

+6.3697% Δ -6.6485%	+1.1221% Δ -0.6926%
PVI = 23+40.00 -L- EL. = 495.48 V.C. = 500.00 FT.	PVI = 18+83.00 -Y- EL. = 458.50 V.C. = 178.00 FT.
GRADE DATA -L-	GRADE DATA -Y-

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Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources

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User: blanning
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DRAWN BY: B.E. LANNING DATE: 06/19
CHECKED BY: P.A. de PAOLI DATE: 07/19
DESIGN ENGINEER OF RECORD: P.A. de PAOLI DATE: 10/20

PLAN
(PILES AND FOOTINGS NOT SHOWN FOR CLARITY)

TOTAL LENGTH OF BRIDGE = 202'-10"
(FILL FACE @ END BENT 1 TO FILL FACE @ END BENT 2)

⊙ DIMENSION TAKEN AT STA. 20+48.90 -RR-

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MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

8/1/2023
Morris Israelman

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON PROPOSED APEX PEAKWAY OVER SALEM STREET AND CSXRR BETWEEN TOWHEE DRIVE AND JAMES STREET

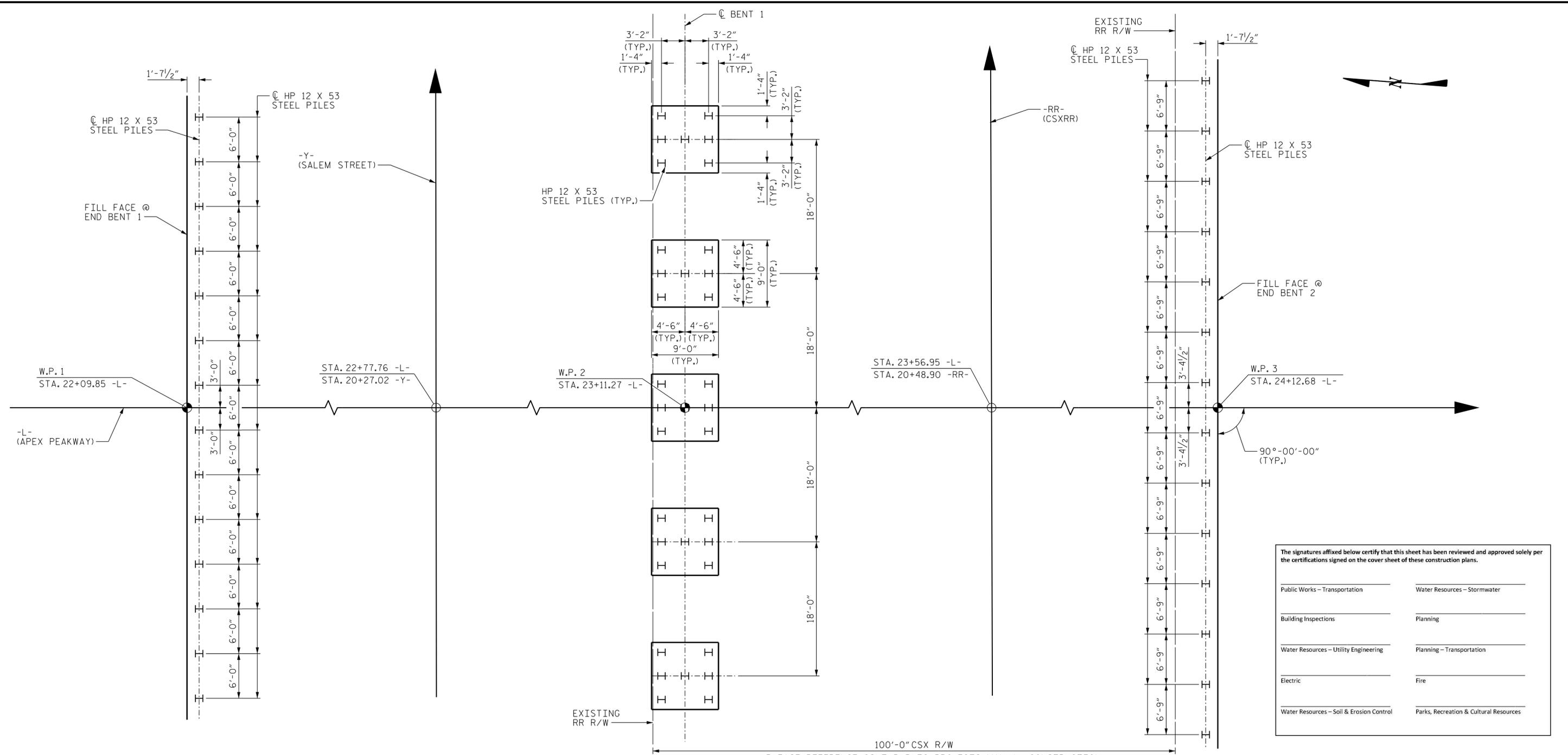
PROJECT NO. U-5928
WAKE COUNTY

STATION: 22+77.76 -L-
20+27.09 -Y-

SHEET 1 OF 4 BRIDGE NO. 539 MILE POST NO. S 172.4

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

SHEET NO. S-1
TOTAL SHEETS 50



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF CAP OR FOOTING.

PLEASE REFERENCE CSXT PUBLIC PROJECTS MANUAL, CONSTRUCTION SUBMISSION CRITERIA SECTION III HOISTING OPERATIONS FOR SUBMISSIONS REQUIRED WHEN THERE IS A POTENTIAL TO FOUL THE TRACK

NOTES

- FOR PILES, SEE SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.
- DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE.
- PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.
- DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 180 TONS PER PILE.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 1, END BENT 2 AND BENT 1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 40-50 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT 1, END BENT 2 AND BENT 1. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILES USING DYNAMIC PILE TESTING EQUIPMENT DURING DRIVING IS REQUIRED AT END BENT 1 OR END BENT 2. FOR DYNAMIC PILE TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS AND FOR PILE DRIVING CRITERIA, SEE PILE DRIVING CRITERIA PROVISION.

TESTING THE FIRST PRODUCTION PILES USING DYNAMIC PILE TESTING EQUIPMENT DURING DRIVING IS REQUIRED AT BENT 1. FOR DYNAMIC PILE TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS AND FOR PILE DRIVING CRITERIA, SEE PILE DRIVING CRITERIA PROVISION.

DYNAMIC PILE TESTING SHOULD BE PERFORMED ON THE FIRST PRODUCTION PILE DRIVEN AT THE SPECIFIED END BENT AND THE INTERIOR BENT. THE DYNAMIC PILE TESTING PILE SHOULD BE DRIVEN TO ACHIEVE THE REQUIRED DRIVING RESISTANCE FOR THE SPECIFIED END BENT. DRIVE CRITERIA SHOULD BE PROVIDED BASED ON THE DYNAMIC PILE TESTING AND ALL REMAINING PRODUCTION PILES SHOULD BE DRIVEN TO THE REQUIRED DRIVING RESISTANCE.

AVERAGE ESTIMATED PILE LENGTHS BASED ON STATIC ANALYSIS USING NCDOT LRFD DRIVEN PILE FOUNDATION DESIGN POLICY AND USING A RESISTANCE FACTOR OF 0.65. ESTIMATED PILE LENGTHS INCLUDE 2 FEET FOR CAP EMBEDMENT.

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Public Works – Transportation	Water Resources – Stormwater
Building Inspections	Planning
Water Resources – Utility Engineering	Planning – Transportation
Electric	Fire
Water Resources – Soil & Erosion Control	Parks, Recreation & Cultural Resources

PROJECT NO. U-5928
 WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 2 OF 4



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MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

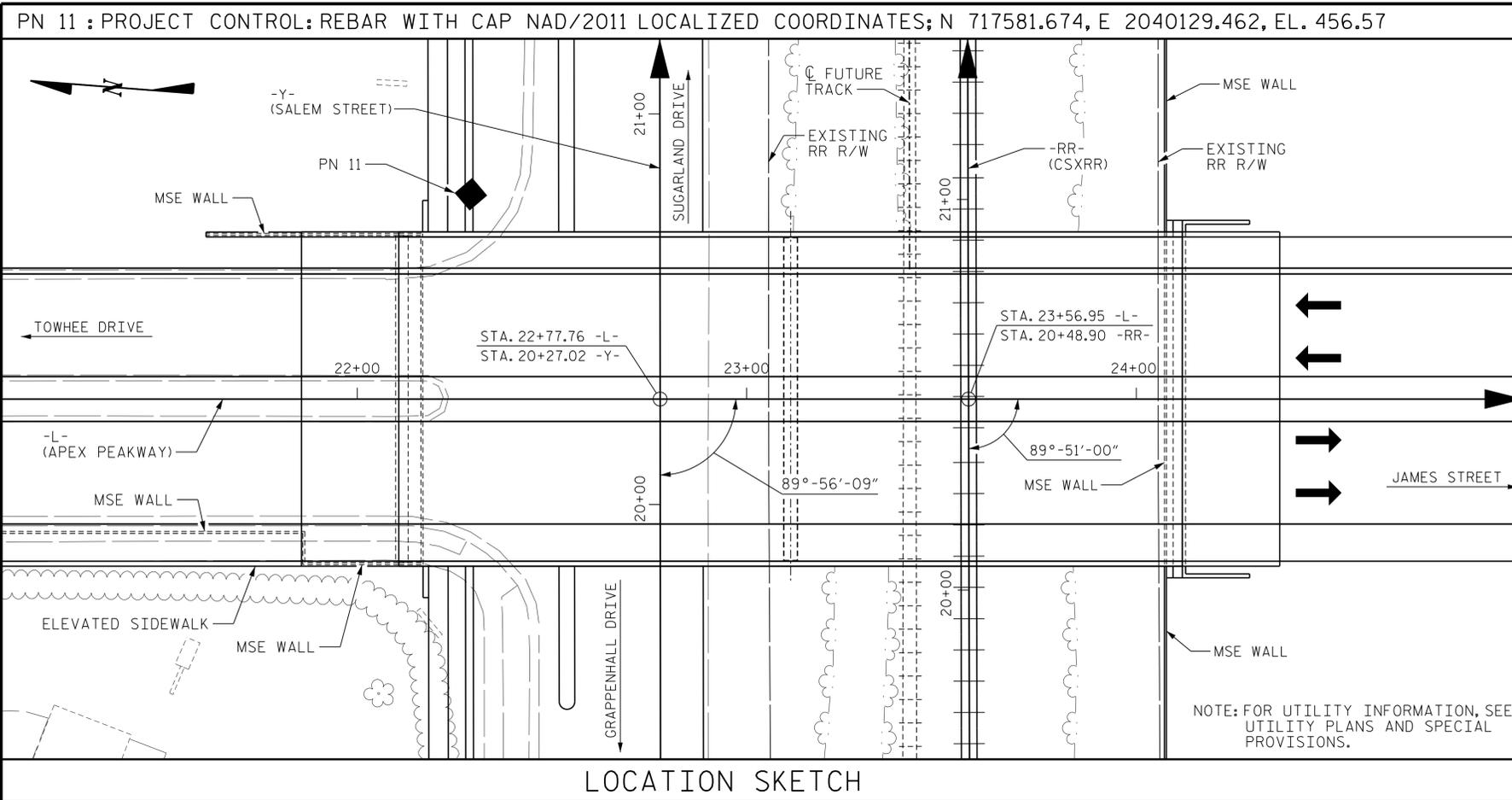
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOR BRIDGE ON PROPOSED
 APEX PEAKWAY OVER
 SALEM STREET AND CSXRR BETWEEN
 TOWHEE DRIVE AND JAMES STREET

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			50

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LOCATION SKETCH

TOTAL BILL OF MATERIAL

	DYNAMIC PILE TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	STEEL PILE POINTS	CONCRETE BARRIER RAIL	104" CHAIN LINK FENCE	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	48" METAL HAND RAIL	12" METAL HAND RAIL	MOMENT SLAB WITH ELEVATED SIDEWALK		
	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LIN. FT.	EACH	NO.	LIN. FT.	EACH	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	
SUPERSTRUCTURE		17,342	11,868					2,001.66				502.33	397.00							
END BENT 1	1			44.7	LUMP SUM	6,383			14	14	700.0	14			19					
BENT 1	1			146.7		22,992	2,783		35	35	875.0	35								
END BENT 2				60.7	LUMP SUM	10,061			14	14	770.0	14			7					
TOTAL	2	17,342	11,868	252.1	LUMP SUM	39,436	2,783	2,001.66	63	63	2,345.0	63	502.33	397.00	26	LUMP SUM	914.00	703.41	210.0	

PROJECT NO. U-5928
WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 3 OF 4

The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed on the cover sheet of these construction plans.

Public Works - Transportation _____
 Building Inspections _____
 Water Resources - Utility Engineering _____
 Electric _____
 Water Resources - Soil & Erosion Control _____

Water Resources - Stormwater _____
 Planning _____
 Planning - Transportation _____
 Fire _____
 Parks, Recreation & Cultural Resources _____



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MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

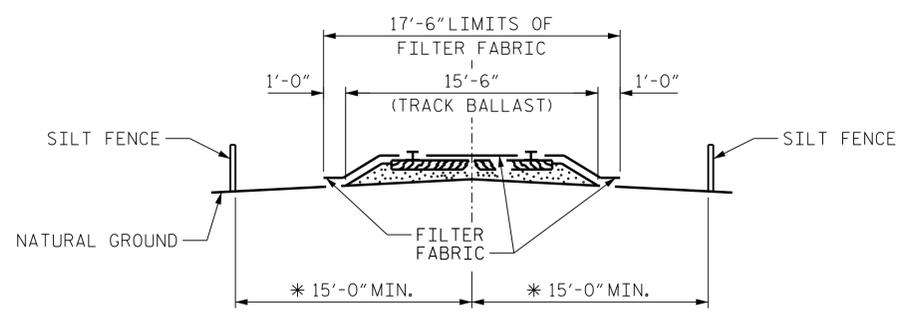
GENERAL DRAWING

FOR BRIDGE ON PROPOSED APEX PEAKWAY OVER SALEM STREET AND CSXRR BETWEEN TOWHEE DRIVE AND JAMES STREET

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			50

DRAWN BY: B.E. LANNING DATE: 06/19
 CHECKED BY: M. ISRAELNAIM DATE: 02/24
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RAILROAD EROSION CONTROL DETAIL

* TO BE DETERMINED BY THE RESIDENT ENGINEER IN CONSULTATION WITH THE RAILROAD ENGINEER.

NOTES

RAILROAD EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO PERFORMING ANY WORK IN THE RAILROAD RIGHT-OF-WAY.

ADDITIONAL EROSION CONTROL MEASURES FOR PROTECTION OF RAILROAD DITCHES MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.

NO SEPARATE PAYMENT WILL BE MADE FOR RAILROAD EROSION CONTROL MEASURES.

LIMITS OF SILT FENCE AND FILTER FABRIC PARALLEL TO RAILROAD SHALL EXTEND A MINIMUM OF 25'-0" OUTSIDE EDGE OF SUPERSTRUCTURE OR TOE OF SLOPE ON CONSTRUCTION. A GREATER LENGTH OF SILT FENCE OR FILTER FABRIC MAY BE REQUIRED IF SO DIRECTED BY THE ENGINEER.

FILTER FABRIC TO BE NAILED TO TIMBER RAIL TIES WITH PRIME SOURCE "GRIP CAP" OR EQUIVALENT. FILTER FABRIC ON SHOULDER TO BE SECURED AS DIRECTED BY THE ENGINEER AND RAILROAD.

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 EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF THE 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.

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

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 FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

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

THE RAILROAD TRACK TOP OF RAIL ELEVATIONS SHOWN ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS AND REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

FOR MSE RETAINING WALLS, SEE GEOTECHNICAL SPECIAL PROVISIONS.

ANY SOIL THAT IS EXCAVATED WITHIN CSXT RIGHT-OF-WAY SHALL NOT BE REMOVED FROM THE PROPERTY. ANY EXCESS SOIL THAT IS NOT RE-USED WITHIN THE CSXT RIGHT-OF-WAY SHALL BE TESTED BY CSXT AND DISPOSED OF AT A CSXT APPROVED FACILITY. CSXT WILL NOT BEAR ANY COSTS RELATED TO DISPOSAL OF EXCESS SOILS GENERATED BY THIS PROJECT. THE CONTRACTOR SHALL NOT TEST ANY SOIL OR WATER WITHIN CSXT RIGHT-OF-WAY. ANY REQUIRED TESTING SHALL BE PERFORMED BY CSXT.

IF SHORING WILL IMPACT THE THEORETICAL RR EMBANKMENT LINE, THE CONTRACTOR SHALL SUBMIT ITS SHORING PLAN TO CSX FOR REVIEW.

FOR MOMENT SLAB WITH ELEVATED SIDEWALK, SEE SPECIAL PROVISIONS.

PROJECT NO. U-5928
WAKE COUNTY
STATION: 22+77.76 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON PROPOSED
APEX PEAKWAY OVER
SALEM STREET AND CSXRR BETWEEN
TOWHEE DRIVE AND JAMES STREET

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MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			50

DRAWN BY : B.E. LANNING DATE : 06/19
 CHECKED BY : P.A. de PAOLI DATE : 07/19
 DESIGN ENGINEER OF RECORD : P.A. de PAOLI DATE : 10/20

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W 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)	--	1	1.47	--	1.75	0.708	2.23	A	I	39.5	0.876	1.47	A	I	78.9	0.80	0.708	1.95	A	I	39.5		
	HL-93 (OPERATING)	--		1.93	--	1.35	0.708	2.88	A	I	39.5	0.876	1.93	A	I	78.9	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.00	2	2.04	73.44	1.75	0.708	3.06	A	I	39.5	0.876	2.04	A	I	78.9	0.80	0.708	2.40	A	I	39.5		
	HS-20 (OPERATING)	36.00		2.68	96.48	1.35	0.708	3.97	A	I	39.5	0.876	2.68	A	I	78.9	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.50		6.30	85.05	1.40	0.708	9.01	A	I	39.5	0.876	6.82	A	I	78.9	0.80	0.708	6.30	A	I	39.5	
		SNGARBS2	20.00		4.56	91.20	1.40	0.708	6.52	A	I	39.5	0.876	4.75	A	I	78.9	0.80	0.708	4.56	A	I	39.5	
		SNAGRIS2	22.00		4.26	93.72	1.40	0.708	6.09	A	I	39.5	0.876	4.37	A	I	78.9	0.80	0.708	4.26	A	I	39.5	
		SNCOTTS3	27.25		3.13	85.29	1.40	0.708	4.48	A	I	39.5	0.876	3.29	A	I	78.9	0.80	0.708	3.13	A	I	39.5	
		SNAGGRS4	34.93		2.56	89.41	1.40	0.708	3.68	A	I	39.5	0.876	2.56	A	I	78.9	0.80	0.708	2.58	A	I	39.5	
		SNS5A	35.55		2.54	90.30	1.40	0.708	3.64	A	I	39.5	0.876	2.57	A	I	78.9	0.80	0.708	2.54	A	I	39.5	
		SNS6A	39.95		2.31	92.28	1.40	0.708	3.30	A	I	39.5	0.876	2.32	A	I	78.9	0.80	0.708	2.31	A	I	39.5	
	SNS7B	42.00		2.20	92.40	1.40	0.708	3.15	A	I	39.5	0.876	2.20	A	I	78.9	0.80	0.708	2.20	A	I	39.5		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.00		2.76	91.08	1.40	0.708	4.05	A	I	39.5	0.876	2.76	A	I	78.9	0.80	0.708	2.83	A	I	39.5	
		TNT4A	33.08		2.81	92.94	1.40	0.708	4.01	A	I	39.5	0.876	2.89	A	I	78.9	0.80	0.708	2.81	A	I	39.5	
		TNT6A	41.60		2.28	94.85	1.40	0.708	3.27	A	I	39.5	0.876	2.31	A	I	78.9	0.80	0.708	2.28	A	I	39.5	
		TNT7A	42.00		2.29	96.18	1.40	0.708	3.27	A	I	39.5	0.876	2.33	A	I	78.9	0.80	0.708	2.29	A	I	39.5	
		TNT7B	42.00		2.22	93.24	1.40	0.708	3.31	A	I	39.5	0.876	2.22	A	I	78.9	0.80	0.708	2.31	A	I	39.5	
		TNAGRIT4	43.00		2.18	93.74	1.40	0.708	3.20	A	I	39.5	0.876	2.18	A	I	78.9	0.80	0.708	2.24	A	I	39.5	
TNAGT5A		45.00		2.08	93.60	1.40	0.708	3.05	A	I	39.5	0.876	2.08	A	I	78.9	0.80	0.708	2.13	A	I	39.5		
TNAGT5B	45.00		2.07	93.15	1.40	0.708	3.01	A	I	39.5	0.876	2.07	A	I	78.9	0.80	0.708	2.10	A	I	39.5			
EMERGENCY VEHICLE (EV)	EV2	28.75		3.21	92.29	1.30	0.708	4.94	A	I	39.5	0.876	3.50	A	I	78.9	0.80	0.708	3.21	A	I	39.5		
	EV3	43	4	2.13	91.59	1.30	0.708	3.29	A	I	39.5	0.876	2.21	A	I	69.1	0.80	0.708	2.13	A	I	39.5		

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. GIRDERS 2 AND 9 CONTROL THE RATING.
2. BARRIER LOADS DISTRIBUTED ACCORDING TO NCDOT DESIGN MANUAL SECTION 2.1.2.1.
3. GIRDERS ASSUMED TO ACT CONTINUOUSLY UNDER COMPOSITE AND LIVE LOADING.
4. RATING INCLUDES PEDESTRIAN LOAD APPLIED TO SIDEWALKS.

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

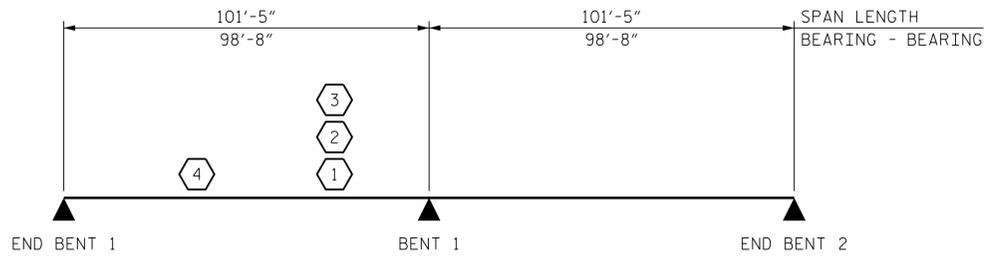
3 LEGAL LOAD RATING **

4 EMERGENCY LEGAL LOAD RATING ***

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



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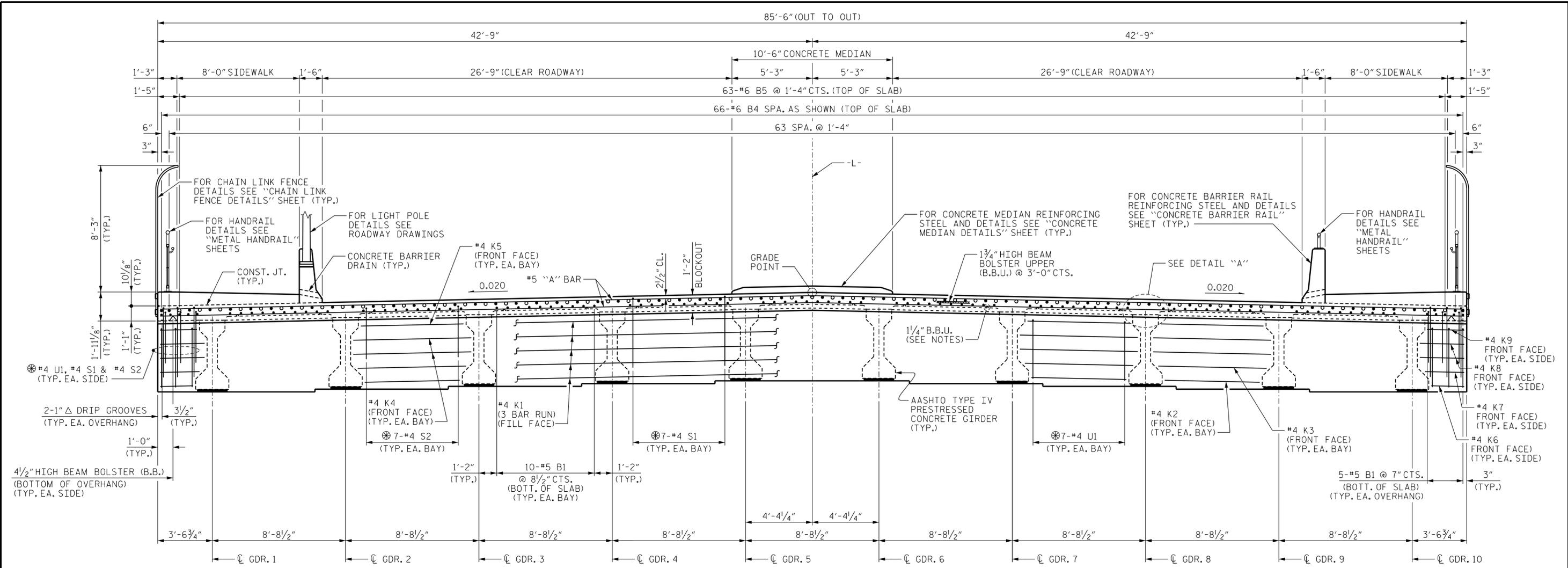
PROJECT NO. U-5928
WAKE COUNTY
STATION: 22+77.76 -L-

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			
2			4			TOTAL SHEETS 50

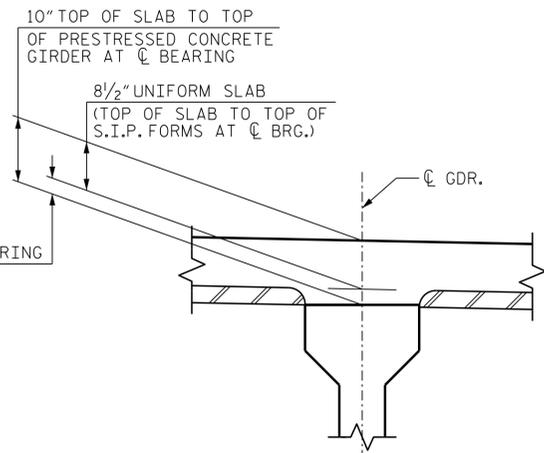
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 Filename: N:\NC Bridges\MI7002 Apex Peakway Bridge\U5928\Structures\401_009_U5928_SML_LRFR1_005.dgn

ASSEMBLED BY : B.E. LANNING	DATE: 05/19
CHECKED BY : M. ISRAELNAIM	DATE: 02/24
DESIGN ENGINEER OF RECORD: M. ISRAELNAIM	DATE: 02/24
DRAWN BY : MAA 1/08	REV. 11/2/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 04/23 BNB/AAI



TYPICAL SECTION AT INTEGRAL END BENT

⊗ #4 S1, #4 S2 AND #4 U1 BARS TO MATCH WITH #4 'V' BARS IN INTEGRAL END BENT CAP.



DETAIL "A"

◇ BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS.

NOTES

- PROVIDE 1/4" 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 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
- LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
- PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
- BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
- ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED.
- FOR DETAILS OF SIGNAL CONDUIT, SEE SIGNAL COMMUNICATIONS PLANS.

The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed on the cover sheet of these construction plans.

Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources

PROJECT NO. U-5928
 WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 1 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION
 AND DETAILS

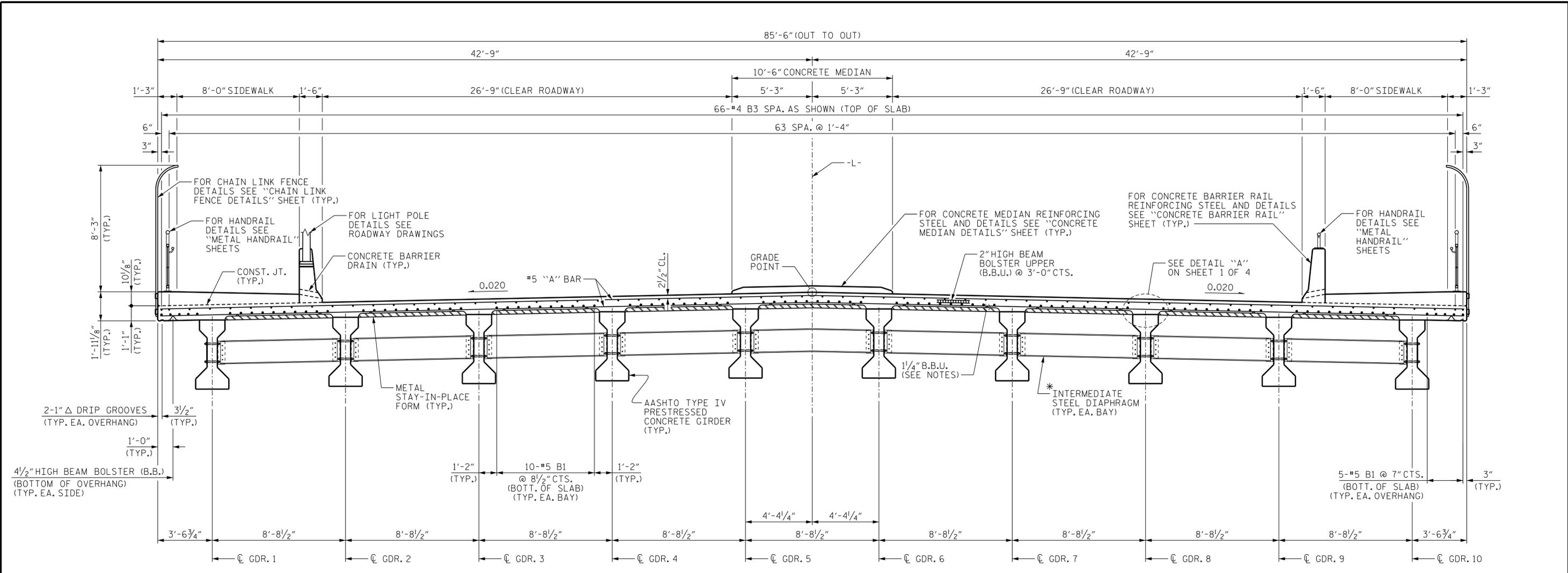
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 (919) 851-6606
 FIRM PE NUMBER: P-0671

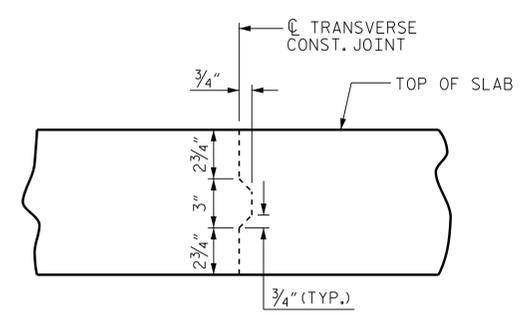
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TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

NOTES
 FOR ADDITIONAL NOTES, SEE SHEET 1 OF 4.
 *FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGM FOR TYPE IV PRESTRESSED CONCRETE GIRDERS" SHEET.

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Public Works - Transportation	Water Resources - Stormwater
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Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources

PROJECT NO. U-5928
WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 2 OF 4



STATE OF NORTH CAROLINA
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 TYPICAL SECTION
 AND DETAILS

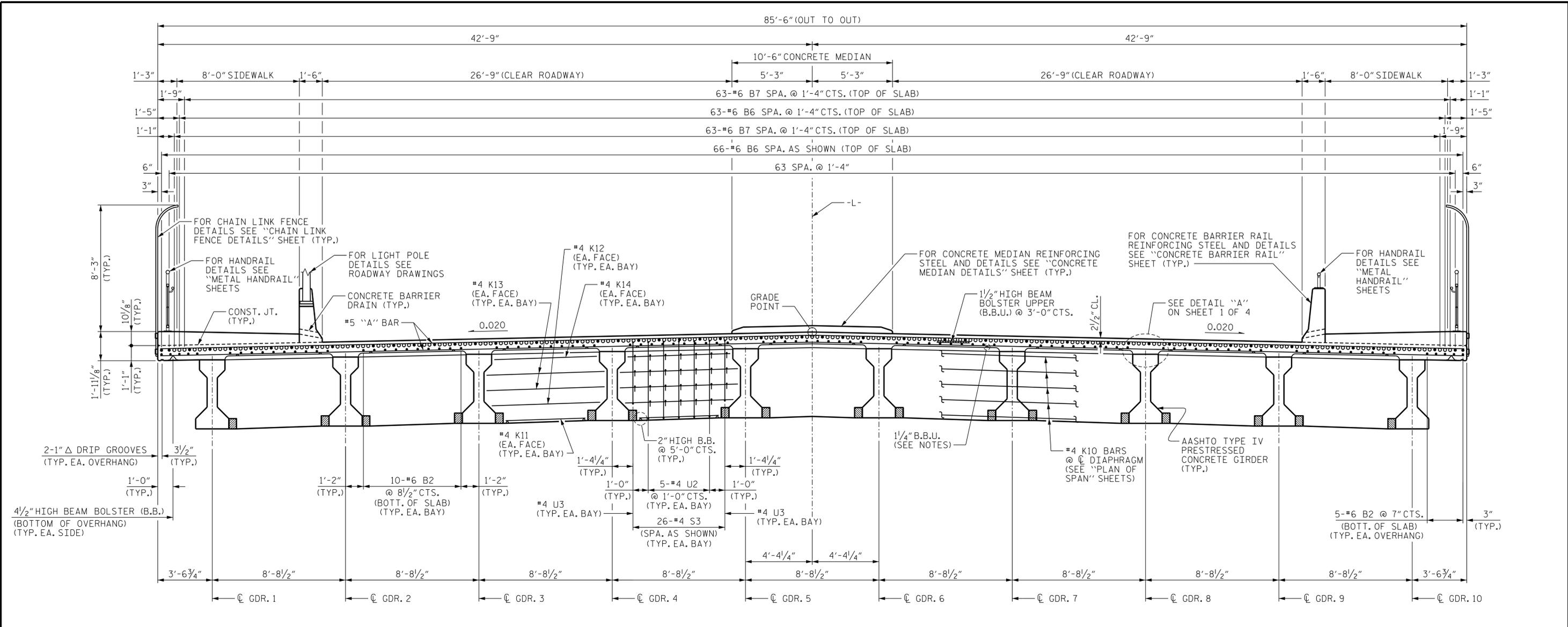
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TYPICAL SECTION AT BENT DIAPHRAGM
FOR NOTES, SEE SHEET 1 OF 4

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Electric	Fire
Water Resources – Soil & Erosion Control	Parks, Recreation & Cultural Resources

PROJECT NO. U-5928
WAKE COUNTY
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SHEET 3 OF 4
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 TYPICAL SECTION
 AND DETAILS



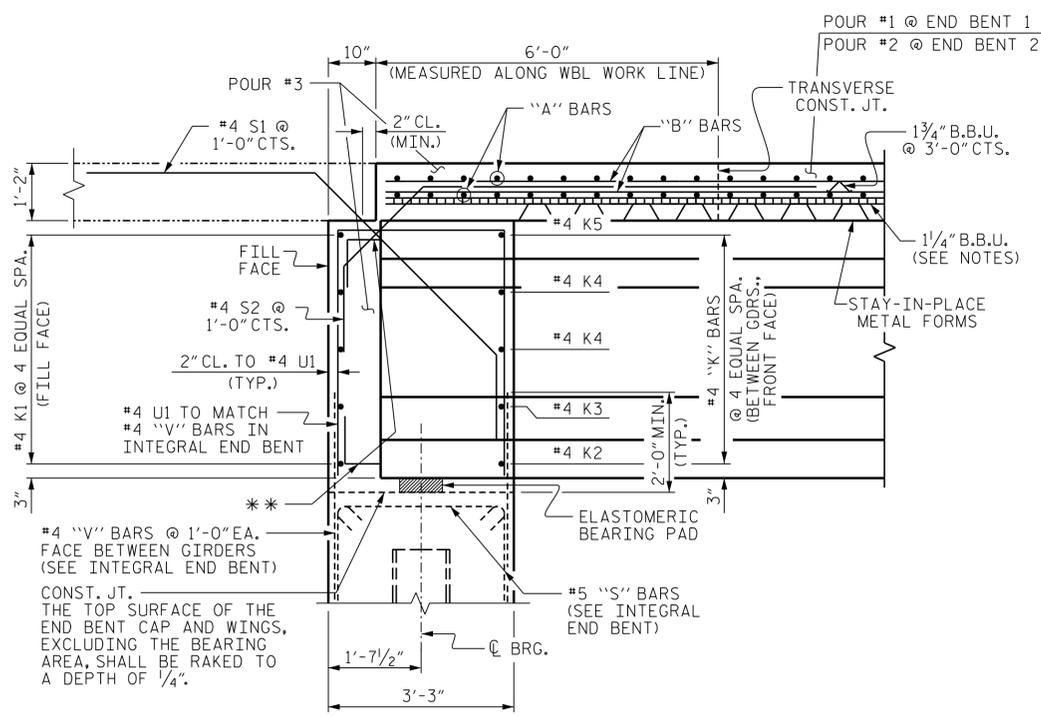
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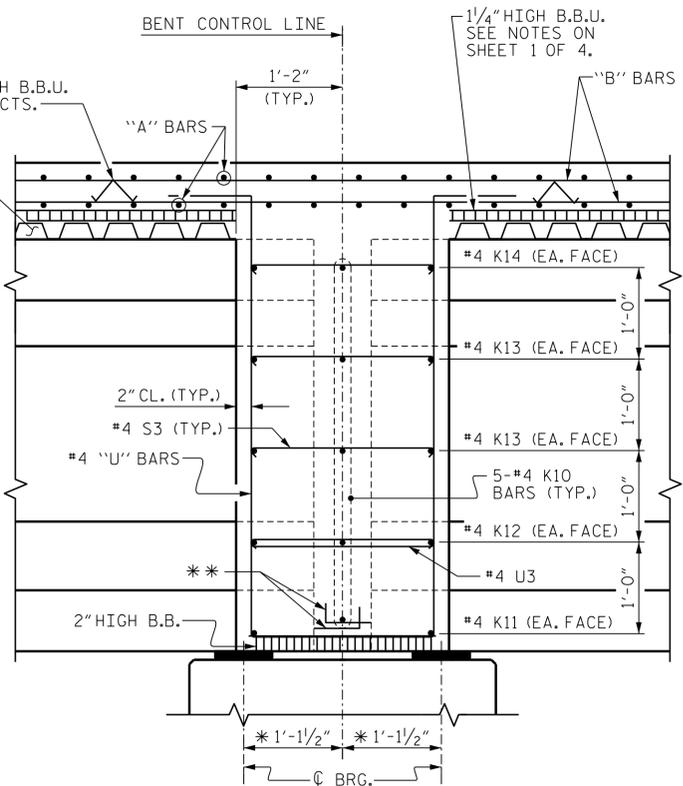
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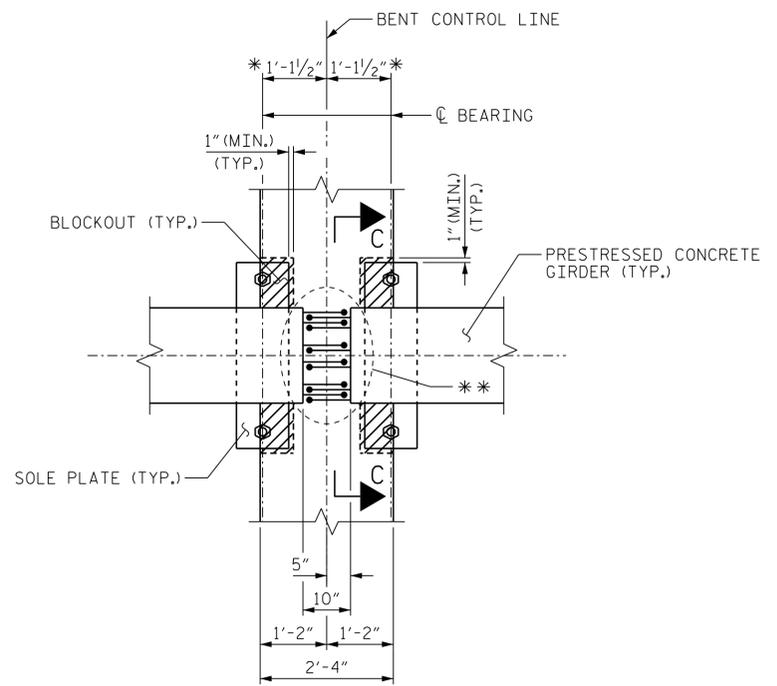
SECTION A-A

