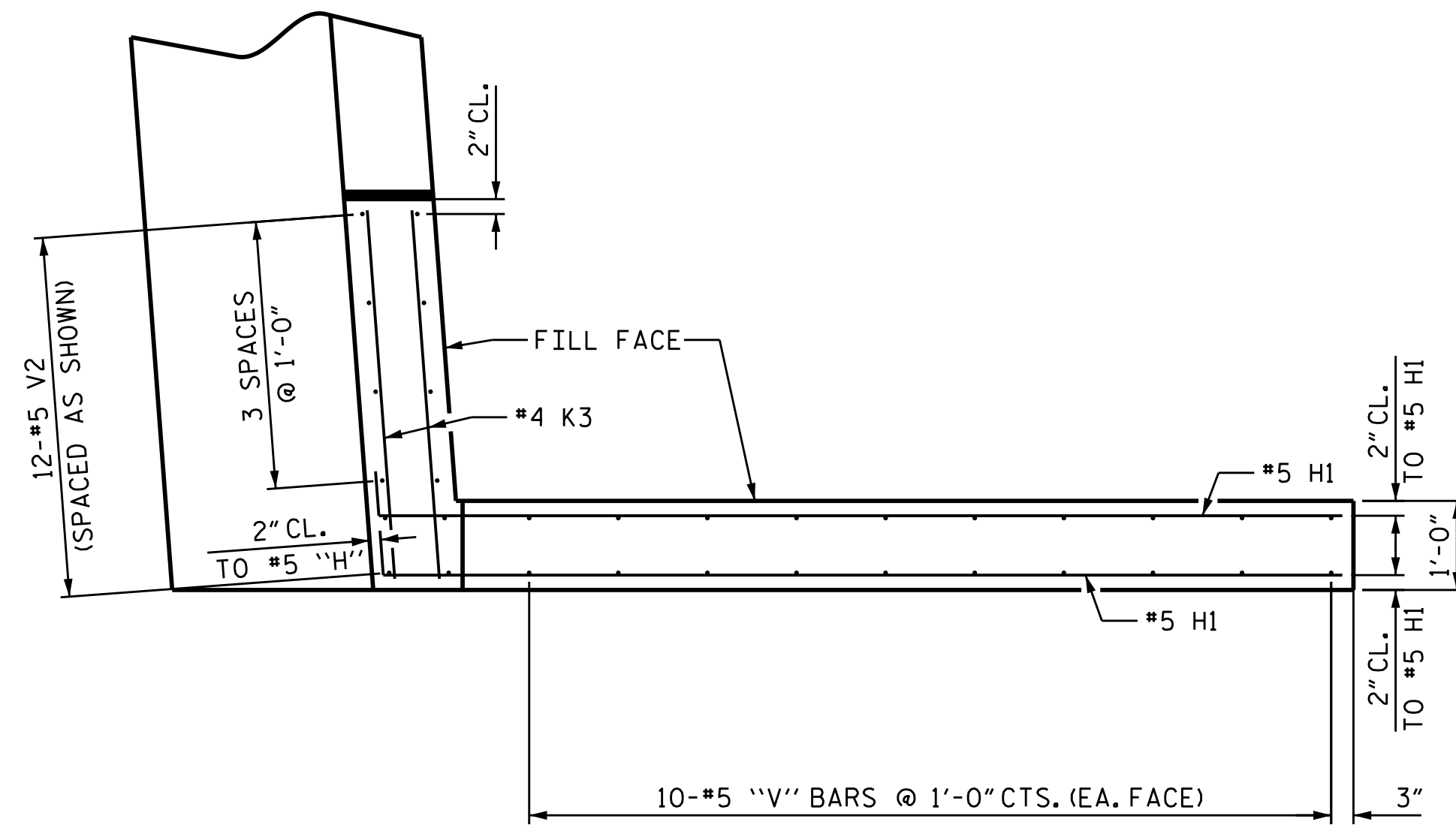


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 1
STAGE II

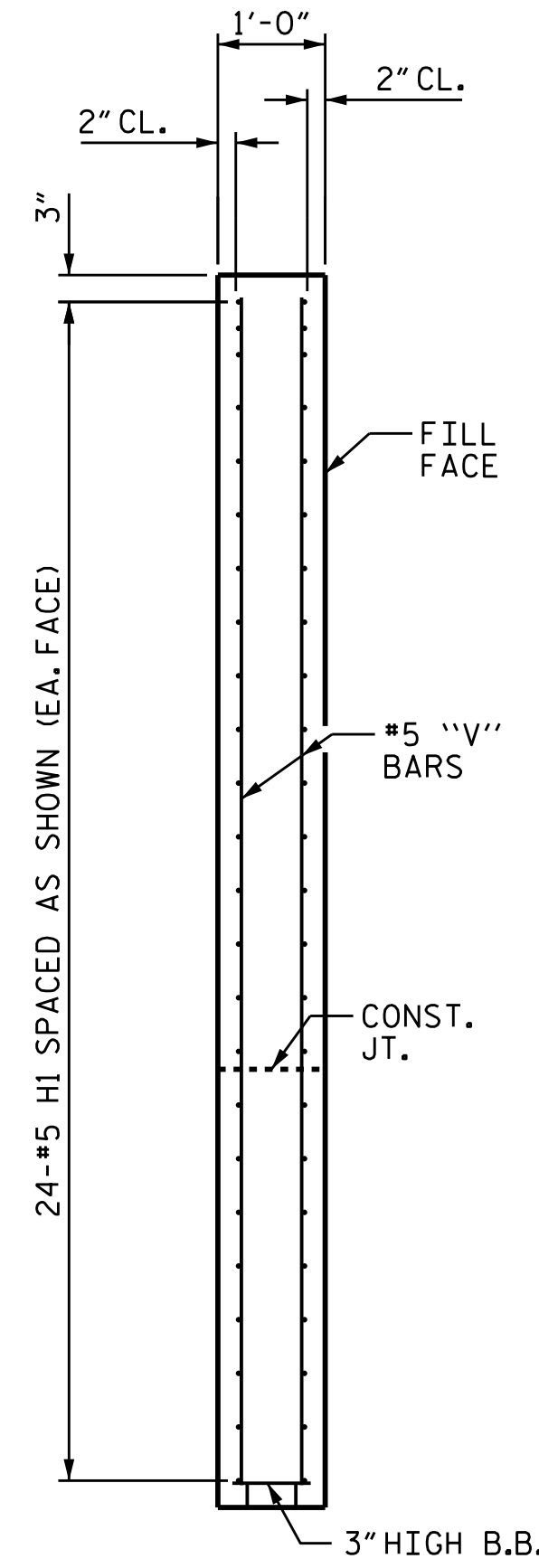
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CHECKED BY: J.P. ADAMS DATE: 07/2015
DESIGN ENGINEER OF RECORD: P.K. NEWTON DATE: 09/2015

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

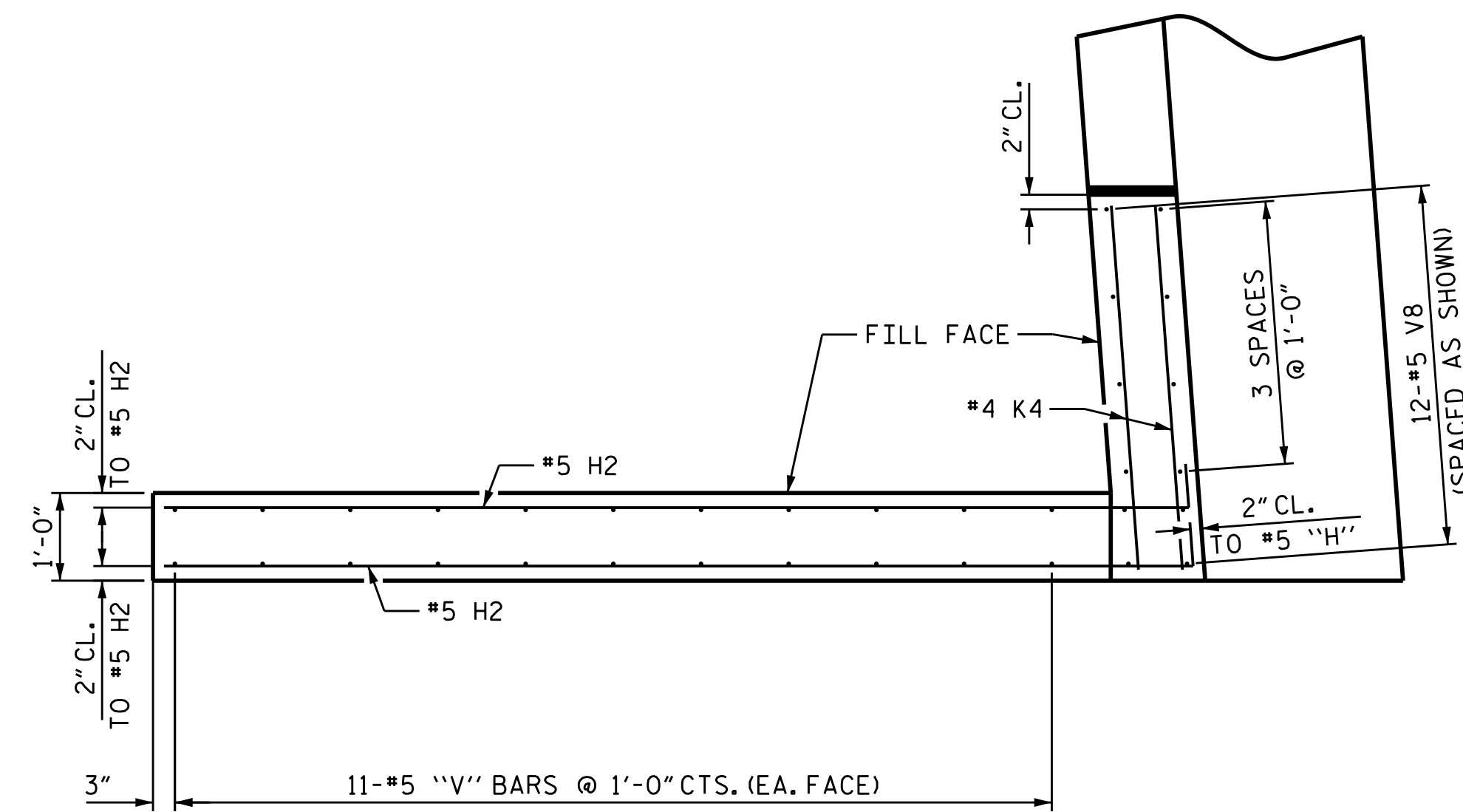
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2			4			84	



