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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-4729A	1	

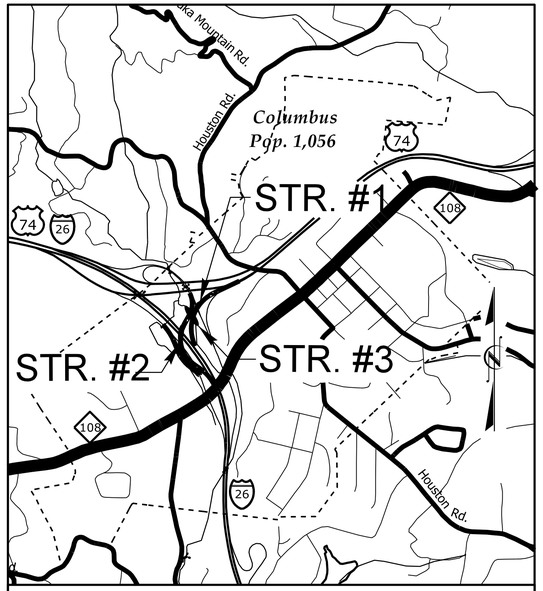
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34243.1.4		PE
34243.2.2		ROW
34243.3.2		CONST

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

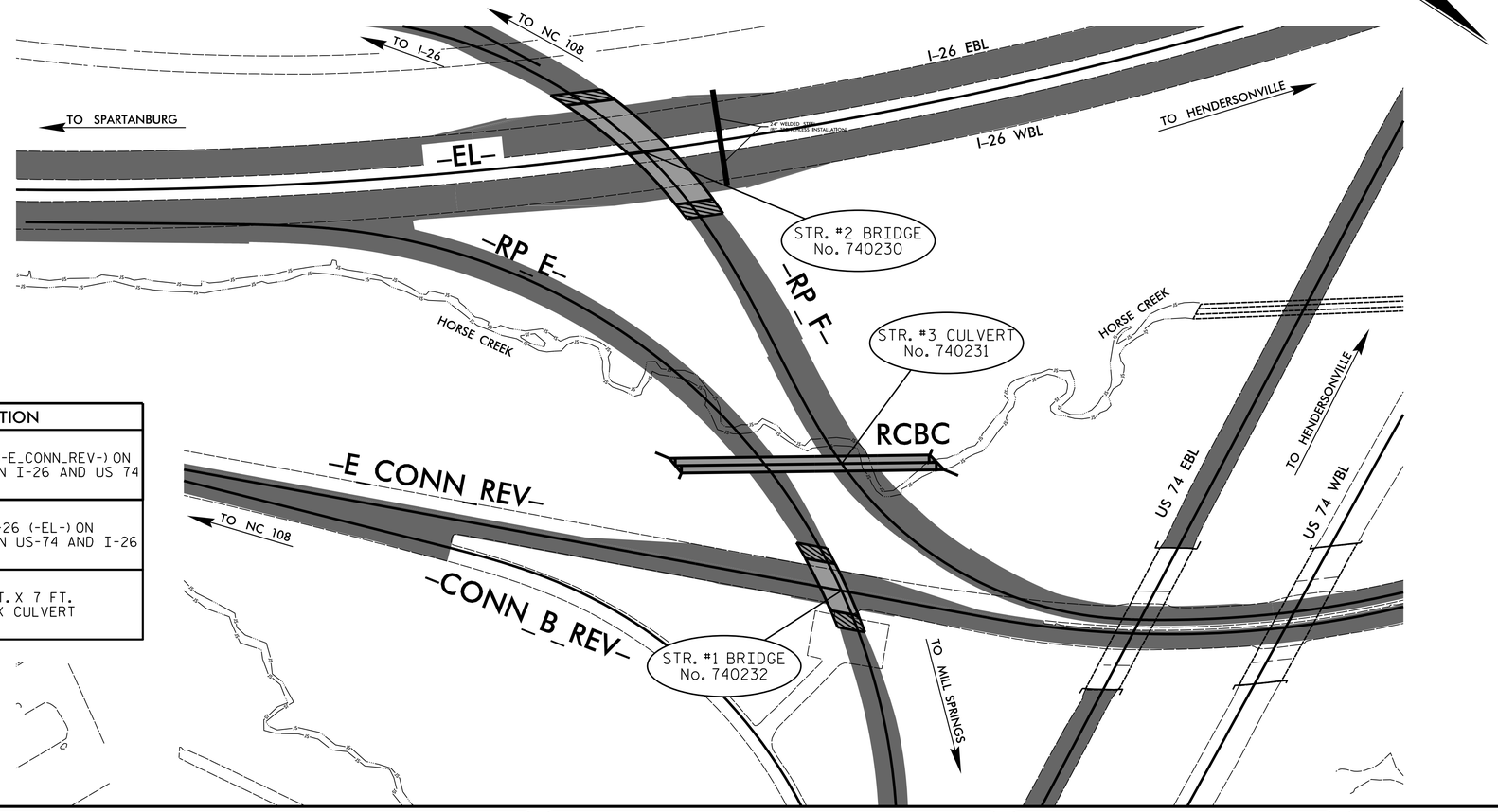
POLK COUNTY

LOCATION: I-26 /US 74 /NC 108 INTERCHANGE MODIFICATION IN THE TOWN OF COLUMBUS

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERT AND STRUCTURES



VICINITY MAP



STRUCTURES

STATION	DESCRIPTION
① STA. 22+87.20 -RP_E- / STA. 25+38.87 -E_CONN_REV-	BRIDGE OVER RAMP (-E_CONN_REV-) ON RAMP (-RP_E-) BETWEEN I-26 AND US 74
② STA. 21+44.22 -RP_F- / STA. 53+95.89 -EL-	BRIDGE OVER I-26 (-EL-) ON RAMP (-RP_F-) BETWEEN US-74 AND I-26
③ STA. 16+47.10 -RP_F-	DOUBLE 10 FT. X 7 FT. CONCRETE BOX CULVERT

CONTRACT: C204039

TIP PROJECT: I-4729A

DESIGN DATA

-EL-

2016	=	21,700
2040	=	30,500
K	=	9 %
D	=	55 %
T	=	24 % *
V	=	70 MPH

* TTST = 21% + DUAL = 3%

FUNC CLASS = RURAL INTERSTATE

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT: I-4729A = 0.679 MILES

TOTAL LENGTH OF TIP PROJECT: I-4729A = 0.679 MILES

PLANS PREPARED BY :

PARSONS

5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

LETTING DATE:
SEPTEMBER 19, 2017

ANUPAM D. SHAH, P.E.
PROJECT ENGINEER

SAM T. PHAN, P.E.
PROJECT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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22+00 +50 23+00 +50

P.V.I. = STA. 21+90.00
EL. = 1,063.86'
V.C. = 255.00'

(+)3.0000% (-)5.7000%

GRADE DATA –RP_E–

FILL FACE @ END BENT 1
STA. 22+45.30 -RP_E-
GRADE POINT EL. 1059.81

SPAN A

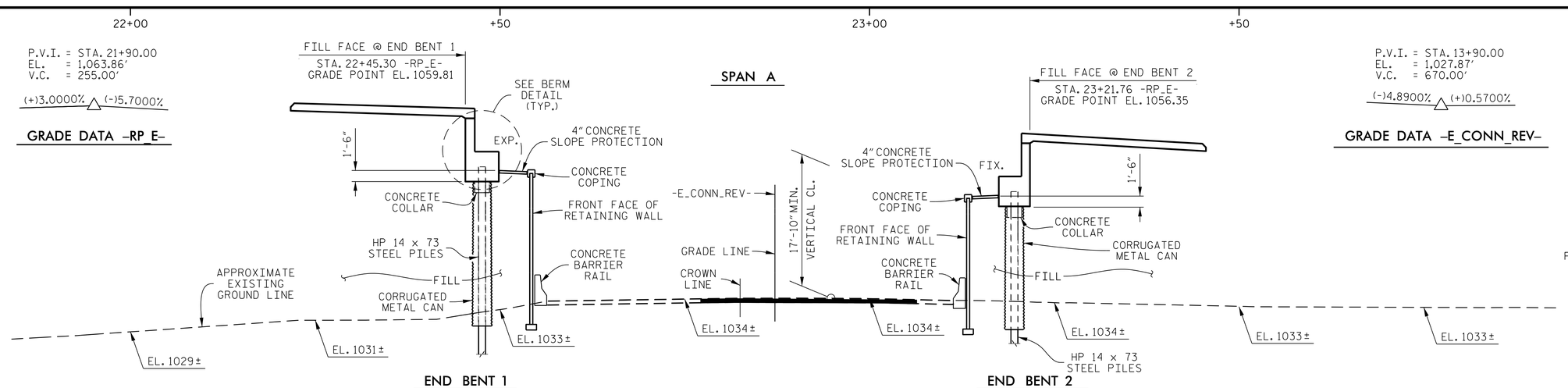
FILL FACE @ END BENT 2
STA. 23+21.76 -RP_E-
GRADE POINT EL. 1056.35

P.V.I. = STA. 13+90.00
EL. = 1,027.87'
V.C. = 670.00'

(-)4.8900% (+)0.5700%

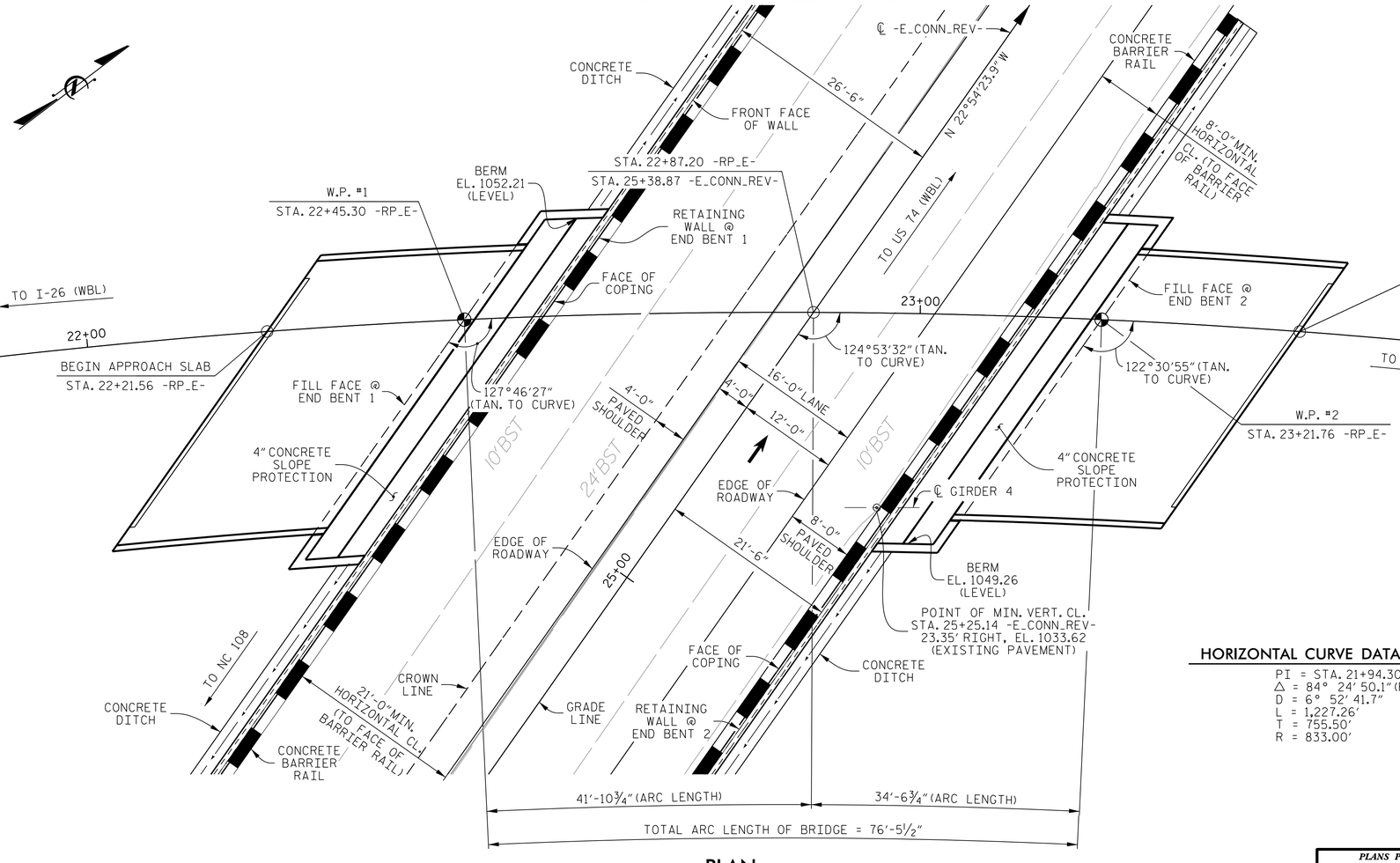
GRADE DATA –E_CONN_REV–

FOR NOTES, SEE SHEET 4 OF 4.



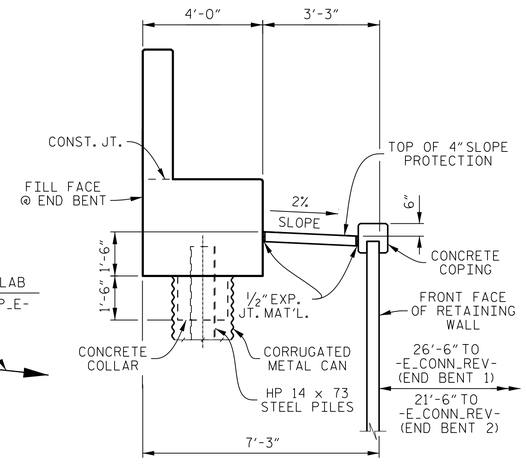
SECTION ALONG –RP_E–

(SECTION AT RIGHT ANGLES TO END BENTS)



PLAN

METAL CANS AND PILES NOT SHOWN IN PLAN VIEW.



BERM DETAIL

(NORMAL TO FILL FACE)

HORIZONTAL CURVE DATA –RP_E–

PI = STA. 21+94.30
Δ = 84° 24' 50.1" (RT.)
D = 6° 52' 41.7"
L = 1,227.26'
T = 755.50'
R = 833.00'

PROJECT NO. I-4729A

POLK COUNTY

STATION: 22+87.20 –RP_E–
25+38.87 –E_CONN_REV–

SHEET 1 OF 4 BRIDGE No. 740232

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER
RAMP (–E_CONN_REV–) ON
RAMP (–RP_E–) BETWEEN
I-26 AND US 74

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM B. SHAH
8/10/2017

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1-1
1			3			TOTAL SHEETS
2			4			24

DRAWN BY : K. E. LOFTON DATE : 5-17
CHECKED BY : A. D. SHAH DATE : 7-17
DESIGN ENGINEER : A. D. SHAH DATE : 8-17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

STR. #1

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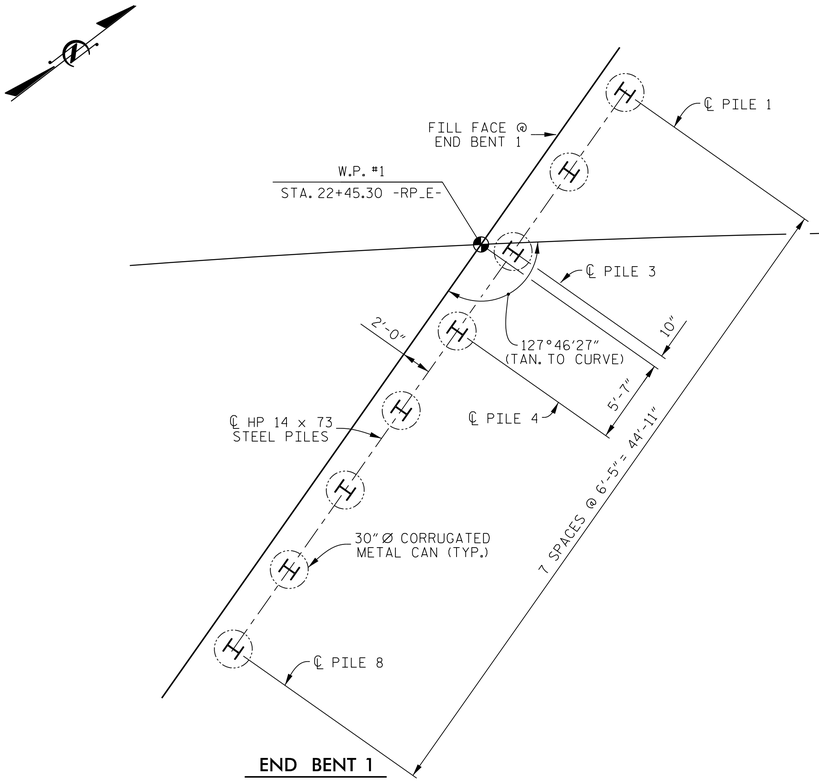
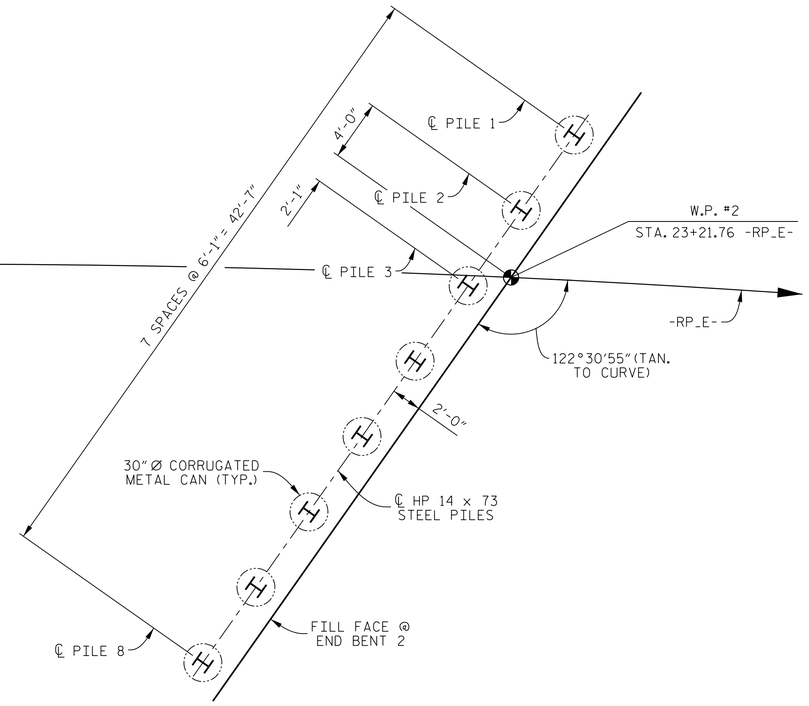


END BENT 1



END BENT 2

FOUNDATION LAYOUT

NOTES

ALL END BENT PILES ARE VERTICAL HP 14 x 73 STEEL PILES.

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINES AT THE BOTTOM OF THE END BENT CAPS.

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 110 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 185 TONS PER PILE.

PILES AT END BENT 1 AND END BENT 2 ARE TO BE DRIVEN AFTER CONSTRUCTION AND RELEASE OF THE MSE WALLS PENDING THE SETTLEMENT MONITORING PROGRAM.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

CORRUGATED METAL CANS AT END BENT 1 AND END BENT 2 ARE TO BE PLACED DURING CONSTRUCTION IN THE REINFORCED BACKFILL OF THE MSE WALLS. SEE MSE WALL PLANS.

INSTALLATION OF CORRUGATED METAL CANS FROM THE BOTTOM OF THE PILE CAP TO THE LEVELING PAD ELEVATION IS REQUIRED FOR PILES AT END BENT 1 AND END BENT 2. THE CANS SHALL BE DESIGNED TO WITHSTAND THE PRESSURES FROM COMPACTION OPERATIONS ON ADJACENT FILLS WITHOUT DISTORTION. AT A MINIMUM, CORRUGATED METAL CANS SHALL BE 16-GAUGE WITH A WALL THICKNESS OF 0.064".

LOOSELY BACKFILL CORRUGATED METAL CANS USING SAME MATERIAL AS MSE REINFORCEMENT ZONE PRIOR TO CONSTRUCTION OF THE END BENT PILE CAP. DO NOT COMPACT MATERIAL WITHIN THE CAN.

OBSERVE A ONE MONTH WAITING PERIOD AFTER CONSTRUCTION OF THE MSE WALLS BEFORE DRIVING PILES. DO NOT DRIVE PILES AT END BENT 1 AND END BENT 2 UNTIL THE WALL HAS BEEN RELEASED FOLLOWING THE SETTLEMENT MONITORING PROGRAM.

FOR SURCHARGES AND WAITING PERIODS, SEE SECTION 235 OF THE STANDARD SPECIFICATIONS AND THE SURCHARGES AND WAITING PERIODS PROVISION.

PROJECT NO. I-4729A

POLK COUNTY

STATION: 22+87.20 -RP_E-

SHEET 2 OF 4

DRAWN BY : K. E. LOFTON DATE : 5-17
CHECKED BY : A. D. SHAH DATE : 7-17
DESIGN ENGINEER : A. D. SHAH DATE : 8-17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANURAG D. SHAH
8/10/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER
RAMP (-E_CONN_REV-) ON
RAMP (-RP_E-) BETWEEN
I-26 AND US 74

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1-2
1			3			TOTAL SHEETS
2			4			24

STR. #1

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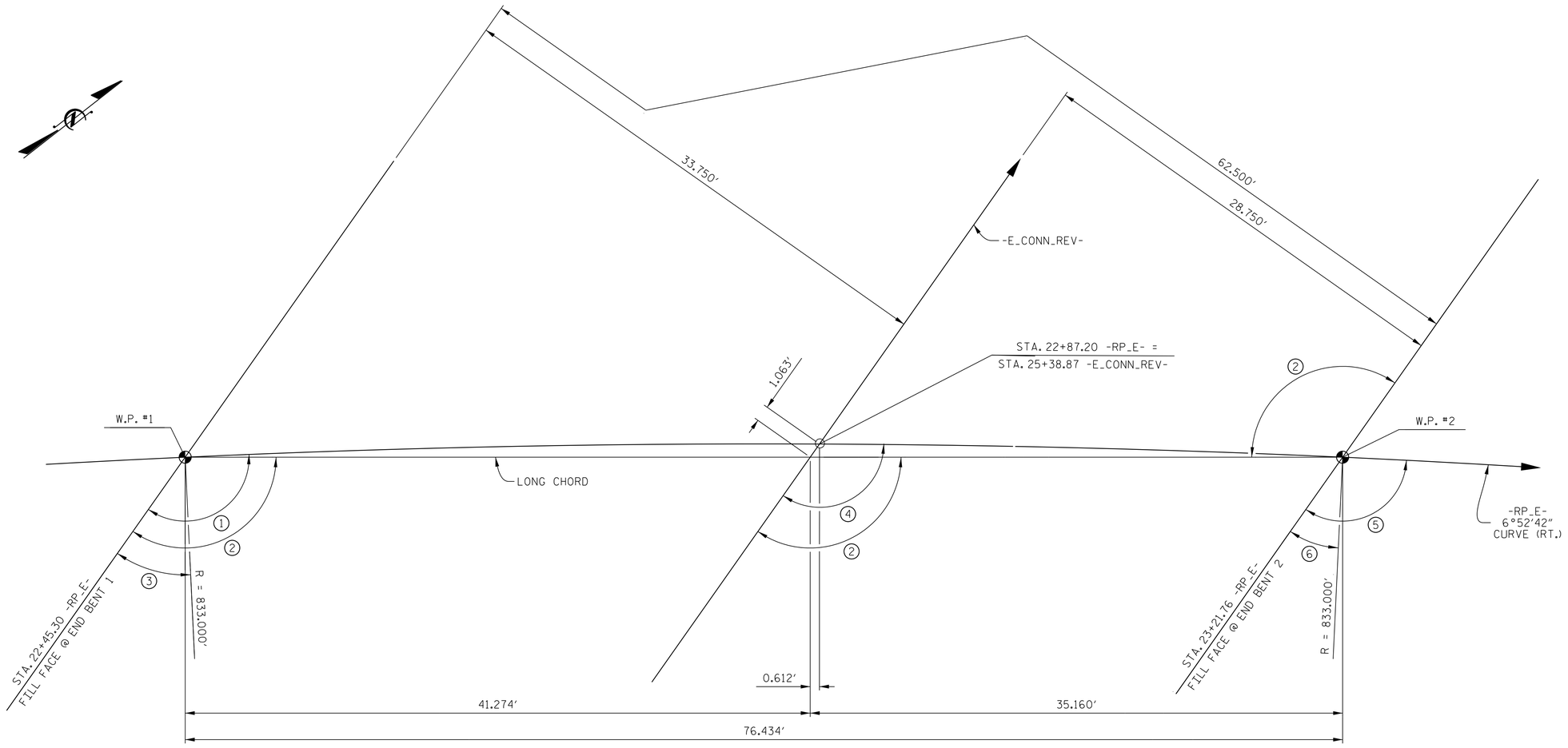

LONG CHORD LAYOUT

NOTE: END BENTS ARE PARALLEL.

ANGLES	
①	127° 46' 27"(TAN. TO CURVE)
②	125° 08' 41"
③	37° 46' 27"
④	124° 53' 32"(TAN. TO CURVE)
⑤	122° 30' 55"(TAN. TO CURVE)
⑥	32° 30' 55"

HORIZONTAL CURVE DATA –RP_E–

PI = STA. 21+94.30
△ = 84° 24' 50.1"(RT.)
D = 6° 52' 41.7"
L = 1,227.26'
T = 755.50'
R = 833.00'

PROJECT NO. I–4729A

POLK COUNTY

STATION: 22+87.20 –RP_E–

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER
RAMP (–E_CONN_REV–) ON
RAMP (–RP_E–) BETWEEN
I–26 AND US 74

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1–3
1			3			TOTAL SHEETS
2			4			24

DRAWN BY : K. E. LOFTON DATE : 5–17
CHECKED BY : A. D. SHAH DATE : 7–17
DESIGN ENGINEER : A. D. SHAH DATE : 8–17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606–3386
NC LICENSE No. F–0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUBHAV D. SHAH
8/10/2017

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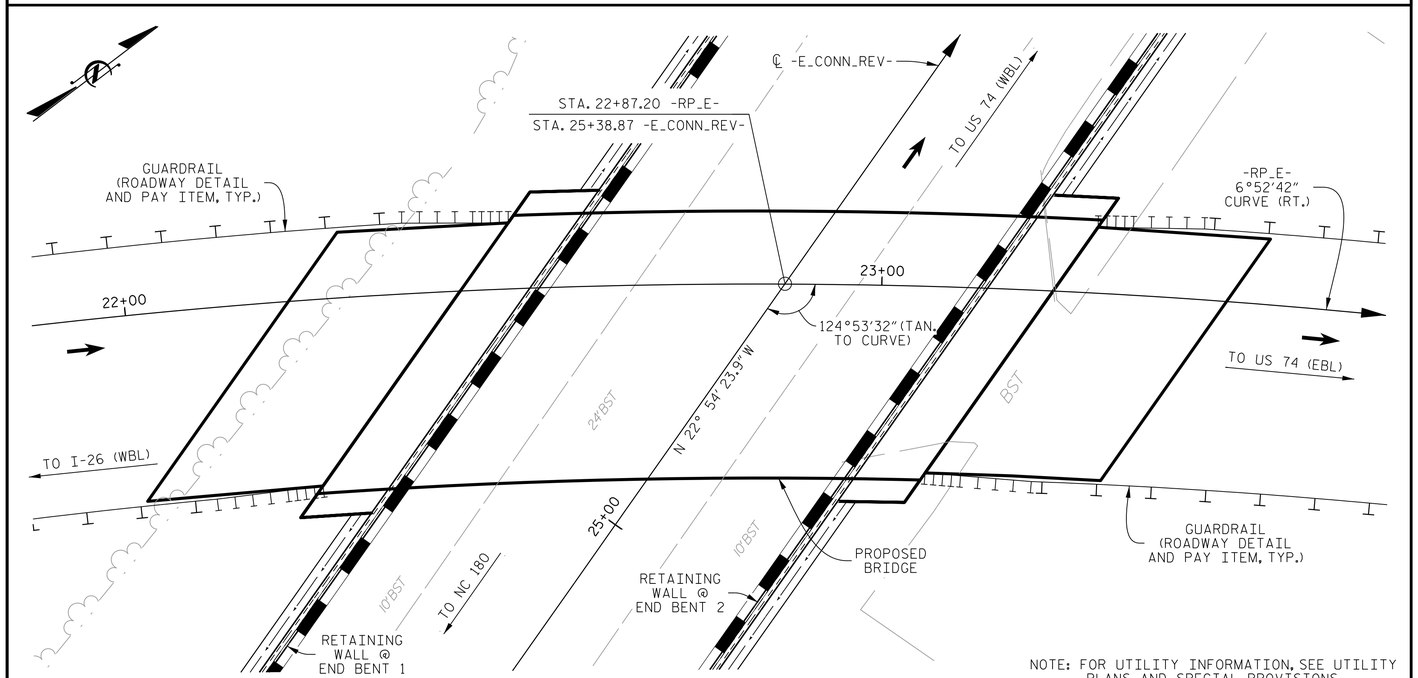
STR. #1

BENCHMARK: "5 - BRIDGE SPIKE IN BASE OF 12"BEECH 15.08' LEFT OF
STA. 15+10.84 -RP_E- EL. 1038.02 N 560676.18 E 1042573.29



NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

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 "STANDARD NOTES" SHEET.

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.

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

A WAITING PERIOD IS REQUIRED PRIOR TO THE CONSTRUCTION OF END BENTS.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

FOR SURVEY CONTROL SHEET, SEE ROADWAY PLANS.

THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE AT STA. 22+87.20 -RP_E-, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	45" PRESTRESSED CONCRETE GIRDERS		HP 14 x 73 STEEL PILES		CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	PILE DRIVING EQUIPMENT SETUP FOR HP14X73 STEEL PILES
	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	No.	LIN. FT.	No.	LIN. FT.	LIN. FT.	SQ. YD.	LUMP SUM	LUMP SUM	EACH
SUPERSTRUCTURE		2,618	3,470		LUMP SUM		4	288.0			148.4		LUMP SUM	LUMP SUM	
END BENT 1				39.9		5,829			8	560		19			8
END BENT 2				38.6		5,522			8	580		18			8
TOTAL	1	2,618	3,470	78.5	LUMP SUM	11,351	4	288.0	16	1,140	148.4	37	LUMP SUM	LUMP SUM	16

PROJECT NO. I-4729A

POLK COUNTY

STATION: 22+87.20 -RP_E-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER
RAMP (-E_CONN_REV-) ON
RAMP (-RP_E-) BETWEEN
I-26 AND US 74

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPEN D. SHAH
8664D0B6C0D8414...
8/16/2017

DRAWN BY : K. E. LOFTON DATE : 6-17
CHECKED BY : A. D. SHAH DATE : 7-17
DESIGN ENGINEER : A. D. SHAH DATE : 8-17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1-4
1			3			TOTAL SHEETS
2			4			24

STR. #1

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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 × RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	(1)	1.08	--	1.75	0.722	1.53	A	EL	35.30	1.201	1.24	A	I	13.70	0.80	0.722	1.08	A	EL	35.30	--
		HL-93 (OPERATING)	N/A		1.63	--	1.35	0.722	1.99	A	EL	35.30	1.201	1.63	A	I	13.70	N/A	--	--	--	--	--	--
		HS-20 (INVENTORY)	36.000	(2)	1.41	51.00	1.75	0.722	2.00	A	EL	35.30	1.201	1.54	A	I	13.70	0.80	0.722	1.41	A	EL	35.30	--
		HS-20 (OPERATING)	36.000		2.02	73.00	1.35	0.722	2.59	A	EL	35.30	1.201	2.02	A	I	13.70	N/A	--	--	--	--	--	--
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		3.43	42.88	1.40	0.722	6.09	A	EL	35.30	1.201	5.05	A	I	13.70	0.80	0.722	3.43	A	EL	35.30	--
		S3C	21.500		2.01	43.22	1.40	0.722	3.57	A	EL	35.30	1.201	2.94	A	I	13.70	0.80	0.722	2.01	A	EL	35.30	--
		S3A	22.750		1.91	43.45	1.40	0.722	3.38	A	EL	35.30	1.201	2.79	A	I	13.70	0.80	0.722	1.91	A	EL	35.30	--
		S4A	26.750		1.69	45.21	1.40	0.722	3.00	A	EL	35.30	1.201	2.45	A	I	13.70	0.80	0.722	1.69	A	EL	35.30	--
		S5A	30.500		1.50	45.75	1.40	0.722	2.66	A	EL	35.30	1.201	2.28	A	I	13.70	0.80	0.722	1.50	A	EL	35.30	--
		S6A	34.500		1.37	47.27	1.40	0.722	2.43	A	EL	35.30	1.201	2.06	A	I	13.70	0.80	0.722	1.37	A	EL	35.30	--
		S7B	38.500		1.25	48.13	1.40	0.722	2.22	A	EL	35.30	1.201	1.96	A	I	13.70	0.80	0.722	1.25	A	EL	35.30	--
		S7A	40.000	(3)	1.24	49.60	1.40	0.722	2.21	A	EL	35.30	1.201	2.06	A	I	13.70	0.80	0.722	1.24	A	EL	35.30	--
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		1.69	47.74	1.40	0.722	2.99	A	EL	35.30	1.201	2.39	A	I	13.70	0.80	0.722	1.69	A	EL	35.30	--
		T5B	32.000		1.48	47.36	1.40	0.722	2.62	A	EL	35.30	1.201	2.31	A	I	13.70	0.80	0.722	1.48	A	EL	35.30	--
		T6A	36.000		1.37	49.32	1.40	0.722	2.43	A	EL	35.30	1.201	2.17	A	I	13.70	0.80	0.722	1.37	A	EL	35.30	--
		T7A	40.000		1.28	51.20	1.40	0.722	2.27	A	EL	35.30	1.201	2.06	A	I	13.70	0.80	0.722	1.28	A	EL	35.30	--
		T7B	40.000		1.39	55.60	1.40	0.722	2.47	A	EL	35.30	1.201	1.87	A	I	13.70	0.80	0.722	1.39	A	EL	35.30	--

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. LEFT EXTERIOR GIRDER IS THE CONTROLLING EXTERIOR GIRDER.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

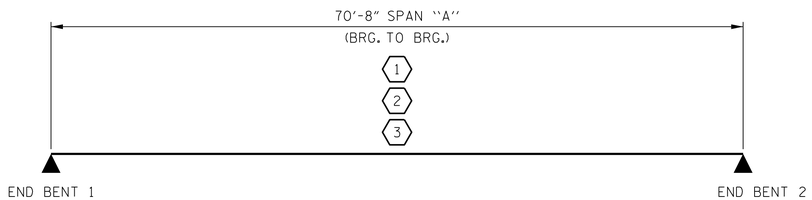
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER (GIRDER A2)
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

PROJECT NO. I-4729A

POLK COUNTY

STATION: 22+87.20 -RP_E-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (INTERSTATE TRAFFIC)

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1-5
1			3			TOTAL SHEETS
2			4			24

STD. No. LRFR2 STR. #1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/10/2017

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY : K. E. LOFTON DATE : 5-17
CHECKED BY : A. D. SHAH DATE : 7-17
DESIGN ENGINEER : A. D. SHAH DATE : 8-17

ASSEMBLED BY : K.E.LOFTON DATE : 5-17
CHECKED BY : A.D.SHAH DATE : 7-17
DRAWN BY : MAA 1/08
CHECKED BY : GM/DI 2/08
REV. 11/12/08RR MAA/GM
REV. 10/1/11 MAA/GM

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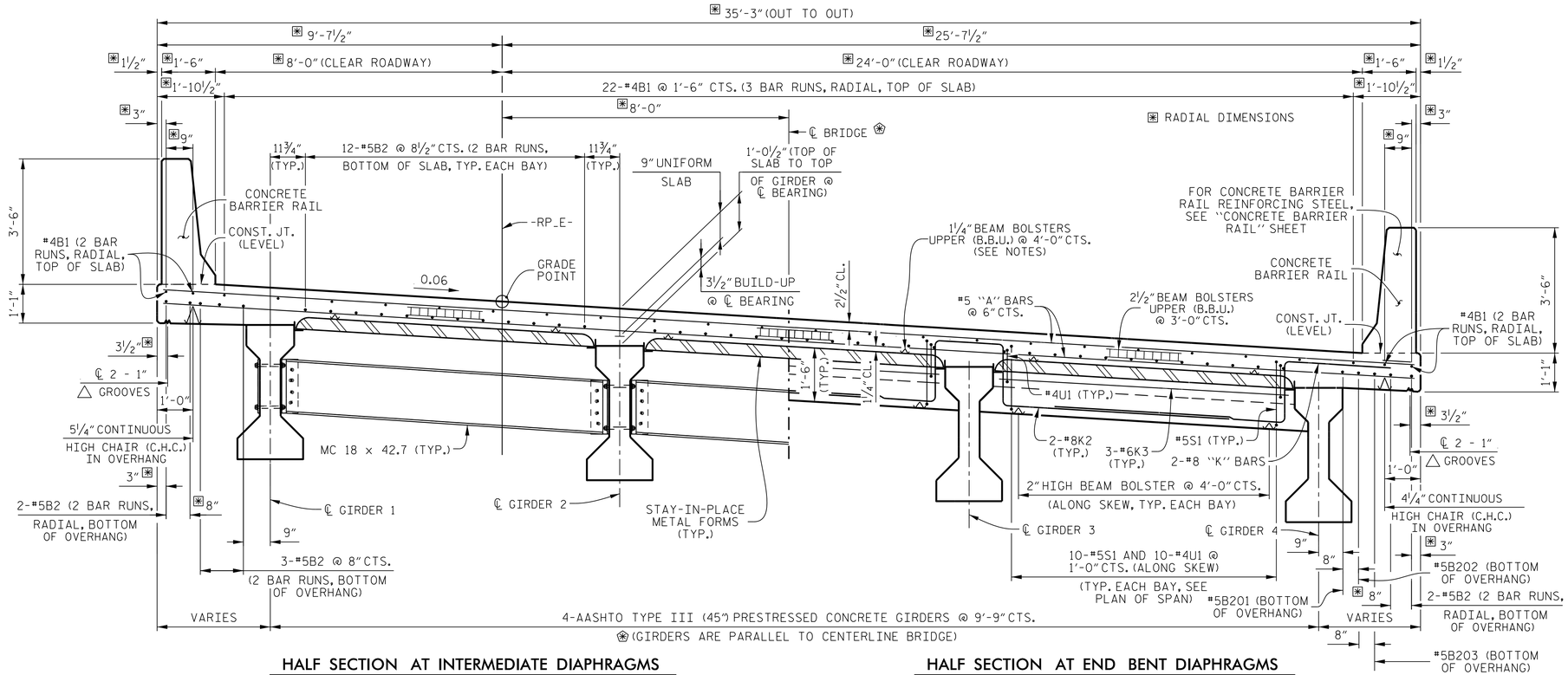


HALF SECTION AT INTERMEDIATE DIAPHRAGMS

HALF SECTION AT END BENT DIAPHRAGMS

TYPICAL SECTION

NOTES

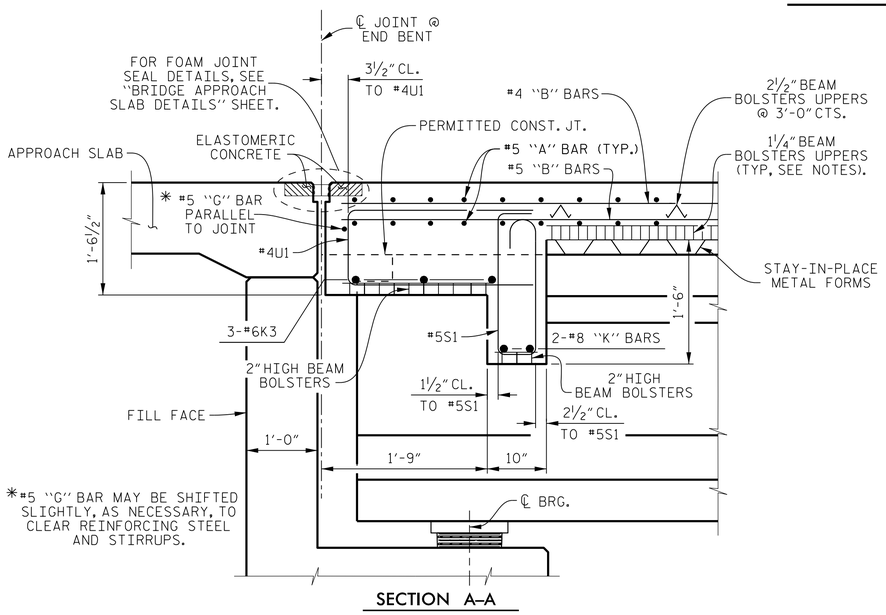
PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2½" ABOVE 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 SPAN "A" SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE SPAN.

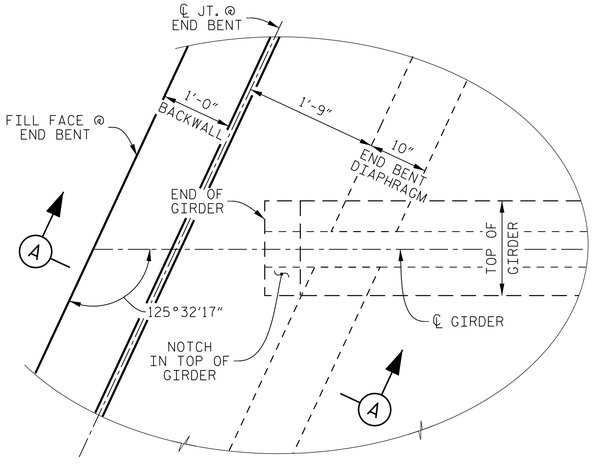
BARRIER RAIL IN SPAN "A" SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

FOR F-SHAPE CONCRETE BARRIER RAIL DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.



SECTION A–A

SECTION THRU END BENT DIAPHRAGM



PLAN OF DIAPHRAGM AT END BENT 1

PROJECT NO. I-4729A

POLK COUNTY

STATION: 22+87.20 -RP_E-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/10/2017

DRAWN BY :	K. E. LOFTON	DATE :	5-17		
CHECKED BY :	A. D. SHAH	DATE :	7-17		
DESIGN ENGINEER :	A. D. SHAH	DATE :	8-17		

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FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

REVISIONS						SHEET No.
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1			3			TOTAL SHEETS
2			4			24

STR. #1

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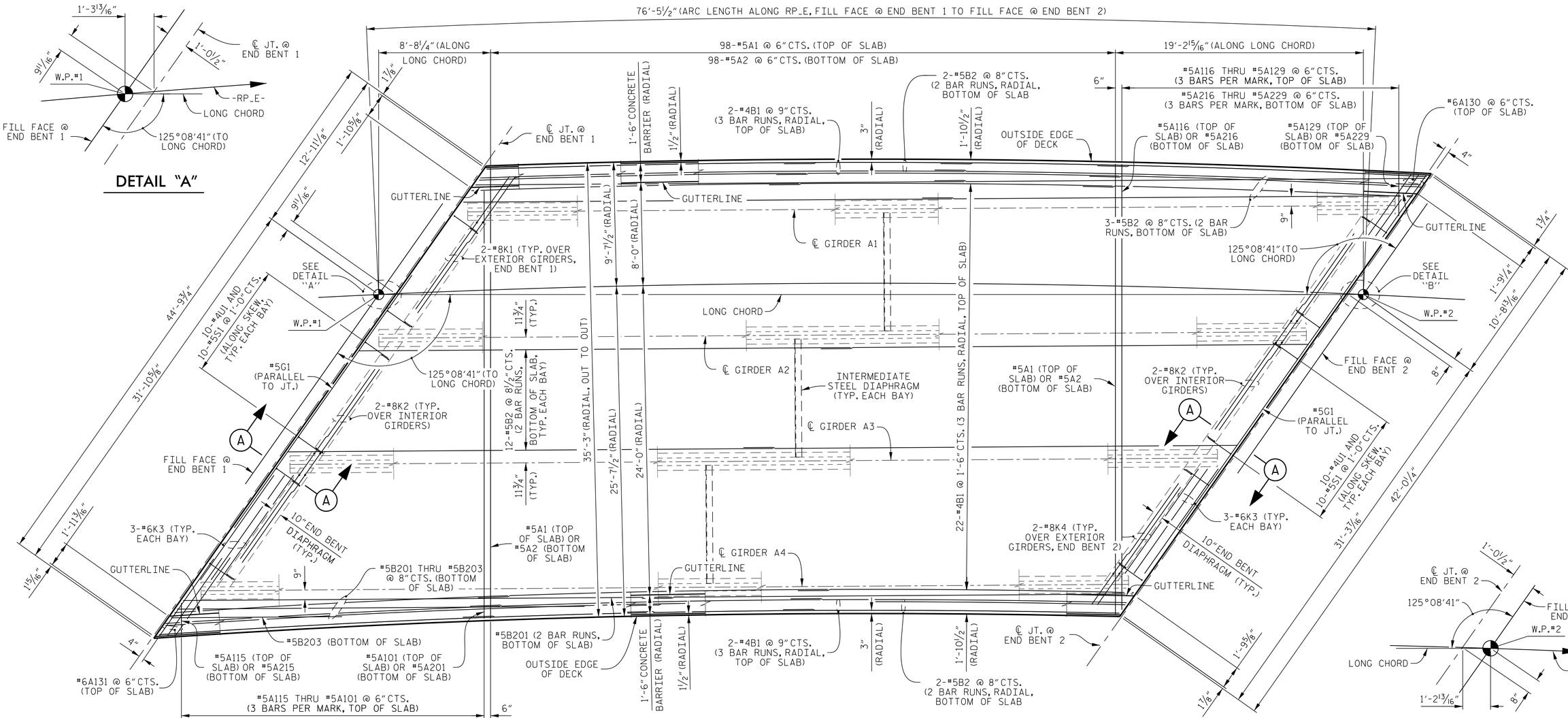
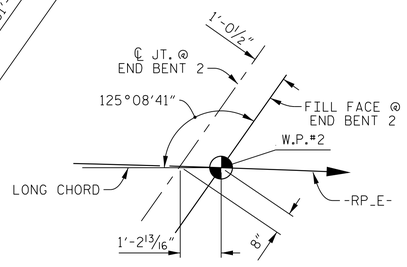
DETAIL "A"



PLAN OF SPAN



DETAIL "B"

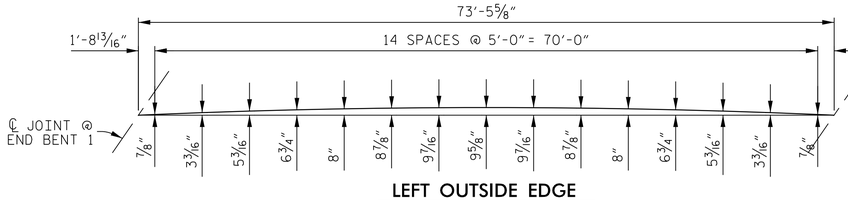
NOTES

#5 "A" BARS SHALL BE PLACED PERPENDICULAR TO LONG CHORD WITH A 2"MINIMUM CLEARANCE ON EACH END.

