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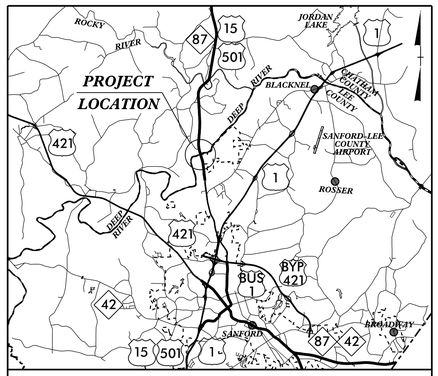
09/08/99

TIP PROJECT: B-4968

CONTRACT: C204179

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Plan Sheet Symbols



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LEE & CHATHAM COUNTIES

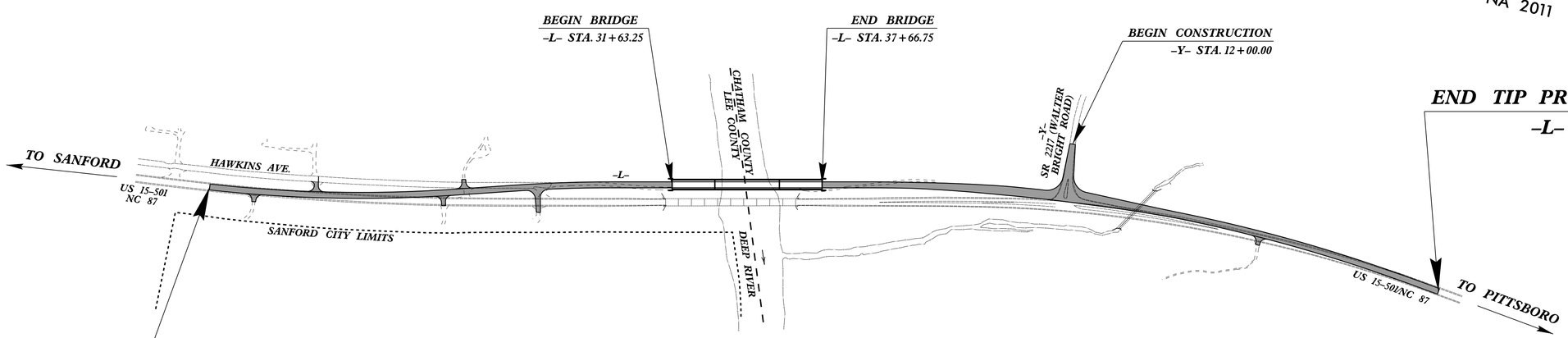
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4968	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
40162.1.1	N/A	PE
40162.2.1	N/A	R/W & UTILITY
40162.3.1	N/A	CONST

LOCATION: BRIDGE NO. 10 OVER DEEP RIVER ON US 15-501/NC 87

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

NAD 83
NA 2011



STRUCTURE

DESIGN DATA

ADT 2019 = 7750
ADT 2039 = 9425
K = 9 %
D = 55 %
T = 8 % *
V = 60 MPH
* TTST = 4% + DUAL = 4%
FUNC CLASS =
MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4968 = 0.833 MILES
LENGTH STRUCTURE TIP PROJECT B-4968 = 0.114 MILES

TOTAL LENGTH TIP PROJECT B-4968 = 0.947 MILES

Prepared for NCDOT In the Office of:

Mead&Hunt
111 E. Hargett Street, Suite 300
Raleigh, North Carolina 27601
919-714-8670 | meadhunt.com
NC License No. F-1235

2018 STANDARD SPECIFICATIONS

LETTING DATE:
APRIL 16, 2019

RICK DECOLA, PE
PROJECT ENGINEER

ALEXANDER FORFA, PE
PROJECT DESIGN ENGINEER

DAVID STUTTS, PE
NCDOT CONTACT

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

20-FEB-2019 14:34
X:\4306200\N70752.01\TECH\Structures\CADD\401_001_B4968_SMU_TSH.dgn
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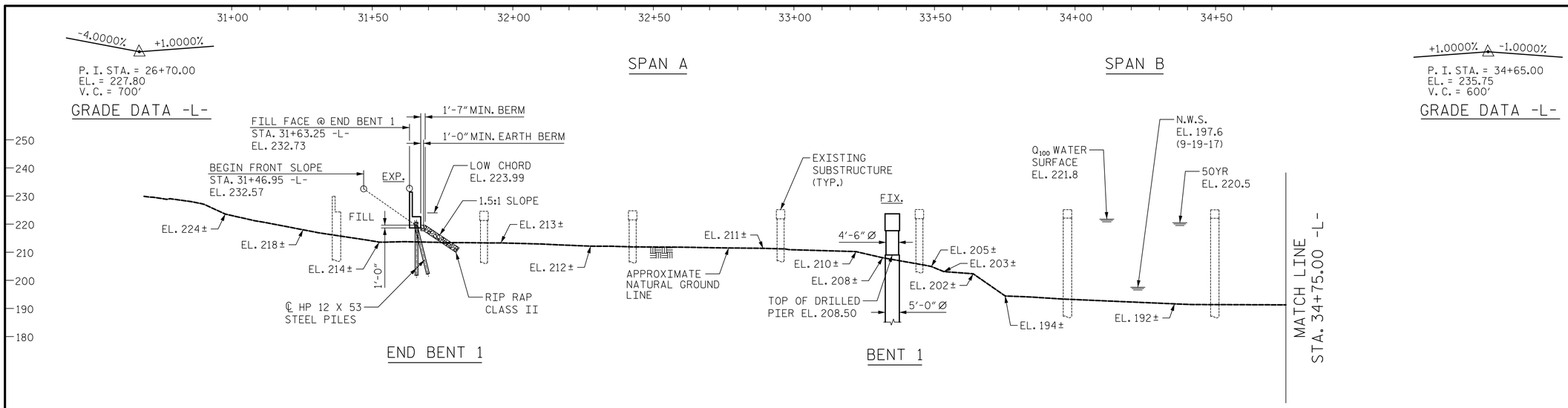
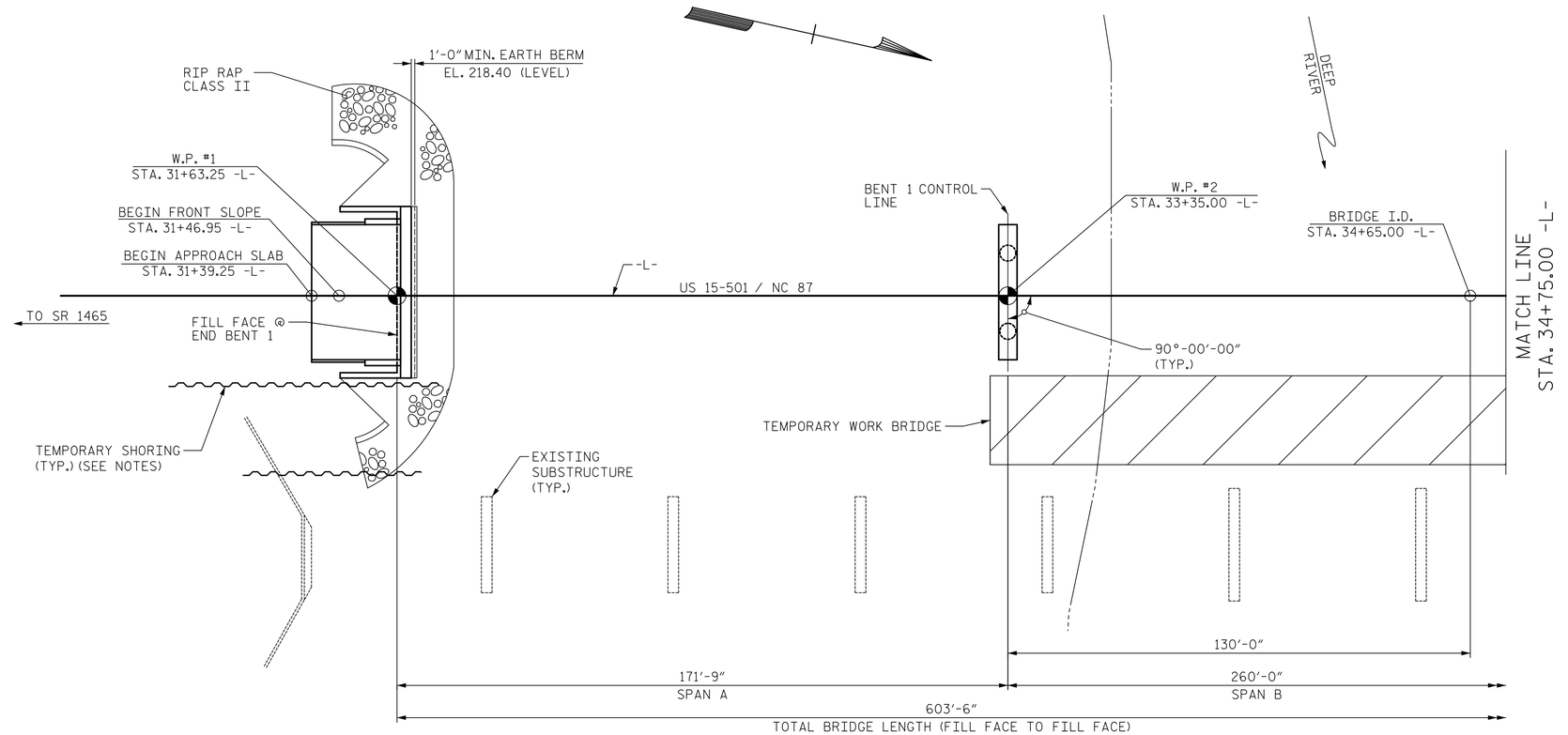


SECTION ALONG CENTERLINE SURVEY -L-



PLAN

(PILES NOT SHOWN IN PLAN VIEW)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

Mead &Hunt
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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

DocuSigned by: Alex Forfa 1/7/2019

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PROJECT NO. B-4968

LEE/CHATHAM COUNTY

STATION: 34+65.00 -L-

SHEET 1 OF 4 REPLACES BRIDGE NO. 10

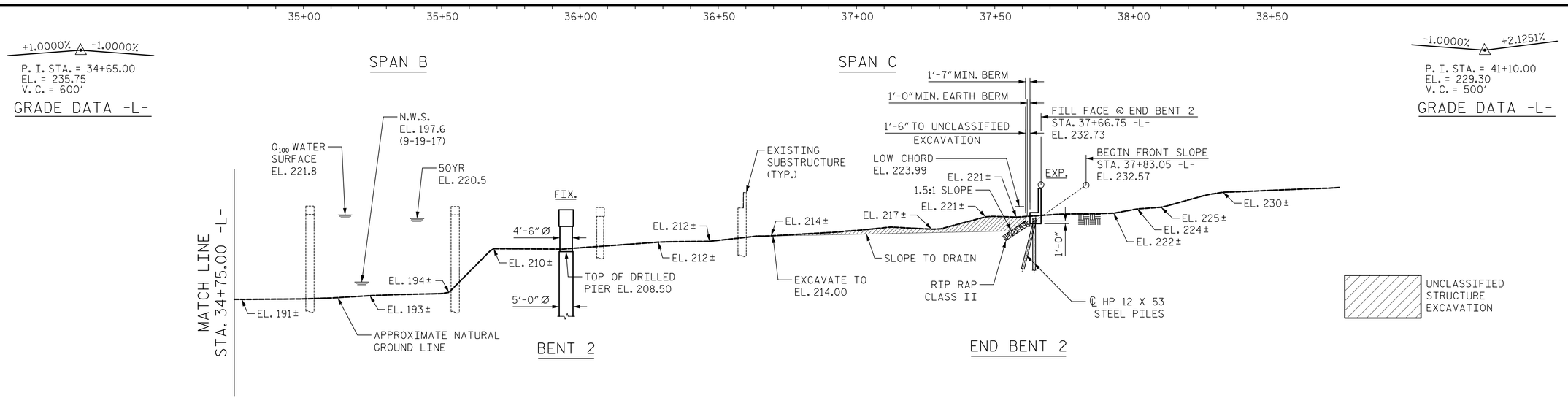
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

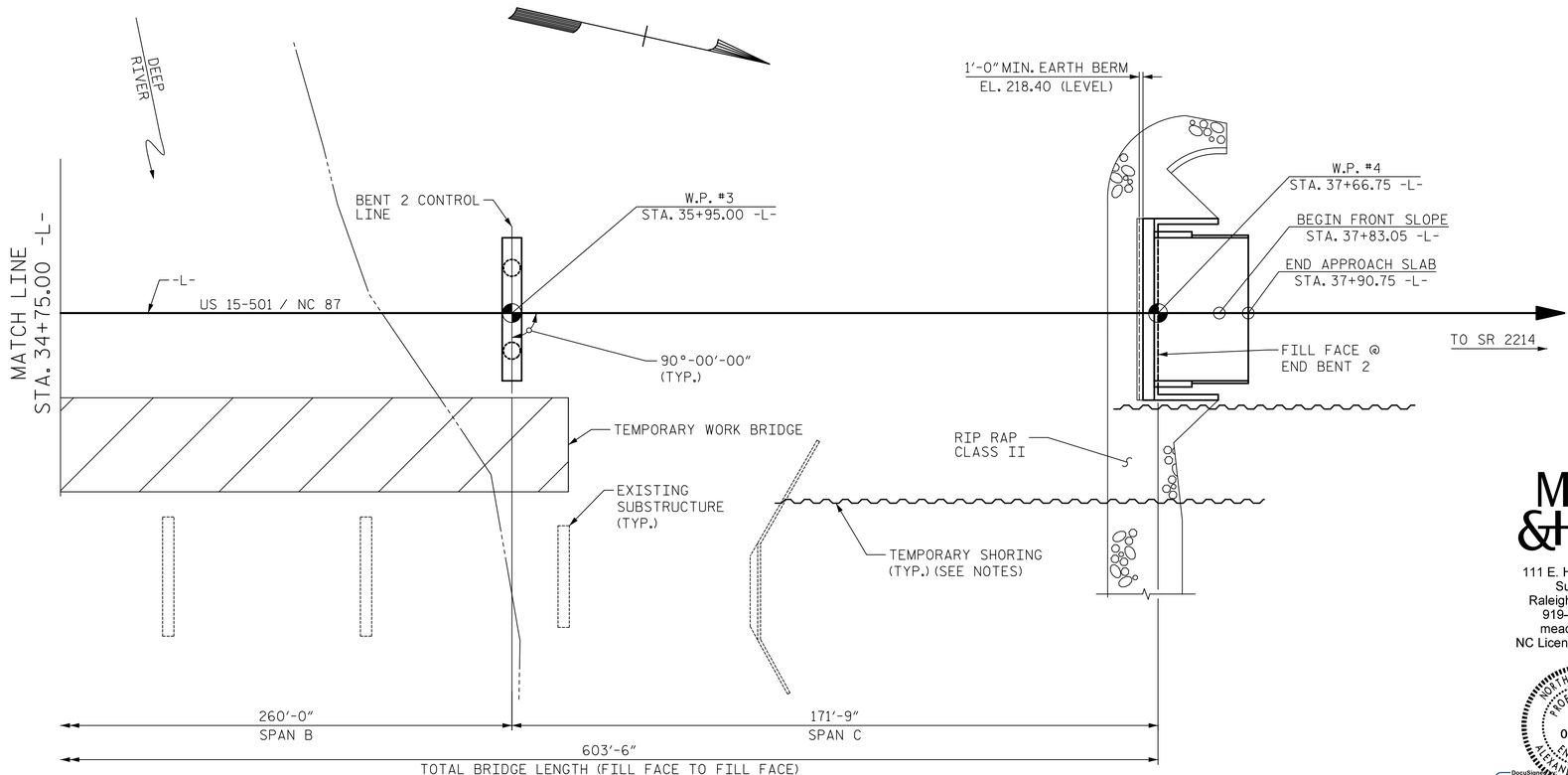
FOR BRIDGE OVER DEEP RIVER ON US 15-501 / NC 87 BETWEEN SR 1465 AND SR 2214

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-01
1			3			TOTAL SHEETS
2			4			42

DRAWN BY :	J.S. HOBSON	DATE : 07/26/18
CHECKED BY :	A.J. FORFA	DATE : 08/22/18
DESIGN ENGINEER OF RECORD :	A.J. FORFA	DATE : 09/28/18



SECTION ALONG CENTERLINE SURVEY -L-



PLAN

(PILES NOT SHOWN IN PLAN VIEW)

DRAWN BY : J.S. HOBSON DATE : 07/26/18
CHECKED BY : A.J. FORFA DATE : 08/22/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

DocuSigned by: Alex Forfa 1/7/2019

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PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

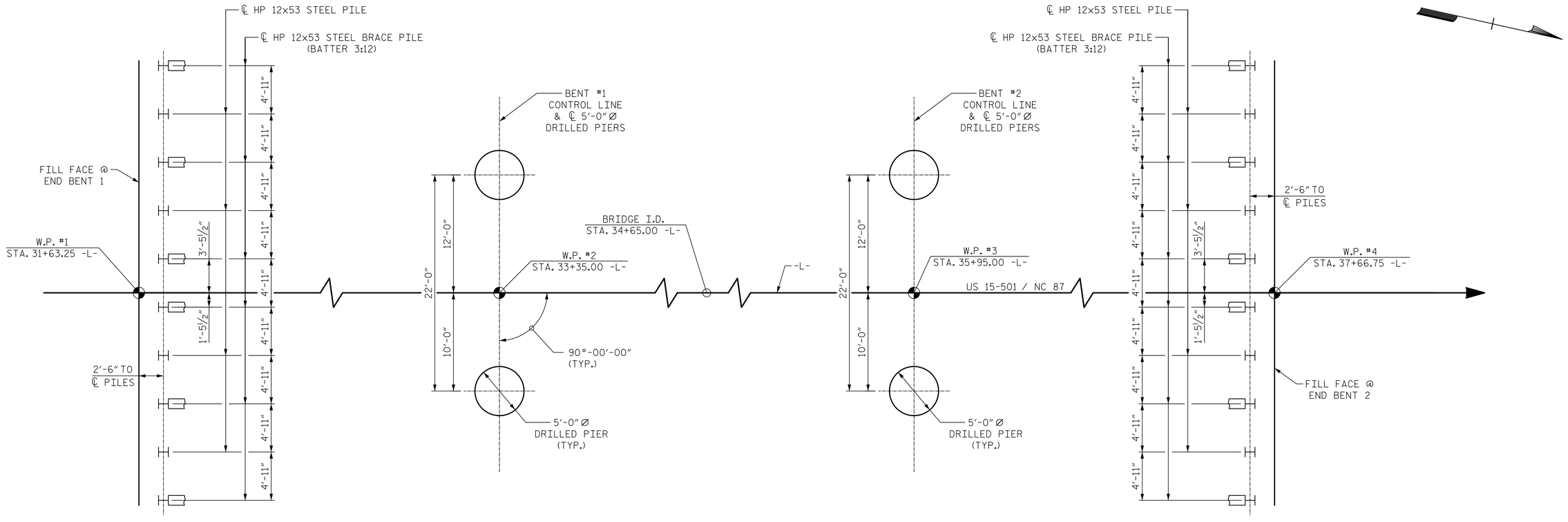
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER DEEP RIVER ON US 15-501 / NC 87 BETWEEN SR 1465 AND SR 2214

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-02
1			3			TOTAL SHEETS
2			4			42



FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE)

FOUNDATION NOTES:

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

DRILLED PIERS AT BENT NO. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 1,350 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 165 TSF.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 1 OR BENT NO. 2. IF REQUIRED, DO NOT EXTEND CASING BELOW ELEVATION 203 FT. (BENT 1), OR ELEVATION 206 FT. (BENT 2) WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

INSTALL DRILLED PIERS AT BENT NO. 1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 173 FT. WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 20 FT. INTO WEATHERED ROCK OR HARD ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

INSTALL DRILLED PIERS AT BENT NO. 2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 166 FT. WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 20 FT. INTO WEATHERED ROCK OR HARD ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 AND BENT NO. 2 IS ELEVATION 195 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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

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

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

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS. PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO. 1 AND END BENT NO. 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

DRAWN BY :	J.S. HOBSON	DATE :	07/26/18
CHECKED BY :	A.J. FORFA	DATE :	08/22/18
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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA

DocuSigned by: Alex Forfa 6F3205D288394DE...
1/7/2019

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PROJECT NO. B-4968

LEE/CHATHAM COUNTY

STATION: 34+65.00 -L-

SHEET 3 OF 4

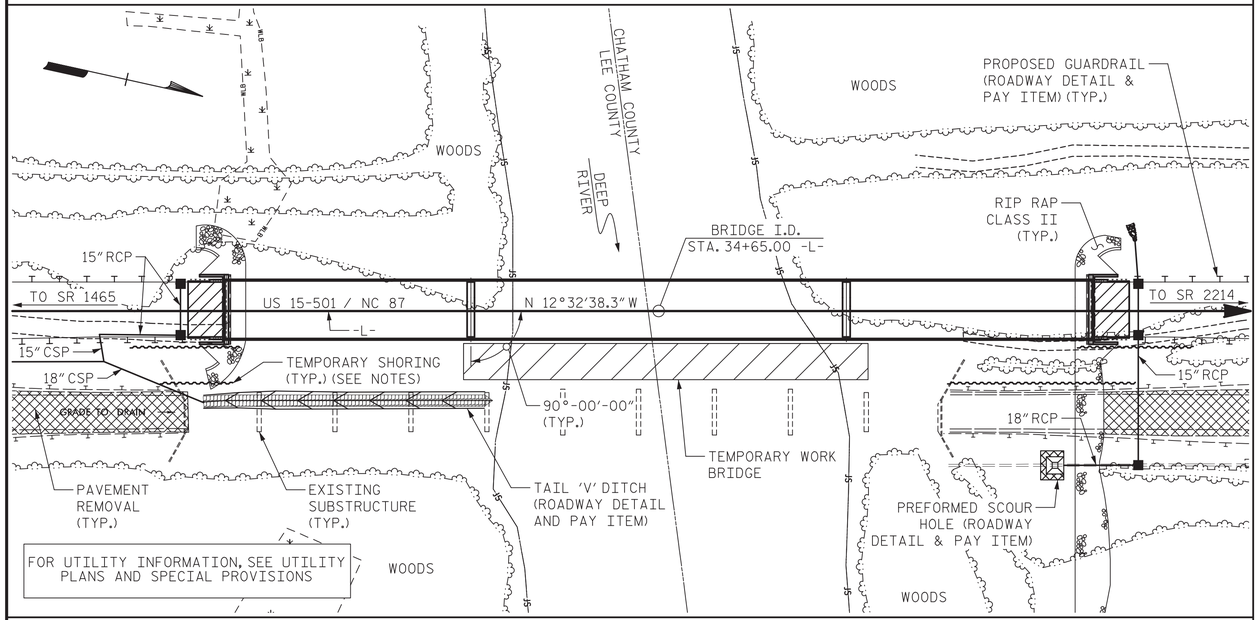
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER DEEP RIVER ON US 15-501 / NC 87 BETWEEN SR 1465 AND SR 2214

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-03
1			3			TOTAL SHEETS
2			4			42

TBM #2: R.R. SPIKE IN BASE OF 27" SYCAMORE, 154.5' LT. OF STA. 33+40.74 -L-, EL. 213.40 (NAD 1983)



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8" EDITION.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 34+65.00 -L-."

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 40-FT LEFT OF CENTERLINE ROADWAY, AND 260-FT RIGHT OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

STEEL SHEET PILING REQUIRED FOR SHORING SHALL BE HOT ROLLED.

TEMPORARY SHORING WILL BE REQUIRED IN THE AREA INDICATED IN THE PLAN VIEW.

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE TEMPORARY ACCESS AT STATION 34+65.00 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF 10 SPANS (3 @ 52'-6", 2 @ 52'-6½", 52'-7", 52'-6½", 52'-6", 52'-7", 52'-6") WITH REINFORCED CONCRETE DECK GIRDERS WITH A CLEAR ROADWAY WIDTH OF 28'-1" ON REINFORCED CONCRETE WALL OR REINFORCED CONCRETE POST AND BEAM BENTS, AND FULL HEIGHT REINFORCED CONCRETE END BENTS, AND LOCATED DOWNSTREAM FROM PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

FOR DEBRIS REMOVAL AND MOBILIZATION FOR DEBRIS REMOVAL, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMPORARY ACCESS AT STA. 34+65.00 -L-	REMOVAL OF EXISTING STRUCTURE AT STA. 34+65.00 -L-	ASBESTOS ASSESSMENT	5'-0" Ø DRILLED PIERS IN SOIL	5'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 5'-0" Ø DRILLED PIER	SID INSPECTION	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION AT STA. 34+65.00 -L-
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	LUMP SUM
SUPERSTRUCTURE										
END BENT NO. 1										
BENT NO. 1				46.0	25.0	11.0				
BENT NO. 2				49.0	36.0	5.0				
END BENT NO. 2										LUMP SUM
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	95.0	61.0	16.0	1	1	1	LUMP SUM

HYDRAULIC DATA

DESIGN DISCHARGE	= 44,000 CFS
FREQUENCY OF DESIGN DISCHARGE	= 50 YEARS
DESIGN HIGH WATER ELEVATION	= 220.5
DRAINAGE AREA	= 1,171 SQ. MI.
BASE DISCHARGE (Q100)	= 49,000 CFS
BASE HIGH WATER ELEVATION	= 221.8

OVERTOPPING DATA

OVERTOPPING DISCHARGE	= 87,500 CFS
FREQUENCY OF OVERTOPPING	= 500+ YEARS
✳ OVERTOPPING ELEVATION	= 230.7

✳ OVERTOPPING WOULD OCCUR AT STA. 28+80.00 -L-

TOTAL BILL OF MATERIAL (CONT'D.)

	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	APPROX. 1,071,000 LBS. STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	DISC BEARINGS	EXPANSION JOINT SEALS	DEBRIS REMOVAL	MOBILIZATION FOR DEBRIS REMOVAL
	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LUMP SUM	EACH	NO.	LIN. FT.	EACH	LIN.FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	CU. YDS.	EACH
SUPERSTRUCTURE	24808	22727		LUMP SUM			LUMP SUM					1242.8			LUMP SUM	LUMP SUM		
END BENT NO. 1			69.4		10858			10	10	326	10		278	309				
BENT NO. 1			57.7		20631	3026												
BENT NO. 2			57.7		22119	3479												
END BENT NO. 2			69.4		10858			10	10	326	10		771	857				
TOTAL	24808	22727	254.2	LUMP SUM	64446	6505	LUMP SUM	20	20	652	20	1242.8	1049	1166	LUMP SUM	LUMP SUM	3000	6

DRAWN BY : J.S. HOBSON DATE : 07/26/18
CHECKED BY : A.J. FORFA DATE : 08/23/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

DocuSigned by: Alex Forfa 2/11/2019

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PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER DEEP RIVER ON US 15-501 / NC 87 BETWEEN SR 1465 AND SR 2214

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-04
1			3			TOTAL SHEETS
2			4			42

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE											SERVICE II LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS $\gamma_{(LL)}$	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (f+)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (f+)	LIVE-LOAD FACTORS $\gamma_{(LL)}$	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (f+)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.07	--	1.75	NOTE 1	1.07	A	ER	142.54	NOTE 1	1.17	B	I	20.88	1.30	NOTE 1	1.69	B	ER	130.00	
		HL-93 (OPERATING)	N/A		1.39	--	1.35	NOTE 1	1.39	A	ER	142.54	NOTE 1	1.51	B	I	20.88	1.00	NOTE 1	2.19	B	ER	130.00	
		HS-20 (INVENTORY)	36.00	⟨2⟩	1.75	63.000	1.75	NOTE 1	1.94	A	ER	142.54	NOTE 1	1.75	B	I	20.88	1.30	NOTE 1	3.34	A	ER	67.70	
		HS-20 (OPERATING)	36.00		2.27	81.720	1.35	NOTE 1	2.52	A	ER	142.54	NOTE 1	2.27	B	I	20.88	1.00	NOTE 1	4.34	A	ER	67.70	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		9.53	128.655	1.40	NOTE 1	12.51	B	ER	130.00	NOTE 1	9.53	B	ER	20.88	1.30	NOTE 1	12.86	A	ER	67.70	
		SNGARBS2	20.000		5.70	114.000	1.40	NOTE 1	7.35	A	ER	142.54	NOTE 1	5.70	B	ER	20.88	1.30	NOTE 1	7.94	A	ER	67.70	
		SNAGRIS2	22.000		6.09	133.980	1.40	NOTE 1	7.84	A	ER	142.54	NOTE 1	6.09	B	ER	20.88	1.30	NOTE 1	8.48	A	ER	67.70	
		SNCOTTS3	27.250		4.93	134.343	1.40	NOTE 1	6.23	A	ER	67.70	NOTE 1	4.93	B	ER	20.88	1.30	NOTE 1	6.40	A	ER	67.70	
		SNAGGRS4	34.925		3.92	136.906	1.40	NOTE 1	4.99	A	ER	142.54	NOTE 1	3.92	B	ER	20.88	1.30	NOTE 1	5.18	A	ER	67.70	
		SNS5A	35.550		3.79	134.735	1.40	NOTE 1	4.90	A	ER	142.54	NOTE 1	3.79	B	ER	20.88	1.30	NOTE 1	5.12	A	ER	67.70	
		SNS6A	39.950		3.40	135.830	1.40	NOTE 1	4.38	A	ER	142.54	NOTE 1	3.40	B	ER	20.88	1.30	NOTE 1	4.65	A	ER	67.70	
		SNS7B	42.000		3.30	138.600	1.40	NOTE 1	4.17	A	ER	142.54	NOTE 1	3.30	B	ER	20.88	1.30	NOTE 1	4.39	A	ER	67.70	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		4.22	139.260	1.40	NOTE 1	5.29	A	ER	142.54	NOTE 1	4.22	B	ER	20.88	1.30	NOTE 1	5.60	A	ER	67.70	
		TNT4A	33.075		4.21	139.246	1.40	NOTE 1	5.27	A	ER	142.54	NOTE 1	4.21	B	ER	20.88	1.30	NOTE 1	5.58	A	ER	67.70	
		TNT6A	41.600		3.38	140.608	1.40	NOTE 1	4.22	A	ER	142.54	NOTE 1	3.38	B	ER	20.88	1.30	NOTE 1	4.53	A	ER	67.70	
		TNT7A	42.000		3.33	139.860	1.40	NOTE 1	4.18	A	ER	142.54	NOTE 1	3.33	B	ER	20.88	1.30	NOTE 1	4.54	A	ER	67.70	
		TNT7B	42.000		3.33	139.860	1.40	NOTE 1	4.18	A	ER	142.54	NOTE 1	3.33	B	ER	20.88	1.30	NOTE 1	4.54	A	ER	67.70	
		TNAGRIT4	43.000		3.18	136.740	1.40	NOTE 1	4.08	A	ER	142.54	NOTE 1	3.18	B	ER	20.88	1.30	NOTE 1	4.41	A	ER	67.70	
		TNAGT5A	45.000		3.12	140.400	1.40	NOTE 1	3.91	A	ER	142.54	NOTE 1	3.12	B	ER	20.88	1.30	NOTE 1	4.20	A	ER	67.70	
		TNAGT5B	45.000	⟨3⟩	3.07	138.150	1.40	NOTE 1	3.90	A	ER	142.54	NOTE 1	3.07	B	ER	20.88	1.30	NOTE 1	4.19	A	ER	67.70	
FATIGUE		HL-93 (INVENTORY)	γ_{LL}=0.75																					

LOAD FACTORS:

	LIMIT STATE	γ_{DC}	γ_{DW}
DESIGN LOAD RATING FACTORS	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.

COMMENTS:

1. ANALYSIS METHOD: PLATE & ECCENTRIC BEAM FINITE ELEMENT MODEL.
2.
3.
4.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

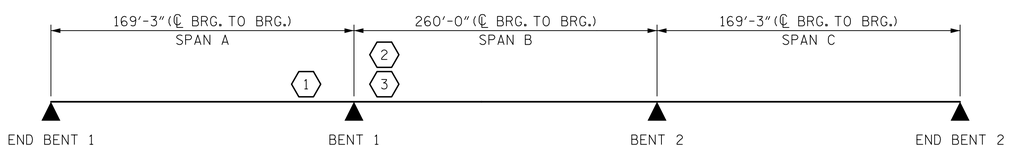
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA

DocuSigned by: Alex Forfa 1/7/2019

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PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

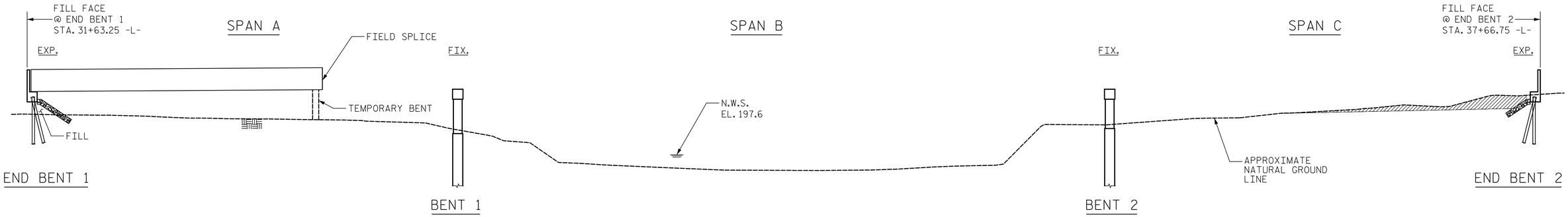
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

LRFR SUMMARY FOR STEEL GIRDERS
(NON-INTERSTATE TRAFFIC)

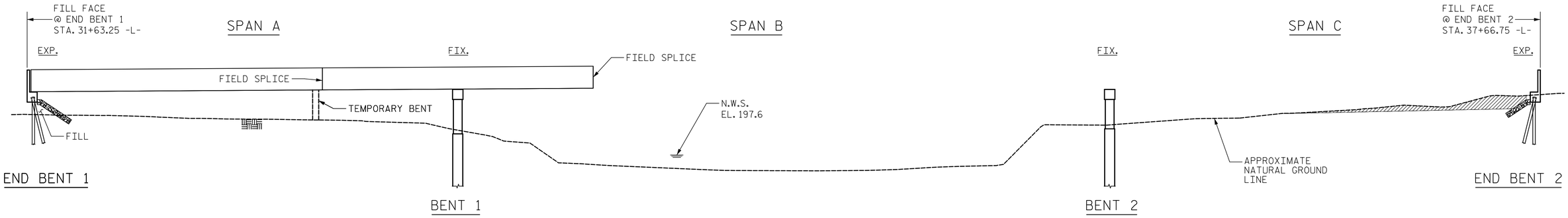
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-05
1			3			TOTAL SHEETS
2			4			42

STD. NO. LRFR3

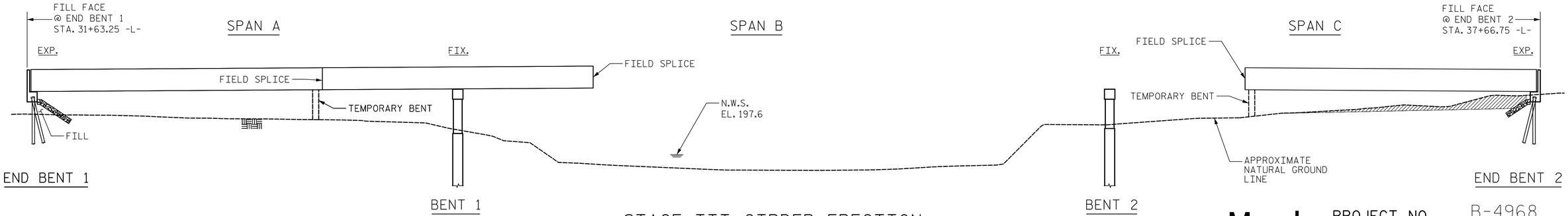
ASSEMBLED BY : J.S. HOBSON	DATE : 08/16/18	
CHECKED BY : A.J. FORFA	DATE : 08/22/18	
DRAWN BY : MAA 1/08	REV. 11/12/08RR	MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11	MAA/GM
	REV. 12/17	MAA/THC



STAGE I GIRDER ERECTION



STAGE II GIRDER ERECTION



STAGE III GIRDER ERECTION

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DocuSigned by: Alex Forfa 0E133E0208394DE...
1/7/2019

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PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

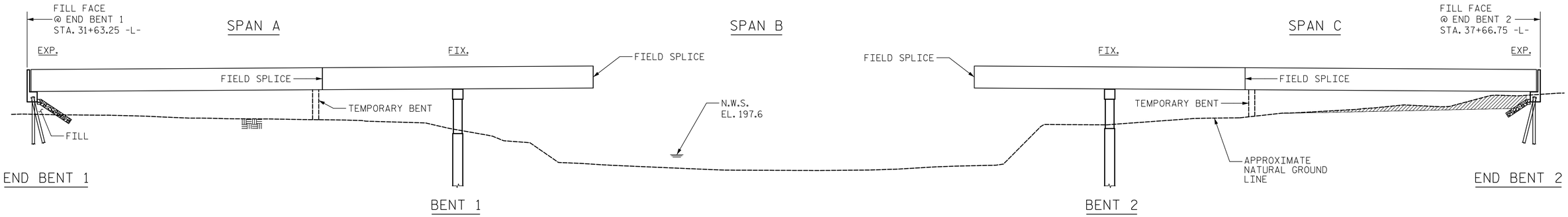
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

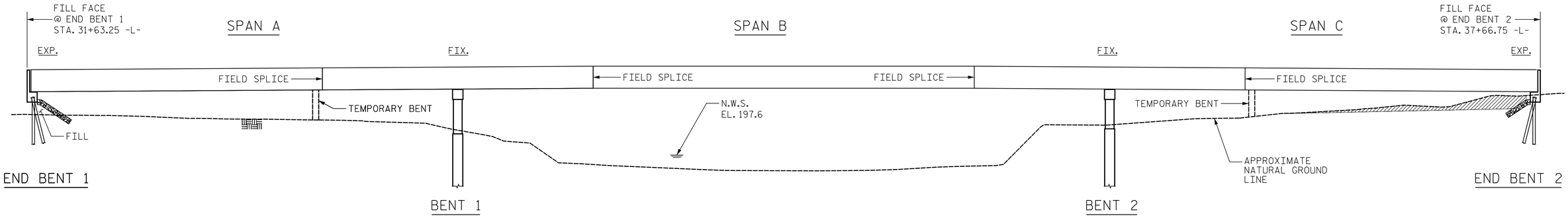
GIRDER ERECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-06
1			3			TOTAL SHEETS
2			4			42

DRAWN BY : J.A. LEE DATE : 07/25/18
CHECKED BY : A.J. FORFA DATE : 08/01/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18



STAGE IV GIRDER ERECTION



STAGE V GIRDER ERECTION

ERECTION NOTES

FOR STAGE I AND STAGE III GIRDER ERECTION, THE FIRST GIRDERS ERECTED SHALL BE A FULLY ASSEMBLED PAIR. PRIOR TO LIFTING, THE CROSSFRAMES SHALL BE IN PLACE AND BOLTED ALONG WITH ANY ADDITIONAL BRACING THAT MAY BE REQUIRED.

