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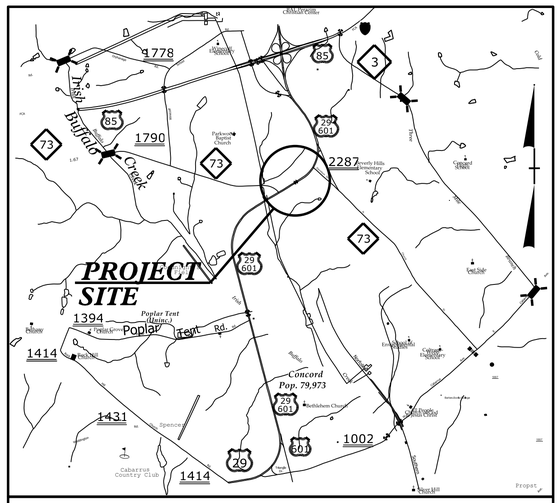
TIP PROJECT: B-5136

CONTRACT: C203565



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

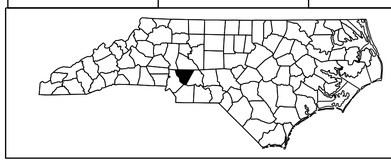
CABARRUS COUNTY

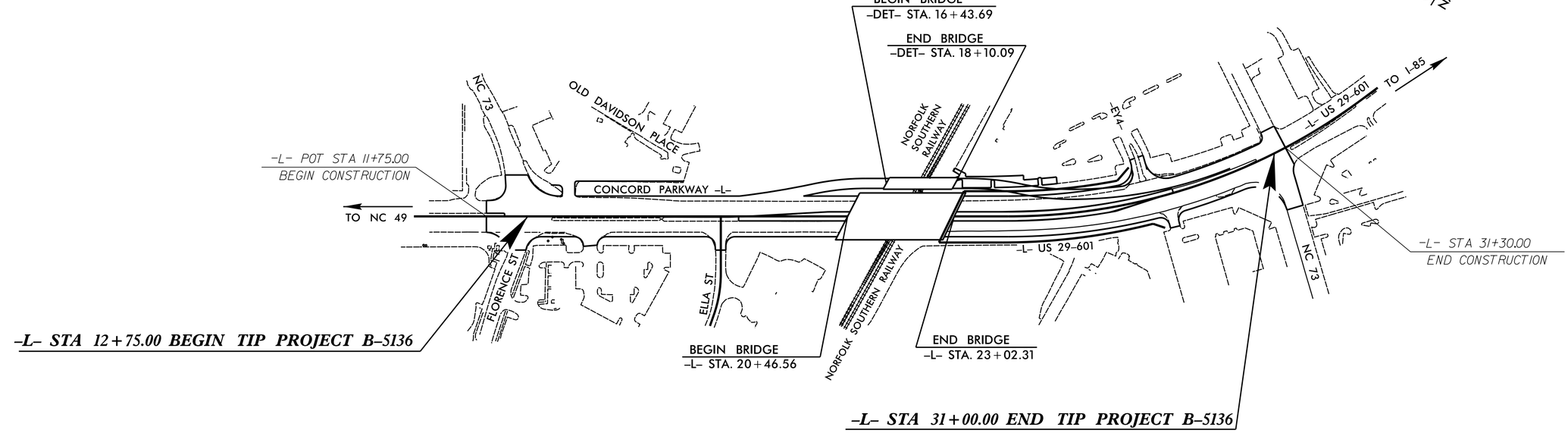
LOCATION: BRIDGES 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/US 601

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE, SIGNALS, LIGHTING AND RETAINING WALLS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5136		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
42295.1.1	BRSTP-0029(43)	PE
42295.2.1	BRSTP-0029(43)	R/W & UTIL
42295.3.FR1	BRSTP-0029(43)	CONST.





STRUCTURE

DESIGN DATA

ADT 2015 = 33,400
ADT 2035 = 54,800
K = 10 %
D = 55 %
T = 6 % *
V = 50 MPH
* TTST = 2% DUAL 4%
FUNC CLASS = PRINCIPAL ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-5136	=	0.297 MILES
LENGTH OF STRUCTURE TIP PROJECT B-5136	=	0.049 MILES
TOTAL LENGTH OF TIP PROJECT B-5136	=	0.346 MILES

Prepared In the Office of:
DIVISION OF HIGHWAYS
STRUCTURE MANAGEMENT UNIT
1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE:
AUGUST 18, 2015

L. E. SUTTON, PE
PROJECT ENGINEER

V. A. PATEL, PE
PROJECT DESIGN ENGINEER

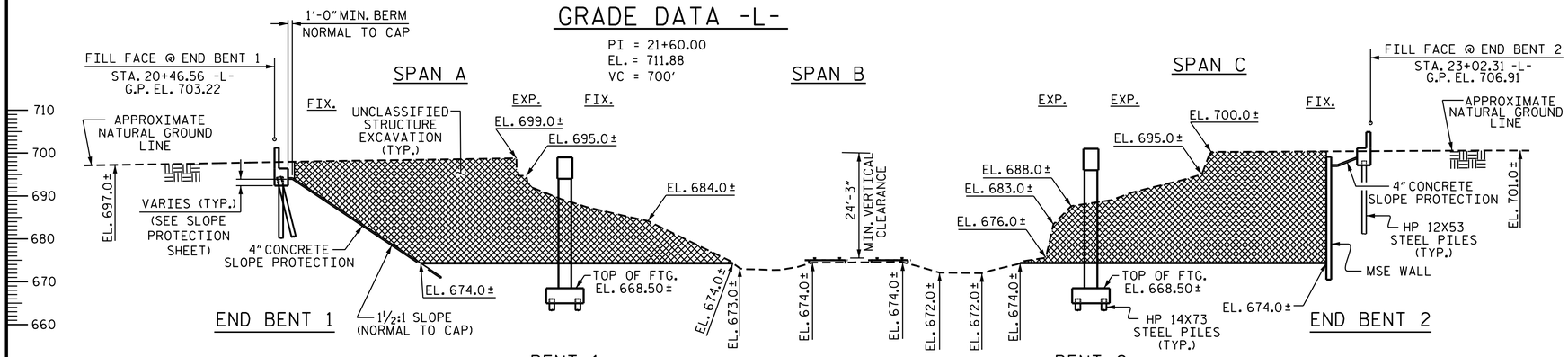
F.A. PROJECT NO.: BRSTP-0029(43)

GRADE DATA -L-

PI = 21+60.00
EL. = 711.88
VC = 700'

+5.1333 % -1.9593 %

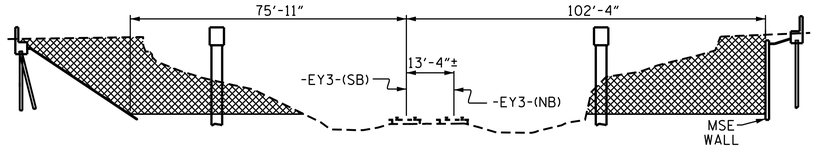
20+00 21+00 22+00 23+00



SECTION ALONG -L-

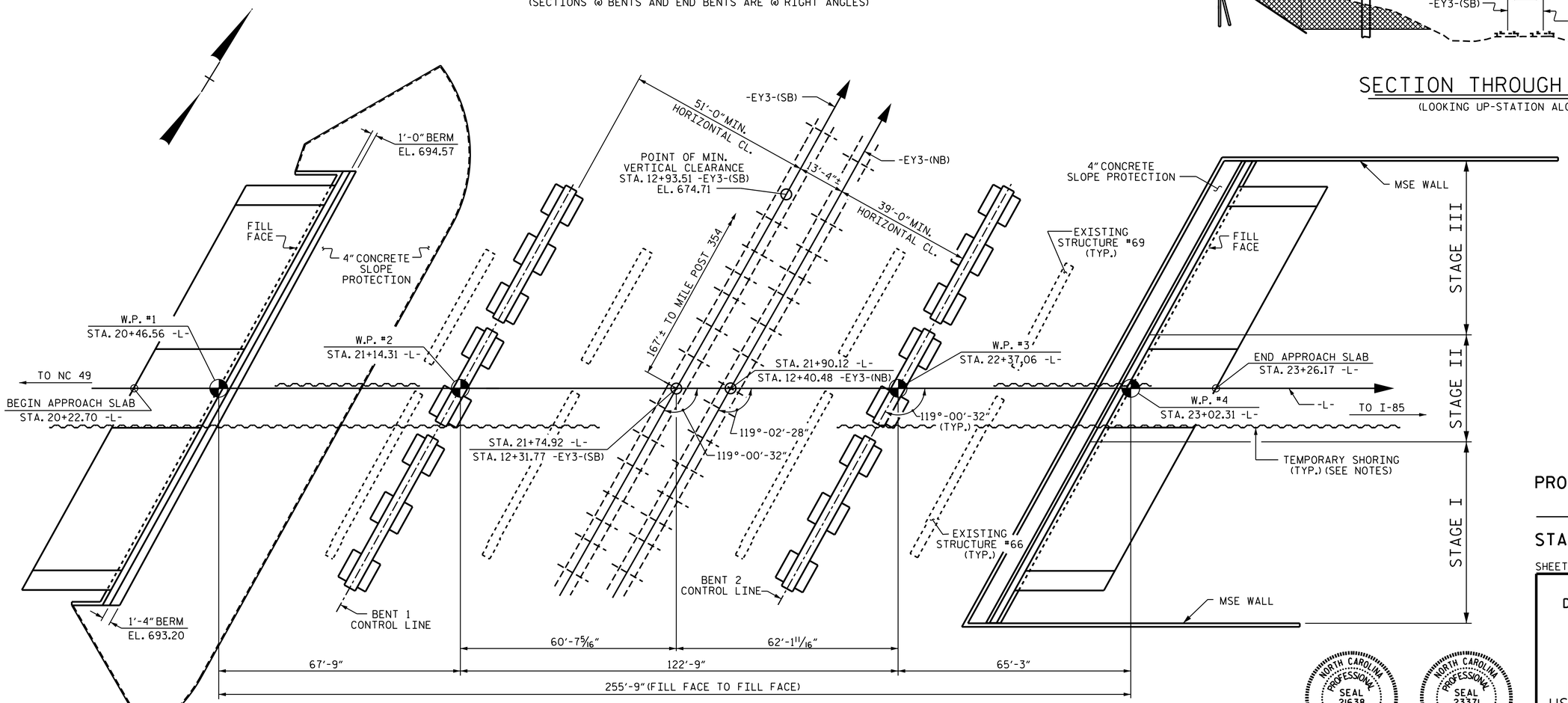
(SECTIONS @ BENTS AND END BENTS ARE @ RIGHT ANGLES)

TOP OF EXISTING RAIL ELEVATIONS	
TRACK -EY3-(SB) STA.	ELEVATION LT. & RT. RAIL
12+00	674.09
12+10	674.13
12+20	674.22
12+30	674.28
12+40	674.33
12+50	674.40
12+60	674.47
TRACK -EY3-(NB) STA.	ELEVATION LT. & RT. RAIL
12+00	673.97
12+10	674.06
12+20	674.13
12+30	674.20
12+40	674.29
12+50	674.39
12+60	674.44



SECTION THROUGH RAILROAD

(LOOKING UP-STATION ALONG TRACKS)



PLAN

PILES & COLUMNS NOT SHOWN FOR CLARITY.

DRAWN BY : P.S. ADKINS DATE : 7/8/14
CHECKED BY : H.A. LOCKLEAR DATE : 12/31/14
DESIGN ENGINEER OF RECORD: V.A. PATEL DATE : 1/5/15

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NORTH CAROLINA PROFESSIONAL SEAL 21638 ENGINEER LAURA E. SUTTON
DocuSigned by: Laura C. Sutton AE35E3E6F27640E... 2/20/2015

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
DocuSigned by: vipul a patel 1C157DE15D4B4F0... 2/19/2015

PROJECT NO. B-5136
CABARRUS COUNTY
STATION: 21+74.92 -L-
BRIDGE 66
SHEET 1 OF 5 REPLACES BRIDGE 66 & 69
MILE POST 354.03

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NORFOLK SOUTHERN RR ON US 29/601 (CONCORD PARKWAY) BETWEEN ELLA ST. AND NC 73

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			75

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

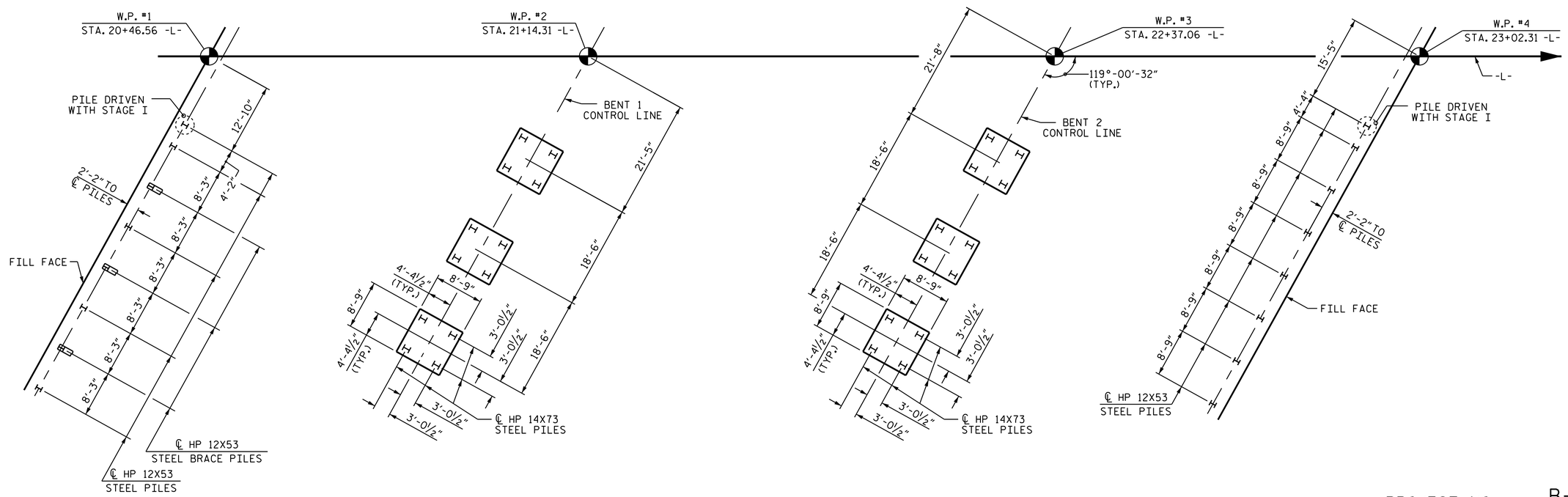
PILES END BENTS 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT END BENTS 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.

PILES AT BENTS 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 160 TONS PER PILE.

DRIVE PILES AT BENTS 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 267 TONS PER PILE.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 55 TO 75 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENTS 1 AND 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.



FOUNDATION LAYOUT-STAGE I

DIMENSIONS LOCATING PILES ARE SHOWN TO CENTERLINE OF PILES. DIMENSIONS LOCATING COLUMNS AND FOOTINGS ARE SHOWN TO CENTERLINE OF COLUMNS AND FOOTINGS. DIMENSIONS FOR FOOTINGS ARE TYPICAL FOR EACH FOOTING. BRACE PILES AT END BENT 1 ARE BATTERED AT 3:12.

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NORFOLK SOUTHERN RR ON US 29/601 (CONCORD PARKWAY) BETWEEN ELLA ST. AND NC 73

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE1504B4... 2/19/2015

DRAWN BY : P.S. ADKINS DATE : 7/9/14
CHECKED BY : H. A. LOCKLEAR DATE : 12/31/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

18-FEB-2015 14:02
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NOTES

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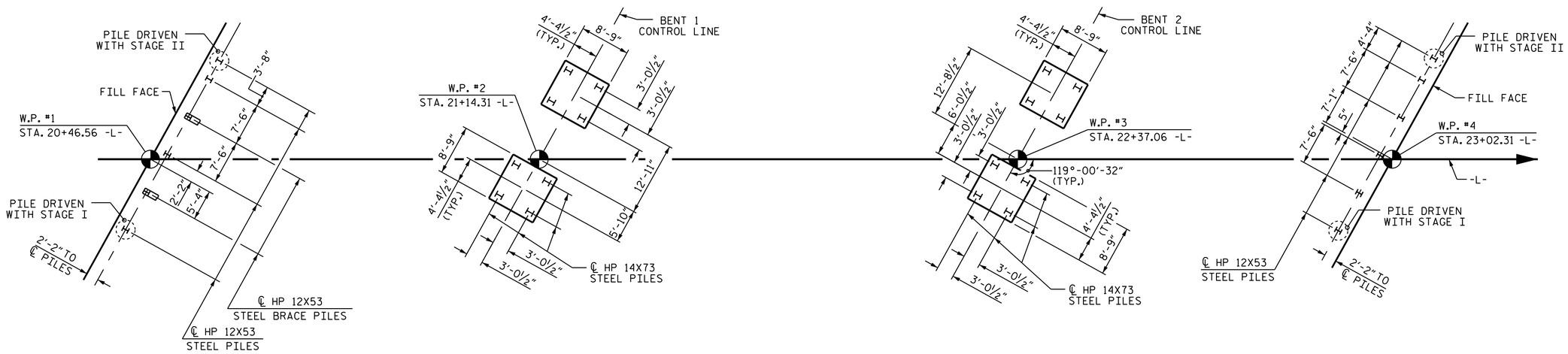
IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 55 TO 75 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENTS 1 AND 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.



FOUNDATION LAYOUT-STAGE II

DIMENSIONS LOCATING PILES ARE SHOWN TO CENTERLINE OF PILES. DIMENSIONS LOCATING COLUMNS AND FOOTINGS ARE SHOWN TO CENTERLINE OF COLUMNS AND FOOTINGS. DIMENSIONS FOR FOOTINGS ARE TYPICAL FOR EACH FOOTING. BRACE PILES AT END BENT 1 ARE BATTERED AT 3:12.

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NORFOLK SOUTHERN RR ON US 29/601 (CONCORD PARKWAY) BETWEEN ELLA ST. AND NC 73

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4A4... 2/19/2015

DRAWN BY : P.S. ADKINS DATE : 7/9/14
CHECKED BY : H. A. LOCKLEAR DATE : 12/31/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

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NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES END BENTS 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT END BENTS 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.

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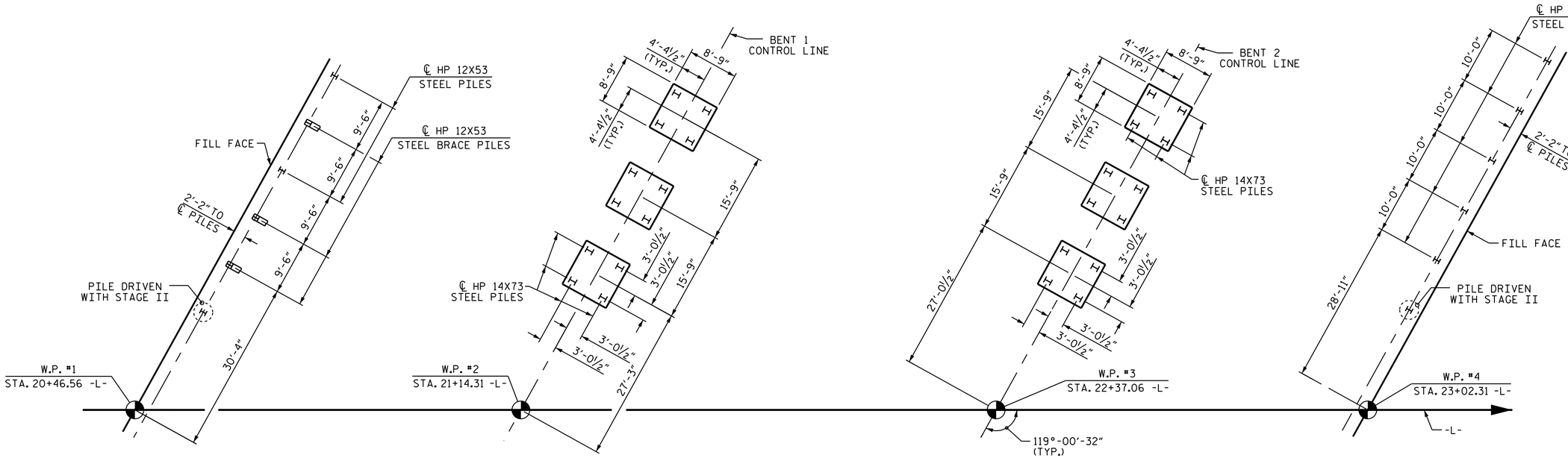

FOUNDATION LAYOUT-STAGE III

DIMENSIONS LOCATING PILES ARE SHOWN TO CENTERLINE OF PILES. DIMENSIONS LOCATING COLUMNS AND FOOTINGS ARE SHOWN TO CENTERLINE OF COLUMNS AND FOOTINGS. DIMENSIONS FOR FOOTINGS ARE TYPICAL FOR EACH FOOTING. BRACE PILES AT END BENT 1 ARE BATTERED AT 3:12.

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NORFOLK SOUTHERN RR ON US 29/601 (CONCORD PARKWAY) BETWEEN ELLA ST. AND NC 73

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4A4... 2/19/2015

DRAWN BY : P.S. ADKINS DATE : 7/9/14
CHECKED BY : H. A. LOCKLEAR DATE : 12/31/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

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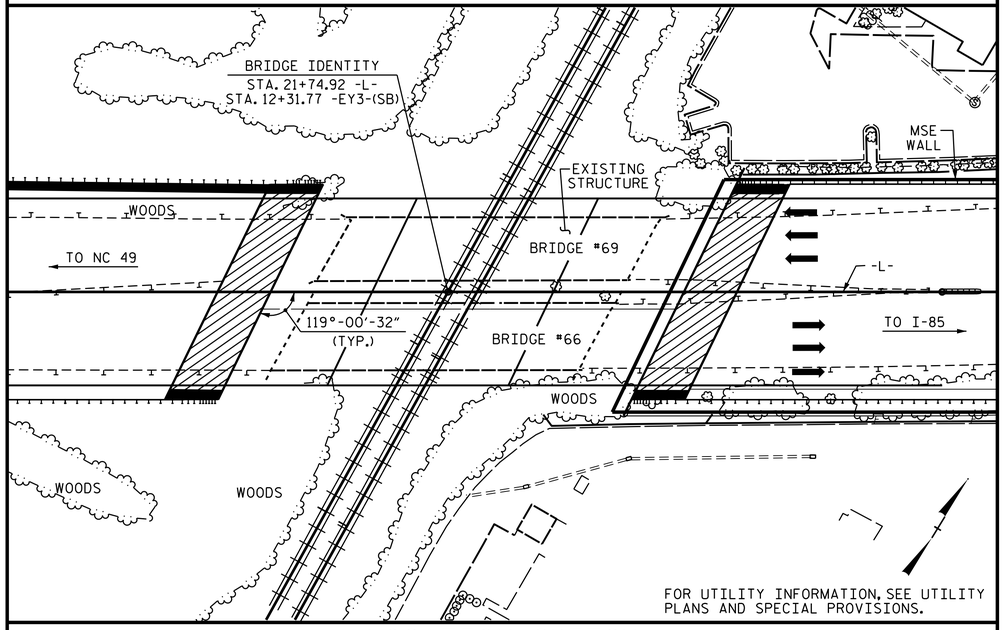
BM3: RR SPIKE SET IN BASE OF 24" OAK, 113' RT OF STA. 20+14 -L-, EL. 687.72



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.

FOR PLACING LOAD ON STRUCTURE MEMBERS, 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.

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

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

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURES AT STATION 21+74.92 -L-."

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 100 FT EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

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

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 21+74.92 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

THE BRIDGE RAILS ON THE TEMPORARY STRUCTURE SHALL BE DESIGNED FOR THE AASHTO LRFD TEST LEVEL 3 (TL-3) CRASH TEST CRITERIA. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING LEFT LANE STRUCTURE CONSISTING OF 1 SPAN @ 44', 1 SPAN @ 71' AND 1 SPAN @ 49' WITH A CLEAR ROADWAY WIDTH OF 28' ON A REINFORCED CONCRETE DECK ON CONTINUOUS I-BEAMS ON END BENTS OF REINFORCED CONCRETE CAPS ON TIMBER PILES AND INTERIOR BENTS OF REINFORCED CONCRETE POST AND BEAM WITH PILE FOOTINGS AND LOCATED AT PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE EXISTING RIGHT LANE STRUCTURE CONSISTING OF 1 SPAN @ 44', 1 SPAN @ 71' AND 1 SPAN @ 48.75' WITH A CLEAR ROADWAY WIDTH OF 26' ON A REINFORCED CONCRETE DECK ON CONTINUOUS I-BEAMS ON END BENTS OF REINFORCED CONCRETE SPILL-THROUGH ABUTMENTS ON PILE FOOTINGS AND INTERIOR BENTS OF REINFORCED CONCRETE POST AND BEAM WITH PILE FOOTINGS AND LOCATED AT PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMPORARY STRUCTURE	REMOVAL OF EXISTING STRUCTURES	FOUNDATION EXCAVATION FOR BENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	APPROACH SLABS	REINFORCING STEEL
	LUMP SUM	LUMP SUM	LUMP SUM	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.
SUPERSTRUCTURE						29,220	29,382		LUMP SUM	
END BENT 1								107.5		13,253
BENT 1			LUMP SUM					212.5		37,211
BENT 2			LUMP SUM					215.7		38,055
END BENT 2								105.1		13,384
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	1	LUMP SUM	29,220	29,382	640.8	LUMP SUM	101,903

	SPIRAL COLUMN REINFORCING STEEL	45" PRESTRESSED CONCRETE GIRDERS		STRUCTURAL STEEL	HP 12X53 STEEL PILES		HP 14X73 STEEL PILES		4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS	CLASSIC CONCRETE BRIDGE RAIL
	LBS.	NO.	LIN. FT.	APPROX. LBS.	NO.	LIN. FT.	NO.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LIN. FT.
SUPERSTRUCTURE		24	1,544.00	437,500						LUMP SUM	LUMP SUM	506.70
END BENT 1					18	1,485			835			
BENT 1	4,624						32	1,840				
BENT 2	4,929						32	1,520				
END BENT 2					18	1,300			65			
TOTAL	9,553	24	1,544.00	437,500	36	2,785	64	3,360	900	LUMP SUM	LUMP SUM	506.70

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER
NORFOLK SOUTHERN RR ON
US 29/601 (CONCORD PARKWAY)
BETWEEN ELLA ST. AND NC 73

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4A4... 2/19/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : P.S. ADKINS DATE : 7/8/14
CHECKED BY : H. A. LOCKLEAR DATE : 12/31/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

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thcarroll

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVELOAD FACTORS	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)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	⟨1⟩	**1.01**	--	1.75	0.872	1.48	A	I-2	32.124	1.118	1.76	A	I-2	19.275	0.80	1.118	**1.01**	A	I-2	32.124	
		HL-93(Opr)	N/A	--	1.92	--	1.35	0.872	1.92	A	I-2	32.124	1.118	2.28	A	I-2	19.275	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	⟨2⟩	**1.37**	49.339	1.75	0.872	2.00	A	I-2	32.124	1.118	2.16	A	I-2	19.275	0.80	0.872	**1.37**	A	I-2	32.124	
		HS-20(Opr)	36.000	--	2.59	93.251	1.35	0.872	2.59	A	I-2	32.124	1.118	2.80	A	I-2	19.275	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.01	40.676	1.40	0.872	5.49	A	I-2	32.124	1.118	6.05	A	I-2	19.275	0.80	0.872	3.01	A	I-2	32.124	
		SNGARBS2	20.000	--	2.28	45.589	1.40	0.872	4.15	A	I-2	32.124	1.118	4.41	A	I-2	19.275	0.80	0.872	2.28	A	I-2	32.124	
		SNAGRIS2	22.000	--	2.17	47.812	1.40	0.872	3.96	A	I-2	32.124	1.118	4.14	A	I-2	19.275	0.80	0.872	2.17	A	I-2	32.124	
		SNCOTTS3	27.250	--	1.50	40.885	1.40	0.872	2.73	A	I-2	32.124	1.118	3.03	A	I-2	19.275	0.80	0.872	1.50	A	I-2	32.124	
		SNAGGRS4	34.925	--	1.27	44.243	1.40	0.872	2.31	A	I-2	32.124	1.118	2.59	A	I-2	19.275	0.80	0.872	1.27	A	I-2	32.124	
		SNS5A	35.550	--	1.24	44.008	1.40	0.872	2.26	A	I-2	32.124	1.118	2.67	A	I-2	19.275	0.80	0.872	1.24	A	I-2	32.124	
		SNS6A	39.950	--	1.14	45.595	1.40	0.872	2.08	A	I-2	32.124	1.118	2.47	A	I-2	19.275	0.80	0.872	1.14	A	I-2	32.124	
		SNS7B	42.000	--	1.09	45.657	1.40	0.872	1.98	A	I-2	32.124	1.118	2.48	A	I-2	19.275	0.80	0.872	1.09	A	I-2	32.124	
	TTST	TNAGRIT3	33.000	--	1.39	45.982	1.40	0.872	2.54	A	I-2	32.124	1.118	2.91	A	I-2	19.275	0.80	0.872	1.39	A	I-2	32.124	
		TNT4A	33.075	--	1.40	46.340	1.40	0.872	2.55	A	I-2	32.124	1.118	2.80	A	I-2	19.275	0.80	0.872	1.40	A	I-2	32.124	
		TNT6A	41.600	--	1.15	47.876	1.40	0.872	2.10	A	I-2	32.124	1.118	2.73	A	I-2	19.275	0.80	0.872	1.15	A	I-2	32.124	
		TNT7A	42.000	--	1.16	48.698	1.40	0.872	2.11	A	I-2	32.124	1.118	2.59	A	I-2	19.275	0.80	0.872	1.16	A	I-2	32.124	
		TNT7B	42.000	--	1.21	50.679	1.40	0.872	2.20	A	I-2	32.124	1.118	2.38	A	I-2	19.275	0.80	0.872	1.21	A	I-2	32.124	
		TNAGRIT4	43.000	--	1.14	49.131	1.40	0.872	2.08	A	I-2	32.124	1.118	2.30	A	I-2	19.275	0.80	0.872	1.14	A	I-2	32.124	
		TNAGT5A	45.000	--	1.08	48.368	1.40	0.872	1.96	A	I-2	32.124	1.118	2.34	A	I-2	19.275	0.80	0.872	1.07	A	I-2	32.124	
		TNAGT5B	45.000	⟨3⟩	**1.06**	47.685	1.40	0.872	1.93	A	I-2	32.124	1.118	2.18	A	I-2	19.275	0.80	0.872	**1.06**	A	I-2	32.124	

LOAD FACTORS:

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

NOTES:

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

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

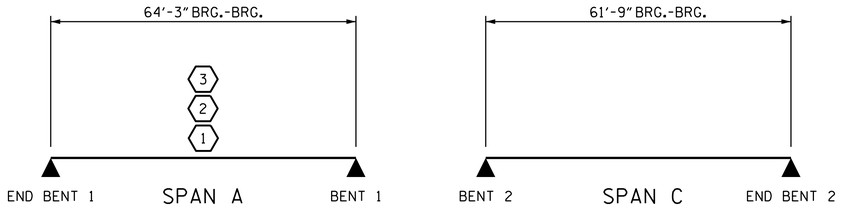
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS
(NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4A4... 2/19/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			75

STD. NO. LRFR1

ASSEMBLED BY : G. W. DICKEY DATE : 5/31/13
CHECKED BY : R. L. CHESSON DATE : 7/15/13

DRAWN BY : MAA 1/08
CHECKED BY : GM/DI 2/08

REV. 11/12/08RR MAA/GM
REV. 10/1/11 MAA/GM

DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

18-FEB-2015 14:02
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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE II LIMIT STATE						COMMENT NUMBER
							LIVE-LOAD FACTORS (γ_{LL})	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ_{LL})	MOMENT					
								DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	**1.17**	--	1.75	0.777	1.41	B	I-2	60.50	1.119	1.41	B	I-2	0.00	1.30	0.777	**1.17**	B	I-2	60.50	
		HL-93 (OPERATING)	N/A		1.53	--	1.35	0.777	1.83	B	I-2	60.50	1.119	1.83	B	I-2	0.00	1.00	0.777	1.53	B	I-2	60.50	
		HS-20 (INVENTORY)	36.00	2	**1.84**	66.24	1.75	0.777	1.88	B	I-2	60.50	1.119	1.98	B	I-2	0.00	1.30	0.777	**1.84**	B	I-2	60.50	
		HS-20 (OPERATING)	36.00		2.39	86.11	1.35	0.777	2.44	B	I-2	60.50	1.119	2.57	B	I-2	0.00	1.00	0.777	2.39	B	I-2	60.50	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.46	60.21	1.40	0.777	5.05	B	I-2	60.50	1.119	5.56	B	I-2	0.00	1.30	0.777	4.46	B	I-2	60.50	
		SNGARBS2	20.000		3.18	63.60	1.40	0.777	3.82	B	I-2	60.50	1.119	4.08	B	I-2	0.00	1.30	0.777	3.18	B	I-2	60.50	
		SNAGRIS2	22.000		2.96	65.12	1.40	0.777	3.59	B	I-2	60.50	1.119	3.79	B	I-2	0.00	1.30	0.777	2.96	B	I-2	60.50	
		SNCOTTS3	27.250		2.21	60.22	1.40	0.777	2.78	B	I-2	60.50	1.119	3.04	B	I-2	121.00	1.30	0.777	2.21	B	I-2	60.50	
		SNAGGRS4	34.925		1.80	62.87	1.40	0.777	2.31	B	I-2	60.50	1.119	2.50	B	I-2	121.00	1.30	0.777	1.80	B	I-2	60.50	
		SNS5A	35.550		1.76	62.57	1.40	0.777	2.26	B	I-2	60.50	1.119	2.49	B	I-2	0.00	1.30	0.777	1.76	B	I-2	60.50	
		SNS6A	39.950		1.59	63.52	1.40	0.777	2.07	B	I-2	60.50	1.119	2.26	B	I-2	0.00	1.30	0.777	1.59	B	I-2	60.50	
		SNS7B	42.000		1.52	63.84	1.40	0.777	1.97	B	I-2	60.50	1.119	2.19	B	I-2	0.00	1.30	0.777	1.52	B	I-2	60.50	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.94	64.02	1.40	0.777	2.47	B	I-2	60.50	1.119	2.68	B	I-2	0.00	1.30	0.777	1.94	B	I-2	60.50	
		TNT4A	33.075		1.94	64.17	1.40	0.777	2.47	B	I-2	60.50	1.119	2.64	B	I-2	0.00	1.30	0.777	1.94	B	I-2	60.50	
		TNT6A	41.600		1.57	65.31	1.40	0.777	2.03	B	I-2	60.50	1.119	2.27	B	I-2	0.00	1.30	0.777	1.57	B	I-2	60.50	
		TNT7A	42.000		1.56	65.52	1.40	0.777	2.03	B	I-2	60.50	1.119	2.23	B	I-2	0.00	1.30	0.777	1.56	B	I-2	60.50	
		TNT7B	42.000		1.59	66.78	1.40	0.777	2.07	B	I-2	60.50	1.119	2.17	B	I-2	0.00	1.30	0.777	1.59	B	I-2	60.50	
		TNAGRIT4	43.000		1.53	65.79	1.40	0.777	1.99	B	I-2	60.50	1.119	2.11	B	I-2	0.00	1.30	0.777	1.53	B	I-2	60.50	
		TNAGT5A	45.000		1.46	65.70	1.40	0.777	1.90	B	I-2	60.50	1.119	2.06	B	I-2	0.00	1.30	0.777	1.46	B	I-2	60.50	
		TNAGT5B	45.000	3	**1.45**	65.25	1.40	0.777	1.89	B	I-2	60.50	1.119	2.02	B	I-2	0.00	1.30	0.777	**1.45**	B	I-2	60.50	
FATIGUE		HL-93 (INVENTORY)	γ_{LL}=0.75		2.73																			

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.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93) **

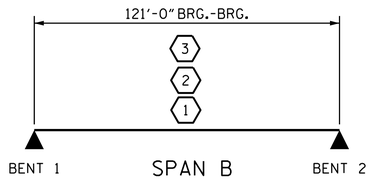
(2) DESIGN LOAD RATING (HS-20) **

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR STEEL GIRDERS

(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			75

STD. NO. LRFR3

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4644A... 2/19/2015

ASSEMBLED BY : G. W. DICKEY DATE : 5/31/13
CHECKED BY : R. L. CHESSON DATE : 8/9/13

DRAWN BY : MAA 1/08 REV. 11/12/08RR MAA/GM REV. 10/1/11 MAA/GM
CHECKED BY : GM/DI 2/08

DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

18-FEB-2015 14:02
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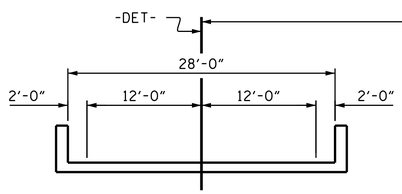
NOTES

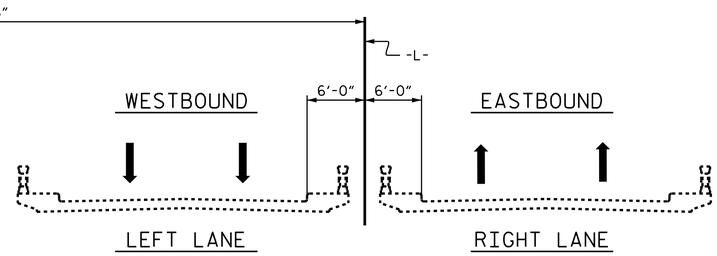
SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE PORTABLE CONCRETE BARRIER.

FOR PHASING AND MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

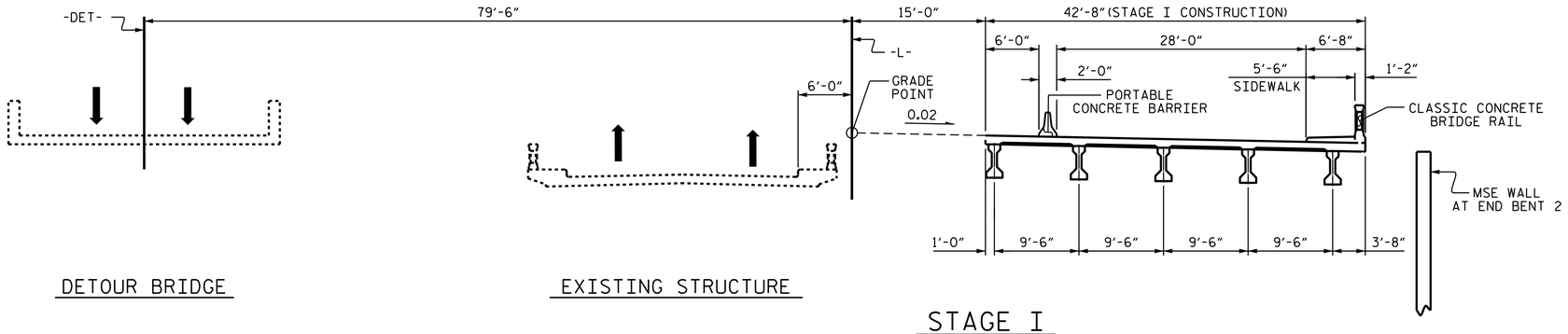


DETOUR BRIDGE

CONSTRUCT DETOUR BRIDGE.



EXISTING STRUCTURES

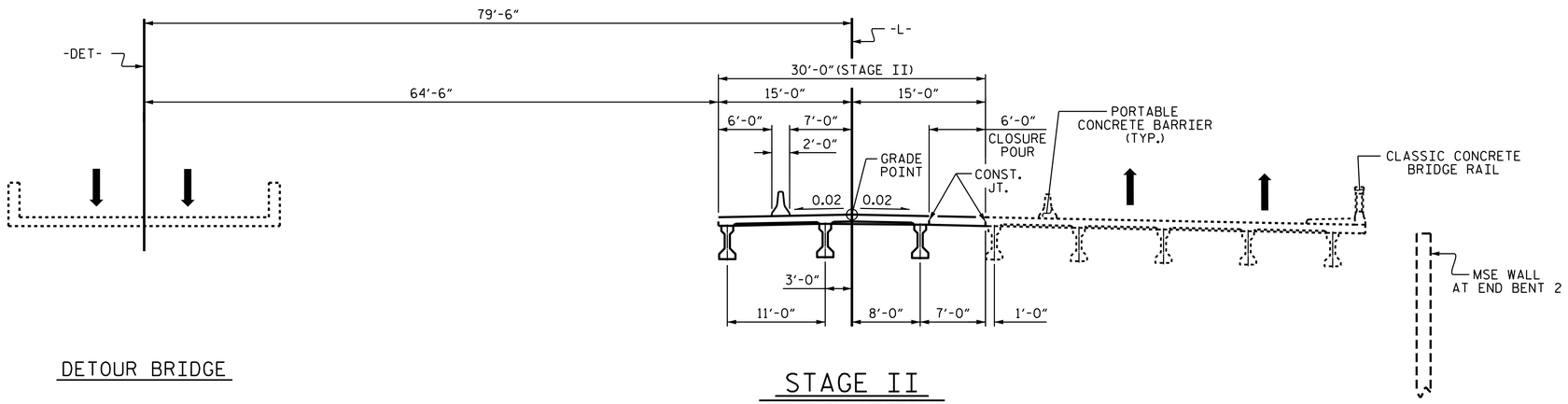


DETOUR BRIDGE

EXISTING STRUCTURE

STAGE I

SHIFT WESTBOUND TRAFFIC ONTO DETOUR BRIDGE AND SHIFT EASTBOUND TRAFFIC ONTO EXISTING LEFT LANE BRIDGE. REMOVE EXISTING RIGHT LANE BRIDGE AND CONSTRUCT MSE WALL AND STAGE I OF THE PROPOSED STRUCTURE.



DETOUR BRIDGE

STAGE II

MAINTAIN WESTBOUND TRAFFIC ON DETOUR BRIDGE AND SHIFT EASTBOUND TRAFFIC ONTO EXISTING STAGE I. REMOVE EXISTING LEFT LANE BRIDGE AND CONSTRUCT MSE WALL AND STAGE II OF THE PROPOSED STRUCTURE.

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONSTRUCTION SEQUENCE

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4A4...

2/19/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : T. H. CARROLL DATE : 11/24/14
CHECKED BY : V. A. PATEL DATE : 12/2/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

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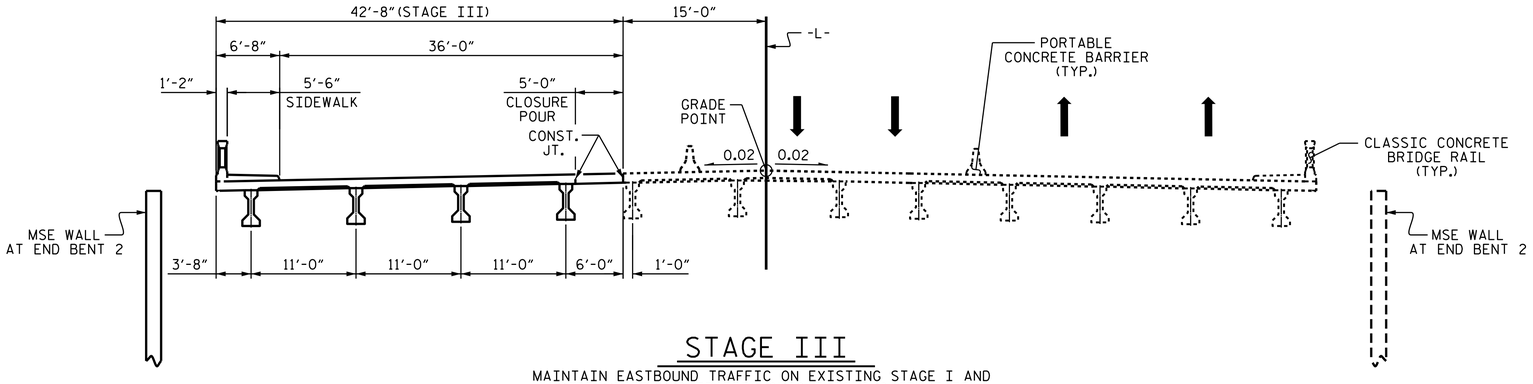
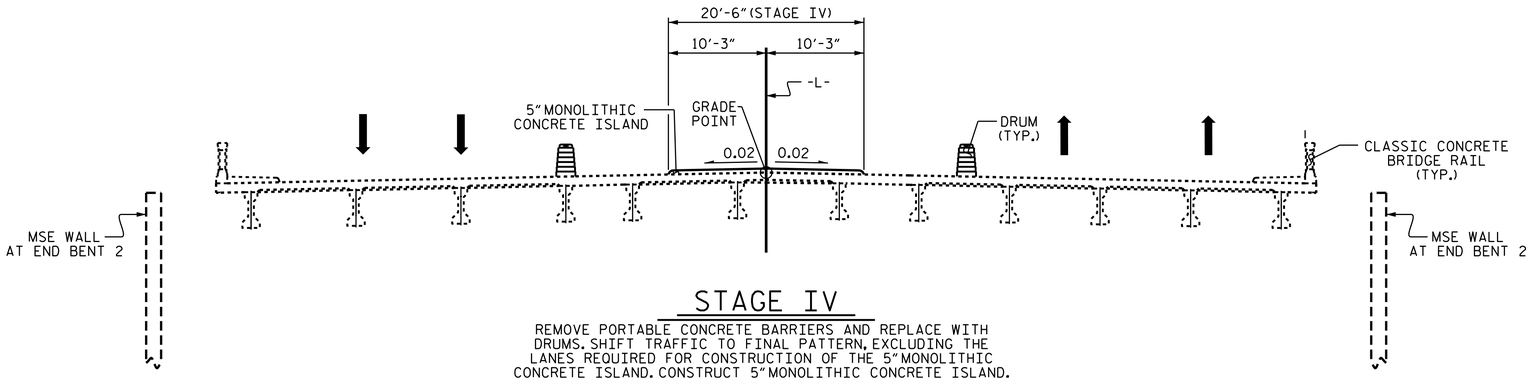
thcarroll



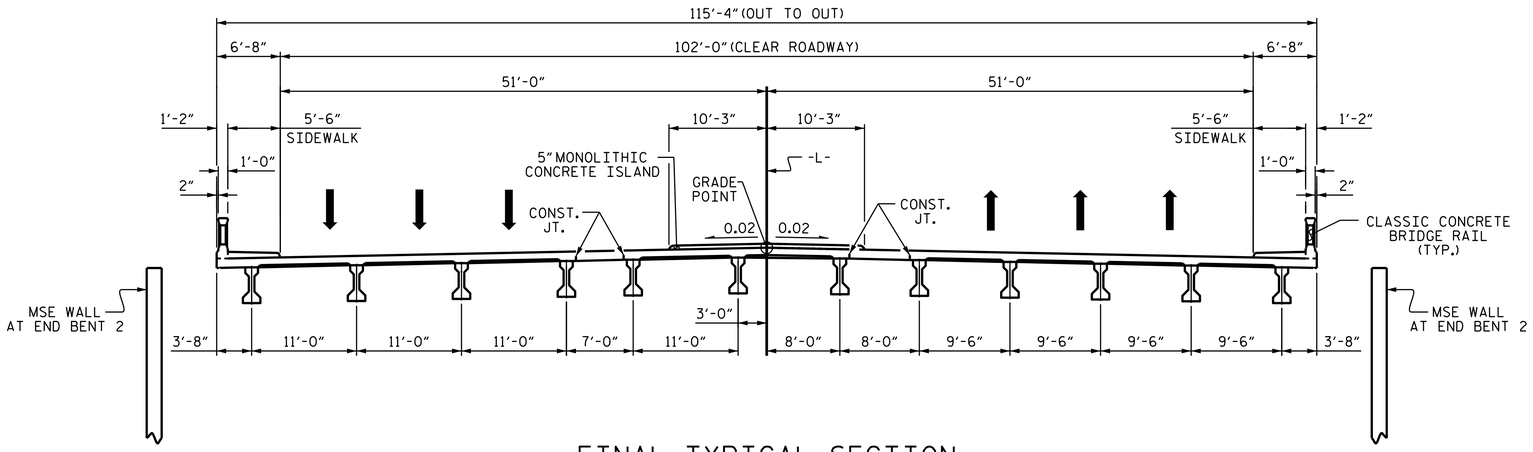
STAGE III

MAINTAIN EASTBOUND TRAFFIC ON EXISTING STAGE I AND SHIFT WESTBOUND TRAFFIC ONTO EXISTING STAGE II. REMOVE DETOUR BRIDGE AND CONSTRUCT MSE WALL AND STAGE III OF THE PROPOSED STRUCTURE.



STAGE IV

REMOVE PORTABLE CONCRETE BARRIERS AND REPLACE WITH DRUMS. SHIFT TRAFFIC TO FINAL PATTERN, EXCLUDING THE LANES REQUIRED FOR CONSTRUCTION OF THE 5" MONOLITHIC CONCRETE ISLAND. CONSTRUCT 5" MONOLITHIC CONCRETE ISLAND.



FINAL TYPICAL SECTION

SHIFT TRAFFIC TO FINAL PATTERN.

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONSTRUCTION SEQUENCE

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4A4...

2/19/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : T. H. CARROLL DATE : 11/24/14
CHECKED BY : V. A. PATEL DATE : 12/2/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

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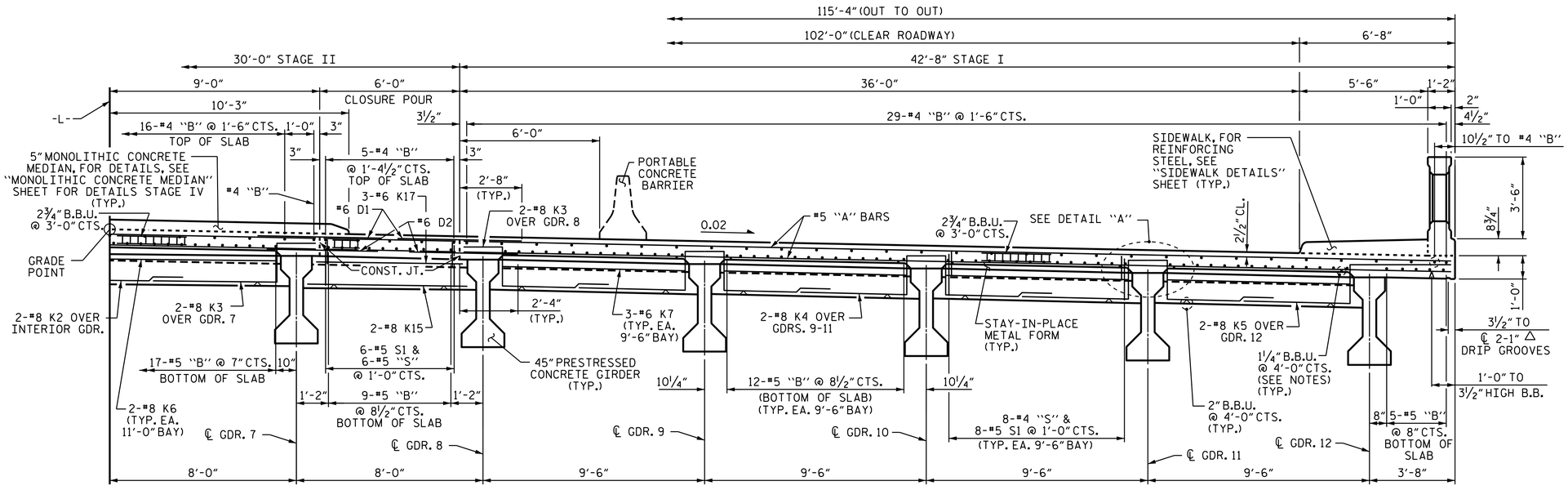
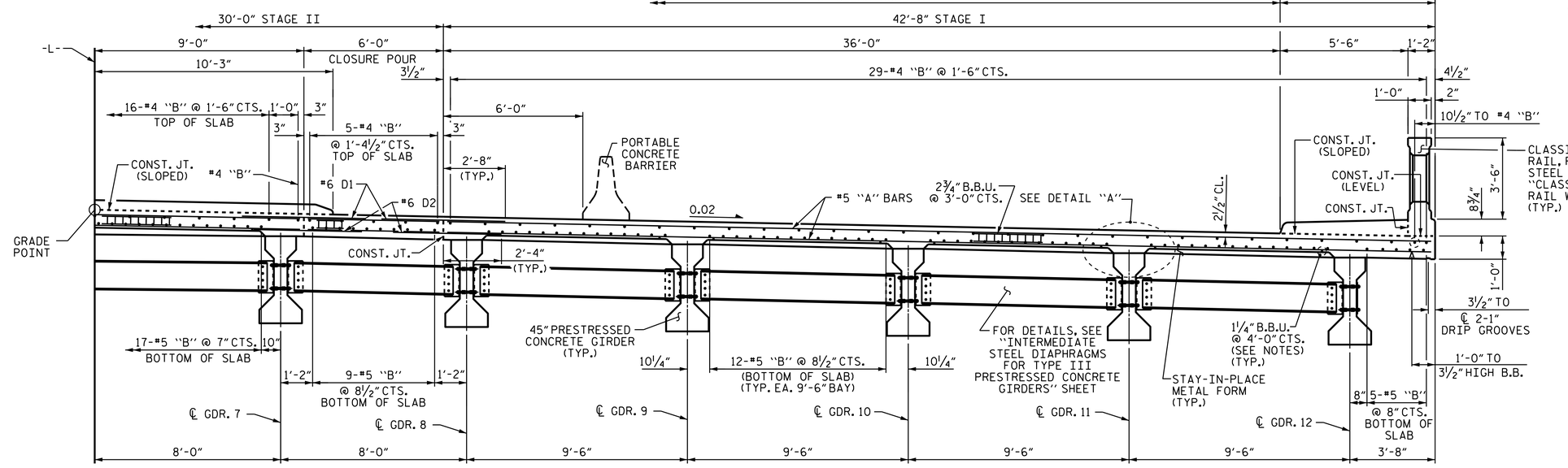
thcarroll



TYPICAL SECTION @ END BENT AND BENT



TYPICAL SECTION @ INTERMEDIATE DIAPHRAGM

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.