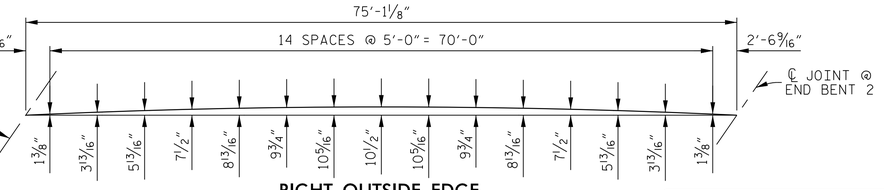
SPACING FOR "B" BARS IN TOP OF SLAB IS RADIAL TO -RP_E-.

FOR BARRIER RAIL REINFORCING STEEL LOCATION, SEE "CONCRETE BARRIER RAIL" SHEET.

FOR SECTION A-A, SEE "TYPICAL DETAILS" SHEET.



LEFT OUTSIDE EDGE



RIGHT OUTSIDE EDGE

ARC OFFSETS – SPAN A

PROJECT NO. I-4729A

POLK COUNTY

STATION: 22+87.20 –RP_E–
25+38.87 –E_CONN_REV–

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/10/2017

PLANS PREPARED BY :
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FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY :	K. E. LOFTON	DATE :	5-17
CHECKED BY :	A. D. SHAH	DATE :	7-17
DESIGN ENGINEER :	A. D. SHAH	DATE :	8-17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

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1			3			TOTAL SHEETS
2			4			24

STR. #1

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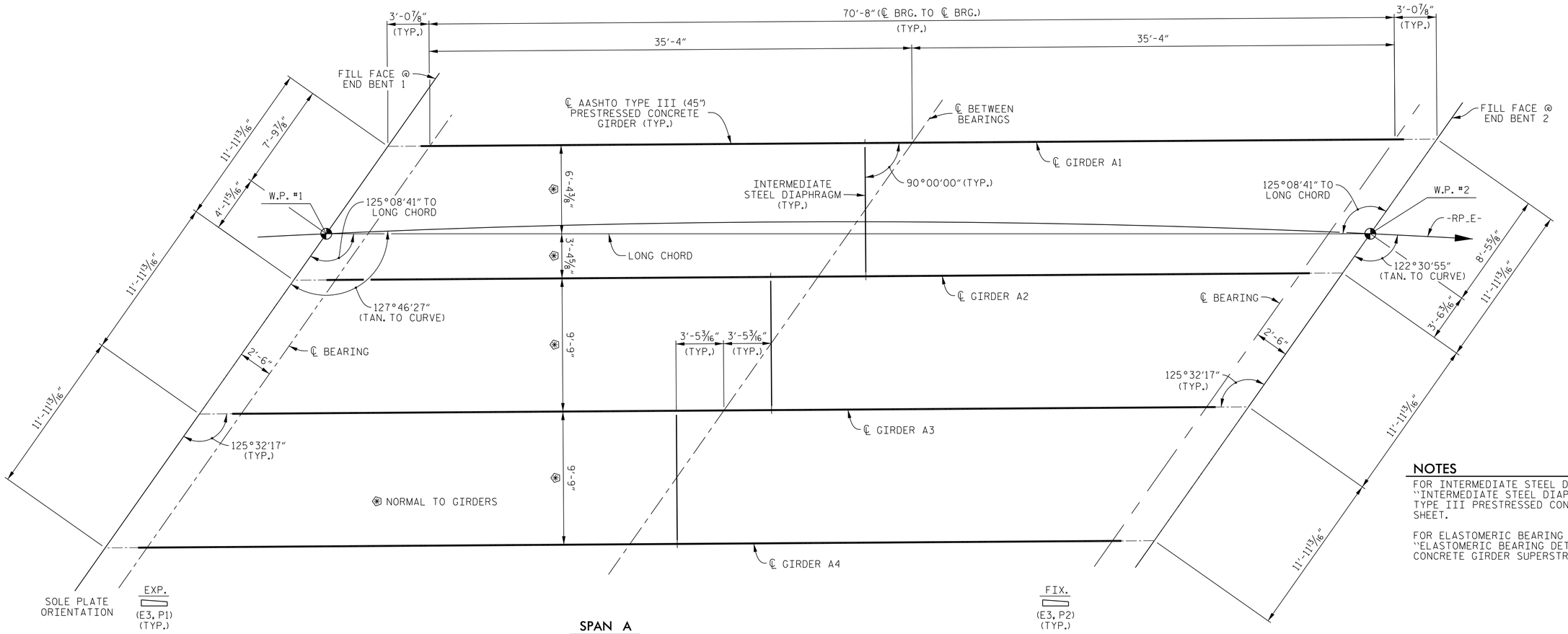


SPAN A

FRAMING PLAN

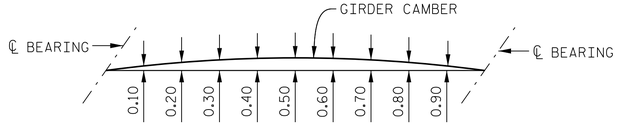
CAMBER AND DEAD LOAD DEFLECTIONS

	SPAN A										
GIRDER 1 AND GIRDER 4	℄ BRG.	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	℄ BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.042	0.080	0.109	0.128	0.134	0.128	0.109	0.080	0.042	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.*	0.000	0.081	0.160	0.223	0.263	0.277	0.263	0.223	0.160	0.081	0.000
FINAL CAMBER	0	7/16"	15/16"	1 3/8"	1 5/8"	1 11/16"	1 5/8"	1 3/8"	15/16"	7/16"	0
GIRDER 2 AND GIRDER 3	℄ BRG.	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	℄ BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.042	0.080	0.109	0.128	0.134	0.128	0.109	0.080	0.042	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.*	0.000	0.078	0.155	0.215	0.254	0.267	0.254	0.215	0.155	0.078	0.000
FINAL CAMBER	0	7/16"	7/8"	1 1/4"	1 1/2"	1 3/16"	1 1/2"	1 1/4"	7/8"	7/16"	0

* INCLUDES FUTURE WEARING SURFACE

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

GIRDER CAMBER AND DEFLECTIONS



NOTES

FOR INTERMEDIATE STEEL DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS" SHEET.

FOR ELASTOMERIC BEARING DETAILS, SEE "ELASTOMERIC BEARING DETAILS PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE" SHEET.

PROJECT NO. I-4729A

POLK COUNTY

STATION: 22+87.20 -RP_E-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANURAG D. SHAH
8/10/2017

PLANS PREPARED BY :
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NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY : K. E. LOFTON DATE : 5-17
CHECKED BY : A. D. SHAH DATE : 7-17
DESIGN ENGINEER : A. D. SHAH DATE : 8-17

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STR. #1

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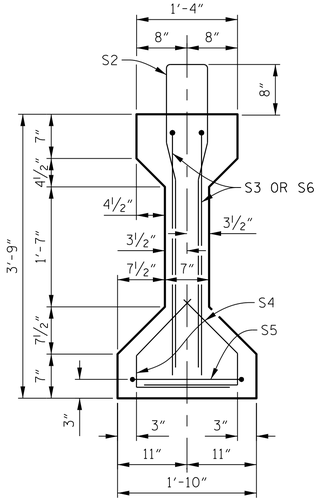
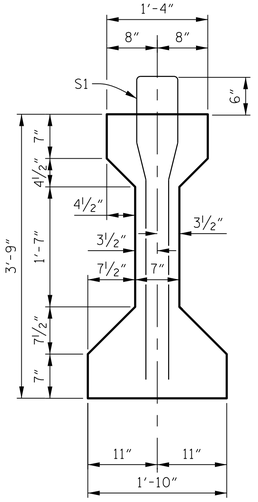
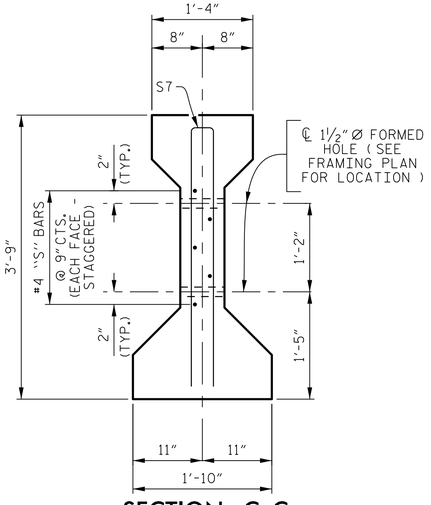


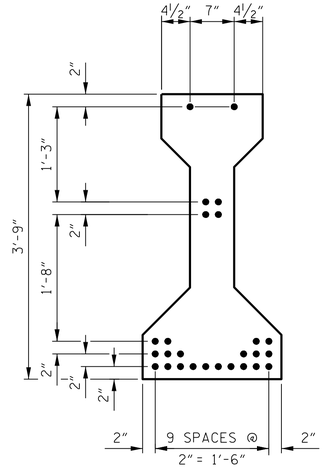
SECTION A–A



SECTION B–B



SECTION C–C
(S1 BARS NOT SHOWN)



26 – 0.6'' Ø LOW RELAXATION STRAND LAYOUT

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.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES.

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.

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5900 PSI.

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

THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF ¼" EXCEPT IN THE AREA BETWEEN THE STIRRUP AND THE EDGE OF THE GIRDER.

FOR EMBEDDED CLIPS FOR PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

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

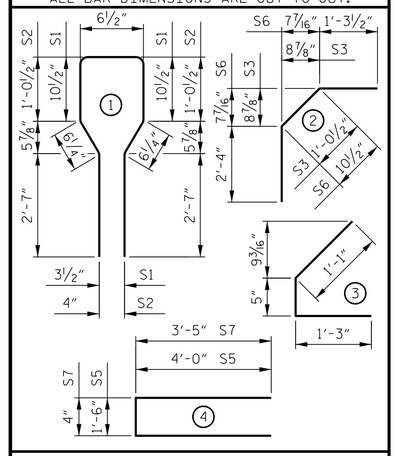
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	73	#4	1	8'- 6"	414
S2	14	#6	1	8'-10"	186
S3	4	#6	2	4'- 8"	28
S4	68	#4	3	2'- 9"	125
S5	2	#4	4	9'- 6"	13
S6	4	#6	2	4'- 6"	27
S7	2	#5	4	7'- 2"	15
S8	5	#4	STR	7'- 0"	23
S7	4	#5	4	7'- 2"	30
S9	5	#4	STR	14'- 0"	47

GIRDERS 1 AND 4

GIRDERS 2 AND 3

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT.

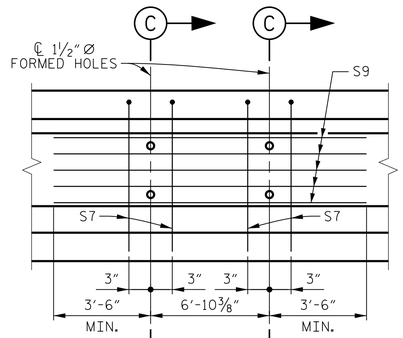


QUANTITIES FOR ONE GIRDER

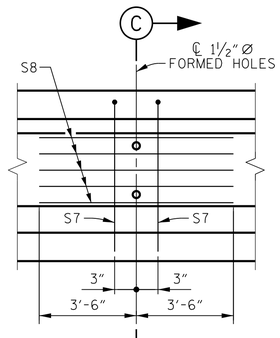
	REINFORCING STEEL LB.	7,500 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
GIRDERS 1 AND 4	831 LBS.	10.4	26
GIRDERS 2 AND 3	870 LBS.	10.4	26

GIRDERS REQUIRED

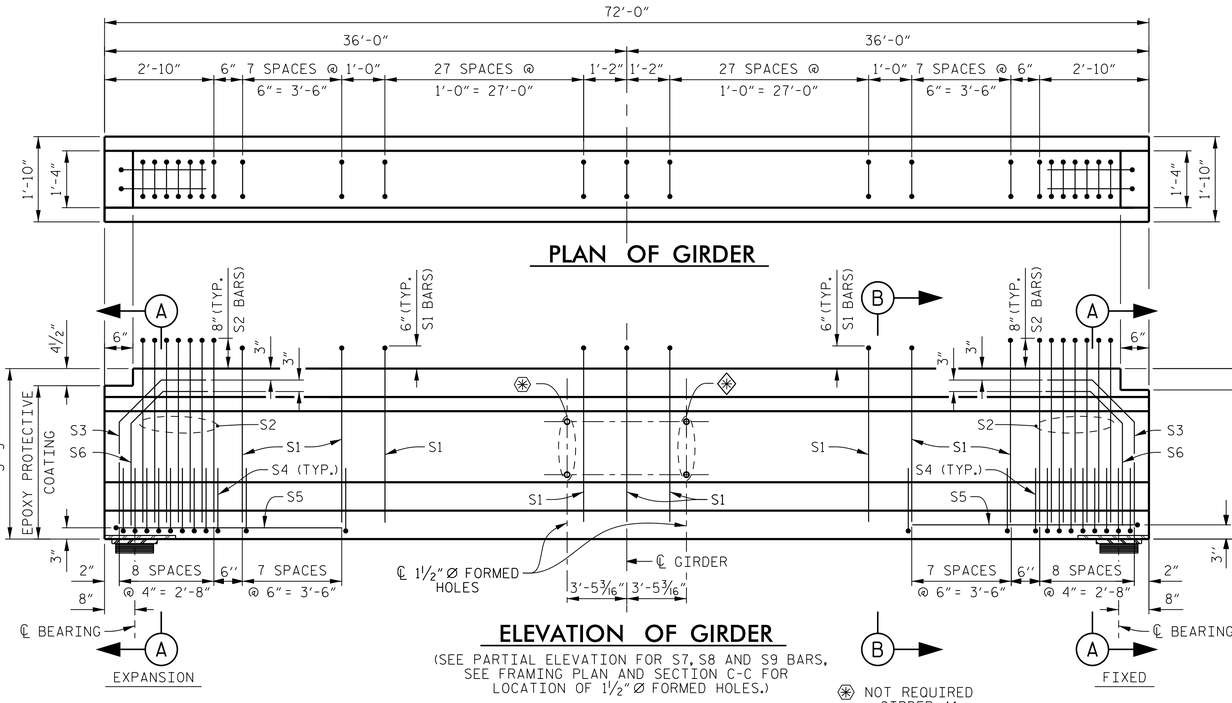
NUMBER	LENGTH	TOTAL LENGTH
4	72'-0"	288.000'



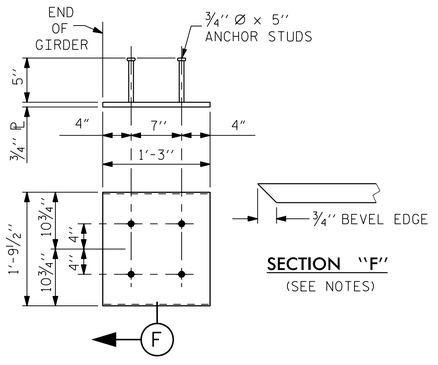
PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS 2 AND 3



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS 1 AND 4



ELEVATION OF GIRDER
(SEE PARTIAL ELEVATION FOR S7, S8 AND S9 BARS, SEE FRAMING PLAN AND SECTION C-C FOR LOCATION OF 1½" Ø FORMED HOLES.)



SECTION "F"
(SEE NOTES)

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

PROJECT NO. I–4729A

POLK COUNTY

STATION: 22+87.20 –RP_E–

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE III PRESTRESSED CONCRETE GIRDER SPAN A

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ARUPAM B. SHAH
8/10/2017

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1-9
1			3			TOTAL SHEETS
2			4			24

STD. No. PCG2 STR. #1

ASSEMBLED BY : K.E.LOFTON		DATE : 5-17	
CHECKED BY : A.D.SHAH		DATE : 7-17	
DRAWN BY : JMB 12/87	REV. 10/1/11		MAA/GM
CHECKED BY : ARB 12/87	REV. 1/15		MAA/TMG
	REV. 2/15		MAA/TMG

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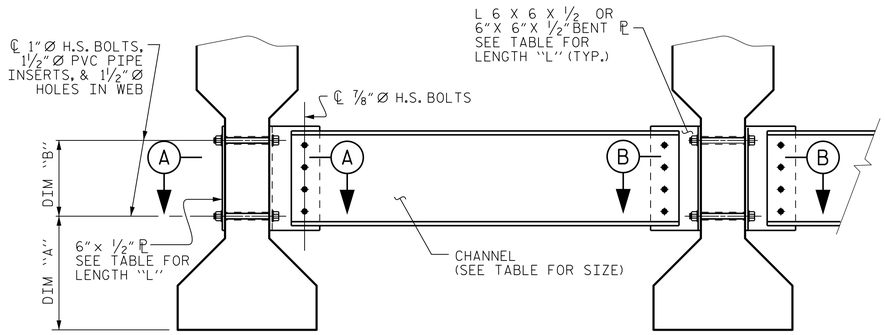
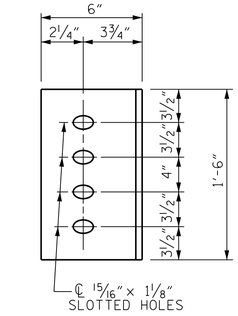


EXTERIOR GIRDER INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM

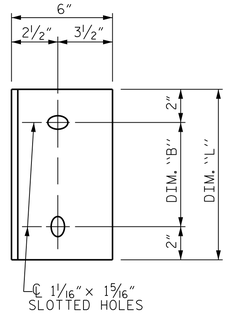
(TYPE III GIRDER SHOWN)

TABLE				
GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
III	MC 18 x 42.7	1'-5"	1'-2"	1'-6"



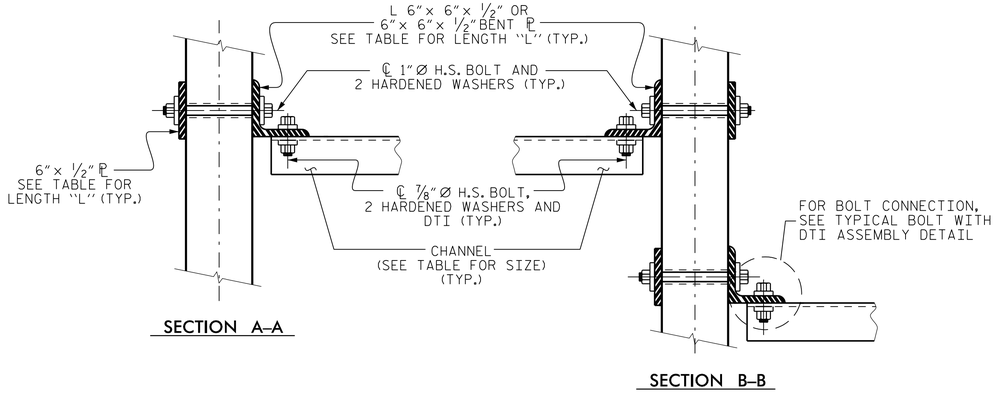
DIAPHRAGM FACE

(TYPE III OR TYPE IV GDR.)



WEB FACE

CONNECTOR PLATE DETAILS



SECTION A–A

SECTION B–B

CONNECTION DETAILS

(FOR SKEW > 110°)

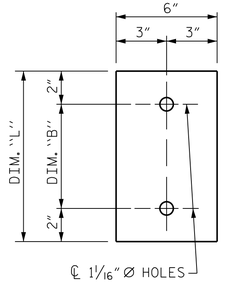
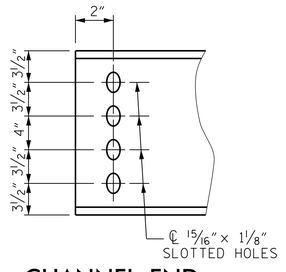
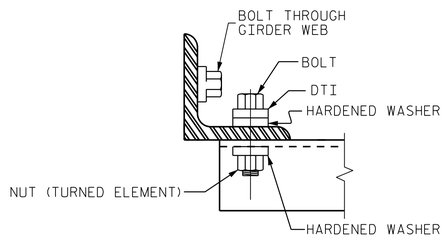


PLATE DETAILS



CHANNEL END

(TYPE III OR TYPE IV GDR.)



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. I–4729A

POLK COUNTY

STATION: 22+87.20 –RP_E–

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1–10
1			3			TOTAL SHEETS
2			4			24

STD.No.PCG12 STR. #1

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/10/2017

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FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY :	K. E. LOFTON	DATE : 5–17
CHECKED BY :	A. D. SHAH	DATE : 7–17
DESIGN ENGINEER :	A. D. SHAH	DATE : 8–17

ASSEMBLED BY :	K. E. LOFTON	DATE : 5–17
CHECKED BY :	A. D. SHAH	DATE : 7–17
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/MG

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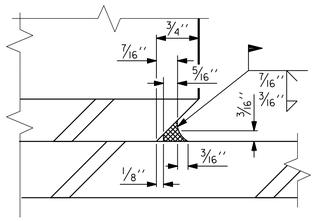
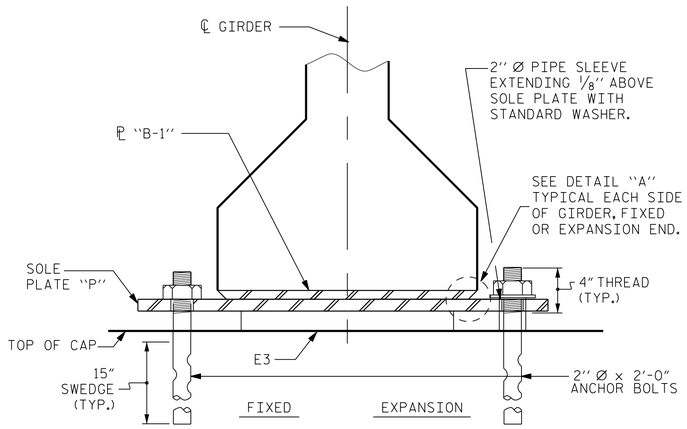
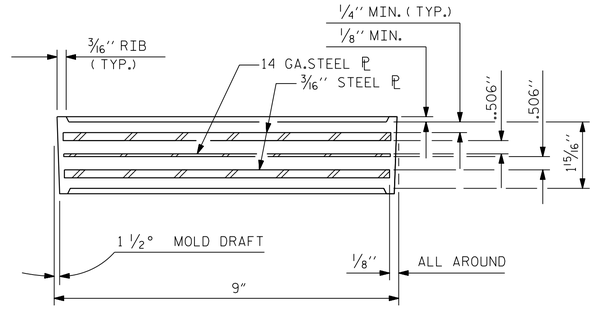


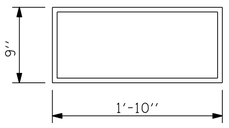
DETAIL "A"



SECTION E–E



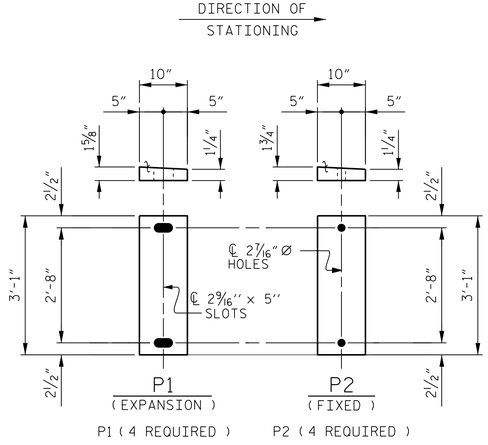
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E3 (8 REQUIRED)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV



SOLE PLATE DETAILS ("P")

NOTES

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

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

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

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

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

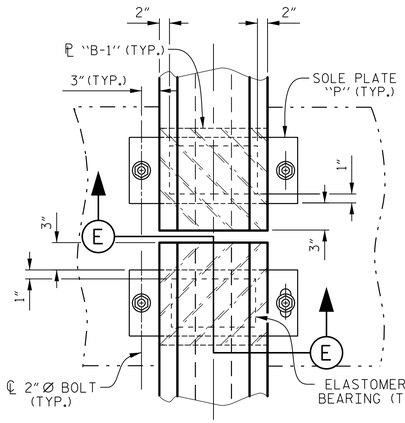
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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



TYPICAL HALF–PLAN
(SHOWING FIXED BEARING)

TYPICAL HALF–PLAN
(SHOWING EXPANSION BEARING)

LOAD RATINGS	
	MAX. D.L.+ L.L.
45" PCG – TYPE IV	225 K

PROJECT NO. I–4729A

POLK COUNTY

STATION: 22+87.20 –RP_E–

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:	S1–11
1			3			TOTAL SHEETS
2			4			24

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/10/2017

PLANS PREPARED BY :
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FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY :	K. E. LOFTON	DATE :	5–17
CHECKED BY :	A. D. SHAH	DATE :	7–17
DESIGN ENGINEER :	A. D. SHAH	DATE :	8–17

ASSEMBLED BY :	K.E.LOFTON	DATE :	5-17
CHECKED BY :	A.D.SHAH	DATE :	7-17
DRAWN BY : WJH	8/89	REV. 10/1/11	MAA/GM
CHECKED BY : CRK	8/89	REV. 6/13	AAC/MAA
		REV. 1/15	MAA/TMG

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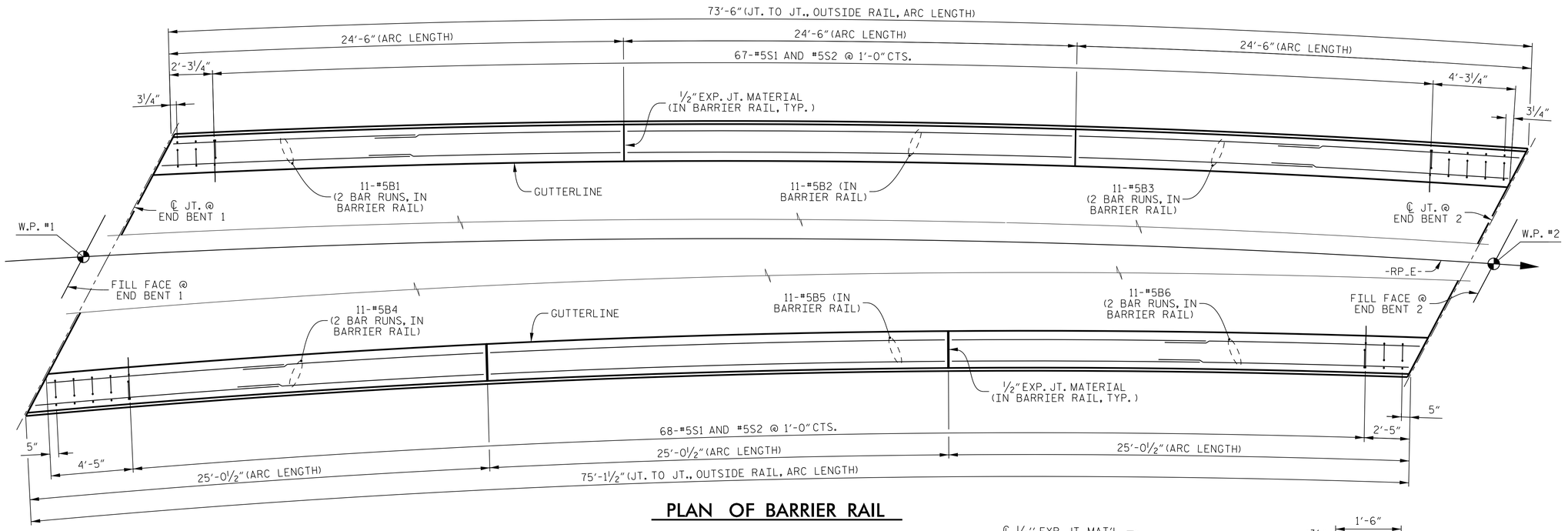


PLAN OF BARRIER RAIL

NOTES

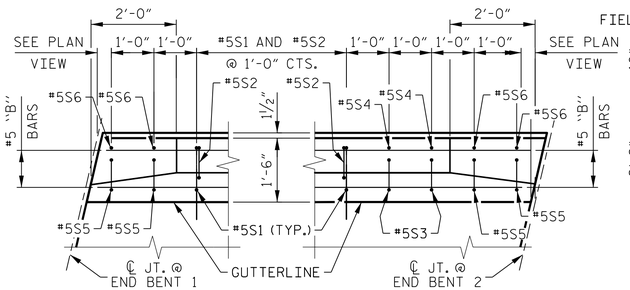
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

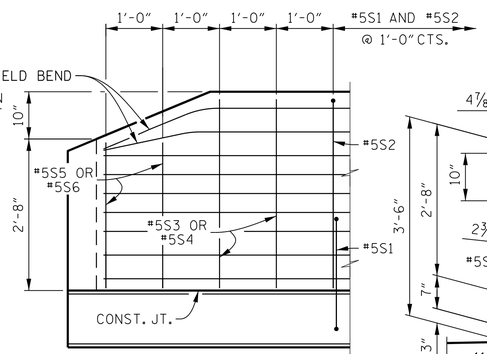
THE #5S3, #5S4, #5S5 AND #5S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5S3, #5S4, #5S5 AND #S6 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

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

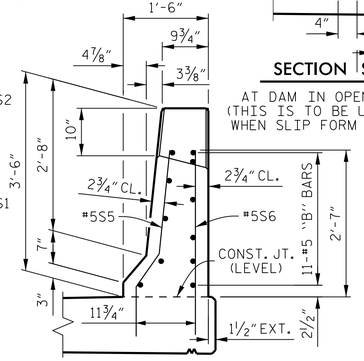


PLAN @ END BENT 1
LEFT SIDE SHOWN, RIGHT SIDE SIMILAR TO END BENT 2

PLAN @ END BENT 2
LEFT SIDE SHOWN, RIGHT SIDE SIMILAR TO END BENT 1

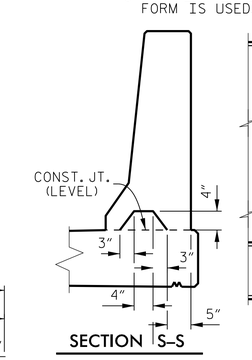


ELEVATION VIEW

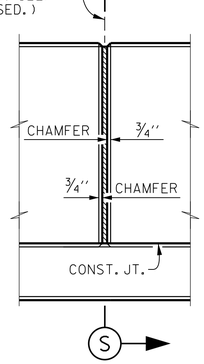


END VIEW

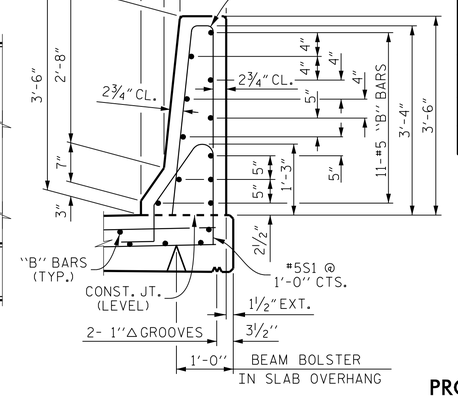
END OF RAIL DETAILS
FOR SAWED JOINTS



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



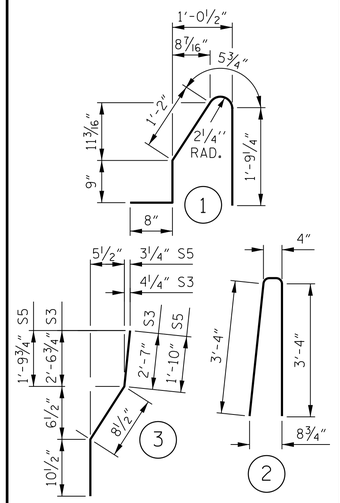
ELEVATION AT EXPANSION JOINTS



SECTION THRU RAIL

BARRIER RAIL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
FOR CONCRETE BARRIER RAIL ONLY

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
✳ B1	22	#5	STR	14'- 1"	323
✳ B2	11	#5	STR	24'- 2"	277
✳ B3	22	#5	STR	13'- 8"	314
✳ B4	22	#5	STR	13'-10"	317
✳ B5	11	#5	STR	24'- 8"	283
✳ B6	22	#5	STR	14'- 3"	327
✳ S1	135	#5	1	4'-10"	681
✳ S2	135	#5	2	7'- 0"	986
✳ S3	4	#5	3	4'- 2"	17
✳ S4	4	#5	STR	4'- 0"	17
✳ S5	8	#5	3	3'- 5"	29
✳ S6	8	#5	STR	3'- 3"	27

✳ EPOXY COATED REINFORCING STEEL	3,598 LBS.
CLASS "AA" CONCRETE	20.2 CU. YDS.
CONCRETE BARRIER RAIL	148.4 LIN. FT.

SPLICE LENGTH		
BAR	SIZE	LENGTH
B1,B3,B4,B6	#5	3'-5"

PROJECT NO. I-4729A
POLK COUNTY
STATION: 22+87.20 –RP_E–

ASSEMBLED BY :	K. E. LOFTON	DATE :	5-17
CHECKED BY :	A. D. SHAH	DATE :	7-17
DRAWN BY : ARB 5/87	REV. 10/1/11		MAA/GM
CHECKED BY : SJD 9/87	REV. 7/12		MAA/GM
	REV. 6/13		MAA/GM

DRAWN BY :	K. E. LOFTON	DATE :	5-17
CHECKED BY :	A. D. SHAH	DATE :	7-17
DESIGN ENGINEER :	A. D. SHAH	DATE :	8-17

PLANS PREPARED BY :
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FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM A. SHAH
8664D2D9C3B4A4...
8/10/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

CONCRETE BARRIER RAIL

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1-12
1			3			TOTAL SHEETS
2			4			24

STD. No. CBR1 STR. #1

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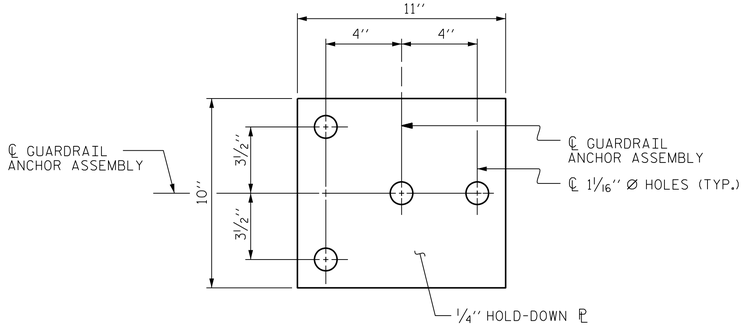
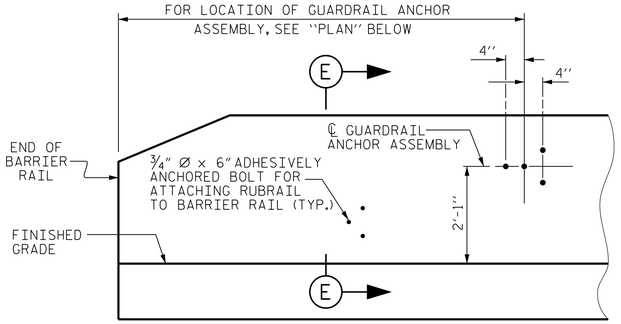


PLAN



ELEVATION

(END BENT 1 SHOWN, END BENT 2 SIMILAR)

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼'' HOLD DOWN PLATE AND 4 - ⅞'' Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅞'' Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

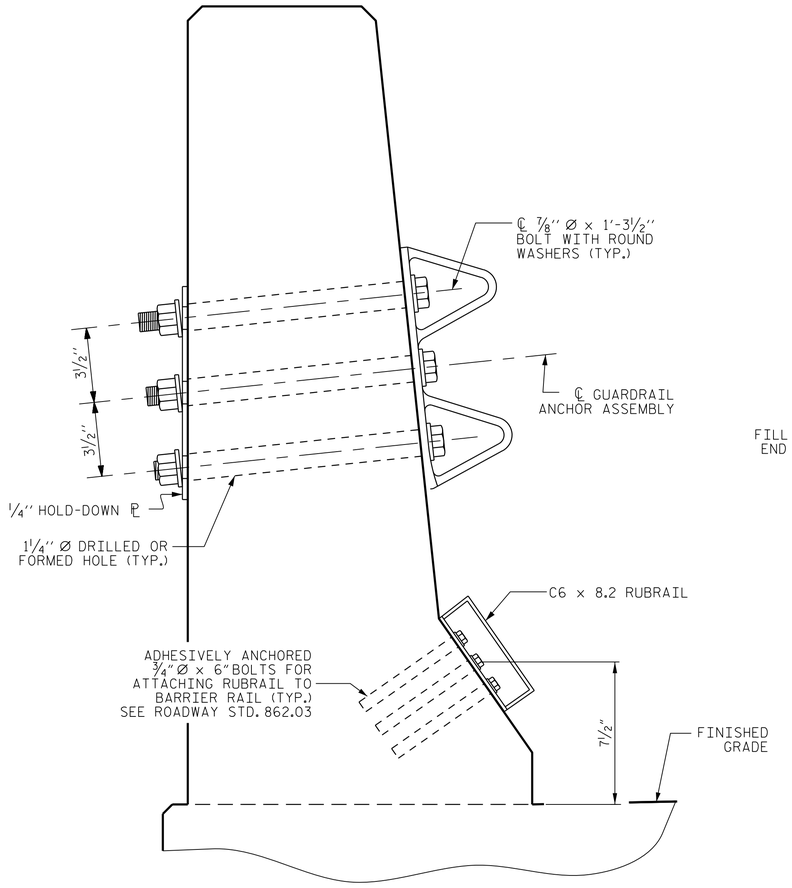
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

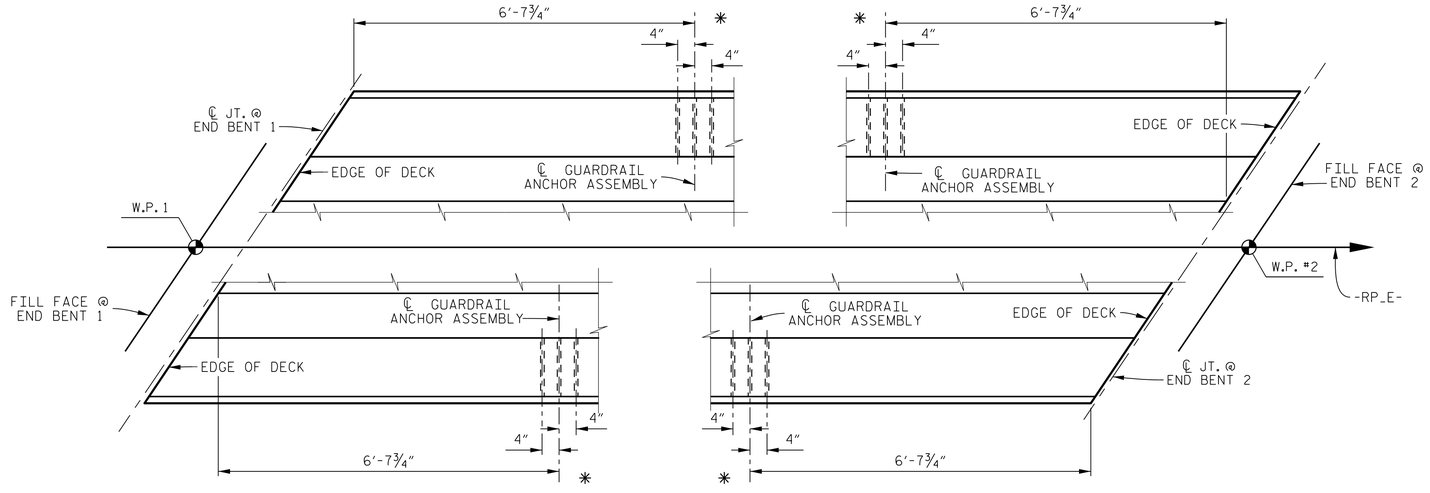
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

THE 1¼'' Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

THE C6 x 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE ¾" Ø x 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



SECTION E–E



PLAN

SKETCH SHOWING POINTS OF ATTACHMENT

✱ LOCATION OF GUARDRAIL ATTACHMENT

GUARDRAIL ANCHOR ASSEMBLY DETAILS

PROJECT NO. I–4729A

POLK COUNTY

STATION: 22+87.20 –RP_E–

ASSEMBLED BY :	K. E. LOFTON	DATE :	5-17
CHECKED BY :	A. D. SHAH	DATE :	7-17
DRAWN BY : TLA	5/06	REV. 10/1/11	MAA/GM
CHECKED BY : GM	5/06	REV. 7/12	MAA/GM
		REV. 6/13	MAA/GM

DRAWN BY :	K. E. LOFTON	DATE :	5–17
CHECKED BY :	A. D. SHAH	DATE :	7–17
DESIGN ENGINEER :	A. D. SHAH	DATE :	8–17

PLANS PREPARED BY :

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER MAURAV D. SHAH
8/10/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1–13
1			3			TOTAL SHEETS
2			4			24

STD. No. GRA2 STR. #1

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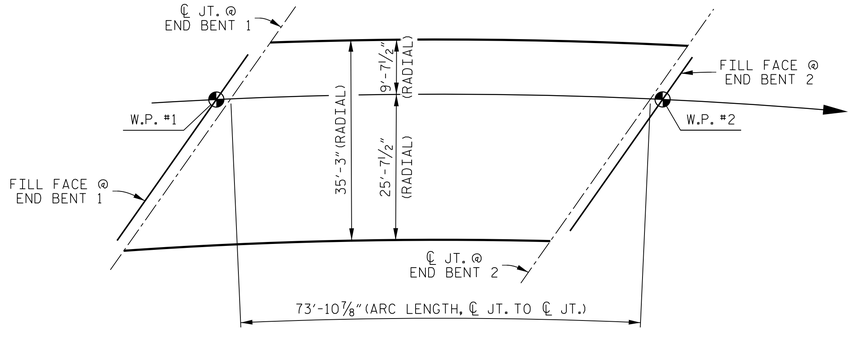
GROOVING BRIDGE FLOORS

	SQ. FT.
APPROACH SLAB AT END BENT 1	682
BRIDGE DECK	2,106
APPROACH SLAB AT END BENT 2	682
TOTAL	3,470

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''	———	———	———



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

(2,618 SQ. FT.)

SPAN A

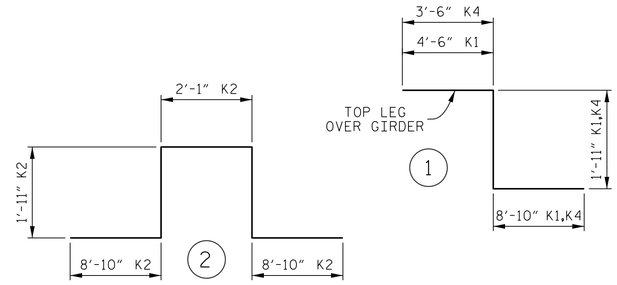
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	98	#5	STR	34'-11"	3,569
✳A101	3	#5	STR	33'- 3"	104
✳A102	3	#5	STR	31'- 2"	98
✳A103	3	#5	STR	29'- 1"	91
✳A104	3	#5	STR	27'- 0"	84
✳A105	3	#5	STR	24'-11"	78
✳A106	3	#5	STR	22'-11"	72
✳A107	3	#5	STR	20'-10"	65
✳A108	3	#5	STR	18'- 9"	59
✳A109	3	#5	STR	16'- 9"	52
✳A110	3	#5	STR	14'- 8"	46
✳A111	3	#5	STR	12'- 7"	39
✳A112	3	#5	STR	10'- 7"	33
✳A113	3	#5	STR	8'- 6"	27
✳A114	3	#5	STR	6'- 6"	20
✳A115	3	#5	STR	4'- 6"	14
✳A116	3	#5	STR	33'- 2"	104
✳A117	3	#5	STR	30'-11"	97
✳A118	3	#5	STR	28'- 9"	90
✳A119	3	#5	STR	26'- 7"	83
✳A120	3	#5	STR	24'- 5"	76
✳A121	3	#5	STR	22'- 3"	70
✳A122	3	#5	STR	20'- 1"	63
✳A123	3	#5	STR	17'-11"	56
✳A124	3	#5	STR	15'- 8"	49
✳A125	3	#5	STR	13'- 6"	42
✳A126	3	#5	STR	11'- 4"	35
✳A127	3	#5	STR	9'- 1"	28
✳A128	3	#5	STR	6'-11"	22
✳A129	3	#5	STR	4'- 9"	15
✳A130	3	#6	STR	5'- 9"	26
✳A131	3	#6	STR	7'- 3"	33
A2	98	#5	STR	34'-11"	3,569
A201	3	#5	STR	33'- 3"	104
A202	3	#5	STR	31'- 2"	98
A203	3	#5	STR	29'- 1"	91
A204	3	#5	STR	27'- 0"	84
A205	3	#5	STR	24'-11"	78
A206	3	#5	STR	22'-11"	72
A207	3	#5	STR	20'-10"	65
A208	3	#5	STR	18'- 9"	59
A209	3	#5	STR	16'- 9"	52

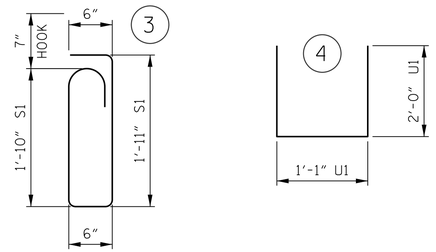
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
A210	3	#5	STR	14'- 8"	46
A211	3	#5	STR	12'- 7"	39
A212	3	#5	STR	10'- 7"	33
A213	3	#5	STR	8'- 6"	27
A214	3	#5	STR	6'- 6"	20
A215	3	#5	STR	4'- 6"	14
A216	3	#5	STR	33'- 2"	104
A217	3	#5	STR	30'-11"	97
A218	3	#5	STR	28'- 9"	90
A219	3	#5	STR	26'- 7"	83
A220	3	#5	STR	24'- 5"	76
A221	3	#5	STR	22'- 3"	70
A222	3	#5	STR	20'- 1"	63
A223	3	#5	STR	17'-11"	56
A224	3	#5	STR	15'- 8"	49
A225	3	#5	STR	13'- 6"	42
A226	3	#5	STR	11'- 4"	35
A227	3	#5	STR	9'- 1"	28
A228	3	#5	STR	6'-11"	22
A229	3	#5	STR	4'- 9"	15
✳B1	78	#4	STR	26'- 5"	1,376
B2	86	#5	STR	38'- 8"	3,468
B201	2	#5	STR	34'- 6"	72
B202	1	#5	STR	32'- 2"	34
B203	1	#5	STR	12'-10"	13
✳G1	2	#5	STR	41'- 6"	87
✳K1	4	#8	1	15'- 3"	163
✳K2	8	#8	2	23'- 7"	504
✳K3	18	#6	STR	9'-11"	268
✳K4	4	#8	1	14'- 3"	152
✳S1	60	#5	3	5'- 2"	323
✳U1	60	#4	4	5'- 1"	204

REINFORCING STEEL 8,868 LBS.

✳EPOXY COATED REINFORCING STEEL 8,417 LBS.

BAR TYPES





ALL BAR DIMENSIONS ARE OUT TO OUT.

TOTAL SUPERSTRUCTURE QUANTITIES

	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL	CLASS "AA" CONCRETE
	LBS.	LBS.	CU. YDS.
SPAN A	8,868	8,417	87.1
✳✳ TOTAL	8,868	8,417	87.1

✳✳QUANTITIES FOR CONCRETE BARRIER RAIL ARE NOT INCLUDED. SEE "CONCRETE CONCRETE BARRIER RAIL" SHEET FOR DETAILS.