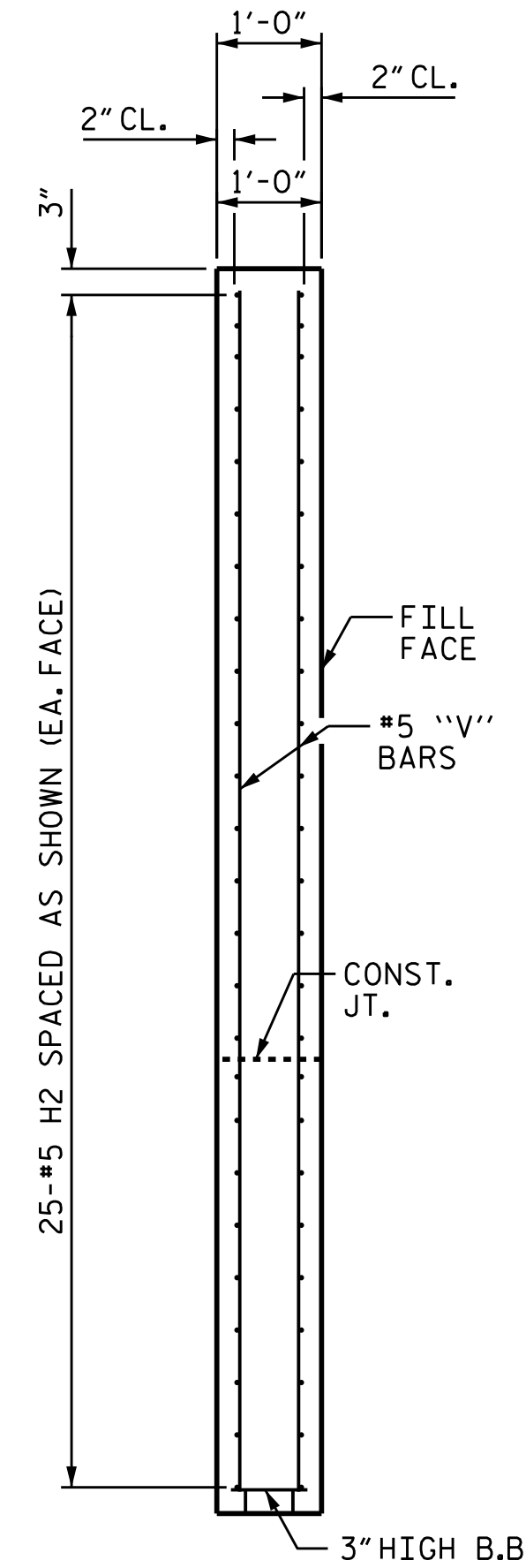
PLAN OF LEFT WING - (W1)
STAGE I



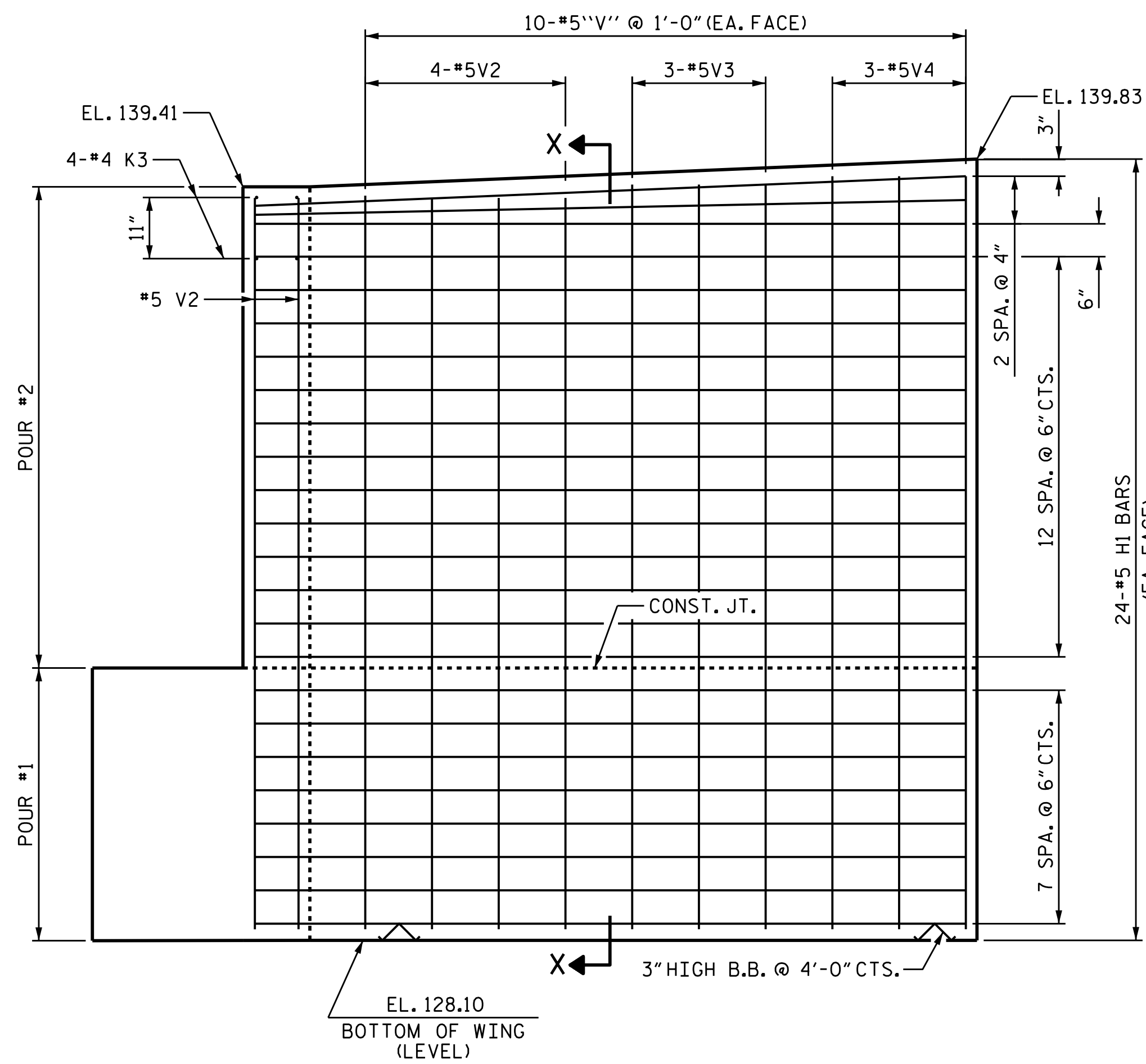
SECTION X-X



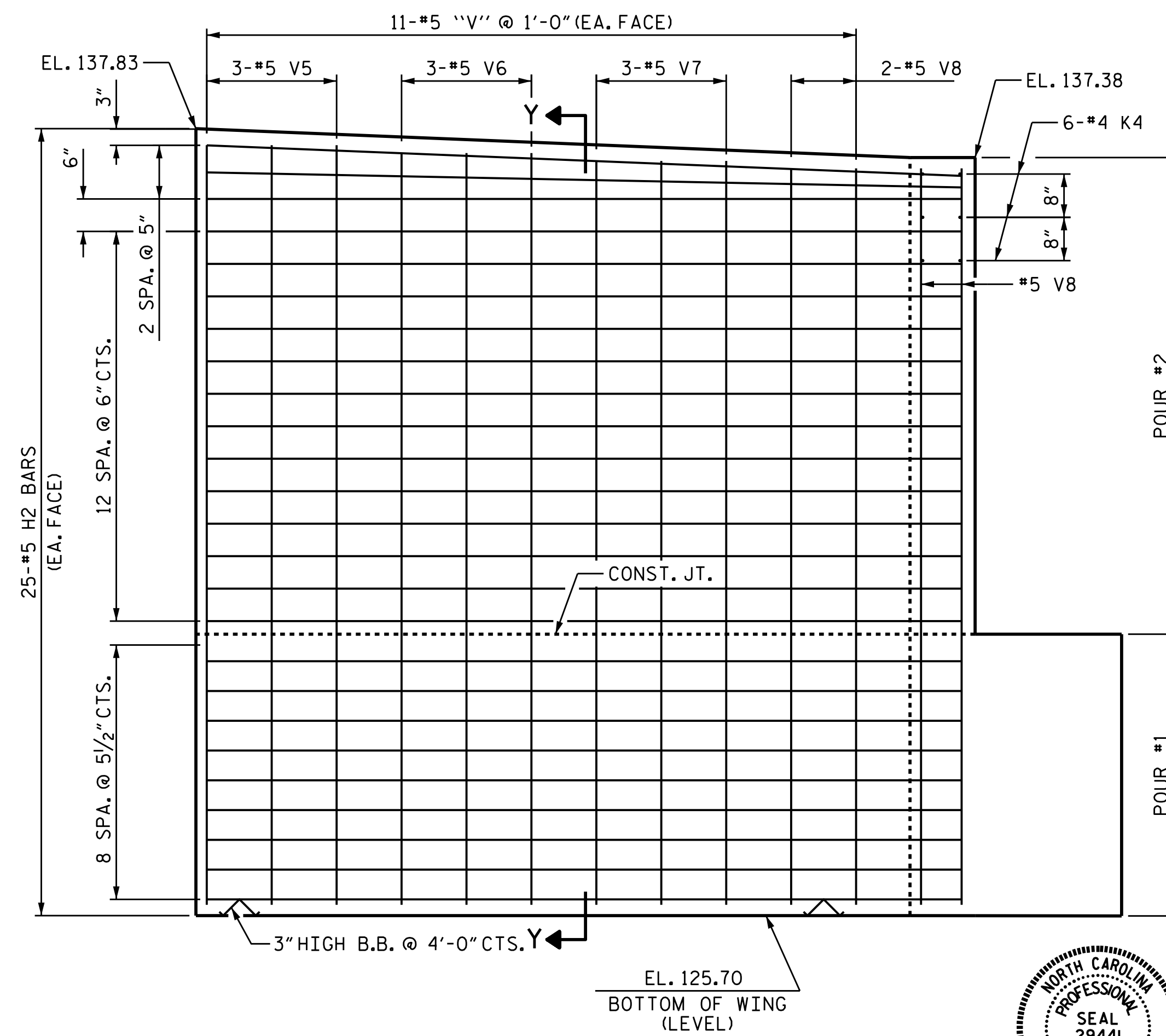
PLAN OF RIGHT WING - (W2)
STAGE II



SECTION Y-Y



ELEVATION OF LEFT WING - (W1)
STAGE I



ELEVATION OF RIGHT WING - (W2)
STAGE II

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-
 SHEET 3 OF 4

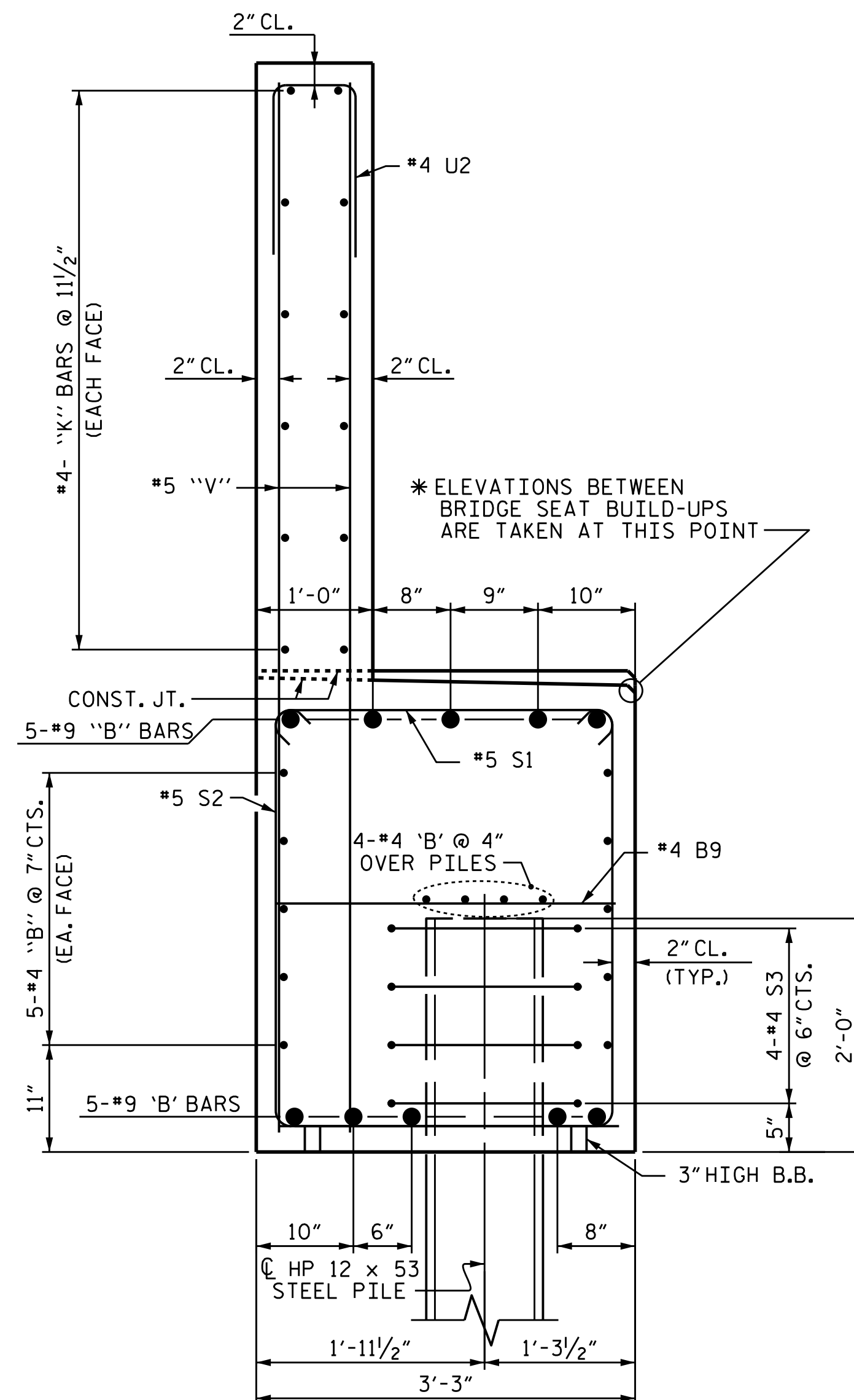


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1

DRAWN BY : D. SHACKELFORD DATE : 02/2015
 CHECKED BY : J.P. ADAMS DATE : 07/2015
 DESIGN ENGINEER OF RECORD: P.K. NEWTON DATE : 09/2015

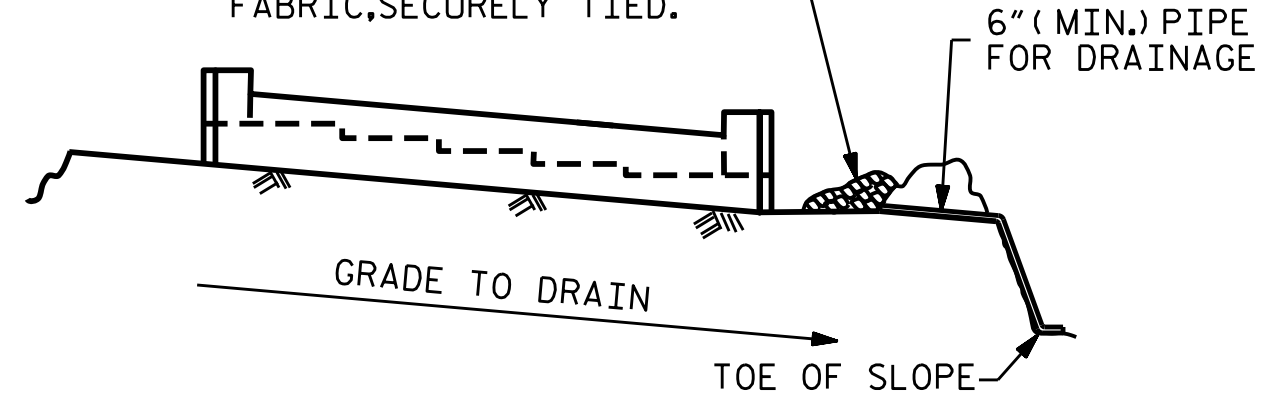
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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-76	
1			3			TOTAL SHEETS 84	
2			4				



SECTION A-A

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

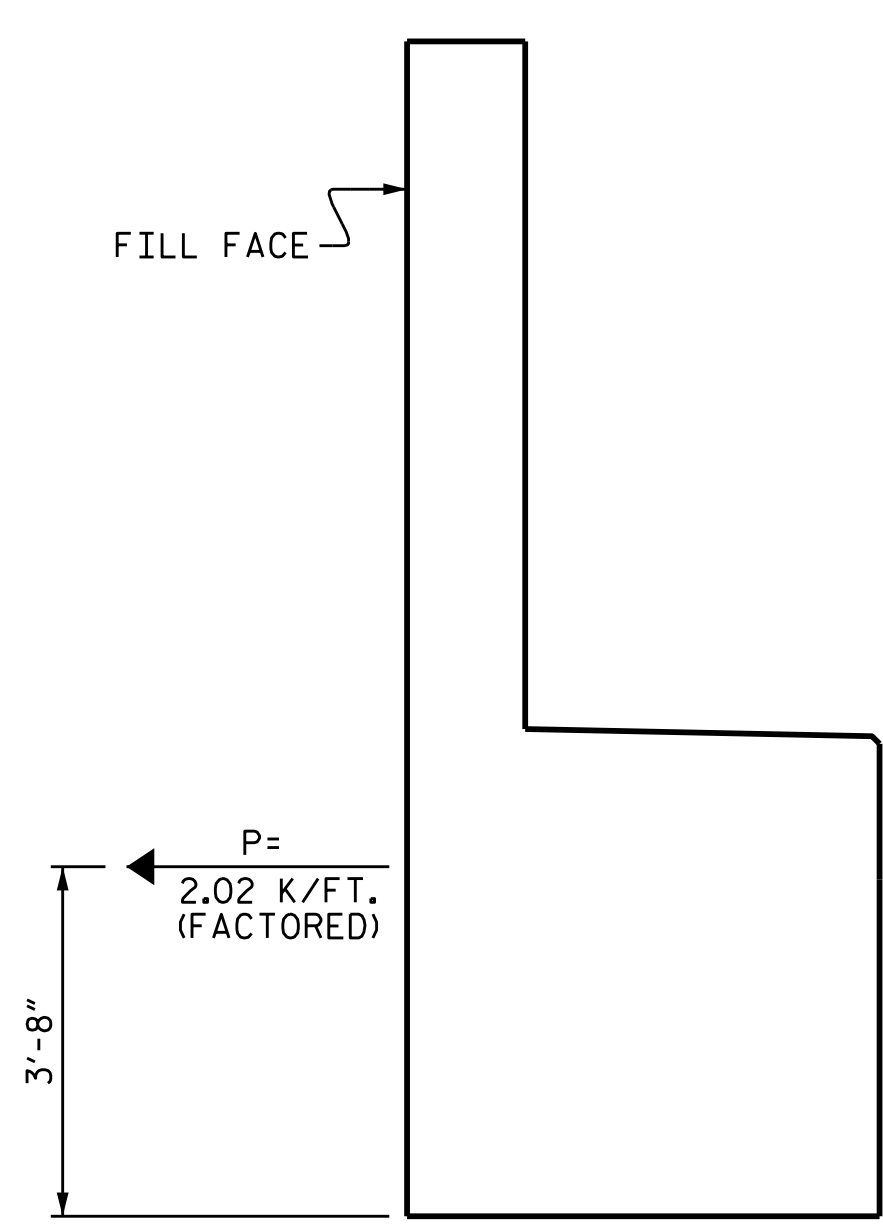


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

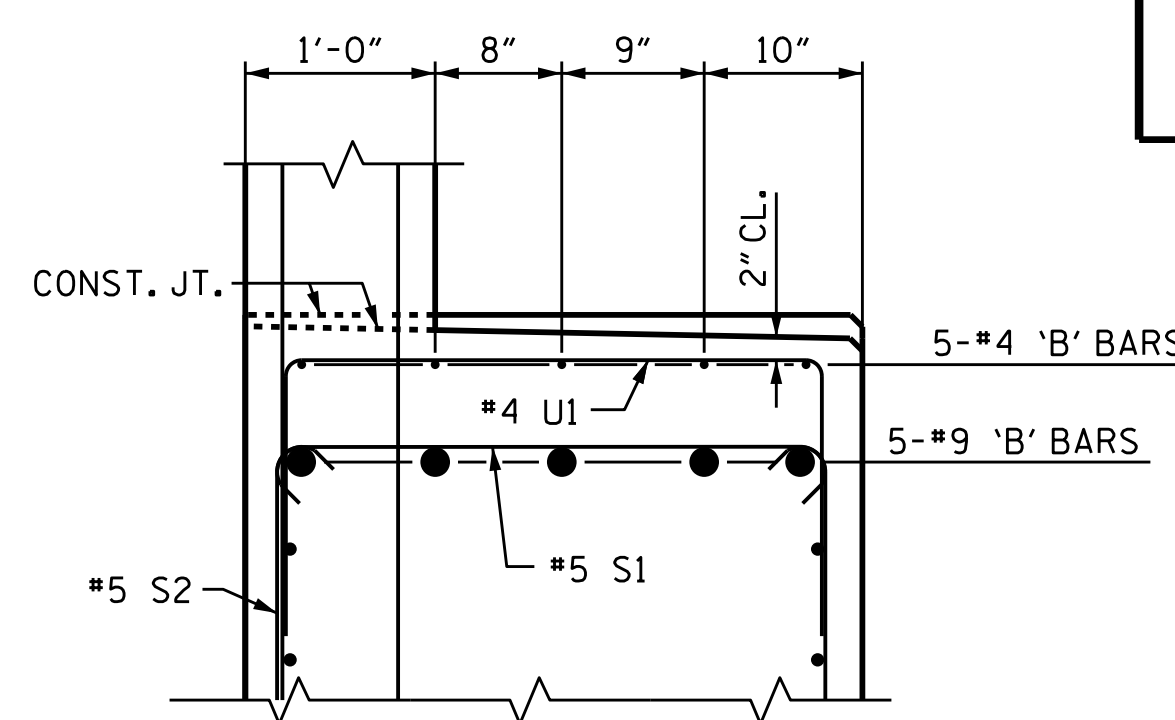
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

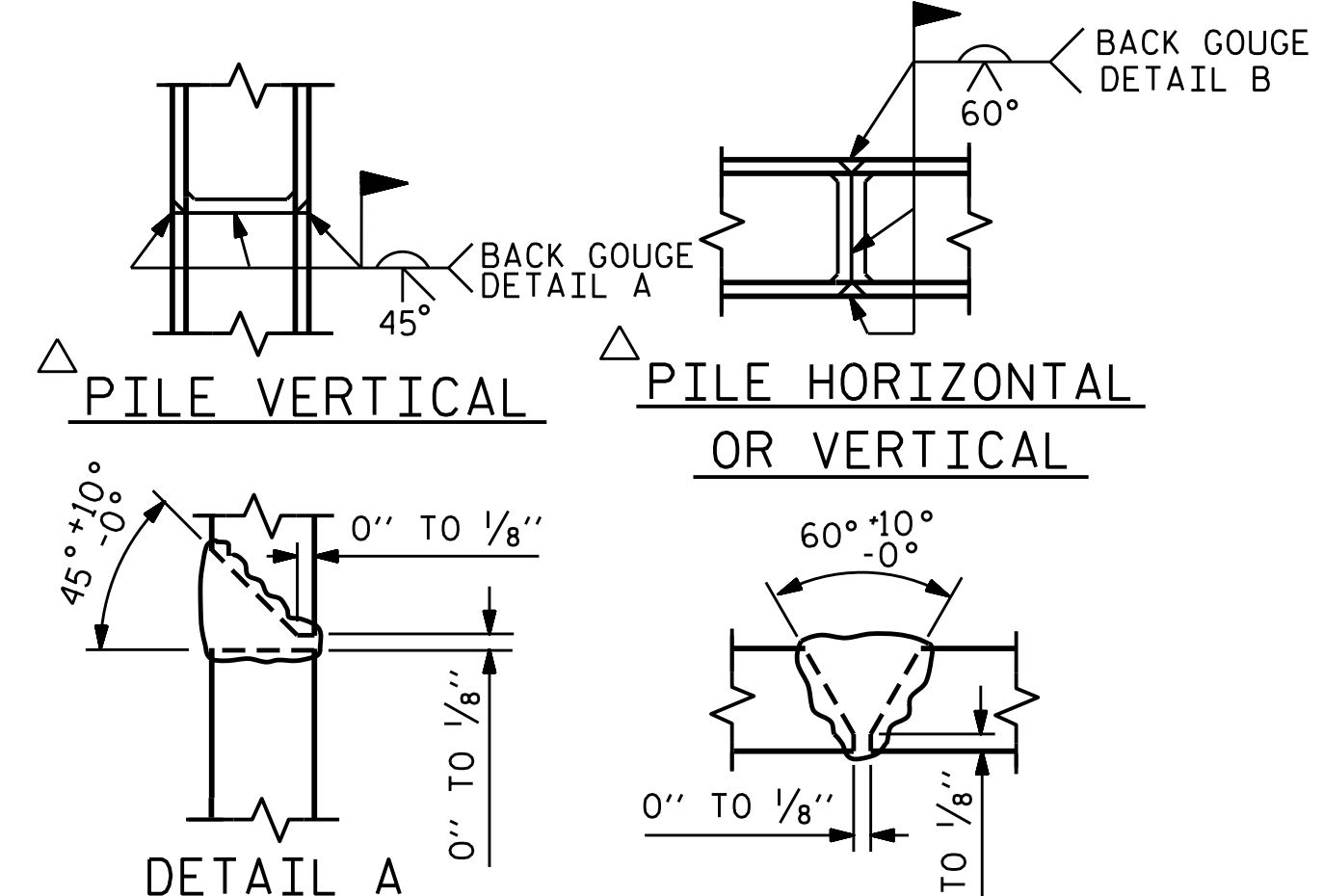


TIE BACK DETAILS

(DETAIL SHOWING TIE BACK RESTRAINT FOR END BENT)

