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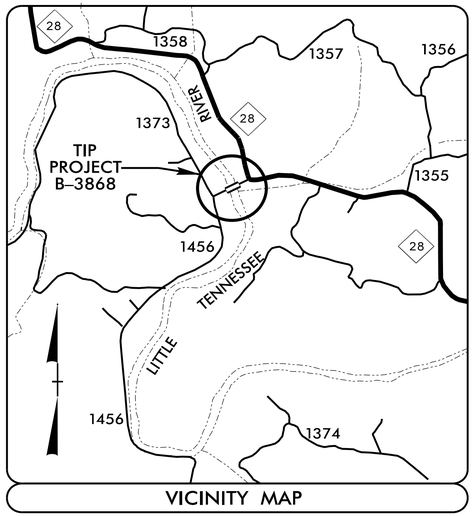
TIP NO: B–3868

CONTRACT: C203656



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

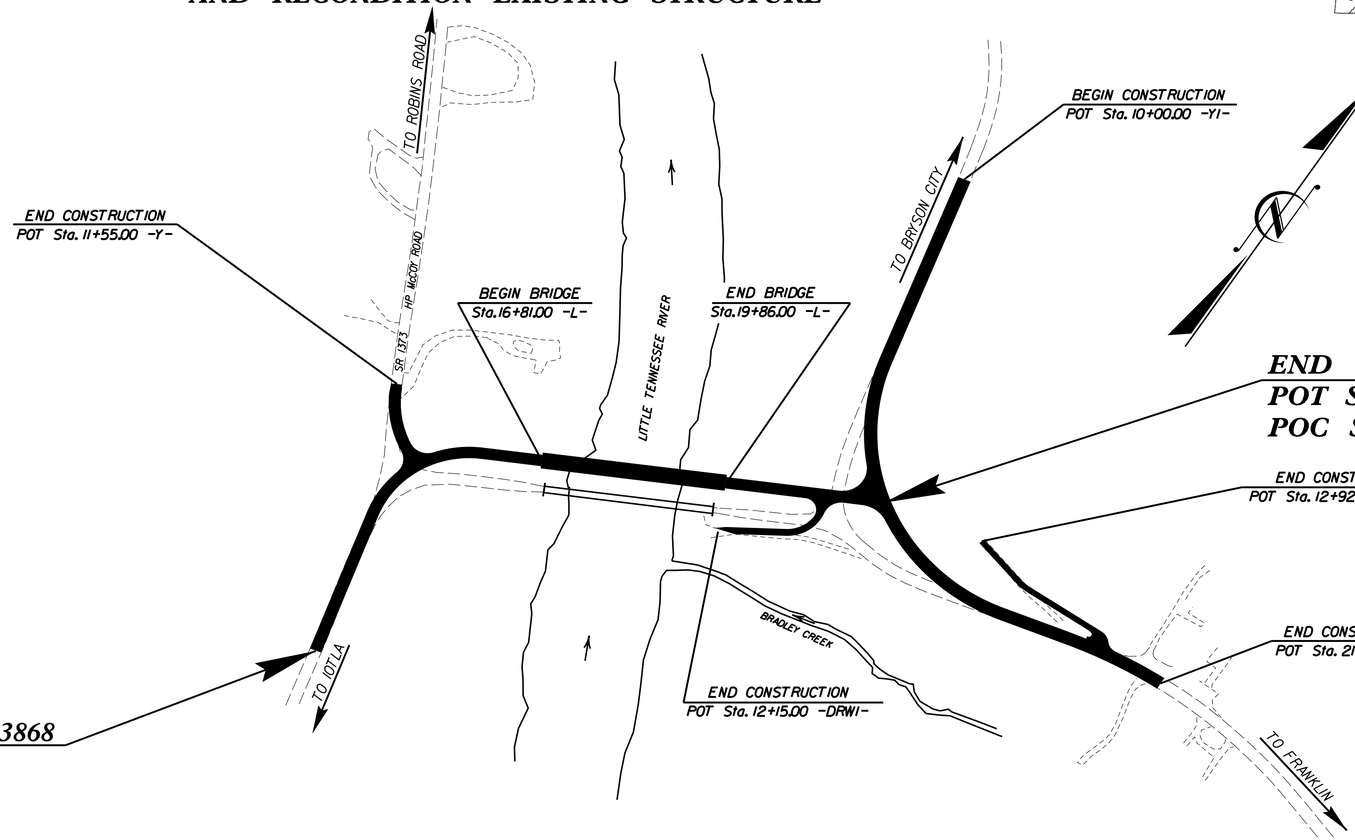
MACON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–3868		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33313.1.1	BRZ–1456(6)	P.E.
33313.2.FD2	BRZ–1456(6)	R/W, UTILITY
33313.3.1	BRZ–1456(6)	CONST.

LOCATION: BRIDGE No. 172 OVER LITTLE TENNESSEE RIVER ON SR 1456

TYPE OF WORK: DRAINAGE, GRADING, PAVING, STRUCTURE, AND RECONDITION EXISTING STRUCTURE



BEGIN TIP PROJECT B–3868
POT Sta. 11+00.00 –L–

STRUCTURES

DESIGN DATA

ADT 2013	=	330
ADT 2035	=	500
DHV	=	10 %
D	=	65 %
T	=	7 % *
V	=	25 MPH

* TTST =1% DUAL 6%

FUNC. CLASS. = LOCAL

SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–3868 = 0.159 MILES

LENGTH STRUCTURE TIP PROJECT B–3868 = 0.058 MILES

TOTAL LENGTH TIP PROJECT B–3868 = 0.217 MILES

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

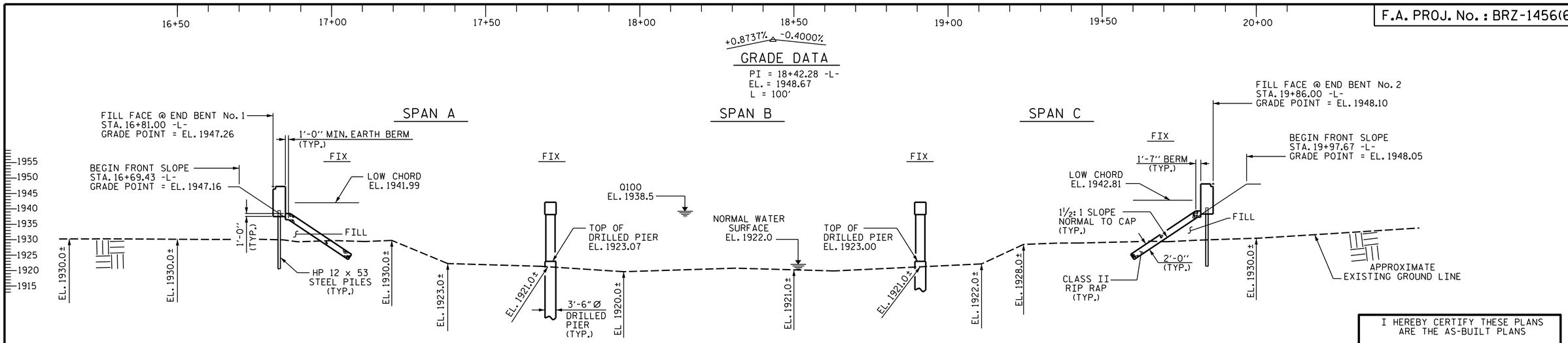
2012 STANDARD SPECIFICATIONS

LETTING DATE : DECEMBER 15, 2015

D.R. CALHOUN, P.E.
PROJECT ENGINEER

MARC G. CHEEK, P.E.
PROJECT DESIGN ENGINEER

F.A. PROJ. No. : BRZ-1456(6)



INTEGRAL
END BENT No. 1

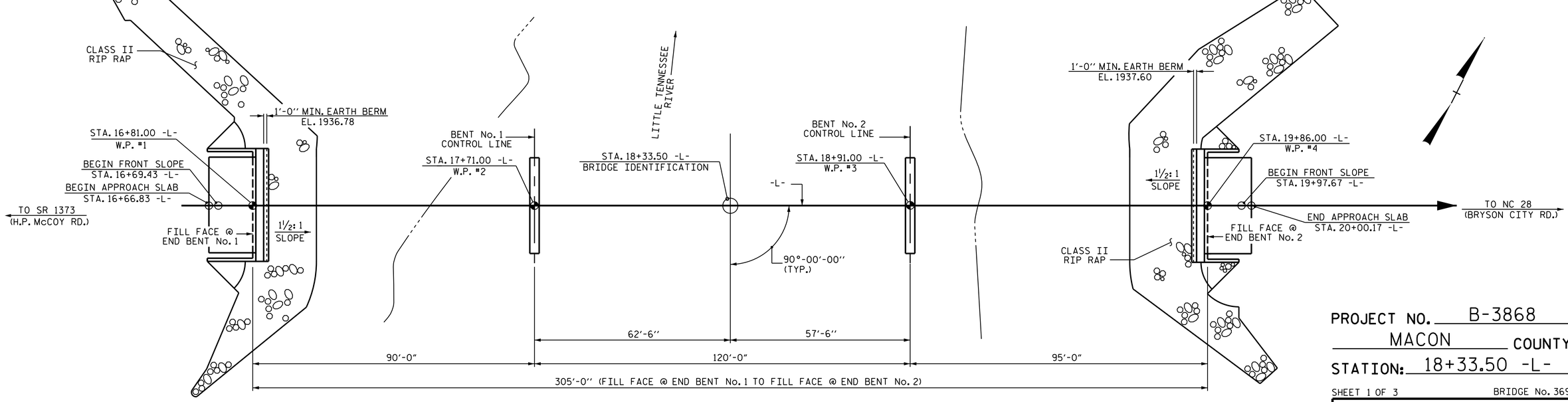
BENT No. 1

BENT No. 2

INTEGRAL
END BENT No. 2

I HEREBY CERTIFY THESE PLANS
ARE THE AS-BUILT PLANS

SECTION ALONG -L-



PLAN

PILES & COLUMNS NOT SHOWN FOR CLARITY
FOR TEMPORARY ACCESS DETAILS, SEE "TEMPORARY ACCESS" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
DocuSigned by: Douglas R. Calhoun 430196F9D5E0429...
9/15/2015

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CREEK, JR.
DocuSigned by: Marshall G. Creek, Jr. 6549D8EBAA3B405...
9/15/2015

DRAWN BY : M. POOLE \ DAH DATE : 6/15
CHECKED BY : H.T. BARBOUR DATE : 6-29-15

PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

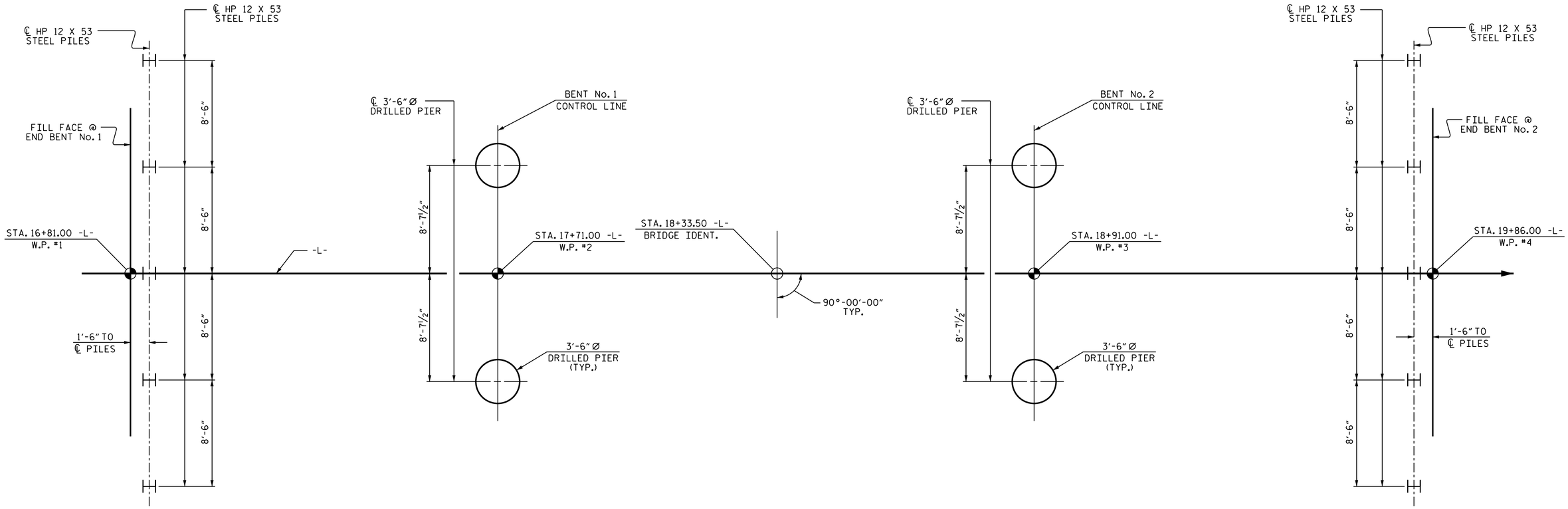
SHEET 1 OF 3 BRIDGE No. 369

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER LITTLE TENNESSEE RIVER ON SR 1456 BETWEEN NC 28 AND SR 1373

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



FOUNDATION LAYOUT

NOTES

FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS.

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

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

FOR DRILLED PIERS, SEE GEOTECHNICAL SPECIAL PROVISIONS.

DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 545 TONS/PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 130 TSF.

INSTALL DRILLED PIERS AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 1907 FT. (LT), 1913 FT. (RT); SATISFY THE REQUIRED TIP RESISTANCE AND HAVE A PENETRATION OF AT LEAST 7 FT. INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 1. IF REQUIRED, DO NOT EXTEND CASING BELOW ELEVATION 1919 FT. WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 1918.0 FT. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRILLED PIERS AT BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 555 TONS/PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 130 TSF.

INSTALL DRILLED PIERS AT BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN 1886 FT. (LT), 1882 FT. (RT); SATISFY THE REQUIRED TIP RESISTANCE AND HAVE A PENETRATION OF AT LEAST 5.5 FT. INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 2. IF REQUIRED, DO NOT EXTEND CASING BELOW ELEVATION 1906 FT. WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 2 IS ELEVATION 1906.0 FT. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS AT BENTS NOS. 1 AND 2. 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 THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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

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

DRAWN BY : D. HODGE DATE : 6/15
CHECKED BY : H.T. BARBOUR DATE : 6-26-15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 8/15

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Digitally signed by Marshall G. Cheek, Jr.
6549D6EEBAA3B405...
9/15/2015

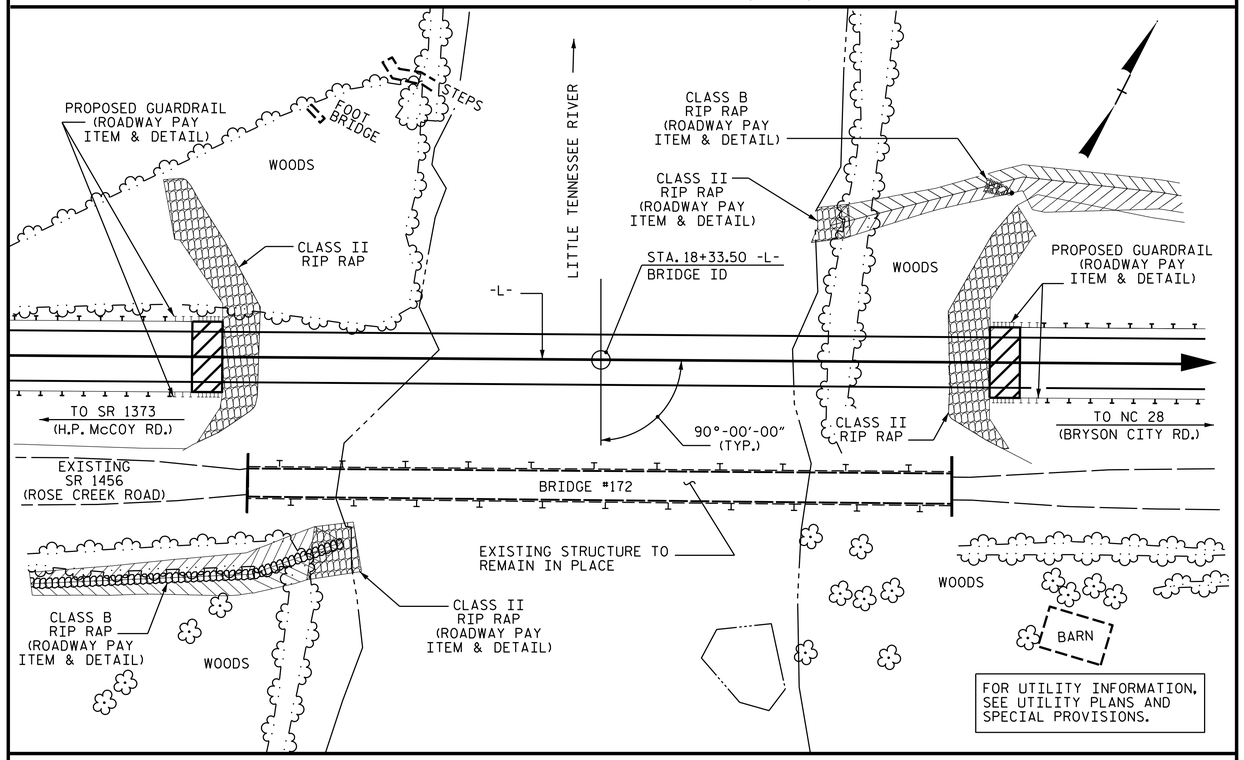
PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER LITTLE TENNESSEE RIVER ON SR 1456 BETWEEN NC 28 AND SR 1373

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



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.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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

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

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

EXISTING BRIDGE No. 172 SHALL SERVE AS A TEMPORARY STRUCTURE DURING CONSTRUCTION OF THE PROPOSED BRIDGE. BRIDGE No. 172 IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. FOLLOWING COMPLETION OF THE PROPOSED STRUCTURE, BRIDGE No. 172 SHALL BE CLOSED TO VEHICULAR TRAFFIC AND WILL SERVE AS A PEDESTRIAN BRIDGE.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

SLURRY CONSTRUCTION SHALL NOT BE USED FOR THIS PROJECT.

HYDRAULIC DATA

DESIGN DISCHARGE_____23800 CFS

FREQUENCY OF DESIGN FLOOD____25 YEARS

DESIGN HIGH WATER ELEVATION_____1936.7

DRAINAGE AREA_____374 SQ. MI.

BASE DISCHARGE (Q100)_____26400 CFS

BASE HIGH WATER ELEVATION_____1938.5

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE_____54000 CFS

FREQUENCY OF OVERTOPPING FLOOD_____500 + YRS.

OVERTOPPING FLOOD ELEVATION_____1946.0

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMPORARY ACCESS	3'-6" Ø DRILLED PIERS IN SOIL	3'-6" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIERS	SID INSPECTIONS	CSL TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS
	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM
SUPERSTRUCTURE							9,328	8,282		LUMP SUM
END BENT No. 1									20.7	
BENT No. 1		7.16	19.00	8.14					24.8	
BENT No. 2		59.00	19.00	34.00					25.1	
END BENT No. 2									20.7	
TOTAL	LUMP SUM	66.16	38.00	42.14	1	1	9,328	8,282	91.3	LUMP SUM

	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	STRUCTURAL STEEL	HP 12 X 53 STEEL PILES		TWO BAR METAL RAIL	1'-2" x 2'-6" CONCRETE PARAPET	RIP RAP CLASS II 2'-0" THICK	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS
	LBS.	LBS.	LUMP SUM	NO.	LIN. FT.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM
SUPERSTRUCTURE			LUMP SUM			595.00	610.00			LUMP SUM
END BENT No. 1	2,784			5	100			215	240	
BENT No. 1	7,062	1,249								
BENT No. 2	14,220	2,344								
END BENT No. 2	2,784			5	215			215	240	
TOTAL	26,850	3,593	LUMP SUM	10	315	595.00	610.00	430	480	LUMP SUM

DRAWN BY : M. POOLE \ DAH DATE : 6/15

CHECKED BY : H. T. BARBOUR DATE : 6-26-15

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Docusigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...

9/11/2015

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

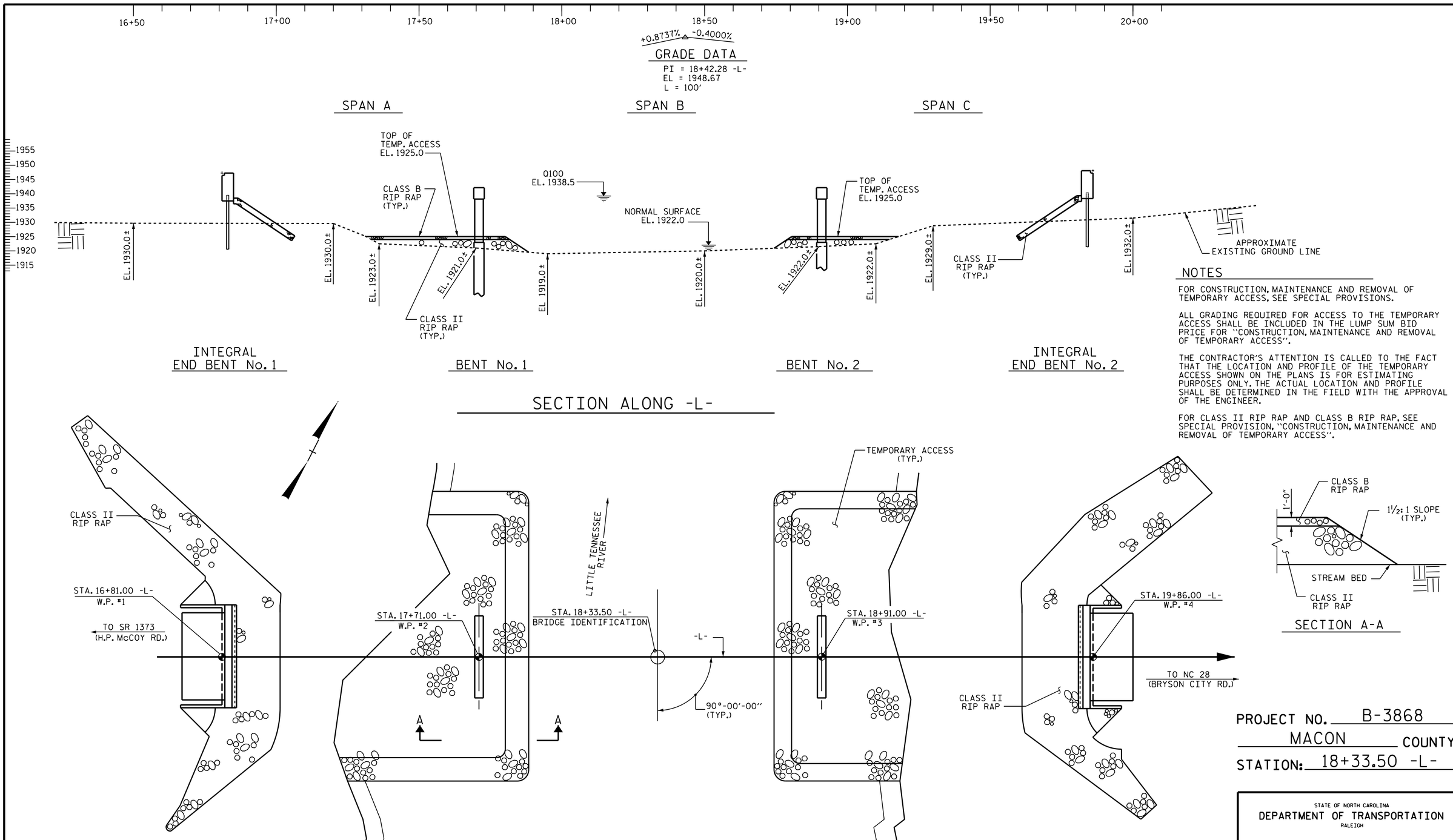
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER LITTLE TENNESSEE RIVER ON SR 1456 BETWEEN NC 28 AND SR 1373

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



SECTION ALONG -L-

NOTES

FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.

ALL GRADING REQUIRED FOR ACCESS TO THE TEMPORARY ACCESS SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR "CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS".

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LOCATION AND PROFILE OF THE TEMPORARY ACCESS SHOWN ON THE PLANS IS FOR ESTIMATING PURPOSES ONLY. THE ACTUAL LOCATION AND PROFILE SHALL BE DETERMINED IN THE FIELD WITH THE APPROVAL OF THE ENGINEER.

FOR CLASS II RIP RAP AND CLASS B RIP RAP, SEE SPECIAL PROVISION, "CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS".

PLAN

PILES & COLUMNS NOT SHOWN FOR CLARITY

SECTION A-A

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TEMPORARY ACCESS

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Marshall G. Cheek, Jr.
6549D8EBAA3B405...
9/11/2015

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

DRAWN BY : D. HODGE DATE : 6/15
CHECKED BY : M. G. CHEEK DATE : 8/15

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE II LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.10	--	1.75	0.718	1.17	B	EXT	120.0	0.832	1.10	B	INT	120.0	1.30	0.718	1.29	C	EXT	0.00	
		HL-93 (OPERATING)	N/A		1.42	--	1.35	0.718	1.52	B	EXT	120.0	0.832	1.42	B	INT	120.0	1.00	0.718	1.67	C	EXT	0.00	
		HS-20 (INVENTORY)	36.00	2	1.62	58.1	1.75	0.718	2.83	B	EXT	0.00	0.832	1.62	B	INT	120.0	1.30	0.718	3.05	C	EXT	56.10	
		HS-20 (OPERATING)	36.00		2.09	75.4	1.35	0.718	3.67	B	EXT	0.00	0.832	2.09	B	INT	120.0	1.00	0.718	3.97	C	EXT	56.10	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.13	69.2	1.40	0.718	8.89	C	EXT	56.10	0.832	5.13	B	INT	120.0	1.30	0.718	7.05	C	EXT	56.10	
		SNGARBS2	20.000		3.54	70.8	1.40	0.718	6.38	B	EXT	0.00	0.832	3.54	B	INT	120.0	1.30	0.718	5.16	C	EXT	56.10	
		SNAGRIS2	22.000		3.24	71.2	1.40	0.718	5.76	B	EXT	0.00	0.832	3.24	B	INT	120.0	1.30	0.718	4.84	C	EXT	56.10	
		SNCOTTS3	27.250		2.55	69.4	1.40	0.718	4.45	C	EXT	56.10	0.832	2.55	B	INT	120.0	1.30	0.718	3.53	C	EXT	56.10	
		SNAGGRS4	34.925		2.04	71.2	1.40	0.718	3.57	B	EXT	0.00	0.832	2.04	B	INT	120.0	1.30	0.718	2.92	C	EXT	56.10	
		SNS5A	35.550		2.02	71.8	1.40	0.718	3.50	B	EXT	0.00	0.832	2.02	B	INT	120.0	1.30	0.718	2.87	C	EXT	56.10	
		SNS6A	39.950		1.82	72.7	1.40	0.718	3.14	B	EXT	0.00	0.832	1.82	B	INT	120.0	1.30	0.718	2.61	C	EXT	56.10	
		SNS7B	42.000		1.75	73.5	1.40	0.718	2.99	B	EXT	0.00	0.832	1.75	B	INT	120.0	1.30	0.718	2.50	C	EXT	56.10	
	TRUCK TRACTOR SEMI-TRAILER (TITST)	TNAGRIT3	33.000		2.19	72.2	1.40	0.718	3.82	B	EXT	0.00	0.832	2.19	B	INT	120.0	1.30	0.718	3.21	C	EXT	56.10	
		TNT4A	33.075		2.17	71.7	1.40	0.718	3.80	B	EXT	0.00	0.832	2.17	B	INT	120.0	1.30	0.718	3.18	C	EXT	56.10	
		TNT6A	41.600		1.81	75.2	1.40	0.718	3.04	B	EXT	0.00	0.832	1.81	B	INT	120.0	1.30	0.718	2.60	C	EXT	56.10	
		TNT7A	42.000		1.79	75.1	1.40	0.718	3.02	B	EXT	0.00	0.832	1.79	B	INT	120.0	1.30	0.718	2.61	C	EXT	56.10	
		TNT7B	42.000		1.74	73.0	1.40	0.718	3.04	B	EXT	0.00	0.832	1.74	B	INT	120.0	1.30	0.718	2.64	C	EXT	56.10	
		TNAGRIT4	43.000		1.69	72.6	1.40	0.718	2.93	B	EXT	0.00	0.832	1.69	B	INT	120.0	1.30	0.718	2.55	C	EXT	56.10	
		TNAGT5A	45.000		1.64	73.8	1.40	0.718	2.81	B	EXT	0.00	0.832	1.64	B	INT	120.0	1.30	0.718	2.43	C	EXT	56.10	
		TNAGT5B	45.000	3	1.61	72.4	1.40	0.718	2.80	B	EXT	0.00	0.832	1.61	B	INT	120.0	1.30	0.718	2.39	C	EXT	56.10	
FATIGUE		HL-93 (INVENTORY)	γ_{LL}=0.75																					

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.
2.
3.
4.