PROJECT NO. I-4729A

POLK COUNTY

STATION: 22+87.20 -RP_E-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

DRAWN BY : K. E. LOFTON DATE : 6-17
CHECKED BY : A. D. SHAH DATE : 7-17
DESIGN ENGINEER : A. D. SHAH DATE : 8-17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/10/2017

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1-14
1			3			TOTAL SHEETS
2			4			24

STR. #1

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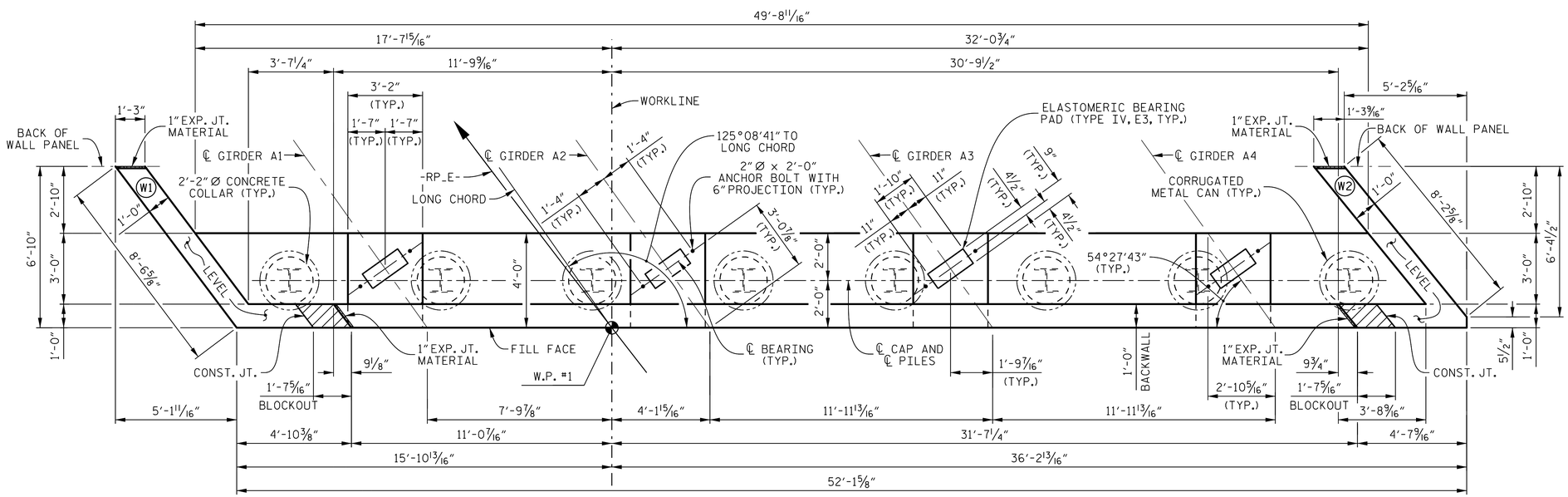

NOTES

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

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

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

▲ THIS ELEVATION IS TAKEN AT FILL FACE OF BACKWALL.

FOR SECTION A-A AND SECTION B-B, SEE SHEET 3 OF 3.

FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTION VIEWS ON SHEET 3 OF 3.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR TEMPORARY DRAINAGE AT END BENT DETAIL, SEE SHEET 3 OF 3.

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

THE COST TO FURNISH AND INSTALL THE 30″Ø CORRUGATED METAL CANS SHALL BE INCLUDED IN THE CONTRACT PRICE FOR MSE RETAINING WALL.

WING (W1) AND WING (W2) DETAILS ARE BASED ON A 5½″ WALL PANEL THICKNESS AND USING DOWELS FOR THE COPING. CONTRACTOR MAY ADJUST WINGS SLIGHTLY AS NECESSARY, BASED ON APPROVED MSE WALL SHOP DRAWINGS.

PROJECT NO. I-4729A

POLK COUNTY

STATION: 22+87.20 -RP_E-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

DRAWN BY : M. CLAREY, K. E. LOFTON DATE : 6-17
CHECKED BY : D. PRETORIUS DATE : 7-17
DESIGN ENGINEER : A. D. SHAH DATE : 8-17

PLANS PREPARED BY :
PARSONS
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Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/10/2017

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1-15
1			3			TOTAL SHEETS
2			4			24

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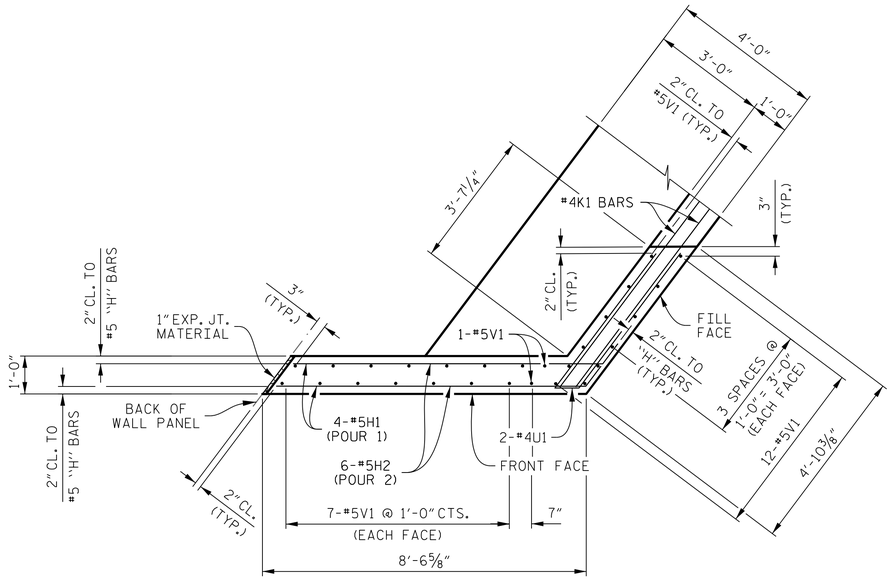
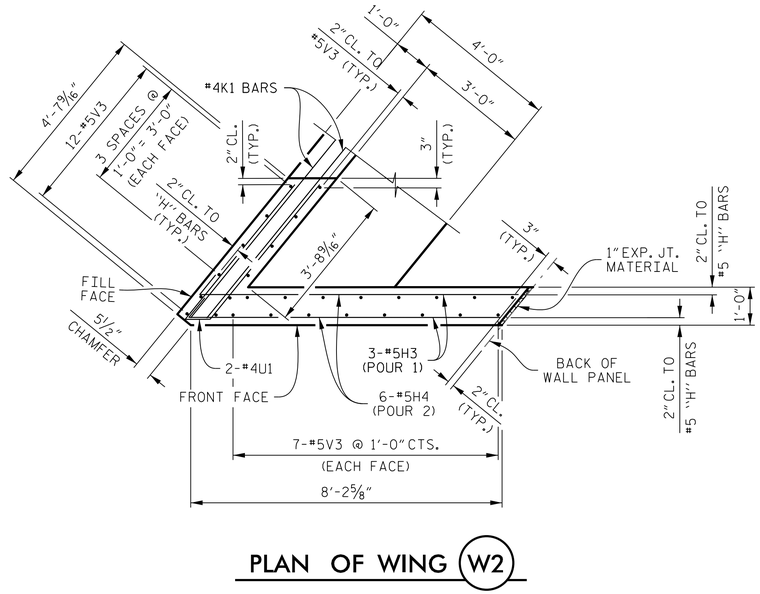
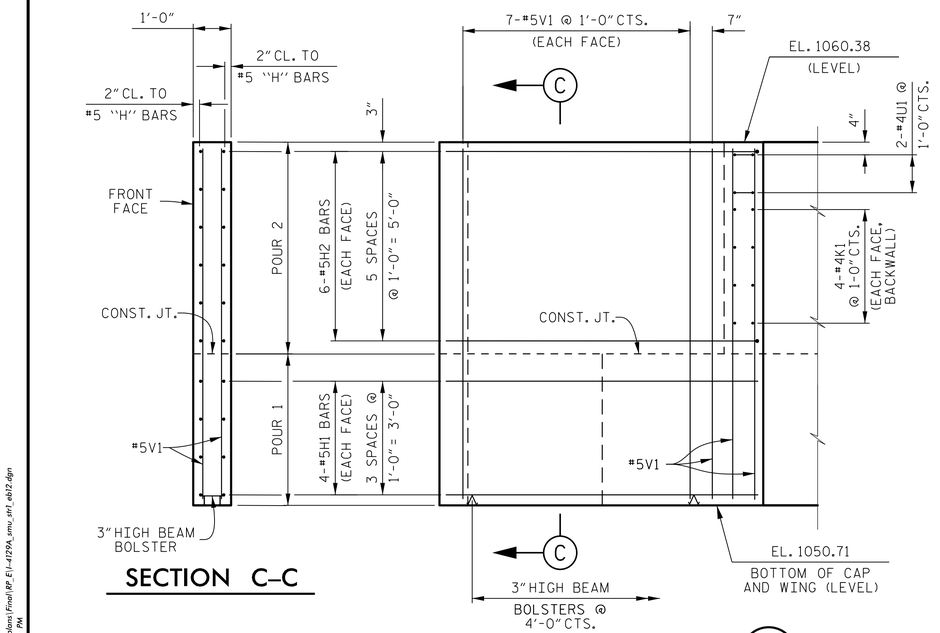


PLAN OF WING (W1)

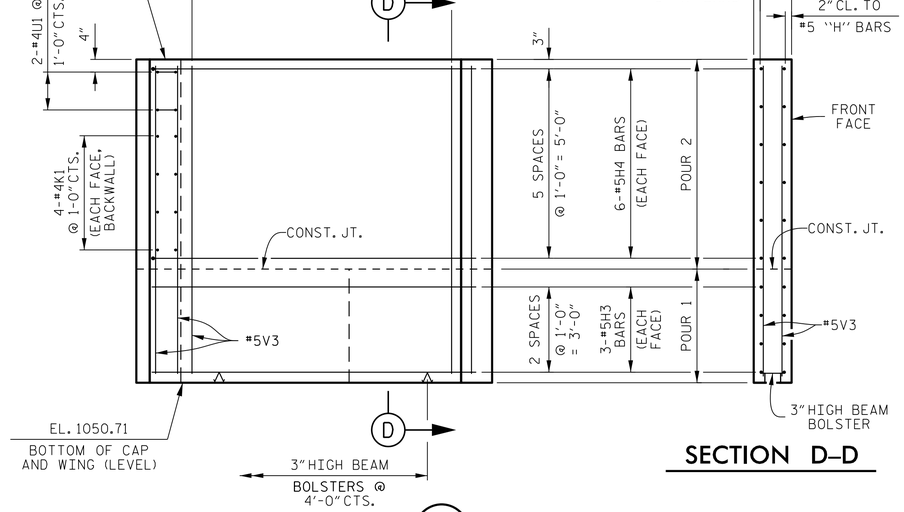


PLAN OF WING (W2)



SECTION C–C

ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

SECTION D–D

PROJECT NO. I–4729A

POLK COUNTY

STATION: 22+87.20 –RP_E–

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER A. D. SHAH
8/10/2017

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY :	K. E. LOFTON	DATE :	6–17
CHECKED BY :	D. PRETORIUS	DATE :	7–17
DESIGN ENGINEER :	A. D. SHAH	DATE :	8–17

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

SHEET No. S1–16

TOTAL SHEETS 24

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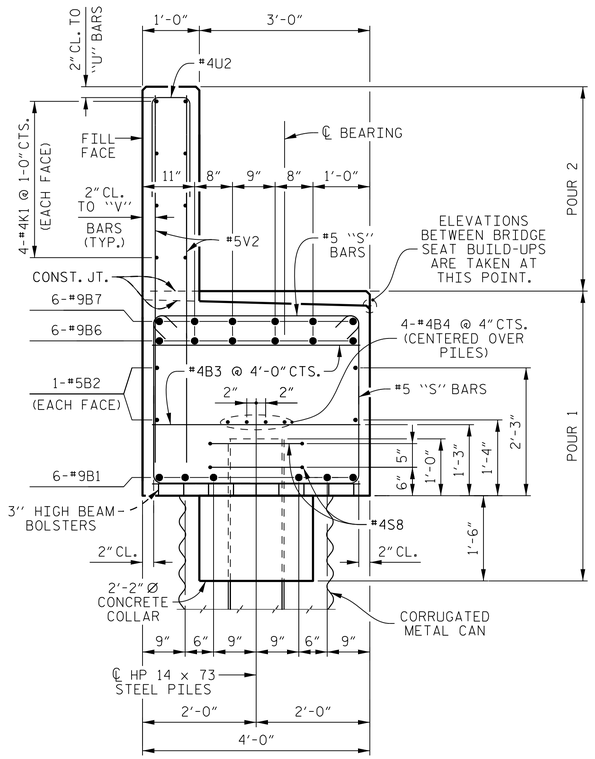
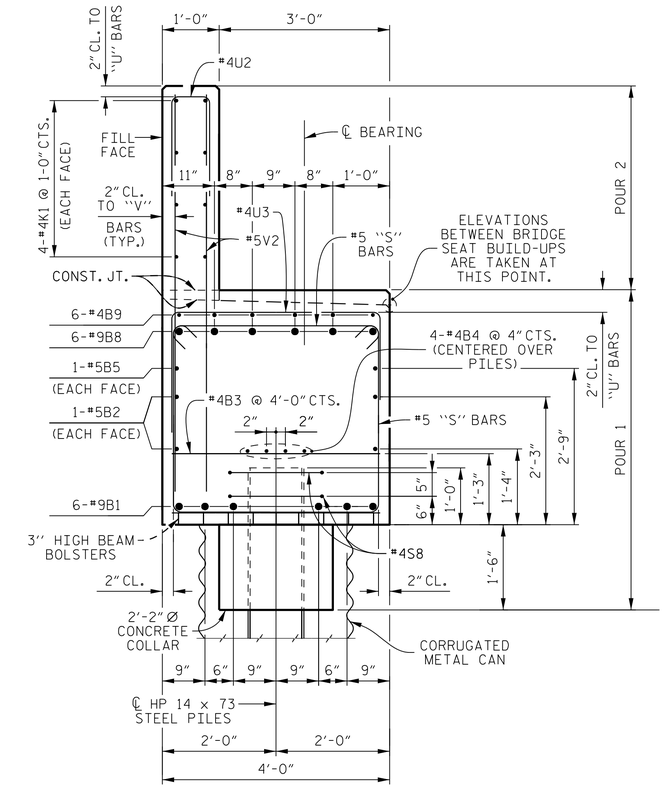


SECTION A–A



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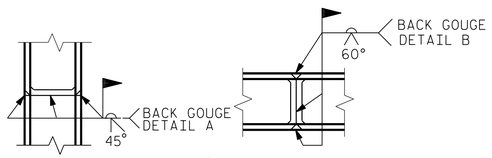
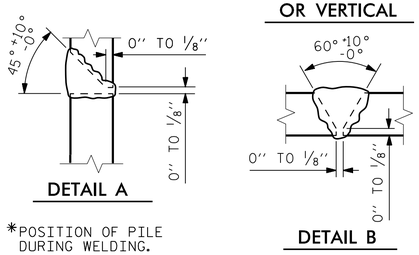


* PILE VERTICAL

* PILE HORIZONTAL OR VERTICAL

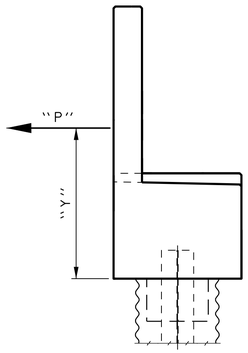


DETAIL A

DETAIL B

*POSITION OF PILE DURING WELDING.

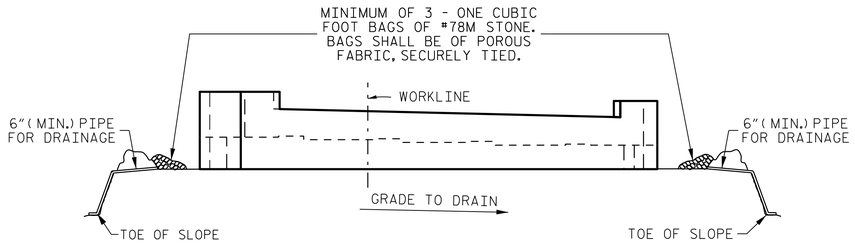
PILE SPLICE DETAILS



END BENT TIEBACK FORCE

COMPONENT		"P" (K /FT.)	"Y" (FT.)
WIND ON STRUCTURE	(WS)	0.10	3.625
WIND ON LIVE LOAD	(WL)	0.05	3.625
BRAKING FORCE	(BR)	0.37	3.625
THERMAL FORCE	(TU)	0.13	3.625
EARTH FORCE	(EH)	1.26	2.500
LIVE LOAD SURCHARGE	(LS)	1.26	3.750

NOTE:
"P" IS UNFACTORED SERVICE LOAD NORMAL TO FILL FACE.



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 FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

BILL OF MATERIAL

END BENT 1

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#9	2	54'- 4"	1,108
B2	4	#5	STR	51'-10"	216
B3	15	#4	STR	3'- 8"	37
B4	8	#4	STR	27'- 2"	145
B5	2	#5	STR	18'- 0"	38
B6	6	#9	9	30'- 4"	619
B7	6	#9	STR	22'- 0"	449
B8	6	#9	9	22'- 4"	456
B9	6	#4	STR	8'- 0"	32
H1	8	#5	STR	8'- 1"	67
H2	12	#5	6	8'- 9"	110
H3	6	#5	STR	8'- 3"	52
H4	12	#5	7	8'-11"	112
K1	16	#4	STR	27'- 6"	294
S1	6	#5	4	4'- 9"	30
S2	3	#5	8	10'- 0"	31
S3	42	#5	4	4'- 7"	201
S4	14	#5	8	9'-10"	144
S5	12	#5	8	10'- 6"	131
S6	16	#5	8	11'- 2"	186
S7	3	#5	8	11'- 4"	35
S8	16	#4	1	7'- 7"	81
U1	4	#4	5	9'- 5"	25
U2	43	#4	3	4'- 2"	120
U3	7	#4	3	6'- 8"	31
V1	28	#5	STR	9'- 4"	273
V2	86	#5	STR	6'- 4"	568
V3	28	#5	STR	8'- 2"	238

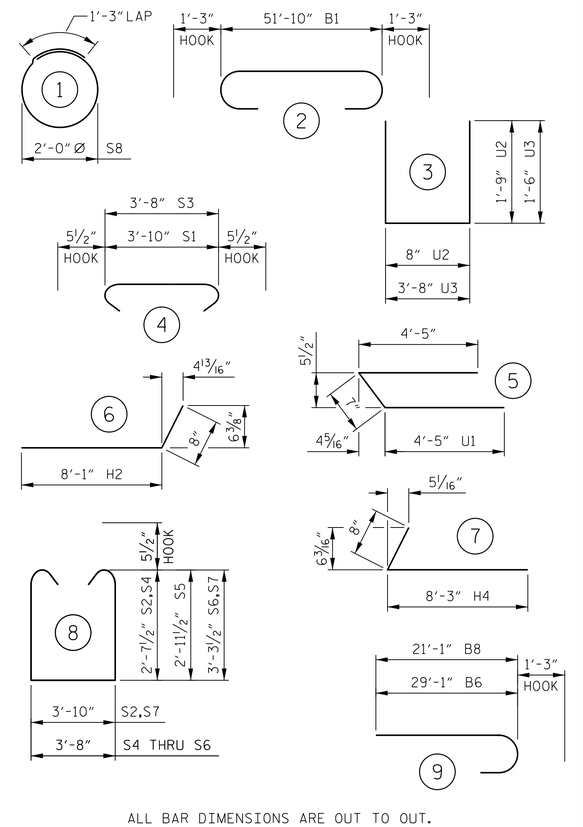
REINFORCING STEEL 5,829 LBS.

CLASS "A" CONCRETE
POUR 1 COLLARS, CAP AND LOWER WINGS 29.3 CU. YDS.
POUR 2 BACKWALL AND UPPER WINGS 10.6 CU. YDS.
TOTAL 39.9 CU. YDS.

HP 14 x 73 STEEL PILES
8 REQUIRED 560.0 LIN. FT.

PILE DRIVING EQUIPMENT SETUP FOR HP14X73 STEEL PILES 8 EACH

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. I-4729A

POLK COUNTY

STATION: 22+87.20 -RP_E-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/16/2017

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1-17
1			3			TOTAL SHEETS
2			4			24

STR. #1

DRAWN BY :	K. E. LOFTON	DATE :	6-17
CHECKED BY :	D. PRETORIUS	DATE :	7-17
DESIGN ENGINEER :	A. D. SHAH	DATE :	8-17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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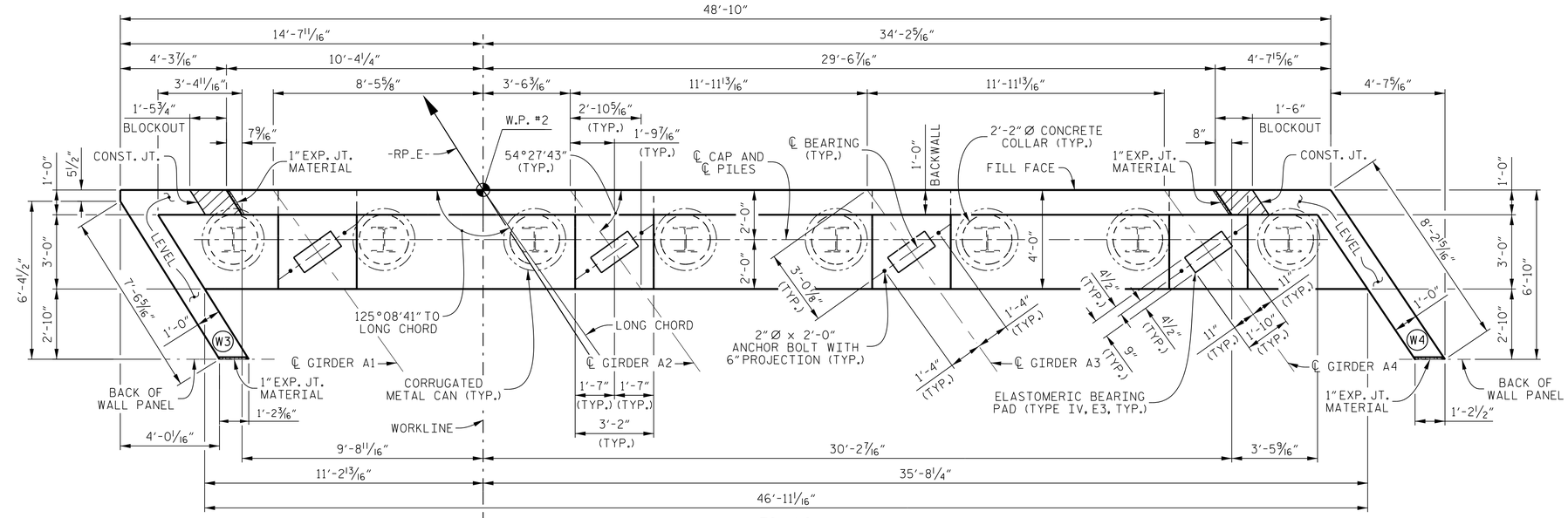
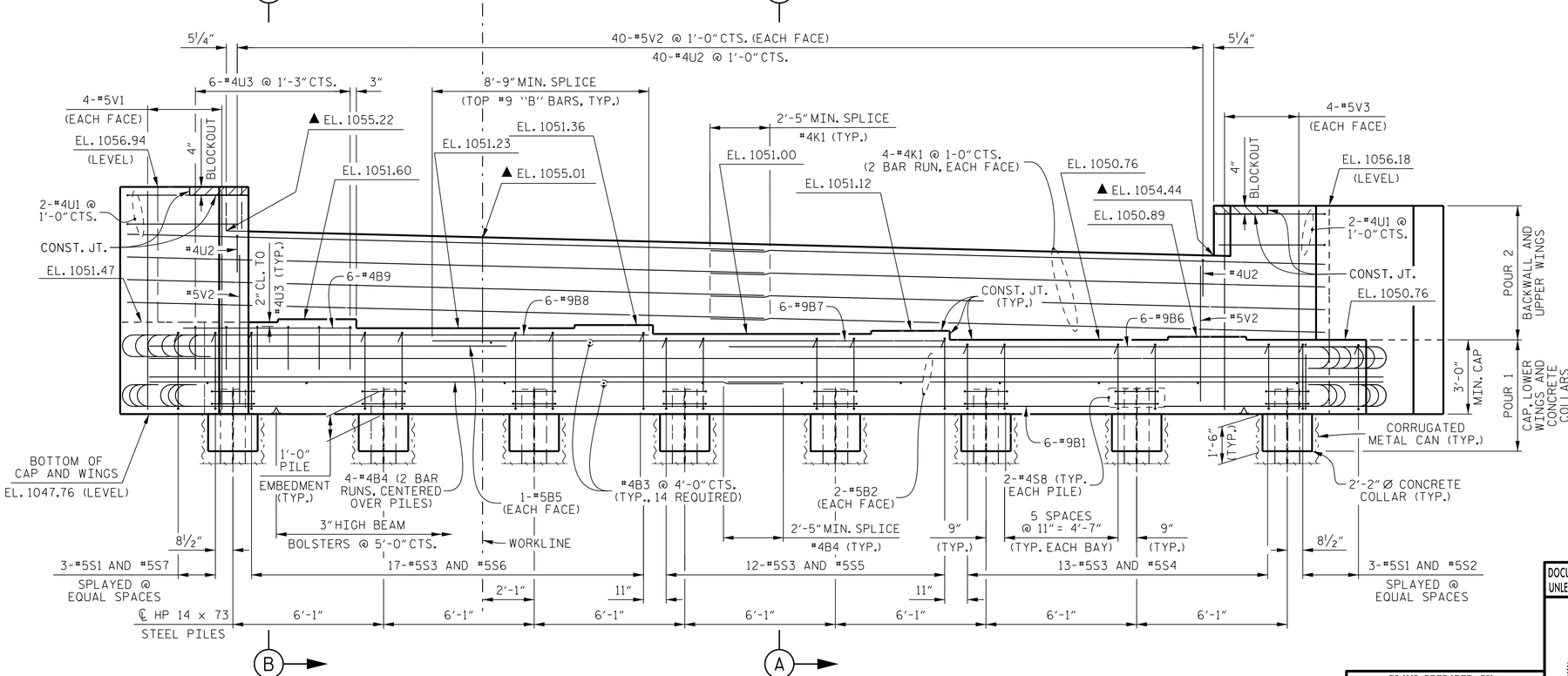


PLAN



ELEVATION

NOTES

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

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

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

▲ THIS ELEVATION IS TAKEN AT FILL FACE OF BACKWALL.

FOR SECTION A-A AND SECTION B-B, SEE SHEET 3 OF 3.

FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTION VIEWS ON SHEET 3 OF 3.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR TEMPORARY DRAINAGE AT END BENT DETAIL, SEE SHEET 3 OF 3.

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

THE COST TO FURNISH AND INSTALL THE 30″Ø CORRUGATED METAL CANS SHALL BE INCLUDED IN THE CONTRACT PRICE FOR MSE RETAINING WALL.

WING (W3) AND WING (W4) DETAILS ARE BASED ON A 5½″ WALL PANEL THICKNESS AND USING DOWELS FOR THE COPING. CONTRACTOR MAY ADJUST WINGS SLIGHTLY AS NECESSARY, BASED ON APPROVED MSE WALL SHOP DRAWINGS.

PROJECT NO. I-4729A

POLK COUNTY

STATION: 22+87.20 -RP_E-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

DRAWN BY : K. E. LOFTON DATE : 6-17
CHECKED BY : D. PRETORIUS DATE : 7-17
DESIGN ENGINEER : A. D. SHAH DATE : 8-17

PLANS PREPARED BY :
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NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/10/2017

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1-18
1			3			TOTAL SHEETS
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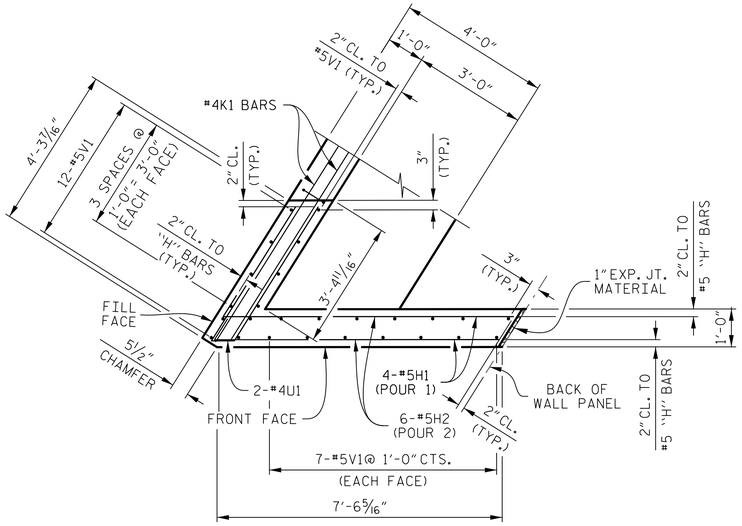
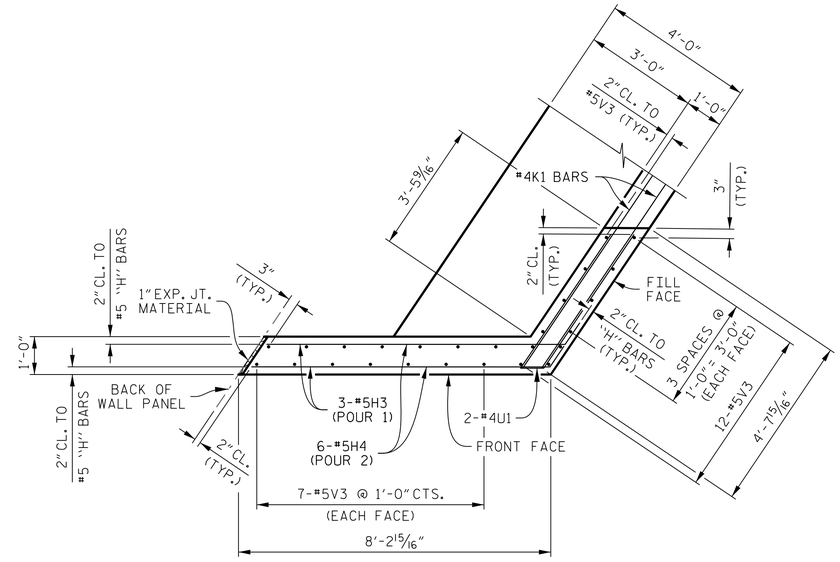


PLAN OF WING W3



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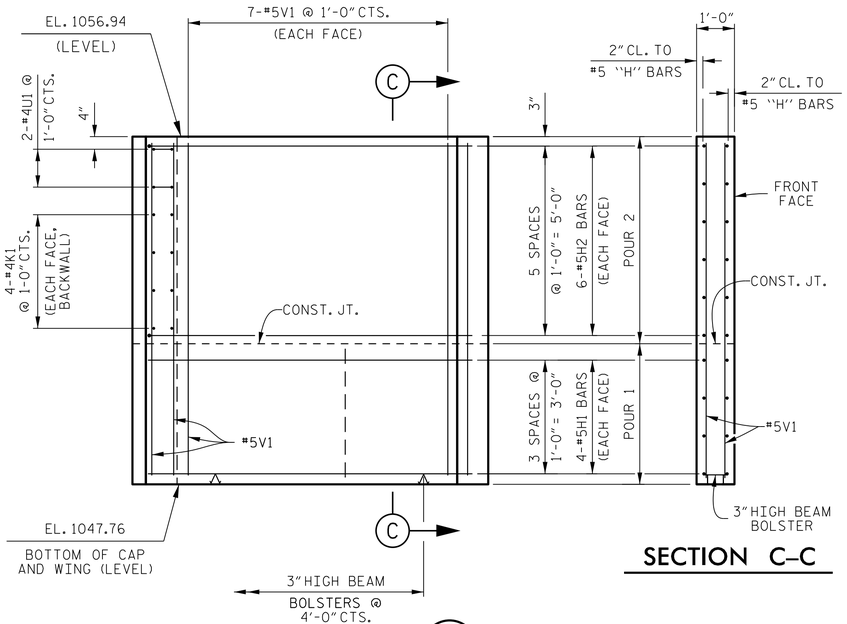
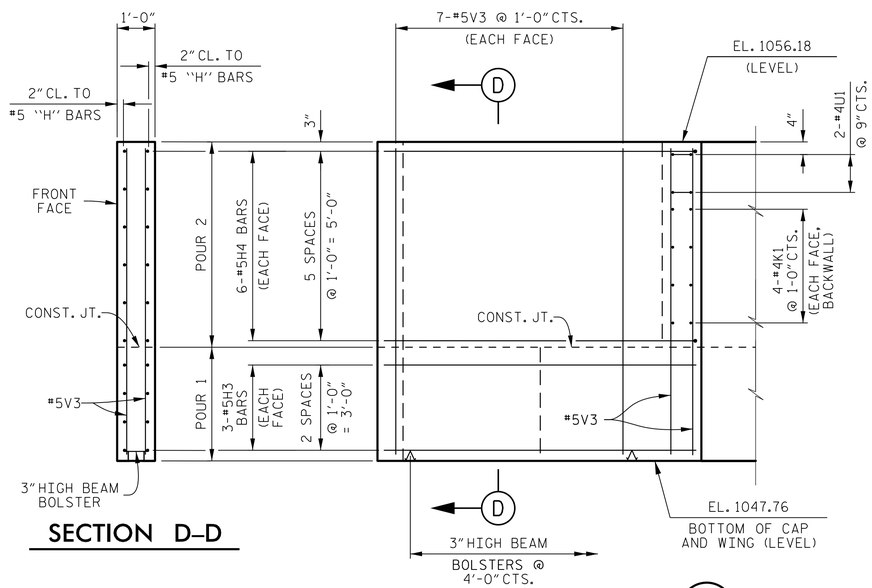


ELEVATION OF WING W3

SECTION C–C



SECTION D–D

ELEVATION OF WING W4

PROJECT NO. I–4729A

POLK COUNTY

STATION: 22+87.20 –RP_E–

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/10/2017

DRAWN BY :	K. E. LOFTON	DATE :	6–17		
CHECKED BY :	D. PRETORIUS	DATE :	7–17		
DESIGN ENGINEER :	A. D. SHAH	DATE :	8–17		

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606–3386
NC LICENSE No. F–0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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No.	BY:	DATE:	No.	BY:	DATE:	S1–19
1			3			TOTAL SHEETS
2			4			24

STR. #1

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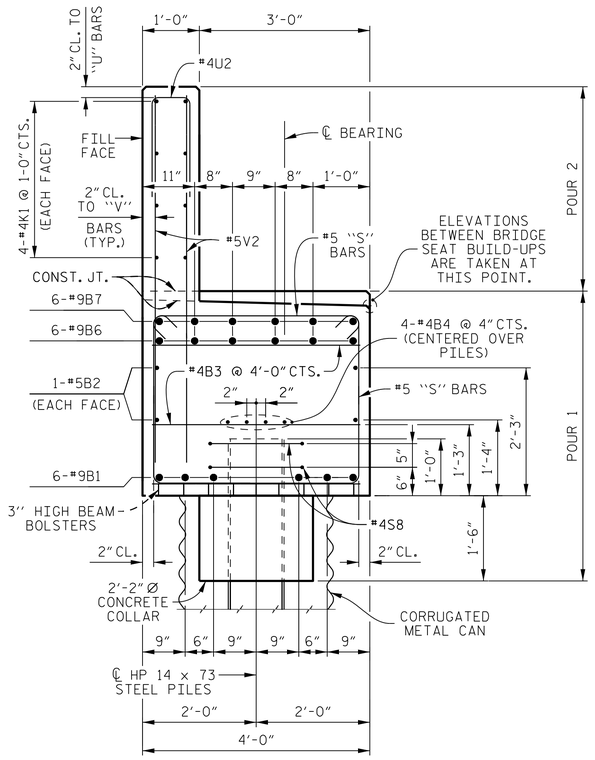
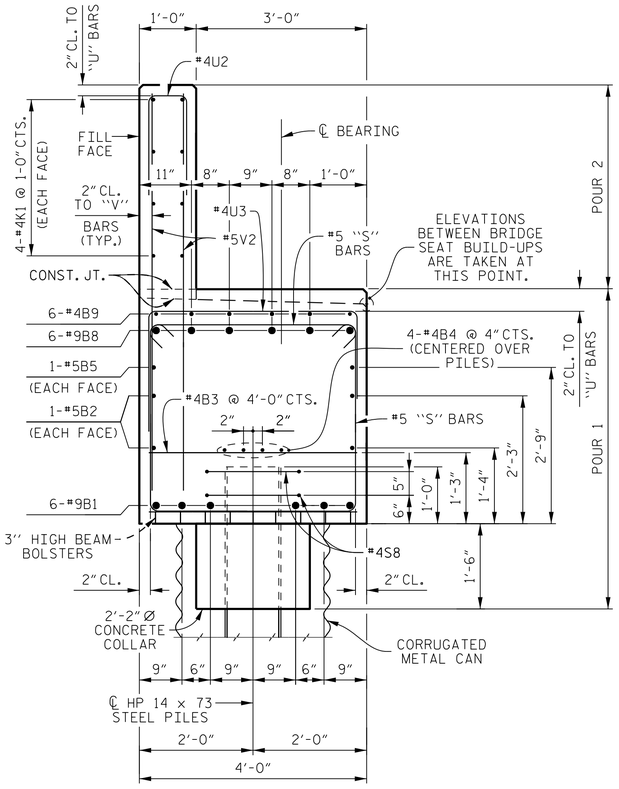
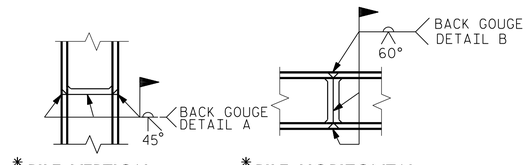


SECTION A–A

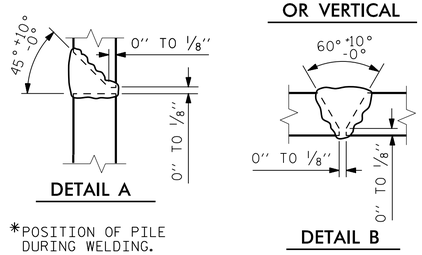


SECTION B–B



* PILE VERTICAL

* PILE HORIZONTAL OR VERTICAL



*POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BILL OF MATERIAL

END BENT 2

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#9	2	51'- 0"	1,040
B2	4	#5	STR	48'- 6"	202
B3	14	#4	STR	3'- 8"	34
B4	8	#4	STR	25'- 6"	136
B5	2	#5	STR	17'- 6"	37
B6	6	#9	9	28'- 1"	573
B7	6	#9	STR	22'- 0"	449
B8	6	#9	9	22'- 7"	461
B9	6	#4	STR	7'- 0"	28
H1	8	#5	STR	7'- 8"	64
H2	12	#5	7	8'- 4"	104
H3	6	#5	STR	7'-10"	49
H4	12	#5	6	8'- 6"	106
K1	16	#4	STR	25'- 6"	273
S1	6	#5	4	4'- 9"	30
S2	3	#5	8	10'- 0"	31
S3	42	#5	4	4'- 7"	201
S4	13	#5	8	9'-10"	133
S5	12	#5	8	10'- 4"	129
S6	17	#5	8	10'- 9"	191
S7	3	#5	8	10'-11"	34
S8	16	#4	1	7'- 7"	81
U1	4	#4	5	9'- 1"	24
U2	40	#4	3	4'- 2"	111
U3	6	#4	3	6'-10"	27
V1	26	#5	STR	8'-10"	240
V2	80	#5	STR	6'- 2"	515
V3	26	#5	STR	8'- 1"	219

REINFORCING STEEL 5,522 LBS.

CLASS "A" CONCRETE

POUR 1 COLLARS, CAP AND LOWER WINGS 27.5 CU. YDS.

POUR 2 BACKWALL AND UPPER WINGS 11.1 CU. YDS.

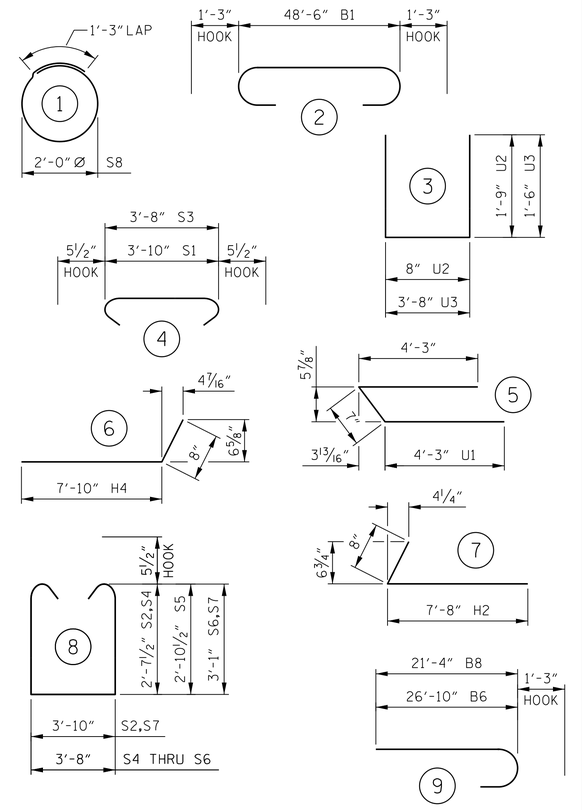
TOTAL 38.6 CU. YDS.

HP 14 x 73 STEEL PILES

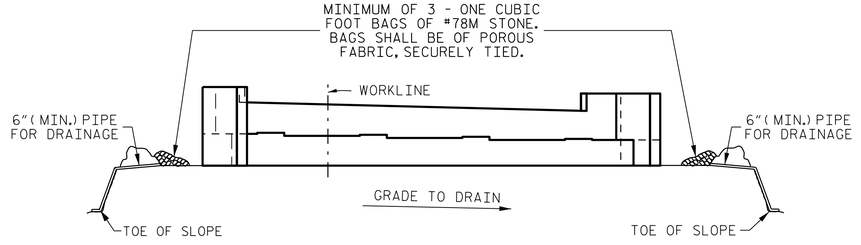
8 REQUIRED 580.0 LIN. FT.

PILE DRIVING EQUIPMENT SETUP FOR HP14X73 STEEL PILES 8 EACH

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



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 FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

PROJECT NO. I-4729A

POLK COUNTY

STATION: 22+87.20 -RP_E-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

DRAWN BY : K. E. LOFTON DATE : 6-17
CHECKED BY : D. PRETORIUS DATE : 7-17
DESIGN ENGINEER : A. D. SHAH DATE : 8-17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8664D2B8C4B4441...
8/16/2017

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1-20
1			3			TOTAL SHEETS
2			4			24

STR. #1

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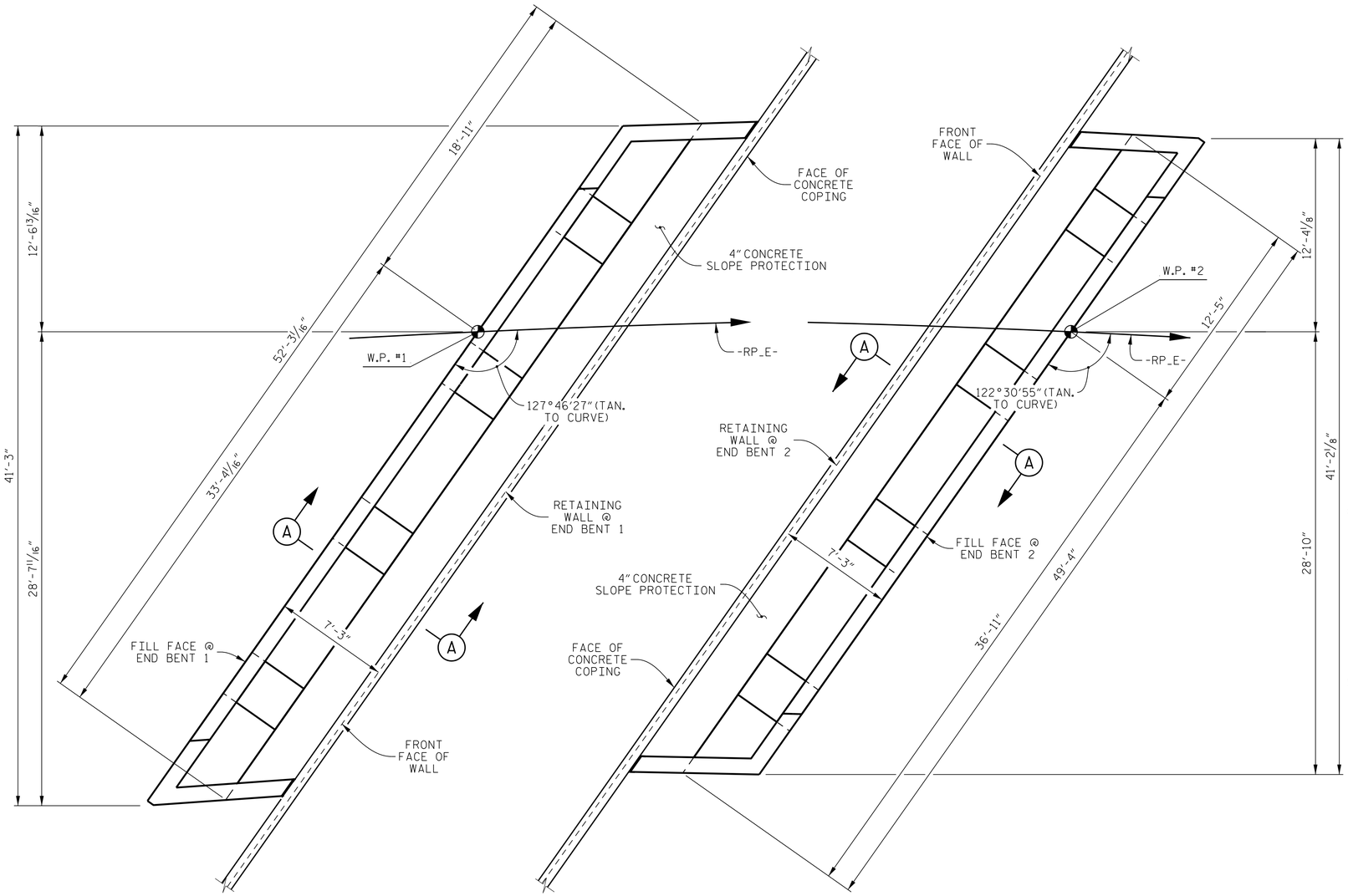
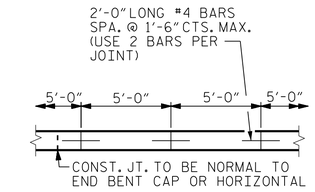


END BENT 1

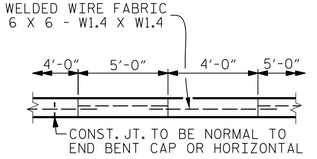
END BENT 2

PLAN

APPROACH SLABS AND CONCRETE DITCHES NOT SHOWN

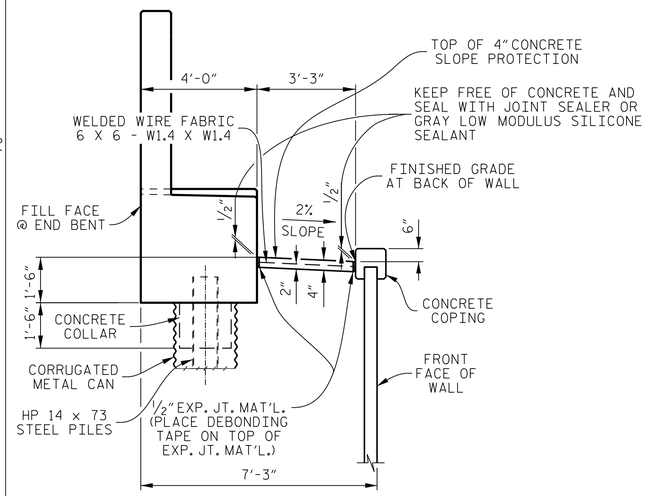


POURING DETAIL



POUR A 4'-0" STRIP FIRST.

