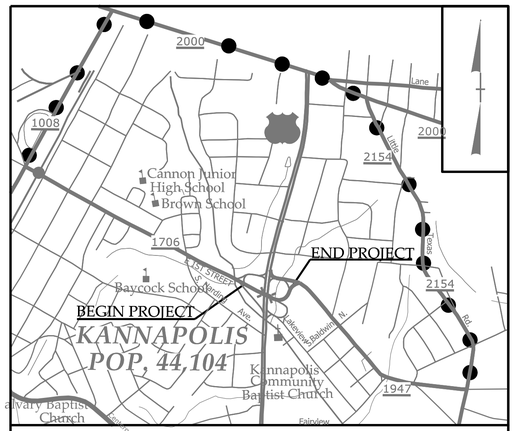
TIP PROJECT: B–5372

CONTRACT: C204384



VICINITY MAP (N.T.S.)
OFF–SITE DETOUR

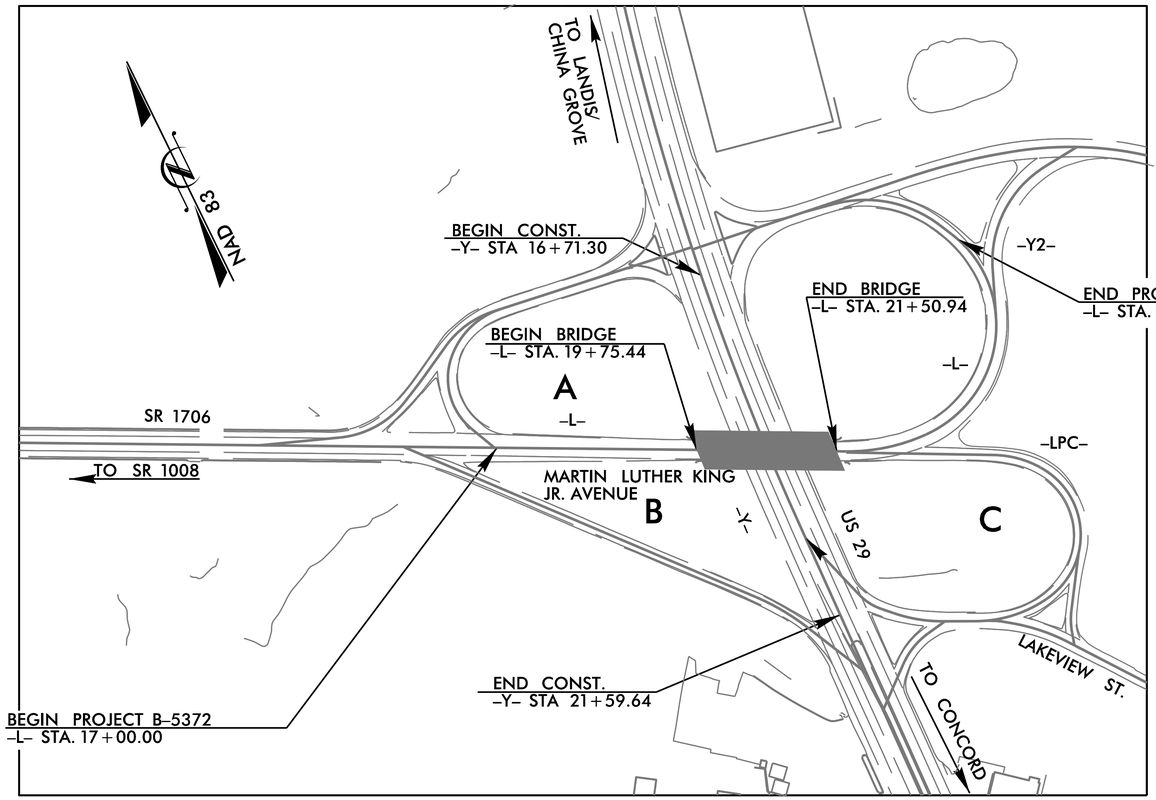
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CABARRUS COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–5372	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
46087.1.1		P.E.
46087.2.1		ROW/UTILITY
46087.3.1		CONST.

LOCATION: BRIDGE NO. 120109 ON SR 1706 (MARTIN LUTHER KING JR. AVE.) OVER US 29
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE



STRUCTURES

DESIGN DATA

ADT (2024) = 3,860
ADT (2040) = 5,600
K = 11 %
D = 55 %
T = 5 % **
* V = 40 MPH
** (TTST 1 %, DUAL 4 %)

FUNC CLASS = MINOR COLLECTOR
SUB–REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–5372 = 1.133 MILES
LENGTH STRUCTURE TIP PROJECT B–5372 = 0.035 MILES

TOTAL LENGTH TIP PROJECT B–5372 = 0.168 MILES

Prepared In the Office of:
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

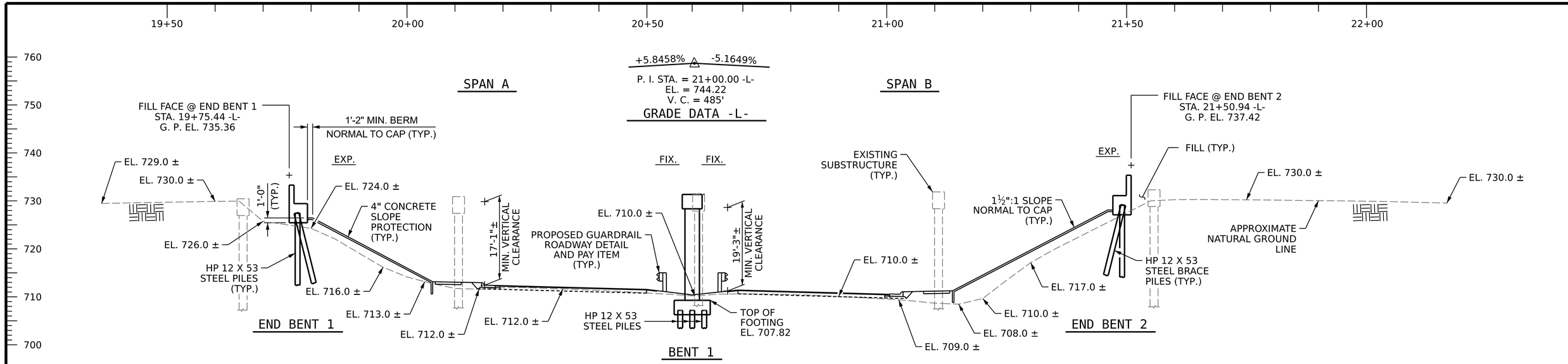
2024 STANDARD SPECIFICATIONS

LETTING DATE :

DECEMBER 17, 2024

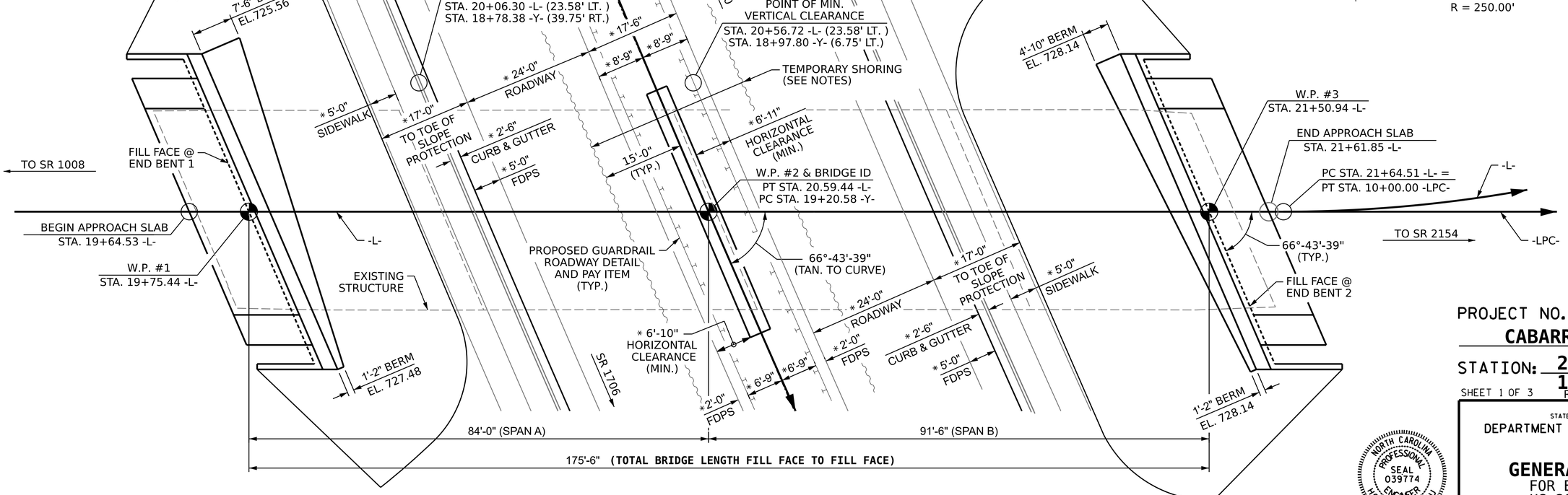
DAVID S. STUTTS P.E.
PROJECT ENGINEER

HOANG T. DIEU P.E.
PROJECT DESIGN ENGINEER



SECTION ALONG -L-

(SECTION AT END BENTS AND BENT ARE TAKEN AT RIGHT ANGLES)



PLAN

(PILES NOT SHOWN FOR CLARITY)
* RADIAL TO -Y-

HORIZONTAL CURVE DATA

-L-	-Y-
PI STA. 22+20.05	PI STA. 18+08.02
△ = 25°-03'-06.3'' (LT.)	△ = 06°-43'-45.3'' (LT.)
D = 22°-55'-05.9''	D = 01°-35'-29.6''
L = 109.31'	L = 422.81'
T = 55.54'	T = 211.65'
R = 250.00'	R = 3,600.00'

PROJECT NO. B-5372
CABARRUS COUNTY
STATION: 20+59.44 -L-
19+20.58 -Y-
SHEET 1 OF 3
REPLACE BRIDGE NO. 120109

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
US 29 ON SR 1706
BETWEEN SR 1008
AND SR 2154

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU
DocuSigned by: Hoang Dieu E6D3DA016F3E4AB...
10/25/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

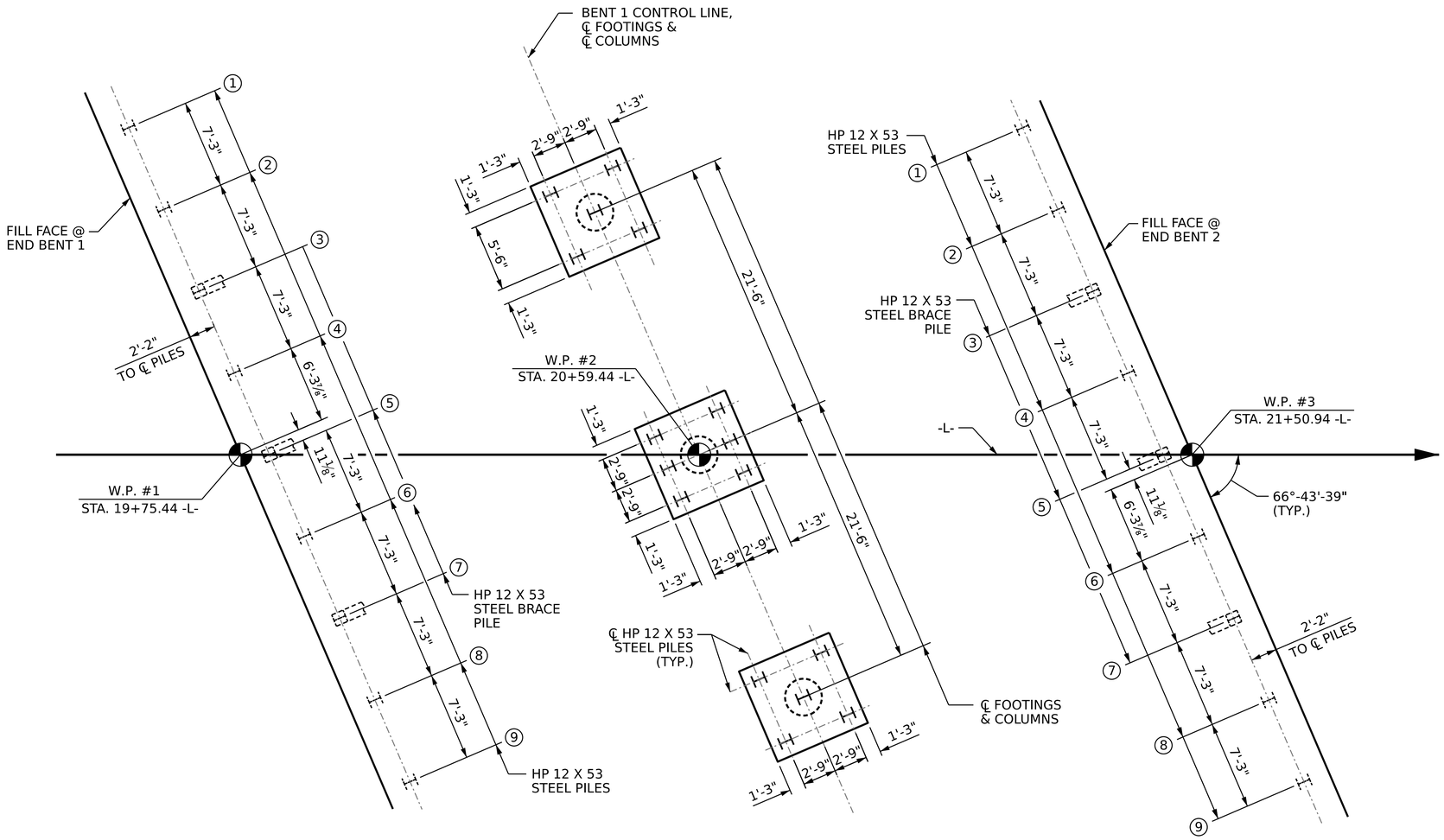
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : M. G. SHAIKH DATE : 8/24
CHECKED BY : J. P. M. DATE : 8/24
DESIGN ENGINEER OF RECORD: H. B. DESAI DATE : 8/24

10/21/2024
S:\PEF\LSA Contracts\LSA Projects\B-5372- SMUPEF\B-5372 OBD\UPDATED SUPERSTRUCTURE PLANS\400_003_B-5372_SMU_ GD_001_120109.dgn
mgshaikh

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.



END BENT 1 | BENT 1 | END BENT 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES, COLUMNS AND SPREAD FOOTING ARE SHOWN TO THE CENTERLINES.

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu E6D3DA016F3E4AB...

10/25/2024

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER
US 29 ON SR 1706
BETWEEN SR 1008
AND SR 2154

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

DRAWN BY : M. G. SHAIKH DATE : 8/24
CHECKED BY : J. P. M. DATE : 8/24
DESIGN ENGINEER OF RECORD: H. B. DESAI DATE : 8/24

10/21/2024
S:\PEF\LSA Contracts\LSA Projects\B-5372- SMUPEF\B-5372 OBD\UPDATED SUPERSTRUCTURE PLANS\400_005_B-5372_SMU_ FL_002_120109.dgn
mgshaikh

SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Factored Resistance per Pile TONS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles*			Drilled-In Piles		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
End Bent No. 1 - Piles 1-5	114	See Structure Drawings	60			190							
End Bent No. 1 - Piles 6-9	114		50			190							
Bent No. 1 - Piles 1-16	120		30			200							
End Bent No. 2 - Piles 1-5	120		55			200							
End Bent No. 2 - Piles 6-9	120		50			200							

**Predrilling for Piles is required for end bents/bents with a predrilling length and at the Contractor's option for end bents/bents with predrilling information but no predrilling length.

$$^{**}RDR = \frac{Factored\ Resistance + Factored\ Downdrag\ Load + Factored\ Dead\ Load}{Dynamic\ Resistance\ Factor} + Nominal\ Downdrag\ Resistance + \frac{Nominal\ Scour\ Resistance}{Scour\ Resistance\ Factor}$$

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load* per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
End Bent No. 1 - Piles 1-9	114			0.60			1.00
Bent No. 1 - Piles 1-16	120			0.60			1.00
End Bent No. 2 - Piles 1-9	120			0.60			1.00

*Factored Dead Load is factored weight of pile above the ground line.

NOTES

1. The Pile and Drilled Pier Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by North Carolina Professional Engineer Michale H. Stephens, PE (PE Seal No. 028893) on 02-20-2023.
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
3. The Engineer will determine the need for PDA Testing, Pipe Pile Plates, Permanent Steel Casing, SPTs, CSL Testing, SID Inspections and PITs when these items may be required.

FOUNDATION NOTES

1) FOR PILES, SEE PILES PROVISION AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. 46087.1.1(B-5372)

CABARRUS COUNTY

STATION: 20+59.44 -L-

Bridge No. 109

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T DIEU

DocuSigned by:
Hoang Dieu 10/25/2024
E6D3DA016F3E4AB
SIGNATURE DATE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

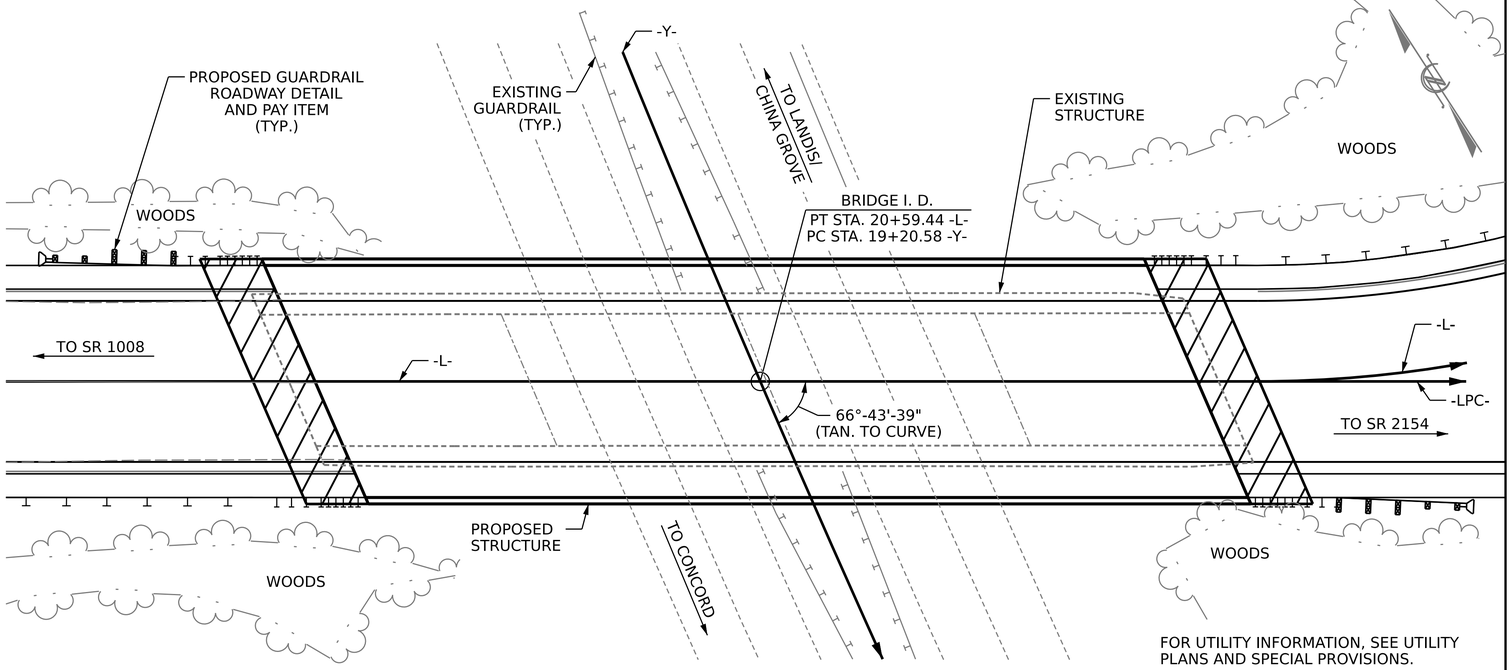
PILE AND DRILLED PIER FOUNDATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

Last Updated: 10/25/2022

BM #2: RR SPIKE SET IN BASE OF 30' PINE TREE, 67' RT OF STA. 26+15.00 -BL-, EL. 726.34



LOCATION SKETCH

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STA.20+59.44 -L-	ASBESTOS ASSESSMENT	FOUNDATION EXCAVATION FOR BENT 1 AT STA. 20.59.44 -L-	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	
	LUMP SUM	LUMP SUM	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.
SUPERSTRUCTURE	LUMP SUM	LUMP SUM	LUMP SUM	8,889	6,864		LUMP SUM			10	856.67
END BENT 1						57.8		7,116			
BENT 1						76.1		12,098	1,290		
END BENT 2						56.7		7,378			
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	8,889	6,864	190.6	LUMP SUM	26,592	1,290	10	856.67

TOTAL BILL OF MATERIAL

	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	ELECTRICAL CONDUIT SYSTEM	CLASSIC CONCRETE BRIDGE RAIL
	EACH	NO.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.
SUPERSTRUCTURE					LUMP SUM	LUMP SUM	LUMP SUM	346.4
END BENT 1	9	9	500	319				
BENT 1	16	16	480					
END BENT 2	9	9	475	432				
TOTAL	34	34	1455	751	LUMP SUM	LUMP SUM	LUMP SUM	346.4

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, SEE SPECIAL PROVISIONS.

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

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, 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.

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

THE EXISTING STRUCTURE CONSISTING OF 4 SPANS (1 @ 45'-0", 2 @ 50'-0", 1 @ 45'-0") OF REINFORCED CONCRETE DECK ON STEEL I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 28'-0", WITH REINFORCED CONCRETE END BENT AND BENT CAPS ON FULLY CONCRETE ENCASED STEEL PILES WITH ADDITIONAL CRUTCH BENTS. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD.

THE SUBSTRUCTURE OF THE EXISTING BRDIGE 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 TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCE 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.

ALL PAVEMENT MARKING WILL BE IN ACCORDANCE WITH THE PAVEMENT MARKING PLANS AND SHALL PROVIDE FOR BICYCLES.

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 20+59.44 -L-."

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

FOR CLASSIC CONCRETE BRIDGE RAIL, SEE SPECIAL PROVISIONS.

FOR ELECTRICAL CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 3 OF 3

DRAWN BY : M. G. SHAIKH DATE : 8/24
CHECKED BY : J. P. M. DATE : 8/24
DESIGN ENGINEER OF RECORD: H. B. DESAI DATE : 8/24

12/10/2024
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mgshaikh

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu E6D3DA016F3E4AB...

12/10/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
US 29 ON SR 1706
BETWEEN SR 1008
AND SR 2154

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

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	1.147	--	1.75	0.983	1.290	B	5	44.00	1.109	1.147	B	3	73.7	0.80	0.851	1.160	B	3	44.00	
		HL-93 (OPERATING)	N/A		1.487	--	1.35	0.983	1.673	B	5	44.00	1.109	1.487	B	3	73.7	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	1.561	56.199	1.75	0.983	1.885	B	5	44.00	1.107	1.561	A	3	69.2	0.80	0.983	1.695	B	5	44.00	
		HS-20 (OPERATING)	36.000		2.024	72.851	1.35	0.983	2.443	B	5	44.00	1.107	2.024	A	3	69.2	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.953	53.366	1.40	0.983	5.495	B	5	44.00	1.107	4.677	A	3	69.2	0.80	0.983	3.953	B	5	44.00	
		SNGARBS2	20.000		2.890	57.809	1.40	0.983	4.018	B	5	44.00	1.107	3.315	A	3	69.2	0.80	0.983	2.890	B	5	44.00	
		SNAGRIS2	22.000		2.715	59.724	1.40	0.983	3.774	B	5	44.00	1.107	3.073	A	3	69.2	0.80	0.983	2.715	B	5	44.00	
		SNCOTTS3	27.250		1.966	53.561	1.40	0.983	2.732	B	5	44.00	1.107	2.334	A	3	69.2	0.80	0.983	1.966	B	5	44.00	
		SNAGGRS4	34.925		1.621	56.622	1.40	0.983	2.254	B	5	44.00	1.107	1.930	A	3	69.2	0.80	0.983	1.621	B	5	44.00	
		SNS5A	35.550		1.587	56.412	1.40	0.983	2.206	B	5	44.00	1.107	1.951	A	3	69.2	0.80	0.983	1.587	B	5	44.00	
		SNS6A	39.950		1.447	57.815	1.40	0.983	2.012	B	5	44.00	1.107	1.777	A	3	69.2	0.80	0.983	1.447	B	5	44.00	
		SNS7B	42.000		1.378	57.869	1.40	0.983	1.915	B	5	44.00	1.107	1.742	A	3	69.2	0.80	0.983	1.378	B	5	44.00	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.762	58.152	1.40	0.983	2.450	B	5	44.00	1.107	2.117	A	3	69.2	0.80	0.983	1.762	B	5	44.00	
		TNT4A	33.075		1.768	58.462	1.40	0.983	2.457	B	5	44.00	1.107	2.066	A	3	69.2	0.80	0.983	1.768	B	5	44.00	
		TNT6A	41.600		1.437	59.778	1.40	0.983	1.998	B	5	44.00	1.109	1.846	B	3	73.7	0.80	0.983	1.437	B	5	44.00	
		TNT7A	42.000		1.440	60.471	1.40	0.983	2.001	B	5	44.00	1.109	1.812	B	3	73.7	0.80	0.983	1.440	B	5	44.00	
		TNT7B	42.000		1.479	62.110	1.40	0.983	2.056	B	5	44.00	1.107	1.704	A	3	69.2	0.80	0.983	1.479	B	5	44.00	
		TNAGRIT4	43.000		1.415	60.833	1.40	0.983	1.967	B	5	44.00	1.107	1.650	A	3	69.2	0.80	0.983	1.415	B	5	44.00	
		TNAGT5A	45.000		1.338	60.194	1.40	0.983	1.859	B	5	44.00	1.107	1.636	A	3	69.2	0.80	0.983	1.338	B	5	44.00	
		TNAGT5B	45.000	3	1.325	59.616	1.40	0.983	1.842	B	5	44.00	1.107	1.570	A	3	69.2	0.80	0.983	1.325	B	5	44.00	
		EV2	28.750		2.037	58.554	1.30	0.983	3.049	B	5	44.00	1.107	2.503	A	3	69.2	0.80	0.983	2.037	B	5	44.00	
		EV3	43.000	4	1.339	57.588	1.30	0.983	2.005	B	5	44.00	1.107	1.686	A	3	69.2	0.80	0.983	1.339	B	5	44.00	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

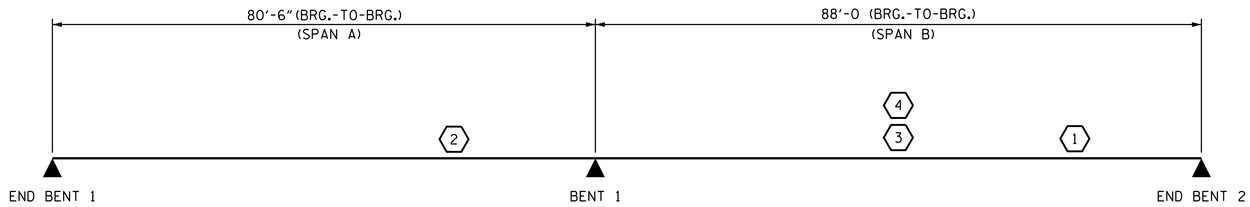
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu E6D3DA016F3E4AB... 10/25/2024

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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			36

STD. NO. LRFR1

ASSEMBLED BY : M. G. SHAIKH	DATE : 8/24		
CHECKED BY : J. P. M.	DATE : 8/24		
DRAWN BY : MAA 1/08	REV. 11/12/08RR	MAA/GM	
CHECKED BY : GM/DI 2/08	REV. 10/1/11	MAA/GM	
	REV. 12/17	MAA/THC	

10/23/2024
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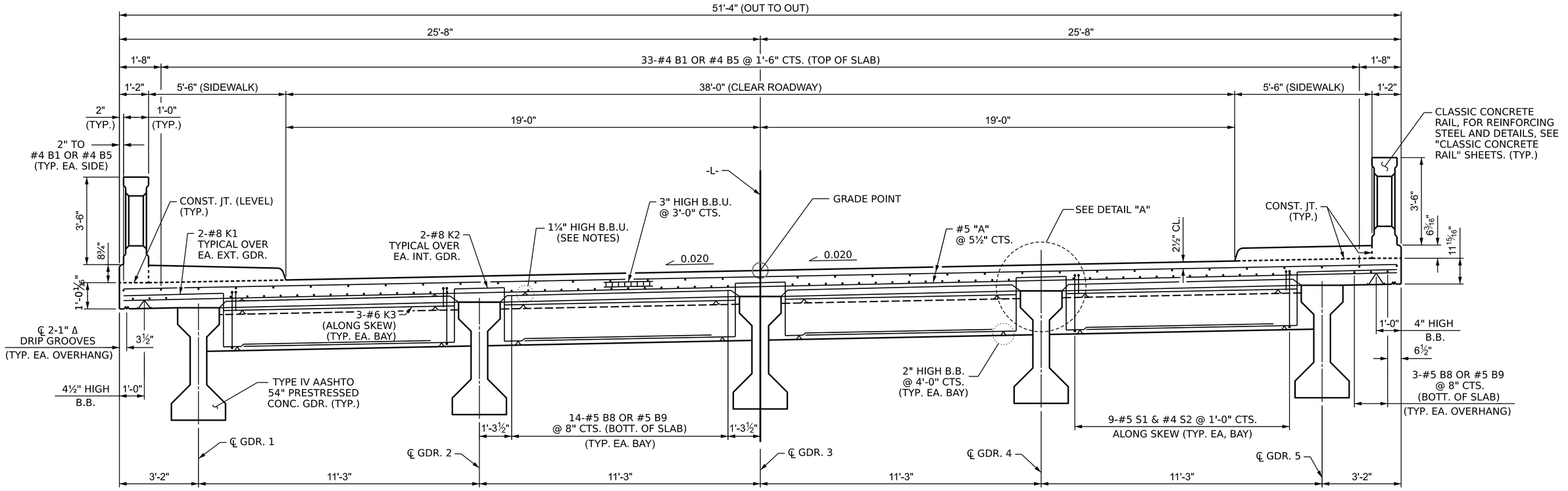
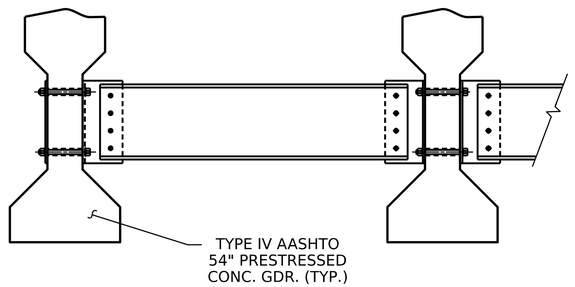
mgshaikh

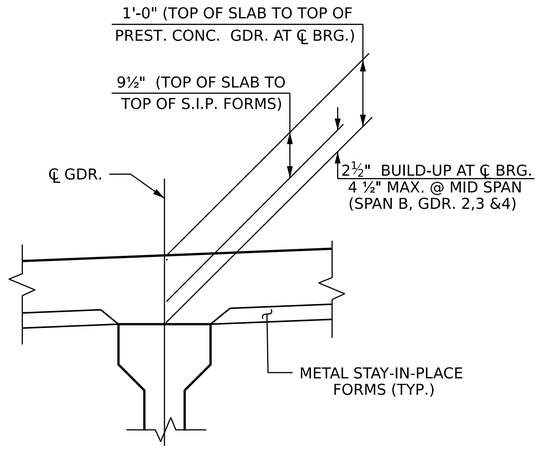


TYPICAL SECTION SHOWING END BENT DIAPHRAGMS



PART SECTION AT INTERMEDIATE DIAPHRAGM

SHOWING INTERMEDIATE STEEL DIAPHRAGM
(FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS,
SEE ``INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV
AASHTO PRESTRESSED CONCRETE GIRDERS SHEET & FRAMING PLAN")
(TYP. EA. BAY)



DETAIL "A"

* BASE ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS.

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.

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu E6D3DA016F3E4AB...