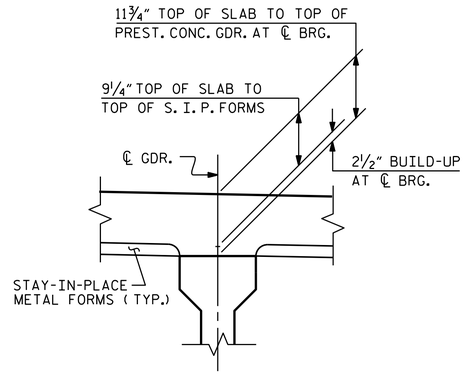
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

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

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

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



DETAIL "A"

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION
STAGE I & HALF
STAGE II & IV

SPANS A & C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4F4... 2/19/2015

DRAWN BY :	P.S. ADKINS	DATE : 7/10/14
CHECKED BY :	K.D. LAYNE	DATE : 11/14/14
DESIGN ENGINEER OF RECORD:	V. A. PATEL	DATE : 1/5/15

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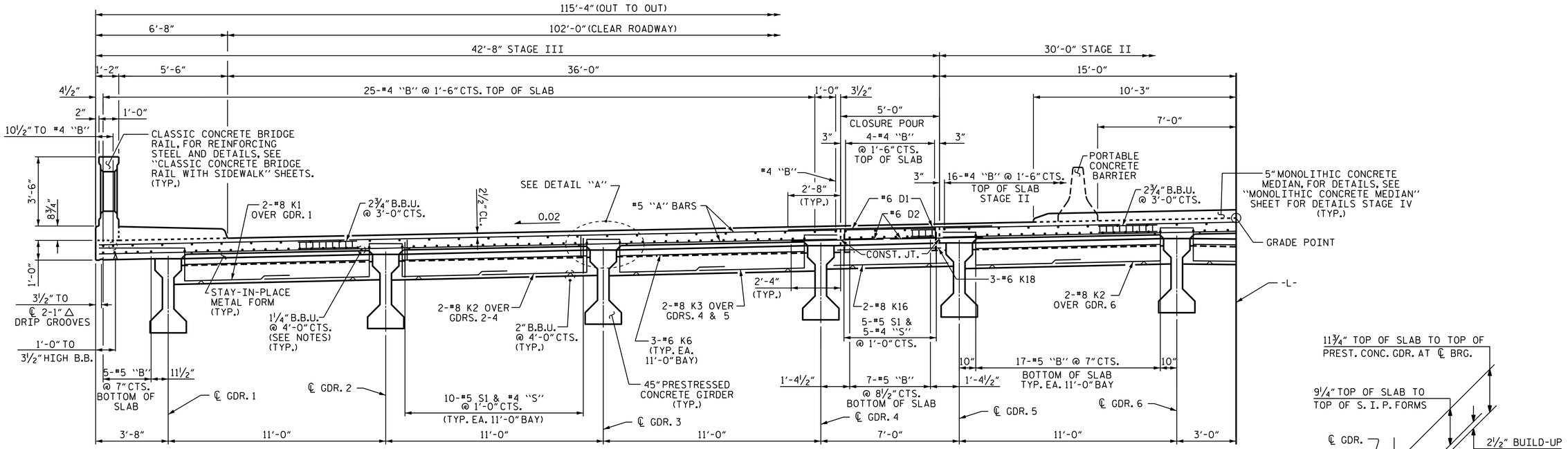
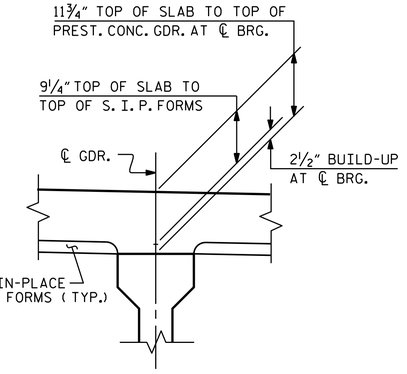
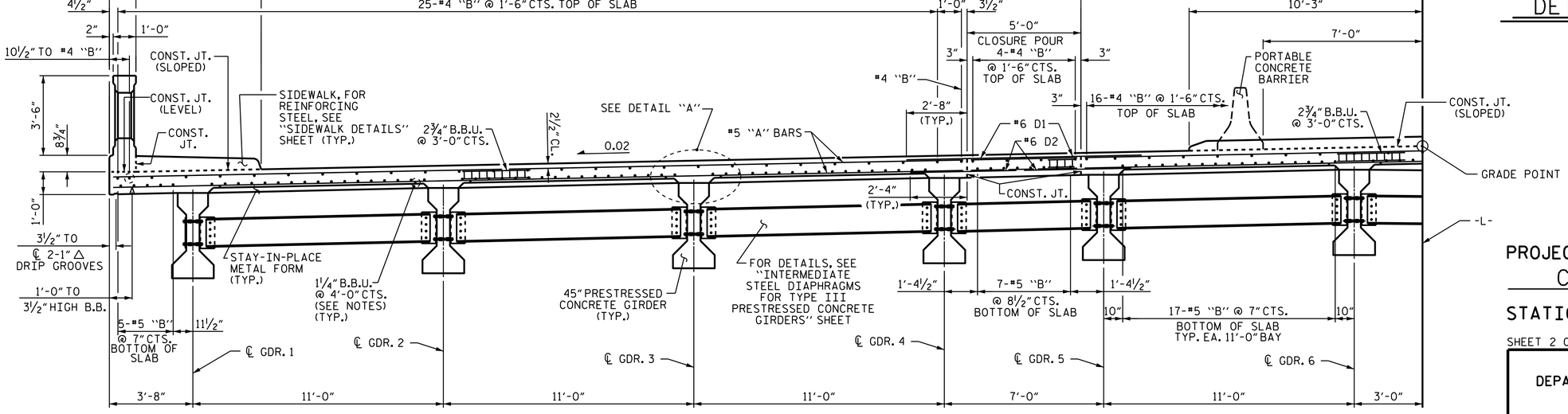


TYPICAL SECTION @ END BENT AND BENT



DETAIL "A"



TYPICAL SECTION @ INTERMEDIATE DIAPHRAGM

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION STAGE III & HALF STAGE II & IV

SPANS A & C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : P.S. ADKINS DATE : 7/10/14
CHECKED BY : K.D. LAYNE DATE : 11/14/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIRUL A. PATEL

DocuSigned by: virul a patel 1C157DE15D464AA... 2/19/2015

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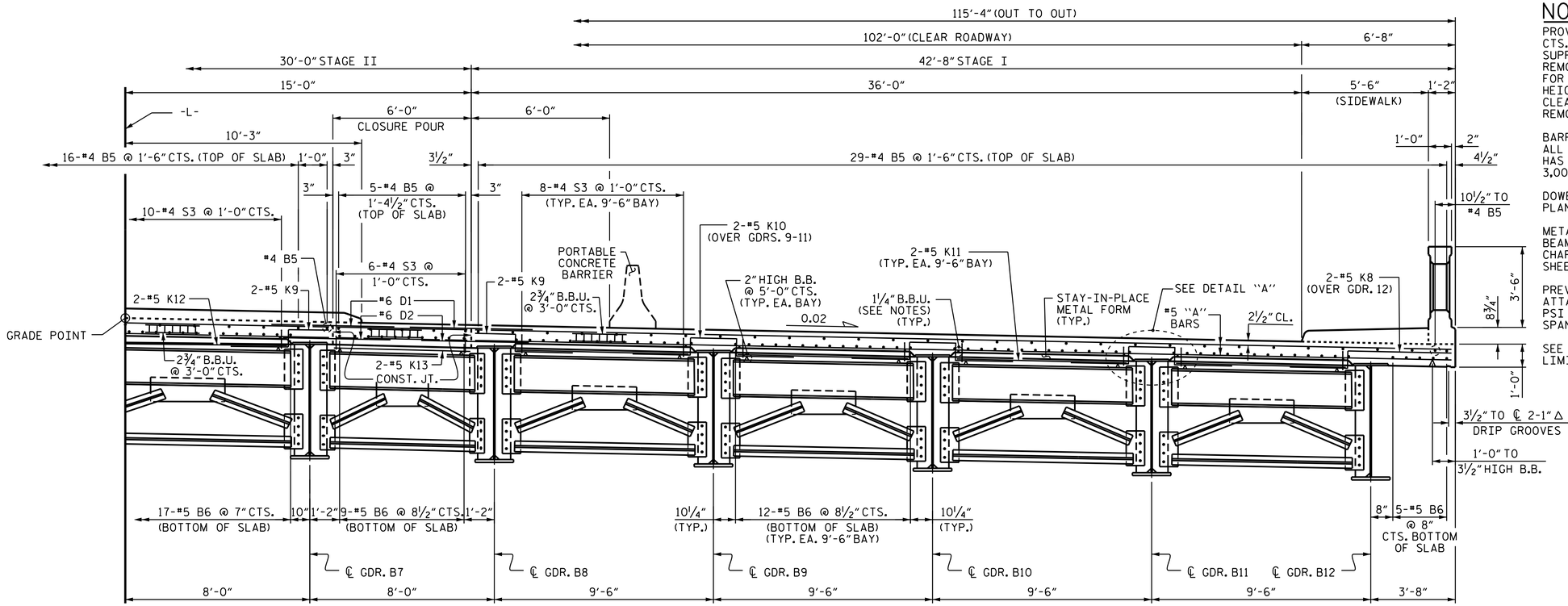
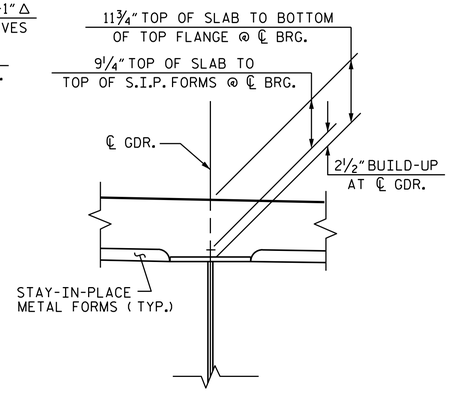
thcarroll



TYPICAL SECTION @ BENT DIAPHRAGM



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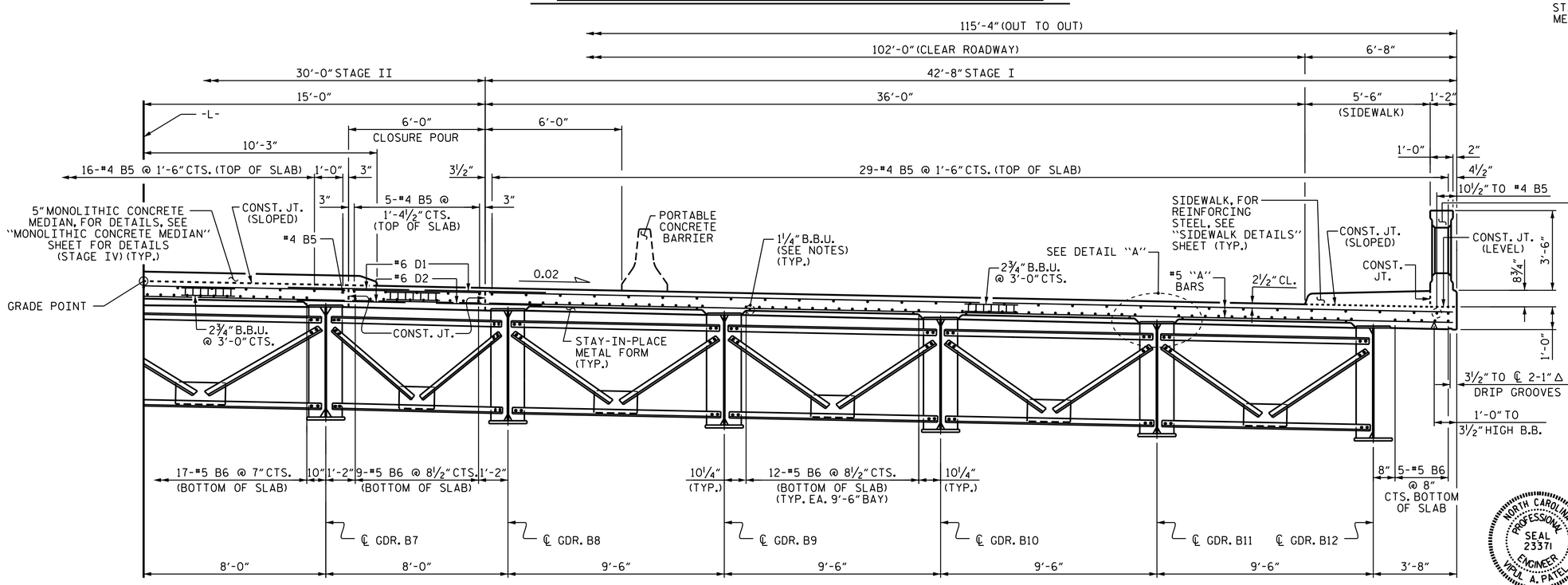

TYPICAL SECTION @ INTERMEDIATE DIAPHRAGM

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.

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

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

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

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

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

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION
STAGE I & HALF
STAGE II & IV
SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4A4...
2/19/2015

DRAWN BY : T. H. CARROLL DATE : 7/15/14
CHECKED BY : K. D. LAYNE DATE : 11/25/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

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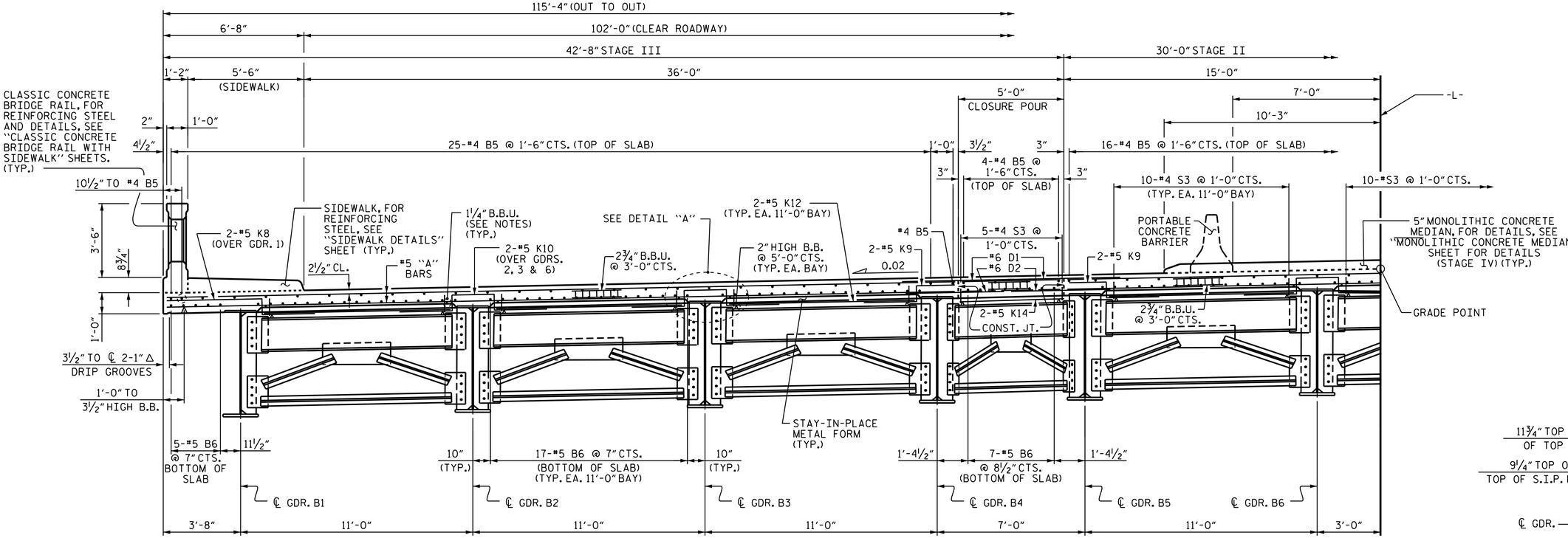
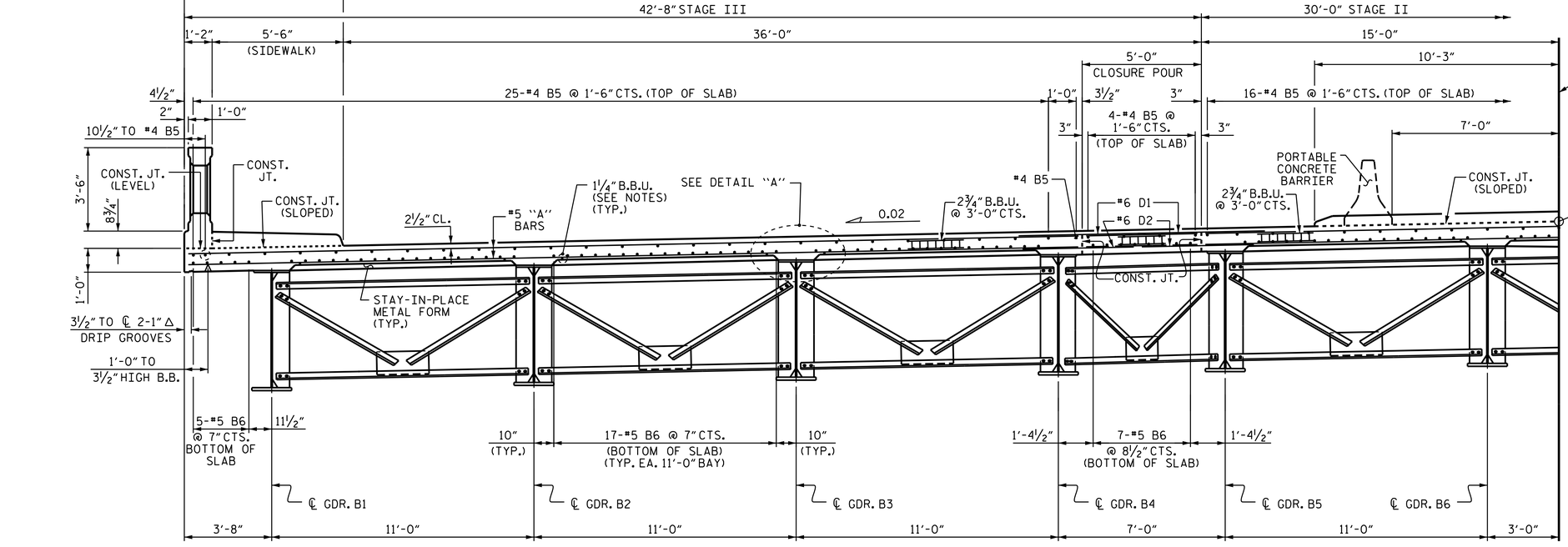
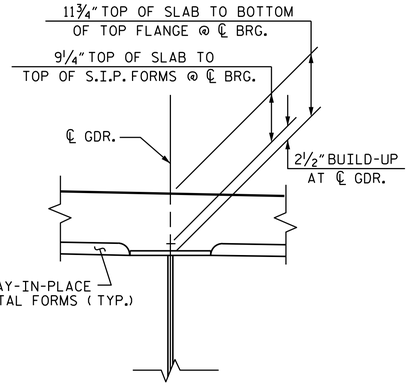


TYPICAL SECTION @ BENT DIAPHRAGM



TYPICAL SECTION @ INTERMEDIATE DIAPHRAGM



DETAIL "A"

DRAWN BY : T. H. CARROLL DATE : 7/14/14
CHECKED BY : K. D. LAYNE DATE : 11/25/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

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NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
DocuSigned by: vipul a patel 1C157DE15D4644...
2/19/2015

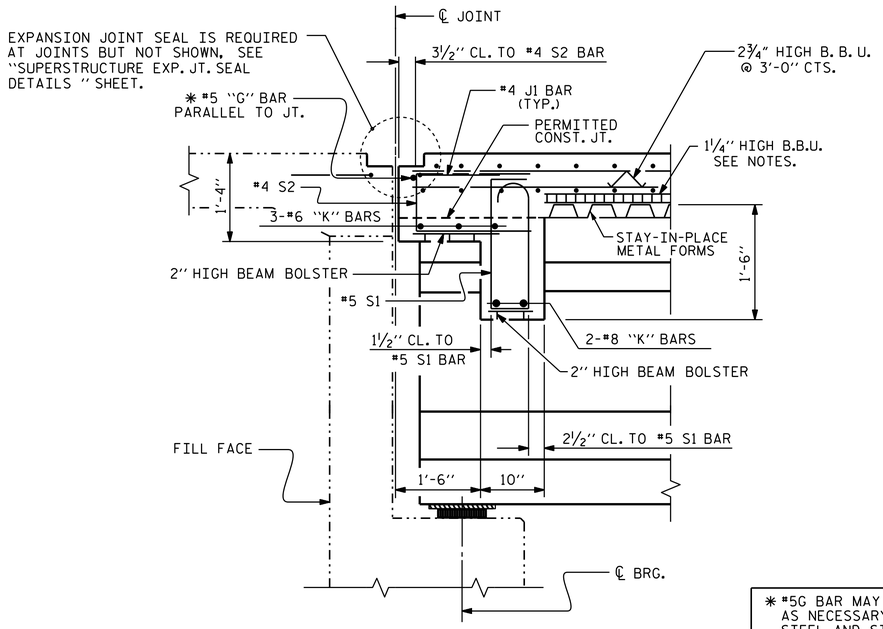
PROJECT NO. B-5136
CABARRUS COUNTY
STATION: 21+74.92 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

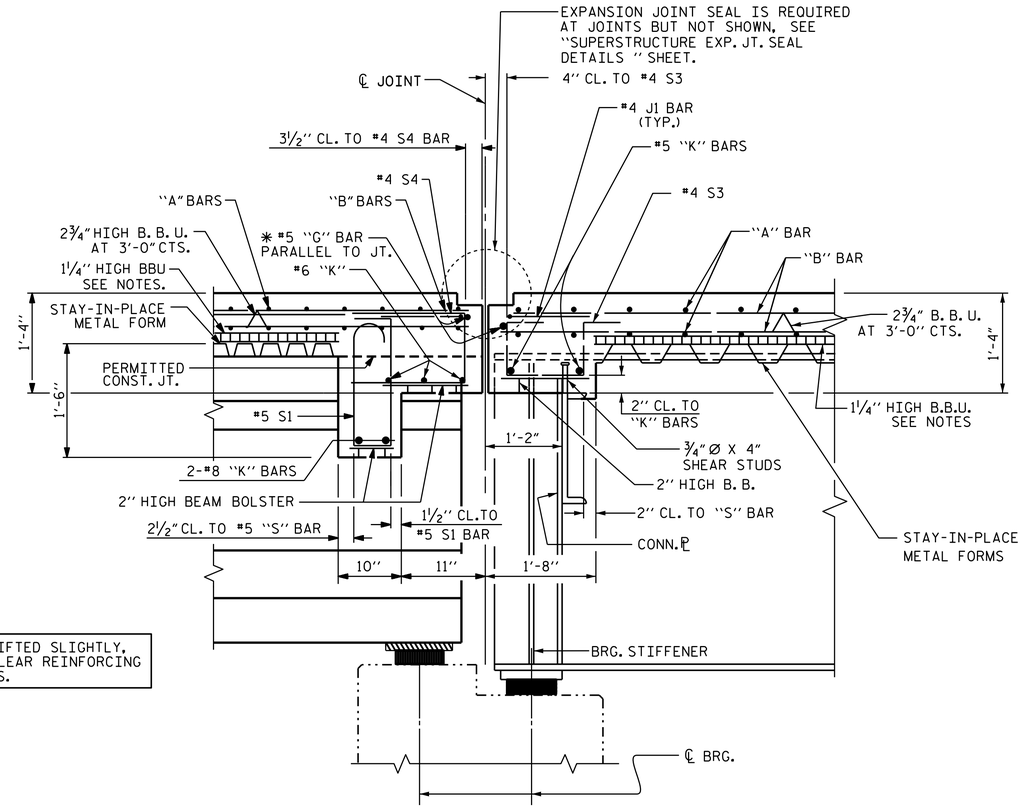
SUPERSTRUCTURE
TYPICAL SECTION STAGE III & HALF STAGE II & IV
SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			75



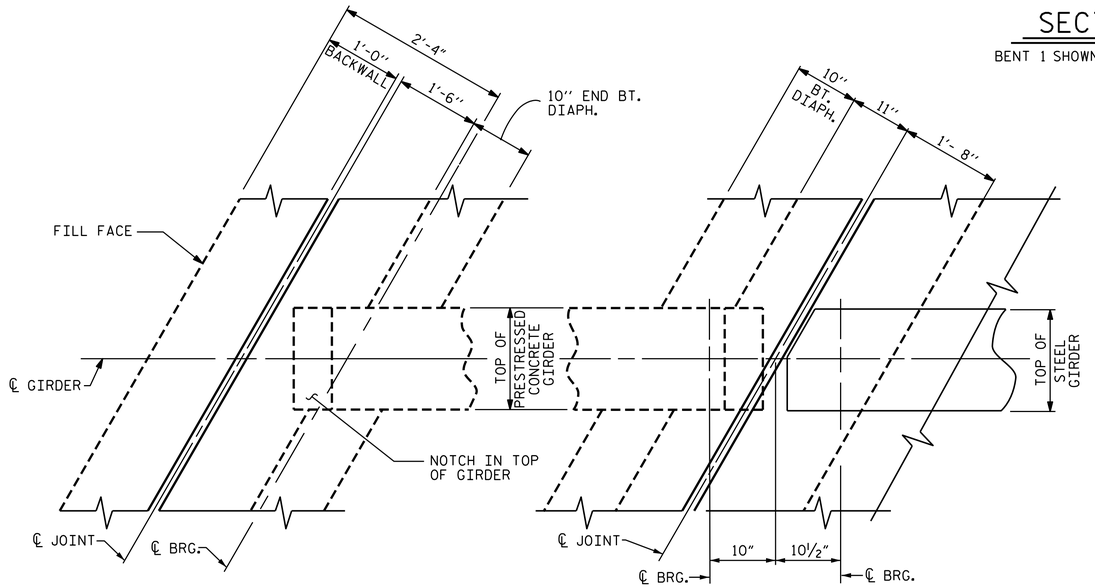
SECTION @ END BENT

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



SECTION @ BENT

BENT 1 SHOWN, BENT 2 SIMILAR BY ROTATION



END BENT DIAPHRAGM

BENT DIAPHRAGM

SEE "STRUCTURAL STEEL DETAILS" SHEET FOR TOP FLANGE CLIP.

PLAN

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D464A8... 2/19/2015

DRAWN BY :	P.S. ADKINS	DATE :	7/17/14
CHECKED BY :	K.D. LAYNE	DATE :	11/14/14
DESIGN ENGINEER OF RECORD:	V. A. PATEL	DATE :	1/5/15

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67'-9"
7"
1'-2 3/8"
1'-0 5/8"
W.P. #1
W.P. #2
-L-
119°-00'-32" (TYP.)
16'-6 13/16"
17'-0 13/16"
15'-0"
8" TO FIRST A1 (TOP OF SLAB)
3" TO FIRST A6 (BOTTOM OF SLAB)
3 1/2"
℄ GDR. A8
℄ JT. @ END BENT 1
2-#8 K3 OVER GDR. 8
10" END BENT DIAPHRAGM
#6 K7 (TYP. EACH 9'-6" BAY)
2'-8" (TYP.)
2'-4" (TYP.)
● 150-#6 D1 @ 5" CTS. (TOP OF SLAB)
● 150-#6 D2 @ 5" CTS. (BOTTOM OF SLAB)
2-#8 K3 OVER GDR. 8
8-#5 S1 & #4 S4 @ 1'-0" CTS. (TYP. EACH 9'-6" BAY)
℄ GDR. A9
10 1/4"
12-#5 B3 @ 8 1/2" CTS. (2 BAR RUN) (BOTTOM OF SLAB) (TYP. EACH 9'-6" BAY)
10 1/4"
FILL FACE
#5 G1
2-#8 K4 (TYP. EACH 9'-6" BAY)
#5 A1 OR #5 A6
#5 A118 OR #5 A201
#6 K7 (TYP. EACH 9'-6" BAY)
2-#8 K4 (TYP. EACH 9'-6" BAY)
℄ GDR. A10
48'-9 7/16"
57'-8"
42'-8" STAGE I
36'-0"
8-#5 S1 & #4 S2 @ 1'-0" CTS. (TYP. EACH 9'-6" BAY)
42-#4 J1 (STAGE 1) SEE "EXPANSION JOINT SEAL DETAILS" SHEET
#5 A101 OR #5 A201
#5 A1 OR #5 A6
29-#4 B1 @ 1'-6" CTS. (3 BAR RUN) (TOP OF SLAB)
10" BENT DIAPHRAGM (TYP.)
℄ JT. @ BENT
#5 G1
℄ GDR. A11
SIDEWALK, FOR REINFORCING STEEL, SEE "SIDEWALK DETAILS" SHEET
GUTTERLINE
42-#4 J1 (STAGE 1) SEE "EXPANSION JOINT SEAL DETAILS" SHEET
2-#8 K5 OVER EXT. GDR.
#4 B1 (3 BAR RUN) (TOP OF SLAB)
℄ GDR. A12
8"
5'-6" SIDEWALK
1'-0"
2"
10 1/2"
4 1/2"
5-#5 B3 @ 8" CTS. (2 BAR RUN) (BOTTOM OF SLAB)
2-#8 K5 OVER EXT. GDR.
5"
5"
CLASSIC CONCRETE BRIDGE RAIL, FOR REINFORCING STEEL AND DETAILS, SEE "CLASSIC CONCRETE BRIDGE RAIL WITH SIDEWALK" SHEETS.
#5 A101 THRU #5 A117 @ 5" CTS. (3 BARS PER MARK) (TOP OF SLAB)
#5 A201 THRU #5 A217 @ 5" CTS. (3 BARS PER MARK) (BOTTOM OF SLAB)
102-#5 A1 @ 5" CTS. (TOP OF SLAB)
103-#5 A6 @ 5" CTS. (BOTTOM OF SLAB)
#5 A118 THRU #5 A134 @ 5" CTS. (3 BARS PER MARK) (TOP OF SLAB)
#5 A201 THRU #6 A217 @ 5" CTS. (3 BARS PER MARK) (BOTTOM OF SLAB)
3" TO FIRST A1 (TOP OF SLAB)
3" TO FIRST A6 (BOTTOM OF SLAB)

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

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

SPAN A

PROJECT NO. B-5136
CABARRUS COUNTY
STATION: 12+74.92 -L-

SHEET 1 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS
STAGE I

SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
DocuSigned by: vipul a patel 1C157DE15D4B4A4...
2/19/2015

DRAWN BY : P.S. ADKINS DATE : 7/14/14
CHECKED BY : K.D. LAYNE DATE : 11/14/14
DESIGN ENGINEER OF RECORD: V.A. PATEL DATE : 1/5/15

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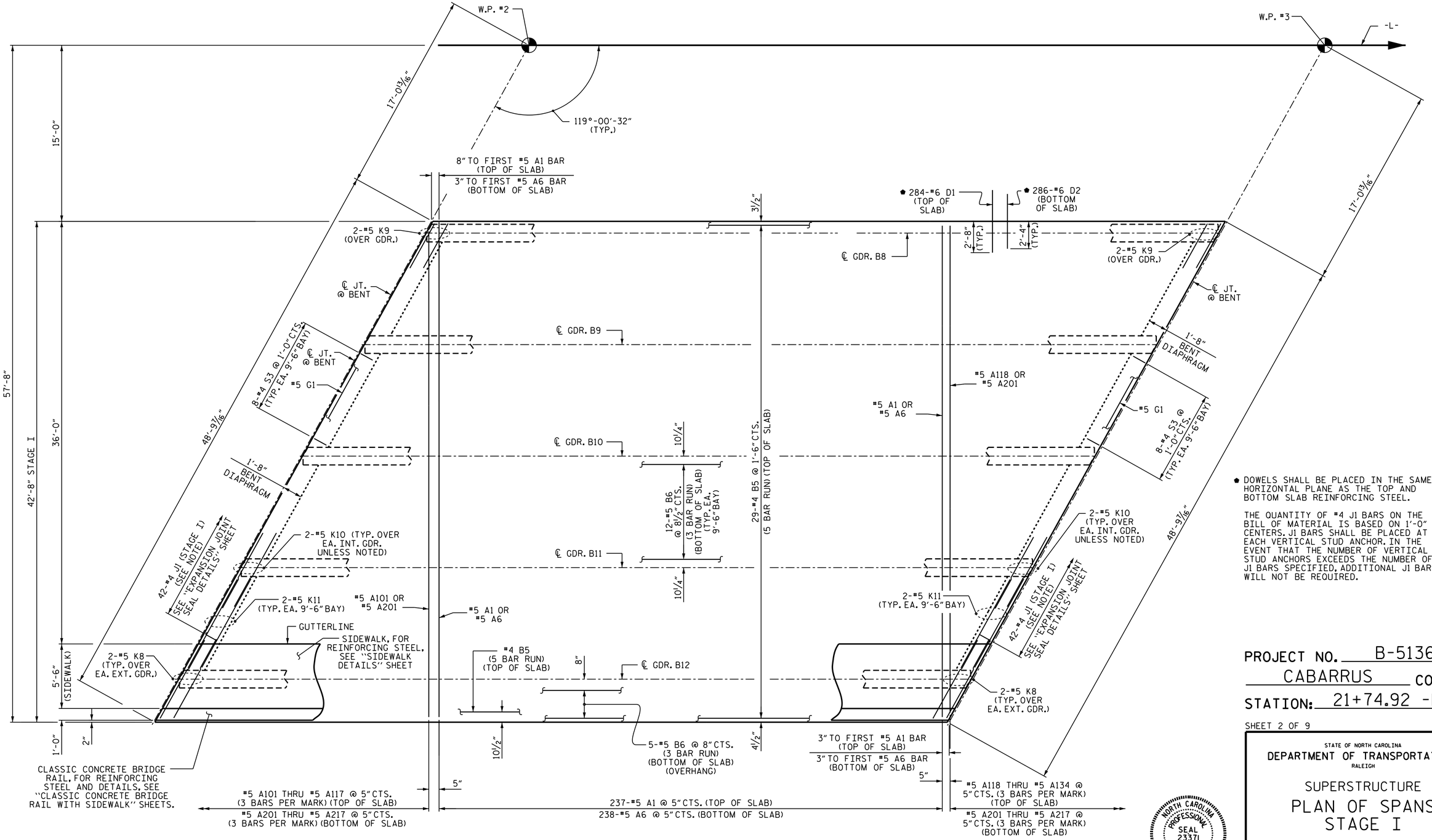

SPAN B

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PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 2 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS
STAGE I

SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4E4A4... 2/19/2015

DRAWN BY : T. H. CARROLL DATE : 07/16/14
CHECKED BY : K. D. LAYNE DATE : 11/25/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

18-FEB-2015 14:03
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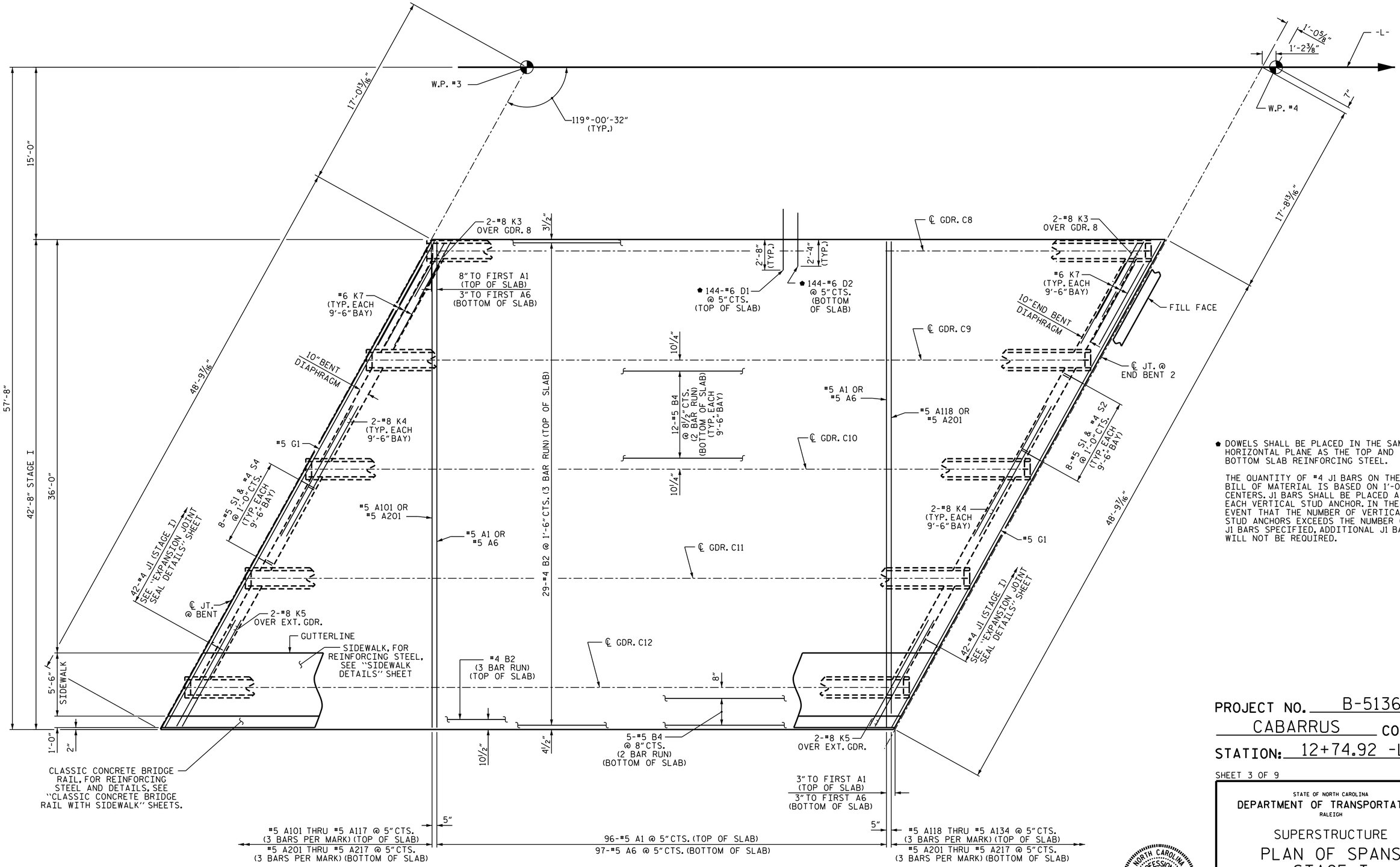

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PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 12+74.92 -L-

SHEET 3 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS STAGE I

SPAN C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D464A4... 2/19/2015

DRAWN BY : P.S. ADKINS DATE : 7/14/14
CHECKED BY : K.D. LAYNE DATE : 11/14/14
DESIGN ENGINEER OF RECORD: V.A. PATEL DATE : 1/5/15

18-FEB-2015 14:03
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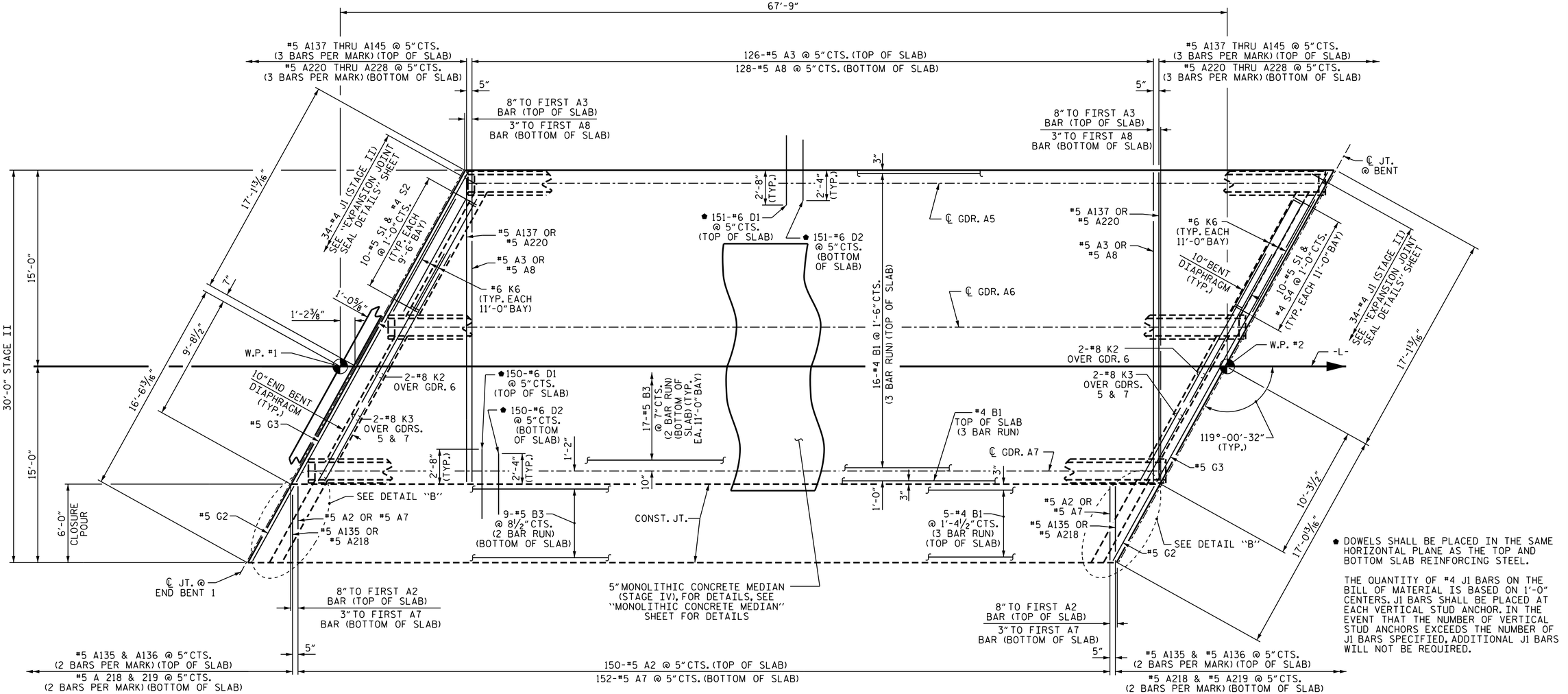
thcarroll



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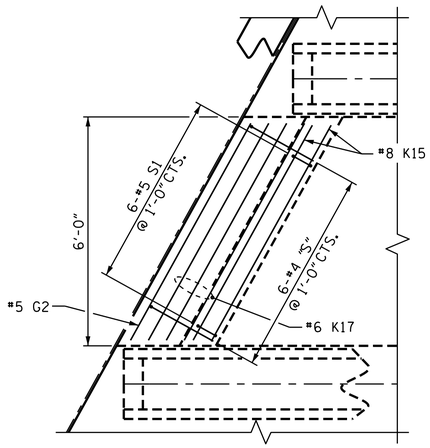

DETAIL "B"

END BENT 1 SHOWN, BENT 2 SIMILAR.

SPAN A

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 12+74.92 -L-

SHEET 4 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS STAGE II

SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4044A...

2/19/2015

DRAWN BY : P.S. ADKINS DATE : 7/14/14
CHECKED BY : K.D. LAYNE DATE : 11/14/14
DESIGN ENGINEER OF RECORD: V.A. PATEL DATE : 1/5/15

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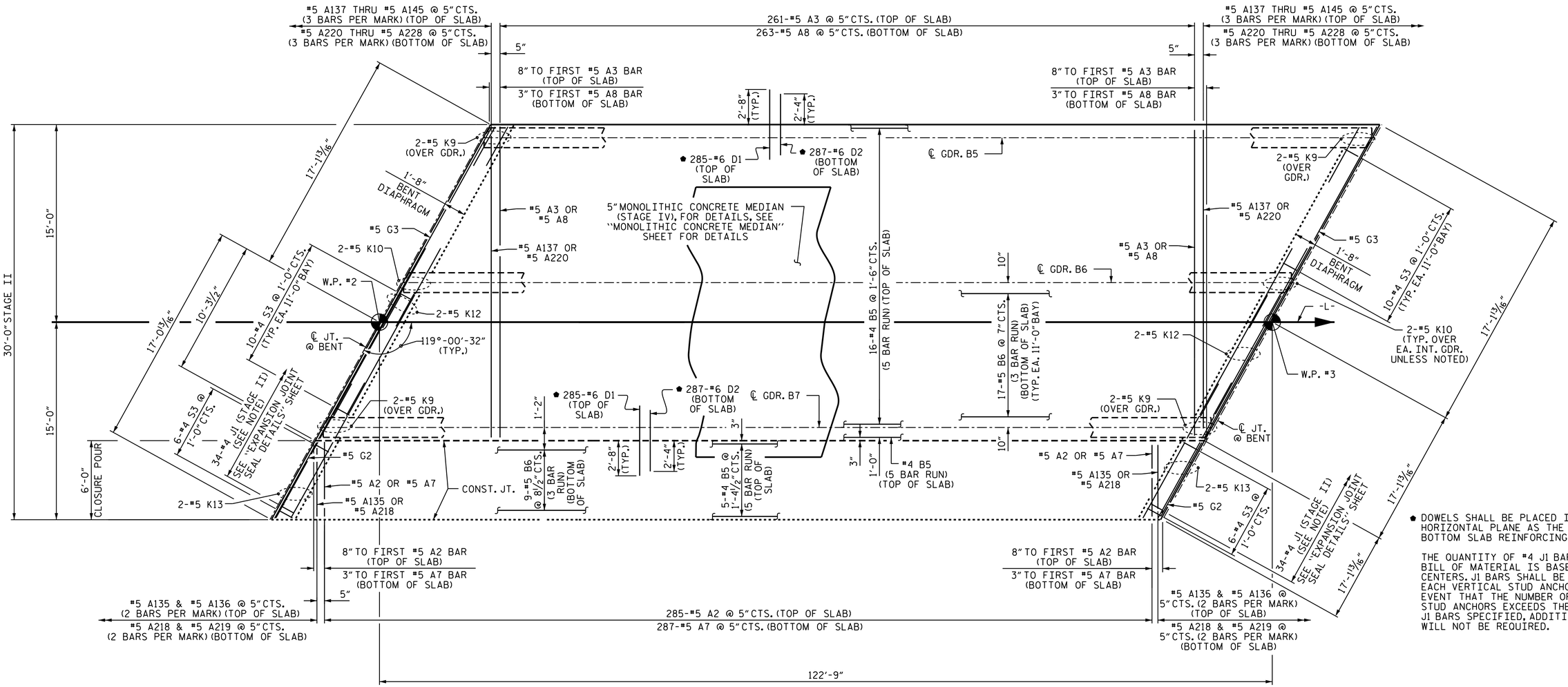

SPAN B

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

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

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 5 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS
STAGE II

SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4A4... 2/19/2015

DRAWN BY : T. H. CARROLL DATE : 07/16/14
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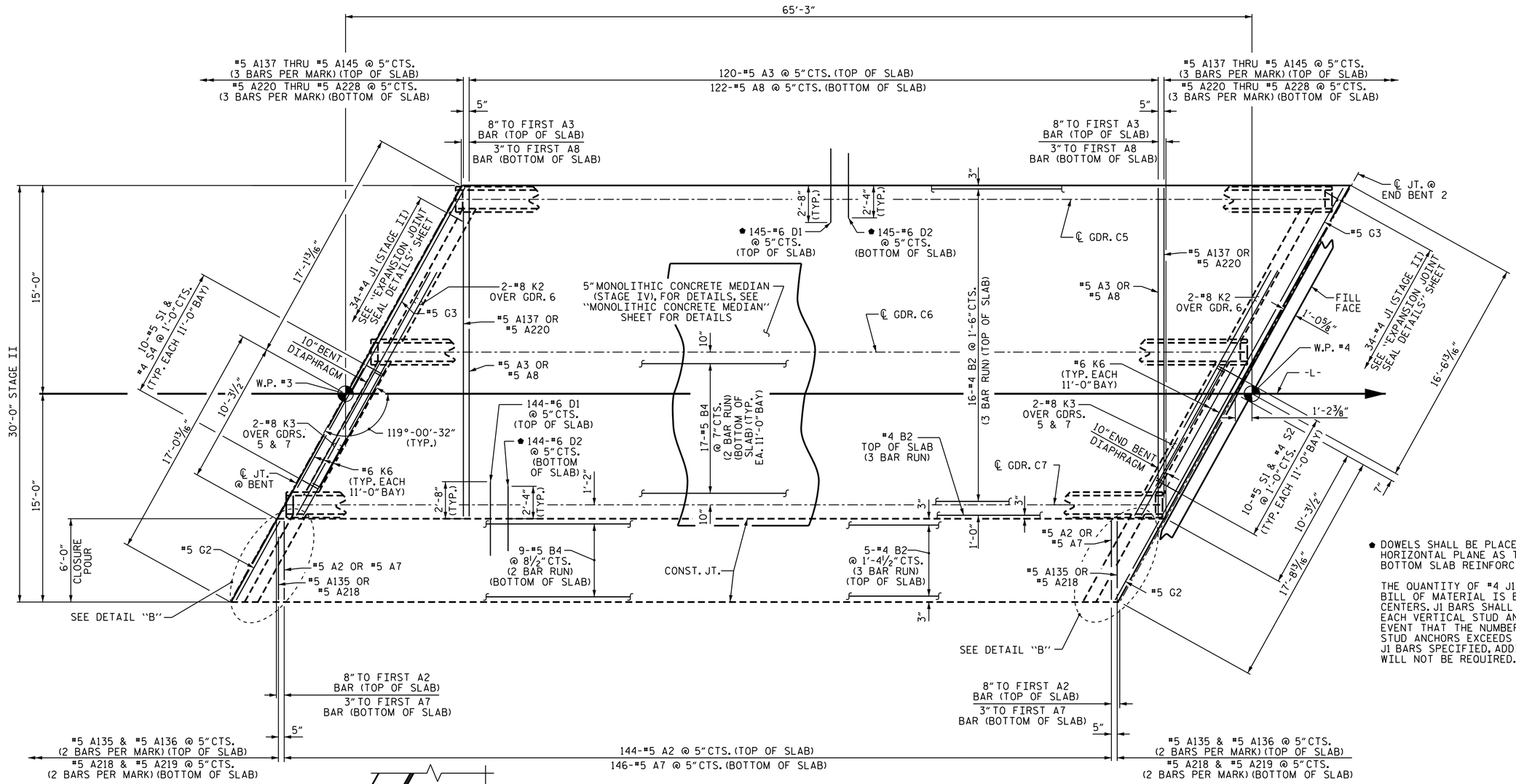

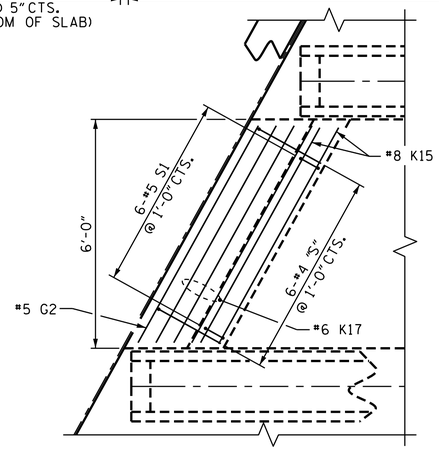

DETAIL "B"

END BENT 1 SHOWN, BENT 2 SIMILAR.

SPAN C

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

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

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 12+74.92 -L-

SHEET 6 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS STAGE II

SPAN C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : P.S. ADKINS DATE : 7/14/14
CHECKED BY : K.D. LAYNE DATE : 11/14/14
DESIGN ENGINEER OF RECORD: V.A. PATEL DATE : 1/5/15

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4A1...

2/19/2015

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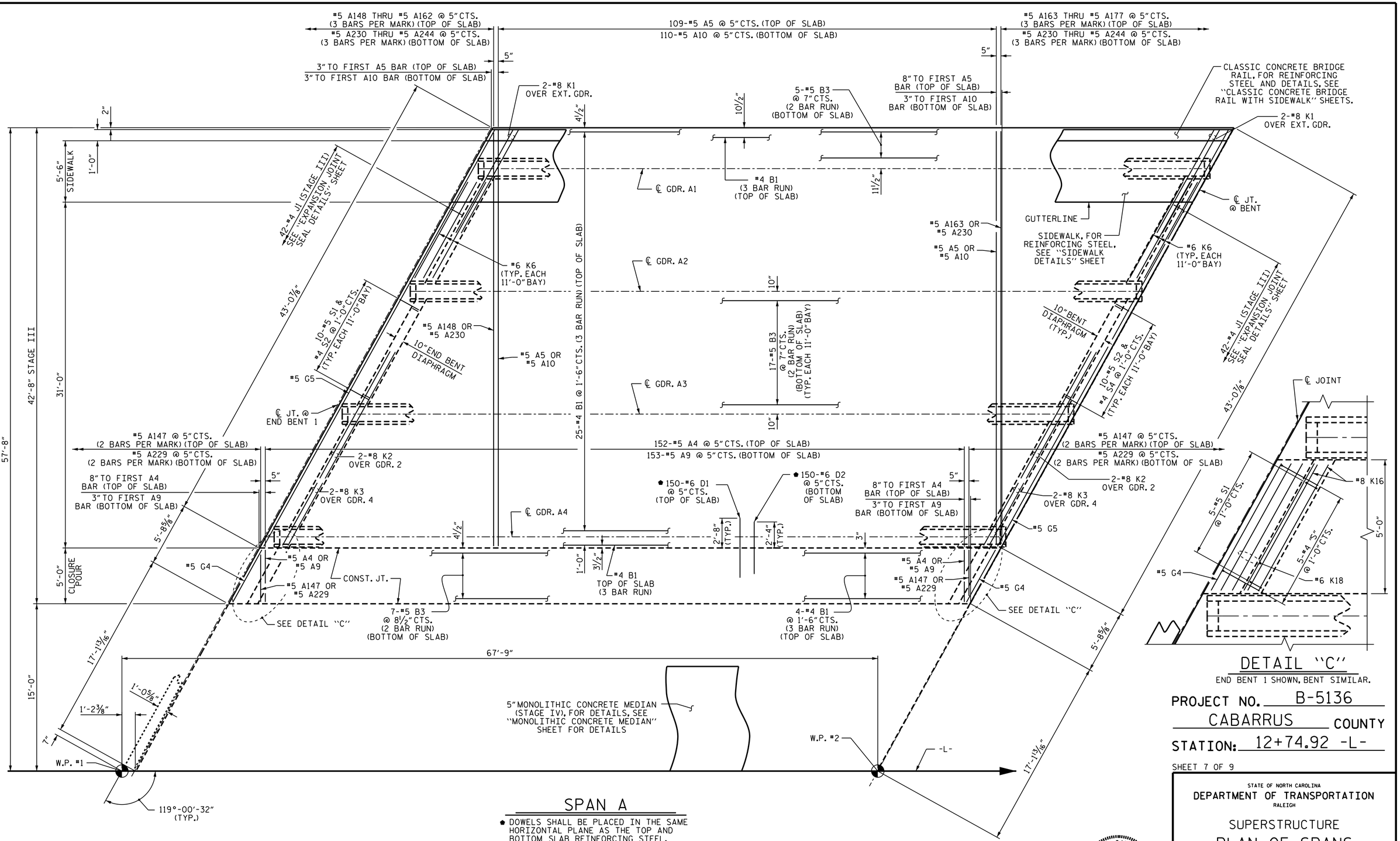

DETAIL "C"

END BENT 1 SHOWN, BENT SIMILAR.

SPAN A

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

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

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 12+74.92 -L-

SHEET 7 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS STAGE III

SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D484A1...

7/19/2015

DRAWN BY :	P.S. ADKINS	DATE : 7/14/14
CHECKED BY :	K.D. LAYNE	DATE : 11/14/14
DESIGN ENGINEER OF RECORD:	V.A. PATEL	DATE : 1/5/15

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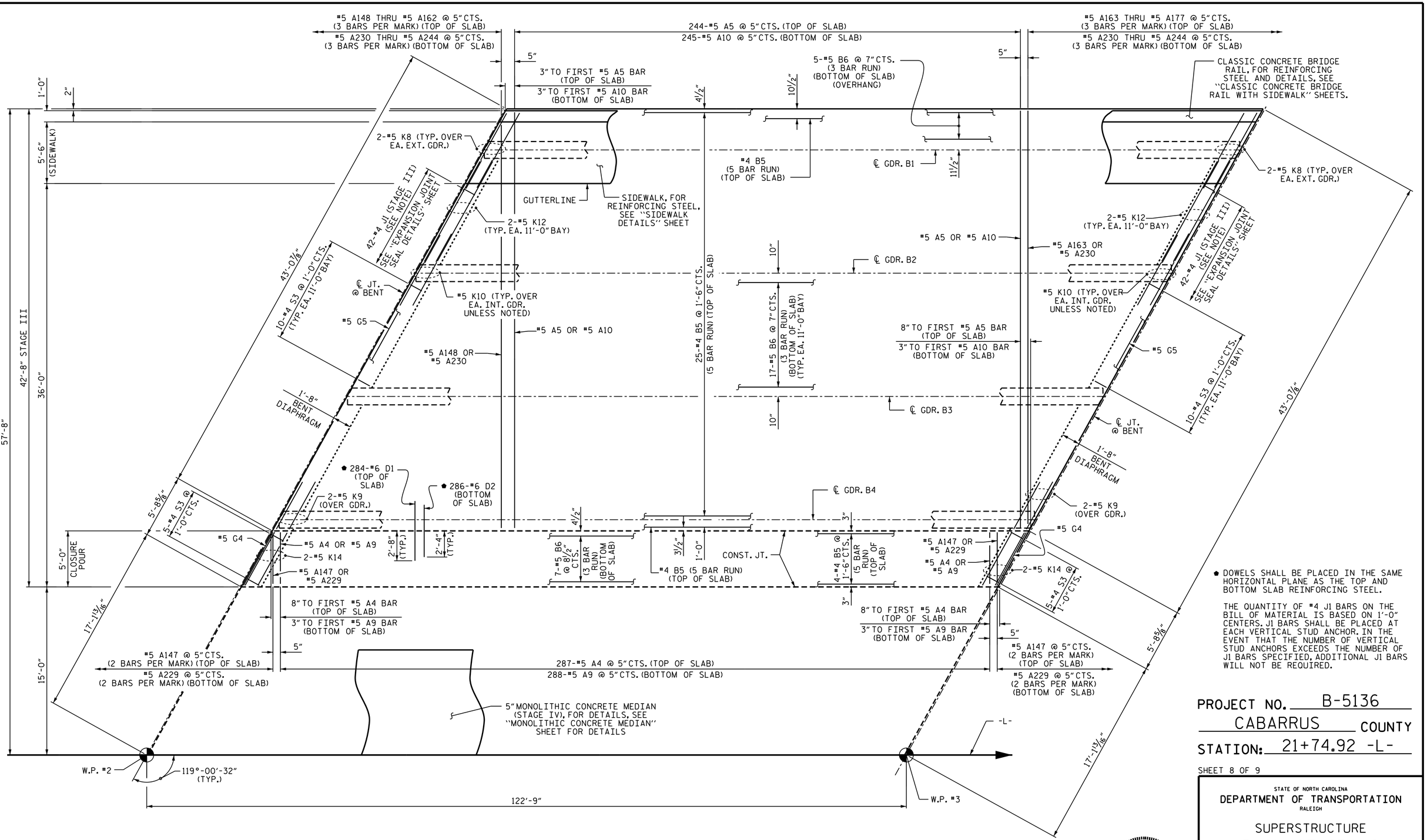

SPAN B

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

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

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 8 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS STAGE III

SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4E4A4... 2/19/2015

DRAWN BY :	T. H. CARROLL	DATE :	07/16/14
CHECKED BY :	K. D. LAYNE	DATE :	11/25/14
DESIGN ENGINEER OF RECORD:	V.A. PATEL	DATE :	1/5/15

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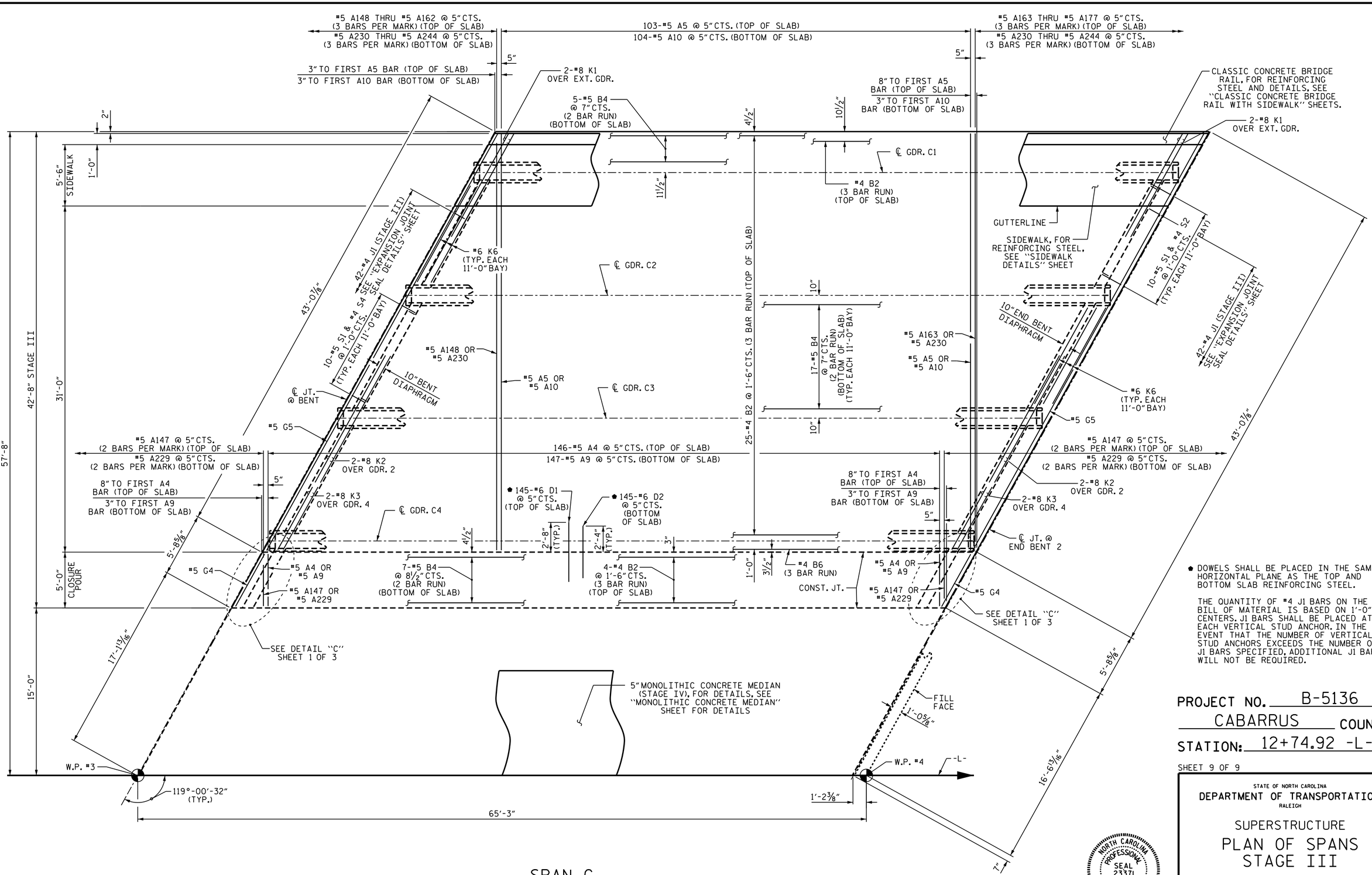

SPAN C

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

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

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 12+74.92 -L-

SHEET 9 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS STAGE III

SPAN C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4A4... 2/19/2015

DRAWN BY : P.S. ADKINS DATE : 7/14/14
CHECKED BY : K.D. LAYNE DATE : 11/14/14
DESIGN ENGINEER OF RECORD: V.A. PATEL DATE : 1/5/15

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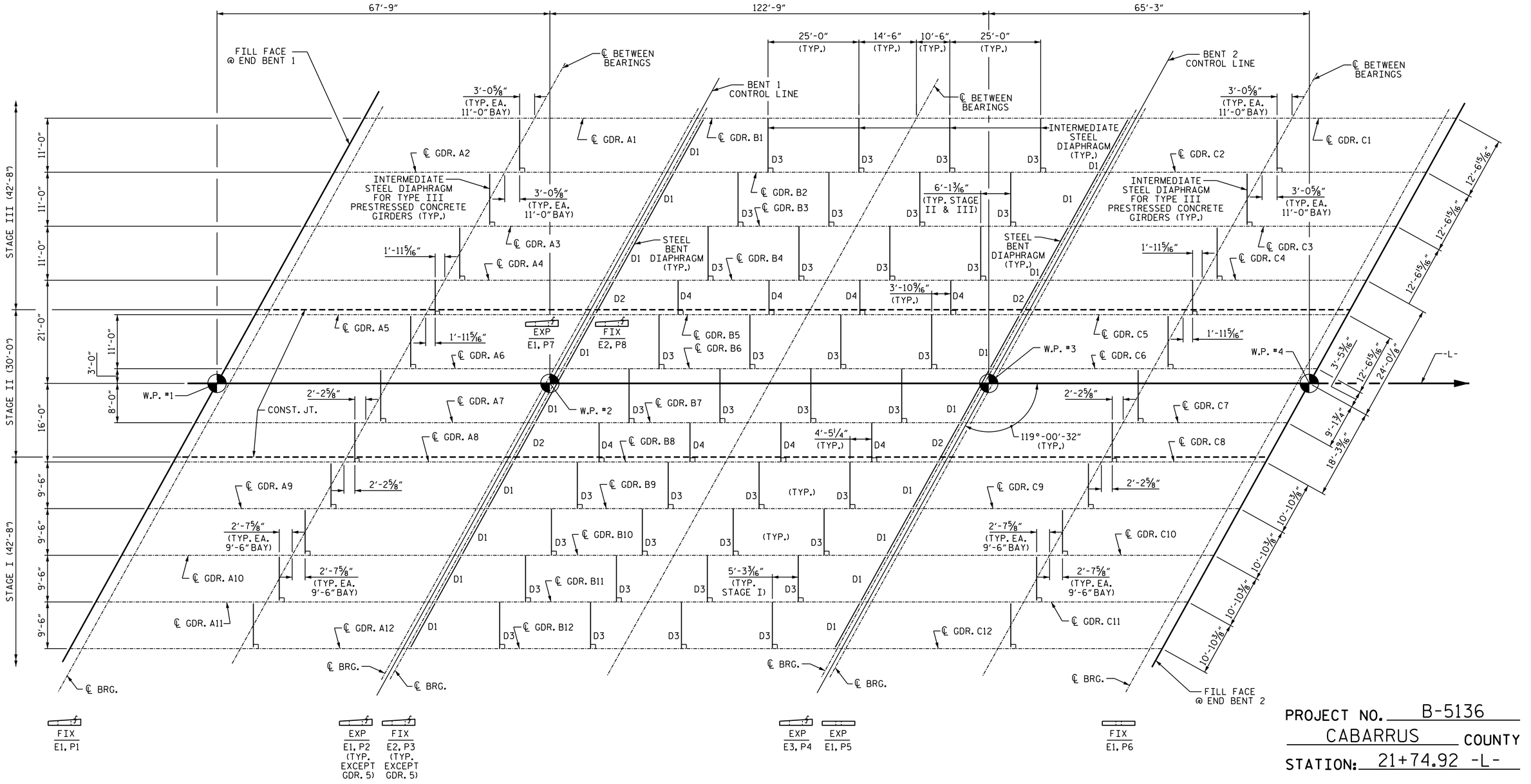

FRAMING PLAN

FOR INTERMEDIATE STEEL DIAPHRAGMS IN SPAN A & C, SEE "INTERMEDIATE STEEL DIAPHRAGM FOR TYPE III PRESTRESSED CONCRETE GIRDERS" SHEET.

