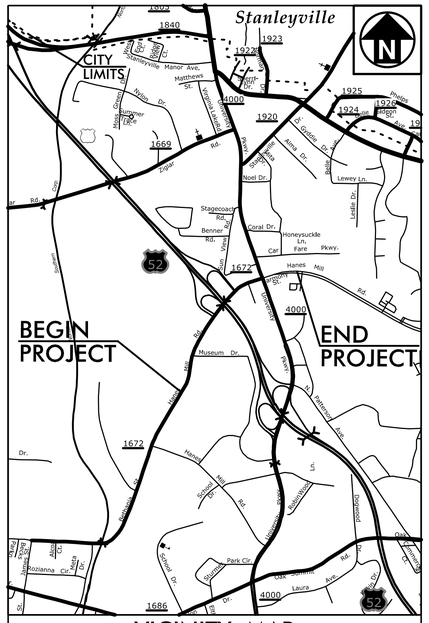
09/08/59

TIP PROJECT: U-2729

CONTRACT: C204837

See Sheet 1A For Index of Sheets



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

FORSYTH COUNTY

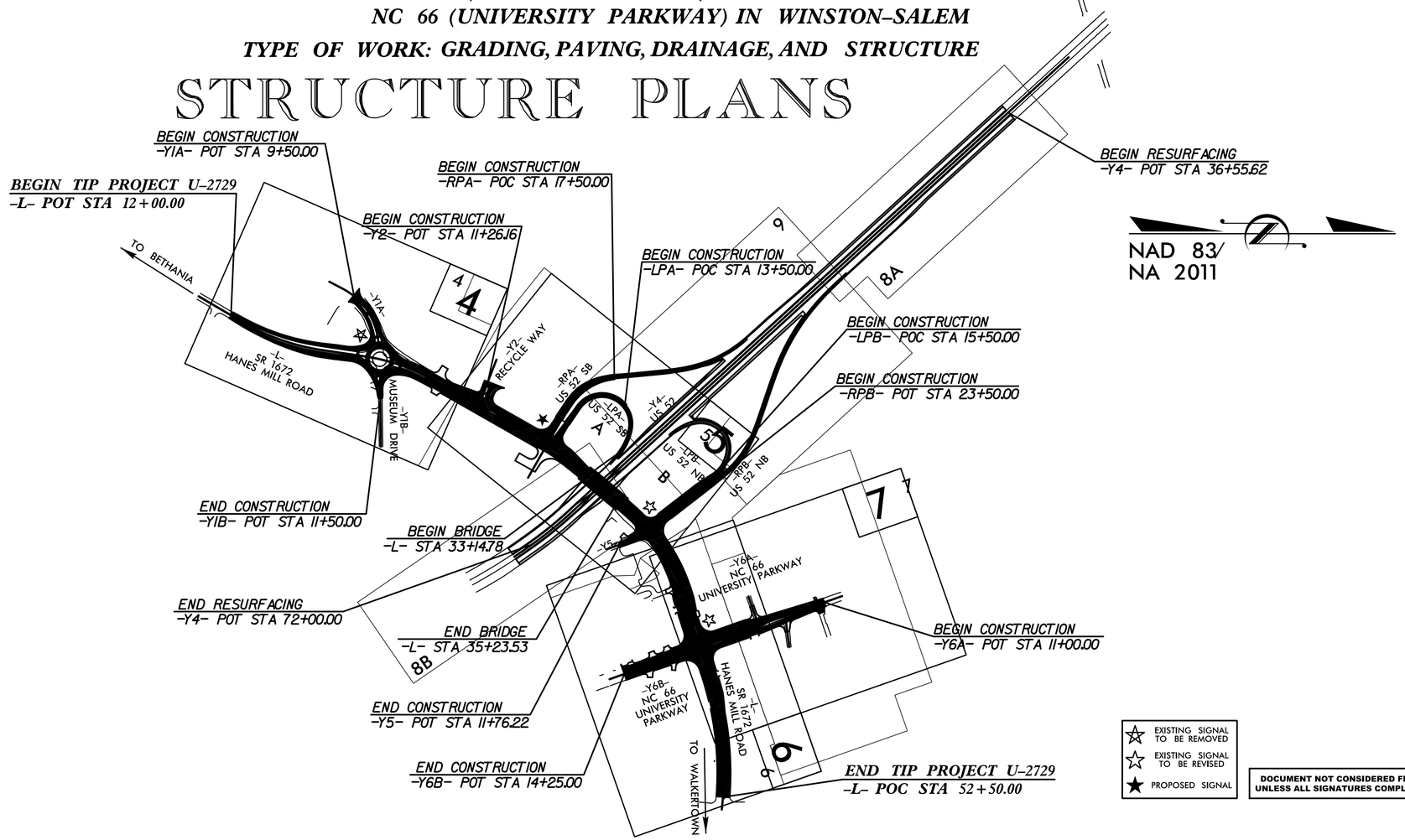
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2729		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34853.1.2		PE
34853.2.2		R/W UTIL.
34853.3.3		CONST.

LOCATION: SR 1672 (HANES MILL ROAD) FROM MUSEUM DRIVE TO NC 66 (UNIVERSITY PARKWAY) IN WINSTON-SALEM

TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE

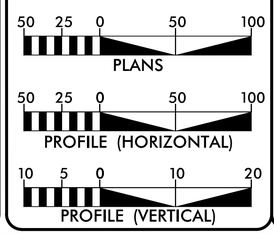
STRUCTURE PLANS



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS

GRAPHIC SCALES



DESIGN DATA

ADT 2023 = 20,222
ADT 2043 = 23,138
K = 8 %
D = 60 %
T = 5 % *
V = 50 MPH
* (TTST 1% + DUAL 4%)
FUNC CLASS = MAJOR COLLECTOR
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2729 = 0.727 MILES
LENGTH STRUCTURE TIP PROJECT U-2729 = 0.040 MILES
TOTAL LENGTH OF TIP PROJECT U-2729 = 0.767 MILES

TOTAL PROJECT LENGTH BASED ON -L- STATIONS.

PLANS PREPARED FOR THE NCDOT BY:

MOTT MACDONALD
7621 Parfoy Road, Suite 115
Fuquay-Varina, NC 27526
(919) 552-2253
(919) 552-2254 (Fax)
www.mottmac.com
NC License No. F-0669

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: APRIL 15, 2019

LETTING DATE: JUNE 20, 2023

DAVID C. WALLER, PE
PROJECT ENGINEER
PEF ENGINEER

HUDSON COKER
PROJECT DESIGN ENGINEER
PEF ENGINEER

CONNIE JAMES, PE
NCDOT DIVISION PROJECT ENGINEER

ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 JOHN A. BATTS

4/6/2023 | 10:39 AM PDT

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PLANS PREPARED BY:

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518

LICENSURE NO. C-4434

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

33+00 34+00 35+00

SPAN A SPAN B SPAN C

BEGIN BRIDGE
FILL FACE @ END BENT 1
STA. 33+14.78 -L-
G.P. EL. 917.39

END BRIDGE
FILL FACE @ END BENT 2
STA. 35+23.53-L-
G.P. EL. 915.95

EXP. FIX. FIX. FIX. FIX. EXP.

3′-0⅝″ (MIN.)

920 910 900 890 880

FILL
2′-0″ MIN. PILE EMBED. (TYP.)
4″ CONCRETE SLOPE PROTECTION (TYP.)
FACE OF MSE WALL
HP 12 X 53 VERTICAL STEEL PILES (TYP. EA. END BENT)
SINGLE FACE PRECAST CONCRETE BARRIER RAIL (ROADWAY DETAIL AND PAY ITEM) (TYP.)
SINGLE FACE PRECAST CONCRETE BARRIER RAIL (ROADWAY DETAIL AND PAY ITEM) (TYP.)
TOP OF FOOTING EL. 880.80
TOP OF FOOTING EL. 890.30
17′-8″ MIN. VERT. CLEARANCE
17′-8″ MIN. VERT. CLEARANCE
3′-0″ Ø COLUMN (TYP.)
FACE OF MSE WALL
6″ (TYP.)
HP 12 X 53 STEEL PILES (TYP. EA. BENT)
UNCLASSIFIED STRUCTURE EXCAVATION

EL. 910 ± EL. 907 ± EL. 891 ± EL. 893 ± EL. 893 ± EL. 892 ± EL. 892 ± EL. 890 ± EL. 898 ± EL. 906 ± EL. 912 ±

END BENT 1 BENT 1 BENT 2 END BENT 2

(+)2.4610% (-)0.6904%
PVI STA. 31+05.00
EL. = 918.84
VC = 250′

(-)0.6904% (-)2.9586%
PVI STA. 36+25.00
EL. = 915.25
VC = 150′

GRADE DATA -L-

SECTION ALONG ℄ SURVEY -L-

(SECTIONS @ END BENTS AND BENTS ARE @ RIGHT ANGLES)

TOTAL BRIDGE LENGTH = 208′-9″ (FILL FACE TO FILL FACE)

84′-4″ (SPAN A) 68′-2″ (SPAN B) 56′-3″ (SPAN C)

10′-0″ MIN. 12′-0″ FUTURE LANE 3 LANES @ 12′-0″ ± = 36′-0″ ± EXISTING PAVEMENT 15′-0″ ✱ ℄ -Y4- 15′-0″ ✱ TO KING 2 LANES @ 12′-0″ ± = 24′-0″ ± EXISTING PAVEMENT 12′-0″ FUTURE LANE 10′-0″ MIN. ✱ (TYP.) 10′-0″ MIN. ✱✱ (TYP.) 2 LANES @ 12′-0″ ± = 24′-0″ ± FUTURE PAVEMENT 10′-0″

4″ CONCRETE SLOPE PROTECTION

✱ MINIMUM HORIZONTAL CLEARANCE FROM FACE OF CONCRETE BARRIER TO EDGE OF ROADWAY

✱✱ MINIMUM HORIZONTAL CLEARANCE FROM FACE OF CONCRETE BARRIER TO EDGE OF 12′-0″ FUTURE LANES

PMVC 1

STA. 33+67.37 -L-
OFFSET 40.25 FT. RT.
BOTTOM OF GDR. EL. 911.16

STA. 66+49.69 -Y4-
OFFSET 26.00 FT. RT.
EL. 893.49

PMVC 2

STA. 34+31.97 -L-
OFFSET 40.25 FT. RT.
BOTTOM OF GDR. EL. 910.71

STA. 66+40.95 -Y4-
OFFSET 38.00 FT. LT.
EL. 893.01

PMVC = POINT OF MINIMUM VERTICAL CLEARANCE

W.P. #1
STA. 33+14.78 -L-
FILL FACE @ END BENT 1

BEGIN APPROACH SLAB
STA. 32+90.79 -L-

TO MUSEUM DR.

STAGE I STAGE II

TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC (SEE NOTES)

EXISTING SUBSTRUCTURE (TYP.)

4″ CONCRETE SLOPE PROTECTION

FACE OF MSE WALL

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

TO WINSTON SALEM

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

BRIDGE ID.
STA. 33+99.11 -L-
STA. 66+05.52 -Y4-

W.P. #2
STA. 33+99.11 -L-
BENT 1 CONTROL LINE

TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC (SEE NOTES)

℄ GDR. 11

PMVC 1

97°-46′-47″ (TYP.)

TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC (SEE NOTES)

PMVC 2

℄ GDR. 11

W.P. #3
STA. 34+67.28 -L-
BENT 2 CONTROL LINE

PROPOSED GUARDRAIL (ROADWAY DETAIL AND PAY ITEM) (TYP.)

FACE OF MSE WALL

℄ -CD- (FUTURE)

W.P. #4
STA. 35+23.53 -L-
FILL FACE @ END BENT 2

END APPROACH SLAB
STA. 35+47.52 -L-

℄ -L-

TO SR 4000

TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC (SEE NOTES)

PLAN

(PILES, COLUMNS AND FOOTINGS NOT SHOWN IN PLAN VIEW)
(BOTH END BENTS AND BENTS ARE PARALLEL)

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

SHEET 1 OF 4 REPLACES BRIDGE #330290

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1672
(HANES MILL RD)
OVER US 52 BETWEEN
MUSEUM DR. AND SR 4000

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			59

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518
LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 JOHN A. BATTS
4/6/2023 | 10:39 AM PDT

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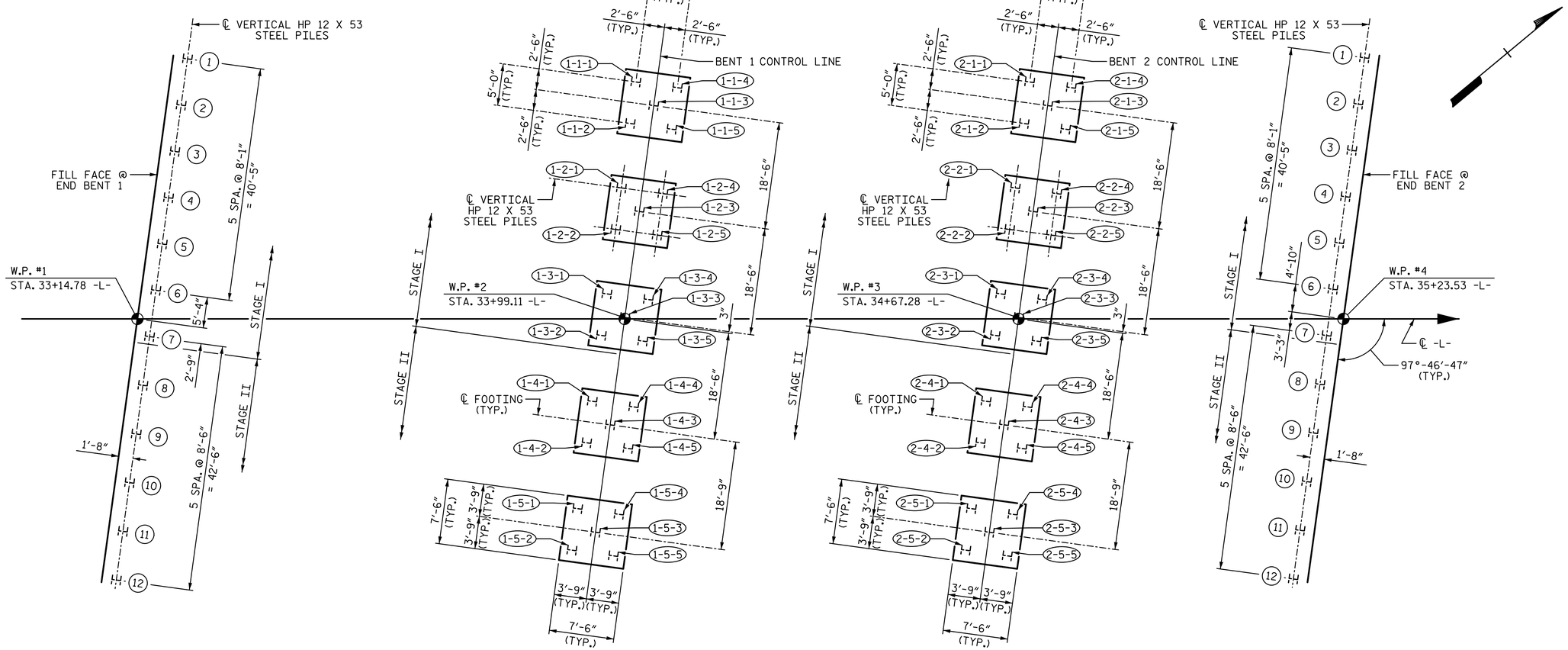

FOUNDATION LAYOUT

(ALL PILES ARE VERTICAL HP STEEL PILES)
(DIMENSIONS LOCATING PILES ARE TO THE PILE CENTERLINE AT THE BOTTOM OF THE CAP OR FOOTING)
TYPICAL PILE LABEL FOR INTERIOR BENTS, (X-Y-Z) IS BENT "X", FOOTING "Y", PILE "Z".

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFCATIONS.

INSTALL PILES AT END BENT 1 AND 2 PRIOR TO MSE WALL CONSTRUCTION.

PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 126 TONS PER PILE.

DRIVE PILES AT END BENT 1 TO A REQUIRED OF 240 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG.

OBSERVE A 2 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT, END BENT AND REINFORCED BRIDGE APPROACH FILL, BEFORE BEGINNING APPROACH SLAB CONSTRUCTION AT END BENT 1 FOR BOTH STAGE 1 AND STAGE 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.

DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.

PILES AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 108 TONS PER PILE.

DRIVE PILES AT BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 180 TONS PER PILE.

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG.

OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT, END BENT AND REINFORCED BRIDGE APPROACH FILL, BEFORE BEGINNING APPROACH SLAB CONSTRUCTION AT END BENT 2 FOR STAGE 1. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICAITONS.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 40,000 TO 55,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT ALL 4 BENTS. 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.

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOUNDATION LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			59

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

WGI
5640 Dillard Drive, Suite 200
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4/6/2023 | 10:39 AM PDT

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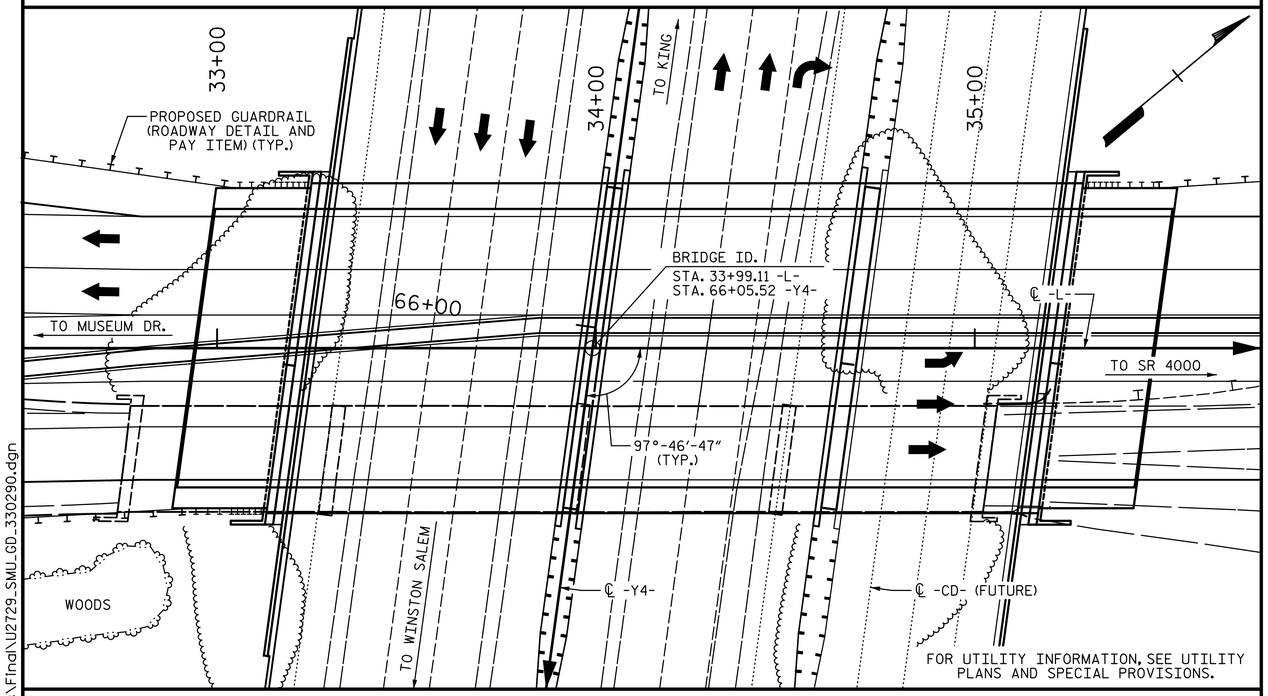
4/6/2023 12:01:43 PM P:\Raleigh\Projects\2018\Division 9 (Mott MacDonald)\U-2729\Structures\Drawings\Final\U2729_SMU_FL_330290.dgn



LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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

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

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST 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 MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 80 FT. LEFT AND RIGHT OF CENTERLINE ROADWAY AT END BENT 2 AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

WORK SHALL NOT BE STARTED ON THIS BRIDGE UNTIL ROADWAY SECTION HAS BEEN EXCAVATED.

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

THE EXISTING STRUCTURE CONSISTS OF 4 SPANS, 1 SPAN @ 54'-10", 1 @ 64'-6", 1 @ 54'-6", AND 1 @ 54'-10", THE SUPERSTRUCTURE HAS A CLEAR ROADWAY WIDTH OF 28'-0" WITH REINFORCED CONCRETE DECK ON PRECAST PRESTRESSED CONCRETE GIRDERS. THE END BENTS CONSIST OF REINFORCED CONCRETE CAP ON PRECAST PRESTRESSED CONCRETE PILES. INTERIOR BENTS CONSIST OF REINFORCED CONCRETE POST AND BEAM CAPS ON SPREAD FOOTINGS. THE EXISTING STRUCTURE, WHICH IS LOCATED AT THE SITE OF THE PROPOSED STRUCTURE, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	FOUNDATION EXCAVATION FOR BENT	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS
	LS	LS	LS	LS	SF	SF	CY	LS
SUPERSTRUCTURE					17,988	17,900		LS
END BENT 1							65.8	
BENT 1			LS				118.9	
BENT 2			LS				116.3	
END BENT 2				LS			66.6	
TOTAL	LS	LS	LS	LS	17,988	17,900	367.6	LS

TOTAL BILL OF MATERIAL

	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	45" PRESTRESSED CONCRETE GIRDER		PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		THREE BAR METAL RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	STRIP SEAL EXPANSION JOINTS
	LB	LB	NO.	LF	EA	NO.	LF	LF	SY	LS	LS
SUPERSTRUCTURE			33	2,255.46				397.77		LS	LS
END BENT 1	10,125				12	12	1,200		27		
BENT 1	17,906	2,095			25	25	1,750				
BENT 2	17,498	1,875			25	25	1,750				
END BENT 2	10,432				12	12	1,200		34		
TOTAL	55,961	3,970	33	2,255.46	74	74	5,900	397.77	61	LS	LS

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1672
(HANES MILL RD)
OVER US 52 BETWEEN
MUSEUM DR. AND SR 4000

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518
LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL SEAL 18056 ENGINEER JOHN A. BATTS
4/6/2023 | 10:39 AM PM

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			59

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	**1.05**	- -	1.75	0.725	1.53	B	I	33.3	0.882	1.90	A	I	7.6	0.80	0.691	**1.05**	A	I	**40.7**	
		HL-93 (OPERATING)	N/A		1.98	- -	1.35	0.725	1.98	B	I	33.3	0.882	2.50	A	I	7.6	N/A	- -	- -	- -	- -	- -	
		HS-20 (INVENTORY)	36.000	⟨2⟩	**1.40**	50.4	1.75	0.725	1.97	B	I	33.3	0.882	2.47	A	I	7.6	0.80	0.691	**1.40**	A	I	**40.7**	
		HS-20 (OPERATING)	36.000		2.56	92.2	1.35	0.725	2.56	B	I	33.3	0.882	3.23	A	I	7.6	N/A	- -	- -	- -	- -	- -	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.23	43.6	1.40	0.725	5.46	B	I	33.3	0.882	7.67	A	I	7.6	0.80	0.691	3.23	A	I	40.7	
		SNGARBS2	20.000		2.38	47.6	1.40	0.725	4.11	B	I	33.3	0.882	5.39	A	I	7.6	0.80	0.691	2.38	A	I		
		SNAGRIS2	22.000		2.24	49.3	1.40	0.725	3.92	B	I	33.3	0.882	4.98	A	I	7.6	0.80	0.691	2.24	A	I	40.7	
		SNCOTTS3	27.250		1.61	43.9	1.40	0.725	2.72	B	I	33.3	0.882	3.77	A	I	7.6	0.80	0.691	1.61	A	I	40.7	
		SNAGGRS4	34.925		1.33	46.5	1.40	0.725	2.29	B	I	33.3	0.882	3.08	A	I	7.6	0.80	0.691	1.33	A	I	40.7	
		SNS5A	35.550		1.30	46.2	1.40	0.725	2.24	B	I	33.3	0.882	3.11	A	I	7.6	0.80	0.691	1.30	A	I	40.7	
		SNS6A	39.950		1.19	47.5	1.40	0.725	2.06	B	I	33.3	0.882	2.82	A	I	7.6	0.80	0.691	1.19	A	I	40.7	
		SNS7B	42.000		1.13	47.5	1.40	0.725	1.96	B	I	33.3	0.882	2.76	A	I	7.6	0.80	0.691	1.13	A	I	40.7	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.45	47.9	1.40	0.725	2.51	B	I	33.3	0.882	3.39	A	I	7.6	0.80	0.691	1.45	A	I	40.7	
		TNT4A	33.075		1.46	48.3	1.40	0.725	2.53	B	I	33.3	0.882	3.31	A	I	7.6	0.80	0.691	1.46	A	I	40.7	
		TNT6A	41.600		1.19	49.5	1.40	0.725	2.07	B	I	33.3	0.882	2.92	A	I	7.6	0.80	0.691	1.19	A	I	40.7	
		TNT7A	42.000		1.19	50.0	1.40	0.725	2.09	B	I	33.3	0.882	2.87	A	I	7.6	0.80	0.691	1.19	A	I	40.7	
		TNT7B	42.000		1.22	51.2	1.40	0.725	2.17	B	I	33.3	0.882	2.70	A	I	7.6	0.80	0.691	1.22	A	I	40.7	
		TNAGRIT4	43.000		1.17	50.3	1.40	0.725	2.06	B	I	33.3	0.882	2.61	A	I	7.6	0.80	0.691	1.17	A	I	40.7	
		TNAGT5A	45.000		1.10	49.5	1.40	0.725	1.94	B	I	33.3	0.882	2.58	A	I	7.6	0.80	0.691	1.10	A	I	40.7	
		TNAGT5B	45.000	⟨3⟩	**1.09**	49.1	1.40	0.725	1.91	B	I	33.3	0.882	2.48	A	I	7.6	0.80	0.691	**1.09**	A	I	**40.7**	

LOAD FACTORS:

	LIMIT STATE	γ_{DC}	γ_{DW}
DESIGN LOAD RATING FACTORS	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. DISTANCE FROM LEFT END OF SPAN IS MEASURED FROM ℄ BEARING.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

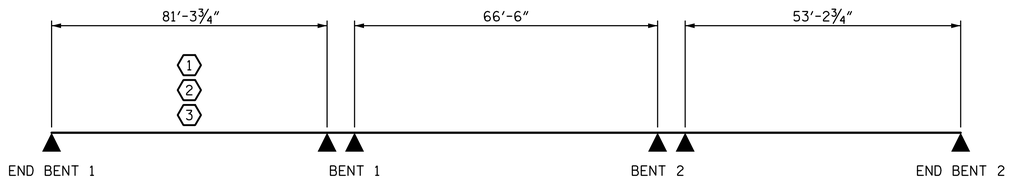
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS
(NON-INTERSTATE TRAFFIC)

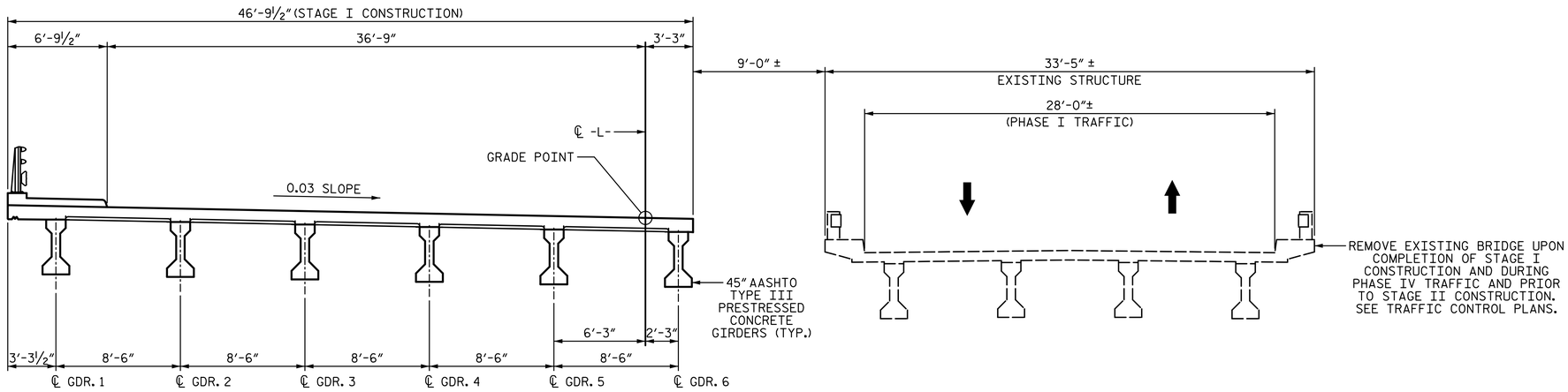
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			59

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518
LICENSURE NO. C-4434

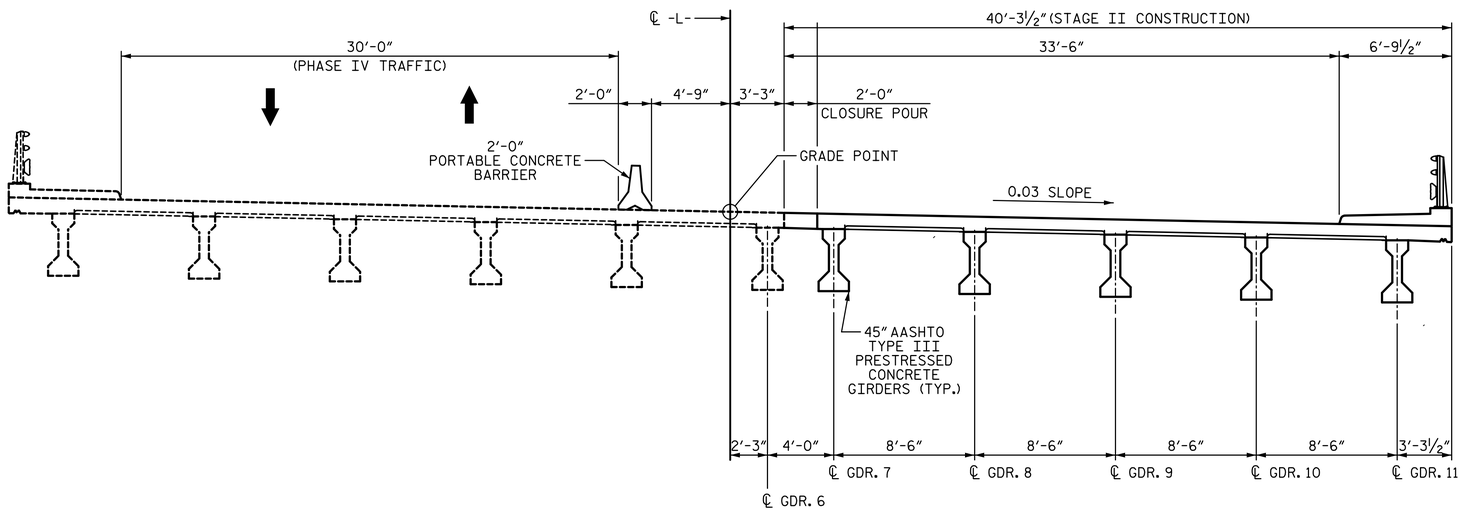
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Digitally signed by JOHN A. BATTS
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 JOHN A. BATTS
4/6/2023 | 10:39 AM PDT



STAGE I CONSTRUCTION

PHASE I OF TRAFFIC MANAGEMENT PLAN



STAGE II CONSTRUCTION

PHASE IV OF TRAFFIC MANAGEMENT PLAN
SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE PORTABLE CONCRETE BARRIER

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

CONSTRUCTION SEQUENCE

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518
LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 ENGINEER JOHN A. BATTS
4/6/2023 | 10:39 AM PDT

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CHECKED BY: T.J. BEACH DATE: 9-22
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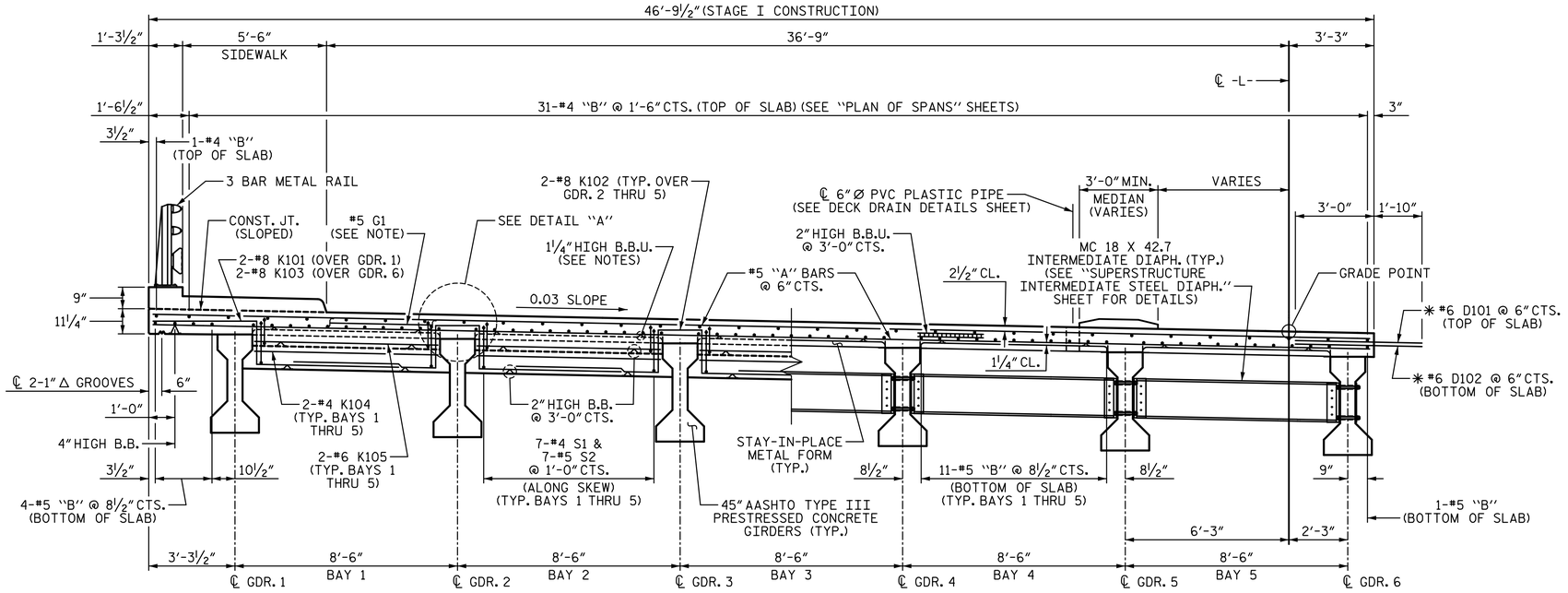
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			59

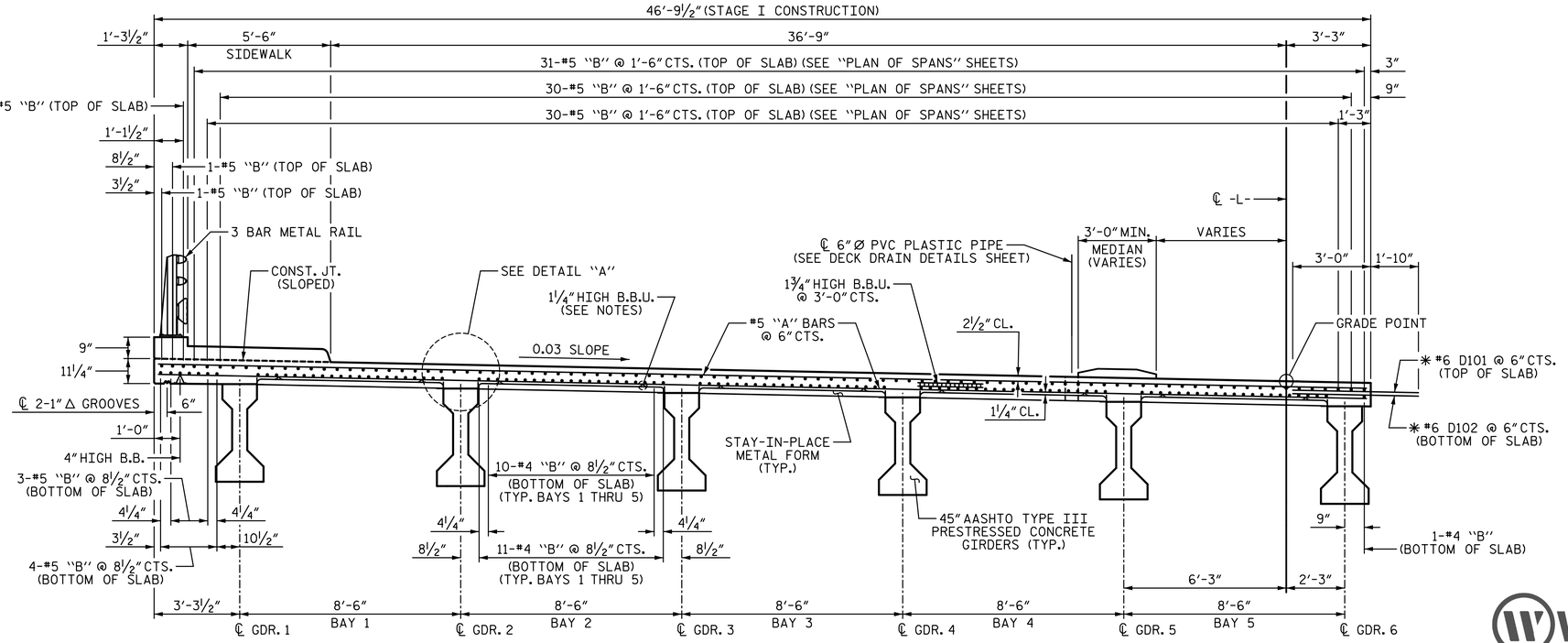


PARTIAL TYPICAL SECTION

(SHOWING END BENT DIAPHRAGM)

PARTIAL TYPICAL SECTION

(SHOWING INTERMEDIATE DIAPHRAGM)



PARTIAL TYPICAL SECTION

(SHOWING LINK SLAB REGION INTERIOR BENT)

NOTES:

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

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

CONCRETE SIDEWALK IN 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.

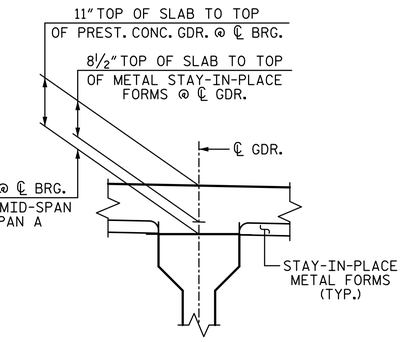
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

✱ #6 D101 & D201 DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP REINFORCING STEEL. #6 D102 & D202 DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE BOTTOM REINFORCING STEEL.

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

3'-0" MIN. MEDIAN SHALL BE POURED AFTER STAGE II IS COMPLETE, SEE CONSTRUCTION SEQUENCE SHEET.

DECK STEEL MAY BE SHIFTED SLIGHTLY TO CLEAR DECK DRAINS.



DETAIL "A"

(TYP. EA. GDR.)