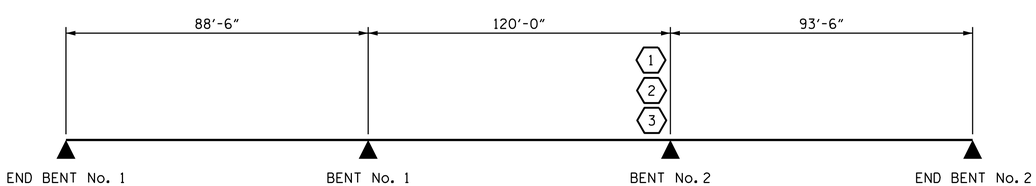
(#) CONTROLLING LOAD RATING

1. DESIGN LOAD RATING (HL-93) **
2. DESIGN LOAD RATING (HS-20) **
3. LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

DIMENSIONS SHOWN ARE BEARING TO BEARING.

PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

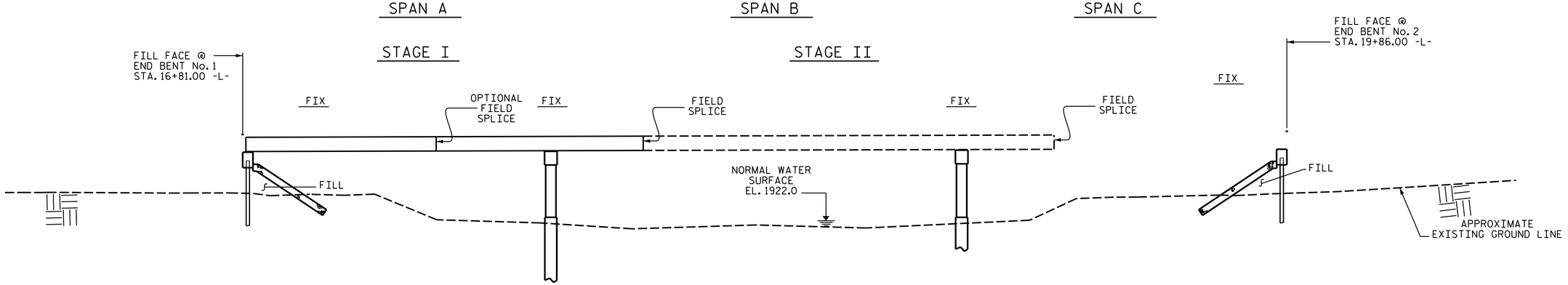
LRFR SUMMARY FOR STEEL GIRDERS
(NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr. 9/11/2015

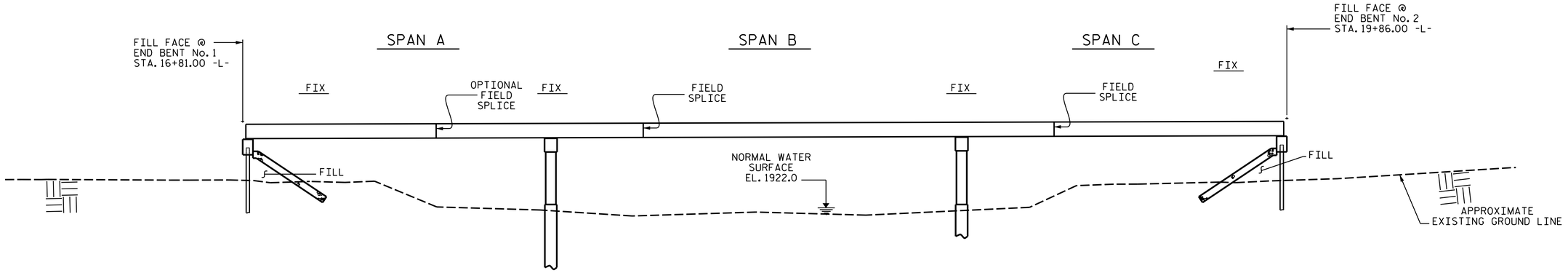
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			40

ASSEMBLED BY : S.T. CHAMPION DATE : 7-31-15
CHECKED BY : M. G. CHEEK DATE : 8-3-15
DRAWN BY : MAA 1/08
CHECKED BY : GM/DI 2/08
REV. 11/12/08RR MAA/GM
REV. 10/1/11 MAA/GM

STD. NO. LRFR3



STAGE I & II GIRDER ERECTION



FINAL STAGE GIRDER ERECTION

NOTES

THIS BRIDGE IS DESIGNED FOR THE ERECTION SEQUENCE SHOWN. THE CONTRACTOR HAS THE OPTION TO DEVIATE FROM THE PROPOSED ERECTION SEQUENCE. IF THE CONTRACTOR CHOOSES TO DEVIATE FROM THE PROPOSED ERECTION SEQUENCE, HE WILL BE RESPONSIBLE FOR ANALYZING THE EFFECTS OF THE PROPOSED CHANGES TO THE PERMANENT STRUCTURE DURING THE CONSTRUCTION PHASE AND IN THE FINAL CONDITION. CALCULATIONS SHOWING REVISED EFFECTS MUST BE SUBMITTED FOR APPROVAL. ANY APPROVED CHANGES WILL BE REFLECTED IN REVISED CONTRACT PLANS FURNISHED BY THE CONTRACTOR. ALL ENGINEERING WORK FOR THE REVISION MUST BE PERFORMED BY A PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA. ANY WORK REQUIRED BY THE CONTRACTOR TO COMPLETE THE DEVIATION FROM THE PROPOSED ERECTION SEQUENCE SHALL BE PERFORMED AT NO ADDITIONAL COST TO THE DEPARTMENT.

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

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

THE FIRST TWO GIRDERS IN STAGE I SHALL BE ERECTED SIMULTANEOUSLY WITH ALL DIAPHRAGMS BETWEEN THE GIRDERS IN PLACE AND THE BOLTS TIGHTENED PRIOR TO RELEASING THE GIRDERS. CONNECT ADDITIONAL GIRDERS AND DIAPHRAGMS ADJACENT TO THE PREVIOUSLY ERECTED GIRDERS AND TIGHTEN ALL BOLTS PRIOR TO RELEASING ADDITIONAL GIRDERS.

AFTER ERECTING STAGE I GIRDERS, GIRDERS AND DIAPHRAGMS IN STAGE II SHALL BE INSTALLED INDIVIDUALLY. AFTER ERECTING STAGE II GIRDERS, GIRDERS AND DIAPHRAGMS IN STAGE III SHALL BE INSTALLED INDIVIDUALLY.

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Digitally signed by Marshall G. Cheek, Jr.
6549D8EBAA3B405...
9/18/2015

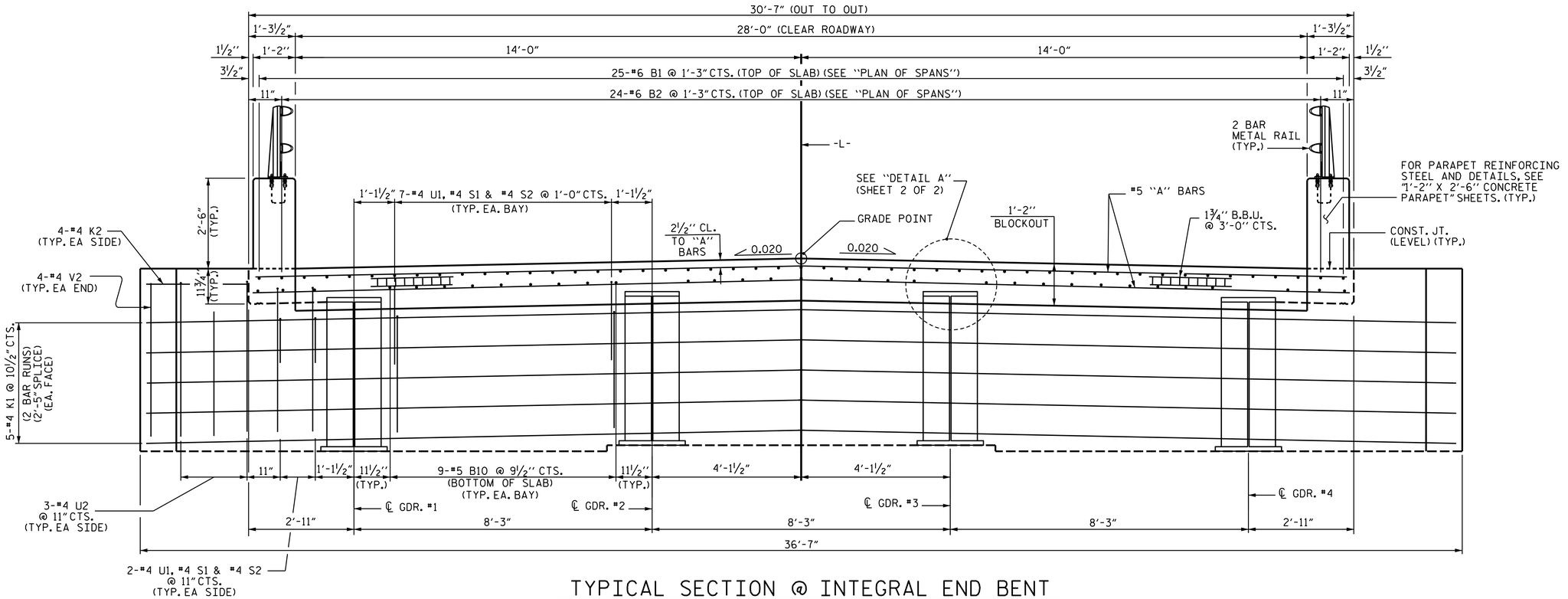
DRAWN BY : D. HODGE DATE : 9/15
CHECKED BY : M.G. CHEEK DATE : 9/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 9/15

PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

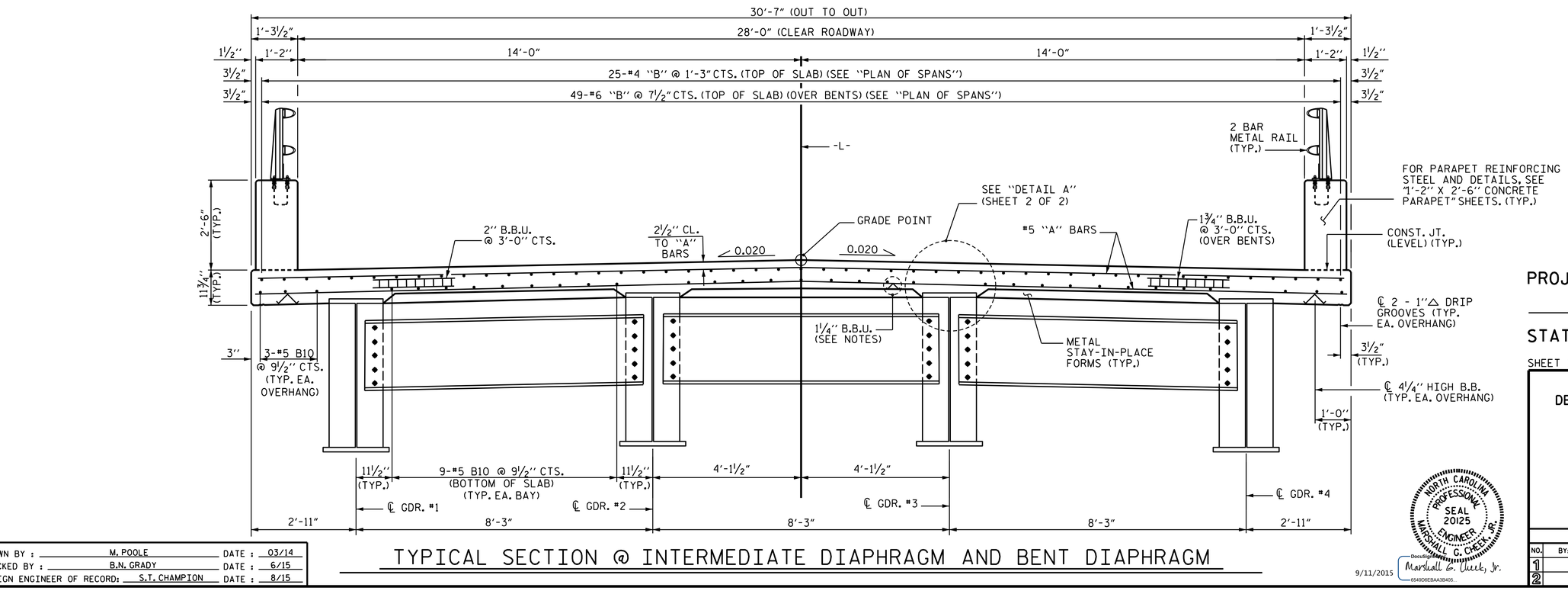
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GIRDER ERECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			40



TYPICAL SECTION @ INTEGRAL END BENT



TYPICAL SECTION @ INTERMEDIATE DIAPHRAGM AND BENT DIAPHRAGM

DRAWN BY : M. POOLE DATE : 03/14
CHECKED BY : B.N. GRADY DATE : 6/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 8/15

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

9/11/2015

DocuSigned by: Marshall G. Cheek, Jr.
8549D6EBAA3B405...

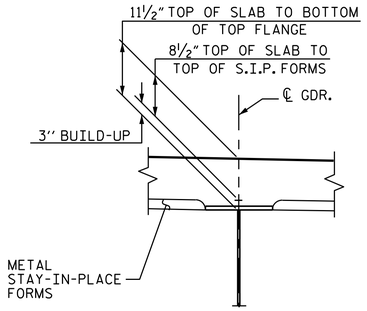
PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

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-7
1			3			TOTAL SHEETS
2			4			40



DETAIL A

NOTES

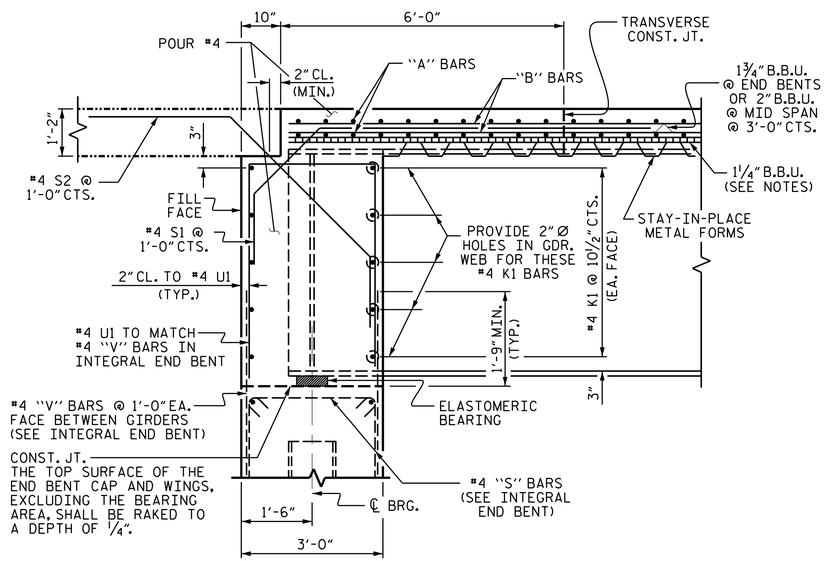
PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

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

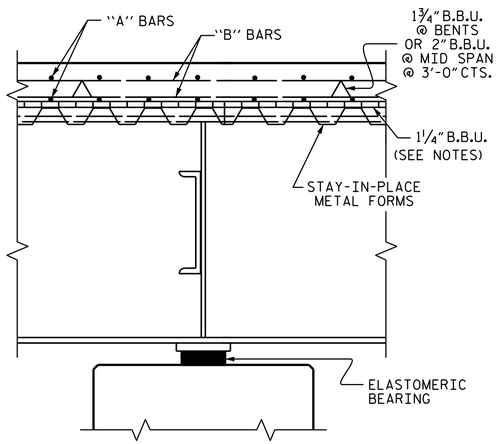
METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.

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.

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



END OF GIRDER DETAIL AT INTEGRAL END BENT



SECTION AT BENT

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...

9/11/2015

DRAWN BY : M. POOLE	DATE : 3/14	REVISIONS				SHEET NO.
CHECKED BY : B.N. GRADY	DATE : 6/15	NO.	BY:	DATE:	NO. BY: DATE:	S-8
DESIGN ENGINEER OF RECORD: S.T. CHAMPION	DATE : 8/15	1			3	TOTAL SHEETS
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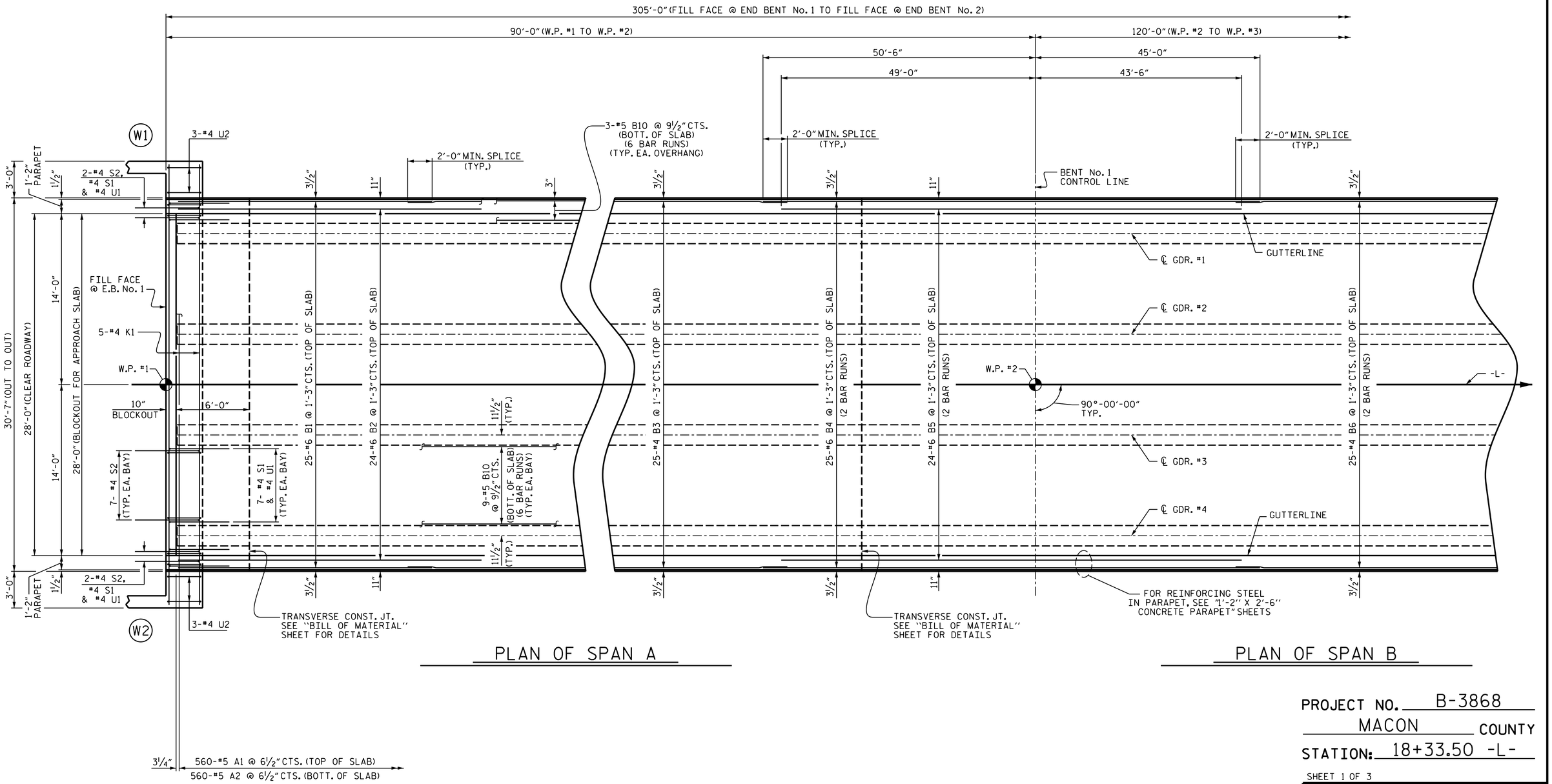


PLAN OF SPAN A

PLAN OF SPAN B

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS

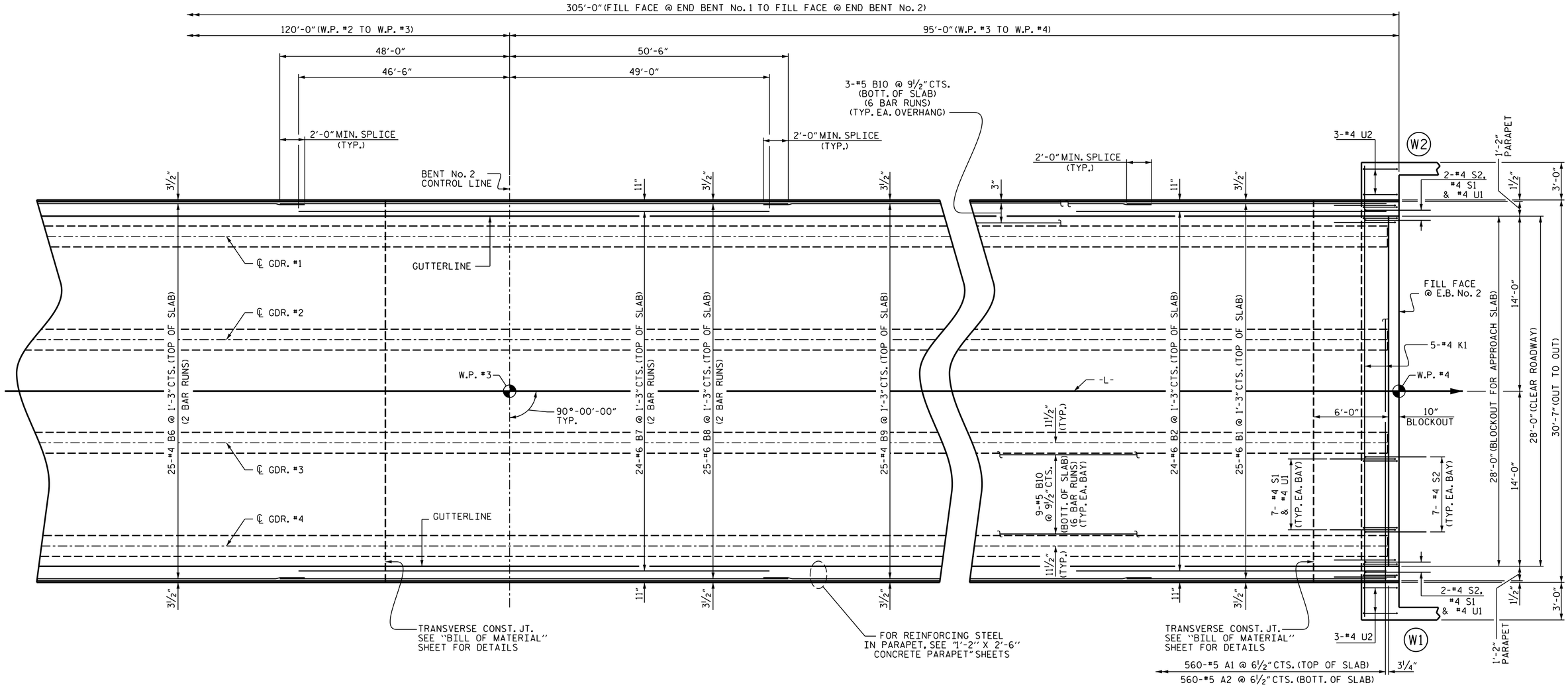
NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CREEK, JR.

DocuSigned by: Marshall G. Creek, Jr. 6549D8EBAA3B405...

9/11/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			40

DRAWN BY :	D. HODGE	DATE : 10/14
CHECKED BY :	B.N. GRADY	DATE : 6/15
DESIGN ENGINEER OF RECORD:	S.T. CHAMPION	DATE : 8/15



PLAN OF SPAN B

PLAN OF SPAN C

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

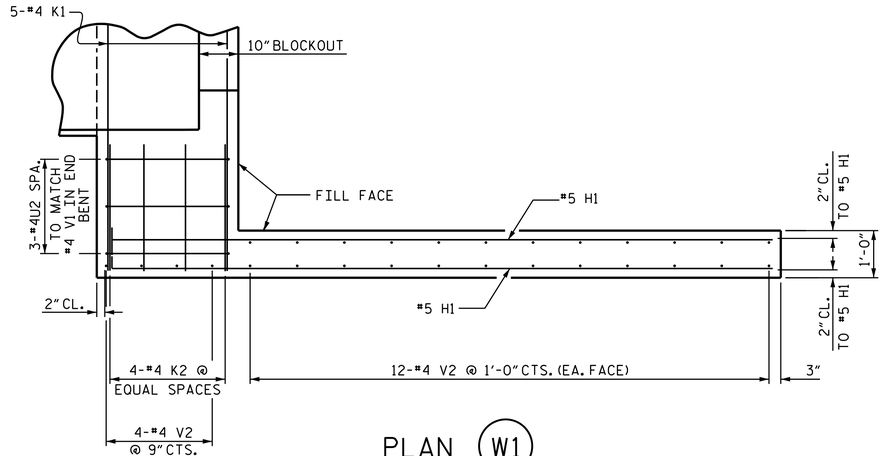
SUPERSTRUCTURE
PLAN OF SPANS

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Digitally signed by Marshall G. Cheek, Jr.
6549D6EBAA3B405...
9/11/2015

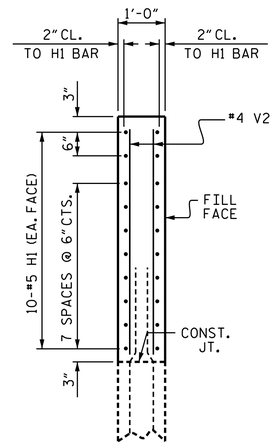
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : D. HODGE DATE : 10/14
CHECKED BY : B.N. GRADY DATE : 6/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 8/15



PLAN W1

(WING W2 SIMILAR)



SECTION X-X

ELEVATION W1

(WING W2 SIMILAR)

UPPER WINGS AT INTEGRAL END BENTS

FOR LOWER WING REINFORCING STEEL AND DETAILS, SEE "INTEGRAL END BENT" SHEETS

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN DETAILS

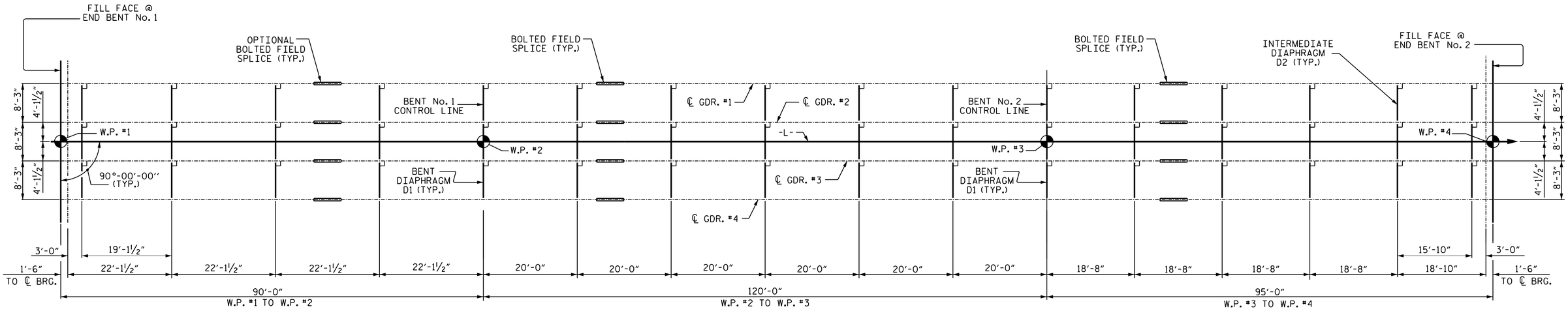
NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Docusigned by: Marshall G. Cheek, Jr. 6549D8EBAA3B405...