FOR INTERMEDIATE STEEL DIAPHRAGMS AND STEEL BENT DIAPHRAGMS IN SPAN B, SEE "STRUCTURAL STEEL DETAILS DETAILS" SHEET.

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4E4... 7/19/2015

DRAWN BY : P.S. ADKINS DATE : 10/7/14
CHECKED BY : H.A. LOCKLEAR DATE : 10/14/14
DESIGN ENGINEER OF RECORD: G.W. DICKY DATE : -

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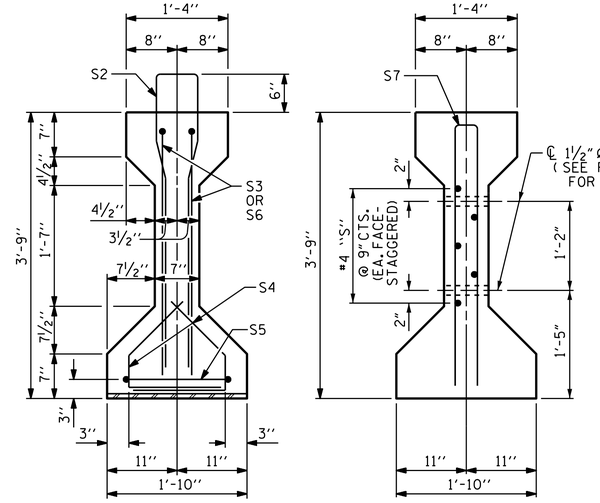
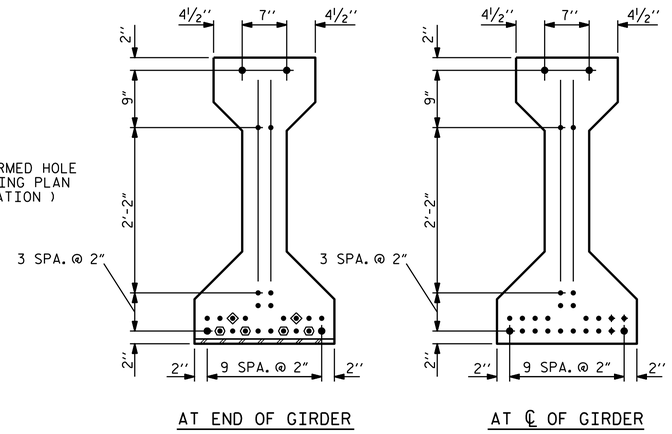


SECTION A-A

SECTION C-C

(S1 BARS NOT SHOWN)



AT END OF GIRDER

AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ◈ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
- ◉ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

ALL PRESTRESSED STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5,600 PSI.

DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF 1/4" EXCEPT IN THE AREA BETWEEN THE STIRRUP AND THE EDGE OF THE GIRDER.

0.6" Ø L. R. GRADE 270 STRANDS

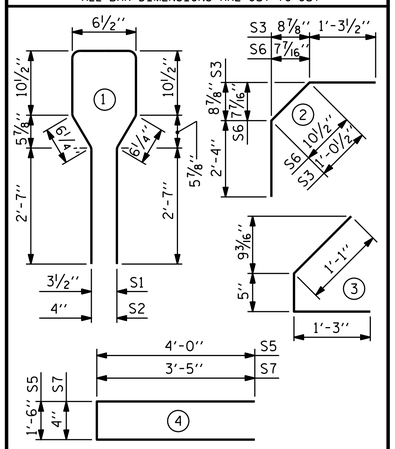
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	129	#4	1	8'-6"	732
	S2	8	#6	1	8'-6"	102
	S3	4	#6	2	4'-8"	28
	S4	72	#4	3	2'-9"	132
	S5	2	#4	4	9'-6"	13
	S6	4	#6	2	4'-6"	27
**	S7	2	#5	4	7'-2"	15
*	S7	4	#5	4	7'-2"	30
**	S8	5	#4	STR	7'-0"	23
*	S9	5	#4	STR	13'-2"	44

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT

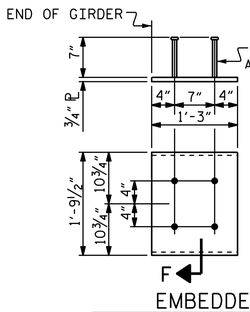


QUANTITIES FOR ONE GIRDER

		REINFORCING STEEL LB.	7,500 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
**	GDR. 1, 4, 5, 7, 8, 12	1,072	9.4	26
*	GDR. 2, 3, 6, 9, 10, 11	1,108	9.4	26

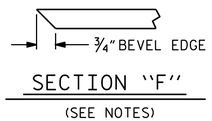
GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
12	65'-7"	787'-0"



EMBEDDED PLATE "B-1" DETAILS

TWO EMBEDDED PLATES "B-1" ARE REQUIRED FOR EACH GIRDER.



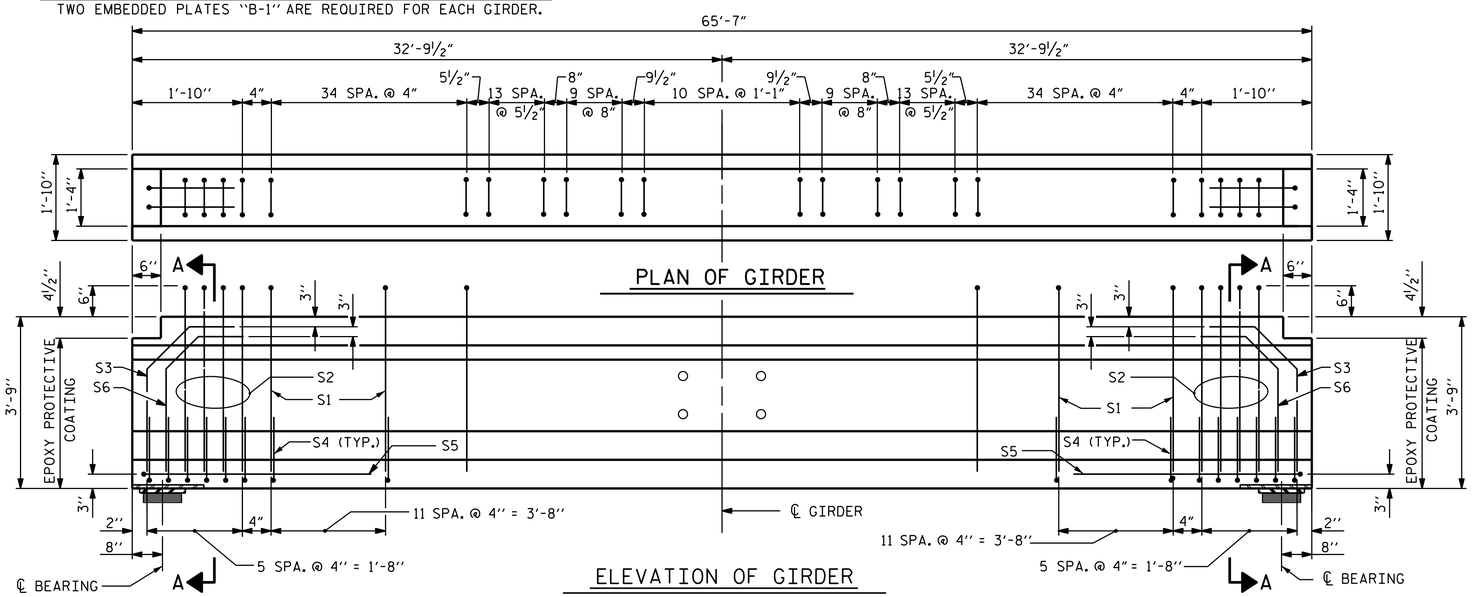
SECTION "F"

(SEE NOTES)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN A GIRDERS #1 THROUGH #12										
TENTH POINTS	BRG.	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.038	0.071	0.098	0.114	0.120	0.114	0.098	0.071	0.038	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.023	0.043	0.059	0.069	0.073	0.069	0.059	0.043	0.023	0
FINAL CAMBER ↑	0	3/16"	5/16"	7/16"	9/16"	9/16"	9/16"	7/16"	5/16"	3/16"	0

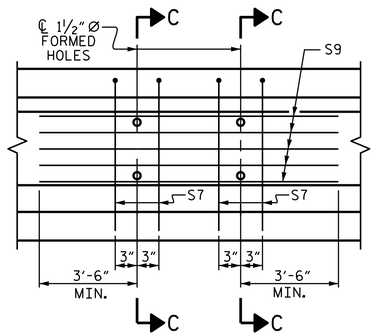
* INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER" WHICH IS GIVEN IN INCHES (FRACTION FORM).



PLAN OF GIRDER

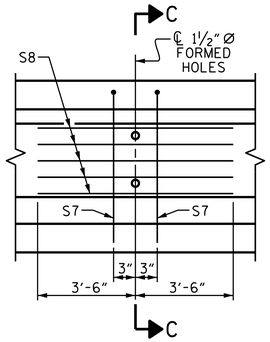
ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

* SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS 2, 3, 6, 9, 10, AND 11.



PARTIAL ELEVATION

** SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS 1, 4, 5, 7, 8, AND 12.

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE III PRESTRESSED CONCRETE GIRDER

SPAN A

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4A4...

2/19/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			75

ASSEMBLED BY : J.D. HAWK	DATE : 7/15/14		
CHECKED BY : H.A. LOCKLEAR	DATE : 10/15/14		
DRAWN BY : JMB 12/87	REV. 8/16/99RR RWW/LES	DESIGN ENGINEER OF RECORD:	
CHECKED BY : ARB 12/87	REV. 5/1/06R TLA/GM	V.A. PATEL	DATE : 1/05/15
	REV. 10/1/11 MAA/GM		

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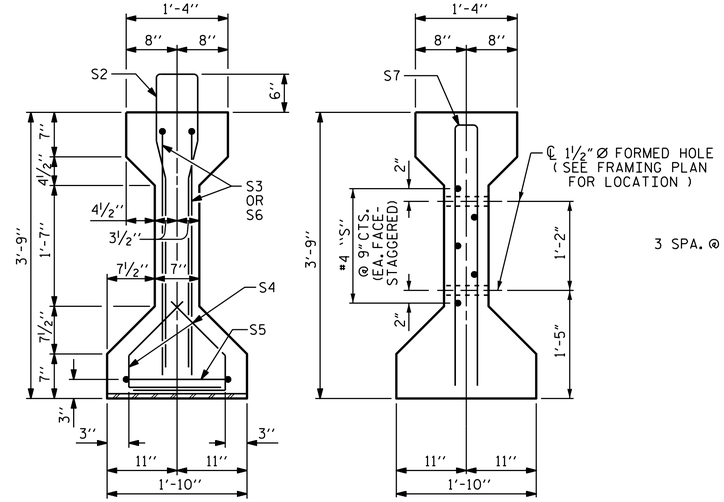
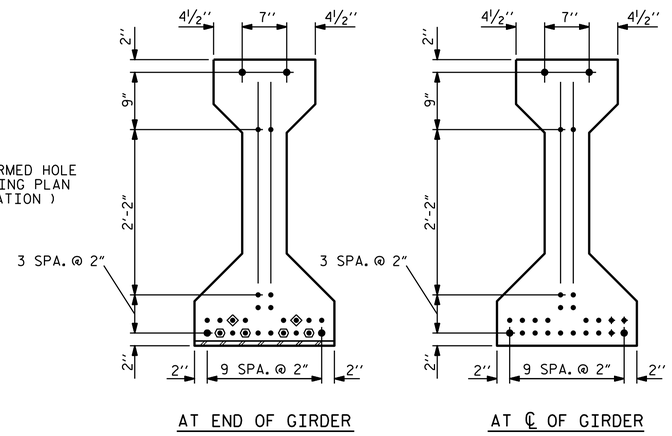
STD. NO. PCG2



SECTION A-A

SECTION C-C

(S1 BARS NOT SHOWN)



0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ◈ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
- ◉ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

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0.6" Ø L. R. GRADE 270 STRANDS

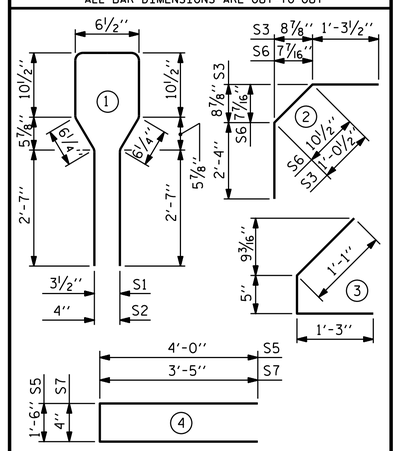
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	125	#4	1	8'-6"	710
	S2	8	#6	1	8'-6"	102
	S3	4	#6	2	4'-8"	28
	S4	72	#4	3	2'-9"	132
	S5	2	#4	4	9'-6"	13
	S6	4	#6	2	4'-6"	27
**	S7	2	#5	4	7'-2"	15
*	S7	4	#5	4	7'-2"	30
**	S8	5	#4	STR	7'-0"	23
*	S9	5	#4	STR	13'-2"	44

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT

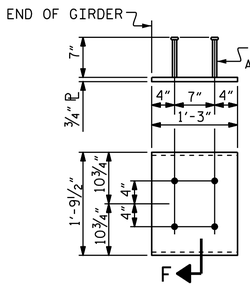


QUANTITIES FOR ONE GIRDER

		REINFORCING STEEL LB.	7,500 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
**	GDR. 1, 4, 5, 7, 8, 12	1,050	9.1	26
*	GDR. 2, 3, 6, 9, 10, 11	1,086	9.1	26

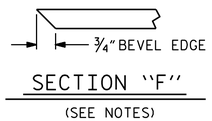
GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
12	63'-1"	757'-0"



EMBEDDED PLATE "B-1" DETAILS

TWO EMBEDDED PLATES "B-1" ARE REQUIRED FOR EACH GIRDER.



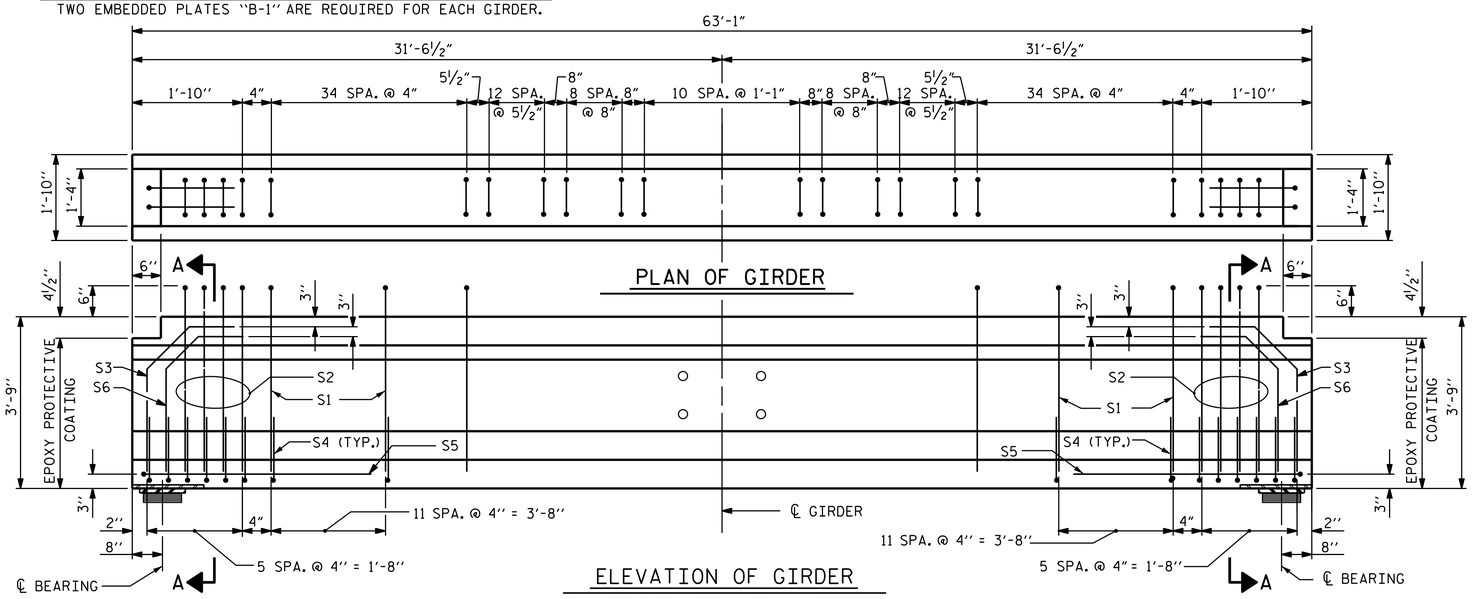
SECTION "F"

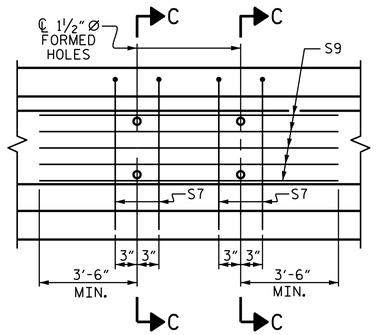
(SEE NOTES)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN C GIRDERS #1 THROUGH #12										
TENTH POINTS	BRG.	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.036	0.068	0.093	0.108	0.114	0.108	0.093	0.068	0.036	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.020	0.037	0.051	0.059	0.062	0.059	0.051	0.037	0.020	0
FINAL CAMBER ↑	0	3/16"	3/8"	1/2"	9/16"	5/8"	9/16"	1/2"	3/8"	3/16"	0

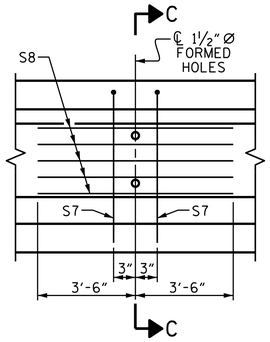
* INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER" WHICH IS GIVEN IN INCHES (FRACTION FORM).





PARTIAL ELEVATION

* SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS 2, 3, 6, 9, 10, AND 11.



PARTIAL ELEVATION

** SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS 1, 4, 5, 7, 8, AND 12.

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE III PRESTRESSED CONCRETE GIRDER

SPAN C

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4A4...

2/19/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			75

ASSEMBLED BY : J.D. HAWK	DATE : 7/15/14		
CHECKED BY : H.A. LOCKLEAR	DATE : 10/15/14		
DRAWN BY : JMB 12/87	REV. 8/16/99RR	RWW/LES	DESIGN ENGINEER OF RECORD:
CHECKED BY : ARB 12/87	REV. 5/1/06R	TLA/GM	V.A. PATEL DATE : 1/05/15
	REV. 10/1/11	MAA/GM	

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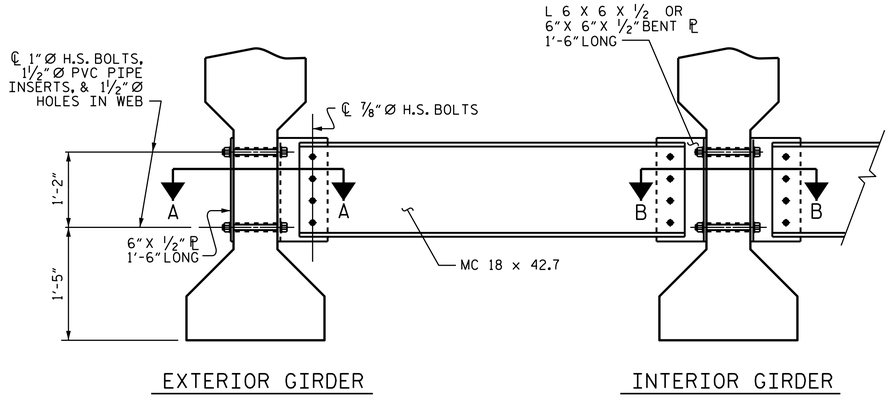
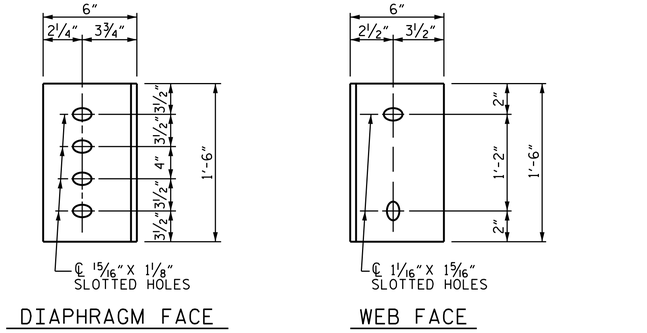
thcarroll

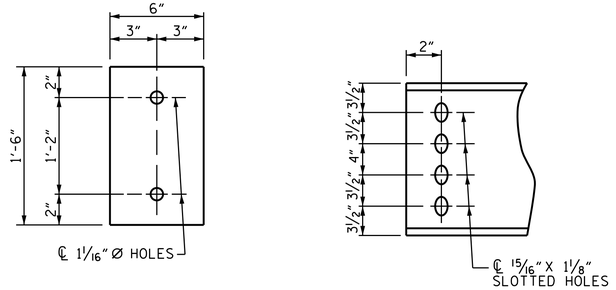
STD. NO. PCG2

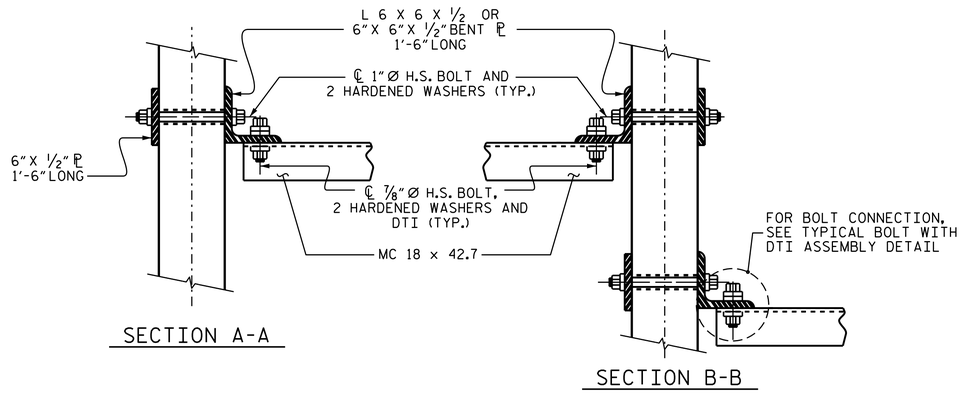


PART SECTION AT INTERMEDIATE DIAPHRAGM

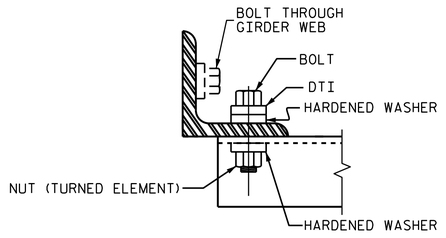


CONNECTOR PLATE DETAILS





CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

STRUCTURAL STEEL NOTES

ALL INTERMEDIATE DIAPHRAGM STEEL AND CONNECTOR PLATES SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

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

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL ¼ TURN.

THE PLATES, BENT PLATES, CHANNELS, AND ANGLES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

USE AN ASTM F436 HARDENED WASHER WITH STANDARD AND SLOTTED HOLES UNDER EACH BOLT HEAD AND NUT.

FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼"PROJECTION BEYOND THE NUT.

INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES IN SPANS A AND C SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

ASSEMBLED BY : J. D. HAWK	DATE : 7/15/14		
CHECKED BY : H. A. LOCKLEAR	DATE : 10/15/14		
DRAWN BY : TLA 6/05	ADDED 10/21/05		
CHECKED BY : VC 6/05	REV. 5/1/06RRR	KMM/GM	
	REV. 10/1/11	MAA/GM	

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thcarroll

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4A9... 2/19/2015

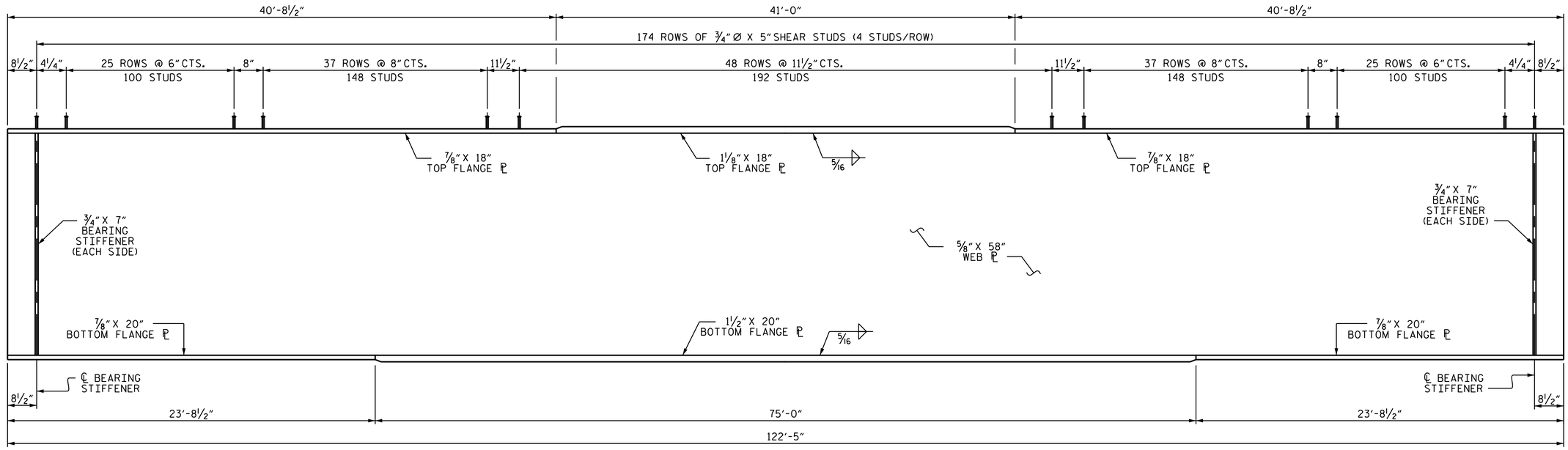
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

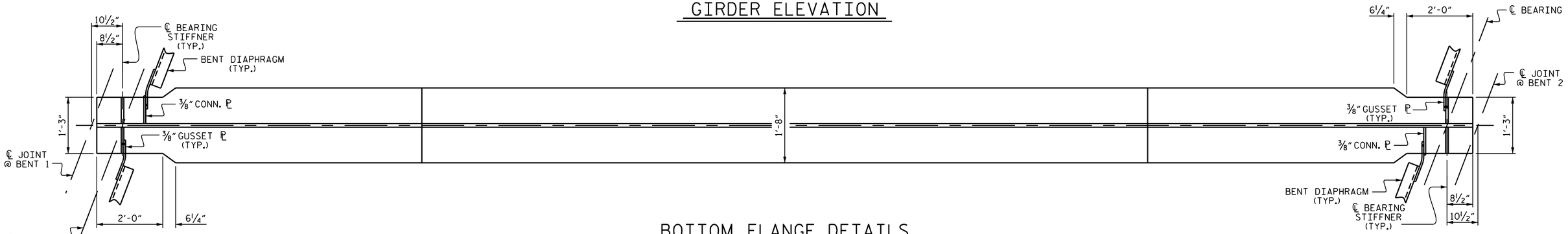
INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			75

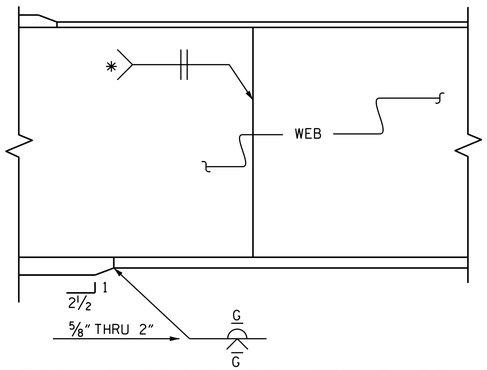
STD. NO. PCG10



GIRDER ELEVATION

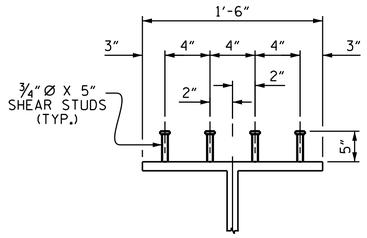


BOTTOM FLANGE DETAILS

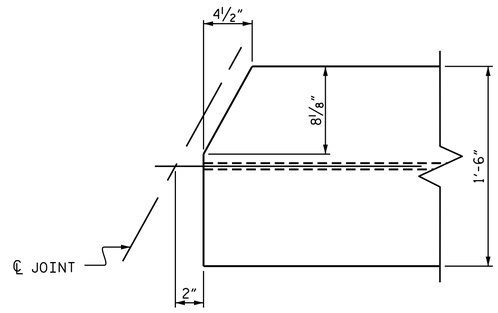


TYPICAL FLANGE AND WEB BUTT JOINT

* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR GIRDERS



SHEAR STUD DETAILS



TOP FLANGE CLIP

BENT 1 SHOWN, BENT 2 SIMILAR BY ROTATION

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

Docusigned by: vipul a patel 1C1157DE155D48A... 2/19/2015

DRAWN BY : T. H. CARROLL DATE : 5/30/14
CHECKED BY : H. A. LOCKLEAR DATE : 10/6/14
DESIGN ENGINEER OF RECORD: V.A.PATEL DATE : 1/13/15

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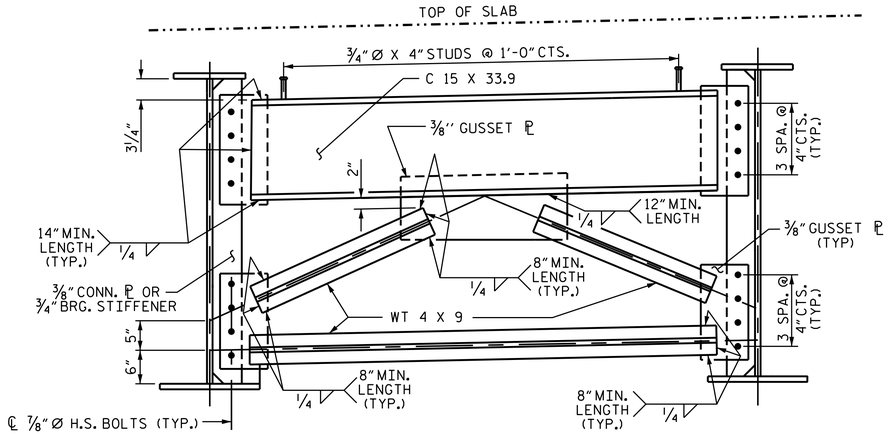
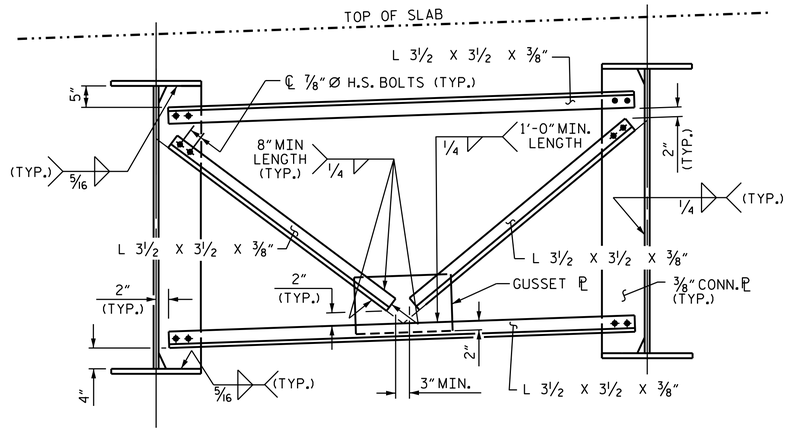


BENT DIAPHRAGM (D1)



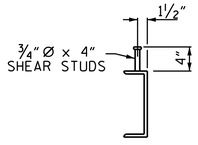
TYPICAL INTERMEDIATE DIAPHRAGM (D3)

BENT DIAPHRAGM CLOSURE POUR (D2)

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

TYPICAL INTERMEDIATE DIAPHRAGM CLOSURE POUR (D4)

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



BENT DIAPHRAGM SHEAR STUD DETAILS

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4E4F4...
2/19/2015

DRAWN BY : T. H. CARROLL DATE : 5/30/14
CHECKED BY : H. A. LOCKLEAR DATE : 10/6/14
DESIGN ENGINEER OF RECORD: G. W. DICKEY DATE :

18-FEB-2015 14:03
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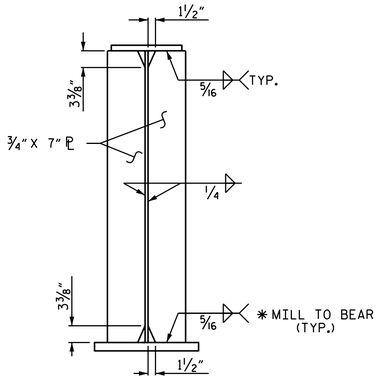
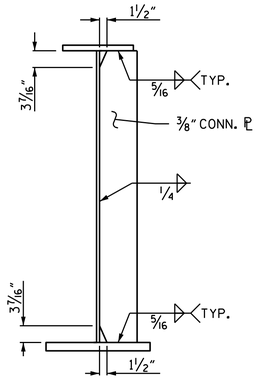
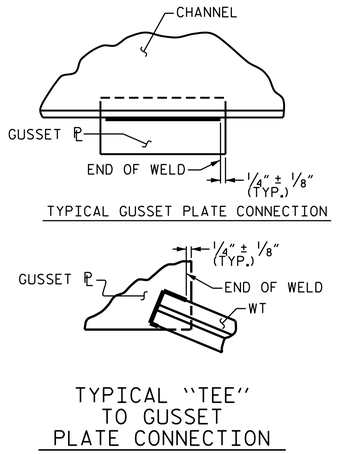


BEARING STIFFENER PLATE DETAIL

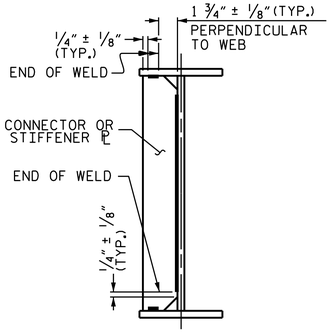


CONNECTOR PLATE DETAIL

✱ WELD ONLY WHEN USED AS CONNECTOR PLATE. BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.



TYPICAL "TEE" TO GUSSET PLATE CONNECTION



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTION

WELD TERMINATION DETAILS

NOTES

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 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 ⅞" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

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

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

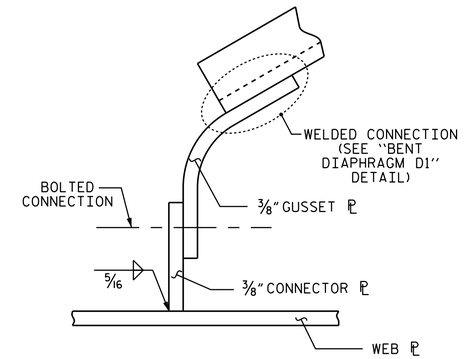
PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

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

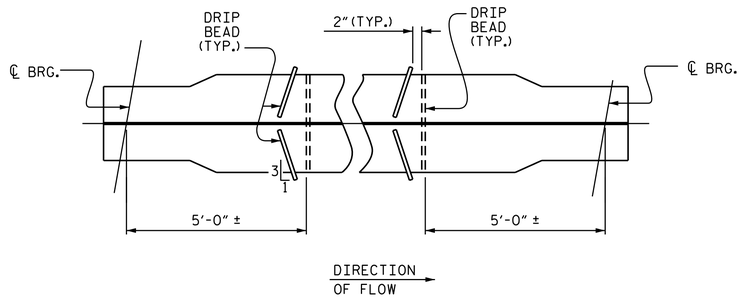
TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

END OF GIRDERS SHALL BE PLUMB.

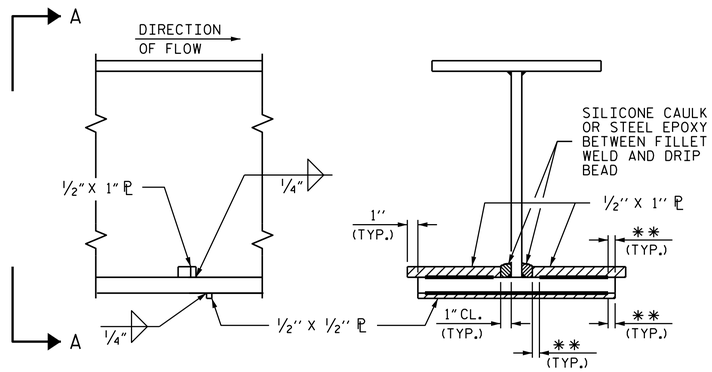
FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR STEEL DEAD LOAD FIT UP.



WELD DETAIL FOR GUSSET ℄



PART PLAN - BOTTOM FLANGE



SECTION

VIEW A-A

✱✱ SEE "WELD TERMINATION DETAILS"

DRIP BEAD DETAILS

DRAWN BY : T. H. CARROLL DATE : 5/30/14
CHECKED BY : H. A. LOCKLEAR DATE : 10/6/14
DESIGN ENGINEER OF RECORD: V.A. PATEL DATE : 1/13/15

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thcarroll

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIRUL A. PATEL

DocuSigned by: virul a patel 1C157DE15D484A8... 2/19/2015

PROJECT NO. B-5136
CABARRUS COUNTY
STATION: 21+74.92 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			75

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN B

GIRDER #1

TWENTIETH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.013	0.026	0.039	0.049	0.059	0.067	0.073	0.077	0.080	0.081	0.080	0.077	0.073	0.067	0.059	0.049	0.039	0.026	0.013	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.056	0.118	0.175	0.226	0.271	0.308	0.337	0.359	0.372	0.376	0.372	0.359	0.337	0.308	0.271	0.226	0.175	0.118	0.056	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.011	0.022	0.033	0.042	0.050	0.057	0.062	0.066	0.069	0.069	0.069	0.066	0.062	0.057	0.050	0.042	0.033	0.022	0.011	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.080	0.166	0.247	0.317	0.380	0.432	0.472	0.502	0.521	0.526	0.521	0.502	0.472	0.432	0.380	0.317	0.247	0.166	0.080	0
VERTICAL CURVE ORDINATE ↓	0	0.035	0.067	0.095	0.119	0.139	0.156	0.169	0.178	0.184	0.186	0.184	0.178	0.169	0.156	0.139	0.119	0.095	0.067	0.035	0
REQUIRED CAMBER ↑	0	1 3/8"	2 13/16"	4 1/8"	5 1/4"	6 1/4"	7 1/16"	7 11/16"	8 3/16"	8 7/16"	8 9/16"	8 7/16"	8 3/16"	7 11/16"	7 1/16"	6 1/4"	5 1/4"	4 1/8"	2 13/16"	1 3/8"	0

GIRDER #2

TWENTIETH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.013	0.026	0.039	0.049	0.059	0.067	0.073	0.077	0.080	0.081	0.080	0.077	0.073	0.067	0.059	0.049	0.039	0.026	0.013	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.046	0.107	0.163	0.213	0.256	0.293	0.322	0.343	0.355	0.360	0.355	0.343	0.322	0.293	0.256	0.213	0.163	0.107	0.046	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.008	0.016	0.023	0.030	0.036	0.040	0.044	0.047	0.049	0.049	0.049	0.047	0.044	0.040	0.036	0.030	0.023	0.016	0.008	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.067	0.149	0.225	0.292	0.351	0.400	0.439	0.467	0.484	0.490	0.484	0.467	0.439	0.400	0.351	0.292	0.225	0.149	0.067	0
VERTICAL CURVE ORDINATE ↓	0	0.035	0.067	0.095	0.119	0.139	0.156	0.169	0.178	0.184	0.186	0.184	0.178	0.169	0.156	0.139	0.119	0.095	0.067	0.035	0
REQUIRED CAMBER ↑	0	1 1/4"	2 9/16"	3 13/16"	4 15/16"	5 7/8"	6 11/16"	7 5/16"	7 3/4"	8"	8 1/8"	8"	7 3/4"	7 5/16"	6 11/16"	5 7/8"	4 15/16"	3 13/16"	2 9/16"	1 1/4"	0

GIRDER #3

TWENTIETH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.013	0.026	0.039	0.049	0.059	0.067	0.073	0.077	0.080	0.081	0.080	0.077	0.073	0.067	0.059	0.049	0.039	0.026	0.013	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.037	0.096	0.150	0.200	0.242	0.278	0.306	0.327	0.339	0.343	0.339	0.327	0.306	0.278	0.242	0.200	0.150	0.096	0.037	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.006	0.011	0.016	0.021	0.025	0.028	0.031	0.033	0.034	0.034	0.034	0.033	0.031	0.028	0.025	0.021	0.016	0.011	0.006	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.056	0.133	0.205	0.270	0.326	0.373	0.410	0.437	0.453	0.458	0.453	0.437	0.410	0.373	0.326	0.270	0.205	0.133	0.056	0
VERTICAL CURVE ORDINATE ↓	0	0.035	0.067	0.095	0.119	0.139	0.156	0.169	0.178	0.184	0.186	0.184	0.178	0.169	0.156	0.139	0.119	0.095	0.067	0.035	0
REQUIRED CAMBER ↑	0	1 1/16"	2 3/8"	3 5/8"	4 11/16"	5 5/16"	6 3/8"	6 15/16"	7 3/8"	7 5/8"	7 3/4"	7 5/8"	7 3/8"	6 15/16"	6 3/8"	5 9/16"	4 11/16"	3 5/8"	2 3/8"	1 1/16"	0

GIRDER #4

TWENTIETH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.013	0.026	0.039	0.049	0.059	0.067	0.073	0.077	0.080	0.081	0.080	0.077	0.073	0.067	0.059	0.049	0.039	0.026	0.013	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.027	0.085	0.138	0.186	0.228	0.263	0.291	0.311	0.323	0.327	0.323	0.311	0.291	0.263	0.228	0.186	0.138	0.085	0.027	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.016	0.031	0.045	0.058	0.069	0.078	0.085	0.091	0.094	0.095	0.094	0.091	0.085	0.078	0.069	0.058	0.045	0.031	0.016	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.056	0.142	0.222	0.293	0.356	0.408	0.449	0.479	0.497	0.503	0.497	0.479	0.449	0.408	0.356	0.293	0.222	0.142	0.056	0
VERTICAL CURVE ORDINATE ↓	0	0.035	0.067	0.095	0.119	0.139	0.156	0.169	0.178	0.184	0.186	0.184	0.178	0.169	0.156	0.139	0.119	0.095	0.067	0.035	0
REQUIRED CAMBER ↑	0	1 1/8"	2 1/2"	3 13/16"	4 15/16"	5 15/16"	6 3/4"	7 7/16"	7 7/8"	8 3/16"	8 1/4"	8 3/16"	7 7/8"	7 7/16"	6 3/4"	5 15/16"	4 15/16"	3 13/16"	2 1/2"	1 1/8"	0

GIRDER #5

TWENTIETH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.013	0.026	0.039	0.049	0.059	0.067	0.073	0.077	0.080	0.081	0.080	0.077	0.073	0.067	0.059	0.049	0.039	0.026	0.013	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.043	0.105	0.162	0.213	0.258	0.295	0.325	0.346	0.359	0.363	0.359	0.346	0.325	0.295	0.258	0.213	0.162	0.105	0.043	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.016	0.031	0.045	0.058	0.069	0.078	0.085	0.091	0.094	0.095	0.094	0.091	0.085	0.078	0.069	0.058	0.045	0.031	0.016	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.073	0.162	0.246	0.320	0.385	0.440	0.483	0.514	0.533	0.539	0.533	0.514	0.483	0.440	0.385	0.320	0.246	0.162	0.073	0
VERTICAL CURVE ORDINATE ↓	0	0.035	0.067	0.095	0.119	0.139	0.156	0.169	0.178	0.184	0.186	0.184	0.178	0.169	0.156	0.139	0.119	0.095	0.067	0.035	0
REQUIRED CAMBER ↑	0	1 5/16"	2 3/4"	4 1/16"	5 1/4"	6 5/16"	7 1/8"	7 13/16"	8 5/16"	8 5/8"	8 11/16"	8 5/8"	8 5/16"	7 13/16"	7 1/8"	6 5/16"	5 1/4"	4 1/16"	2 3/4"	1 5/16"	0

GIRDER #6

TWENTIETH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.013	0.026	0.039	0.049	0.059	0.067	0.073	0.077	0.080	0.081	0.080	0.077	0.073	0.067	0.059	0.049	0.039	0.026	0.013	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.041	0.101	0.157	0.206	0.249	0.286	0.314	0.335	0.347	0.351	0.347	0.335	0.314	0.286	0.249	0.206	0.157	0.101	0.041	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.006	0.011	0.017	0.021	0.025	0.029	0.031	0.033	0.035	0.035	0.035	0.033	0.031	0.029	0.025	0.021	0.017	0.011	0.006	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.061	0.138	0.213	0.276	0.333	0.382	0.418	0.445	0.462	0.467	0.462	0.445	0.418	0.382	0.333	0.276	0.213	0.138	0.061	0
VERTICAL CURVE ORDINATE ↓	0	0.035	0.067	0.095	0.119	0.139	0.156	0.169	0.178	0.184	0.186	0.184	0.178	0.169	0.156	0.139	0.119	0.095	0.067	0.035	0
REQUIRED CAMBER ↑	0	1 1/4"	2 7/16"	3 11/16"	4 3/4"	5 11/16"	6 7/16"	7 1/16"	7 1/2"	7 3/4"	7 13/16"	7 3/4"	7 1/2"	7 1/16"	6 7/16"	5 11/16"	4 3/4"	3 11/16"	2 7/16"	1 1/4"	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).

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DEAD LOAD DEFLECTIONS

SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			75

STR. #1

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIRAL A. PATEL

DocuSigned by: viral a patel 1C157DE15D4B444... 2/19/2015

DRAWN BY : H. A. LOCKLEAR DATE : 11/5/14
CHECKED BY : T. R. PETERSON DATE : 11/6/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 11/6/14

18-FEB-2015 14:03
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thcarroll

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN B

GIRDER #7

TWENTIETH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.013	0.026	0.039	0.049	0.059	0.067	0.073	0.077	0.080	0.081	0.080	0.077	0.073	0.067	0.059	0.049	0.039	0.026	0.013	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.043	0.105	0.162	0.213	0.258	0.295	0.325	0.346	0.359	0.363	0.359	0.346	0.325	0.295	0.258	0.213	0.162	0.105	0.043	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.018	0.035	0.051	0.065	0.077	0.088	0.096	0.102	0.106	0.107	0.106	0.102	0.096	0.088	0.077	0.065	0.051	0.035	0.018	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.074	0.166	0.252	0.327	0.394	0.450	0.494	0.525	0.545	0.551	0.545	0.525	0.494	0.450	0.394	0.327	0.252	0.166	0.074	0
VERTICAL CURVE ORDINATE ↓	0	0.035	0.067	0.095	0.119	0.139	0.156	0.169	0.178	0.184	0.186	0.184	0.178	0.169	0.156	0.139	0.119	0.095	0.067	0.035	0
REQUIRED CAMBER ↑	0	1 5/16"	2 13/16"	4 3/16"	5 3/8"	6 3/8"	7 1/4"	7 15/16"	8 7/16"	8 3/4"	8 13/16"	8 3/4"	8 7/16"	7 15/16"	7 1/4"	6 3/8"	5 3/8"	4 3/16"	2 13/16"	1 5/16"	0

GIRDER #8

TWENTIETH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.013	0.026	0.039	0.049	0.059	0.067	0.073	0.077	0.080	0.081	0.080	0.077	0.073	0.067	0.059	0.049	0.039	0.026	0.013	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	-0.022	0.024	0.066	0.104	0.137	0.165	0.187	0.203	0.212	0.215	0.212	0.203	0.187	0.165	0.137	0.104	0.066	0.024	-0.022	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.018	0.036	0.052	0.067	0.080	0.091	0.099	0.105	0.109	0.111	0.109	0.105	0.099	0.091	0.080	0.067	0.052	0.036	0.018	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.009	0.086	0.157	0.220	0.276	0.323	0.359	0.385	0.401	0.407	0.401	0.385	0.359	0.323	0.276	0.220	0.157	0.086	0.009	0
VERTICAL CURVE ORDINATE ↓	0	0.035	0.067	0.095	0.119	0.139	0.156	0.169	0.178	0.184	0.186	0.184	0.178	0.169	0.156	0.139	0.119	0.095	0.067	0.035	0
REQUIRED CAMBER ↑	0	1/2"	1 13/16"	3"	4 1/16"	5"	5 3/4"	6 5/16"	6 3/4"	7"	7 1/8"	7"	6 3/4"	6 5/16"	5 3/4"	5"	4 1/16"	3"	1 13/16"	1/2"	0

GIRDER #9

TWENTIETH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.013	0.026	0.039	0.049	0.059	0.067	0.073	0.077	0.080	0.081	0.080	0.077	0.073	0.067	0.059	0.049	0.039	0.026	0.013	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	-0.005	0.043	0.087	0.126	0.160	0.189	0.212	0.228	0.238	0.241	0.238	0.228	0.212	0.189	0.160	0.126	0.087	0.043	-0.005	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.006	0.012	0.017	0.022	0.026	0.030	0.033	0.035	0.036	0.037	0.036	0.035	0.033	0.030	0.026	0.022	0.017	0.012	0.006	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.014	0.081	0.143	0.197	0.245	0.286	0.318	0.340	0.354	0.359	0.354	0.340	0.318	0.286	0.245	0.197	0.143	0.081	0.014	0
VERTICAL CURVE ORDINATE ↓	0	0.035	0.067	0.095	0.119	0.139	0.156	0.169	0.178	0.184	0.186	0.184	0.178	0.169	0.156	0.139	0.119	0.095	0.067	0.035	0
REQUIRED CAMBER ↑	0	9/16"	1 3/4"	2 7/8"	3 13/16"	4 5/8"	5 5/16"	5 7/8"	6 3/16"	6 7/16"	6 9/16"	6 7/16"	6 3/16"	5 7/8"	5 5/16"	4 5/8"	3 13/16"	2 7/8"	1 3/4"	9/16"	0

GIRDER #10

TWENTIETH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.013	0.026	0.039	0.049	0.059	0.067	0.073	0.077	0.080	0.081	0.080	0.077	0.073	0.067	0.059	0.049	0.039	0.026	0.013	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.012	0.061	0.107	0.148	0.183	0.213	0.237	0.254	0.264	0.268	0.264	0.254	0.237	0.213	0.183	0.148	0.107	0.061	0.012	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.006	0.012	0.017	0.022	0.026	0.029	0.032	0.034	0.035	0.036	0.035	0.034	0.032	0.029	0.026	0.022	0.017	0.012	0.006	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.031	0.099	0.163	0.219	0.268	0.309	0.342	0.365	0.379	0.385	0.379	0.365	0.342	0.309	0.268	0.219	0.163	0.099	0.031	0
VERTICAL CURVE ORDINATE ↓	0	0.035	0.067	0.095	0.119	0.139	0.156	0.169	0.178	0.184	0.186	0.184	0.178	0.169	0.156	0.139	0.119	0.095	0.067	0.035	0
REQUIRED CAMBER ↑	0	13/16"	2"	3 1/16"	4 1/16"	4 7/8"	5 9/16"	6 1/8"	6 1/2"	6 3/4"	6 7/8"	6 3/4"	6 1/2"	6 1/8"	5 9/16"	4 7/8"	4 1/16"	3 1/16"	2"	13/16"	0

GIRDER #11

TWENTIETH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.013	0.026	0.039	0.049	0.059	0.067	0.073	0.077	0.080	0.081	0.080	0.077	0.073	0.067	0.059	0.049	0.039	0.026	0.013	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.028	0.079	0.127	0.169	0.206	0.237	0.262	0.279	0.290	0.294	0.290	0.279	0.262	0.237	0.206	0.169	0.127	0.079	0.028	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.008	0.017	0.024	0.031	0.037	0.042	0.046	0.049	0.051	0.052	0.051	0.049	0.046	0.042	0.037	0.031	0.024	0.017	0.008	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.049	0.122	0.190	0.249	0.302	0.346	0.381	0.405	0.421	0.427	0.421	0.405	0.381	0.346	0.302	0.249	0.190	0.122	0.049	0
VERTICAL CURVE ORDINATE ↓	0	0.035	0.067	0.095	0.119	0.139	0.156	0.169	0.178	0.184	0.186	0.184	0.178	0.169	0.156	0.139	0.119	0.095	0.067	0.035	0
REQUIRED CAMBER ↑	0	1"	2 1/4"	3 7/16"	4 7/16"	5 5/16"	6"	6 5/8"	7"	7 1/4"	7 3/8"	7 1/4"	7"	6 5/8"	6"	5 5/16"	4 7/16"	3 7/16"	2 1/4"	1"	0

GIRDER #12

TWENTIETH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.013	0.026	0.039	0.049	0.059	0.067	0.073	0.077	0.080	0.081	0.080	0.077	0.073	0.067	0.059	0.049	0.039	0.026	0.013	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.045	0.098	0.147	0.191	0.229	0.262	0.287	0.305	0.316	0.320	0.316	0.305	0.287	0.262	0.229	0.191	0.147	0.098	0.045	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.012	0.023	0.034	0.043	0.051	0.058	0.064	0.068	0.070	0.071	0.070	0.068	0.064	0.058	0.051	0.043	0.034	0.023	0.012	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.070	0.147	0.220	0.283	0.339	0.387	0.424	0.450	0.466	0.472	0.466	0.450	0.424	0.387	0.339	0.283	0.220	0.147	0.070	0
VERTICAL CURVE ORDINATE ↓	0	0.035	0.067	0.095	0.119	0.139	0.156	0.169	0.178	0.184	0.186	0.184	0.178	0.169	0.156	0.139	0.119	0.095	0.067	0.035	0
REQUIRED CAMBER ↑	0	1 1/4"	2 9/16"	3 3/4"	4 13/16"	5 3/4"	6 1/2"	7 1/8"	7 9/16"	7 13/16"	7 7/8"	7 13/16"	7 9/16"	7 1/8"	6 1/2"	5 3/4"	4 13/16"	3 3/4"	2 9/16"	1 1/4"	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).