** #5 "S" BARS (TYP.)
(SEE GIRDER SHEETS)

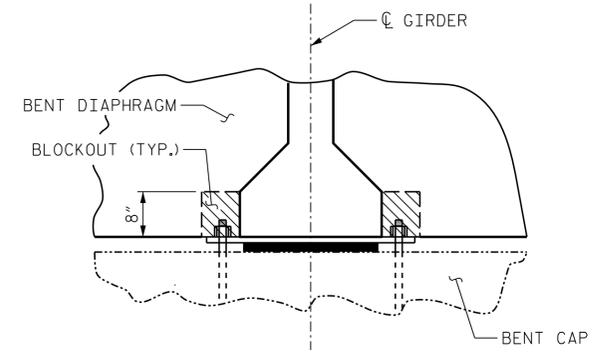


SECTION B-B

* MEASURED ALONG CL GIRDER

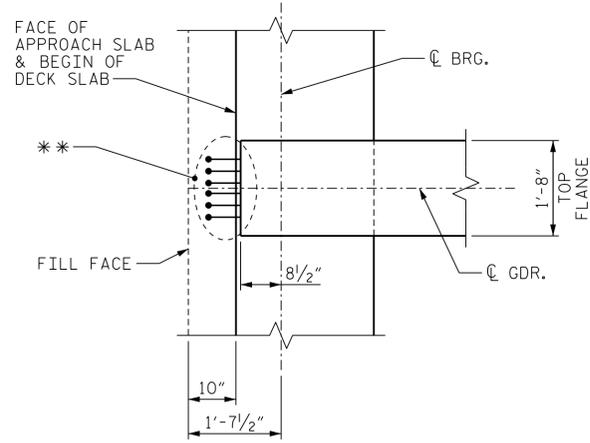


PLAN

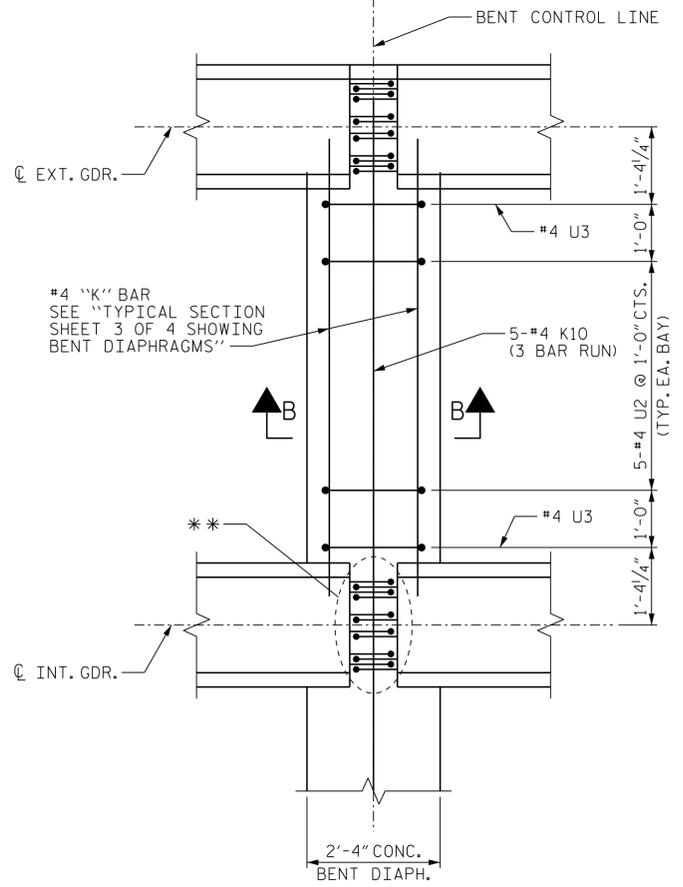


SECTION C-C

BENT DIAPHRAGM BLOCK-OUT DETAIL



PLAN OF GIRDER
AT INTEGRAL END BENT
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



PLAN OF BENT DIAPHRAGM

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Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources

PROJECT NO. U-5928
WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 4 OF 4



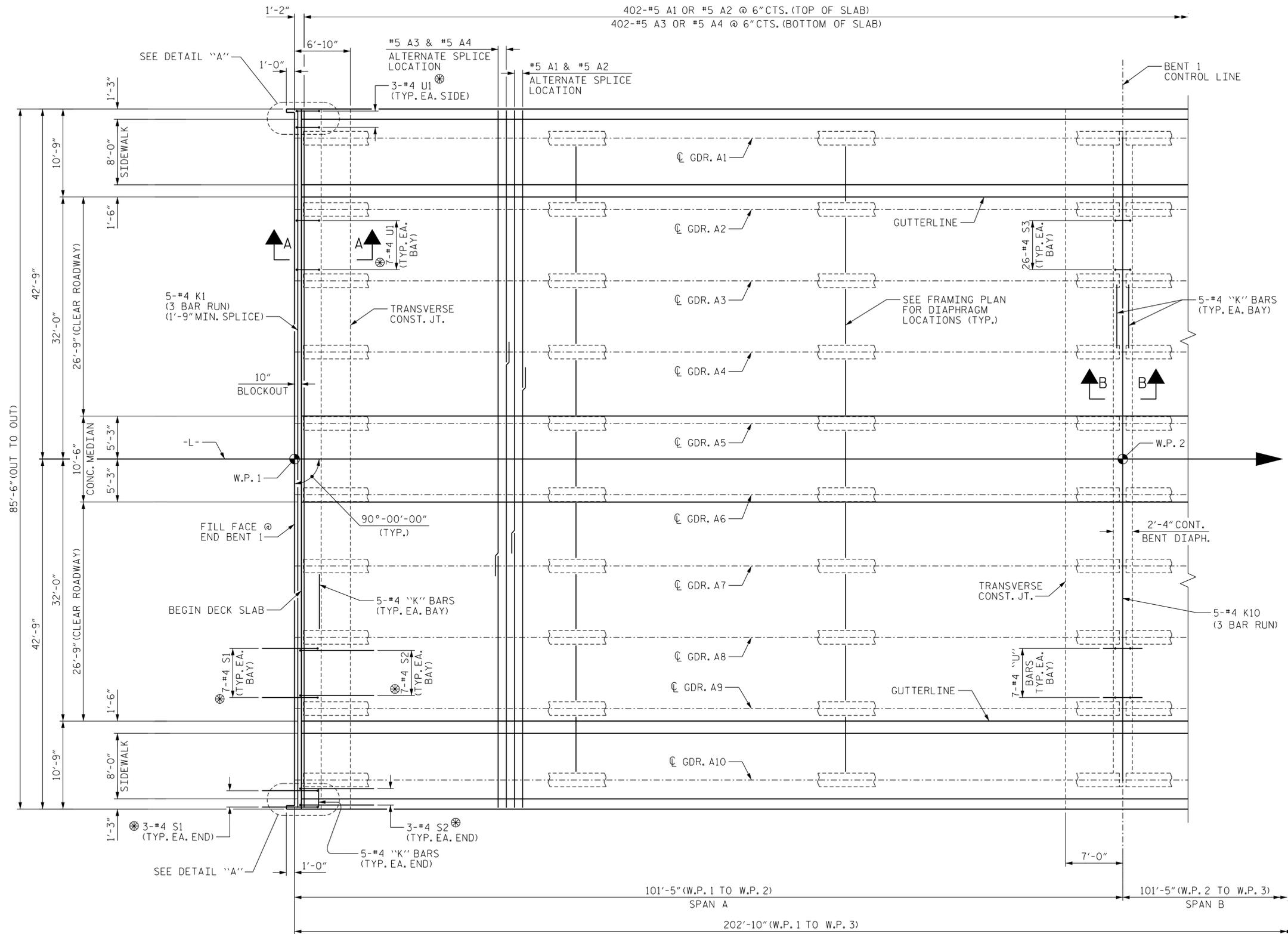
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REVISIONS					
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1			3		
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SHEET NO. S-9					TOTAL SHEETS 50

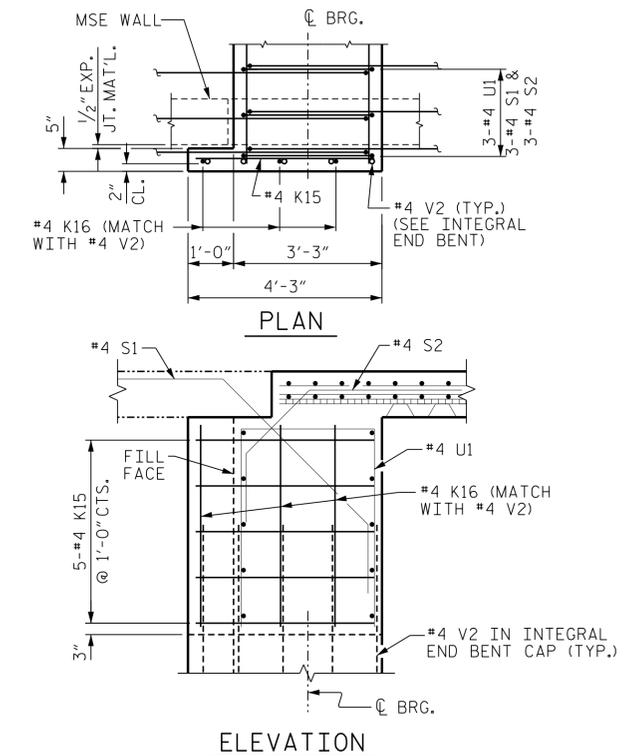
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NOTES:

- FOR REINFORCING STEEL IN BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.
- FOR REINFORCING STEEL IN CONCRETE MEDIAN AND SIDEWALK, SEE "CONCRETE MEDIAN AND SIDEWALK DETAILS" SHEET.
- FOR SECTION VIEWS, SEE "SUPERSTRUCTURE TYPICAL SECTION AND DETAILS" SHEETS.
- FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "SUPERSTRUCTURE FRAMING PLAN" SHEET.
- FOR TOP AND BOTTOM "B" BARS NOT SHOWN, SEE SHEET 3 OF 3.
- #4 S1, #4 S2 & #4 U1 TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP.
- FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "SUPERSTRUCTURE TYPICAL SECTION AND DETAILS" SHEET 2 OF 4.
- FOR POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.



DETAIL "A"

(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)

PROJECT NO. U-5928
WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 1 OF 3

PLAN OF SPAN A

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Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources



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 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 PLAN OF SPANS
 SPAN A**

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

SHEET NO. **S-10**
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NOTES:

FOR REINFORCING STEEL IN BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR REINFORCING STEEL IN CONCRETE MEDIAN AND SIDEWALK, SEE "CONCRETE MEDIAN AND SIDEWALK DETAILS" SHEET.

FOR SECTION VIEWS, SEE "SUPERSTRUCTURE TYPICAL SECTION AND DETAILS" SHEETS.

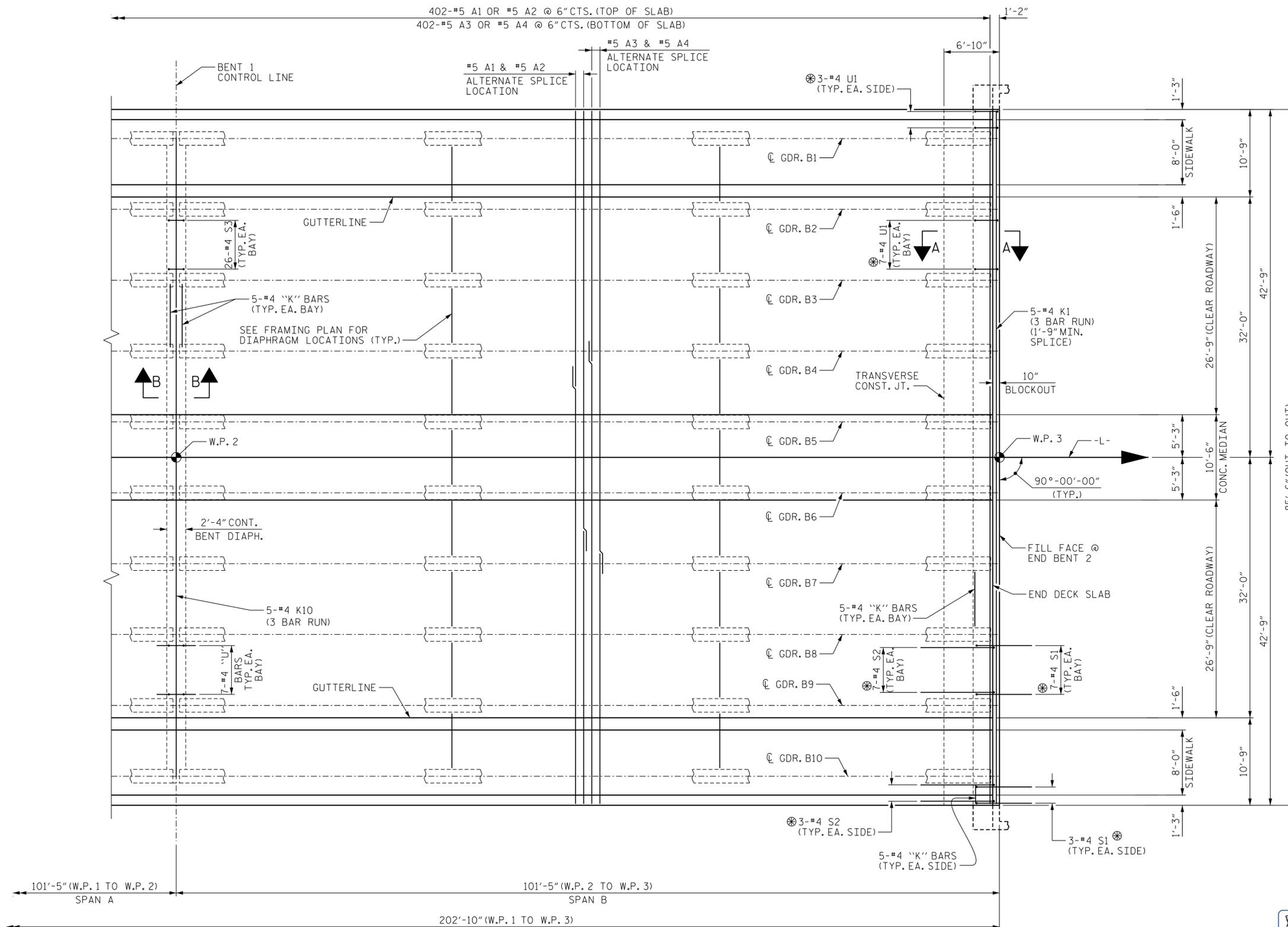
FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "SUPERSTRUCTURE FRAMING PLAN" SHEET.

FOR TOP AND BOTTOM "B" BARS NOT SHOWN, SEE SHEET 3 OF 3.

⊗ #4 S1, #4 S2 & #4 U1 TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP.

FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "SUPERSTRUCTURE TYPICAL SECTION AND DETAILS" SHEET 2 OF 4.

FOR POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.



PLAN OF SPAN B

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Public Works – Transportation	Water Resources – Stormwater
Building Inspections	Planning
Water Resources – Utility Engineering	Planning – Transportation
Electric	Fire
Water Resources – Soil & Erosion Control	Parks, Recreation & Cultural Resources

PROJECT NO. U-5928
WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 2 OF 3



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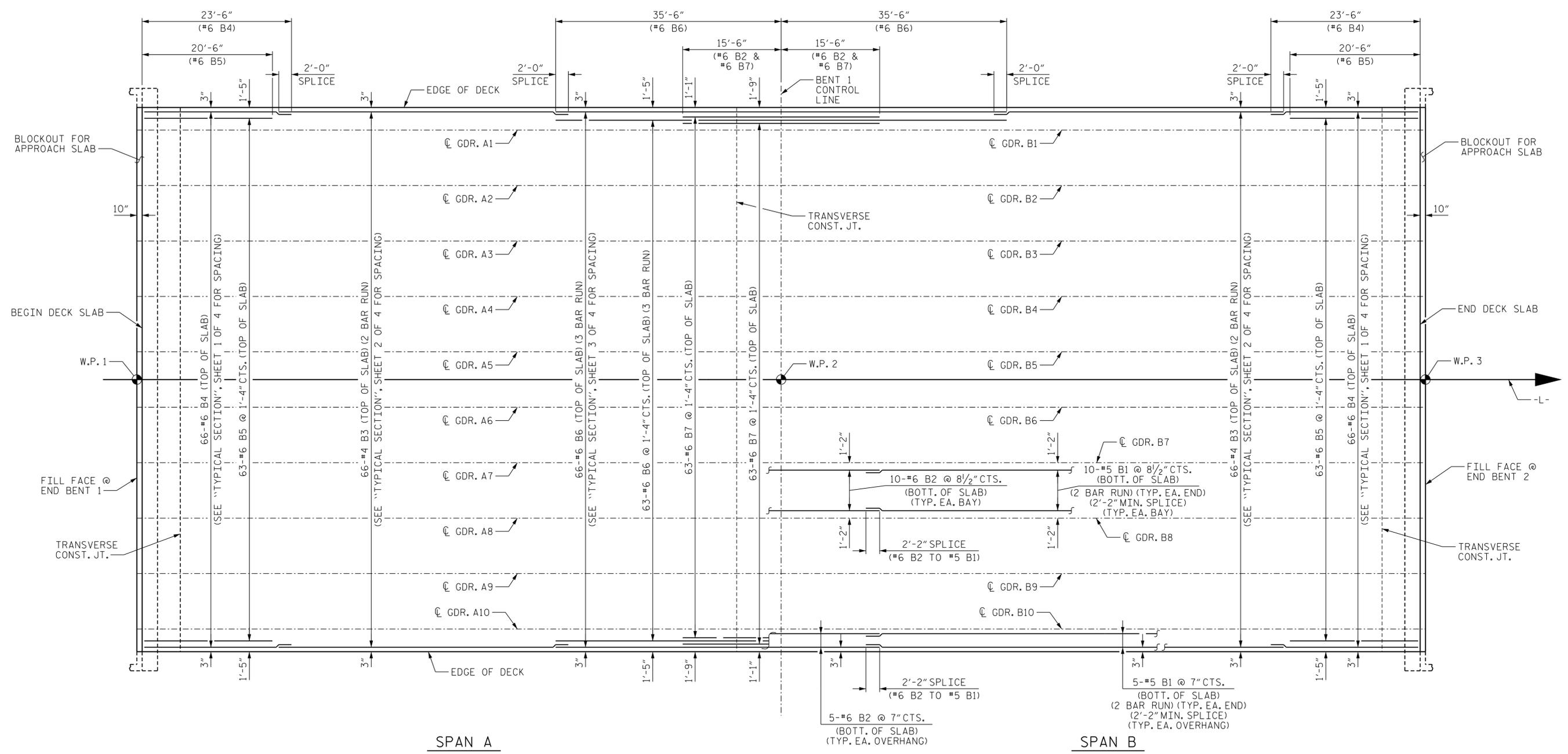
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SUPERSTRUCTURE PLAN OF SPANS SPAN B					
REVISIONS					
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SHEET NO. S-11					TOTAL SHEETS 50

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PLAN - "B" BAR LAYOUT

NOTES
SEE "TYPICAL SECTION AND DETAILS" SHEETS FOR TRANSVERSE BAR SPACING.
GUTTERLINE NOT SHOWN FOR CLARITY.

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Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources

PROJECT NO. U-5928
WAKE COUNTY
STATION: 22+77.76 -L-
SHEET 3 OF 3



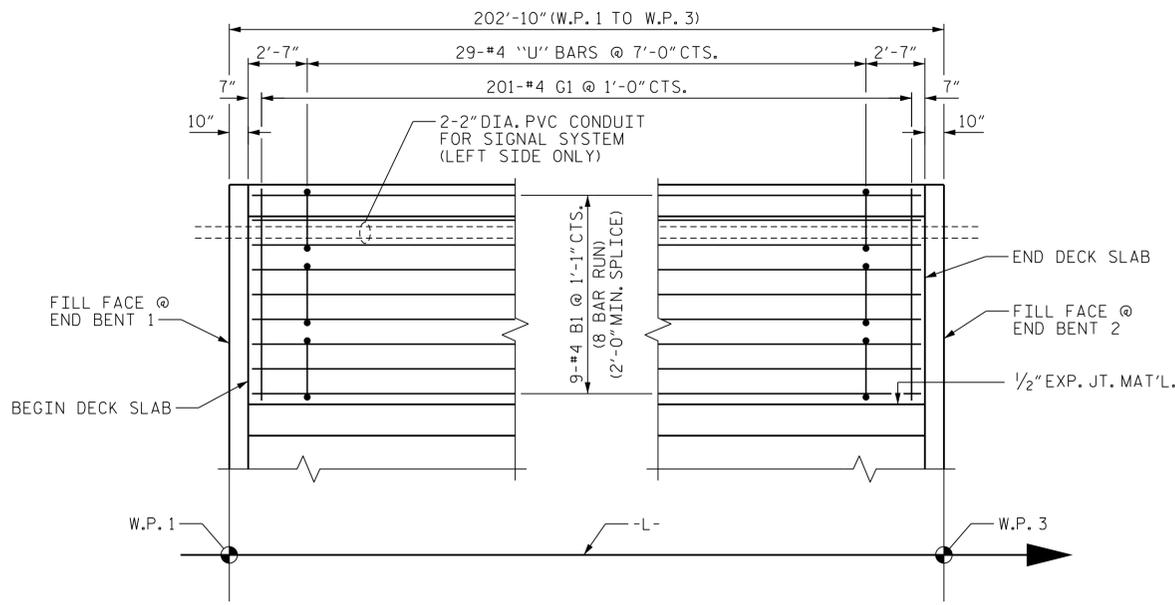
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RALEIGH
SUPERSTRUCTURE
PLAN OF SPANS
"B" BAR LAYOUT

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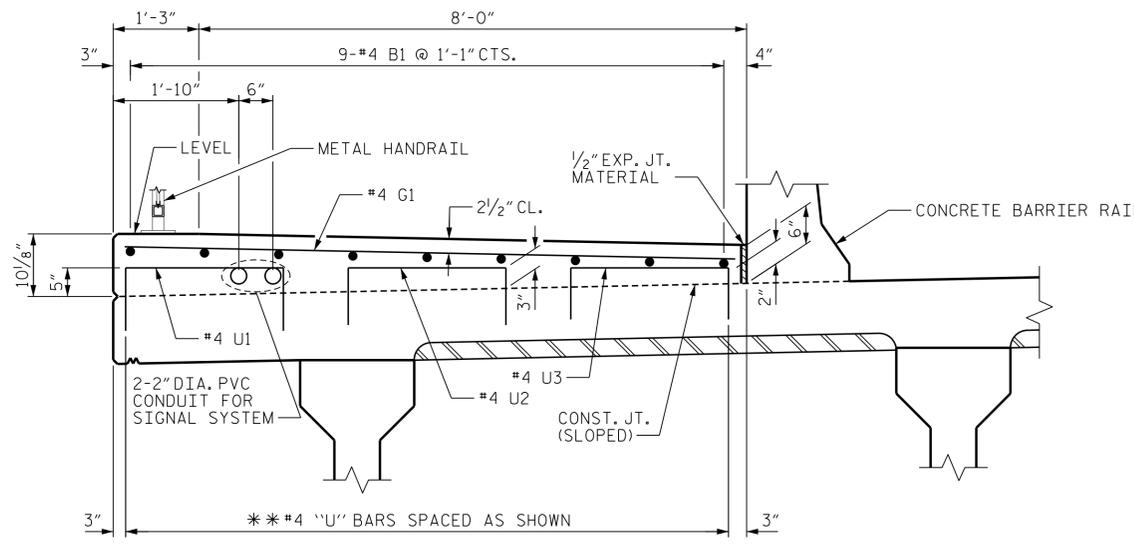
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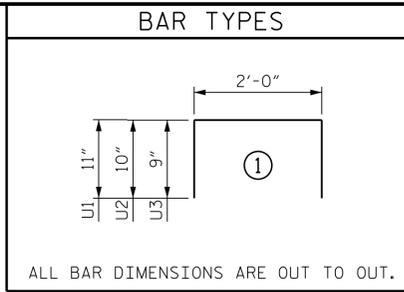


PLAN OF SIDEWALK
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)

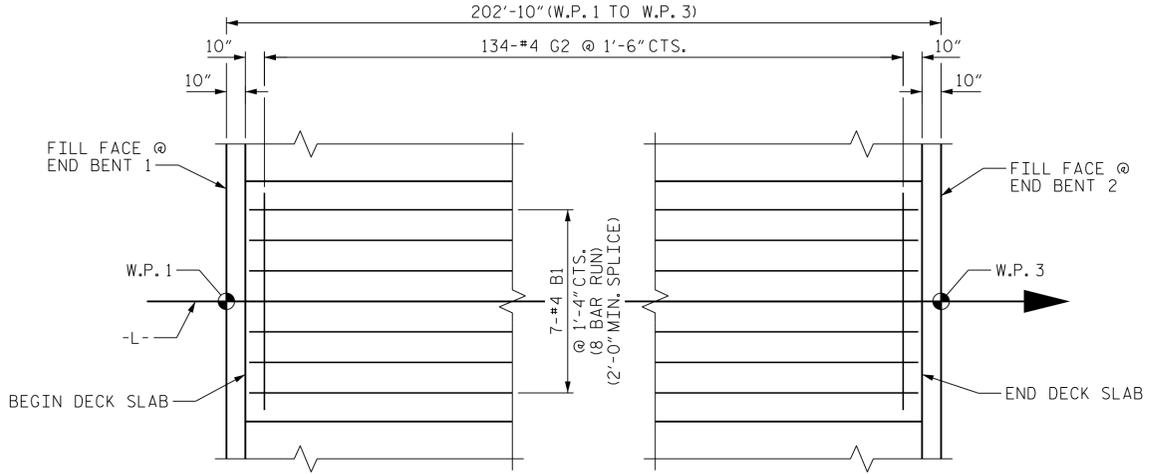


SECTION THRU SIDEWALK
* #4 'U' BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

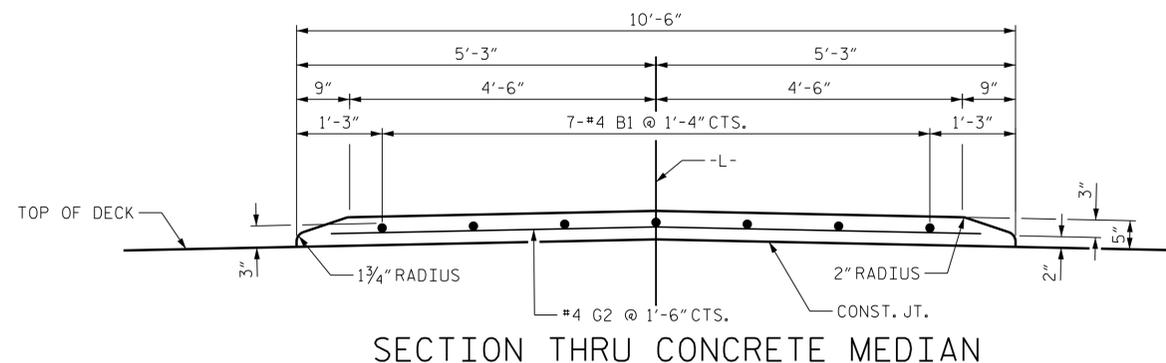
NOTES
FOR CONCRETE BARRIER RAIL REINFORCING STEEL AND DETAILS, SEE "CONCRETE BARRIER RAIL" SHEETS.
GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF SIDEWALK AND CONCRETE MEDIAN IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS 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.
THE SIDEWALK AND CONCRETE MEDIAN IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
SIDEWALK ON THE BRIDGE IS PAID FOR AS PART OF THE REINFORCED CONCRETE DECK SLAB PAY ITEM.
NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR MATERIALS OR LABOR REQUIRED TO CONSTRUCT THE CONCRETE MEDIAN. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT BID PRICE BID FOR THE REINFORCED CONCRETE DECK SLAB.
ALL REINFORCING STEEL IN SIDEWALK AND CONCRETE MEDIAN SHALL BE EPOXY COATED.
FOR METAL HANDRAIL DETAILS, SEE "METAL HANDRAIL" SHEETS.
FOR DETAILS OF SIGNAL CONDUIT, SEE SIGNAL COMMUNICATIONS PLANS.
#4 G1 AND #4 U1 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR HANDRAIL ANCHOR BOLTS.



BILL OF MATERIAL					
SIDEWALK					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	144	#4	STR	26'-10"	2581
*G1	402	#4	STR	8'-10"	2372
*U1	58	#4	1	3'-10"	149
*U2	58	#4	1	3'-8"	142
*U3	58	#4	1	3'-6"	136
* EPOXY COATED REINFORCING STEEL					5380 LBS.
CLASS AA CONCRETE					94.2 C.Y.
CONCRETE MEDIAN					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	56	#4	STR	26'-10"	1004
*G2	134	#4	STR	9'-2"	821
* EPOXY COATED REINFORCING STEEL					1825 LBS.
CLASS AA CONCRETE					31.2 C.Y.



PLAN OF CONCRETE MEDIAN



SECTION THRU CONCRETE MEDIAN

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Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources



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DEPARTMENT OF TRANSPORTATION
RALEIGH
**SUPERSTRUCTURE
SIDEWALK AND
CONCRETE MEDIAN
DETAILS**

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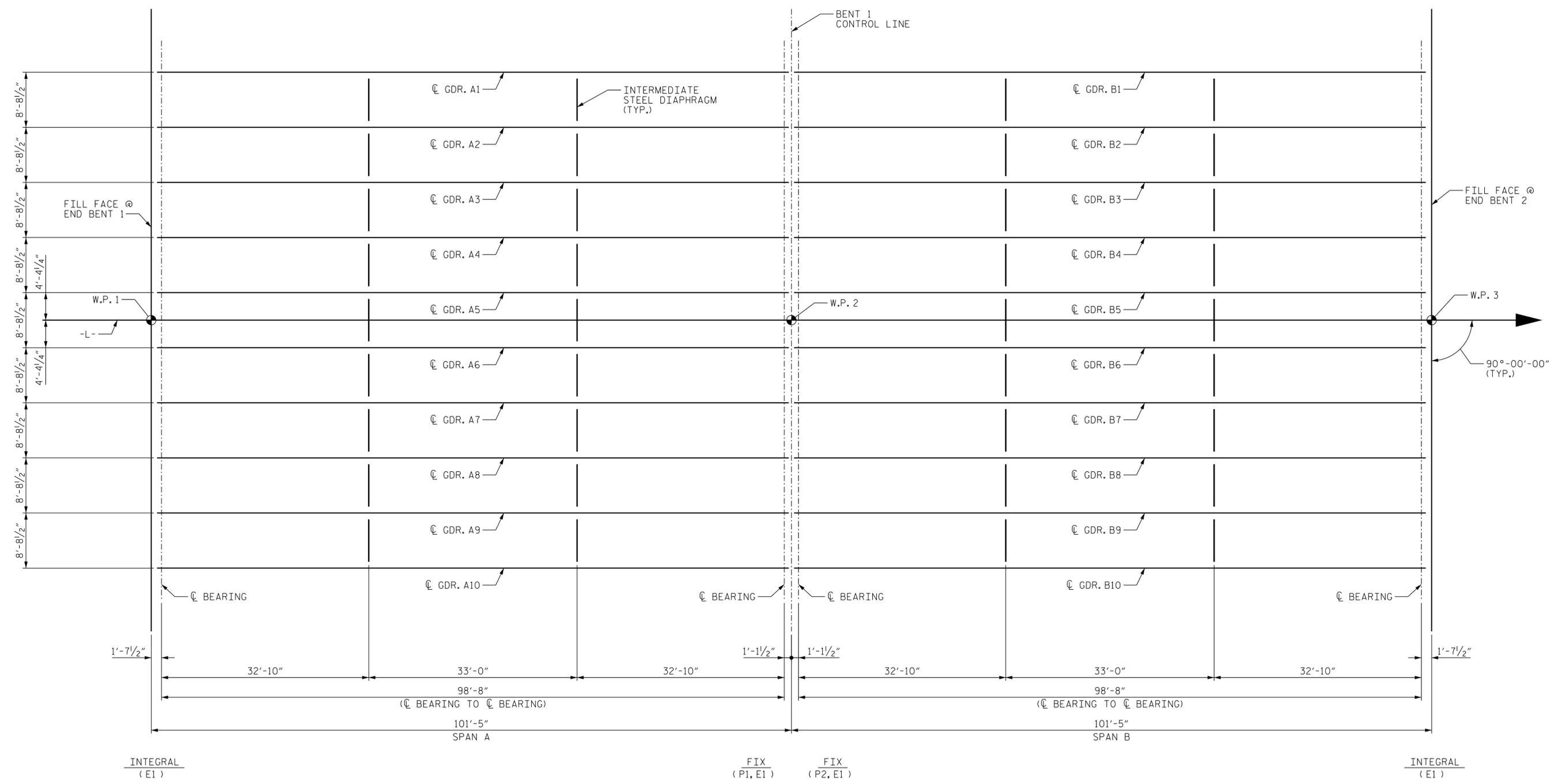
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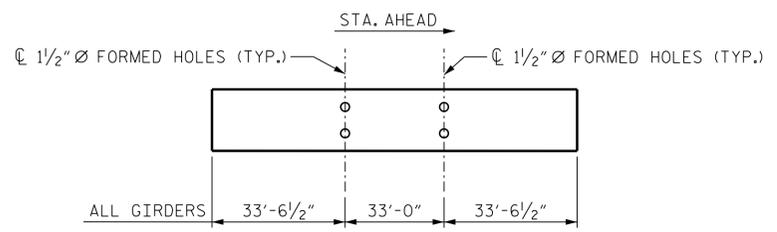


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FRAMING PLAN



GIRDER ELEVATION

MEASUREMENTS GIVEN ALONG BOTTOM OF GIRDER

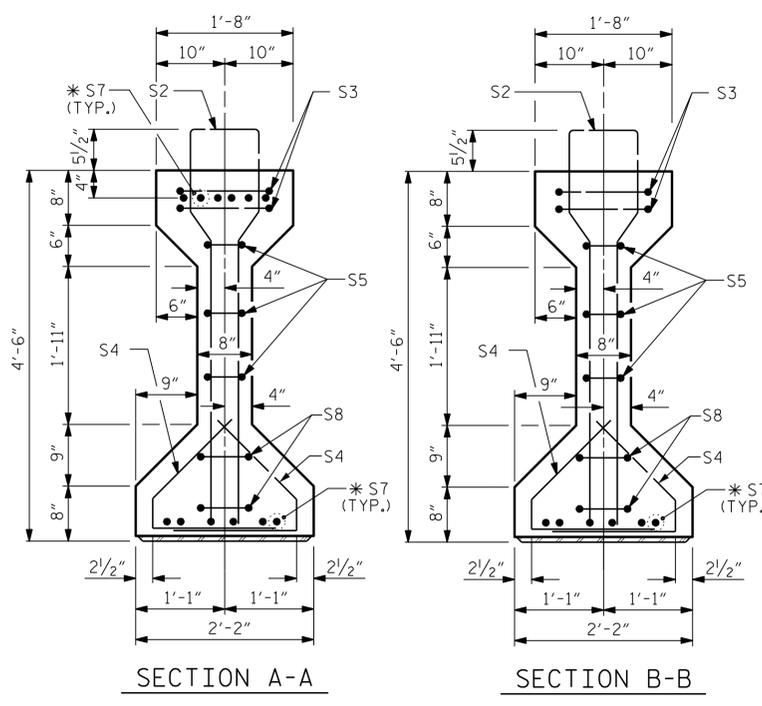


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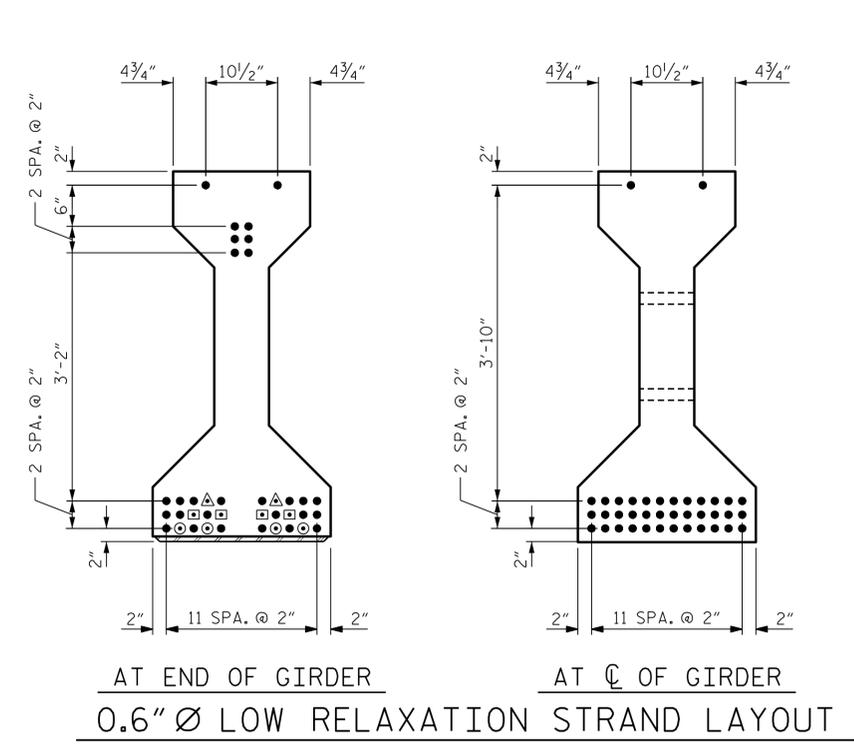
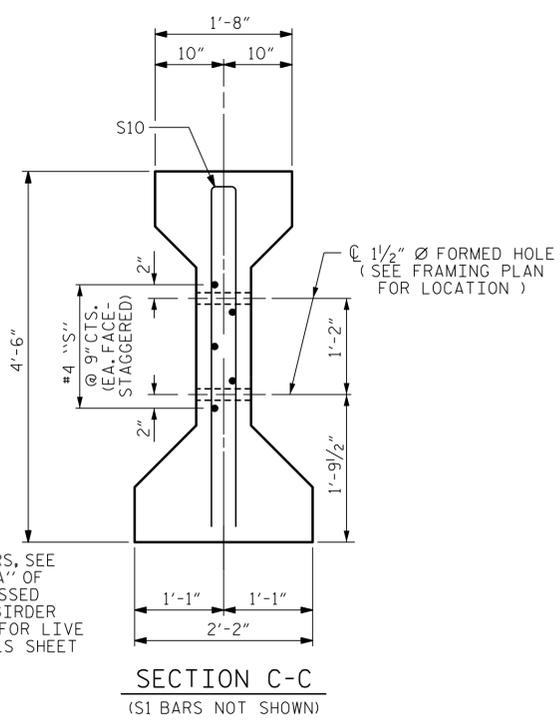
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WAKE COUNTY
 STATION: 22+77.76 -L-

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SUPERSTRUCTURE FRAMING PLAN					
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SHEET NO. S-14					TOTAL SHEETS 50



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

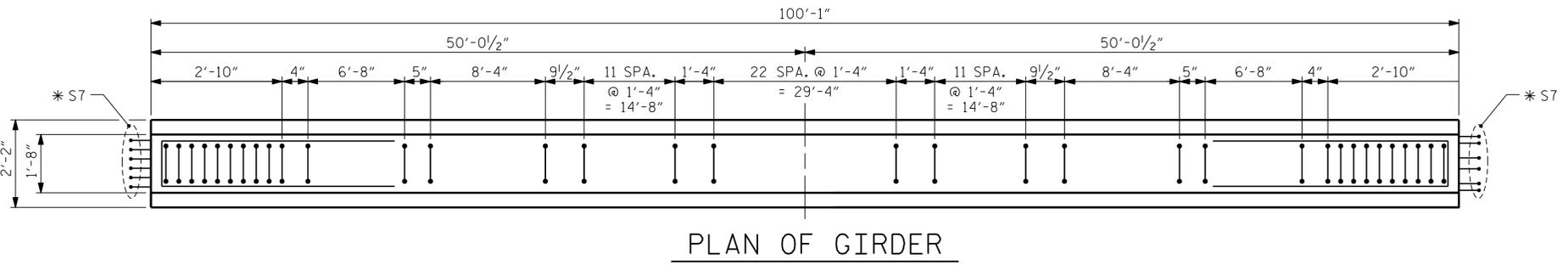
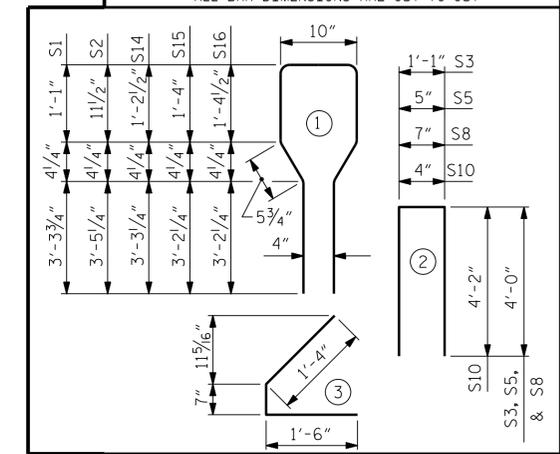


0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

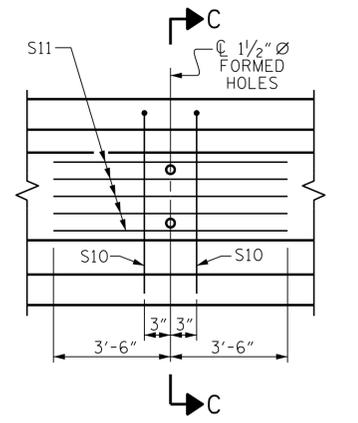
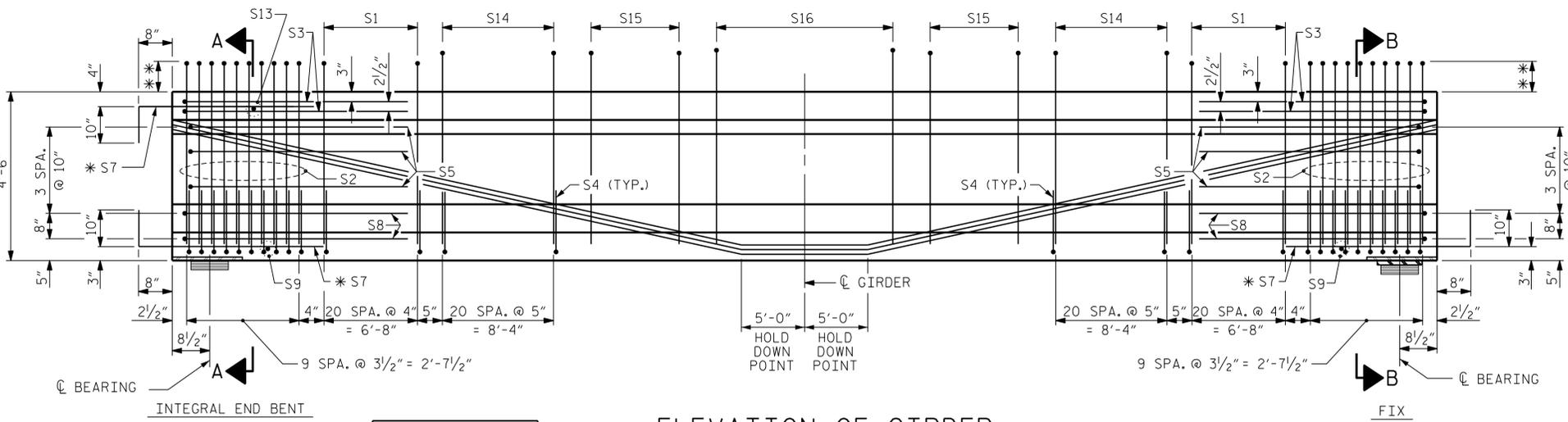
REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	42	#5	1	10'-7"	464
S2	20	#6	1	10'-7"	318
S3	4	#4	2	9'-1"	24
S4	208	#4	3	3'-5"	475
S5	6	#4	2	8'-5"	34
* S7	18	#5	STR	3'-8"	69
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	4	#5	2	8'-8"	36
S11	10	#4	STR	7'-0"	47
S13	1	#3	STR	1'-4"	1
S14	42	#5	1	10'-10"	475
S15	24	#4	1	10'-10"	174
S16	23	#4	1	10'-11"	168

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

BAR TYPES
ALL BAR DIMENSIONS ARE OUT-TO-OUT

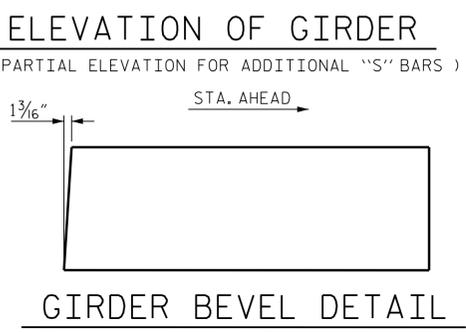


- DEBONDING LEGEND**
- FULLY BONDED STRANDS
 - STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
 - STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
 - STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER



**** BAR PROJECTION**

S1	5 1/2"
S2	5 1/2"
S14	7"
S15	7"
S16	7 1/2"



The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed on the cover sheet of these construction plans.

Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

QUANTITIES FOR ONE GIRDER

GIRDER	REINFORCING STEEL (LB.)	8500 PSI CONCRETE (C.Y.)	0.6" Ø L. R. STRANDS (No.)
A1-A10	2141	20.3	38

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
10	100'-1"	1000'-10"

PROJECT NO. U-5928
WAKE COUNTY
STATION: 22+77.76 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

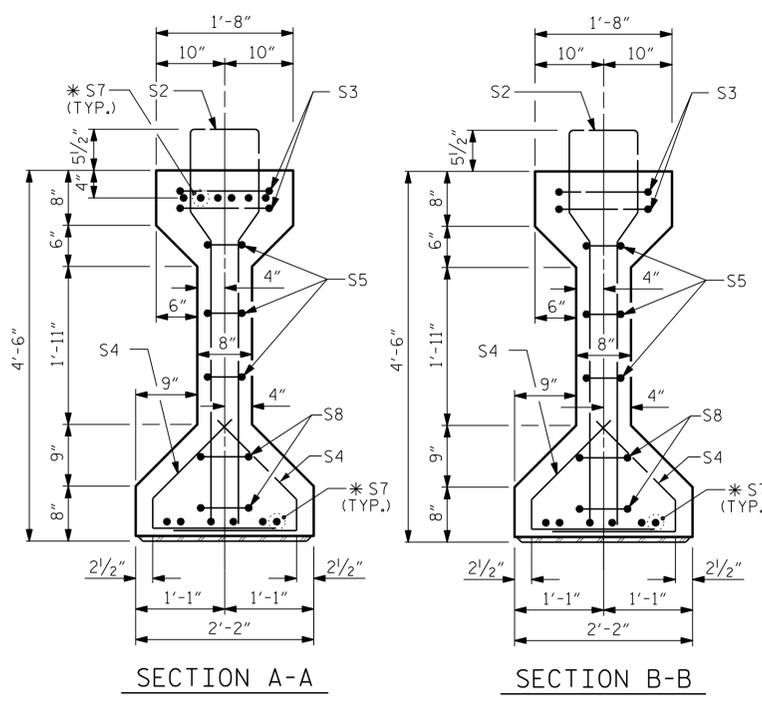
STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN A

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

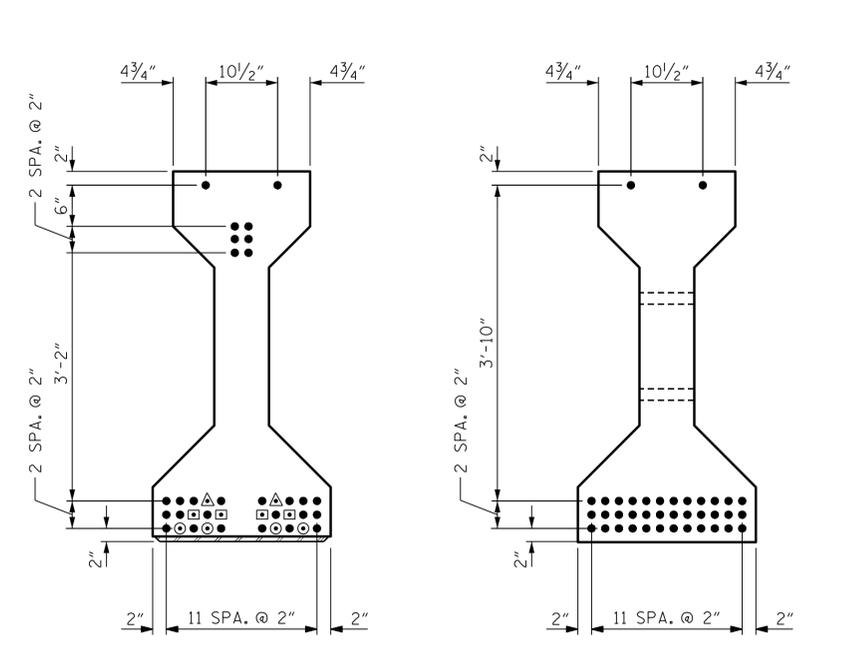
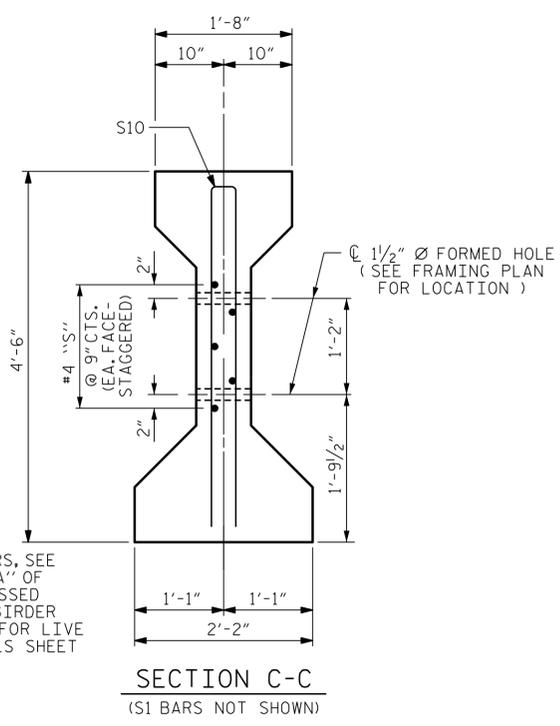
SHEET NO. **S-15**
TOTAL SHEETS **50**

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ASSEMBLED BY: B.E. LANNING DATE: 04/19
 CHECKED BY: M. ISRAELNAIM DATE: 02/24
 DESIGN ENGINEER OF RECORD: M. ISRAELNAIM DATE: 02/24
 DRAWN BY: ELR 8/91 REV. 10/1/11 MAA/GM
 CHECKED BY: GRP 8/91 REV. 1/15 MAA/TMG
 REV. 12/17 MAA/THC



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

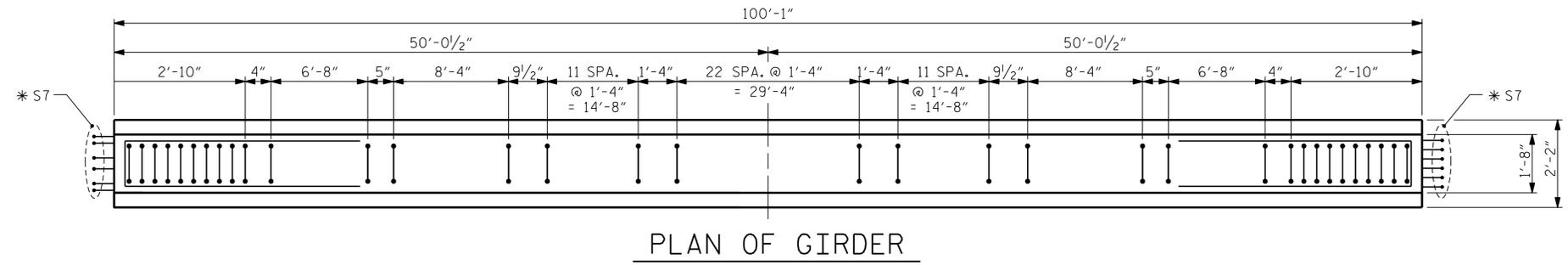


0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

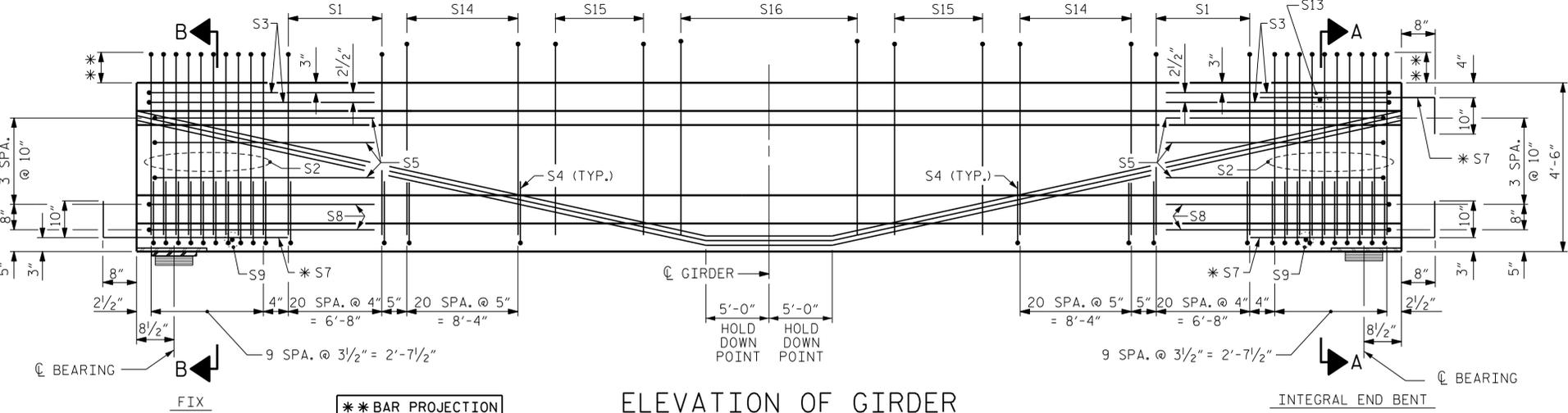
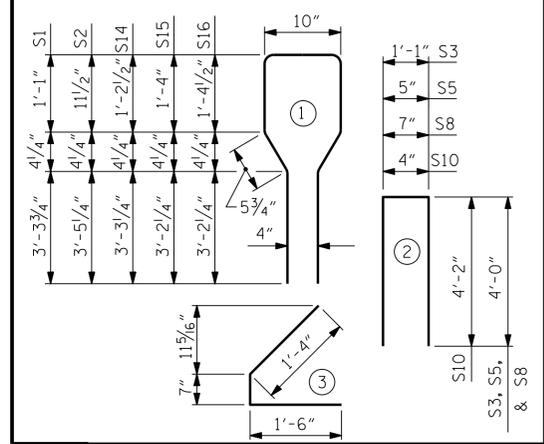
REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	42	#5	1	10'-7"	464
S2	20	#6	1	10'-7"	318
S3	4	#4	2	9'-1"	24
S4	208	#4	3	3'-5"	475
S5	6	#4	2	8'-5"	34
* S7	18	#5	STR	3'-8"	69
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	4	#5	2	8'-8"	36
S11	10	#4	STR	7'-0"	47
S13	1	#3	STR	1'-4"	1
S14	42	#5	1	10'-10"	475
S15	24	#4	1	10'-10"	179
S16	23	#4	1	10'-11"	168

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

BAR TYPES
ALL BAR DIMENSIONS ARE OUT-TO-OUT

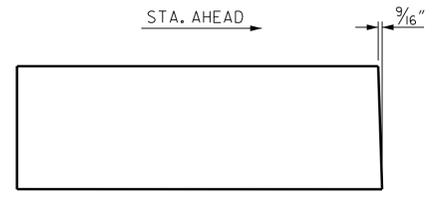
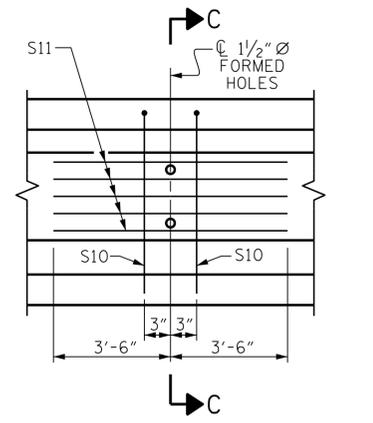


- DEBONDING LEGEND**
- FULLY BONDED STRANDS
 - STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
 - STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
 - STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER



**** BAR PROJECTION**

S1	5 1/2"
S2	5 1/2"
S14	7"
S15	7"
S16	7 1/2"



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Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources



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MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

QUANTITIES FOR ONE GIRDER

GIRDER	REINFORCING STEEL (LB.)	8500 PSI CONCRETE (C.Y.)	0.6" Ø L. R. STRANDS (No.)
B1-B10	2141	20.3	38

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
10	100'-1"	1000'-10"

PROJECT NO. U-5928
WAKE COUNTY
 STATION: 22+77.76 -L-
 SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

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

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

SHEET NO. **S-16**
 TOTAL SHEETS **50**

2/27/2024 3:07:00 PM User: blanning
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ASSEMBLED BY: B.E. LANNING DATE: 04/19
 CHECKED BY: M. ISRAELNAIM DATE: 02/24
 DESIGN ENGINEER OF RECORD: M. ISRAELNAIM DATE: 02/24

DRAWN BY: ELR 8/91	REV. 10/1/11	MAA/GM
CHECKED BY: GRP 8/91	REV. 1/15	MAA/TMG
	REV. 12/17	MAA/THC

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

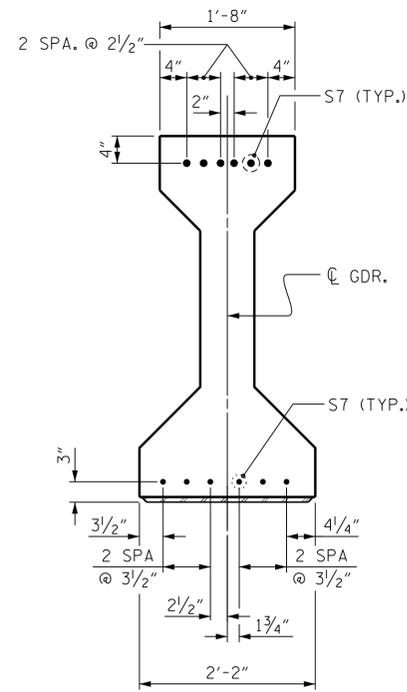
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6500 PSI.

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

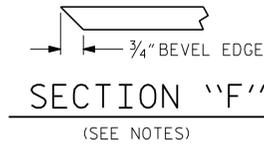
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

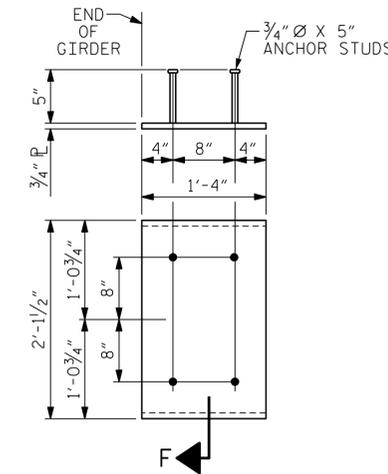
THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.



DETAIL "A"



(SEE NOTES)



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

(2 REQ'D. PER GIRDER)

The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed on the cover sheet of these construction plans.

Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources

ASSEMBLED BY: B.E. LANNING	DATE: 04/19
CHECKED BY: P.A. de PAOLI	DATE: 05/19
DESIGN ENGINEER OF RECORD: P.A. de PAOLI	DATE: 03/20
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

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

PROJECT NO. U-5928
WAKE COUNTY
STATION: 22+77.76 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
DETAILS

SHEET 3 OF 5

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			50

STD. NO. PCC9

11/5/2020 2:51:57 PM User: blanning
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DEAD LOAD DEFLECTION AND CAMBER TABLE FOR GIRDERS

GIRDER		SPAN A																		SPAN B																								
		0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	
1 & 10	TWENTIETH POINTS	↑	0	0.037	0.074	0.108	0.139	0.167	0.191	0.210	0.223	0.232	0.234	0.232	0.223	0.210	0.191	0.167	0.139	0.108	0.074	0.037	0	0	0.037	0.074	0.108	0.139	0.167	0.191	0.210	0.223	0.232	0.234	0.232	0.223	0.210	0.191	0.167	0.139	0.108	0.074	0.037	0
	CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.037	0.074	0.108	0.139	0.167	0.191	0.210	0.223	0.232	0.234	0.232	0.223	0.210	0.191	0.167	0.139	0.108	0.074	0.037	0	0	0.037	0.074	0.108	0.139	0.167	0.191	0.210	0.223	0.232	0.234	0.232	0.223	0.210	0.191	0.167	0.139	0.108	0.074	0.037	0
	** DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.024	0.047	0.069	0.090	0.107	0.124	0.135	0.145	0.148	0.151	0.147	0.142	0.131	0.119	0.102	0.084	0.063	0.042	0.021	0	0	0.021	0.042	0.063	0.084	0.102	0.119	0.131	0.142	0.147	0.151	0.148	0.145	0.135	0.124	0.107	0.090	0.069	0.047	0.024	0
	FINAL CAMBER	↑	0	3/16"	5/16"	1/2"	9/16"	3/4"	13/16"	7/8"	15/16"	1"	1"	1"	1"	15/16"	7/8"	13/16"	11/16"	9/16"	3/8"	3/16"	0	0	3/16"	3/8"	9/16"	11/16"	13/16"	7/8"	15/16"	1"	1"	1"	1"	15/16"	7/8"	13/16"	3/4"	9/16"	1/2"	5/16"	3/16"	0
2 & 9	CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.037	0.074	0.108	0.139	0.167	0.191	0.210	0.223	0.232	0.234	0.232	0.223	0.210	0.191	0.167	0.139	0.108	0.074	0.037	0	0	0.037	0.074	0.108	0.139	0.167	0.191	0.210	0.223	0.232	0.234	0.232	0.223	0.210	0.191	0.167	0.139	0.108	0.074	0.037	0
	** DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.024	0.047	0.070	0.092	0.109	0.126	0.137	0.147	0.150	0.153	0.149	0.144	0.132	0.120	0.103	0.085	0.064	0.042	0.021	0	0	0.021	0.042	0.064	0.085	0.103	0.120	0.132	0.144	0.149	0.153	0.150	0.147	0.137	0.126	0.109	0.092	0.070	0.047	0.024	0
	FINAL CAMBER	↑	0	3/16"	5/16"	7/16"	9/16"	11/16"	3/4"	7/8"	15/16"	1"	1"	1"	15/16"	15/16"	7/8"	3/4"	5/8"	9/16"	3/8"	3/16"	0	0	3/16"	3/8"	9/16"	5/8"	3/4"	7/8"	15/16"	15/16"	1"	1"	1"	15/16"	7/8"	3/4"	11/16"	9/16"	7/16"	5/16"	3/16"	0
	3 & 8	CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.037	0.074	0.108	0.139	0.167	0.191	0.210	0.223	0.232	0.234	0.232	0.223	0.210	0.191	0.167	0.139	0.108	0.074	0.037	0	0	0.037	0.074	0.108	0.139	0.167	0.191	0.210	0.223	0.232	0.234	0.232	0.223	0.210	0.191	0.167	0.139	0.108	0.074	0.037
** DEFLECTION DUE TO SUPERIMPOSED D.L.		↓	0	0.023	0.046	0.068	0.089	0.106	0.123	0.133	0.143	0.147	0.150	0.146	0.141	0.130	0.118	0.101	0.084	0.063	0.042	0.021	0	0	0.021	0.042	0.063	0.084	0.101	0.118	0.130	0.141	0.146	0.150	0.147	0.143	0.133	0.123	0.106	0.089	0.068	0.046	0.023	0
FINAL CAMBER		↑	0	3/16"	5/16"	1/2"	5/8"	3/4"	13/16"	15/16"	1"	1"	11/16"	1"	15/16"	7/8"	13/16"	11/16"	9/16"	3/8"	3/16"	0	0	3/16"	3/8"	9/16"	11/16"	13/16"	7/8"	15/16"	1"	11/16"	1"	1"	15/16"	15/16"	13/16"	3/4"	5/8"	1/2"	5/16"	3/16"	0	
4 & 7		CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.037	0.074	0.108	0.139	0.167	0.191	0.210	0.223	0.232	0.234	0.232	0.223	0.210	0.191	0.167	0.139	0.108	0.074	0.037	0	0	0.037	0.074	0.108	0.139	0.167	0.191	0.210	0.223	0.232	0.234	0.232	0.223	0.210	0.191	0.167	0.139	0.108	0.074	0.037
	** DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.022	0.044	0.065	0.085	0.101	0.117	0.128	0.138	0.141	0.144	0.140	0.136	0.126	0.115	0.099	0.082	0.062	0.041	0.021	0	0	0.021	0.041	0.062	0.082	0.099	0.115	0.126	0.136	0.140	0.144	0.141	0.138	0.128	0.117	0.101	0.085	0.065	0.044	0.022	0
	FINAL CAMBER	↑	0	3/16"	3/8"	1/2"	5/8"	13/16"	7/8"	1"	1"	11/16"	11/16"	11/8"	11/16"	1"	15/16"	13/16"	11/16"	9/16"	3/8"	3/16"	0	0	3/16"	3/8"	9/16"	11/16"	13/16"	15/16"	1"	11/16"	11/8"	11/16"	11/16"	1"	1"	7/8"	13/16"	5/8"	1/2"	3/8"	3/16"	0
	5 & 6	CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.037	0.074	0.108	0.139	0.167	0.191	0.210	0.223	0.232	0.234	0.232	0.223	0.210	0.191	0.167	0.139	0.108	0.074	0.037	0	0	0.037	0.074	0.108	0.139	0.167	0.191	0.210	0.223	0.232	0.234	0.232	0.223	0.210	0.191	0.167	0.139	0.108	0.074	0.037
** DEFLECTION DUE TO SUPERIMPOSED D.L.		↓	0	0.023	0.045	0.066	0.087	0.104	0.120	0.130	0.140	0.143	0.146	0.142	0.138	0.127	0.116	0.100	0.083	0.063	0.042	0.021	0	0	0.021	0.042	0.063	0.083	0.100	0.116	0.127	0.138	0.142	0.146	0.143	0.140	0.130	0.120	0.104	0.087	0.066	0.045	0.023	0
FINAL CAMBER		↑	0	3/16"	3/8"	1/2"	5/8"	3/4"	7/8"	15/16"	1"	11/16"	11/16"	11/16"	1"	1"	7/8"	13/16"	11/16"	9/16"	3/8"	3/16"	0	0	3/16"	3/8"	9/16"	11/16"	13/16"	7/8"	1"	1"	11/16"	11/16"	11/16"	1"	15/16"	7/8"	3/4"	5/8"	1/2"	3/8"	3/16"	0

** INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

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

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Building Inspections	Planning
Water Resources – Utility Engineering	Planning – Transportation
Electric	Fire
Water Resources – Soil & Erosion Control	Parks, Recreation & Cultural Resources

PROJECT NO. U-5928
WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 4 OF 5



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 DEAD LOAD DEFLECTION
 AND CAMBER TABLES

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 CHECKED BY : P.A. de PAOLI DATE : 05/19
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NOTES

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

STEEL SOLE PLATES, ANCHOR BOLTS, 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, AND WASHERS SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

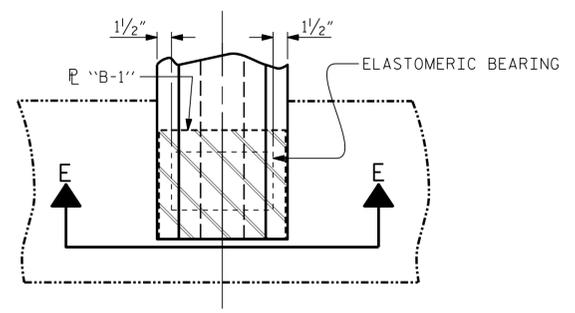
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

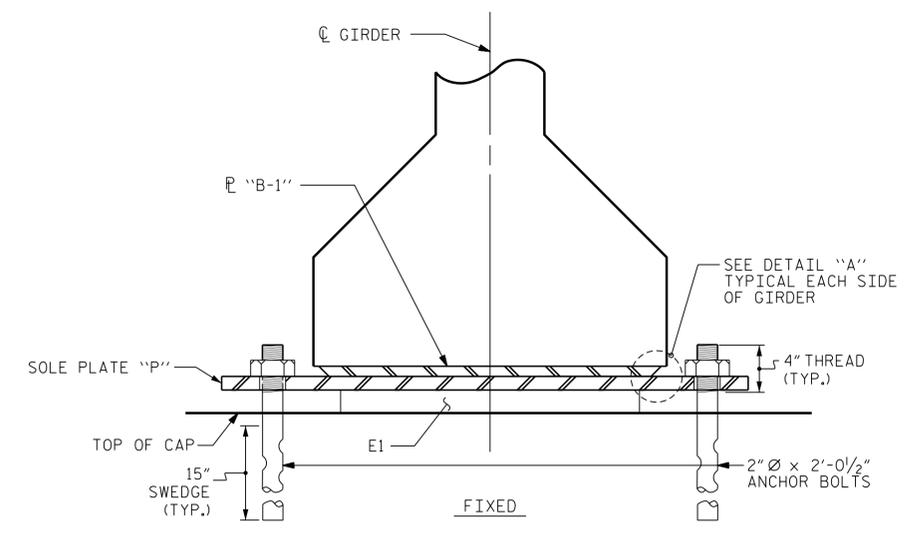
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE STANDARD SPECIFICATIONS.

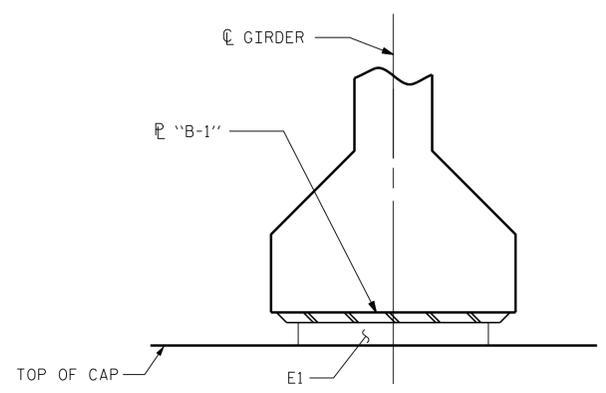
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



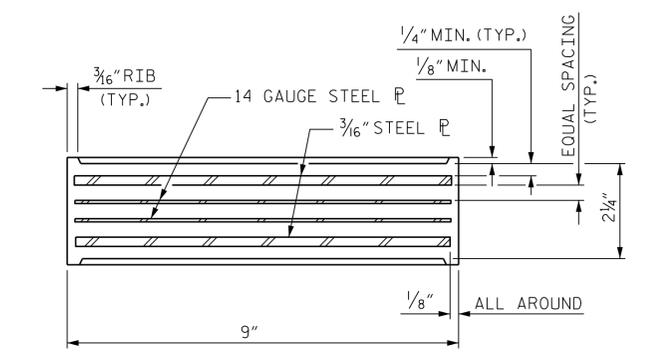
PLAN VIEW
(SHOWING INTEGRAL END BENT)



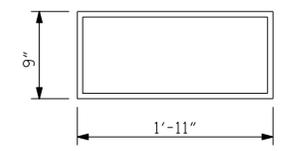
SECTION F-F
(SHOWING INTERIOR BENT)



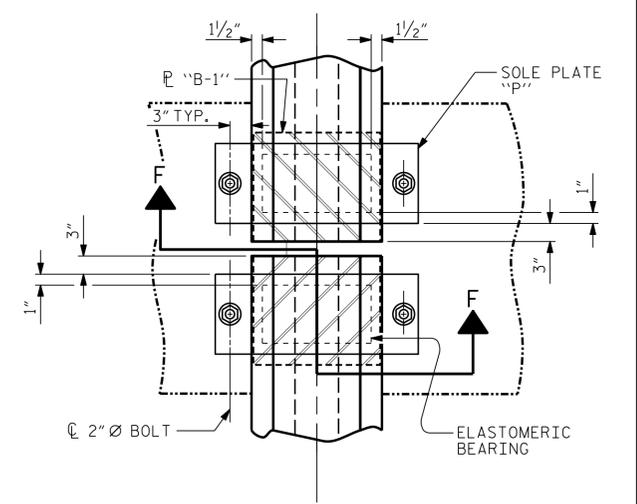
SECTION E-E
(SHOWING INTEGRAL END BENT)



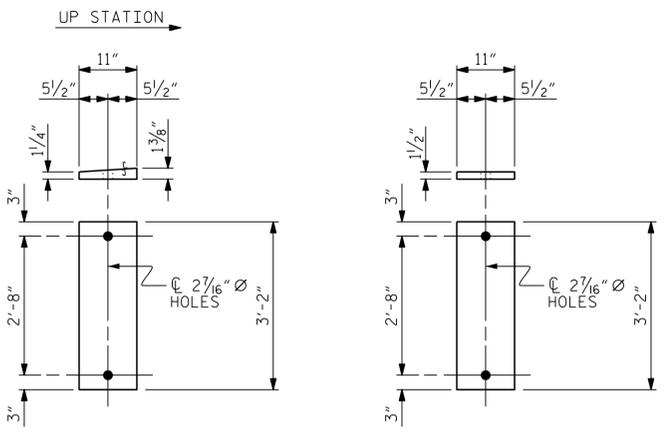
TYPICAL SECTION OF ELASTOMERIC BEARINGS



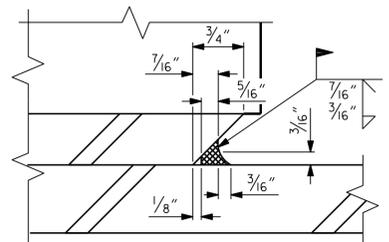
E1 (40 REQ'D.)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE V



PLAN VIEW
(SHOWING INTERIOR BENT)



P-1 (FIXED) (10 REQ'D.)
P-2 (FIXED) (10 REQ'D.)
SOLE PLATE DETAILS ("P")



DETAIL "A"

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	335 k

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WAKE COUNTY
STATION: 22+77.76 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
ELASTOMERIC BEARING
DETAILS
PRESTRESSED CONCRETE GIRDER
SUPERSTRUCTURE

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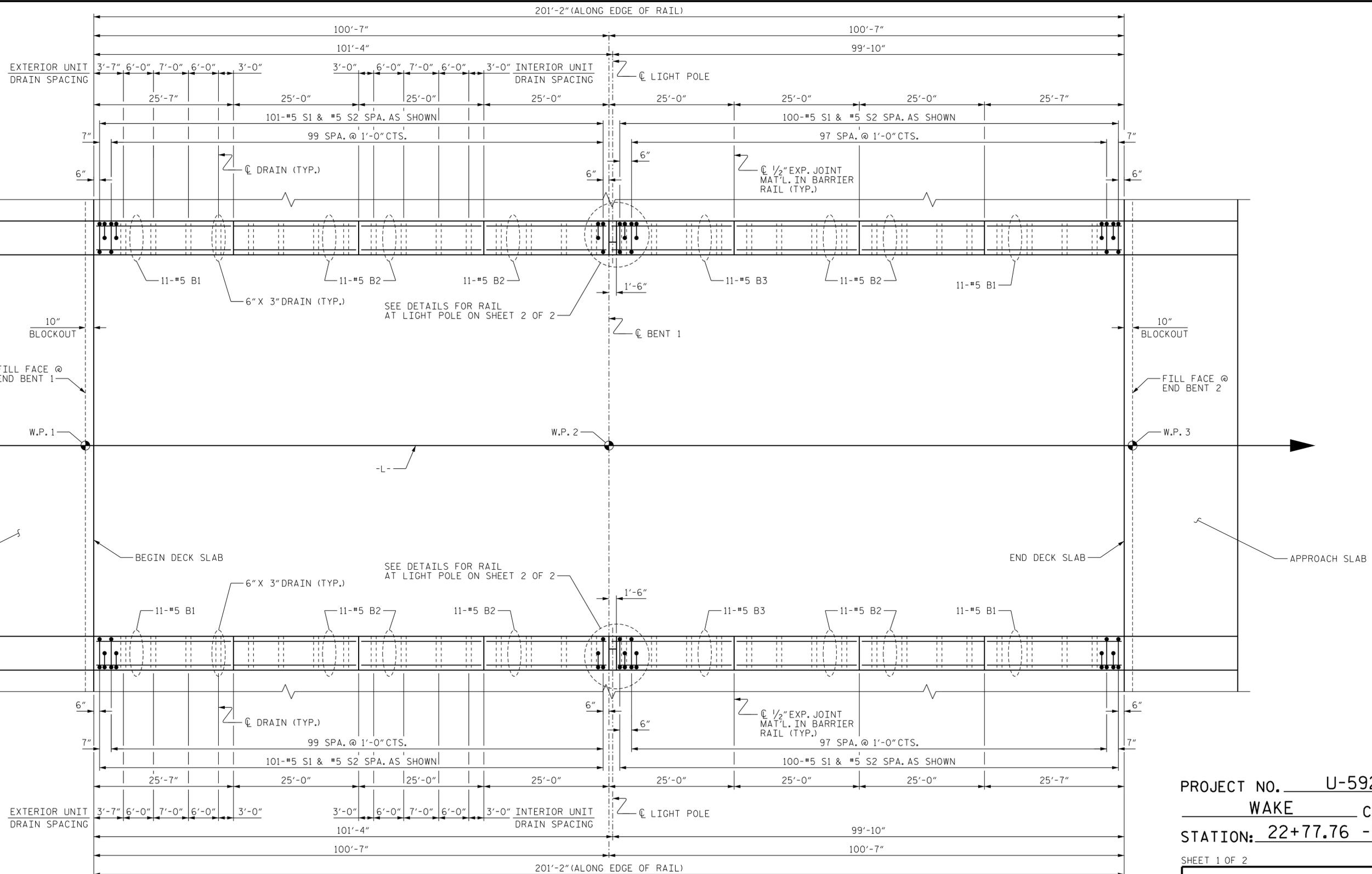
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11/5/2020
2:52:02 PM

User: blanning

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SPAN A

SPAN B

PLAN OF BARRIER RAIL

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PROJECT NO. U-5928
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 SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE CONCRETE BARRIER RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		
SHEET NO. S-21					TOTAL SHEETS 50

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CHECKED BY : <u>P.A. de PAOLI</u>	DATE : <u>05/19</u>
DESIGN ENGINEER OF RECORD : <u>P.A. de PAOLI</u>	DATE : <u>10/20</u>

NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

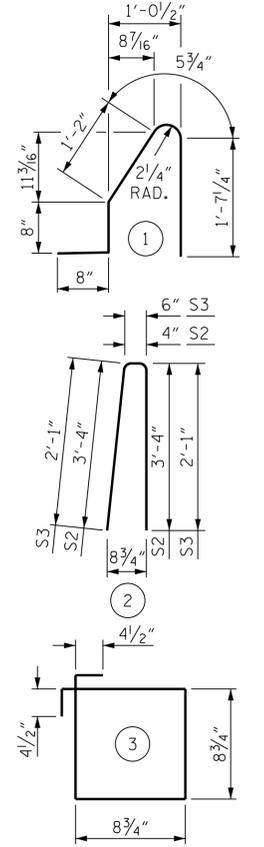
DIMENSIONS FOR #4S4 BARS ARE APPROXIMATE. DETAIL BARS TO FIT TIGHTLY AROUND ANCHOR BOLTS.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS, THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

FOR DETAILS OF ELECTRICAL CONDUIT SYSTEM, SEE ROADWAY DRAWINGS.

FOR METAL HANDRAIL DETAILS, SEE "METAL HANDRAIL" SHEETS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	44	#5	STR.	25'-2"	1155
* B2	110	#5	STR.	24'-7"	2820
* B3	22	#5	STR.	23'-1"	530
* B4	20	#5	STR.	1'-1"	23
* S1	406	#5	1	4'-7"	1941
* S2	402	#5	2	7'-0"	2935
* S3	4	#5	2	4'-8"	19
* S4	6	#4	3	3'-8"	15

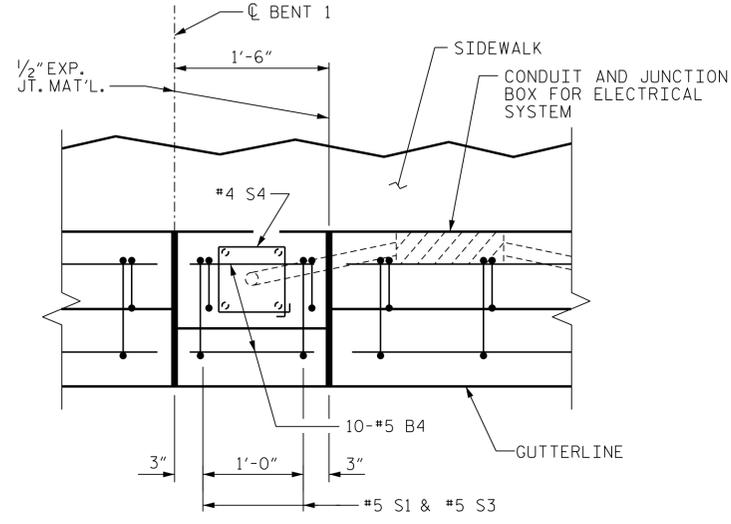
* EPOXY COATED REINFORCING STEEL 9,438 LBS.
 CLASS AA CONCRETE 54.3 CU. YDS.
 * CONCRETE BARRIER RAIL 402.33 LIN. FT.