OPTIONAL POURING DETAIL



SECTION A–A

BRIDGE AT STA. 22+87.20 –RP_E–	4" SLOPE PROTECTION	WELDED WIRE FABRIC
	SQUARE YARDS	APPROX. LINEAR FEET
END BENT 1	19	34
END BENT 2	18	32

GENERAL NOTES

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

STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT.

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. 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.

PROJECT NO. I–4729A

POLK COUNTY

STATION: 22+87.20 –RP_E–

ASSEMBLED BY : K.E.LOFTON	DATE : 5-17		
CHECKED BY : A.D.SHAH	DATE : 7-17		
DRAWN BY : ELR	5/92	REV. 10/1/11	MAA/GM
CHECKED BY : GRP	6/92	REV. 12/21/11	MAA/GM
		REV. 1 /16	MAA/TMG

DRAWN BY : K. E. LOFTON	DATE : 5–17		
CHECKED BY : A. D. SHAH	DATE : 7–17		
DESIGN ENGINEER : A. D. SHAH	DATE : 8–17		

PLANS PREPARED BY :

PARSONS

5540 Centerview Drive, Suite 217
Raleigh, NC 27606–3386
NC LICENSE No. F–0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANWAR M. SHAH
8/10/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1–21
1			3			TOTAL SHEETS
2			4			24

STD. No. SP1 STR. #1

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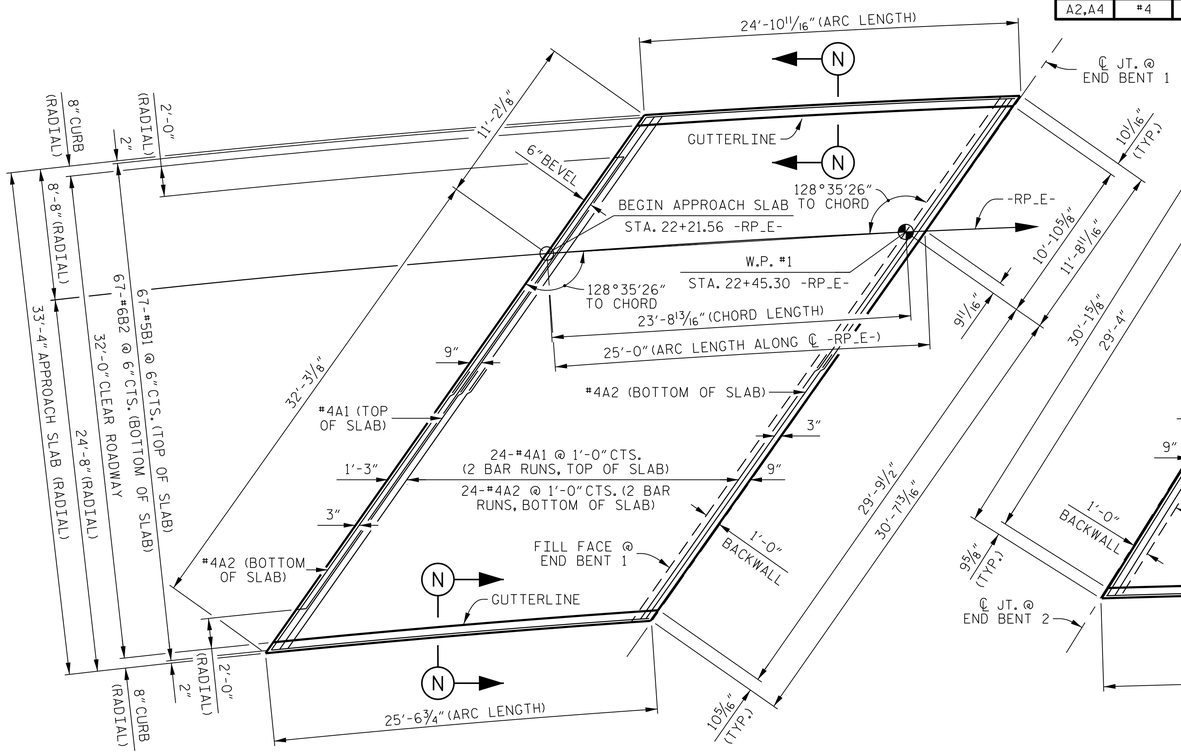
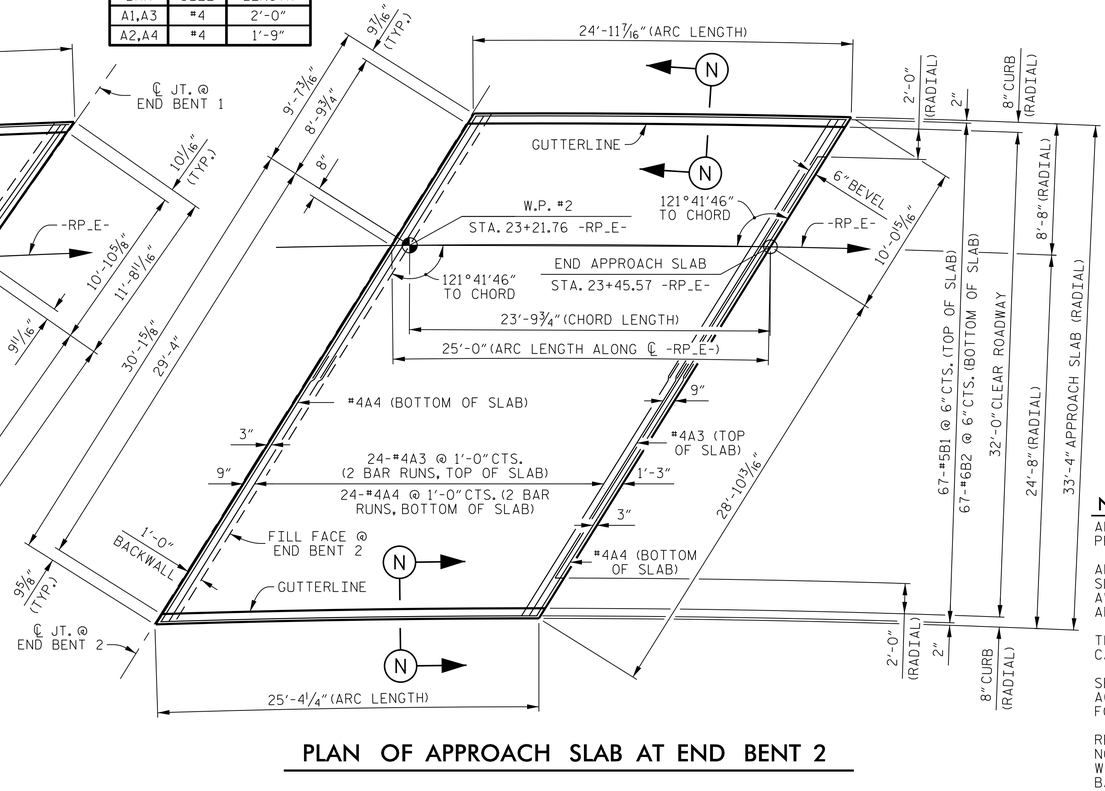
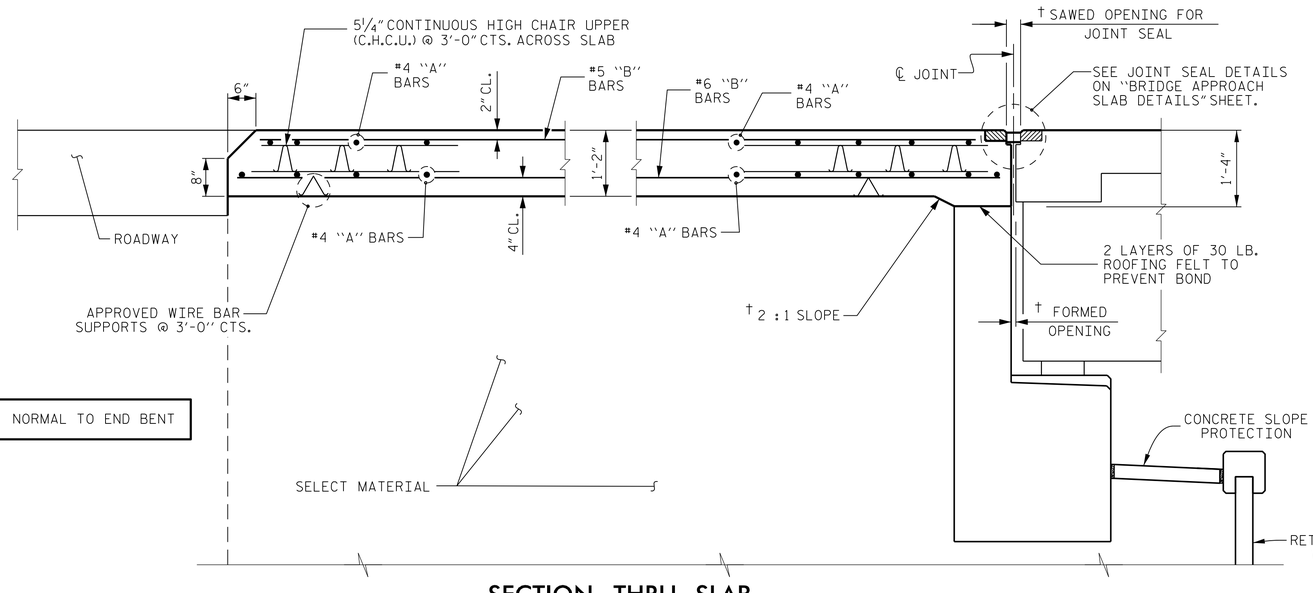
SPLICE LENGTHS		
BAR	SIZE	LENGTH
A1,A3	#4	2'-0"
A2,A4	#4	1'-9"



PLAN OF APPROACH SLAB AT END BENT 1

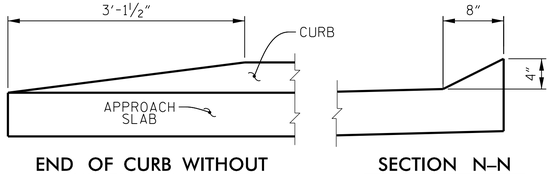


PLAN OF APPROACH SLAB AT END BENT 2



† NORMAL TO END BENT

SECTION THRU SLAB



END OF CURB WITHOUT SHOULDER BERM GUTTER

SECTION N–N

CURB DETAILS

BILL OF MATERIAL

APPROACH SLAB AT END BENT 1

	BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
*	A1	50	#4	STR	22'- 6"	752
	A2	52	#4	STR	22'- 4"	776
*	B1	67	#5	STR	24'- 1"	1,683
	B2	67	#6	STR	24'- 8"	2,482
	REINFORCING STEEL					3,258 LBS.
*	EPOXY COATED REINFORCING STEEL					2,435 LBS.
	CLASS "AA" CONCRETE					36.7 CU. YDS.

APPROACH SLAB AT END BENT 2

	BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
*	A3	50	#4	STR	20'- 8"	690
	A4	52	#4	STR	20'- 6"	712
*	B1	67	#5	STR	24'- 1"	1,683
	B2	67	#6	STR	24'- 8"	2,482
	REINFORCING STEEL					3,194 LBS.
*	EPOXY COATED REINFORCING STEEL					2,373 LBS.
	CLASS "AA" CONCRETE					36.5 CU. YDS.

NOTES

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

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 SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

SELECT BACKFILL MATERIAL SHALL BE THE AGGREGATE USED IN THE REINFORCED ZONE FOR THE MSE RETAINING WALL.

REINFORCED BRIDGE APPROACH FILLS ARE NOT REQUIRED AT END BENTS DUE TO MSE WALL REINFORCEMENT CONNECTED TO THE BACKWALL OF THE END BENT CAP.

FOR ARC OFFSETS, SEE SHEET 2 OF 2.

WITH FOAM JOINT SEAL

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2½".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

PROJECT NO. I-4729A

POLK COUNTY

STATION: 22+87.20 –RP_E–

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1-22
1			3			TOTAL SHEETS
2			4			24

STD. No. BAS2 STR. #1

ASSEMBLED BY :	K. E. LOFTON	DATE :	5-17
CHECKED BY :	A. D. SHAH	DATE :	7-17
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

DRAWN BY :	K. E. LOFTON	DATE :	5-17
CHECKED BY :	A. D. SHAH	DATE :	7-17
DESIGN ENGINEER :	A. D. SHAH	DATE :	8-17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUBA D. SHAH
8/10/2017

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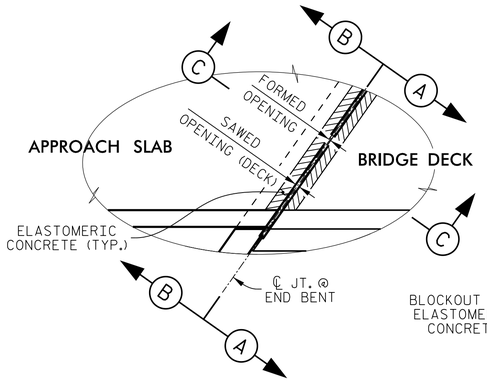
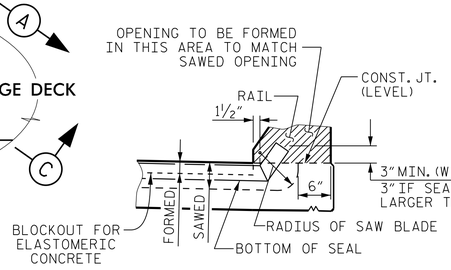
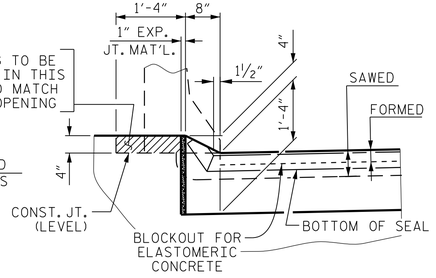


PLAN VIEW OF FOAM JOINT SEAL AT END BENT FOR BARRIER RAIL



SECTION A–A



SECTION B–B

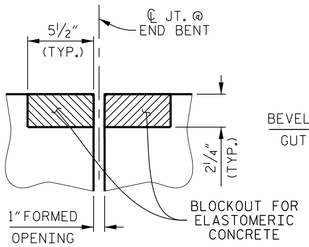
JOINT SEAL DETAILS AT END BENT FOR BARRIER RAIL

FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

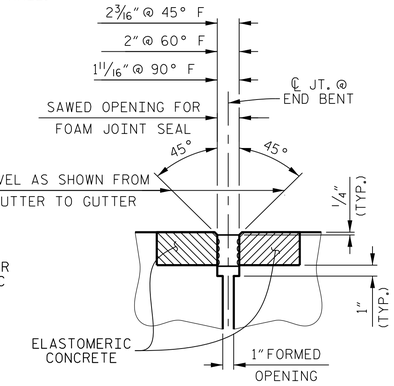
ELASTOMERIC CONCRETE	
END BENT	ELASTOMERIC CONCRETE * (CU. FT.)
1	7.0
2	6.6
TOTAL	13.6

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

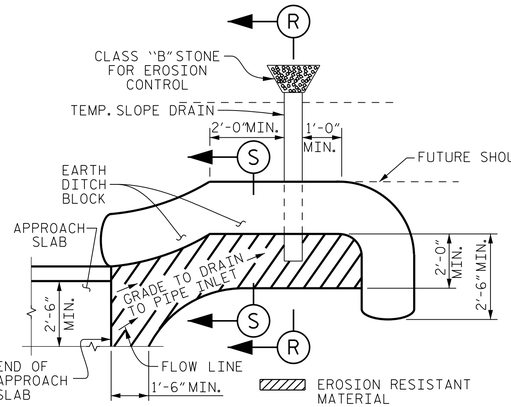


SECTION C–C

FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)

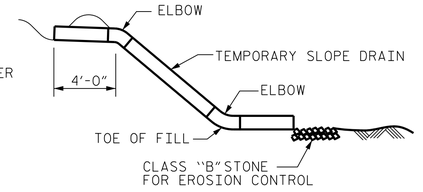


SECTION C–C

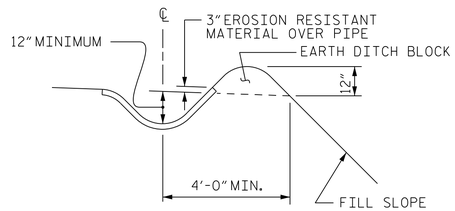


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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



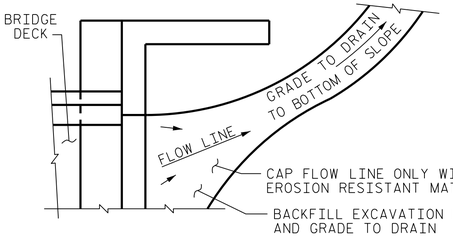
SECTION R–R



SECTION S–S

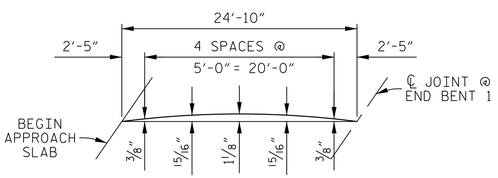
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

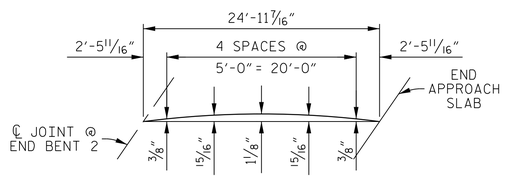


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

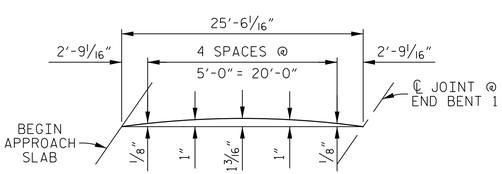
TEMPORARY DRAINAGE DETAIL



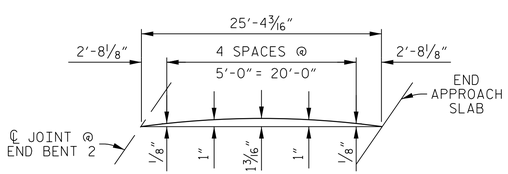
LEFT OUTSIDE EDGE



LEFT OUTSIDE EDGE



RIGHT OUTSIDE EDGE



RIGHT OUTSIDE EDGE

ARC OFFSETS – APPROACH SLAB AT END BENT 1

ARC OFFSETS – APPROACH SLAB AT END BENT 2

PROJECT NO. I–4729A

POLK COUNTY

STATION: 22+87.20 –RP_E–

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1–23
1			3			TOTAL SHEETS
2			4			24

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/10/2017

DRAWN BY :	K. E. LOFTON	DATE :	5–17
CHECKED BY :	A. D. SHAH	DATE :	7–17
DESIGN ENGINEER :	A. D. SHAH	DATE :	8–17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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STR. #1

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

PROJECT NO. I-4729A

POLK COUNTY

STATION: 22+87.20 -RP_E-

ENGLISH

JANUARY, 1990

DRAWN BY : K. E. LOFTON DATE : 5-17
CHECKED BY : A. D. SHAH DATE : 7-17
DESIGN ENGINEER : A. D. SHAH DATE : 8-17

PLANS PREPARED BY :

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NC LICENSE No. F-0246

FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/10/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD NOTES

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1-24
1			3			TOTAL SHEETS
2			4			24

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

STD. No. SN STR. #1

20+00 +50 21+00 +50 22+00 +50 23+00

P.V.I. = STA. 20+90.00
EL. = 1,095.810'
V.C. = 815.00'

(+)6.7600% (-)6.6000%

GRADE DATA –RP_F–

1090 1080 1070 1060 1050 1040 1030 1020

FILL FACE @ END BENT 1
STA. 20+52.09 -RF_F-
GRADE POINT EL. 1082.05

SEE BERM DETAIL (TYP.)

SPAN A

℄ BENT 1 (CONTROL LINE)

-EL- (I-26)

FIX. FIX.

SPAN B

FILL FACE @ END BENT 2
STA. 22+46.75 -RP_F-
GRADE POINT EL. 1080.31

1'-6"
EXP.
CONCRETE COLLAR
4" CONCRETE SLOPE PROTECTION
FILL
HP 14 x 74 STEEL PILES
FRONT FACE OF RETAINING WALL
18'-8" MIN. VERT. CL.
CONCRETE BARRIER RAIL
I-26 (WBL)
3'-6" Ø COLUMNS
20'-8" MIN. VERT. CL.
CONCRETE BARRIER RAIL
I-26 (EBL)
FACE OF COPING (TYP.)
FRONT FACE OF RETAINING WALL
CONCRETE BARRIER RAIL
EXP.
1'-6"
CONCRETE COLLAR
FILL
HP 14 x 74 STEEL PILES
4" CONCRETE SLOPE PROTECTION

APPROXIMATE EXISTING GROUND LINE

EL. 1036± EL. 1039± EL. 1042± EL. 1048± EL. 1056± EL. 1057± EL. 1056± EL. 1055± EL. 1053± EL. 1052.50 TOP OF DRILLED PIERS EL. 1055± EL. 1053± EL. 1051± EL. 1051± EL. 1058± EL. 1066± EL. 1075±

4'-0" Ø DRILLED PIER

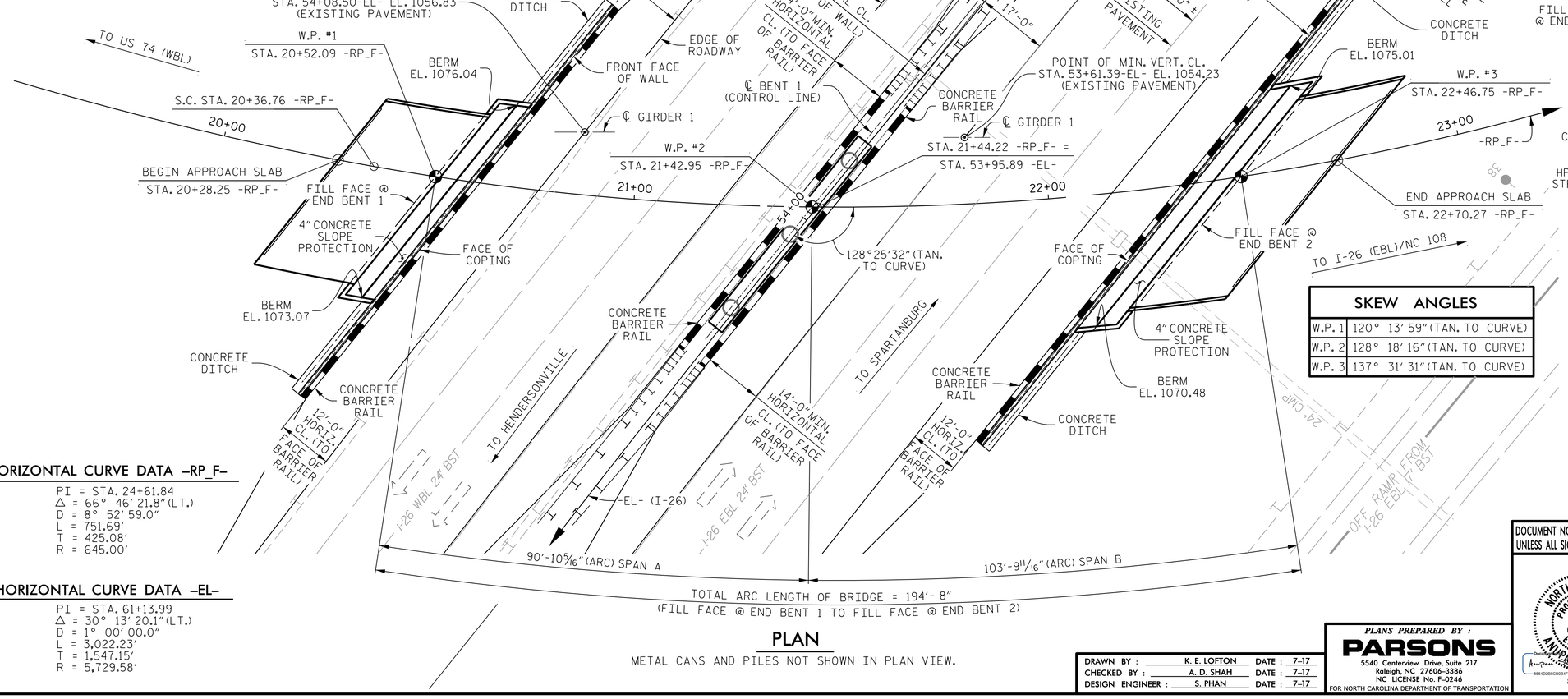
END BENT 1 BENT 1 END BENT 2

NOTE

FOR NOTES, SEE SHEET 4 OF 4.

SECTION ALONG –RP_F–

(SECTIONS AT RIGHT ANGLES TO END BENTS AND BENT)



HORIZONTAL CURVE DATA –RP_F–

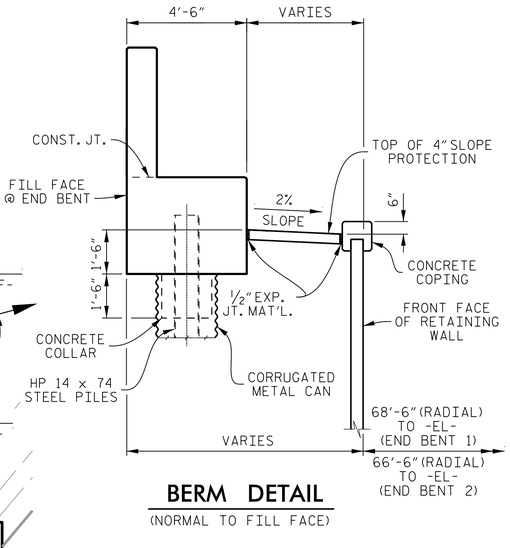
PI = STA. 24+61.84
Δ = 66° 46' 21.8" (LT.)
D = 8° 52' 59.0"
L = 751.69'
T = 425.08'
R = 645.00'

HORIZONTAL CURVE DATA –EL–

PI = STA. 61+13.99
Δ = 30° 13' 20.1" (LT.)
D = 1° 00' 00.0"
L = 3,022.23'
T = 1,547.15'
R = 5,729.58'

PLAN

METAL CANS AND PILES NOT SHOWN IN PLAN VIEW.



BERM DETAIL

(NORMAL TO FILL FACE)

SKEW ANGLES	
W.P. 1	120° 13' 59" (TAN. TO CURVE)
W.P. 2	128° 18' 16" (TAN. TO CURVE)
W.P. 3	137° 31' 31" (TAN. TO CURVE)

PROJECT NO. I-4729A
POLK COUNTY
STATION: 21+44.22 –RP_F–
53+95.89 –EL–
SHEET 1 OF 4 BRIDGE No. 740230

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER I-26 (–EL–)
ON RAMP (–RP_F–)
BETWEEN US-74 AND I-26

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/11/2017

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

STR. #2

DRAWN BY : K. E. LOFTON DATE : 7-17
CHECKED BY : A. D. SHAH DATE : 7-17
DESIGN ENGINEER : S. PHAN DATE : 7-17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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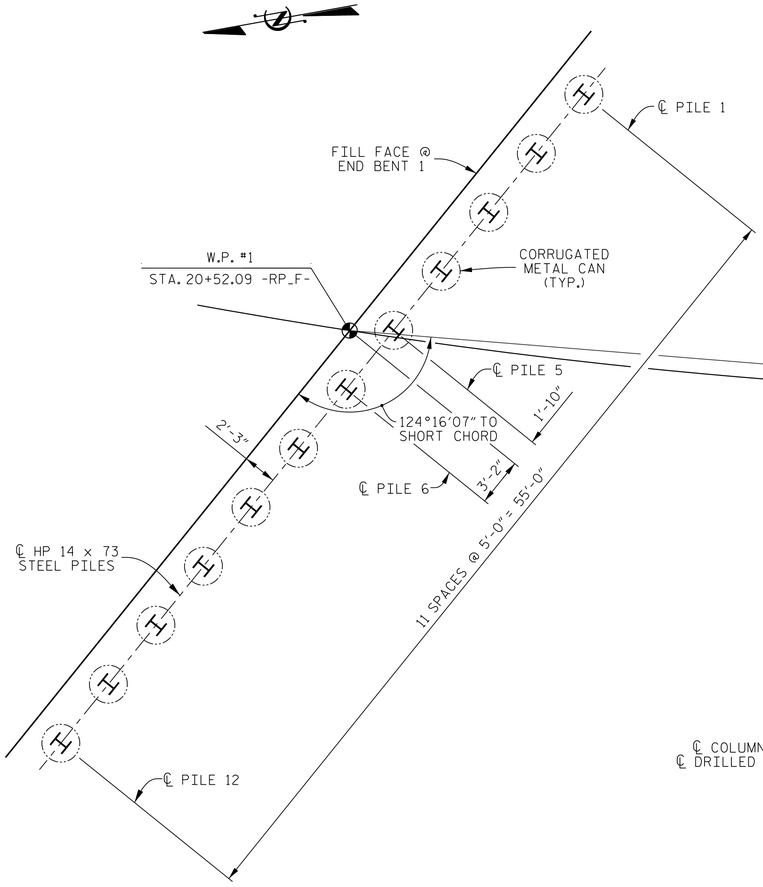
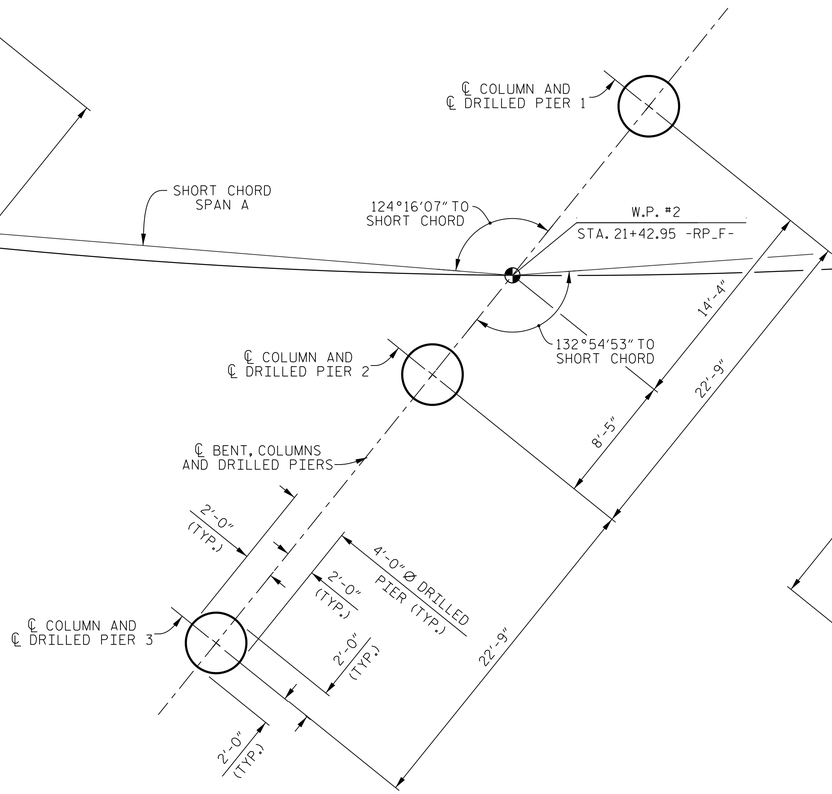
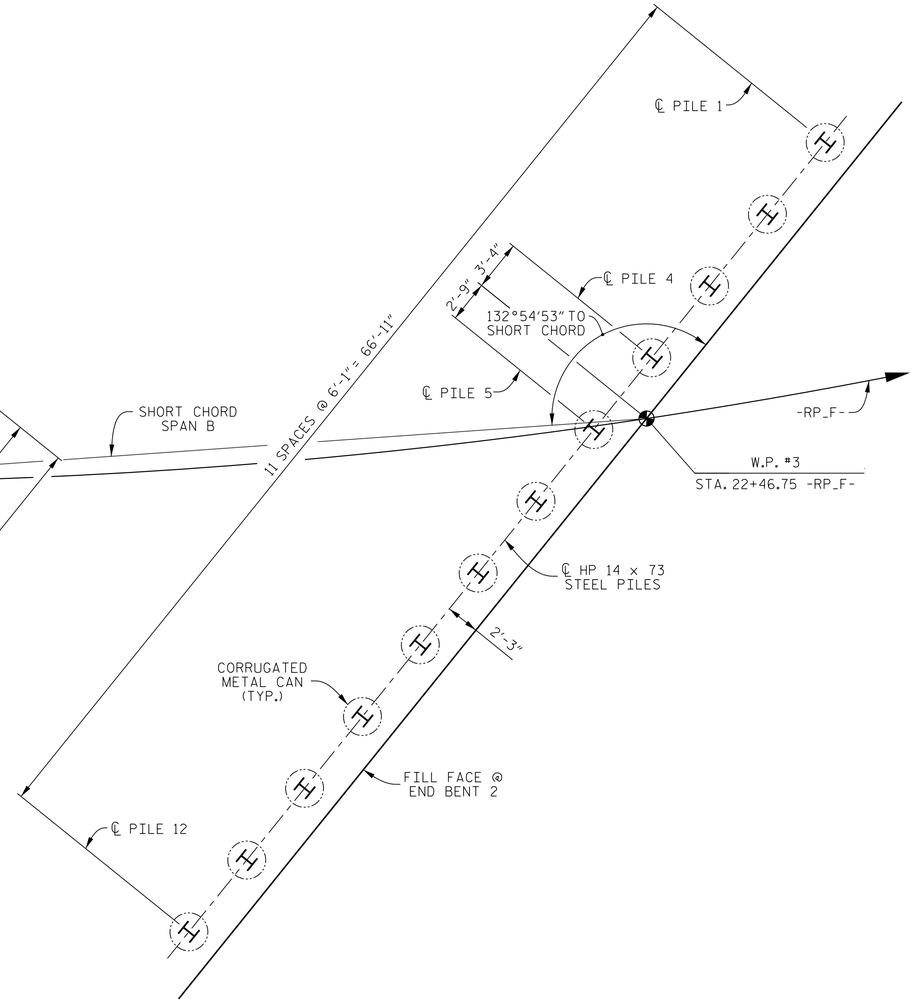


END BENT 1



BENT 1



END BENT 2

FOUNDATION LAYOUT

NOTES

ALL END BENT PILES ARE VERTICAL HP 14 x 73 STEEL PILES.

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINES AT THE BOTTOM OF THE END BENT CAPS.

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 125 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 210 TONS PER PILE.

PILES AT END BENT 1 AND END BENT 2 ARE TO BE DRIVEN AFTER CONSTRUCTION AND RELEASE OF THE MSE WALLS PENDING THE SETTLEMENT MONITORING PROGRAM.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 570 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 50 TSF.

INSTALL DRILLED PIERS AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 1002.5 FEET (FOR LEFT TO CENTER) AND 1015.0 FEET (FOR RIGHT) WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 10 FEET 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 INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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

CORRUGATED METAL CANS AT END BENT 1 AND END BENT 2 ARE TO BE PLACED DURING CONSTRUCTION IN THE REINFORCED BACKFILL OF THE MSE WALLS. SEE MSE WALL PLANS.

INSTALLATION OF CORRUGATED METAL CANS FROM THE BOTTOM OF THE PILE CAP TO THE LEVELING PAD ELEVATION IS REQUIRED FOR PILES AT END BENT 1 AND END BENT 2. THE CANS SHALL BE DESIGNED TO WITHSTAND THE PRESSURES FROM COMPACTION OPERATIONS ON ADJACENT FILLS WITHOUT DISTORTION. AT A MINIMUM, CORRUGATED METAL CANS SHALL BE 16-GAUGE WITH A WALL THICKNESS OF 0.064".

LOOSELY BACKFILL CORRUGATED METAL CANS USING SAME MATERIAL AS MSE REINFORCEMENT ZONE PRIOR TO CONSTRUCTION OF THE END BENT PILE CAP. DO NOT COMPACT MATERIAL WITHIN THE CAN.

OBSERVE A ONE MONTH WAITING PERIOD AFTER CONSTRUCTION OF THE MSE WALLS BEFORE DRIVING PILES. DO NOT DRIVE PILES AT END BENT 1 AND END BENT 2 UNTIL THE WALL HAS BEEN RELEASED FOLLOWING THE SETTLEMENT MONITORING PROGRAM.

FOR SURCHARGES AND WAITING PERIODS, SEE SECTION 235 OF THE STANDARD SPECIFICATIONS AND THE SURCHARGES AND WAITING PERIODS PROVISION.

DRAWN BY : K. E. LOFTON DATE : 7-17
CHECKED BY : A. D. SHAH DATE : 7-17
DESIGN ENGINEER : S. PHAN DATE : 7-17

PLANS PREPARED BY :
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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/11/2017

PROJECT NO. I-4729A
POLK COUNTY
STATION: 21+44.22 -RP_F-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER I-26 (-EL-)
ON RAMP (-RP_F-)
BETWEEN US-74 AND I-26

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

STR. #2

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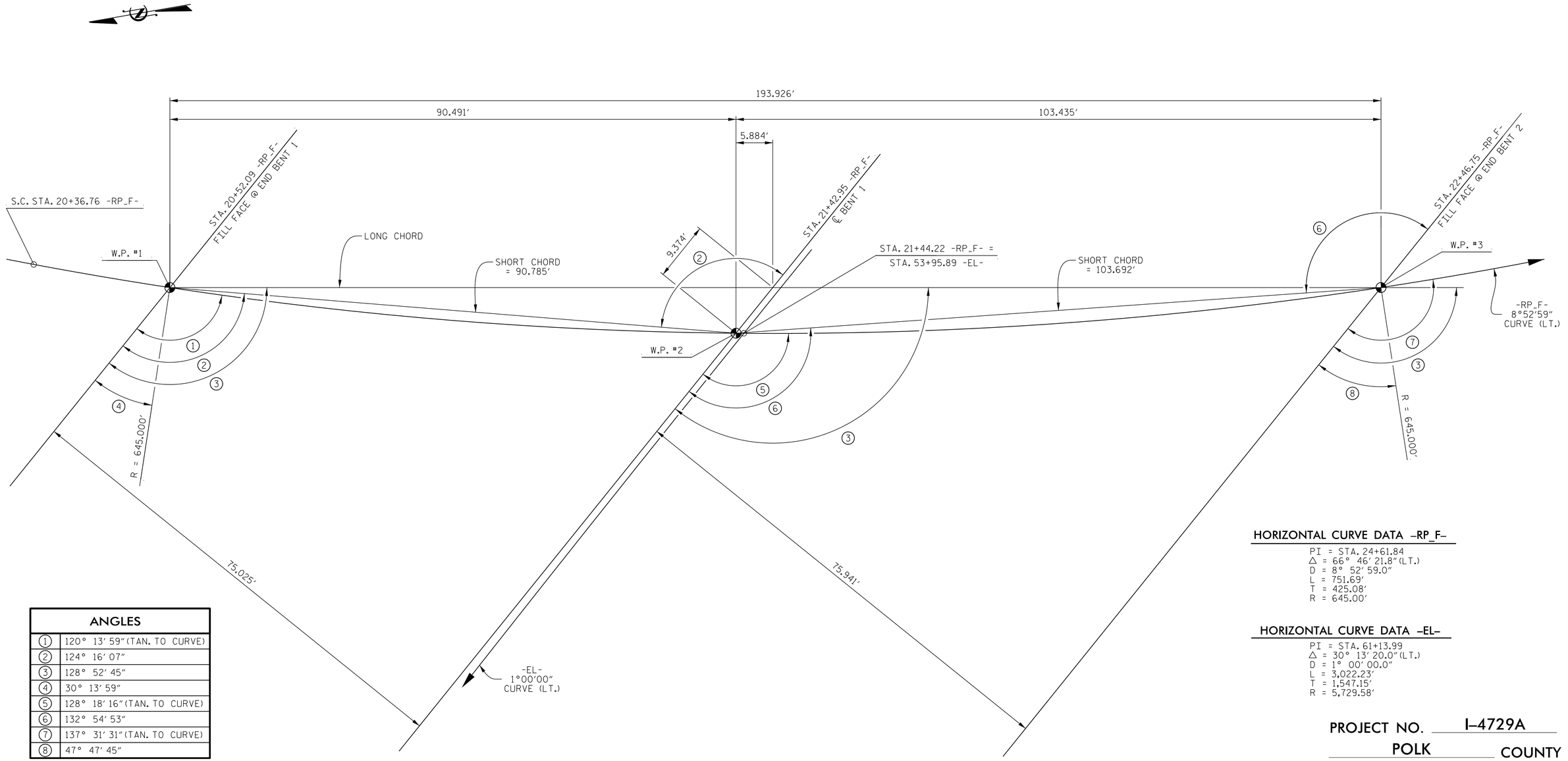

ANGLES	
①	120° 13′ 59″(TAN. TO CURVE)
②	124° 16′ 07″
③	128° 52′ 45″
④	30° 13′ 59″
⑤	128° 18′ 16″(TAN. TO CURVE)
⑥	132° 54′ 53″
⑦	137° 31′ 31″(TAN. TO CURVE)
⑧	47° 47′ 45″

HORIZONTAL CURVE DATA –RP_F–

PI = STA. 24+61.84
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D = 8° 52′ 59.0″
L = 751.69′
T = 425.08′
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HORIZONTAL CURVE DATA –EL–

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Δ = 30° 13′ 20.0″(LT.)
D = 1° 00′ 00.0″
L = 3,022.23′
T = 1,547.15′
R = 5,729.58′

LONG CHORD LAYOUT

NOTE: END BENTS AND BENT ARE PARALLEL.

PROJECT NO. I–4729A

POLK COUNTY

STATION: 21+44.22 –RP_F–

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER I–26 (–EL–)
ON RAMP (–RP_F–)
BETWEEN US–74 AND I–26

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/11/2017

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PLANS PREPARED BY :
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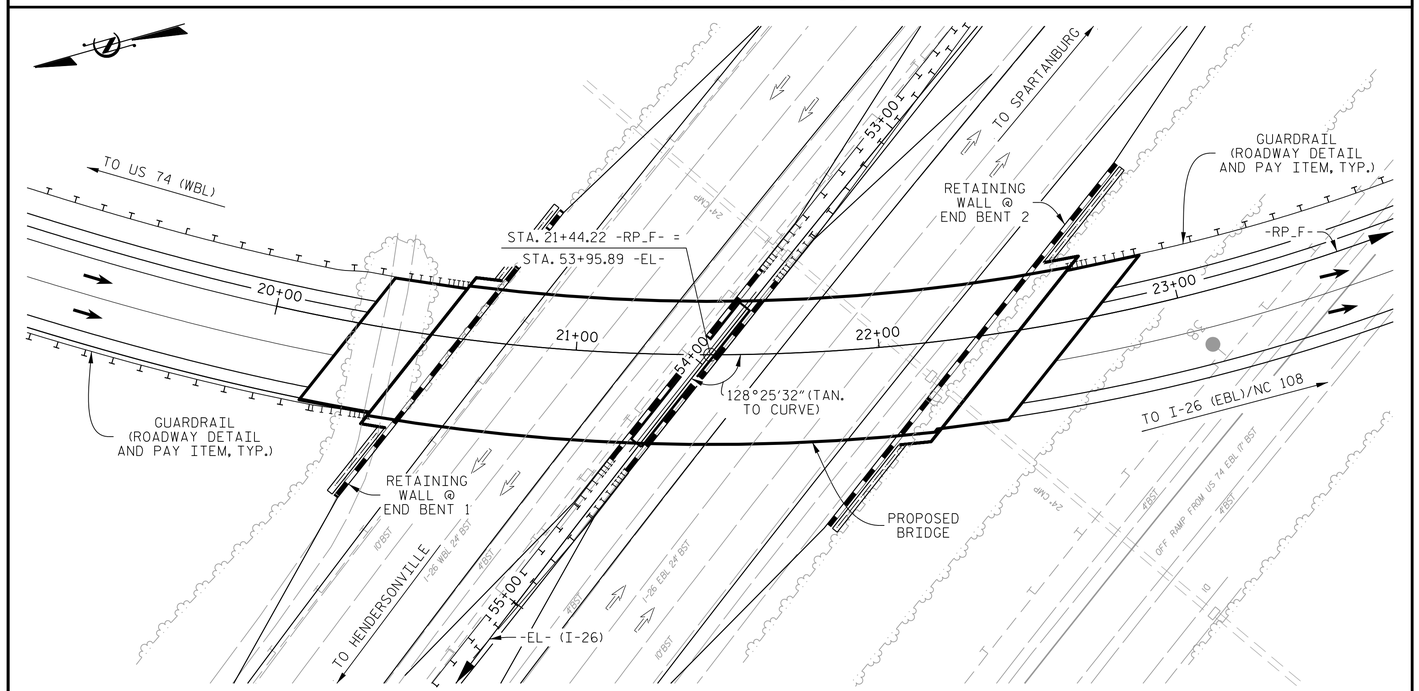
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S2–3
1			3			TOTAL SHEETS
2			4			31

STR. #2

FILE: j:\i-4729a\structures\plans\final\i-4729a_smu_sh2_lcl.dgn
DATE: 8/1/2017 12:19:06 AM

BENCHMARK: #6 - RAILROAD SPIKE IN BASE 20" WHITE OAK 577.68' RIGHT OF
STA. 18+44.38 -RP_F- EL. 1080.99 N 561443.04 E 1041924.09



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 "STANDARD NOTES" SHEET.

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.

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

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE AT STA. 21+44.22 -RP_F-, SEE SPECIAL PROVISIONS.

A WAITING PERIOD IS REQUIRED PRIOR TO THE CONSTRUCTION OF END BENTS.

THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

TOTAL BILL OF MATERIAL

	4'-0" Ø DRILLED PIERS IN SOIL	4'-0" Ø DRILLED PIERS NOT IN SOIL	PDA TESTING	SID INSPECTIONS	CSL TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS		HP 14 x 73 STEEL PILES		CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	PILE DRIVING EQUIPMENT SETUP FOR HP14X73 STEEL PILES
	LIN. FT.	LIN. FT.	EACH	EACH	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	No.	LIN. FT.	No.	LIN. FT.	LIN. FT.	SQ. YD.	LUMP SUM	LUMP SUM	EACH
SUPERSTRUCTURE						9,019	9,581		LUMP SUM			12	1,123.7			382.4		LUMP SUM	LUMP SUM	
END BENT 1								71.5		7,755				12	630.0		19			12
BENT 1	107.5	30.0		1	1			66.6		33,245	5,006									
END BENT 2								87.6		9,330				12	660.0		26			12
TOTAL	107.5	30.0	1	1	1	9,019	9,581	225.7	LUMP SUM	50,330	5,006	12	1,123.7	24	1,290.0	382.4	45	LUMP SUM	LUMP SUM	24

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 -RP_F-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER I-26 (-EL-)
ON RAMP (-RP_F-)
BETWEEN US-74 AND I-26

DRAWN BY : K. E. LOFTON DATE : 7-17
CHECKED BY : A. D. SHAH DATE : 7-17
DESIGN ENGINEER : S. PHAN DATE : 7-17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8664208b0d5f4ee...
8/16/2017

REVISIONS						SHEET No.
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1			3			TOTAL SHEETS
2			4			31

STR. #2

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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 × RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
							LIVE-LOAD FACTORS (γ_{LL})	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ_{LL})	MOMENT					
								DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPANS	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPANS	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.05	--	1.75	0.639	1.35	A	EL	43.80	0.901	1.13	B	EL	9.50	0.80	0.698	1.05	B	EL	50.50	--
		HL-93 (OPERATING)	N/A		1.50	--	1.35	0.639	1.75	A	EL	43.80	0.901	1.50	B	EL	9.50	N/A	--	--	--	--	--	--
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.47	53.00	1.75	0.639	1.83	A	EL	43.80	0.901	1.55	B	EL	9.50	0.80	0.698	1.47	B	EL	50.50	--
		HS-20 (OPERATING)	36.000		2.05	74.00	1.35	0.639	2.38	A	EL	43.80	0.901	2.05	B	EL	9.50	N/A	--	--	--	--	--	--
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		3.80	47.50	1.40	0.639	5.80	A	EL	43.80	0.901	5.43	B	EL	9.50	0.80	0.698	3.80	B	EL	50.50	--
		S3C	21.500		2.22	47.73	1.40	0.639	3.39	A	EL	43.80	0.901	3.14	B	EL	9.50	0.80	0.698	2.22	B	EL	50.50	--
		S3A	22.750		2.10	47.78	1.40	0.639	3.22	A	EL	43.80	0.901	2.97	B	EL	9.50	0.80	0.698	2.10	B	EL	50.50	--
		S4A	26.750		1.84	49.22	1.40	0.639	2.83	A	EL	43.80	0.901	2.57	B	EL	9.50	0.80	0.698	1.84	B	EL	50.50	--
		S5A	30.500		1.62	49.41	1.40	0.639	2.50	A	EL	43.80	0.901	2.32	B	EL	9.50	0.80	0.698	1.62	B	EL	50.50	--
		S6A	34.500		1.47	50.72	1.40	0.639	2.26	A	EL	43.80	0.901	2.08	B	EL	9.50	0.80	0.698	1.47	B	EL	50.50	--
		S7B	38.500		1.33	51.21	1.40	0.639	2.06	A	EL	43.80	0.901	1.92	B	EL	9.50	0.80	0.698	1.33	B	EL	50.50	--
		S7A	40.000	⟨3⟩	1.31	52.40	1.40	0.639	2.04	A	EL	43.80	0.901	1.94	B	EL	9.50	0.80	0.698	1.31	B	EL	50.50	--
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		1.80	50.85	1.40	0.639	2.79	A	EL	43.80	0.901	2.48	B	EL	9.50	0.80	0.698	1.80	B	EL	50.50	--
		T5B	32.000		1.59	50.88	1.40	0.639	2.45	A	EL	43.80	0.901	2.31	B	EL	9.50	0.80	0.698	1.59	B	EL	50.50	--
		T6A	36.000		1.45	52.20	1.40	0.639	2.24	A	EL	43.80	0.901	2.10	B	EL	9.50	0.80	0.698	1.45	B	EL	50.50	--
		T7A	40.000		1.33	53.20	1.40	0.639	2.08	A	EL	43.80	0.901	1.94	B	EL	9.50	0.80	0.698	1.33	B	EL	50.50	--
		T7B	40.000		1.41	56.40	1.40	0.639	2.22	A	EL	43.80	0.901	1.84	B	EL	9.50	0.80	0.698	1.41	B	EL	50.50	--

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. LEFT EXTERIOR GIRDER IS THE CONTROLLING EXTERIOR GIRDER.

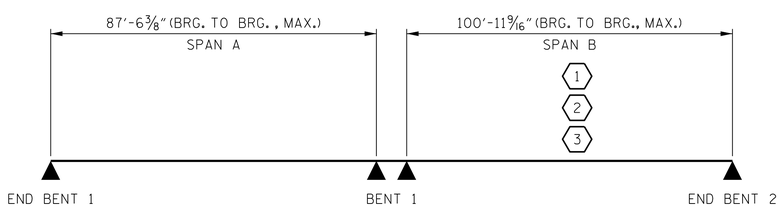
⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 -RP_F-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (INTERSTATE TRAFFIC)

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S2-5
1			3			TOTAL SHEETS
2			4			31

STD. No. LRFR2 STR. #2

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH

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8/11/2017

PLANS PREPARED BY :
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NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY : K. E. LOFTON DATE : 7-17
CHECKED BY : A. D. SHAH DATE : 7-17
DESIGN ENGINEER : S. PHAN DATE : 7-17

ASSEMBLED BY : K.E.LOFTON DATE : 5-17
CHECKED BY : A.D.SHAH DATE : 7-17

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

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

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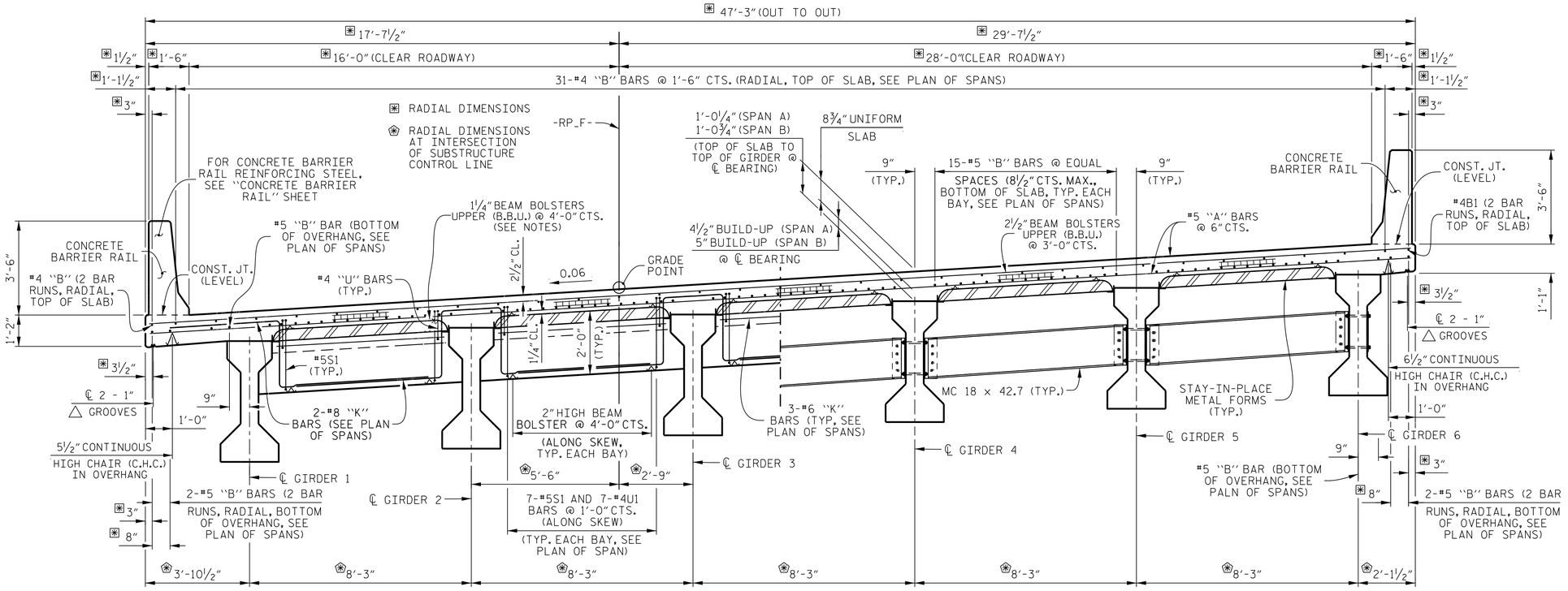


HALF SECTION AT END BENT DIAPHRAGMS

HALF SECTION AT INTERMEDIATE DIAPHRAGMS

TYPICAL SECTION

NOTES

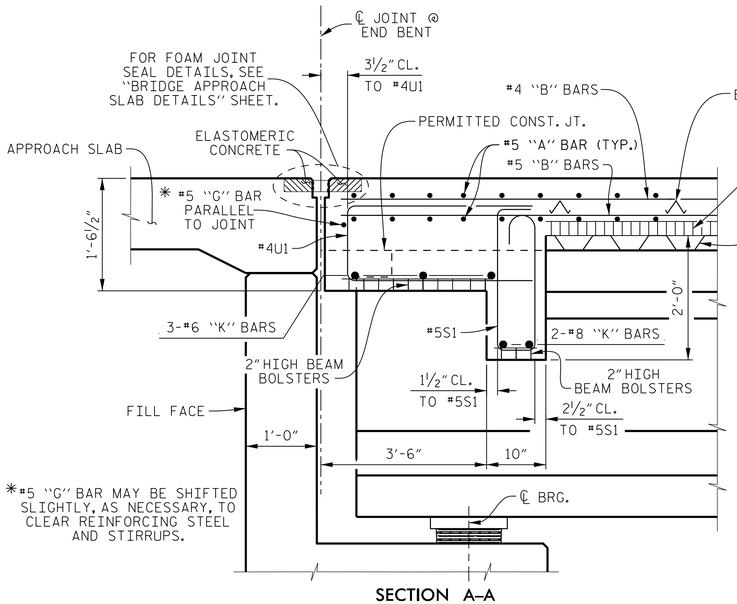
PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2½" ABOVE 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 SPAN SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE SPAN.

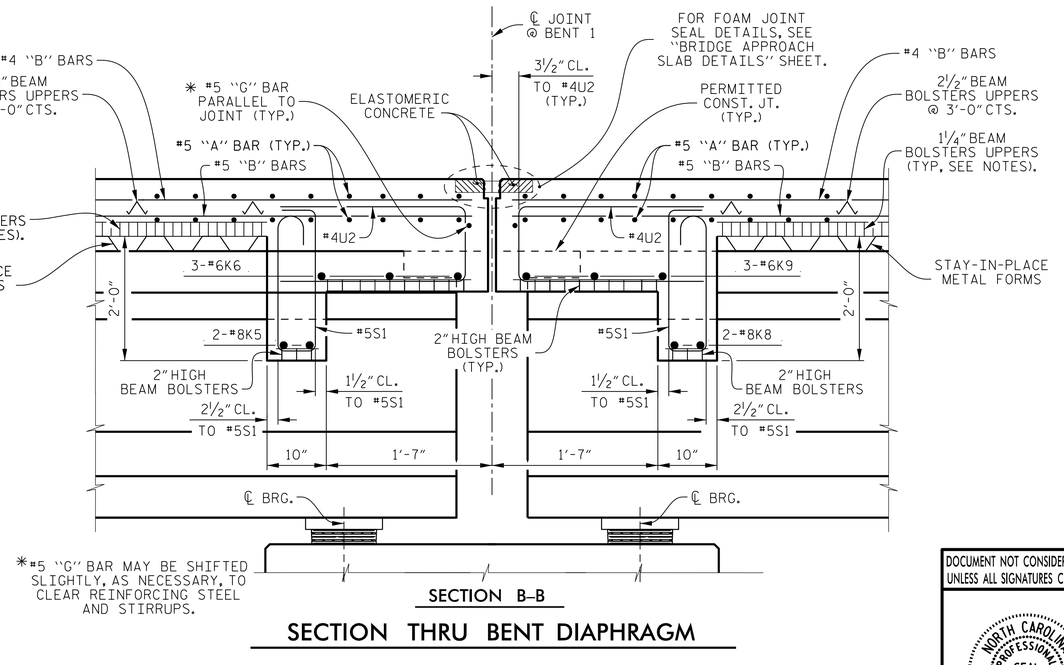
BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

FOR CONCRETE BARRIER RAIL DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.



SECTION A–A

SECTION THRU END BENT DIAPHRAGM



SECTION B–B

SECTION THRU BENT DIAPHRAGM

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 –RP_F–

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH

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8/11/2017

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2			4			31

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FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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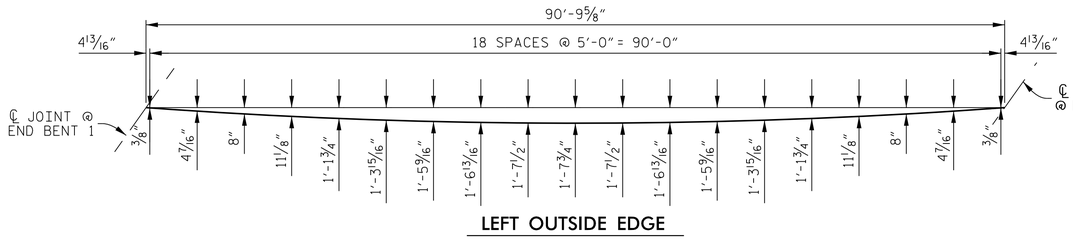
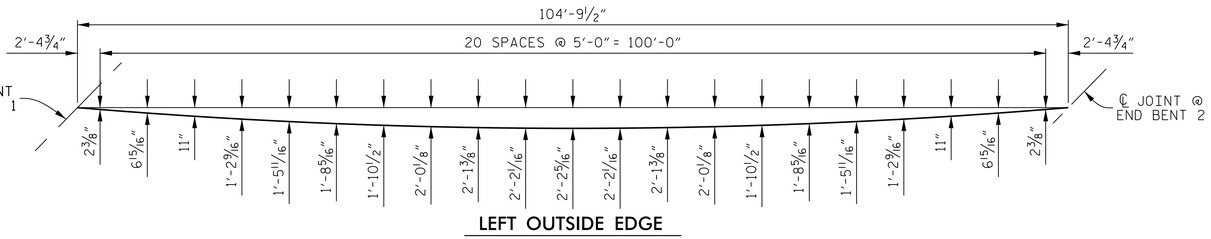


LEFT OUTSIDE EDGE



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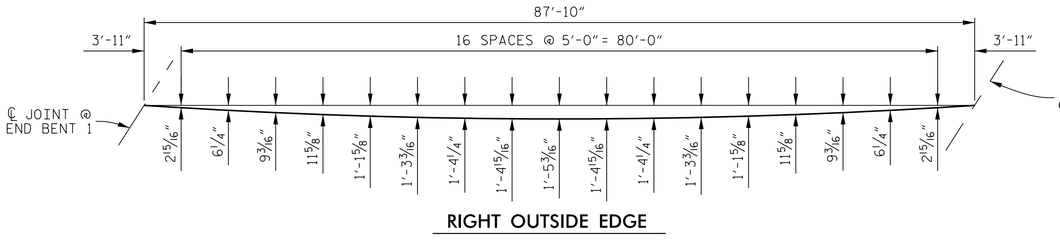

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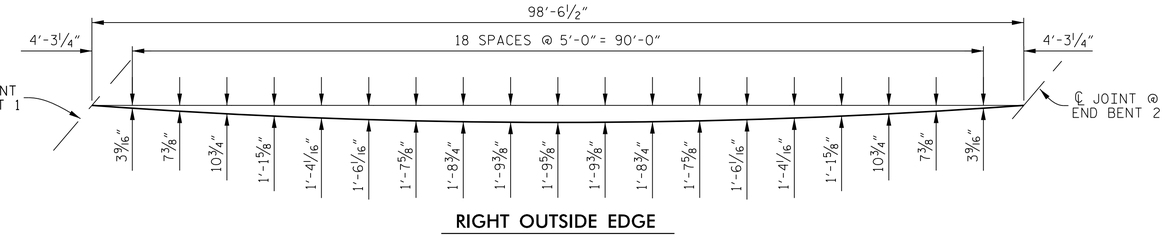
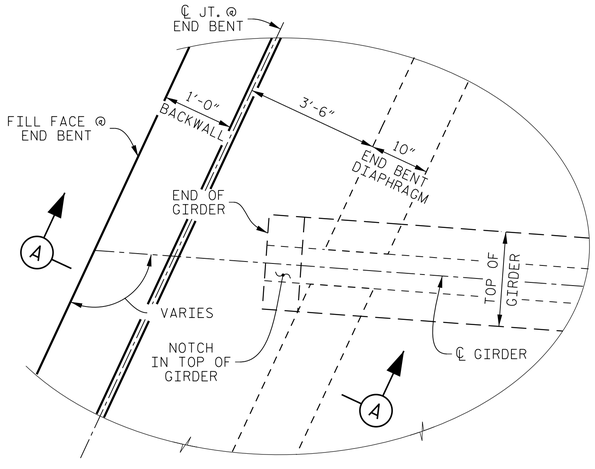


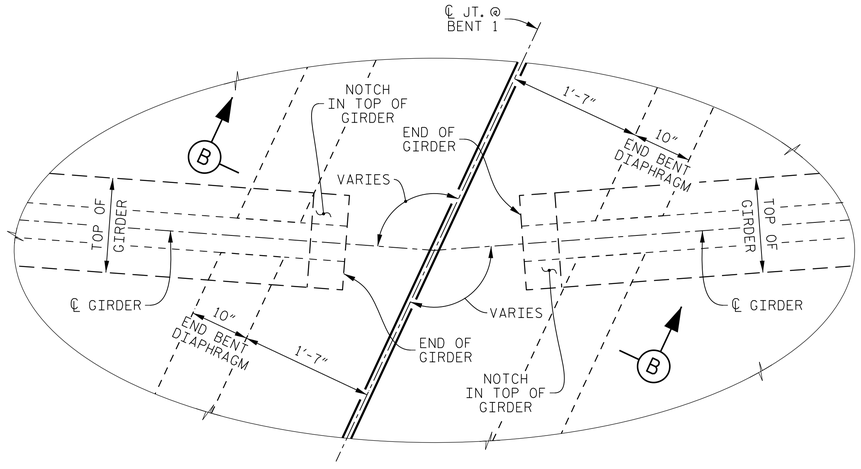
RIGHT OUTSIDE EDGE

ARC OFFSETS – SPAN A

ARC OFFSETS – SPAN B



PLAN OF DIAPHRAGM AT END BENT



PLAN OF DIAPHRAGM AT BENT 1

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 –RP_F–

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

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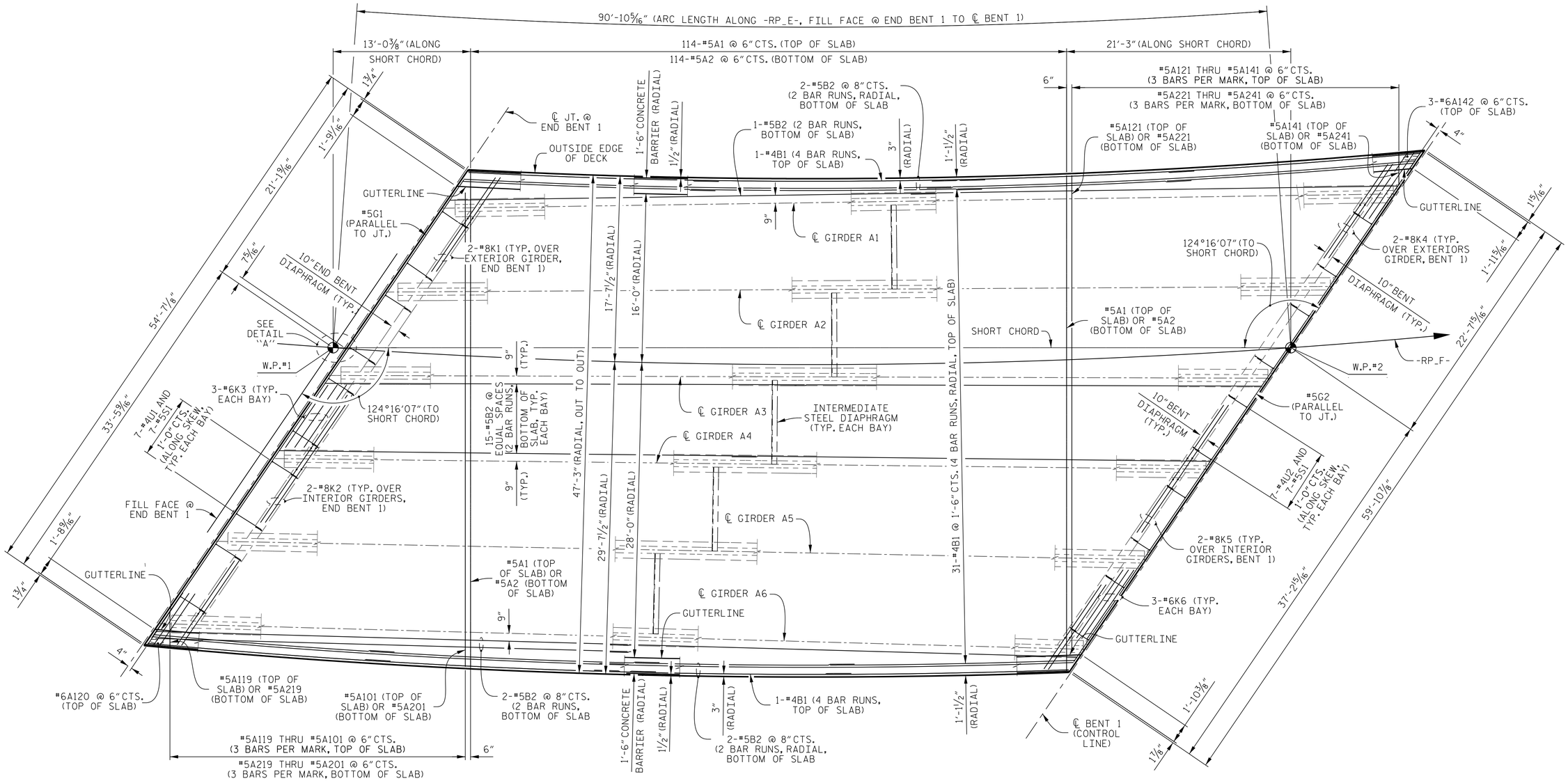
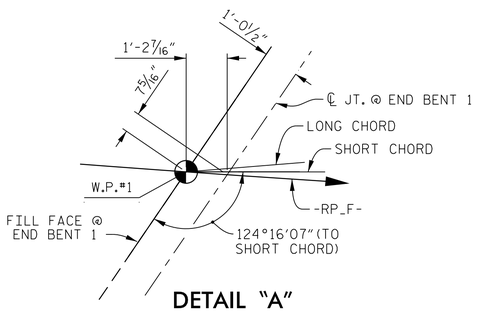
STR. #2



PLAN OF SPAN A



DETAIL "A"

NOTES

#5 "A" BARS SHALL BE PLACED PERPENDICULAR TO SHORT CHORD WITH A 2" MINIMUM CLEARANCE ON EACH END.

SPACING FOR "B" BARS IN TOP OF SLAB IS RADIAL TO -RP_F-.

FOR BARRIER RAIL REINFORCING STEEL LOCATION, SEE "CONCRETE BARRIER RAIL" SHEET.

FOR ARC OFFSETS, SEE "TYPICAL SECTION" SHEET 2 OF 2.

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 -RP_F-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A

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2			4			31

STR. #2

DRAWN BY : K. E. LOFTON DATE : 7-17
CHECKED BY : A. D. SHAH DATE : 7-17
DESIGN ENGINEER : S. PHAN DATE : 7-17

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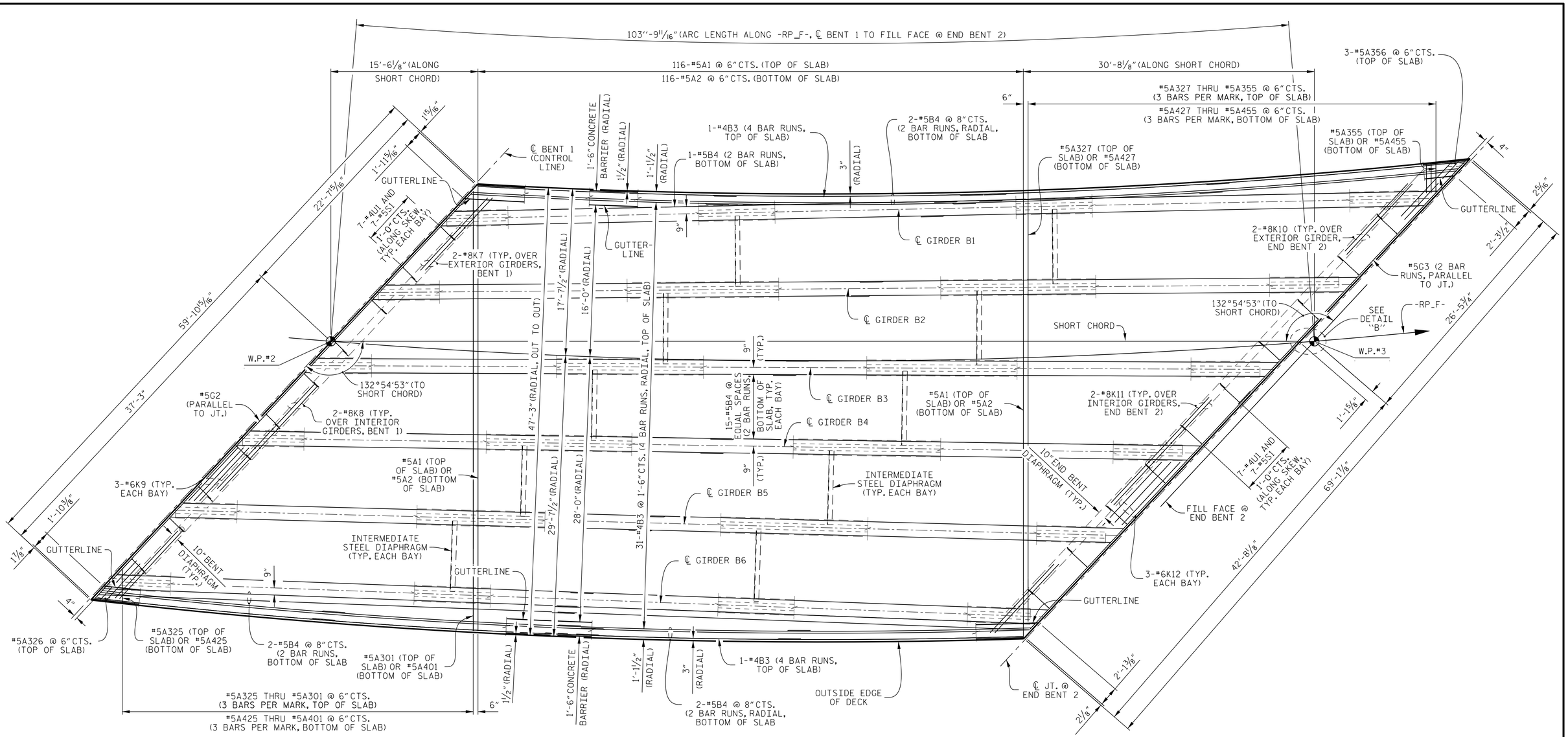
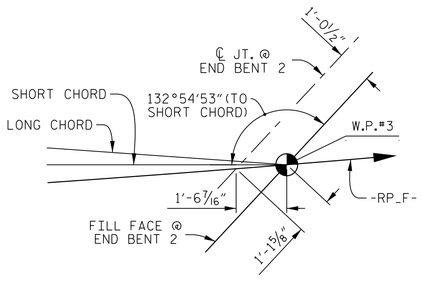


PLAN OF SPAN B



DETAIL "B"

NOTES

#5 "A" BARS SHALL BE PLACED PERPENDICULAR TO SHORT CHORD WITH A 2" MINIMUM CLEARANCE ON EACH END.

SPACING FOR "B" BARS IN TOP OF SLAB IS RADIAL TO -RP_F-.

FOR BARRIER RAIL REINFORCING STEEL LOCATION, SEE "CONCRETE BARRIER RAIL" SHEET.

FOR ARC OFFSETS, SEE "TYPICAL SECTION" SHEET 2 OF 2.

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 -RP_F-

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH

8/11/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN B

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S2-9
1			3			TOTAL SHEETS
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STR. #2

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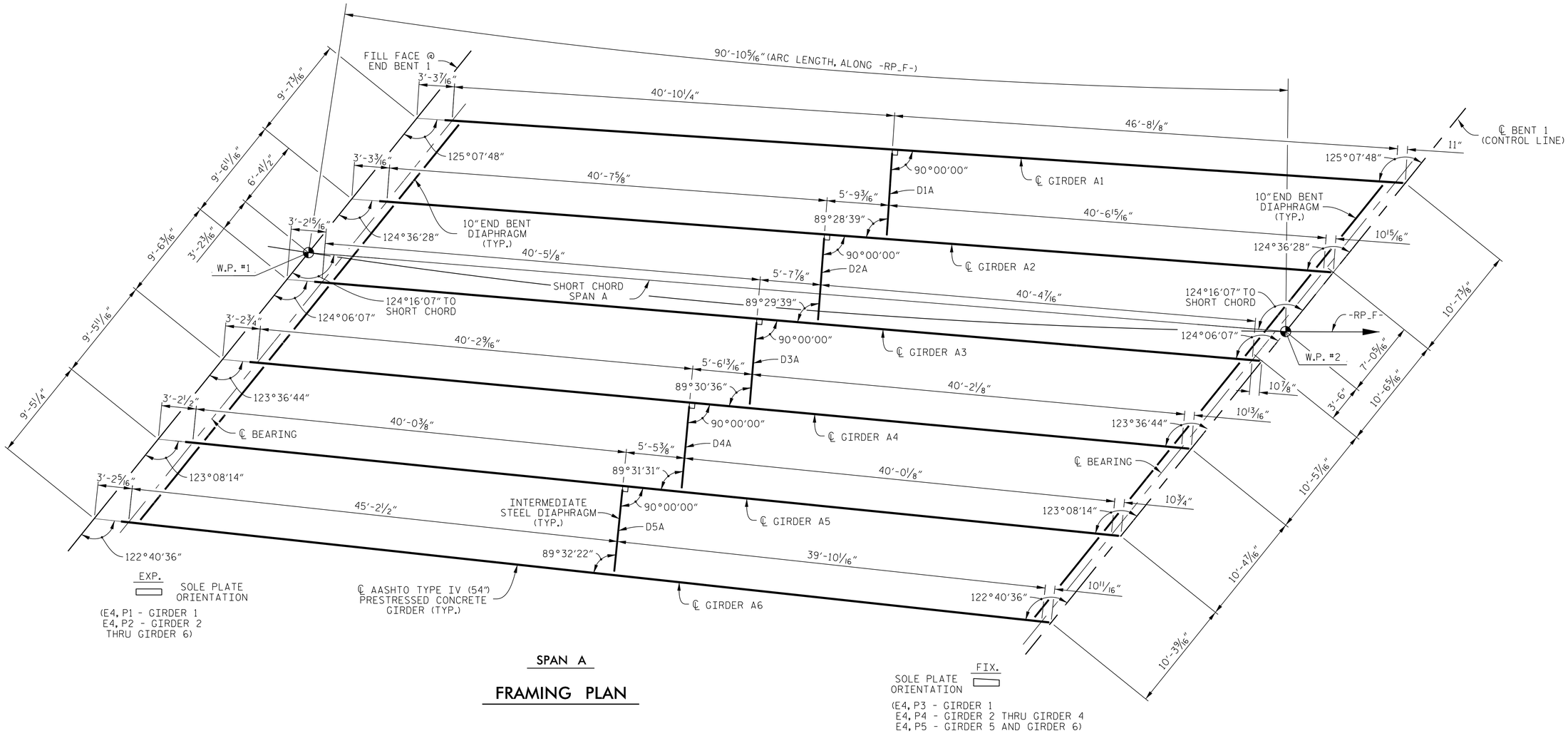

SPAN A

FRAMING PLAN

INTERMEDIATE STEEL DIAPHRAGM LENGTHS
D1A = 8'-3 5/8"
D2A = 8'-3 5/8"
D3A = 8'-9 9/16"
D4A = 8'-3 9/16"
D5A = 8'-3 1/2"

LOCATION	BEARING TO BEARING (ALONG CENTER GIRDER)
GIRDER A1	87'-6 3/8"
GIRDER A2	86'-11 3/4"
GIRDER A3	86'-5 7/16"
GIRBER A4	85'-11 1/2"
GIRDER A5	85'-5 7/8"
GIRDER A6	85'-0 9/16"

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 -RP_F-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN (SPAN A)

DRAWN BY : K. E. LOFTON DATE : 7-17
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DESIGN ENGINEER : S. PHAN DATE : 7-17

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8/11/2017

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S2-10
1			3			TOTAL SHEETS
2			4			31

STR. #2

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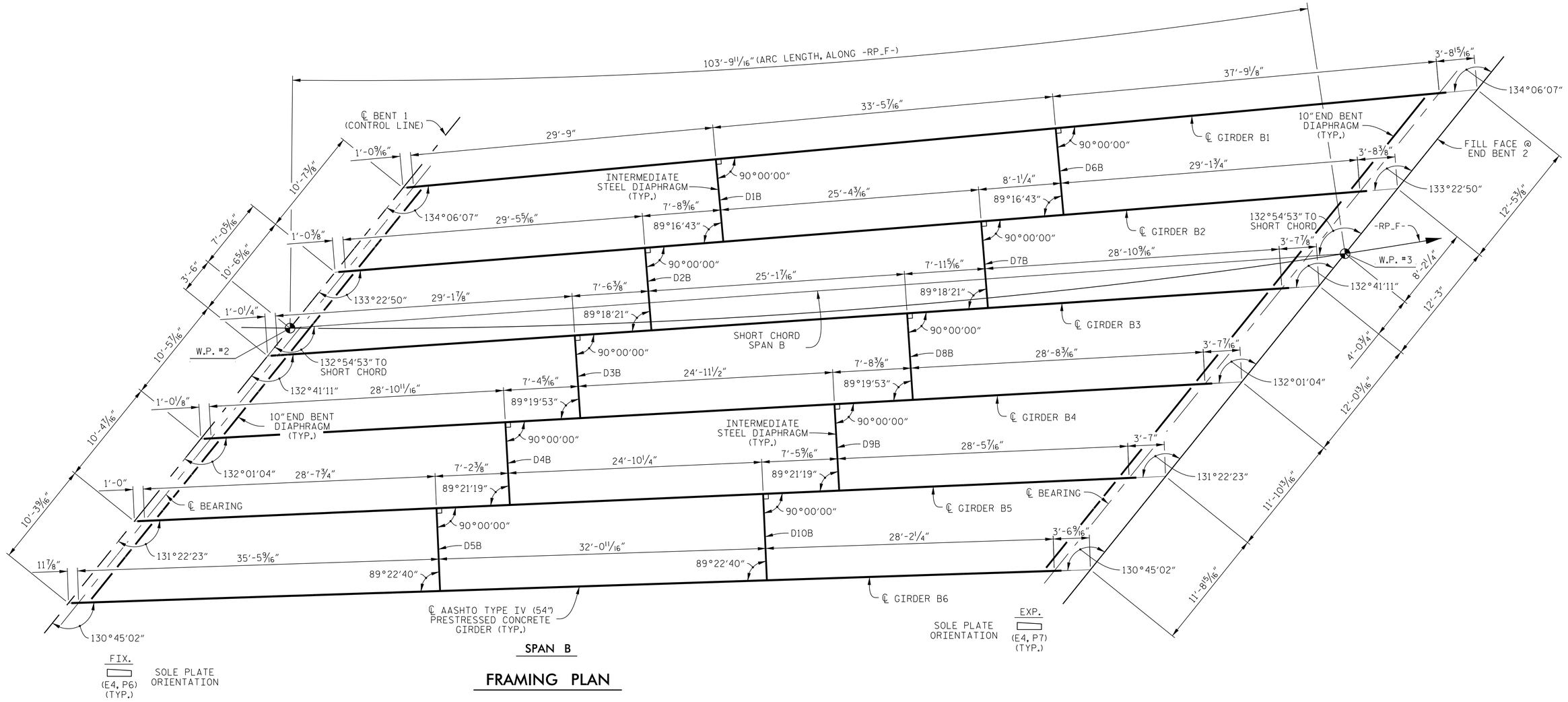

SPAN B

FRAMING PLAN

INTERMEDIATE STEEL DIAPHRAGM LENGTHS	
D1B = 8'-1 1/4"	D6B = 8'-6 5/16"
D2B = 8'-1 5/16"	D7B = 8'-6 1/8"
D3B = 8'-1 3/8"	D8B = 8'-5 15/16"
D4B = 8'-1 7/16"	D9B = 8'-5 3/4"
D5B = 8'-1 7/16"	D10B = 8'-5 5/8"

LOCATION	BEARING TO BEARING (ALONG CENTER GIRDER)
GIRDER B1	100'-11 9/16"
GIRDER B2	99'-9 1/16"
GIRDER B3	98'-7 5/8"
GIRBER B4	97'-7 1/16"
GIRDER B5	96'-7 3/8"
GIRDER B6	95'-8 1/2"

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 -RP_F-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN (SPAN B)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH

Digitally signed by Anupam D. Shah
8664D288C6904A4...
8/11/2017

DRAWN BY : K. E. LOFTON DATE : 7-17
CHECKED BY : A. D. SHAH DATE : 7-17
DESIGN ENGINEER : S. PHAN DATE : 7-17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S2-11
1			3			TOTAL SHEETS
2			4			31

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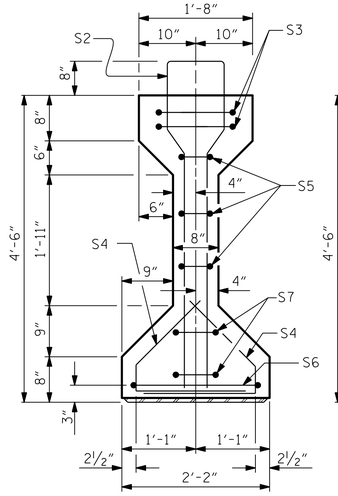


SECTION A–A

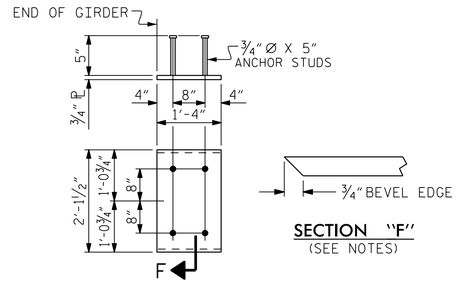
SECTION B–B

SECTION C–C
(S1 BARS NOT SHOWN)

AT END OF GIRDER

AT ℄ OF GIRDER

26 – 0.6" Ø LOW RELAXATION STRAND LAYOUT

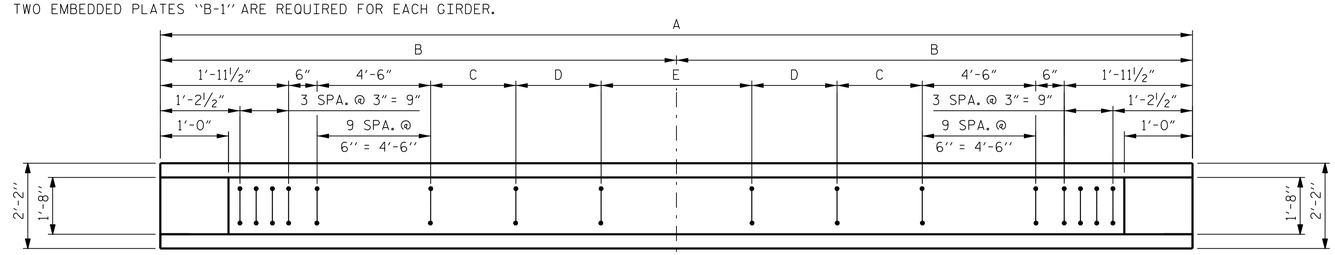


SECTION "F"
(SEE NOTES)

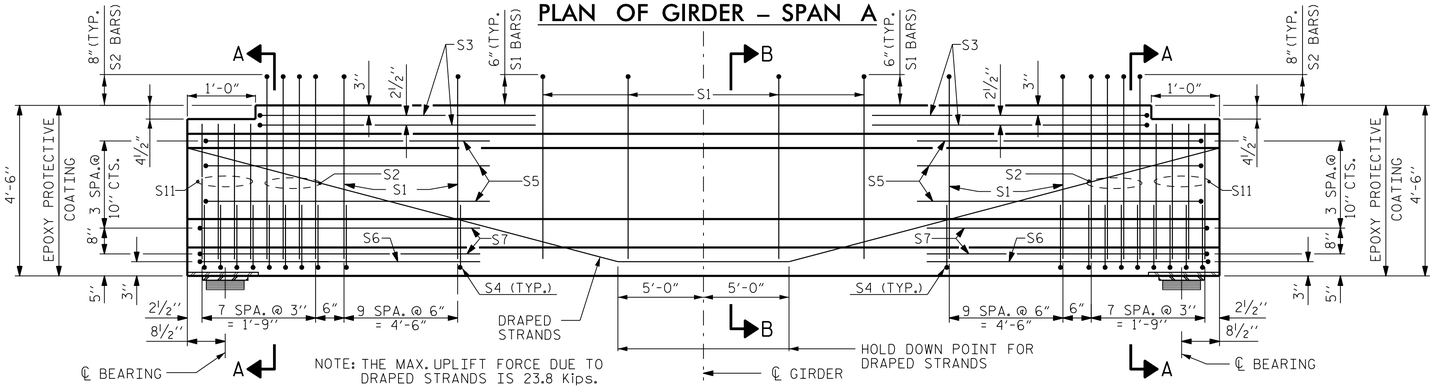
EMBEDDED PLATE "B–1" DETAILS

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

GIRDER	A	B	C	D	E	REINFORCING STEEL (LBS.)	7500 PSI CONCRETE (C.Y.)
A1	88'-11⅜"	44'-5¹¹⁄₁₆"	2 SPA. @ 1'-0"	1'-6⅜"	34 SPA. @ 2'-0"	1192	18.0
A2	88'-4¹¹⁄₁₆"	44'-2⅜"	2 SPA. @ 1'-0"	1'-2⅞"	34 SPA. @ 2'-0"	1240	17.9
A3	87'-10⁷⁄₁₆"	43'-11¼"	2 SPA. @ 1'-0"	1'-11¹¹⁄₁₆"	33 SPA. @ 2'-0"	1229	17.8
A4	87'-4⁹⁄₁₆"	43'-8¼"	2 SPA. @ 1'-0"	1'-8¾"	33 SPA. @ 2'-0"	1229	17.7
A5	86'-10¹⁵⁄₁₆"	43'-5⅜"	2 SPA. @ 1'-0"	1'-5¹⁵⁄₁₆"	33 SPA. @ 2'-0"	1229	17.6
A6	86'-5½"	43'-2¾"	2 SPA. @ 1'-0"	1'-3⅝"	33 SPA. @ 2'-0"	1189	17.5
TOTAL = 525'-11½"						TOTAL = 7,300	TOTAL = 106.5



PLAN OF GIRDER – SPAN A



NOTE: THE MAX. UPLIFT FORCE DUE TO DRAPED STRANDS IS 23.8 Kips.

ELEVATION OF GIRDER – SPAN A

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

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.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES.

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. (GDRS. A1 & A2; GDRS. A3 - A6)

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

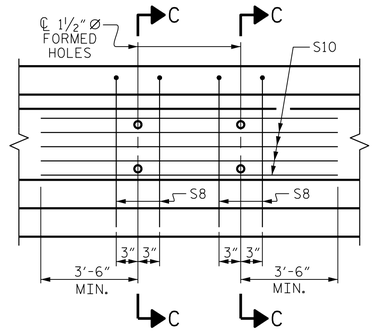
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 7500 PSI. (GDRS. A1 & A6; GDRS. A2 - A5)

DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER. (GDRS. A1 & A6; GDRS. A2 - A5)

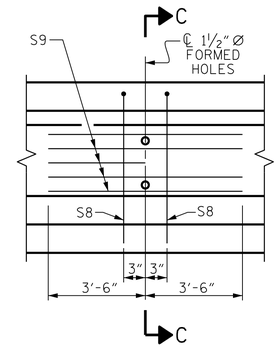
THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF ¼" EXCEPT IN THE AREA BETWEEN THE STIRRUP AND THE EDGE OF THE GIRDER.

WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN ½" OF THE THEORETICAL LOCATION SHOWN.