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DEAD LOAD DEFLECTIONS
SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			75

STR. #1

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4E4A4... 2/19/2015

DRAWN BY : H. A. LOCKLEAR DATE : 11/5/14
CHECKED BY : T. R. PETERSON DATE : 11/6/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 11/6/14

18-FEB-2015 14:03
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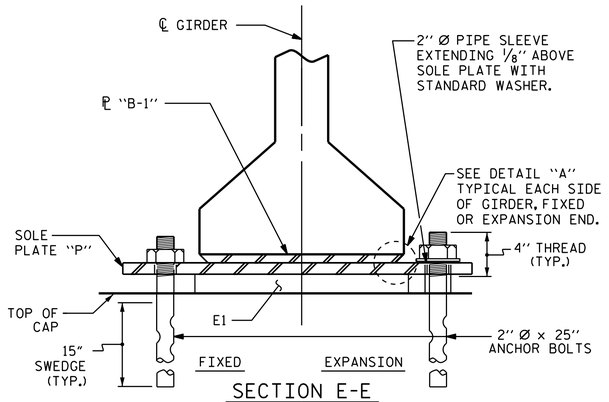
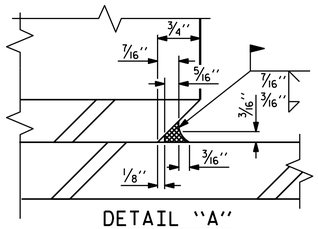
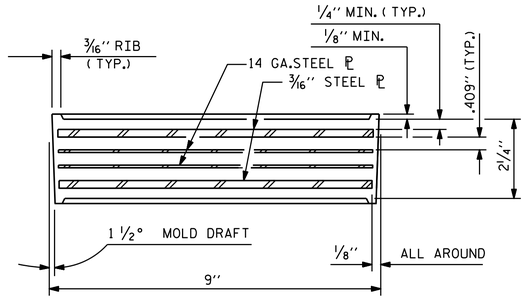
thcarroll



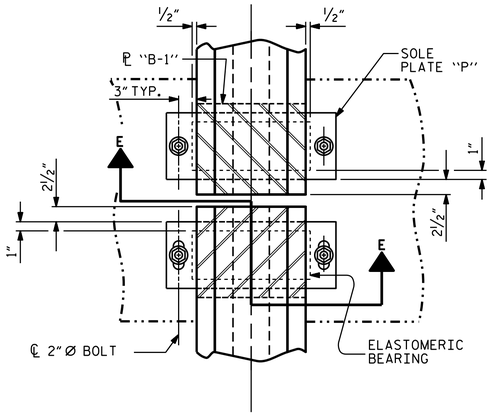
SECTION E-E



DETAIL "A"

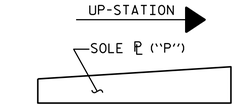


TYPICAL SECTION OF ELASTOMERIC BEARINGS

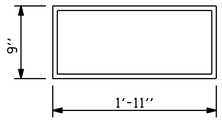


TYPICAL HALF-PLAN

(SHOWING SIMPLE SPAN BENT)



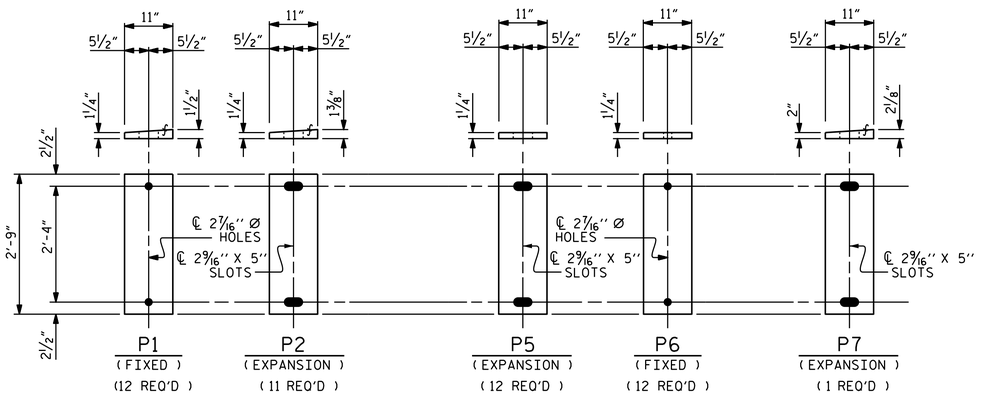
SOLE ℄ PLACEMENT DETAIL



E1 (48 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V (C)



SOLE PLATE DETAILS ("P")

NOTES

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

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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. NO SHOP DRAWINGS ARE 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 V	365 k

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
ELASTOMERIC BEARING DETAILS
PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE
SPANS A & C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			75

STD. NO. EB4

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D464A4... 2/19/2015

ASSEMBLED BY : J. D. HAWK	DATE : 8/11/14	
CHECKED BY : H.A. LOCKLEAR	DATE : 10/15/14	
DRAWN BY : EEM 2/97	REV. 5/1/06	TLA/GM
CHECKED BY : VAP 2/97	REV. 10/1/11	MAA/GM
	REV. 6/13	AAC/MAA

DESIGN ENGINEER OF RECORD: V.A. PATEL DATE : 1/05/15

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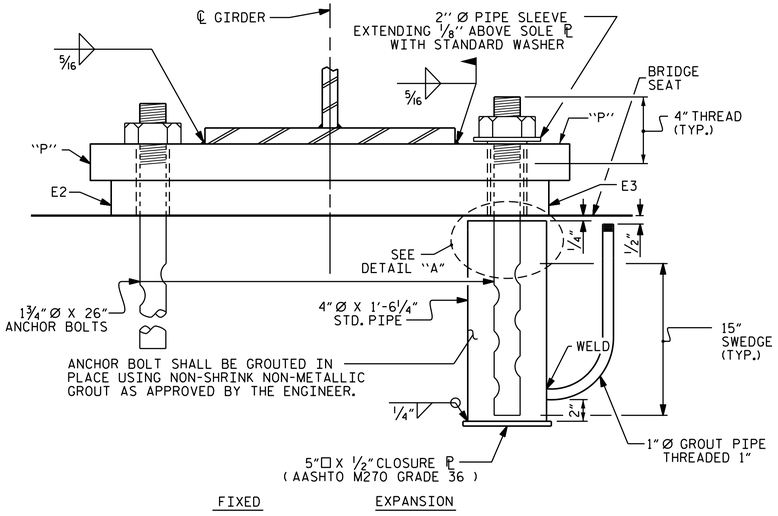
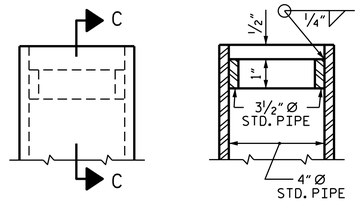
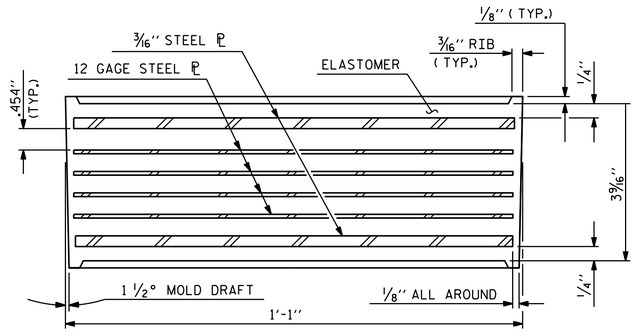


END VIEW

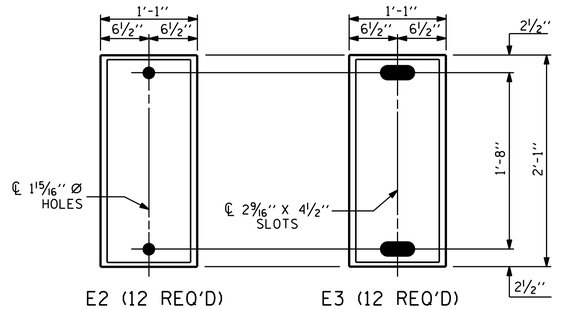


DETAIL "A"

SECTION C-C

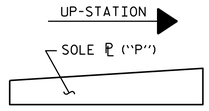


TYPICAL SECTION OF ELASTOMERIC BEARING



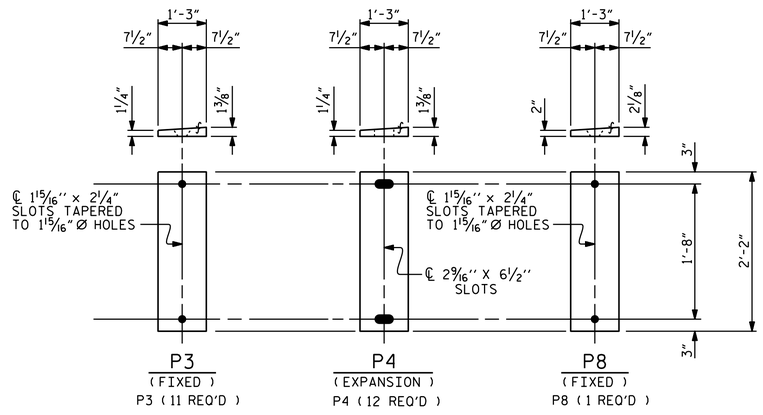
PLAN VIEW OF ELASTOMERIC BEARING

TYPE V (S)



SOLE ℙ PLACEMENT DETAIL

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	335 k



SOLE PLATE DETAILS ("P")

NOTES

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

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

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

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

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

WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

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

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

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

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

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

(STEEL SUPERSTRUCTURE)

SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			75

STD. NO. EB2

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4A1... 2/19/2015

ASSEMBLED BY : J. D. HAWK	DATE : 8/11/14		
CHECKED BY : H.A. LOCKLEAR	DATE : 10/15/14		
DRAWN BY : EEM 10/95	REV. 5/1/06	TLA/GM	DESIGN ENGINEER OF RECORD: V.A. PATEL DATE : 1/05/15
CHECKED BY : PEK 10/95	REV. 10/1/11	MAA/GM	
	REV. 6/13	AAC/MAA	

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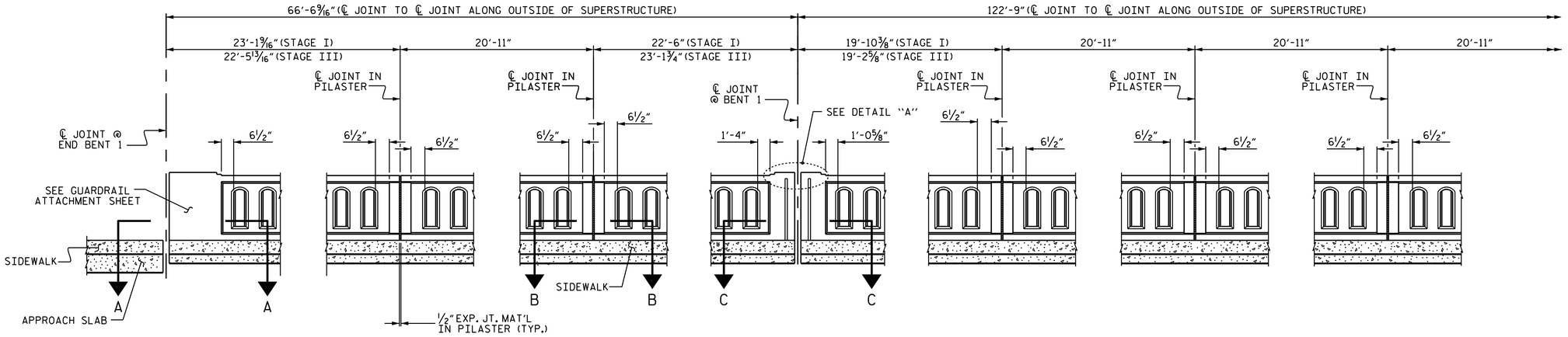
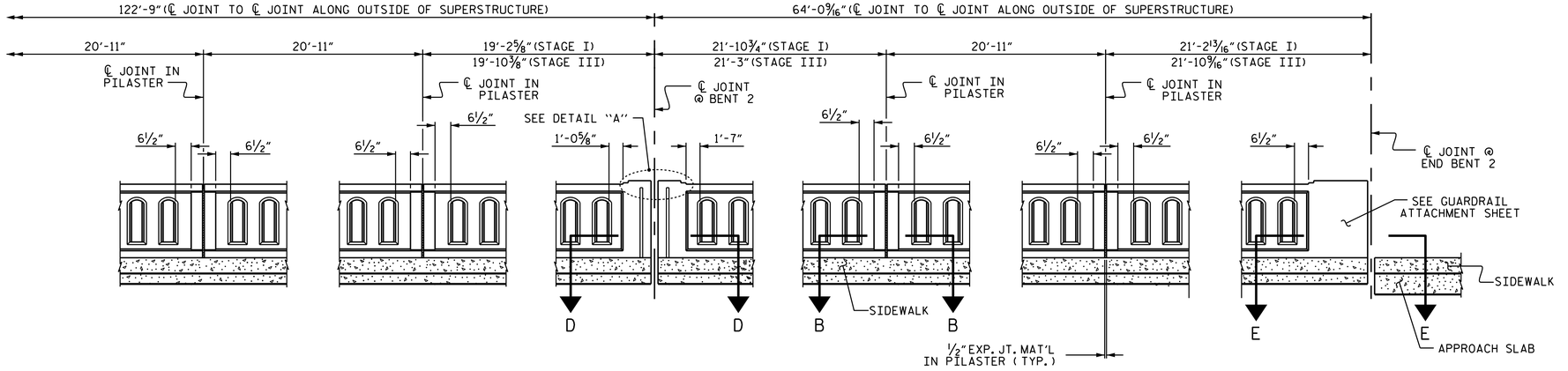
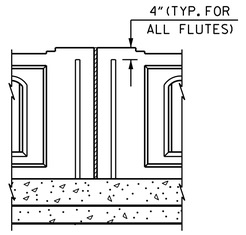


ROADWAY ELEVATION OF RAIL
(SPAN A-B)



ROADWAY ELEVATION OF RAIL
(SPAN B-C)

FOR SECTIONS, SEE SHEET 2 OF 5.



DETAIL "A"

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CLASSIC CONCRETE BRIDGE RAIL WITH SIDEWALK

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4A4... 2/19/2015

DRAWN BY : T. H. CARROLL DATE : 7/31/14
CHECKED BY : P. S. ADKINS DATE : 8/12/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

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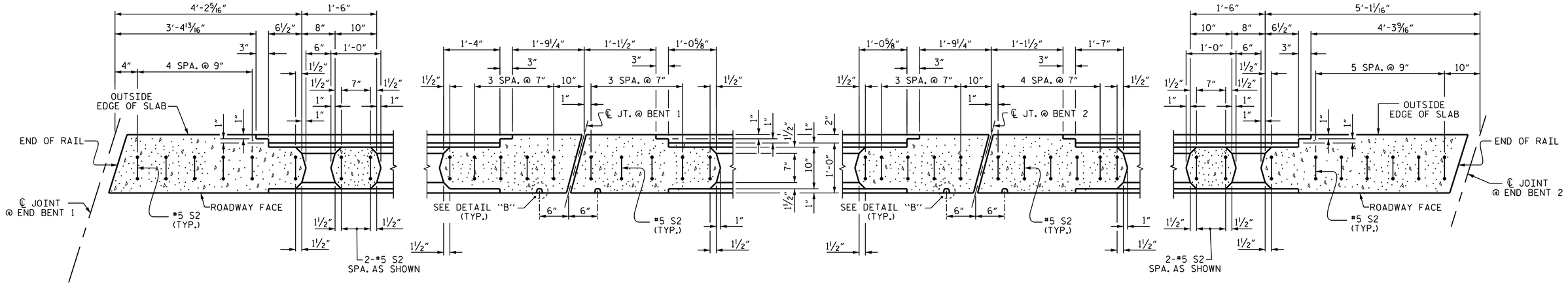
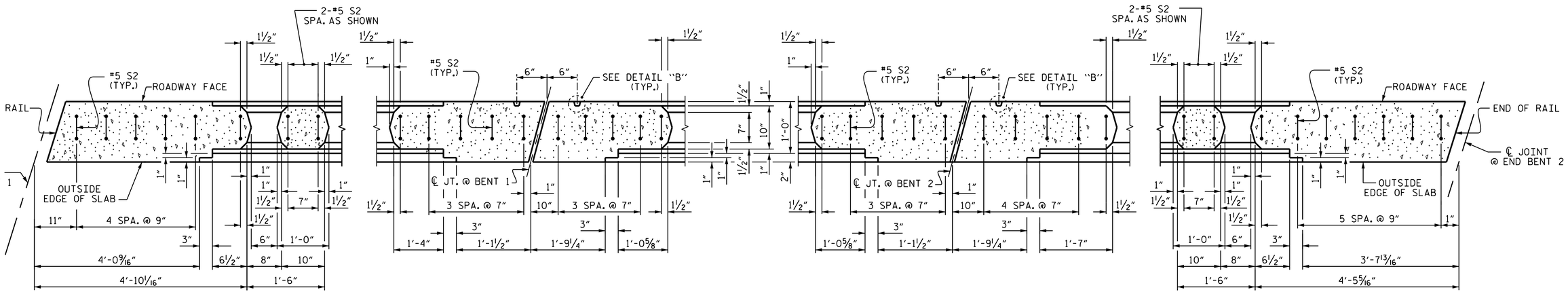


SECTION A-A
SHOWING PILASTER @ END BENT 1
(STAGE III)

SECTION C-C
SHOWING JOINT IN PILASTER @ BENT 1
(STAGE III)

SECTION D-D
SHOWING JOINT IN PILASTER @ BENT 2
(STAGE III)

SECTION E-E
SHOWING PILASTER @ END BENT 2
(STAGE III)

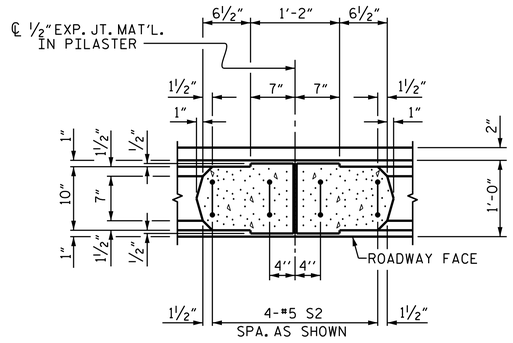


SECTION A-A
SHOWING PILASTER @ END BENT 1
(STAGE I)

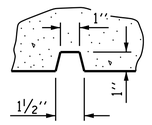
SECTION C-C
SHOWING JOINT IN PILASTER @ BENT 1
(STAGE I)

SECTION D-D
SHOWING JOINT IN PILASTER @ BENT 2
(STAGE I)

SECTION E-E
SHOWING PILASTER @ END BENT 2
(STAGE I)



SECTION B-B
SHOWING JOINT IN PILASTER
(STAGE III SHOWN, STAGE I SIMILAR BY ROTATION.)



DETAIL "B"
TYPICAL FLUTE

PROJECT NO. B-5136
CABARRUS COUNTY
STATION: 21+74.92 -L-
SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CLASSIC CONCRETE BRIDGE RAIL WITH SIDEWALK

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
DocuSigned by: vipul a patel 1C157DE15D4B4A4...
2/19/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : T. H. CARROLL DATE : 7/31/14
CHECKED BY : P. S. ADKINS DATE : 8/12/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

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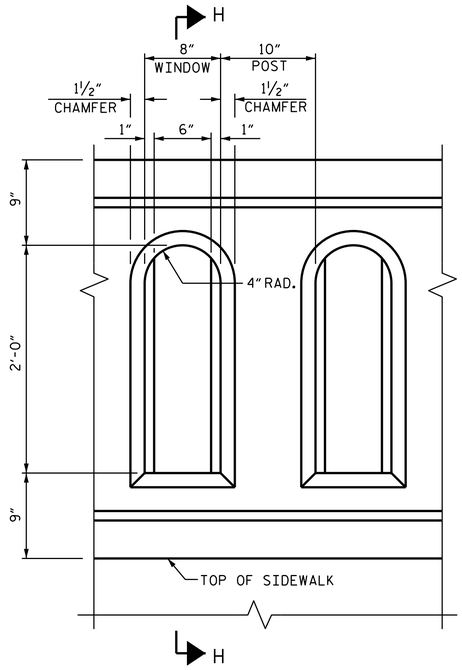
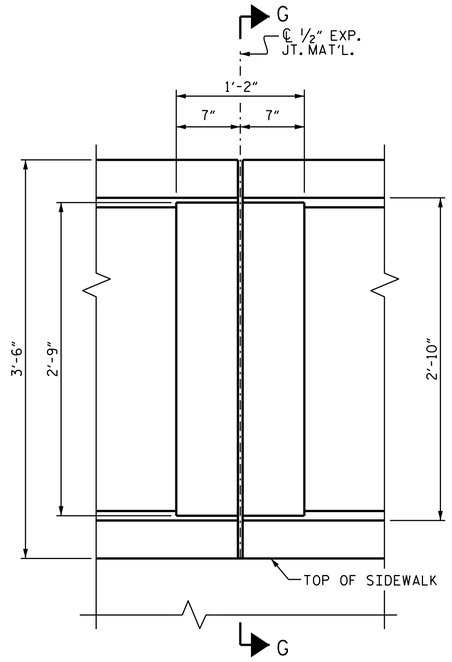
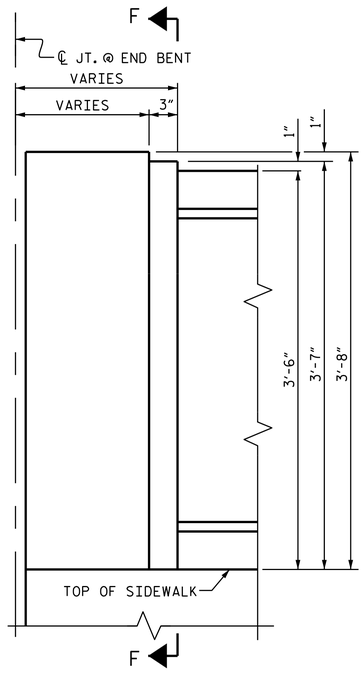
EXTERIOR PILASTER ELEVATIONS



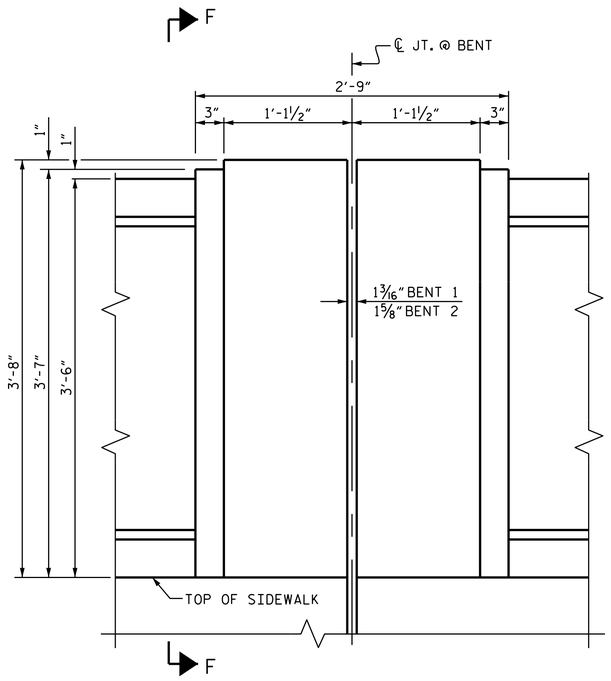
WINDOW DETAIL



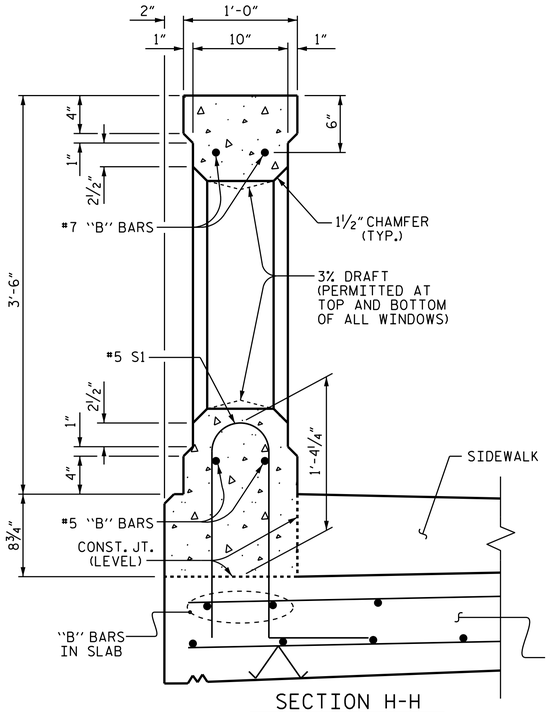
SPAN PILASTER



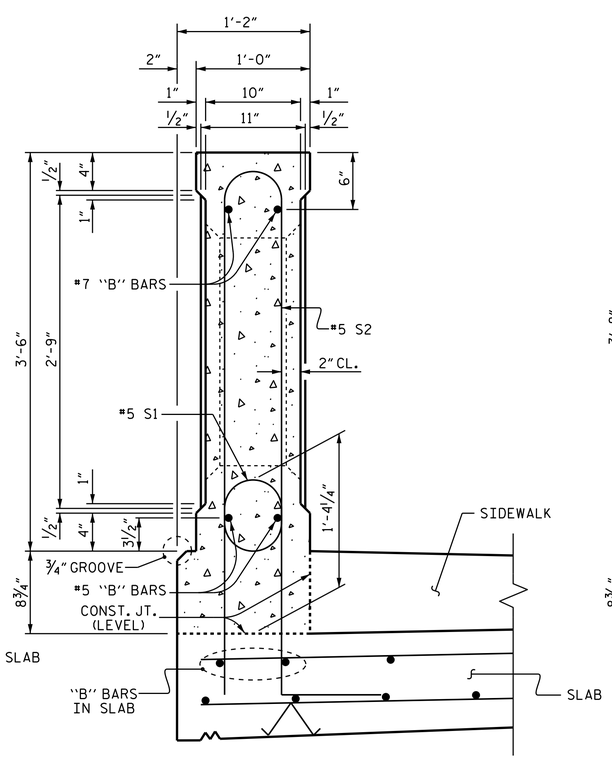
END BENT PILASTER



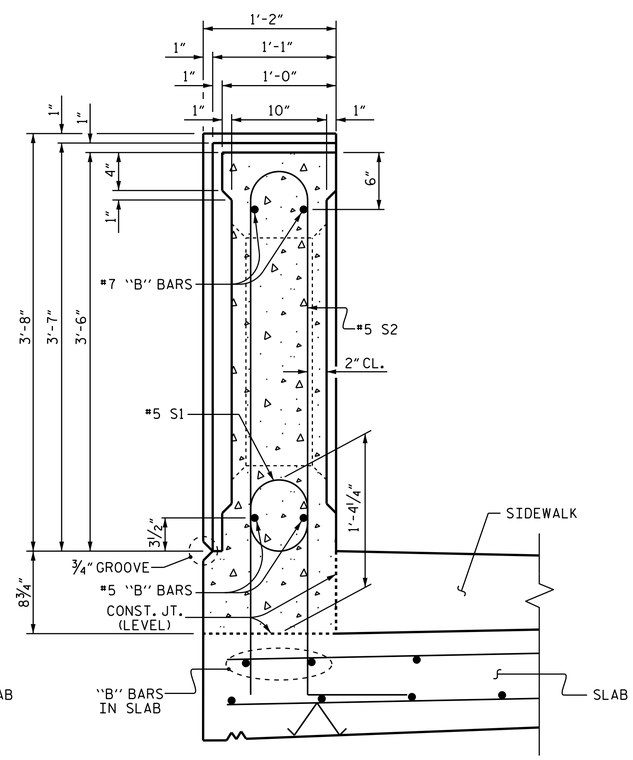
BENT PILASTER



SECTION H-H
(SHOWING WINDOW OF RAIL)



SECTION G-G
(SHOWING SPAN PILASTER)



SECTION F-F
(SHOWING END BENT & BENT PILASTER)

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4644A... 2/19/2015

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

CLASSIC CONCRETE BRIDGE RAIL WITH SIDEWALK

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			75

STD. No. CCR2

DRAWN BY :	T. H. CARROLL	DATE : 7/29/14
CHECKED BY :	P. S. ADKINS	DATE : 8/12/14
DESIGN ENGINEER OF RECORD:	V. A. PATEL	DATE : 1/5/15

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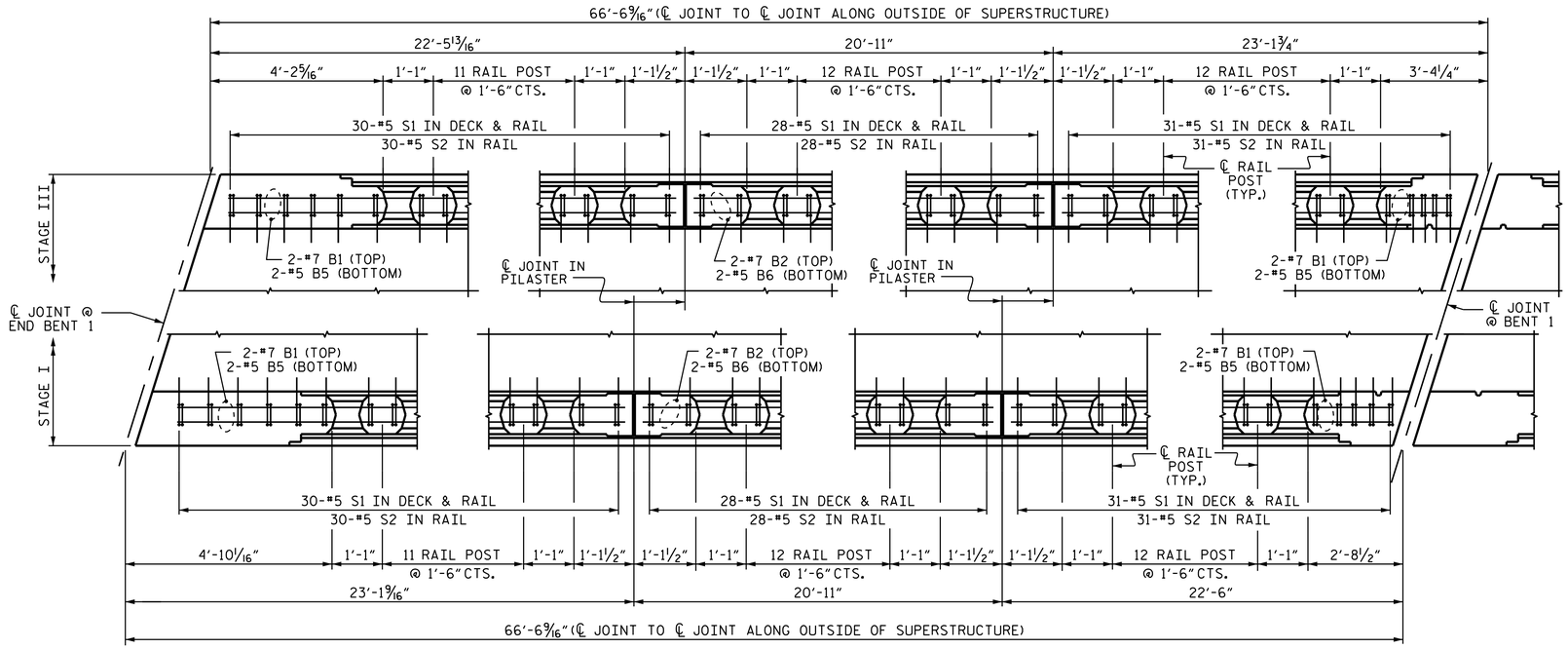
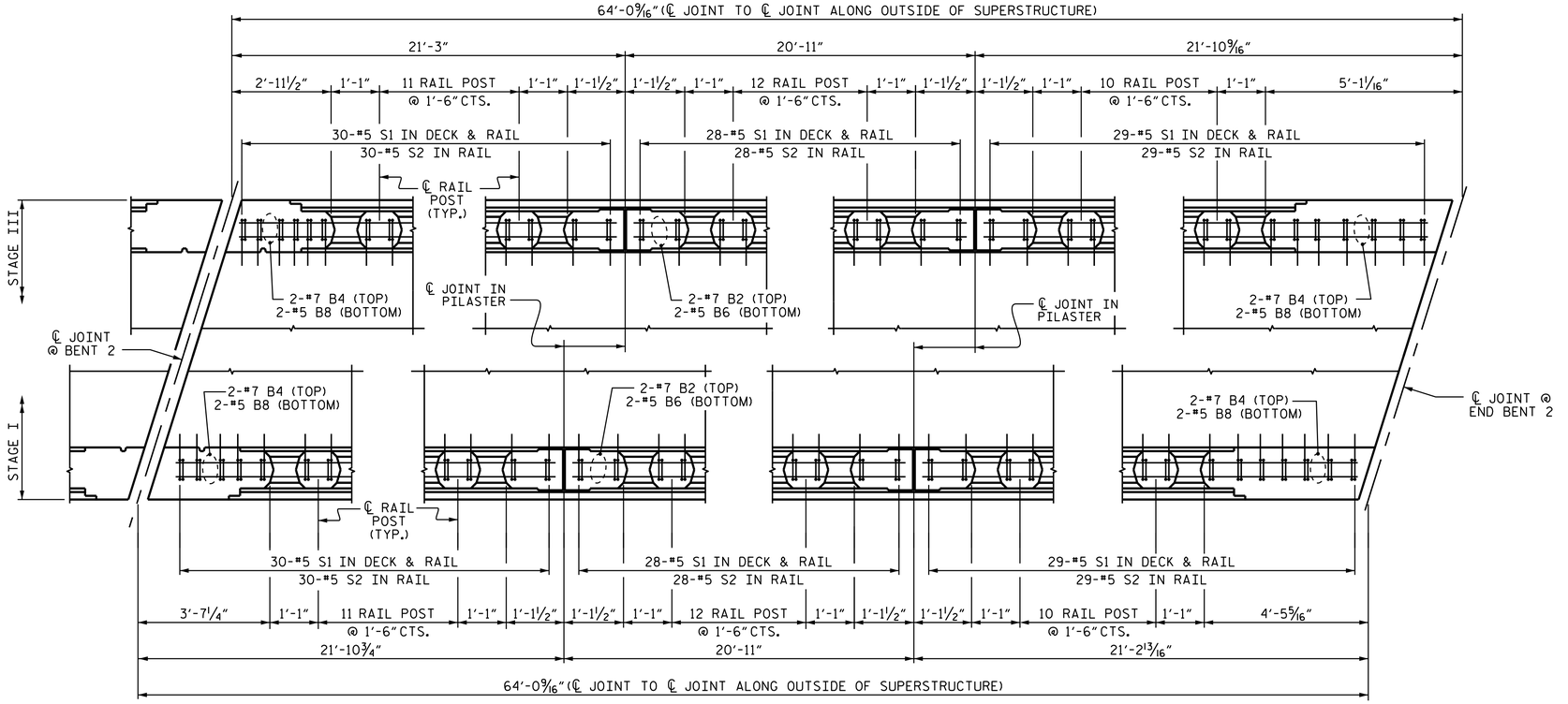


PLAN OF SPAN A

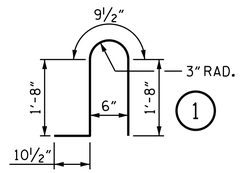
(FOR EXACT PLACEMENT OF S1 BARS IN DECK & RAIL, SEE SHEET 2 OF 5)

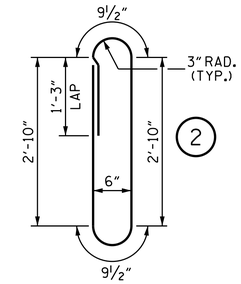


PLAN OF SPAN C

(FOR EXACT PLACEMENT OF S1 BARS IN DECK & RAIL, SEE SHEET 2 OF 5)

BAR TYPES





ALL BAR DIMENSIONS ARE OUT TO OUT.

TOTAL BILL OF MATERIAL CLASSIC RAIL

✳EPOXY COATED REINFORCING STEEL	LBS.	12,678
CLASS AA CONCRETE	C.Y.	70.2
CLASSIC CONCRETE BRIDGE RAIL	LIN. FT.	506.70

BILL OF MATERIAL CLASSIC RAIL (STAGE I)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	4	#7	STR	22'-1"	181
✳B2	12	#7	STR	20'-6"	503
✳B3	4	#7	STR	18'-10"	154
✳B4	4	#7	STR	20'-10"	170
✳B5	4	#5	STR	22'-1"	92
✳B6	12	#5	STR	20'-6"	257
✳B7	4	#5	STR	18'-10"	79
✳B8	4	#5	STR	20'-10"	87
✳S1	342	#5	1	5'-0"	1784
✳S2	342	#5	2	8'-6"	3032
✳EPOXY COATED REINFORCING STEEL				LBS.	6,339
CLASS AA CONCRETE				C.Y.	35.1
CLASSIC CONCRETE BRIDGE RAIL				LIN. FT.	253.35

BILL OF MATERIAL CLASSIC RAIL (STAGE III)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	4	#7	STR	22'-1"	181
✳B2	12	#7	STR	20'-6"	503
✳B3	4	#7	STR	18'-10"	154
✳B4	4	#7	STR	20'-10"	170
✳B5	4	#5	STR	22'-1"	92
✳B6	12	#5	STR	20'-6"	257
✳B7	4	#5	STR	18'-10"	79
✳B8	4	#5	STR	20'-10"	87
✳S1	342	#5	1	5'-0"	1784
✳S2	342	#5	2	8'-6"	3032
✳EPOXY COATED REINFORCING STEEL				LBS.	6,339
CLASS AA CONCRETE				C.Y.	35.1
CLASSIC CONCRETE BRIDGE RAIL				LIN. FT.	253.35

NOTES

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

ALL REINFORCING STEEL IN THE CLASSIC CONCRETE BRIDGE RAILS SHALL BE EPOXY COATED.

SIDEWALK QUANTITIES ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIAL.

FOR CLASSIC CONCRETE BRIDGE RAIL, SEE SPECIAL PROVISIONS.

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CLASSIC CONCRETE BRIDGE RAIL WITH SIDEWALK

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4F4A8... 2/19/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : T. H. CARROLL DATE : 7/31/14
CHECKED BY : P. S. ADKINS DATE : 8/12/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

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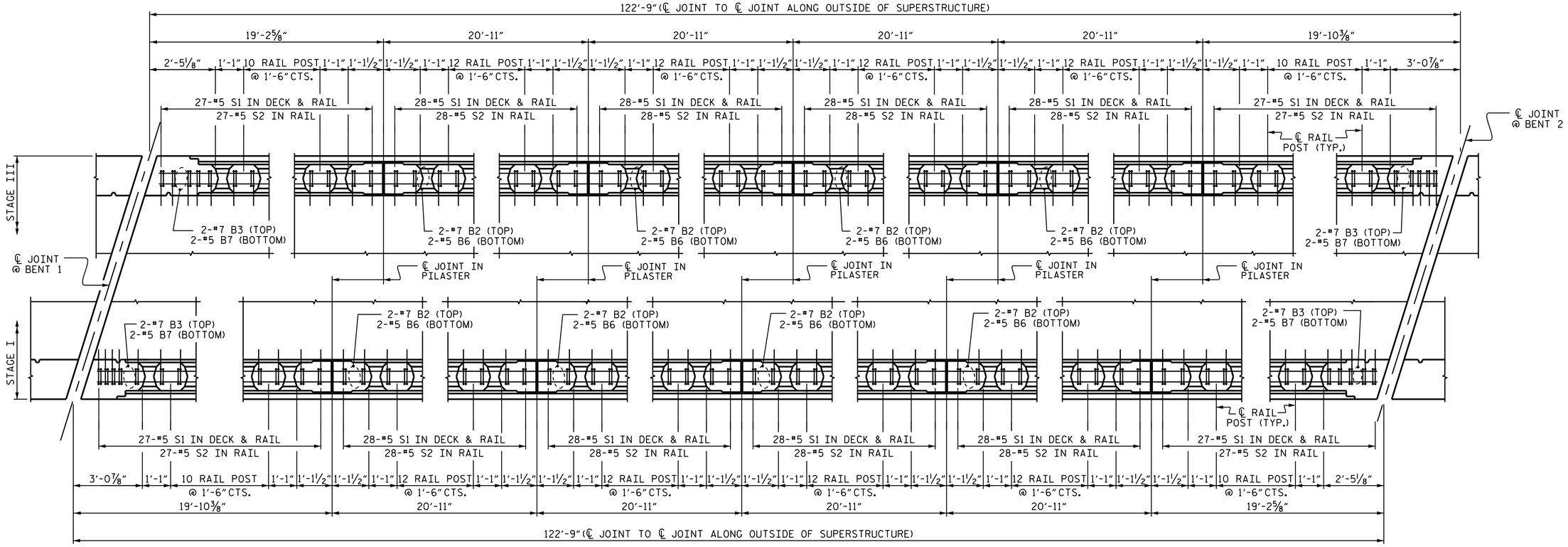

PLAN OF SPAN B

(FOR EXACT PLACEMENT OF S1 BARS IN DECK & RAIL, SEE SHEET 2 OF 5)

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CLASSIC CONCRETE BRIDGE RAIL WITH SIDEWALK

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

Docusigned by: vipul a patel 1C1577DE15D48A4... 2/19/2015

DRAWN BY : T. H. CARROLL DATE : 7/31/14
CHECKED BY : P. S. ADKINS DATE : 8/12/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

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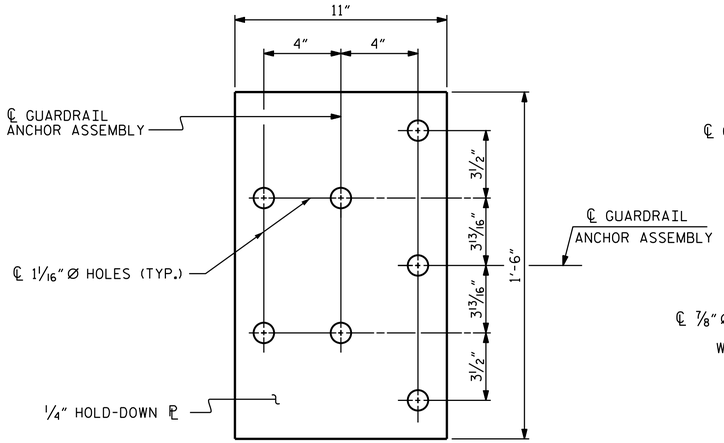
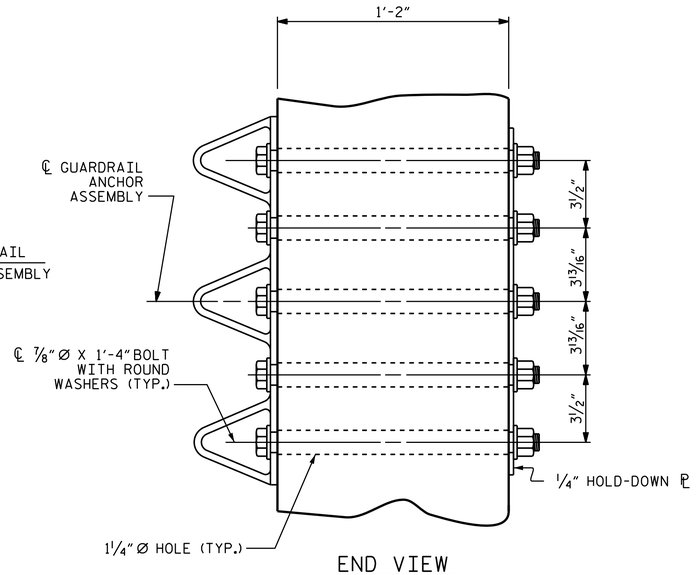


PLAN



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.)

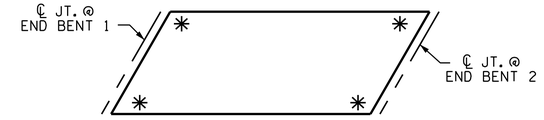
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

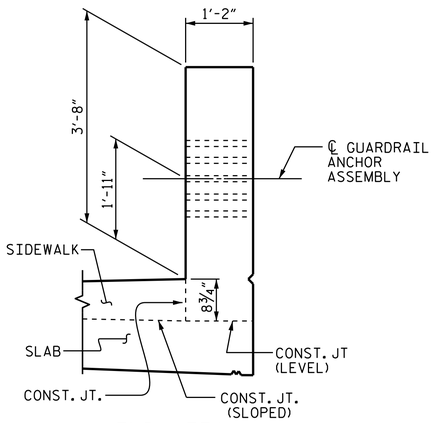
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END BENT PILASTER TO CLEAR ASSEMBLY BOLTS.

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.

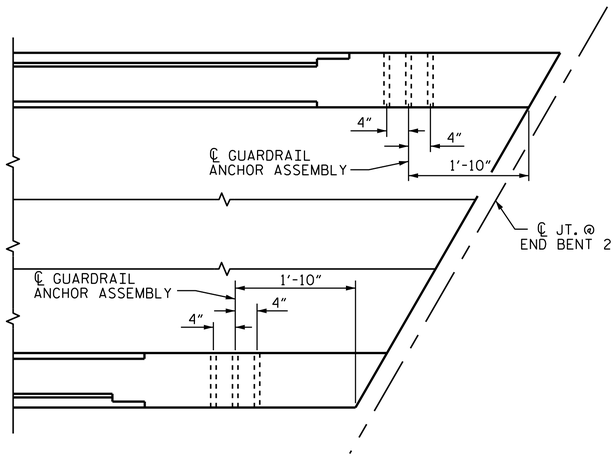


SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

END BENT 2 SHOWN, END BENT 1 SIMILAR.

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

Docusigned by: vipul a patel 1C1157DE15D4A9A... 2/19/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			75

ASSEMBLED BY : T. H. CARROLL		DATE : 8/26/14
CHECKED BY : P. S. ADKINS		DATE : 9/2/14
DRAWN BY : MAA 5/10	REV. 10/1/11	MAA/GM
CHECKED BY : GM 5/10	REV. 12/5/11	MAA/GM
	REV. 6/13	MAA/GM

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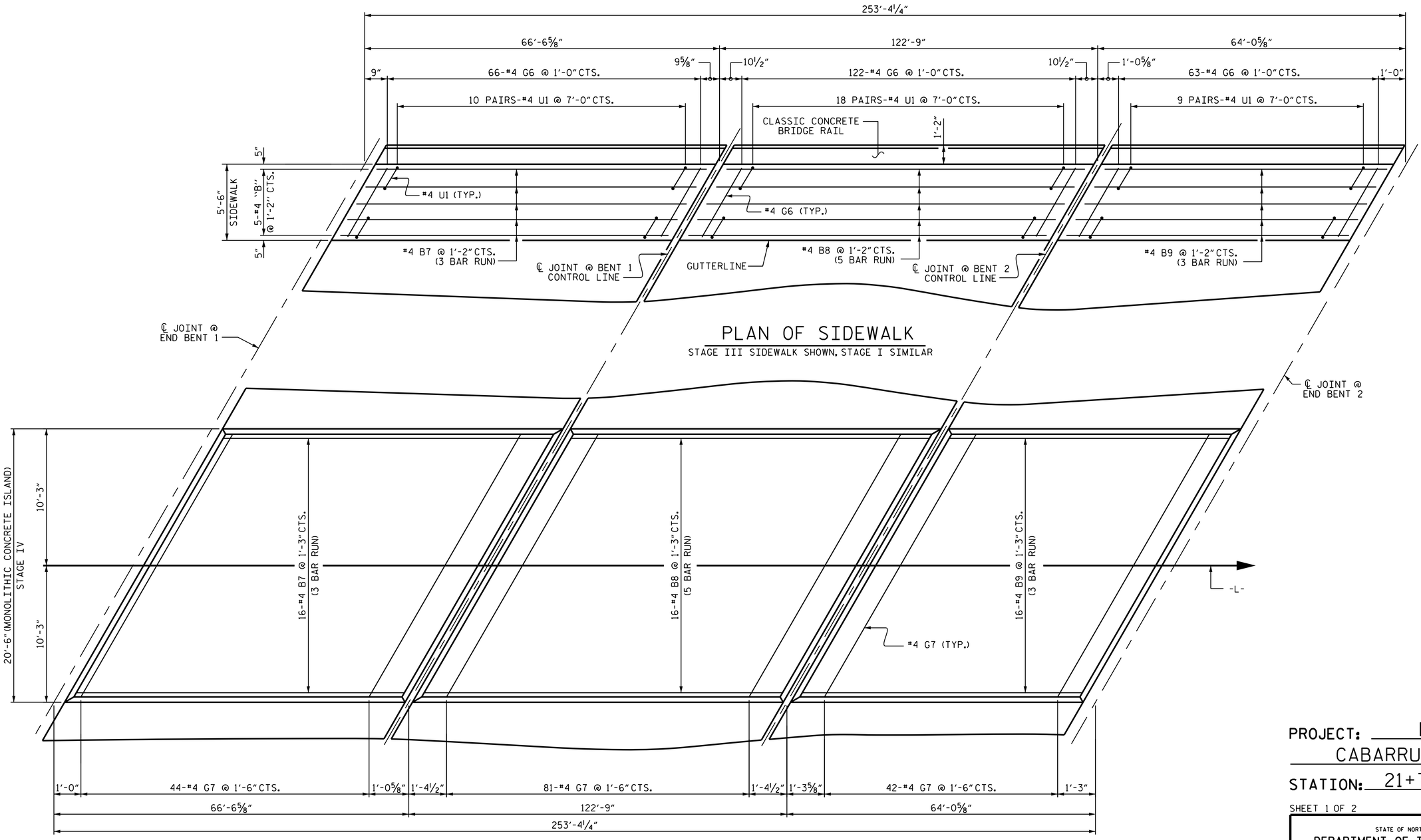
STD. NO. GRA3



PLAN OF SIDEWALK

STAGE III SIDEWALK SHOWN, STAGE I SIMILAR

SPAN A SPAN B SPAN C

PLAN OF MONOLITHIC CONCRETE ISLAND

DRAWN BY : J. D. HAWK DATE : 7/28/14
CHECKED BY : T. H. CARROLL DATE : 10/8/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

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NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
DocuSigned by: vipul a patel 1C157DE15D4A4A4...
2/19/2015

PROJECT: B-5136
CABARRUS COUNTY
STATION: 21+74.92 -L-

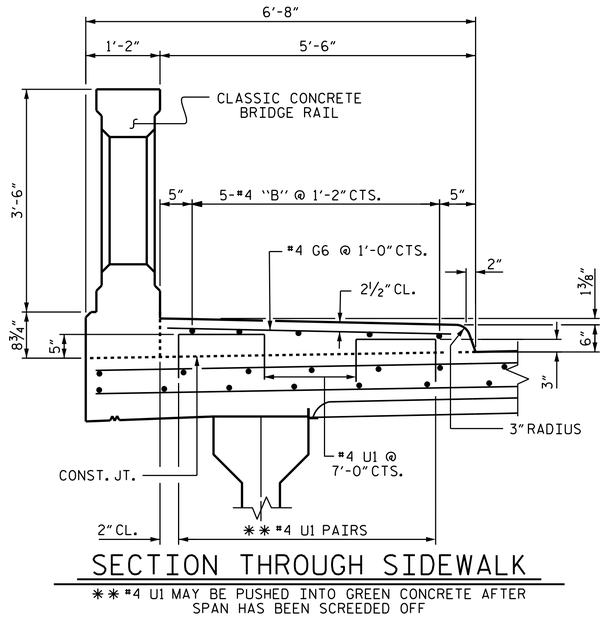
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

SIDEWALK & MONOLITHIC CONCRETE ISLAND

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			75



SECTION THROUGH SIDEWALK

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

NOTES

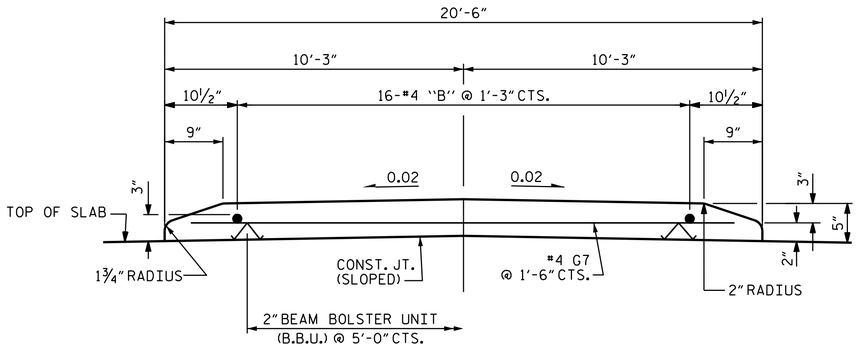
SIDEWALK IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

GROOVED CONTRACTION JOINTS, ½″ IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK AND MONOLITHIC CONCRETE ISLAND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FT. IN LENGTH.

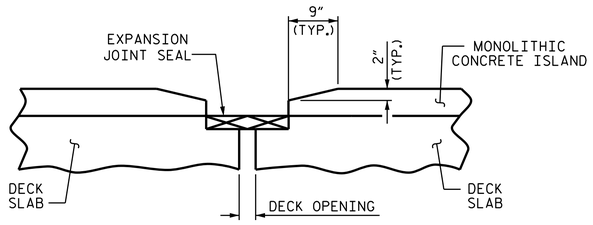
ALL REINFORCING STEEL IN SIDEWALK & MONOLITHIC CONCRETE ISLAND SHALL BE EPOXY COATED.

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

FOR SIDEWALK AND MONOLITHIC CONCRETE ISLAND ON APPROACH SLAB, SEE APPROACH SLAB DETAILS.



SECTION THROUGH MONOLITHIC CONCRETE ISLAND



SECTION THROUGH MONOLITHIC CONCRETE ISLAND AT EXP. JOINT SEALS

BENTS SHOWN, END BENTS SIMILAR

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

SIDEWALK & MONOLITHIC CONCRETE ISLAND DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

Digitally signed by: Vipul A. Patel
339D08CBE1C486...
5/28/2015

DRAWN BY :	J. D. HAWK	DATE :	7/28/14
CHECKED BY :	T. H. CARROLL	DATE :	10/8/14
DESIGN ENGINEER OF RECORD:	V. A. PATEL	DATE :	1/5/15

28-MAY-2015 09:28
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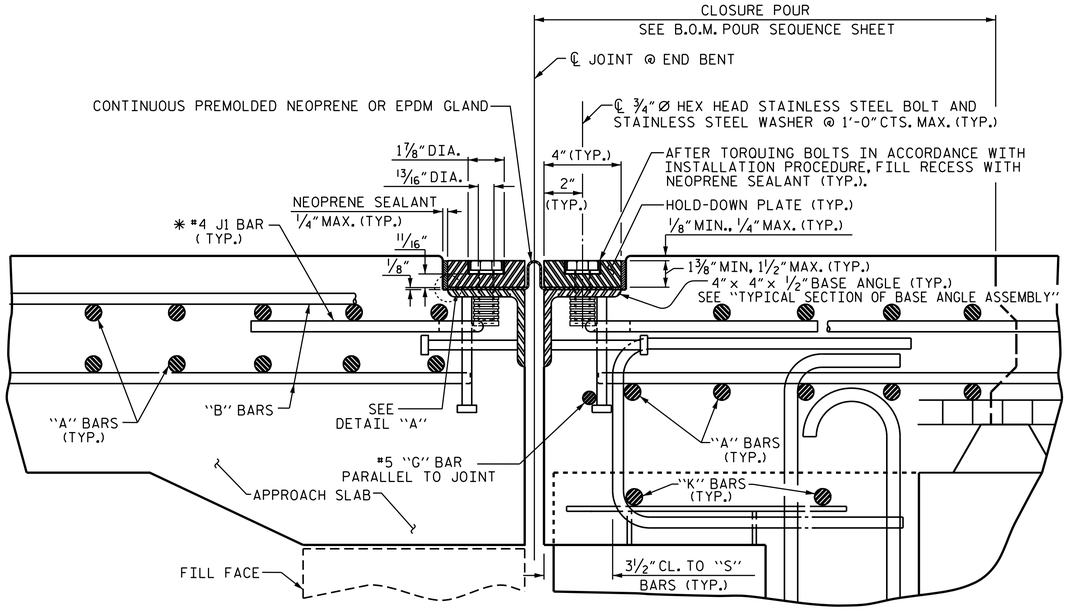
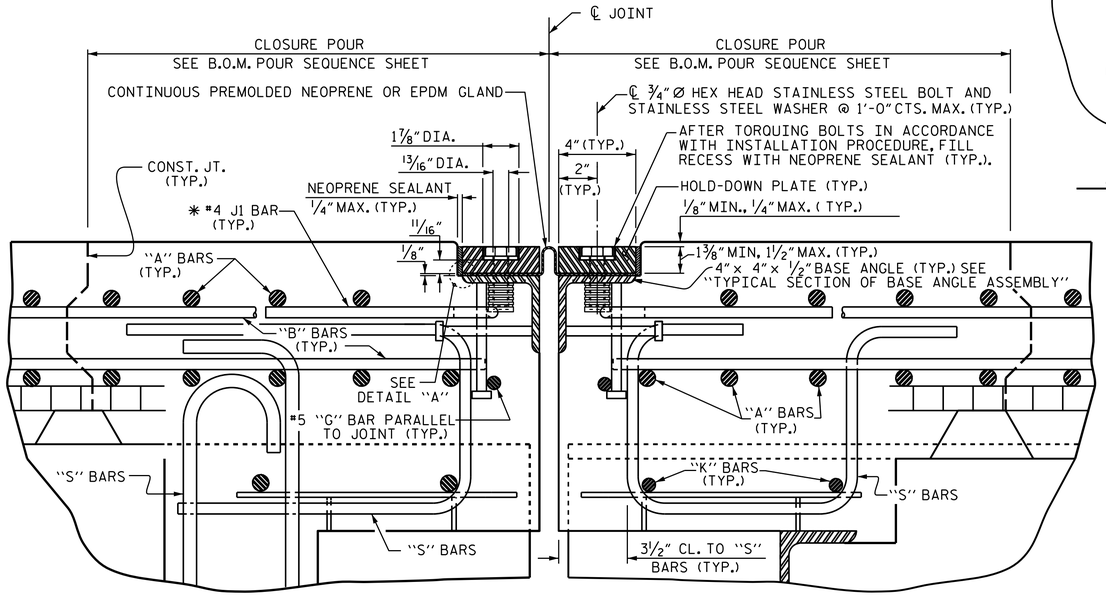
vpatel



EXPANSION JOINT DETAILS @ END BENTS

SECTION NORMAL TO JOINT PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE



EXPANSION JOINT DETAILS @ BENTS

SECTION NORMAL TO JOINT PRESTRESSED CONCRETE GIRDER & STEEL SUPERSTRUCTURE
(BENT 1 SHOWN, BENT 2 SIMILAR BY ROTATION)

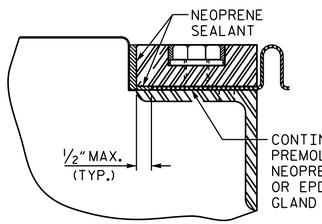
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

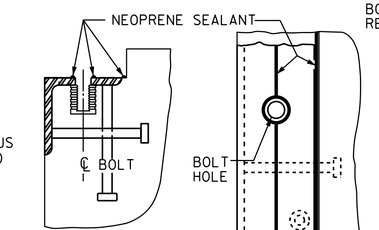
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4⅛" TO 4¼" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE ¾"Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1"Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4"X 4"X ½" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED ⅞" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TOROUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3,000 LBS. MIN.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
7. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
8. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
9. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
10. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE ¾"Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

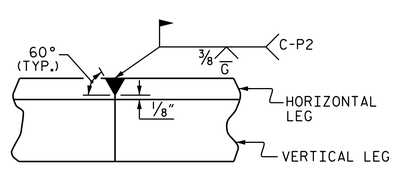


DETAIL "A"



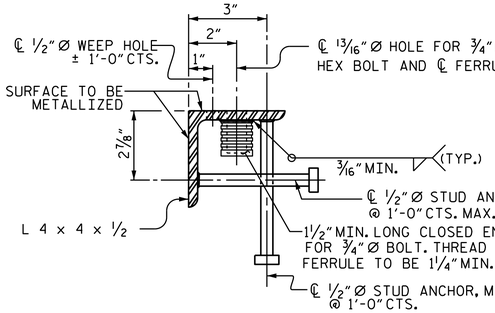
CROSS SECTION PLAN VIEW

INSTALLATION SKETCH



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

MOVEMENT AND SETTING AT JOINT					
LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	119°-00'-32"	-	1¾6"	1¾6"	1¾6"
BENT 1	119°-00'-32"	7⁄16"	1¼"	1¾6"	1⁄16"
BENT 2	119°-00'-32"	1⁄16"	1¹³⁄16"	1⅝"	1¼"
END BENT 2	119°-00'-32"	-	1¾6"	1¾6"	1¾6"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

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PROJECT NO. B-5136
CABARRUS COUNTY
STATION: 21+74.92 -L-

SHEET 1 OF 3

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			75

STD. NO. EJS1

ASSEMBLED BY : T. H. CARROLL	DATE : 7/14/14		
CHECKED BY : H. A. LOCKLEAR	DATE : 10/15/14		
DRAWN BY : REK 9/87	REV. 5/7/03R	RWW/JTE	DESIGN ENGINEER OF RECORD: V.A. PATEL DATE : 1/05/15
CHECKED BY : CRK 10/87	REV. 5/1/06R	TLA/GM	
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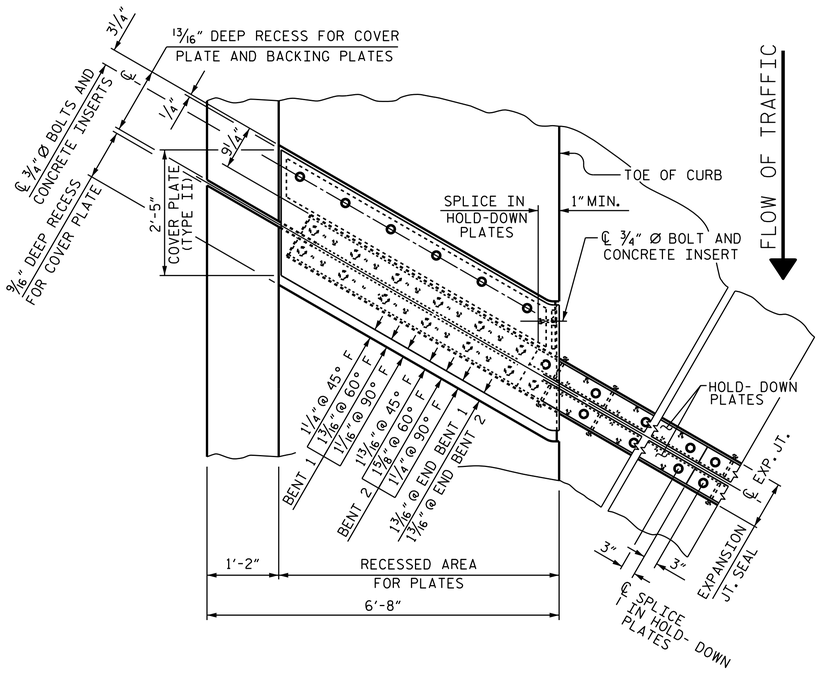
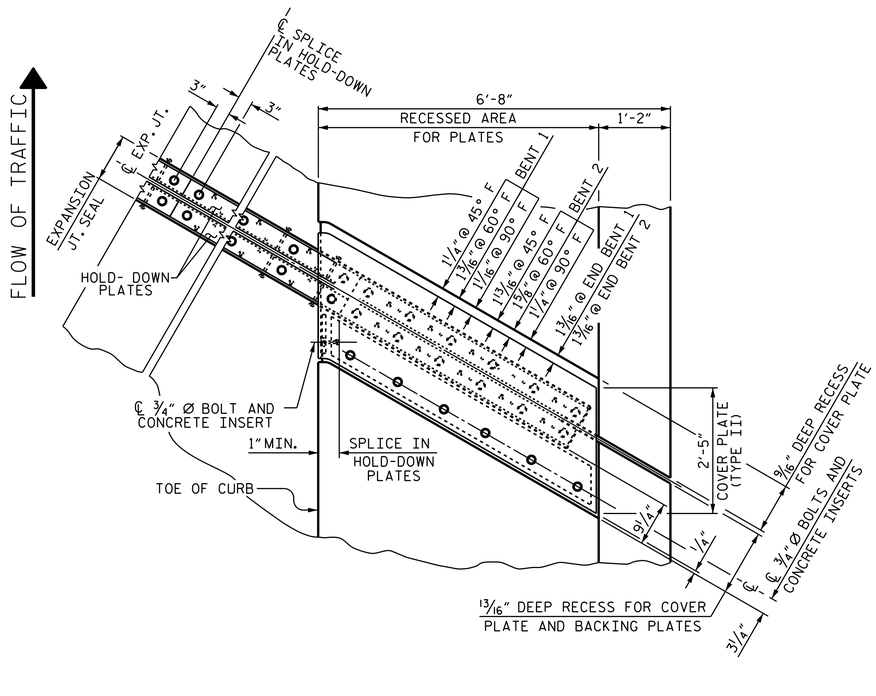
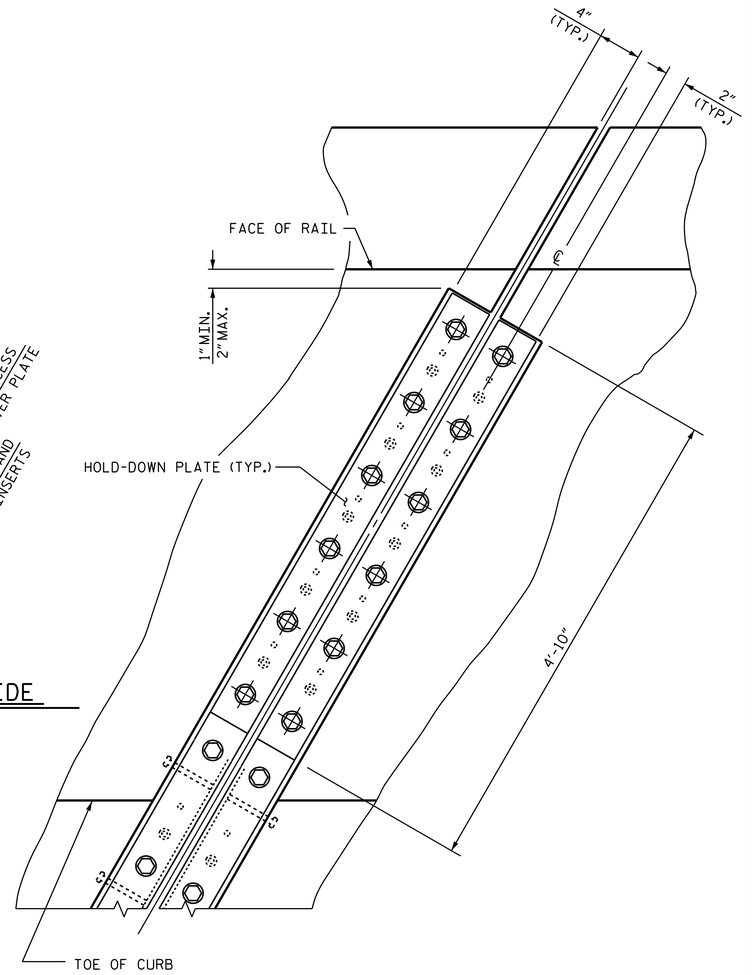


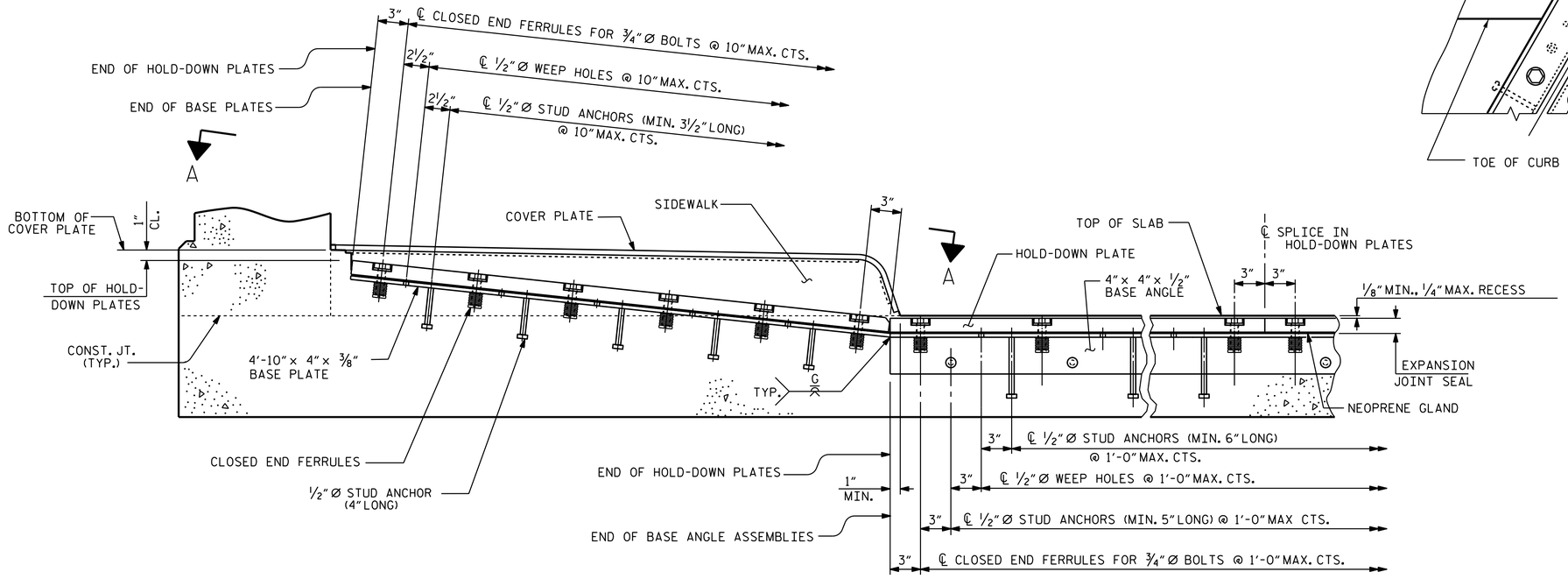
PLAN OF EXPANSION JOINT SEAL - LEFT SIDE



PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE



SECTION A - A



SECTION THRU SIDEWALK NORMAL TO JOINT

COVER PLATE BOLTS NOT SHOWN FOR CLARITY.

