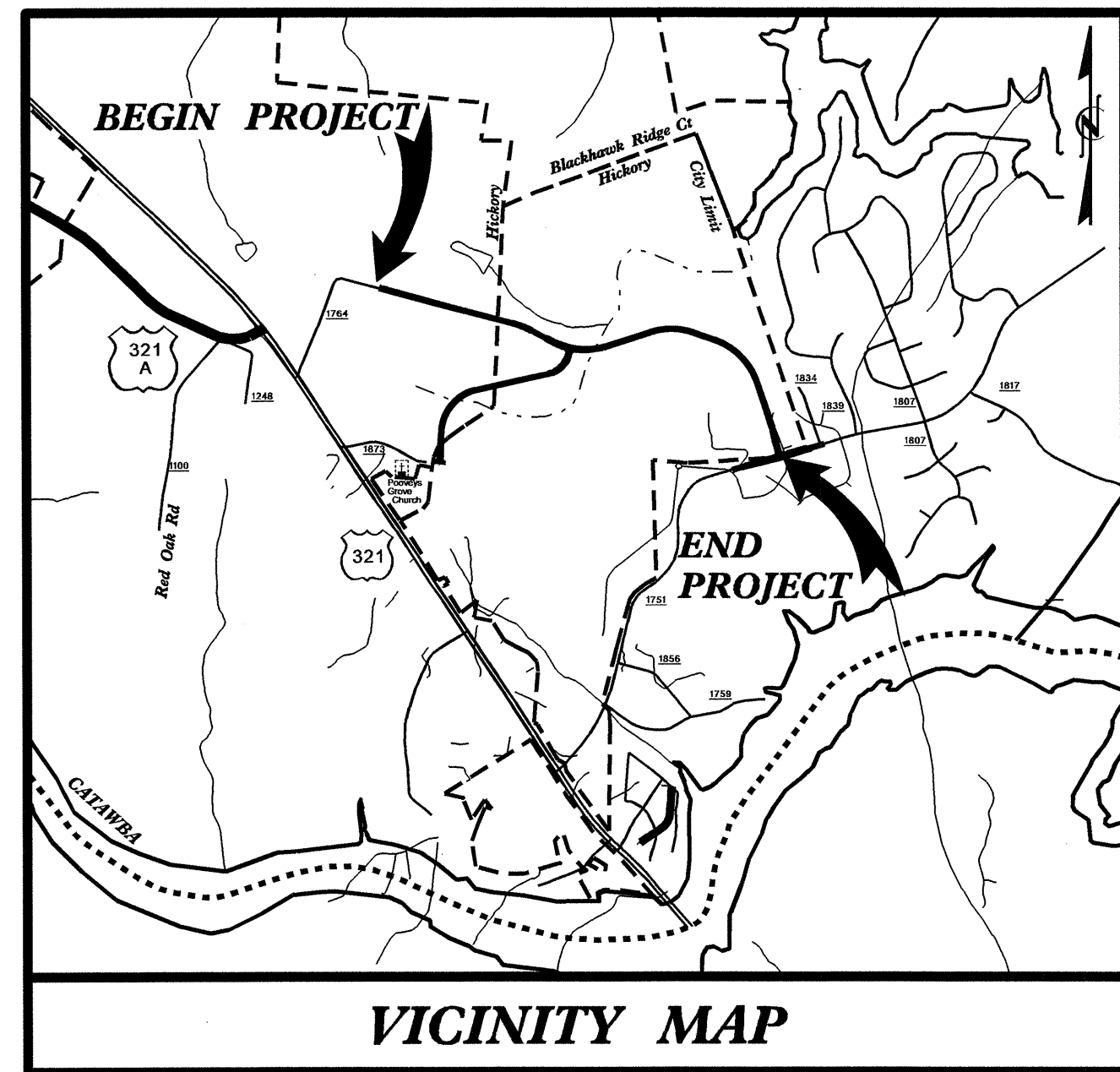


TIP PROJECT: U-5204

CONTRACT: C202565

STRUCTURES



VICINITY MAP

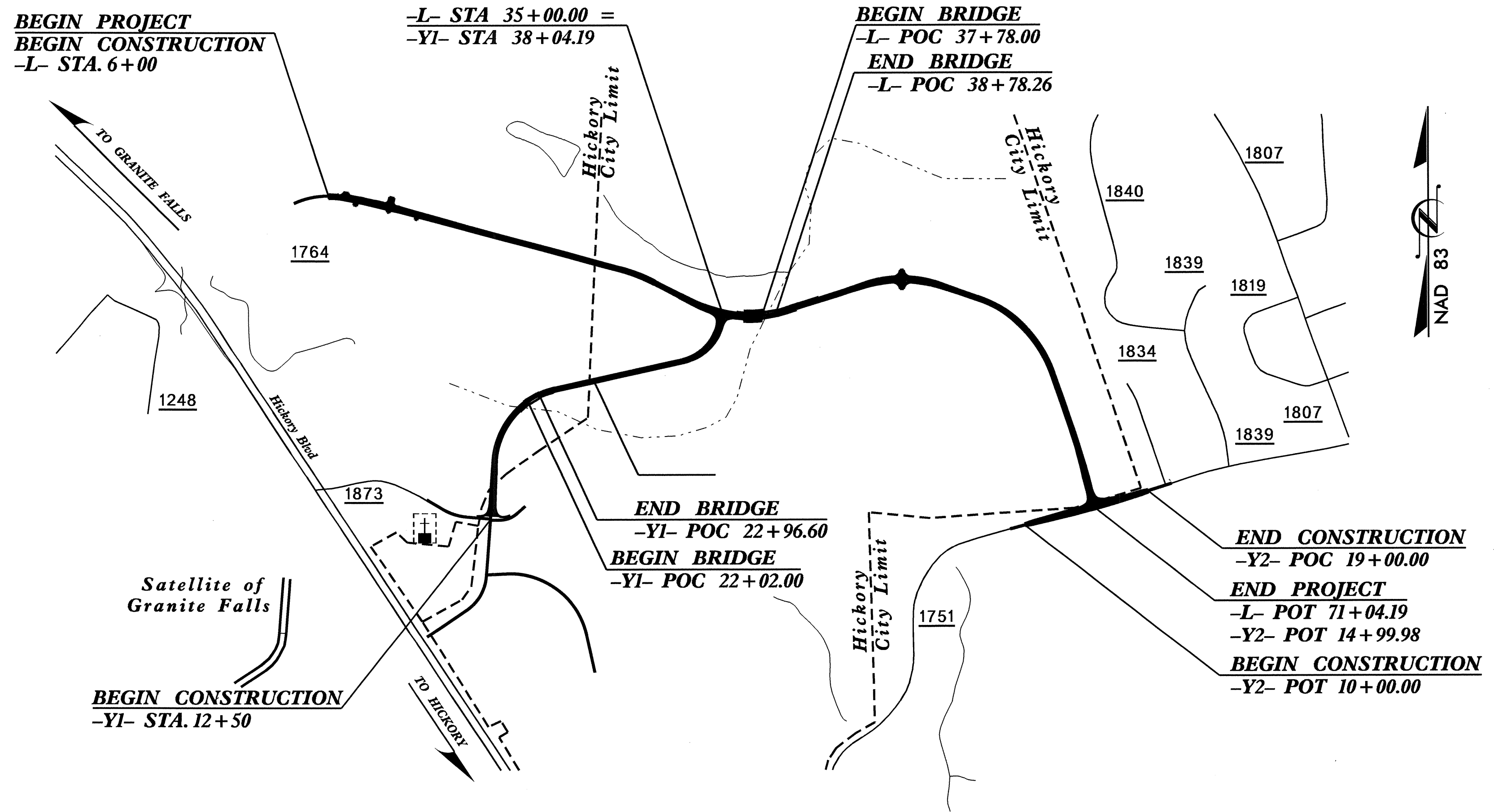
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CALDWELL COUNTY