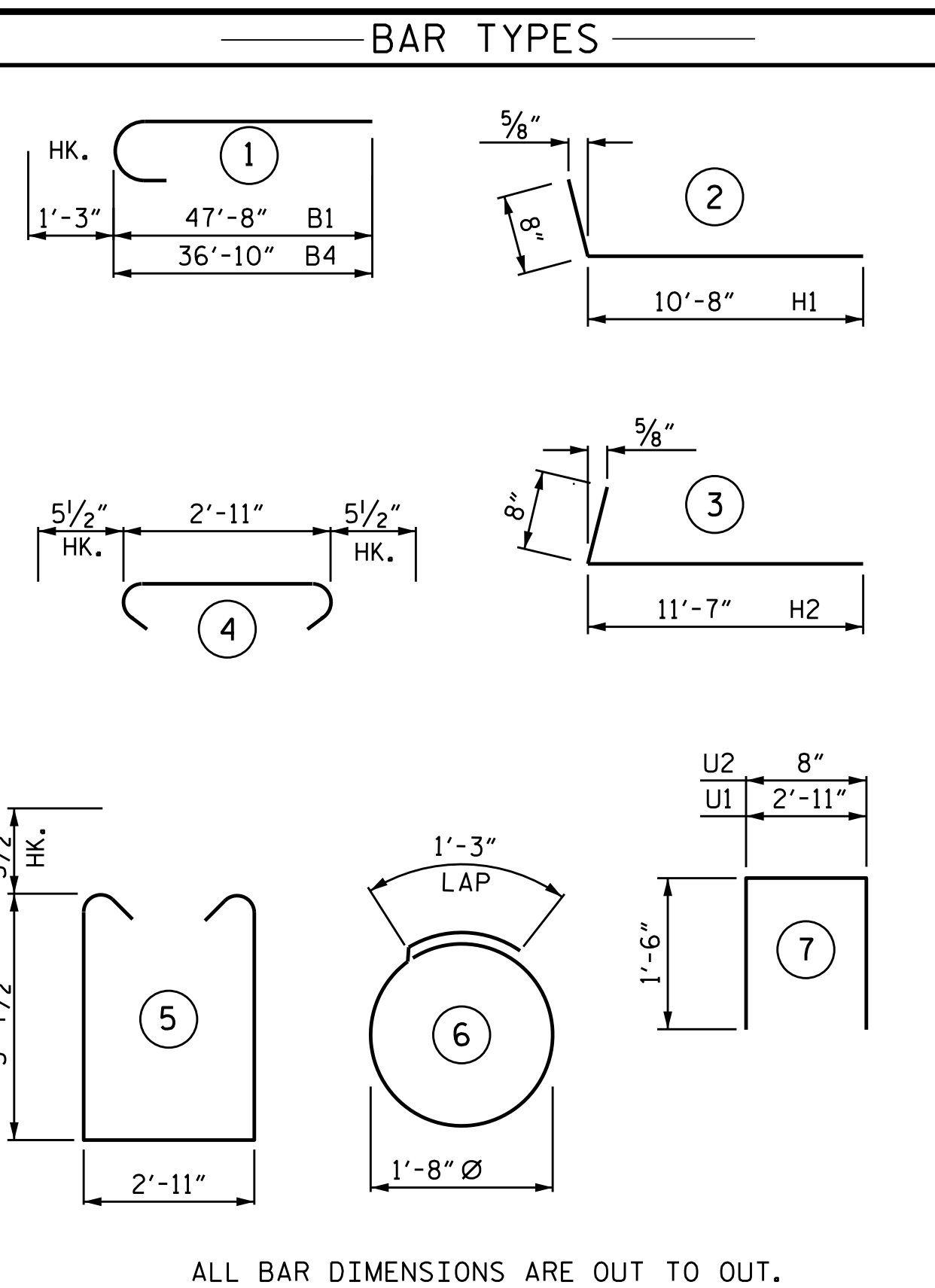


PARTIAL SECTION B

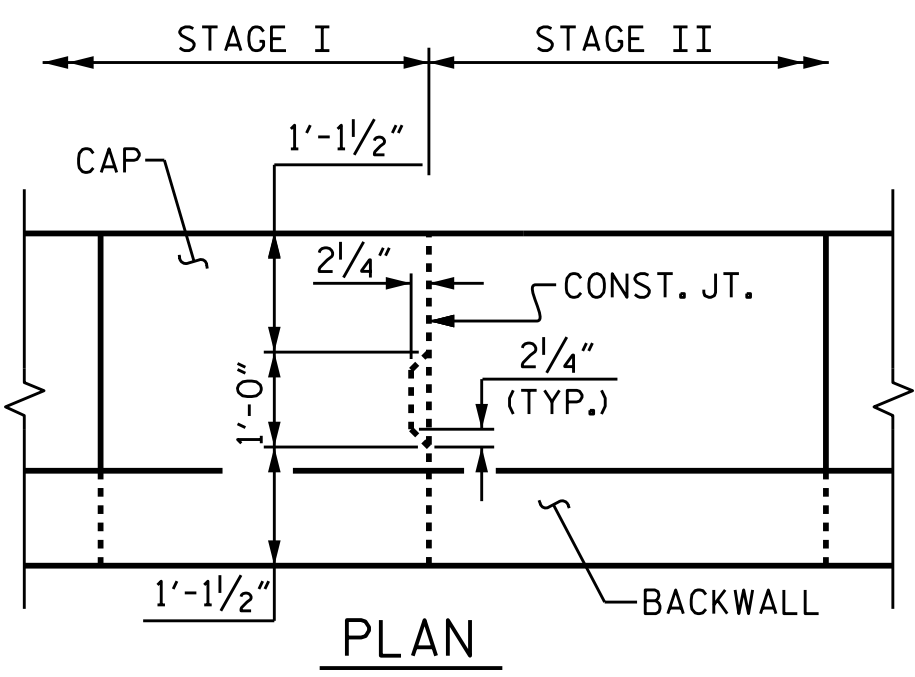


PILE SPLICE DETAILS

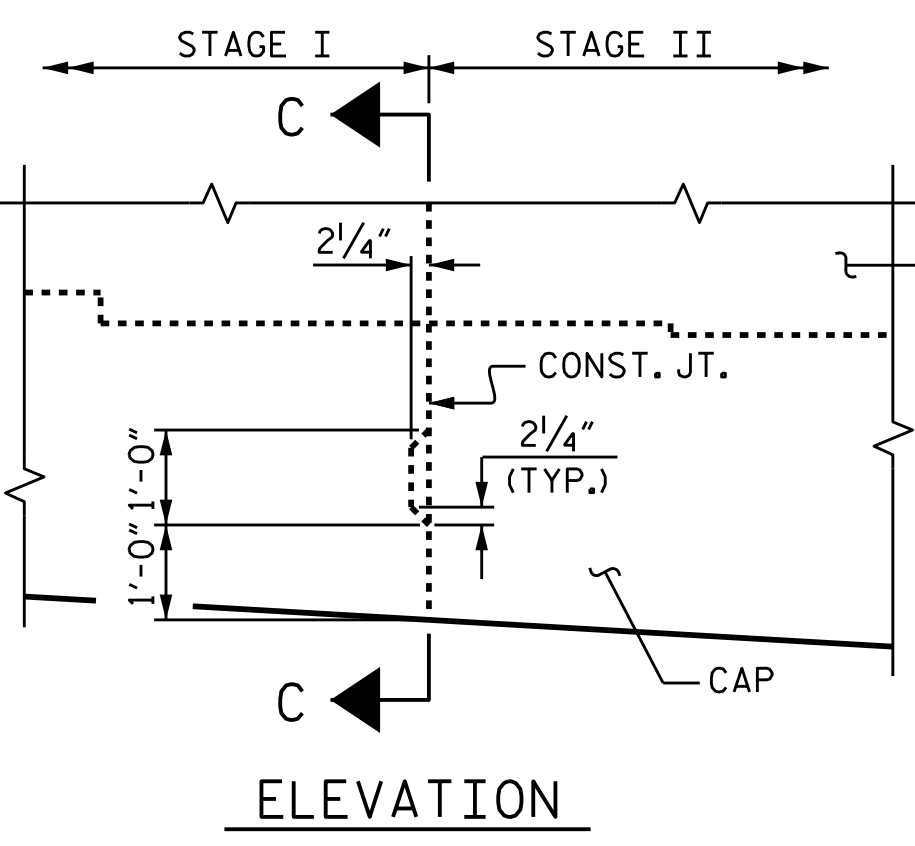
POSITION OF PILE DURING WELDING.



ALL BAR DIMENSIONS ARE OUT TO OUT.



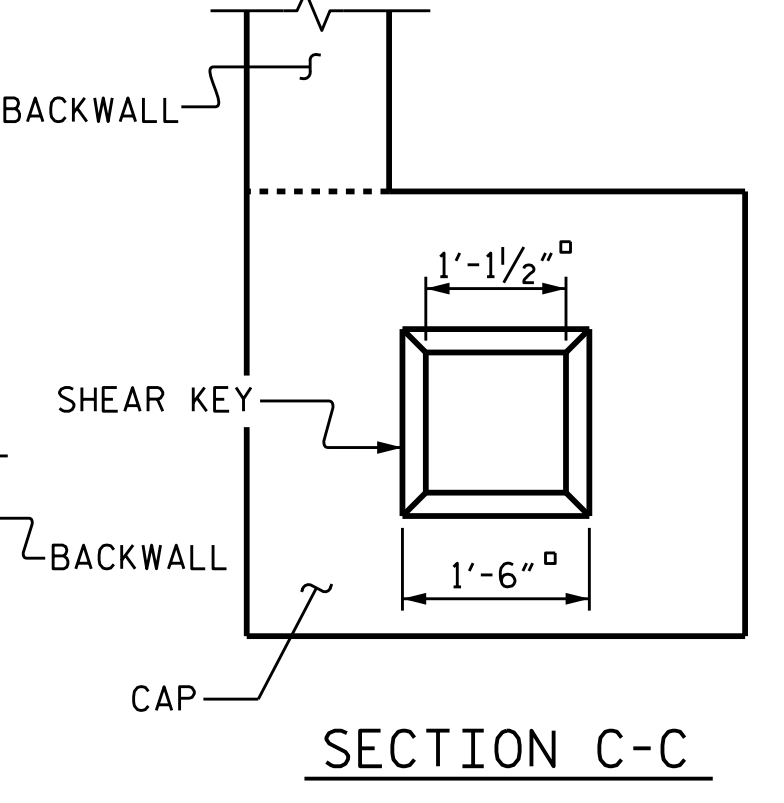
PLAN



ELEVATION

SHEAR KEY DETAIL

REINFORCING STEEL NOT SHOWN



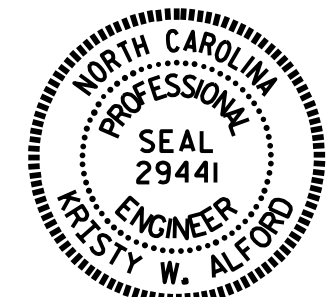
SECTION C-C

BILL OF MATERIAL						BILL OF MATERIAL					
END BENT 1 - STAGE I						END BENT 1 - STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	48'-11"	1663	B4	10	#9	1	38'-1"	1295
B2	5	#9	STR	38'-10"	660	B6	28	#4	STR	19'-10"	371
B3	5	#9	STR	33'-10"	575	B7	15	#4	STR	2'-4"	23
B5	42	#4	STR	25'-4"	711	B8	5	#4	STR	7'-6"	25
B7	35	#4	STR	2'-4"	55	B9	10	#4	STR	2'-11"	19
B9	17	#4	STR	2'-11"	33						
						H2	50	#5	3	12'-3"	639
						K2	24	#4	STR	19'-10"	318
						K4	6	#4	STR	4'-1"	16
						S1	37	#5	4	3'-10"	148
						S2	37	#5	5	11'-1"	428
						S3	20	#4	6	6'-6"	87
						U1	14	#4	7	5'-11"	55
						U2	33	#4	7	3'-8"	81
						V1	66	#5	STR	9'-2"	631
						V5	6	#5	STR	11'-8"	73
						V6	6	#5	STR	11'-7"	72
						V7	6	#5	STR	11'-5"	72
						V8	16	#5	STR	11'-4"	189
REINFORCING STEEL = 7,970 LBS						REINFORCING STEEL = 4,542 LBS					
CLASS A CONCRETE: POUR 1						CLASS A CONCRETE: POUR 1					
CAP, LOWER WING = 36.2 C.Y.						CAP, LOWER WING = 20.6 C.Y.					
POUR 2						POUR 2					
BACKWALL, UPPER WING = 16.6 C.Y.						BACKWALL, UPPER WING = 10.6 C.Y.					
TOTAL: 52.8 C.Y.						TOTAL: 31.2 C.Y.					
HP 12 X 53 STEEL PILES NO. 11 LIN. FT. 660						HP 12 X 53 STEEL PILES NO. 4 LIN. FT. 240					

TOTAL QUANTITIES STAGE I & II					
	REINFORCING STEEL	CLASS A CONCRETE	HP 12 X 53 STEEL PILES	PILE REDRIVES	
	LBS.	C.Y.	NO.	LIN. FT.	EACH
STAGE I	7,970	52.8	11	660	-
STAGE II	4,542	31.2	4	240	-
TOTAL	12,512	84.0	15	900	7

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 35+23.40 -L-

SHEET 4 OF 4



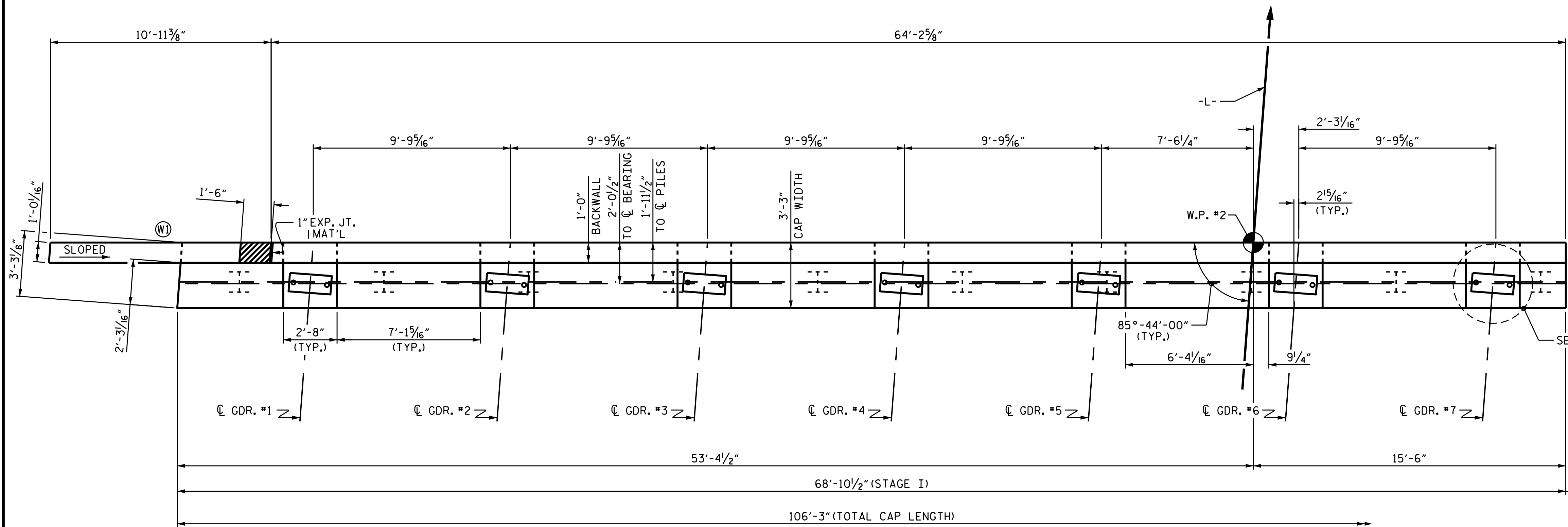
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 1

DRAWN BY : D. SHACKELFORD DATE : 02/2015
CHECKED BY : J.P. ADAMS DATE : 07/2015
DESIGN ENGINEER OF RECORD: P.K. NEWTON DATE : 09/2015

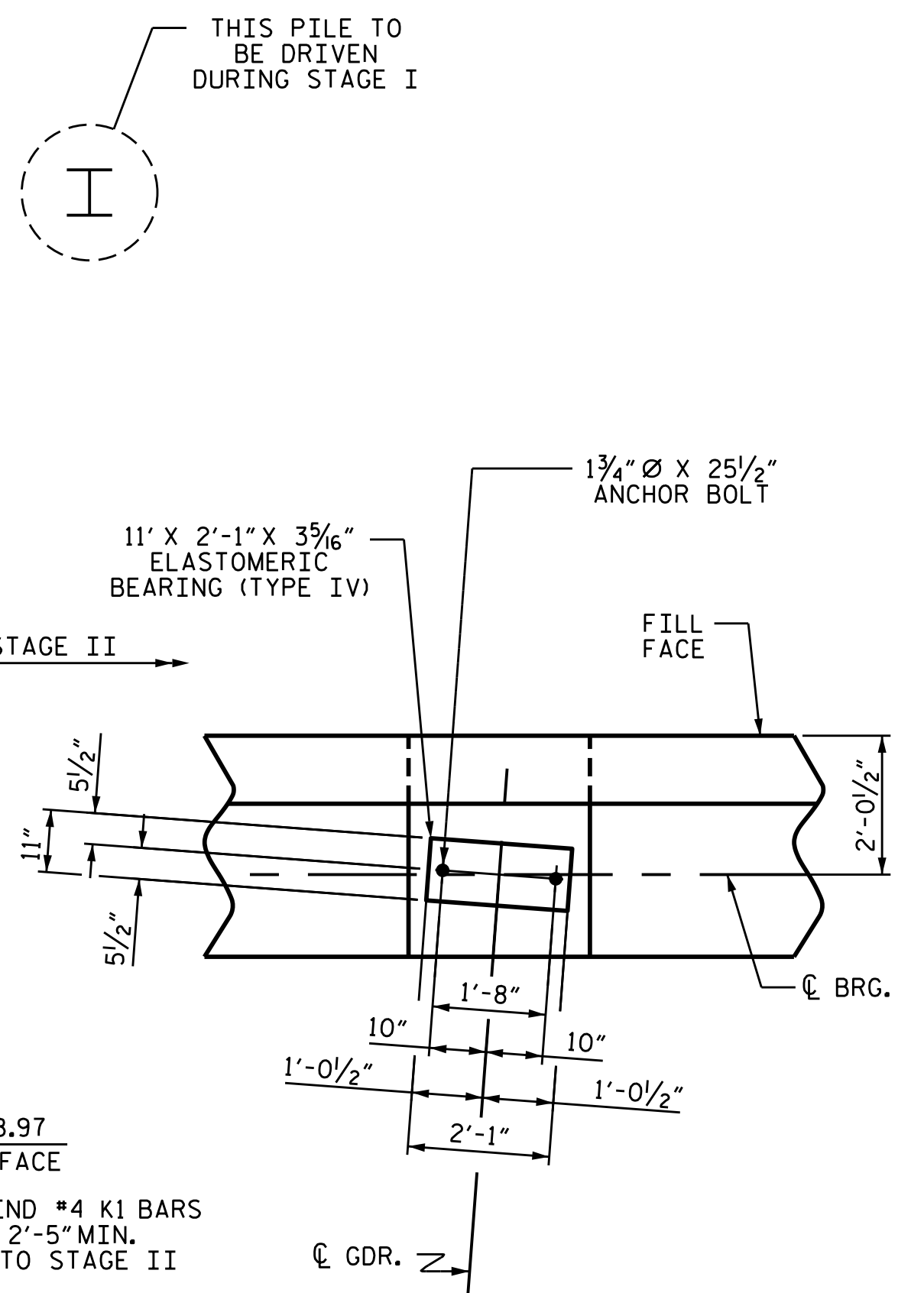
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-77
1			3			TOTAL SHEETS 84
2			4			

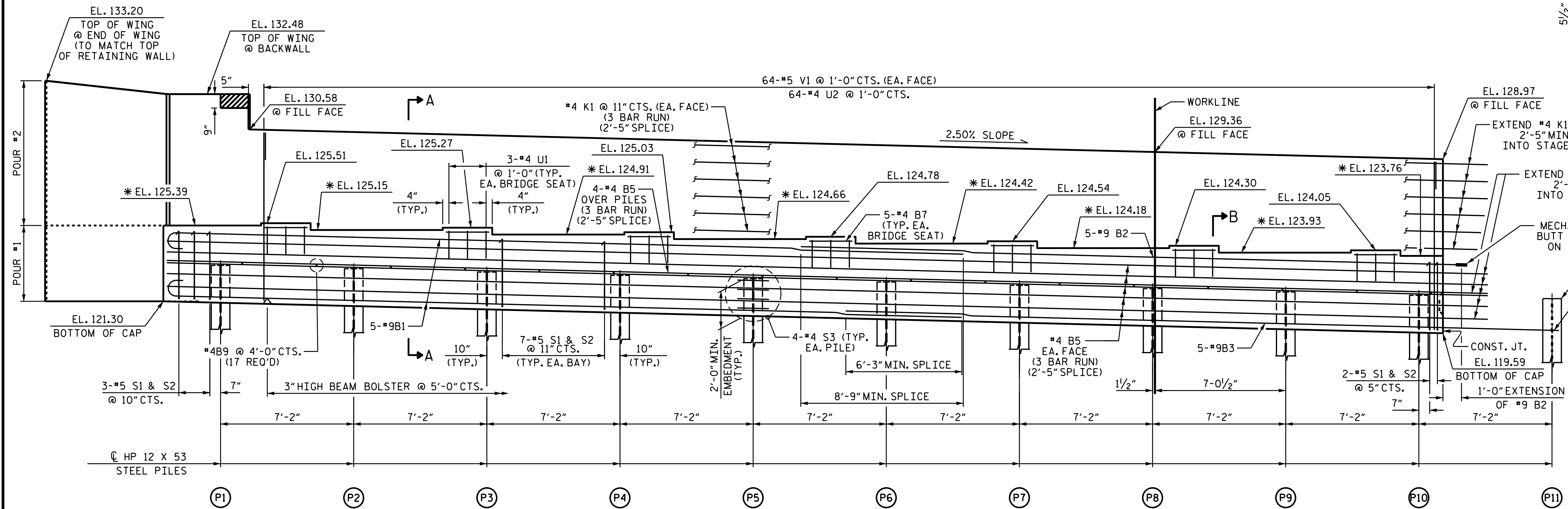
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SIGNATURES COMPLETED



