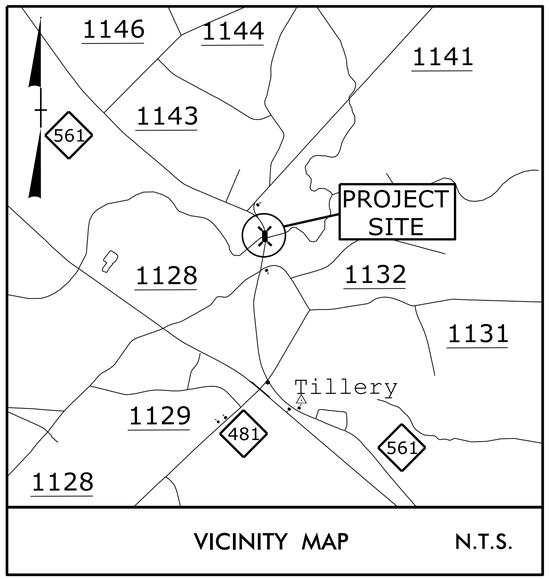
TIP PROJECT: B–5662

CONTRACT: C204489



VICINITY MAP N.T.S.

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

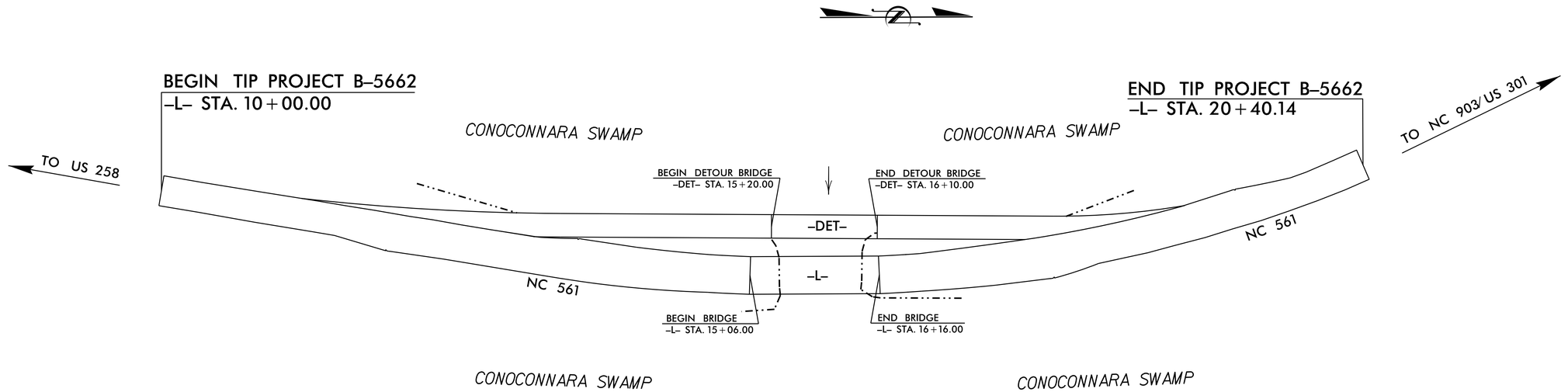
HALIFAX COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–5662		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45617.1.1	–	P.E.
45617.2.1	–	ROW/UTIL.
45617.3.1	–	CONST.

LOCATION: *REPLACE BRIDGE NO. 93 OVER CONOCONNARA SWAMP ON NC 561*

TYPE OF WORK: *GRADING, DRAINAG, PAVING, AND STRUCTURE*



STRUCTURE

DESIGN DATA

ADT 2020 = 1,150
ADT 2040 = 1,400
K = 10 %
D = 55 %
T = 12 % **
* V = 60 MPH
** (TTST 5 %, DUAL 7 %)

FUNC CLASS = MAJOR COLLECTOR

REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–5662 = 0.176 MILES
LENGTH STRUCTURE TIP PROJECT B–5662 = 0.021 MILES

TOTAL LENGTH TIP PROJECT B–5662 = 0.197 MILES

Prepared in the Office of:

DIVISION OF HIGHWAYS

STRUCTURES MANAGEMENT UNIT

1000 BIRCH RIDGE DR.

RALEIGH, N.C. 27610

2018 STANDARD SPECIFICATIONS

LETTING DATE :

FEBRUARY 16, 2021

KRISTY L. W. ALFORD, P.E., CPM

PROJECT ENGINEER

A. G. ABRAHA, P.E.

PROJECT DESIGN ENGINEER

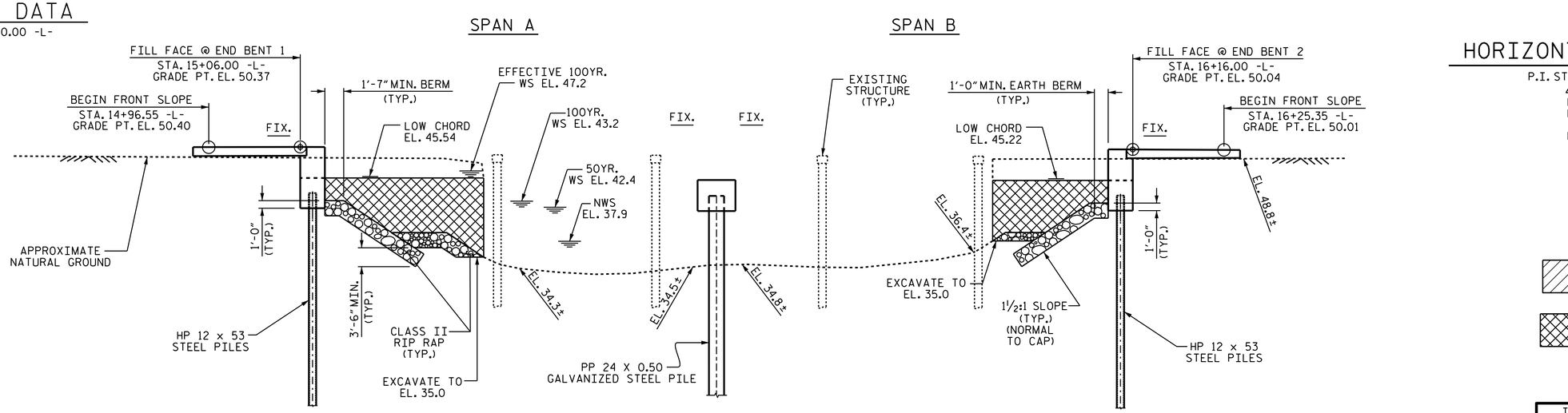
GRADE DATA

(+)0.5097% (-)0.3000%

PI STA. 13+90.00 -L-
EL. = 50.72
VC = 180'

HORIZONTAL CURVE DATA

P.I. STA. = 15+10.79 -L-
△ = 14°-55'-31.0" (LT)
D = 4° 18' 28.6"
L = 346.46'
T = 174.22'
R = 1,330.00'



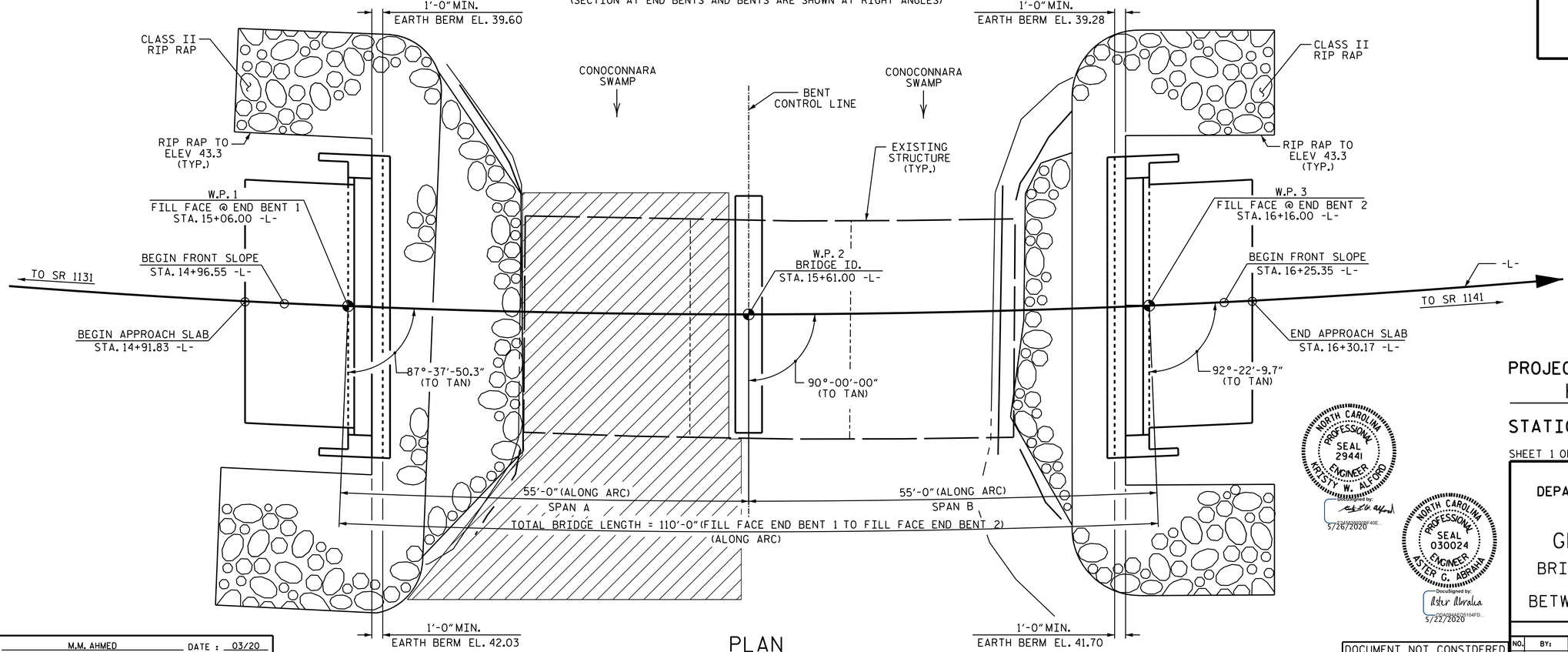
TEMPORARY ACCESS

UNCLASSIFIED STRUCTURE EXCAVATION

NAD 83/2011

SECTION ALONG -L-

(SECTION AT END BENTS AND BENTS ARE SHOWN AT RIGHT ANGLES)



PLAN

(PILES NOT SHOWN FOR CLARITY)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD
DocuSigned by: 5/26/2020

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
DocuSigned by: 5/22/2020

DRAWN BY : M.M. AHMED DATE : 03/20
CHECKED BY : S. WANCE DATE : 04/20
DESIGN ENGINEER OF RECORD: M.M. AHMED DATE : 11/19

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5662
HALIFAX COUNTY
STATION: 15+61.00 -L-

SHEET 1 OF 4 REPLACES BRIDGE #93

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER CONOCONNARA SWAMP ON NC 561 BETWEEN SR 1131 AND SR 1141

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

22-MAY-2020 18:43
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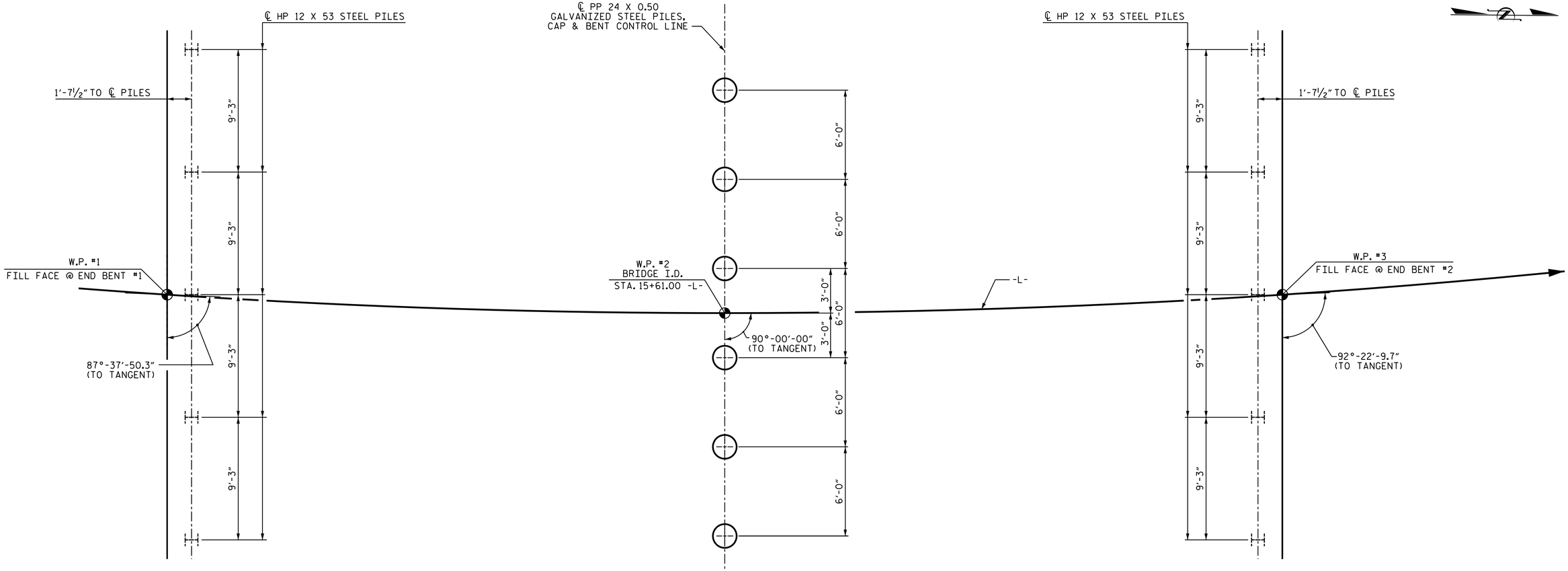

END BENT #1

BENT #1

END BENT #2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE.

NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.

PILES AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 140 TONS PER PILE.

DRIVE PILES AT BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

INSTALL PILES AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN (-)11.0 FT.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 21.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF STRUCTURE.

TESTING THE FIRST TWO PRODUCTION PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED AT BENT NO. 1. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PIPE PILE PLATES ARE REQUIRED FOR STEEL PIPE PILES AT BENT NO. 1. USE PIPE PILE PLATES WITH A DIAMETER EQUAL TO THE PIPE PILE DIAMETER. FOR STEEL PIPE PILE PLATES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OF REDRIVING MAY BE REQUIRED AT END BENT NO. 1 AND END BENT NO. 2. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING FOR END BENTS. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

DRAWN BY :	M.M. AHMED	DATE :	3/20
CHECKED BY :	S. WANCE	DATE :	04/20
DESIGN ENGINEER OF RECORD:	M.M. AHMED	DATE :	11/19

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PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 2 OF 4 REPLACES BRIDGE #93

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ALTER G. ABRALIA

DocuSigned by: Alter Abralia DDA094AED5104FD...

5/22/2020

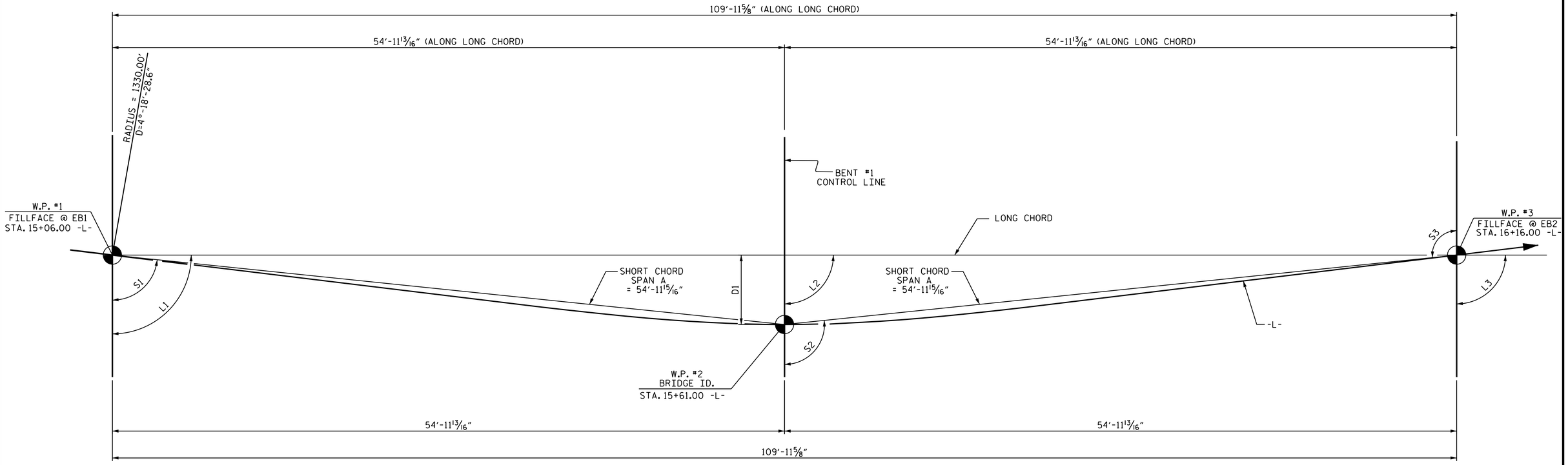
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER CONOCONNARA SWAMP ON NC 561 BETWEEN SR 1131 AND SR 1141

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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



ANGLES			
LONG CHORD		SHORT CHORD	
L1	90°-00′-00″	S1	88°-48′-55″
L2	90°-00′-00″	S2	91°-11′-05″
L3	90°-00′-00″	S3	91°-11′-05″

HORIZONTAL CURVE DATA -L-
P.I. = 15+10.79
Δ = 14° 55′ 31.0″(LT)
D = 4° 18′ 28.6″
T = 174.22′
L = 346.46′
R = 1,330.00′
SE = 0.060

OFFSETS

D1=1′-1⅝″

LONG CHORD LAYOUT

PROJECT NO. B-5662
HALIFAX COUNTY
STATION: 15+61.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER CONOCONNARA SWAMP ON NC 561 BETWEEN SR 1131 AND SR 1141

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
DOA094AED5104FD...
5/22/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DRAWN BY : M.M. AHMED DATE : 3/2020
CHECKED BY : A. ABRAHA DATE : 4/2020
DESIGN ENGINEER OF RECORD: M.M. AHMED DATE : 11/2019

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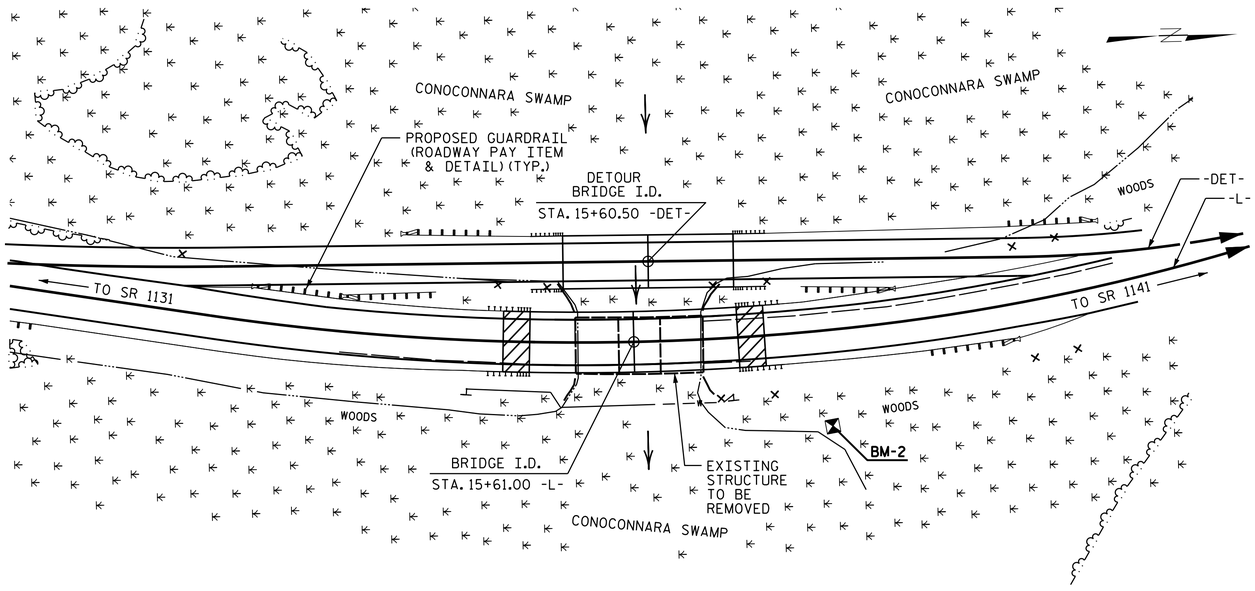
TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STA. 15+61.00 -L-	CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY STRUCTURE AT STA. 15+60.50 -DET-	CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY ACCESS	ASBESTOS ASSESSMENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	36" PRESTRESSED CONCRETE GIRDERS		PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR PP 24 X 0.50 GALVANIZED STEEL PILES	HP 12 X 53 STEEL PILES		PP 24 X 0.50 GALVANIZED STEEL PILES		PIPE PILE PLATES	PILE REDRIVES	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	FIBER OPTIC CONDUIT SYSTEM
	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	EACH	EACH	NO.	LIN. FT.	NO.	LIN. FT.	EACH	EACH	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LIN. FT.
SUPERSTRUCTURE							3,819	3,954		LUMP SUM		8	431.00									216.67			LUMP SUM	212.67
END BENT 1									31.0		4,522			5		5	325				3		415	462		
BENT 1									17.2		2,610				6			6	480	6	3					
END BENT 2									31.0		4,522			5		5	325				3		325	361		
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	4	LUMP SUM	3,819	3,954	79.2	LUMP SUM	11,654	8	431.00	10	6	10	650	6	480	6	9	216.67	740	823	LUMP SUM	212.67

BENCH MARK: B.M.#2 R/R SPIKE IN 16"SYCAMORE, 50.8' RT. OF STA. 16+61.37 -L-, ELEV. 42.33



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	= 2570 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YRS.
DESIGN HIGH WATER ELEVATION	= 42.4 FT.
DRAINAGE AREA	= 37.0 SQ. MI.
BASE DISCHARGE (Q100)	= 3100 CFS
BASE HIGH WATER ELEVATION	= 43.2 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 11000 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YRS.
OVERTOPPING FLOOD ELEVATION	= 49.1 FT.

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE CONISTS OF 2 SPANS, 1 SPAN @ 22'-10" AND 1 SPAN @ 22'-0" WITH A CLEAR ROADWAY WIDTH OF 30.0 FT. WITH RC FLOOR AND CONT. I-BEAMS, END BENTS AND BENTS ARE ON A TIMBER CAPS ON TIMBER PILES.

FOR FIBER OPTIC CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STA. 15+60.50 -DET- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

TEMPORARY ABUTMENT WALLS AND CLASS I RIP RAP ASSOCIATED WITH THE DETOUR STRUCTURE SHALL BE CONSIDERED INCIDENTAL TO THE COST OF CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY STRUCTURE AT STA. 15+60.50 -DET-.

TEMPORARY FILL SHALL NOT BLOCK MORE THAN 50 PERCENT OF THE CHANNEL AT ANY TIME.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTAION 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.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE MATERIAL SHOWN IN THE CROSS HATCHED AREA ON SHEET 1 OF 3 SHALL BE EXCAVATED FOR A DISTANCE OF 34' LEFT AND 40' RIGHT OF CENTERLINE ROADWAY AT END BENT #1, AND 30' LEFT AND 43' RIGHT OF CENTERLINE ROADWAY AT END BENT #2, OR AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION.

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

THE SCOUR CRITICAL ELEVATION FOR BENT NO.1 IS ELEVATION 21.0 FEET. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

FOR INTERIOR BENT, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEETS FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

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 15+61.00 -L-".

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 4 OF 4 REPLACES BRIDGE #93

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Signed by: Aster Abraha DDA094AE05104FD...