9/11/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : D. HODGE DATE : 10/14
CHECKED BY : B.N. GRADY DATE : 6/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 8/15



FIXED
E1

FIXED
E1, P1

FIXED
E1, P1

FIXED
E1

SPAN A

SPAN B

SPAN C

FRAMING PLAN

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
FRAMING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Marshall G. Cheek, Jr.
6549D6EBAA3B405...

9/11/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : M. POOLE/DAH DATE : 03/15
CHECKED BY : B.N. GRADY DATE : 6/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 8/15

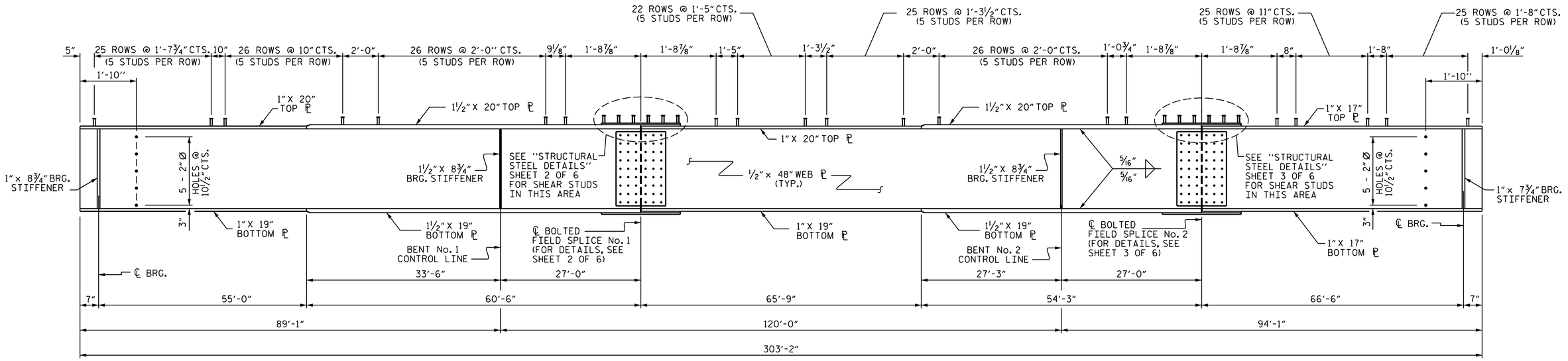
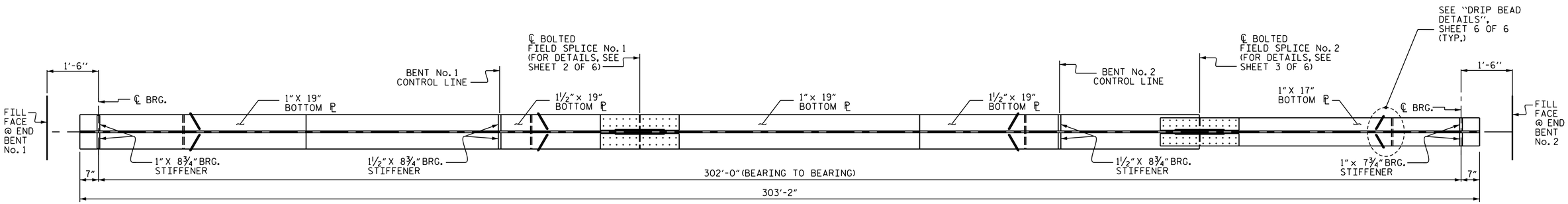
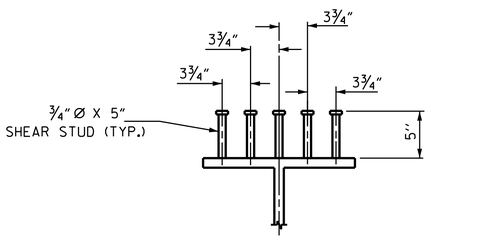


PLATE GIRDER ELEVATION

(DIAPHRAGM CONNECTOR PLATES AND DRIP BEADS NOT SHOWN)

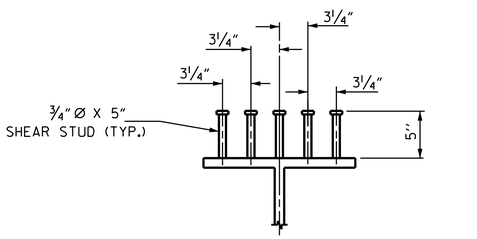


PLAN OF BOTTOM FLANGE



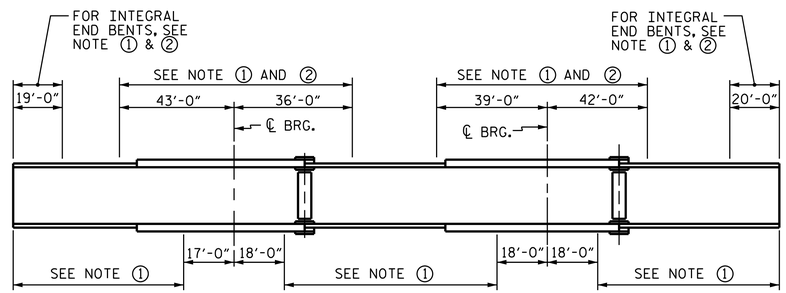
SHEAR STUD DETAILS

(FOR 20" TOP ℄)



SHEAR STUD DETAILS

(FOR 17" TOP ℄)



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

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 65490BEBAA3B405...

9/11/2015

DRAWN BY : D. HODGE DATE : 6/14
CHECKED BY : B.N. GRADY DATE : 6/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 8/15

PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

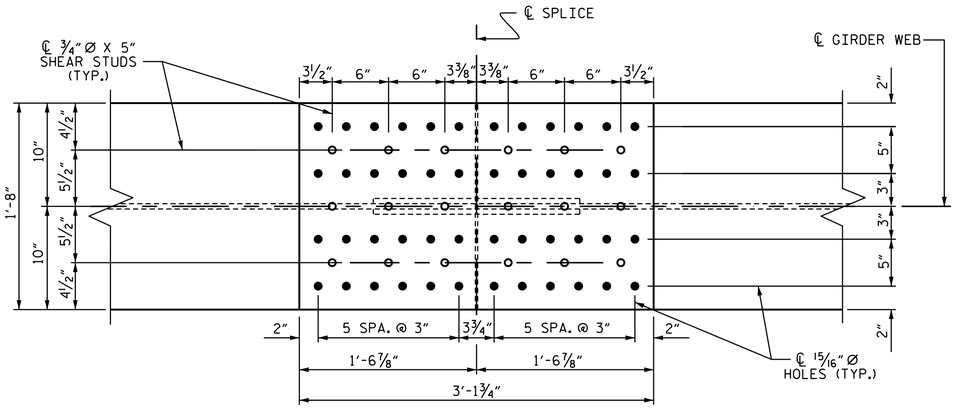
SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

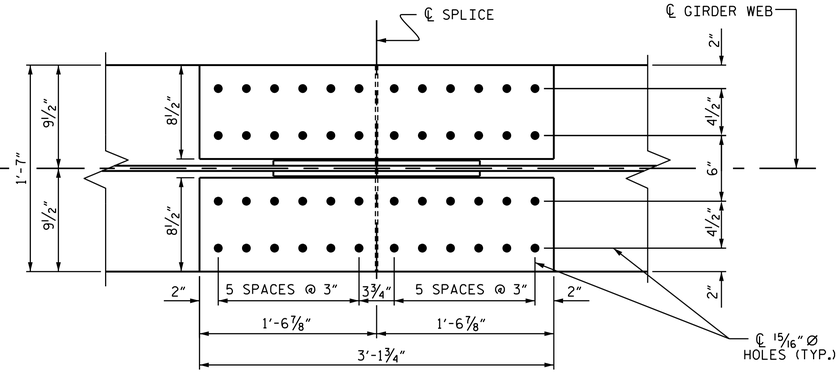
SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

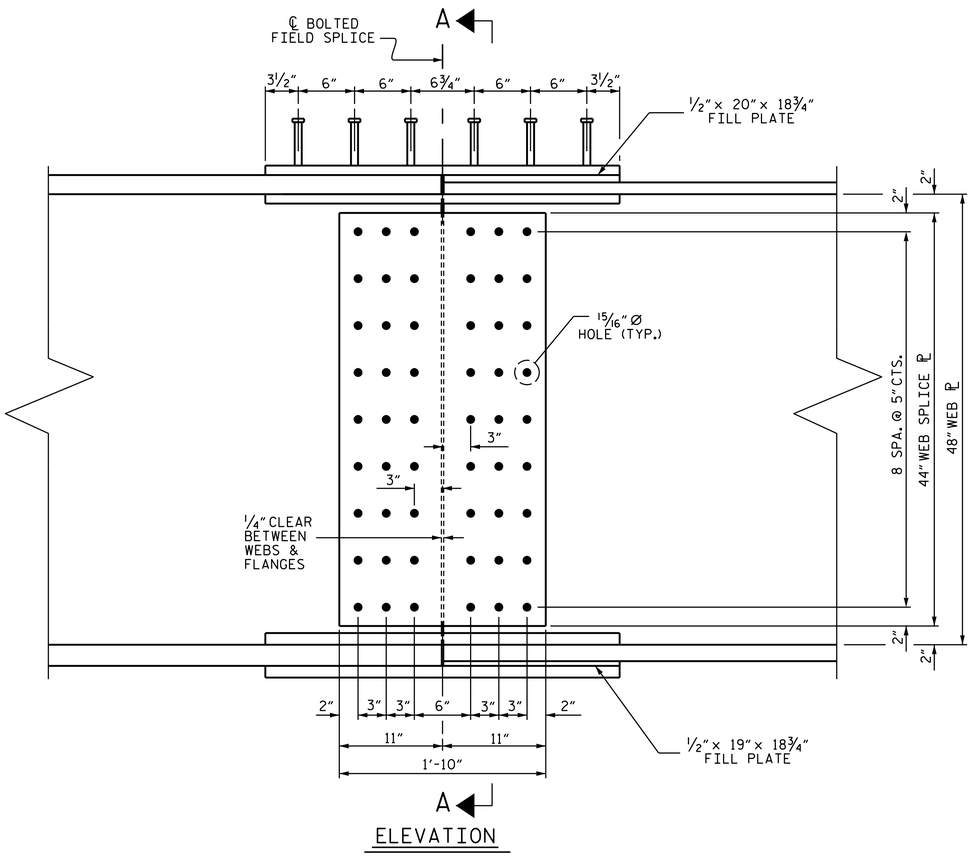
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			40



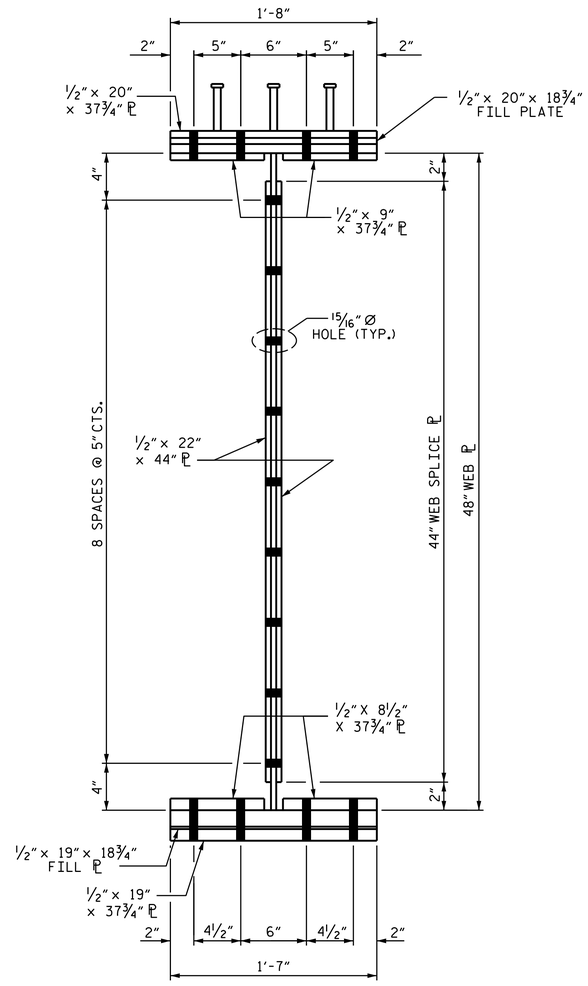
PLAN (TOP OF TOP FLANGE)



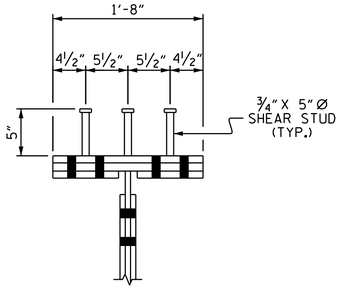
PLAN (TOP OF BOTTOM FLANGE)



ELEVATION



SECTION A-A



SHEAR STUD DETAIL
FOR TOP FLANGE SPLICE PLATE

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

BOLTED FIELD
SPLICE No. 1 DETAILS

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -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-14
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : D. HODGE DATE : 6/14
CHECKED BY : B.N. GRADY DATE : 6/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 8/15

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Marshall G. Cheek, Jr.

9/11/2015

$$$$$$SYSTIME$$$$$
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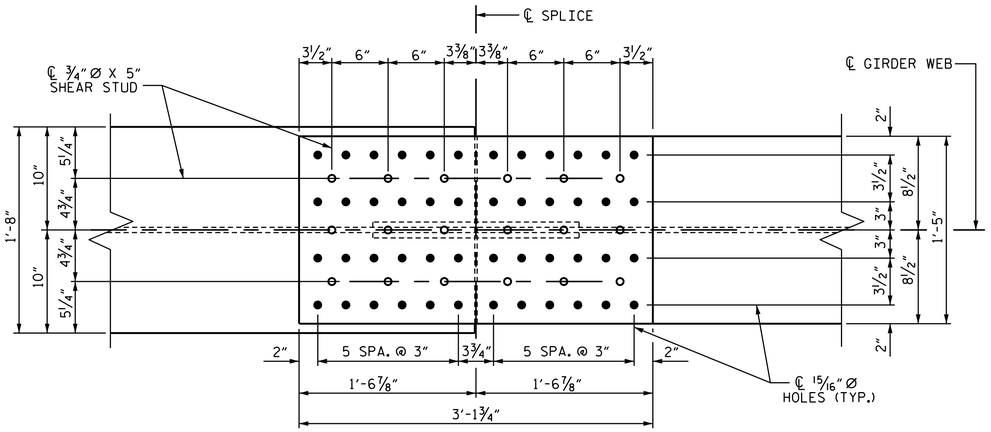
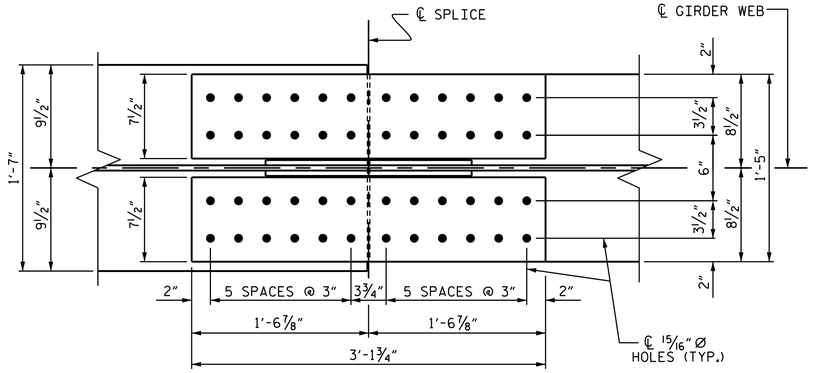
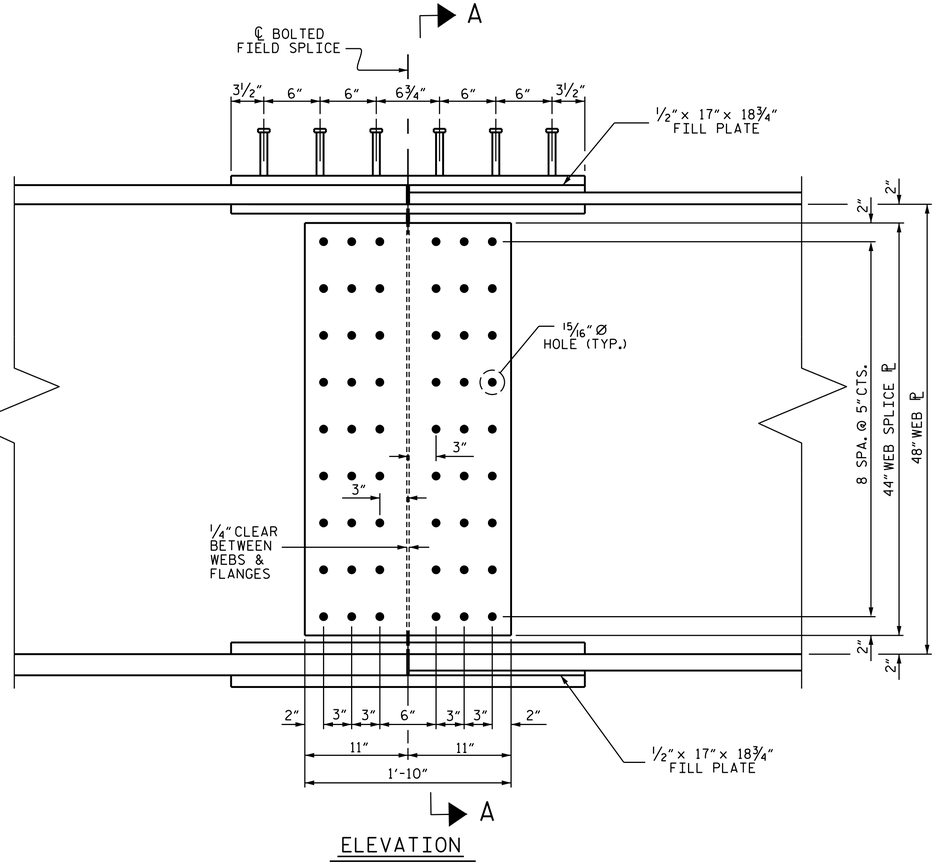
$$$$USERNAME$$$$



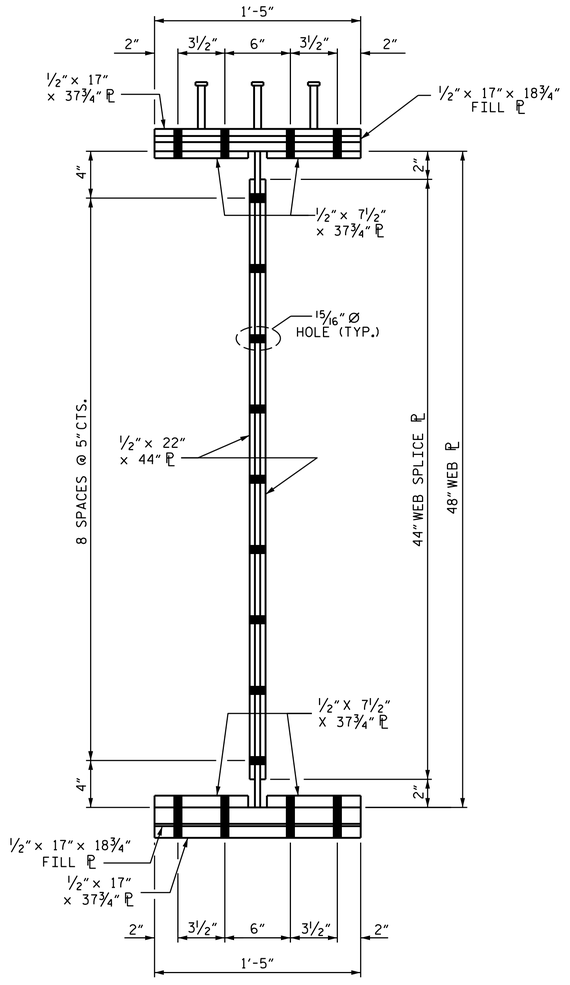
PLAN (TOP OF TOP FLANGE)



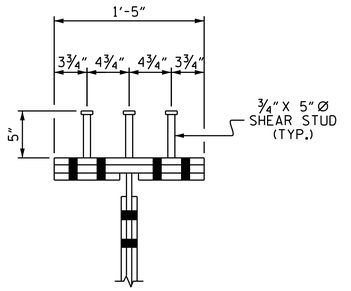
PLAN (TOP OF BOTTOM FLANGE)



ELEVATION



SECTION A-A



SHEAR STUD DETAIL
FOR TOP FLANGE SPLICE PLATE

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

BOLTED FIELD SPLICE No. 2 DETAILS

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : D. HODGE DATE : 6/14
CHECKED BY : B.N. GRADY DATE : 6/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 8/15

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$$$$USERNAME$$$$

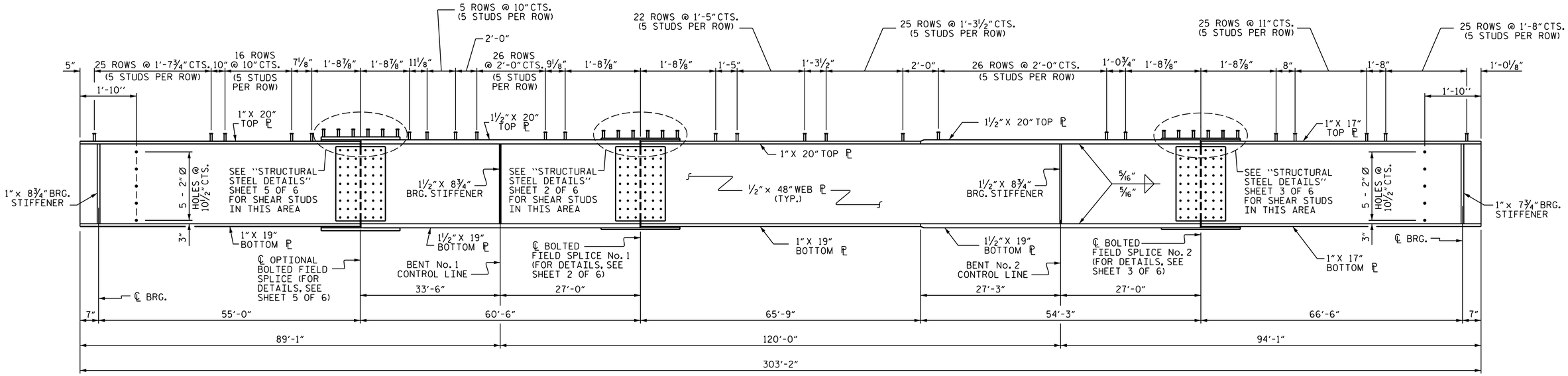
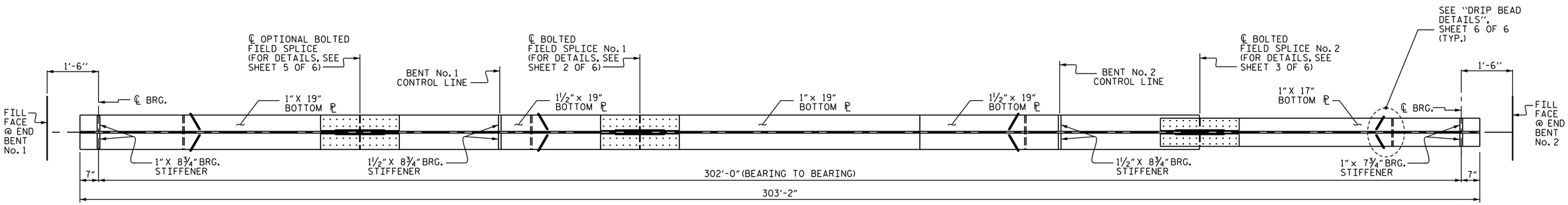


PLATE GIRDER ELEVATION

(DIAPHRAGM CONNECTOR PLATES AND DRIP BEADS NOT SHOWN)



PLAN OF BOTTOM FLANGE

NOTES

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

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

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

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

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.

A BOLTED FIELD SPLICE WILL BE PERMITTED IN THE GIRDERS IN SPAN A AS DETAILED IN THE PLANS. IF A FIELD SPLICE IS USED, IT SHALL BE MADE ENTIRELY AT THE CONTRACTOR'S EXPENSE AND NO ADDITIONAL MEASUREMENT OR PAYMENT WILL BE MADE FOR THE ADDITIONAL MATERIALS REQUIRED.

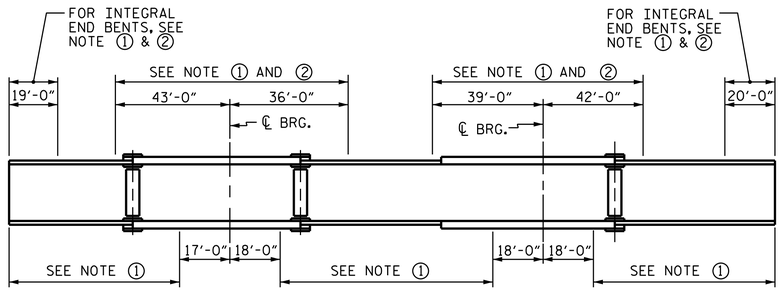
STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

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

END OF GIRDERS SHALL BE PLUMB.

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

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



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

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CLUCK, JR.

Digitally signed by Marshall G. Cluck, Jr. 9/18/2015

6540D8EBAA3B405...