FOR EMBEDDED CLIPS FOR PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR GIRDERS A2, A3, A4 & A5



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR GIRDERS A1 & A6

0.6" Ø L. R. GRADE 270 STRANDS

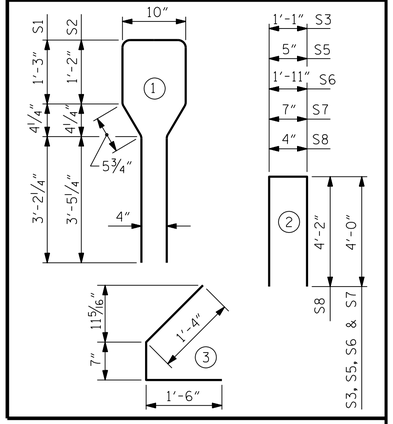
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	59	#5	1	10'-8"	656
S1	58	#5	1	10'-8"	645
S2	8	#6	1	11'-0"	133
S3	4	#4	2	9'-1"	24
S4	72	#4	3	3'-5"	164
S5	6	#4	2	8'-5"	34
S6	2	#4	2	9'-11"	13
S7	4	#4	2	8'-7"	23
S8	2	#5	2	8'-8"	18
S8	4	#5	2	8'-8"	36
S9	5	#5	STR.	7'-0"	37
S10	5	#5	STR.	12'-1"	67
S11	16	#6	STR.	3'-9"	90

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



PROJECT NO. I–4729A

POLK COUNTY

STATION: 21+44.22 –RP_F–

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER SPAN A

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
Docusigned by: 866402B8C2B0497...
8/11/2017

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S2–12
1			3			TOTAL SHEETS
2			4			31

STR. #2

DRAWN BY : T. DETMERS DATE : 7–17
CHECKED BY : D. DELK DATE : 7–17
DESIGN ENGINEER : S. PHAN DATE : 7–17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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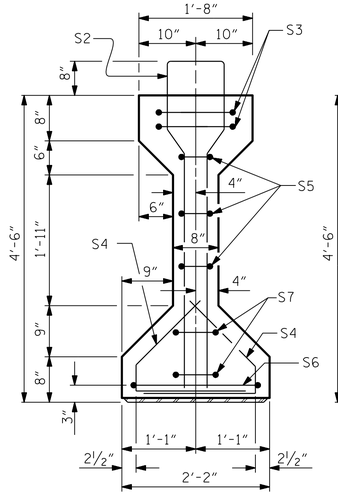
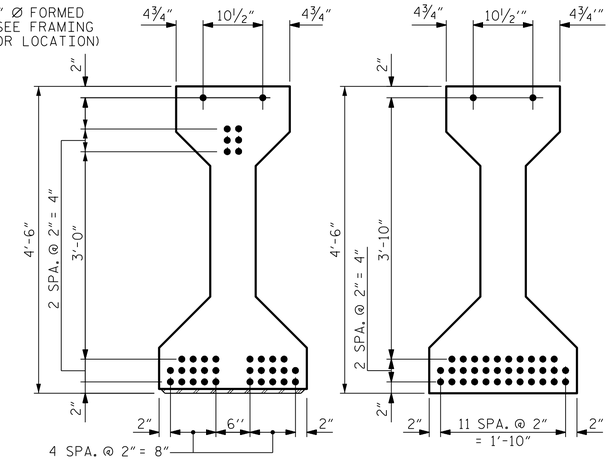


SECTION A–A

SECTION B–B

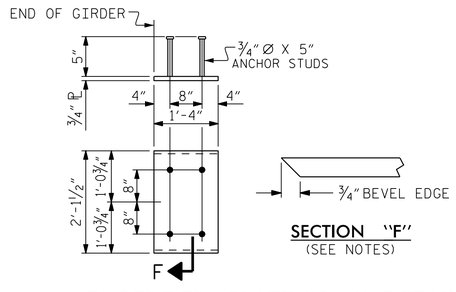
SECTION C–C
(S1 BARS NOT SHOWN)



AT END OF GIRDER

AT ℄ OF GIRDER

36 – 0.6" Ø LOW RELAXATION STRAND LAYOUT

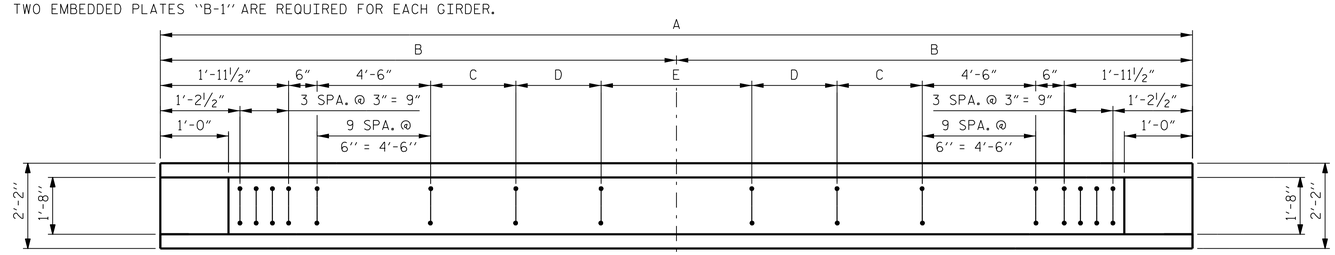


SECTION "F"
(SEE NOTES)

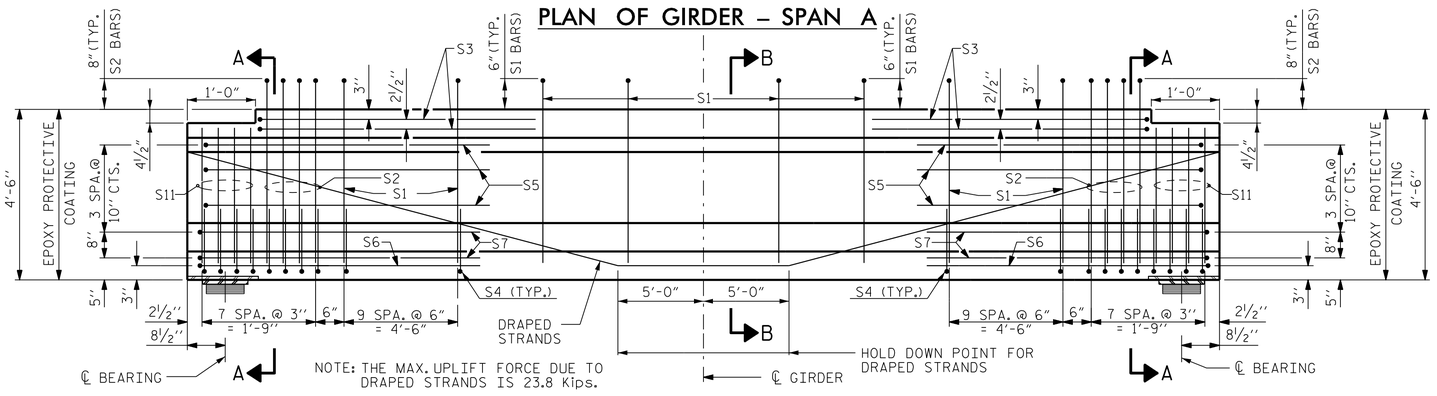
EMBEDDED PLATE "B–1" DETAILS

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

GIRDER	A	B	C	D	E	REINFORCING STEEL (LBS.)	7500 PSI CONCRETE (C.Y.)
B1	102'-4 9/16"	51'-2 1/4"	2 SPA. @ 1'-0"	1'-2¾"	41 SPA. @ 2'-0"	1324	20.7
B2	101'-2 1/16"	50'-7 1/16"	2 SPA. @ 1'-0"	1'-7 9/16"	40 SPA. @ 2'-0"	1435	20.5
B3	100'-0 5/8"	50'-0 3/8"	2 SPA. @ 1'-0"	1'-0¾"	40 SPA. @ 2'-0"	1435	20.3
B4	99'-0 1/8"	49'-6"	2 SPA. @ 1'-0"	1'-6 9/16"	39 SPA. @ 2'-0"	1424	20.0
B5	98'-0 3/8	49'-0 1/4"	2 SPA. @ 1'-0"	1'-0¾"	39 SPA. @ 2'-0"	1424	19.9
B6	97'-1 1/16"	48'-6¾"	2 SPA. @ 1'-0"	1'-7 1/4"	38 SPA. @ 2'-0"	1291	19.7
TOTAL = 597'-9 1/4"						TOTAL = 8,333	TOTAL = 121.1



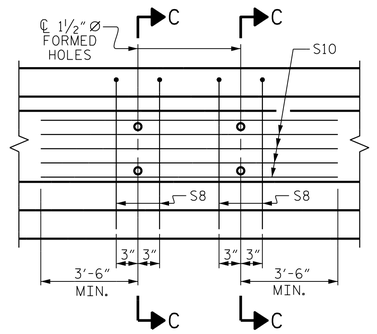
PLAN OF GIRDER – SPAN A



NOTE: THE MAX. UPLIFT FORCE DUE TO DRAPED STRANDS IS 23.8 Kips.

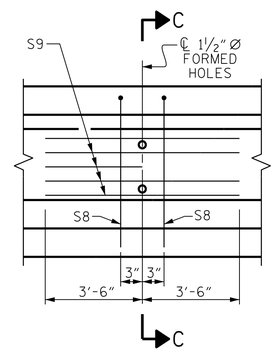
ELEVATION OF GIRDER – SPAN A

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR GIRDERS A2, A3, A4 & A5



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR GIRDERS A1 & A6

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.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES.

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.

GDR. B1
GDRS. B2 & B3
GDRS. B4 & B5
GDR. B6

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 7500 PSI.

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

GDRS. B1 & B6
GDRS. B2 - B5
GDRS. B1 & B6
GDRS. B2 - B5

THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF ¼" EXCEPT IN THE AREA BETWEEN THE STIRRUP AND THE EDGE OF THE GIRDER.

WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN ½" OF THE THEORETICAL LOCATION SHOWN.

FOR EMBEDDED CLIPS FOR PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

0.6" Ø L. R. GRADE 270 STRANDS

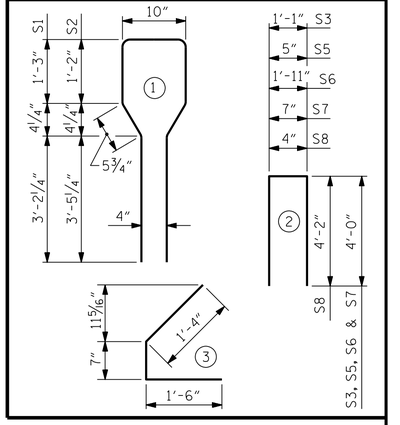
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	66	#5	1	10'-8"	734
S1	65	#5	1	10'-8"	723
S1	64	#5	1	10'-8"	712
S1	63	#5	1	10'-8"	701
S2	8	#6	1	11'-0"	133
S3	4	#4	2	9'-1"	24
S4	72	#4	3	3'-5"	164
S5	6	#4	2	8'-5"	34
S6	2	#4	2	9'-11"	13
S7	4	#4	2	8'-7"	23
S8	2	#5	2	8'-8"	18
S8	4	#5	2	8'-8"	36
S9	5	#5	STR.	7'-0"	73
S10	5	#5	STR.	15'-2"	159
S11	16	#6	STR.	3'-9"	90

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



PROJECT NO. I–4729A

POLK COUNTY

STATION: 21+44.22 –RP_F–

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER SPAN B

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
DocuSigned by: Anupam Shah 8664D2B8C8D94EF...
8/11/2017

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S2–13
1			3			TOTAL SHEETS
2			4			31

STR. #2

DRAWN BY :	T. DETMERS	DATE :	7–17
CHECKED BY :	D. DELK	DATE :	7–17
DESIGN ENGINEER :	S. PHAN	DATE :	7–17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606–3386
NC LICENSE No. F–0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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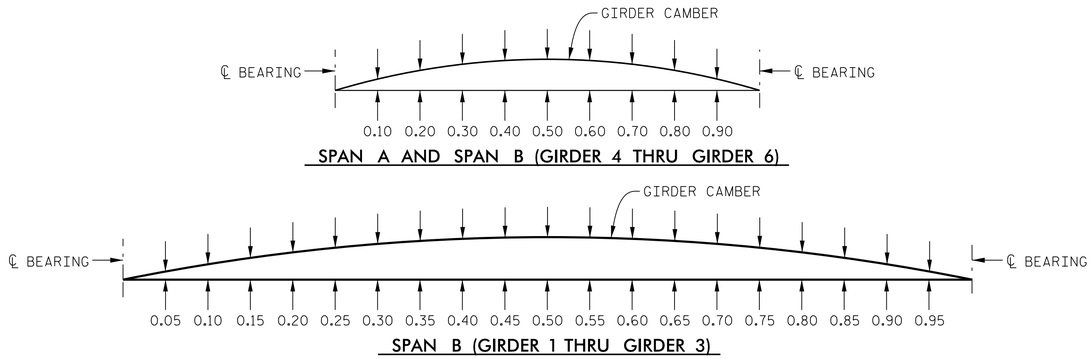
CAMBER AND DEAD LOAD DEFLECTIONS

	SPAN A										
GIRDERS 1 AND 6	℄ BRG.	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	℄ BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.035	0.067	0.091	0.107	0.112	0.107	0.091	0.067	0.035	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. *	0.000	0.080	0.154	0.219	0.258	0.271	0.258	0.219	0.154	0.080	0.000
FINAL CAMBER	0	9/16"	1 1/16"	1 1/2"	1 13/16"	1 7/8"	1 13/16"	1 1/2"	1 1/16"	9/16"	0
GIRDERS 2 THRU 5	℄ BRG.	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	℄ BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.035	0.067	0.091	0.107	0.112	0.107	0.091	0.067	0.035	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. *	0.000	0.078	0.154	0.213	0.251	0.264	0.251	0.213	0.154	0.078	0.000
FINAL CAMBER	0	1/2"	1 1/16"	1 7/16"	1 3/4"	1 13/16"	1 3/4"	1 7/16"	1 1/16"	1/2"	0



GIRDER CAMBER AND DEFLECTIONS

CAMBER AND DEAD LOAD DEFLECTIONS

	SPAN B																				
GIRDERS 1	℄ BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	℄ BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.036	0.072	0.104	0.136	0.161	0.186	0.201	0.217	0.223	0.228	0.223	0.217	0.201	0.186	0.161	0.136	0.104	0.072	0.036	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. *	0.000	0.074	0.147	0.218	0.289	0.345	0.400	0.436	0.471	0.483	0.495	0.483	0.471	0.436	0.400	0.345	0.289	0.218	0.147	0.074	0.000
FINAL CAMBER	0	7/16"	7/8"	1 3/8"	1 13/16"	2 3/16"	2 9/16"	2 13/16"	3 1/16"	3 1/8"	3 3/16"	3 1/8"	3 1/16"	2 13/16"	2 9/16"	2 3/16"	1 13/16"	1 3/8"	7/8"	7/16"	0
GIRDERS 2	℄ BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	℄ BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.036	0.071	0.103	0.135	0.160	0.185	0.201	0.217	0.222	0.228	0.222	0.217	0.201	0.185	0.160	0.135	0.103	0.071	0.036	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. *	0.000	0.071	0.142	0.210	0.278	0.332	0.385	0.420	0.454	0.465	0.477	0.465	0.454	0.420	0.385	0.332	0.278	0.210	0.142	0.071	0.000
FINAL CAMBER	0	7/16"	13/16"	1 1/4"	1 11/16"	2 1/16"	2 3/8"	2 5/8"	2 7/8"	2 15/16"	3"	2 15/16"	2 7/8"	2 5/8"	2 3/8"	2 1/16"	1 11/16"	1 1/4"	13/16"	7/16"	0
GIRDERS 3	℄ BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	℄ BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.036	0.071	0.103	0.135	0.159	0.184	0.200	0.216	0.221	0.227	0.221	0.216	0.200	0.184	0.159	0.135	0.103	0.071	0.036	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. *	0.000	0.066	0.132	0.196	0.260	0.311	0.361	0.393	0.425	0.436	0.446	0.436	0.425	0.393	0.361	0.311	0.260	0.196	0.132	0.066	0.000
FINAL CAMBER	0	3/8"	3/4"	1 1/8"	1 1/2"	1 13/16"	2 1/8"	2 5/16"	2 1/2"	2 9/16"	2 5/8"	2 9/16"	2 1/2"	2 5/16"	2 1/8"	1 13/16"	1 1/2"	1 1/8"	3/4"	3/8"	0

CAMBER AND DEAD LOAD DEFLECTIONS

	SPAN B										
GIRDERS 4	℄ BRG.	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	℄ BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.071	0.134	0.183	0.215	0.226	0.215	0.183	0.134	0.071	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. *	0.000	0.126	0.249	0.345	0.406	0.427	0.406	0.345	0.249	0.126	0.000
FINAL CAMBER	0	11/16"	1 3/8"	1 15/16"	2 5/16"	2 7/16"	2 5/16"	1 15/16"	1 3/8"	11/16"	0
GIRDERS 5	℄ BRG.	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	℄ BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.071	0.133	0.182	0.214	0.224	0.214	0.182	0.133	0.071	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. *	0.000	0.124	0.243	0.337	0.397	0.417	0.397	0.337	0.243	0.124	0.000
FINAL CAMBER	0	5/8"	1 5/16"	1 7/8"	2 3/16"	2 5/16"	2 3/16"	1 7/8"	1 5/16"	5/8"	0
GIRDERS 6	℄ BRG.	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	℄ BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.070	0.133	0.182	0.213	0.223	0.213	0.182	0.133	0.070	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. *	0.000	0.134	0.263	0.365	0.430	0.450	0.430	0.365	0.263	0.134	0.000
FINAL CAMBER	0	3/4"	1 9/16"	2 3/16"	2 5/8"	2 11/16"	2 5/8"	2 3/16"	1 9/16"	3/4"	0

* INCLUDES FUTURE WEARING SURFACE.

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

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 -RP_F-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS AND CAMBER TABLES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
DocuSigned by: Anupam Shah 866402B8C8B3BBF...
8/11/2017

DRAWN BY : K. E. LOFTON DATE : 7-17
CHECKED BY : A. D. SHAH DATE : 7-17
DESIGN ENGINEER : S. PHAN DATE : 7-17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S2-14
1			3			TOTAL SHEETS
2			4			31

STR. #2

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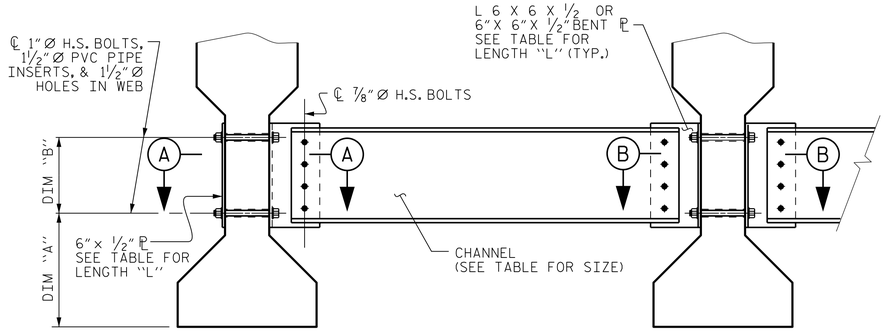
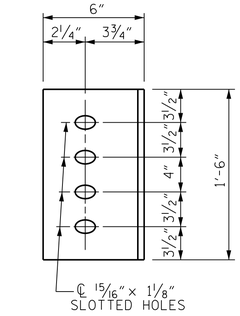


EXTERIOR GIRDER INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM

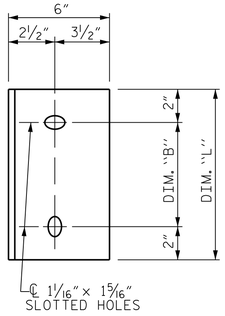
(TYPE IV GIRDER SHOWN)

TABLE				
GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9½"	1'-2"	1'-6"



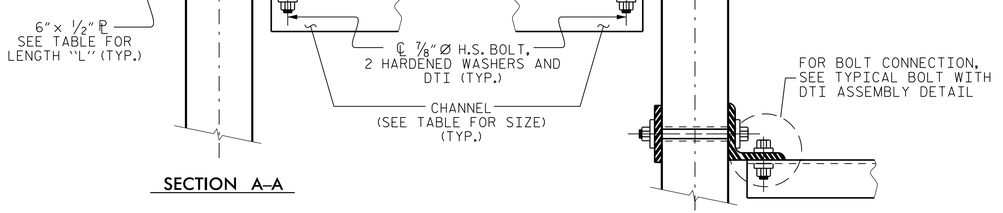
DIAPHRAGM FACE

(TYPE III OR TYPE IV GDR.)



WEB FACE

CONNECTOR PLATE DETAILS



SECTION A–A

SECTION B–B

CONNECTION DETAILS

(FOR SKEW > 110°)

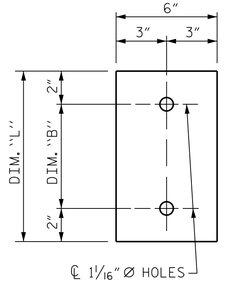
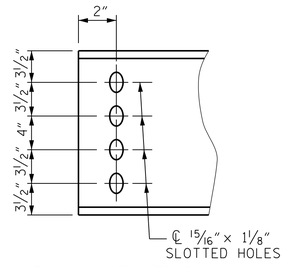
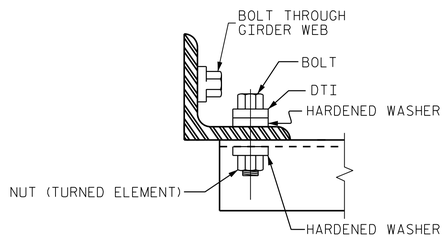


PLATE DETAILS



CHANNEL END

(TYPE III OR TYPE IV GDR.)



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. I-4729A

POLK COUNTY

STATION: 21+44.22 –RP_F–

FILE: i:\i-4729a\structures\plans\final\i-4129A_smu_str2_det1.dgn
DATE: 8/11/2017 12:19:40 AM

ASSEMBLED BY : K.E.LOFTON	DATE : 7-17		
CHECKED BY : A.D.SHAH	DATE : 7-17		
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/MG		

DRAWN BY : K. E. LOFTON	DATE : 7-17	
CHECKED BY : A. D. SHAH	DATE : 7-17	
DESIGN ENGINEER : S. PHAN	DATE : 7-17	

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANKUR D. SHAH
Docusigned by: Ankur Shah
8664D2B6C05B4A4...
8/11/2017

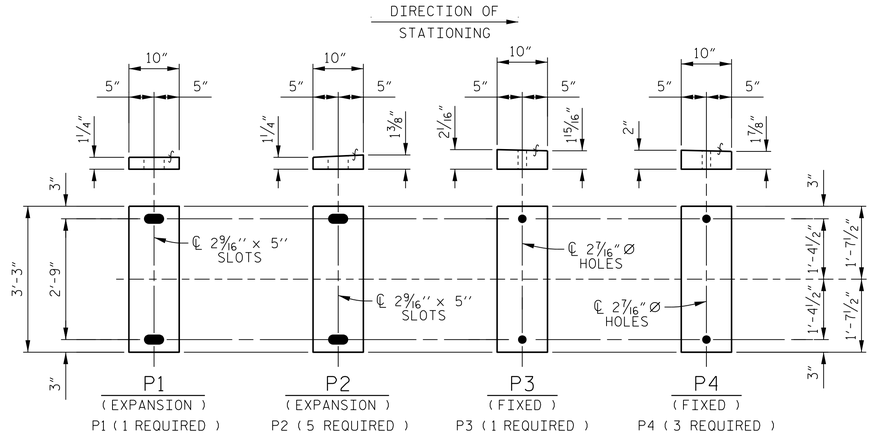
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

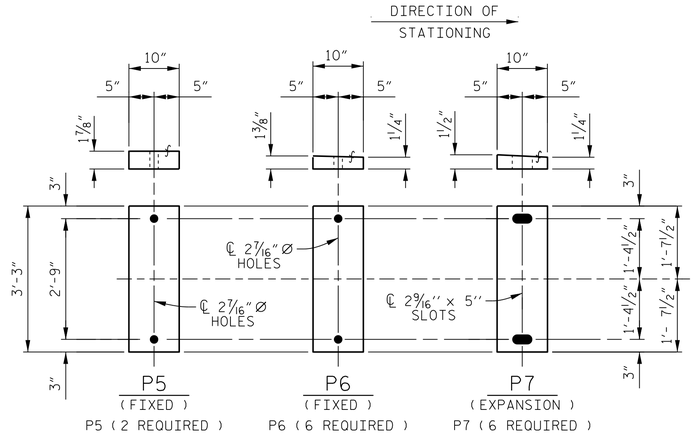
STANDARD

INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS

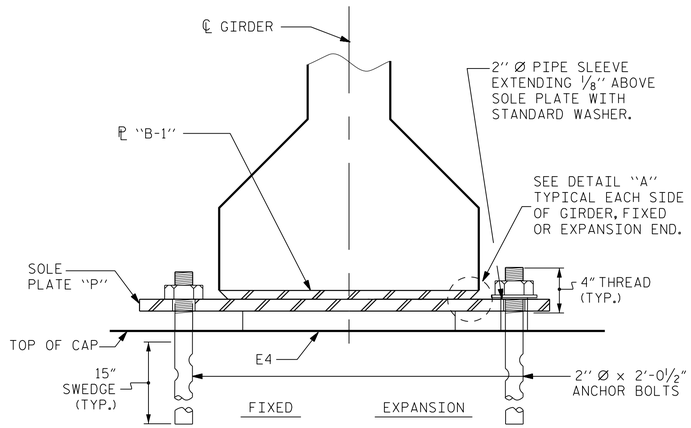
REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S2-15
1			3			TOTAL SHEETS
2			4			31

STD.No.PCG10 STR. #2

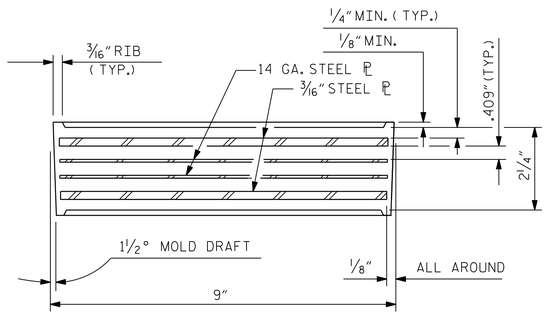




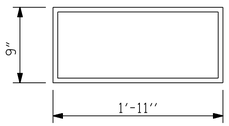
SOLE PLATE DETAILS (''P'')



SECTION E–E

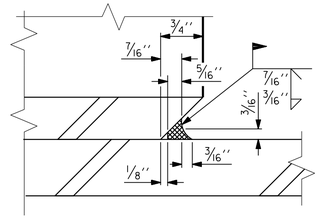


TYPICAL SECTION OF ELASTOMERIC BEARINGS

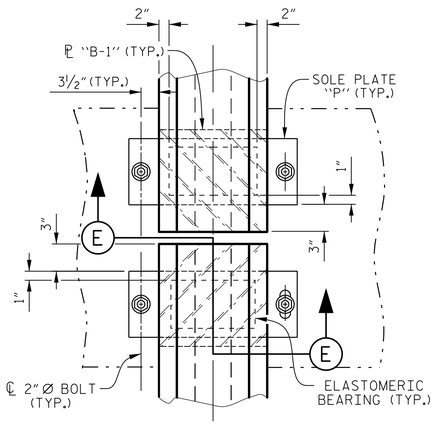


E4 (24 REQUIRED)

PLAN VIEW OF ELASTOMERIC BEARING



DETAIL ''A''



TYPICAL HALF–PLAN
(SHOWING FIXED BEARING)

TYPICAL HALF–PLAN
(SHOWING EXPANSION 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.

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

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

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

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

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

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

LOAD RATINGS	
	MAX. D.L.+ L.L.
54" PCG – TYPE V	365 K

PROJECT NO. I–4729A

POLK COUNTY

STATION: 21+44.22 –RP_F–

ASSEMBLED BY :	K. E. LOFTON	DATE :	7-17		
CHECKED BY :	A. D. SHAH	DATE :	7-17		
DRAWN BY : WJH	8/89	REV. 10/1/11	MAA/GM		
CHECKED BY : CRK	8/89	REV. 6/13	AAC/MAA		
		REV. 1/15	MAA/TMG		

DRAWN BY :	K. E. LOFTON	DATE :	7–17
CHECKED BY :	A. D. SHAH	DATE :	7–17
DESIGN ENGINEER :	S. PHAN	DATE :	7–17

PLANS PREPARED BY :
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NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER MAURAY D. SHAH
Docusigned by: Mauray Shah 8664D2B8C5E54A4...
8/11/2017

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:	S2–16
1			3			TOTAL SHEETS
2			4			31

STD. No. EB3 STR. #2

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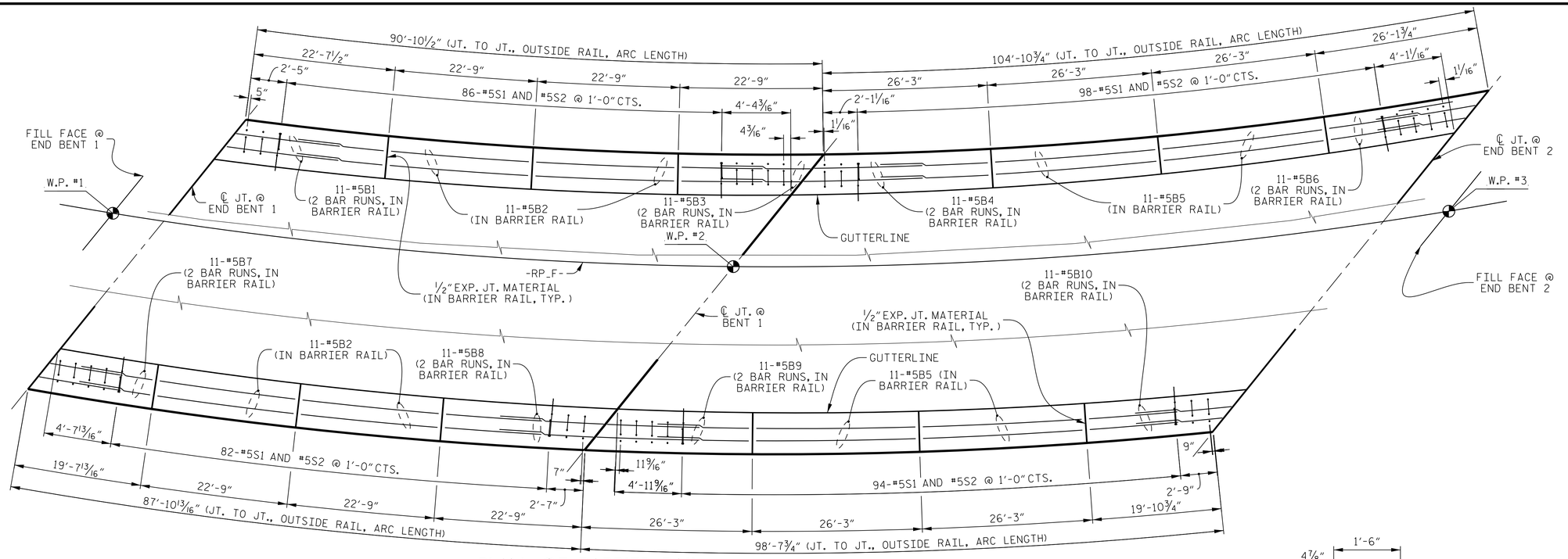


PLAN OF BARRIER RAIL

NOTES

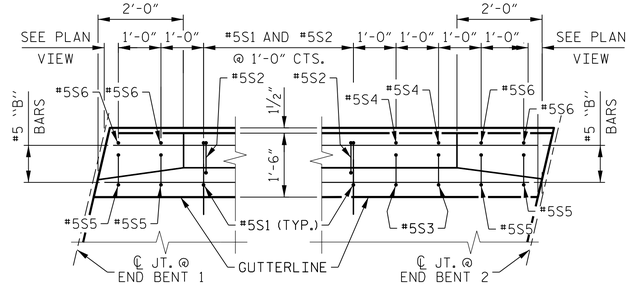
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5S3, #5S4, #5S5 AND #5S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5S3, #5S4, #5S5 AND #5S6 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

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



PLAN @ END BENT 1

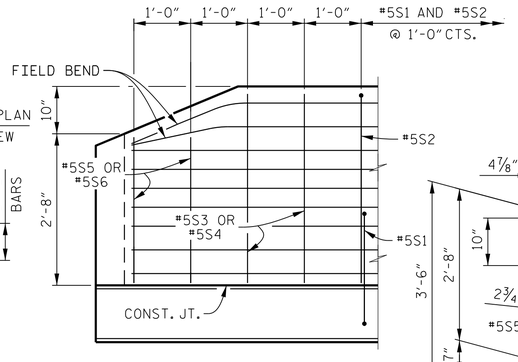
LEFT SIDE SHOWN, RIGHT SIDE SIMILAR TO END BENT 2

PLAN @ END BENT 2

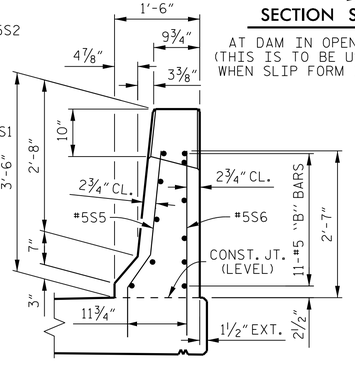
LEFT SIDE SHOWN, RIGHT SIDE SIMILAR TO END BENT 1

END OF RAIL DETAILS

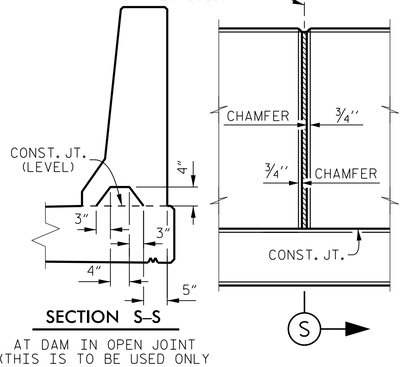
FOR SAWED JOINTS



ELEVATION VIEW



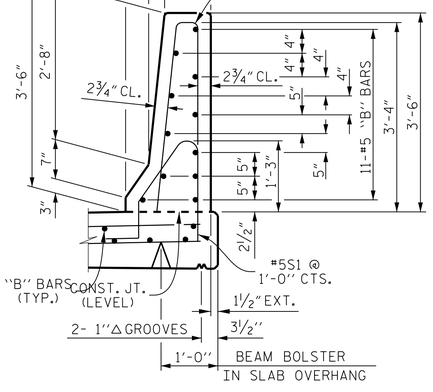
END VIEW



SECTION S–S

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

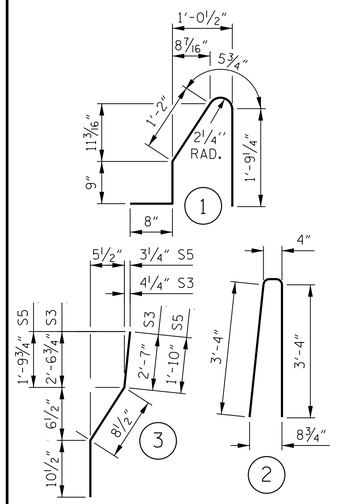
ELEVATION AT EXPANSION JOINTS



SECTION THRU RAIL

BARRIER RAIL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
✳ B1	22	#5	STR	13'- 4"	306
✳ B2	44	#5	STR	22'- 5"	1029
✳ B3	22	#5	STR	12'- 11"	296
✳ B4	22	#5	STR	15'- 4"	352
✳ B5	44	#5	STR	25'- 11"	1189
✳ B6	22	#5	STR	14'- 7"	335
✳ B7	22	#5	STR	11'- 7"	266
✳ B8	22	#5	STR	13'- 6"	342
✳ B9	22	#5	STR	14'- 11"	337
✳ B10	22	#5	STR	12'- 3"	281
✳ S1	364	#5	1	4'-10"	1835
✳ S2	364	#5	2	7'- 0"	2658
✳ S3	4	#5	3	4'- 2"	17
✳ S4	4	#5	STR	4'- 0"	17
✳ S5	8	#5	3	3'- 5"	29
✳ S6	8	#5	STR	3'- 3"	27

✳ EPOXY COATED REINFORCING STEEL	9,289 LBS.
CLASS "AA" CONCRETE	52.1 CU. YDS.
CONCRETE BARRIER RAIL	382.4 LIN. FT.

SPLICE LENGTH

BAR	SIZE	LENGTH
B1,B3,B4,B6,B7,B8,B9,B10	#5	3'-5"

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 –RP_F–

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

CONCRETE BARRIER RAIL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/11/2017

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S2-17
1			3			TOTAL SHEETS
2			4			31

STD. No. CBR1 STR. #2

ASSEMBLED BY : CLAREY/DETMERS DATE : 7-17
CHECKED BY : D. PRETORIUS DATE : 7-17

DRAWN BY : ARB 5/87	REV. 10/1/11	MAA/GM
CHECKED BY : SJD 9/87	REV. 7/12	MAA/GM
	REV. 6/13	MAA/GM

DRAWN BY : M. CLAREY / T. DETMERS DATE : 7-17
CHECKED BY : D. PRETORIUS DATE : 7-17
DESIGN ENGINEER : D. PRETORIUS DATE : 7-17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

FILE: i:\i-4729a\structures\comp 1 final dgns from orlando\i-4729a_smu_sh2_br1.dgn
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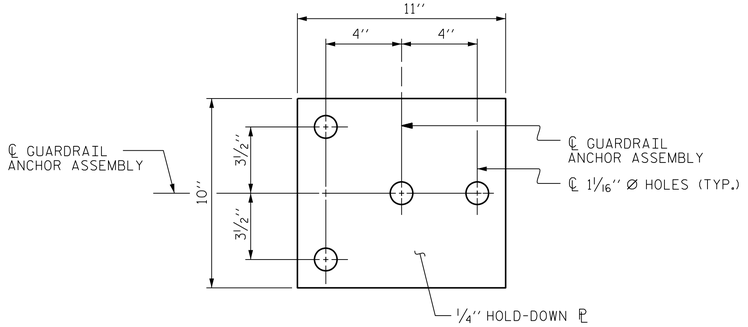
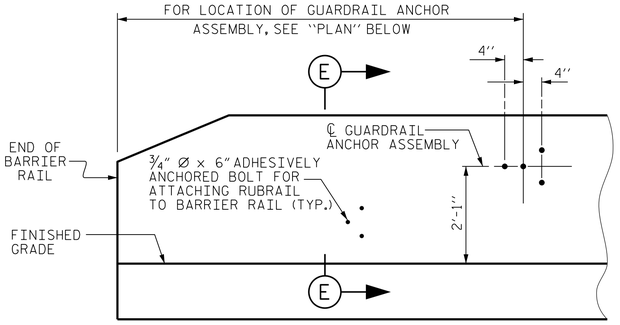


PLAN



ELEVATION

(END BENT 1 SHOWN, END BENT 2 SIMILAR)

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼'' HOLD DOWN PLATE AND 4 - ⅞'' Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅞'' Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

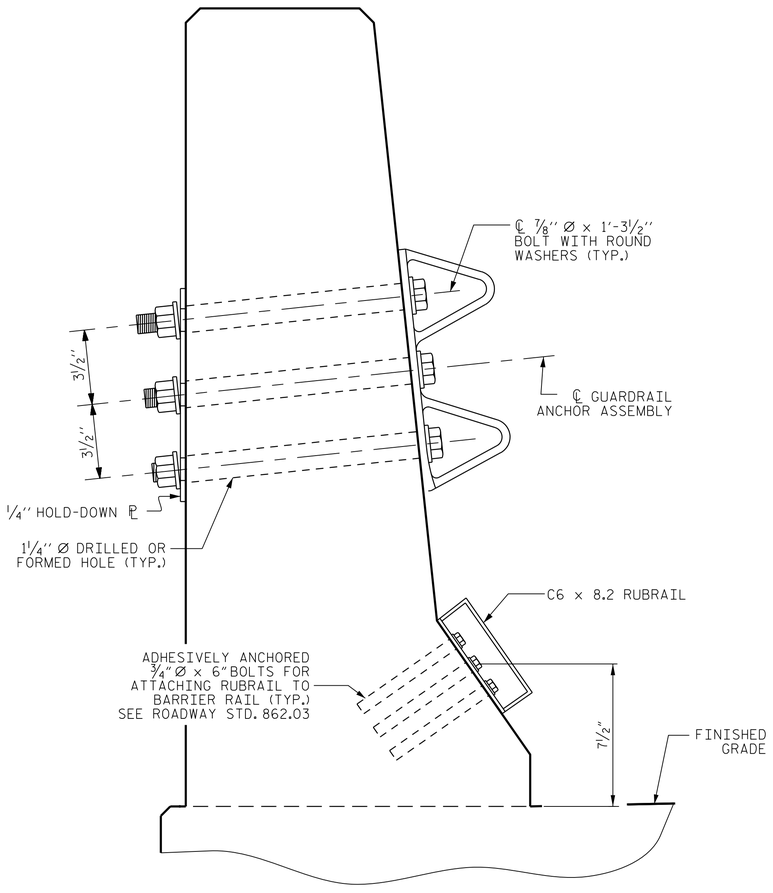
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

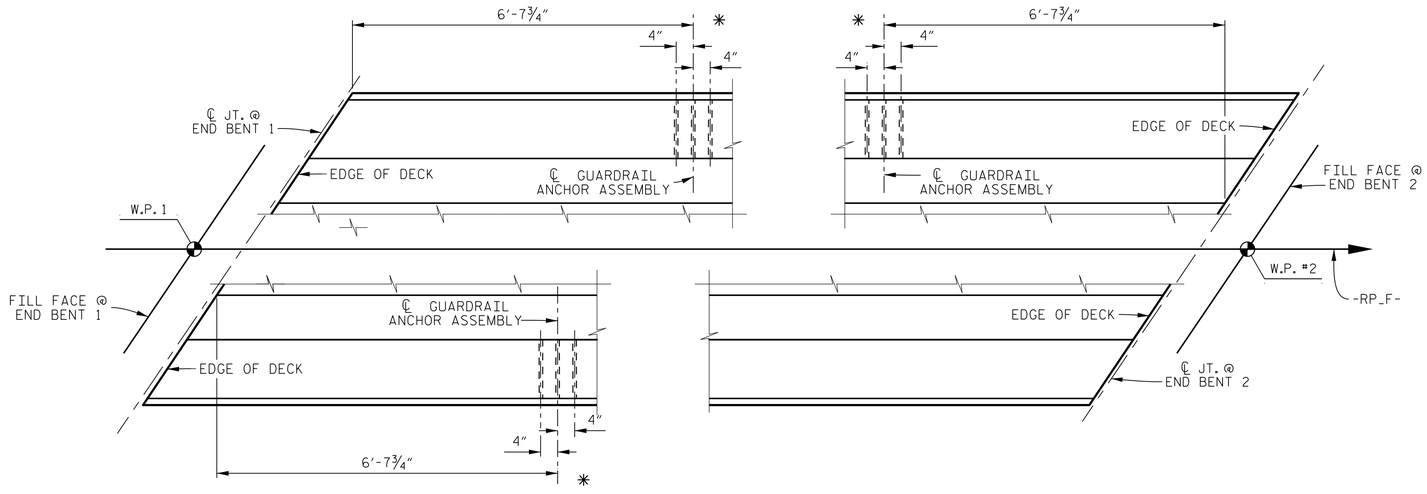
THE 1¼'' Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

THE C6 x 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE ¾" Ø x 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



SECTION E–E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

SKETCH SHOWING POINTS OF ATTACHMENT

✳LOCATION OF GUARDRAIL ATTACHMENT

PROJECT NO. I–4729A

POLK COUNTY

STATION: 21+44.22 –RP_F–

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

ASSEMBLED BY : K. E. LOFTON	DATE : 7-17
CHECKED BY : A. D. SHAH	DATE : 7-17
DRAWN BY : TLA 5/06	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

DRAWN BY : K. E. LOFTON	DATE : 7–17
CHECKED BY : A. D. SHAH	DATE : 7–17
DESIGN ENGINEER : S. PHAN	DATE : 7–17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/11/2017

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S2-18
1			3			TOTAL SHEETS
2			4			31

STD. No. GRA2 STR. #2

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DATE: 8/11/2017 12:19:48 AM

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''	———	———	———

TOTAL SUPERSTRUCTURE QUANTITIES

	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL	CLASS ''AA'' CONCRETE
	LBS.	LBS.	CU. YDS.
SPAN A	16,485	12,929	146.7
SPAN B	18,315	14,657	166.6
** TOTAL	34,800	27,586	313.3

** QUANTITIES FOR CONCRETE BARRIER RAIL ARE NOT INCLUDED. SEE ''CONCRETE CONCRETE BARRIER RAIL'' SHEET FOR DETAILS.

GROOVING BRIDGE FLOORS

	SQ. FT.
APPROACH SLAB AT END BENT 1	962
BRIDGE DECK SPAN A	3,595
BRIDGE DECK SPAN B	4,088
APPROACH SLAB AT END BENT 2	935
TOTAL	9,581

SPAN A

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
*A1	114	#5	STR	46'-11"	5,578
*A101	3	#5	STR	44'-11"	141
*A102	3	#5	STR	42'- 8"	134
*A103	3	#5	STR	40'- 4"	126
*A104	3	#5	STR	38'- 1"	119
*A105	3	#5	STR	35'- 9"	112
*A106	3	#5	STR	33'- 6"	105
*A107	3	#5	STR	31'- 2"	98
*A108	3	#5	STR	28'-11"	90
*A109	3	#5	STR	26'- 7"	83
*A110	3	#5	STR	24'- 3"	76
*A111	3	#5	STR	22'- 0"	69
*A112	3	#5	STR	19'- 8"	62
*A113	3	#5	STR	17'- 4"	54
*A114	3	#5	STR	15'- 0"	47
*A115	3	#5	STR	12'- 9"	40
*A116	3	#5	STR	10'- 5"	33
*A117	3	#5	STR	8'- 1"	25
*A118	3	#5	STR	5'- 9"	18
*A119	3	#5	STR	3'- 6"	11
*A120	3	#6	STR	6'- 0"	27
*A121	3	#5	STR	45'- 1"	141
*A122	3	#5	STR	42'-10"	134
*A123	3	#5	STR	40'- 9"	128
*A124	3	#5	STR	38'- 7"	121
*A125	3	#5	STR	36'- 6"	114
*A126	3	#5	STR	34'- 4"	107
*A127	3	#5	STR	32'- 3"	101
*A128	3	#5	STR	30'- 1"	94
*A129	3	#5	STR	28'- 0"	88
*A130	3	#5	STR	25'-11"	81
*A131	3	#5	STR	23'- 9"	74
*A132	3	#5	STR	21'- 8"	68
*A133	3	#5	STR	19'- 7"	61
*A134	3	#5	STR	17'- 6"	55
*A135	3	#5	STR	15'- 5"	48
*A136	3	#5	STR	13'- 4"	42
*A137	3	#5	STR	11'- 3"	35
*A138	3	#5	STR	9'- 2"	29
*A139	3	#5	STR	7'- 1"	22
*A140	3	#5	STR	5'- 0"	16
*A141	3	#5	STR	3'- 0"	9
*A142	3	#6	STR	7'- 6"	34
A2	114	#5	STR	46'-11"	5,578
A201	3	#5	STR	44'-11"	141
A202	3	#5	STR	42'- 8"	134
A203	3	#5	STR	40'- 4"	126
A204	3	#5	STR	38'- 1"	119
A205	3	#5	STR	35'- 9"	112
A206	3	#5	STR	33'- 6"	105
A207	3	#5	STR	31'- 2"	98
A208	3	#5	STR	28'-11"	90
A209	3	#5	STR	26'- 7"	83
A210	3	#5	STR	24'- 3"	76
A211	3	#5	STR	22'- 0"	69
A212	3	#5	STR	19'- 8"	62
A213	3	#5	STR	17'- 4"	54
A214	3	#5	STR	15'- 0"	47
A215	3	#5	STR	12'- 9"	40
A216	3	#5	STR	10'- 5"	33
A217	3	#5	STR	8'- 1"	25
A218	3	#5	STR	5'- 9"	18
A219	3	#5	STR	3'- 6"	11
A221	3	#5	STR	45'- 1"	141
A222	3	#5	STR	42'-10"	134
A223	3	#5	STR	40'- 9"	128
A224	3	#5	STR	38'- 7"	121
A225	3	#5	STR	36'- 6"	114
A226	3	#5	STR	34'- 4"	107
A227	3	#5	STR	32'- 3"	101
A228	3	#5	STR	30'- 1"	94
A229	3	#5	STR	28'- 0"	88
A230	3	#5	STR	25'-11"	81
A231	3	#5	STR	23'- 9"	74
A232	3	#5	STR	21'- 8"	68
A233	3	#5	STR	19'- 7"	61
A234	3	#5	STR	17'- 6"	55
A235	3	#5	STR	15'- 5"	48
A236	3	#5	STR	13'- 4"	42
A237	3	#5	STR	11'- 3"	35
A238	3	#5	STR	9'- 2"	29
A239	3	#5	STR	7'- 1"	22
A240	3	#5	STR	5'- 0"	16
A241	3	#5	STR	3'- 0"	9
*B1	132	#4	STR	23'- 9"	2,094
B2	164	#5	STR	45'- 6"	7,783
*G1	1	#5	STR	52'- 7"	55
*G2	1	#5	STR	57'- 8"	60
*K1	4	#8	1	12'- 4"	132
*K2	8	#8	4	19'- 4"	413
*K3	15	#6	STR	7'- 1"	160
*K4	4	#8	1	12'- 8"	135
*K5	8	#8	4	20'- 4"	434
*K6	15	#6	STR	7'-11"	178
*S1	70	#5	3	6'- 4"	462
*U1	35	#4	2	6'- 8"	156
*U2	35	#4	2	4'-10"	113

REINFORCING STEEL 16,485 LBS.

*EPOXY COATED REINFORCING STEEL 12,929 LBS.

NOTE: BAR A220 HAS BEEN OMITTED.