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR SIDEWALK

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4F4A4... 2/19/2015

ASSEMBLED BY : T. H. CARROLL	DATE : 7/14/14		
CHECKED BY : H. A. LOCKLEAR	DATE : 10/15/14		
DRAWN BY : REK 10/87	REV. 2/6/97	EEM/RGW	DESIGN ENGINEER OF RECORD: V.A. PATEL DATE : 1/05/15
CHECKED BY : CRK 1/88	REV. 5/1/06	TLA/GM	
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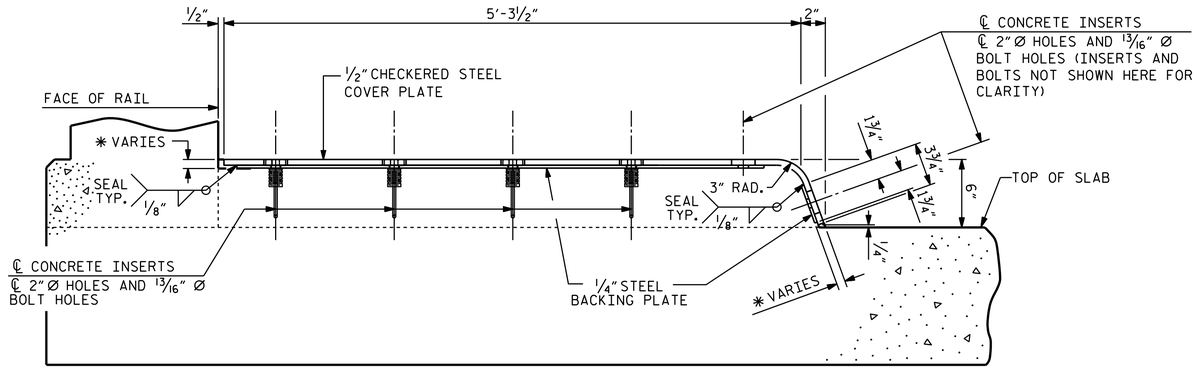


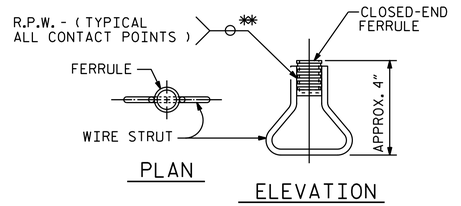
END VIEW

(NORMAL TO SIDEWALK)

* CONCRETE RECESS DIMENSIONS:

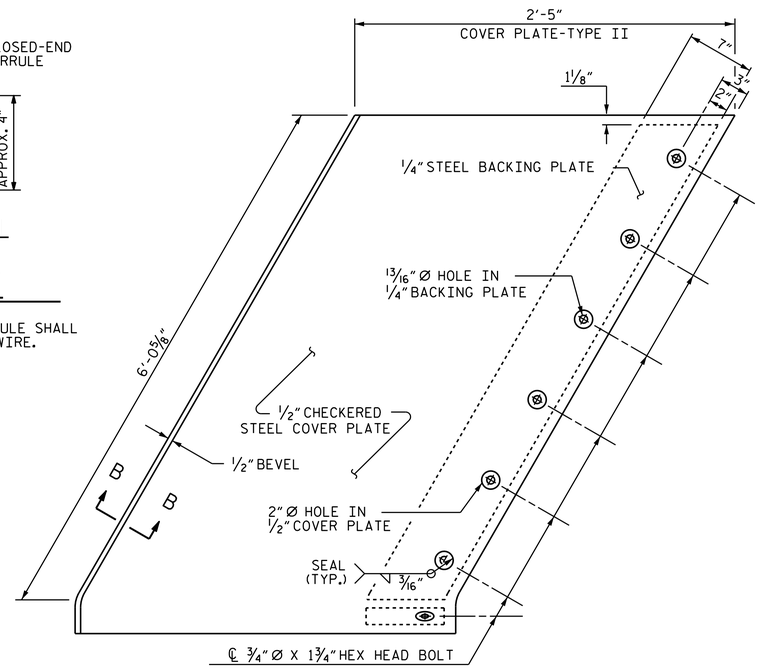
13/16" FOR THE SIDE OF THE JOINT HAVING THE ½" COVER PLATE WITH A ¼" BACKING PLATE.

9/16" FOR THE SIDE OF THE JOINT HAVING ONLY THE ½" COVER PLATE.



CONCRETE INSERT

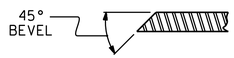
** EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



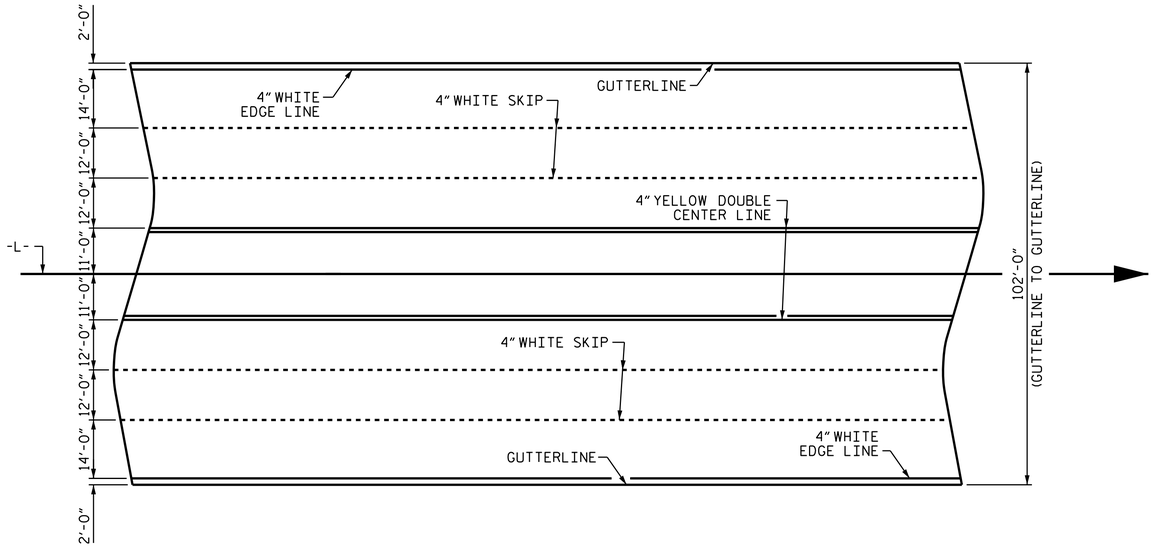
TYPE II - PLAN VIEW

COVER PLATE DETAILS

(8 REQUIRED)



SECTION B-B



PAVEMENT MARKING ALIGNMENT

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR SIDEWALK

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D464A4... 2/19/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			75

ASSEMBLED BY : T. H. CARROLL DATE : 7/14/14
CHECKED BY : H. A. LOCKLEAR DATE : 10/15/14

DRAWN BY : REK 10/87
CHECKED BY : CRK 1/88

REV. 10/17/00 RWW/LES
REV. 5/1/06 TLA/GM
REV. 10/1/11 MAA/GM

DESIGN ENGINEER OF RECORD: V.A. PATEL DATE : 1/05/15

18-FEB-2015 14:03
R:\Structures\Plans\B5136_SD_JS_01.dgn
thcarroll

STD. NO. EJS4

REINFORCING BAR SCHEDULE FOR STAGE I

SPAN A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	102	#5	STR	42'-4"	4504	A203	6	#5	STR	35'-7"	223
A6	103	#5	STR	42'-4"	4548	A204	6	#5	STR	33'-4"	209
						A205	6	#5	STR	31'-1"	195
✱ A101	3	#5	STR	40'-2"	126	A206	6	#5	STR	28'-10"	180
✱ A102	3	#5	STR	37'-11"	119	A207	6	#5	STR	26'-7"	166
✱ A103	3	#5	STR	35'-8"	112	A208	6	#5	STR	24'-4"	152
✱ A104	3	#5	STR	33'-5"	105	A209	6	#5	STR	22'-1"	138
✱ A105	3	#5	STR	31'-2"	98	A210	6	#5	STR	19'-10"	124
✱ A106	3	#5	STR	28'-10"	90	A211	6	#5	STR	17'-7"	110
✱ A107	3	#5	STR	26'-7"	83	A212	6	#5	STR	15'-4"	96
✱ A108	3	#5	STR	24'-4"	76	A213	6	#5	STR	13'-1"	82
✱ A109	3	#5	STR	22'-1"	69	A214	6	#5	STR	10'-10"	68
✱ A110	3	#5	STR	19'-10"	62	A215	6	#5	STR	8'-7"	54
✱ A111	3	#5	STR	17'-7"	55	A216	6	#5	STR	6'-4"	40
✱ A112	3	#5	STR	15'-4"	48	A217	6	#5	STR	4'-1"	26
✱ A113	3	#5	STR	13'-1"	41						
✱ A114	3	#5	STR	10'-10"	34	✱ B1	90	#4	STR	23'-3"	1398
✱ A115	3	#5	STR	8'-7"	27	B3	106	#5	STR	34'-2"	3777
✱ A116	3	#5	STR	6'-4"	20	✱ B7	15	#4	STR	23'-1"	231
✱ A117	3	#5	STR	4'-1"	13						
✱ A118	3	#5	STR	39'-5"	123	✱ D1	150	#6	STR	5'-4"	1202
✱ A119	3	#5	STR	37'-2"	116	D2	150	#6	STR	4'-8"	1051
✱ A120	3	#5	STR	34'-11"	109						
✱ A121	3	#5	STR	32'-8"	102	✱ G1	2	#5	STR	48'-4"	101
✱ A122	3	#5	STR	30'-4"	95	✱ G6	66	#4	STR	5'-8"	250
✱ A123	3	#5	STR	28'-1"	88						
✱ A124	3	#5	STR	25'-10"	81	✱ J1	84	#4	5	1'-5"	79
✱ A125	3	#5	STR	23'-7"	74						
✱ A126	3	#5	STR	21'-4"	67	✱ K3	4	#8	1	11'-5"	122
✱ A127	3	#5	STR	19'-1"	60	✱ K4	12	#8	2	21'-1"	676
✱ A128	3	#5	STR	16'-10"	53	✱ K5	4	#8	1	14'-6"	155
✱ A129	3	#5	STR	14'-7"	46	✱ K7	24	#6	STR	8'-11"	321
✱ A130	3	#5	STR	12'-4"	39						
✱ A131	3	#5	STR	10'-1"	32	✱ S1	64	#5	3	4'-10"	323
✱ A132	3	#5	STR	7'-10"	25	✱ S2	32	#4	4	4'-4"	93
✱ A133	3	#5	STR	5'-7"	17	✱ S4	32	#4	4	3'-2"	68
✱ A134	3	#5	STR	3'-4"	10						
						✱ U1	20	#4	7	3'-4"	45
A201	6	#5	STR	40'-1"	251						
A202	6	#5	STR	37'-10"	237						

REINFORCING STEEL LBS. 11,836

✱ EPOXY COATED REINFORCING STEEL LBS. 11,774

SPAN B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	237	#5	STR	42'-4"	10464	A203	6	#5	STR	35'-7"	223
A6	238	#5	STR	42'-4"	10509	A204	6	#5	STR	33'-4"	209
						A205	6	#5	STR	31'-1"	195
✱ A101	3	#5	STR	40'-2"	126	A206	6	#5	STR	28'-10"	180
✱ A102	3	#5	STR	37'-11"	119	A207	6	#5	STR	26'-7"	166
✱ A103	3	#5	STR	35'-8"	112	A208	6	#5	STR	24'-4"	152
✱ A104	3	#5	STR	33'-5"	105	A209	6	#5	STR	22'-1"	138
✱ A105	3	#5	STR	31'-2"	98	A210	6	#5	STR	19'-10"	124
✱ A106	3	#5	STR	28'-10"	90	A211	6	#5	STR	17'-7"	110
✱ A107	3	#5	STR	26'-7"	83	A212	6	#5	STR	15'-4"	96
✱ A108	3	#5	STR	24'-4"	76	A213	6	#5	STR	13'-1"	82
✱ A109	3	#5	STR	22'-1"	69	A214	6	#5	STR	10'-10"	68
✱ A110	3	#5	STR	19'-10"	62	A215	6	#5	STR	8'-7"	54
✱ A111	3	#5	STR	17'-7"	55	A216	6	#5	STR	6'-4"	40
✱ A112	3	#5	STR	15'-4"	48	A217	6	#5	STR	4'-1"	26
✱ A113	3	#5	STR	13'-1"	41						
✱ A114	3	#5	STR	10'-10"	34	✱ B5	150	#4	STR	26'-1"	2614
✱ A115	3	#5	STR	8'-7"	27	B6	159	#5	STR	42'-4"	7020
✱ A116	3	#5	STR	6'-4"	20	✱ B8	25	#4	STR	25'-11"	433
✱ A117	3	#5	STR	4'-1"	13						
✱ A118	3	#5	STR	39'-5"	123	✱ D1	284	#6	STR	5'-4"	2275
✱ A119	3	#5	STR	37'-2"	116	D2	286	#6	STR	4'-8"	2005
✱ A120	3	#5	STR	34'-11"	109						
✱ A121	3	#5	STR	32'-8"	102	✱ G1	2	#5	STR	48'-4"	101
✱ A122	3	#5	STR	30'-4"	95	✱ G6	122	#4	STR	5'-8"	462
✱ A123	3	#5	STR	28'-1"	88						
✱ A124	3	#5	STR	25'-10"	81	✱ J1	84	#4	5	1'-5"	79
✱ A125	3	#5	STR	23'-7"	74						
✱ A126	3	#5	STR	21'-4"	67	✱ K8	4	#5	1	8'-2"	34
✱ A127	3	#5	STR	19'-1"	60	✱ K9	4	#5	1	5'-2"	22
✱ A128	3	#5	STR	16'-10"	53	✱ K10	12	#5	2	8'-6"	106
✱ A129	3	#5	STR	14'-7"	46	✱ K11	16	#5	STR	8'-10"	147
✱ A130	3	#5	STR	12'-4"	39						
✱ A131	3	#5	STR	10'-1"	32	✱ S3	64	#5	6	3'-6"	234
✱ A132	3	#5	STR	7'-10"	25						
✱ A133	3	#5	STR	5'-7"	17	✱ U1	36	#4	7	3'-4"	80
✱ A134	3	#5	STR	3'-4"	10						
A201	6	#5	STR	40'-1"	251						
A202	6	#5	STR	37'-10"	237						

REINFORCING STEEL LBS. 21,885

✱ EPOXY COATED REINFORCING STEEL LBS. 19,366

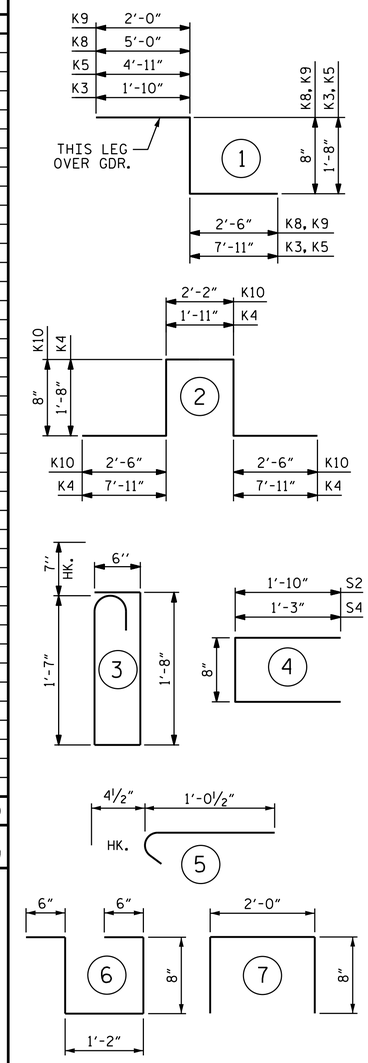
SPAN C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	96	#5	STR	42'-4"	4239	A203	6	#5	STR	35'-7"	223
A2	97	#5	STR	42'-4"	4283	A204	6	#5	STR	33'-4"	209
						A205	6	#5	STR	31'-1"	195
✱ A101	3	#5	STR	40'-2"	126	A206	6	#5	STR	28'-10"	180
✱ A102	3	#5	STR	37'-11"	119	A207	6	#5	STR	26'-7"	166
✱ A103	3	#5	STR	35'-8"	112	A208	6	#5	STR	24'-4"	152
✱ A104	3	#5	STR	33'-5"	105	A209	6	#5	STR	22'-1"	138
✱ A105	3	#5	STR	31'-2"	98	A210	6	#5	STR	19'-10"	124
✱ A106	3	#5	STR	28'-10"	90	A211	6	#5	STR	17'-7"	110
✱ A107	3	#5	STR	26'-7"	83	A212	6	#5	STR	15'-4"	96
✱ A108	3	#5	STR	24'-4"	76	A213	6	#5	STR	13'-1"	82
✱ A109	3	#5	STR	22'-1"	69	A214	6	#5	STR	10'-10"	68
✱ A110	3	#5	STR	19'-10"	62	A215	6	#5	STR	8'-7"	54
✱ A111	3	#5	STR	17'-7"	55	A216	6	#5	STR	6'-4"	40
✱ A112	3	#5	STR	15'-4"	48	A217	6	#5	STR	4'-1"	26
✱ A113	3	#5	STR	13'-1"	41						
✱ A114	3	#5	STR	10'-10"	34	✱ B2	90	#4	STR	22'-6"	1353
✱ A115	3	#5	STR	8'-7"	27	B4	106	#5	STR	33'-2"	3667
✱ A116	3	#5	STR	6'-4"	20	✱ B9	15	#4	STR	22'-3"	223
✱ A117	3	#5	STR	4'-1"	13						
✱ A118	3	#5	STR	39'-5"	123	✱ D1	144	#6	STR	5'-4"	1153
✱ A119	3	#5	STR	37'-2"	116	D2	144	#6	STR	4'-8"	1009
✱ A120	3	#5	STR	34'-11"	109						
✱ A121	3	#5	STR	32'-8"	102	✱ G1	2	#5	STR	48'-4"	101
✱ A122	3	#5	STR	30'-4"	95	✱ G6	63	#4	STR	5'-8"	238
✱ A123	3	#5	STR	28'-1"	88						
✱ A124	3	#5	STR	25'-10"	81	✱ J1	84	#4	5	1'-5"	79
✱ A125	3	#5	STR	23'-7"	74						
✱ A126	3	#5	STR	21'-4"	67	✱ K3	4	#8	1	11'-5"	122
✱ A127	3	#5	STR	19'-1"	60	✱ K4	12	#8	2	21'-1"	676
✱ A128	3	#5	STR	16'-10"	53	✱ K5	4	#8	1	14'-6"	155
✱ A129	3	#5	STR	14'-7"	46	✱ K7	24	#6	STR	8'-11"	321
✱ A130	3	#5	STR	12'-4"	39						
✱ A131	3	#5	STR	10'-1"	32	✱ S1	64	#5	3	4'-10"	323
✱ A132	3	#5	STR	7'-10"	25	✱ S2	32	#4	4	4'-4"	93
✱ A133	3	#5	STR	5'-7"	17	✱ S4	32	#4	4	3'-2"	68
✱ A134	3	#5	STR	3'-4"	10						
						✱ U1	18	#4	7	3'-4"	40
A201	6	#5	STR	40'-1"	251						
A202	6	#5	STR	37'-10"	237						

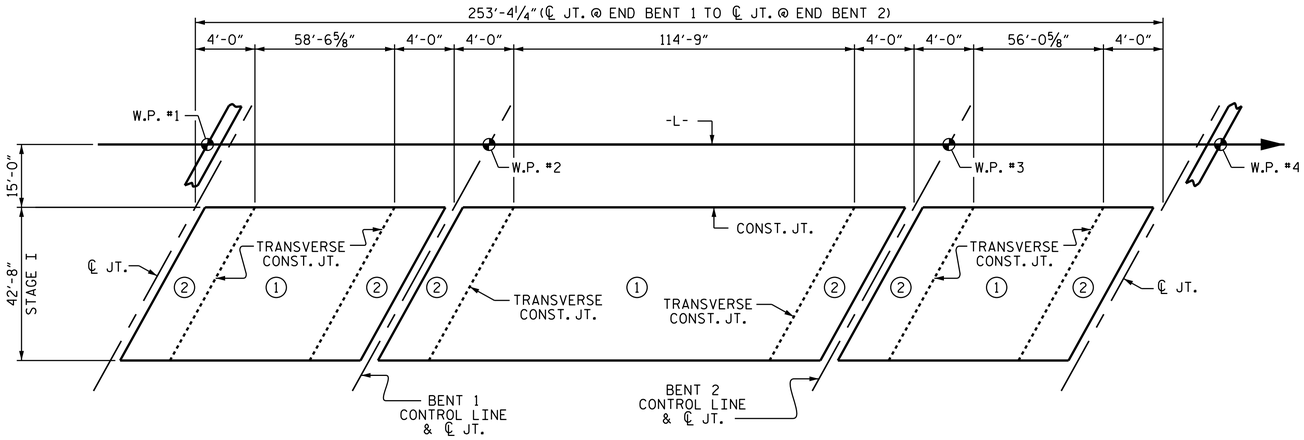
REINFORCING STEEL LBS. 11,310

✱ EPOXY COATED REINFORCING STEEL LBS. 11,359

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



POURING SEQUENCE

(#) INDICATES POUR NUMBER

SUPERSTRUCTURE BILL OF MATERIAL STAGE I

	CLASS AA CONCRETE (CU. YDS.)			REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
	POUR #1	POUR #2	SIDEWALK		
SPAN A	82.8	15.4	8.2	11,836	11,774
SPAN B	162.6	12.7	15.2	21,885	19,366
SPAN C	79.2	15.4	7.9	11,310	11,359
TOTALS ✱✱	324.6	43.5	31.3	45,031	42,499

✱✱ QUANTITIES FOR CLASSIC RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS STAGE I

	SQ.FT.
APPROACH SLABS	1,560
BRIDGE DECK	
SPAN A	2,155
SPAN B	4,007
SPAN C	2,072
TOTAL	9,794

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4644A...

2/19/2015

DRAWN BY : T. H. CARROLL DATE : 07/14/14
CHECKED BY : K. D. LAYNE DATE : 11/25/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

18-FEB-2015 14:03
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thcarroll

PROJECT NO. B-5136
CABARRUS COUNTY
STATION: 21+74.92 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BILL OF MATERIAL
STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS
2			4			75

REINFORCING BAR SCHEDULE FOR STAGE II

SPAN A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A2	150	#5	STR	5'-8"	887	✱ B1	66	#4	STR	23'-3"	1025
✱ A3	126	#5	STR	23'-8"	3110	B3	86	#5	STR	34'-2"	3065
A7	152	#5	STR	5'-8"	898						
A8	128	#5	STR	23'-8"	3160	✱ D1	301	#6	STR	5'-4"	2411
						D2	301	#6	STR	4'-8"	2110
✱ A135	4	#5	STR	4'-3"	18						
✱ A136	4	#5	STR	2'-9"	11	✱ G2	2	#5	STR	6'-5"	13
✱ A137	6	#5	STR	21'-6"	135	✱ G3	2	#5	STR	27'-0"	56
✱ A138	6	#5	STR	19'-3"	120						
✱ A139	6	#5	STR	17'-0"	106	✱ J1	68	#4	5	1'-5"	64
✱ A140	6	#5	STR	14'-9"	92						
✱ A141	6	#5	STR	12'-6"	78	✱ K2	4	#8	2	22'-9"	243
✱ A142	6	#5	STR	10'-2"	64	✱ K3	8	#8	1	12'-3"	262
✱ A143	6	#5	STR	7'-11"	50	✱ K6	12	#6	STR	10'-8"	192
✱ A144	6	#5	STR	5'-8"	35	✱ K15	4	#8	STR	6'-6"	69
✱ A145	6	#5	STR	3'-5"	21	✱ K17	6	#6	STR	6'-6"	59
A218	4	#5	STR	4'-2"	17	✱ S1	52	#5	3	4'-10"	262
A219	4	#5	STR	2'-8"	11	✱ S2	26	#4	4	4'-4"	75
A220	6	#5	STR	21'-5"	134	✱ S4	26	#4	4	3'-2"	55
A221	6	#5	STR	19'-2"	120						
A222	6	#5	STR	16'-11"	106						
A223	6	#5	STR	14'-8"	92						
A224	6	#5	STR	12'-5"	78						
A225	6	#5	STR	10'-2"	64						
A226	6	#5	STR	7'-11"	50						
A227	6	#5	STR	5'-8"	35						
A228	6	#5	STR	3'-5"	21						

REINFORCING STEEL LBS. 9,961

✱ EPOXY COATED REINFORCING STEEL LBS. 9,513

SPAN B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A2	285	#5	STR	5'-8"	1684	✱ B5	110	#4	STR	26'-1"	1917
✱ A3	261	#5	STR	23'-8"	6443	B6	129	#5	STR	42'-4"	5696
A7	287	#5	STR	5'-8"	1696						
A8	263	#5	STR	23'-8"	6492	✱ D1	570	#6	STR	5'-4"	4566
						D2	574	#6	STR	4'-8"	4023
✱ A135	4	#5	STR	4'-3"	18						
✱ A136	4	#5	STR	2'-9"	11	✱ G2	2	#5	STR	6'-5"	13
✱ A137	6	#5	STR	21'-6"	135	✱ G3	2	#5	STR	27'-0"	56
✱ A138	6	#5	STR	19'-3"	120						
✱ A139	6	#5	STR	17'-0"	106	✱ J1	68	#4	5	1'-5"	64
✱ A140	6	#5	STR	14'-9"	92						
✱ A141	6	#5	STR	12'-6"	78	✱ K9	8	#5	1	5'-2"	43
✱ A142	6	#5	STR	10'-2"	64	✱ K10	4	#5	2	8'-6"	35
✱ A143	6	#5	STR	7'-11"	50	✱ K12	8	#5	STR	12'-1"	101
✱ A144	6	#5	STR	5'-8"	35	✱ K13	4	#5	STR	8'-8"	36
✱ A145	6	#5	STR	3'-5"	21						
						✱ S3	52	#5	6	3'-6"	190
A218	4	#5	STR	4'-2"	17						
A219	4	#5	STR	2'-8"	11						
A220	6	#5	STR	21'-5"	134						
A221	6	#5	STR	19'-2"	120						
A222	6	#5	STR	16'-11"	106						
A223	6	#5	STR	14'-8"	92						
A224	6	#5	STR	12'-5"	78						
A225	6	#5	STR	10'-2"	64						
A226	6	#5	STR	7'-11"	50						
A227	6	#5	STR	5'-8"	35						
A228	6	#5	STR	3'-5"	21						

REINFORCING STEEL LBS. 18,635

✱ EPOXY COATED REINFORCING STEEL LBS. 15,878

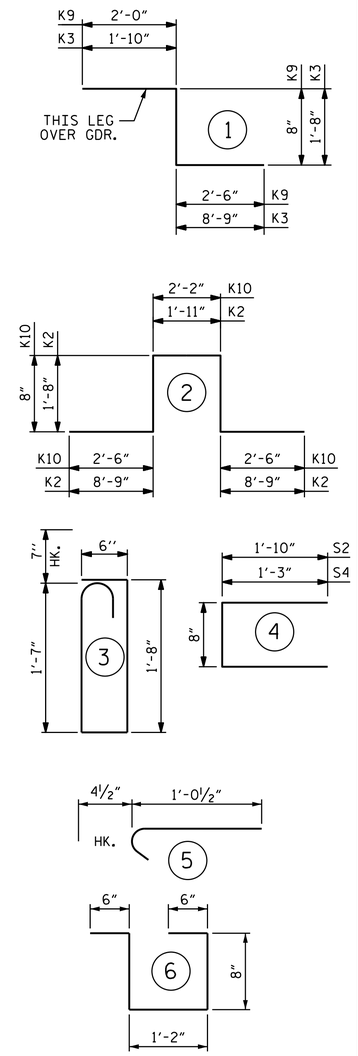
SPAN C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A2	144	#5	STR	5'-8"	851	✱ B2	66	#4	STR	22'-6"	992
✱ A3	120	#5	STR	23'-8"	2962	B4	86	#5	STR	33'-2"	2940
A7	146	#5	STR	5'-8"	863						
A8	122	#5	STR	23'-8"	3012	✱ D1	289	#6	STR	5'-4"	2315
						D2	289	#6	STR	4'-8"	2026
✱ A135	4	#5	STR	4'-3"	18						
✱ A136	4	#5	STR	2'-9"	11	✱ G2	2	#5	STR	6'-5"	13
✱ A137	6	#5	STR	21'-6"	135	✱ G3	2	#5	STR	27'-0"	56
✱ A138	6	#5	STR	19'-3"	120						
✱ A139	6	#5	STR	17'-0"	106	✱ J1	68	#4	5	1'-5"	64
✱ A140	6	#5	STR	14'-9"	92						
✱ A141	6	#5	STR	12'-6"	78	✱ K2	4	#8	2	22'-9"	243
✱ A142	6	#5	STR	10'-2"	64	✱ K3	8	#8	1	12'-3"	262
✱ A143	6	#5	STR	7'-11"	50	✱ K6	12	#6	STR	10'-8"	192
✱ A144	6	#5	STR	5'-8"	35	✱ K15	4	#8	STR	6'-6"	69
✱ A145	6	#5	STR	3'-5"	21	✱ K17	6	#6	STR	6'-6"	59
A218	4	#5	STR	4'-2"	17	✱ S1	52	#5	3	4'-11"	262
A219	4	#5	STR	2'-8"	11	✱ S2	26	#4	4	4'-4"	75
A220	6	#5	STR	21'-5"	134	✱ S4	26	#4	4	3'-2"	55
A221	6	#5	STR	19'-2"	120						
A222	6	#5	STR	16'-11"	106						
A223	6	#5	STR	14'-8"	92						
A224	6	#5	STR	12'-5"	78						
A225	6	#5	STR	10'-2"	64						
A226	6	#5	STR	7'-11"	50						
A227	6	#5	STR	5'-8"	35						
A228	6	#5	STR	3'-5"	21						

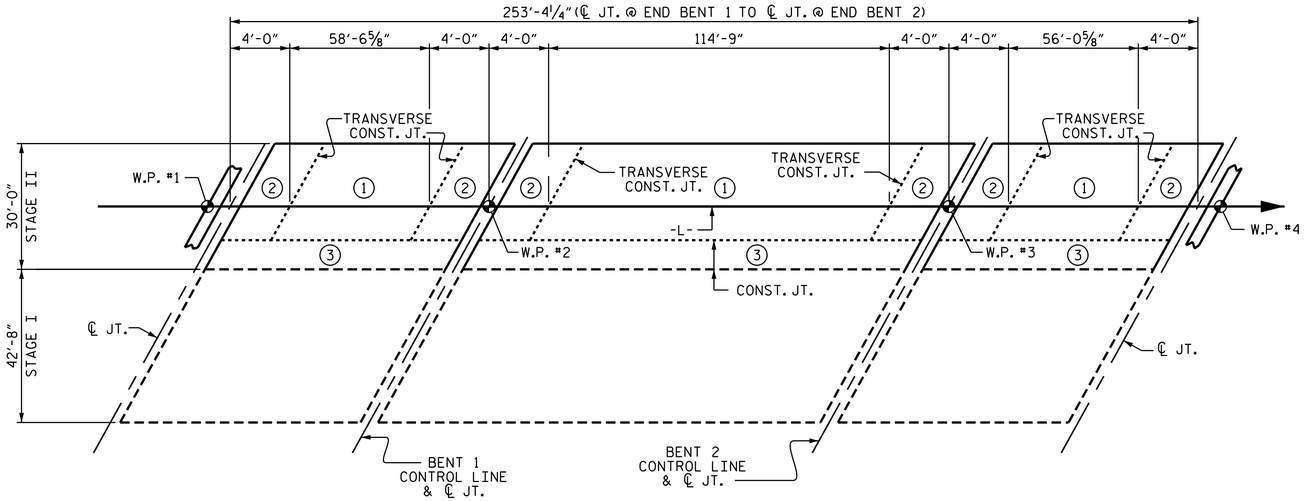
REINFORCING STEEL LBS. 9,569

✱ EPOXY COATED REINFORCING STEEL LBS. 9,200

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



POURING SEQUENCE

(#) INDICATES POUR NUMBER

SUPERSTRUCTURE BILL OF MATERIAL STAGE II

	CLASS AA CONCRETE (CU. YDS.)			REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
	POUR #1	POUR #2	POUR #3		
SPAN A	46.3	8.7	12.8	9,961	9,513
SPAN B	90.9	7.1	22.9	18,635	15,878
SPAN C	44.3	8.7	12.3	9,569	9,200
TOTALS ✱✱	181.5	24.5	48.0	38,165	34,591

✱✱ QUANTITIES FOR CLASSIC RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS STAGE II

	SQ.FT.
APPROACH SLABS	1,419
BRIDGE DECK	
SPAN A	1,959
SPAN B	3,643
SPAN C	1,883
TOTAL	8,904

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4F4A4... 2/19/2015

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BILL OF MATERIAL
STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : T. H. CARROLL DATE : 07/14/14
CHECKED BY : K. D. LAYNE DATE : 11/25/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

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thcarroll

REINFORCING BAR SCHEDULE FOR STAGE III

SPAN A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A4	152	#5	STR	4′-8″	740
✱ A5	109	#5	STR	37′-4″	4244
A9	153	#5	STR	4′-8″	745
A10	110	#5	STR	37′-4″	4283
✱ A147	4	#5	STR	3′-3″	14
✱ A148	3	#5	STR	34′-5″	108
✱ A149	3	#5	STR	32′-2″	101
✱ A150	3	#5	STR	29′-11″	94
✱ A151	3	#5	STR	27′-8″	87
✱ A152	3	#5	STR	25′-4″	79
✱ A153	3	#5	STR	23′-1″	72
✱ A154	3	#5	STR	20′-10″	65
✱ A155	3	#5	STR	18′-7″	58
✱ A156	3	#5	STR	16′-4″	51
✱ A157	3	#5	STR	14′-1″	44
✱ A158	3	#5	STR	11′-10″	37
✱ A159	3	#5	STR	9′-7″	30
✱ A160	3	#5	STR	7′-4″	23
✱ A161	3	#5	STR	5′-1″	16
✱ A162	3	#5	STR	2′-10″	9
✱ A163	3	#5	STR	35′-2″	110
✱ A164	3	#5	STR	32′-11″	103
✱ A165	3	#5	STR	30′-8″	96
✱ A166	3	#5	STR	28′-5″	89
✱ A167	3	#5	STR	26′-2″	82
✱ A168	3	#5	STR	23′-10″	75
✱ A169	3	#5	STR	21′-7″	68
✱ A170	3	#5	STR	19′-4″	60
✱ A171	3	#5	STR	17′-1″	53
✱ A172	3	#5	STR	14′-10″	46
✱ A173	3	#5	STR	12′-7″	39
✱ A174	3	#5	STR	10′-4″	32
✱ A175	3	#5	STR	8′-1″	25
✱ A176	3	#5	STR	5′-10″	18
✱ A177	3	#5	STR	3′-7″	11
A229	4	#5	STR	3′-2″	13
A230	6	#5	STR	35′-1″	220
A231	6	#5	STR	32′-10″	205

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A232	6	#5	STR	30′-7″	191
A233	6	#5	STR	28′-4″	177
A234	6	#5	STR	26′-1″	163
A235	6	#5	STR	23′-10″	149
A236	6	#5	STR	21′-7″	135
✱ A237	6	#5	STR	19′-4″	121
✱ A238	6	#5	STR	17′-1″	107
✱ A239	6	#5	STR	14′-10″	93
✱ A240	6	#5	STR	12′-7″	79
✱ A241	6	#5	STR	10′-4″	65
✱ A242	6	#5	STR	8′-1″	51
✱ A243	6	#5	STR	5′-10″	37
✱ A244	6	#5	STR	3′-7″	22
✱ B1	93	#4	STR	23′-3″	1444
B3	126	#5	STR	34′-2″	4490
✱ B7	15	#4	STR	23′-1″	231
✱ D1	150	#6	STR	5′-4″	1202
D2	150	#6	STR	4′-8″	1051
✱ G4	2	#5	STR	5′-4″	11
✱ G5	2	#5	STR	42′-8″	89
✱ G6	66	#4	STR	5′-8″	250
✱ J1	84	#4	5	1′-5″	79
✱ K1	4	#8	1	15′-4″	164
✱ K2	8	#8	2	22′-9″	486
✱ K3	4	#8	1	11′-3″	120
✱ K6	18	#6	STR	10′-8″	288
✱ K16	4	#8	STR	5′-4″	57
✱ K18	6	#6	STR	5′-4″	48
✱ S1	70	#5	3	4′-10″	353
✱ S2	35	#4	4	4′-4″	101
✱ S4	35	#4	4	3′-2″	74
✱ U1	20	#4	7	3′-4″	45

REINFORCING STEEL LBS. 12,397

✱ EPOXY COATED REINFORCING STEEL LBS. 11,821

SPAN B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A4	287	#5	STR	4′-8″	1397
✱ A5	244	#5	STR	37′-4″	9501
A9	288	#5	STR	4′-8″	1402
A10	245	#5	STR	37′-4″	9540
✱ A147	4	#5	STR	3′-3″	14
✱ A148	3	#5	STR	34′-5″	108
✱ A149	3	#5	STR	32′-2″	101
✱ A150	3	#5	STR	29′-11″	94
✱ A151	3	#5	STR	27′-8″	87
✱ A152	3	#5	STR	25′-4″	79
✱ A153	3	#5	STR	23′-1″	72
✱ A154	3	#5	STR	20′-10″	65
✱ A155	3	#5	STR	18′-7″	58
✱ A156	3	#5	STR	16′-4″	51
✱ A157	3	#5	STR	14′-1″	44
✱ A158	3	#5	STR	11′-10″	37
✱ A159	3	#5	STR	9′-7″	30
✱ A160	3	#5	STR	7′-4″	23
✱ A161	3	#5	STR	5′-1″	16
✱ A162	3	#5	STR	2′-10″	9
✱ A163	3	#5	STR	35′-2″	110
✱ A164	3	#5	STR	32′-11″	103
✱ A165	3	#5	STR	30′-8″	96
✱ A166	3	#5	STR	28′-5″	89
✱ A167	3	#5	STR	26′-2″	82
✱ A168	3	#5	STR	23′-10″	75
✱ A169	3	#5	STR	21′-7″	68
✱ A170	3	#5	STR	19′-4″	60
✱ A171	3	#5	STR	17′-1″	53
✱ A172	3	#5	STR	14′-10″	46
✱ A173	3	#5	STR	12′-7″	39
✱ A174	3	#5	STR	10′-4″	32
✱ A175	3	#5	STR	8′-1″	25
✱ A176	3	#5	STR	5′-10″	18
✱ A177	3	#5	STR	3′-7″	11
A229	4	#5	STR	3′-2″	13
A230	6	#5	STR	35′-1″	220
A231	6	#5	STR	32′-10″	205

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A232	6	#5	STR	30′-7″	191
A233	6	#5	STR	28′-4″	177
A234	6	#5	STR	26′-1″	163
A235	6	#5	STR	23′-10″	149
A236	6	#5	STR	21′-7″	135
A237	6	#5	STR	19′-4″	121
A238	6	#5	STR	17′-1″	107
A239	6	#5	STR	14′-10″	93
A240	6	#5	STR	12′-7″	79
A241	6	#5	STR	10′-4″	65
A242	6	#5	STR	8′-1″	51
A243	6	#5	STR	5′-10″	37
A244	6	#5	STR	3′-7″	22
✱ B5	155	#4	STR	26′-1″	2701
B6	189	#5	STR	42′-4″	8345
✱ B8	25	#4	STR	25′-11″	433
✱ D1	284	#6	STR	5′-4″	2275
D2	286	#6	STR	4′-8″	2005
✱ G4	2	#5	STR	5′-4″	11
✱ G5	2	#5	STR	42′-8″	89
✱ G6	122	#4	STR	5′-8″	462
✱ J1	84	#4	5	1′-5″	79
✱ K8	4	#5	1	8′-2″	34
✱ K9	4	#5	1	5′-2″	22
✱ K10	8	#5	2	8′-6″	71
✱ K12	12	#5	STR	12′-1″	151
✱ K14	4	#5	STR	7′-6″	31
✱ S3	70	#5	6	3′-6″	256
✱ U1	36	#4	7	3′-4″	80

REINFORCING STEEL LBS. 23,120

✱ EPOXY COATED REINFORCING STEEL LBS. 19,388

SPAN C

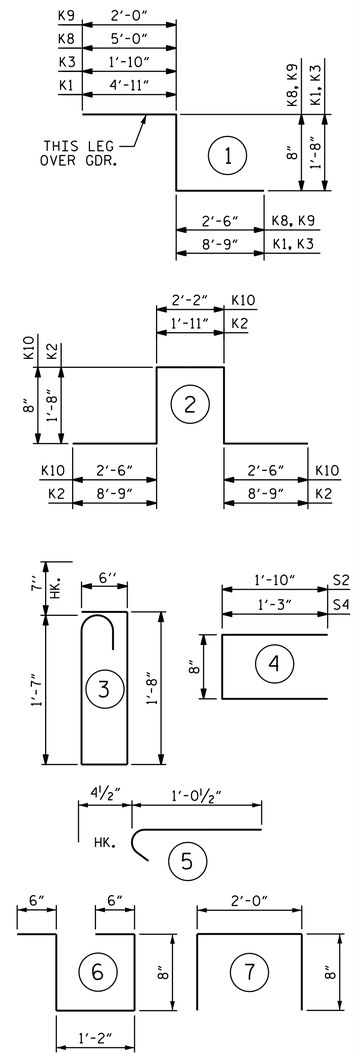
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A4	146	#5	STR	4′-8″	711
✱ A5	103	#5	STR	37′-4″	4011
A9	147	#5	STR	4′-8″	716
A10	104	#5	STR	37′-4″	4050
✱ A147	4	#5	STR	3′-3″	14
✱ A148	3	#5	STR	34′-5″	108
✱ A149	3	#5	STR	32′-2″	101
✱ A150	3	#5	STR	29′-11″	94
✱ A151	3	#5	STR	27′-8″	87
✱ A152	3	#5	STR	25′-4″	79
✱ A153	3	#5	STR	23′-1″	72
✱ A154	3	#5	STR	20′-10″	65
✱ A155	3	#5	STR	18′-7″	58
✱ A156	3	#5	STR	16′-4″	51
✱ A157	3	#5	STR	14′-1″	44
✱ A158	3	#5	STR	11′-10″	37
✱ A159	3	#5	STR	9′-7″	30
✱ A160	3	#5	STR	7′-4″	23
✱ A161	3	#5	STR	5′-1″	16
✱ A162	3	#5	STR	2′-10″	9
✱ A163	3	#5	STR	35′-2″	110
✱ A164	3	#5	STR	32′-11″	103
✱ A165	3	#5	STR	30′-8″	96
✱ A166	3	#5	STR	28′-5″	89
✱ A167	3	#5	STR	26′-2″	82
✱ A168	3	#5	STR	23′-10″	75
✱ A169	3	#5	STR	21′-7″	68
✱ A170	3	#5	STR	19′-4″	60
✱ A171	3	#5	STR	17′-1″	53
✱ A172	3	#5	STR	14′-10″	46
✱ A173	3	#5	STR	12′-7″	39
✱ A174	3	#5	STR	10′-4″	32
✱ A175	3	#5	STR	8′-1″	25
✱ A176	3	#5	STR	5′-10″	18
✱ A177	3	#5	STR	3′-7″	11
A229	4	#5	STR	3′-2″	13
A230	6	#5	STR	35′-1″	220
A231	6	#5	STR	32′-10″	205

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A232	6	#5	STR	30′-7″	191
A233	6	#5	STR	28′-4″	177
A234	6	#5	STR	26′-1″	163
A235	6	#5	STR	23′-10″	149
A236	6	#5	STR	21′-7″	135
A237	6	#5	STR	19′-4″	121
A238	6	#5	STR	17′-1″	107
A239	6	#5	STR	14′-10″	93
A240	6	#5	STR	12′-7″	79
A241	6	#5	STR	10′-4″	65
A242	6	#5	STR	8′-1″	51
A243	6	#5	STR	5′-10″	37
A244	6	#5	STR	3′-7″	22
✱ B2	93	#4	STR	22′-6″	1398
B4	126	#5	STR	33′-2″	4359
✱ B9	15	#4	STR	22′-3″	223
✱ D1	145	#6	STR	5′-4″	1161
D2	145	#6	STR	4′-8″	1016
✱ G4	2	#5	STR	5′-4″	11
✱ G5	2	#5	STR	42′-8″	89
✱ G6	63	#4	STR	5′-8″	238
✱ J1	84	#4	5	1′-5″	79
✱ K1	4	#8	1	15′-4″	164
✱ K2	8	#8	2	22′-9″	486
✱ K3	4	#8	1	11′-3″	120
✱ K6	18	#6	STR	10′-8″	288
✱ K16	4	#8	STR	5′-4″	57
✱ K18	6	#6	STR	5′-4″	48
✱ S1	70	#5	3	4′-10″	353
✱ S2	35	#4	4	4′-4″	101
✱ S4	35	#4	4	3′-2″	74
✱ U1	18	#4	7	3′-4″	40

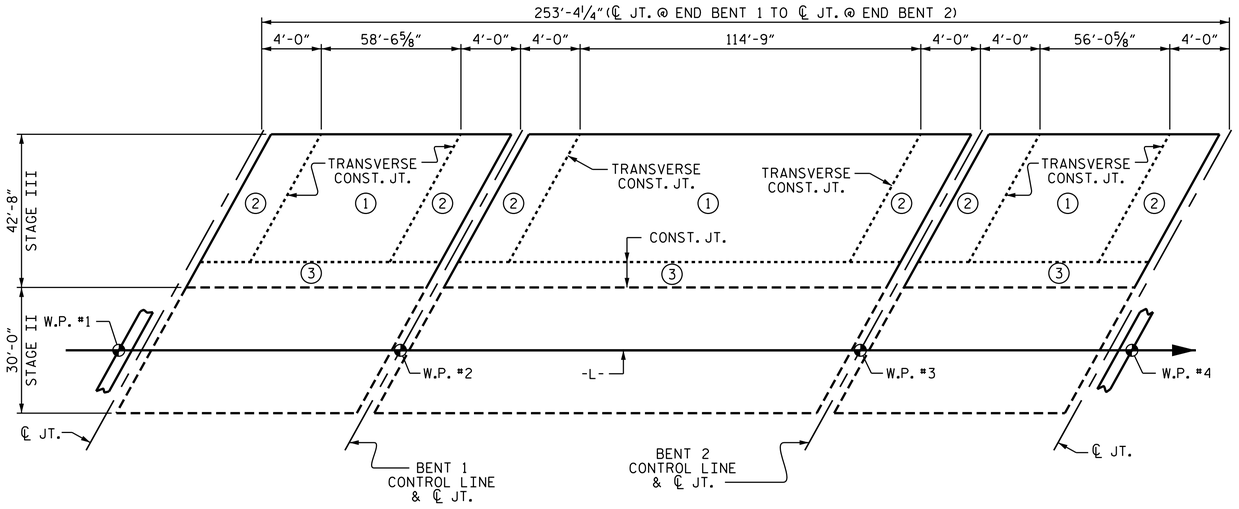
REINFORCING STEEL LBS. 11,968

✱ EPOXY COATED REINFORCING STEEL LBS. 11,447

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



POURING SEQUENCE

(#) INDICATES POUR NUMBER

SUPERSTRUCTURE BILL OF MATERIAL STAGE III

	CLASS AA CONCRETE (CU. YDS.)				REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
	POUR #1	POUR #2	POUR #3	SIDEWALK		
SPAN A	73.0	13.6	10.7	8.2	12,397	11,821
SPAN B	143.4	11.2	18.9	15.2	23,120	19,388
SPAN C	69.9	13.6	10.3	7.9	11,968	11,447
TOTALS ✱✱	286.3	38.4	39.9	31.3	47,485	42,656

✱✱ QUANTITIES FOR CLASSIC RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS STAGE III

	SQ.FT.
APPROACH SLABS	1,702
BRIDGE DECK	
SPAN A	2,351
SPAN B	4,371
SPAN C	2,260
TOTAL	10,684

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

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PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BILL OF MATERIAL
STAGE III

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : T. H. CARROLL DATE : 07/14/14
CHECKED BY : K. D. LAYNE DATE : 11/25/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

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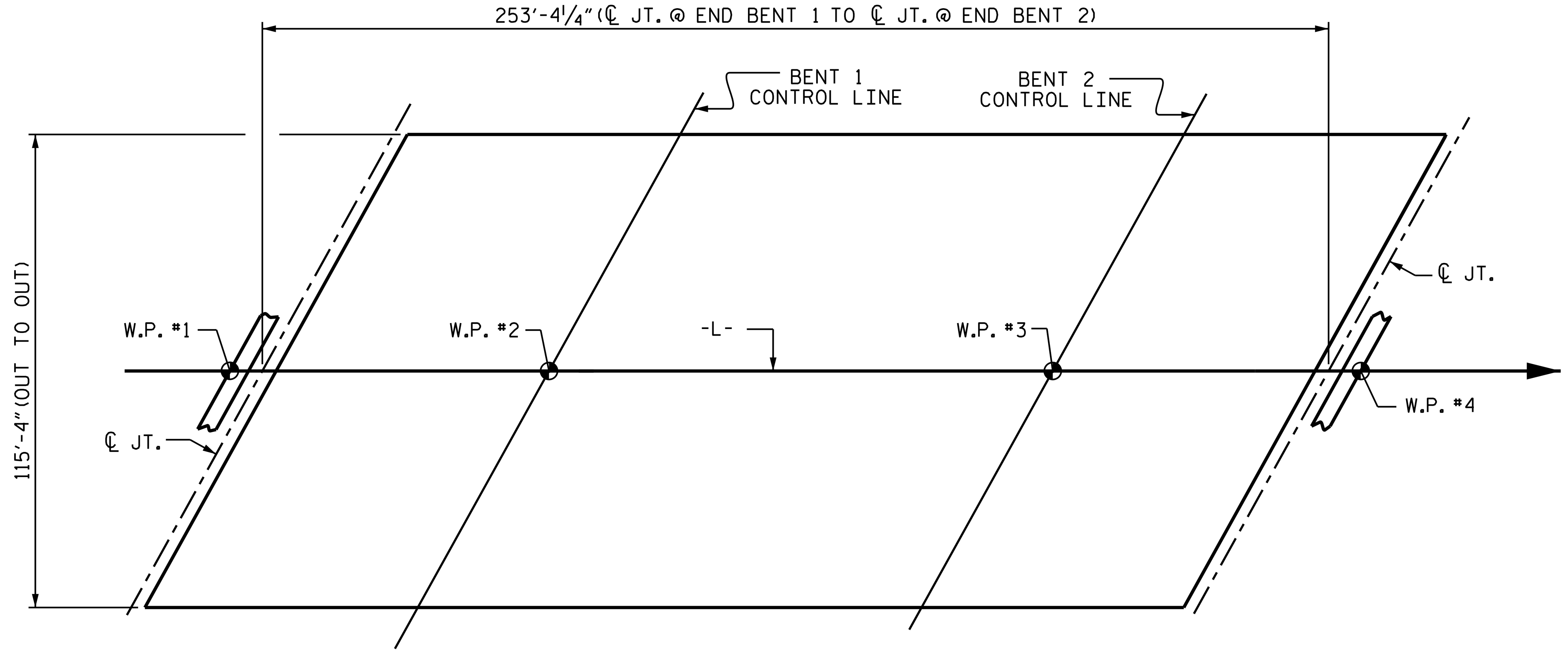
REINFORCING BAR SCHEDULE FOR STAGE IV					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B7	48	#4	STR	23'-1"	740
* B8	80	#4	STR	25'-11"	1385
* B9	48	#4	STR	22'-3"	713
* G7	167	#4	STR	21'-8"	2417
* EPOXY COATED REINFORCING STEEL				LBS.	5,255
CLASS AA CONCRETE				CU. YDS.	77.7



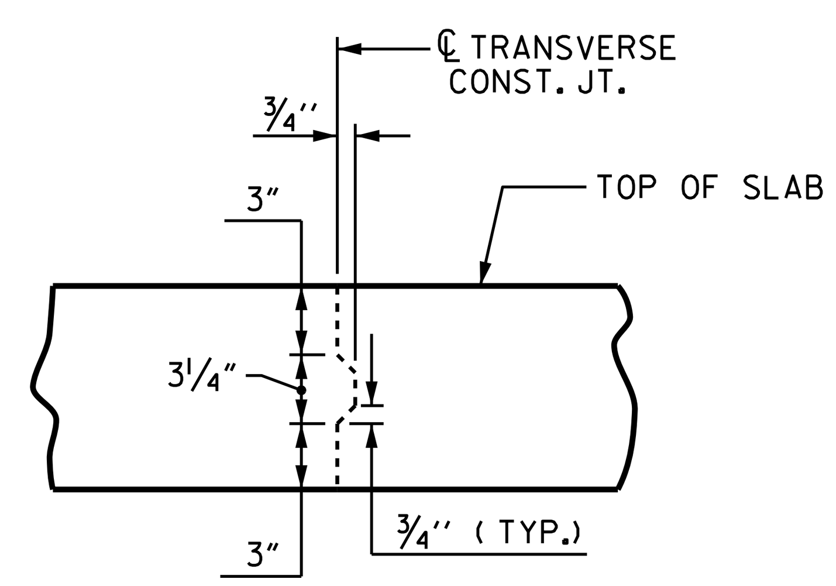
LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB

(STAGE I - SQ. FT. = 10,810)
(STAGE II - SQ. FT. = 7,600)
(STAGE III - SQ. FT. = 10,810)
(TOTAL - SQ. FT. = 29,220)

SUPERSTRUCTURE BILL OF MATERIAL	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
SPAN A	279.7	34,194	33,108
SPAN B	500.1	63,640	54,632
SPAN C	269.5	32,847	32,006
CONCRETE ISLAND	77.7		5,255
TOTALS **	1,127.00	130,681	125,001

** QUANTITIES FOR CLASSIC RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS	SQ.FT.
APPROACH SLABS	4,681
BRIDGE DECK	
SPAN A	6,465
SPAN B	12,021
SPAN C	6,215
TOTAL	29,382



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

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"			

PROJECT NO. B-5136
CABARRUS COUNTY
STATION: 21+74.92 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BILL OF MATERIAL
STAGE IV

DocuSigned by: Vipul A. Patel
5/28/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : T. H. CARROLL DATE : 7/14/14
CHECKED BY : K. D. LAYNE DATE : 11/25/14
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/5/15

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NOTES

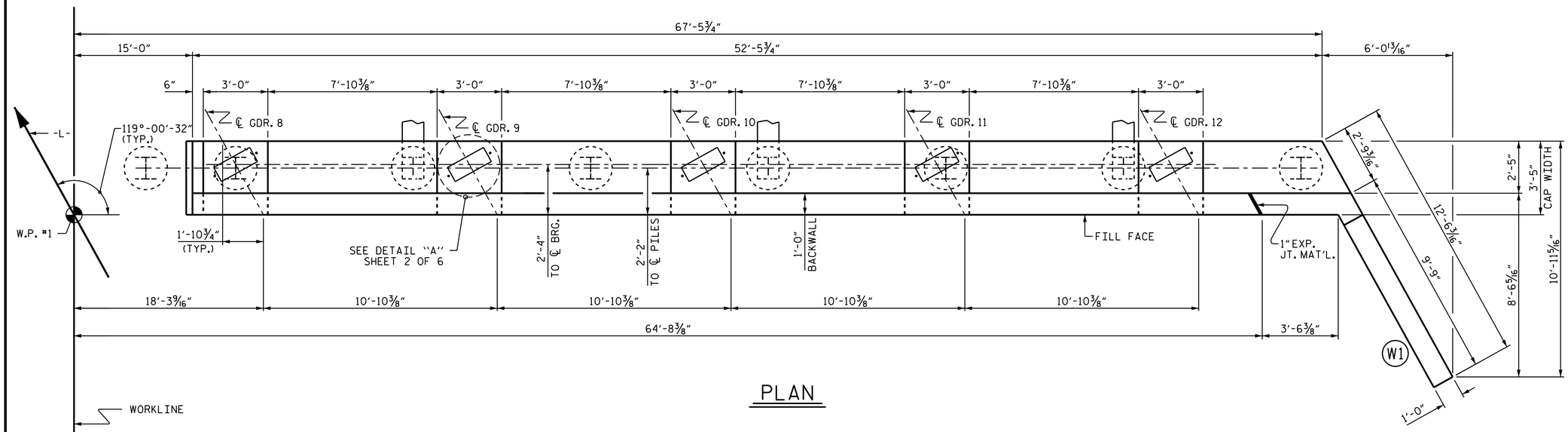
STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

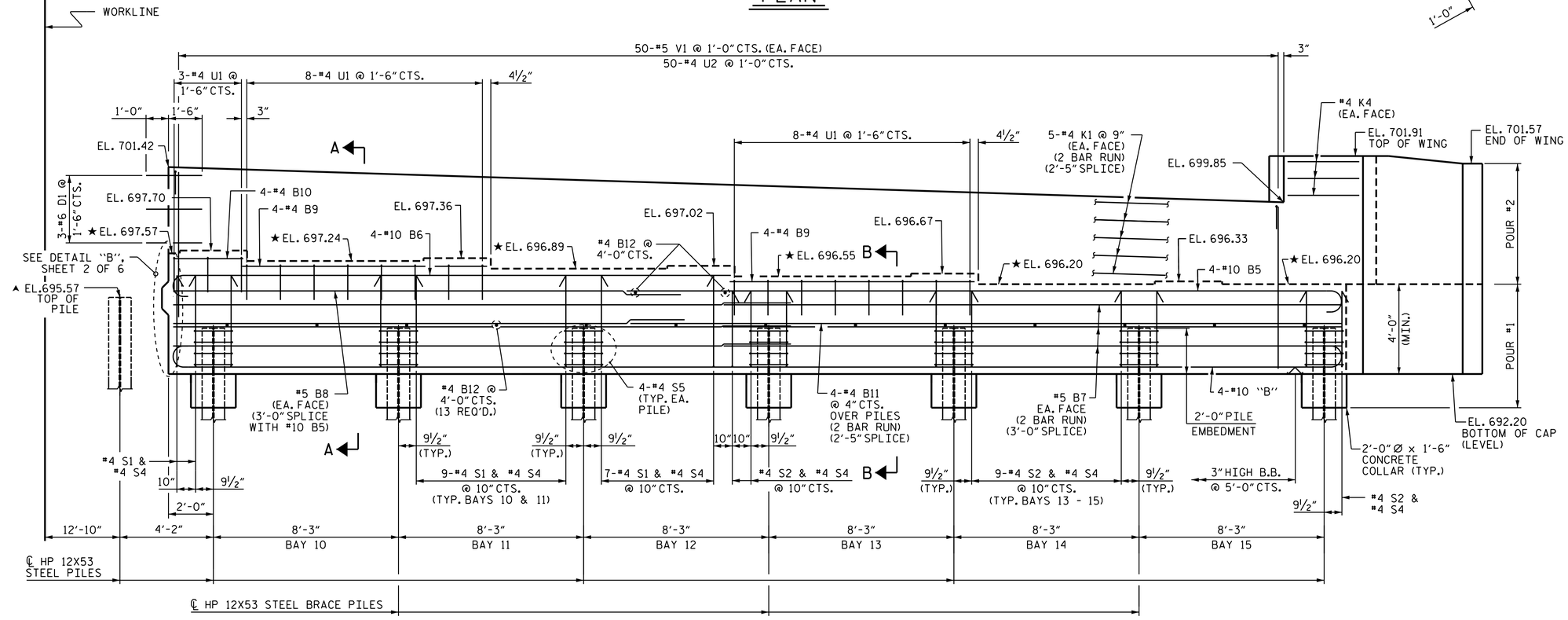
THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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



PLAN



ELEVATION

▲ DRIVE END PILE WITH STAGE I
★ ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS ARE SHOWN AT THIS POINT (TYP.)