AFTER THE FIRST GIRDER(S) HAS BEEN PLACED IN EACH STAGE, ERECT EACH SUBSEQUENT GIRDER WITH CROSSFRAMES CONNECTING TO THE ADJACENT PREVIOUSLY ERECTED GIRDER AND TIGHTEN ALL BOLTS BEFORE RELEASING THE GIRDER.

THE STRUCTURAL STEEL SHALL BE SUPPORTED DURING ERECTION IN ITS CAMBERED POSITION.

TEMPORARY BENTS SHALL BE OF SUFFICIENT WIDTH/SIZE SUCH THAT ALL GIRDERS IN THE BRIDGE TYPICAL SECTION CAN BE FULLY SUPPORTED THROUGHOUT THE ERECTION OF ALL GIRDER SECTIONS AND FINAL INSTALLATION OF ALL HIGH STRENGTH BOLTS. SEQUENCES OR METHODS WHICH USE A COMBINATION OF PARTIAL WIDTH TEMPORARY BENTS AND CRANES WILL NOT BE PERMITTED.

TEMPORARY BENTS SHALL REMAIN IN PLACE UNTIL ALL CROSSFRAMES ARE IN PLACE AND ALL HIGH STRENGTH BOLTS ARE TIGHTENED.

TEMPORARY BENTS SHALL PROVIDE BEARING AT CONNECTOR PLATE LOCATIONS. WHEN CONNECTOR PLATES ARE USED AS TEMPORARY BEARING STIFFENER, DIAPHRAGMS MUST BE ATTACHED.

THE CONTRACTOR'S ERECTION PLAN SHALL INCLUDE A METHOD OF UNLOADING TEMPORARY BENTS THAT WILL UNIFORMLY TRANSFER THE STRUCTURAL WEIGHT TO THE CROSSFRAMES AND GIRDERS.

WORKING DRAWINGS FOR THE GIRDER ERECTION, INCLUDING BUT NOT LIMITED TO, TEMPORARY BENT DESIGN AND ERECTION, GIRDER ERECTION, AND TEMPORARY BENT REMOVAL SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA AND SUBMITTED FOR APPROVAL.

DURING THE GIRDER ERECTION PROCEDURE, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING LATERAL BRACING AND OTHER MEANS OF SUPPORT, AS REQUIRED TO ENSURE STABILITY OF THE GIRDERS, AVOID UPLIFT OF THE GIRDERS AT THE TEMPORARY BENTS, AND ENSURE PLUMBNESS OF THE GIRDERS IN THE FINAL CONDITION.

ALL COSTS ASSOCIATED WITH THE TEMPORARY BENTS, GIRDER ERECTION, AND REMOVAL OF THE TEMPORARY BENTS, INCLUDING BUT NOT LIMITED TO, COST FOR ALL MATERIALS, EQUIPMENT, TOOLS, LABOR AND ANY INCIDENTALS SHALL BE CONSIDERED INCIDENTAL TO THE LUMP SUM BID PRICE FOR STRUCTURAL STEEL.

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

FOR TEMPORARY BENTS, SEE SPECIAL PROVISIONS.

THE CONTRACTOR MAY SUBMIT AN ALTERNATIVE ERECTION SEQUENCE TO THE ENGINEER FOR REVIEW AND APPROVAL. IF SO, CONTRACTOR WILL BE RESPONSIBLE FOR ANALYZING THE EFFECTS OF THIS CHANGE TO THE STRUCTURE DURING THE CONSTRUCTION PHASE AND IN THE FINAL CONDITION AND PROVIDE CALCULATIONS INDICATING THE REVISED EFFECTS FOR APPROVAL. ANY APPROVED CHANGES WILL BE REFLECTED IN REVISED CONTRACT PLANS PROVIDED BY THE CONTRACTOR. ALL ENGINEERING WORK ASSOCIATED WITH AN ALTERNATIVE ERECTION SEQUENCE MUST BE PERFORMED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA. NO SEPARATE PAYMENT WILL BE MADE FOR ANY COSTS ASSOCIATED WITH THIS CHANGE.

FOR ADDITIONAL NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.

DRAWN BY : J.A. LEE DATE : 07/25/18
CHECKED BY : A.J. FORFA DATE : 08/01/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA

DocuSigned by: Alex Forfa 96132E0D8304DE...
1/7/2019

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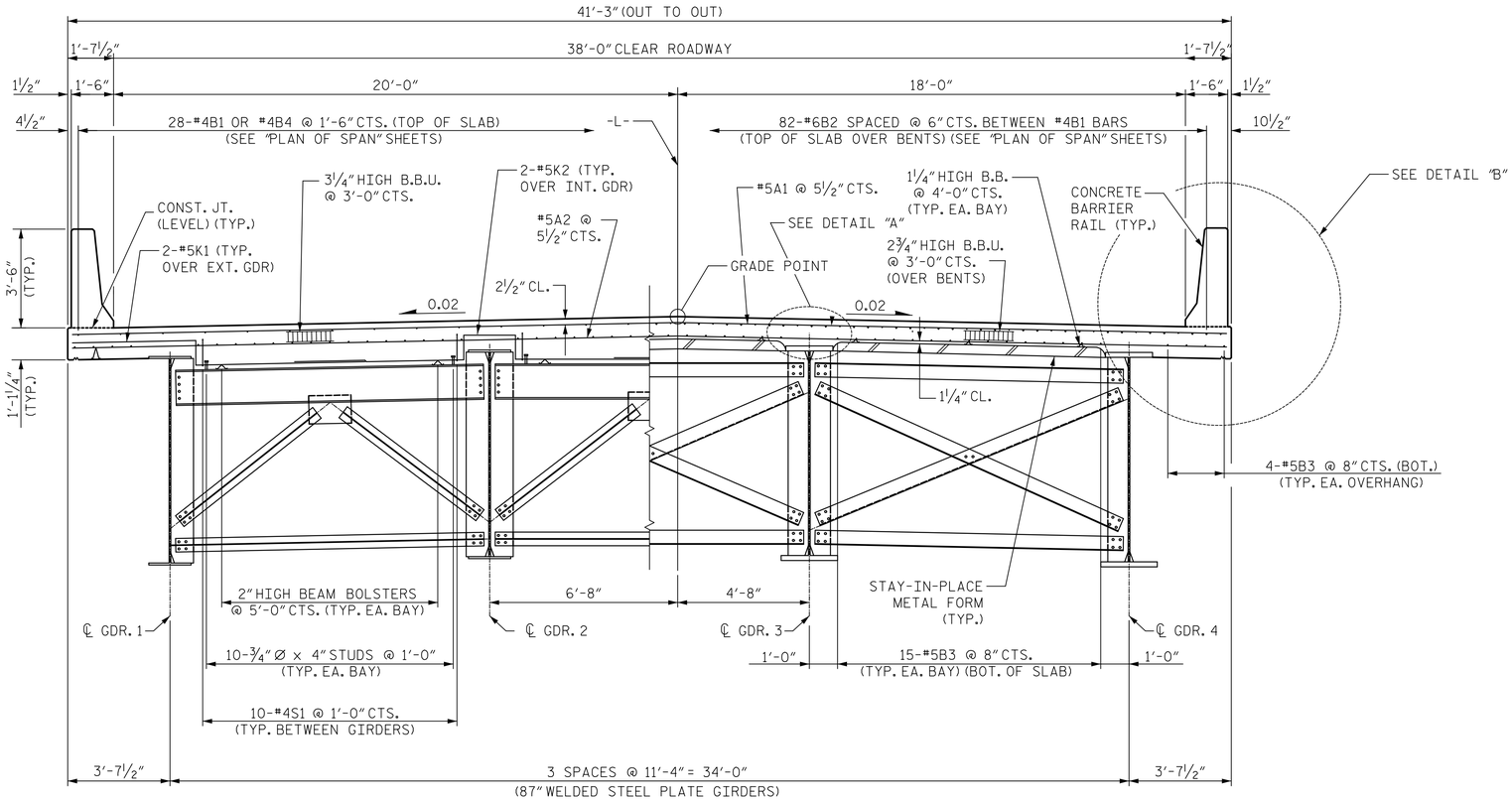
PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GIRDER ERECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-07
1			3			TOTAL SHEETS
2			4			42

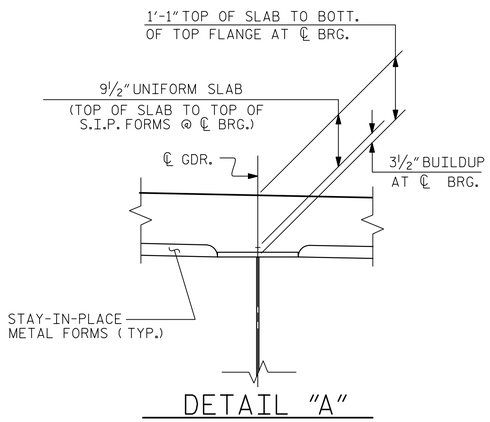


HALF SECTION AT END BENT DIAPHRAGMS

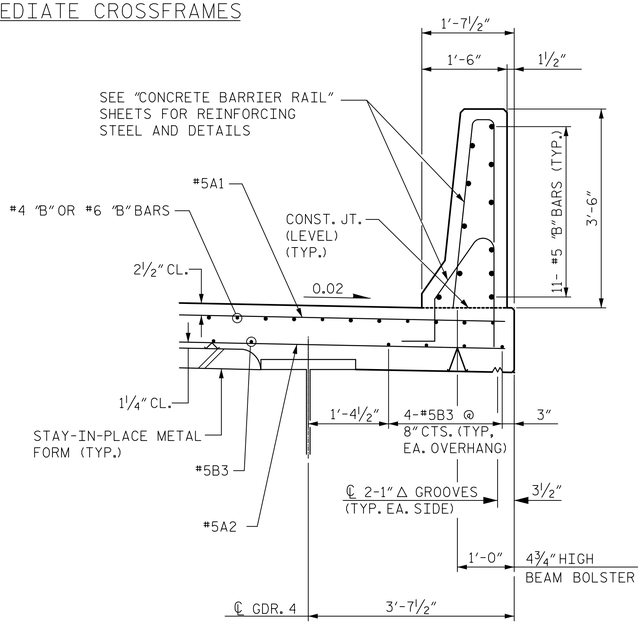
HALF SECTION AT INTERMEDIATE CROSSFRAMES

TYPICAL SECTION

3 SPAN CONTINUOUS, COMPOSITE, HYBRID STEEL PLATE GIRDER



DETAIL "A"



DETAIL "B"

(RT. OVERHANG SHOWN, LT. OVERHANG SIMILIAR)

NOTES

PROVIDE 1¼" 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 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

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

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

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

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.

DRAWN BY : J.A. LEE DATE : 06/12/18
CHECKED BY : A.J. FORFA DATE : 08/02/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042449 ALEXANDER JOHN FORFA

DocuSigned by: Alex Forfa 1/7/2019

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PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

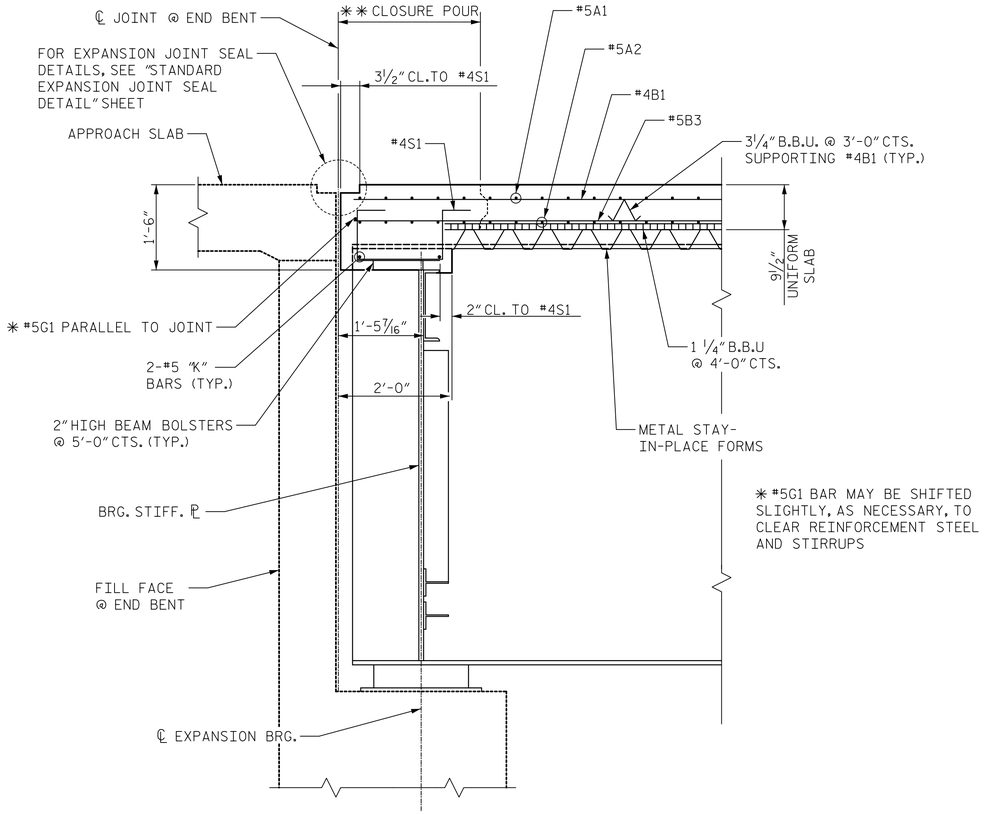
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

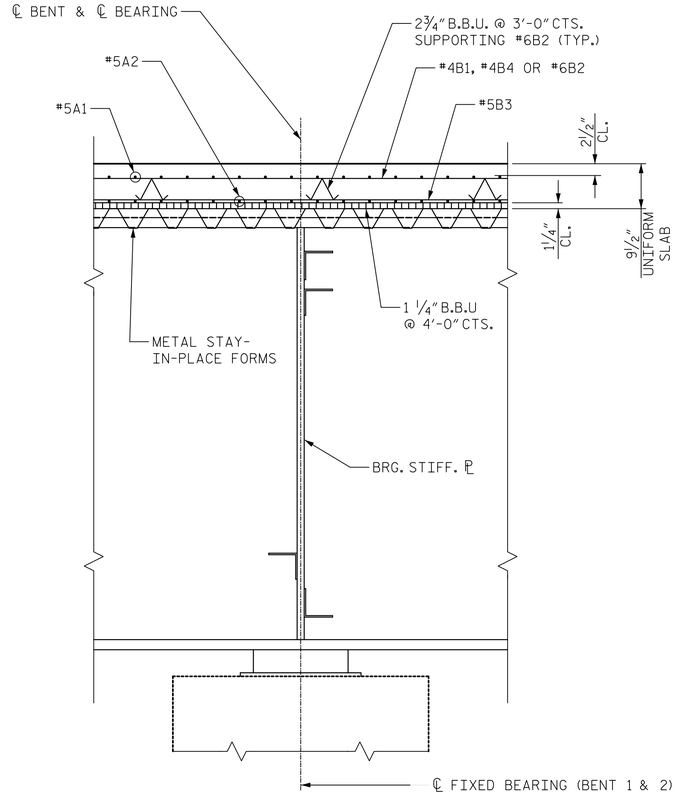
TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-08
1			3			TOTAL SHEETS
2			4			42

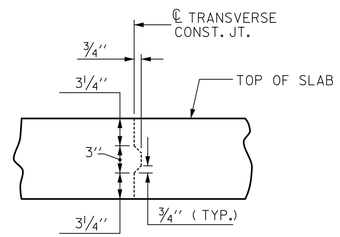


SECTION AT END BENT

** SEE "BILL OF MATERIAL" SHEET FOR CLOSURE POUR LOCATIONS AT END BENTS



SECTION AT BENT



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

DRAWN BY : J.A. LEE DATE : 06/12/18
CHECKED BY : A.J. FORFA DATE : 08/02/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

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PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

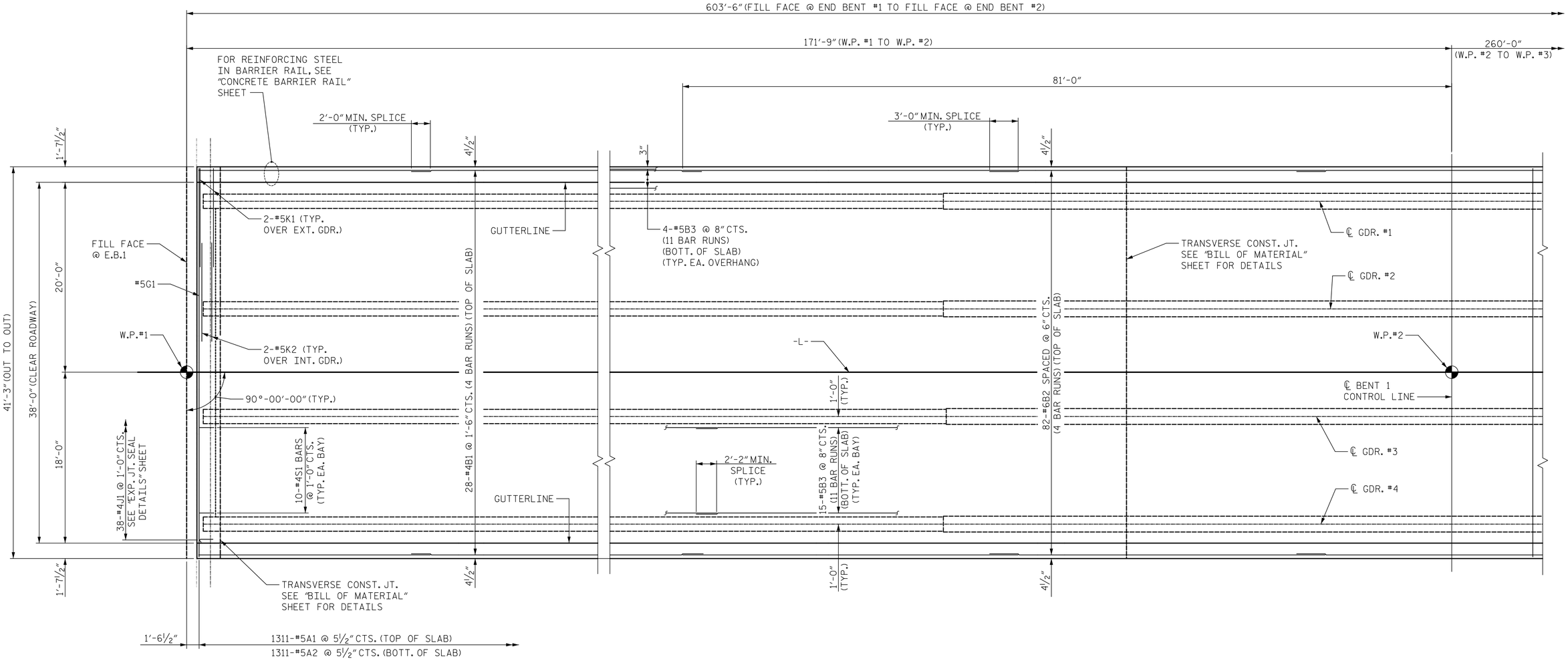
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

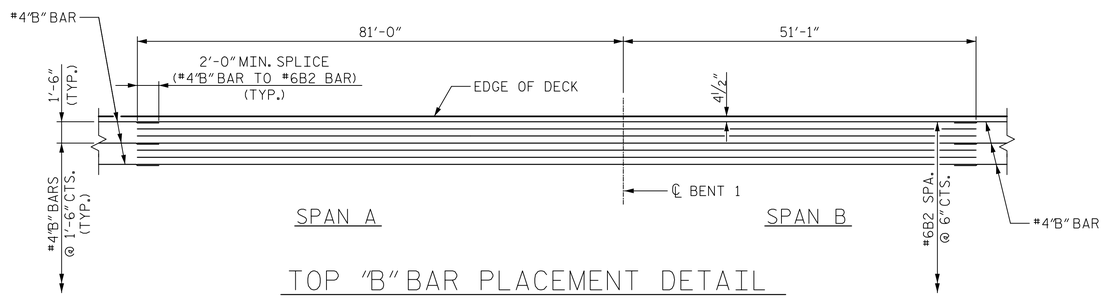
SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-09
1			3			TOTAL SHEETS
2			4			42



PLAN OF SPAN A



TOP "B" BAR PLACEMENT DETAIL

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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA

Docusigned by: Alex Forfa 1/7/2019

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PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

SHEET 1 OF 3

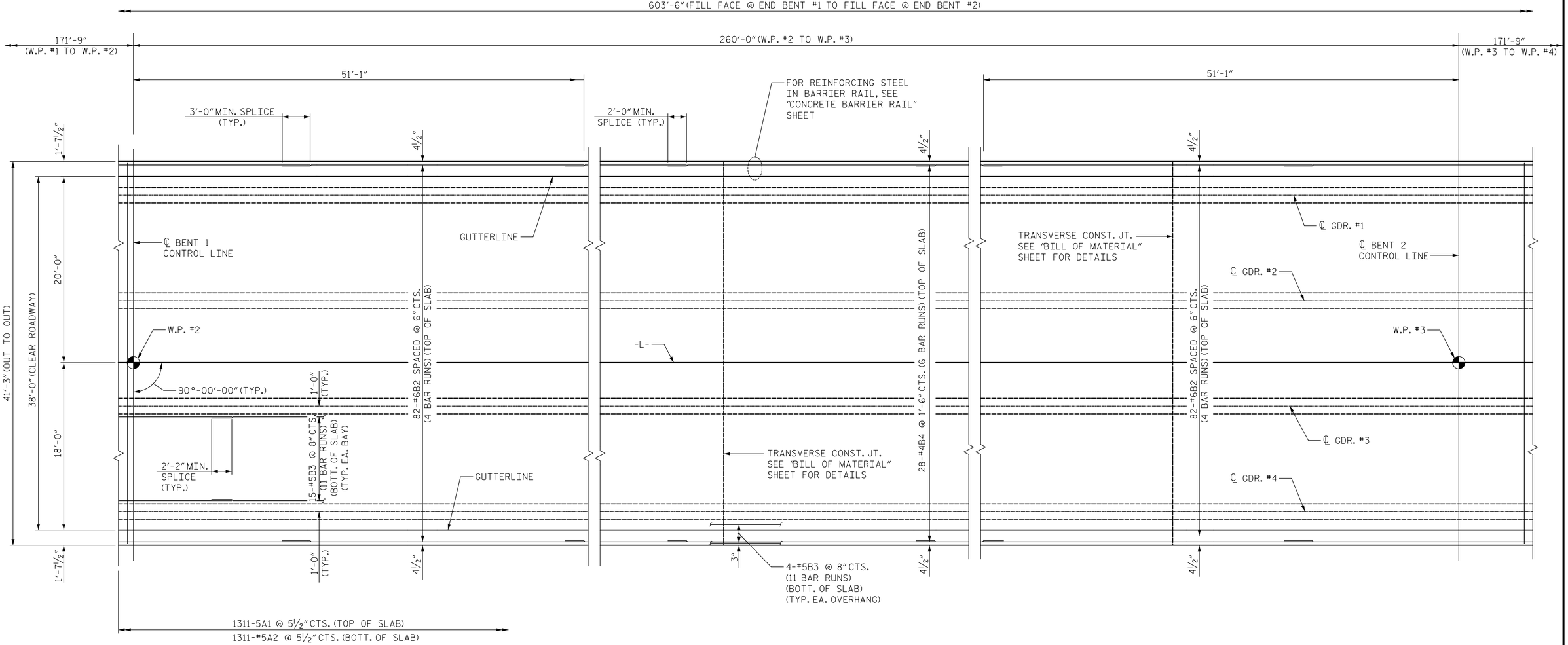
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			42

DRAWN BY : J.A. LEE DATE : 06/14/18
CHECKED BY : A.J. FORFA DATE : 08/03/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18



PLAN OF SPAN B

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1/7/2019

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PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

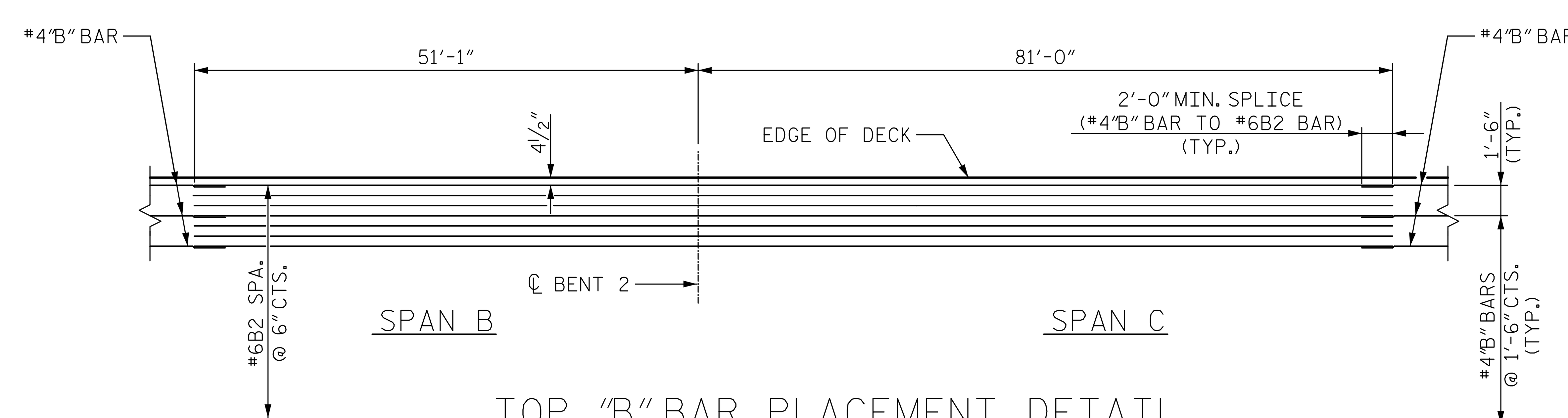
SUPERSTRUCTURE

PLAN OF SPANS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			42

DRAWN BY : J.A. LEE DATE : 06/18/18
CHECKED BY : A.J. FORFA DATE : 08/03/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

PLAN OF SPAN C



TOP "B" BAR PLACEMENT DETAIL

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1/7/2019

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PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

SHEET 3 OF 3

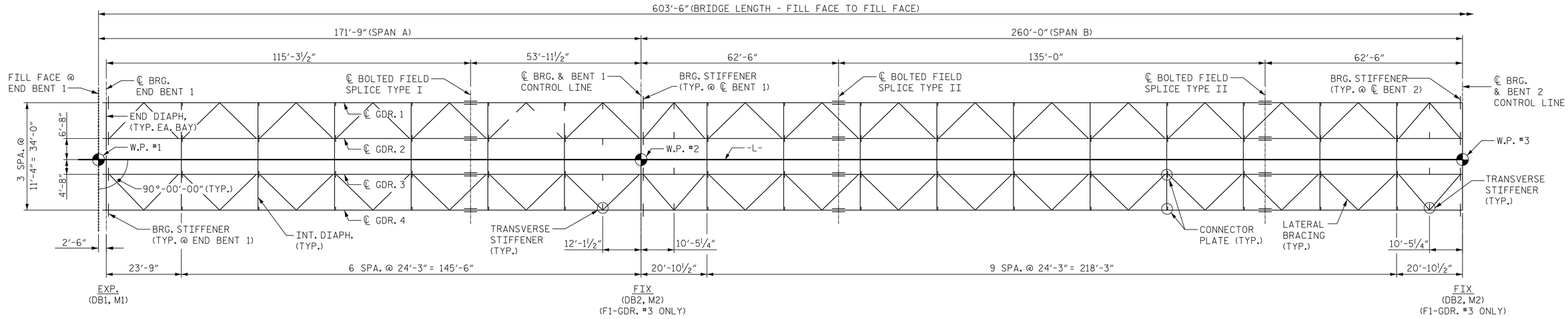
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

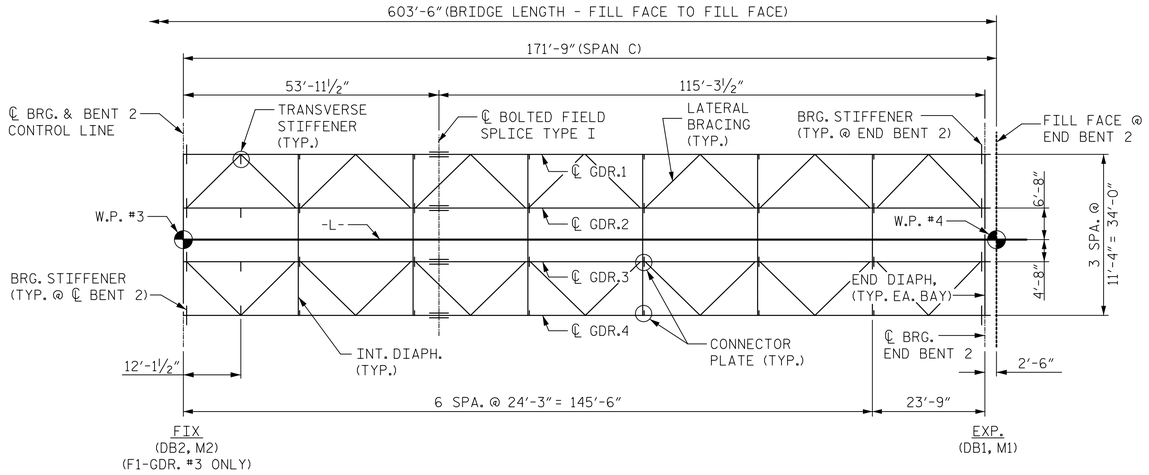
PLAN OF SPANS

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S-12
1			3					TOTAL SHEETS
2			4					42

DRAWN BY :	J.A. LEE	DATE :	06/20/18
CHECKED BY :	A.J. FORFA	DATE :	08/03/18
DESIGN ENGINEER OF RECORD :	A.J. FORFA	DATE :	09/28/18



FRAMING PLAN - SPANS A & B



FRAMING PLAN - SPAN C

DRAWN BY : J.A. LEE DATE : 07/11/18
CHECKED BY : A.J. FORFA DATE : 08/10/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

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DocuSigned by: Alex Forfa
1/7/2019

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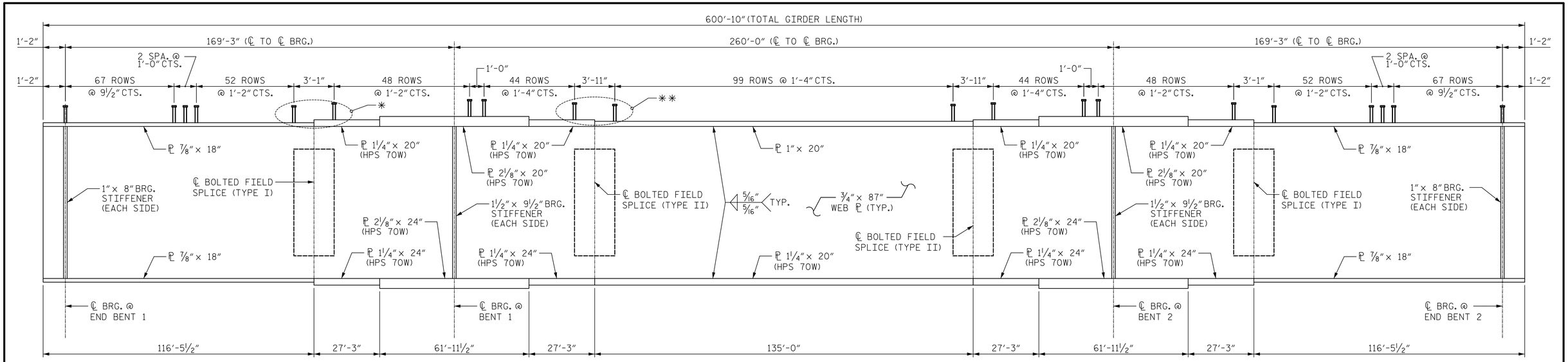
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			42

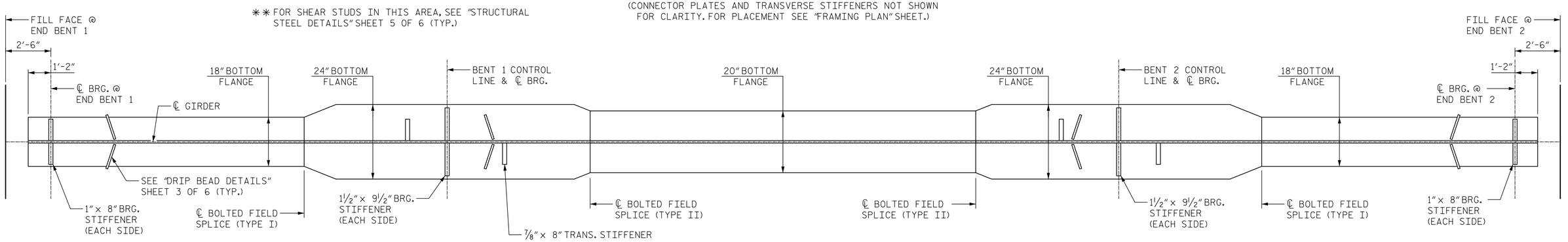


* FOR SHEAR STUDS IN THIS AREA, SEE "STRUCTURAL STEEL DETAILS" SHEET 4 OF 6 (TYP.)

** FOR SHEAR STUDS IN THIS AREA, SEE "STRUCTURAL STEEL DETAILS" SHEET 5 OF 6 (TYP.)

PLATE GIRDER ELEVATION

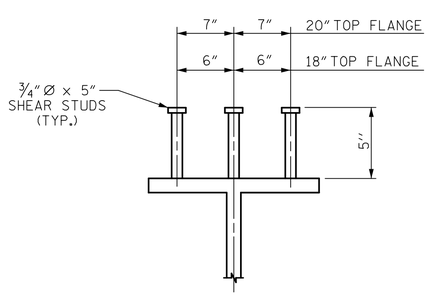
(CONNECTOR PLATES AND TRANSVERSE STIFFENERS NOT SHOWN FOR CLARITY. FOR PLACEMENT SEE "FRAMING PLAN" SHEET.)



NOTE: TRANSVERSE STIFFENERS ARE TO BE PLACED ON ALTERNATING SIDES OF INTERIOR GIRDERS, AND ARE TO BE PLACED ONLY ON INSIDE OF EXTERIOR GIRDERS. SEE "FRAMING PLAN" SHEET FOR LOCATION.

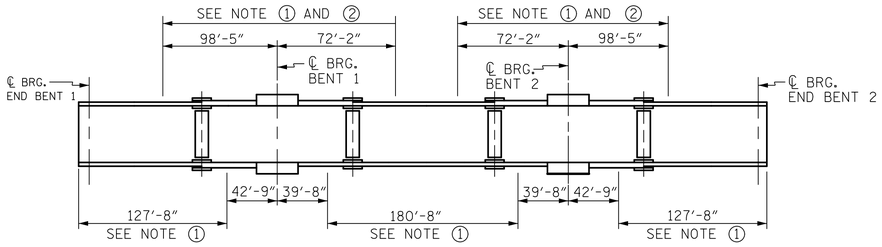
PLAN OF BOTTOM FLANGE

(CONNECTOR PLATES NOT SHOWN FOR CLARITY. FOR PLACEMENT SEE "FRAMING PLAN" SHEET.)



SHEAR STUD DETAILS

(TYP. EA. GIRDER, EXCEPT @ TOP FLANGE SPLICE PLATES)



GIRDER MAKE UP

NOTE ①: CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

NOTE ②: NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.