SPAN B

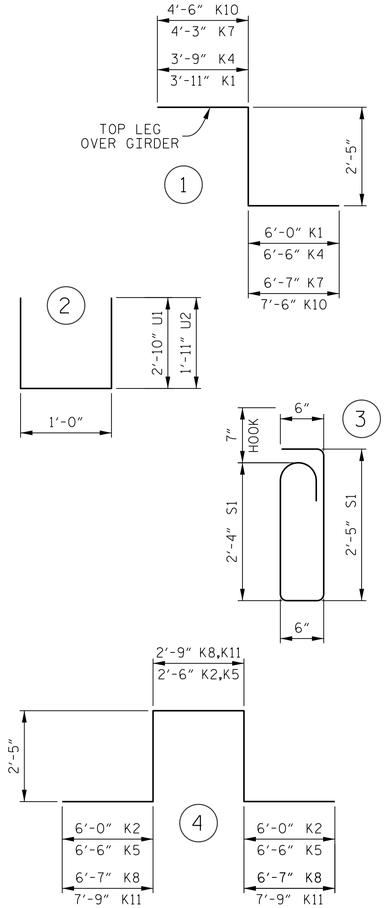
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
*A1	116	#5	STR	46'-11"	5,676
*A301	3	#5	STR	45'- 3"	142
*A302	3	#5	STR	43'- 7"	136
*A303	3	#5	STR	41'-10"	131
*A304	3	#5	STR	40'- 2"	126
*A305	3	#5	STR	38'- 5"	120
*A306	3	#5	STR	36'- 9"	115
*A307	3	#5	STR	35'- 0"	110
*A308	3	#5	STR	33'- 3"	104
*A309	3	#5	STR	31'- 7"	99
*A310	3	#5	STR	29'-10"	93
*A311	3	#5	STR	28'- 1"	88
*A312	3	#5	STR	26'- 4"	82
*A313	3	#5	STR	24'- 8"	77
*A314	3	#5	STR	22'-11"	72
*A315	3	#5	STR	21'- 2"	66
*A316	3	#5	STR	19'- 5"	61
*A317	3	#5	STR	17'- 8"	55
*A318	3	#5	STR	15'-11"	50
*A319	3	#5	STR	14'- 2"	44
*A320	3	#5	STR	12'- 5"	39
*A321	3	#5	STR	10'- 7"	33
*A322	3	#5	STR	8'-10"	28
*A323	3	#5	STR	7'- 1"	22
*A324	3	#5	STR	5'- 4"	17
*A325	3	#5	STR	3'- 6"	11
*A326	3	#6	STR	6'- 0"	27
*A327	3	#5	STR	45'- 4"	142
*A328	3	#5	STR	43'- 9"	137
*A329	3	#5	STR	42'- 3"	132
*A330	3	#5	STR	40'- 8"	127
*A331	3	#5	STR	39'- 1"	122
*A332	3	#5	STR	37'- 7"	118
*A333	3	#5	STR	36'- 0"	113
*A334	3	#5	STR	34'- 6"	108
*A335	3	#5	STR	33'- 0"	103
*A336	3	#5	STR	31'- 5"	98
*A337	3	#5	STR	29'-11"	94
*A338	3	#5	STR	28'- 5"	89
*A339	3	#5	STR	26'-11"	84
*A340	3	#5	STR	25'- 4"	79
*A341	3	#5	STR	23'-10"	75
*A342	3	#5	STR	22'- 4"	70
*A343	3	#5	STR	20'-10"	65
*A344	3	#5	STR	19'- 4"	60
*A345	3	#5	STR	17'-10"	56
*A346	3	#5	STR	16'- 4"	51
*A347	3	#5	STR	14'-10"	46
*A348	3	#5	STR	13'- 5"	42
*A349	3	#5	STR	11'-11"	37
*A350	3	#5	STR	10'- 5"	33
*A351	3	#5	STR	8'-11"	28
*A352	3	#5	STR	7'- 6"	23
*A353	3	#5	STR	6'- 0"	19
*A354	3	#5	STR	4'- 7"	14
*A355	3	#5	STR	3'- 1"	10
*A356	3	#6	STR	8'- 3"	37
A2	116	#5	STR	46'-11"	5,676
A401	3	#5	STR	45'- 3"	142
A402	3	#5	STR	43'- 7"	136
A403	3	#5	STR	41'-10"	131
A404	4	#5	STR	40'- 2"	168
A405	3	#5	STR	38'- 5"	120
A406	3	#5	STR	36'- 9"	115
A407	3	#5	STR	35'- 0"	110
A408	3	#5	STR	33'- 3"	104
A409	3	#5	STR	31'- 7"	99
A410	3	#5	STR	29'-10"	93
A411	3	#5	STR	28'- 1"	88
A412	3	#5	STR	26'- 4"	82
A413	3	#5	STR	24'- 8"	77
A414	3	#5	STR	22'-11"	72
A415	3	#5	STR	21'- 2"	66
A416	3	#5	STR	19'- 5"	61
A417	3	#5	STR	17'- 8"	55
A418	3	#5	STR	15'-11"	50
A419	3	#5	STR	14'- 2"	44
A420	3	#5	STR	12'- 5"	39
A421	3	#5	STR	10'- 7"	33
A422	3	#5	STR	8'-10"	28
A423	3	#5	STR	7'- 1"	22
A424	3	#5	STR	5'- 4"	17
A425	3	#5	STR	3'- 6"	11
A427	3	#5	STR	45'- 4"	142
A428	3	#5	STR	43'- 9"	137
A429	3	#5	STR	42'- 3"	132
A430	3	#5	STR	40'- 8"	127
A431	3	#5	STR	39'- 1"	122
A432	3	#5	STR	37'- 7"	118
A433	3	#5	STR	36'- 0"	113
A434	3	#5	STR	34'- 6"	108
A435	3	#5	STR	33'- 0"	103
A436	3	#5	STR	31'- 5"	98
A437	3	#5	STR	29'-11"	94
A438	3	#5	STR	28'- 5"	89
A439	3	#5	STR	26'-11"	84
A440	3	#5	STR	25'- 4"	79
A441	3	#5	STR	23'-10"	75
A442	3	#5	STR	22'- 4"	70
A443	3	#5	STR	20'-10"	65
A444	3	#5	STR	19'- 4"	60
A445	3	#5	STR	17'-10"	56
A446	3	#5	STR	16'- 4"	51
A447	3	#5	STR	14'-10"	46
A448	3	#5	STR	13'- 5"	42
A449	3	#5	STR	11'-11"	37
A450	3	#5	STR	10'- 5"	33
A451	3	#5	STR	8'-11"	28
A452	3	#5	STR	7'- 6"	23
A453	3	#5	STR	6'- 0"	19
A454	3	#5	STR	4'- 7"	14
A455	3	#5	STR	3'- 1"	10
*B3	132	#4	STR	26'- 9"	2,359
B4	158	#5	STR	51'- 7"	8,501
*G2	1	#5	STR	57'- 8"	60
*G3	2	#5	STR	34'- 6"	72
*K7	4	#8	1	13'- 3"	142
*K8	8	#8	4	20'- 9"	443
*K9	15	#6	STR	7'- 8"	173
*K10	4	#8	1	14'- 5"	154
*K11	8	#8	4	22'- 7"	482
*K12	15	#6	STR	9'- 1"	205
*S1	70	#5	3	6'- 4"	462
*U1	35	#4	2	6'- 8"	156
*U2	35	#4	2	4'-10"	113

REINFORCING STEEL 18,315 LBS.

*EPOXY COATED REINFORCING STEEL 14,657 LBS.

NOTE: BAR A426 HAS BEEN OMITTED.

BAR TYPES



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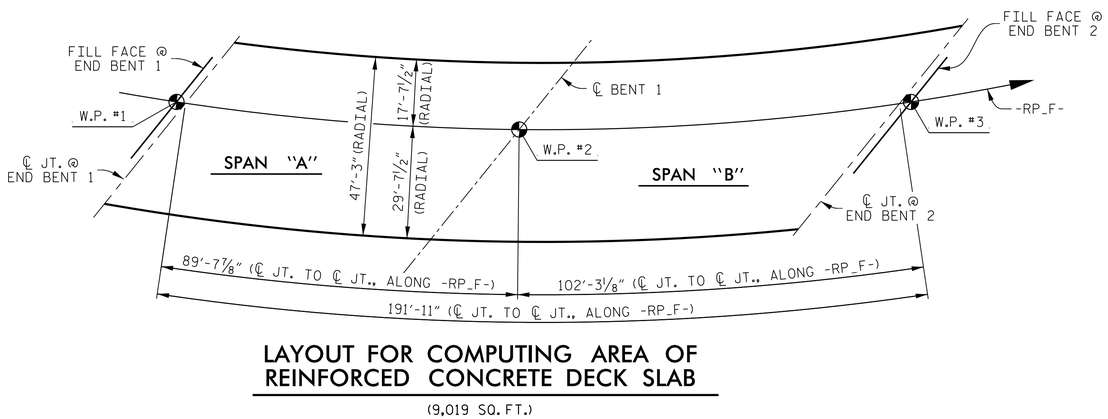

LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

(9,019 SQ. FT.)

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 -RP_F-

DRAWN BY : K. E. LOFTON DATE : 7-17

CHECKED BY : A. D. SHAH DATE : 7-17

DESIGN ENGINEER : S. PHAN DATE : 7-17

PLANS PREPARED BY :

PARSONS

5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH

DocuSigned by: Anupam Shah B664D5B8C6B84A4...

8/11/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S2-19
1			3			TOTAL SHEETS
2			4			31

STR. #2

FILE: (:\I-4729a structures plans\ final\ I-4729A_smu_str2_bm1.dgn
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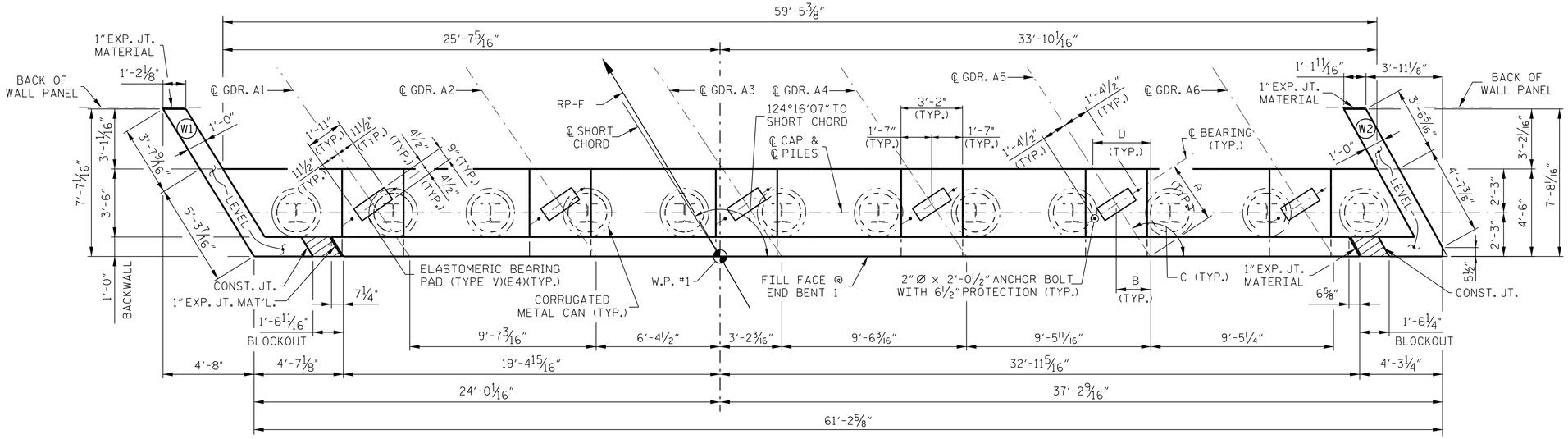
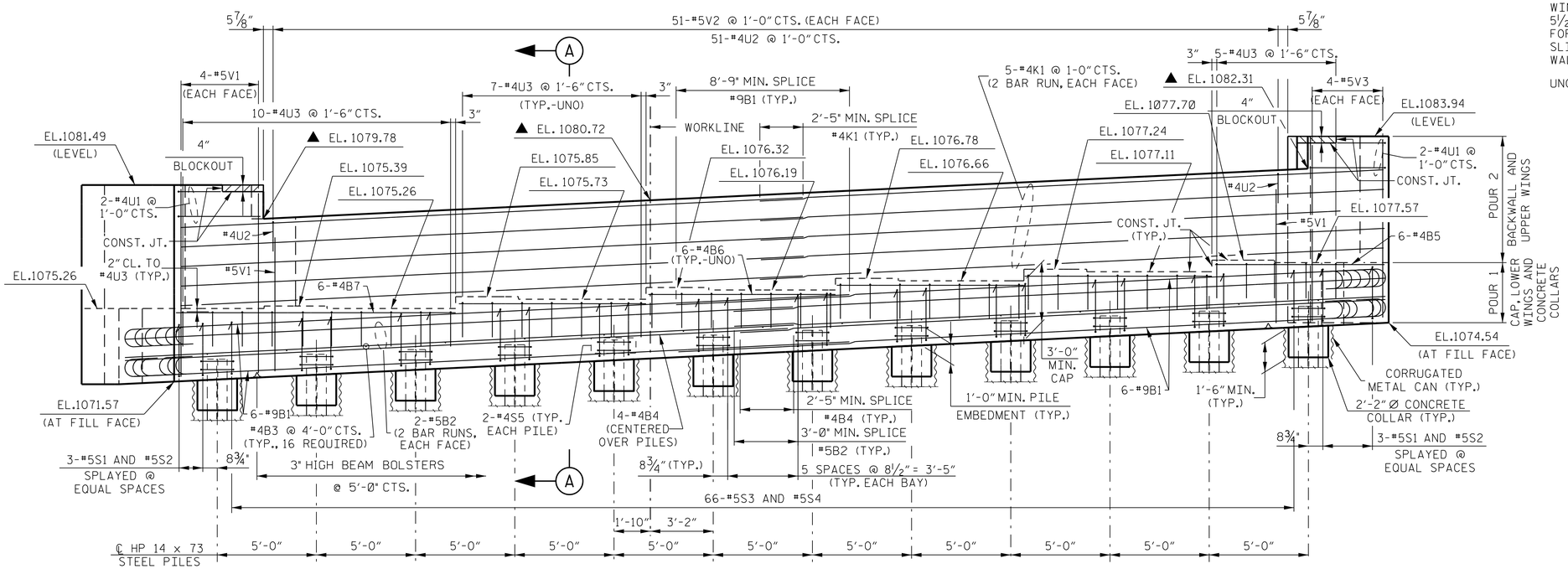


PLAN



ELEVATION

TABLE OF GIRDER VARIABLES				
END BENT 1	A (FT.)	B (FT.)	C (DEG.)	D (FT.)
GIRDER A1	3'-3 7/16"	1'-10 11/16"	125°07'48"	3'-2"
GIRDER A2	3'-3 3/16"	1'-10 1/4"	124°36'28"	3'-1 1/4"
GIRDER A3	3'-2 15/16"	1'-9 3/16"	124°06'07"	3'-0 9/16"
GIRDER A4	3'-2 3/4"	1'-9 7/16"	123°36'44"	2'-11 7/8"
GIRDER A5	3'-2 1/2"	1'-9 1/16"	123°08'14"	2'-11 1/4"
GIRDER A6	3'-2 5/16"	1'-8 11/16"	122°40'36"	2'-10 5/8"

NOTES

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

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

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

▲ THIS ELEVATION IS TAKEN AT FILL FACE OF BACKWALL.

FOR SECTION A-A, SEE SHEET 3 OF 3.

FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTION VIEWS ON SHEET 3 OF 3.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR TEMPORARY DRAINAGE AT END BENT DETAIL, SEE SHEET 3 OF 3.

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

THE COST TO FURNISH AND INSTALL THE 30" Ø CORRUGATED METAL CANS SHALL BE INCLUDED IN THE CONTRACT PRICE FOR MSE RETAINING WALL.

WING (W1) AND WING (W2) DETAILS ARE BASED ON A 5 1/2" WALL PANEL THICKNESS AND USING DOWELS FOR THE COPING. CONTRACTOR MAY ADJUST WINGS SLIGHTLY AS NECESSARY, BASED ON APPROVED MSE WALL SHOP DRAWINGS.

UNO = UNLESS NOTED OTHERWISE

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 -RP_F-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANDREW D. SHAW
8664D288C58F4A4...
8/11/2017

DRAWN BY : M. CLAREY / T. DETMERS DATE : 7-17
CHECKED BY : D. PRETORIUS DATE : 7-17
DESIGN ENGINEER : D. PRETORIUS DATE : 7-17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

REVISIONS						SHEET No.
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2			4			31

STR. #2

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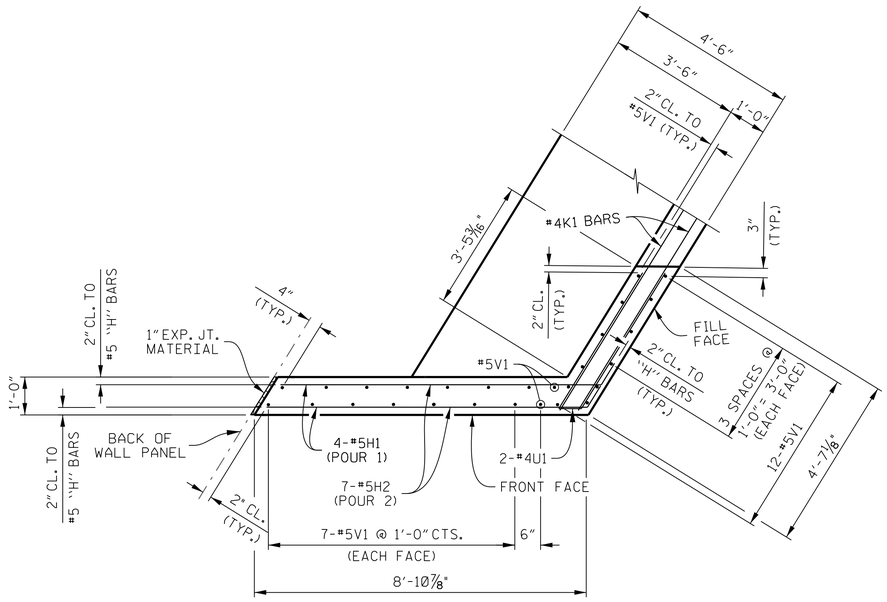
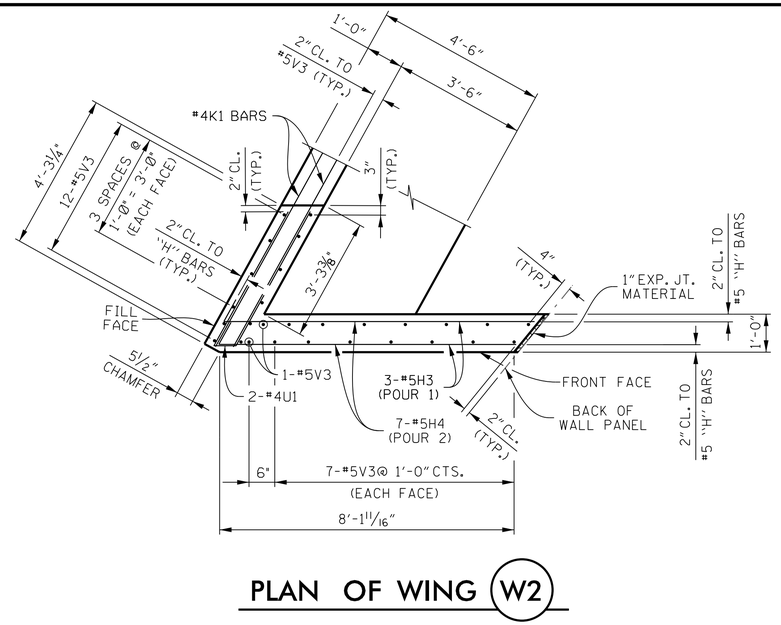
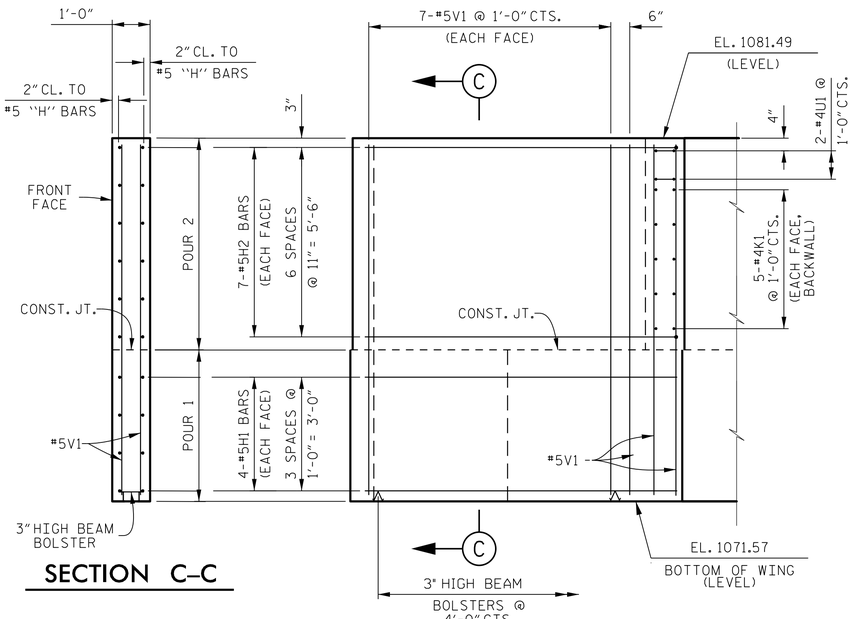


PLAN OF WING W1

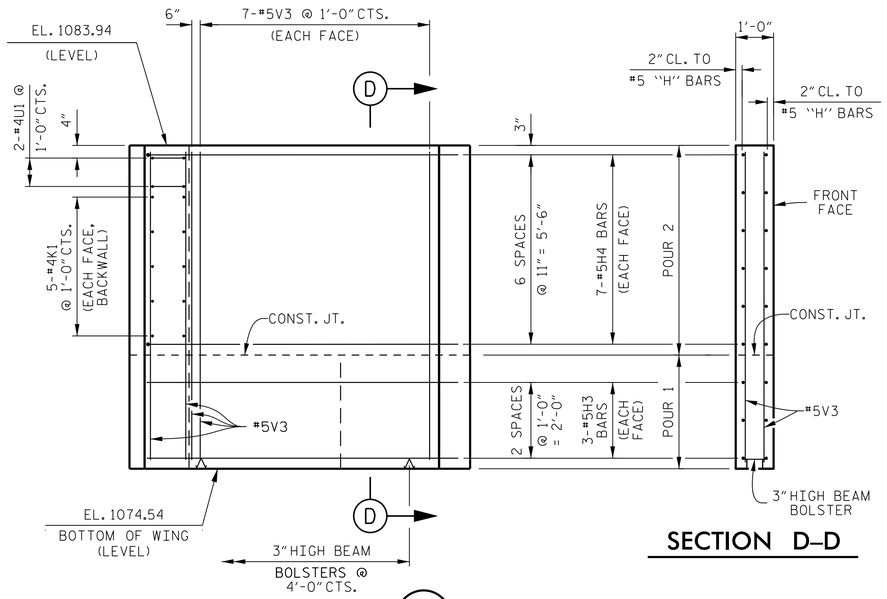


PLAN OF WING W2



SECTION C–C

ELEVATION OF WING W1



SECTION D–D

ELEVATION OF WING W2

PROJECT NO. I–4729A

POLK COUNTY

STATION: 21+44.22 –RP_F–

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM P. SHAH
8/11/2017

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S2–21
1			3			TOTAL SHEETS
2			4			31

STR. #2

DRAWN BY : M. CLAREY / T. DETMERS DATE : 7–17
CHECKED BY : D. PRETORIUS DATE : 7–17
DESIGN ENGINEER : D. PRETORIUS DATE : 7–17

PLANS PREPARED BY :
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Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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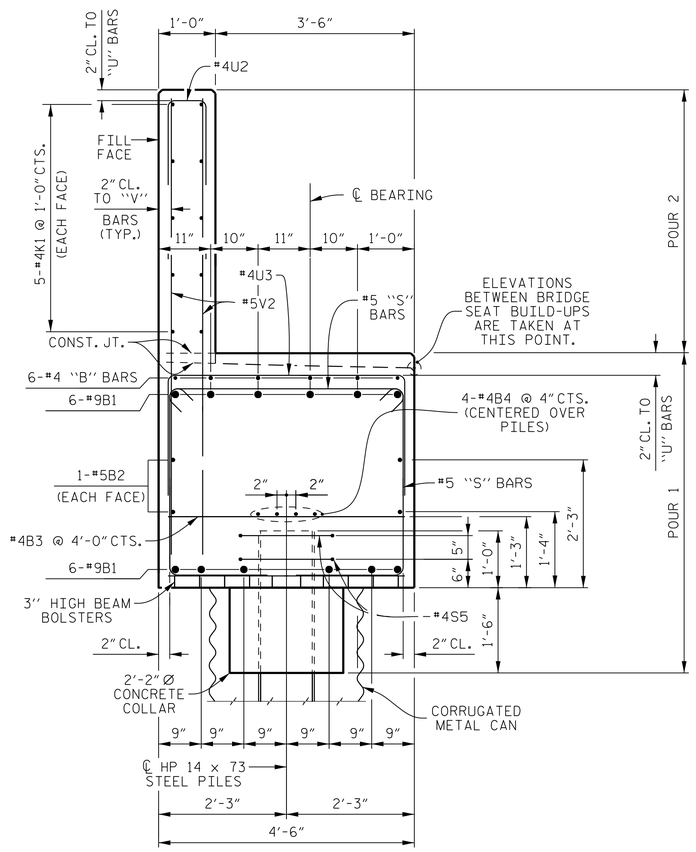
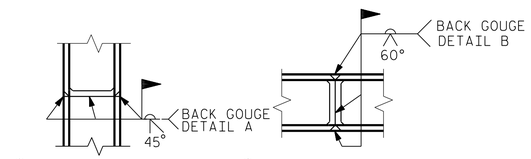
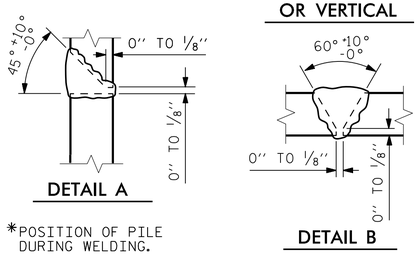


SECTION A–A



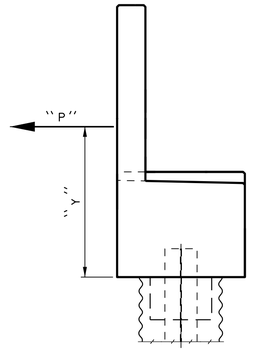
* PILE VERTICAL

* PILE HORIZONTAL OR VERTICAL



*POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



END BENT TIEBACK FORCE

COMPONENT		"P" (K /FT.)	"Y" (FT.)
WIND ON STRUCTURE	(WS)	0.10	3.514
WIND ON LIVE LOAD	(WL)	0.05	3.514
BRAKING FORCE	(BR)	0.57	3.514
THERMAL FORCE	(TU)	0.21	3.514
EARTH FORCE	(EH)	1.28	2.684
LIVE LOAD SURCHARGE	(LS)	1.27	4.025

NOTE:
"P" IS UNFACTORED SERVICE LOAD NORMAL TO FILL FACE.

BILL OF MATERIAL

END BENT 1

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	24	#9	2	40'- 8"	3,318
B2	8	#5	STR	33'- 8"	281
B3	16	#4	STR	4'- 2"	45
B4	8	#4	STR	33'- 2"	177
B5	6	#4	STR	6'- 0"	24
B6	24	#4	STR	9'- 6"	152
B7	6	#4	STR	13'- 6"	54
H1	8	#5	STR	8'- 7"	72
H2	14	#5	6	9'- 6"	139
H3	6	#5	STR	7'- 9"	48
H4	14	#5	7	8'- 9"	128
K1	20	#4	STR	31'- 8"	423
S1	6	#5	4	5'- 3"	33
S2	6	#5	8	10'- 6"	66
S3	66	#5	4	5'- 1"	350
S4	66	#5	8	10'- 4"	711
S5	24	#4	1	7'- 7"	122
U1	4	#4	5	9'- 6"	25
U2	51	#4	3	4'- 2"	142
U3	43	#4	3	7'- 2"	206
V1	28	#5	STR	9'- 6"	277
V2	102	#5	STR	7'- 9"	824
V3	28	#5	STR	8'-11"	260

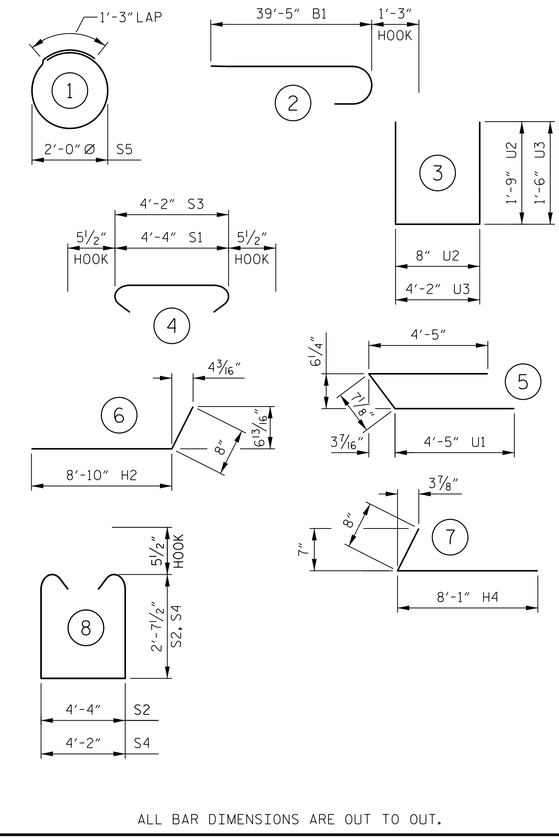
REINFORCING STEEL 7,755 LBS.

CLASS "A" CONCRETE
POUR 1 COLLARS, CAP AND LOWER WINGS 57.0 CU. YDS.
POUR 2 BACKWALL AND UPPER WINGS 14.5 CU. YDS.
TOTAL 71.5 CU. YDS.

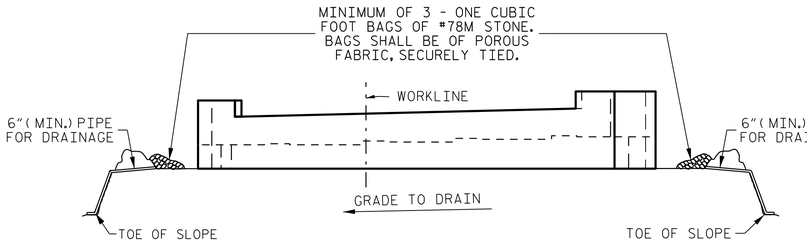
HP 14 x 73 STEEL PILES
12 REQUIRED 630.0 LIN. FT.

PILE DRIVING EQUIPMENT SETUP FOR HP14X73 STEEL PILES 12 EACH

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



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 FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 –RP_F–

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

DRAWN BY : M. CLAREY / T. DETMERS DATE : 7-17
CHECKED BY : D. PRETORIUS DATE : 7-17
DESIGN ENGINEER : D. PRETORIUS DATE : 7-17

PLANS PREPARED BY :
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Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANDREW B. SMITH
8/16/2017

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1			3			TOTAL SHEETS
2			4			31

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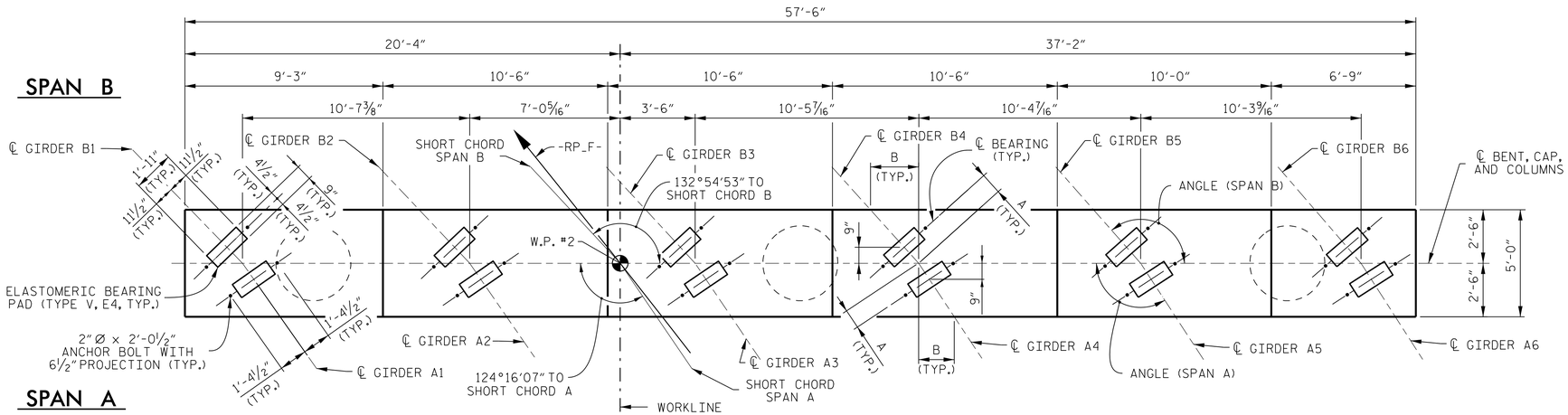
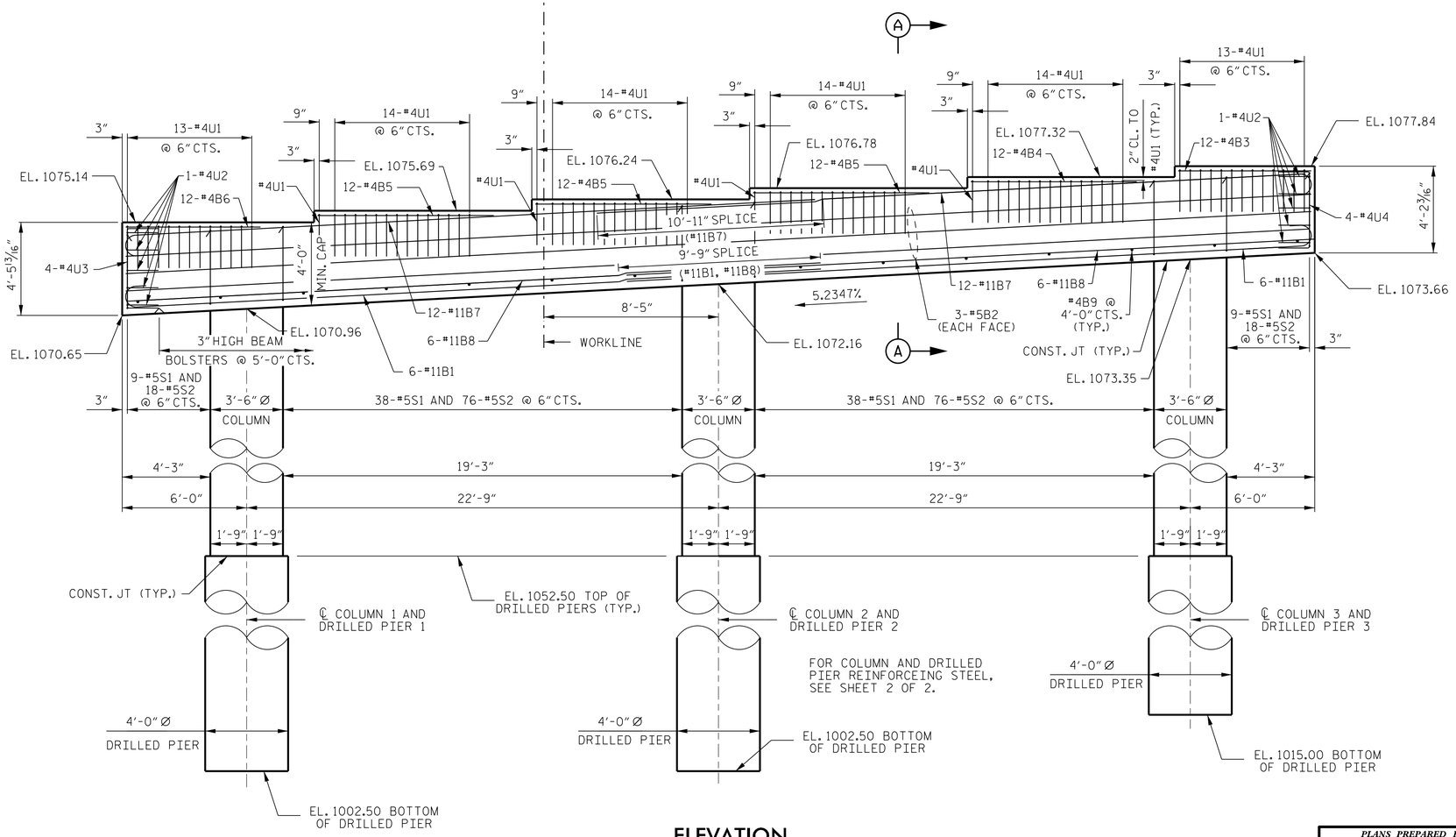


PLAN



ELEVATION

NOTES

FOR SECTION A-A, SEE "SHEET 2 OF 2."

STIRRUPS AND U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "M" AND "B" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

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 THE DRILLED PIERS ("M" BARS) IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

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

FOR GIRDER ANGLES, SEE "FRAMING PLANS" SHEETS S2-10 AND S2-11.

TABLE OF GIRDER VARIABLES		
BENT 1	A	B
GIRDER A1	11"	1'-9⅛"
GIRDER A2	10¹⁵⁄₁₆"	1'-8¹¹⁄₁₆"
GIRDER A3	10⅞"	1'-8⅝"
GIRDER A4	10¹³⁄₁₆"	1'-7¹⁵⁄₁₆"
GIRDER A5	10¾"	1'-7⅝"
GIRDER A6	10¹¹⁄₁₆"	1'-7¼"
GIRDER B1	1'-0⁹⁄₁₆"	2'-5¹⁄₁₆"
GIRDER B2	1'-0⅜"	2'-4⅜"
GIRDER B3	1'-0¼"	2'-3¹¹⁄₁₆"
GIRDER B4	1'-0⅛"	2'-3"
GIRDER B5	1'-0"	2'-2⁷⁄₁₆"
GIRDER B6	11⅞"	2'-1⅞"

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 -RP_F-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

DRAWN BY : D. PRETORIUS DATE : 7-17
CHECKED BY : S. PHAN DATE : 7-17
DESIGN ENGINEER : D. PRETORIUS DATE : 7-17

PLANS PREPARED BY :
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FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPEM D. SHAH
8664D2B8C8095A4...
8/11/2017

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1			3			TOTAL SHEETS
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STR. #2

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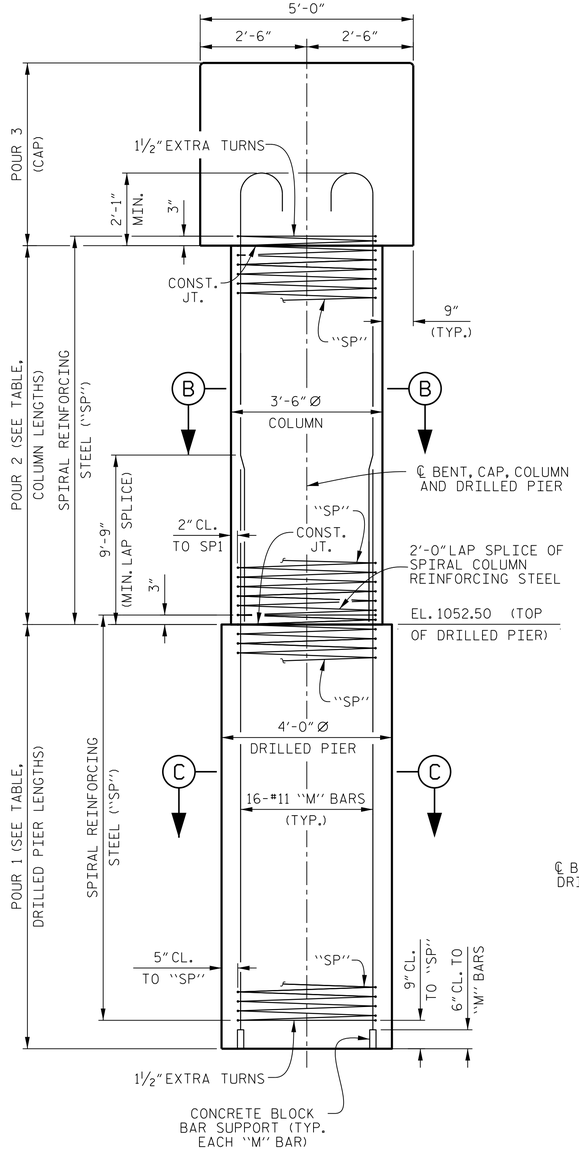
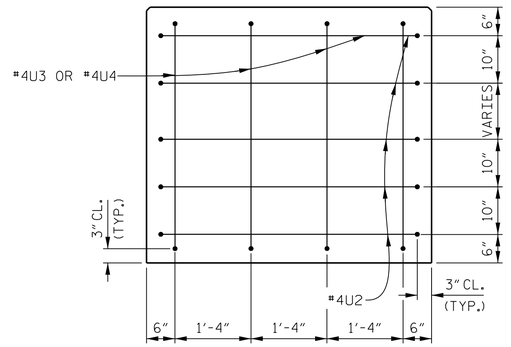
TABLE OF COLUMN REINFORCING			COLUMN LENGTH
COLUMN	SPIRAL	"M" BAR	
1	SP2	M2	18'-5 9/16"
2	SP4	M4	19'-7 1/8"
3	SP6	M6	20'-10 3/16"

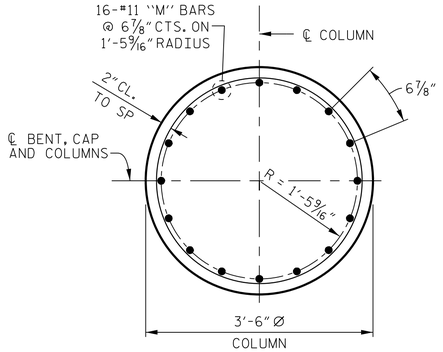
TABLE OF DRILLED PIER REINFORCING			DRILLED PIER LENGTH
COLUMN	SPIRAL	"M" BAR	
1	SP1	M1	50'-0"
2	SP3	M3	50'-0"
3	SP5	M5	37'-6"



END VIEW

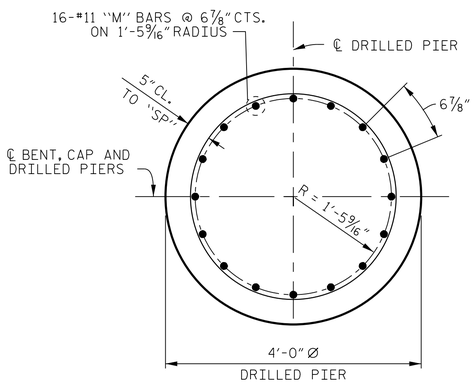


END OF CAP DETAIL



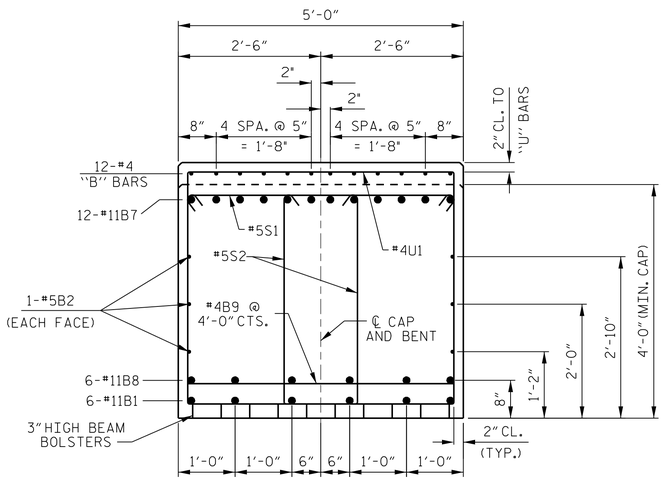
SECTION B–B

(TYP. ALL COLUMNS)



SECTION C–C

(TYP. ALL DRILLED PIERS)



SECTION A–A

BILL OF MATERIAL

BENT 1

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#11	2	35'- 1"	2,237
B2	6	#5	STR	57'- 2"	358
B3	12	#4	STR	6'- 5"	51
B4	12	#4	STR	8'- 0"	64
B5	36	#4	STR	8'- 6"	204
B6	12	#4	STR	6'- 5"	51
B7	24	#11	2	37'- 5"	4,771
B8	12	#11	STR	33'- 6"	2,136
B9	15	#4	STR	4'- 8"	47
M1	16	#11	STR	59'- 3"	5,037
M2	16	#11	2	22'- 3"	1,891
M3	16	#11	STR	59'- 3"	5,037
M4	16	#11	2	23'- 5"	1,991
M5	16	#11	STR	46'- 9"	3,974
M6	16	#11	2	24'- 7"	2,090
S1	94	#5	4	5'- 7"	547
S2	188	#5	3	11'- 1"	2,173
U1	86	#4	1	8'- 8"	498
U2	10	#4	1	7'- 8"	51
U3	4	#4	1	7'- 0"	19
U4	4	#4	1	6'-11"	18

REINFORCING STEEL 33,245 LBS.

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
SP1	1	***	5	1178'- 3"	1,229
SP2	1	**	5	764'- 8"	511
SP3	1	***	5	1178'- 3"	1,229
SP4	1	**	5	811'- 5"	542
SP5	1	***	5	884'- 5"	922
SP6	1	**	5	858'- 3"	573

SPIRAL COLUMN REINFORCING STEEL 5,006 LBS.

CLASS A CONCRETE

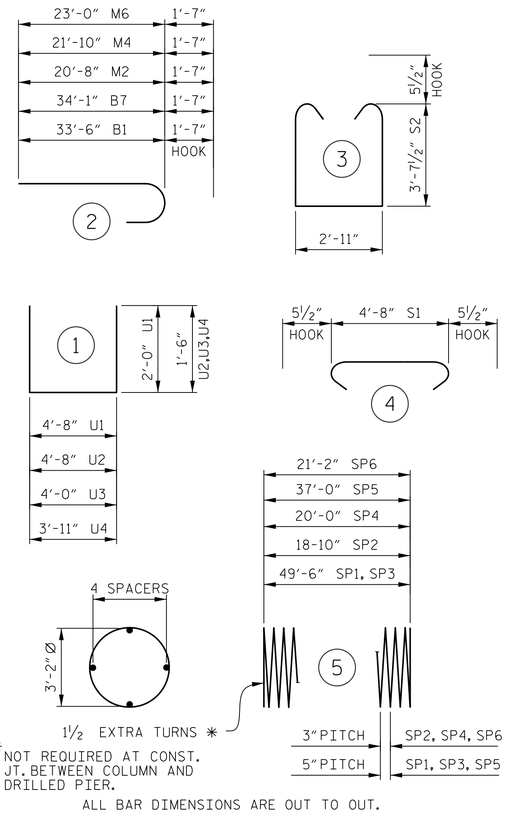
POUR 3	CAP	45.6 CU. YDS.
POUR 2	COLUMNS	21.0 CU. YDS.
	TOTAL	66.6 CU. YDS.

DRILLED PIER CONCRETE

POUR 1	64.0 CU. YDS.

4'-0" DIA. DRILLED PIER NOT IN SOIL	30.0 FT.
4'-0" DIA. DRILLED PIER IN SOIL	107.5 FT.

