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F.A. PROJECT NO. STP-55(20)

16+00 16+50 17+00 17+50 18+00

SPAN A SPAN B

+0.6733% -1.1385%
PI STA. = 18+50.00 -Y-
EL. = 418.72
L = 100.0'
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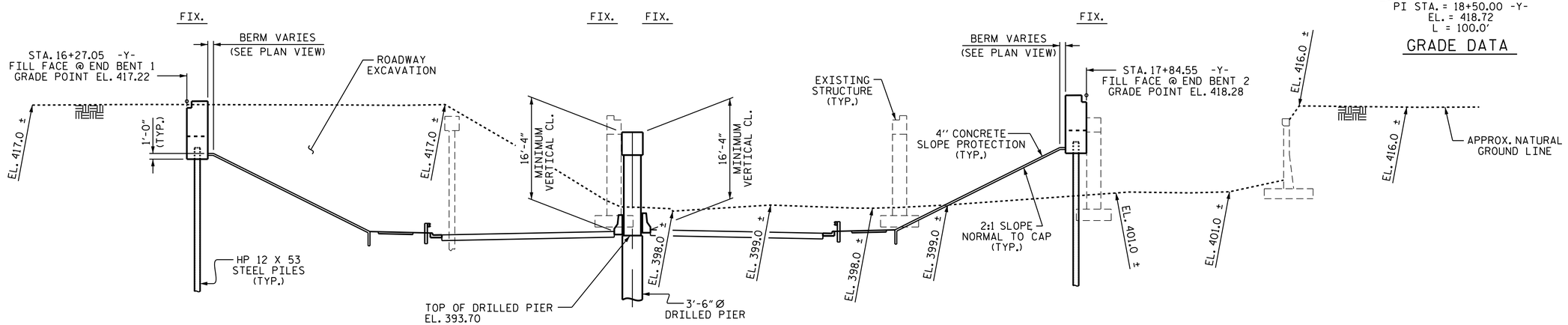
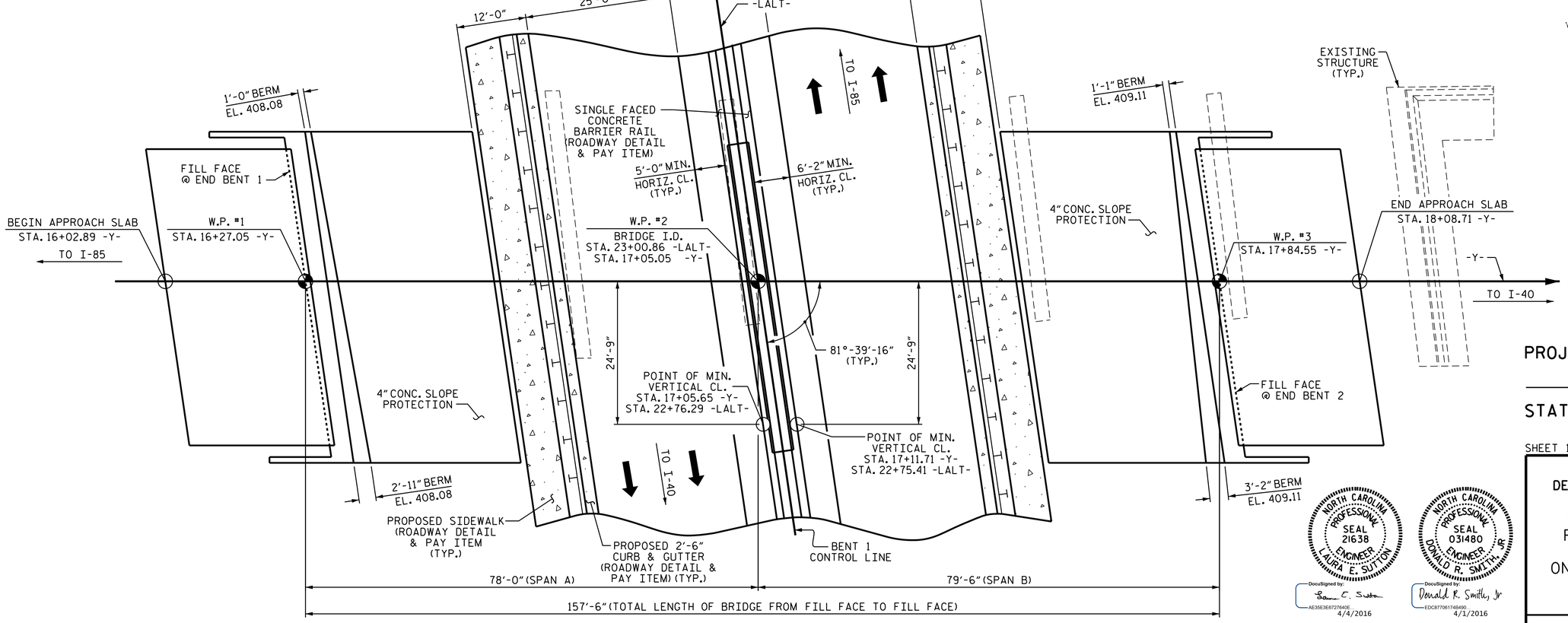


INTEGRAL END BENT 1 BENT 1 INTEGRAL END BENT 2

SECTION ALONG -Y-

SECTION THROUGH END BENTS & BENT TAKEN @ RIGHT ANGLES



PLAN

PILES, COLUMNS AND DRILLED PIERS NOT SHOWN FOR CLARITY

DRAWN BY : P.S. ADKINS DATE : 9/8/14
CHECKED BY : H.P. KIM DATE : 9/30/14
DESIGN ENGINEER OF RECORD: D.R. SMITH DATE : 11/3/14

31-MAR-2016 13:50
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jdhawk

NORTH CAROLINA PROFESSIONAL SEAL 21638 ENGINEER LAURA E. SUTTON
DocuSigned by: Laura E. Sutton AE35E3E6727640E...
4/4/2016

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.
DocuSigned by: Donald R. Smith, Jr EDC87706174B490...
4/1/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. U-3308
DURHAM COUNTY
STATION: 23+00.86-LALT- 17+05.05-Y-

SHEET 1 OF 3 REPLACES BRIDGE 44

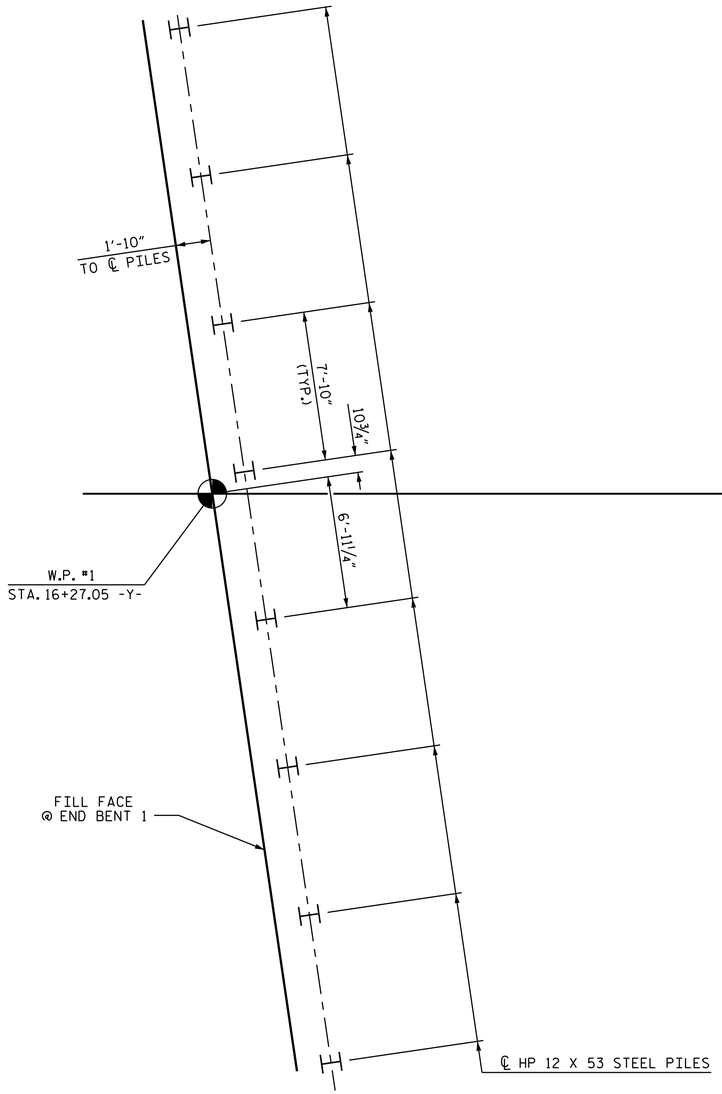
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

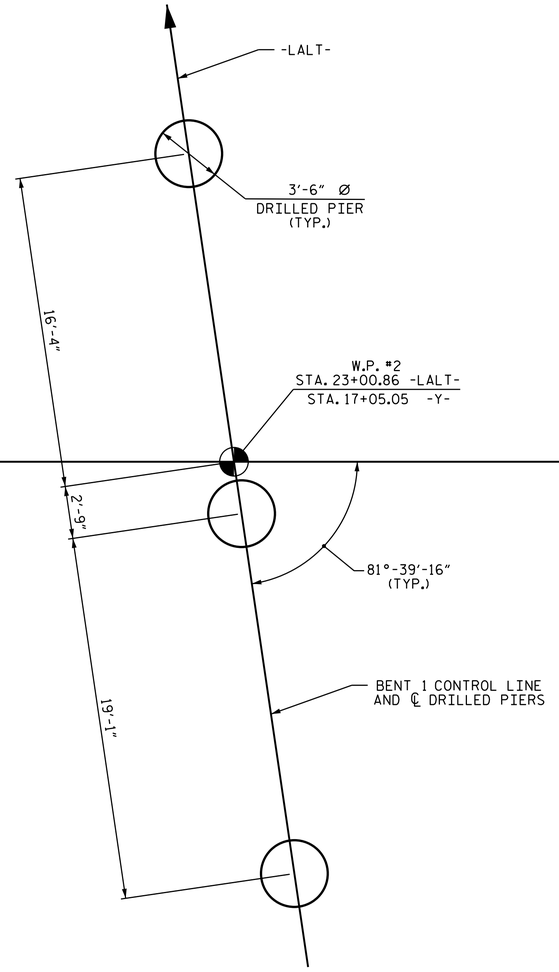
FOR BRIDGE OVER NC 55 (ALSTON AVE.) ON PETTIGREW ST. BETWEEN FAYETTEVILLE RD. AND BRIGGS AVE.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-1
1			3			TOTAL SHEETS
2			4			32

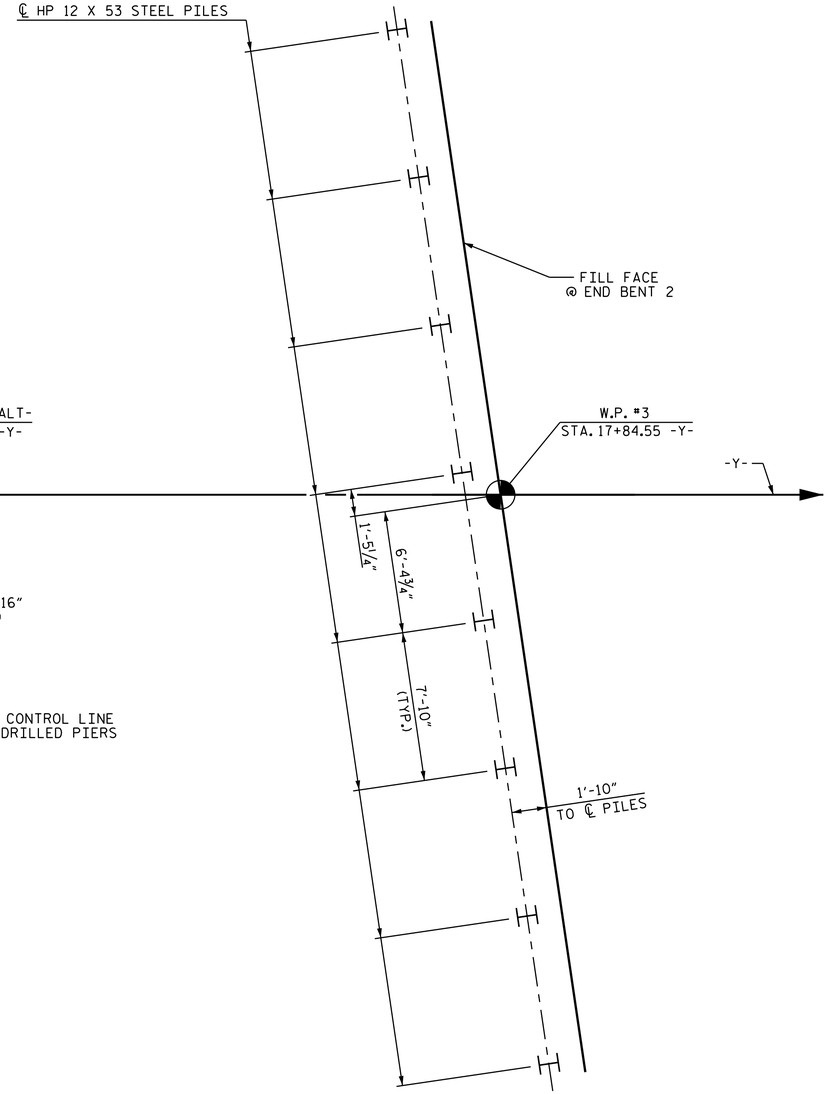
STR. #2



INTEGRAL END BENT 1



BENT 1



INTEGRAL END BENT 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING DRILLED PIERS ARE SHOWN TO DRILLED PIER CENTERLINES.

NOTES

FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT 1. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 395.0 FT. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

CONCRETE OR GROUT IS REQUIRED TO FILL BOTTOM 3 FT. OF HOLES AND SELECT GRANULAR MATERIAL IS REQUIRED TO FILL THE REMAINING HOLES FOR PILE EXCAVATION AT END BENT 1. SELECT GRANULAR MATERIAL SHALL MEET THE CRITERIA OUTLINED IN THE STANDARD SPECIFICATIONS, ARTICLE 1016-3 CLASS II OR III.

FOR DRILLED PIERS, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 580 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 70 TSF.

INSTALL DRILLED PIERS AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 373 FT. LT., 372 FT. CT. AND 371 FT. RT. WITH THE REQUIRED TIP RESISTANCE AND PENETRATION OF AT LEAST 5 FT. INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

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

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

DRILLED PIER EXCAVATIONS AT BENT 1 WILL EXTEND INTO MATERIAL THAT DETERIORATES WHEN EXPOSED TO THE ELEMENTS. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE AND PLACE CONCRETE IMMEDIATELY AFTER THE EXCAVATION IS COMPLETED.

DRAWN BY : P.S. ADKINS DATE : 9/9/14
CHECKED BY : H.P. KIM DATE : 9/30/14
DESIGN ENGINEER OF RECORD: D.R. SMITH DATE : 11/3/14

22-MAR-2016 11:35
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jdhawk

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr
EDC87706174B490...
4/1/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. U-3308
DURHAM COUNTY
BRIDGE NO. 23+00.86-LALT-

SHEET 2 OF 3

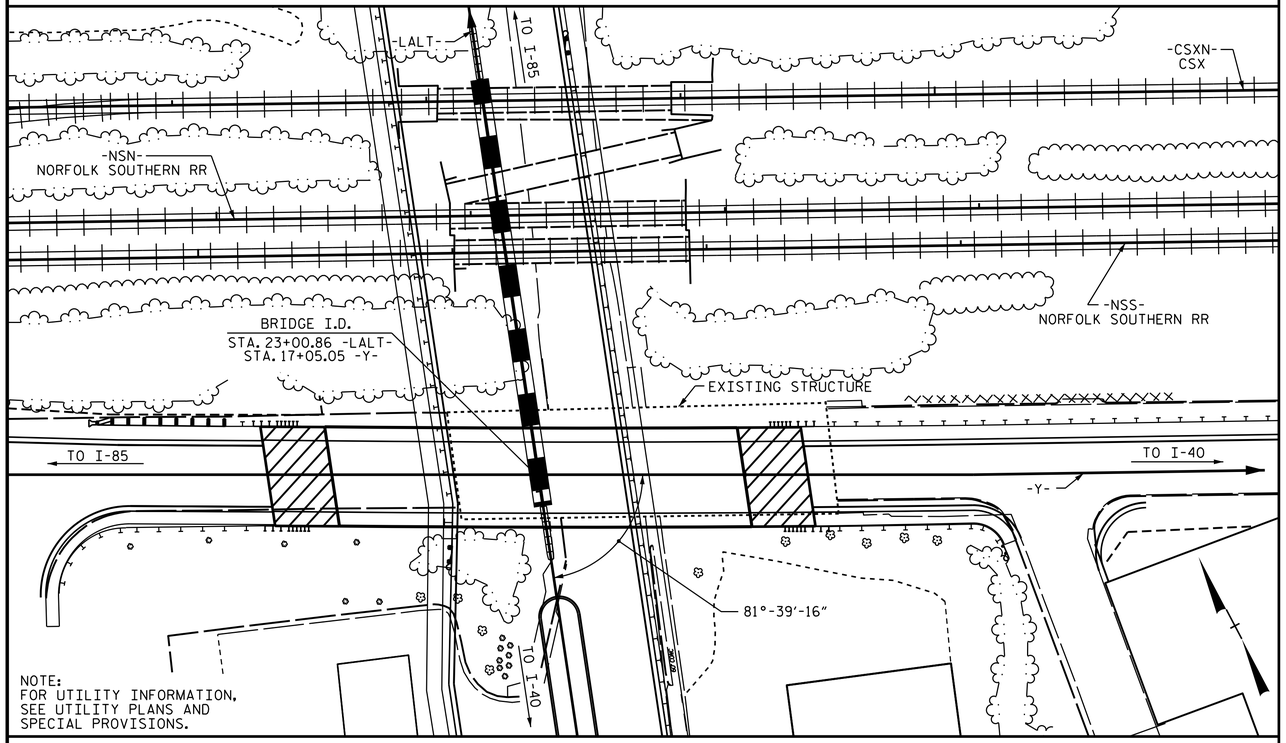
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER NC 55 (ALSTON AVE.) ON PETTIGREW ST. BETWEEN FAYETTEVILLE RD. AND BRAGGS AVE.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-2
1			3			TOTAL SHEETS
2			4			32

STR. #2

BM 503: RAILROAD SPIKE SET IN 15" PIN OAK, 57.15' LEFT OF STA. 14+56.75 -Y-, EL. 414.78.



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.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

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

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

THE EXISTING PAVEMENT WITHIN THE AREA OF THE END BENT 2 PILES SHALL BE REMOVED AND THE ROADBED SCARIFIED TO A MINIMUM DEPTH OF 2'-0".

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

WORK SHALL NOT START ON THIS BRIDGE UNTIL ROADWAY SECTION HAS BEEN EXCAVATED.

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 23+00.86-LALT-."

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 EXISTING STRUCTURE CONSISTING OF 4 SPANS (29'-6", 50', 34', AND 33') WITH REINFORCED CONCRETE FLOOR ON I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 36 FT. ON A SUBSTRUCTURE WITH REINFORCED CONCRETE CAP ON TIMBER PILES AT END BENT 1, FULL HEIGHT REINFORCED CONCRETE ABUTMENT AT END BENT 2, AND INTERIOR BENTS OF REINFORCED CONCRETE POST AND BEAM ON SPREAD FOOTINGS AND LOCATED AT THE 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.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON THE PROPOSED GROUND LINE ELEVATION. IF NECESSARY FOR PHASING, THE CONTRACTOR MAY LOWER THE CONSTRUCTION JOINT UP TO 1 FT. BELOW PROPOSED THE GROUND LINE.

FOR IMPACTS TO BRIDGE CONSTRUCTION DUE TO TRAFFIC PHASING, SEE TRANSPORTATION MANAGEMENT PLANS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	3'-6" DIA. DRILLED PIERS IN SOIL	3'-6" DIA. DRILLED PIERS NOT IN SOIL	SID INSPECTIONS	CSL TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE
	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	SQ.FT.	SQ.FT.	CU.YDS.
SUPERSTRUCTURE								8,046	8,150	
END BENT 1		80	16							37.4
BENT 1				42.25	23.00					41.6
END BENT 2										37.4
TOTAL	LUMP SUM	80	16	42.25	23.00	1	1	8,046	8,150	116.4

	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS		HP 12 X 53 STEEL PILES		STEEL PILE POINTS	TWO BAR METAL RAIL	1'-2" X 3'-0" CONCRETE PARAPET	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	ASBESTOS ASSESSMENT
	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	SQ.YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM			10	771.88				295.78	311.63		LUMP SUM	
END BENT 1		5,223				8	96	8			225		
BENT 1		12,329	2,271										
END BENT 2		5,223				8	320				235		
TOTAL	LUMP SUM	22,775	2,271	10	771.88	16	416	8	295.78	311.63	460	LUMP SUM	LUMP SUM

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 23+00.86-LALT-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER NC 55 (ALSTON AVE.)
ON PETTIGREW ST. BETWEEN FAYETTEVILLE RD. AND BRAGGS AVE.

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr
EDC877061748490...
4/1/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-3
1			3			TOTAL SHEETS
2			4			32

STR. #2

DRAWN BY : P.S. ADKINS DATE : 9/8/14
CHECKED BY : H.P. KIM DATE : 9/30/14
DESIGN ENGINEER OF RECORD: D.R. SMITH DATE : 11/3/14

22-MAR-2016 11:35
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jdhawk

LOAD AND RESISTANCE FACTOR RATING (LRFR) 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⟩	**1.03**	--	1.75	0.9	1.44	B	ER	38.261	1.041	2.02	B	I	38.261	0.80	1.041	**1.03**	B	I	38.261	
		HL-93(Opr)	N/A	--	1.87	--	1.35	0.9	1.87	B	ER	38.261	1.041	2.62	B	I	38.261	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	⟨2⟩	**1.41**	50.698	1.75	0.9	2.05	B	ER	38.261	1.041	2.39	B	I	38.261	0.80	0.879	**1.41**	B	I	38.261	
		HS-20(Opr)	36.000	--	2.66	95.626	1.35	0.9	2.66	B	ER	38.261	1.041	3.10	B	I	38.261	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.21	43.328	1.4	0.9	5.84	B	ER	38.261	1.041	6.46	B	I	38.261	0.80	0.879	3.21	B	I	38.261	
		SNGARBS2	20.000	--	2.38	47.572	1.4	0.9	4.33	B	ER	38.261	1.041	4.79	B	I	38.261	0.80	0.879	2.38	B	I	38.261	
		SNAGRIS2	22.000	--	2.25	49.436	1.4	0.9	4.09	B	ER	38.261	1.041	4.52	B	I	38.261	0.80	0.879	2.25	B	I	38.261	
		SNCOTTS3	27.250	--	1.60	43.511	1.4	0.9	2.90	B	ER	38.261	1.041	3.24	B	I	38.261	0.80	0.879	1.60	B	I	38.261	
		SNAGGRS4	34.925	--	1.33	46.427	1.4	0.9	2.42	B	ER	38.261	1.041	2.83	B	I	38.261	0.80	0.879	1.33	B	I	38.261	
		SNS5A	35.550	--	1.30	46.225	1.4	0.9	2.36	B	ER	38.261	1.041	2.94	B	I	38.261	0.80	0.879	1.30	B	I	38.261	
		SNS6A	39.950	--	1.19	47.577	1.4	0.9	2.17	B	ER	38.261	1.041	2.75	B	I	38.261	0.80	0.879	1.19	B	I	38.261	
		SNS7B	42.000	--	1.13	47.630	1.4	0.9	2.06	B	ER	38.261	1.041	2.79	B	I	38.261	0.80	0.879	1.13	B	I	38.261	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	1.45	47.904	1.4	0.9	2.64	B	ER	38.261	1.041	3.22	B	I	38.261	0.80	0.879	1.45	B	I	38.261	
		TNT4A	33.075	--	1.46	48.205	1.4	0.9	2.65	B	ER	38.261	1.041	3.07	B	I	38.261	0.80	0.879	1.46	B	I	38.261	
		TNT6A	41.600	--	1.19	49.490	1.4	0.9	2.16	B	ER	38.261	1.041	3.15	B	I	38.261	0.80	0.879	1.19	B	I	38.261	
		TNT7A	42.000	--	1.20	50.170	1.4	0.9	2.17	B	ER	38.261	1.041	3.05	B	I	38.261	0.80	0.879	1.20	B	I	38.261	
		TNT7B	42.000	--	1.23	51.791	1.4	0.9	2.24	B	ER	38.261	1.041	2.66	B	I	38.261	0.80	0.879	1.23	B	I	38.261	
		TNAGRIT4	43.000	--	1.18	50.526	1.4	0.9	2.14	B	ER	38.261	1.041	2.55	B	I	38.261	0.80	0.879	1.18	B	I	38.261	
		TNAGT5A	45.000	--	1.11	49.897	1.4	0.9	2.02	B	ER	38.261	1.041	2.64	B	I	38.261	0.80	0.879	1.11	B	I	38.261	
		TNAGT5B	45.000	⟨3⟩	**1.10**	49.331	1.4	0.9	1.99	B	ER	38.261	1.041	2.42	B	I	38.261	0.80	0.879	**1.10**	B	I	38.261	

LOAD FACTORS:

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

COMMENTS:

1.
2.
3.
4.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

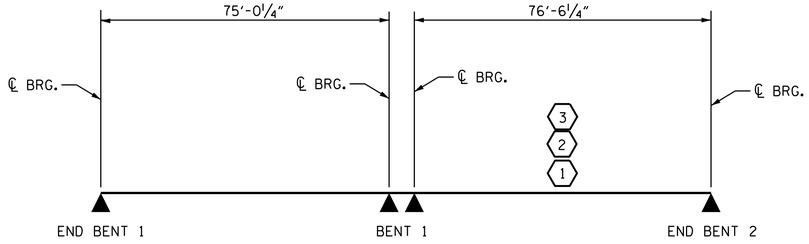
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