CHARPY V-NOTCH TESTS FOR CONTINUOUS PLATE GIRDERS

DRAWN BY : J.S. HOBSON DATE : 08/03/18
CHECKED BY : A.J. FORFA DATE : 08/10/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

DocuSigned by: Alex Forfa 1/7/2019

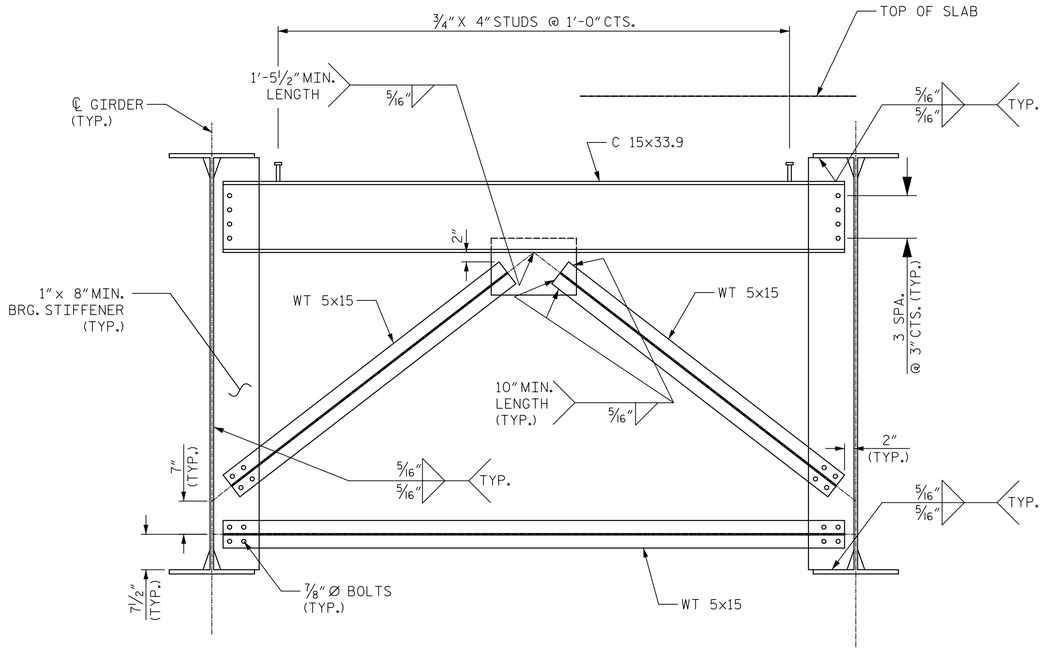
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-
SHEET 1 OF 6

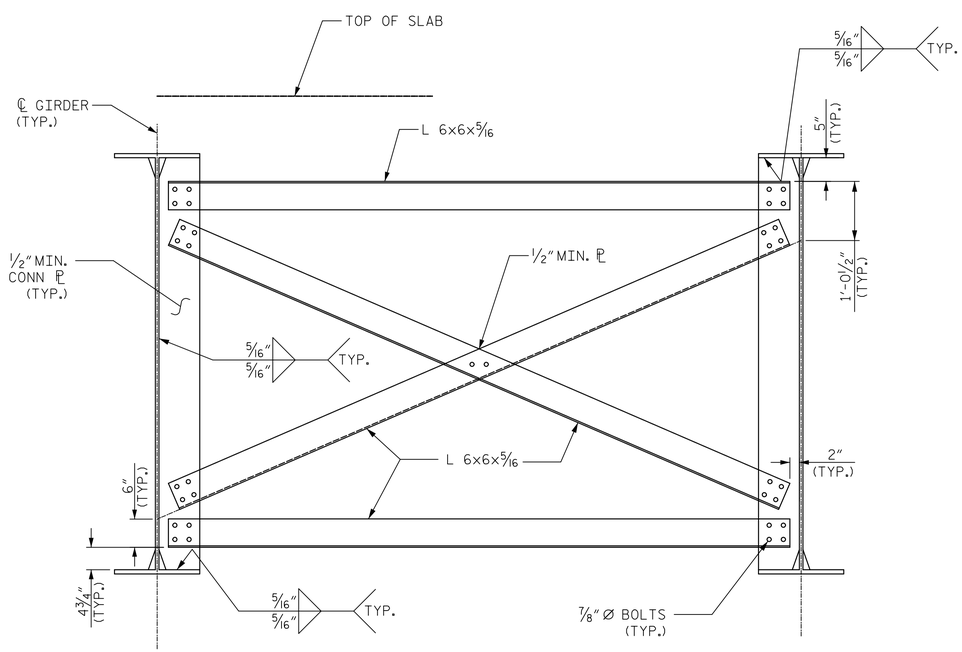
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

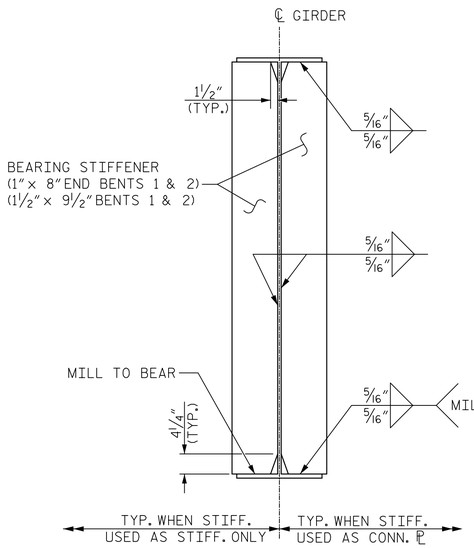
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			42



END DIAPHRAGM

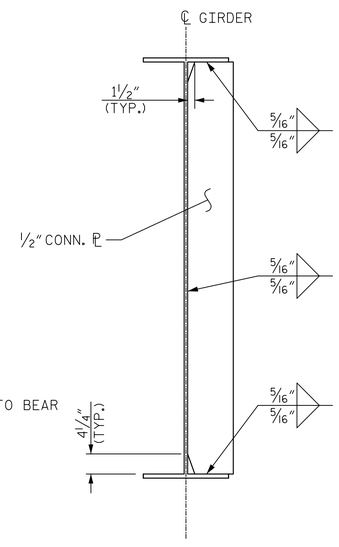


INTERMEDIATE DIAPHRAGM

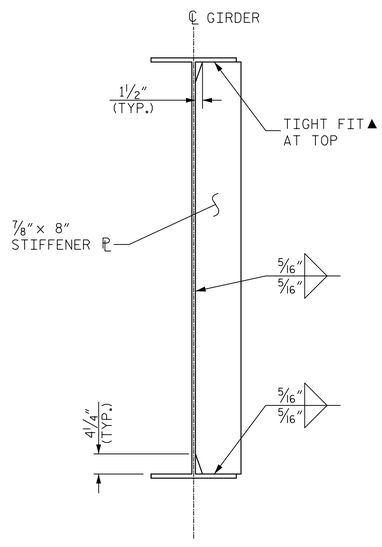


BEARING STIFFENER DETAIL

(BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAT BOTTOM FLANGE)



CONNECTOR PLATE DETAIL



TRANSVERSE STIFFENER DETAIL

(TOP FLANGE IN TENSION)

▲ IF TRANSVERSE STIFFENERS ARE USED FOR CONNECTOR PLATES, WELD TOP AND BOTTOM OF STIFFENERS TO FLANGES. INCREASE STIFFENER WIDTH AS REQUIRED WHEN USED AS A CONNECTOR PLATE. INCREASE STIFFENER THICKNESS AS REQUIRED TO MAINTAIN WIDTH TO THICKNESS RATIO NO LARGER THAN 14.0.

DRAWN BY : J.A. LEE DATE : 07/06/18
CHECKED BY : A.J. FORFA DATE : 08/10/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA

DocuSigned by: Alex Forfa 1/7/2019

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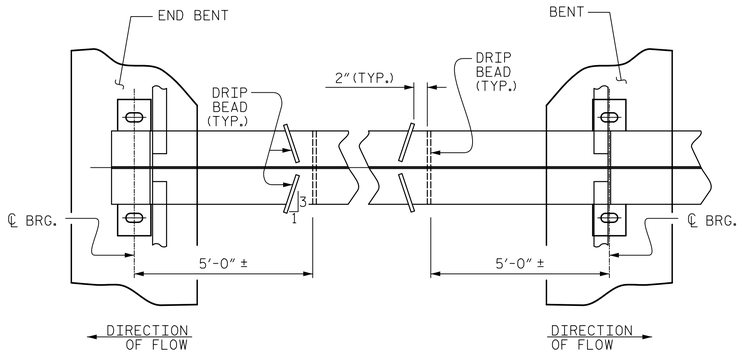
PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

SHEET 2 OF 6

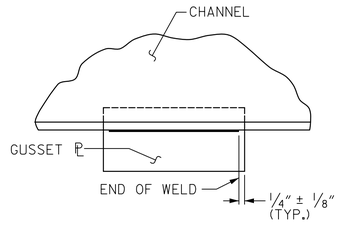
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

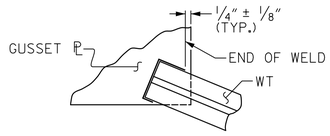
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			42



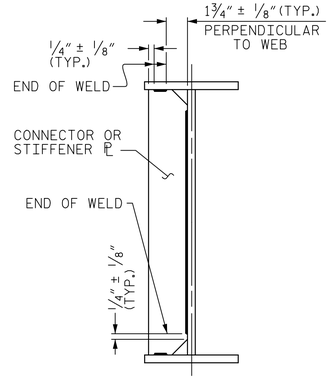
PART PLAN - BOTTOM FLANGE



TYPICAL GUSSET PLATE CONNECTION

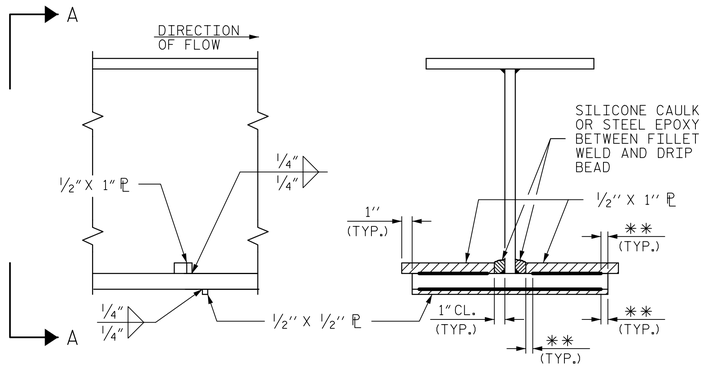


TYPICAL "TEE" TO GUSSET PLATE CONNECTION



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

WELD TERMINATION DETAILS

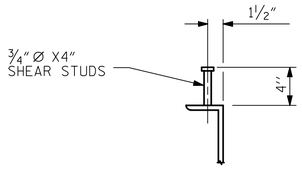


SECTION

VIEW A-A

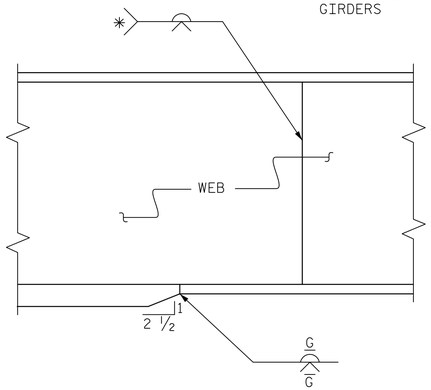
** SEE "WELD TERMINATION DETAILS"

DRIP BEAD DETAILS



END DIAPHRAGM SHEAR STUD DETAILS

* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR GIRDERS



ELEVATION

TYPICAL FLANGE AND WEB BUTT JOINT

STRUCTURAL STEEL NOTES

THE TOP AND BOTTOM FLANGES IN HIGHER MOMENT REGIONS SHALL BE AASHTO M270 GRADE 70W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS. FOR LOACTIONS OF HPS 70W STEEL, SEE "STRUCTURAL STEEL DETAILS" SHEET 1 OF 6.

ALL OTHER STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

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

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

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 BEAMS AND GIRDERS SHALL BE PLUMB.

DRAWN BY : J.A. LEE DATE : 06/28/18
CHECKED BY : A.J. FORFA DATE : 08/08/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

DocuSigned by: Alex Forfa 1/7/2019

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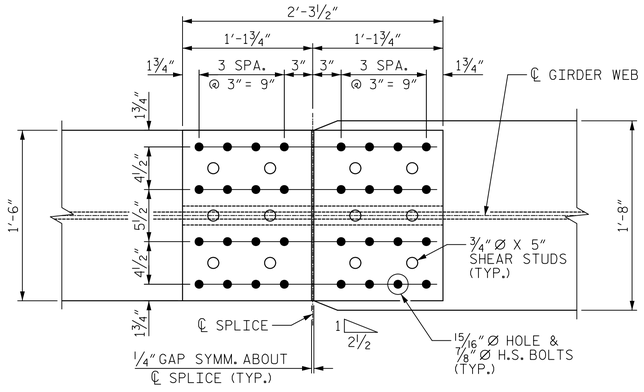
PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

SHEET 3 OF 6

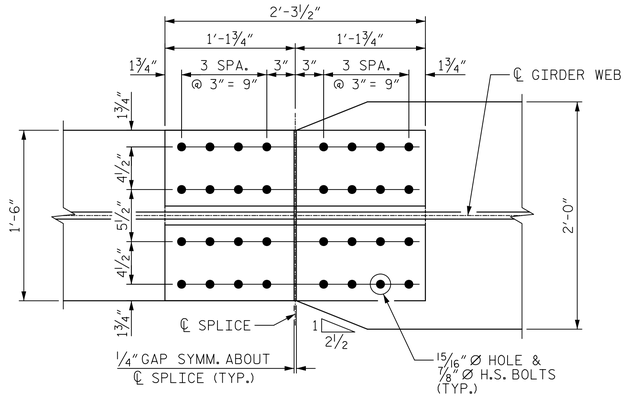
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

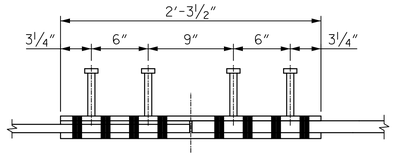
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			42



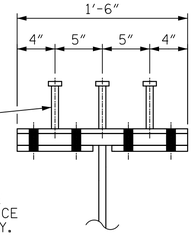
PLAN (TOP OF TOP FLANGE)



PLAN (TOP OF BOTTOM FLANGE)

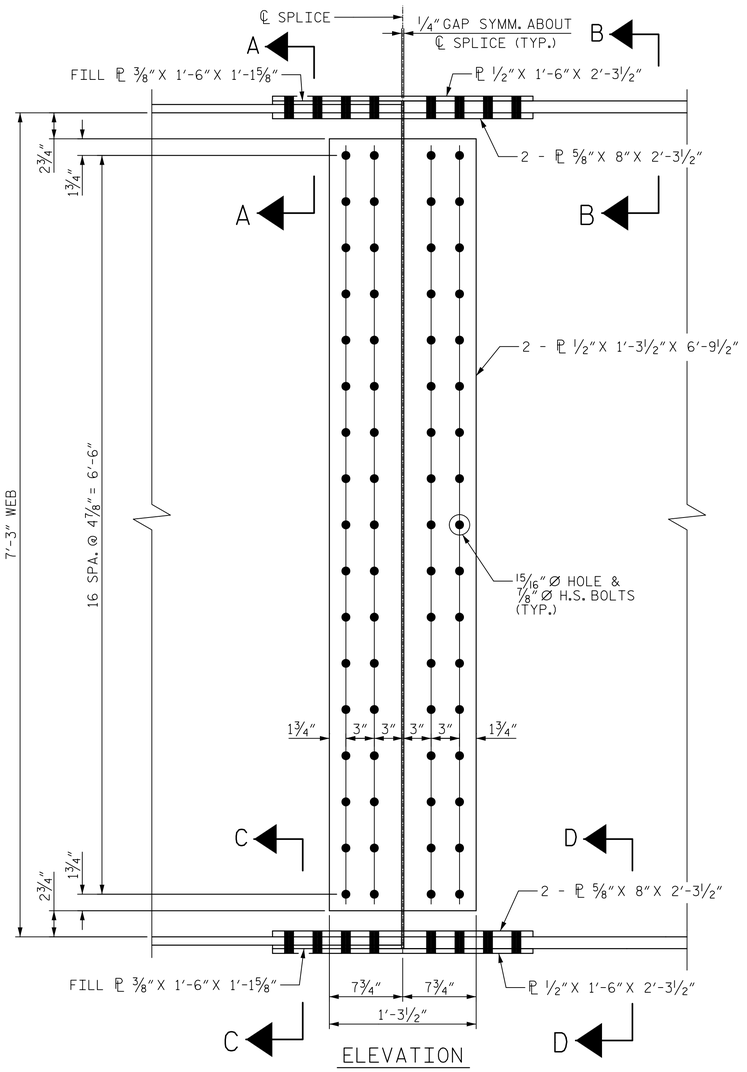


ELEVATION

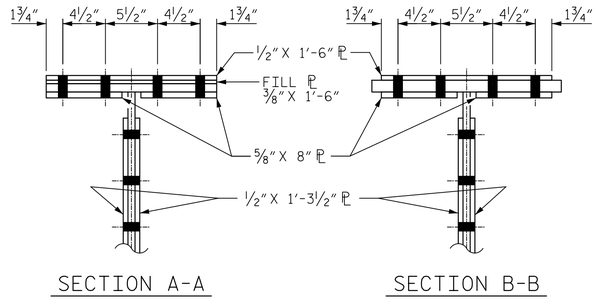


NOTE: SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF SPLICE PLATE BEFORE FIELD ASSEMBLY.

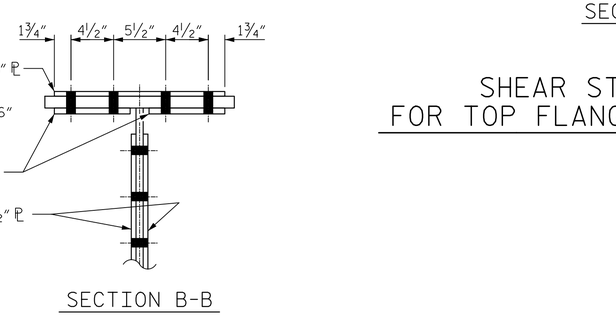
SECTION



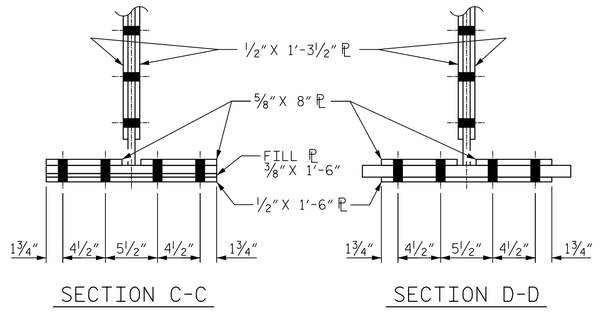
ELEVATION



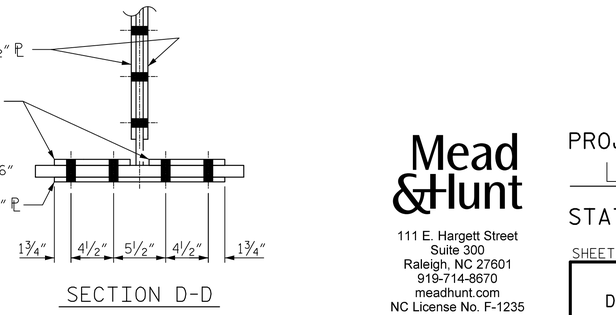
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

BOLTED FIELD SPLICE DETAILS - TYPE I

DRAWN BY : J.S. HOBSON DATE : 08/03/18
CHECKED BY : A.J. FORFA DATE : 08/10/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042449 ALEXANDER J. FORFA

DocuSigned by: Alex Forfa 6F4136D0B8394DE...
1/7/2019

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LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

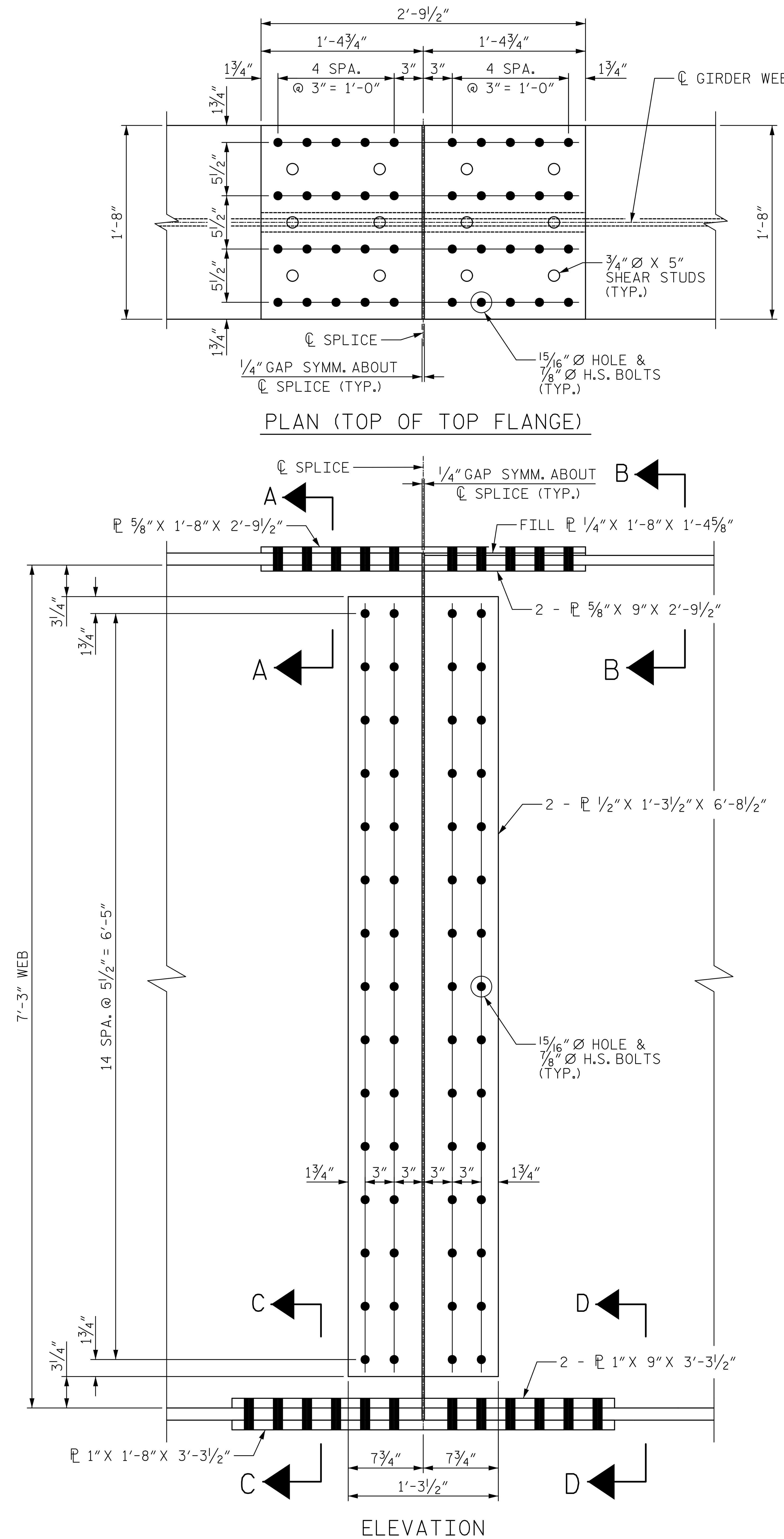
SHEET 4 OF 6

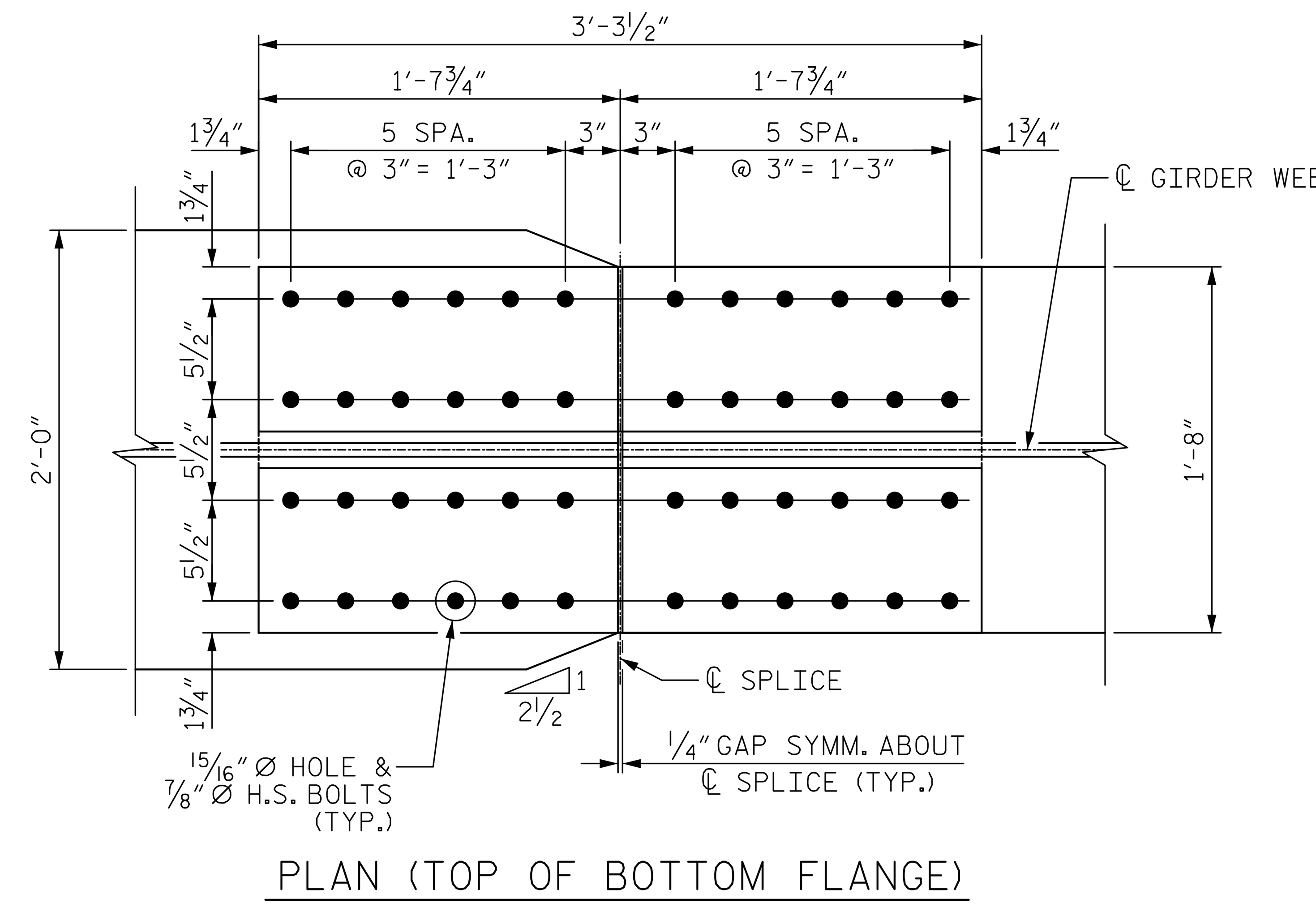
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

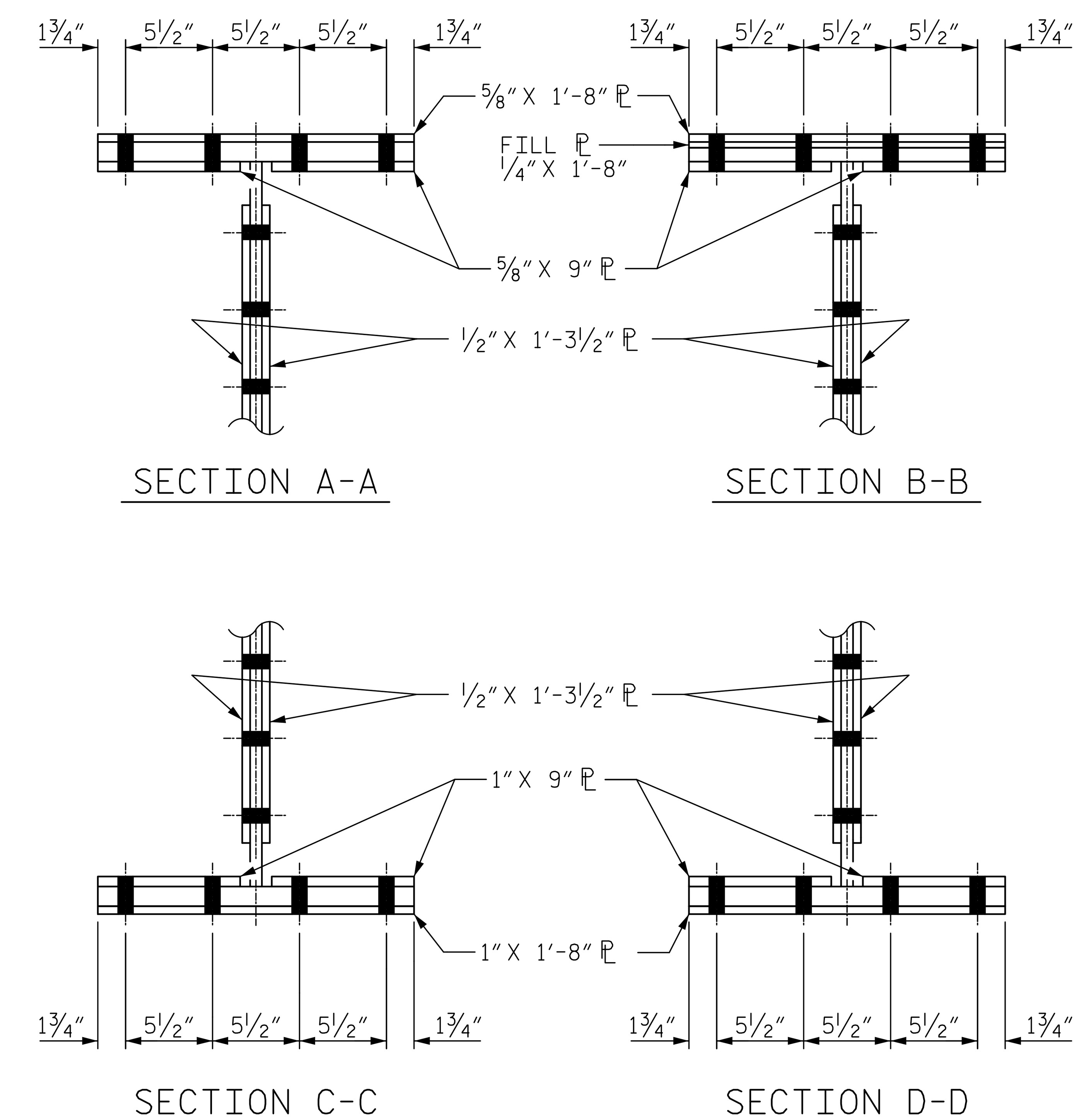
STRUCTURAL STEEL DETAILS

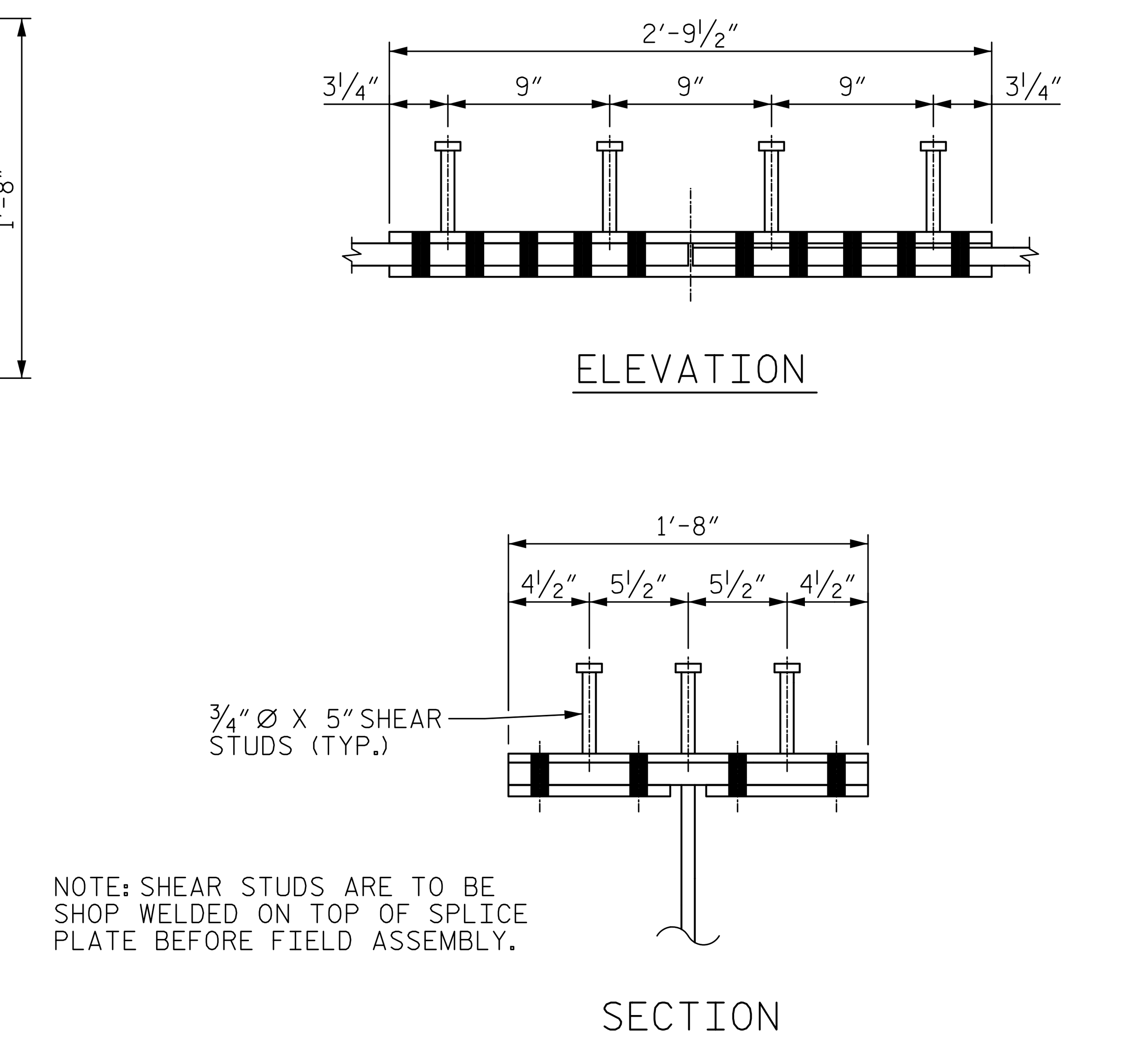
TYPE I FIELD SPLICE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			42









SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

BOLTED FIELD SPLICE DETAILS - TYPE II

DRAWN BY : J.S. HOBSON DATE : 08/03/18
CHECKED BY : A.J. FORFA DATE : 08/10/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA
DocuSigned by: Alex Forfa
1/7/2019

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PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

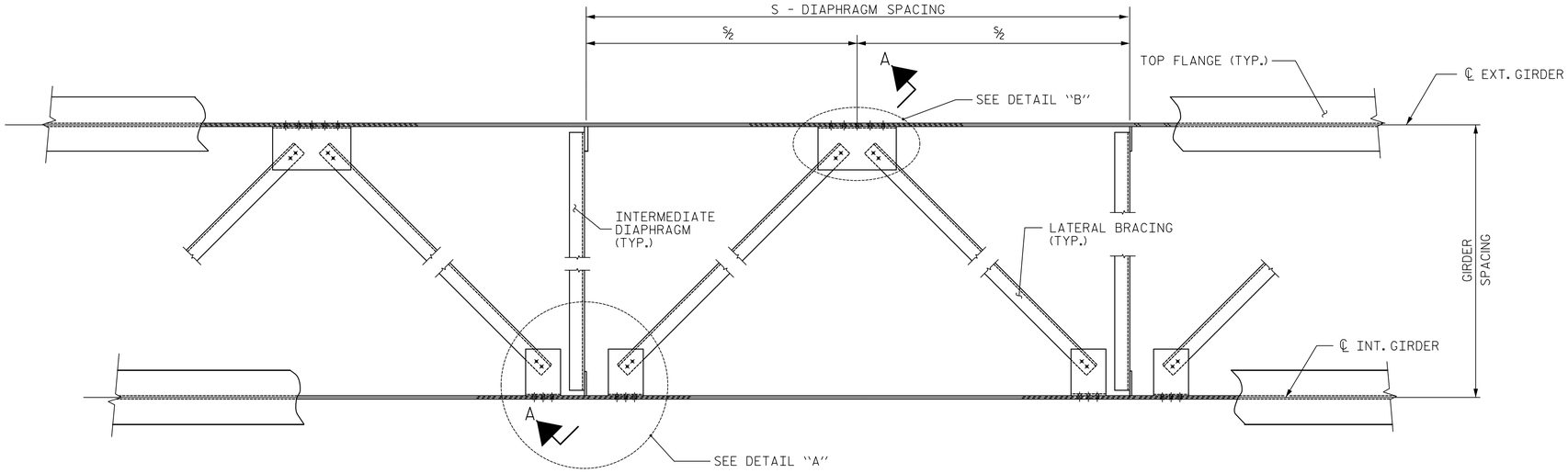
SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

TYPE II FIELD SPLICE

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S-18
1			3				TOTAL SHEETS
2			4				42



PART PLAN - NEAR TOP FLANGE LATERAL BRACING

(THROUGHOUT EXTERIOR BAYS ONLY)

NOTES

LATERAL BRACING ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W OR APPROVED EQUAL.

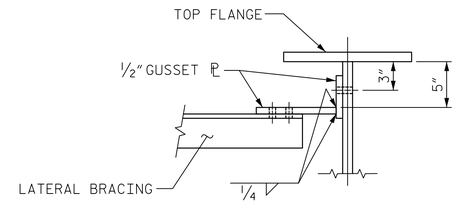
TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL BOLTED CONNECTIONS SHALL BE 7/8" Ø HIGH STRENGTH BOLTS.

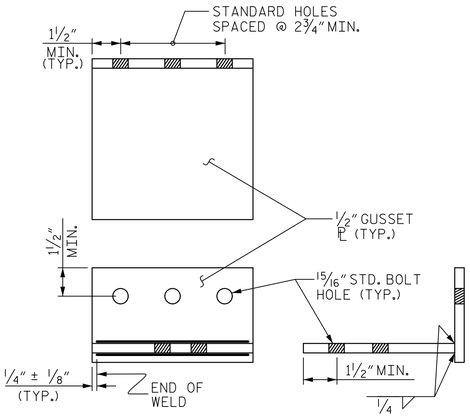
THE CONTRACTOR HAS THE OPTION TO CLIP THE PROTRUDING CORNERS OF THE GUSSET PLATES, AT NO ADDITIONAL COST TO THE DEPARTMENT.

BENT GUSSET PLATES OR ROLLED ANGLE SHAPES MAY BE SUBSTITUTED FOR THE WELDED GUSSET PLATES DETAILED IF APPROVED BY THE ENGINEER, AT NO ADDITIONAL COST TO THE DEPARTMENT.

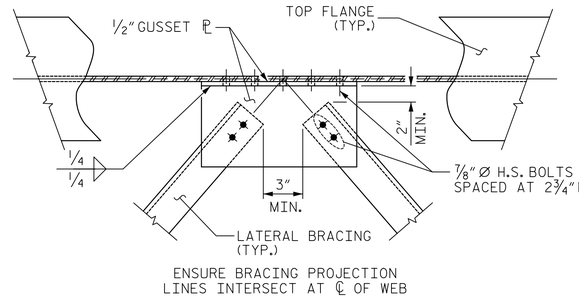
INSTALL THE LATERAL BRACING AFTER ERECTING THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER AND INSTALLING THE INTERMEDIATE DIAPHRAGMS.



