This electronic collection of documents is provided for the convenience of the user and is Not a Certified Document –

The documents contained herein were originally issued and sealed by the individuals whose names and license numbers appear on each page, on the dates appearing with their signature on that page.
This file or an individual page shall not be considered a certified document.

09/08/99

CONTRACT: C204093 BRIDGES 008, 129, & 130

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

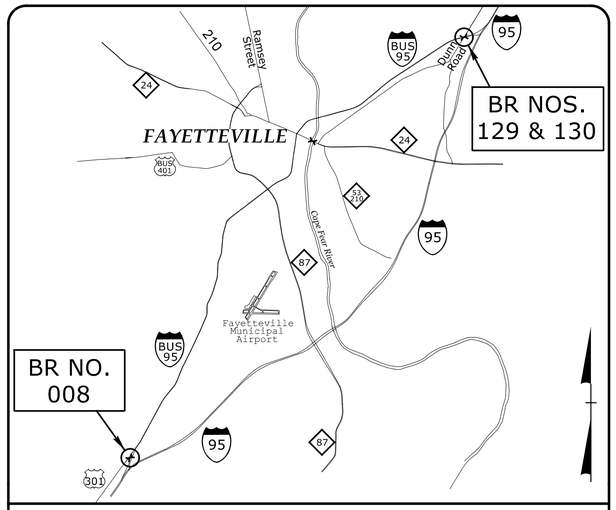
CUMBERLAND COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BRIDGES 008, 129, & 130	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
41665.7A		PE & CONST	

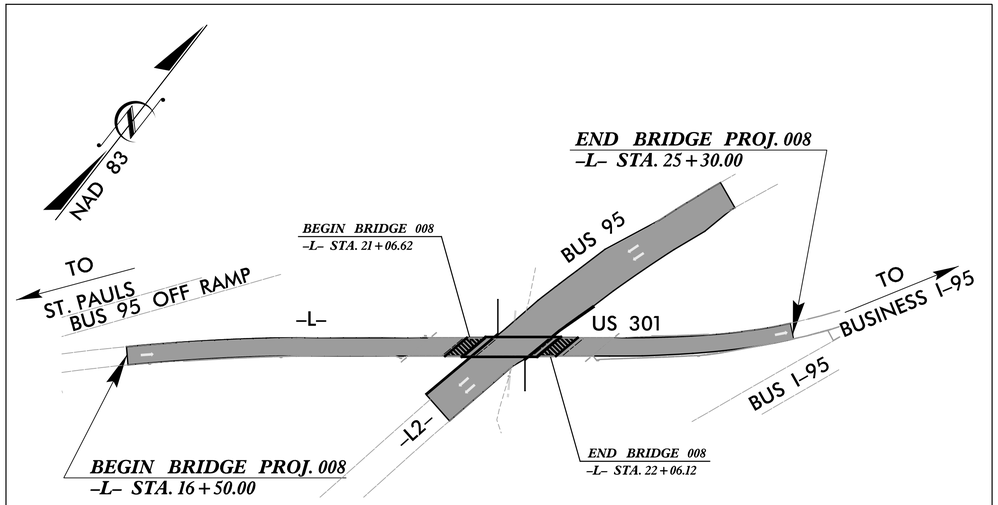
LOCATION: *BRIDGE NOS. 129 & 130 ON I–95 BUSINESS LOOP OVER US 301 AND BRIDGE NO. 008 ON US 301 OVER I–95 BUSINESS LOOP SBL*

TYPE OF WORK: *GRADING, PAVING, DRAINAGE, STRUCTURE, SIGNING & TRAFFIC CONTROL*

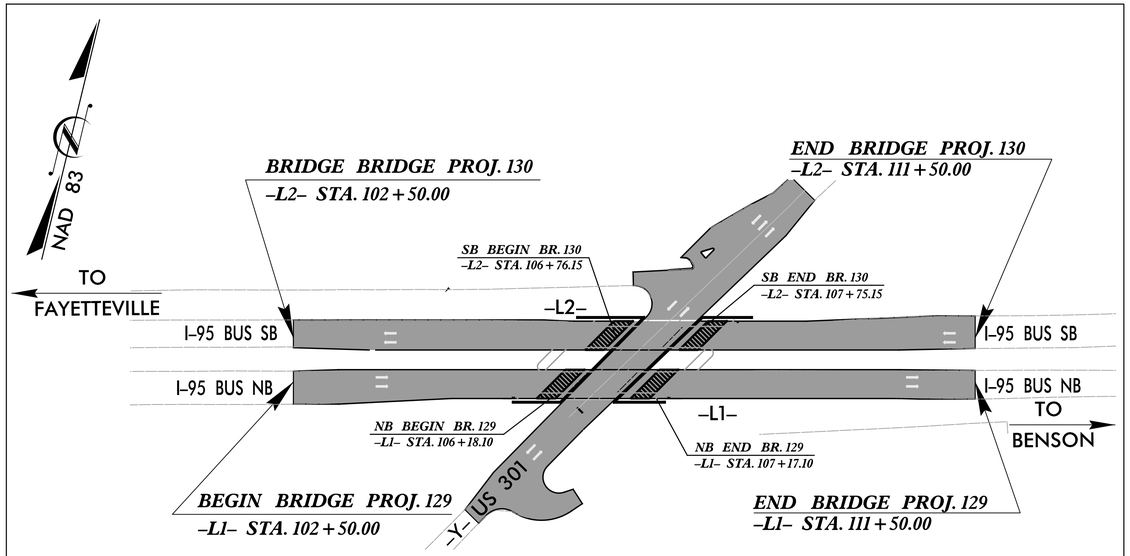
STRUCTURES



VICINITY MAP
NOT TO SCALE



BRIDGE NO. 008



BRIDGE NOS. 129 & 130

DESIGN DATA

BRIDGE 008:
V = 40 MPH

BRIDGES 129 & 130
V = 60 MPH

FUNC CLASS =

INTERSTATE TIER

PROJECT LENGTH

TIP PROJECT BRIDGE 008:		
LENGTH ROADWAY	=	0.148 MI.
LENGTH STRUCTURE	=	0.019 MI.
TOTAL LENGTH OF PROJECT	=	0.167 MI.
TIP PROJECT BRIDGES 129 & 130:		
LENGTH ROADWAY (EACH)	=	0.151 MI.
LENGTH STRUCTURE (EACH)	=	0.019 MI.
TOTAL LENGTH OF PROJECT (EACH)	=	0.170 MI.

Prepared In the Office of:

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

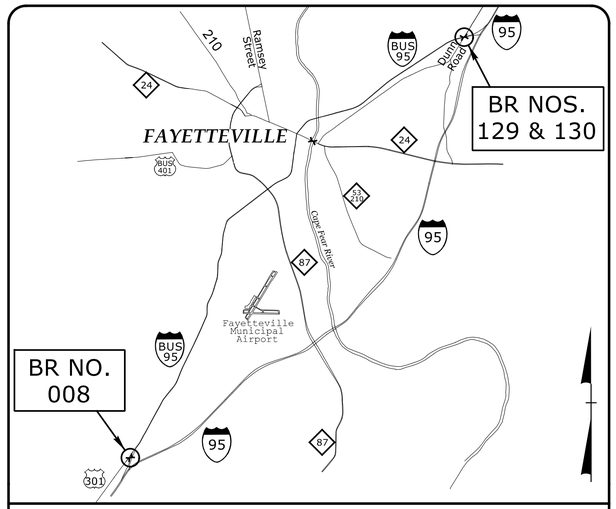
2012 STANDARD SPECIFICATIONS

LETTING DATE:
DECEMBER 19, 2017

ERIC B. NELSON JR., PE
PROJECT ENGINEER

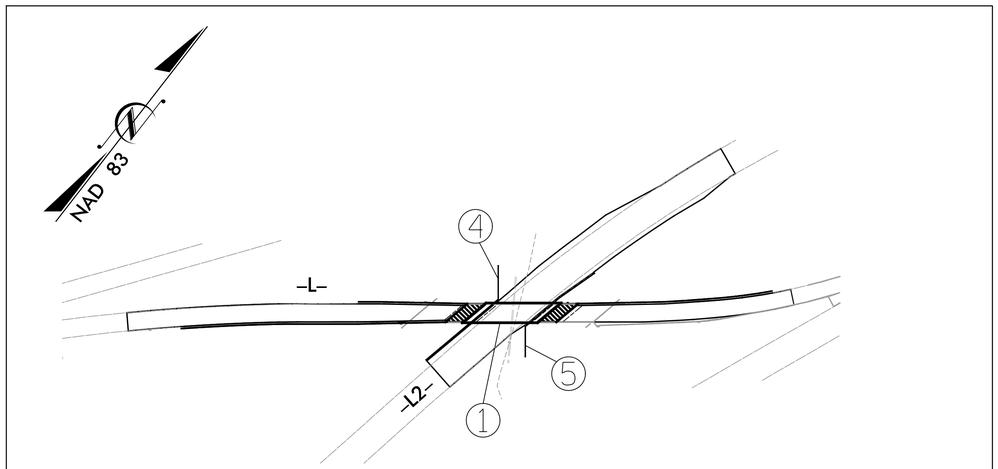
RICHARD F. WERTMAN, PE
PROJECT DESIGN ENGINEER

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

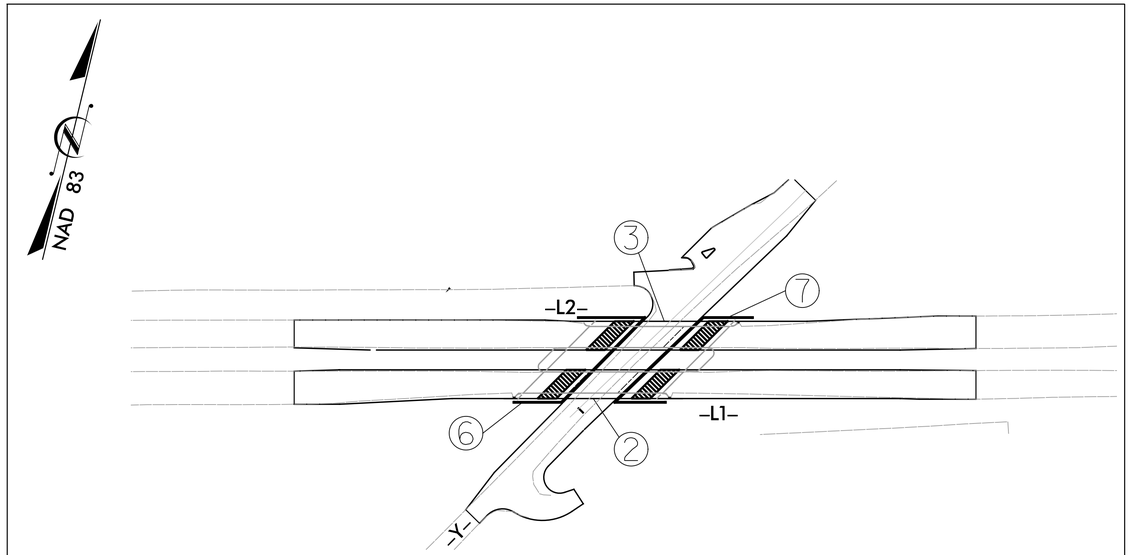


VICINITY MAP

NOT TO SCALE



BRIDGE NO. 008



BRIDGE NOS. 129 & 130

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION:

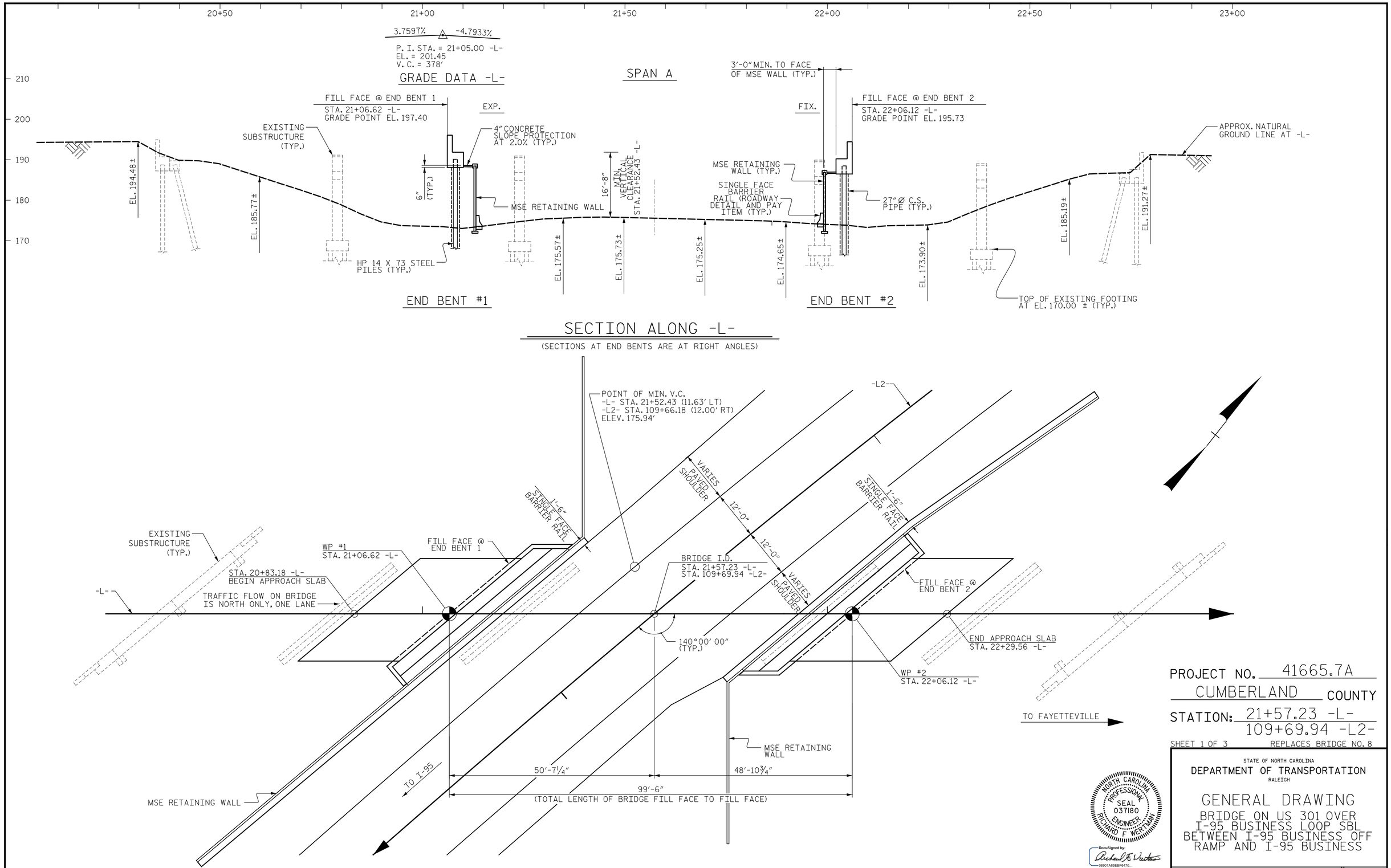
INDEX

STRUCTURE	STATION	DESCRIPTION	SHEET NUMBERS
1	21+57.23 -L- 109+69.94 -L2-	BRIDGE ON US 301 OVER I-95 BUSINESS LOOP SBL BETWEEN I-95 BUSINESS OFF RAMP AND I-95 BUSINESS	S01-1 THRU S01-24
2	106+59.75 -L1- 14+51.19 -Y-	BRIDGE ON I-95 BUSINESS LOOP NBL OVER US 301 BETWEEN DOBBIN HOLMES ROAD AND I-95	S02-1 THRU S02-24
3	107+16.84 -L2- 13+69.76 - Y-	BRIDGE ON I-95 BUSINESS LOOP SBL OVER US 301 BETWEEN DOBBIN HOLMES ROAD AND I-95	S03-1 THRU S03-24
4	21+57.23 -L- 109+69.94 -L2-	MSE RETAINING WALL NO. 1 AT END BENT 1 OF STR. #1	W-1 THRU W-4
5	21+57.23 -L- 109+69.94 -L2-	MSE RETAINING WALL NO. 2 AT END BENT 2 OF STR. #1	W-1 THRU W-4
6	14+10.22 -Y-	MSE RETAINING WALL NO. 3 AT END BENT 1 OF STR. #2 AND STR. #3	W-5 THRU W-9
7	14+10.22 -Y-	MSE RETAINING WALL NO. 4 AT END BENT 2 OF STR. #2 AND STR. #3	W-5 THRU W-9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

INDEX

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



PLAN

(PILES NOT SHOWN FOR CLARITY)

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

SHEET 1 OF 3 REPLACES BRIDGE NO. 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON US 301 OVER I-95 BUSINESS LOOP SBL BETWEEN I-95 BUSINESS OFF RAMP AND I-95 BUSINESS

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman
11/7/2017

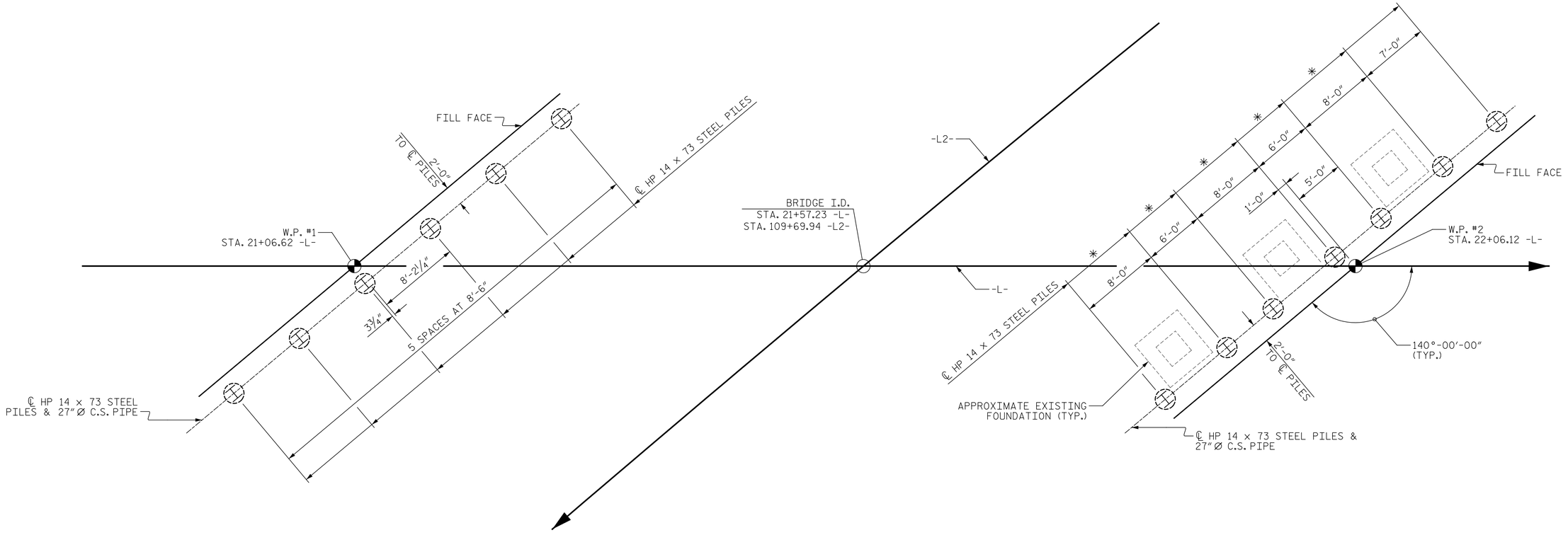
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-1
1			3			TOTAL SHEETS
2			4			24

STR. NO. 1

DRAWN BY : J.A. BOYER DATE : 08/27/17
CHECKED BY : R.F. WERTMAN DATE : 08/29/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



END BENT #1

END BENT #2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE.

NOTES:

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

PILES AT END BENTS NO. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.

DRIVE PILES AT END BENTS NO. 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 140 TONS PER PILE.

OBSERVE A ONE MONTH WAITING PERIOD AFTER CONSTRUCTING THE MSE WALLS AND BEFORE DRIVING PILES AT END BENTS NO. 1 AND 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SPECIAL PROVISIONS.

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

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.

PILE SLEEVES AT END BENTS NO. 1 AND 2 ARE TO BE PLACED DURING CONSTRUCTION IN THE REINFORCED BACKFILL OF THE MSE WALLS. SEE MSE WALL PLANS.

PILES AT END BENTS NO. 1 AND 2 ARE TO BE DRIVEN AFTER CONSTRUCTION AND RELEASE OF THE MSE WALLS PENDING THE SETTLEMENT MONITORING PROGRAM.

THE MSE WALL MAY NEED TO BE INSTALLED USING TWO-STAGED CONSTRUCTION TECHNIQUES, TO ALLOW THE SETTLEMENT TO OCCUR. THE ANTICIPATED SETTLEMENT WAS APPROXIMATELY 3.5-INCHES FOR BOTH END BENTS NO. 1 AND 2.

✳ END BENT NO. 2 PILES LOCATED NEAR THE EXISTING FOOTING CAN BE SHIFTED TO AVOID INTERFERENCE. PILE SPACING NOT TO EXCEED 8'-6". THE CONTRACTOR IS RESPONSIBLE FOR LOCATING EXISTING FOOTINGS BEFORE DRIVING NEW PILES.

DRAWN BY : J.A. BOYER DATE : 09/25/17
CHECKED BY : R.F. WERTMAN DATE : 10/09/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by:
Richard F Wertman
11/7/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. 41665.7A
CUMBERLAND COUNTY
STATION: 21+57.23 -L-
109+69.94 -L2-

SHEET 2 OF 3

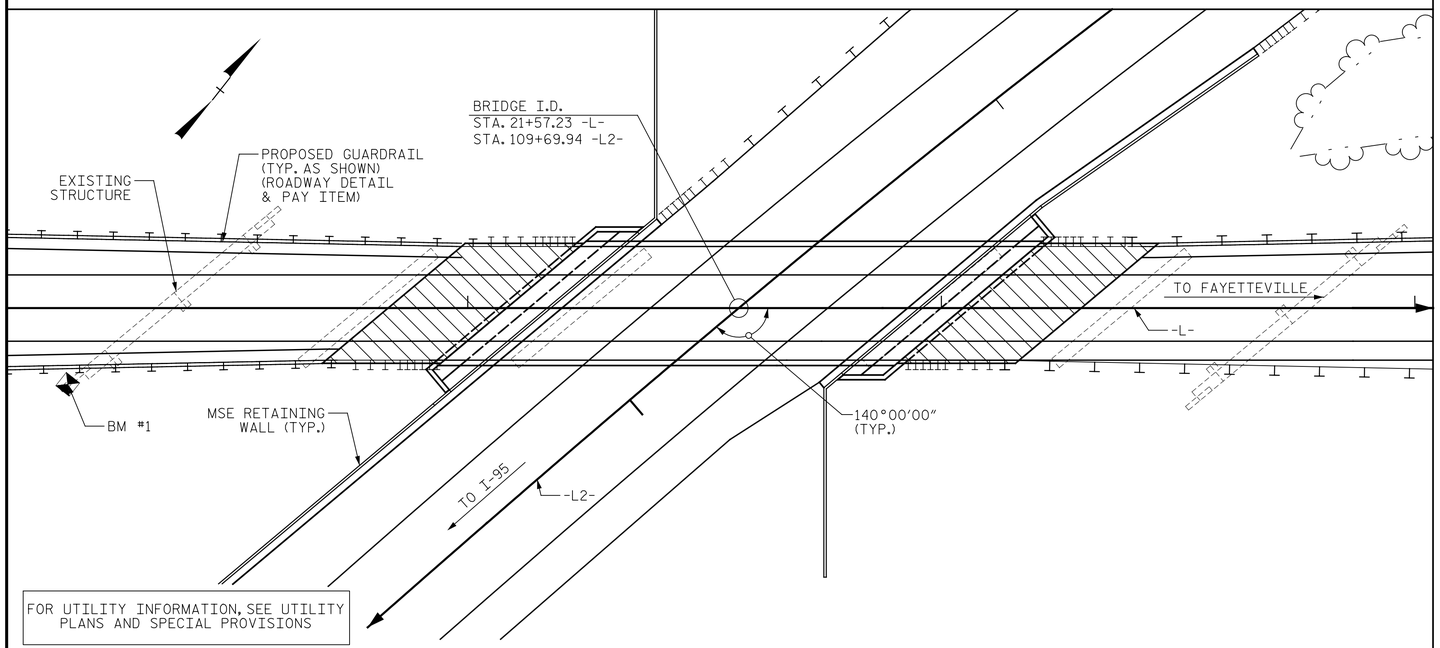
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON US 301 OVER I-95 BUSINESS LOOP SBL BETWEEN I-95 BUSINESS OFF RAMP AND I-95 BUSINESS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-2
1			3			TOTAL SHEETS
2			4			24

STR. NO. 1

BENCH MARK #1: CHISELED SQUARE IN CONCRETE HEADWALL, -L- STA. 20+15.52, 16.083' RIGHT, EL. 194.92



LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION 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, SEE SPECIAL PROVISIONS.

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

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

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 21+57.23 -L-".

THE EXISTING STRUCTURE CONSISTING OF TWO SPANS @ 45'-0", ONE SPAN @ 75'-0", AND TWO SPANS @ 40'-0", WITH A CLEAR ROADWAY OF 24'-1" AND REINFORCED CONCRETE DECK ON STEEL I-BEAMS ON END BENTS WITH REINFORCED CONCRETE CAPS ON STEEL PILES & INTERIOR BENTS WITH REINFORCED CONCRETE POSTS AND BEAMS ON PILE FOOTINGS LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

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

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL APPROX. 81650 LBS.	PILE DRIVEN EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES	HP 14 X 73 STEEL PILES		PILE REDRIVES	VERTICAL CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	ASBESTOS ASSESSMENT
	LUMP SUM	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LUMP SUM	EACH	NO.	LIN.FT.	EACH	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			2527	3052		LUMP SUM		LUMP SUM					192.5		LUMP SUM	LUMP SUM	LUMP SUM
END BENT NO. 1					40.4		5646		6	6	492	6		12			
END BENT NO. 2					42.4		5704		7	7	504	7		12			
TOTAL	LUMP SUM	1	2527	3052	82.8	LUMP SUM	11350	LUMP SUM	13	13	996	13	192.5	24	LUMP SUM	LUMP SUM	LUMP SUM

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON US 301 OVER I-95 BUSINESS LOOP SBL BETWEEN I-95 BUSINESS OFF RAMP AND I-95 BUSINESS

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F. WERTMAN

DocuSigned by: Richard F. Wertman 08901A86EBF8470...
11/14/2017

DRAWN BY : B.A. WHITE DATE : 09/22/17
CHECKED BY : R.F. WERTMAN DATE : 10/08/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-3
1			3			TOTAL SHEETS
2			4			24

STR. NO. 1

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.48	--	1.75	0.648	1.48	A	EL	45.86	0.959	1.85	A	I	0.00	1.30	0.648	1.65	A	EL	20.00	
		HL-93 (OPERATING)	N/A		1.92	--	1.35	0.648	1.92	A	EL	45.86	0.959	2.40	A	I	0.00	1.00	0.648	2.14	A	EL	20.00	
		HS-20 (INVENTORY)	36.00	2	2.03	73.08	1.75	0.648	2.03	A	EL	45.86	0.959	2.49	A	I	0.00	1.30	0.648	2.24	A	EL	20.00	
		HS-20 (OPERATING)	36.00		2.63	94.68	1.35	0.648	2.63	A	EL	45.86	0.959	3.22	A	I	0.00	1.00	0.648	2.91	A	EL	20.00	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.38	72.63	1.40	0.648	6.03	A	EL	45.86	0.959	7.65	A	I	0.00	1.30	0.648	5.38	A	EL	20.00	
		SNGARBS2	20.000		3.81	76.20	1.40	0.648	4.35	A	EL	45.86	0.959	5.35	A	I	0.00	1.30	0.648	3.81	A	EL	20.00	
		SNAGRIS2	22.000		3.53	77.66	1.40	0.648	4.04	A	EL	45.86	0.959	4.94	A	I	0.00	1.30	0.648	3.53	A	EL	20.00	
		SNCOTTS3	27.250		2.68	73.03	1.40	0.648	2.95	A	EL	45.86	0.959	3.81	A	I	0.00	1.30	0.648	2.68	A	EL	20.00	
		SNAGGRS4	34.925		2.19	76.49	1.40	0.648	2.43	A	EL	45.86	0.959	3.11	A	I	0.00	1.30	0.648	2.19	A	EL	20.00	
		SNS5A	35.550		2.16	76.79	1.40	0.648	2.39	A	EL	45.86	0.959	3.11	A	I	0.00	1.30	0.648	2.16	A	EL	20.00	
		SNS6A	39.950		1.96	78.30	1.40	0.648	2.17	A	EL	45.86	0.959	2.82	A	I	0.00	1.30	0.648	1.96	A	EL	20.00	
		SNS7B	42.000		1.89	79.38	1.40	0.648	2.06	A	EL	45.86	0.959	2.74	A	I	0.00	1.30	0.648	1.89	A	EL	20.00	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.42	79.86	1.40	0.648	2.65	A	EL	45.86	0.959	3.38	A	I	0.00	1.30	0.648	2.42	A	EL	20.00	
		TNT4A	33.075		2.35	77.73	1.40	0.648	2.65	A	EL	45.86	0.959	3.31	A	I	0.00	1.30	0.648	2.35	A	EL	20.00	
		TNT6A	41.600		1.98	82.37	1.40	0.648	2.15	A	EL	45.86	0.959	2.87	A	I	0.00	1.30	0.648	1.98	A	EL	45.86	
		TNT7A	42.000		1.94	81.48	1.40	0.648	2.16	A	EL	45.86	0.959	2.82	A	I	0.00	1.30	0.648	1.94	A	EL	20.00	
		TNT7B	42.000		1.93	81.06	1.40	0.648	2.20	A	EL	45.86	0.959	2.70	A	I	0.00	1.30	0.648	1.93	A	EL	20.00	
		TNAGRIT4	43.000		1.87	80.41	1.40	0.648	2.11	A	EL	45.86	0.959	2.62	A	I	0.00	1.30	0.648	1.87	A	EL	20.00	
		TNAGT5A	45.000		1.84	82.80	1.40	0.648	2.00	A	EL	45.86	0.959	2.57	A	I	0.00	1.30	0.648	1.84	A	EL	45.86	
		TNAGT5B	45.000	3	1.78	80.10	1.40	0.648	1.98	A	EL	45.86	0.959	2.50	A	I	0.00	1.30	0.648	1.78	A	EL	20.00	
FATIGUE		HL-93 (INVENTORY)	γ_{LL}=0.75		--																		

LOAD FACTORS:

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

NOTES:

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

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

(#) CONTROLLING LOAD RATING

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

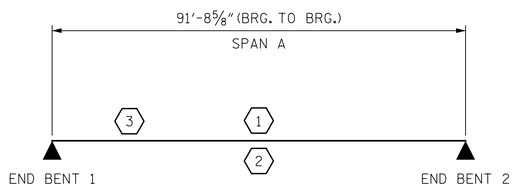
(2) DESIGN LOAD RATING (HS-20) **

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 08901A86EBF6470...
11/7/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

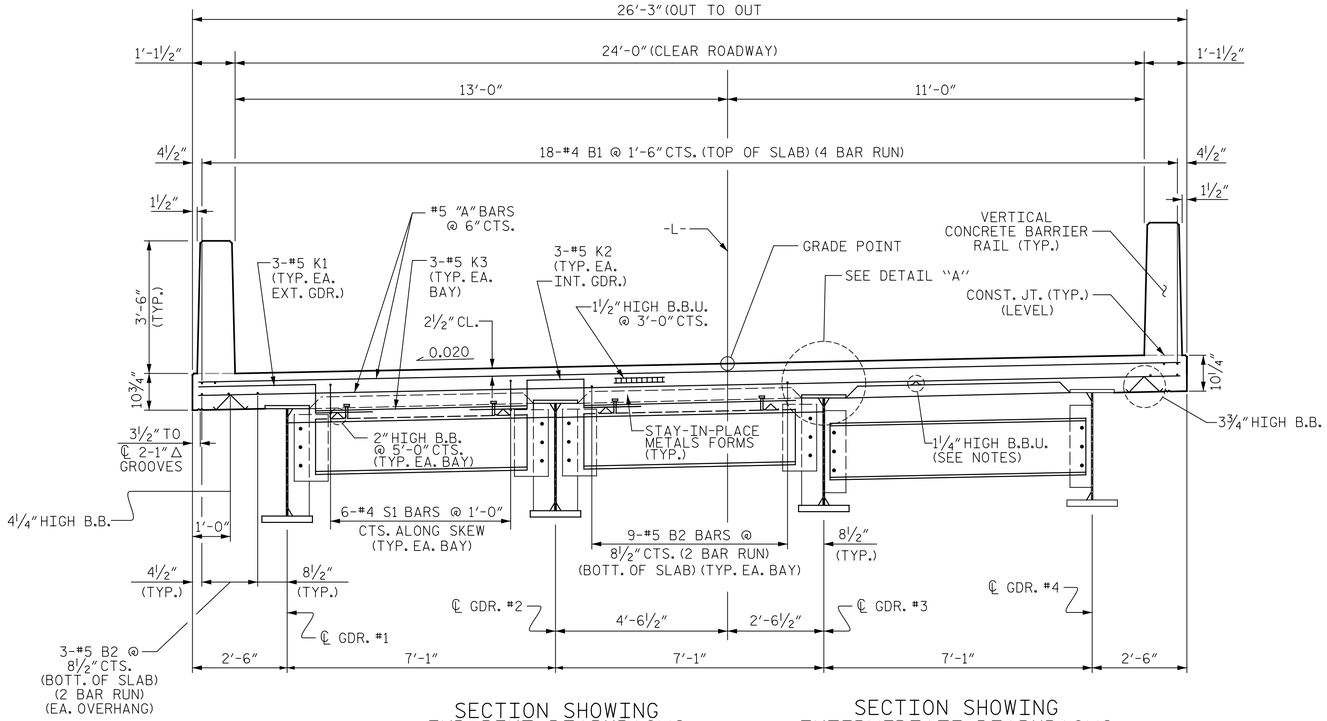
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

LRFR SUMMARY FOR STEEL GIRDERS
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-4
1			3			TOTAL SHEETS
2			4			24

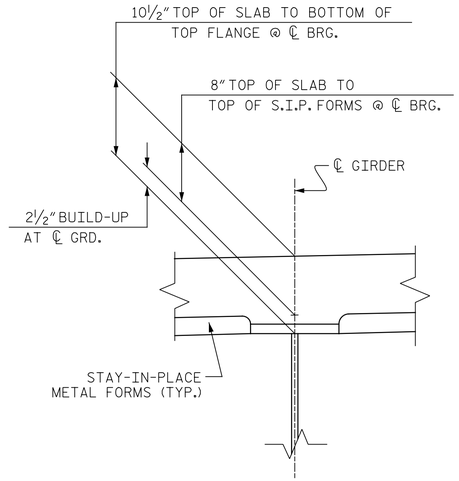
ASSEMBLED BY : B.A. WHITE DATE : 09/20/17
CHECKED BY : R.F. WERTMAN DATE : 09/24/17
DRAWN BY : MAA 1/08
CHECKED BY : GM/DI 2/08
REV. 11/12/08RR MAA/GM
REV. 10/1/11 MAA/GM

STR. NO. 1 STD. NO. LRFR3



SECTION SHOWING END BENT DIAPHRAGMS

SECTION SHOWING INTERMEDIATE DIAPHRAGMS



DETAIL "A"

TYPICAL SECTION

STEEL PLATE GIRDER 34″WEB DEPTH

NOTES:

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

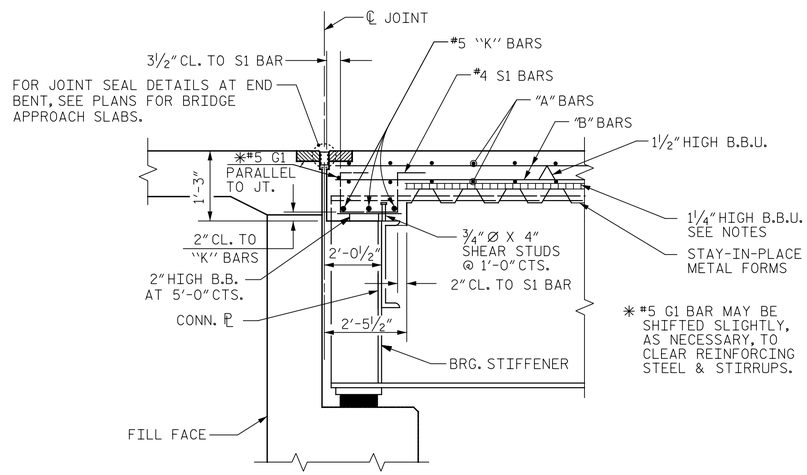
BARRIER RAIL SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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

FOR VERTICAL CONCRETE BARRIER RAIL REINFORCING STEEL AND DETAILS, SEE "VERTICAL CONCRETE BARRIER RAIL PLAN & DETAIL" SHEET.

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

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



END OF GIRDER DETAIL AT END BENT

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman
11/7/2017

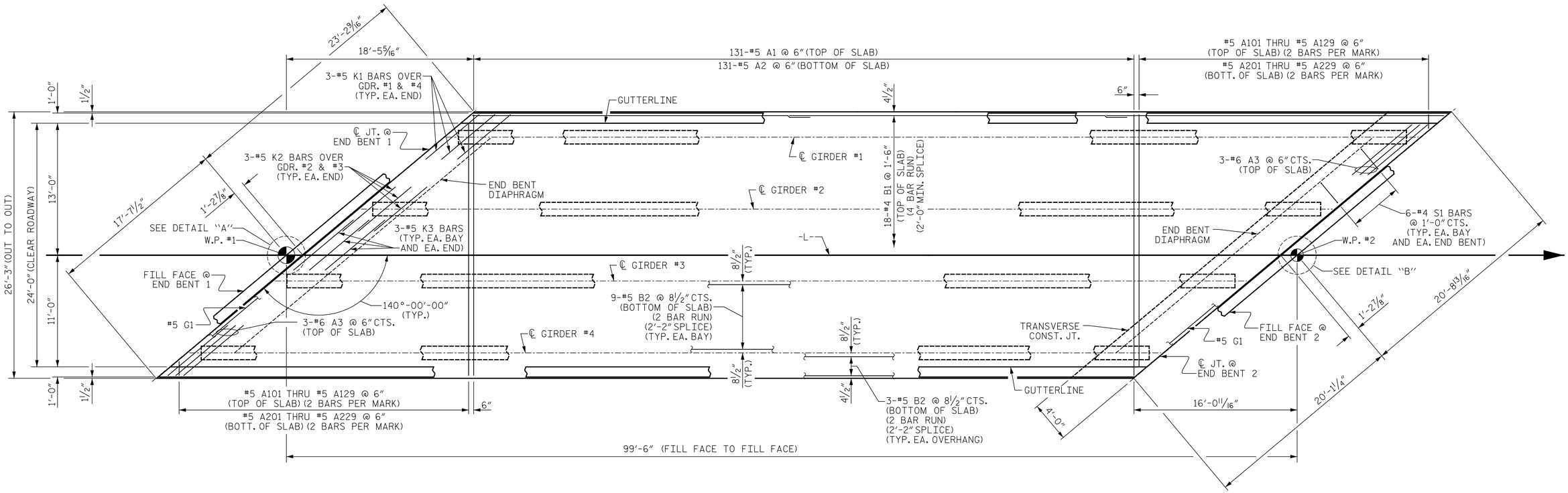
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-5
1			3			TOTAL SHEETS
2			4			24

DRAWN BY : B.A. WHITE DATE : 09/11/17
CHECKED BY : R.F. WERTMAN DATE : 09/24/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

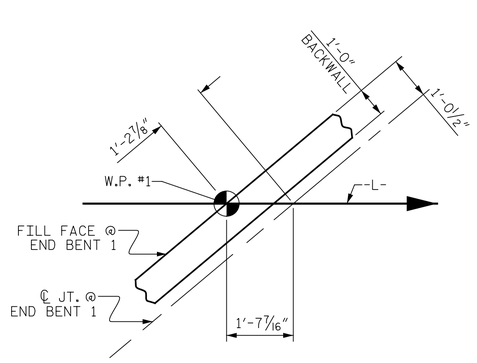
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

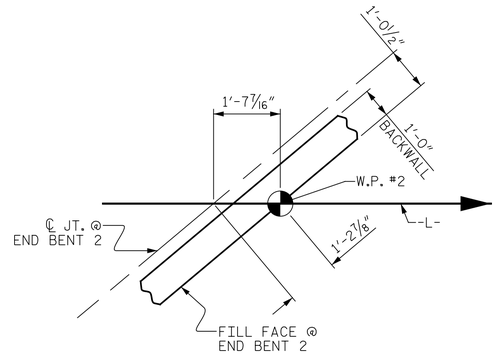
STR. NO. 1



PLAN OF SPAN A



DETAIL "A"



DETAIL "B"

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 08901A86EBF6470...
11/7/2017

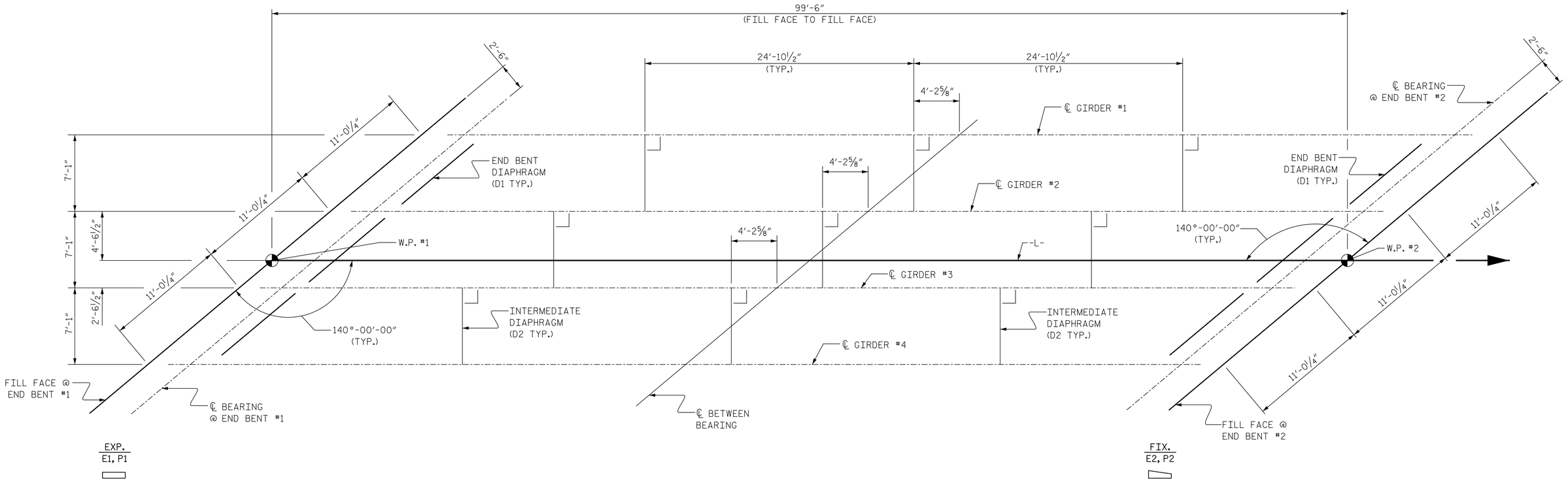
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-6
1			3			TOTAL SHEETS
2			4			24

DRAWN BY : B.A. WHITE DATE : 09/18/17
CHECKED BY : R.F. WERTMAN DATE : 09/25/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STR. NO. 1



SPAN A

FRAMING PLAN

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by:
Richard F. Wertman
11/7/2017

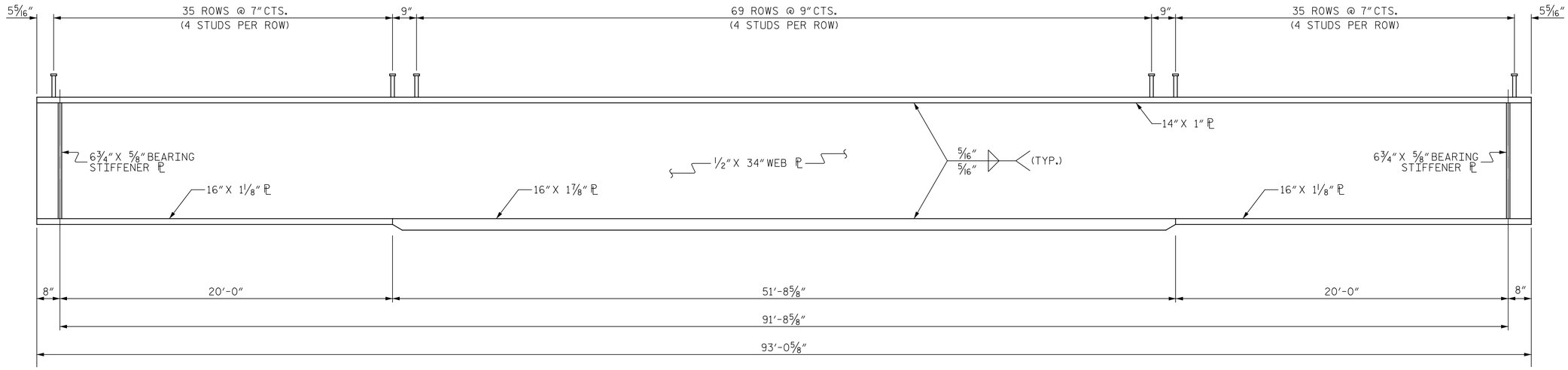
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-7
1			3			TOTAL SHEETS
2			4			24

DRAWN BY : B.A. WHITE DATE : 09/12/17
CHECKED BY : R.F. WERTMAN DATE : 09/26/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

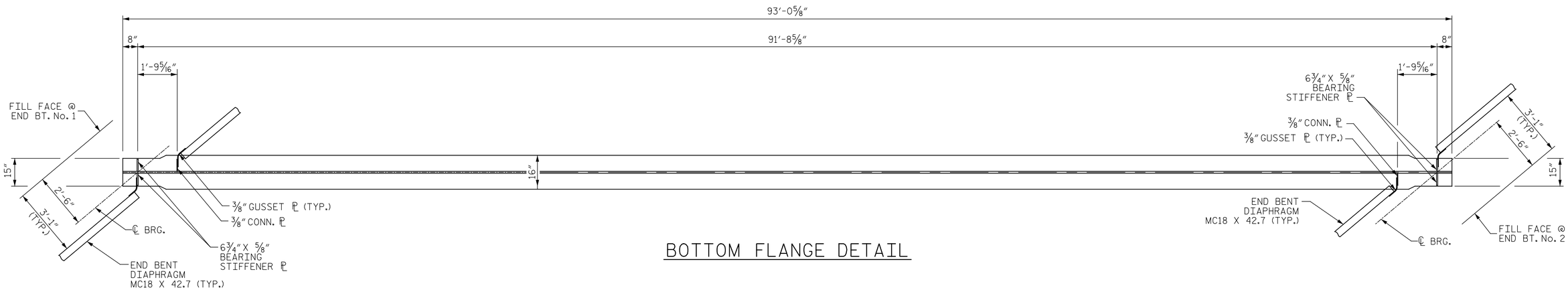
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

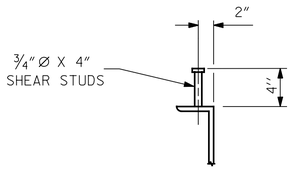
STR. NO. 1



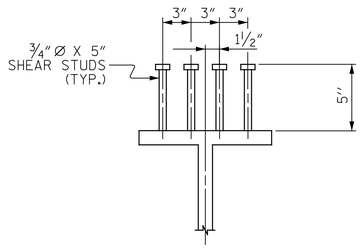
GIRDER ELEVATION
(INTERMEDIATE DIAPHRAGMS NOT SHOWN)



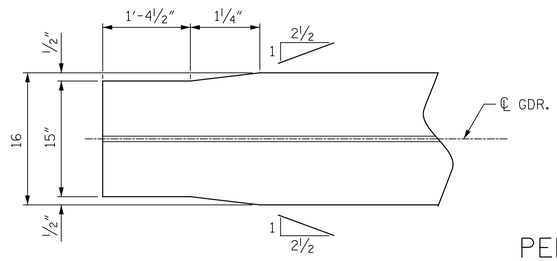
BOTTOM FLANGE DETAIL



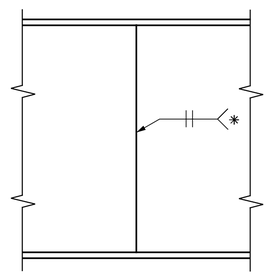
SHEAR STUD DETAILS
(TYP. EACH END BENT DIAPHRAGM)



SHEAR STUD DETAILS
(TYP. EACH GIRDER)

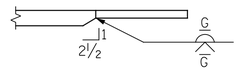


END OF GIRDER DETAIL
(BOTTOM FLANGE ONLY)



PERMISSIBLE SHOP WEB SPLICE

* GRIND SMOOTH AND FLUSH ON OUTSIDE OF EXTERIOR GIRDERS



SECTION THRU FLANGE

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 09501ABBEBF6470...
11/7/2017

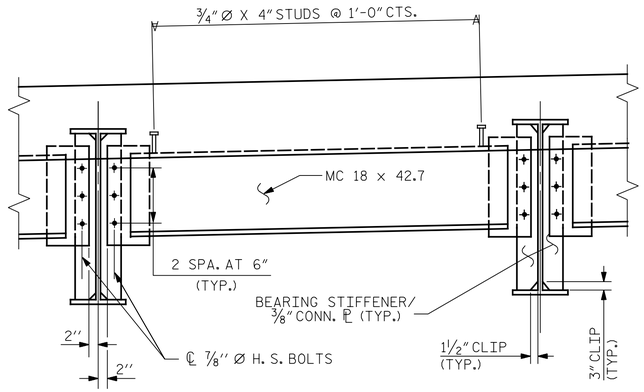
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-8
1			3			TOTAL SHEETS
2			4			24

DRAWN BY : B.A. WHITE DATE : 09/06/17
CHECKED BY : R.F. WERTMAN DATE : 09/26/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

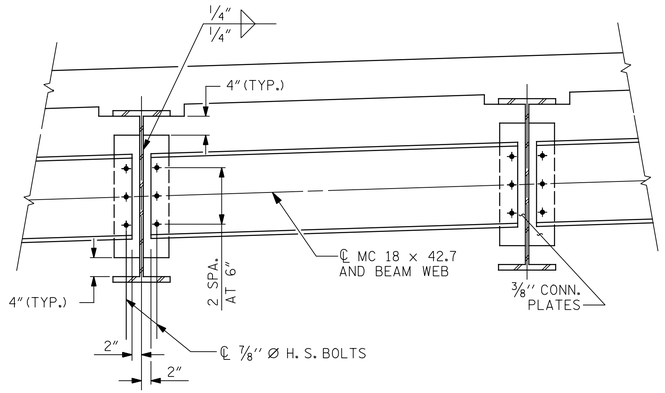
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

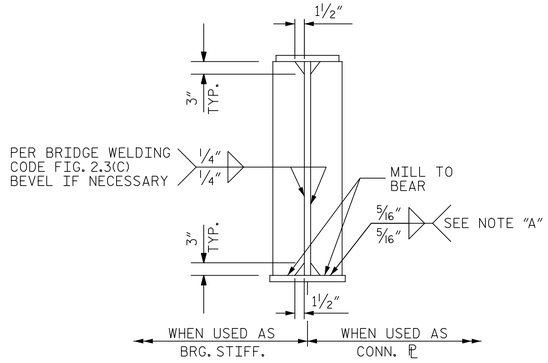
STR. NO. 1



TYPICAL END BENT DIAPHRAGM (D1)



INTERMEDIATE DIAPHRAGM (D2)



BEARING STIFFENER

NOTE "A":
ONLY WELD BEARING STIFFENER TO BOTTOM FLANGE IF DIAPHRAGM IS ATTACHED TO BEARING STIFFENER.