(✱✱ BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS)

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

TYPICAL SECTION

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			59

DRAWN BY: T. BANKOVICH DATE: 9-22
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 JOHN A. BATTS
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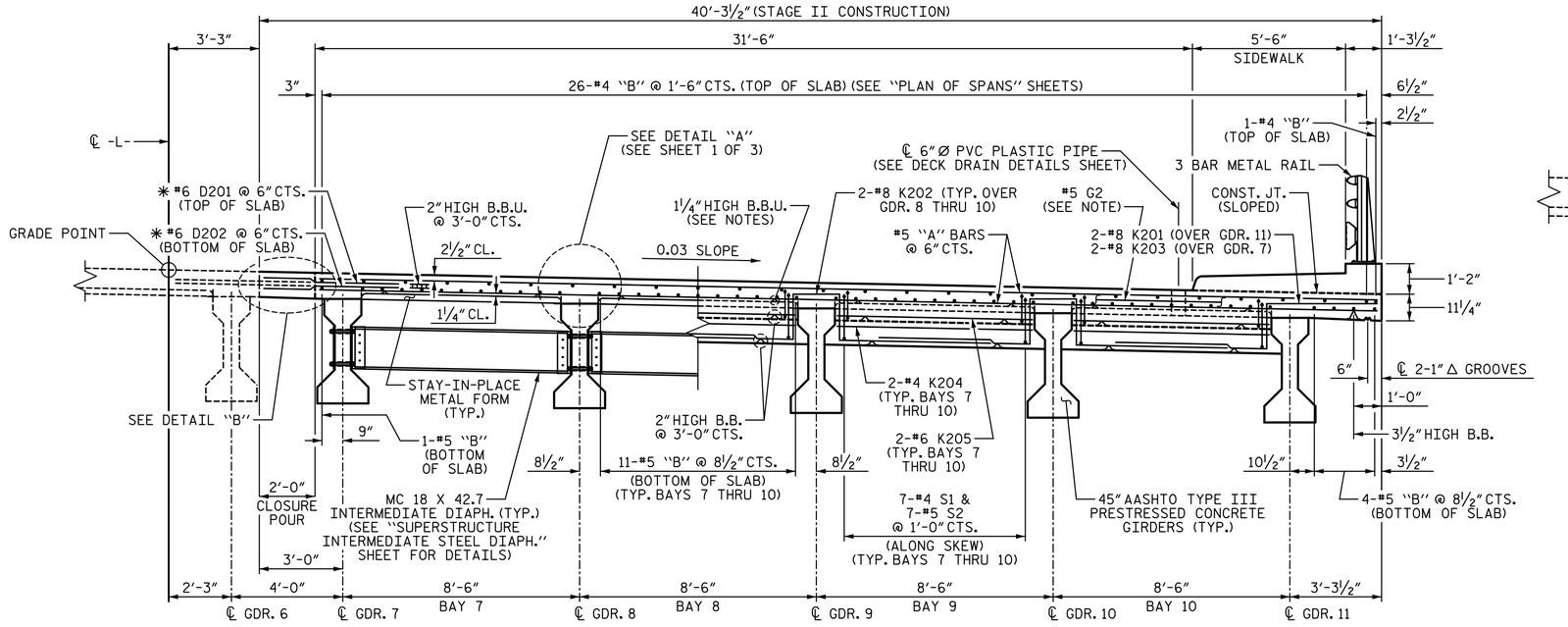
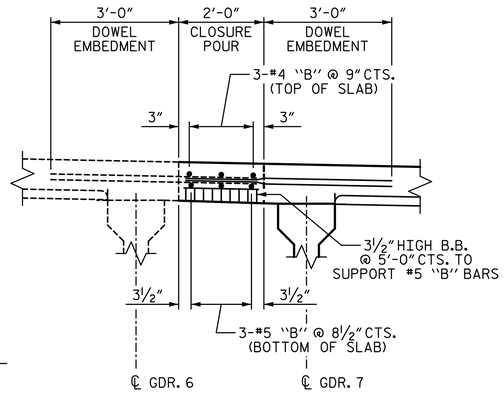


PARTIAL TYPICAL SECTION

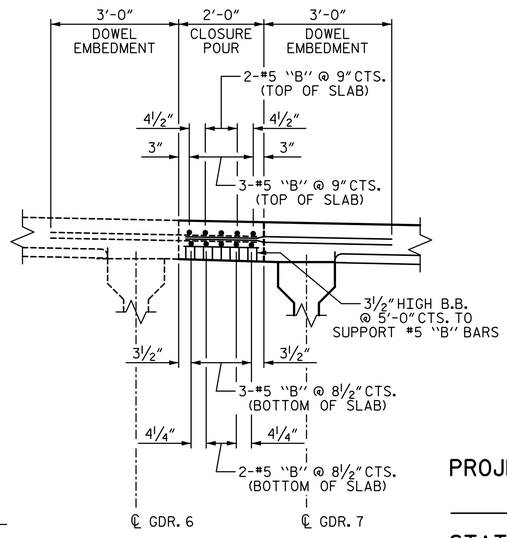
(SHOWING INTERMEDIATE DIAPHRAGM)

PARTIAL TYPICAL SECTION

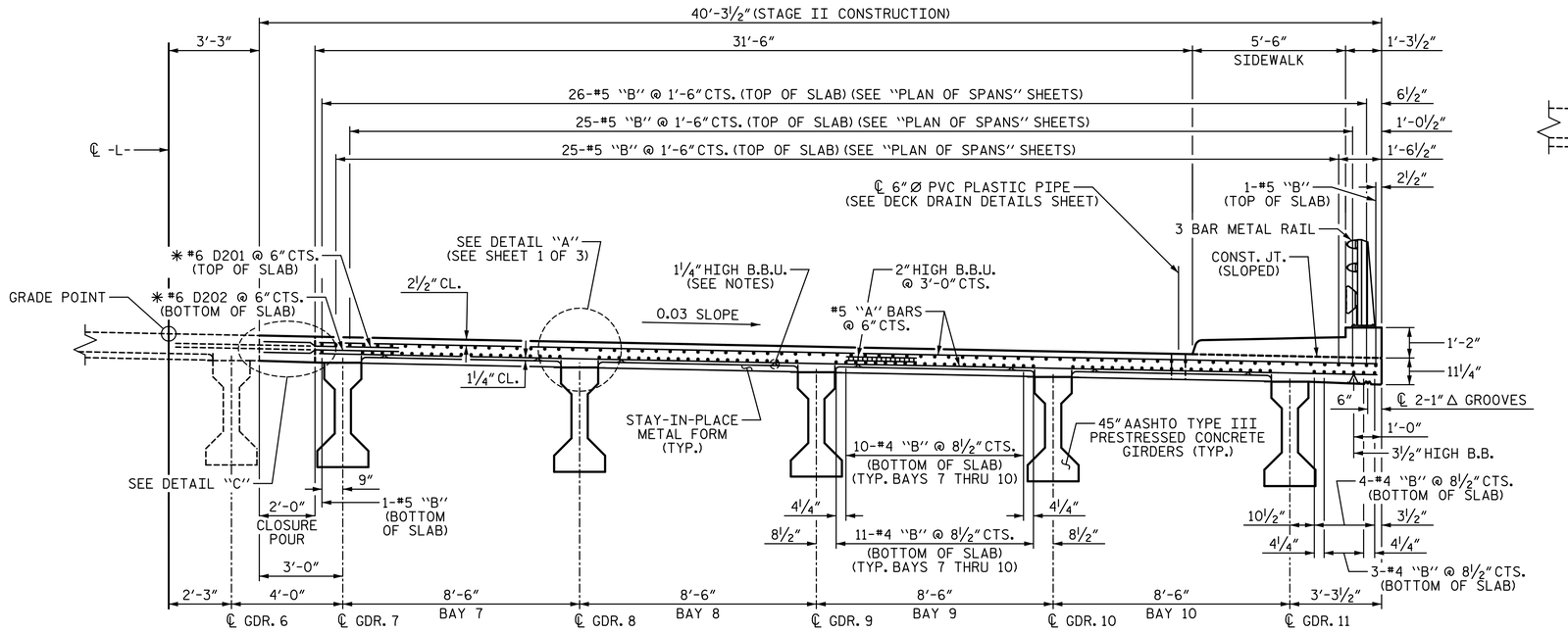
(SHOWING END BENT DIAPHRAGM)



DETAIL "B"



DETAIL "C"



PARTIAL TYPICAL SECTION

(SHOWING LINK SLAB REGION INTERIOR BENT)

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

TYPICAL SECTION

STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			59

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

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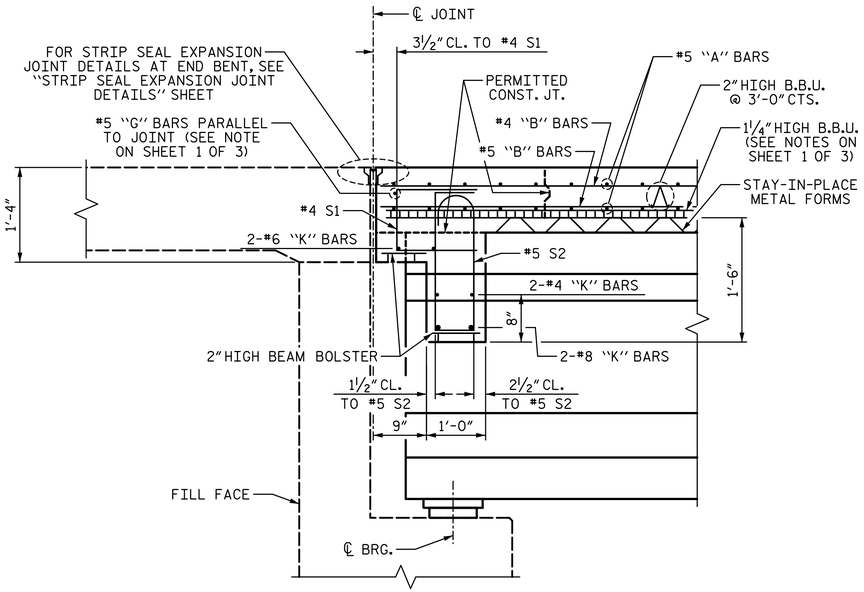
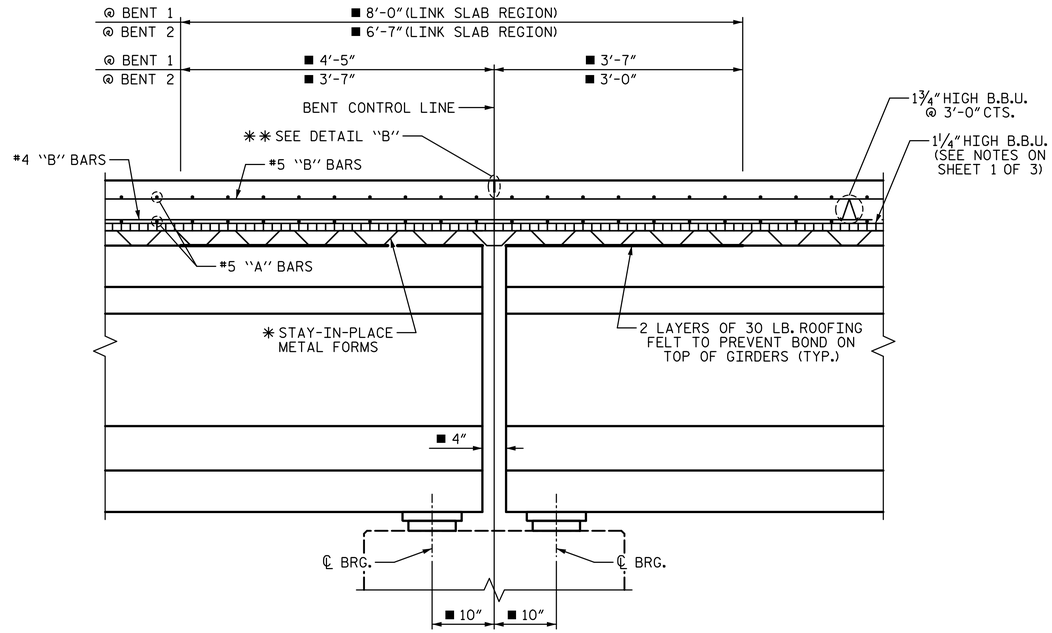


SECTION A-A

SECTION AT END BENT

(END BENT 1 SHOWN, END BENT 2 SIMILAR)



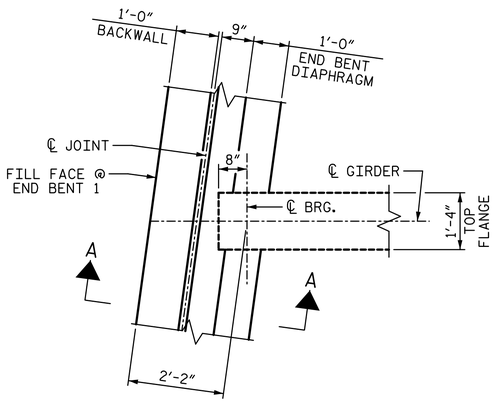
SECTION B-B

SECTION AT BENT

■ DIMENSIONS MEASURED ALONG ℄ GIRDER

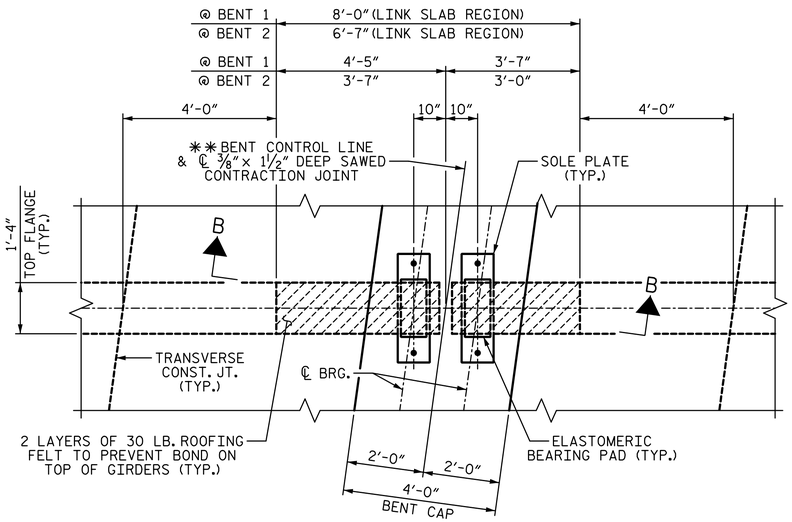
✱ METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO THE GIRDER FLANGES IN THE REGION OF THE LINK SLAB.

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



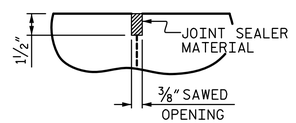
PLAN OF GIRDER AT END BENT

(END BENT 1 SHOWN, END BENT 2 SIMILAR)



PLAN OF GIRDER AT BENT

(LINK SLAB AREA SHALL BE SMOOTH AND FREE OF DEBRIS, STIRRUPS, AND ANCHORS)



DETAIL "B"

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			59

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

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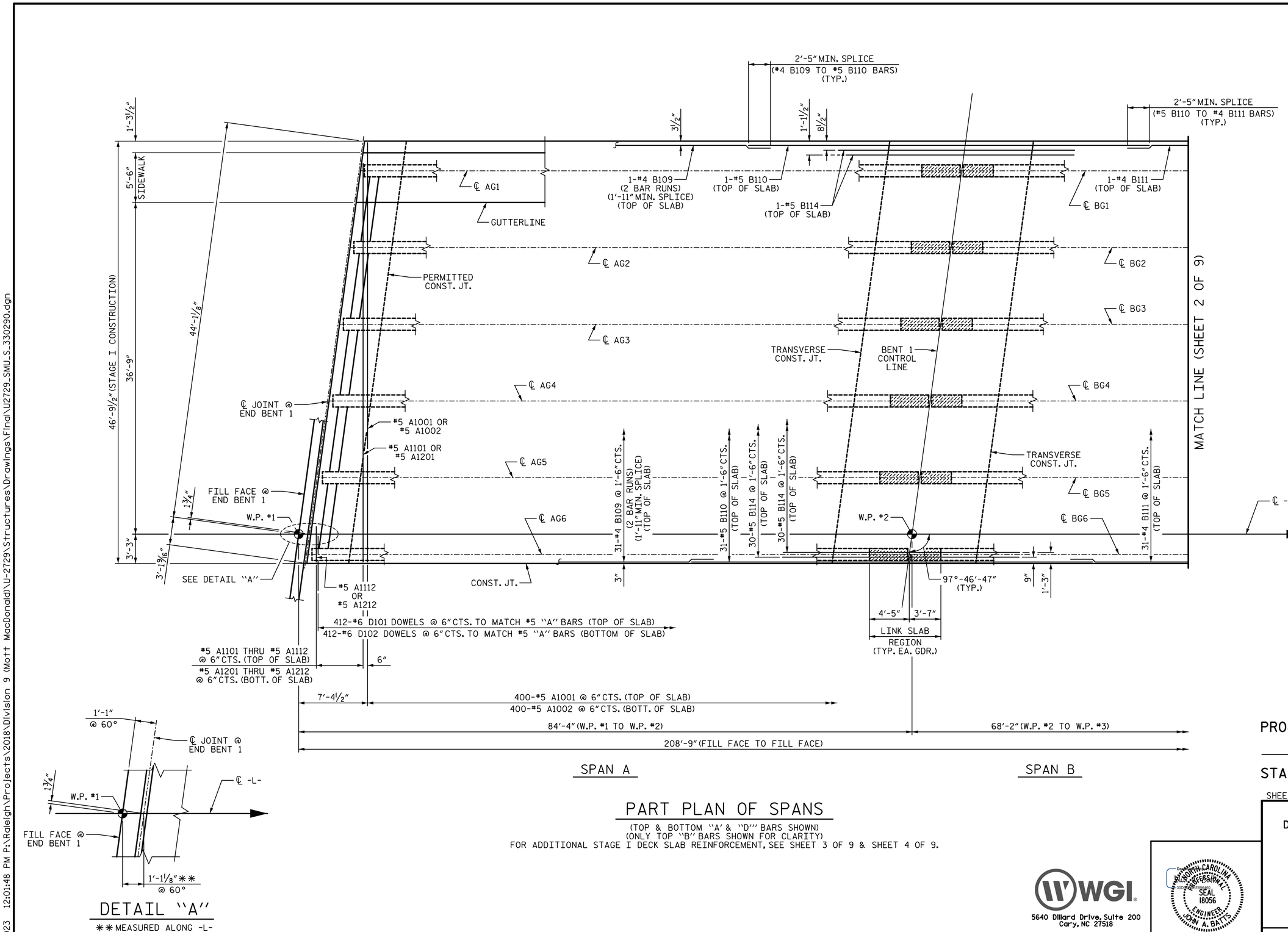

SPAN A SPAN B

PART PLAN OF SPANS

(TOP & BOTTOM "A" & "D" BARS SHOWN)
(ONLY TOP "B" BARS SHOWN FOR CLARITY)
FOR ADDITIONAL STAGE I DECK SLAB REINFORCEMENT, SEE SHEET 3 OF 9 & SHEET 4 OF 9.

DETAIL "A"

**MEASURED ALONG -L-

NOTES:

SEE "SUPERSTRUCTURE TYPICAL SECTION" SHEETS FOR SECTIONS AT END BENTS AND BENTS.

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

FOR POUR SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINT, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

FOR ADDITIONAL REINFORCING STEEL IN SIDEWALKS AND DECK, SEE "SUPERSTRUCTURE SIDEWALK DETAILS" SHEET.

SEE SHEET 9 OF 9 FOR "B" BAR PLACEMENT DETAILS.

FOR JOINT DETAILS, SEE "SUPERSTRUCTURE STRIP SEAL EXPANSION JOINT DETAILS" SHEETS.

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

SHEET 1 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

PLAN OF SPANS

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			59

DRAWN BY: T. BANKOVICH DATE: 9-22
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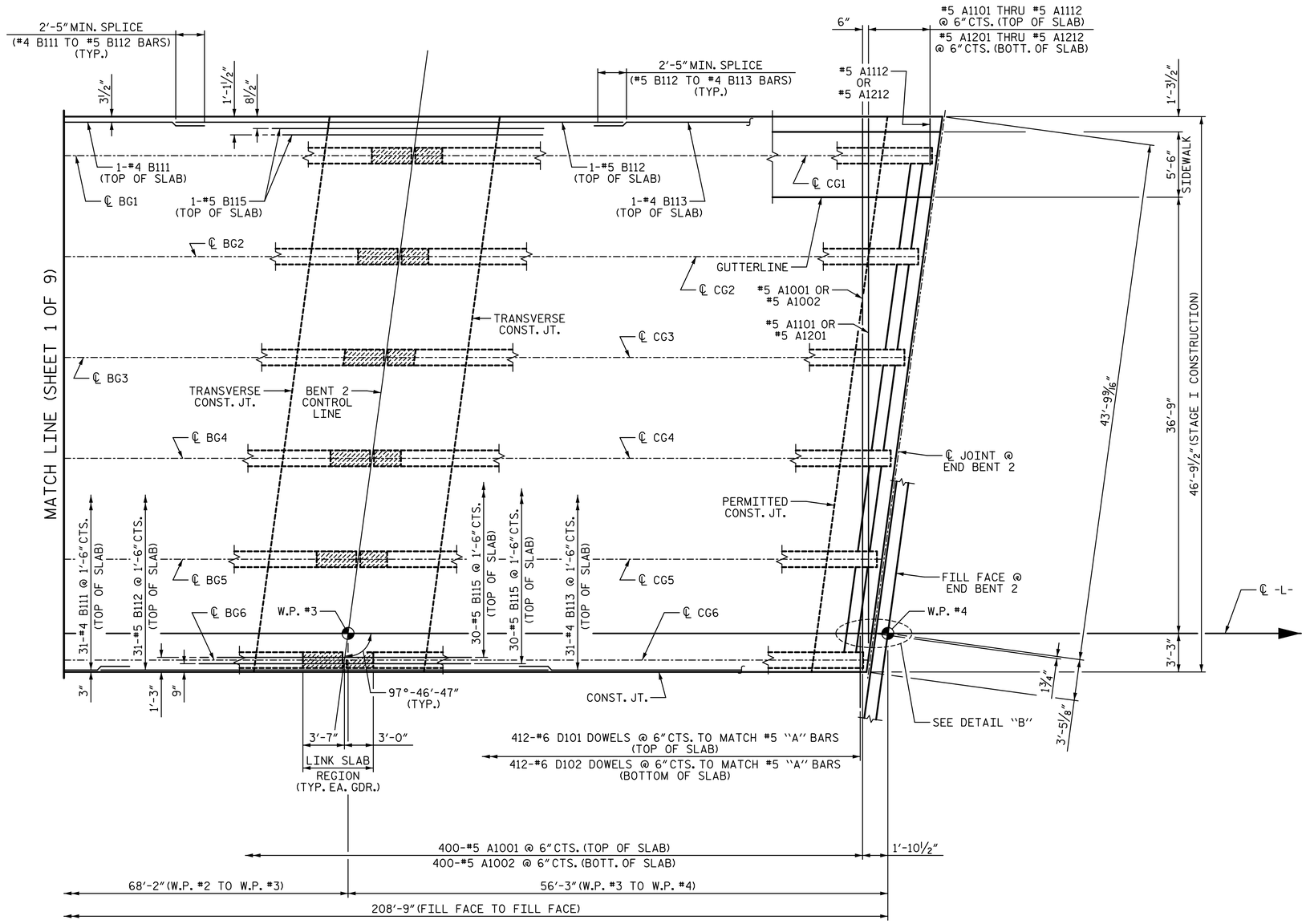

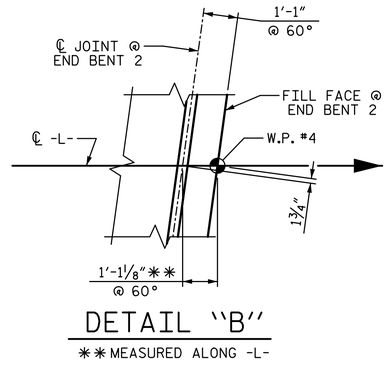

DETAIL ″B″

**MEASURED ALONG -L-

PART PLAN OF SPANS

(TOP & BOTTOM ″A″ & ″D″ BARS SHOWN)
(ONLY TOP ″B″ BARS SHOWN FOR CLARITY)
FOR ADDITIONAL STAGE I DECK SLAB REINFORCEMENT, SEE SHEET 3 OF 9 & SHEET 4 OF 9.

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

SHEET 2 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

PLAN OF SPANS

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			59

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
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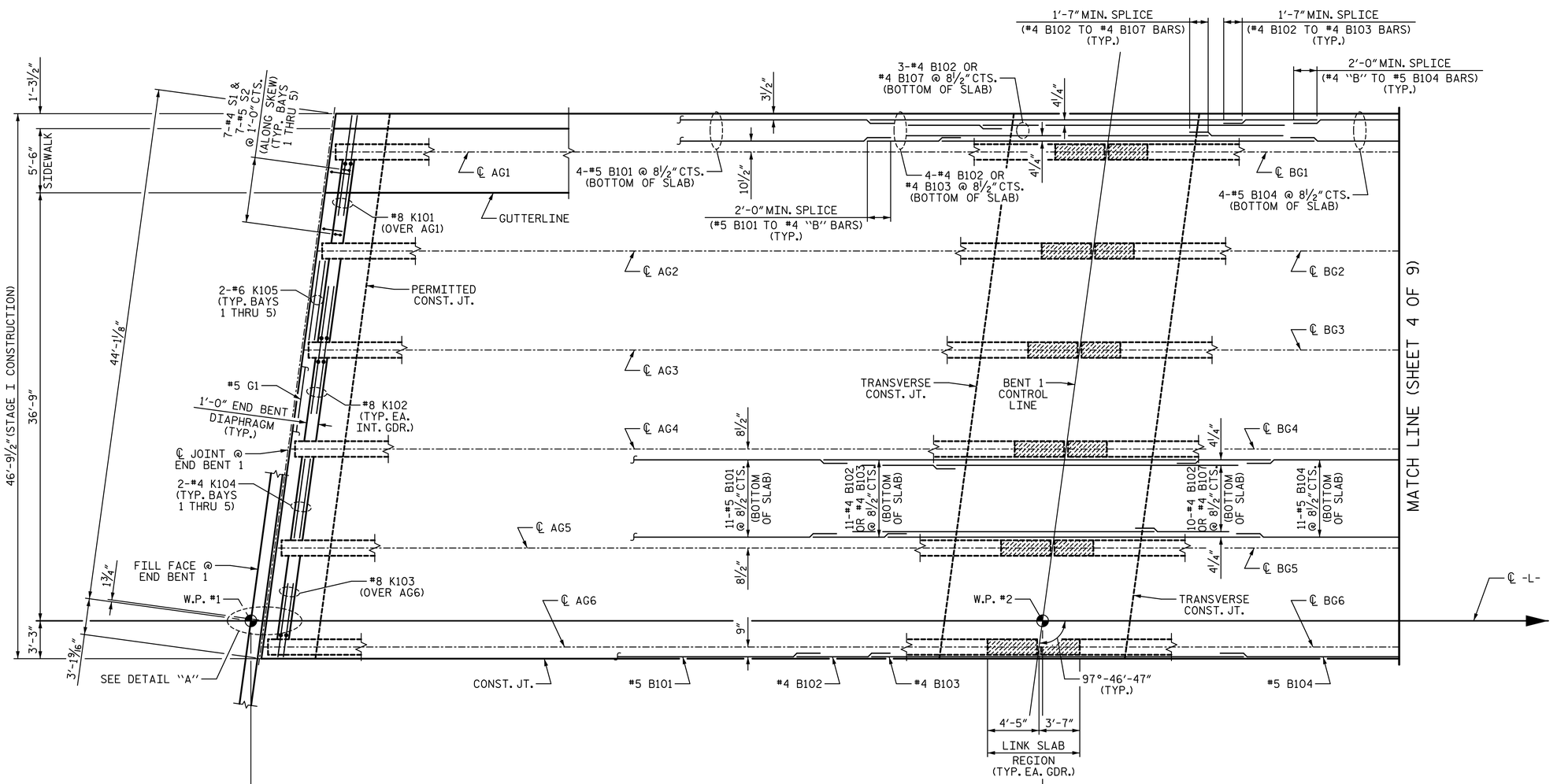

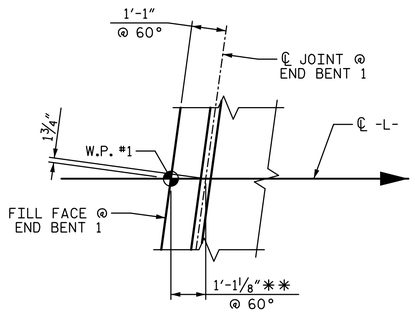

DETAIL "A"

**MEASURED ALONG -L-

PART PLAN OF SPANS

BOTTOM "B" BARS AND DIAPHRAGM BARS SHOWN.

DRAWN BY:	T. BANKOVICH	DATE:	9-22
CHECKED BY:	T.J. BEACH	DATE:	9-22
DESIGN ENGINEER OF RECORD:	J.A. BATTS	DATE:	9-22

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PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

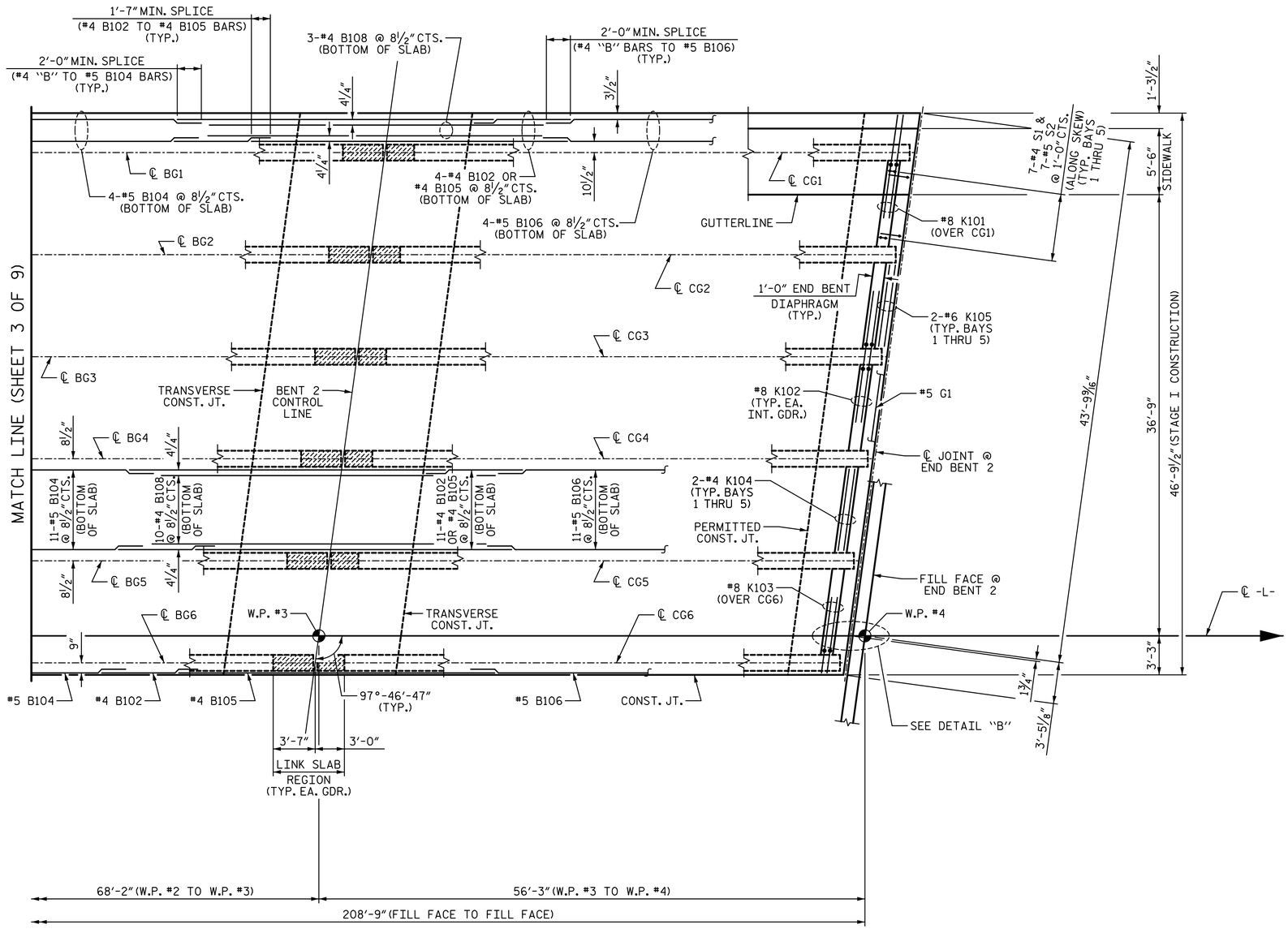
SHEET 3 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

PLAN OF SPANS

STAGE I

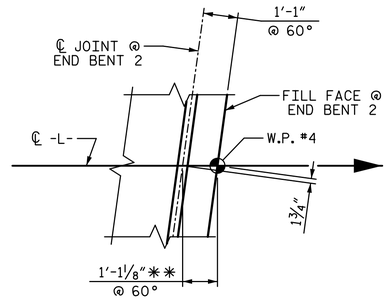
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			59



SPAN B SPAN C

PART PLAN OF SPANS

BOTTOM "B" BARS AND DIAPHRAGM BARS SHOWN.



DETAIL "B"

** MEASURED ALONG -L-

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 4 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

PLAN OF SPANS

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			59

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LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 JOHN A. BATTS

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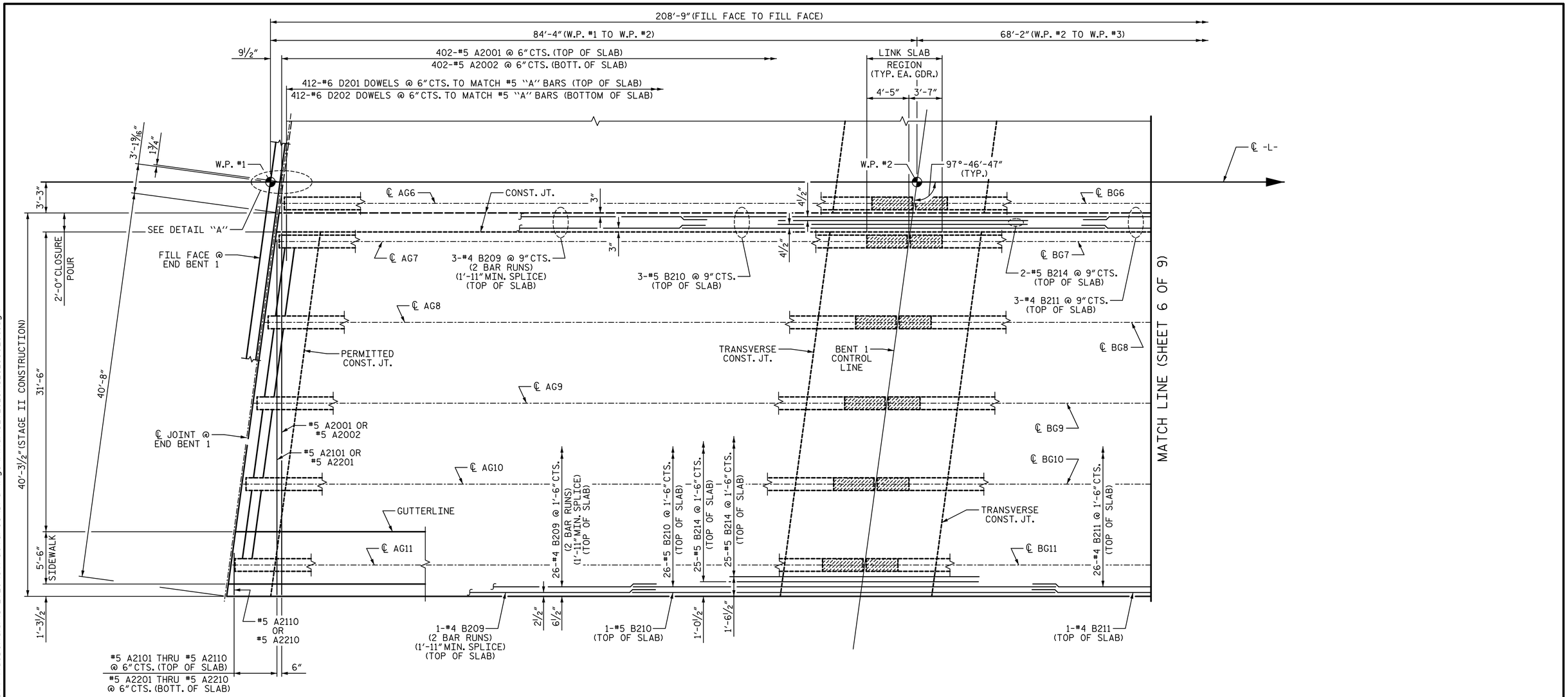
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

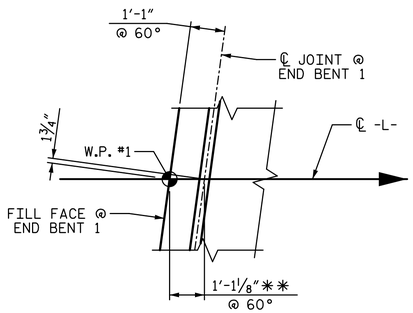


SPAN A

SPAN B

PART PLAN OF SPANS

(TOP & BOTTOM "A' & "D"' BARS SHOWN)
(ONLY TOP "B" BARS SHOWN FOR CLARITY)
FOR ADDITIONAL STAGE II DECK SLAB REINFORCEMENT, SEE SHEET 7 OF 9 AND SHEET 8 OF 9.



DETAIL "A"

**MEASURED ALONG -L-

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

SHEET 5 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

PLAN OF SPANS

STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			59

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

WGI
5640 Dillard Drive, Suite 200
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LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL SEAL 18056 ENGINEER JOHN A. BATTS
4/6/2023 | 10:39 AM PDT

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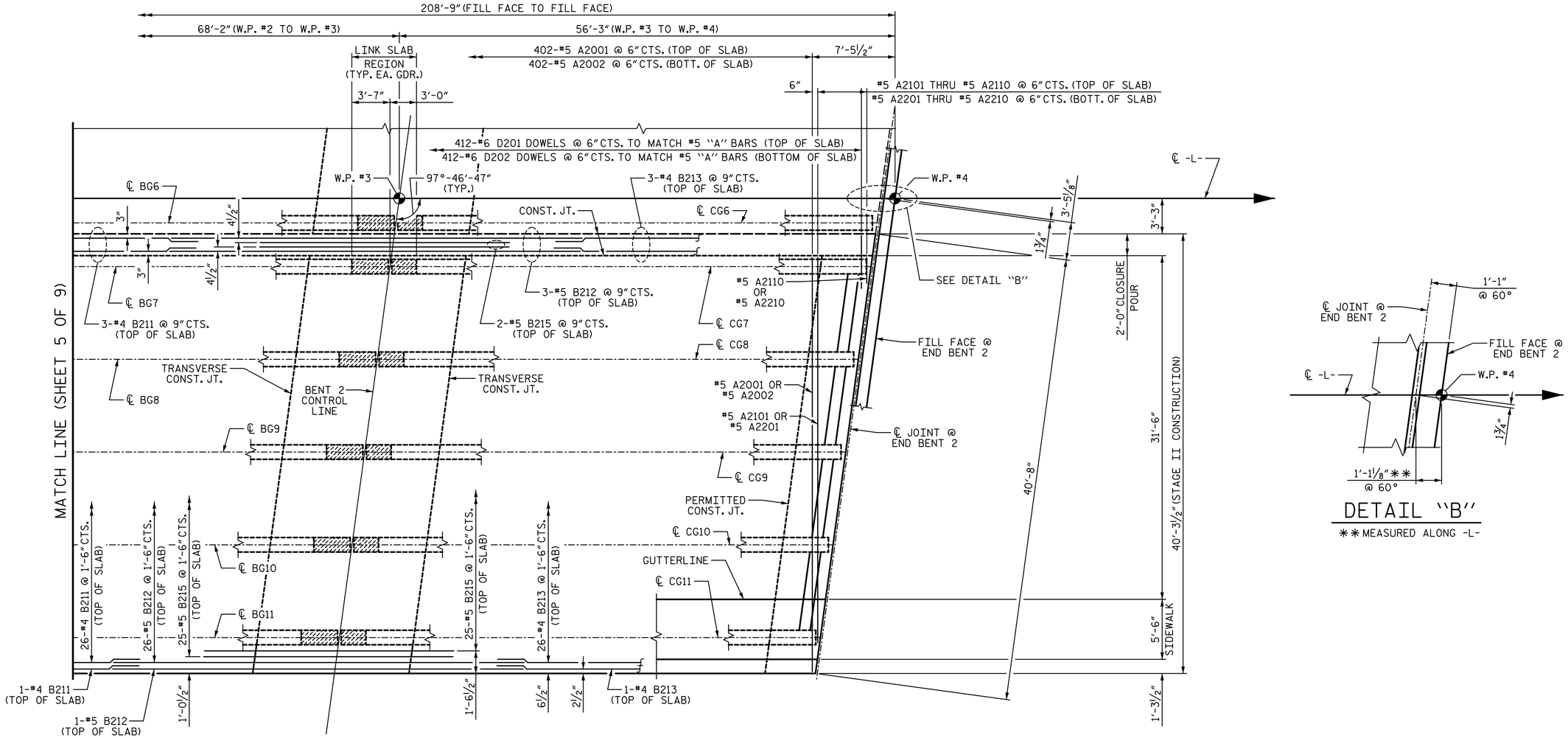

DETAIL "B"

**MEASURED ALONG -L-

SPAN B SPAN C

PART PLAN OF SPANS

(TOP & BOTTOM "A" & "D" BARS SHOWN)
(ONLY TOP "B" BARS SHOWN FOR CLARITY)
FOR ADDITIONAL STAGE II DECK SLAB REINFORCEMENT,
SEE SHEET 7 OF 9 AND SHEET 8 OF 9.

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

SHEET 6 OF 9

STATE OF NORTH CAROLINA
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RALEIGH
SUPERSTRUCTURE

PLAN OF SPANS

STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			59

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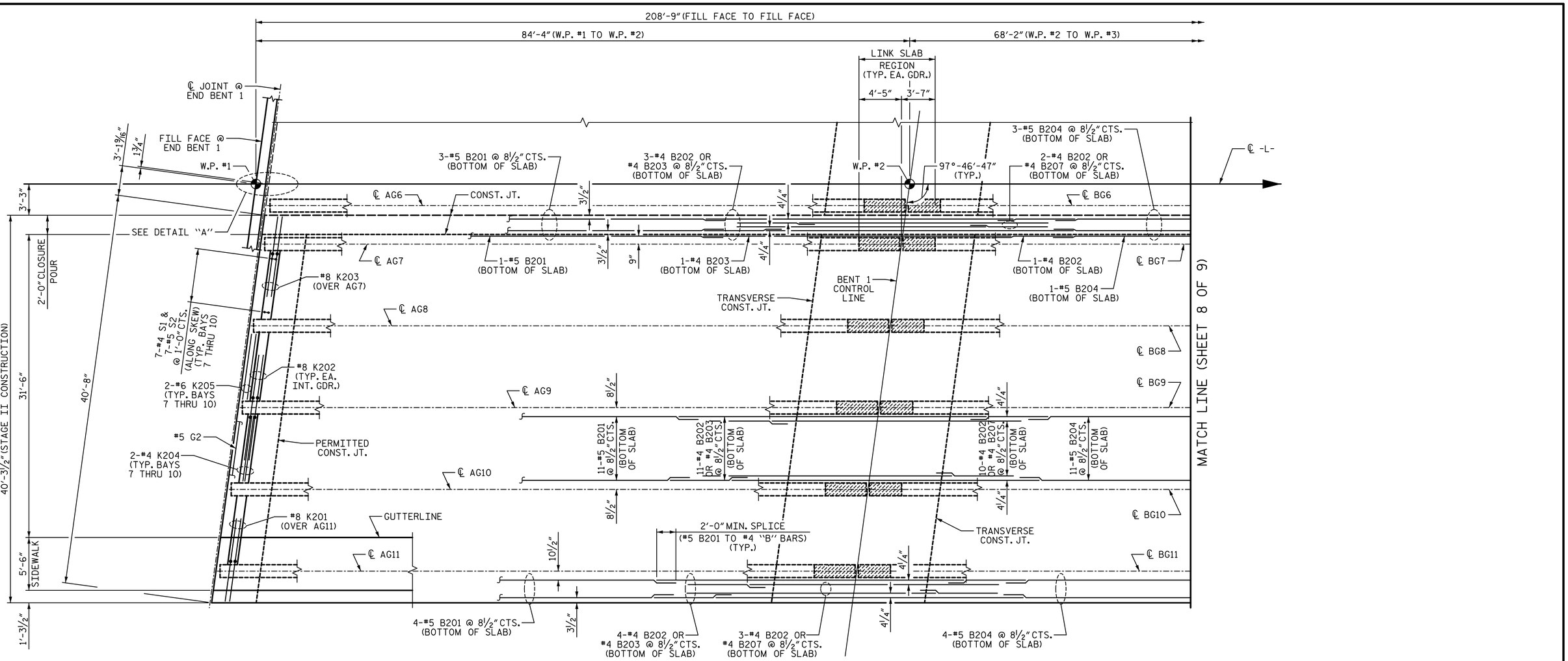
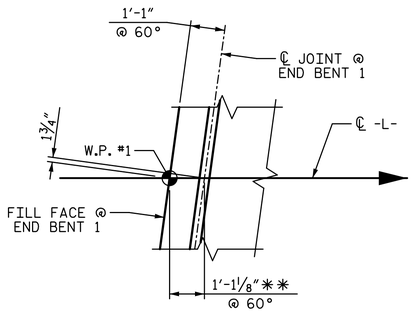


SPAN A

SPAN B

PART PLAN OF SPANS

BOTTOM "B" BARS AND DIAPHRAGM BARS SHOWN.



DETAIL "A"

**MEASURED ALONG -L-

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 7 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			59

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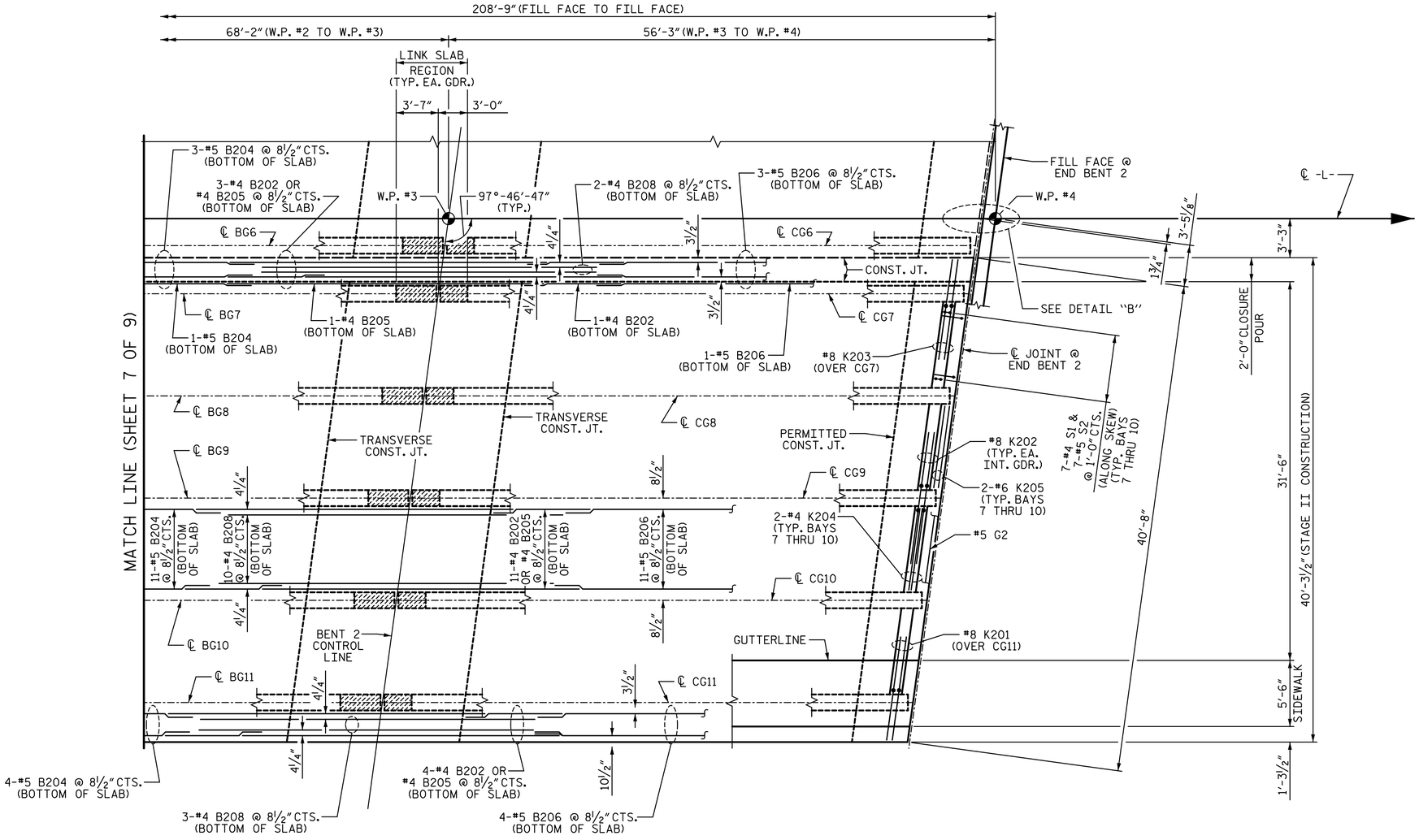

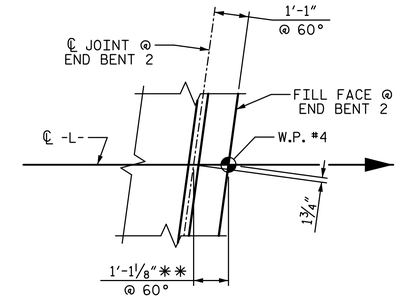

DETAIL "B"

** MEASURED ALONG -L-

SPAN B

SPAN C

PART PLAN OF SPANS

BOTTOM "B" BARS AND DIAPHRAGM BARS SHOWN.