SECTION THRU CONNECTION

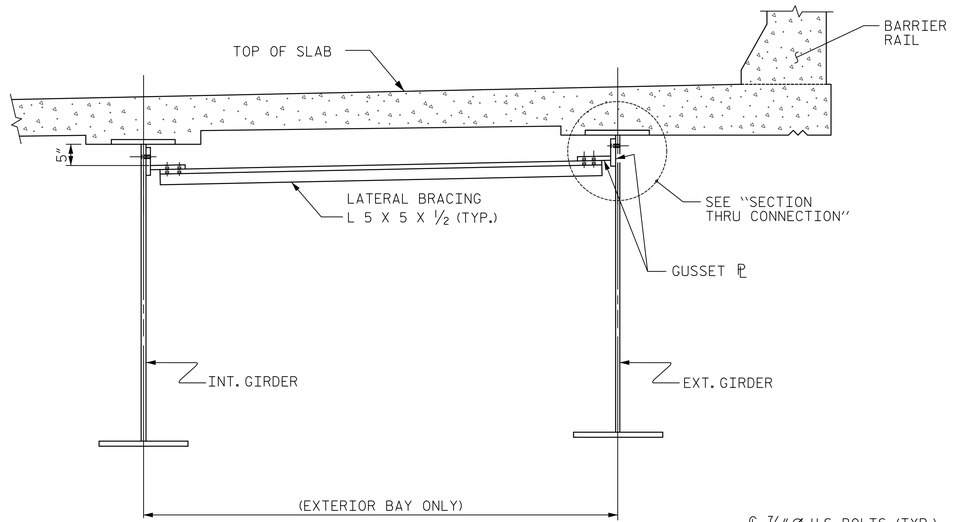


CONNECTION DETAIL

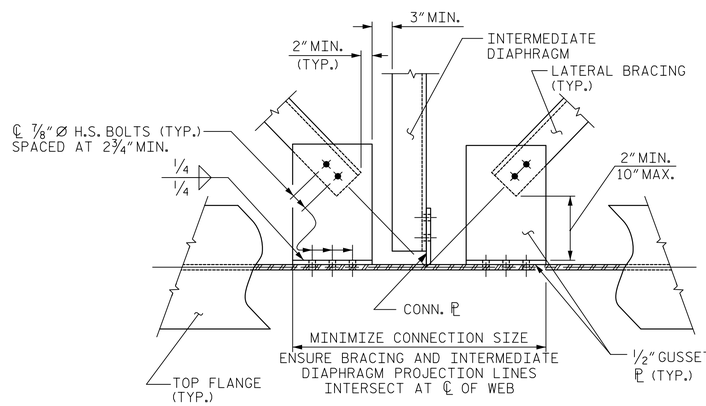


ENSURE BRACING PROJECTION LINES INTERSECT AT ℄ OF WEB

DETAIL "B"



SECTION A-A



ENSURE BRACING AND INTERMEDIATE DIAPHRAGM PROJECTION LINES INTERSECT AT ℄ OF WEB

DETAIL "A"

ASSEMBLED BY : J.A. LEE	DATE : 07/02/18		
CHECKED BY : A.J. FORFA	DATE : 08/16/18		
DRAWN BY : WMC 6/11	REV. 12/17 MAA/THC		
CHECKED BY : GM 6/11			

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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

DocuSigned by: Alex Forfa 1/7/2019

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PROJECT NO. B-4968

LEE/CHATHAM COUNTY

STATION: 34+65.00 -L-

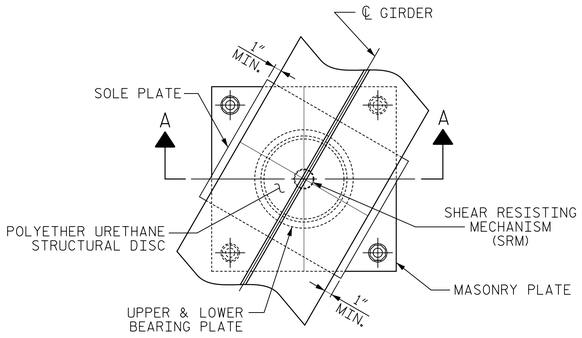
SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

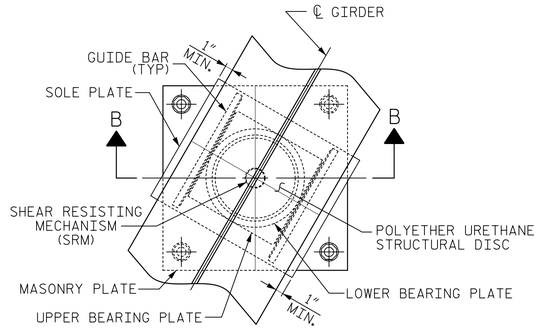
LATERAL BRACING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			42

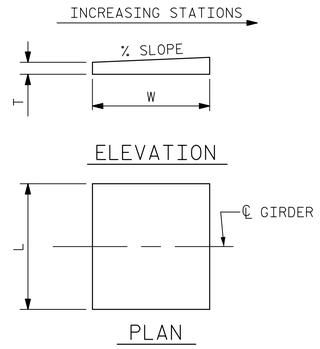
STD. NO. LB1



PLAN



PLAN



PLAN

NOTE:
DIMENSIONS "W" AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER.

NOTES

FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50W OR GRADE 50.

AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED PLUS AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR URETHANE DISC.

AFTER BEARING ASSEMBLY IS IN PLACE AND ANCHOR BOLTS HAVE BEEN FINALLY POSITIONED, THEY SHALL BE GROUTED IN PLACE AS SHOWN.

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

SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES AND ANCHOR BOLTS SHOULD BE GROUTED BEFORE FALSEWORK IS PLACED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

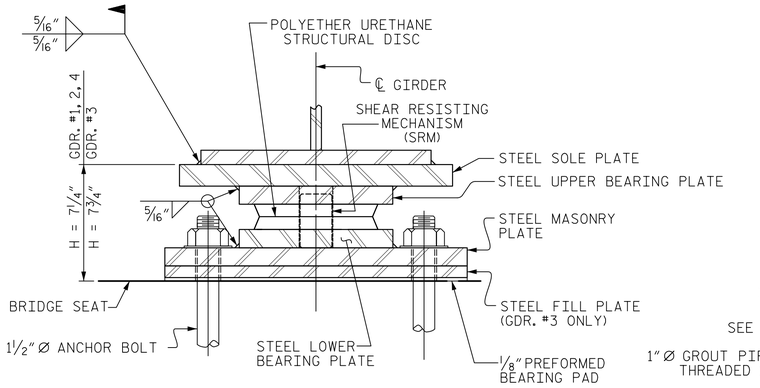
FOR ATTACHMENT OF THE STAINLESS STEEL SHEETS TO THE STEEL SOLE PLATE AND GUIDE BARS, AS WELL AS THE TOP AND SIDE PTFE SHEETS TO THE STEEL UPPER BEARING PLATE, SEE SPECIAL PROVISIONS.

FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE MINIMUM ROTATIONAL CAPACITY FOR ALL BEARINGS SHALL BE 0.02 RADIANS.

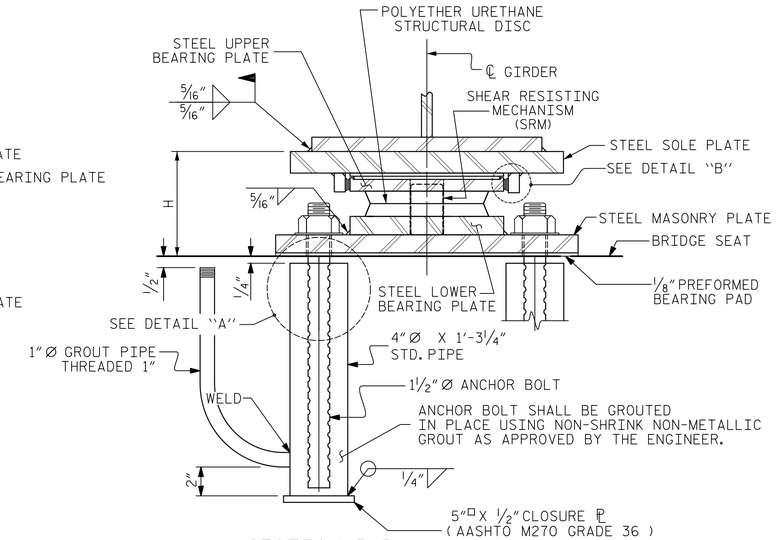
AT THE CONTRACTOR'S OPTION, FILL PLATES (WHERE USED) MAY BE COMBINED WITH MASONRY PLATES.

SOLE PLATE DETAILS



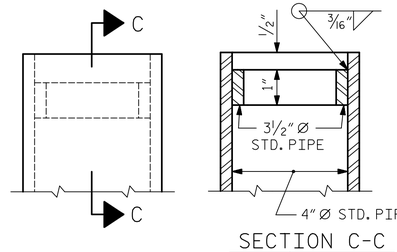
SECTION A-A

DB2 FIXED

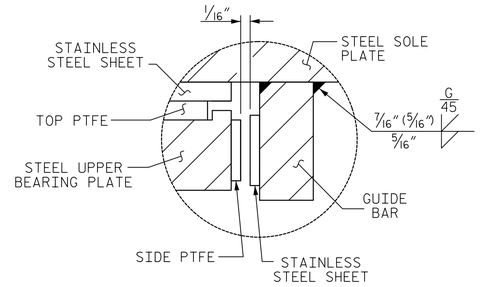


SECTION B-B

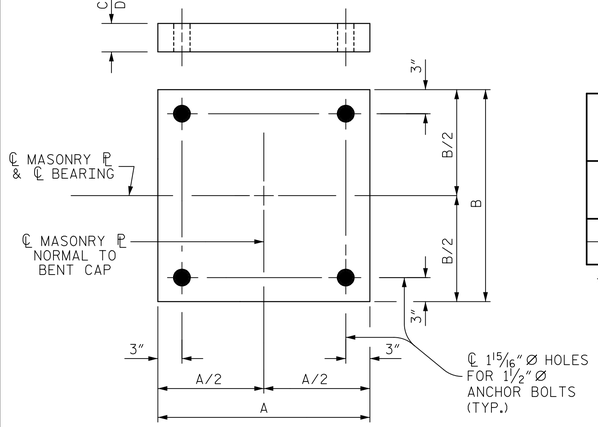
DB1 EXP.



SECTION C-C



DETAIL "B"



PLAN

MASONRY & FILL PLATE DETAILS

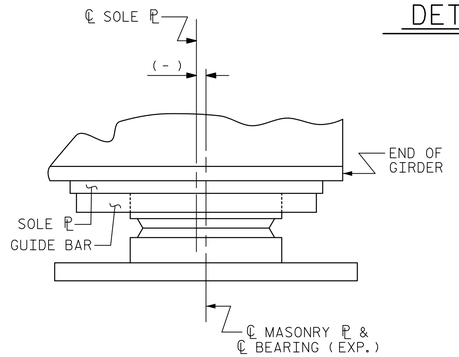
PLATE SETTING DATA

(EXPANSION DISC BEARINGS)

LOCATION	TEMPERATURE AT TIME OF SETTING			*
	45° F	60° F	90° F	
END BENT 1	-3/8"	0	11/16"	-7/16"
END BENT 2	-3/8"	0	11/16"	-7/16"

* CORRECTION FOR END ROTATION DUE TO WEIGHT OF SLAB AND COMPOSITE DEAD LOAD.

TEMPERATURE SETTING DETAIL



DESIGNATIONS		LOCATION	NUMBER OF BEARINGS	DIMENSIONS						LOADS AND MOVEMENT				
				BEARING	MASONRY & FILL PLATE			SOLE PLATE		UNFACTORED VERTICAL LOAD (KIPS)			FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)
BEARINGS	MASONRY & FILL ℙ			H (IN.)	A (IN.)	B (IN.)	C (IN.)	D (IN.)	TOP SLOPE (%)	L (IN.)	DEAD		LIVE		
											DC	DW	LL+IM		
DB1 (EXP.)	M1	END BENT 1	4	5 5/8"	25 1/2"	25 1/2"	3/4"	--	0.998	20	115.6	15.5	120.9	47.9	2 5/16"
DB2 (FIXED)	M2, F1	BENT 1	4	**	30"	30"	1"	1/2"	0.433	26	566.0	70.2	274.6	193.4	0
DB2 (FIXED)	M2, F1	BENT 2	4	**	30"	30"	1"	1/2"	-0.433	26	566.0	70.2	274.6	193.4	0
DB1 (EXP.)	M1	END BENT 2	4	5 5/8"	25 1/2"	25 1/2"	3/4"	--	-0.998	20	115.6	15.5	120.9	47.9	2 5/16"

** SEE "SECTION A-A"

Mead & Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA

DocuSigned by: Alex Forfa 061D5D2B8394DE...
1/7/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

DISC BEARING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			42

ASSEMBLED BY :	J.S. HOBSON	DATE : 05/23/18
CHECKED BY :	A.J. FORFA	DATE : 08/16/18
DRAWN BY : TMG 08/13	REV. 12/17	MAA/THC
CHECKED BY : EKP 10/13		

STD. NO. DB1 (SHT 1)

NOTES

VALUES GIVEN ARE AT THIRTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

UPWARD DEFLECTIONS ARE INDICATED WITH A "-" SIGN.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN A - GIRDERS 1 & 4

THIRTIETH POINTS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.003	0.008	0.011	0.014	0.017	0.019	0.020	0.021	0.022	0.021	0.019	0.018	0.016	0.012	0.010	0.007	0.002	-0.001	-0.004	-0.008	-0.011	-0.013	-0.015	-0.017	-0.016	-0.015	-0.014	-0.010	-0.004	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.018	0.042	0.061	0.074	0.093	0.107	0.113	0.122	0.129	0.127	0.125	0.124	0.115	0.103	0.094	0.080	0.062	0.048	0.034	0.016	0.002	-0.008	-0.022	-0.031	-0.033	-0.034	-0.035	-0.025	-0.011	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.002	0.005	0.007	0.009	0.011	0.013	0.014	0.015	0.016	0.016	0.016	0.016	0.015	0.014	0.013	0.012	0.010	0.008	0.007	0.005	0.003	0.002	0.000	-0.001	-0.002	-0.002	-0.003	-0.002	-0.001	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.023	0.055	0.079	0.097	0.121	0.139	0.147	0.158	0.167	0.164	0.160	0.158	0.146	0.129	0.117	0.099	0.074	0.055	0.037	0.013	-0.006	-0.019	-0.037	-0.049	-0.051	-0.051	-0.052	-0.037	-0.016	0.000
VERTICAL CURVE ORDINATE	0.000	0.015	0.030	0.043	0.055	0.066	0.076	0.085	0.093	0.100	0.106	0.111	0.115	0.117	0.119	0.119	0.119	0.117	0.115	0.111	0.106	0.100	0.093	0.085	0.076	0.066	0.055	0.043	0.030	0.015	0.000
REQUIRED CAMBER	0"	7/16"	1"	1 7/16"	1 13/16"	2 1/4"	2 9/16"	2 13/16"	3"	3 3/16"	3 1/4"	3 1/4"	3 1/4"	3 3/16"	3"	2 13/16"	2 5/8"	2 5/16"	2 1/16"	1 3/4"	1 7/16"	1 1/8"	7/8"	9/16"	5/16"	3/16"	1/16"	-1/8"	-1/16"	0"	0"

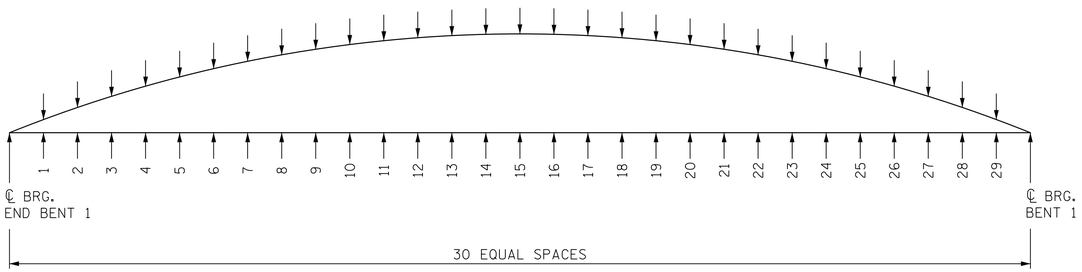
* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT " REQUIRED CAMBER ", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN A - GIRDERS 2 & 3

THIRTIETH POINTS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.003	0.008	0.011	0.014	0.017	0.019	0.020	0.021	0.022	0.021	0.020	0.019	0.016	0.013	0.010	0.007	0.002	-0.001	-0.004	-0.008	-0.011	-0.013	-0.015	-0.017	-0.016	-0.015	-0.014	-0.010	-0.004	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.019	0.044	0.062	0.077	0.096	0.110	0.117	0.126	0.133	0.131	0.129	0.128	0.119	0.107	0.098	0.084	0.065	0.052	0.037	0.018	0.004	-0.006	-0.020	-0.030	-0.031	-0.033	-0.035	-0.024	-0.010	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.002	0.005	0.007	0.009	0.011	0.013	0.014	0.015	0.016	0.016	0.016	0.016	0.015	0.014	0.013	0.012	0.010	0.008	0.007	0.005	0.003	0.002	0.000	-0.001	-0.002	-0.002	-0.003	-0.002	-0.001	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.024	0.057	0.080	0.100	0.124	0.142	0.151	0.162	0.171	0.168	0.165	0.163	0.150	0.134	0.121	0.103	0.077	0.059	0.040	0.015	-0.004	-0.017	-0.035	-0.048	-0.049	-0.050	-0.052	-0.036	-0.015	0.000
VERTICAL CURVE ORDINATE	0.000	0.015	0.030	0.043	0.055	0.066	0.076	0.085	0.093	0.100	0.106	0.111	0.115	0.117	0.119	0.119	0.119	0.117	0.115	0.111	0.106	0.100	0.093	0.085	0.076	0.066	0.055	0.043	0.030	0.015	0.000
REQUIRED CAMBER	0"	1/2"	1 1/16"	1 1/2"	1 7/8"	2 5/16"	2 5/8"	2 13/16"	3 1/16"	3 1/4"	3 5/16"	3 5/16"	3 5/16"	3 3/16"	3 1/16"	2 7/8"	2 11/16"	2 5/16"	2 1/16"	1 13/16"	1 7/16"	1 1/8"	15/16"	5/8"	5/16"	3/16"	1/16"	-1/8"	-1/16"	0"	0"

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



SPAN A

SCHEMATIC CAMBER ORDINATES

(SLOPE FOR THE ZERO CAMBER BASE LINE VARIES)

Mead & Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA

DocuSigned by: Alex Forfa
1/7/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4968

LEE/CHATHAM COUNTY

STATION: 34+65.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

DEAD LOAD DEFLECTION AND CAMBER TABLES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			42

DRAWN BY : J.S. HOBSON DATE : 07/23/18
CHECKED BY : A.J. FORFA DATE : 08/16/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

NOTES

VALUES GIVEN ARE AT THIRTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

UPWARD DEFLECTIONS ARE INDICATED WITH A "-" SIGN.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN B - GIRDERS 1 & 4

THIRTIETH POINTS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.014	0.032	0.046	0.064	0.089	0.108	0.127	0.151	0.170	0.183	0.201	0.215	0.220	0.226	0.231	0.226	0.220	0.215	0.201	0.183	0.170	0.151	0.127	0.108	0.089	0.064	0.046	0.032	0.014	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳	0.000	0.042	0.098	0.140	0.201	0.282	0.343	0.406	0.489	0.552	0.598	0.659	0.705	0.721	0.743	0.760	0.743	0.721	0.705	0.659	0.598	0.552	0.489	0.406	0.343	0.282	0.201	0.141	0.098	0.042	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.004	0.010	0.014	0.021	0.030	0.036	0.043	0.052	0.058	0.063	0.069	0.074	0.076	0.078	0.080	0.078	0.076	0.074	0.070	0.063	0.058	0.052	0.043	0.036	0.030	0.021	0.014	0.010	0.004	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.060	0.140	0.200	0.286	0.401	0.487	0.576	0.692	0.780	0.844	0.929	0.994	1.017	1.047	1.071	1.047	1.017	0.994	0.930	0.844	0.780	0.692	0.576	0.487	0.401	0.286	0.201	0.140	0.060	0.000
VERTICAL CURVE ORDINATE	0.000	0.036	0.070	0.101	0.130	0.156	0.180	0.202	0.220	0.237	0.250	0.262	0.270	0.277	0.280	0.282	0.280	0.277	0.270	0.262	0.250	0.237	0.220	0.202	0.180	0.156	0.130	0.101	0.070	0.036	0.000
REQUIRED CAMBER	0″	1 1/8″	2 1/2″	3 5/8″	5″	6 11/16″	8″	9 5/16″	10 15/16″	12 3/16″	13 1/8″	14 5/16″	15 3/16″	15 1/2″	15 15/16″	16 1/4″	15 15/16″	15 1/2″	15 3/16″	14 5/16″	13 1/8″	12 3/16″	10 15/16″	9 5/16″	8″	6 11/16″	5″	3 5/8″	2 1/2″	1 1/8″	0″

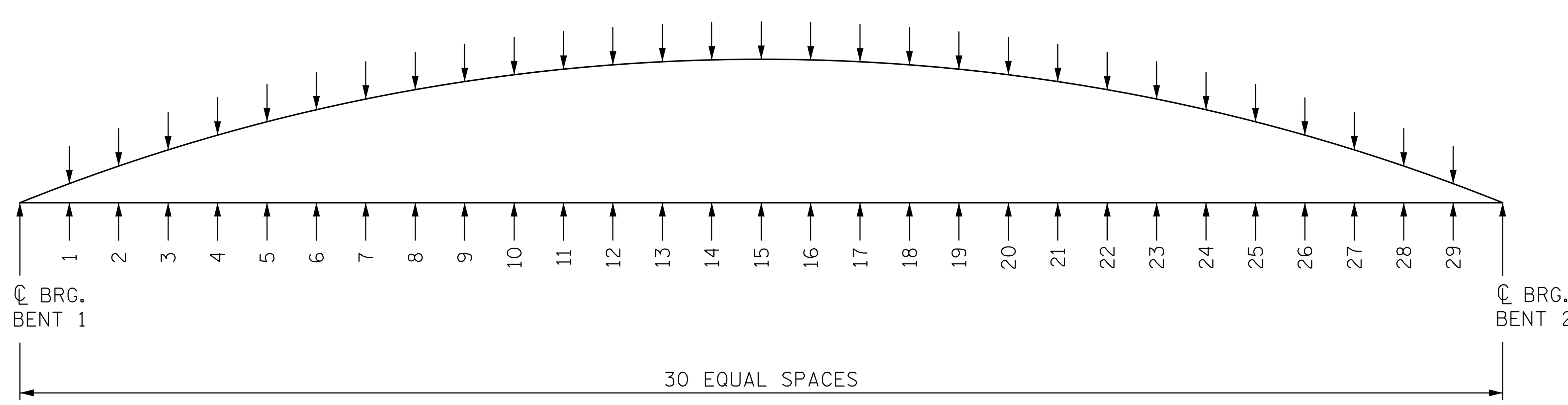
✳ INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN B - GIRDERS 2 & 3

THIRTIETH POINTS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.014	0.032	0.046	0.065	0.090	0.108	0.127	0.152	0.170	0.184	0.202	0.215	0.220	0.226	0.231	0.226	0.220	0.215	0.202	0.184	0.170	0.152	0.127	0.108	0.090	0.065	0.046	0.032	0.014	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳	0.000	0.042	0.099	0.141	0.203	0.284	0.346	0.408	0.492	0.555	0.601	0.662	0.708	0.725	0.747	0.764	0.747	0.725	0.708	0.662	0.601	0.555	0.492	0.409	0.346	0.284	0.203	0.141	0.099	0.042	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.004	0.010	0.014	0.021	0.030	0.036	0.043	0.052	0.058	0.063	0.069	0.074	0.076	0.078	0.080	0.078	0.076	0.074	0.069	0.063	0.058	0.052	0.043	0.036	0.030	0.021	0.014	0.010	0.004	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.060	0.141	0.201	0.289	0.404	0.490	0.578	0.696	0.783	0.848	0.933	0.997	1.021	1.051	1.075	1.051	1.021	0.997	0.933	0.848	0.783	0.696	0.579	0.490	0.404	0.289	0.201	0.141	0.060	0.000
VERTICAL CURVE ORDINATE	0.000	0.036	0.070	0.101	0.130	0.156	0.180	0.202	0.220	0.237	0.250	0.262	0.270	0.277	0.280	0.282	0.280	0.277	0.270	0.262	0.250	0.237	0.220	0.202	0.180	0.156	0.130	0.101	0.070	0.036	0.000
REQUIRED CAMBER	0″	1 1/8″	2 9/16″	3 5/8″	5″	6 3/4″	8 1/16″	9 3/8″	11″	12 1/4″	13 3/16″	14 5/16″	15 3/16″	15 9/16″	16″	16 1/4″	16″	15 9/16″	15 3/16″	14 5/16″	13 3/16″	12 1/4″	11″	9 3/8″	8 1/16″	6 3/4″	5″	3 5/8″	2 9/16″	1 1/8″	0″

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



SPAN B

SCHEMATIC CAMBER ORDINATES

(SLOPE FOR THE ZERO CAMBER BASE LINE VARIES)

Mead & Hunt
111 E. Hargett Street
Suite 300
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NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA

DocuSigned by: Alex Forfa
1/7/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTION AND CAMBER TABLES

DRAWN BY :	J.S. HOBSON	DATE :	07/23/18
CHECKED BY :	A.J. FORFA	DATE :	08/16/18
DESIGN ENGINEER OF RECORD :	A.J. FORFA	DATE :	09/28/18

REVISIONS

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

SHEET NO. S-22
TOTAL SHEETS 42

NOTES

VALUES GIVEN ARE AT THIRTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

UPWARD DEFLECTIONS ARE INDICATED WITH A "-" SIGN.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN C - GIRDERS 1 & 4

THIRTIETH POINTS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	-0.004	-0.010	-0.014	-0.015	-0.016	-0.017	-0.015	-0.013	-0.011	-0.008	-0.004	-0.001	0.002	0.007	0.010	0.012	0.016	0.018	0.019	0.021	0.022	0.021	0.020	0.019	0.017	0.014	0.011	0.008	0.003	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	-0.011	-0.025	-0.035	-0.034	-0.033	-0.031	-0.022	-0.008	0.001	0.015	0.034	0.048	0.062	0.080	0.094	0.103	0.115	0.124	0.125	0.127	0.129	0.122	0.113	0.107	0.093	0.075	0.061	0.043	0.018	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	-0.001	-0.002	-0.003	-0.002	-0.002	-0.001	0.000	0.002	0.003	0.005	0.007	0.008	0.010	0.012	0.013	0.014	0.015	0.016	0.016	0.016	0.016	0.015	0.014	0.013	0.011	0.009	0.007	0.005	0.002	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	-0.016	-0.037	-0.052	-0.051	-0.051	-0.049	-0.037	-0.019	-0.007	0.012	0.037	0.055	0.074	0.099	0.117	0.129	0.146	0.158	0.160	0.164	0.167	0.158	0.147	0.139	0.121	0.098	0.079	0.056	0.023	0.000
VERTICAL CURVE ORDINATE	0.000	0.015	0.030	0.043	0.055	0.066	0.076	0.085	0.093	0.100	0.106	0.111	0.115	0.117	0.119	0.119	0.119	0.117	0.115	0.111	0.106	0.100	0.093	0.085	0.076	0.066	0.055	0.043	0.030	0.015	0.000
REQUIRED CAMBER	0"	0"	-1/16"	-1/8"	1/16"	3/16"	5/16"	9/16"	7/8"	1 1/8"	1 7/16"	1 3/4"	2 1/16"	2 5/16"	2 5/8"	2 13/16"	3"	3 3/16"	3 1/4"	3 1/4"	3 1/4"	3 3/16"	3"	2 13/16"	2 9/16"	2 1/4"	1 13/16"	1 7/16"	1"	7/16"	0"

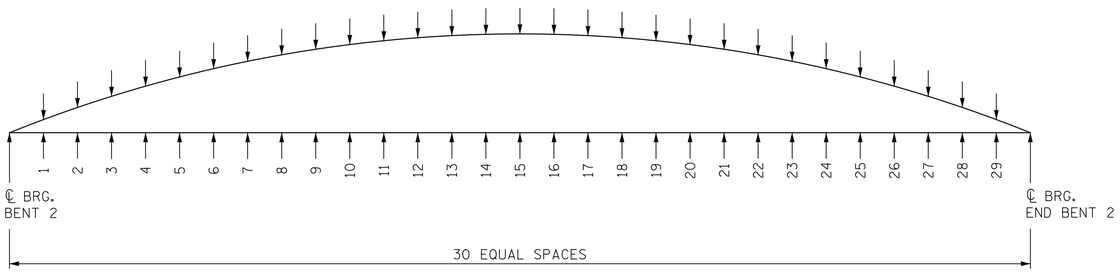
* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN C - GIRDERS 2 & 3

THIRTIETH POINTS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	-0.004	-0.010	-0.014	-0.015	-0.016	-0.017	-0.015	-0.013	-0.011	-0.008	-0.004	-0.001	0.002	0.007	0.010	0.013	0.016	0.019	0.020	0.021	0.022	0.021	0.020	0.019	0.017	0.014	0.011	0.008	0.003	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	-0.010	-0.024	-0.035	-0.033	-0.031	-0.030	-0.020	-0.006	0.004	0.018	0.037	0.052	0.065	0.084	0.098	0.107	0.119	0.128	0.129	0.131	0.133	0.126	0.117	0.110	0.096	0.077	0.062	0.044	0.019	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	-0.001	-0.002	-0.003	-0.002	-0.002	-0.001	0.000	0.002	0.003	0.005	0.007	0.008	0.010	0.012	0.013	0.014	0.015	0.016	0.016	0.016	0.016	0.015	0.014	0.013	0.011	0.009	0.007	0.005	0.002	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	-0.015	-0.036	-0.052	-0.050	-0.049	-0.048	-0.035	-0.017	-0.004	0.015	0.040	0.059	0.077	0.103	0.121	0.134	0.150	0.163	0.165	0.168	0.171	0.162	0.151	0.142	0.124	0.100	0.080	0.057	0.024	0.000
VERTICAL CURVE ORDINATE	0.000	0.015	0.030	0.043	0.055	0.066	0.076	0.085	0.093	0.100	0.106	0.111	0.115	0.117	0.119	0.119	0.119	0.117	0.115	0.111	0.106	0.100	0.093	0.085	0.076	0.066	0.055	0.043	0.030	0.015	0.000
REQUIRED CAMBER	0"	0"	-1/16"	-1/8"	1/16"	3/16"	5/16"	5/8"	15/16"	1 1/8"	1 7/16"	1 13/16"	2 1/16"	2 5/16"	2 11/16"	2 7/8"	3 1/16"	3 3/16"	3 5/16"	3 5/16"	3 5/16"	3 1/4"	3 1/16"	2 13/16"	2 5/8"	2 5/16"	1 7/8"	1 1/2"	1 1/16"	1/2"	0"

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



SPAN C

SCHEMATIC CAMBER ORDINATES

(SLOPE FOR THE ZERO CAMBER BASE LINE VARIES)

Mead & Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA

DocuSigned by: Alex Forfa 1/7/2019

DRAWN BY : J.S. HOBSON DATE : 07/23/18
CHECKED BY : A.J. FORFA DATE : 08/16/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

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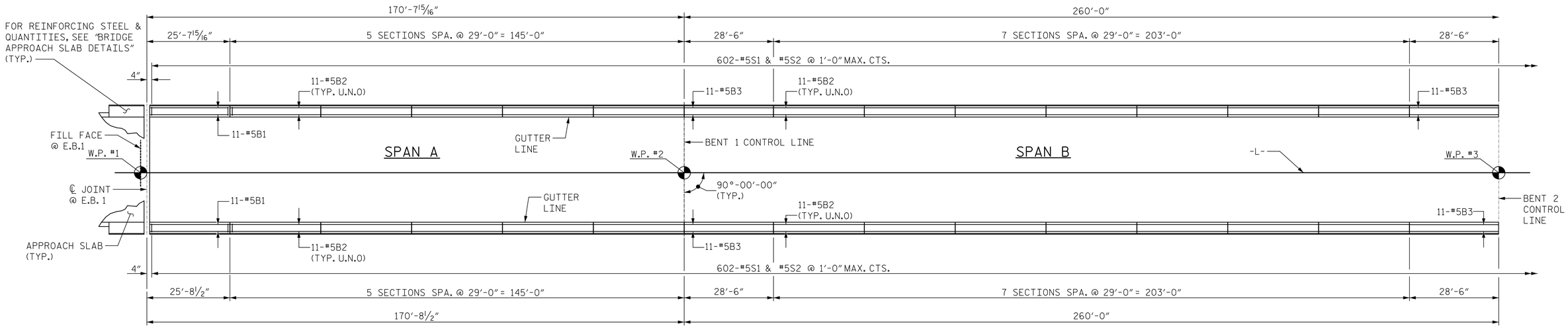
PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

SHEET 3 OF 3

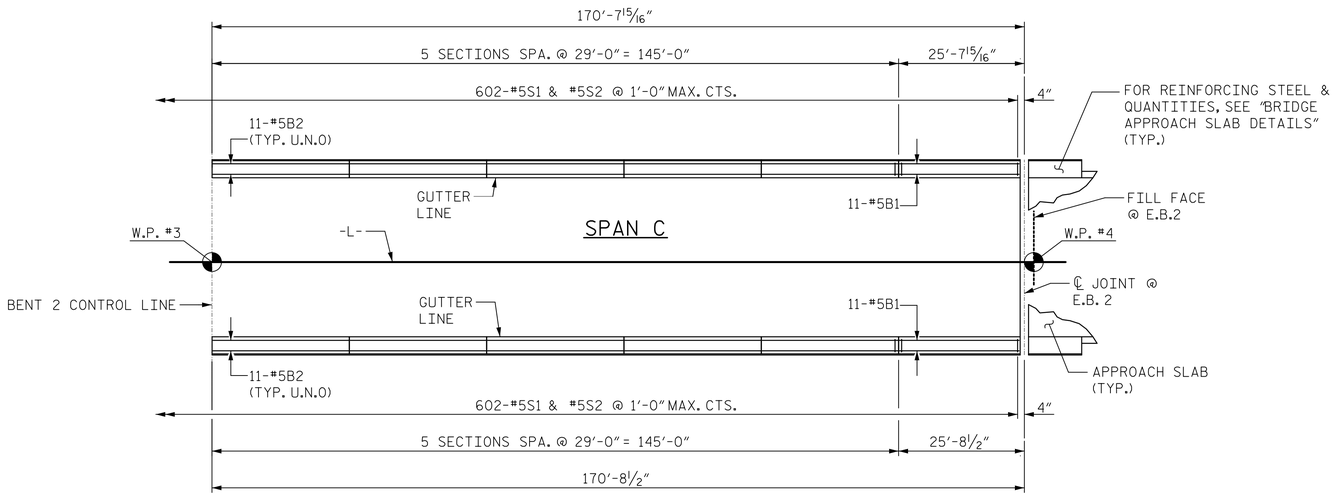
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

DEAD LOAD DEFLECTION AND CAMBER TABLES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			42



PLAN - SPANS A & B



PLAN - SPAN C

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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA

DocuSigned by: Alex Forfa 1/7/2019

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PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			42

DRAWN BY : J.A. LEE DATE : 05/30/18
CHECKED BY : A.J. FORFA DATE : 08/08/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

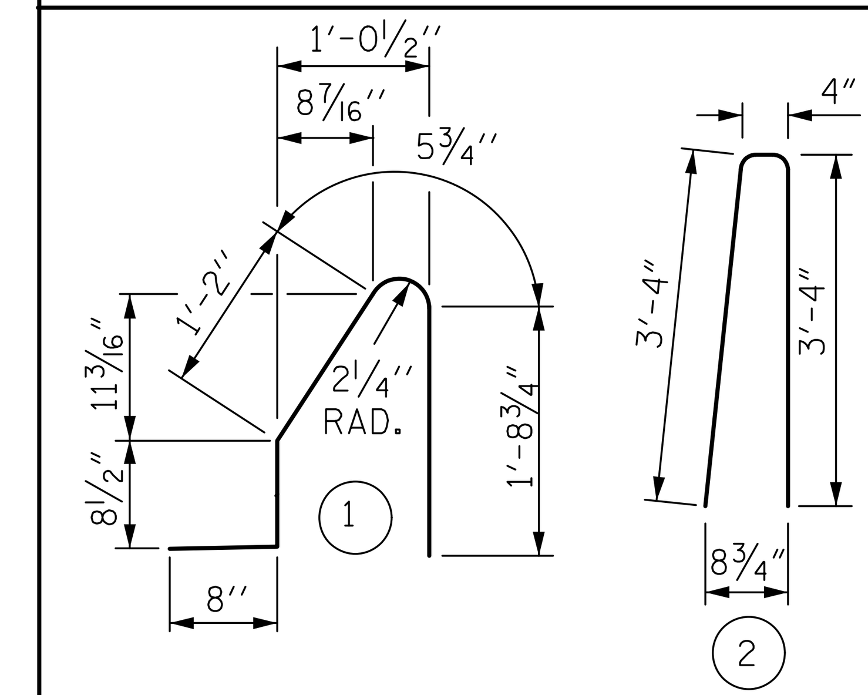
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

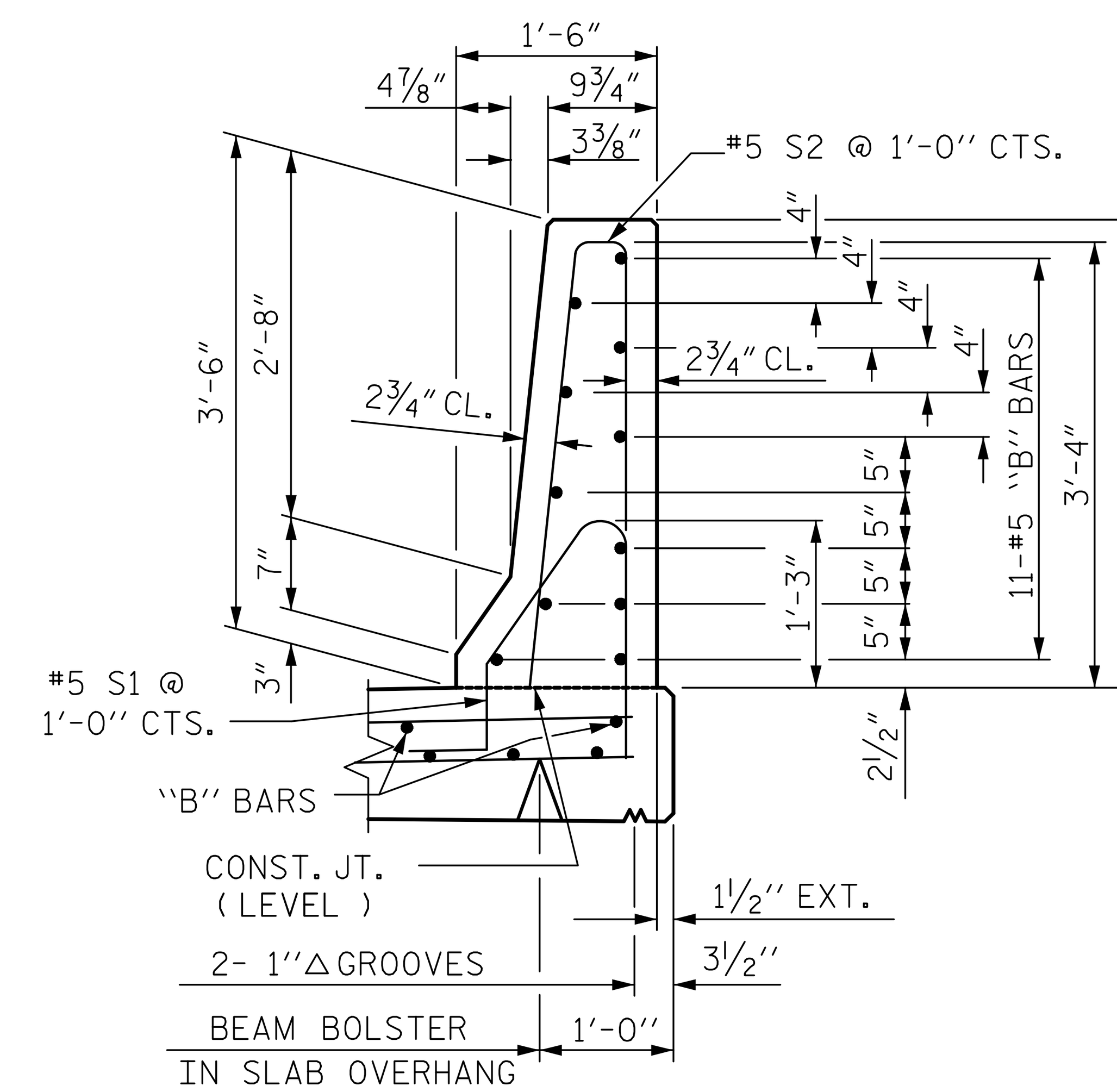
BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

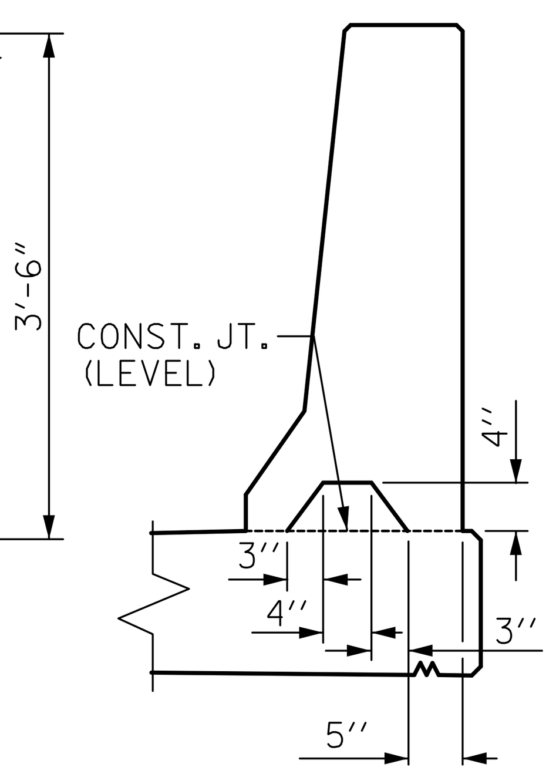
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	1204	#5	1	4'-9"	5965
* S2	1204	#5	2	7'-0"	8790
* B1	44	#5	STR	25'-3"	1159
* B2	374	#5	STR	28'-7"	11150
* B3	44	#5	STR	28'-1"	1289

* EPOXY COATED REINFORCING STEEL	28353 LBS.
CLASS AA CONCRETE	163.6 CU. YDS.
CONCRETE BARRIER RAIL	
SUPERSTRUCTURE	1202.8 LIN. FT.
• APPROACH SLABS	40.0 LIN. FT.
TOTAL	1242.8 LIN. FT.