NOTES:

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

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

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

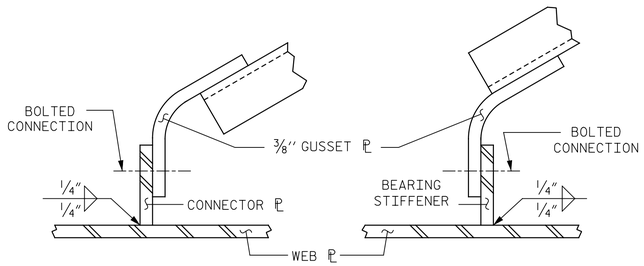
BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

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

PERMITTED FLANGE AND WEB SHOP SLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

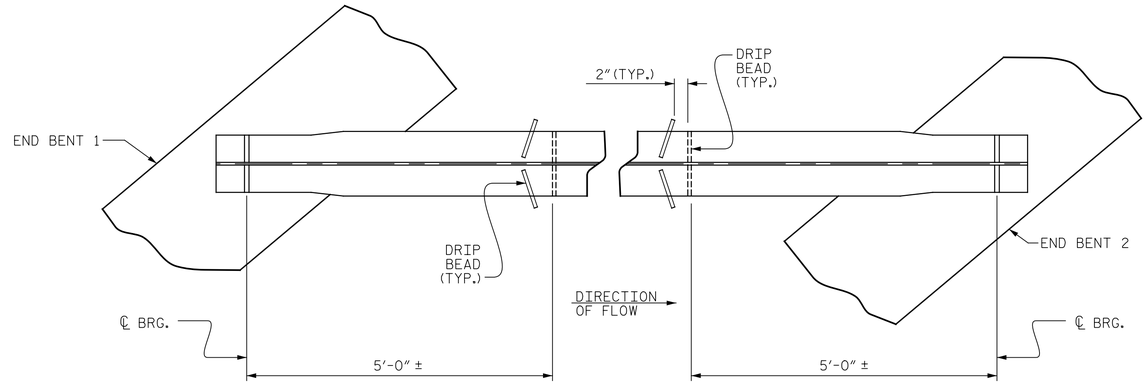
STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

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

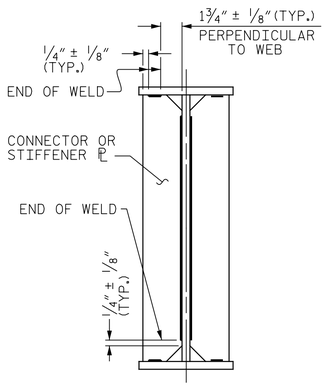


WITH CONNECTOR ℙ — WITH BEARING STIFFENER

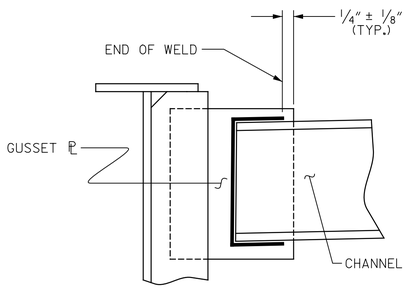
GUSSET PLATE DETAILS



PART PLAN - BOTTOM FLANGE

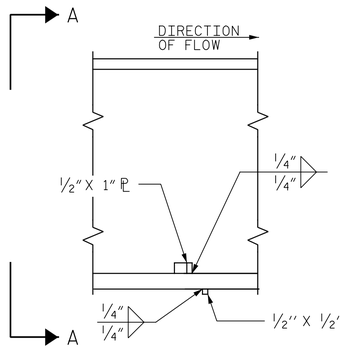


TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

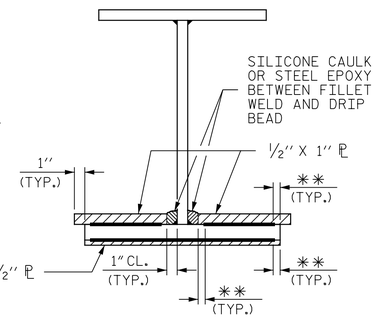


TYPICAL CHANNEL CONNECTION

WELD TERMINATION DETAILS



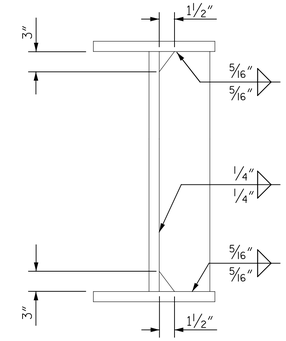
SECTION



VIEW A-A

**SEE "WELD TERMINATION DETAILS"

DRIP BEAD DETAILS



CONNECTOR PLATE DETAILS

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-9
1			3			TOTAL SHEETS
2			4			24

DRAWN BY : B.A. WHITE DATE : 09/06/17
CHECKED BY : R.F. WERTMAN DATE : 09/26/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

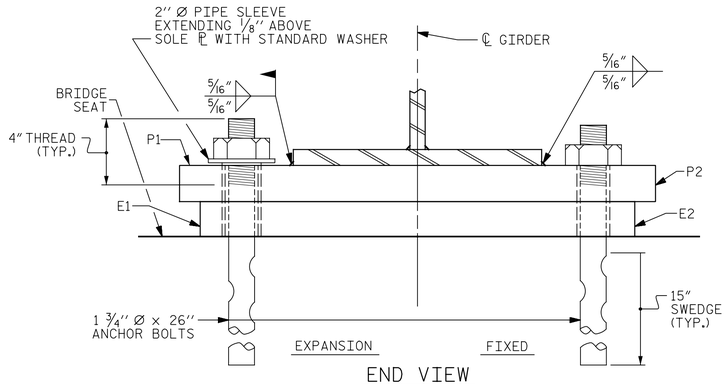
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

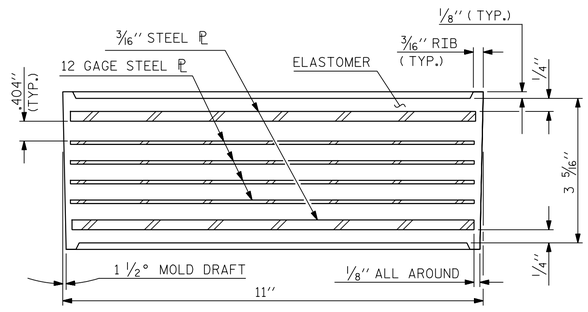
NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F. Wertman 11/7/2017

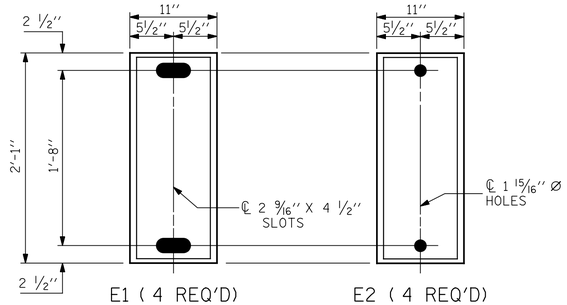
STR. NO. 1



END VIEW

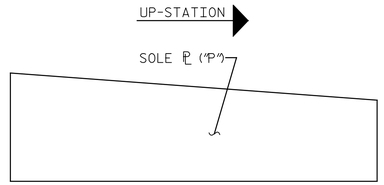


TYPICAL SECTION OF ELASTOMERIC BEARING



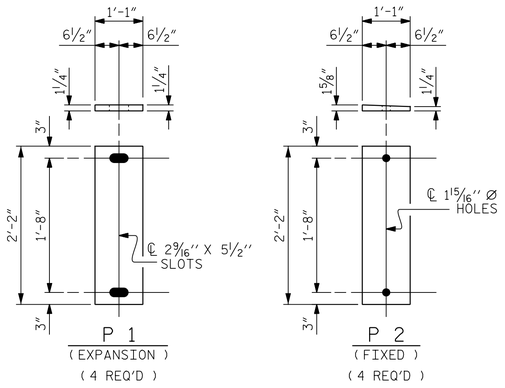
PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV



SOLE ℄ PLACEMENT DETAIL

(END BENT 2 ONLY)



SOLE PLATE DETAILS ("P")

NOTES

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

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

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

FOR PAINTED STRUCTURAL STEEL (EXCLUDING AASHTO M270 GRADE 50W), SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

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

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

—LOAD RATING—	
	MAX. D.L.+L.L.
TYPE IV	310 k

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F. Wertman 08901A86E8F0470...
11/7/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
ELASTOMERIC BEARING DETAILS
(STEEL SUPERSTRUCTURE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-10
1			3			TOTAL SHEETS
2			4			24

STR. NO. 1 STD. NO. EB2

ASSEMBLED BY : B.A. WHITE	DATE : 09/14/17
CHECKED BY : R.F. WERTMAN	DATE : 09/26/17
DRAWN BY : EEM 2/97	REV. 10/1/11 MAA/GM
CHECKED BY : VAP 2/97	REV. 6/13 AAC/MAA
	REV. 1/15 MAA/TMG

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

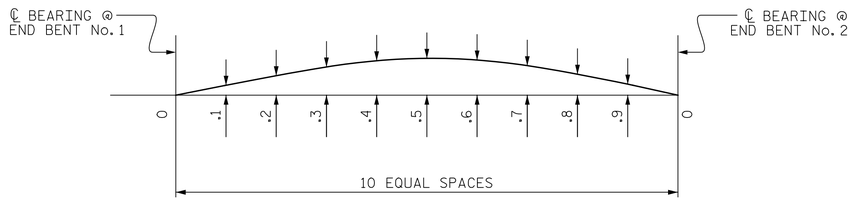
DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	GIRDER 1 & GIRDER 4											GIRDER 2 & GIRDER 3										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.023	0.043	0.059	0.069	0.072	0.069	0.059	0.043	0.023	0	0	0.023	0.043	0.059	0.069	0.072	0.069	0.059	0.043	0.023	0
DEFLECTION DUE TO WEIGHT OF SLAB ✳ ↓	0	0.060	0.118	0.162	0.190	0.200	0.190	0.162	0.118	0.060	0	0	0.051	0.102	0.140	0.164	0.173	0.164	0.140	0.102	0.051	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.013	0.026	0.033	0.038	0.040	0.038	0.033	0.026	0.013	0	0	0.013	0.026	0.033	0.038	0.040	0.038	0.033	0.026	0.013	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.096	0.187	0.254	0.297	0.312	0.297	0.254	0.187	0.096	0	0	0.087	0.171	0.232	0.271	0.285	0.271	0.232	0.171	0.087	0
VERTICAL CURVE ORDINATE ↑	0	0.086	0.152	0.200	0.228	0.238	0.228	0.200	0.152	0.086	0	0	0.086	0.152	0.200	0.228	0.238	0.228	0.200	0.152	0.086	0
REQUIRED CAMBER ↑	0	2 3/16"	4 1/16"	5 7/16"	6 5/16"	6 5/8"	6 5/16"	5 7/16"	4 1/16"	2 3/16"	0	0	2 1/16"	3 7/8"	5 3/16"	6"	6 1/4"	6"	5 3/16"	3 7/8"	2 1/16"	0

✳ INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.

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

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHALL BE PLUMB AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.



SCHEMATIC OF CAMBER ORDINATES

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTION TABLES

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 11/7/2017

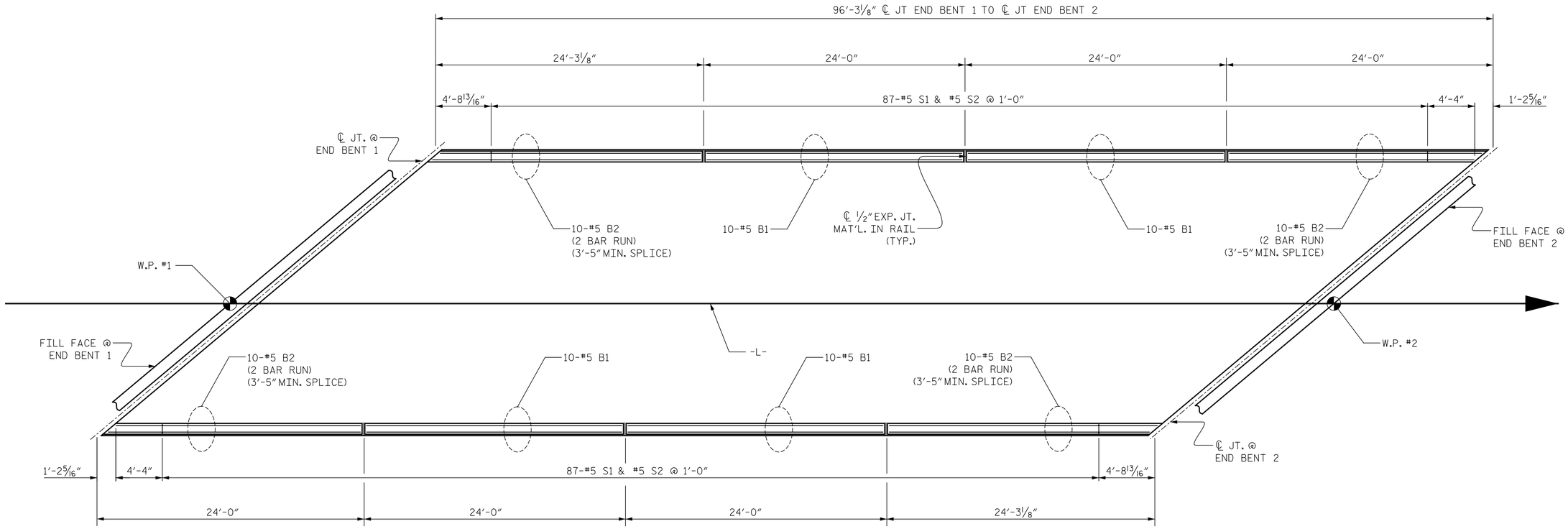
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-11
1			3			TOTAL SHEETS
2			4			24

DRAWN BY : B.A. WHITE DATE : 09/15/17
CHECKED BY : R.F. WERTMAN DATE : 09/27/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STR. NO. 1



PLAN OF BARRIER RAIL

**SEE "END OF RAIL DETAILS" ON SHEET 2 OF 2 FOR ADDITIONAL REINFORCING STEEL.

DIMENSIONS ARE SHOWN FROM ℄ JOINT AT BACK FACE OF BARRIER RAIL

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

VERTICAL CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F. Wertman 11/7/2017

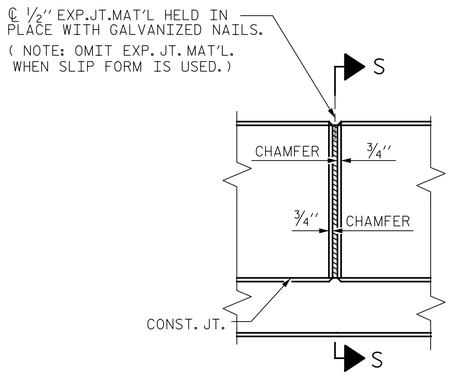
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-12
1			3			TOTAL SHEETS
2			4			24

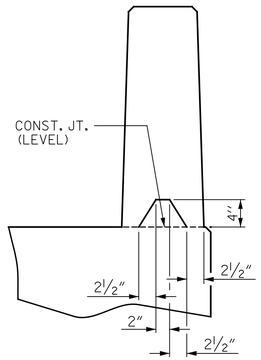
DRAWN BY : B.A. WHITE DATE : 09/11/17
CHECKED BY : T.M. FORD DATE : 09/27/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

STR. NO. 1



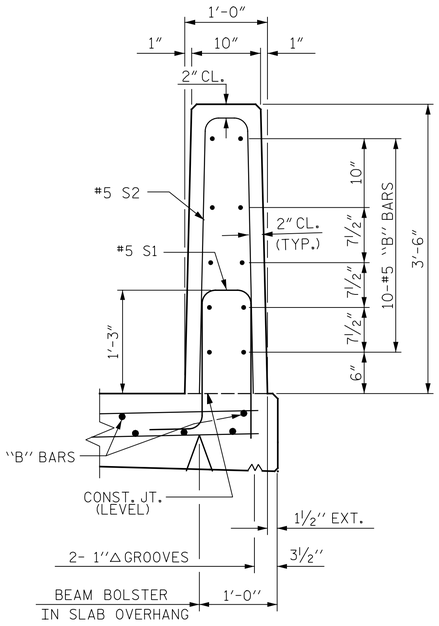
ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS



SECTION S-S

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



SECTION THRU 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.

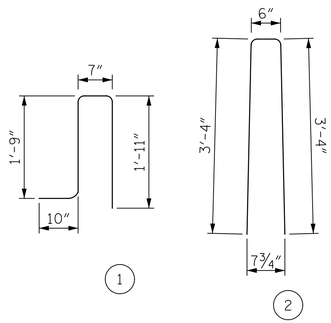
WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF VERTICAL CONCRETE BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3 & S4 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3 & S4 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.

BAR TYPES



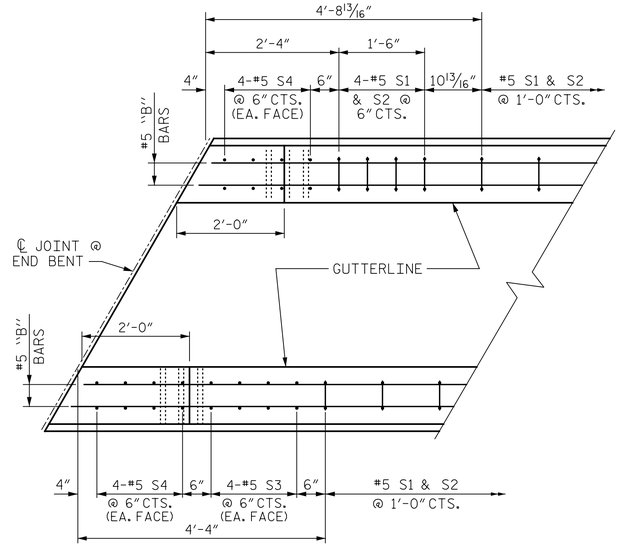
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

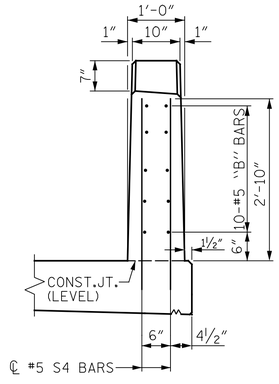
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ B1	40	#5	STR	23'-8"	988
✱ B2	80	#5	STR	14'-2"	1182
✱ S1	182	#5	1	5'-1"	965
✱ S2	182	#5	2	7'-2"	1361
✱ S3	16	#5	STR	4'-0"	67
✱ S4	32	#5	STR	3'-6"	117

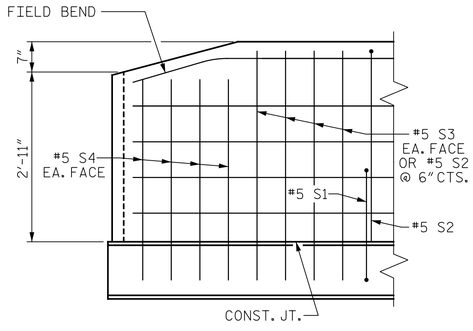
✱EPOXY COATED REINFORCING STEEL	4,680 LBS.
CLASS AA CONCRETE	23.0 CU. YDS.
VERTICAL CONCRETE BARRIER RAIL	192.5 LIN. FT.



PLAN



END VIEW



SIDE VIEW

END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS

ASSEMBLED BY : B.A. WHITE		DATE :	09/11/17
CHECKED BY : T.M. FORD		DATE :	09/27/17
DRAWN BY : MAA 5/10	REV. 10/1/11		MAA/GM
CHECKED BY : GM 5/10	REV. 12/5/11		MAA/GM
	REV. 6/13		MAA/GM

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DocuSigned by: Richard F Wertman
D9501A8EE8F647D...
11/7/2017

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. 41665.7A
CUMBERLAND COUNTY
STATION: 21+57.23 -L-
109+69.94 -L2-

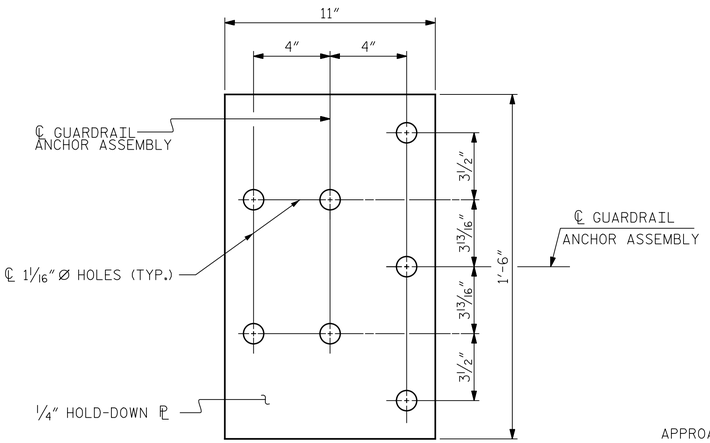
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

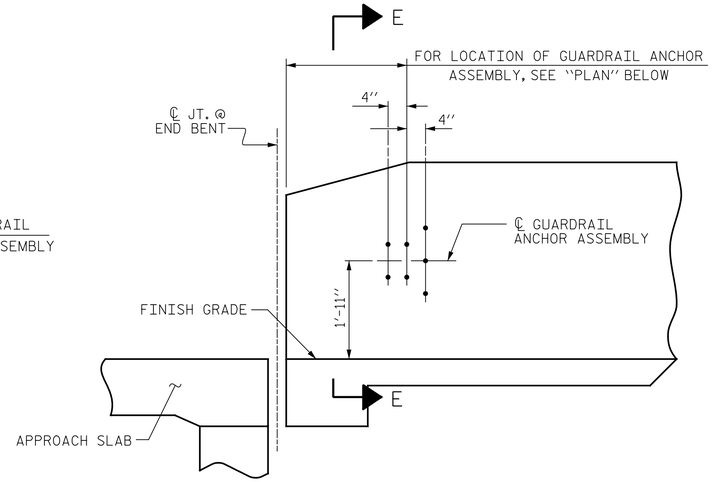
VERTICAL CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-13
1			3			TOTAL SHEETS
2			4			24

STR. NO. 1 STD. NO. CBR2

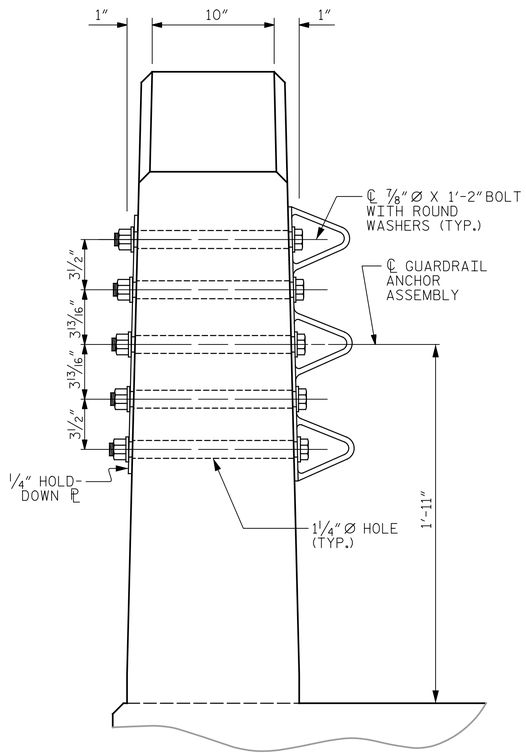


PLAN



ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF 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 VERTICAL CONCRETE BARRIER RAIL.

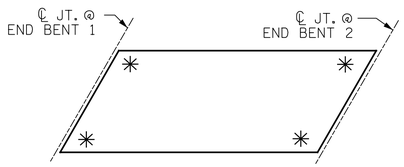
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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

PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

(TYP. EA. SIDE)



SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

ASSEMBLED BY : B.A. WHITE	DATE : 09/12/17
CHECKED BY : T.M. FORD	DATE : 09/27/17
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

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

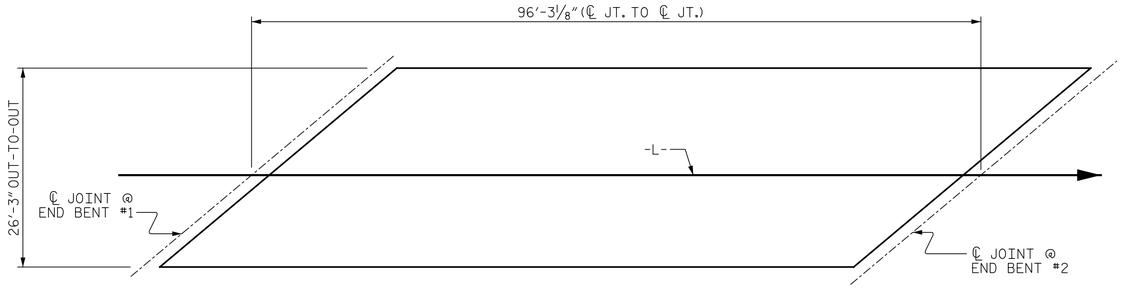
NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F. Wertman 08901A86EBF6470...
11/7/2017

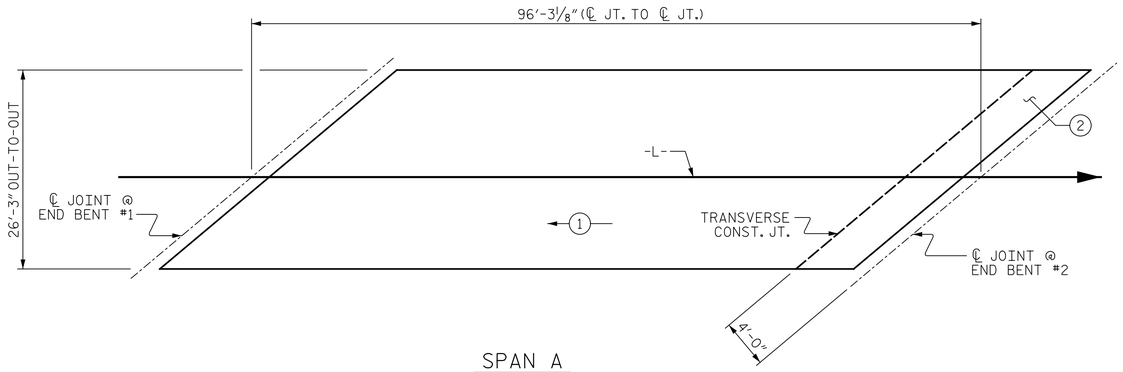
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-14
1			3			TOTAL SHEETS
2			4			24

STR. NO. 1 STD. NO. GRA3



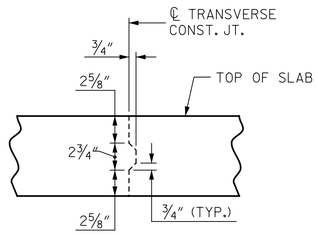
LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 2527)



SPAN A

POURING SEQUENCE

IF THE CONTRACTOR CHOOSES TO REVERSE THE DIRECTION OF POUR #1, A CONSTRUCTION JOINT WILL BE REQUIRED 4′-0″FROM THE JOINT SEAL.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

REINFORCING BAR SCHEDULE

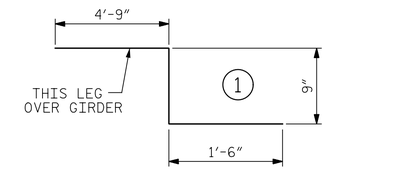
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	131	#5	STR	25′-8″	3507	A201	4	#5	STR	24′-10″	104
A2	131	#5	STR	25′-8″	3507	A202	4	#5	STR	24′-0″	101
✳ A3	6	#6	STR	15′-0″	136	A203	4	#5	STR	23″-2″	97
✳ A101	4	#5	STR	24′-10″	104	A204	4	#5	STR	22′-4″	94
✳ A102	4	#5	STR	24′-0″	101	A205	4	#5	STR	21′-5″	90
✳ A103	4	#5	STR	23″-2″	97	A206	4	#5	STR	20′-7″	86
✳ A104	4	#5	STR	22′-4″	94	A207	4	#5	STR	19′-9″	83
✳ A105	4	#5	STR	21′-5″	90	A208	4	#5	STR	18′-11″	79
✳ A106	4	#5	STR	20′-7″	86	A209	4	#5	STR	18′-1″	76
✳ A107	4	#5	STR	19′-9″	83	A210	4	#5	STR	17′-3″	72
✳ A108	4	#5	STR	18′-11″	79	A211	4	#5	STR	16′-5″	69
✳ A109	4	#5	STR	18′-1″	76	A212	4	#5	STR	15′-7″	65
✳ A110	4	#5	STR	17′-3″	72	A213	4	#5	STR	14′-9″	62
✳ A111	4	#5	STR	16′-5″	69	A214	4	#5	STR	13′-11″	58
✳ A112	4	#5	STR	15′-7″	65	A215	4	#5	STR	13′-1″	55
✳ A113	4	#5	STR	14′-9″	62	A216	4	#5	STR	12′-3″	52
✳ A114	4	#5	STR	13′-11″	58	A217	4	#5	STR	11′-5″	48
✳ A115	4	#5	STR	13′-1″	55	A218	4	#5	STR	10′-7″	45
✳ A116	4	#5	STR	12′-3″	52	A219	4	#5	STR	9′-9″	41
✳ A117	4	#5	STR	11′-5″	48	A220	4	#5	STR	8′-10″	37
✳ A118	4	#5	STR	10′-7″	45	A221	4	#5	STR	8′-0″	34
✳ A119	4	#5	STR	9′-9″	41	A222	4	#5	STR	7′-2″	30
✳ A120	4	#5	STR	8′-10″	37	A223	4	#5	STR	6′-4″	27
✳ A121	4	#5	STR	8′-0″	34	A224	4	#5	STR	5′-6″	23
✳ A122	4	#5	STR	7′-2″	30	A225	4	#5	STR	4′-8″	20
✳ A123	4	#5	STR	6′-4″	27	A226	4	#5	STR	3′-10″	16
✳ A124	4	#5	STR	5′-6″	23	A227	4	#5	STR	3′-0″	13
✳ A125	4	#5	STR	4′-8″	20	A228	4	#5	STR	2′-2″	9
✳ A126	4	#5	STR	3′-10″	16	A229	4	#5	STR	1′-4″	6
✳ A127	4	#5	STR	3′-0″	13						
✳ A128	4	#5	STR	2′-2″	9	✳ B1	72	#4	STR	25′-6″	1227
✳ A129	4	#5	STR	1′-4″	6	B2	66	#5	STR	49′-1″	3379
						✳ G1	2	#5	STR	40′-4″	85
						✳ K1	12	#5	1	7′-0″	88
						✳ K2	12	#5	2	6′-10″	86
						✳ K3	18	#5	STR	8′-8″	163
						✳ S1	36	#4	3	4′-7″	111

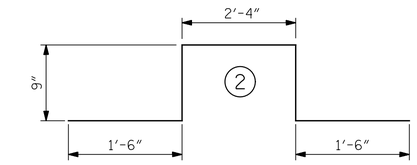
REINFORCING STEEL = 8,478
✳ EPOXY COATED REINF. STEEL = 6,995

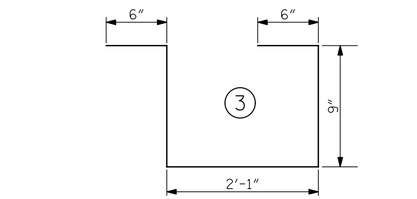
GROOVING BRIDGE FLOORS

BRIDGE DECK	2016 SQ. FT.
APPROACH SLABS	1036 SQ. FT.
TOTAL	3052 SQ. FT.

BAR TYPES







ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	✳ EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
TOTALS	69.7	8532	6,995

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″

PROJECT NO. 41665.7A
CUMBERLAND COUNTY
STATION: 21+57.23 -L-
109+69.94 -L2-

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 11/7/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

ASSEMBLED BY : B.A. WHITE	DATE : 09/14/17
CHECKED BY : R.F. WERTMAN	DATE : 09/25/17

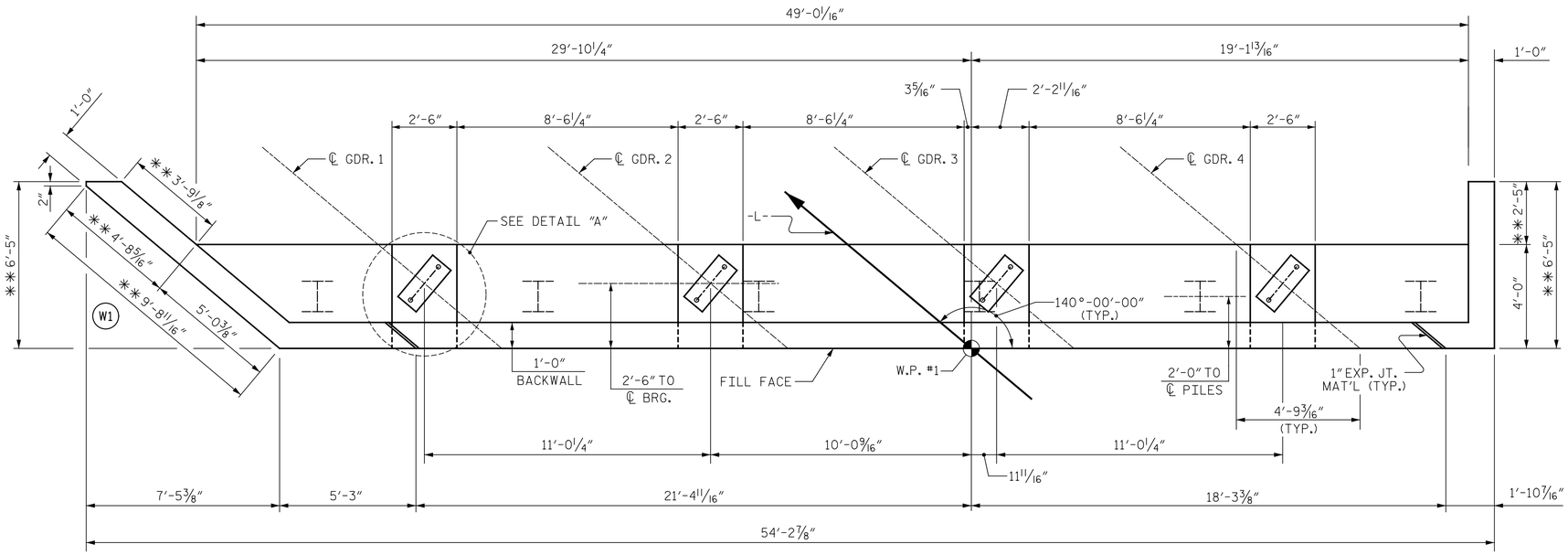
DRAWN BY : JMB 5/87	REV. 8/16/99	RWW/LES
CHECKED BY : SJD 9/87	REV. 5/1/06	TLA/GM
	REV. 10/1/11	MAA/GM

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

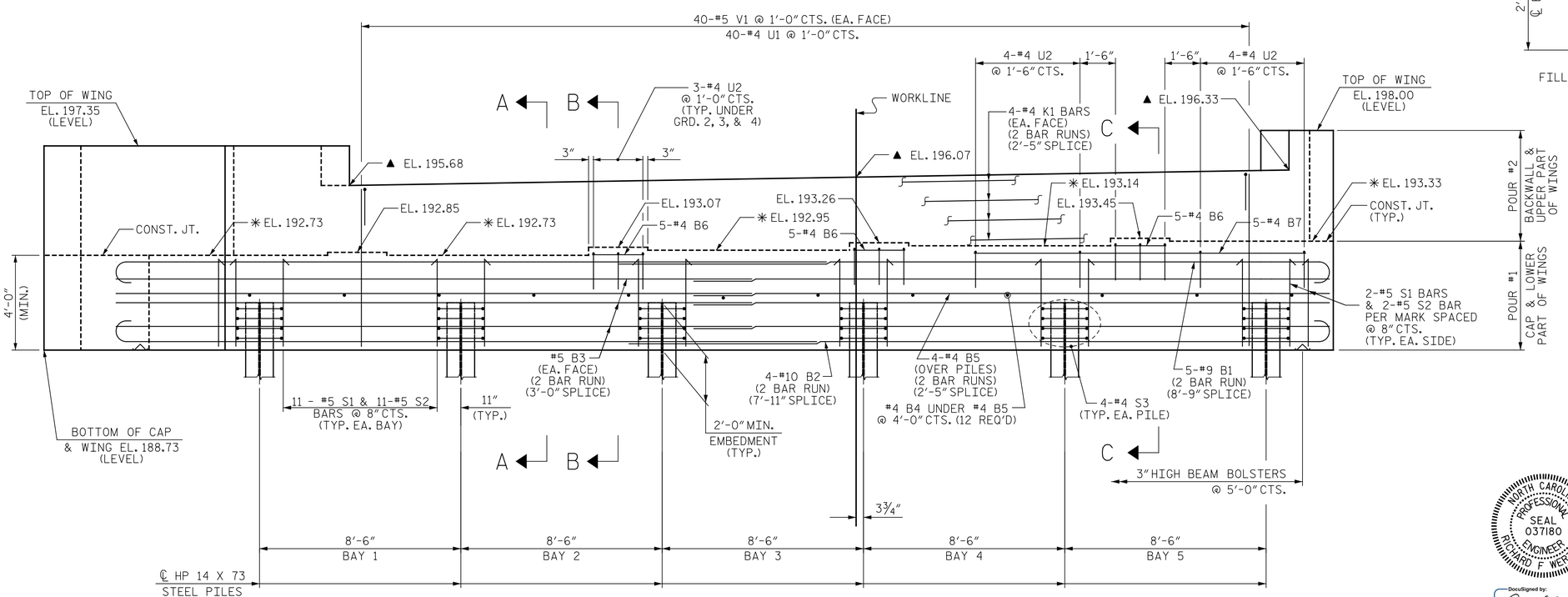
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-15
1			3			TOTAL SHEETS
2			4			24

STR. NO. 1 STD. NO. BOM1



PLAN



ELEVATION

SEE "SECTION A-A" ON SHEET 3 OF 3 FOR 27"Ø C.S. PIPE DETAILS

NOTES:

✳ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 3 OF 3.

▲ THIS ELEVATION TAKEN ON FILL FACE OF BACKWALL.

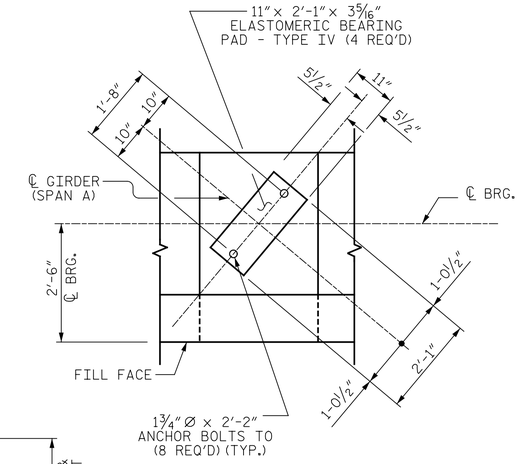
STIRRUPS & U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

✳✳ CONTRACTOR SHALL VERIFY WING WALL LENGTH BASED ON MSE WALL DESIGN AND MODIFY THE WING WALL LENGTH ACCORDINGLY, SUCH THAT THE WING WALL AND 1" EXPANSION JOINT MATERIAL IS FLUSH WITH THE BACK OF THE MSE WALL PANEL.



DETAIL "A"

(TYP. EA. GIRDER)

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 11/7/2017

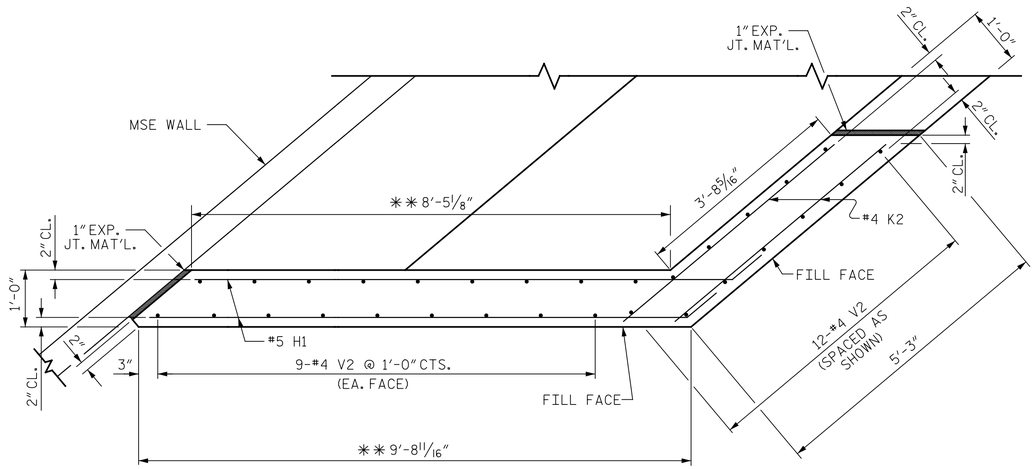
DRAWN BY : J.A. BOYER DATE : 09/27/17
CHECKED BY : T.M. FORD DATE : 10/03/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

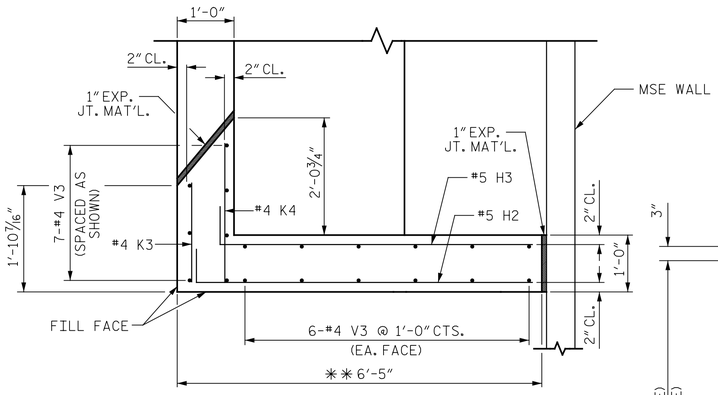
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-16
1			3			TOTAL SHEETS
2			4			24

STR. NO. 1

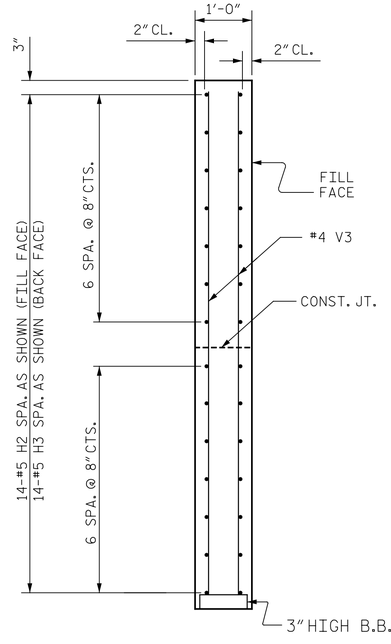


PLAN OF WING (W1)

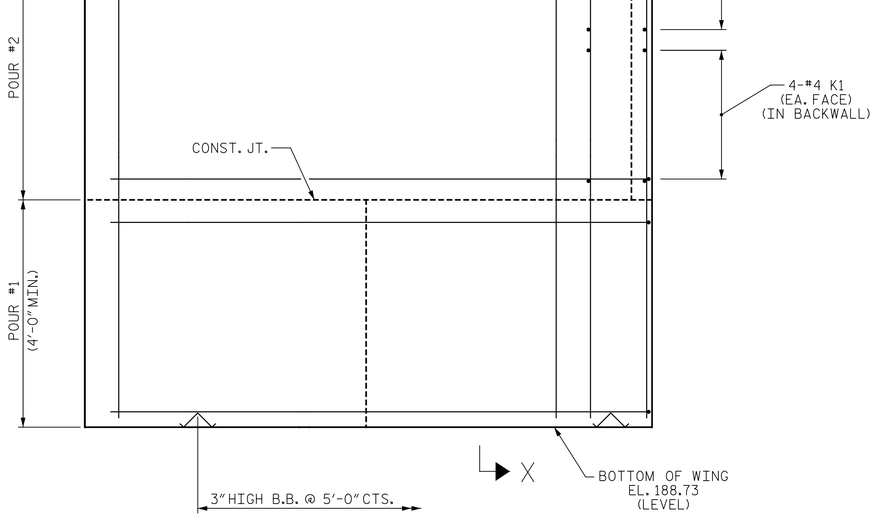


PLAN OF WING (W2)

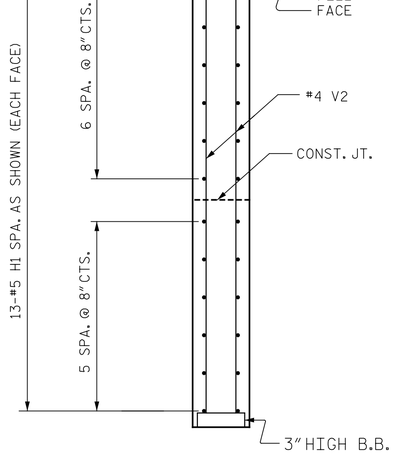
** CONTRACTOR SHALL VERIFY WING WALL LENGTH BASED ON MSE WALL DESIGN AND MODIFY THE WING WALL LENGTH ACCORDINGLY, SUCH THAT THE WING WALL AND 1"EXPANSION JOINT MATERIAL IS FLUSH WITH THE BACK OF THE MSE WALL PANEL.



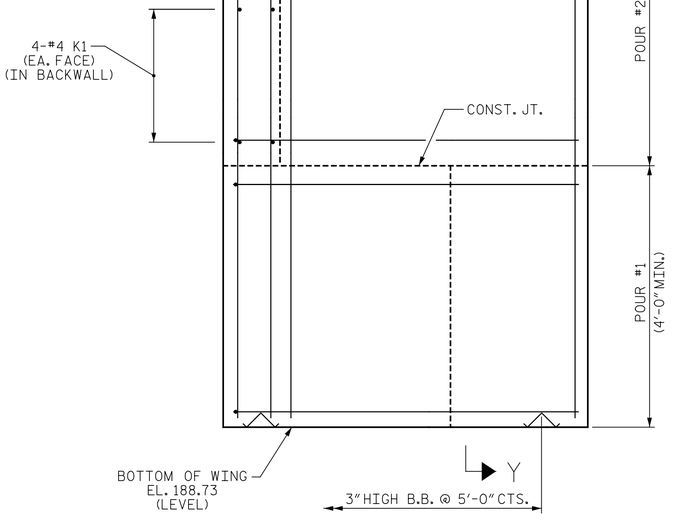
SECTION Y-Y



ELEVATION OF WING (W1)



SECTION X-X



ELEVATION OF WING (W2)

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-17
1			3			TOTAL SHEETS
2			4			24

STR. NO. 1

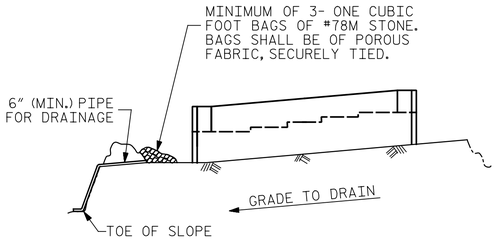
DRAWN BY : J.A. BOYER DATE : 09/28/17
CHECKED BY : T.M. FORD DATE : 10/03/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DocuSigned by:
Richard F. Wertman
08901A86EBF470...
11/7/2017

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

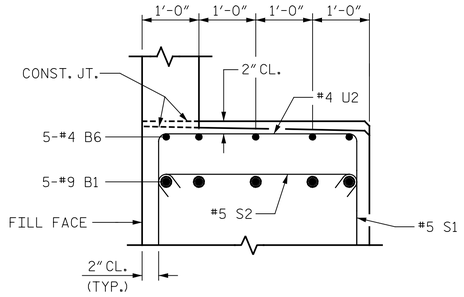


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

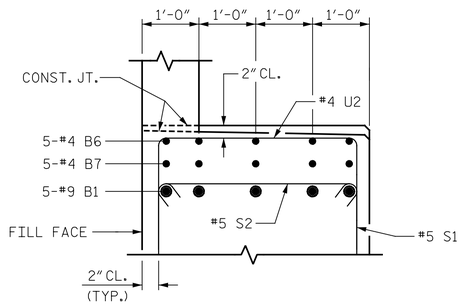
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



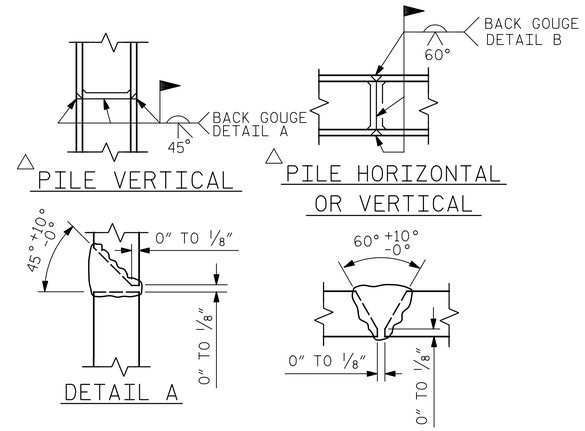
PARTIAL SECTION B-B

(TYP. @ BRG. 2 & 3)



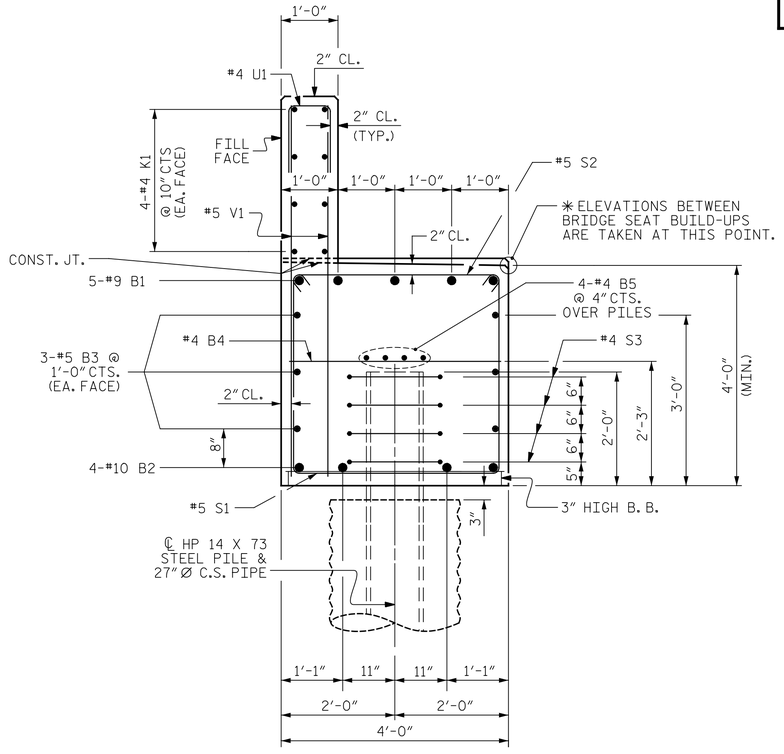
PARTIAL SECTION C-C

(TYP. @ BRG. 4)



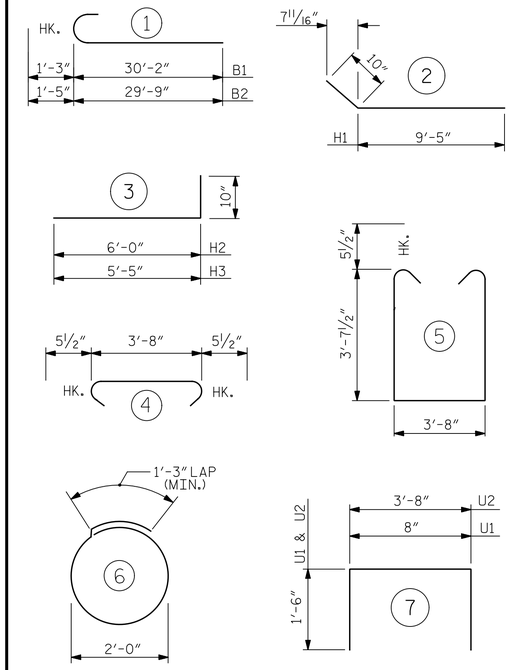
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

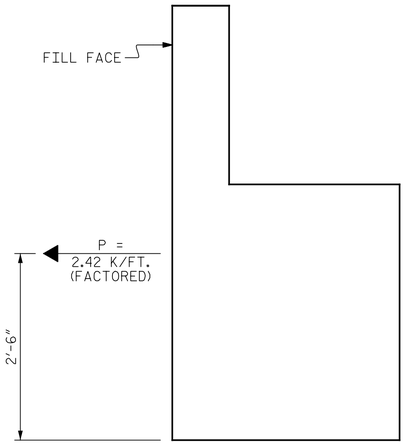


SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



TIE BACK DETAILS

(DETAIL SHOWING TIE BACK RESTRAINT FOR END BENT)

BILL OF MATERIAL

END BENT #1

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	31'-5"	1069
B2	8	#10	1	31'-2"	1073
B3	12	#5	STR	27'-4"	342
B4	12	#4	STR	3'-8"	30
B5	8	#4	STR	27'-0"	145
B6	15	#4	STR	2'-2"	22
B7	5	#4	STR	15'-0"	50
H1	26	#5	2	10'-3"	278
H2	14	#5	3	6'-10"	100
H3	14	#5	3	6'-3"	93
K1	16	#4	STR	24'-8"	264
K2	6	#4	STR	4'-8"	19
K3	3	#4	STR	1'-8"	4
K4	3	#4	STR	2'-5"	5
S1	59	#5	5	11'-10"	728
S2	59	#5	4	4'-7"	282
S3	24	#4	6	7'-7"	122
U1	41	#4	7	3'-8"	101
U2	17	#4	7	6'-8"	76
V1	82	#5	STR	6'-7"	563
V2	30	#4	STR	8'-3"	166
V3	19	#4	STR	8'-11"	114

REINFORCING STEEL	5,646 LBS.
CLASS A CONCRETE	
POUR #1 (CAP & LOWER WINGS)	32.4 C.Y.
POUR #2 (UPPER WINGS & BACKWALL)	8.0 C.Y.
TOTAL	40.4 C.Y.
HP 14 X 73 STEEL PILES	
No. = 6	492 LIN. FT.
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES	6 EACH
PILE REDRIVES	6 EACH

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 08901A86EBF6470...