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

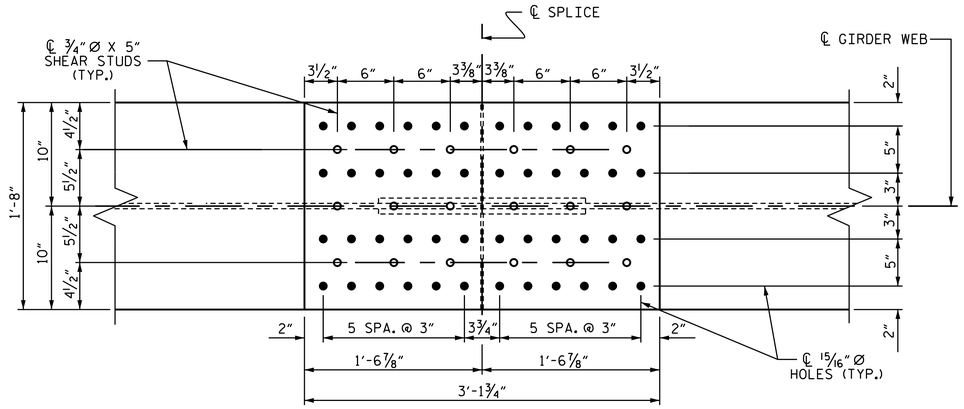
OPTIONAL BOLTED FIELD SPLICE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			40

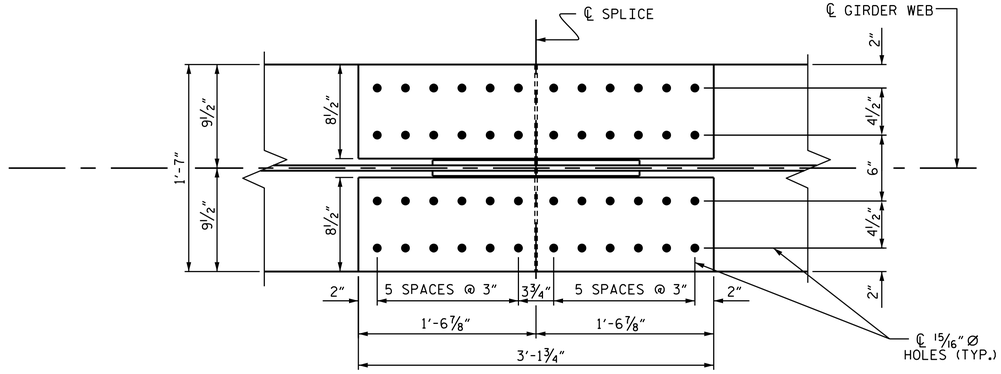
DRAWN BY : D. HODGE DATE : 6/14

CHECKED BY : B.N. GRADY DATE : 6/15

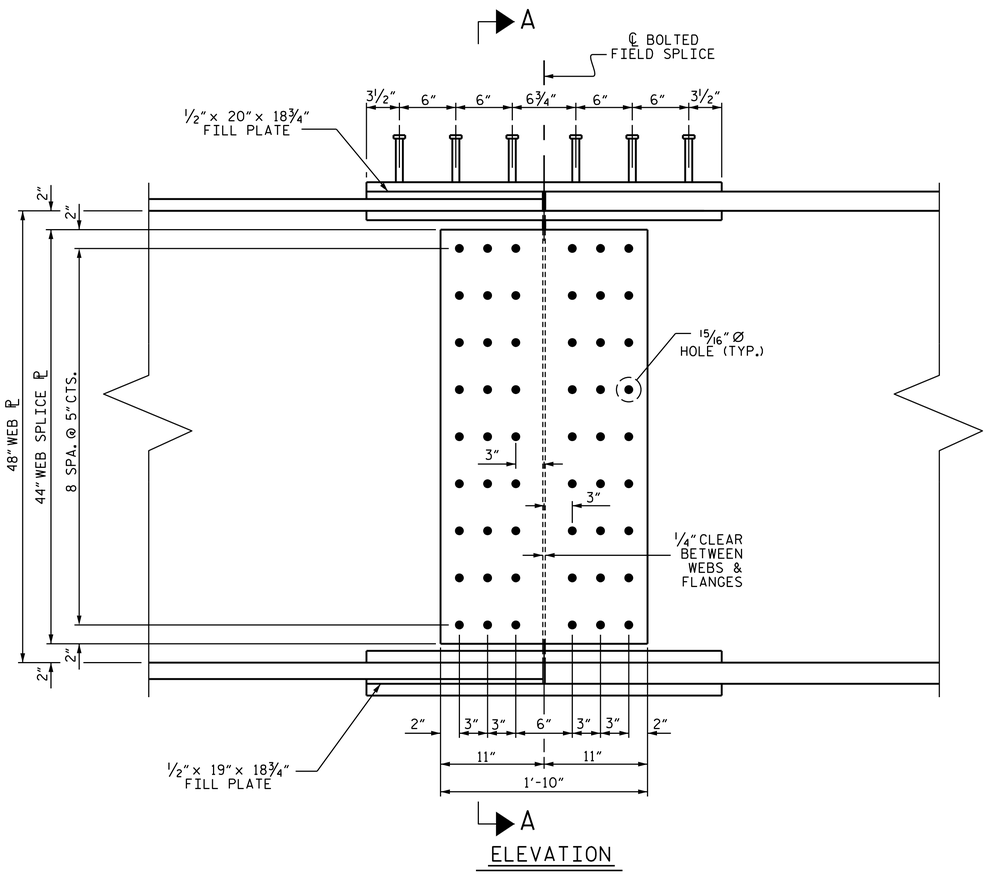
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 8/15



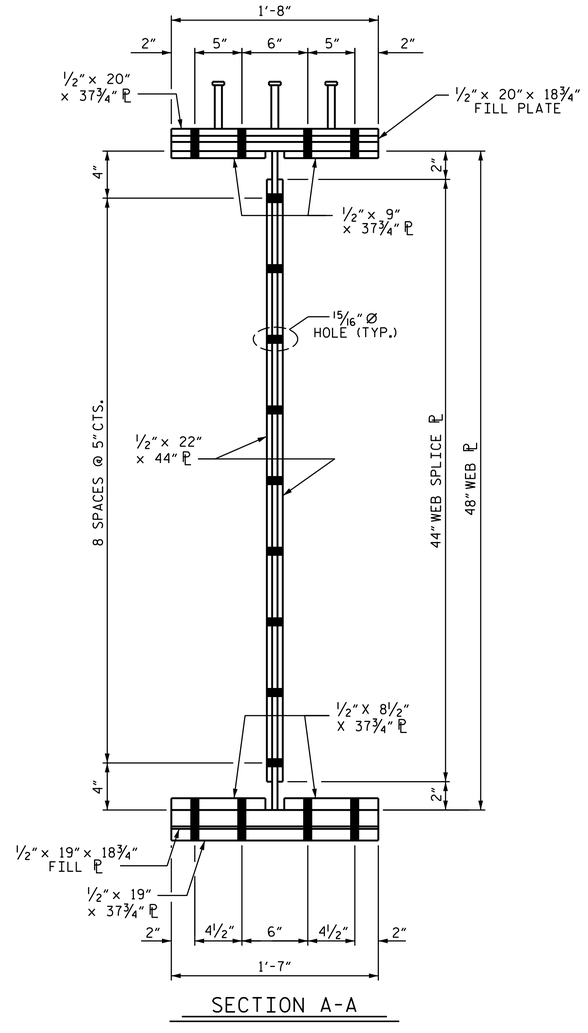
PLAN (TOP OF TOP FLANGE)



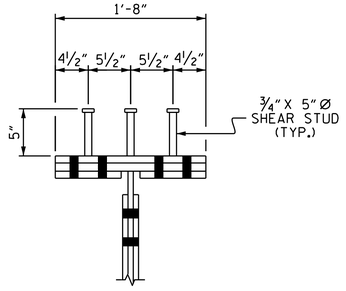
PLAN (TOP OF BOTTOM FLANGE)



ELEVATION



SECTION A-A



SHEAR STUD DETAIL
FOR TOP FLANGE SPLICE PLATE

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

OPTIONAL BOLTED FIELD SPLICE DETAILS

DRAWN BY : D. HODGE DATE : 6/14
CHECKED BY : B.N. GRADY DATE : 6/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 8/15

$$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$$

PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

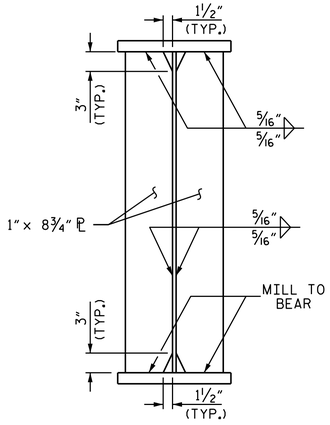
SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

OPTIONAL
BOLTED FIELD SPLICE

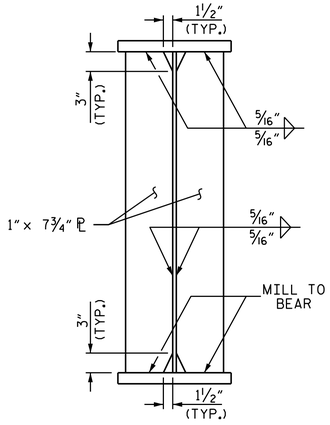
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			40

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.



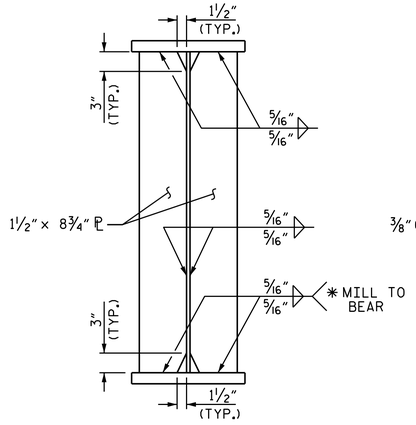
BEARING STIFFENER

(AT END BENT No. 1)



BEARING STIFFENER

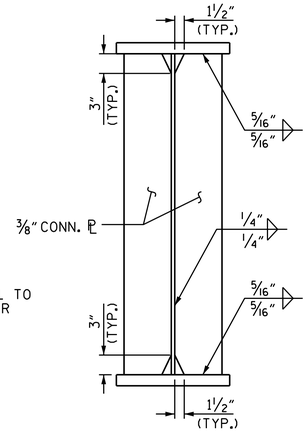
(AT END BENT No. 2)



BEARING STIFFENER

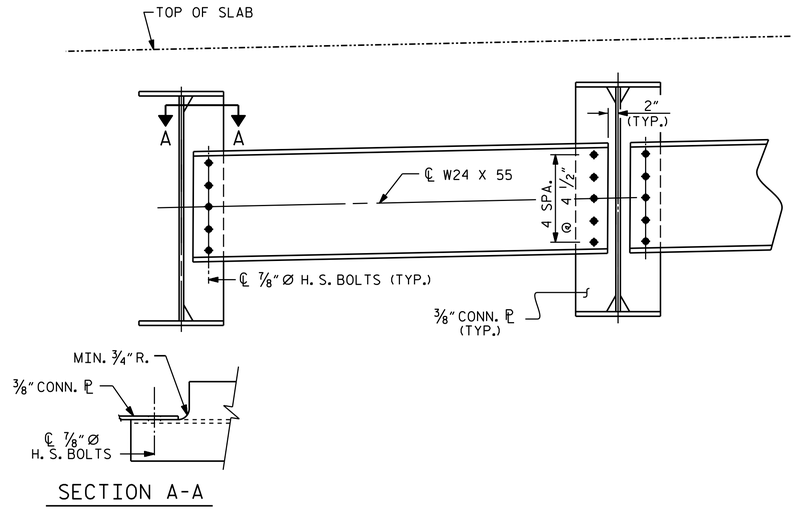
(AT BENTS)

* WELD ONLY WHEN USED AS CONNECTOR ℙ



CONNECTOR PLATE DETAIL

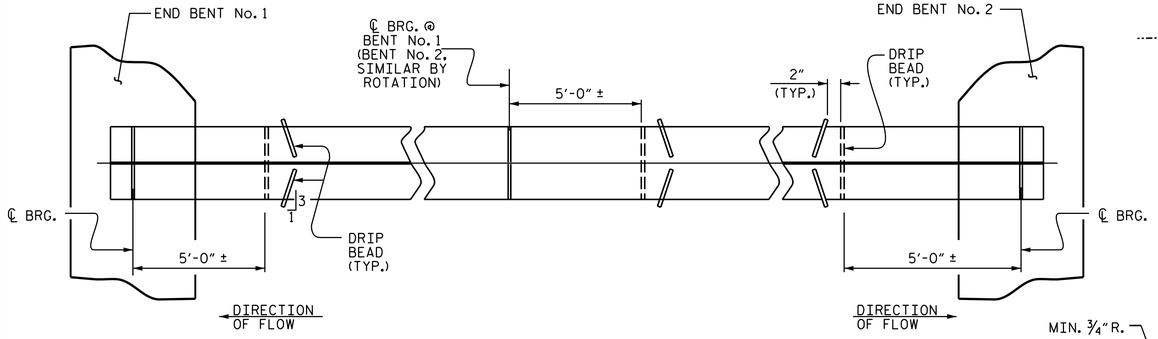
(AT INTERMEDIATE DIAPHRAGM)



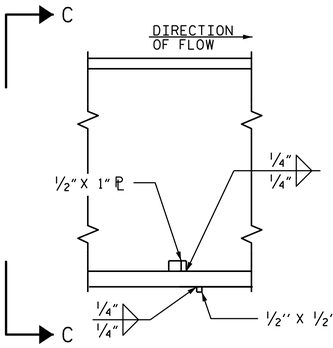
SECTION A-A

TYPICAL INTERMEDIATE DIAPHRAGM (D2)

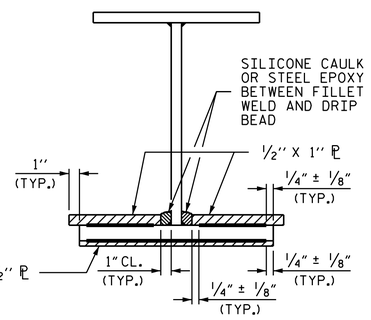
FOR WELD SIZE, SEE CONNECTOR PLATE DETAIL.



PART PLAN - BOTTOM FLANGE

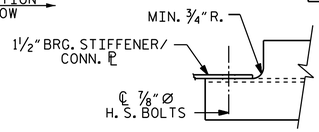


SECTION

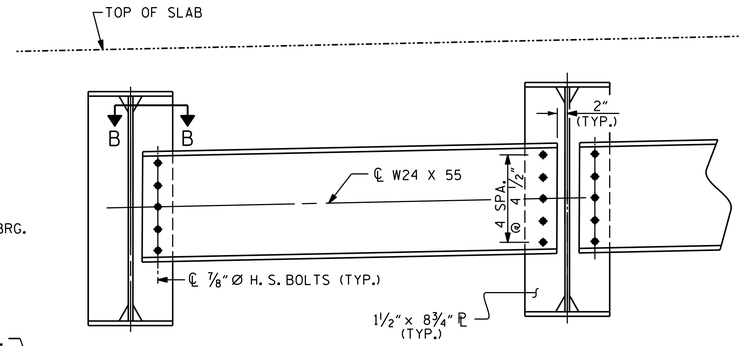


VIEW C-C

DRIP BEAD DETAILS

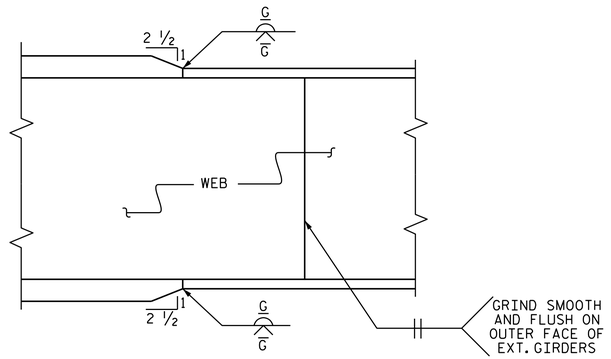


SECTION B-B



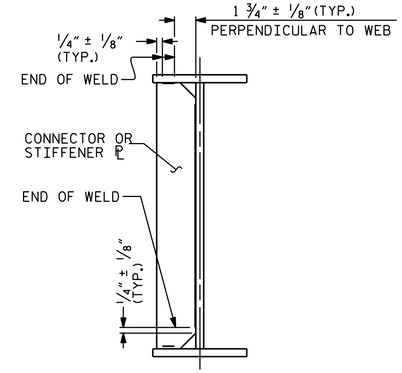
TYPICAL BENT DIAPHRAGM (D1)

FOR WELD SIZE, SEE BEARING STIFFENER DETAILS.



ELEVATION

TYPICAL FLANGE AND WEB BUTT JOINT



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

WELD TERMINATION DETAILS

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...

9/11/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : D. HODGE DATE : 6/14
CHECKED BY : B.N. GRADY DATE : 6/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 8/15

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A GIRDERS #1 - #4										
TENTH POINTS	℄ BRG.	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.004	0.008	0.010	0.011	0.010	0.008	0.005	0.002	0.000	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.017	0.032	0.041	0.044	0.040	0.032	0.020	0.009	0.001	0.000
DEFLECTION DUE TO WEIGHT OF PARAPET	0.000	0.002	0.004	0.006	0.006	0.005	0.004	0.003	0.001	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.023	0.044	0.057	0.061	0.055	0.044	0.028	0.012	0.001	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/4''	1/2''	11/16''	3/4''	11/16''	1/2''	5/16''	1/8''	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

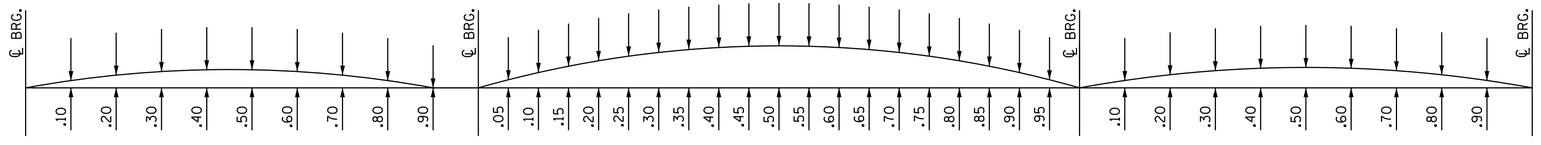
	SPAN B GIRDERS #1 - #4																				
TWENTIETH POINTS	℄ BRG.	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	℄ BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.002	0.004	0.007	0.011	0.015	0.018	0.021	0.023	0.025	0.025	0.025	0.023	0.021	0.018	0.014	0.011	0.007	0.004	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.005	0.014	0.025	0.038	0.050	0.062	0.073	0.080	0.085	0.086	0.084	0.079	0.070	0.059	0.047	0.034	0.022	0.011	0.004	0.000
DEFLECTION DUE TO WEIGHT OF PARAPET	0.000	0.001	0.002	0.004	0.006	0.008	0.009	0.011	0.012	0.013	0.013	0.013	0.012	0.011	0.009	0.007	0.005	0.003	0.002	0.001	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.008	0.020	0.036	0.055	0.073	0.089	0.105	0.115	0.123	0.124	0.122	0.114	0.102	0.086	0.068	0.050	0.032	0.017	0.006	0.000
VERTICAL CURVE ORDINATE	0.000	0.031	0.062	0.093	0.124	0.150	0.172	0.190	0.203	0.211	0.215	0.214	0.209	0.199	0.184	0.165	0.141	0.113	0.080	0.042	0.000
REQUIRED CAMBER	0	7/16''	1''	1 9/16''	2 1/8''	2 11/16''	3 1/8''	3 9/16''	3 13/16''	4''	4 1/16''	4 1/16''	3 7/8''	3 5/8''	3 1/4''	2 13/16''	2 5/16''	1 3/4''	1 3/16''	9/16''	0

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN C GIRDERS #1 - #4										
TENTH POINTS	℄ BRG.	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.000	0.003	0.007	0.010	0.013	0.014	0.013	0.010	0.006	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.004	0.017	0.034	0.050	0.061	0.065	0.061	0.047	0.026	0.000
DEFLECTION DUE TO WEIGHT OF PARAPET	0.000	0.001	0.002	0.005	0.007	0.008	0.009	0.008	0.006	0.003	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.005	0.022	0.046	0.067	0.082	0.088	0.082	0.063	0.035	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/16''	1/4''	5/16''	13/16''	1''	1 1/16''	1''	3/4''	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)



SPAN A SPAN B SPAN C

SCHEMATIC CAMBER ORDINATES

SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.

DRAWN BY : M. POOLE/DAH DATE : 04/14
CHECKED BY : B.N. GRADY DATE : 6/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 8/15

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
9/11/2015

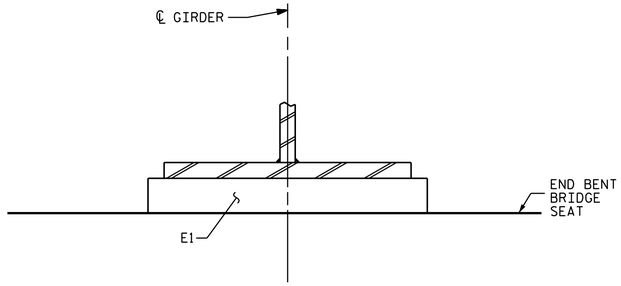
PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

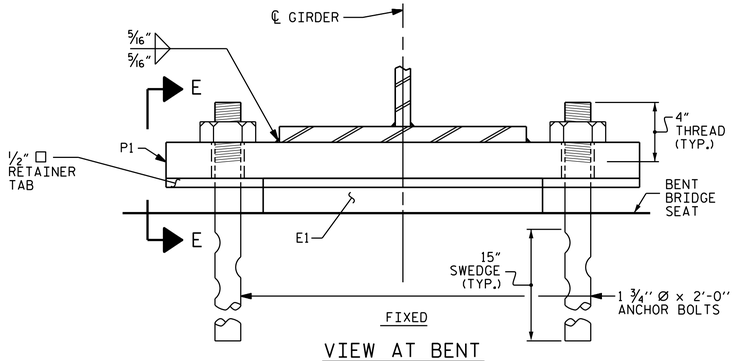
DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			40



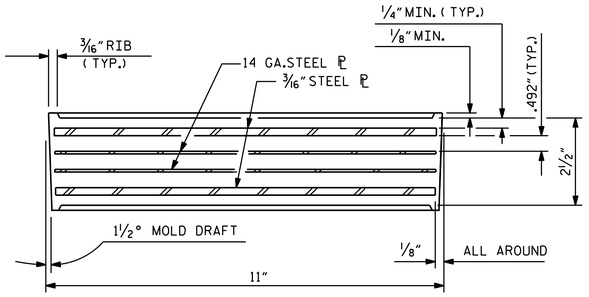
FIXED

VIEW AT
INTEGRAL END BENT

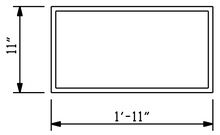


FIXED

VIEW AT BENT



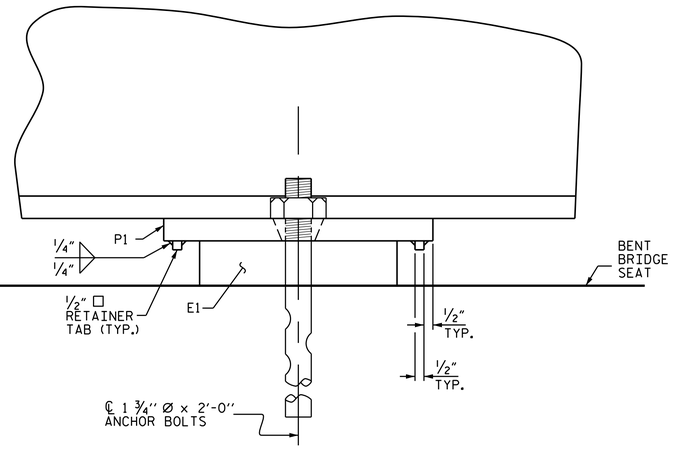
TYPICAL SECTION OF ELASTOMERIC BEARINGS



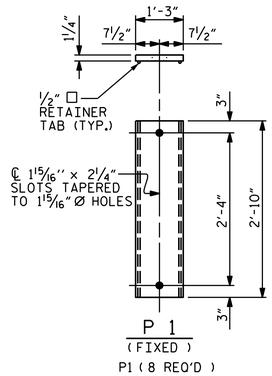
E1 (16 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE VI



VIEW E-E



P 1
(FIXED)

P1 (8 REQ'D)

SOLE PLATE DETAILS (P1)

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE VI	420 k

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ELASTOMERIC BEARING DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

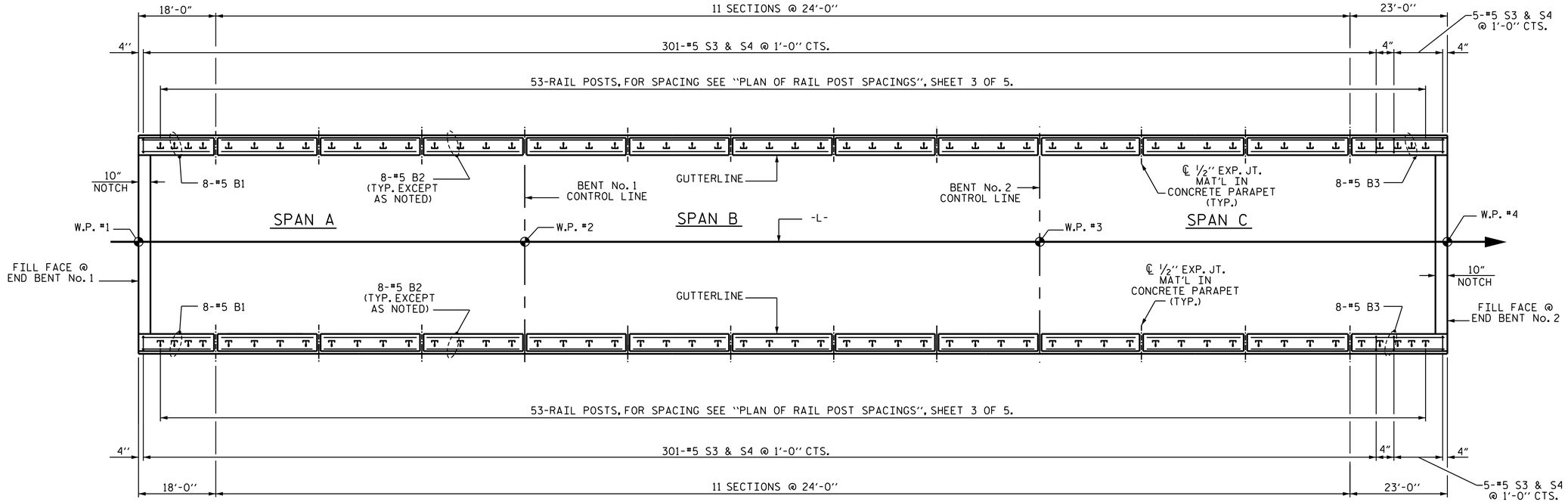
DocuSigned by: Marshall G. Cheek, Jr.
6549D6EBAA3B405...

9/11/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			40

ASSEMBLED BY : D. HODGE	DATE : 4/15	
CHECKED BY : B.N. GRADY	DATE : 6/15	
DRAWN BY : EEM 10/95	REV. 5/1/06	TLA/GM
CHECKED BY : PEK 10/95	REV. 10/1/11	MAA/GM
	REV. 6/13	AAC/MAA

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$



PLAN OF PARAPET

NOTES

FOR DETAILS OF CONCRETE INSERT AND GUARDRAIL ANCHOR ASSEMBLY, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEETS.

ALL REINFORCING STEEL IN CONCRETE PARAPET SHALL BE EPOXY COATED.

THE JOINT OPENING AT THE DECK/APPROACH SLAB INTERFACE SHALL BE SAWED PRIOR TO THE CASTING OF THE CONCRETE PARAPET.

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

CONCRETE PARAPET 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.