• FOR EPOXY COATED REINFORCING STEEL AND CLASS AA CONCRETE IN THE BARRIER RAIL ON THE APPROACH SLABS, SEE "BRIDGE APPROACH SLAB DETAILS" SHEET.

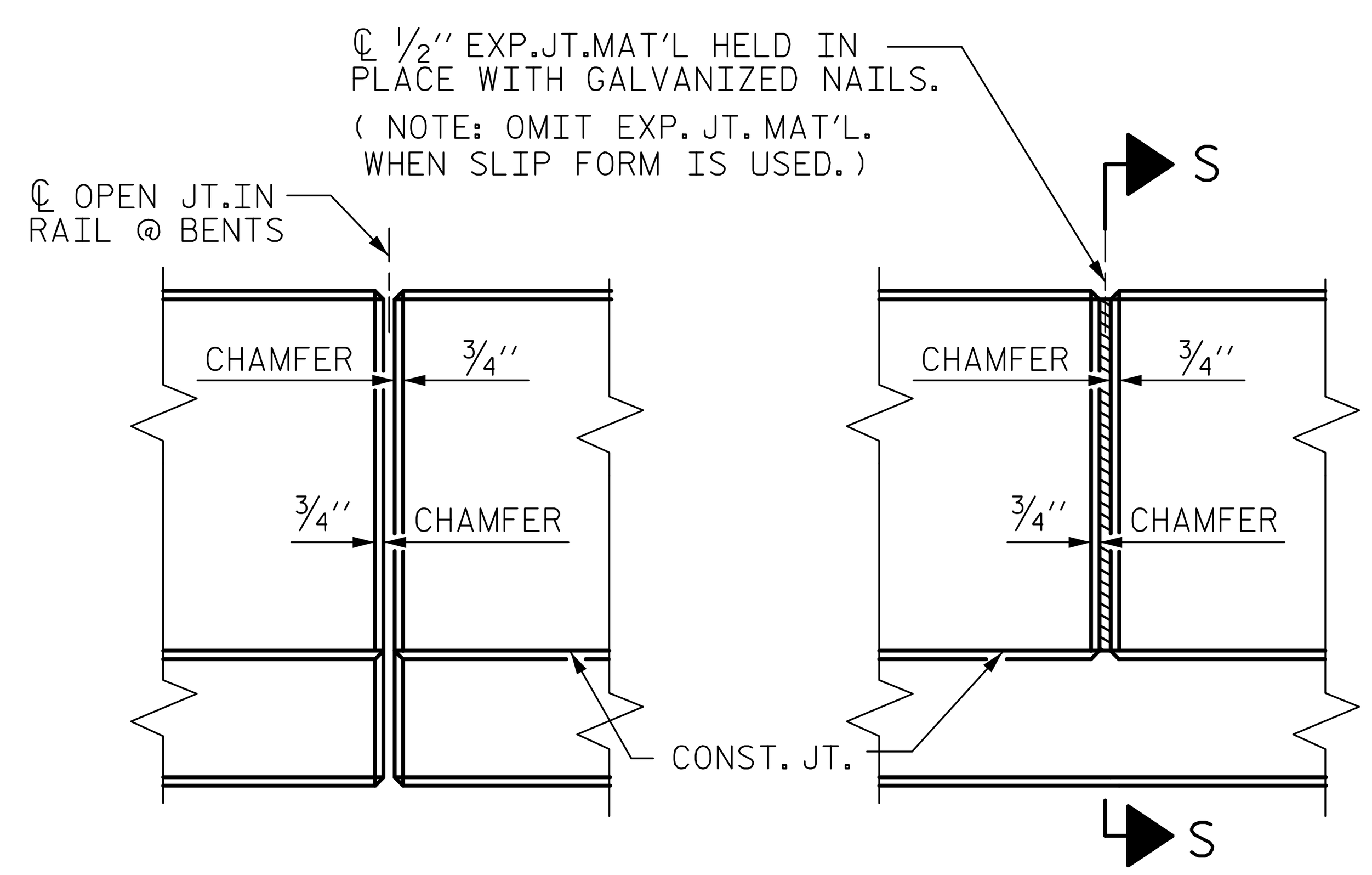


SECTION THRU RAIL



SECTION S-S

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



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

Mead & Hunt
111 E. Hargett Street
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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA

DocuSigned by: Alex Forfa
1/7/2019

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PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE BARRIER RAIL

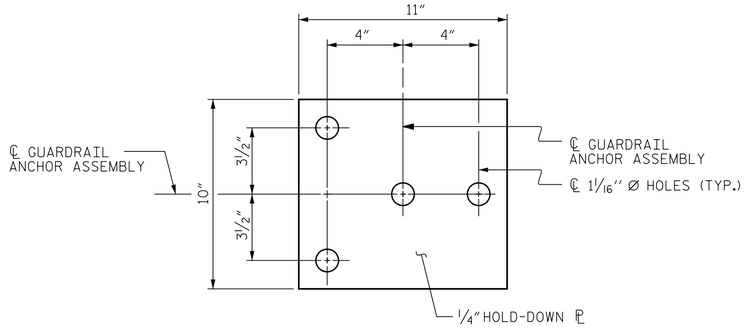
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-25
TOTAL SHEETS 42

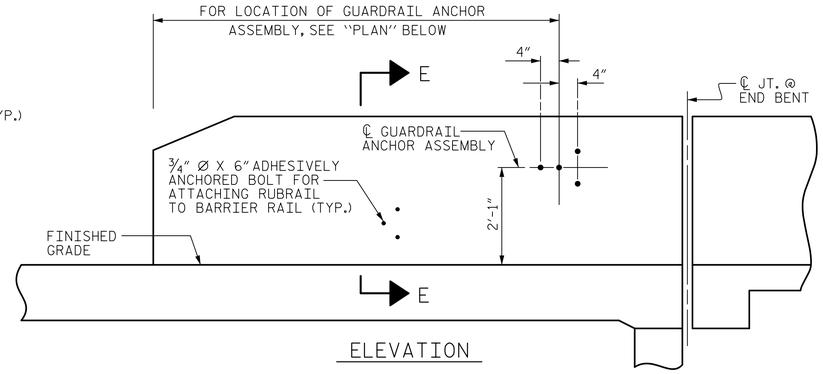
ASSEMBLED BY : J.A. LEE	DATE : 05/23/18
CHECKED BY : A.J. FORFA	DATE : 08/09/18

DRAWN BY : ARB 5/87	REV. 7/12	MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13	MAA/GM
	REV. 12/17	MAA/THC

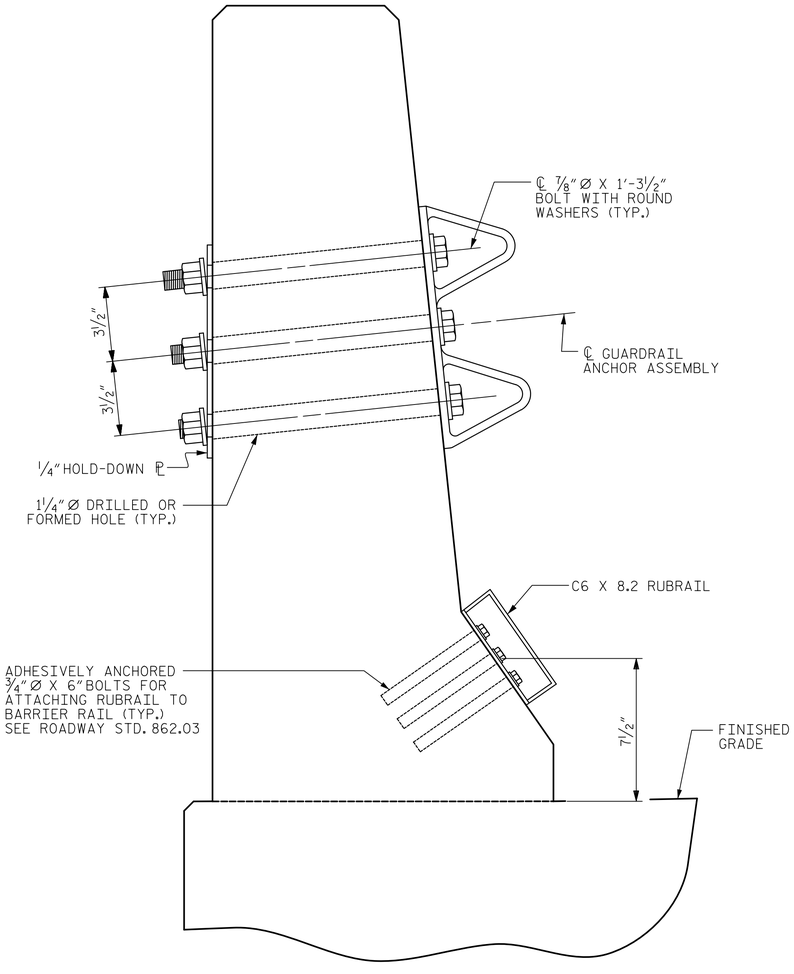
STD. NO. CBR1 (SHT 1)



PLAN

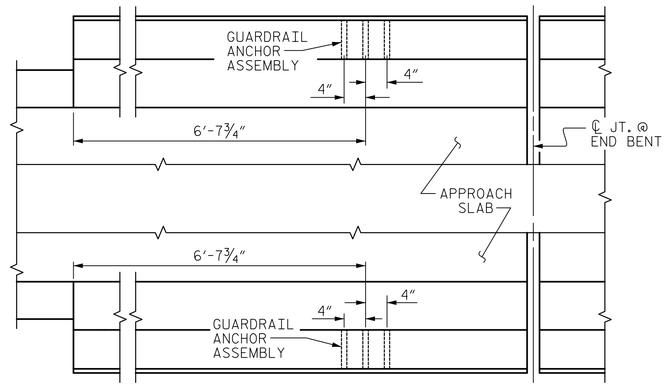


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR

NOTES

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

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 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.)

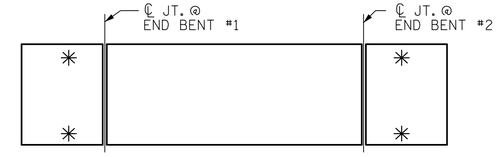
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

ASSEMBLED BY : J.A. LEE	DATE : 05/10/18
CHECKED BY : A.J. FORFA	DATE : 08/09/18
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042449 ALEXANDER J. FORFA

DocuSigned by: Alex Forfa 0013302B8304DE...

1/7/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4968

LEE/CHATHAM COUNTY

STATION: 34+65.00 -L-

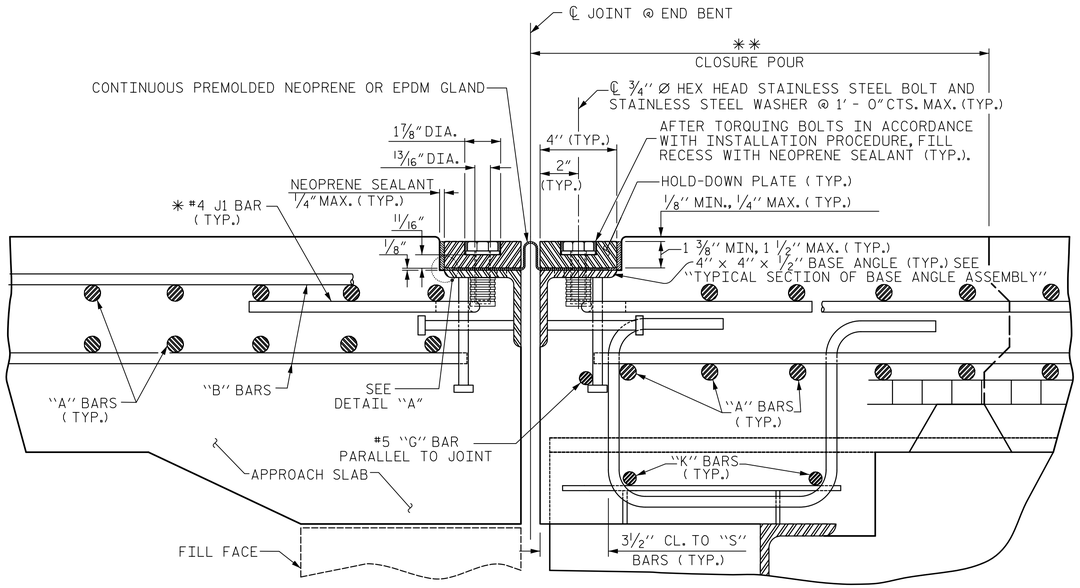
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			42

STD. NO. GRA2 (SHT 3)



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.

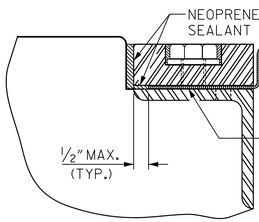
** SEE "BILL OF MATERIAL" SHEET FOR CLOSURE POUR LOCATIONS AT END BENTS.

INSTALLATION PROCEDURE

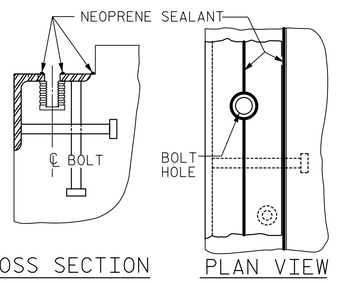
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4⅛" TO 4¼" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE ¾" 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 ½" 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 REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED ⅞" 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, THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, AND THE LIFTING HOLES IN THE HOLD-DOWN PLATE, AND COMPLETELY FILL THE RECESSES AND LIFTING HOLES 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. MINIMUM.
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 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
7. THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
8. 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 REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
9. 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.
10. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
11. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE ¾" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.
12. THE FABRICATOR SHALL PROVIDE ½" Ø THREADED HOLES IN THE HOLD-DOWN PLATES TO ASSIST IN LIFTING AND PLACING. THE HOLES SHALL BE ¾" DEEP AT 6'-0" MAXIMUM SPACING AND A MINIMUM OF TWO HOLES PER PLATE.

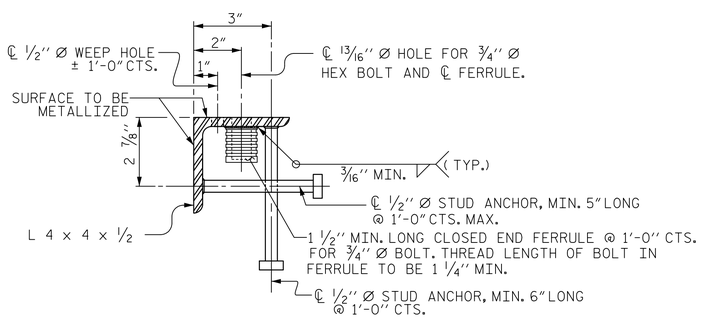


DETAIL ''A''

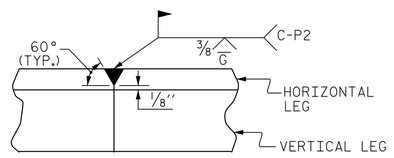


INSTALLATION SKETCH

MOVEMENT AND SETTING AT JOINT					
END BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	90°	2 5⁄16"	2 ½"	2 3⁄16"	1 1⁄16"
2	90°	2 5⁄16"	2 ½"	2 3⁄16"	1 1⁄16"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

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DocuSigned by: Alex Forfa 1/7/2019

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PROJECT NO. B-4968

LEE/CHATHAM COUNTY

STATION: 34+65.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

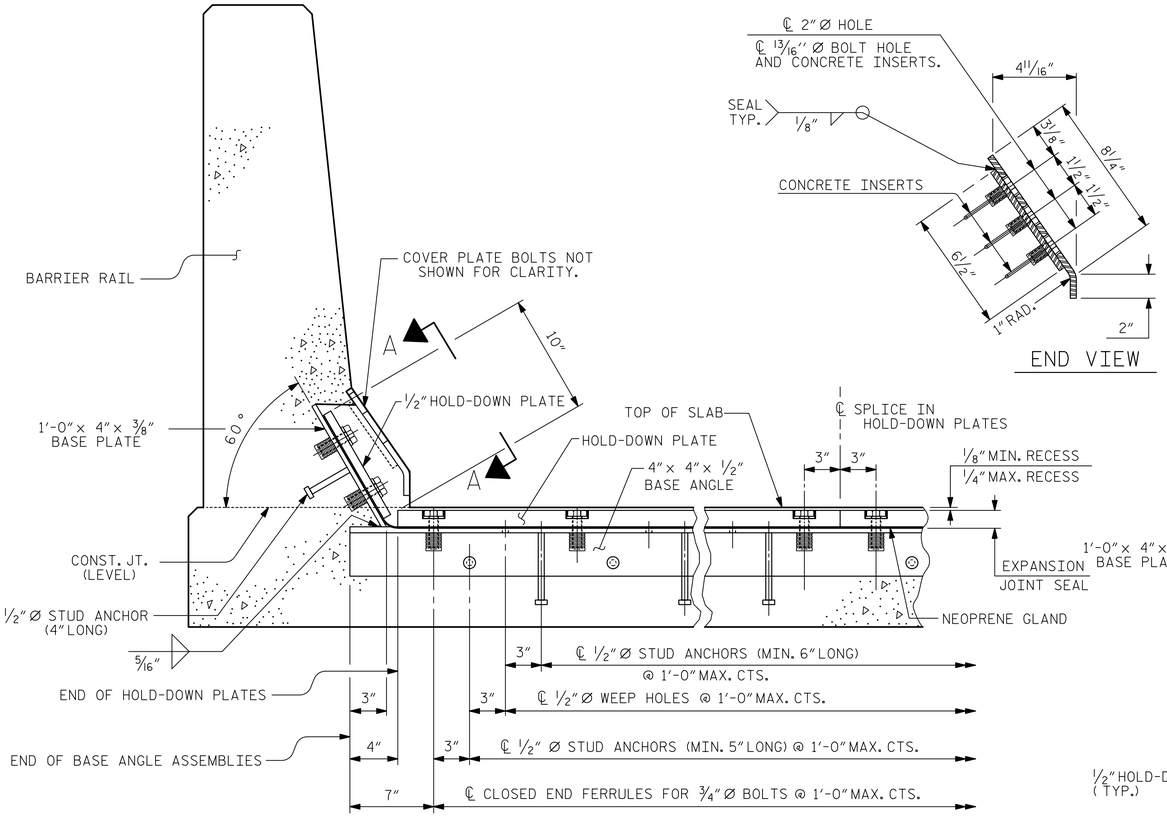
STANDARD

EXPANSION JOINT SEAL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			42

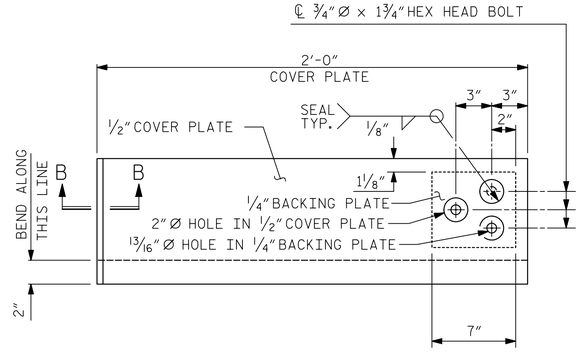
ASSEMBLED BY : J. A. LEE		DATE : 05/15/18
CHECKED BY : A.J. FORFA		DATE : 08/02/18
DRAWN BY : REK 9/87	REV. 10/1/11	MAA/GM.
CHECKED BY : CRK 10/87	REV. 10/17	MAA/THC.
	REV. 6/18	MAA/THC.

STD. NO. EJS1 (SHT 2a)



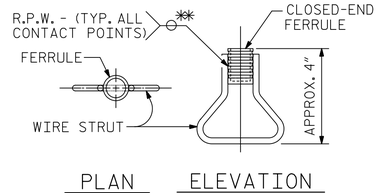
SECTION THRU RAIL NORMAL TO JOINT

END VIEW



TYPE II - ELEVATION VIEW

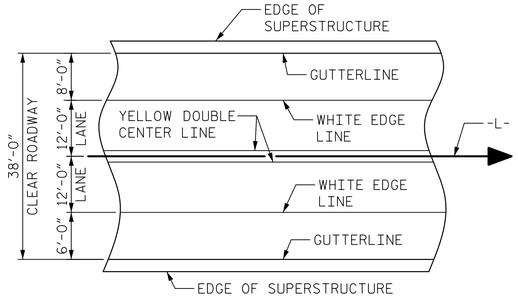
COVER PLATE DETAILS



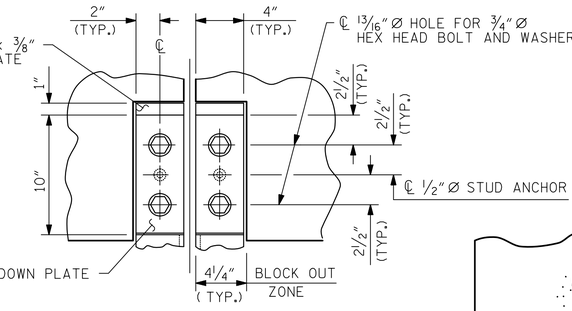
PLAN ELEVATION

CONCRETE INSERT

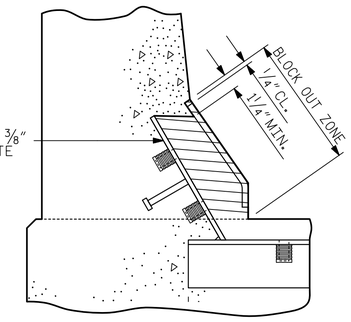
** EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



PAVEMENT MARKING ALIGNMENT

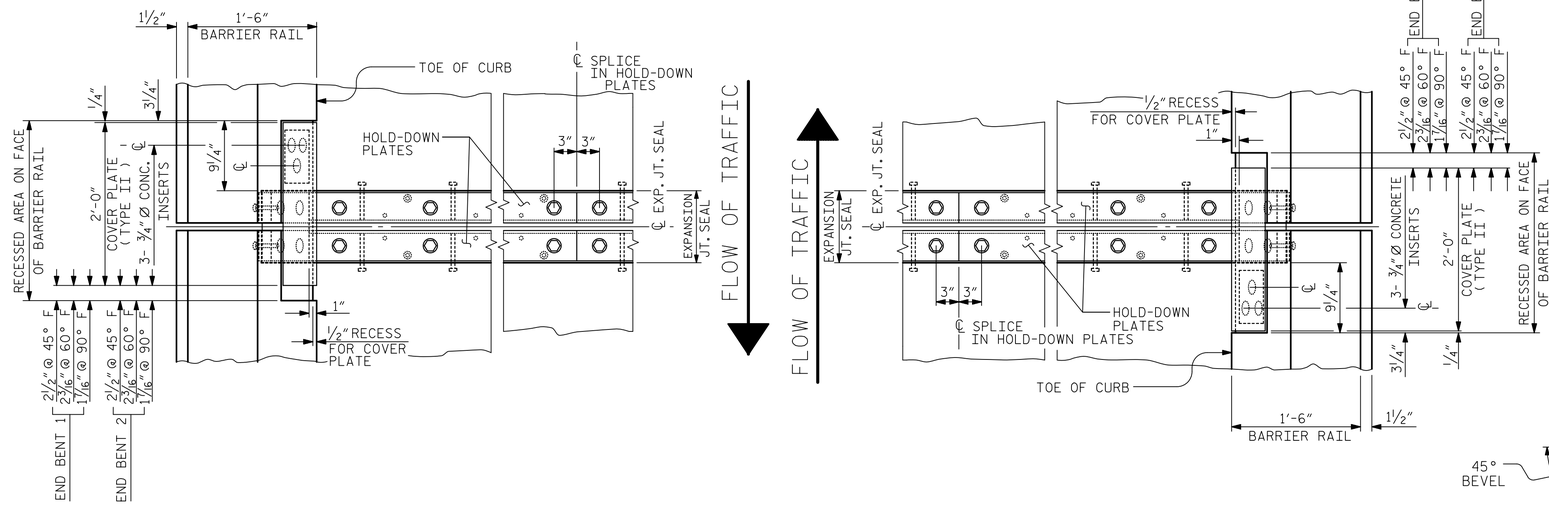


SECTION A - A

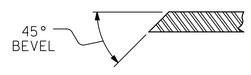


BLOCK OUT DETAIL

SEE "SECTION A - A" FOR OTHER DETAILS.



PLAN OF EXPANSION JOINT SEAL



SECTION B - B

ASSEMBLED BY : J. A. LEE	DATE : 05/16/18		
CHECKED BY : A.J. FORFA	DATE : 08/07/18		
DRAWN BY : REK 9/87	REV. 7/12	MAA/GM	
CHECKED BY : CRK 10/87	REV. 6/13	MAA/GM	
	REV. 12/17	MAA/THC	

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DocuSigned by: Alex Forfa 1/7/2019

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PROJECT NO. B-4968

LEE/CHATHAM COUNTY

STATION: 34+65.00 -L-

SHEET 2 OF 2

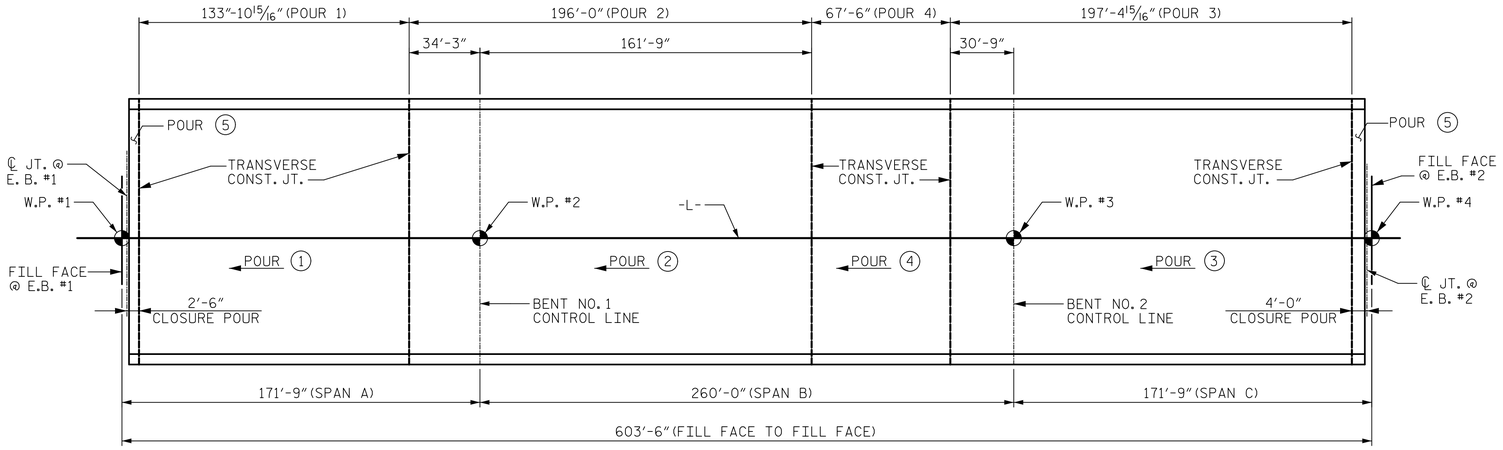
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

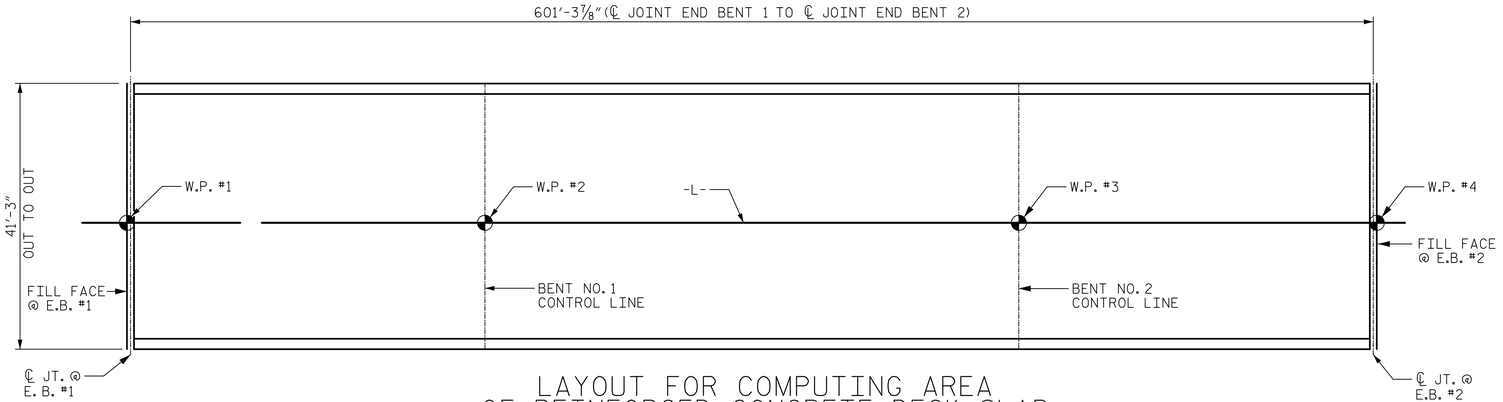
EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			42

STD. NO. EJS2 (SHT 1)

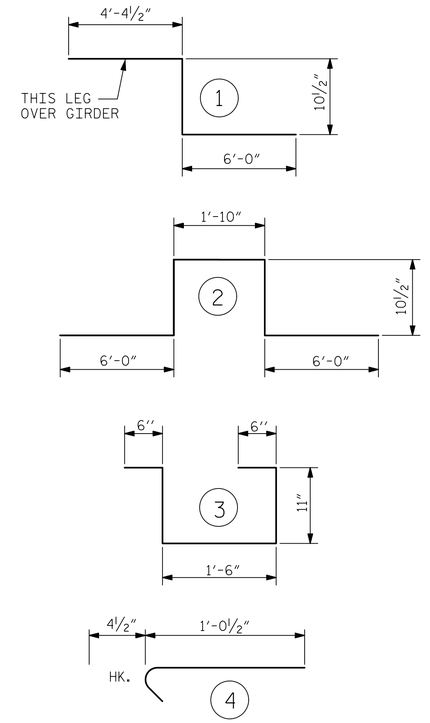


POURING SEQUENCE



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ.FT. = 24,808)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	1311	#5	STR	40′-11″	55,948
A2	1311	#5	STR	40′-11″	55,948
✳ B1	224	#4	STR	24′-5″	3,654
✳ B2	656	#6	STR	35′-4″	34,814
B3	583	#5	STR	56′-8″	34,457
✳ B4	168	#4	STR	28′-8″	3,217
✳ G1	2	#5	STR	40′-11″	85
✳ J1	76	#4	4	1′-5″	72
✳ K1	8	#5	1	11′-3″	94
✳ K2	8	#5	2	15′-7″	130
✳ S1	60	#4	3	4′-4″	174

✳EPOXY COATED REINF. STEEL (LBS.)	98,188
REINF. STEEL (LBS.)	90,405

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
SPANS A-C		90,405	98,188
POUR 1	176.7		
POUR 2	257.2		
POUR 3	259.2		
POUR 4	89.0		
POUR 5	12.3		
TOTALS✳✳	794.4	90,405	98,188

✳✳QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

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

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

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,715	SQ.FT.
BRIDGE DECK	21,022	SQ.FT.
TOTAL	22,727	SQ.FT.