12/15/2020

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER CONOCONNARA SWAMP ON NC 561 BETWEEN SR 1131 AND SR 1141

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : M.M. AHMED DATE : 03/20
CHECKED BY : A. ABRAHA DATE : 04/20
DESIGN ENGINEER OF RECORD: M.M. AHMED DATE : 11/19

15-DEC-2020 14:05
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gabraha

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							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	1.268	0.000	1.75	0.782	1.437	A	I	31.52	0.939	1.913	A	I	11.33	0.80	0.782	1.268	A	I	26.27	
		HL-93 (OPERATING)	N/A		1.268	0.000	1.35	0.782	1.862	A	I	31.52	0.939	2.479	A	I	11.33	N/A	0.782	1.268	A	I	26.27	
		HS-20 (INVENTORY)	36.000	2	1.585	57.066	1.75	0.782	1.782	A	I	31.52	0.939	2.256	A	I	11.33	0.80	0.782	1.585	A	I	26.27	
		HS-20 (OPERATING)	36.000		1.585	57.066	1.35	0.782	2.31	A	I	31.52	0.939	2.924	A	I	11.33	N/A	0.782	1.585	A	I	26.27	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.301	44.568	1.40	0.782	4.716	A	I	31.52	0.939	6.129	A	I	21.02	0.80	0.782	3.301	A	I	26.27	
		SNGARBS2	20.000		2.574	51.489	1.40	0.782	3.577	A	I	31.52	0.939	4.566	A	I	11.33	0.80	0.782	2.574	A	I	26.27	
		SNAGRIS2	22.000		2.489	54.762	1.40	0.782	3.414	A	I	31.52	0.939	4.3	A	I	11.33	0.80	0.782	2.489	A	I	26.27	
		SNCOTTS3	27.250		1.646	44.853	1.40	0.782	2.376	A	I	31.52	0.939	3.088	A	I	21.02	0.80	0.782	1.646	A	I	26.27	
		SNAGGRS4	34.925		1.419	49.551	1.40	0.782	2.028	A	I	31.52	0.939	2.692	A	I	11.33	0.80	0.782	1.419	A	I	26.27	
		SNS5A	35.550		1.384	49.216	1.40	0.782	2.01	A	I	31.52	0.939	2.787	A	I	11.33	0.80	0.782	1.384	A	I	26.27	
		SNS6A	39.950		1.289	51.498	1.40	0.782	1.86	A	I	31.52	0.939	2.591	A	I	11.33	0.80	0.782	1.289	A	I	26.27	
		SNS7B	42.000		1.228	51.588	1.40	0.782	1.773	A	I	31.52	0.939	2.613	A	I	11.33	0.80	0.782	1.228	A	I	26.27	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.578	52.061	1.40	0.782	2.323	A	I	31.52	0.939	3.044	A	I	11.33	0.80	0.782	1.578	A	I	26.27	
		TNT4A	33.075		1.59	52.584	1.40	0.782	2.256	A	I	31.52	0.939	2.916	A	I	11.33	0.80	0.782	1.59	A	I	26.27	
		TNT6A	41.600		1.319	54.858	1.40	0.782	1.899	A	I	31.52	0.939	2.873	A	I	11.33	0.80	0.782	1.319	A	I	26.27	
		TNT7A	42.000		1.336	56.093	1.40	0.782	1.91	A	I	31.52	0.939	2.654	A	I	11.33	0.80	0.782	1.336	A	I	26.27	
		TNT7B	42.000		1.393	58.526	1.40	0.782	1.94	A	I	31.52	0.939	2.502	A	I	11.33	0.80	0.782	1.393	A	I	26.27	
		TNAGRIT4	43.000		1.32	56.748	1.40	0.782	1.85	A	I	31.52	0.939	2.406	A	I	11.33	0.80	0.782	1.32	A	I	26.27	
		TNAGT5A	45.000		1.235	55.596	1.40	0.782	1.783	A	I	31.52	0.939	2.467	A	I	11.33	0.80	0.782	1.235	A	I	26.27	
		TNAGT5B	45.000	3	1.213	54.573	1.40	0.782	1.728	A	I	31.52	0.939	2.28	A	I	11.33	0.80	0.782	1.213	A	I	26.27	

LOAD FACTORS:

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

NOTES:

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

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

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

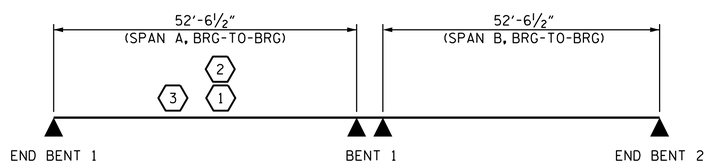
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-5662
HALIFAX COUNTY
STATION: 15+61.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
DDA094AED5104FD...
5/22/2020

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			30

STD. NO. LRFR1

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ASSEMBLED BY : A. Y. GODFREY DATE : 04/2020
CHECKED BY : A.ABRAHA DATE : 04/2020
DRAWN BY : MAA 1/08
CHECKED BY : GM/DI 2/08

REV. 11/12/08RR	MAA/GM
REV. 10/1/11	MAA/GM
REV. 12/17	MAA/THC

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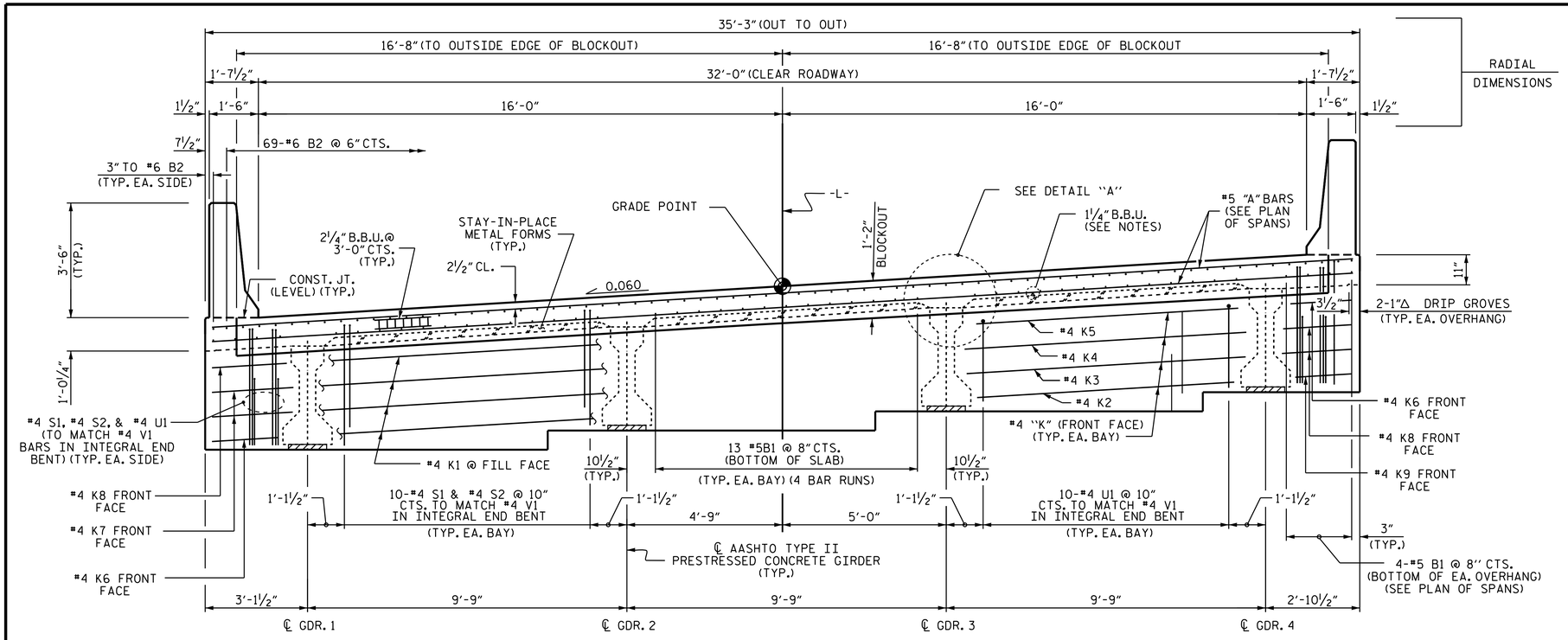
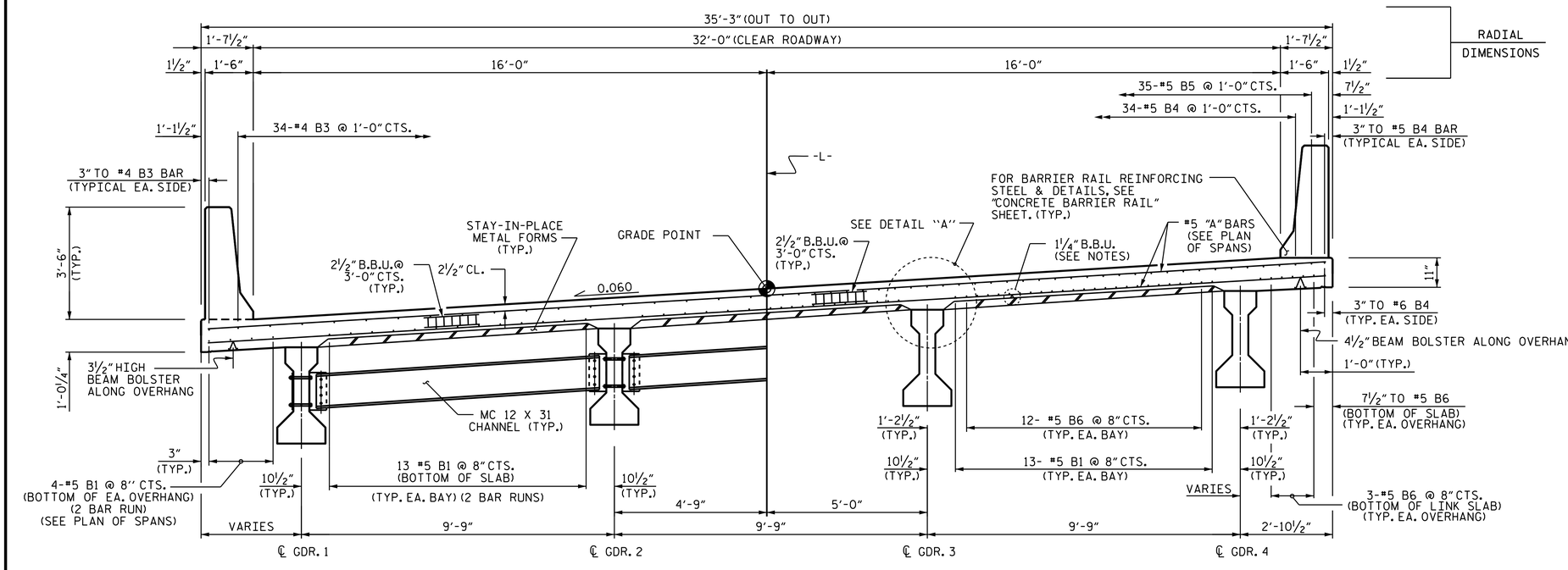
aabraha



TYPICAL SECTION @ INTEGRAL END BENT

SHOWING ABUTMENT WALL AT FILL FACE OF END BENTS. WINGS NOT SHOWN FOR CLARITY.



HALF SECTION @ MIDSPAN

HALF SECTION - LINK SLAB @ BENT

TYPICAL SECTION

NOTES

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

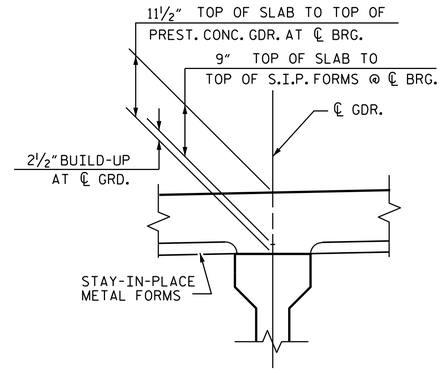
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

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

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

METAL STAY IN-PLACE FORMS SHALL NOT BE WELDED TO THE SUPPORT ANGLES WITHIN THE LINK SLAB AREA. SEE "PLAN OF SPANS" SHEETS FOR LOCATION.



DETAIL "A"

PROJECT NO. B-5662

HALIFIX COUNTY

STATION: 15+61.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER C. ABRAHA

DocuSigned by: Aster Abraha 2DA094AED5104FD...
5/22/2020

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : A. Y. GODFREY DATE : 02/2020
CHECKED BY : S. WANCE DATE : 04/2020
DESIGN ENGINEER OF RECORD: M. M. AHMED DATE : 10/2019

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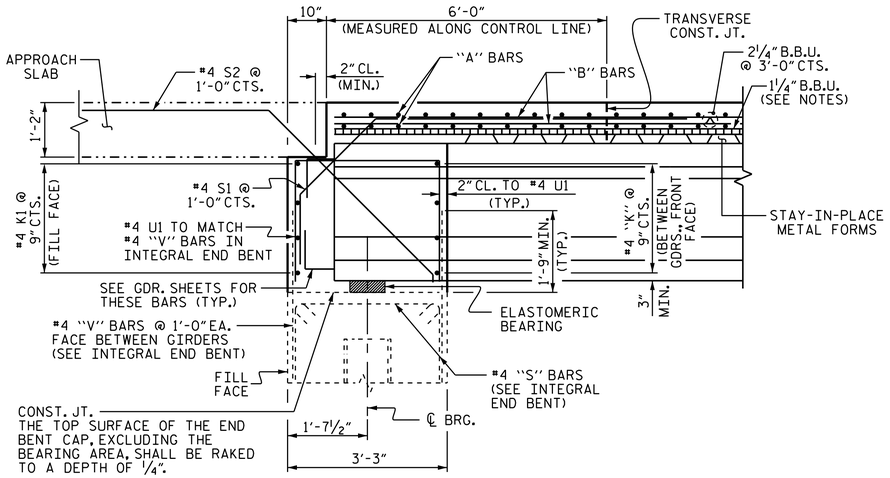
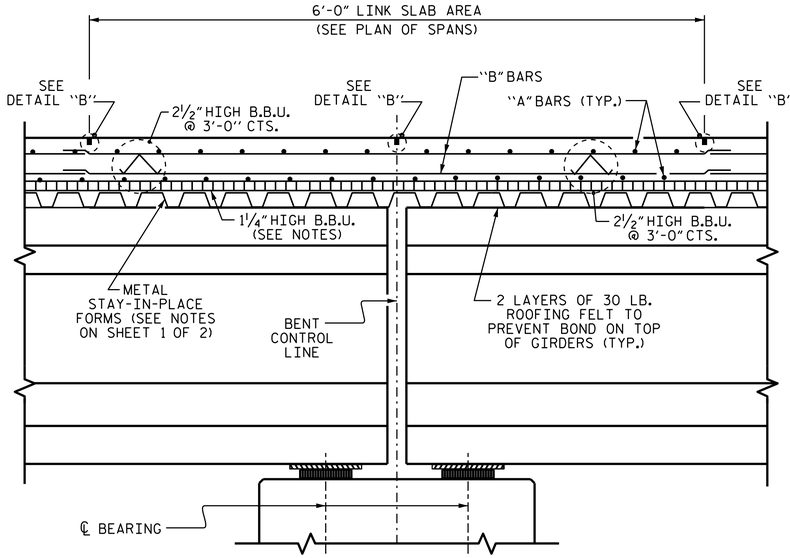
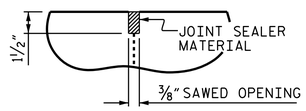


SECTION @ INTEGRAL END BENT

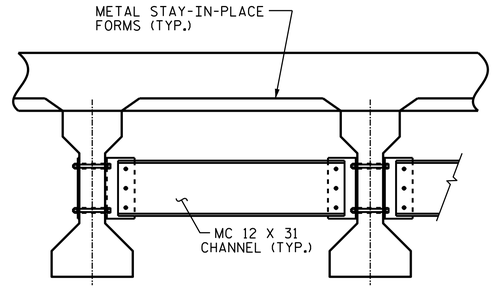


SECTION @ LINK SLAB



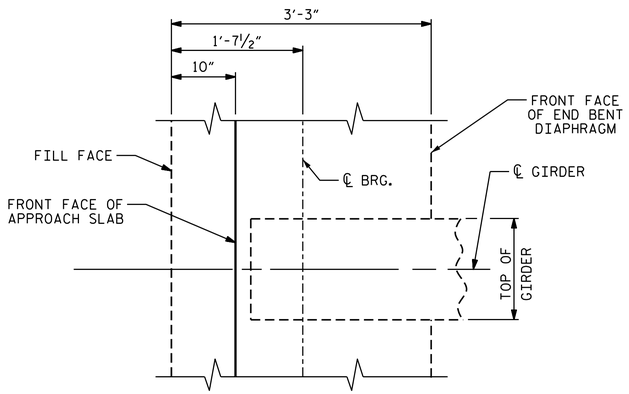
DETAIL "B"

A 1½" DEEP CONTRACTION JOINT AT BENT CONTROL LINE AND EDGE OF LINK SLAB AREA SHALL BE SAWN WITHIN 24 HOURS OF POURINGTHE DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE B LOW MODULUS SILICONE SEALANT. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

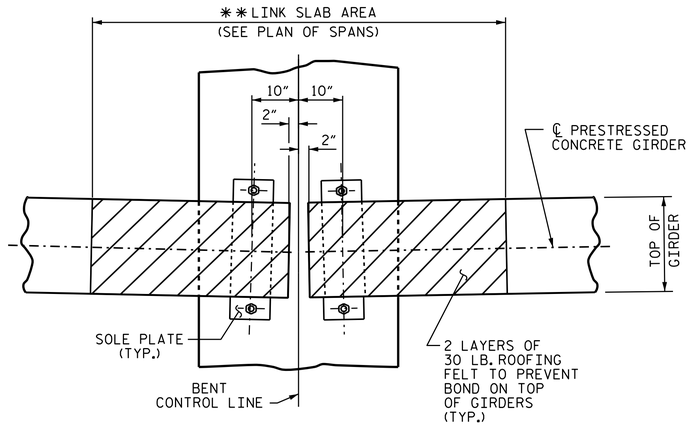


TYPICAL INTERMEDIATE DIAPHRAGM

SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE II PRESTRESSED CONCRETE GIRDERS" SHEET FOR DETAILS.



PLAN @ INTEGRAL END BENT



PLAN @ BENT

**THE TOP OF THE GIRDER IN THE AREA OF THE LINK SLAB SHALL BE SMOOTH AND FREE OF STIRRUPS OR ANCHOR STUDS.

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRALIA

DocuSigned by: Aster Abralia DDA094AED5104FD...

5/22/2020

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			30

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DRAWN BY : A. Y. GODFREY DATE : 02/2020
CHECKED BY : S. WANCE DATE : 04/2020
DESIGN ENGINEER OF RECORD: M. M. AHMED DATE : 10/2019

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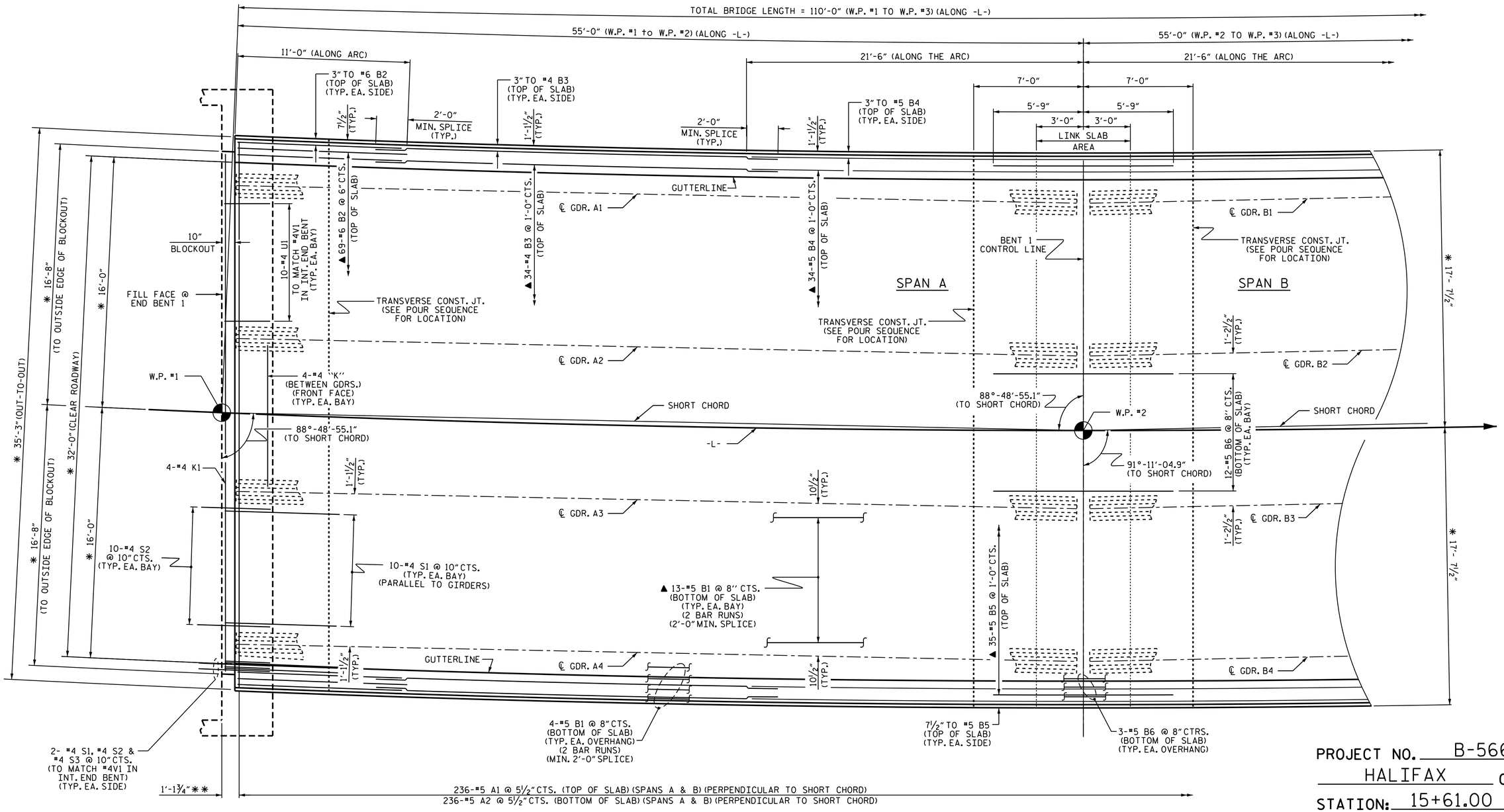

PLAN OF SPAN "A"

FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGM" SHEET.

FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE FRAMING PLAN.

* RADIAL DIMENSIONS

* * MEASURED ALONG SURVEY LINE

▲ BARS TO BE LAID OUT ALONG ARC

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

DocuSigned by: Aster Abraha DDA094AED5104FD...

5/22/2020

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			30

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DRAWN BY : A. Y. GODFREY DATE : 03/2020
CHECKED BY : S. WANCE DATE : 04/2020
DESIGN ENGINEER OF RECORD: M. M. AHMED DATE : 10/2019

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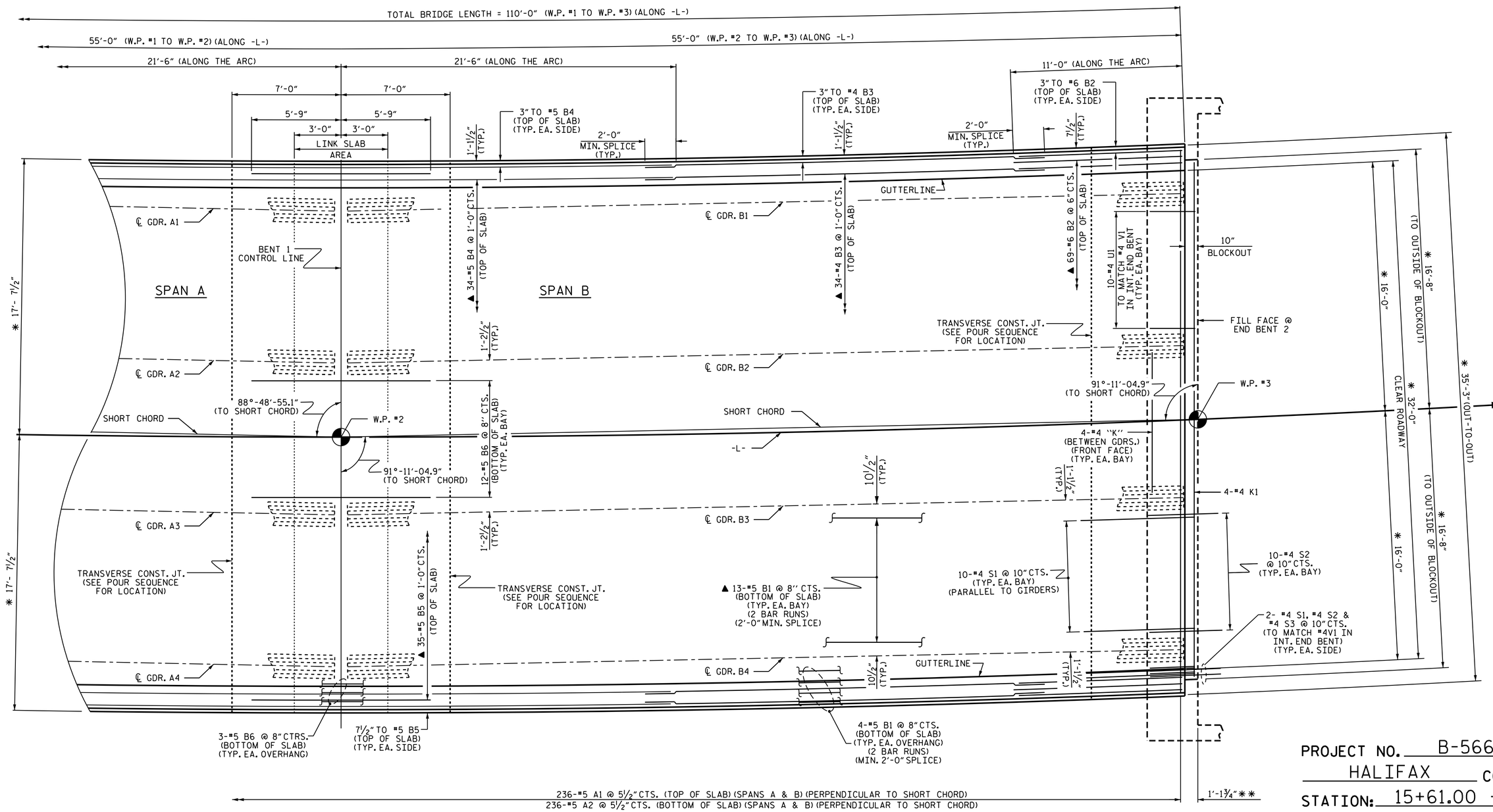

PLAN OF SPAN "B"

FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGM" SHEET.

FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE FRAMING PLAN.