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

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405... 9/11/2015

DRAWN BY :	M. POOLE/DAH	DATE :	3/14
CHECKED BY :	B.N. GRADY	DATE :	6/15
DESIGN ENGINEER OF RECORD:	S.T. CHAMPION	DATE :	8/15

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

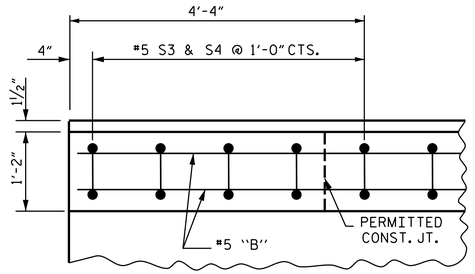
SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

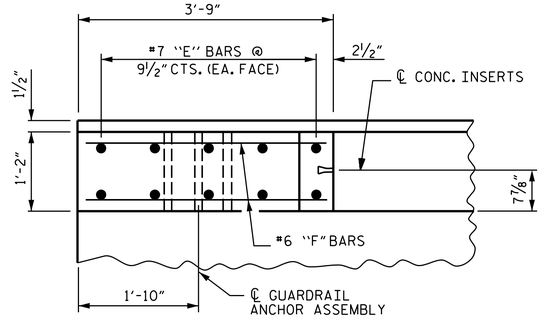
SUPERSTRUCTURE

1'-2" X 2'-6" CONCRETE PARAPET

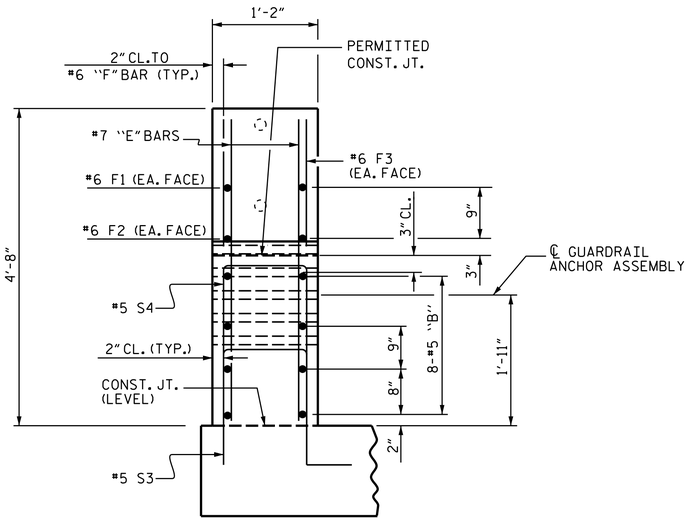
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			40



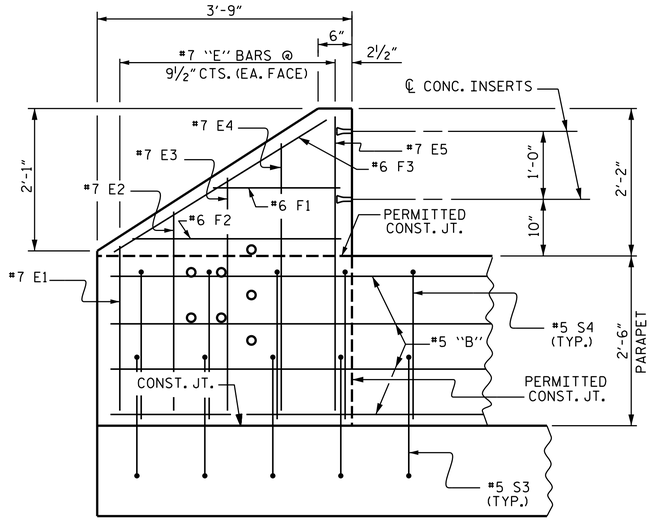
PLAN OF PARAPET



PLAN OF END POST



END VIEW



ELEVATION

PARAPET AND END POST FOR TWO BAR RAIL

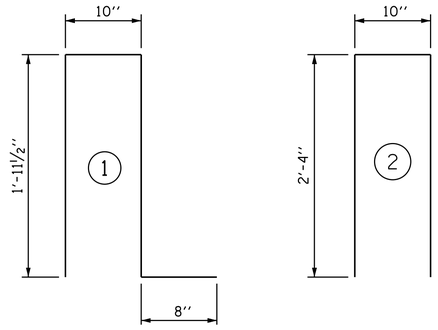
BILL OF MATERIAL

CONCRETE PARAPET & END POSTS

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
* B1	16	5	STR	17'-7"	293
* B2	176	5	STR	23'-7"	4329
* B3	16	5	STR	22'-7"	377
* E1	8	7	STR	2'-6"	41
* E2	8	7	STR	3'-0"	49
* E3	8	7	STR	3'-6"	57
* E4	8	7	STR	4'-0"	65
* E5	8	7	STR	4'-4"	71
* F1	8	6	STR	1'-10"	22
* F2	8	6	STR	3'-0"	36
* F3	8	6	STR	3'-4"	40
* S3	612	5	1	5'-5"	3458
* S4	612	5	2	5'-6"	3511

* EPOXY COATED REINFORCING STEEL	12,349 LBS.
CLASS AA CONCRETE	66.7 C.Y.
1'-2" X 2'-6" CONCRETE PARAPET	610.00 LIN. FT.

BAR TYPES



PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

1'-2" X 2'-6" CONCRETE PARAPET DETAILS

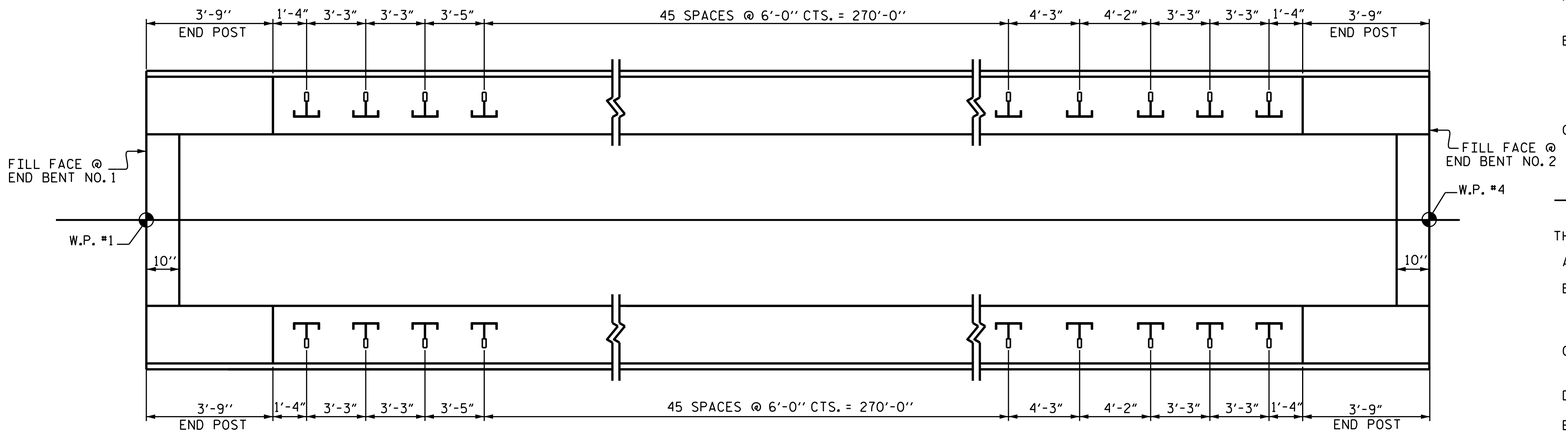
NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 8549D6EBAA3B405...

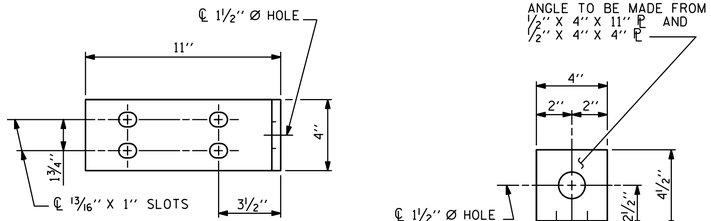
9/11/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			40

DRAWN BY :	M. POOLE/DAH	DATE : 4/14
CHECKED BY :	B.N. GRADY	DATE : 6/15
DESIGN ENGINEER OF RECORD:	S.T. CHAMPION	DATE : 8/15

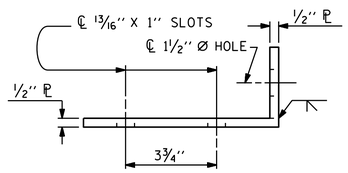


PLAN OF RAIL POST SPACINGS

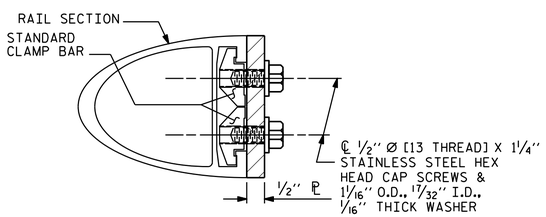


ELEVATION

END VIEW (FIX)

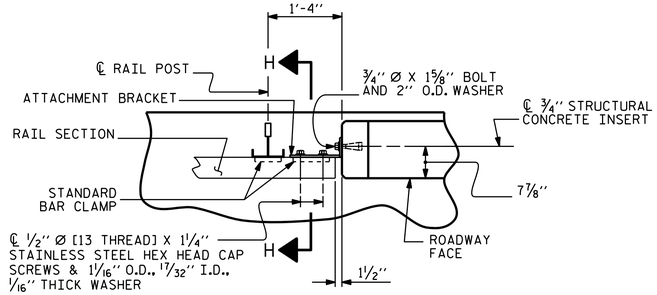


TOP VIEW



SECTION H-H (FIX)

FIXED



PLAN - RAIL AND END POST

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

STRUCTURAL CONCRETE INSERT

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1½".

B. 1 - ¾" Ø X 1⅝" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾" Ø X 1⅝" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. ½" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. ¾" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A ¾"Ø X 1⅝" BOLT WITH 2" O.D. WASHER IN PLACE. THE ¾"Ø X 1⅝" BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.

D. STANDARD CLAMP BARS (SEE SHEET 5 OF 5).

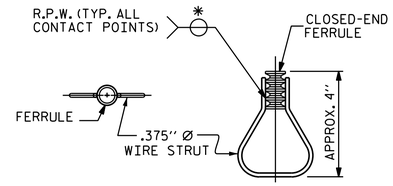
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

THE ¾" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE ¾" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾" Ø X 1⅝" BOLT WITH WASHER SHALL BE REPLACED WITH A ¾"Ø X 6½" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾" Ø X 1⅝" BOLT SHALL APPLY TO THE ¾"Ø X 6 ½" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
RAIL POST SPACINGS
AND
END OF RAIL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			40

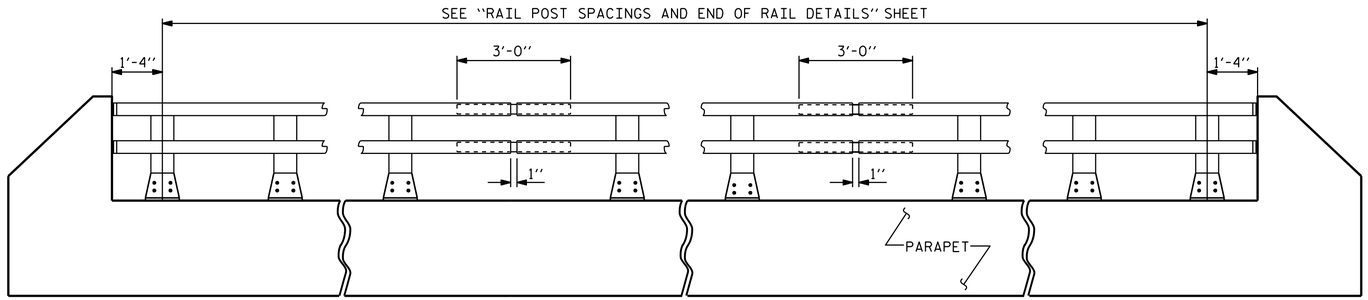
NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CREEK, JR.

Documents#
Marshall G. Creek, Jr.
8540D6EBAA3B405...
9/11/2015

ASSEMBLED BY :	M. POOLE/DAH	DATE :	4/14
CHECKED BY :	B.N. GRADY	DATE :	6/15
DRAWN BY : FCJ 1/88	REV. 5/7/03		RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06		TLA/GM
	REV. 10/1/11		MAA/GM

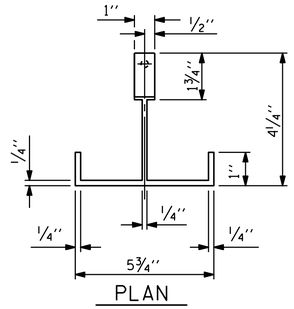
$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

STD. NO. BMR2

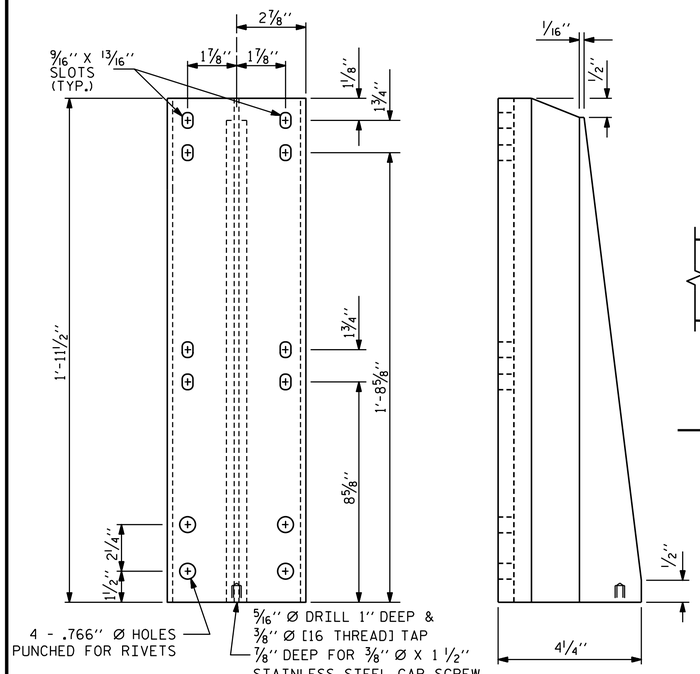


ELEVATION

NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET 3 OF 5.

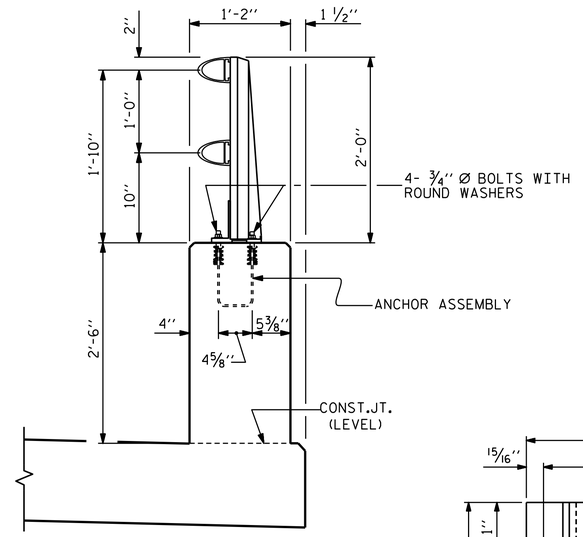


PLAN

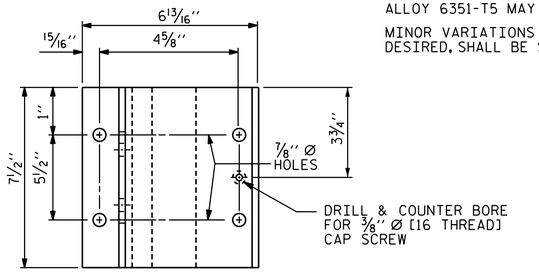


FRONT ELEVATION SIDE ELEVATION

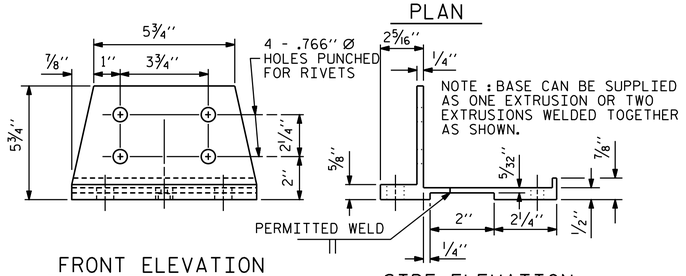
DETAILS OF POST



SECTION THRU PARAPET AND RAIL

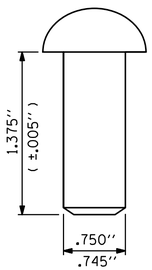


PLAN



FRONT ELEVATION SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

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

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

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE SHEET 3 OF 5.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

PAY LENGTH = 595.00 LIN. FT.

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
DocuSigned by: Marshall G. Cheek, Jr.
6549D6EBAA38405...
9/11/2015

PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

ASSEMBLED BY : M. POOLE/DAH	DATE : 04/14
CHECKED BY : B.N. GRADY	DATE : 06/15

DRAWN BY : EEM 6/94	REV. 5/1/06	TLA/GM
CHECKED BY : RGW 6/94	REV. 10/1/11	MAA/GM
	REV. 6/13	MAA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			40

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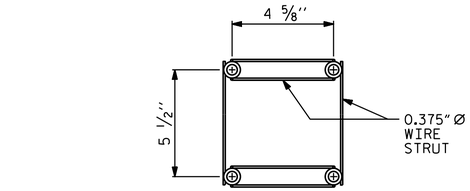
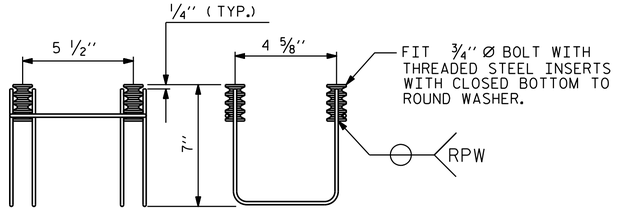
STD. NO. BMR3



PLAN



SIDE VIEW ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(106 ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2'' FOR 3/4'' FERRULES.

B. 4 - 3/4'' Ø X 2 1/2'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4'' Ø X 2 1/2'' GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

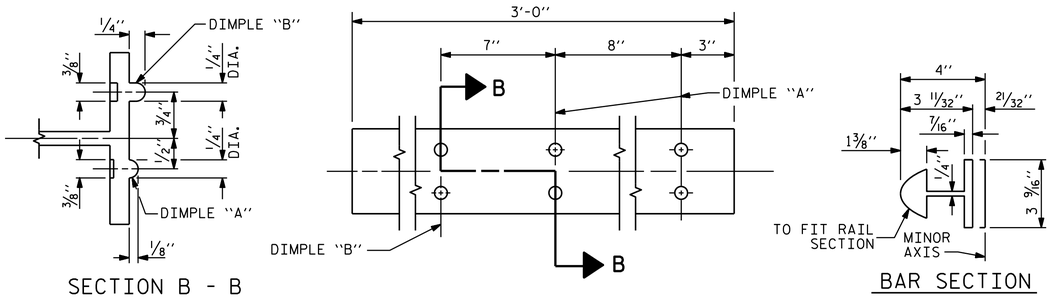
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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

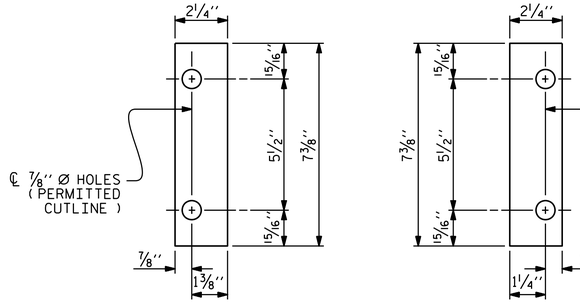
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY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



SECTION B - B

BAR SECTION

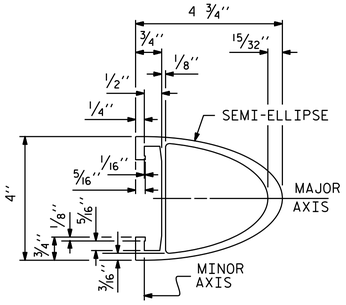
EXPANSION BAR DETAILS



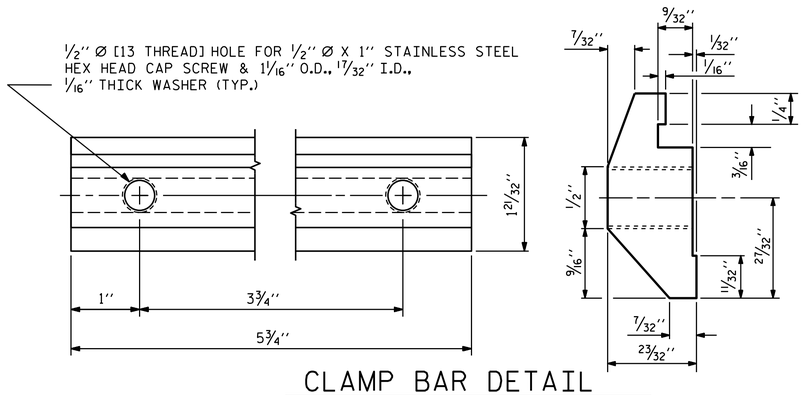
FRONT PLATE REAR PLATE

SHIM DETAILS

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

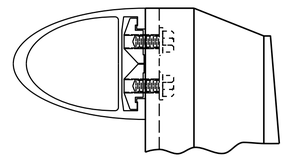


RAIL SECTION

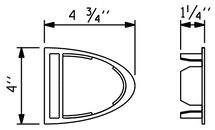


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D0EBAA3B405...

9/11/2015

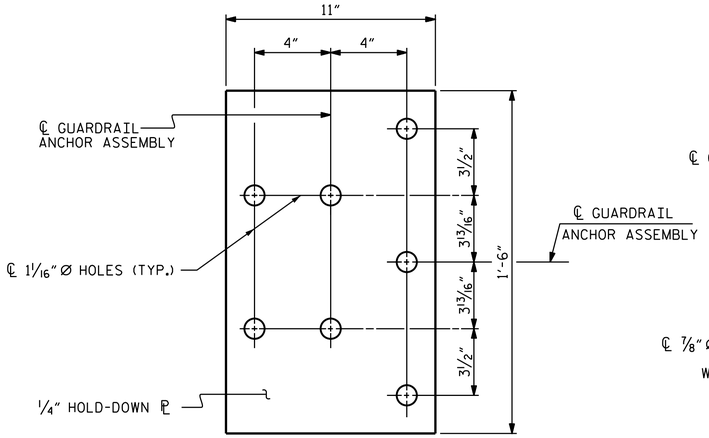
ASSEMBLED BY : M. POOLE/DAH	DATE : 04/14
CHECKED BY : B.N. GRADY	DATE : 06/15

DRAWN BY : EEM	6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RGW	6/94	REV. 5/1/06R KMM/GM
		REV. 10/1/11 MAA/GM

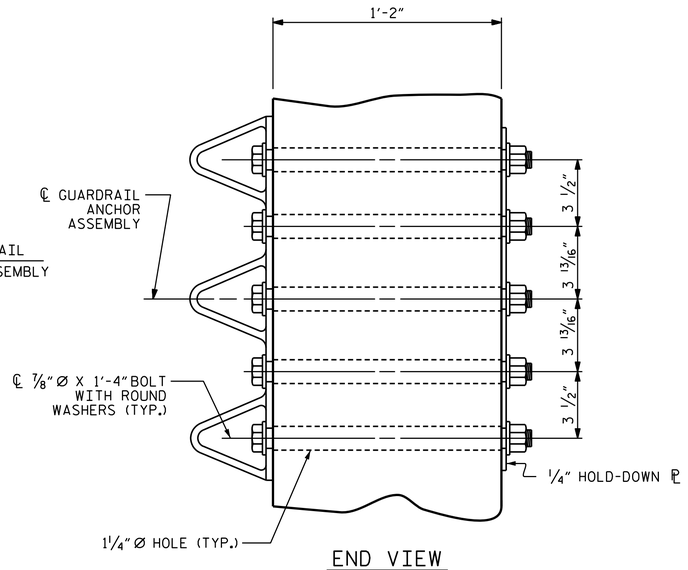
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			40

STD. NO. BMR4

$$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$



PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

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

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

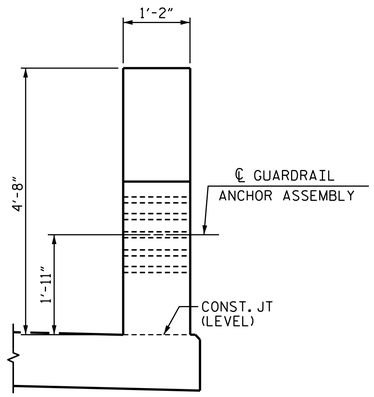
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

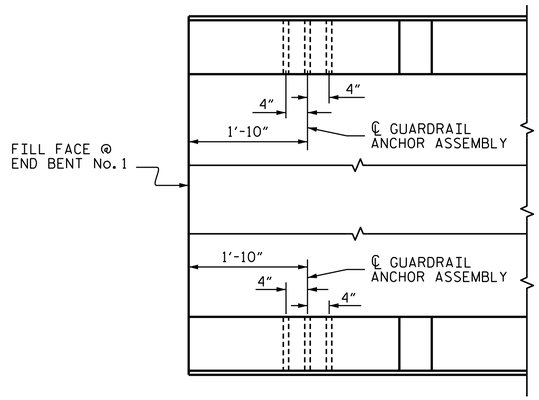
THE 1 1/4'' Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
(TWO BAR METAL RAIL)



PLAN
END BENT No. 2 SIMILAR

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

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

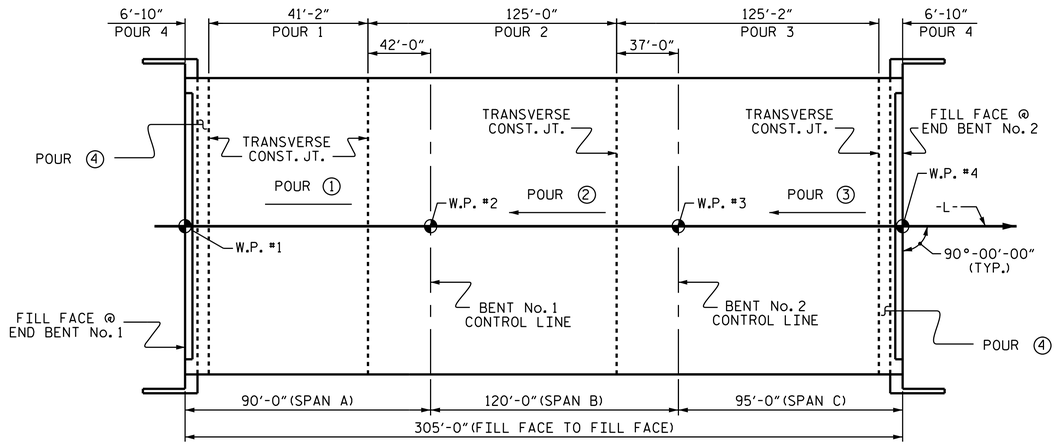
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			40

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...
9/11/2015

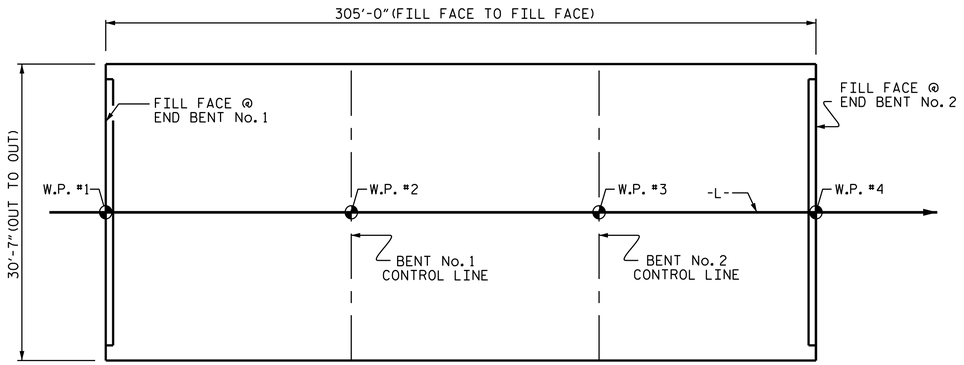
ASSEMBLED BY : M. POOLE/DAH	DATE : 04/14		
CHECKED BY : B.N. GRADY	DATE : 06/15		
DRAWN BY : MAA 5/10	REV. 12/5/11	MAA/GM	
CHECKED BY : GM 5/10	REV. 6/13	MAA/GM	
	REV. 1/15	MAA/TMG	

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

(SHT 2) STD. NO. GRA3

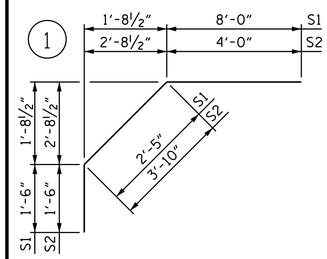


POURING SEQUENCE



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 9,328)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	560	#5	STR	30'-3"	17,668
A2	560	#5	STR	30'-3"	17,668
✳B1	50	#6	STR	20'-10"	1,565
✳B2	48	#6	STR	24'-10"	1,790
✳B3	25	#4	STR	21'-8"	362
✳B4	50	#6	STR	49'-3"	3,699
✳B5	48	#6	STR	47'-9"	3,443
✳B6	50	#4	STR	16'-6"	551
✳B7	48	#6	STR	49'-3"	3,551
✳B8	50	#6	STR	50'-9"	3,811
✳B9	25	#4	STR	26'-8"	445
B10	198	#5	STR	52'-7"	10,859
H1	80	#5	STR	14'-2"	1,182
K1	40	#4	STR	19'-4"	517
K2	16	#4	STR	2'-8"	29
✳S1	50	#4	1	11'-11"	398
✳S2	50	#4	1	9'-4"	312
U1	50	#4	2	10'-0"	334
U2	12	#4	2	12'-4"	99
V2	112	#4	STR	5'-0"	374

REINFORCING STEEL LBS. 31,062
✳EPOXY COATED
REINFORCING STEEL LBS. 37,595

FOR ADDITIONAL "S" BARS EMBEDDED IN DECK SLAB, SEE "1'-2" X 2'-6" CONCRETE PARAPET".