** LENGTH OF CONCRETE BARRIER RAIL ON APPROACH SLAB AND PEDESTRIAN CROSSING IS NOT INCLUDED IN THIS LENGTH.

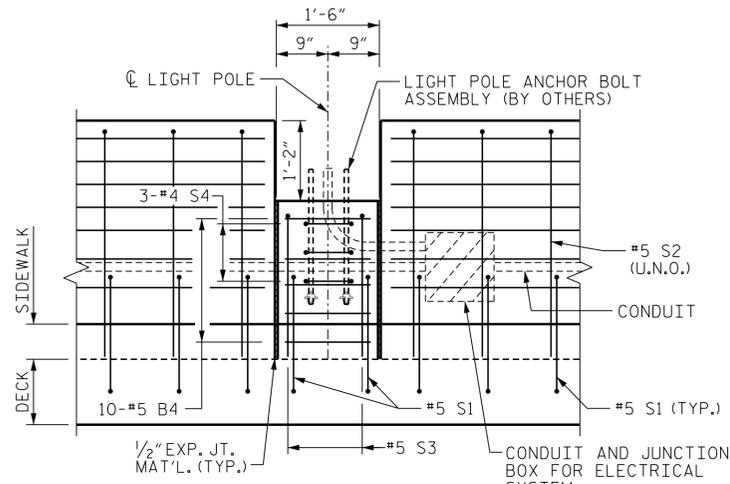
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WAKE COUNTY
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SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**SUPERSTRUCTURE
 CONCRETE BARRIER
 RAIL DETAILS**



PLAN

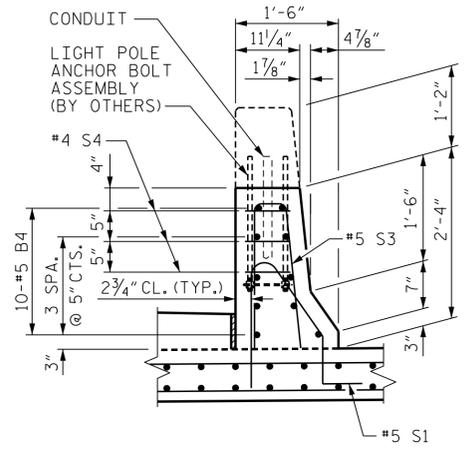


ELEVATION

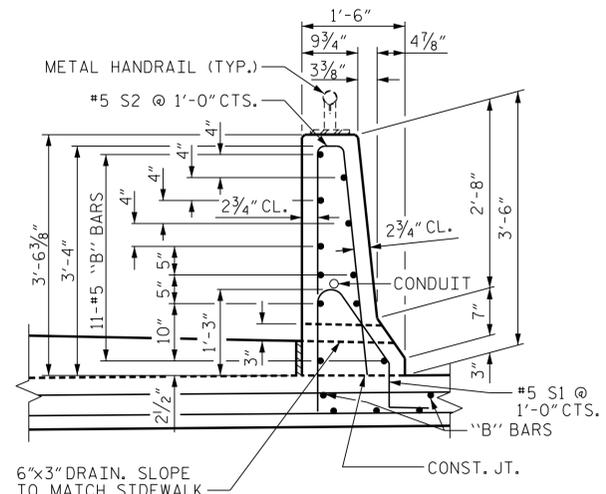
LIGHT PEDESTAL DETAILS

NOTE: FIELD CUT OR BEND BARS AS NECESSARY TO CLEAR CONDUIT AND JUNCTION BOX.

(LS3 TO LS8) SEE ELECTRICAL PLANS - SHEET E2.

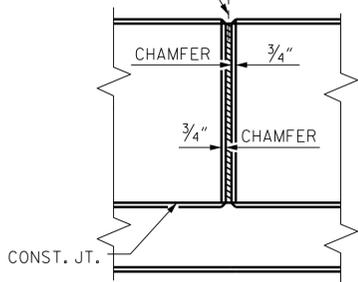


SECTION



SECTION THRU RAIL

1/2" EXP. JT. MAT'L. HELD IN PLACE WITH GALVANIZED NAILS. (NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

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Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources



3/10/2022

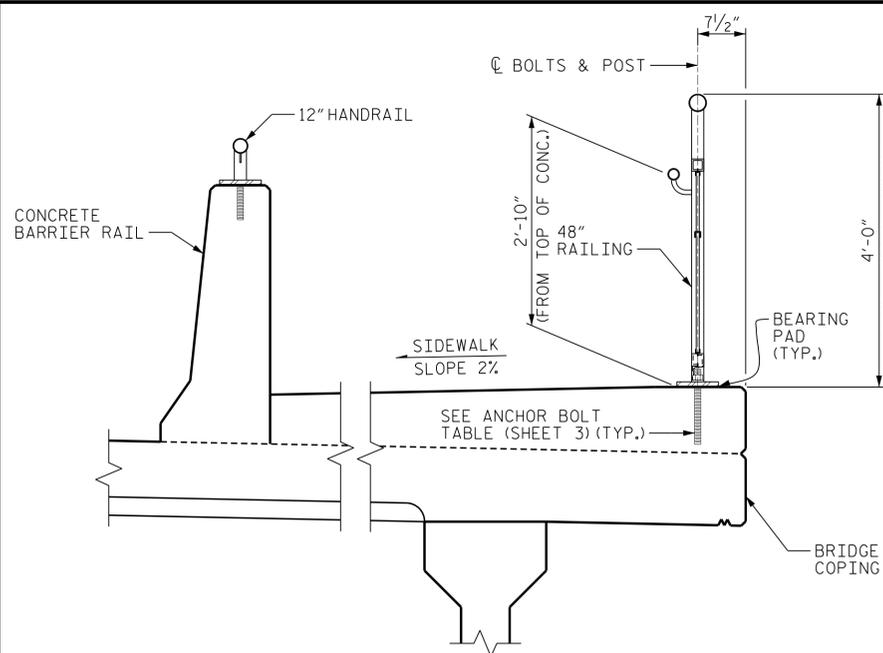
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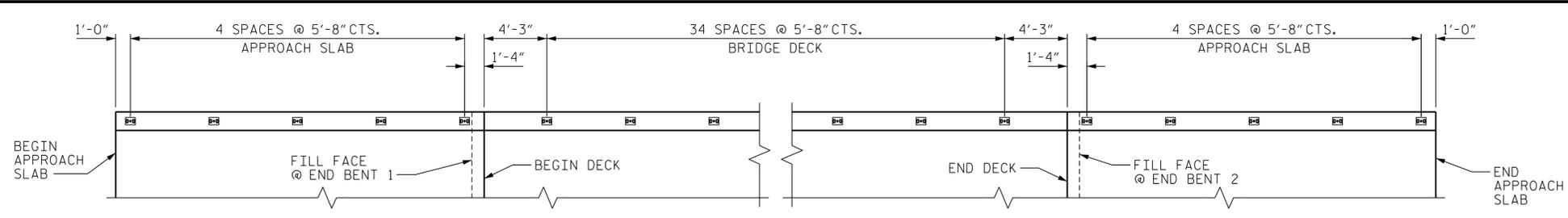
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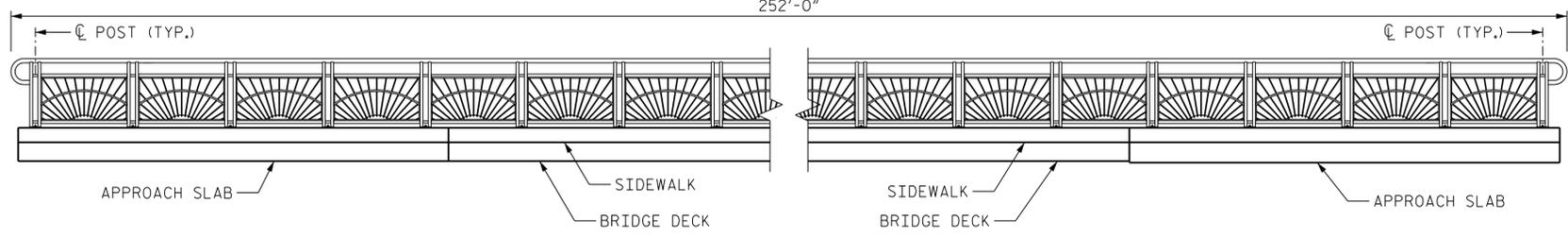
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SECTION THRU RAIL

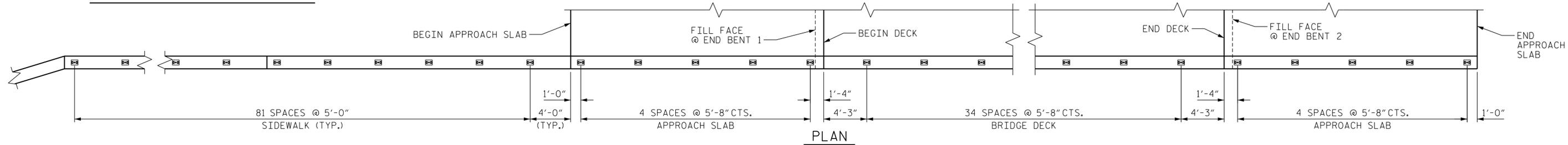


PLAN

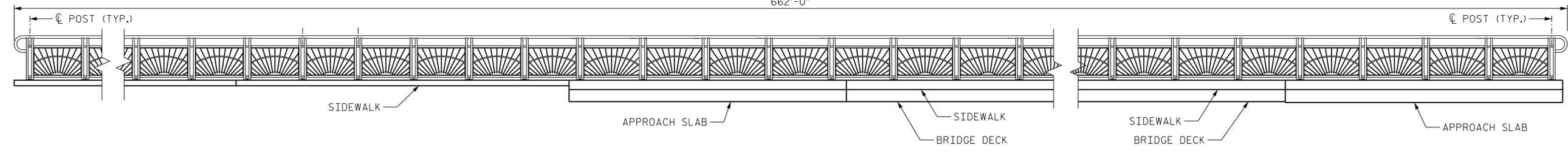


ELEVATION

48" METAL RAILING AT LEFT SIDE

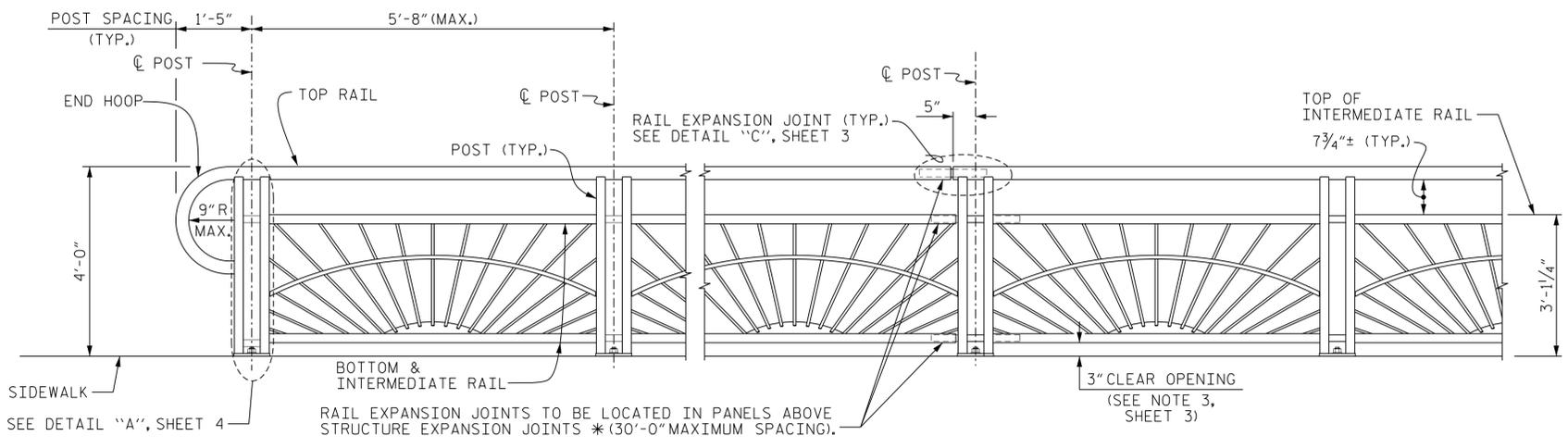


PLAN



ELEVATION

48" METAL RAILING AT RIGHT SIDE



ELEVATION

(SHOWING OUTSIDE FACE OF RAILING)
TYPICAL RAILING DETAILS

NOTE: BRIDGE MOUNTED CHAIN LINK FENCE NOT SHOWN FOR CLARITY.

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PROJECT NO. U-5928
 WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 1 OF 5



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 METAL HANDRAIL
 PLAN AND ELEVATION

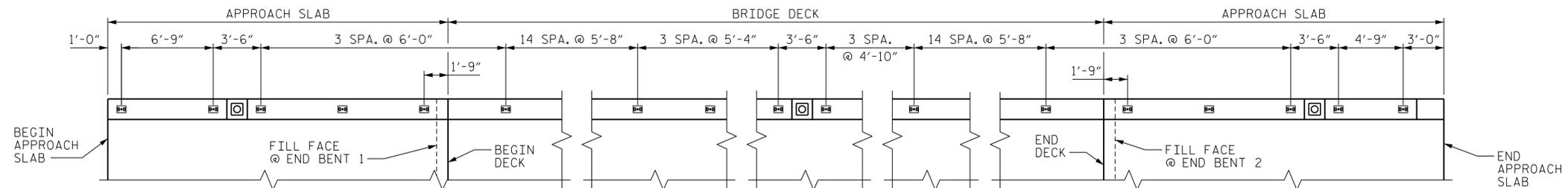
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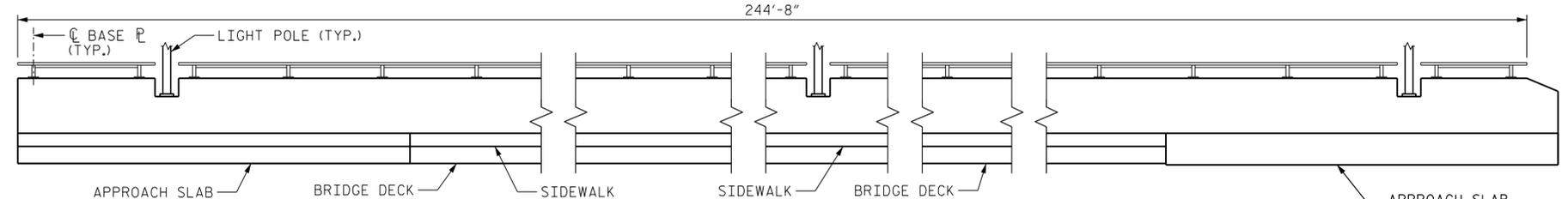
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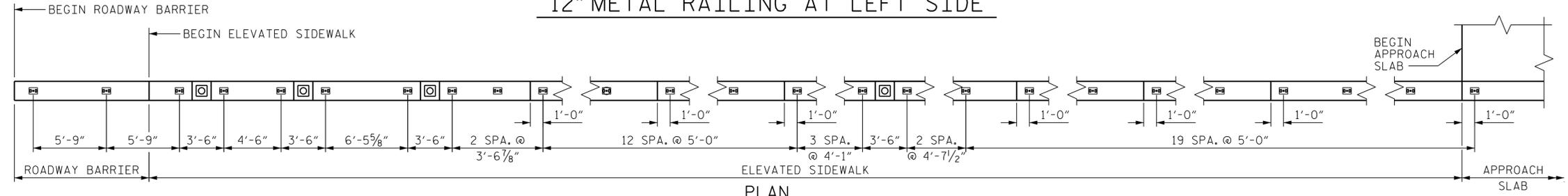


PLAN

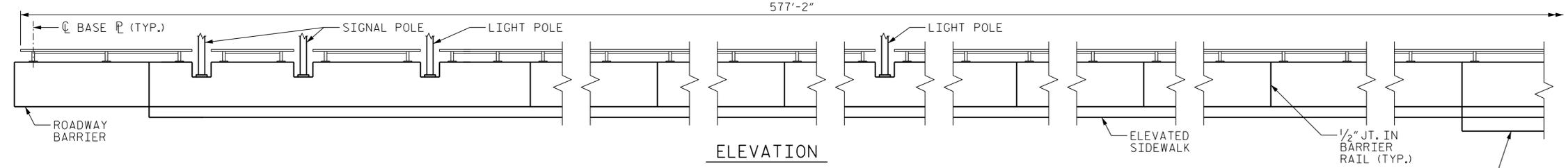


ELEVATION

12" METAL RAILING AT LEFT SIDE

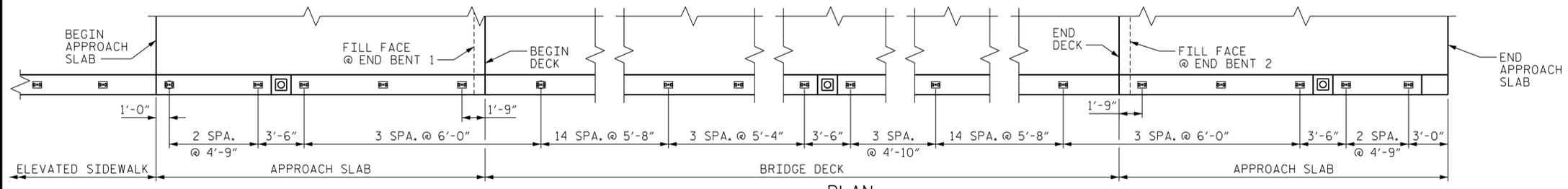


PLAN

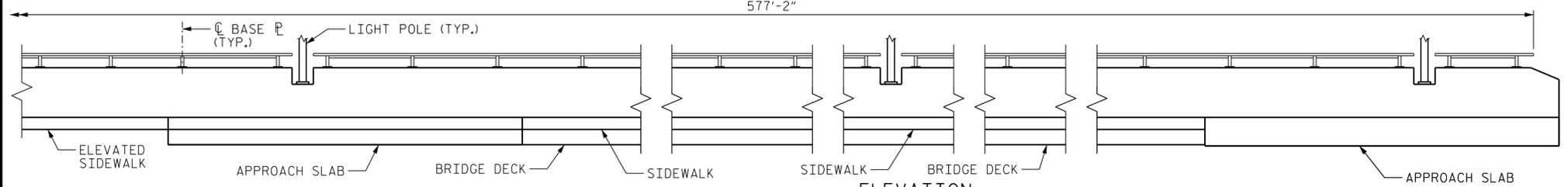


ELEVATION

12" METAL RAILING AT ELEVATED SIDEWALK



PLAN



ELEVATION

12" METAL RAILING AT RIGHT SIDE

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PROJECT NO. U-5928
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 METAL HANDRAIL
 PLAN AND ELEVATION



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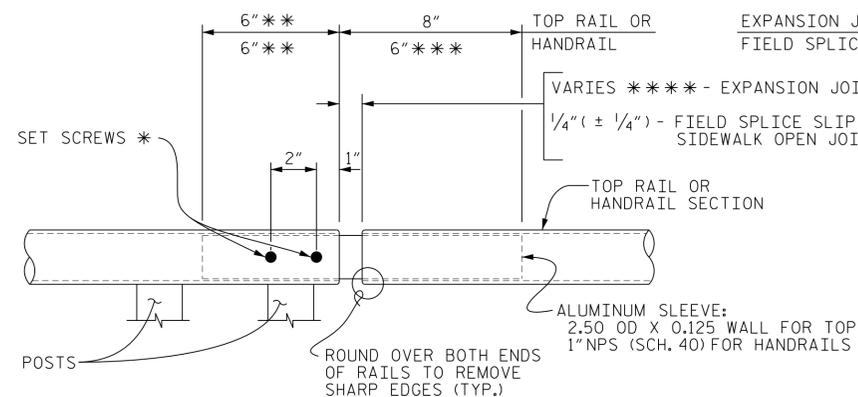
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TABLE 1 - RAILING MEMBERS

MEMBER	ALLOY ⁽¹⁾	DESIGNATION	OUTSIDE DIMENSION	WALL THICKNESS
POSTS	6061-T6	EXTRUSION 1 1/2 X 2 1/2 X 0.125	1.50" X 2.50"	0.125"
TOP PLATE	6061-T6	EXTRUSION (SEE DETAILS)	2 3/4" X 7"	VARIES
TOP RAIL	6061-T6	2 1/2" NPS (SCH. 10)	2.875"	0.120"
END HOOPS	6063-T5	2 1/2" NPS (SCH. 10)	2.875"	0.120"
TOP RAIL JOINT/SPLICE SLEEVES	6063-T5	2.50 OD X 0.125 WALL	2.500"	0.125"
INTERMEDIATE & BOTTOM RAIL	6061-T6	RT 2X2X0.250	2.00" X 2.00"	0.250" ⁽²⁾
INT. & BOTTOM RAIL POST CONNECTION SLEEVE	6063-T5	1.50 OD X 0.125 WALL	1.500"	0.125"
HANDRAIL JOINT/SPLICE SLEEVES	6063-T5	1" NPS (SCH. 40)	1.315"	0.133"
	6063-T5	1.50 OD X 0.125 WALL	1.500"	0.125"
HANDRAILS	6061-T6	1 1/2" NPS (SCH. 40)	1.900"	0.145"
HANDRAIL SUPPORT BAR	6061-T6	3/4" Ø ROUND BAR	0.750"	N/A
INFILL PANEL MEMBERS	6063-T5	VARIES (SEE DETAILS)	VARIES	VARIES

TABLE 1 NOTES:

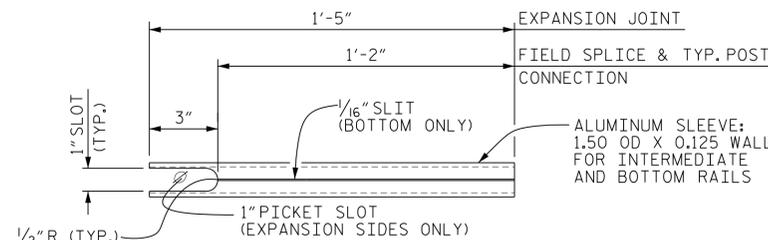
- (1) ALLOY 6061-T6 OR 6063-T52 & T6 MAY BE SUBSTITUTED FOR ALLOY 6063-T5.
- (2) 0.188" WALL THICKNESS PERMITTED FOR RAILS WITH POST SPACINGS LESS THAN 5'-9".



ROUND RAILS - TOP RAIL OR HANDRAIL

- * 1/4" Ø X 3/4" PAN HEAD ALUMINUM (ALLOY 7075-T73) OR STAINLESS STEEL (TYPE 316 OR 18-8 ALLOY) SET SCREWS ALONG OUTSIDE FACE OF RAILING. SET SCREWS MUST BE SET FLUSH AGAINST THE RAIL SURFACE. A 3/4" Ø PLUG WELD MAY BE SUBSTITUTED FOR THE TWO SET SCREWS AT EXPANSION JOINTS.
- ** EMBEDDED LENGTH MAY BE 4" FOR PLUG WELDED CONNECTION.
- *** INCREASE HANDRAIL SLEEVE EMBEDMENT TO 8" FOR EXPANSION JOINT OPENINGS GREATER THAN 2".
- **** EXPANSION JOINT OPENING SHALL MATCH THE CLEAR OPENING IN THE SIDEWALK BUT NOT GREATER THAN 3".

SQUARE RAILS - INTERMEDIATE OR BOTTOM RAIL



INTERMEDIATE OR BOTTOM RAIL - ALUMINUM SLEEVE DETAIL (BOTTOM SIDE SHOWN)

DETAIL "C" EXPANSION JOINT (FIELD SPLICE SIMILAR)

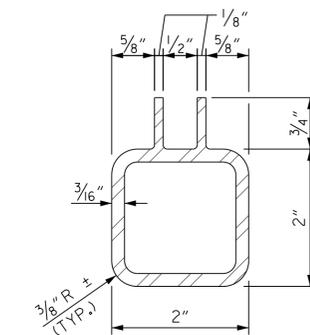
48" METAL HANDRAIL PAY LENGTH = 914.00 FT.
 12" METAL HANDRAIL PAY LENGTH = 703.41 FT.

DIMENSIONS		ANCHOR LENGTH		ANCHOR SIZE
MIN. EDGE DIST.	EMBEDMENT	C.I.P. HEX HEAD BOLT	ADHESIVE ANCHOR	
4"	9"	10 1/2"	11"	7/8" Ø
5"	5"	6 1/2"	7"	7/16" Ø

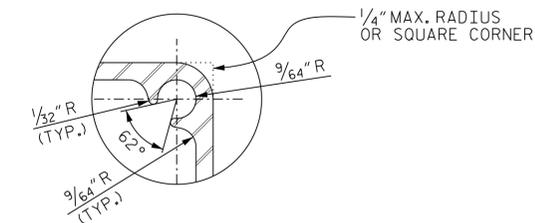
7/16" Ø ANCHOR BOLTS ARE REQUIRED FOR 48" RAILING ON ELEVATED SIDEWALK.

NOTES

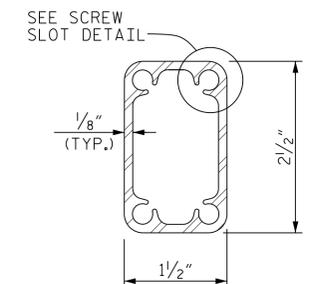
- SHOP DRAWINGS ARE REQUIRED, SEE SPECIAL PROVISIONS.
- MATERIALS:
 - A. STRUCTURAL EXTRUSIONS, TUBE, PIPE AND BARS: TABLE 1 AND ASTM B221 OR ASTM B429
 - B. BASE PLATES AND RAIL CAPS: ASTM B209 ALLOY 6061-T6
 - C. STAINLESS STEEL (SS) SCREWS: TYPE 316 OR 18-8 ALLOY
 - D. ALUMINUM SCREWS: ALLOY 2024-T4 OR 7075-T73
 - E. GALVANIZED STEEL FASTENERS: COATED IN ACCORDANCE WITH SPECIFICATION SECTION 1076.
 - a. HEX HEAD BOLTS: ASTM A 307
 - 1. 7/16" DIAMETER SINGLE BOLT OPTION, GRADE 36
 - 2. 7/16" DIAMETER FOUR BOLT OPTION, GRADE 55
 - b. ADHESIVE ANCHORS: ASTM F1554 FULLY THREADED RODS, GRADE 55
 - c. HEX NUTS: ASTM A563
 - d. FLAT WASHERS: ASTM F436
 - e. PLATE WASHERS: ASTM A36 OR ASTM A706 GRADE 36.
 - F. SHIMS: ASTM B209 ALLOY 6061
 - G. BEARING PADS: PROVIDE 1/8" THICK PLAIN, FABRIC REINFORCED OR FABRIC LAMINATED BEARING PADS MEETING THE REQUIREMENTS OF SPECIFICATION SECTION 1079 FOR ANCILLARY STRUCTURES.
- PANEL INFILLS MAY BE FABRICATED PARALLEL TO THE LONGITUDINAL GRADE. MAINTAIN A MAXIMUM CLEAR OPENING OF 5 7/8".
- LOCATE RAILING EXPANSION JOINTS BETWEEN THE POSTS ON EITHER SIDE OF THE DECK EXPANSION JOINT. MAXIMUM SPACING BETWEEN EXPANSION JOINTS IS 30'-0".
- FIELD SPLICES ARE SIMILAR TO THE EXPANSION JOINT DETAIL AND MAY BE APPROVED BY THE ENGINEER TO FACILITATE HANDLING; BUT THE TOP RAIL MUST BE CONTINUOUS ACROSS A MINIMUM OF TWO POSTS.
- HANDRAILS ARE REQUIRED AND MUST BE CONTINUOUS.
- INSTALLATION: CUTTING OF REINFORCING STEEL IS PERMITTED FOR POST INSTALLED ANCHORS.
- ALL HAND RAIL COMPONENTS SHALL BE PAINTED BLACK WITH COATING COMPLYING WITH AAMA 2605.179, EXCEPT THAT ONLY FLUOROPOLYMER BASED POWDERS ARE PERMITTED.
- FOR SETTING ANCHOR BOLTS, THE CONTRACTOR SHALL USE AN ADHESIVE BONDING SYSTEM. LEVEL ONE FIELD TESTING OF BONDING SYSTEM IS REQUIRED. THE ADHESIVE BONDING SYSTEM SHALL BE CHOSEN FROM THOSE ON THE NCDOT APPROVED PRODUCTS LIST. THE ADHESIVE BONDING SYSTEM SHALL HAVE A MINIMUM PULLOUT STRENGTH OF 10 KIPS.



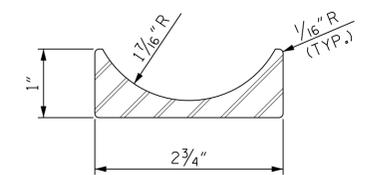
ALTERNATIVE BOTTOM & INTERMEDIATE RAIL SECTION



SCREW SLOT DETAIL



POST SCREW SLOT SECTION



OPTIONAL TOP PLATE EXTRUSION SECTION

PROJECT NO. U-5928
WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 3 OF 5



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 FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA
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 METAL HANDRAIL
 TYPICAL SECTION
 AND DETAILS

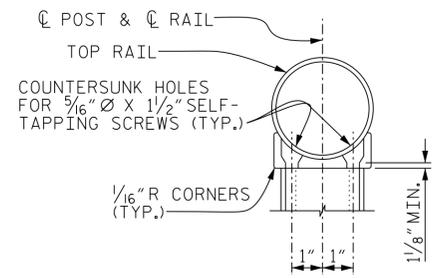
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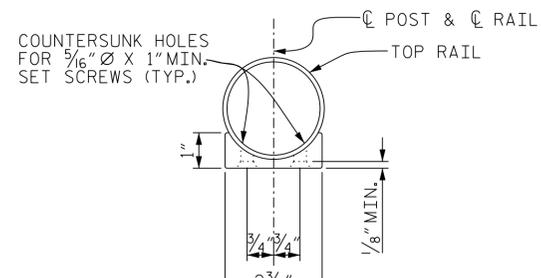
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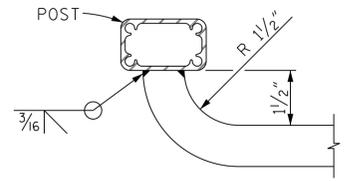
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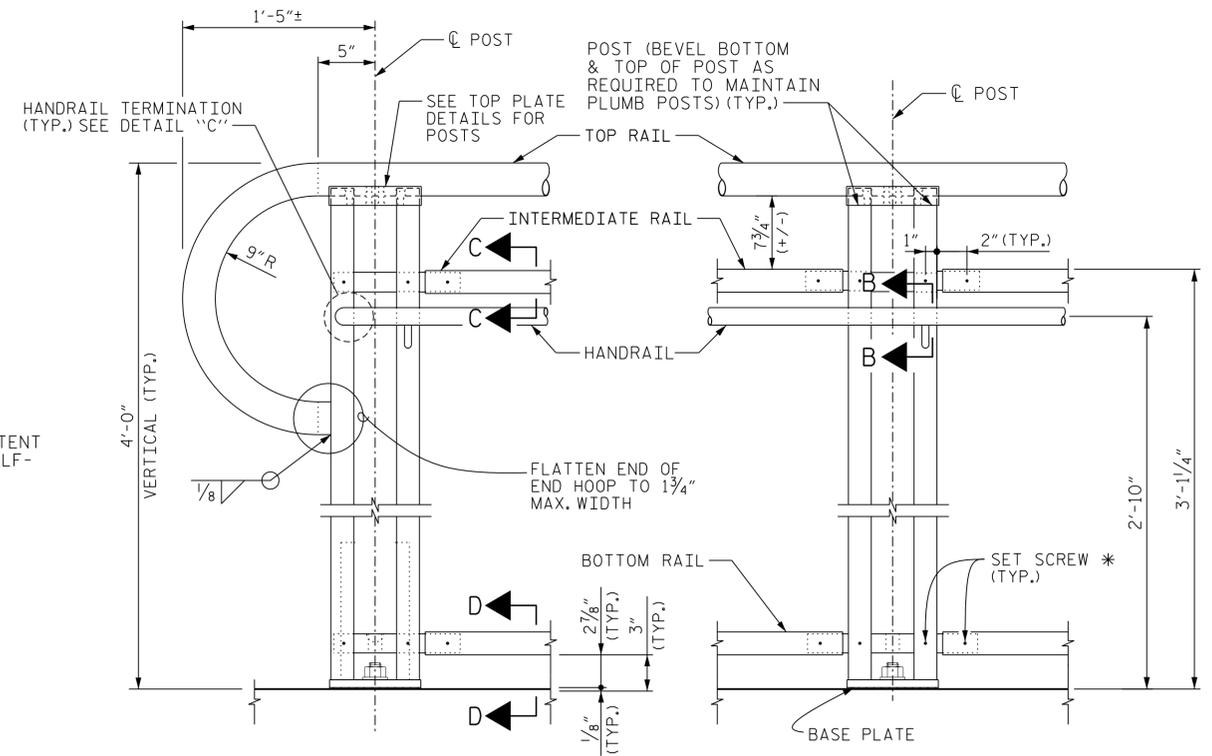
SECTION A-2



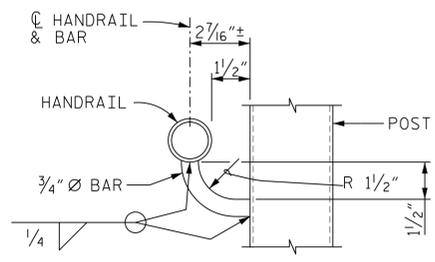
SECTION A-1



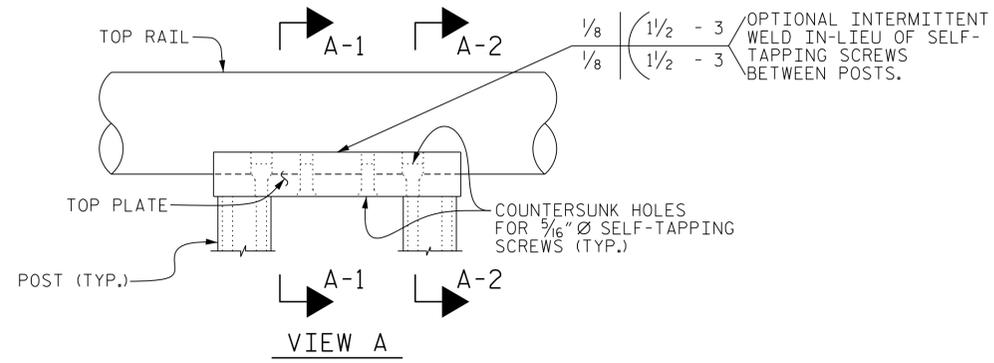
DETAIL "C"
HANDRAIL TERMINATION
(SHOWING PLAN VIEW)



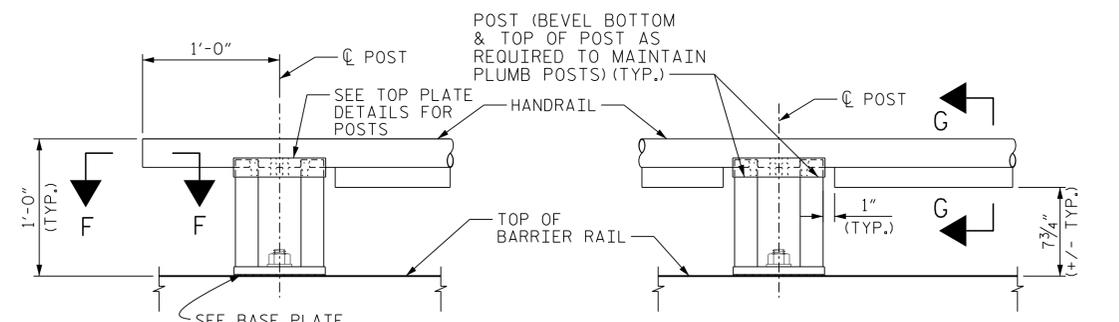
DETAIL "A" - RAIL CONNECTIONS
(SHOWING INSIDE FACE OF RAILING)



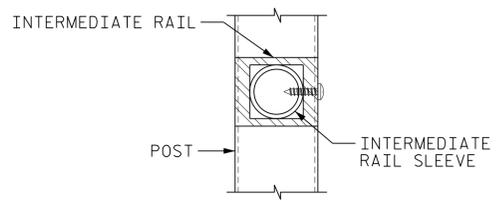
SECTION B-B
(HANDRAIL CONNECTION)



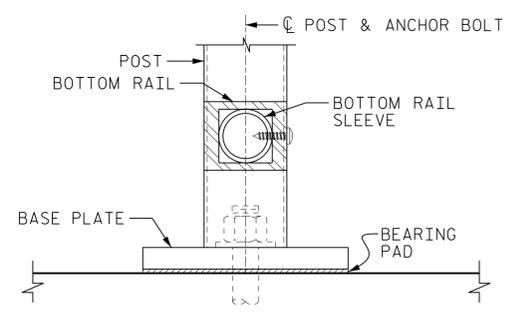
TOP PLATE DETAILS FOR POST
(SCREWS NOT SHOWN FOR CLARITY)



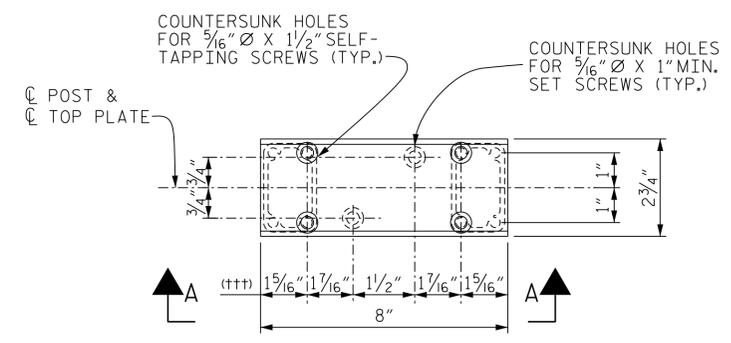
DETAIL "B" - RAIL CONNECTIONS
(SHOWING INSIDE FACE OF RAILING)



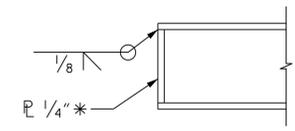
SECTION C-C
(INTERMEDIATE RAIL CONNECTION)



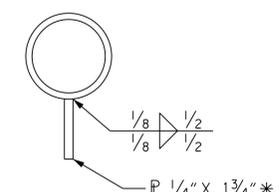
SECTION D-D
(BOTTOM RAIL CONNECTION)



TOP PLATE DETAILS FOR POST
(SCREWS NOT SHOWN FOR CLARITY)



SECTION F-F



SECTION G-G

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WAKE COUNTY
 STATION: 22+77.76 -L-
 SHEET 4 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 METAL HANDRAIL
 TYPICAL SECTION
 AND DETAILS

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Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources



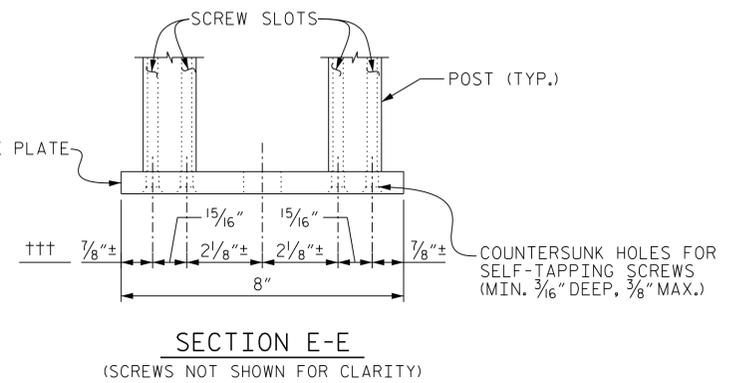
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MI ENGINEERING
 1011 SCHAUH DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

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2			4			50

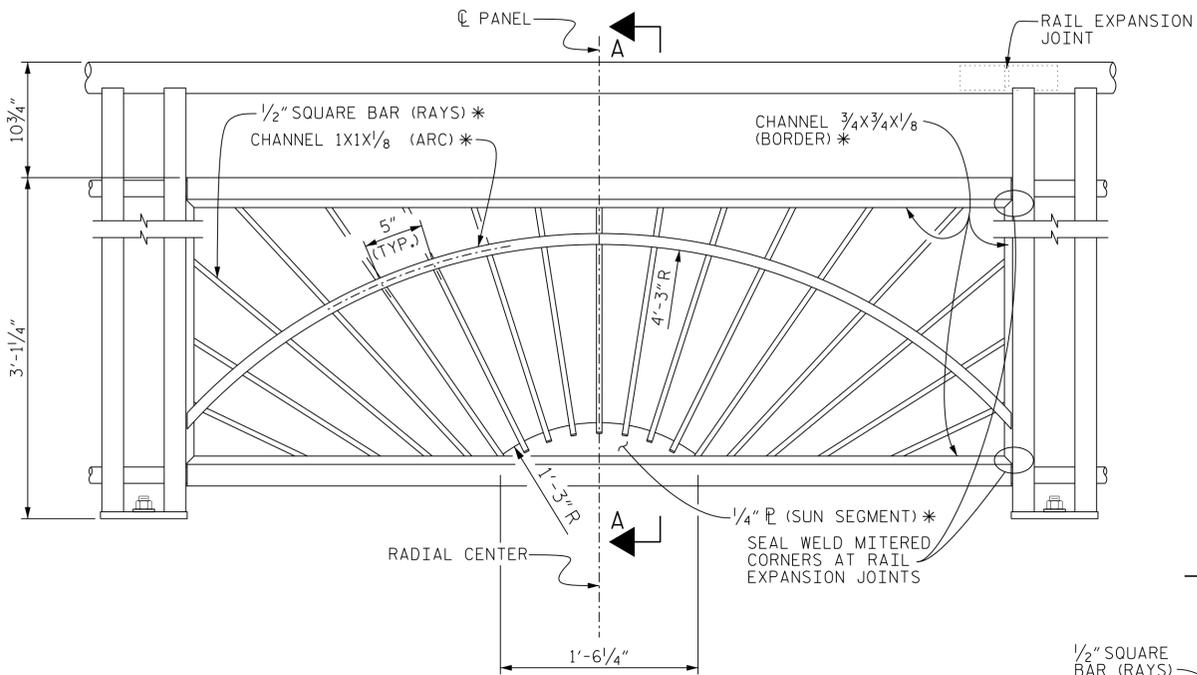
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BASE PLATE DETAILS FOR POST
 (SCREWS NOT SHOWN FOR CLARITY)



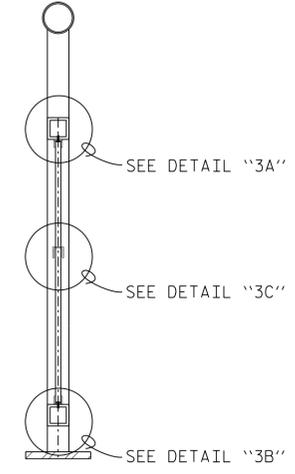
SECTION E-E
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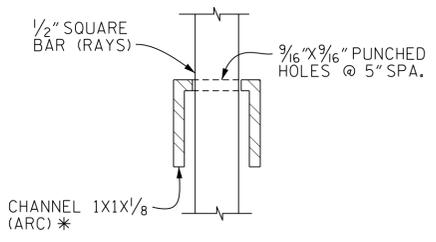


TYPE 3 - SUNSHINE INFILL PANEL

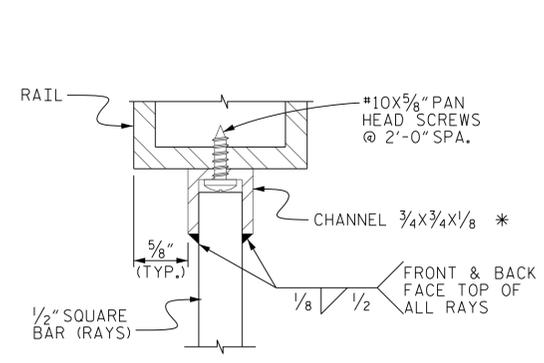
* ARC, RAYS AND SUN SEGMENT MAY BE FORMED IN A SINGLE PANEL FROM 1/2" PLATE (ASTM B209 ALLOY 6061-T6 OR T651) PATTERN CUT WITH LASER OR PLASMA CNC, WELDED TO A 1X1/8" ANGLE BORDER OR THE 3/4X3/4X1/8" CHANNEL BORDER SHOWN.