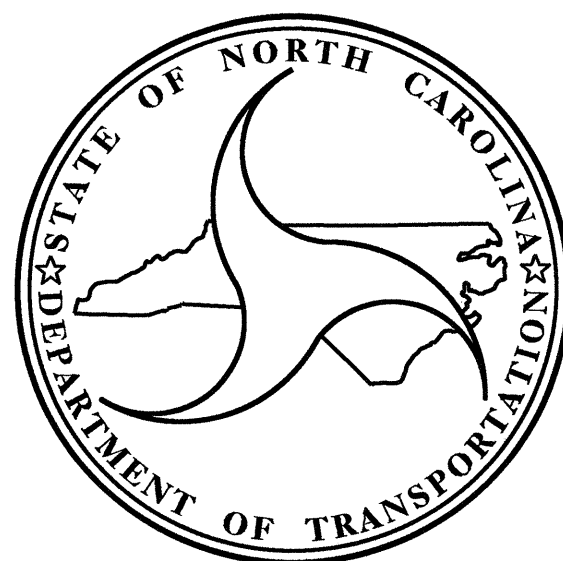
**LOCATION: NEW FARM ROAD
FROM NEW FARM ROAD (SR 1764)
TO GRACE CHAPEL ROAD (SR 1751)**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING,
STRUCTURES AND RETAINING WALL**

STATE	STATE PROJECT REFERENCE NO.	
N.C.	U-5204	
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION
45328.1.1		P.E., RW, UTIL.
45328.3.1		CONSTR.



THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, North Carolina 27605



DESIGN DATA

ADT 2010 = 4,400
ADT 2030 = 6,800
DHV = 50 %
D = 4 %
T = 4 % *
V = 40 MPH
* TTST 4 DUAL 2
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT U-5204 = 1.232 MILES
LENGTH STRUCTURES PROJECT U-5204 = 0.019 MILES
TOTAL LENGTH PROJECT U-5204 = 1.213 MILES