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 8 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

PLAN OF SPANS

STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			59

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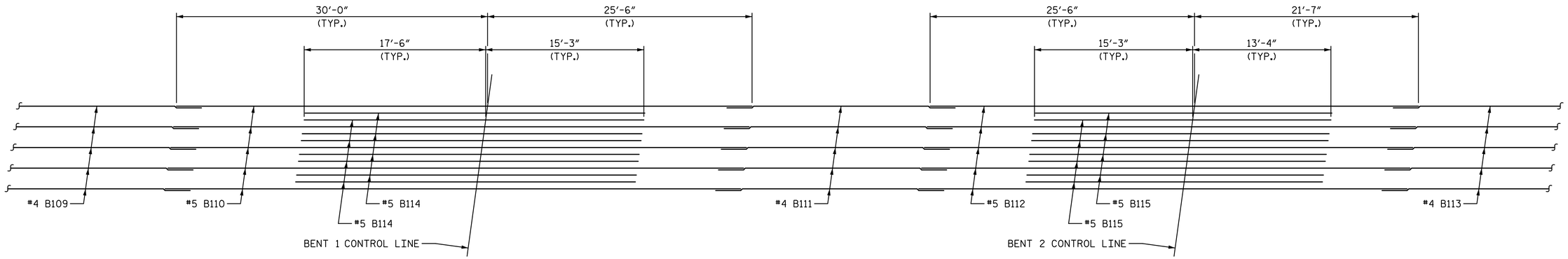
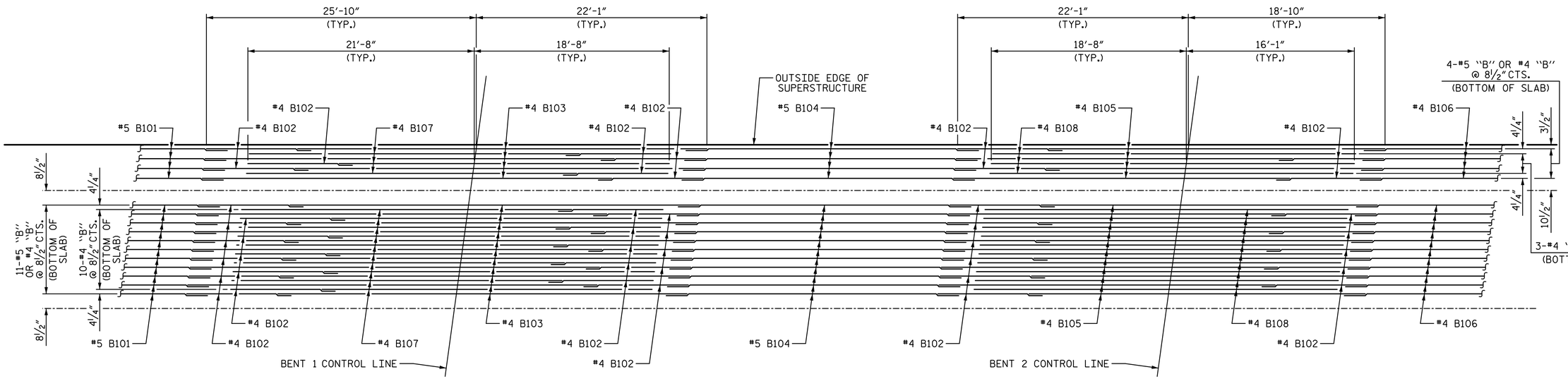


TOP OF DECK "B" BAR PLACEMENT

STAGE I B109 THRU B115 SHOWN, STAGE II B209 THRU B215 SIMILAR



BOTTOM OF DECK "B" BAR PLACEMENT

STAGE I B101 THRU B108 SHOWN, STAGE II B201 THRU B208 SIMILAR

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FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 9 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			59

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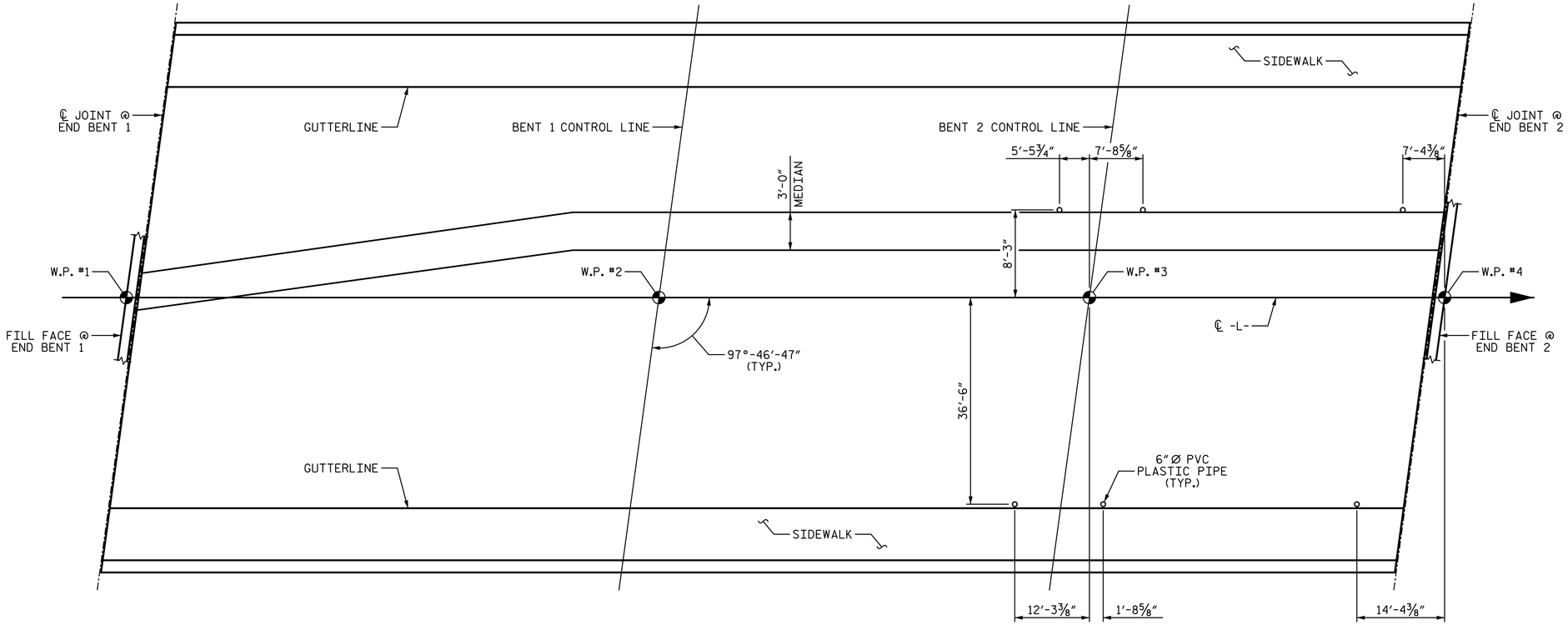
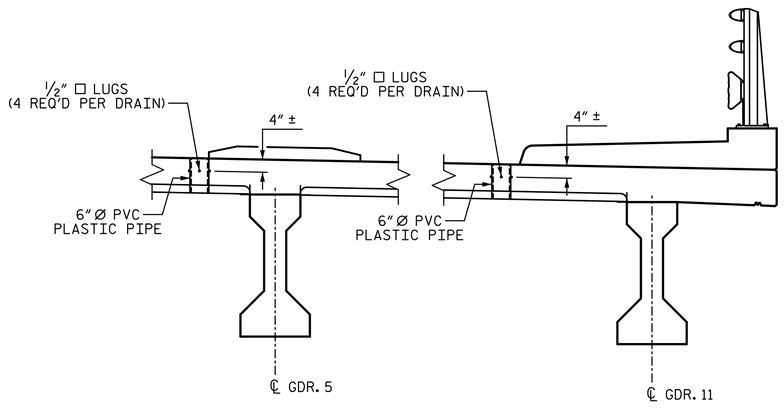
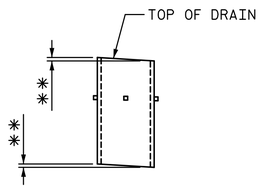


SPAN A SPAN B SPAN C

PLAN OF DECK DRAINS



ELEVATION



PIPE DETAIL

** TO BE SET MATCH SLOPE OF TOP AND BOTTOM OF SLAB

DRAIN DETAILS

(6 PIPE DRAINS REQUIRED)

DRAIN NOTES:

TOP OF FLOOR DRAINS TO BE SET ⅜″ BELOW SURFACE OF SLAB.

4 - ½″ □ LUGS TO BE GLUED TO THE PVC PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4″FROM THE TOP OF PIPE.

THE 6″Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DECK DRAIN DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			59

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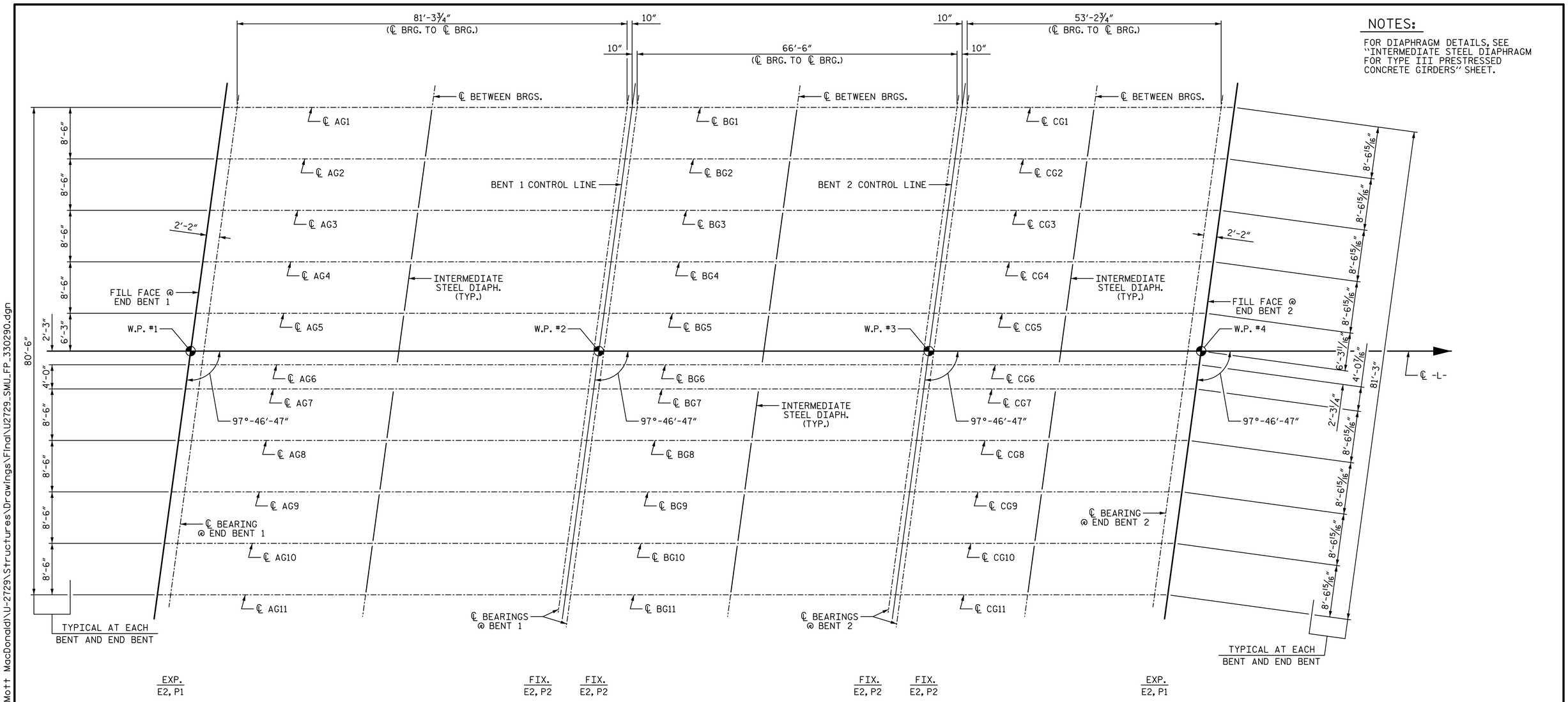

NOTES:

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

FRAMING PLAN

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

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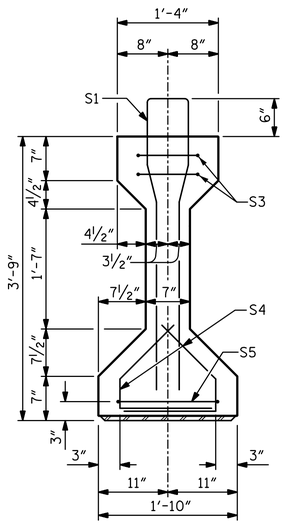
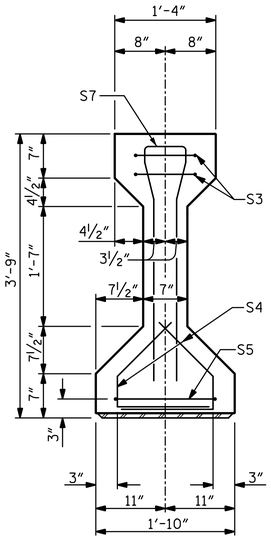
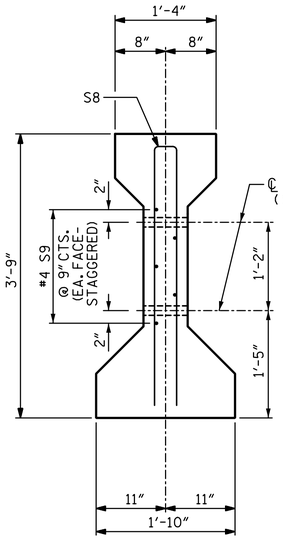
1			3			TOTAL SHEETS
2			4			59



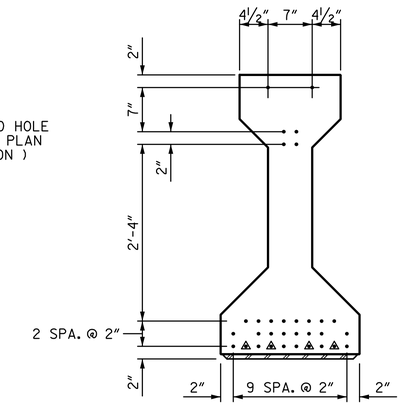
SECTION A-A



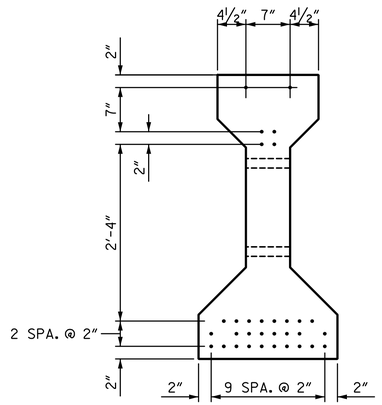
SECTION B-B



SECTION C-C
(S1 BARS NOT SHOWN)



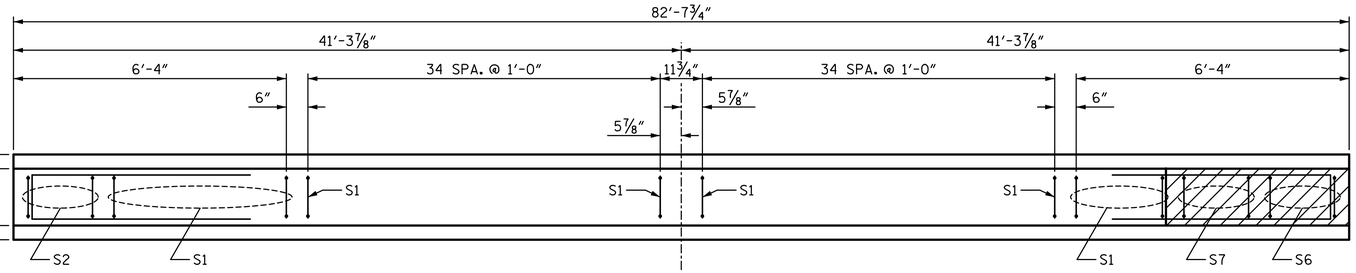
AT END OF GIRDER



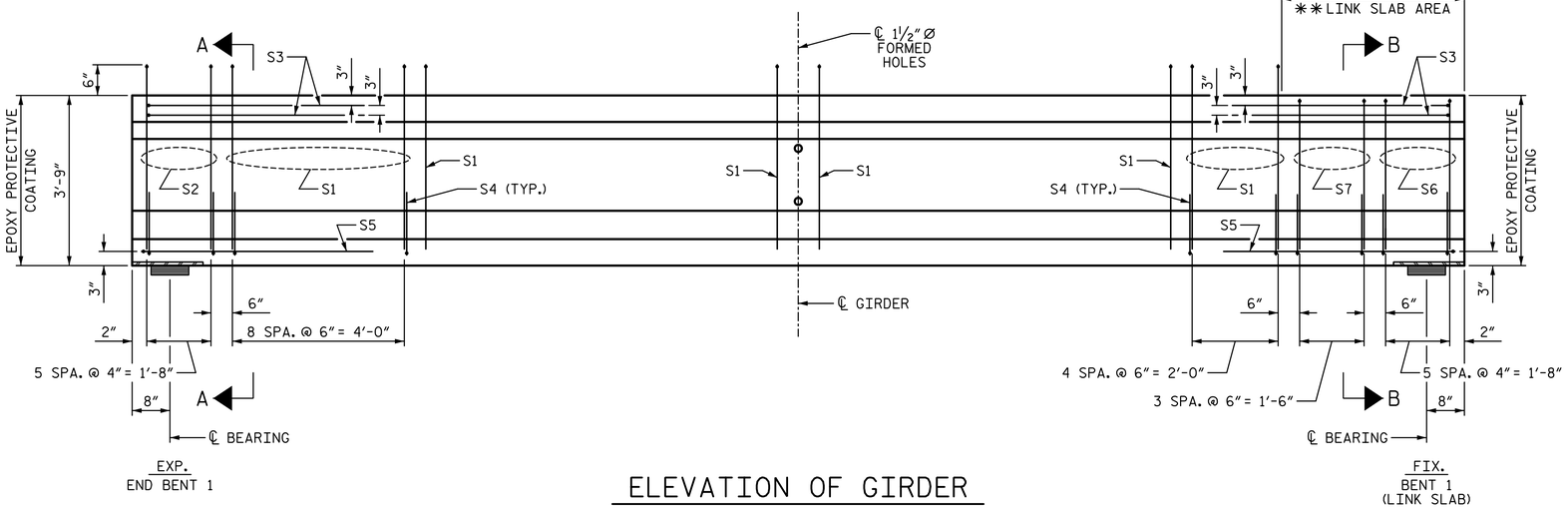
AT ℄ OF GIRDER

0.6"Ø LOW RELAXATION STRAND LAYOUT

- FULLY BONDED STRAND
- ▲ STRAND DEBONDED FOR 12'-0" FROM END OF GIRDER



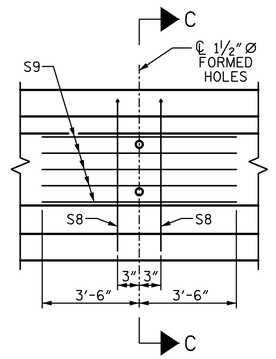
PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

** DO NOT RAKE TOP OF GIRDER IN THIS AREA



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

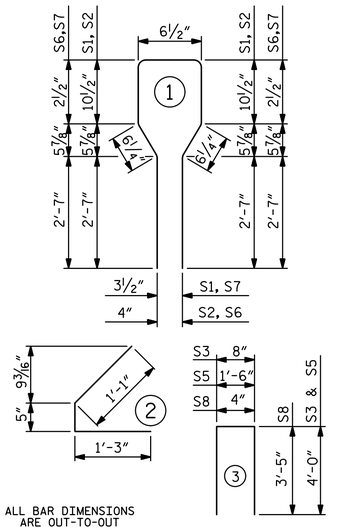
0.6" Ø L. R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	84	#5	1	8'-6"	745
S2	6	#6	1	8'-6"	77
S3	4	#4	3	8'-8"	23
S4	60	#4	2	2'-9"	110
S5	2	#4	3	9'-6"	13
S6	6	#6	1	7'-2"	65
S7	4	#5	1	7'-2"	30
S8	2	#5	3	7'-2"	15
S9	5	#4	STR	7'-0"	23

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8400 PSI CONCRETE	0.6"Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDERS	1101	11.9	32

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
11	82'-7¾"	909'-1¼"

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

AASHTO TYPE III PRESTRESSED CONCRETE GIRDERS SPAN A

DRAWN BY:	T. BANKOVICH	DATE:	9-22
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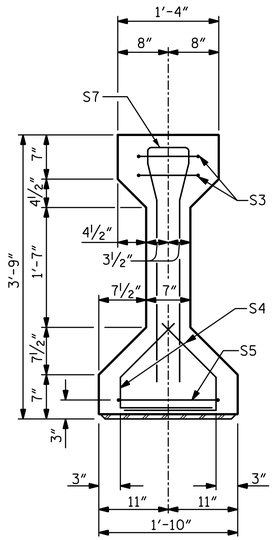
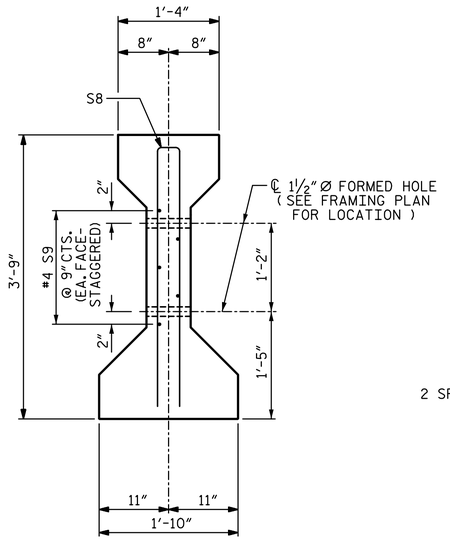
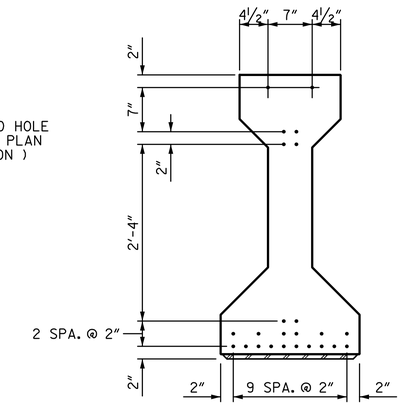


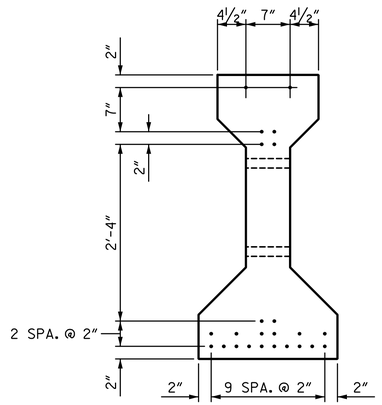
SECTION B-B



SECTION C-C
(S1 BARS NOT SHOWN)



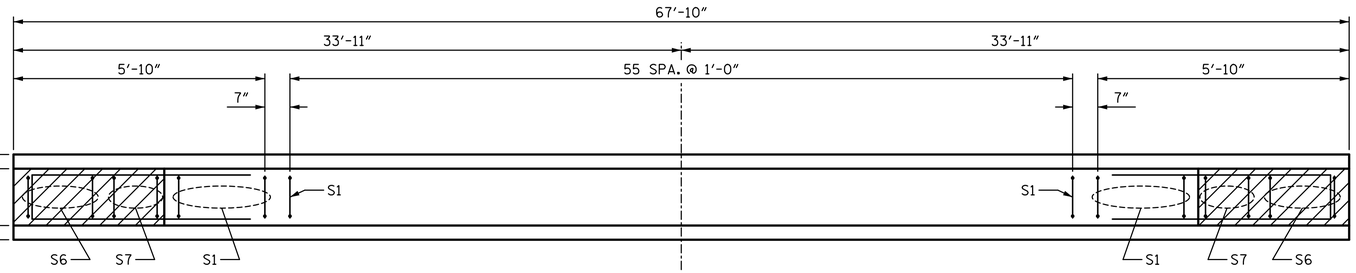
AT END OF GIRDER



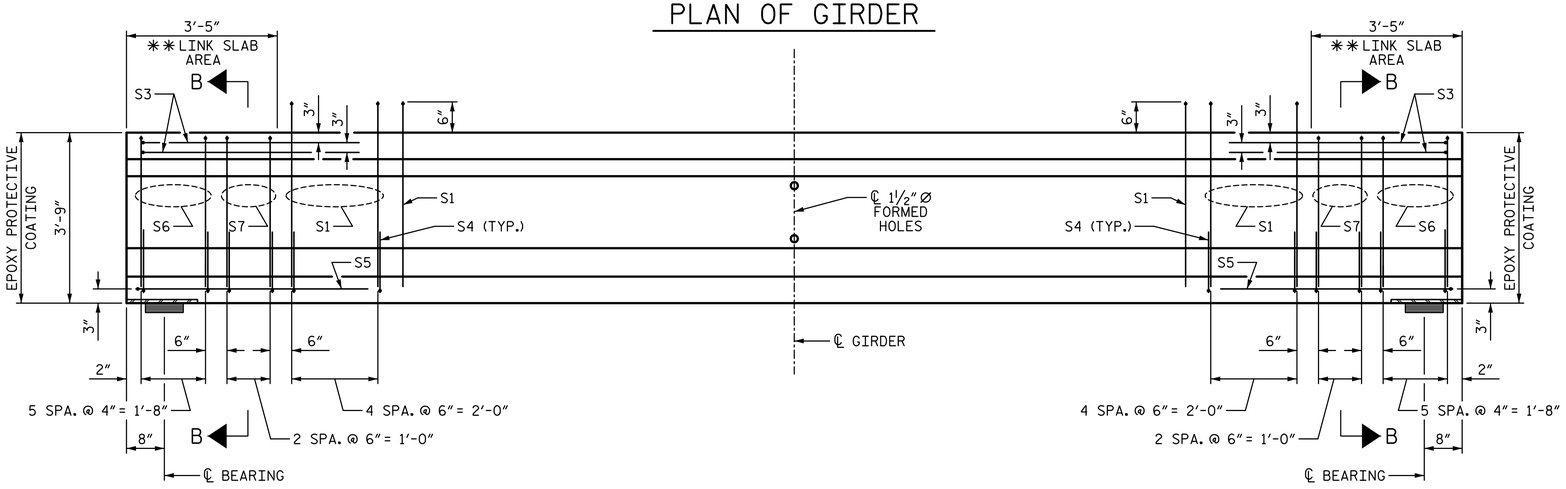
AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

● FULLY BONDED STRAND



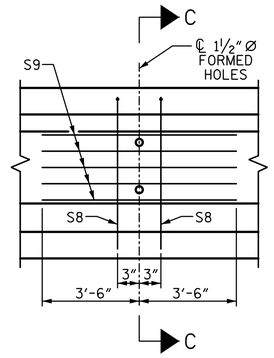
PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

**DO NOT RAKE TOP OF GIRDER IN THIS AREA



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR ALL GIRDERS

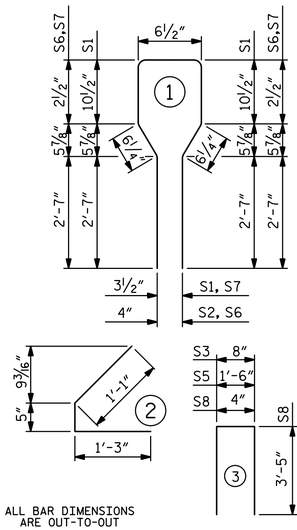
0.6" Ø L. R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	66	#5	1	8'-6"	585
S3	4	#4	3	8'-8"	23
S4	56	#4	2	2'-9"	103
S5	2	#4	3	9'-6"	13
S6	12	#6	1	7'-2"	129
S7	6	#5	1	7'-2"	45
S8	2	#5	3	7'-2"	15
S9	5	#4	STR	7'-0"	23

BAR TYPES



ALL BAR DIMENSIONS
ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	7600 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
GIRDERS	936	9.8	24

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
11	67'-10"	746'-2"

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

AASHTO TYPE III PRESTRESSED CONCRETE GIRDERS SPAN B

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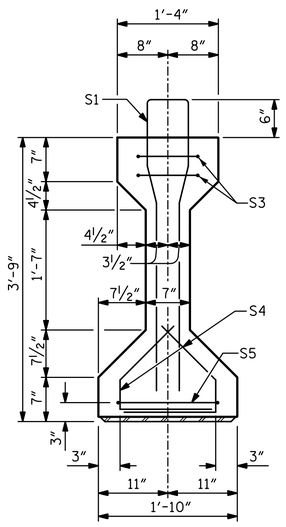
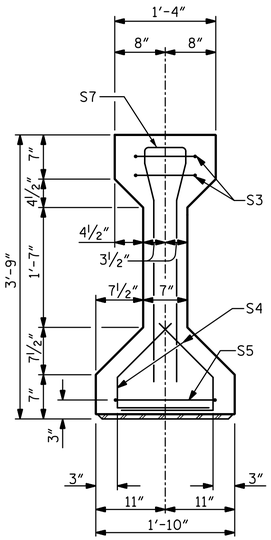
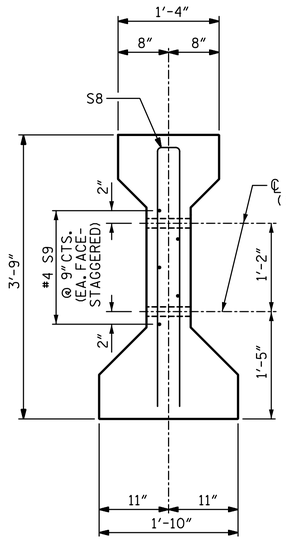


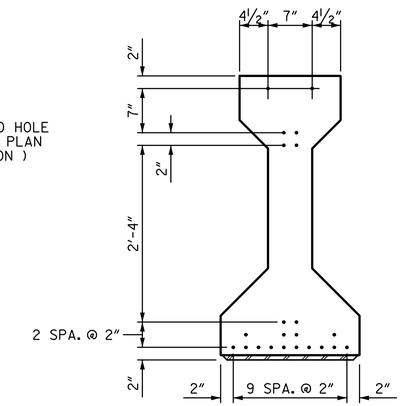
SECTION A-A



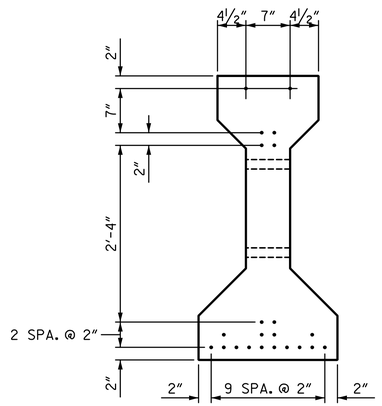
SECTION B-B



SECTION C-C
(S1 BARS NOT SHOWN)



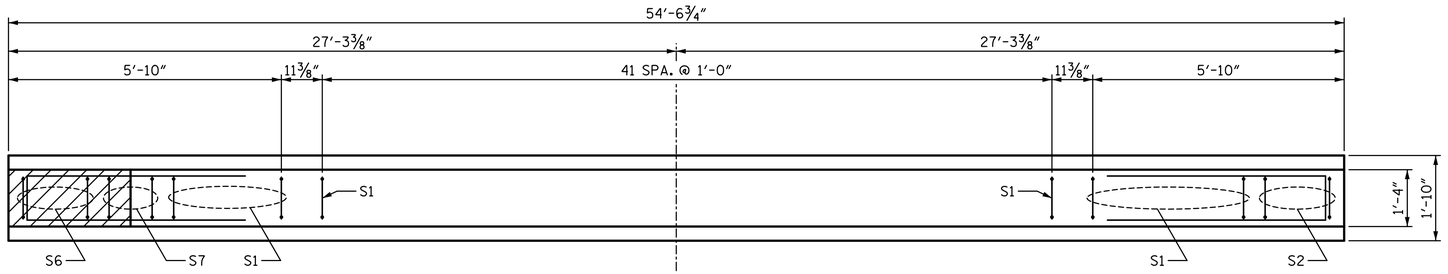
AT END OF GIRDER



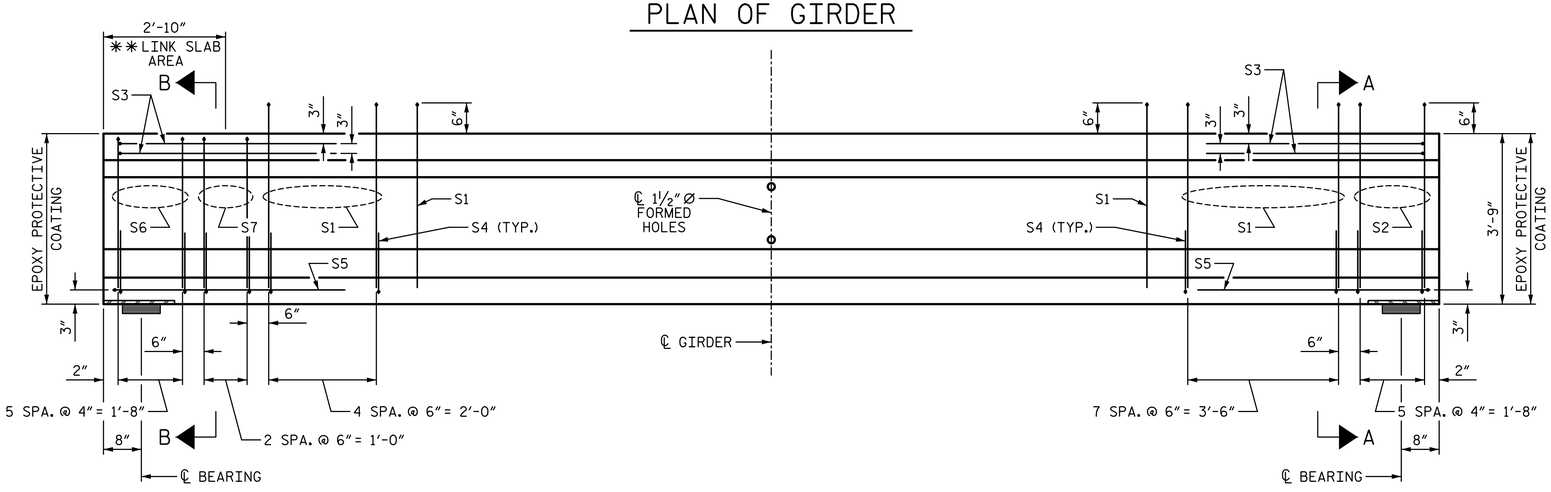
AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

● FULLY BONDED STRAND



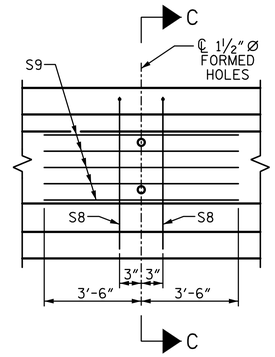
PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

**DO NOT RAKE TOP OF GIRDER IN THIS AREA



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR ALL GIRDERS

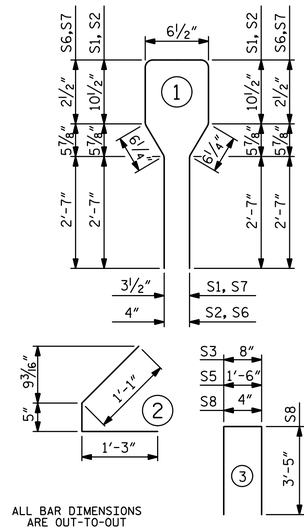
0.6" Ø L. R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	55	#5	1	8'-6"	488
S2	6	#6	1	8'-6"	77
S3	4	#4	3	8'-8"	23
S4	56	#4	2	2'-9"	103
S5	2	#4	3	9'-6"	13
S6	6	#6	1	7'-2"	65
S7	3	#5	1	7'-2"	22
S8	2	#5	3	7'-2"	15
S9	5	#4	STR	7'-0"	23

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	7000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDERS	829	7.9	22

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
11	54'-6¾"	600'-2¼"

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

AASHTO TYPE III PRESTRESSED CONCRETE GIRDERS SPAN C

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			59

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

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LICENSURE NO. C-4434

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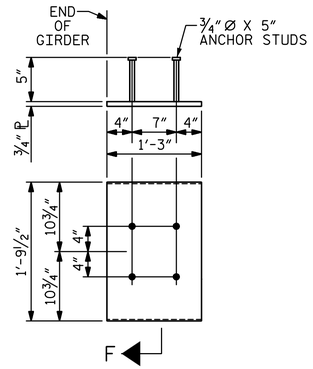


EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE III GIRDER

(2 REQ'D GIRDER)

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.

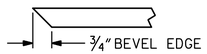
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6600 PSI FOR SPAN A, 6000 PSI FOR SPAN B AND 5600 FOR SPAN C.

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 ¼" EXCEPT IN THE LINK SLAB AREA AS NOTED ON GIRDER SHEETS.

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



SECTION "F"

(SEE NOTES)

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PRESTRESSED CONCRETE GIRDER DETAILS

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DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

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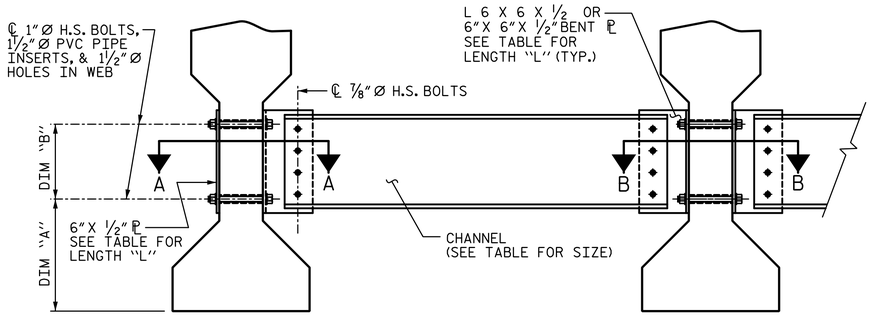
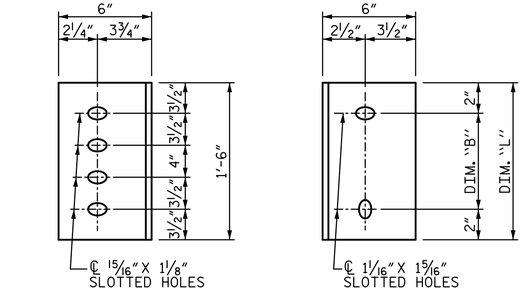


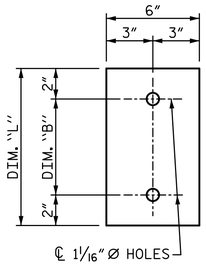
EXTERIOR GIRDER INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE WEB FACE

CONNECTOR PLATE DETAILS



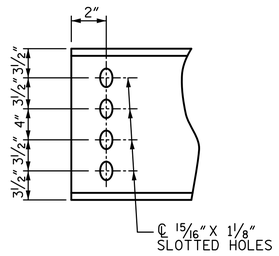
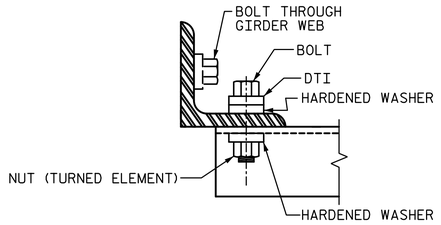


PLATE DETAILS CHANNEL END

SECTION A-A SECTION B-B

CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

TABLE

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

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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INTERMEDIATE STEEL DIAPHRAGM FOR TYPE III PRESTRESSED CONCRETE GIRDERS

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CHECKED BY:	T.J. BEACH	DATE:	9-22		
DESIGN ENGINEER OF RECORD:	J.A. BATTS	DATE:	9-22		

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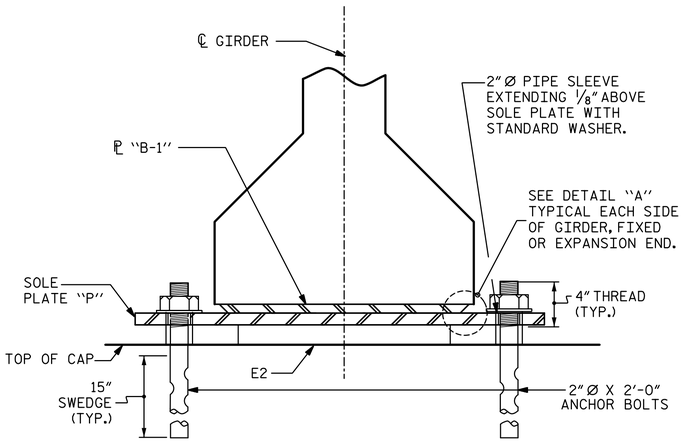
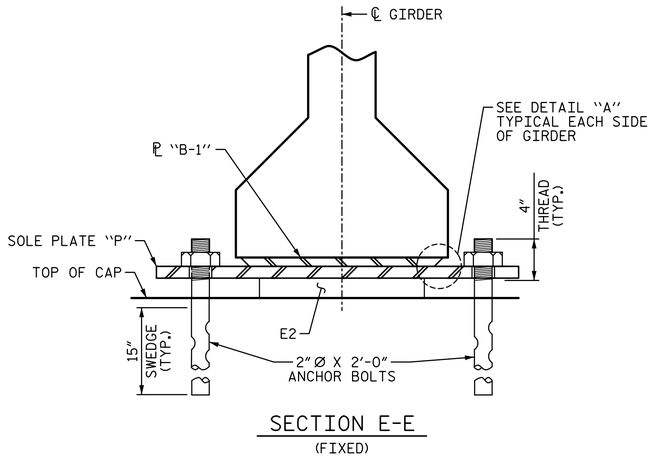


SECTION D-D
(EXPANSION)



SECTION E-E
(FIXED)

NOTES:

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

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

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

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

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

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

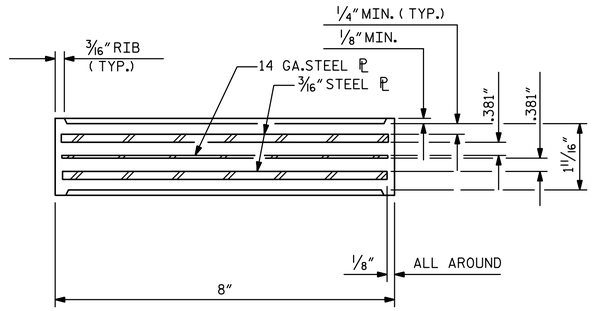
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

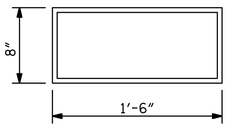
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

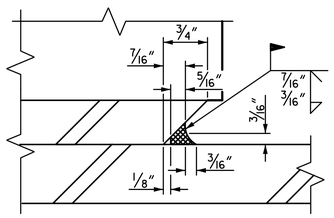


TYPICAL SECTION OF ELASTOMERIC BEARINGS

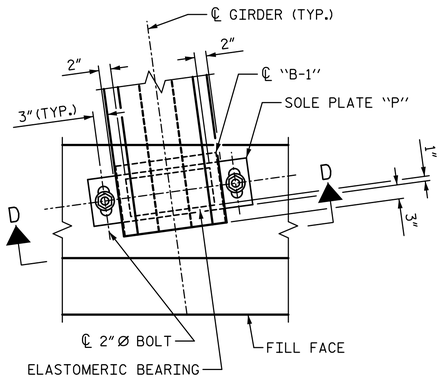


E2 (66 REQ'D)
PLAN VIEW OF ELASTORMERIC BEARING

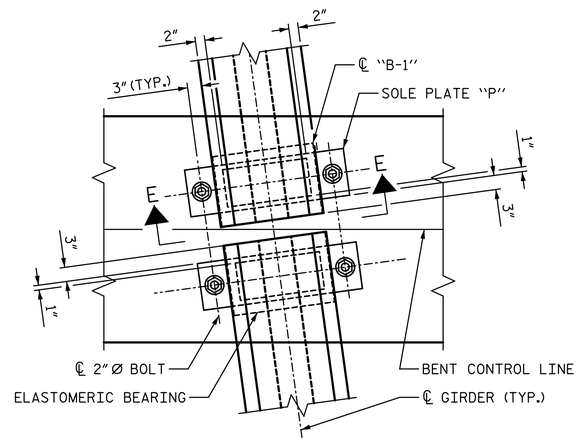
TYPE III



DETAIL "A"

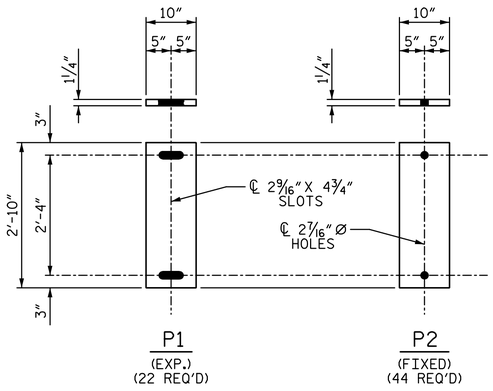


TYPICAL PLAN
(SHOWING END BENT)
(EXPANSION)



TYPICAL PLAN
(SHOWING INTERIOR BENT)
(FIXED)

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE III	205 k



SOLE PLATE DETAILS ("P")

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FORSYTH COUNTY
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ELASTOMERIC BEARING DETAILS