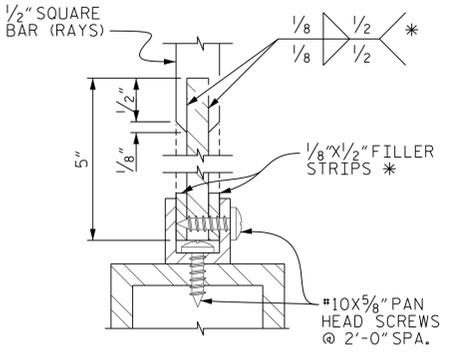
SECTION A-A



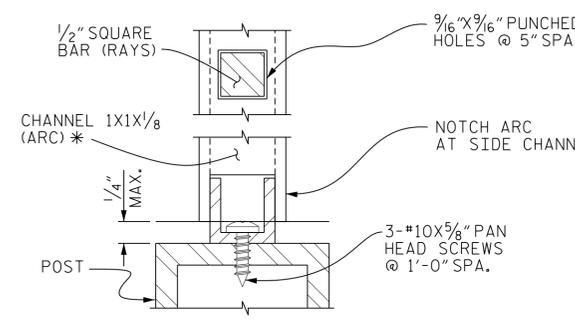
**DETAIL "3C"
RAY/ARC CONNECTION**



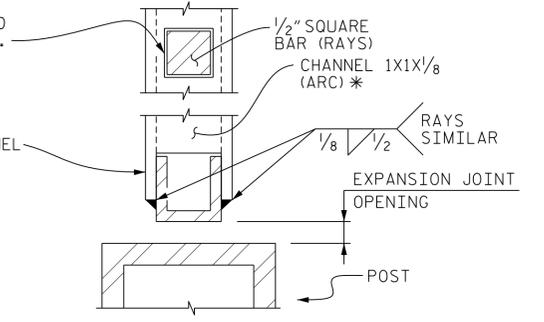
**DETAIL "3A"
INTERMEDIATE RAIL/RAY
CONNECTION**



**DETAIL "3B"
BOTTOM RAIL/RAY CONNECTION**



**DETAIL "3D"
ARC/POST CONNECTION
(CONTINUOUS TOP RAIL)**



**DETAIL "3E"
PANEL END CONNECTION
AT POST WITH EXPANSION JOINT**

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Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources

PROJECT NO. U-5928
WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 5 OF 5



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 METAL HANDRAIL
 TYPICAL SECTION
 AND DETAILS

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 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

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DESIGN ENGINEER OF RECORD : <u>P.A. de PAOLI</u>	DATE : <u>10/20</u>

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NOTES

FOR BRIDGE MOUNTED CHAIN LINK FENCE, SEE SPECIAL PROVISIONS.

MATERIAL FOR ANCHOR BOLTS SHALL BE TYPE 304 STAINLESS STEEL WITH A MINIMUM 9000 PSI ULTIMATE STRENGTH. NUTS AND WASHERS SHALL BE TYPE 304 STAINLESS STEEL. ANCHOR BOLTS SHALL BE EMBEDDED AS PER ADHESIVE BONDING SYSTEM MANUFACTURER SPECIFICATIONS. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK NUTS, CLASS 2B THREADS.

FOR SETTING ANCHOR BOLTS, THE CONTRACTOR SHALL USE AN ADHESIVE BONDING SYSTEM. LEVEL ONE FIELD TESTING OF BONDING SYSTEM IS REQUIRED.

ADHESIVE BONDING SYSTEM SHALL HAVE MINIMUM PULLOUT STRENGTH OF 10 KIPS. THE ADHESIVE BONDING SYSTEM SHALL BE CHOSEN FROM THOSE ON THE NCDOT APPROVED PRODUCTS LIST.

ALL FENCE MATERIAL SHALL MEET THE REQUIREMENTS OF SECTION 1050 OF THE STANDARD SPECIFICATIONS. VINYL COAT ALL STEEL PARTS AND HARDWARE IN ACCORDANCE WITH ARTICLE 1050 OF THE STANDARD SPECIFICATIONS.

ALL POSTS AND BRACE RAILS SHALL BE HIGH STRENGTH GRADE, SCHEDULE 40, GALVANIZED STEEL PIPE.

WELDING SHALL BE DONE IN ACCORDANCE WITH ARTICLE 1072-20 OF STANDARD SPECIFICATIONS.

ALL FENCE COMPONENTS SHALL BE VINYL COATED - BLACK.

104" CHAIN LINK FENCE
TOTAL PAY LENGTH 397.0 LIN. FT.

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Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources

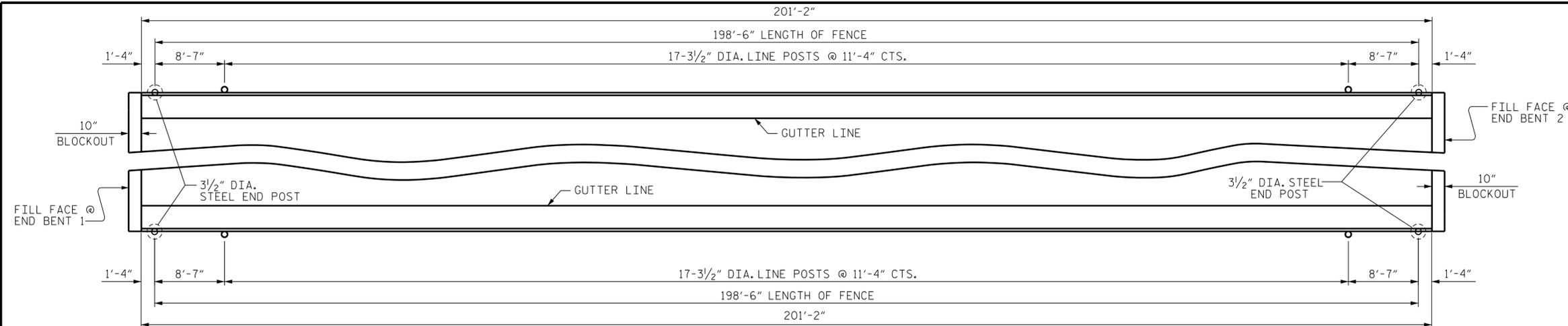
PROJECT NO. U-5928
WAKE COUNTY
STATION: 22+77.76 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
BRIDGE MOUNTED
CHAIN LINK FENCE
DETAILS

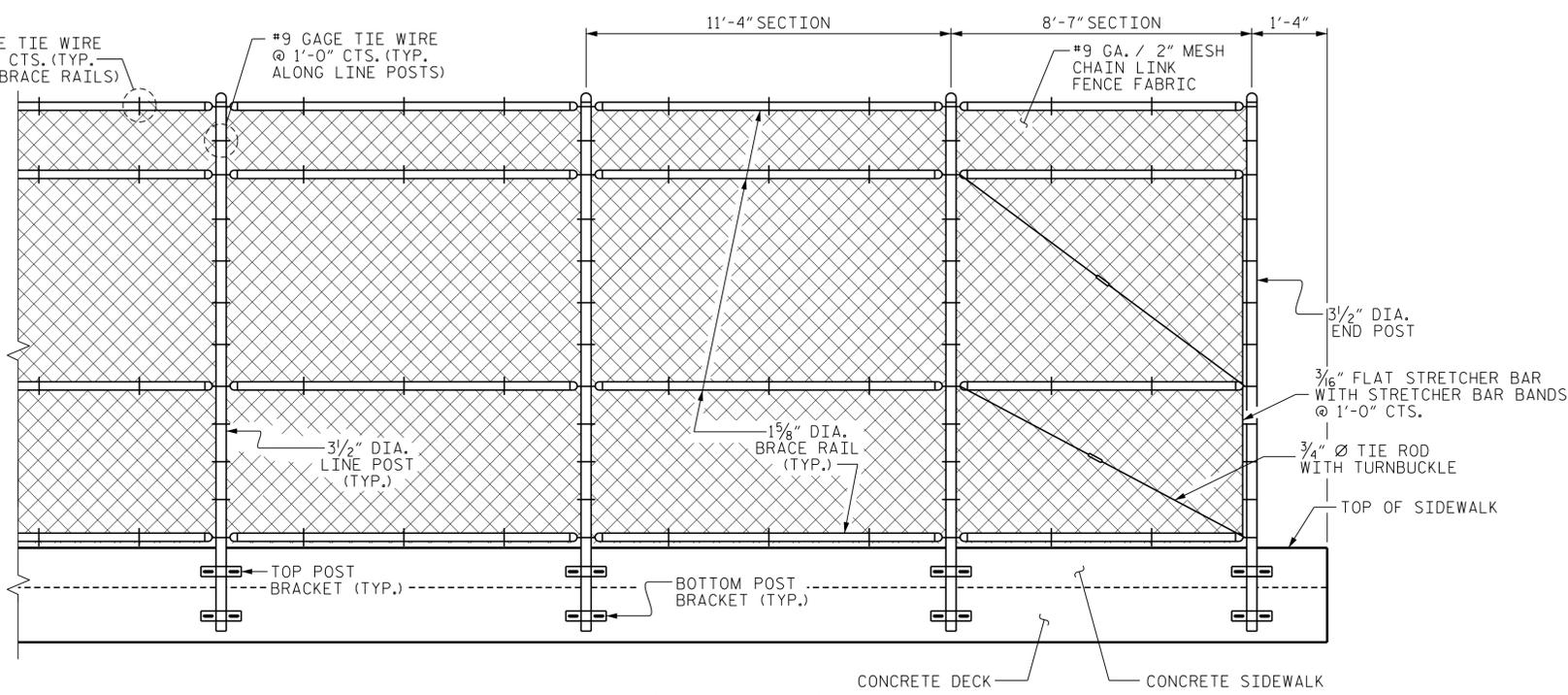


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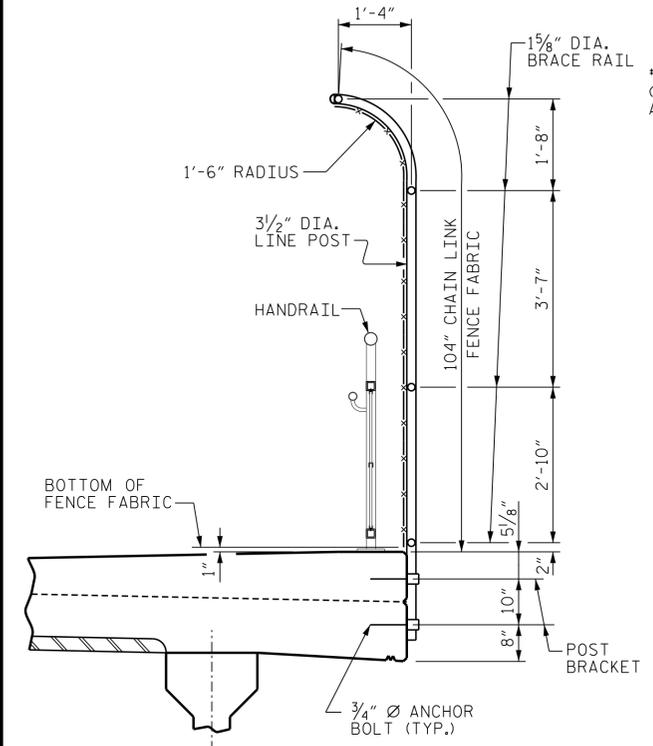
MI ENGINEERING 1011 SCHAUB DRIVE, SUITE 100 RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER: P-0671		REVISIONS		SHEET NO. S-28
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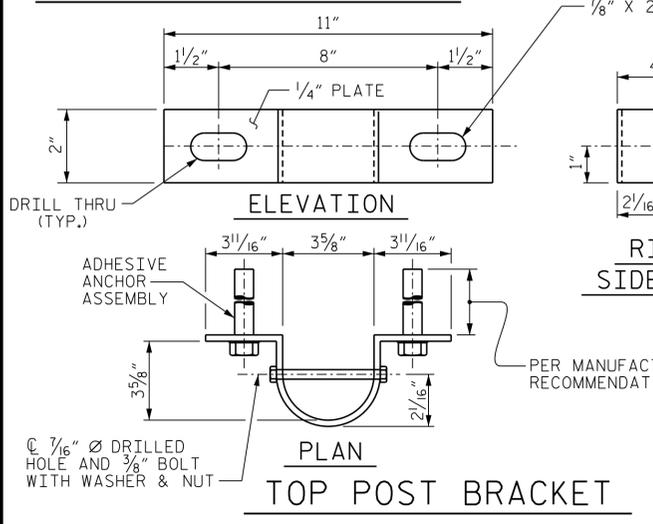
PLAN OF FENCE POST SPACING



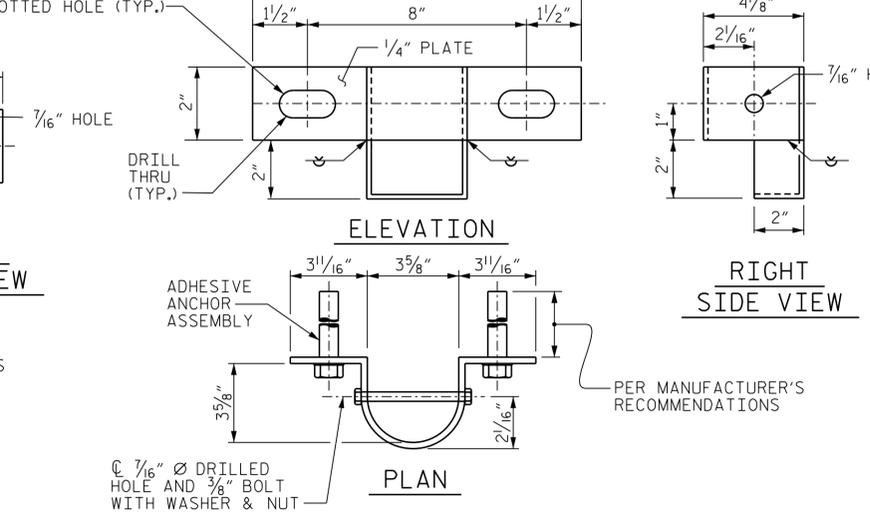
PARTIAL ELEVATION



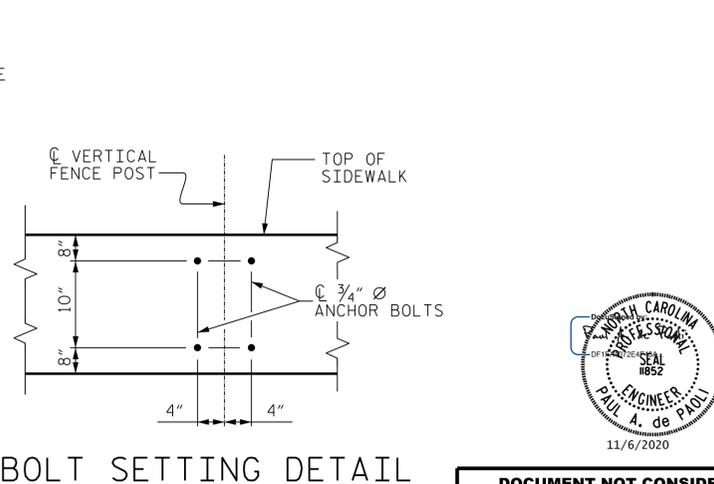
SECTION THRU FENCE



TOP POST BRACKET



BOTTOM POST BRACKET



BOLT SETTING DETAIL

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 DESIGN ENGINEER OF RECORD: P.A. de PAOLI DATE: 10/20

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD-DOWN PLATE AND 4 - 1/8" Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

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

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

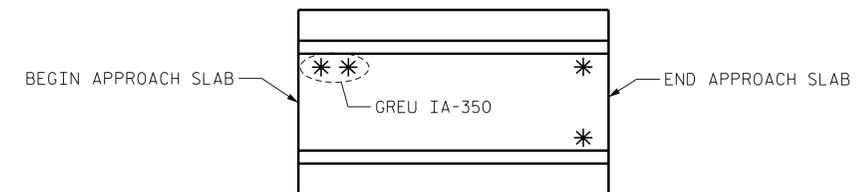
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.

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Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. U-5928
WAKE COUNTY
 STATION: 22+77.76 -L-



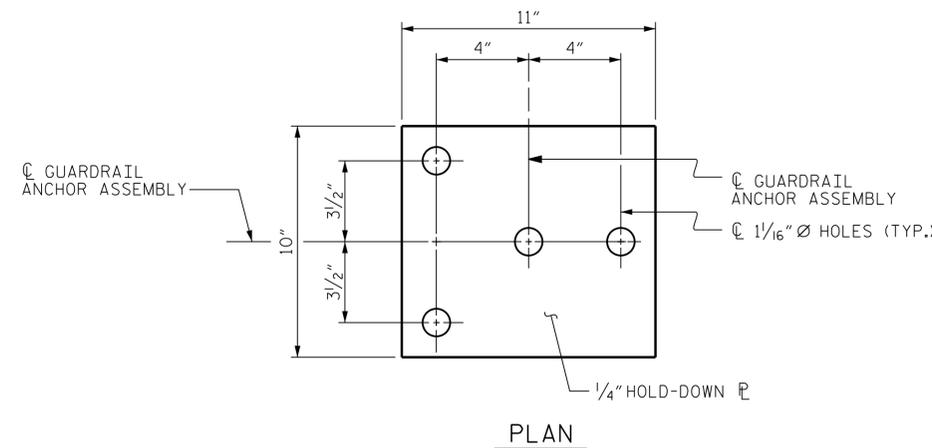
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 (919) 851-6606
 FIRM PE NUMBER: P-0671

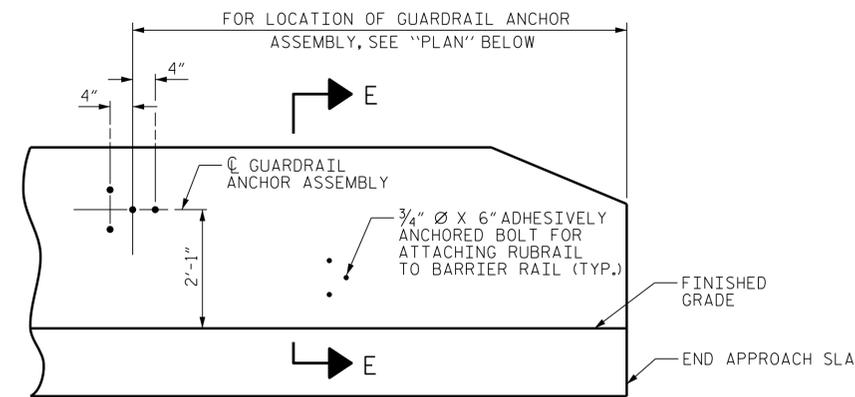
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 FOR BARRIER RAIL

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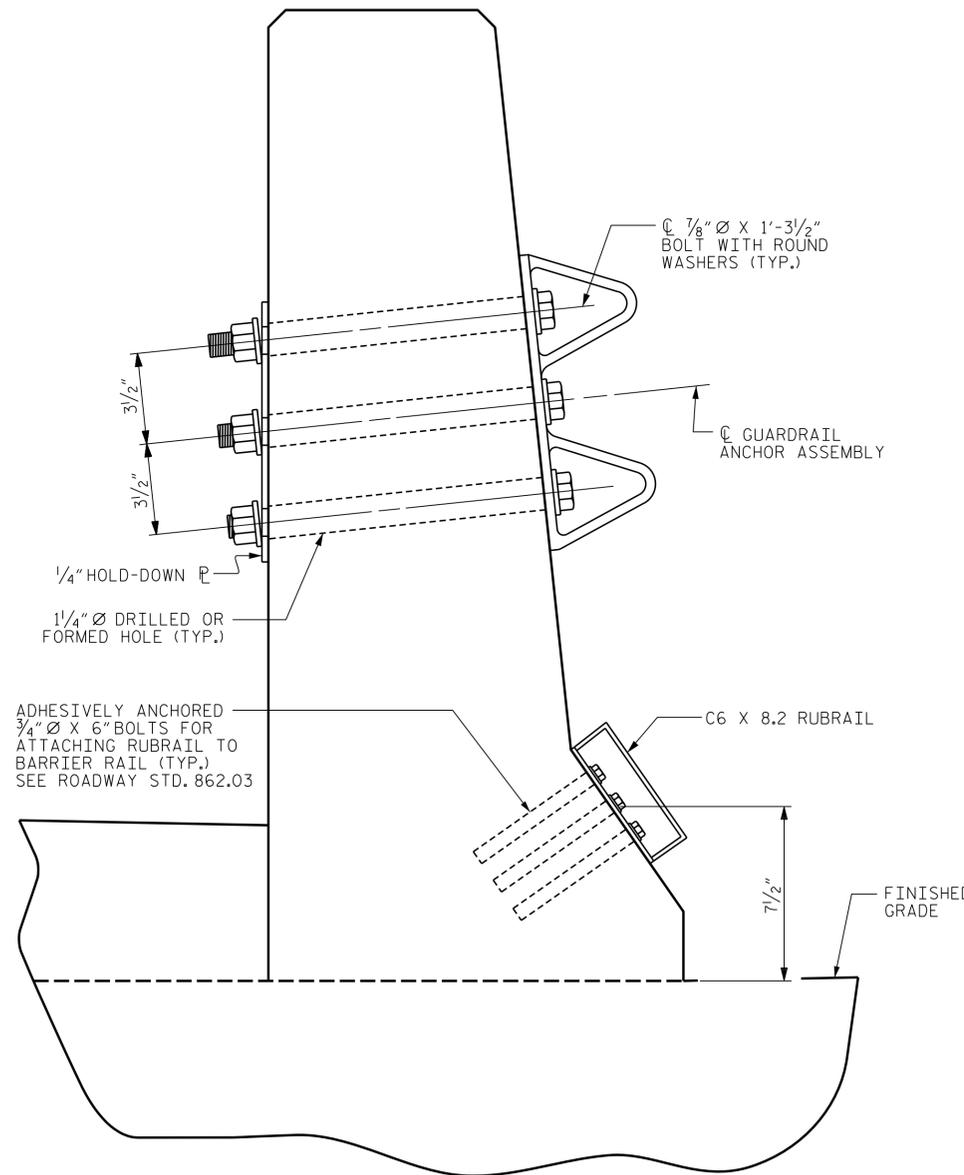
(SHT 1) STD. NO. GRA2



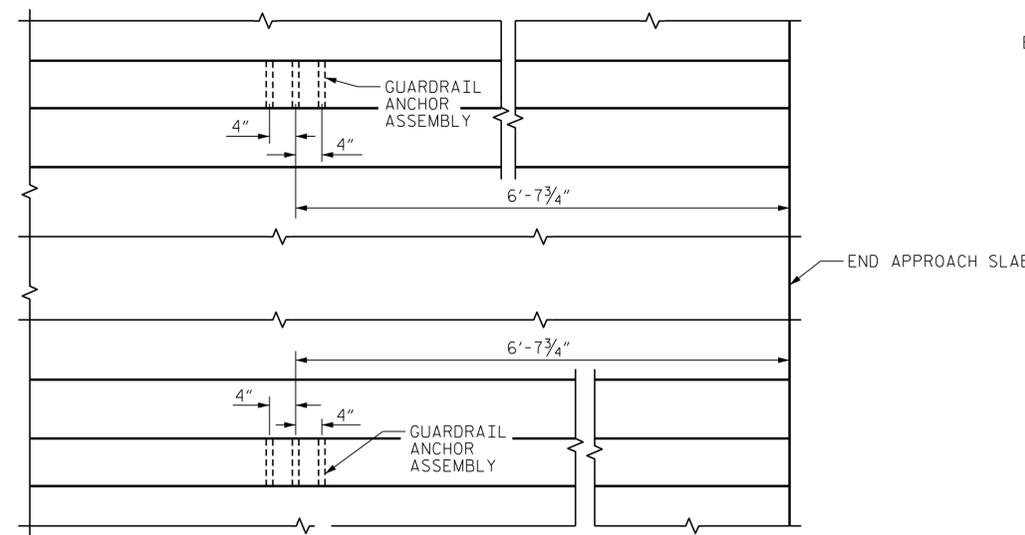
PLAN



ELEVATION



SECTION E-E
 GUARDRAIL ANCHOR ASSEMBLY DETAILS

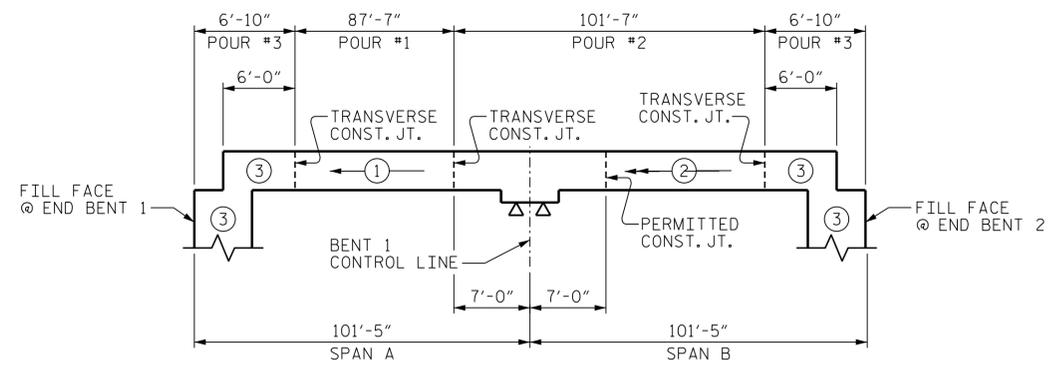


LOCATION OF ANCHORS FOR GUARDRAIL

APPROACH SLAB 2 SHOWN

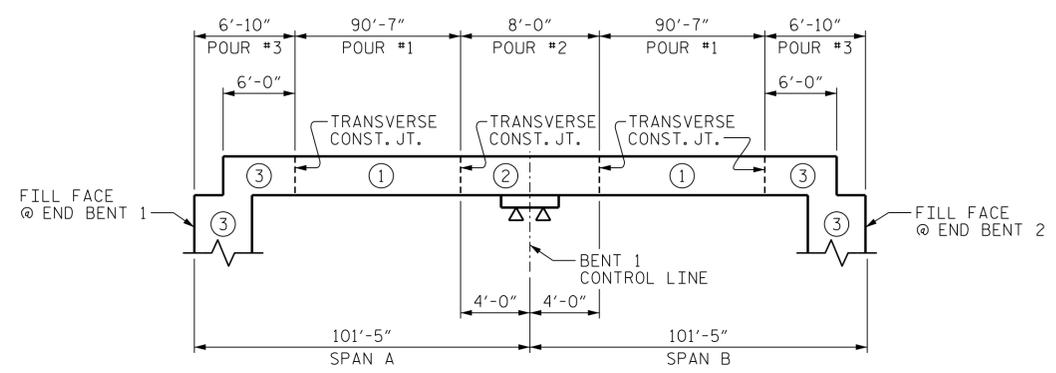
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CHECKED BY: P.A. de PAOLI	DATE: 05/19
DESIGN ENGINEER OF RECORD: P.A. de PAOLI	DATE: 03/20
DRAWN BY: TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY: GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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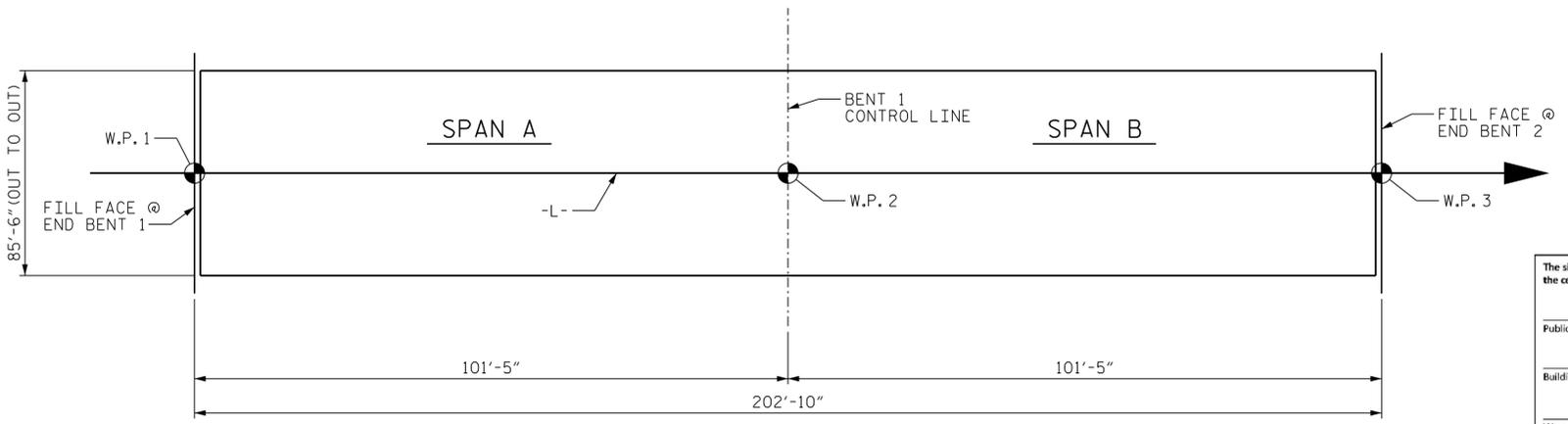
POURING SEQUENCE

① INDICATES POUR NUMBER AND DIRECTION OF POUR



OPTIONAL POURING SEQUENCE

POUR ② SHALL NOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3,000 PSI.

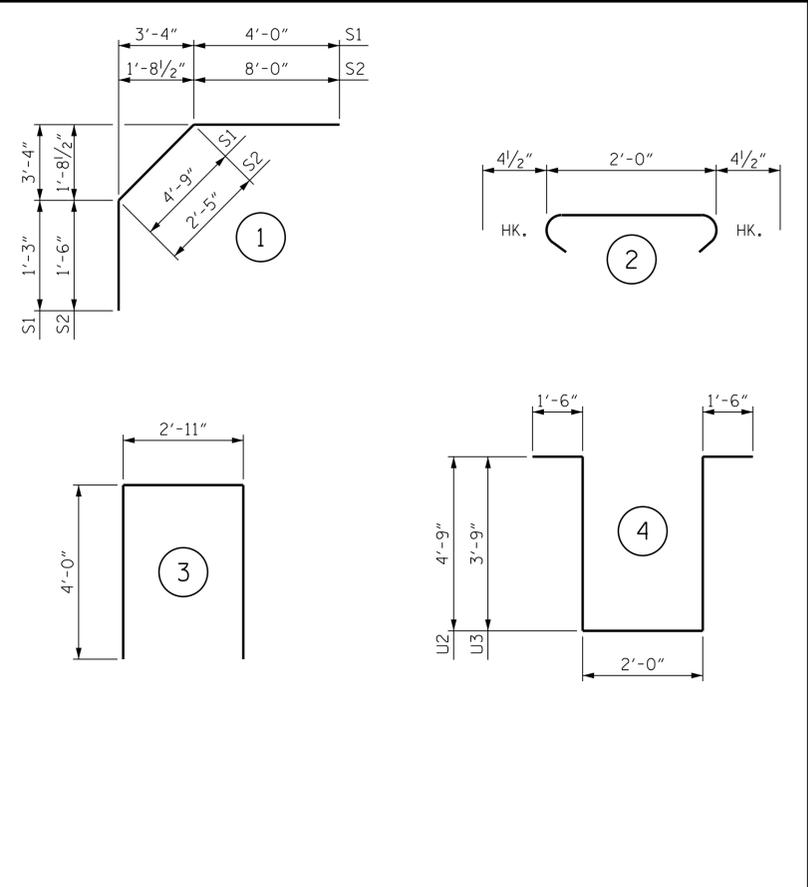


LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 17,342)

REINFORCING BAR SCHEDULE

SPANS A & B						
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	402	#5	STR	35'-2"	14745	
*A2	402	#5	STR	52'-7"	22047	
A3	402	#5	STR	30'-8"	12858	
A4	402	#5	STR	56'-9"	23794	
B1	400	#5	STR	44'-8"	18635	
B2	100	#6	STR	31'-0"	4656	
*B3	264	#4	STR	23'-10"	4203	
*B4	132	#6	STR	23'-4"	4626	
*B5	126	#6	STR	20'-4"	3848	
*B6	387	#6	STR	25'-8"	14919	
*B7	126	#6	STR	31'-0"	5867	
K1	30	#4	STR	29'-7"	593	
K2	18	#4	STR	6'-2"	74	
K3	18	#4	STR	7'-1"	85	
K4	36	#4	STR	7'-8"	184	
K5	18	#4	STR	6'-8"	80	
K6	4	#4	STR	2'-1"	6	
K7	4	#4	STR	2'-7"	7	
K8	8	#4	STR	2'-10"	15	
K9	4	#4	STR	2'-4"	6	
K10	15	#4	STR	27'-5"	275	
K11	18	#4	STR	5'-0"	60	
K12	18	#4	STR	7'-1"	85	
K13	36	#4	STR	7'-8"	184	
K14	18	#4	STR	6'-8"	80	
K15	10	#4	STR	3'-11"	26	
K16	6	#4	STR	3'-11"	16	
*S1	138	#4	1	10'-0"	922	
*S2	138	#4	1	11'-11"	1099	
S3	468	#4	2	2'-9"	860	
U1	138	#4	3	10'-11"	1006	
U2	45	#4	4	14'-6"	436	
U3	18	#4	4	12'-6"	150	

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

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

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	*EPOXY COATED REINFORCING STEEL (LBS.)
POUR #1	229.9	-	-
POUR #2	294.8	-	-
POUR #3	121.3	-	-
TOTALS**	646.0	64,171	72,276

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS

APPROACH SLABS	2312 SQ.FT.
BRIDGE DECK	9556 SQ.FT.
TOTAL	11868 SQ.FT.

PROJECT NO. U-5928
 WAKE COUNTY
 STATION: 22+77.76 -L-

The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed on the cover sheet of these construction plans.

Public Works - Transportation _____
 Building Inspections _____
 Water Resources - Utility Engineering _____
 Electric _____
 Water Resources - Soil & Erosion Control _____

Water Resources - Stormwater _____
 Planning _____
 Planning - Transportation _____
 Fire _____
 Parks, Recreation & Cultural Resources _____



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MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

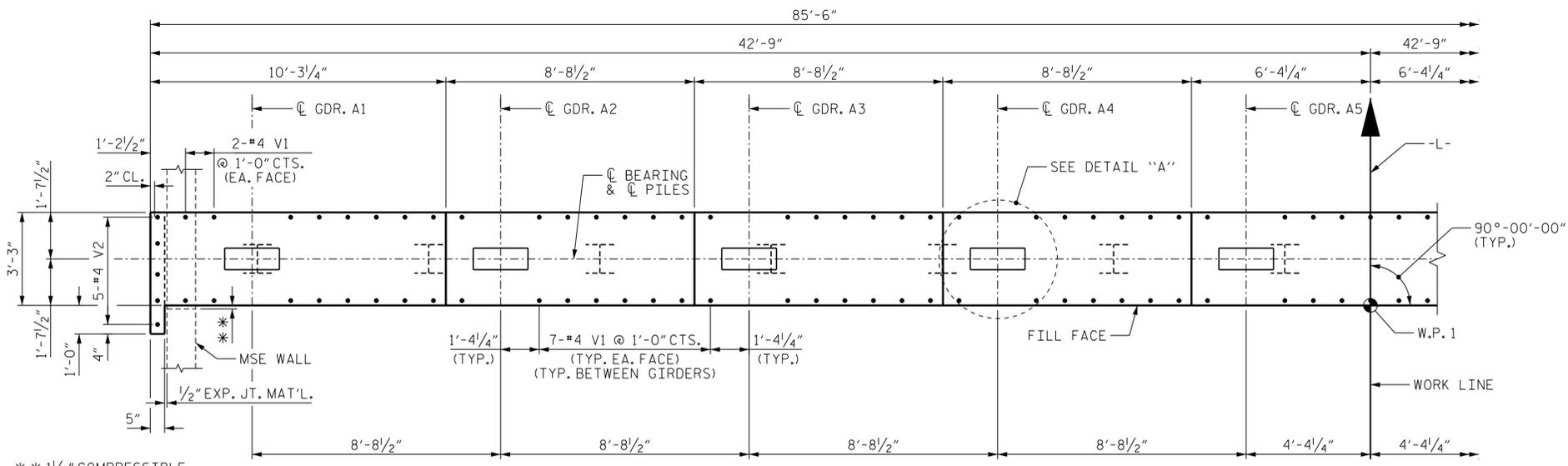
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 SUPERSTRUCTURE
 BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-30
2			4			TOTAL SHEETS 50

STD. NO. BOM2

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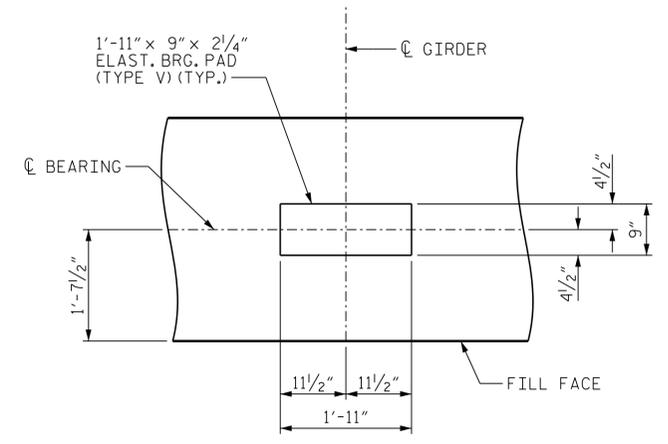
ASSEMBLED BY: B.E. LANNING	DATE: 05/19
CHECKED BY: P.A. de PAOLI	DATE: 06/19
DESIGN ENGINEER OF RECORD: P.A. de PAOLI	DATE: 03/20
DRAWN BY: JMB 5/87	REV. 5/1/06 TLA/GM
CHECKED BY: SJD 9/87	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC



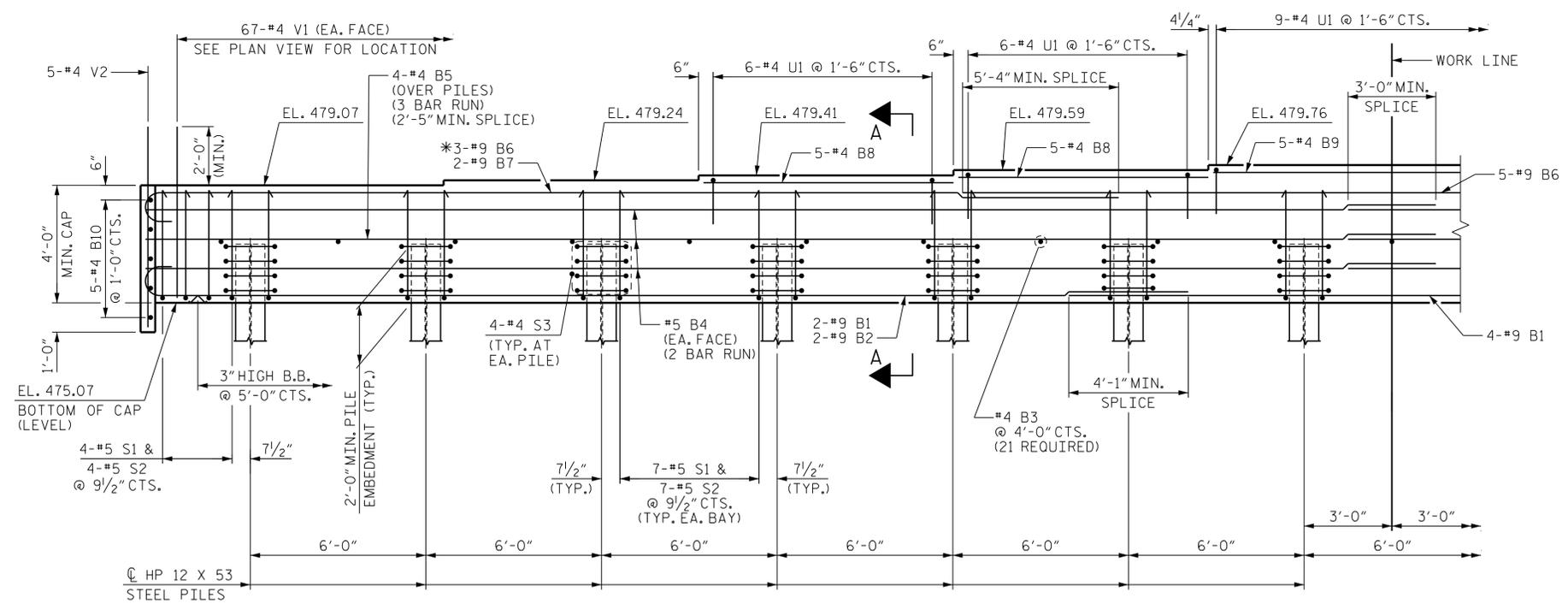
PLAN

* * 1/2" COMPRESSIBLE EXP. JT. MAT'L.