PLAN



DETAIL A
(TYP. EA. GIRDER)

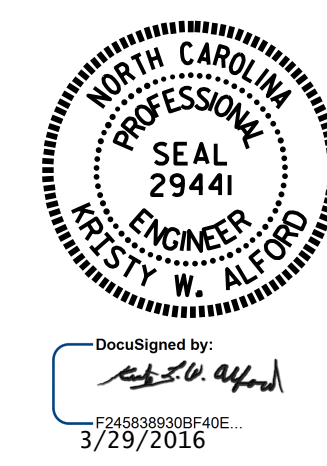


ELEVATION

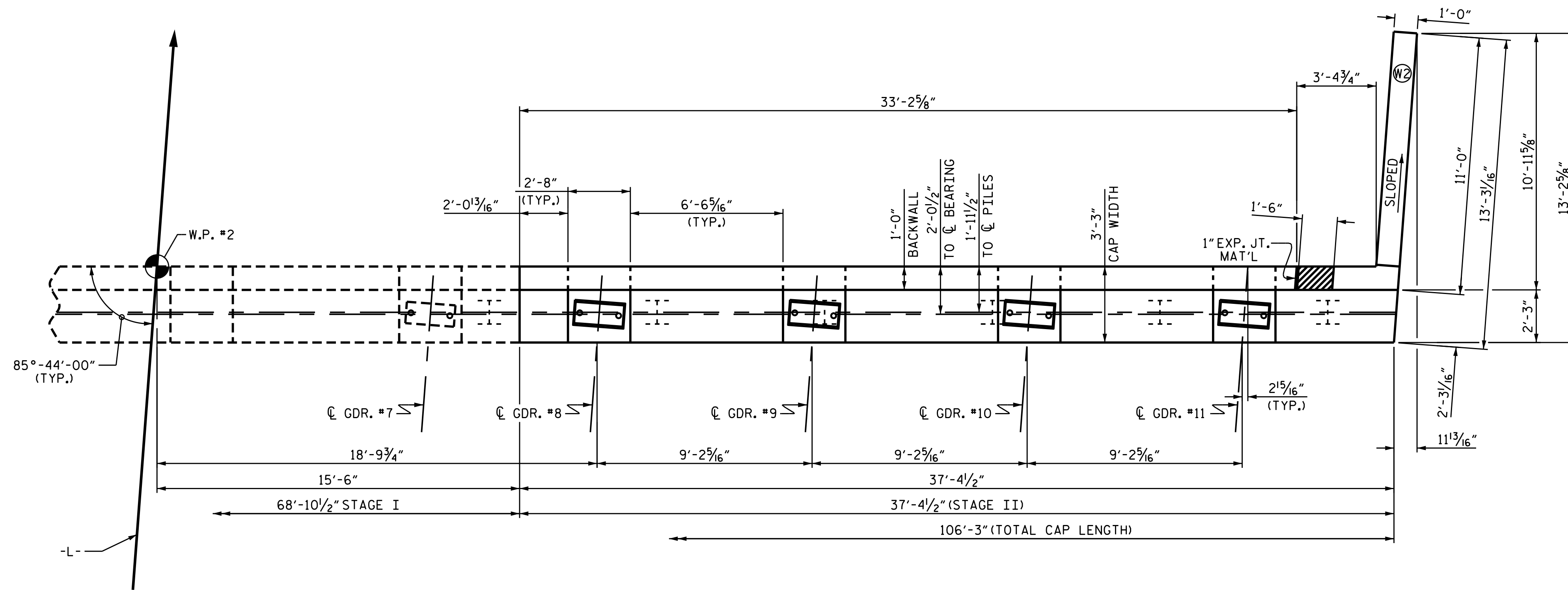
* FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS, SEE SHEET 4 OF 4.
FOR TOP OF PILE ELEVATIONS, SEE SHEET 2 OF 4.
FOR SHEAR KEY DETAIL, SEE SHEET 4 OF 4.

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 35+23.40 -L-
SHEET 1 OF 4

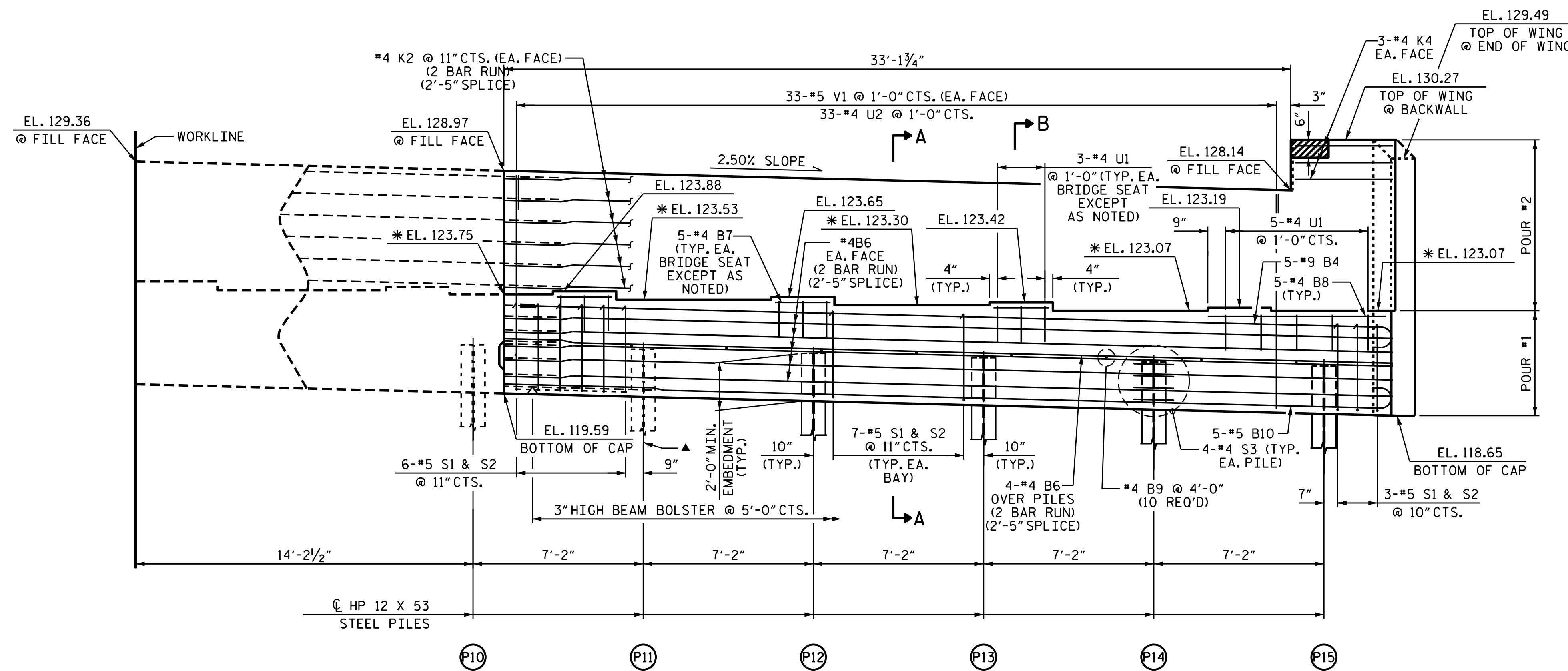
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 2 STAGE I					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					84



DRAWN BY: D. SHACKELFORD DATE: 03/2015
CHECKED BY: J.P. ADAMS DATE: 07/2015
DESIGN ENGINEER OF RECORD: P.K. NEWTON DATE: 09/2015



PLAN



ELEVATION

* FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS, SEE SHEET 4 OF 4.

FOR SHEAR KEY DETAIL, SEE SHEET 4 OF 4.

▲ THIS PILE SHALL BE DRIVEN DURING STAGE 1.

NOTES

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

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.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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%.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.

THE #5 "V" BARS SHALL BE PLACED 2" CLEAR FROM THE TOP OF THE BACKWALL.

TOP OF PILE ELEVATIONS

P1	123.26
P2	123.08
P3	122.90
P4	122.73
P5	122.55
P6	122.37
P7	122.19
P8	121.01
P9	121.83
P10	121.65
P11	121.47
P12	121.30
P13	121.12
P14	120.94
P15	120.76

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-

SHEET 2 OF 4



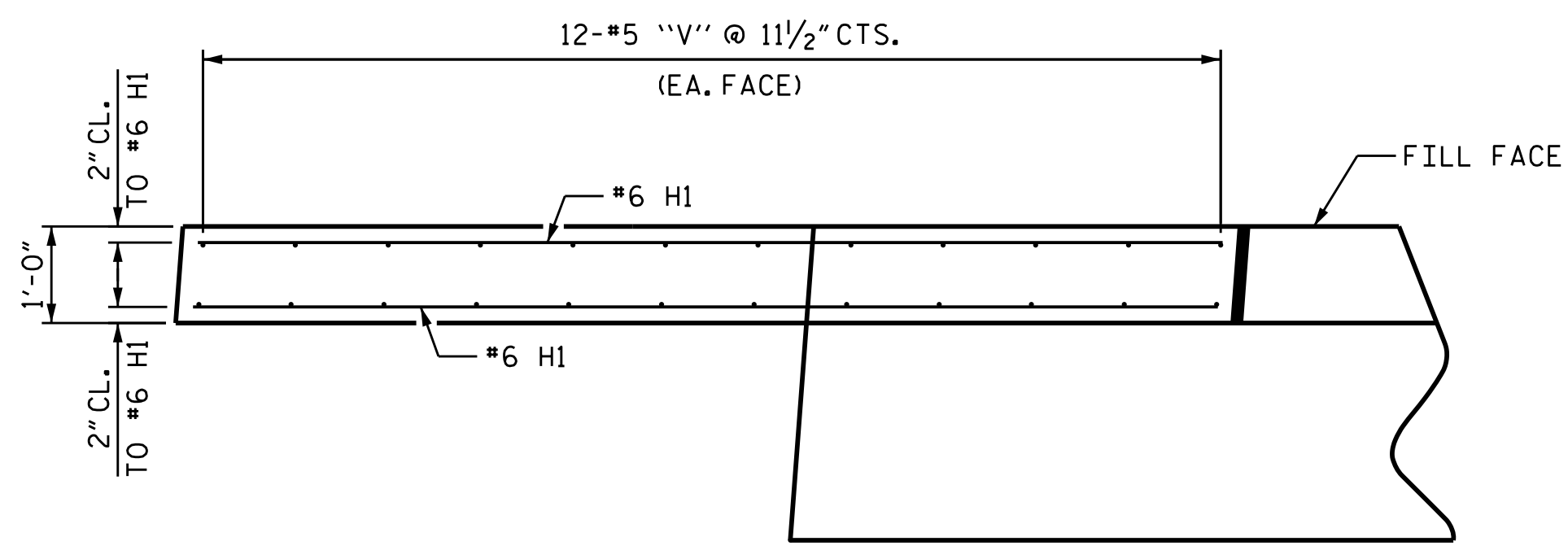
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 3/29/2016

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

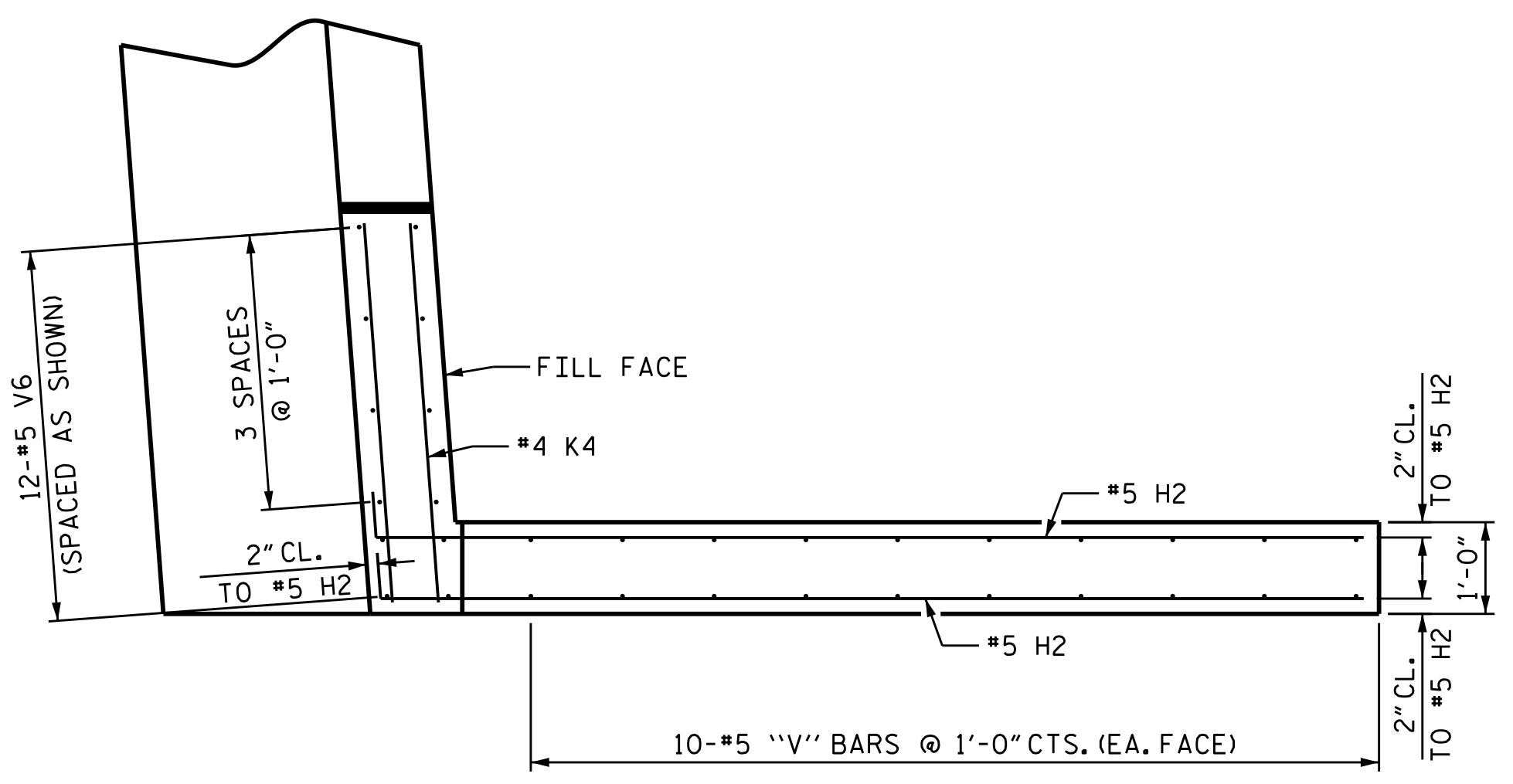
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-79
1			3			TOTAL SHEETS
2			4			84

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

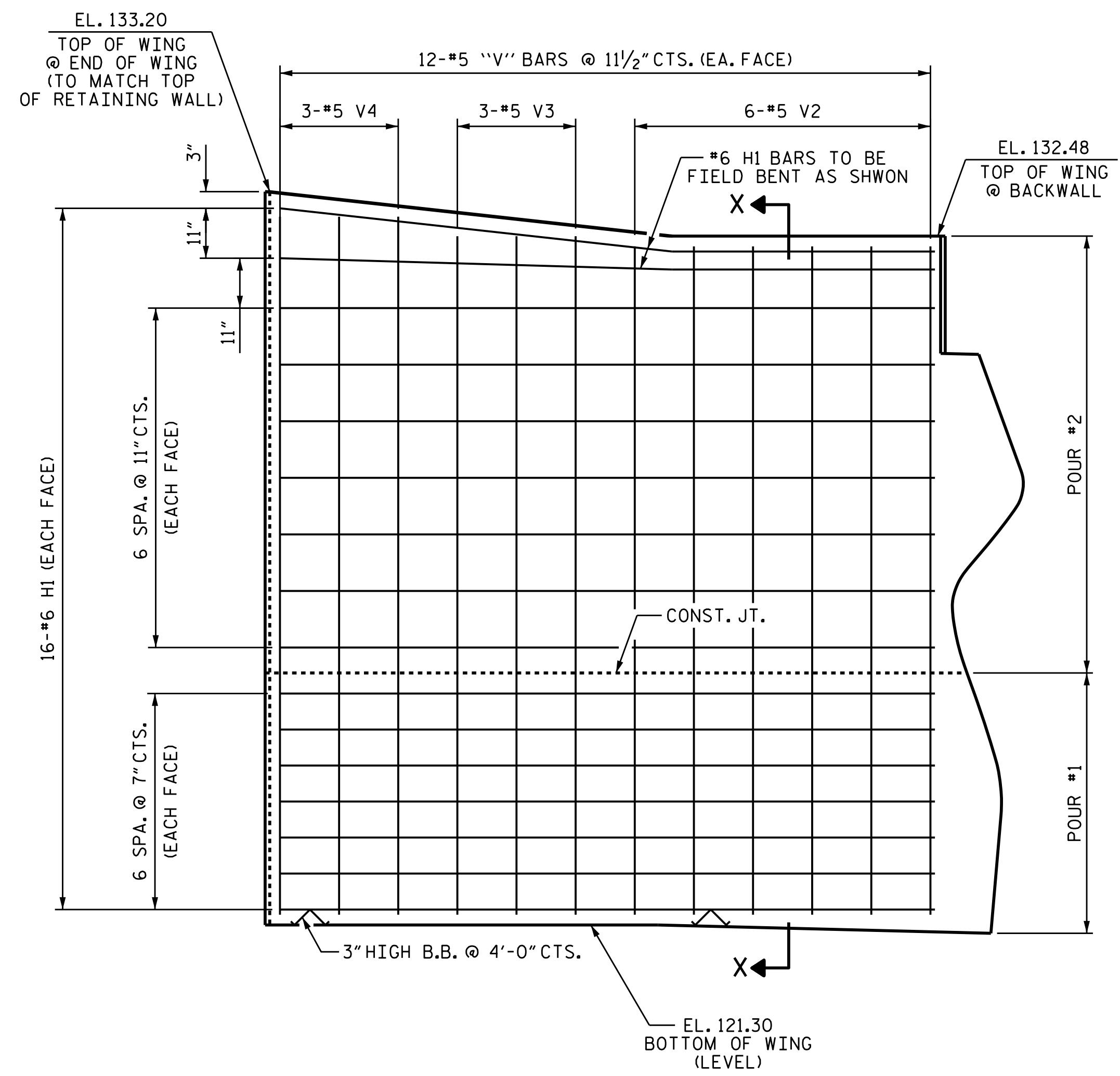
DRAWN BY : D. SHACKELFORD DATE : 03/2015
 CHECKED BY : J.P. ADAMS DATE : 07/2015
 DESIGN ENGINEER OF RECORD: P.K. NEWTON DATE : 09/2015