Prepared for the Office of:
DIVISION OF HIGHWAYS

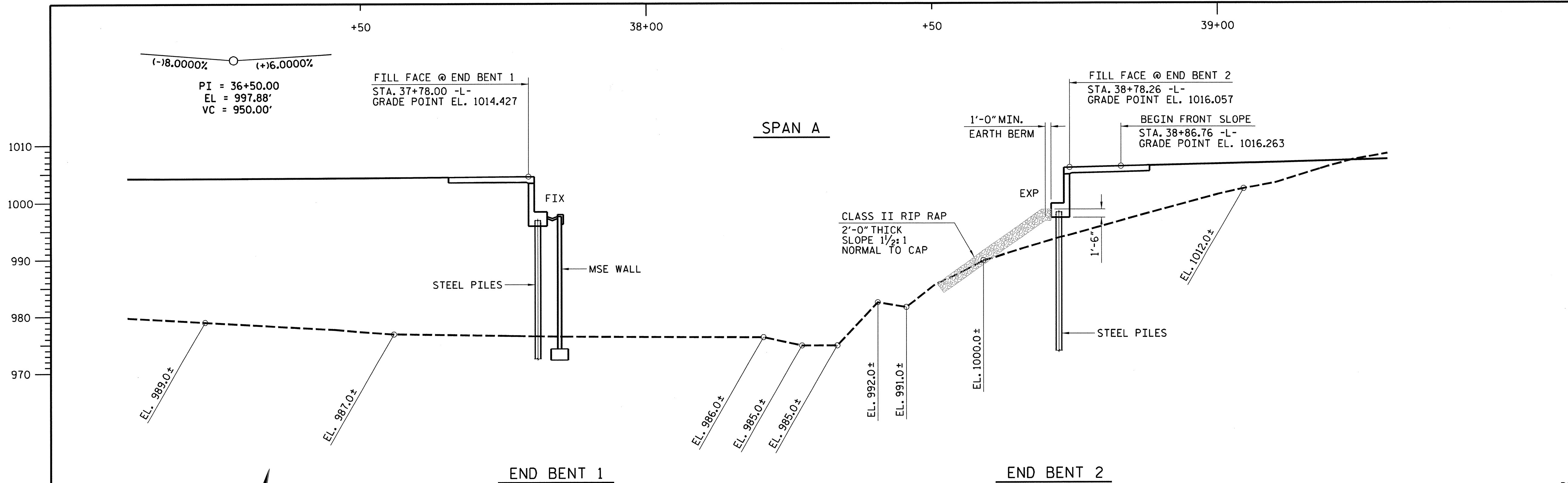
2006 STANDARD SPECIFICATIONS

LETTING DATE:
December 20, 2011

STRUCTURE DESIGN UNIT
1000 BIRCH RIDGE DR. RALEIGH, NC 27611

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER



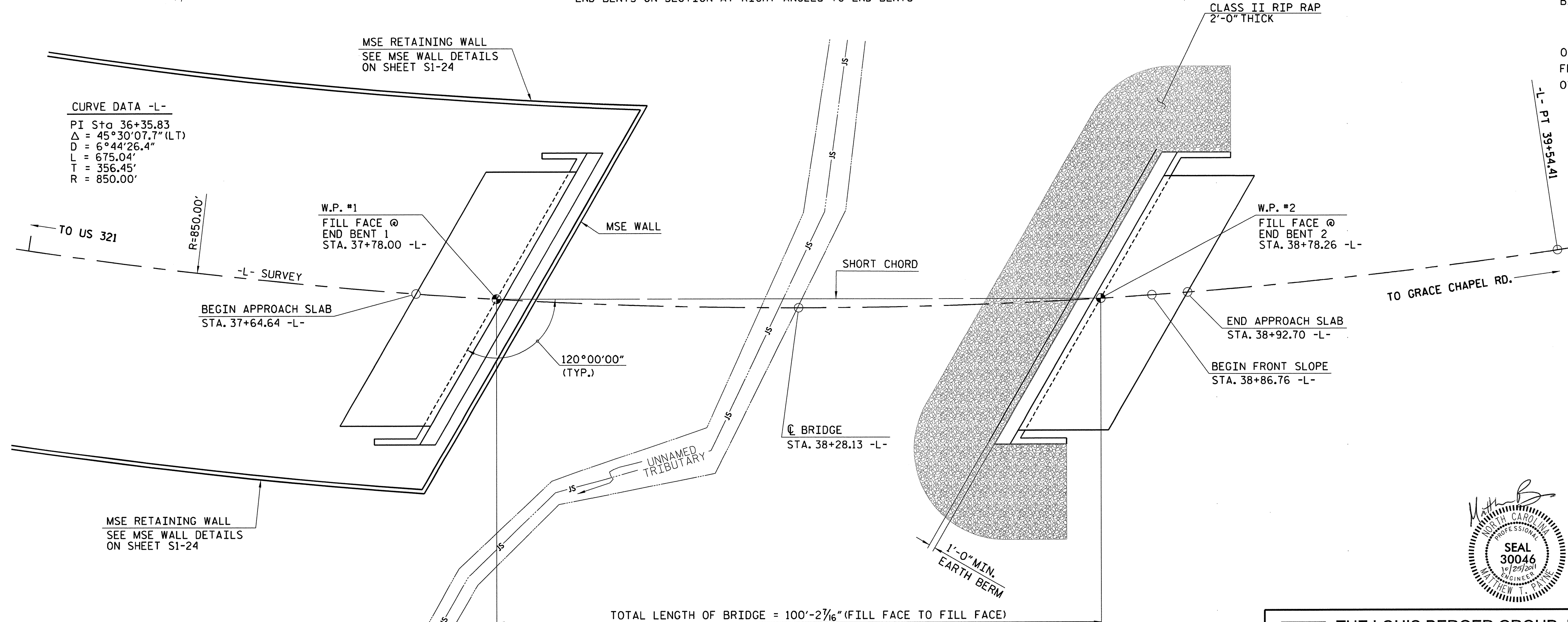
HYDRAULIC DATA

DESIGN DISCHARGE	= 390 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YR.
DESIGN HIGH WATER ELEVATION	= 986.0
DRAINAGE AREA	= 0.25 SQ. MI.
BASIC DISCHARGE (Q100)	= 510 CFS
BASIC HIGH WATER ELEVATION	= 986.6

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= N/A
FREQUENCY OF OVERTOPPING FLOOD	= N/A
OVERTOPPING FLOOD ELEVATION	= N/A

SECTION ALONG C SURVEY -L-
END BENTS ON SECTION AT RIGHT ANGLES TO END BENTS



PLAN

PROJECT NO. U-5204
CALDWELL COUNTY
STATION: 38+28.13 -L-

SHEET 1 OF 4
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
**GENERAL DRAWING
FOR BRIDGE OVER
UNNAMED TRIBUTARY
ON NEW FARM RD. BETWEEN
ALEX LEE BLVD. & GRACE
CHAPEL RD. (SR 1751)**

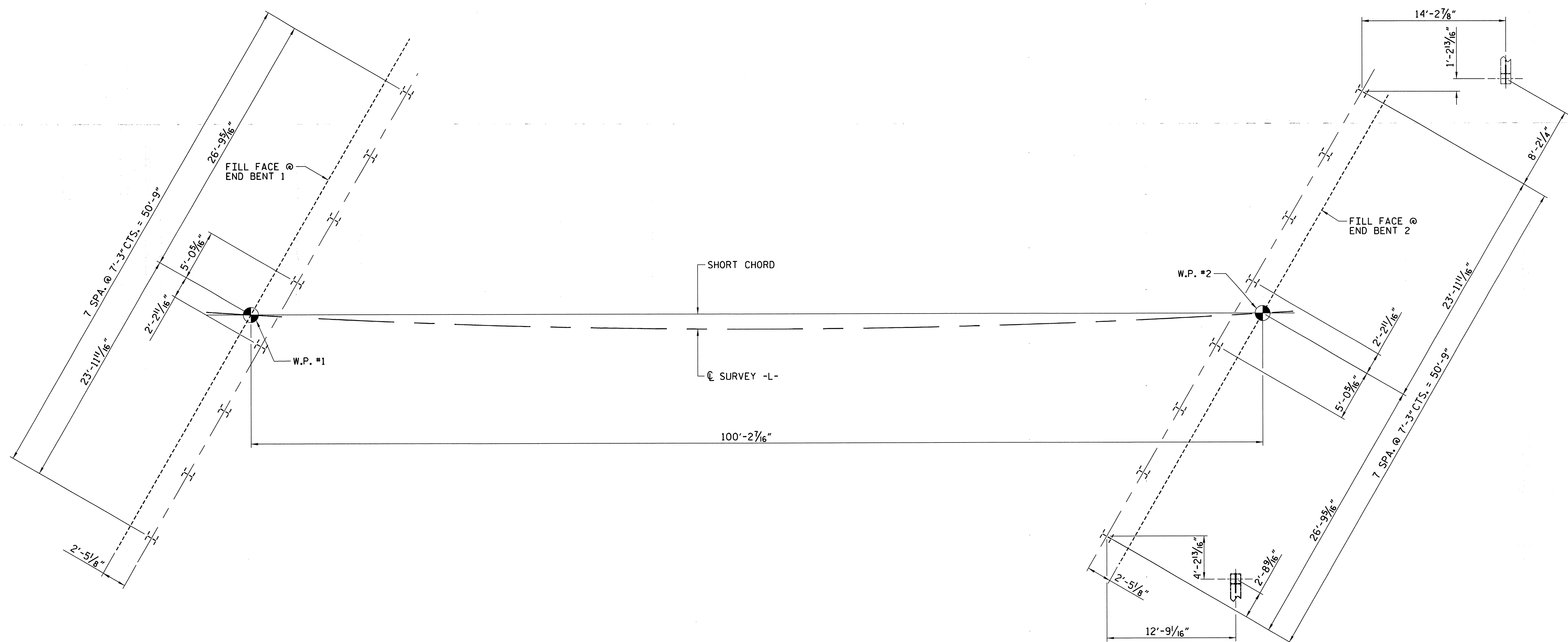


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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
1			3			S1-1	
2			4			48	

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10/25/2011 8:37:58 AM 1052_PDF_full.plt.cfb 1052_str.tbl

DRAWN BY: R. KNIGHT DATE: 2/11
CHECKED BY: M. PAYNE DATE: 6/11



END BENT 1
 [] DENOTES VERTICAL PILES

END BENT 2
 [] DENOTES VERTICAL PILES
 [] DENOTES WINGWALL BRACE PILE

FOUNDATION LAYOUT
 END BENTS ARE PARALLEL
 DIMENSIONS ARE MEASURED TO CL PILES

PROJECT NO. U-5204
CALDWELL COUNTY
 STATION: 38+28.13 -L-

SHEET 2 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**GENERAL DRAWING
 FOR BRIDGE OVER
 UNNAMED TRIBUTARY
 ON NEW FARM RD. BETWEEN
 ALEX LEE BLVD. & GRACE
 CHAPEL RD. (SR 1751)**

THE LOUIS BERGER GROUP, Inc.
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 Raleigh, NC 27605-3322