11/7/2017

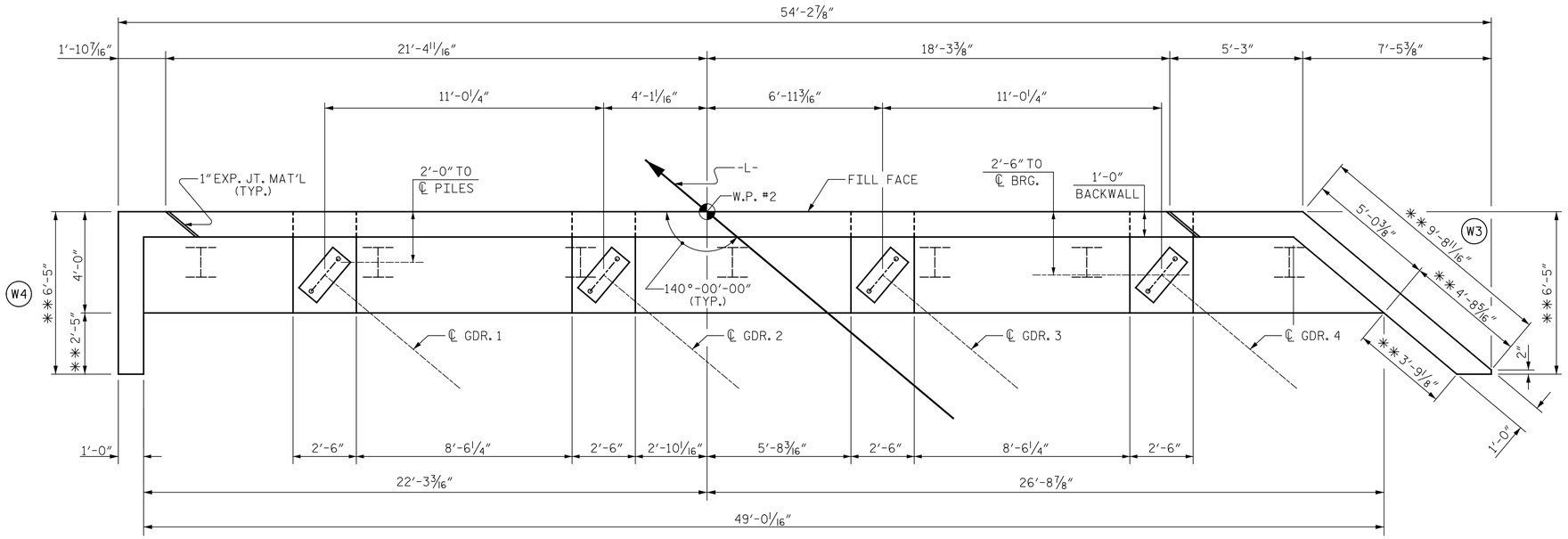
DRAWN BY : J.A. BOYER DATE : 09/26/17
CHECKED BY : T.M. FORD DATE : 10/03/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

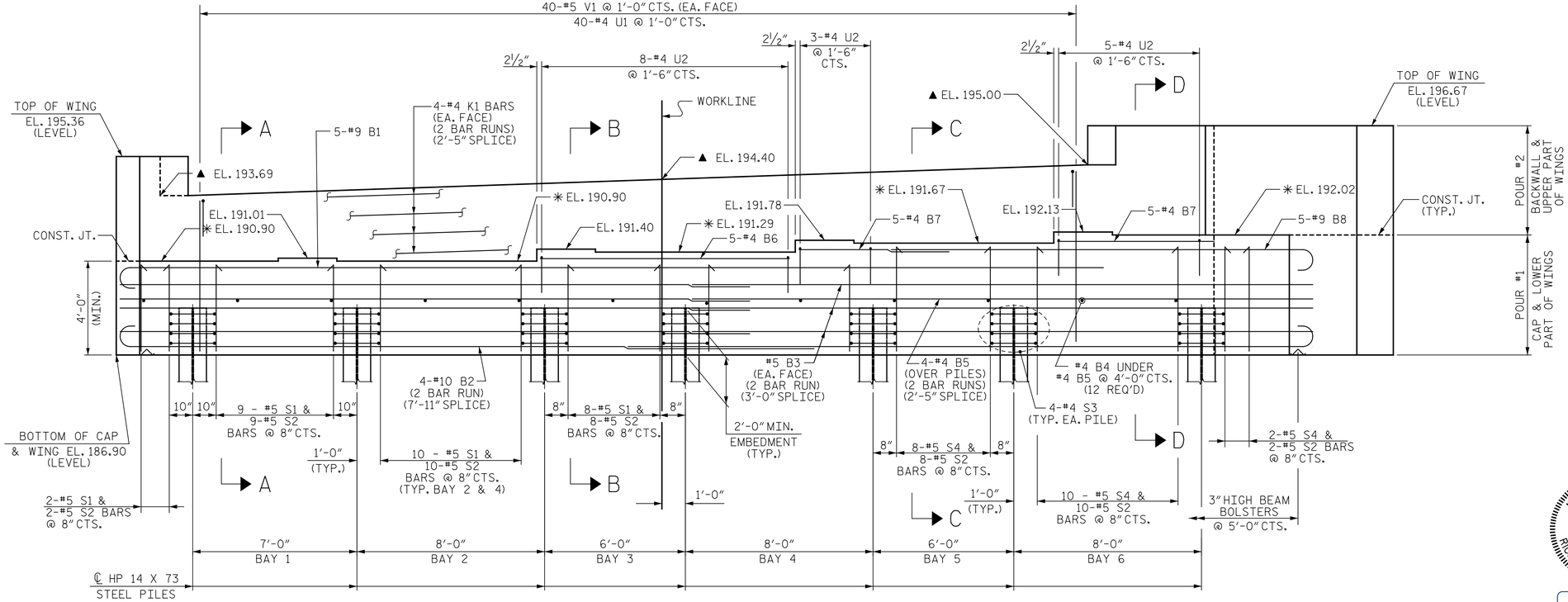
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-18
1			3			TOTAL SHEETS
2			4			24

STR. NO. 1



PLAN



ELEVATION

SEE "SECTION A-A" ON SHEET 3 OF 3 FOR 27″Ø C.S. PIPE DETAILS

NOTES:

✳ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 3 OF 3.

▲ THIS ELEVATION TAKEN ON FILL FACE OF BACKWALL.

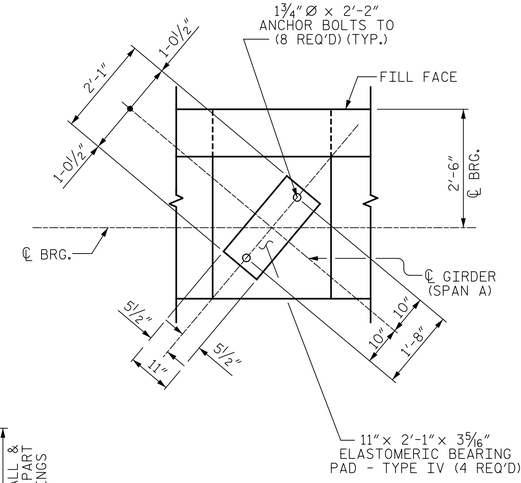
STIRRUPS & U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

✳✳ CONTRACTOR SHALL VERIFY WING WALL LENGTH BASED ON MSE WALL DESIGN AND MODIFY THE WING WALL LENGTH ACCORDINGLY, SUCH THAT THE WING WALL AND 1″ EXPANSION JOINT MATERIAL IS FLUSH WITH THE BACK OF THE MSE WALL PANEL.



DETAIL "A"

(TYP. EA. GIRDER)

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: 08001A86EBF6470... 11/7/2017

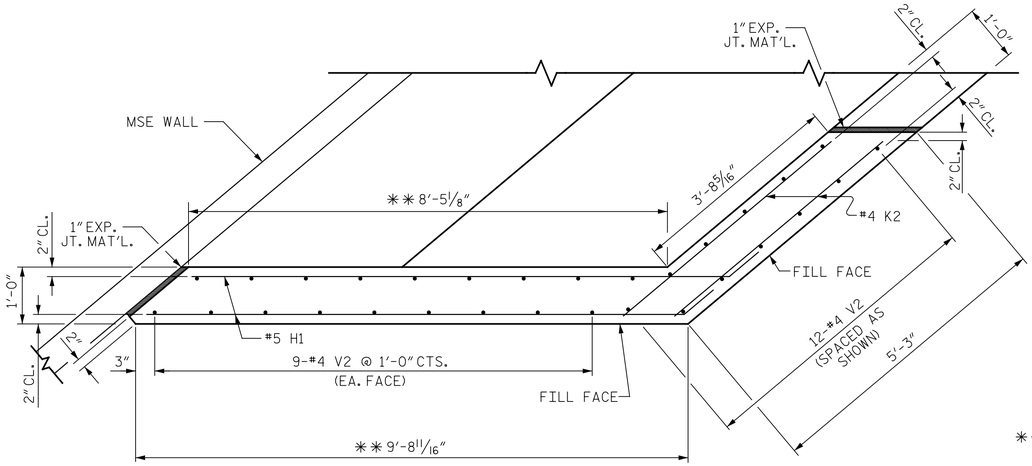
DRAWN BY : J.A. BOYER DATE : 09/27/17
CHECKED BY : R.F. WERTMAN DATE : 10/07/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road Suite 102 Raleigh NC 27607-3073 (919) 420-7660
NC Lic. No. F-0270

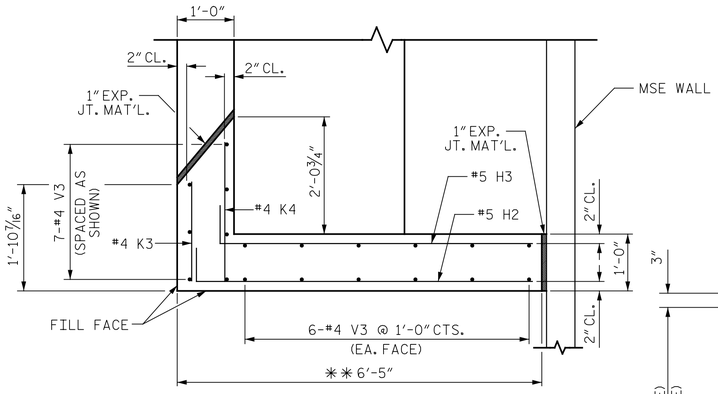
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-19
1			3			TOTAL SHEETS
2			4			24

STR. NO. 1

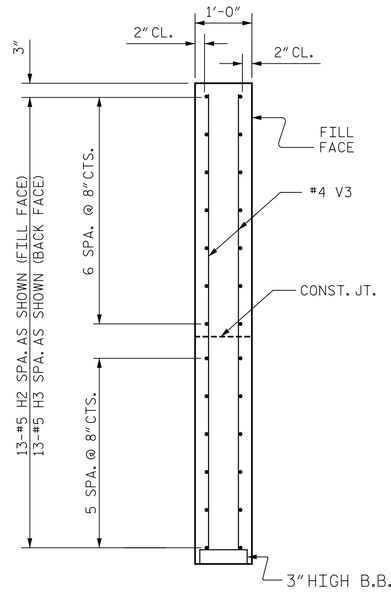


PLAN OF WING W3

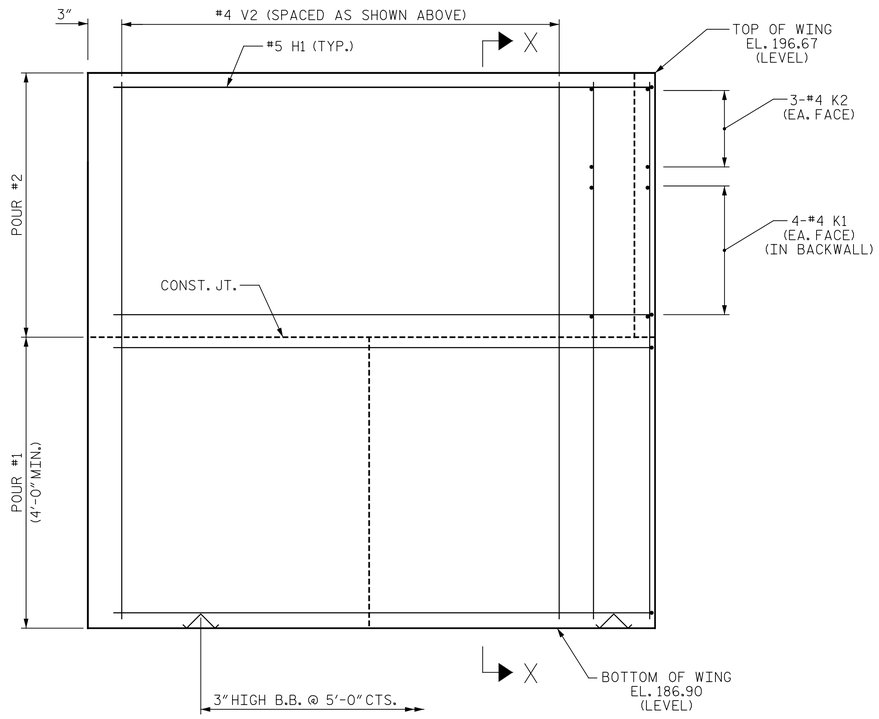


** CONTRACTOR SHALL VERIFY WING WALL LENGTH BASED ON MSE WALL DESIGN AND MODIFY THE WING WALL LENGTH ACCORDINGLY, SUCH THAT THE WING WALL AND 1" EXPANSION JOINT MATERIAL IS FLUSH WITH THE BACK OF THE MSE WALL PANEL.

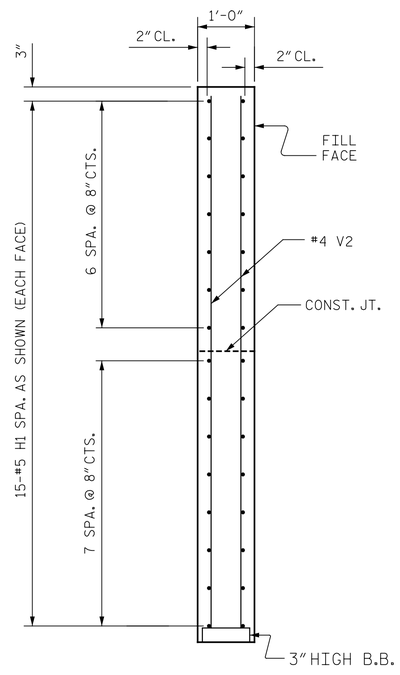
PLAN OF WING W4



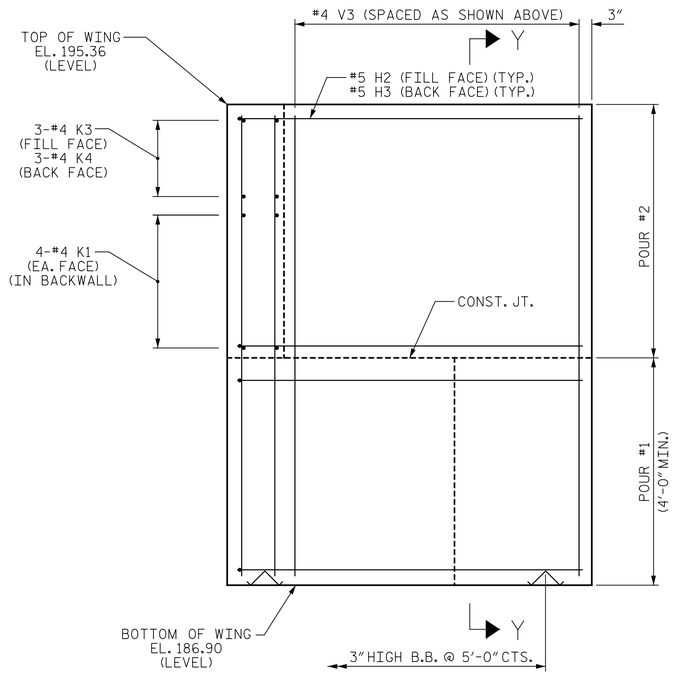
SECTION Y-Y



ELEVATION OF WING W3



SECTION X-X



ELEVATION OF WING W4

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 08501A86EBF6470...
11/7/2017

PROJECT NO. 41665.7A
CUMBERLAND COUNTY
STATION: 21+57.23 -L-
109+69.94 -L2-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

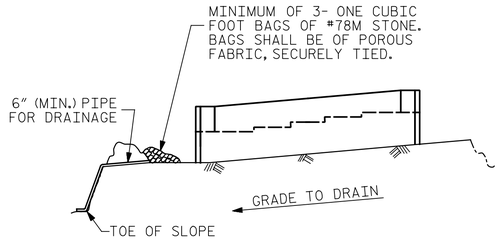
DRAWN BY : J.A. BOYER DATE : 10/06/17
CHECKED BY : R.F. WERTMAN DATE : 10/07/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-20
1			3			TOTAL SHEETS
2			4			24

STR. NO. 1

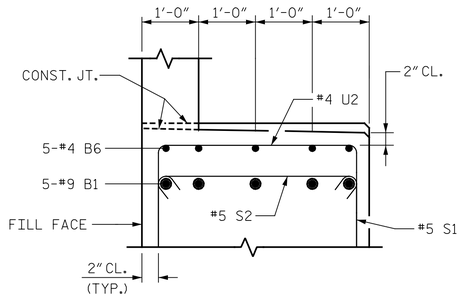


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

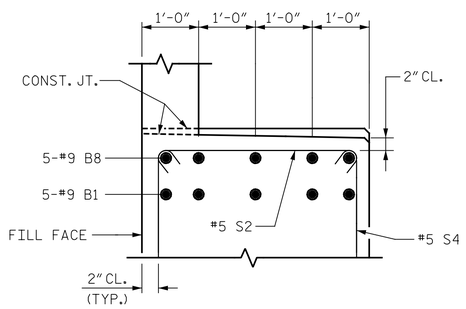
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

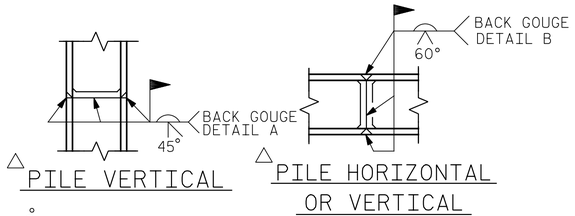
TEMPORARY DRAINAGE AT END BENT



PARTIAL SECTION B-B

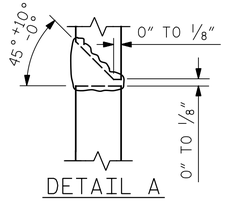


PARTIAL SECTION C-C

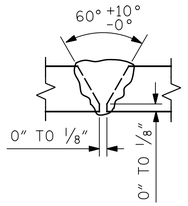


△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



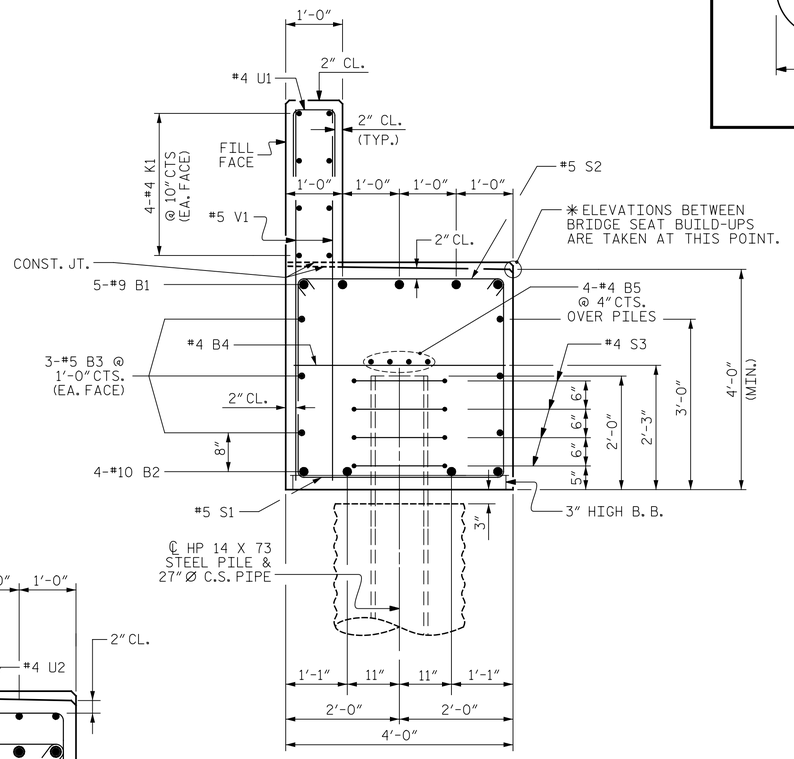
DETAIL A



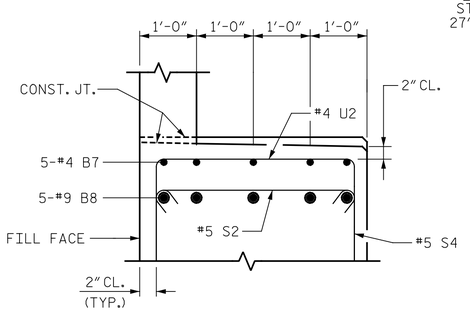
DETAIL B

POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

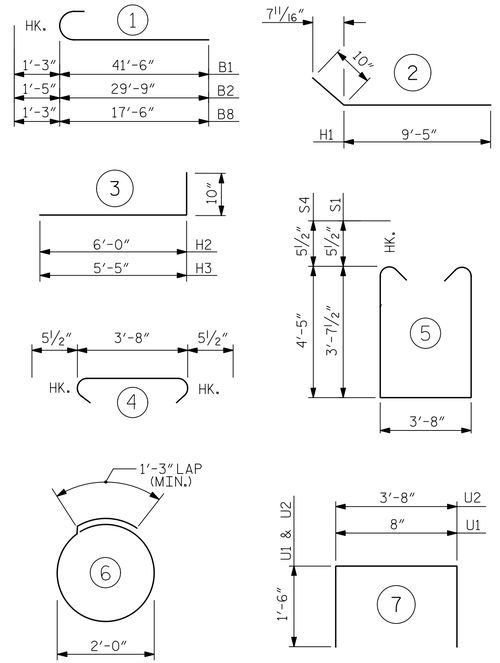


SECTION A-A

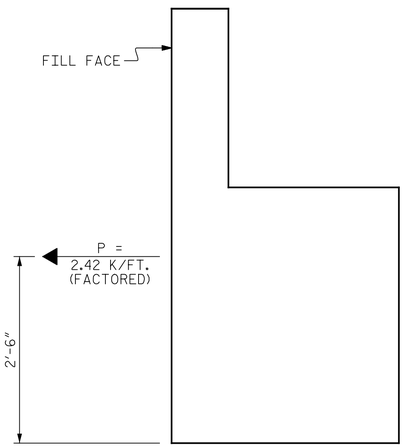


PARTIAL SECTION D-D

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



TIE BACK DETAILS

(DETAIL SHOWING TIE BACK RESTRAINT FOR END BENT)

BILL OF MATERIAL

END BENT #1

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	42'-9"	727
B2	8	#10	1	31'-2"	1073
B3	12	#5	STR	27'-4"	342
B4	12	#4	STR	3'-8"	30
B5	8	#4	STR	27'-0"	145
B6	5	#4	STR	10'-9"	36
B7	10	#4	STR	6'-6"	44
B8	5	#9	STR	18'-9"	319
H1	30	#5	2	10'-3"	321
H2	13	#5	3	6'-10"	93
H3	13	#5	3	6'-3"	85
K1	16	#4	STR	24'-8"	264
K2	6	#4	STR	4'-8"	19
K3	3	#4	STR	1'-8"	4
K4	3	#4	STR	2'-5"	5
S1	39	#5	5	11'-10"	481
S2	59	#5	4	4'-7"	282
S3	28	#4	6	7'-7"	142
S4	20	#5	5	13'-5"	280
U1	41	#4	7	3'-8"	101
U2	16	#4	7	6'-8"	72
V1	82	#5	STR	6'-5"	549
V2	30	#4	STR	9'-4"	187
V3	19	#4	STR	8'-1"	103

REINFORCING STEEL	5,704 LBS.
CLASS A CONCRETE	
POUR #1 (CAP & LOWER WINGS)	34.3 C.Y.
POUR #2 (UPPER WINGS & BACKWALL)	8.1 C.Y.
TOTAL	42.4 C.Y.
HP 14 X 73 STEEL PILES	
No. = 7	504 LIN. FT.
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES	7 EACH
PILE REDRIVES	7 EACH

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 08901A86E8F6470... 11/7/2017

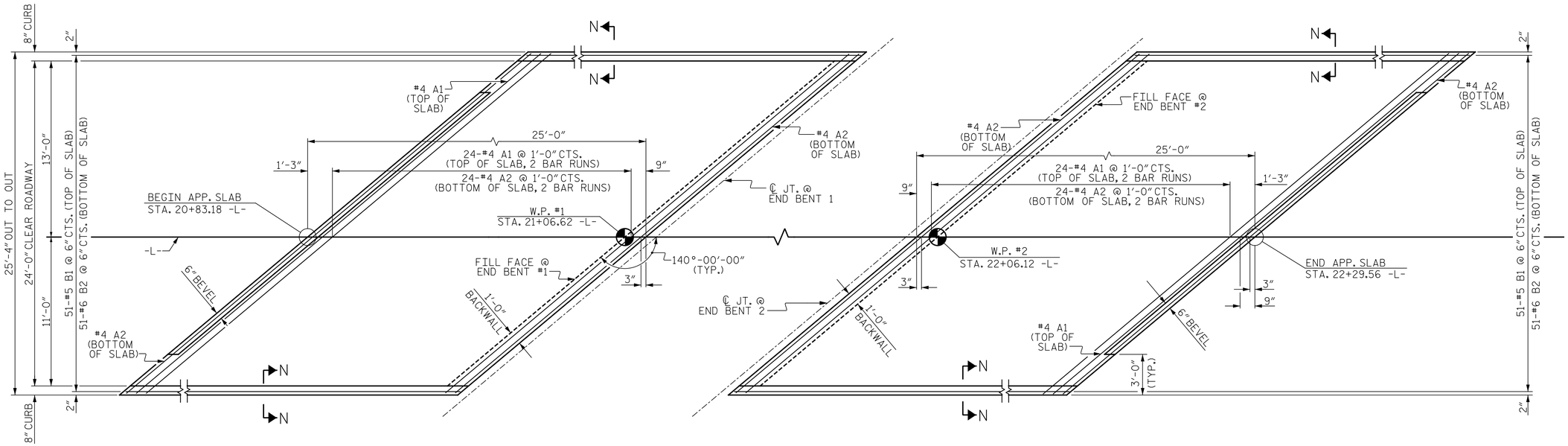
DRAWN BY : J.A. BOYER DATE : 09/26/17
CHECKED BY : R.F. WERTMAN DATE : 10/07/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-21
1			3			TOTAL SHEETS
2			4			24

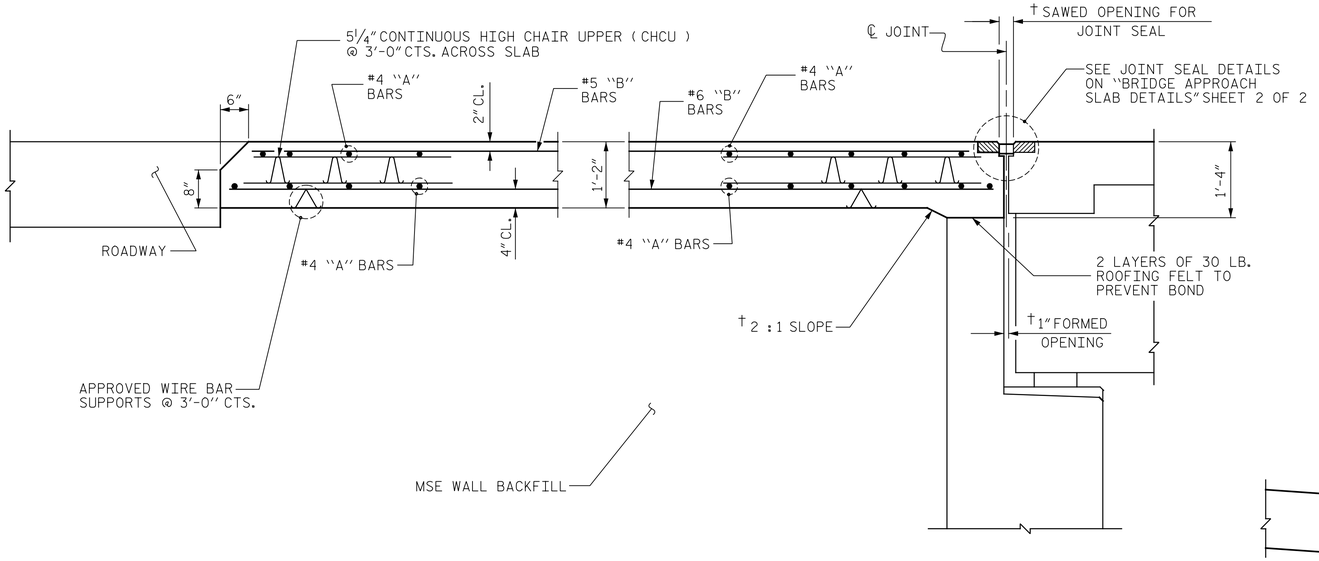
STR. NO. 1



PLAN @ END BENT #1

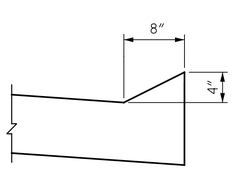
PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

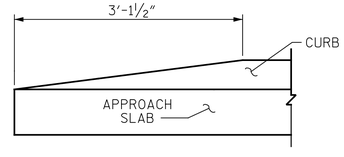


SECTION THRU SLAB

† NORMAL TO END BENT



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

ASSEMBLED BY : B.A. WHITE	DATE : 09/18/17		
CHECKED BY : T.M. FORD	DATE : 09/27/17		
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	

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F. WERTMAN

DocuSigned by: Richard F. Wertman
D8901A86E8F647D...
11/7/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

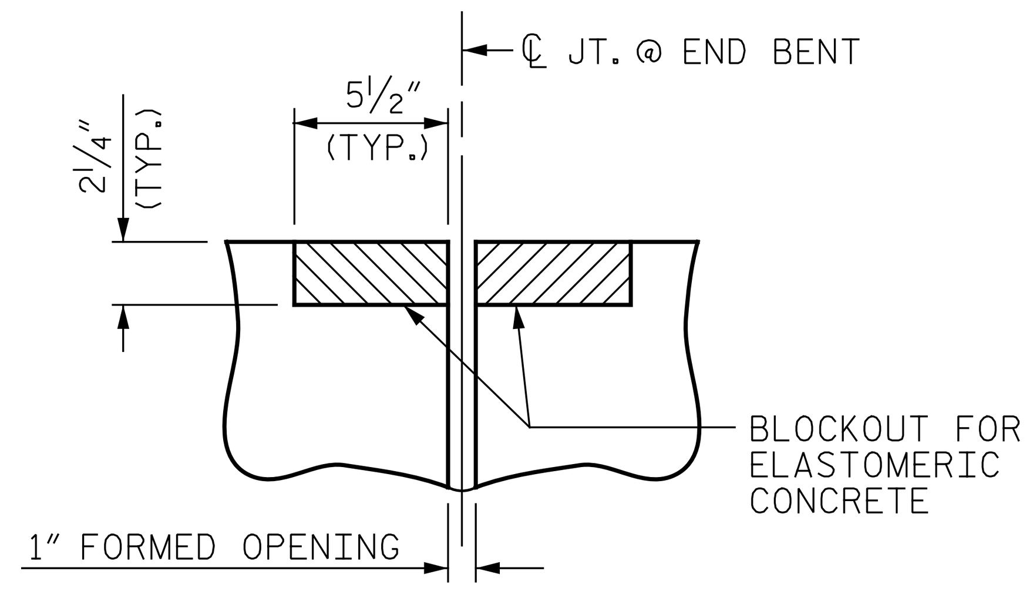
PROJECT NO. 41665.7A
CUMBERLAND COUNTY
STATION: 21+57.23 -L-
109+69.94 -L2-
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

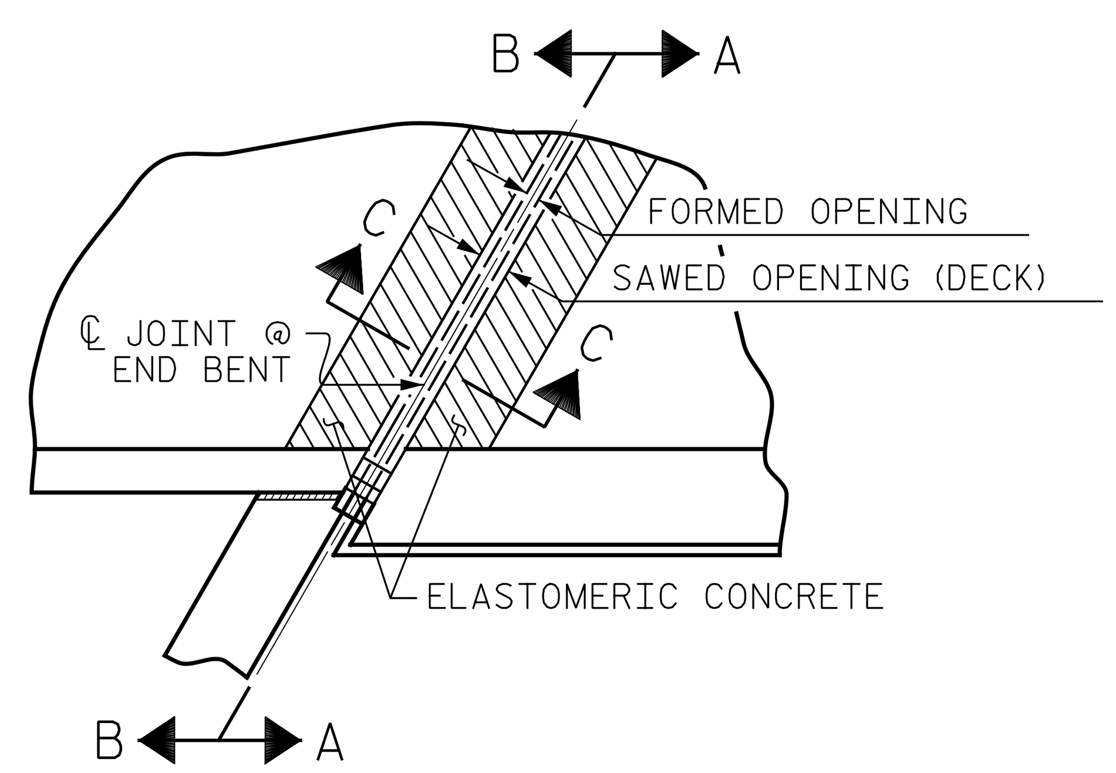
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-22
1			3			TOTAL SHEETS
2			4			24

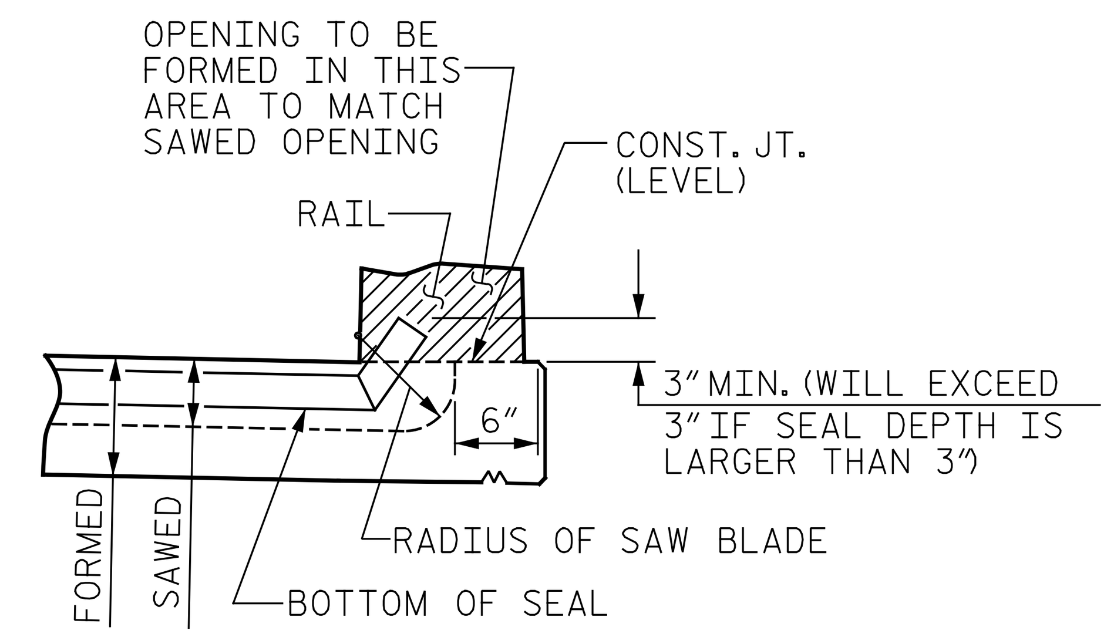
STR. NO. 1 STD. NO. BAS2



SECTION C-C
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



PLAN



SECTION A-A

NOTES:

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

FOR MSE WALL BACKFILL SEE "MSE RETAINING WALL" PLANS.

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.

BILL OF MATERIAL
FOR ONE APPROACH SLAB (2 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
∗A1	50	#4	STR	21′-2″	707
A2	52	#4	STR	21′-0″	730
∗B1	51	#5	STR	24′-2″	1286
B2	51	#6	STR	24′-8″	1890
REINFORCING STEEL				LBS.	2620
∗EPOXY COATED REINFORCING STEEL				LBS.	1993
CLASS AA CONCRETE				C.Y.	27.9

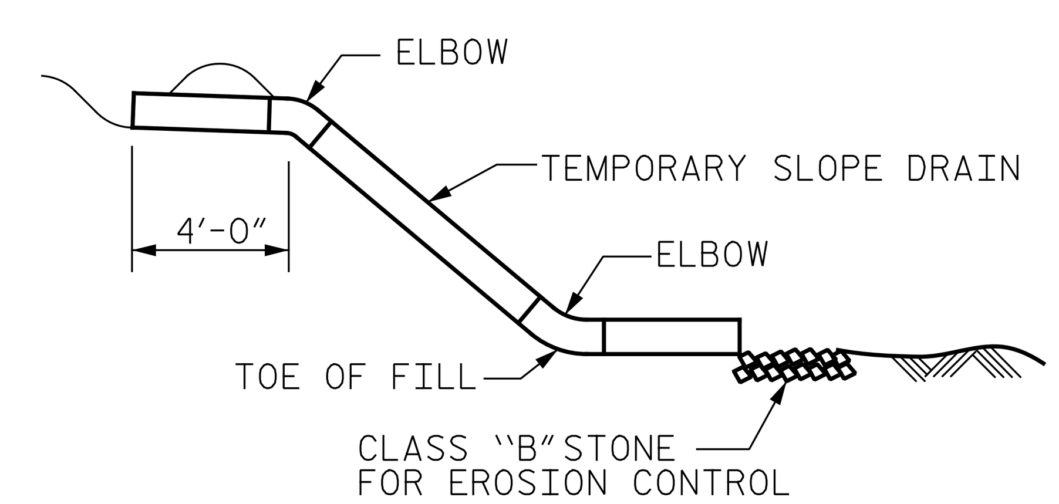
ELASTOMERIC CONCRETE

END BENT NO.	ELASTOMERIC CONCRETE ∗ (CU. FT.)
1	6.8
2	6.8
TOTAL	13.6

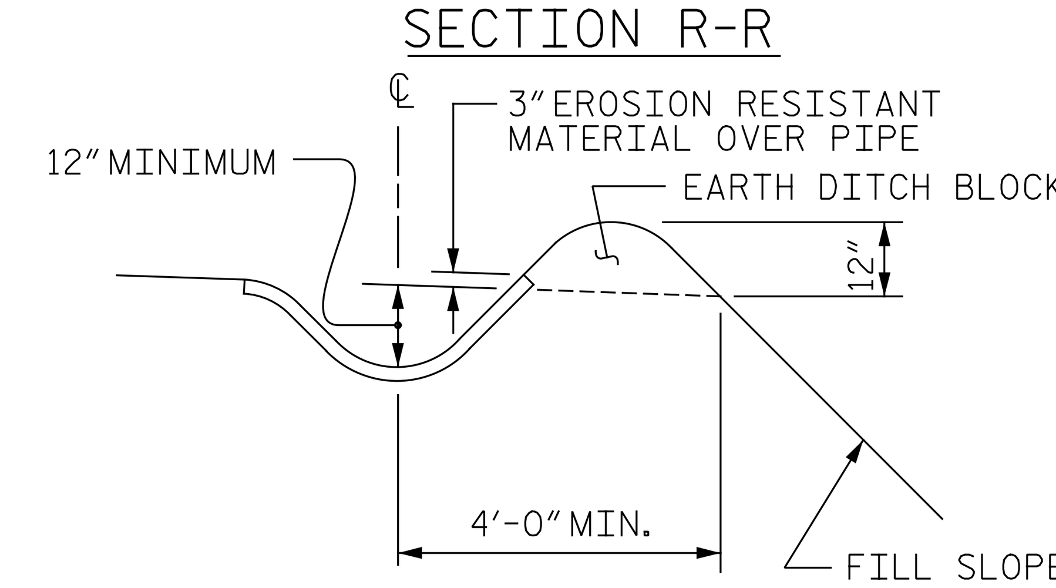
∗ BASED ON THE MINIMUM BLOCKOUT SHOWN.

SPLICE LENGTHS CHART

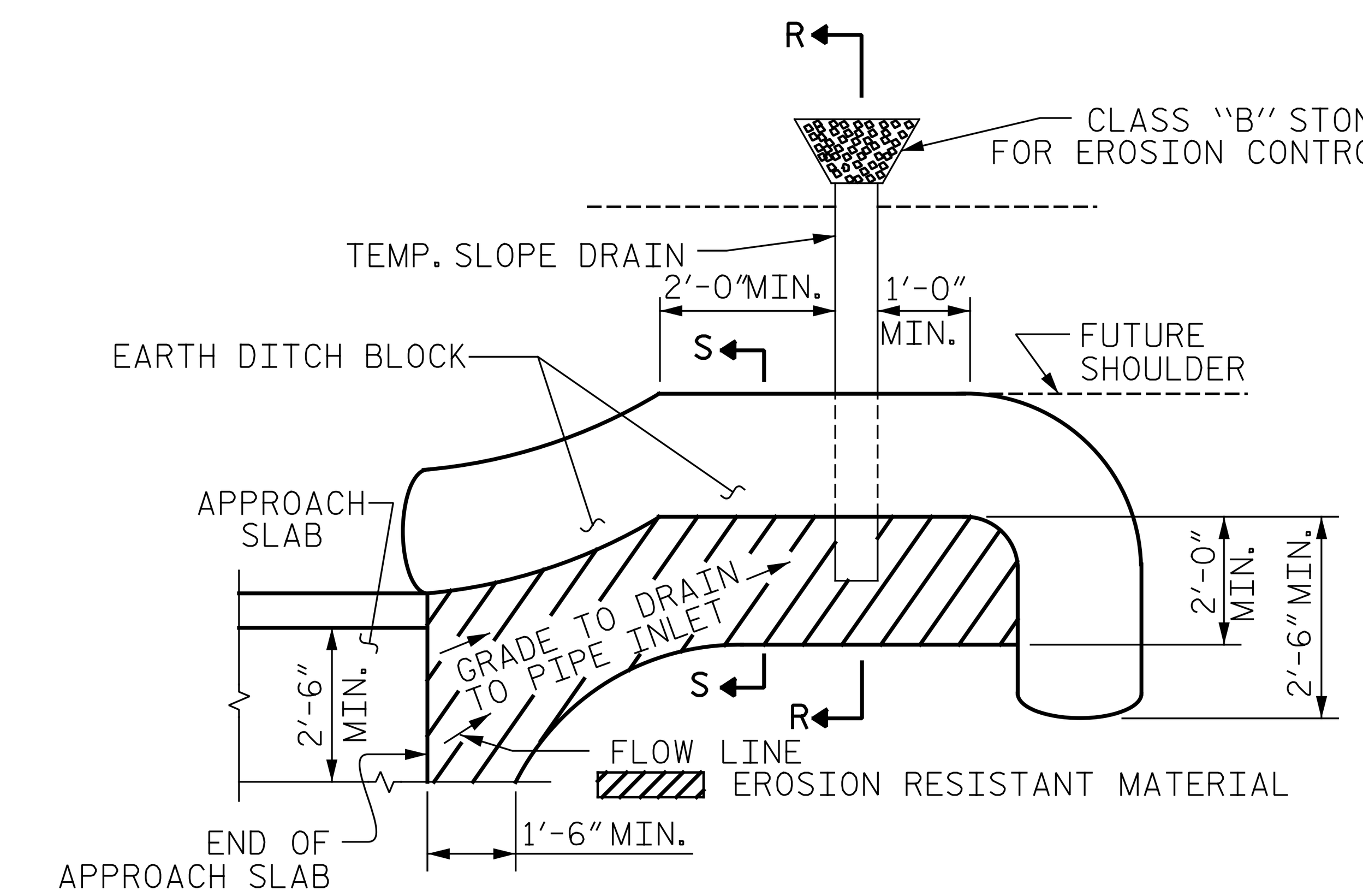
BAR SIZE	EPOXY COATED	UNCOATED
#4	2′-0″	1′-9″
#5	2′-6″	2′-2″
#6	3′-10″	2′-7″



SECTION R-R

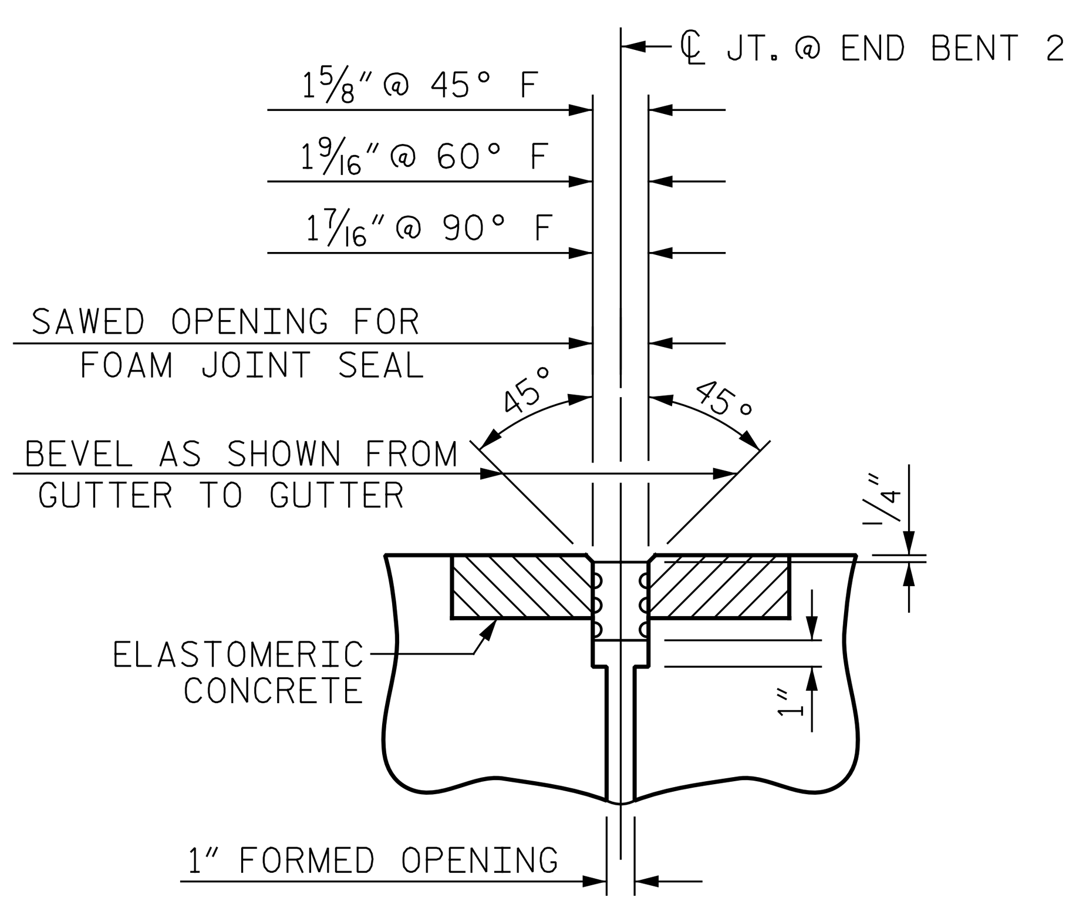


SECTION S-S

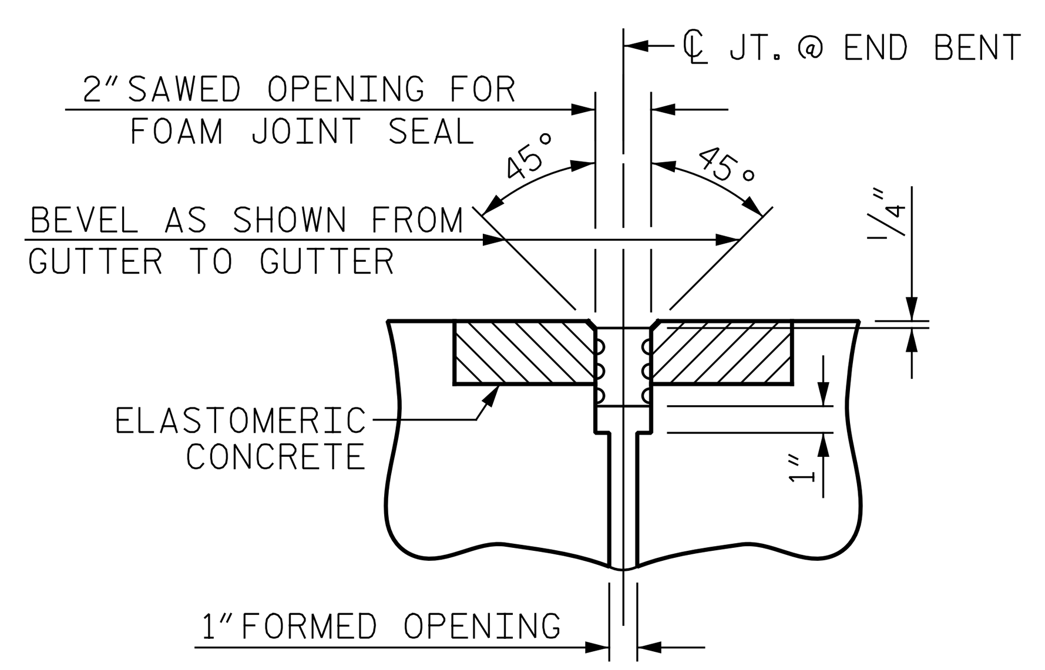


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

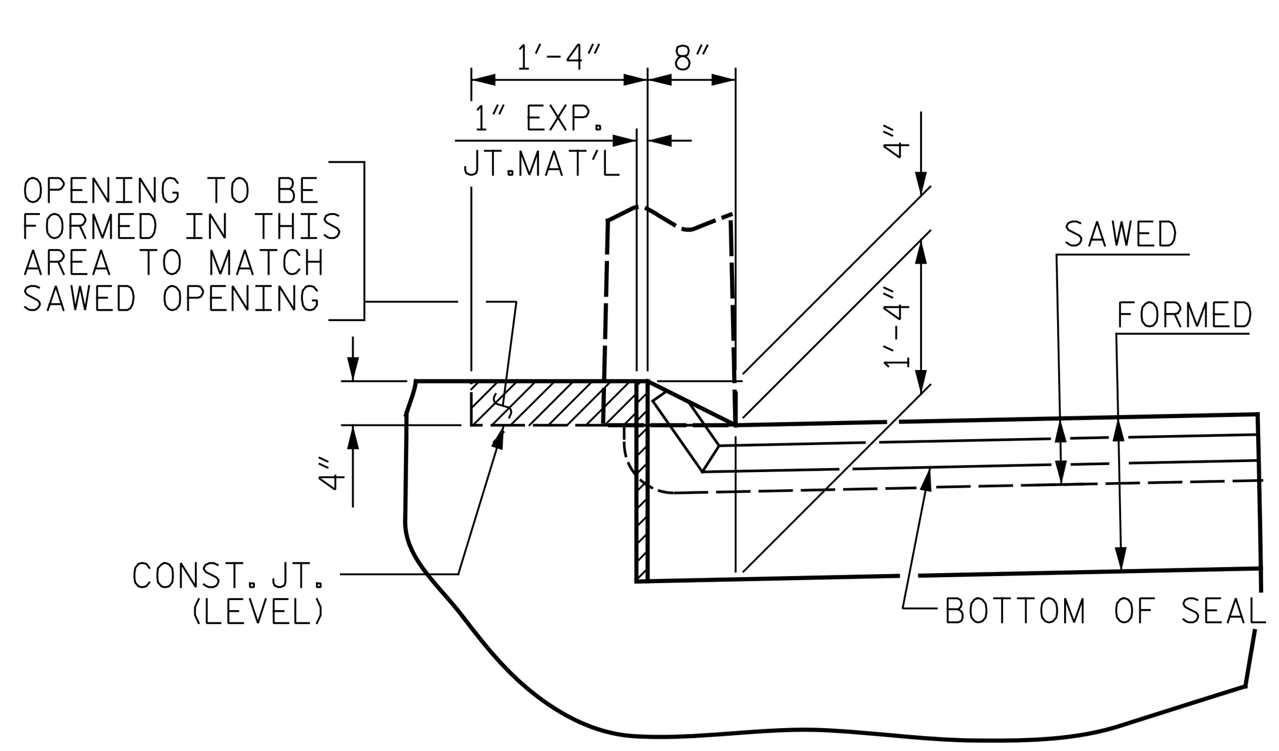
PLAN VIEW



SECTION C-C
FOAM JOINT SEAL
(EXPANSION)



SECTION C-C
FOAM JOINT SEAL
(FIXED)