ASSEMBLED BY : J.A.LEE DATE : 06/19/18
CHECKED BY : A.J. FORFA DATE : 08/07/18

DRAWN BY : JMB 5/87
CHECKED BY : SJD 9/87

REV. 5/1/06 TLA/GM
REV. 10/1/11 MAA/GM
REV. 12/17 MAA/THC

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DocuSigned by: Alex Forfa 0613FED2B839ADE...
1/7/2019

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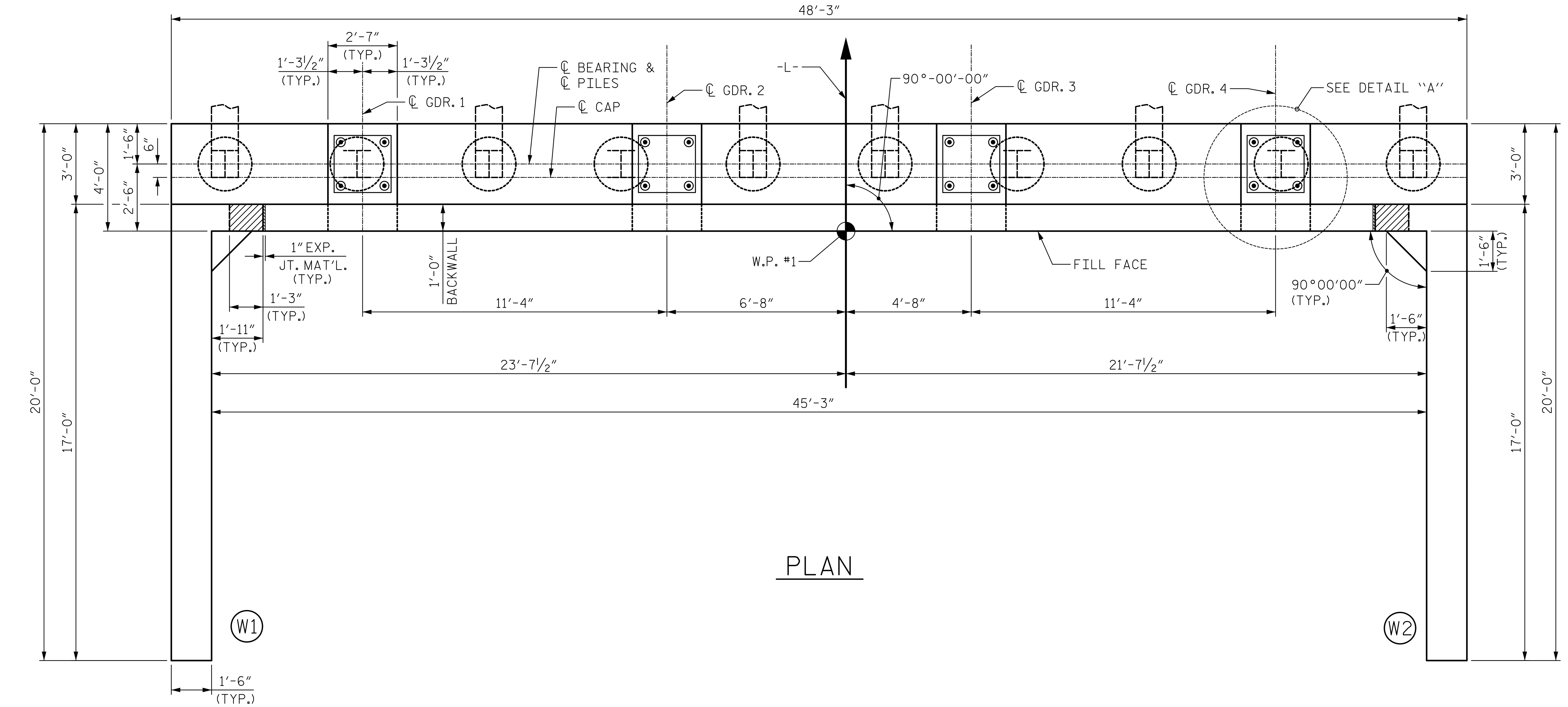
PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			42



PLAN

NOTES:

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR PIPE INSERTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

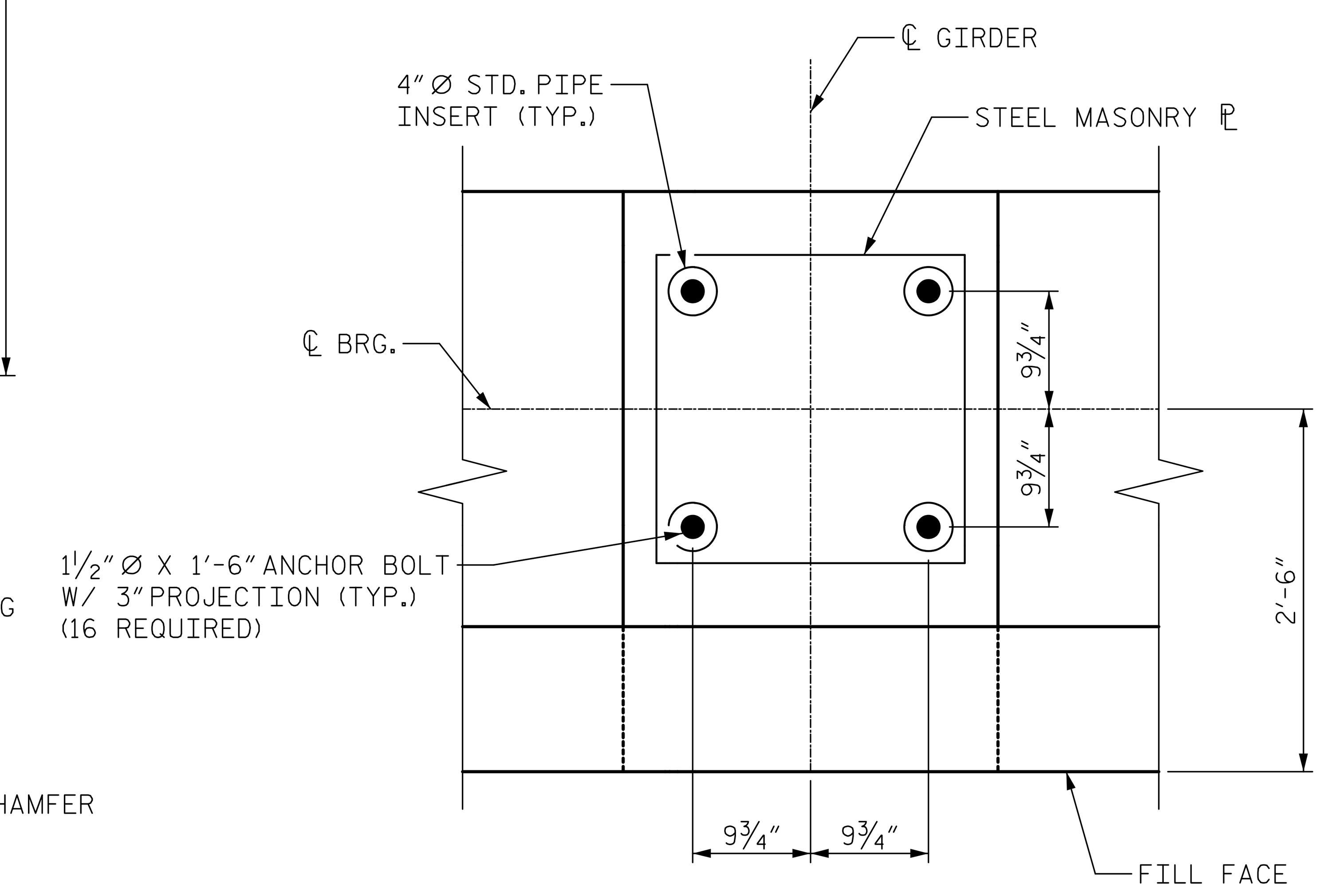
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILD-UPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

THE CONCRETE IN THE SHADED AREA OF THE WINGS SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

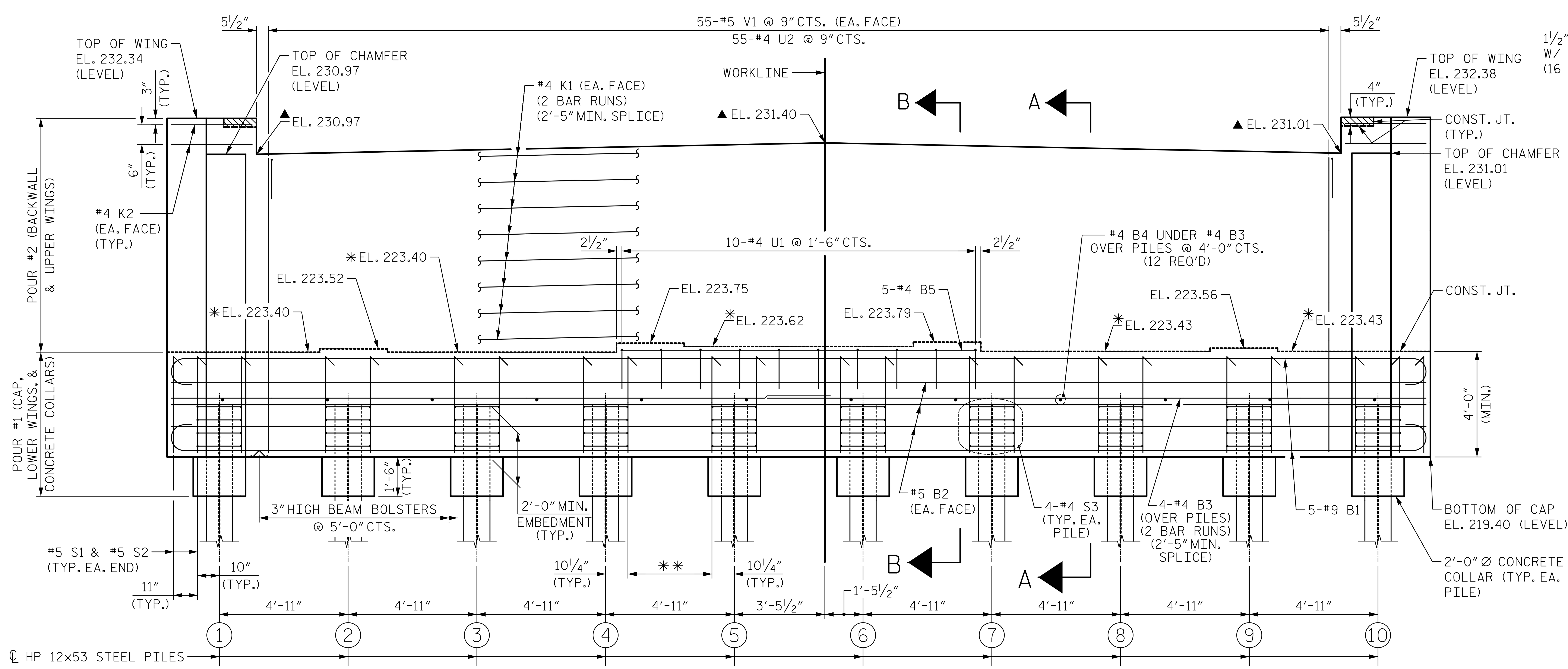
FOR PIPE INSERT DETAILS, SEE "DISC BEARING DETAILS" SHEET.

✳ FOR LOCATION OF ELEVATION BETWEEN BUILDUPS, SEE SECTION A-A ON SHEET 3 OF 3.

▲ ELEVATION TAKEN ALONG FILL FACE OF BACKWALL.



DETAIL "A"
(TYP. AT EACH BRIDGE SEAT)



ELEVATION

PILES AND REINFORCING STEEL NOT SHOWN IN WING BRACE PILE CAP FOR CLARITY, SEE WING DETAILS, SHEET 2 OF 3.

✳✳ 8-#5 S1 & S2 @ 5½" CTS. (TYP. EA. BAY)

DRAWN BY :	J.S. HOBSON	DATE :	07/17/18
CHECKED BY :	J.A. LEE	DATE :	08/08/18
DESIGN ENGINEER OF RECORD :	A.J. FORFA	DATE :	09/28/18

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DocuSigned by: Alex Forfa
1/7/2019

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PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

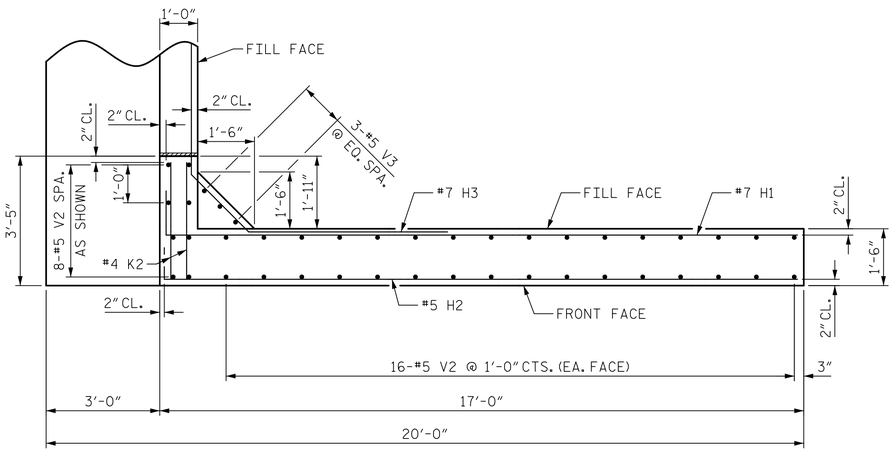
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

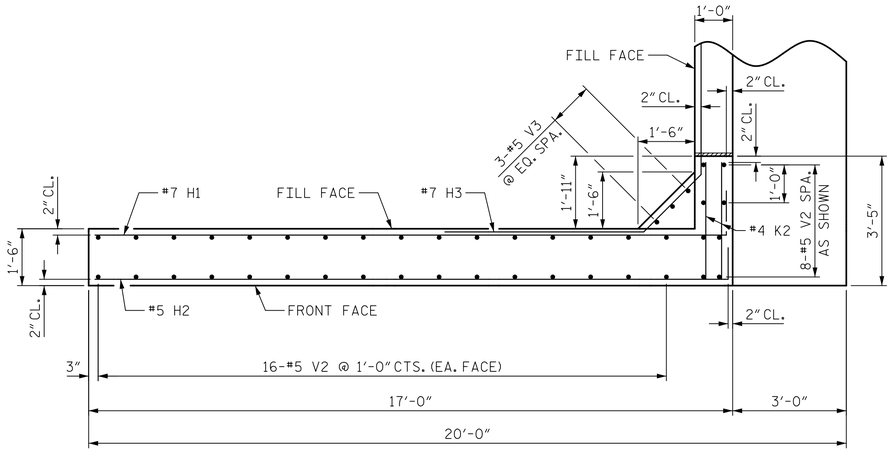
SUBSTRUCTURE

END BENT No. 1

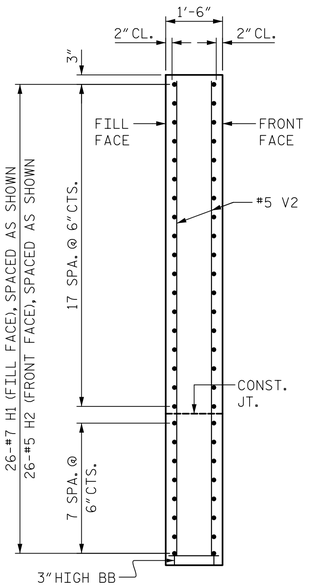
REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S-30
1			3					TOTAL SHEETS
2			4					42



PLAN OF WING W1



PLAN OF WING W2



SECTION X-X

ELEVATION OF WING W1

ELEVATION OF WING W2

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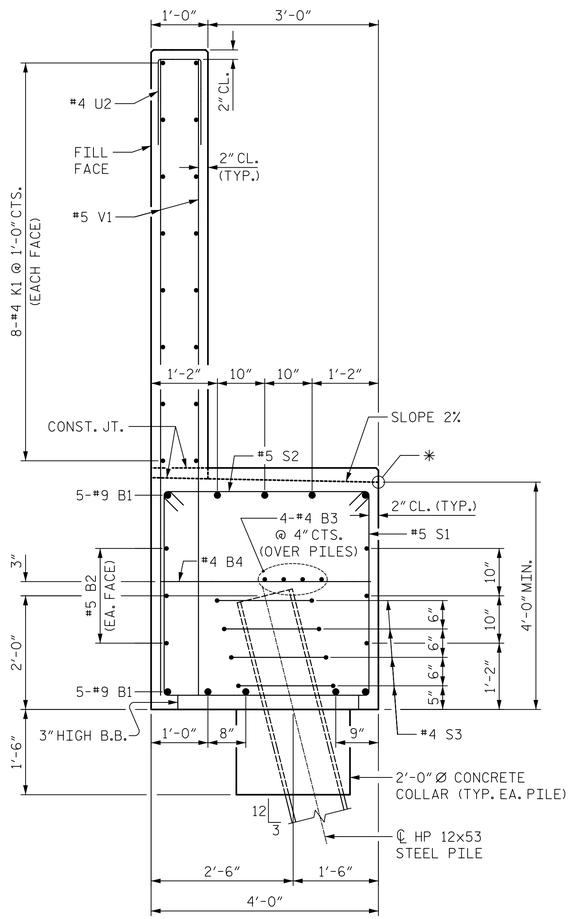
STATION: 34+65.00 -L-

SHEET 2 OF 3

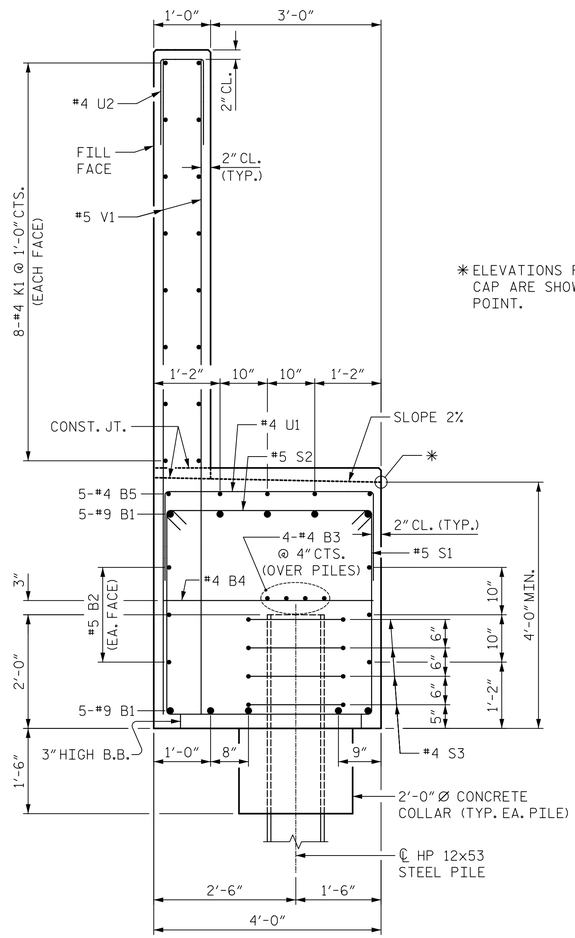
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			42

DRAWN BY : J.S. HOBSON DATE : 07/17/18
CHECKED BY : J.A. LEE DATE : 08/08/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18



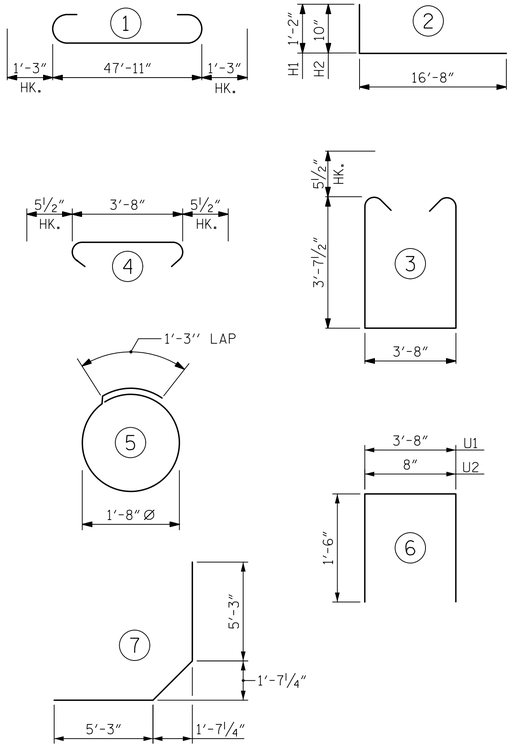
SECTION "A-A"



SECTION "B-B"

*ELEVATIONS FOR TOP OF CAP ARE SHOWN TO THIS POINT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	50'-5"	1714
B2	6	#5	STR	47'-11"	300
B3	8	#4	STR	25'-2"	134
B4	12	#4	STR	3'-8"	29
B5	5	#4	STR	13'-7"	45
H1	52	#7	2	17'-10"	1895
H2	52	#5	2	17'-6"	949
H3	46	#7	7	12'-9"	1199
K1	32	#4	STR	25'-2"	538
K2	8	#4	STR	3'-1"	16
S1	76	#5	3	11'-10"	938
S2	76	#5	4	4'-7"	363
S3	40	#4	5	6'-6"	174
U1	10	#4	6	6'-8"	45
U2	55	#4	6	3'-8"	135
V1	110	#5	STR	11'-1"	1272
V2	80	#5	STR	12'-6"	1043
V3	6	#5	STR	11'-1"	69

REINFORCING STEEL 10,858 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 39.0 C.Y.

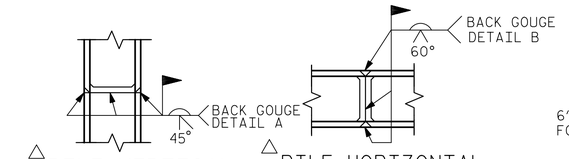
POUR #2 BACKWALL & UPPER PART OF WINGS 30.4 C.Y.

TOTAL CLASS A CONCRETE 69.4 C.Y.

HP 12 X 53 STEEL PILES
NO. 10 LIN. FT.= 326

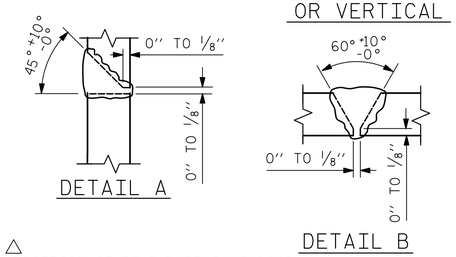
STEEL PILE POINTS NO: 10

PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 10



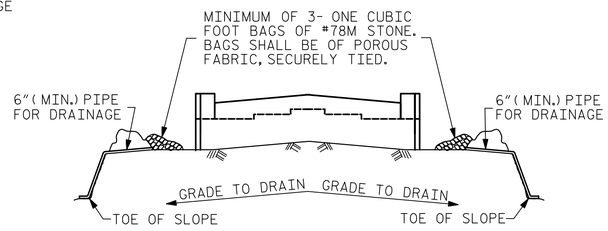
△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

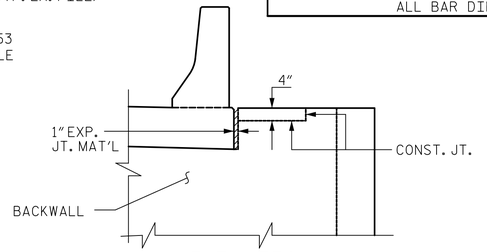


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

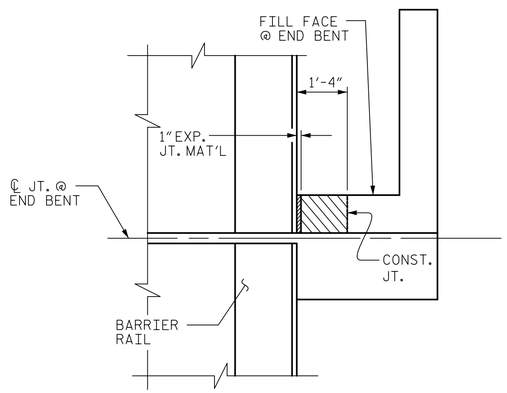
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



ELEVATION



PLAN

BLOCKOUT IN WING WALL

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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA

DocuSigned by: Alex Forfa 1/7/2019

DRAWN BY : J.S. HOBSON DATE : 07/17/18
CHECKED BY : J.A. LEE DATE : 08/08/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

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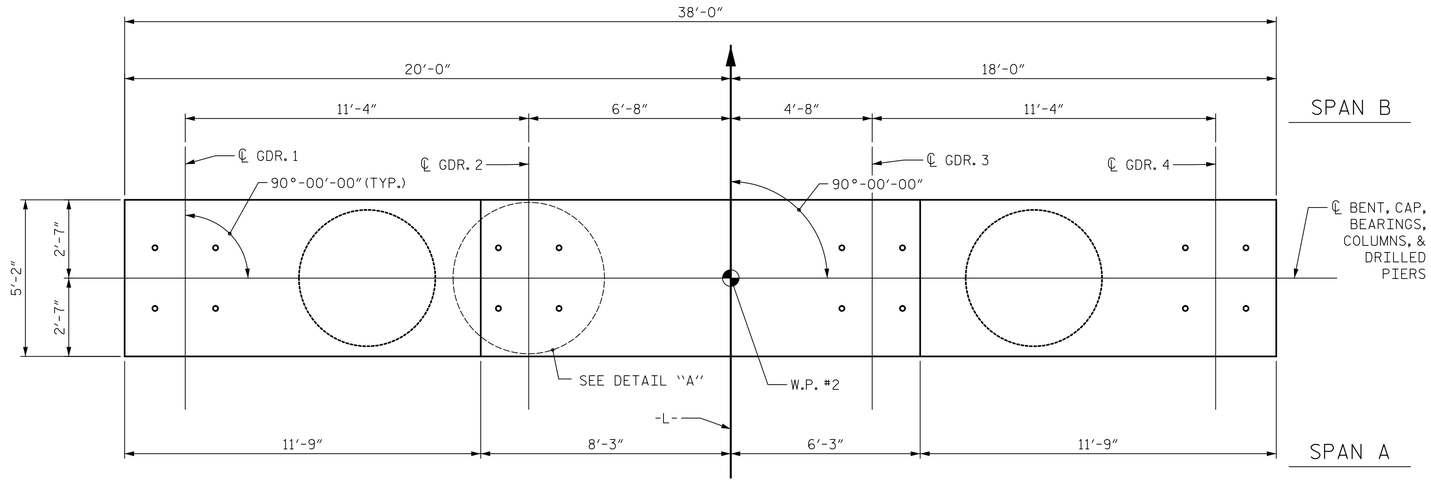
PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			42



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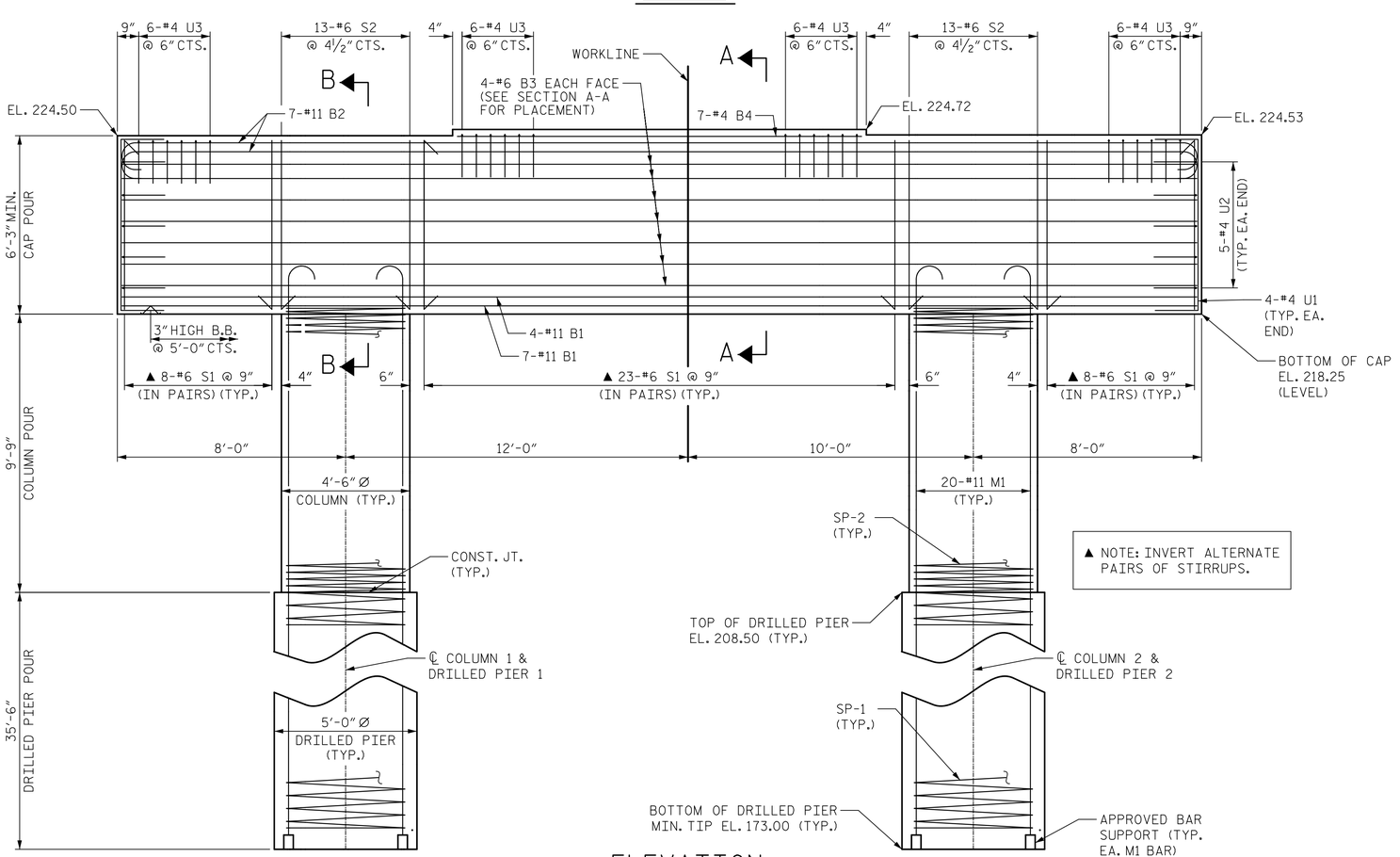

▲ NOTE: INVERT ALTERNATE PAIRS OF STIRRUPS.

ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER, UNLESS OTHERWISE NOTED.
FOR SECTIONS A-A AND B-B, SEE SHEET 2 OF 2

NOTES

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

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

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

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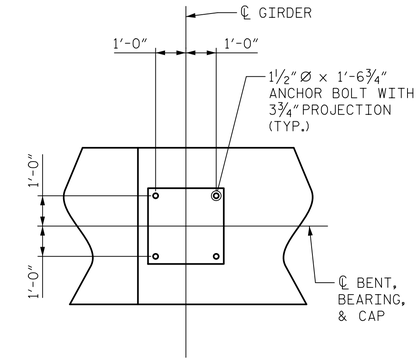
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIER WILL NOT BE PERMITTED.



DETAIL ″A″
(TYPICAL AT EACH BEARING)

Mead &Hunt
111 E. Hargett Street
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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER FORFA

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LEE/CHATHAM COUNTY
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SHEET 1 OF 2

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
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DRAWN BY : A.J. FORFA DATE : 07/19/18
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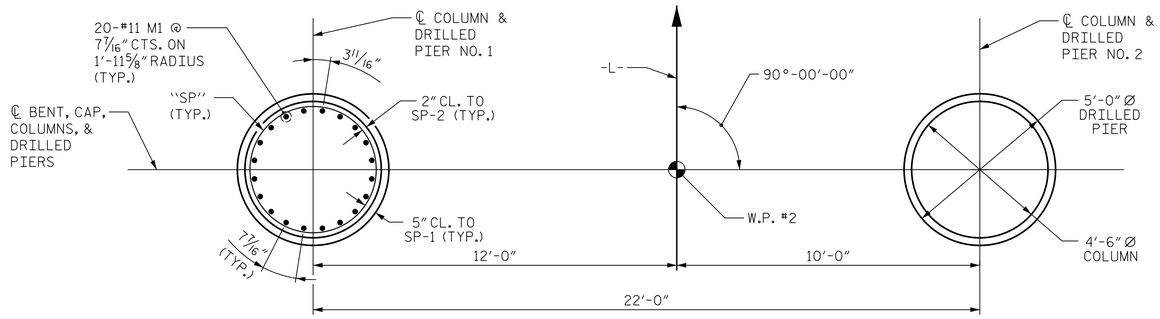
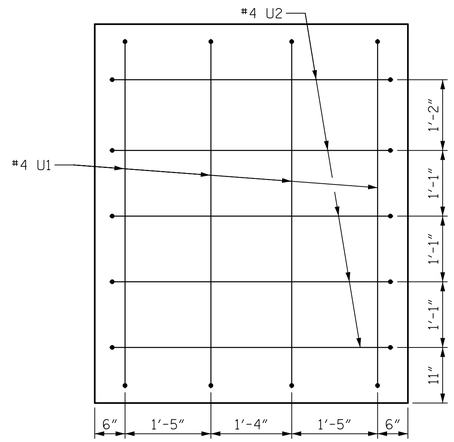
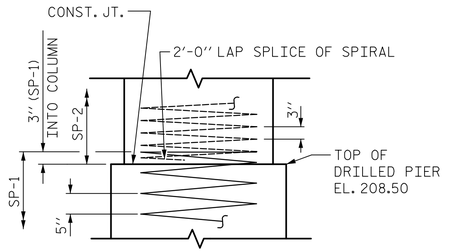


PLAN OF DRILLED PIERS & COLUMNS

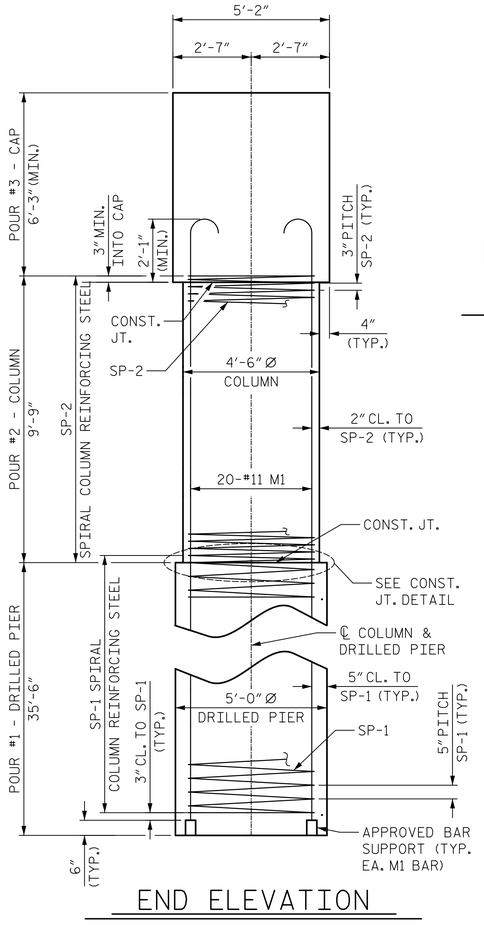


END OF CAP VIEW

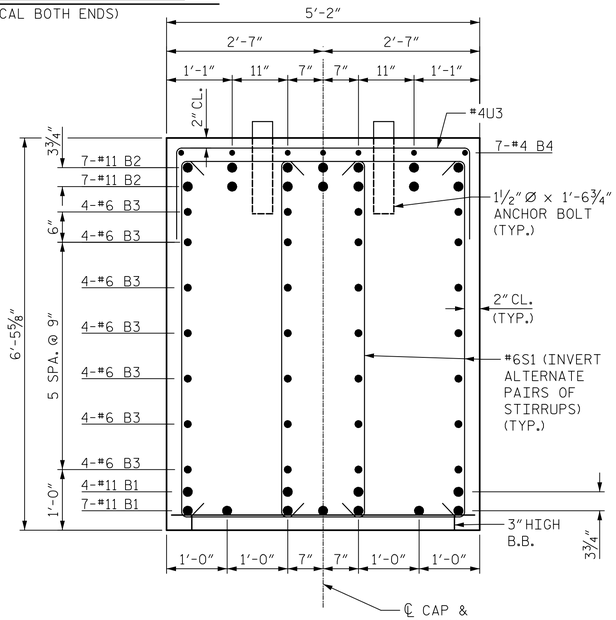
(TYPICAL BOTH ENDS)



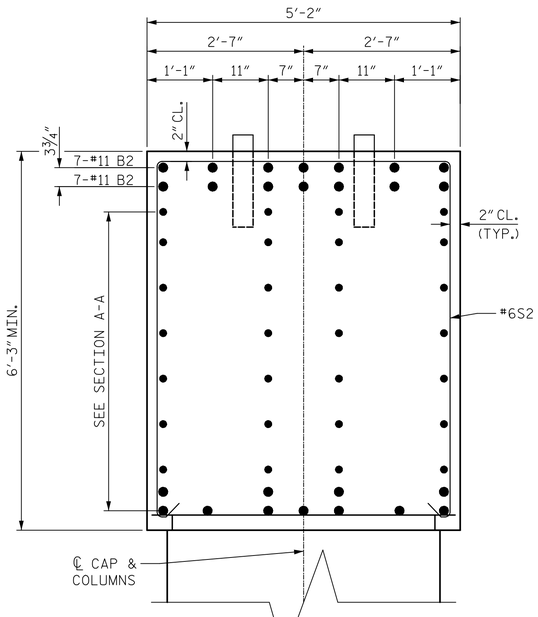
CONSTRUCTION JOINT DETAIL



END ELEVATION



SECTION A-A



SECTION B-B

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	11	#11	STR	37'-8"	2201
B2	14	#11	1	40'-8"	3025
B3	28	#6	STR	37'-8"	1584
B4	7	#4	STR	14'-2"	66
M1	40	#11	2	51'-5"	10927
S1	78	#6	3	16'-3"	1904
S2	26	#6	3	17'-11"	700
U1	8	#4	4	8'-9"	47
U2	10	#4	4	7'-8"	51
U3	24	#4	4	7'-10"	126
REINFORCING STEEL					20,631 LBS
SP-1	2	*	5	1105'-10"	2307
SP-2	2	**	6	537'-11"	719
SPIRAL COLUMN REINFORCING STEEL					3,026 LBS

*THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

**THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN	
POUR #2 (COLUMNS)	11.5 C.Y.
POUR #3 (CAP)	46.2 C.Y.
TOTAL CLASS A CONCRETE	57.7 C.Y.

DRILLED PIERS:

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	51.7 C.Y.
5'-0" Ø DRILLED PIER NOT IN SOIL	25.0 LIN. FT.
5'-0" Ø DRILLED PIER IN SOIL	46.0 LIN. FT.
PERMANENT STEEL CASING FOR 5'-0" Ø DRILLED PIER	11.0 LIN. FT.
CSL TUBES	370.0 LIN. FT.