SPAN A SPAN B

LRFR SUMMARY

PROJECT NO. U-3308
DURHAM COUNTY
STATION: 23+00.86-LALT-

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

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR

DocuSigned by: Donald R. Smith, Jr
EDC87706174849D...
4/1/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-4
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY : P.S. ADKINS DATE : 4/15/14
CHECKED BY : J.D. HAWK DATE : 5/29/14
DRAWN BY : MAA 1/08 REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08 REV. 10/1/11 MAA/GM
DESIGN ENGINEER OF RECORD: D.R. SMITH DATE : 11/3/14

22-MAR-2016 11:35
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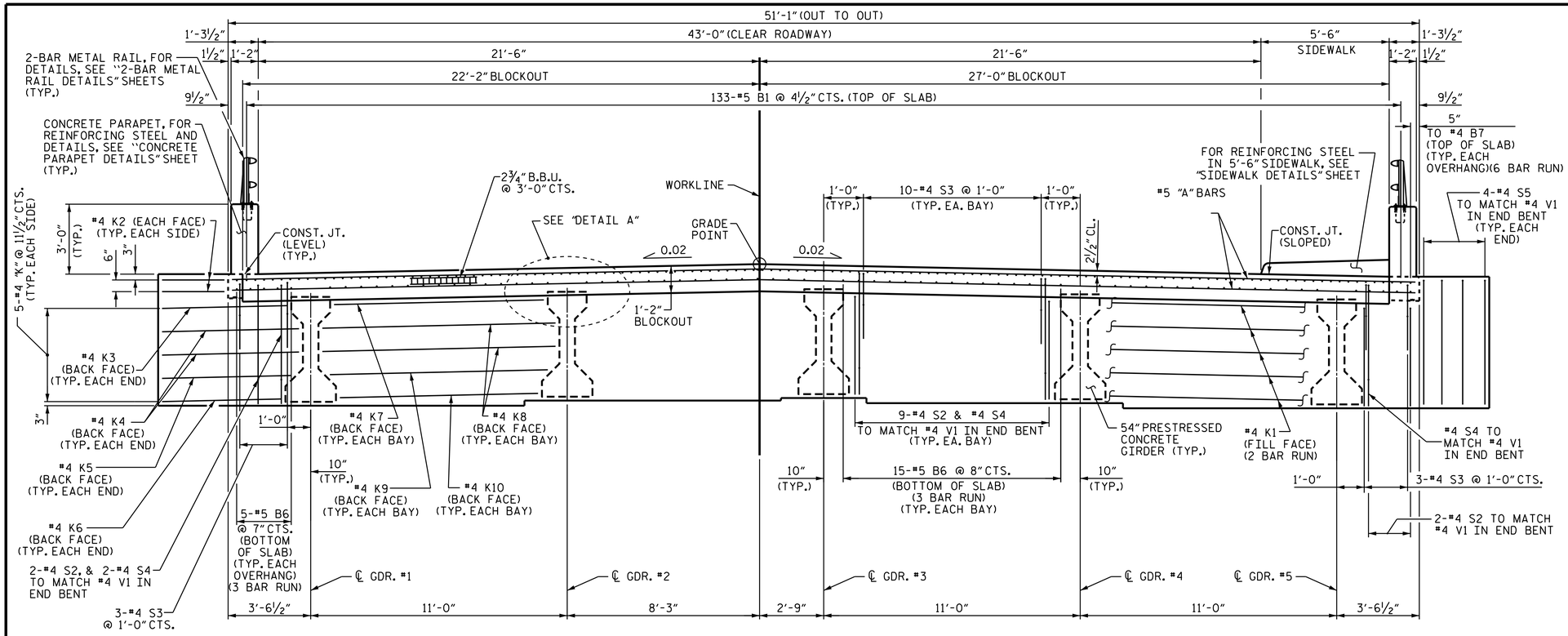
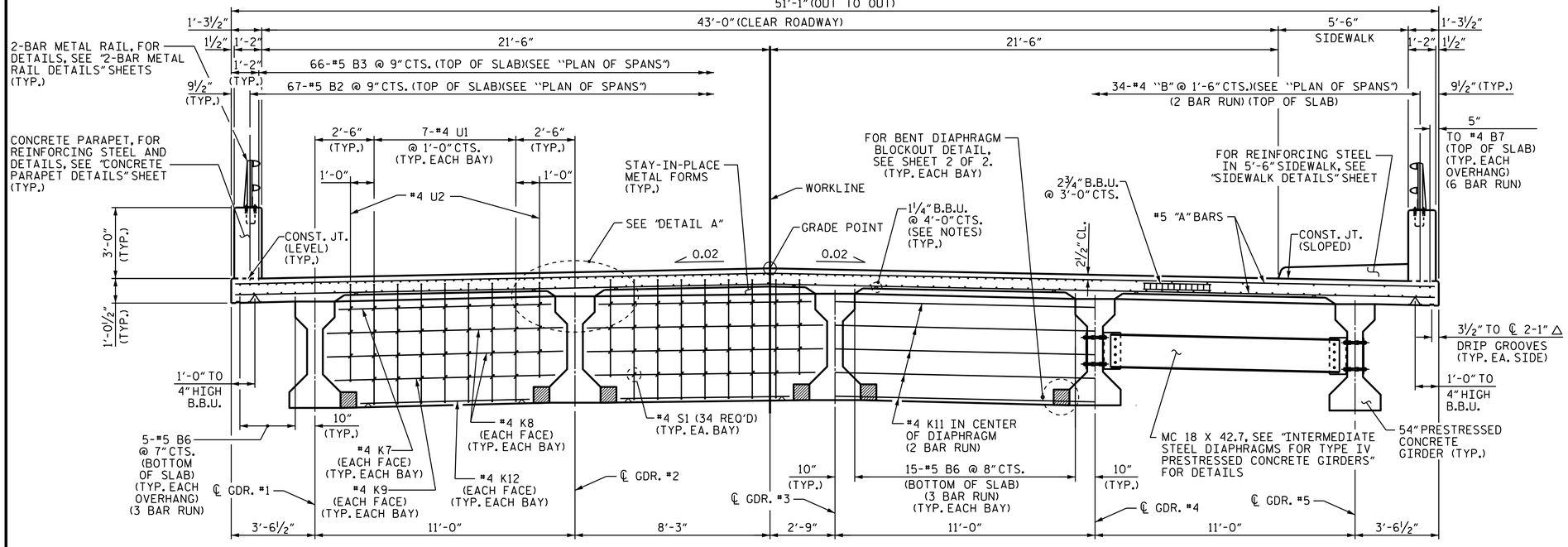
jdhawk

STR. #2 STD. NO. LRFR1



TYPICAL SECTION @ INTEGRAL END BENT

(END BENT 1 SHOWN, END BENT 2 SIMILAR)
(FOR SECTION THROUGH END BENT, SEE "SECTION THRU INTEGRAL END BENT" ON SHEET 2 OF 2)



TYPICAL SECTION @ BENT DIAPHRAGM

TYPICAL SECTION @ INTERMEDIATE DIAPHRAGM

NOTES

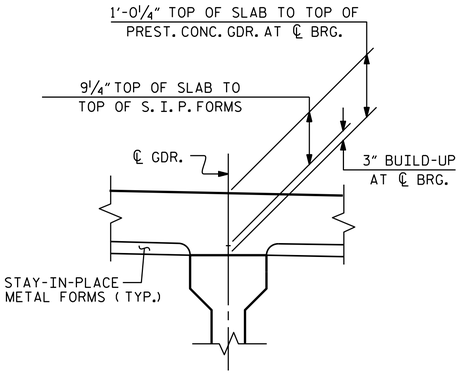
PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2½" ABOVE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

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

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

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

FOR WING ELEVATIONS AND DETAILS, SEE "PLAN OF SPAN DETAILS" SHEETS.



DETAIL A

(TYP. EACH GDR.)

PROJECT NO. U-3308
DURHAM COUNTY
STATION: 23+00.86-LALT-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr
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4/1/2016

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1			3			TOTAL SHEETS
2			4			32

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DESIGN ENGINEER OF RECORD:	D.R. SMITH	DATE :	11/3/14

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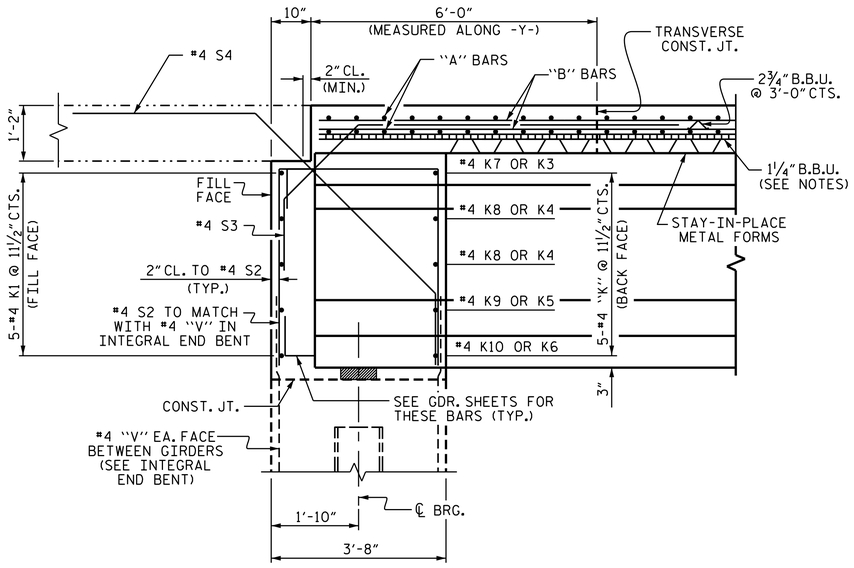
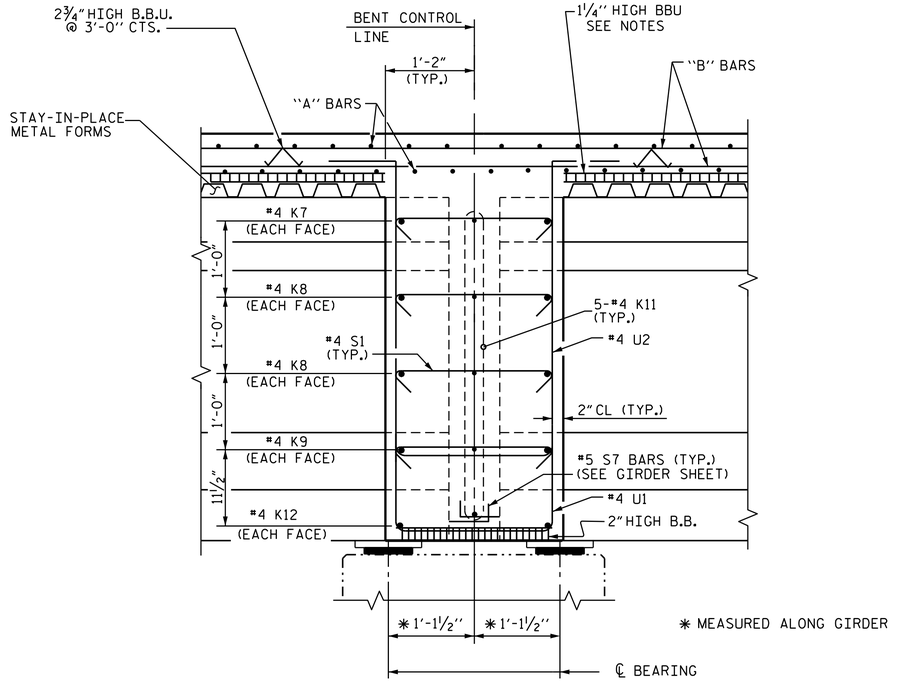
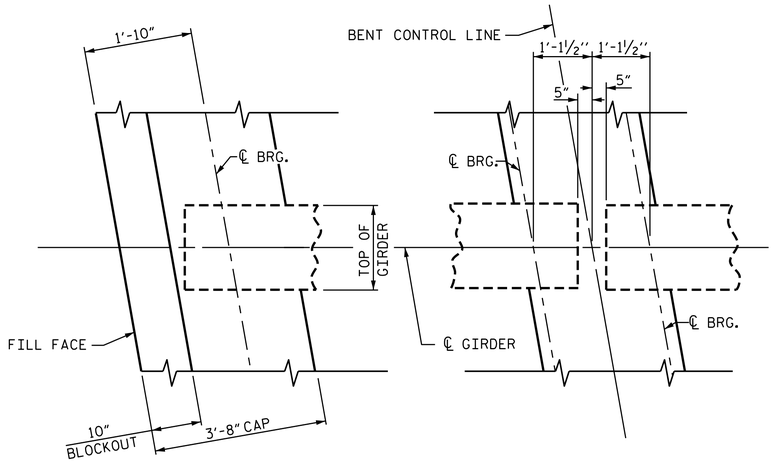


SECTION THROUGH INTEGRAL END BENT

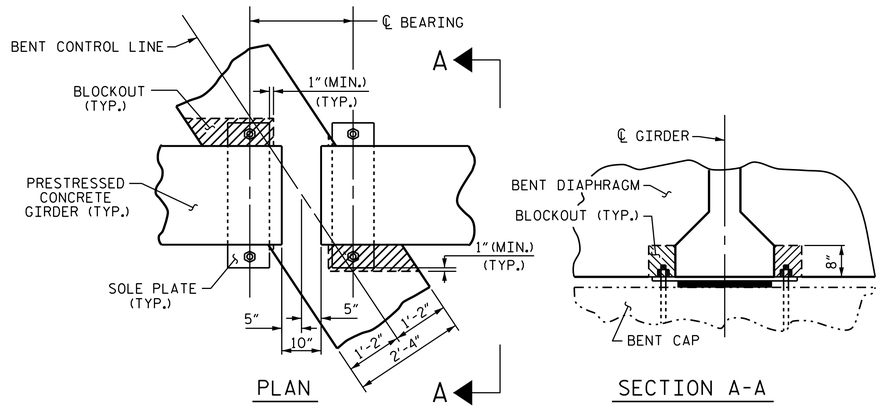


SECTION THROUGH BENT DIAPHRAGM



INTEGRAL END BENT CONTINUOUS BENT DIAPHRAGM

PLAN OF GIRDER



BENT DIAPHRAGM BLOCKOUT DETAIL

PROJECT NO. U-3308
DURHAM COUNTY
STATION: 23+00.86-LALT-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

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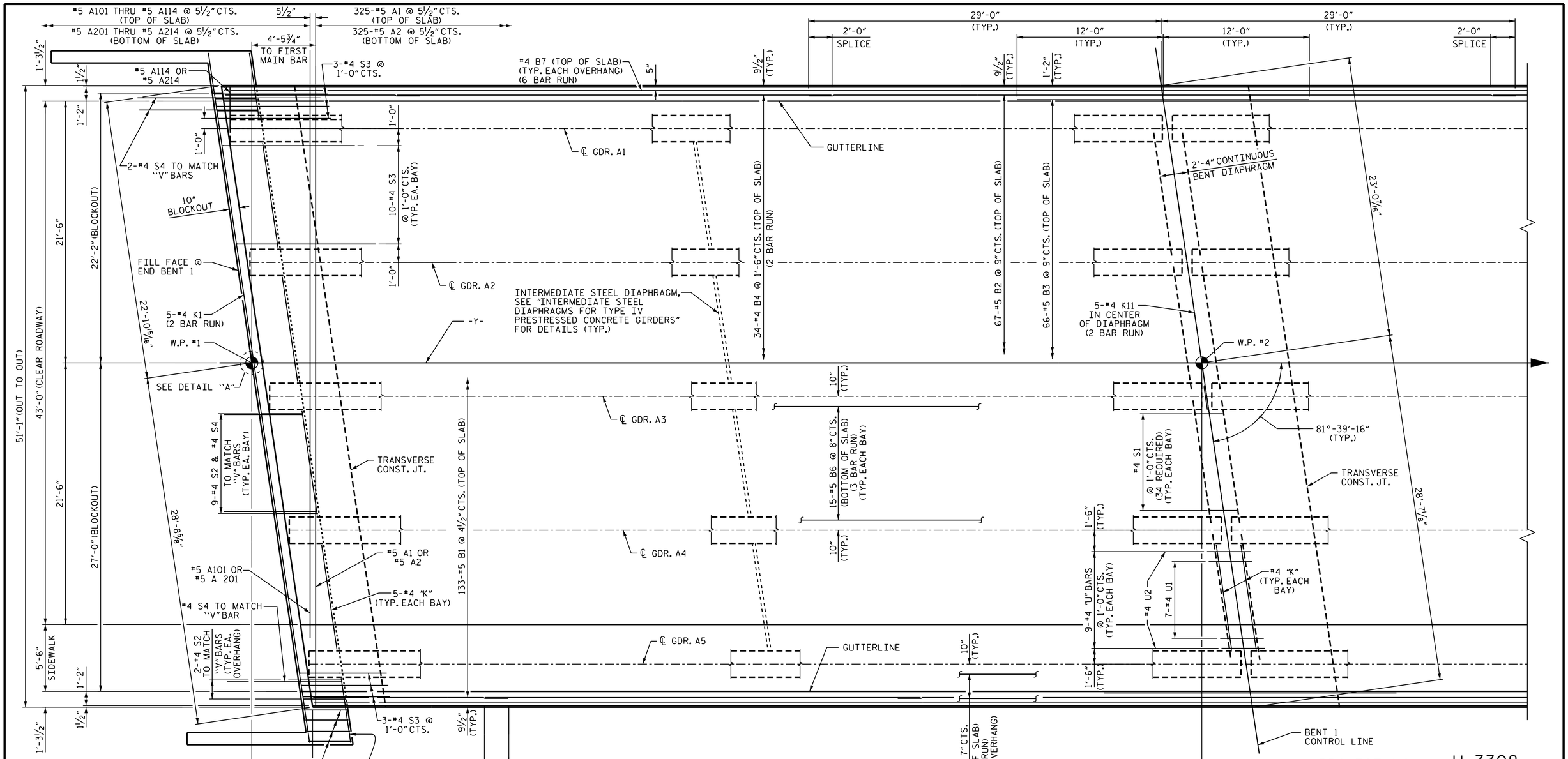

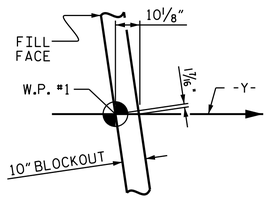

DETAIL "A"

PLAN OF SPAN A

SEE "PLAN OF SPAN DETAILS" SHEETS FOR ADDITIONAL REINFORCING STEEL IN WINGS.
FOR REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.
FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

PROJECT NO. U-3308
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STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN A

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

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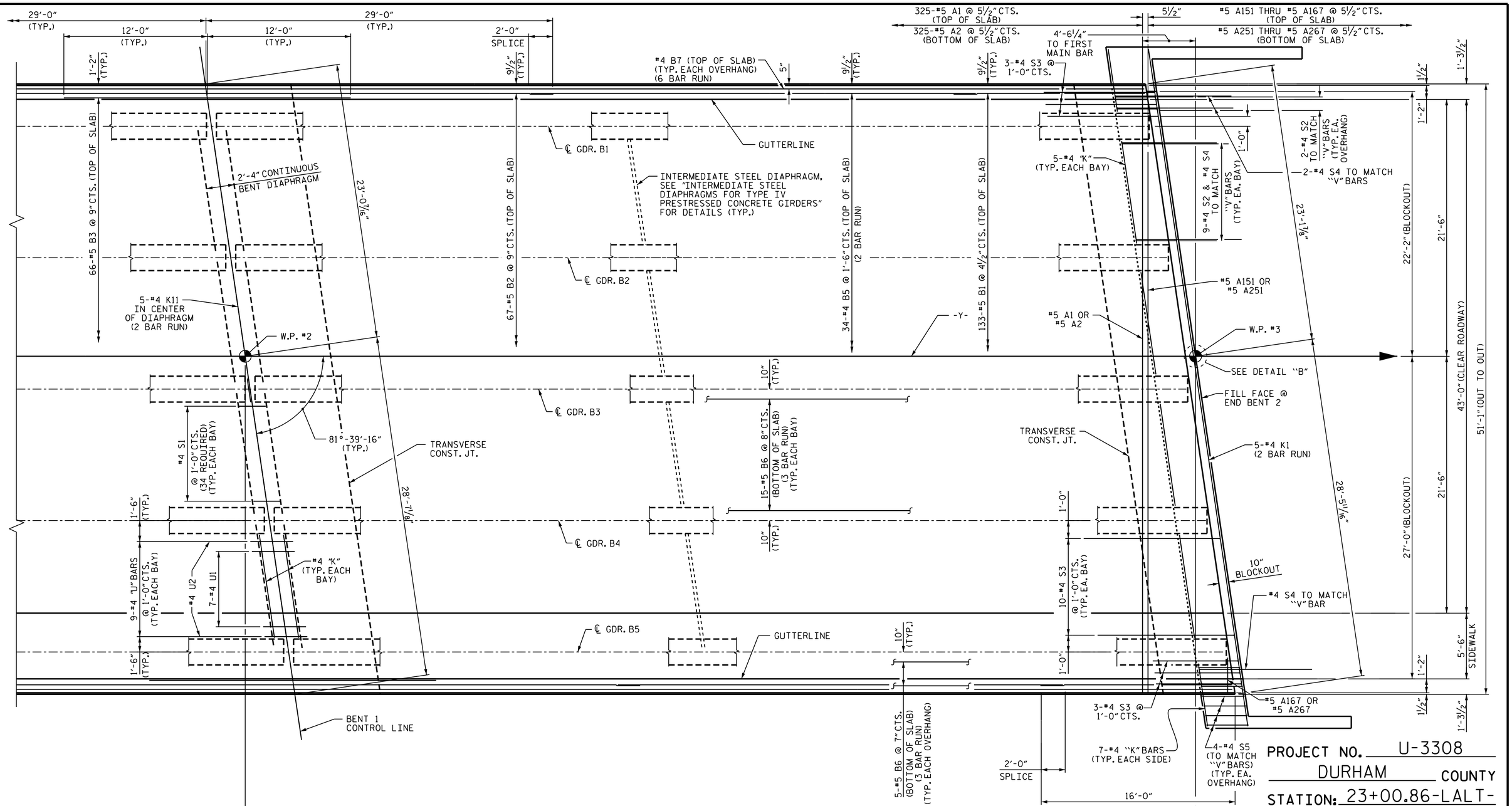

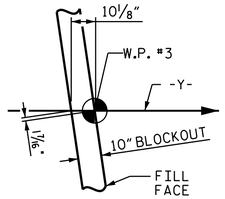

DETAIL "B"

PLAN OF SPAN B

SEE "PLAN OF SPAN DETAILS" SHEETS FOR ADDITIONAL REINFORCING STEEL IN WINGS.
FOR REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.
FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN B

REVISIONS						SHEET NO.
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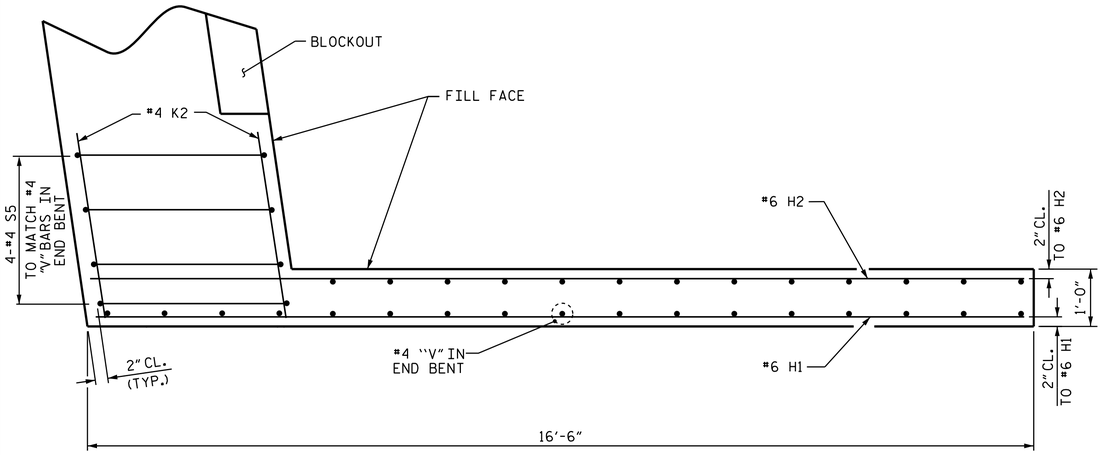
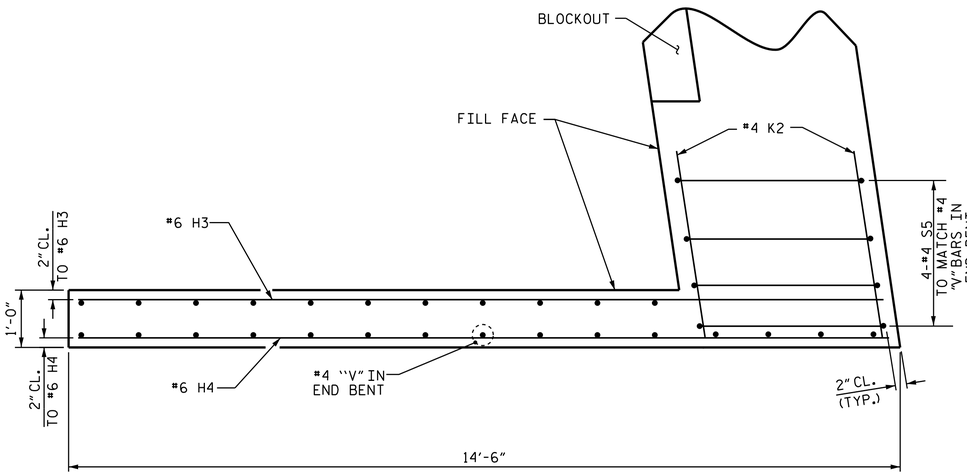