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DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A																				
0.6"Ø LOW RELAXATION	GIRDER 2-5 & 8-10																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.026	0.051	0.075	0.097	0.116	0.132	0.145	0.155	0.161	0.163	0.161	0.155	0.145	0.132	0.116	0.097	0.075	0.051	0.026	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.020	0.044	0.067	0.088	0.106	0.122	0.135	0.144	0.149	0.151	0.149	0.144	0.135	0.122	0.106	0.088	0.067	0.044	0.020	0
FINAL CAMBER ↑	0	1/16"	1/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/16"	1/16"	0

	SPAN A																				
0.6"Ø LOW RELAXATION	GIRDER 6 & 7																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.026	0.051	0.075	0.097	0.116	0.132	0.145	0.155	0.161	0.163	0.161	0.155	0.145	0.132	0.116	0.097	0.075	0.051	0.026	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.017	0.037	0.056	0.073	0.089	0.102	0.112	0.120	0.125	0.126	0.125	0.120	0.112	0.102	0.089	0.073	0.056	0.037	0.017	0
FINAL CAMBER ↑	0	1/8"	3/16"	1/4"	5/16"	5/16"	3/8"	3/8"	7/16"	7/16"	7/16"	7/16"	7/16"	3/8"	3/8"	5/16"	5/16"	1/4"	3/16"	1/8"	0

	SPAN A																				
0.6"Ø LOW RELAXATION	GIRDER 1 & 11																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.026	0.051	0.075	0.097	0.116	0.132	0.145	0.155	0.161	0.163	0.161	0.155	0.145	0.132	0.116	0.097	0.075	0.051	0.026	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.019	0.041	0.062	0.081	0.098	0.113	0.125	0.133	0.138	0.140	0.138	0.133	0.125	0.113	0.098	0.081	0.062	0.041	0.019	0
FINAL CAMBER ↑	0	1/16"	1/8"	1/8"	3/16"	3/16"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	3/16"	3/16"	1/8"	1/8"	1/16"	0

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN B																				
0.6"Ø LOW RELAXATION	GIRDER 2-5 & 8-10																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.014	0.028	0.041	0.052	0.063	0.072	0.079	0.084	0.087	0.088	0.087	0.084	0.079	0.072	0.063	0.052	0.041	0.028	0.014	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.009	0.021	0.031	0.041	0.050	0.057	0.063	0.068	0.070	0.071	0.070	0.068	0.063	0.057	0.050	0.041	0.031	0.021	0.009	0
FINAL CAMBER ↑	0	1/16"	1/16"	1/8"	1/8"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	1/8"	1/8"	1/16"	1/16"	0

	SPAN B																				
0.6"Ø LOW RELAXATION	GIRDER 6 & 7																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.014	0.028	0.041	0.052	0.063	0.072	0.079	0.084	0.087	0.088	0.087	0.084	0.079	0.072	0.063	0.052	0.041	0.028	0.014	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.008	0.017	0.026	0.034	0.042	0.048	0.053	0.057	0.059	0.059	0.059	0.057	0.053	0.048	0.042	0.034	0.026	0.017	0.008	0
FINAL CAMBER ↑	0	1/16"	1/8"	3/16"	3/16"	1/4"	5/16"	5/16"	5/16"	5/16"	3/8"	5/16"	5/16"	5/16"	5/16"	1/4"	3/16"	3/16"	1/8"	1/16"	0

	SPAN B																				
0.6"Ø LOW RELAXATION	GIRDER 1 & 11																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.014	0.028	0.041	0.052	0.063	0.072	0.079	0.084	0.087	0.088	0.087	0.084	0.079	0.072	0.063	0.052	0.041	0.028	0.014	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.009	0.019	0.029	0.038	0.046	0.053	0.059	0.063	0.065	0.066	0.065	0.063	0.059	0.053	0.046	0.038	0.029	0.019	0.009	0
FINAL CAMBER ↑	0	1/16"	1/8"	1/8"	3/16"	3/16"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	3/16"	3/16"	1/8"	1/8"	1/16"	0

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

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

GIRDER CAMBER DETAILS

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518
LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 JOHN A. BATTS
4/6/2023 | 10:39 AM EDT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			59

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN C																				
0.6"Ø LOW RELAXATION	GIRDER 2-5 & 8-10																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.009	0.018	0.027	0.035	0.042	0.048	0.052	0.056	0.058	0.059	0.058	0.056	0.052	0.048	0.042	0.035	0.027	0.018	0.009	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.004	0.009	0.013	0.017	0.021	0.024	0.027	0.029	0.030	0.030	0.030	0.029	0.027	0.024	0.021	0.017	0.013	0.009	0.004	0
FINAL CAMBER ↑	0	1/16"	1/8"	3/16"	3/16"	1/4"	5/16"	5/16"	5/16"	5/16"	3/8"	5/16"	5/16"	5/16"	5/16"	1/4"	3/16"	3/16"	1/8"	1/16"	0

	SPAN C																				
0.6"Ø LOW RELAXATION	GIRDER 6 & 7																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.009	0.018	0.027	0.035	0.042	0.048	0.052	0.056	0.058	0.059	0.058	0.056	0.052	0.048	0.042	0.035	0.027	0.018	0.009	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.003	0.007	0.011	0.014	0.018	0.020	0.022	0.024	0.025	0.025	0.025	0.024	0.022	0.020	0.018	0.014	0.011	0.007	0.003	0
FINAL CAMBER ↑	0	1/16"	1/8"	3/16"	1/4"	5/16"	5/16"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	5/16"	5/16"	1/4"	3/16"	1/8"	1/16"	0

	SPAN C																				
0.6"Ø LOW RELAXATION	GIRDER 1 & 11																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.009	0.018	0.027	0.035	0.042	0.048	0.052	0.056	0.058	0.059	0.058	0.056	0.052	0.048	0.042	0.035	0.027	0.018	0.009	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.003	0.008	0.012	0.016	0.019	0.023	0.025	0.026	0.027	0.028	0.027	0.026	0.025	0.023	0.019	0.016	0.012	0.008	0.003	0
FINAL CAMBER ↑	0	1/16"	1/8"	3/16"	1/4"	1/4"	5/16"	5/16"	3/8"	3/8"	3/8"	3/8"	3/8"	5/16"	5/16"	1/4"	1/4"	3/16"	1/8"	1/16"	0

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

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

GIRDER CAMBER DETAILS

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518
LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 JOHN A. BATTS
4/6/2023 | 10:39 AM PDT

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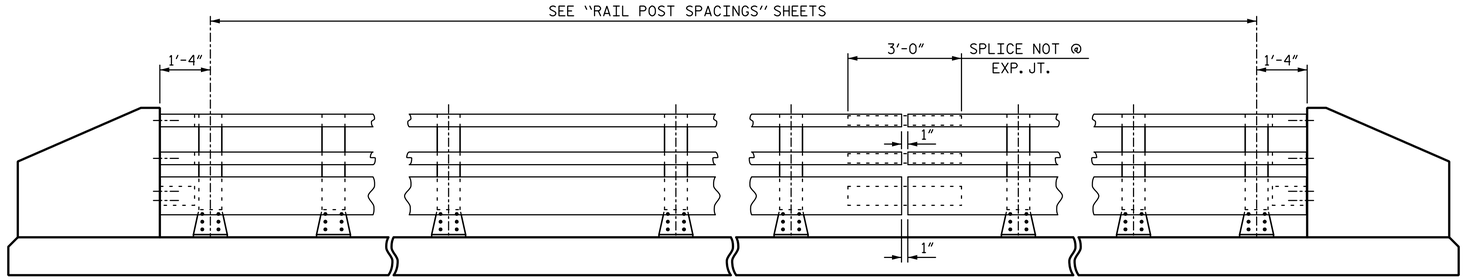
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			59

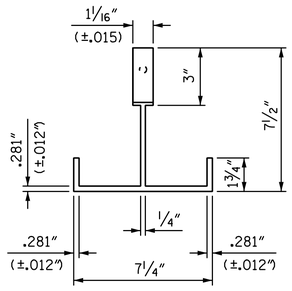
DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

4/6/2023 12:01:57 PM P:\Raleigh\Projects\2018\Division 9 (Mott MacDonald)\U-2729\Structures\Drawings\Final\U2729_SMU_DL_330290.dgn

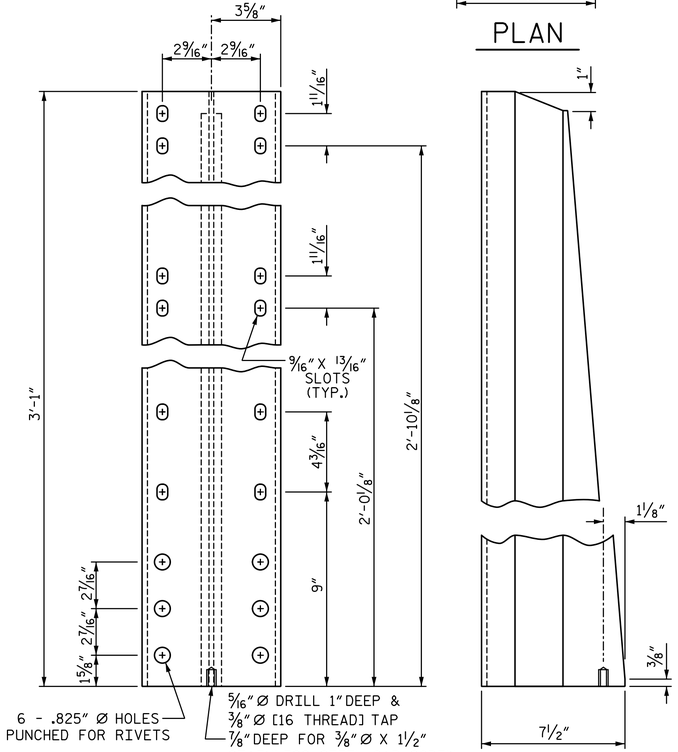


ELEVATION

NOTE:
FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "3 BAR METAIL RAIL" SHEET 3 OF 3.



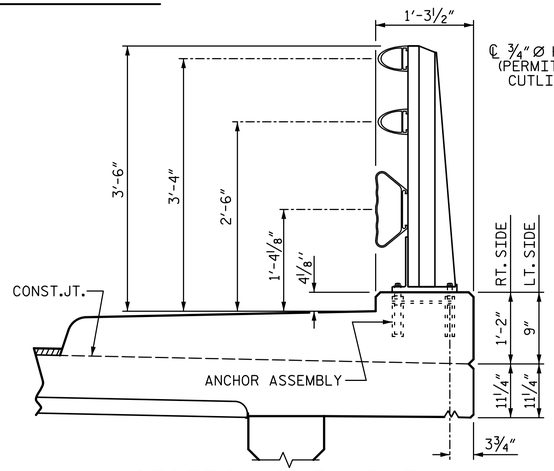
PLAN



FRONT ELEVATION

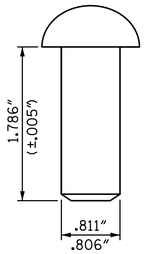
SIDE ELEVATION

DETAILS OF POST

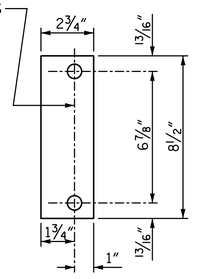


SECTION THRU RAIL

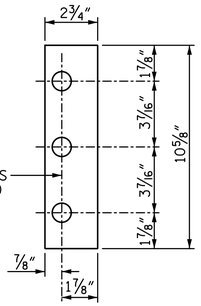
FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL" SHEET 2 OF 3.



RIVET DETAIL



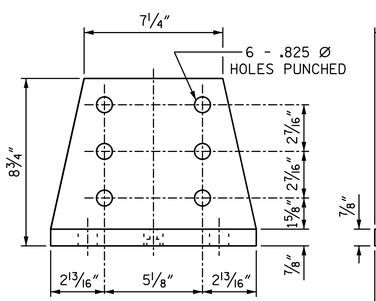
REAR PLATE



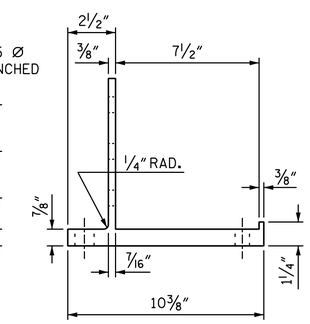
FRONT PLATE

SHIM DETAILS

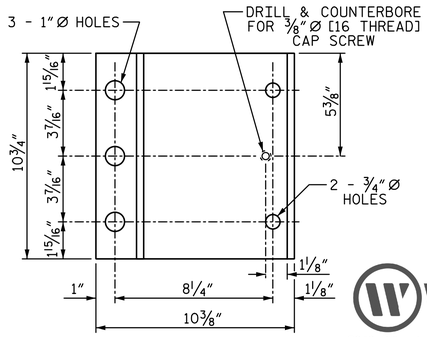
NOTE: SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



FRONT ELEVATION



SIDE ELEVATION



PLAN

POST BASE DETIALS

NOTES:

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS : AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

GENERAL NOTES:

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS. PLACE ONE JOINT SPLICE JUST BEYOND THE 3RD RAIL POST FROM EACH END, TYPICALLY 14' FROM THE END. PLACE OTHER JOINTS AS NEEDED.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE "3 BAR METAL RAIL" SHEET 3 OF 3.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAIN VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

PAY LENGTH = 397.77 LF

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

3 BAR METAL RAIL

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518
LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 JOHN A. BATTS
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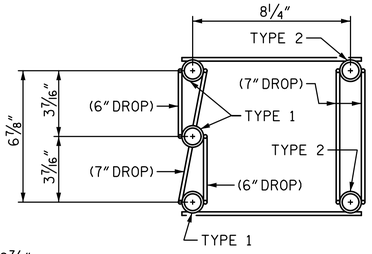
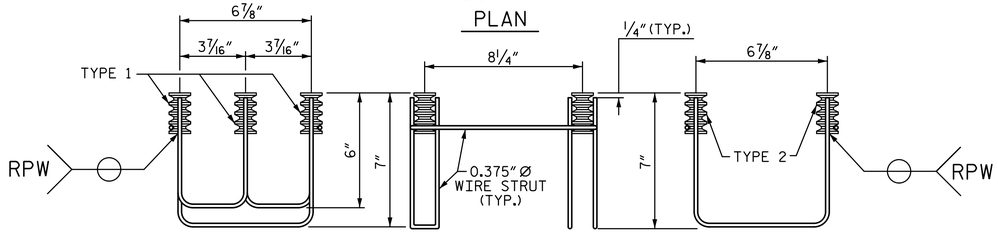
1			3			TOTAL SHEETS
2			4			59



TYPE 1 FERRULE
THREADED STEEL FERRULES WITH CLOSED BOTTOM TO FIT ¾"Ø BOLT WITH ROUND WASHER.

TYPE 2 FERRULE
THREADED STEEL FERRULES WITH CLOSED BOTTOM TO FIT ⅝"Ø BOLT WITH ROUND WASHER.

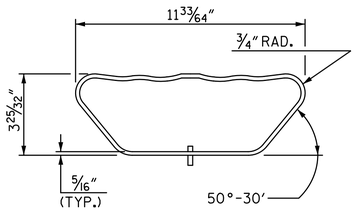
PLAN



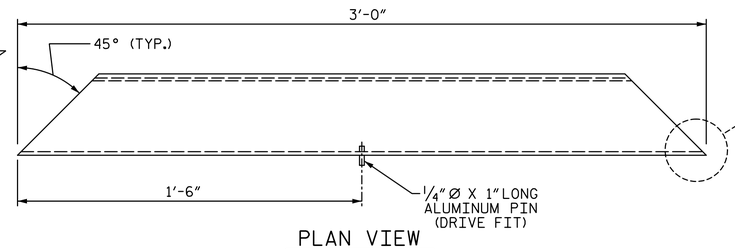
LEFT SIDE VIEW ELEVATION RIGHT SIDE VIEW

5-BOLT METAL RAIL ANCHOR ASSEMBLY

(68 ASSEMBLIES REQUIRED)



END VIEW



PLAN VIEW

BOTTOM RAIL EXPANSION BAR

NOTES:

STRUCTURAL CONCRETE ANCHOR ASSEMBLY
THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2"FOR ¾"FERRULES AND 1¾"FOR ⅝"FERRULES.

B. 3 - ¾"Ø X 2½" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ¾"Ø X 2½" GALVANIZED BOLTS 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.

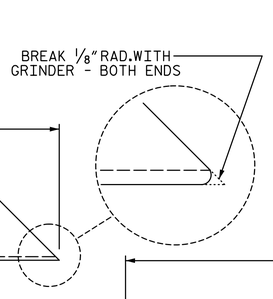
C. 2 - ⅝"Ø X 2¼" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅝"Ø X 2¼" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

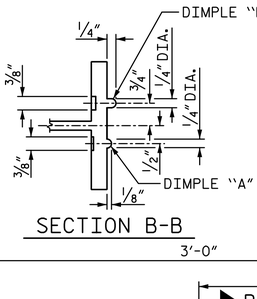
D. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16"Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

E. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

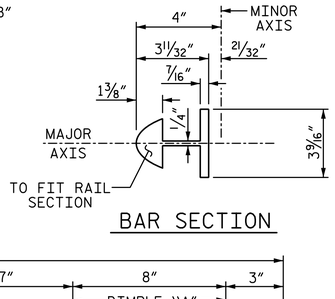
F. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

G. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

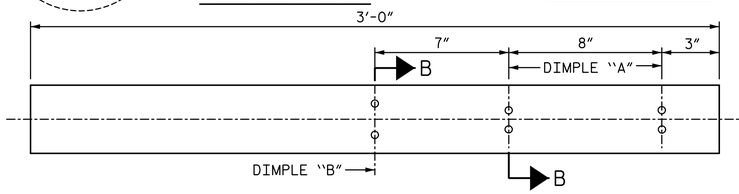




SECTION B-B

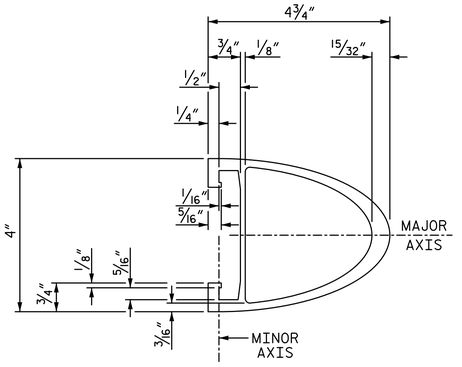


BAR SECTION

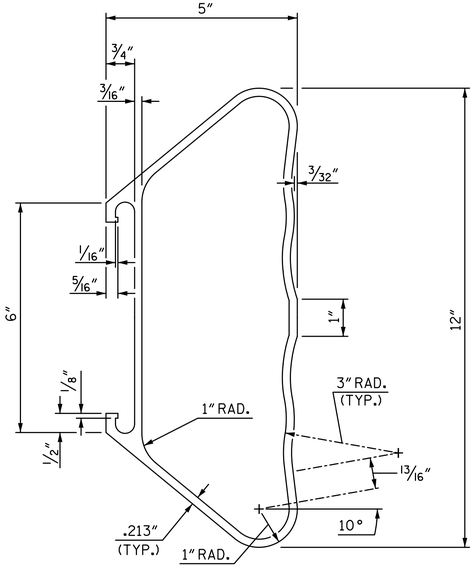


BACK ELEVATION

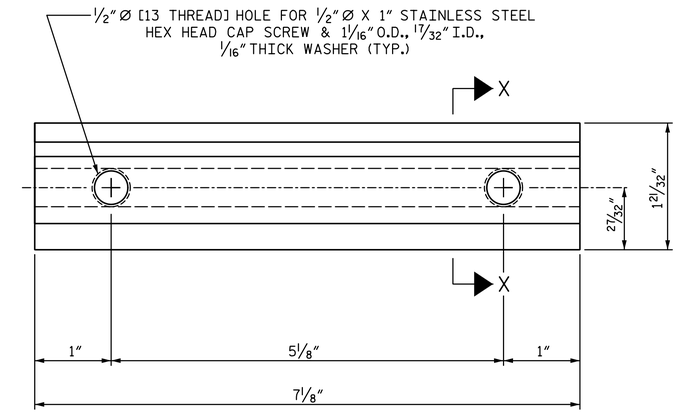
TOP & MIDDLE RAIL EXPANSION BAR



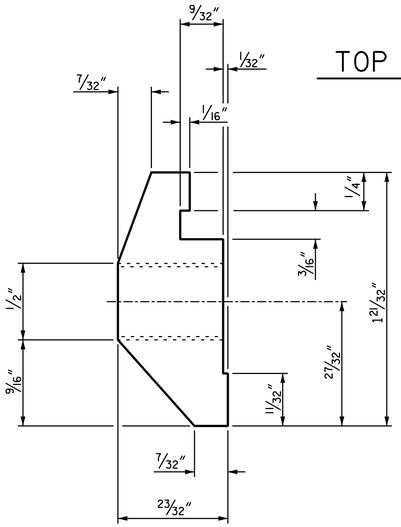
TOP & MIDDLE RAIL SECTION



BOTTOM RAIL SECTION



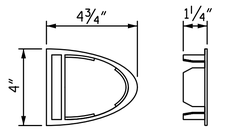
ELEVATION



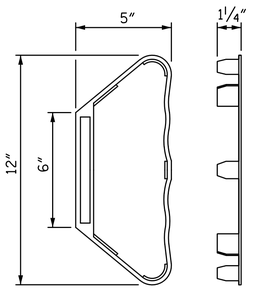
SECTION X-X

CLAMP BAR DETAIL

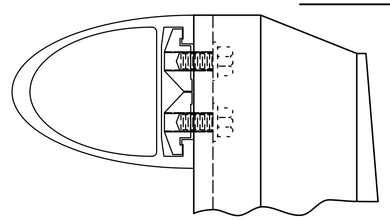
(6 REQUIRED PER POST)



TOP & MIDDLE RAIL CAP



BOTTOM RAIL CAP



CLAMP ASSEMBLY

TOP RAIL SHOWN
(MIDDLE & BOTTOM RAIL ARE SIMILAR)

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SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

3 BAR METAL RAIL

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518
LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 JOHN A. BATTS

4/6/2023 | 10:39 AM P...

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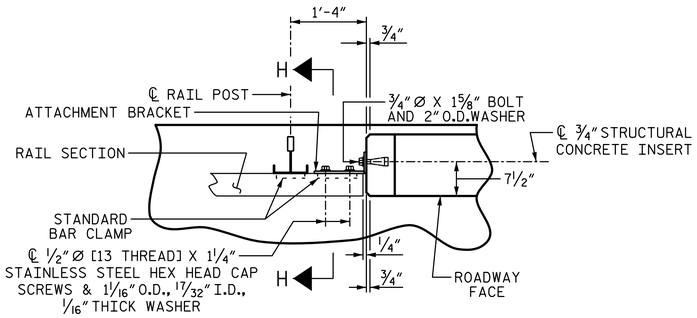
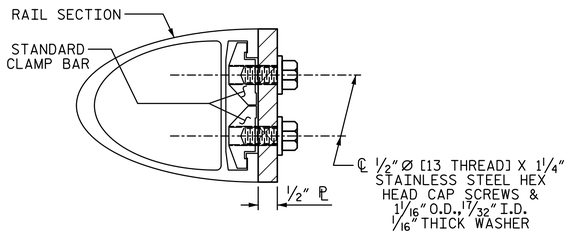
DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22



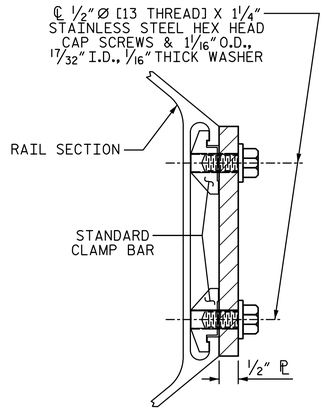
PLAN OF RAIL AND END POST

(STIFFENER ON ½" ℙ NOT SHOWN FOR CLARITY)



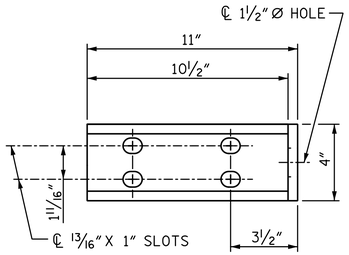
SECTION H-H

(FOR TOP & MIDDLE RAIL)

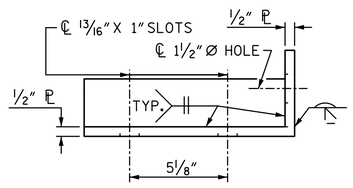


SECTION H-H

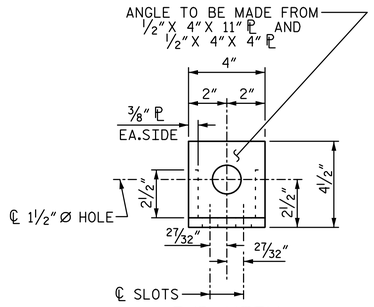
(FOR BOTTOM RAIL)



ELEVATION



PLAN

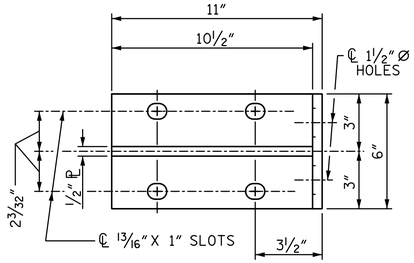


END VIEW

(FIX. AND EXP.)

DETAILS FOR ATTACHMENT BRACKET

(TOP & MIDDLE RAIL ONLY)



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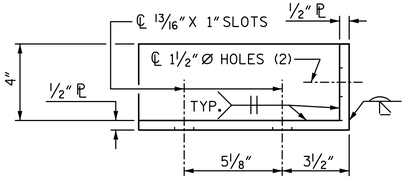

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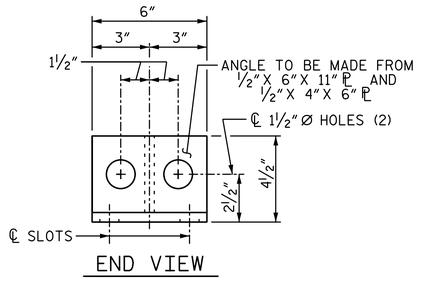


END VIEW

DETAILS FOR ATTACHMENT BRACKET

(BOTTOM RAIL ONLY)

NOTES:

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. ½" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. ¾" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A ¾" Ø X 1⅝" BOLT WITH 2'' O.D. WASHER IN PLACE. THE ¾" Ø X 1⅝" BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

D. STANDARD CLAMP BARS (''3 BAR METAL RAIL'' SHEET 2 OF 3).

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 3 BAR METAL RAIL.

THE ¾" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE ¾" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾"Ø X 1⅝" BOLT WITH WASHER SHALL BE REPLACED WITH A ¾"Ø X 6 ½" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾"Ø X 1⅝" BOLT SHALL APPLY TO THE ¾"Ø X 6 ½" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

NOTES:

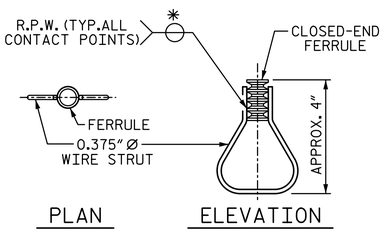
STRUCTURAL CONCRETE INSERT

THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1½".

B. 1 - ¾"Ø X 1⅝" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾"Ø X 1⅝" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/16"Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

*EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

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FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
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SUPERSTRUCTURE

3 BAR METAL RAIL

DRAWN BY:	T. BANKOVICH	DATE:	9-22
CHECKED BY:	T.J. BEACH	DATE:	9-22
DESIGN ENGINEER OF RECORD:	J.A. BATTS	DATE:	9-22

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518
LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL SEAL 18056 ENGINEER JOHN A. BATTS

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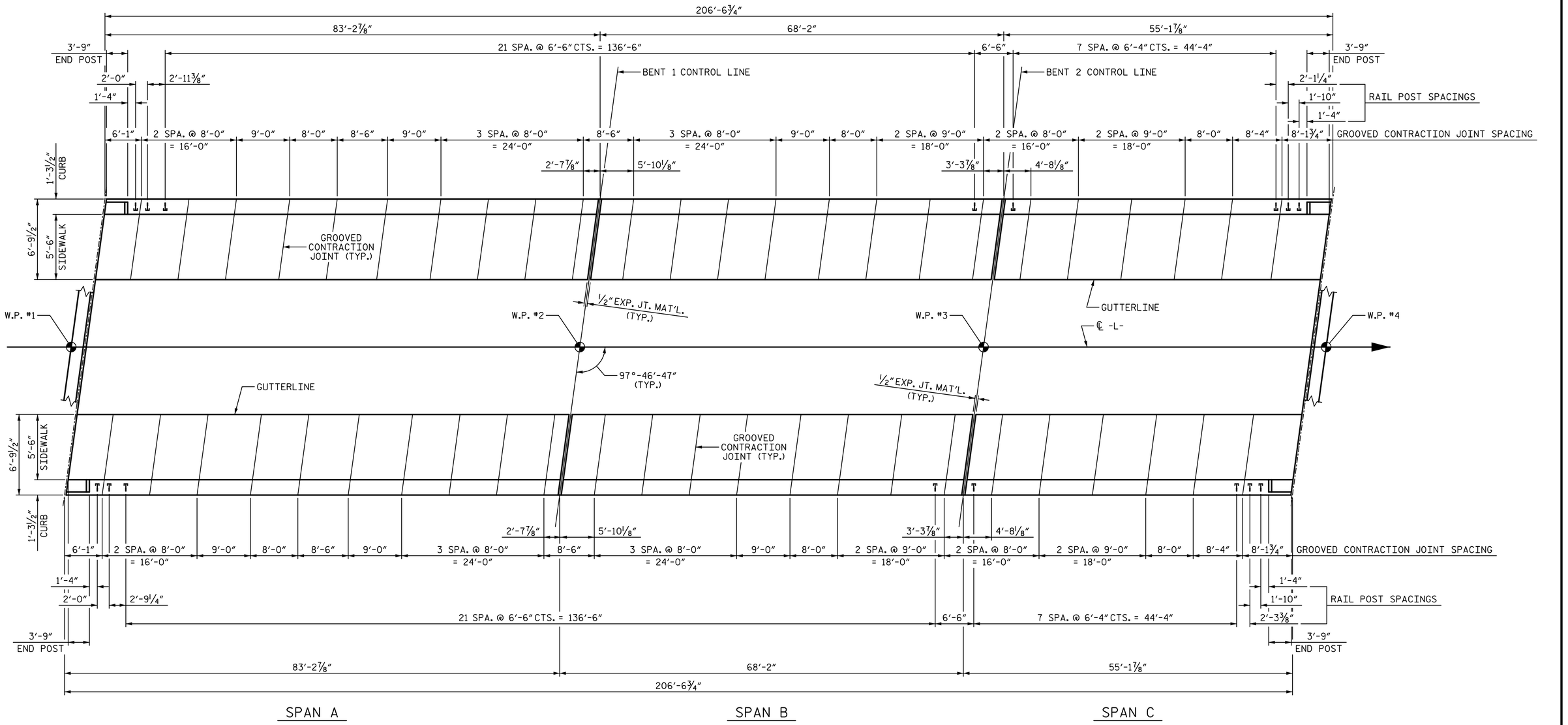

PLAN OF RAIL POST SPACING

DIMENSIONS ARE MEASURED ALONG OUTSIDE FACE OF CONCRETE CURB

PROJECT NO. U-2729

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STATE OF NORTH CAROLINA
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RAIL POST SPACING

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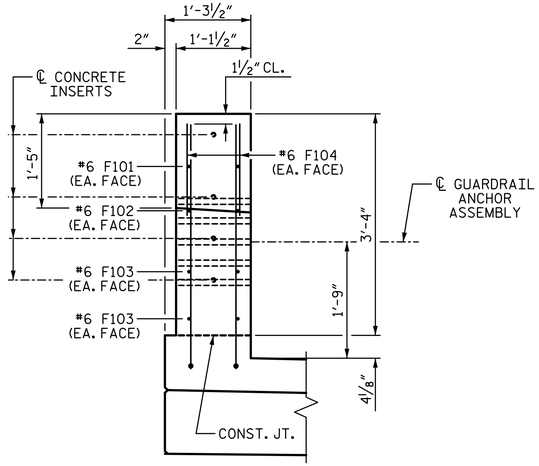

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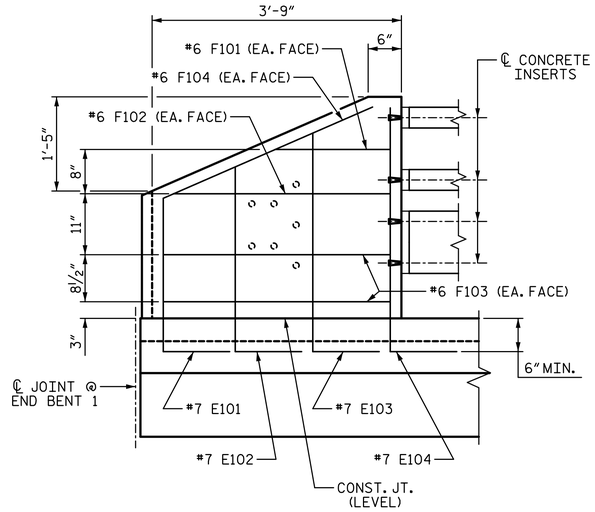
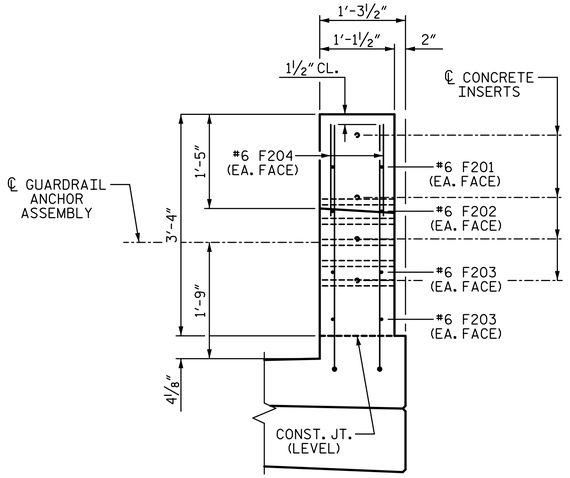


ELEVATION

END POST FOR THREE BAR METAL RAIL

STAGE I
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



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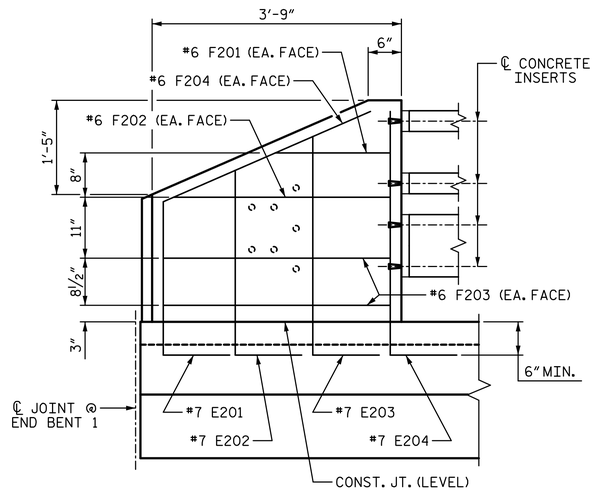


ELEVATION

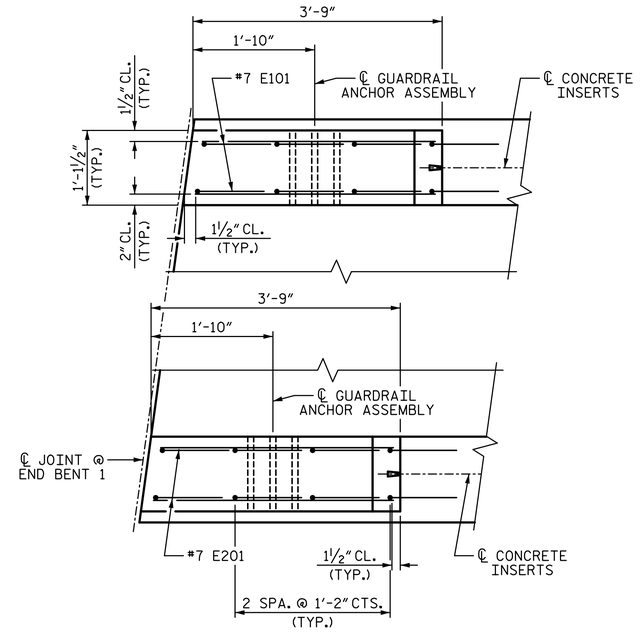
END POST FOR THREE BAR METAL RAIL

STAGE II
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

NOTES:

FOR END POST REINFORCING STEEL AND CONCRETE QUANTITIES, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEETS.

FOR DETAILS OF GUARDRAIL ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS" SHEET.



PLAN

END BENT 1 SHOWN, END BENT 2 SIMILAR

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

STATE OF NORTH CAROLINA
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RALEIGH
SUPERSTRUCTURE

END POST DETAILS

DRAWN BY:	T. BANKOVICH	DATE:	9-22
CHECKED BY:	T.J. BEACH	DATE:	9-22
DESIGN ENGINEER OF RECORD:	J.A. BATTS	DATE:	9-22

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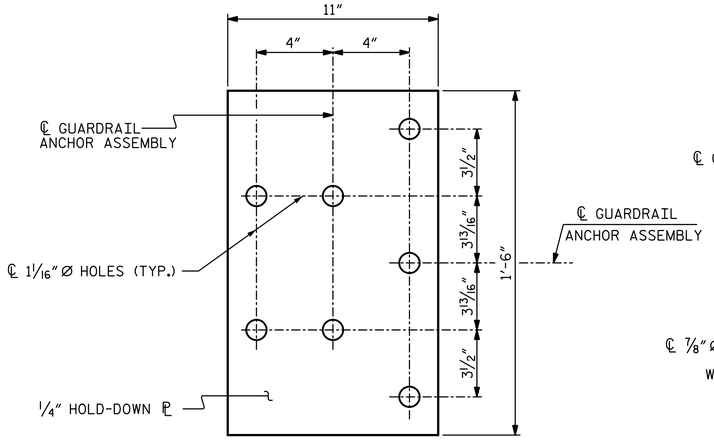
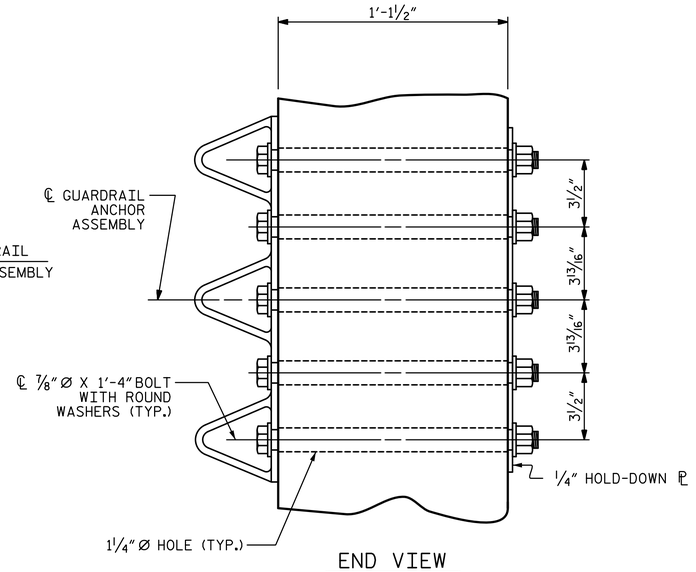


PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES:

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

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

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

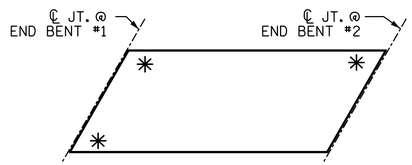
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

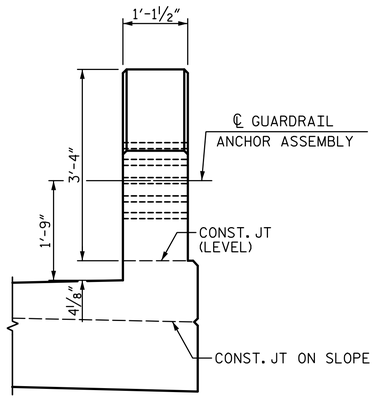
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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

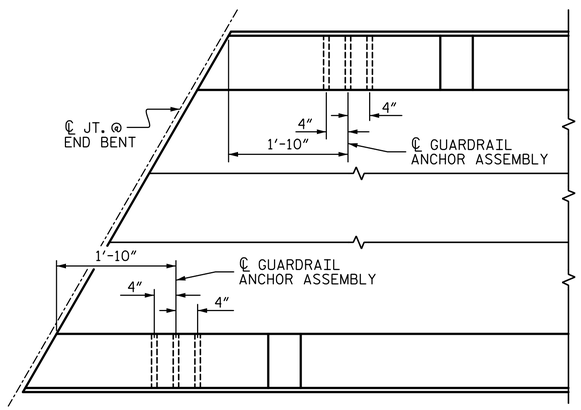


SKETCH SHOWING POINTS OF ATTACHMENT

✳LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
(THREE BAR METAL RAIL)



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

END BENT 1 SHOWN, END BENT 2 SIMILAR EXCEPT NO ATTACHMENT ON STAGE II.

PROJECT NO. U-2729
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GUARDRAIL ANCHORAGE DETAIL

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DESIGN ENGINEER OF RECORD:	J.A. BATTS	DATE: 9-22

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NOTES:

ALL REINFORCING STEEL IN CONCRETE MEDIANS SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH SHALL BE TOOLED IN ALL EXPOSED FACES OF THE CONCRETE MEDIAN IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

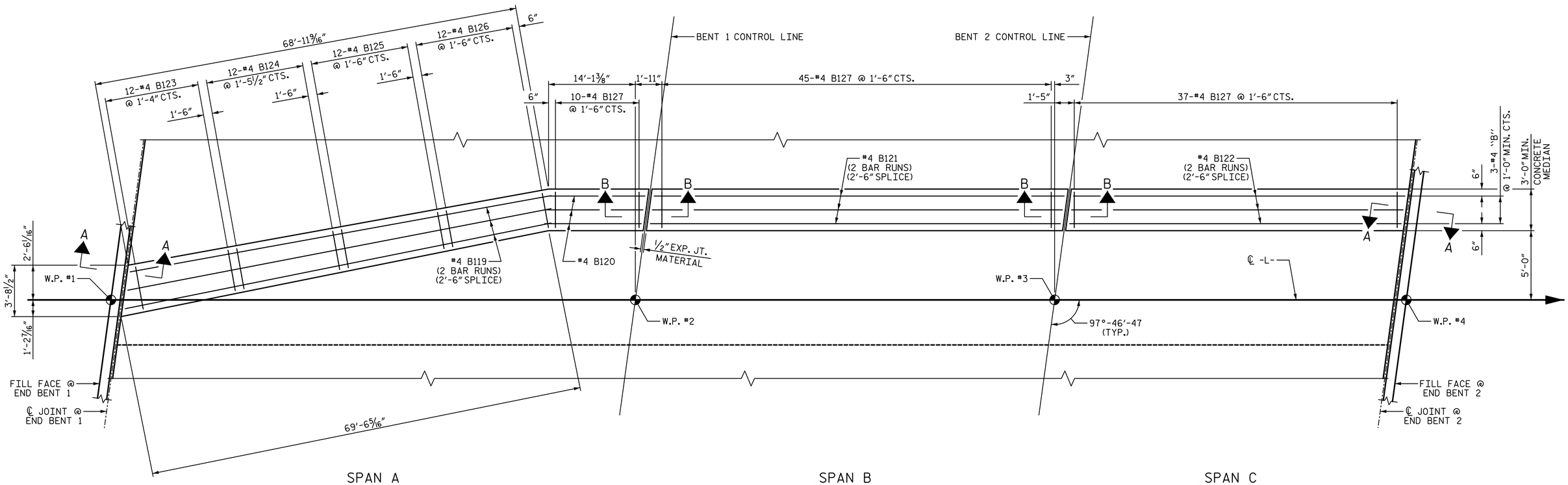
THE CONCRETE MEDIAN IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI

NO SEPERATE MEASUREMENT OR PAYMENT WILL BE MADE FOR MATERIALS OR LABOR REQUIRED TO CONSTRUCT THE CONCRETE MEDIAN. THE ENTIRE COST OF THE WORK SHALL BE INCLUDED IN THE UNIT BID PRICE FOR THE REINFORCED CONCRETE DECK SLAB.

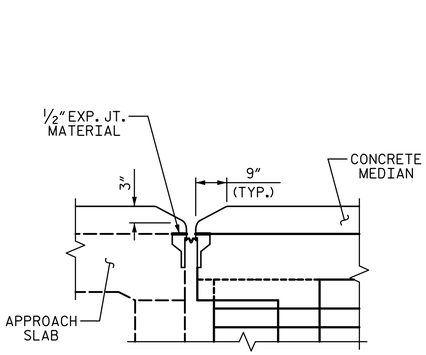
FOR REINFORCING STEEL AND CONCRETE QUANTITIES, SEE SUPERSTRUCTURE "BILL OF MATERIAL" SHEETS.