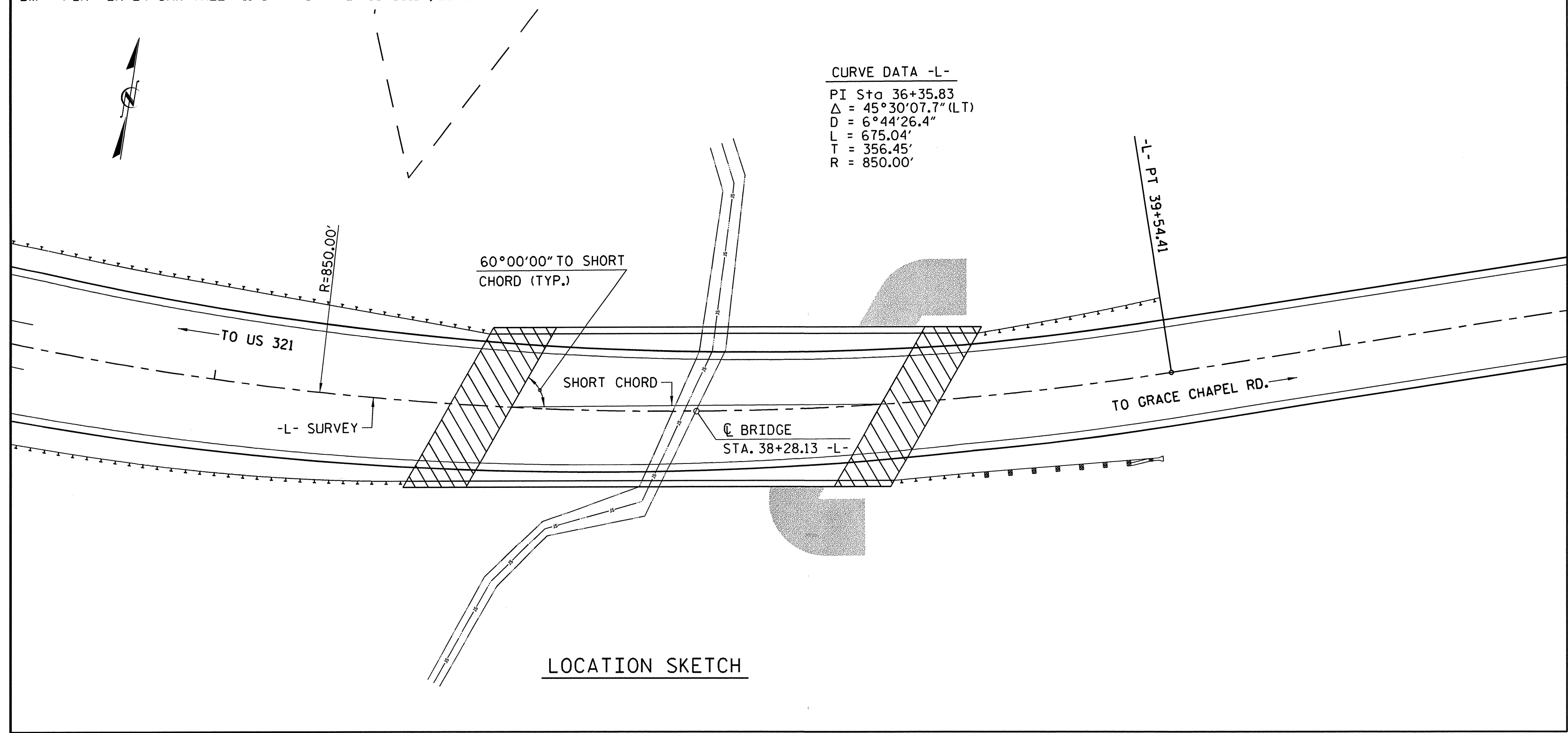
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NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
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2			4			48

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DRAWN BY : R. KNIGHT DATE : 2/11
 CHECKED BY : M. PAYNE DATE : 6/11

BM - PIN IN 24" OAK TREE 41.49' RT OF -Y2- 16+53.54, EL. 1102.19

CURVE DATA -L-
 PI Sta 36+35.83
 $\Delta = 45^{\circ}30'07.7''$ (LT)
 D = $6^{\circ}44'26.4''$
 L = 675.04'
 T = 356.45'
 R = 850.00'



NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LFRD BRIDGE SPECIFICATIONS FOR SEISMIC ZONE 1.
 FOR ADDITIONAL DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
 ALL MATERIALS SHALL BE IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES, JULY 2006.
 FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.
 THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE (1) 30 INCH SAMPLE OF EACH BARS SIZE USED. FOR PROJECTS REQUIRING MORE THAN 400 TONS OF REINFORCING STEEL, TWO (2) 30 INCH SAMPLES OF EACH BAR SIZE USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN SHALL BE SPLICED WITH REPLACEMENT BARS OF SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY (30) BAR DIAMETERS. PAYMENT FOR SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.
 FOR PILES, SEE SPECIAL PROVISIONS.
 PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR 120 TONS PER PILE. DRIVE PILES TO THE REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.
 STEEL PILE POINTS (WITH TEETH) ARE REQUIRED FOR ALL PILES.
 TESTING THE FIRST PRODUCTION PILE WITH PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING, OR REDRIVING IS REQUIRED. FOR PDA, SEE SPECIAL PROVISIONS.
 OBSERVE A ONE MONTH WAITING PERIOD AFTER CONSTRUCTING THE MSE WALL, END BENT, AND REINFORCED EARTH FILL PRIOR TO CONSTRUCTING APPROACH SLAB AT END BENT 1.
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 NO KNOWN UTILITY CONFLICTS.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 FOR FALSEWORKS AND FORMWORK, SEE SPECIAL PROVISIONS.

LOCATION SKETCH

TOTAL BILL OF MATERIAL

	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLAB	REINFORCING STEEL	63" MODIFIED PRESTRESSED CONCRETE GIRDER	PDA TESTING	HP 12 x 53 STEEL PILES	STEEL PILE POINTS	CONCRETE BARRIER RAIL	CLASS II RIP RAP (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	
	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LIN. FT.	EA.	NO.	LIN. FT	EACH	LIN. FT.	TONS	SO. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	4,115	4,823				480	1			195.5					
END BENT 1			43.5		5,392			8	480	8					
END BENT 2			53.0		6,491			10	350	10		183	170		
TOTAL	4,112	4,823	96.5	LUMP SUM	11,883	480	1	18	830	18	195.5	183	170	LUMP SUM	LUMP SUM

PROJECT NO. U-5204
CALDWELL COUNTY
 STATION: 38+28.13 -L-

SHEET 3 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING FOR
 BRIDGE OVER UNNAMED
 TRIBUTARY ON
 NEW FARM RD. BETWEEN
 ALEX LEE BLVD. &
 GRACE CHAPEL RD. (SR 1751)

THE LOUIS BERGER GROUP, Inc.
 1001 Wade Avenue, Suite 400
 Raleigh, NC 27605-3322

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

TOTAL SHEETS	48
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DRAWN BY : R. KNIGHT DATE : 4/11
 CHECKED BY : M. PAYNE DATE : 6/11

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LOAD FACTORS:

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

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS																								
LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE								COMMENT NUMBER
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (%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 (%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	1.11	--	1.75	0.6	1.75	A	EL	47.29	0.98	1.11	A	EL	8.89	0.8	0.60	1.85	A	EL	47.29		
	HL-93 (OPERATING)	N/A		1.43	--	1.35	0.6	2.27	A	EL	47.29	0.98	1.43	A	EL	8.89	N/A	--	--	A	EL	47.29		
	HS-20 (INVENTORY)	36.00	②	1.49	53.64	1.75	0.6	2.41	A	EL	47.29	0.92	1.49	A	EL	8.89	0.8	0.60	2.55	A	EL	47.29		
	HS-20 (OPERATING)	36.00		1.94	69.84	1.35	0.6	3.13	A	EL	47.29	0.92	1.94	A	EL	8.89	N/A	--	--	A	EL	47.29		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.50		4.62	57.75	1.40	0.6	7.11	A	EL	47.29	0.98	4.62	A	EL	8.89	0.8	0.60	6.00	A	EL	47.29	
		S3C	21.50		2.68	57.62	1.40	0.6	4.12	A	EL	47.29	0.98	2.68	A	EL	8.89	0.8	0.60	3.48	A	EL	47.29	
		S3A	22.75		2.35	53.46	1.40	0.6	3.63	A	EL	47.29	0.98	2.35	A	EL	8.89	0.8	0.60	3.07	A	EL	47.29	
		S4A	26.75		2.05	54.84	1.40	0.6	3.17	A	EL	47.29	0.98	2.05	A	EL	8.89	0.8	0.60	2.68	A	EL	47.29	
		S5A	30.50		1.87	57.04	1.40	0.6	2.84	A	EL	47.29	0.98	1.87	A	EL	8.89	0.8	0.60	2.40	A	EL	47.29	
		S6A	34.50		1.70	58.65	1.40	0.6	2.59	A	EL	47.29	0.98	1.7	A	EL	8.89	0.8	0.60	2.18	A	EL	47.29	
		S7B	38.50	③	1.63	62.76	1.40	0.6	2.44	A	EL	47.29	0.98	1.63	A	EL	8.89	0.8	0.60	2.06	A	EL	47.29	
	S7A	40.00		1.72	68.80	1.40	0.6	2.49	A	EL	47.29	0.98	1.72	A	EL	8.89	0.8	0.60	2.11	A	EL	47.29		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.25		2.48	70.06	1.40	0.6	3.16	A	EL	47.29	0.98	2.48	A	EL	8.89	0.8	0.60	2.67	A	EL	47.29	
		T5B	32.00		2.31	73.92	1.40	0.6	2.80	A	EL	47.29	0.98	2.31	A	EL	8.89	0.8	0.60	2.37	A	EL	47.29	
		T6A	36.00		2.14	77.04	1.40	0.6	2.56	A	EL	47.29	0.98	2.14	A	EL	8.89	0.8	0.60	2.16	A	EL	47.29	
		T7A	40.00		2.10	84.00	1.40	0.6	2.56	A	EL	47.29	0.98	2.1	A	EL	8.89	0.8	0.60	2.17	A	EL	47.29	
		T7B	40.00		1.99	79.60	1.40	0.6	2.63	A	EL	47.29	0.98	1.99	A	EL	8.89	0.8	0.60	2.22	A	EL	47.29	

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

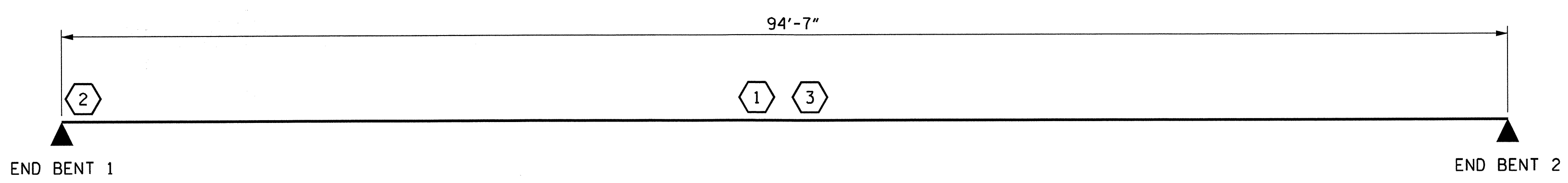
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

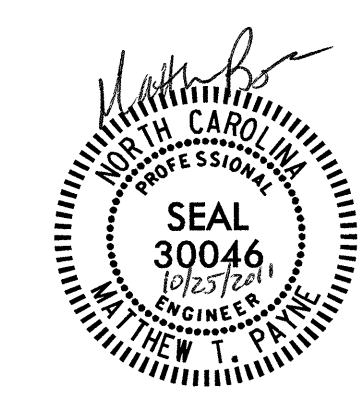
GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. U-5204
CALDWELL COUNTY
STATION: 38+28.13 -L-
SHEET 4 OF 4



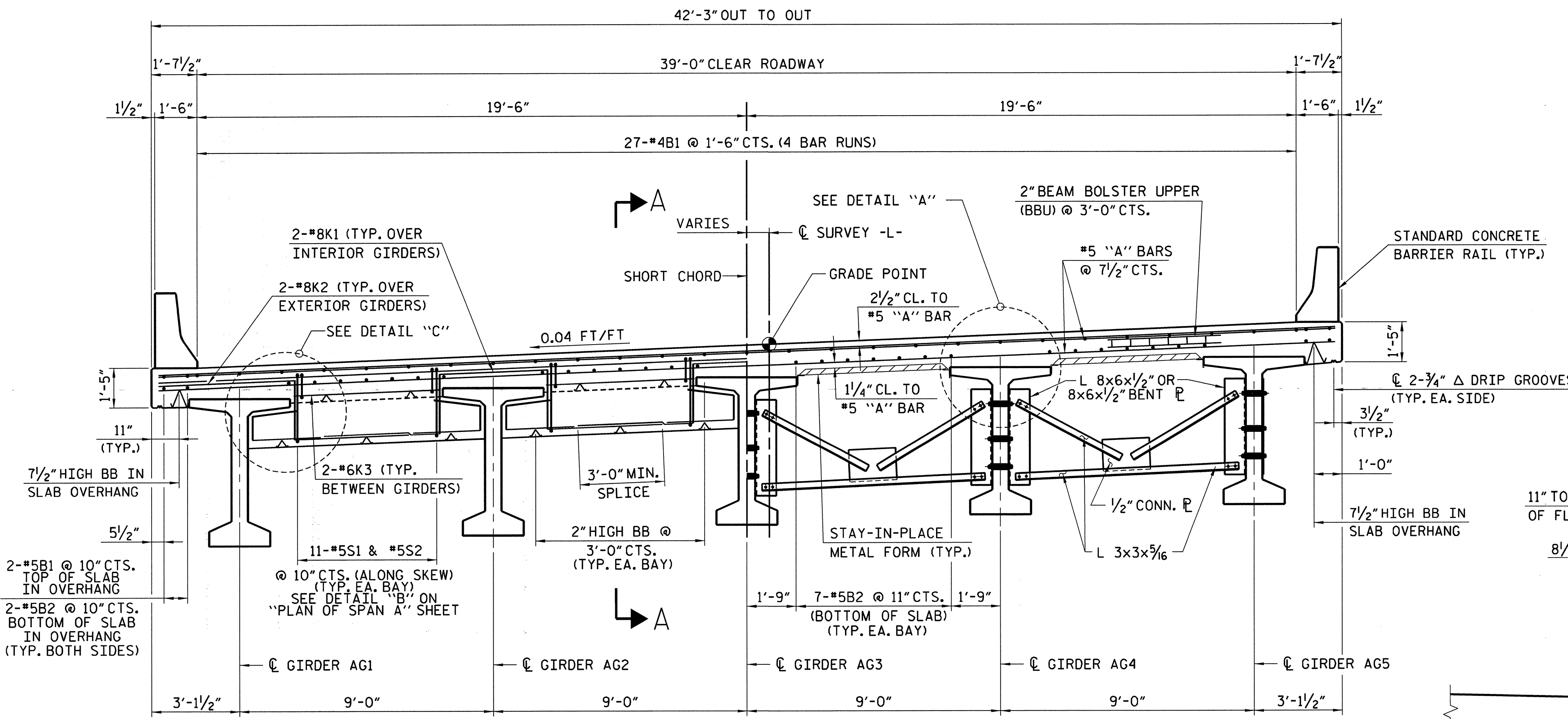
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
PRESTRESSED
CONCRETE GIRDERS
(NON-INTERSTATE TRAFFIC)

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ASSEMBLED BY : J. DAWKINS	DATE : 7/11
CHECKED BY : M. PAYNE	DATE : 7/11
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	

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Raleigh, NC 27605-3322

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			46



NOTES:

PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

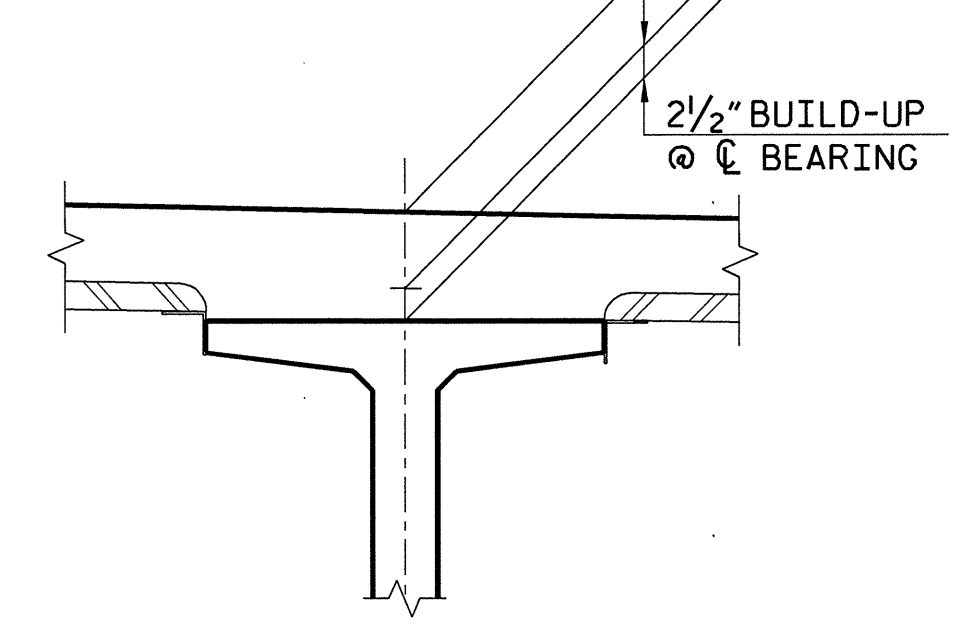
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2" AT END BENT #2. FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

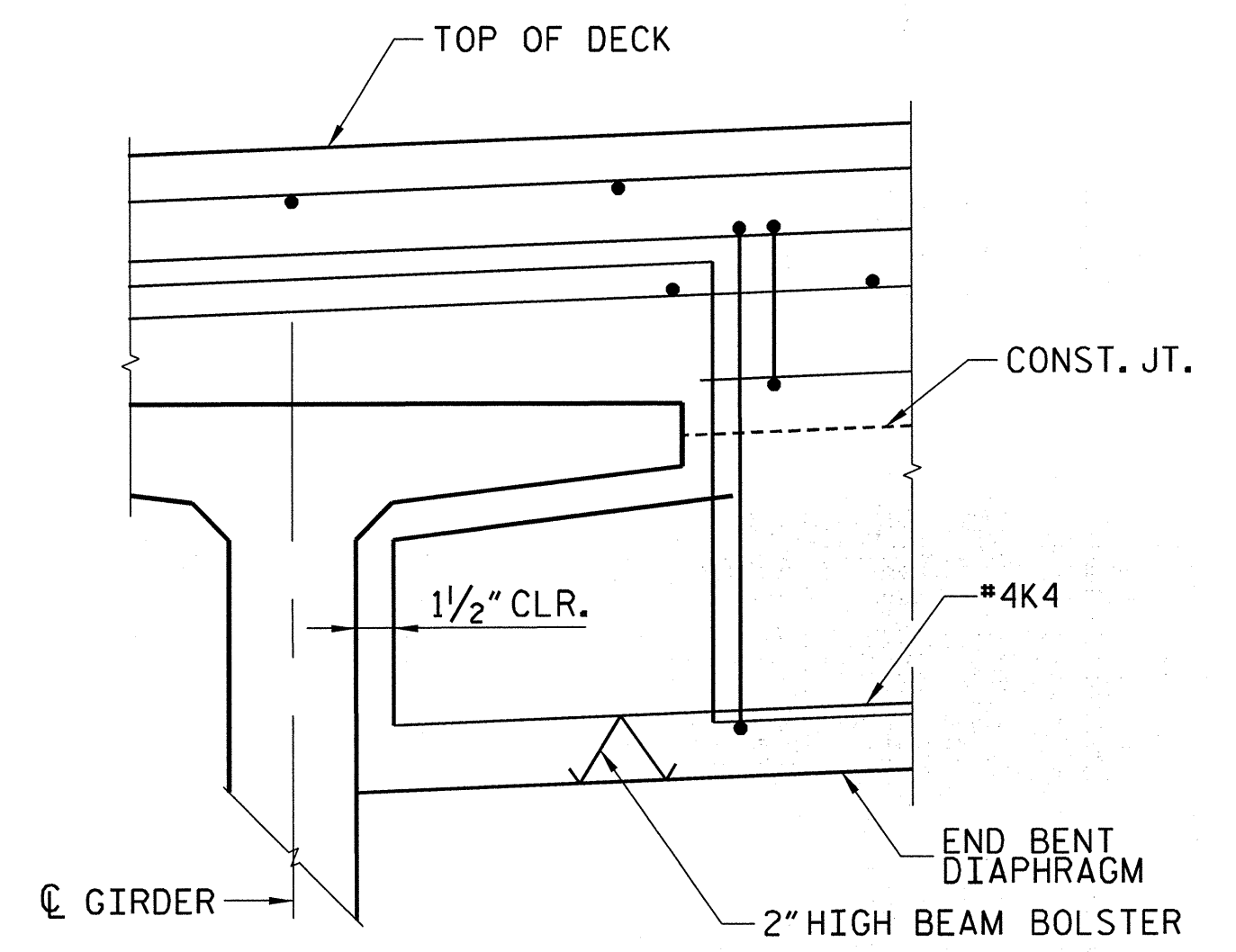
TYPICAL HALF SECTION (END BENT DIAPHRAGMS)

TYPICAL HALF SECTION (INTERMEDIATE DIAPHRAGMS)