* RADIAL DIMENSIONS

** MEASURED ALONG SURVEY LINE

▲ BARS TO BE LAID OUT ALONG ARC

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
DDA094AED5104FD...
5/22/2020

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : A. Y. GODFREY DATE : 03/2020
CHECKED BY : S. WANCE DATE : 04/2020
DESIGN ENGINEER OF RECORD: M. M. AHMED DATE : 10/2019

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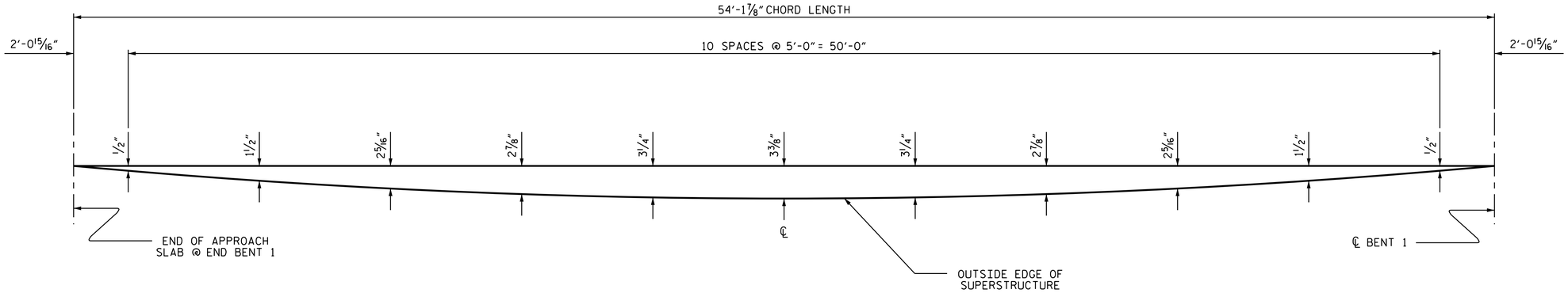
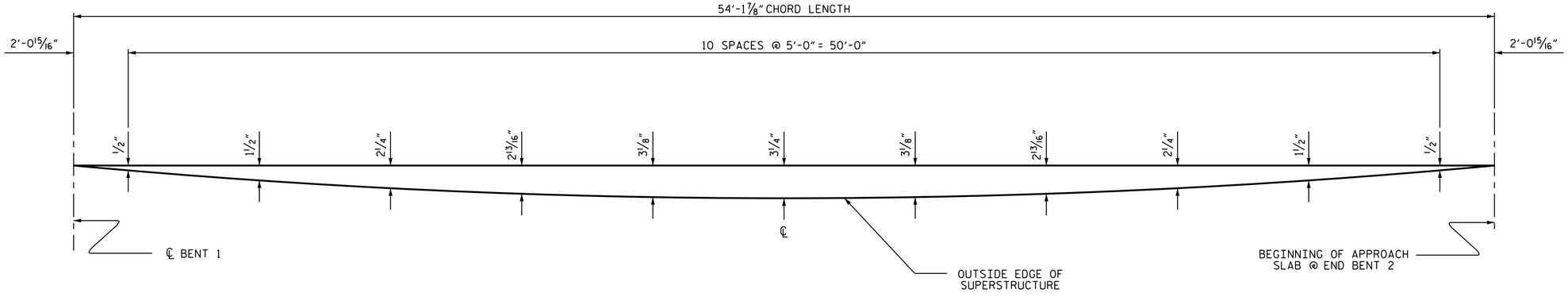


OUTSIDE LEFT OVERHANG ARC OFFSETS SPANS A & B



OUTSIDE RIGHT OVERHANG ARC OFFSETS SPANS A & B

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ARC OFFSETS

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
DOCUSIGNED BY: DOA094AED5104FD...
5/22/2020

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : A. Y. GODFREY DATE : 03/2020
CHECKED BY : S. WANCE DATE : 04/2020
DESIGN ENGINEER OF RECORD: M. M. AHMED DATE : 12/2019

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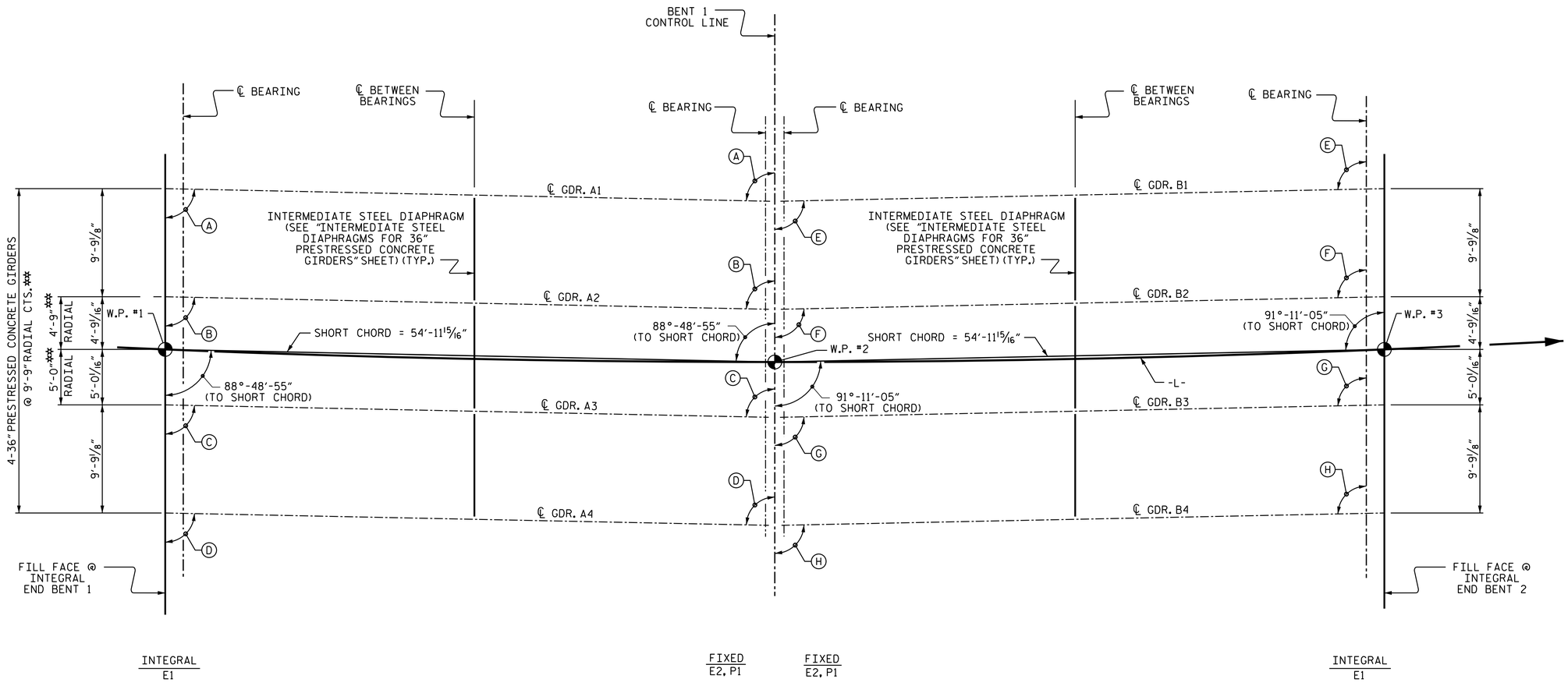

SPAN A

SPAN B

GIRDER LAYOUT

** DIMENSIONS SHOWN ARE TO ARCS CONCENTRIC WITH -L-.
GIRDERS ARE ON THE CHORDS OF THESE CONCENTRIC ARCS.

ANGLES			
A	88°-48'-08"	E	91°-11'-52"
B	88°-48'-40"	F	91°-11'-20"
C	88°-49'-11"	G	91°-10'-49"
D	88°-49'-42"	H	91°-10'-18"

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
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5/22/2020

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE FRAMING PLAN

DRAWN BY : M. AHMED DATE : 04/20
CHECKED BY : S. WANCE DATE : 04/20
DESIGN ENGINEER OF RECORD: M.M. AHMED DATE : 11/19

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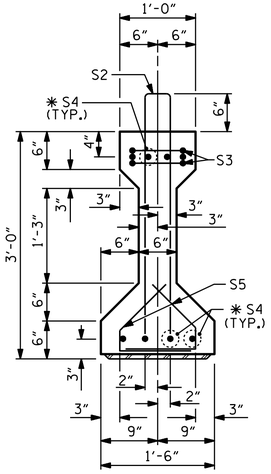
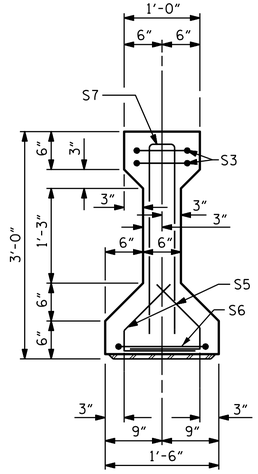
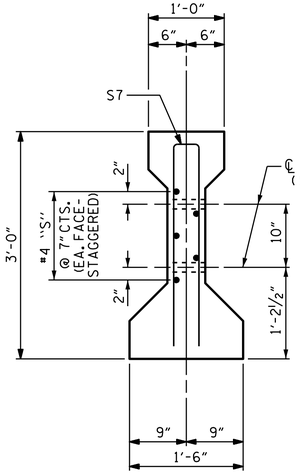
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			30



SECTION A-A

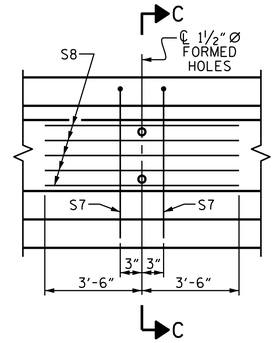


SECTION B-B



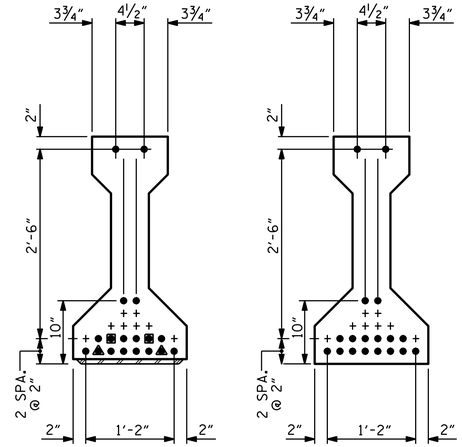
SECTION C-C

(S1 BARS NOT SHOWN)



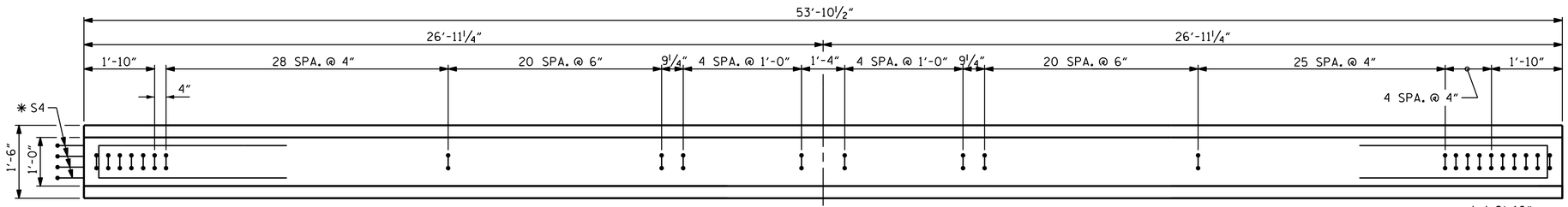
PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1-4

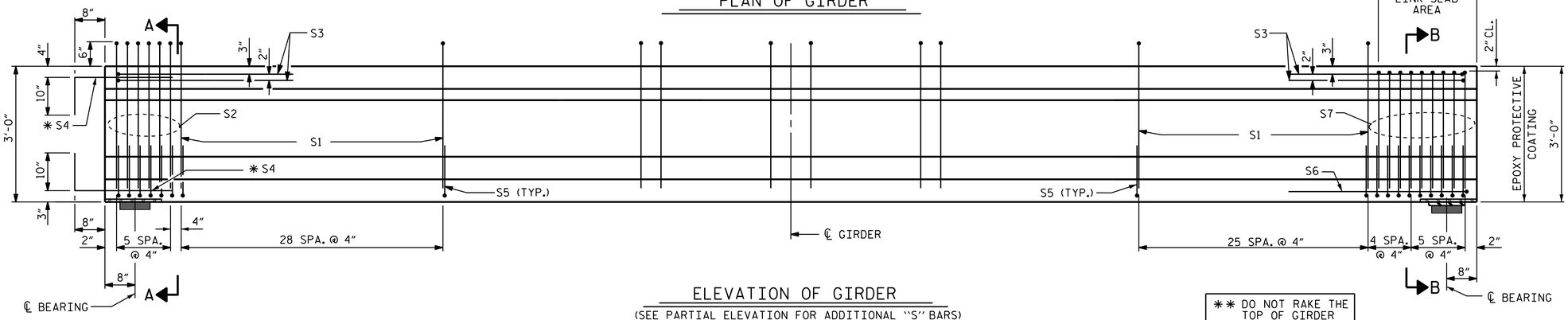


0.6" Ø LOW RELAXATION STRAND LAYOUT

▲ STRANDS DEBONDED 12'-0" FROM END OF GIRDER
● STRANDS DEBONDED 6'-0" FROM END OF GIRDER



PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)
(SPAN A SHOWN, SPAN B SIMILAR BY ROTATION)

✱✱ DO NOT RAKE THE TOP OF GIRDER IN THIS AREA

0.6" Ø L. R. GRADE 270 STRANDS

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

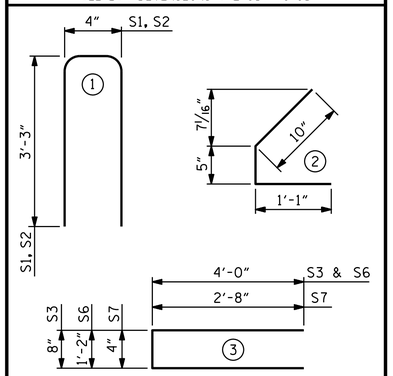
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	108	#4	1	6'-10"	493
S2	6	#5	1	6'-10"	43
S3	4	#4	3	8'-8"	23
✱S4	8	#5	STR	3'-8"	31
S5	140	#4	2	2'-4"	218
S6	1	#4	3	9'-2"	6
S7	11	#5	3	5'-8"	65
S8	5	#4	STR	7'-0"	23

✱NOTE: S4 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	7000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
	902	5.1	18

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	53'-10½"	431.0

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
AASHTO TYPE II
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
(SPANS A & B)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			30

DESIGN ENGINEER OF RECORD: M.M. AHMED DATE : 03/20

ASSEMBLED BY : M.M. AHMED DATE : 03/20
CHECKED BY : A.ABRAHA DATE : 04/20

DRAWN BY : ELR 8/91
CHECKED BY : GRP 8/91

REV. 10/1/11 MAA/GM
REV. 1/15 MAA/TMG
REV. 12/17 MAA/THC

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
Aster Abraha
5/22/2020

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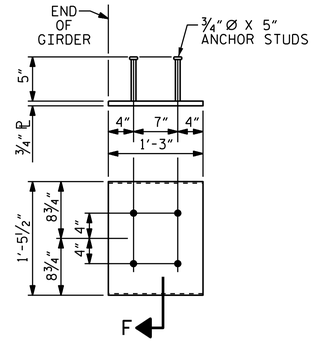
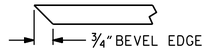
STD. NO. PCG4 (Sht. 2)



EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE II GIRDER

(2 REQ'D PER GIRDER)



SECTION "F"

(SEE NOTES)

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6100 PSI.

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

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4" AND LINK SLAB AREA, SHALL BE RAKED TO A DEPTH OF ¼".

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPANS A & B																						
0.6" Ø LOW RELAXATION	EXTERIOR GIRDERS 1 & 4																					
TWENTIETH POINTS	0	.05	.1	.15	.2	.25	.3	.35	.4	.45	.5	.55	.6	.65	.7	.75	.8	.85	.9	.95	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.018	0.035	0.051	0.067	0.079	0.092	0.099	0.107	0.110	0.113	0.110	0.107	0.099	0.092	0.079	0.067	0.051	0.035	0.018	0
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.010	0.020	0.029	0.038	0.045	0.052	0.057	0.061	0.063	0.064	0.063	0.061	0.057	0.052	0.045	0.038	0.029	0.020	0.010	0
FINAL CAMBER ↑	0	1/16"	3/16"	1/4"	3/8"	7/16"	1/2"	1/2"	9/16"	9/16"	9/16"	9/16"	9/16"	1/2"	1/2"	7/16"	3/8"	1/4"	3/16"	1/16"	0
SPANS A & B																						
0.6" Ø LOW RELAXATION	INTERIOR GIRDERS 2 & 3																					
TWENTIETH POINTS	0	.05	.1	.15	.2	.25	.3	.35	.4	.45	.5	.55	.6	.65	.7	.75	.8	.85	.9	.95	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.018	0.035	0.051	0.066	0.079	0.091	0.099	0.107	0.109	0.112	0.109	0.107	0.099	0.091	0.079	0.066	0.051	0.035	0.018	0
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.012	0.024	0.034	0.045	0.053	0.062	0.067	0.072	0.074	0.076	0.074	0.072	0.067	0.062	0.053	0.045	0.034	0.024	0.012	0
FINAL CAMBER ↑	0	1/16"	1/8"	3/16"	1/4"	5/16"	3/8"	3/8"	7/16"	7/16"	7/16"	7/16"	7/16"	3/8"	3/8"	5/16"	1/4"	3/16"	1/8"	1/16"	0

✱ INCLUDES FUTURE WEARING SURFACE.

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

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
DocuSigned by: DDA094AED5104FD...
5/22/2020

DESIGN ENGINEER OF RECORD: M.M. AHMED DATE : 03/20

ASSEMBLED BY : M.M. AHMED/A.Y.G. DATE : 05/20
CHECKED BY : S. WANCE DATE : 05/2020

DRAWN BY : ELR 11/91
CHECKED BY : GRP 11/91

REV. 1/15 MAA/TMG
REV. 2/15 MAA/TMG
REV. 12/17 MAA/THC

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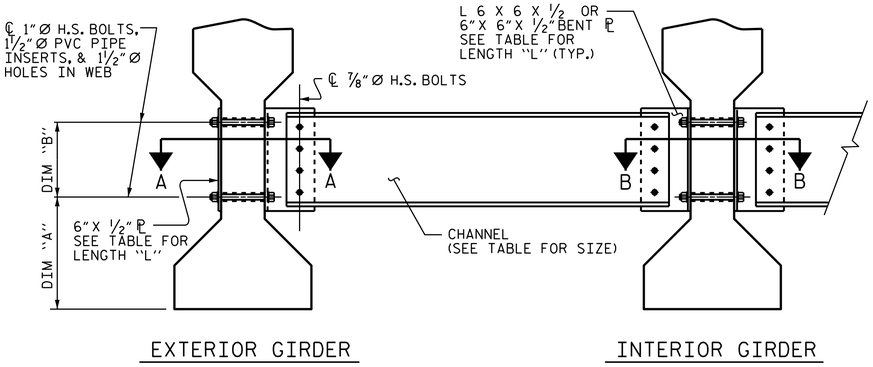
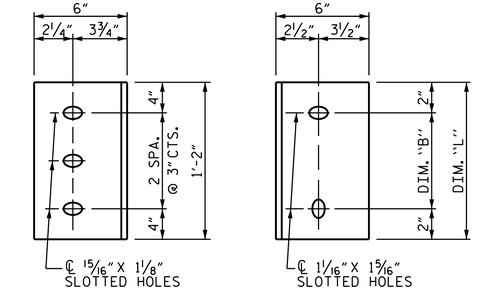


EXTERIOR GIRDER INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE WEB FACE

CONNECTOR PLATE DETAILS

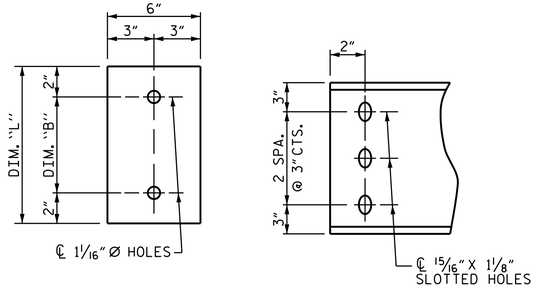
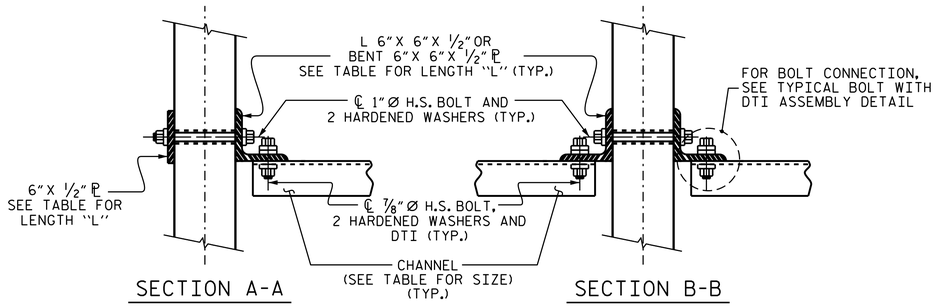
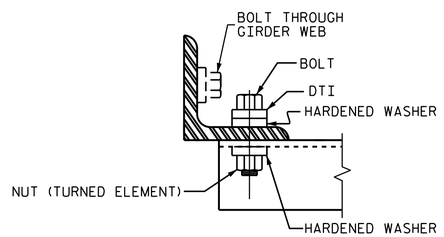


PLATE DETAILS CHANNEL END



SECTION A-A SECTION B-B

CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

STRUCTURAL STEEL NOTES

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

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

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

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

FOR METALLIZATION, APPLY A THERMAL SPRAYED COATING WITH A SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM, THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

FOR METALLIZATION, APPLY 1 COAT EACH OF 1080-12 BROWN AND 1080-12 GRAY PAINT ON THE EDGES AND THE WEB FACE OF THE CONNECTOR PLATE WHICH COMES IN CONTACT WITH THE CONCRETE GIRDER IN ACCORDANCE WITH SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

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

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

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

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

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

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

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
II	MC 12 x 31	1'-2½"	10"	1'-2"

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

DocuSigned by: Aster Abraha DDA094AED5104FD...

5/22/2020

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE II PRESTRESSED CONCRETE GIRDERS

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ASSEMBLED BY : M.M. AHMED	DATE : 03/20		
CHECKED BY : A.ABRAHA	DATE : 04/20		
DRAWN BY : TLA 6/05	REV. 5/1/06RRR	KMM/GM	
CHECKED BY : VC 6/05	REV. 10/1/11	MAA/GM	
	REV. 12/17	MAA/THC	

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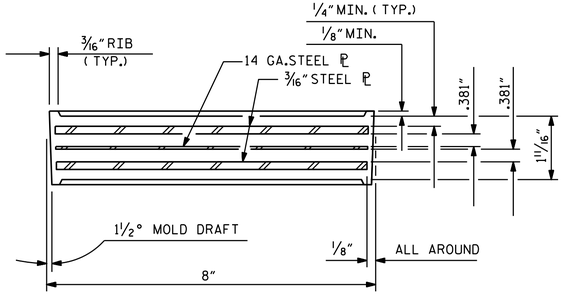
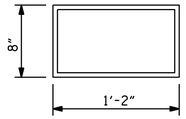


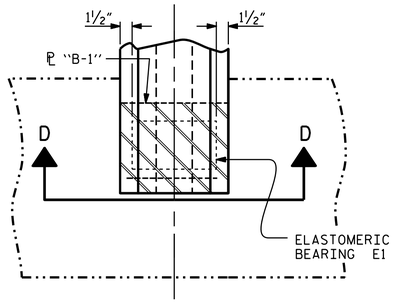
TYPICAL SECTION OF ELASTOMERIC BEARINGS



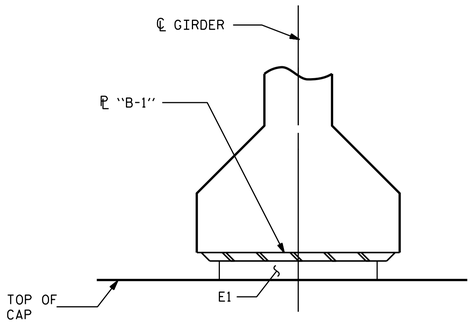
E1 (8 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

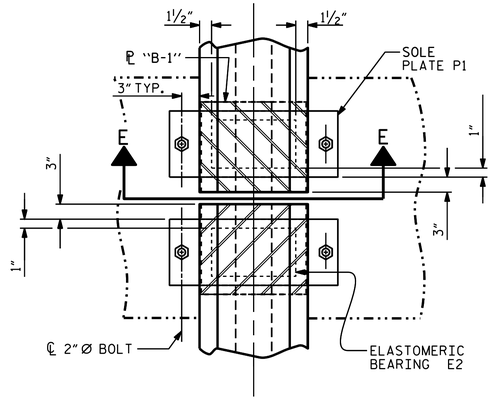
TYPE II



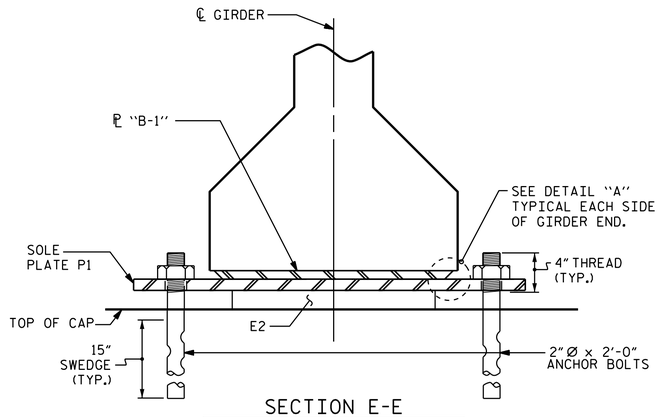
TYPICAL PLAN OF INTEGRAL END BENT



SECTION D-D



TYPICAL PLAN
(SHOWING CONTINUOUS BENT)



SECTION E-E

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.

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

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

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

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

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, AND NUTS. SHOP INSPECTION IS REQUIRED.