FOR MEDIAN ON APPROACH SLABS, SEE "APPROACH SLAB" SHEETS.

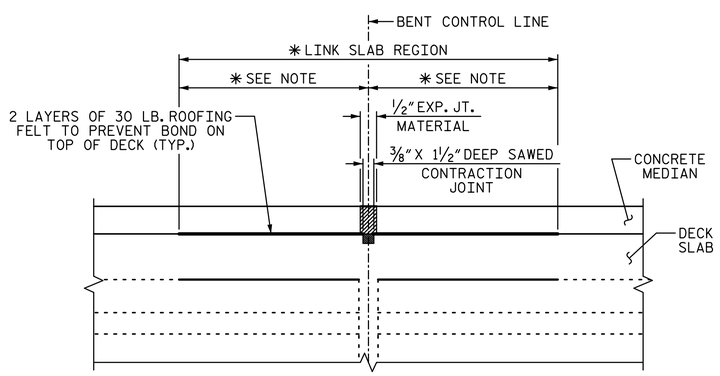
MEDIAN WIDTH AND LOCATION ARE BASED ON THE BEST INFORMATION AVAILABLE. ENGINEER SHALL LOCATE THE MEDIAN TO MATCH THE MEDIAN ON THE ROADWAY SECTION.



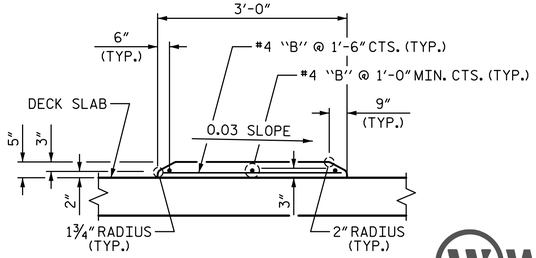
PLAN OF CONCRETE MEDIAN



SECTION A-A



SECTION B-B



REINFORCING STEEL DETAIL

CONCRETE MEDIAN DETAILS

* SEE "TYPICAL SECTION" SHEET 3 OF 3

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518
LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 JOHN A. BATTS
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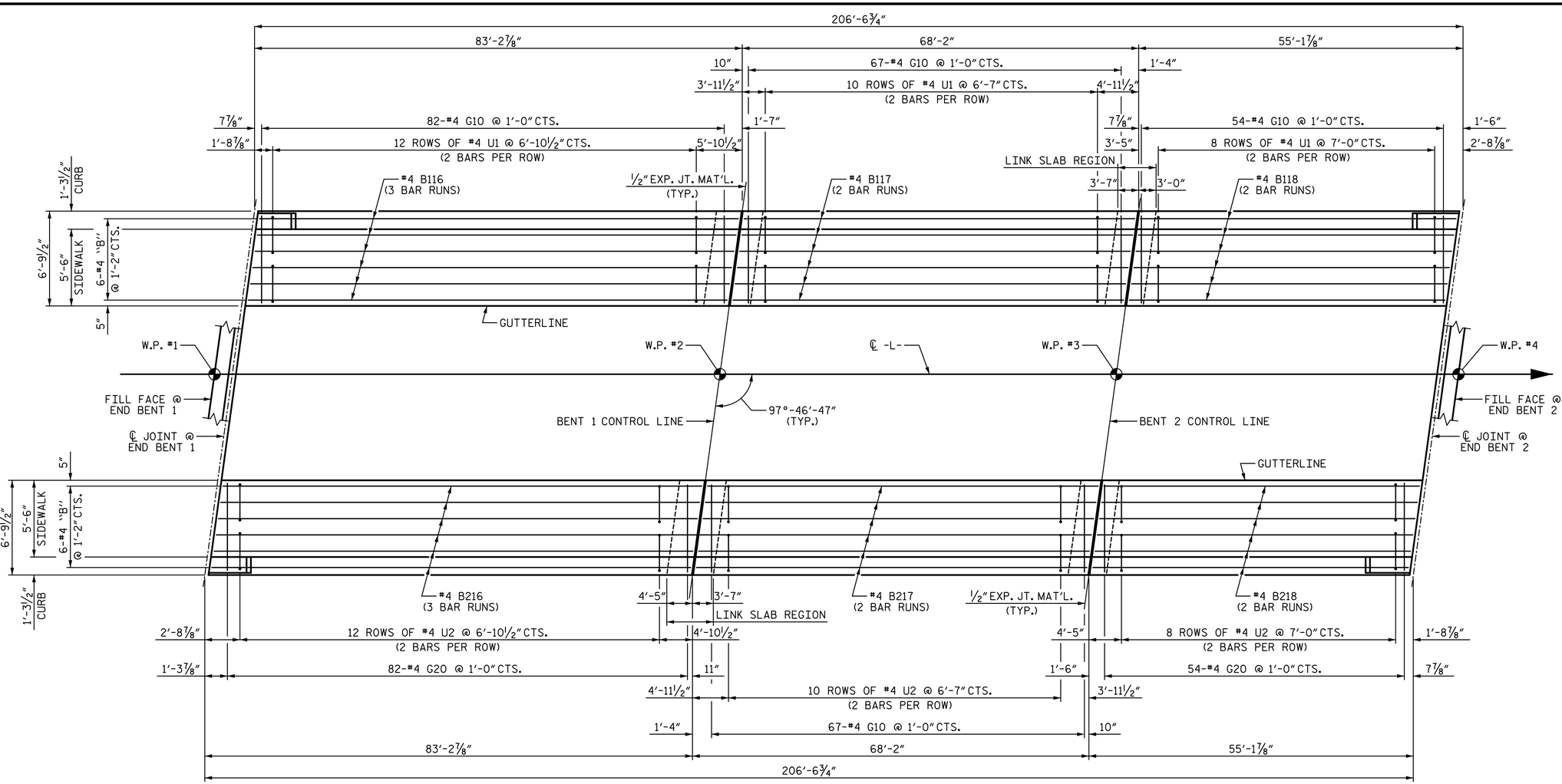
PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

CONCRETE MEDIAN

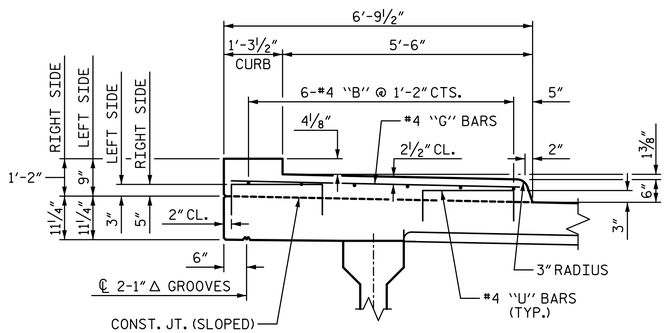
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			59



PLAN OF SIDEWALK

ALL DIMENSIONS ARE MEASURED ALONG OUTSIDE FACE OF CONCRETE CURB

GROOVED CONTRACTION JOINTS IN SIDEWALK AND CURB NOT SHOWN FOR CLARITY, SEE NOTES.



SECTION THRU SIDEWALK

LEFT SIDE SHOWN, RIGHT SIDE SIMILAR

NOTES:

SIDEWALK 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.

ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.

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

FOR SIDEWALK REINFORCING STEEL AND CONCRETE QUANTITIES SEE SUPERSTRUCTURE "BILL OF MATERIAL" SHEET.

"U" BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

SEE "STRIP SEAL EXPANSION JOINT DETAILS FOR SIDEWALK" SHEETS FOR SIDEWALK COVER PLATES AT END BENTS.

PROJECT NO. U-2729

FORSYTH COUNTY

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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SIDEWALK DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			59

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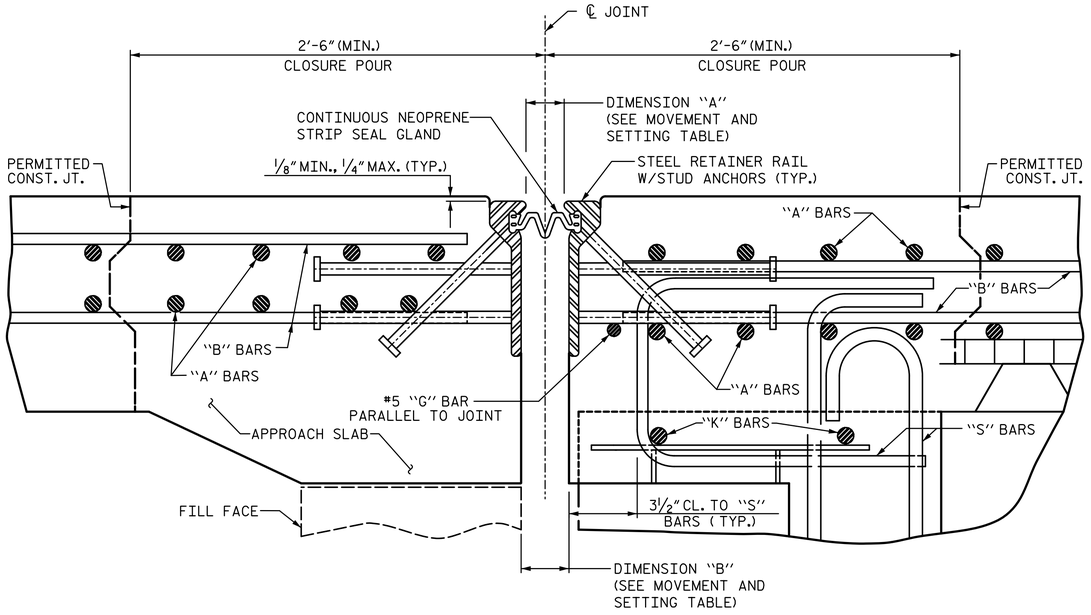
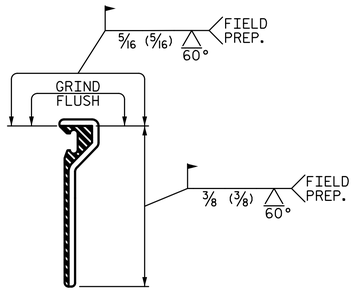
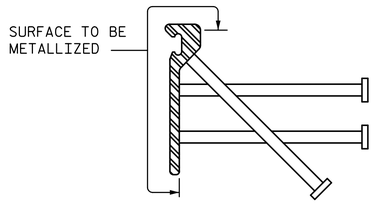


STRIP SEAL EXPANSION JOINT DETAILS

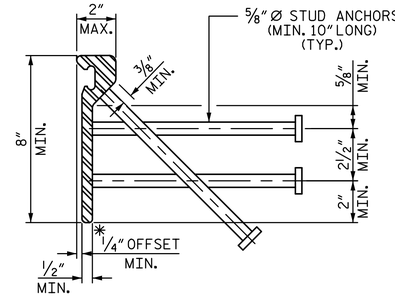
SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE



STEEL RETAINER RAIL (FIELD SPLICE DETAIL)



METALLIZING DETAIL



TYPICAL SECTION STEEL RETAINER RAIL

* DIMENSION "B" BASED ON STEEL RETAINER RAIL TOP OFFSET TO FACE OF RAIL OF 1/4" MINIMUM. IF ACTUAL OFFSET IS GREATER ADJUST DIMENSION "B" AS REQUIRED.

MOVEMENT AND SETTING AT JOINT								
LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	DIMENSION "A"			DIMENSION "B"		
			PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	97°-46'-47"	5/8"	2 1/8"	2"	1 13/16"	2 5/8"	2 1/2"	2 5/16"
END BENT 2	97°-46'-47"	5/8"	2 1/8"	2"	1 13/16"	2 5/8"	2 1/2"	2 5/16"

JOINT INSTALLATION PROCEDURE:

1. INSTALL THE STRIP SEAL EXPANSION JOINT AS RECOMMENDED BY THE MANUFACTURER.
2. A MANUFACTURER'S REPRESENTATIVE SHALL BE PRESENT DURING INSTALLATION OF THE JOINT.
3. PLACE STEEL RETAINER RAILS IN JOINT OPENING. PROPERLY ALIGN THE RAILS BOTH HORIZONTALLY AND VERTICALLY. DO NOT WELD SUPPORT SYSTEM TO THE METALLIZED SURFACES OF THE STEEL RETAINER RAILS.
4. CONFLICTING REINFORCING STEEL MAY BE SHIFTED SLIGHTLY WHEN NECESSARY.
5. DECK SLAB CONCRETE PLACEMENT OPERATIONS SHALL COMMENCE PER THE POURING SEQUENCE AFTER FINAL JOINT ALIGNMENT IS SET.
6. PROTECT THE STEEL RETAINER RAILS FROM BEING FOULED BY CONCRETE SPILLOVER DURING THE DECK POUR.
7. LOOSEN THE STEEL RETAINER RAIL SUPPORT SYSTEM TO ALLOW MOVEMENT WHILE CONCRETE CURES.
8. RE-LEVEL AND RE-ALIGN STEEL RETAINER RAIL AS REQUIRED ON OPPOSITE SIDE OF JOINT.
9. PLACE APPROACH/DECK SLAB CONCRETE.
10. ONCE THE CONCRETE HAS HARDENED SUFFICIENTLY ON BOTH SIDES OF JOINT, STEEL RETAINER RAILS SHALL BE CLEANED THOROUGHLY AND SEAL CHANNELS SHALL BE INSPECTED TO ASCERTAIN THE ABSENCE OF CONCRETE AND DEBRIS.
11. COAT THE STRIP SEAL LUGS WITH LUBRICANT-ADHESIVE AND INSTALL THE NEOPRENE STRIP SEAL GLAND AS RECOMMENDED BY THE STRIP SEAL EXPANSION JOINT MANUFACTURER.

GENERAL NOTES:

FOR STRIP SEAL EXPANSION JOINTS, SEE SPECIAL PROVISIONS.

STEEL RETAINER RAILS AND COVER PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR GRADE 50 STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.

ONLY STEEL RETAINER RAILS OF ONE-PIECE CONSTRUCTION ARE PERMITTED. STEEL RETAINER RAILS CONSISTING OF TWO OR MORE COMPONENTS WELDED TOGETHER TO OBTAIN THEIR FINAL CROSS-SECTIONAL SHAPE ARE NOT PERMITTED.

STUD ANCHORS SHALL BE SHOP WELDED AND SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.

SURFACES COMING IN CONTACT WITH STRIP SEAL GLAND SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.

UPON COMPLETION OF SHOP FABRICATION, THE STEEL RETAINER RAILS SHALL BE METALLIZED AS SHOWN IN THE "METALLIZING DETAIL". SEE SPECIAL PROVISIONS FOR THERMAL SPRAYED COATINGS (METALLIZATION).

INSTALLED STEEL RETAINER RAILS SHALL FOLLOW THE ROADWAY SLOPE.

FIELD SPLICES OF THE RETAINER RAILS SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. FINISHED WELDS SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

NEOPRENE STRIP SEAL GLAND SHALL BE CONTINUOUS THROUGHOUT THE JOINT AND SHALL BE COMPATIBLE WITH THE STEEL RETAINER RAILS. FIELD SPLICING THE GLAND IS NOT PERMITTED.

NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.

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

THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

PROJECT NO. U-2729

FORSYTH COUNTY

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SHEET 1 OF 3

STATE OF NORTH CAROLINA
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STRIP SEAL EXPANSION JOINT DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			59

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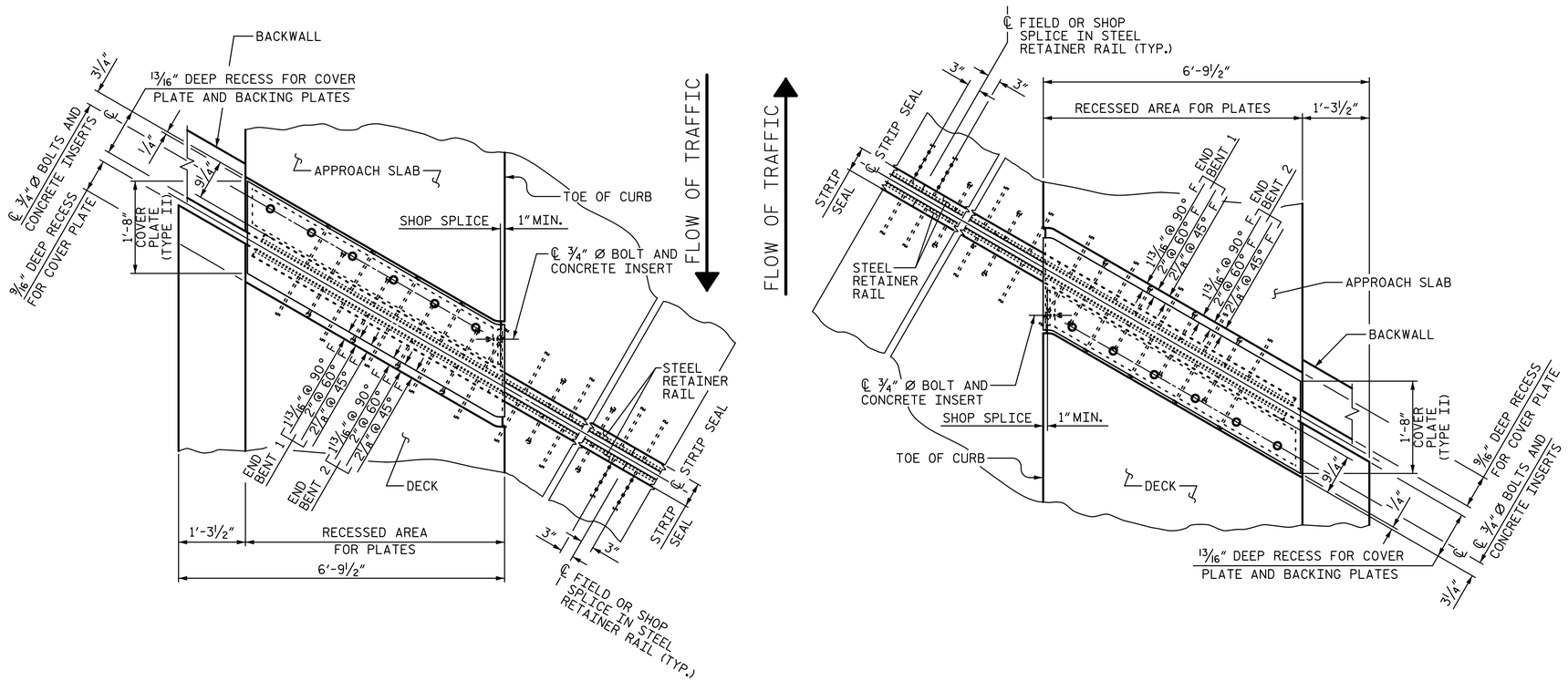
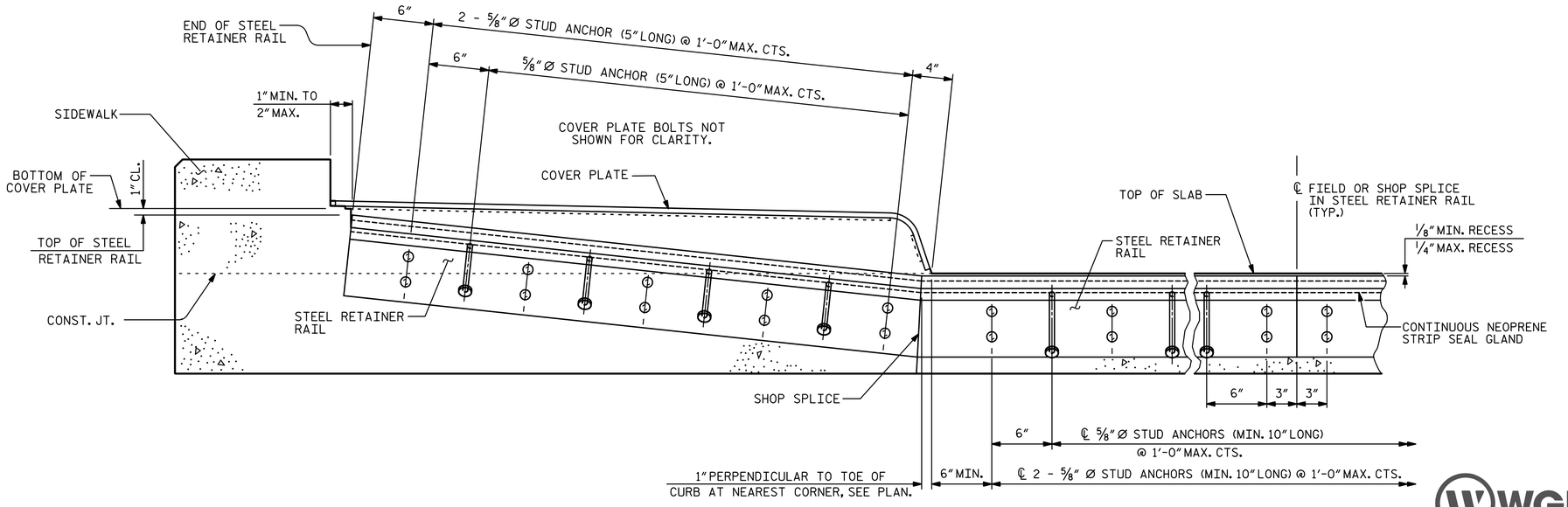
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

4/6/2023 12:02:03 PM P:\Raleigh\Projects\2018\Division 9 (Mott MacDonald)\U-2729\Structures\Drawings\Final\U2729_SMU_JT_330290.dgn



PLAN OF STRIP SEAL EXPANSION JOINT

END BENT 1 SHOWN, END BENT 2 SIMILAR



SECTION THRU SIDEWALK NORMAL TO JOINT

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

STRIP SEAL EXPANSION JOINT DETAILS FOR SIDEWALK

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			59

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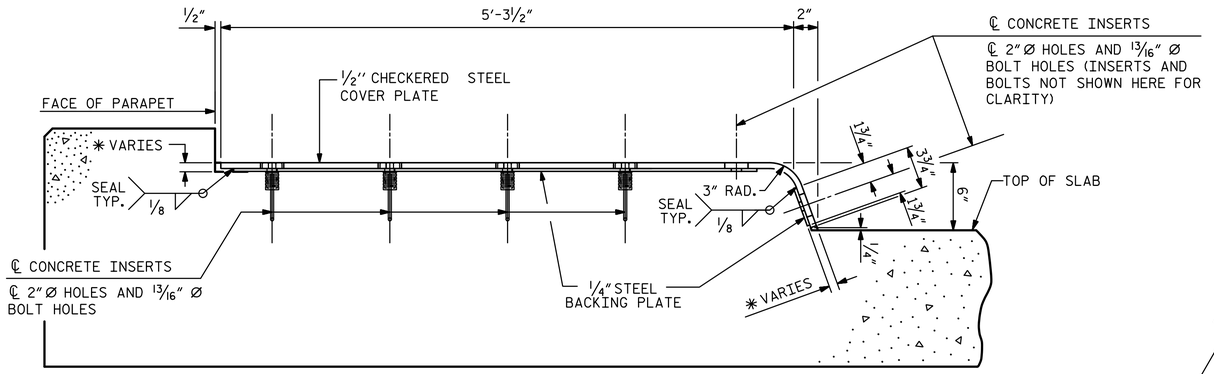
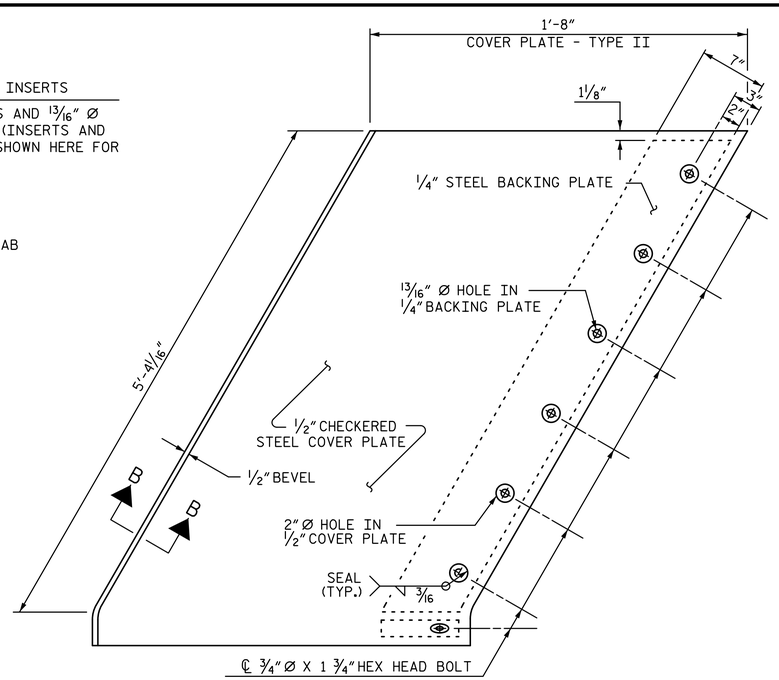


END VIEW
(NORMAL TO SIDEWALK)

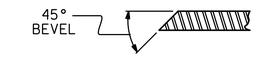
* CONCRETE RECESS DIMENSIONS:

13/16" FOR THE SIDE OF THE JOINT HAVING THE 1/2" COVER PLATE WITH A 1/4" BACKING PLATE.

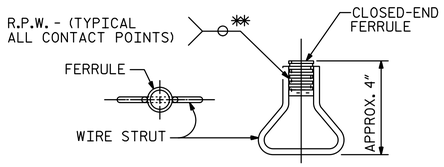
9/16" FOR THE SIDE OF THE JOINT HAVING ONLY THE 1/2" COVER PLATE.



TYPE II - PLAN VIEW



SECTION B-B

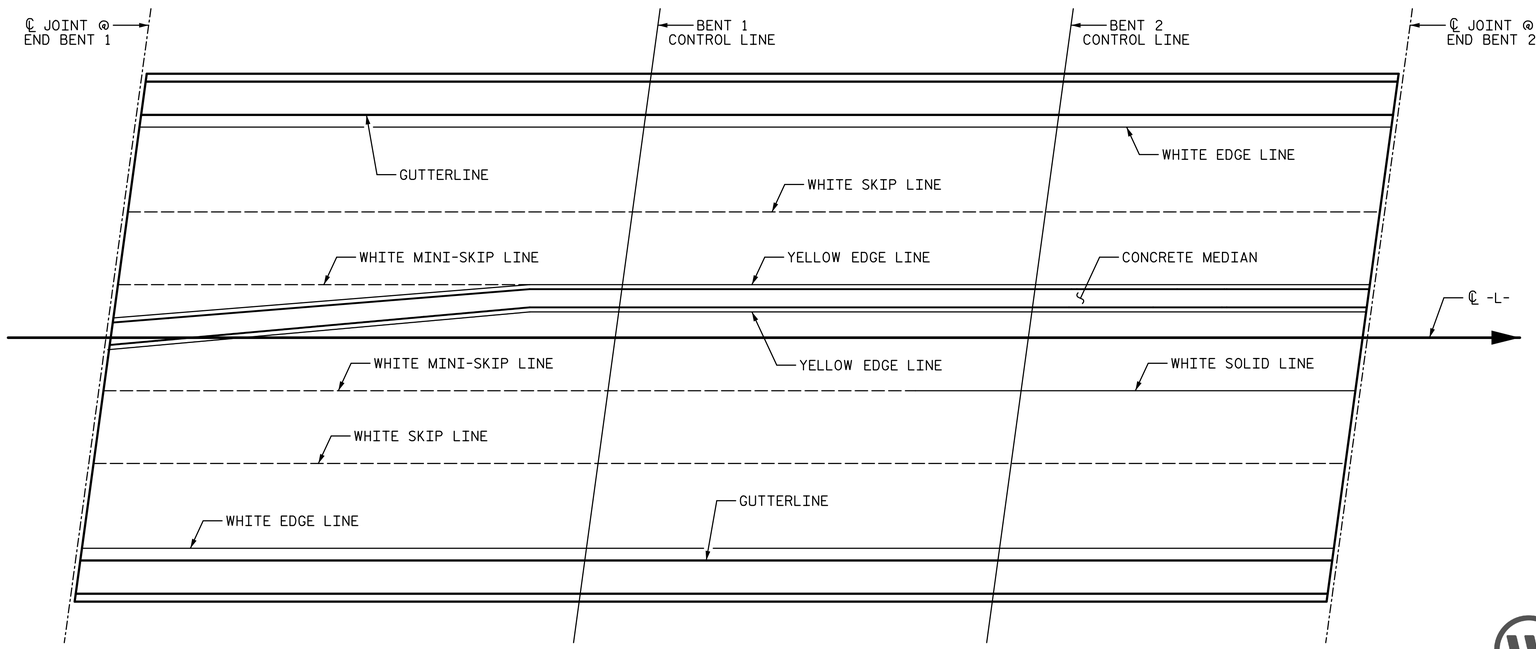


PLAN ELEVATION

CONCRETE INSERT

** EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

COVER PLATE DETAILS



PAVEMENT MARKING ALIGNMENT

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

STRIP SEAL EXPANSION JOINT DETAILS FOR SIDEWALK

DRAWN BY: T. BANKOVICH DATE: 9-22
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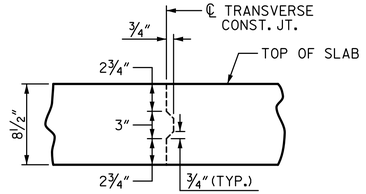
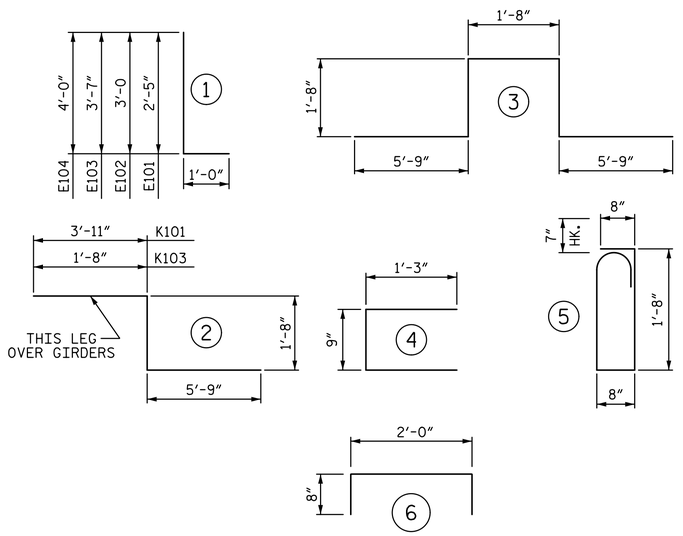


TRANSVERSE CONSTRUCTION JOINT DETAIL

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

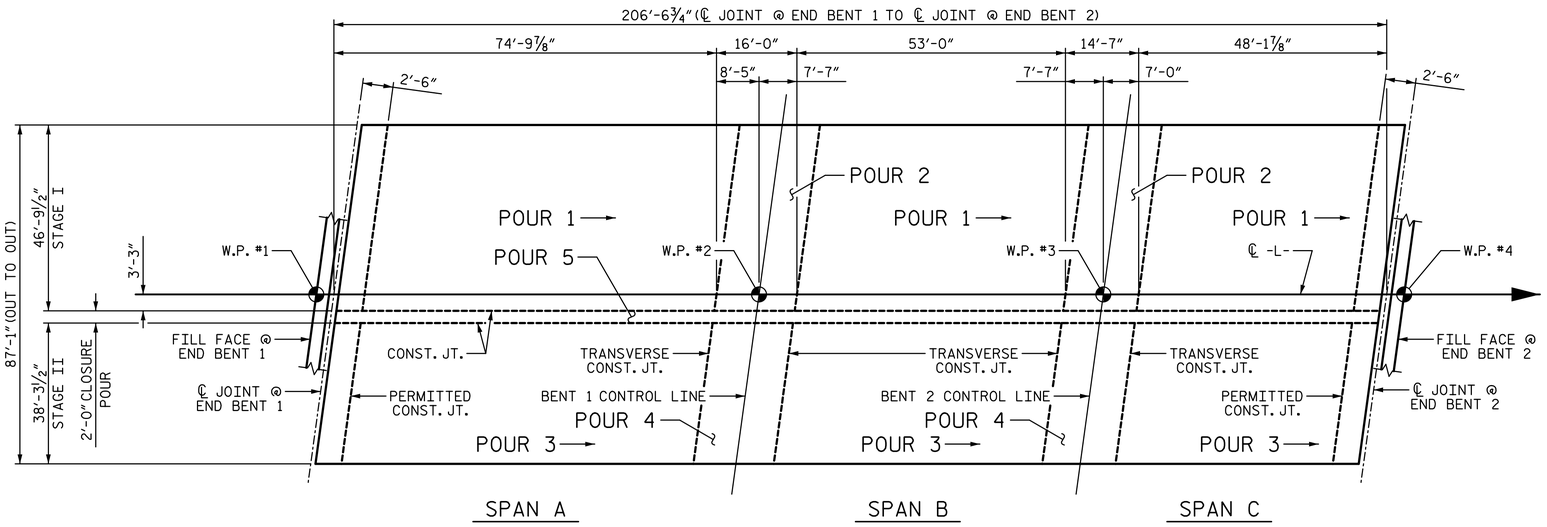
STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1001	400	#5	STR	46'-5"	19365
A1002	400	#5	STR	46'-5"	19365
✳ A1101	2	#5	STR	44'-2"	92
✳ A1102	2	#5	STR	40'-6"	84
✳ A1103	2	#5	STR	36'-10"	77
✳ A1104	2	#5	STR	33'-2"	69
✳ A1105	2	#5	STR	29'-6"	62
✳ A1106	2	#5	STR	25'-10"	54
✳ A1107	2	#5	STR	22'-2"	46
✳ A1108	2	#5	STR	18'-6"	39
✳ A1109	2	#5	STR	14'-10"	31
✳ A1110	2	#5	STR	11'-2"	23
✳ A1111	2	#5	STR	7'-6"	16
✳ A1112	2	#5	STR	3'-11"	8
A1201	2	#5	STR	44'-2"	92
A1202	2	#5	STR	40'-6"	84
A1203	2	#5	STR	36'-10"	77
A1204	2	#5	STR	33'-2"	69
A1205	2	#5	STR	29'-6"	62
A1206	2	#5	STR	25'-10"	54
A1207	2	#5	STR	22'-2"	46
A1208	2	#5	STR	18'-6"	39
A1209	2	#5	STR	14'-10"	31
A1210	2	#5	STR	11'-2"	23
A1211	2	#5	STR	7'-6"	16
A1212	2	#5	STR	3'-11"	8
B101	60	#5	STR	59'-5"	3718
B102	173	#4	STR	10'-0"	1156
B103	60	#4	STR	39'-6"	1583
B104	60	#5	STR	28'-0"	1752
B105	60	#4	STR	32'-6"	1303
B106	60	#5	STR	38'-4"	2399
B107	53	#4	STR	31'-11"	1130
B108	53	#4	STR	34'-9"	1230
✳ B109	64	#4	STR	28'-10"	1233

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B110	32	#5	STR	55'-6"	1852
✳ B111	32	#4	STR	22'-0"	470
✳ B112	32	#5	STR	47'-1"	1571
✳ B113	32	#4	STR	36'-0"	770
✳ B114	62	#5	STR	32'-9"	2118
✳ B115	62	#5	STR	28'-7"	1848
✳ B116	18	#4	STR	29'-4"	353
✳ B117	12	#4	STR	35'-2"	282
✳ B118	12	#4	STR	28'-8"	230
✳ B119	6	#4	STR	35'-9"	143
✳ B120	3	#4	STR	15'-0"	30
✳ B121	6	#4	STR	35'-2"	141
✳ B122	6	#4	STR	28'-8"	115
✳ B123	12	#4	STR	2'-11"	23
✳ B124	12	#4	STR	2'-9"	22
✳ B125	12	#4	STR	2'-7"	21
✳ B126	12	#4	STR	2'-6"	20
✳ B127	92	#4	STR	2'-6"	154
✳ D101	412	#6	STR	4'-10"	2991
D202	412	#6	STR	4'-10"	2991
✳ E101	4	#7	1	3'-5"	28
✳ E102	4	#7	1	4'-0"	33
✳ E103	4	#7	1	4'-7"	37
✳ E104	4	#7	1	5'-0"	41
✳ F101	4	#6	STR	1'-8"	10
✳ F102	4	#6	STR	3'-3"	20
✳ F103	8	#6	STR	3'-5"	41
✳ F104	4	#6	STR	3'-5"	21
✳ G1	2	#5	STR	46'-10"	98
✳ G10	203	#4	STR	6'-4"	859
✳ K101	4	#8	2	11'-4"	121
✳ K102	16	#8	3	16'-6"	705
✳ K103	4	#8	2	9'-1"	97
K104	20	#4	STR	6'-10"	91
K105	20	#6	STR	6'-10"	205
✳ S1	70	#4	4	3'-3"	152
✳ S2	70	#5	5	5'-3"	383
✳ U1	60	#4	6	3'-4"	134

REINFORCING STEEL	37524 LB
EPOXY COATED REINFORCING STEEL	37133 LB

✳ INDICATES EPOXY COATED REINFORCING STEEL



POUR SEQUENCE AND LAYOUT FOR COMPUTING REINFORCED CONCRETE DECK SLAB AREA

(SQ. FT. 17,988)

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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SUPERSTRUCTURE

BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			59

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

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5640 Dillard Drive, Suite 200
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LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 JOHN A. BATTS
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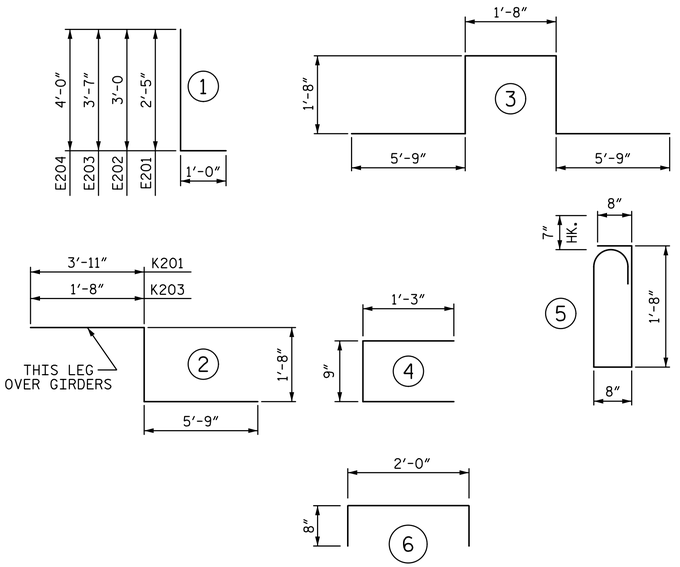
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	1′-11″	1′-7″	1′-11″	1′-7″	2′-6″
#5	2′-5″	2′-0″	2′-5″	2′-0″	3′-1″
#6	2′-10″	2′-5″	3′-7″	2′-5″	3′-8″
#7	4′-2″	2′-9″			
#8	4′-9″	3′-2″			

GROOVING BRIDGE FLOORS

APPROACH SLABS	3,396	SQ. FT.
BRIDGE DECK	14,504	SQ. FT.
TOTAL	17,900	SQ. FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A2001	402	#5	STR	37′-11″	15898
A2002	402	#5	STR	37′-11″	15898
✳ A2101	2	#5	STR	36′-3″	76
✳ A2102	2	#5	STR	32′-7″	68
✳ A2103	2	#5	STR	28′-11″	60
✳ A2104	2	#5	STR	25′-3″	53
✳ A2105	2	#5	STR	21′-7″	45
✳ A2106	2	#5	STR	17′-11″	37
✳ A2107	2	#5	STR	14′-4″	30
✳ A2108	2	#5	STR	10′-8″	22
✳ A2109	2	#5	STR	7′-0″	15
✳ A2110	2	#5	STR	3′-4″	7
A2201	2	#5	STR	36′-3″	76
A2202	2	#5	STR	32′-7″	68
A2203	2	#5	STR	28′-11″	60
A2204	2	#5	STR	25′-3″	53
A2205	2	#5	STR	21′-7″	45
A2206	2	#5	STR	17′-11″	37
A2207	2	#5	STR	14′-4″	30
A2208	2	#5	STR	10′-8″	22
A2209	2	#5	STR	7′-0″	15
A2210	2	#5	STR	3′-4″	7
B201	52	#5	STR	59′-5″	3223
B202	149	#4	STR	10′-0″	995
B203	52	#4	STR	39′-6″	1372
B204	52	#5	STR	28′-0″	1519
B205	52	#4	STR	32′-6″	1129
B206	52	#5	STR	38′-4″	2079
B207	45	#4	STR	31′-11″	959
B208	45	#4	STR	34′-9″	1045
✳ B209	60	#4	STR	28′-10″	1156
✳ B210	30	#5	STR	55′-6″	1737
✳ B211	30	#4	STR	22′-0″	441
✳ B212	30	#5	STR	47′-1″	1473
✳ B213	30	#4	STR	36′-0″	721
✳ B214	52	#5	STR	32′-9″	1776
✳ B215	52	#5	STR	28′-7″	1550
✳ B216	18	#4	STR	29′-4″	353
✳ B217	12	#4	STR	35′-2″	282
✳ B218	12	#4	STR	28′-8″	230
✳ D201	412	#6	STR	4′-10″	2991
D 202	412	#6	STR	4′-10″	2991
✳ E201	4	#7	1	3′-5″	28
✳ E202	4	#7	1	4′-0″	33
✳ E203	4	#7	1	4′-7″	37
✳ E204	4	#7	1	5′-0″	41
✳ F201	4	#6	STR	1′-8″	10
✳ F202	4	#6	STR	3′-3″	20
✳ F203	8	#6	STR	3′-5″	41
✳ F204	4	#6	STR	3′-5″	21
✳ G2	2	#5	STR	40′-3″	84
✳ G20	203	#4	STR	6′-4″	859
✳ K201	4	#8	2	11′-4″	121
✳ K202	12	#8	3	16′-6″	529
✳ K203	4	#8	2	9′-1″	97
K204	16	#4	STR	6′-10″	73
K205	16	#6	STR	6′-10″	164
✳ S1	56	#4	4	3′-3″	122
✳ S2	56	#5	5	5′-3″	307
✳ U2	60	#4	6	3′-4″	134
REINFORCING STEEL					31860 LB
EPOXY COATED REINFORCING STEEL					31505 LB

✳ INDICATES EPOXY COATED REINFORCING STEEL

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS "AA" CONCRETE		REINFORCING STEEL		EPOXY COATED REINFORCING STEEL	
	CY		LB		LB	
	STAGE I	STAGE II	STAGE I	STAGE II	STAGE I	STAGE II
POUR 1 / POUR 3	254.7	207.1	--	--	--	--
POUR 2 / POUR 4	43.5	37.8	--	--	--	--
POUR 5	--	14.0	--	--	--	--
SIDEWALK & END POSTS	27.5	38.3	--	--	--	--
SUB TOTAL	325.7	297.2	37,524	31,860	37,133	31,505
MEDIAN	8.5	--	--	--	--	--
TOTAL	631.4		69,384		68,638	

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

BILL OF MATERIAL

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518
LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL SEAL 18056 ENGINEER JOHN A. BATTS

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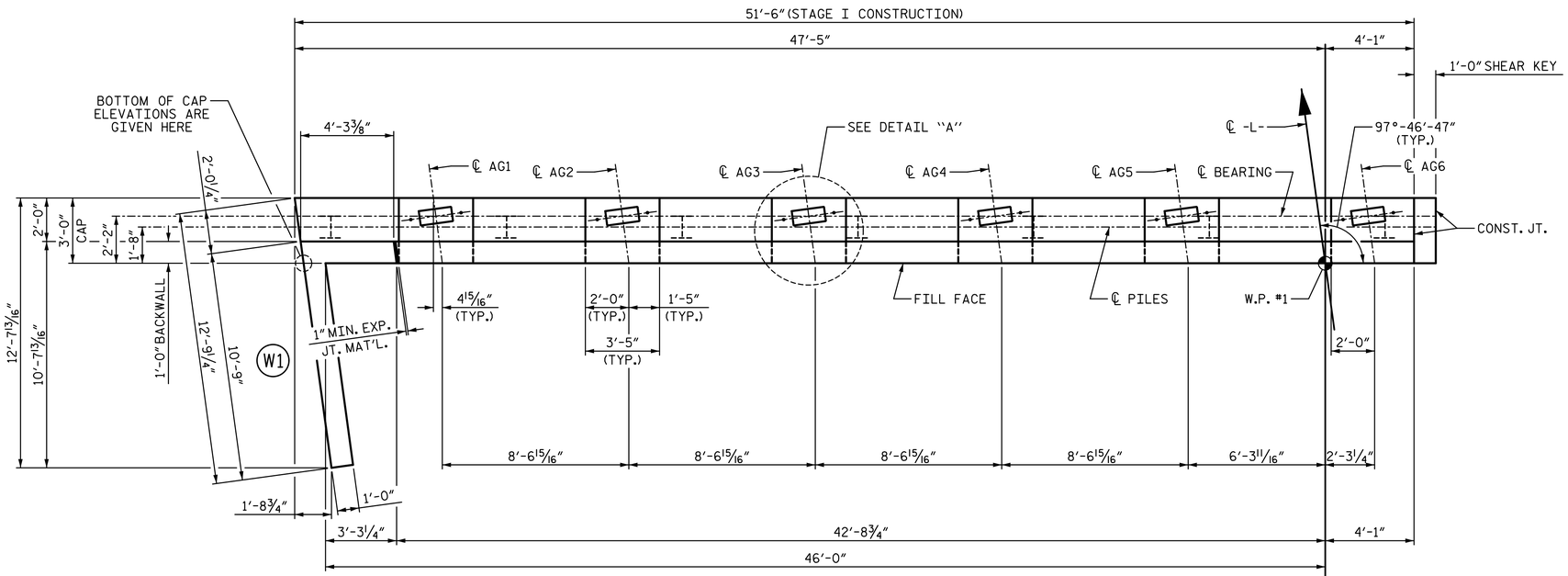


PLAN

NOTES:

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

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #9 "B" BARS IN STAGE I WITH THE #9 "B" BARS IN STAGE II. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BARS BY 1 FOOT AND THE STAGE I BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1'-0" AND A MAXIMUM OF 2'-0" EXTENSION INTO STAGE II CONSTRUCTION.

FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICE FOR REINFORCING STEEL IN STANDARD SPECIFICAITONS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #9 "B" BARS IN THE STAGED CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.

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

* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS SEE SECTION A-A, SEE SHEET 4 OF 4.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

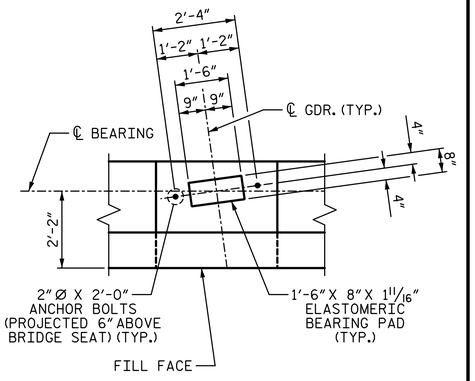
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXPECT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

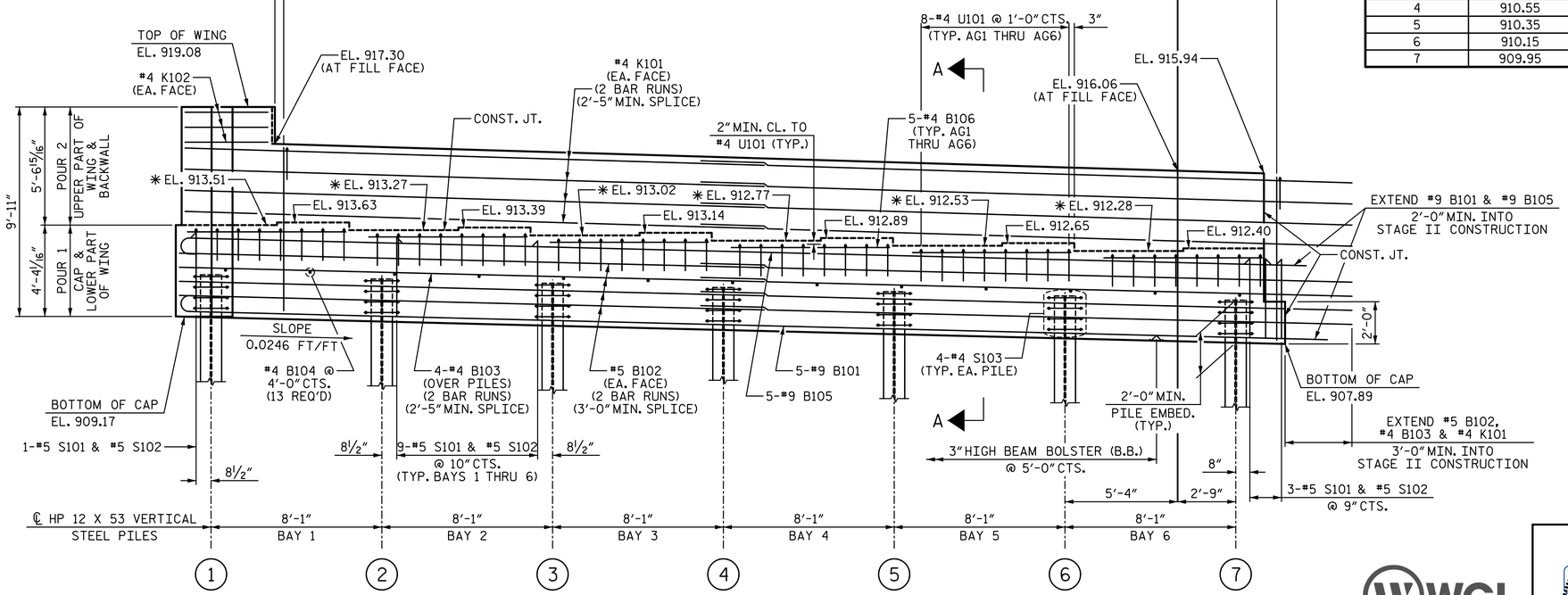
SEE GENERAL DRAWING "FOUNDATION LAYOUT" FOR ADDITIONAL NOTES FOR DRIVING PILES.

TOP OF PILE ELEVATIONS

PILE	ELEVATION
1	911.15
2	910.95
3	910.75
4	910.55
5	910.35
6	910.15
7	909.95



DETAIL "A"
(TYP. EA. GIRDER)



ELEVATION

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 1

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			59

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5640 Dillard Drive, Suite 200
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LICENSURE NO. C-4434

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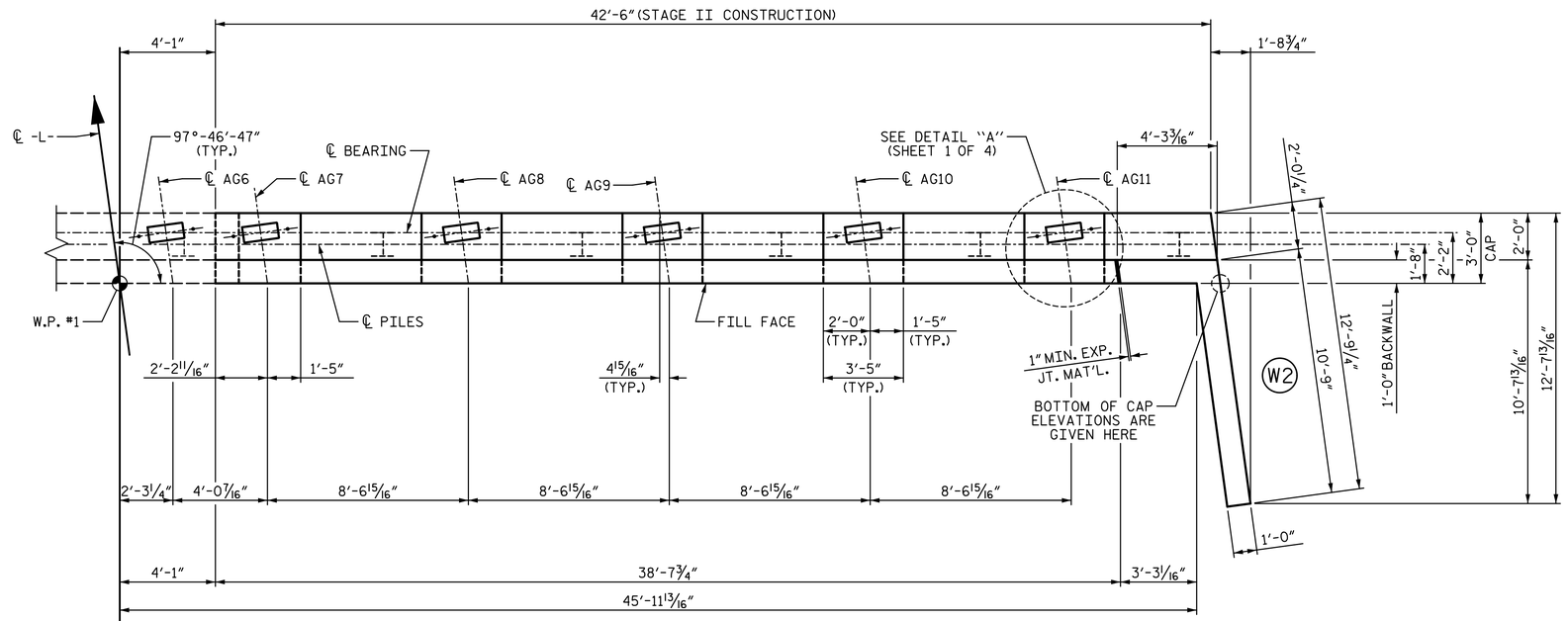
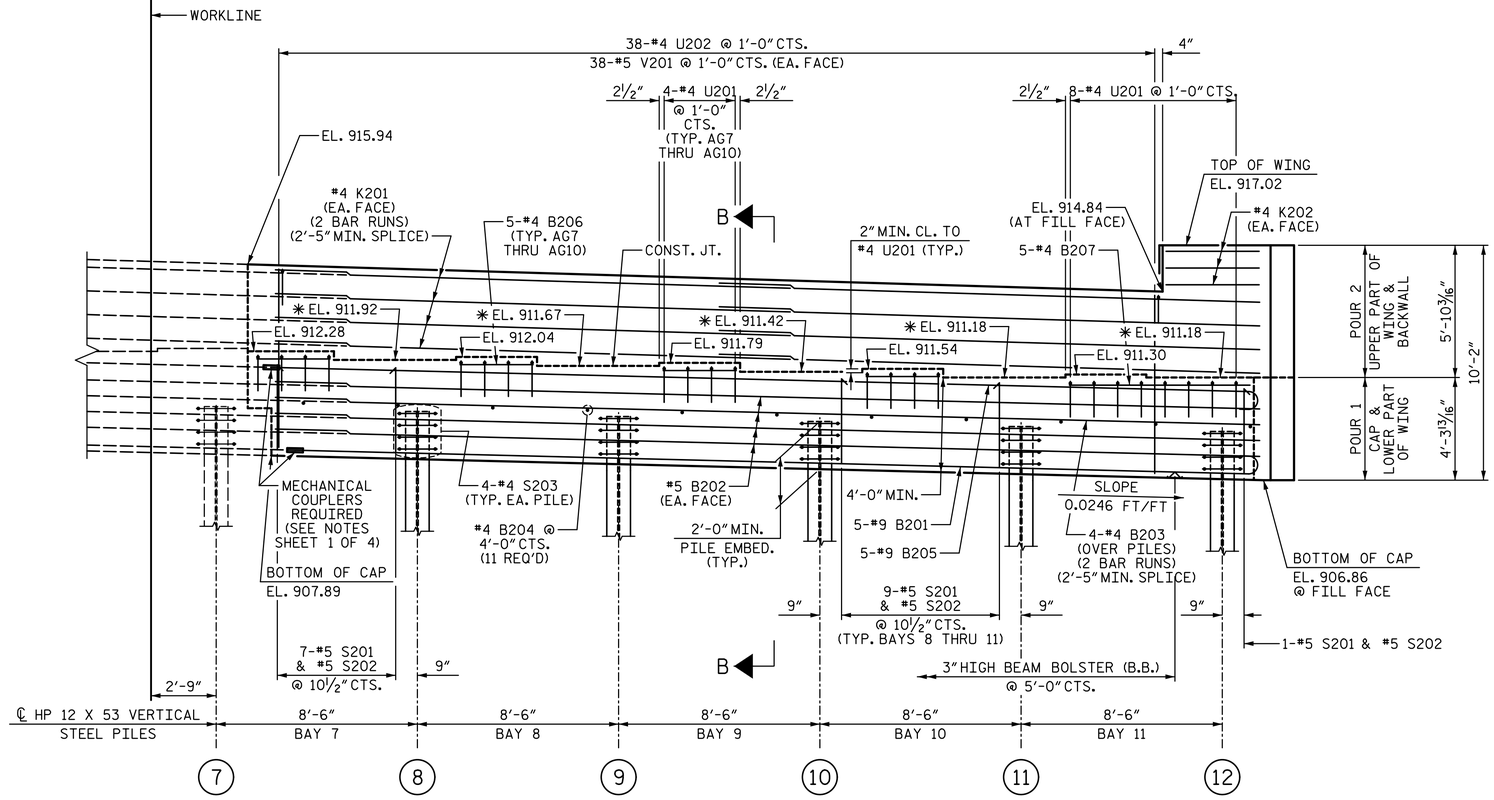


PLAN



ELEVATION

CAP WING

TIEBACK DETAILS

(BOTH STAGES SIMILAR)

NOTES:

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

✳ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS SEE SECTION B-B, SEE SHEET 4 OF 4.

FOR ALL OTHER NOTES, SEE SHEET 1 OF 4.

TOP OF PILE ELEVATIONS

PILE	ELEVATION
8	909.74
9	909.53
10	909.32
11	909.11
12	908.90

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			59

DRAWN BY: T. BANKOVICH DATE: 9-22
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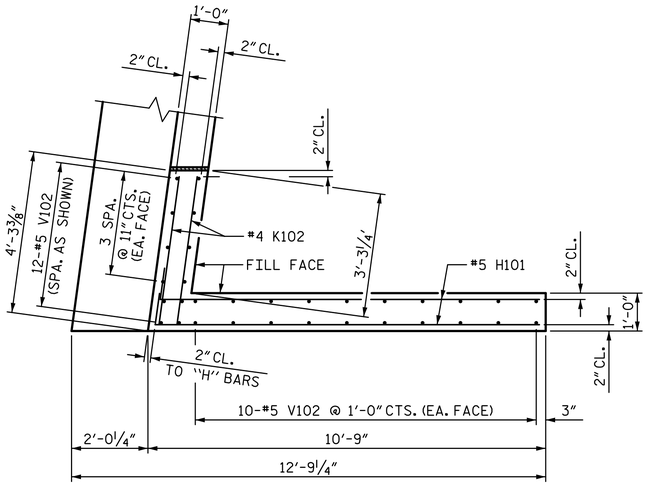
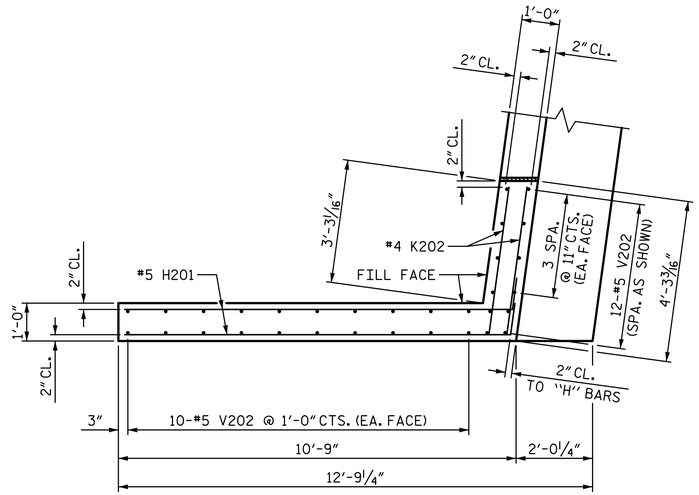
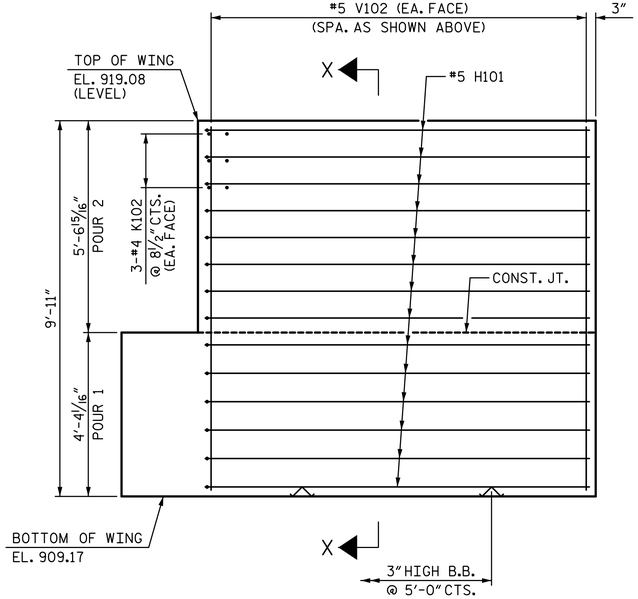


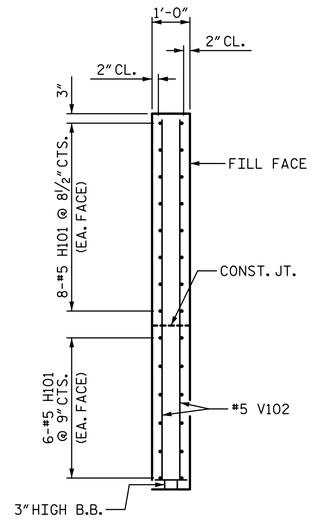
PLAN OF WING (W1)



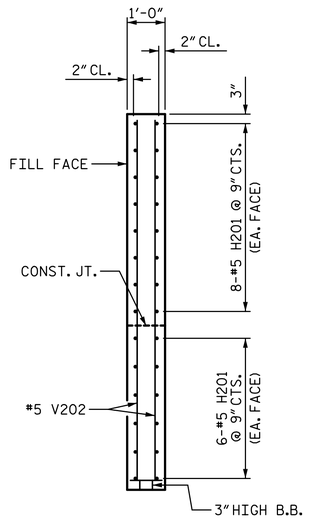
PLAN OF WING (W2)



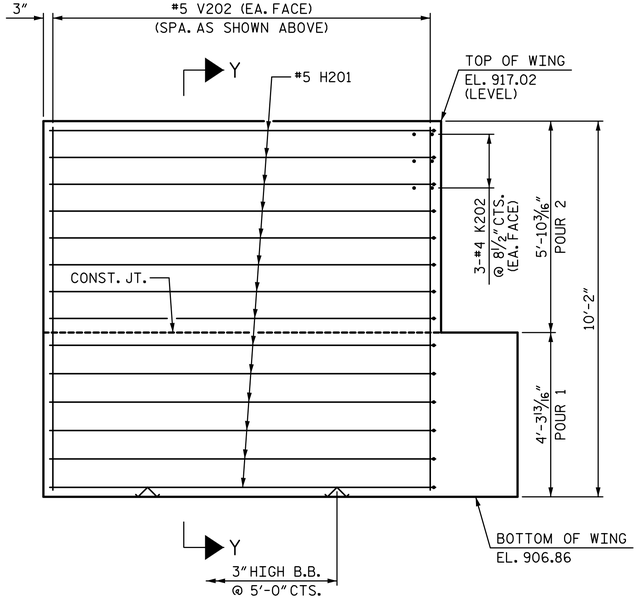
ELEVATION OF WING (W1)



SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W2)

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
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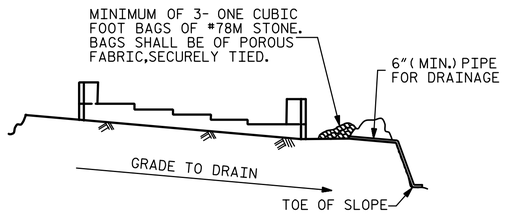
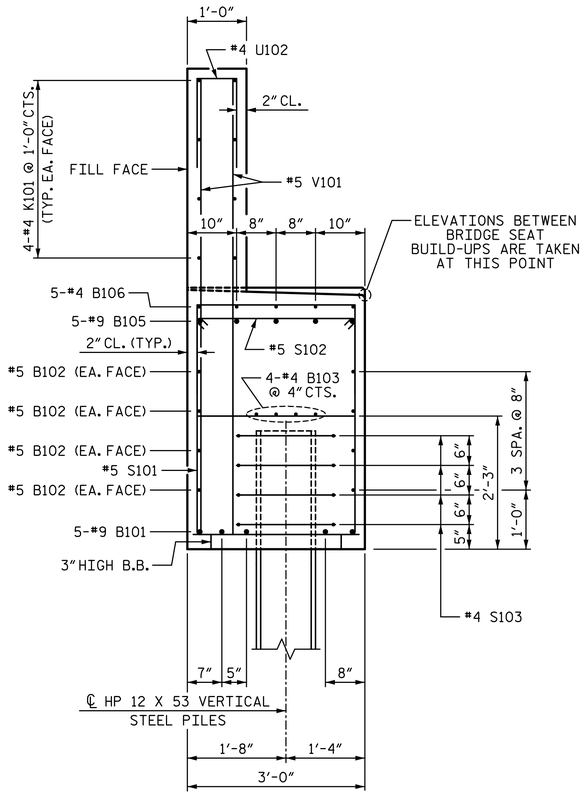


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

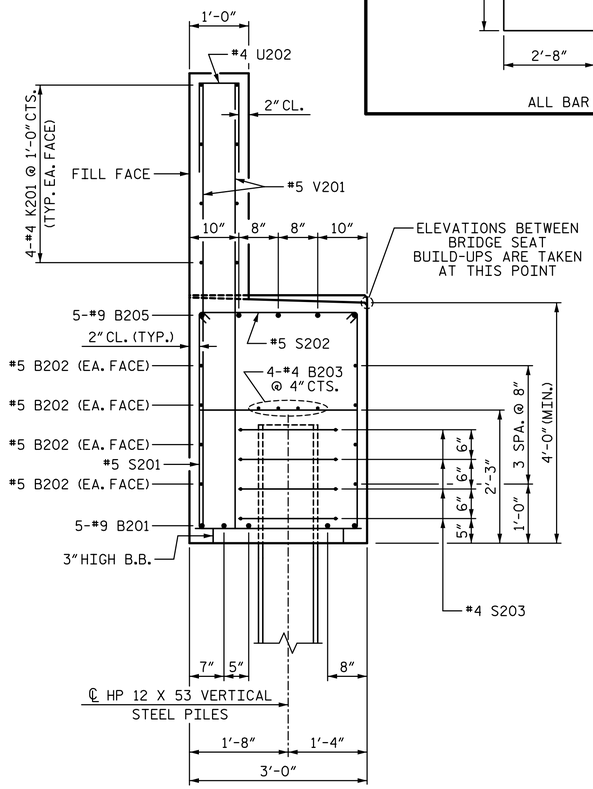
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



SECTION A-A

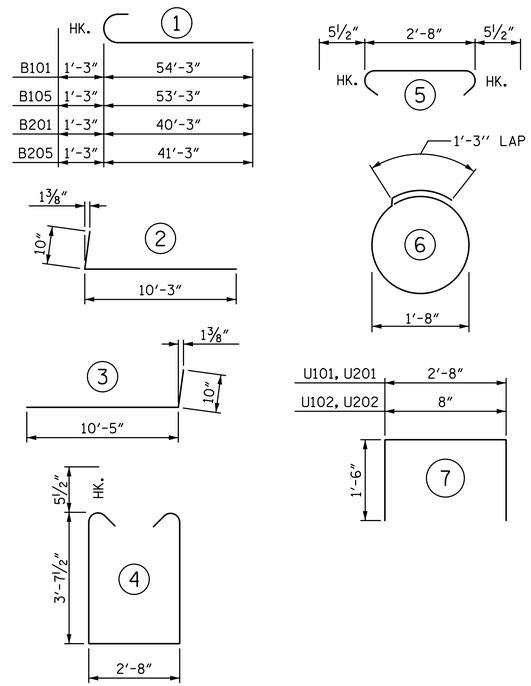
(STAGE I)



SECTION B-B

(STAGE II)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

END BENT 1

STAGE I

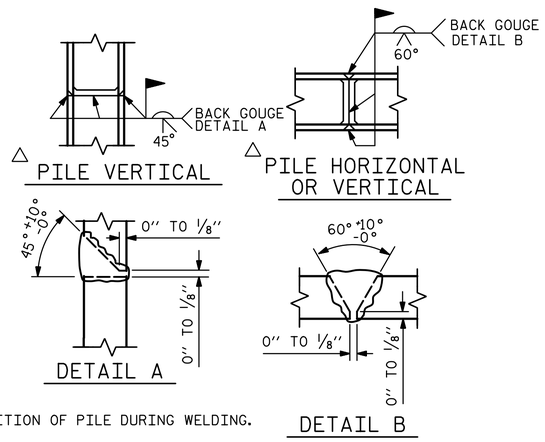
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B101	5	#9	1	55'-6"	944
B102	16	#5	STR	29'-3"	488
B103	8	#4	STR	28'-11"	155
B104	13	#4	STR	2'-8"	23
B105	5	#9	1	54'-6"	927
B106	30	#4	STR	7'-5"	149
H101	28	#5	2	11'-1"	324
K101	16	#4	STR	28'-11"	309
K102	6	#4	STR	3'-11"	16
S101	58	#5	4	10'-10"	655
S102	58	#5	5	3'-7"	217
S103	28	#4	6	6'-6"	122
U101	48	#4	7	5'-8"	182
U102	48	#4	7	3'-8"	118
V101	96	#5	STR	7'-8"	768
V102	32	#5	STR	9'-7"	320
TOTAL REINFORCING STEEL					5717 LB

CLASS "A" CONCRETE BREAKDOWN	
POUR 1	26.8 CY
(CAP & LOWER WING)	
POUR 2	9.3 CY
(UPPER WING & BACKWALL)	
TOTAL	36.1 CY
HP 12 X 53 STEEL PILES	
NO. 7	700 LF
PILE DRIVING EQUIPMENT SETUP	
HP 12 X 53 STEEL PILES	7 EA

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B201	5	#9	1	41'-6"	706
B202	8	#5	STR	41'-2"	343
B203	8	#4	STR	21'-10"	117
B204	11	#4	STR	2'-8"	20
B205	5	#9	1	42'-6"	723
B206	20	#4	STR	3'-1"	41
B207	5	#4	STR	7'-7"	25
H201	28	#5	3	11'-3"	329
K201	16	#4	STR	21'-10"	233
K202	6	#4	STR	3'-11"	16
S201	44	#5	4	10'-10"	497
S202	44	#5	5	3'-7"	164
S203	20	#4	6	6'-6"	87
U201	24	#4	7	5'-8"	91
U202	38	#4	7	3'-8"	93
V201	76	#5	STR	7'-6"	595
V202	32	#5	STR	9'-10"	328
TOTAL REINFORCING STEEL					4408 LB

CLASS "A" CONCRETE BREAKDOWN	
POUR 1	21.5 CY
(CAP & LOWER WING)	
POUR 2	8.2 CY
(UPPER WING & BACKWALL)	
TOTAL	29.7 CY
HP 12 X 53 STEEL PILES	
NO. 5	500 LF
PILE DRIVING EQUIPMENT SETUP	
HP 12 X 53 STEEL PILES	5 EA



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

DRAWN BY: T. BANKOVICH DATE: 9-22
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1			3			TOTAL SHEETS
2			4			59

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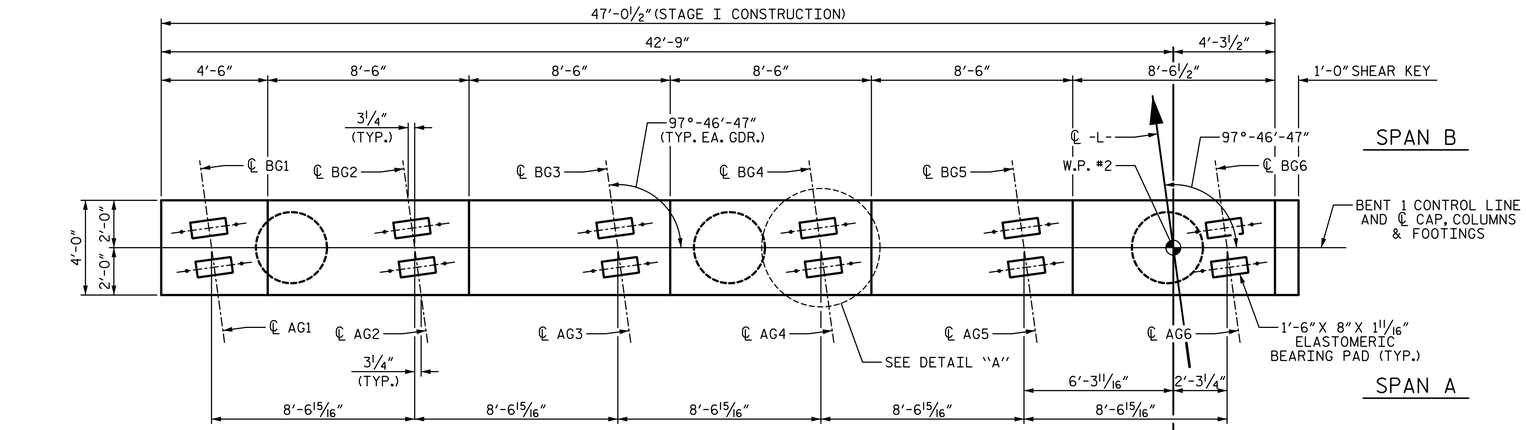
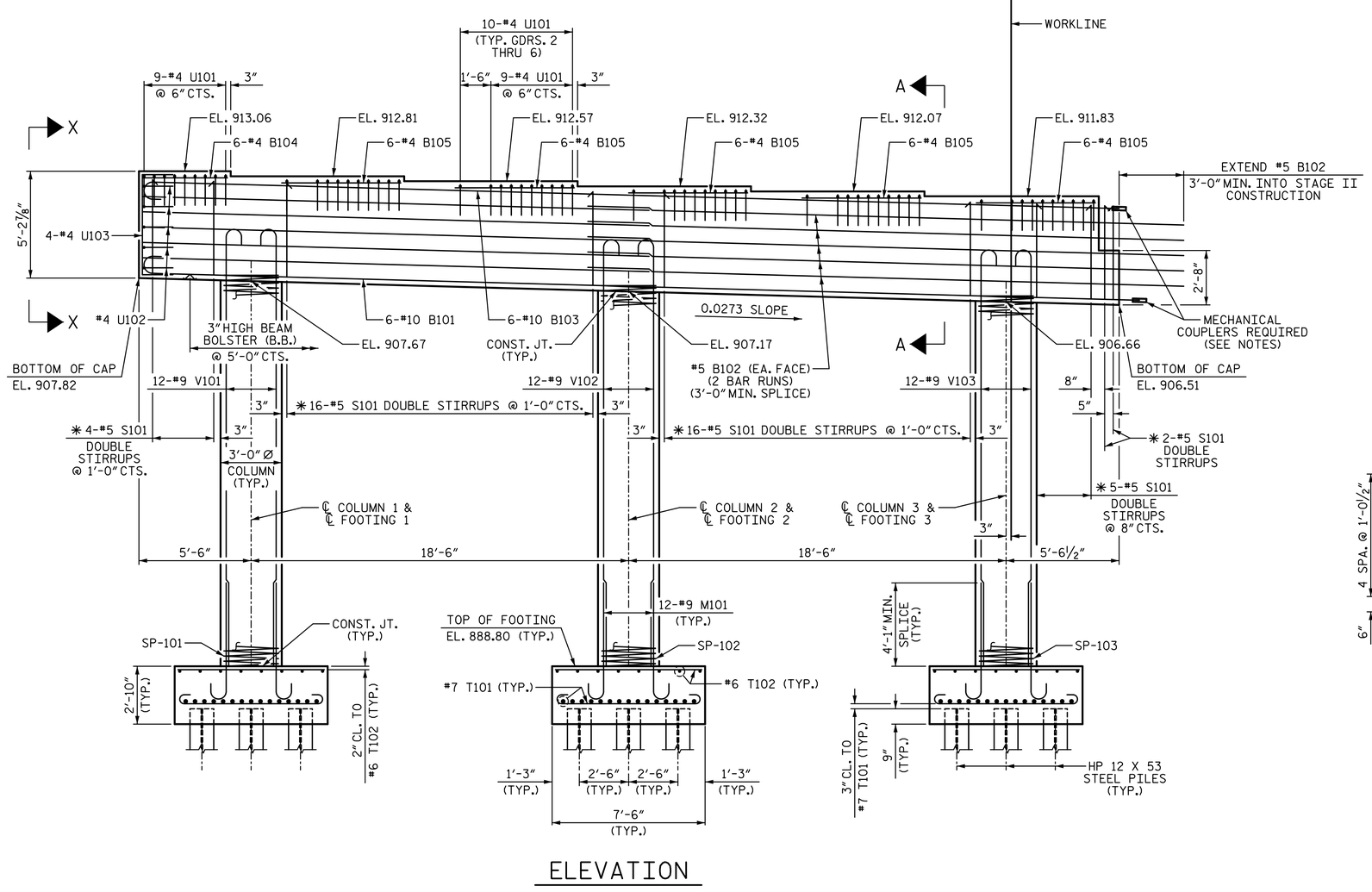


PLAN



ELEVATION

NOTES:

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

✳ INVERT ALTERNATE STIRRUPS.

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #10 ″B″ BARS IN STAGE I WITH THE #10 ″B″ BARS IN STAGE II. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BARS BY 1 FOOT AND THE STAGE I BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1′-0″ AND A MAXIMUM OF 2′-0″ EXTENSION INTO STAGE II CONSTRUCTION.

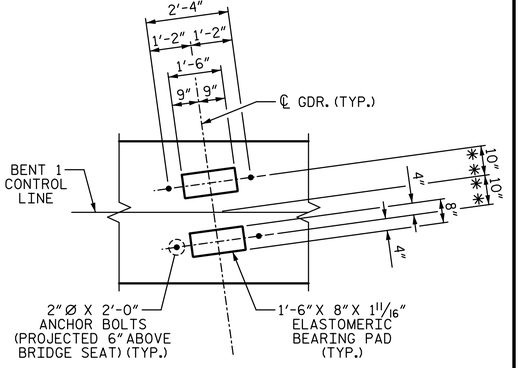
FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICE FOR REINFORCING STEEL IN STANDARD SPECIFICAITONS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #10 ″B″ BARS IN THE STAGED CONSTRUCTION JOINT MAY NEED TO ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.

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

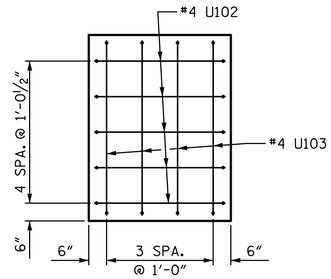
FOR SECTION A-A, SEE SHEET 3 OF 3.

SEE GENERAL DRAWING ″FOUNDATION LAYOUT″ FOR ADDITIONAL NOTES FOR DRIVING PILES.



DETAIL ″A″

(TYP. EA. GIRDER)
(✳✳ MEASURED ALONG ℄ GIRDER)



VIEW X-X

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT 1

STAGE I

DRAWN BY:	T. BANKOVICH	DATE:	9-22
CHECKED BY:	T.J. BEACH	DATE:	9-22
DESIGN ENGINEER OF RECORD:	J.A. BATTS	DATE:	9-22

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518
LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 JOHN A. BATTS
4/6/2023 | 10:39 AM PDT

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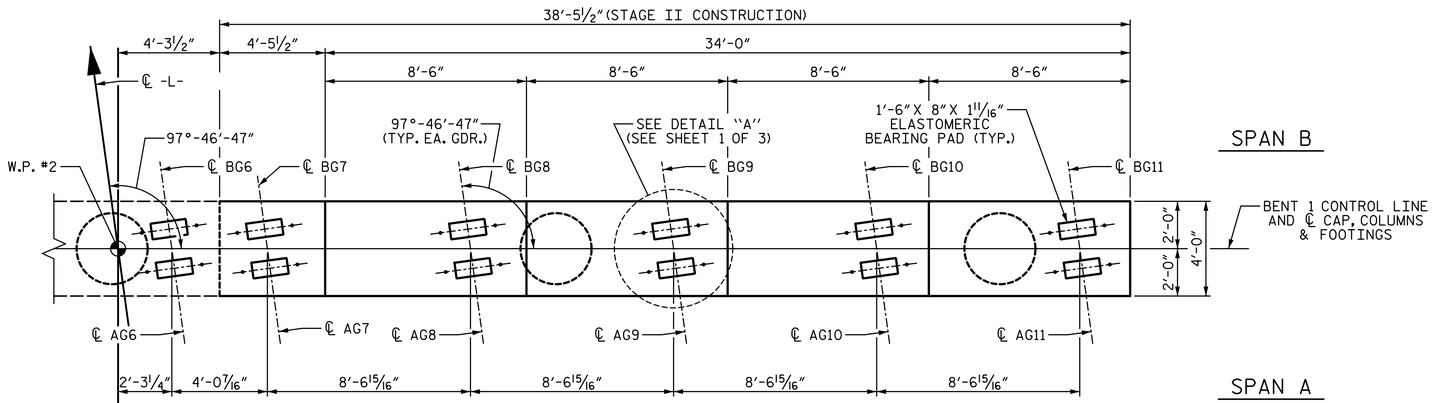
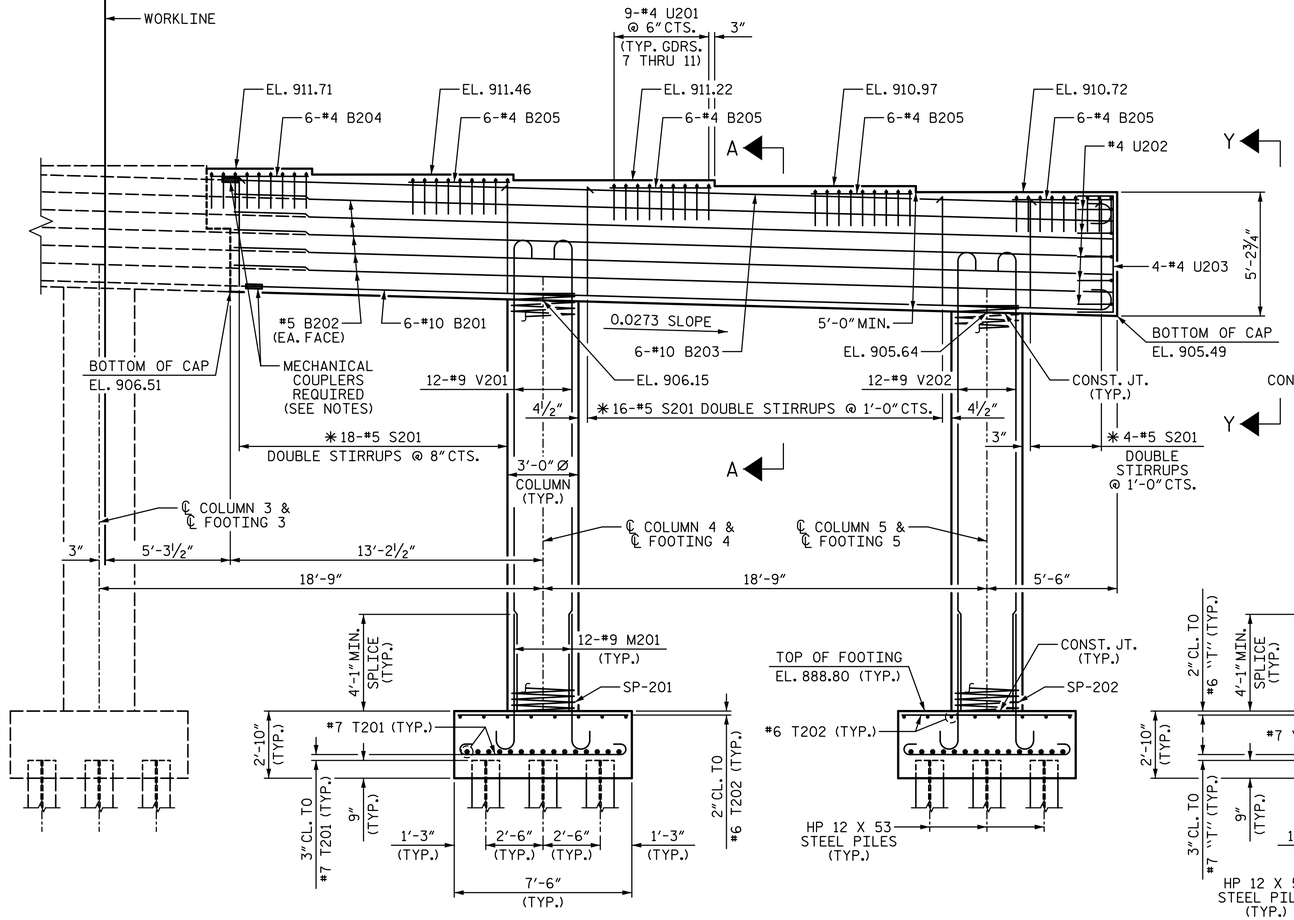
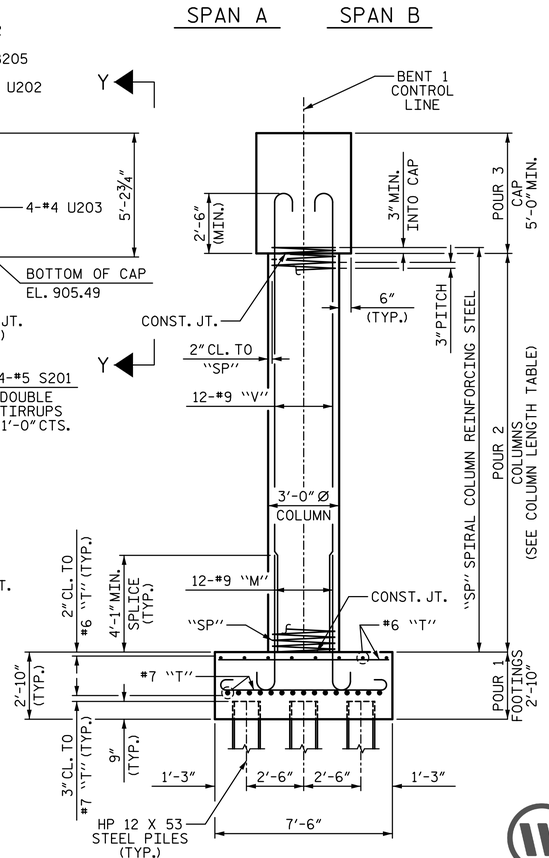
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			59



PLAN

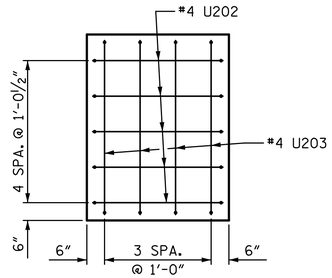


ELEVATION



END ELEVATION

(DETAILS, DIMENSION & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND FOOTING)



VIEW Y-Y

COLUMN LENGTH TABLE

COLUMN	LENGTH
1	18'-10 7/16"
2	18'-4 7/16"
3	17'-10 5/16"
4	17'-4 3/16"
5	16'-10 1/16"

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS
2			4			59

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518
LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL SEAL 18056 ENGINEER JOHN A. BATTS
4/6/2023 | 10:39 AM PDT

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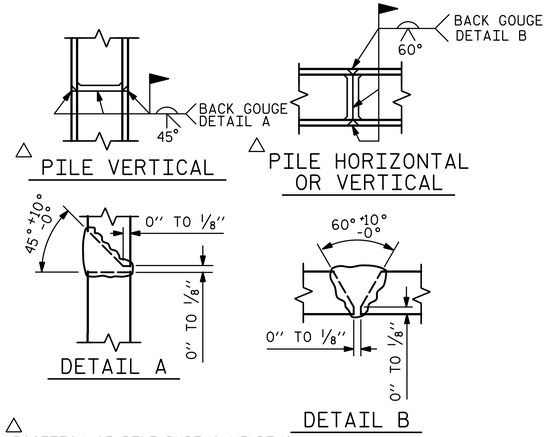
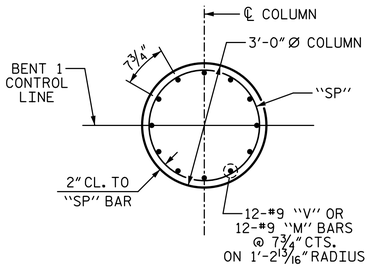
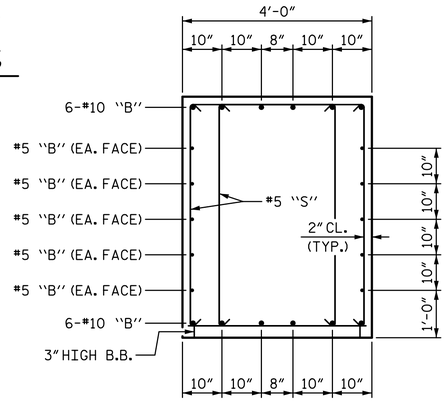