NOTES
 THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BEARING AREA SHALL BE RAKED TO A DEPTH OF 1/4".
 FOR SECTION A-A, SEE SHEET 3 OF 3.
 FOR PILE SPLICE DETAILS AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 3 OF 3.
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.
 DIMENSIONS ARE BASED ON ASSUMED WALL THICKNESS OF 1'-0". ADJUST DIMENSIONS BASED ON APPROVED WALL SUBMITTALS.

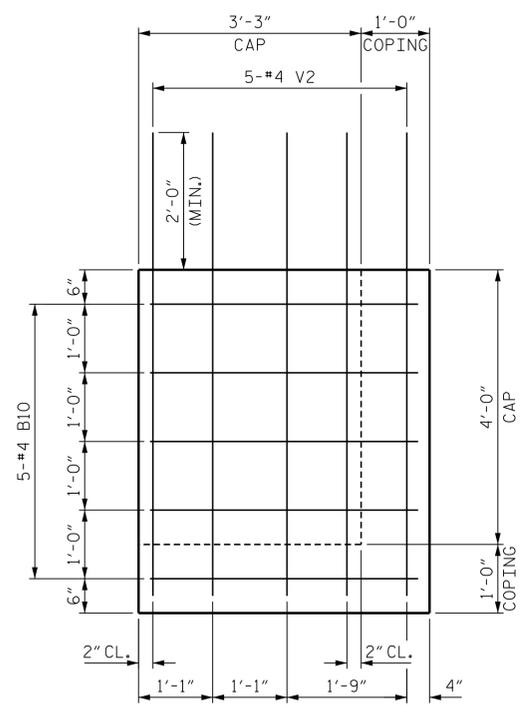


DETAIL "A"



ELEVATION

* #9 B6 TO SPLICE WITH #9 B7 AT ALTERNATE LOCATIONS.



END OF CAP VIEW
 (LEFT END SHOWN, RIGHT END SIMILAR)

PROJECT NO. U-5928
WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 1 OF 3

The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed on the cover sheet of these construction plans.

Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources



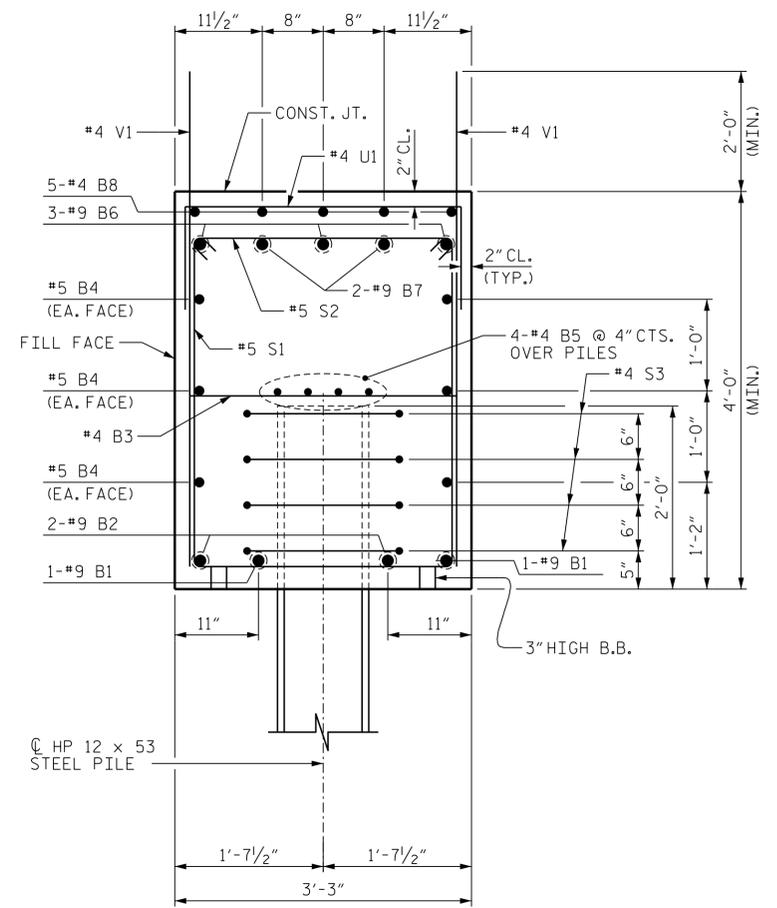
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

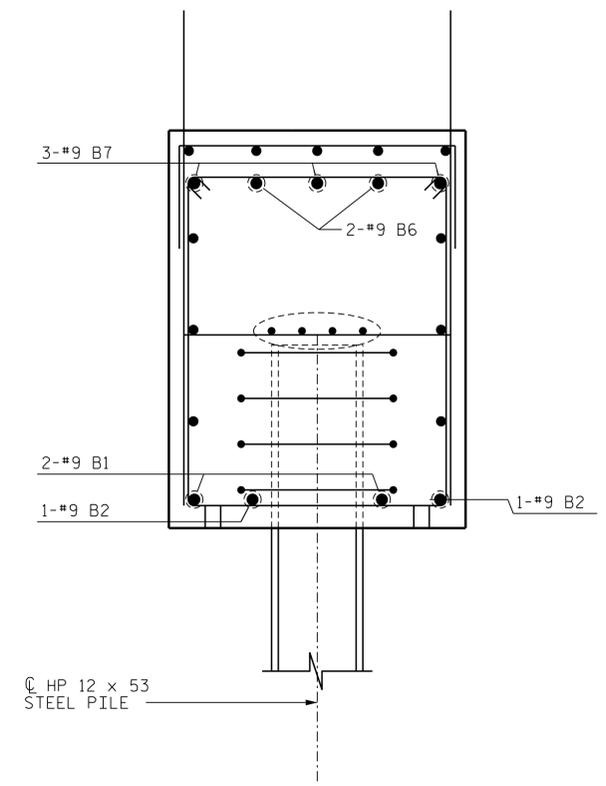
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 1 PLAN AND ELEVATION					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-31					TOTAL SHEETS 50

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DRAWN BY: B.E. LANNING DATE: 05/19
 CHECKED BY: P.A. de PAOLI DATE: 05/19
 DESIGN ENGINEER OF RECORD: P.A. de PAOLI DATE: 10/20

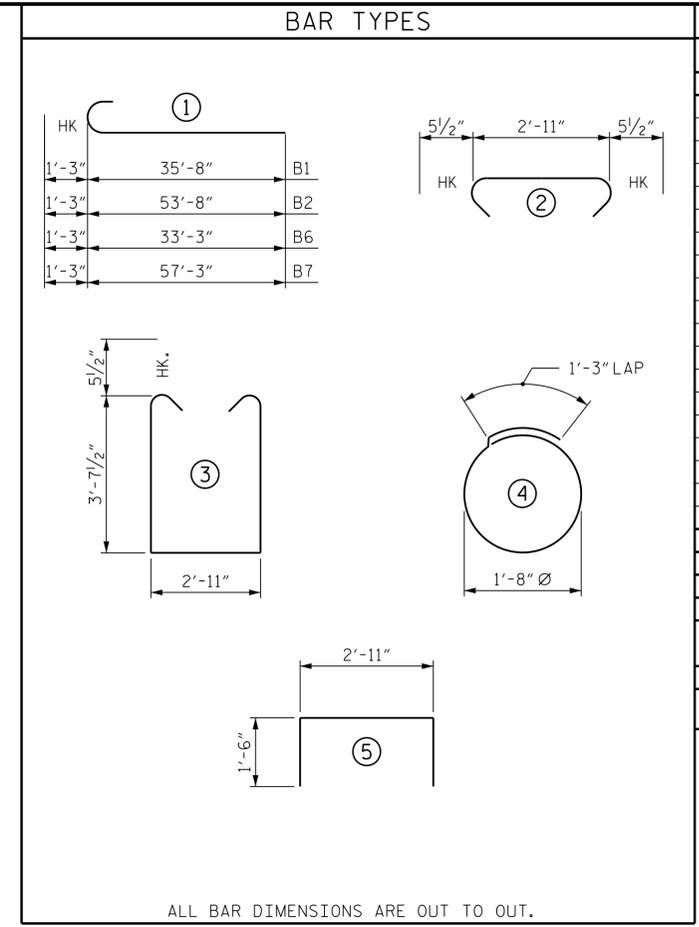


SECTION A-A



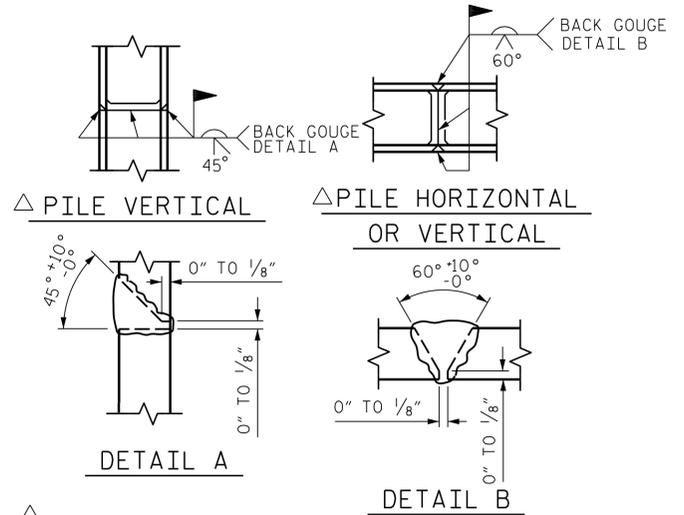
SECTION B-B

SEE SECTION A-A FOR OTHER DIMENSIONS AND BAR DETAILS

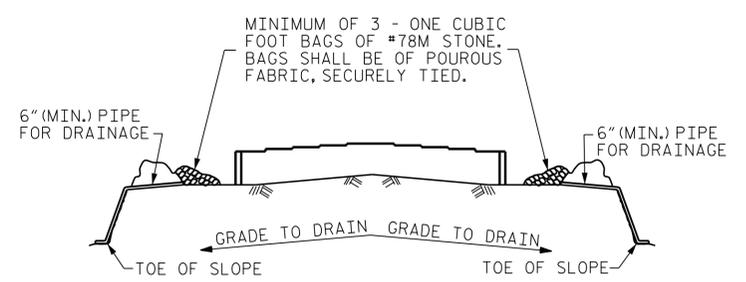


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	1	36'-11"	502
B2	4	#9	1	54'-11"	747
B3	21	#4	STR	2'-11"	41
B4	12	#5	STR	44'-1"	552
B5	12	#4	STR	30'-0"	240
B6	5	#9	1	34'-6"	587
B7	5	#9	1	58'-6"	995
B8	20	#4	STR	8'-4"	111
B9	5	#4	STR	12'-4"	41
B10	10	#4	STR	3'-11"	26
S1	99	#5	3	11'-1"	1144
S2	99	#5	2	3'-10"	396
S3	56	#4	4	6'-6"	243
U1	33	#4	5	5'-11"	130
V1	134	#4	STR	6'-6"	582
V2	10	#4	STR	6'-10"	46
REINFORCING STEEL					6383 LBS.
CLASS A CONCRETE					44.7 C.Y.
HP 12 X 53 STEEL PILES				NO.:	14
				700.0 LIN. FT.	
STEEL PILE POINTS					14
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES					EA.: 14



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. MINES 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

The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed on the cover sheet of these construction plans.

Public Works – Transportation	Water Resources – Stormwater
Building Inspections	Planning
Water Resources – Utility Engineering	Planning – Transportation
Electric	Fire
Water Resources – Soil & Erosion Control	Parks, Recreation & Cultural Resources

PROJECT NO. U-5928
WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1
 DETAILS AND
 BILL OF MATERIAL

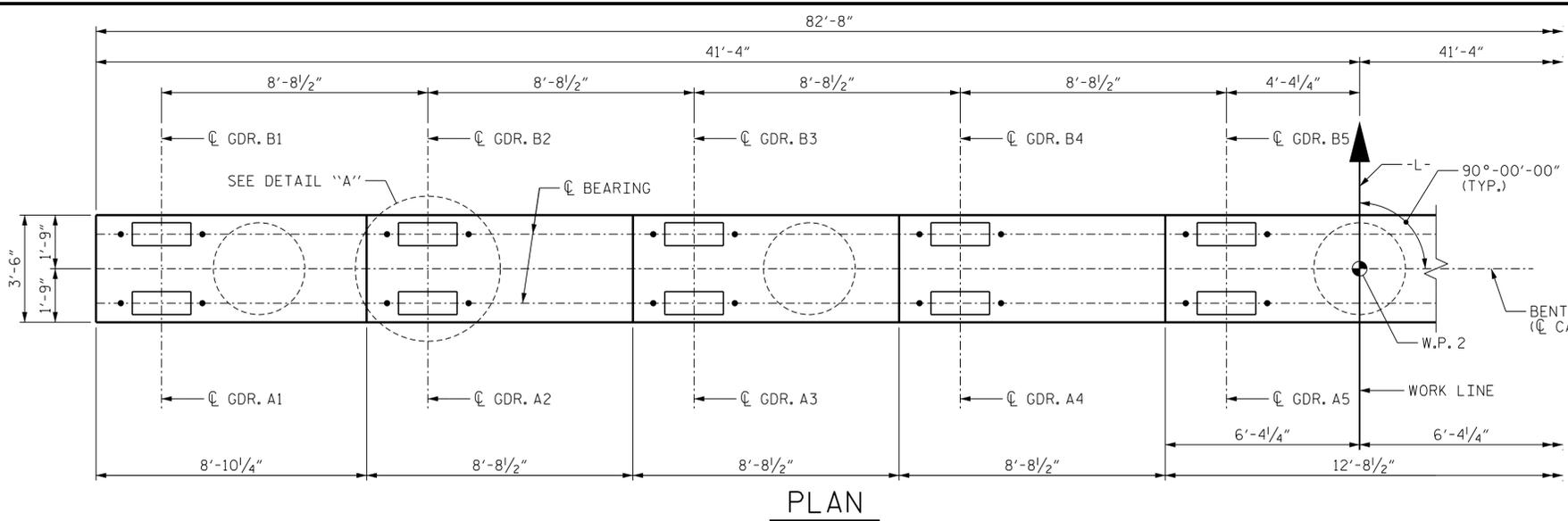
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			50

DRAWN BY: <u>B.E. LANNING</u>	DATE: <u>05/19</u>
CHECKED BY: <u>P.A. de PAOLI</u>	DATE: <u>05/19</u>
DESIGN ENGINEER OF RECORD: <u>P.A. de PAOLI</u>	DATE: <u>10/20</u>

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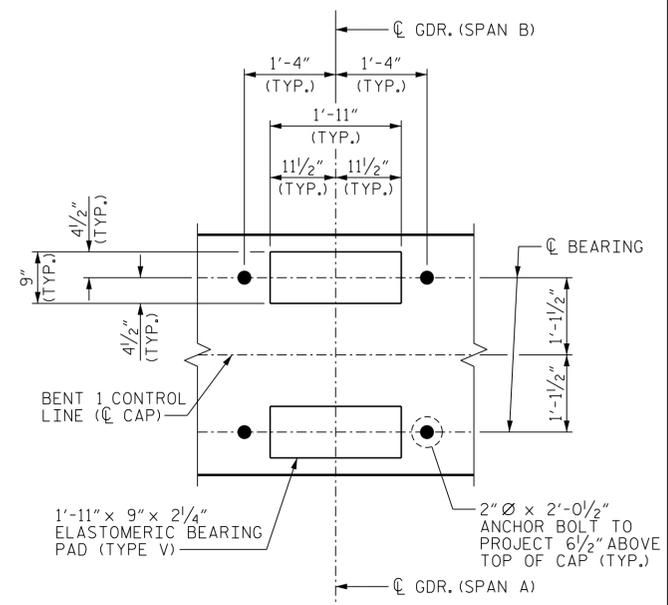


PLAN

SPAN B

SPAN A

NOTES
 STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 FOR PILE SPLICE DETAILS, SEE END BENT 1 SHEET 3 OF 3.
 FOR SECTION A-A AND END ELEVATION, SEE SHEET 3 OF 3.
 FOR END ELEVATION VIEW, SEE SHEET 2 OF 3.
 ⊗ INVERT ONE BAR IN EACH PAIRS OF STIRRUPS.



DETAIL "A"

(DIMENSIONS ARE TYPICAL AT EACH BEARING)

The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed on the cover sheet of these construction plans.

Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources

PROJECT NO. U-5928
 WAKE COUNTY
 STATION: 22+77.76 -L-

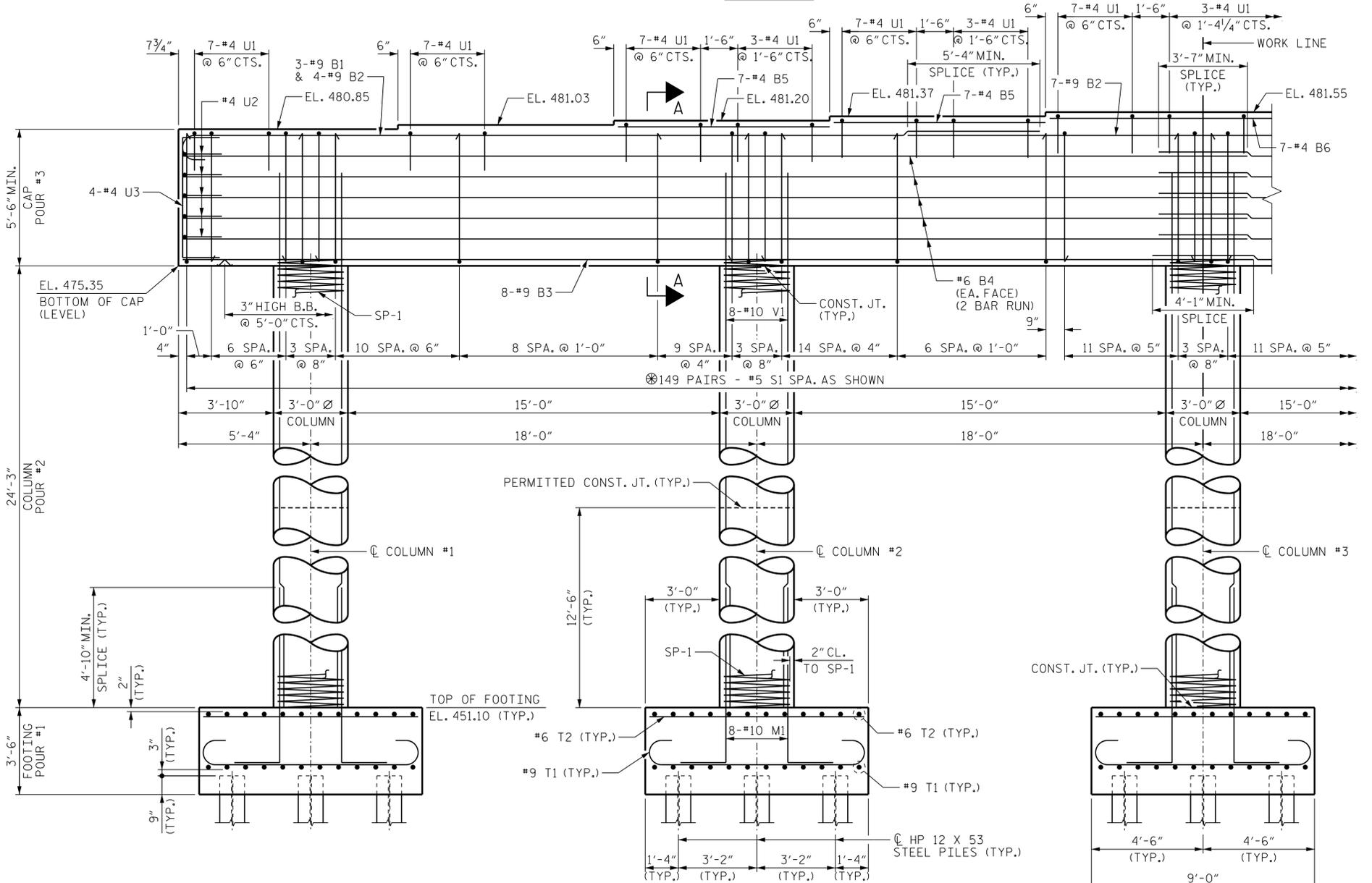
SHEET 1 OF 3



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 1011 SCHAUB DRIVE, SUITE 100
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 (919) 851-6606
 FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 1 PLAN AND ELEVATION					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-34					TOTAL SHEETS 50

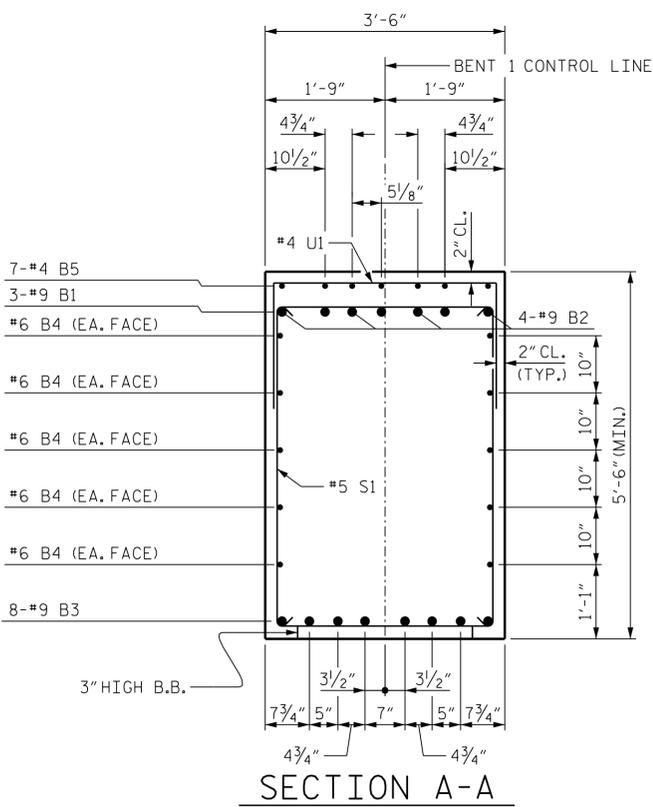


ELEVATION

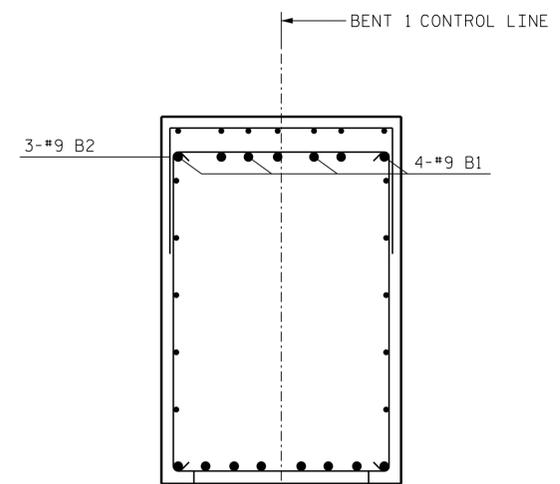
REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED

DRAWN BY: B.E. LANNING	DATE: 05/19
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DESIGN ENGINEER OF RECORD: P.A. de PAOLI	DATE: 10/20

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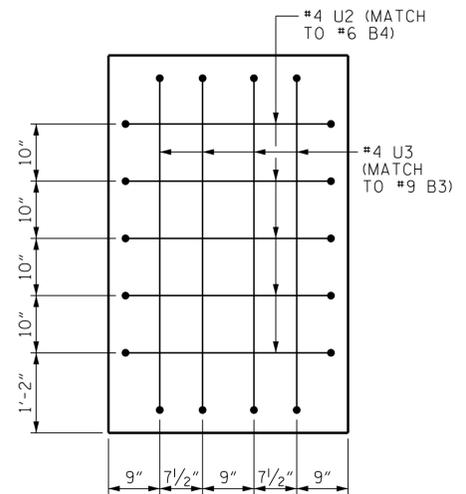


SECTION A-A



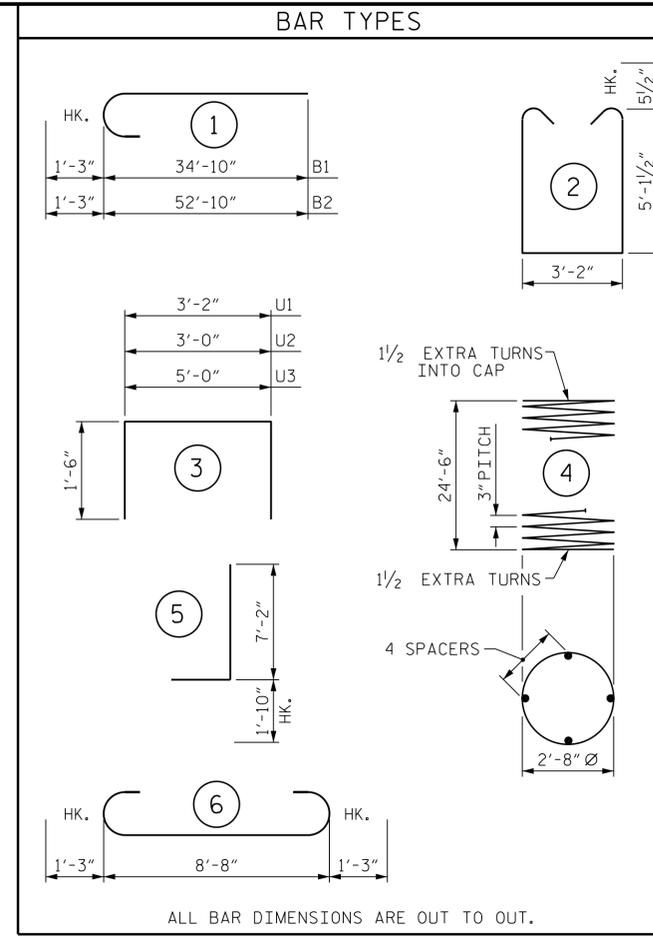
SECTION B-B

SEE SECTION A-A FOR OTHER DIMENSIONS AND BAR DETAILS



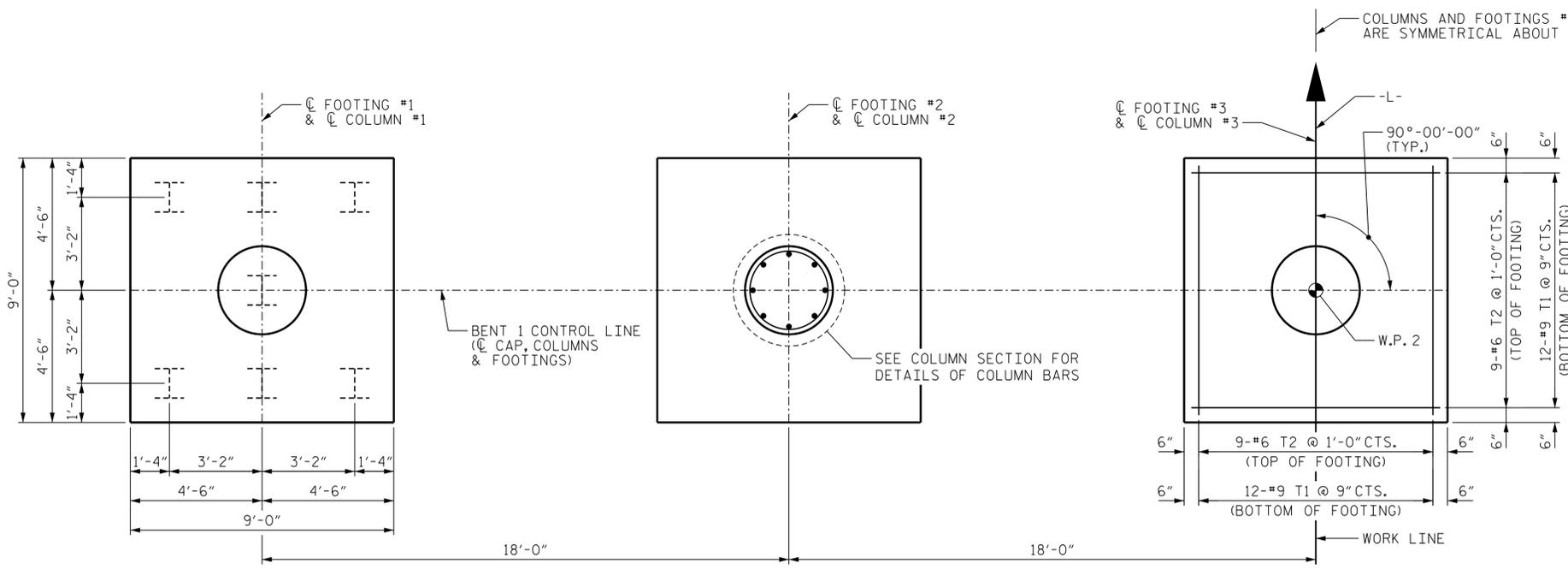
END OF CAP VIEW

(TYPICAL BOTH ENDS)



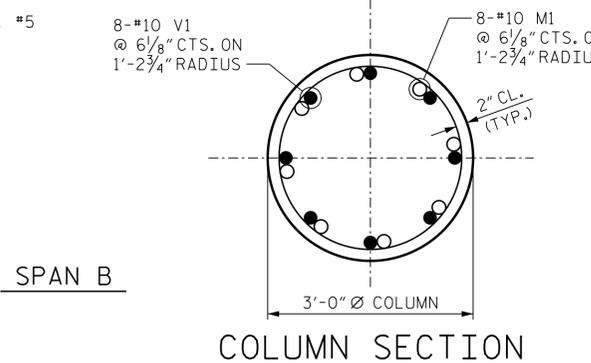
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL							
BENT 1							
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT			
B1	#9	1	36'-1"	859			
B2	#9	1	54'-1"	1287			
B3	#9	STR	43'-3"	2353			
B4	#6	STR	43'-0"	1292			
B5	#4	STR	8'-6"	159			
B6	#4	STR	12'-4"	58			
M1	#10	5	9'-0"	1549			
S1	#5	2	14'-4"	4455			
T1	#9	6	11'-2"	4556			
T2	#6	STR	8'-8"	1172			
U1	#4	3	6'-2"	350			
U2	#4	3	6'-0"	40			
U3	#4	3	8'-0"	43			
V1	#10	STR	28'-0"	4819			
REINFORCING STEEL				22,992	LBS.		
SPIRAL COLUMN REINFORCING STEEL							
SP-1				5	* 4	833'-4"	2783
SPIRAL COLUMN REINFORCING STEEL				2,783	LBS.		
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.							
CLASS A CONCRETE BREAKDOWN							
POUR #3 (CAP)				62.5	C.Y.		
POUR #2 (COLUMNS)				31.7	C.Y.		
POUR #1 (FOOTINGS)				52.5	C.Y.		
TOTAL				146.7	C.Y.		
HP 12 X 53 STEEL PILES				NO. :	35		
				875.0	LIN. FT.		
STEEL PILE POINTS				NO. :	35		
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES				EA. :	35		



PLAN OF COLUMNS AND FOOTINGS

(DIMENSIONS FOR REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND FOOTING)



COLUMN SECTION

Public Works - Transportation		Water Resources - Stormwater	
Building Inspections		Planning	
Water Resources - Utility Engineering		Planning - Transportation	
Electric		Fire	
Water Resources - Soil & Erosion Control		Parks, Recreation & Cultural Resources	

PROJECT NO. U-5928
 WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 3 OF 3



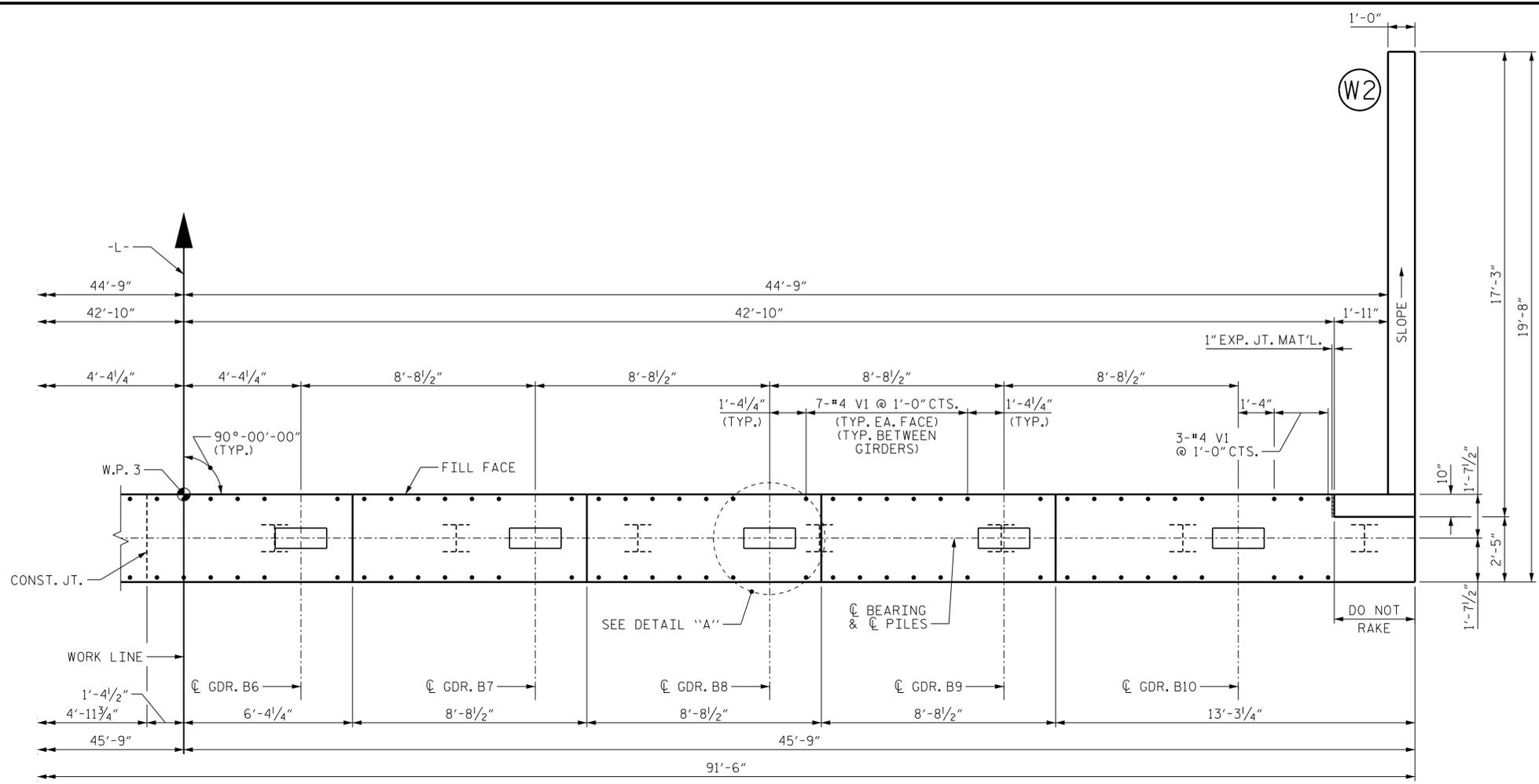
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MI ENGINEERING
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 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

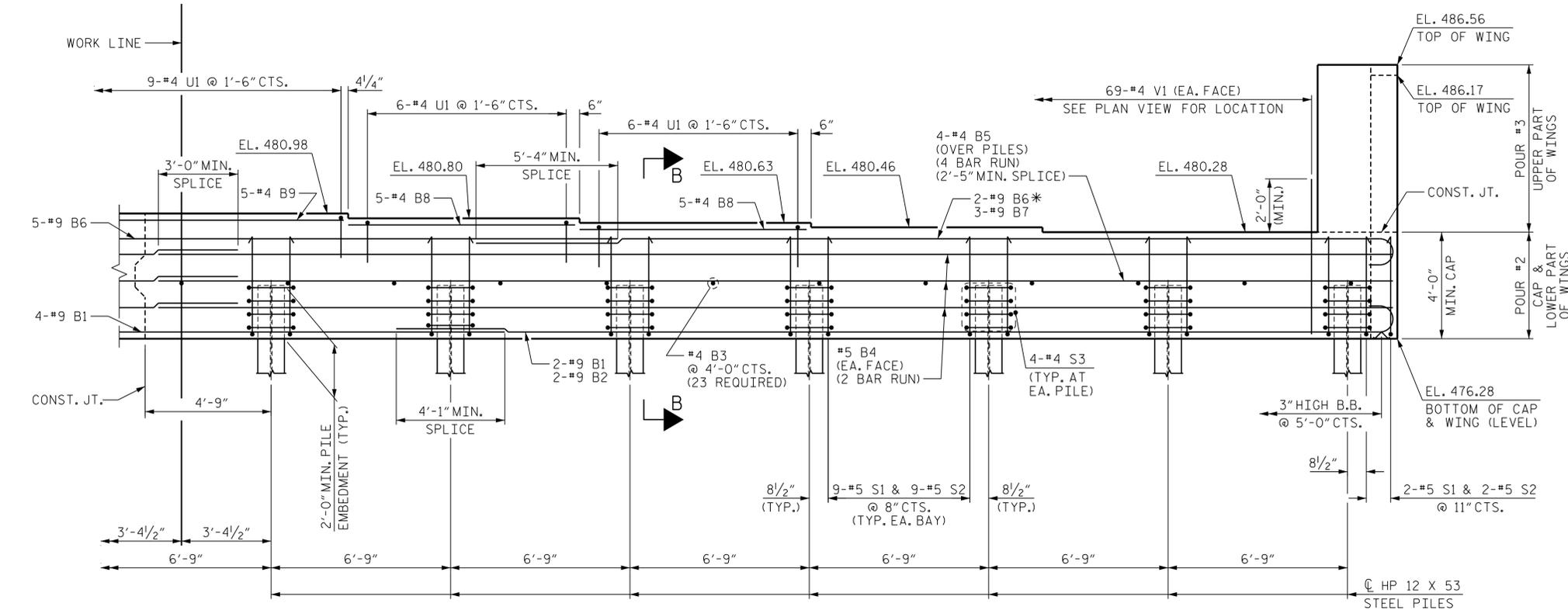
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 1 SECTIONS AND DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-36					TOTAL SHEETS 50

DRAWN BY : B.E. LANNING	DATE : 05/19
CHECKED BY : P.A. de PAOLI	DATE : 06/19
DESIGN ENGINEER OF RECORD : P.A. de PAOLI	DATE : 10/20

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PLAN



ELEVATION

NOTES

FOR ADDITIONAL NOTES, SEE SHEET 1 OF 4.

FOR DETAIL "A", SEE SHEET 1 OF 4.

FOR DETAILS OF CONSTRUCTION JOINT IN CAP, SEE DETAIL "B" ON SHEET 1 OF 4.

FOR SECTION B-B, SEE SHEET 4 OF 4.

The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed on the cover sheet of these construction plans.