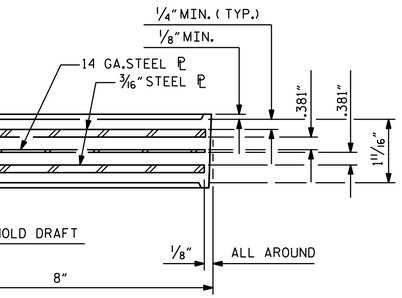
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

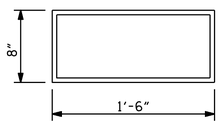
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE II	145 k
TYPE III	166 k



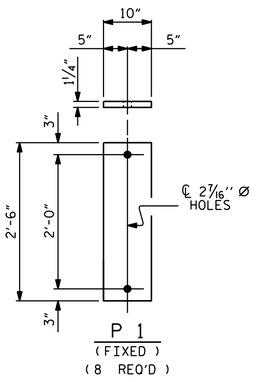
TYPICAL SECTION OF ELASTOMERIC BEARINGS



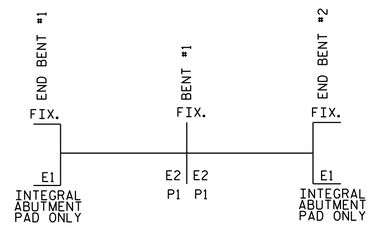
E2 (8 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

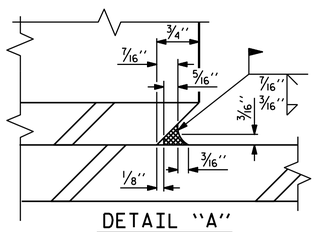
TYPE III



SOLE PLATE DETAILS P1



SOLE PLATE LOCATION SKETCH



DETAIL "A"

PROJECT NO. B-5662
HALIFAX COUNTY
STATION: 15+61.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Digitally signed by: Aster Abraha
DocuSigned by: DDA0944AED5104FD...
5/22/2020

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ASSEMBLED BY : S. WANCE	DATE : 02/2020	
CHECKED BY : A. G. ABRAHA	DATE : 03/2020	
DRAWN BY : EEM 2/97	REV. 6/13	AAC/MAA
CHECKED BY : VAP 2/97	REV. 1/15	MAA/TMG
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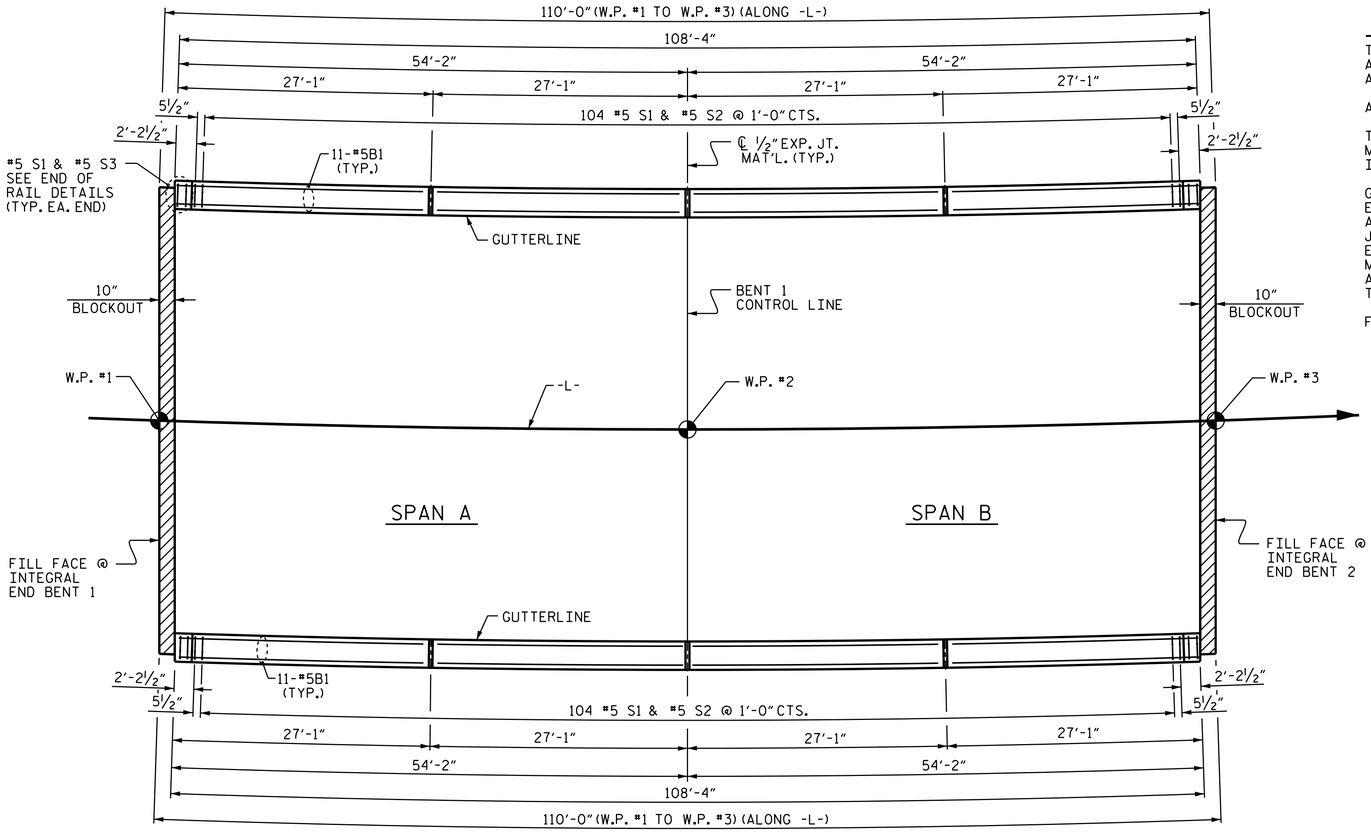


PLAN

DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE FACE OF BARRIER RAIL

NOTES

THE BARRIER RAIL IN A CONTINUOUS 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.

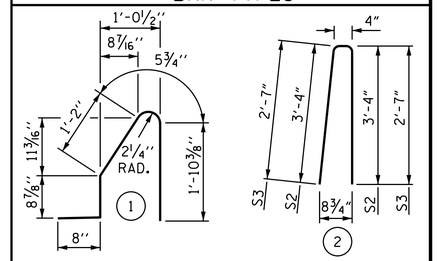
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S1 AND #5 S2 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2″ MINIMUM CLEARANCE TO ½″ EXPANSION JOINT MATERIAL IN THE BARRIER RAIL.

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.

FOR FIBER OPTIC CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.

BAR TYPES

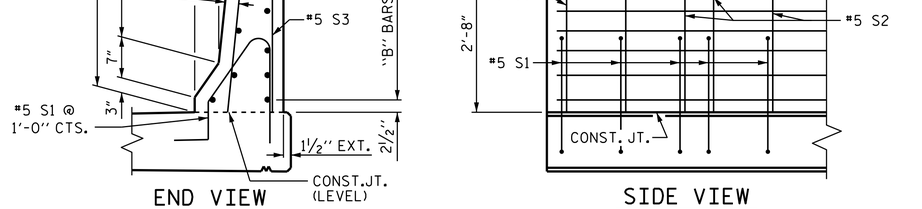


ALL BAR DIMENSIONS ARE OUT TO OUT

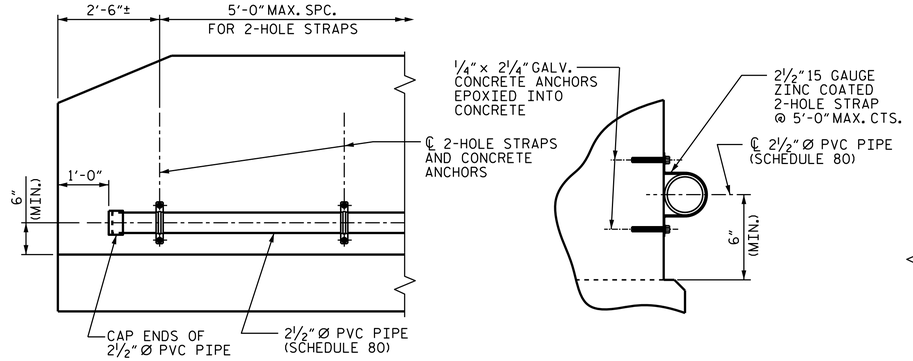
BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B1	88	#5	STR	26′-8″	2,448
✳ S1	220	#5	1	4′-11″	1,128
✳ S2	212	#5	2	7′-0″	1,548
✳ S3	8	#5	2	5′-6″	46
✳ EPOXY COATED REINFORCING STEEL					5,170 LBS.
CLASS AA CONCRETE					29.5 CU. YDS.
CONCRETE BARRIER RAIL					216.67 LIN. FT.

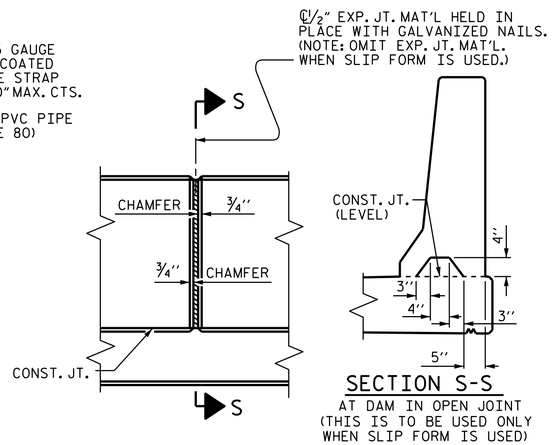


END OF RAIL DETAILS



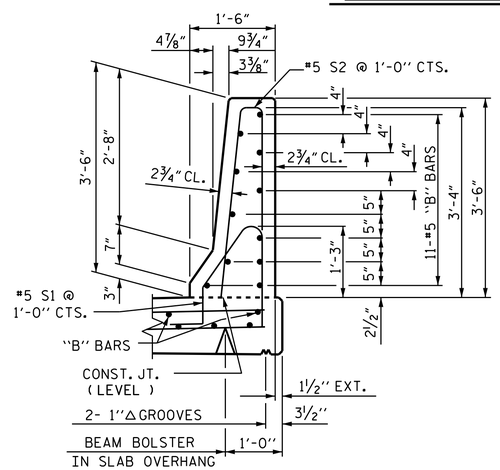
FIBER OPTIC CONDUIT SYSTEM DETAILS

2½″ Ø SCHEDULE 80 PVC PIPE ATTACHED TO THE BACK OF BOTH RAILS FOR FUTURE FIBER OPTIC CABLE.



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS



SECTION THRU RAIL

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRALIA

Docusigned by: Aster Abralia DDA094AED5104FD...

5/22/2020

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DRAWN BY : A. Y. GODFREY DATE : 03/2020
CHECKED BY : M. M. AHMED DATE : 04/2020
DESIGN ENGINEER OF RECORD: M. M. AHMED DATE : 10/2019

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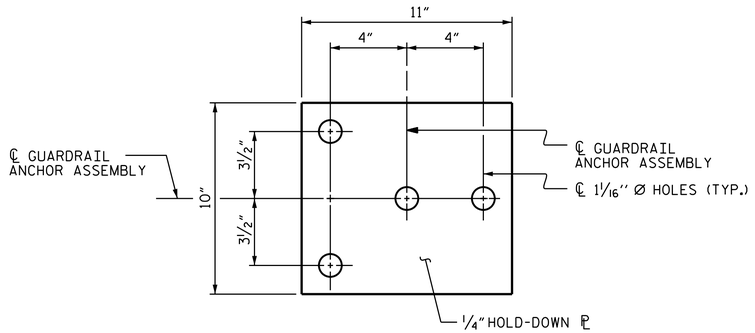
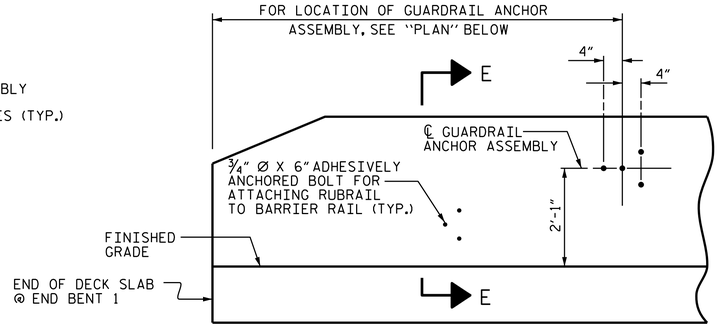
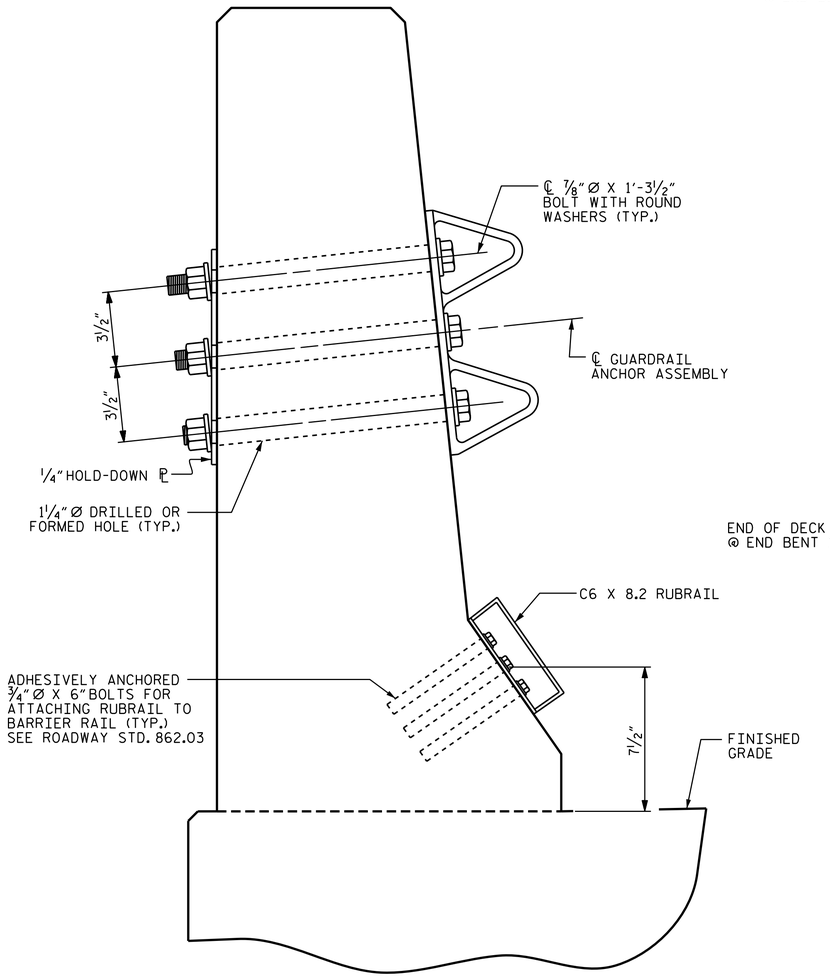


PLAN

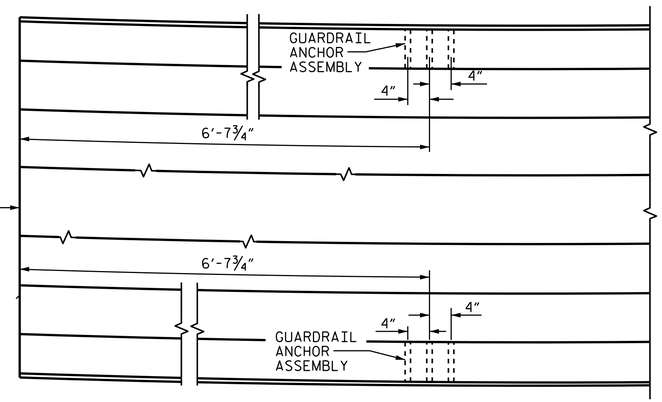


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

NOTES

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

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

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

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

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

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

THE 1 ¼" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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

SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER C. ABRAHA

DocuSigned by: Aster Abralia DOA094AED5104FD...

5/22/2020

ASSEMBLED BY : A. Y. GODFREY	DATE : 03/2020
CHECKED BY : M. M. AHMED	DATE : 04/2020
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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(SHT 1) STD. NO. GRA2

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPETS, AND BARRIER RAILS		APPROACH SLABS		PARAPETS AND BARRIER RAILS
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"
#7	4'-2"	2'-9"			
#8	4'-9"	3'-2"			

CLASS AA CONCRETE BREAKDOWN

SPANS A & B	(CU. YDS.)
POUR #1	94.6
POUR #2	16.0
POUR #3	40.1
TOTAL **	150.7

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS

APPROACH SLABS	822	SQ.FT.
BRIDGE DECK	3,132	SQ.FT.
TOTAL	3,954	SQ.FT.

REINFORCING BAR SCHEDULE

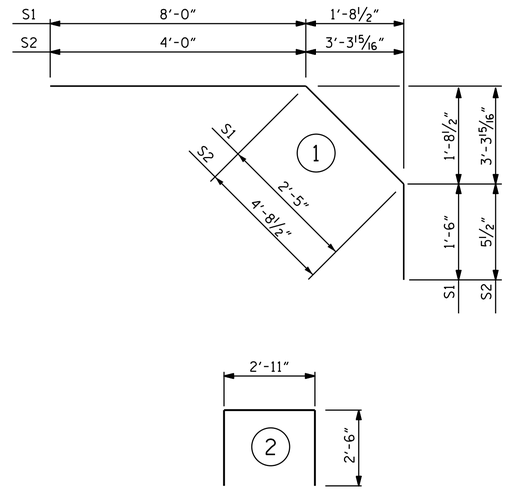
SPANS "A & B"

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
* A1	236	#5	STR.	34'-10"	8,574
A2	236	#5	STR.	34'-10"	8,574
B1	94	#5	STR.	55'-0"	5,392
* B2	142	#6	STR.	10'-10"	2,311
* B3	72	#4	STR.	25'-8"	1,234
* B4	36	#5	STR.	43'-0"	1,615
* B5	35	#5	STR.	11'-6"	420
B6	42	#5	STR.	11'-6"	504
K1	8	#4	STR.	34'-10"	186
K2	6	#4	STR.	7'-11"	32
K3	6	#4	STR.	8'-9"	35
K4	6	#4	STR.	8'-11"	36
K5	6	#4	STR.	8'-5"	34
K6	4	#4	STR.	2'-0"	5
K7	4	#4	STR.	2'-6"	7
K8	6	#4	STR.	2'-3"	9
K9	2	#4	STR.	1'-9"	2
* S1	68	#4	1	12'-11"	587
* S2	68	#4	1	9'-2"	416
U1	68	#4	2	7'-11"	360

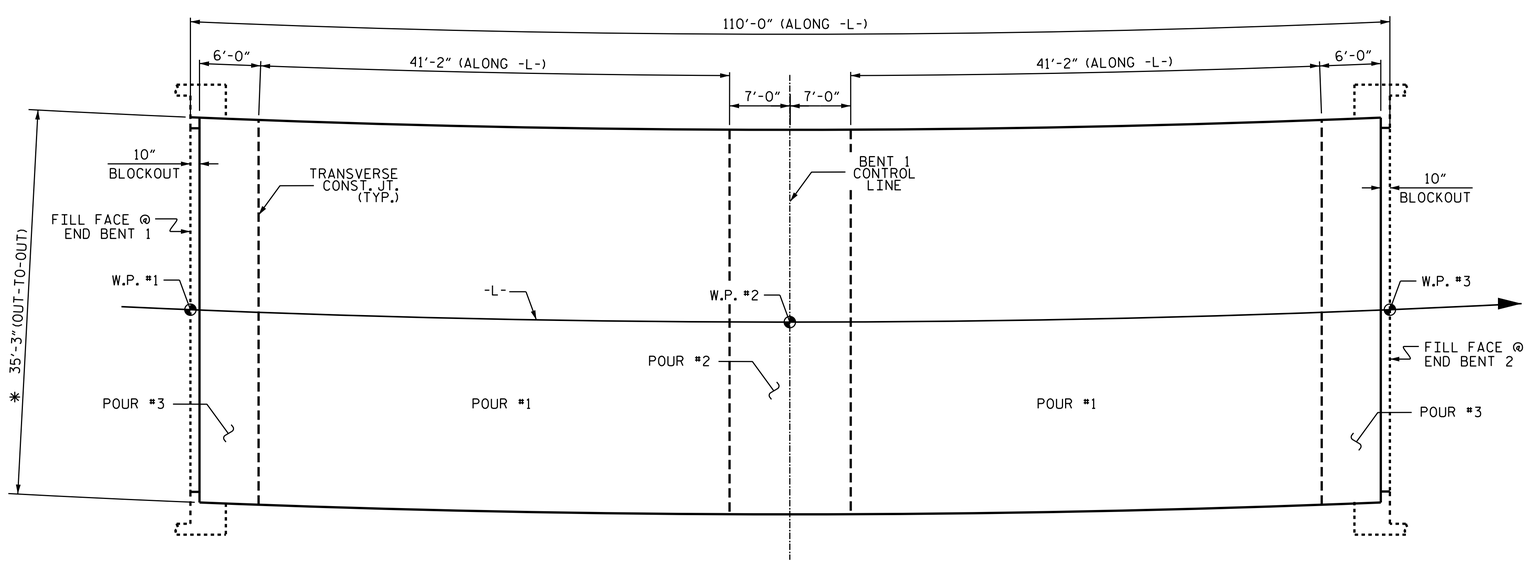
REINFORCING STEEL 15,176

* EPOXY COATED REINFORCING STEEL 15,157

BAR TYPES

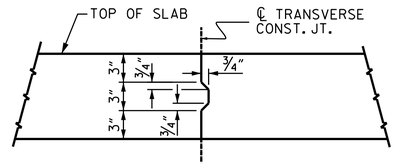


ALL BAR DIMENSIONS ARE OUT TO OUT



POURING SEQUENCE AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 3,819)

*MEASURED RADIALLY



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Digitally signed by: Aster Abraha
DOA094AED5104FD...
5/22/2020

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SHEET NO. S-18

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DRAWN BY : A. Y. GODFREY DATE : 03/2020
CHECKED BY : S. WANCE DATE : 04/2020
DESIGN ENGINEER OF RECORD: M. M. AHMED DATE : 12/2019

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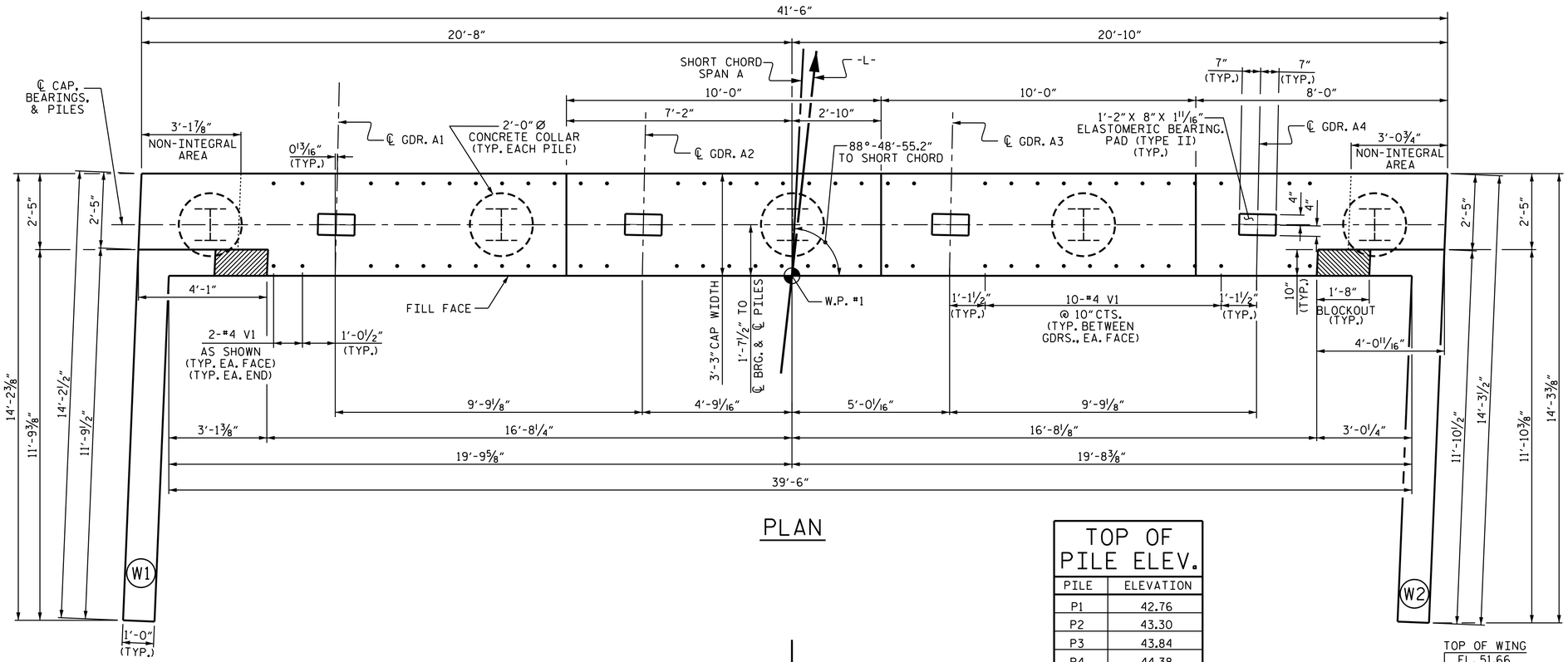
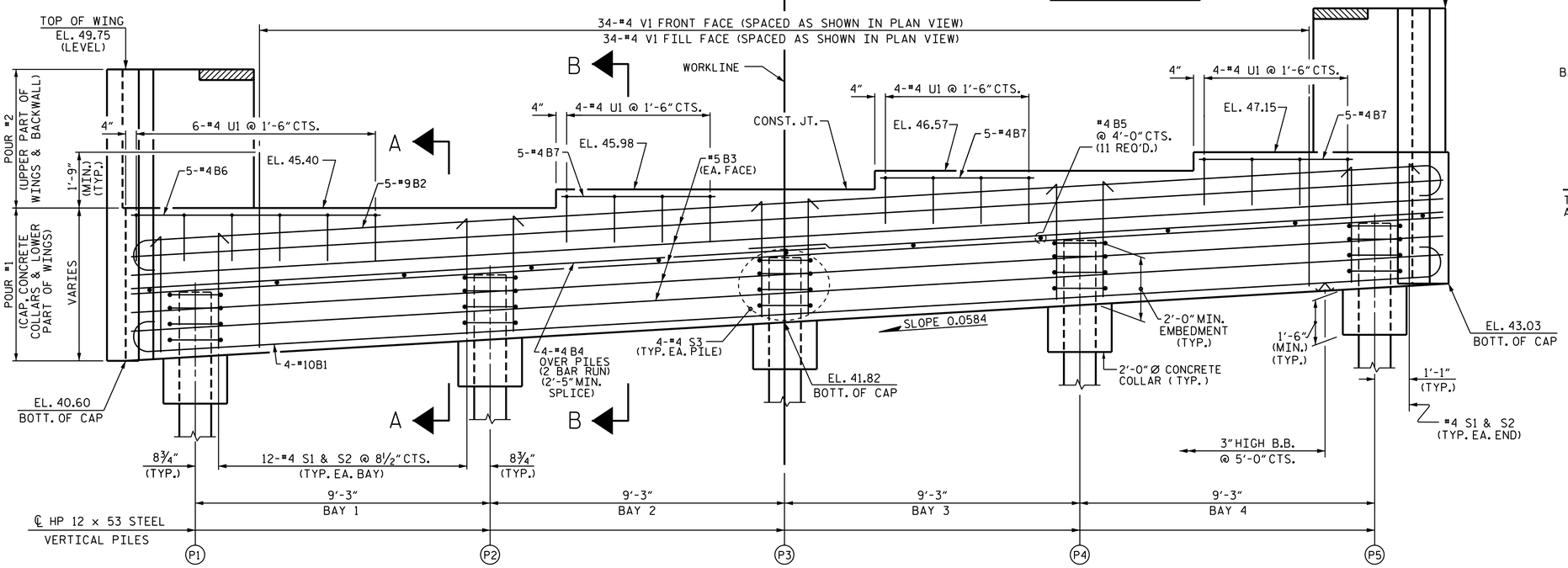


PLAN

TOP OF PILE ELEV.	
PILE	ELEVATION
P1	42.76
P2	43.30
P3	43.84
P4	44.38
P5	44.92



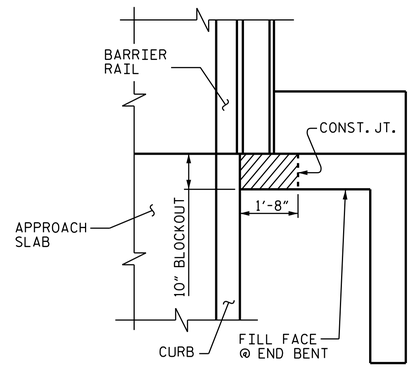
ELEVATION

NOTES :

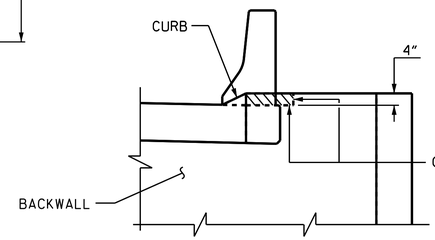
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.