PLAN OF LEFT WING
@ END BENT 1



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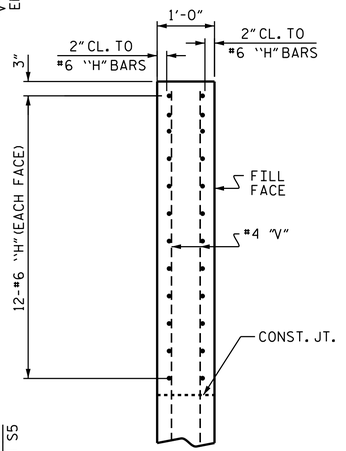
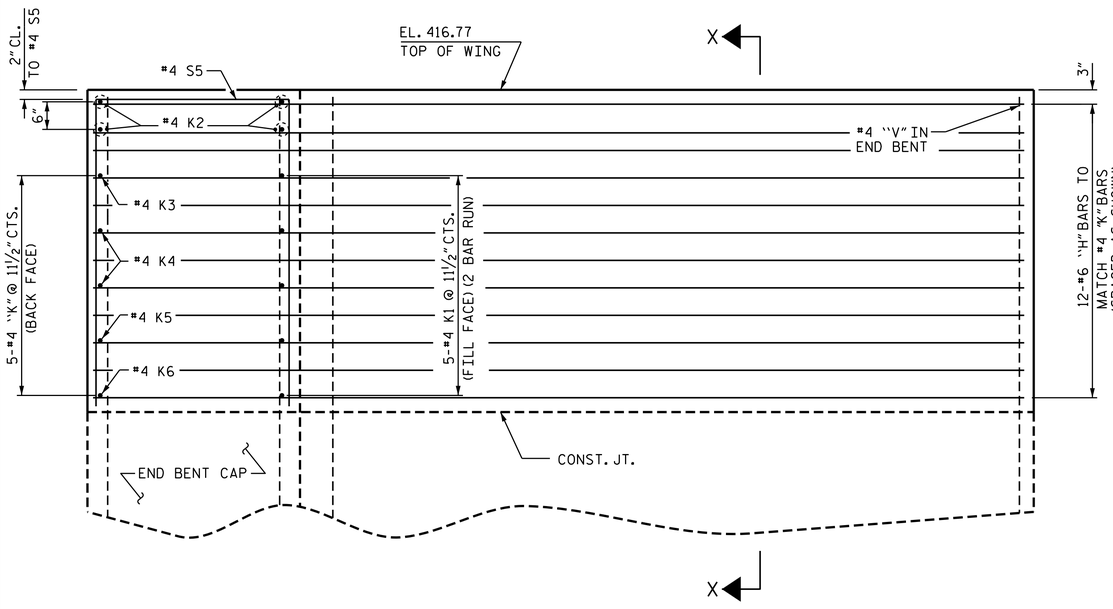


SECTION X-X



ELEVATION OF LEFT WING
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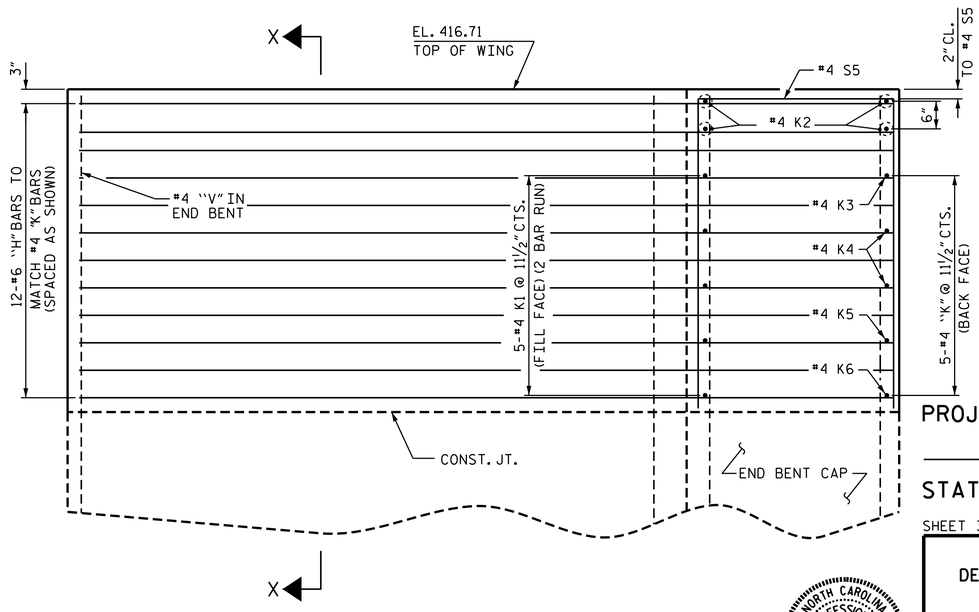

ELEVATION OF RIGHT WING
@ END BENT 1

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 23+00.86-LALT-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN DETAILS

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STR. #2

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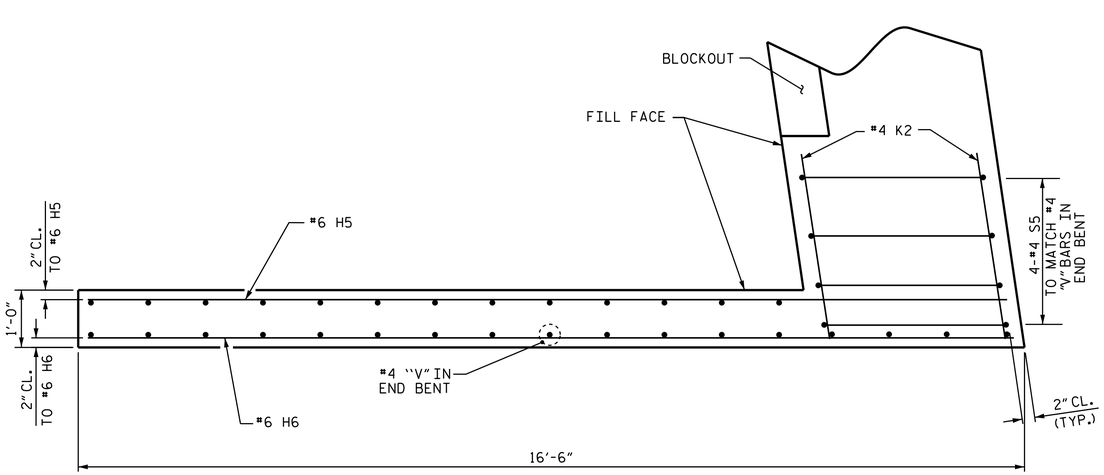

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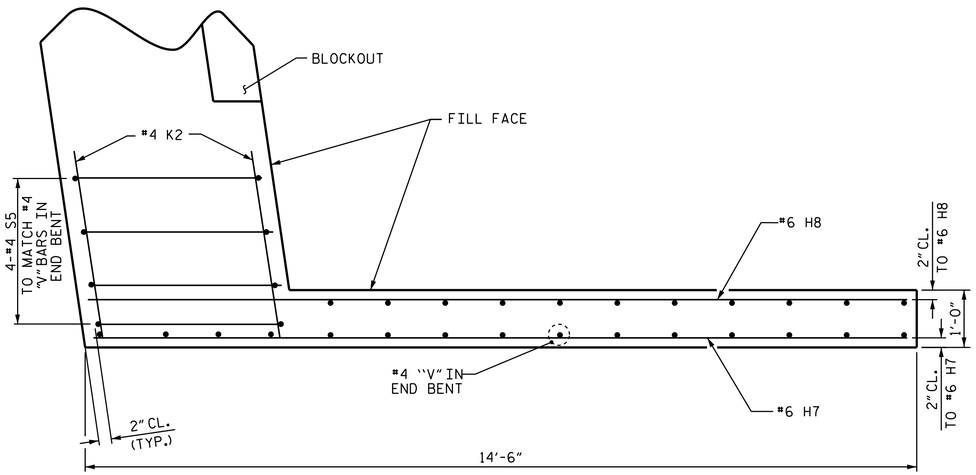

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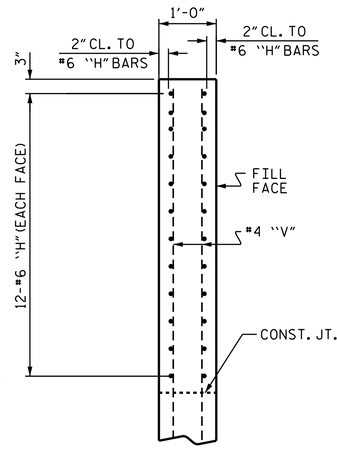

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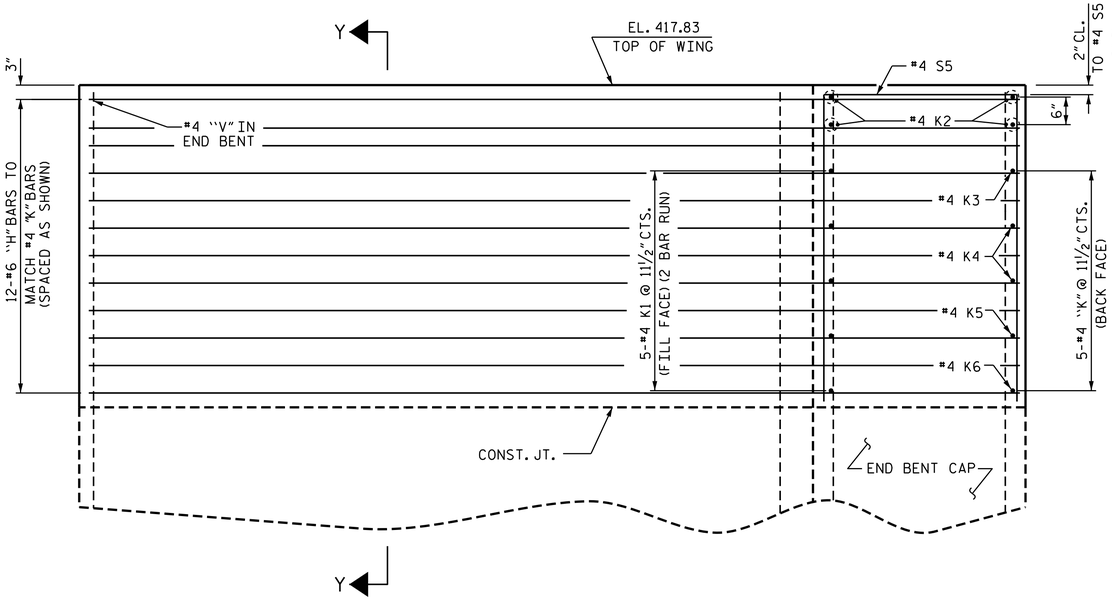
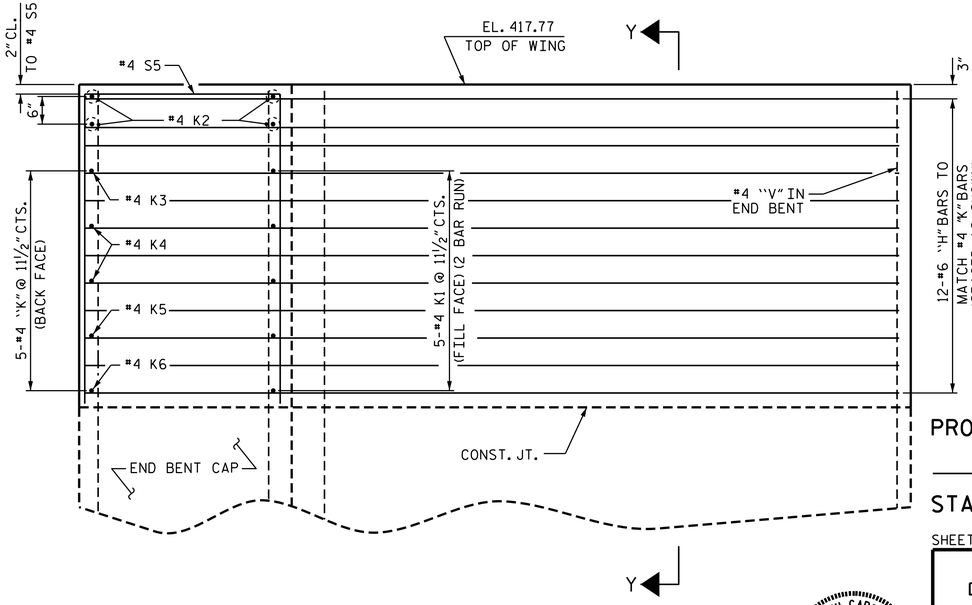


ELEVATION OF LEFT WING
@ END BENT 2



ELEVATION OF RIGHT WING
@ END BENT 2

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SHEET 4 OF 4

STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-10
1			3			TOTAL SHEETS
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STR. #2

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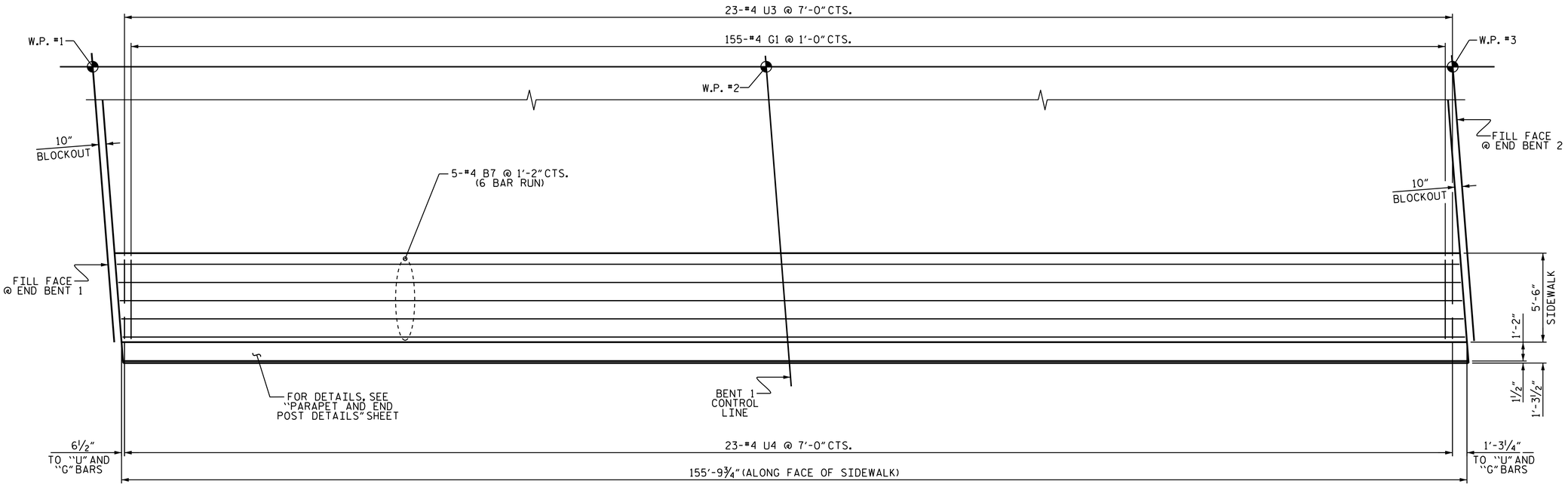
NOTES

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

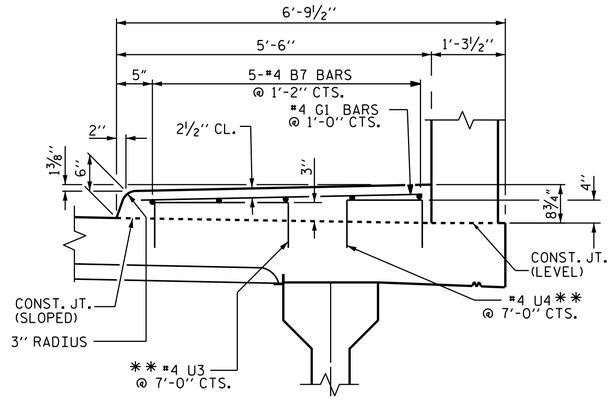
ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.

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

THE ⅜" OPENING IN THE DECK SHALL BE SAWED PRIOR TO CASTING THE SIDEWALK.



PLAN



SECTION THROUGH SIDEWALK

** "U" BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.
REINFORCING STEEL IN DECK SLAB AND PARAPET NOT SHOWN FOR CLARITY.

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SUPERSTRUCTURE

SIDEWALK DETAILS

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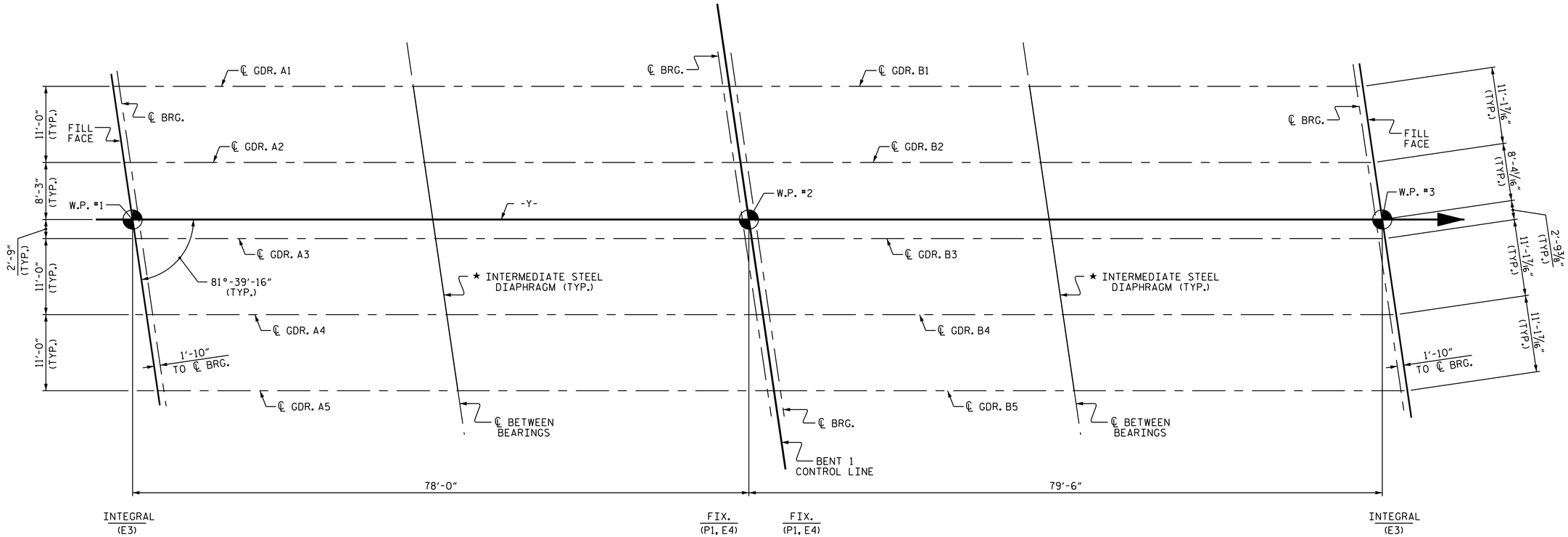

GIRDER LAYOUT

★ SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS".

PROJECT NO. U-3308

DURHAM COUNTY

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GIRDER LAYOUT

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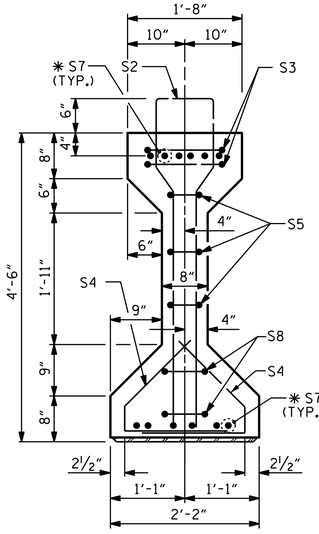
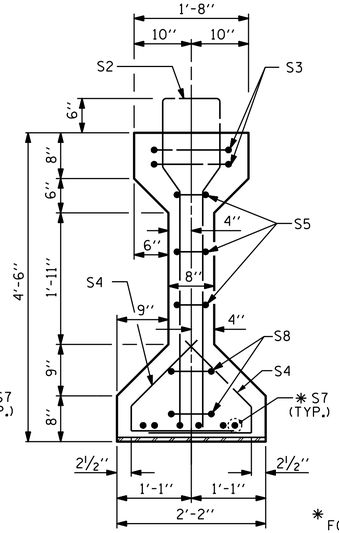
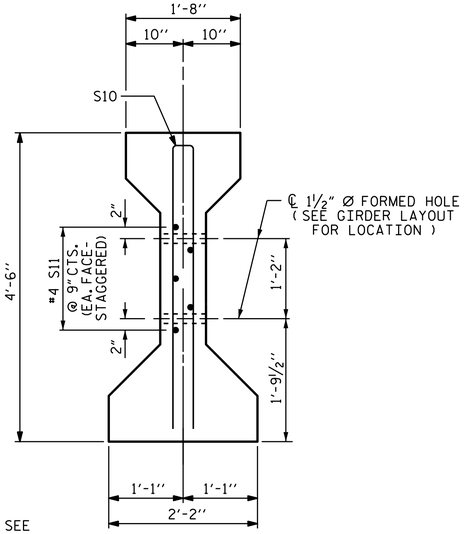


SECTION A-A



SECTION B-B

✱ FOR S7 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

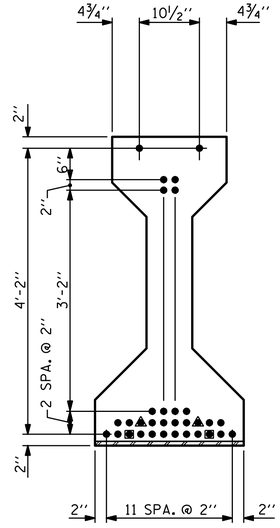


SECTION C-C

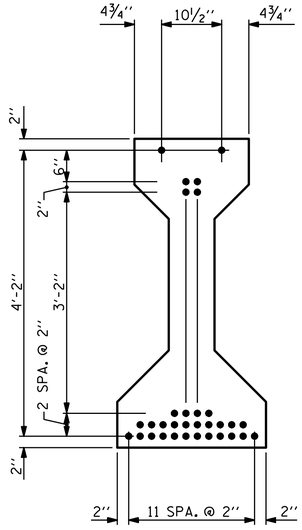
(S1 BARS NOT SHOWN)

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▲ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◙ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER

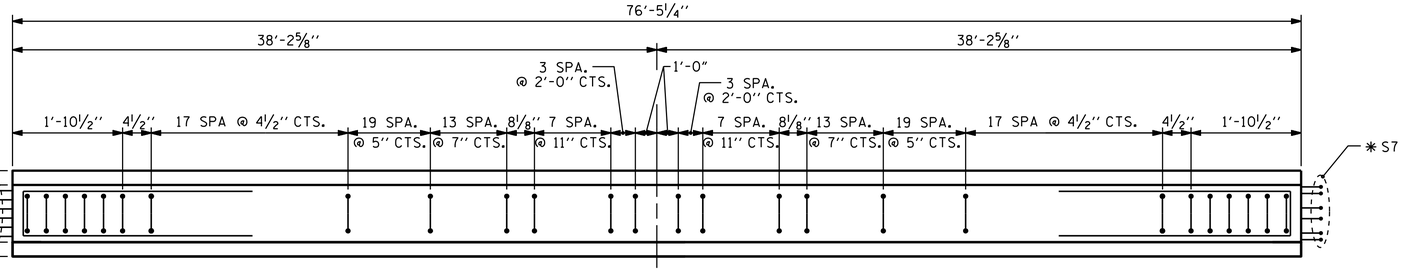


AT END OF GIRDER

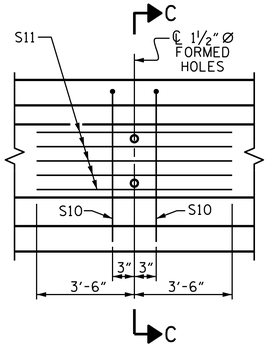


AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

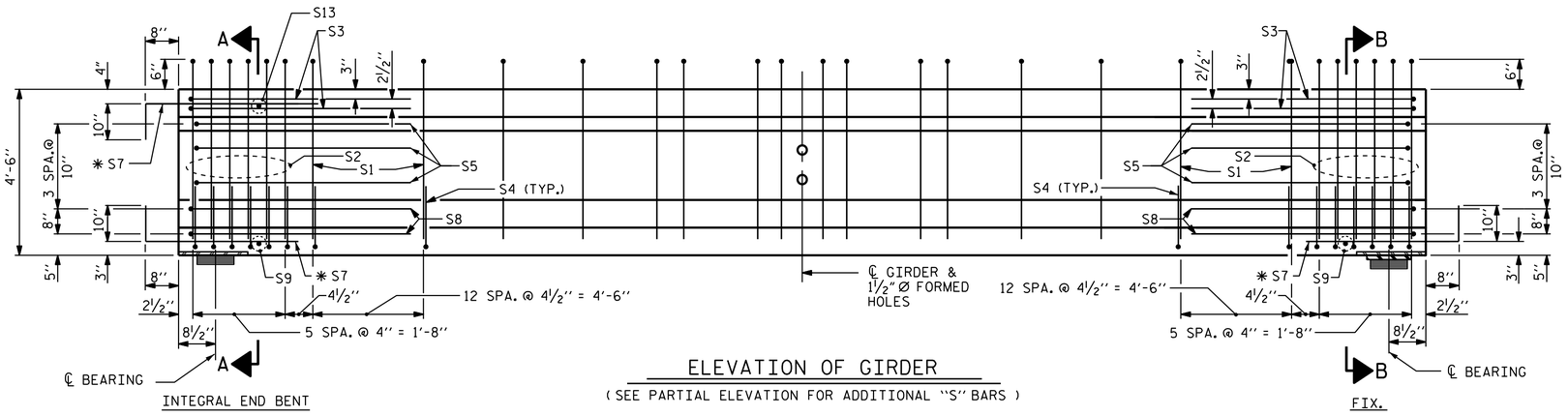


PLAN OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

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

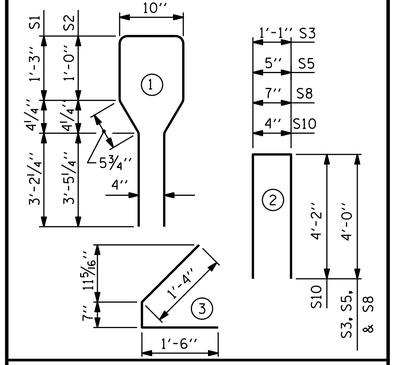
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	122	#4	1	10'-8"	869
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	76	#4	3	3'-5"	173
S5	6	#4	2	8'-5"	34
✱S7	18	#5	STR	3'-8"	69
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S13	1	#3	STR	1'-4"	1