10/25/2024

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : M. G. SHAIKH DATE : 8/24
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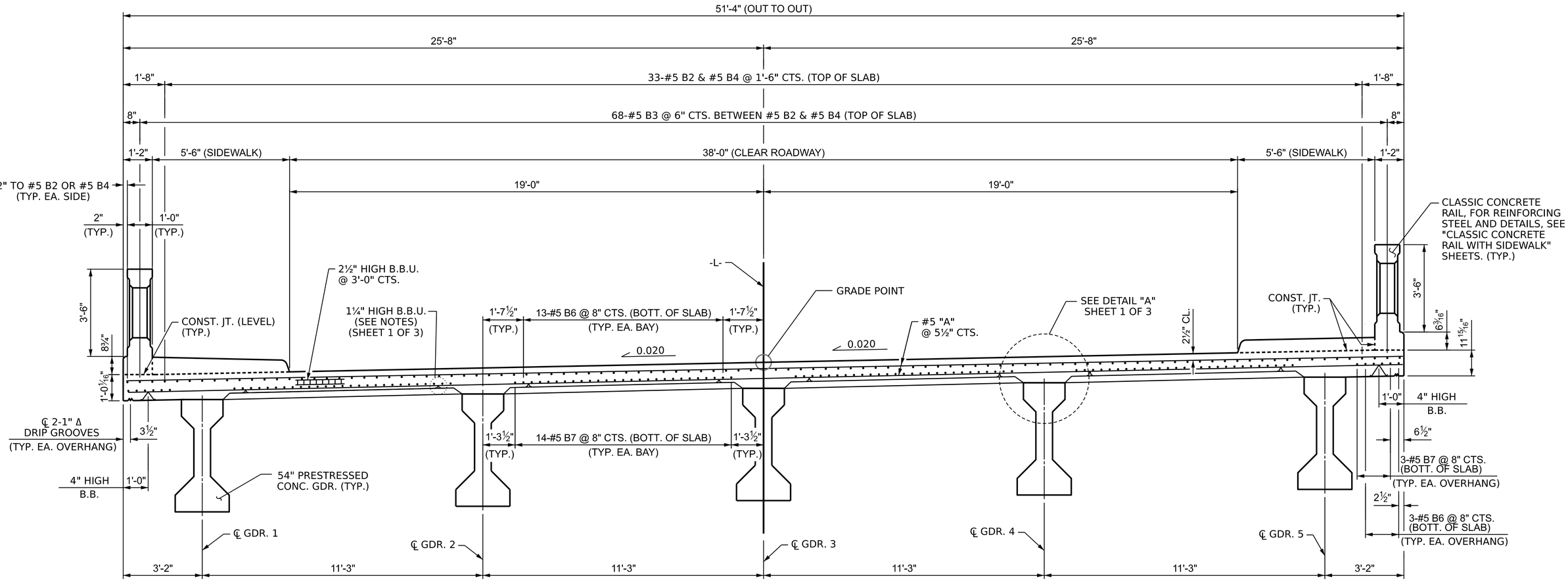

LINK SLAB AT BENT

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : M. G. SHAIKH DATE : 8/24
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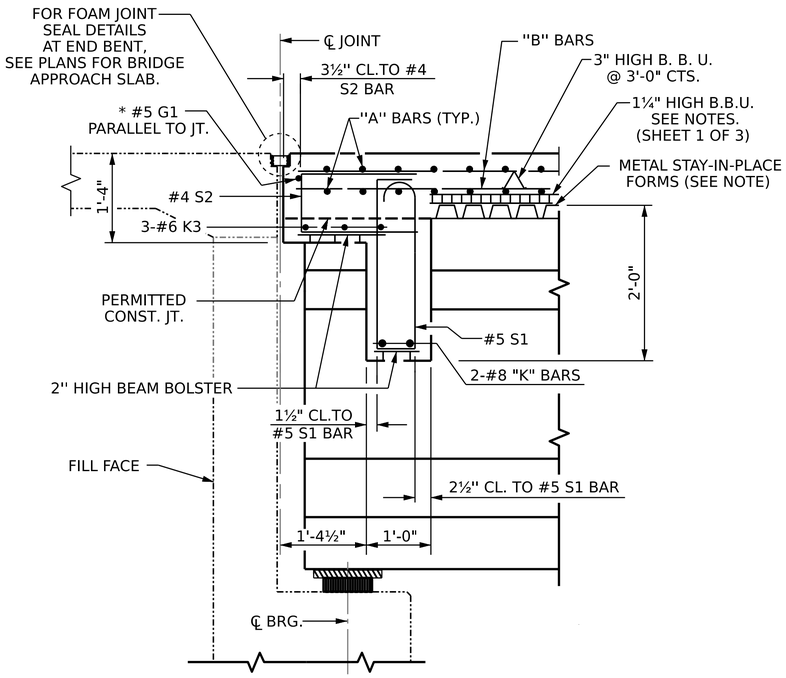
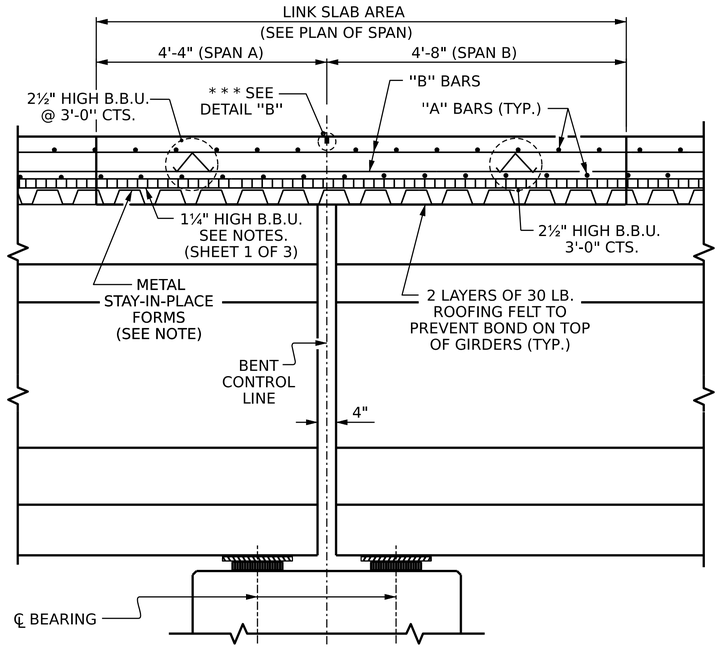


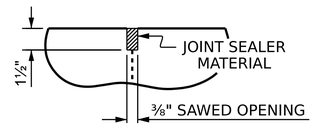
SECTION THROUGH END BENT DIAPHRAGM

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



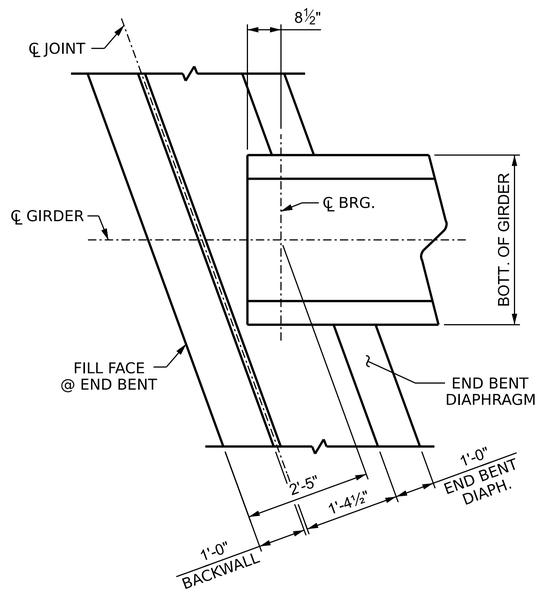
SECTION @ LINK SLAB

METAL STAY IN PLACE FORMS SHALL NOT BE WELDED TO THE GIRDER FLANGES IN THE REGION OF THE LINK SLAB.

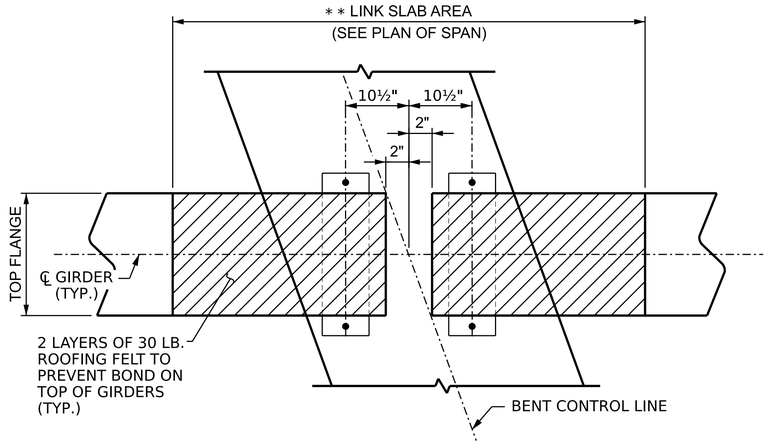


DETAIL "B"

* * * A 1½" DEEP, ⅜" WIDE CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWN WITHIN 24 HOURS OF POURING THE DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS



PLAN OF END BENT DIAPHRAGM



PLAN @ BENT

* * THE TOP OF THE GIRDER IN THE REGION OF THE LINK SLAB SHALL BE SMOOTH (NOT RAKED) AND FREE OF STIRRUPS, ANCHOR STUDS, DECK FORMWORK ATTACHMENTS, AND OVERHANG FALSEWORK/FORMWORK ATTACHMENTS.

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu E6D3DAD16F3E4AB...
10/25/2024

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			36

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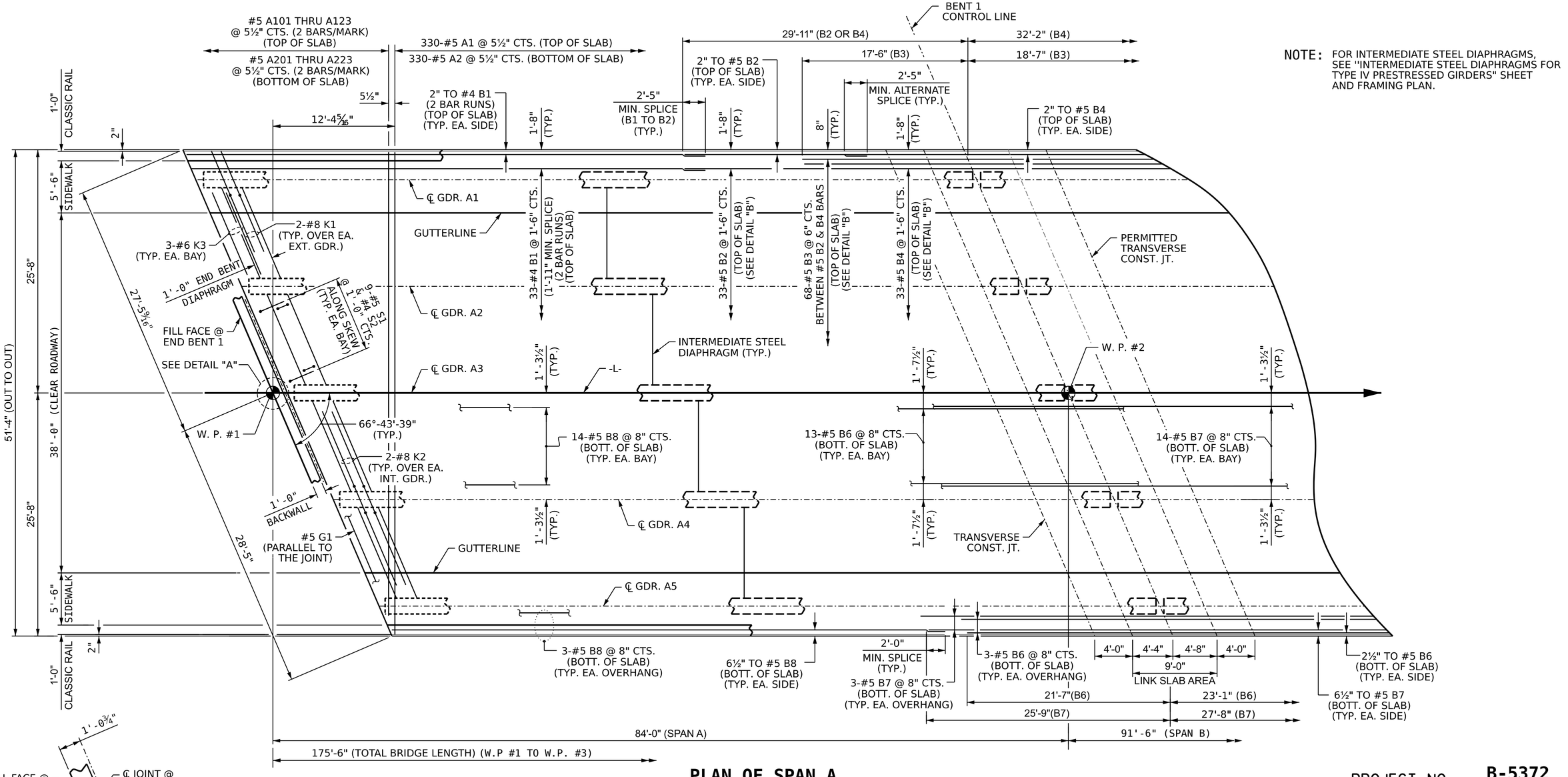
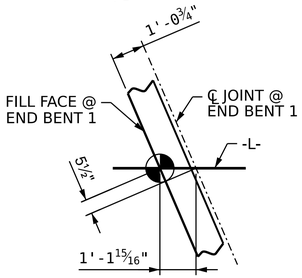
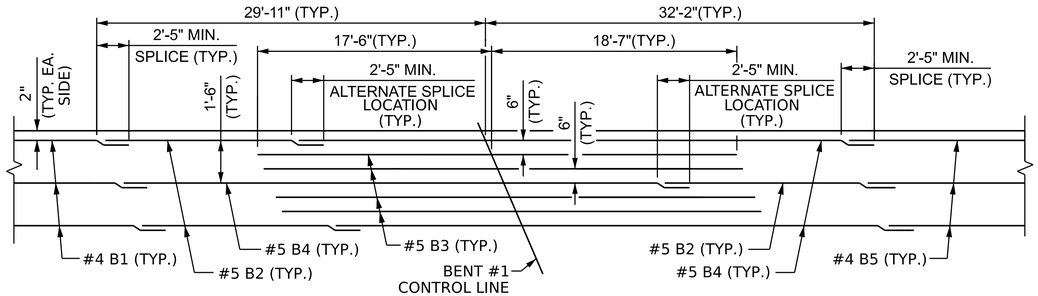


PLAN OF SPAN A

NOTE: FOR INTERMEDIATE STEEL DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED GIRDERS" SHEET AND FRAMING PLAN.



DETAIL "A"



DETAIL "B" AT BENT 1
(TOP OF SLAB)

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			36

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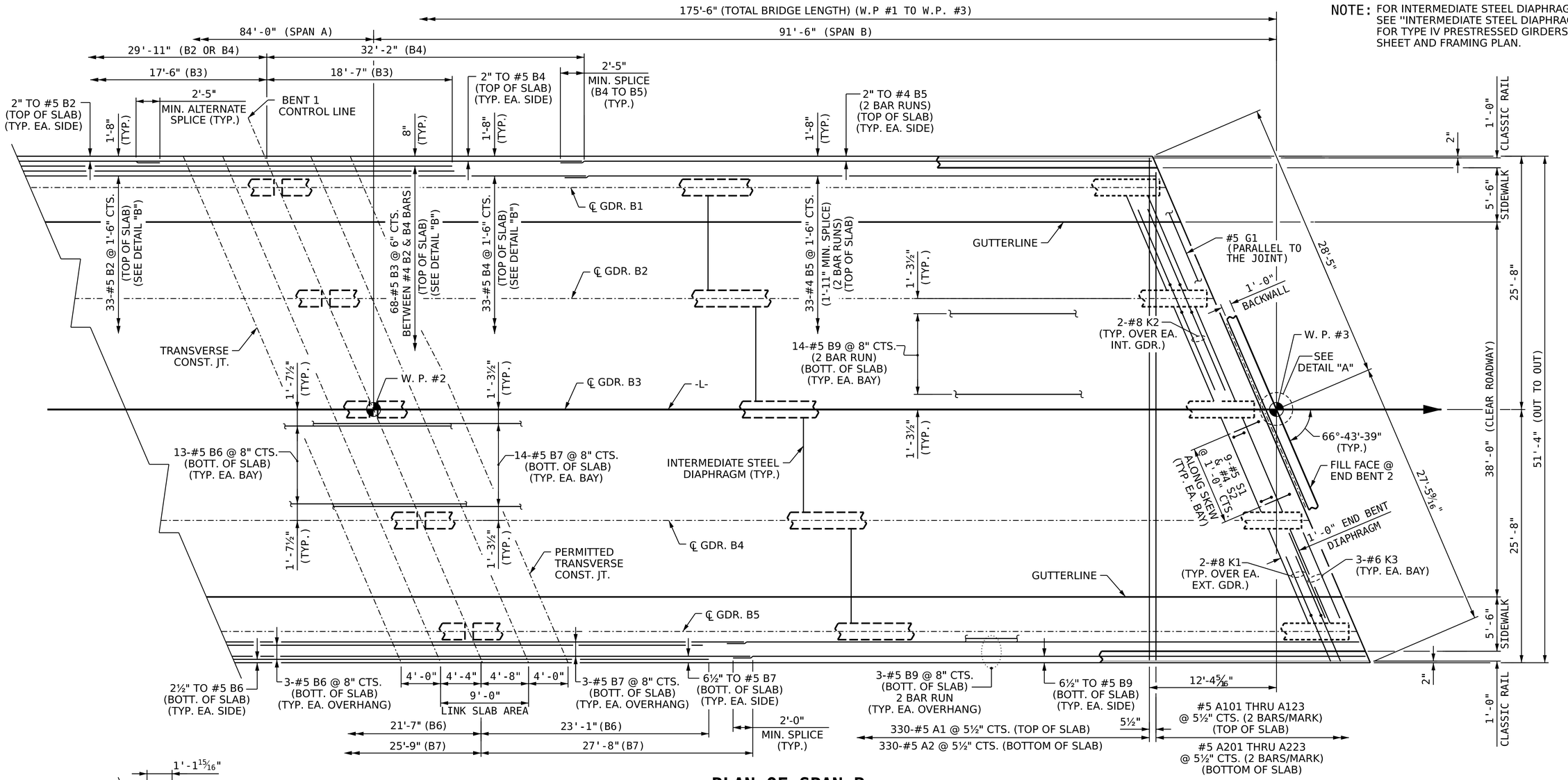
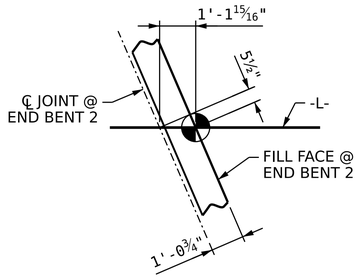
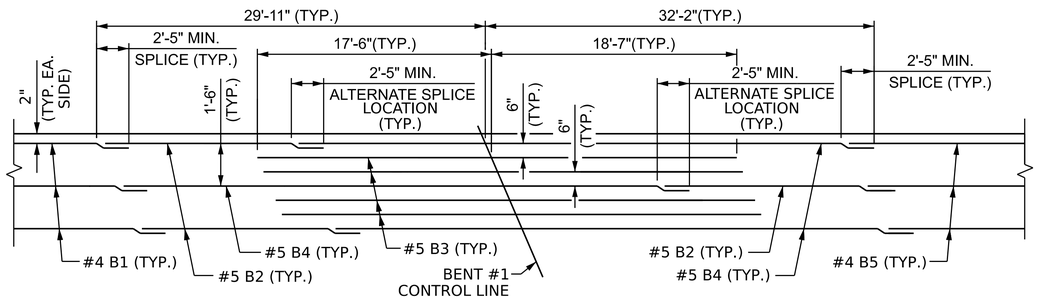
NOTE: FOR INTERMEDIATE STEEL DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED GIRDERS" SHEET AND FRAMING PLAN.



PLAN OF SPAN B



DETAIL "A"



DETAIL "B" AT BENT 1 (TOP OF SLAB)

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN B

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

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10/25/2024

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : M. G. SHAIKH DATE : 8/24
CHECKED BY : J. P. M. DATE : 8/24
DESIGN ENGINEER OF RECORD: H. B. DESAI DATE : 8/24

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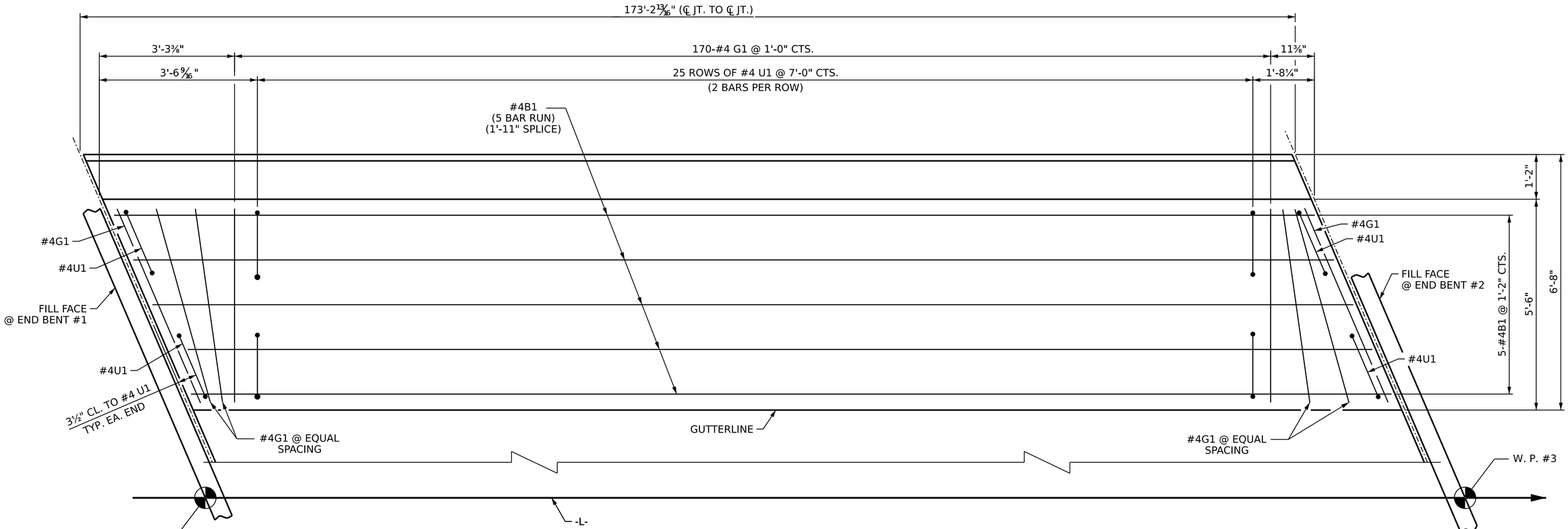
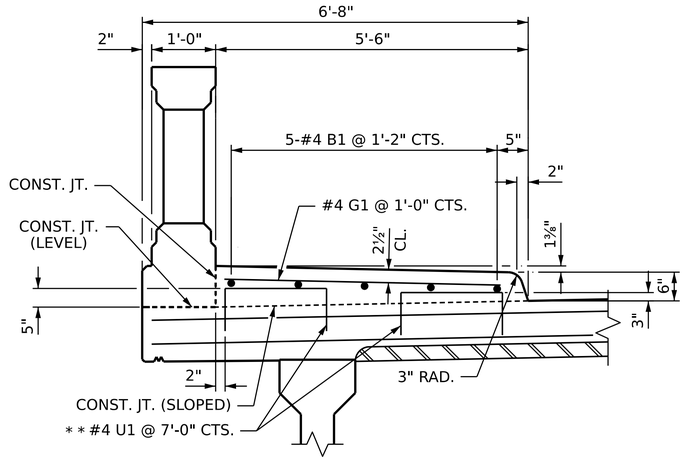


PLAN OF SIDEWALK

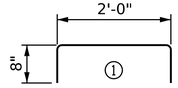
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)



SECTION THRU SIDEWALK

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

BAR TYPE



BAR DIMENSION IS OUT TO OUT

BILL OF MATERIALS

SIDEWALK (BOTH SIDES)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	50	#4	STR	36'-2"	1208
* G1	352	#4	STR	5'-2"	1215
* U1	108	#4	1	3'-4"	240
* EPOXY COATED REINF. STEEL = 2663 LBS					
CLASS AA CONCRETE = 42.3 C.Y.					

NOTES

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

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

PAYMENT FOR SIDEWALK SHALL BE INCLUDED IN UNIT PRICE FOR "REINFORCED CONCRETE DECK SLAB".

ADJUST #4G1 BARS AND #4U1 BARS AS NECESSARY TO CLEAR CONDUIT JUNCTION BOX. CUT #4B1 BARS AT JUNCTION BOX LOCATIONS. SEE "CLASSIC CONCRETE BRIDGE RAIL DETAILS" SHEETS.

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

SIDEWALK DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			36

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S:\PEF\LSA Contracts\LSA Projects\B-5372- SMUPEF\B-5372 OBD\UPDATED PLANS DGN_10-24\400_023_B-5372_SMU_ SW_0011_120109.dgn
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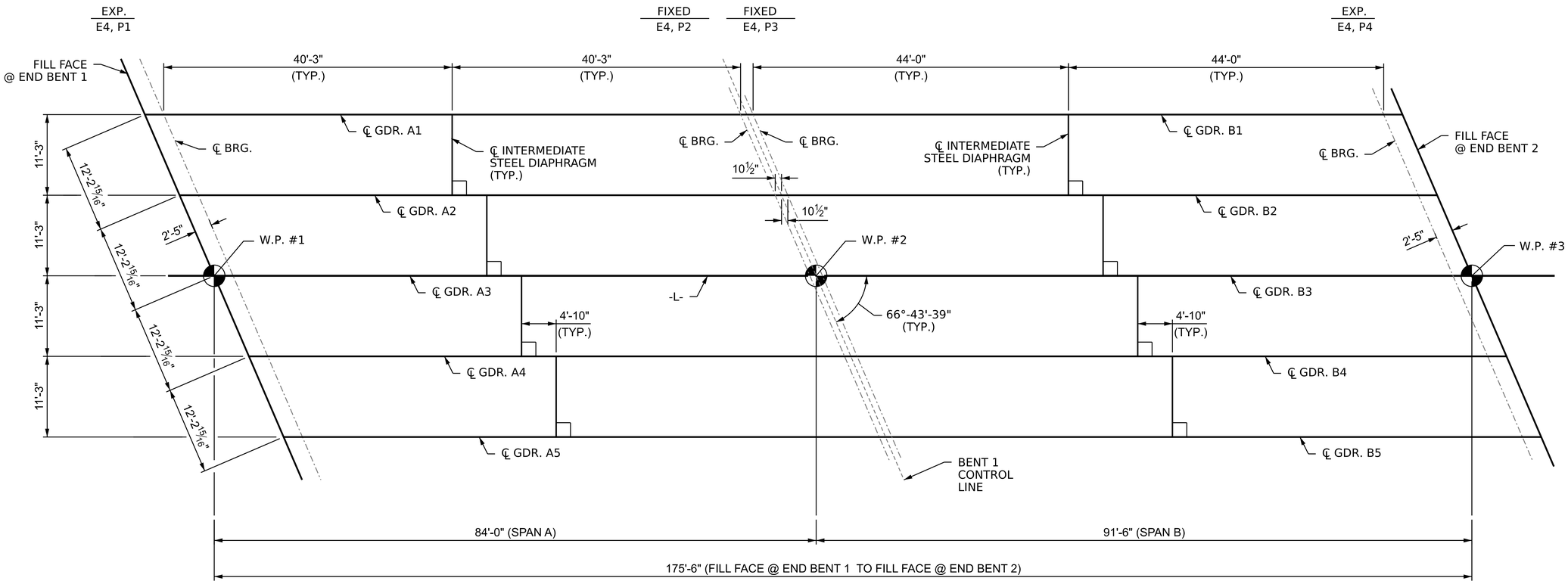

FRAMING PLAN

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

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10/25/2024

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

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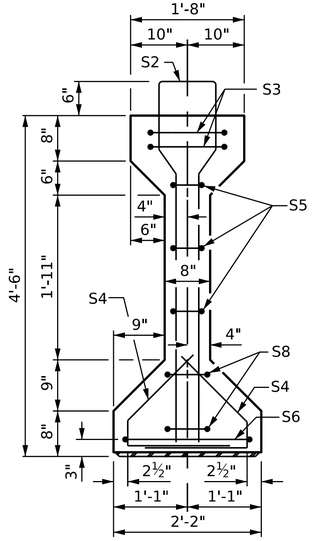
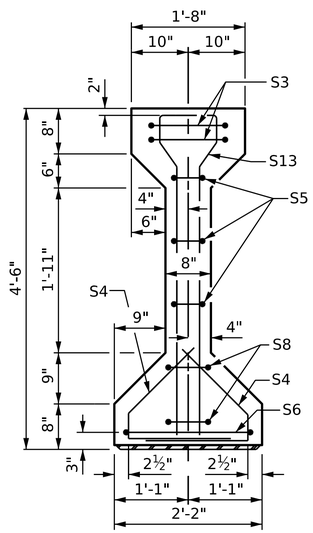
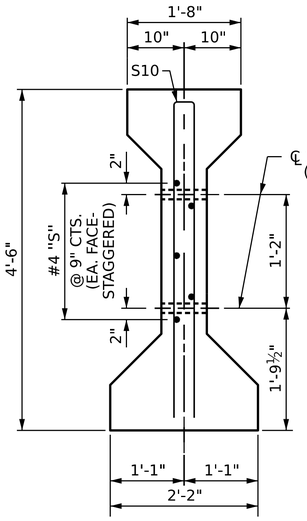


SECTION A-A



SECTION B-B

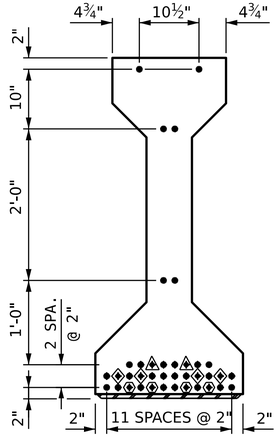


SECTION C-C

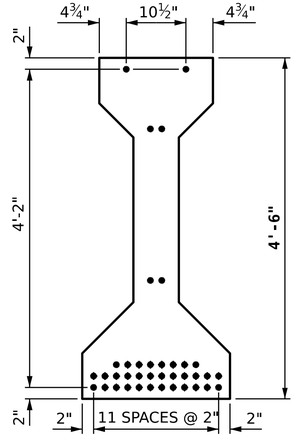
(S1 BARS NOT SHOWN)

DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

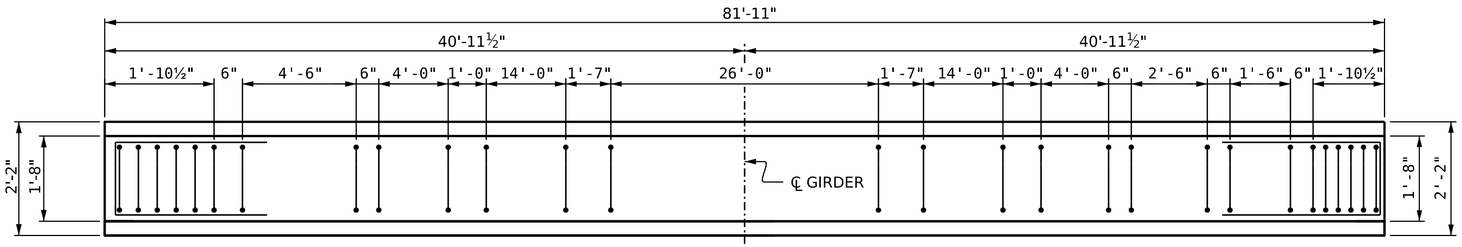


AT END OF GIRDER

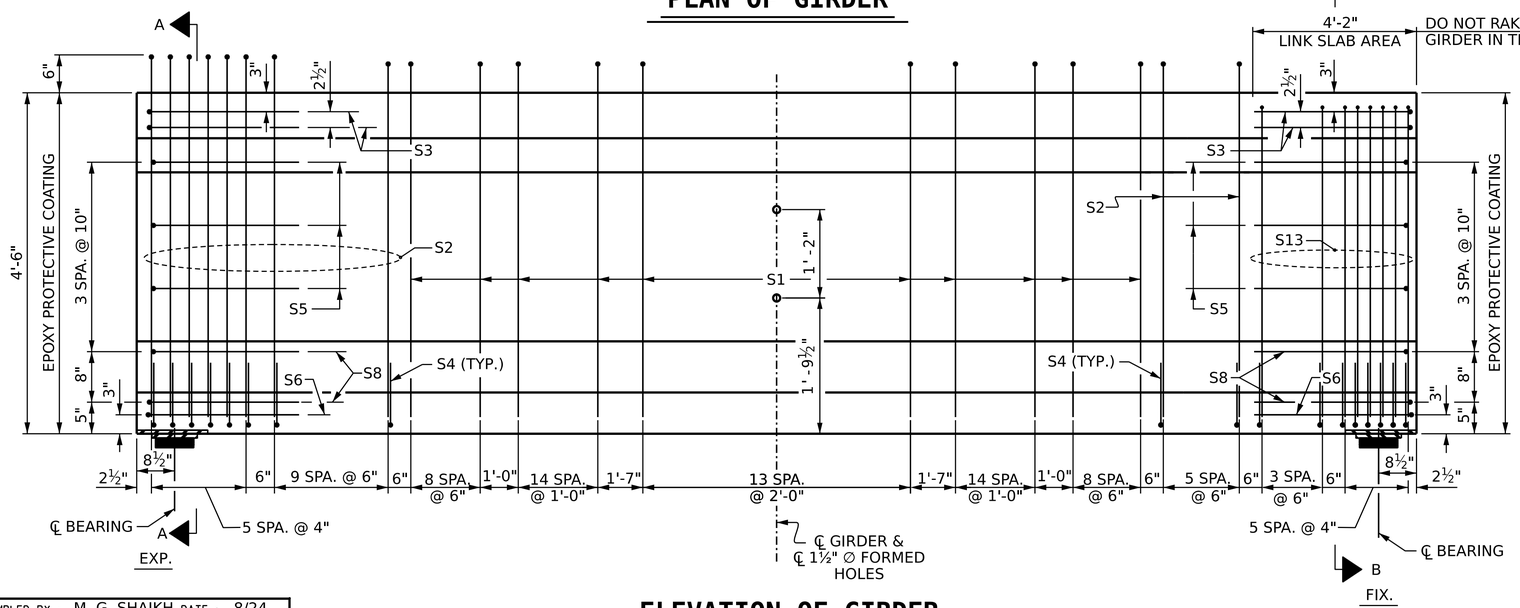


AT ℄ OF GIRDER

0.6" ⌀ LOW RELAXATION STRAND LAYOUT

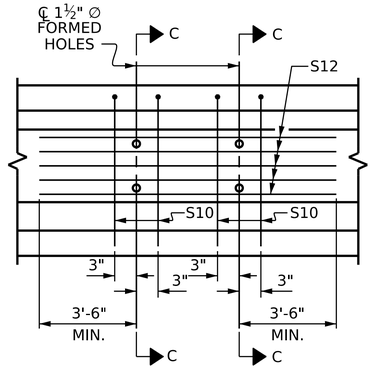


PLAN OF GIRDER



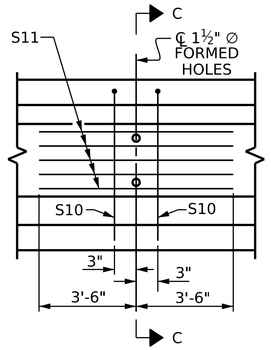
ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR INTERIOR GIRDERS.