THE TOP SURFACE OF POUR #1 OF THE END BENT CAP AND WINGS, EXCLUDING THE BEARING AREA AND NON-INTEGRAL AREA AT THE ENDS OF CAP, SHALL BE RAKED TO A DEPTH OF ¼".

THE UPPER PORTION OF THE INTEGRAL END BENT SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE PLANS.



PLAN



ELEVATION

BLOCKOUT IN WING WALL

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

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

DocuSigned by: Aster Abralia DDA094AED5104FD...
5/22/2020

DRAWN BY : M.M. AHMED DATE : 04/20
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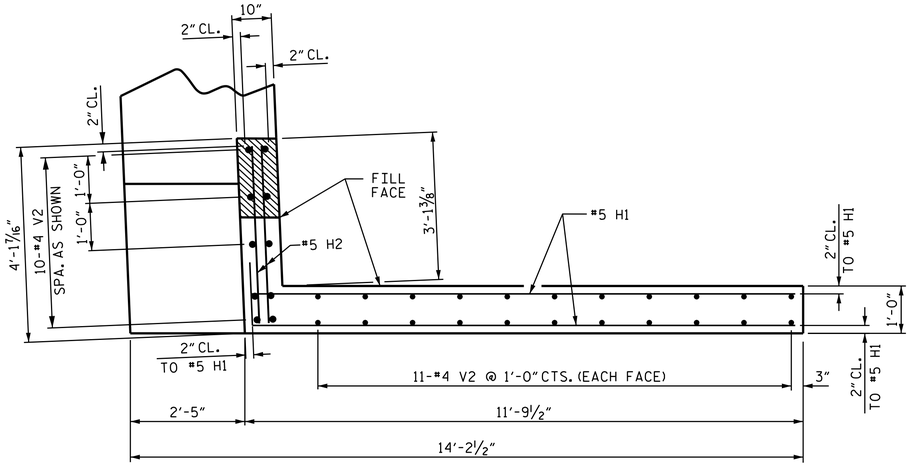
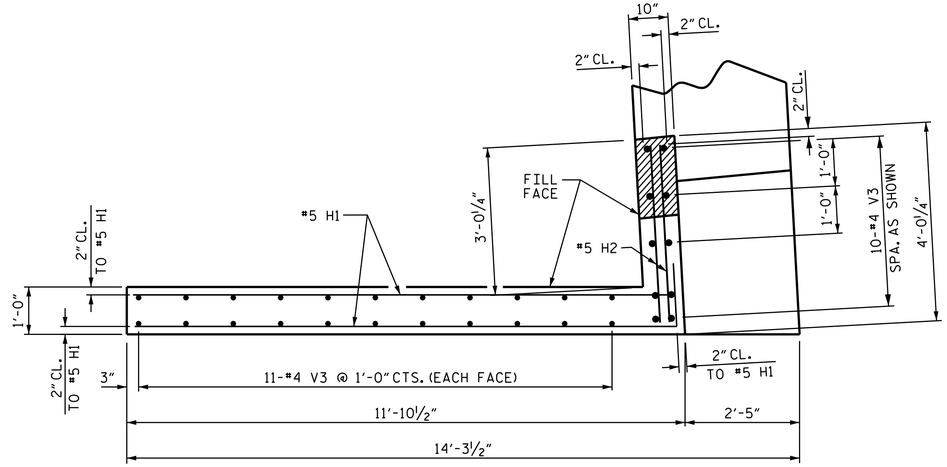
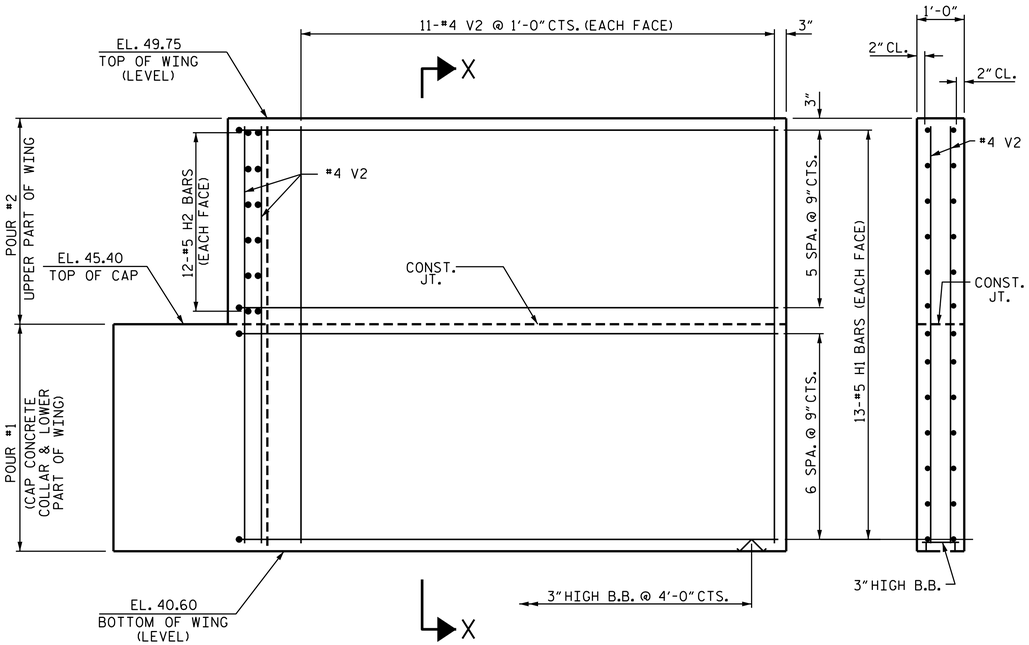


PLAN OF WING W1

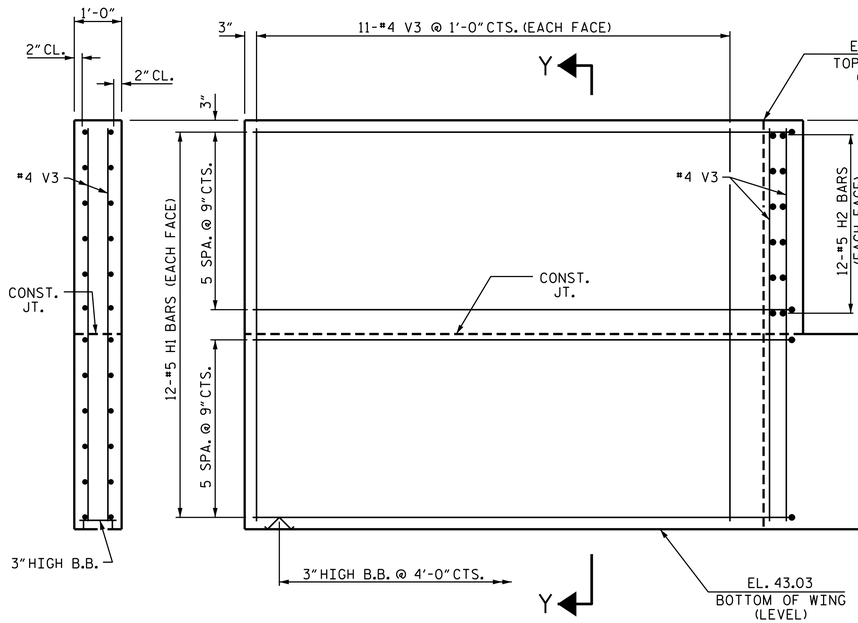


PLAN OF WING W2



ELEVATION OF WING W1

SECTION X-X



SECTION Y-Y

ELEVATION OF WING W2

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL
END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
DDA094AED5104FD...
5/22/2020

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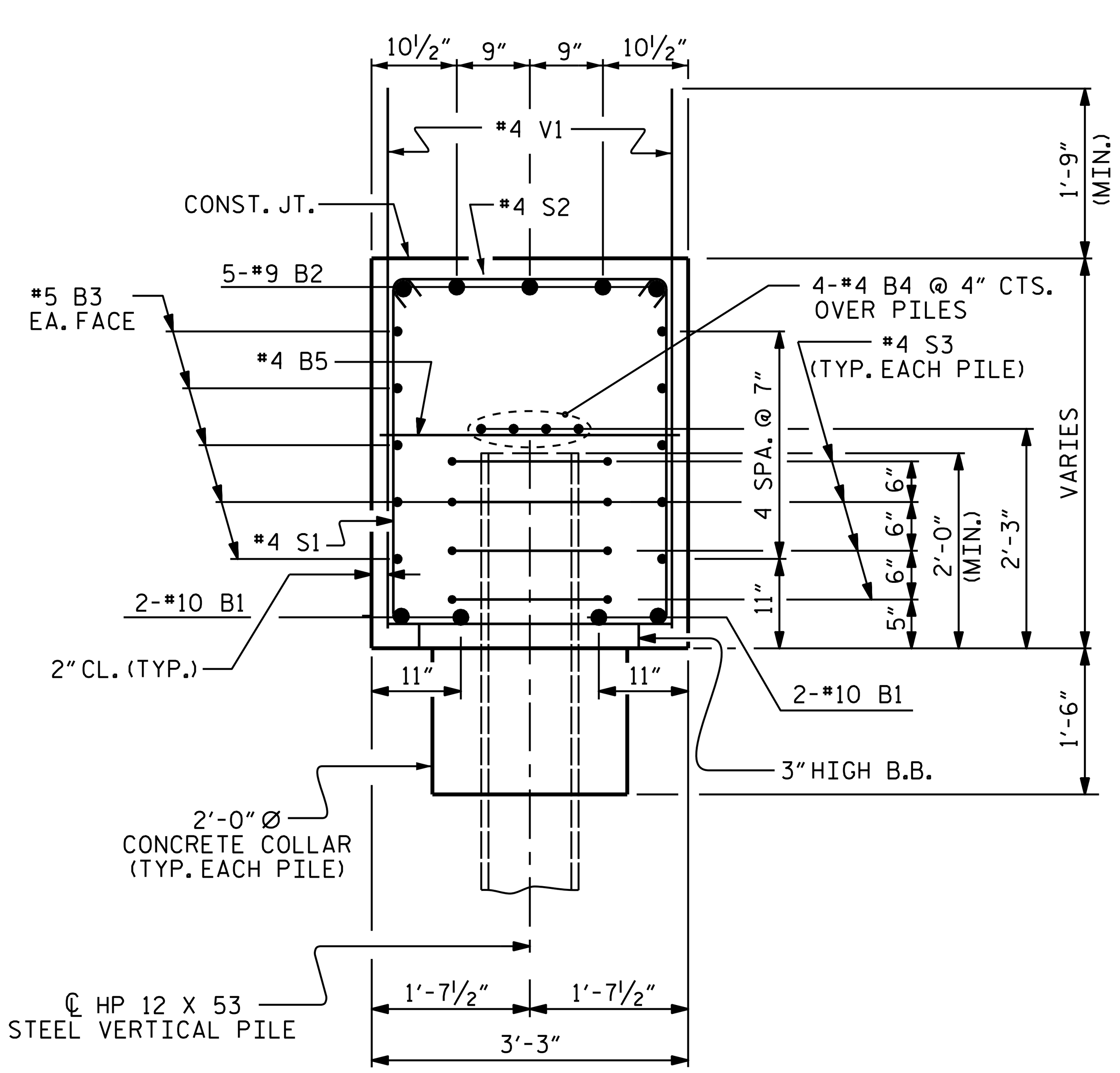
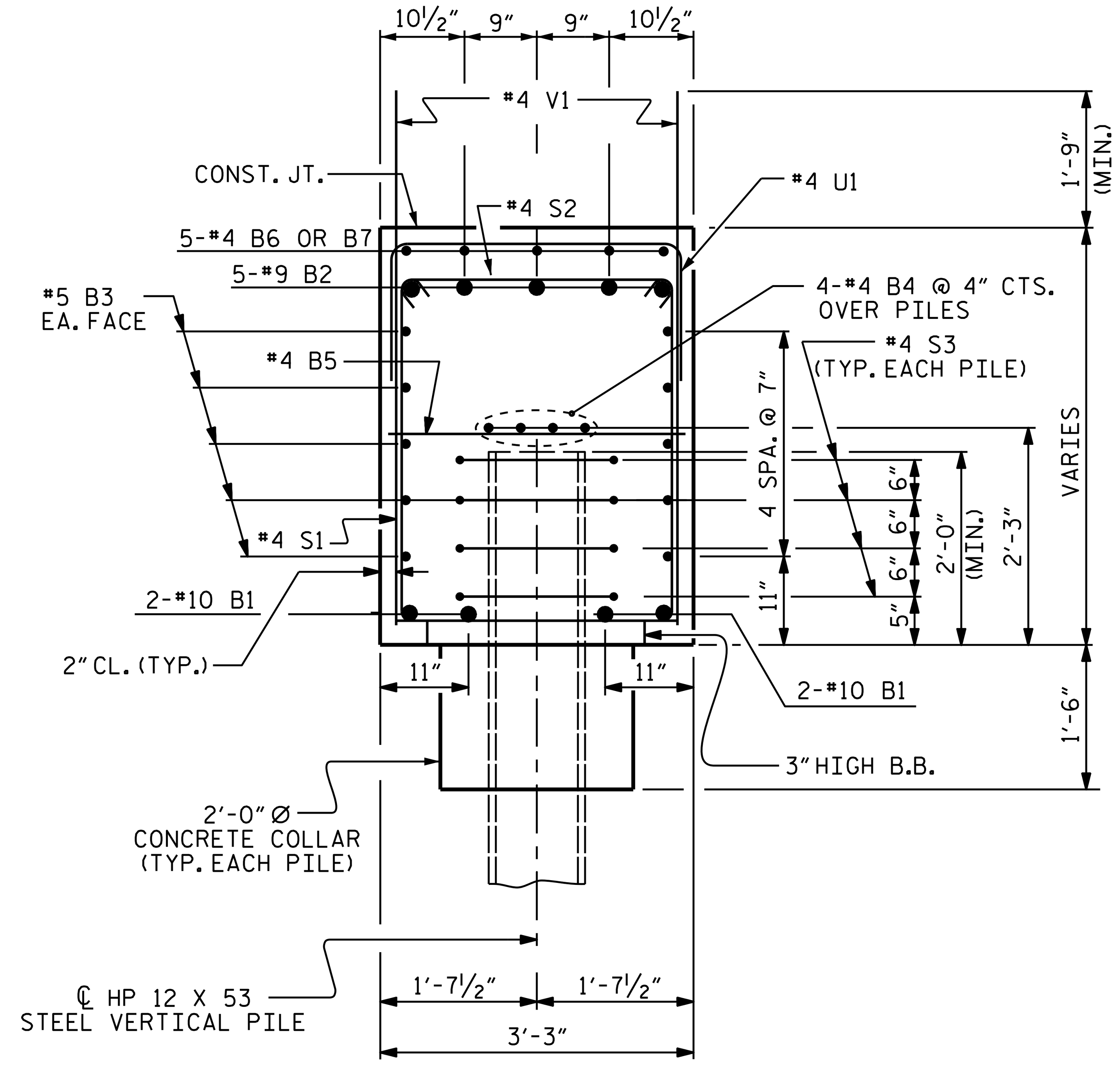
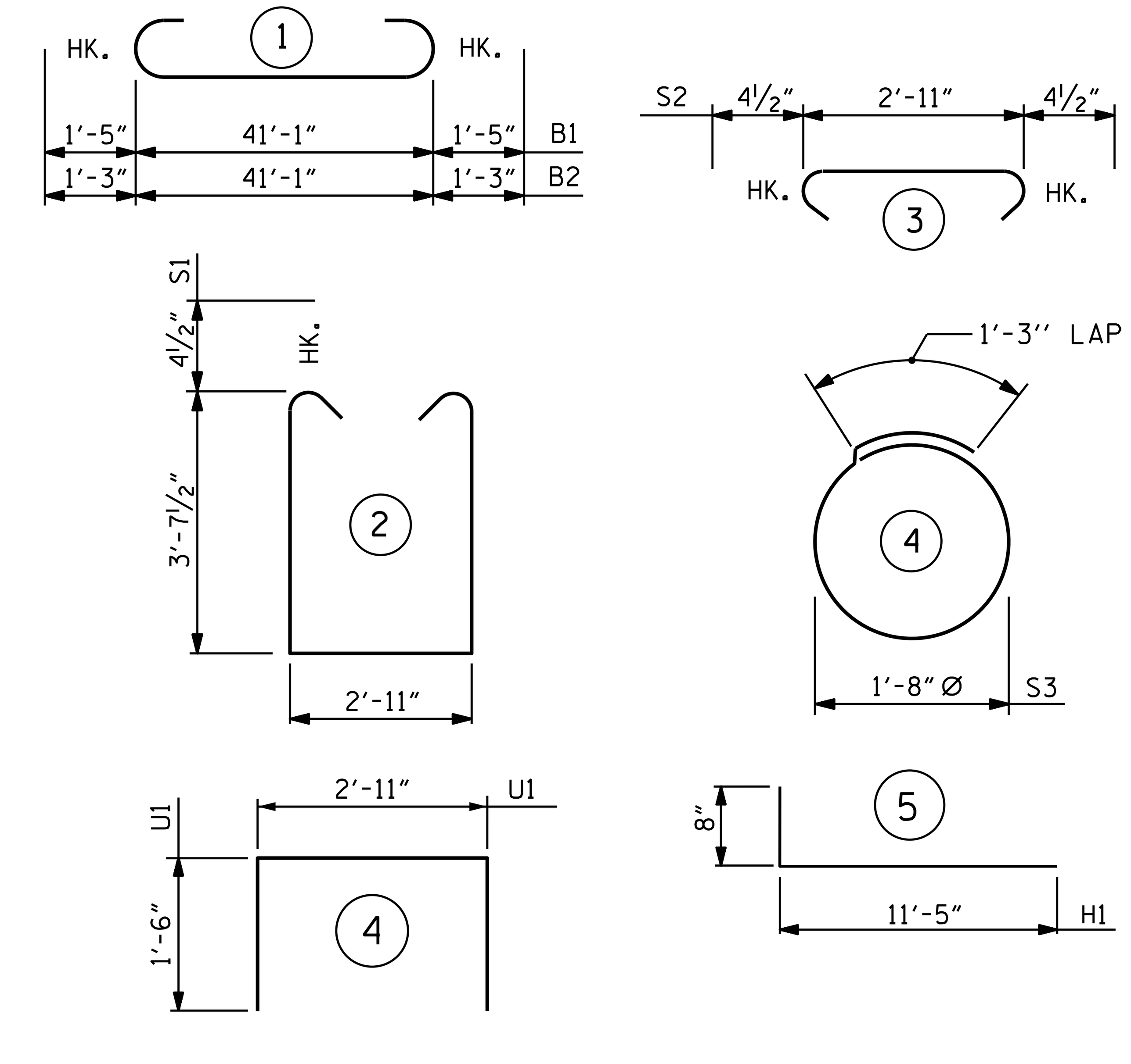


SECTION A-A



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

INTEGRAL END BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	43′-11″	756
B2	5	#9	1	43′-7″	741
B3	10	#5	STR	41′-3″	430
B4	8	#4	STR	21′-10″	117
B5	11	#4	STR	2′-11″	21
B6	5	#4	STR	7′-10″	26
B7	15	#4	STR	4′-10″	48
H1	50	#5	5	12′-1″	630
H2	24	#5	STR	3′-9″	94
S1	50	#4	2	10′-11″	365
S2	50	#4	3	3′-8″	122
S3	20	#4	4	6′-6″	87
U1	18	#4	STR	5′-11″	71
V1	68	#4	STR	6′-2″	280
V2	64	#4	STR	8′-10″	378
V3	64	#4	STR	8′-4″	356

REINFORCING STEEL = 4522 LBS

CLASS A CONCRETE

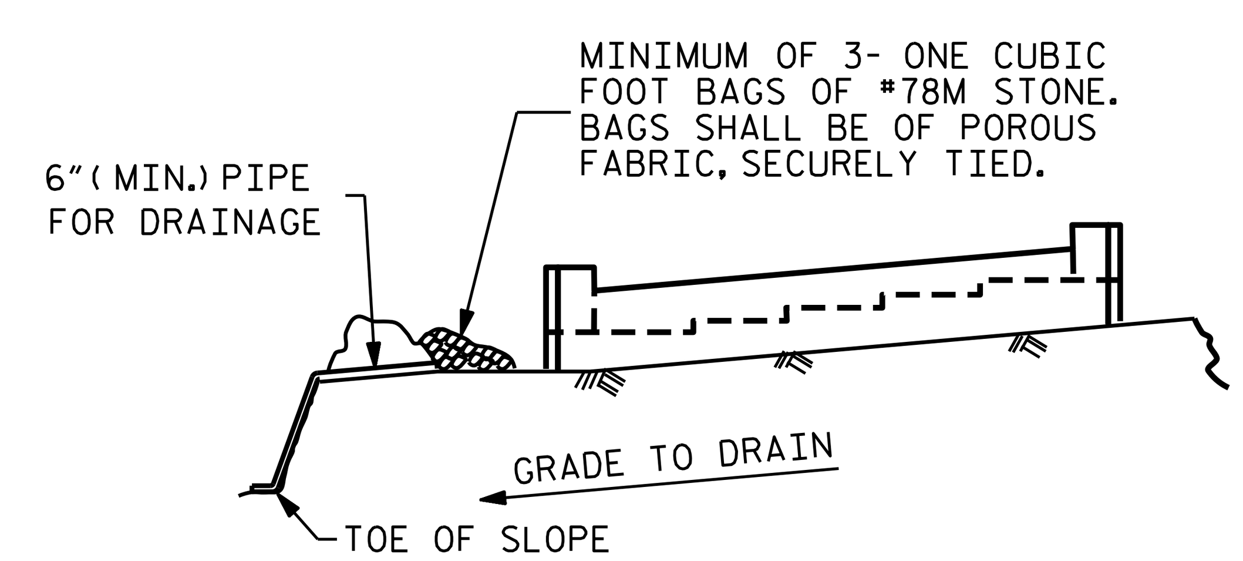
POUR #1 (CAP, CONCRETE COLLARS & LOWER PART OF WINGS) 26.2 C.Y.

POUR #2 (UPPER PART OF WINGS) 4.8 C.Y.

TOTAL 31.0 C.Y.

HP 12 x 53 STEEL PILES No. 5 325 LIN FT.

PILE REDRIVES 3 EA.