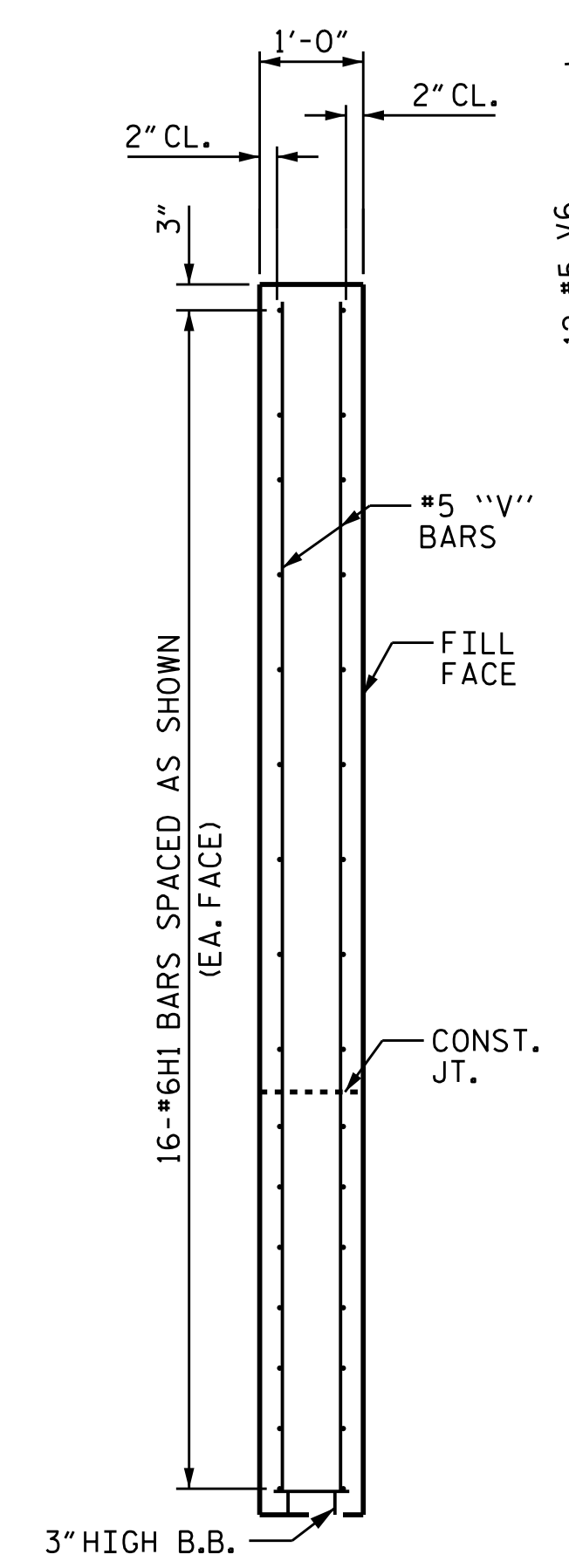
PLAN OF LEFT WING - (W1)
STAGE I



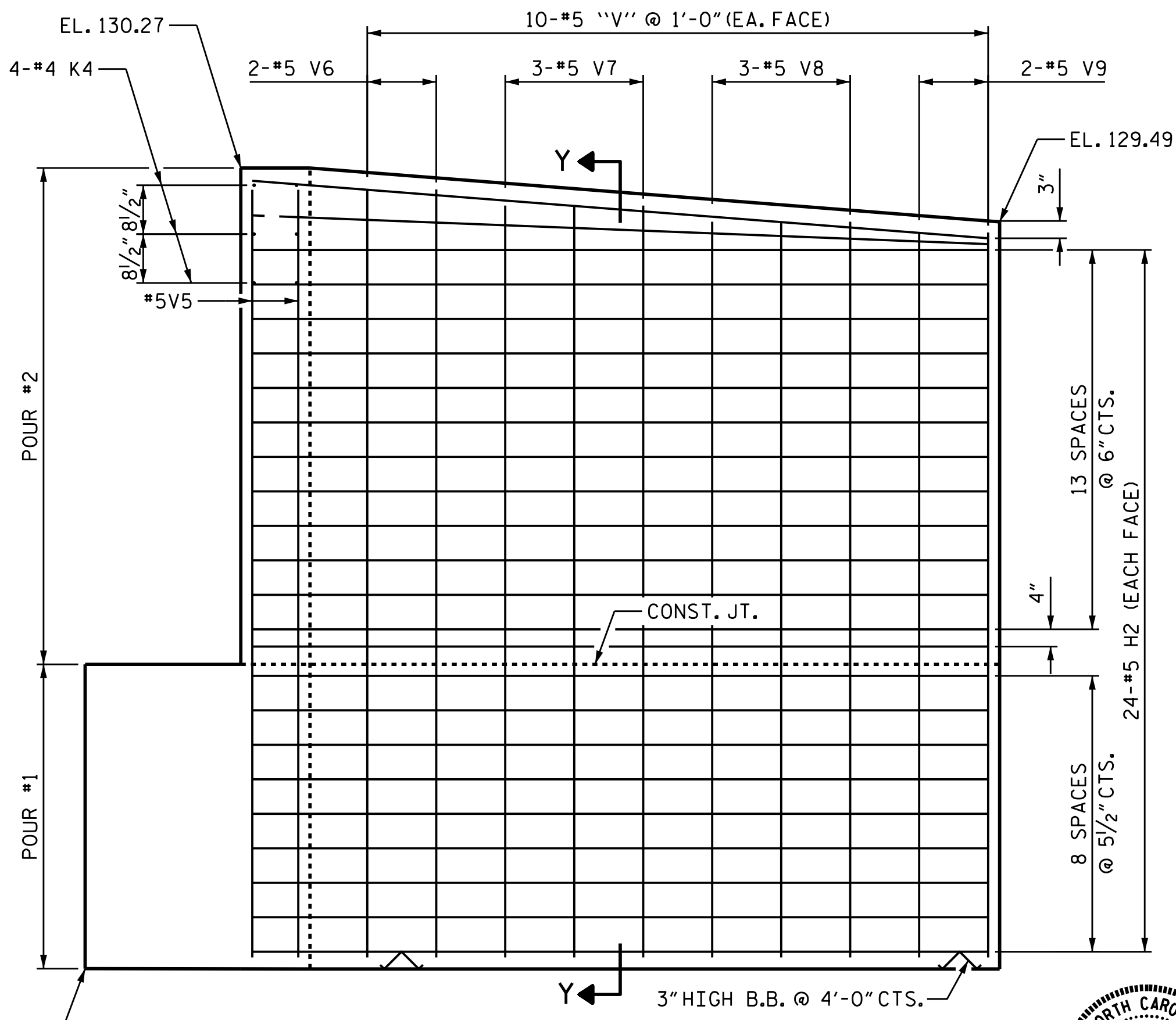
PLAN OF RIGHT WING - (W2)
STAGE II



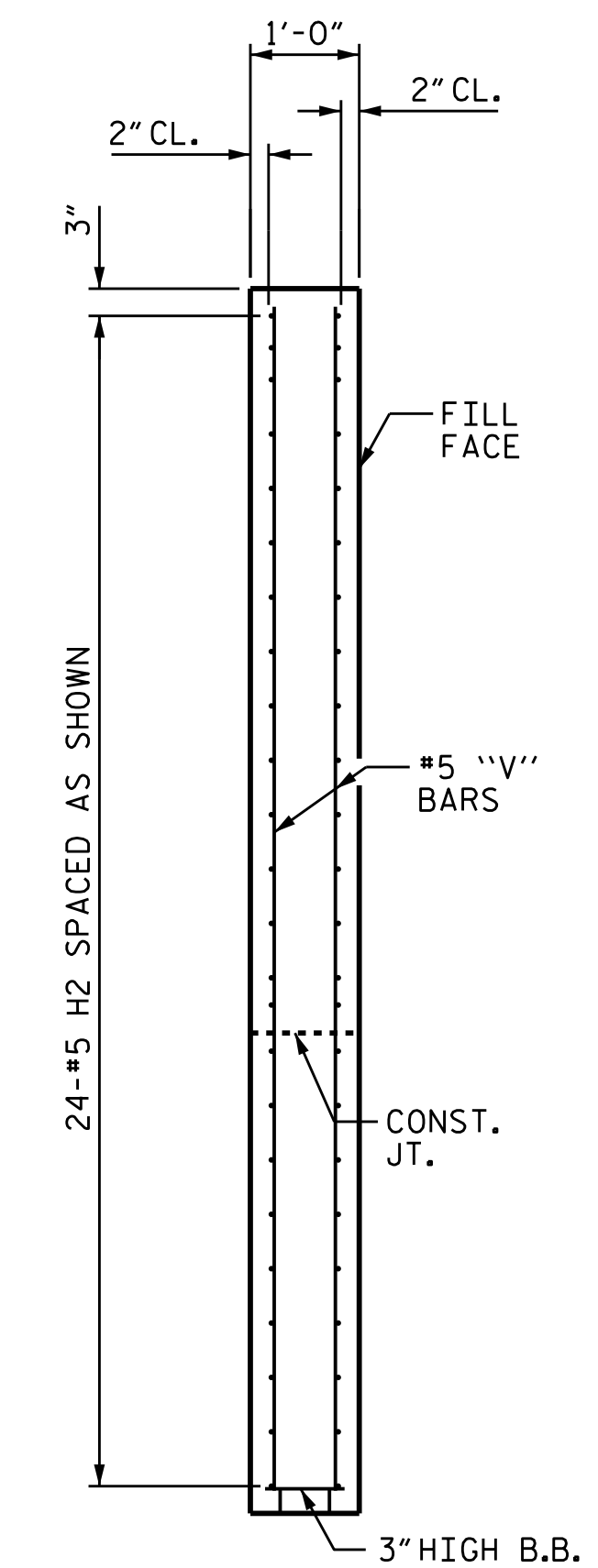
ELEVATION OF LEFT WING - (W1)
STAGE I



SECTION X-X

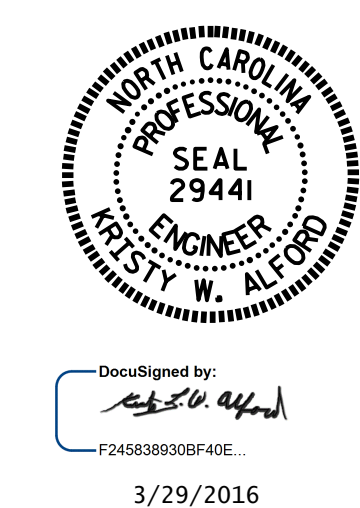


ELEVATION OF RIGHT WING - (W2)
STAGE II



SECTION Y-Y

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-
 SHEET 3 OF 3



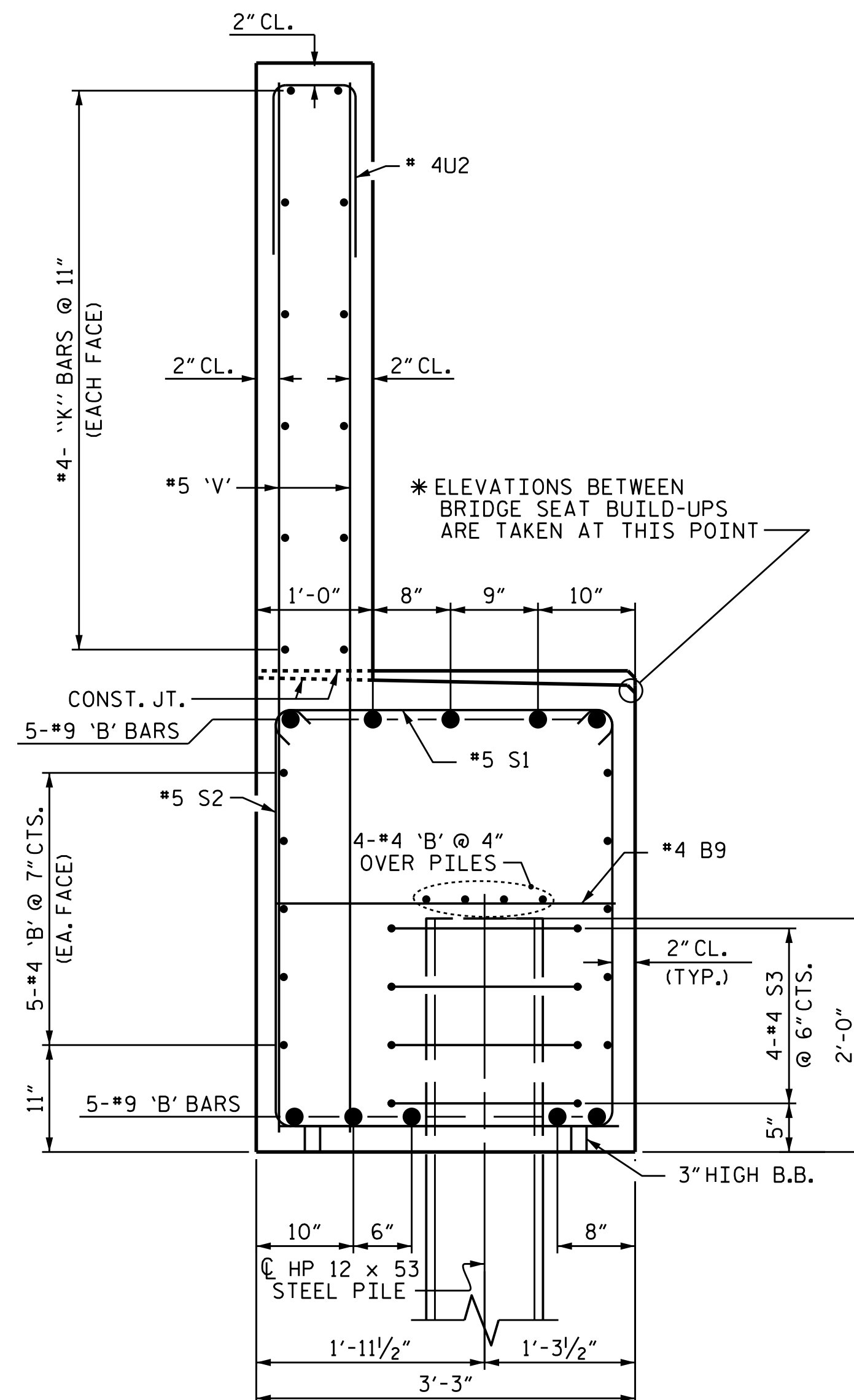
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 2

DRAWN BY : D. SHACKELFORD DATE : 02/2015
 CHECKED BY : J.P. ADAMS DATE : 07/2015
 DESIGN ENGINEER OF RECORD: P.K. NEWTON DATE : 09/2015

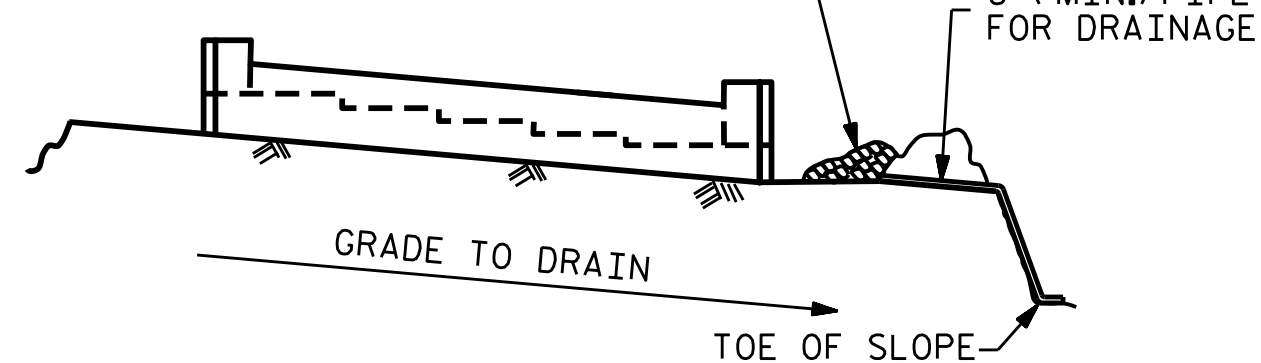
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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-80	
1			3			TOTAL SHEETS 84	
2			4				



SECTION A-A

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

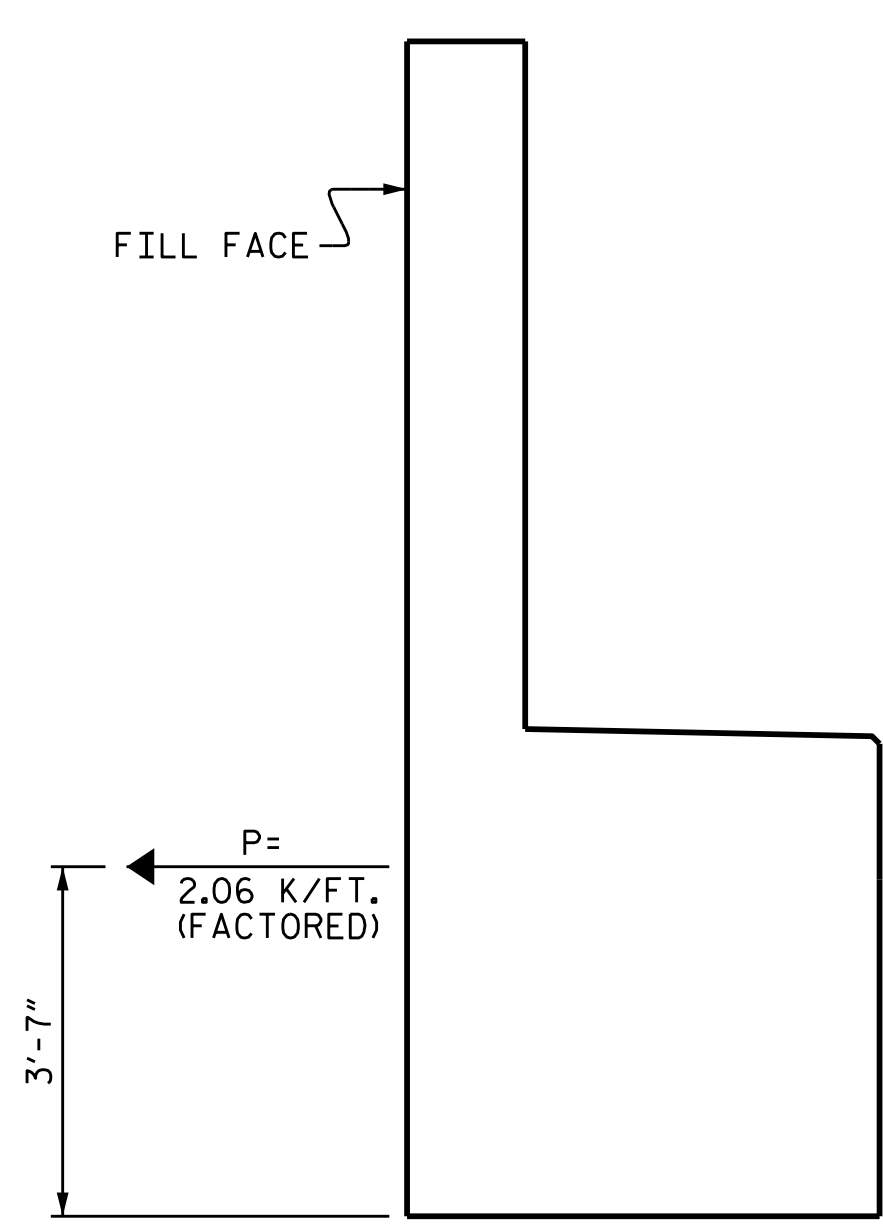


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

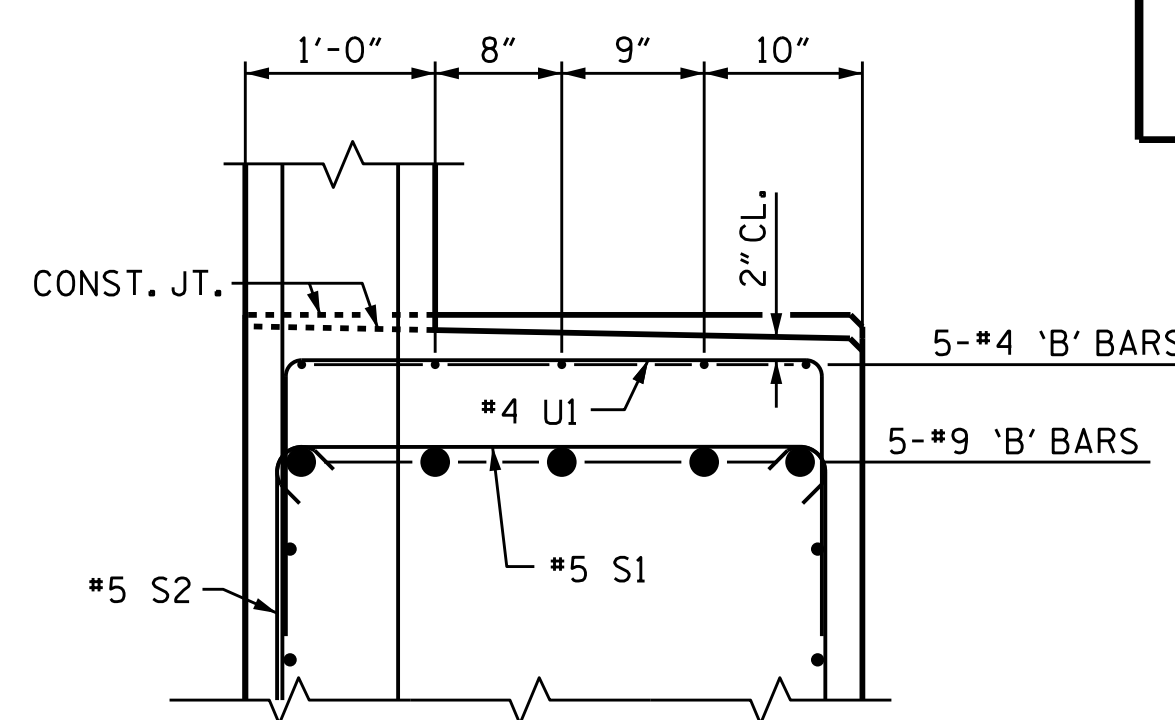
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