Public Works – Transportation	Water Resources – Stormwater
Building Inspections	Planning
Water Resources – Utility Engineering	Planning – Transportation
Electric	Fire
Water Resources – Soil & Erosion Control	Parks, Recreation & Cultural Resources

PROJECT NO. U-5928

WAKE COUNTY

STATION: 22+77.76 -L-

SHEET 2 OF 4



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1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 2 PLAN AND ELEVATION					
NO.		BY:		DATE:	
1		3		4	
2		4		5	
REVISIONS				SHEET NO.	
				S-38	
				TOTAL SHEETS	
				50	

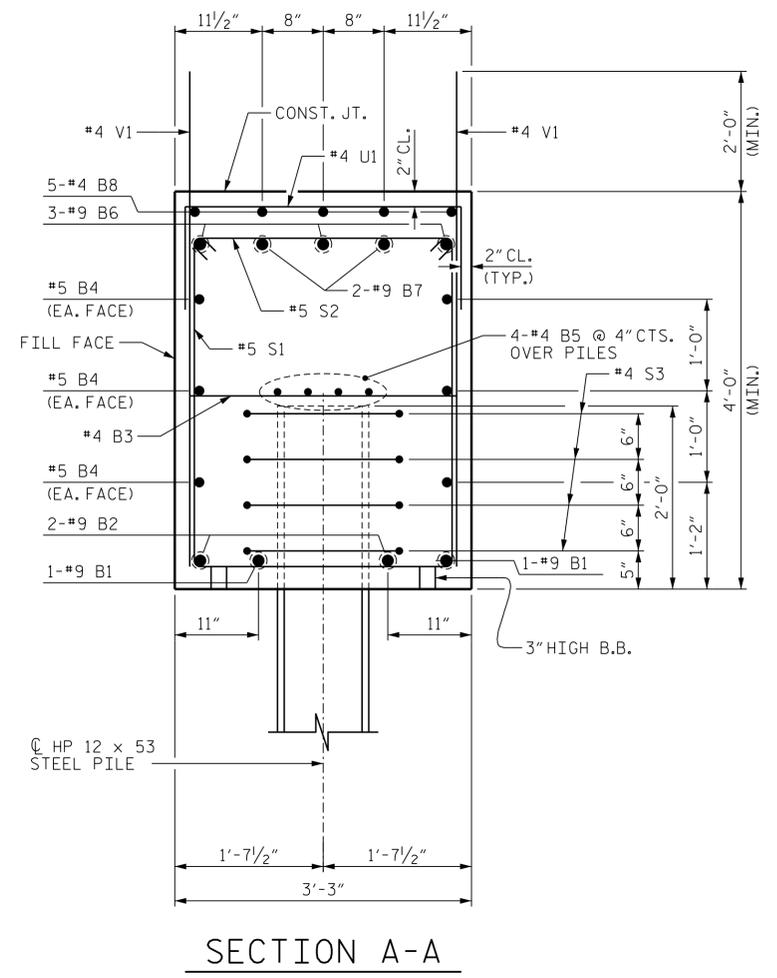
DRAWN BY: B.E. LANNING DATE: 05/19

CHECKED BY: P.A. de PAOLI DATE: 05/19

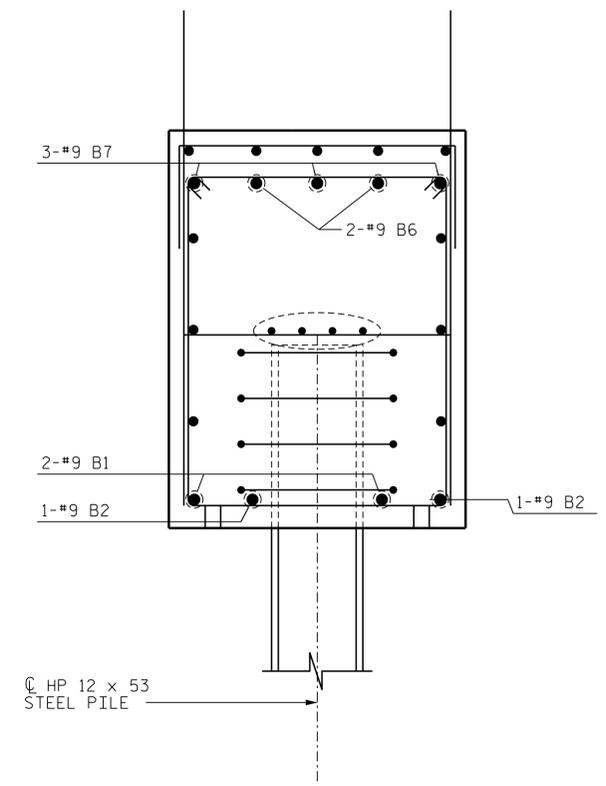
DESIGN ENGINEER OF RECORD: P.A. de PAOLI DATE: 10/20

*#9 B6 TO SPLICE WITH #9 B7 AT ALTERNATE LOCATIONS.

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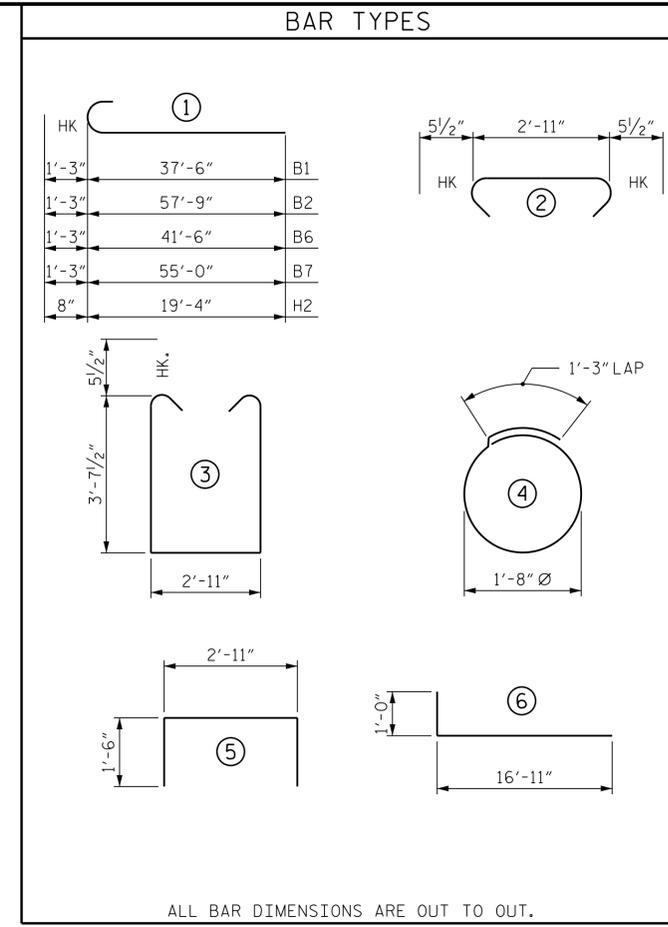


SECTION A-A



SECTION B-B

SEE SECTION A-A FOR OTHER DIMENSIONS AND BAR DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

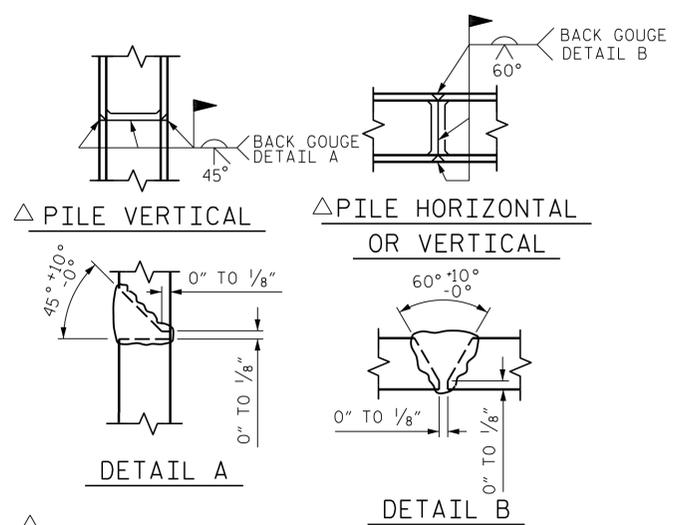
BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	1	38'-9"	527
B2	4	#9	1	59'-0"	802
B3	23	#4	STR	2'-11"	45
B4	12	#5	STR	47'-1"	589
B5	16	#4	STR	24'-8"	264
B6	5	#9	1	42'-9"	727
B7	5	#9	1	56'-3"	956
B8	20	#4	STR	8'-4"	111
B9	5	#4	STR	12'-4"	41
H1	48	#6	6	17'-11"	1292
H2	32	#6	1	20'-0"	961
K1	24	#4	STR	2'-7"	41
S1	121	#5	3	11'-1"	1399
S2	121	#5	2	3'-10"	484
S3	56	#4	4	6'-6"	243
U1	33	#4	5	5'-11"	130
V1	138	#4	STR	6'-6"	599
V2	20	#5	STR	9'-11"	207
V3	24	#5	STR	9'-9"	244
V4	24	#5	STR	9'-7"	240
V5	16	#5	STR	9'-6"	159
REINFORCING STEEL					10,061 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 (CAP & LOWER PART OF WINGS TO LT. OF C.J.)					25.3 C.Y.
POUR #2 (CAP & LOWER PART OF WINGS TO RT. OF C.J.)					26.9 C.Y.
POUR #3 (UPPER PART OF WINGS)					8.5 C.Y.
TOTAL					60.7 C.Y.
HP 12 X 53 STEEL PILES					NO. : 14 770.0 LIN. FT.
STEEL PILE POINTS					14
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES					EA. : 14

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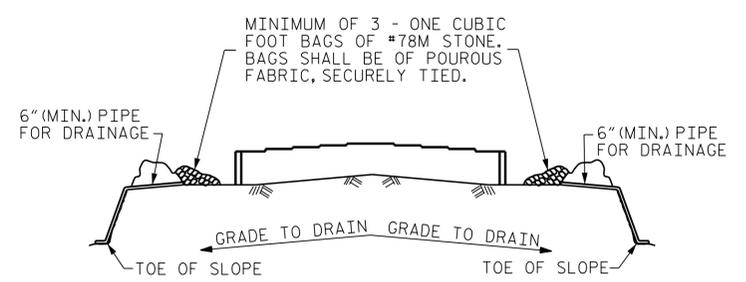
Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources

PROJECT NO. U-5928
WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 4 OF 4



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. MINES 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



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MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT 2
 DETAILS AND
 BILL OF MATERIAL**

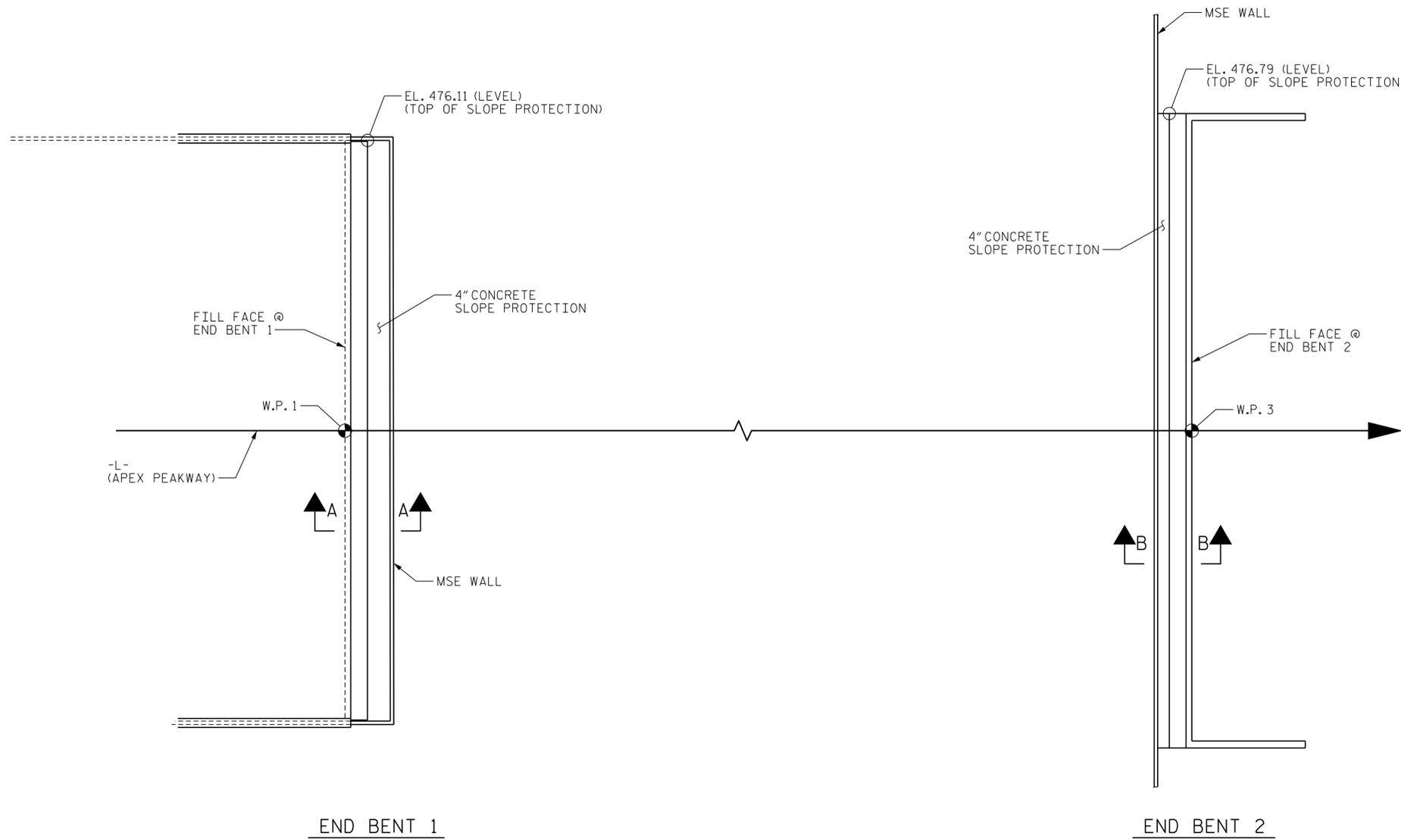
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NO.	BY:	DATE:	NO.	BY:	DATE:
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SHEET NO. S-40	
TOTAL SHEETS 50	

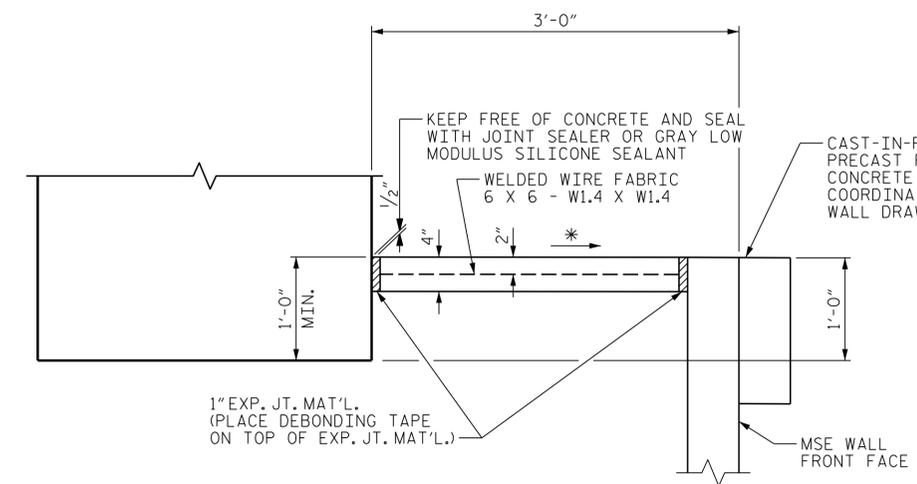
DRAWN BY : B.E. LANNING	DATE : 05/19
CHECKED BY : P.A. de PAOLI	DATE : 05/19
DESIGN ENGINEER OF RECORD : P.A. de PAOLI	DATE : 10/20

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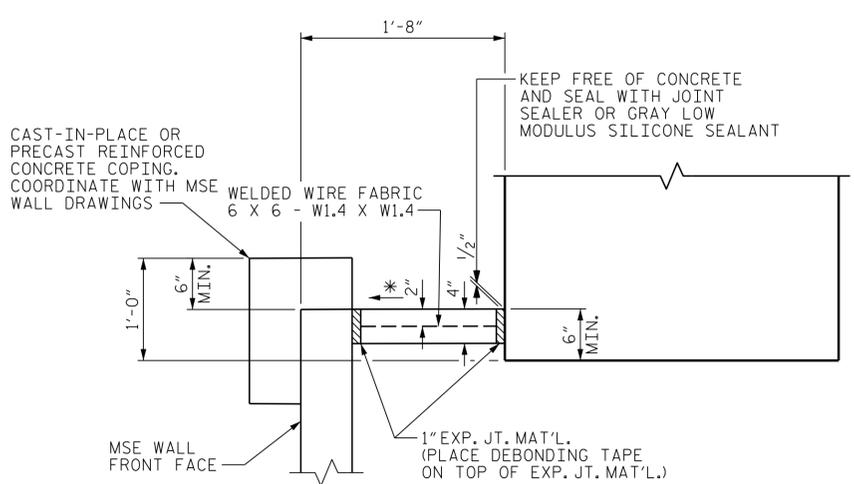


PLAN



SECTION A-A

* 2% SLOPE (NORMAL TO CAP)



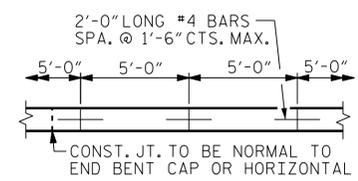
SECTION B-B

* 2% SLOPE (NORMAL TO CAP)

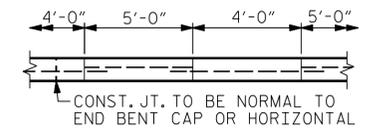
NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN SECTION A-A. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT.

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE SECTIONS 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.



POURING DETAIL



OPTIONAL POURING DETAIL

STRIP WIDTHS MAY VARY IN CURVED PORTION.

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

BRIDGE @ STA. 22+77.76 -L-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	19	34
END BENT 2	7	13

* QUANTITY SHOWN IS BASED ON 5' POURS.

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Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources

PROJECT NO. U-5928
 WAKE COUNTY
 STATION: 22+77.76 -L-



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MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SLOPE PROTECTION					
SHEET NO. S-41					
TOTAL SHEETS 50					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY : B.E. LANNING	DATE : 05/19
CHECKED BY : P.A. de PAOLI	DATE : 06/19
DESIGN ENGINEER OF RECORD : P.A. de PAOLI	DATE : 10/20

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

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

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

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

GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF SIDEWALK AND CONCRETE MEDIAN 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.

NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR MATERIALS OR LABOR REQUIRED TO CONSTRUCT THE SIDEWALK AND CONCRETE MEDIAN. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR BRIDGE APPROACH SLABS.

ALL REINFORCING STEEL IN SIDEWALK AND CONCRETE MEDIAN SHALL BE EPOXY COATED.

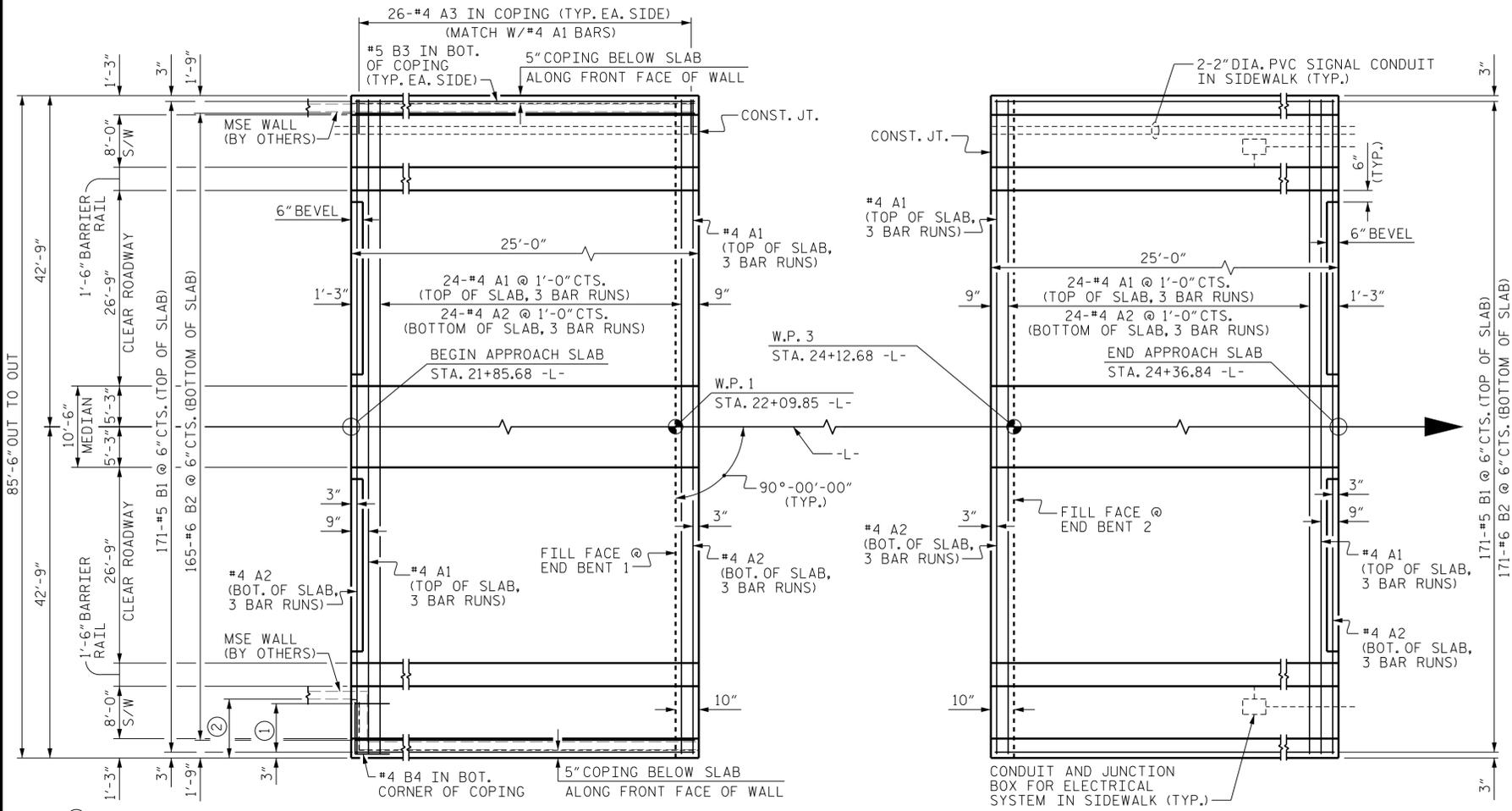
FOR REINFORCING IN THE SIDEWALK AND CONCRETE MEDIAN, SEE "BRIDGE APPROACH SLAB DETAILS, SHEET 2 OF 4".

FOR BARRIER RAIL DETAILS, SEE "BRIDGE APPROACH SLAB DETAILS, SHEET 3 OF 4".

FOR METAL HANDRAIL DETAILS, SEE "METAL HANDRAIL" SHEETS.

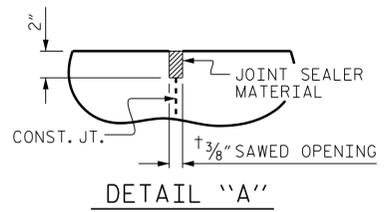
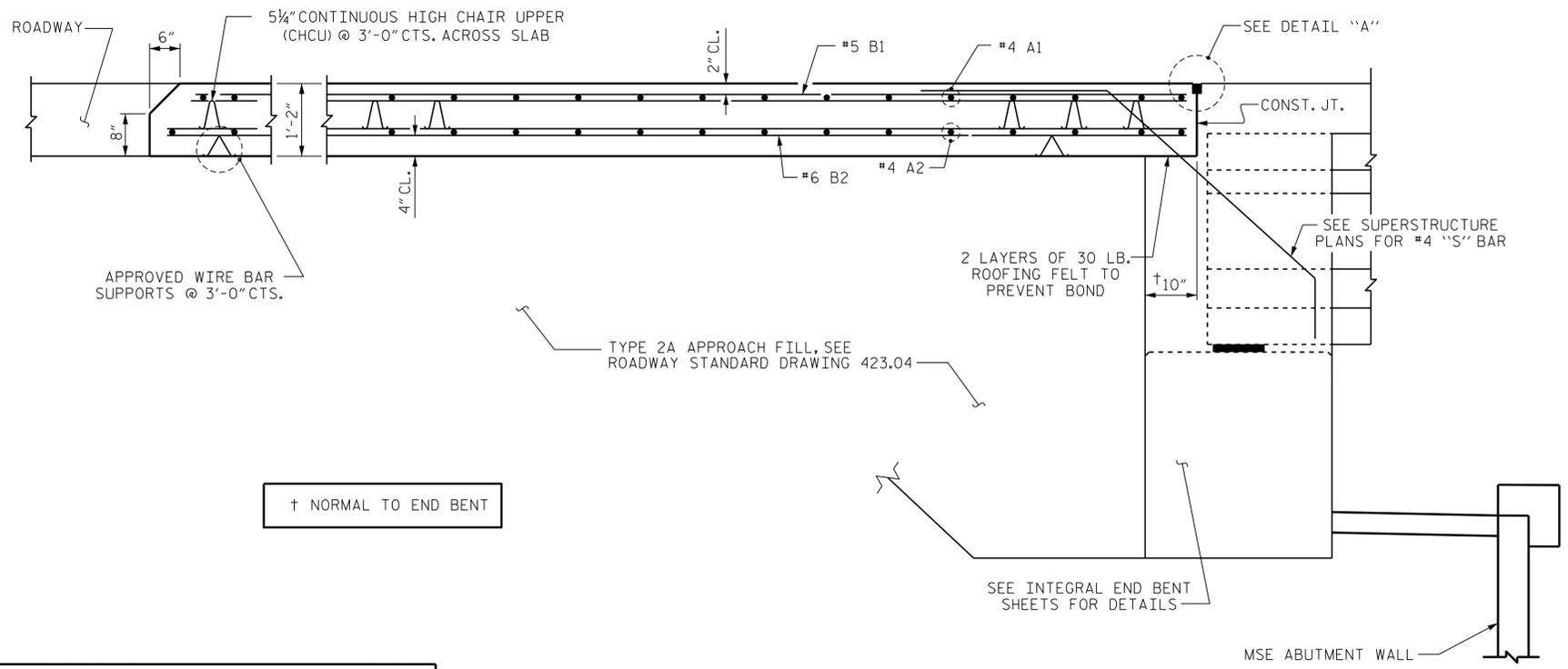
FOR DETAILS OF ELECTRICAL CONDUIT SYSTEM, SEE ROADWAY DRAWINGS.

FOR DETAILS OF SIGNAL CONDUIT SYSTEM, SEE SIGNAL COMMUNICATION PLANS.



- ① 8-#4 A3 IN COPING (ALONG THIS FACE ONLY)
- ② 8'-0" COPING ALONG BEGIN APPROACH SLAB, FIELD CUT "B" BARS AS NECESSARY.

PLAN @ END BENT 1
 PLAN @ END BENT 2
 DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

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Public Works – Transportation	Water Resources – Stormwater
Building Inspections	Planning
Water Resources – Utility Engineering	Planning – Transportation
Electric	Fire
Water Resources – Soil & Erosion Control	Parks, Recreation & Cultural Resources

PROJECT NO. U-5928
 WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT



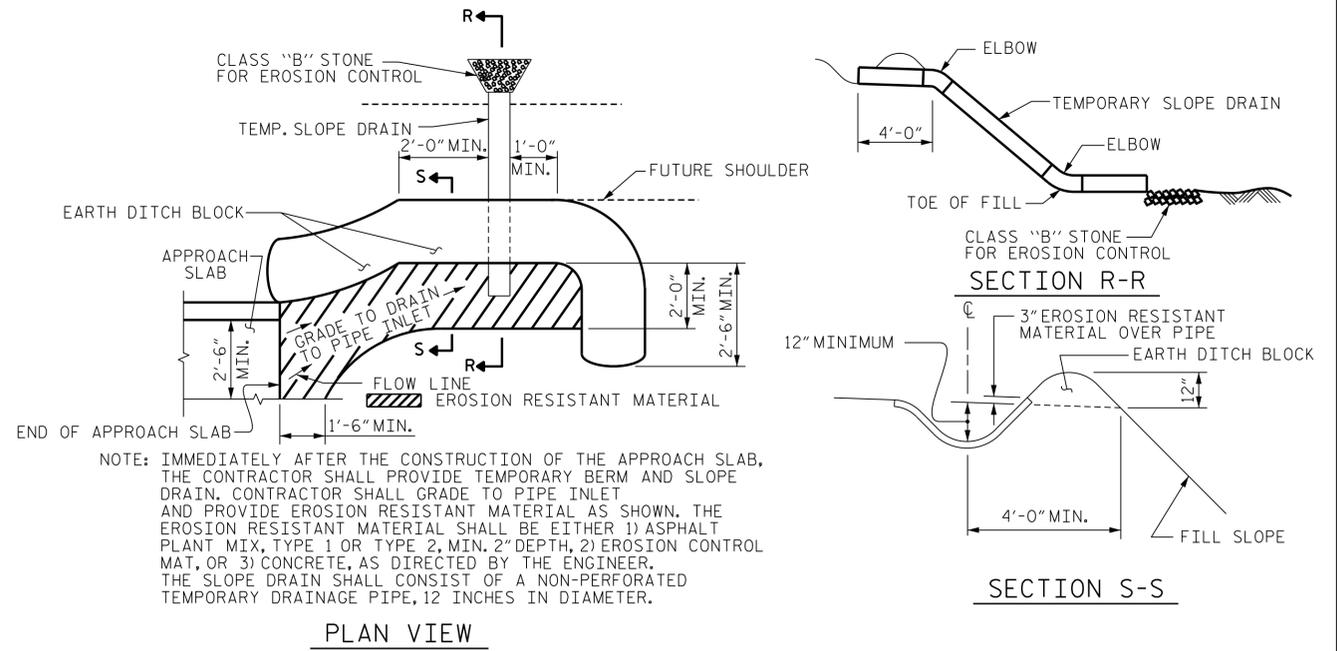
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MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO. S-42
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			

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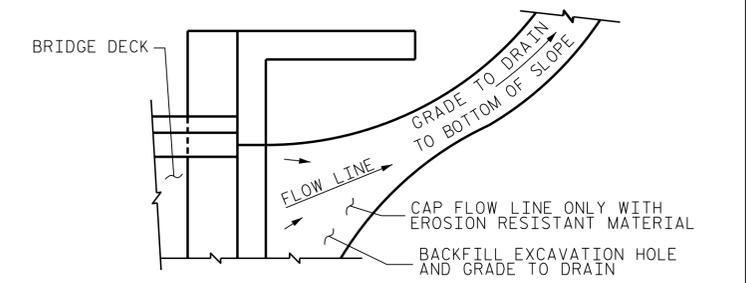
DRAWN BY: B.E. ATKINSON DATE: 05/19
 CHECKED BY: M. ISRAELNAIM DATE: 02/24
 DESIGN ENGINEER OF RECORD: M. ISRAELNAIM DATE: 02/24



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

PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS



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

PROJECT NO. U-5928
WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 4 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**BRIDGE APPROACH
 SLAB DETAILS**

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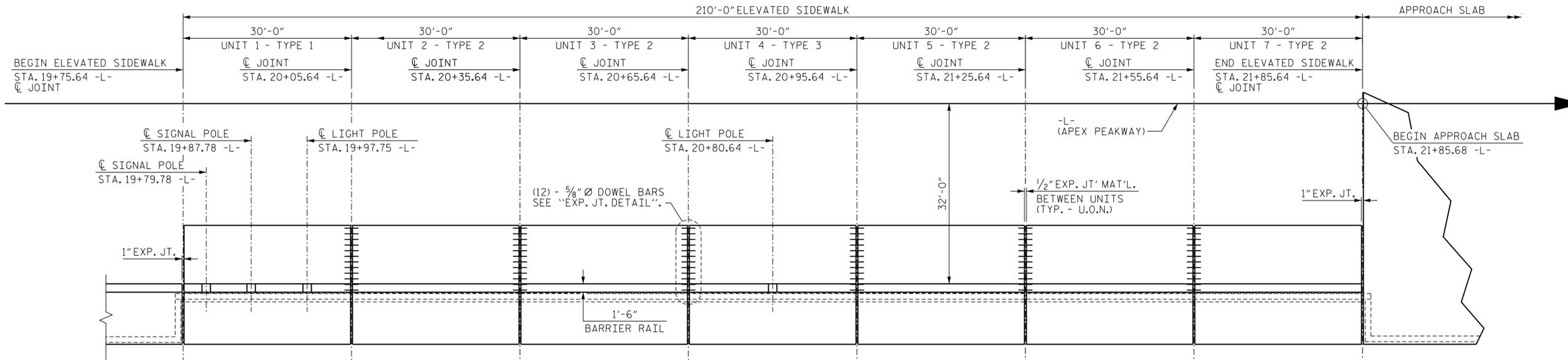
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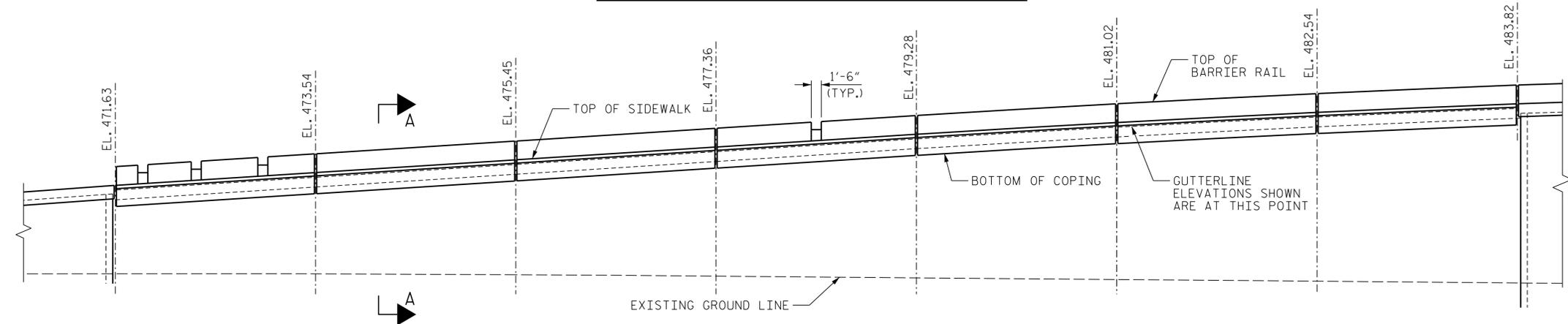
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Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources

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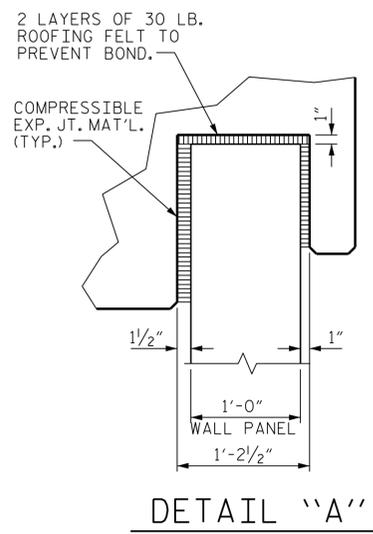
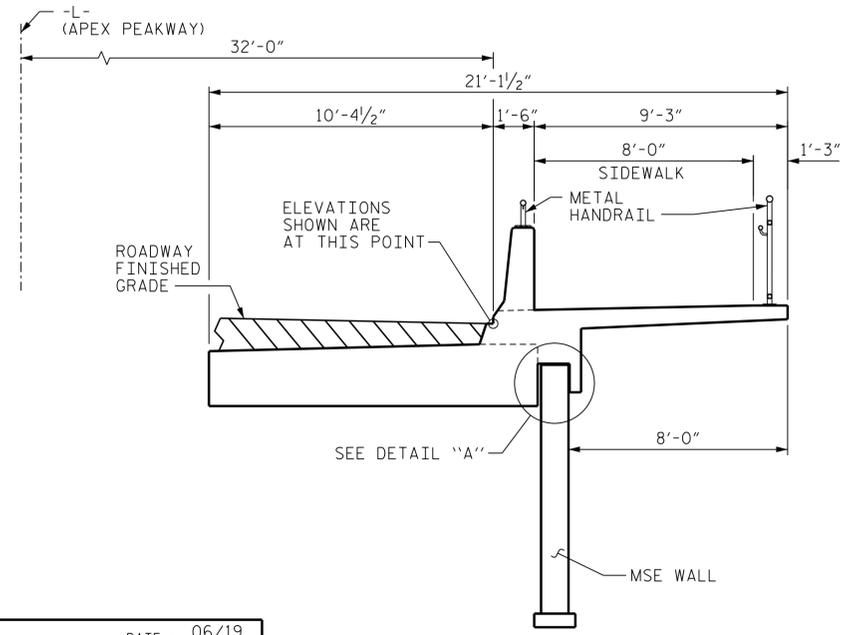
DRAWN BY : <u>B.E. ATKINSON</u>	DATE : <u>05/19</u>
CHECKED BY : <u>P.A. de PAOLI</u>	DATE : <u>05/19</u>
DESIGN ENGINEER OF RECORD : <u>P.A. de PAOLI</u>	DATE : <u>10/20</u>



PLAN OF UNIT 1 THRU UNIT 7



ELEVATION OF UNIT 1 THRU UNIT 7



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Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources

PROJECT NO. U-5928
WAKE COUNTY
 STATION: 22+77.76 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

ELEVATED SIDEWALK
 PLAN AND ELEVATION



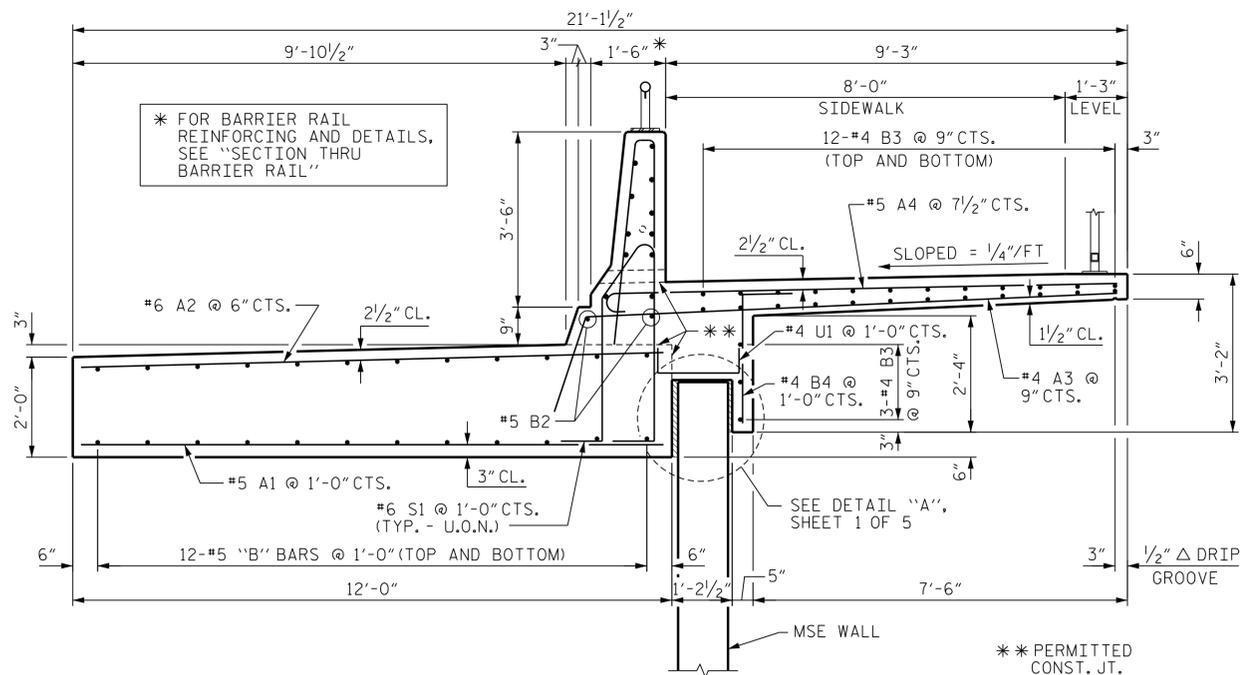
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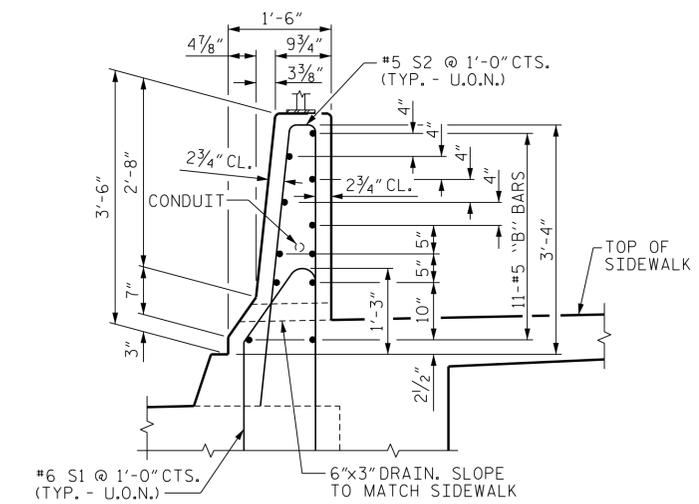
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2			4			50

DRAWN BY : B.E. ATKINSON DATE : 06/19
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 DESIGN ENGINEER OF RECORD : P.A. de PAOLI DATE : 10/20

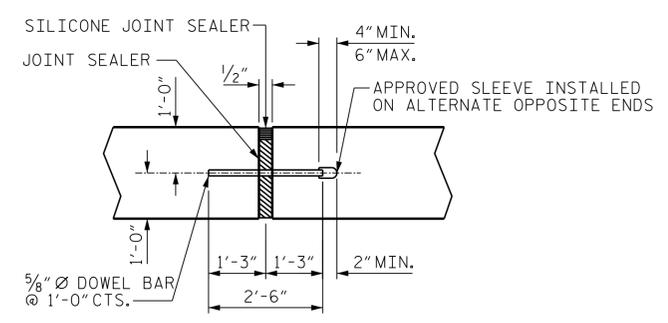
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SECTION THRU UNIT

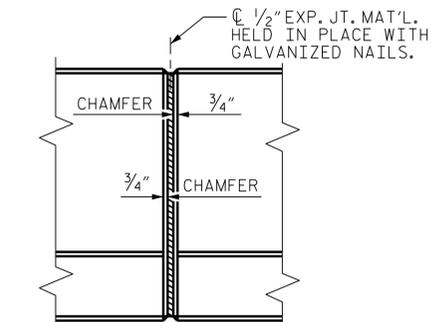


SECTION THRU BARRIER RAIL



EXPANSION JOINT DETAIL

USE AN APPROVED TYPE OF DOWEL ASSEMBLY IN ALL TRANSVERSE EXPANSION JOINTS. USE RIGID CONSTRUCTED DOWEL ASSEMBLY, CAPABLE OF HOLDING THE DOWEL BARS IN PROPER POSITION DURING PLACEMENT OF THE CONCRETE AND DESIGNED TO PERMIT UNRESTRICTED MOVEMENT OF THE SLAB. SEE NCDOT ROADWAY STANDARD 700.03 FOR THE DOWEL ASSEMBLY.