PARTIAL ELEVATION

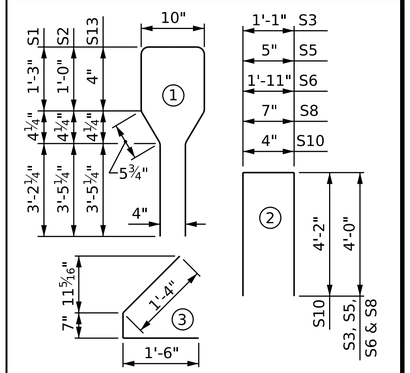
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR EXTERIOR GIRDERS

0.6"⌀ 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	62	#4	1	10'-8"	442
	S2	22	#6	1	10'-8"	352
	S3	4	#4	2	9'-1"	24
	S4	64	#4	3	3'-5"	146
	S5	6	#4	2	8'-5"	34
	S6	2	#4	2	9'-11"	13
	S8	4	#4	2	8'-7"	23
EXTERIOR GDR.	S10	2	#5	2	8'-8"	18
INTERIOR GDR.	S10	4	#5	2	8'-8"	36
EXTERIOR GDR.	S11	5	#4	STR	7'-0"	23
INTERIOR GDR.	S12	5	#4	STR	11'-10"	40
	S13	10	#6	1	9'-4"	140

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8,000 PSI CONCRETE	0.6" ∅ L. R. STRANDS
	LB.	C.Y.	No.
EXT. GIRDER	1215	16.6	38
INT. GIRDER	1250	16.6	38

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	81'-11"	409'-7"

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER - LINK SLAB SPAN "A"

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

Docusigned by: Hoang Dieu E6D5DA01F73E4AB... 10/25/2024

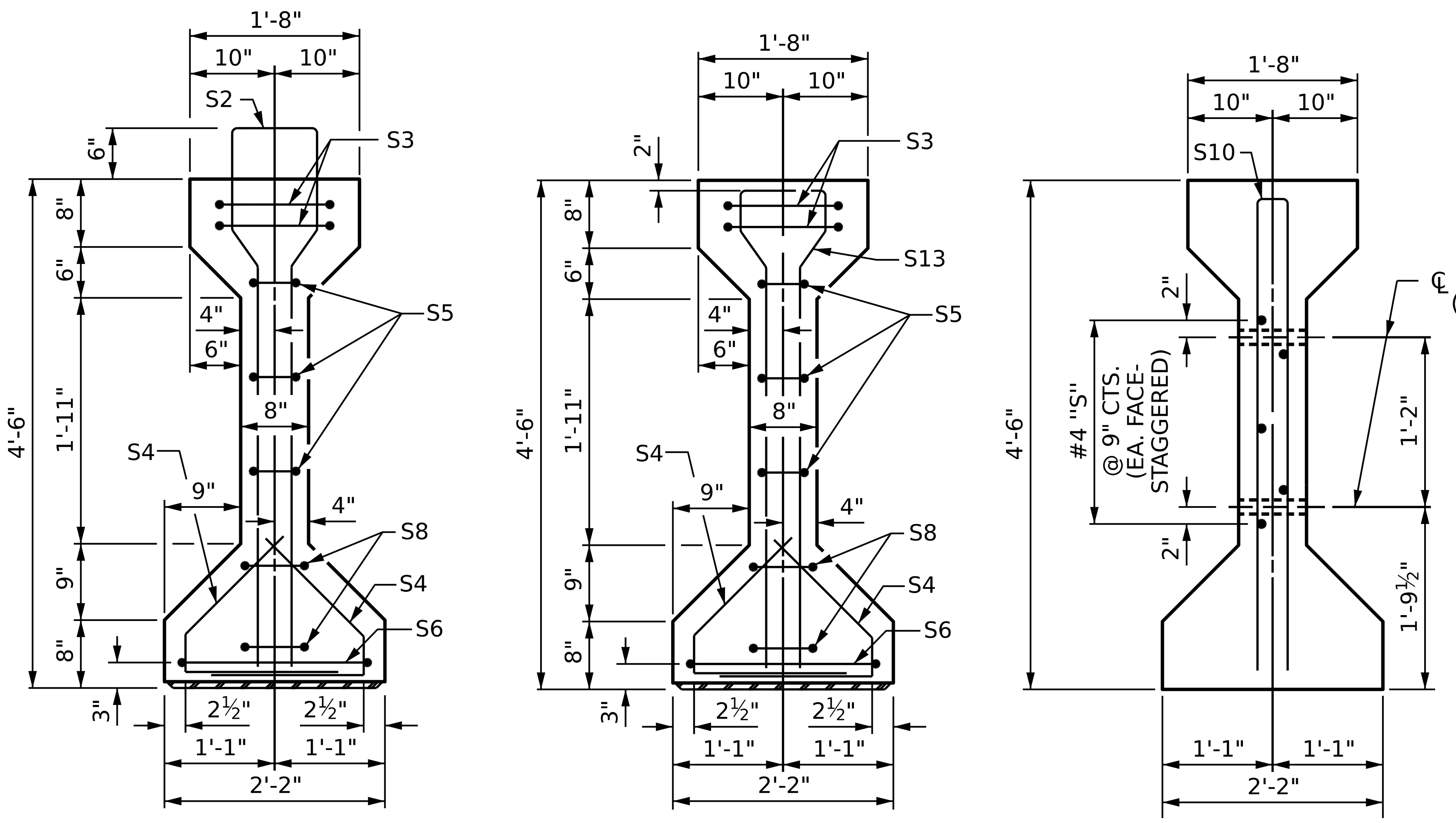
ASSEMBLED BY : M. G. SHAIKH	DATE : 8/24
CHECKED BY : J. P. M.	DATE : 8/24
DRAWN BY : BNB 09/21	
CHECKED BY : AAI 09/21	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			36

10/17/2024
S:\PEF\LSA Contracts\LSA Projects\B-5372- SMUPEF\B-5372 OBD\UPDATED SUPERSTRUCTURE PLANS\400_027_B-5372_SMU_ G*_0013_120109.dgn
mgshaikh

STD. NO. PCG6 (SHT. 1)



SECTION A-A

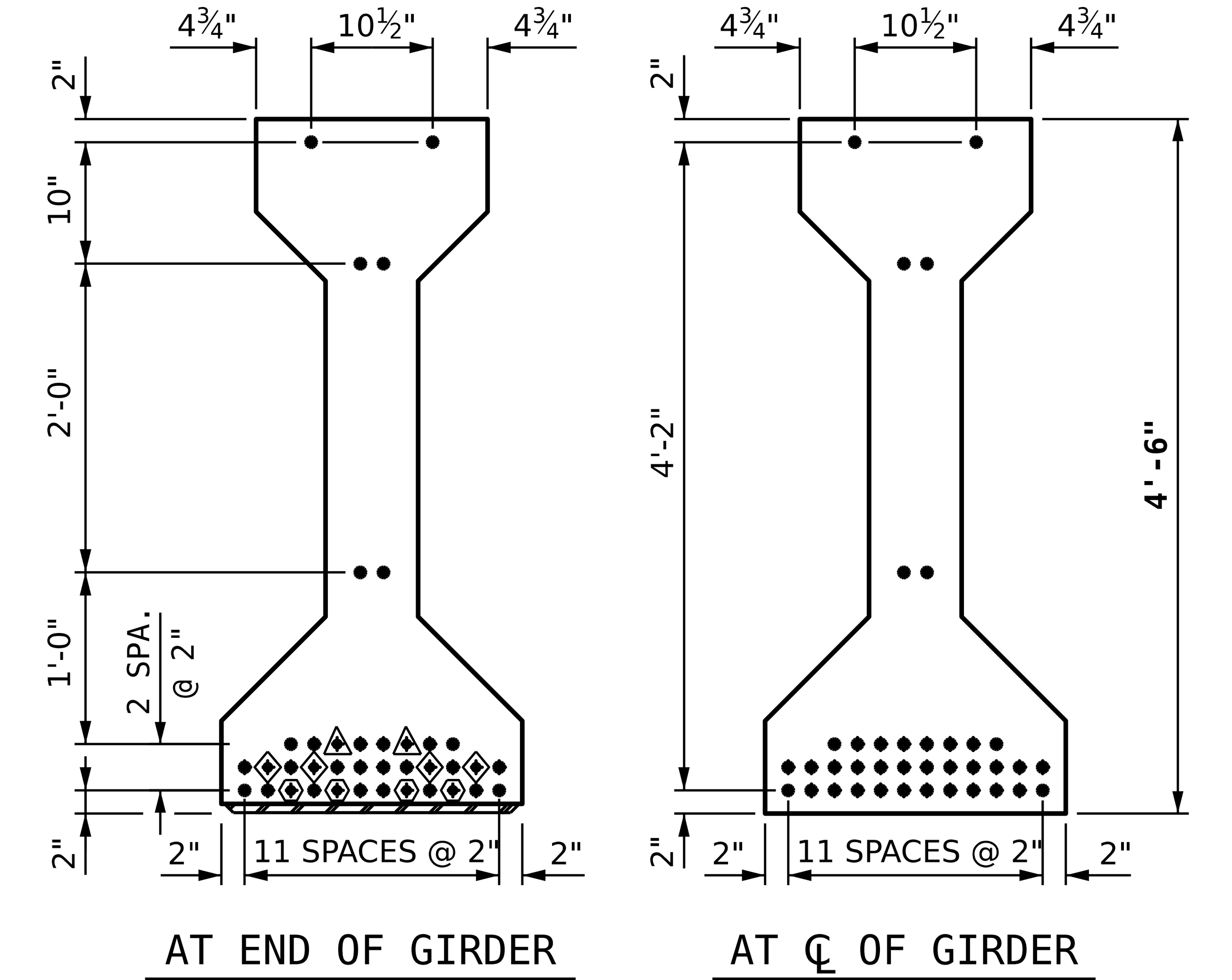
SECTION B-B

SECTION C-C

(S1 BARS NOT SHOWN)

DEBONDING LEGEND

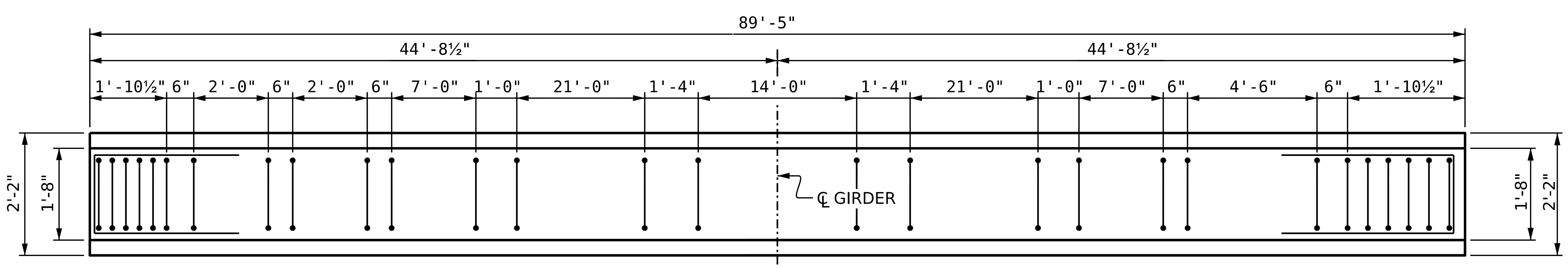
- • FULLY BONDED STRANDS
- △ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◇ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER



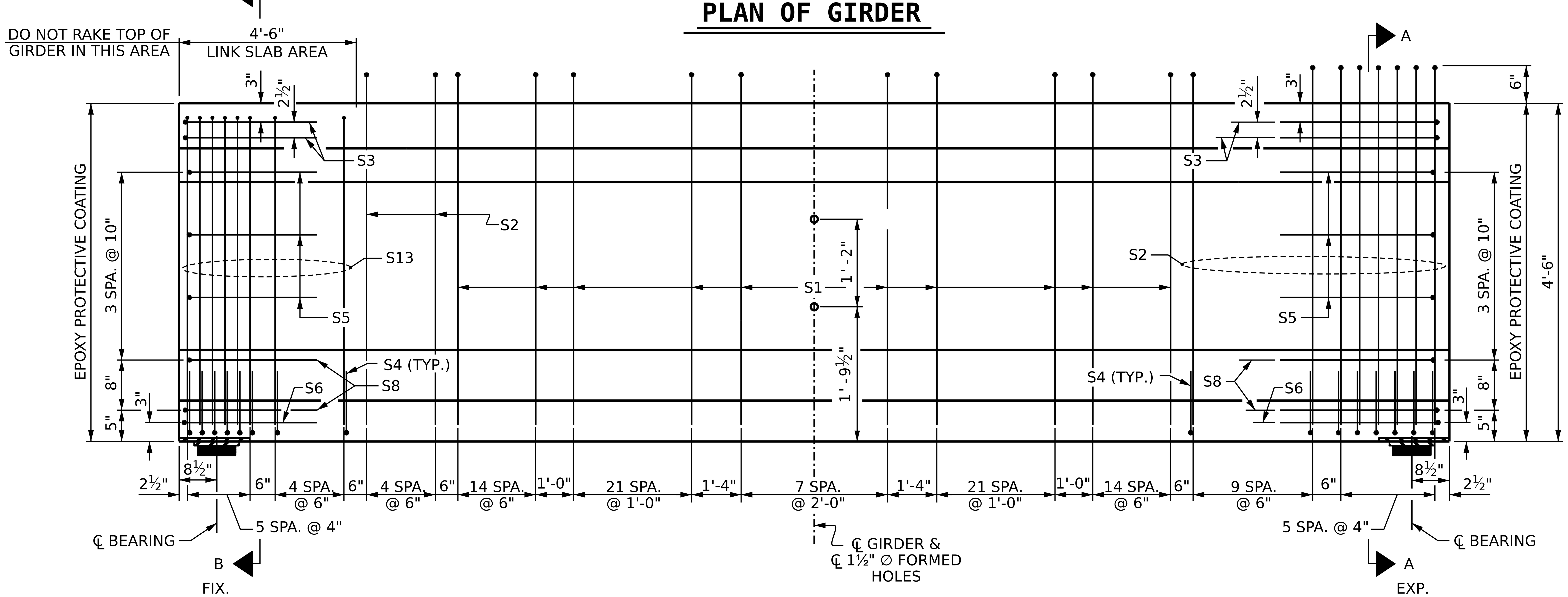
AT END OF GIRDER

AT ℄ OF GIRDER

0.6" ⌀ LOW RELAXATION STRAND LAYOUT

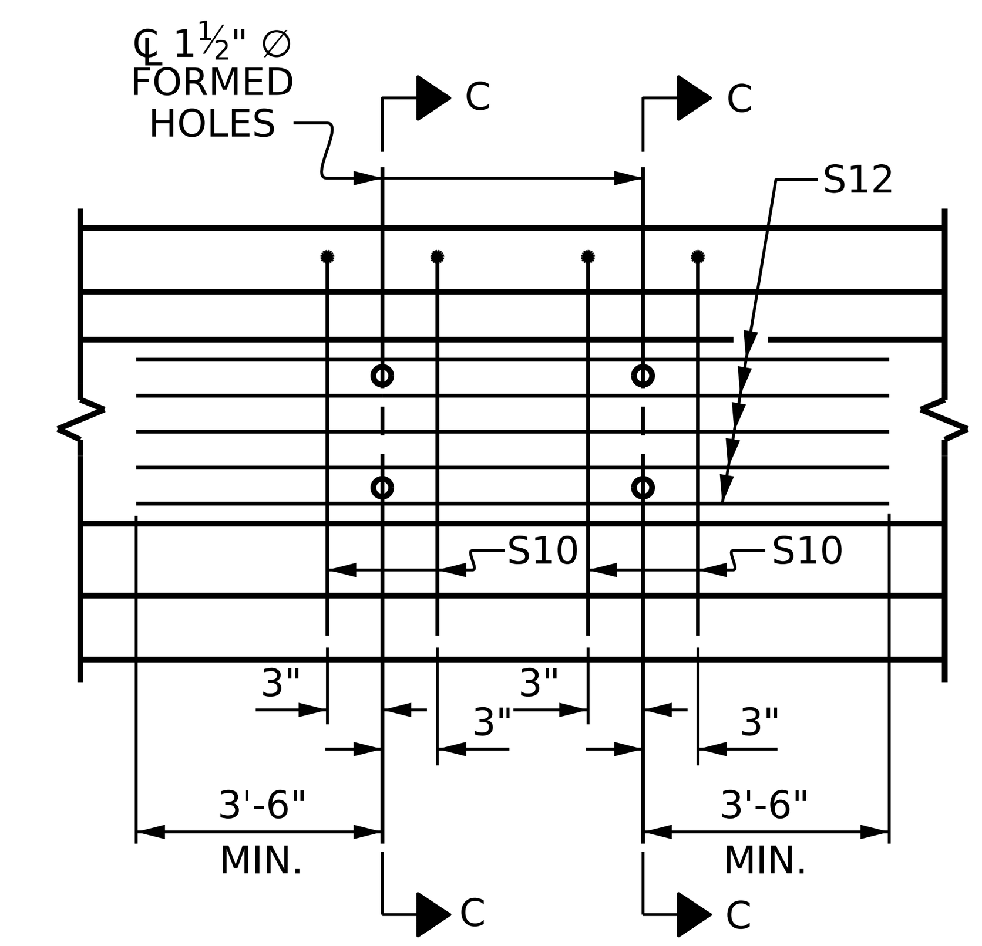


PLAN OF GIRDER



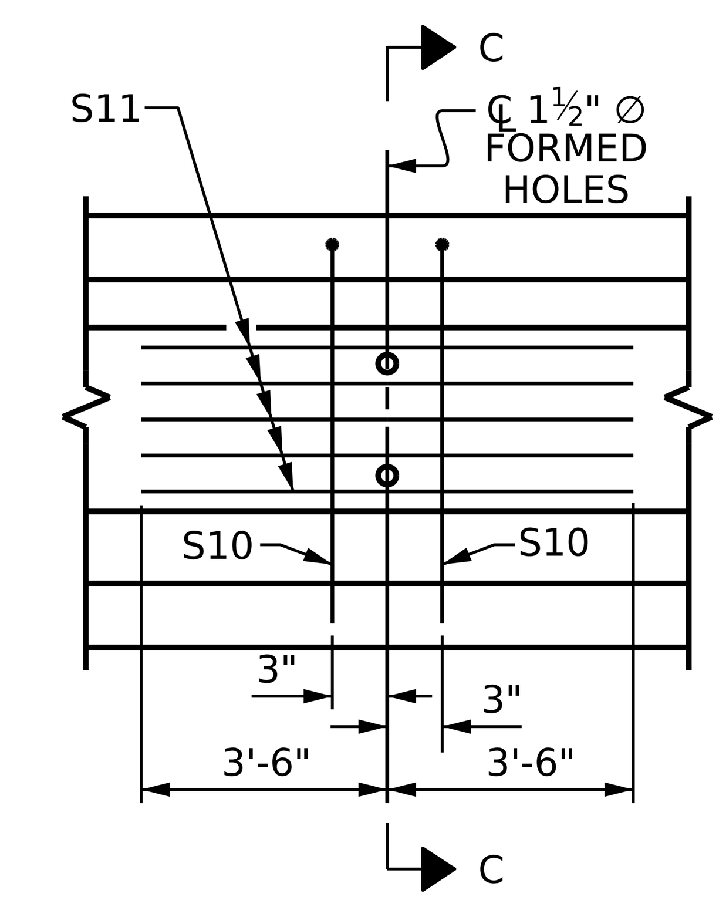
ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR INTERIOR GIRDERS.



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR EXTERIOR GIRDERS

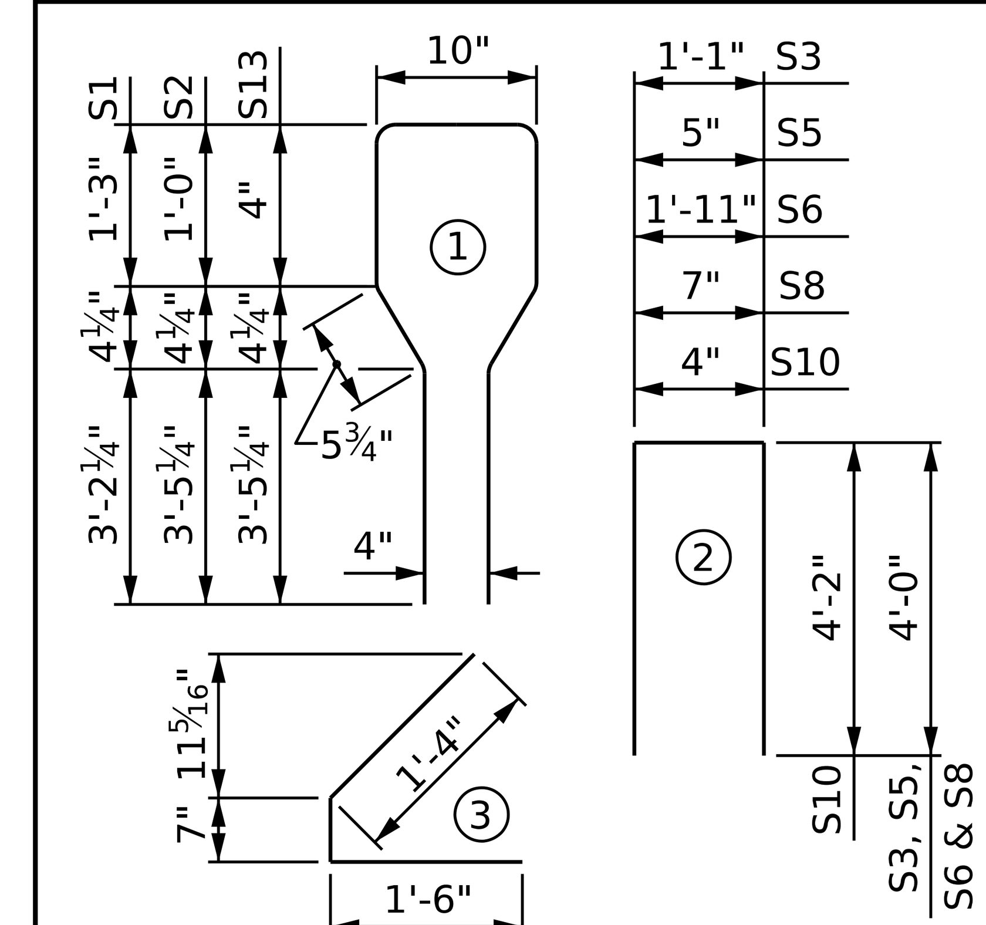
0.6"⌀ L.R. GRADE 270 STRANDS

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	82	#4	1	10'-8"	584
	S2	21	#6	1	10'-8"	336
	S3	4	#4	2	9'-1"	24
	S4	64	#4	3	3'-5"	146
	S5	6	#4	2	8'-5"	34
	S6	2	#4	2	9'-11"	13
	S8	4	#4	2	8'-7"	23
EXTERIOR GDR.	S10	2	#5	2	8'-8"	18
INTERIOR GDR.	S10	4	#5	2	8'-8"	36
EXTERIOR GDR.	S11	5	#4	STR	7'-0"	23
INTERIOR GDR.	S12	5	#4	STR	11'-10"	40
	S13	11	#6	1	9'-4"	154

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8,000 PSI CONCRETE	0.6" ⌀ L. R. STRANDS
	LB.	C.Y.	No.
EXT. GIRDER	1355	18.2	38
INT. GIRDER	1390	18.2	38

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	89'-5"	447'-1"

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER - LINK SLAB SPAN "B"

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu 10/25/2024

ASSEMBLED BY : M. G. SHAIKH	DATE : 8/24
CHECKED BY : J. P. M.	DATE : 8/24
DRAWN BY : BNB 09/21	
CHECKED BY : AAI 09/21	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

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

SHEET NO. S-14

TOTAL SHEETS 36

10/23/2024
S:\PEF\LSA Contracts\LSA Projects\B-5372- SMUPEF\B-5372 OBD\UPDATED PLANS DGN_10-24\400_029_B-5372_SMU_ G*_0014_120109.dgn
mgshaikh

STD. NO. PCG6 (SHT. 1)

DEAD LOAD DEFLECTION TABLE FOR SPAN A

0.6" ∅ LOW RELAXATION	GIRDER 1 & 5																					
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0.000
CAMBER (GIRDER ALONE IN PLACE) †	0.000	0.027	0.053	0.077	0.100	0.120	0.137	0.150	0.160	0.166	0.168	0.166	0.160	0.150	0.137	0.120	0.100	0.077	0.053	0.027	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. †	0.000	0.014	0.028	0.041	0.052	0.063	0.072	0.079	0.084	0.087	0.088	0.087	0.084	0.079	0.072	0.063	0.052	0.041	0.028	0.014	0.000
FINAL CAMBER †	0	1/8"	5/16"	7/16"	9/16"	11/16"	3/4"	7/8"	15/16"	15/16"	15/16"	15/16"	15/16"	7/8"	3/4"	11/16"	9/16"	7/16"	5/16"	1/8"	0

DEAD LOAD DEFLECTION TABLE FOR SPAN A

0.6" ∅ LOW RELAXATION	GIRDERS 2 & 4																				
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0.000
CAMBER (GIRDER ALONE IN PLACE) †	0.000	0.027	0.053	0.077	0.100	0.120	0.136	0.150	0.160	0.166	0.168	0.166	0.160	0.150	0.136	0.120	0.100	0.077	0.053	0.027	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. †	0.000	0.016	0.031	0.046	0.059	0.071	0.081	0.089	0.095	0.099	0.100	0.099	0.095	0.089	0.081	0.071	0.059	0.046	0.031	0.016	0.000
FINAL CAMBER †	0	1/8"	1/4"	3/8"	1/2"	9/16"	11/16"	3/4"	3/4"	13/16"	13/16"	13/16"	3/4"	3/4"	11/16"	9/16"	1/2"	3/8"	1/4"	1/8"	0

DEAD LOAD DEFLECTION TABLE FOR SPAN A

0.6" ∅ LOW RELAXATION	GIRDER 3																				
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0.000
CAMBER (GIRDER ALONE IN PLACE) †	0.000	0.027	0.053	0.077	0.100	0.120	0.136	0.150	0.160	0.166	0.168	0.166	0.160	0.150	0.136	0.120	0.100	0.077	0.053	0.027	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. †	0.000	0.016	0.032	0.047	0.061	0.073	0.083	0.092	0.093	0.101	0.103	0.101	0.098	0.092	0.083	0.073	0.061	0.047	0.032	0.016	0.000
FINAL CAMBER †	0	1/8"	1/4"	3/8"	7/16"	9/16"	5/8"	11/16"	3/4"	3/4"	13/16"	3/4"	3/4"	11/16"	5/8"	9/16"	7/16"	3/8"	1/4"	1/8"	0

DEAD LOAD DEFLECTION TABLE FOR SPAN B

0.6" ∅ LOW RELAXATION	GIRDER 1 & 5																				
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0.000
CAMBER (GIRDER ALONE IN PLACE) †	0.000	0.029	0.058	0.085	0.110	0.131	0.150	0.165	0.176	0.182	0.184	0.182	0.176	0.165	0.150	0.131	0.110	0.085	0.058	0.029	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. †	0.000	0.020	0.040	0.058	0.075	0.090	0.101	0.113	0.121	0.125	0.127	0.125	0.121	0.113	0.103	0.090	0.075	0.058	0.040	0.020	0.000
FINAL CAMBER †	0	1/8"	3/16"	5/16"	7/16"	1/2"	9/16"	5/8"	11/16"	11/16"	11/16"	11/16"	11/16"	5/8"	9/16"	1/2"	7/16"	5/16"	3/16"	1/8"	0

DEAD LOAD DEFLECTION TABLE FOR SPAN B

0.6" ∅ LOW RELAXATION	GIRDERS 2 & 4																				
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0.000
CAMBER (GIRDER ALONE IN PLACE) †	0.000	0.029	0.058	0.085	0.109	0.131	0.149	0.164	0.175	0.181	0.184	0.181	0.175	0.164	0.149	0.131	0.109	0.085	0.058	0.029	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. †	0.000	0.023	0.045	0.066	0.085	0.102	0.116	0.128	0.136	0.141	0.143	0.141	0.136	0.128	0.116	0.102	0.085	0.066	0.045	0.023	0.000
FINAL CAMBER †	0	1/16"	1/8"	1/4"	5/16"	3/8"	3/8"	7/16"	7/16"	1/2"	1/2"	1/2"	7/16"	7/16"	3/8"	3/8"	5/16"	1/4"	1/8"	1/16"	0

DEAD LOAD DEFLECTION TABLE FOR SPAN B

0.6" ∅ LOW RELAXATION	GIRDER 3																				
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0.000
CAMBER (GIRDER ALONE IN PLACE) †	0.000	0.029	0.058	0.085	0.109	0.131	0.149	0.164	0.175	0.181	0.184	0.181	0.175	0.164	0.149	0.131	0.109	0.085	0.058	0.029	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. †	0.000	0.023	0.046	0.067	0.087	0.104	0.119	0.131	0.140	0.145	0.147	0.145	0.140	0.131	0.119	0.104	0.087	0.067	0.046	0.023	0.000
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 GIVEN IN INCHES (FRACTION FORM).

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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.

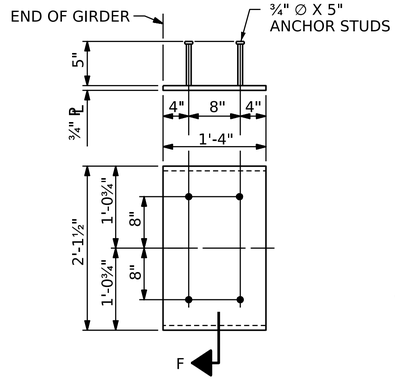
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 0R APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

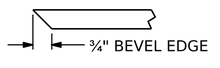
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6500 PSI.

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".

THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.





SECTION "F"
(SEE NOTES)

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

(2 REQ'D PER GIRDER)

PROJECT NO. B-5372
CABARRUS COUNTY
STATION: 20+59.44 -L-

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu E6D3DA018F3E4AB...
10/25/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

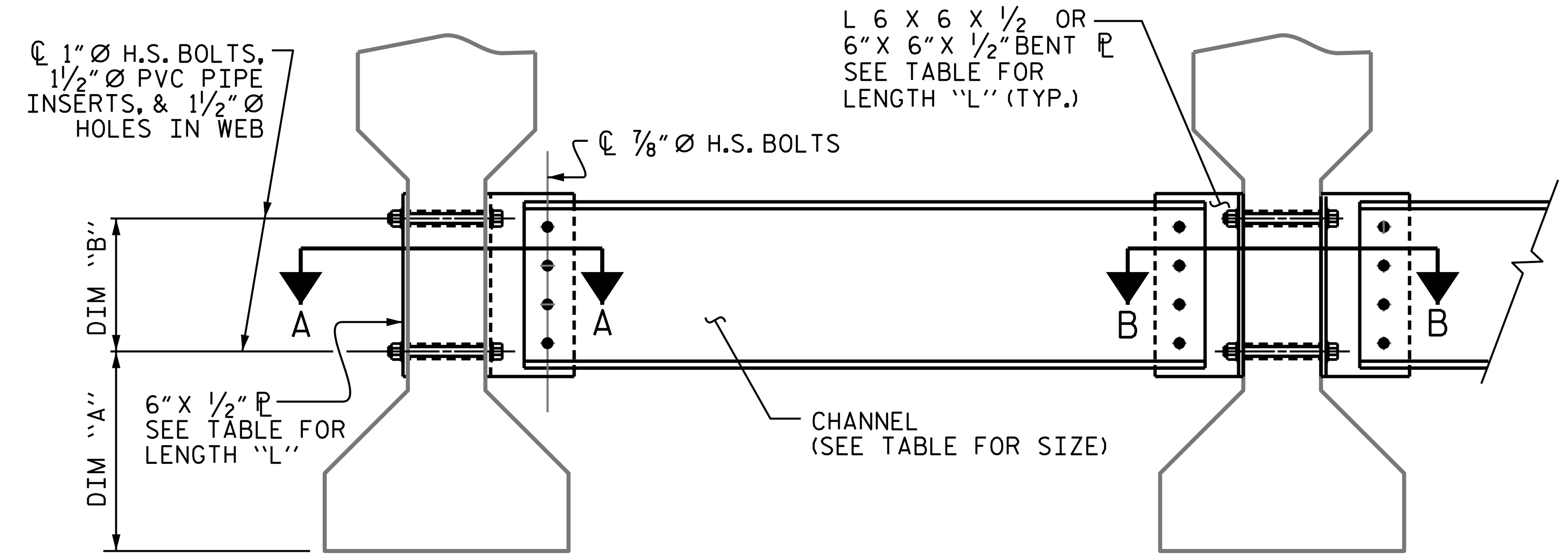
ASSEMBLED BY : M. G. SHAIKH DATE : 08/24	
CHECKED BY : J. P. M. DATE : 08/24	
DRAWN BY : ELR 11/91	REV. 1/15 MAA/TMG
CHECKED BY : GRP 11/91	REV. 2/15 MAA/TMG
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			36

10/21/2024
S:\PEF\LSA Contracts\LSA Projects\B-5372- SMUPEF\B-5372 OBD\UPDATED SUPERSTRUCTURE PLANS\400_031_B-5372_SMU_ DL_0015_120109.dgn
mgshaikh

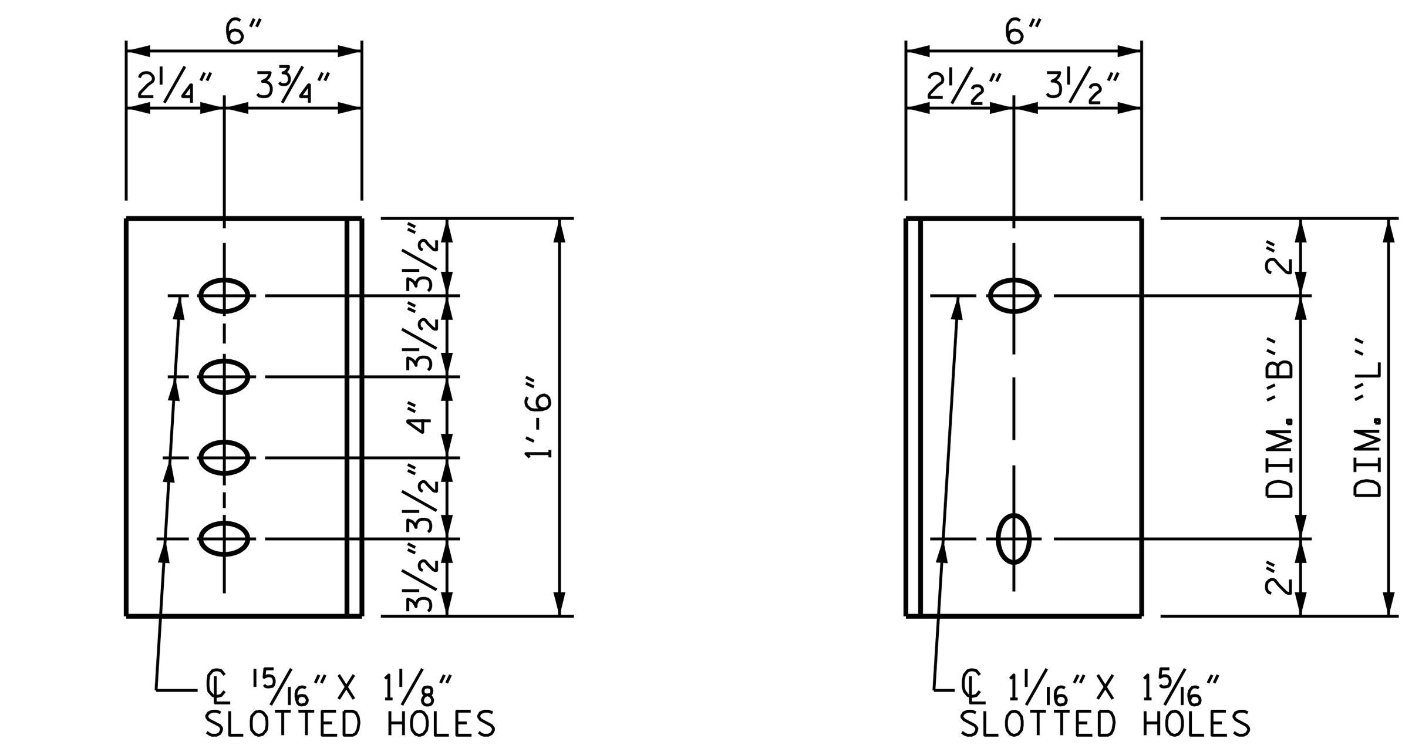
STD. NO. PCG9 (Sht. 3)



EXTERIOR GIRDER

INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE

WEB FACE

CONNECTOR PLATE DETAILS

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.