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"			

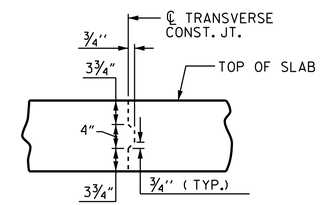
SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
POUR 1	38.9	———	———
POUR 2	118.3	———	———
POUR 3	118.4	———	———
POUR 4	54.7	———	———
TOTALS**	330.3	31,062	37,595

**QUANTITIES FOR PARAPET ARE NOT INCLUDED

GROOVING BRIDGE FLOORS

BRIDGE DECK	7,574	SQ.FT.
APPROACH SLABS	708	SQ.FT.
TOTAL	8,282	SQ.FT.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Digitally signed by Marshall G. Cheek, Jr.
6549D6EBAA3B405...
9/18/2015

PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

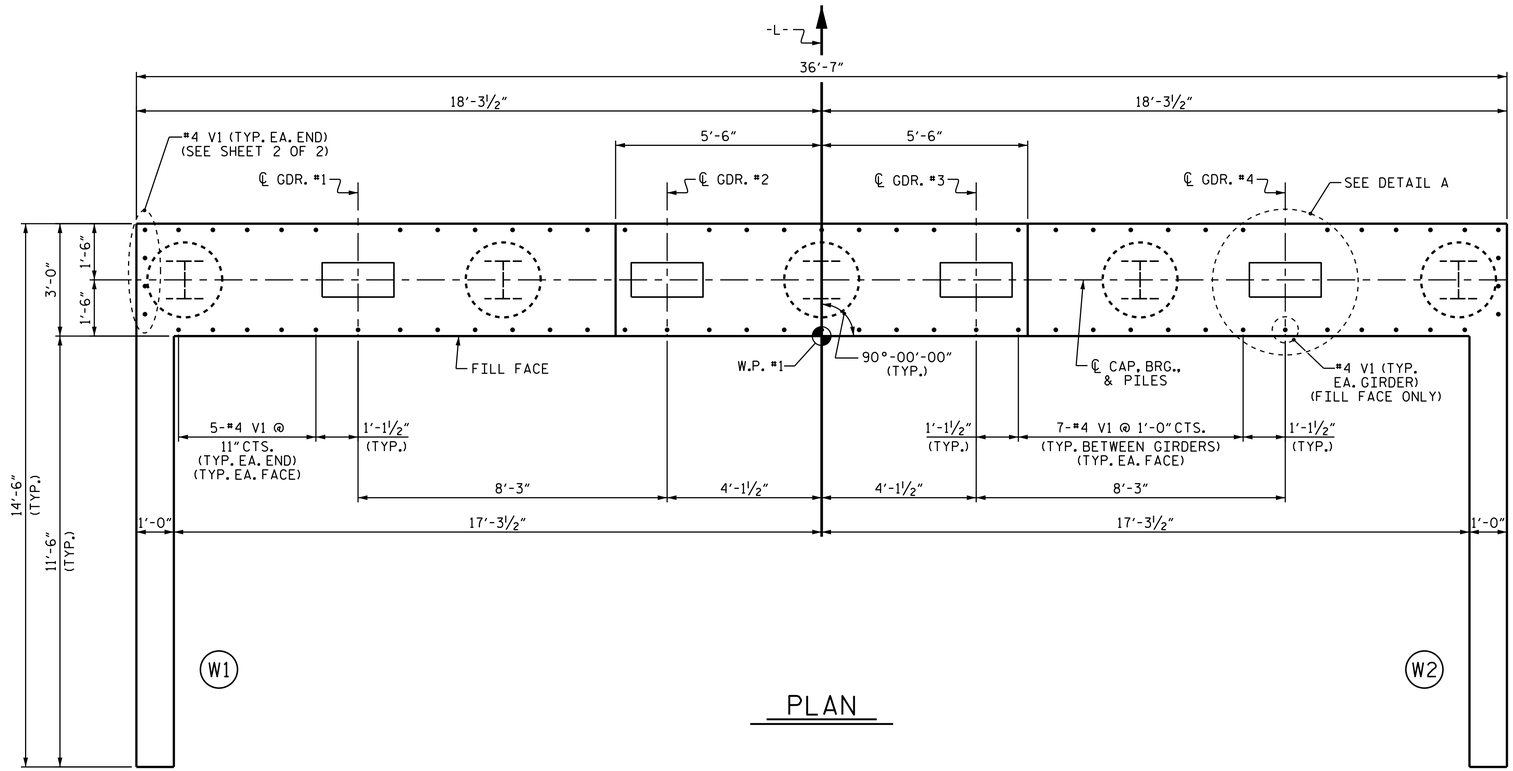
SUPERSTRUCTURE

BILL OF MATERIAL

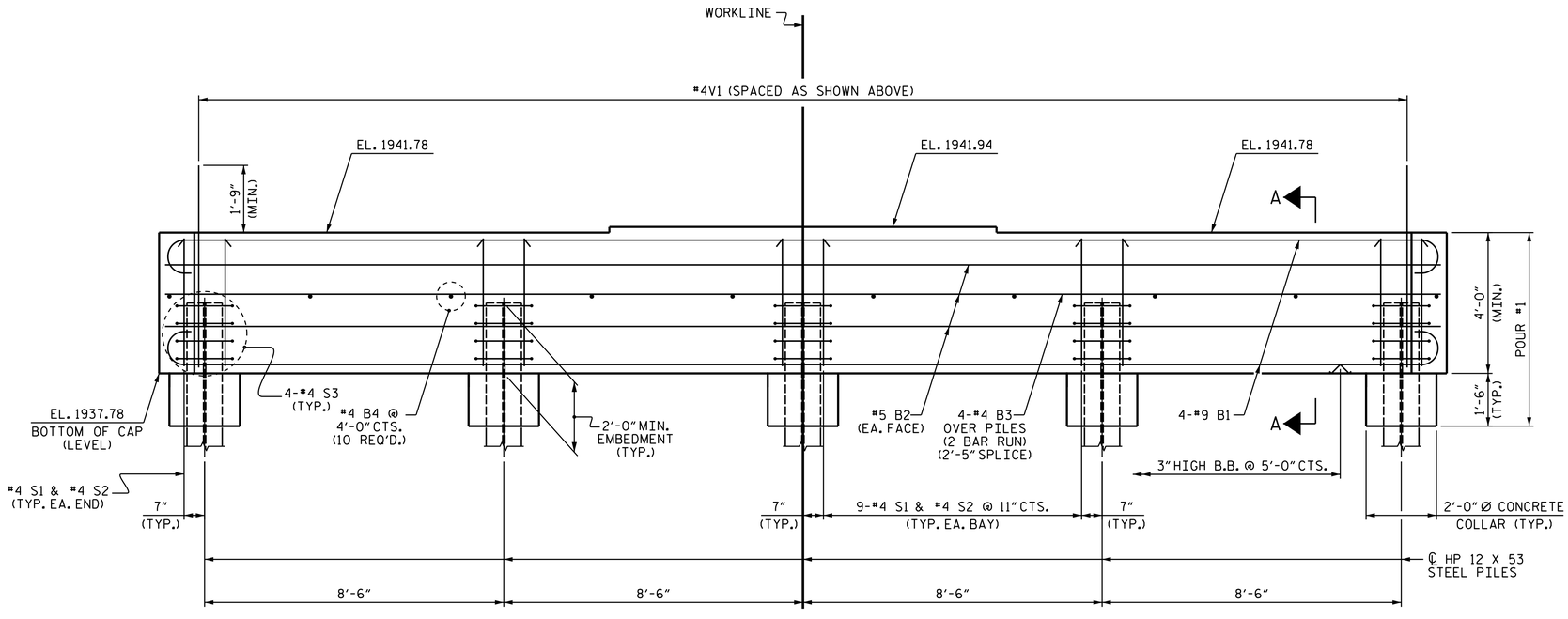
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-27
TOTAL SHEETS 40

DRAWN BY : D. HODGE DATE : 10/14
CHECKED BY : B.N. GRADY DATE : 6/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 8/15



PLAN



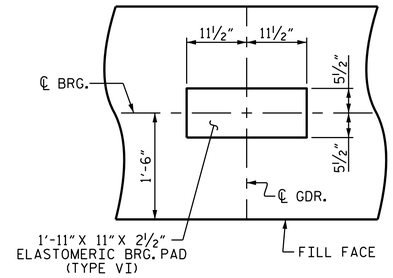
ELEVATION

NOTES

SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAILS.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE UPPER PART OF THE END BENT WINGS ARE TO BE POURED WITH POUR #4 OF THE SUPERSTRUCTURE.



DETAIL A
(TYP. EA. BEARING)

PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : B.N. GRADY	DATE : 2/15
CHECKED BY : H.T. BARBOUR	DATE : 2/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION	DATE : 8/15

11-SEP-2015 09:48
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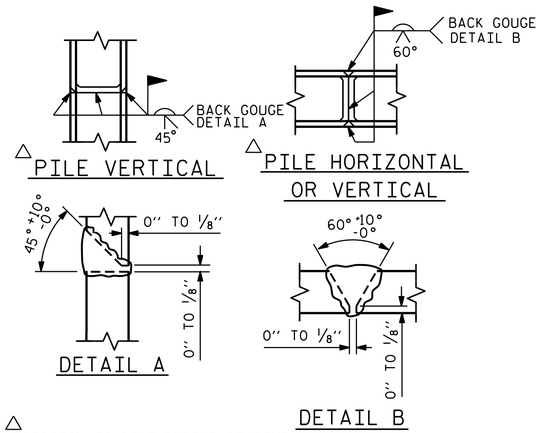
bngrady

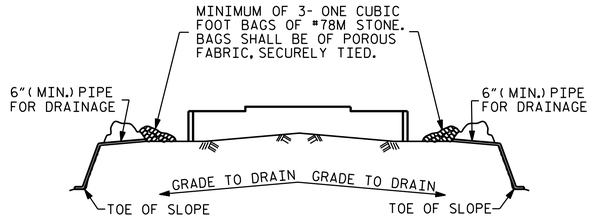
NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...

9/11/2015



PILE SPLICE DETAILS



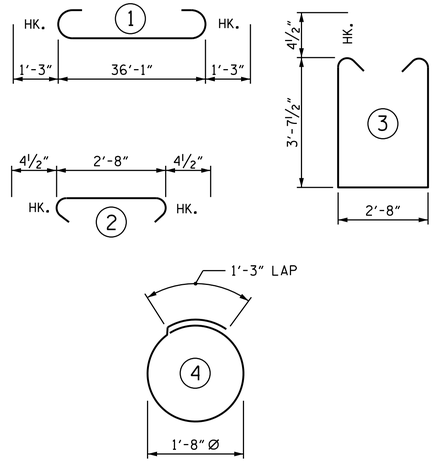
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BAR TYPES

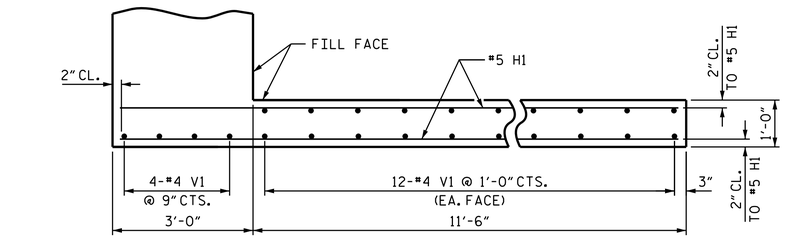


ALL BAR DIMENSIONS ARE OUT TO OUT.

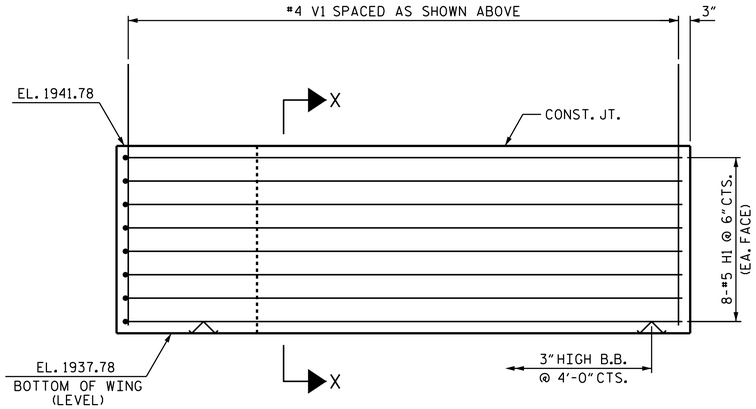
BILL OF MATERIAL
END BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	38'-7"	1049
B2	6	#5	STR	36'-3"	227
B3	8	#4	STR	19'-4"	103
B4	10	#4	STR	2'-8"	18
H1	32	#5	STR	14'-2"	473
S1	38	#4	3	10'-8"	271
S2	38	#4	2	3'-5"	87
S3	20	#4	4	6'-6"	87
V1	122	#4	STR	5'-9"	469

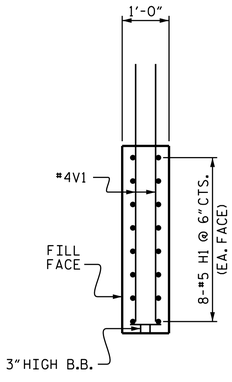
REINFORCING STEEL	LBS.	2,784
CLASS A CONCRETE	C.Y.	20.7
HP 12 X 53 STEEL PILES		
NO. 5	LIN. FT.	100



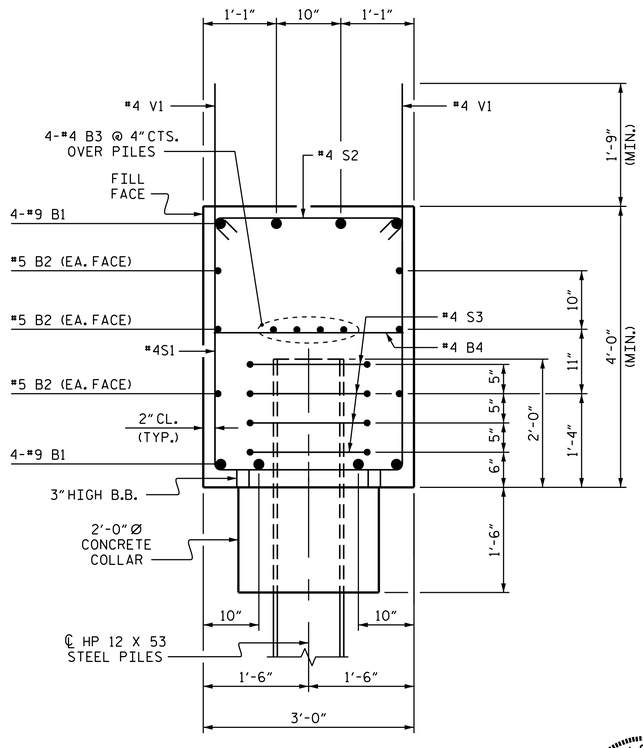
PLAN OF WING W1
(WING W2 SIMILAR)



ELEVATION OF WING W1
(WING W2 SIMILAR)



SECTION X-X



SECTION A-A

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
DocuSigned by: Marshall G. Cheek, Jr.
65490DEBAA3B405...
9/11/2015

PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : B.N. GRADY	DATE : 1/15
CHECKED BY : H.T. BARBOUR	DATE : 2/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION	DATE : 8/15

11-SEP-2015 09:48
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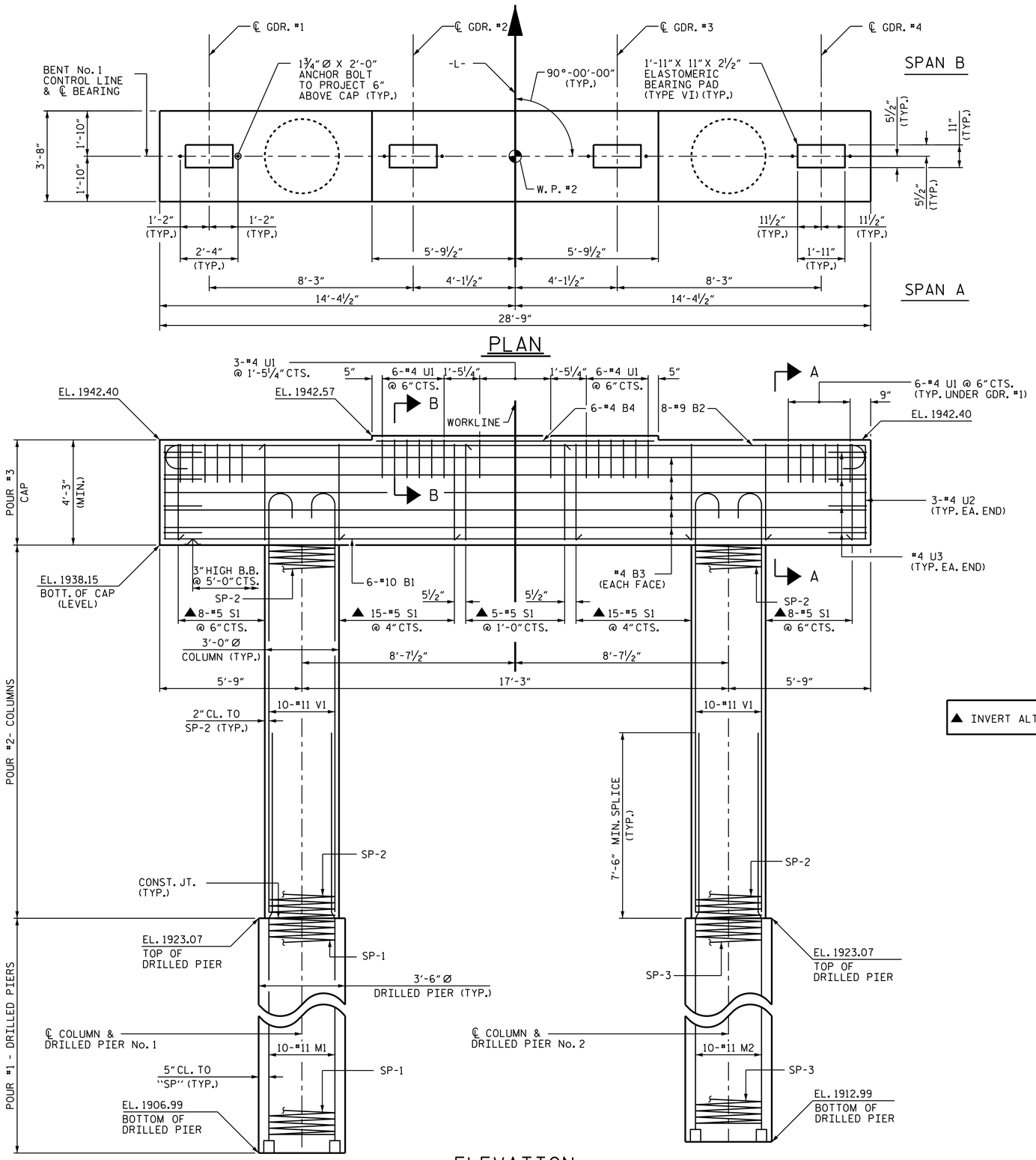
bngrady



▲ INVERT ALTERNATE STIRRUPS

NOTES

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

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

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

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

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

DRILLED PIERS SHALL BE TERMINATED ONE FOOT ± ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.

DRAWN BY : R.W. BRANNAN DATE : 7-9-15
CHECKED BY : B. N. GRADY DATE : 7-15-15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 8/15

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Digitally signed by Marshall G. Cheek, Jr.
6549D8EBAA3B405...
9/15/2015

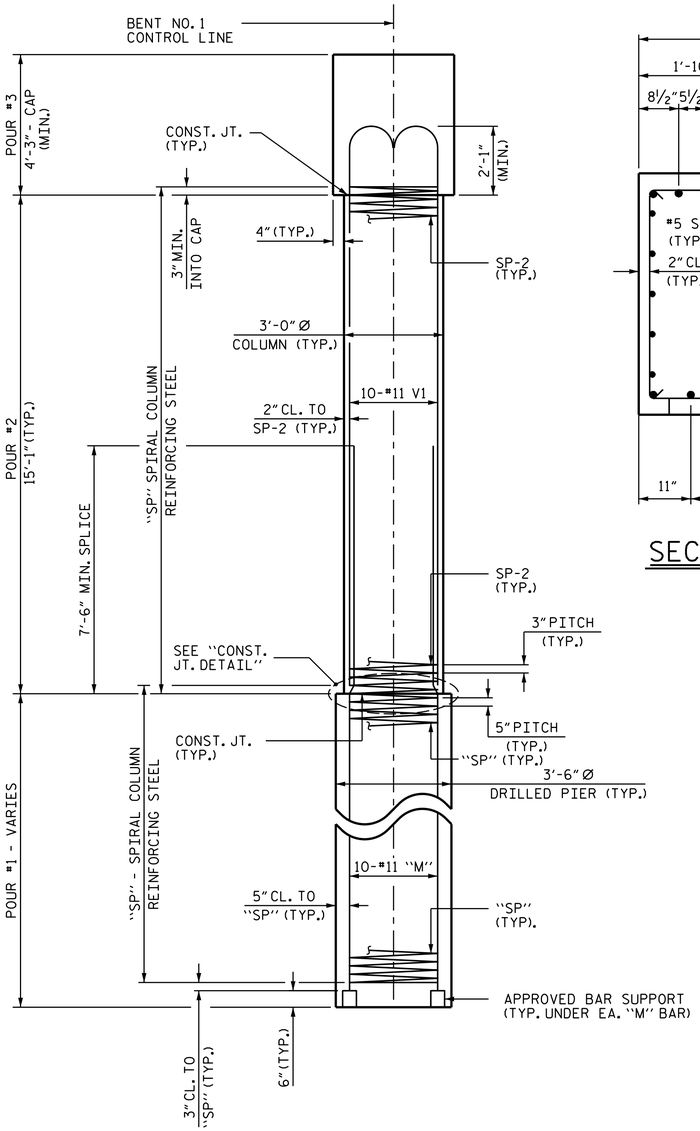
PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

SHEET 1 OF 2

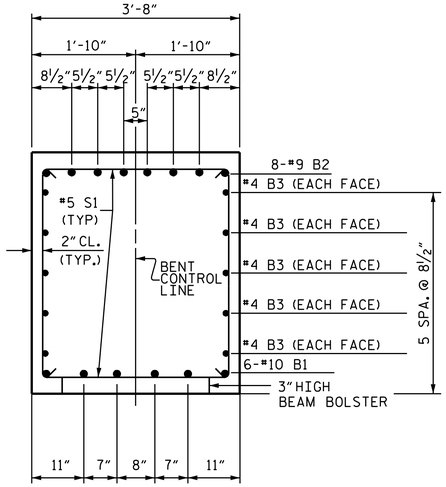
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

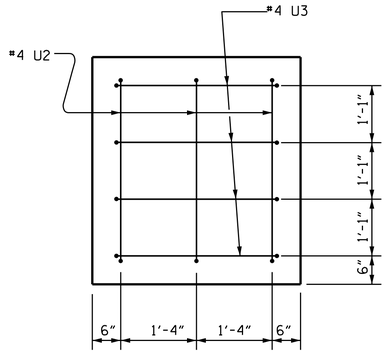
SUBSTRUCTURE
BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			40



SECTION A-A

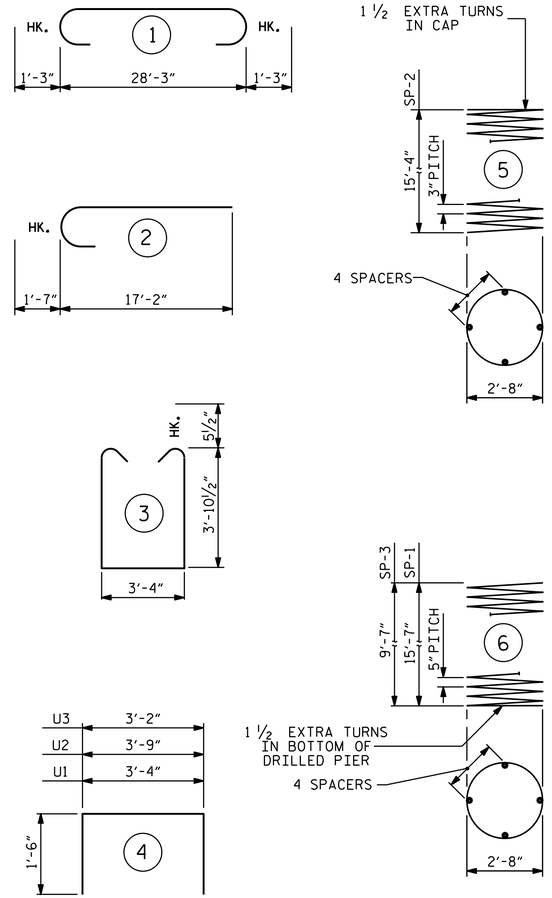




END OF CAP ELEVATION
(TYP. EA. END)

SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	STR	28'-5"	734
B2	8	#9	1	30'-9"	836
B3	10	#4	STR	28'-5"	190
B4	6	#4	STR	11'-3'	45
M1	10	#11	STR	26'-1"	1386
M2	10	#11	STR	20'-1"	1067
S1	51	#5	3	12'-0"	638
U1	27	#4	4	6'-4"	114
U2	6	#4	4	6'-9"	27
U3	8	#4	4	6'-2"	33
V1	20	#11	2	18'-9"	1992

REINFORCING STEEL 7062 LBS.

SPIRAL COLUMN REINFORCING STEEL					
SP-1	1	***	6	324'-11'	339
SP-2	2	**	5	523'-11"	700
SP-3	1	***	6	201'-7"	210

TOTAL SPIRAL
COLUMN REINFORCING STEEL 1249 LBS.

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

*** THE SP-1 & SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

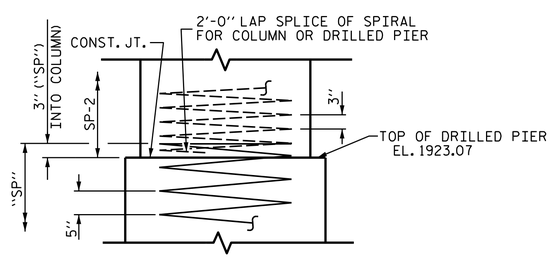
CLASS A CONCRETE BREAKDOWN

POUR #2 - COLUMNS	7.9 CU. YDS.
POUR #3 - CAP	16.9 CU. YDS.
TOTAL CLASS A CONCRETE	24.8 CU. YDS.

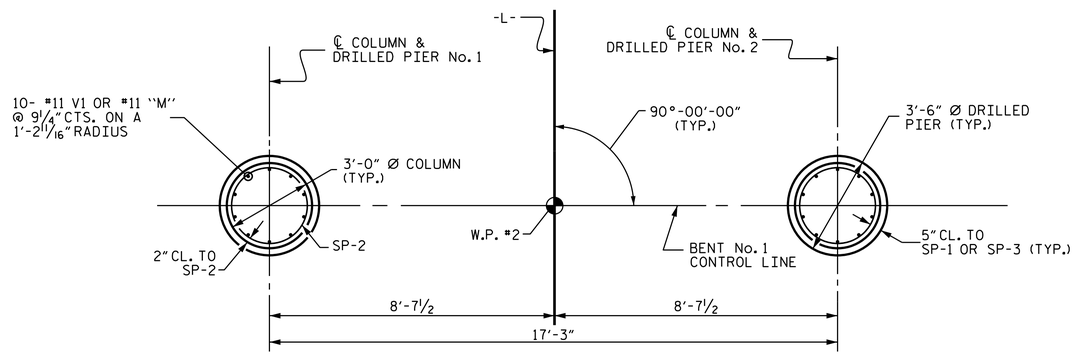
DRILLED PIERS:

DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	9.3 CU. YDS.
3'-6" Ø DRILLED PIERS IN SOIL	7.16 LIN. FT.
3'-6" Ø DRILLED PIERS NOT IN SOIL	19.00 LIN. FT.
PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIERS	8.14 LIN. FT.
CSL TUBES	116.72 LIN. FT.