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

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PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : M.E. GILES DATE : 8/4/14
CHECKED BY : M.K. BEARD DATE : 10/16/14
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 10/16/14

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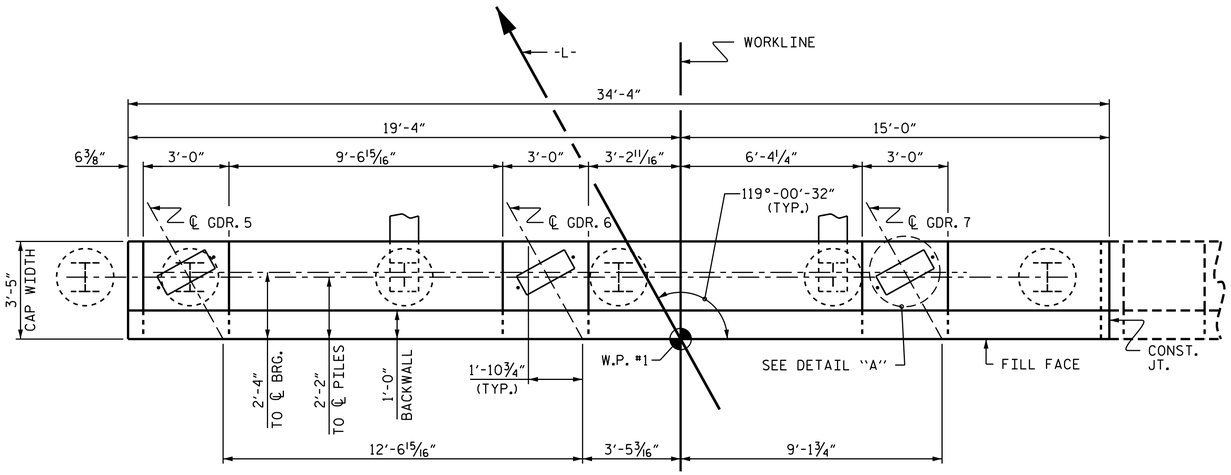
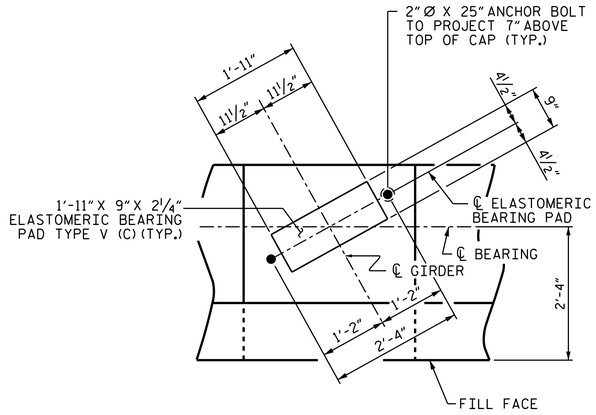
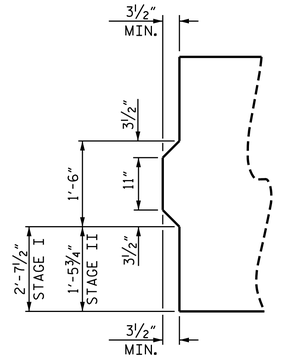


PLAN



DETAIL "A"



DETAIL "B"

ELEVATION

▲ DRIVE END PILE WITH STAGE II
★ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS ARE SHOWN AT THIS POINT (TYP.)

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4... 2/19/2015

DRAWN BY :	M.E. GILES	DATE :	8/4/14
CHECKED BY :	M.K. BEARD	DATE :	10/16/14
DESIGN ENGINEER OF RECORD:	H.A. LOCKLEAR	DATE :	10/16/14

18-FEB-2015 14:04
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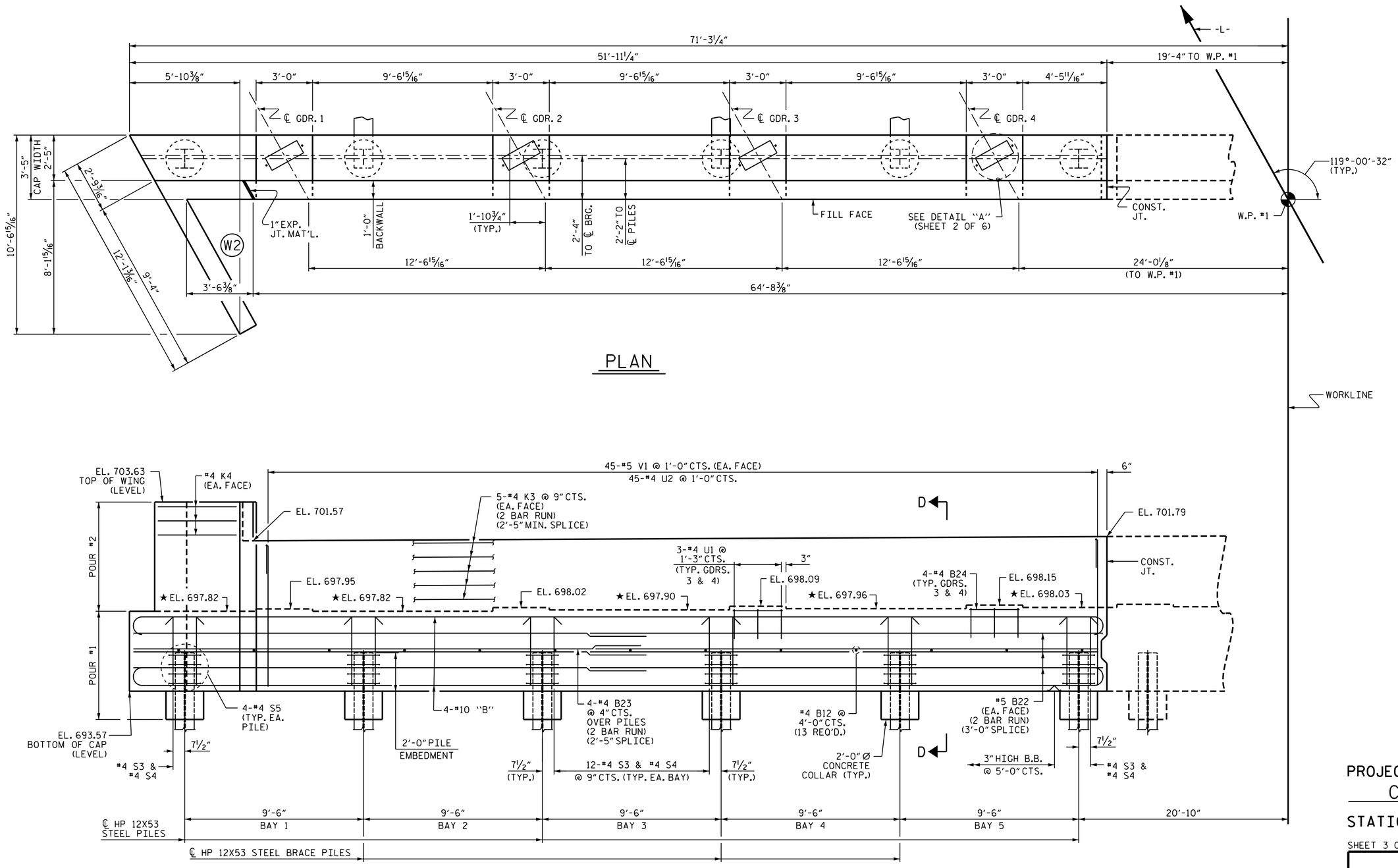

PLAN

ELEVATION

★ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS ARE SHOWN AT THIS POINT (TYP.)

DRAWN BY : M.E. GILES DATE : 8/4/2014
CHECKED BY : M.K. BEARD DATE : 10/16/14
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 10/16/14

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NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4644A... 2/19/2015

PROJECT NO. B-5136
CABARRUS COUNTY
STATION: 21+74.92 -L-
SHEET 3 OF 6

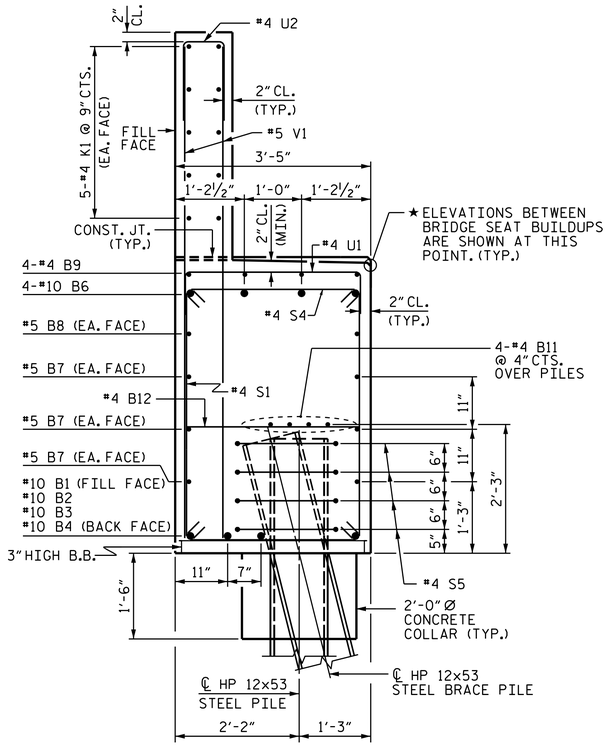
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

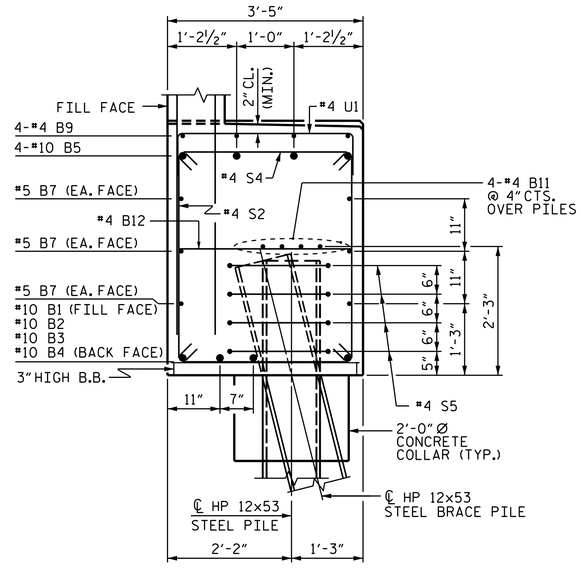
STAGE III

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-52
1			3			TOTAL SHEETS
2			4			75



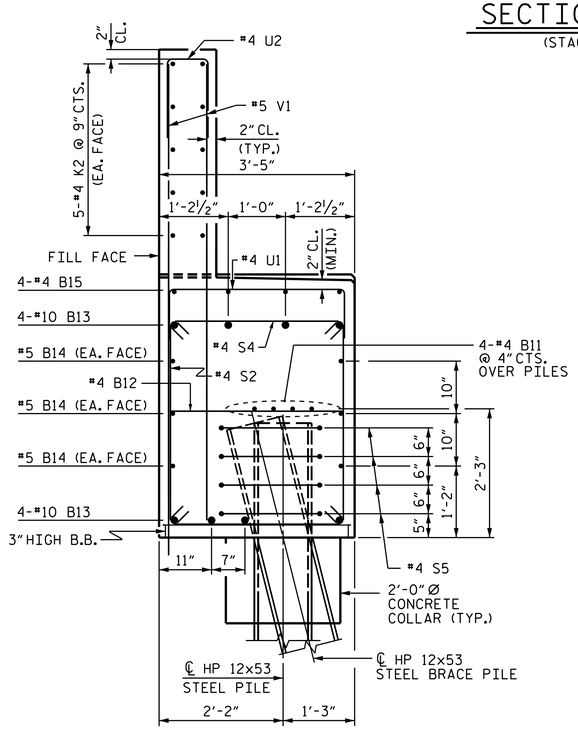
SECTION A-A

(STAGE I)



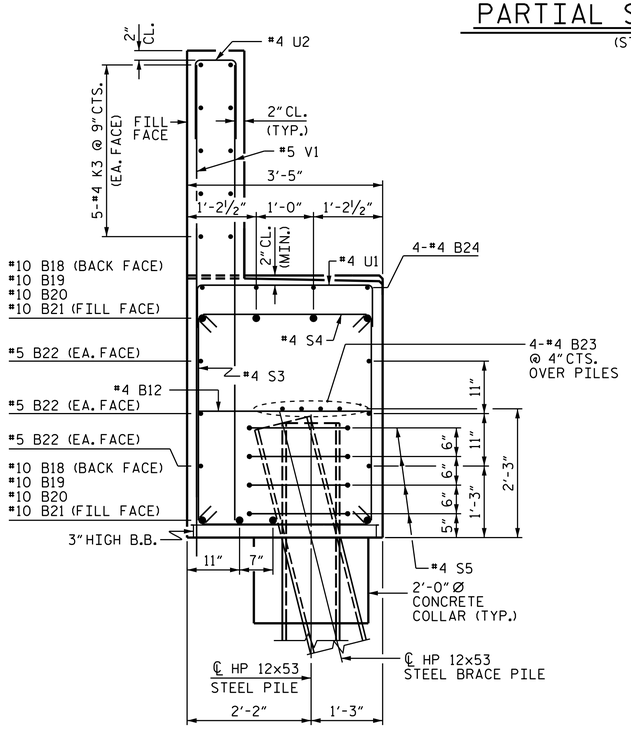
PARTIAL SECTION B-B

(STAGE I)



SECTION C-C

(STAGE II)



SECTION D-D

(STAGE III)

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

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DRAWN BY :	M.E.GILES	DATE :	8/4/14
CHECKED BY :	M.K. BEARD	DATE :	10/16/14
DESIGN ENGINEER OF RECORD:	H.A. LOCKLEAR	DATE :	10/16/14

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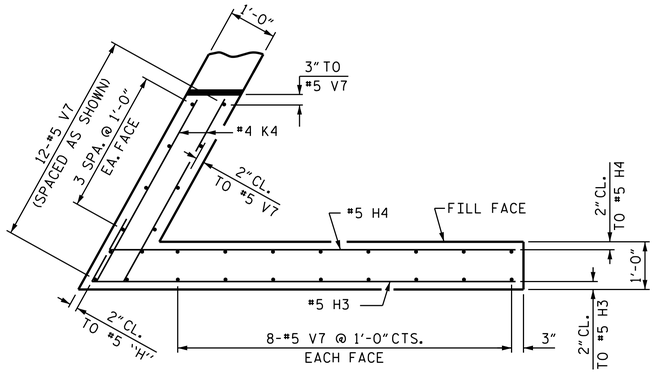
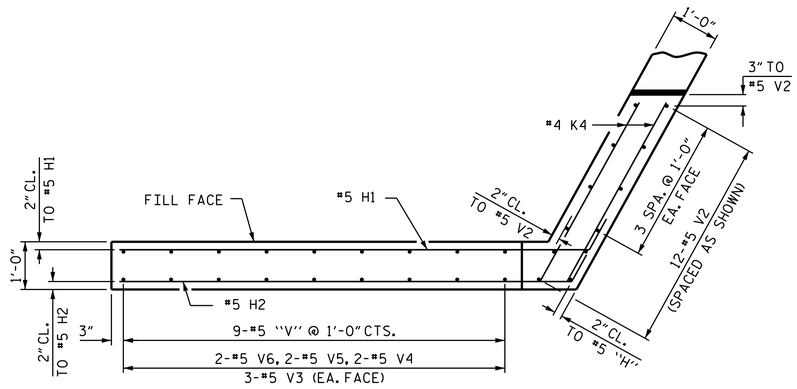
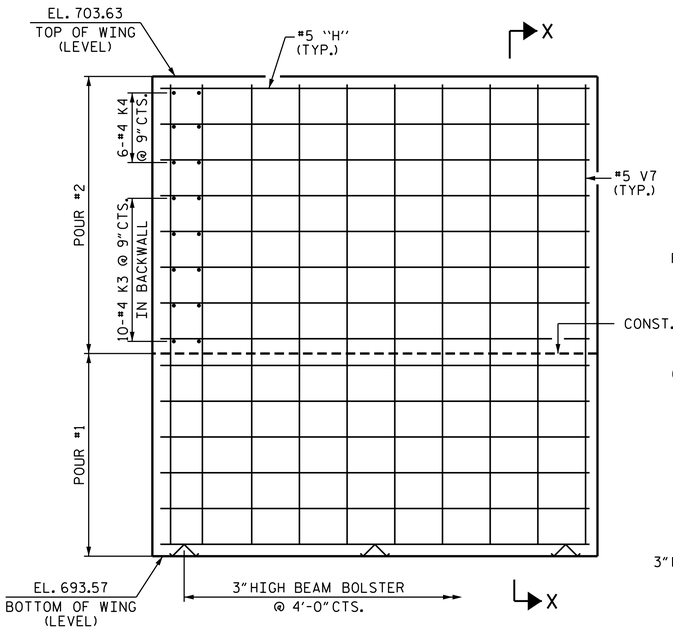


PLAN OF LEFT WING (W2)

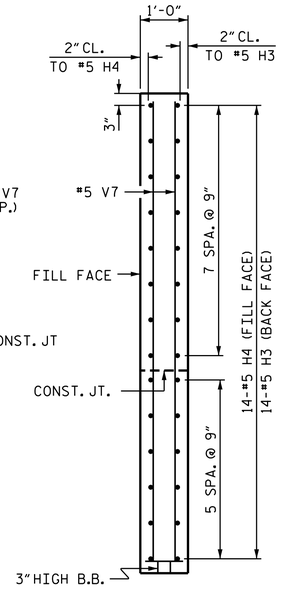


PLAN OF RIGHT WING (W1)



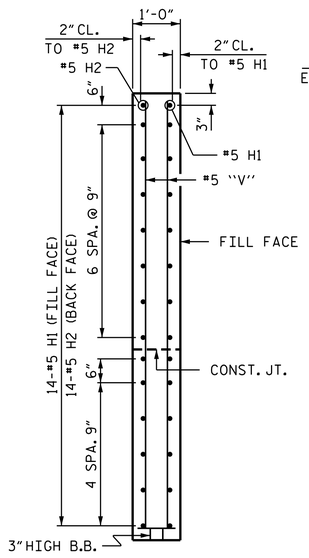
ELEVATION OF LEFT WING (W2)

(STAGE III)



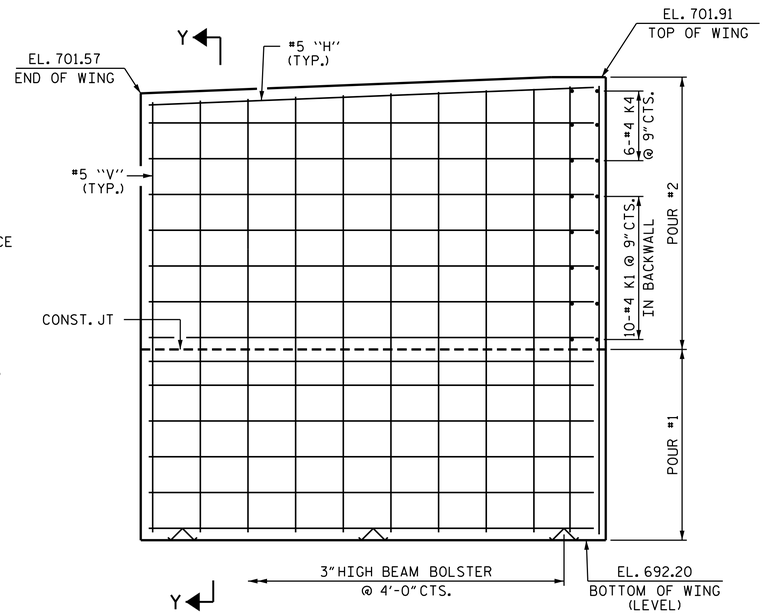
SECTION X-X

(STAGE III)



SECTION Y-Y

(STAGE I)



ELEVATION OF RIGHT WING (W1)

(STAGE I)

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-54
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D464A4... 2/19/2015

DRAWN BY : M.E.GILES DATE : 8/4/14
CHECKED BY : M.K. BEARD DATE : 10/16/14
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 10/16/14

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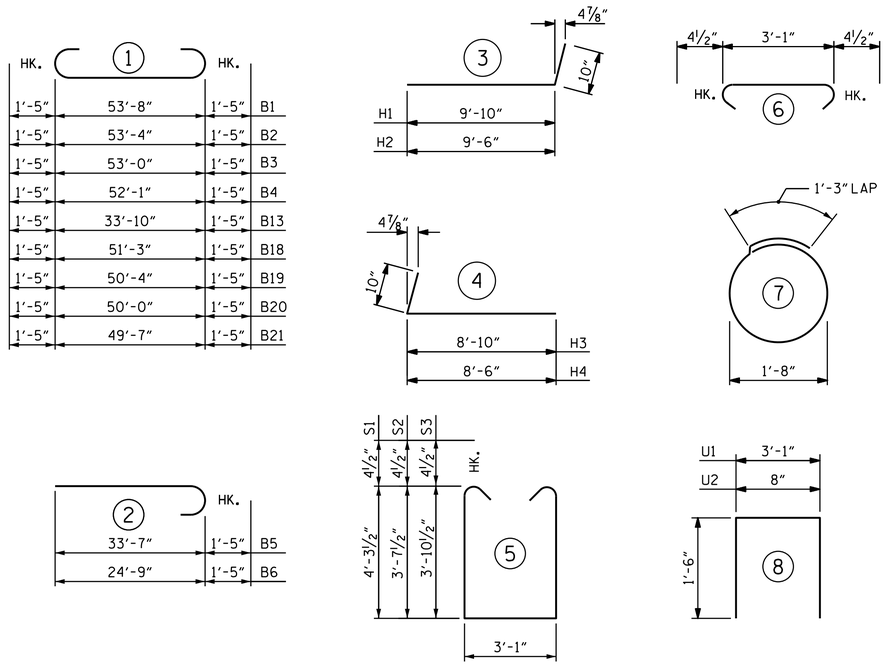
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	1	10	1	54'-11"	236
B2	1	10	1	55'-10"	240
B3	1	10	1	56'-2"	242
B4	1	10	1	56'-6"	243
B5	4	10	2	35'-0"	602
B6	4	10	2	26'-2"	450
B7	12	5	STR	28'-6"	357
B8	2	5	STR	21'-9"	45
B9	8	4	STR	10'-8"	57
B10	4	4	STR	3'-2"	8
B11	8	4	STR	27'-6"	147
B12	15	4	STR	3'-1"	31
D1	3	6	STR	2'-6"	11
H1	14	5	3	10'-8"	156
H2	14	5	3	10'-4"	151
K1	20	4	STR	28'-3"	377
K4	6	4	STR	4'-4"	17
S1	27	4	5	12'-5"	224
S2	30	4	5	11'-1"	222
S4	57	4	6	3'-10"	146
S5	28	4	7	6'-6"	122
U1	19	4	8	6'-1"	77
U2	50	4	8	3'-8"	122
V1	100	5	STR	7'-3"	756
V2	12	5	STR	9'-4"	117
V3	6	5	STR	9'-3"	58
V4	4	5	STR	9'-2"	38
V5	4	5	STR	9'-1"	38
V6	4	5	STR	9'-0"	38

REINFORCING STEEL LBS. 5,330

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WING W1 & COLLARS	C.Y. 33.2
POUR #2	BACKWALL & UPPER PART OF WING W1	C.Y. 9.9
TOTAL		C.Y. 43.1

HP 12X53 STEEL PILES NO. 8 LIN. FT. 680

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B12	9	4	STR	3'-1"	19
B13	8	10	1	36'-8"	1262
B14	6	5	STR	33'-8"	211
B15	4	4	STR	12'-6"	33
B16	4	4	STR	15'-9"	42
B17	8	4	STR	18'-3"	98
D1	3	6	STR	2'-6"	11
K2	20	4	STR	18'-3"	244
S2	40	4	5	11'-1"	296
S4	40	4	6	3'-10"	102
S5	20	4	7	6'-6"	87
U1	20	4	8	6'-1"	81
U2	34	4	8	3'-8"	83
V1	68	5	STR	7'-3"	514

REINFORCING STEEL LBS. 3,083

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP & COLLARS	C.Y. 20.0
POUR #2	BACKWALL	C.Y. 4.9
TOTAL		C.Y. 24.9

HP 12X53 STEEL PILES NO. 5 LIN. FT. 405

STAGE III

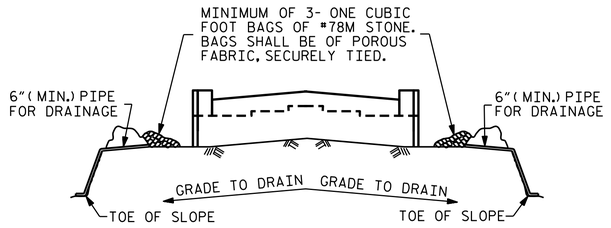
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B12	13	4	STR	3'-1"	27
B18	2	10	1	54'-1"	465
B19	2	10	1	53'-2"	458
B20	2	10	1	52'-10"	455
B21	2	10	1	52'-5"	451
B22	12	5	STR	27'-3"	341
B23	8	4	STR	26'-10"	143
B24	8	4	STR	2'-8"	14
H3	14	5	4	9'-8"	141
H4	14	5	4	9'-4"	136
K3	20	4	STR	26'-4"	352
K4	6	4	STR	4'-4"	17
S3	62	4	5	11'-7"	480
S4	62	4	6	3'-10"	159
S5	24	4	7	6'-6"	104
U1	6	4	8	6'-1"	24
U2	45	4	8	3'-8"	110
V1	90	5	STR	7'-3"	681
V7	28	5	STR	9'-8"	282

REINFORCING STEEL LBS. 4,840

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WING W2 & COLLARS	C.Y. 30.5
POUR #2	BACKWALL & UPPER PART OF WING W2	C.Y. 9.0
TOTAL		C.Y. 39.5

HP 12X53 STEEL PILES NO. 5 LIN. FT. 400

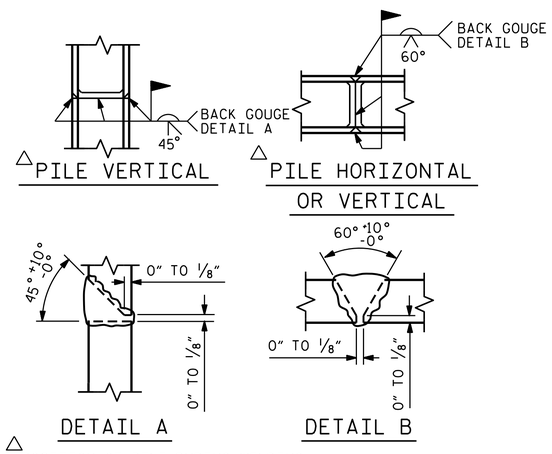


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-55
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4A4 2/19/2015

DRAWN BY : M.E.GILES DATE : 8/4/14
CHECKED BY : M.K. BEARD DATE : 10/16/14
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 10/16/14

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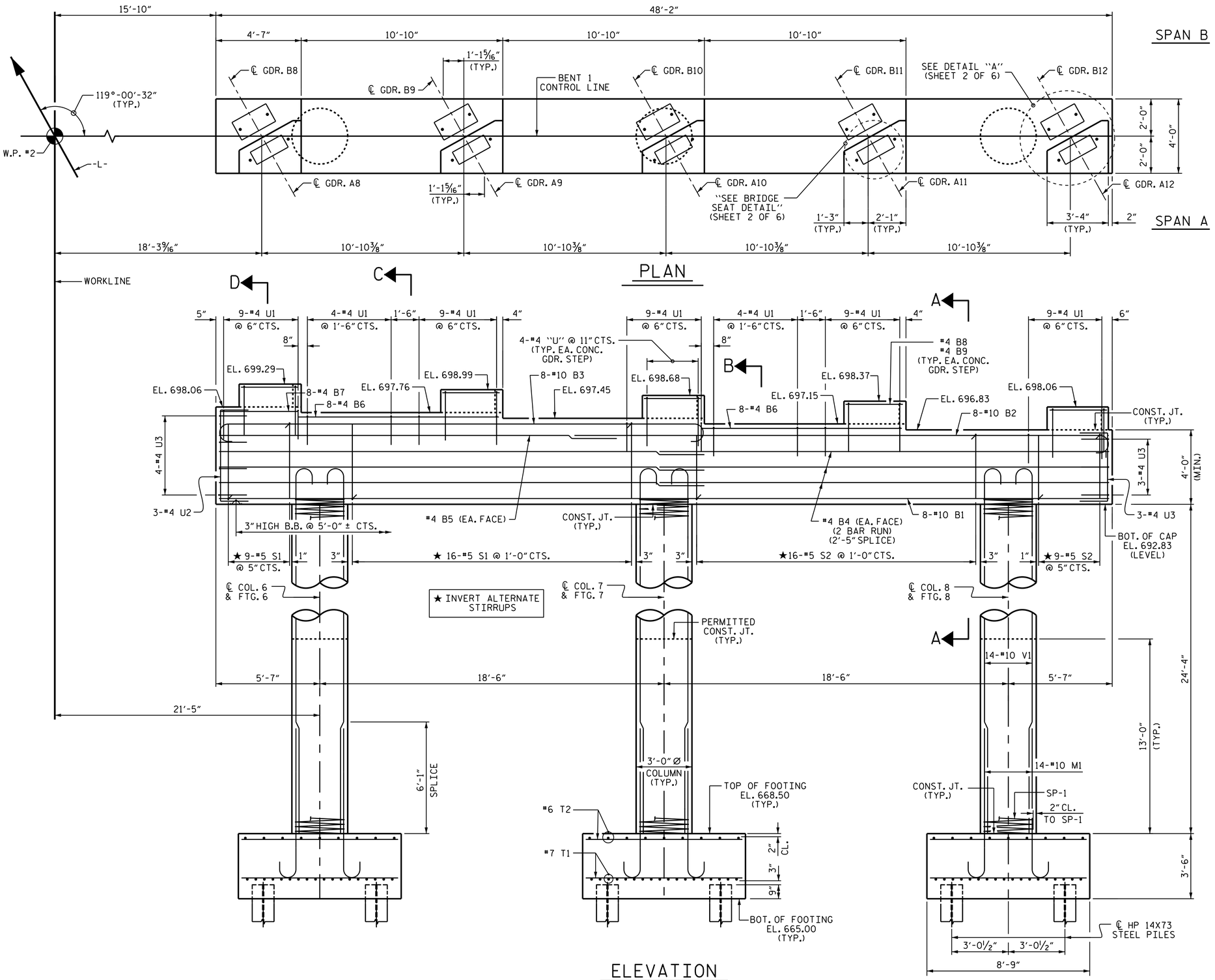


ELEVATION

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.

NOTES

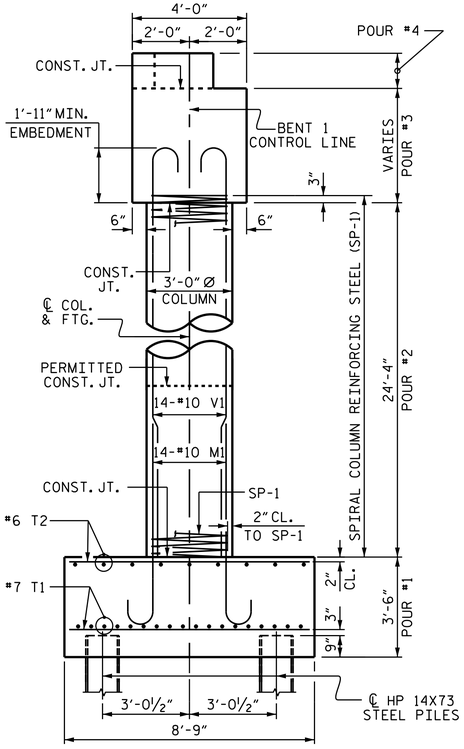
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR PILE SPLICE DETAILS, SEE END BENT 1, SHEET 6 OF 6.

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

EPOXY COAT THE BENT CAP EXCEPT THE AREA UNDERNEATH THE ELASTOMERIC BEARING PADS.



END VIEW

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-56
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

Docusigned by: vipul a patel 1C1577DE15D4A4A... 2/19/2015

DRAWN BY :	J.P. MCCARTHA	DATE :	8/31/14
CHECKED BY :	T. H. CARROLL	DATE :	10/1/14
DESIGN ENGINEER OF RECORD:	H.A. LOCKLEAR	DATE :	10/1/14

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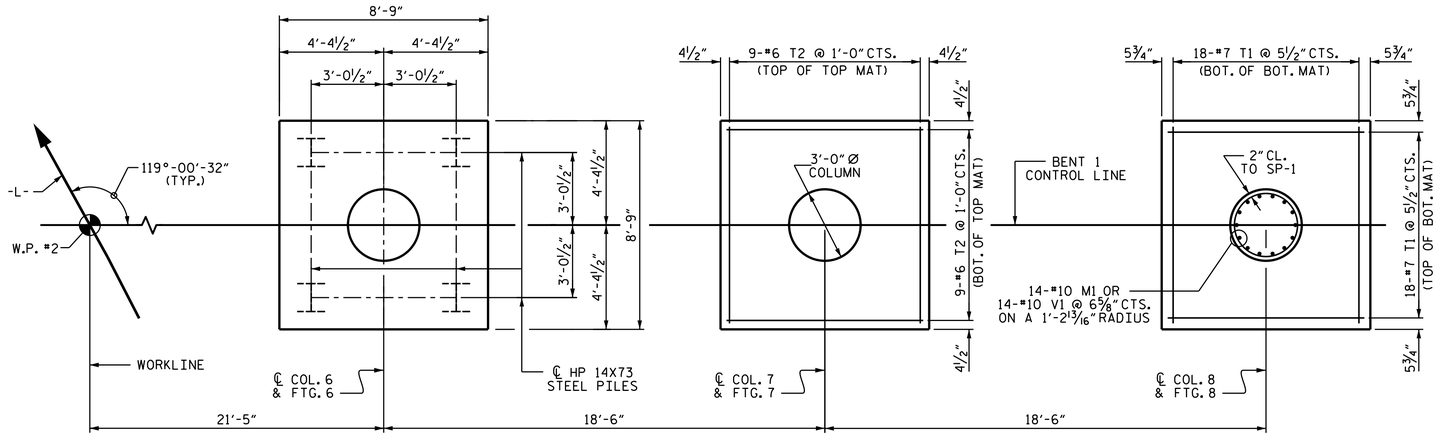
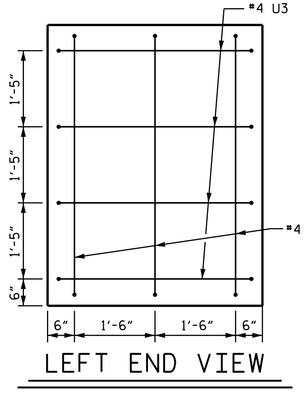


PLAN OF FOOTINGS & COLUMNS

PILES, REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED

RIGHT END VIEW



LEFT END VIEW

SECTION A-A

★INVERT ALTERNATE STIRRUPS

PART SECTION B-B

★INVERT ALTERNATE STIRRUPS

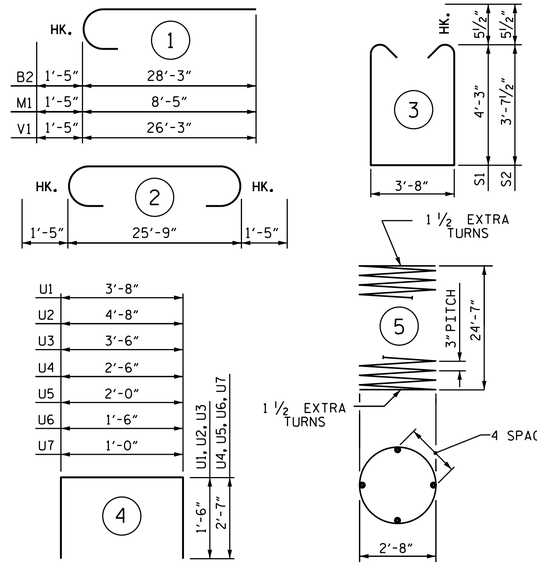
PART SECTION C-C

★INVERT ALTERNATE STIRRUPS

PART SECTION D-D

★INVERT ALTERNATE STIRRUPS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

DETAIL "A"

(TYP. EA. BRIDGE SEAT)

BRIDGE SEAT DETAIL

(TYP. EA. CONC. GDR. BRIDGE SEAT)

BILL OF MATERIAL

BENT 1-STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	STR	47'-10"	1,647
B2	8	#10	1	29'-8"	1,021
B3	8	#10	2	28'-7"	984
B4	12	#4	STR	25'-2"	202
B5	2	#4	STR	22'-0"	29
B6	16	#4	STR	10'-10"	116
B7	8	#4	STR	4'-3"	23
B8	5	#4	STR	3'-5"	11
B9	5	#4	STR	3'-0"	10
M1	42	#10	1	9'-10"	1,777
S1	25	#5	3	13'-1"	341
S2	25	#5	3	11'-10"	309
T1	108	#7	STR	8'-3"	1,821
T2	54	#6	STR	8'-3"	669
U1	53	#4	4	6'-8"	236
U2	3	#4	4	7'-8"	15
U3	10	#4	4	6'-6"	43
U4	5	#4	4	7'-8"	26
U5	5	#4	4	7'-2"	24
U6	5	#4	4	6'-8"	22
U7	5	#4	4	6'-2"	21
V1	42	#10	1	27'-8"	5,000
REINFORCING STEEL				LBS.	14,347
SP-1	3	**	5	837'-6"	1,678
SPIRAL COLUMN REINFORCING STEEL				LBS.	1,678

CLASS A CONCRETE BREAKDOWN:		
POUR #1 (FOOTINGS)	C.Y.	29.8
POUR #2 (COLUMNS)	C.Y.	19.1
POUR #3 (CAP)	C.Y.	32.4
POUR #4 (STEPS)	C.Y.	1.6
TOTAL CLASS A CONCRETE	C.Y.	82.9

HP 14X73 STEEL PILES		
No. 12	LIN. FT.	660
FOUNDATION EXCAVATION		LUMP SUM

** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W-20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

STAGE I

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4F4A0... 2/19/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-57
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : J.P. MCCARTHA DATE : 8/31/14
CHECKED BY : T. H. CARROLL DATE : 10/1/14
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 10/1/14

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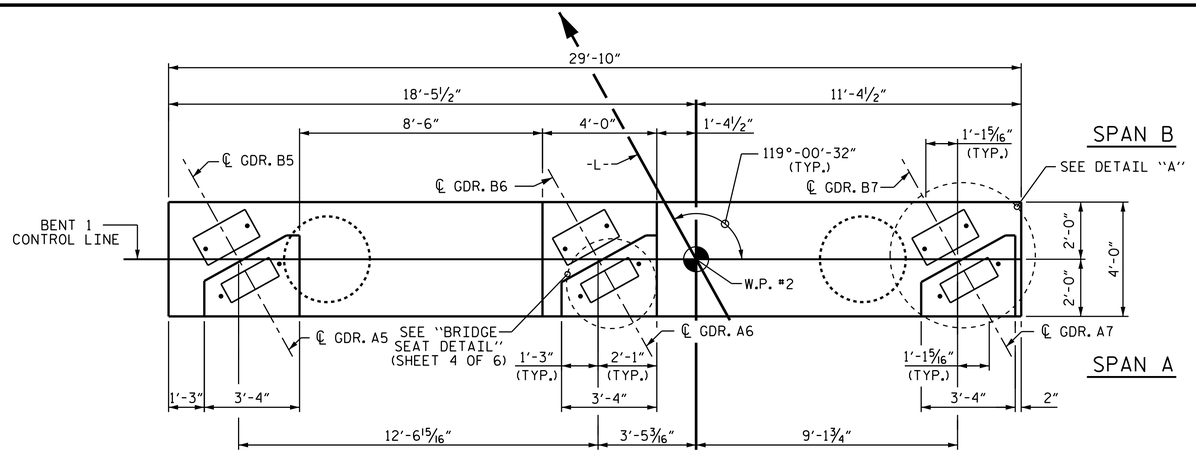
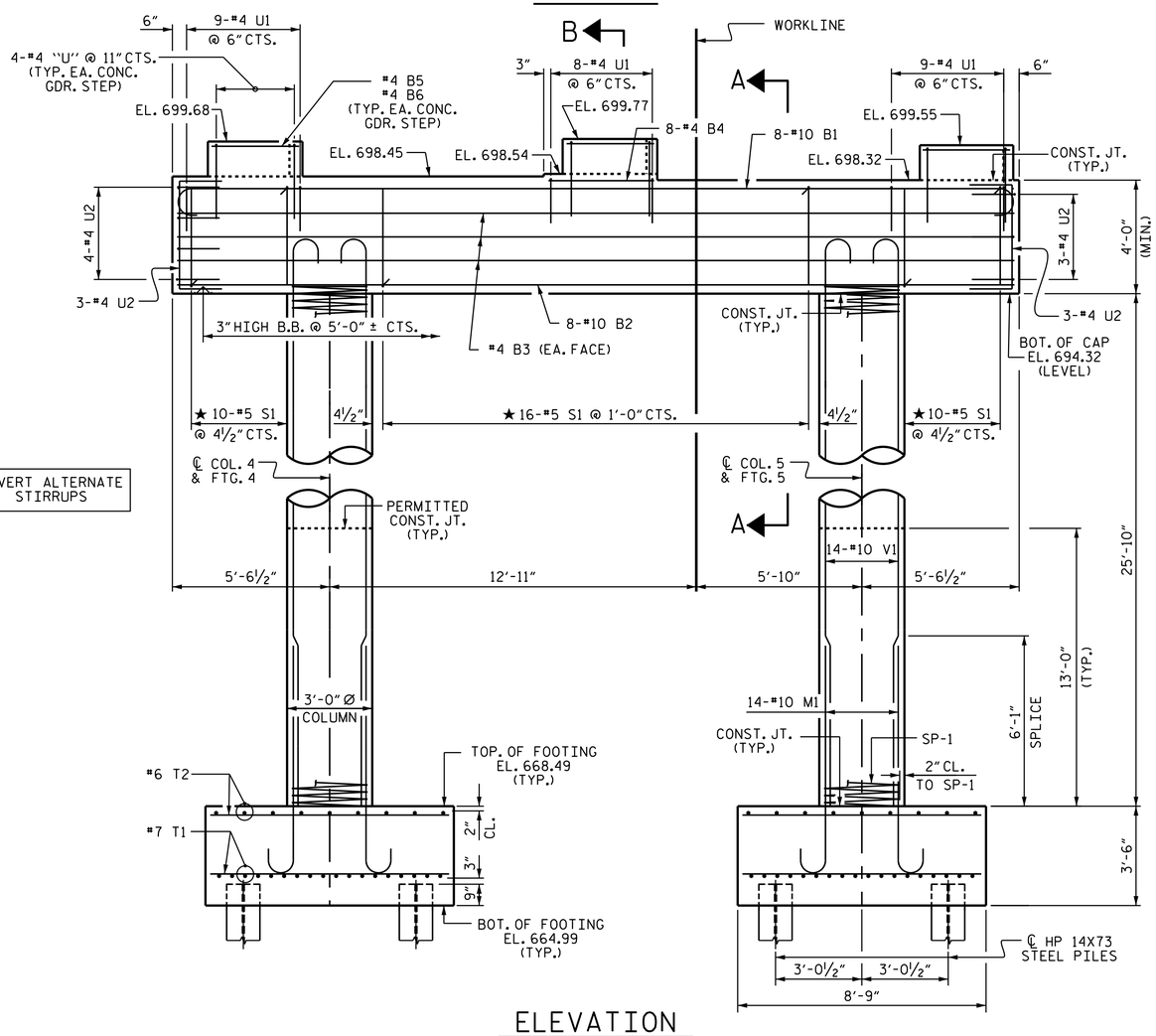
thcarroll

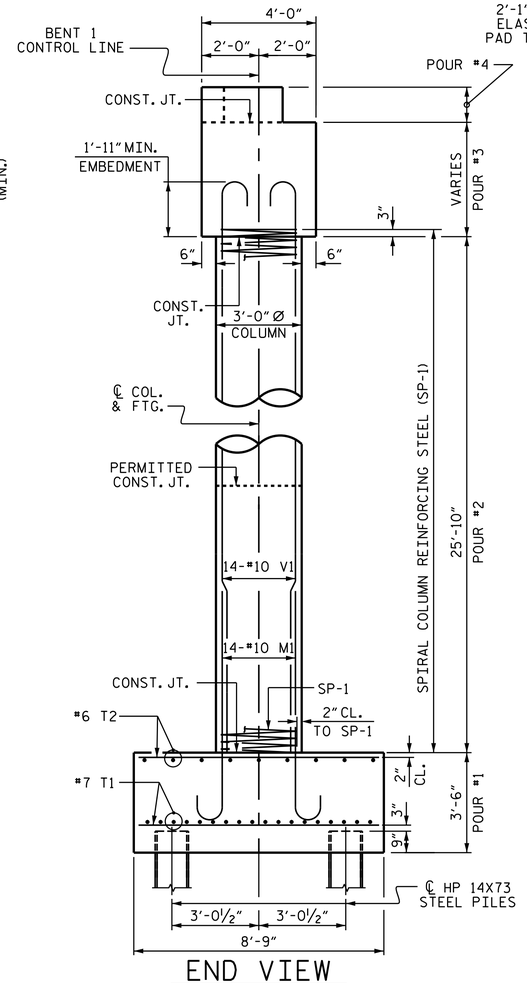


PLAN



ELEVATION

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.



END VIEW

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.

NOTES

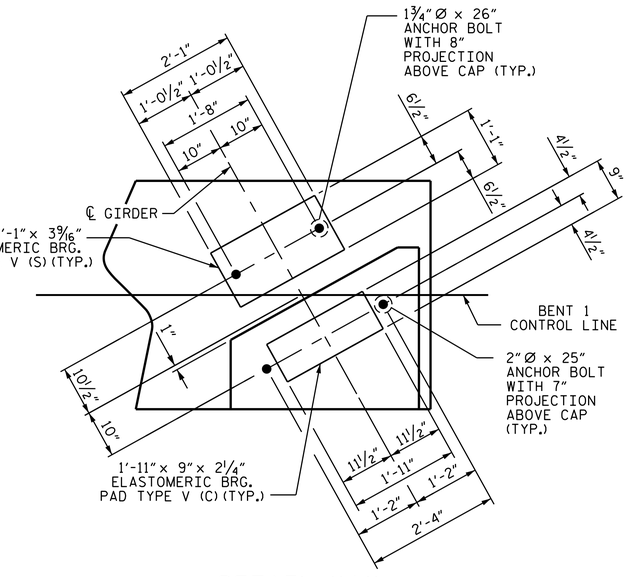
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR PILE SPLICE DETAILS, SEE END BENT 1, SHEET 6 OF 6.

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

EPOXY COAT THE BENT CAP EXCEPT THE AREA UNDERNEATH THE ELASTOMERIC BEARING PADS.



DETAIL "A"

(TYP. EA. BRIDGE SEAT)

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-58
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : J.P. MCCARTHA DATE : 8/31/14
CHECKED BY : T. H. CARROLL DATE : 10/1/14
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 10/1/14

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D484A4... 2/19/2015

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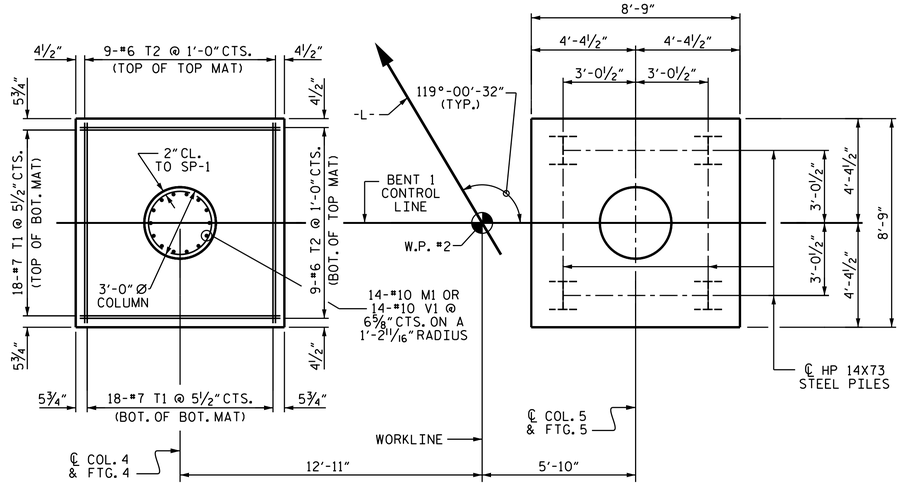
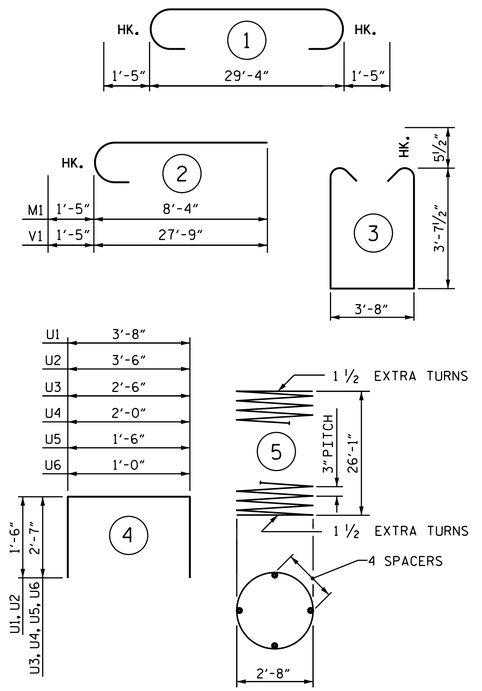
thcarroll



PLAN OF FOOTINGS & COLUMNS

PILES, REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1-STAGE II

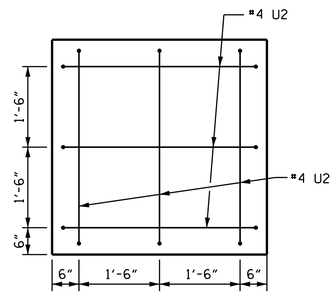
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	32'-2"	1,107
B2	8	#10	STR	29'-6"	1,016
B3	6	#4	STR	29'-6"	118
B4	8	#4	STR	3'-8"	20
B5	3	#4	STR	3'-5"	7
B6	3	#4	STR	3'-0"	6
M1	28	#10	2	9'-9"	1,175
S1	36	#5	3	11'-10"	444
T1	72	#7	STR	8'-3"	1,214
T2	36	#6	STR	8'-3"	446
U1	26	#4	4	6'-8"	116
U2	12	#4	4	6'-6"	52
U3	3	#4	4	7'-8"	15
U4	3	#4	4	7'-2"	14
U5	3	#4	4	6'-8"	13
U6	3	#4	4	6'-2"	12
V1	28	#10	2	29'-2"	3,514
REINFORCING STEEL				LBS.	9,289
SP-1	2	**	5	887'-0"	1,185
SPIRAL COLUMN REINFORCING STEEL				LBS.	1,185

CLASS A CONCRETE BREAKDOWN:

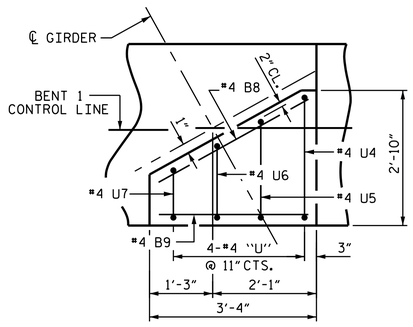
POUR #1	(FOOTINGS)	C.Y.	19.9
POUR #2	(COLUMNS)	C.Y.	13.5
POUR #3	(CAP)	C.Y.	18.1
POUR #4	(STEPS)	C.Y.	1.0
TOTAL CLASS A CONCRETE		C.Y.	52.5

HP 14X73 STEEL PILES No. 8	LIN. FT.	460
FOUNDATION EXCAVATION	LUMP SUM	

** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W-20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

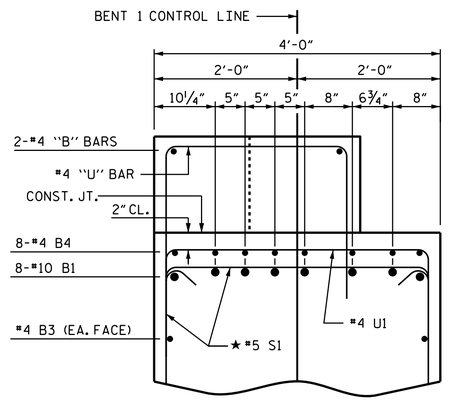


END VIEW



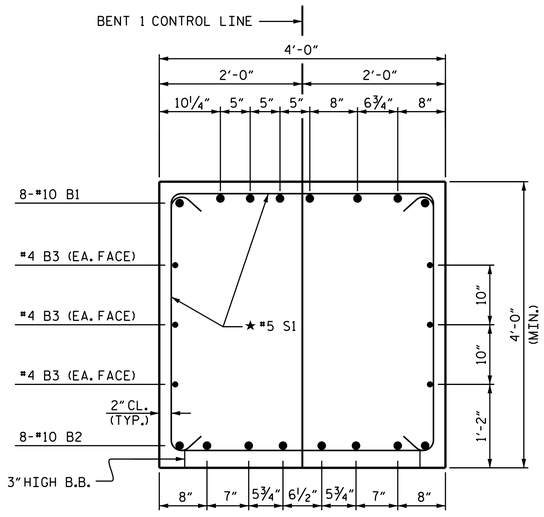
BRIDGE SEAT DETAIL

(TYP. EA. CONC. GDR. BRIDGE SEAT)



PART SECTION B-B

★ INVERT ALTERNATE STIRRUPS



SECTION A-A

★ INVERT ALTERNATE STIRRUPS

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4A4A1... 2/19/2015

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-59
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : J.P. MCCARTHA DATE : 8/31/14
CHECKED BY : T.H. CARROLL DATE : 10/1/14
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 10/1/14

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thcarroll

NOTES

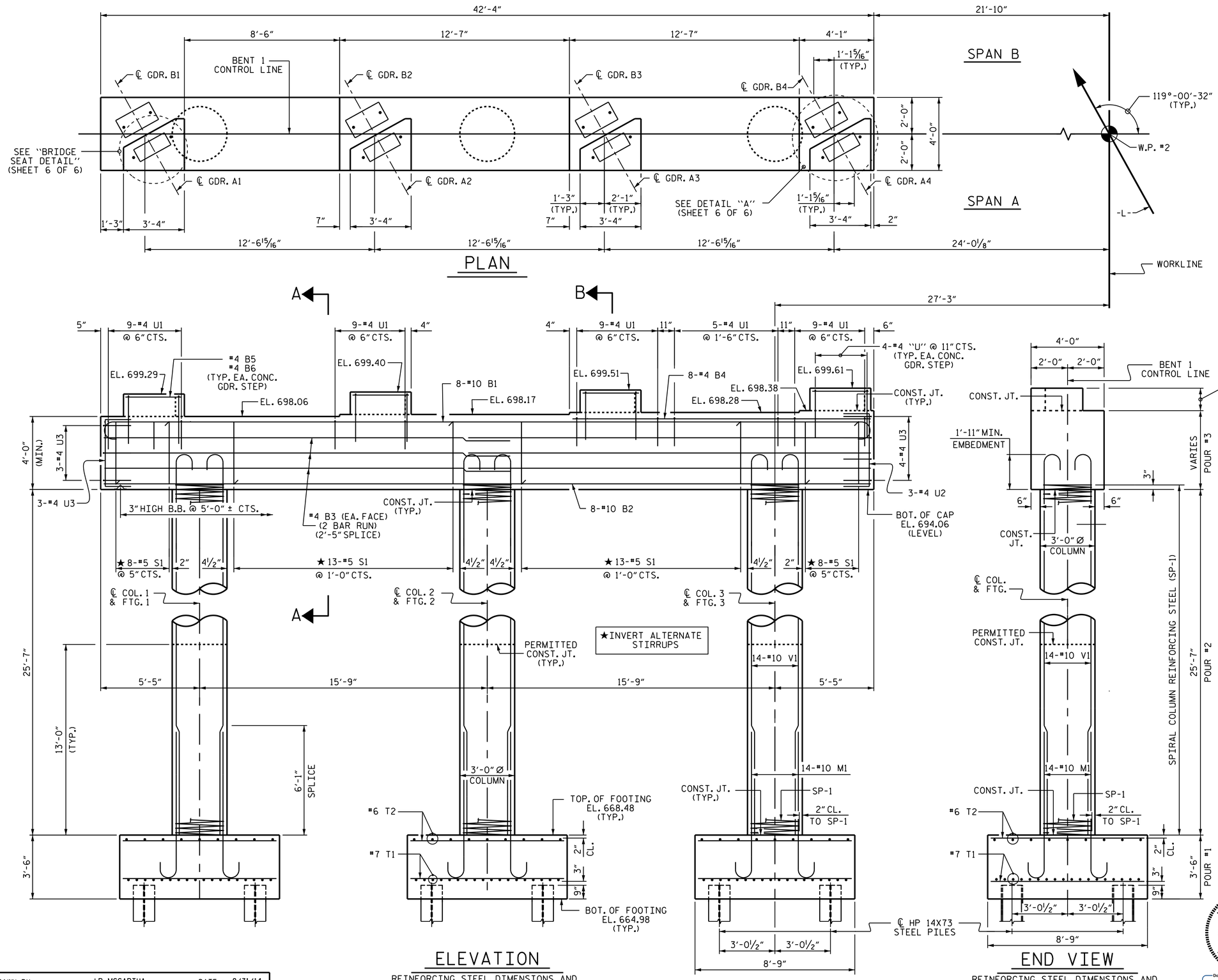
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR PILE SPLICE DETAILS, SEE END BENT 1, SHEET 6 OF 6.