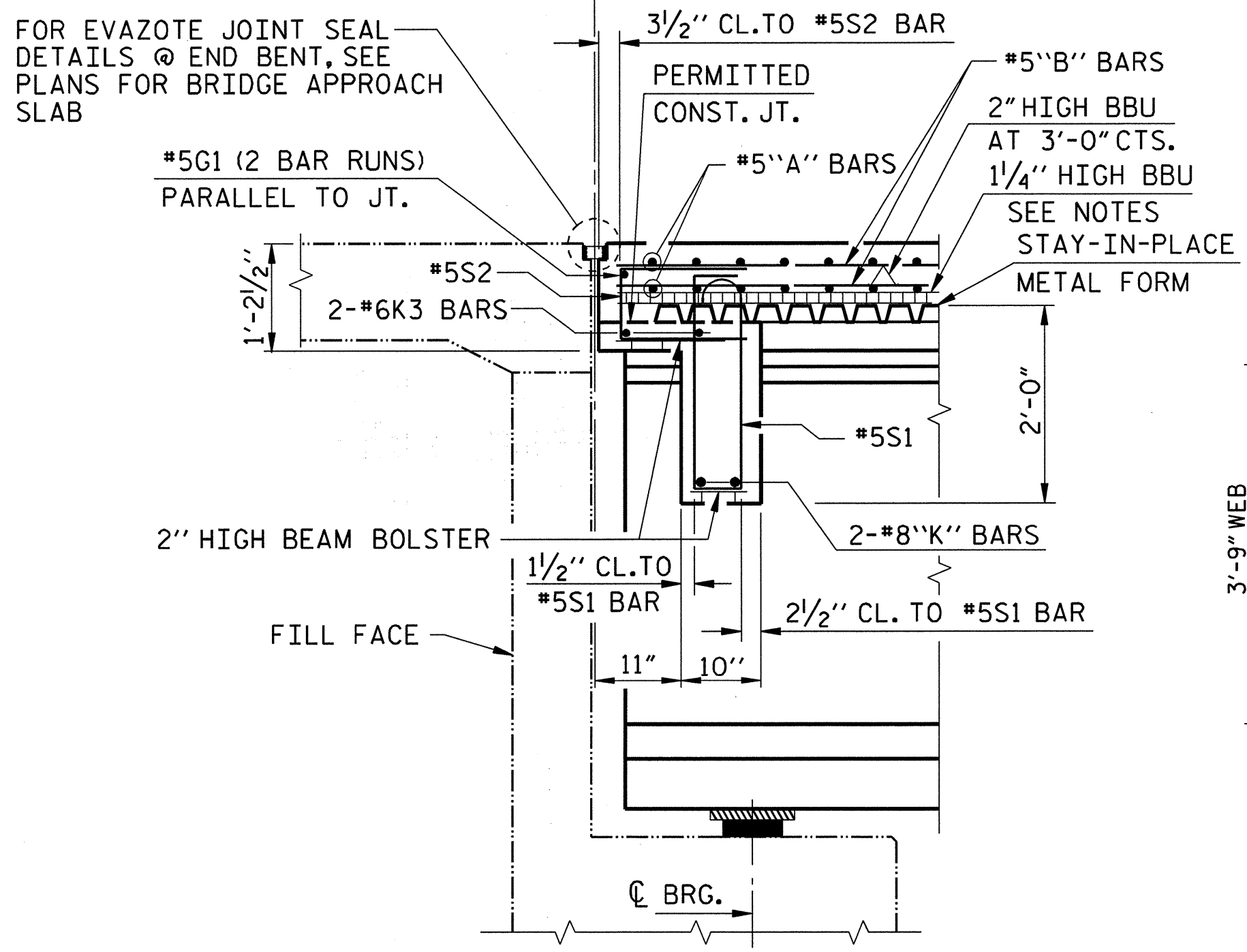
TYPICAL SECTION



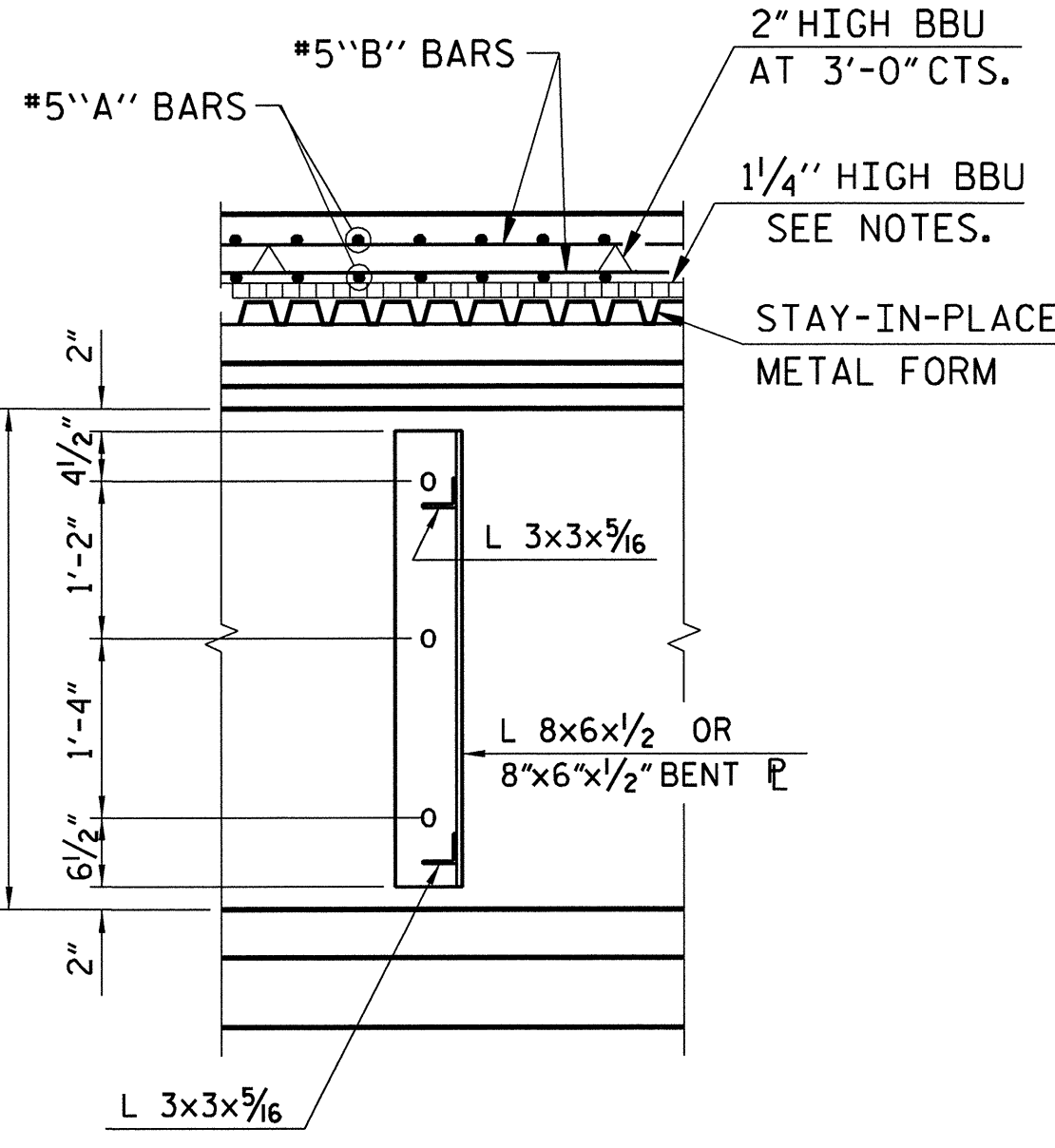
DETAIL "A"