DRAWN BY : A.J. FORFA DATE : 07/20/18
CHECKED BY : J.A. LEE DATE : 08/23/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

Mead &Hunt
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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER FORFA

DocuSigned by: Alex Forfa 1/7/2019

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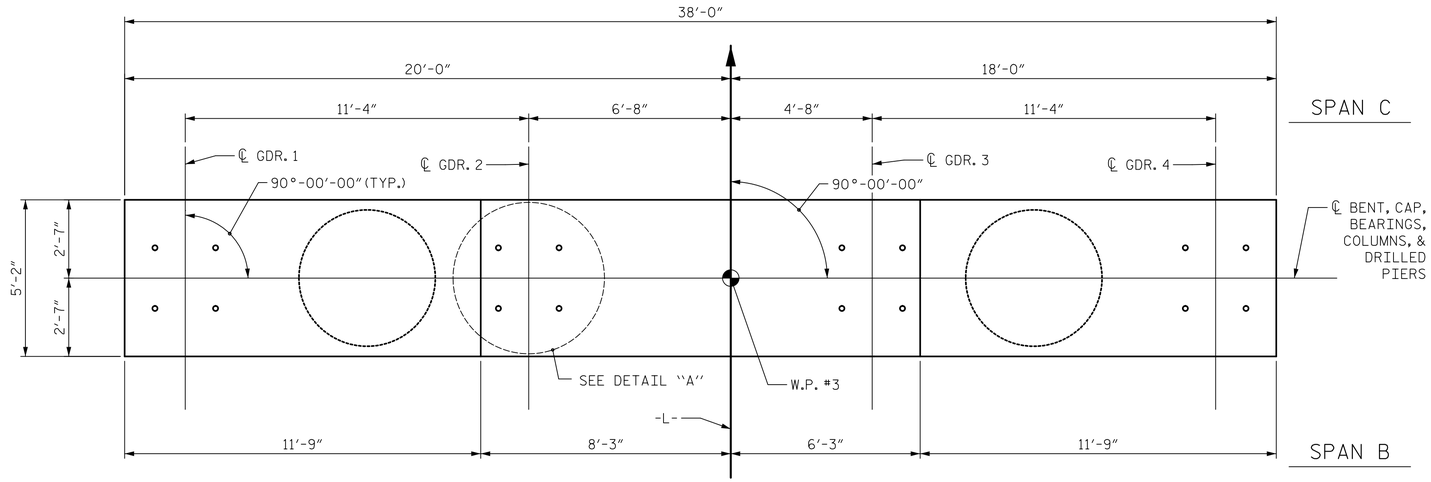
PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

SHEET 2 OF 2

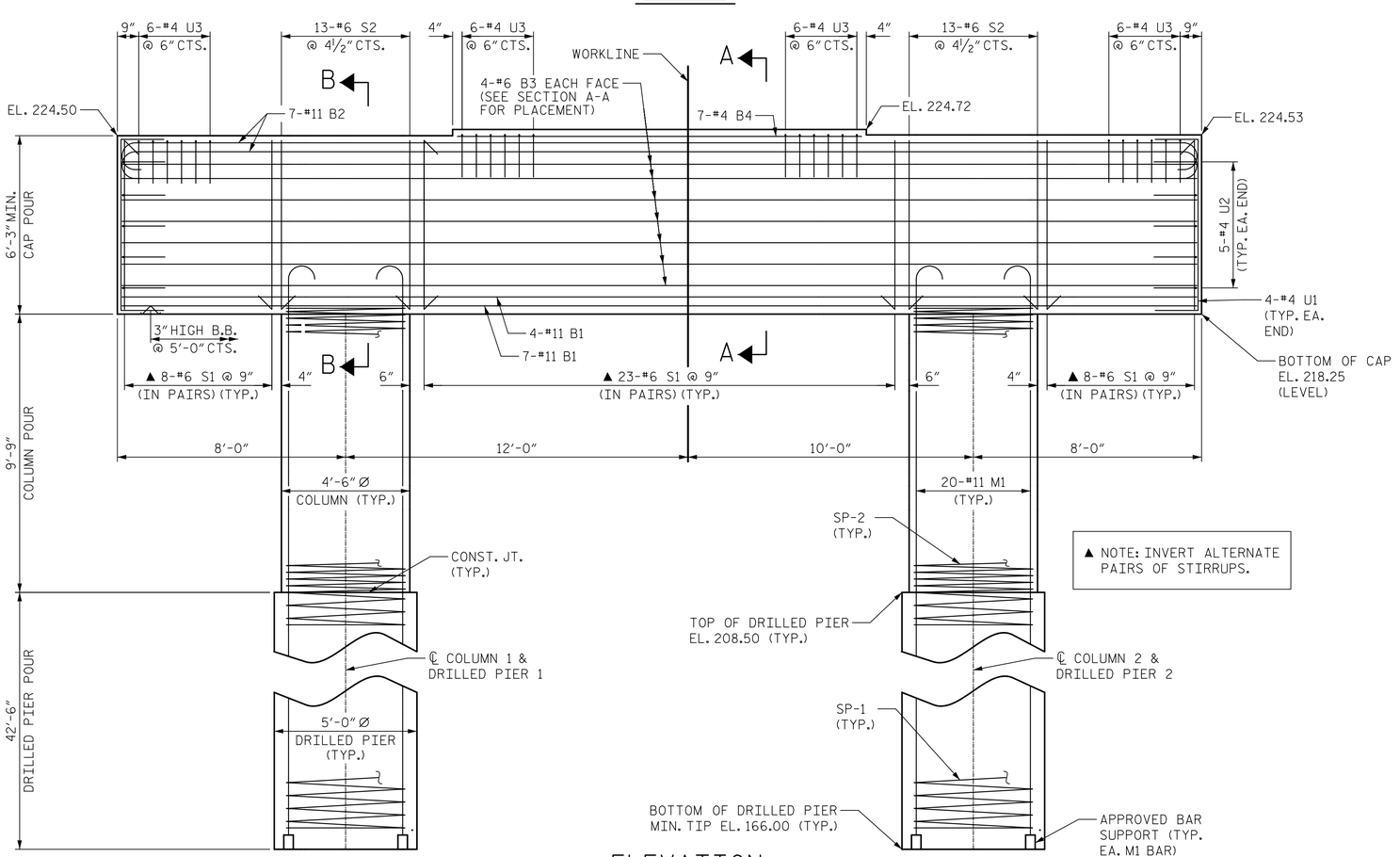
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			42



PLAN



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FOR SECTIONS A-A AND B-B, SEE SHEET 2 OF 2

NOTES

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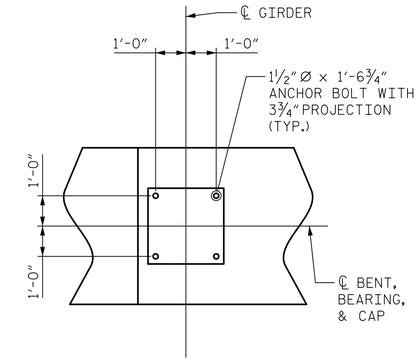

DETAIL ″A″

(TYPICAL AT EACH BEARING)

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042449 ALEXANDER FORFA

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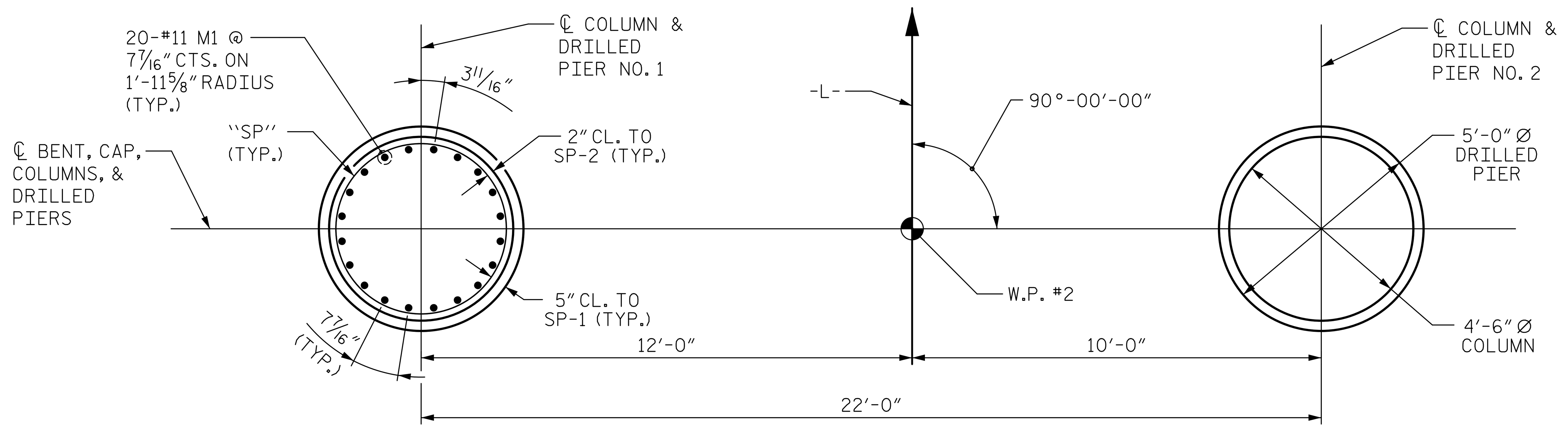
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

SHEET 1 OF 2

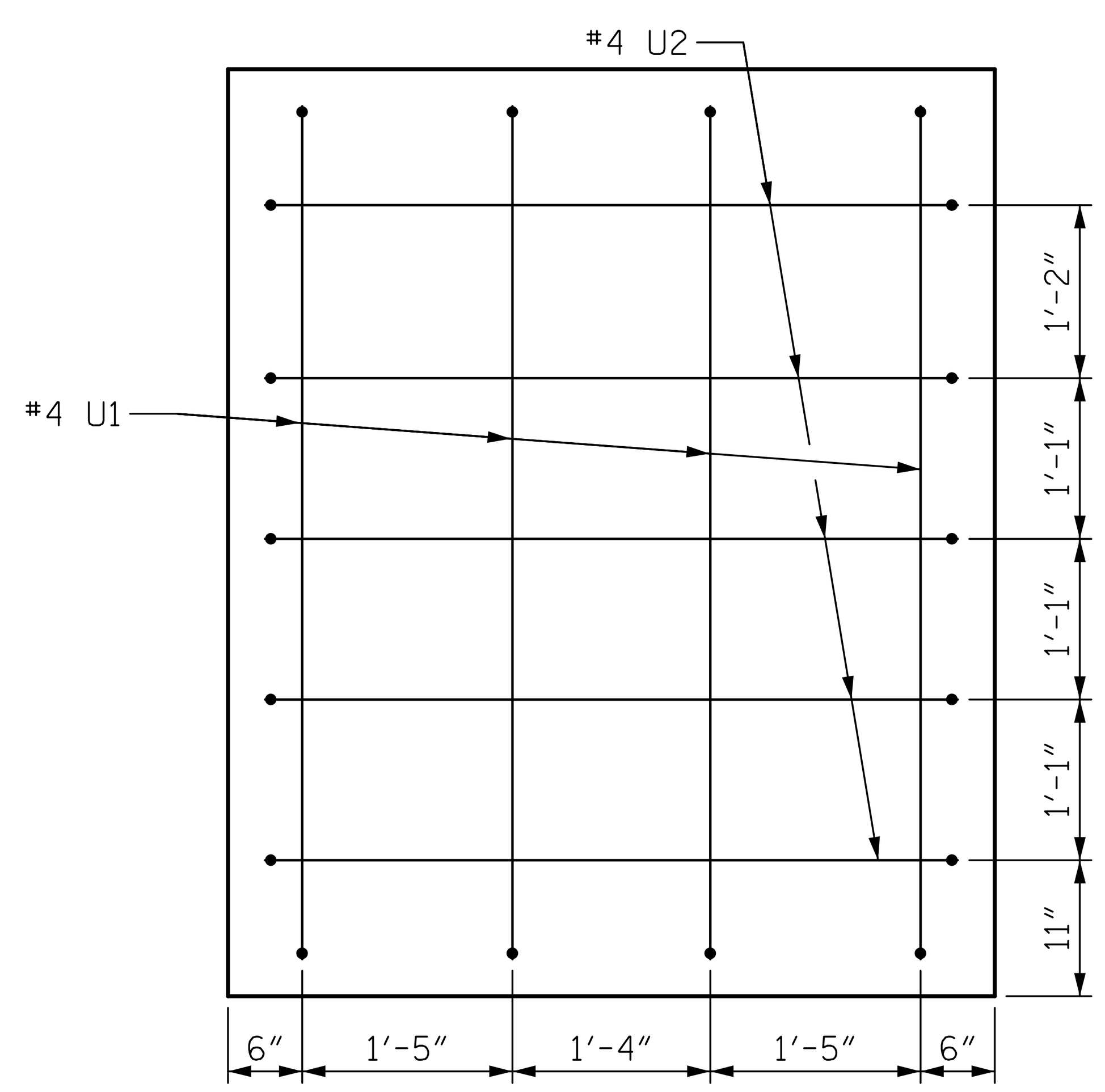
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			42

DRAWN BY : A.J. FORFA DATE : 08/17/18
CHECKED BY : J.A. LEE DATE : 08/24/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

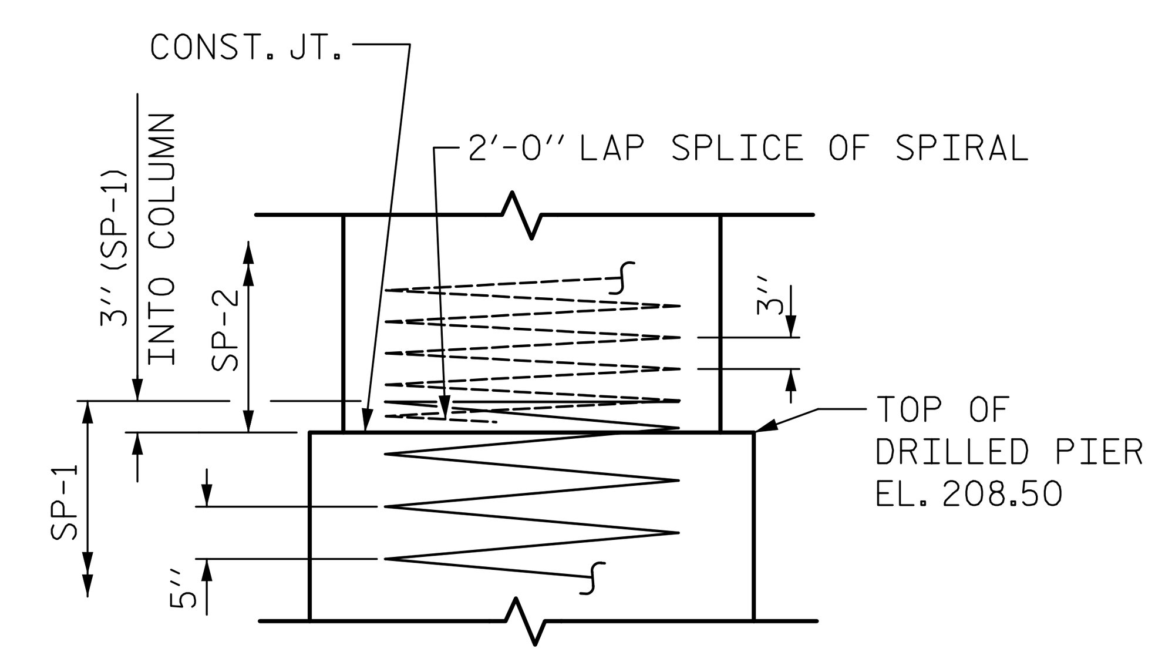


PLAN OF DRILLED PIERS & COLUMNS



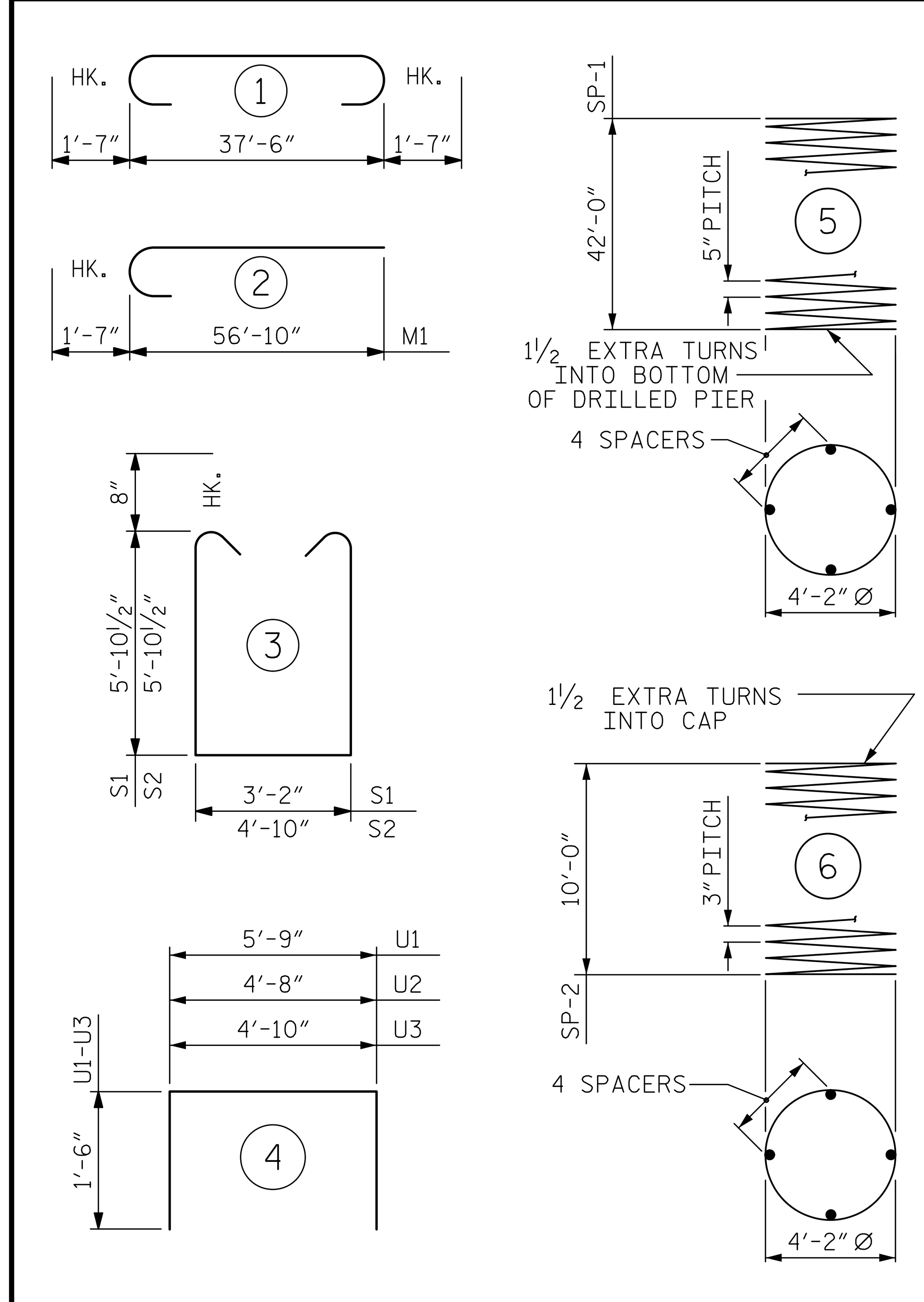
END OF CAP VIEW

(TYPICAL BOTH ENDS)



CONSTRUCTION JOINT DETAIL

BAR TYPES



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B3	28	#6	STR	37'-8"	1584
B4	7	#4	STR	14'-2"	66
M1	40	#11	2	58'-5"	12415
S1	78	#6	3	16'-3"	1904
S2	26	#6	3	17'-11"	700
U1	8	#4	4	8'-9"	47
U2	10	#4	4	7'-8"	51
U3	24	#4	4	7'-10"	126
REINFORCING STEEL					22,119 LBS
SP-1	2	*	5	1323'-1"	2760
SP-2	2	**	6	537'-11"	719
SPIRAL COLUMN REINFORCING STEEL					3,479 LBS

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

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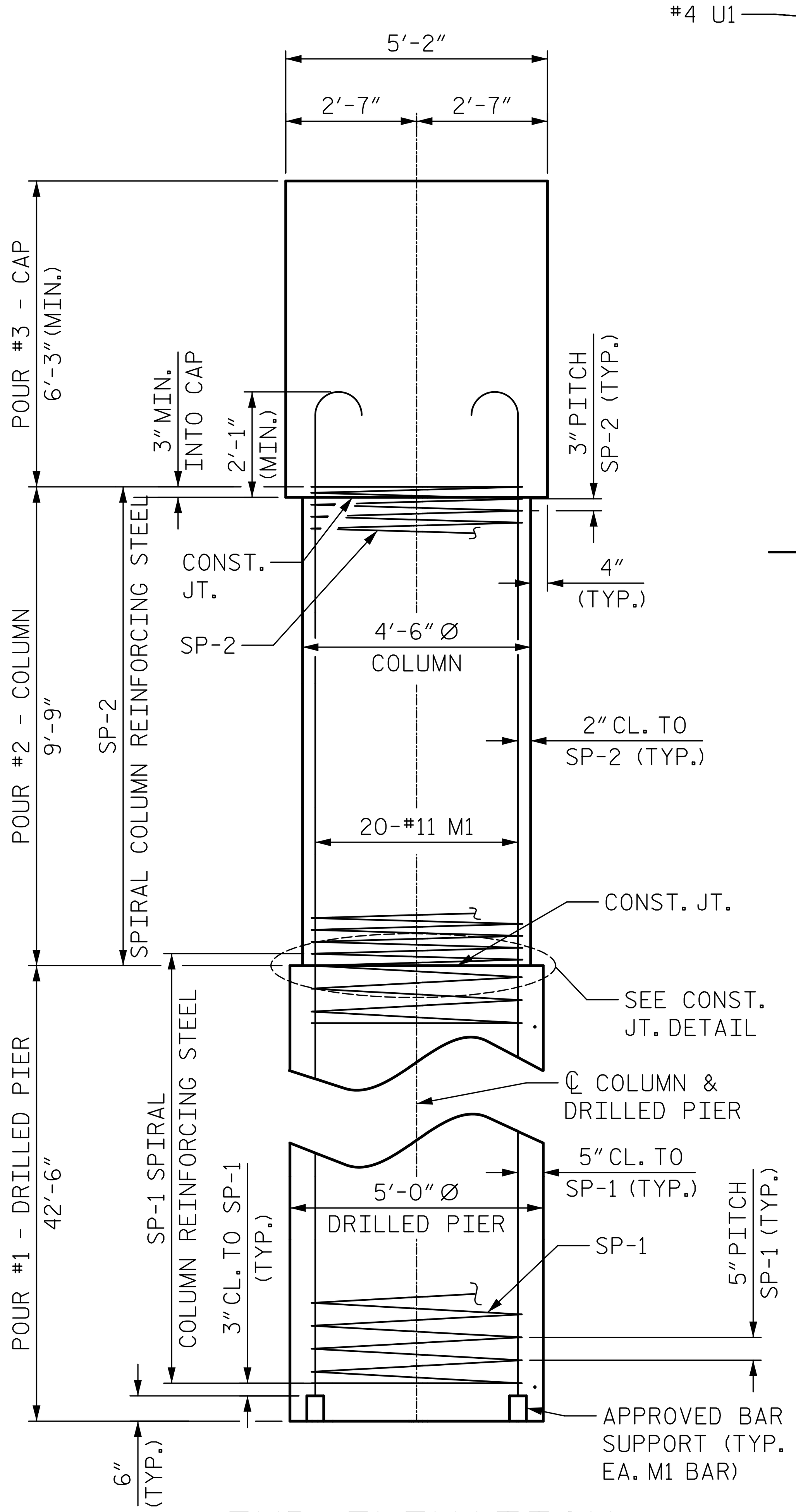
CLASS A CONCRETE BREAKDOWN

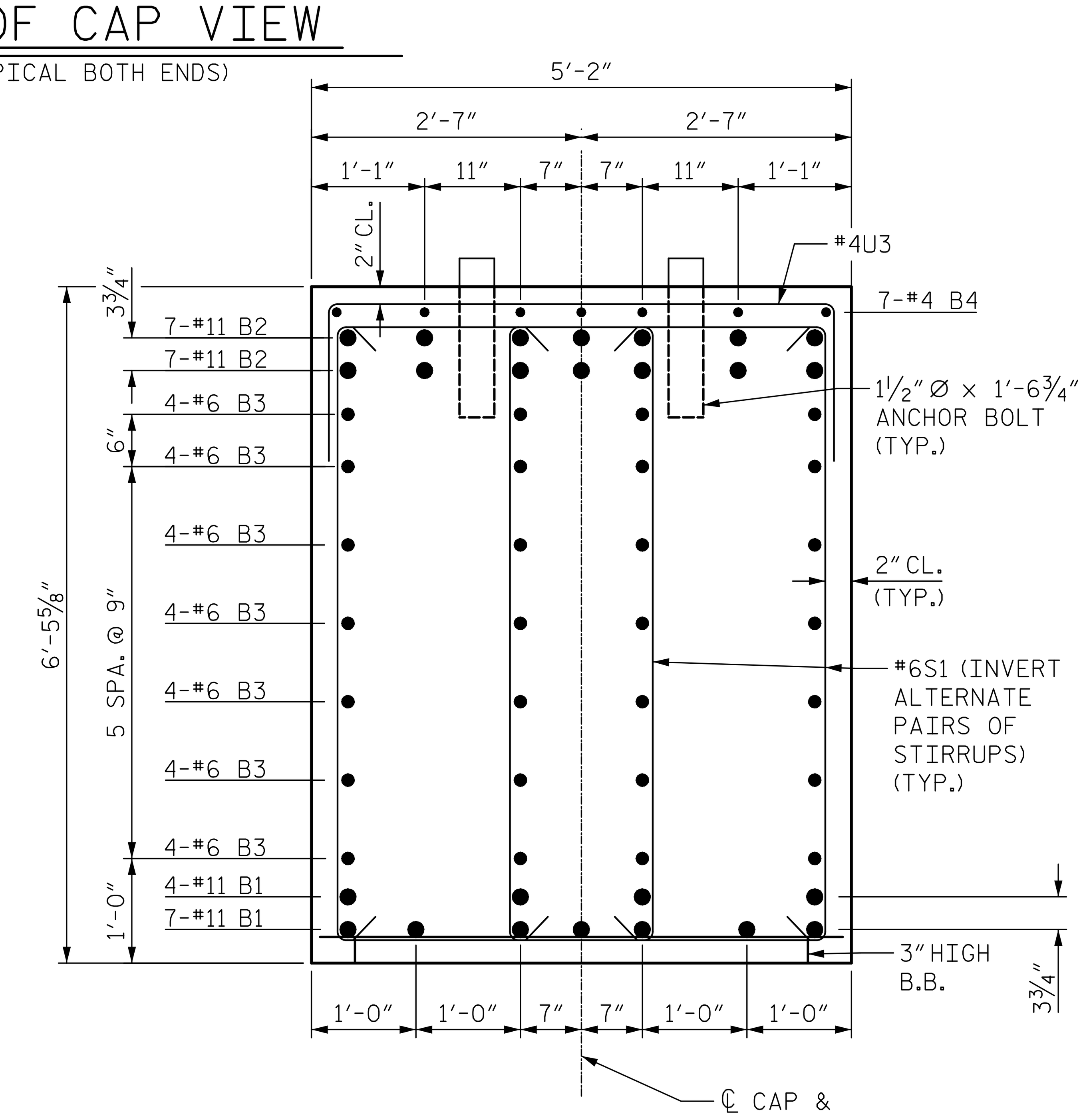
POUR #2 (COLUMNS)	11.5 C.Y.
POUR #3 (CAP)	46.2 C.Y.
TOTAL CLASS A CONCRETE	57.7 C.Y.

DRILLED PIERS:

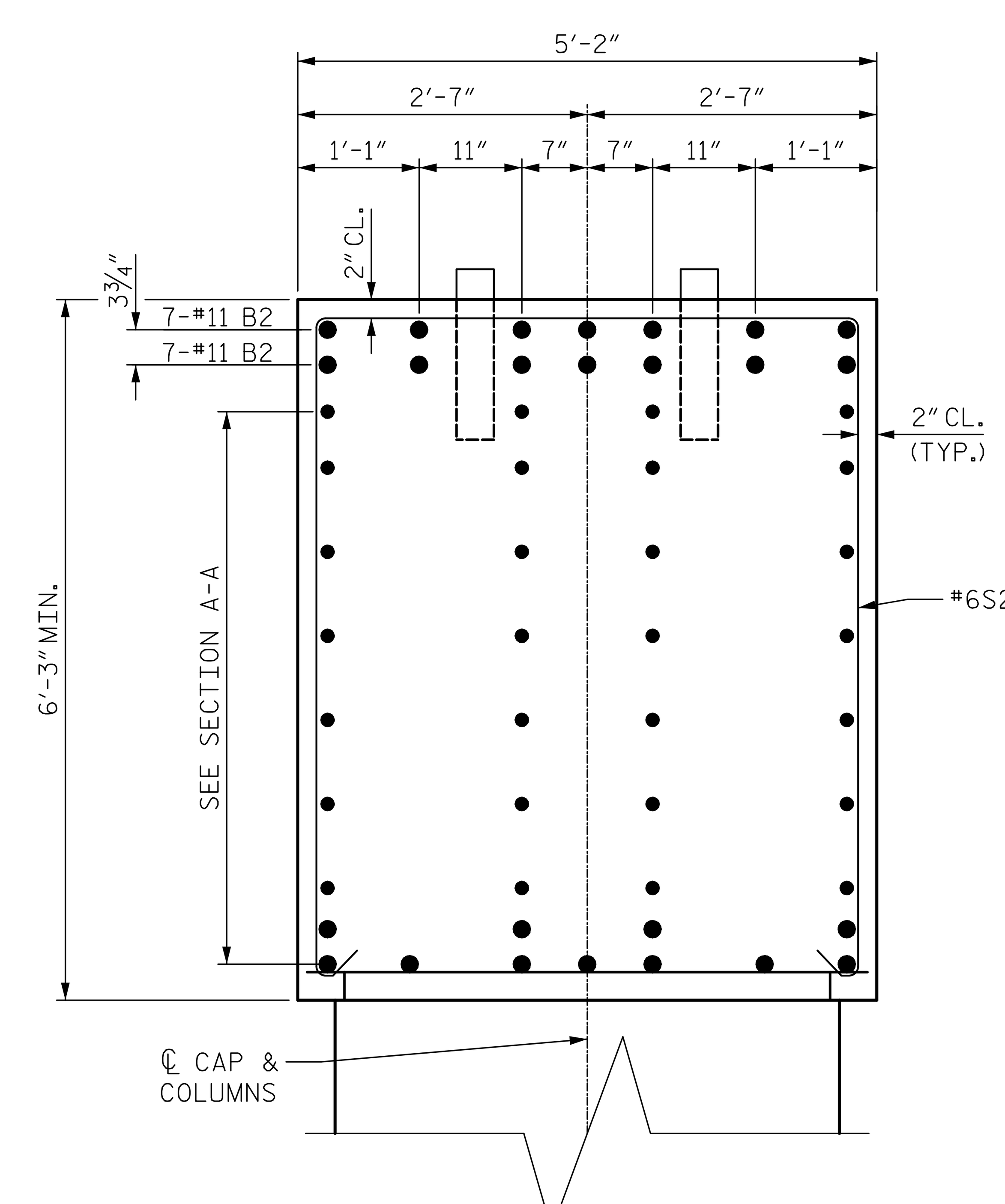
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	61.9 C.Y.
5'-0" Ø DRILLED PIER NOT IN SOIL	36.0 LIN. FT.
5'-0" Ø DRILLED PIER IN SOIL	49.0 LIN. FT.
PERMANENT STEEL CASING FOR 5'-0" Ø DRILLED PIER	5.0 LIN. FT.
CSL TUBES	440.0 LIN. FT.



END ELEVATION



SECTION A-A



SECTION B-B

Mead &Hunt

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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA

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PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

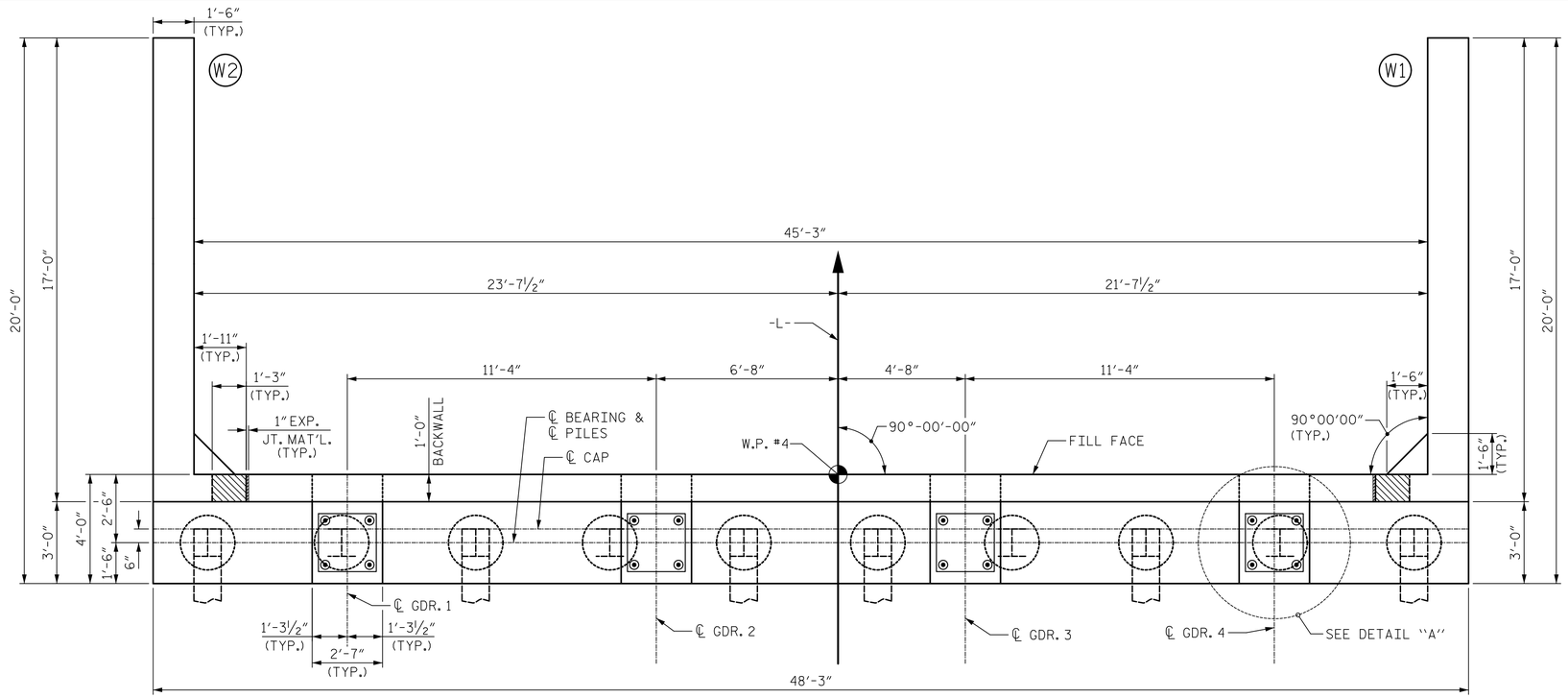
BENT No. 2

DRAWN BY : A.J. FORFA	DATE : 08/17/18
CHECKED BY : J.A. LEE	DATE : 08/24/18
DESIGN ENGINEER OF RECORD : A.J. FORFA	DATE : 09/28/18

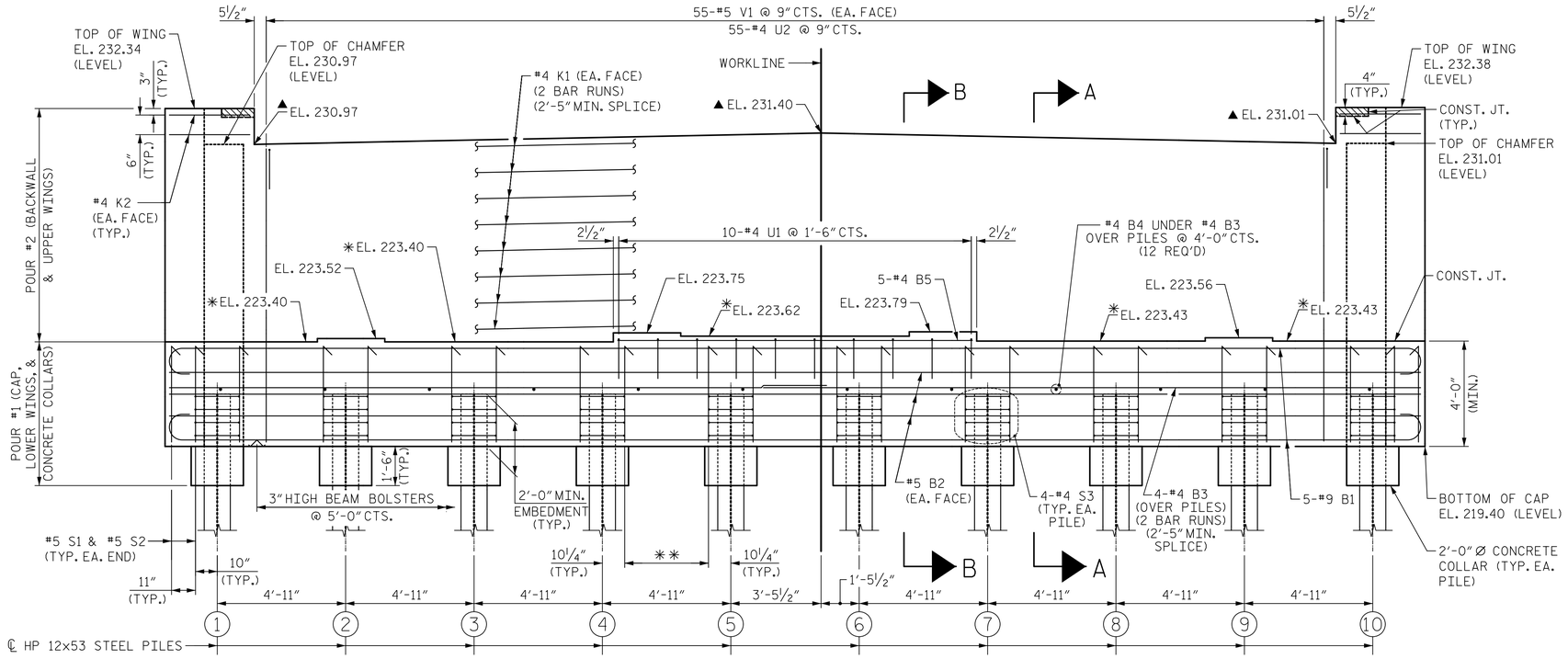
REVISIONS

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

SHEET NO. S-36
TOTAL SHEETS 42



PLAN



ELEVATION

PILES AND REINFORCING STEEL NOT SHOWN IN WING BRACE PILE CAP FOR CLARITY, SEE WING DETAILS, SHEET 2 OF 3.

✳✳ 8-#5 S1 & S2 @ 5½" CTS. (TYP. EA. BAY)

NOTES:

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR PIPE INSERTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

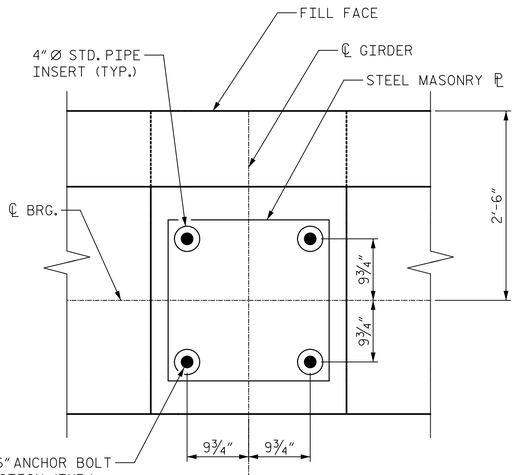
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILD-UPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

THE CONCRETE IN THE SHADED AREA OF THE WINGS SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PIPE INSERT DETAILS, SEE "DISC BEARING DETAILS" SHEET.

✳ FOR LOCATION OF ELEVATION BETWEEN BUILDUPS, SEE SECTION A-A ON SHEET 3 OF 3.

▲ ELEVATION TAKEN ALONG FILL FACE OF BACKWALL.