END ELEVATION



CONSTRUCTION JOINT DETAIL



PLAN OF DRILLED PIERS & COLUMNS
(REINFORCING STEEL IS TYPICAL FOR EACH COLUMN & DRILLED PIER)

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405... 9/22/2015

PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

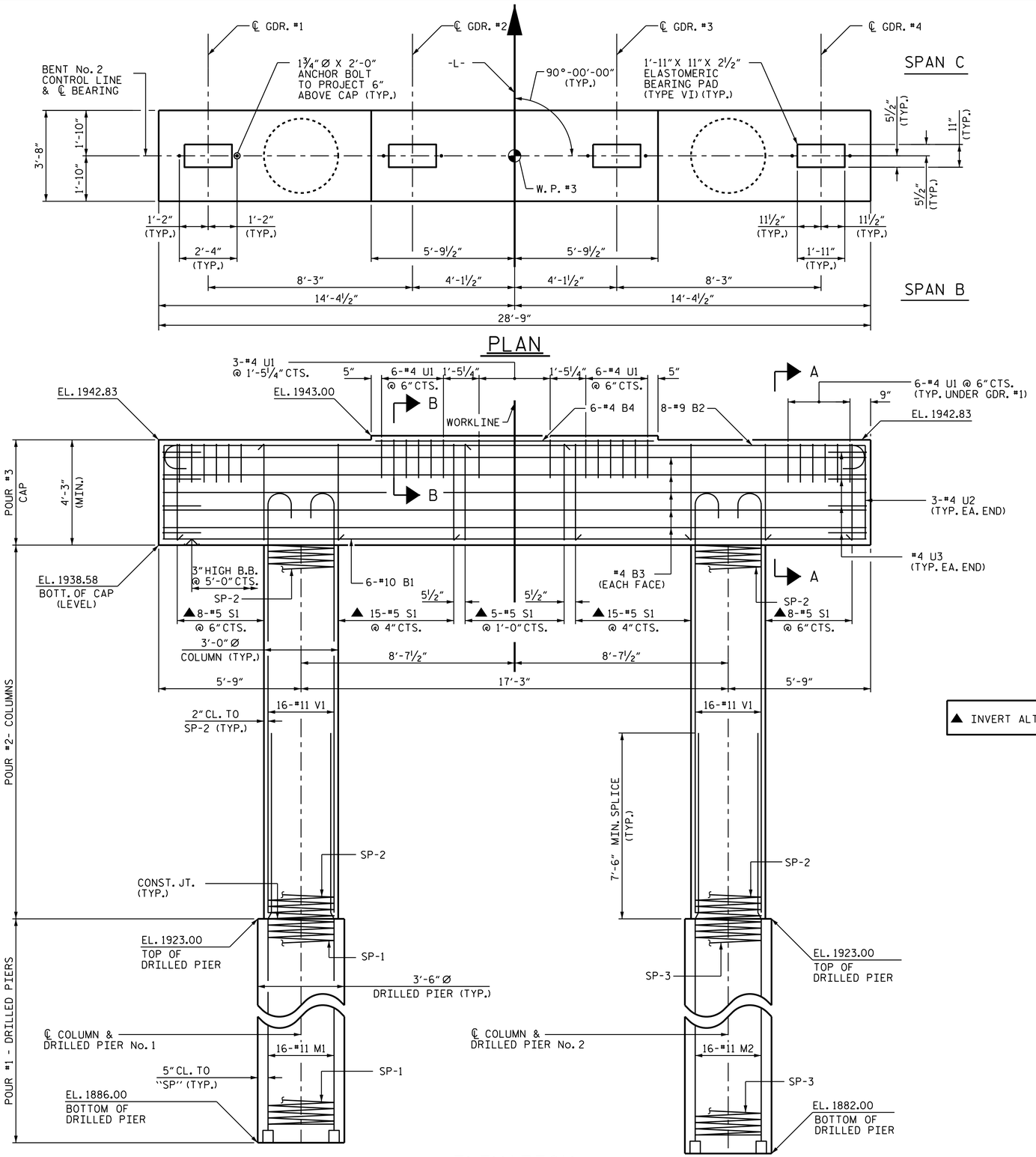
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT NO. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : R.W. BRANNAN DATE : 7/10/15
CHECKED BY : B. N. GRADY DATE : 7/15/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 8/15



▲ INVERT ALTERNATE STIRRUPS

NOTES

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

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

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

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

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

DRILLED PIERS SHALL BE TERMINATED ONE FOOT ± ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.

DRAWN BY : R.W. BRANNAN DATE : 7-9-15
CHECKED BY : B. N. GRADY DATE : 7-15-15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 8/15

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405... 9/15/2015

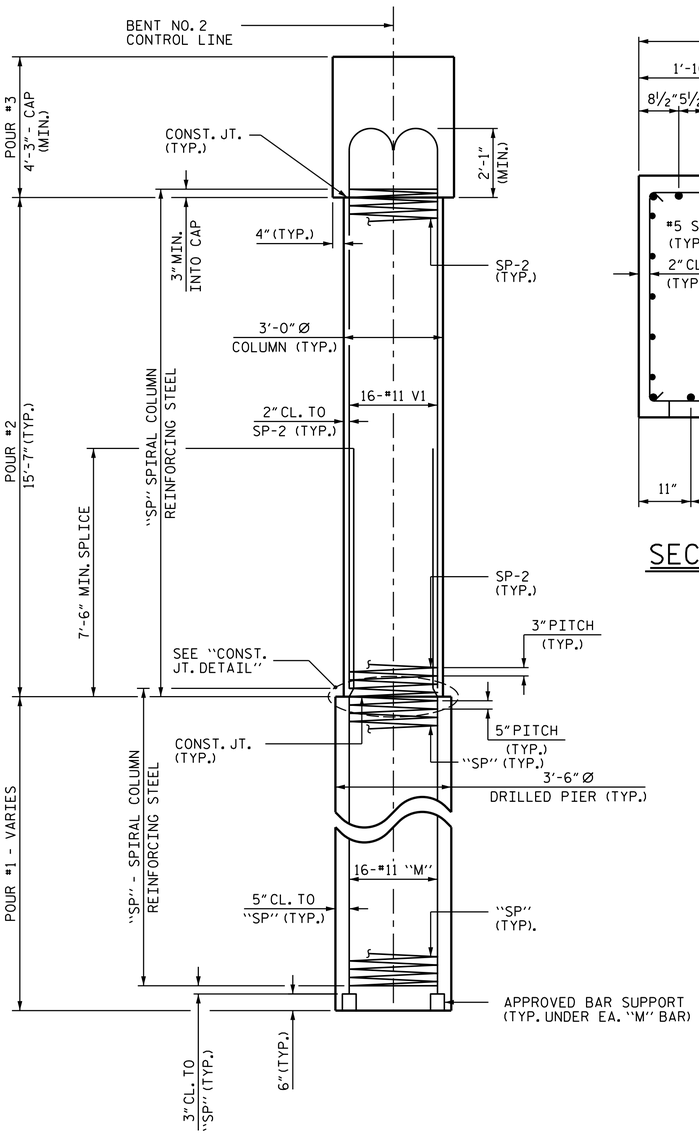
PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

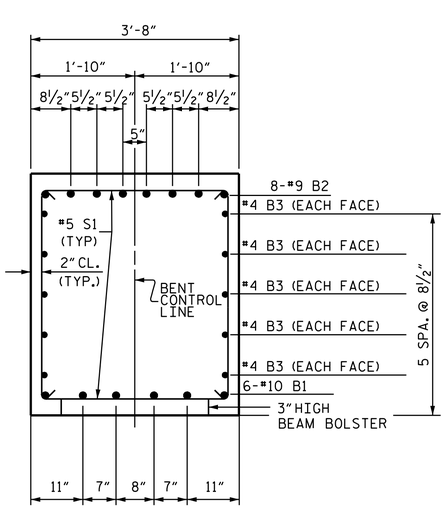
SUBSTRUCTURE
BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			40

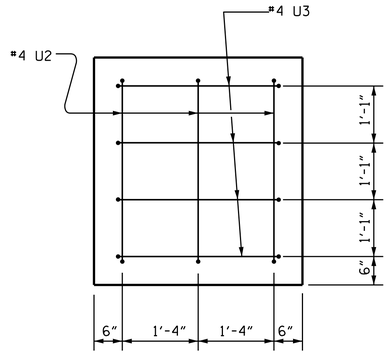


END ELEVATION

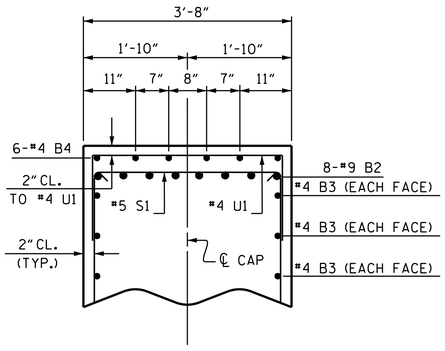
CONSTRUCTION JOINT DETAIL



SECTION A-A

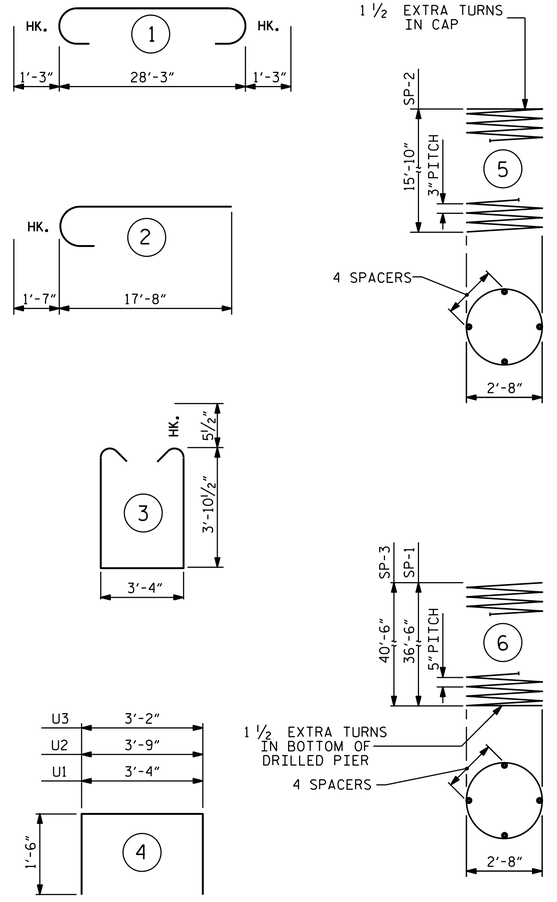


END OF CAP ELEVATION
(TYP. EA. END)



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	STR	28'-5"	734
B2	8	#9	1	30'-9"	836
B3	10	#4	STR	28'-5"	190
B4	6	#4	STR	11'-3'	45
M1	16	#11	STR	47'-0"	3995
M2	16	#11	STR	51'-0"	4335
S1	51	#5	3	12'-0"	638
U1	27	#4	4	6'-4"	114
U2	6	#4	4	6'-9"	27
U3	8	#4	4	6'-2"	33
V1	32	#11	2	19'-3"	3273

REINFORCING STEEL 14220LBS.

SPIRAL COLUMN REINFORCING STEEL

SP-1	1	***	6	736'-2"	768
SP-2	2	**	5	540'-5"	722
SP-3	1	***	6	818'-5"	854

TOTAL SPIRAL
COLUMN REINFORCING STEEL 2344 LBS.

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

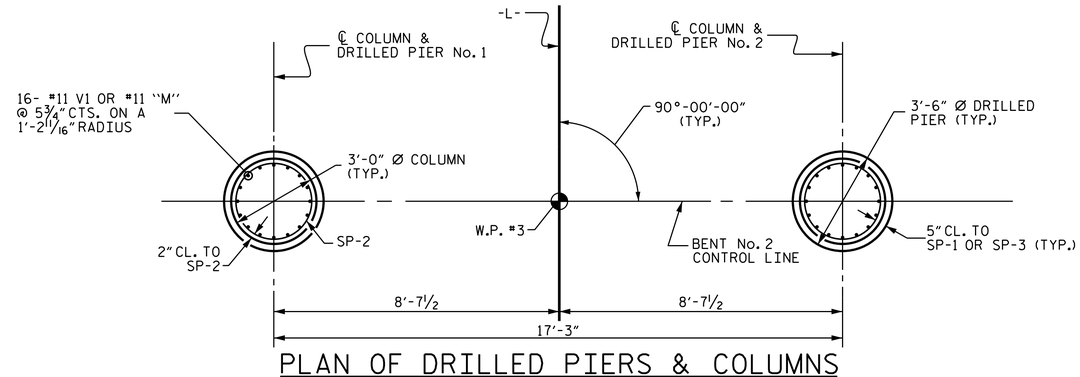
*** THE SP-1 & SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

CLASS A CONCRETE BREAKDOWN

POUR #2 - COLUMNS	8.2 CU. YDS.
POUR #3 - CAP	16.9 CU. YDS.
TOTAL CLASS A CONCRETE	25.1 CU. YDS.

DRILLED PIERS:

DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	27.8 CU. YDS.
3'-6" Ø DRILLED PIERS IN SOIL	59.00 LIN. FT.
3'-6" Ø DRILLED PIERS NOT IN SOIL	19.00 LIN. FT.
PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIERS	34.00 LIN. FT.
CSL TUBES	324.00 LIN. FT.



PLAN OF DRILLED PIERS & COLUMNS
(REINFORCING STEEL IS TYPICAL FOR EACH COLUMN & DRILLED PIER)

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
9/22/2015

DRAWN BY : R.W. BRANNAN DATE : 7/10/15
CHECKED BY : B. N. GRADY DATE : 7/15/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 8/15

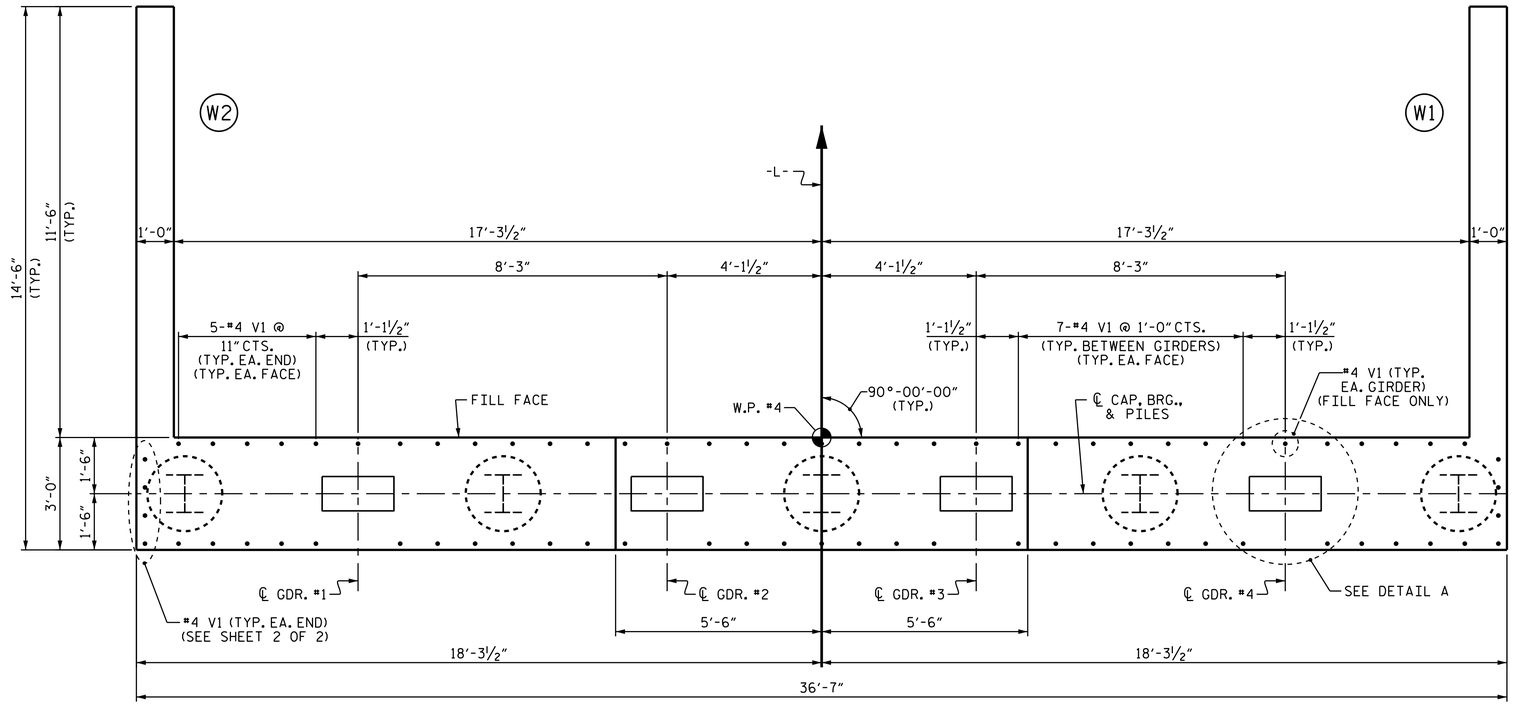
PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT NO. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			40



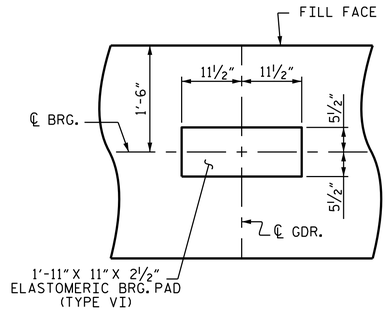
PLAN

NOTES

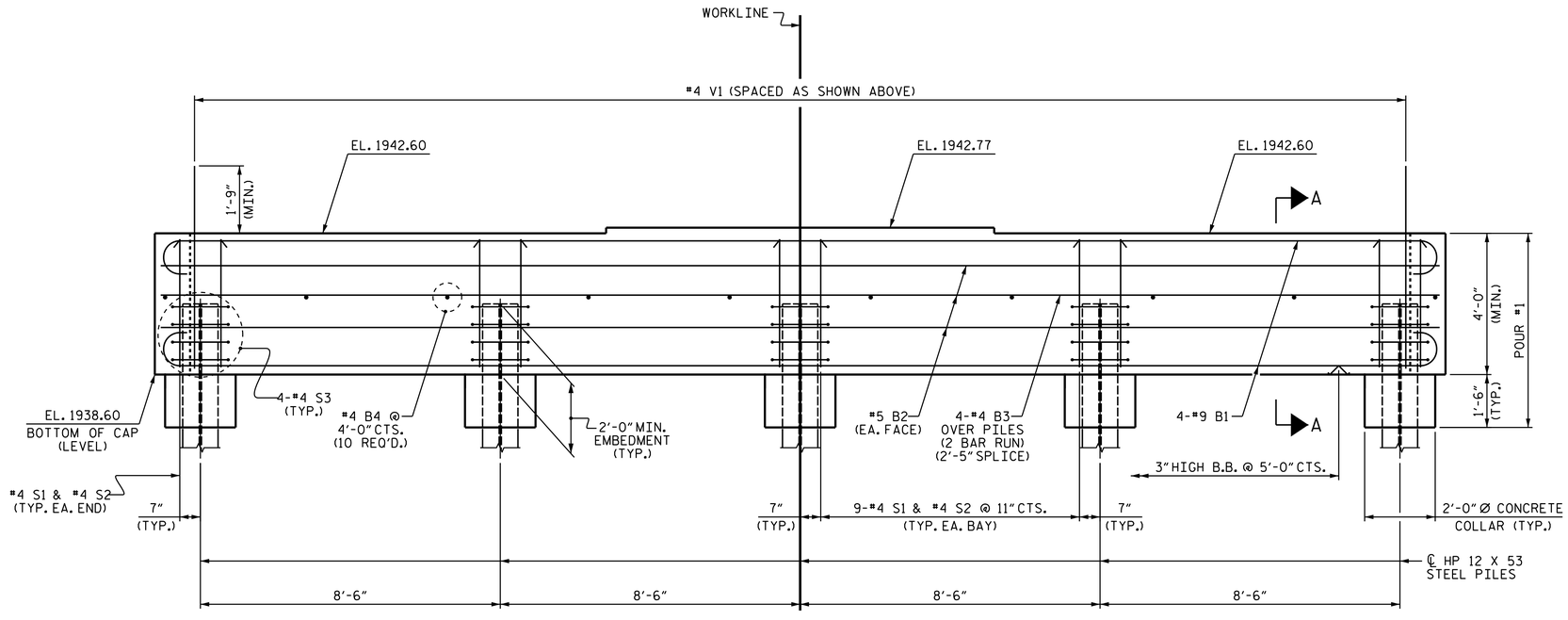
SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAILS.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE UPPER PART OF THE END BENT WINGS ARE TO BE POURED WITH POUR #4 OF THE SUPERSTRUCTURE.



DETAIL A
(TYP. EA. BEARING)



ELEVATION

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE INTEGRAL END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			40

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBBAA3B405...

9/11/2015

DRAWN BY : B.N. GRADY	DATE : 2/15
CHECKED BY : H.T. BARBOUR	DATE : 2/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION	DATE : 8/15

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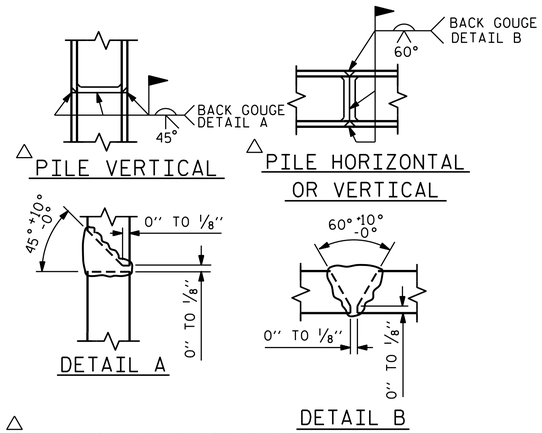
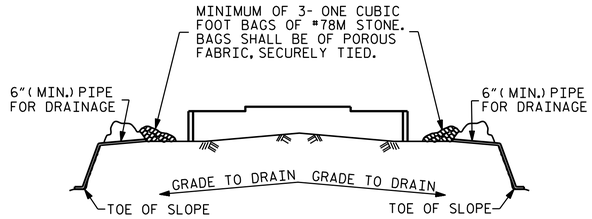


PILE SPLICE DETAILS



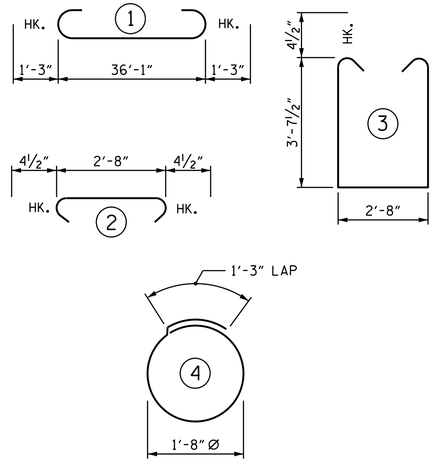
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BAR TYPES

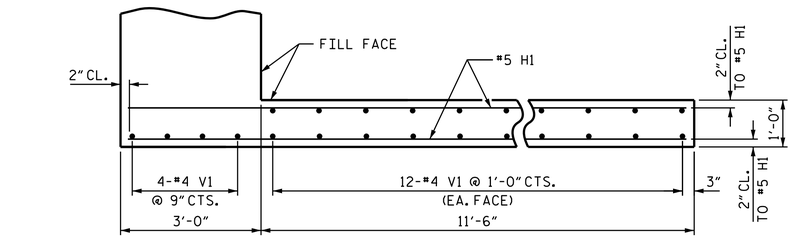


ALL BAR DIMENSIONS ARE OUT TO OUT.

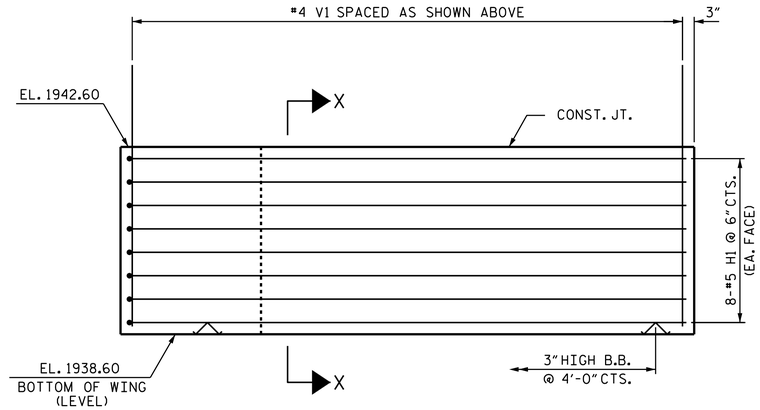
BILL OF MATERIAL
END BENT No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	38'-7"	1049
B2	6	#5	STR	36'-3"	227
B3	8	#4	STR	19'-4"	103
B4	10	#4	STR	2'-8"	18
H1	32	#5	STR	14'-2"	473
S1	38	#4	3	10'-8"	271
S2	38	#4	2	3'-5"	87
S3	20	#4	4	6'-6"	87
V1	122	#4	STR	5'-9"	469

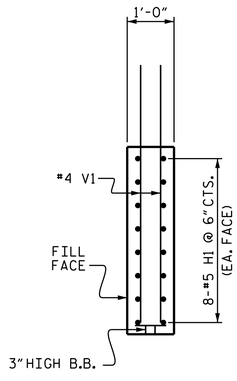
REINFORCING STEEL	LBS.	2,784
CLASS A CONCRETE	C.Y.	20.7
HP 12 X 53 STEEL PILES		
NO. 5	LIN. FT.	215



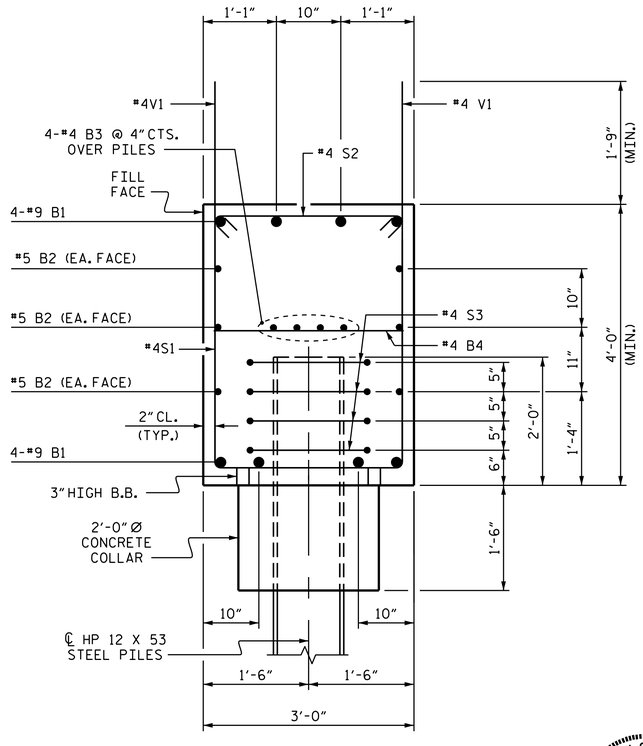
PLAN OF WING W1
(WING W2 SIMILAR)



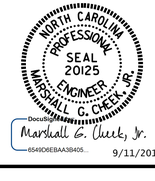
ELEVATION OF WING W1
(WING W2 SIMILAR)



SECTION X-X



SECTION A-A



PROJECT NO. B-3868
MACON COUNTY
STATION: 18+33.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : B.N. GRADY	DATE : 1/15
CHECKED BY : H.T. BARBOUR	DATE : 2/15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION	DATE : 8/15