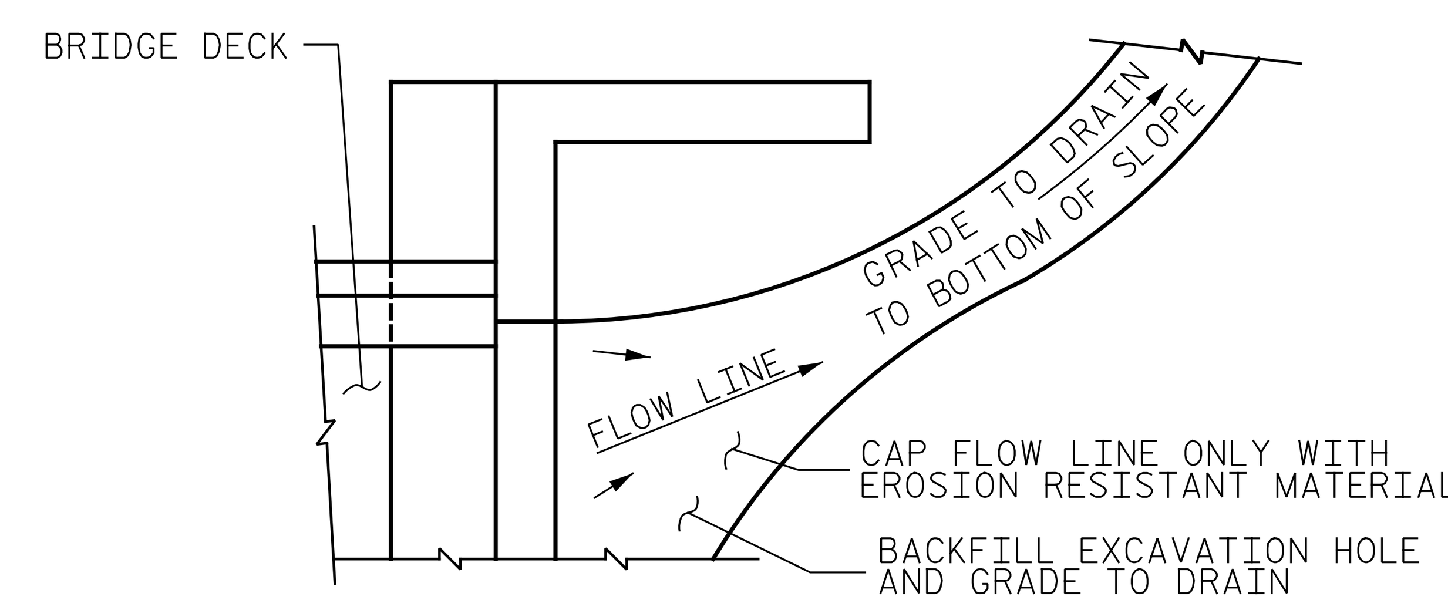


SECTION B-B

JOINT SEAL DETAILS @ END BENT

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

TEMPORARY DRAINAGE DETAIL

TEMPORARY BERM AND SLOPE DRAIN DETAILS
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. 41665.7A
CUMBERLAND COUNTY
STATION: 21+57.23 -L-
109+69.94 -L2-
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F. WERTMAN

DocuSigned by:
0B901A86EBF6470...
11/7/2017

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : B.A. WHITE	DATE : 09/18/17
CHECKED BY : T.M. FORD	DATE : 09/27/17

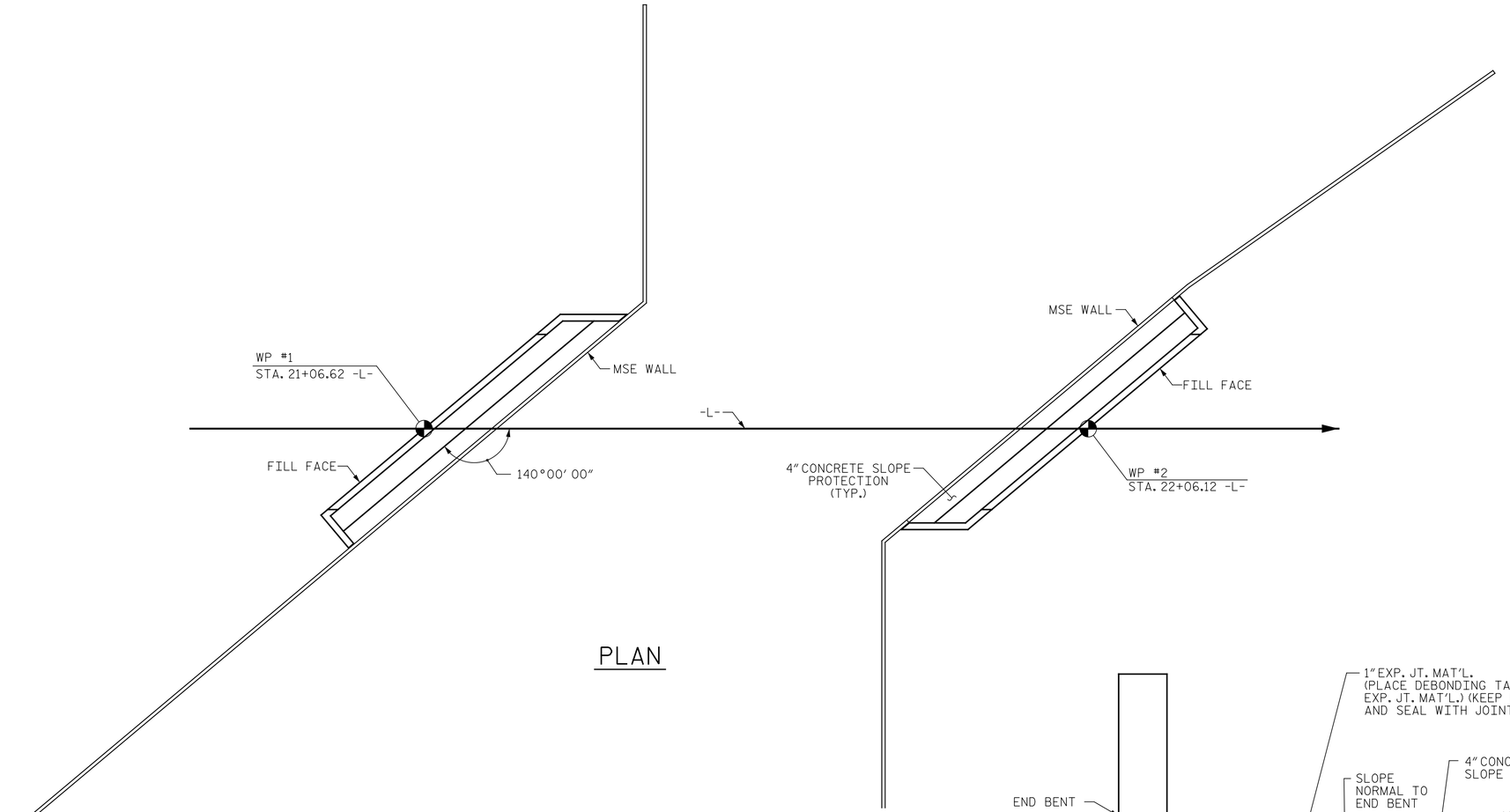
DRAWN BY : FCJ 11/88	REV. 10/1/11	MAA/GM
CHECKED BY : ARB 11/88	REV. 7/12	MAA/GM
	REV. 6/13	MAA/GM

REVISIONS

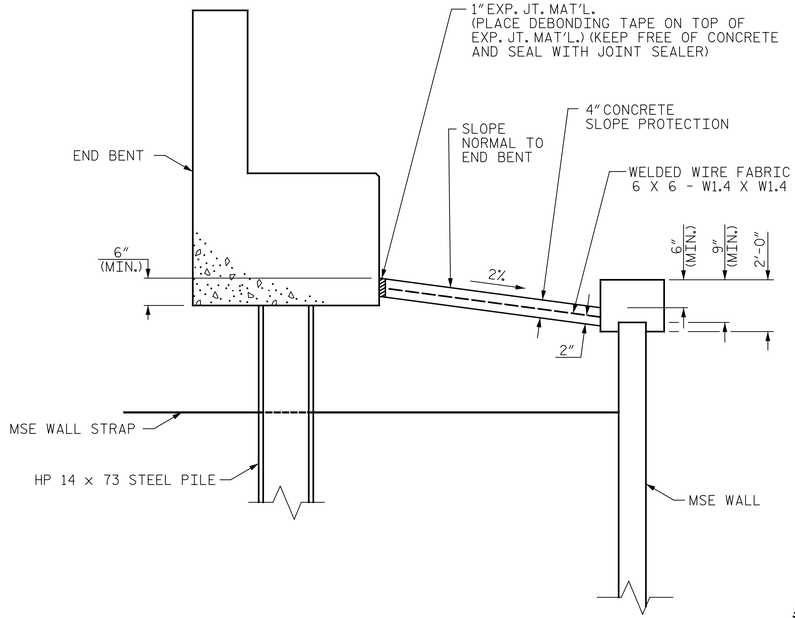
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S01-23
TOTAL SHEETS 24

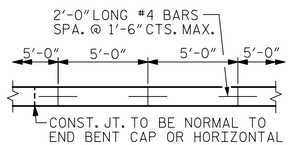
STR. NO. 1
STD. NO. BAS4



PLAN

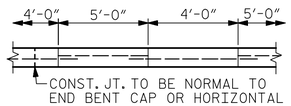


SECTION ALONG ℄ ROADWAY



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



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

OPTIONAL POURING DETAIL

NOTES

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

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FINISHED TO THE SATISFACTION OF THE ENGINEER. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 20" WIDE. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 21+57.23 -L- STA. 109+69.94 -L2-	4 INCH SLOPE PROTECTION	✳ WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	12	22
END BENT 2	12	22

✳ QUANTITY SHOWN IS BASED ON 5' POURS.

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 21+57.23 -L-
109+69.94 -L2-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F. WERTMAN

DocuSigned by: Richard F. Wertman
11/7/2017

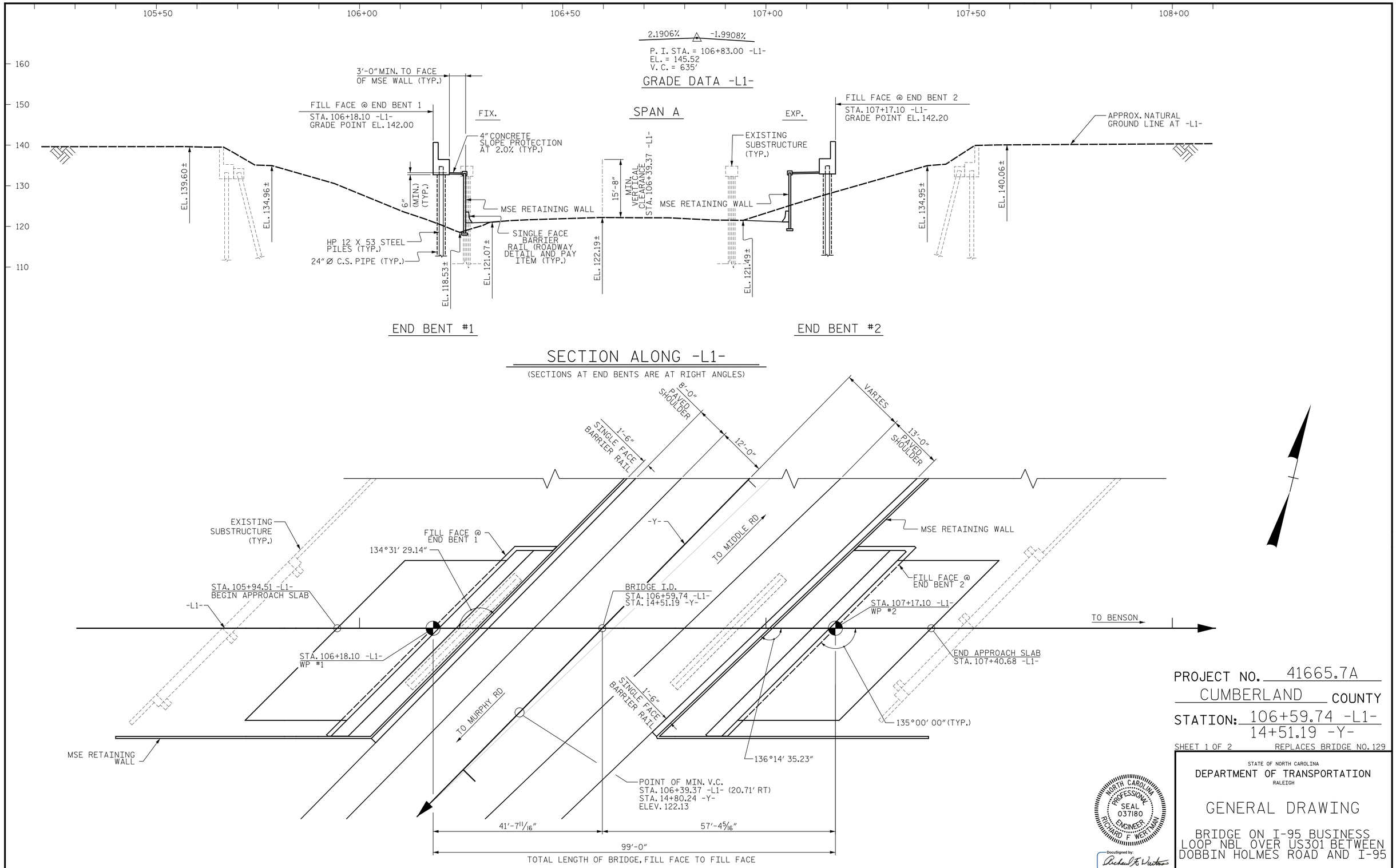
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DRAWN BY : B.A. WHITE DATE : 10/03/17
CHECKED BY : T.M. FORD DATE : 10/05/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-24
1			3			TOTAL SHEETS
2			4			24

STR. NO. 1



PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

SHEET 1 OF 2 REPLACES BRIDGE NO. 129

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON I-95 BUSINESS LOOP NBL OVER US301 BETWEEN DOBBIN HOLMES ROAD AND I-95

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 08901A86EBF6470...

11/7/2017

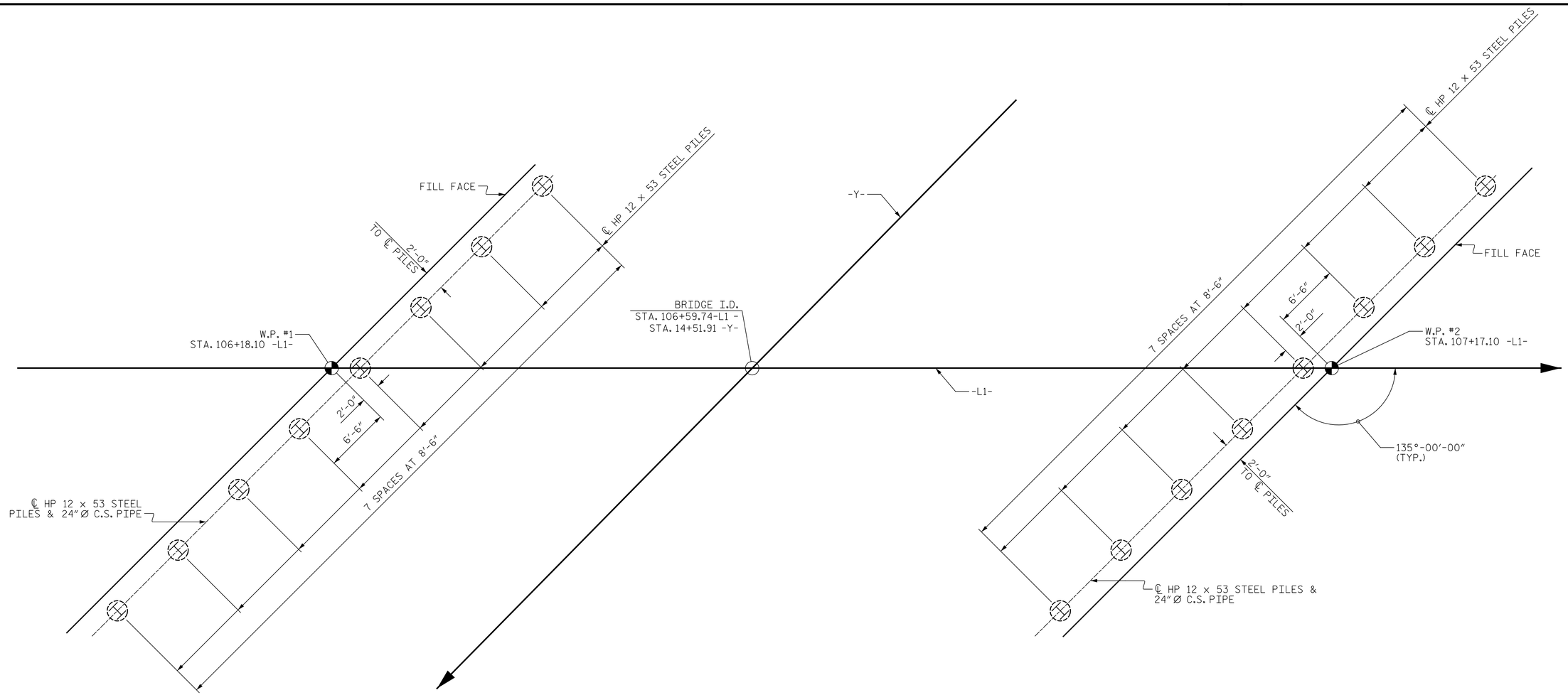
DRAWN BY : J.A. BOYER DATE : 09/03/17
CHECKED BY : R.F. WERTMAN DATE : 10/11/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-1
1			3			TOTAL SHEETS
2			4			24

STR. NO. 2



END BENT #1

END BENT #2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE.

NOTES:

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

PILES AT END BENTS NO. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.

DRIVE PILES AT END BENTS NO. 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.

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.

PILE SLEEVES AT END BENTS NO. 1 AND 2 ARE TO BE PLACED DURING CONSTRUCTION IN THE REINFORCED BACKFILL OF THE MSE WALLS. SEE MSE WALL PLANS.

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON I-95 BUSINESS LOOP NBL OVER US301 BETWEEN DOBBIN HOLMES ROAD AND I-95

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F. Wertman 11/7/2017

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-2
1			3			TOTAL SHEETS
2			4			24

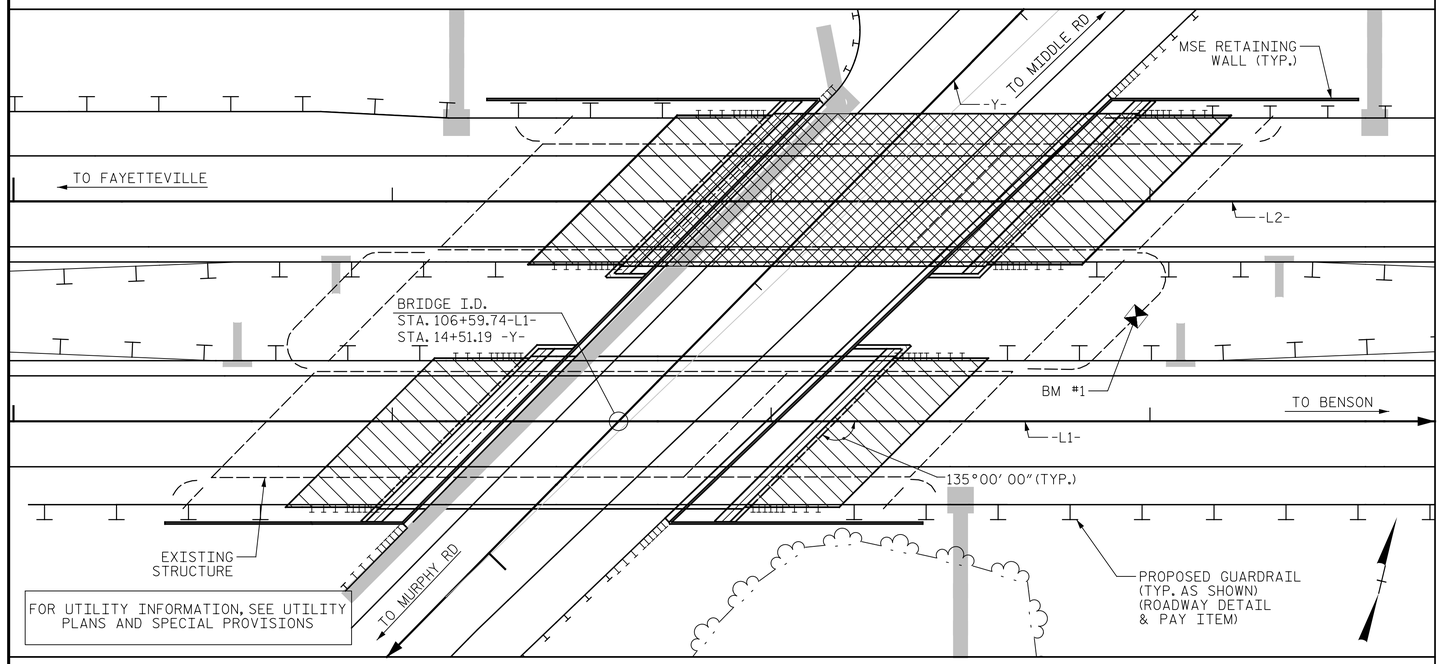
DRAWN BY : J.A. BOYER DATE : 10/11/17
CHECKED BY : R.F. WERTMAN DATE : 10/12/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STR. NO. 2

BENCH MARK #1: CHISELED SQUARE IN CONCRETE HEADWALL, -L1- STA. 107+96.38, 27.69' LEFT, EL. 140.48



LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION 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, SEE SPECIAL PROVISIONS.

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

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

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 106+59.74 -L-".

THE EXISTING STRUCTURE CONSISTING OF TWO SPANS @ 60'-0" AND ONE SPAN @ 65'-0", WITH A CLEAR ROADWAY OF 28' AND REINFORCED CONCRETE DECK ON STEEL I-BEAMS ON END BENTS WITH REINFORCED CONCRETE CAPS ON PRECAST PRESTRESSED CONCRETE PILES & INTERIOR BENTS WITH REINFORCED CONCRETE CAPS ON PRECAST PRESTRESSED CONCRETE PILES LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

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

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL APPROX. 122,200 LBS.	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		PILE REDRIVES	VERTICAL CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	ASBESTOS ASSESSMENT
	LUMP SUM	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LUMP SUM	EACH	NO.	LIN.FT.	EACH	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			3866	4939		LUMP SUM		LUMP SUM					192.1		LUMP SUM	LUMP SUM	LUMP SUM
END BENT NO. 1					51.3		7053		8	8	576	8		24			
END BENT NO. 2					51.9		7162		8	8	576	8		49			
TOTAL	LUMP SUM	1	3866	4939	103.2	LUMP SUM	14203	LUMP SUM	16	16	1152	16	192.1	73	LUMP SUM	LUMP SUM	LUMP SUM

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON I-95 BUSINESS LOOP NBL OVER US301 BETWEEN DOBBIN HOLMES ROAD AND I-95

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 11/14/2017

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-3
1			3			TOTAL SHEETS
2			4			24

STR. NO. 2

DRAWN BY : J.A. BOYER DATE : 09/03/17
CHECKED BY : R.F. WERTMAN DATE : 10/16/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	(#) CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.66	--	1.75	0.649	1.91	A	EL	45.97	0.926	2.24	A	I	0.00	1.30	0.649	1.66	A	EL	20.00	
		HL-93 (OPERATING)	N/A		2.16	--	1.35	0.649	2.48	A	EL	45.97	0.926	2.90	A	I	0.00	1.00	0.649	2.16	A	EL	20.00	
		HS-20 (INVENTORY)	36.00	2	2.26	81.36	1.75	0.649	2.62	A	EL	45.97	0.926	3.00	A	I	0.00	1.30	0.649	2.26	A	EL	20.00	
		HS-20 (OPERATING)	36.00		2.93	105.48	1.35	0.649	3.40	A	EL	45.97	0.926	3.88	A	I	0.00	1.00	0.649	2.93	A	EL	20.00	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		5.89	73.63	1.40	0.649	8.45	A	EL	45.97	0.926	9.99	A	I	0.00	1.30	0.649	5.89	A	EL	20.00	
		S3C	21.500		3.45	74.18	1.40	0.649	4.88	A	EL	45.97	0.926	5.85	A	I	0.00	1.30	0.649	3.45	A	EL	20.00	
		S3A	22.750		3.27	74.39	1.40	0.649	4.63	A	EL	45.97	0.926	5.55	A	I	0.00	1.30	0.649	3.27	A	EL	20.00	
		S4A	26.750		2.85	76.24	1.40	0.649	4.08	A	EL	45.97	0.926	4.82	A	I	0.00	1.30	0.649	2.85	A	EL	20.00	
		S5A	30.500		2.54	77.47	1.40	0.649	3.60	A	EL	45.97	0.926	4.35	A	I	0.00	1.30	0.649	2.54	A	EL	20.00	
		S6A	34.500		2.29	79.01	1.40	0.649	3.25	A	EL	45.97	0.926	3.93	A	I	0.00	1.30	0.649	2.29	A	EL	20.00	
		S7B	38.500		2.10	80.85	1.40	0.649	2.96	A	EL	45.97	0.926	3.65	A	I	0.00	1.30	0.649	2.10	A	EL	20.00	
		S7A	40.000	3	2.09	83.60	1.40	0.649	2.91	A	EL	45.97	0.926	3.70	A	I	0.00	1.30	0.649	2.09	A	EL	45.97	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		2.76	77.97	1.40	0.649	3.99	A	EL	45.97	0.926	4.66	A	I	0.00	1.30	0.649	2.76	A	EL	20.00	
		T5B	32.000		2.50	80.00	1.40	0.649	3.51	A	EL	45.97	0.926	4.37	A	I	0.00	1.30	0.649	2.50	A	EL	20.00	
		T6A	36.000		2.30	82.80	1.40	0.649	3.21	A	EL	45.97	0.926	3.99	A	I	0.00	1.30	0.649	2.30	A	EL	45.97	
		T7A	40.000		2.13	85.20	1.40	0.649	2.97	A	EL	45.97	0.926	3.69	A	I	0.00	1.30	0.649	2.13	A	EL	45.97	
		T7B	40.000		2.11	84.40	1.40	0.649	3.15	A	EL	45.97	0.926	3.51	A	I	0.00	1.30	0.649	2.11	A	EL	20.00	
FATIGUE		HL-93 (INVENTORY)	γ_{LL}=0.75		--																			

LOAD FACTORS:

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

NOTES:

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

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

(#) CONTROLLING LOAD RATING

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

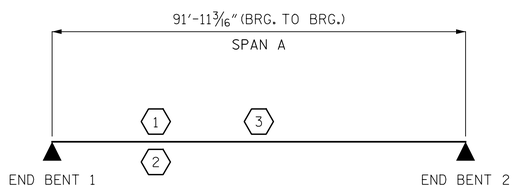
(2) DESIGN LOAD RATING (HS-20) **

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. 41665.7A
CUMBERLAND COUNTY
STATION: 106+59.74 -L1-
14+51.19 -Y-

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 11/7/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

LRFR SUMMARY FOR STEEL GIRDERS
(INTERSTATE TRAFFIC)

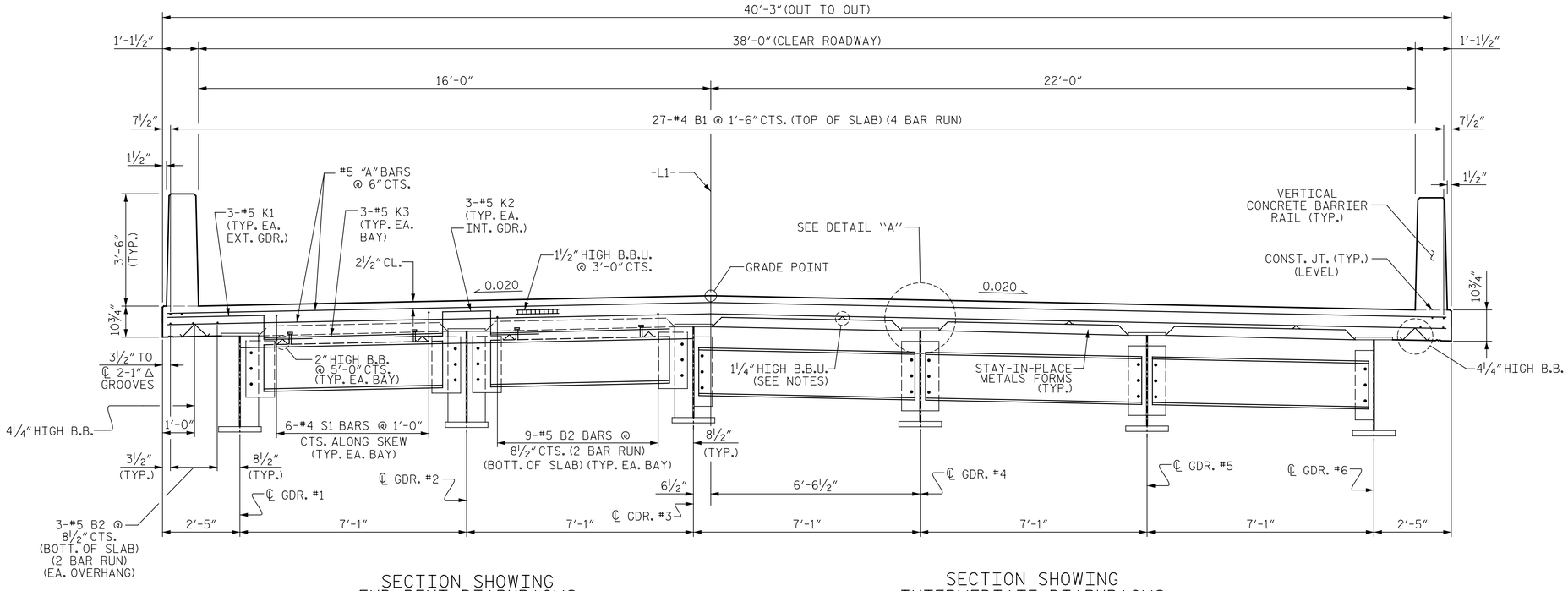
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-4
1			3			TOTAL SHEETS
2			4			24

ASSEMBLED BY : B.A. WHITE	DATE : 10/12/17
CHECKED BY : R.F. WERTMAN	DATE : 10/13/17
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

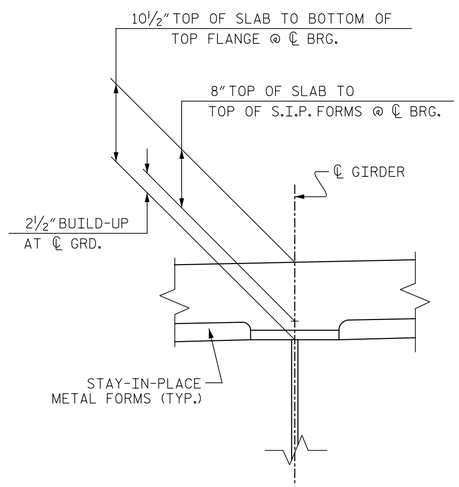
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STR. NO. 2 STD. NO. LRFR4



SECTION SHOWING END BENT DIAPHRAGMS

SECTION SHOWING INTERMEDIATE DIAPHRAGMS



DETAIL "A"

TYPICAL SECTION

STEEL PLATE GIRDER 34" WEB DEPTH

NOTES:

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

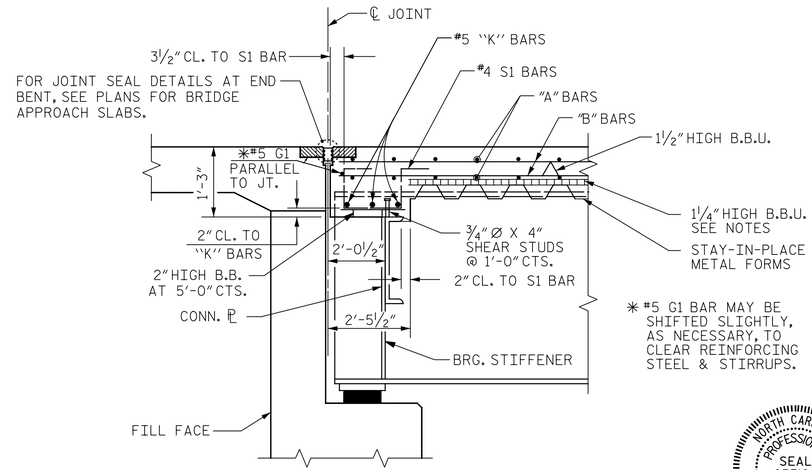
BARRIER RAIL SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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

FOR VERTICAL CONCRETE BARRIER RAIL REINFORCING STEEL AND DETAILS, SEE "VERTICAL CONCRETE BARRIER RAIL PLAN & DETAIL" SHEET.

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

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



END OF GIRDER DETAIL AT END BENT

* #5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL & STIRRUPS.

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 11/7/2017

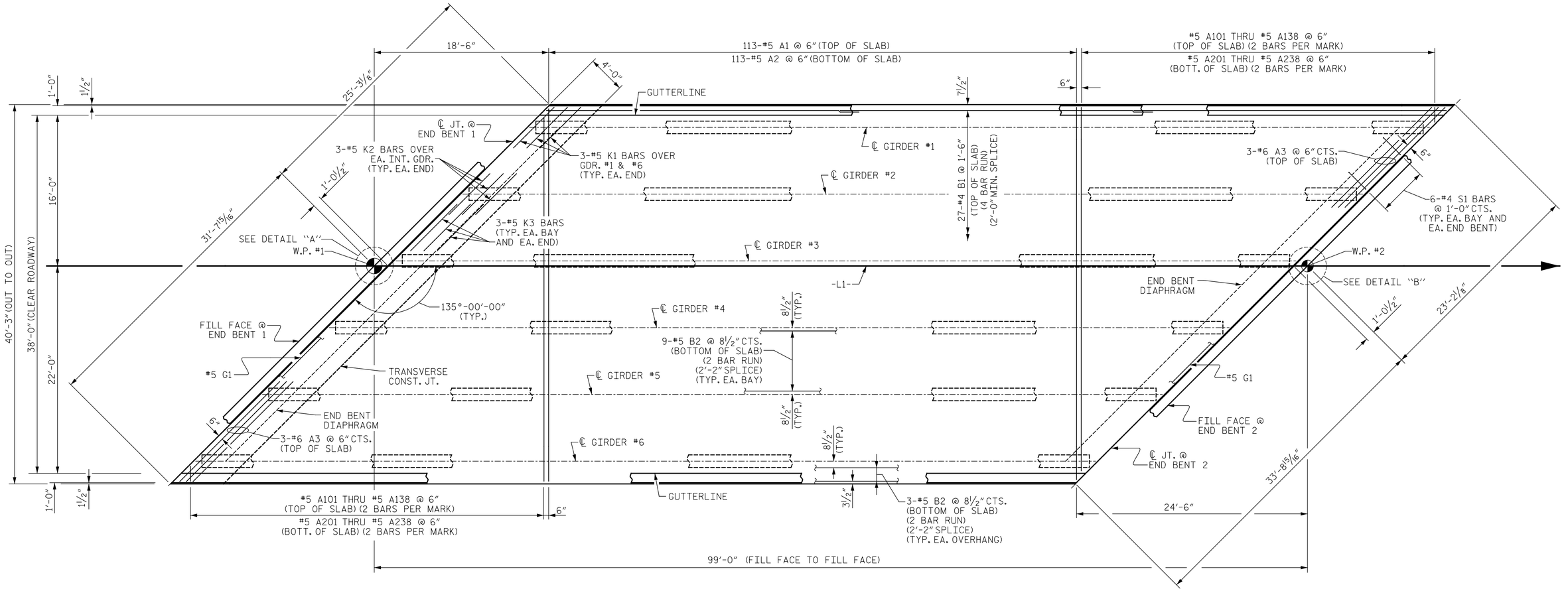
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-5
1			3			TOTAL SHEETS
2			4			24

DRAWN BY : B.A. WHITE DATE : 10/10/17
CHECKED BY : R.F. WERTMAN DATE : 10/12/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

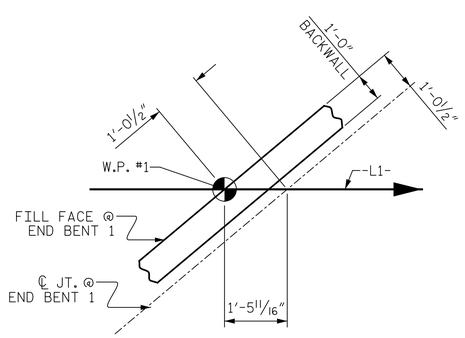
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

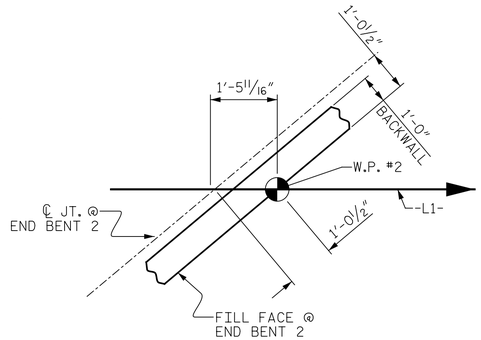
STR. NO. 2



PLAN OF SPAN A



DETAIL "A"



DETAIL "B"

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 11/7/2017

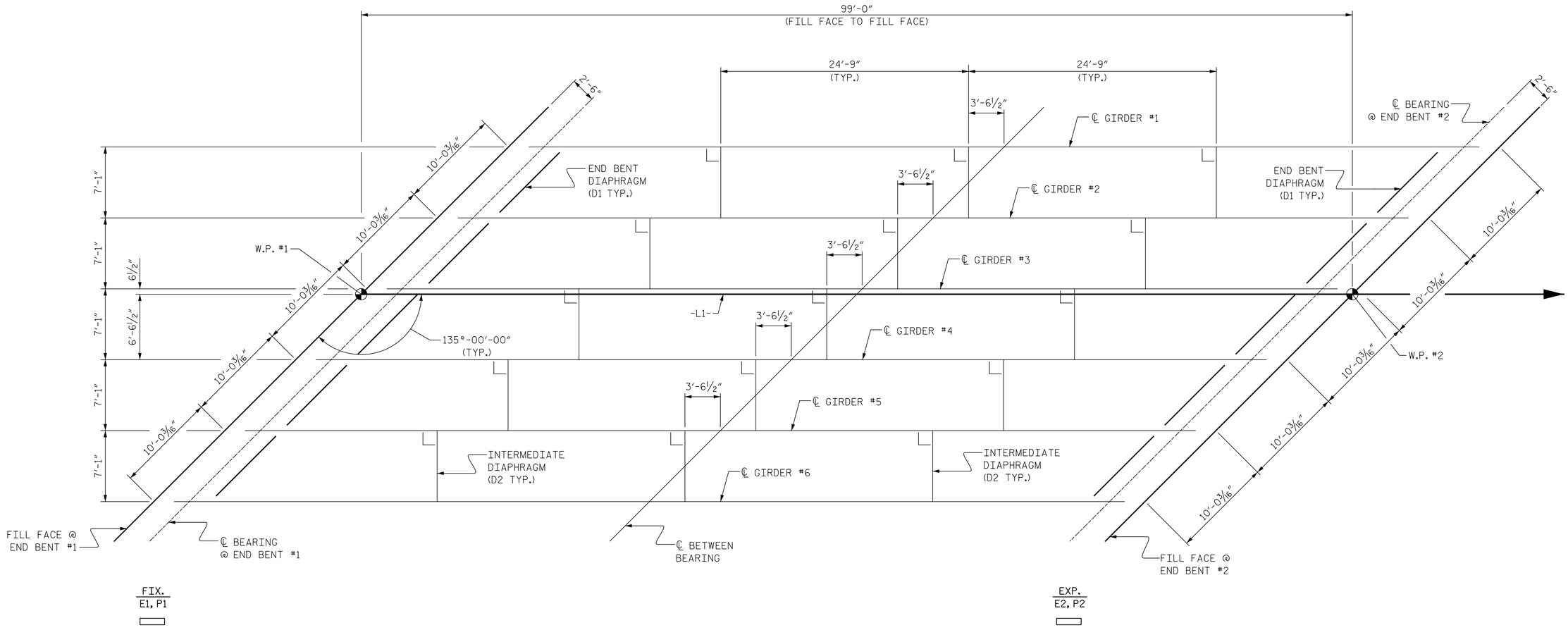
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-6
1			3			TOTAL SHEETS
2			4			24

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DRAWN BY : B.A. WHITE DATE : 10/12/17
CHECKED BY : R.F. WERTMAN DATE : 10/12/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

STR. NO. 2



FIX.
E1, P1

EXP.
E2, P2

SPAN A

FRAMING PLAN

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by:
Richard F Wertman
0B901A8EEBF8470...
11/7/2017

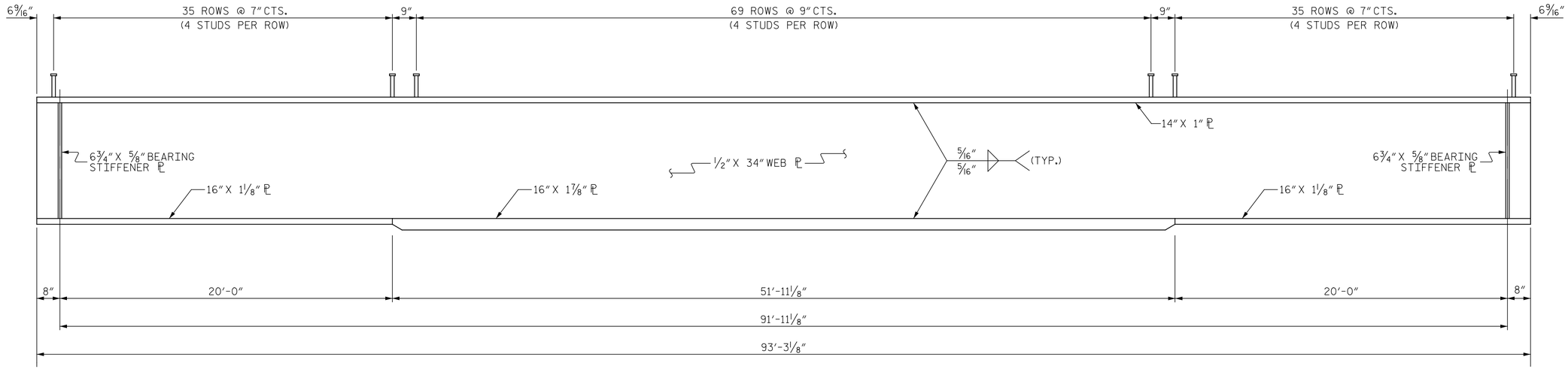
DRAWN BY : B.A. WHITE DATE : 10/04/17
CHECKED BY : R.F. WERTMAN DATE : 10/14/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

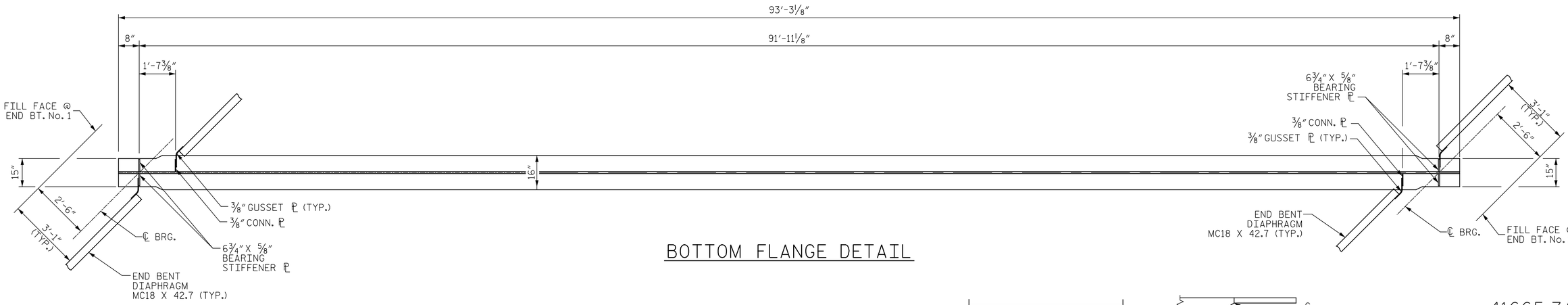
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-7
1			3			TOTAL SHEETS
2			4			24

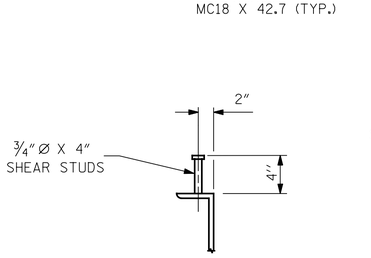
STR. NO. 2



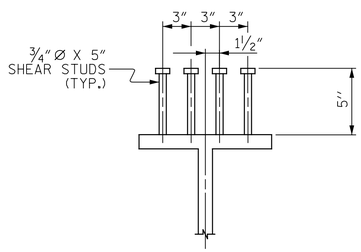
GIRDER ELEVATION
(INTERMEDIATE DIAPHRAGMS NOT SHOWN)



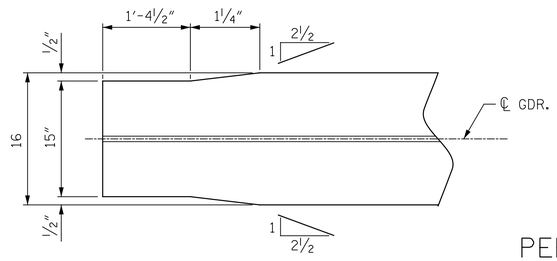
BOTTOM FLANGE DETAIL



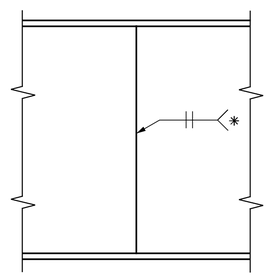
SHEAR STUD DETAILS
(TYP. EACH END BENT DIAPHRAGM)



SHEAR STUD DETAILS
(TYP. EACH GIRDER)

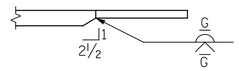


END OF GIRDER DETAIL
(BOTTOM FLANGE ONLY)



PERMISSIBLE SHOP WEB SPLICE

* GRIND SMOOTH AND FLUSH ON OUTSIDE OF EXTERIOR GIRDERS



SECTION THRU FLANGE

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by:
Richard F Wertman
-09301ABBE8F6470...
11/7/2017

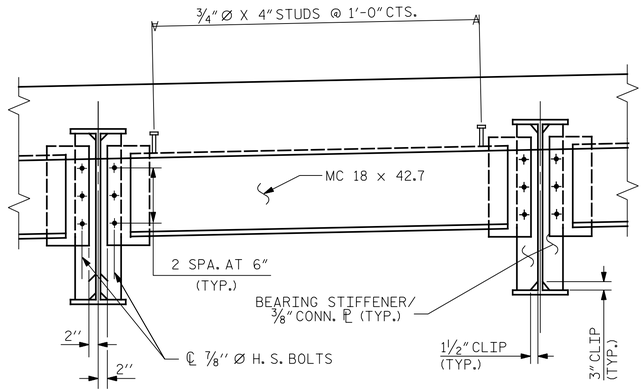
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-8
1			3			TOTAL SHEETS
2			4			24

DRAWN BY : T.M. FORD DATE : 10/10/17
CHECKED BY : R.F. WERTMAN DATE : 10/14/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

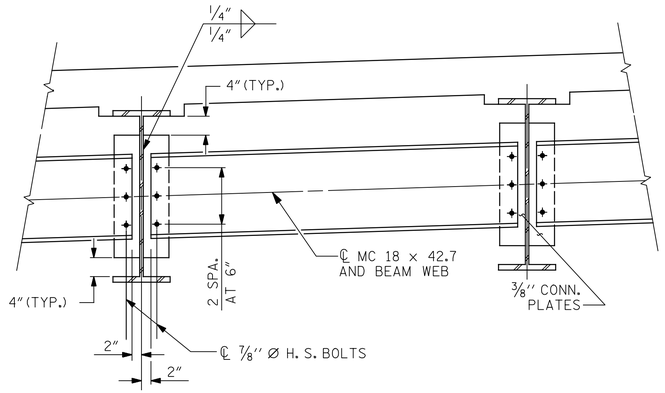
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

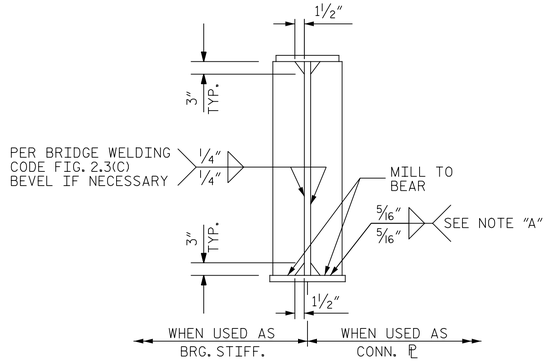
STR. NO. 2



TYPICAL END BENT DIAPHRAGM (D1)



INTERMEDIATE DIAPHRAGM (D2)



BEARING STIFFENER

NOTE "A":
ONLY WELD BEARING STIFFENER TO BOTTOM FLANGE IF DIAPHRAGM IS ATTACHED TO BEARING STIFFENER.

NOTES:

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

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

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

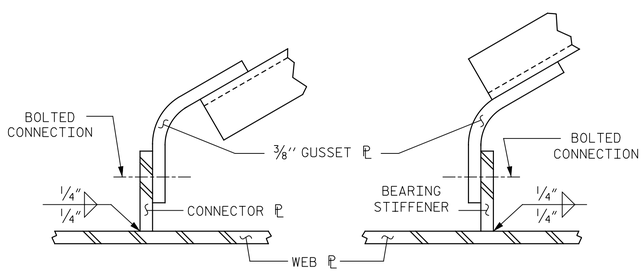
BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

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

PERMITTED FLANGE AND WEB SHOP SLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

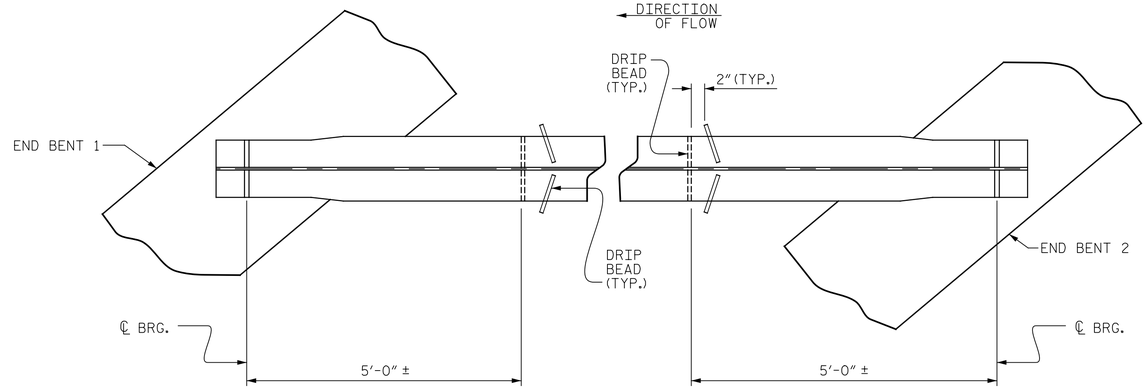
STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

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

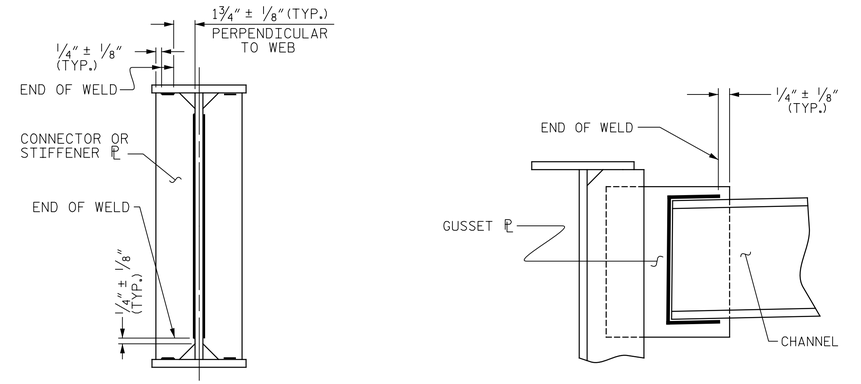


WITH CONNECTOR ℙ — WITH BEARING STIFFENER

GUSSET PLATE DETAILS



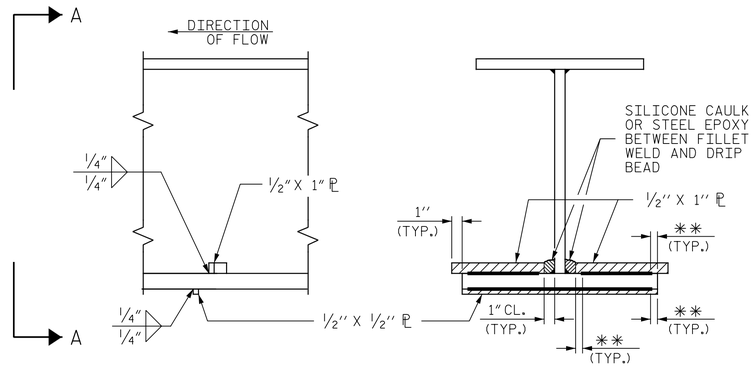
PART PLAN - BOTTOM FLANGE



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

TYPICAL CHANNEL CONNECTION

WELD TERMINATION DETAILS

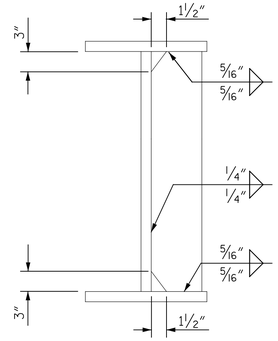


SECTION

VIEW A-A

**SEE "WELD TERMINATION DETAILS"

DRIP BEAD DETAILS



CONNECTOR PLATE DETAILS

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 11/7/2017

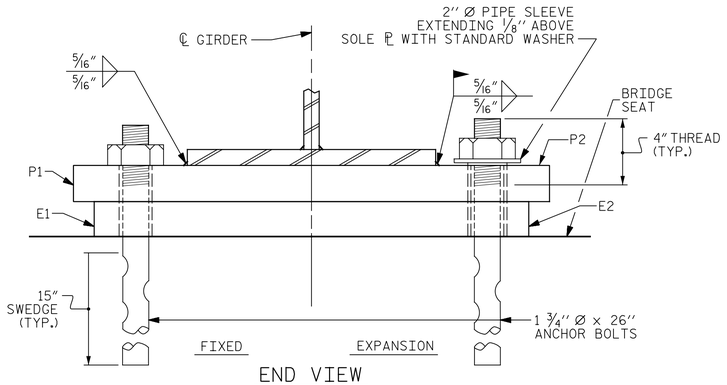
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-9
1			3			TOTAL SHEETS
2			4			24

STR. NO. 2

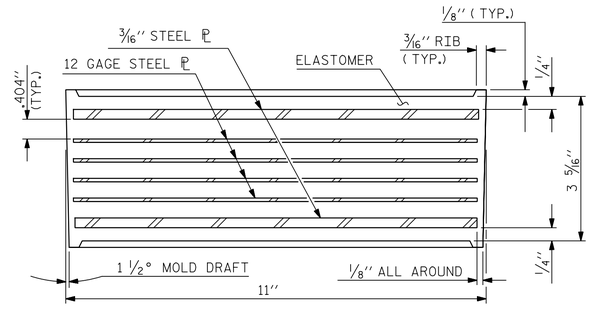
DRAWN BY : B.A. WHITE DATE : 09/06/17
CHECKED BY : R.F. WERTMAN DATE : 10/14/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

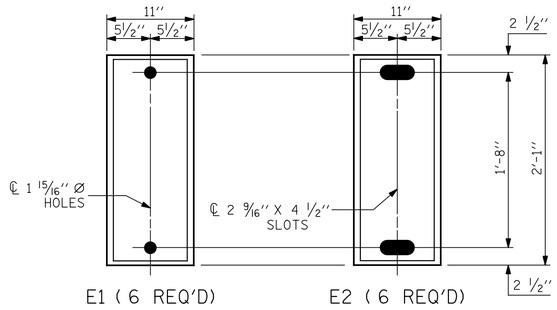
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



END VIEW

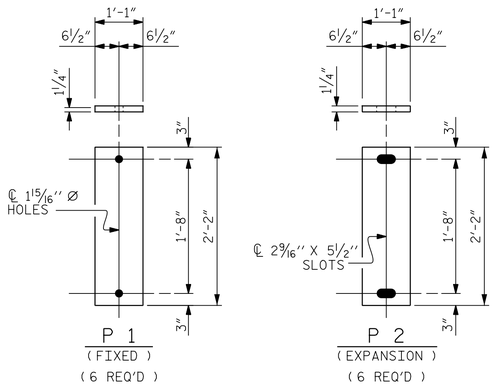


TYPICAL SECTION OF ELASTOMERIC BEARING



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.