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.

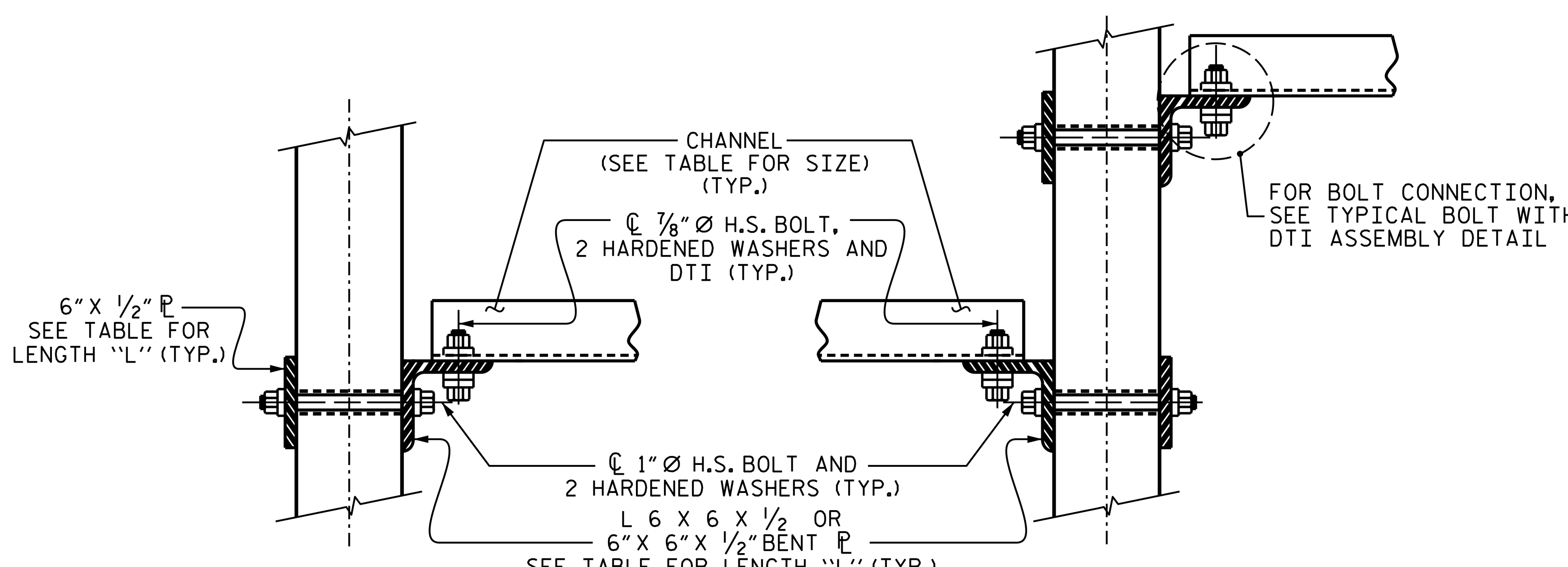
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼″ PROJECTION BEYOND THE NUT.

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.

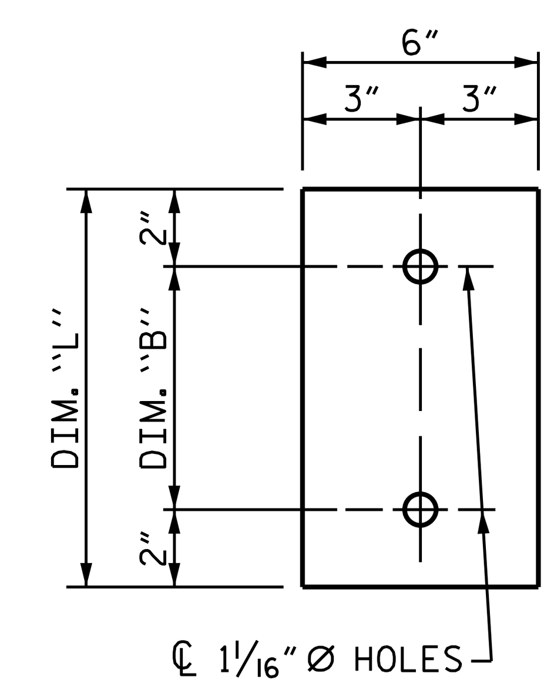
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



SECTION A-A

SECTION B-B

CONNECTION DETAILS



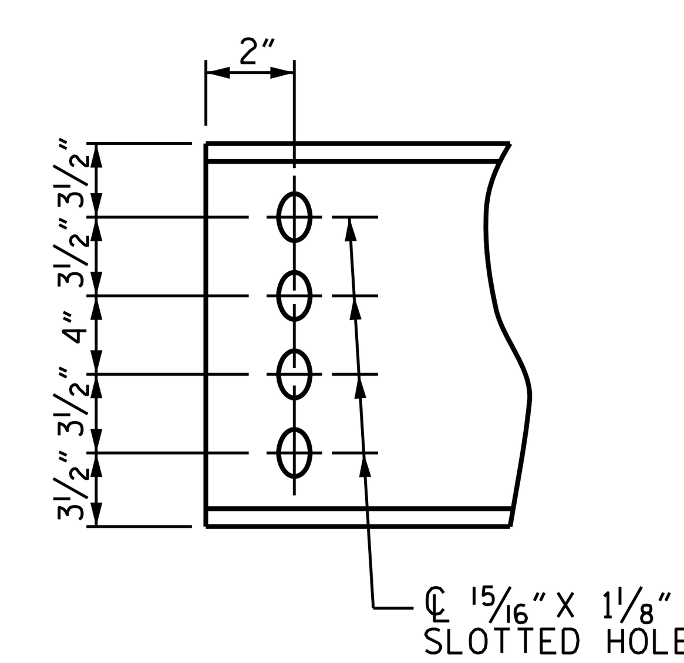
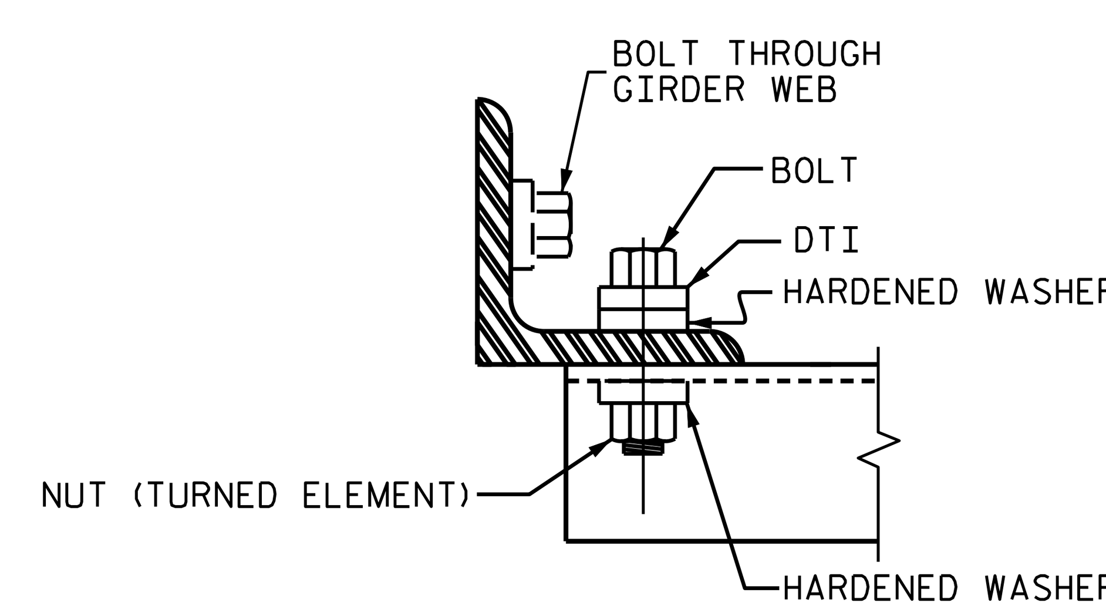


PLATE DETAILS

CHANNEL END

TABLE

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



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039774 HOANG T. DIEU

DocuSigned by: Hoang Dieu

10/25/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS

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

SHEET NO. S-16

TOTAL SHEETS 36

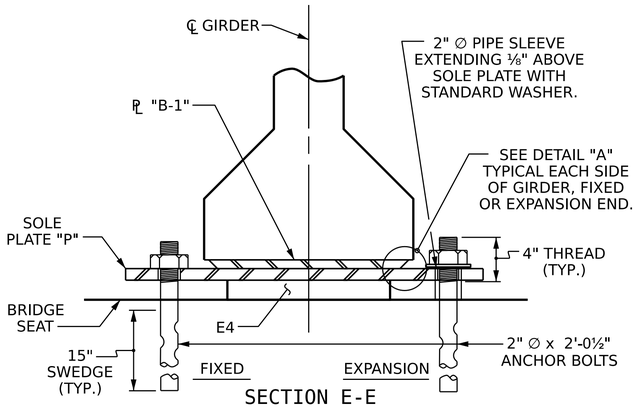
ASSEMBLED BY : M. G. SHAIKH DATE : 8/24
CHECKED BY : J. P. M. DATE : 8/24

DRAWN BY : TLA 6/05
CHECKED BY : VC 6/05

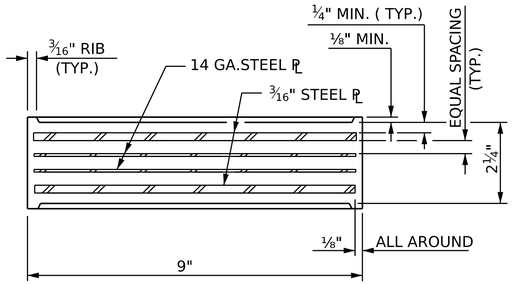
REV. 5/1/06RRR KMM/GM
REV. 10/1/11 MAA/GM
REV. 12/17 MAA/THC

10/21/2024
S:\PEF\LSA Contracts\LSA Projects\B-5372- SMUPEF\B-5372 OBD\UPDATED SUPERSTRUCTURE PLANS\400_033_B-5372_SMU_ DIA_0016_120109.dgn
mgshaikh

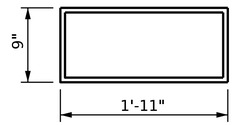
STD. NO. PCG10 (SHT 1)



SECTION E-E



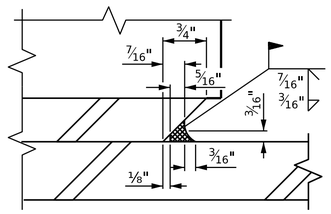
TYPICAL SECTION OF ELASTOMERIC BEARINGS



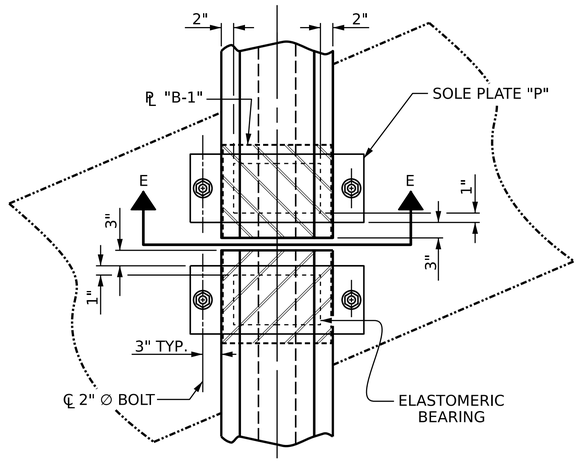
E4 (20 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

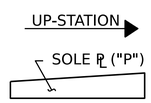
TYPE V



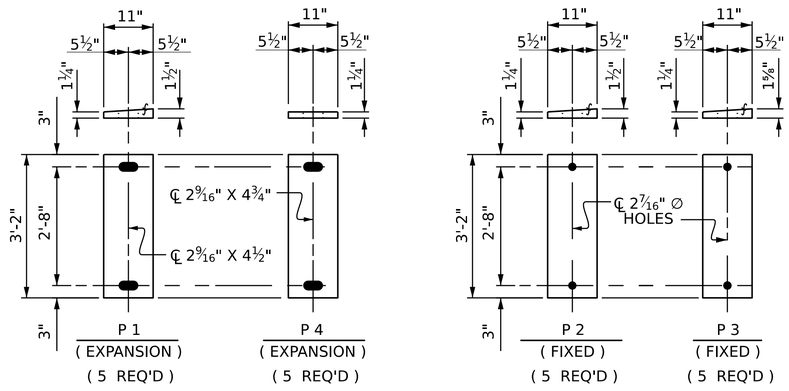
DETAIL "A"



PLAN VIEW AT BENT
(SHOWING CONTINUOUS BENT)



SOLE ℄ PLACEMENT DETAIL



SOLE PLATE DETAILS ("P")

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

NOTES

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

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

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

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

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

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

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE STANDARD SPECS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu 10/25/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

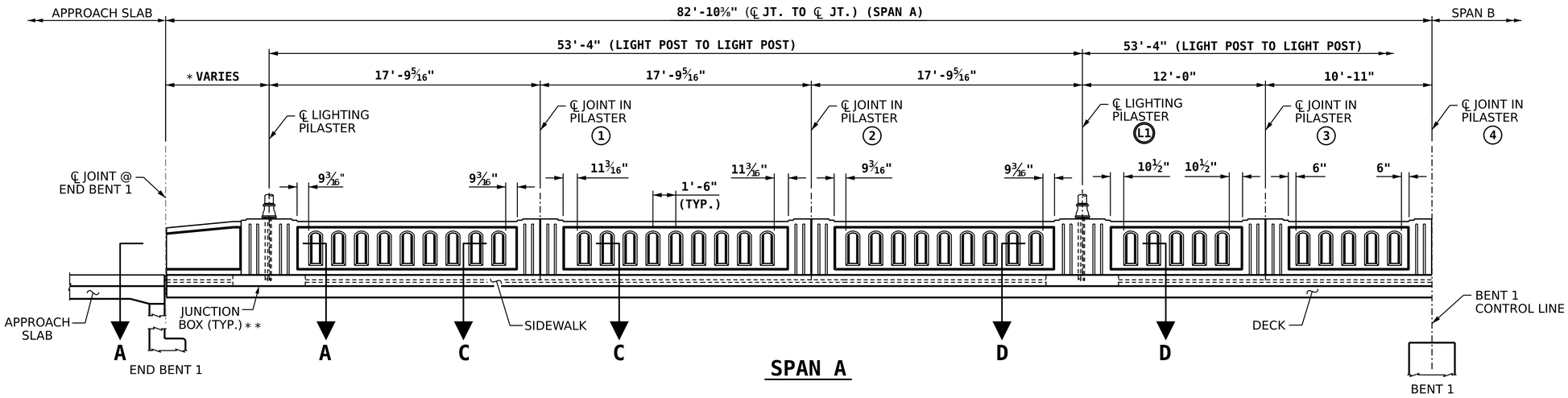
PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			36

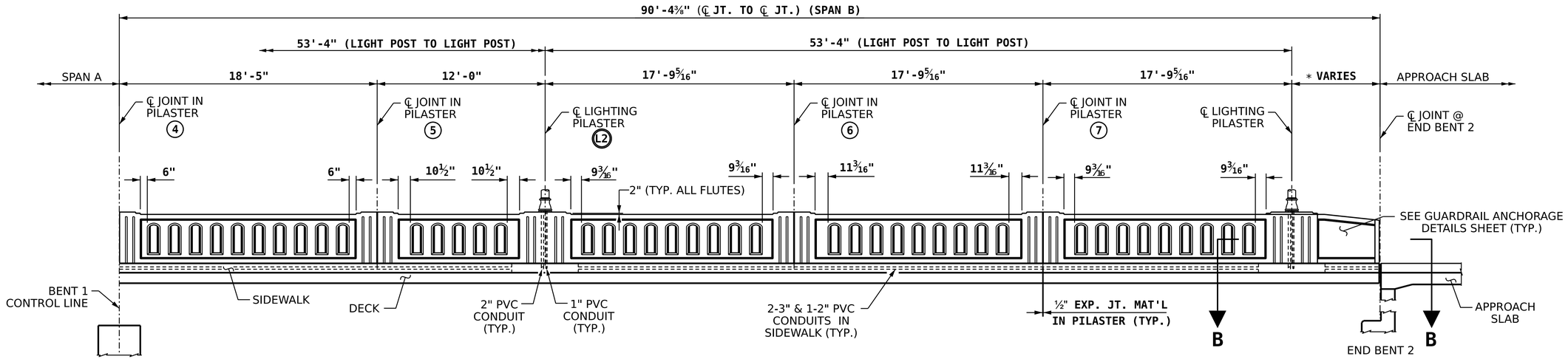
STD. NO. EB4

ASSEMBLED BY : M. G. SHAIKH	DATE :	8/24	
CHECKED BY : J. P. M.	DATE :	8/24	
DRAWN BY : WJH	8/89	REV. 1/15	MAA/TMG
CHECKED BY : CRK	8/89	REV. 12/17	MAA/THC
		REV. 10/21	BNB/AAI

10/21/2024
S:\PEF\LSA Contracts\LSA Projects\B-5372- SMUPEF\B-5372 OBD\UPDATED SUPERSTRUCTURE PLANS\400_035_B-5372_SMU_ BG_0017_120109.dgn
mgshaikh



SPAN A



SPAN B

ELEVATION OF RAIL

(LEFT RAIL INTERIOR SHOWN, RIGHT RAIL SIMILAR)

NOTES:

FOR SECTIONS, SEE SHEET 4 OF 6.

* SEE SHEET 2 OF 6.

* * FOR JUNCTION BOX DETAILS SEE SHEET 6 OF 6.

DETAILS FOR THE PILASTER NUMBER, SEE SHEET 2 OF 6.

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CLASSIC CONCRETE BRIDGE RAIL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu E6D3DA016F3E4AB...

10/25/2024

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : M. G. SHAIKH DATE : 8/24
CHECKED BY : J. P. M. DATE : 8/24
DESIGN ENGINEER OF RECORD: H. B. DESAI DATE : 8/24

10/21/2024
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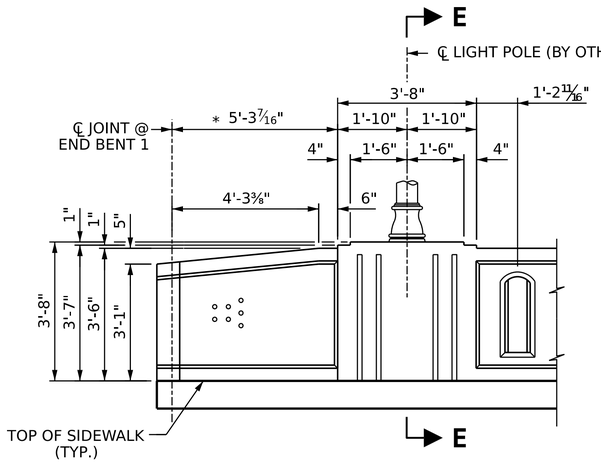
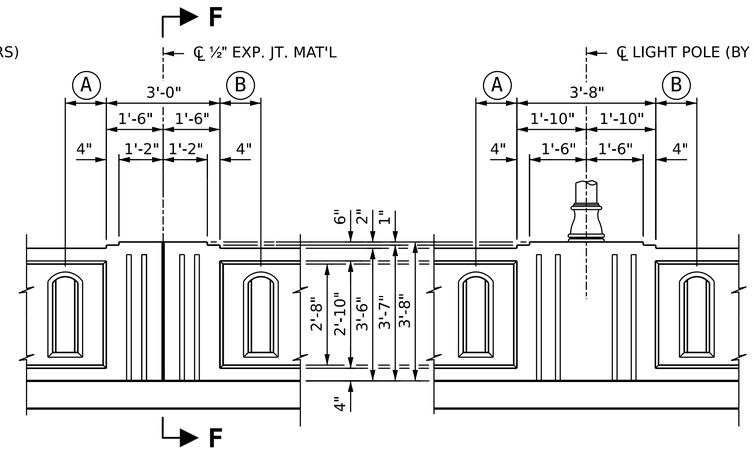
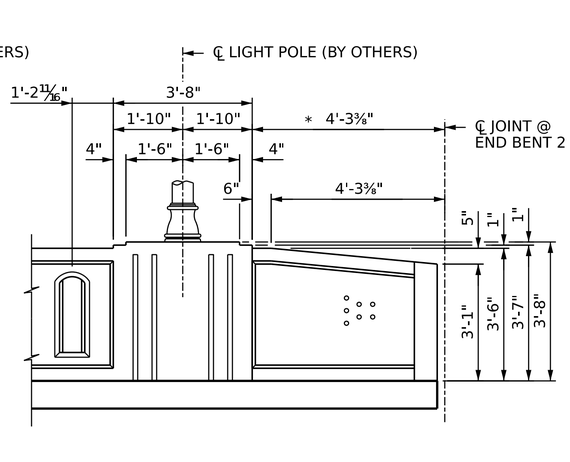


LEFT INTERIOR ELEVATION

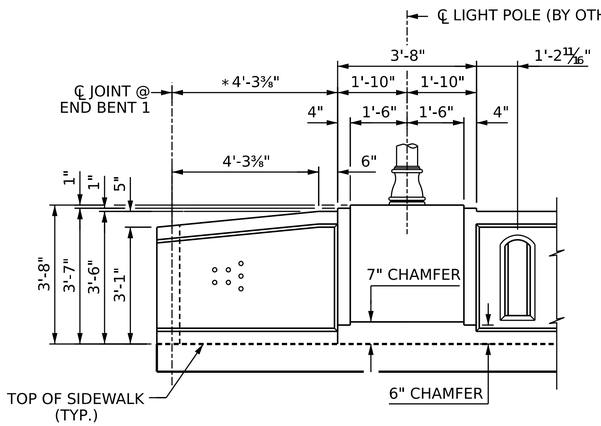


LEFT INTERIOR ELEVATION

LEFT INTERIOR ELEVATION

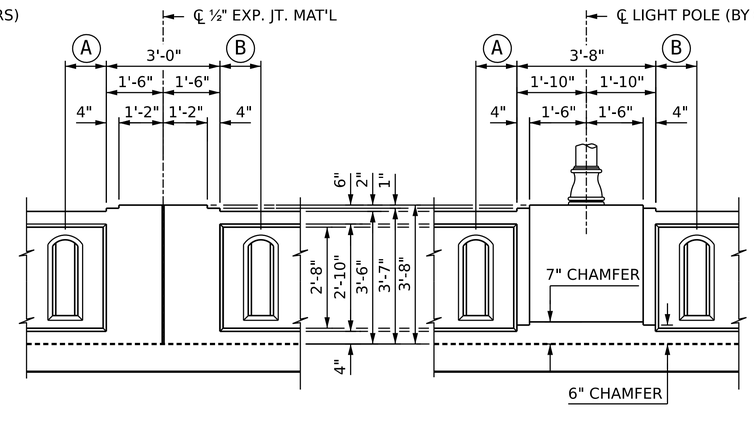


LEFT INTERIOR ELEVATION



RIGHT EXTERIOR ELEVATION

END BENT 1 PILASTER



RIGHT EXTERIOR ELEVATION

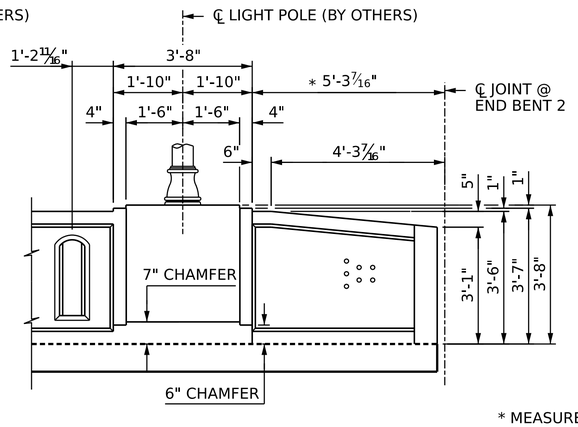
JOINT PILASTER

(PILASTER 1 THROUGH 7)

RIGHT EXTERIOR ELEVATION

LIGHTING PILASTER

(PILASTER L1 & L2)



RIGHT EXTERIOR ELEVATION

END BENT 2 PILASTER

∗ MEASURED ALONG OUTSIDE OF DECK

NOTES:

FOR SECTIONS, SEE SHEET 5 OF 6.

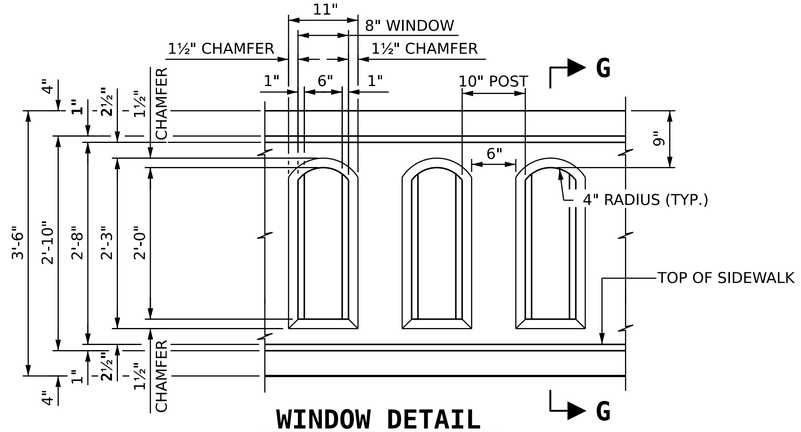
PVC CONDUIT FOR BRIDGE LIGHTING NOT SHOWN FOR CLARITY.

LIGHT PILASTER NO.	DIMENSION	
	A	B
L1	1'-2 11/16"	1'-4"
L2	1'-4"	1'-2 11/16"

(FOR LIGHT PILASTER NO. , SEE SHEET 1 OF 6)

PILASTER NO.	DIMENSION	
	A	B
1	1'-2 11/16"	1'-4 11/16"
2	1'-4 11/16"	1'-2 11/16"
3	1'-4"	11½"
4	11½"	11½"
5	11½"	1'-4"
6	1'-2 11/16"	1'-4 11/16"
7	1'-4 11/16"	1'-2 11/16"

(FOR PILASTER NO. , SEE SHEET 1 OF 6)



WINDOW DETAIL

(TYPICAL FOR EACH FACE)

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CLASSIC CONCRETE BRIDGE RAIL DETAILS

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 2 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu E603DA016F3E4AB...

10/25/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : M. G. SHAIKH DATE : 8/24

CHECKED BY : J. P. M. DATE : 8/24

DESIGN ENGINEER OF RECORD: H. B. DESAI DATE : 8/24

10/21/2024
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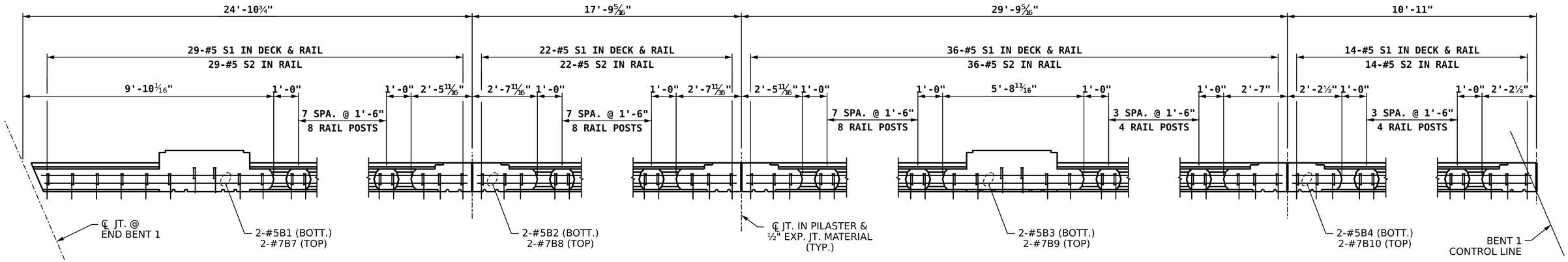
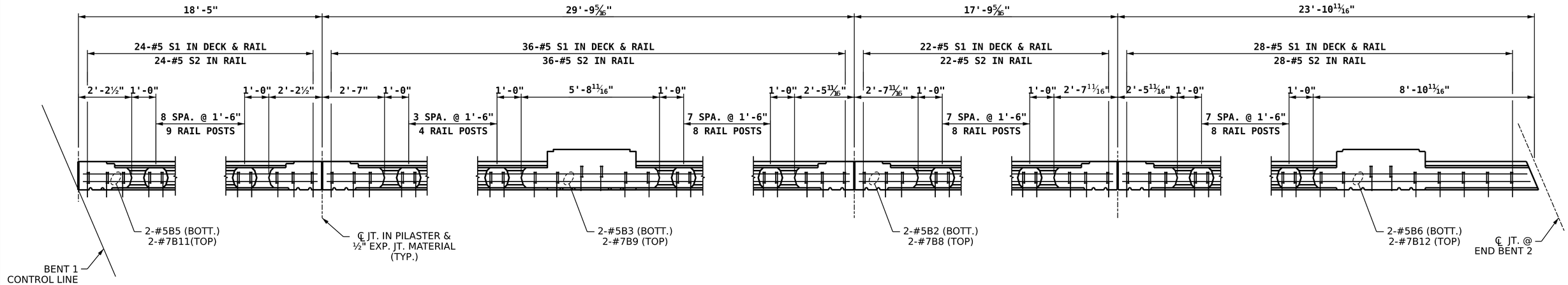
mgshaikh



PLAN OF SPAN A

(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)



PLAN OF SPAN B

(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)

NOTE:

FOR ADDITIONAL REINFORCEMENT AND EXACT PLACEMENT OF "S" BARS IN DECK & RAIL, SEE SHEET 4 OF 6 AND 5 OF 6.