✱NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LBS.	8000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
	1,427	15.5	32

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	76'-5¼"	382'-2¼"

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 23+00.86-LALT-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN A

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr EDC87706174B490...
4/1/2016

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-13
1			3			TOTAL SHEETS
2			4			32

STR. #2

STD. NO. PCG6

ASSEMBLED BY : P.S. ADKINS	DATE : 3/5/15	
CHECKED BY : J.D. HAWK	DATE : 3/5/15	
DRAWN BY : ELR 8/91	REV. 5/1/06R TLA/GM	DESIGN ENGINEER OF RECORD:
CHECKED BY : GRP 8/91	REV. 10/1/11 MAA/GM	D.R. SMITH DATE : 3/5/15
	REV. 1/15 MAA/TMG	

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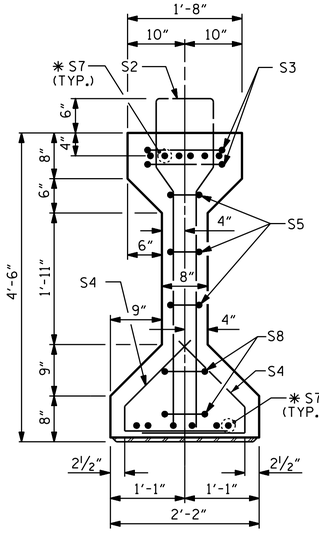
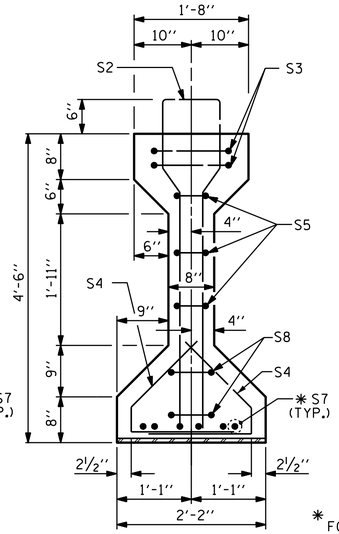
jdhawk

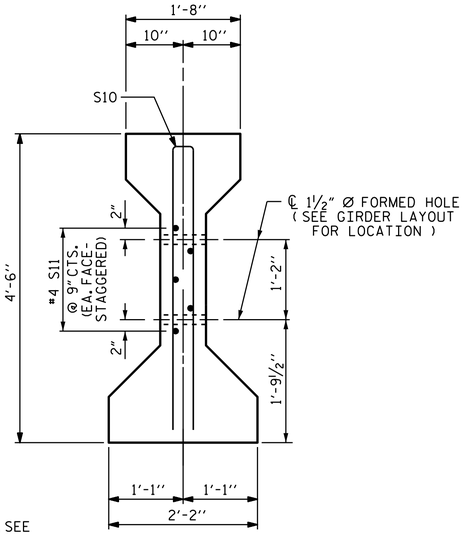


SECTION A-A



SECTION B-B

* FOR S7 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

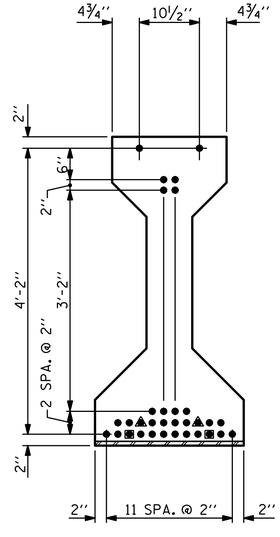


SECTION C-C

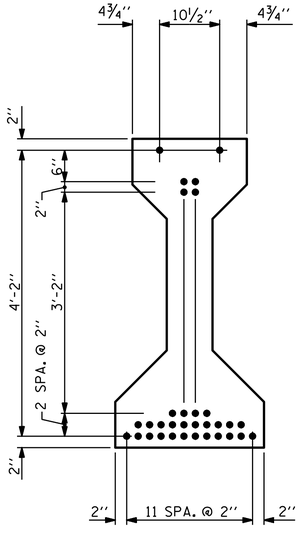
(S1 BARS NOT SHOWN)

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▲ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◙ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER

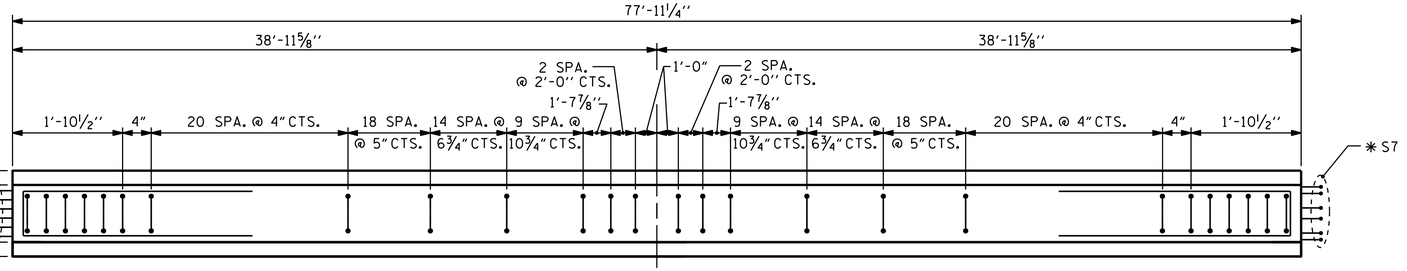


AT END OF GIRDER

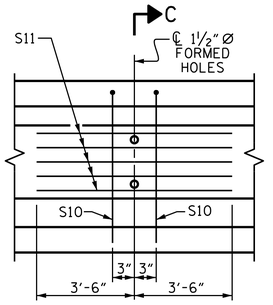


AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

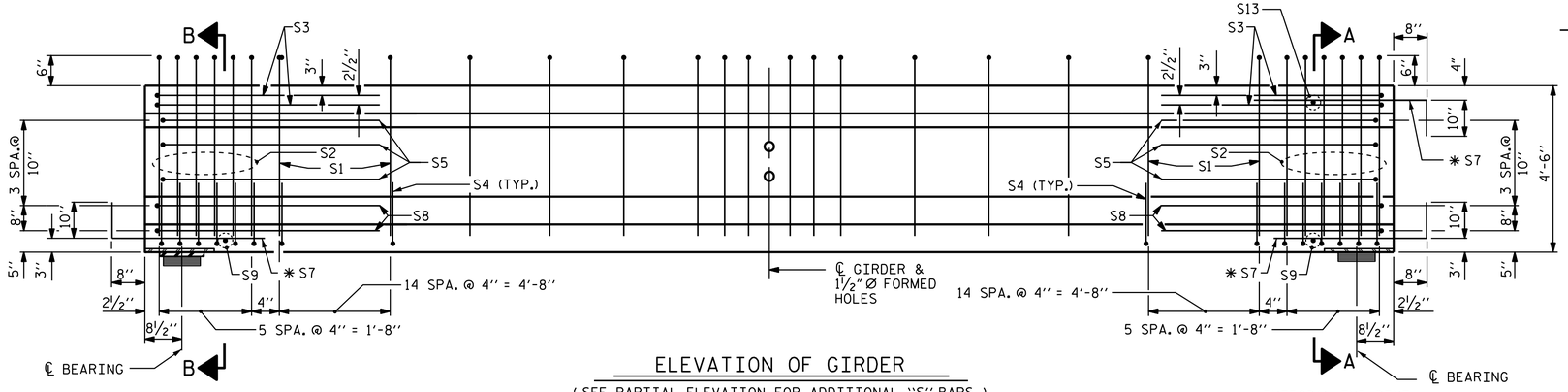


PLAN OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS



FIX.

ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

INTEGRAL END BENT

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

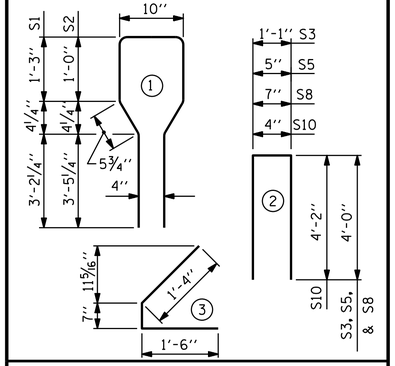
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	130	#4	1	10'-8"	926
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	84	#4	3	3'-5"	192
S5	6	#4	2	8'-5"	34
* S7	18	#5	STR	3'-8"	69
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S13	1	#3	STR	1'-4"	1

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LBS.	8000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
	1,503	15.8	32

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	77'-11¼"	389'-8¼"

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 23+00.86-LALT-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN B

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr EDC87706174B490...
4/1/2016

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-14
1			3			TOTAL SHEETS
2			4			32

STR. #2

STD. NO. PCG6

ASSEMBLED BY : P.S. ADKINS	DATE : 3/5/15	
CHECKED BY : J.D. HAWK	DATE : 3/5/15	
DRAWN BY : ELR 8/91	REV. 5/1/06R TLA/GM	DESIGN ENGINEER OF RECORD:
CHECKED BY : GRP 8/91	REV. 10/1/11 MAA/GM	D.R. SMITH DATE : 3/5/15
	REV. 1/15 MAA/TMG	

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jdhawk

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6"Ø LOW RELAXATION	SPAN A											SPAN B										
	GIRDERS 2, 3 & 4											GIRDERS 2, 3 & 4										
TENTH POINTS	BRG	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG	BRG	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG
CAMBER (GIRDER ALONE IN PLACE)	0	0.037	0.069	0.095	0.111	0.116	0.111	0.095	0.069	0.037	0	0	0.037	0.070	0.096	0.113	0.118	0.113	0.096	0.070	0.037	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L.	0	0.024	0.045	0.062	0.072	0.076	0.072	0.062	0.045	0.024	0	0	0.026	0.049	0.067	0.078	0.082	0.078	0.067	0.049	0.026	0
FINAL CAMBER	0	1/8"	5/16"	3/8"	7/16"	1/2"	7/16"	3/8"	5/16"	1/8"	0	0	1/8"	1/4"	3/8"	7/16"	7/16"	7/16"	3/8"	1/4"	1/8"	0

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6"Ø LOW RELAXATION	SPAN A											SPAN B										
	GIRDER 1											GIRDER 1										
TENTH POINTS	BRG	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG	BRG	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG
CAMBER (GIRDER ALONE IN PLACE)	0	0.037	0.069	0.095	0.111	0.116	0.111	0.095	0.069	0.037	0	0	0.037	0.070	0.096	0.113	0.118	0.113	0.096	0.070	0.037	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L.	0	0.020	0.037	0.051	0.060	0.063	0.060	0.051	0.037	0.020	0	0	0.021	0.041	0.055	0.065	0.068	0.065	0.055	0.041	0.021	0
FINAL CAMBER	0	3/16"	3/8"	1/2"	5/8"	5/8"	5/8"	1/2"	3/8"	3/16"	0	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).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6"Ø LOW RELAXATION	SPAN A											SPAN B										
	GIRDER 5											GIRDER 5										
TENTH POINTS	BRG	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG	BRG	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG
CAMBER (GIRDER ALONE IN PLACE)	0	0.037	0.069	0.095	0.111	0.116	0.111	0.095	0.069	0.037	0	0	0.037	0.070	0.096	0.113	0.118	0.113	0.096	0.070	0.037	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L.	0	0.021	0.040	0.054	0.063	0.067	0.063	0.054	0.040	0.021	0	0	0.023	0.043	0.059	0.069	0.072	0.069	0.059	0.043	0.023	0
FINAL CAMBER	0	3/16"	3/8"	1/2"	9/16"	9/16"	9/16"	1/2"	3/8"	3/16"	0	0	3/16"	5/16"	7/16"	1/2"	9/16"	1/2"	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).

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.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

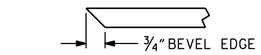
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

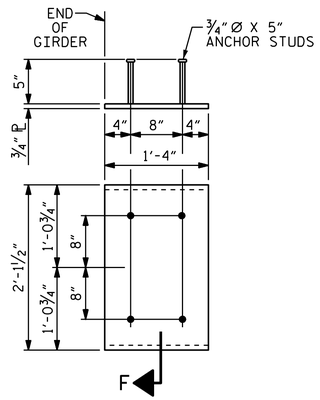
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5,000 PSI.

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

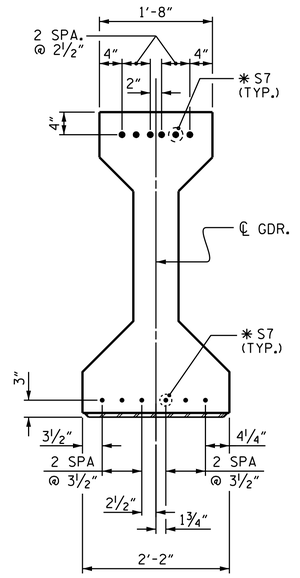
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".



SECTION "F"
(SEE NOTES)



EMBEDDED PLATE "B-1" DETAILS
FOR AASHTO TYPE IV GIRDER
(2 REQ'D PER GIRDER)



DETAIL "A"
(FOR AASHTO TYPE IV GIRDERS)

✳ S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.
DocuSigned by: Donald R. Smith, Jr
EDC87706174B490...
4/1/2016

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PROJECT NO. U-3308
DURHAM COUNTY
STATION: 23+00.86-LALT-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
DETAILS

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S2-15
1			3				TOTAL SHEETS
2			4				32

STR. #2
STD. NO. PCG9

ASSEMBLED BY : P.S. ADKINS	DATE : 3/5/15	
CHECKED BY : J.D. HAWK	DATE : 3/5/15	
DRAWN BY : ELR 11/91	REV. 10/1/11	MAA/GM
CHECKED BY : GRP 11/91	REV. 1/15	MAA/TMG
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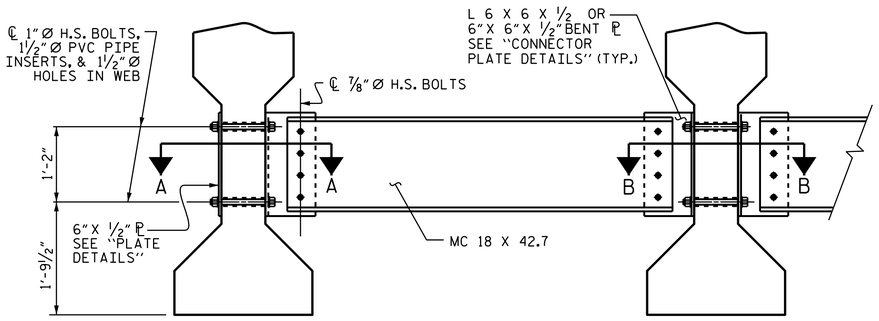
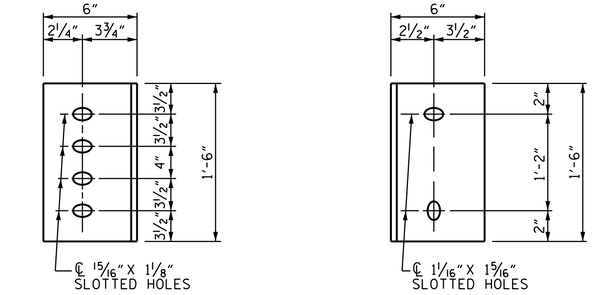


PART SECTION AT INTERMEDIATE DIAPHRAGM



CONNECTOR PLATE DETAILS

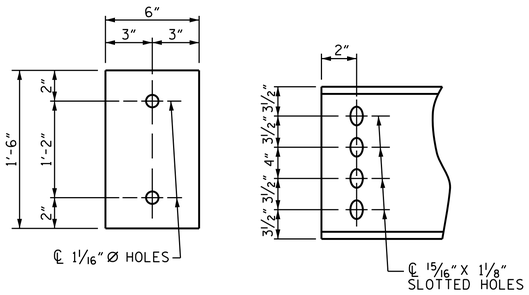
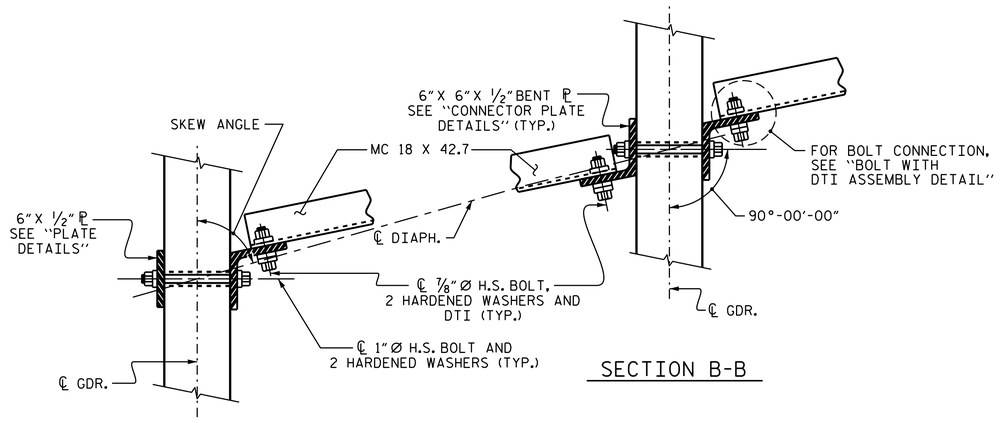
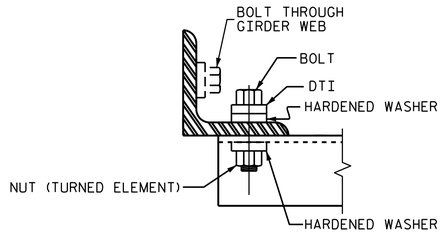


PLATE DETAILS CHANNEL END



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 SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 23+00.86-ALT-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr. EDC877061748490... 4/1/2016

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-16
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY : P.S. ADKINS	DATE : 4/17/14
CHECKED BY : J.D. HAWK	DATE : 4/29/14
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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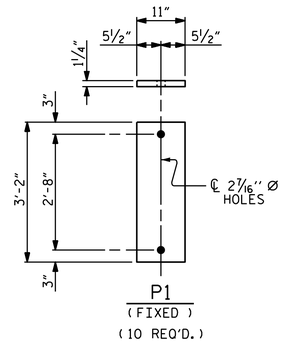
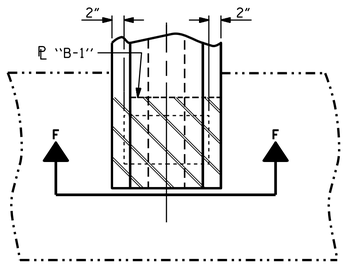
jdhawk

STR. #2

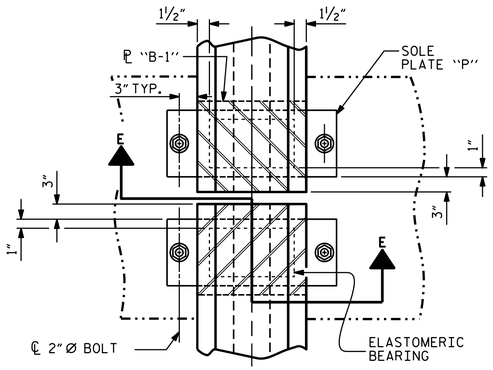
STD. NO. PCG10



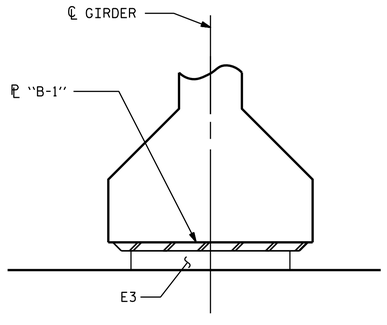
SOLE PLATE DETAILS ("P")



TYPICAL PLAN @ INTEGRAL END BENT

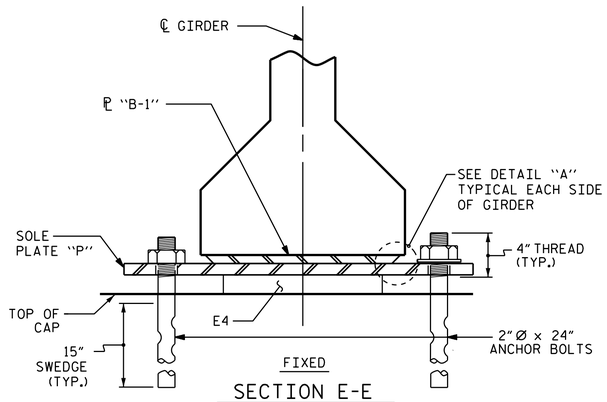


TYPICAL PLAN @ BENT



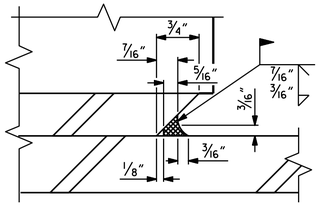
FIXED

SECTION F-F

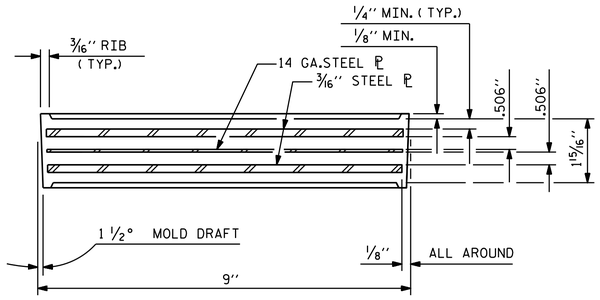


FIXED

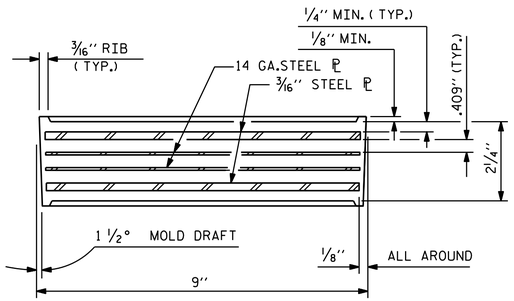
SECTION E-E



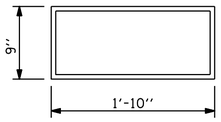
DETAIL "A"



TYPICAL SECTION OF ELASTOMERIC BEARINGS



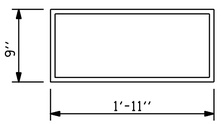
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E3 (10 REQ'D.)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV



E4 (10 REQ'D.)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF ½ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	225 k
TYPE V	365 k

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 23+00.86-LALT-

ASSEMBLED BY : P.S. ADKINS	DATE : 4/17/14		
CHECKED BY : J.D. HAWK	DATE : 4/29/14		
DRAWN BY : EEM 2/97	REV. 10/1/11	MAA/GM	DESIGN ENGINEER OF RECORD: D.R. SMITH DATE : 11/3/14
CHECKED BY : VAP 2/97	REV. 6/13	AAC/MAA	
	REV. 1/15	MAA/TMG	

30-MAR-2016 12:11
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jdhawk

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr EDC87706174B496... 4/1/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

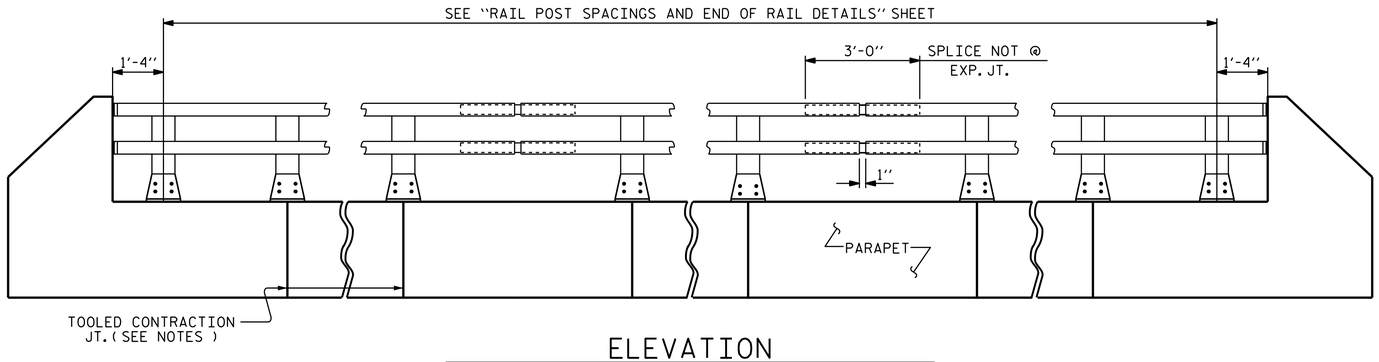
ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-17
1			3			TOTAL SHEETS
2			4			32

STR. #2

STD. NO. EB4



ELEVATION

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

NOTES

METAL RAIL SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 460 OF THE STANDARD SPECIFICATIONS AND METAL RAIL COMPONENTS SHALL MEET THE REQUIREMENTS OF ARTICLE 1074-5 OF THE STANDARD SPECIFICATIONS.