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

FOR PAINTED STRUCTURAL STEEL (EXCLUDING AASHTO M270 GRADE 50W), SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

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

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

—LOAD RATING—	
	MAX. D.L.+L.L.
TYPE IV	310 k

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
ELASTOMERIC BEARING DETAILS
(STEEL SUPERSTRUCTURE)

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 11/7/2017

ASSEMBLED BY : B.A. WHITE	DATE : 10/04/17
CHECKED BY : R.F. WERTMAN	DATE : 10/14/17
DRAWN BY : EEM 2/97	REV. 10/1/11 MAA/GM
CHECKED BY : VAP 2/97	REV. 6/13 AAC/MAA
	REV. 1/15 MAA/TMG

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-10
1			3			TOTAL SHEETS
2			4			24

STR. NO. 2

STD. NO. EB2

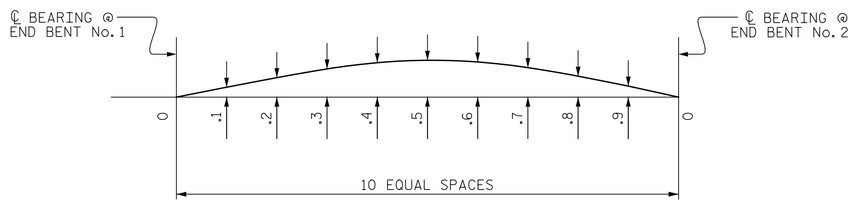
DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	GIRDER 1 & GIRDER 6											GIRDER 2 & GIRDER 5											GIRDER 3 & GIRDER 4										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.023	0.044	0.059	0.069	0.072	0.069	0.059	0.044	0.023	0	0	0.023	0.044	0.059	0.069	0.072	0.069	0.059	0.044	0.023	0	0	0.023	0.044	0.059	0.069	0.072	0.069	0.059	0.044	0.023	0
DEFLECTION DUE TO WEIGHT OF SLAB ✳ ↓	0	0.062	0.124	0.171	0.201	0.211	0.201	0.171	0.124	0.062	0	0	0.055	0.111	0.154	0.181	0.190	0.181	0.154	0.111	0.055	0	0	0.048	0.098	0.136	0.160	0.168	0.160	0.136	0.098	0.048	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.011	0.020	0.028	0.032	0.033	0.032	0.028	0.020	0.011	0	0	0.011	0.020	0.028	0.032	0.033	0.032	0.028	0.020	0.011	0	0	0.011	0.020	0.028	0.032	0.033	0.032	0.028	0.020	0.011	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.096	0.188	0.258	0.302	0.316	0.302	0.258	0.188	0.096	0	0	0.089	0.175	0.241	0.282	0.295	0.282	0.241	0.175	0.089	0	0	0.082	0.162	0.223	0.261	0.273	0.261	0.223	0.162	0.082	0
VERTICAL CURVE ORDINATE ↑	0	0.025	0.045	0.058	0.067	0.070	0.067	0.058	0.045	0.025	0	0	0.025	0.045	0.058	0.067	0.070	0.067	0.058	0.045	0.025	0	0	0.025	0.045	0.058	0.067	0.070	0.067	0.058	0.045	0.025	0
REQUIRED CAMBER ↑	0	1 7/16″	2 13/16″	3 13/16″	4 7/16″	4 5/8″	4 7/16″	3 13/16″	2 13/16″	1 7/16″	0	0	1 3/8″	2 5/8″	3 9/16″	4 13/16″	4 3/8″	4 13/16″	3 9/16″	2 5/8″	1 3/8″	0	0	1 1/4″	2 1/2″	3 3/8″	3 15/16″	4 1/8″	3 15/16″	3 3/8″	2 1/2″	1 1/4″	0

✳ INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.

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

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHALL BE PLUMB AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.



SCHEMATIC OF CAMBER ORDINATES

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTION TABLES

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F. Wertman 08901A08EBF6470...
11/7/2017

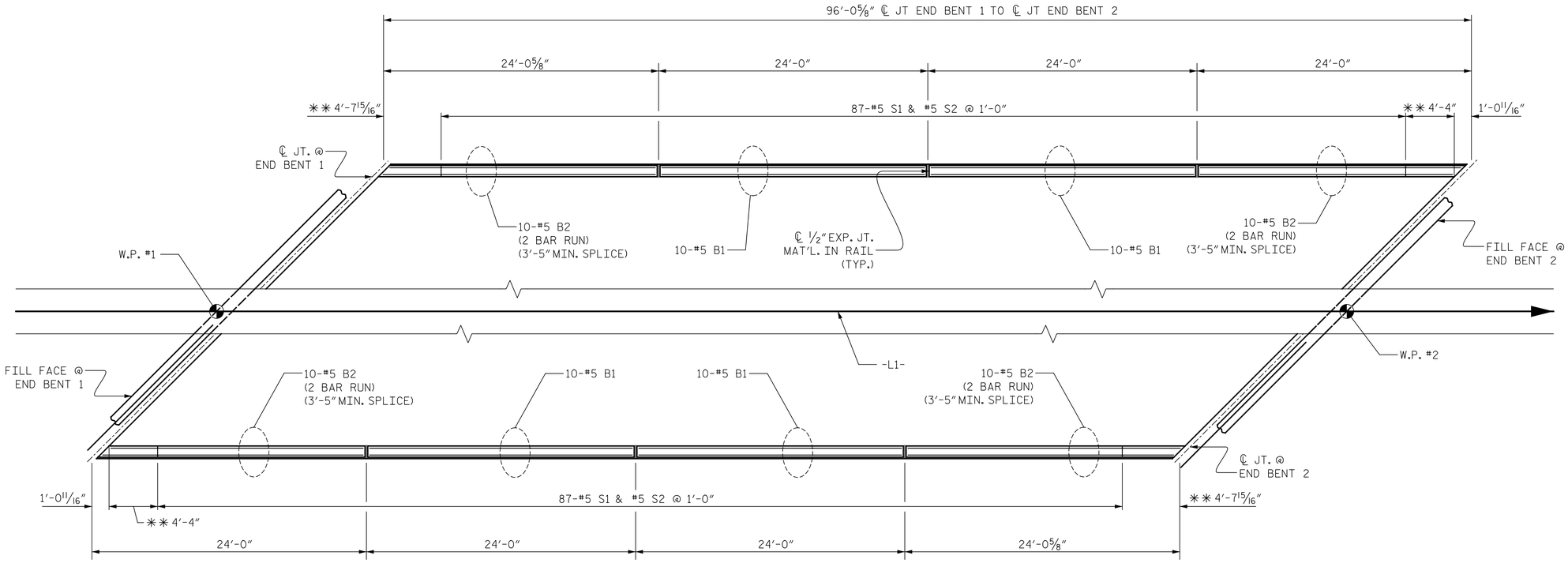
DRAWN BY : T.M. FORD DATE : 10/09/17
CHECKED BY : R.F. WERTMAN DATE : 10/14/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-11
1			3			TOTAL SHEETS
2			4			24

STR. NO. 2



PLAN OF BARRIER RAIL

✳✳ SEE "END OF RAIL DETAILS" ON SHEET 2 OF 2 FOR ADDITIONAL REINFORCING STEEL.

DIMENSIONS ARE SHOWN FROM ℄ JOINT AT BACK FACE OF BARRIER RAIL

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

VERTICAL CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 08901A88EBF8470...
11/7/2017

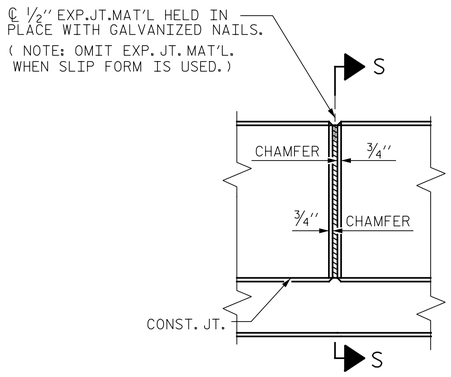
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-12
1			3			TOTAL SHEETS
2			4			24

STR. NO. 2

DRAWN BY : B.A. WHITE DATE : 10/12/17
CHECKED BY : R.F. WERTMAN DATE : 10/14/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

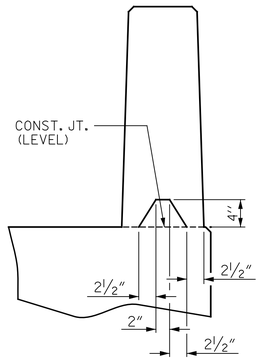
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



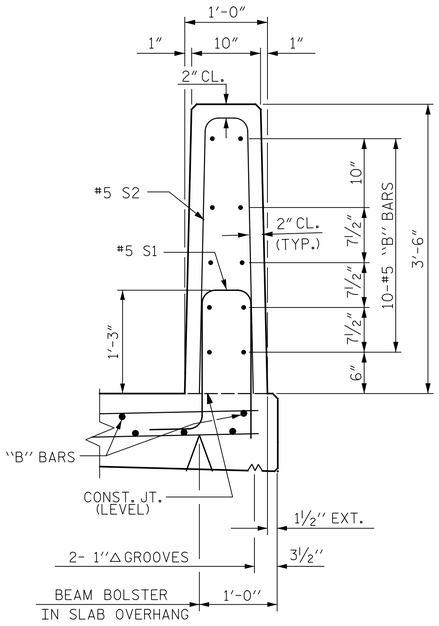
ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS



SECTION S-S

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



SECTION THRU 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.

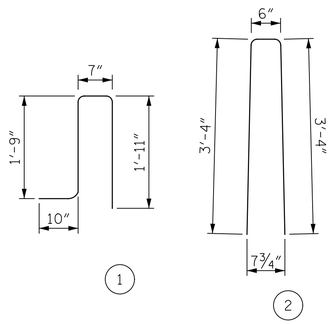
WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF VERTICAL CONCRETE BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3 & S4 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3 & S4 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.

BAR TYPES



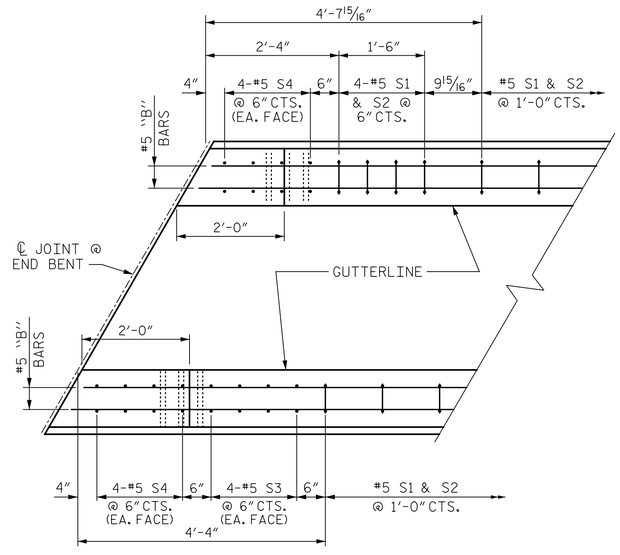
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

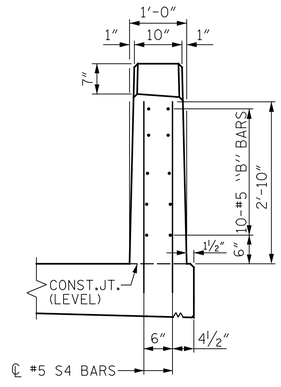
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ B1	40	#5	STR	23'-8"	988
✱ B2	80	#5	STR	14'-1"	1175
✱ S1	182	#5	1	5'-1"	965
✱ S2	182	#5	2	7'-2"	1361
✱ S3	16	#5	STR	4'-0"	67
✱ S4	32	#5	STR	3'-6"	117

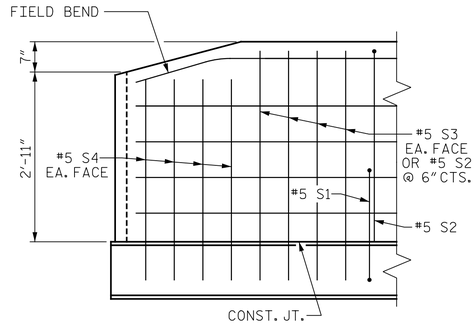
✱EPOXY COATED REINFORCING STEEL	4,673 LBS.
CLASS AA CONCRETE	22.8 CU. YDS.
VERTICAL CONCRETE BARRIER RAIL	192.1 LIN. FT.



PLAN



END VIEW



SIDE VIEW

END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS

ASSEMBLED BY : B.A. WHITE		DATE :	09/11/17
CHECKED BY : T.M. FORD		DATE :	09/27/17
DRAWN BY : MAA 5/10	REV. 10/1/11		MAA/GM
CHECKED BY : GM 5/10	REV. 12/5/11		MAA/GM
	REV. 6/13		MAA/GM

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F. Wertman 0890 1A8 6EBF0470...
11/7/2017

PROJECT NO. 41665.7A
CUMBERLAND COUNTY
STATION: 106+59.74 -L1-
14+51.19 -Y-

SHEET 2 OF 2

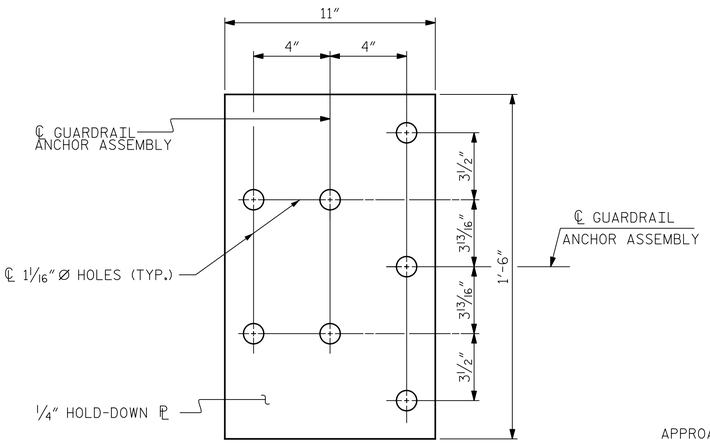
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

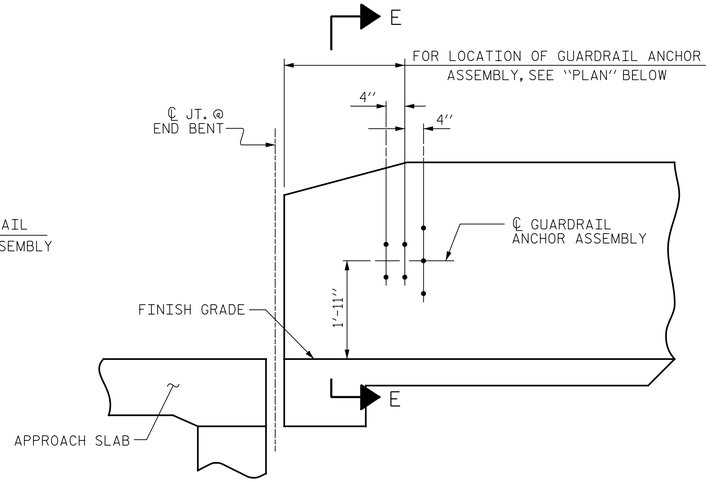
VERTICAL CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-13
1			3			TOTAL SHEETS
2			4			24

STR. NO. 2 STD. NO. CBR2

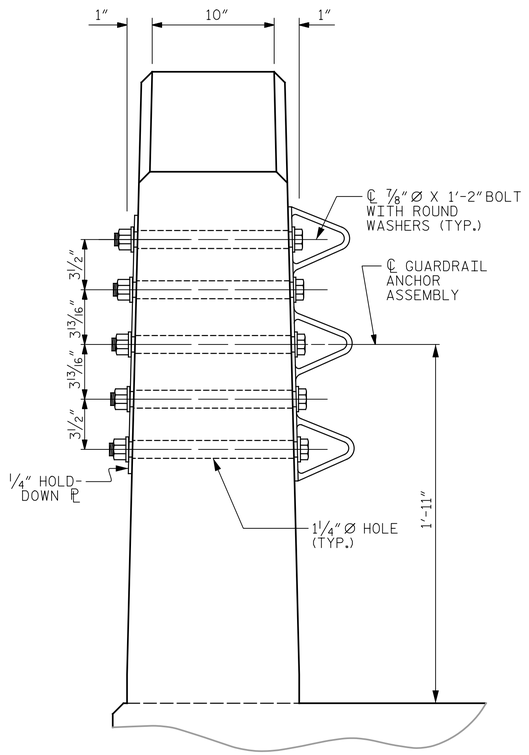


PLAN



ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF 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 VERTICAL CONCRETE BARRIER RAIL.

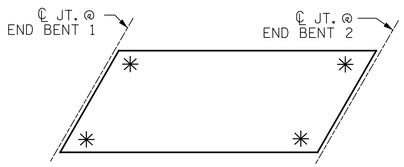
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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

PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

(TYP. EA. SIDE)



SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

ASSEMBLED BY : B.A. WHITE	DATE : 09/12/17
CHECKED BY : T.M. FORD	DATE : 10/15/17
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

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

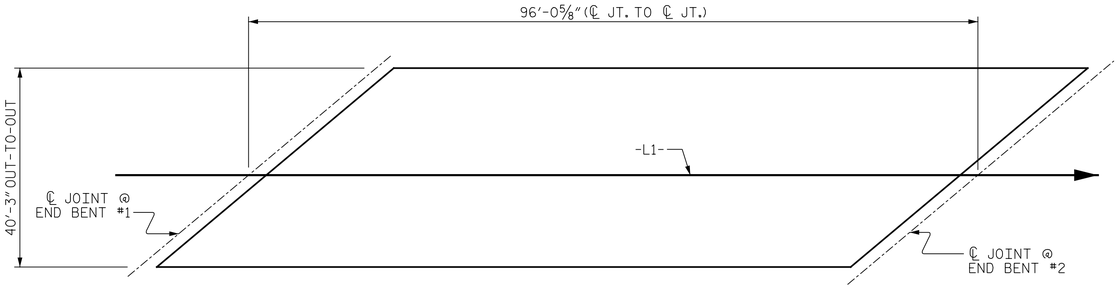
NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 08901A86EBF6470...
11/7/2017

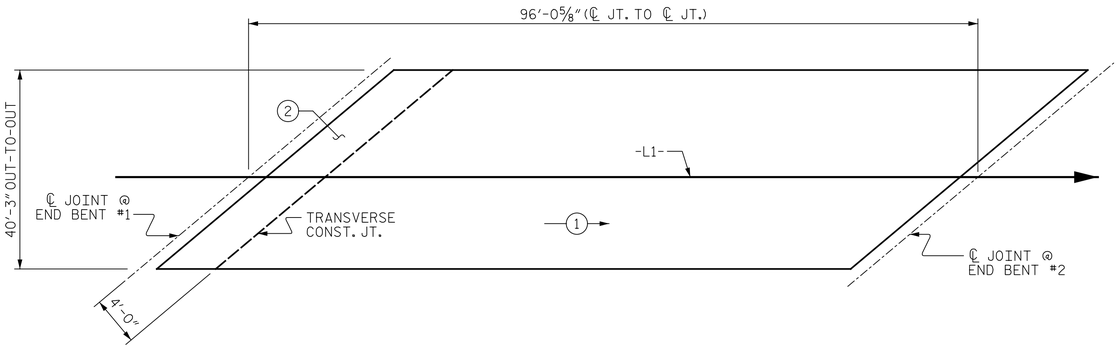
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-14
1			3			TOTAL SHEETS
2			4			24

STR. NO. 2 STD. NO. GRA3



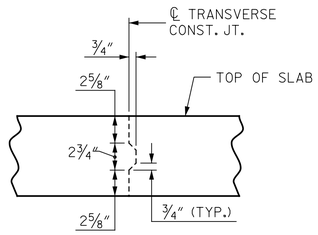
LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 3866)



SPAN A

POURING SEQUENCE

IF THE CONTRACTOR CHOOSES TO REVERSE THE DIRECTION OF POUR #1, A CONSTRUCTION JOINT WILL BE REQUIRED 4′-0″FROM THE JOINT SEAL.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	✳EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
TOTALS	105.9	13103	10658

REINFORCING BAR SCHEDULE

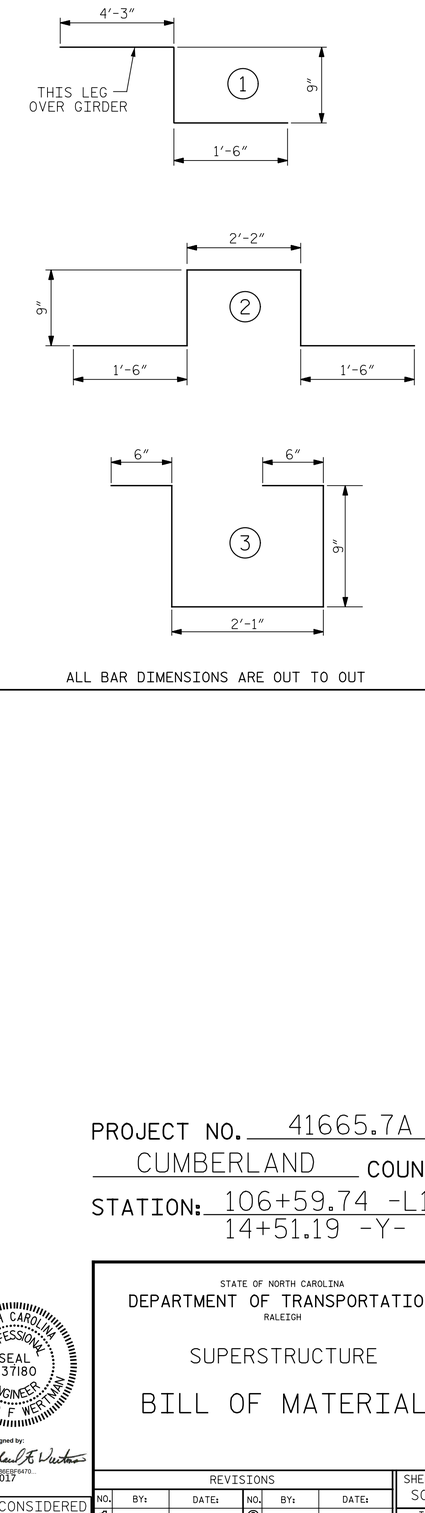
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	113	#5	STR	39′-11″	4705	A201	4	#5	STR	38′-7″	161
A2	113	#5	STR	39′-11″	4705	A202	4	#5	STR	37′-7″	157
✳A3	6	#6	STR	15′-0″	136	A203	4	#5	STR	36′-7″	153
						A204	4	#5	STR	35′-7″	148
✳A101	4	#5	STR	38′-7″	161	A205	4	#5	STR	34′-7″	144
✳A102	4	#5	STR	37′-7″	157	A206	4	#5	STR	33′-7″	140
✳A103	4	#5	STR	36′-7″	153	A207	4	#5	STR	32′-7″	136
✳A104	4	#5	STR	35′-7″	148	A208	4	#5	STR	31′-7″	132
✳A105	4	#5	STR	34′-7″	144	A209	4	#5	STR	30′-7″	128
✳A106	4	#5	STR	33′-7″	140	A210	4	#5	STR	29′-7″	123
✳A107	4	#5	STR	32′-7″	136	A211	4	#5	STR	28′-7″	119
✳A108	4	#5	STR	31′-7″	132	A212	4	#5	STR	27′-7″	115
✳A109	4	#5	STR	30′-7″	128	A213	4	#5	STR	26′-7″	111
✳A110	4	#5	STR	29′-7″	123	A214	4	#5	STR	25′-7″	107
✳A111	4	#5	STR	28′-7″	119	A215	4	#5	STR	24′-7″	103
✳A112	4	#5	STR	27′-7″	115	A216	4	#5	STR	23′-7″	98
✳A113	4	#5	STR	26′-7″	111	A217	4	#5	STR	22′-7″	94
✳A114	4	#5	STR	25′-7″	107	A218	4	#5	STR	21′-7″	90
✳A115	4	#5	STR	24′-7″	103	A219	4	#5	STR	20′-7″	86
✳A116	4	#5	STR	23′-7″	98	A220	4	#5	STR	19′-7″	82
✳A117	4	#5	STR	22′-7″	94	A221	4	#5	STR	18′-7″	78
✳A118	4	#5	STR	21′-7″	90	A222	4	#5	STR	17′-7″	73
✳A119	4	#5	STR	20′-7″	86	A223	4	#5	STR	16′-7″	69
✳A120	4	#5	STR	19′-7″	82	A224	4	#5	STR	15′-7″	65
✳A121	4	#5	STR	18′-7″	78	A225	4	#5	STR	14′-7″	61
✳A122	4	#5	STR	17′-7″	73	A226	4	#5	STR	13′-7″	57
✳A123	4	#5	STR	16′-7″	69	A227	4	#5	STR	12′-7″	53
✳A124	4	#5	STR	15′-7″	65	A228	4	#5	STR	11′-7″	48
✳A125	4	#5	STR	14′-7″	61	A229	4	#5	STR	10′-7″	44
✳A126	4	#5	STR	13′-7″	57	A230	4	#5	STR	9′-7″	40
✳A127	4	#5	STR	12′-7″	53	A231	4	#5	STR	8′-7″	36
✳A128	4	#5	STR	11′-7″	48	A232	4	#5	STR	7′-7″	32
✳A129	4	#5	STR	10′-7″	44	A233	4	#5	STR	6′-7″	27
✳A130	4	#5	STR	9′-7″	40	A234	4	#5	STR	5′-7″	23
✳A131	4	#5	STR	8′-7″	36	A235	4	#5	STR	4′-7″	19
✳A132	4	#5	STR	7′-7″	32	A236	4	#5	STR	3′-7″	15
✳A133	4	#5	STR	6′-7″	27	A237	4	#5	STR	2′-7″	11
✳A134	4	#5	STR	5′-7″	23	A238	4	#5	STR	1′-7″	7
✳A135	4	#5	STR	4′-7″	19						
✳A136	4	#5	STR	3′-7″	15	✳B1	108	#4	STR	25′-5″	1834
✳A137	4	#5	STR	2′-7″	11	B2	102	#5	STR	49′-0″	5213
✳A138	4	#5	STR	1′-7″	7						
						✳G1	2	#5	STR	56′-5″	118
						✳K1	12	#5	1	6′-6″	81
						✳K2	24	#5	2	6′-8″	167
						✳K3	30	#5	STR	7′-11″	248
						✳S1	60	#4	3	4′-7″	184

REINFORCING STEEL = 13,103
✳EPOXY COATED REINF. STEEL = 10,658

GROOVING BRIDGE FLOORS

BRIDGE DECK	3360 SQ. FT.
APPROACH SLABS	1579 SQ. FT.
TOTAL	4939 SQ. FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

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″

PROJECT NO. 41665.7A
CUMBERLAND COUNTY
STATION: 106+59.74 -L1-
14+51.19 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 11/9/2017

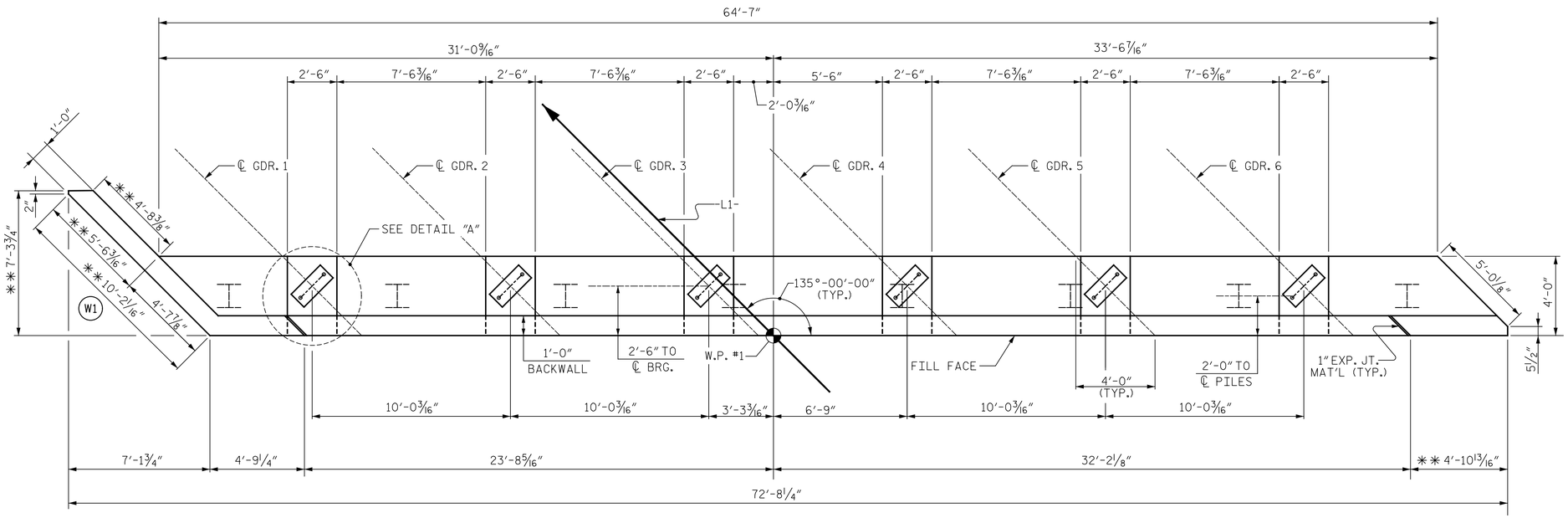
ASSEMBLED BY : B.A. WHITE	DATE : 10/12/17
CHECKED BY : R.F. WERTMAN	DATE : 10/15/17
DRAWN BY : JMB 5/87	REV. 8/16/99 RWW/LES
CHECKED BY : SJD 9/87	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

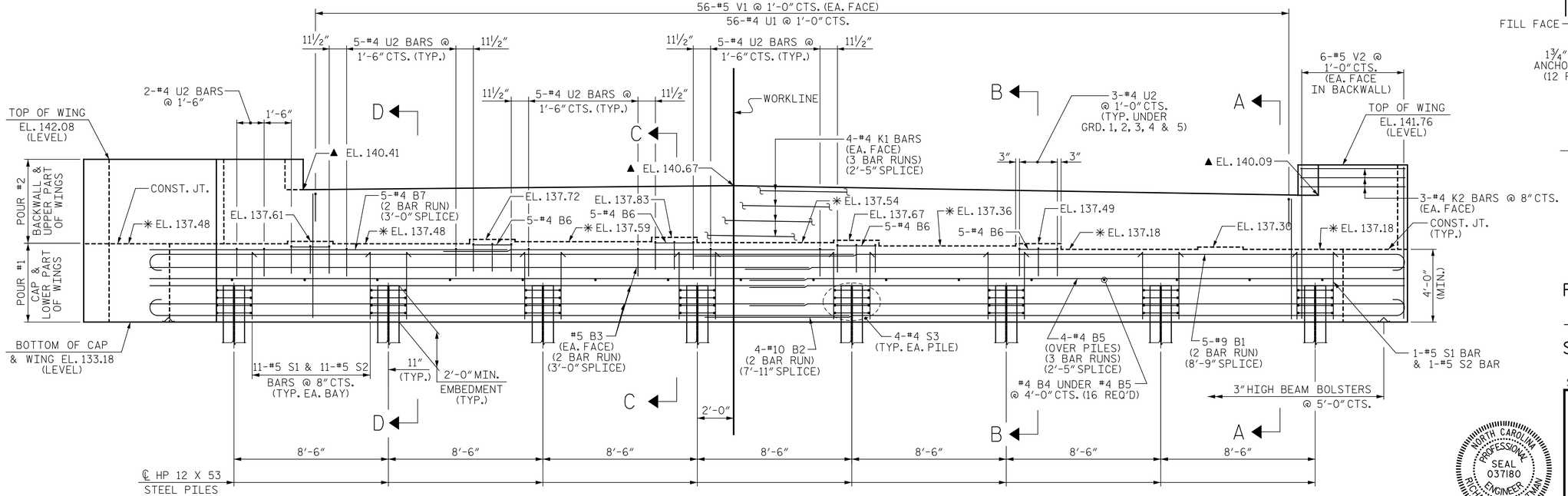
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-15
1			3			TOTAL SHEETS
2			4			24

STR. NO. 2 STD. NO. BOM1



PLAN



ELEVATION

SEE "SECTION A-A" ON SHEET 3 OF 3 FOR 24" Ø C.S. PIPE DETAILS

NOTES:

✱ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 3 OF 3.

▲ THIS ELEVATION TAKEN ON FILL FACE OF BACKWALL.

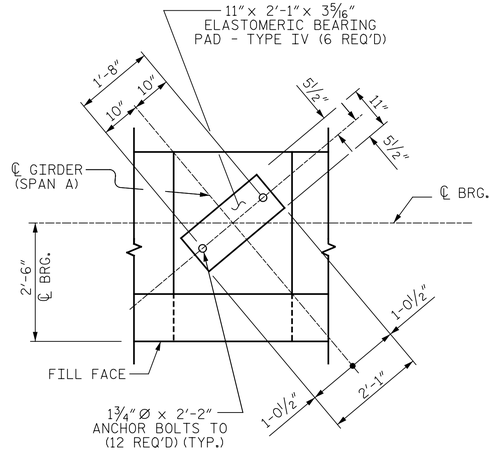
STIRRUPS & U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

✱✱ CONTRACTOR SHALL VERIFY WING WALL LENGTH BASED ON MSE WALL DESIGN AND MODIFY THE WING WALL LENGTH ACCORDINGLY, SUCH THAT THE WING WALL AND 1" EXPANSION JOINT MATERIAL IS FLUSH WITH THE BACK OF THE MSE WALL PANEL.



DETAIL "A"

(TYP. EA. GIRDER)

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: 08901A86EBF6470... 11/7/2017

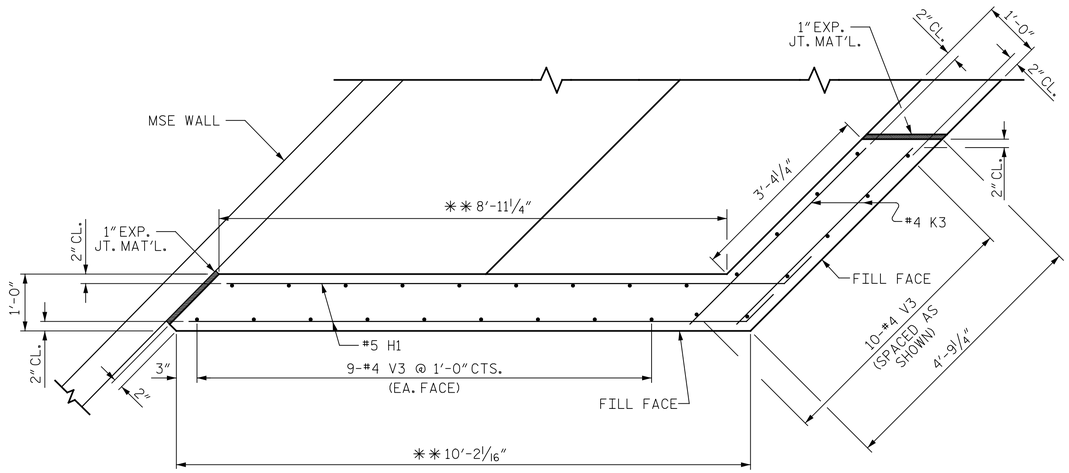
DRAWN BY : T.M. FORD DATE : 10/18/17
CHECKED BY : R.F. WERTMAN DATE : 10/18/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

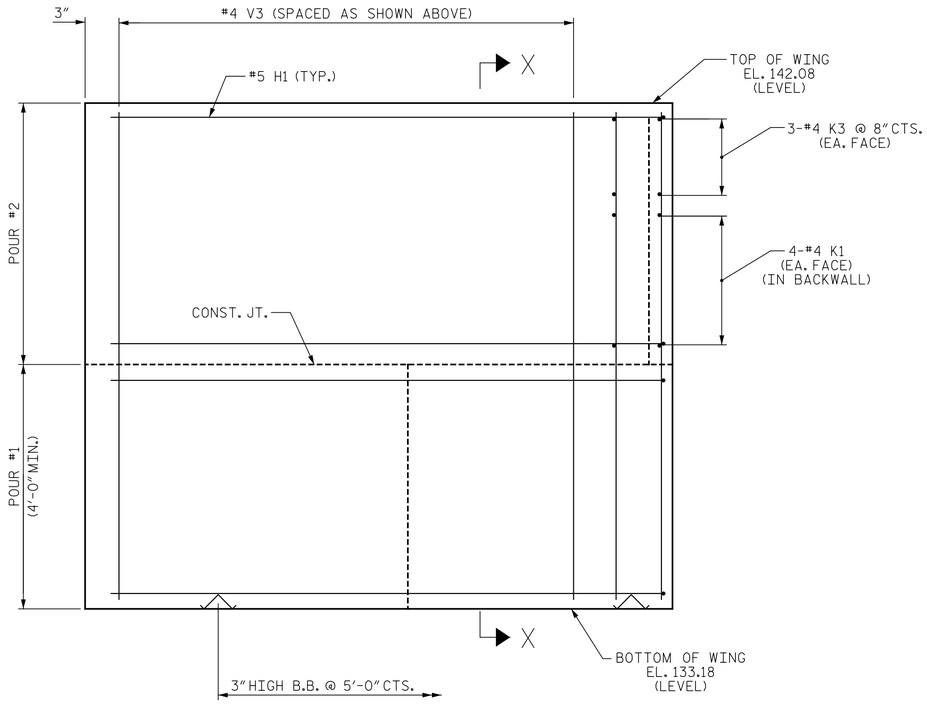
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-16
1			3			TOTAL SHEETS
2			4			24

STR. NO. 2

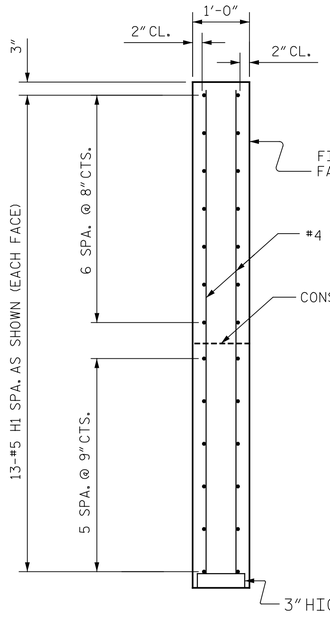


PLAN OF WING (W1)

** CONTRACTOR SHALL VERIFY WING WALL LENGTH BASED ON MSE WALL DESIGN AND MODIFY THE WING WALL LENGTH ACCORDINGLY, SUCH THAT THE WING WALL AND 1"EXPANSION JOINT MATERIAL IS FLUSH WITH THE BACK OF THE MSE WALL PANEL.



ELEVATION OF WING (W1)



SECTION X-X

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-17
1			3			TOTAL SHEETS
2			4			24

STR. NO. 2

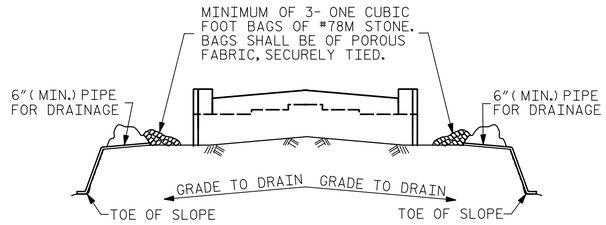
DRAWN BY : J.A. BOYER DATE : 10/17/17
CHECKED BY : R.F. WERTMAN DATE : 10/17/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by:
Richard F. Wertman
08901A86EBF0470...
11/7/2017

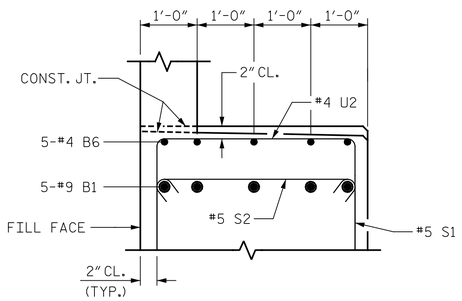


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

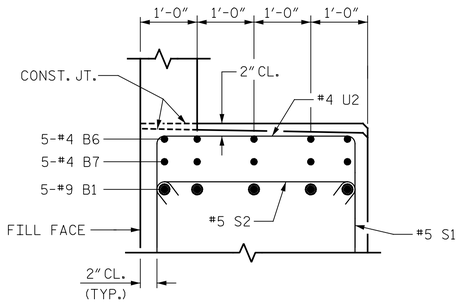
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

TEMPORARY DRAINAGE AT END BENT

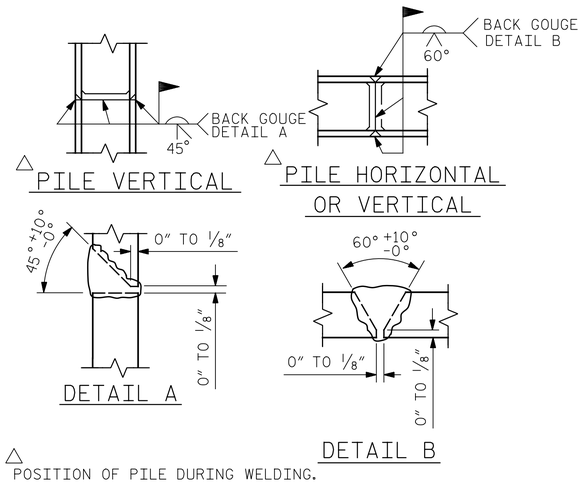


PARTIAL SECTION B-B



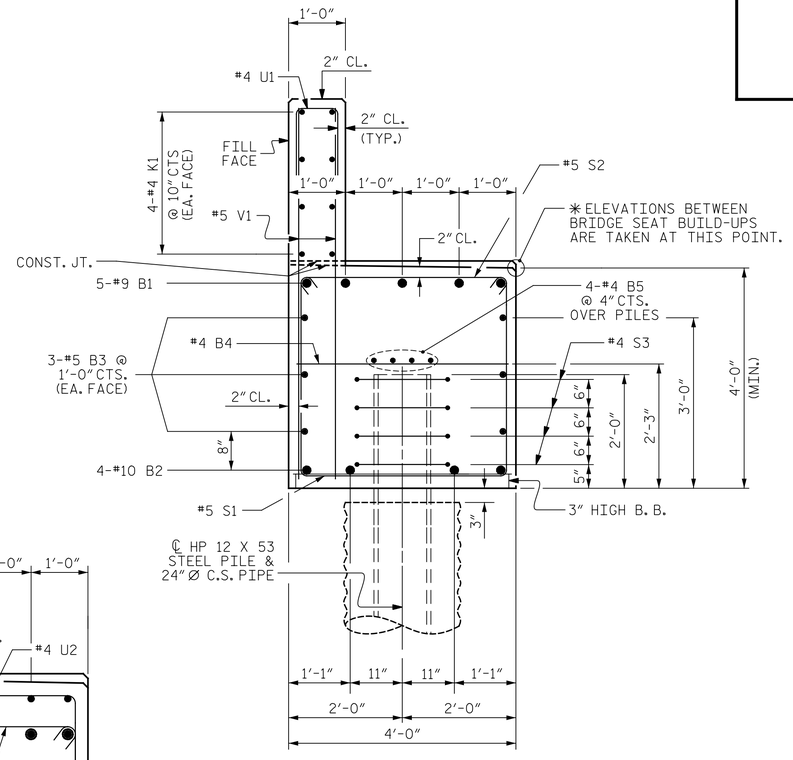
PARTIAL SECTION C-C

(TYP. @ BRG. 1, 2, & 3)

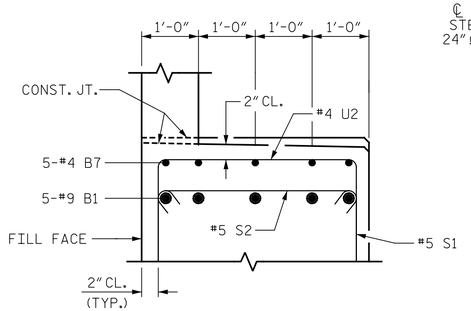


△ POSITION OF PILE DURING WELDING.

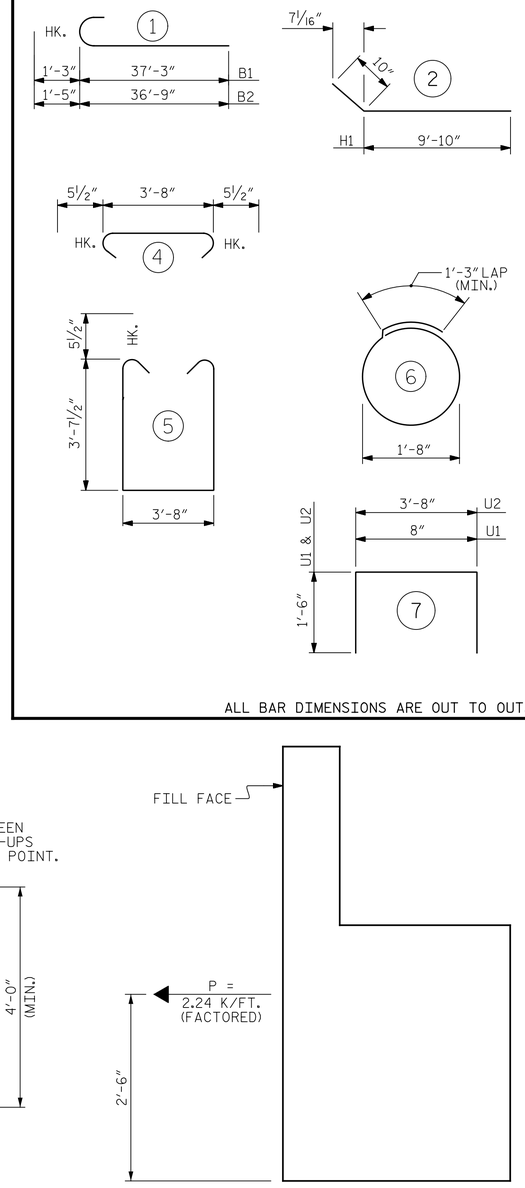
PILE SPLICE DETAILS



SECTION A-A



PARTIAL SECTION D-D



TIE BACK DETAILS

(DETAIL SHOWING TIE BACK RESTRAINT FOR END BENT)

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #1

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	38'-6"	1309
B2	8	#10	1	38'-2"	1314
B3	12	#5	STR	34'-4"	430
B4	16	#4	STR	3'-8"	40
B5	12	#4	STR	23'-7"	189
B6	25	#4	STR	2'-2"	36
B7	10	#4	STR	20'-4"	136
H1	26	#5	2	10'-8"	290
K1	24	#4	STR	23'-7"	378
K2	6	#4	STR	4'-6"	18
K3	6	#4	STR	4'-4"	18
S1	78	#5	5	11'-10"	963
S2	78	#5	4	4'-7"	373
S3	32	#4	6	6'-6"	139
U1	56	#4	7	3'-8"	138
U2	32	#4	7	6'-8"	143
V1	112	#5	STR	6'-7"	769
V2	12	#5	STR	8'-3"	104
V3	30	#5	STR	8'-6"	266

REINFORCING STEEL	7053 LBS.
CLASS A CONCRETE	
POUR #1 (CAP & LOWER WINGS)	41.7 C.Y.
POUR #2 (UPPER WINGS & BACKWALL)	9.6 C.Y.
TOTAL	51.3 C.Y.
HP 12 X 53 STEEL PILES	
No. = 8	576 LIN. FT.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	8 EACH
PILE REDRIVES	8 EACH

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1- 14+51.19 -Y-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F. Wertman 11/14/2017

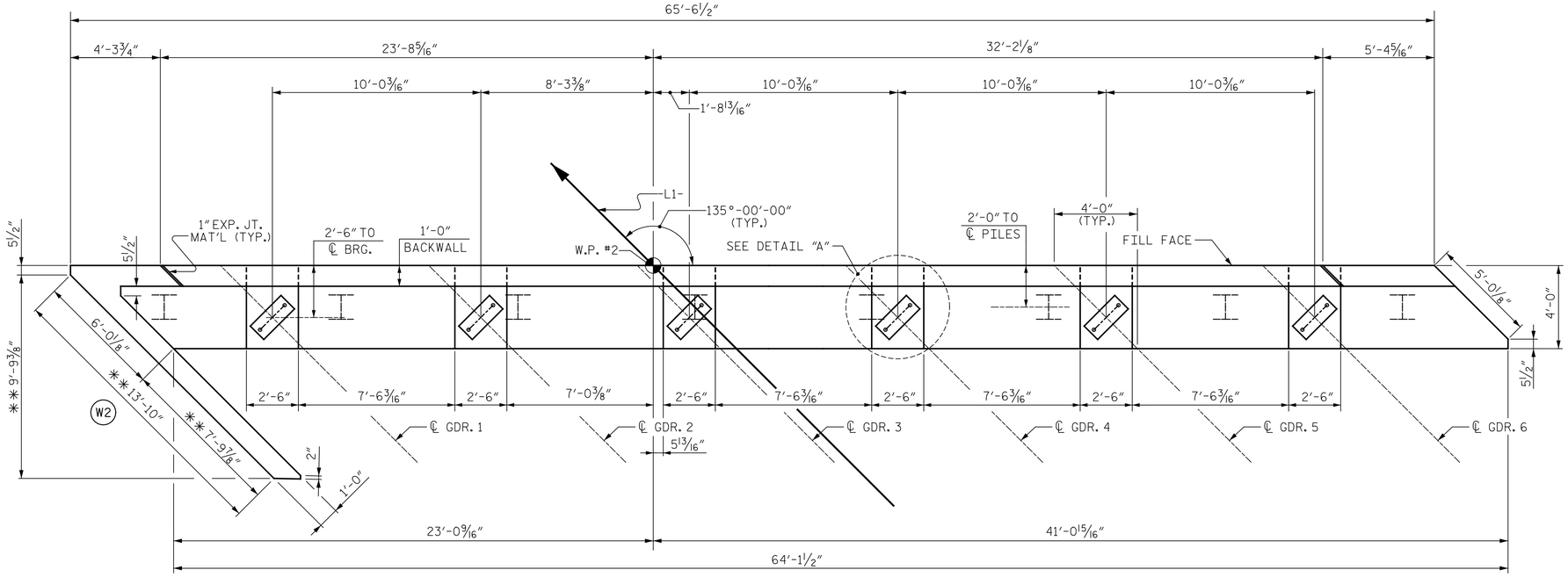
DRAWN BY : T.M. FORD DATE : 10/16/17
CHECKED BY : R.F. WERTMAN DATE : 10/18/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

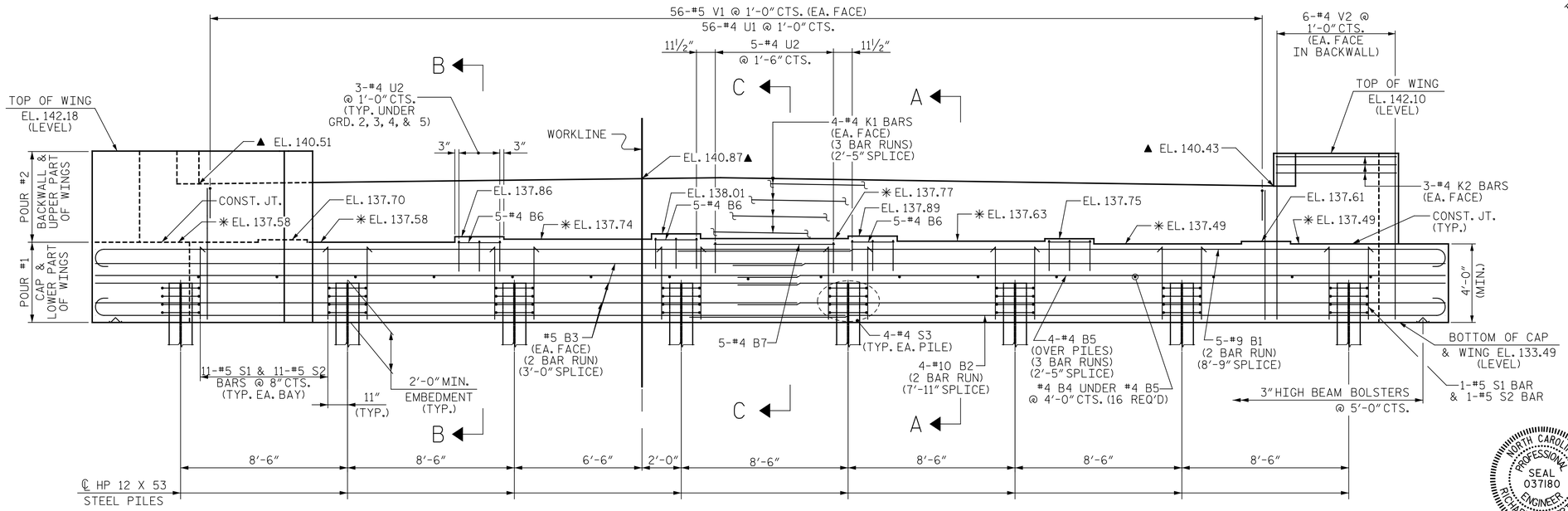
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-18
1			3			TOTAL SHEETS
2			4			24

STR. NO. 2

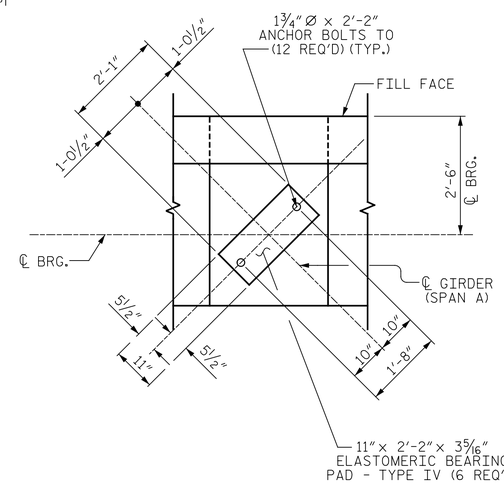


PLAN



ELEVATION

SEE "SECTION A-A" ON SHEET 3 OF 3 FOR 24" Ø C.S. PIPE DETAILS



DETAIL "A"

(TYP. EA. GIRDER)

NOTES:

* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 3 OF 3.