DETAIL "A"

(TYP. AT EACH BRIDGE SEAT)

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SHEET 1 OF 3

STATE OF NORTH CAROLINA
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SUBSTRUCTURE

END BENT No. 2

REVISIONS						SHEET NO.
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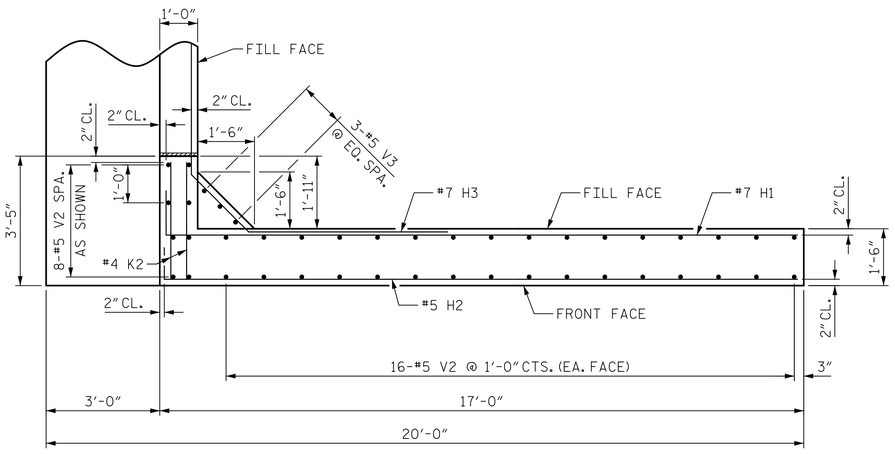
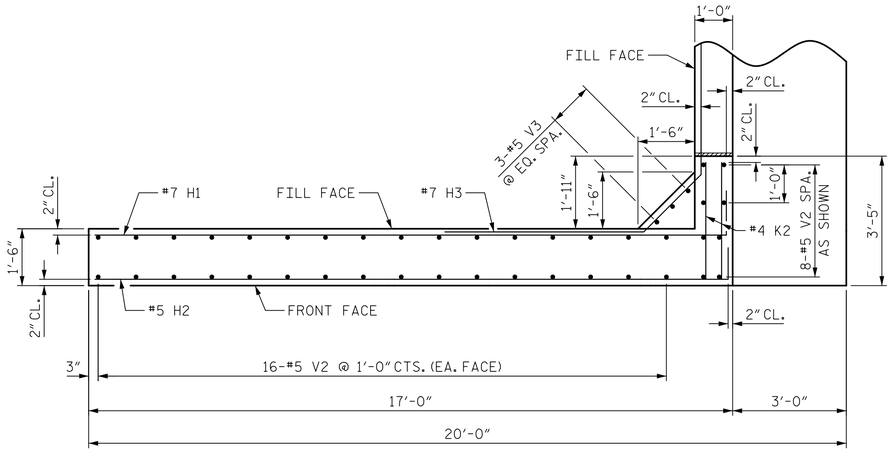
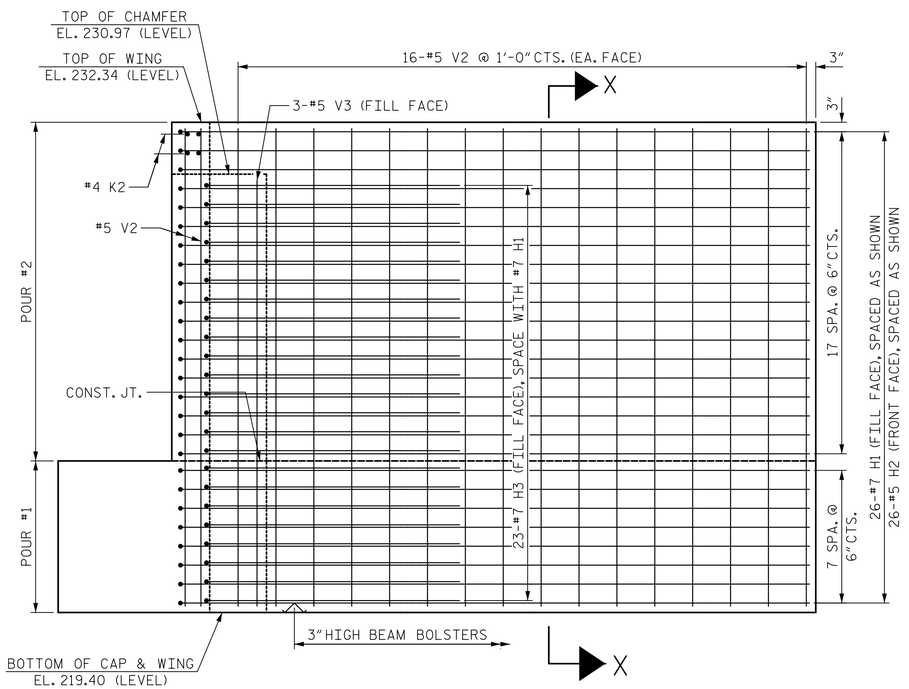


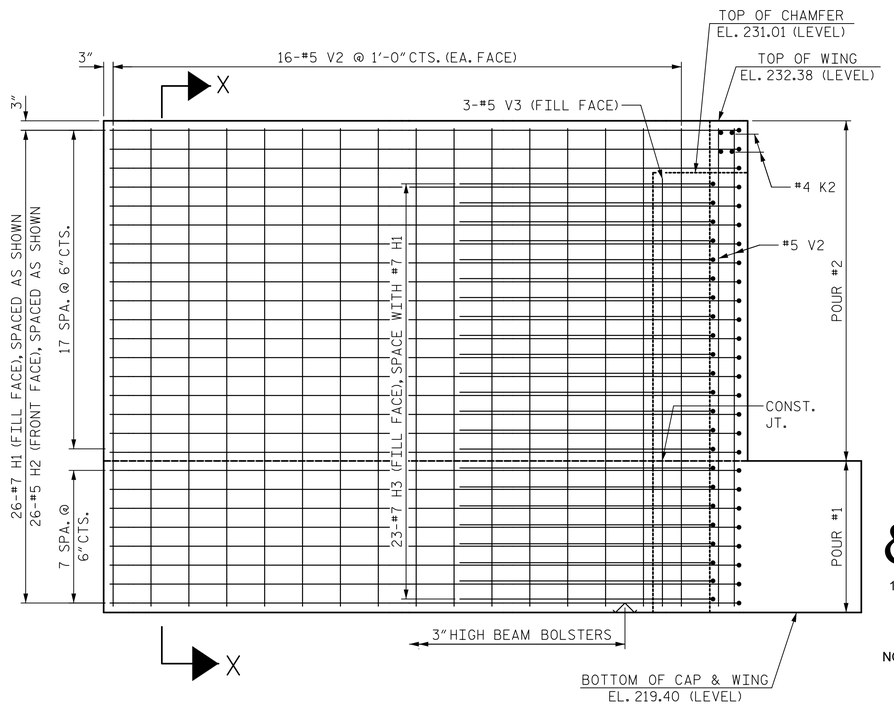
PLAN OF WING W1



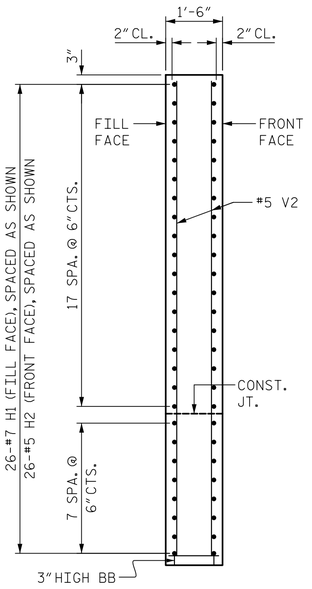
PLAN OF WING W2



ELEVATION OF WING W1



ELEVATION OF WING W2



SECTION X-X

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LEE/CHATHAM COUNTY

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SHEET 2 OF 3

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

END BENT No. 2

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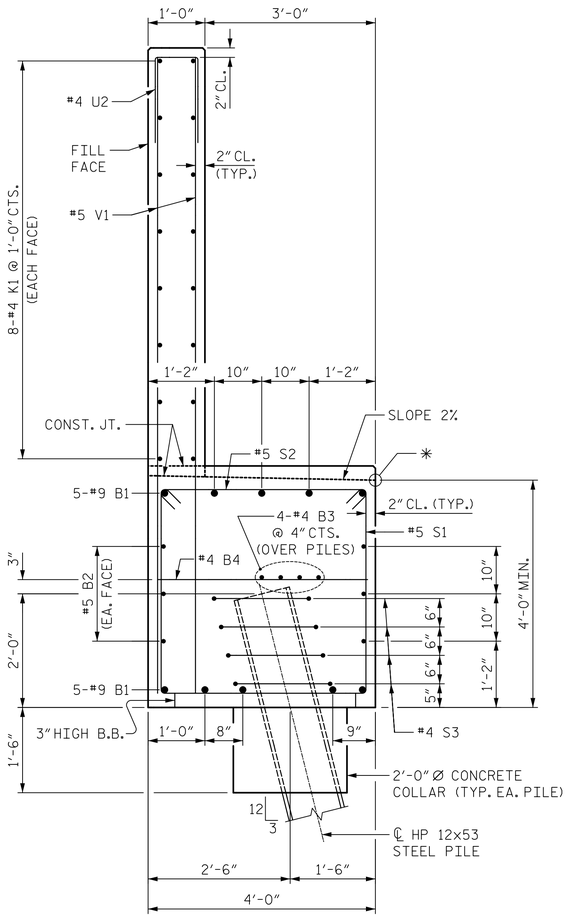
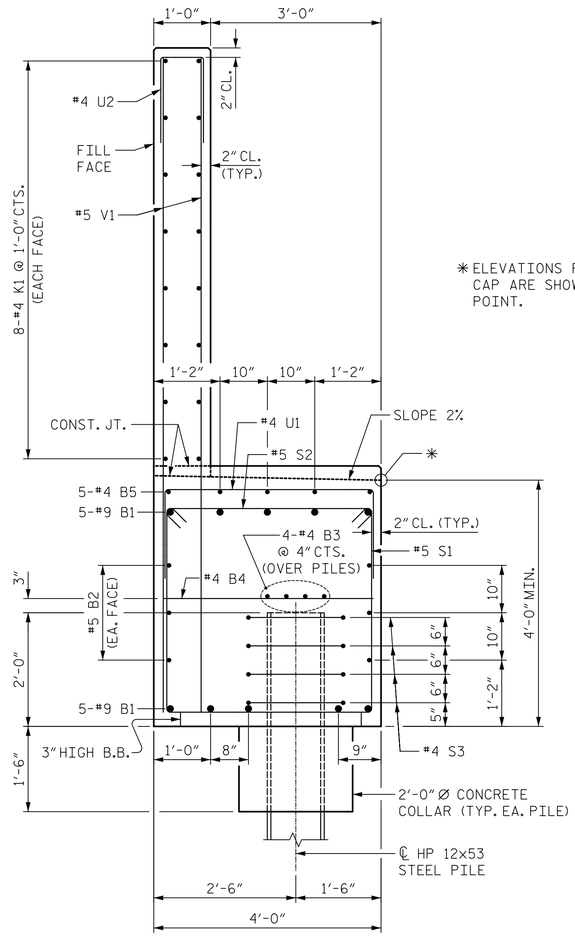


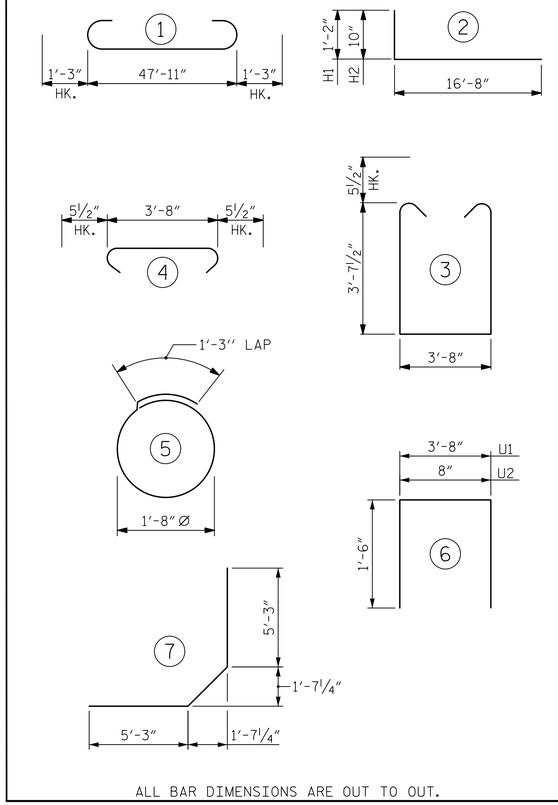
SECTION "A-A"



*ELEVATIONS FOR TOP OF CAP ARE SHOWN TO THIS POINT.

SECTION "B-B"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	50'-5"	1714
B2	6	#5	STR	47'-11"	300
B3	8	#4	STR	25'-2"	134
B4	12	#4	STR	3'-8"	29
B5	5	#4	STR	13'-7"	45
H1	52	#7	2	17'-10"	1895
H2	52	#5	2	17'-6"	949
H3	46	#7	7	12'-9"	1199
K1	32	#4	STR	25'-2"	538
K2	8	#4	STR	3'-1"	16
S1	76	#5	3	11'-10"	938
S2	76	#5	4	4'-7"	363
S3	40	#4	5	6'-6"	174
U1	10	#4	6	6'-8"	45
U2	55	#4	6	3'-8"	135
V1	110	#5	STR	11'-1"	1272
V2	80	#5	STR	12'-6"	1043
V3	6	#5	STR	11'-1"	69

REINFORCING STEEL 10,858 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 39.0 C.Y.

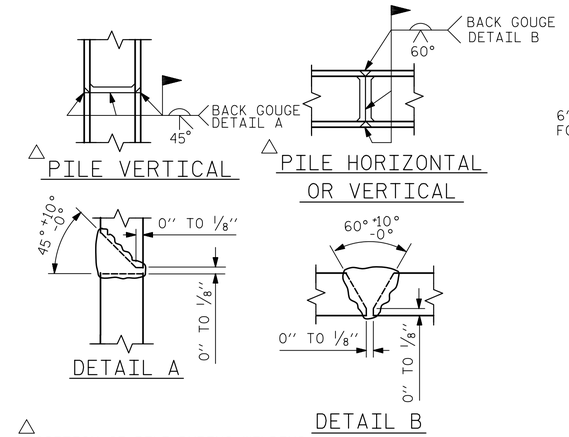
POUR #2 BACKWALL & UPPER PART OF WINGS 30.4 C.Y.

TOTAL CLASS A CONCRETE 69.4 C.Y.

HP 12 X 53 STEEL PILES
NO. 10 LIN. FT.= 326

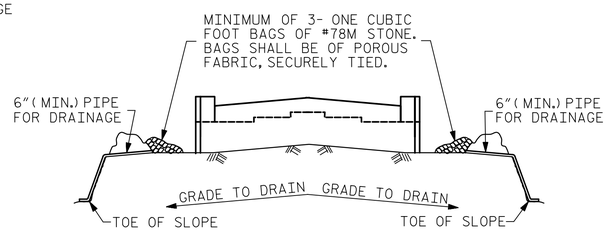
STEEL PILE POINTS NO: 10

PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 10



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

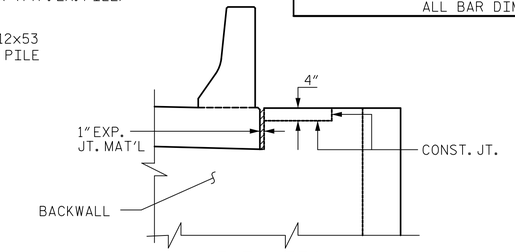


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

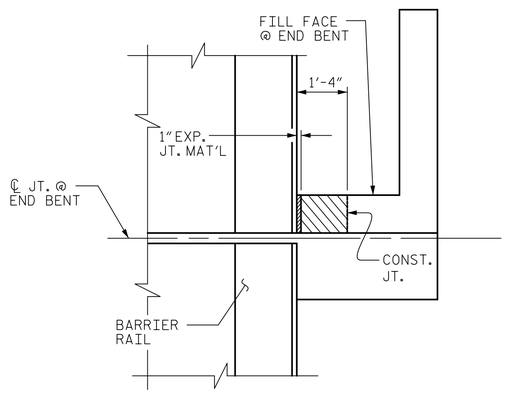
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



ELEVATION



PLAN

BLOCKOUT IN WING WALL

Mead &Hunt
111 E. Hargett Street
Suite 300
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919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

DocuSigned by: Alex Forfa 1/7/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : J.S. HOBSON DATE : 07/17/18
CHECKED BY : J.A. LEE DATE : 08/08/18
DESIGN ENGINEER OF RECORD : A.J. FORFA DATE : 09/28/18

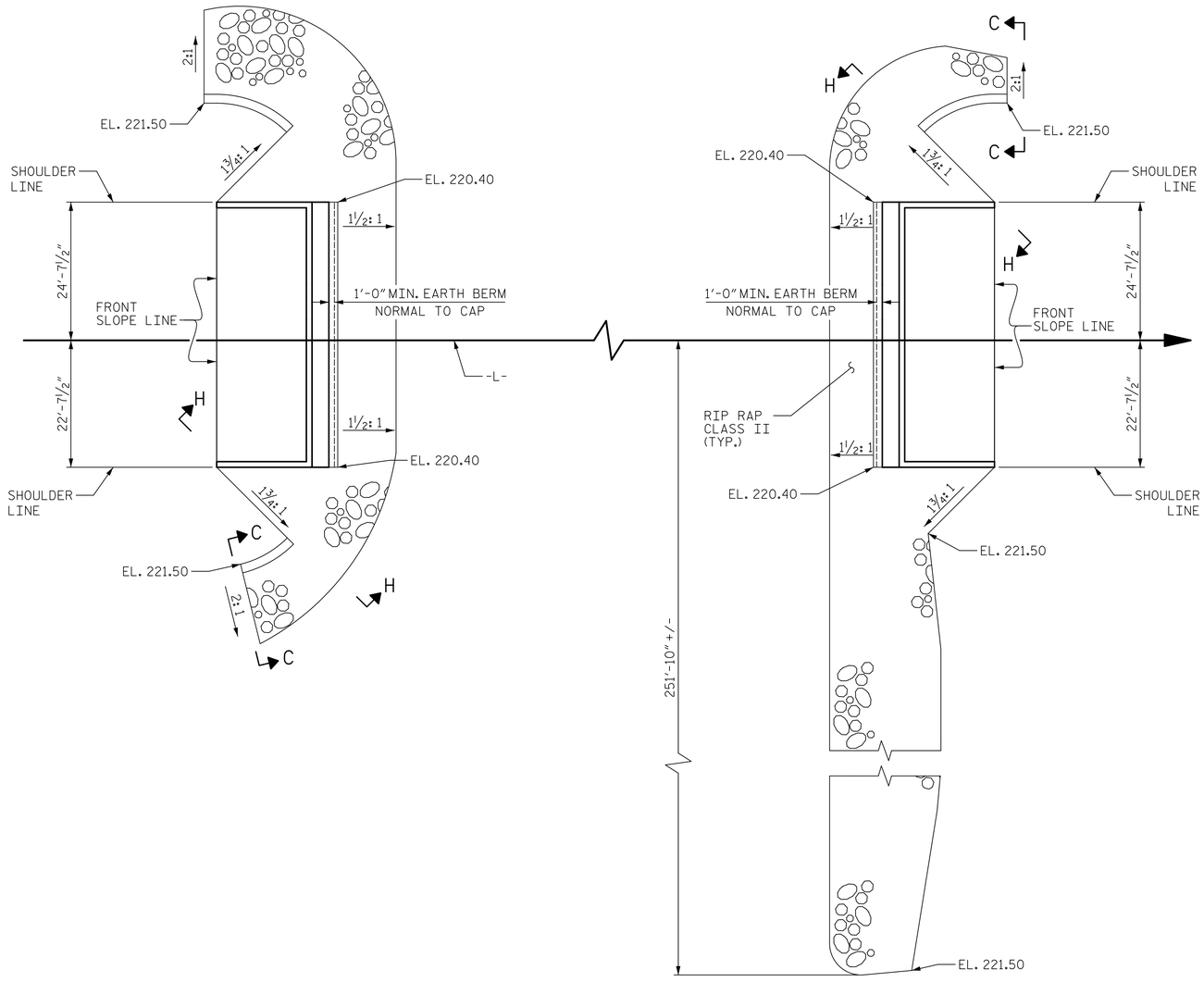
PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

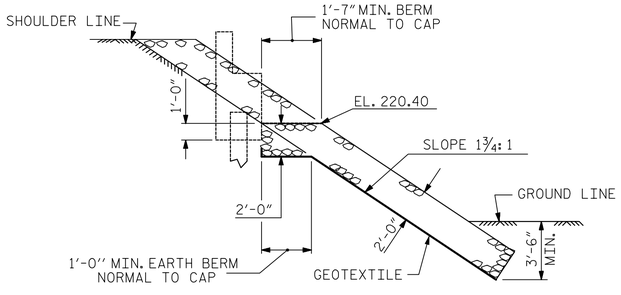
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

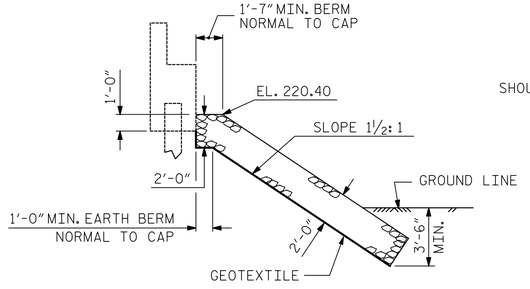
END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			42

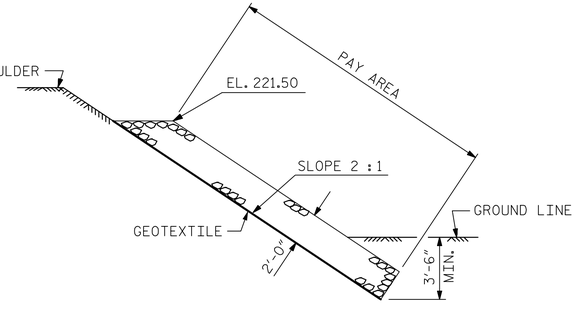




SECTION H-H



℄ SECTION
BERM RIP RAPPED



SECTION C-C

ESTIMATED QUANTITIES		
BRIDGE @ STA. 34+65.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	278	309
END BENT 2	771	857

ASSEMBLED BY : A.J. FORFA	DATE : 08/01/18		
CHECKED BY : J.S. HOBSON	DATE : 09/13/18		
DRAWN BY : REK 1/84	REV. 10/1/11	MAA/GM	
CHECKED BY : RDU 1/84	REV. 12/21/11	MAA/GM	
	REV. 12/17	MAA/THC	

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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA

DocuSigned by: Alex Forfa 1/7/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4968
LEE/CHATHAM COUNTY
STATION: 34+65.00 -L-

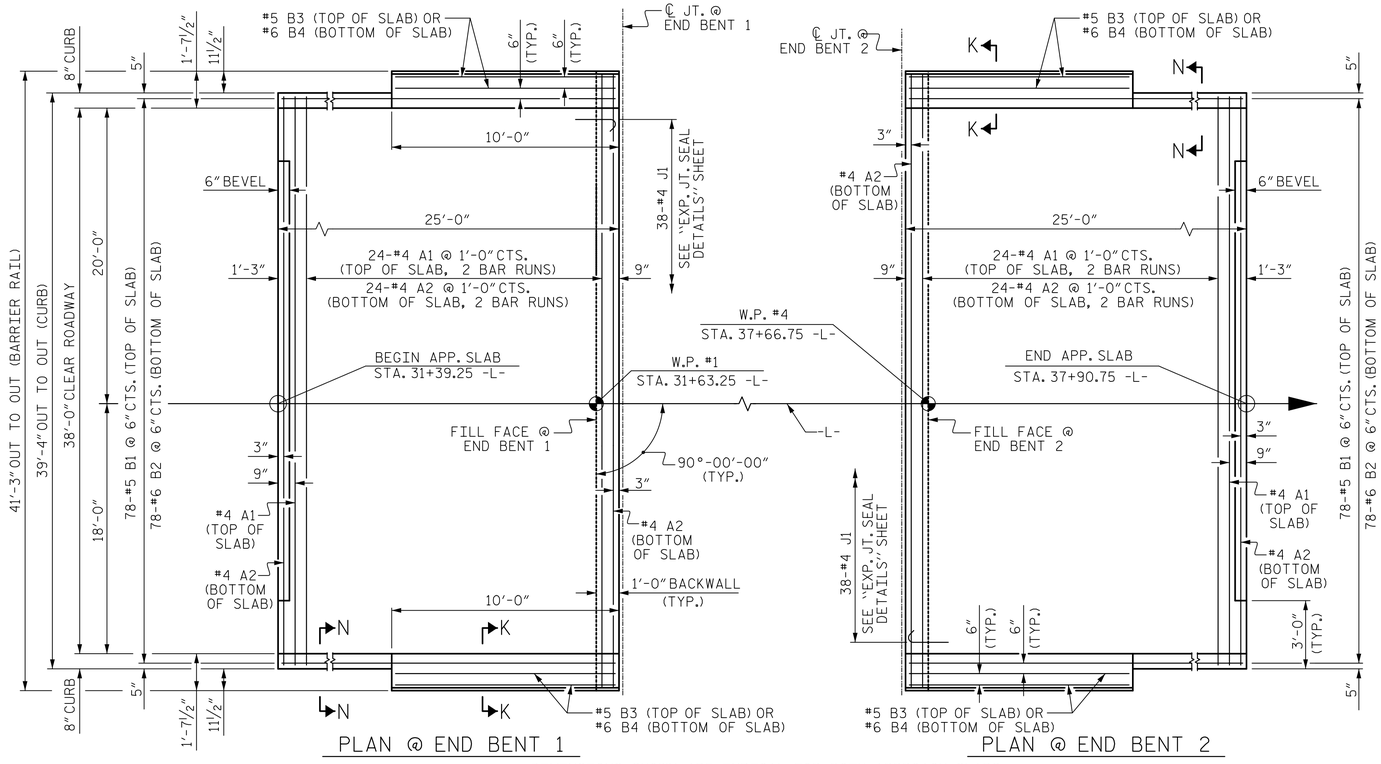
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

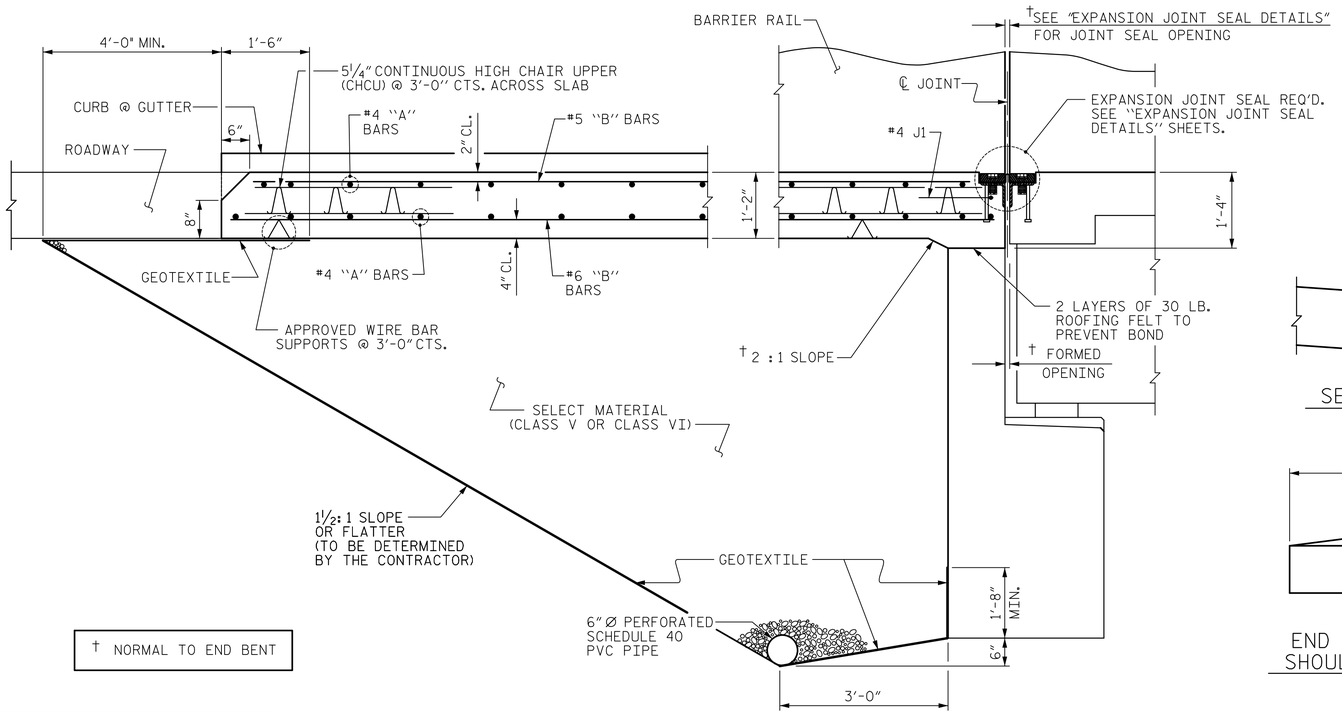
RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			42

STD. NO. RR1 (Sht 2)



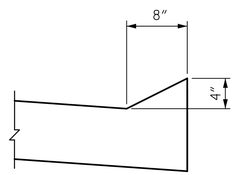
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



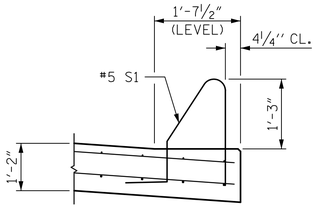
† NORMAL TO END BENT

SECTION THRU SLAB

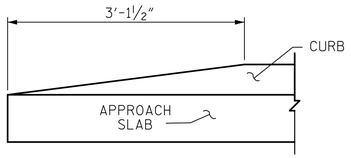
(TYPE I - STANDARD APPROACH FILL)



SECTION N-N



SECTION K-K



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

NOTES

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

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

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

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

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

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

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

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	50	#4	STR	21′-6″	718
A2	52	#4	STR	21′-4″	741
✱B1	78	#5	STR	23′-10″	1939
B2	78	#6	STR	24′-8″	2890
✱B3	4	#5	STR	9′-8″	40
B4	4	#6	STR	9′-8″	58
✱J1	38	#4	1	1′-5″	36
REINFORCING STEEL ✱✱				LBS.	3689
✱EPOXY COATED REINFORCING STEEL ✱✱				LBS.	2733
CLASS AA CONCRETE ✱✱				C. Y.	43.5

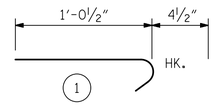
APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	50	#4	STR	21′-6″	718
A2	52	#4	STR	21′-4″	741
✱B1	78	#5	STR	23′-10″	1939
B2	78	#6	STR	24′-8″	2890
✱B3	4	#5	STR	9′-8″	40
B4	4	#6	STR	9′-8″	58
✱J1	38	#4	1	1′-5″	36
REINFORCING STEEL ✱✱				LBS.	3689
✱EPOXY COATED REINFORCING STEEL ✱✱				LBS.	2733
CLASS AA CONCRETE ✱✱				C. Y.	43.5

SPLICE LENGTHS

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

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

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

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.

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meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

DocuSigned by: Alex Forfa 1/7/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4968

LEE/CHATHAM COUNTY

STATION: 34+65.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

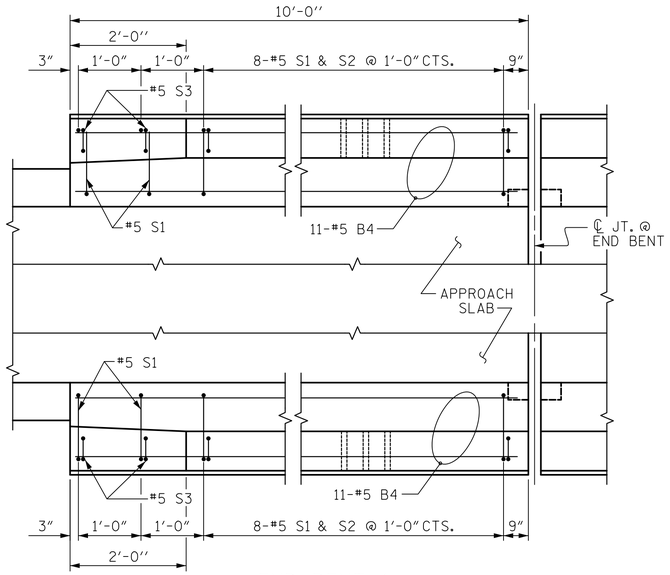
STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

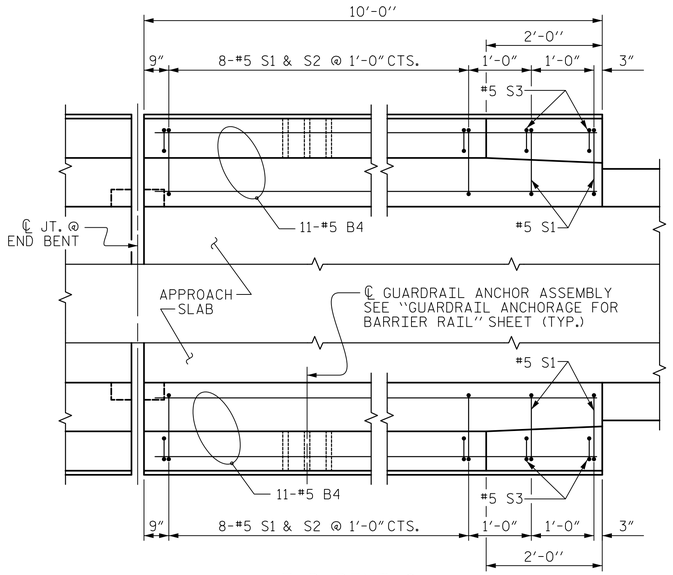
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			42

ASSEMBLED BY : J.A. LEE		DATE : 06/07/18	
CHECKED BY : A.J. FORFA		DATE : 08/20/18	
DRAWN BY : EEM 3/95	REV. 12/21/11	MAA/GM	
CHECKED BY : VAP 3/95	REV. 6/13	MAA/GM	
	REV. 12/17	MAA/THC	

STD. NO. BAS2 (SHT 3)



END BENT 1



END BENT 2

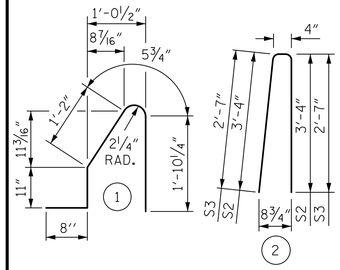
NOTES

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

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

BAR TYPES



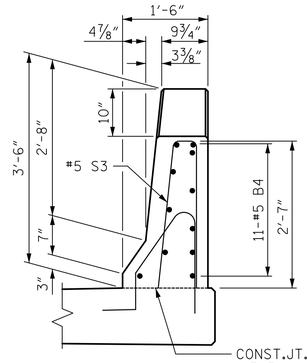
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

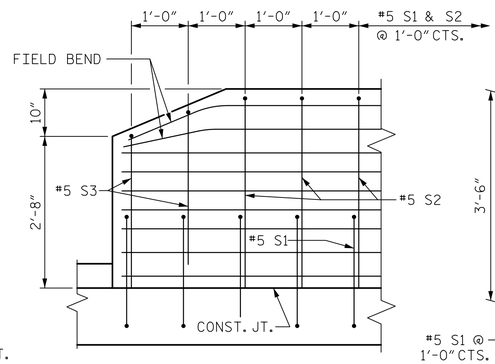
BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B4	44	#5	STR	9′-8″	444
✱S1	40	#5	1	5′-1″	212
✱S2	32	#5	2	7′-0″	234
✱S3	8	#5	2	5′-6″	46
✱EPOXY COATED REINFORCING STEEL				LBS.	936
CLASS AA CONCRETE				C.Y.	5.3
CONCRETE BARRIER RAIL					40.0 LIN. FT.

PLAN OF BARRIER RAIL

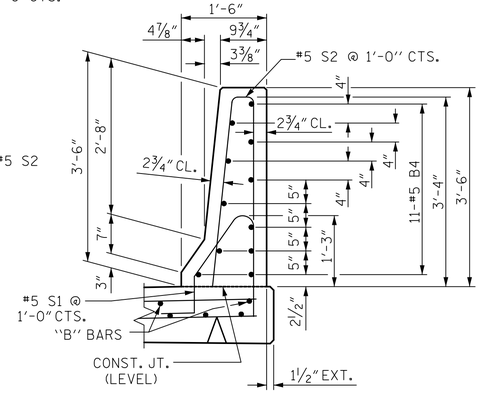


END VIEW

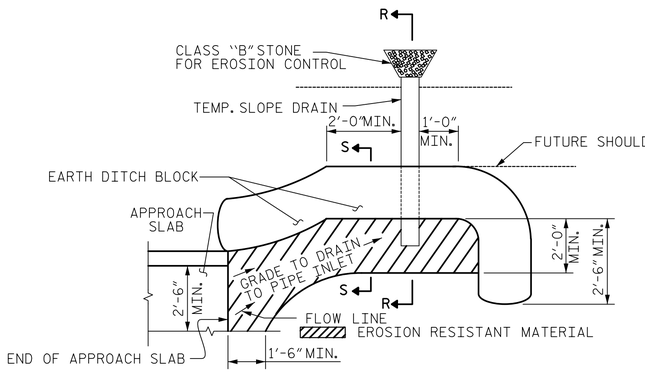


SIDE VIEW

END OF RAIL DETAILS

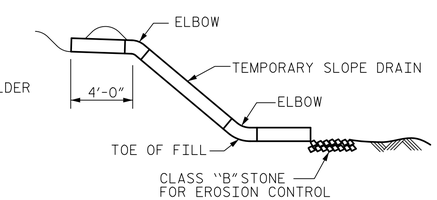


SECTION THRU RAIL

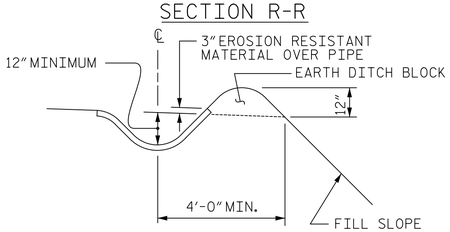


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

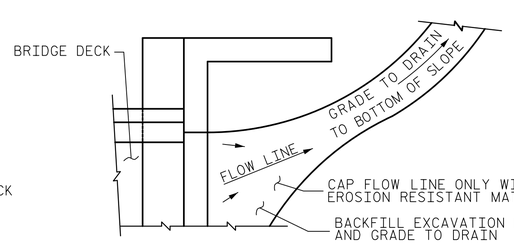
PLAN VIEW



SECTION R-R



SECTION S-S



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

TEMPORARY DRAINAGE DETAIL

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

ASSEMBLED BY : J.A. LEE		DATE : 06/11/18	
CHECKED BY : A.J. FORFA		DATE : 08/20/18	
DRAWN BY : FCJ	11/88	REV. 6/13	MAA/GM
CHECKED BY : ARB	11/88	REV. 12/17	MAA/THC
		REV. 5/18	MAA/THC

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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER FORFA

DocuSigned by: Alex Forfa 1/7/2019

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PROJECT NO. B-4968

LEE/CHATHAM COUNTY

STATION: 34+65.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

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

STD. NO. BAS4 (SHT 3)

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS - - - - - - - - - - - - - - - - - -	A.A.S.H.T.O. (CURRENT)
LIVE LOAD -	SEE PLANS
IMPACT ALLOWANCE - - - - - - - - - - - - - - - - -	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36 - -	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W - -	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50 - -	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60 - - -	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION - - - - - - - - - - - -	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR - - - - - - - - - - - - - - - -	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS - - -	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER - - - - -	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH - - - - -	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM (c) RGW REV. 5-7-03 RWW (c) JTE REV. 10-1-11 MAA (c) GM
REV. 8-16-99 RWW (c) LES REV. 5-1-06 TLA (c) GM REV. 12-17 MAA (c) THC