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

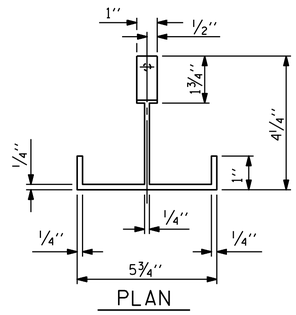
FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STD. NO. BMR2.

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

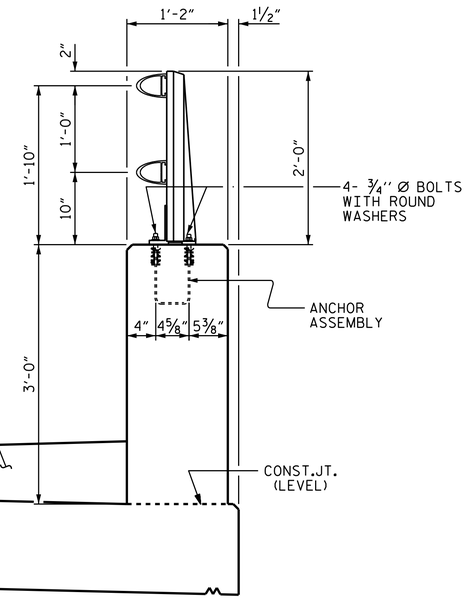
METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

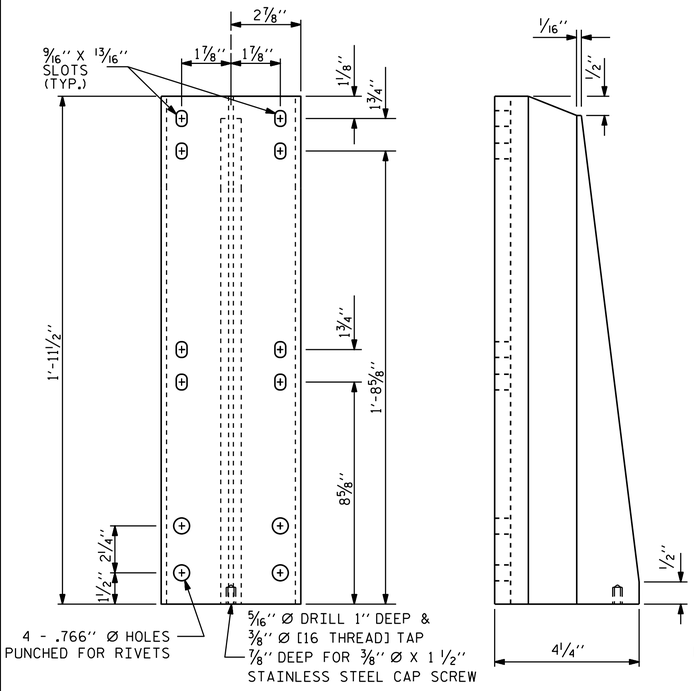
MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.



PLAN



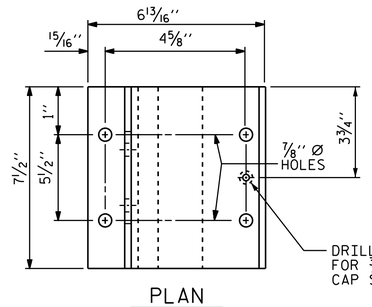
SECTION THROUGH PARAPET AND RAIL



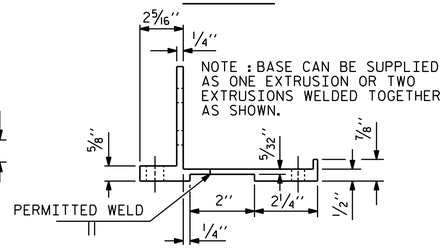
FRONT ELEVATION

SIDE ELEVATION

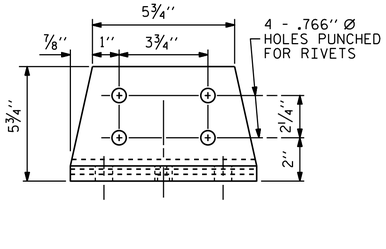
DETAILS OF POST



PLAN

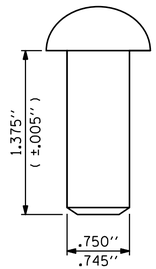


SIDE ELEVATION



FRONT ELEVATION

POST BASE DETAILS



RIVET DETAIL

PAY LENGTH	295.78 LIN. FT.

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 23+00.86-LALT-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr
EDC87706174B490...
4/1/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-18
1			3			TOTAL SHEETS
2			4			32

STR. #2

STD. NO. BMR3

ASSEMBLED BY : P.S. ADKINS	DATE : 4/23/14		
CHECKED BY : J.D. HAWK	DATE : 5/29/14		
DRAWN BY : EEM 6/94	REV. 5/1/06	TLA/GM	
CHECKED BY : RGW 6/94	REV. 10/1/11	MAA/GM	
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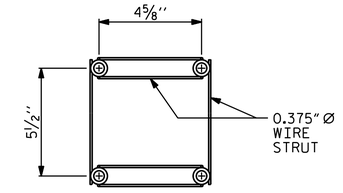
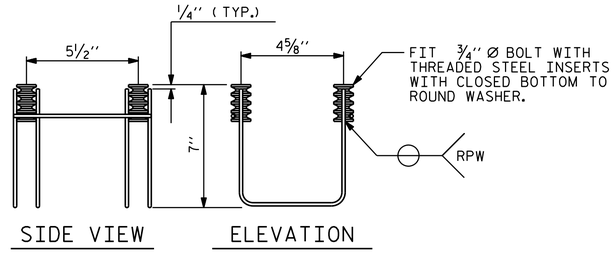


PLAN



SIDE VIEW ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(52 ASSEMBLIES REQUIRED)

NOTES

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2'' FOR ¾'' FERRULES.

B. 4 - ¾'' Ø X 2½'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ¾'' Ø X 2½'' GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

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

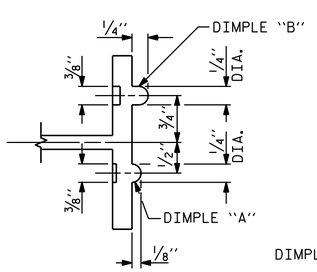
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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

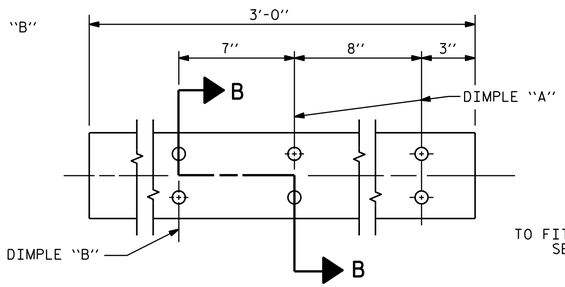
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

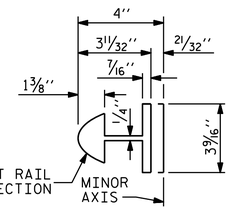
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾'' Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

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



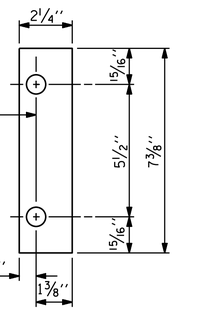
SECTION B - B



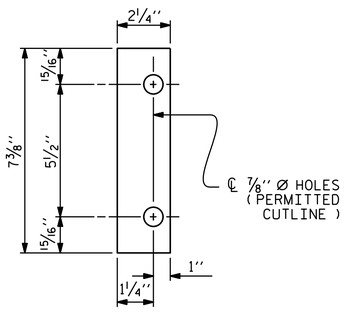


BAR SECTION

EXPANSION BAR DETAILS



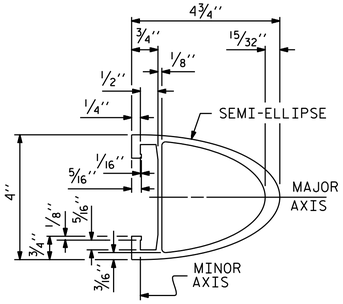
FRONT PLATE



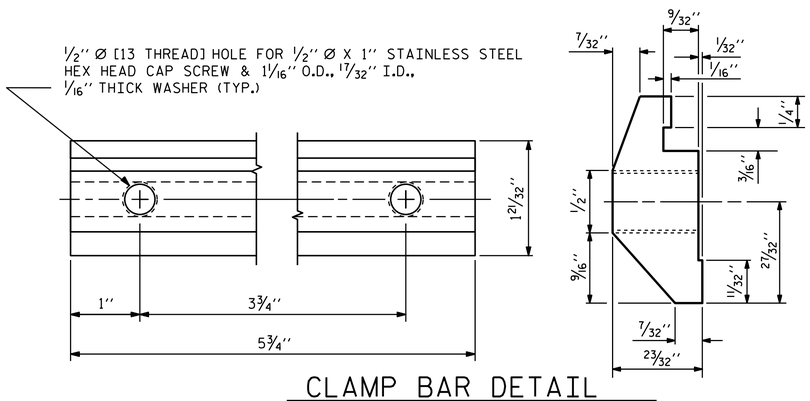
REAR PLATE

SHIM DETAILS

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

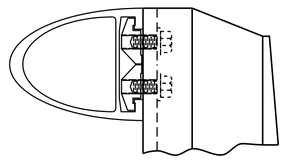


RAIL SECTION

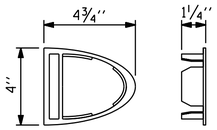


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr
EDC87706174B490...
4/1/2016

PROJECT NO. U-3308
DURHAM COUNTY
STATION: 23+00.86-LALT-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

ASSEMBLED BY : P.S. ADKINS	DATE : 4/23/14
CHECKED BY : J.D. HAWK	DATE : 5/29/14
DRAWN BY : EEM 6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RGW 6/94	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-19
1			3			TOTAL SHEETS
2			4			32

STR. #2

STD. NO. BMR4

29-MAR-2016 10:59
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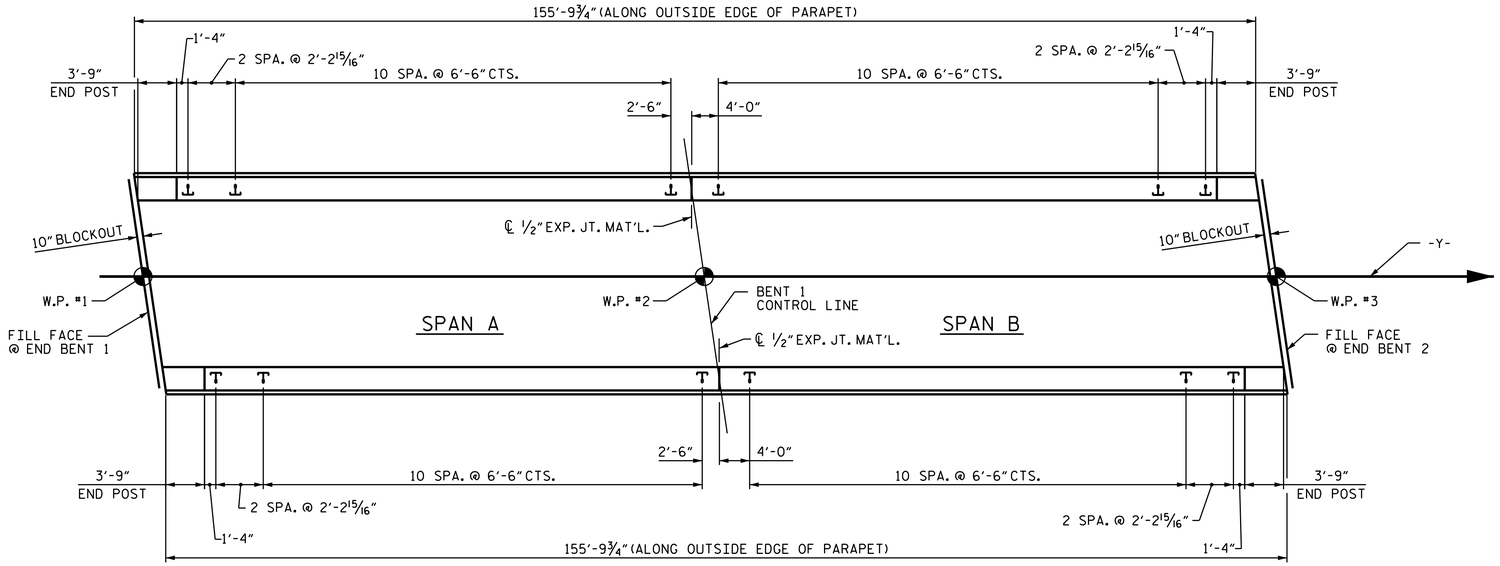
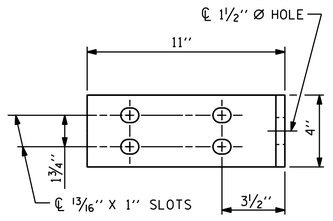
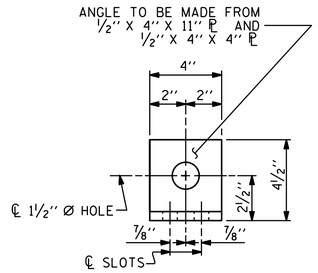
jdhawk



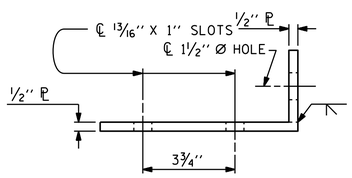
PLAN OF RAIL POST SPACINGS



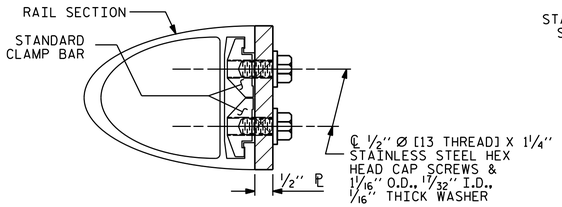
ELEVATION



END VIEW

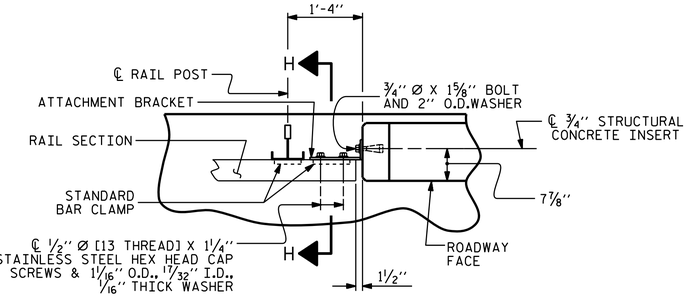


TOP VIEW



SECTION H-H

DETAILS FOR ATTACHING METAL RAIL TO END POST



PLAN - RAIL AND END POST

NOTES

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

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

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

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

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

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

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

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

D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).

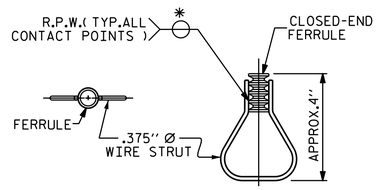
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

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

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

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



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 23+00.86-LALT-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS

FOR TWO BAR METAL RAILS

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr EDC87706174B490...
4/1/2016

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-20
1			3			TOTAL SHEETS
2			4			32

STR. #2

STD. NO. BMR2

ASSEMBLED BY : P.S. ADKINS	DATE : 4/23/14		
CHECKED BY : J.D. HAWK	DATE : 5/29/14		
DRAWN BY : FCJ 1/88	REV. 5/7/03	RWW/JTE	
CHECKED BY : CRK 3/89	REV. 5/1/06	TLA/GM	
	REV. 10/1/11	MAA/GM	

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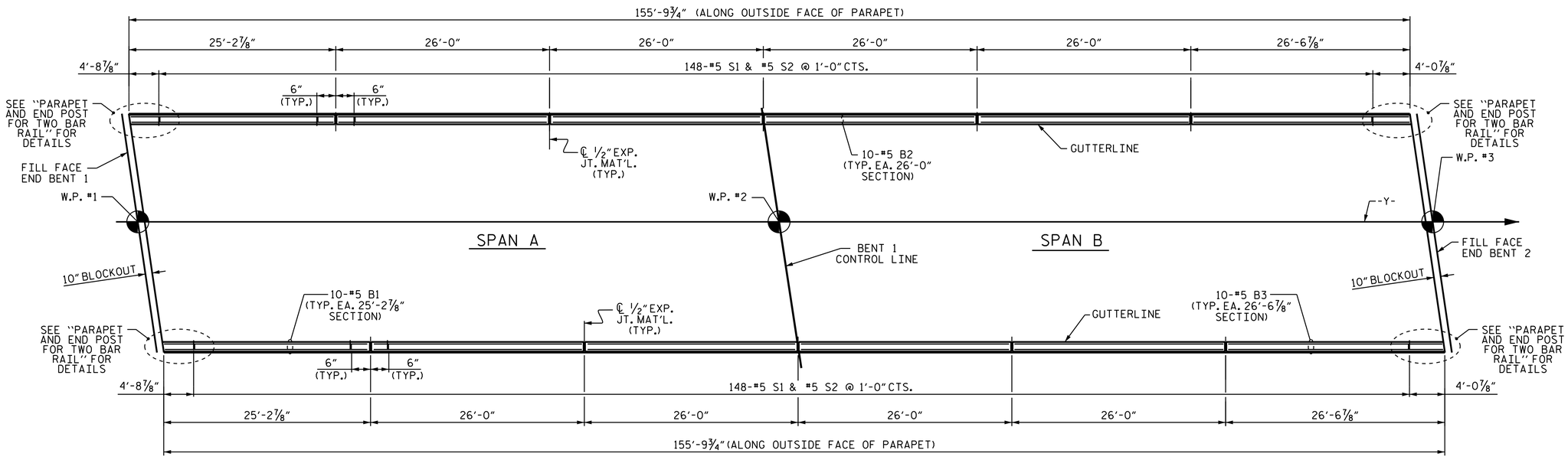
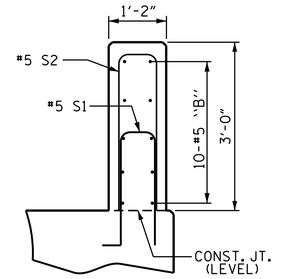
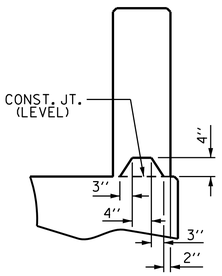
jdhawk



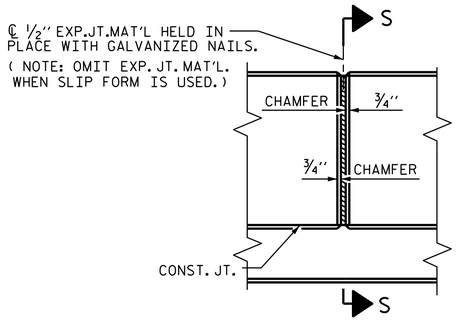


SECTION THRU PARAPET

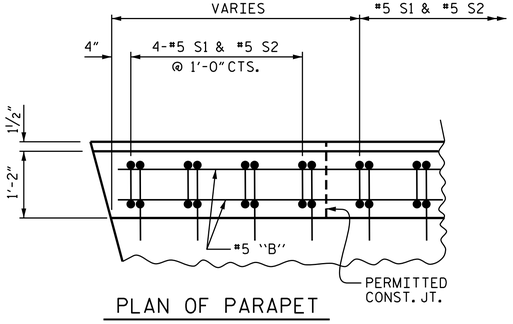


SECTION S-S

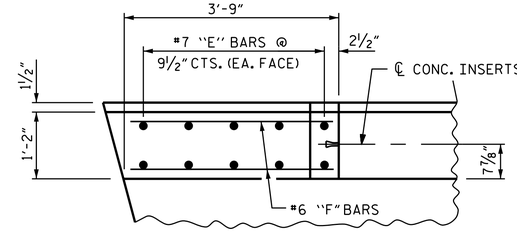
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED.)



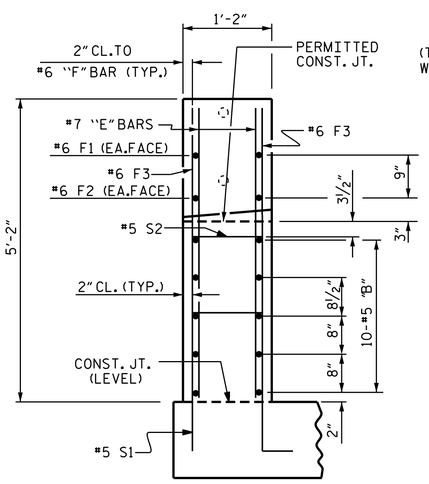
ELEVATION AT EXPANSION JOINTS



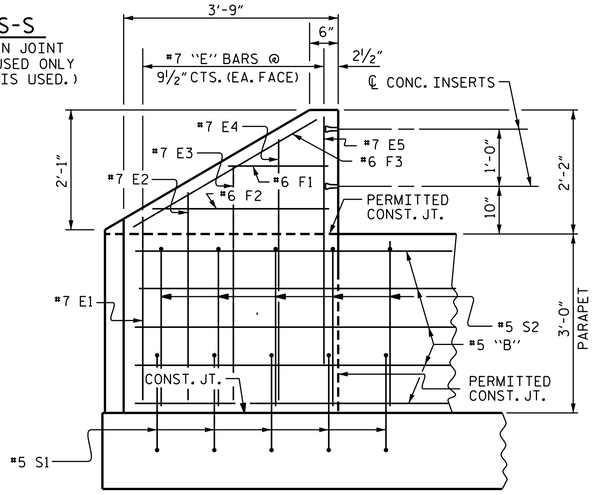
PLAN OF PARAPET



PLAN OF END POST



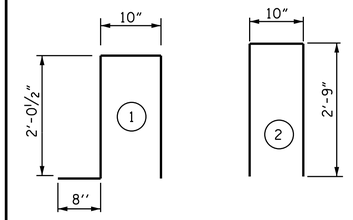
END VIEW



ELEVATION

PARAPET AND END POST FOR TWO BAR RAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR CONCRETE PARAPET AND END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	20	#5	STR	24'-10"	518
* B2	80	#5	STR	25'-7"	2135
* B3	20	#5	STR	26'-1"	544
* E1	8	#7	STR	3'-0"	49
* E2	8	#7	STR	3'-6"	57
* E3	8	#7	STR	4'-0"	65
* E4	8	#7	STR	4'-6"	74
* E5	8	#7	STR	4'-10"	79
* F1	8	#6	STR	1'-10"	22
* F2	8	#6	STR	3'-0"	36
* F3	8	#6	STR	3'-8"	44
* S1	312	#5	1	5'-7"	1817
* S2	312	#5	2	6'-4"	2061
* EPOXY COATED REINFORCING STEEL				LBS.	7,501
CLASS AA CONCRETE				CU. YDS.	41.2
1'-2" X 3'-0" CONCRETE PARAPET				LIN. FT.	311.63

NOTES

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

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

FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE FOR METAL RAILS" SHEET.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 23+00.86-LALT-

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr
EDC877061748490...
4/1/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PARAPET AND END POST DETAILS

ASSEMBLED BY : P.S. ADKINS	DATE : 4/23/14
CHECKED BY : J.D. HAWK	DATE : 5/29/14

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

REVISIONS						SHEET NO.
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2			4			32

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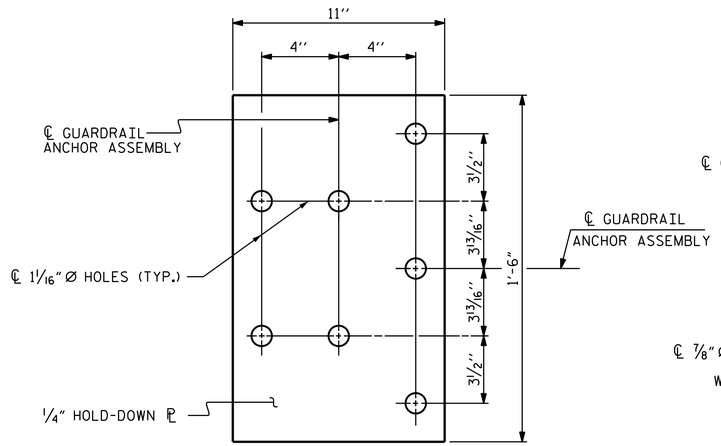

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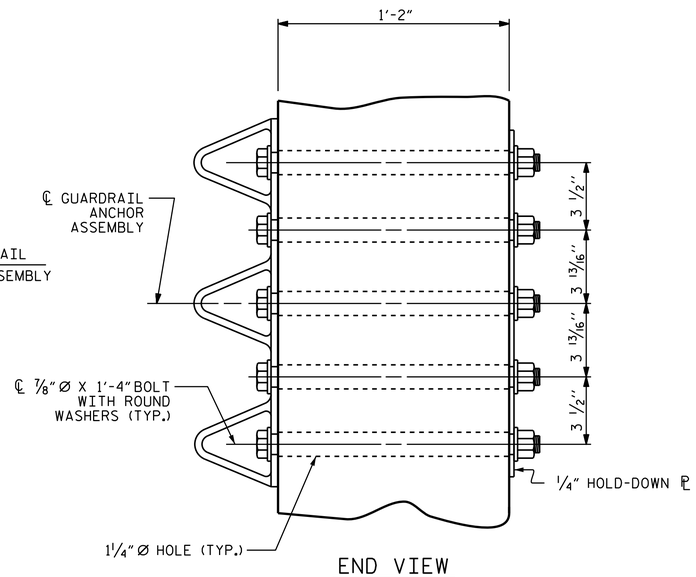