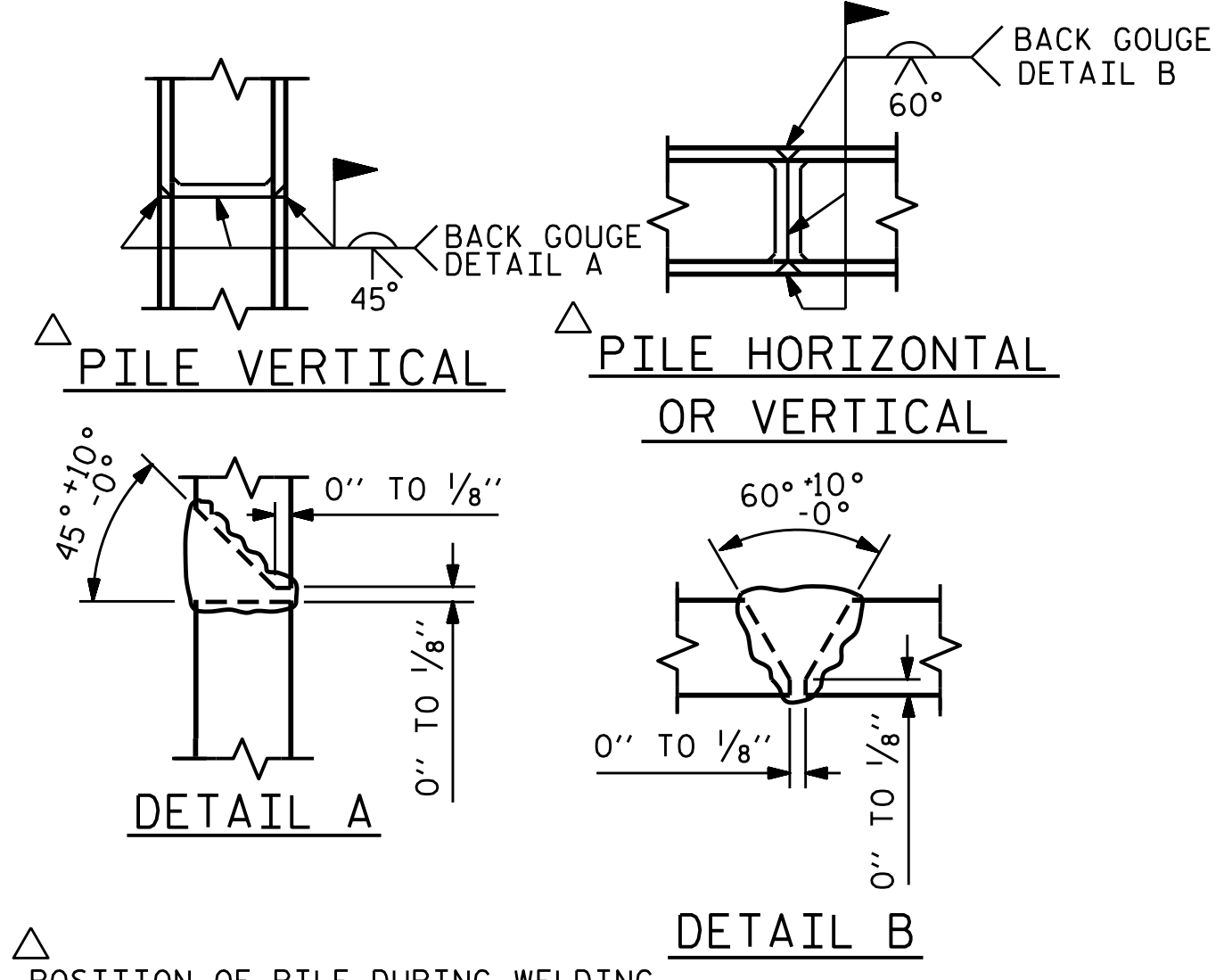


TIE BACK DETAILS

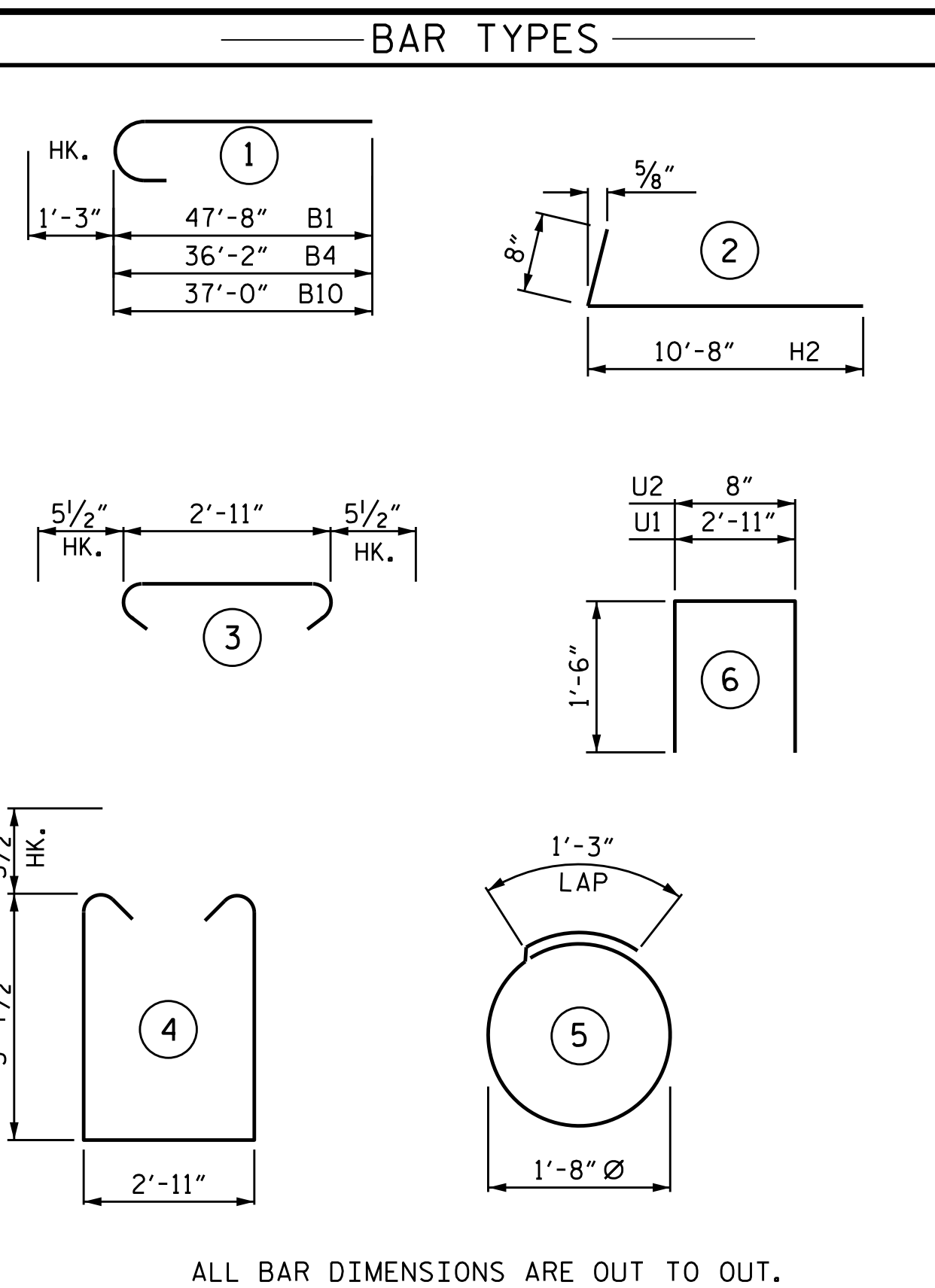
(DETAIL SHOWING TIE BACK RESTRAINT FOR END BENT)



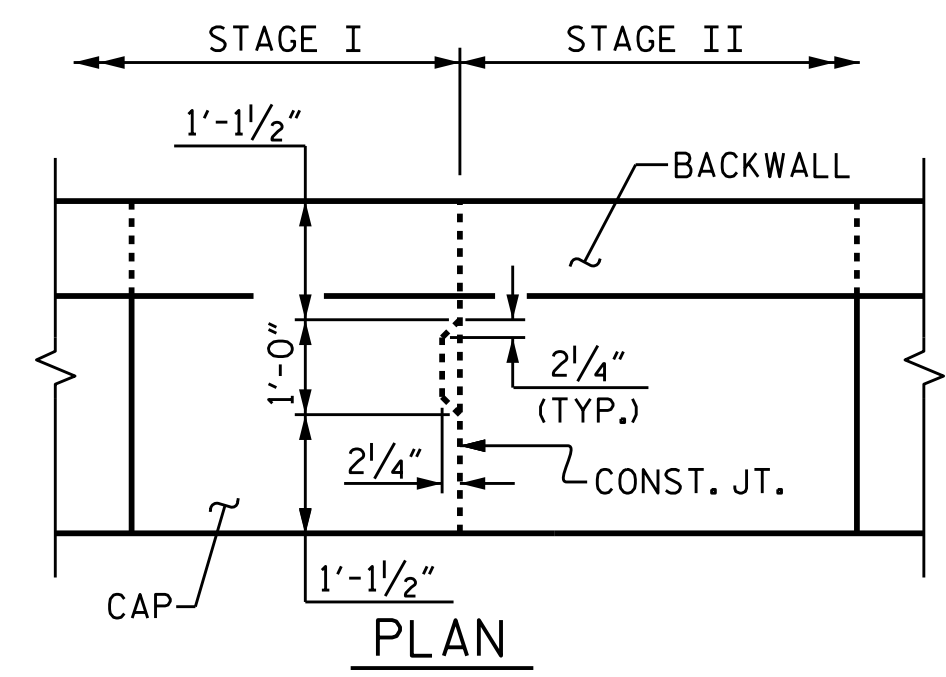
PARTIAL SECTION B



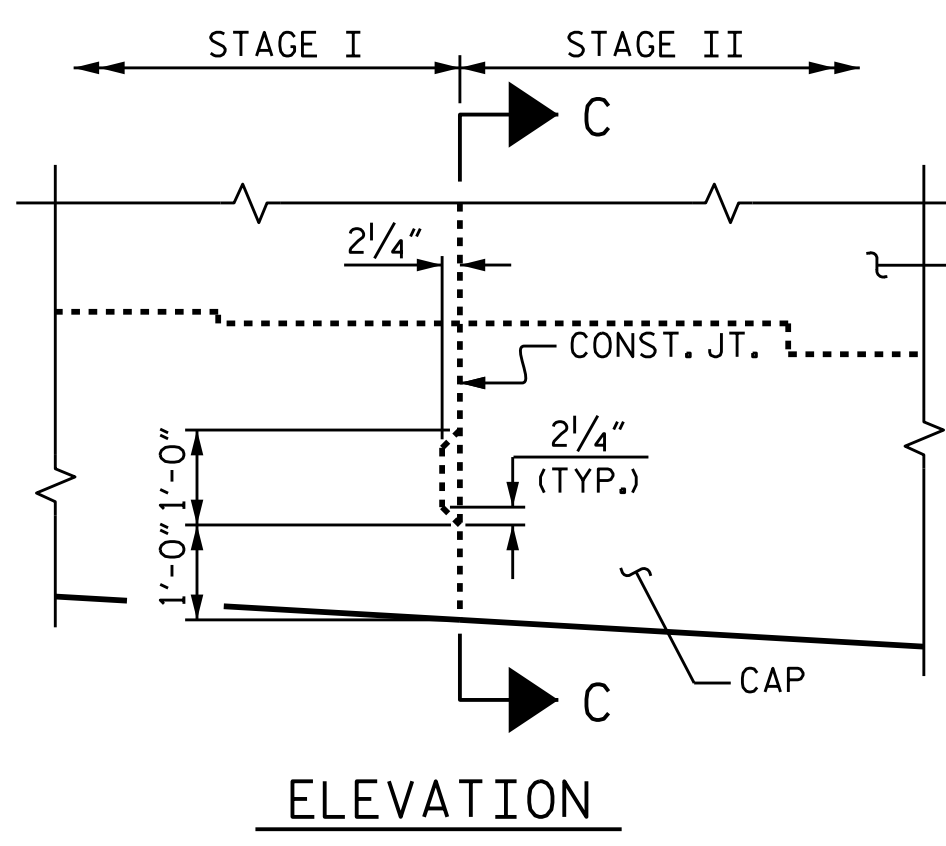
PILE SPLICE DETAILS



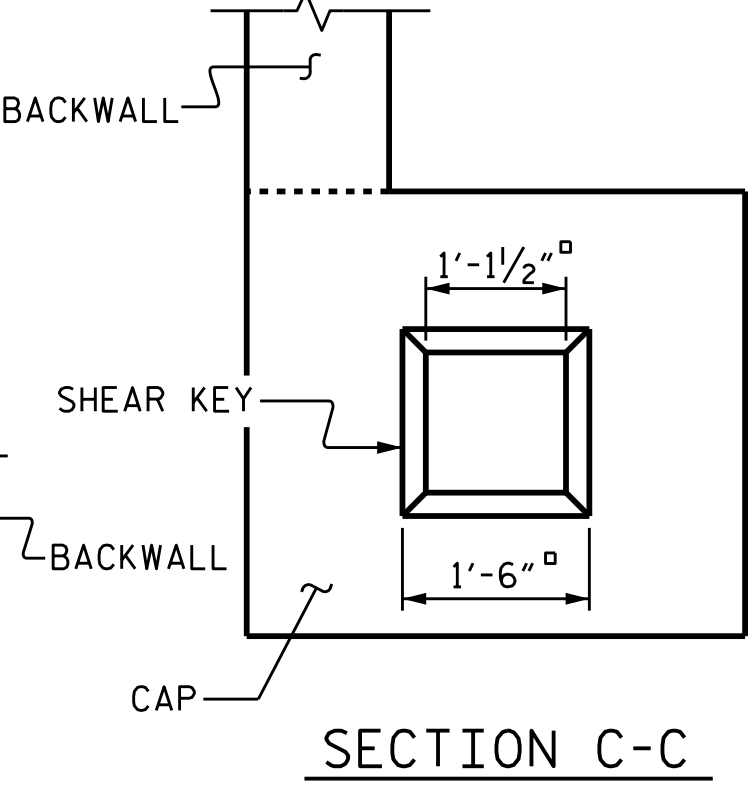
ALL BAR DIMENSIONS ARE OUT TO OUT.



PLAN



ELEVATION



SECTION C-C

SHEAR KEY DETAIL

REINFORCING STEEL NOT SHOWN

BILL OF MATERIAL										BILL OF MATERIAL									
END BENT 2 - STAGE I										END BENT 2 - STAGE II									
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT								
B1	10	#9	1	48'-11"	1663	B4	5	#9	1	37'-5"	636								
B2	5	#9	STR	30'-10"	524	B6	28	#4	STR	19'-10"	371								
B3	5	#9	STR	33'-10"	575	B7	15	#4	STR	2'-4"	23								
B5	42	#4	STR	25'-4"	711	B8	5	#4	STR	7'-6"	25								
B7	35	#4	STR	2'-4"	55	B9	10	#4	STR	2'-11"	19								
B9	17	#4	STR	2'-11"	33	B10	5	#9	1	38'-3"	650								
H1	32	#6	STR	10'-7"	509	H2	48	#5	2	11'-4"	567								
K1	36	#4	STR	25'-5"	611	K2	24	#4	STR	19'-10"	318								
						K4	6	#4	STR	4'-0"	16								
S1	68	#5	3	3'-10"	272	S1	37	#5	3	3'-10"	148								
S2	68	#5	4	11'-1"	786	S2	37	#5	4	11'-1"	428								
S3	40	#4	5	6'-6"	174	S3	20	#4	5	6'-6"	87								
U1	21	#4	6	5'-11"	83	U1	14	#4	6	5'-11"	55								
U2	64	#4	6	3'-8"	157	U2	33	#4	6	3'-8"	81								
V1	128	#5	STR	9'-0"	1202	V1	66	#5	STR	9'-0"	620								
V2	12	#5	STR	10'-10"	136	V6	16	#5	STR	11'-2"	186								
V3	6	#5	STR	11'-0"	69	V7	6	#5	STR	10'-11"	68								
V4	6	#5	STR	11'-3"	70	V8	6	#5	STR	10'-8"	67								
						V9	4	#5	STR	10'-6"	44								
REINFORCING STEEL =					7,630 LBS	REINFORCING STEEL =					4,409 LBS								
CLASS A CONCRETE:						CLASS A CONCRETE:													
POUR 1						POUR 1													
CAP, LOWER WING = 36.2 C.Y.						CAP, LOWER WING = 20.7 C.Y.													
POUR 2						POUR 2													
BACKWALL, UPPER WING = 15.7 C.Y.						BACKWALL, UPPER WING = 10.0 C.Y.													
TOTAL:					51.9 C.Y.	TOTAL:					30.7 C.Y.								
HP 12 X 53 STEEL PILES						HP 12 X 53 STEEL PILES													
NO. 11 LIN. FT. 660						NO. 4 LIN. FT. 240													

TOTAL QUANTITIES STAGE I & II				
	REINFORCING STEEL	CLASS A CONCRETE	HP 12 x 53 STEEL PILES	PILE REDRIVES
	LBS.	C.Y.	NO.	LIN. FT.
STAGE I	7,630	51.9	11	660
STAGE II	4,409	30.7	4	240
TOTAL	12,039	82.6	15	900

PROJECT NO. B-4490
 CUMBERLAND COUNTY
 STATION: 35+23.40 -L-

SHEET 4 OF 4



DocuSigned by:
 Kristy W. Alford
 F24583890BF40E
 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 2