▲ THIS ELEVATION TAKEN ON FILL FACE OF BACKWALL.

STIRRUPS & U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

** CONTRACTOR SHALL VERIFY WING WALL LENGTH BASED ON MSE WALL DESIGN AND MODIFY THE WING WALL LENGTH ACCORDINGLY, SUCH THAT THE WING WALL AND 1" EXPANSION JOINT MATERIAL IS FLUSH WITH THE BACK OF THE MSE WALL PANEL.

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 0B901A86EBF6470...
11/7/2017

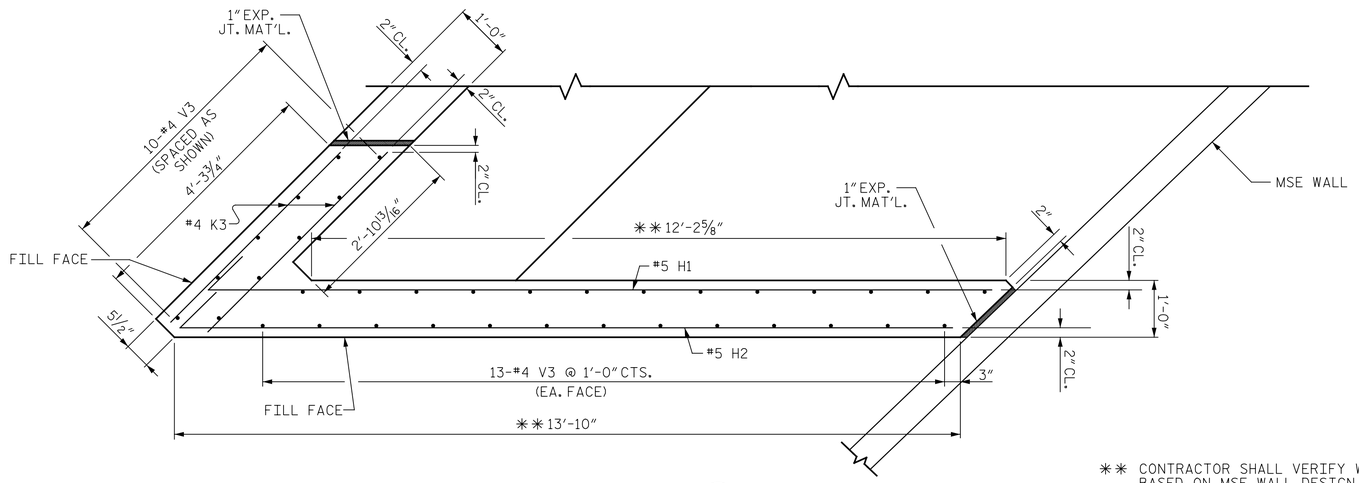
DRAWN BY : T.M. FORD DATE : 10/16/17
CHECKED BY : R.F. WERTMAN DATE : 10/18/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

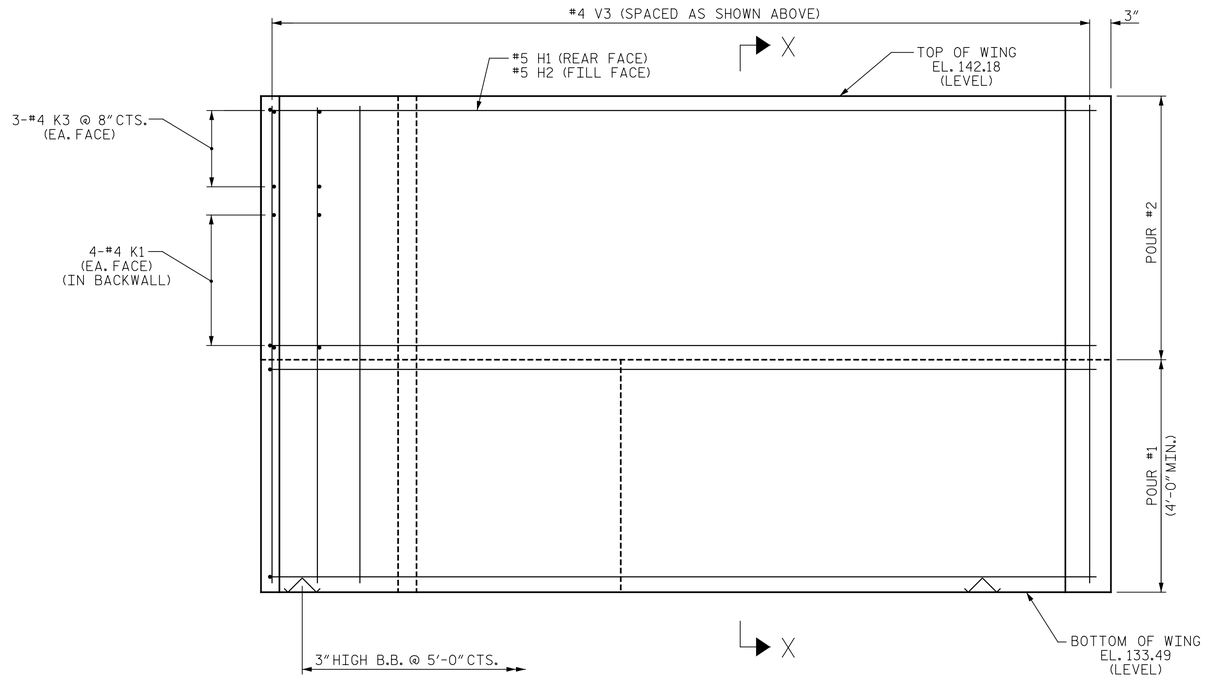
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-19
1			3			TOTAL SHEETS
2			4			24

STR. NO. 2

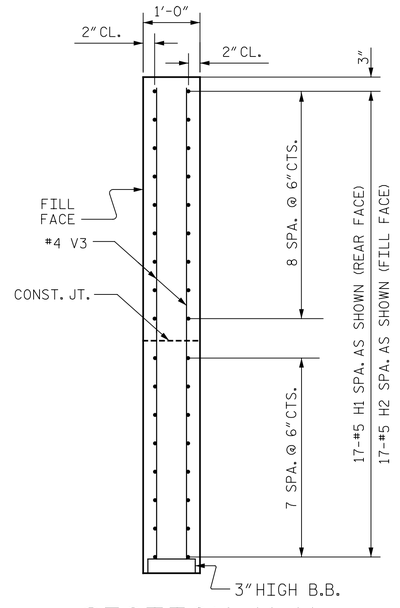


PLAN OF WING (W2)

** CONTRACTOR SHALL VERIFY WING WALL LENGTH BASED ON MSE WALL DESIGN AND MODIFY THE WING WALL LENGTH ACCORDINGLY, SUCH THAT THE WING WALL AND 1″EXPANSION JOINT MATERIAL IS FLUSH WITH THE BACK OF THE MSE WALL PANEL.



ELEVATION OF WING (W2)



SECTION X-X

DRAWN BY : T.M. FORD DATE : 10/17/17
CHECKED BY : R.F. WERTMAN DATE : 10/18/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by:
[signature]
0B901A86EBF6470...
11/7/2017

PROJECT NO. 41665.7A
CUMBERLAND COUNTY
STATION: 106+59.74 -L1-
14+51.19 -Y-

SHEET 2 OF 3

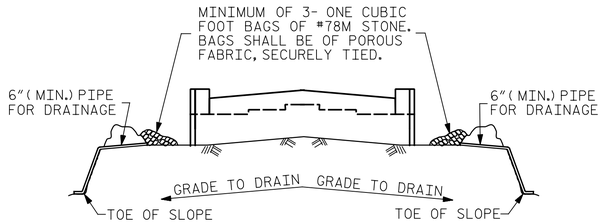
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-20
1			3			TOTAL SHEETS
2			4			24

STR. NO. 2

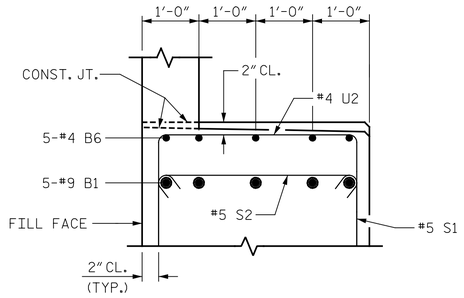


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

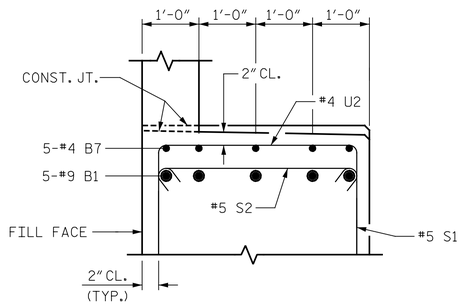
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

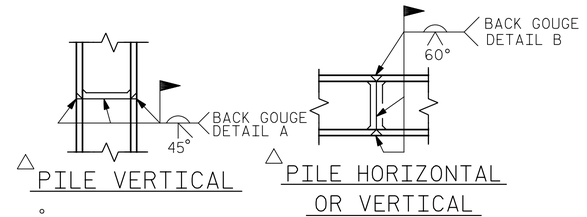


PARTIAL SECTION B-B

(TYP. @ BRG. 2, 3, 4, & 5)

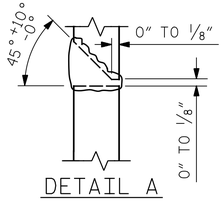


PARTIAL SECTION C-C

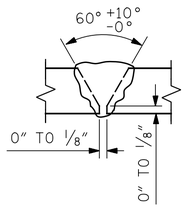


△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



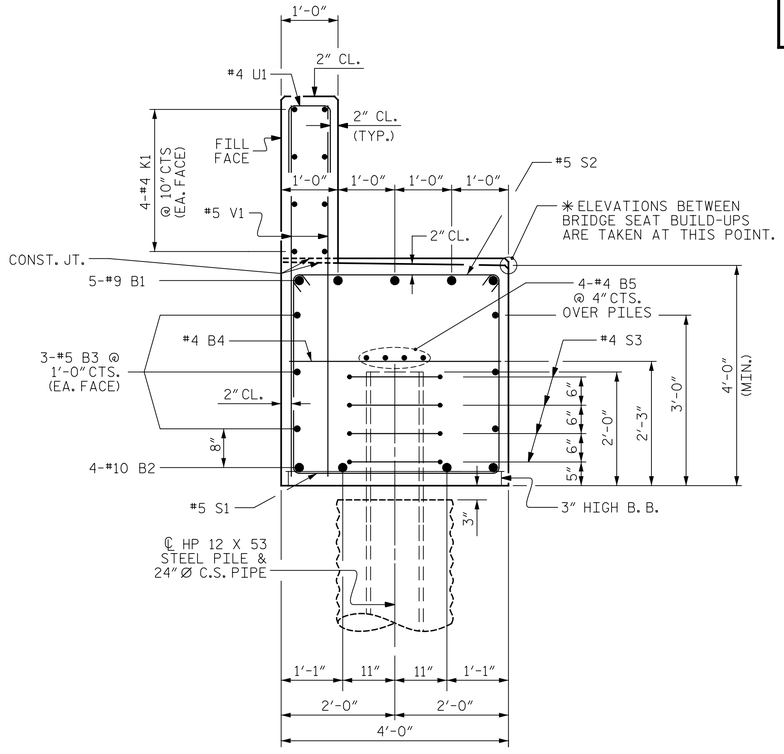
DETAIL A



DETAIL B

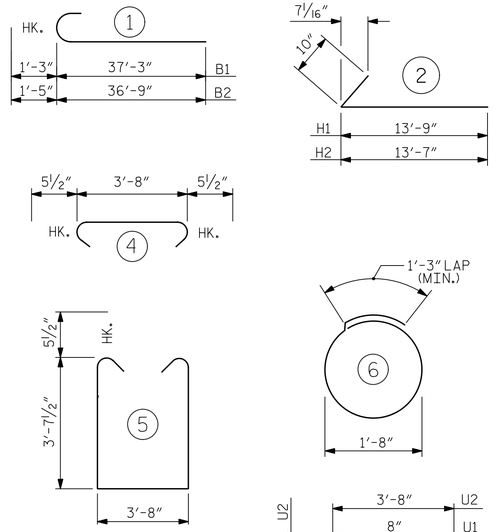
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

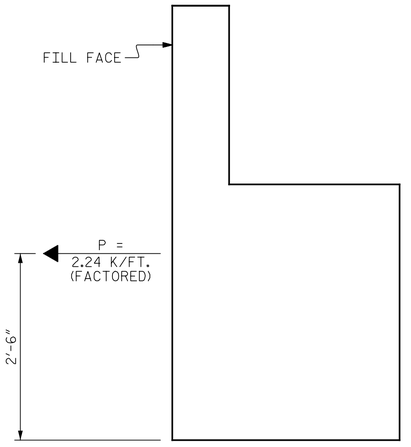


SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



TIE BACK DETAILS

(DETAIL SHOWING TIE BACK RESTRAINT FOR END BENT)

BILL OF MATERIAL

END BENT #2

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	38'-6"	1309
B2	8	#10	1	38'-2"	1314
B3	12	#5	STR	34'-4"	430
B4	16	#4	STR	3'-8"	40
B5	12	#4	STR	23'-7"	189
B6	20	#4	STR	2'-2"	29
B7	10	#4	STR	7'-6"	51
H1	17	#5	2	14'-7"	259
H2	17	#5	2	14'-5"	256
K1	24	#4	STR	23'-7"	378
K2	6	#4	STR	5'-0"	20
K3	6	#4	STR	4'-0"	16
S1	78	#5	5	11'-10"	963
S2	78	#5	4	4'-7"	373
S3	32	#4	6	6'-6"	139
U1	56	#4	7	3'-8"	138
U2	17	#4	7	6'-8"	76
V1	112	#5	STR	6'-7"	769
V2	12	#5	STR	8'-2"	103
V3	36	#5	STR	8'-3"	310

REINFORCING STEEL	7162 LBS.
CLASS A CONCRETE	
POUR #1 (CAP & LOWER WINGS)	41.9 C.Y.
POUR #2 (UPPER WINGS & BACKWALL)	10.0 C.Y.
TOTAL	51.9 C.Y.
HP 12 X 53 STEEL PILES	
No. = 8	576 LIN. FT.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	8 EACH
PILE REDRIVES	8 EACH

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1- 14+51.19 -Y-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 11/14/2017

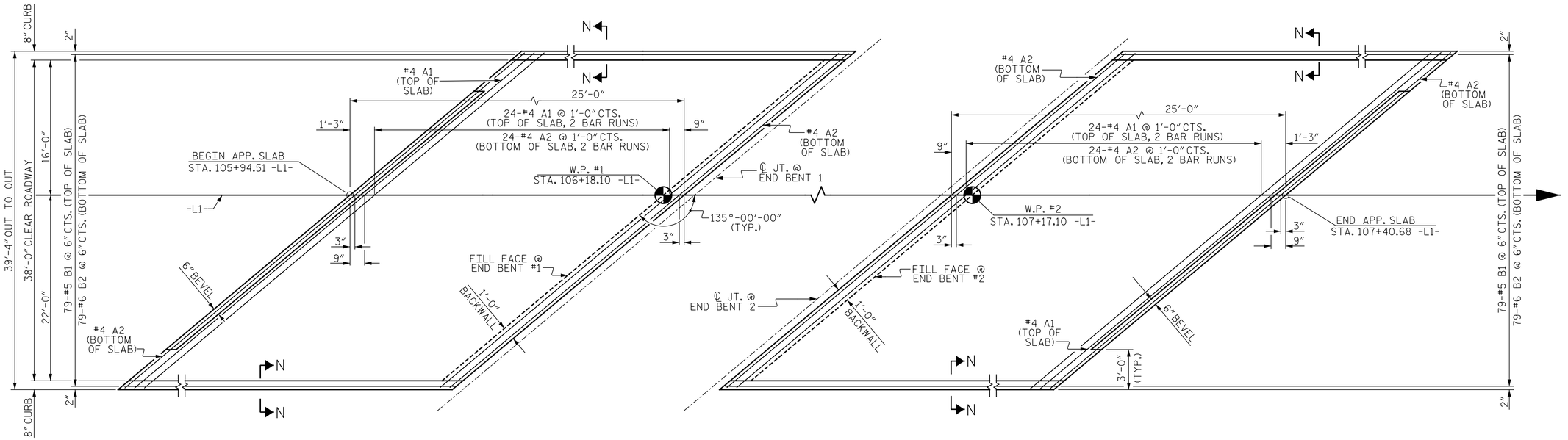
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-21
1			3			TOTAL SHEETS
2			4			24

DRAWN BY : J.A. BOYER DATE : 09/26/17
CHECKED BY : R.F. WERTMAN DATE : 10/18/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

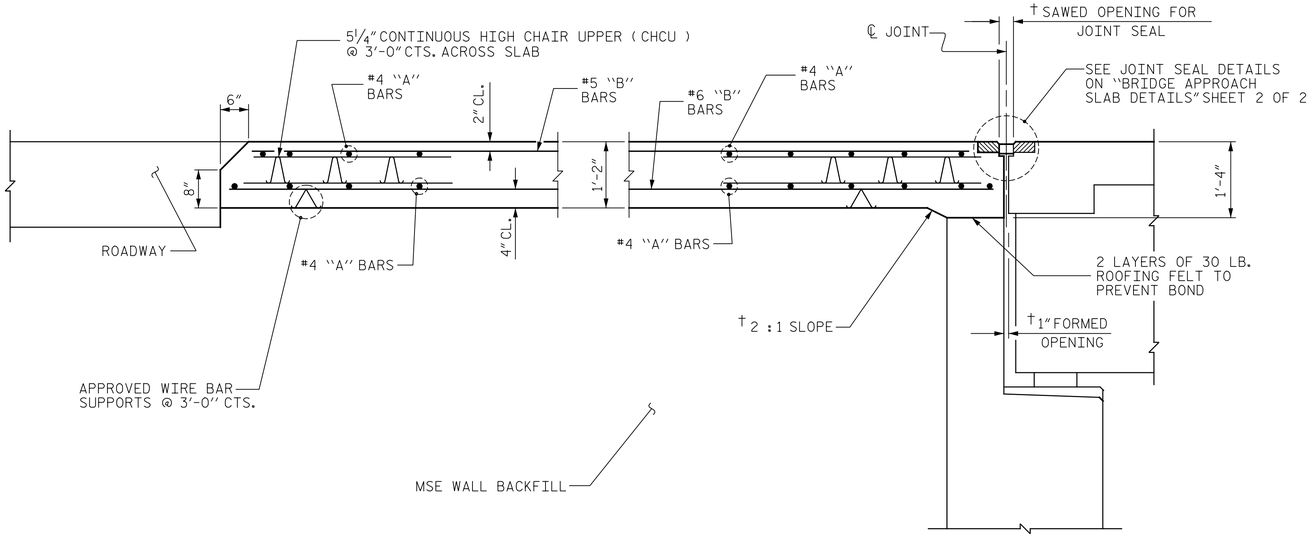
STR. NO. 2



PLAN @ END BENT #1

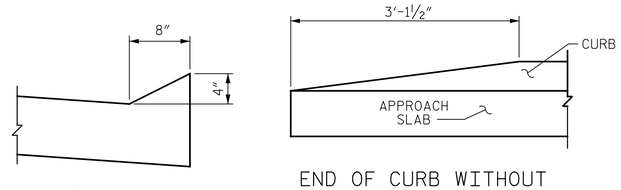
PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

† NORMAL TO END BENT



SECTION N-N

END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

ASSEMBLED BY : B.A. WHITE	DATE : 09/18/17		
CHECKED BY : T.M. FORD	DATE : 10/15/17		
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	

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F. WERTMAN

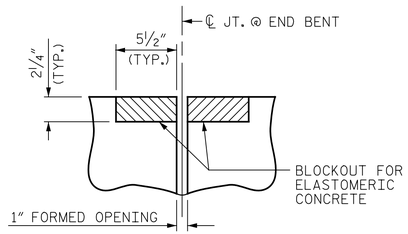
DocuSigned by: Richard F. Wertman 08901A86EBF947D...
11/7/2017

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

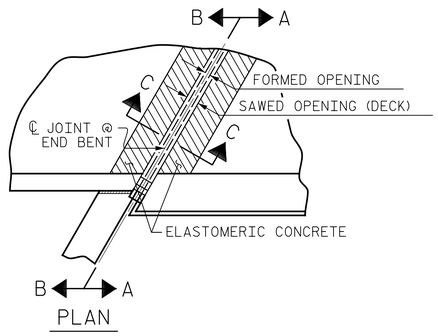
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-22
1			3			TOTAL SHEETS
2			4			24

STR. NO. 2 STD. NO. BAS2

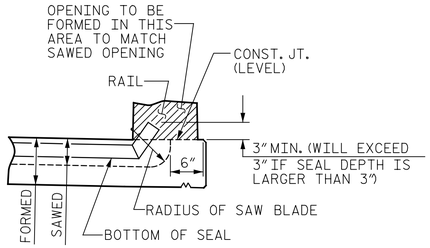


SECTION C-C

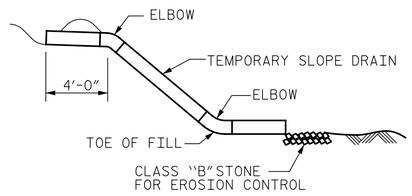
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC
CONCRETE DIMENSIONS)



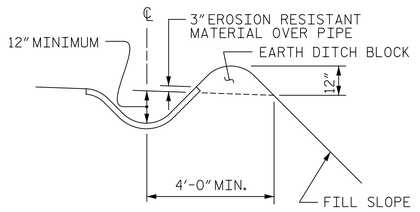
PLAN



SECTION A-A



SECTION R-R



SECTION S-S

NOTES:

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

FOR MSE WALL BACKFILL SEE "MSE RETAINING WALL" PLANS.

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.

BILL OF MATERIAL

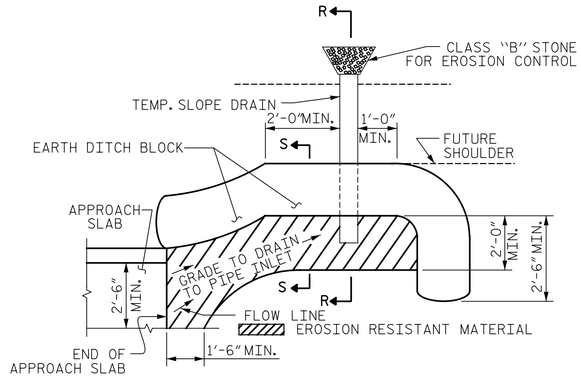
FOR ONE APPROACH SLAB
(2 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	50	#4	STR	29'-3"	977
A2	52	#4	STR	29'-1"	1010
✳B1	79	#5	STR	24'-2"	1992
B2	79	#6	STR	24'-8"	2928
REINFORCING STEEL				LBS.	3938
✳EPOXY COATED REINFORCING STEEL				LBS.	2969
CLASS AA CONCRETE				C.Y.	42.6

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

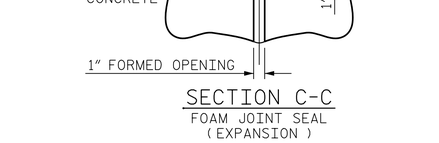
ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE ✳ (CU. FT.)
1	9.2
2	9.2
TOTAL	18.4

✳ BASED ON THE MINIMUM BLOCKOUT SHOWN.



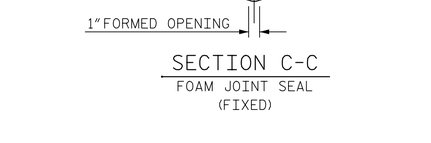
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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



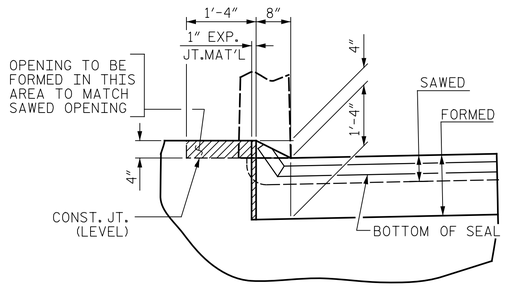
SECTION C-C

FOAM JOINT SEAL
(EXPANSION)



SECTION C-C

FOAM JOINT SEAL
(FIXED)

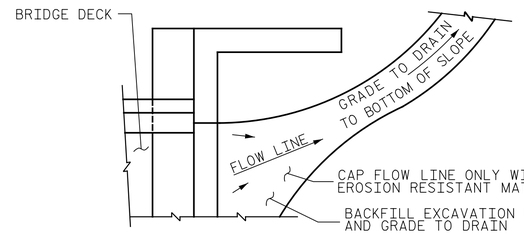


SECTION B-B

JOINT SEAL DETAILS @ END BENT

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

TEMPORARY DRAINAGE DETAIL

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

ASSEMBLED BY : B.A. WHITE	DATE : 09/18/17
CHECKED BY : T.M. FORD	DATE : 10/15/17

DRAWN BY : FCJ 11/88	REV. 10/1/11 MAA/GM
CHECKED BY : ARB 11/88	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised

2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

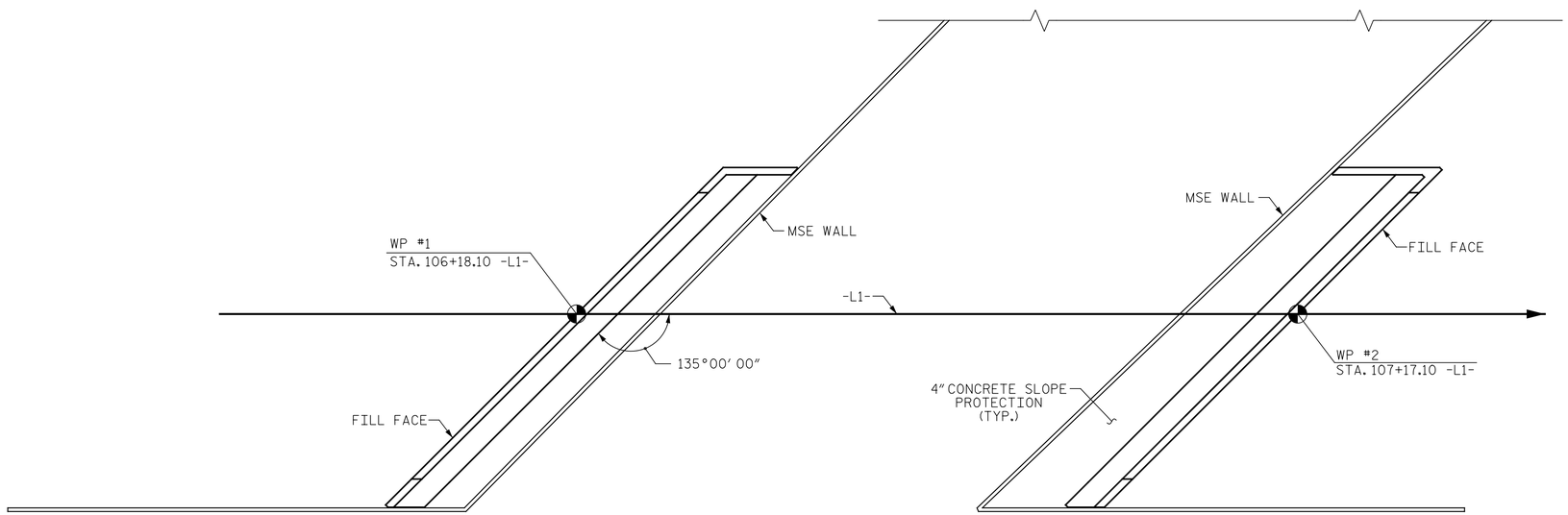
NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F. WERTMAN

DocuSigned by:
Richard F. Wertman
08901A86E8F647D...
11/7/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-23
1			3			TOTAL SHEETS
2			4			24

STR. NO. 2 STD. NO. BAS4



PLAN

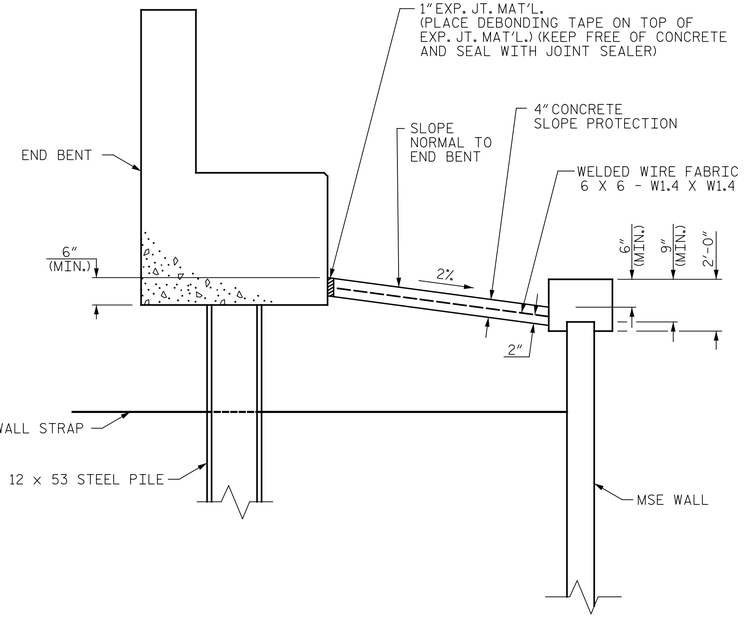
NOTES

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

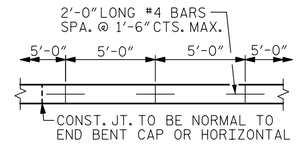
SLOPE PROTECTION SHALL CONSIST OF 4″ POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FINISHED TO THE SATISFACTION OF THE ENGINEER. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 20″ WIDE. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 106+59.74 -L1- STA. 14+51.19 -Y-	4 INCH SLOPE PROTECTION	✳ WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	24	44
END BENT 2	49	78

✳ QUANTITY SHOWN IS BASED ON 5′ POURS.

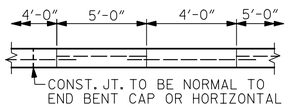


SECTION ALONG ℄ ROADWAY



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



POUR A 4′-0″ STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 106+59.74 -L1-
14+51.19 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F. Wertman 08901A86EBF6470...
11/7/2017

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-24
1			3			TOTAL SHEETS
2			4			24

STR. NO. 2

DRAWN BY : B.A. WHITE DATE : 10/12/17
CHECKED BY : R.F. WERTMAN DATE : 10/16/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

106+00 106+50 107+00 107+50 108+00 108+50

2.5856% -3.0219%

P. I. STA. = 107+17.00 -L2-
EL. = 148.21
V. C. = 850'

GRADE DATA -L2-

160 150 140 130 120 110

3'-0" MIN. TO FACE OF MSE WALL (TYP.)

FILL FACE @ END BENT 1
STA. 106+76.15 -L2-
GRADE POINT EL. 142.29

FIX.

SPAN A

EXP.

FILL FACE @ END BENT 2
STA. 107+75.15 -L2-
GRADE POINT EL. 142.02

APPROX. NATURAL GROUND LINE AT -L2-

4" CONCRETE SLOPE PROTECTION AT 2.0% (TYP.)

EXISTING SUBSTRUCTURE (TYP.)

EL. 139.61±

EL. 135.31±

6" (MIN.) (TYP.)

MSE RETAINING WALL

15'-8" MIN. VERTICAL CLEARANCE STA. 107+37.21 -L2-

MSE RETAINING WALL

EL. 134.95±

EL. 139.72±

EL. 129.78±

24" Ø C.S. PIPE (TYP.)

HP 12 x 53 STEEL PILES (TYP)

SINGLE FACE BARRIER RAIL (ROADWAY DETAIL AND PAY ITEM (TYP.)

EL. 118.50±

EL. 121.24±

EL. 122.20±

EL. 121.56±

END BENT #1

END BENT #2

SECTION ALONG -L2-

(SECTIONS AT END BENTS ARE AT RIGHT ANGLES)

POINT OF MIN. V.C.
STA. 107+37.21 -L2- (20.71' LT)
STA. 13+40.72 -Y-
ELEV. 122.23

8'-0" PAVED SHOULDER

12'-0"

VARIES

13'-0" PAVED SHOULDER

-Y-

TO MIDDLE RD

MSE RETAINING WALL

EXISTING SUBSTRUCTURE (TYP.)

MSE RETAINING WALL

FILL FACE @ END BENT 1

134°31' 29.14"

FILL FACE @ END BENT 2

STA. 106+52.57-L2-
BEGIN APPROACH SLAB

BRIDGE I.D.
STA. 107+16.84 -L2-
STA. 13+69.76 -Y-

STA. 107+75.15 -L2-
WP #2

-L2-

TO FAYETTEVILLE

STA. 106+76.15 -L2-
WP #1

END APPROACH SLAB
STA. 107+98.74 -L2-

TO MURPHY RD

1'-6" SINGLE FACE BARRIER RAIL

136°14' 35.23"

135°00' 00"(TYP.)

1'-6" SINGLE FACE BARRIER RAIL

40'-8¼" 58'-3¾"

99'-0"

TOTAL LENGTH OF BRIDGE, FILL FACE TO FILL FACE

PLAN

(PILES NOT SHOWN FOR CLARITY)

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

SHEET 1 OF 3 REPLACES BRIDGE NO. 130

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON I-95 BUSINESS LOOP SBL OVER US301 BETWEEN DOBBIN HOLMES ROAD AND I-95

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F. Wertman 08901A86E8F6470...
11/7/2017

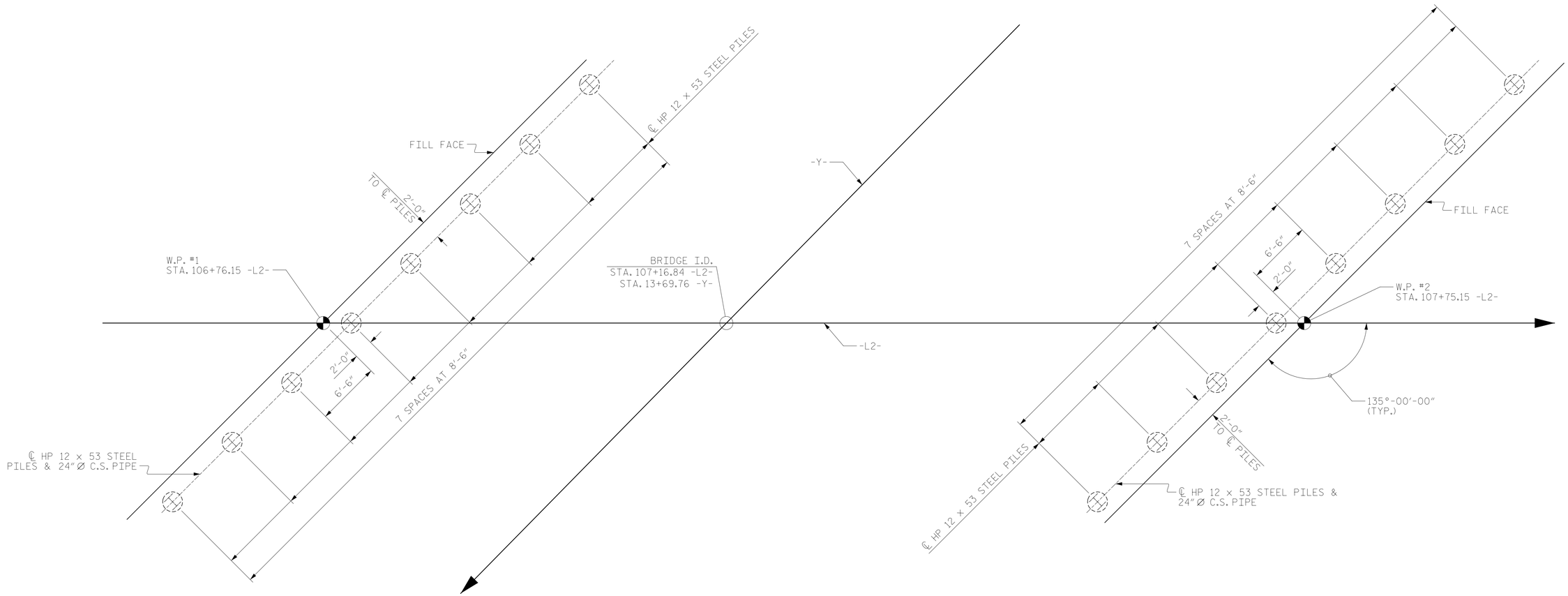
DRAWN BY : J.A. BOYER DATE : 09/05/17
CHECKED BY : R.F. WERTMAN DATE : 10/16/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-1
1			3			TOTAL SHEETS
2			4			24

STR. NO. 3



END BENT #1

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE.

END BENT #2

NOTES:

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

PILES AT END BENTS NO. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.

DRIVE PILES AT END BENTS NO. 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.

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.

PILE SLEEVES AT END BENTS NO. 1 AND 2 ARE TO BE PLACED DURING CONSTRUCTION IN THE REINFORCED BACKFILL OF THE MSE WALLS. SEE MSE WALL PLANS.

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON I-95 BUSINESS LOOP NBL OVER US301 BETWEEN DOBBIN HOLMES ROAD AND I-95

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by:
11/7/2017

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-2
1			3			TOTAL SHEETS
2			4			24

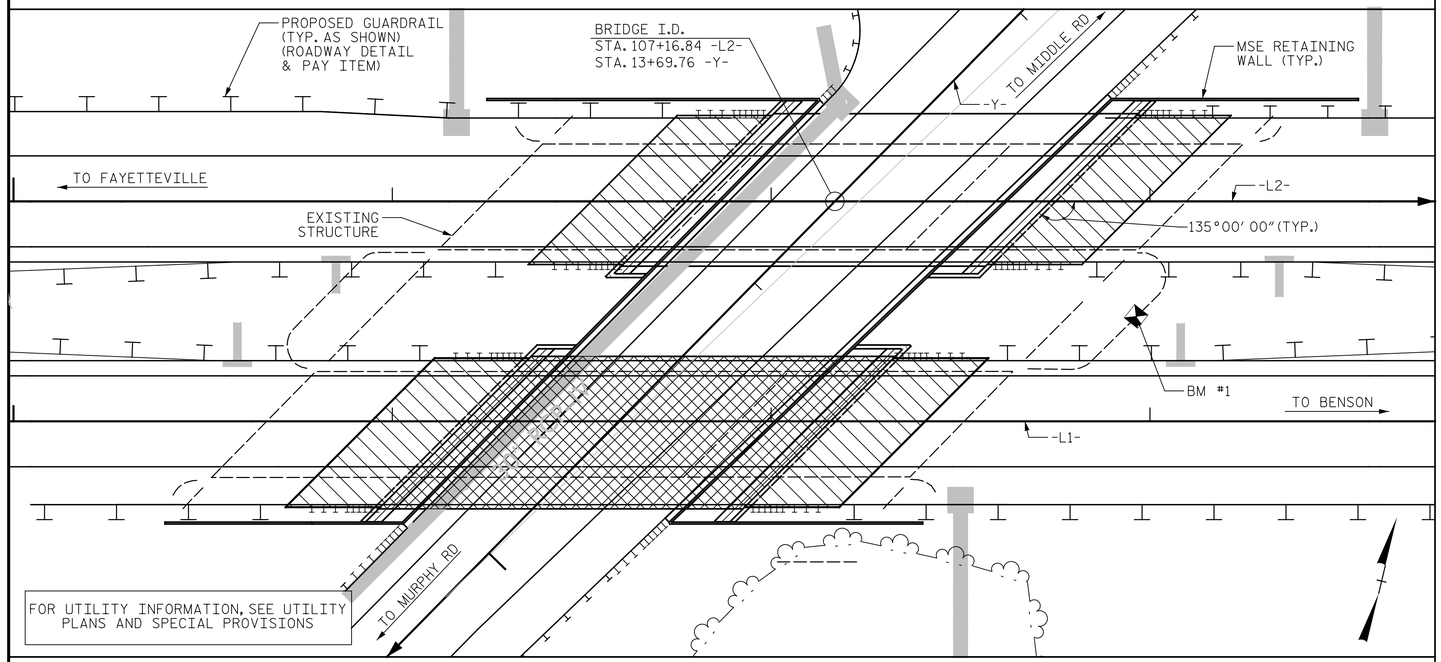
DRAWN BY : J.A. BOYER DATE : 10/11/17
CHECKED BY : R.F. WERTMAN DATE : 10/16/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STR. NO. 3

BENCH MARK #1: CHISELED SQUARE IN CONCRETE HEADWALL, -L2- STA. 107+96.38, 30.37' RIGHT, EL. 140.48



LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION 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, SEE SPECIAL PROVISIONS.

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

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

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 107+16.84 -L2-".

THE EXISTING STRUCTURE CONSISTING OF TWO SPANS @ 60'-0" AND ONE SPAN @ 65'-0", WITH A CLEAR ROADWAY OF 28' AND REINFORCED CONCRETE DECK ON STEEL I-BEAMS ON END BENTS WITH REINFORCED CONCRETE CAPS ON PRECAST PRESTRESSED CONCRETE PILES & INTERIOR BENTS WITH REINFORCED CONCRETE CAPS ON PRECAST PRESTRESSED CONCRETE PILES LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

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

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL APPROX. 122,200 LBS.	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		PILE REDRIVES	VERTICAL CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	ASBESTOS ASSESSMENT
	LUMP SUM	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LUMP SUM	EACH	NO.	LIN.FT.	EACH	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			3866	4939		LUMP SUM		LUMP SUM					192.1		LUMP SUM	LUMP SUM	LUMP SUM
END BENT NO. 1					49.9		6872		8	8	576	8		19			
END BENT NO. 2					52.5		7391		8	8	576	8		34			
TOTAL	LUMP SUM	1	3866	4939	102.4	LUMP SUM	14263	LUMP SUM	16	16	1152	16	192.1	53	LUMP SUM	LUMP SUM	LUMP SUM

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON I-95 BUSINESS LOOP SBL OVER US301 BETWEEN DOBBIN HOLMES ROAD AND I-95

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 08901A86EBF5470...
11/14/2017

DRAWN BY : J.A. BOYER DATE : 09/03/17
CHECKED BY : R.F. WERTMAN DATE : 10/16/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-3
1			3			TOTAL SHEETS
2			4			24

STR. NO. 3

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE II LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS γ_{LL}	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS γ_{LL}	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.66	--	1.75	0.649	1.91	A	EL	45.97	0.926	2.24	A	I	0.00	1.30	0.649	1.66	A	EL	20.00	
		HL-93 (OPERATING)	N/A		2.16	--	1.35	0.649	2.48	A	EL	45.97	0.926	2.90	A	I	0.00	1.00	0.649	2.16	A	EL	20.00	
		HS-20 (INVENTORY)	36.00	2	2.26	81.36	1.75	0.649	2.62	A	EL	45.97	0.926	3.00	A	I	0.00	1.30	0.649	2.26	A	EL	20.00	
		HS-20 (OPERATING)	36.00		2.93	105.48	1.35	0.649	3.40	A	EL	45.97	0.926	3.88	A	I	0.00	1.00	0.649	2.93	A	EL	20.00	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		5.89	73.63	1.40	0.649	8.45	A	EL	45.97	0.926	9.99	A	I	0.00	1.30	0.649	5.89	A	EL	20.00	
		S3C	21.500		3.45	74.18	1.40	0.649	4.88	A	EL	45.97	0.926	5.85	A	I	0.00	1.30	0.649	3.45	A	EL	20.00	
		S3A	22.750		3.27	74.39	1.40	0.649	4.63	A	EL	45.97	0.926	5.55	A	I	0.00	1.30	0.649	3.27	A	EL	20.00	
		S4A	26.750		2.85	76.24	1.40	0.649	4.08	A	EL	45.97	0.926	4.82	A	I	0.00	1.30	0.649	2.85	A	EL	20.00	
		S5A	30.500		2.54	77.47	1.40	0.649	3.60	A	EL	45.97	0.926	4.35	A	I	0.00	1.30	0.649	2.54	A	EL	20.00	
		S6A	34.500		2.29	79.01	1.40	0.649	3.25	A	EL	45.97	0.926	3.93	A	I	0.00	1.30	0.649	2.29	A	EL	20.00	
		S7B	38.500		2.10	80.85	1.40	0.649	2.96	A	EL	45.97	0.926	3.65	A	I	0.00	1.30	0.649	2.10	A	EL	20.00	
		S7A	40.000	3	2.09	83.60	1.40	0.649	2.91	A	EL	45.97	0.926	3.70	A	I	0.00	1.30	0.649	2.09	A	EL	45.97	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		2.76	77.97	1.40	0.649	3.99	A	EL	45.97	0.926	4.66	A	I	0.00	1.30	0.649	2.76	A	EL	20.00	
		T5B	32.000		2.50	80.00	1.40	0.649	3.51	A	EL	45.97	0.926	4.37	A	I	0.00	1.30	0.649	2.50	A	EL	20.00	
		T6A	36.000		2.30	82.80	1.40	0.649	3.21	A	EL	45.97	0.926	3.99	A	I	0.00	1.30	0.649	2.30	A	EL	45.97	
		T7A	40.000		2.13	85.20	1.40	0.649	2.97	A	EL	45.97	0.926	3.69	A	I	0.00	1.30	0.649	2.13	A	EL	45.97	
		T7B	40.000		2.11	84.40	1.40	0.649	3.15	A	EL	45.97	0.926	3.51	A	I	0.00	1.30	0.649	2.11	A	EL	20.00	
FATIGUE		HL-93 (INVENTORY)	γ_{LL}=0.75		--																			

LOAD FACTORS:

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

NOTES:

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

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

(#) CONTROLLING LOAD RATING

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

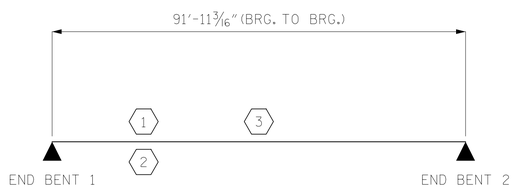
(2) DESIGN LOAD RATING (HS-20) **

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. 41665.7A
CUMBERLAND COUNTY
STATION: 107+16.84 -L2-
13+69.76 -Y-

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 08901A86E8F6470...
11/7/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

LRFR SUMMARY FOR STEEL GIRDERS
(INTERSTATE TRAFFIC)

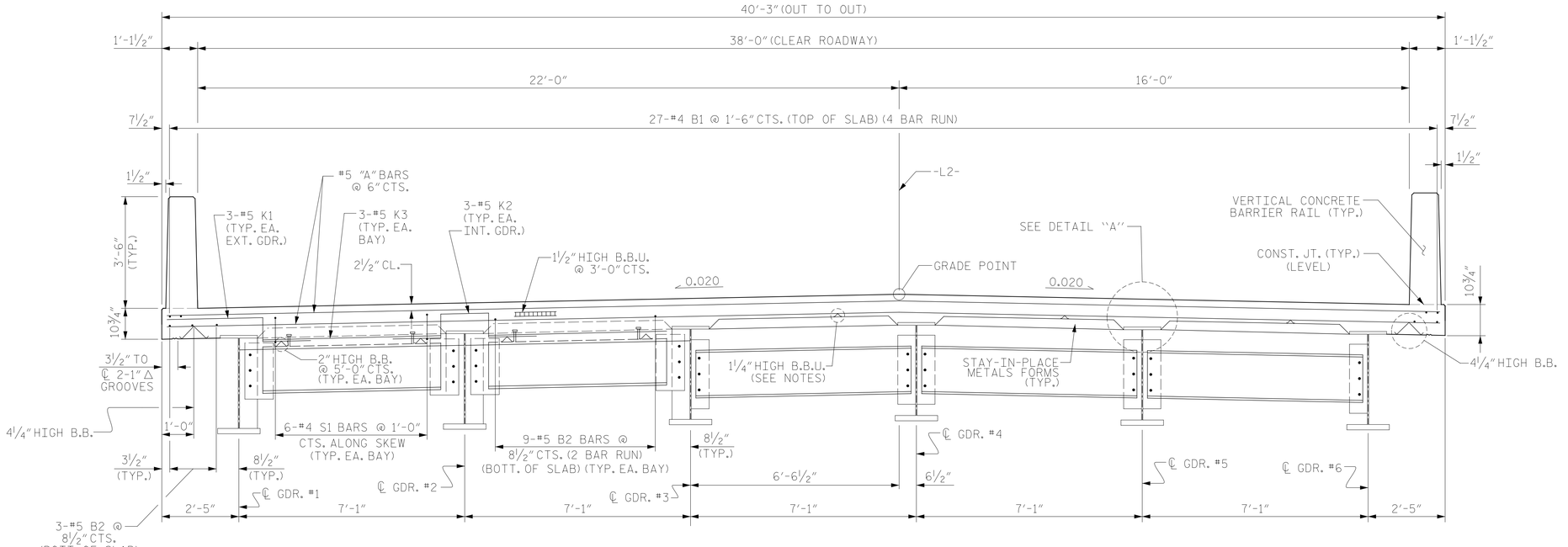
ASSEMBLED BY : B.A. WHITE	DATE : 10/13/17
CHECKED BY : R.F. WERTMAN	DATE : 10/16/17
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

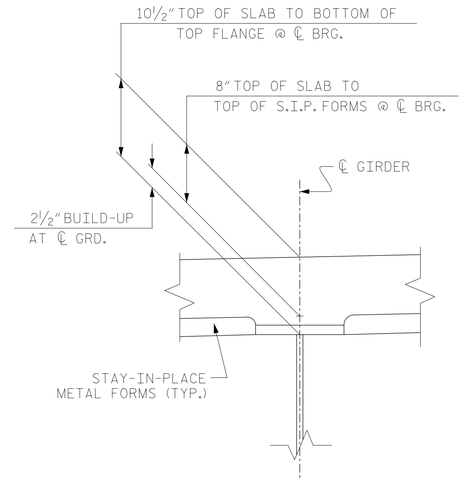
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-4
1			3			TOTAL SHEETS
2			4			24

STR. NO. 3 STD. NO. LRFR4



SECTION SHOWING
END BENT DIAPHRAGMS

SECTION SHOWING
INTERMEDIATE DIAPHRAGMS



DETAIL "A"

TYPICAL SECTION

STEEL PLATE GIRDER 34" WEB DEPTH

NOTES:

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

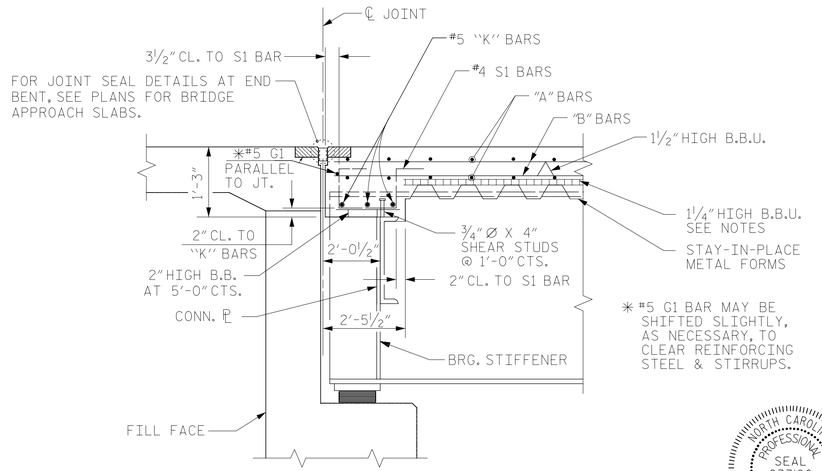
BARRIER RAIL SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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

FOR VERTICAL CONCRETE BARRIER RAIL REINFORCING STEEL AND DETAILS, SEE "VERTICAL CONCRETE BARRIER RAIL PLAN & DETAIL" SHEET.