END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

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

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

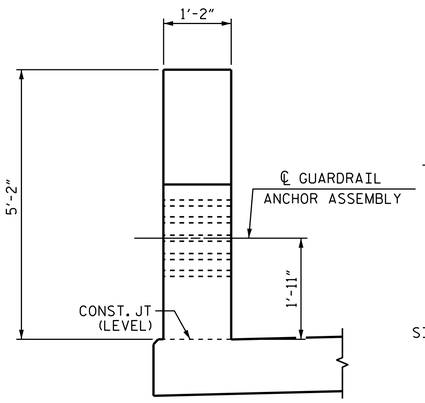
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

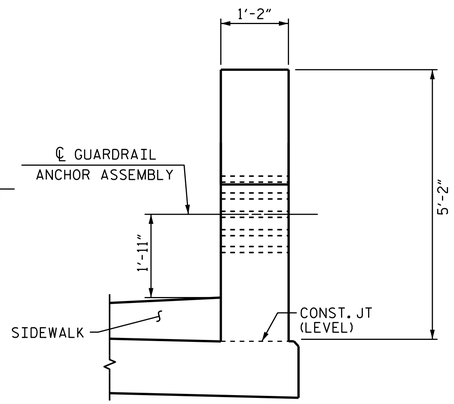
THE 1 1/4'' Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

SKETCH SHOWING POINTS OF ATTACHMENT

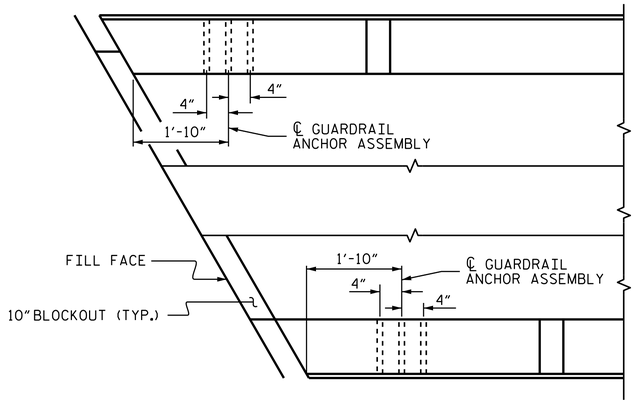
* LOCATION OF GUARDRAIL ATTACHMENT



LEFT SIDE VIEW



RIGHT SIDE VIEW



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 23+00.86-LALT-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR

DocuSigned by: Donald R. Smith, Jr
EDC877061748490...
4/1/2016

ASSEMBLED BY : P.S. ADKINS	DATE : 3/6/15		
CHECKED BY : J.D. HAWK	DATE : 3/6/15		
DRAWN BY : MAA 5/10	REV. 12/5/11	MAA/GM	
CHECKED BY : GM 5/10	REV. 6/13	MAA/GM	
	REV. 1/15	MAA/TMG	

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2			4			32

STR. #2

STD. NO. GRA3

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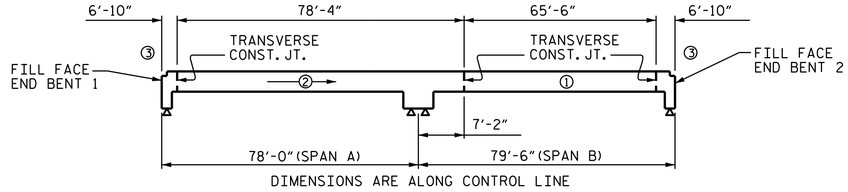
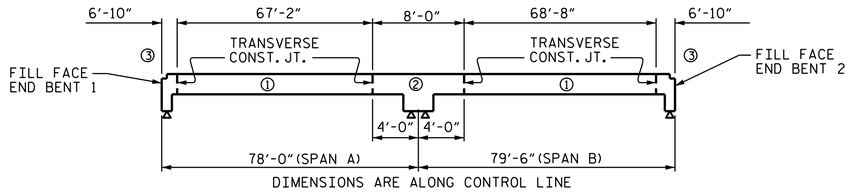
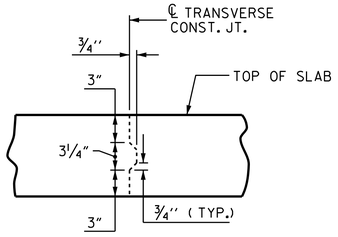


POURING SEQUENCE-PRESTRESSED CONCRETE SUPERSTRUCTURE

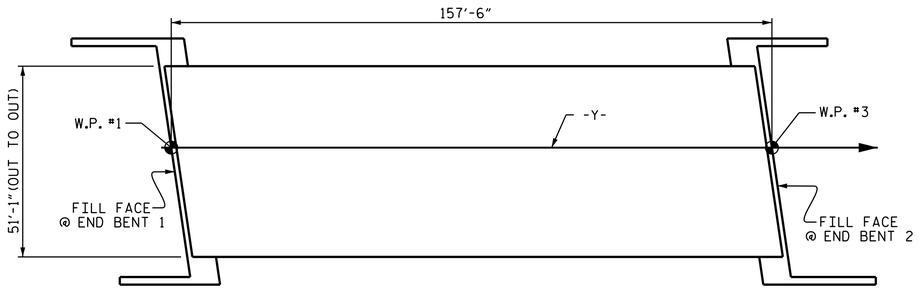


OPTIONAL POURING SEQUENCE PRESTRESSED CONCRETE SUPERSTRUCTURE



TRANSVERSE CONSTRUCTION JOINT DETAIL

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



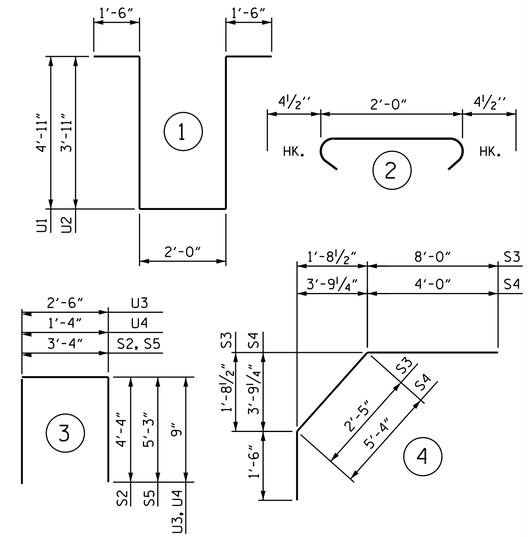
LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 8,046)

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	325	#5	STR	50'-9"	17,203	A256	1	#5	STR	33'-0"	34
A2	325	#5	STR	50'-9"	17,203	A257	1	#5	STR	29'-11"	31
						A258	1	#5	STR	26'-9"	28
✳ A101	1	#5	STR	42'-11"	45	A259	1	#5	STR	23'-8"	25
✳ A102	1	#5	STR	39'-9"	41	A260	1	#5	STR	20'-6"	21
✳ A103	1	#5	STR	36'-8"	38	A261	1	#5	STR	17'-5"	18
✳ A104	1	#5	STR	33'-6"	35	A262	1	#5	STR	14'-3"	15
✳ A105	1	#5	STR	30'-5"	32	A263	1	#5	STR	11'-2"	12
✳ A106	1	#5	STR	27'-3"	28	A264	1	#5	STR	8'-0"	8
✳ A107	1	#5	STR	24'-2"	25	A265	1	#5	STR	6'-5"	7
✳ A108	1	#5	STR	21'-0"	22	A266	1	#5	STR	5'-5"	6
✳ A109	1	#5	STR	17'-11"	19	A267	1	#5	STR	4'-5"	5
✳ A110	1	#5	STR	14'-9"	15						
✳ A111	1	#5	STR	11'-8"	12	✳ B1	266	#5	STR	15'-10"	4,393
✳ A112	1	#5	STR	8'-7"	9	✳ B2	67	#5	STR	58'-0"	4,053
✳ A113	1	#5	STR	5'-5"	6	✳ B3	66	#5	STR	24'-0"	1,652
✳ A114	1	#5	STR	2'-4"	2	✳ B4	68	#4	STR	19'-1"	867
						✳ B5	68	#4	STR	19'-11"	905
A201	1	#5	STR	42'-11"	45	B6	210	#5	STR	53'-8"	11,755
A202	1	#5	STR	39'-9"	41	✳ B7	42	#4	STR	27'-10"	781
A203	1	#5	STR	36'-8"	38						
A204	1	#5	STR	33'-6"	35	✳ G1	155	#4	STR	4'-11"	509
A205	1	#5	STR	30'-5"	32						
A206	1	#5	STR	27'-3"	28	H1	12	#6	STR	16'-2"	291
A207	1	#5	STR	24'-2"	25	H2	12	#6	STR	16'-3"	293
A208	1	#5	STR	21'-0"	22	H3	12	#6	STR	14'-0"	252
A209	1	#5	STR	17'-11"	19	H4	12	#6	STR	14'-1"	254
A210	1	#5	STR	14'-9"	15	H5	12	#6	STR	16'-0"	288
A211	1	#5	STR	11'-8"	12	H6	12	#6	STR	16'-1"	290
A212	1	#5	STR	8'-7"	9	H7	12	#6	STR	14'-2"	255
A213	1	#5	STR	5'-5"	6	H8	12	#6	STR	14'-3"	257
A214	1	#5	STR	2'-4"	2						
						K1	20	#4	STR	29'-7"	395
✳ A151	1	#5	STR	48'-8"	51	K2	16	#4	STR	2'-8"	29
✳ A152	1	#5	STR	45'-6"	47	K3	4	#4	STR	5'-4"	14
✳ A153	1	#5	STR	42'-5"	44	K4	8	#4	STR	5'-10"	31
✳ A154	1	#5	STR	39'-3"	41	K5	4	#4	STR	5'-3"	14
✳ A155	1	#5	STR	36'-2"	38	K6	4	#4	STR	5'-1"	14
✳ A156	1	#5	STR	33'-0"	34	K7	16	#4	STR	9'-1"	97
✳ A157	1	#5	STR	29'-11"	31	K8	32	#4	STR	10'-1"	216
✳ A158	1	#5	STR	26'-9"	28	K9	16	#4	STR	9'-5"	101
✳ A159	1	#5	STR	23'-8"	25	K10	8	#4	STR	8'-7"	46
✳ A160	1	#5	STR	20'-6"	21	K11	10	#4	STR	23'-5"	156
✳ A161	1	#5	STR	17'-5"	18	K12	8	#4	STR	7'-4"	39
✳ A162	1	#5	STR	14'-3"	15						
✳ A163	1	#5	STR	11'-2"	12	S1	136	#4	2	2'-9"	250
✳ A164	1	#5	STR	8'-0"	8	S2	80	#4	3	12'-0"	641
✳ A165	1	#5	STR	6'-5"	7	✳ S3	92	#4	4	11'-11"	732
✳ A166	1	#5	STR	5'-5"	6	✳ S4	78	#4	4	10'-10"	564
✳ A167	1	#5	STR	4'-5"	5	S5	16	#4	3	13'-10"	148
A251	1	#5	STR	48'-8"	51	U1	28	#4	1	14'-10"	277
A252	1	#5	STR	45'-6"	47	U2	8	#4	1	12'-10"	69
A253	1	#5	STR	42'-5"	44	✳ U3	23	#4	3	4'-0"	61
A254	1	#5	STR	39'-3"	41	✳ U4	23	#4	3	2'-10"	44
A255	1	#5	STR	36'-2"	38						

✳ EPOXY COATED REINFORCING STEEL	LBS.	32,524
REINFORCING STEEL	LBS.	34,435

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	113.4	34,435	32,524
POUR 2	153.2		
POUR 3	100.8		
SIDEWALK	19.1		
TOTALS ✳✳	386.5	34,435	32,524

✳✳ QUANTITIES FOR PARAPET ARE NOT INCLUDED

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,932	SQ.FT.
BRIDGE DECK	6,218	SQ.FT.
TOTAL	8,150	SQ.FT.

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. U-3308
DURHAM COUNTY
STATION: 23+00.86-LALT-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SUPERSTRUCTURE BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH
DocuSigned by: Donald R. Smith, Jr
EDC87706174B490...
4/1/2016

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2			4		

SHEET NO. S2-23
TOTAL SHEETS 32

DRAWN BY : P.S. ADKINS DATE : 4/22/14
CHECKED BY : J.D. HAWK DATE : 5/29/14
DESIGN ENGINEER OF RECORD: D.R. SMITH DATE : 11/3/14

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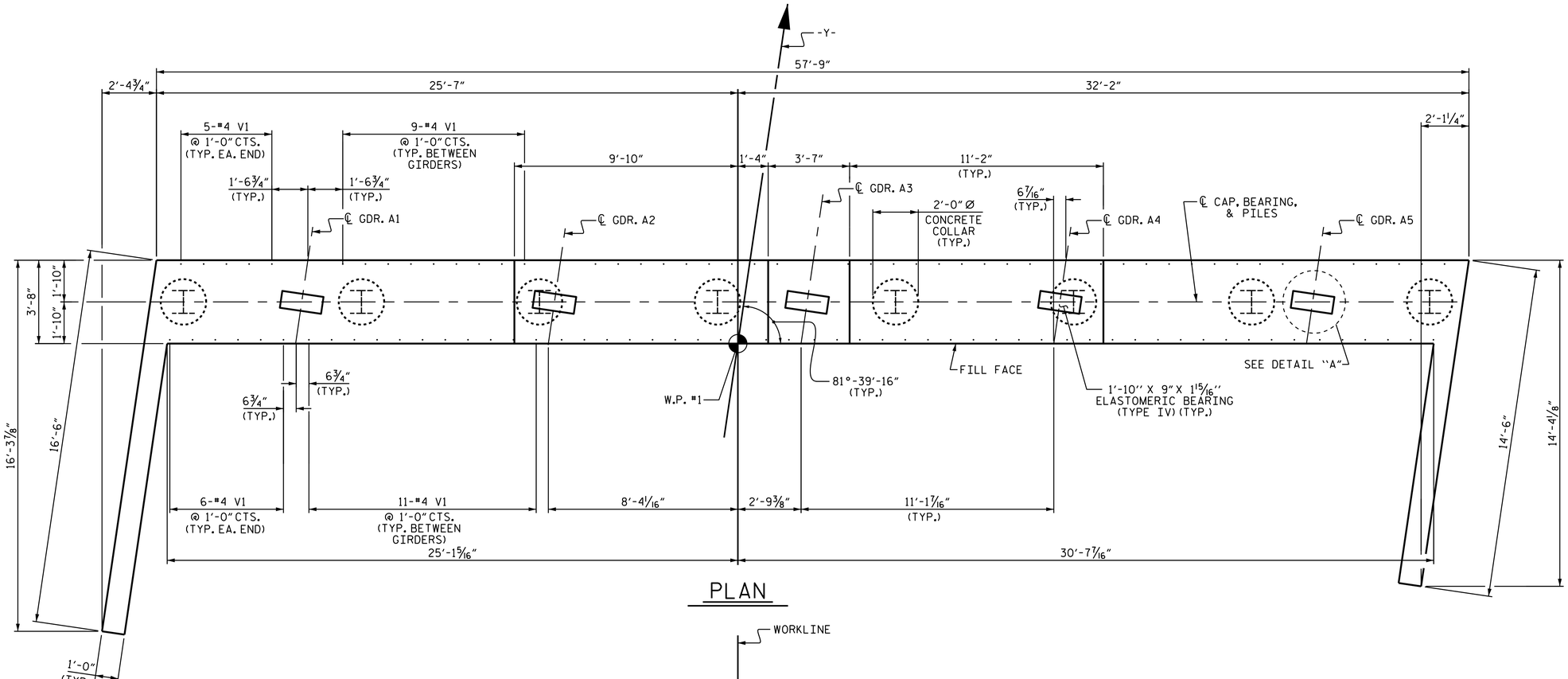
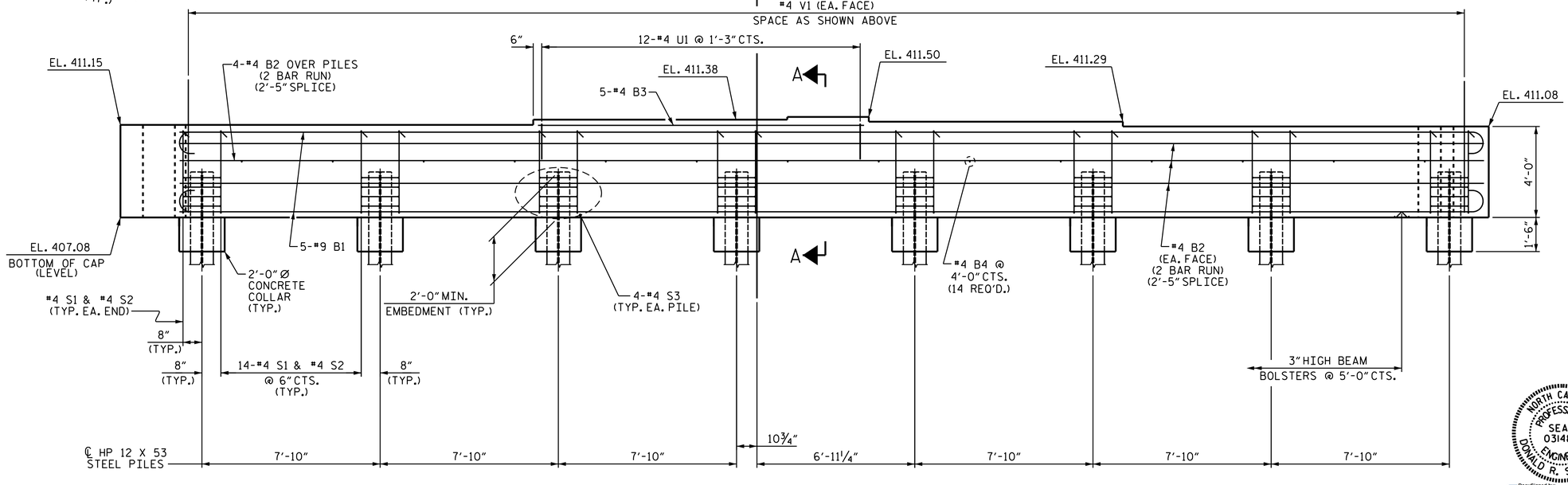
STR. #2

STD. NO. BOM2



PLAN



ELEVATION

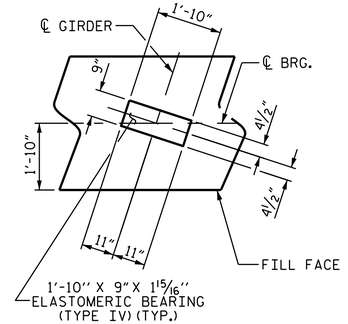
NOTES

THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼".

THE UPPER PORTION OF THE WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIAL. FOR DETAILS, SEE SUPERSTRUCTURE PLANS.

INSTALL THE 4" DIA. 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.

FOR TEMPORARY DRAINAGE AT END BENT, SEE END BENT 2.



DETAIL "A"
(TYP. EA. BEARING)

PROJECT NO. U-3308
DURHAM COUNTY
STATION: 23+00.86-LALT-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.
DocuSigned by: Donald R. Smith, Jr
EDC877061748490...
4/1/2016

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			32

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DRAWN BY : J.D.HAWK DATE : 8/13/14
CHECKED BY : P.S. ADKINS DATE : 9/3/14
DESIGN ENGINEER OF RECORD: D.R. SMITH DATE : 11/3/14

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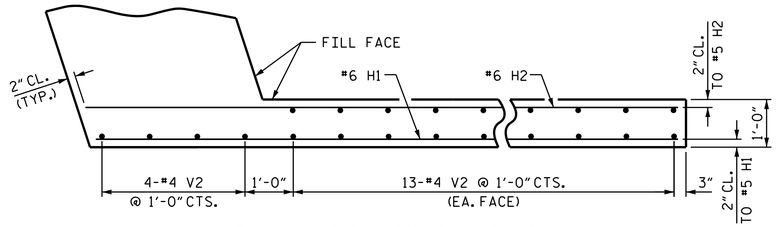
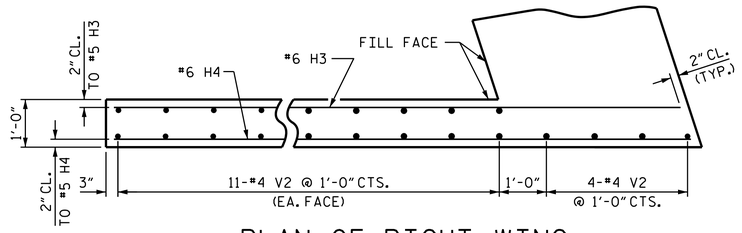
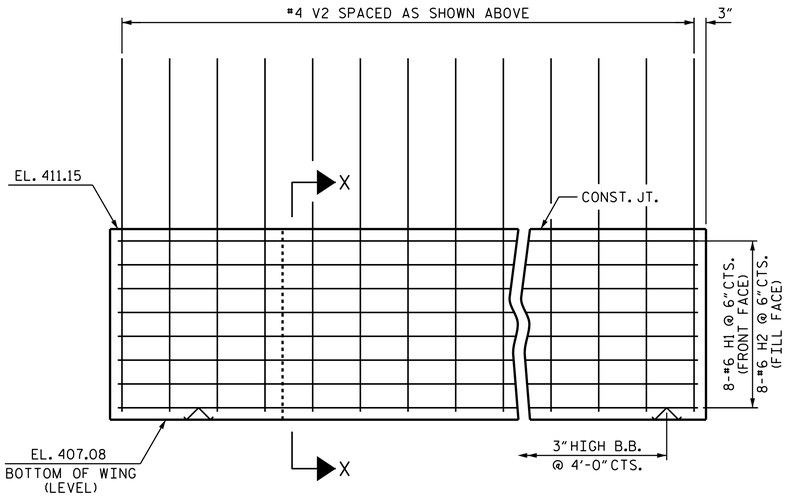


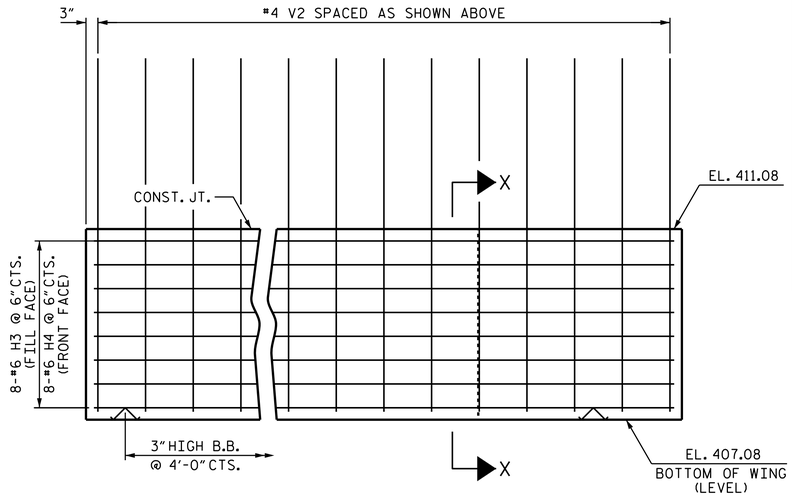
PLAN OF LEFT WING



PLAN OF RIGHT WING

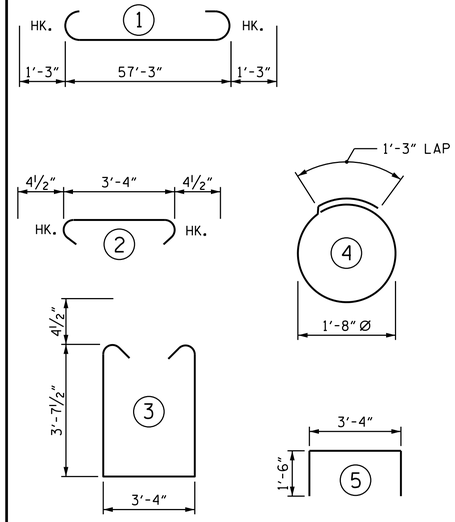


ELEVATION OF LEFT WING



ELEVATION OF RIGHT WING

BAR TYPES



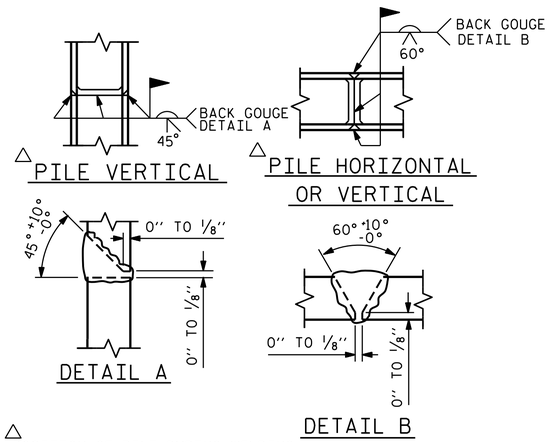
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

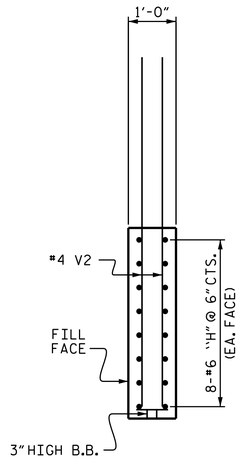
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	59'-9"	2032
B2	20	#4	STR	29'-11"	400
B3	5	#4	STR	14'-5"	48
B4	14	#4	STR	3'-4"	31
H1	8	#6	STR	16'-2"	194
H2	8	#6	STR	16'-3"	195
H3	8	#6	STR	14'-0"	168
H4	8	#6	STR	14'-1"	169
S1	100	#4	3	11'-4"	757
S2	100	#4	2	4'-1"	273
S3	32	#4	4	6'-6"	139
U1	12	#4	5	6'-4"	51
V1	102	#4	STR	6'-2"	420
V2	56	#4	STR	9'-3"	346

REINFORCING STEEL	LBS.	5,223
CLASS A CONCRETE	C.Y.	37.4
HP 12 X 53 STEEL PILES NO. 8	LIN. FT.	96
STEEL PILE POINTS	NO.	8
PILE EXCAVATION IN SOIL	LIN. FT.	80
PILE EXCAVATION NOT IN SOIL	LIN. FT.	16

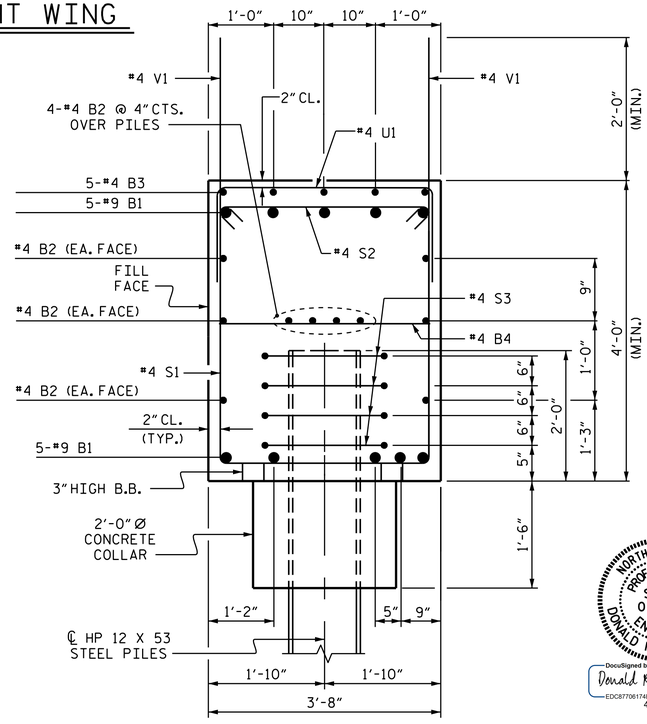


△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



SECTION X-X



SECTION A-A

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr. EDC87706174B490...