DRAWN BY :	D. SHACKELFORD	DATE :	02/2015
CHECKED BY :	J.P. ADAMS	DATE :	07/2015
DESIGN ENGINEER OF RECORD:	P.K. NEWTON	DATE :	09/2015

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

TOTAL SHEETS 84

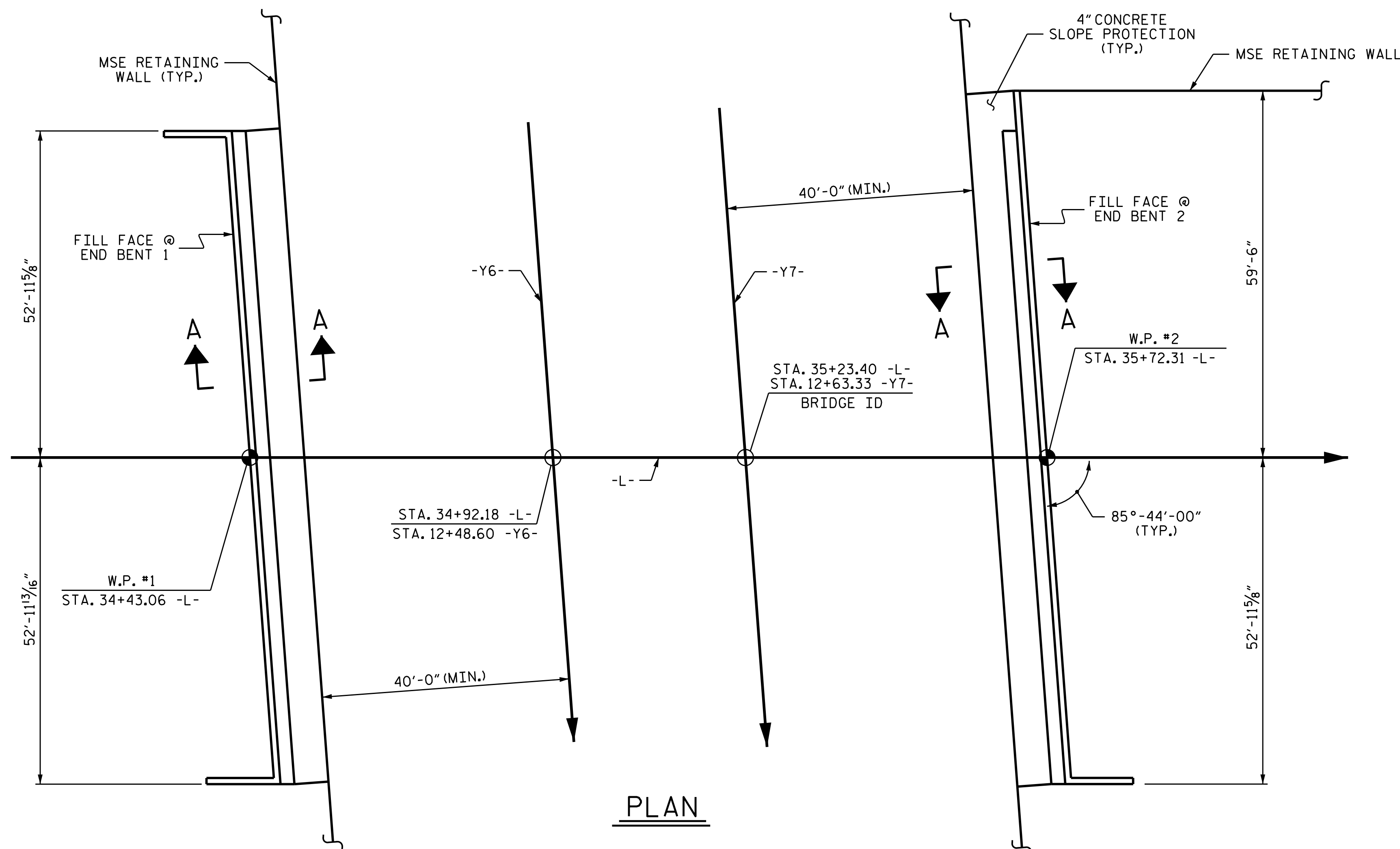
NOTES

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

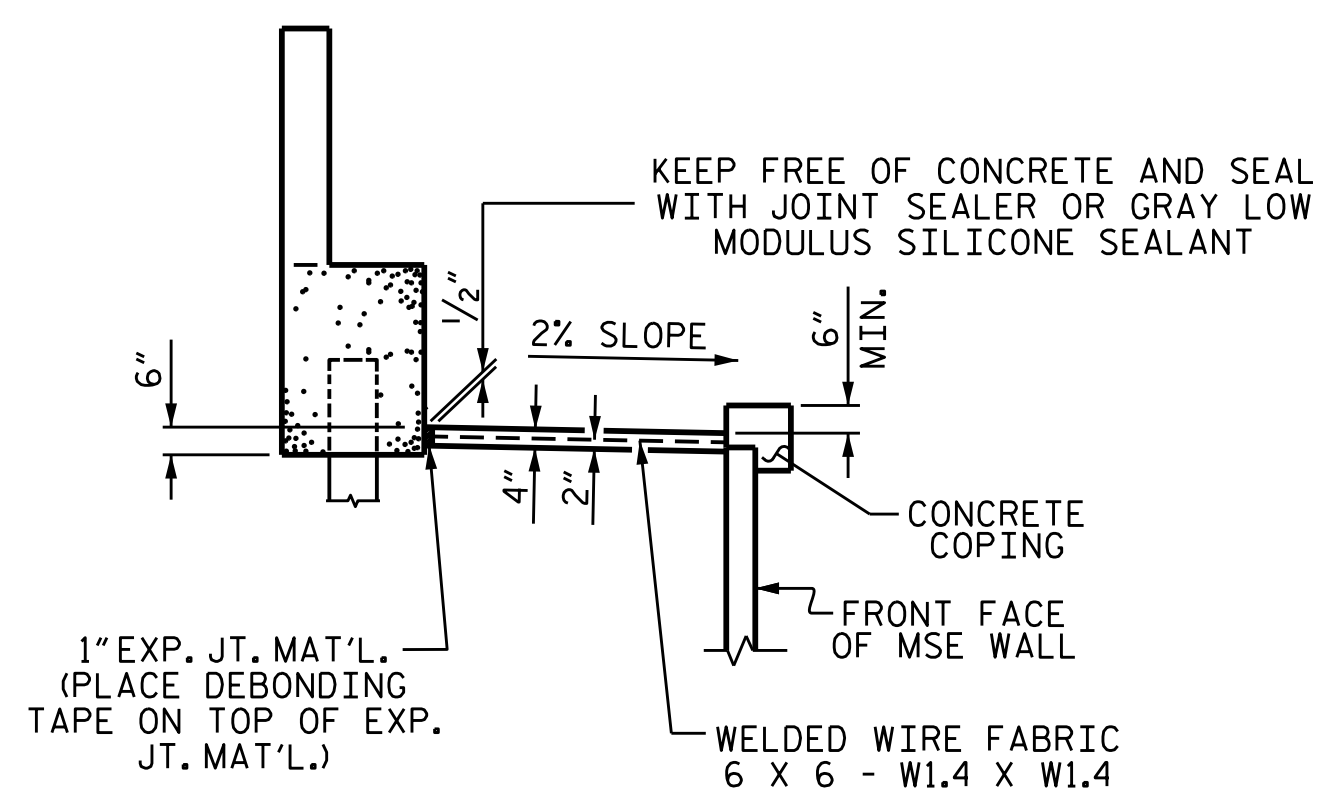
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 35+23.40 -L-	4" SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	53	106
END BENT 2	54	108

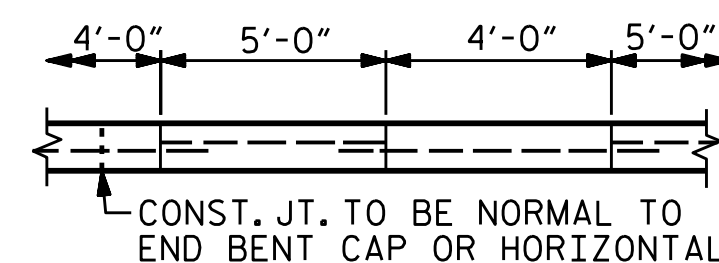
* QUANTITY SHOWN IS BASED ON 5' POURS.



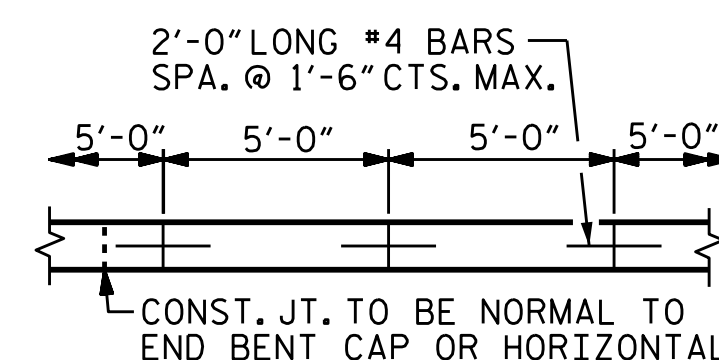
PLAN



SECTION A-A

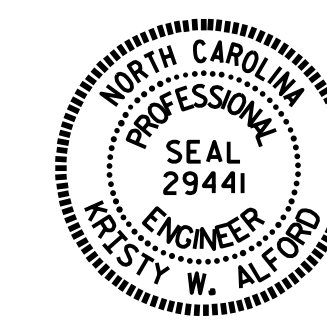


OPTIONAL POURING DETAIL



POURING DETAIL

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-



DocuSigned by:
 Kristy W. Alford
 3/29/2016

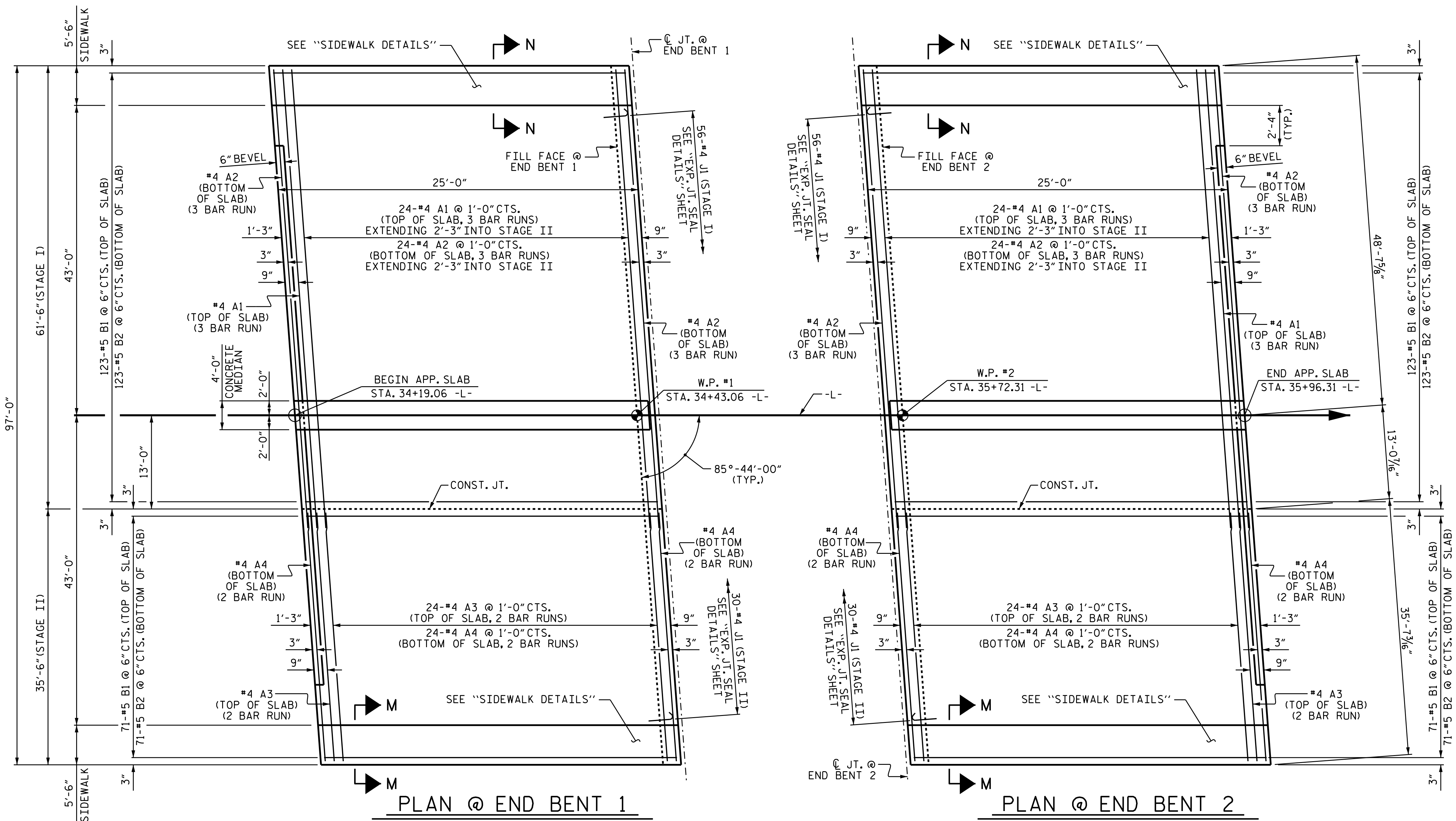
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SLOPE PROTECTION DETAILS

DRAWN BY : J.P. ADAMS DATE : 8/2015
 CHECKED BY : T.L. AVERETTE DATE : 8/2015
 DESIGN ENGINEER OF RECORD : T.L. AVERETTE DATE : 9/2016

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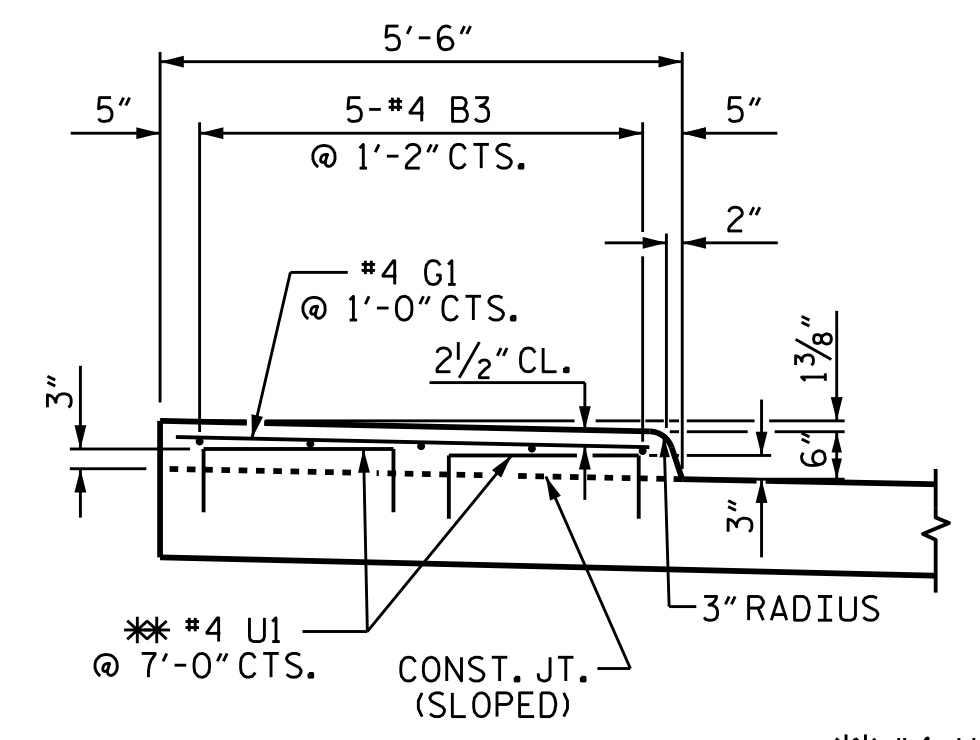
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-82
1			3			TOTAL SHEETS
2			4			84



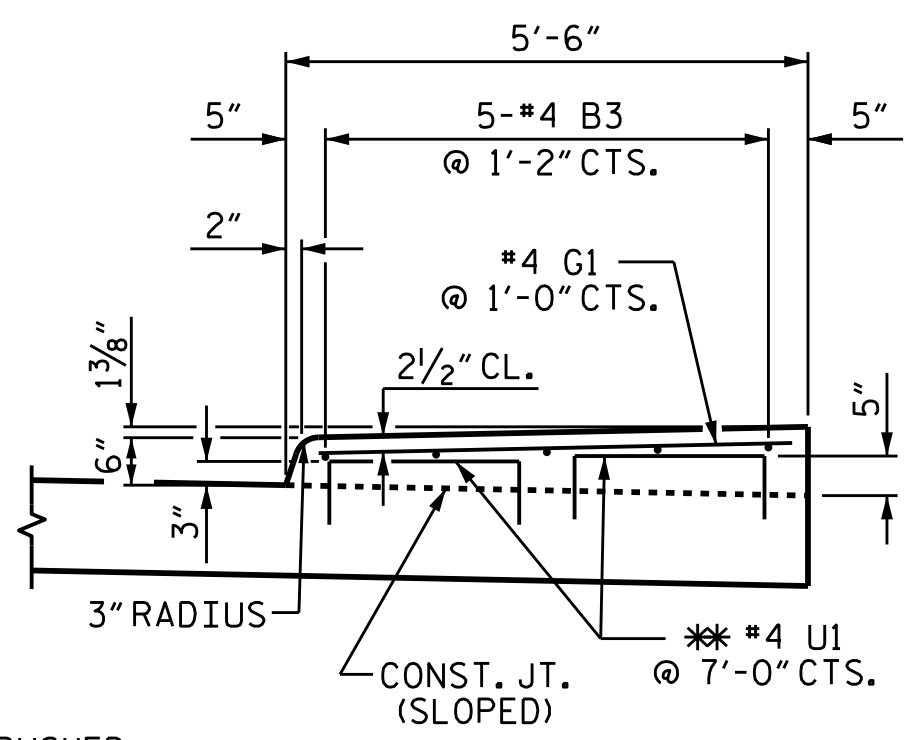
PLAN @ END BENT 1

PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS.
PORTABLE CONCRETE BARRIER NOT SHOWN FOR CLARITY. SEE NOTES.