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

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



END OF GIRDER DETAIL AT END BENT

* #5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL & STIRRUPS.

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L-
13+69.76 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by:
Richard F. Wertman
08901A86EBF6470...
11/7/2017

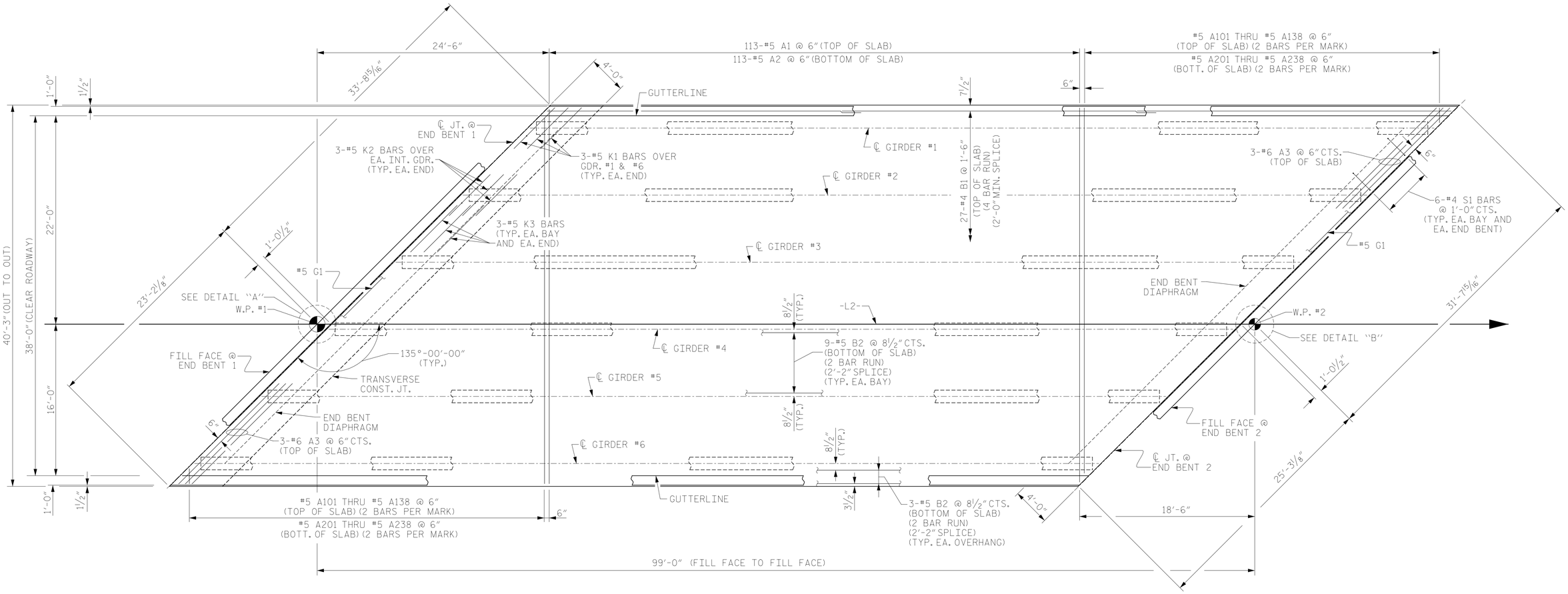
REVISIONS						SHEET NO. S03-5
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 24
2			4			

STR. NO. 3

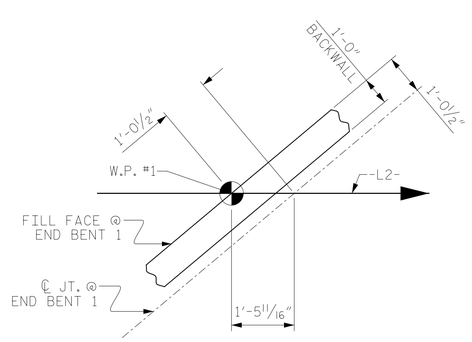
DRAWN BY : B.A. WHITE DATE : 10/13/17
CHECKED BY : R.F. WERTMAN DATE : 10/16/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

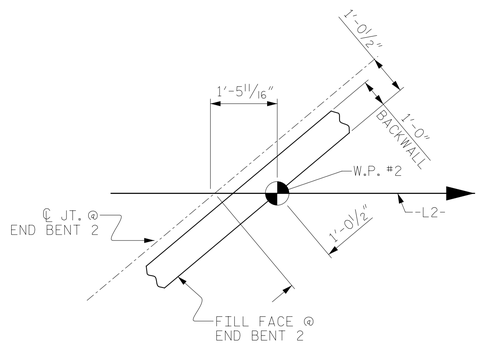
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PLAN OF SPAN A



DETAIL "A"



DETAIL "B"

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by:
Richard F Wertman
0B9D1A8EE8F6470...
11/7/2017

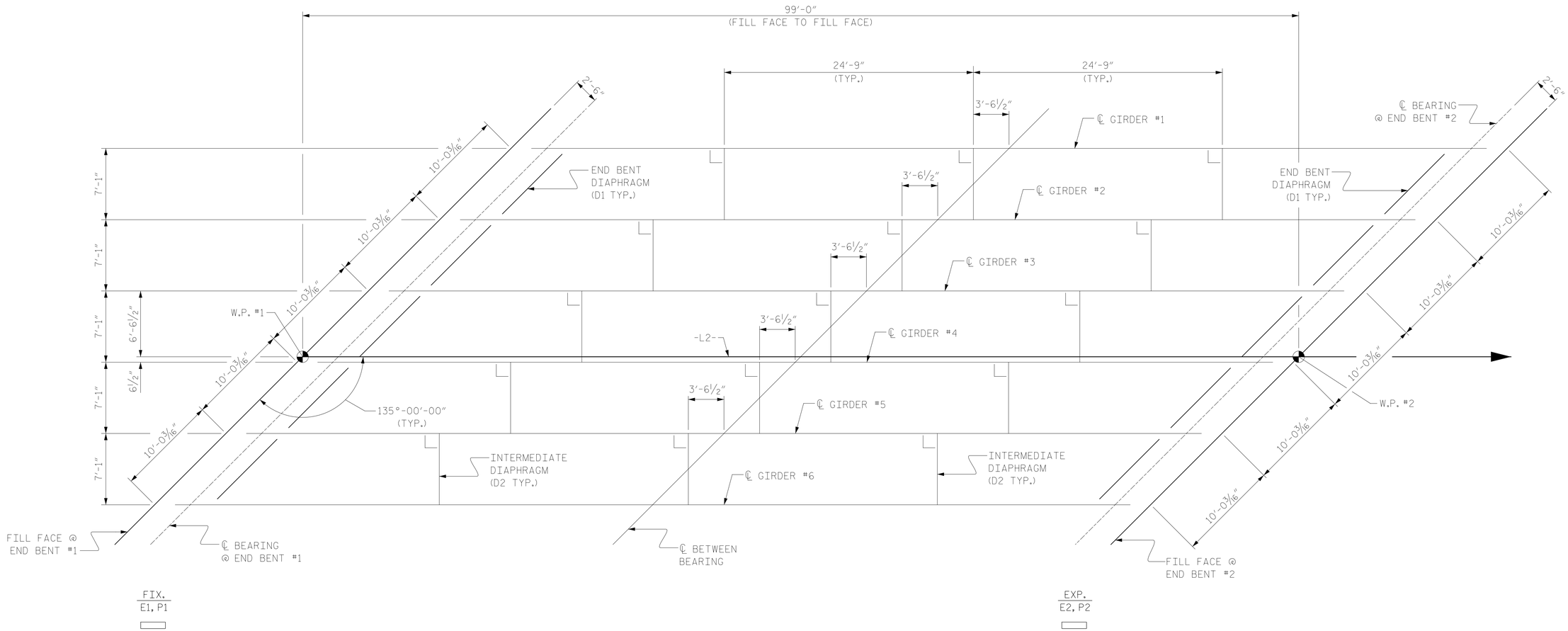
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-6
1			3			TOTAL SHEETS
2			4			24

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DRAWN BY : B.A. WHITE DATE : 10/12/17
CHECKED BY : R.F. WERTMAN DATE : 10/16/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

STR. NO. 3



SPAN A

FRAMING PLAN

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by:
Richard F Wertman
08501A88EBF6470...
11/7/2017

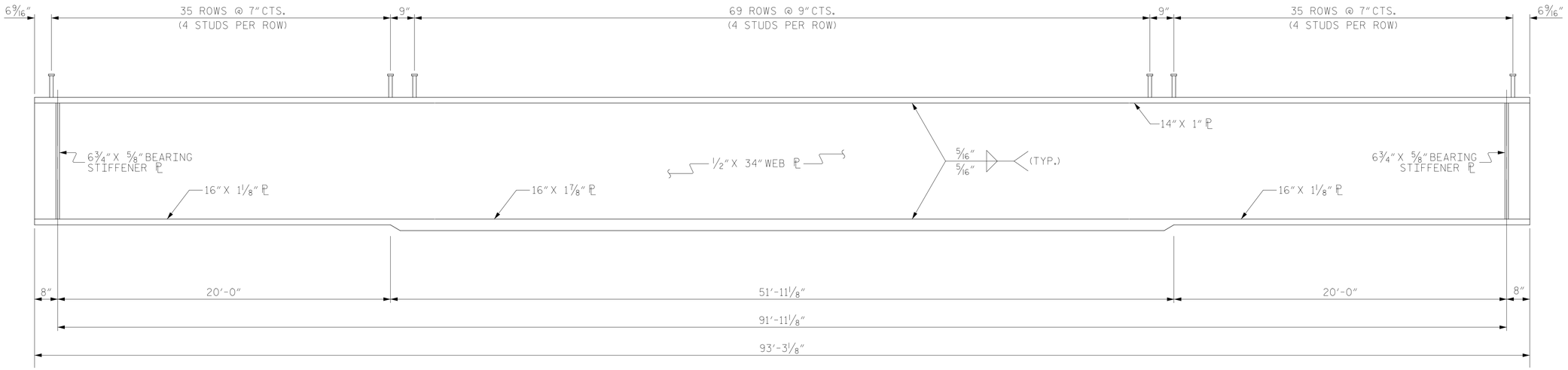
DRAWN BY : B.A. WHITE DATE : 10/12/17
CHECKED BY : R.F. WERTMAN DATE : 10/16/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

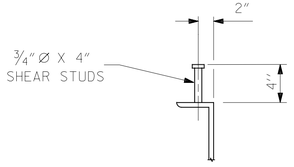
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-7
1			3			TOTAL SHEETS
2			4			24

STR. NO. 3

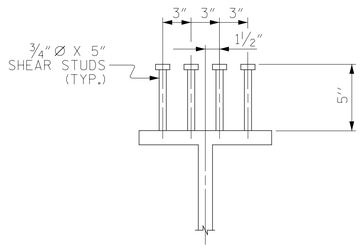


GIRDER ELEVATION
(INTERMEDIATE DIAPHRAGMS NOT SHOWN)

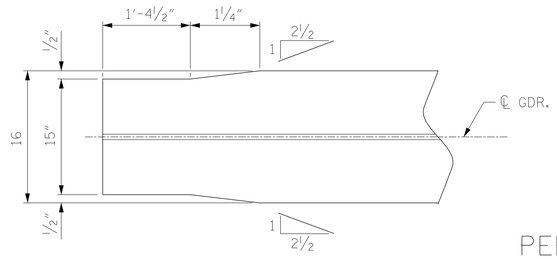
BOTTOM FLANGE DETAIL



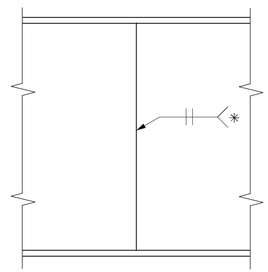
SHEAR STUD DETAILS
(TYP. EACH END BENT DIAPHRAGM)



SHEAR STUD DETAILS
(TYP. EACH GIRDER)

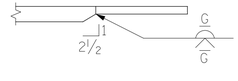


END OF GIRDER DETAIL
(BOTTOM FLANGE ONLY)



PERMISSIBLE SHOP WEB SPLICE

* GRIND SMOOTH AND FLUSH ON OUTSIDE OF EXTERIOR GIRDERS



SECTION THRU FLANGE

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F. WERTMAN

DocuSigned by:
Richard F. Wertman
080018A8EBF6470...
11/7/2017

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

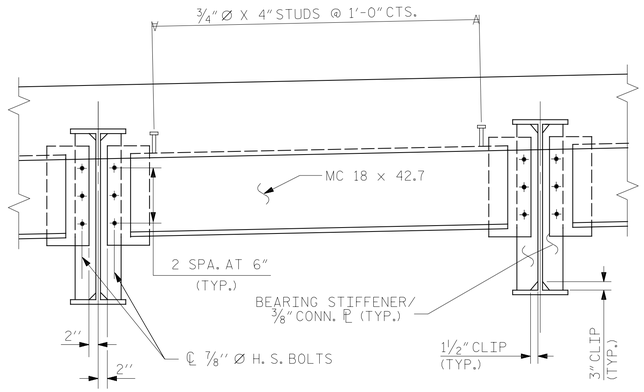
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S03-8

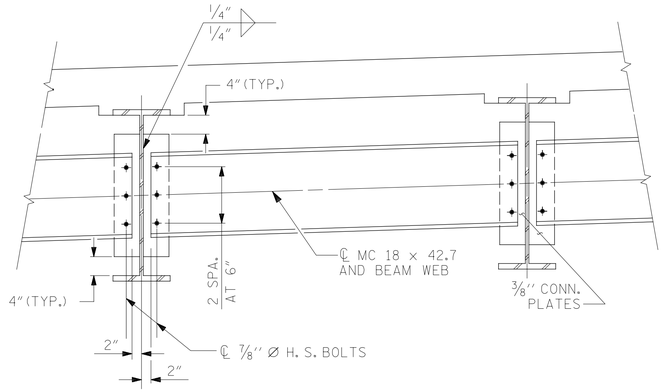
TOTAL SHEETS 24

DRAWN BY : T.M. FORD DATE : 10/10/17
CHECKED BY : R.F. WERTMAN DATE : 10/16/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

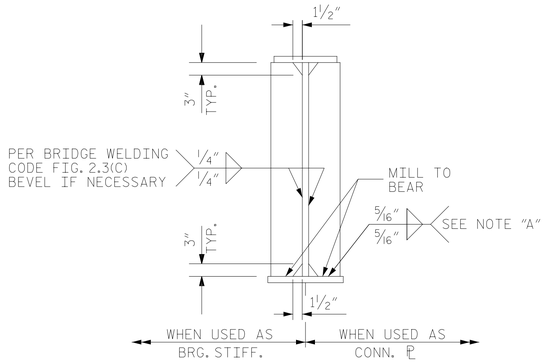
STR. NO. 3



TYPICAL END BENT DIAPHRAGM (D1)



INTERMEDIATE DIAPHRAGM (D2)



BEARING STIFFENER

NOTE "A":
ONLY WELD BEARING STIFFENER TO BOTTOM FLANGE IF DIAPHRAGM IS ATTACHED TO BEARING STIFFENER.

NOTES:

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

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

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

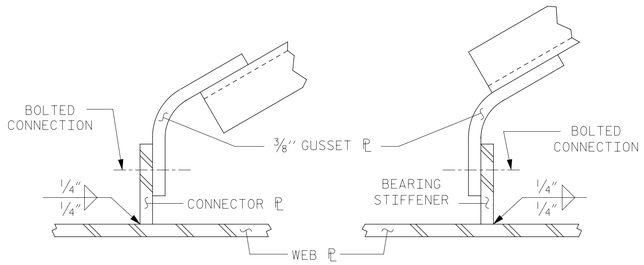
BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

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

PERMITTED FLANGE AND WEB SHOP SLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

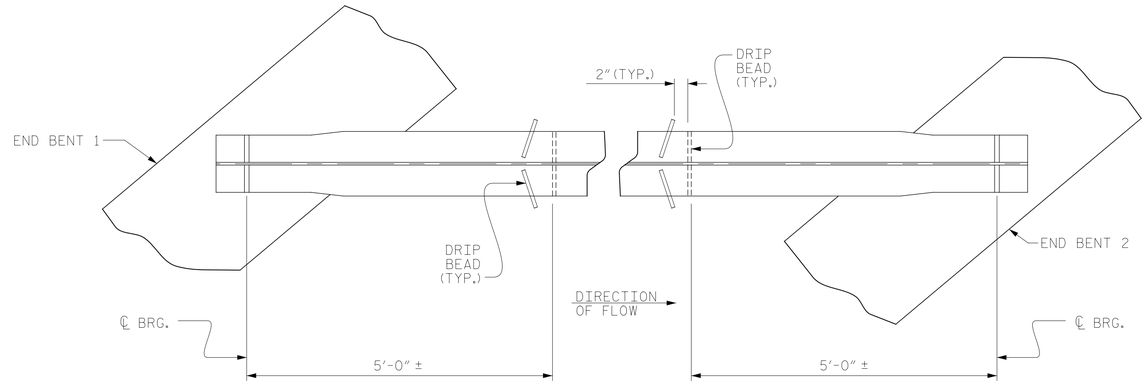
STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

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

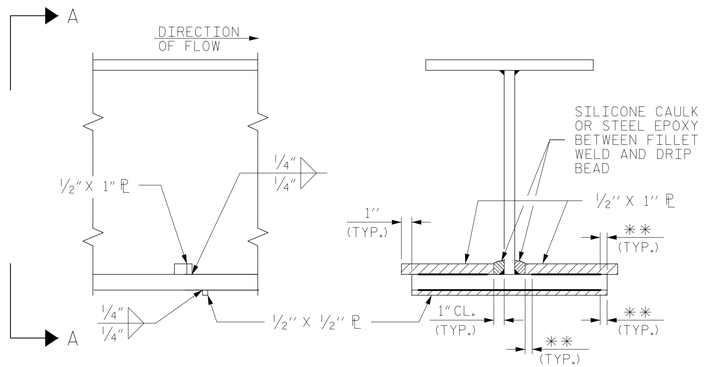


WITH CONNECTOR ℄ WITH BEARING STIFFENER

GUSSET PLATE DETAILS



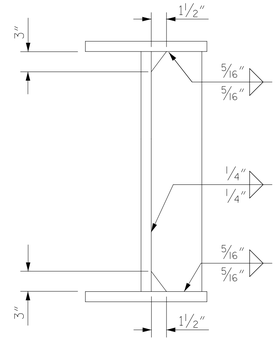
PART PLAN - BOTTOM FLANGE



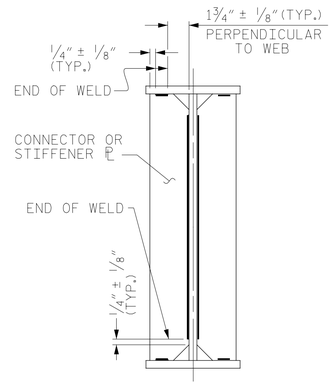
SECTION VIEW A-A

**SEE "WELD TERMINATION DETAILS"

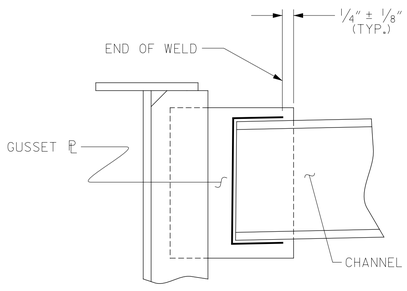
DRIP BEAD DETAILS



CONNECTOR PLATE DETAILS



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS



TYPICAL CHANNEL CONNECTION

WELD TERMINATION DETAILS

PROJECT NO. 41665.7A
CUMBERLAND COUNTY
STATION: 107+16.84 -L2-
13+69.76 -Y-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 08901A86EBF647D...
11/7/2017

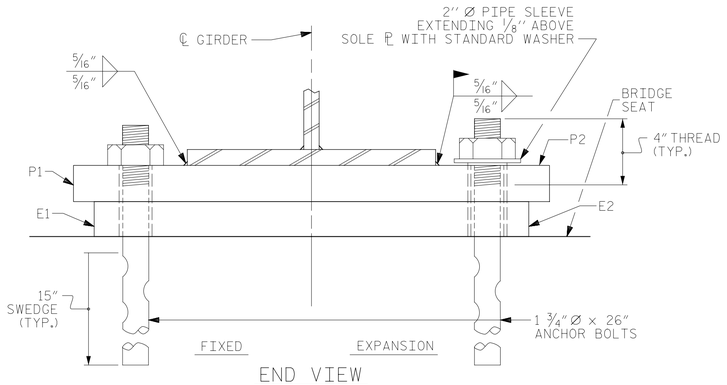
DRAWN BY : T.M. FORD DATE : 10/11/17
CHECKED BY : R.F. WERTMAN DATE : 10/16/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

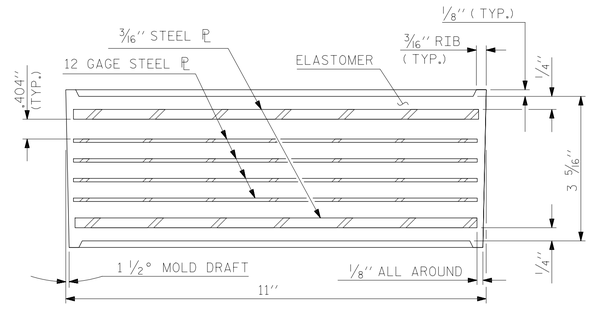
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-9
1			3			TOTAL SHEETS
2			4			24

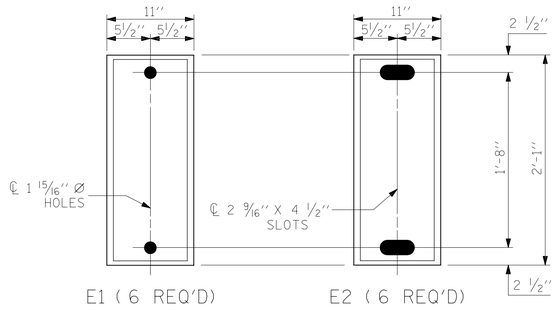
STR. NO. 3



END VIEW

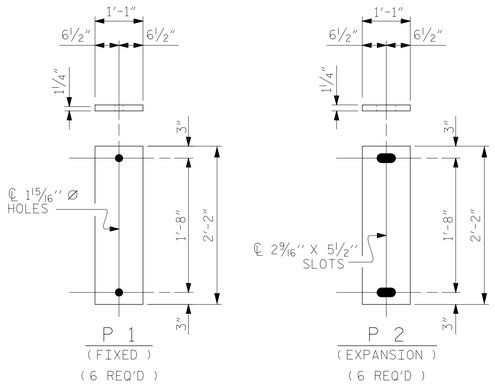


TYPICAL SECTION OF ELASTOMERIC BEARING



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.

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

FOR PAINTED STRUCTURAL STEEL (EXCLUDING AASHTO M270 GRADE 50W), SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

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

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

—LOAD RATING—	
	MAX. D.L.+L.L.
TYPE IV	310 k

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 08901A86EBF8470...

11/7/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
ELASTOMERIC BEARING DETAILS
(STEEL SUPERSTRUCTURE)

ASSEMBLED BY : B.A. WHITE	DATE : 10/04/17
CHECKED BY : R.F. WERTMAN	DATE : 10/16/17
DRAWN BY : EEM 2/97	REV. 10/1/11 MAA/GM
CHECKED BY : VAP 2/97	REV. 6/13 AAC/MAA
	REV. 1/15 MAA/TMG

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-10
1			3			TOTAL SHEETS
2			4			24

STR. NO. 3 STD. NO. EB2

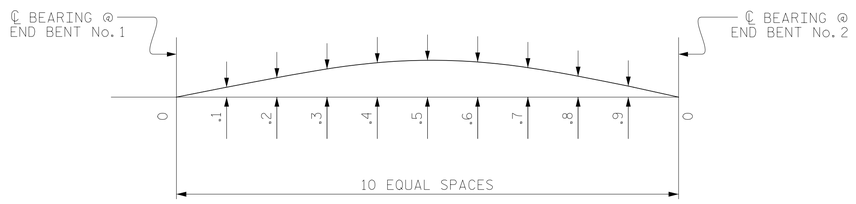
DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	GIRDER 1 & GIRDER 6											GIRDER 2 & GIRDER 5											GIRDER 3 & GIRDER 4										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.023	0.044	0.059	0.069	0.072	0.069	0.059	0.044	0.023	0	0	0.023	0.044	0.059	0.069	0.072	0.069	0.059	0.044	0.023	0	0	0.023	0.044	0.059	0.069	0.072	0.069	0.059	0.044	0.023	0
DEFLECTION DUE TO WEIGHT OF SLAB ✳ ↓	0	0.062	0.124	0.171	0.201	0.211	0.201	0.171	0.124	0.062	0	0	0.055	0.111	0.154	0.181	0.190	0.181	0.154	0.111	0.055	0	0	0.048	0.098	0.136	0.160	0.168	0.160	0.136	0.098	0.048	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.011	0.020	0.028	0.032	0.033	0.032	0.028	0.020	0.011	0	0	0.011	0.020	0.028	0.032	0.033	0.032	0.028	0.020	0.011	0	0	0.011	0.020	0.028	0.032	0.033	0.032	0.028	0.020	0.011	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.096	0.188	0.258	0.302	0.316	0.302	0.258	0.188	0.096	0	0	0.089	0.175	0.241	0.282	0.295	0.282	0.241	0.175	0.089	0	0	0.082	0.162	0.223	0.261	0.273	0.261	0.223	0.162	0.082	0
VERTICAL CURVE ORDINATE ↑	0	0.025	0.045	0.058	0.067	0.070	0.067	0.058	0.045	0.025	0	0	0.025	0.045	0.058	0.067	0.070	0.067	0.058	0.045	0.025	0	0	0.025	0.045	0.058	0.067	0.070	0.067	0.058	0.045	0.025	0
REQUIRED CAMBER ↑	0	1 7/16″	2 13/16″	3 13/16″	4 7/16″	4 5/8″	4 7/16″	3 13/16″	2 13/16″	1 7/16″	0	0	1 3/8″	2 5/8″	3 9/16″	4 13/16″	4 3/8″	4 13/16″	3 9/16″	2 5/8″	1 3/8″	0	0	1 1/4″	2 1/2″	3 3/8″	3 15/16″	4 1/8″	3 15/16″	3 3/8″	2 1/2″	1 1/4″	0

✳ INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.

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

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHALL BE PLUMB AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.



SCHEMATIC OF CAMBER ORDINATES

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTION TABLES

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 08901A86EBF8470...
11/7/2017

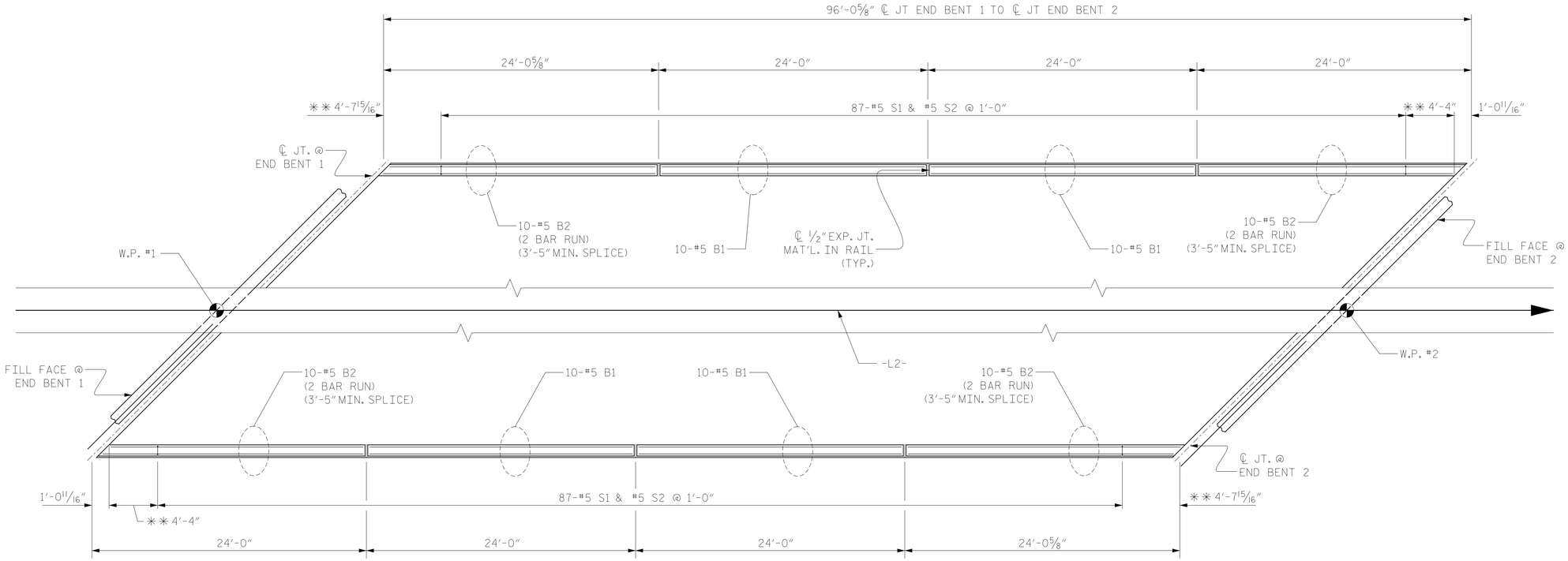
DRAWN BY : T.M. FORD DATE : 10/09/17
CHECKED BY : R.F. WERTMAN DATE : 10/17/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-11
1			3			TOTAL SHEETS
2			4			24

STR. NO. 3



PLAN OF BARRIER RAIL

** SEE "END OF RAIL DETAILS" ON SHEET 2 OF 2 FOR ADDITIONAL REINFORCING STEEL.

DIMENSIONS ARE SHOWN FROM ℄ JOINT AT BACK FACE OF BARRIER RAIL

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

VERTICAL CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F. WERTMAN

DocuSigned by:
Richard F. Wertman
11/7/2017

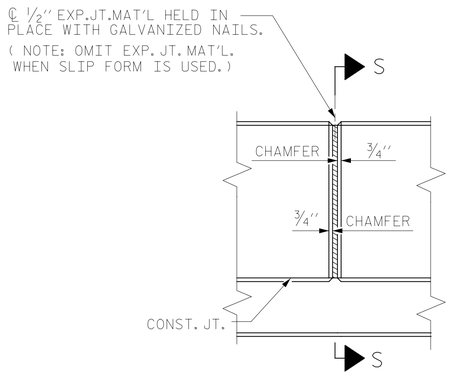
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-12
1			3			TOTAL SHEETS
2			4			24

DRAWN BY : B.A. WHITE DATE : 10/12/17
CHECKED BY : R.F. WERTMAN DATE : 10/17/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

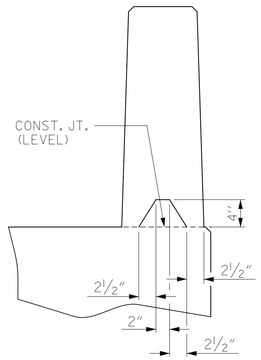
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STR. NO. 3



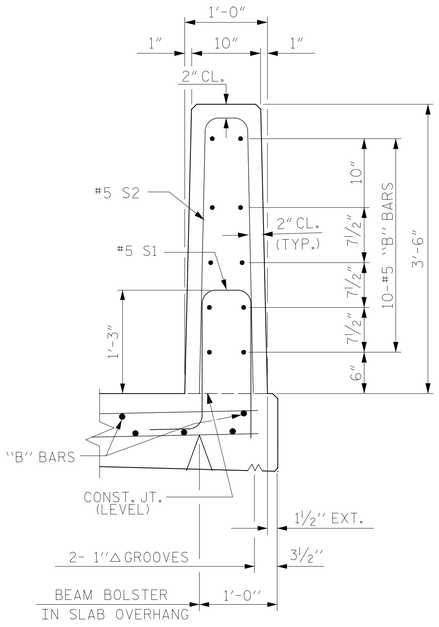
ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS



SECTION S-S

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



SECTION THRU 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.

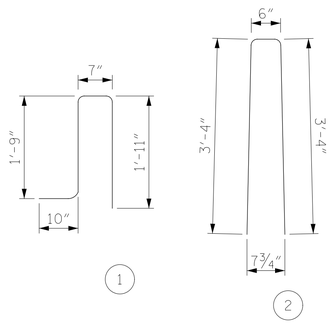
WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF VERTICAL CONCRETE BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3 & S4 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3 & S4 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.

BAR TYPES



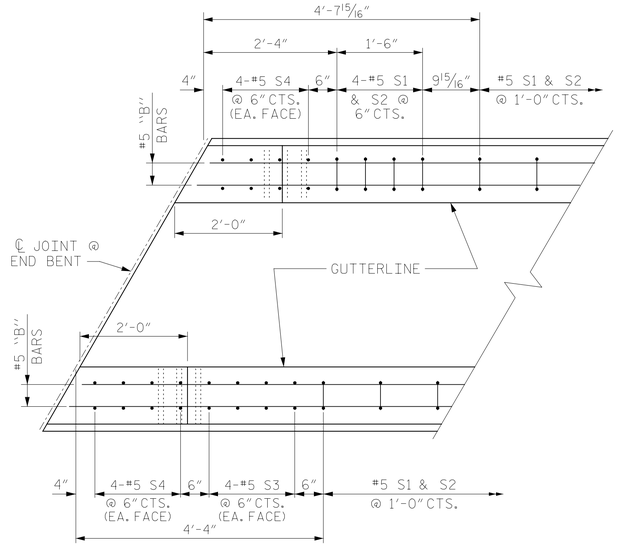
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

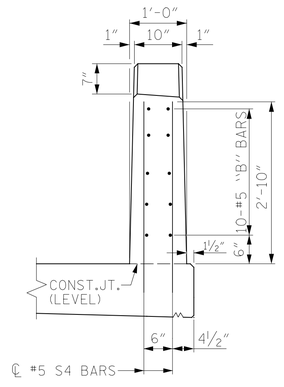
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	40	#5	STR	23'-8"	988
* B2	80	#5	STR	14'-1"	1175
* S1	182	#5	1	5'-1"	965
* S2	182	#5	2	7'-2"	1361
* S3	16	#5	STR	4'-0"	67
* S4	32	#5	STR	3'-6"	117

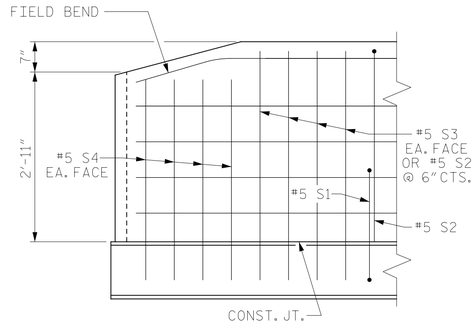
*EPOXY COATED REINFORCING STEEL	4,673 LBS.
CLASS AA CONCRETE	22.8 CU. YDS.
VERTICAL CONCRETE BARRIER RAIL	192.1 LIN. FT.



PLAN



END VIEW



SIDE VIEW

END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS

ASSEMBLED BY : B.A. WHITE		DATE :	09/11/17
CHECKED BY : T.M. FORD		DATE :	09/27/17
DRAWN BY : MAA	5/10	REV. 10/1/11	MAA/GM
CHECKED BY : GM	5/10	REV. 12/5/11	MAA/GM
		REV. 6/13	MAA/GM

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F. Wertman
0B001A85EEBF477...
11/7/2017

PROJECT NO. 41665.7A
CUMBERLAND COUNTY
STATION: 107+16.84 -L2-
13+69.76 -Y-

SHEET 2 OF 2

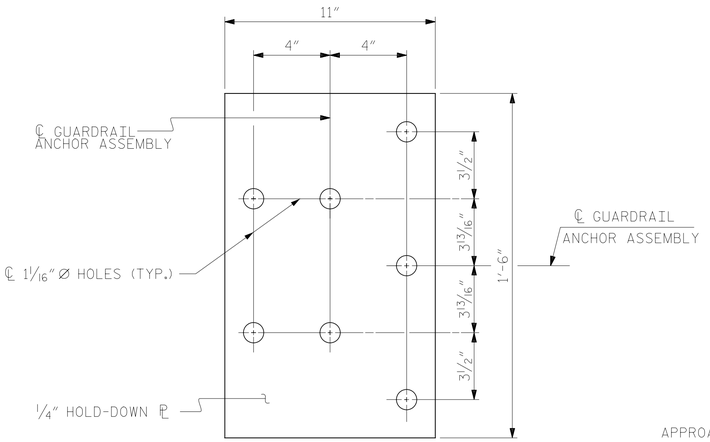
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

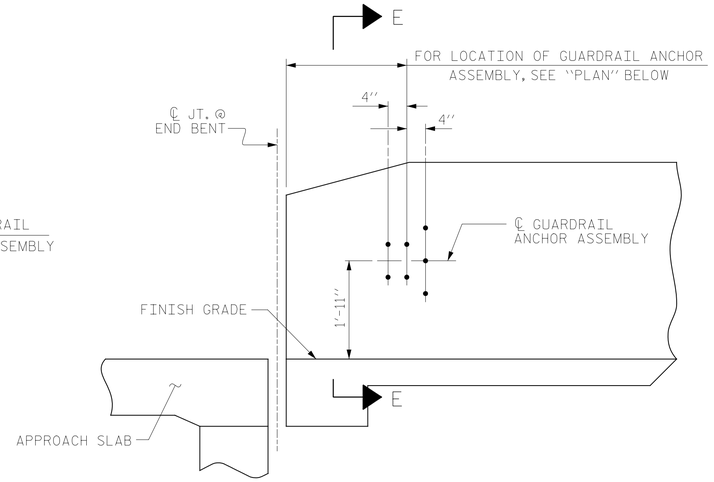
VERTICAL CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-13
1			3			TOTAL SHEETS
2			4			24

STR. NO. 3 STD. NO. CBR2

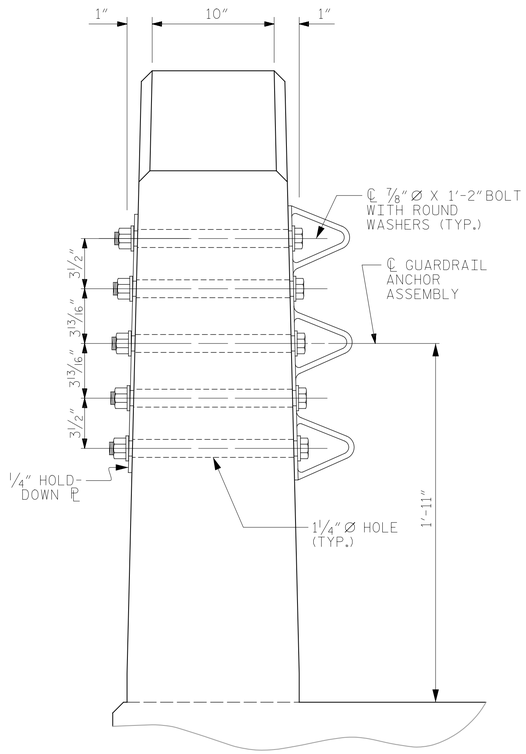


PLAN



ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF 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 VERTICAL CONCRETE BARRIER RAIL.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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

PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

(TYP. EA. SIDE)

SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 08901A8BEBF6470...
11/7/2017

ASSEMBLED BY : T.M. FORD	DATE : 10/11/17
CHECKED BY : R.F. WERTMAN	DATE : 10/17/17
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

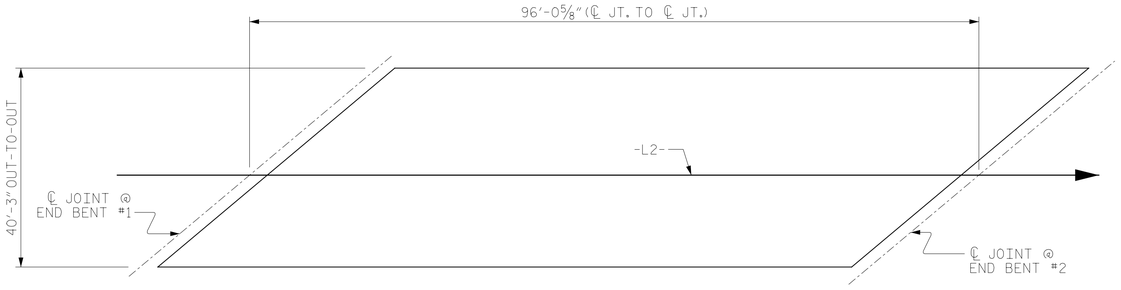
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

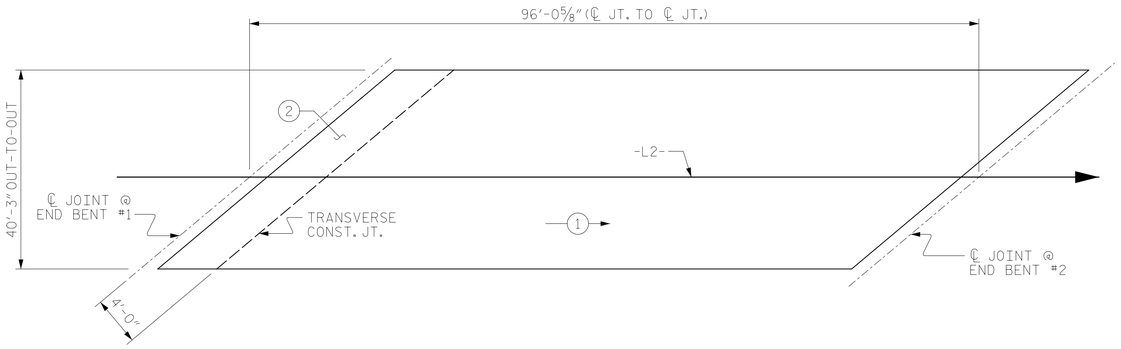
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-14
1			3			TOTAL SHEETS
2			4			24

STR. NO. 3

STD. NO. GRA3



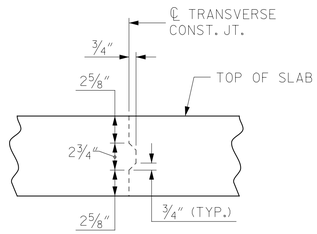
LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 3866)



SPAN A

POURING SEQUENCE

IF THE CONTRACTOR CHOOSES TO REVERSE THE DIRECTION OF POUR #1, A CONSTRUCTION JOINT WILL BE REQUIRED 4'-0" FROM THE JOINT SEAL.



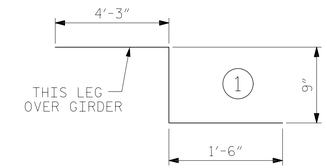
TRANSVERSE CONSTRUCTION JOINT DETAIL

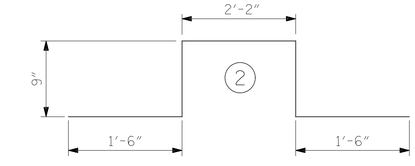
NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT

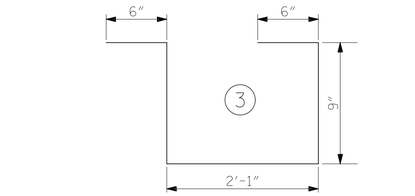
REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	113	#5	STR	39'-11"	4705	A201	4	#5	STR	38'-7"	161
A2	113	#5	STR	39'-11"	4705	A202	4	#5	STR	37'-7"	157
✳ A3	6	#6	STR	15'-0"	136	A203	4	#5	STR	36'-7"	153
						A204	4	#5	STR	35'-7"	148
✳ A101	4	#5	STR	38'-7"	161	A205	4	#5	STR	34'-7"	144
✳ A102	4	#5	STR	37'-7"	157	A206	4	#5	STR	33'-7"	140
✳ A103	4	#5	STR	36'-7"	153	A207	4	#5	STR	32'-7"	136
✳ A104	4	#5	STR	35'-7"	148	A208	4	#5	STR	31'-7"	132
✳ A105	4	#5	STR	34'-7"	144	A209	4	#5	STR	30'-7"	128
✳ A106	4	#5	STR	33'-7"	140	A210	4	#5	STR	29'-7"	123
✳ A107	4	#5	STR	32'-7"	136	A211	4	#5	STR	28'-7"	119
✳ A108	4	#5	STR	31'-7"	132	A212	4	#5	STR	27'-7"	115
✳ A109	4	#5	STR	30'-7"	128	A213	4	#5	STR	26'-7"	111
✳ A110	4	#5	STR	29'-7"	123	A214	4	#5	STR	25'-7"	107
✳ A111	4	#5	STR	28'-7"	119	A215	4	#5	STR	24'-7"	103
✳ A112	4	#5	STR	27'-7"	115	A216	4	#5	STR	23'-7"	98
✳ A113	4	#5	STR	26'-7"	111	A217	4	#5	STR	22'-7"	94
✳ A114	4	#5	STR	25'-7"	107	A218	4	#5	STR	21'-7"	90
✳ A115	4	#5	STR	24'-7"	103	A219	4	#5	STR	20'-7"	86
✳ A116	4	#5	STR	23'-7"	98	A220	4	#5	STR	19'-7"	82
✳ A117	4	#5	STR	22'-7"	94	A221	4	#5	STR	18'-7"	78
✳ A118	4	#5	STR	21'-7"	90	A222	4	#5	STR	17'-7"	73
✳ A119	4	#5	STR	20'-7"	86	A223	4	#5	STR	16'-7"	69
✳ A120	4	#5	STR	19'-7"	82	A224	4	#5	STR	15'-7"	65
✳ A121	4	#5	STR	18'-7"	78	A225	4	#5	STR	14'-7"	61
✳ A122	4	#5	STR	17'-7"	73	A226	4	#5	STR	13'-7"	57
✳ A123	4	#5	STR	16'-7"	69	A227	4	#5	STR	12'-7"	53
✳ A124	4	#5	STR	15'-7"	65	A228	4	#5	STR	11'-7"	48
✳ A125	4	#5	STR	14'-7"	61	A229	4	#5	STR	10'-7"	44
✳ A126	4	#5	STR	13'-7"	57	A230	4	#5	STR	9'-7"	40
✳ A127	4	#5	STR	12'-7"	53	A231	4	#5	STR	8'-7"	36
✳ A128	4	#5	STR	11'-7"	48	A232	4	#5	STR	7'-7"	32
✳ A129	4	#5	STR	10'-7"	44	A233	4	#5	STR	6'-7"	27
✳ A130	4	#5	STR	9'-7"	40	A234	4	#5	STR	5'-7"	23
✳ A131	4	#5	STR	8'-7"	36	A235	4	#5	STR	4'-7"	19
✳ A132	4	#5	STR	7'-7"	32	A236	4	#5	STR	3'-7"	15
✳ A133	4	#5	STR	6'-7"	27	A237	4	#5	STR	2'-7"	11
✳ A134	4	#5	STR	5'-7"	23	A238	4	#5	STR	1'-7"	7
✳ A135	4	#5	STR	4'-7"	19						
✳ A136	4	#5	STR	3'-7"	15	✳ B1	108	#4	STR	25'-5"	1834
✳ A137	4	#5	STR	2'-7"	11	B2	102	#5	STR	49'-0"	5213
✳ A138	4	#5	STR	1'-7"	7						
						✳ G1	2	#5	STR	56'-5"	118
						✳ K1	12	#5	1	6'-6"	81
						✳ K2	24	#5	2	6'-8"	167
						✳ K3	30	#5	STR	7'-11"	248
						✳ S1	60	#4	3	4'-7"	184
						REINFORCING STEEL = 13,103					
						✳ EPOXY COATED REINF. STEEL = 10,658					

BAR TYPES







ALL BAR DIMENSIONS ARE OUT TO OUT

GROOVING BRIDGE FLOORS

BRIDGE DECK	3360 SQ. FT.
APPROACH SLABS	1579 SQ. FT.
TOTAL	4939 SQ. FT.

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	✳ EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
TOTALS	105.9	13103	10658

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"

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 11/7/2017

ASSEMBLED BY : B.A. WHITE	DATE : 10/12/17
CHECKED BY : R.F. WERTMAN	DATE : 10/17/17
DRAWN BY : JMB 5/87	REV. 8/16/99 RWW/LES
CHECKED BY : SJD 9/87	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

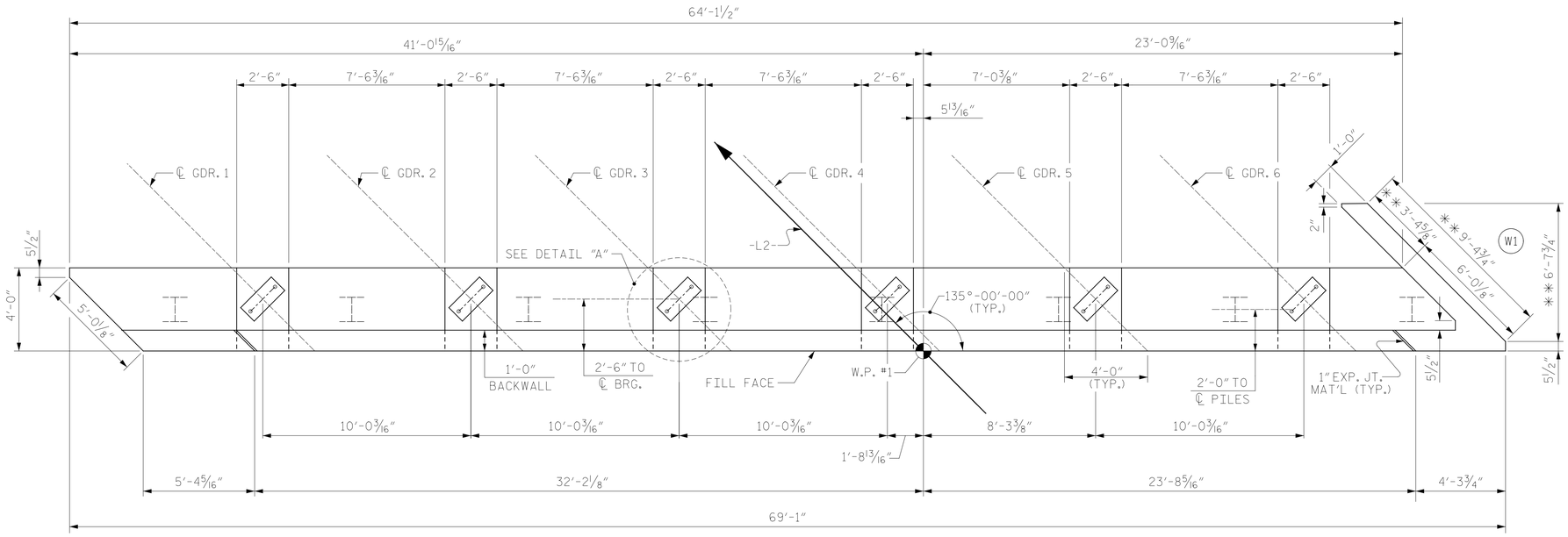
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

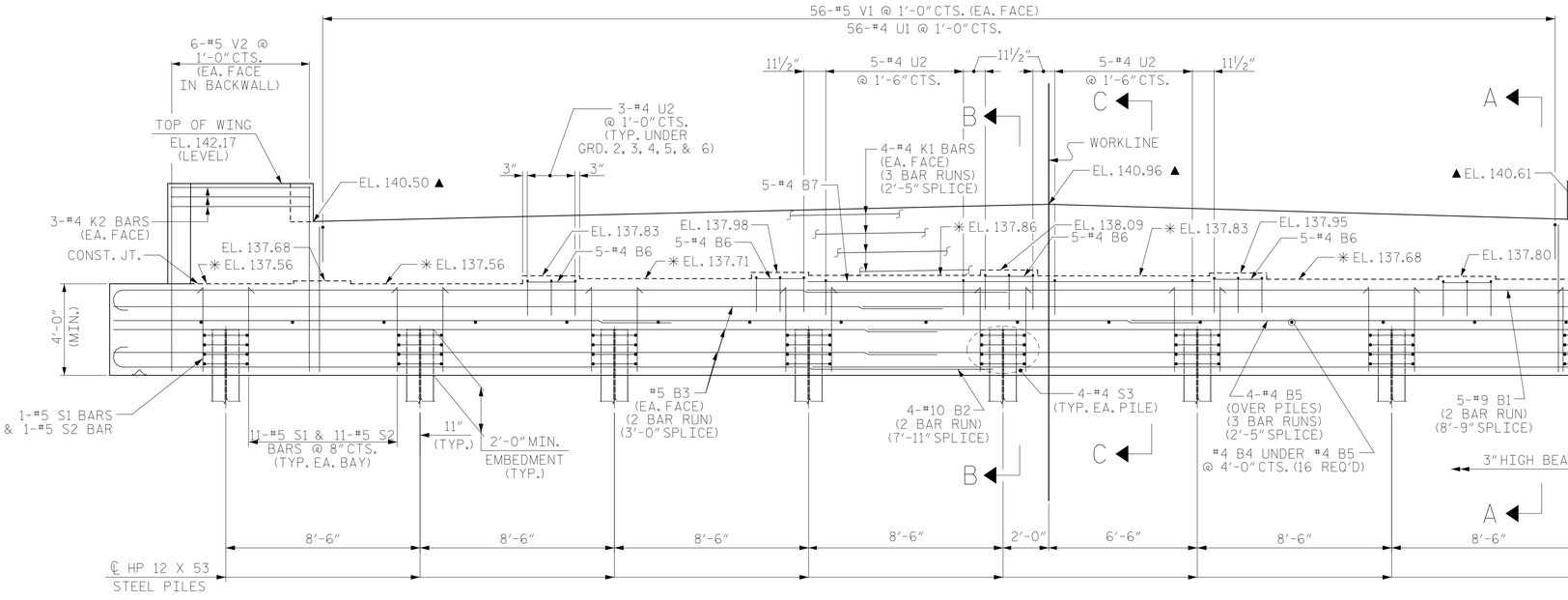
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-15
1			3			TOTAL SHEETS
2			4			24

STR. NO. 3

STD. NO. BOM1



PLAN



ELEVATION

SEE "SECTION A-A" ON SHEET 3 OF 3 FOR 24″Ø C.S. PIPE DETAILS

NOTES:

✱ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 3 OF 3.