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CLASSIC CONCRETE BRIDGE RAIL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu
E6D3DA016F3E4AB...
10/25/2024

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : M. G. SHAIKH DATE : 8/24
CHECKED BY : J. P. M. DATE : 8/24
DESIGN ENGINEER OF RECORD: H. B. DESAI DATE : 8/24

10/21/2024
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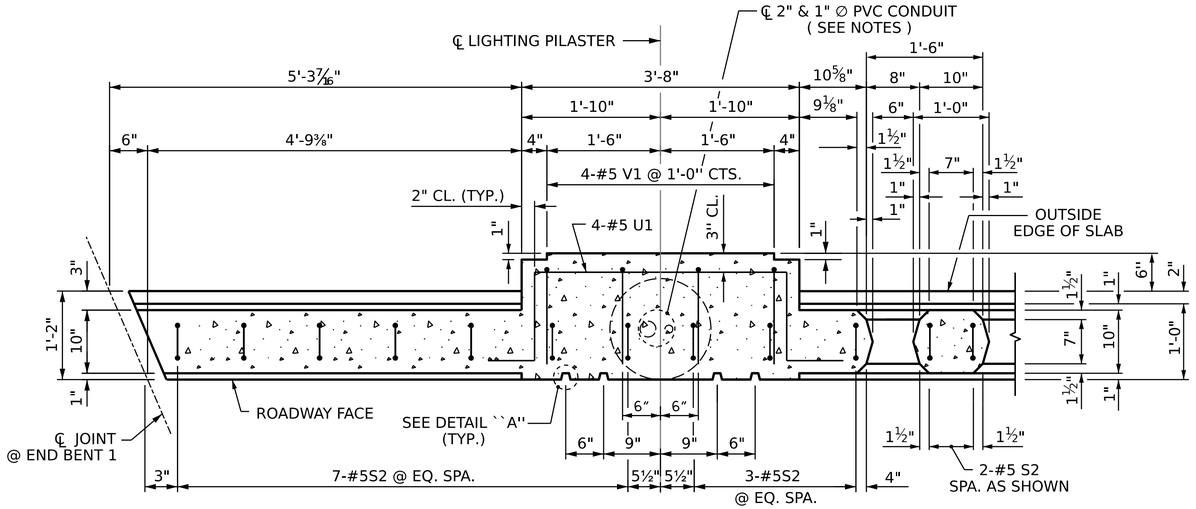
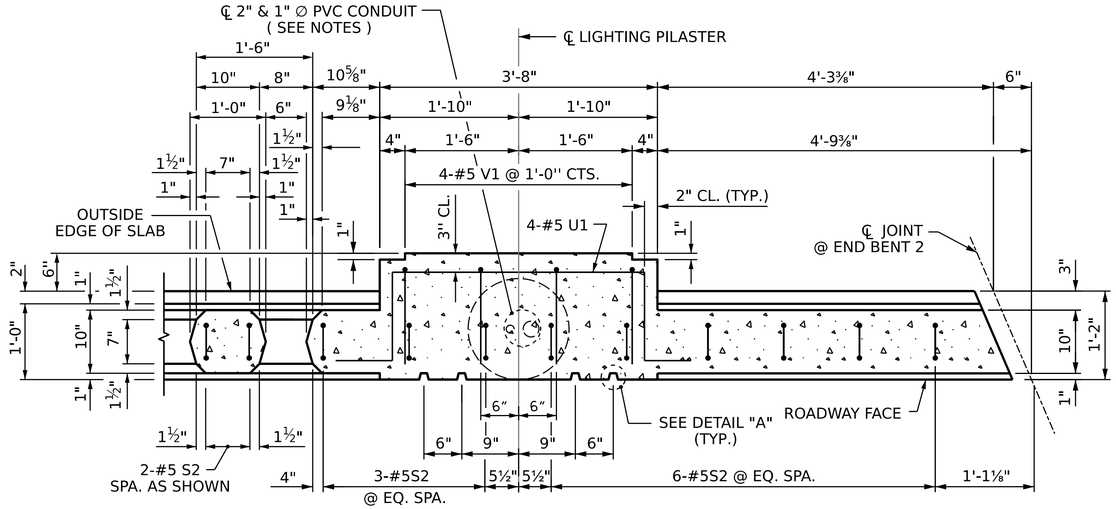


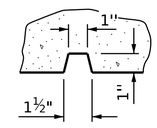
SECTION A-A

SHOWING LIGHTING PILASTER AT END BENT 1
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)



SECTION B-B

SHOWING LIGHTING PILASTER AT END BENT 2
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)

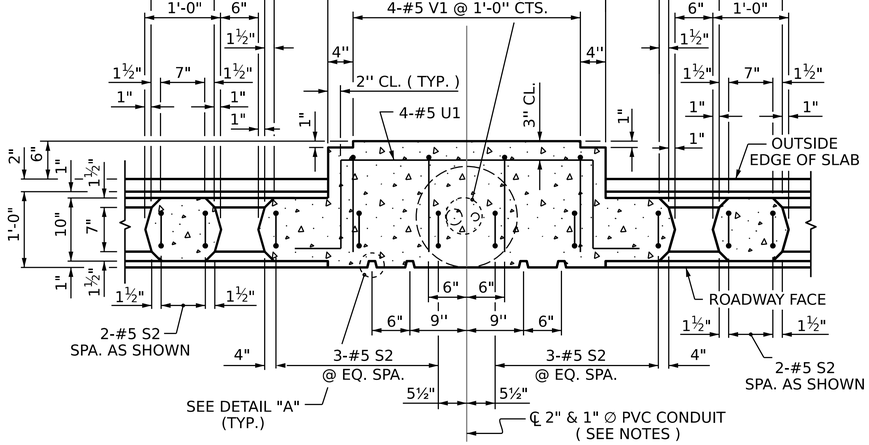


DETAIL "A"

TYPICAL FLUTE

#5 S1 BARS NOT SHOWN FOR CLARITY.
#5 S2 BARS ARE PAIRED WITH #5 S1 BARS.

FOR CONDUIT AND JUNCTION BOX DETAILS, SEE SHEET 6 OF 6.

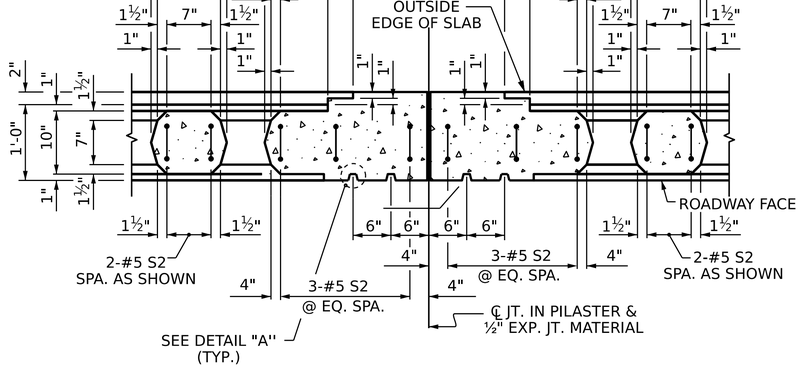


SECTION D-D

SHOWING LIGHTING PILASTER
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)
(FOR DIMENSION A AND B , SEE TABLE BELOW)

LIGHT PILASTER NO.	DIMENSION	
	A	B
L1	9 3/16"	10½"
L2	10½"	9⅛"

(FOR LIGHT PILASTER NO. , SEE SHEET 1 OF 6)



SECTION C-C

SHOWING JOINT IN PILASTER
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)
(FOR DIMENSION A AND B , SEE TABLE BELOW)

PILASTER NO.	DIMENSION	
	A	B
1	9 3/16"	11 3/16"
2	11 3/16"	9 3/16"
3	10½"	6"
4	6"	6"
5	6"	10½"
6	9 3/16"	11 3/16"
7	11 3/16"	9 3/16"

(FOR PILASTER NO. , SEE SHEET 1 OF 6)

PROJECT NO. B-5372
CABARRUS COUNTY
STATION: 20+59.44 -L-
SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CLASSIC CONCRETE BRIDGE RAIL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU
DocuSigned by: Hoang Dieu
10/25/2024

DRAWN BY : M. G. SHAIKH DATE : 8/24
CHECKED BY : J. P. M. DATE : 8/24
DESIGN ENGINEER OF RECORD: H. B. DESAI DATE : 8/24

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			36

10/24/2024
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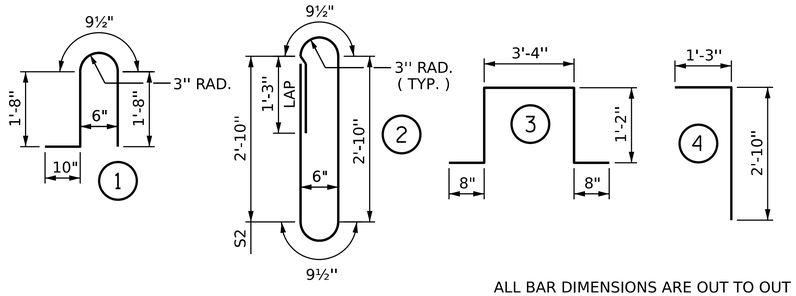
mgshaikh

NOTE:

COORDINATE WITH CITY OF KANNAPOLIS FOR INSTALLATION OF ANCHOR BOLT. ANCHOR BOLTS SIZE AND LOCATION ARE TO BE AS SPECIFIED BY LIGHT POLE MANUFACTURER.

FOR LOCATION OF SECTIONS, SEE SHEET 2 OF 6.

BAR TYPES



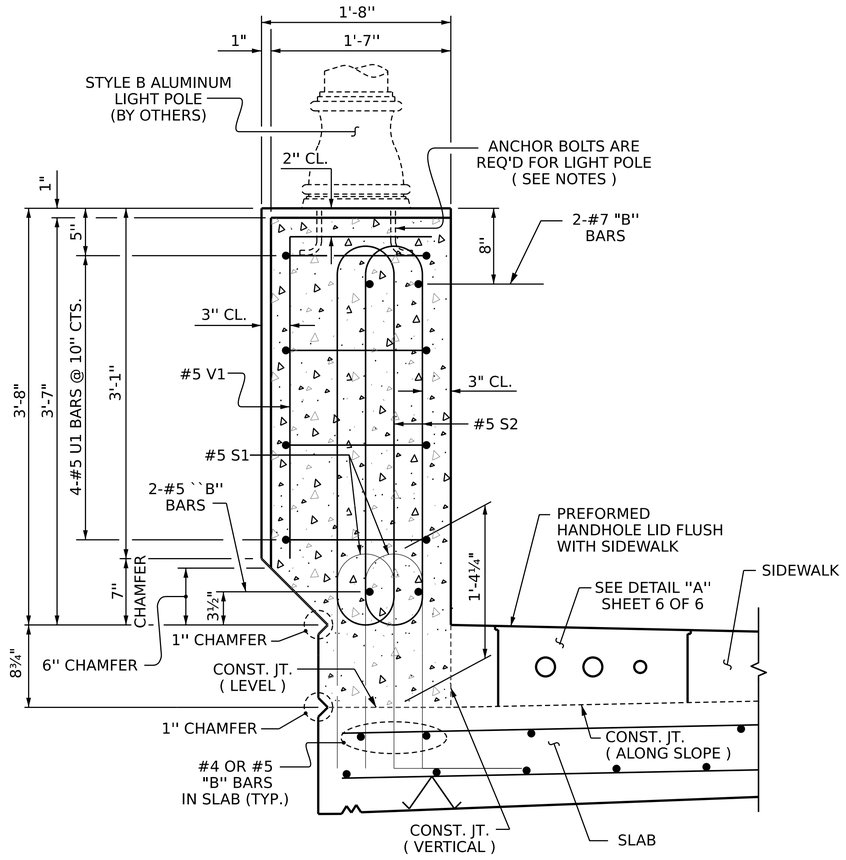
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CLASSIC CONCRETE BRIDGE RAIL ONLY

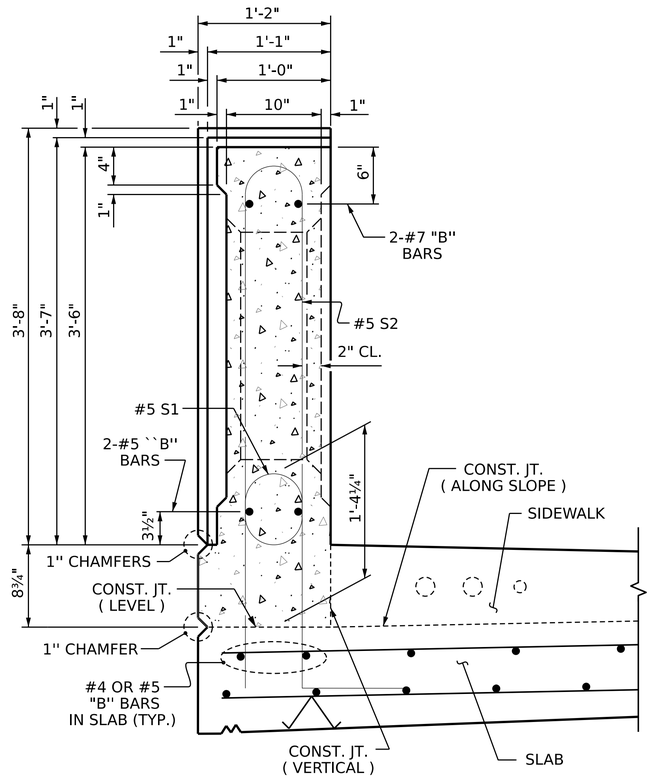
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	4	5	STR.	24'-1"	100
* B2	8	5	STR.	17'-4"	145
* B3	8	5	STR.	29'-4"	245
* B4	4	5	STR.	10'-6"	44
* B5	4	5	STR.	18'-0"	66
* B6	4	5	STR.	23'-8"	75
* B7	4	7	STR.	24'-1"	197
* B8	8	7	STR.	17'-4"	283
* B9	8	7	STR.	29'-4"	480
* B10	4	7	STR.	10'-6"	86
* B11	4	7	STR.	18'-0"	147
* B12	4	7	STR.	23'-8"	193
* S1	422	5	1	5'-0"	2201
* S2	422	5	2	8'-6"	3741
* U1	32	5	3	7'-0"	234
* V1	32	5	4	4'-1"	136

*EPOXY COATED REINF. STEEL	8,373	LBS.
CLASS AA CONCRETE	38.4	CU. YDS.
CLASSIC CONCRETE BRIDGE RAIL	346.4	LIN. FT.



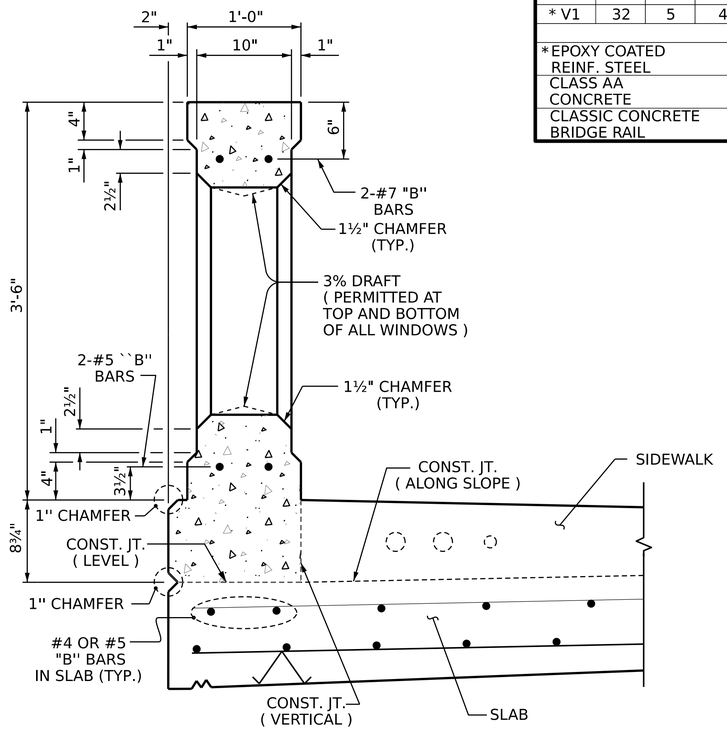
SECTION E-E

(SHOWING LIGHTING PILASTER)
(FOR LOCATION OF CONDUIT, SEE SHEET 6 OF 6.)
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)



SECTION F-F

(SHOWING JOINT IN PILASTER)
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)



SECTION G-G

(SHOWING WINDOW OF RAIL)
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CLASSIC CONCRETE BRIDGE RAIL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu E6D3DA016F3E4AB...
10/25/2024

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
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DRAWN BY : M. G. SHAIKH DATE : 8/24
CHECKED BY : J. P. M. DATE : 8/24
DESIGN ENGINEER OF RECORD: H. B. DESAI DATE : 8/24

10/24/2024
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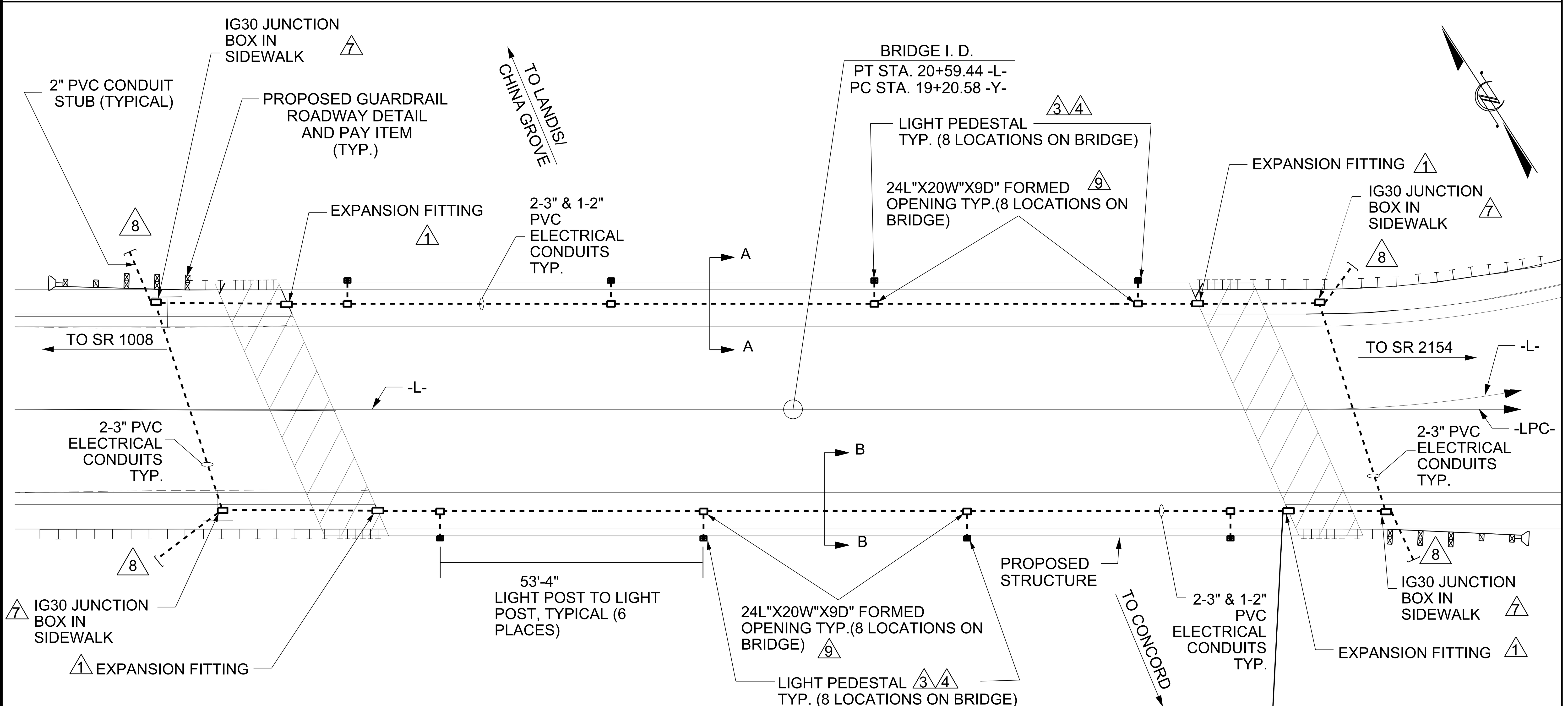
USE FOR LIGHTING CONSTRUCTION ONLY



LOCATION SKETCH

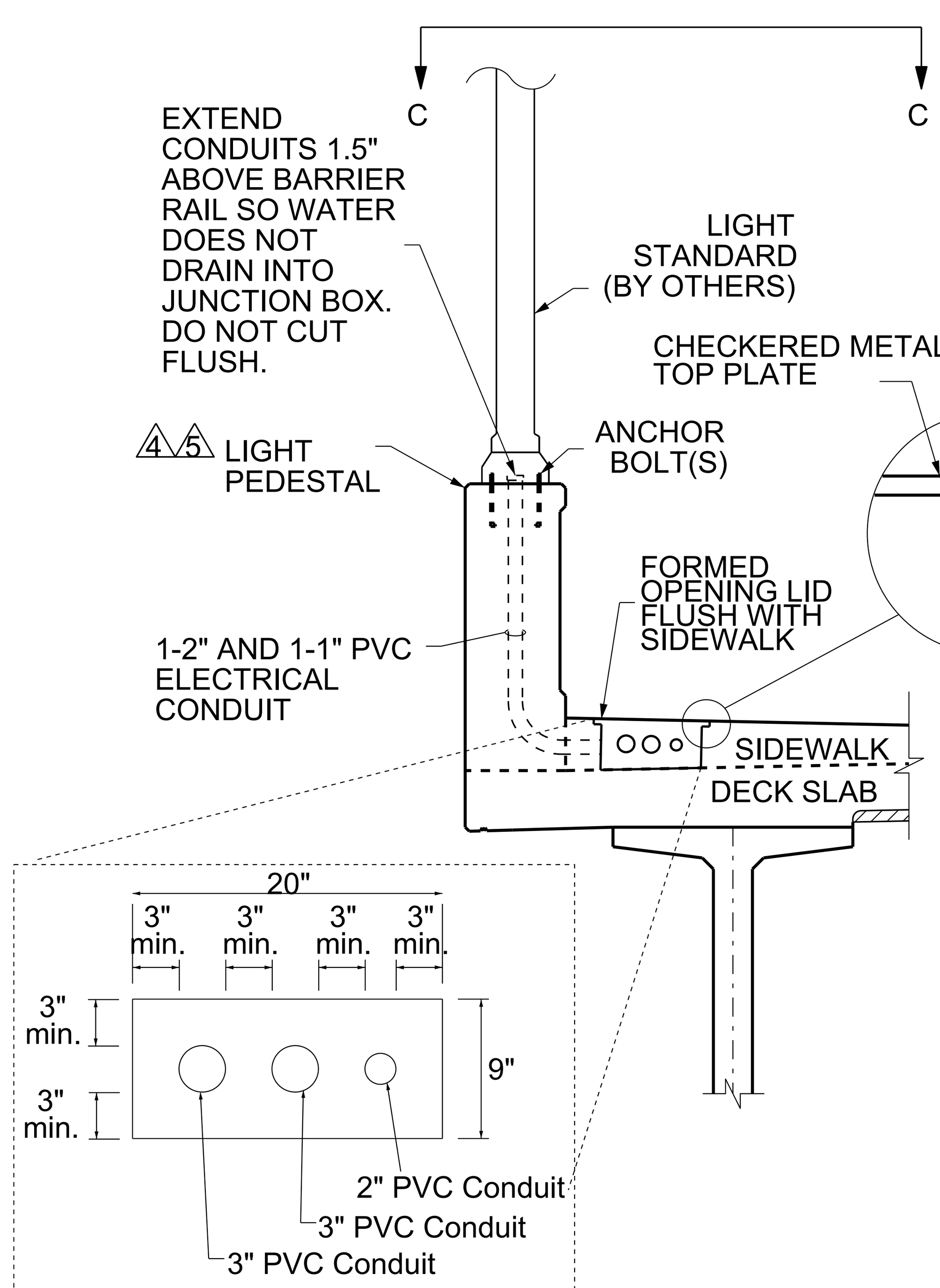
NOT TO SCALE

NOTES

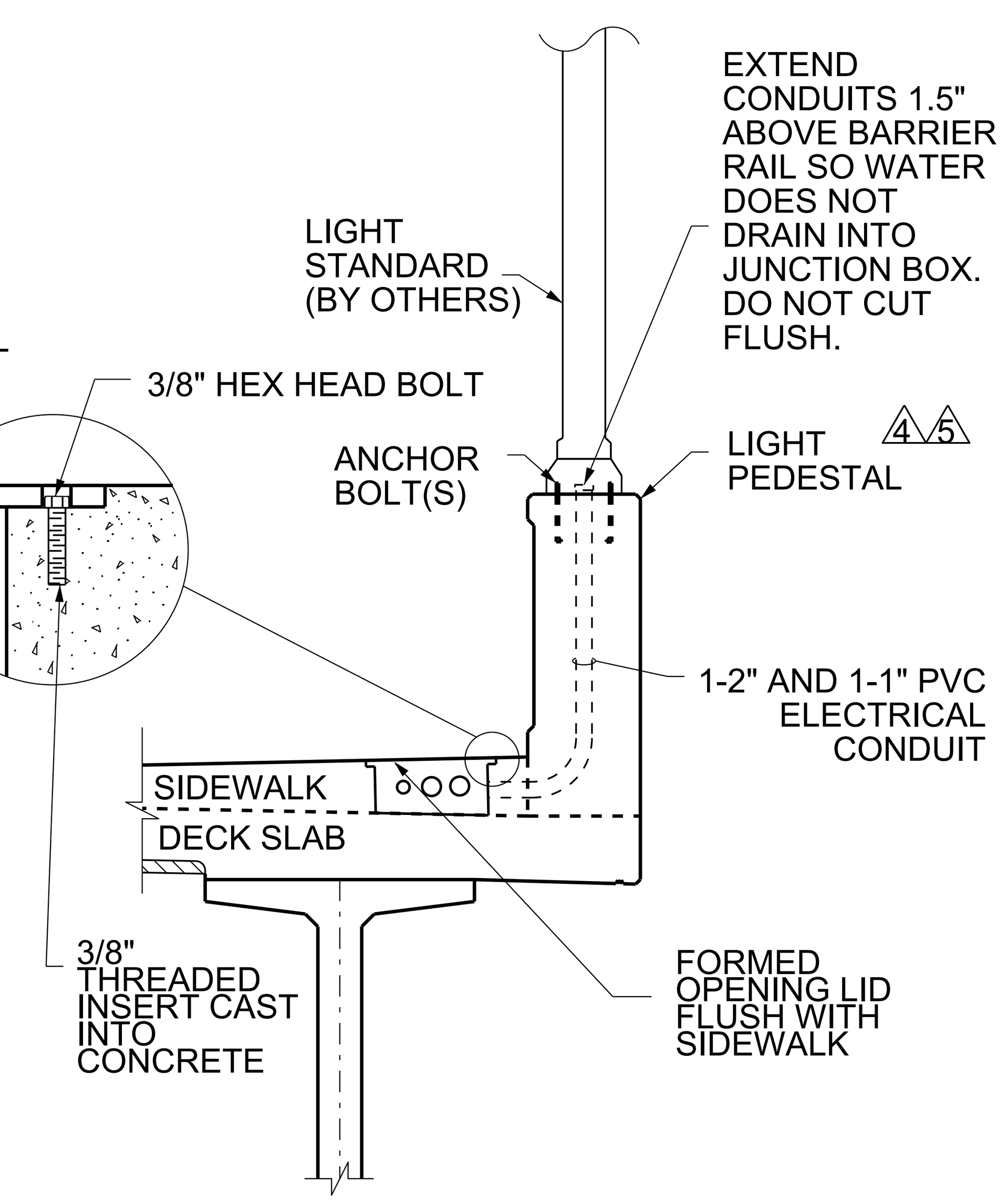
1. PROVIDE EXPANSION FITTING AT ALL EXPANSION JOINTS.
2. CONTRACTOR SHALL INSTALL CONDUIT AND JUNCTION BOXES ONLY. DUKE ENERGY WILL INSTALL CONDUCTOR AND POLES AT A LATER DATE.
3. SEE STRUCTURE PLANS FOR LOCATION OF LIGHT PEDESTALS AND PREFORMED HANDHOLES. (8 PLACES)
4. INSTALL ANCHOR BOLTS ACCORDING TO BOLT TEMPLATE AS PROVIDED BY DUKE ENERGY CAROLINAS.
5. CONTRACTOR SHALL SUPPLY ANCHOR BOLTS.
6. COORDINATE WITH DUKE ENERGY CAROLINAS FOR HANDHOLE INSTALLATION SPECIFICATIONS.
7. TYPE IG30 JUNCTION BOXES ARE POLYMER CONCRETE (THERMOPLASTIC NOT ALLOWED), SIZED 30"L X 17"W X 18"H. SEE ARTICLE 1411 OF THE STANDARD SPECIFICATIONS.
8. INSTALL 2" CONDUIT STUB A MINIMUM OF 30" BELOW GRADE. TURN STUB UP AND TERMINATE A MINIMUM OF 3' ABOVE GRADE. INSTALL NON-ROTTING PULL LINE AND CAP CONDUIT.
9. ADJUST STRUCTURAL STEEL AS NEEDED PER STRUCTURAL PLANS.
10. COORDINATE INSTALLATION OF THE CONDUIT WITH UTILITIES BY OTHERS.

ESTIMATED BILL OF MATERIALS

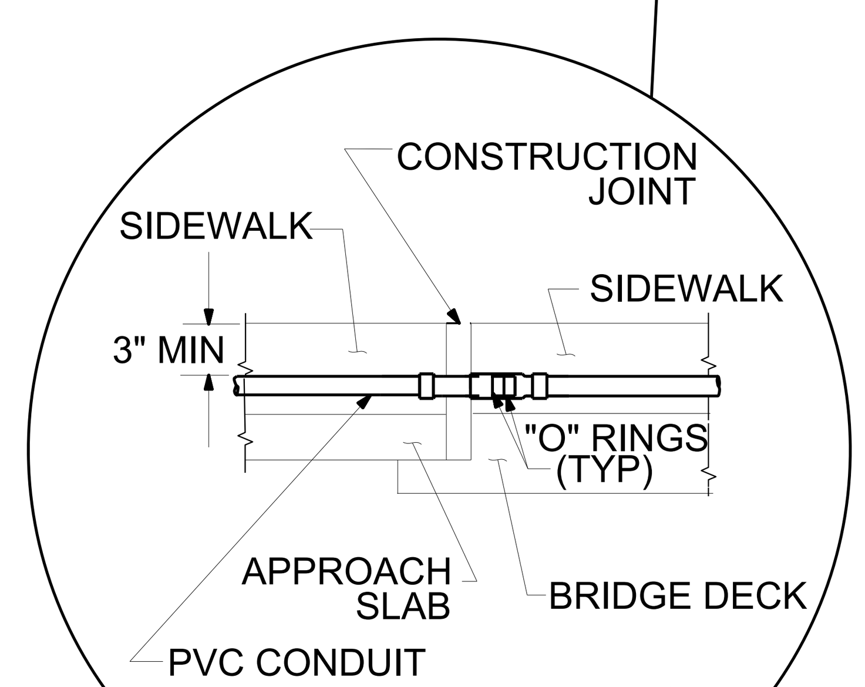
UNIT	ITEM	QTY
LF	1" PVC CONDUIT	40
LF	2" PVC CONDUIT	590
LF	3" PVC CONDUIT	1100
EA	HANDHOLE COVER	8
EA	IG30 JUNCTION BOX	4
EA	3/8" DIAMETER HEX HEAD TAMPER PROOF BOLT	112
EA	2" EXPANSION FITTING	4
EA	3" EXPANSION FITTING	8
EA	1" BUSHING	16
EA	2" BUSHING	32
EA	3" BUSHING	32
EA	3/4" X 17" HOOKED ANCHOR BOLTS	112



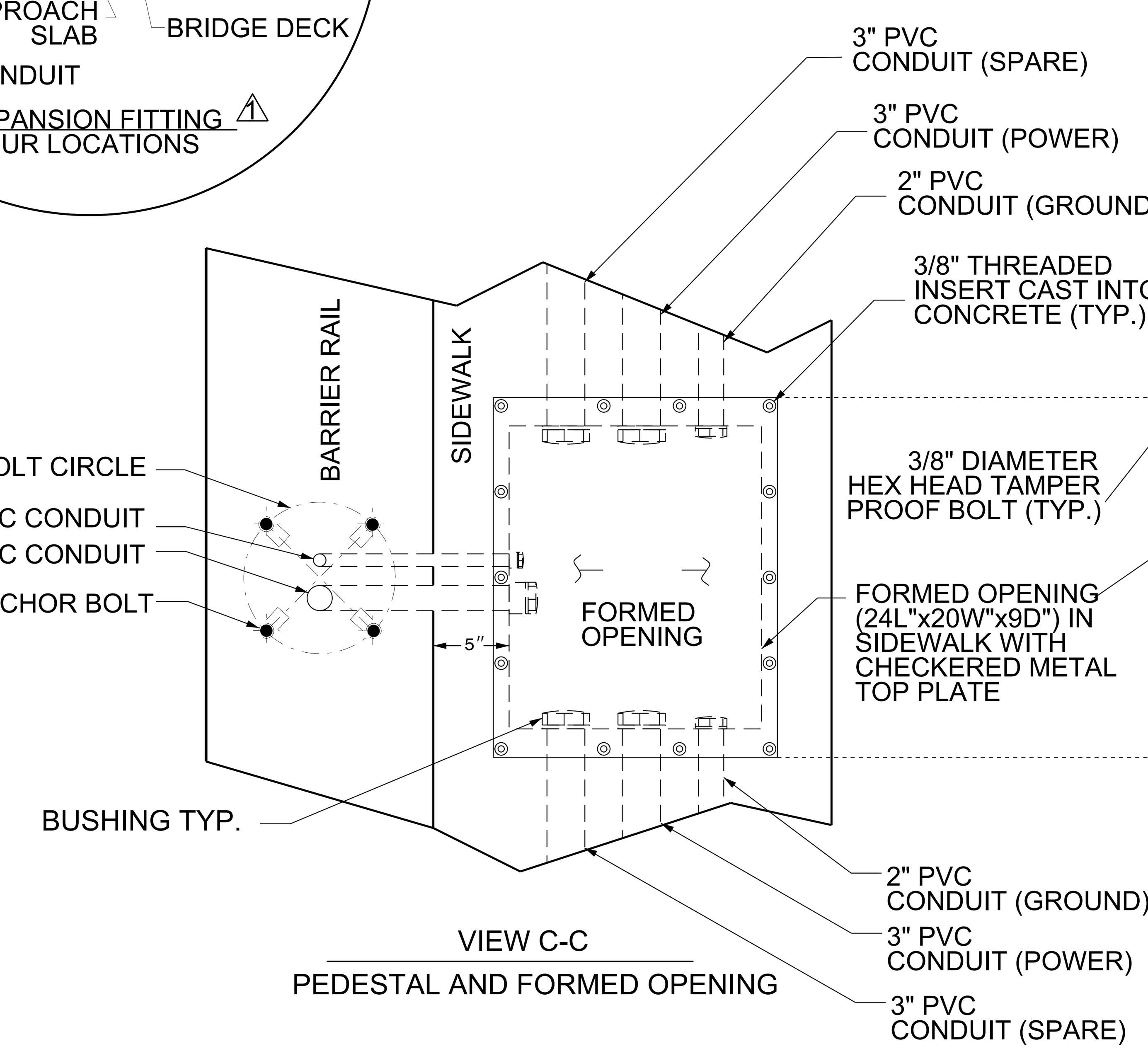
VIEW A-A
3 PEDESTAL FOR LIGHT POLE AND FORMED OPENING



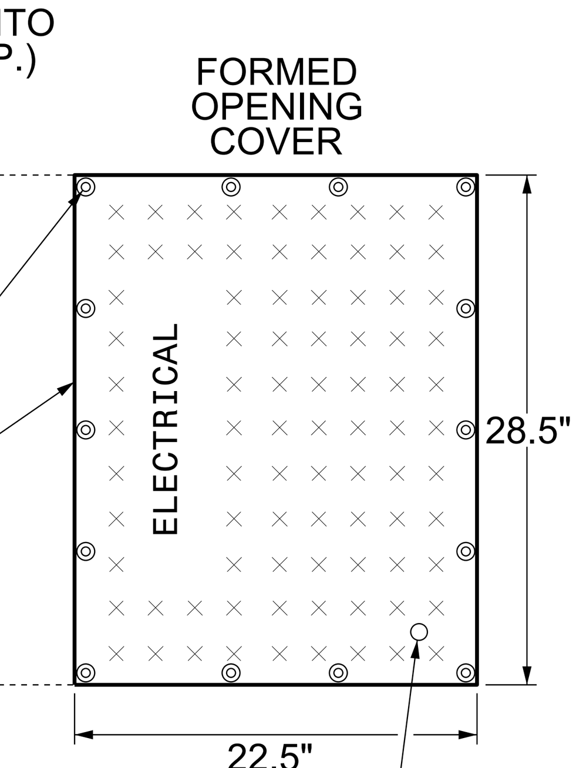
VIEW B-B 3
PEDESTAL FOR LIGHT POLE AND FORMED OPENING