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

EPOXY COAT THE BENT CAP EXCEPT THE AREA UNDERNEATH THE ELASTOMERIC BEARING PADS.



ELEVATION

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.

END VIEW

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

Docusigned by: vipul a patel 1C1517DE15D4A4A... 4/29/2015

DRAWN BY : J.P. MCCARTHA DATE : 8/31/14
CHECKED BY : T. H. CARROLL DATE : 10/1/14
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 10/1/14

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PROJECT NO. B-5136
CABARRUS COUNTY
STATION: 21+74.92 -L-

SHEET 5 OF 6

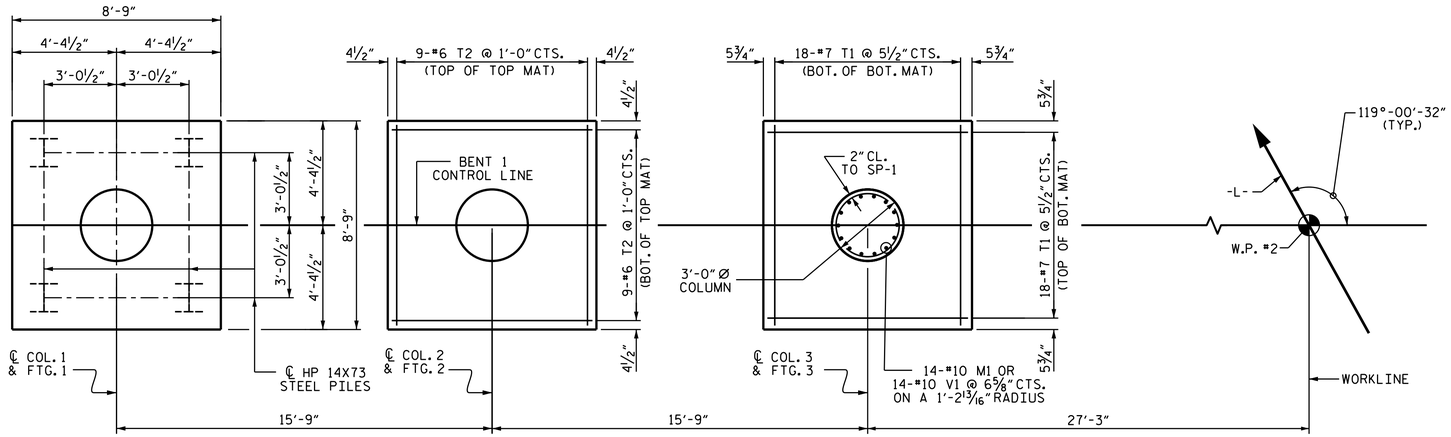
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

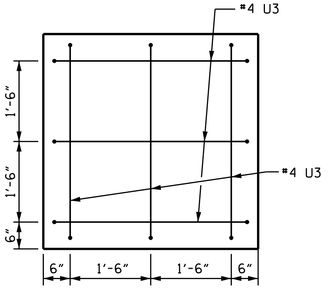
STAGE III

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-60
1			3			TOTAL SHEETS
2			4			75

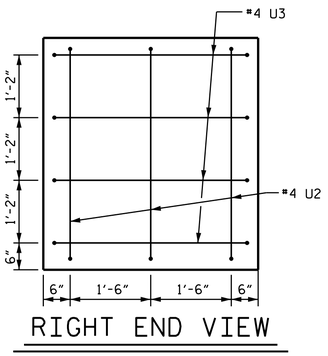


PLAN OF FOOTINGS & COLUMNS

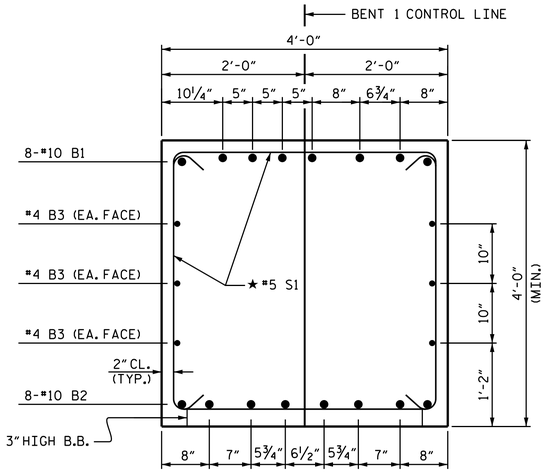
PILES, REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED



LEFT END VIEW

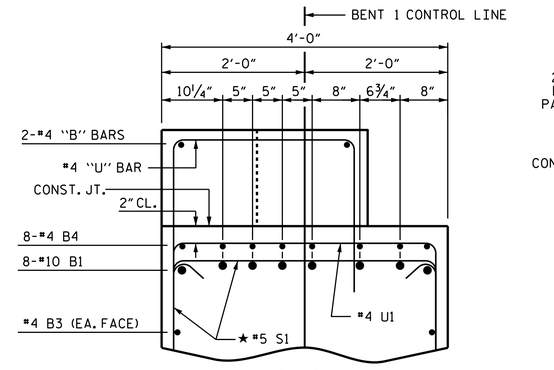


RIGHT END VIEW



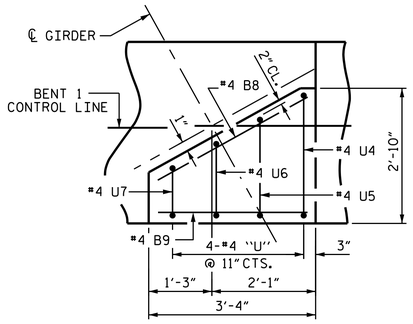
SECTION A-A

★ INVERT ALTERNATE STIRRUPS



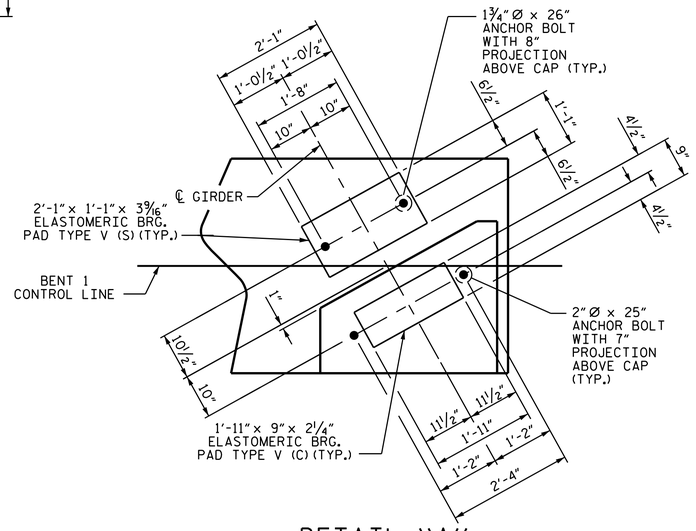
PART SECTION B-B

★ INVERT ALTERNATE STIRRUPS



BRIDGE SEAT DETAIL

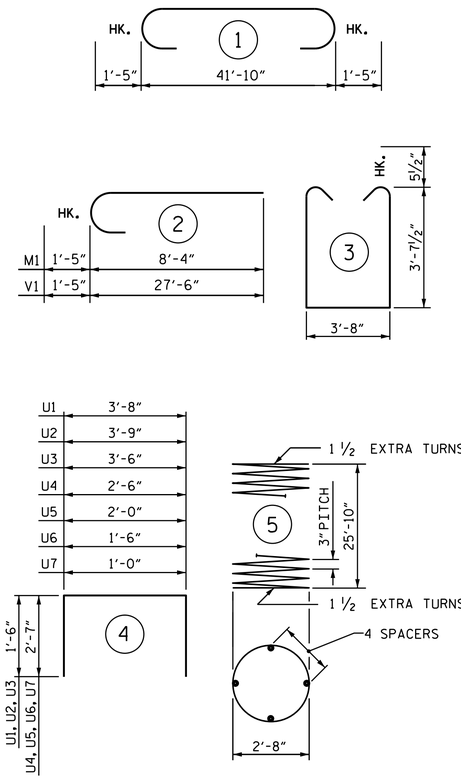
(TYP. EA. CONC. GDR. BRIDGE SEAT)



DETAIL "A"

(TYP. EA. BRIDGE SEAT)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1-STAGE III

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	44'-8"	1,538
B2	8	#10	STR	42'-0"	1,446
B3	12	#4	STR	22'-3"	178
B4	8	#4	STR	16'-4"	87
B5	4	#4	STR	3'-5"	9
B6	4	#4	STR	3'-0"	8
M1	42	#10	2	9'-9"	1,762
S1	42	#5	3	11'-10"	518
T1	108	#7	STR	8'-3"	1,821
T2	54	#6	STR	8'-3"	669
U1	41	#4	4	6'-8"	183
U2	3	#4	4	6'-9"	14
U3	10	#4	4	6'-6"	43
U4	4	#4	4	7'-8"	20
U5	4	#4	4	7'-2"	19
U6	4	#4	4	6'-8"	18
U7	4	#4	4	6'-2"	16
V1	42	#10	2	28'-11"	5,226
REINFORCING STEEL				LBS.	13,575
SP-1	3	**	5	878'-9"	1,761
SPIRAL COLUMN REINFORCING STEEL				LBS.	1,761

CLASS A CONCRETE BREAKDOWN:

POUR #1	(FOOTINGS)	C.Y.	29.8
POUR #2	(COLUMNS)	C.Y.	20.1
POUR #3	(CAP)	C.Y.	25.9
POUR #4	(STEPS)	C.Y.	1.3
TOTAL CLASS A CONCRETE		C.Y.	77.1

HP 14X73 STEEL PILES No. 12	LIN. FT.	720
FOUNDATION EXCAVATION		LUMP SUM

** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W-20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

STAGE III

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-61
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4E4A1...

2/19/2015

DRAWN BY :	J.P. MCCARTHA	DATE :	8/31/14
CHECKED BY :	T. H. CARROLL	DATE :	10/1/14
DESIGN ENGINEER OF RECORD:	H.A. LOCKLEAR	DATE :	10/1/14

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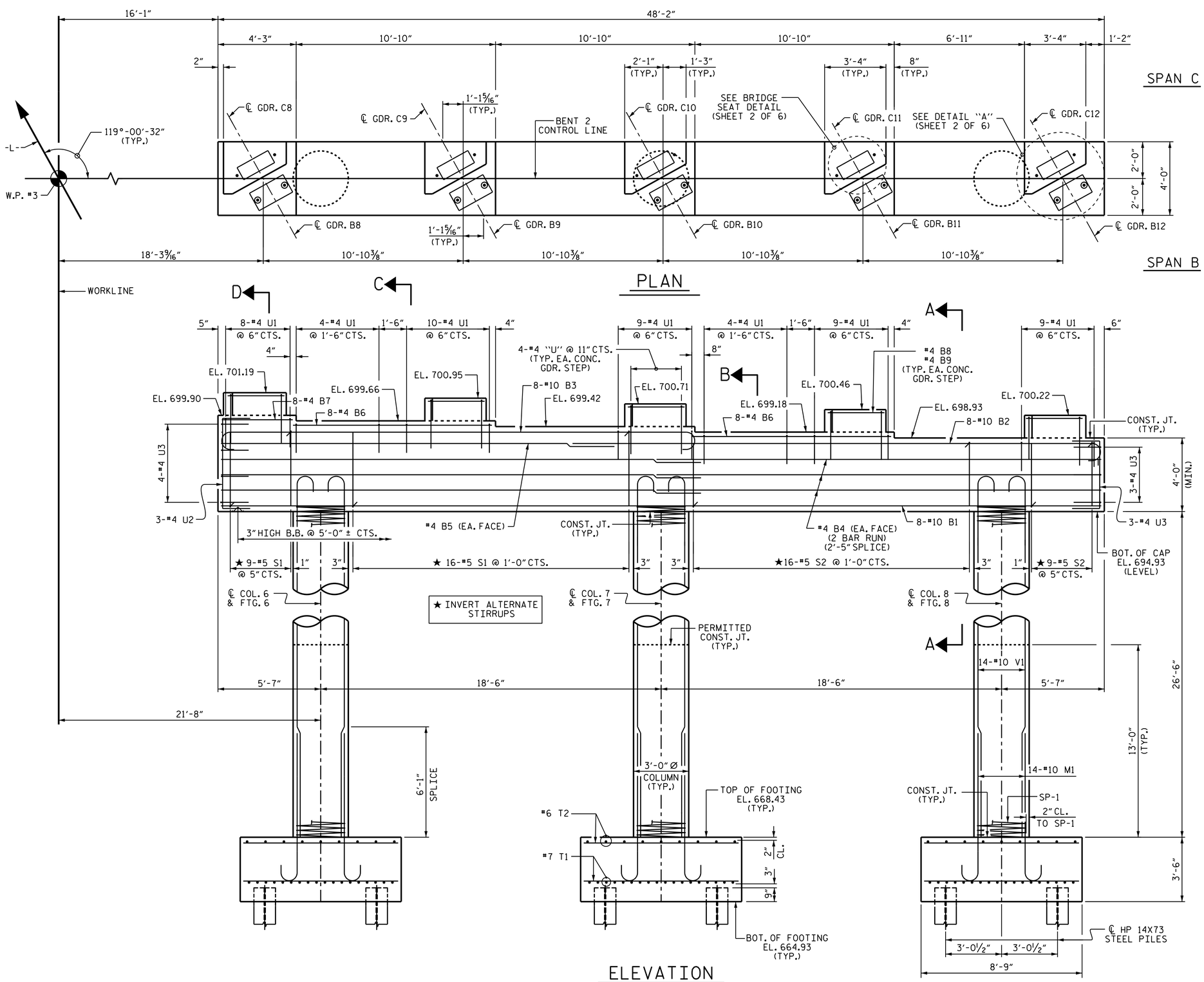
thcarroll



ELEVATION

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.

NOTES

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

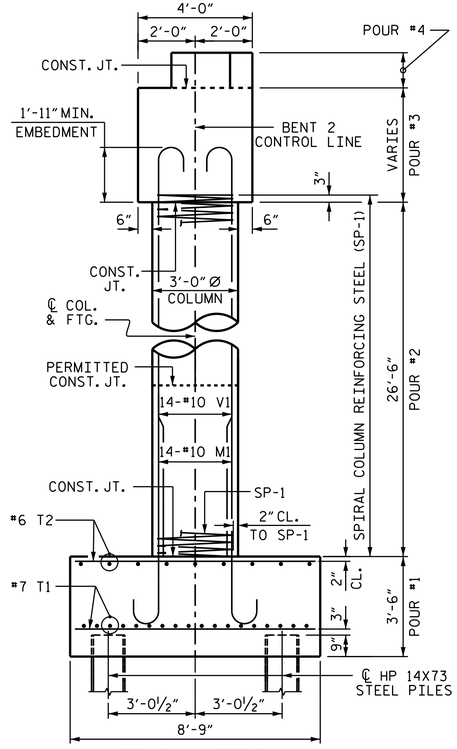
STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR PILE SPLICE DETAILS, SEE END BENT 1, SHEET 6 OF 6.

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

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

FOR PIPE INSERT DETAILS, SEE BEARINGS SHEET.



END VIEW

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-62
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

Docusigned by: vipul a patel 1C1575DE15D4484... 2/19/2015

DRAWN BY :	T. H. CARROLL	DATE :	10/27/14
CHECKED BY :	V. A. PATEL	DATE :	11/4/14
DESIGN ENGINEER OF RECORD:	H.A. LOCKLEAR	DATE :	11/4/14

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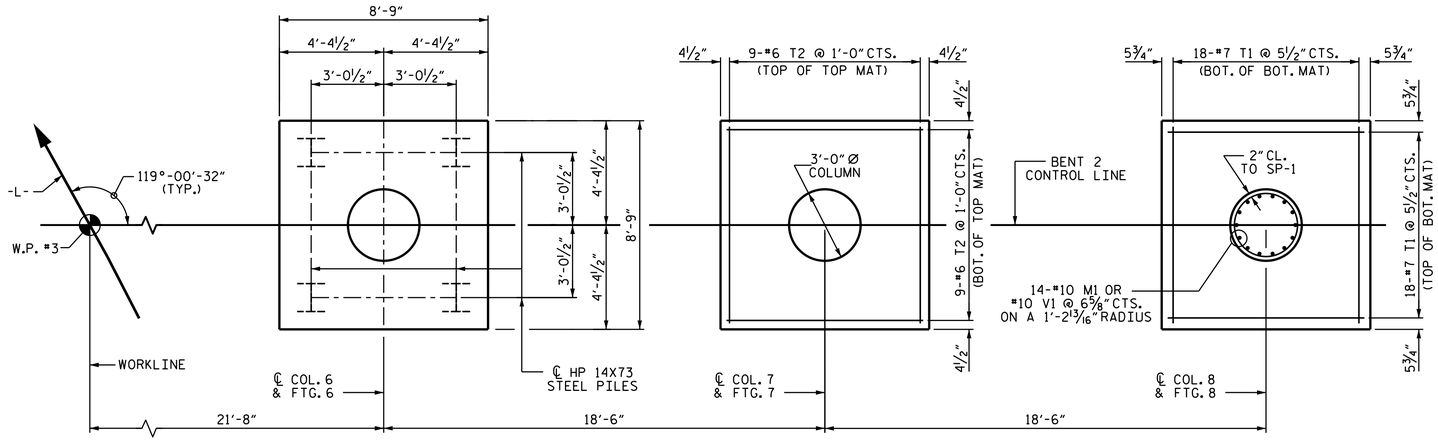
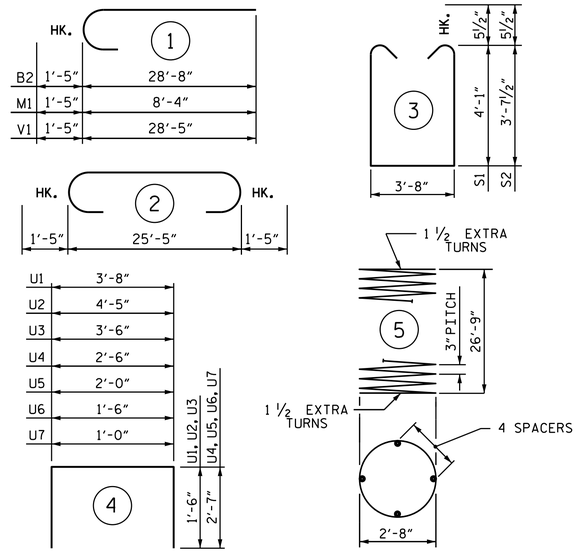
thcarroll



PLAN OF FOOTINGS & COLUMNS

PILES, REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

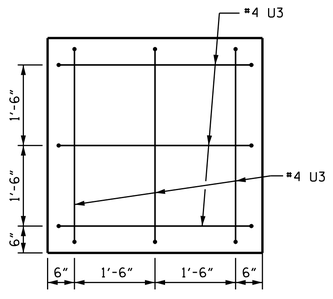
BILL OF MATERIAL

BENT 2-STAGE I

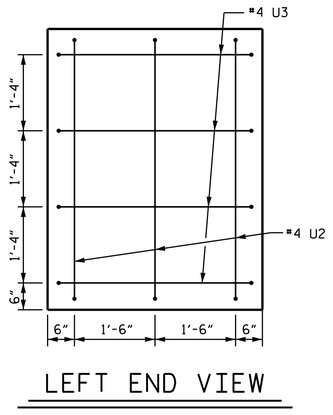
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	STR	47'-10"	1,647
B2	8	#10	1	30'-1"	1,036
B3	8	#10	2	28'-3"	972
B4	12	#4	STR	25'-2"	202
B5	2	#4	STR	21'-8"	29
B6	16	#4	STR	10'-10"	116
B7	8	#4	STR	3'-11"	21
B8	5	#4	STR	3'-5"	11
B9	5	#4	STR	3'-0"	10
M1	42	#10	1	9'-10"	1,777
S1	25	#5	3	12'-9"	332
S2	25	#5	3	11'-10"	309
T1	108	#7	STR	8'-3"	1,821
T2	54	#6	STR	8'-3"	669
U1	53	#4	4	6'-8"	236
U2	3	#4	4	7'-5"	15
U3	10	#4	4	6'-6"	43
U4	5	#4	4	7'-8"	26
U5	5	#4	4	7'-2"	24
U6	5	#4	4	6'-8"	22
U7	5	#4	4	6'-2"	21
V1	42	#10	1	29'-10"	5,392
REINFORCING STEEL				LBS.	14,731
SP-1	3	**	5	907'-7"	1,819
SPIRAL COLUMN REINFORCING STEEL				LBS.	1,819

CLASS A CONCRETE BREAKDOWN:		
POUR #1 (FOOTINGS)	C.Y.	29.8
POUR #2 (COLUMNS)	C.Y.	20.8
POUR #3 (CAP)	C.Y.	31.5
POUR #4 (STEPS)	C.Y.	1.7
TOTAL CLASS A CONCRETE	C.Y.	83.8
HP 14X73 STEEL PILES No. 12	LIN. FT.	600
FOUNDATION EXCAVATION	LUMP SUM	

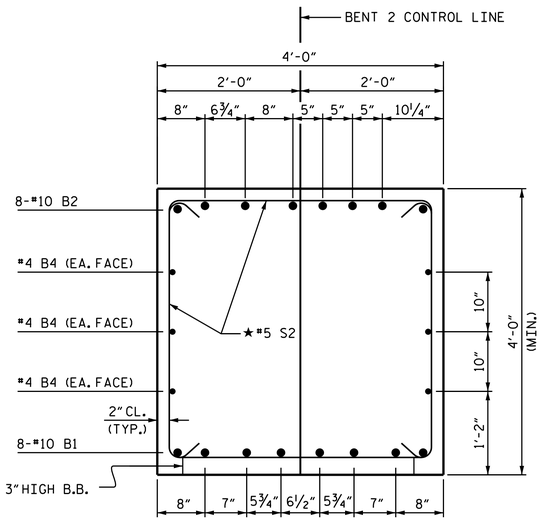
** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W-20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.



RIGHT END VIEW

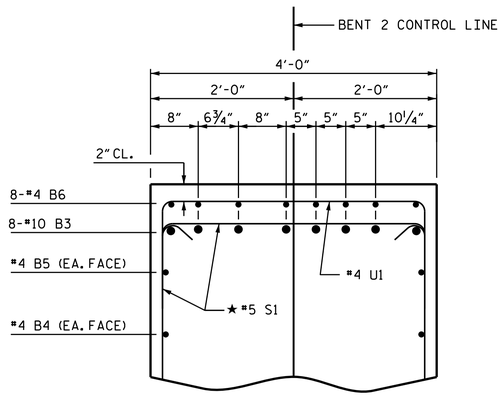


LEFT END VIEW



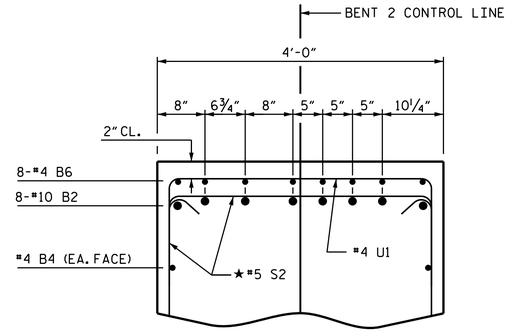
SECTION A-A

★INVERT ALTERNATE STIRRUPS



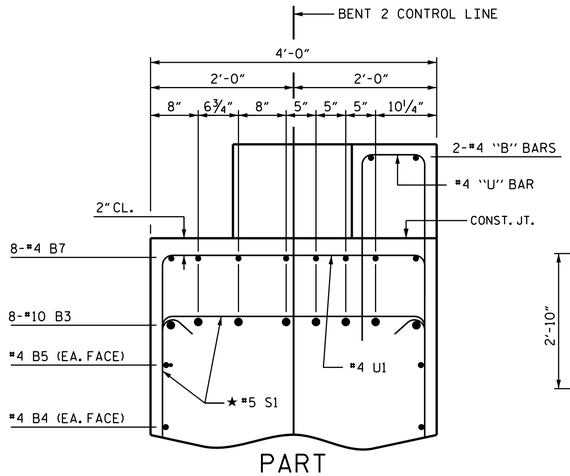
PART SECTION C-C

★INVERT ALTERNATE STIRRUPS



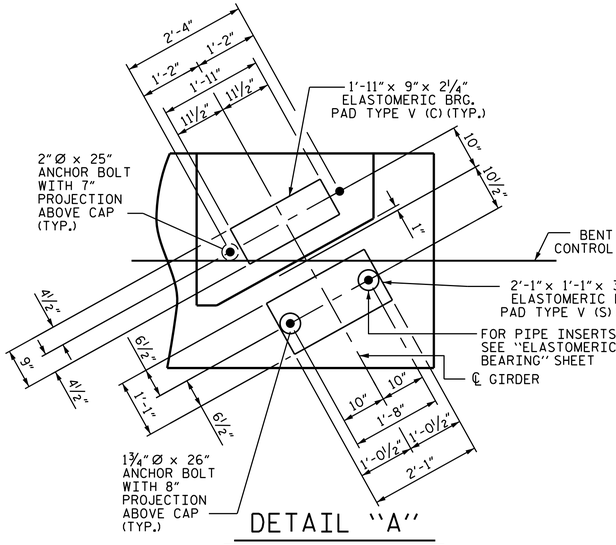
PART SECTION B-B

★INVERT ALTERNATE STIRRUPS



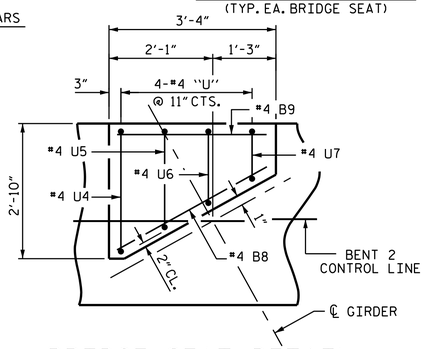
PART SECTION D-D

★INVERT ALTERNATE STIRRUPS



DETAIL "A"

(TYP. EA. BRIDGE SEAT)



BRIDGE SEAT DETAIL

(TYP. EA. CONC. GDR. BRIDGE SEAT)

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4F4A1... 2/19/2015

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-63
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : T. H. CARROLL DATE : 10/27/14
CHECKED BY : V. A. PATEL DATE : 11/4/14
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 11/4/14

18-FEB-2015 14:04
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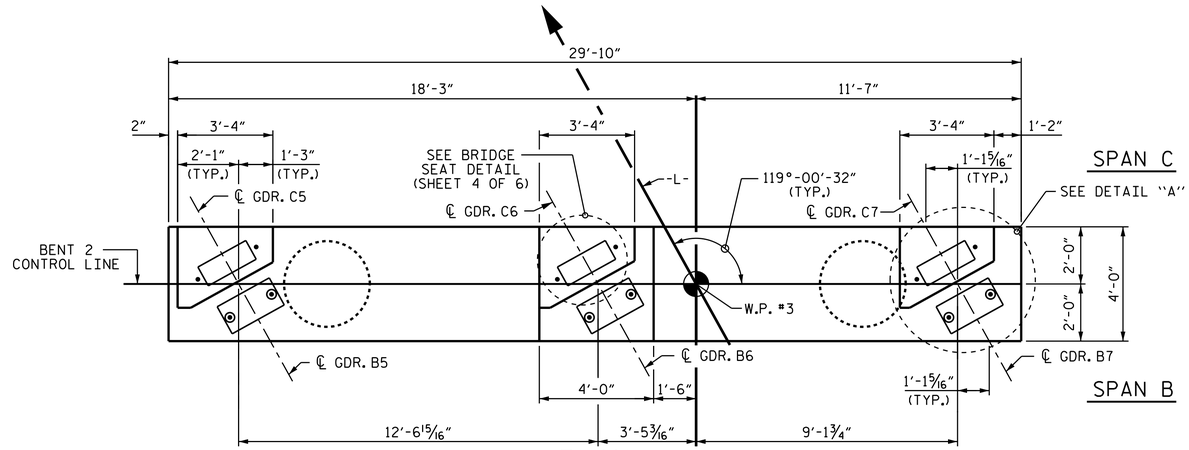
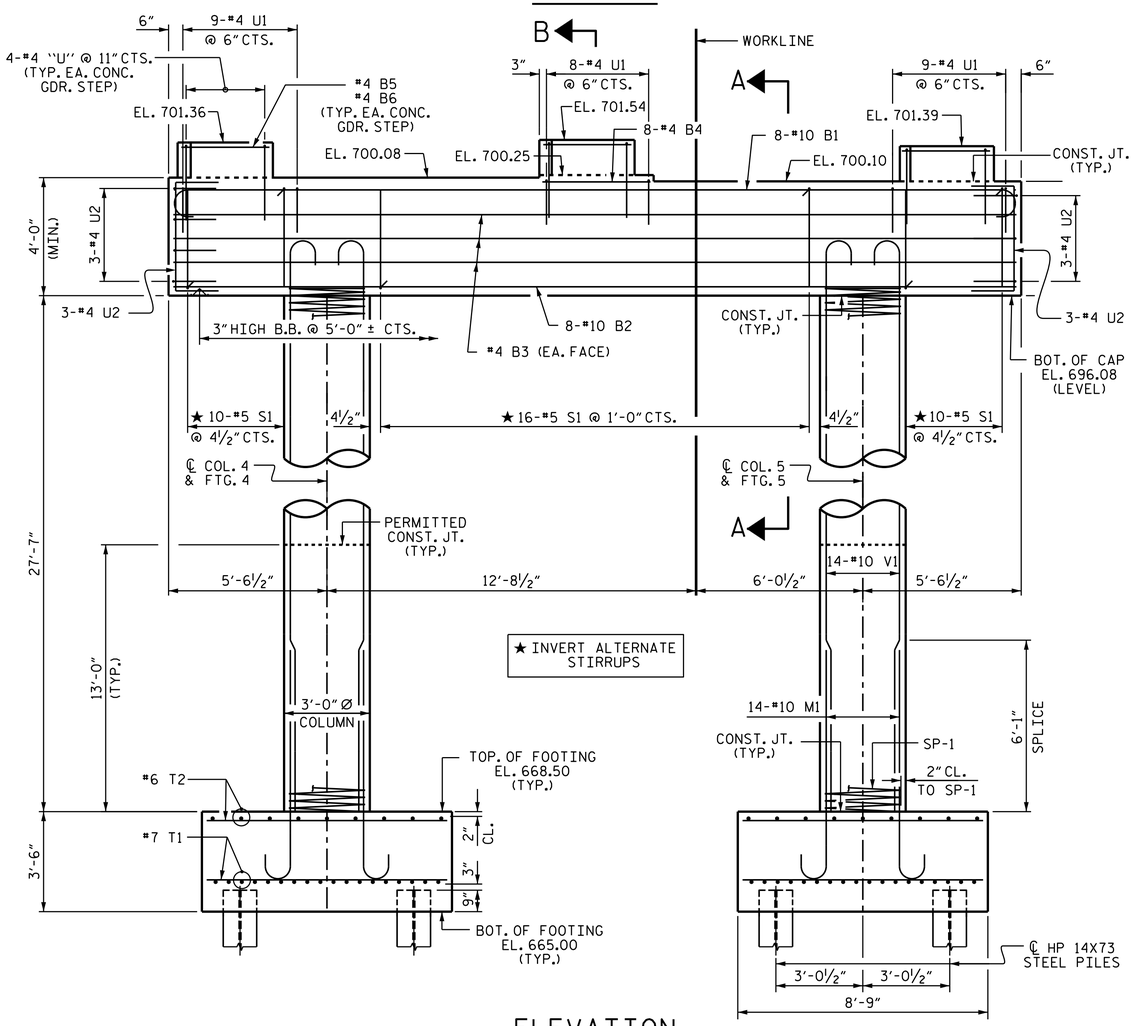
thcarroll

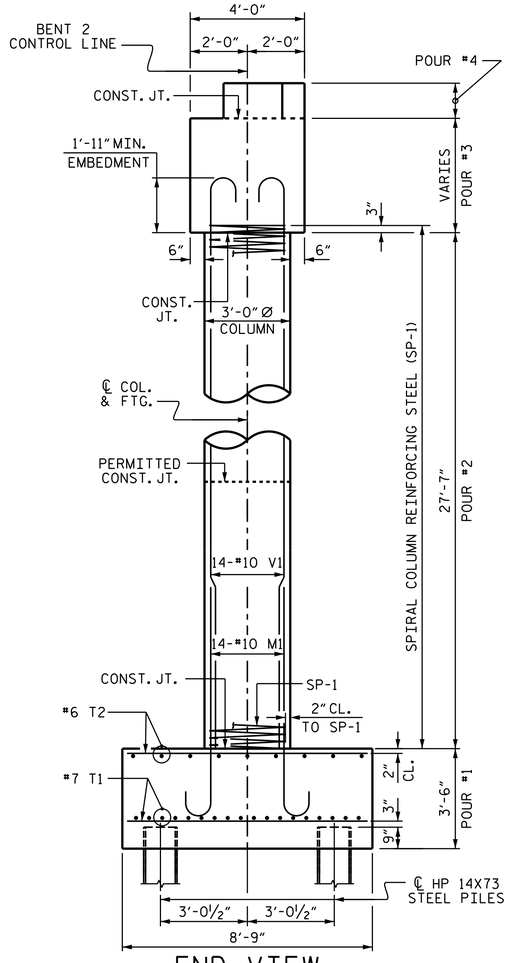


PLAN



ELEVATION

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.



END VIEW

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.

NOTES

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

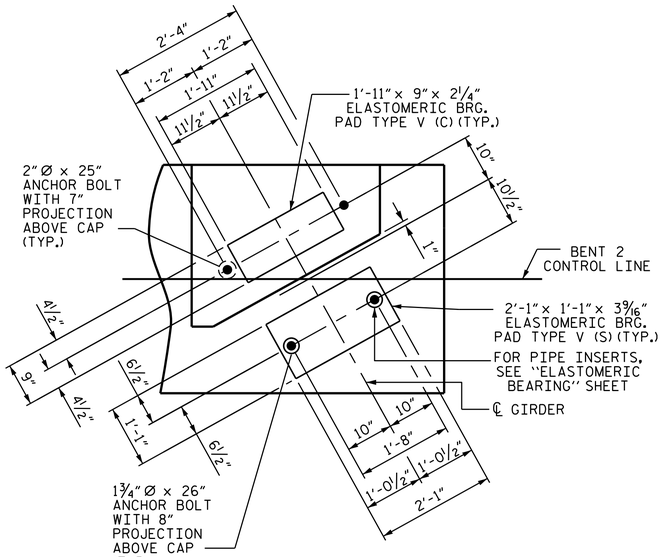
STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR PILE SPLICE DETAILS, SEE END BENT 1, SHEET 6 OF 6.

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

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

FOR PIPE INSERT DETAILS, SEE BEARINGS SHEET.



DETAIL "A"

(TYP. EA. BRIDGE SEAT)

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-64
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : T. H. CARROLL DATE : 10/27/14
CHECKED BY : V. A. PATEL DATE : 11/4/14
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 11/4/14

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4A4A4... 2/19/2015

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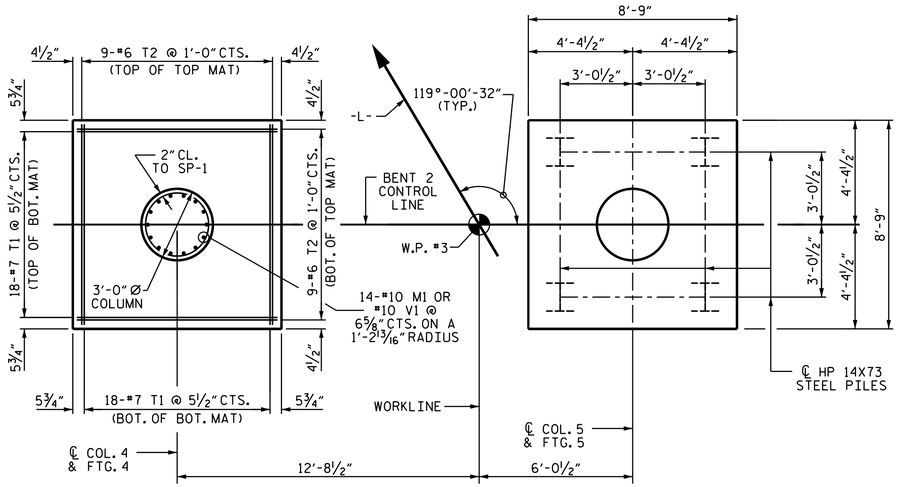
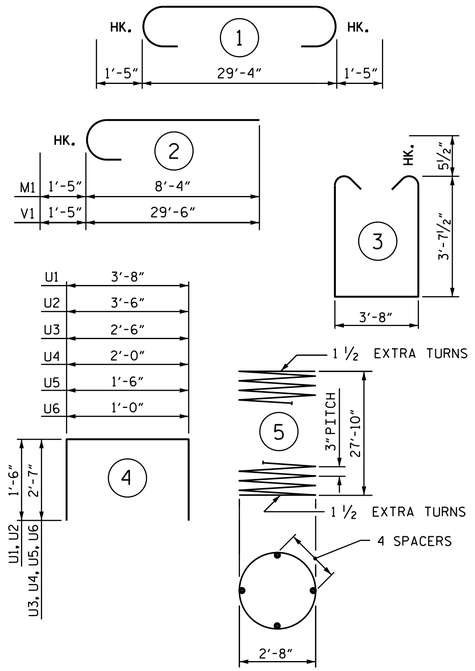
thcarroll



PLAN OF FOOTINGS & COLUMNS

PILES, REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 2-STAGE II

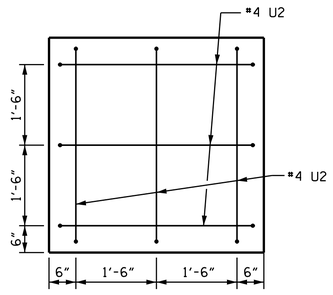
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	32'-2"	1,107
B2	8	#10	STR	29'-6"	1,016
B3	6	#4	STR	29'-6"	118
B4	8	#4	STR	3'-8"	20
B5	3	#4	STR	3'-5"	7
B6	3	#4	STR	3'-0"	6
M1	28	#10	2	9'-9"	1,175
S1	36	#5	3	11'-10"	444
T1	72	#7	STR	8'-3"	1,214
T2	36	#6	STR	8'-3"	446
U1	26	#4	4	6'-8"	116
U2	12	#4	4	6'-6"	52
U3	3	#4	4	7'-8"	15
U4	3	#4	4	7'-2"	14
U5	3	#4	4	6'-8"	13
U6	3	#4	4	6'-2"	12
V1	28	#10	2	30'-11"	3,725
REINFORCING STEEL				LBS.	9,500
SP-1	2	**	5	944'-9"	1,262
SPIRAL COLUMN REINFORCING STEEL				LBS.	1,262

CLASS A CONCRETE BREAKDOWN:

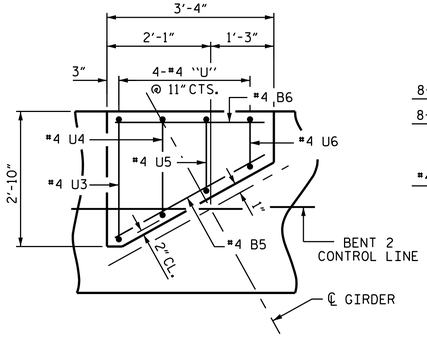
POUR #1 (FOOTINGS)	C.Y.	19.9
POUR #2 (COLUMNS)	C.Y.	14.4
POUR #3 (CAP)	C.Y.	17.8
POUR #4 (STEPS)	C.Y.	1.0
TOTAL CLASS A CONCRETE	C.Y.	53.1

HP 14X73 STEEL PILES No. 8	LIN. FT.	380
FOUNDATION EXCAVATION	LUMP SUM	

** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W-20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

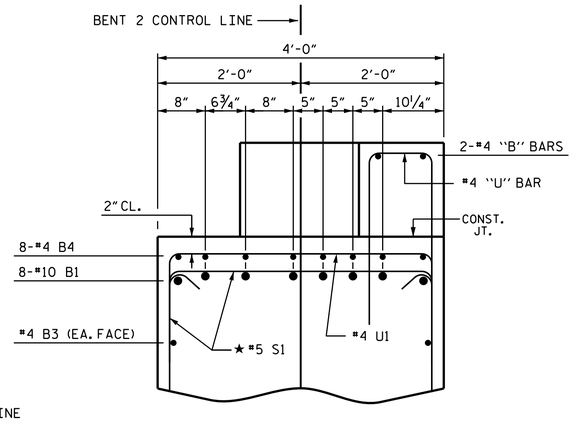


END VIEW



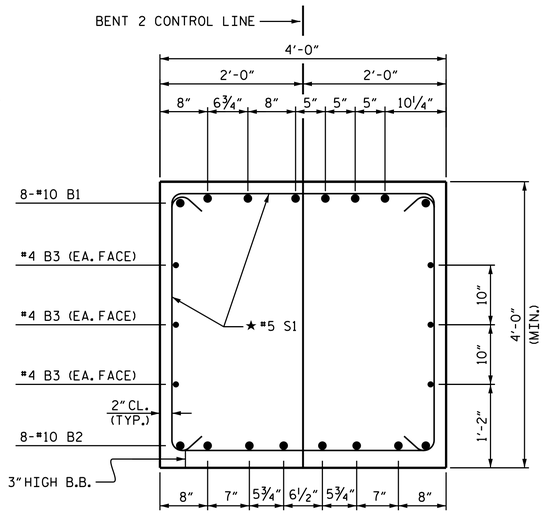
BRIDGE SEAT DETAIL

(TYP. EA. CONC. GDR. BRIDGE SEAT)



PART SECTION B-B

★ INVERT ALTERNATE STIRRUPS



SECTION A-A

★ INVERT ALTERNATE STIRRUPS

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-65
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D494A1... 2/19/2015

DRAWN BY : T. H. CARROLL DATE : 10/27/14
CHECKED BY : V. A. PATEL DATE : 11/4/14
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 11/4/14

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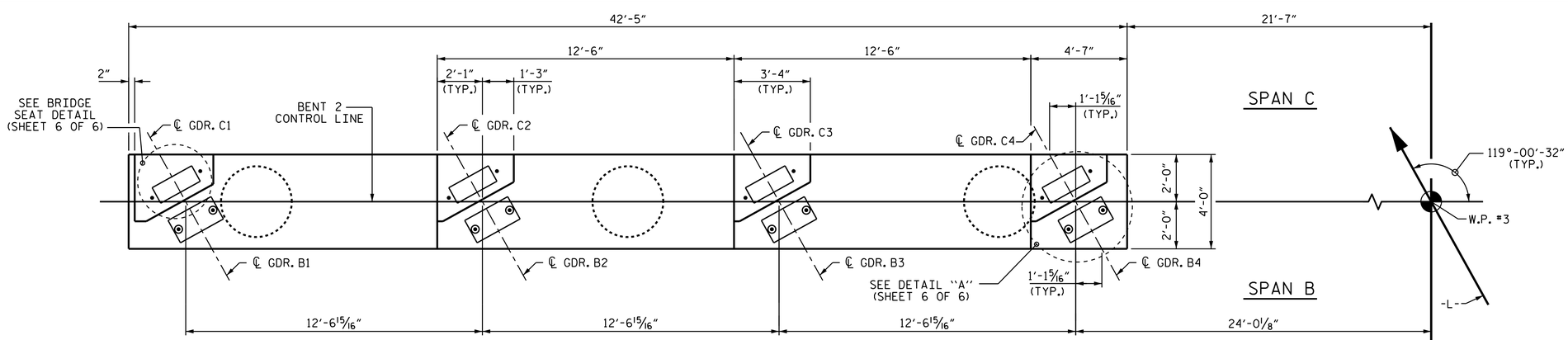
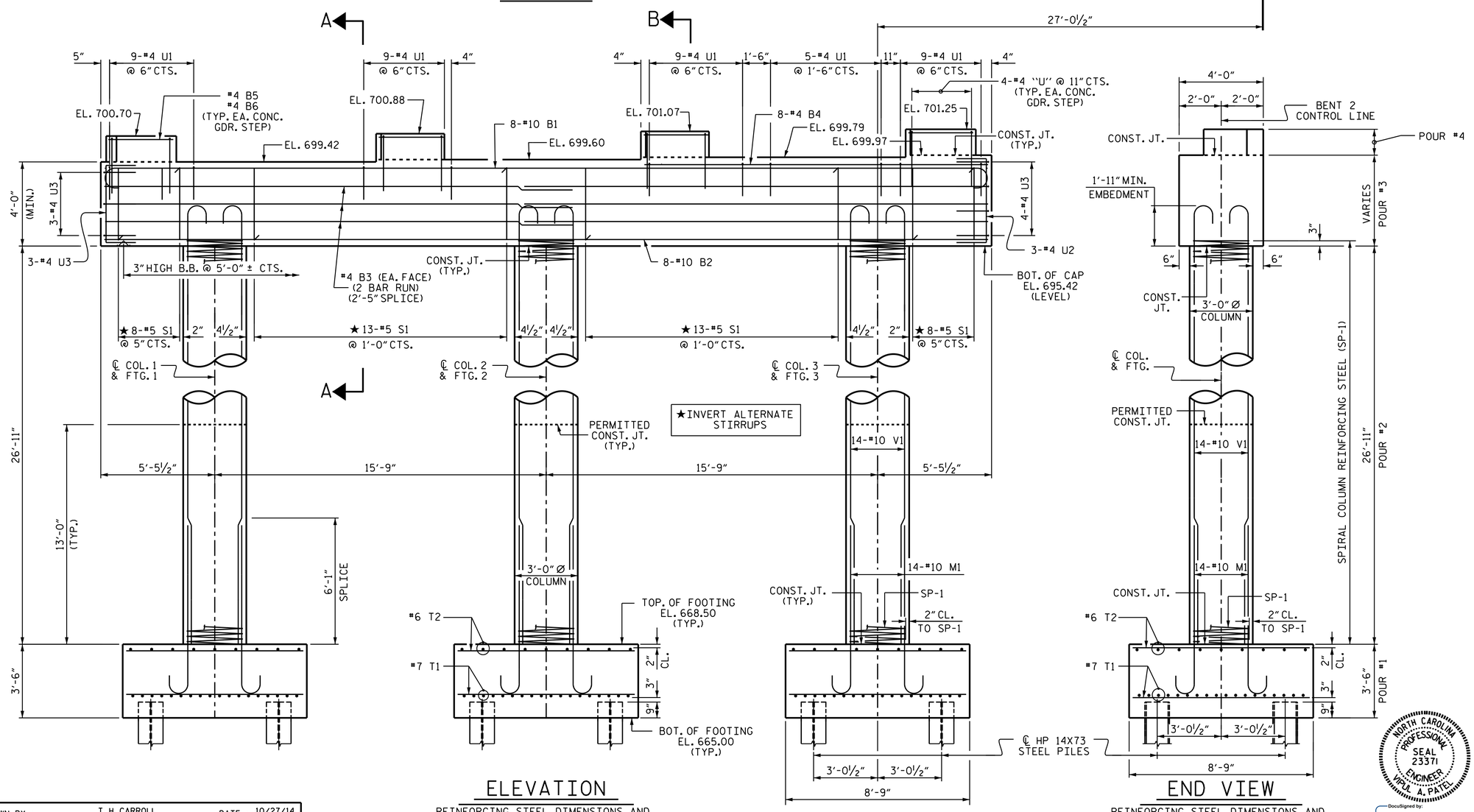


PLAN



ELEVATION

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.

END VIEW

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.

NOTES

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

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR PILE SPLICE DETAILS, SEE END BENT 1, SHEET 6 OF 6.

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

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

FOR PIPE INSERT DETAILS, SEE BEARINGS SHEET.

DRAWN BY : T. H. CARROLL DATE : 10/27/14
CHECKED BY : V. A. PATEL DATE : 11/4/14
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 11/4/14

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PROJECT NO. B-5136
CABARRUS COUNTY
STATION: 21+74.92 -L-
SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

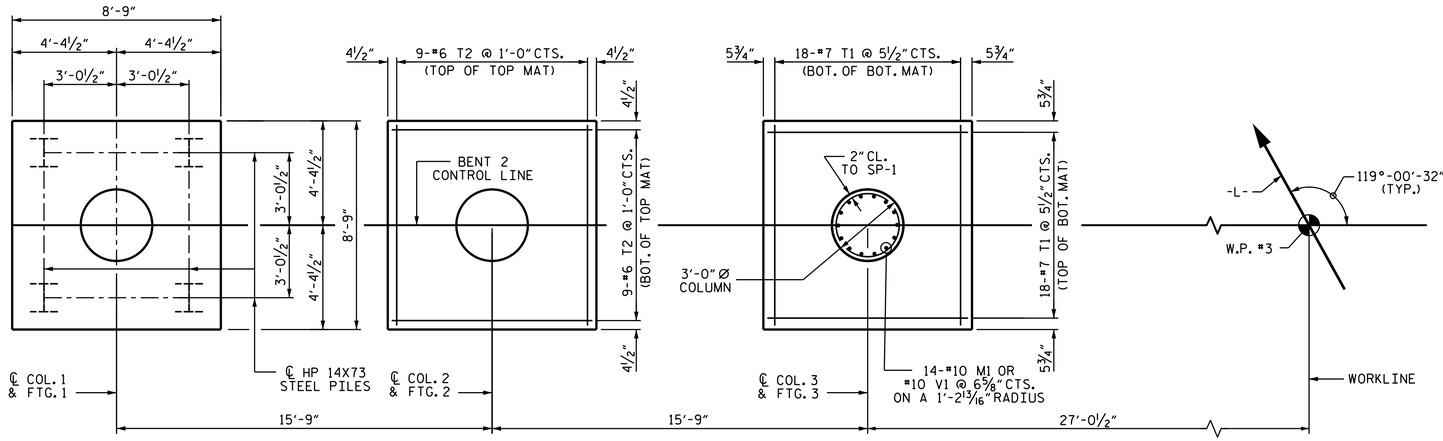
BENT 2

STAGE III

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

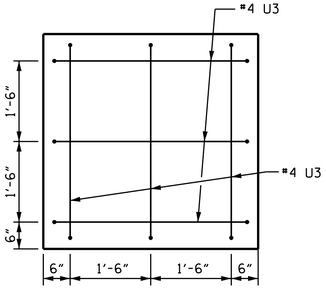
DocuSigned by: vipul a patel 1C157DE15D4B4A4... 2/19/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-66
1			3			TOTAL SHEETS
2			4			75

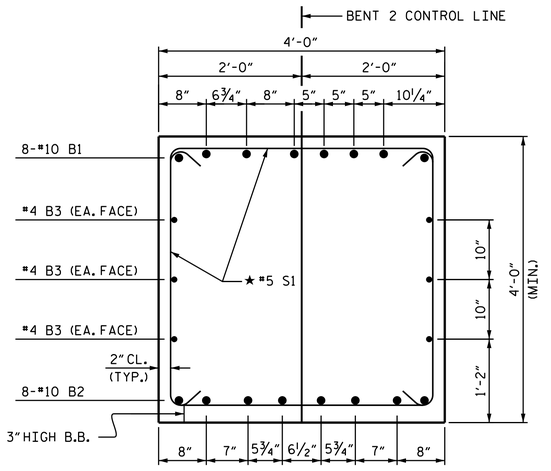


PLAN OF FOOTINGS & COLUMNS

PILES, REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED

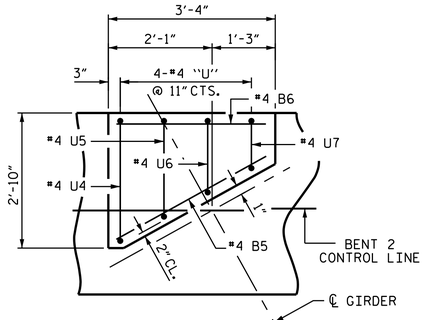


LEFT END VIEW



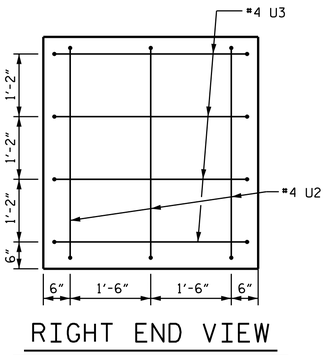
SECTION A-A

★INVERT ALTERNATE STIRRUPS

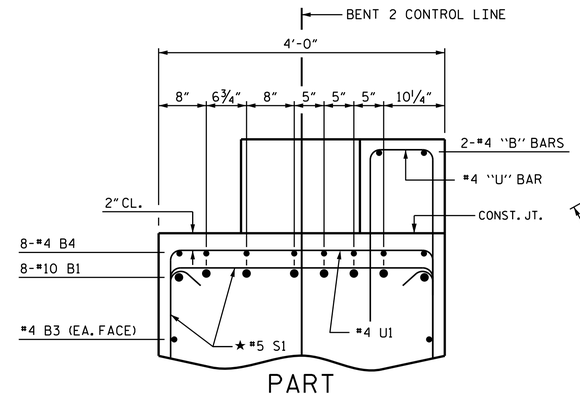


BRIDGE SEAT DETAIL

(TYP. EA. CONC. GDR. BRIDGE SEAT)

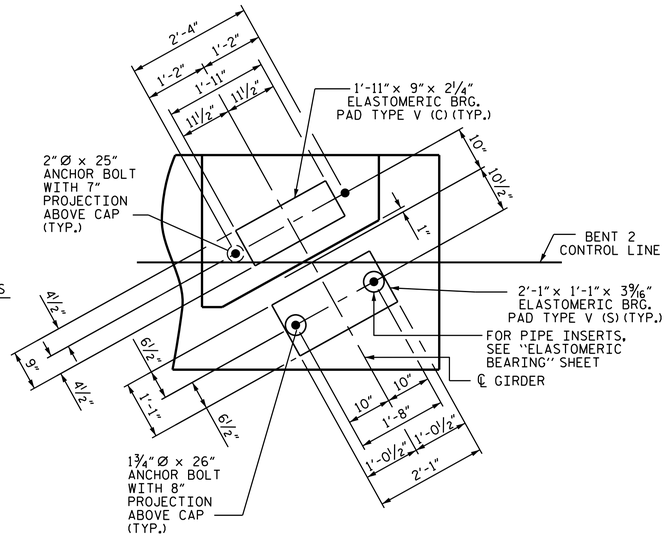


RIGHT END VIEW



PART SECTION B-B

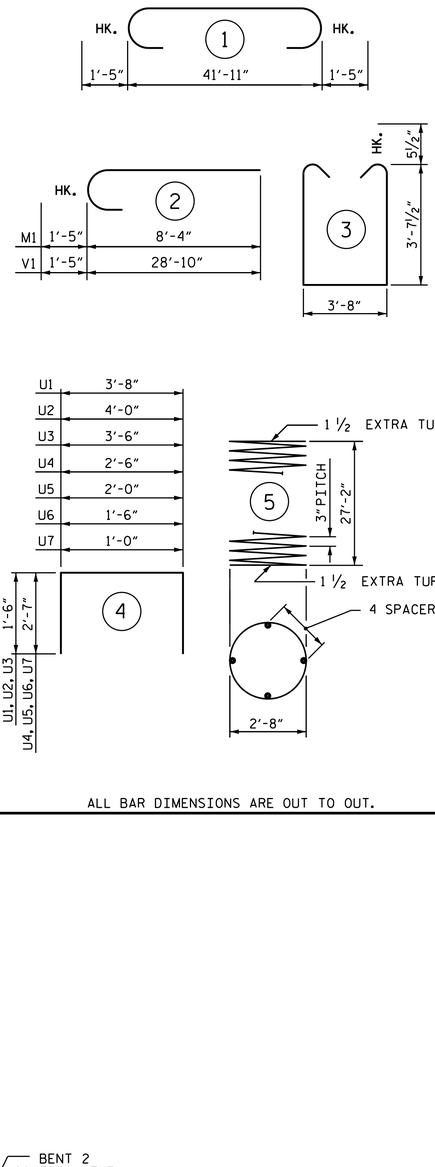
★INVERT ALTERNATE STIRRUPS



DETAIL "A"

(TYP. EA. BRIDGE SEAT)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 2-STAGE III

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	44'-9"	1,540
B2	8	#10	STR	42'-1"	1,449
B3	12	#4	STR	22'-3"	178
B4	8	#4	STR	16'-9"	90
B5	4	#4	STR	3'-5"	9
B6	4	#4	STR	3'-0"	8
M1	42	#10	2	9'-9"	1,762
S1	42	#5	3	11'-10"	518
T1	108	#7	STR	8'-3"	1,821
T2	54	#6	STR	8'-3"	669
U1	41	#4	4	6'-8"	183
U2	3	#4	4	7'-0"	14
U3	10	#4	4	6'-6"	43
U4	4	#4	4	7'-8"	20
U5	4	#4	4	7'-2"	19
U6	4	#4	4	6'-8"	18
U7	4	#4	4	6'-2"	16
V1	42	#10	2	30'-3"	5,467
REINFORCING STEEL				LBS.	13,824
SP-1	3	**	5	922'-0"	1,848
SPIRAL COLUMN REINFORCING STEEL				LBS.	1,848

CLASS A CONCRETE BREAKDOWN:

POUR #1	(FOOTINGS)	C.Y.	29.8
POUR #2	(COLUMNS)	C.Y.	21.1
POUR #3	(CAP)	C.Y.	26.5
POUR #4	(STEPS)	C.Y.	1.4
TOTAL CLASS A CONCRETE		C.Y.	78.8

HP 14X73 STEEL PILES No. 12	LIN. FT.	540
FOUNDATION EXCAVATION		LUMP SUM

** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W-20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

STAGE III

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-67
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4E4A1... 2/19/2015

DRAWN BY : T. H. CARROLL DATE : 10/27/14
CHECKED BY : V. A. PATEL DATE : 11/4/14
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 11/4/14

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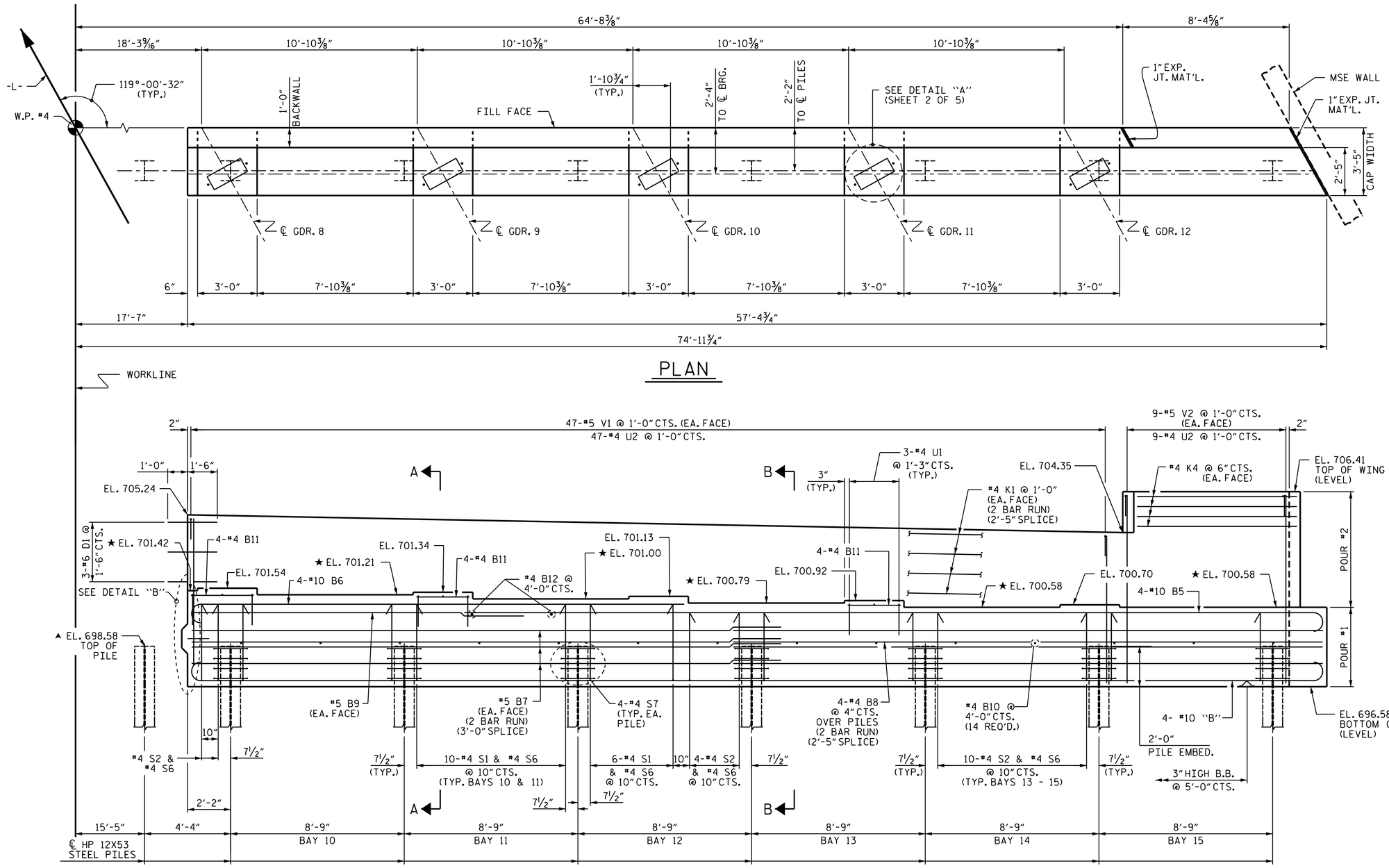


PLAN

ELEVATION

▲ DRIVE END PILE WITH STAGE I
★ ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS ARE SHOWN AT THIS POINT (TYP.)