4/1/2016

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 23+00.86-LALT-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 1

DRAWN BY : J.D. HAWK — DATE : 8/13/14
CHECKED BY : P.S. ADKINS — DATE : 9/3/14
DESIGN ENGINEER OF RECORD: D.R. SMITH — DATE : 11/3/14

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-25
1			3			TOTAL SHEETS
2			4			32

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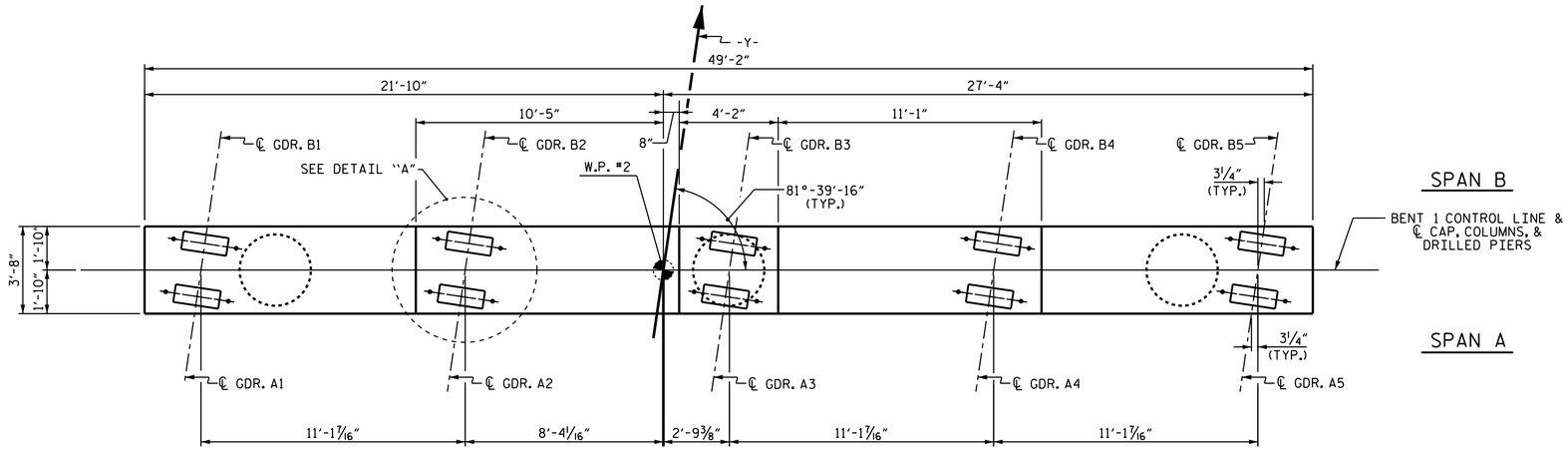
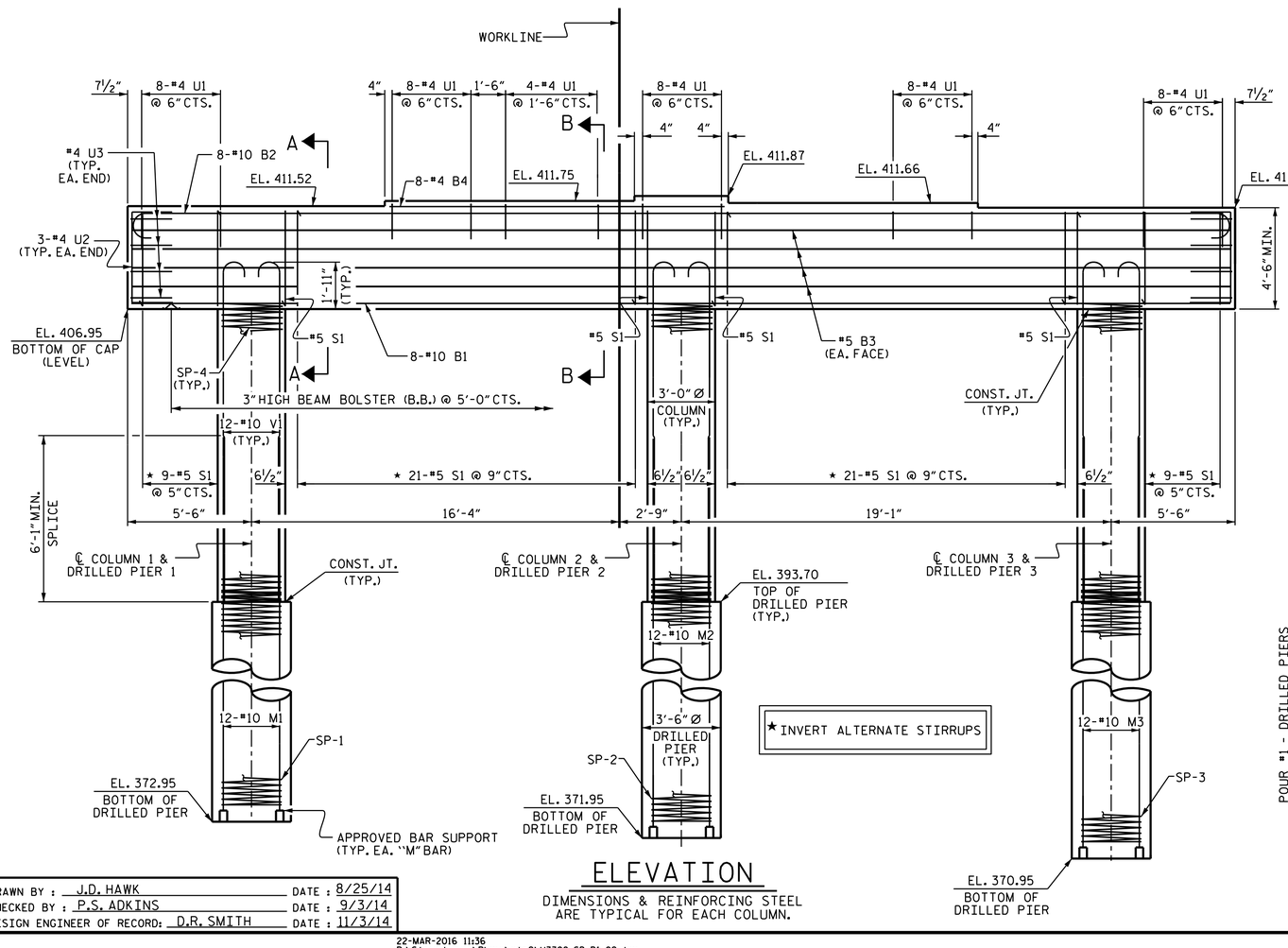
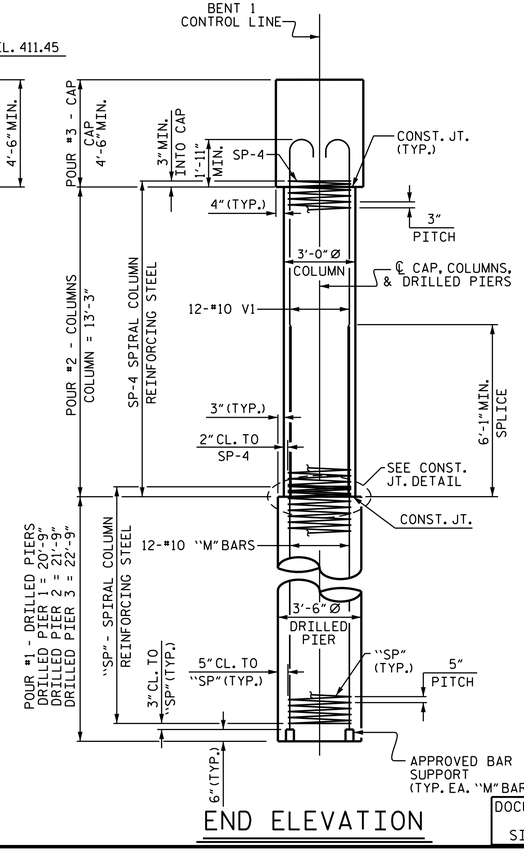


PLAN

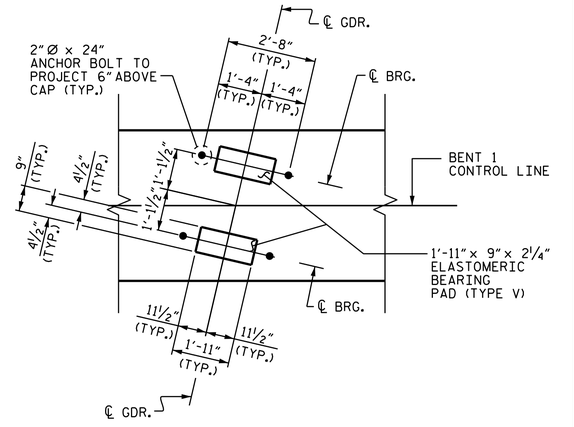


ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN.



END ELEVATION



DETAIL "A"

NOTES

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

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

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

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

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN PROPOSED GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 23+00.86-LALT-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr. EDC87706174B490...
4/1/2016

DRAWN BY : J.D. HAWK DATE : 8/25/14
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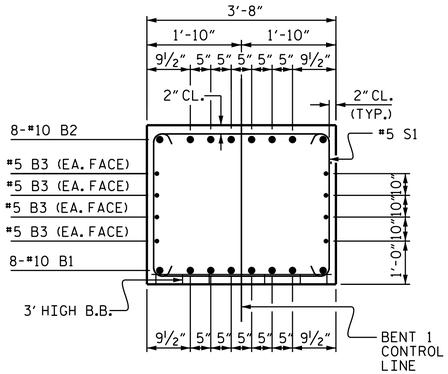
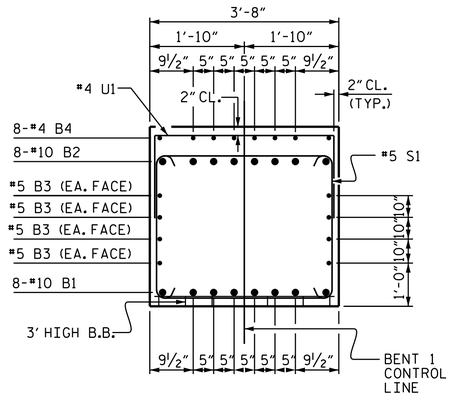


SECTION A-A



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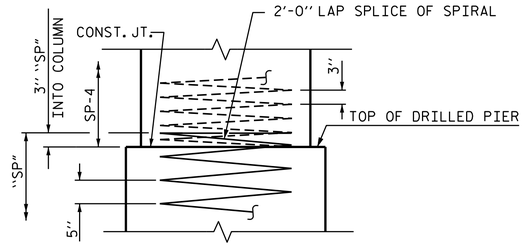
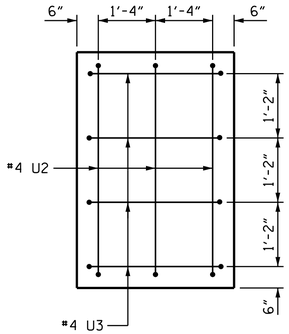
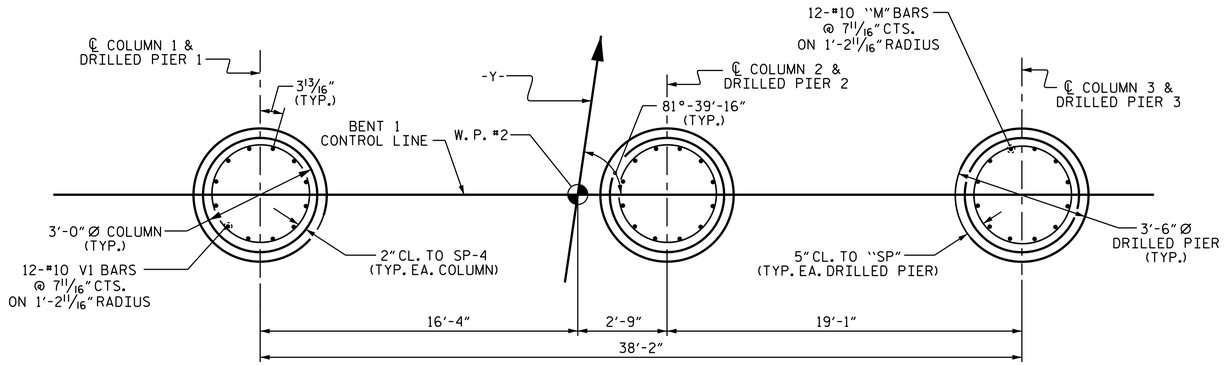


CONSTRUCTION JOINT DETAIL



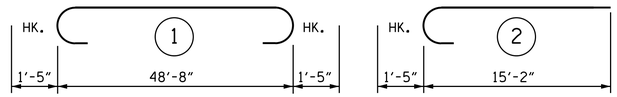
END VIEW

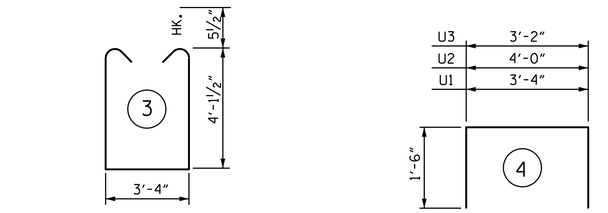


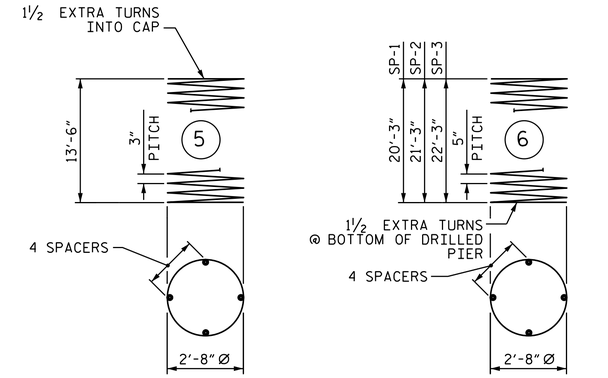
PLAN OF COLUMNS & DRILLED PIERS

(REINFORCING STEEL AND DIMENSION ARE TYPICAL FOR ALL COLUMNS AND DRILLED PIERS)

BAR TYPES







ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	STR	48'-10"	1681
B2	8	#10	1	51'-6"	1773
B3	8	#5	STR	48'-10"	407
B4	8	#4	STR	14'-11"	80
M1	12	#10	STR	29'-7"	1528
M2	12	#10	STR	30'-7"	1579
M3	12	#10	STR	31'-7"	1631
S1	64	#5	3	12'-6"	834
U1	44	#4	4	6'-4"	186
U2	6	#4	4	7'-0"	28
U3	8	#4	4	6'-2"	33
V1	36	#10	2	16'-7"	2569
REINFORCING STEEL				LBS.	12,329
SP-1	1	✱✱	6	413'-4"	431
SP-2	1	✱✱	6	431'-10"	450
SP-3	1	✱✱	6	452'-5"	472
SP-4	3	✱	5	457'-11"	918
SPIRAL COLUMN REINFORCING STEEL				LBS.	2,271

CLASS A CONCRETE BREAKDOWN

POUR #2 - COLUMNS	C.Y.	10.4
POUR #3 - CAP	C.Y.	31.2
TOTAL	C.Y.	41.6

DRILLED PIER QUANTITIES

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	C.Y.	23.3
3'-6" Ø DRILLED PIER IN SOIL	LIN. FT.	42.25
3'-6" Ø DRILLED PIER NOT IN SOIL	LIN. FT.	23.00
CSL TUBES	LIN. FT.	279.00

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

✱✱ THE SP-1 THROUGH SP-3 SPIRAL REINFORCING STEEL SHALL BE W-31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 23+00.86-LALT-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr
EDC877061748490...
4/1/2016

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-27
1			3			TOTAL SHEETS
2			4			32

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DRAWN BY : J.D. HAWK DATE : 8/25/14
CHECKED BY : P.S. ADKINS DATE : 9/3/14
DESIGN ENGINEER OF RECORD: D.R. SMITH DATE : 11/3/14

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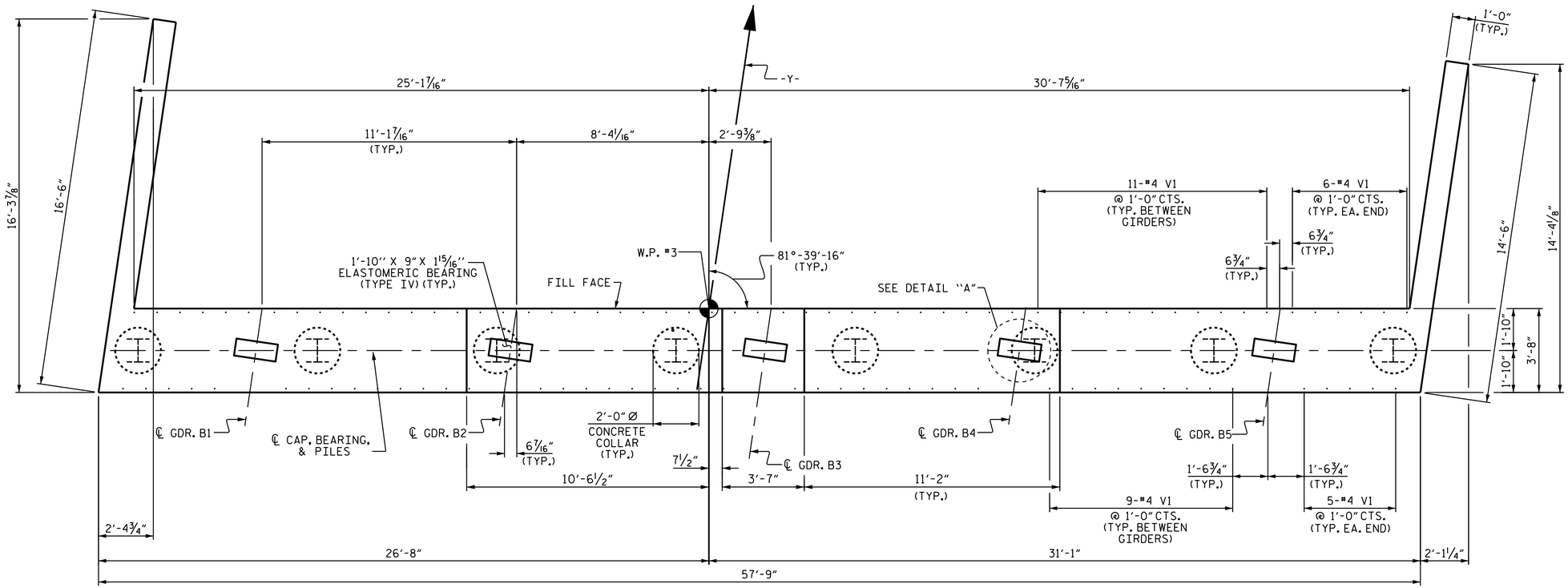
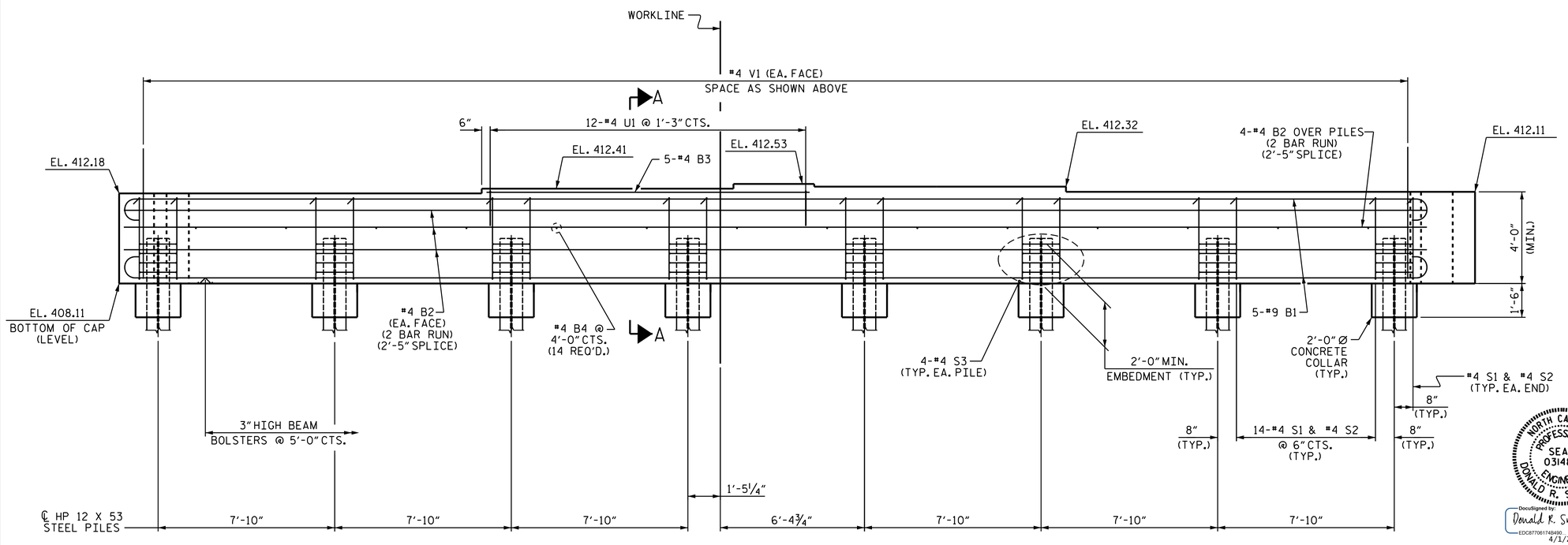
STR. #2



PLAN



ELEVATION

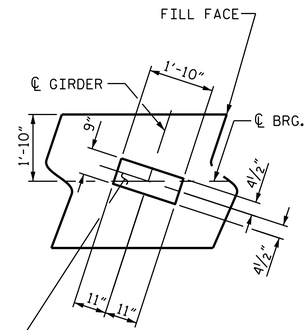
NOTES

THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

THE UPPER PORTION OF THE WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIAL. FOR DETAILS, SEE SUPERSTRUCTURE PLANS.

INSTALL THE 4" DIA. 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.

FOR PILE SPLICE DETAILS, SEE END BENT 1.