▲ THIS ELEVATION TAKEN ON FILL FACE OF BACKWALL.

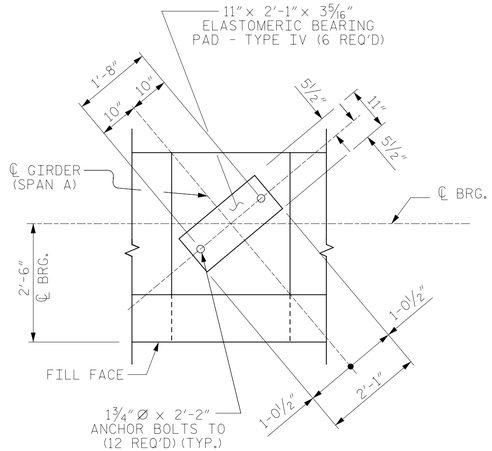
STIRRUPS & U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

✱✱ CONTRACTOR SHALL VERIFY WING WALL LENGTH BASED ON MSE WALL DESIGN AND MODIFY THE WING WALL LENGTH ACCORDINGLY, SUCH THAT THE WING WALL AND 1″EXPANSION JOINT MATERIAL IS FLUSH WITH THE BACK OF THE MSE WALL PANEL.



DETAIL "A"

(TYP. EA. GIRDER)

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L-
13+69.76 -Y-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F. WERTMAN

DocuSigned by: Richard F. Wertman D8901A88E8F847D...
11/7/2017

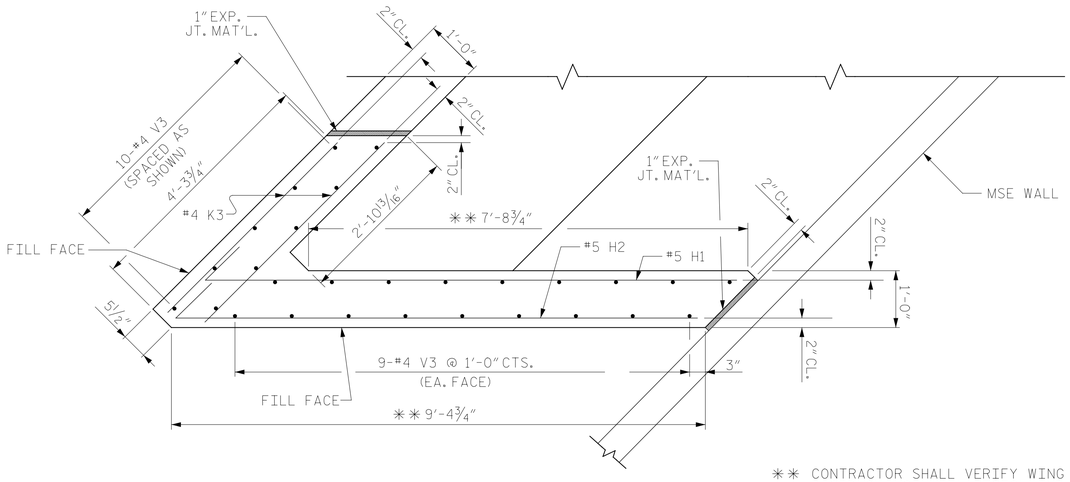
DRAWN BY : T.M. FORD DATE : 10/18/17
CHECKED BY : R.F. WERTMAN DATE : 10/19/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

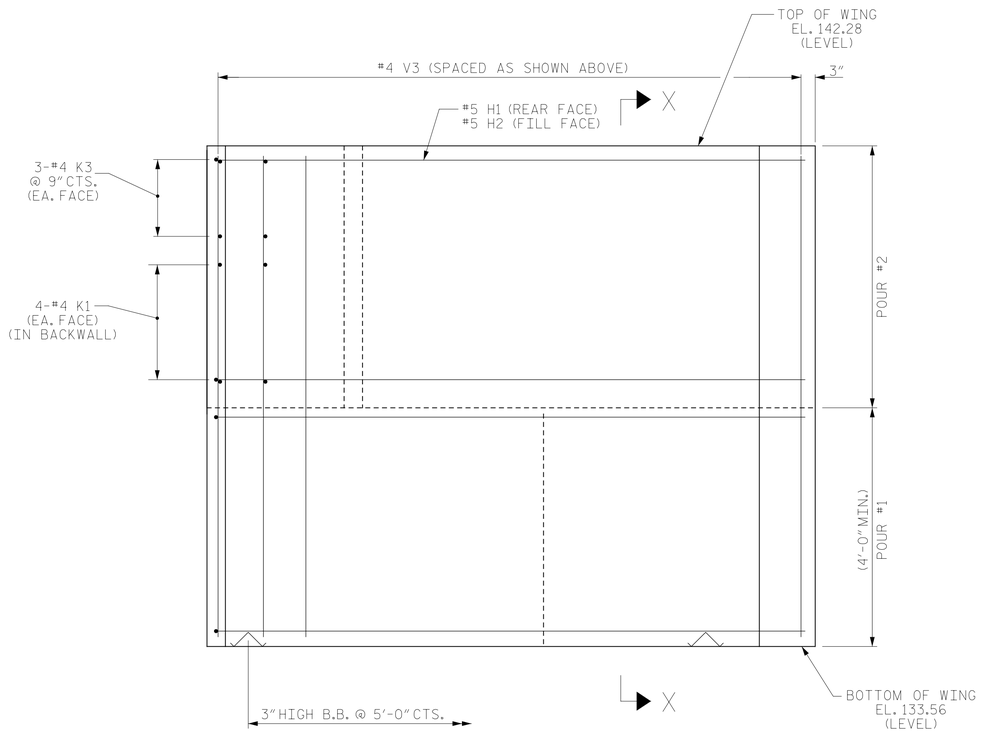
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-16
1			3			TOTAL SHEETS
2			4			24

STR. NO. 3

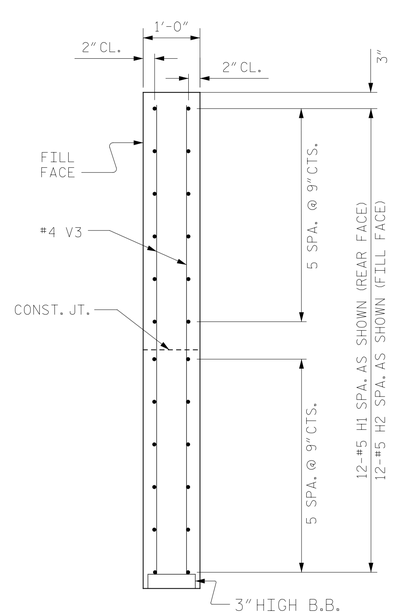


PLAN OF WING (W1)

** CONTRACTOR SHALL VERIFY WING WALL LENGTH BASED ON MSE WALL DESIGN AND MODIFY THE WING WALL LENGTH ACCORDINGLY, SUCH THAT THE WING WALL AND 1" EXPANSION JOINT MATERIAL IS FLUSH WITH THE BACK OF THE MSE WALL PANEL.



ELEVATION OF WING (W1)



SECTION X-X

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 0B0D1A8EE0F847D...

11/7/2017

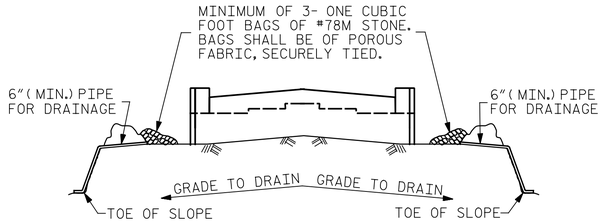
DRAWN BY : J.A. BOYER DATE : 10/17/17
CHECKED BY : R.F. WERTMAN DATE : 10/19/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-17
1			3			TOTAL SHEETS
2			4			24

STR. NO. 3

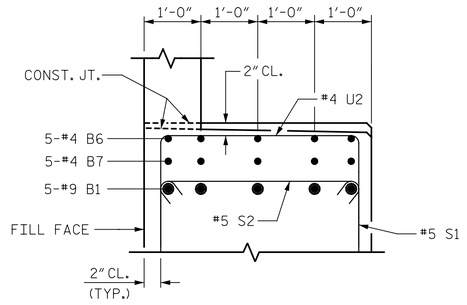


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

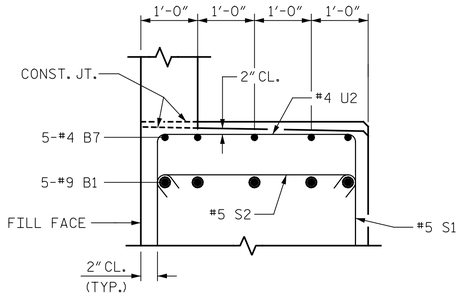
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

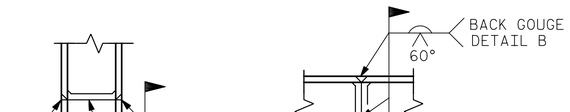
TEMPORARY DRAINAGE AT END BENT



PARTIAL SECTION B-B

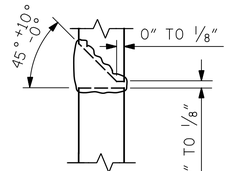


PARTIAL SECTION C-C

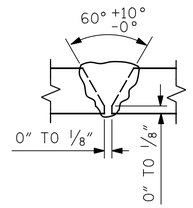


△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



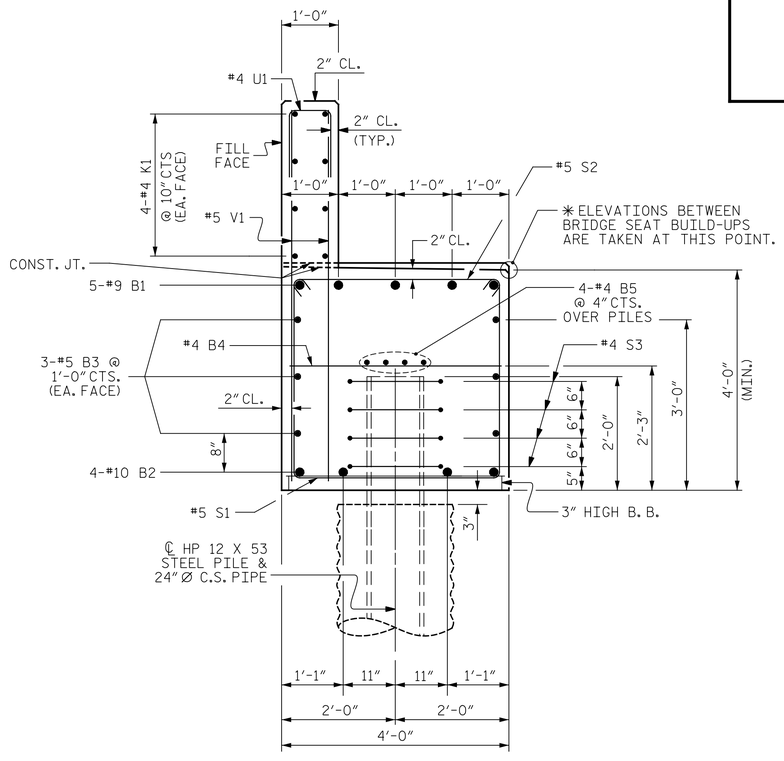
DETAIL A



DETAIL B

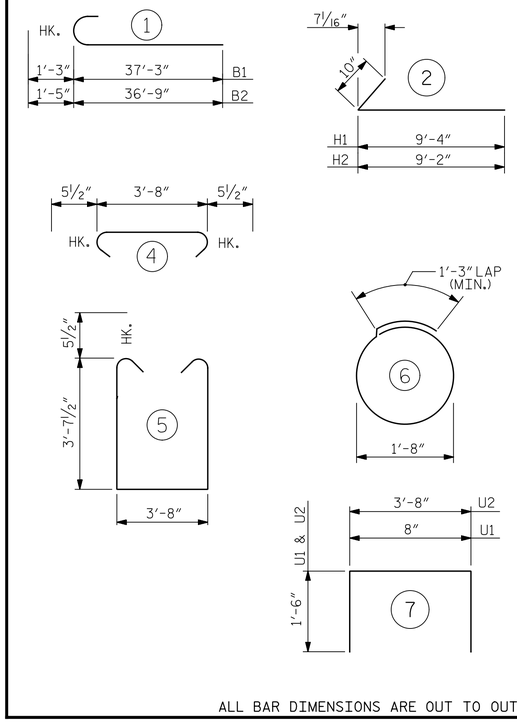
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

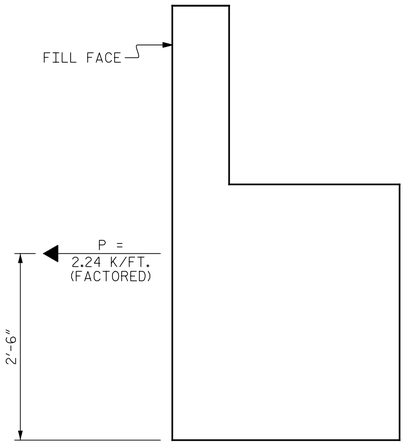


SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



TIE BACK DETAILS

(DETAIL SHOWING TIE BACK RESTRAINT FOR END BENT)

BILL OF MATERIAL

END BENT #1

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	38'-6"	1309
B2	8	#10	1	38'-2"	1314
B3	12	#5	STR	34'-4"	430
B4	16	#4	STR	3'-8"	40
B5	12	#4	STR	23'-7"	189
B6	20	#4	STR	2'-2"	29
B7	5	#4	STR	17'-4"	58
H1	12	#5	2	10'-2"	128
H2	12	#5	2	10'-0"	125
K1	24	#4	STR	23'-7"	378
K2	6	#4	STR	5'-0"	20
K3	6	#4	STR	4'-0"	16
S1	78	#5	5	11'-10"	963
S2	78	#5	4	4'-7"	373
S3	32	#4	6	6'-6"	139
U1	56	#4	7	3'-8"	138
U2	25	#4	7	6'-8"	112
V1	112	#5	STR	6'-4"	769
V2	12	#5	STR	8'-2"	103
V3	28	#5	STR	8'-2"	239

REINFORCING STEEL	6872 LBS.
CLASS A CONCRETE	
POUR #1 (CAP & LOWER WINGS)	40.4 C.Y.
POUR #2 (UPPER WINGS & BACKWALL)	9.5 C.Y.
TOTAL	49.9 C.Y.
HP 12 X 53 STEEL PILES	
No. = 8	576 LIN. FT.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	8 EACH
PILE REDRIVES	8 EACH

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F. WERTMAN

DocuSigned by: Richard F. Wertman 08001A86E8F0470...
11/14/2017

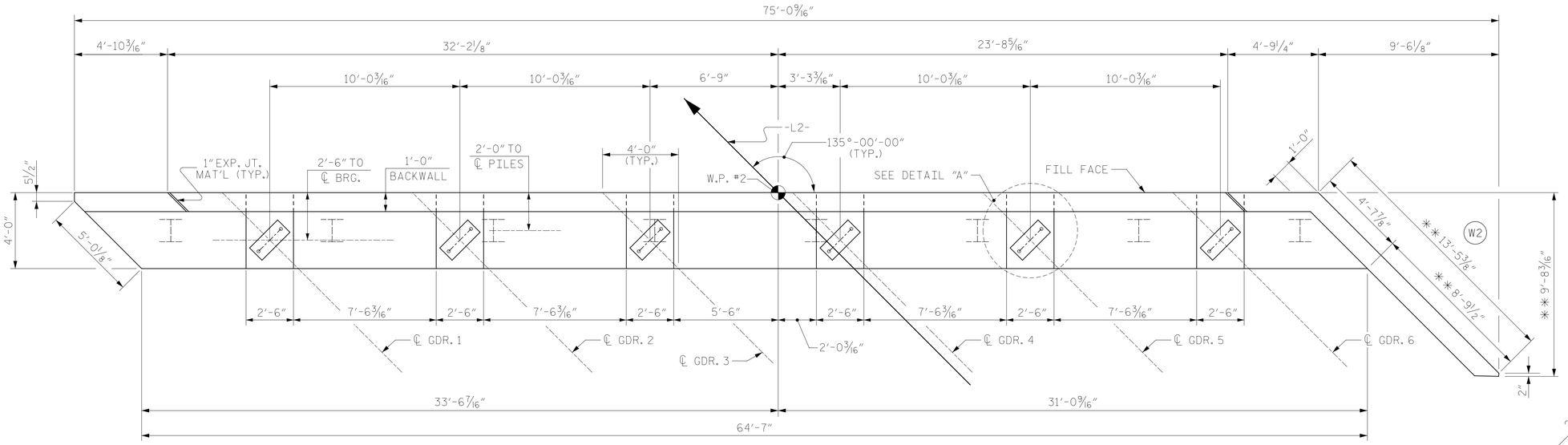
DRAWN BY : T.M. FORD DATE : 10/16/17
CHECKED BY : R.F. WERTMAN DATE : 10/19/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

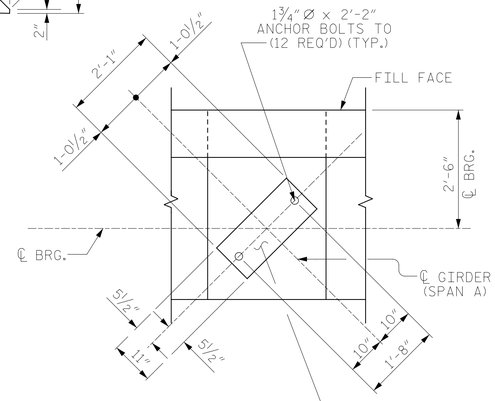
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-18
1			3			TOTAL SHEETS
2			4			24

STR. NO. 3

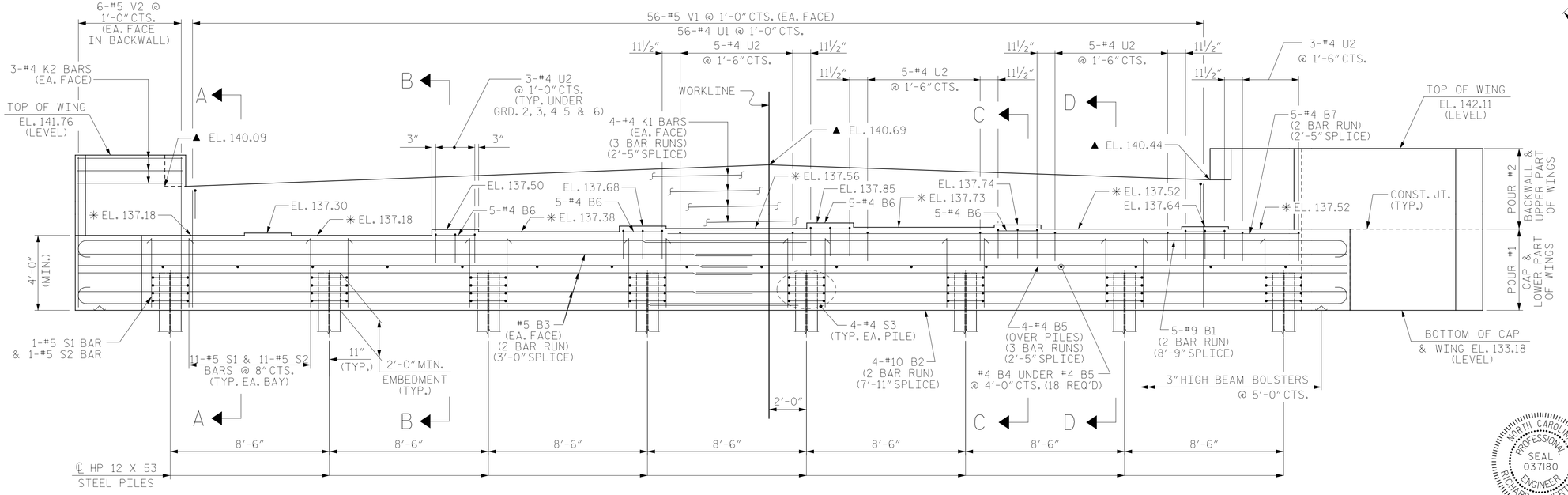


PLAN



DETAIL "A"

(TYP. EA. GIRDER)



ELEVATION

SEE "SECTION A-A" ON SHEET 3 OF 3 FOR 24" Ø C.S. PIPE DETAILS

NOTES:

✳ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 3 OF 3.

▲ THIS ELEVATION TAKEN ON FILL FACE OF BACKWALL.

STIRRUPS & U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

✳✳ CONTRACTOR SHALL VERIFY WING WALL LENGTH BASED ON MSE WALL DESIGN AND MODIFY THE WING WALL LENGTH ACCORDINGLY, SUCH THAT THE WING WALL AND 1" EXPANSION JOINT MATERIAL IS FLUSH WITH THE BACK OF THE MSE WALL PANEL.

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L- 13+69.76 -Y-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 08901A86EBF6470...
11/7/2017

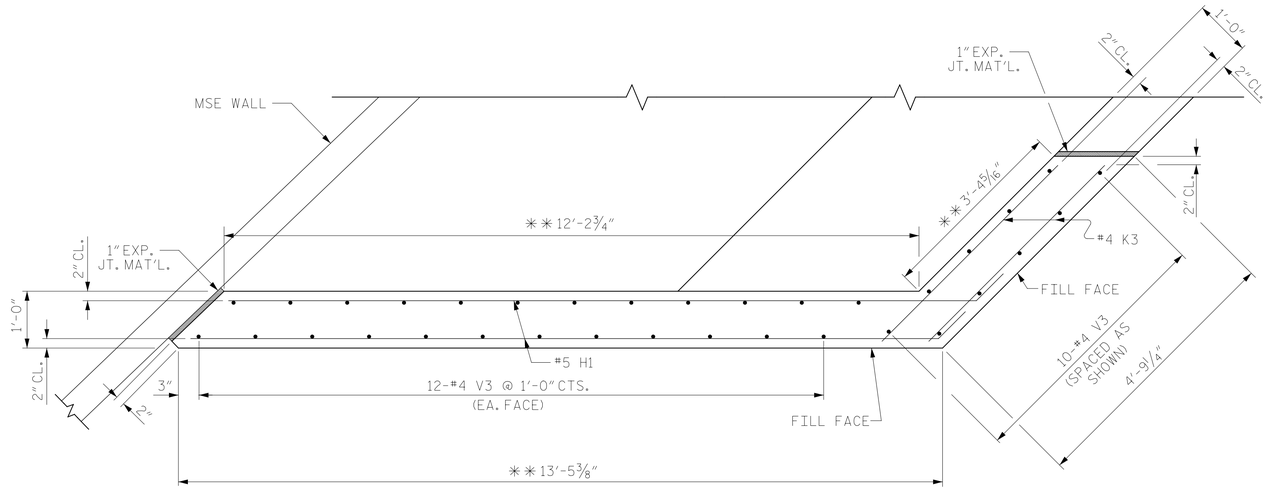
DRAWN BY : T.M. FORD DATE : 10/13/17
CHECKED BY : R.F. WERTMAN DATE : 10/19/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

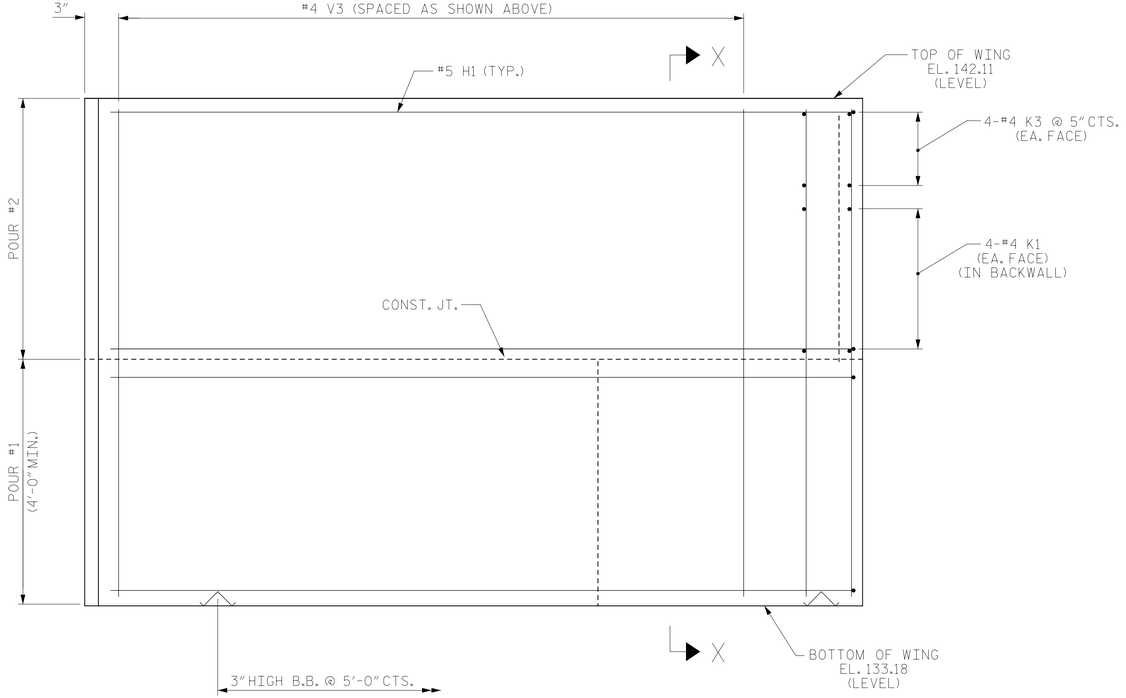
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-19
1			3			TOTAL SHEETS
2			4			24

STR. NO. 3

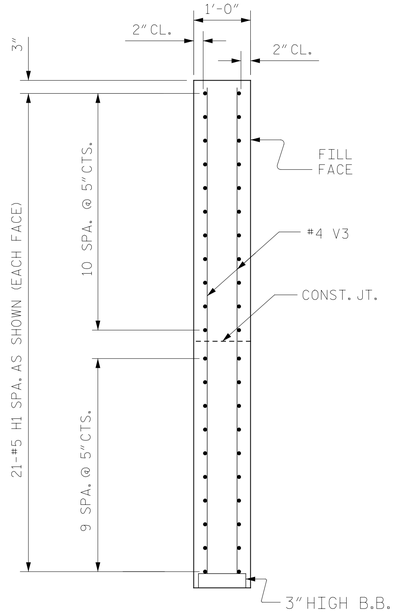


PLAN OF WING (W2)

** CONTRACTOR SHALL VERIFY WING WALL LENGTH BASED ON MSE WALL DESIGN AND MODIFY THE WING WALL LENGTH ACCORDINGLY, SUCH THAT THE WING WALL AND 1" EXPANSION JOINT MATERIAL IS FLUSH WITH THE BACK OF THE MSE WALL PANEL.



ELEVATION OF WING (W2)



SECTION X-X

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 11/7/2017

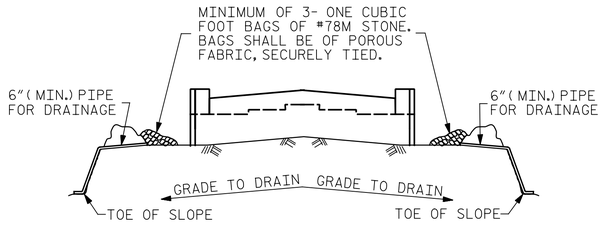
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-20
1			3			TOTAL SHEETS
2			4			24

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DRAWN BY : J.A. BOYER DATE : 10/19/17
CHECKED BY : R.F. WERTMAN DATE : 10/19/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

STR. NO. 3

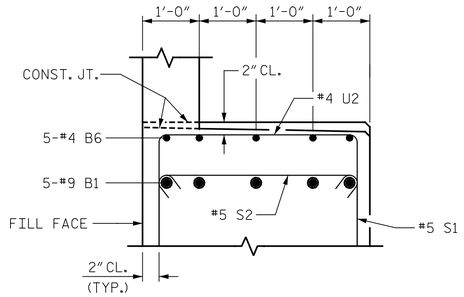


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

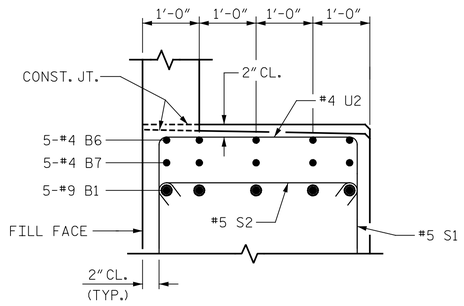
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

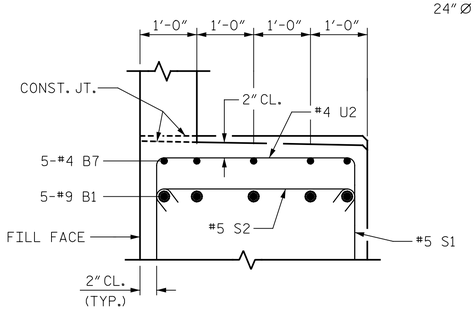
TEMPORARY DRAINAGE AT END BENT



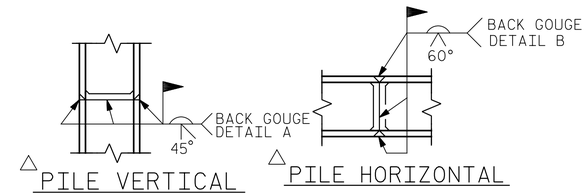
PARTIAL SECTION B-B



PARTIAL SECTION C-C

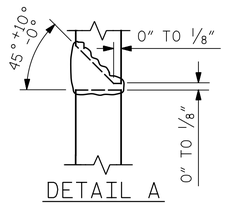


PARTIAL SECTION D-D

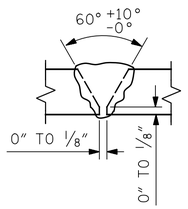


△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



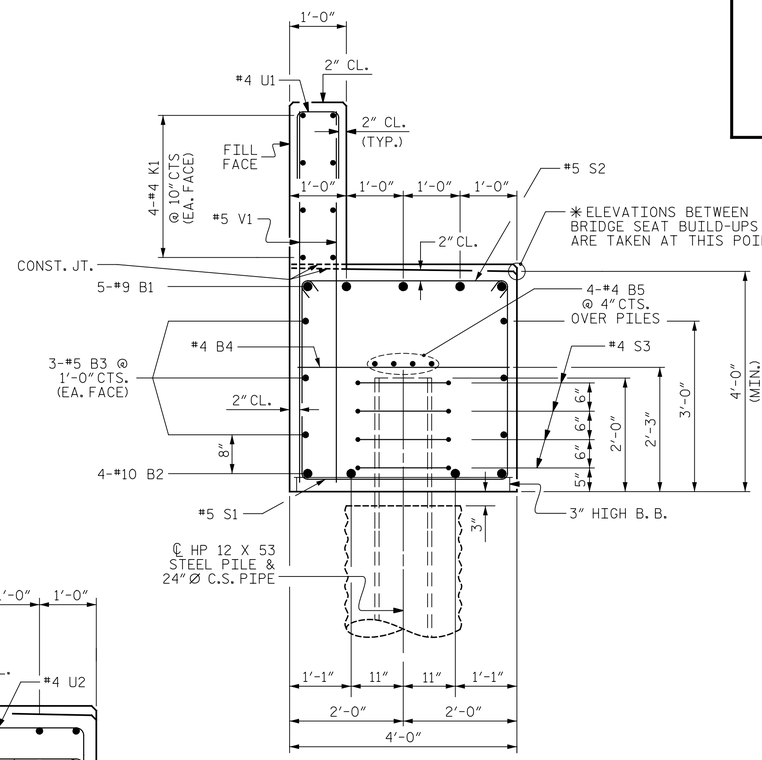
DETAIL A



DETAIL B

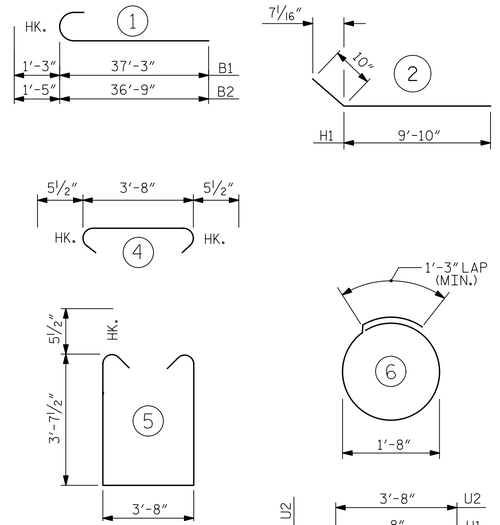
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

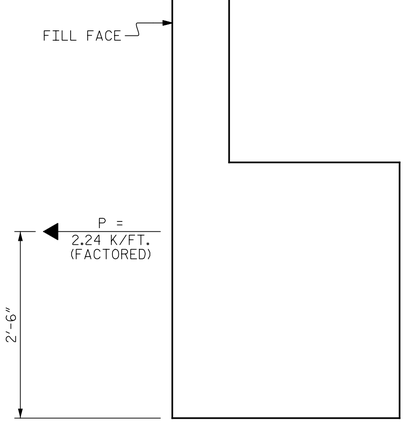


SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



TIE BACK DETAILS

(DETAIL SHOWING TIE BACK RESTRAINT FOR END BENT)

BILL OF MATERIAL

END BENT #2

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	38'-6"	1309
B2	8	#10	1	38'-2"	1314
B3	12	#5	STR	34'-4"	430
B4	16	#4	STR	3'-8"	40
B5	12	#4	STR	23'-7"	189
B6	25	#4	STR	2'-2"	36
B7	10	#4	STR	20'-4"	136
H1	42	#5	2	13'-4"	584
K1	24	#4	STR	23'-7"	378
K2	6	#4	STR	4'-6"	18
K3	8	#4	STR	4'-4"	24
S1	78	#5	5	11'-10"	963
S2	78	#5	4	4'-7"	373
S3	32	#4	6	6'-6"	139
U1	56	#4	7	3'-8"	138
U2	33	#4	7	6'-8"	147
V1	112	#5	STR	6'-7"	769
V2	12	#5	STR	8'-3"	103
V3	34	#5	STR	8'-6"	301

REINFORCING STEEL	7391 LBS.
CLASS A CONCRETE	
POUR #1 (CAP & LOWER WINGS)	42.4 C.Y.
POUR #2 (UPPER WINGS & BACKWALL)	10.1 C.Y.
TOTAL	52.5 C.Y.
HP 12 X 53 STEEL PILES	
No. = 8	576 LIN. FT.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	8 EACH
PILE REDRIVES	8 EACH

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 0B0014A8EEF6470... 11/14/2017

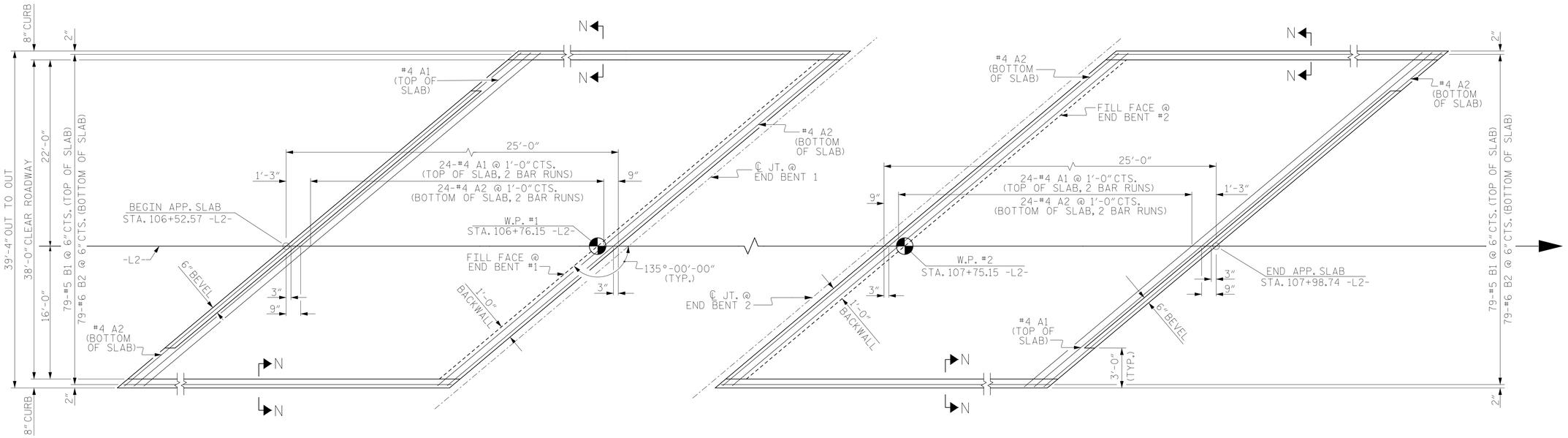
DRAWN BY : J.A. BOYER DATE : 10/19/17
CHECKED BY : R.F. WERTMAN DATE : 10/19/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-21
1			3			TOTAL SHEETS
2			4			24

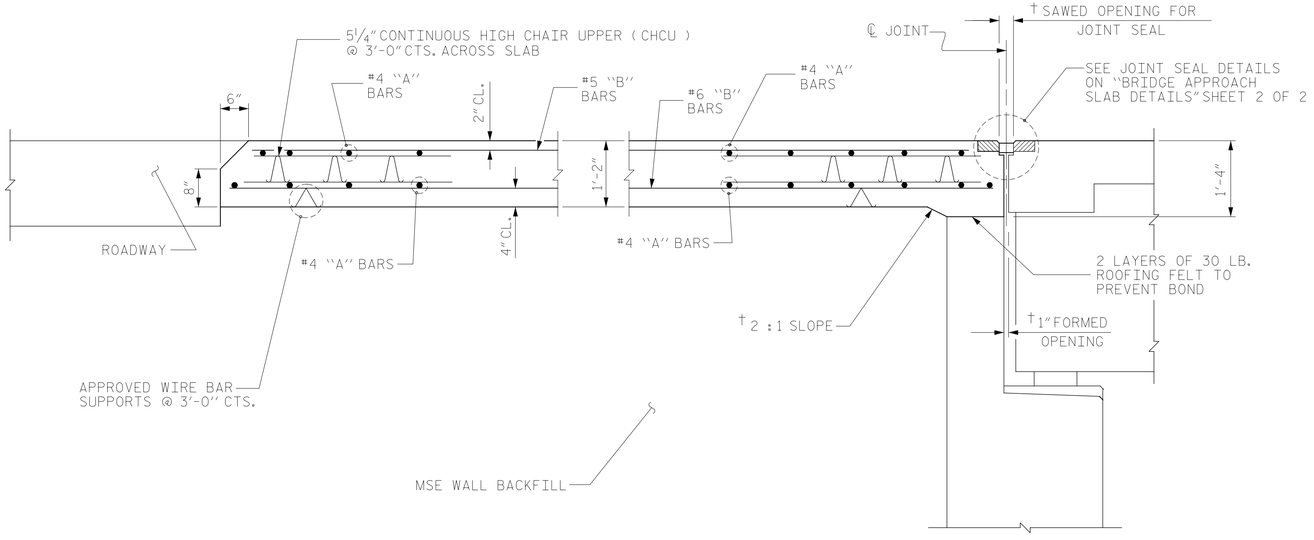
STR. NO. 3



PLAN @ END BENT #1

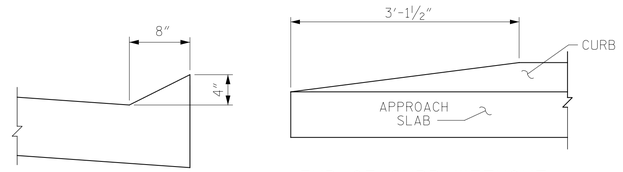
PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

† NORMAL TO END BENT



SECTION N-N

END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F Wertman 08901A86EBF6470...
11/7/2017

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

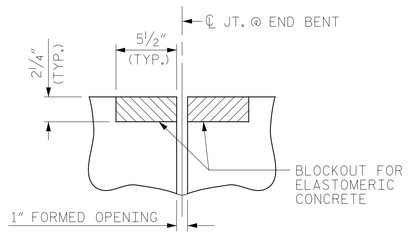
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-22
1			3			TOTAL SHEETS
2			4			24

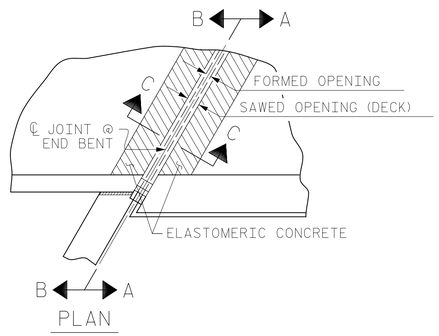
ASSEMBLED BY : T.M. FORD	DATE : 10/11/17
CHECKED BY : R.F. WERTMAN	DATE : 10/17/17
DRAWN BY : TLA 10/05	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 12/21/11 MAA/GM
	REV. 6/13 MAA/GM

STR. NO. 3

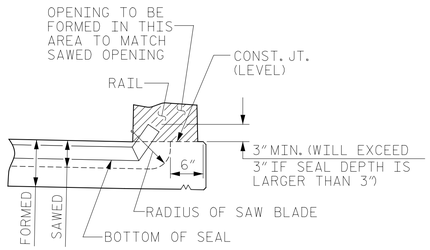
STD. NO. BAS2



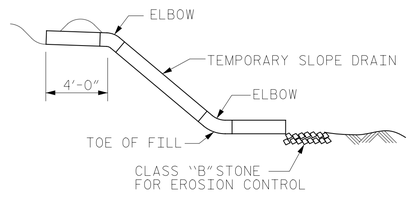
SECTION C-C
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC
CONCRETE DIMENSIONS)



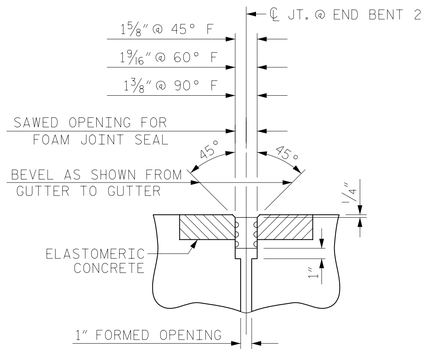
PLAN



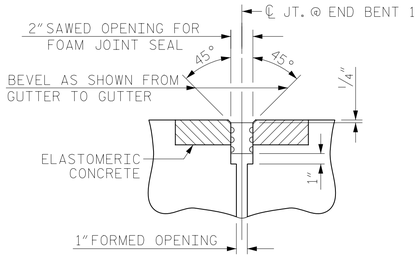
SECTION A-A



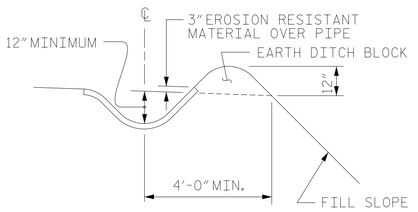
SECTION R-R



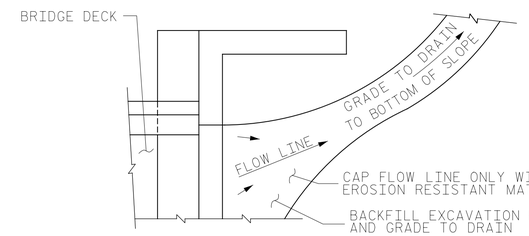
SECTION C-C
FOAM JOINT SEAL
(EXPANSION)



SECTION C-C
FOAM JOINT SEAL
(FIXED)

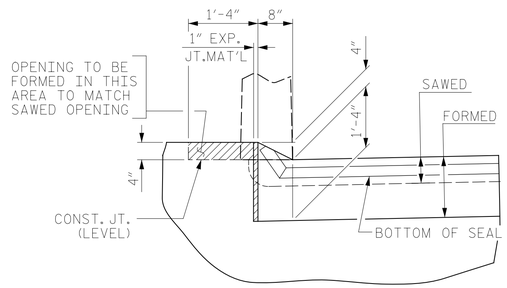


SECTION S-S



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

TEMPORARY DRAINAGE DETAIL



SECTION B-B

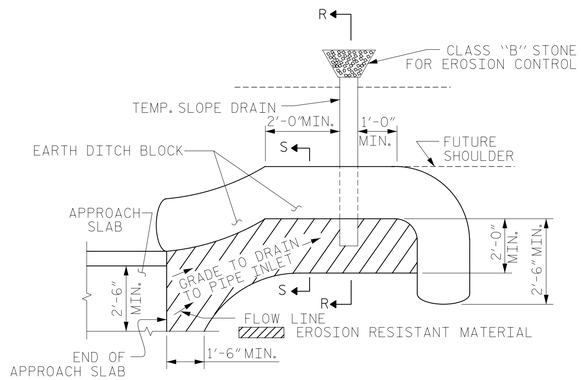
JOINT SEAL DETAILS @ END BENT

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.

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

NOTES:

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

FOR MSE WALL BACKFILL SEE "MSE RETAINING WALL" PLANS.

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.

BILL OF MATERIAL

FOR ONE APPROACH SLAB
(2 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	50	#4	STR	29'-3"	977
A2	52	#4	STR	29'-1"	1010
✳ B1	79	#5	STR	24'-2"	1992
B2	79	#6	STR	24'-8"	2928
REINFORCING STEEL				LBS.	3938
✳ EPOXY COATED REINFORCING STEEL				LBS.	2969
CLASS AA CONCRETE				C.Y.	42.6

ELASTOMERIC CONCRETE

END BENT NO.	ELASTOMERIC CONCRETE ✳ (CU. FT.)
1	9.2
2	9.2
TOTAL	18.4

✳ BASED ON THE MINIMUM BLOCKOUT SHOWN.

SPLICE LENGTHS CHART

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

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by:
Richard F. Wertman
09D1A8E8F6470...
11/7/2017

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

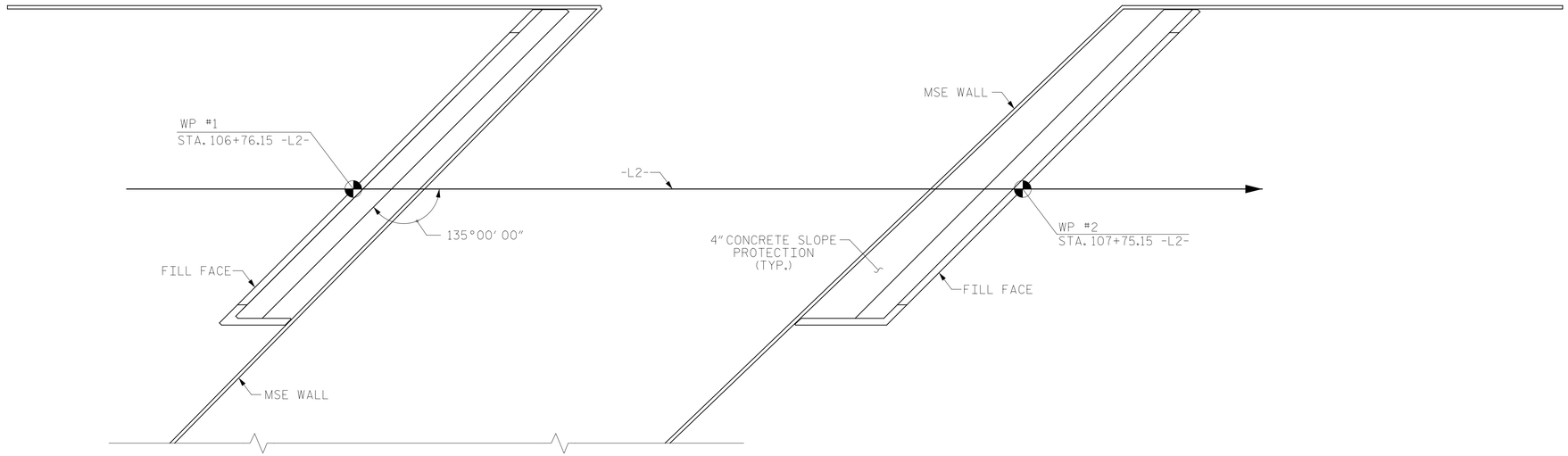
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-23
1			3			TOTAL SHEETS
2			4			24

STR. NO. 3

STD. NO. BAS4

ASSEMBLED BY : T.M. FORD		DATE : 10/11/17
CHECKED BY : R.F. WERTMAN		DATE : 10/17/17
DRAWN BY : FCJ 11/88	REV. 10/1/11	MAA/GM
CHECKED BY : ARB 11/88	REV. 7/12	MAA/GM
	REV. 6/13	MAA/GM



PLAN

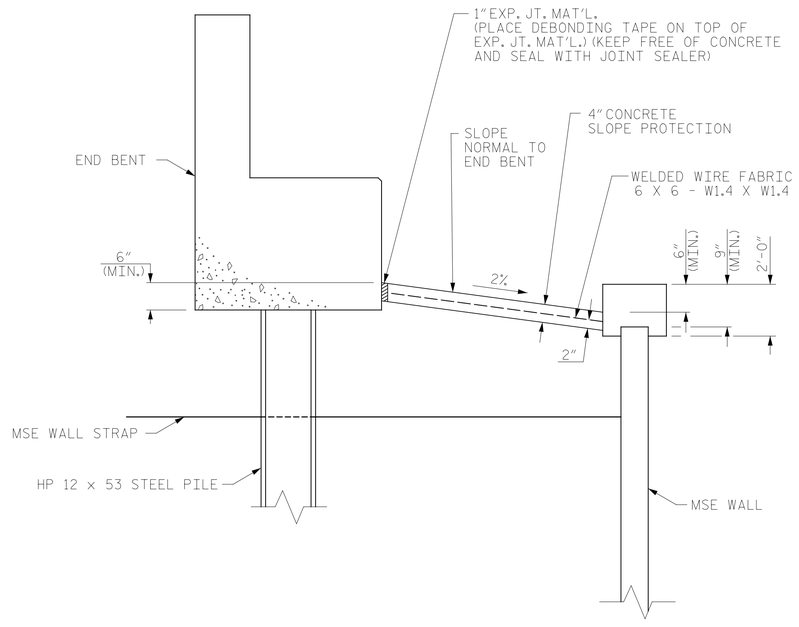
NOTES

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

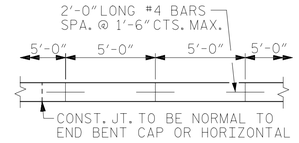
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FINISHED TO THE SATISFACTION OF THE ENGINEER. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 20" WIDE. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 107+16.84 -L2- STA. 13+69.76 -Y-	4 INCH SLOPE PROTECTION	✳ WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	19	34
END BENT 2	34	60

✳ QUANTITY SHOWN IS BASED ON 5' POURS.

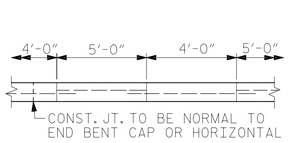


SECTION ALONG ℄ ROADWAY



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



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

OPTIONAL POURING DETAIL

PROJECT NO. 41665.7A

CUMBERLAND COUNTY

STATION: 107+16.84 -L2-
13+69.76 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 037180 ENGINEER RICHARD F WERTMAN

DocuSigned by: Richard F. Wertman 08901A86EBF5470...
11/7/2017

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-24
1			3			TOTAL SHEETS
2			4			24

DRAWN BY : B.A. WHITE DATE : 10/12/17
CHECKED BY : R.F. WERTMAN DATE : 10/17/17
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 11/06/17

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STR. NO. 3

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

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

ENGLISH

JANUARY, 1990

STD. NO. SN