EXPANSION FITTING 1
FOUR LOCATIONS



VIEW C-C
PEDESTAL AND FORMED OPENING



PROJECT NO. B-5372
CABARRUS COUNTY
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SHEET 1 OF 1

STATE OF NORTH CAROLINA
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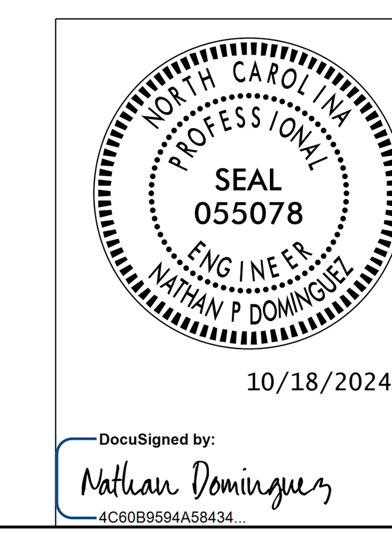
RALEIGH

ELECTRICAL CONDUIT SYSTEM FOR BRIDGE OVER US 29 ON SR 1706 BETWEEN SR 1008 AND SR 2154



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SHEET NO. S-23
TOTAL SHEETS 36

DRAWN BY : NATHAN DOMINGUEZ DATE : 07/23
CHECKED BY : GREG HALL DATE : 07/23
DESIGN ENGINEER OF RECORD: NPD DATE : 07/23

18-OCT-2024 12:13
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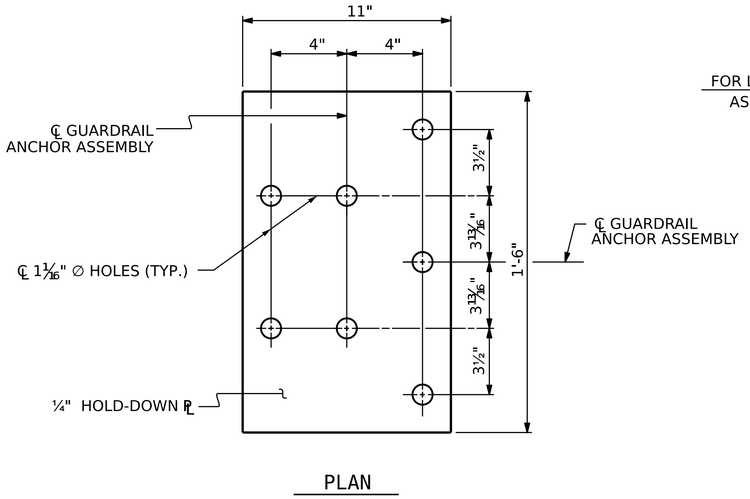
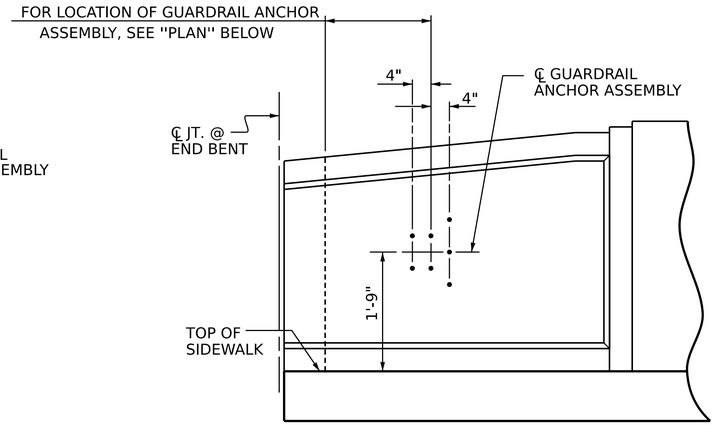
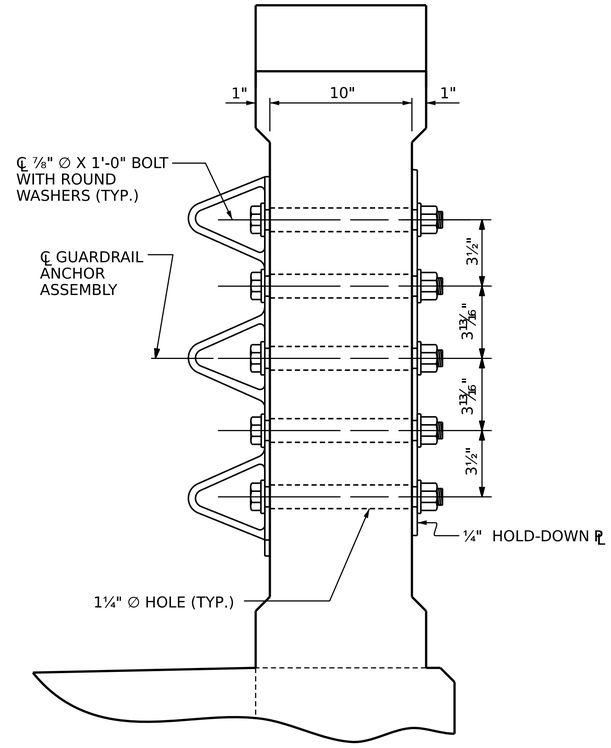
7/9/24



PLAN

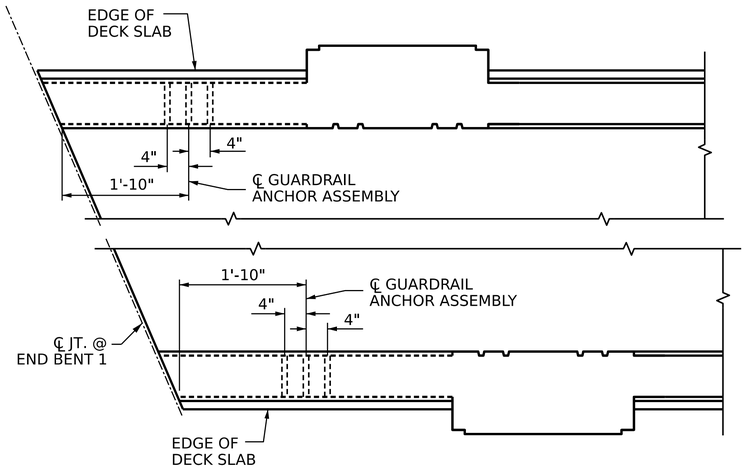


ELEVATION



END VIEW

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 7 - ⅞'' ∅ 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 ⅞'' ∅ 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.)

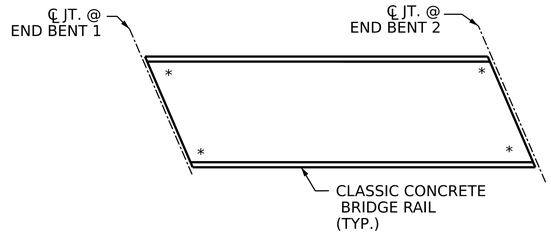
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF CLASSIC CONCRETE BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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 CLASSIC CONCRETE BARRIER RAIL.

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

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



SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-5372

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NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GUARDRAIL ANCHORAGE FOR CLASSIC CONCRETE BARRIER RAIL

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10/21/2024
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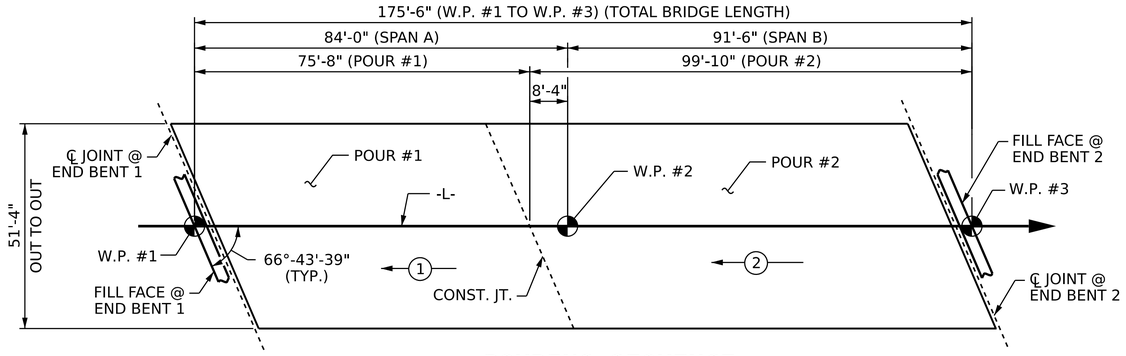
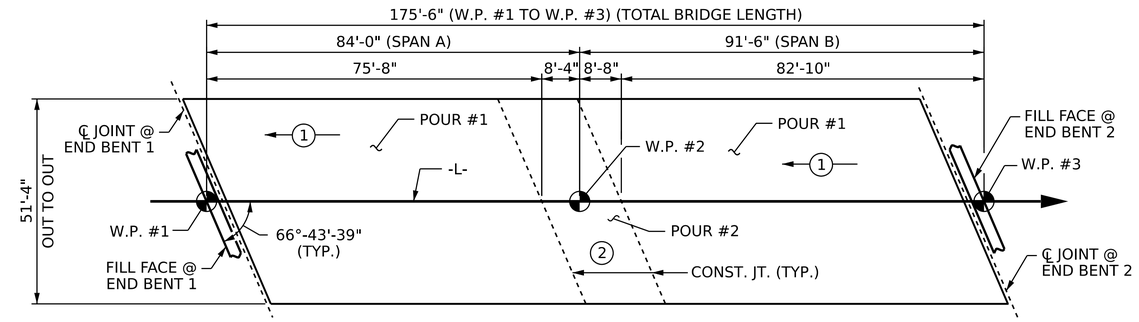


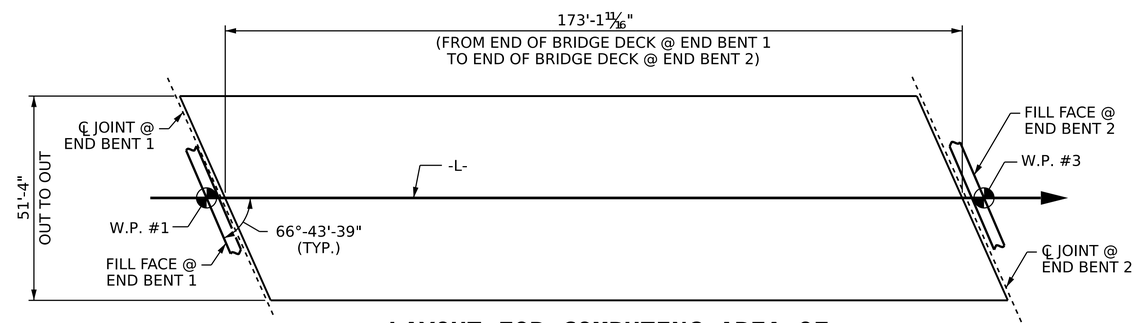
POURING SEQUENCE

POUR #2 CANNOT BE STARTED UNTIL BOTH ADJACENT #1 POURS REACH A MIN. OF 3000 PSI.
(#) = INDICATES POUR NUMBER AND DIRECTION OF POUR

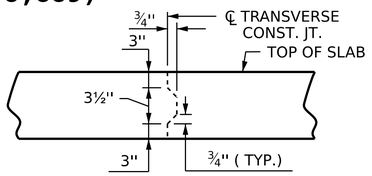


OPTIONAL POURING SEQUENCE

POUR #2 CANNOT BE STARTED UNTIL BOTH ADJACENT #1 POURS REACH A MIN. OF 3000 PSI.
(#) = INDICATES POUR NUMBER AND DIRECTION OF POUR



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ.FT. = 8,889)



TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB DETAIL

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

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	330	#5	STR	51'-0"	17,554	A213	4	#5	STR	23'-5"	98
A2	330	#5	STR	51'-0"	17,554	A214	4	#5	STR	21'-3"	89
						A215	4	#5	STR	19'-1"	80
* A101	4	#5	STR	48'-11"	204	A216	4	#5	STR	17'-0"	71
* A102	4	#5	STR	46'-10"	195	A217	4	#5	STR	14'-10"	62
* A103	4	#5	STR	44'-8"	186	A218	4	#5	STR	12'-9"	53
* A104	4	#5	STR	42'-7"	178	A219	4	#5	STR	10'-7"	44
* A105	4	#5	STR	40'-5"	169	A220	4	#5	STR	8'-6"	35
* A106	4	#5	STR	38'-3"	160	A221	4	#5	STR	6'-4"	26
* A107	4	#5	STR	36'-2"	151	A222	4	#5	STR	4'-2"	17
* A108	4	#5	STR	34'-0"	142	A223	4	#5	STR	2'-1"	9
* A109	4	#5	STR	31'-11"	133						
* A110	4	#5	STR	29'-9"	124	* B1	70	#4	STR	28'-8"	1340
* A111	4	#5	STR	27'-8"	115	* B2	35	#5	STR	19'-6"	712
* A112	4	#5	STR	25'-6"	106	* B3	68	#5	STR	36'-1"	2559
* A113	4	#5	STR	23'-5"	98	* B4	35	#5	STR	45'-1"	1646
* A114	4	#5	STR	21'-3"	89	* B5	70	#4	STR	31'-2"	1457
* A115	4	#5	STR	19'-1"	80	B6	58	#5	STR	44'-8"	2702
* A116	4	#5	STR	17'-0"	71	B7	62	#5	STR	53'-5"	3454
* A117	4	#5	STR	14'-10"	62	B8	62	#5	STR	58'-11"	3810
* A118	4	#5	STR	12'-9"	53	B9	124	#5	STR	33'-3"	4300
* A119	4	#5	STR	10'-7"	44						
* A120	4	#5	STR	8'-6"	35	* G1	2	#5	STR	55'-6"	116
* A121	4	#5	STR	6'-4"	26						
* A122	4	#5	STR	4'-2"	17	* K1	8	#8	1	13'-10"	295
* A123	4	#5	STR	2'-1"	9	* K2	12	#8	2	21'-3"	681
						* K3	24	#6	STR	10'-1"	363
A201	4	#5	STR	48'-11"	204						
A202	4	#5	STR	46'-10"	195	* S1	72	#5	3	6'-4"	476
A203	4	#5	STR	44'-8"	186	* S2	72	#4	4	4'-8"	224
A204	4	#5	STR	42'-7"	178						
A205	4	#5	STR	40'-5"	169						
A206	4	#5	STR	38'-3"	160						
A207	4	#5	STR	36'-2"	151						
A208	4	#5	STR	34'-0"	142						
A209	4	#5	STR	31'-11"	133						
A210	4	#5	STR	29'-9"	124						
A211	4	#5	STR	27'-8"	115						
A212	4	#5	STR	25'-6"	106						

REINFORCING STEEL	LBS.	34,267
* EPOXY COATED REINFORCING STEEL	LBS.	29,870

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR #1	135.0	-	-
POUR #2	175.2	-	-
TOTALS**	310.2	34,267	29,870

** QUANTITIES FOR CLASSIC CONCRETE BARRIER RAIL AND SIDEWALK ARE NOT INCLUDED

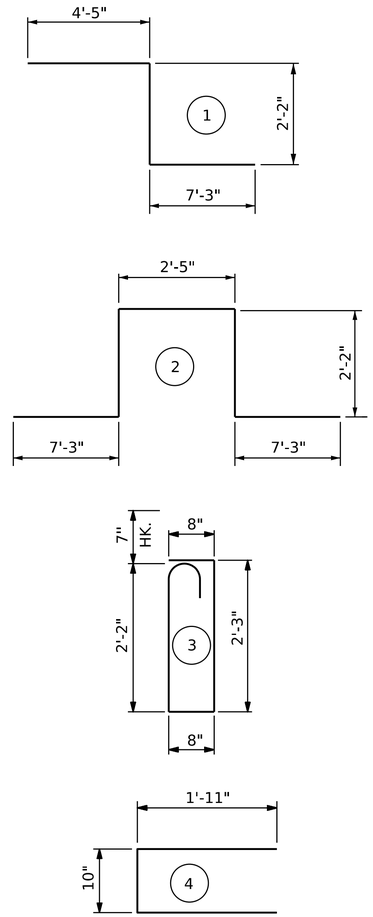
GROOVING BRIDGE FLOORS

APPROACH SLABS	816	SQ.FT.
BRIDGE DECK	6048	SQ.FT.
TOTAL	6864	SQ.FT.

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"			

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

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10/25/2024

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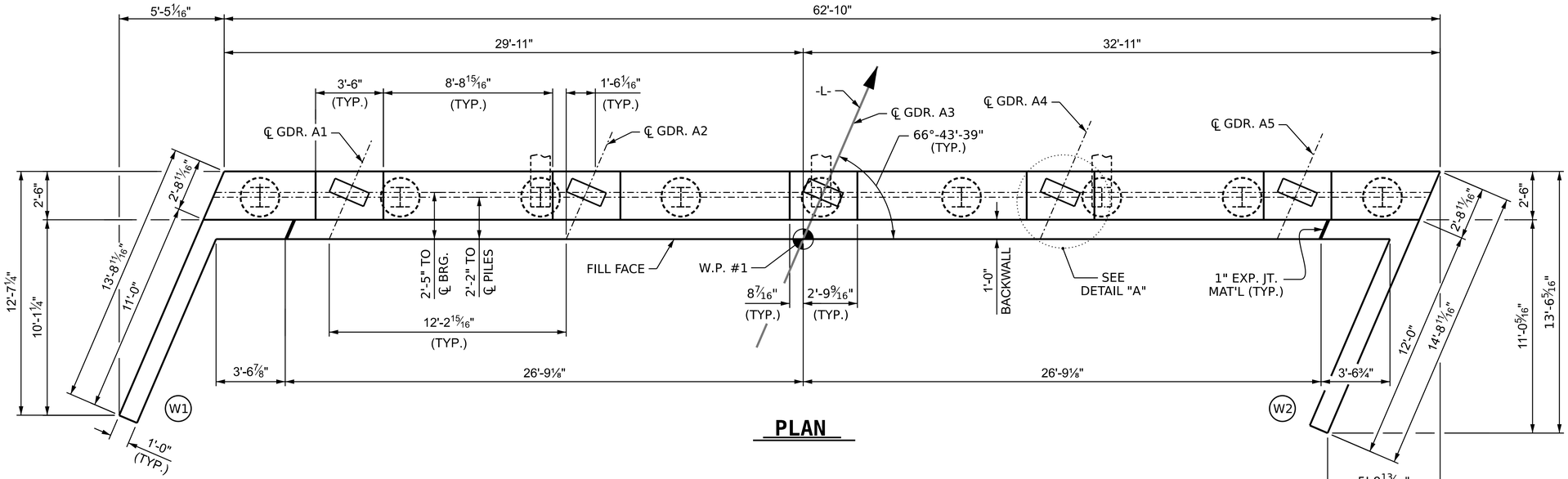
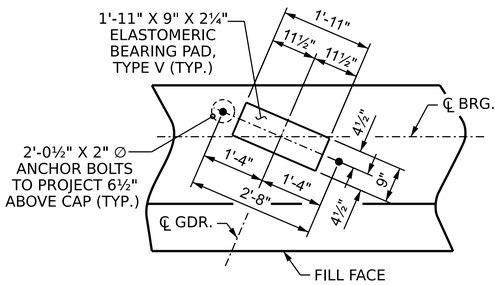
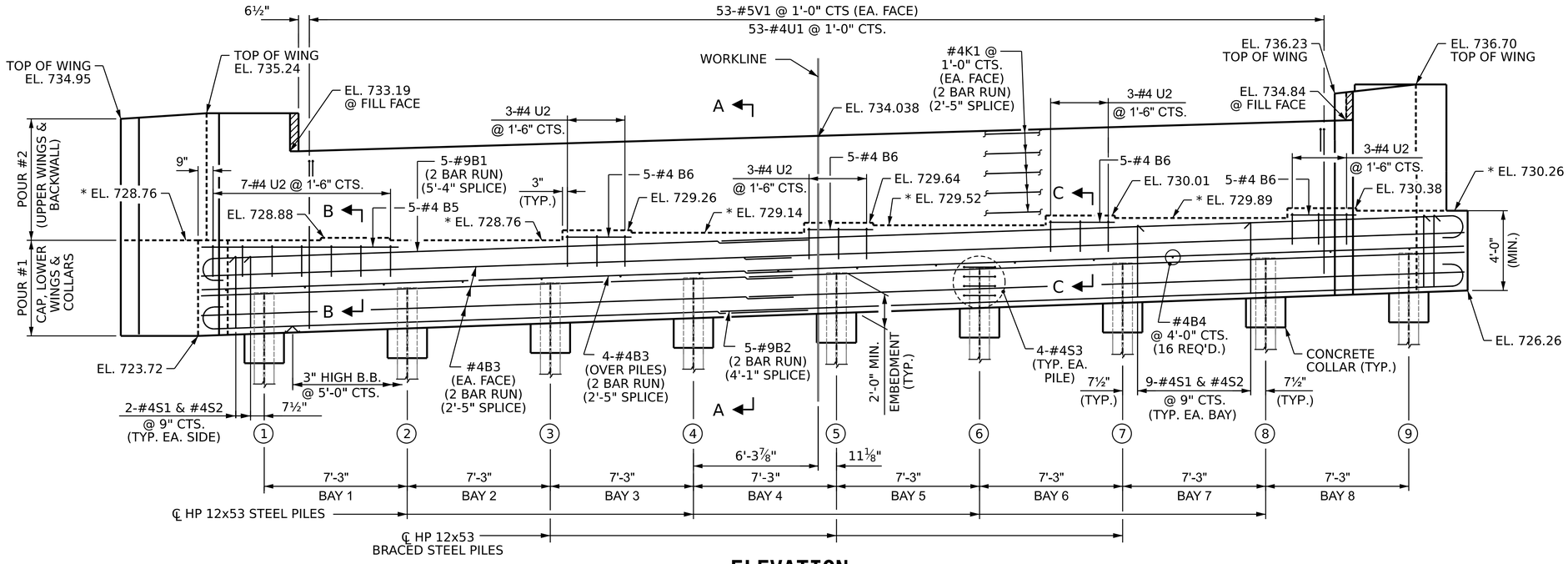


PLAN



DETAIL "A"

(TYP. EA. GDR.)



ELEVATION

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

FOR CONCRETE COLLER DETAILS, SEE SHEET 3 OF 3.

NOTES

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

THE #5 V1 BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM THE TOP OF BACKWALL.

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.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

FOR SECTION VIEWS, SEE SHEET 3 OF 3.

INSTALL THE 4"∅ DRAIN PIPE THROUGH THE WINGWALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WINGWALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

TOP OF PILE ELEVATIONS

①	725.80
②	726.09
③	726.38
④	726.67
⑤	726.96
⑥	727.25
⑦	727.54
⑧	727.83
⑨	728.12

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

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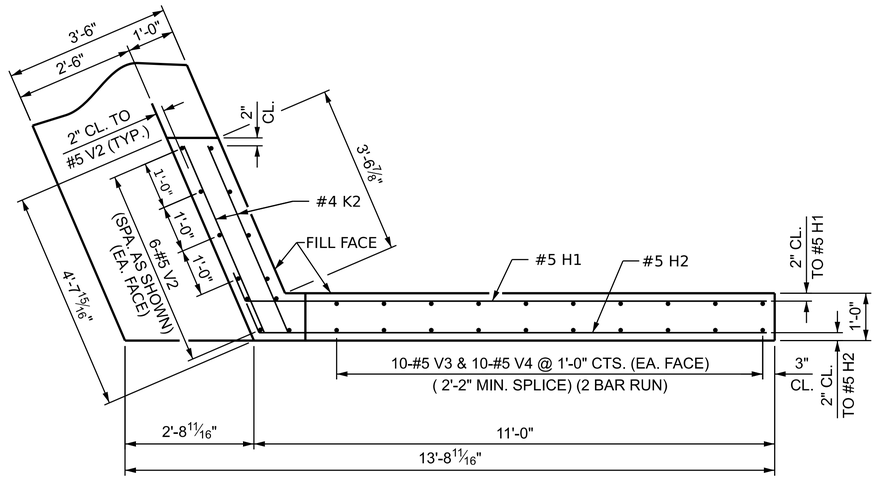
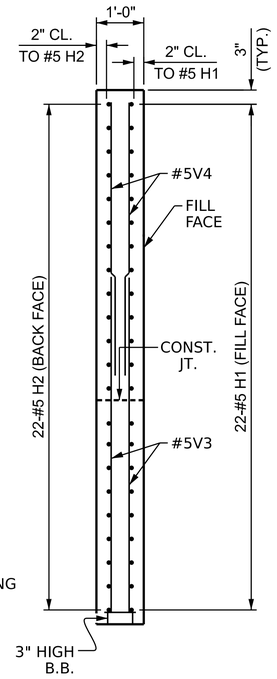
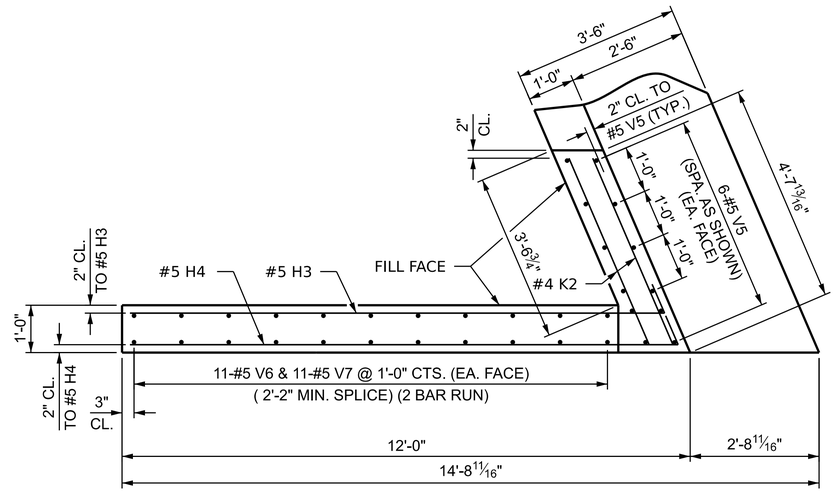


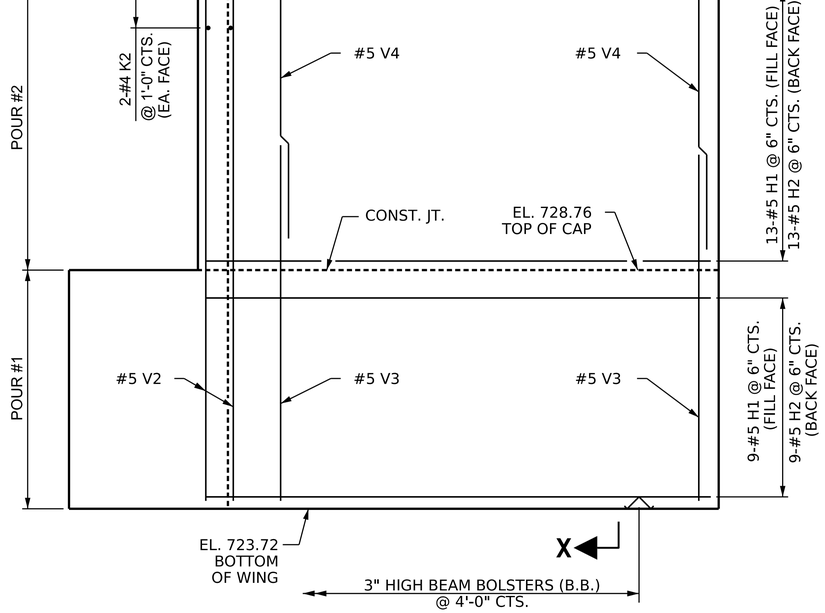
PLAN OF LEFT WING-W1



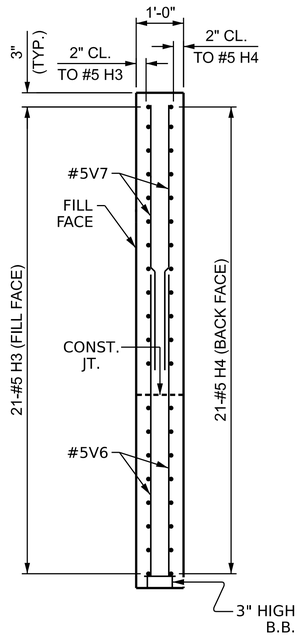
SECTION X-X



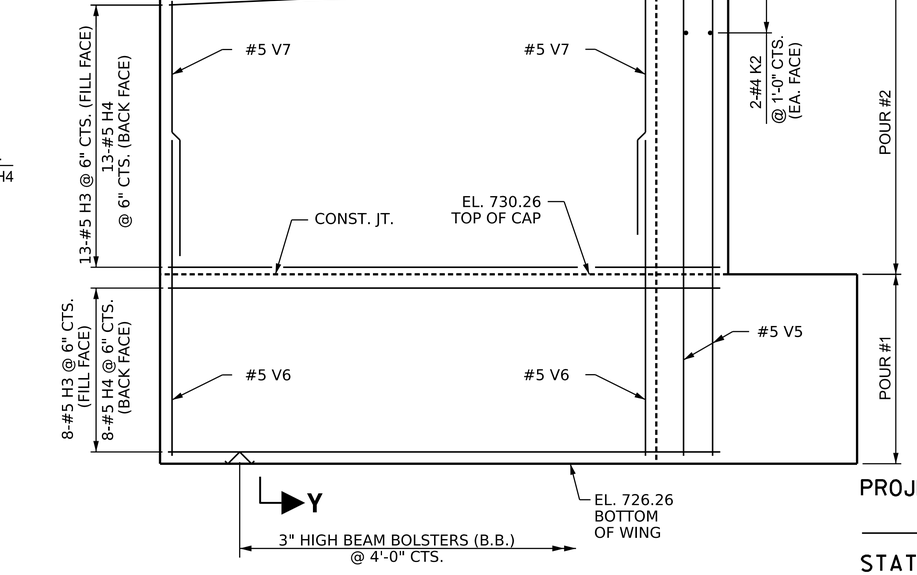
PLAN OF RIGHT WING-W2



ELEVATION OF LEFT WING-W1



SECTION Y-Y



ELEVATION OF RIGHT WING-W2

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu E6D3DAD16F3E4AB...
10/25/2024

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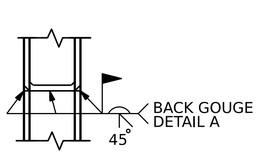
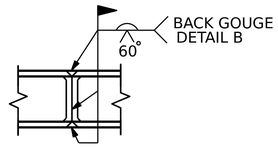
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : M. G. SHAIKH DATE : 8/24
CHECKED BY : J. P. M. DATE : 8/24
DESIGN ENGINEER OF RECORD: H. B. DESAI DATE : 8/24

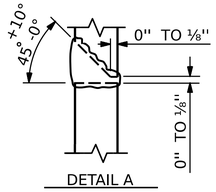
10/24/2024
S:\PEF\LSA Contracts\LSA Projects\B-5372- SMUPEF\B-5372 OBD\B-5372_UPDATED PLANS DGN_10-24\400_055_B-5372_SMU_ E1_0027_120109.dgn
mgshaikh



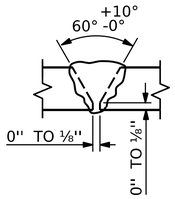


△PILE VERTICAL

△PILE HORIZONTAL OR VERTICAL



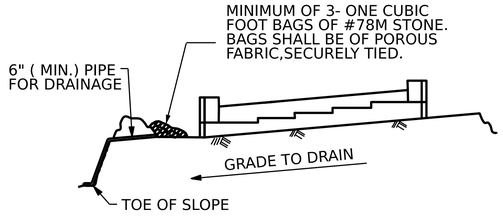
DETAIL A



DETAIL B

△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



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

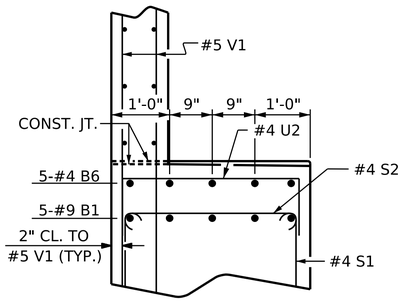
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

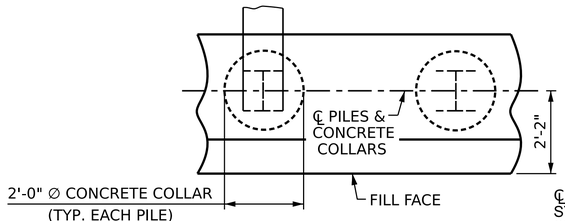
TEMPORARY DRAINAGE AT END BENT

SECTION A-A

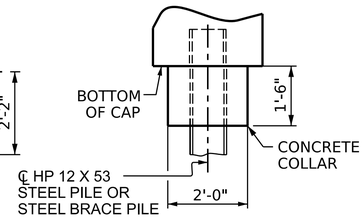
SECTION B-B



SECTION C-C



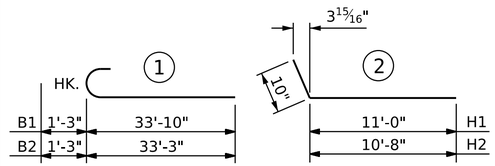
PLAN

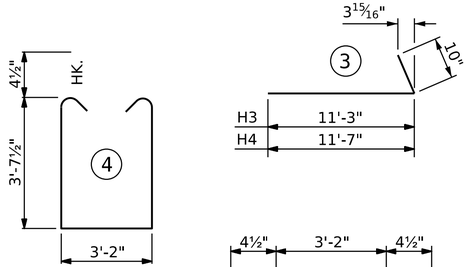


ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

BAR TYPES





ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	35'-1"	1193
B2	10	#9	1	34'-6"	1173
B3	20	#4	STR	32'-6"	434
B4	16	#4	STR	3'-2"	34
B5	5	#4	STR	10'-0"	33
B6	20	#4	STR	3'-4"	45
H1	22	#5	2	11'-10"	272
H2	22	#5	2	11'-6"	264
H3	21	#5	3	12'-1"	265
H4	21	#5	3	12'-5"	272
K1	10	#4	STR	32'-6"	217
K2	8	#4	STR	4'-3"	23
S1	76	#4	4	11'-2"	567
S2	76	#4	5	3'-11"	199
S3	36	#4	6	6'-6"	156
U1	53	#4	7	3'-8"	130
U2	19	#4	7	6'-2"	78
V1	106	#5	STR	8'-6"	940
V2	12	#5	STR	11'-0"	138
V3	20	#5	STR	7'-6"	156
V4	20	#5	STR	5'-8"	119
V5	12	#5	STR	10'-0"	125
V6	22	#5	STR	6'-11"	159
V7	22	#5	STR	5'-5"	124

REINFORCING STEEL 7116 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WING & COLLARS	41.5 C.Y.
POUR #2	BACKWALL & UPPER PART OF WINGS	16.3 C.Y.
TOTAL CLASS A CONCRETE		57.8 C.Y.