DETAIL "A"
(TYP. EA. BEARING)

PROJECT NO. U-3308
DURHAM COUNTY
STATION: 23+00.86-LALT-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr
EDC87706174B490...
4/1/2016

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-28
1			3			TOTAL SHEETS
2			4			32

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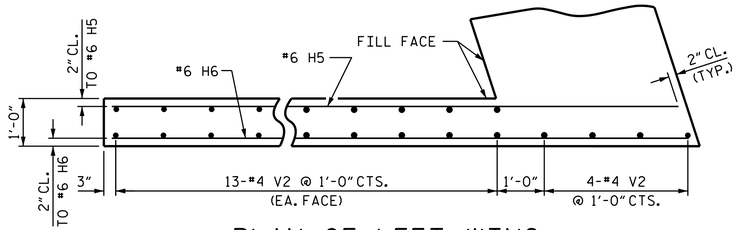
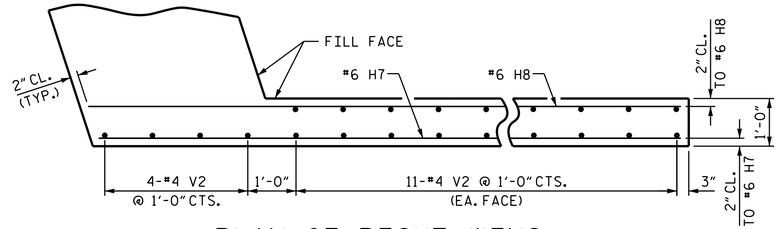
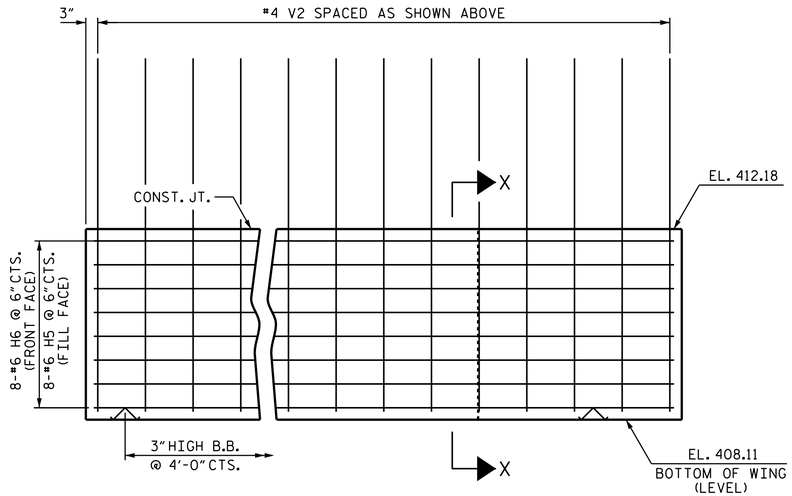
STR. #2



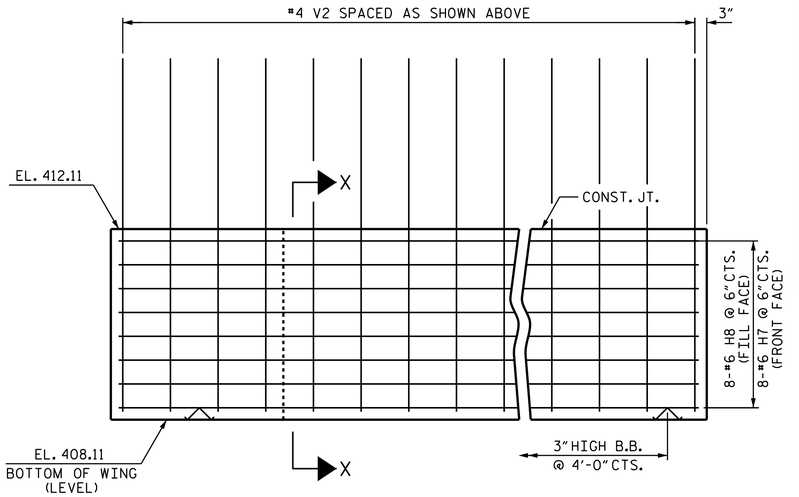
PLAN OF LEFT WING



PLAN OF RIGHT WING

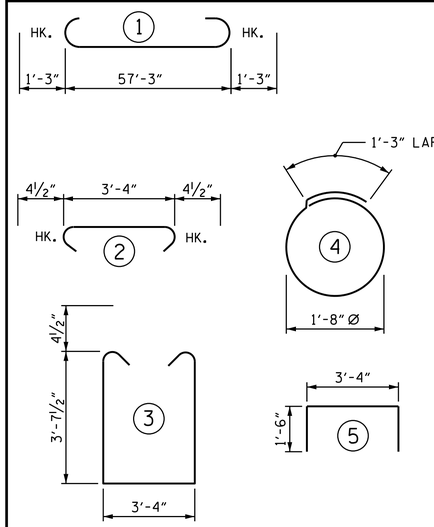


ELEVATION OF LEFT WING



ELEVATION OF RIGHT WING

BAR TYPES



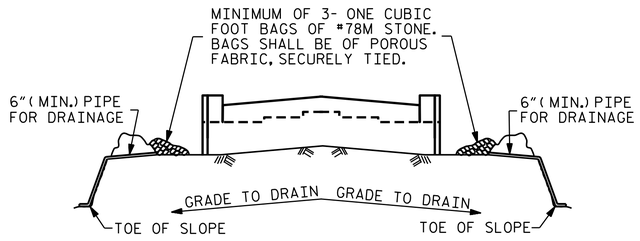
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	59'-9"	2032
B2	20	#4	STR	29'-11"	400
B3	5	#4	STR	14'-5"	48
B4	14	#4	STR	3'-4"	31
H5	8	#6	STR	16'-0"	192
H6	8	#6	STR	16'-1"	193
H7	8	#6	STR	14'-2"	170
H8	8	#6	STR	14'-3"	171
S1	100	#4	3	11'-4"	757
S2	100	#4	2	4'-1"	273
S3	32	#4	4	6'-6"	139
U1	12	#4	5	6'-4"	51
V1	102	#4	STR	6'-2"	420
V2	56	#4	STR	9'-3"	346

REINFORCING STEEL	LBS.	5,223
CLASS A CONCRETE	C.Y.	37.4
HP 12 X 53 STEEL PILES NO. 8	LIN. FT.	320

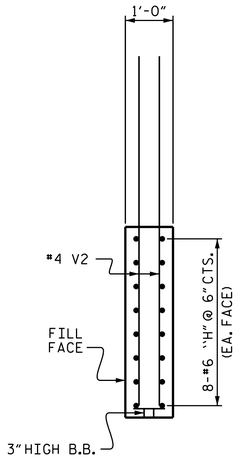


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

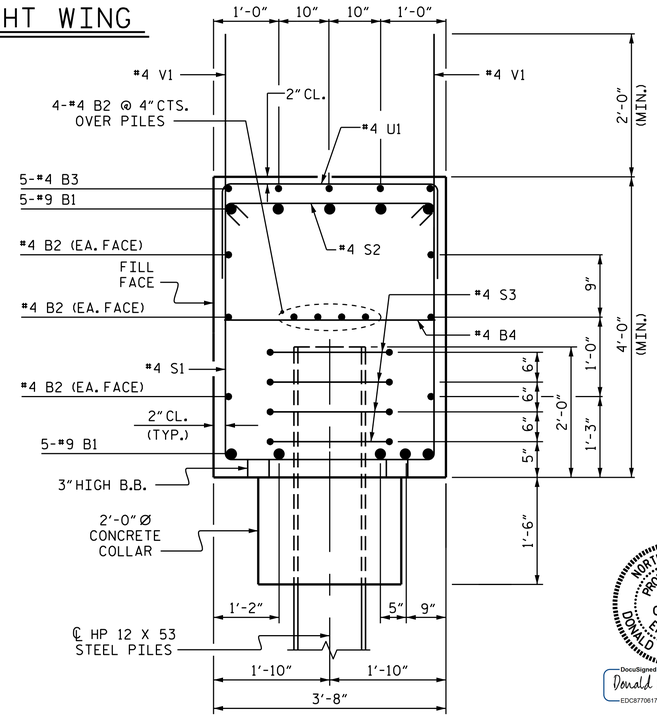
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



SECTION X-X



SECTION A-A

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr. EDC87706174B490... 4/1/2016

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 23+00.86 -LALT-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-29
1			3			TOTAL SHEETS
2			4			32

STR. #2

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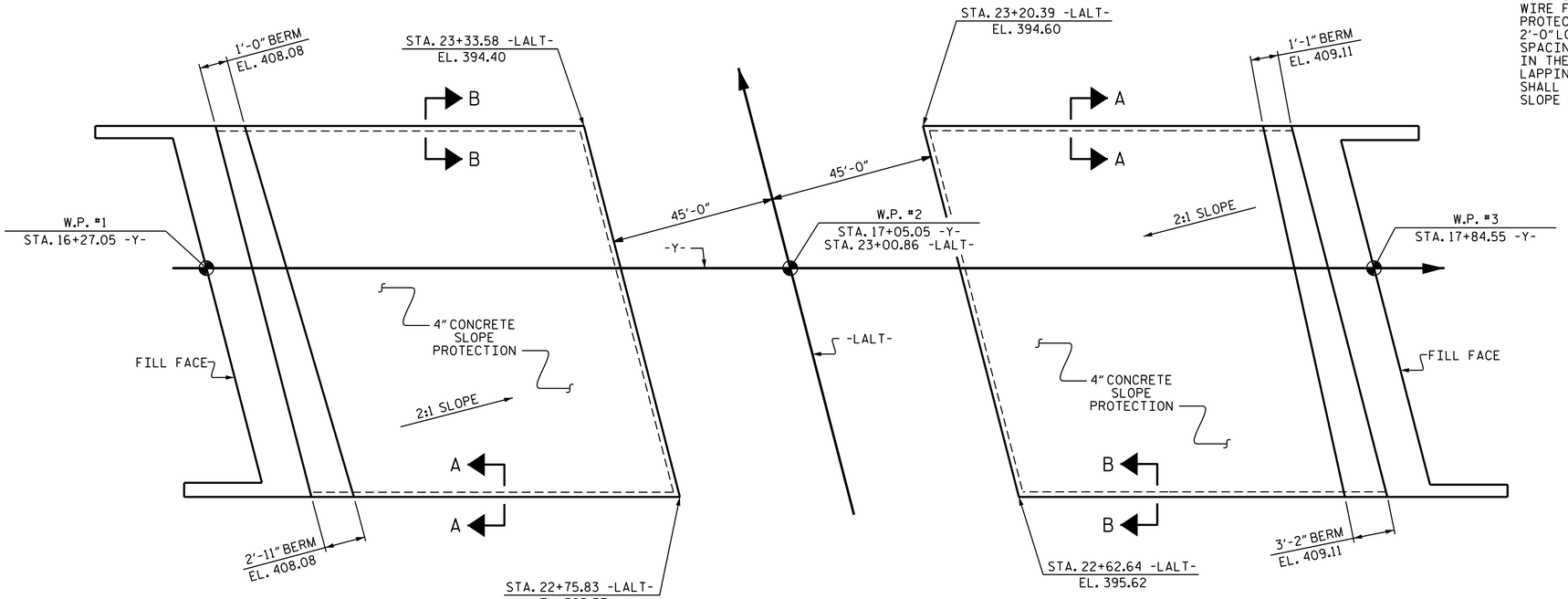
DRAWN BY : J.D. HAWK DATE : 8/13/14
CHECKED BY : P.S. ADKINS DATE : 9/3/14
DESIGN ENGINEER OF RECORD: D.R. SMITH DATE : 11/3/14

22-MAR-2016 11:36
R:\Structures\Plans\str2\U3308_SD_E2_02.dgn
jdhawk

NOTES

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

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



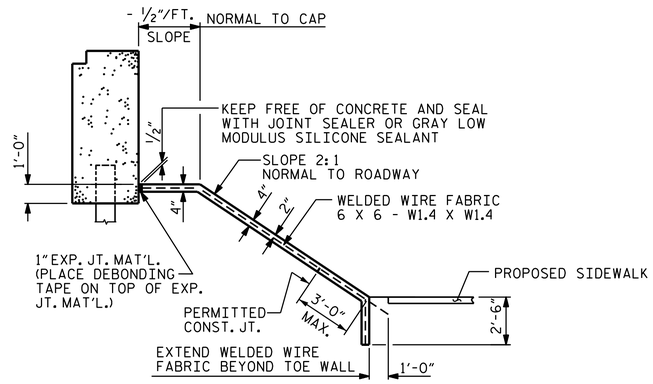
END BENT 1

END BENT 2

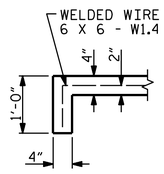
PLAN

BRIDGE @ STA. 23+00.86 -LALT-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	225	450
END BENT 2	235	470
TOTAL	460	920

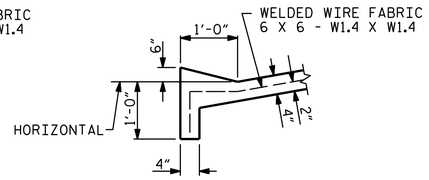
* QUANTITY SHOWN IS BASED ON 5' POURS.



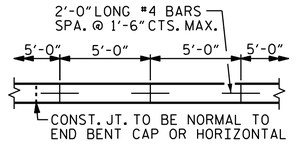
SECTION ALONG ℄ ROADWAY



SECTION A-A

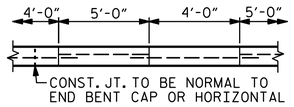


SECTION B-B



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

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr
EDC87706174B490...
4/1/2016

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 23+00.86-LALT-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS

ASSEMBLED BY : T. H. CARROLL	DATE : 06/26/13
CHECKED BY : R. P. PATEL	DATE : 06/28/13
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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-30
1			3			TOTAL SHEETS
2			4			32

STR. #2

STD. NO. SP1

22-MAR-2016 11:36
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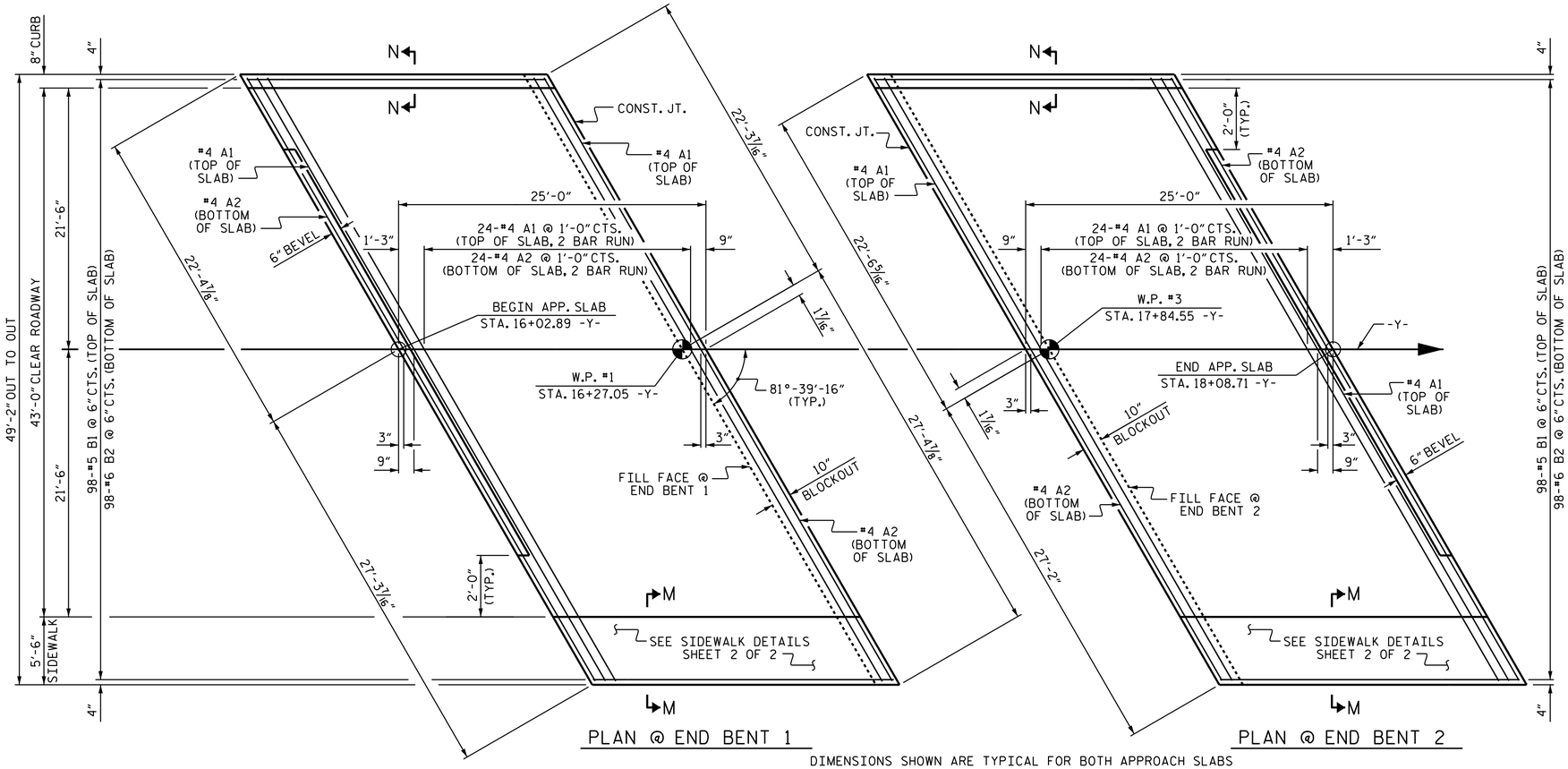
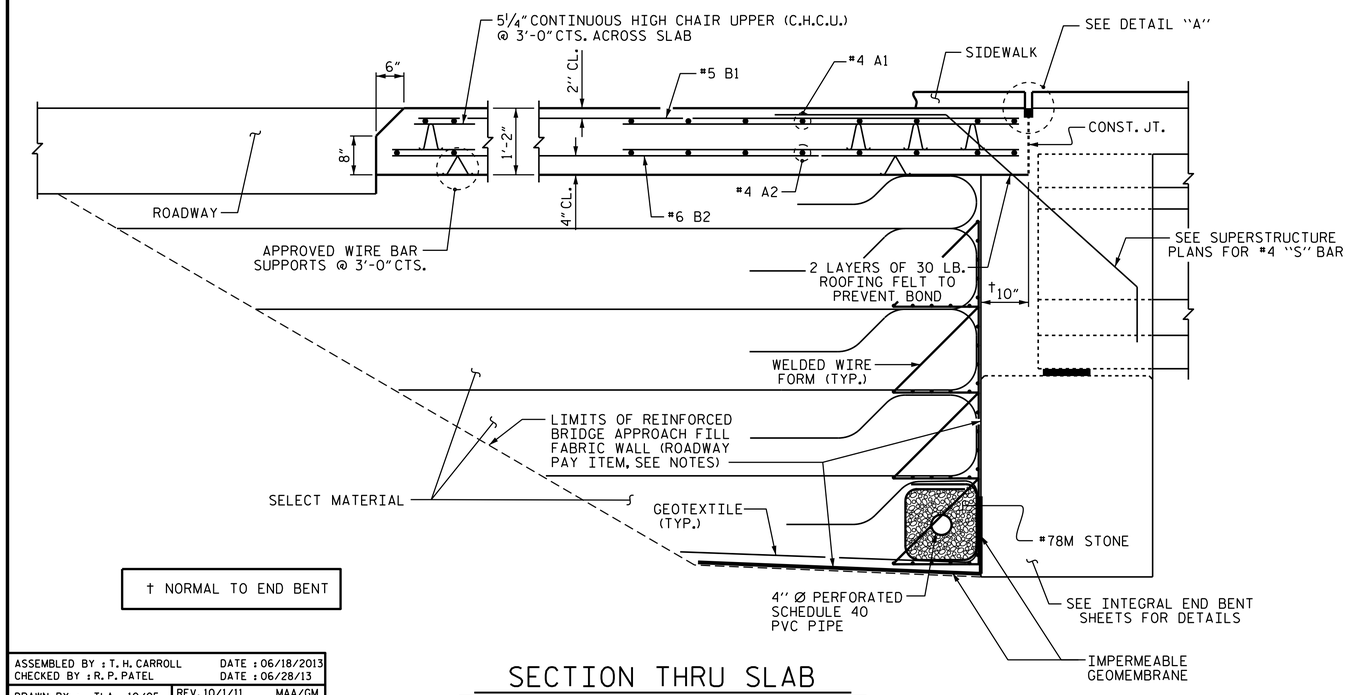
jdhawk

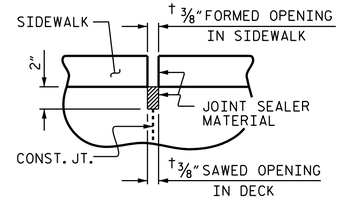


DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

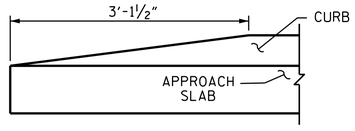


† NORMAL TO END BENT

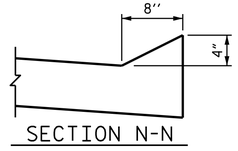
SECTION THRU SLAB



DETAIL "A"



END OF CURB WITHOUT SHOULDER BERM GUTTER



SECTION N-N

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	52	#4	STR	25'-9"	894
A2	52	#4	STR	25'-7"	889
✱ B1	98	#5	STR	24'-1"	2462
B2	98	#6	STR	24'-7"	3619
✱ B3	5	#4	STR	24'-7"	82
✱ G1	25	#4	STR	4'-11"	82
✱ U1	5	#4	1	2'-10"	9
✱ U2	5	#4	1	4'-0"	13

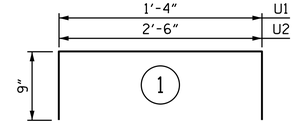
REINFORCING STEEL LBS. 4508

✱ EPOXY COATED REINFORCING STEEL LBS. 3542

CLASS AA CONCRETE BREAKDOWN

POUR #1 - APP. SLAB	C.Y.	52.9
POUR #2 - SIDEWALK	C.Y.	3.1
TOTAL	C.Y.	56.0

BAR TYPES



BAR DIMENSIONS ARE OUT TO OUT

NOTES

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

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

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

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

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 23+00.86-LALT-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith Jr
EDC87706174B490...
4/1/2016

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-31
1			3			TOTAL SHEETS
2			4			32

STR. #2

STD. NO. BAS5

ASSEMBLED BY : T. H. CARROLL	DATE : 06/18/2013	
CHECKED BY : R. P. PATEL	DATE : 06/28/13	
DRAWN BY : TLA 10/05	REV. 10/1/11	MAA/GM
CHECKED BY : GM 5/06	REV. 12/21/11	MAA/GM
	REV. 6/13	MAA/GM

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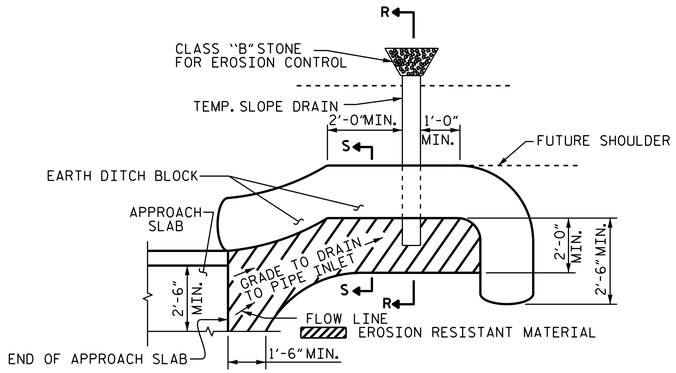
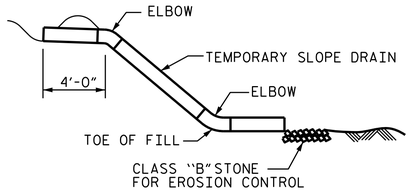
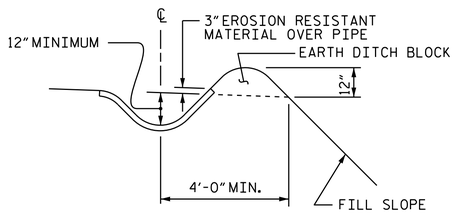


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



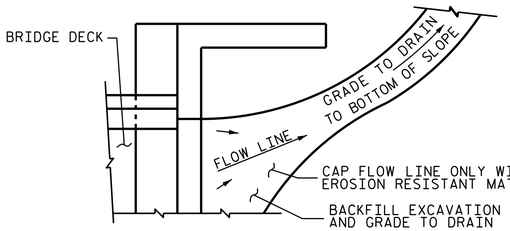
SECTION R-R



SECTION S-S

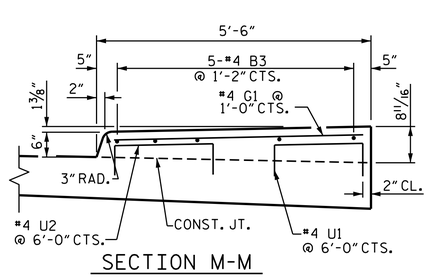
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

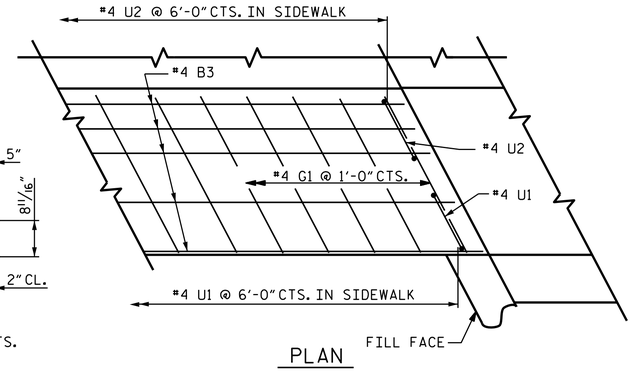


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



SECTION M-M



PLAN

SIDEWALK DETAILS

BEGIN APPROACH SLAB SHOWN, END APPROACH SLAB SIMILAR.

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 23+00.86-LALT-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 031480 ENGINEER DONALD R. SMITH, JR.

DocuSigned by: Donald R. Smith, Jr. EDC87706174B490...

4/1/2016

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-32
1			3			TOTAL SHEETS
2			4			32

STR. #2 STD. NO. BAS4

ASSEMBLED BY : T. H. CARROLL		DATE : 06/18/13	
CHECKED BY : R. P. PATEL		DATE : 06/28/13	
DRAWN BY : FCJ 11/88	REV. 10/1/11	MAA/GM	
CHECKED BY : ARB 11/88	REV. 7/12	MAA/GM	
	REV. 6/13	MAA/GM	

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