NOTES

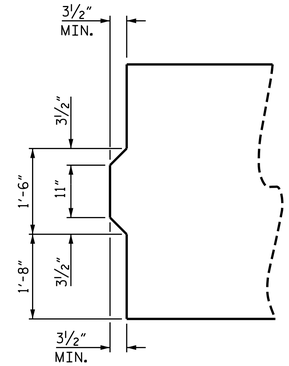
STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

FOR MSE RETAINING WALLS, SEE SPECIAL PROVISIONS.



DETAIL "B"

PROJECT NO. B-5136
CABARRUS COUNTY
STATION: 21+74.92 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 2

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-68
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D484A4... 2/19/2015

DRAWN BY : M.E. GILES DATE : 8/13/14
CHECKED BY : M.K. BEARD DATE : 10/21/14
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 10/21/14

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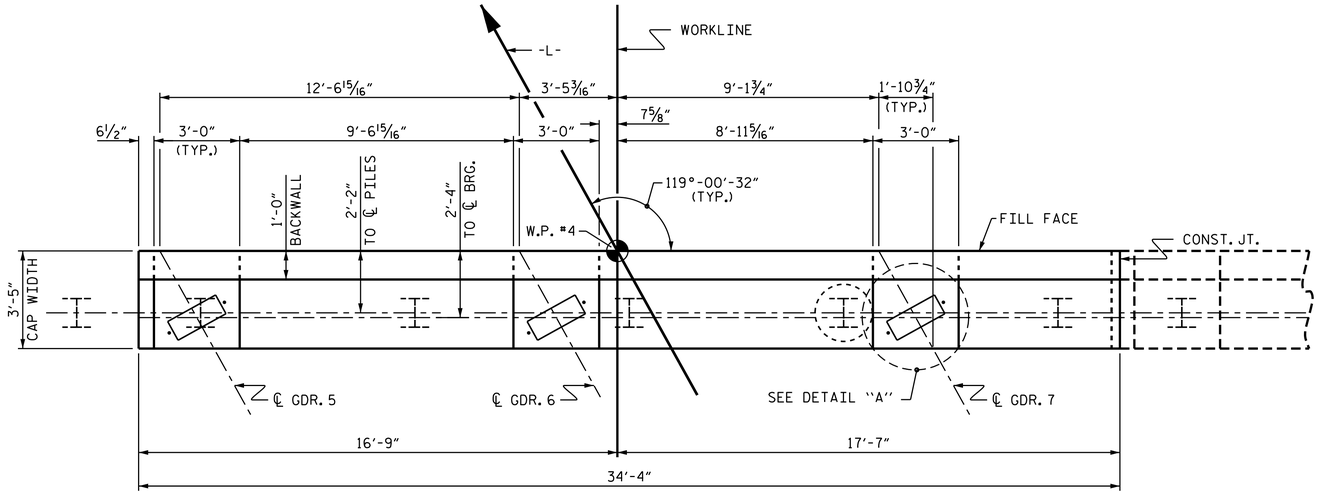
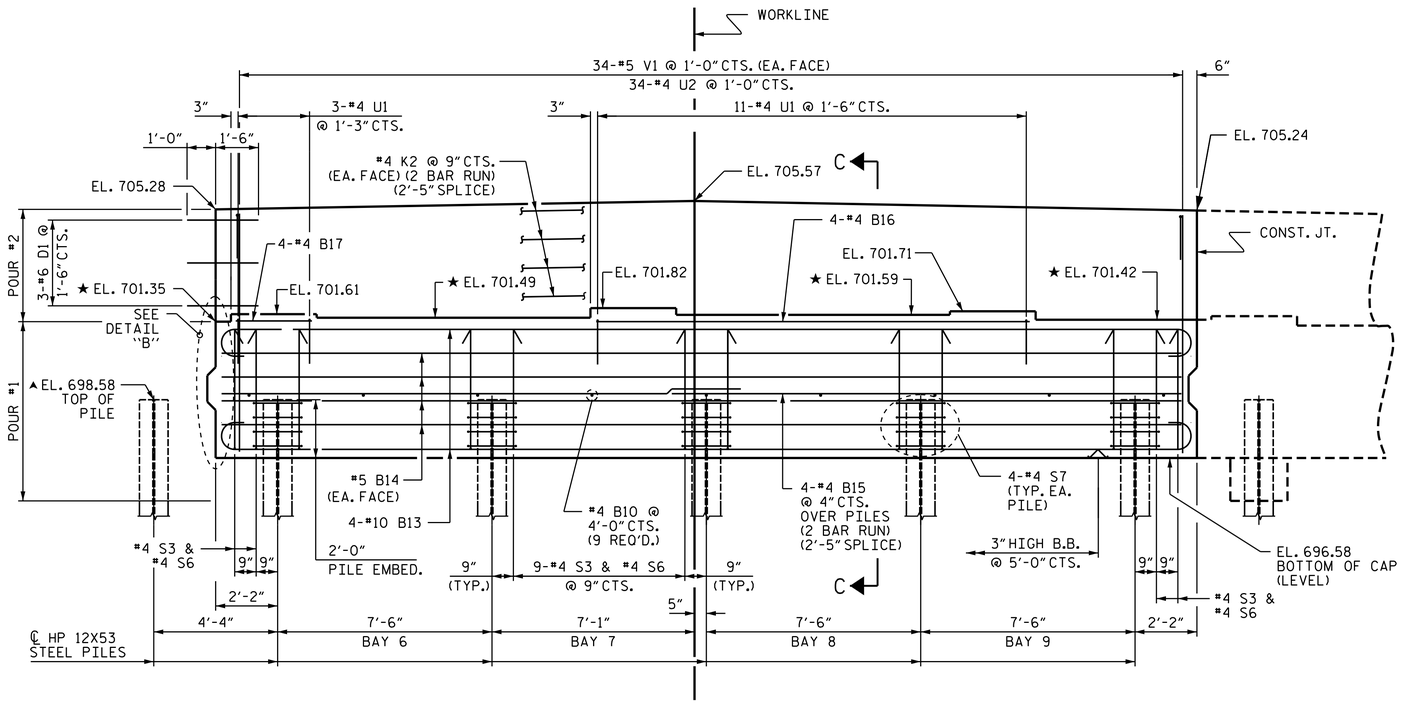
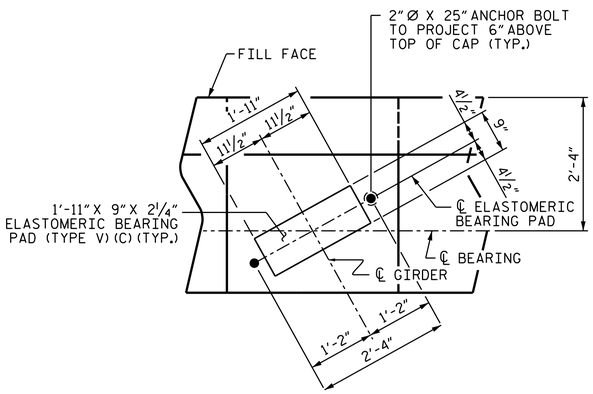


PLAN

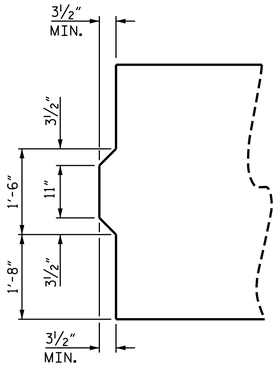


ELEVATION

▲ DRIVE END PILE WITH STAGE II
★ ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS ARE SHOWN AT THIS POINT (TYP.)



DETAIL "A"



DETAIL "B"

PROJECT NO. B-5136
CABARRUS COUNTY
STATION: 21+74.92 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-69
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4B4A4...
2/19/2015

DRAWN BY :	M.E. GILES	DATE :	8/15/14
CHECKED BY :	M.K. BEARD	DATE :	10/21/14
DESIGN ENGINEER OF RECORD:	H.A. LOCKLEAR	DATE :	10/21/14

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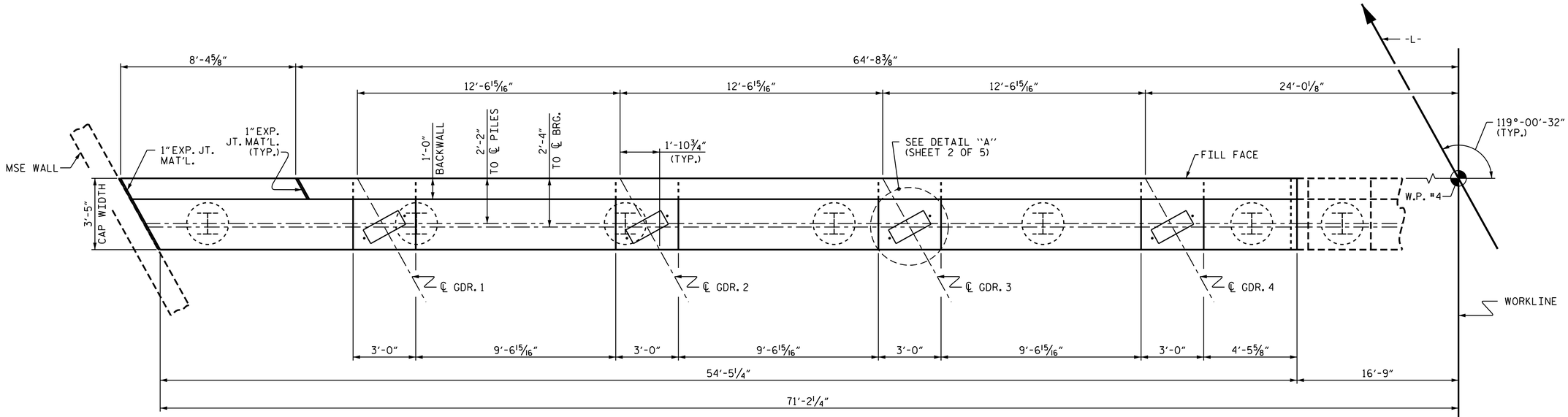
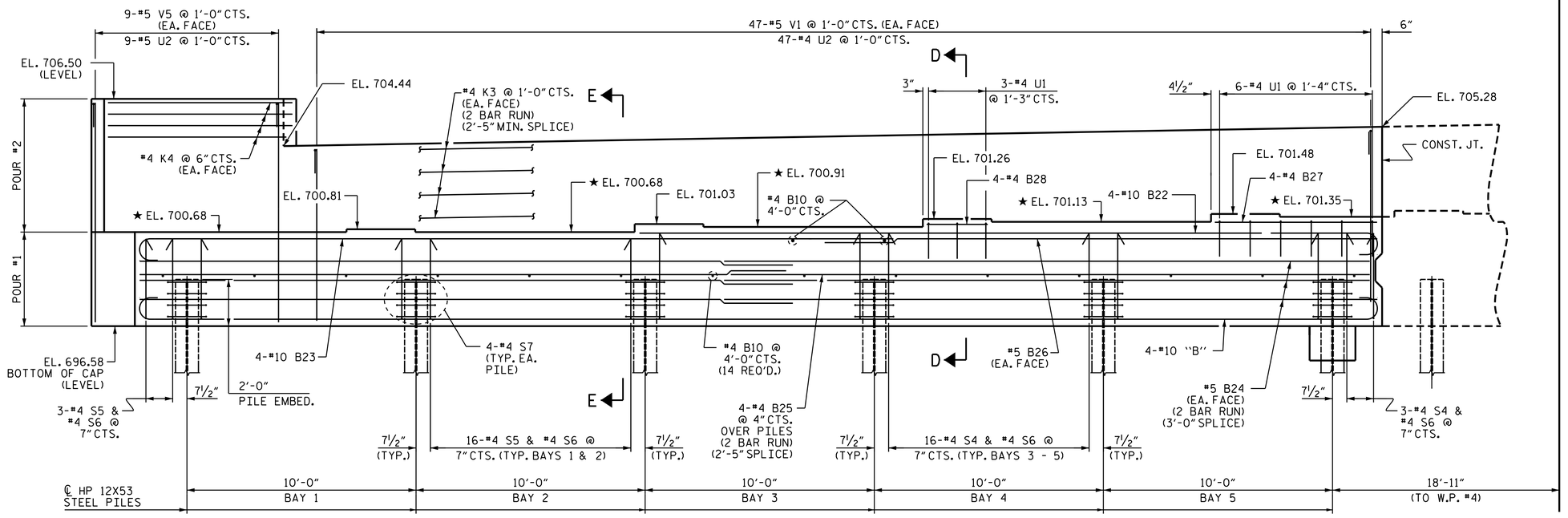


PLAN



ELEVATION

★ ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS ARE SHOWN AT THIS POINT (TYP.)

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

STAGE III

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-70
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D464A4...
2/19/2015

DRAWN BY : M.E. GILES DATE : 8/19/14
CHECKED BY : M.K. BEARD DATE : 10/21/14
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 10/21/14

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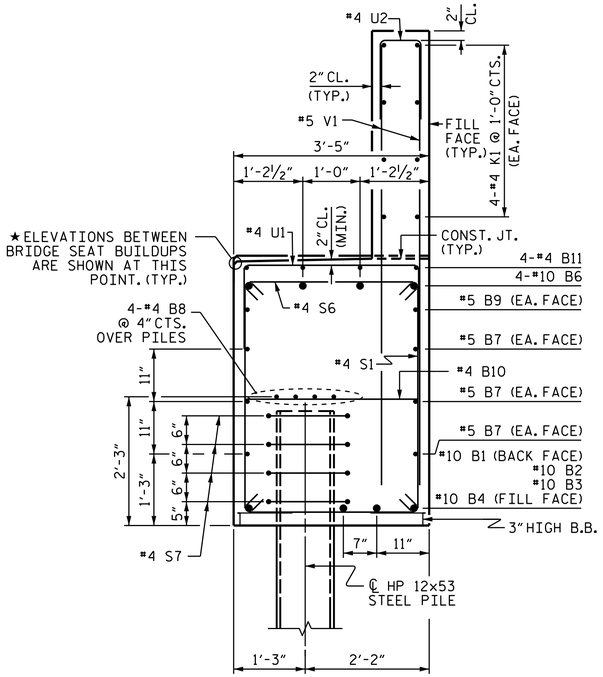
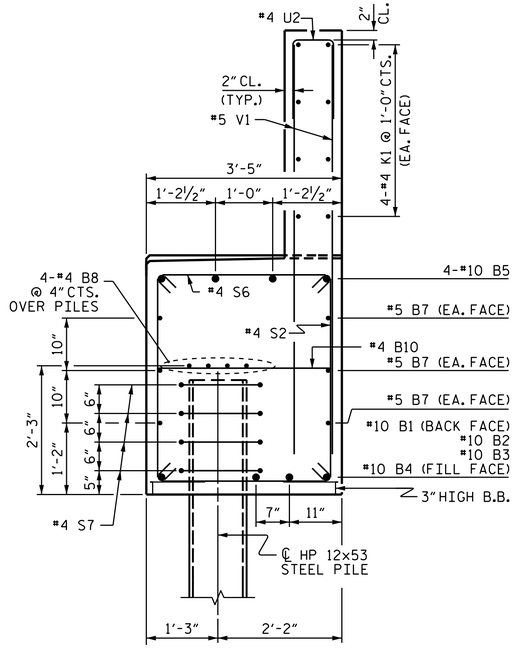


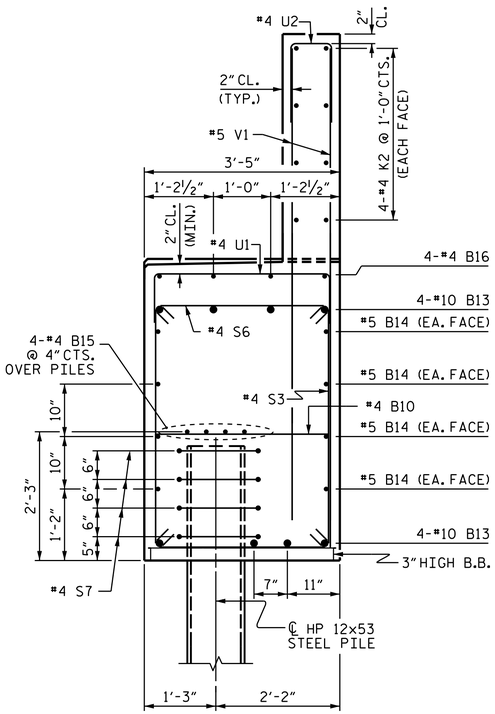
SECTION A-A

(STAGE I)



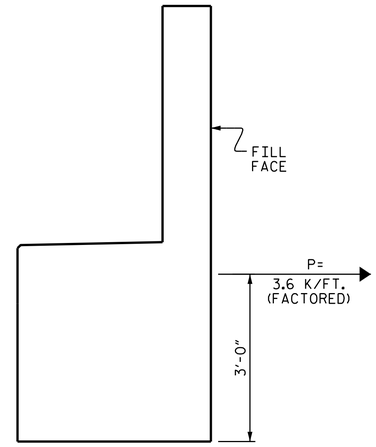
SECTION B-B

(STAGE I)



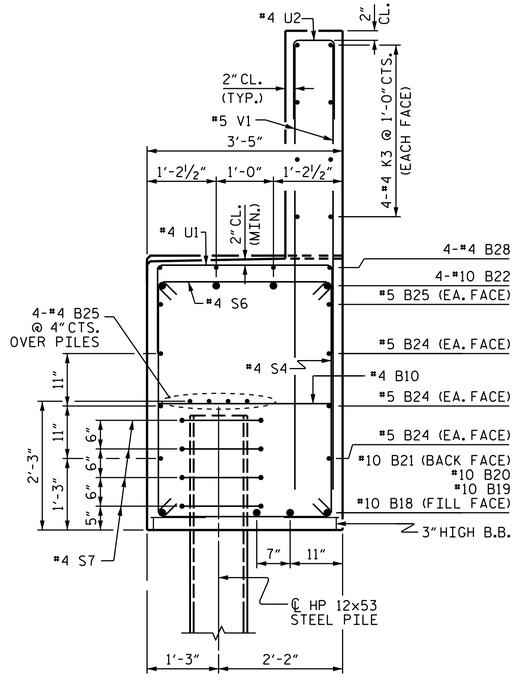
SECTION C-C

(STAGE II)



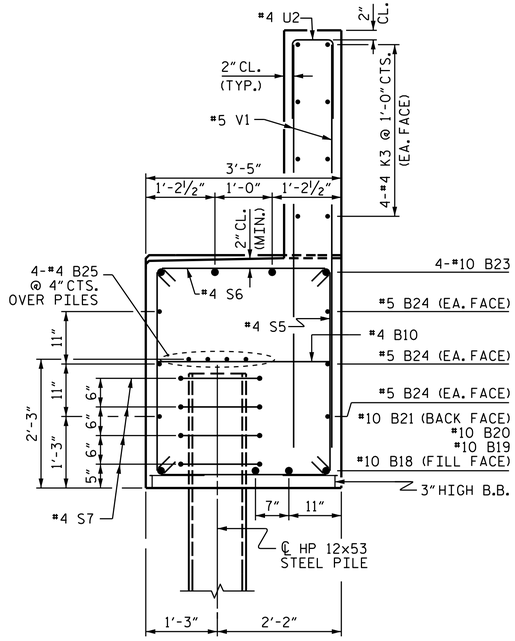
TIE BACK DETAILS

(SHOWING TIE BACK RESTRAINT)



SECTION D-D

(STAGE III)



SECTION E-E

(STAGE III)

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-71
1			3			TOTAL SHEETS
2			4			75

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4F4A4...

2/19/2015

DRAWN BY : M.E. GILES DATE : 8/13/14

CHECKED BY : M.K. BEARD DATE : 10/21/14

DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 10/21/14

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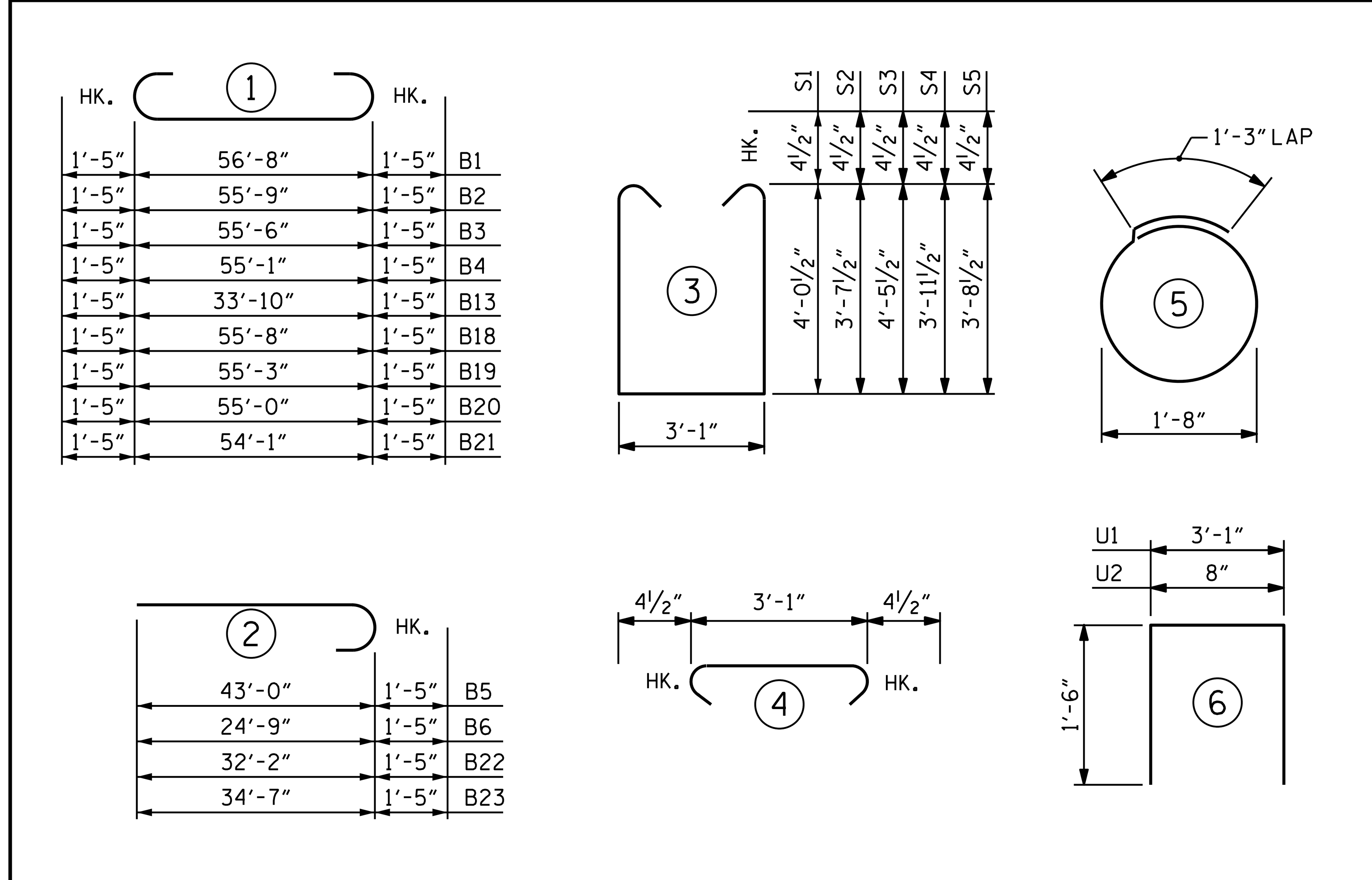
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	1	10	1	59'-6"	256
B2	1	10	1	58'-8"	252
B3	1	10	1	58'-4"	251
B4	1	10	1	57'-11"	249
B5	4	10	2	44'-5"	764
B6	4	10	2	26'-2"	450
B7	12	5	STR	30'-1"	377
B8	8	4	STR	29'-10"	159
B9	2	5	STR	16'-10"	35
B10	16	4	STR	3'-1"	33
B11	12	4	STR	2'-8"	21
D1	3	6	STR	2'-6"	11
K1	16	4	STR	29'-1"	311
K4	8	4	STR	8'-0"	43
S1	28	4	3	11'-11"	223
S2	34	4	3	11'-1"	252
S6	62	4	4	3'-10"	159
S7	28	4	5	6'-6"	122
U1	9	4	6	6'-1"	37
U2	56	4	6	3'-8"	137
V1	94	5	STR	7'-5"	727
V2	18	5	STR	9'-5"	177

REINFORCING STEEL LBS. 5,046

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP	C.Y.	30.9
POUR #2 BACKWALL	C.Y.	8.5
TOTAL	C.Y.	39.4

HP 12X53 STEEL PILES NO. 8 LIN. FT. 560

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B10	9	4	STR	3'-1"	19
B13	8	10	1	36'-8"	1262
B14	8	5	STR	33'-8"	281
B15	8	4	STR	18'-3"	98
B16	4	4	STR	15'-2"	41
B17	4	4	STR	2'-8"	7
D1	3	6	STR	2'-6"	11
K2	16	4	STR	18'-3"	195
S3	40	4	3	12'-9"	341
S6	40	4	4	3'-10"	102
S7	20	4	5	6'-6"	87
U1	14	4	6	6'-1"	57
U2	34	4	6	3'-8"	83
V1	68	5	STR	7'-5"	526

REINFORCING STEEL LBS. 3,110

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP	C.Y.	21.7
POUR #2 BACKWALL	C.Y.	4.9
TOTAL	C.Y.	26.3

HP 12X53 STEEL PILES NO. 5 LIN. FT. 365

STAGE III

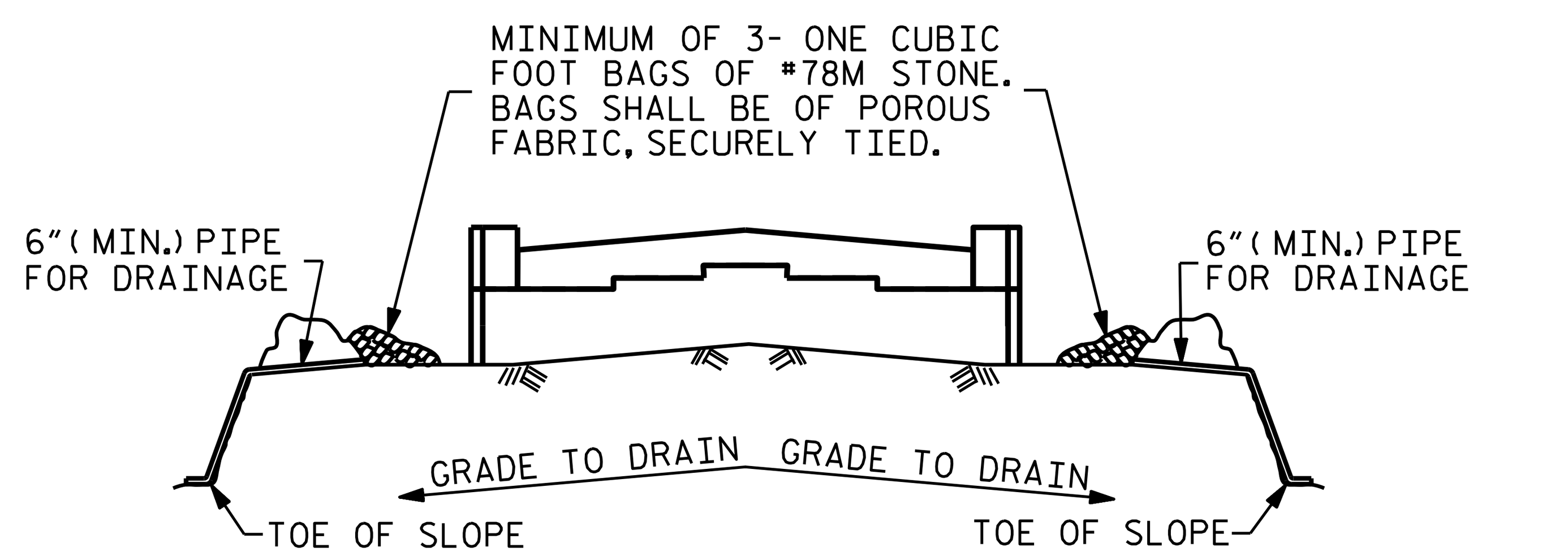
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B10	16	4	STR	3'-1"	33
B18	1	10	1	58'-6"	252
B19	1	10	1	58'-1"	250
B20	1	10	1	57'-10"	249
B21	1	10	1	56'-11"	245
B22	4	10	2	33'-7"	578
B23	4	10	2	36'-0"	620
B24	12	5	STR	29'-6"	369
B25	8	4	STR	28'-9"	154
B26	2	5	STR	24'-3"	51
B27	4	4	STR	7'-2"	19
B28	4	4	STR	2'-8"	7
K3	16	4	STR	29'-2"	312
K4	8	4	STR	8'-0"	43
S4	51	4	3	11'-9"	400
S5	35	4	3	11'-3"	263
S6	86	4	4	3'-10"	220
S7	24	4	5	6'-6"	104
U1	9	4	6	6'-1"	37
U2	47	4	6	3'-8"	115
V1	94	5	STR	7'-5"	727
V5	18	5	STR	9'-7"	180

REINFORCING STEEL LBS. 5,228

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP	C.Y.	30.8
POUR #2 BACKWALL	C.Y.	8.6
TOTAL	C.Y.	39.4

HP 12X53 STEEL PILES NO. 5 LIN. FT. 375

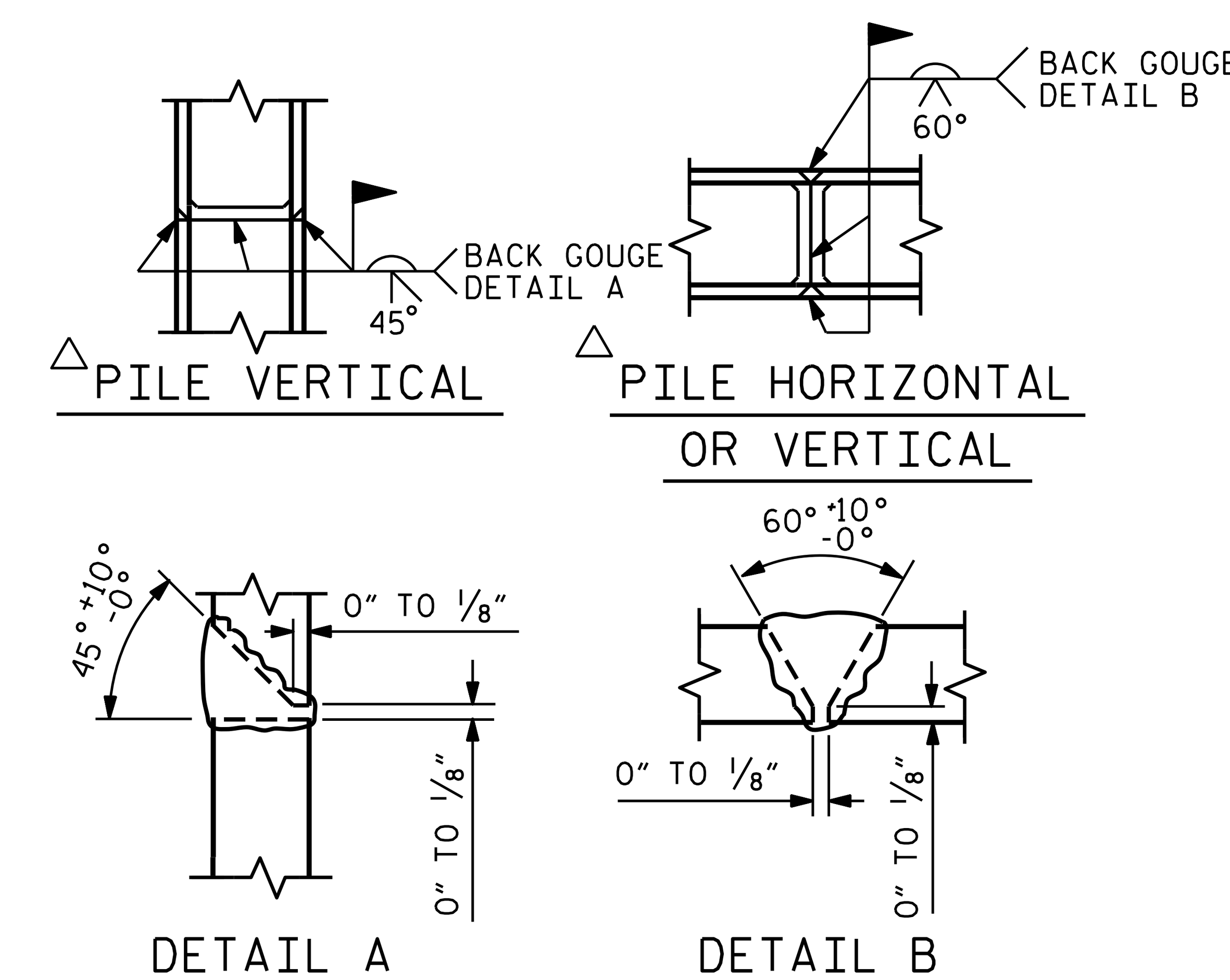


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

DocuSigned by: vipul a. patel 2/19/2015

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-72
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : M.E. GILES DATE : 8/4/14
CHECKED BY : M.K. BEARD DATE : 10/16/14
DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR DATE : 10/16/14

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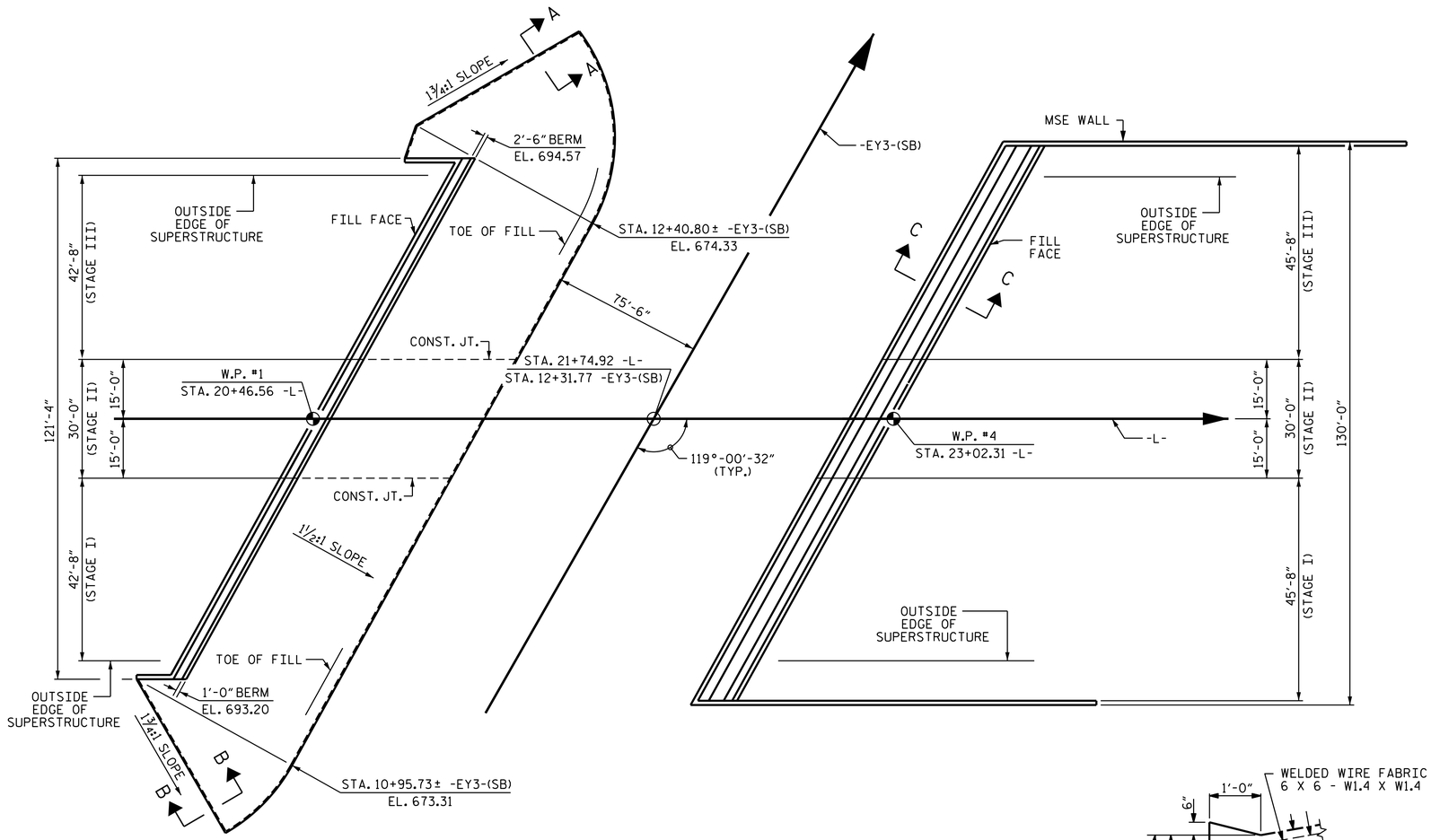


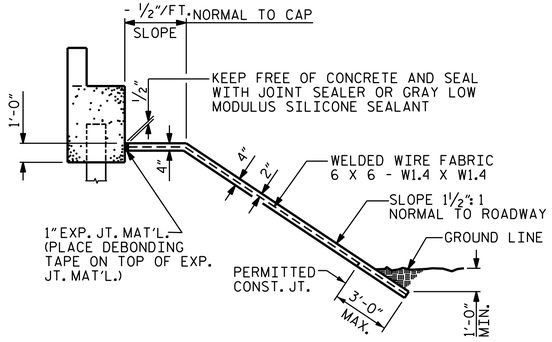
NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS.

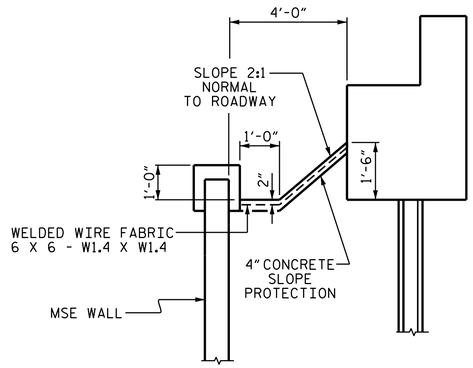
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL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

BRIDGE @ STA. 21+74.92 -L-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1		
(STAGE I)	380	760
(STAGE II)	140	280
(STAGE III)	315	630
TOTAL	**835**	**1670**
END BENT 2		
(STAGE I)	25	50
(STAGE II)	15	30
(STAGE III)	25	50
TOTAL	**65**	**130**

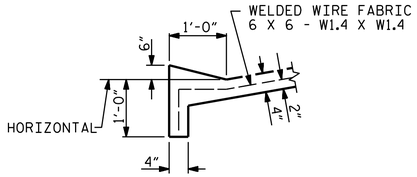
* QUANTITY SHOWN IS BASED ON 5' POURS.



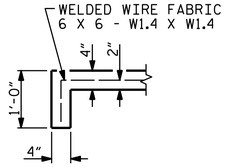
SECTION ALONG ℄ ROADWAY AT END BENT 1



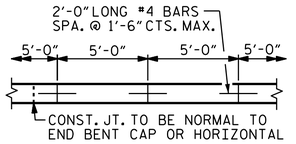
SECTION C-C



SECTION B-B

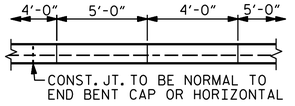


SECTION A-A



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

Docusigned by: vipul a patel 1C1577DE15D4484... 2/19/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-73
1			3			TOTAL SHEETS
2			4			75

STD. NO. SP1

ASSEMBLED BY : N.D'AIUTO	DATE : 7/18/14	
CHECKED BY : T.H.CARROLL	DATE : 11/12/14	
DRAWN BY : ELR 5/92	REV. 5/1/06	TLA/GM
CHECKED BY : GRP 6/92	REV. 10/1/11	MAA/GM
	REV. 12/21/11	MAA/GM

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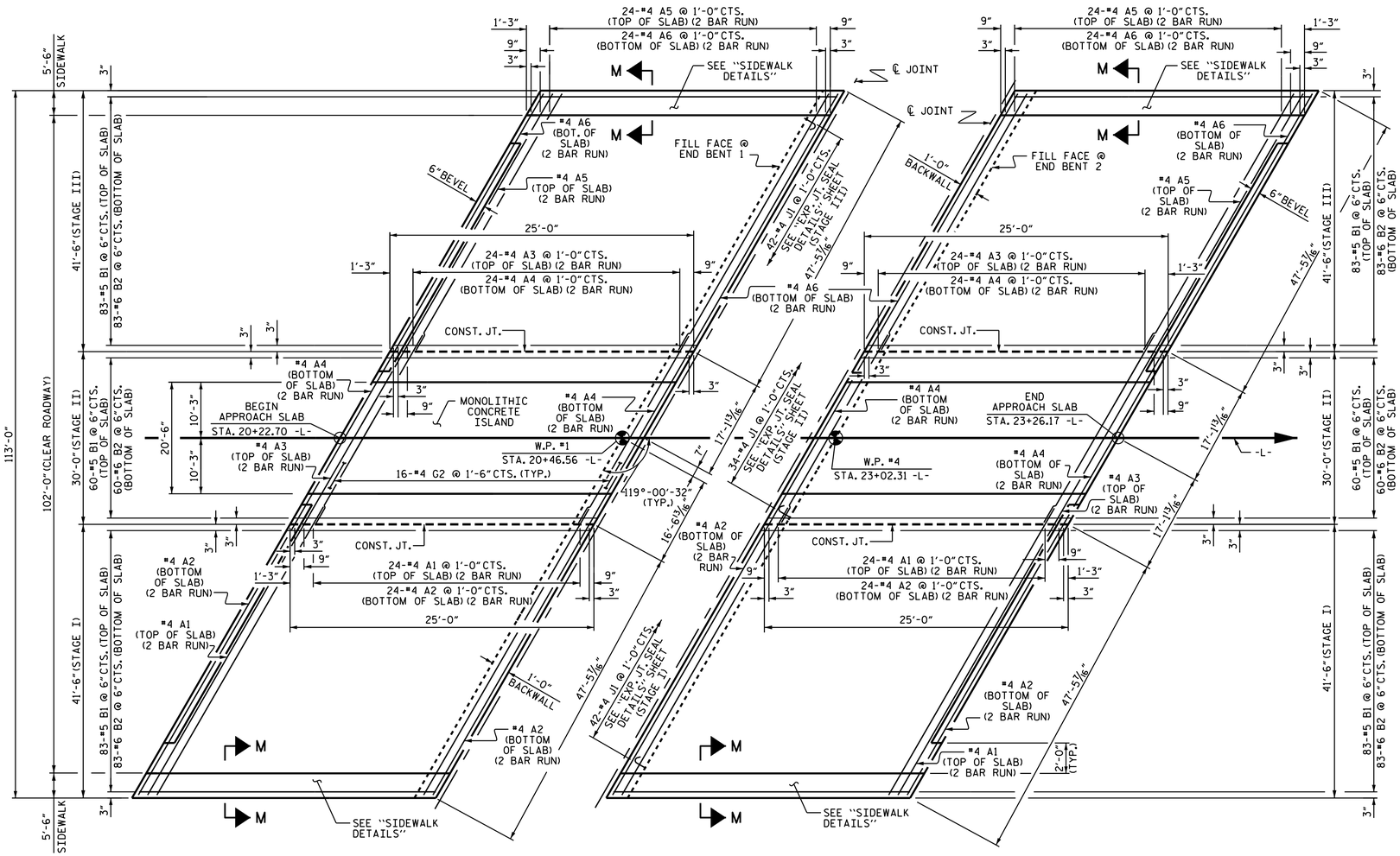
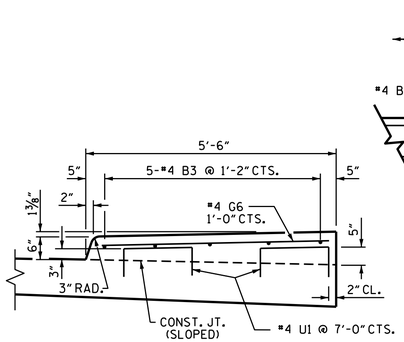


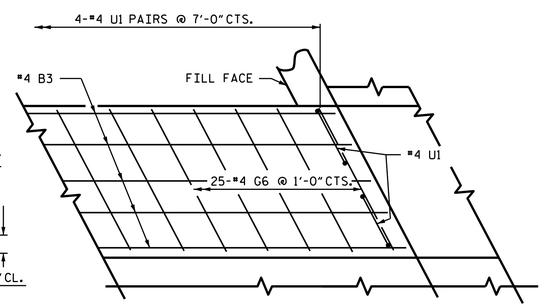
PLAN @ END BENT 1

PLAN @ END BENT 2

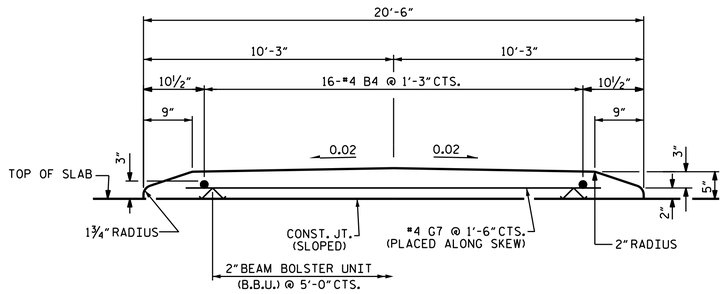
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS.
FOR REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS".
#4 A1 & #4 A2 TO EXTEND 2'-0" INTO STAGE II.
#4 A3 & #4 A4 TO EXTEND 2'-0" INTO STAGE III.



SECTION M-M



PLAN



SECTION THROUGH MONOLITHIC CONCRETE ISLAND

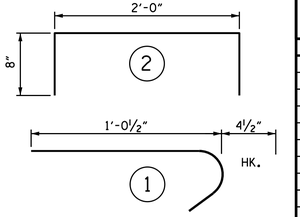
STAGE IV

SEE "SECTION THROUGH ISLAND AT END BENTS" ON "SIDEWALK AND MONOLITHIC CONCRETE ISLAND DETAILS" SHEET FOR JOINT DETAILS BETWEEN APPROACH SLAB AND BRIDGE.

SIDEWALK DETAILS

BEGIN APPROACH SLAB SHOWN, END APPROACH SLAB SIMILAR.
RIGHT SIDEWALK SHOWN, LEFT SIDEWALK SIMILAR.
FOR COVER PLATE DETAILS, SEE "EXPANSION JOINT SEAL DETAILS" SHEET.

BAR TYPE



BAR DIMENSIONS ARE OUT TO OUT

STAGE IV FOR ONE MONOLITHIC CONCRETE ISLAND (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B4	16	#4	STR	23'-11"	256
* G7	16	#4	STR	21'-8"	232
* EPOXY COATED REINFORCING STEEL				LBS.	488
CLASS AA CONCRETE CONCRETE ISLAND				C.Y.	7.6

BILL OF MATERIAL

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

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	50	#4	STR	25'-9"	860
A2	52	#4	STR	25'-7"	889
* B1	83	#5	STR	23'-9"	2056
B2	83	#6	STR	24'-7"	3065
* B3	5	#4	STR	24'-2"	81
* G6	25	#4	STR	5'-8"	95
* J1	42	#4	1	1'-5"	40
* U1	8	#4	2	3'-4"	18
REINFORCING STEEL				LBS.	3,954
* EPOXY COATED REINFORCING STEEL				LBS.	3,150
CLASS AA CONCRETE POUR 1 - APP. SLAB				C.Y.	45.0
POUR 2 - SIDEWALK				C.Y.	3.1
TOTAL				C.Y.	48.1

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

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	50	#4	STR	19'-2"	640
A4	52	#4	STR	19'-1"	663
* B1	60	#5	STR	23'-9"	1486
B2	60	#6	STR	24'-7"	2215
* J1	34	#4	1	1'-5"	32
REINFORCING STEEL				LBS.	2,878
* EPOXY COATED REINFORCING STEEL				LBS.	2,158
CLASS AA CONCRETE POUR 1 - APP. SLAB				C.Y.	32.5

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

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A5	50	#4	STR	24'-7"	821
A6	52	#4	STR	24'-5"	848
* B1	83	#5	STR	23'-9"	2056
B2	83	#6	STR	24'-7"	3065
* B3	5	#4	STR	24'-2"	81
* G6	25	#4	STR	5'-8"	95
* J1	42	#4	1	1'-5"	40
* U1	8	#4	2	3'-4"	18
REINFORCING STEEL				LBS.	3,913
* EPOXY COATED REINFORCING STEEL				LBS.	3,111
CLASS AA CONCRETE POUR 1 - APP. SLAB				C.Y.	45.0
POUR 2 - SIDEWALK				C.Y.	3.1
TOTAL				C.Y.	48.1

NOTES

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4"Ø DRAINAGE PIPE, #78M STONE, 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.

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDWALK AND MONOLITHIC CONCRETE ISLAND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET. NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

FOR GALVANIZED REINFORCING STRAPS AND BACKFILL MATERIAL, SEE MSE RETAINING WALL PLANS AND SPECIAL PROVISIONS.

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

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

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.91 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D464AA... 2/27/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-74
1			3			TOTAL SHEETS
2			4			75

STD. NO. BAS2

ASSEMBLED BY : N.D'AIUTO	DATE : 7/16/14
CHECKED BY : T.H.CARROLL	DATE : 10/29/14
DRAWN BY : MAA 11/11	
CHECKED BY : AAC 11/11	

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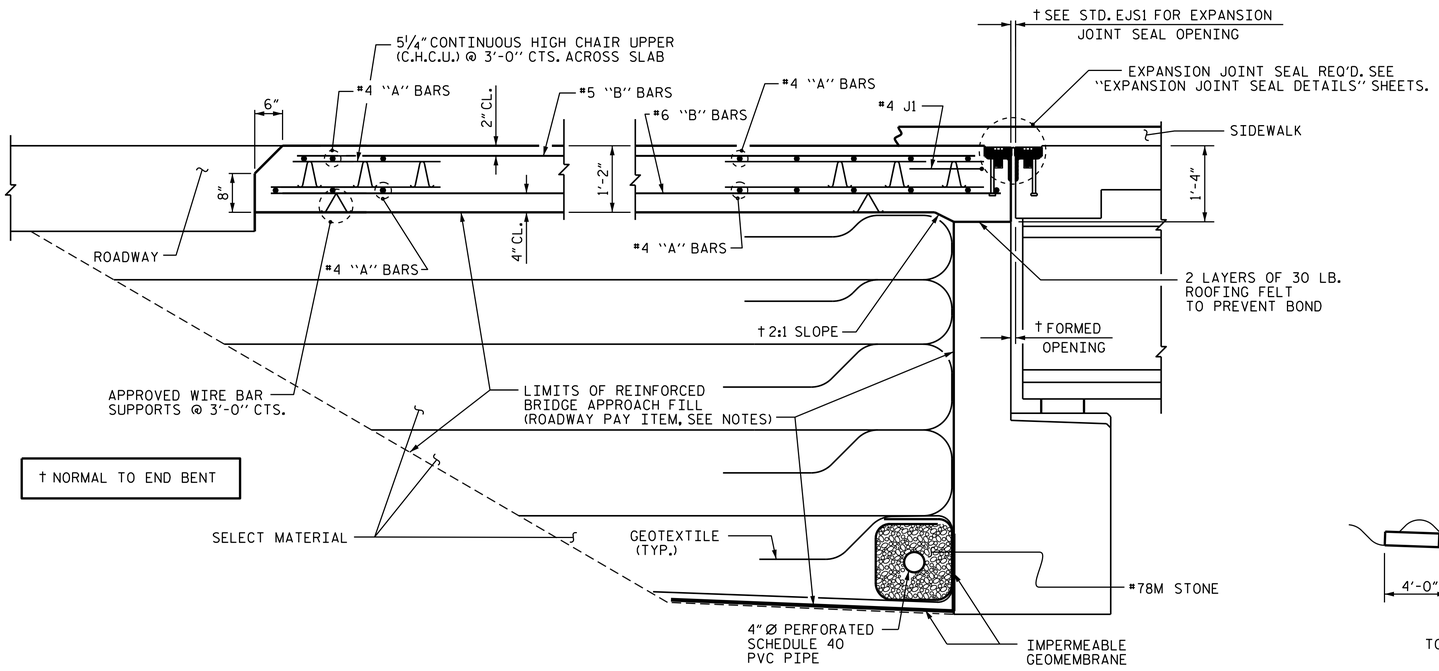
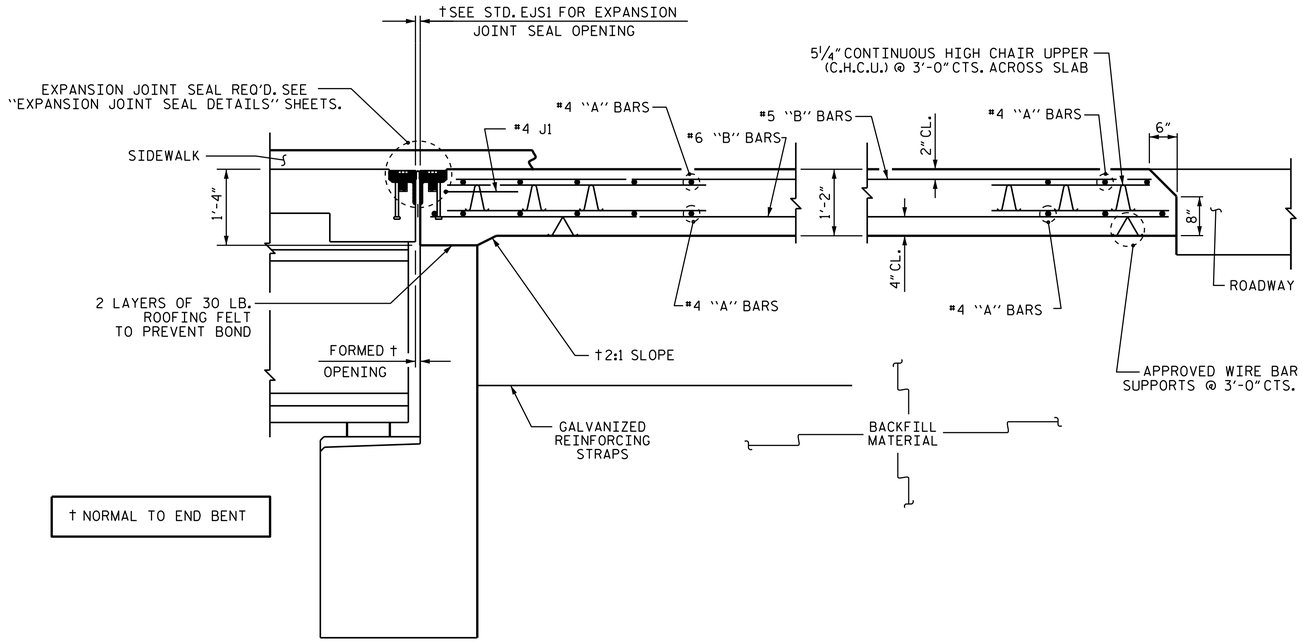
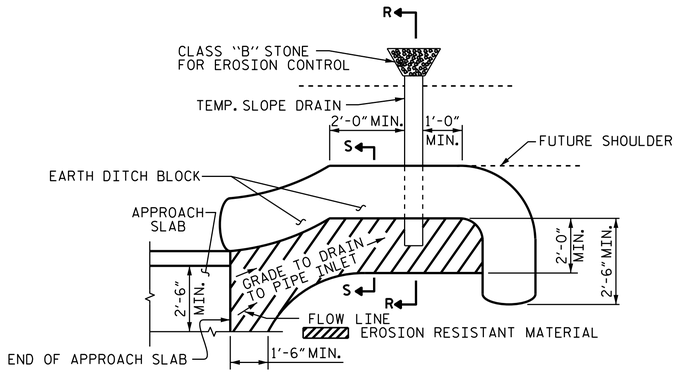


SECTION THROUGH SLAB @ END BENT 1

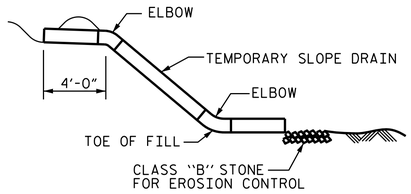


SECTION THROUGH SLAB @ END BENT 2



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

PLAN VIEW



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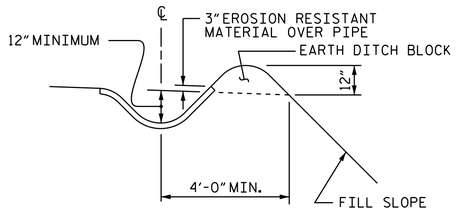

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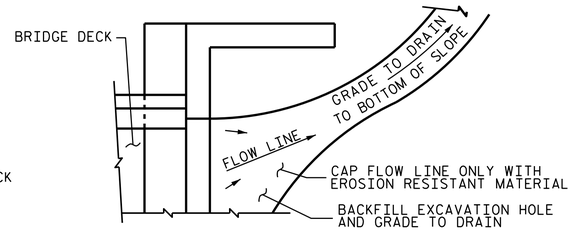

NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. B-5136

CABARRUS COUNTY

STATION: 21+74.92 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

DocuSigned by: vipul a patel 1C157DE15D4A4A4... 2/19/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-75
1			3			TOTAL SHEETS
2			4			75

DRAWN BY : N.D'AIUTO DATE : 7/16/14
CHECKED BY : T.H.CARROLL DATE : 10/29/14

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