PROJECT NO. B-5372

CABARRRUS COUNTY

STATION: 20+59.44 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu E6D30DA01BF3E4AB... 10/25/2024

DRAWN BY : M. G. SHAIKH DATE : 8/24
CHECKED BY : J. P. M. DATE : 8/24
DESIGN ENGINEER OF RECORD: H. B. DESAI DATE : 8/24

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10/22/2024
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mgshaikh

NOTES

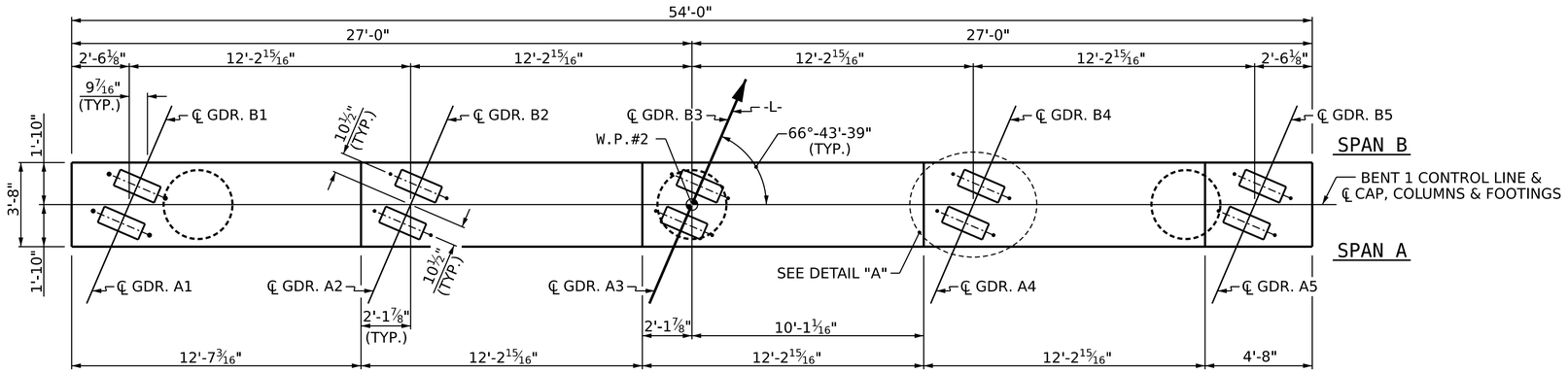
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

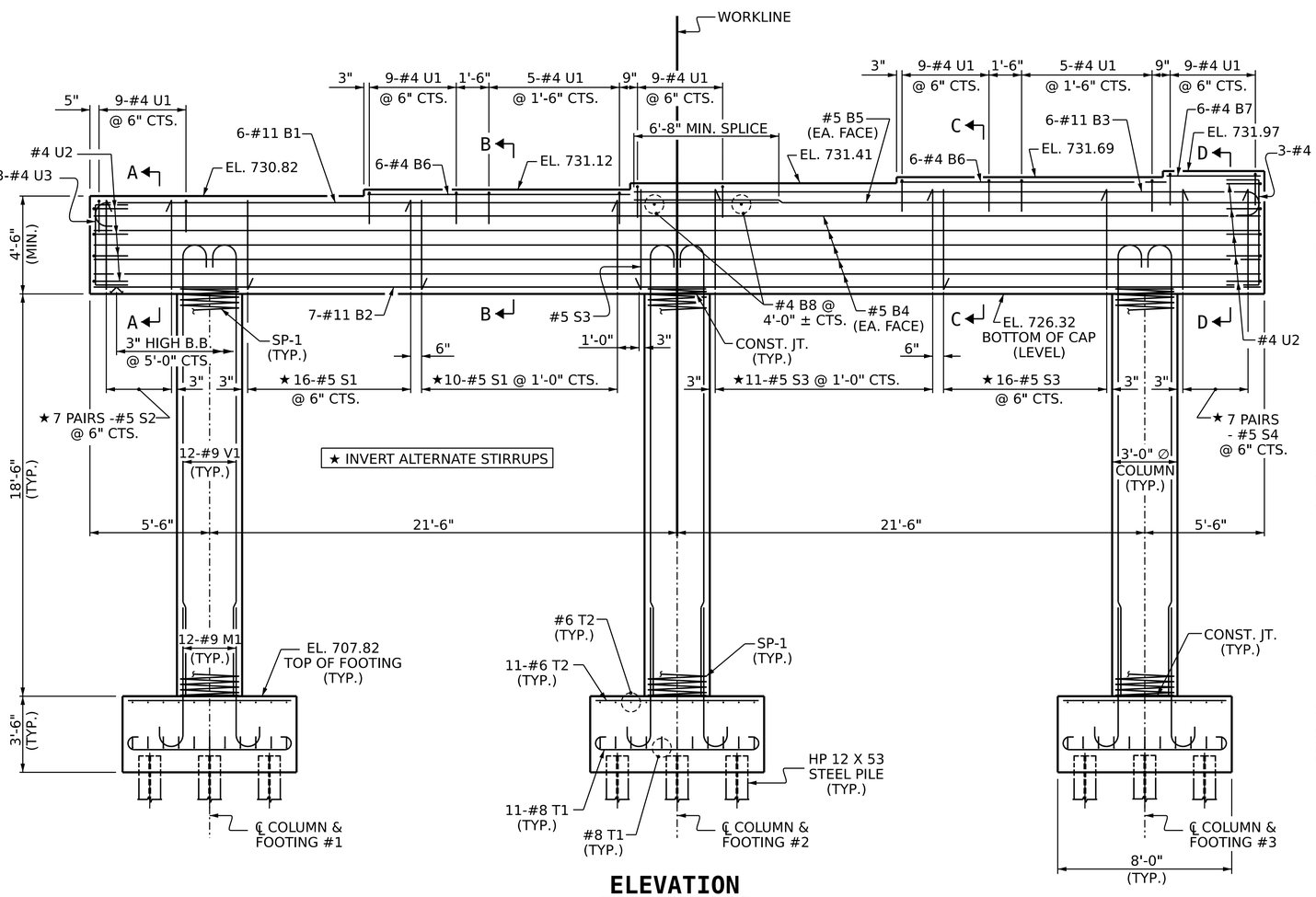
FOR PILE SPLICE DETAILS, SEE END BENT SHEETS.

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

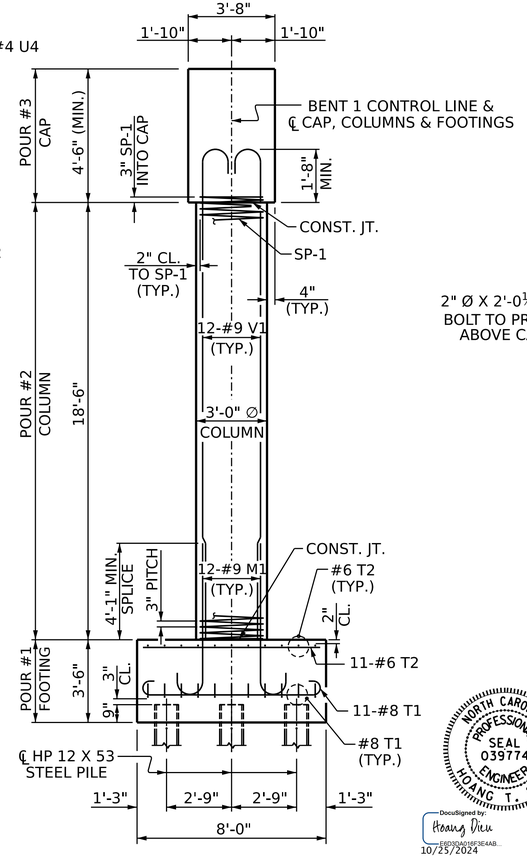
SEE SHEET 2 OF 2 FOR SECTION VIEWS.



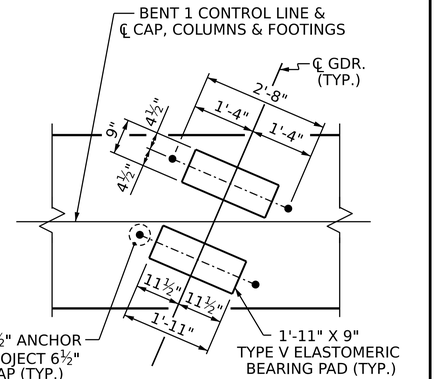
PLAN



ELEVATION



END ELEVATION



DETAIL "A"

DIMENSIONS ARE TYPICAL FOR EACH GIRDER

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

DRAWN BY : T. L. AVERETTE DATE : 8/24
CHECKED BY : J. P. M. DATE : 8/24
DESIGN ENGINEER OF RECORD: T. L. AVERETTE DATE : 8/24

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu 10/25/2024

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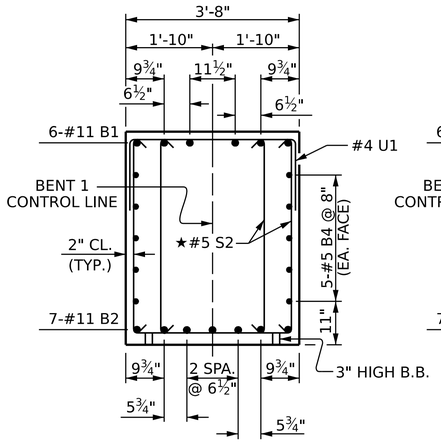
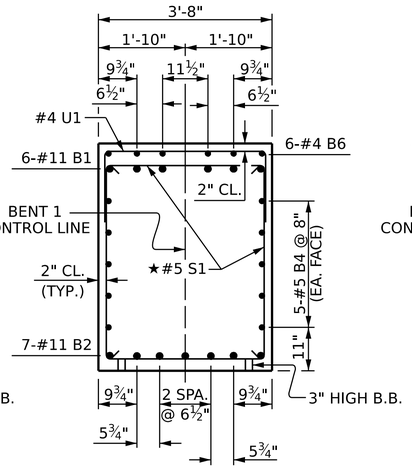
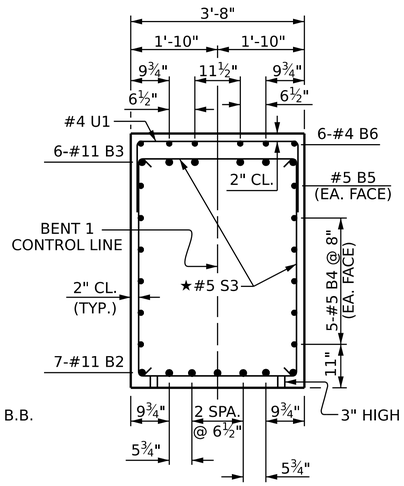
mgshaikh



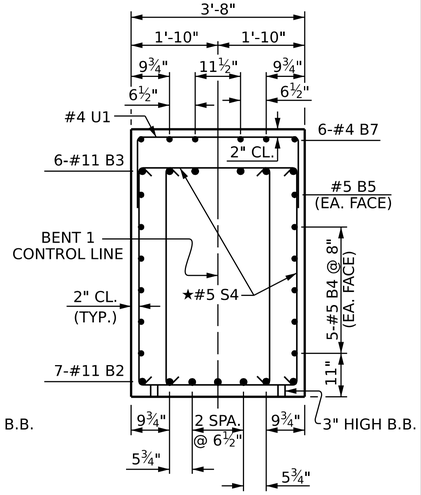
SECTION A-A



SECTION B-B

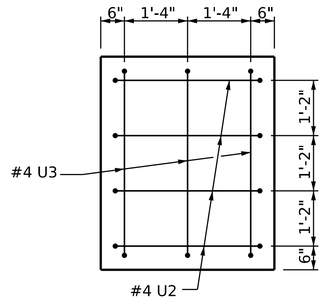


SECTION C-C

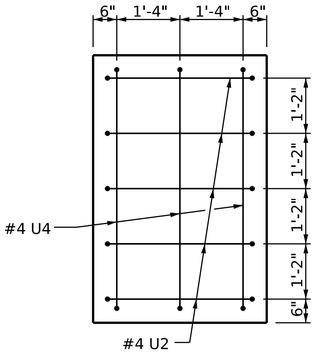


SECTION D-D

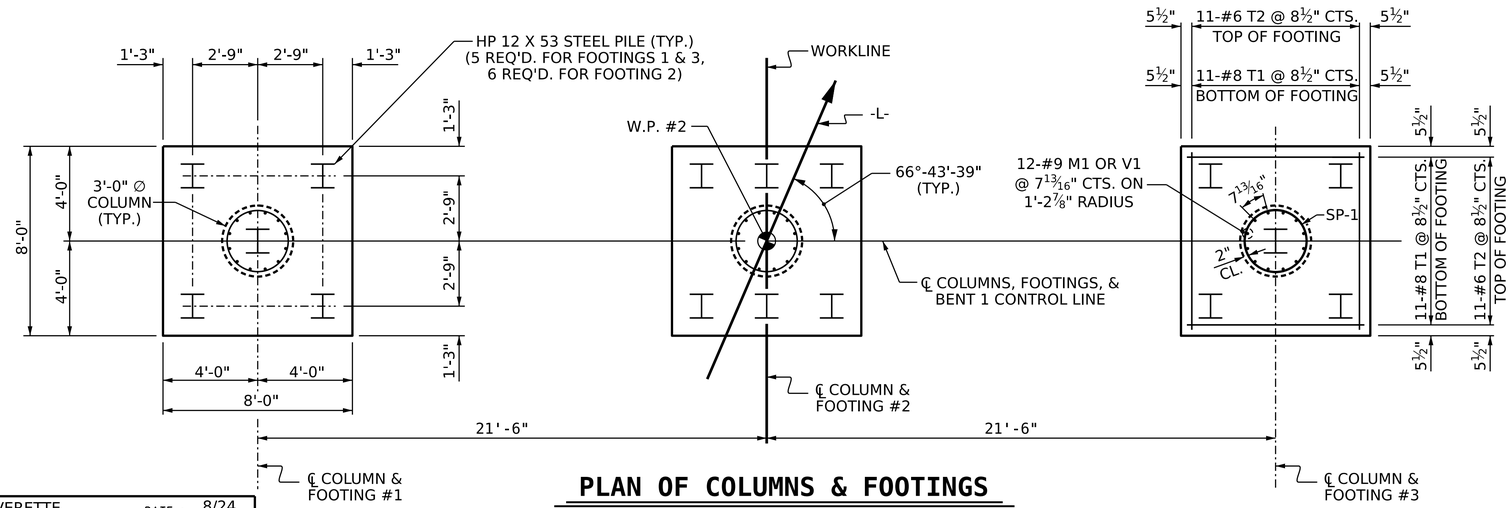
★ INVERT ALTERNATE STIRRUPS



LEFT END VIEW



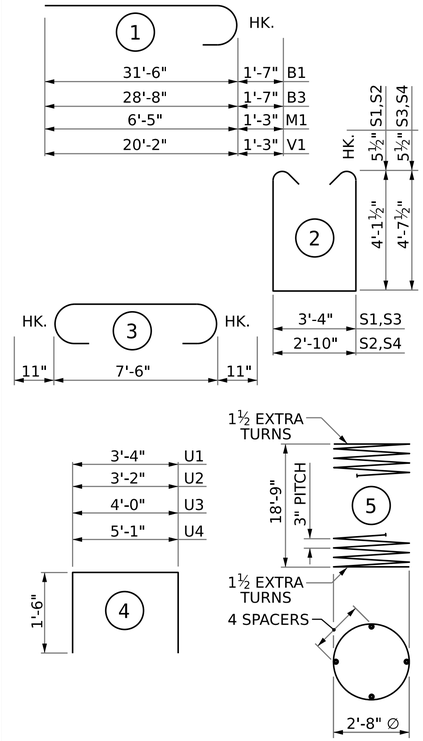
RIGHT END VIEW



PLAN OF COLUMNS & FOOTINGS

REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR EACH COLUMN & FOOTING

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	1	33'-1"	1055
B2	7	#11	STR	53'-8"	1996
B3	6	#11	1	30'-3"	964
B4	10	#5	STR	53'-8"	560
B5	2	#5	STR	28'-10"	60
B6	12	#4	STR	12'-1"	97
B7	6	#4	STR	4'-4"	17
B8	2	#4	STR	3'-4"	4
M1	36	#9	1	7'-8"	938
S1	26	#5	2	12'-6"	339
S2	14	#5	2	12'-0"	175
S3	28	#5	2	13'-6"	394
S4	14	#5	2	13'-0"	190
T1	66	#8	3	9'-4"	1645
T2	66	#6	STR	7'-6"	743
U1	55	#4	4	6'-4"	233
U2	9	#4	4	6'-2"	37
U3	3	#4	4	7'-0"	14
U4	3	#4	4	8'-1"	16
V1	36	#9	1	21'-5"	2621
REINFORCING STEEL					12,098 LBS.
SP-1	3	**	5	643'-7"	1290
SPIRAL COLUMN REINFORCING STEEL					1,290 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 FOOTINGS	24.9 C.Y.
POUR #2 COLUMNS	14.5 C.Y.
POUR #3 CAP	36.7 C.Y.
TOTAL CLASS A CONCRETE	76.1 C.Y.

FOUNDATION EXCAVATION FOR BENT — LUMP SUM

** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu
E6D3DAD16F3E4AB...
10/25/2024

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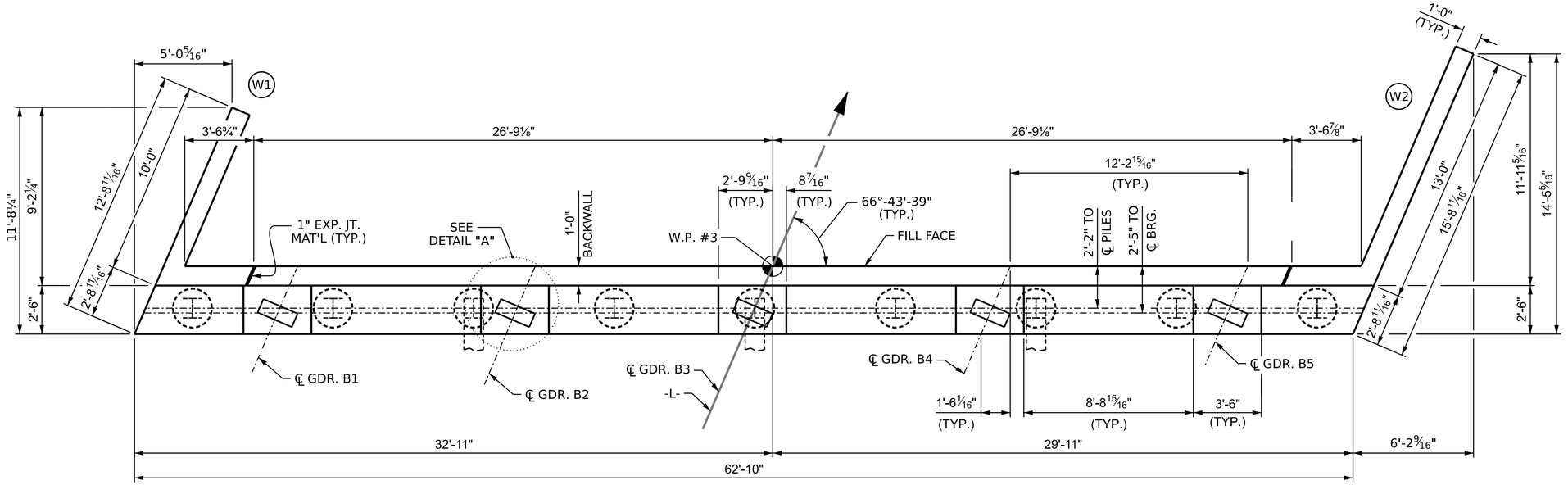
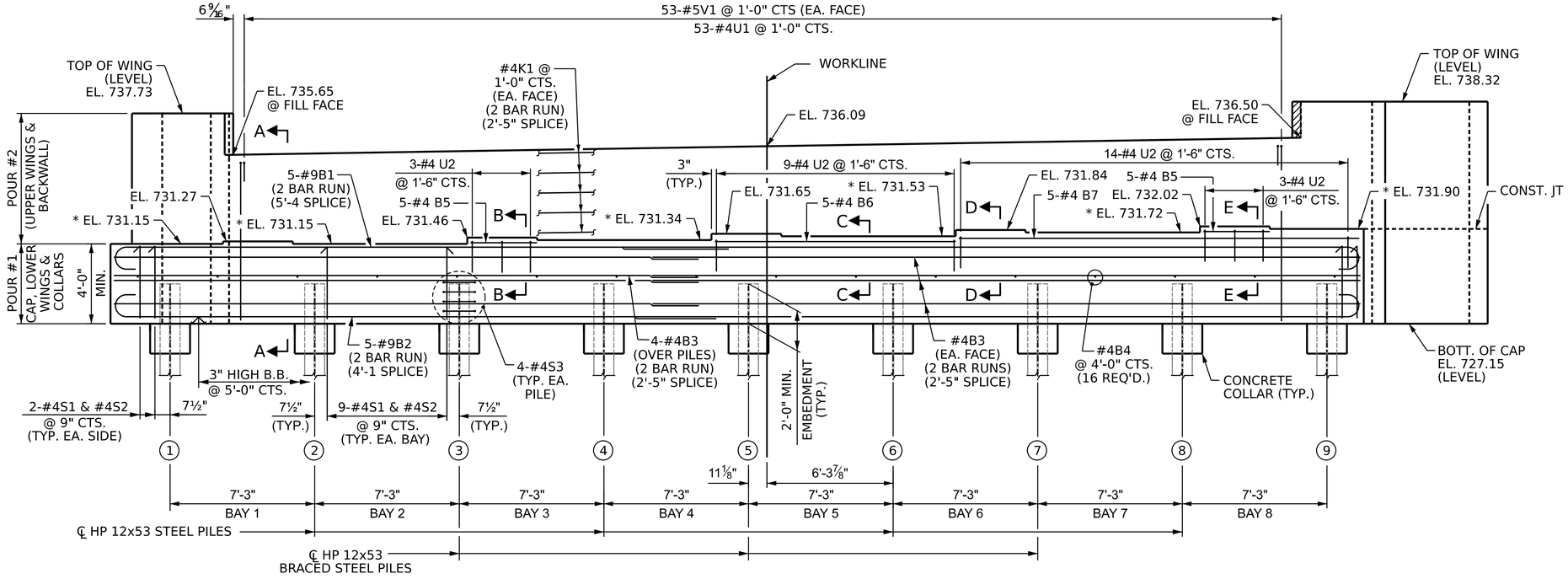


PLAN



ELEVATION

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

FOR CONCRETE COLLAR DETAILS, SEE SHEET 3 OF 3.

NOTES

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

THE #5 V1 BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM THE TOP OF BACKWALL.

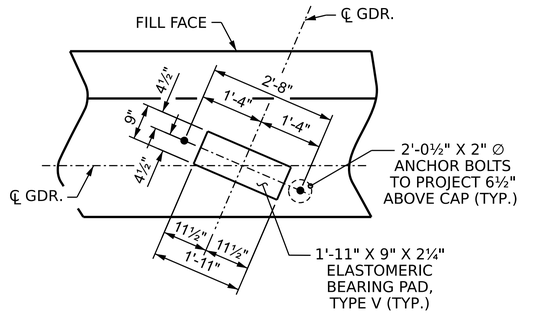
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

FOR SECTION VIEWS, SEE SHEET 3 OF 3.

INSTALL THE 4"∅ DRAIN PIPE THROUGH THE WINGWALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WINGWALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



DETAIL "A"

(TYP. EA. GDR.)

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu E6D3DA016F3E4AB...

10/25/2024

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CHECKED BY :	J. P. M.	DATE :	8/24
DESIGN ENGINEER OF RECORD:	H. B. DESAI	DATE :	8/24

10/24/2024
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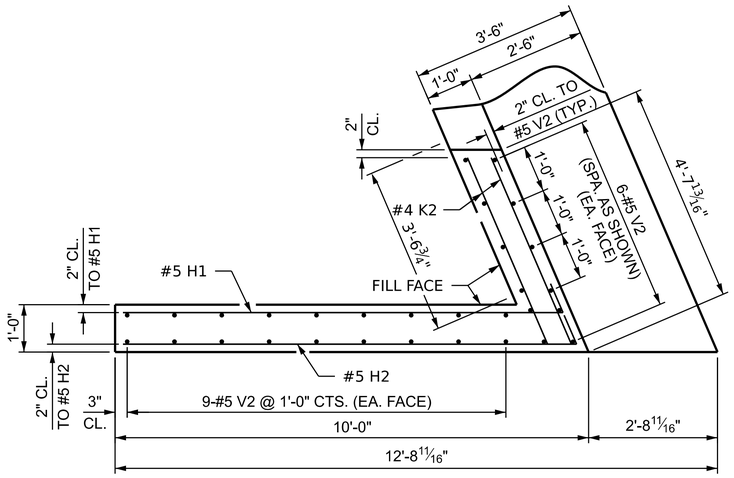
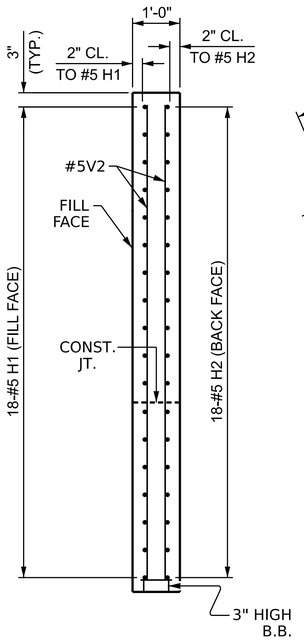
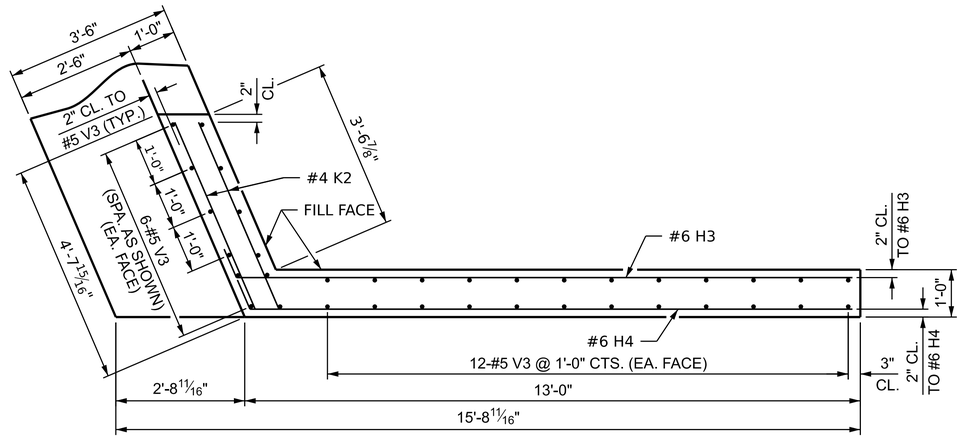


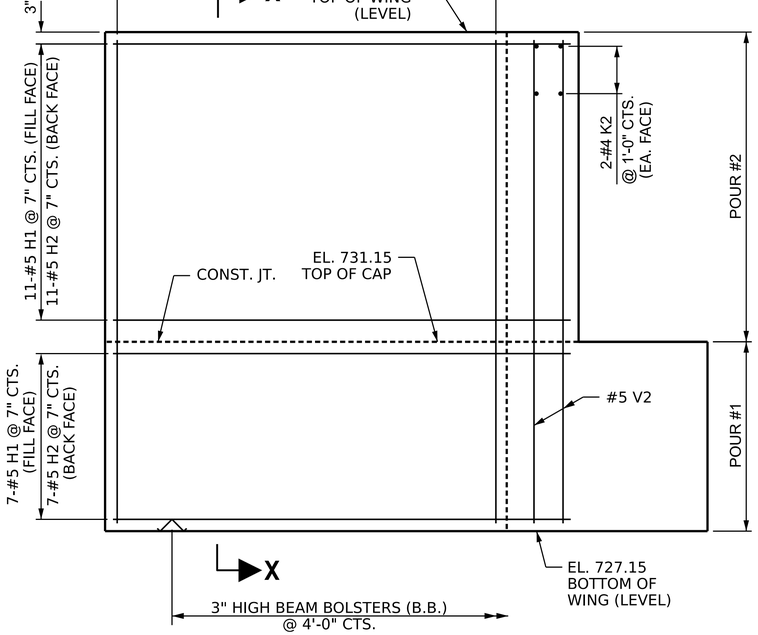
PLAN OF LEFT WING-W1



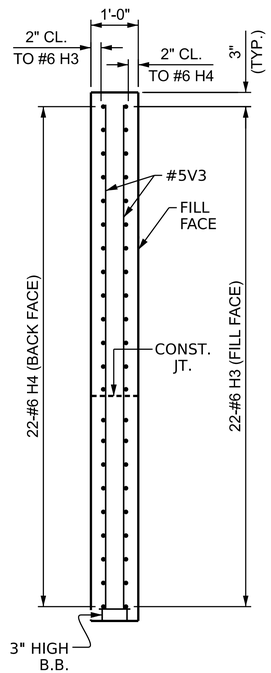
SECTION X-X



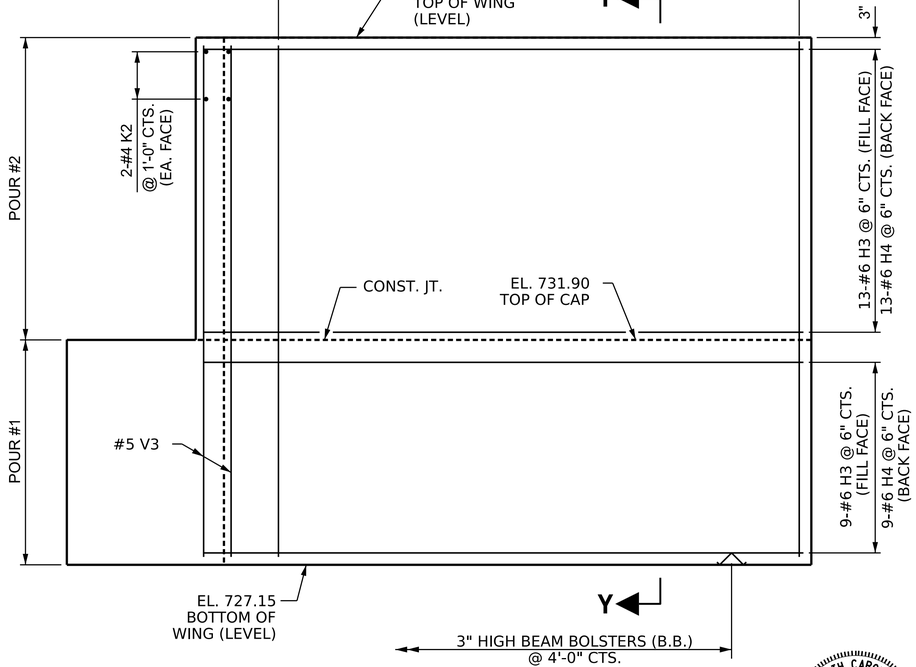
PLAN OF RIGHT WING-W2



ELEVATION OF LEFT WING-W1



SECTION Y-Y



ELEVATION OF RIGHT WING-W2

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

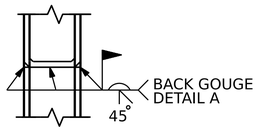
DocuSigned by: Hoang Dieu E6D3DA016F3E4AB...
10/25/2024

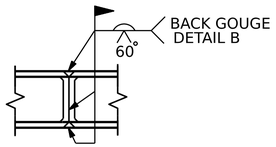
DRAWN BY : M. G. SHAIKH DATE : 8/24
CHECKED BY : J. P. M. DATE : 8/24
DESIGN ENGINEER OF RECORD: H. B. DESAI DATE : 8/24

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			36

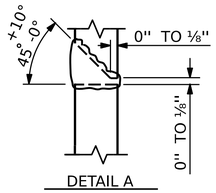
10/24/2024
S:\PEF\LSA Contracts\LSA Projects\B-5372- SMUPEF\B-5372 OBD\B-5372_UPDATED PLANS DGN_10-24\400_065_B-5372_SMU_ E2_0032_120109.dgn
mgshaikh