ELEVATION AT EXPANSION JOINTS

NOTES

- ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.
- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.
- FOR DETAILS OF ELECTRICAL CONDUIT SYSTEM, SEE ROADWAY DRAWINGS.
- FOR METAL HANDRAIL DETAILS, SEE 'METAL HANDRAIL' SHEETS.
- DIMENSIONS ARE BASED ON ASSUMED WALL THICKNESS OF 1'-0". ADJUST DIMENSIONS BASED ON APPROVED WALL SUBMITTALS.
- THE COST OF THE DOWEL ASSEMBLY SHALL BE INCLUDED IN THE UNIT PRICE OF THE PAY ITEMS BID FOR THE ELEVATED SIDEWALK.
- #4 A3 AND #5 A4 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR HANDRAIL ANCHOR BOLTS.
- FOR MOMENT SLAB WITH ELEVATED SIDEWALK, SEE SPECIAL PROVISIONS.

MOMENT SLAB WITH ELEVATED SIDEWALK
TOTAL PAY LENGTH = 210.0 LIN. FT.

PROJECT NO. U-5928
WAKE COUNTY
STATION: 22+77.76 -L-

SHEET 2 OF 5



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Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources

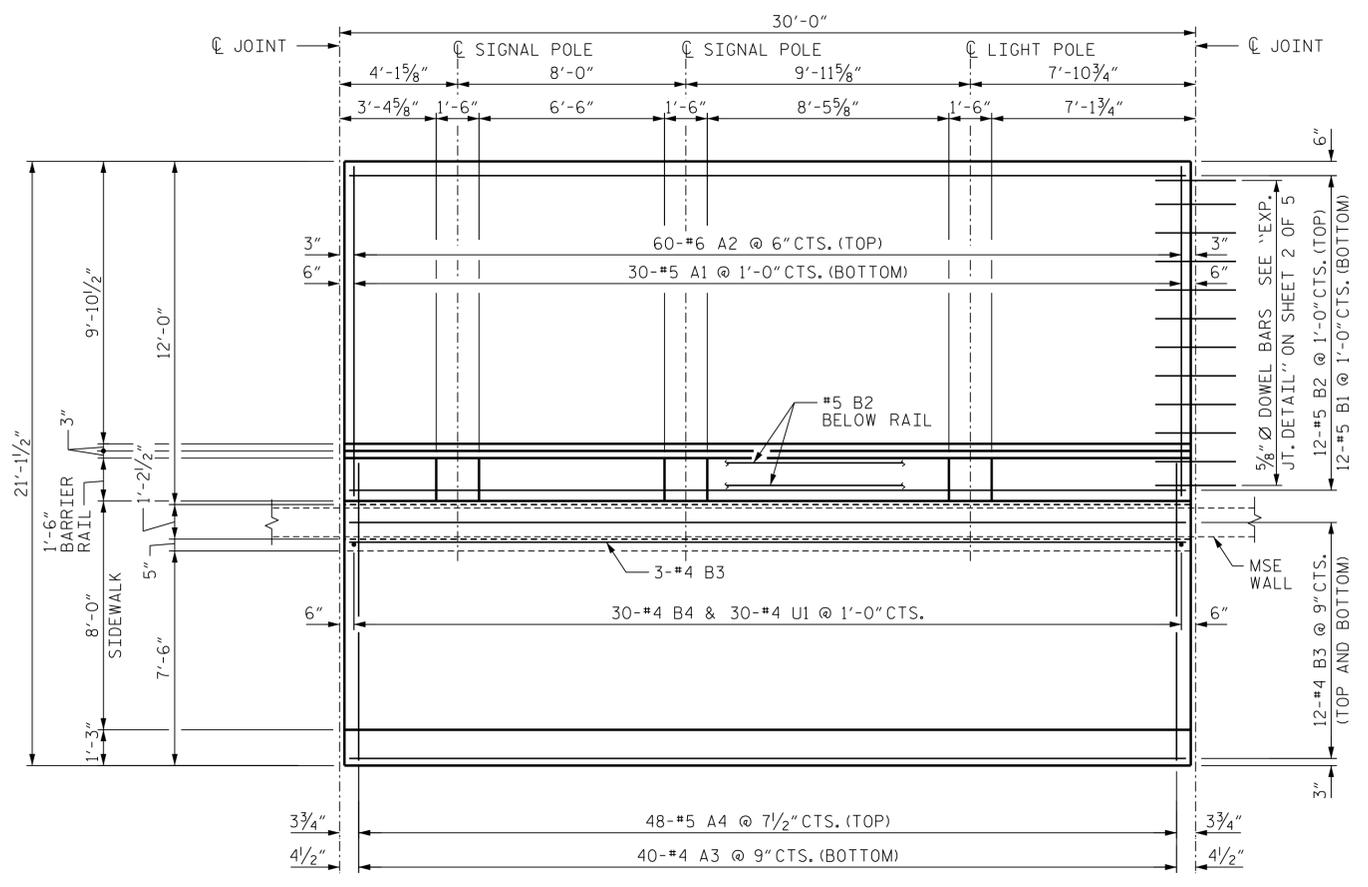
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ELEVATED SIDEWALK SECTION AND DETAILS

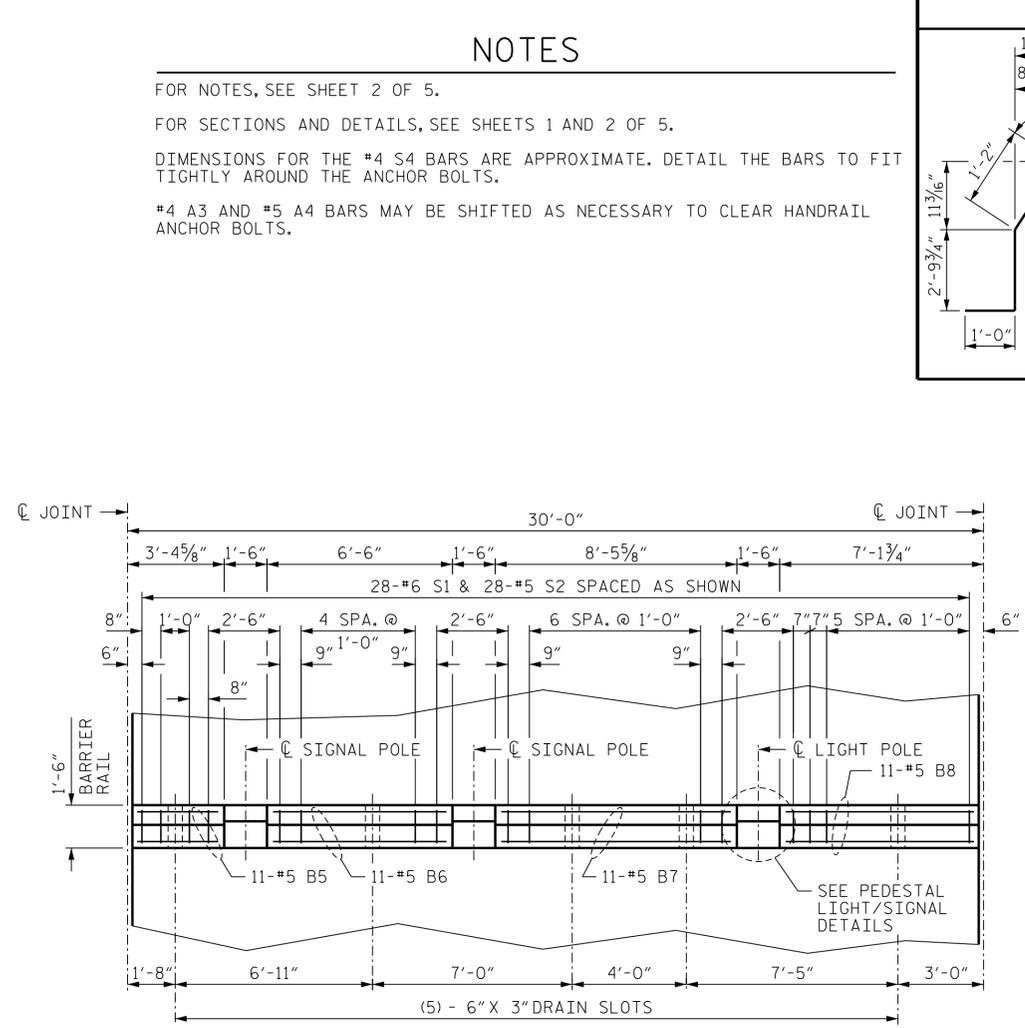
DRAWN BY : B.E. ATKINSON	DATE : 06/19
CHECKED BY : P.A. de PAOLI	DATE : 06/19
DESIGN ENGINEER OF RECORD : P.A. de PAOLI	DATE : 10/20

MI ENGINEERING 1011 SCHAUB DRIVE, SUITE 100 RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER : P-0671		REVISIONS		SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 50

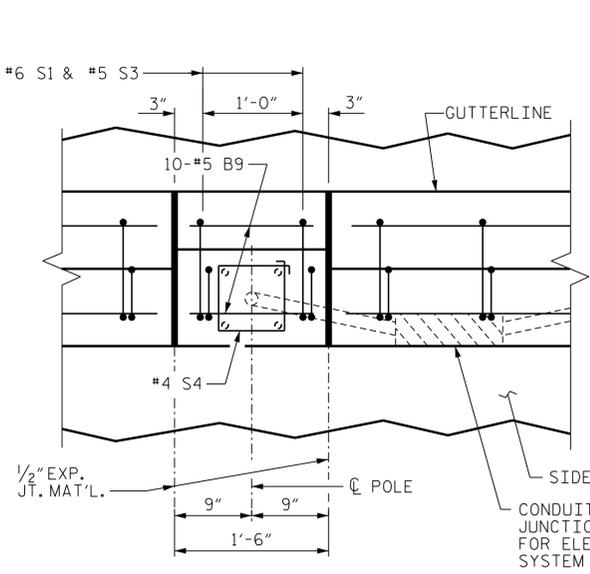
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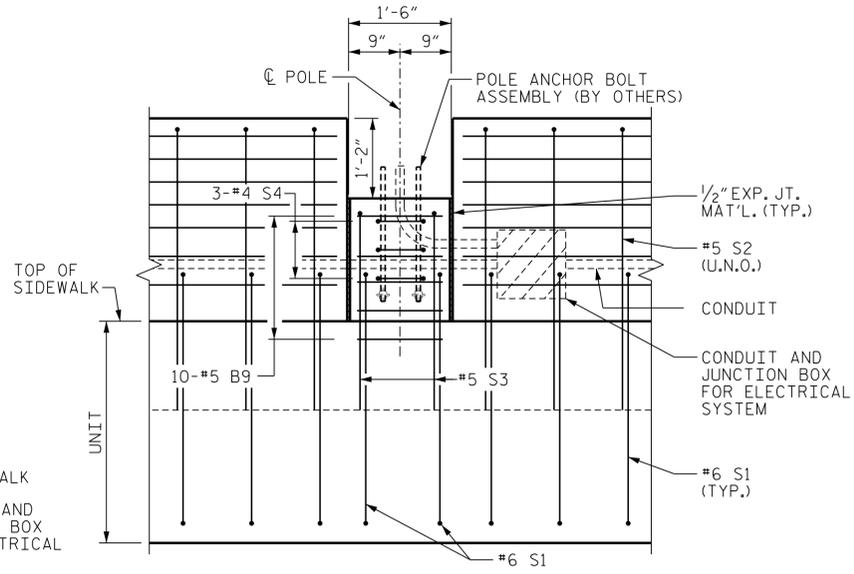
TYPE 1 UNIT PLAN



TYPE 1 BARRIER RAIL PLAN



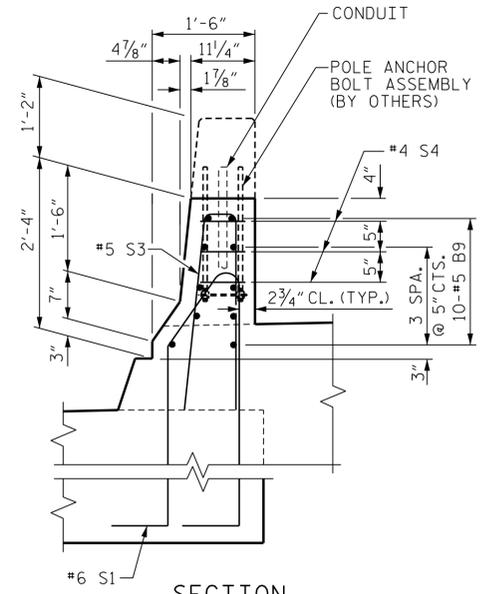
PLAN



ELEVATION

LIGHT/SIGNAL PEDESTAL DETAILS

(LS1 TO LS2) SEE ELECTRICAL PLANS - SHEET E2.

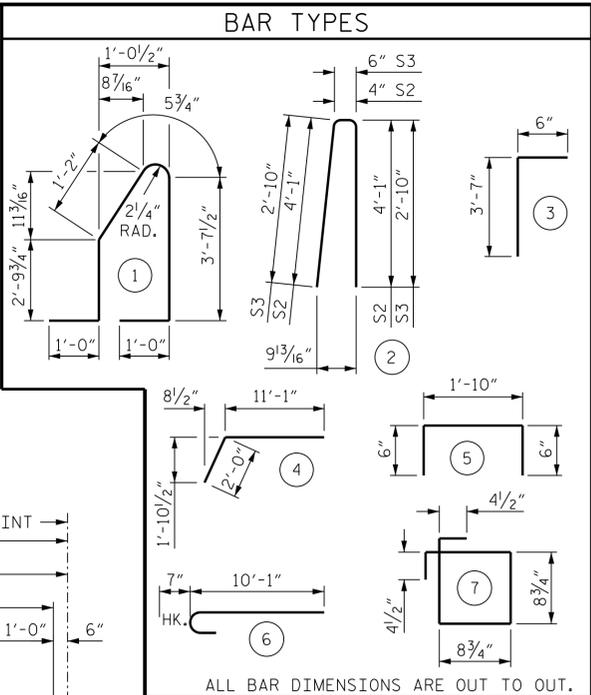


SECTION

SEE "SECTION THRU UNIT" ON SHEET 2 OF 5 FOR ADDITIONAL REINFORCING REQUIREMENTS.

NOTES

FOR NOTES, SEE SHEET 2 OF 5.
 FOR SECTIONS AND DETAILS, SEE SHEETS 1 AND 2 OF 5.
 DIMENSIONS FOR THE #4 S4 BARS ARE APPROXIMATE. DETAIL THE BARS TO FIT TIGHTLY AROUND THE ANCHOR BOLTS.
 #4 A3 AND #5 A4 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR HANDRAIL ANCHOR BOLTS.



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

ELEVATED SIDEWALK - TYPE 1 FOR ONE UNIT (1 REQ'D.)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	30	#5	STR	11'-8"	365
*A2	60	#6	STR	13'-3"	1194
*A3	40	#4	4	13'-1"	350
*A4	48	#5	6	10'-8"	534
B1	12	#5	STR	29'-7"	370
*B2	14	#5	STR	29'-7"	432
*B3	27	#4	STR	29'-7"	534
*B4	30	#4	3	3'-1"	62
*B5	11	#5	STR	3'-0"	34
*B6	11	#5	STR	6'-1"	70
*B7	11	#5	STR	8'-1"	93
*B8	11	#5	STR	6'-9"	77
*B9	30	#5	STR	1'-1"	34
*S1	34	#6	1	10'-1"	515
*S2	28	#5	2	8'-6"	248
*S3	6	#5	2	6'-2"	39
*S4	9	#4	7	3'-8"	22
*U1	30	#4	5	2'-10"	57

REINFORCING STEEL	LBS.	735
*EPOXY COATED REINFORCING STEEL	LBS.	4295
CLASS AA CONCRETE	C. Y.	44.0

PROJECT NO. **U-5928**
 WAKE COUNTY
 STATION: **22+77.76 -L-**

SHEET 3 OF 5

The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed on the cover sheet of these construction plans.

Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources



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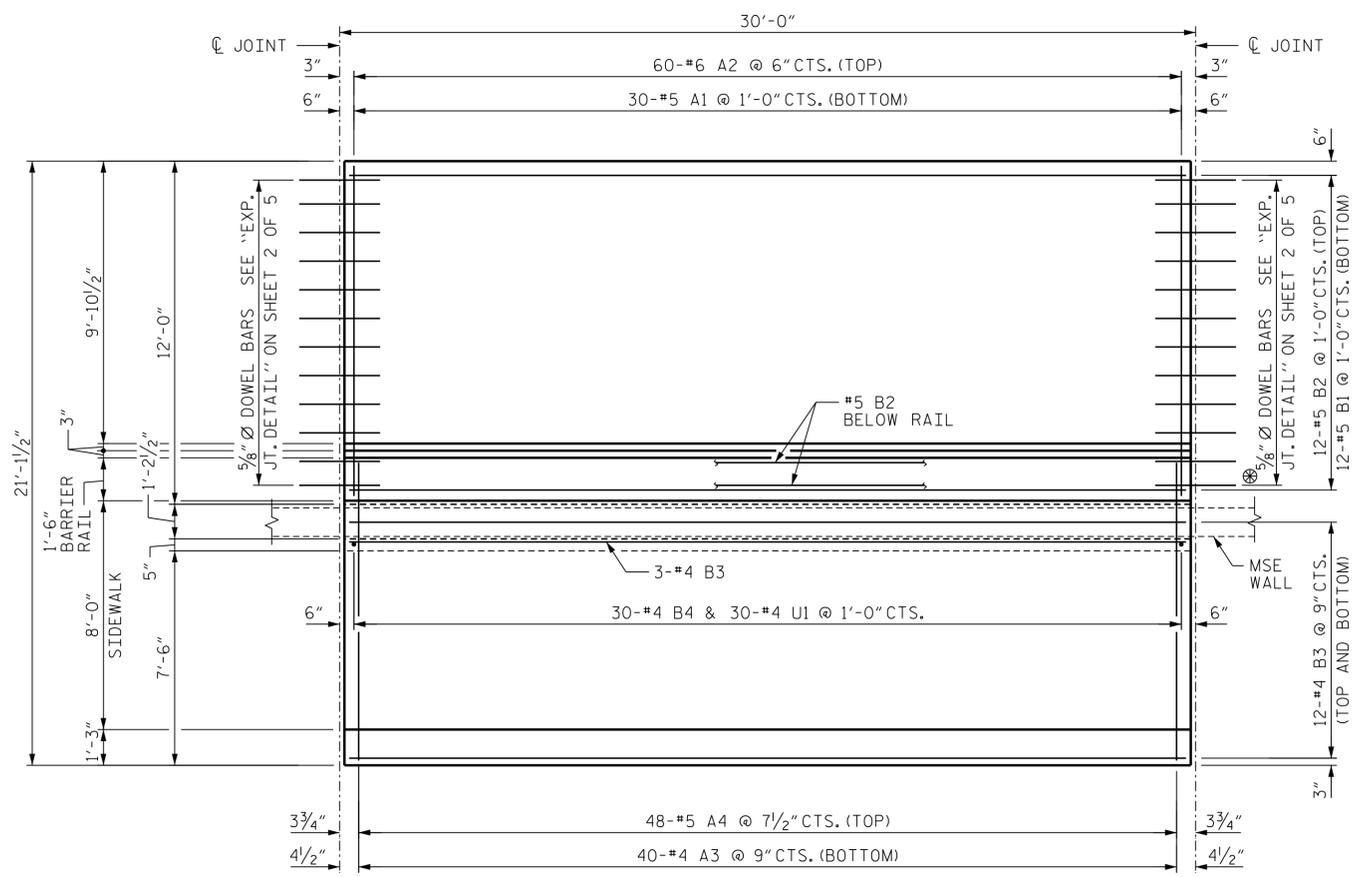
MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
ELEVATED SIDEWALK UNIT DETAILS TYPE 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-48
TOTAL SHEETS 50

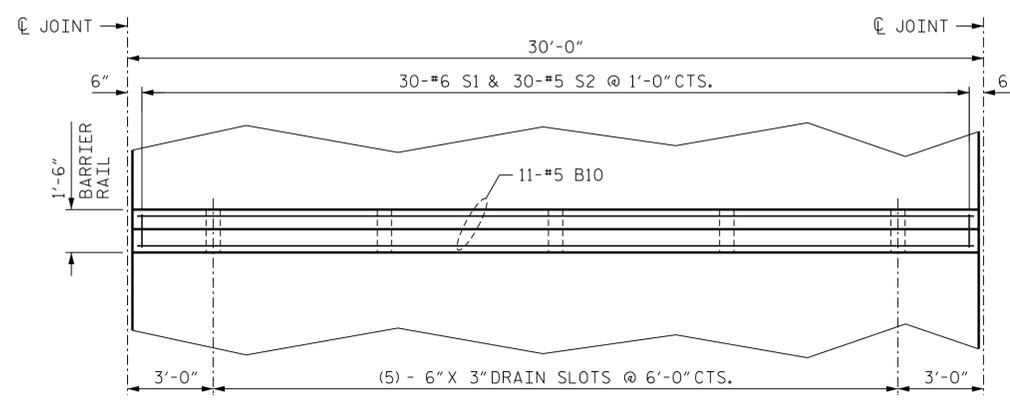
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DRAWN BY: B.E. ATKINSON	DATE: 06/19
CHECKED BY: P.A. de PAOLI	DATE: 06/19
DESIGN ENGINEER OF RECORD: P.A. de PAOLI	DATE: 10/20



TYPE 2 UNIT PLAN

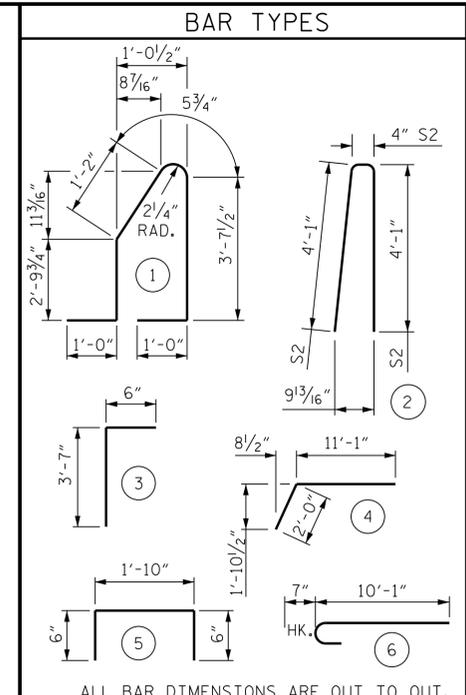
⊗ DOWEL NOT REQUIRED ON THIS END OF UNIT 7.



TYPE 2 BARRIER RAIL PLAN

NOTES

FOR NOTES, SEE SHEET 2 OF 5.
 FOR SECTIONS AND DETAILS, SEE SHEETS 1 AND 2 OF 5.
 #4 A3 AND #5 A4 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR HANDRAIL ANCHOR BOLTS.



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

ELEVATED SIDEWALK - TYPE 2 FOR ONE UNIT (5 REQ'D.)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	30	#5	STR	11'-8"	365
* A2	60	#6	STR	13'-3"	1194
* A3	40	#4	4	13'-1"	350
* A4	48	#5	6	10'-8"	534
B1	12	#5	STR	29'-7"	370
* B2	14	#5	STR	29'-7"	432
* B3	27	#4	STR	29'-7"	534
* B4	30	#4	3	3'-1"	62
* B10	11	#5	STR	29'-7"	339
* S1	30	#6	1	10'-1"	454
* S2	30	#5	2	8'-6"	266
* U1	30	#4	5	2'-10"	57
REINFORCING STEEL				LBS.	735
* EPOXY COATED REINFORCING STEEL				LBS.	4222
CLASS AA CONCRETE				C. Y.	44.2

PROJECT NO. U-5928

WAKE COUNTY

STATION: 22+77.76 -L-

SHEET 4 OF 5



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 ELEVATED SIDEWALK
 UNIT DETAILS
 TYPE 2

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MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

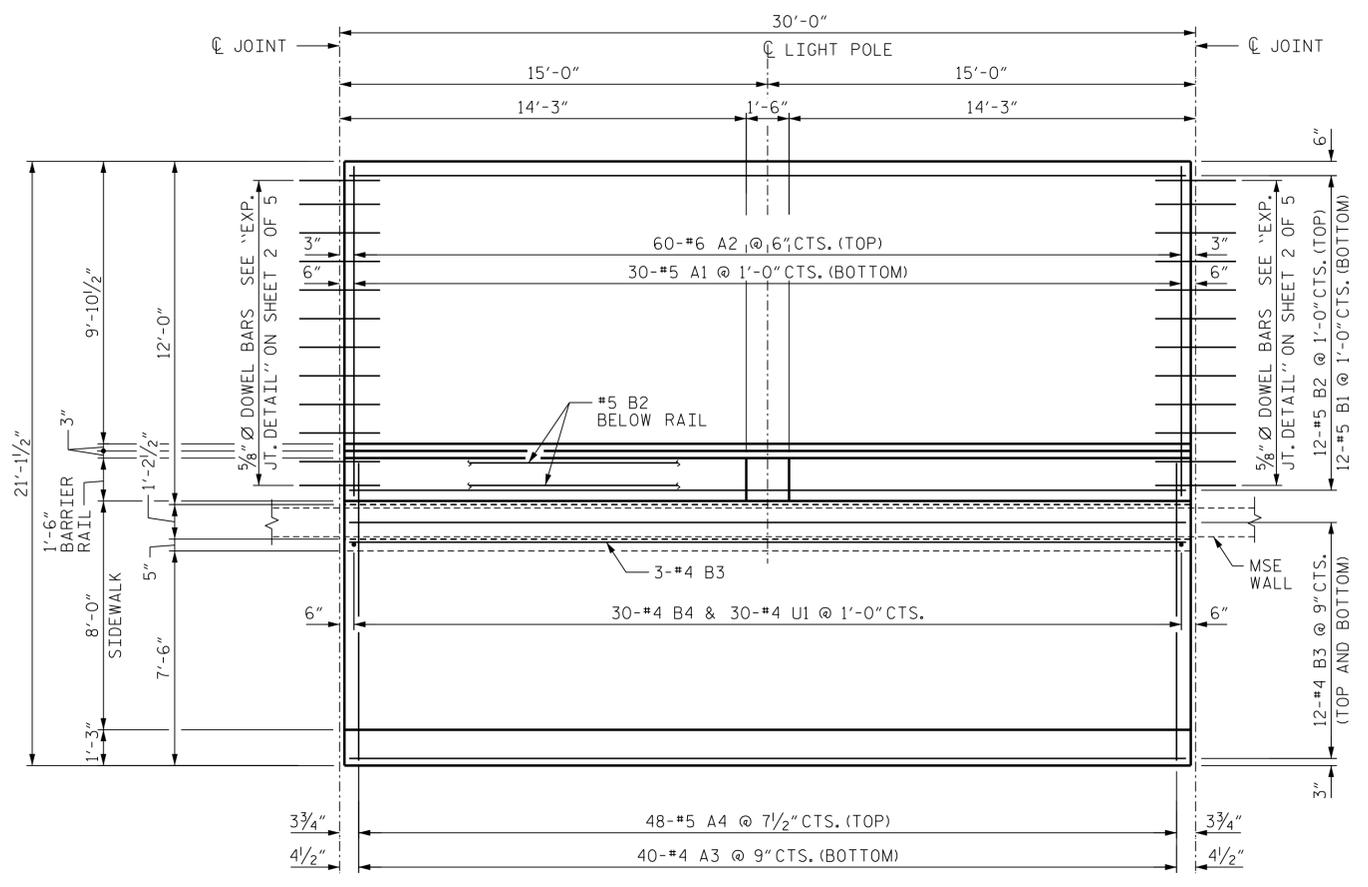
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			50

The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed on the cover sheet of these construction plans.

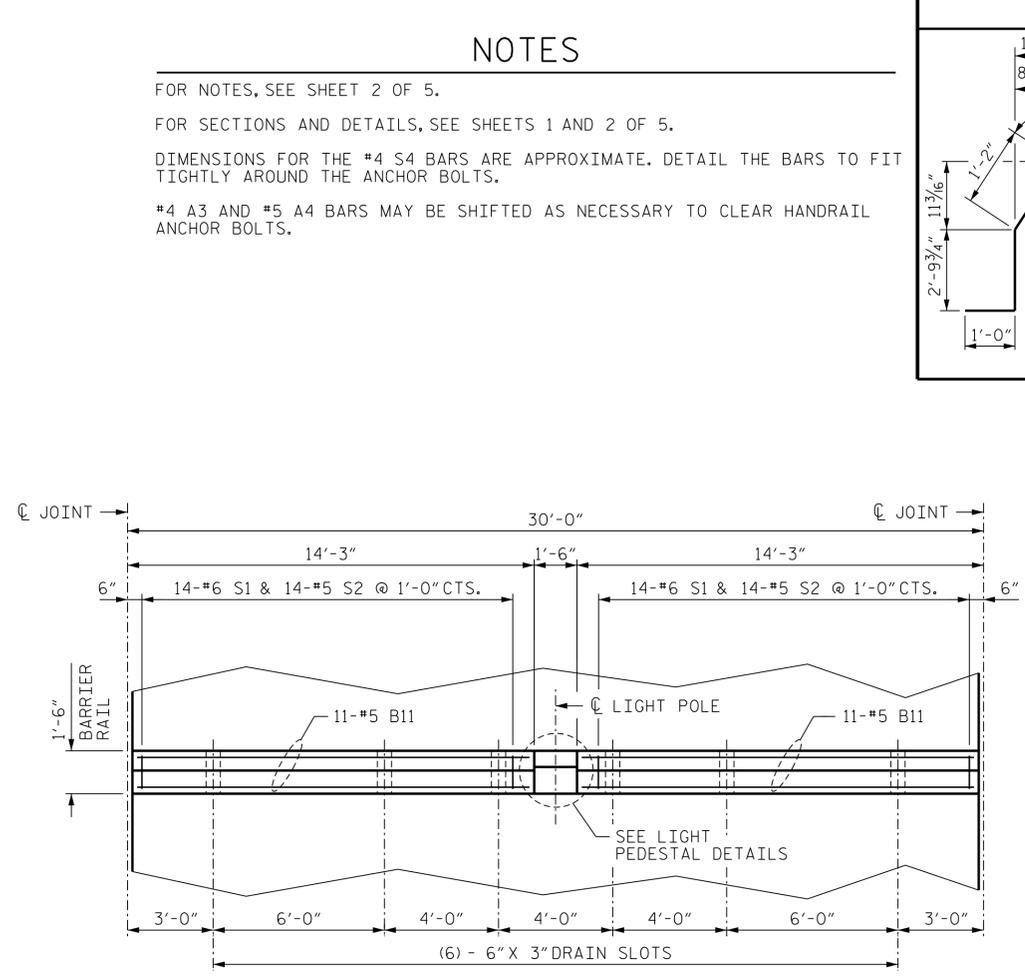
Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources

DRAWN BY : B.E. ATKINSON DATE : 06/19
 CHECKED BY : P.A. de PAOLI DATE : 06/19
 DESIGN ENGINEER OF RECORD : P.A. de PAOLI DATE : 10/20

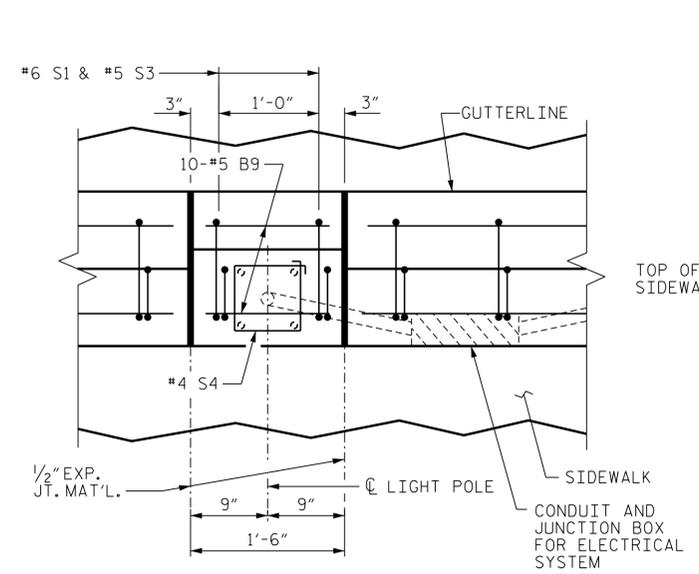
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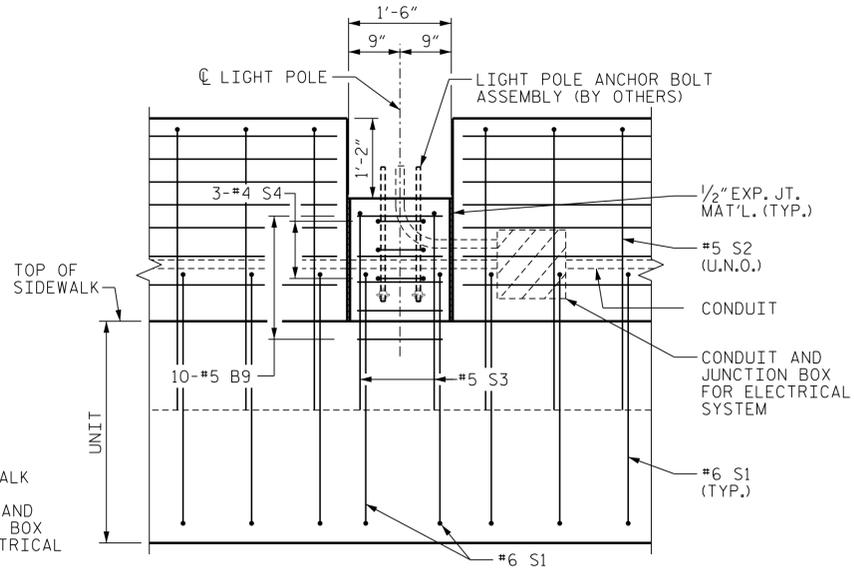
TYPE 3 UNIT PLAN



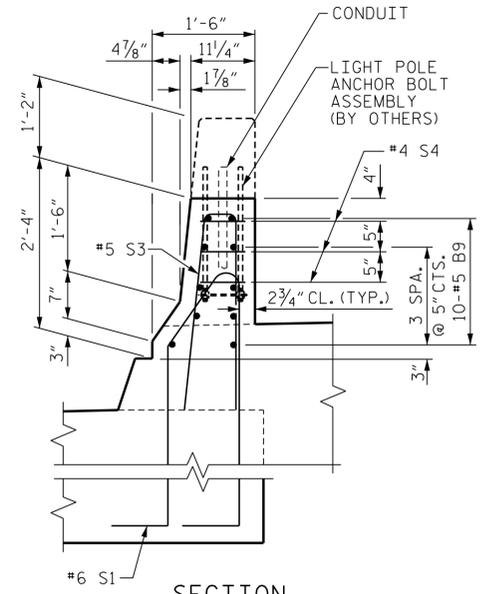
TYPE 3 BARRIER RAIL PLAN



PLAN



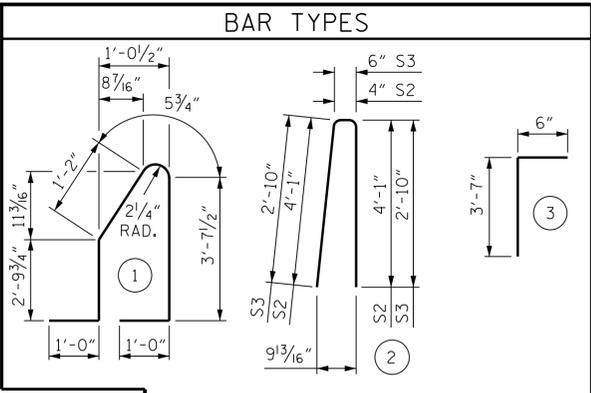
ELEVATION



SECTION

NOTES

FOR NOTES, SEE SHEET 2 OF 5.
 FOR SECTIONS AND DETAILS, SEE SHEETS 1 AND 2 OF 5.
 DIMENSIONS FOR THE #4 S4 BARS ARE APPROXIMATE. DETAIL THE BARS TO FIT TIGHTLY AROUND THE ANCHOR BOLTS.
 #4 A3 AND #5 A4 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR HANDRAIL ANCHOR BOLTS.



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

ELEVATED SIDEWALK - TYPE 3 FOR ONE UNIT (1 REQ'D.)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	30	#5	STR	11'-8"	365
* A2	60	#6	STR	13'-3"	1194
* A3	40	#4	4	13'-1"	350
* A4	48	#5	6	10'-8"	534
B1	12	#5	STR	29'-7"	370
* B2	14	#5	STR	29'-7"	432
* B3	27	#4	STR	29'-7"	534
* B4	30	#4	3	3'-1"	62
* B9	10	#5	STR	1'-1"	11
* B11	22	#5	STR	13'-10"	317
* S1	30	#6	1	10'-1"	454
* S2	28	#5	2	8'-6"	243
* S3	2	#5	2	6'-2"	13
* S4	3	#4	7	3'-8"	7
* U1	30	#4	5	2'-10"	57

REINFORCING STEEL	LBS.	735
* EPOXY COATED REINFORCING STEEL	LBS.	4213
CLASS AA CONCRETE	C. Y.	44.1

PROJECT NO. U-5928

WAKE COUNTY

STATION: 22+77.76 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

ELEVATED SIDEWALK
 UNIT DETAILS
 TYPE 3

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Public Works - Transportation	Water Resources - Stormwater
Building Inspections	Planning
Water Resources - Utility Engineering	Planning - Transportation
Electric	Fire
Water Resources - Soil & Erosion Control	Parks, Recreation & Cultural Resources



DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-50
2			4			TOTAL SHEETS 50

DRAWN BY: B.E. ATKINSON	DATE: 06/19
CHECKED BY: P.A. de PAOLI	DATE: 06/19
DESIGN ENGINEER OF RECORD: P.A. de PAOLI	DATE: 10/20

(LS1 TO LS2) SEE ELECTRICAL PLANS - SHEET E2.

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STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 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 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 3/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

HANDRAILS AND POSTS:

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

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINISHES 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.

<p>The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed on the cover sheet of these construction plans.</p>	
<p>_____ Public Works – Transportation</p>	<p>_____ Water Resources – Stormwater</p>
<p>_____ Building Inspections</p>	<p>_____ Planning</p>
<p>_____ Water Resources – Utility Engineering</p>	<p>_____ Planning – Transportation</p>
<p>_____ Electric</p>	<p>_____ Fire</p>
<p>_____ Water Resources – Soil & Erosion Control</p>	<p>_____ Parks, Recreation & Cultural Resources</p>

ENGLISH