PILE SPLICE DETAILS



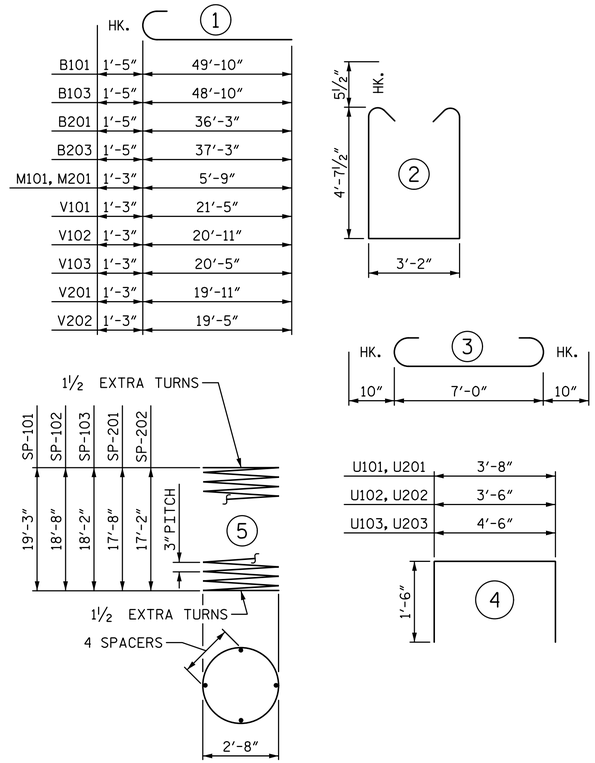
PLAN OF COLUMN

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN)



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT 1

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B101	6	#10	1	51'-3"	1323
B102	20	#5	STR	27'-1"	565
B103	6	#10	1	50'-3"	1297
B104	6	#4	STR	4'-2"	17
B105	30	#4	STR	5'-10"	117
M101	36	#9	1	7'-0"	857
S101	86	#5	2	13'-4"	1196
T101	90	#7	3	8'-8"	1594
T102	48	#6	STR	7'-0"	505
U101	59	#4	4	6'-8"	263
U102	5	#4	4	6'-6"	22
U103	4	#4	4	7'-6"	20
V101	12	#9	1	22'-8"	925
V102	12	#9	1	22'-2"	904
V103	12	#9	1	21'-8"	884
SP-101	1	✳	5	660'-1"	441
SP-102	1	✳	5	643'-7"	430
SP-103	1	✳	5	627'-1"	419

REINFORCING STEEL	10489 LB
SPIRAL COL. REINF. STEEL	1290 LB

CLASS "A" CONCRETE BREAKDOWN	
POUR 1 (FOOTINGS)	17.8 CY
POUR 2 (COLUMNS)	14.5 CY
POUR 3 (CAP)	36.7 CY
TOTAL	69.0 CY

HP 12 X 53 STEEL PILES	
NO. 15	1050 LF
PILE DRIVING EQUIPMENT SETUP	
HP 14 X 73 STEEL PILES	15 EA

STAGE II

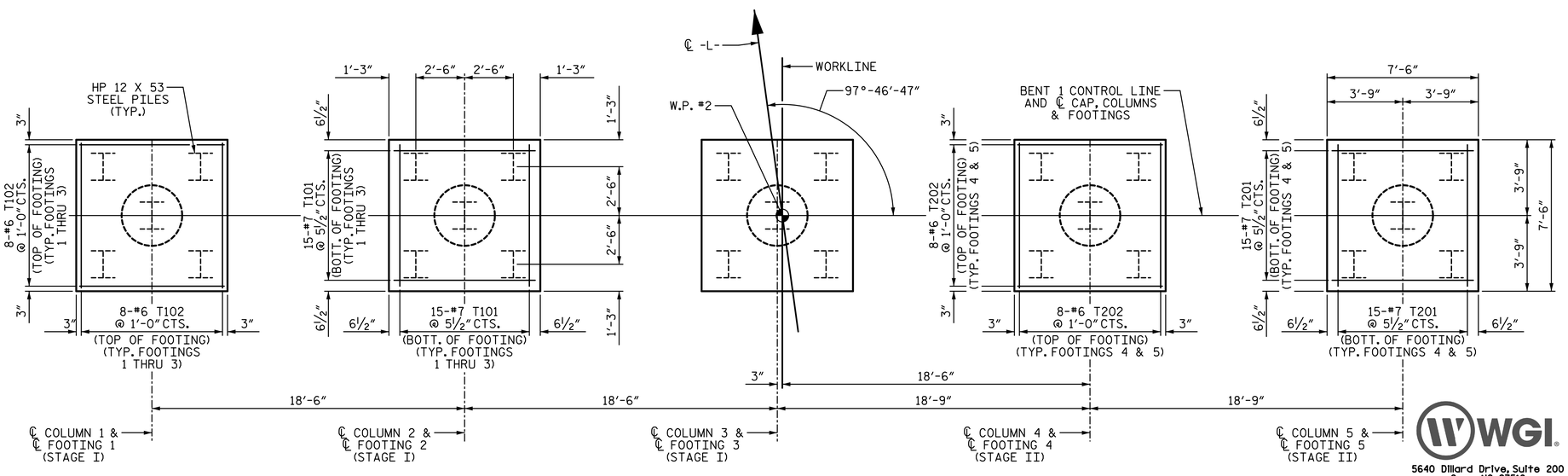
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B201	6	#10	1	37'-8"	972
B202	10	#5	STR	37'-1"	387
B203	6	#10	1	38'-8"	998
B204	6	#4	STR	4'-1"	16
B205	24	#4	STR	4'-3"	68
M201	24	#9	1	7'-0"	571
S201	76	#5	2	13'-4"	1057
T201	60	#7	3	8'-8"	1063
T202	32	#6	STR	7'-0"	336
U201	45	#4	4	6'-8"	200
U202	5	#4	4	6'-6"	22
U203	4	#4	4	7'-6"	20
V201	12	#9	1	21'-2"	864
V202	12	#9	1	20'-8"	843
SP-201	1	✳	5	610'-7"	408
SP-202	1	✳	5	594'-1"	397

REINFORCING STEEL	7417 LB
SPIRAL COL. REINF. STEEL	805 LB

CLASS "A" CONCRETE BREAKDOWN	
POUR 1 (FOOTINGS)	11.9 CY
POUR 2 (COLUMNS)	9.0 CY
POUR 3 (CAP)	29.0 CY
TOTAL	49.9 CY

HP 12 X 53 STEEL PILES	
NO. 10	700 LF
PILE DRIVING EQUIPMENT SETUP	
HP 14 X 73 STEEL PILES	10 EA

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



PLAN OF FOOTINGS

(PILE PLACEMENT AND DIMENSIONS ARE TYPICAL FOR EACH FOOTING)
(REINFORCING STEEL IS TYPICAL FOR EACH FOOTING, EACH STAGE)

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT 1

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518
LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 JOHN A. BATTS

4/6/2023 | 10:39 AM PE

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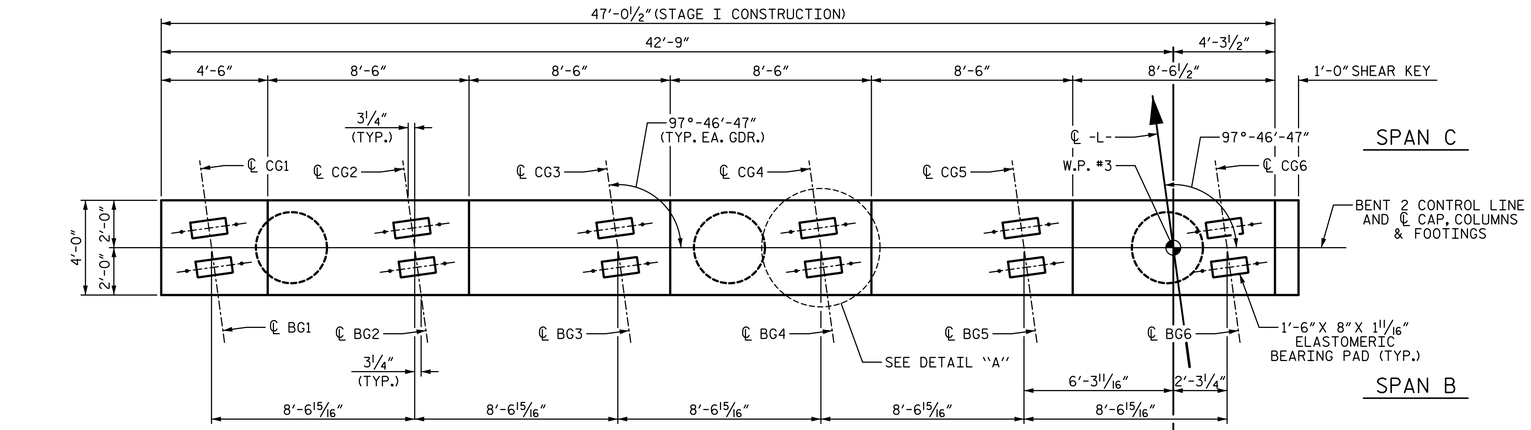
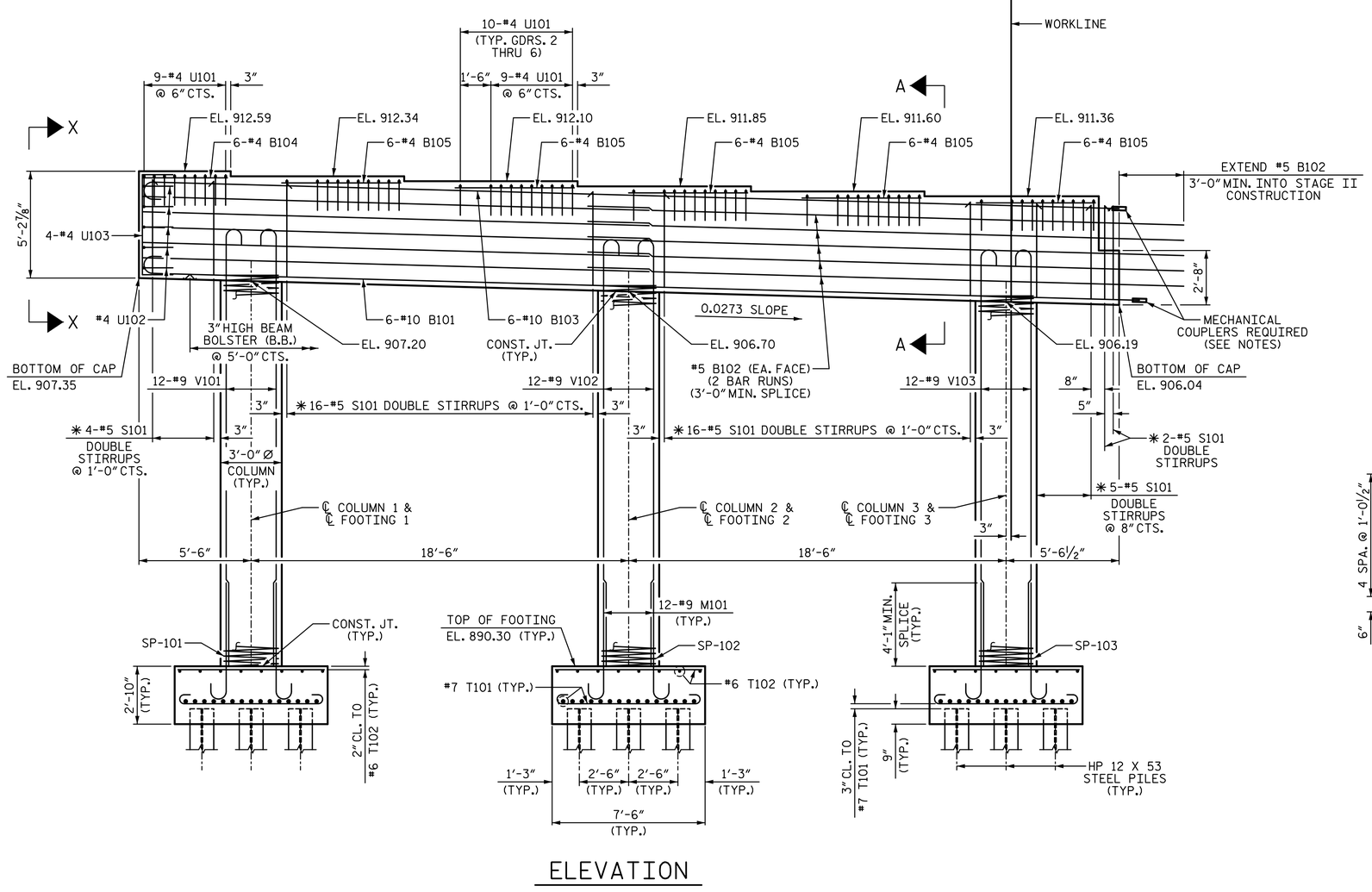
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-47
TOTAL SHEETS 59



PLAN



ELEVATION

NOTES:

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

✳ INVERT ALTERNATE STIRRUPS.

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #10 ″B″ BARS IN STAGE I WITH THE #10 ″B″ BARS IN STAGE II. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BARS BY 1 FOOT AND THE STAGE I BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1′-0″ AND A MAXIMUM OF 2′-0″ EXTENSION INTO STAGE II CONSTRUCTION.

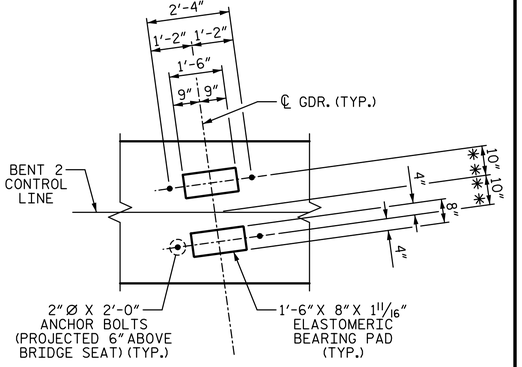
FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICE FOR REINFORCING STEEL IN STANDARD SPECIFICAITONS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #10 ″B″ BARS IN THE STAGED CONSTRUCTION JOINT MAY NEED TO ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.

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

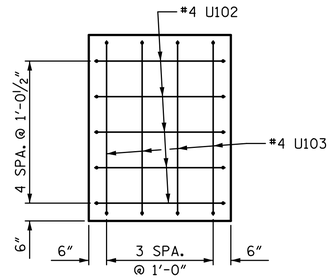
FOR SECTION A-A, SEE SHEET 3 OF 3.

SEE GENERAL DRAWING ″FOUNDATION LAYOUT″ FOR ADDITIONAL NOTES FOR DRIVING PILES.



DETAIL ″A″

(TYP. EA. GIRDER)
(✳✳ MEASURED ALONG ℄ GIRDER)



VIEW X-X

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT 2

STAGE I

DRAWN BY:	T. BANKOVICH	DATE:	9-22
CHECKED BY:	T.J. BEACH	DATE:	9-22
DESIGN ENGINEER OF RECORD:	J.A. BATTS	DATE:	9-22

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518
LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 JOHN A. BATTS
4/6/2023 | 10:39 AM PDT

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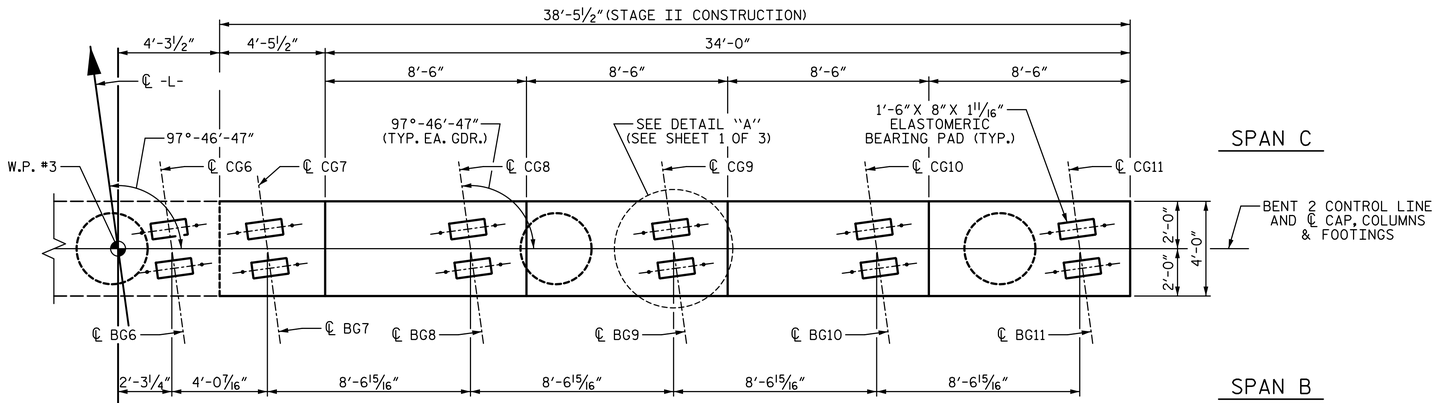
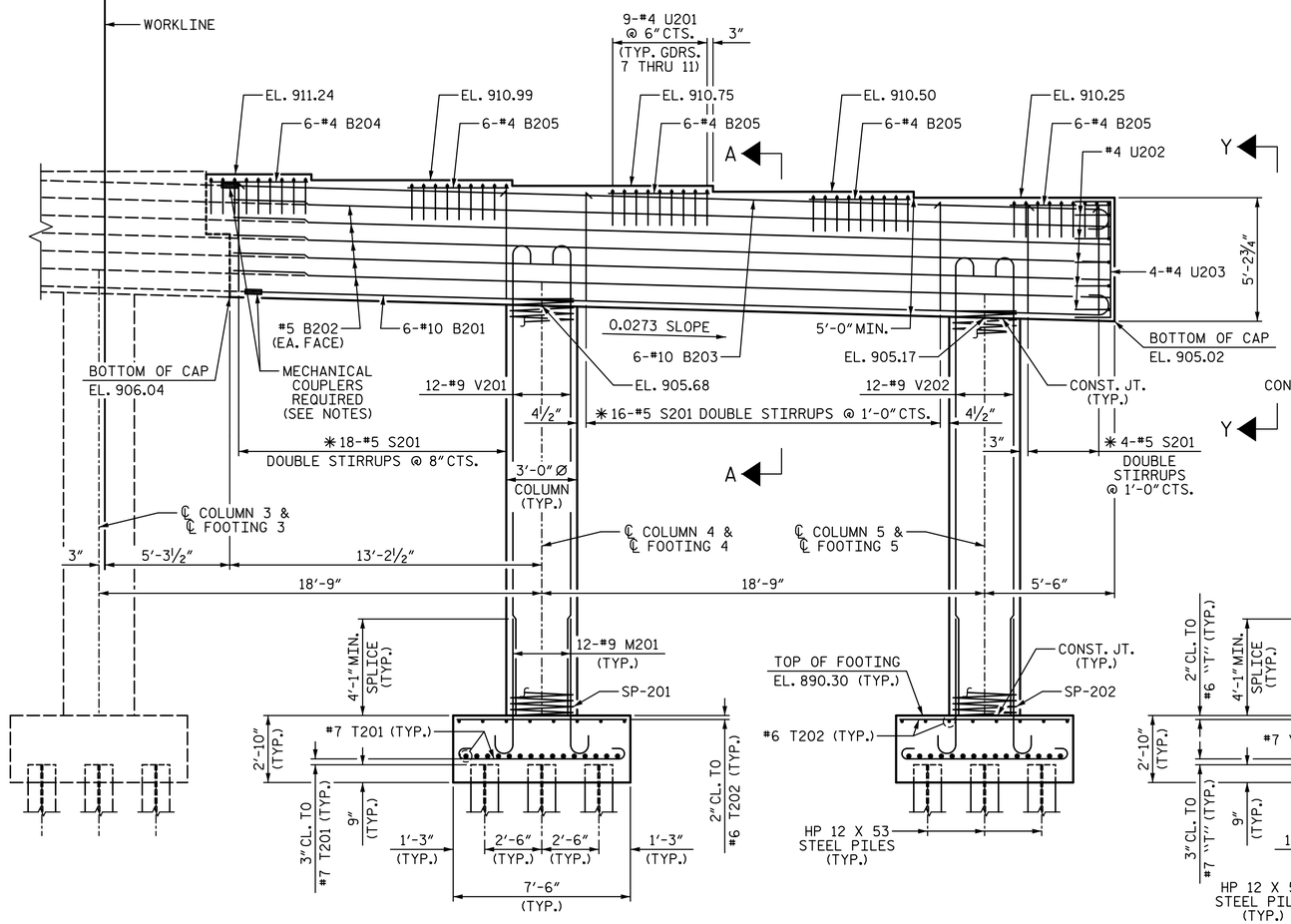
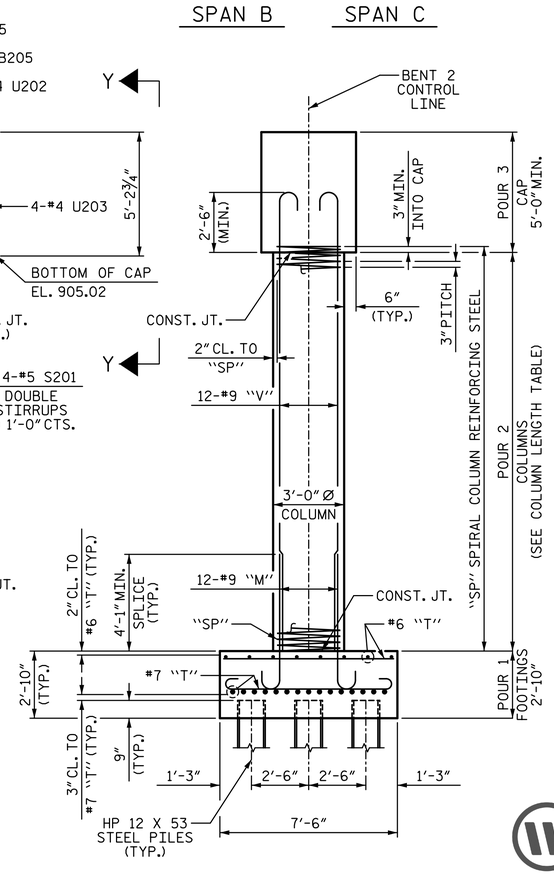
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			59



PLAN

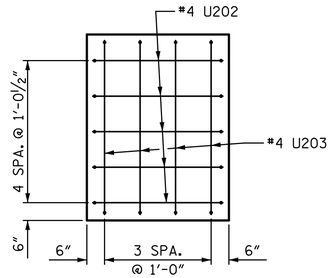


ELEVATION



END ELEVATION

(DETAILS, DIMENSION & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND FOOTING)



VIEW Y-Y

COLUMN LENGTH TABLE	
COLUMN	LENGTH
1	16'-10 13/16"
2	16'-4 13/16"
3	15'-10 11/16"
4	15'-4 9/16"
5	14'-10 7/16"

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			59

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518
LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 JOHN A. BATTS

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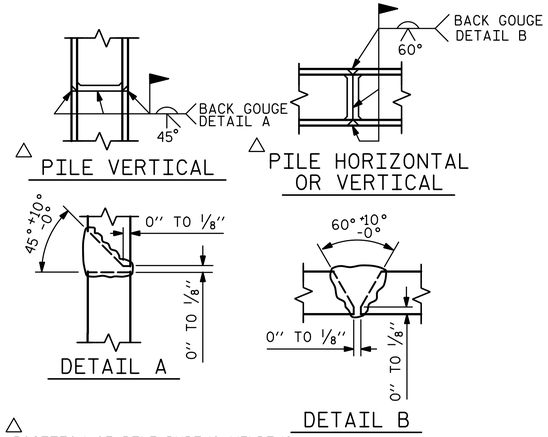
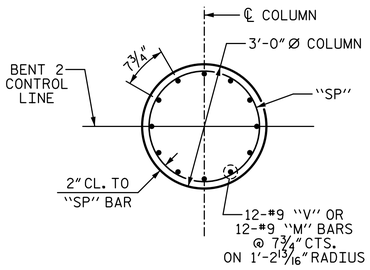
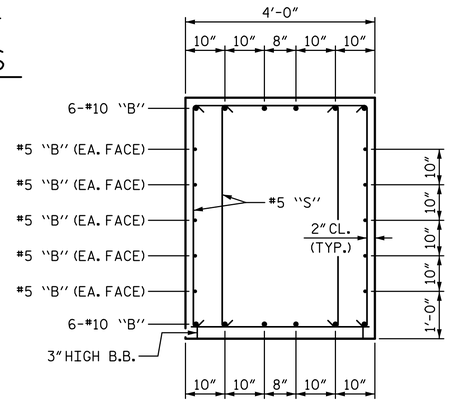


PILE SPLICE DETAILS



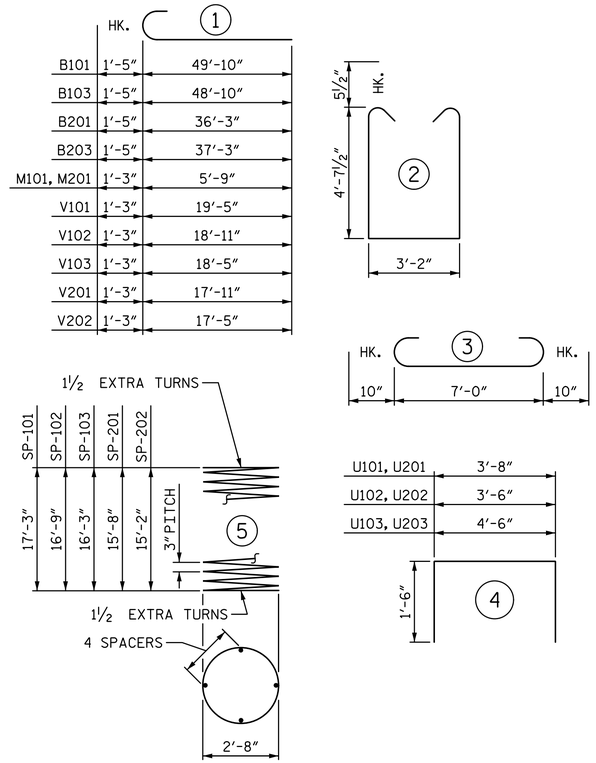
PLAN OF COLUMN

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN)



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT 2

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B101	6	#10	1	51'-3"	1323
B102	20	#5	STR	27'-1"	565
B103	6	#10	1	50'-3"	1297
B104	6	#4	STR	4'-2"	17
B105	30	#4	STR	5'-10"	117
M101	36	#9	1	7'-0"	857
S101	86	#5	2	13'-4"	1196
T101	90	#7	3	8'-8"	1594
T102	48	#6	STR	7'-0"	505
U101	59	#4	4	6'-8"	263
U102	5	#4	4	6'-6"	22
U103	4	#4	4	7'-6"	20
V101	12	#9	1	20'-8"	843
V102	12	#9	1	20'-2"	823
V103	12	#9	1	19'-8"	802
SP-101	1	*	5	594'-1"	397
SP-102	1	*	5	577'-7"	386
SP-103	1	*	5	561'-1"	375

REINFORCING STEEL 10244 LB

SPIRAL COL. REINF. STEEL 1158 LB

CLASS "A" CONCRETE BREAKDOWN

POUR 1 (FOOTINGS)	17.8 CY
POUR 2 (COLUMNS)	12.9 CY
POUR 3 (CAP)	36.7 CY
TOTAL	67.4 CY

HP 12 X 53 STEEL PILES

NO. 15	1050 LF

PILE DRIVING EQUIPMENT SETUP

HP 14 X 73 STEEL PILES	15 EA

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B201	6	#10	1	37'-8"	972
B202	10	#5	STR	37'-1"	387
B203	6	#10	1	38'-8"	998
B204	6	#4	STR	4'-1"	16
B205	24	#4	STR	4'-3"	68
M201	24	#9	1	7'-0"	571
S201	76	#5	2	13'-4"	1057
T201	60	#7	3	8'-8"	1063
T202	32	#6	STR	7'-0"	336
U201	45	#4	4	6'-8"	200
U202	5	#4	4	6'-6"	22
U203	4	#4	4	7'-6"	20
V201	12	#9	1	19'-2"	782
V202	12	#9	1	18'-8"	762
SP-201	1	*	5	544'-7"	364
SP-202	1	*	5	528'-1"	353

REINFORCING STEEL 7254 LB

SPIRAL COL. REINF. STEEL 717 LB

CLASS "A" CONCRETE BREAKDOWN

POUR 1 (FOOTINGS)	11.9 CY
POUR 2 (COLUMNS)	8.0 CY
POUR 3 (CAP)	29.0 CY
TOTAL	48.9 CY

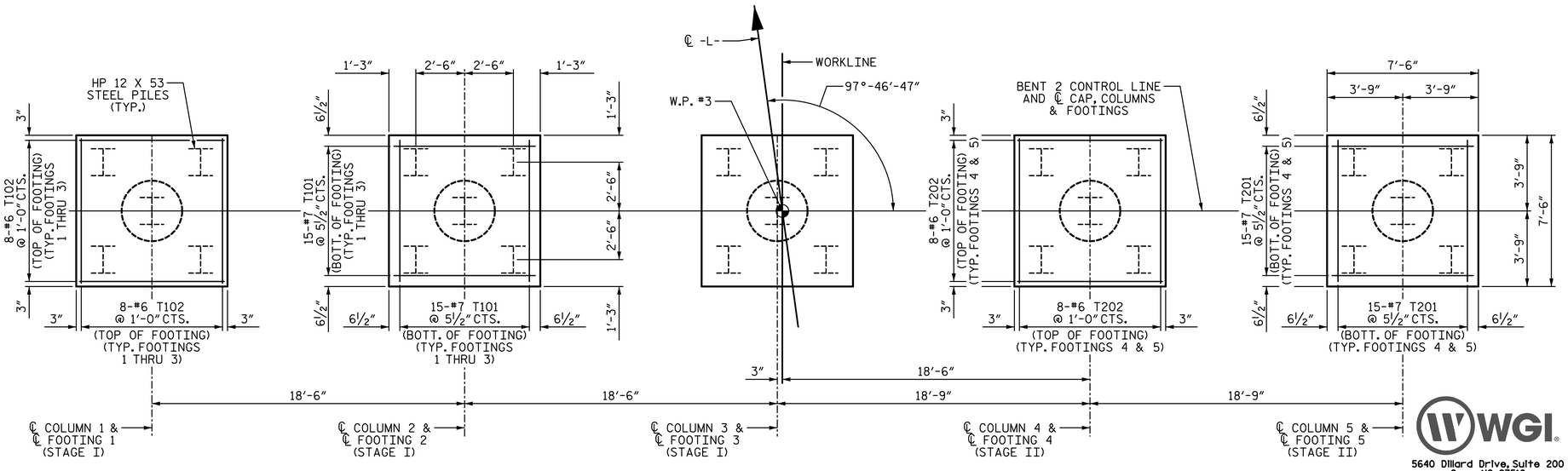
HP 12 X 53 STEEL PILES

NO. 10	700 LF

PILE DRIVING EQUIPMENT SETUP

HP 14 X 73 STEEL PILES	10 EA

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



PLAN OF FOOTINGS

(PILE PLACEMENT AND DIMENSIONS ARE TYPICAL FOR EACH FOOTING)
(REINFORCING STEEL IS TYPICAL FOR EACH FOOTING, EACH STAGE)

WGI
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Cary, NC 27518
LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 JOHN A. BATTS
4/6/2023 | 10:39 AM EDT

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

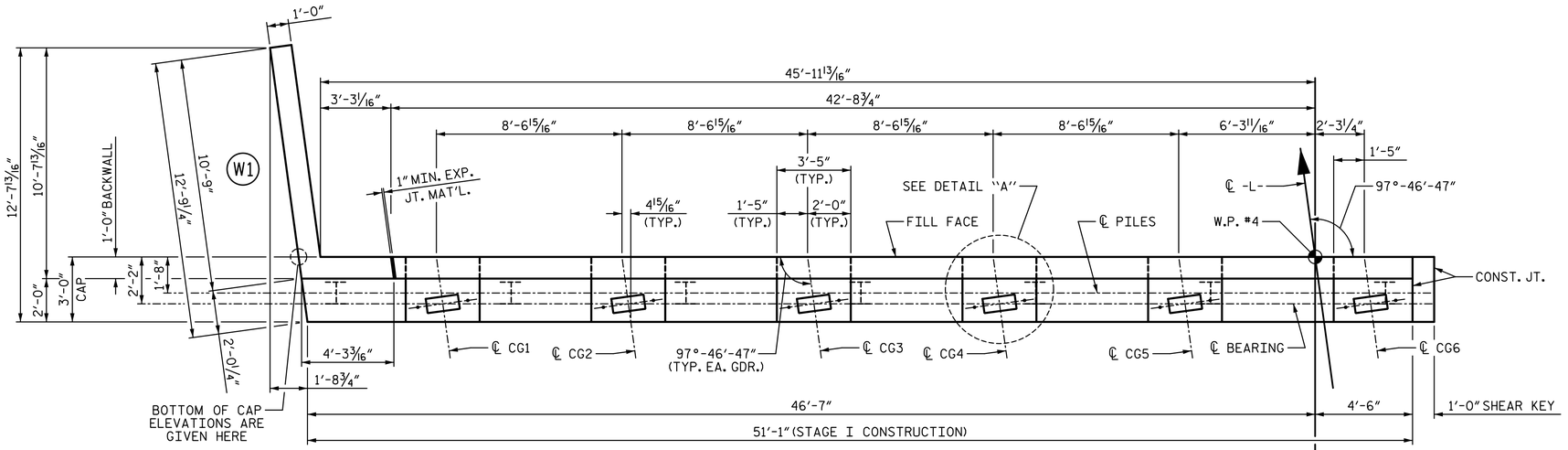
PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

SHEET 3 OF 3

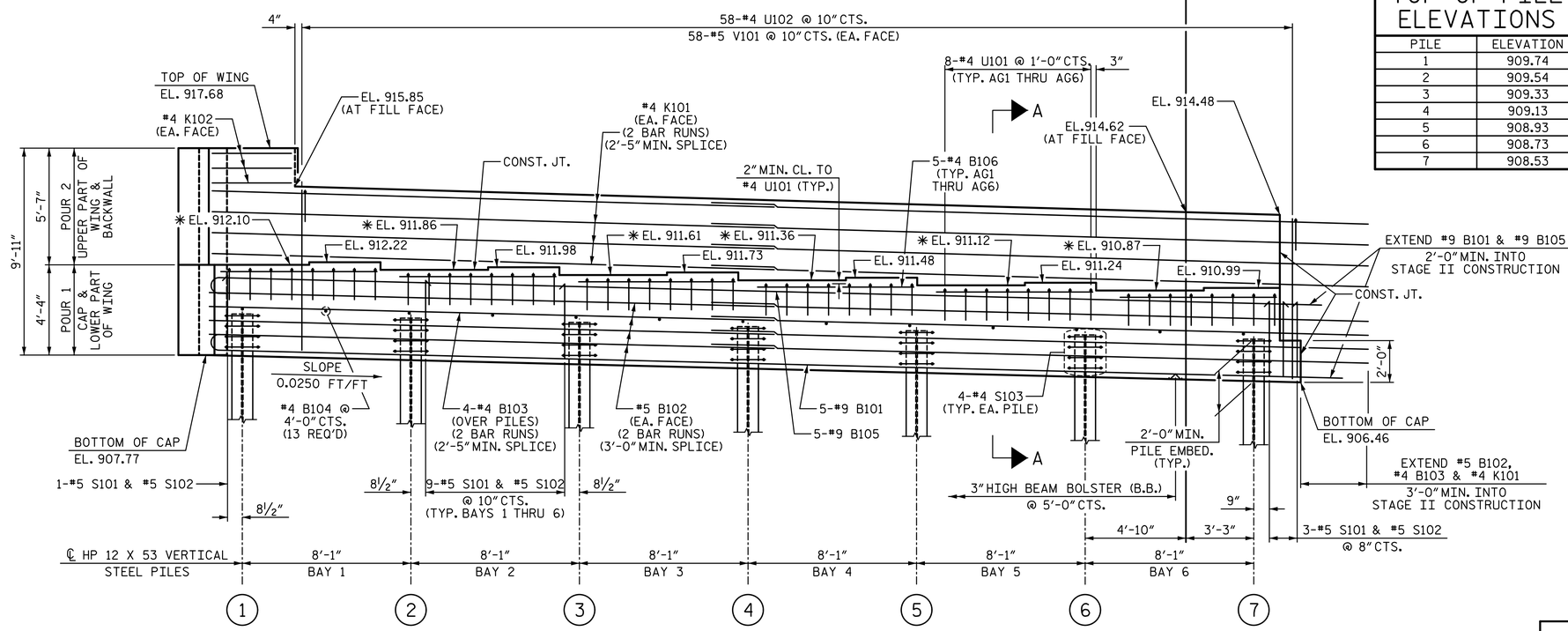
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			59



PLAN



ELEVATION

NOTES:

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

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #9 "B" BARS IN STAGE I WITH THE #9 "B" BARS IN STAGE II. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BARS BY 1 FOOT AND THE STAGE I BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1'-0" AND A MAXIMUM OF 2'-0" EXTENSION INTO STAGE II CONSTRUCTION.

FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICE FOR REINFORCING STEEL IN STANDARD SPECIFICAITONS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #9 "B" BARS IN THE STAGED CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.

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

✳FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS SEE SECTION A-A, SEE SHEET 4 OF 4.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

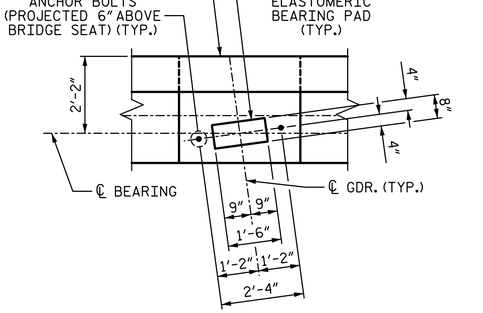
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXPECT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

SEE GENERAL DRAWING "FOUNDATION LAYOUT" FOR ADDITIONAL NOTES FOR DRIVING PILES.

TOP OF PILE ELEVATIONS

PILE	ELEVATION
1	909.74
2	909.54
3	909.33
4	909.13
5	908.93
6	908.73
7	908.53



DETAIL "A"

(TYP. EA. GIRDER)

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			59

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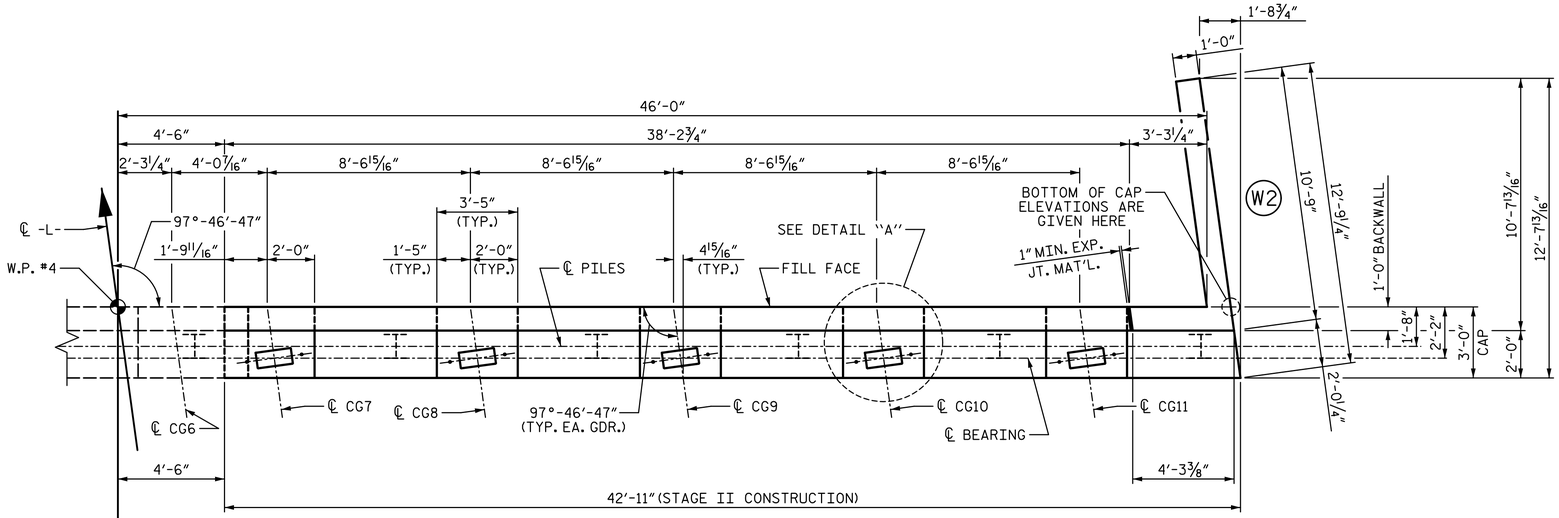

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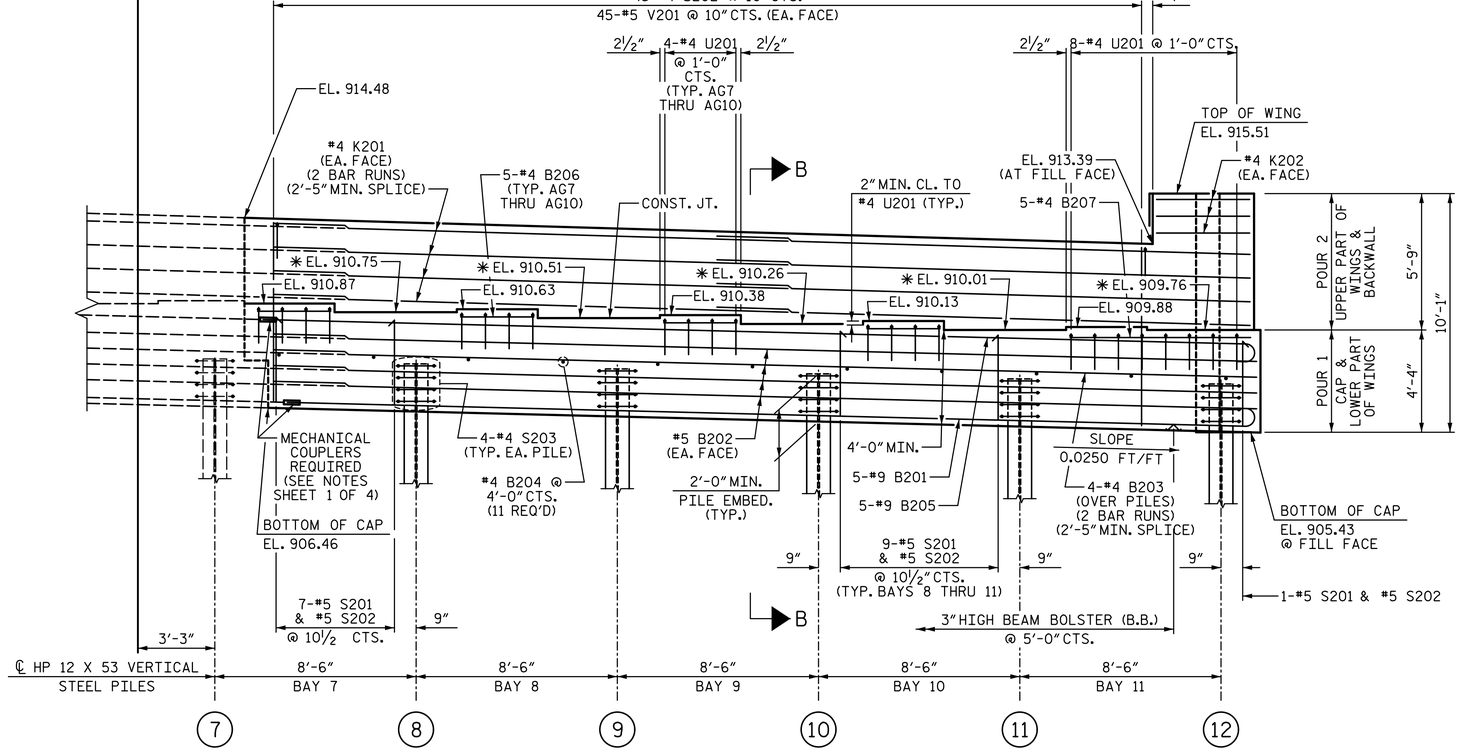

ELEVATION

NOTES:

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

✱FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS SEE SECTION B-B, SEE SHEET 4 OF 4.

FOR ALL OTHER NOTES, SEE SHEET 1 OF 4.