BAR TYPES



* NOT REQUIRED AT CONST. JT. BETWEEN COLUMN AND DRILLED PIER.

ALL BAR DIMENSIONS ARE OUT TO OUT.

** THE SP2, SP4, AND SP6 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

*** THE SP1, SP3, AND SP5 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

AN ESTIMATED 568 FEET OF CSL TUBES ARE REQUIRED AND WILL BE PAID FOR WITH THE DRILLED PIERS, SEE DRILLED PIER SPECIAL PROVISION.

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 -RP_F-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/11/2017

DRAWN BY : DT. FRETWELL DATE : 7-17
CHECKED BY : D. DEAN DATE : 7-17
DESIGN ENGINEER : D. BREEANUS DATE : 7-17

PLANS PREPARED BY :
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NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

REVISIONS						SHEET No.
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STR. #2

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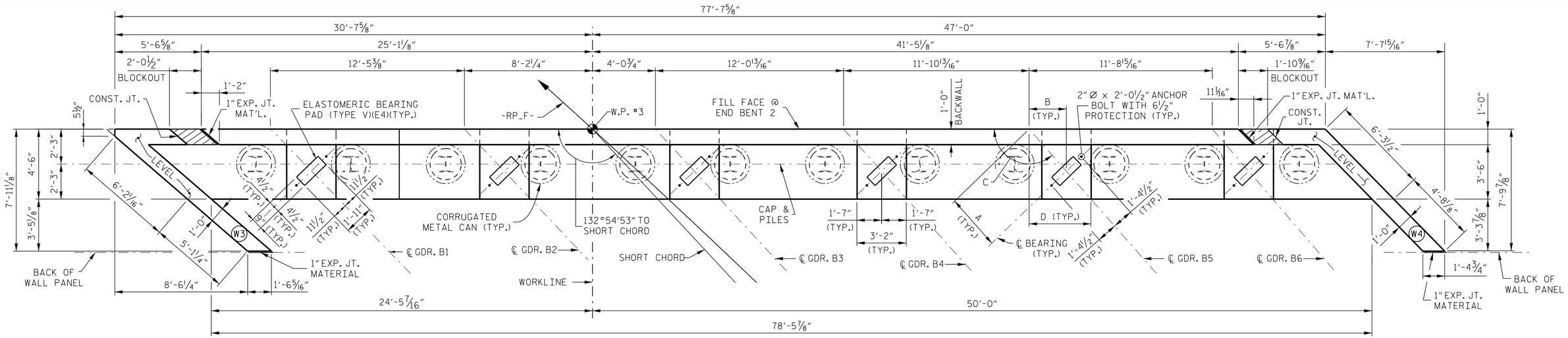
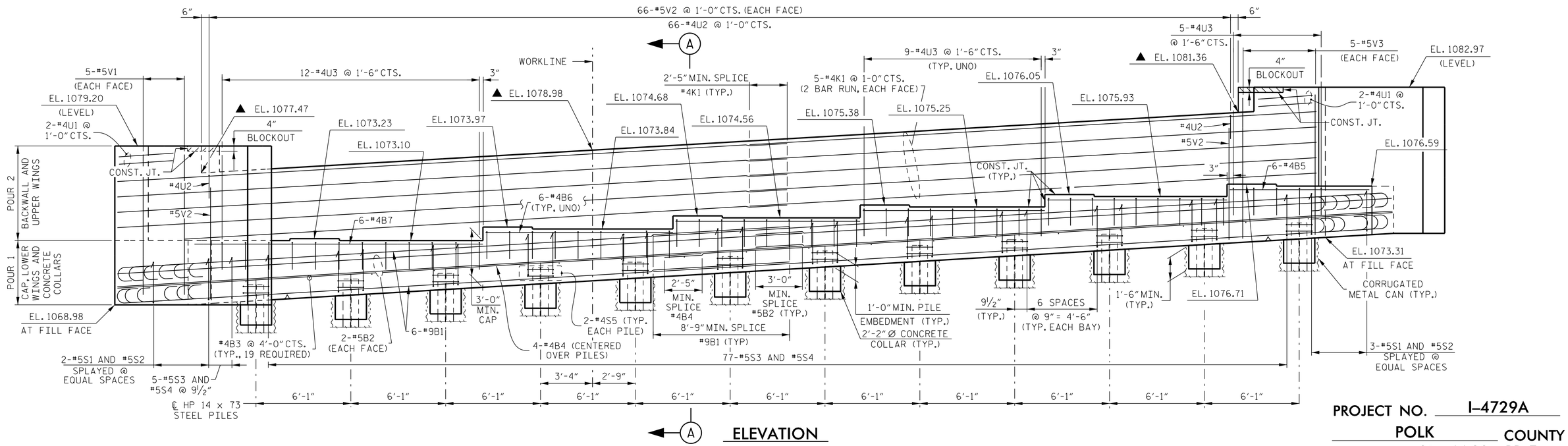


PLAN



ELEVATION

TABLE OF GIRDER VARIABLES				
END BENT 2	A (FT.)	B (FT.)	C (DEG.)	D (FT.)
GIRDER B1	3′-8¹⁵⁄₁₆″	2′-7¼″	134°06′07″	4′-4⅝″
GIRDER B2	3′-8⅜″	2′-6½″	133°22′50″	4′-3″
GIRDER B3	3′-7⅞″	2′-5¾″	132°41′11″	4′-1³⁄₁₆″
GIRDER B4	3′-7⅞″	2′-5⅛″	132°01′04″	4′-0⅝″
GIRDER B5	3′-7″	2′-4⅜″	131°22′23″	3′-11⅜″
GIRDER B6	3′-6⅜″	2′-3¹³⁄₁₆″	130°45′02″	3′-10½″

NOTES

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

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

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

▲ THIS ELEVATION IS TAKEN AT FILL FACE OF BACKWALL.

FOR SECTION A-A, SEE SHEET 3 OF 3.

FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTION VIEWS ON SHEET 3 OF 3.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR TEMPORARY DRAINAGE AT END BENT DETAIL, SEE SHEET 3 OF 3.

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

THE COST TO FURNISH AND INSTALL THE 30″ Ø CORRUGATED METAL CANS SHALL BE INCLUDED IN THE CONTRACT PRICE FOR MSE RETAINING WALL.

WING (W3) AND WING (W4) DETAILS ARE BASED ON A 5½″ WALL PANEL THICKNESS AND USING DOWELS FOR THE COPING. CONTRACTOR MAY ADJUST WINGS SLIGHTLY AS NECESSARY, BASED ON APPROVED MSE WALL SHOP DRAWINGS.

UNO = UNLESS NOTED OTHERWISE

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 -RP_F-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER MATTHEW D. SHAW
8664D28BC8584A4...
8/11/2017

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S2-25
1			3			TOTAL SHEETS
2			4			31

STR. #2

DRAWN BY : M. CLAREY /OETTINGERS DATE : 7-17
CHECKED BY : D. PRETORIUS DATE : 7-17
DESIGN ENGINEER : D. PRETORIUS DATE : 7-17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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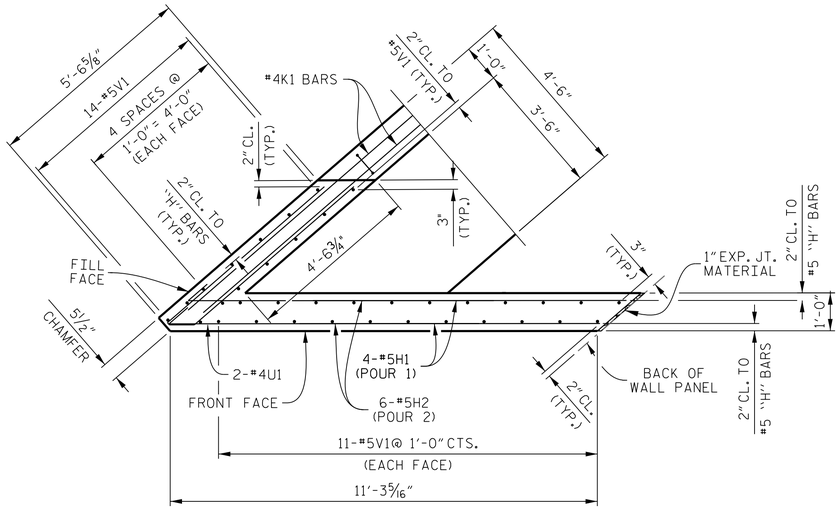
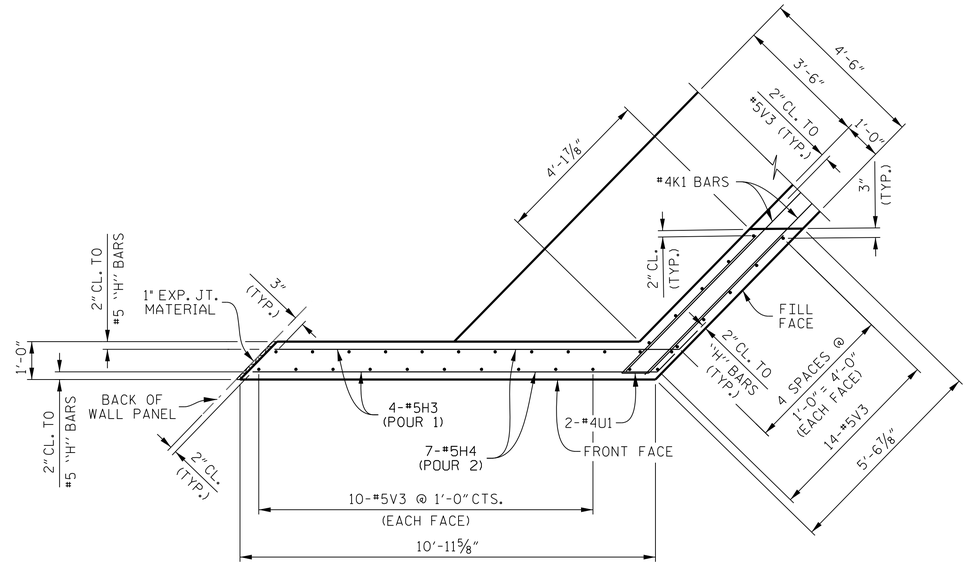
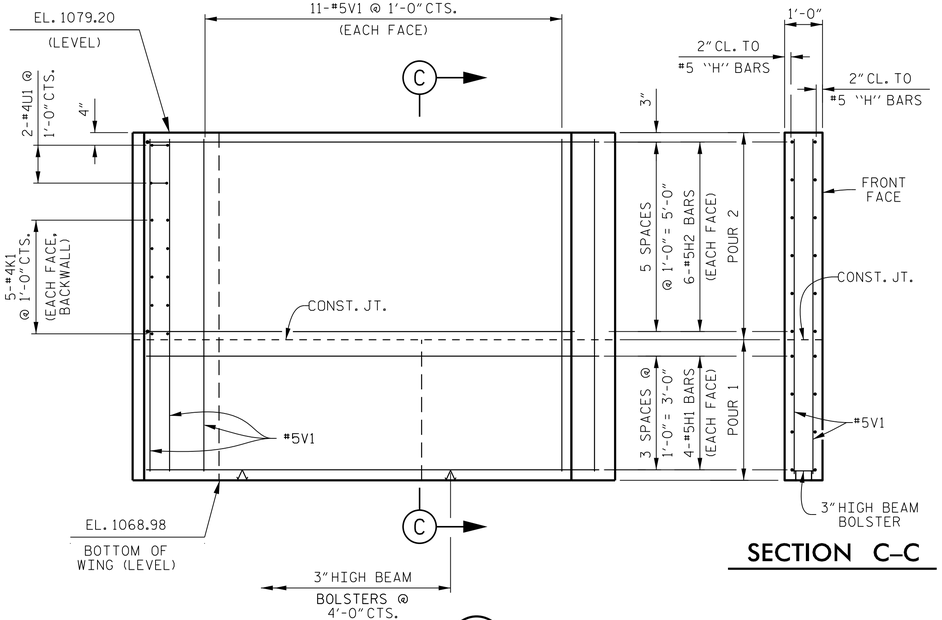


PLAN OF WING W3

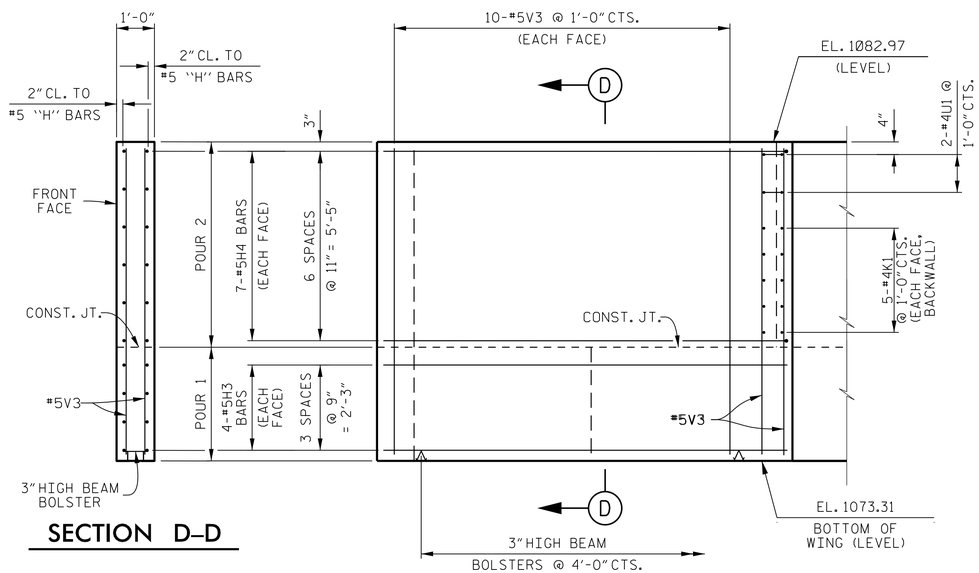


PLAN OF WING W4



ELEVATION OF WING W3

SECTION C–C



SECTION D–D

ELEVATION OF WING W4

PROJECT NO. I–4729A

POLK COUNTY

STATION: 21+44.22 –RP_F–

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANDREW D. SHAW
8/11/2017

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2			4			31

STR. #2

DRAWN BY : M. CLAREY / T. DETMERS DATE : 7–17
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DESIGN ENGINEER : D. PRETORIUS DATE : 7–17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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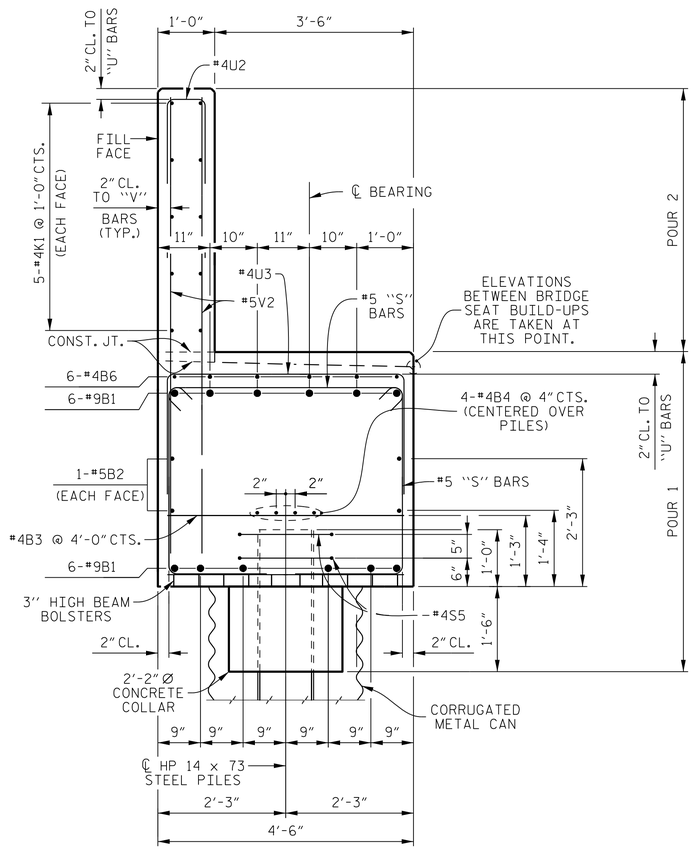
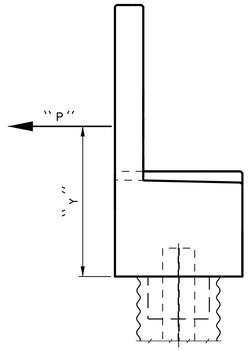


SECTION A–A



END BENT TIEBACK FORCE

COMPONENT	"P" (K /FT.)	"Y" (FT.)
WIND ON STRUCTURE (WS)	0.11	3.514
WIND ON LIVE LOAD (WL)	0.05	3.514
BRAKING FORCE (BR)	0.33	3.514
THERMAL FORCE (TU)	0.16	3.514
EARTH FORCE (EH)	1.28	2.684
LIVE LOAD SURCHARGE (LS)	1.27	4.025

NOTE:
"P" IS UNFACTORED SERVICE LOAD NORMAL TO FILL FACE.

BILL OF MATERIAL

END BENT 2

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	24	#9	2	44'- 6"	3,631
B2	8	#5	STR	40'- 2"	349
B3	18	#4	STR	4'- 2"	50
B4	8	#4	STR	40'- 0"	214
B5	6	#4	STR	7'- 3"	29
B6	24	#4	STR	11'- 6"	184
B7	6	#4	STR	23'- 5"	94
H1	8	#5	STR	11'- 0"	92
H2	12	#5	7	11'- 8"	146
H3	8	#5	STR	10'- 8"	89
H4	14	#5	6	11'- 6"	168
K1	20	#4	STR	40'- 0"	534
S1	5	#5	4	5'- 7"	29
S2	5	#5	8	10'-10"	56
S3	82	#5	4	5'- 1"	435
S4	82	#5	8	10'- 4"	884
S5	24	#4	1	7'- 7"	122
U1	4	#4	5	9'- 7"	26
U2	66	#4	3	4'- 2"	184
U3	53	#4	3	7'- 2"	254
V1	36	#5	STR	9'- 9"	366
V2	132	#5	STR	7'-10"	1,078
V3	34	#5	STR	8'- 11"	316

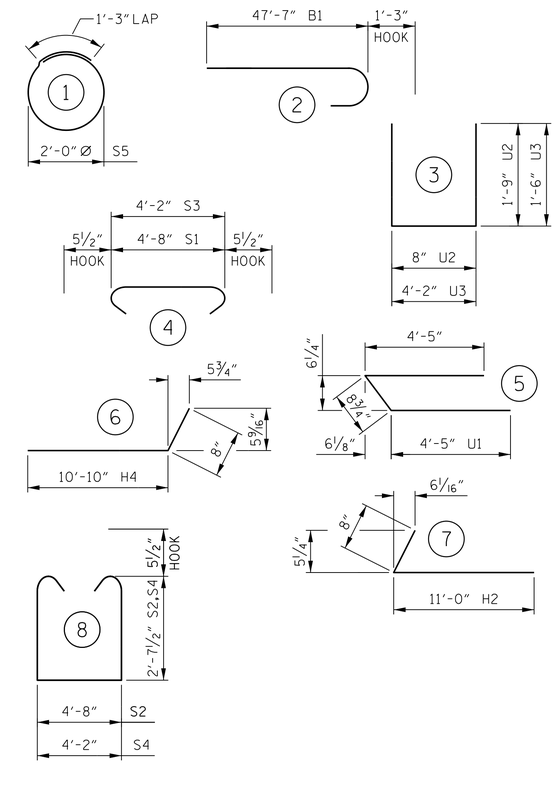
REINFORCING STEEL 9,330 LBS.

CLASS "A" CONCRETE
POUR 1 COLLARS, CAP AND LOWER WINGS 68.3 CU. YDS.
POUR 2 BACKWALL AND UPPER WINGS 19.3 CU. YDS.
TOTAL 87.6 CU. YDS.

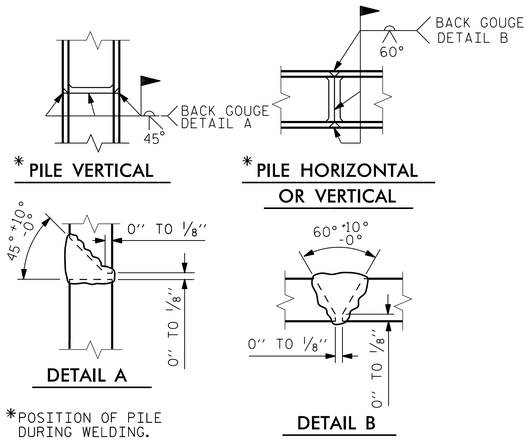
HP 14 x 73 STEEL PILES
12 REQUIRED 660.0 LIN. FT.

PILE DRIVING EQUIPMENT SETUP FOR HP14X73 STEEL PILES 12 EACH

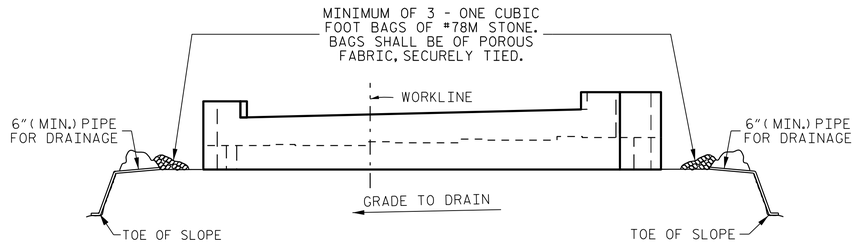
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



PILE SPLICE DETAILS



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

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

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

TEMPORARY DRAINAGE AT END BENT

PROJECT NO. I-4729A
POLK COUNTY
STATION: 21+44.22 –RP_F–

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

DRAWN BY : M. CLAREY / T. DETMERS DATE : 7-17
CHECKED BY : D. PRETORIUS DATE : 7-17
DESIGN ENGINEER : D. PRETORIUS DATE : 7-17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANDREW D. SMITH
8/16/2017

REVISIONS						SHEET No.
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1			3			TOTAL SHEETS
2			4			31

STR. #2

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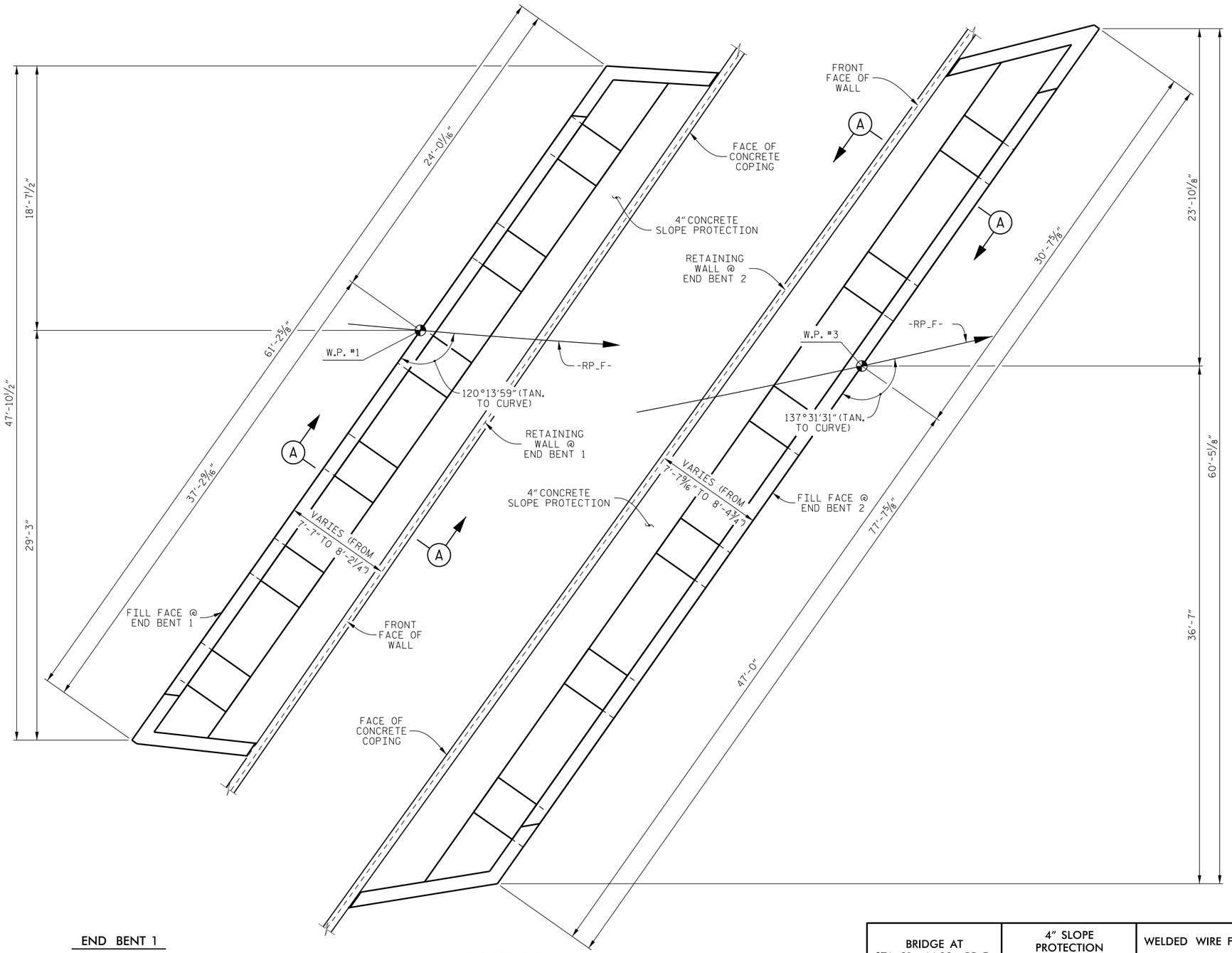
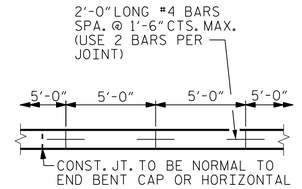
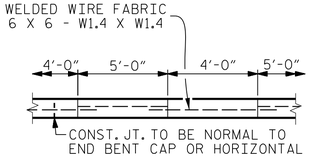


PLAN

APPROACH SLABS AND CONCRETE DITCHES NOT SHOWN

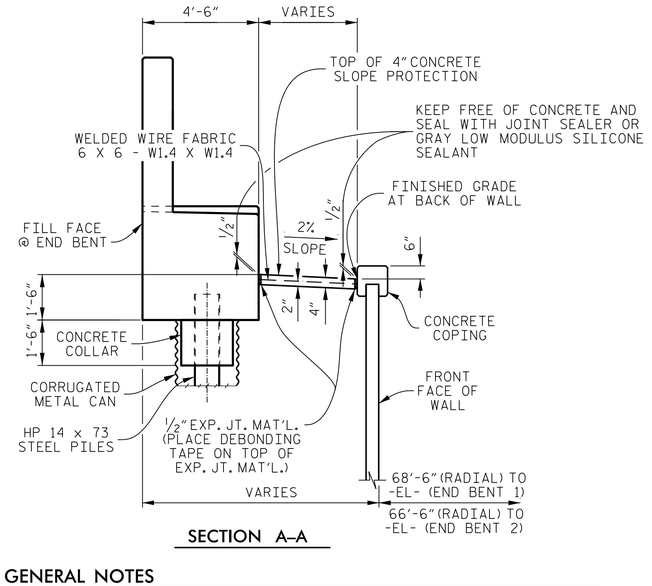


POURING DETAIL



POUR A 4'-0" STRIP FIRST.

OPTIONAL POURING DETAIL



SECTION A–A

GENERAL NOTES

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

STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT.

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. 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.

PROJECT NO. I–4729A

POLK COUNTY

STATION: 21+44.22 –RP_F–

BRIDGE AT STA. 21+44.22 –RP_F–	4" SLOPE PROTECTION	WELDED WIRE FABRIC
	SQUARE YARDS	APPROX. LINEAR FEET
END BENT 1	19	34
END BENT 2	26	48

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/11/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S2–28
1			3			TOTAL SHEETS
2			4			31

STD. No. SP1 STR. #2

ASSEMBLED BY :	K. E. LOFTON	DATE :	7-17
CHECKED BY :	D. PRETORIUS	DATE :	7-17
DRAWN BY : ELR	5/92	REV. 10/1/11	MAA/GM
CHECKED BY : GRP	6/92	REV. 12/21/11	MAA/GM
		REV. 1 /16	MAA/TMG

DRAWN BY :	K. E. LOFTON	DATE : 8-17
CHECKED BY :	A. D. SHAH	DATE : 7-17
DESIGN ENGINEER :	S. PHAN	DATE : 7-17

PLANS PREPARED BY :
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5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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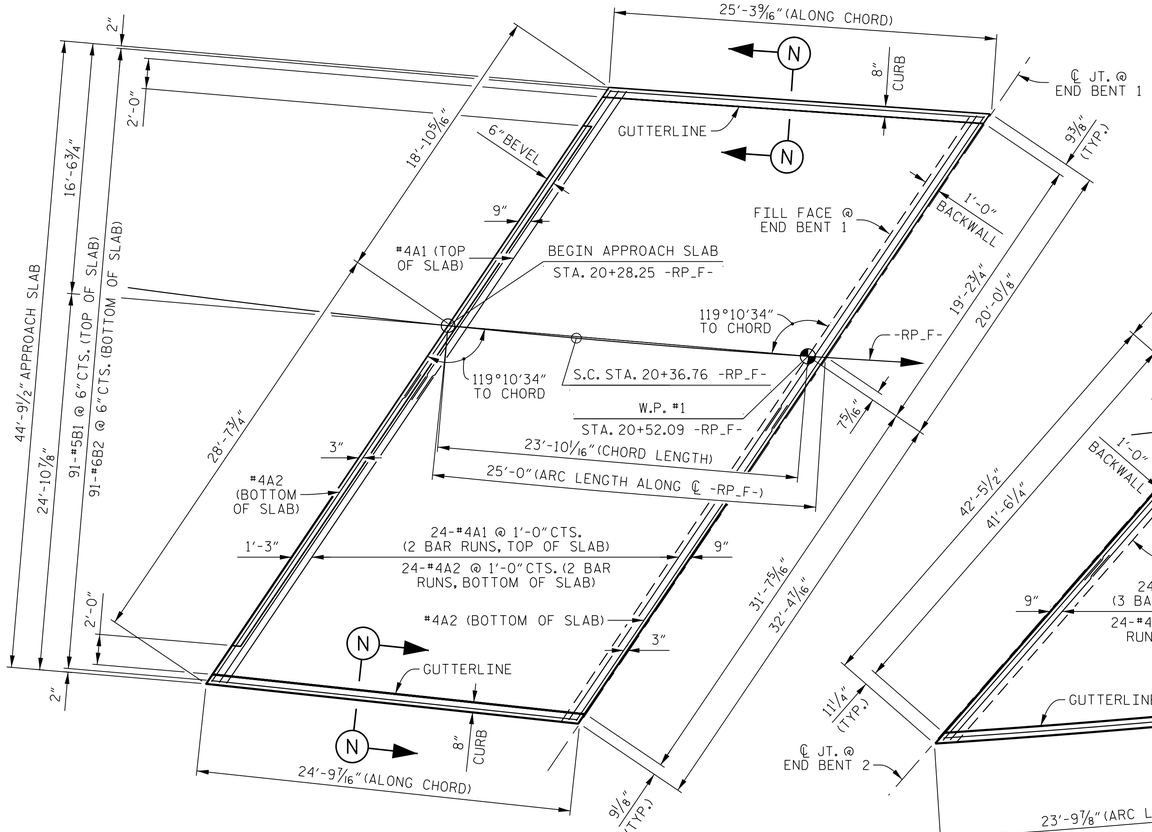
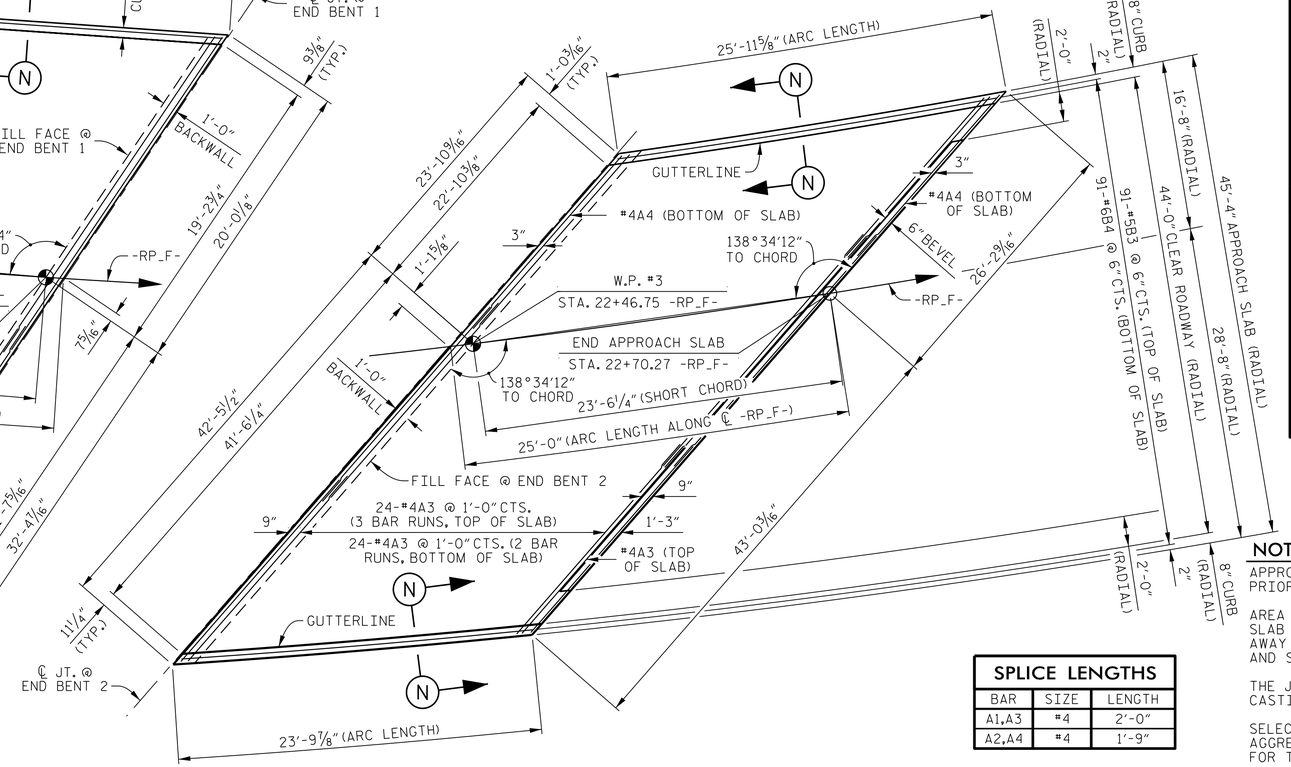


PLAN OF APPROACH SLAB AT END BENT 1



PLAN OF APPROACH SLAB AT END BENT 2

BILL OF MATERIAL

APPROACH SLAB AT END BENT 1

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
* A1	50	#4	STR	26'- 9"	893
A2	52	#4	STR	26'- 7"	923
* B1	91	#5	STR	24'- 1"	2,286
B2	91	#6	STR	24'- 6"	3,349
REINFORCING STEEL					4,272 LBS.
* EPOXY COATED REINFORCING STEEL					3,179 LBS.
CLASS "AA" CONCRETE					43.9 CU. YDS.

APPROACH SLAB AT END BENT 2

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
* A3	75	#4	STR	23'- 9"	1,190
A4	78	#4	STR	23'- 7"	1,229
* B3	91	#5	STR	23'-10"	2,262
B4	91	#6	STR	24'- 3"	3,315
REINFORCING STEEL					4,544 LBS.
* EPOXY COATED REINFORCING STEEL					3,452 LBS.
CLASS "AA" CONCRETE					42.6 CU. YDS.

SPLICE LENGTHS

BAR	SIZE	LENGTH
A1,A3	#4	2'-0"
A2,A4	#4	1'-9"

NOTES

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

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 SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

SELECT BACKFILL MATERIAL SHALL BE THE AGGREGATE USED IN THE REINFORCED ZONE FOR THE MSE RETAINING WALL.

REINFORCED BRIDGE APPROACH FILLS ARE NOT REQUIRED AT END BENTS DUE TO MSE WALL REINFORCEMENT CONNECTED TO THE BACKWALL OF THE END BENT CAP.

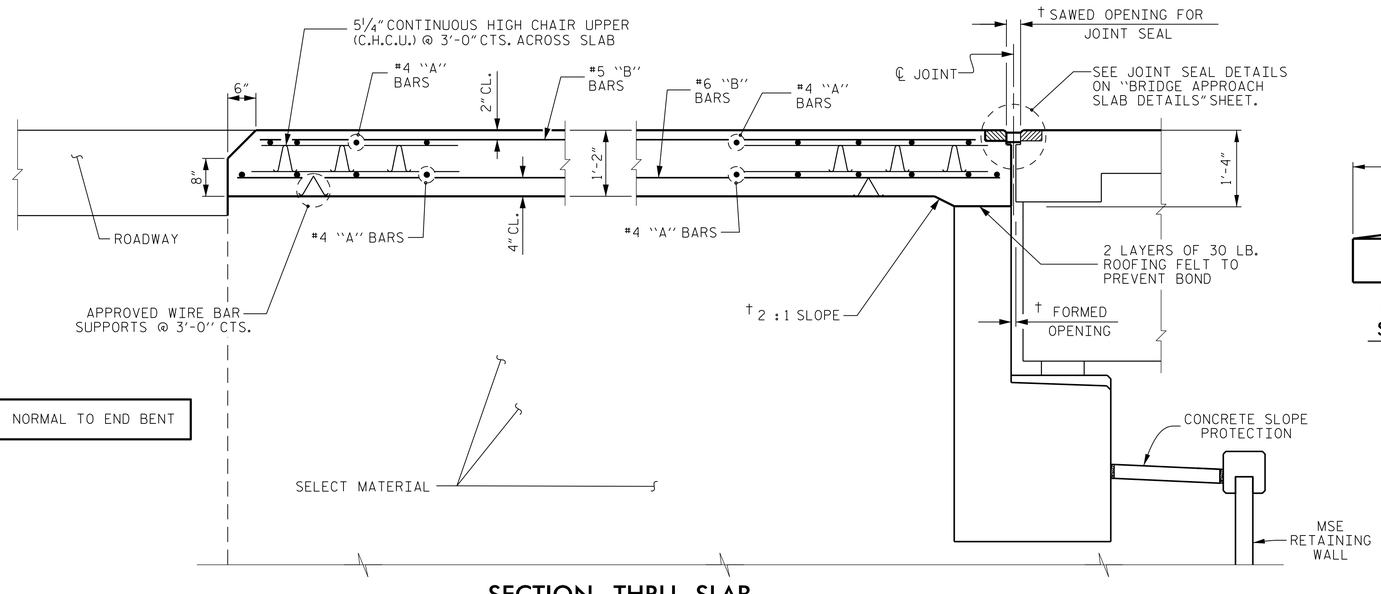
FOR ARC OFFSETS, SEE SHEET 2 OF 2.

WITH FOAM JOINT SEAL

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

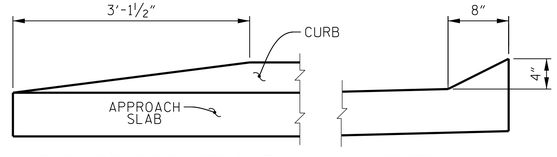
THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.



† NORMAL TO END BENT

SECTION THRU SLAB



END OF CURB WITHOUT SHOULDER BERM GUTTER

SECTION N-N

CURB DETAILS

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 -RP_F-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

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NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPEM D. SHAH
8664D2B6C5F4ee...
8/11/2017

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1			3			TOTAL SHEETS
2			4			31

STD. No. BAS2 STR. #2

ASSEMBLED BY : K. E. LOFTON DATE : 7-17
CHECKED BY : A. D. SHAH DATE : 7-17

DRAWN BY : TLA 10/05
CHECKED BY : GM 5/06

REV. 10/1/11 MAA/GM
REV. 12/21/11 MAA/GM
REV. 6/13 MAA/GM

DRAWN BY : K. E. LOFTON DATE : 8-17
CHECKED BY : A. D. SHAH DATE : 7-17
DESIGN ENGINEER : S. PHAN DATE : 7-17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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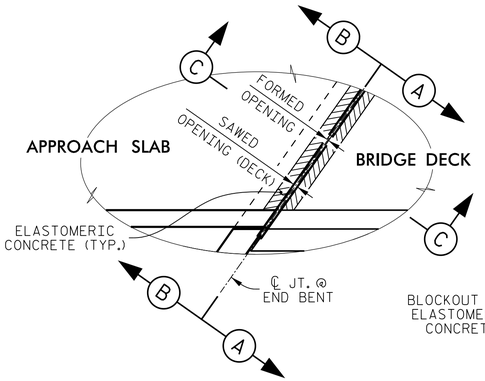
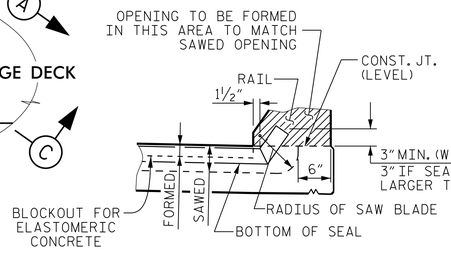
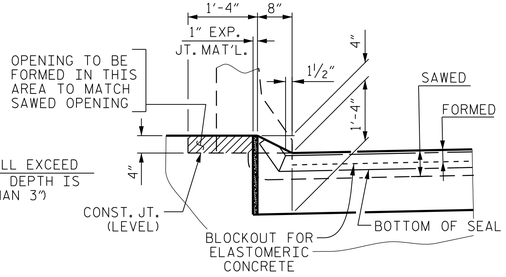


PLAN VIEW OF FOAM JOINT SEAL AT END BENT FOR BARRIER RAIL



SECTION A–A

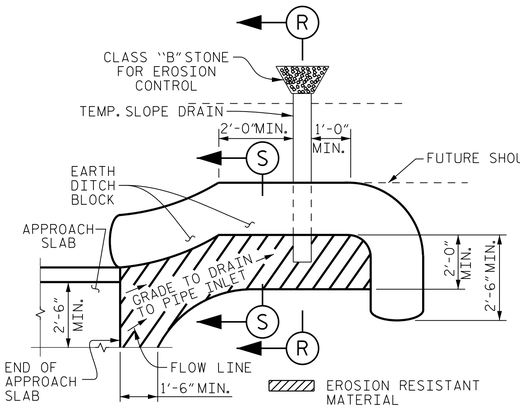


SECTION B–B

JOINT SEAL DETAILS AT END BENT FOR BARRIER RAIL

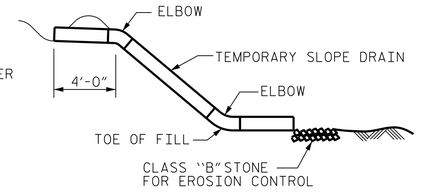
FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

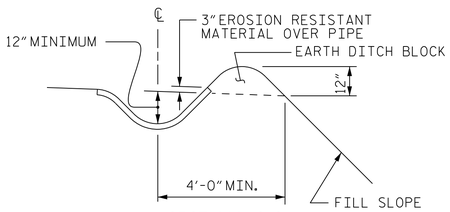


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



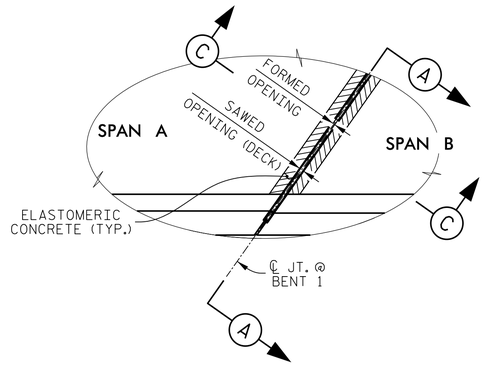
SECTION R–R



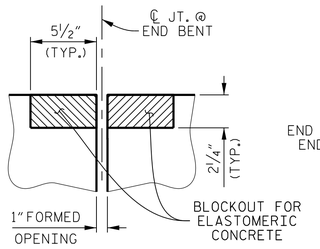
SECTION S–S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

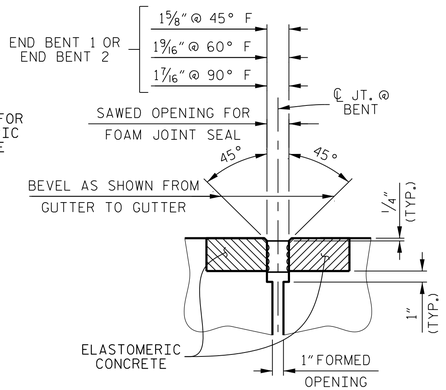


PLAN VIEW OF FOAM JOINT SEAL AT BENT FOR BARRIER RAIL



SECTION C–C

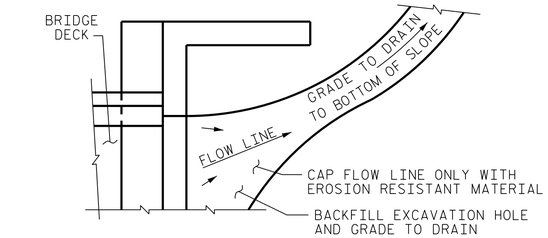
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



SECTION C–C

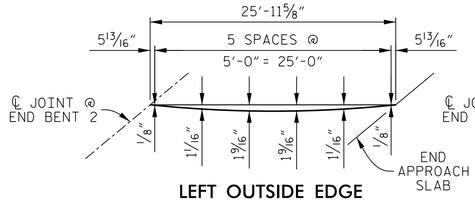
ELASTOMERIC CONCRETE	
LOCATION	ELASTOMERIC CONCRETE * (CU. FT.)
END BENT 1	8.7
BENT 1	9.6
END BENT 2	11.1
TOTAL	29.4

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

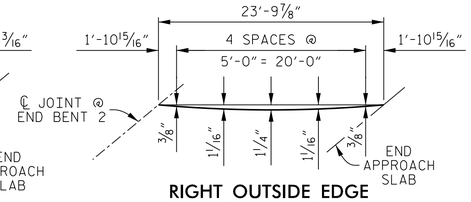


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



LEFT OUTSIDE EDGE



RIGHT OUTSIDE EDGE

ARC OFFSETS – APPROACH SLAB AT END BENT 2

PROJECT NO. I–4729A

POLK COUNTY

STATION: 21+44.22 –RP_F–

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

DRAWN BY : K. E. LOFTON DATE : 7–17
CHECKED BY : A. D. SHAH DATE : 7–17
DESIGN ENGINEER : S. PHAN DATE : 7–17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606–3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/11/2017

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S2–30
1			3			TOTAL SHEETS
2			4			31

STR. #2

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STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

PROJECT NO. I-4729A

POLK COUNTY

STATION: 21+44.22 -RP_F-

ENGLISH

JANUARY, 1990

DRAWN BY : K. E. LOFTON DATE : 7-17
CHECKED BY : A. D. SHAH DATE : 7-17
DESIGN ENGINEER : S. PHAN DATE : 7-17

PLANS PREPARED BY :
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 029979 ENGINEER ANUPAM D. SHAH
8/11/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD NOTES

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

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REV. 8-16-99 RWW (-) LES REV. 5-1-06 TLA (-) GM

STD. No. SN STR. #2