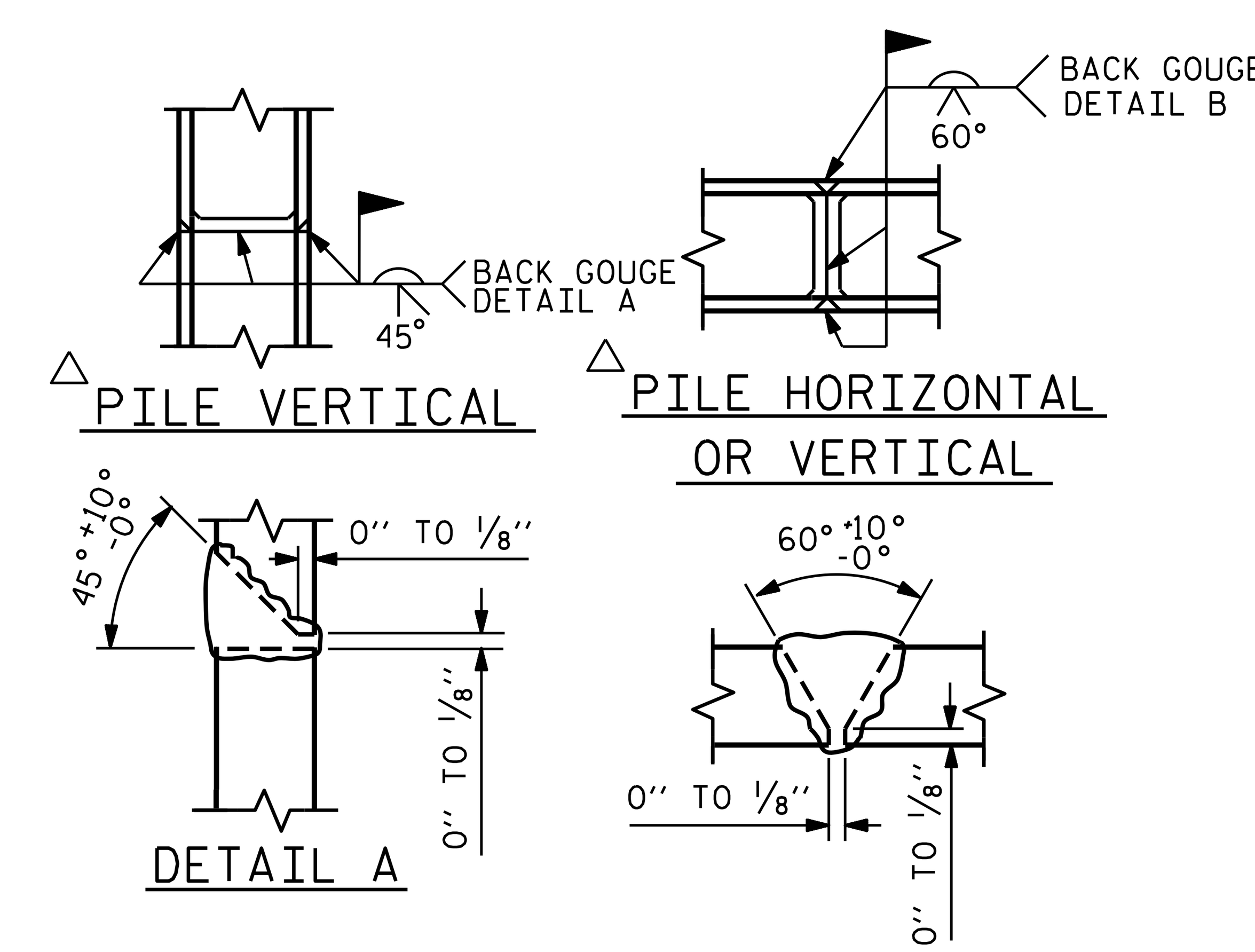


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

5/22/2020

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PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 1

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S-21
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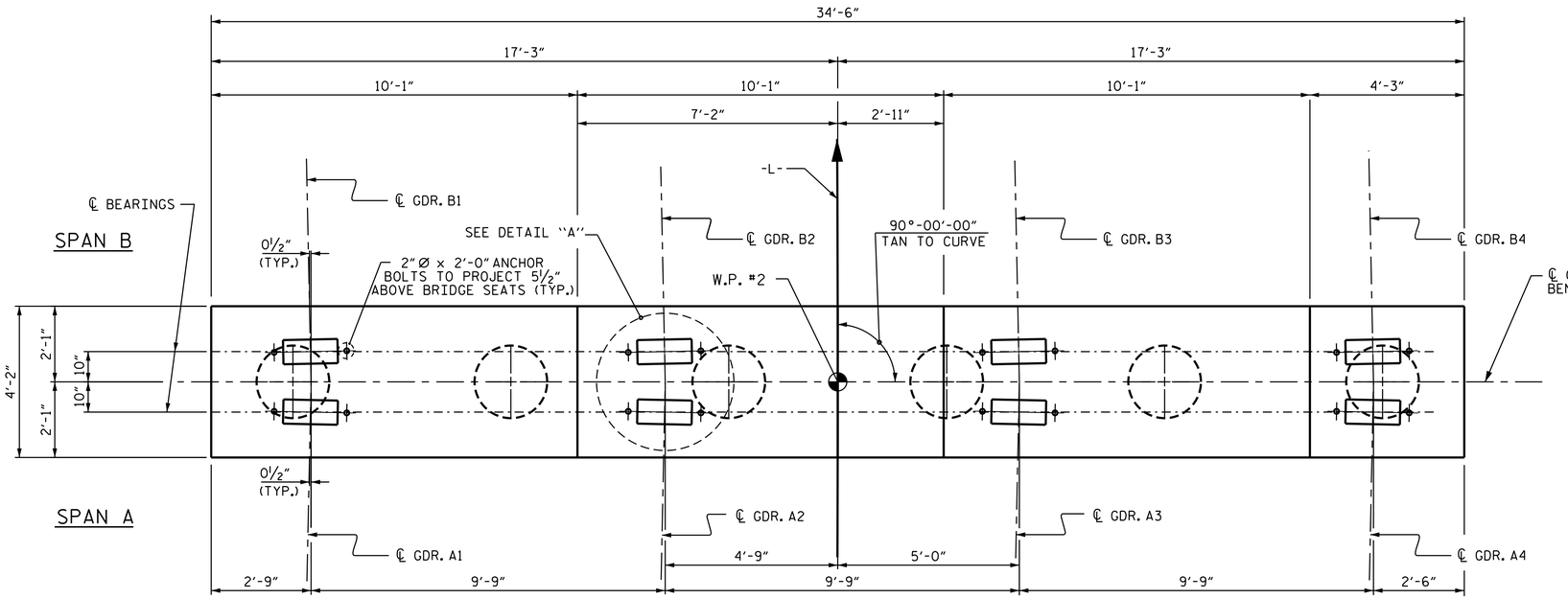


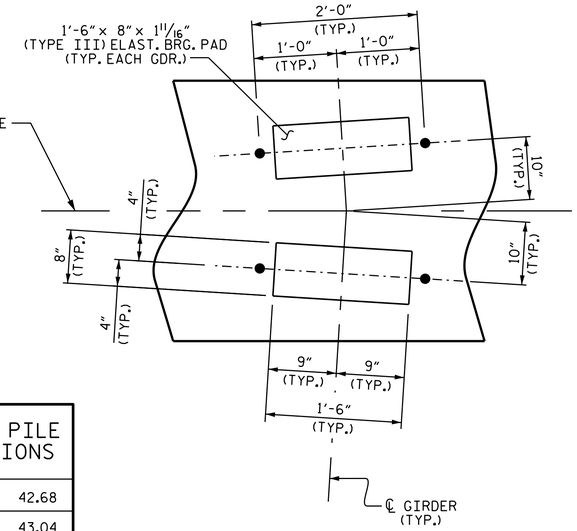
PLAN

NOTES:

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

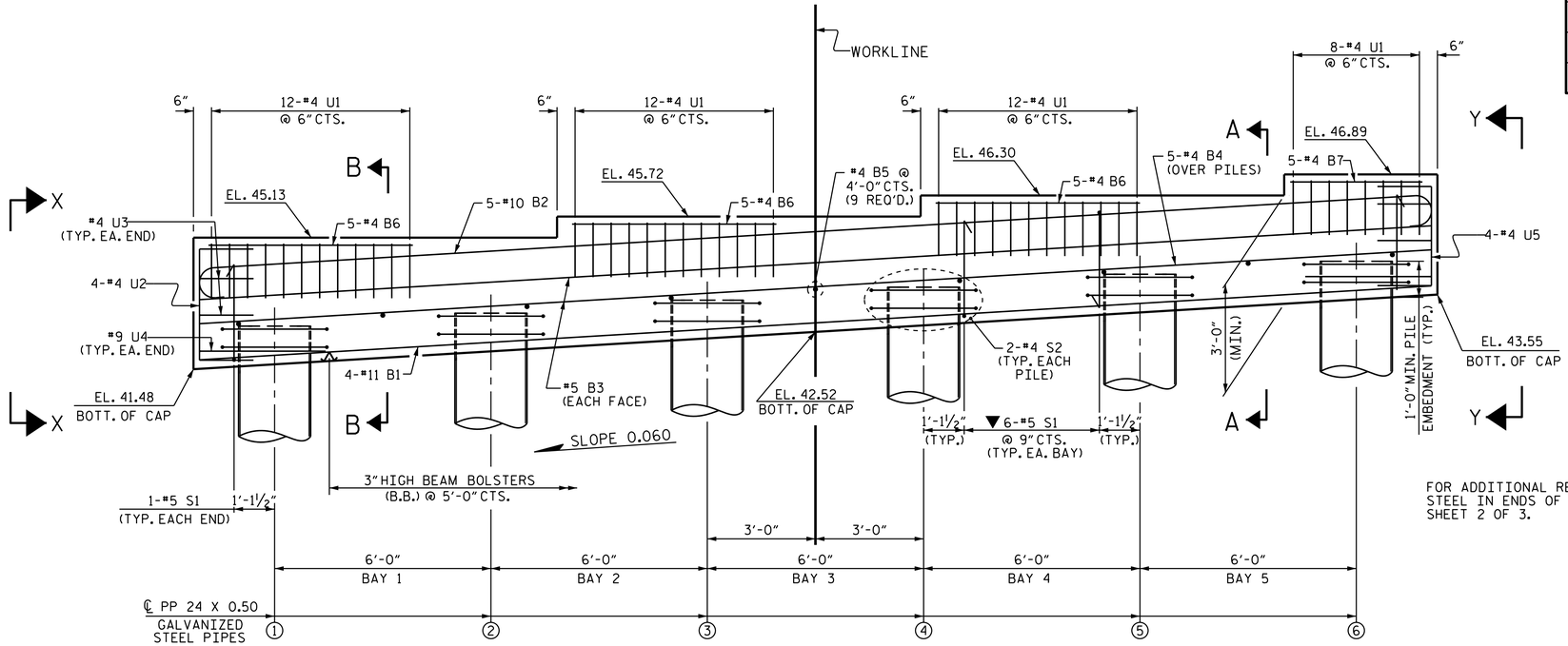
GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 30 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

FOR PIPE PILES, SEE ″24″ STEEL PIPE PILE″ SHEET.



DETAIL ″A″
(TYP. EA. GDR.)

TOP OF PILE ELEVATIONS	
P1	42.68
P2	43.04
P3	43.40
P4	43.76
P5	44.12
P6	44.48



ELEVATION

FOR ADDITIONAL REINFORCING STEEL IN ENDS OF CAP, SEE SHEET 2 OF 3.

▼ INVERT ALTERNATE STIRRUPS

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

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STR. #1

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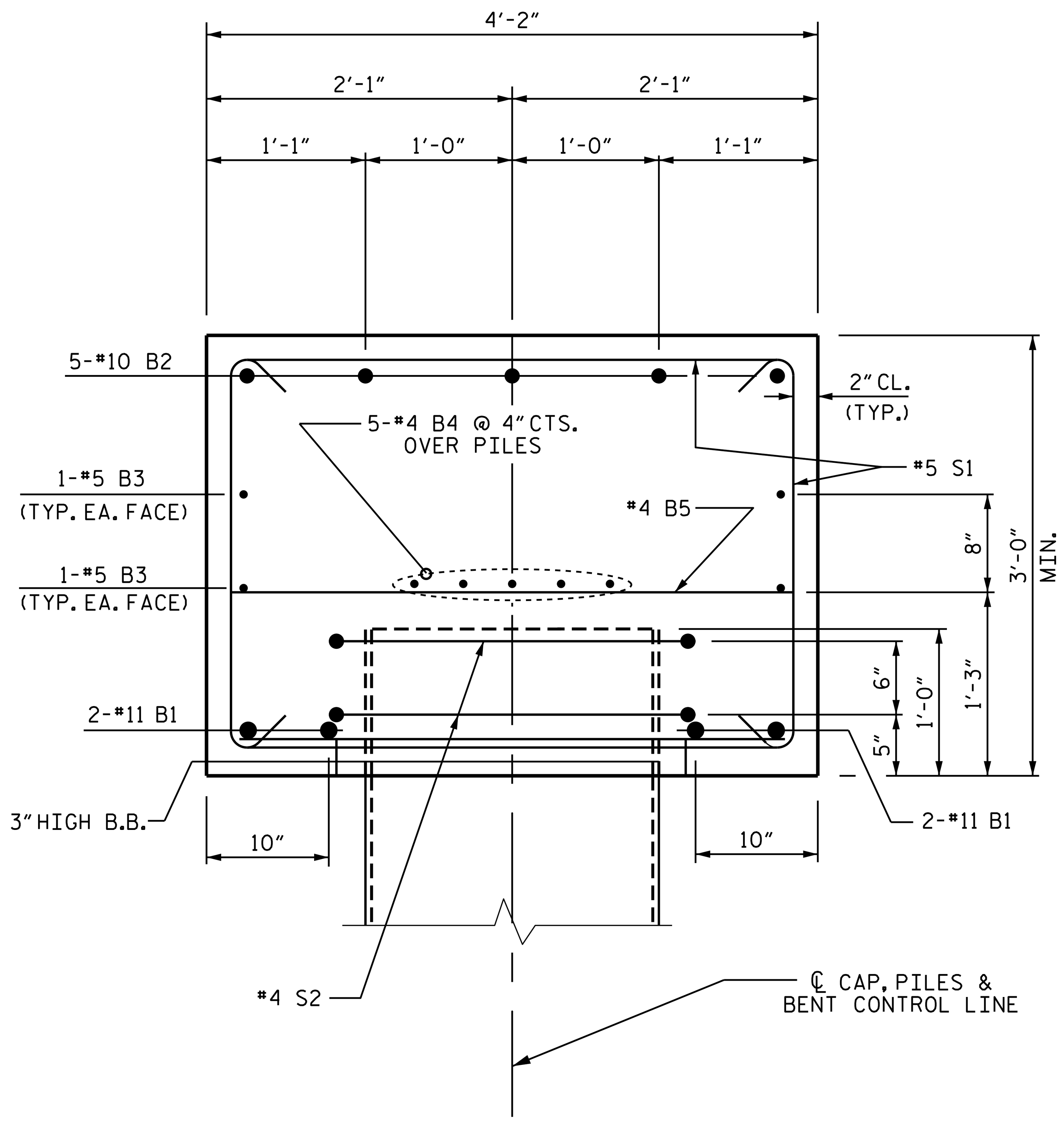
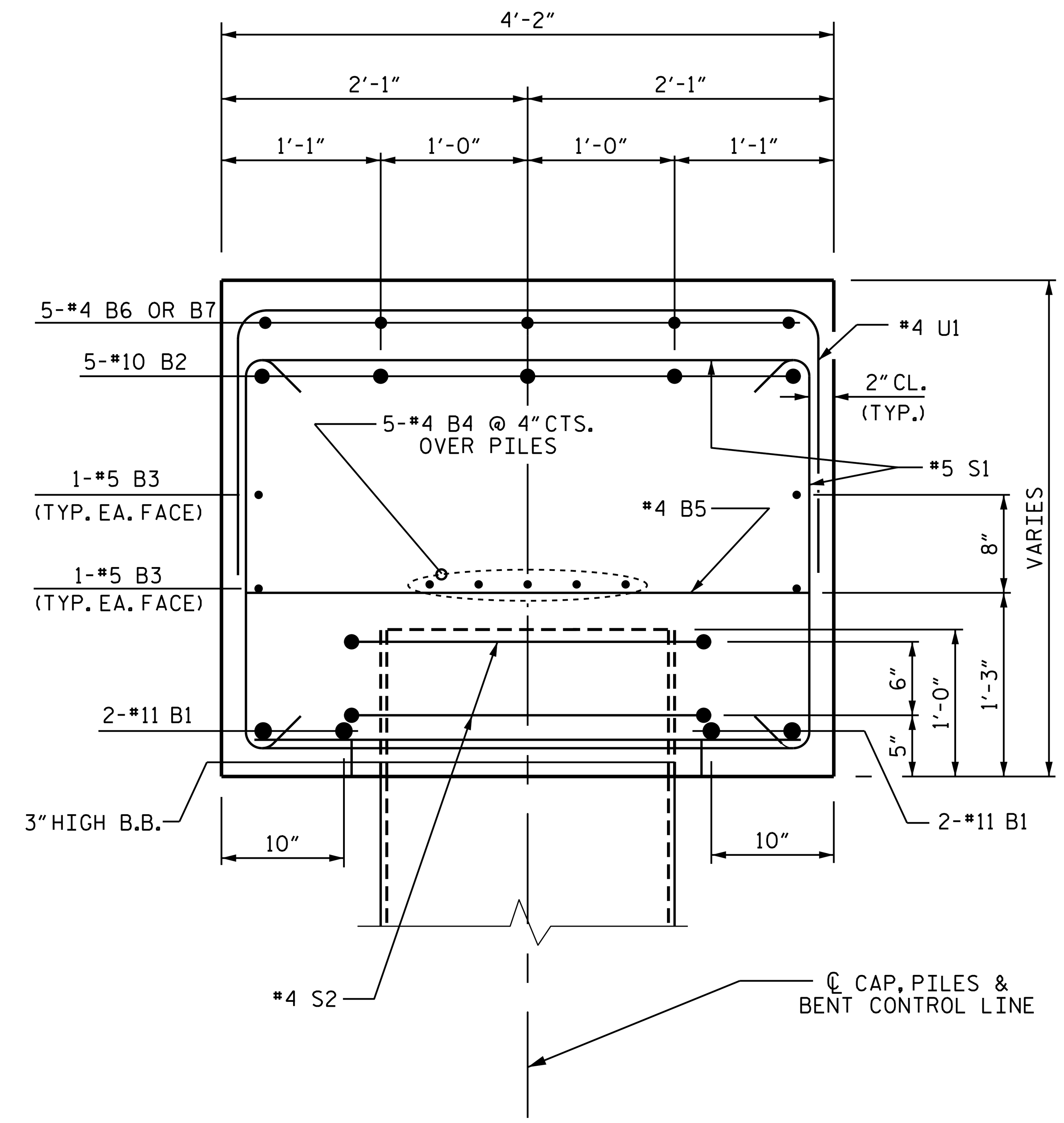
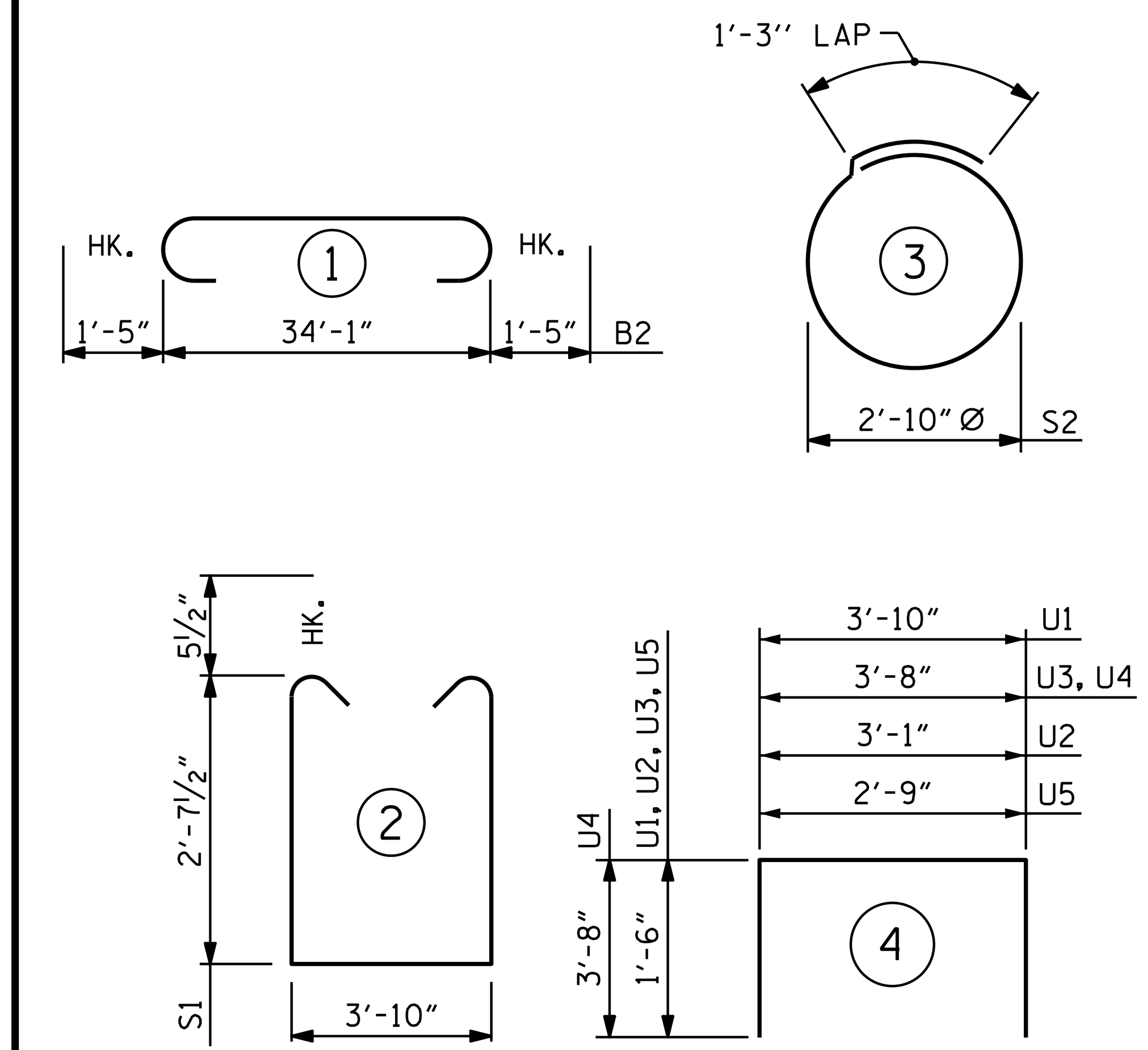


SECTION A-A



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#11	STR	34'-2"	726
B2	5	#10	1	36'-11"	794
B3	4	#5	STR	34'-2"	143
B4	5	#4	STR	34'-2"	114
B5	9	#4	STR	3'-10"	23
B6	15	#4	STR	5'-8"	57
B7	5	#4	STR	3'-8"	12
S1	32	#5	2	10'-0"	334
S2	12	#4	3	10'-2"	82
U1	44	#4	4	6'-10"	201
U2	4	#4	4	6'-1"	16
U3	4	#4	4	6'-8"	18
U4	2	#9	4	11'-0"	75
U5	4	#4	4	5'-9"	15

REINFORCING STEEL ______ 2610 LBS.

CLASS A CONCRETE

TOTAL CLASS A CONCRETE ______ ▲17.2 C.Y.

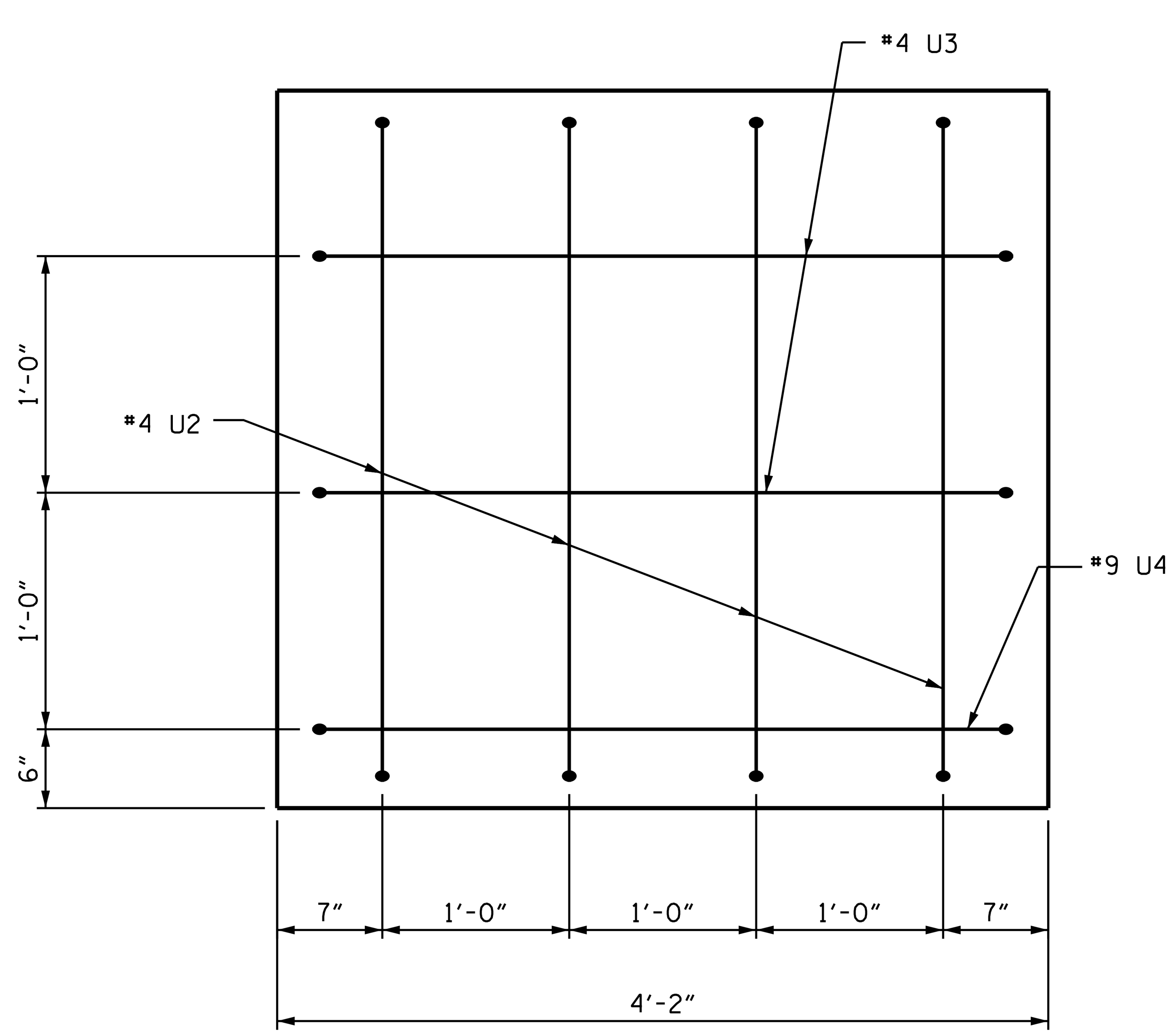
PP 24 x 0.50 GALVANIZED STEEL PILES

No. 6 ______ LIN. FT. 480

PILE REDRIVES ______ EA. 3

PIPE PILE PLATES ______ EA. 6

▲ CONCRETE DISPLACED BY THE 24" STEEL PIPE PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.