CAP WING

TIEBACK DETAILS

(BOTH STAGES SIMILAR)

TOP OF PILE ELEVATIONS

PILE	ELEVATION
8	908.32
9	908.11
10	907.90
11	907.69
12	907.47

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 2

STAGE II

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2			4			59

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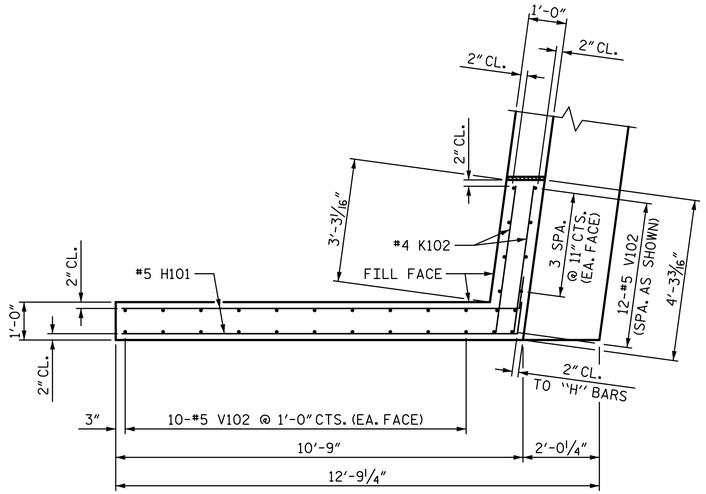
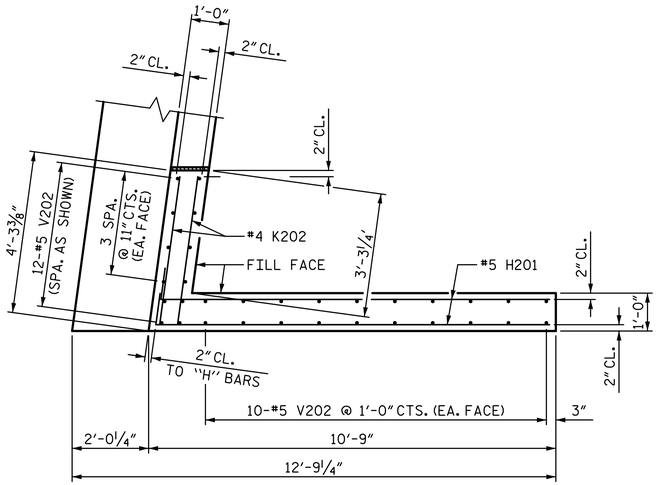
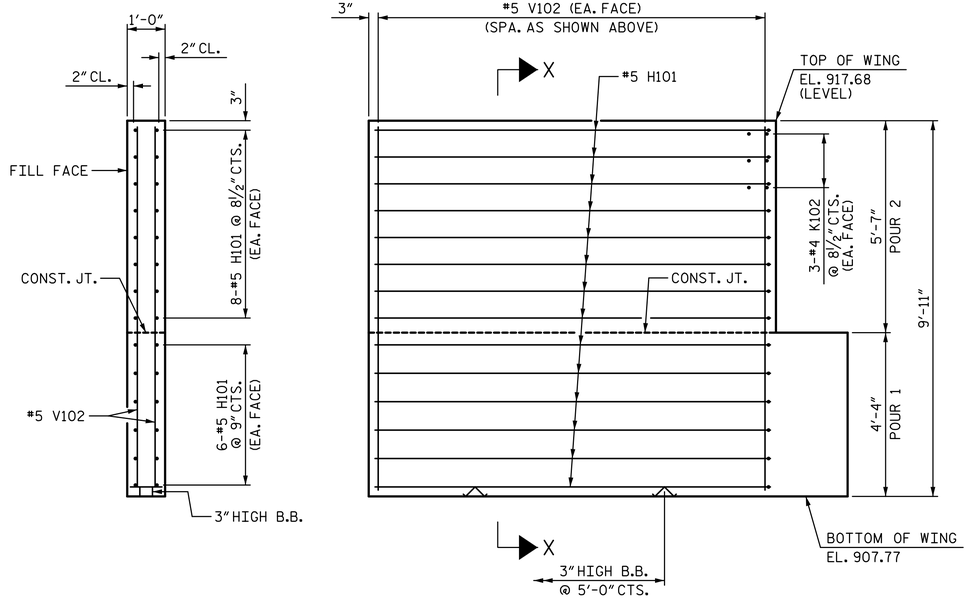


PLAN OF WING (W1)

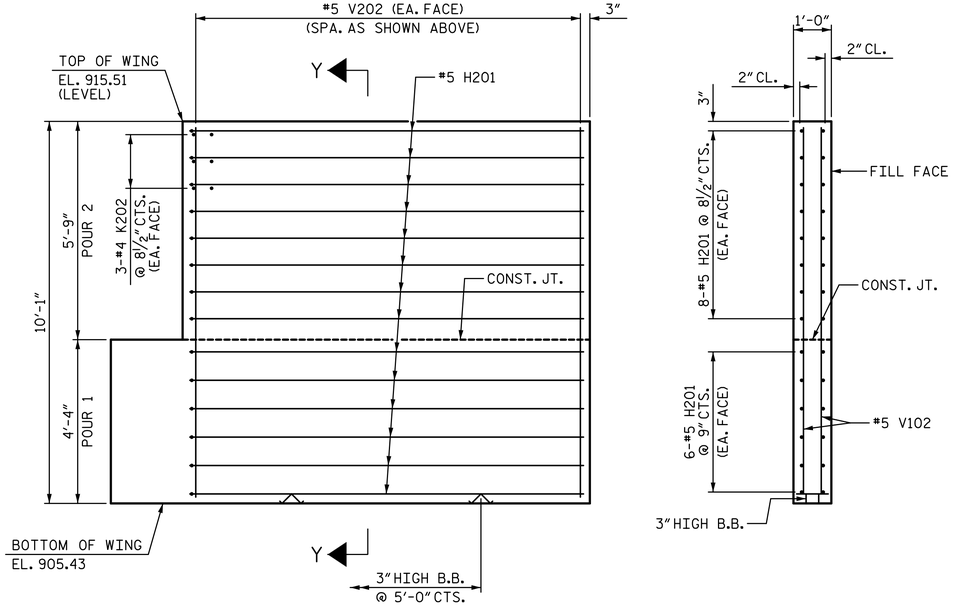


PLAN OF WING (W2)



SECTION X-X

ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

SECTION Y-Y

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			59

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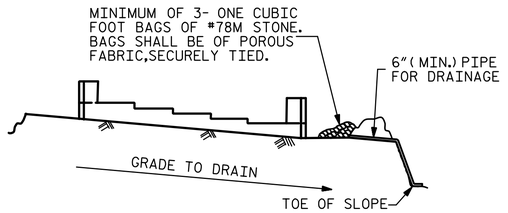
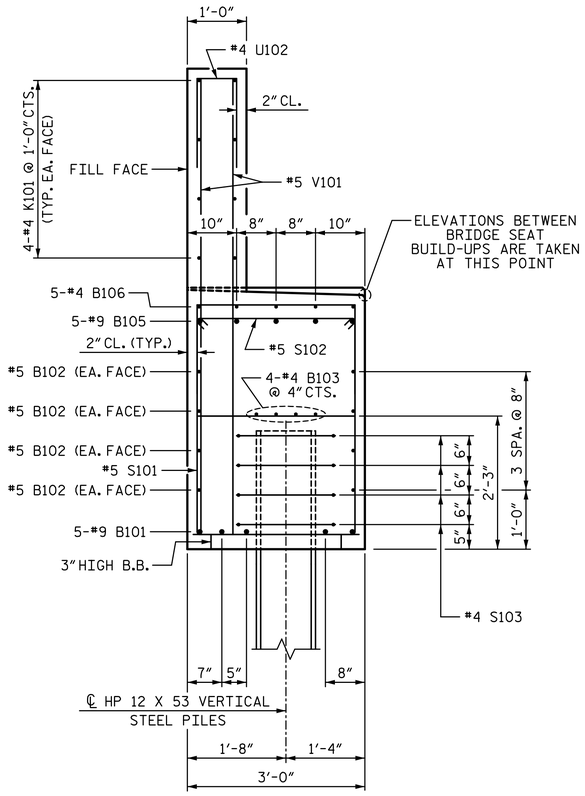


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

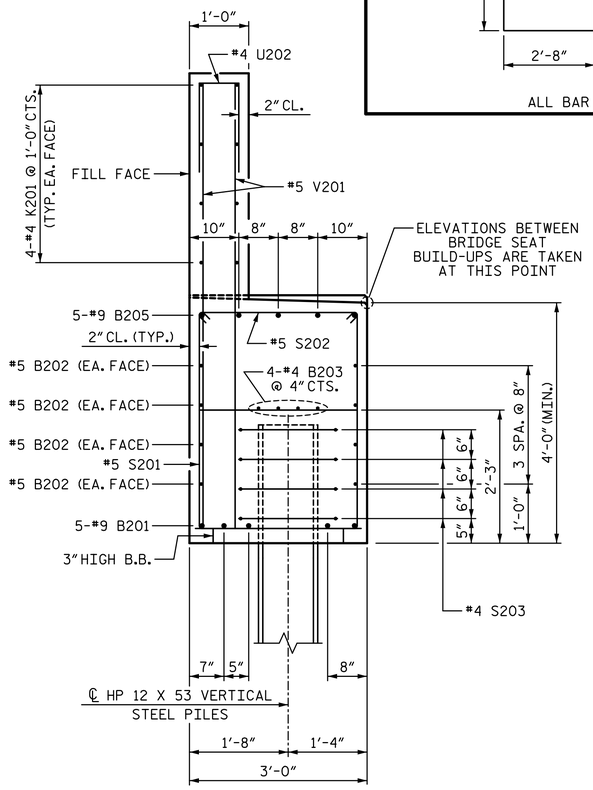
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



SECTION A-A

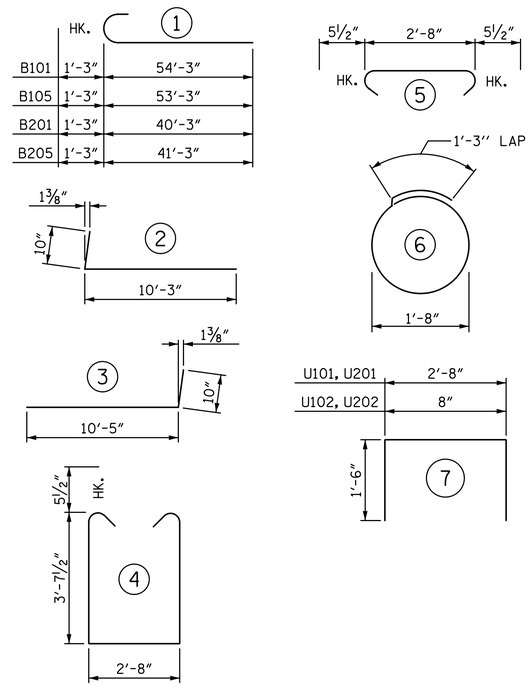
(STAGE I)



SECTION B-B

(STAGE II)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

END BENT 2

STAGE I

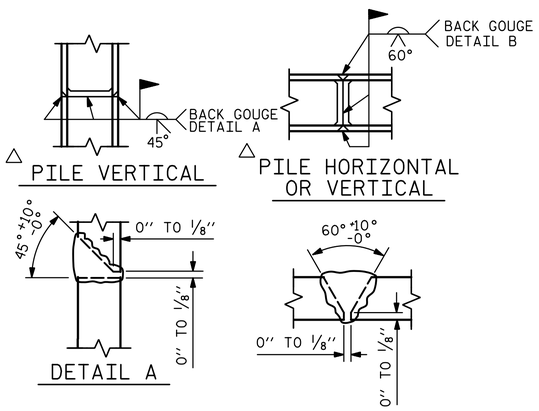
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B101	5	#9	1	55'-6"	944
B102	16	#5	STR	29'-3"	488
B103	8	#4	STR	28'-11"	155
B104	13	#4	STR	2'-8"	23
B105	5	#9	1	54'-6"	927
B106	30	#4	STR	7'-5"	149
H101	28	#5	3	11'-3"	329
K101	16	#4	STR	28'-11"	309
K102	6	#4	STR	3'-11"	16
S101	58	#5	4	10'-10"	655
S102	58	#5	5	3'-7"	217
S103	28	#4	6	6'-6"	122
U101	48	#4	7	5'-8"	182
U102	58	#4	7	3'-8"	142
V101	116	#5	STR	7'-8"	928
V102	32	#5	STR	9'-7"	320
TOTAL REINFORCING STEEL					5906 LB

CLASS "A" CONCRETE BREAKDOWN	
POUR 1	27.0 CY
(CAP & LOWER WING)	
POUR 2	9.3 CY
(UPPER WING & BACKWALL)	
TOTAL	36.3 CY
HP 12 X 53 STEEL PILES	
NO. 7	700 LF
PILE DRIVING EQUIPMENT SETUP	
HP 12 X 53 STEEL PILES	7 EA

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B201	5	#9	1	41'-6"	706
B202	8	#5	STR	41'-2"	343
B203	8	#4	STR	21'-10"	117
B204	11	#4	STR	2'-8"	20
B205	5	#9	1	42'-6"	723
B206	20	#4	STR	3'-1"	41
B207	5	#4	STR	7'-7"	25
H201	28	#5	2	11'-1"	324
K201	16	#4	STR	21'-10"	233
K202	6	#4	STR	3'-11"	16
S201	44	#5	4	10'-10"	497
S202	44	#5	5	3'-7"	164
S203	20	#4	6	6'-6"	87
U201	24	#4	7	5'-8"	91
U202	45	#4	7	3'-8"	110
V201	90	#5	STR	7'-6"	704
V202	32	#5	STR	9'-9"	325
TOTAL REINFORCING STEEL					4526 LB

CLASS "A" CONCRETE BREAKDOWN	
POUR 1	22.1 CY
(CAP & LOWER WING)	
POUR 2	8.2 CY
(UPPER WING & BACKWALL)	
TOTAL	30.3 CY
HP 12 X 53 STEEL PILES	
NO. 5	500 LF
PILE DRIVING EQUIPMENT SETUP	
HP 12 X 53 STEEL PILES	5 EA



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 2

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DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

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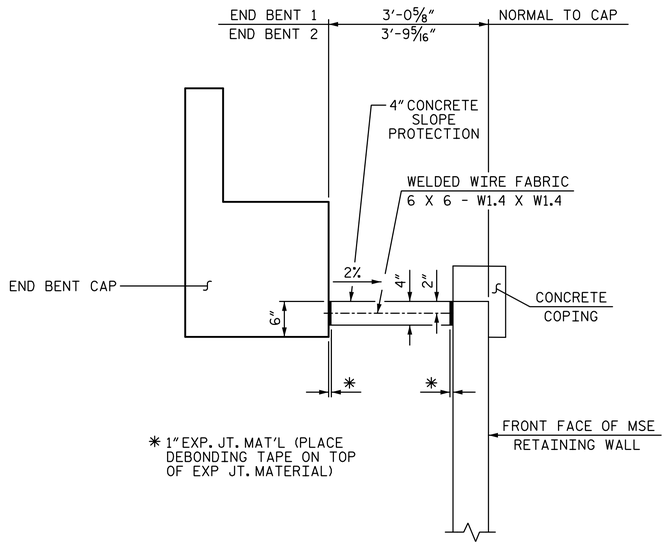
1			3			TOTAL SHEETS
2			4			59



SECTION A-A

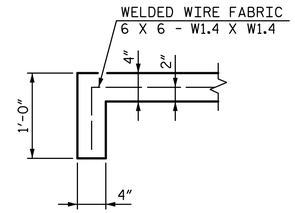
BRIDGE @ STA. 33+99.11 -L-	4" SLOPE PROTECTION	** WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	27	48
END BENT 2	34	62

** QUANTITIES SHOWN ARE BASED ON 5' POURS

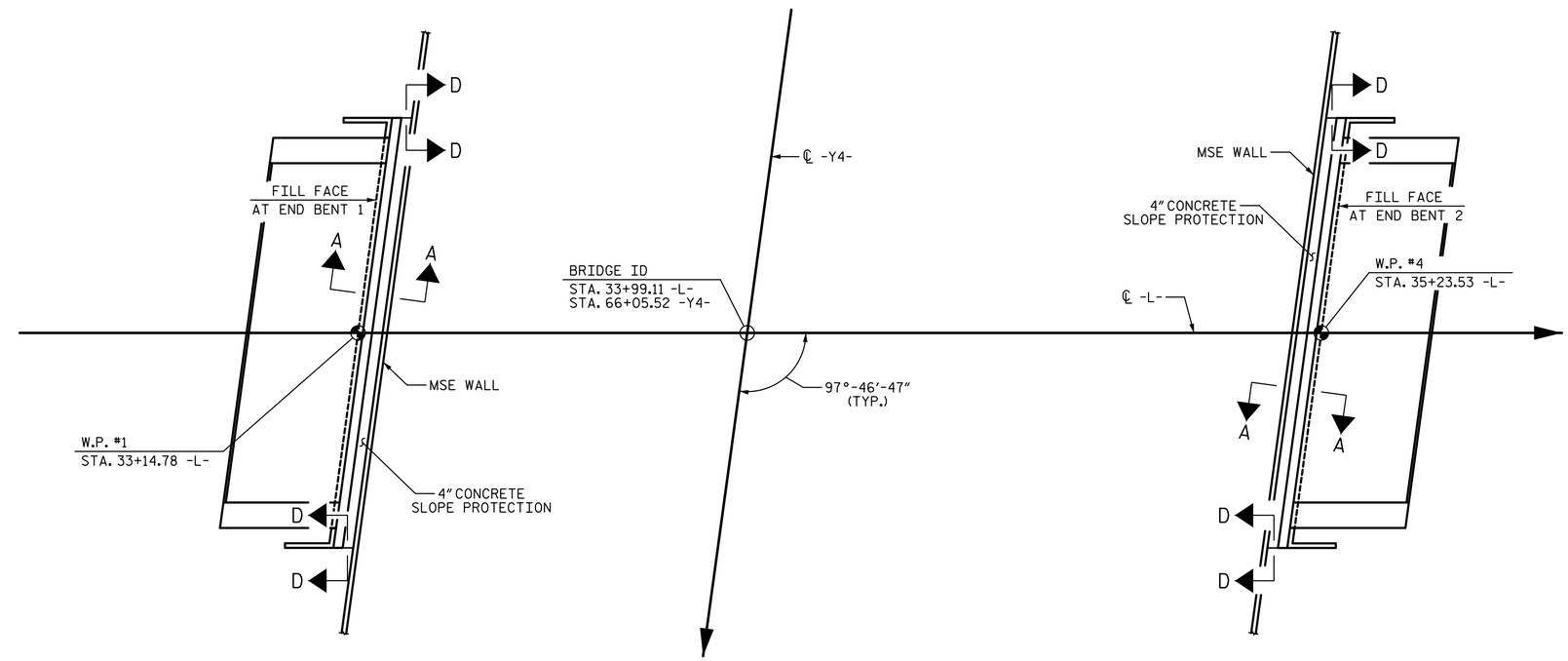
NOTES:

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.

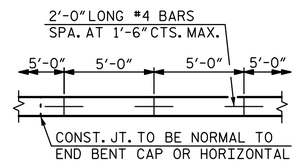
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE SECTIONS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL 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.



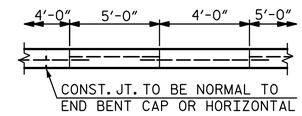
SECTION D-D



PLAN



POURING DETAIL



POUR A 4'-0" STRIP FIRST.

OPTIONAL POURING DETAIL

PROJECT NO. U-2729

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SLOPE PROTECTION

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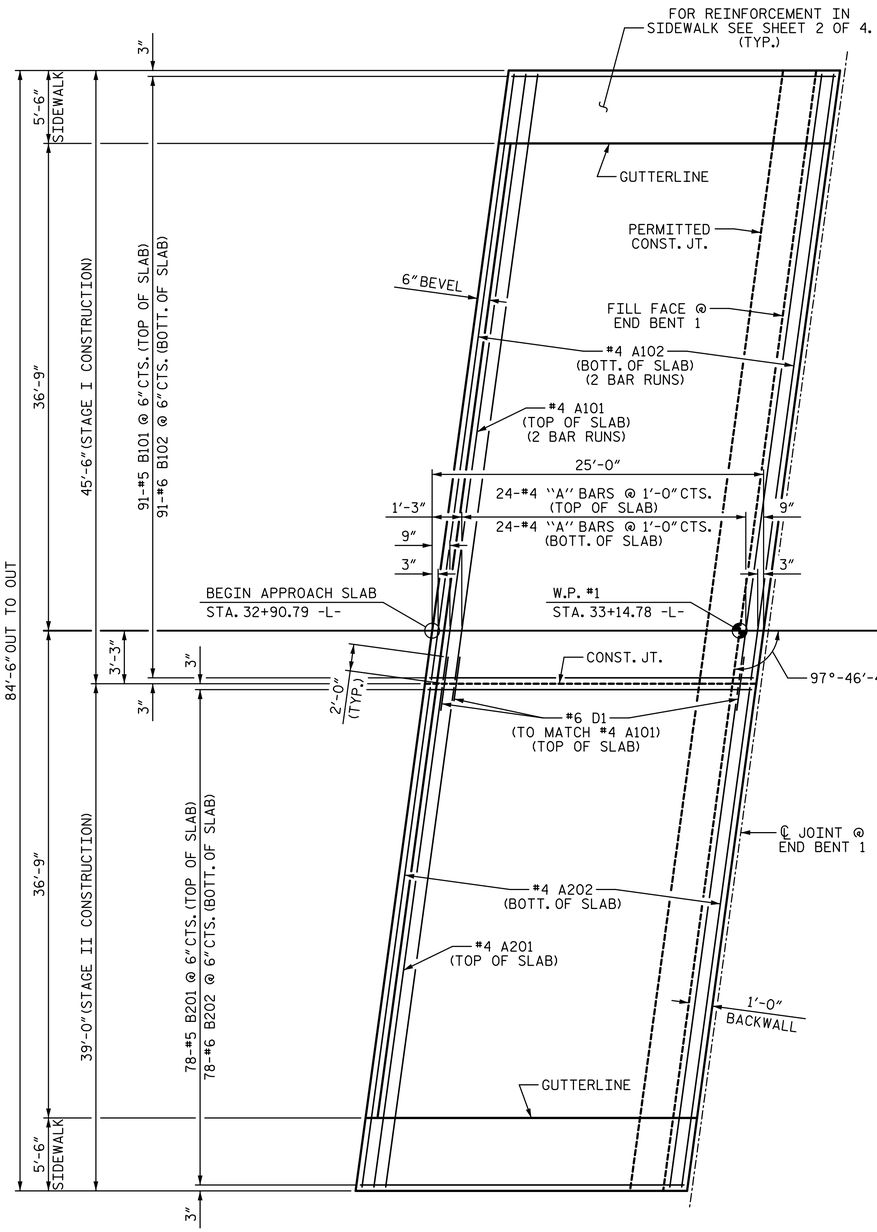
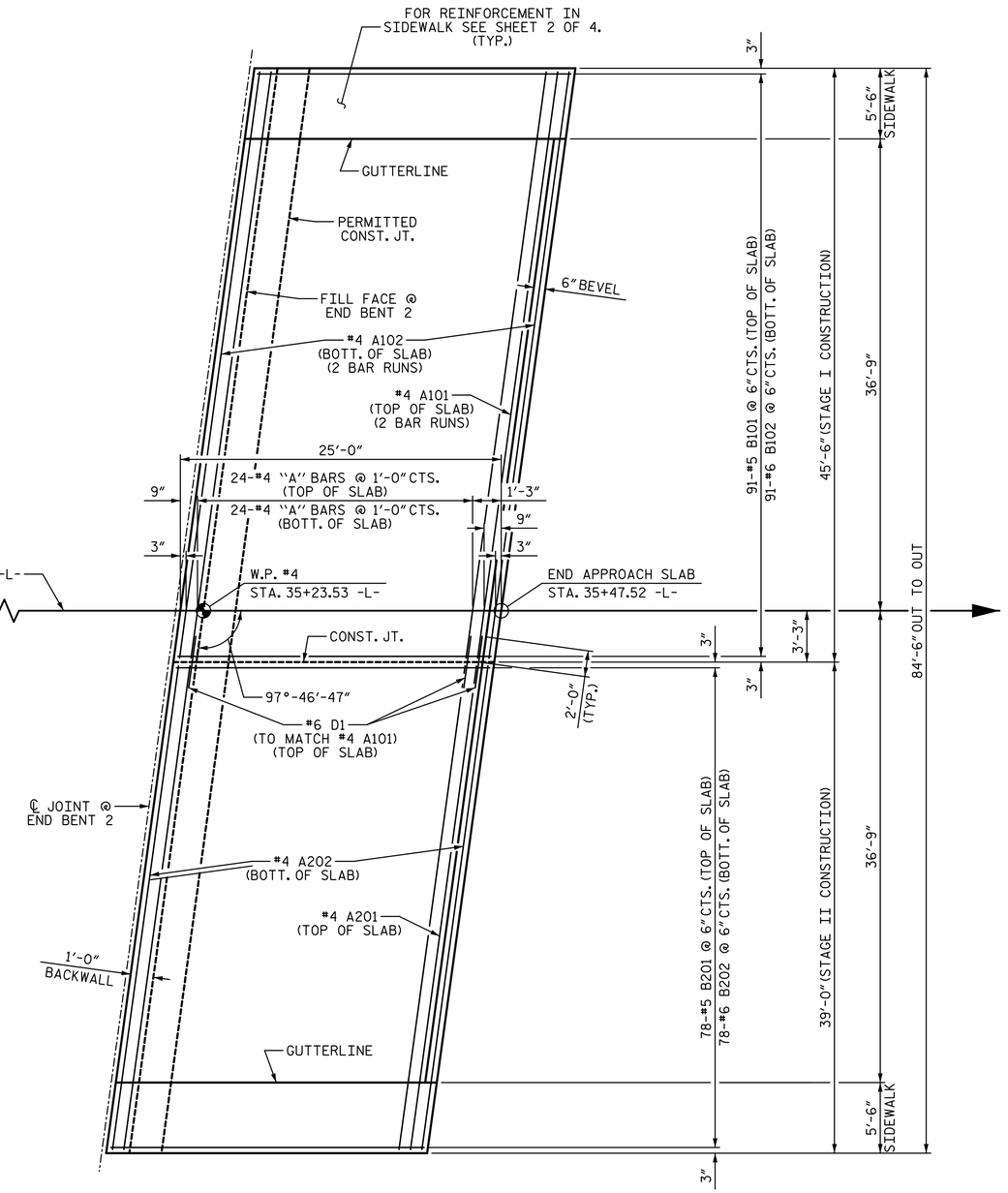


PLAN @ END BENT 1

CONCRETE MEDIAN NOT SHOWN FOR CLARITY, SEE SHEET 2 OF 4 FOR DETAILS



PLAN @ END BENT 2

CONCRETE MEDIAN NOT SHOWN FOR CLARITY, SEE SHEET 2 OF 4 FOR DETAILS

NOTES:

* #6 D1 DOWEL SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP REINFORCING STEEL.

3'-0" MIN. MEDIAN SHALL BE POURED AFTER STAGE II IS COMPLETE, SEE CONSTRUCTION SEQUENCE SHEET.

FOR JOINT DETAILS SEE "SUPERSTRUCTURE STRIP SEAL EXPANSION JOINT DETAILS" SHEETS.

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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BRIDGE APPROACH SLAB

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			59

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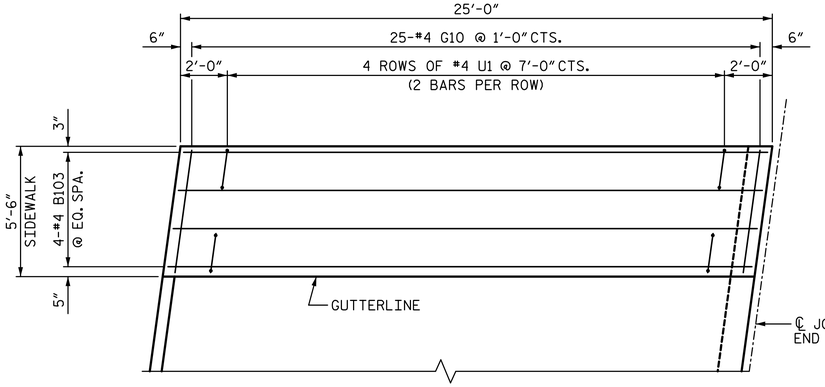

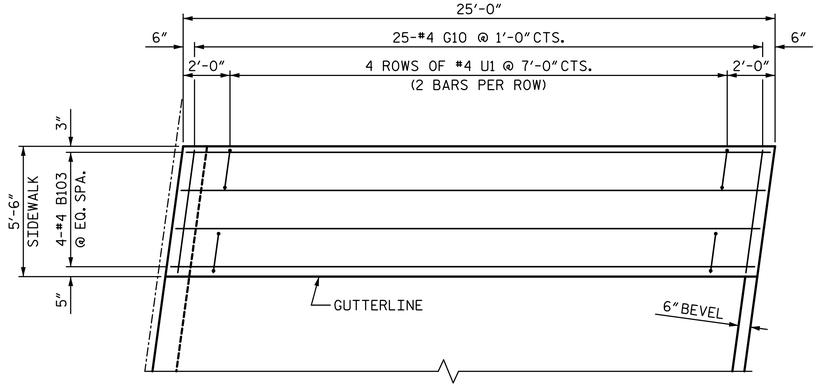

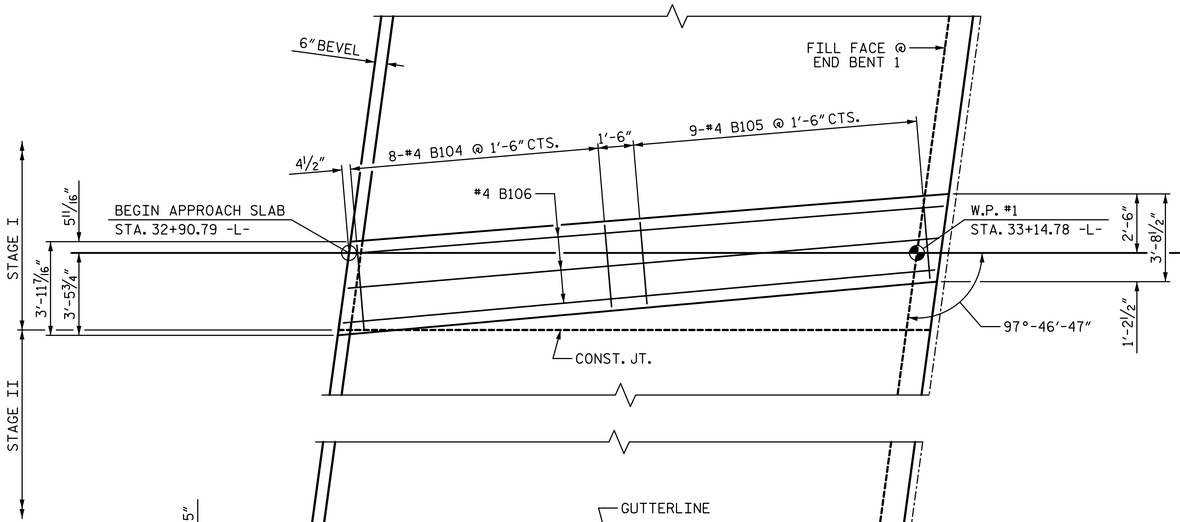

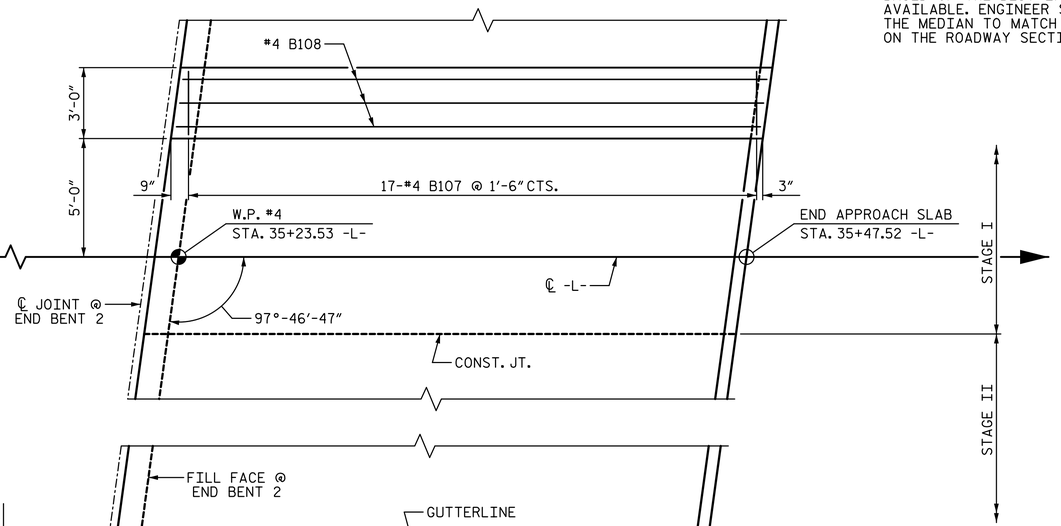

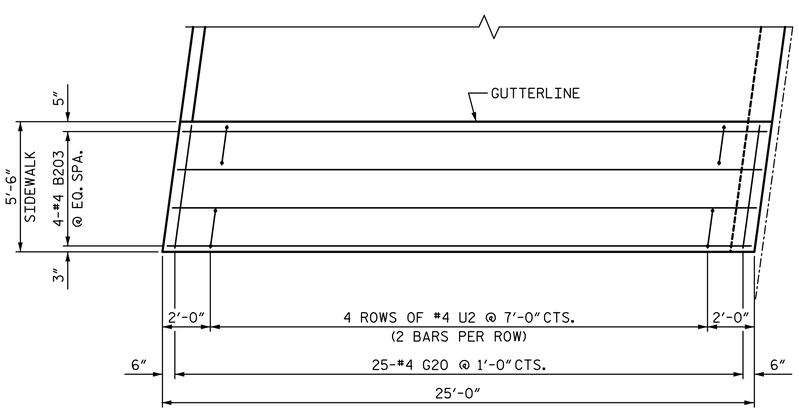

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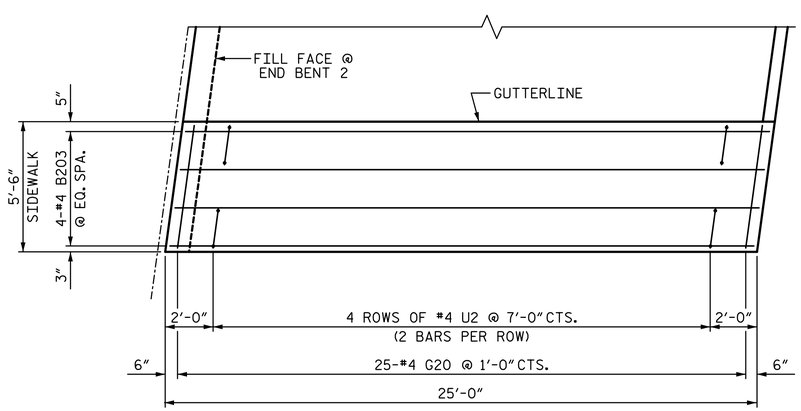

PLAN @ END BENT 2

NOTES:

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

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

"U" BARS IN SIDEWALKS MAY BE PUSHED INTO GREEN CONCRETE AFTER APPROACH SLAB HAS BEEN SCREEDED OFF.

MEDIAN WIDTH AND LOCATION ARE BASED ON THE BEST INFORMATION AVAILABLE. ENGINEER SHALL LOCATE THE MEDIAN TO MATCH THE MEDIAN ON THE ROADWAY SECTIONS.

PROJECT NO. U-2729
FORSYTH COUNTY
STATION: 33+99.11 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-57
1			3			TOTAL SHEETS
2			4			59

DRAWN BY: T. BANKOVICH DATE: 9-22
CHECKED BY: T.J. BEACH DATE: 9-22
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 9-22

WGI
5640 Dillard Drive, Suite 200
Cary, NC 27518
LICENSURE NO. C-4434

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18056 JOHN A. BATTS

4/6/2023 | 10:39 AM PDT

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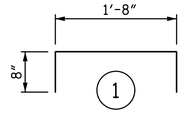
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

APPROACH SLAB @ END BENT 1

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A101	50	#4	STR	23′-9″	793
A102	52	#4	STR	23′-7″	819
✳ B101	91	#5	STR	24′-1″	2286
B102	91	#6	STR	24′-8″	3371
✳ B103	4	#4	STR	24′-8″	66
✳ D1	25	#6	STR	4′-0″	150
✳ G10	25	#4	STR	5′-0″	84
✳ U1	8	#4	1	3′-0″	16
REINFORCING STEEL					4190 LB
EPOXY COATED REINFORCING STEEL					3395 LB
CLASS ″AA″ CONCRETE BREAKDOWN					
POUR 1 (SLAB)					49.2 CY
POUR 2 (SIDEWALK)					2.4 CY
TOTAL					51.6 CY

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A201	25	#4	STR	39′-0″	651
A202	26	#4	STR	39′-0″	677
✳ B201	78	#5	STR	24′-1″	1959
B202	78	#6	STR	24′-8″	2890
✳ B203	4	#4	STR	24′-8″	66
✳ G20	25	#4	STR	5′-0″	84
✳ U2	8	#4	1	3′-0″	16
REINFORCING STEEL					3567 LB
EPOXY COATED REINFORCING STEEL					2776 LB
CLASS ″AA″ CONCRETE BREAKDOWN					
POUR 1 (SLAB)					42.3 CY
POUR 2 (SIDEWALK)					3.2 CY
TOTAL					45.5 CY

APPROACH SLAB @ END BENT 2

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A101	50	#4	STR	23′-9″	793
A102	52	#4	STR	23′-7″	819
✳ B101	91	#5	STR	24′-1″	2286
B102	91	#6	STR	24′-8″	3371
✳ B103	4	#4	STR	24′-8″	66
✳ D1	25	#6	STR	4′-0″	150
✳ G10	25	#4	STR	5′-0″	84
✳ U1	8	#4	1	3′-0″	16
REINFORCING STEEL					4190 LB
EPOXY COATED REINFORCING STEEL					3395 LB
CLASS ″AA″ CONCRETE BREAKDOWN					
POUR 1 (SLAB)					49.2 CY
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BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
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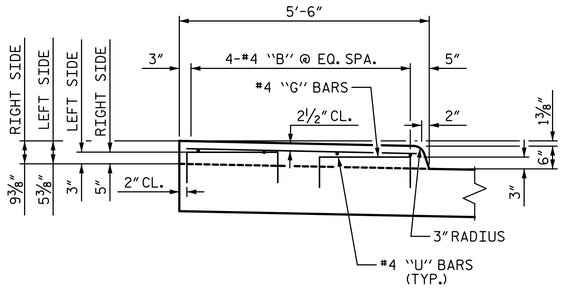
✳ U2	8	#4	1	3′-0″	16
REINFORCING STEEL					3567 LB
EPOXY COATED REINFORCING STEEL					2776 LB
CLASS ″AA″ CONCRETE BREAKDOWN					
POUR 1 (SLAB)					42.3 CY
POUR 2 (SIDEWALK)					3.2 CY
TOTAL					45.5 CY

✳ INDICATES EPOXY COATED REINFORCING STEEL



SECTION THRU SIDEWALK

LEFT SIDE SHOWN, RIGHT SIDE SIMILAR

SPLICE CHART

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

BILL OF MATERIAL
CONCRETE MEDIAN

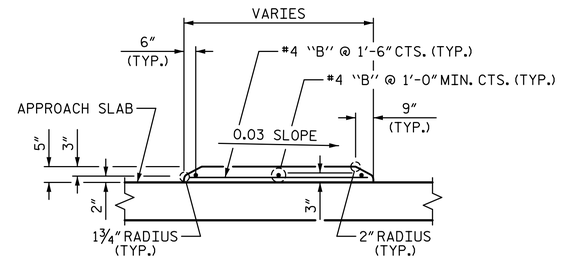
@ END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B104	8	#4	STR	3′-5″	18
✳ B105	9	#4	STR	3′-3″	20
✳ B106	3	#4	STR	25′-0″	50
EPOXY COATED REINFORCING STEEL					88 LB
CLASS ″AA″ CONCRETE BREAKDOWN					
POUR 3 (MEDIAN) ✳✳					1.3 CY

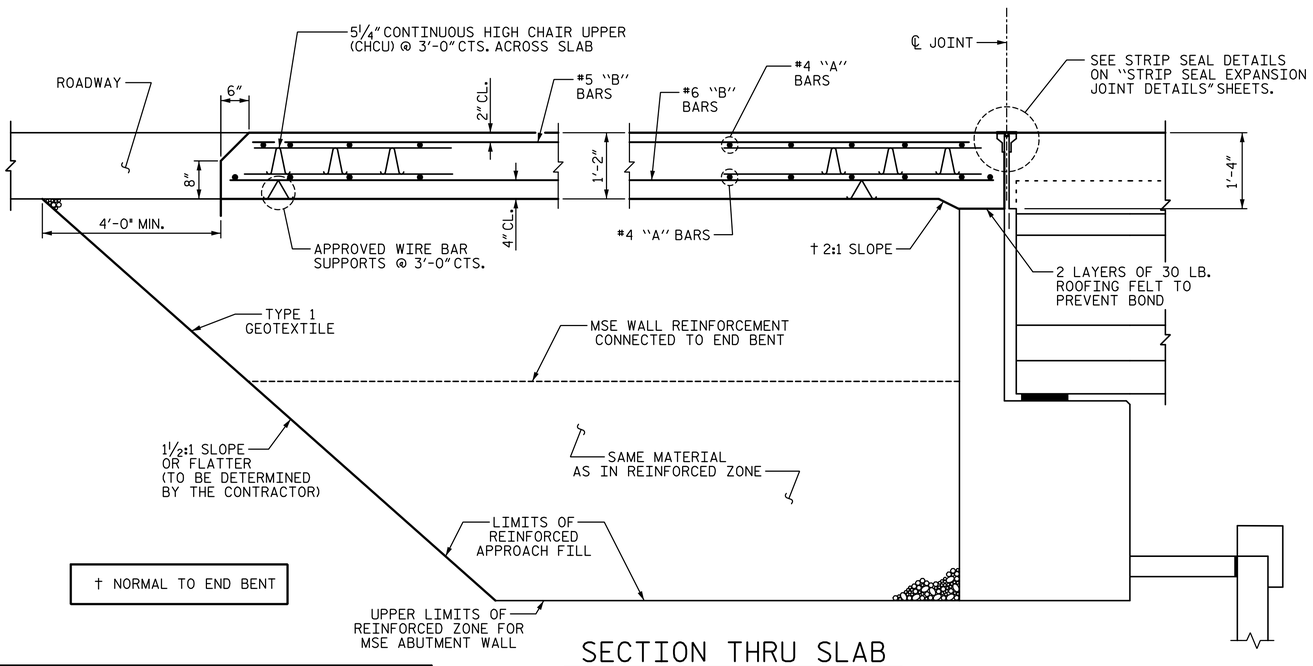
@ END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B107	17	#4	STR	2′-8″	30
✳ B108	3	#4	STR	24′-8″	49
EPOXY COATED REINFORCING STEEL					79 LB
CLASS ″AA″ CONCRETE BREAKDOWN					
POUR 3 (MEDIAN) ✳✳					1.0 CY

✳ INDICATES EPOXY COATED REINFORCING STEEL
✳✳ CONCRETE MEDIAN SHALL BE POURED AFTER STAGE II APPROACH SLAB IS COMPLETE.



SECTION THRU MEDIAN



SECTION THRU SLAB

(TYPE III APPROACH FILL)
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

PROJECT NO. U-2729
FORSYTH COUNTY
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SHEET 3 OF 4

STATE OF NORTH CAROLINA
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RALEIGH

BRIDGE APPROACH SLAB

WGI
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DESIGN ENGINEER OF RECORD:	J.A. BATTS	DATE: 9-22

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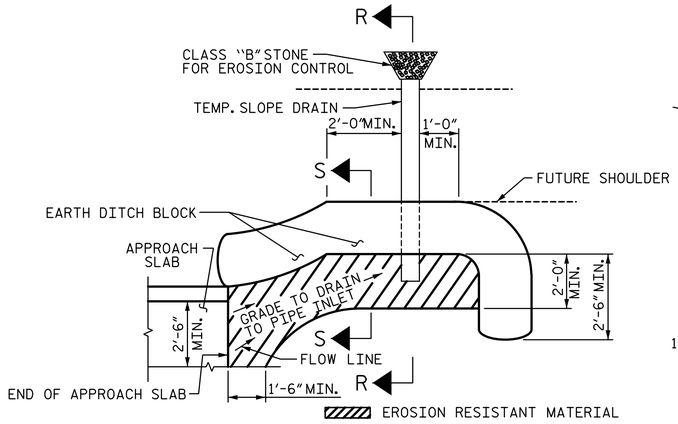
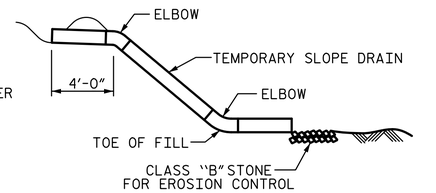
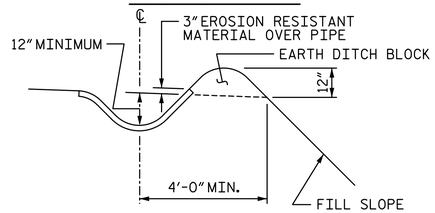


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



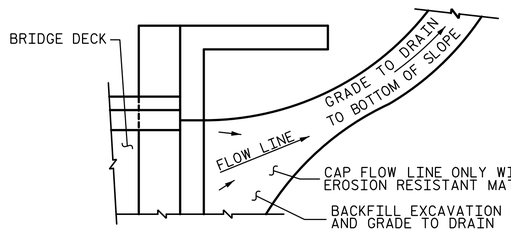
SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. U-2729

FORSYTH COUNTY

STATION: 33+99.11 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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BRIDGE APPROACH SLAB DETAILS

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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 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990