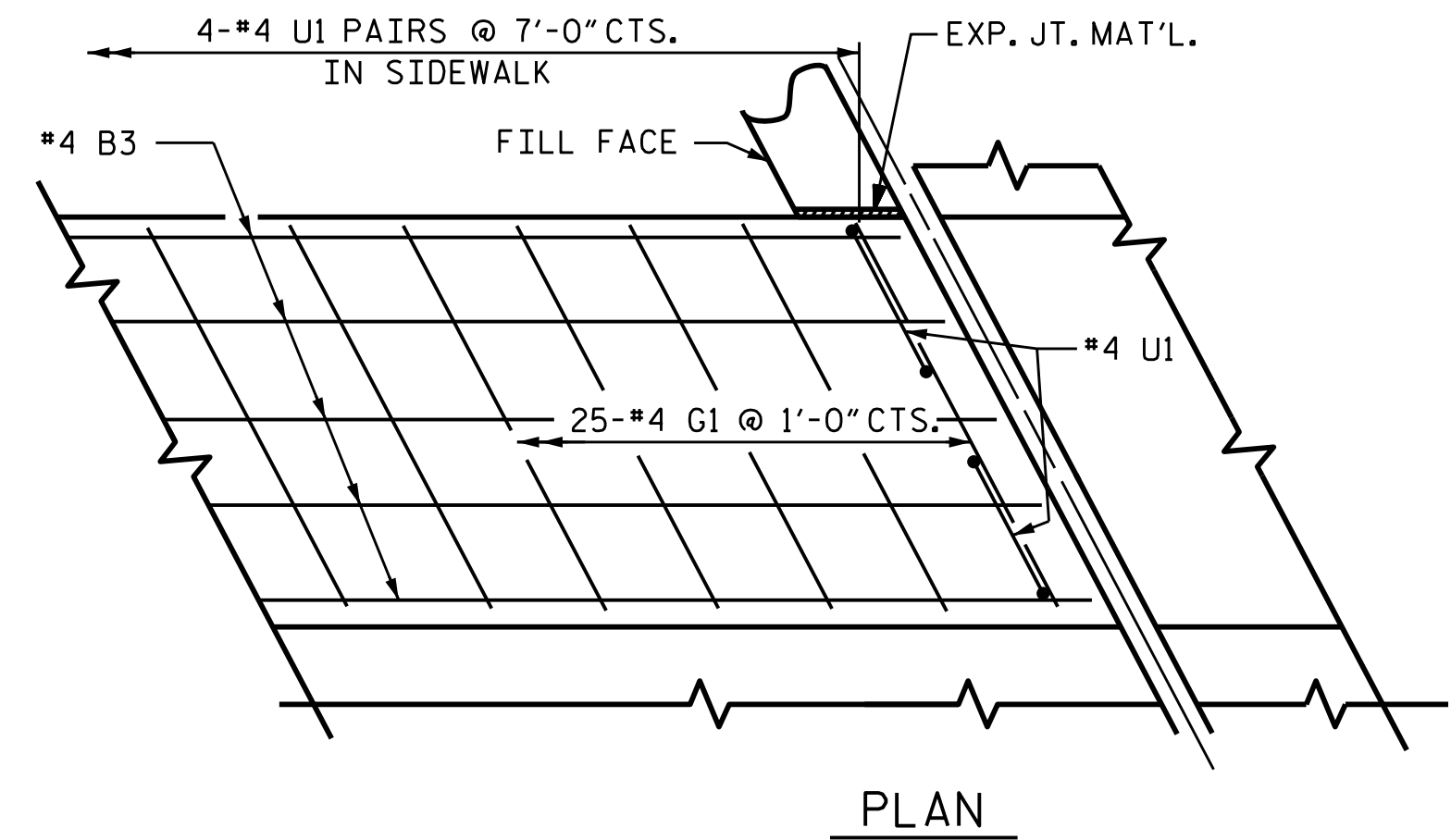


SECTION N-N



SECTION M-M

** #4 U1 MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN SCREEDED OFF



PLAN

SIDEWALK DETAILS

NOTES

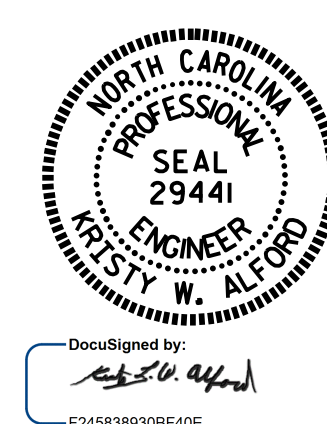
- APPROACH SLAB IN EACH STAGE SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- FOR MSE WALL BACKFILL, SEE "MSE RETAINING WALL" PLANS.
- AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
- FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
- SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE PORTABLE CONCRETE BARRIER.
- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK AND THE CONCRETE MEDIAN IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.
- ALL REINFORCING STEEL IN THE CONCRETE MEDIAN AND THE SIDEWALK SHALL BE EPOXY COATED.

DRAWN BY :	I.L. AVERETTE	DATE :	11/2014
CHECKED BY :	J.P. ADAMS	DATE :	7/2015
DESIGN ENGINEER OF RECORD :	I.L. AVERETTE	DATE :	9/2015

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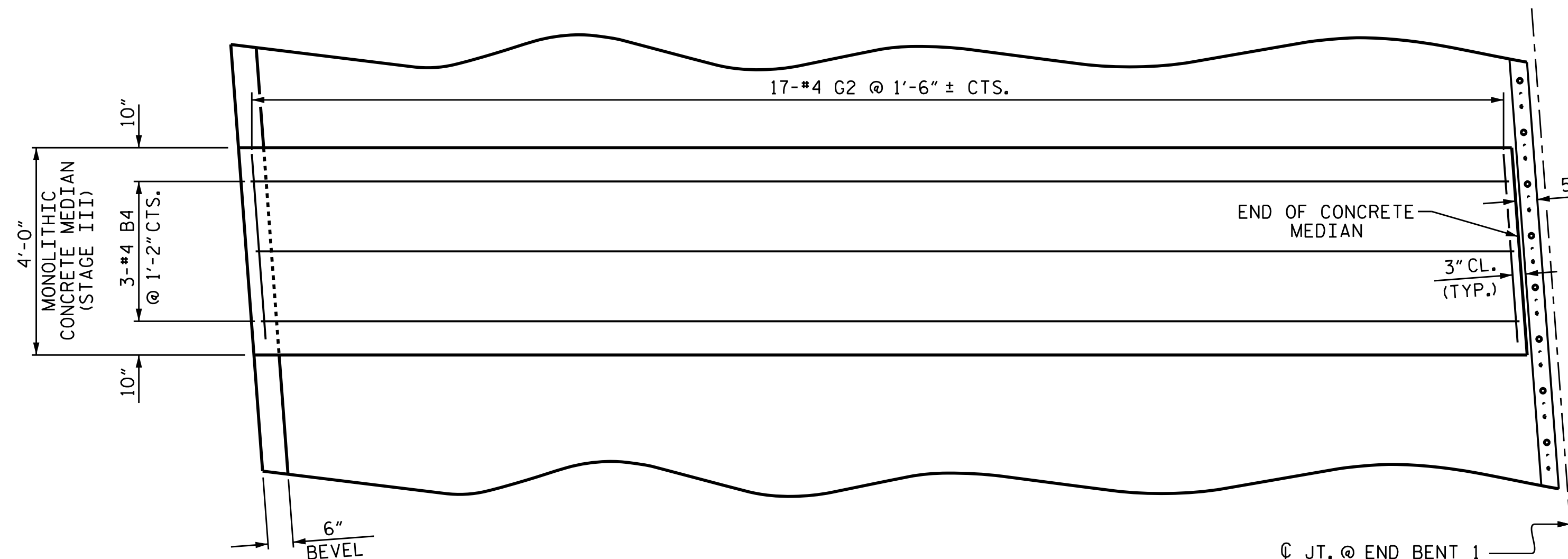
PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 35+23.40 -L-

SHEET 1 OF 2



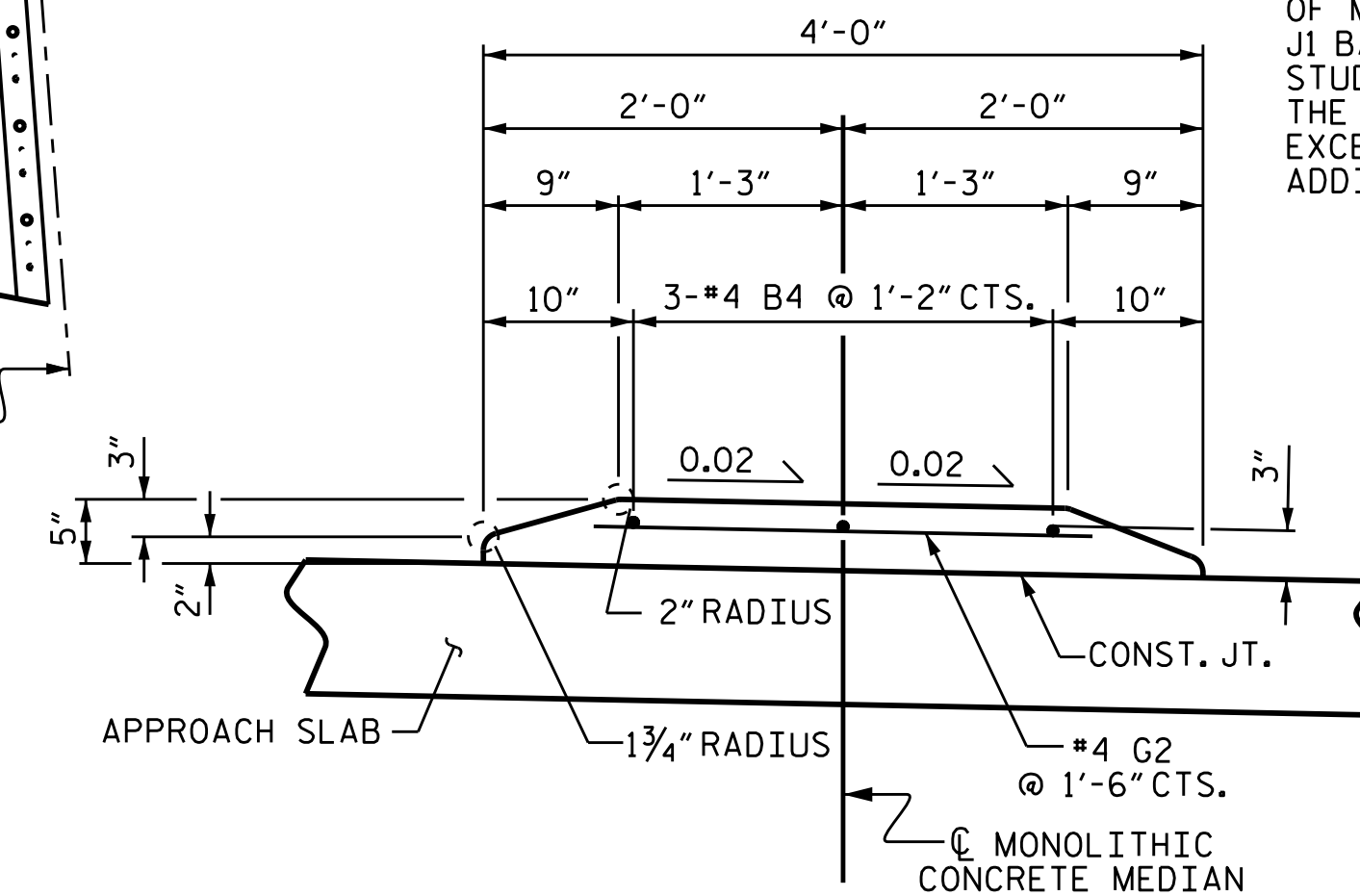
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BRIDGE APPROACH SLAB DETAILS					
SHEET NO. S-83					
TOTAL SHEETS 84					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

STR. #2



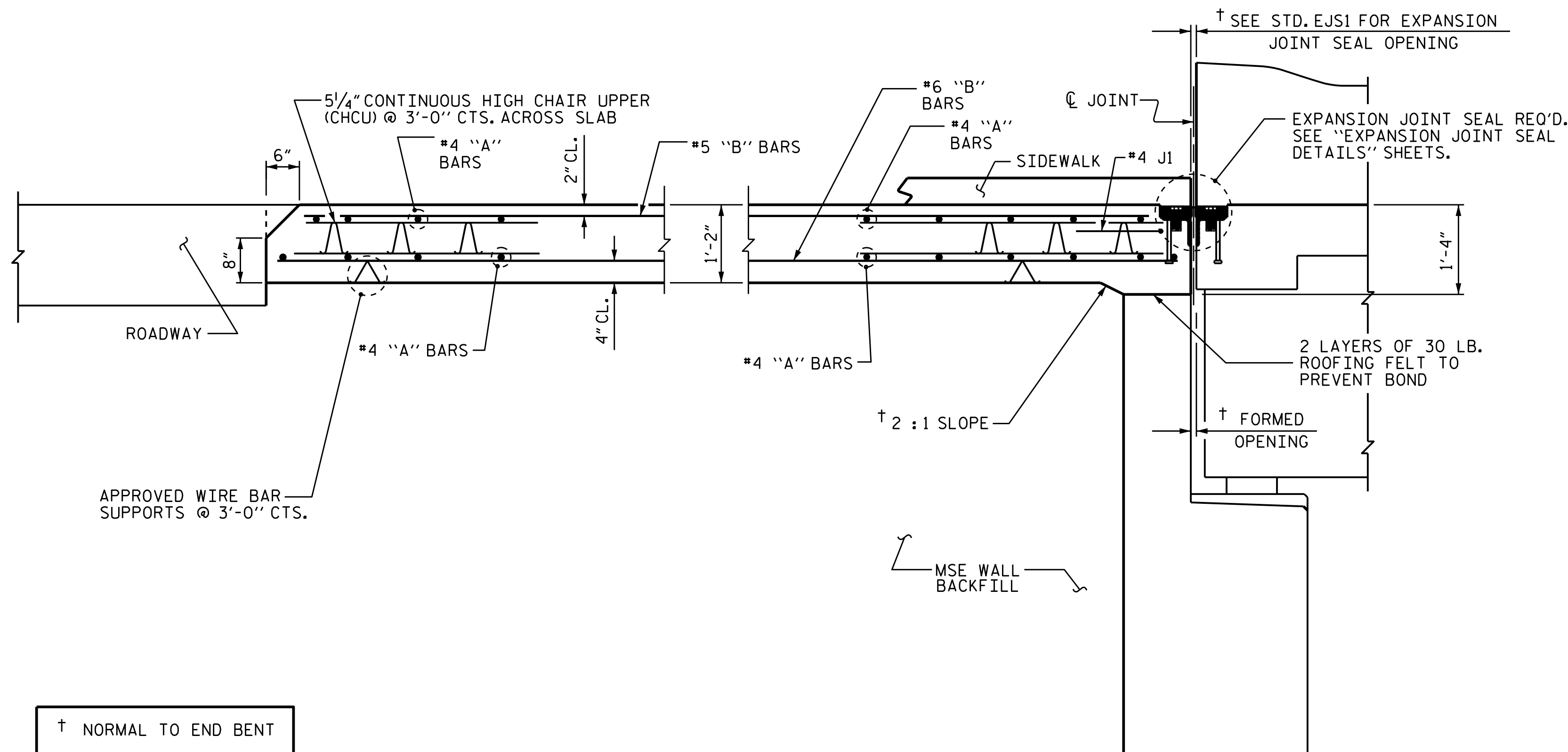
PLAN OF CONCRETE MEDIAN

APPROACH SLAB AT END BENT 1 SHOWN. APPROACH SLAB AT END BENT 2 SIMILAR.

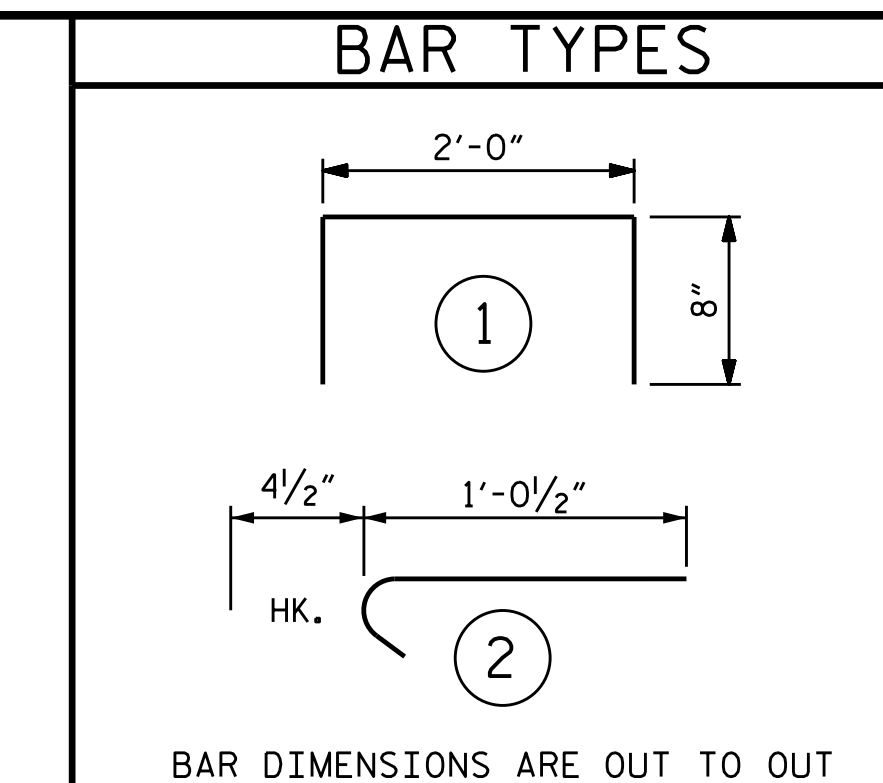


SECTION THROUGH CONCRETE MEDIAN

SEE "MONOLITHIC CONCRETE MEDIAN" SHEET FOR JOINT DETAILS BETWEEN APPROACH SLAB AND BRIDGE.



SECTION THRU SLAB



BAR TYPES

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

BILL OF MATERIAL

STAGE I FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	75	#4	STR	22'-7"	1131
A2	78	#4	STR	22'-5"	1168
* B1	123	#5	STR	23'-9"	3047
B2	123	#6	STR	24'-7"	4542
* B3	5	#4	STR	24'-7"	82
* G1	25	#4	STR	5'-1"	85
* J1	56	#4	2	1'-5"	53
* U1	8	#4	1	3'-4"	18
REINFORCING STEEL				LBS.	5,710
* EPOXY COATED REINFORCING STEEL				LBS.	4,416
CLASS AA CONCRETE					
POUR 1 - APP. SLAB				C.Y.	66.6
POUR 2 - SIDEWALK				C.Y.	2.5
TOTAL				C.Y.	69.1

STAGE II FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	50	#4	STR	18'-8"	623
A4	52	#4	STR	18'-6"	643
* B1	71	#5	STR	23'-9"	1759
B2	71	#6	STR	24'-7"	2622
* B3	5	#4	STR	24'-7"	82
* G1	25	#4	STR	5'-1"	85
* J1	30	#4	1	1'-5"	28
* U1	8	#4	2	3'-4"	18
REINFORCING STEEL				LBS.	3,265
* EPOXY COATED REINFORCING STEEL				LBS.	2,595
CLASS AA CONCRETE					
POUR 1 - APP. SLAB				C.Y.	38.4
POUR 2 - SIDEWALK				C.Y.	3.1
TOTAL				C.Y.	41.5

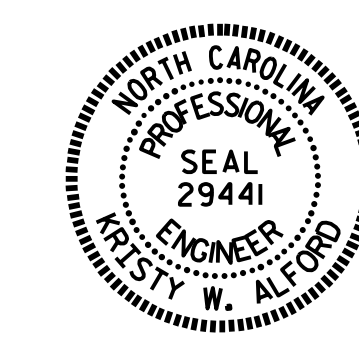
STAGE III FOR ONE MONOLITHIC CONCRETE MEDIAN (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B4	3	#4	STR	24'-0"	48
* G2	17	#4	STR	2'-8"	30
* EPOXY COATED REINFORCING STEEL				LBS.	78
CLASS AA CONCRETE					
CONCRETE MEDIAN				C.Y.	1.4

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

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 35+23.40 -L-

SHEET 2 OF 2



3/29/2016

DocuSigned by: Kristy W. Alford

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-84
1			3			TOTAL SHEETS
2			4			84

ASSEMBLED BY : T.L. AVERETTE	DATE : 02/15
CHECKED BY : J.P. ADAMS	DATE : 07/15
DRAWN BY : EEM	3/95
CHECKED BY : VAP	3/95
REV. 10/17/11	MAA/GM
REV. 12/21/11	MAA/GM
REV. 6/13	MAA/GM