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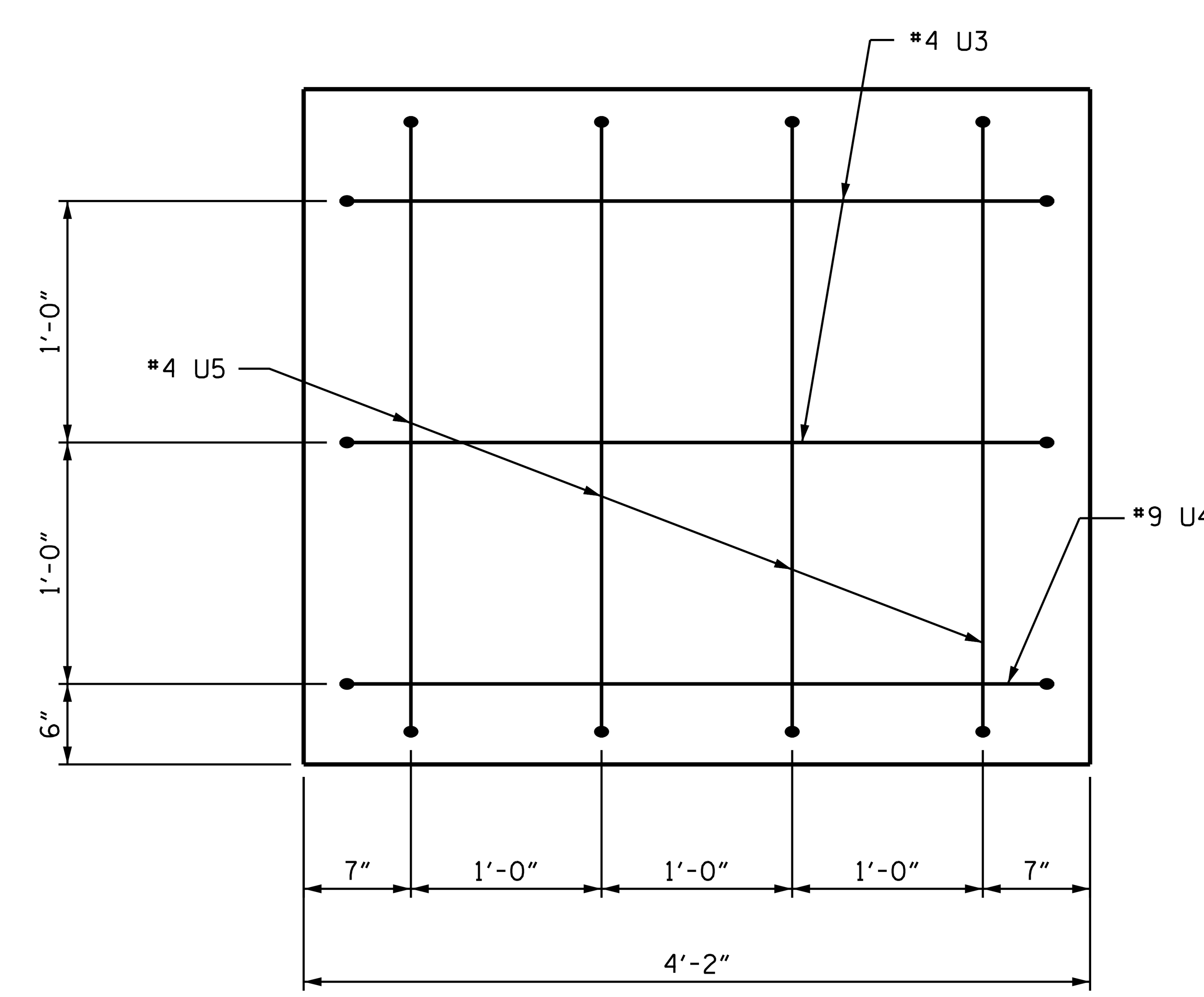

SECTION Y-Y

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

REVISIONS							SHEET NO.
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STR. #1

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CHECKED BY : S. WANCE DATE : 04/20
DESIGN ENGINEER OF RECORD: M.M. AHMED DATE : 11/19

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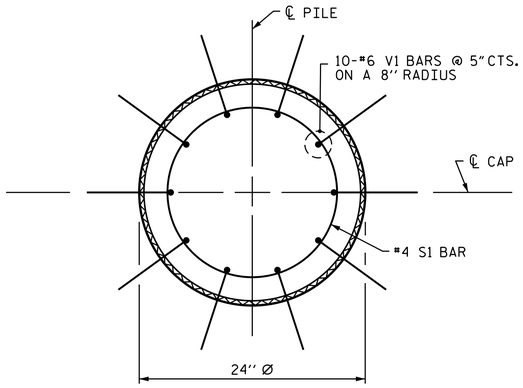
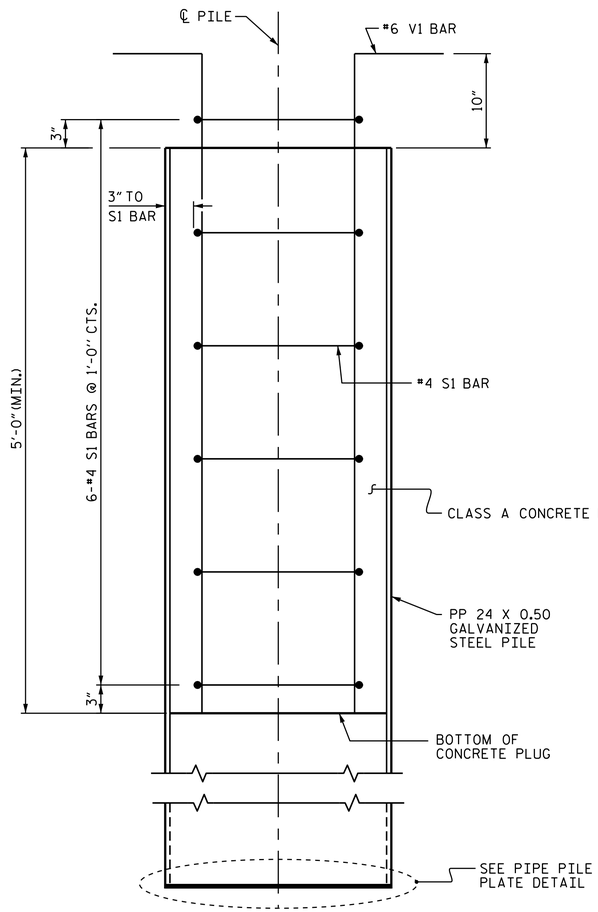


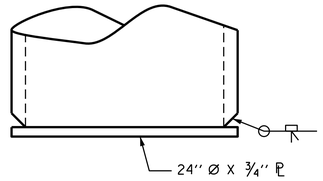
PLAN



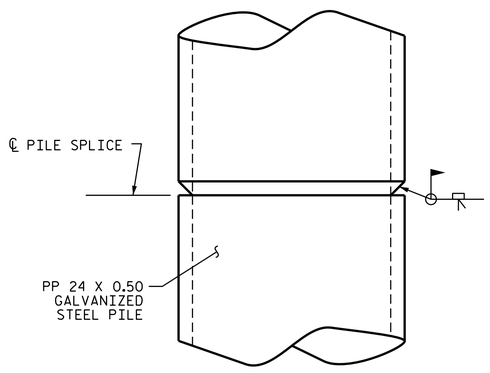
ELEVATION

PP 24 X 0.50 GALVANIZED STEEL PILE

(CLOSED ENDED)



PIPE PILE PLATE DETAIL



PIPE PILE SPLICE DETAIL

NOTES

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

GALVANIZE STEEL PIPE PILES IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS UNLESS METALLIZING IS REQUIRED. GALVANIZING OR METALLIZING PIPE PILE PLATES IS NOT REQUIRED.

PIPE PILE PLATES SHALL BE IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

FOR CLOSED END PIPE PILES, REMOVE ALL SOIL AND WATER FROM INSIDE THE PILES JUST PRIOR TO PLACING REINFORCING STEEL AND CONCRETE FOR THE CONCRETE PLUG.

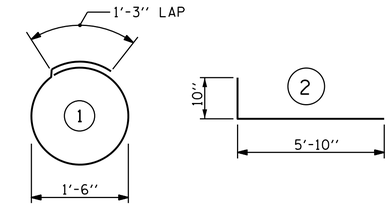
FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

THE REINFORCING STEEL, CLASS A CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 24 X 0.50 GALVANIZED STEEL PILES.

BILL OF MATERIAL FOR ONE PP 24 X 0.50 GALVANIZED STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	6'-0"	24
V1	10	#6	2	6'-8"	100
REINFORCING STEEL =				124	lbs
CLASS A CONCRETE					
5'-0" MINIMUM PLUG					0.5 CY

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

24" STEEL PIPE PILE

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Digitally signed by Aster Abrala DDA094AED5104FD...

5/22/2020

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ASSEMBLED BY : M.M. AHMED	DATE : 02/2020		
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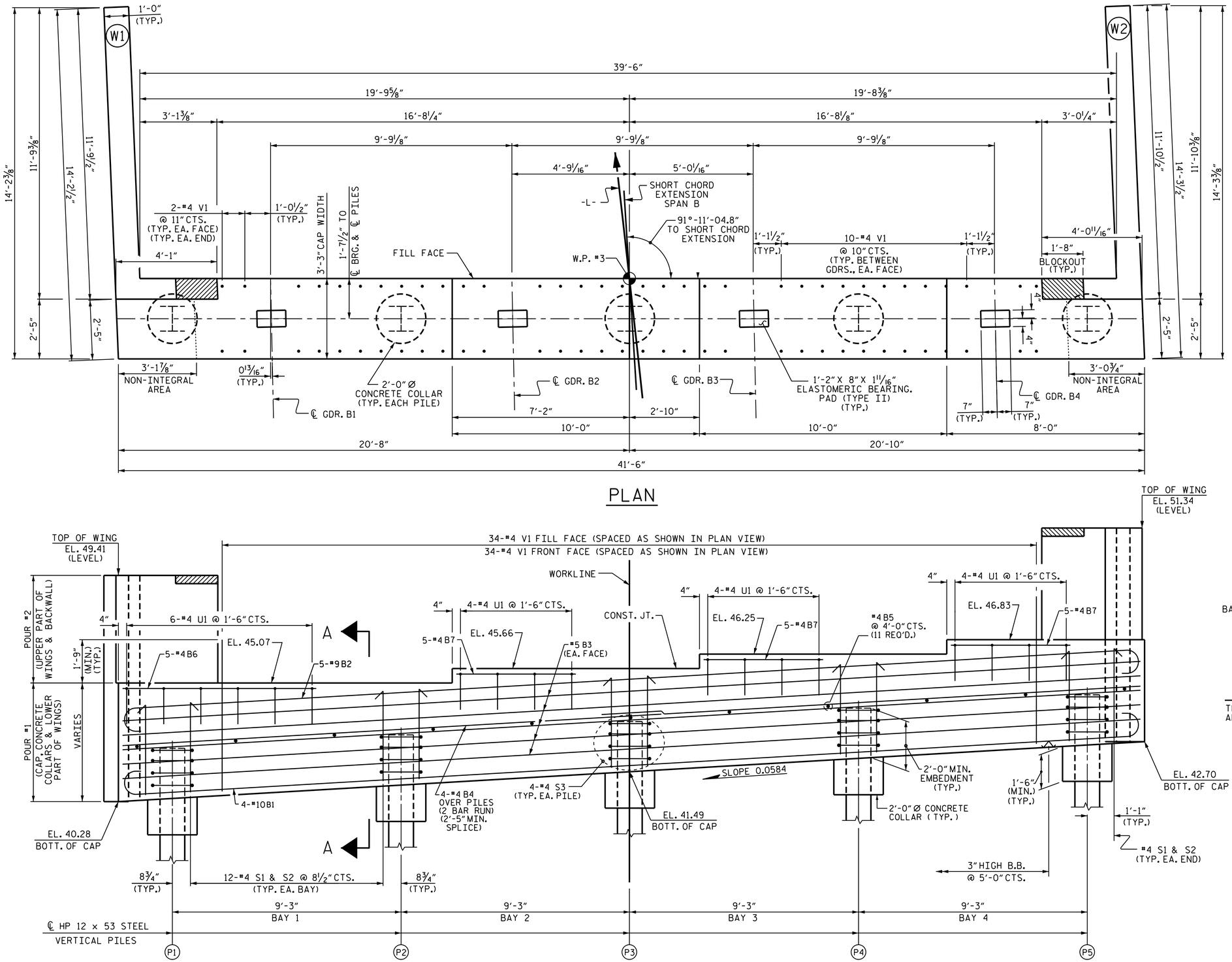
STD. NO. SPP4



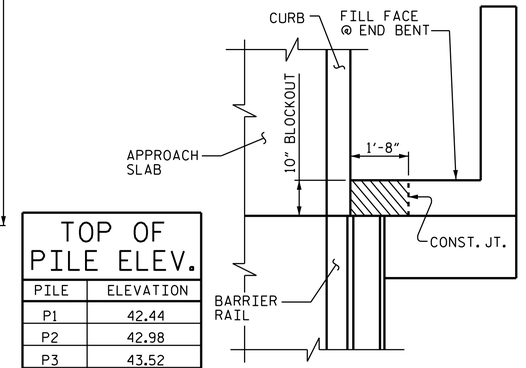
PLAN

NOTES :

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.

THE TOP SURFACE OF POUR #1 OF THE END BENT CAP AND WINGS, EXCLUDING THE BEARING AREA AND NON-INTEGRAL AREA AT THE ENDS OF CAP, SHALL BE RAKED TO A DEPTH OF ¼".

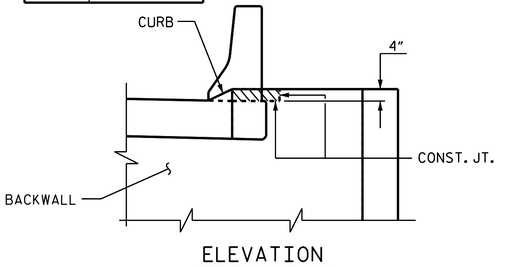
THE UPPER PORTION OF THE INTEGRAL END BENT SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE PLANS.



PLAN

TOP OF PILE ELEV.

PILE	ELEVATION
P1	42.44
P2	42.98
P3	43.52
P4	44.06
P5	44.60



ELEVATION

ELEVATION

BLOCKOUT IN WING WALL

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

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Digitally signed by: Aster Abraha
DocuSigned by: 2DA094AED5104FD...
5/22/2020

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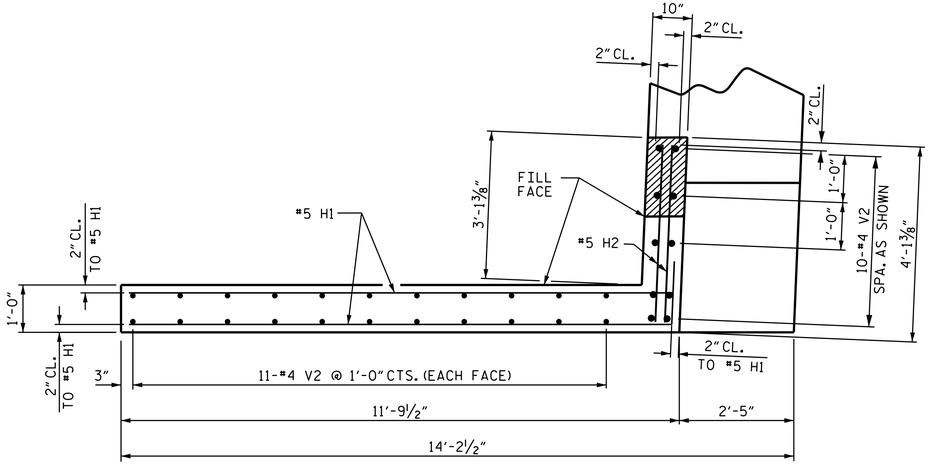
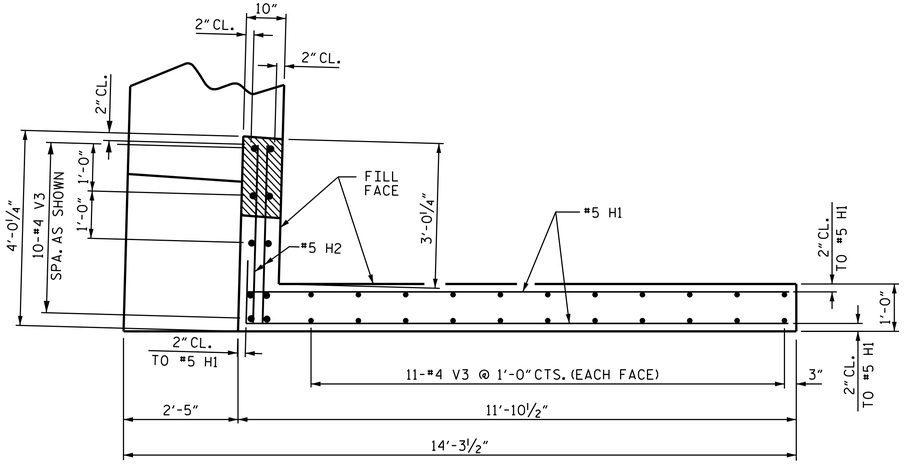
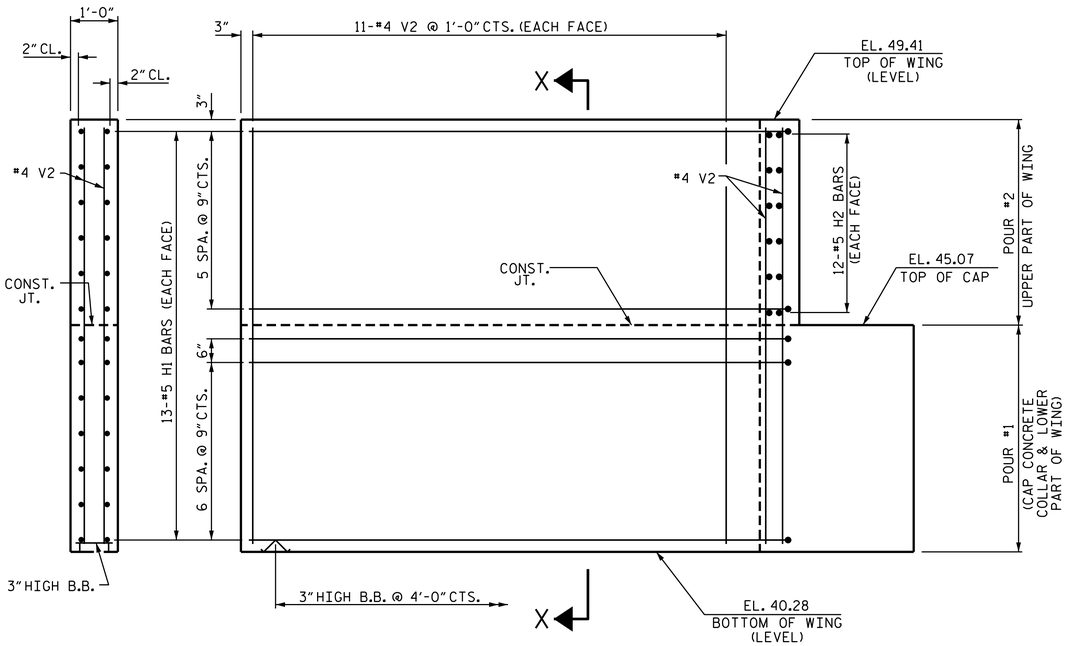
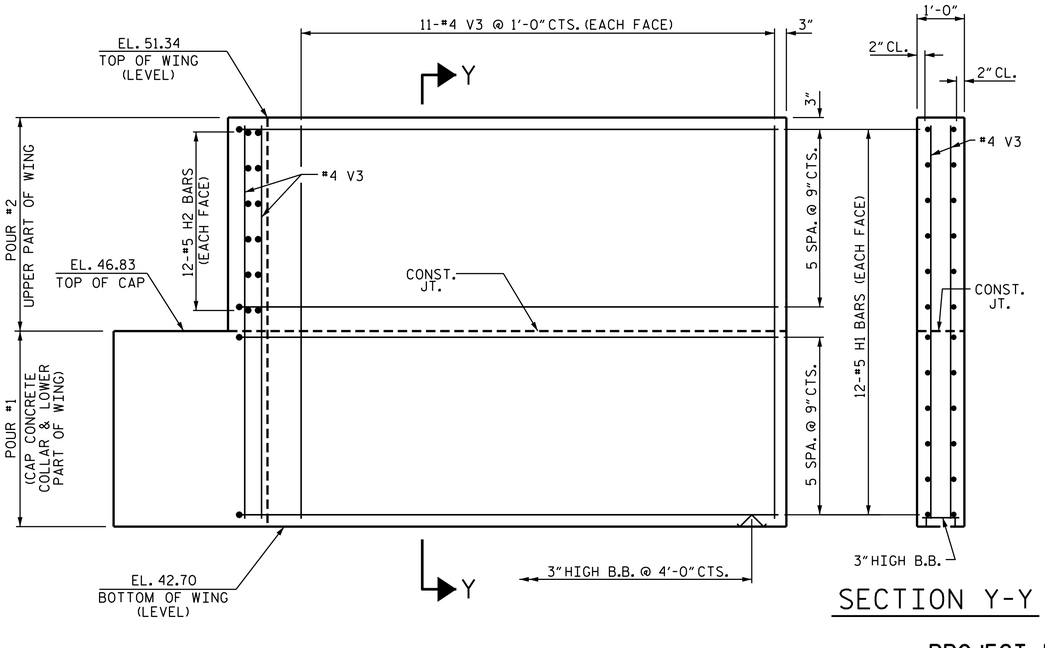




PLAN OF WING W1



PLAN OF WING W2



SECTION X-X

ELEVATION OF WING W1

ELEVATION OF WING W2

SECTION Y-Y

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

DocuSigned by: Aster Abraha DDA094AED5104FD...

5/22/2020

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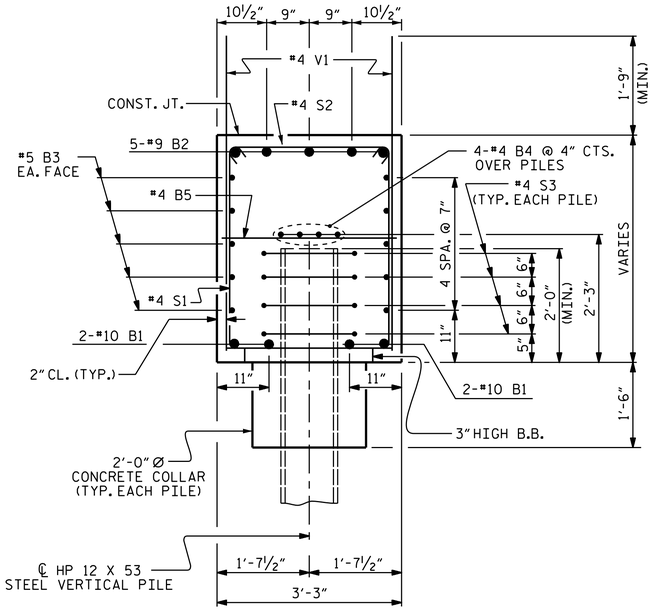
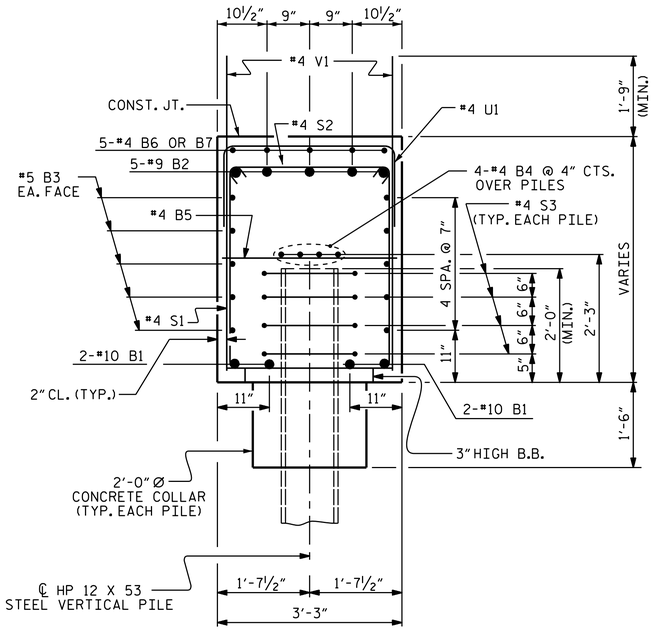
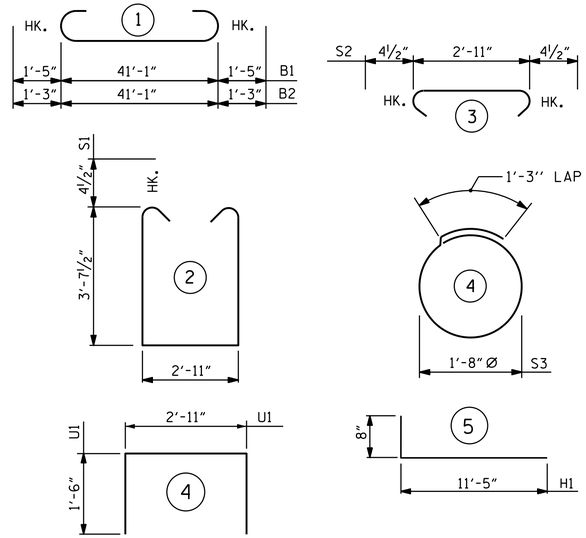


SECTION A-A



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

INTEGRAL END BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	43'-11"	756
B2	5	#9	1	43'-7"	741
B3	10	#5	STR	41'-3"	430
B4	8	#4	STR	21'-10"	117
B5	11	#4	STR	2'-11"	21
B6	5	#4	STR	7'-10"	26
B7	15	#4	STR	4'-10"	48
H1	50	#5	5	12'-1"	630
H2	24	#5	STR	3'-9"	94
S1	50	#4	2	10'-11"	365
S2	50	#4	3	3'-8"	122
S3	20	#4	4	6'-6"	87
U1	18	#4	STR	5'-11"	71
V1	68	#4	STR	6'-2"	280
V2	64	#4	STR	8'-10"	378
V3	64	#4	STR	8'-4"	356

REINFORCING STEEL = 4522 LBS

CLASS A CONCRETE

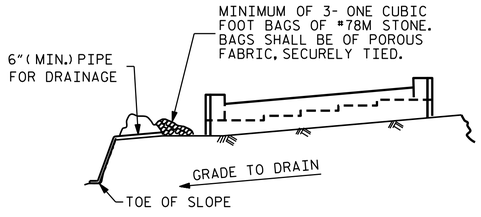
POUR #1 (CAP, CONCRETE COLLARS & LOWER PART OF WINGS) 26.2 C.Y.