11-SEP-2015 09:48
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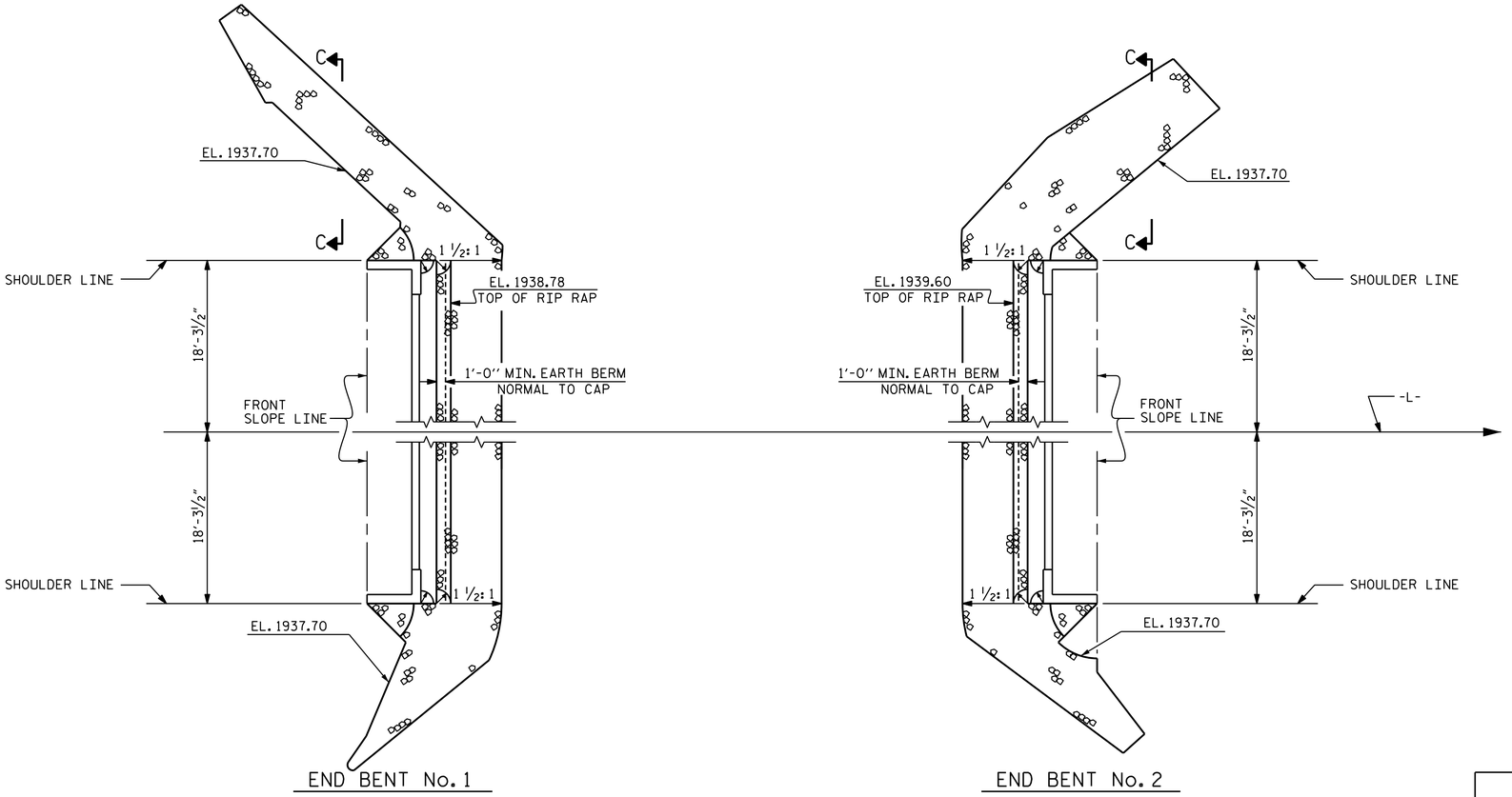
bngrady

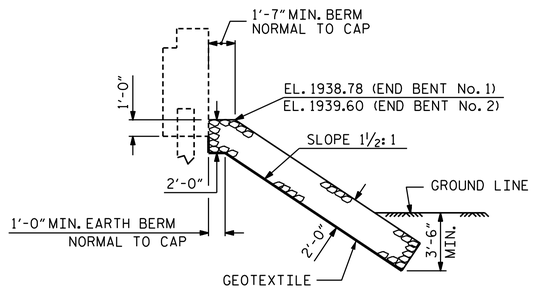
NOTES :

FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



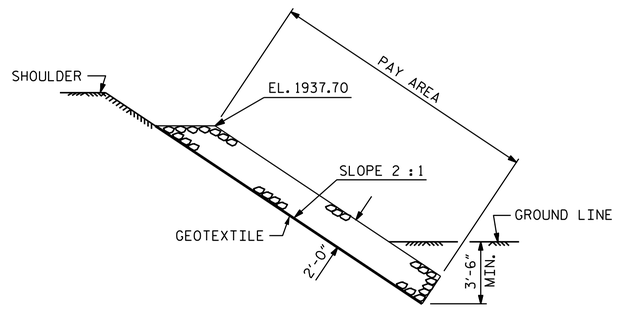
PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 18+33.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT No. 1	215	240
END BENT No. 2	215	240
TOTAL	430	480



℄ SECTION

BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CREEK, JR.

DocuSigned by: Marshall G. Creek, Jr. 6549D6EBAA3B405...

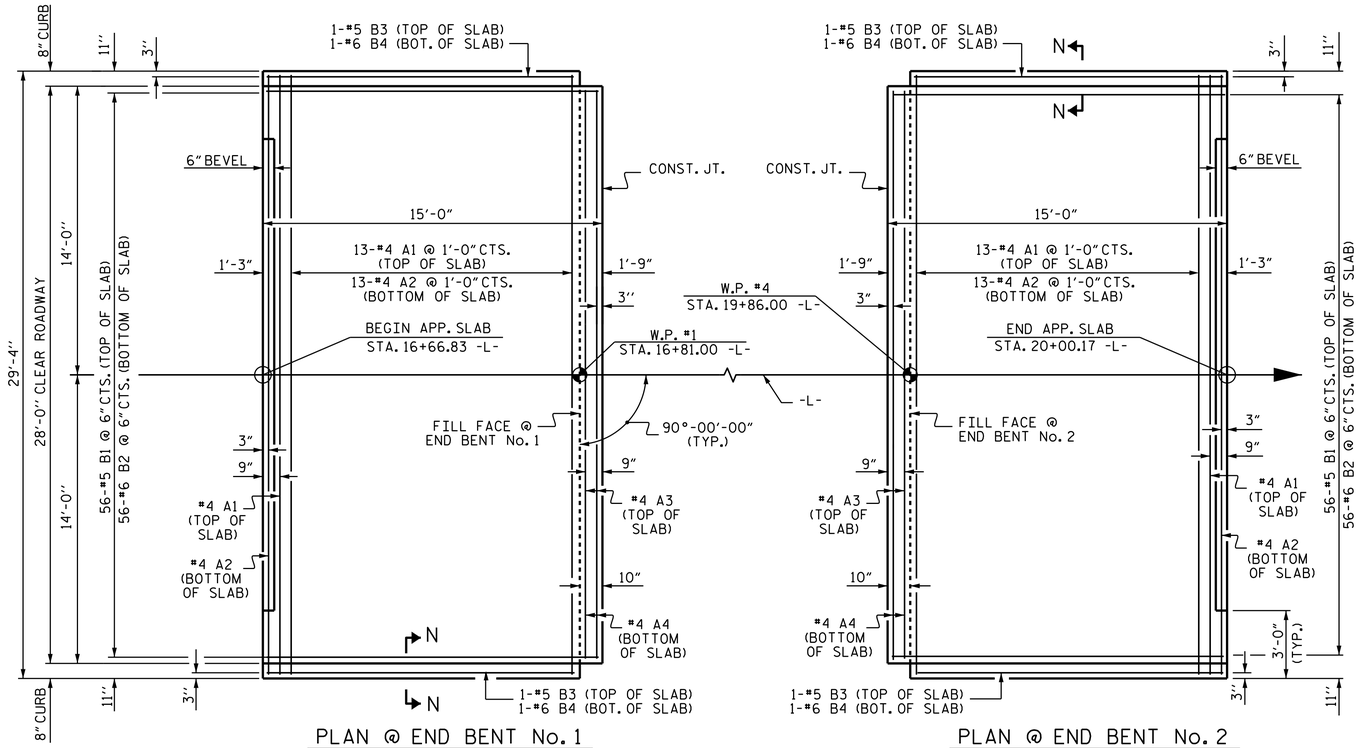
9/22/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			40

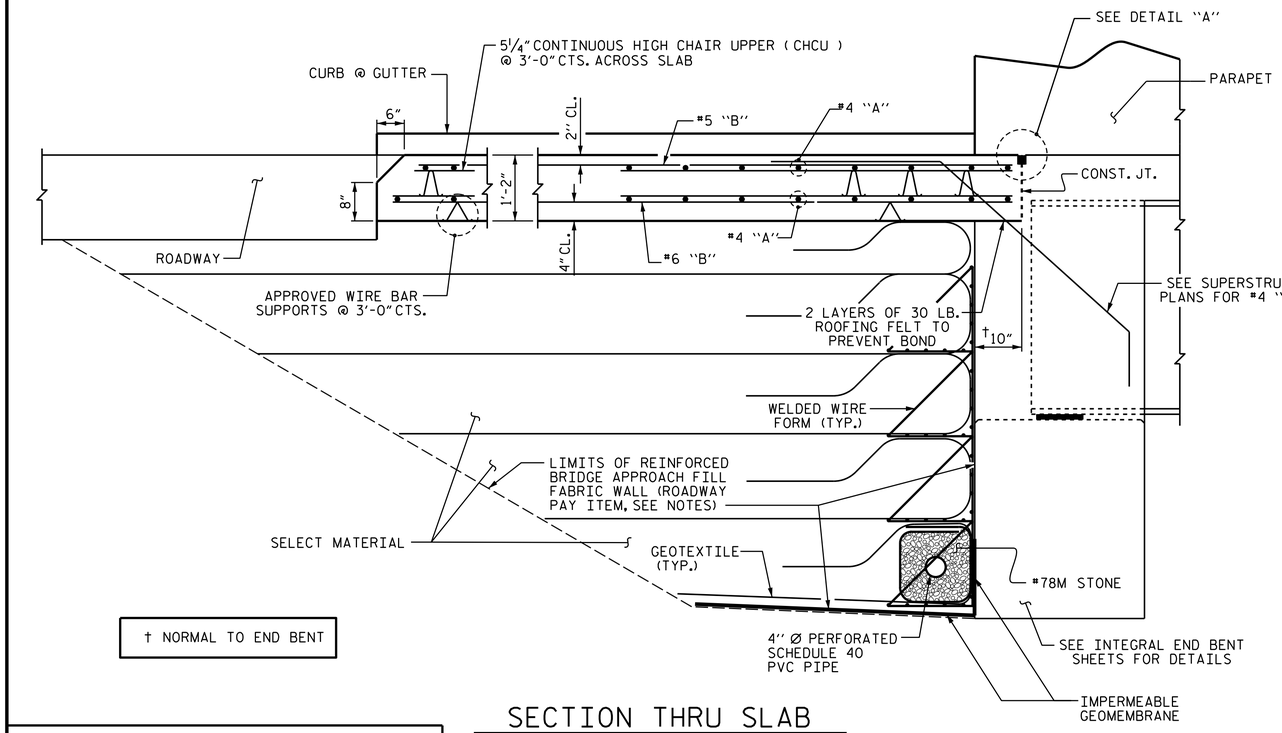
ASSEMBLED BY : D. HODGE	DATE : 4/14	
CHECKED BY : H.T. BARBOUR	DATE : 3/15	
DRAWN BY : REK 1/84	REV. 5/1/06R	TLA/GM
CHECKED BY : RDU 1/84	REV. 10/1/11	MAA/GM
	REV. 12/21/11	MAA/GM

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

STD. NO. RR1 (Sht 2)

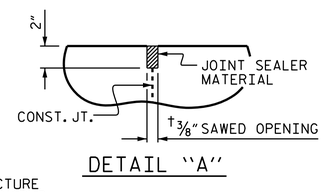


DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

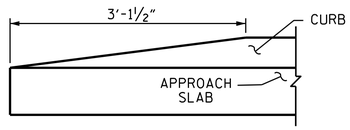


† NORMAL TO END BENT

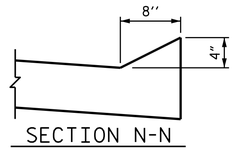
SECTION THRU SLAB



DETAIL "A"



END OF CURB WITHOUT
SHOULDER BERM GUTTER



SECTION N-N

NOTES

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

FOR REINFORCED BRIDGE APPROACH FILL FABRIC WALL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

BILL OF MATERIAL

FOR ONE APPROACH SLAB
(2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	14	#4	STR	29'-0"	271
A2	14	#4	STR	29'-0"	271
* A3	2	#4	STR	27'-8"	37
A4	2	#4	STR	27'-8"	37
* B1	56	#5	STR	14'-3"	832
B2	56	#6	STR	14'-8"	1234
* B3	2	#5	STR	13'-10"	29
B4	2	#6	STR	13'-10"	42
REINFORCING STEEL				LBS.	1584
*EPOXY COATED REINFORCING STEEL				LBS.	1169
CLASS AA CONCRETE				C.Y.	19.0

SPLICE LENGTHS

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

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

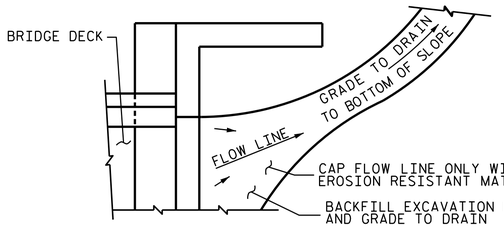
BRIDGE APPROACH SLAB
FOR INTEGRAL ABUTMENT

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D0EBAA3B405... 9/22/2015

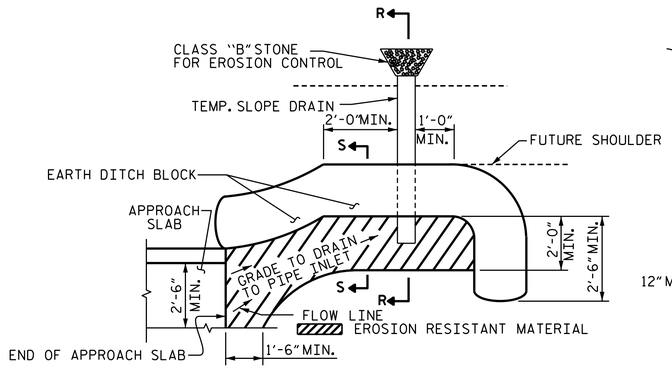
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : M. POOLE DATE : 3/14
CHECKED BY : H.T BARBOUR DATE : 3/15



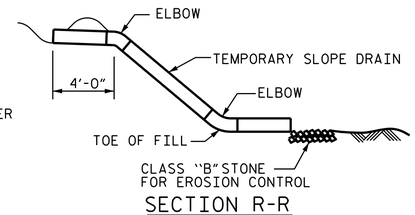
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

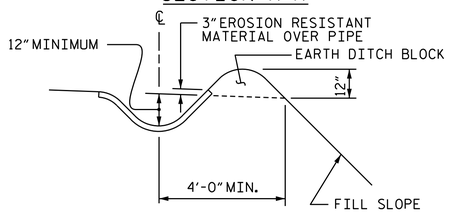


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE I OR TYPE 2, MIN. 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

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. B-3868

MACON COUNTY

STATION: 18+33.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

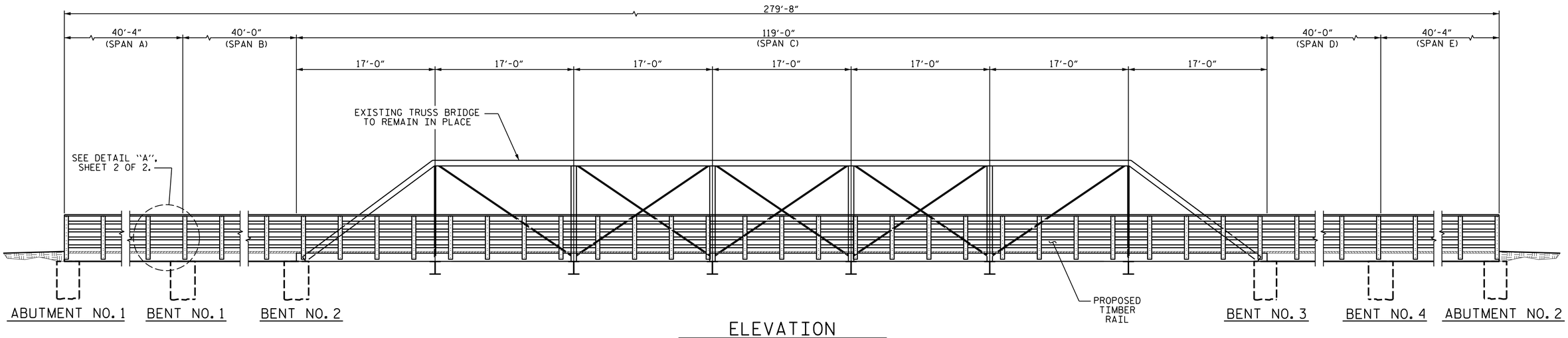
BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			40

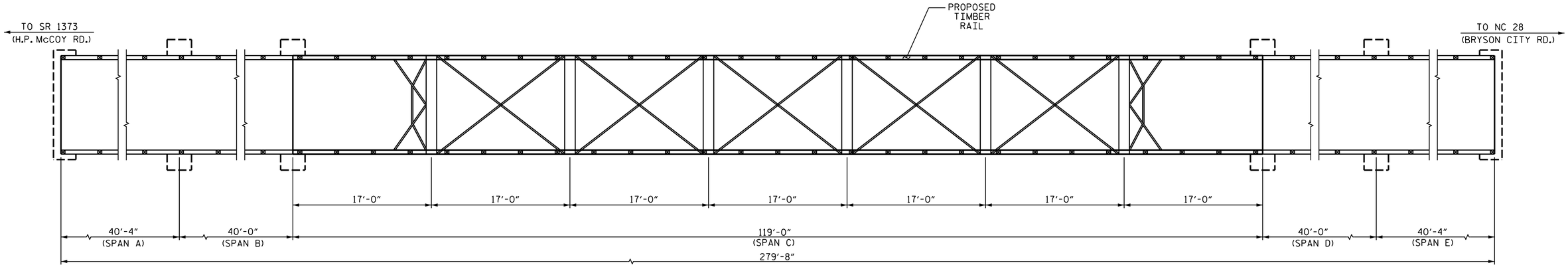
NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Digitally signed by Marshall G. Cheek, Jr.
6545f0DEBAA3B405...
9/11/2015

DRAWN BY : M. POOLE DATE : 3/14
CHECKED BY : H.T BARBOUR DATE : 3/15



ELEVATION



PLAN

TOTAL BILL OF MATERIAL	
	TIMBER BRIDGE RAIL
	LUMP SUM
TOTAL	LUMP SUM

DRAWN BY : D. HODGE DATE : 7/15
CHECKED BY : M.G. CHEEK DATE : 7/15

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
DocuSigned by: Douglas R. Calhoun 43016F9D5ED429
9/18/2015

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
DocuSigned by: Marshall G. Cheek, Jr. 6549D8EB8AA3B405
9/18/2015

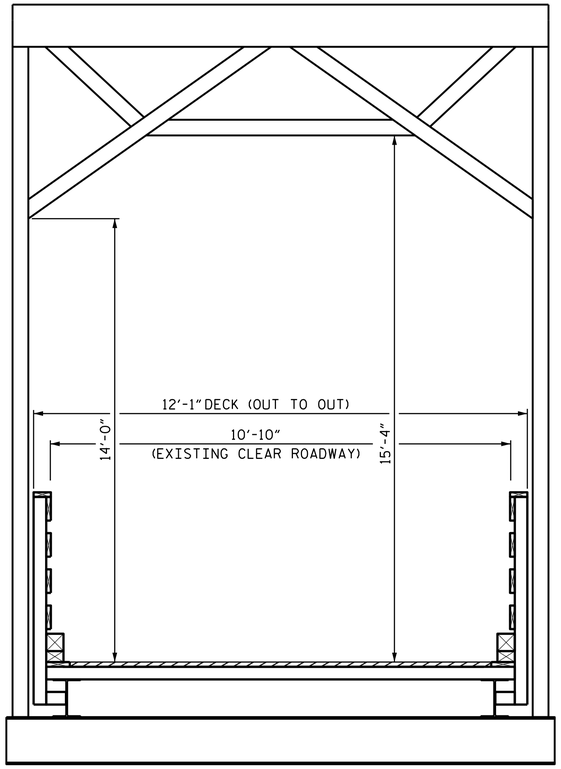
PROJECT NO. B-3868
MACON COUNTY
STATION:

SHEET 1 OF 2 BRIDGE No. 172

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TIMBER BRIDGE RAIL FOR BRIDGE No. 172 OVER LITTLE TENNESSEE RIVER ON SR 1456 BETWEEN NC 28 AND SR 1373

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			40



TYPICAL SECTION THRU TRUSS

(SHOWING PROPOSED RAIL REPLACEMENT)

NOTES

DIMENSIONS SHOWN ON THE PLANS ARE APPROXIMATE AND SHOULD BE VERIFIED BY THE CONTRACTOR IN THE FIELD AS NEEDED.

THE DEPICTIONS 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 AS SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

REMOVE EXISTING STEEL GUARDRAILS AND STEEL POSTS AND PROVIDE NEW TIMBER BRIDGE RAILS AS DIRECTED BY THE ENGINEER. SEE SPECIAL PROVISION FOR "TIMBER BRIDGE RAIL".

ALL TREATED LUMBER FOR THE BRIDGE RAILS & POSTS SHALL MEET THE REQUIREMENTS OF SECTION 1082 OF THE NCDOT STANDARD SPECIFICATIONS.

ALL SCREWS, BOLTS, NUTS AND WASHERS ARE TO BE HOT DIPPED GALVANIZED AND SHALL MEET THE REQUIREMENTS OF SECTION 1076 OF THE STANDARD SPECIFICATIONS.

STAGGER 2"X 6"END JOINTS SO THAT THERE ARE NO MORE THAN 2 JOINTS ON A POST.

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 COST 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 "TIMBER BRIDGE RAIL".

FOR TIMBER BRIDGE RAIL, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

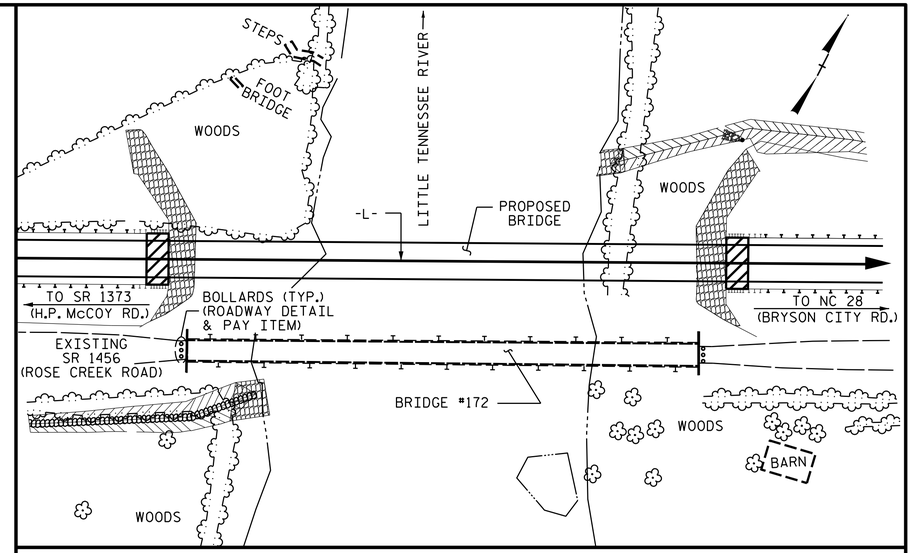
FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

EXISTING ASPHALT WEARING SURFACE ON BRIDGE DECK WILL BE SEALED BY DIVISION OF HIGHWAYS.

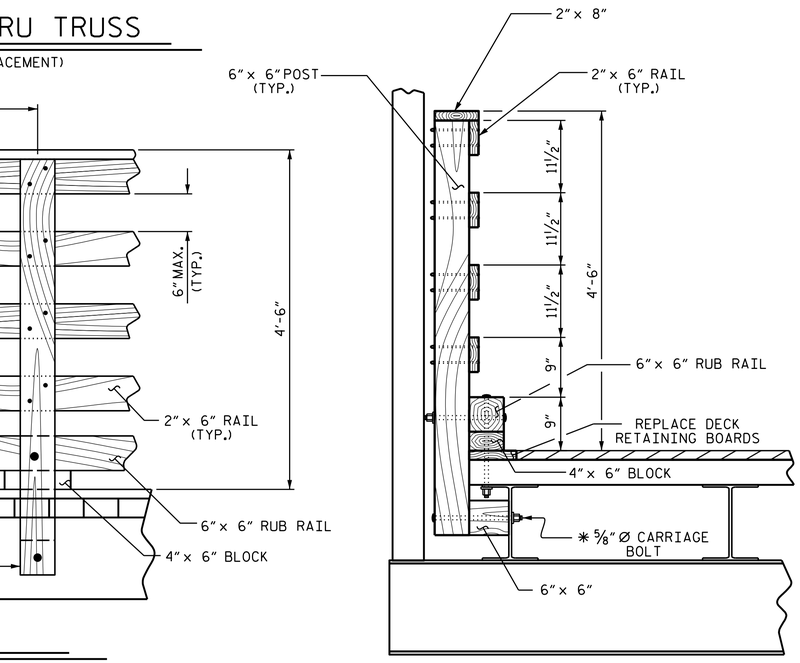
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE GALVANIZED BOLTS, NUTS AND WASHERS. THEY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

THE DECK RETAINING BOARDS SHALL BE REPLACED AS DIRECTED BY THE ENGINEER.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.



LOCATION SKETCH

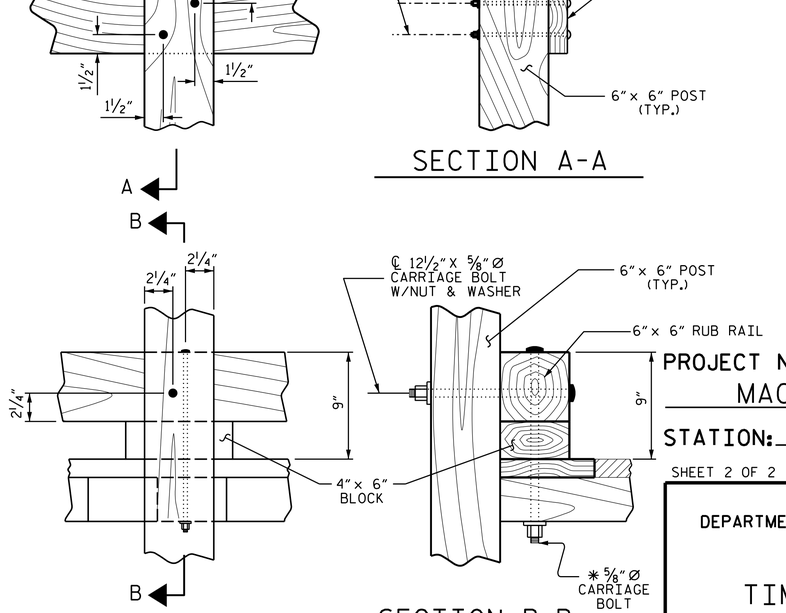


DETAIL "A"

NOTE: OPENING BETWEEN RAILS MAY NOT EXCEED 6"

SECTION THRU RAIL

* BOLT LENGTH TO BE DETERMINED BY CONTRACTOR



SECTION A-A

SECTION B-B

* BOLT LENGTH TO BE DETERMINED BY CONTRACTOR

CONNECTION DETAILS

OUTSIDE VIEW

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...

9/22/2015

PROJECT NO. B-3868

MACON COUNTY

STATION:

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TIMBER BRIDGE RAIL DETAILS

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

DRAWN BY : D. HODGE DATE : 7/15
CHECKED BY : M.G. CHEEK DATE : 7/15

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 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

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

HANDRAILS AND POSTS:

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

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. 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.

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

ENGLISH

JANUARY, 1990

STD. NO. SN