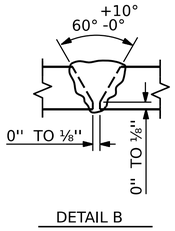




△PILE VERTICAL

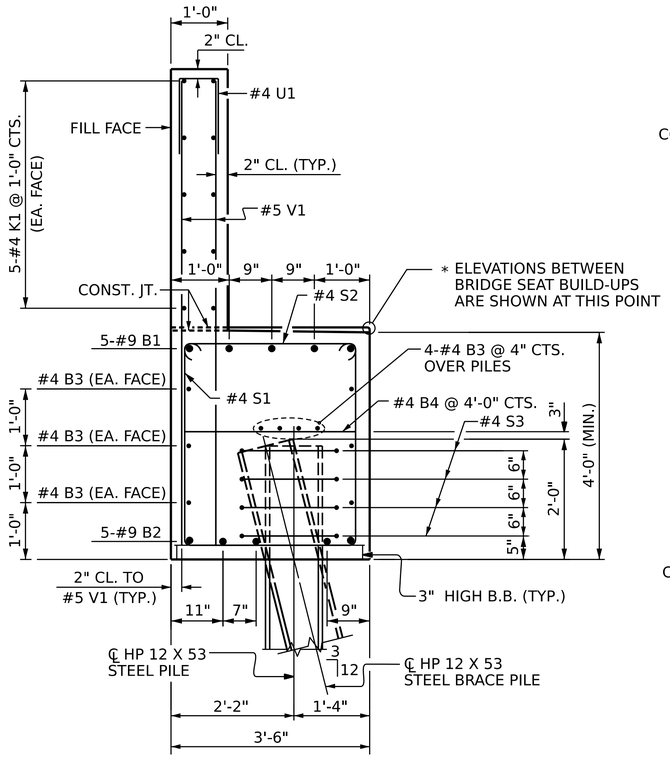
△PILE HORIZONTAL OR VERTICAL



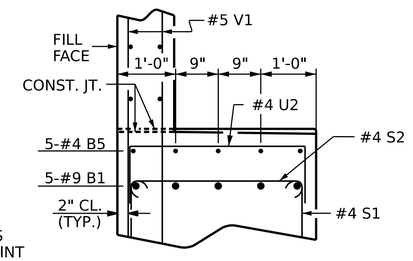


△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



SECTION A-A



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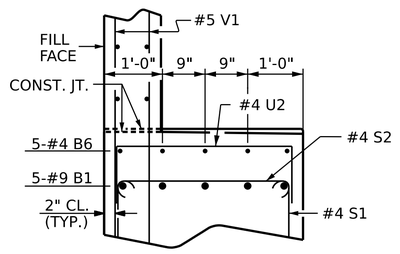

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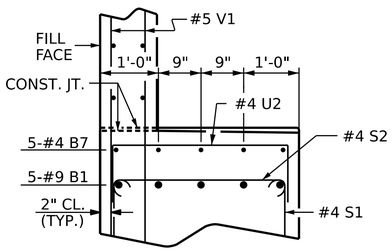

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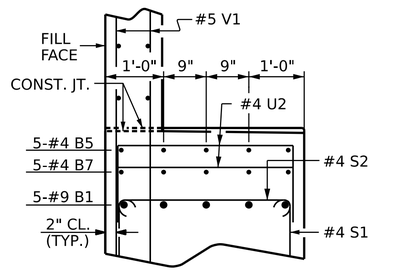

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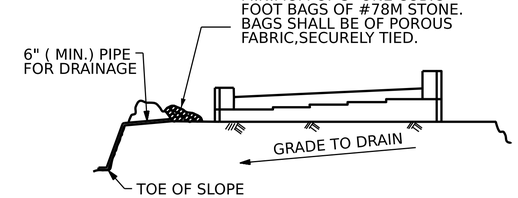


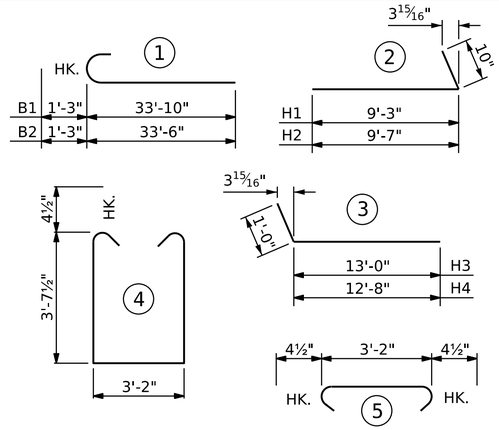
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

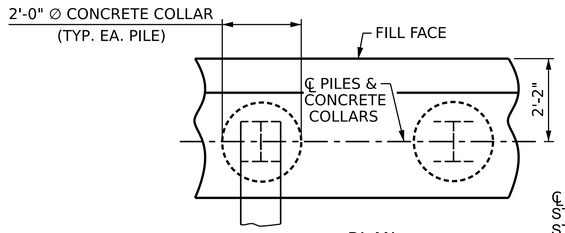
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	35'-1"	1193
B2	10	#9	1	34'-9"	1182
B3	20	#4	STR	32'-6"	434
B4	16	#4	STR	3'-2"	34
B5	10	#4	STR	3'-4"	22
B6	5	#4	STR	12'-1"	40
B7	5	#4	STR	20'-1"	67
H1	18	#5	2	10'-1"	189
H2	18	#5	2	10'-5"	197
H3	22	#6	3	14'-0"	463
H4	22	#6	3	13'-8"	452
K1	10	#4	STR	32'-6"	217
K2	8	#4	STR	4'-3"	23
S1	76	#4	4	11'-2"	567
S2	76	#4	5	3'-11"	194
S3	36	#4	6	6'-6"	156
U1	53	#4	7	3'-8"	130
U2	29	#4	7	6'-2"	119
V1	106	#5	STR	8'-10"	977
V2	30	#5	STR	10'-2"	318
V3	36	#5	STR	10'-9"	404

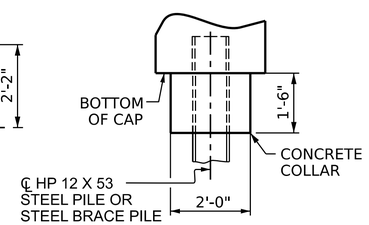
REINFORCING STEEL 7378 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WING & COLLARS	40.6 C.Y.
POUR #2	BACKWALL & UPPER PART OF WING	16.1 C.Y.
TOTAL CLASS A CONCRETE		56.7 C.Y.



PLAN



ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu E6D3DA0169F3E4AB...

10/25/2024

DRAWN BY : M. G. SHAIKH DATE : 8/24
CHECKED BY : J. P. M. DATE : 8/24
DESIGN ENGINEER OF RECORD: H. B. DESAI DATE : 8/24

10/23/2024
S:\PEF\LSA Contracts\LSA Projects\B-5372- SMUPEF\B-5372 OBD\UPDATED SUBSTRUCTURE\UPDATED SUB PLANS\400_067_B-5372_SMU_ E2_0033_120109.dgn
mgshaikh

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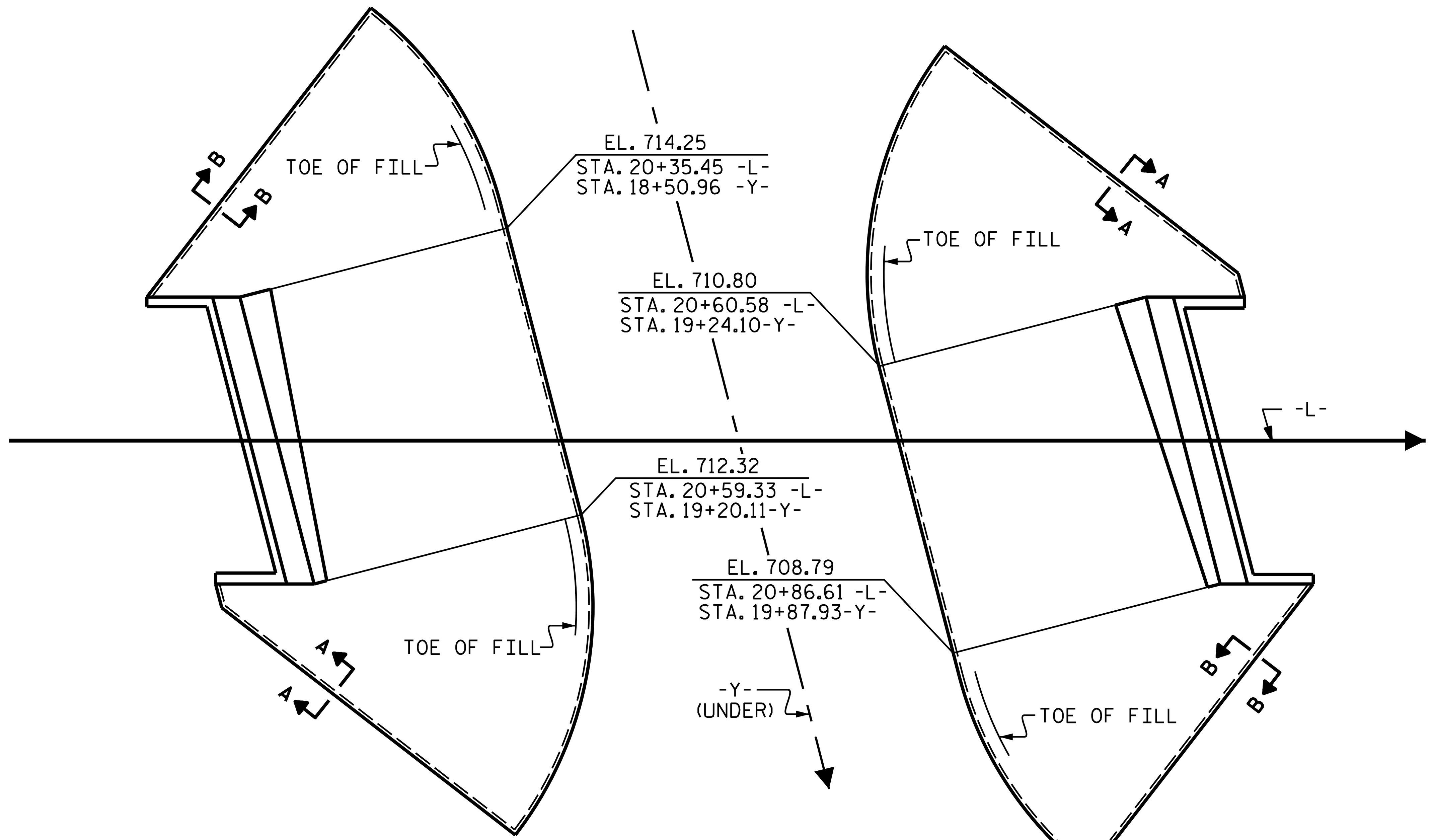
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			36

GENERAL NOTES

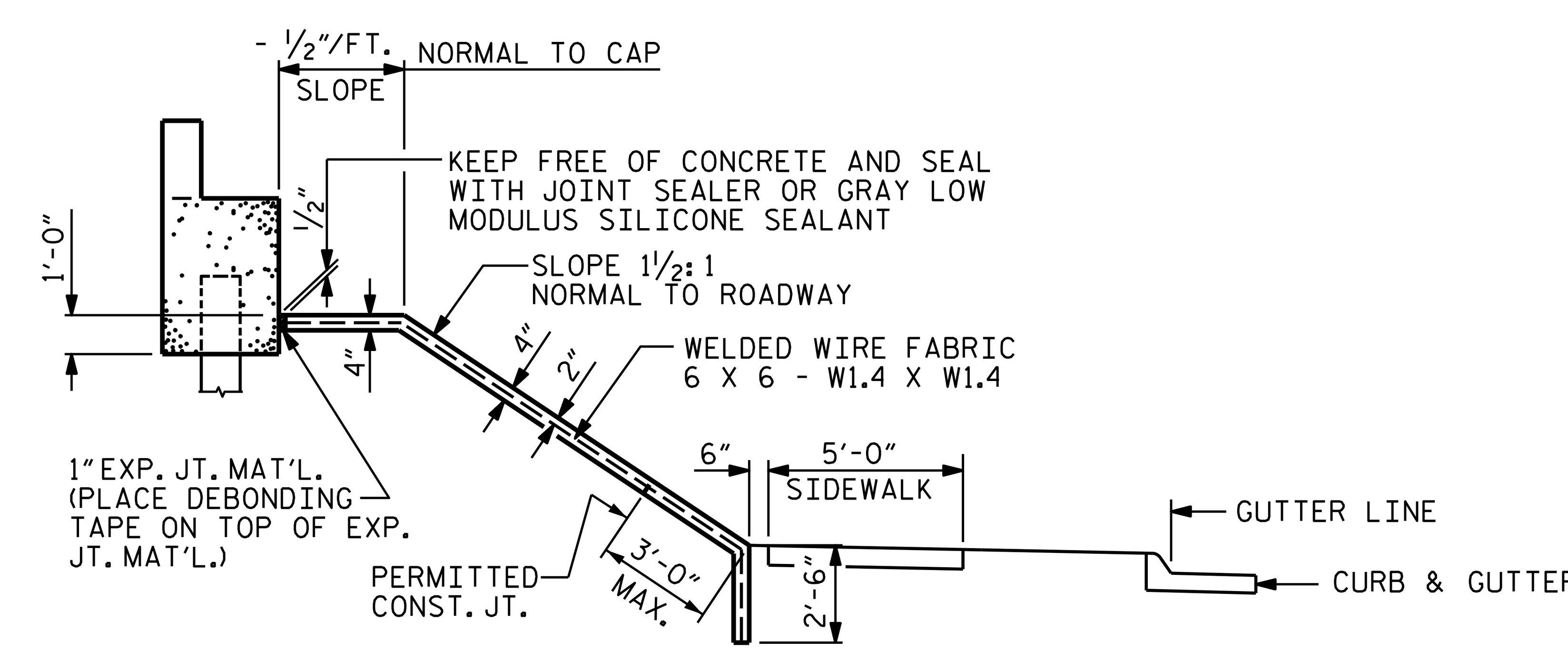
STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING. SLOPE PROTECTION SHALL CONSIST OF 4'' POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS ''B''. THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60'' WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE ''POURING DETAIL'' WITH 2'-0'' LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6'' MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE ''OPTIONAL POURING DETAIL'' WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6''. THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 20.59.44 -L-	4'' INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	319	574
END BENT 2	432	778

* QUANTITY SHOWN IS BASED ON 5' POURS.

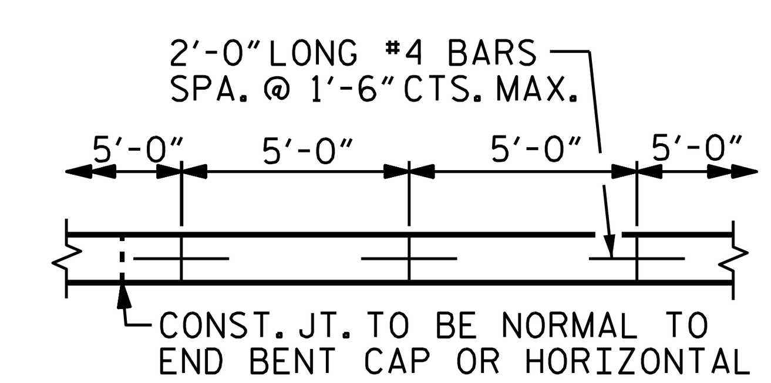


PLAN



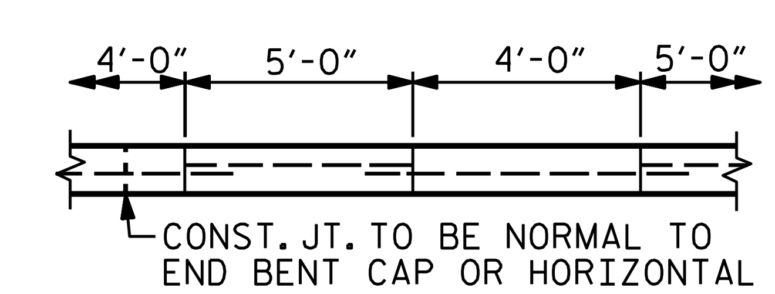
SECTION ALONG ℄ SURVEY

(TYP. EA. SIDE)



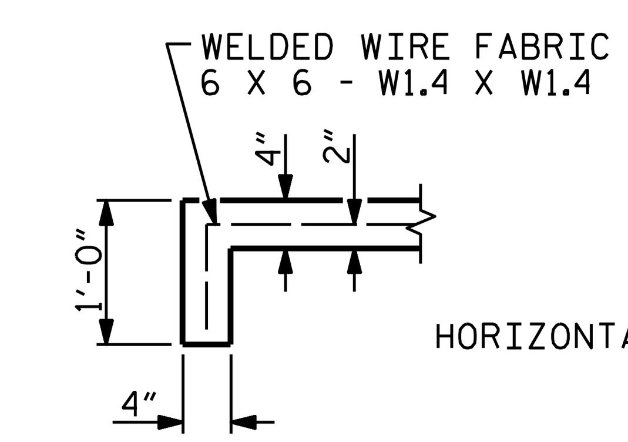
STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL

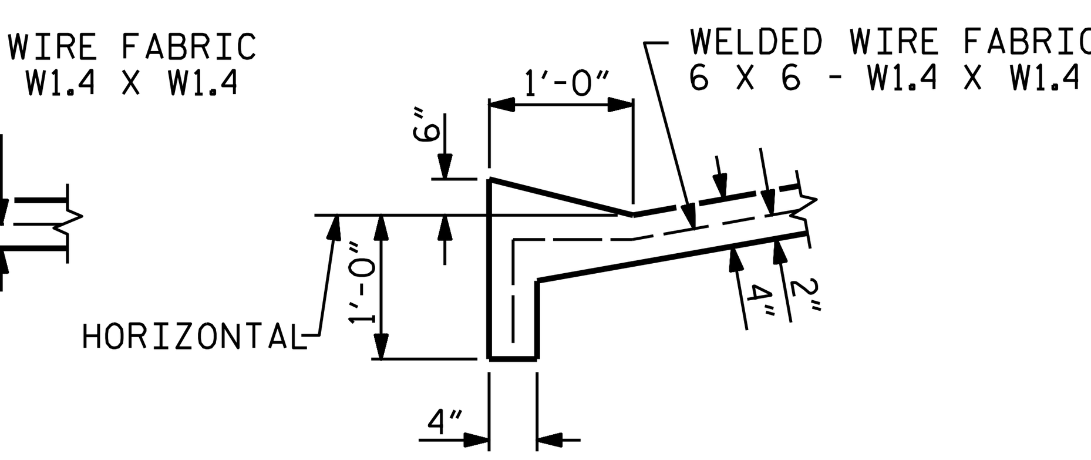


POUR A 4'-0'' STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL



SECTION A-A

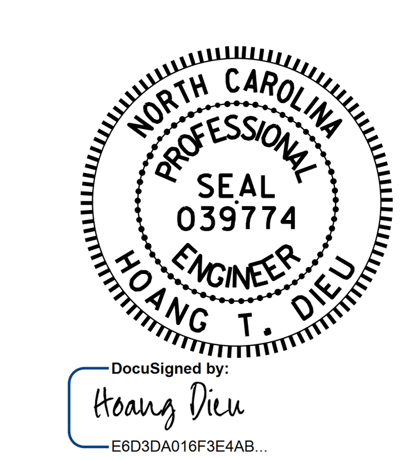


SECTION B-B

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS

ASSEMBLED BY : M. G. SHAIKH	DATE : 8/24
CHECKED BY : J. P. M.	DATE : 8/24

DRAWN BY : ELR 5/92	REV. 12/21/11	MAA/GM
CHECKED BY : GRP 6/92	REV. 1/16	MAA/TMG
	REV. 12/17	MAA/THC

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

SHEET NO. S-34

TOTAL SHEETS 36

10/24/2024
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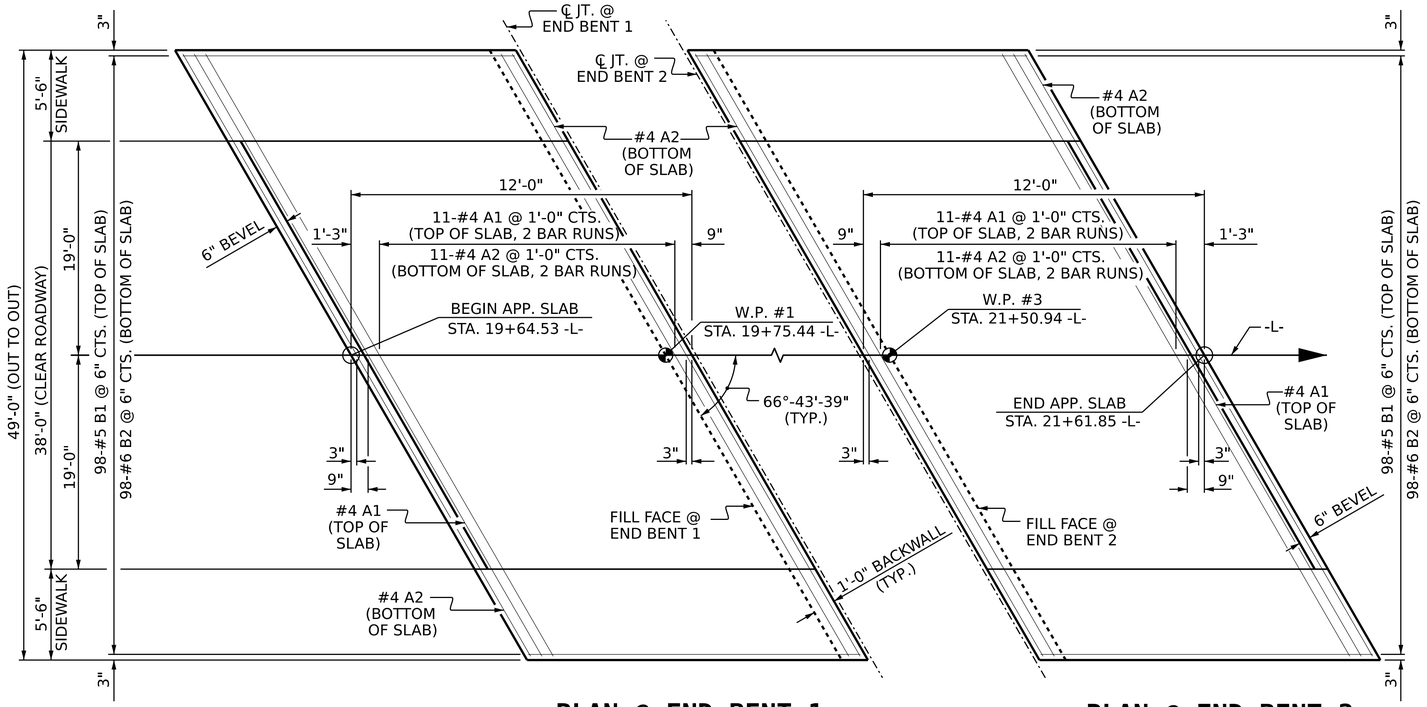
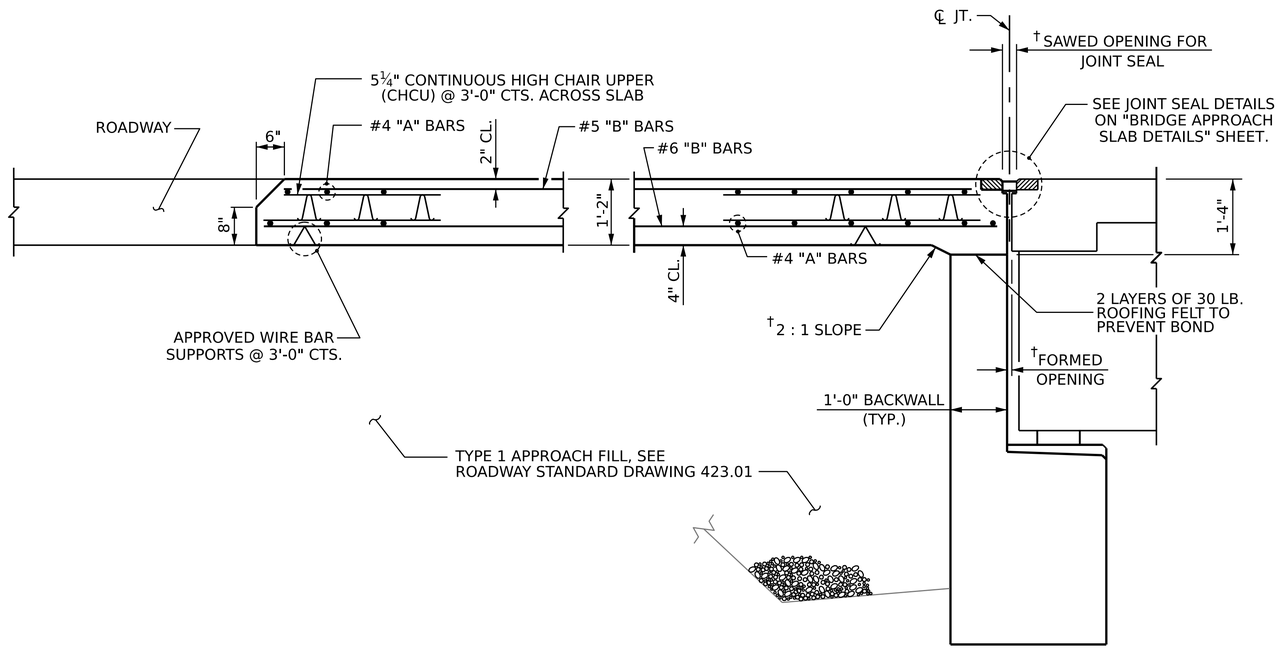
mgshaikh

STD. NO. SP1 (SHT 5)



PLAN @ END BENT 1 **PLAN @ END BENT 2**

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS
FOR SIDEWALK REINFORCING, SEE SHEET 2 OF 2.



SECTION THRU SLAB

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

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

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL OR PARAPET AND END POST.

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.

WITH FOAM JOINT SEAL

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

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

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

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

BILL OF MATERIAL

APPROACH SLAB AT END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	24	#4	STR	27'-6"	441
A2	26	#4	STR	27'-4"	475
✳B1	98	#5	STR	10'-8"	1090
B2	98	#6	STR	11'-8"	1717
REINFORCING STEEL				LBS.	2192
✳EPOXY COATED REINFORCING STEEL				LBS.	1531
CLASS AA CONCRETE				C.Y.	25.6

APPROACH SLAB AT END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	24	#4	STR	27'-6"	441
A2	26	#4	STR	27'-4"	475
✳B1	98	#5	STR	10'-8"	1090
B2	98	#6	STR	11'-8"	1717
REINFORCING STEEL				LBS.	2192
✳EPOXY COATED REINFORCING STEEL				LBS.	1531
CLASS AA CONCRETE				C.Y.	25.6

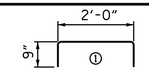
APPROACH SLAB 1 SIDEWALK

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	10	#4	STR	11'-7"	77
✳G1	24	#4	STR	5'-7"	90
✳U1	8	#4	1	3'-5"	18
✳EPOXY COATED REINFORCING STEEL				LBS.	185
CLASS AA CONCRETE				C.Y.	2.9

APPROACH SLAB 2 SIDEWALK

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	10	#4	STR	11'-7"	77
✳G1	24	#4	STR	5'-7"	90
✳U1	8	#4	1	3'-5"	18
✳EPOXY COATED REINFORCING STEEL				LBS.	185
CLASS AA CONCRETE				C.Y.	2.9

BAR TYPE



BAR DIMENSIUON IS OUT TO OUT

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+49.44 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu E603DA016F3E4AB...

10/25/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			36

ASSEMBLED BY :	M. G. SHAIKH	DATE :	8/24
CHECKED BY :	J. P. M.	DATE :	8/24
DRAWN BY : EEM	3/95	REV. 6/13	MAA/GM
CHECKED BY : VAP	3/95	REV. 12/17	MAA/THC
		REV. 06/19	BNB/THC

10/24/2024
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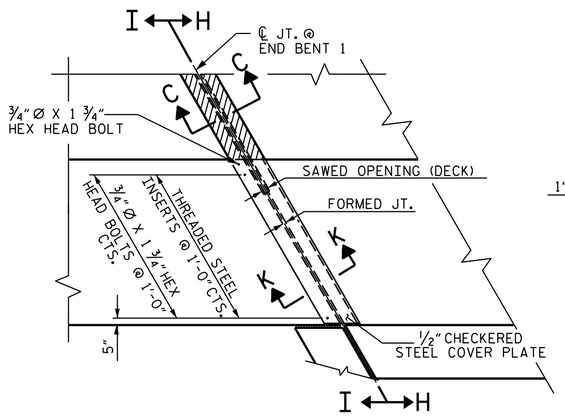
mgshaikh

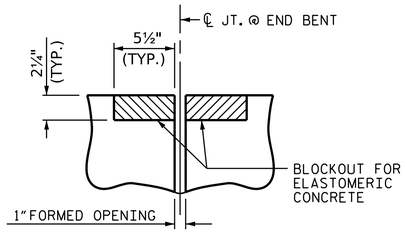
STD. NO. BAS1 (SHT 1a)



PLAN VIEW OF FOAM

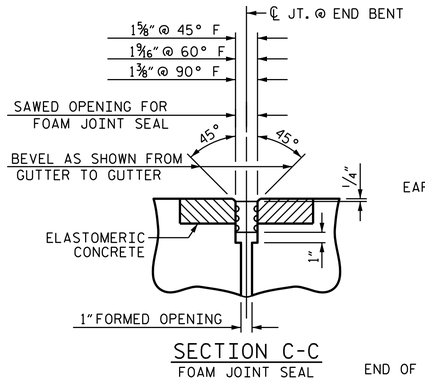
JOINT SEAL @ END BENT FOR SIDEWALK

(END BENT 1 SHOWN, END BENT 2 SIMILAR)



SECTION C-C

FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)

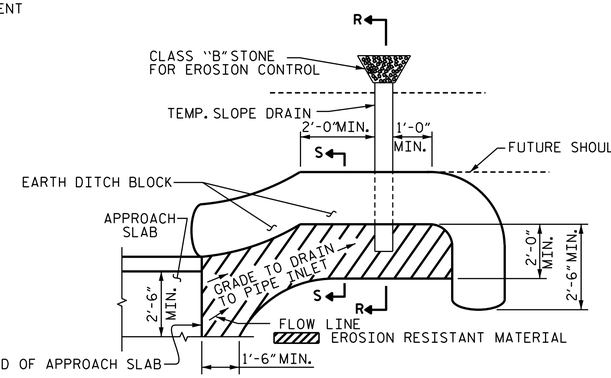


SECTION C-C

FOAM JOINT SEAL
(EXPANSION)

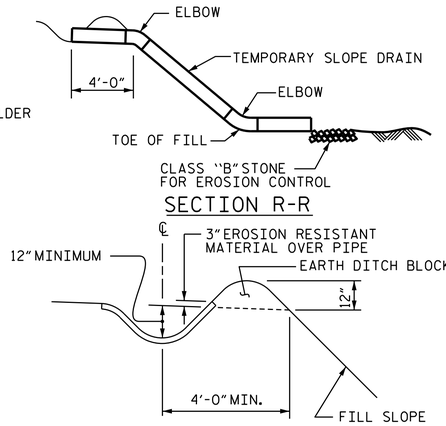
ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE *** (CU. FT.)
1	9.2
2	9.2
TOTAL	18.4

*** BASED ON THE MINIMUM BLOCKOUT SHOWN.

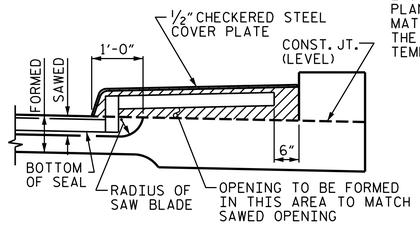


PLAN VIEW

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.



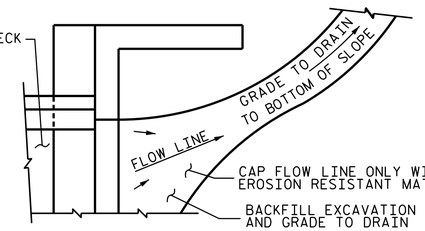
SECTION S-S



SECTION H-H

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

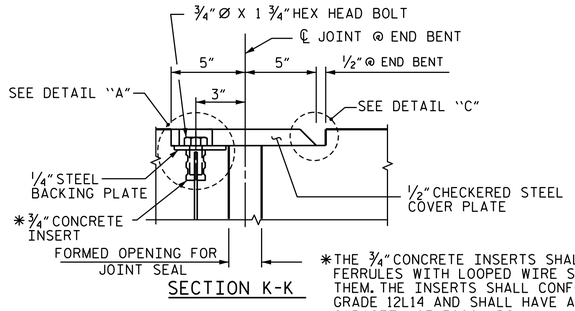
TEMPORARY DRAINAGE DETAIL

SECTION N-N

SECTION I-I

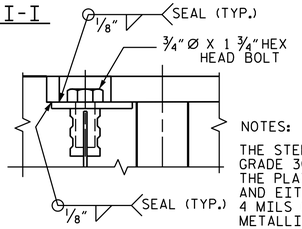
SIDEWALK DETAILS

PLAN



SECTION K-K

*THE ¾" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14 AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LBS.



DETAIL "A"

NOTES:

THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL. AFTER FABRICATION, THE PLATES SHALL BE COMMERCIALLY BLAST CLEANED AND EITHER COATED WITH A MINIMUM THICKNESS OF 4 MILS (DRY) OF ZINC-RICH PAINT, GALVANIZED OR METALLIZED TO A MINIMUM THICKNESS OF 6 MILS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE ¾" DIAMETER HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR "FOAM JOINT SEALS".

DETAIL "B" DETAIL "C"

JOINT SEAL DETAILS @ END BENT

DETAILS OF SIDEWALK ON APPROACH SLAB

(END BENT 1 SHOWN, END BENT 2 SIMILAR)
(FOR SIDEWALK NOTES SEE, SHEET S-11)

ASSEMBLED BY :	M. G. SHAIKH	DATE :	8/24
CHECKED BY :	J. P. M.	DATE :	8/24
DRAWN BY :	FCJ 11/88	REV. 6/13	MAA/GM
CHECKED BY :	ARB 11/88	REV. 12/17	MAA/THC
		REV. 5/18	MAA/THC

PROJECT NO. B-5372

CABARRUS COUNTY

STATION: 20+59.44 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DocuSigned by: Hoang Dieu
10/25/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

10/23/2024
S:\PEF\LSA Contracts\LSA Projects\B-5372- SMUPEF\B-5372 OBD\UPDATED SUPERSTRUCTURE PLANS\400_073_B-5372_SMU_ AS_0036_120109.dgn
mgshaikh

STD. NO. BAS4 (SHT 2a)

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	AASHTO (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE AASHTO
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 AASHTO
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 2024 "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" ∅ SHEAR STUDS FOR THE ¾" ∅ STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" ∅ STUDS FOR 4 - ¾" ∅ STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" ∅ STUDS ALONG THE BEAM AS SHOWN FOR ¾" ∅ STUDS BASED ON THE RATIO OF 3 - ⅞"∅ STUDS FOR 4 - ¾" ∅ 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" 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.