POUR #2 (UPPER PART OF WINGS) 4.8 C.Y.

TOTAL 31.0 C.Y.

HP 12 x 53 STEEL PILES
No. 5 325 LIN FT.

PILE REDRIVES 3 EA.

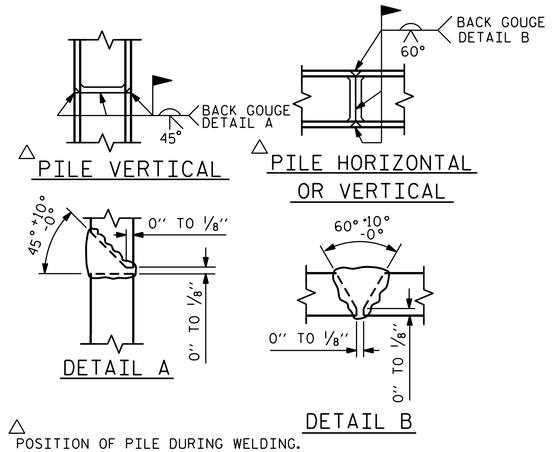


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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



△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL

DETAIL A

DETAIL B

△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

ESIGNED by: Aster Abraha
-DDA094AED5104FD...
5/22/2020

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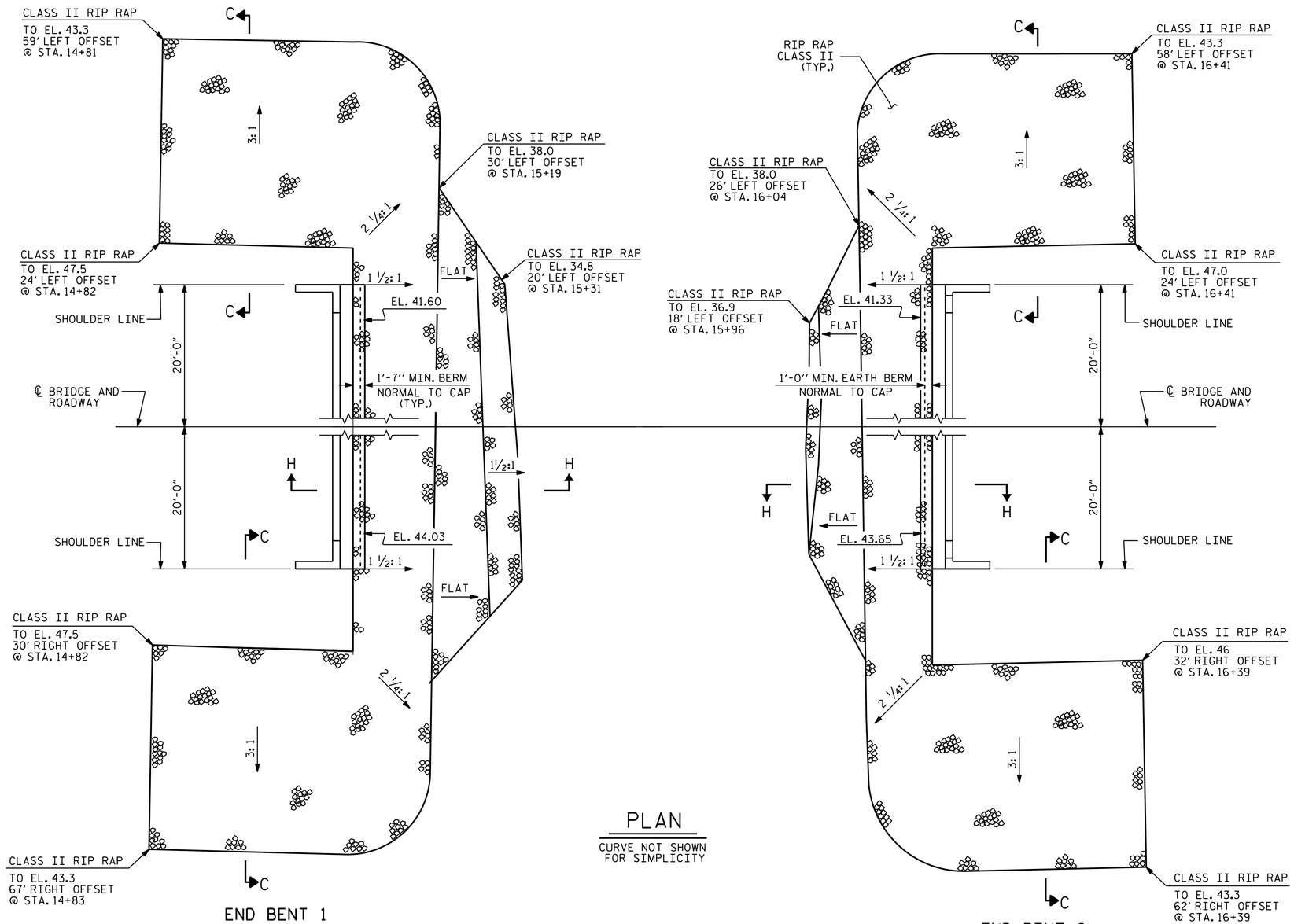
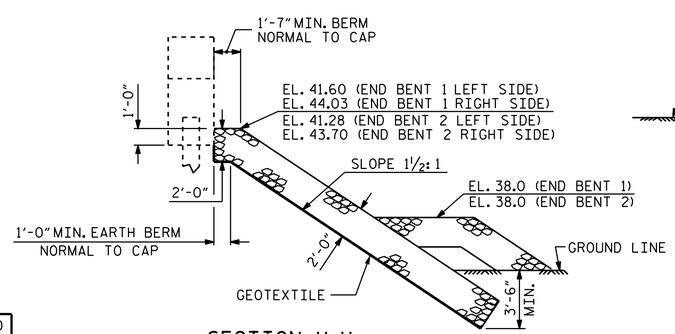


PLAN

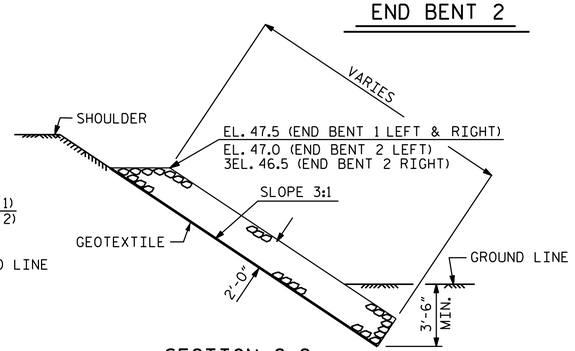
CURVE NOT SHOWN
FOR SIMPLICITY

END BENT 1

END BENT 2



SECTION H-H



SECTION C-C

ESTIMATED QUANTITIES

BRIDGE @ STA. 15+61.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	415	462
END BENT 2	325	361

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
DDA094AED5104FD...
5/22/2020

ASSEMBLED BY : S. WANCE	DATE : 03/2020
CHECKED BY : M.M. AHMED	DATE : 04/2020
DRAWN BY : REK 1/84	REV. 10/1/11 MAA/GM
CHECKED BY : RDU 1/84	REV. 12/21/11 MAA/GM
	REV. 12/17 MAA/THC

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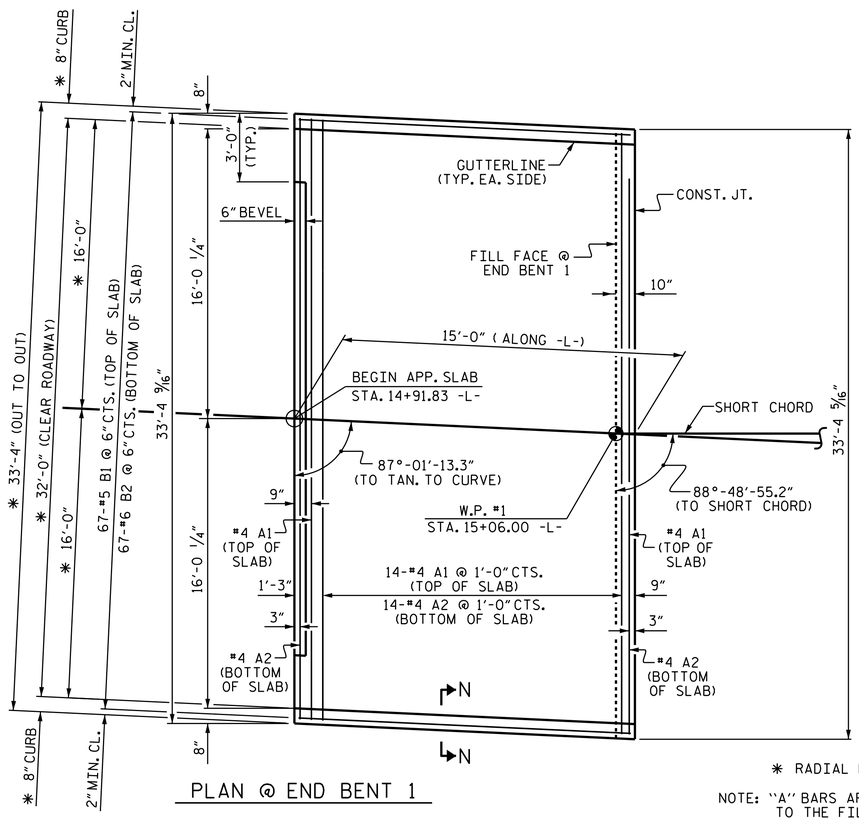
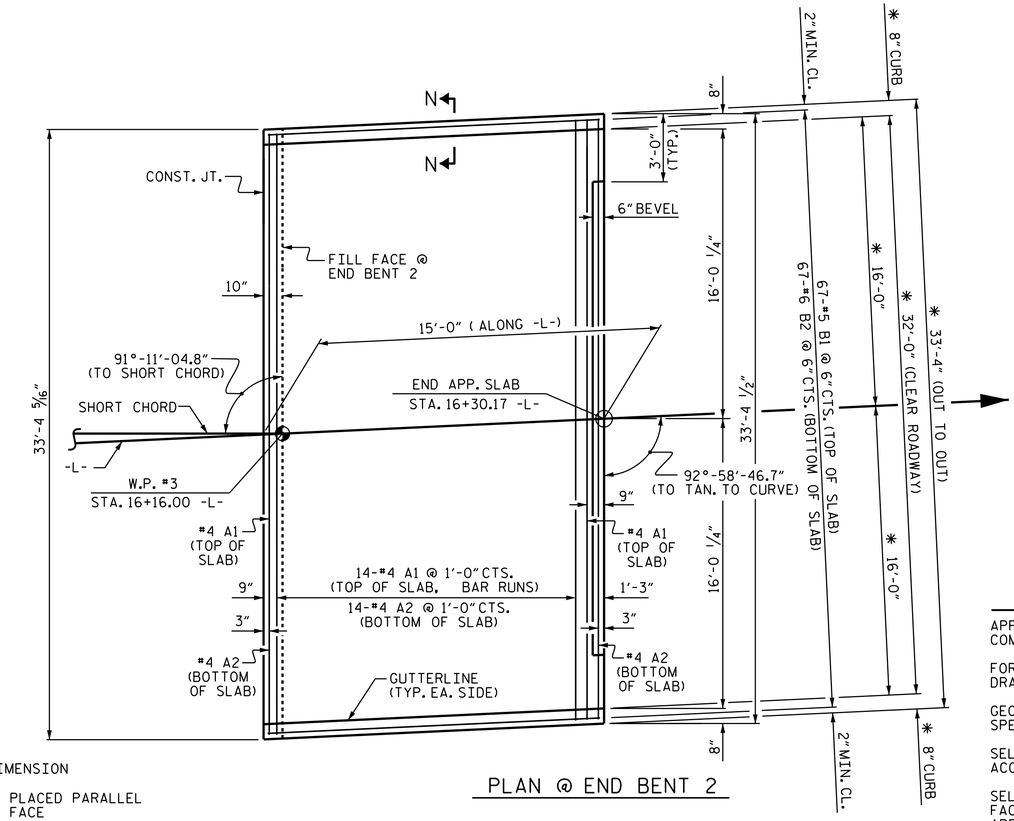
STD. NO. RR1 (Sht 2)



PLAN @ END BENT 1



PLAN @ END BENT 2

* RADIAL DIMENSION

NOTE: "A" BARS ARE PLACED PARALLEL TO THE FILL FACE

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	16	#4	STR	33'-0"	353
A2	16	#4	STR	33'-0"	353
* B1	67	#5	STR	14'-2"	990
B2	67	#6	STR	14'-8"	1476

REINFORCING STEEL	1829 LBS.
* EPOXY COATED REINFORCING STEEL	1343 LBS.
CLASS AA CONCRETE	21.6 C. Y.

SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"

NOTES

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

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6"Ø DRAINAGE PIPE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

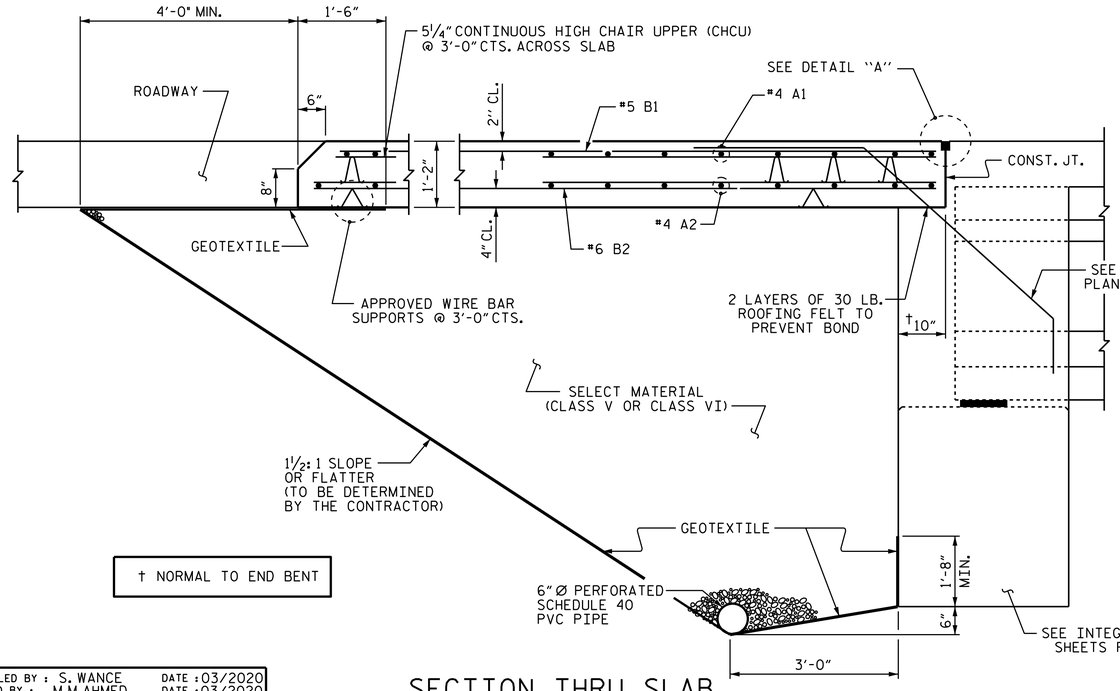
SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 6"Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

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

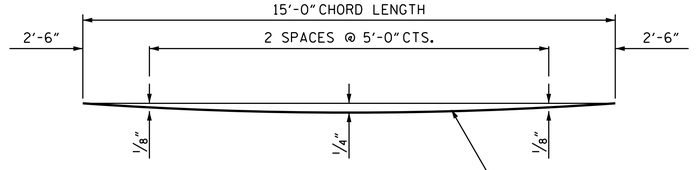
AT THE CONTRACTORS OPTION, "TYPE A - ALTERNATE APPROACH FILL" IN LIEU OF "TYPE I - STANDARD APPROACH FILL" MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT. SEE SHEET 2 OF 2 FOR DETAILS AND NOTES.



† NORMAL TO END BENT

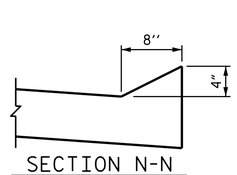
SECTION THRU SLAB

(TYPE I - STANDARD APPROACH FILL)

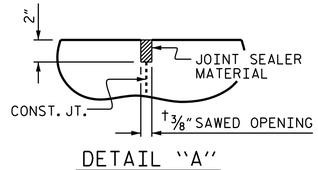


CHORD-ARC ORDINATES

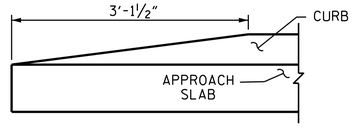
(TYPICAL)



SECTION N-N



DETAIL "A"



END OF CURB WITHOUT SHOULDER BERM GUTTER

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
ODA094AED5104FD...
5/22/2020

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DRAWN BY : TLA 10/05		REV. 12/17	MAA/THC
CHECKED BY : GM 5/06			

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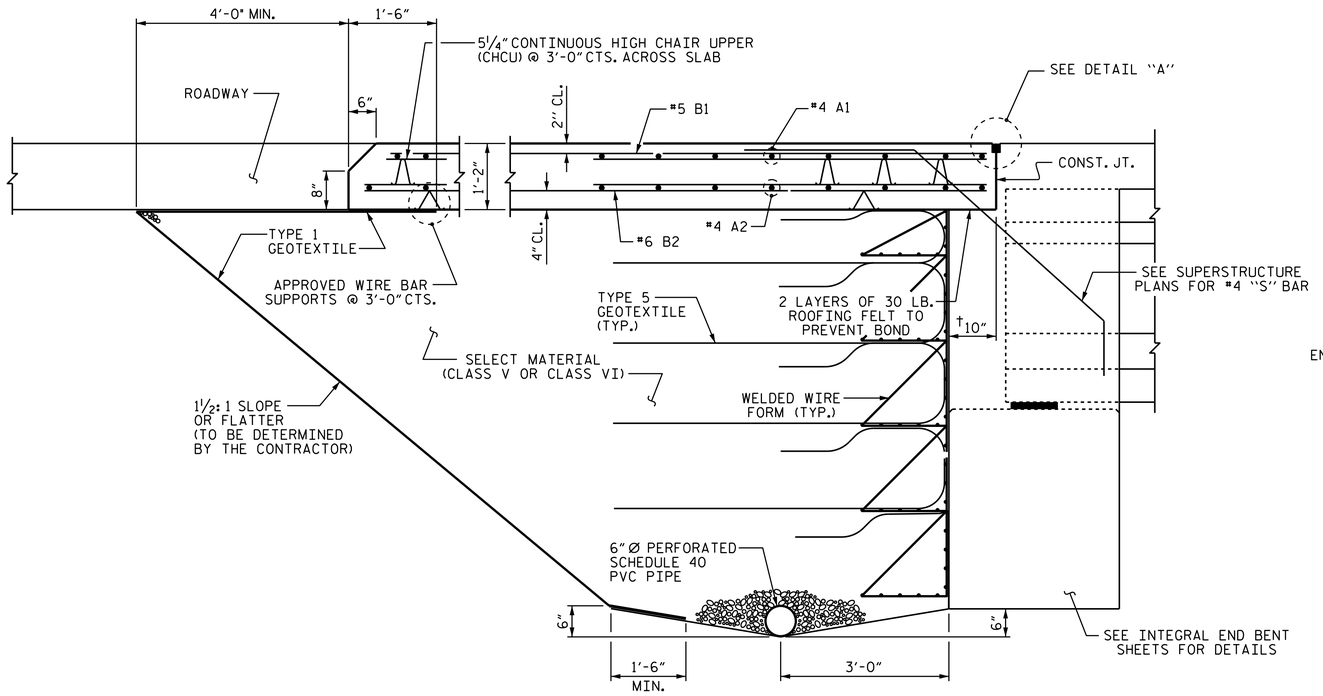
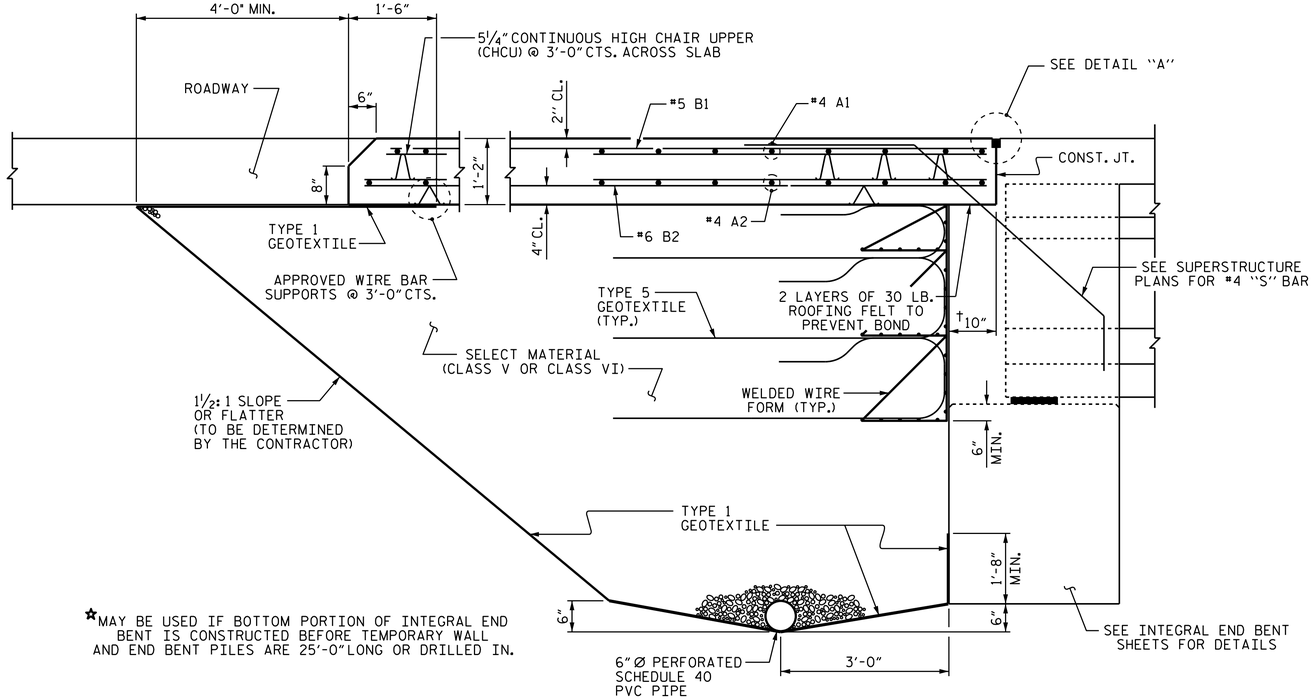
STD. NO. BAS5 (SHT 1)



SECTION THRU SLAB

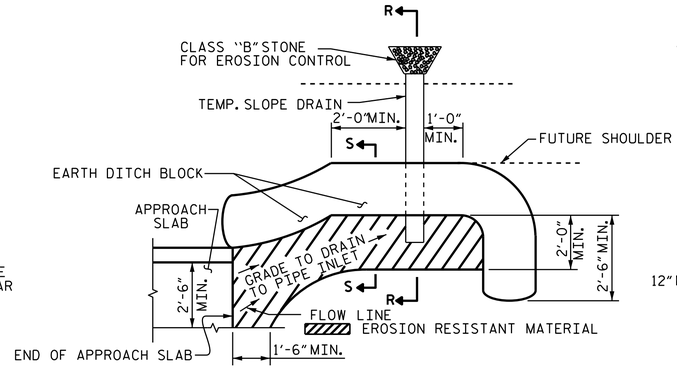
(TYPE A - ALTERNATE APPROACH FILL)



SECTION THRU SLAB

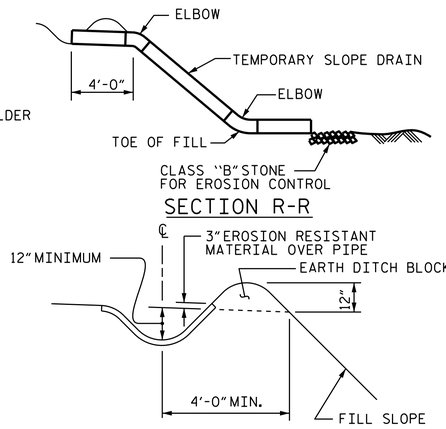
★(TYPE A - ALTERNATE APPROACH FILL)

★MAY BE USED IF BOTTOM PORTION OF INTEGRAL END BENT IS CONSTRUCTED BEFORE TEMPORARY WALL AND END BENT PILES ARE 25'-0" LONG OR DRILLED IN.



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.

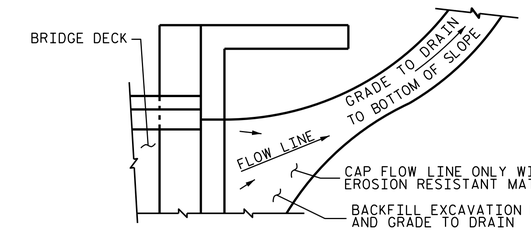
PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

TEMPORARY DRAINAGE DETAIL

NOTES

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

FOR TEMPORARY GEOTEXTILE WALL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

GEOTEXTILE (TYPE 1 OR TYPE 5) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

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

PROJECT NO. B-5662

HALIFAX COUNTY

STATION: 15+61.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abralia

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5/22/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ASSEMBLED BY : S. WANCE	DATE : 03/2020	
CHECKED BY : M.M.AHMED	DATE : 03/2020	
DRAWN BY : TLA 10/05	REV. 12/21/11	MAA/GM
CHECKED BY : GM 5/06	REV. 6/13	MAA/GM
	REV. 12/17	MAA/THC

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STD. NO. BAS5 (SHT 1)

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "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 ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" 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 ¼" 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 ⅞"Ø SHEAR STUDS FOR THE ¾"Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞"Ø STUDS FOR 4 - ¾"Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞"Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾"Ø STUDS BASED ON THE RATIO OF 3 - ⅞"Ø STUDS FOR 4 - ¾"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.

ENGLISH

JANUARY, 1990

REV. 6-16-95 EEM (/) RGW REV. 5-7-03 RWW (/) JTE REV. 10-1-11 MAA (/) GM
REV. 8-16-99 RWW (/) LES REV. 5-1-06 TLA (/) GM REV. 12-17 MAA (/) THC