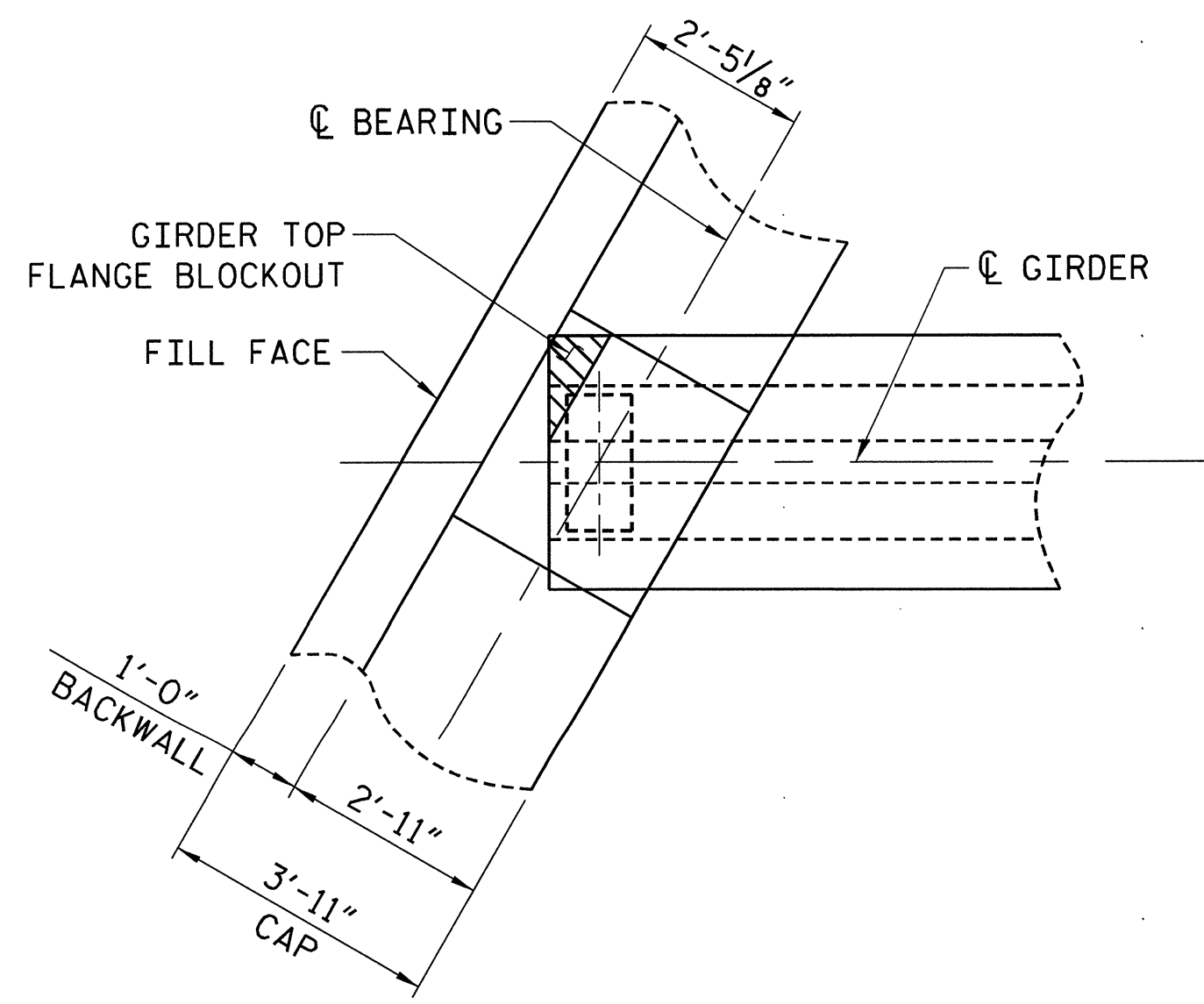
DETAIL "C"



SECTION A-A (END BENT 1 SHOWN, END BENT 2 SIMILAR)



TYPICAL SECTION @ INTERMEDIATE DIAPHRAGM



PLAN OF GIRDER @ END BENT
END BENT 1 SHOWN, END BENT 2 SIMILAR

PROJECT NO. U-5204
CALDWELL COUNTY
STATION: 38+28.13 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTIONS

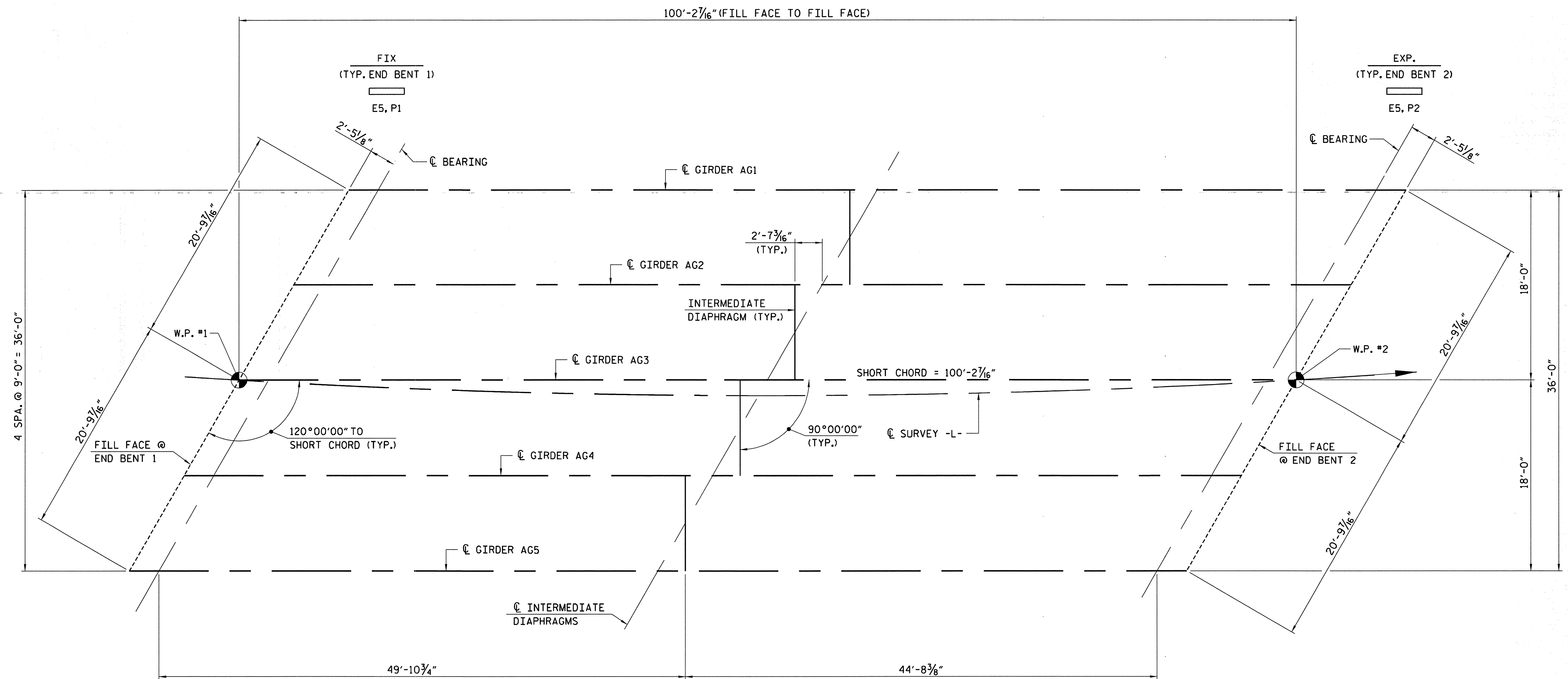


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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-5	
1			3			TOTAL SHEETS	46
2			4				

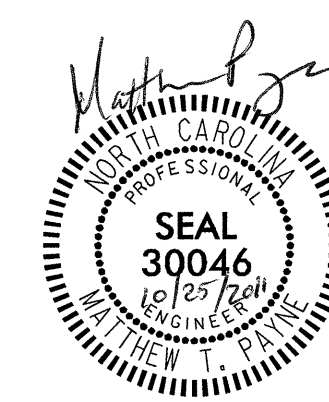
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DRAWN BY: R. KNIGHT DATE: 3/11
CHECKED BY: M. PAYNE DATE: 6/11



SPAN A
FRAMING PLAN

PROJECT NO. U-5204
CALDWELL COUNTY
 STATION: 38+28.13 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
FRAMING PLAN

G:\OR Projects\OR1052-US 321 Connector\Structures\OR1052-SD-L-FRM.dgn
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DRAWN BY: J. DAWKINS DATE: 3/11
 CHECKED BY: M. PAYNE DATE: 6/11

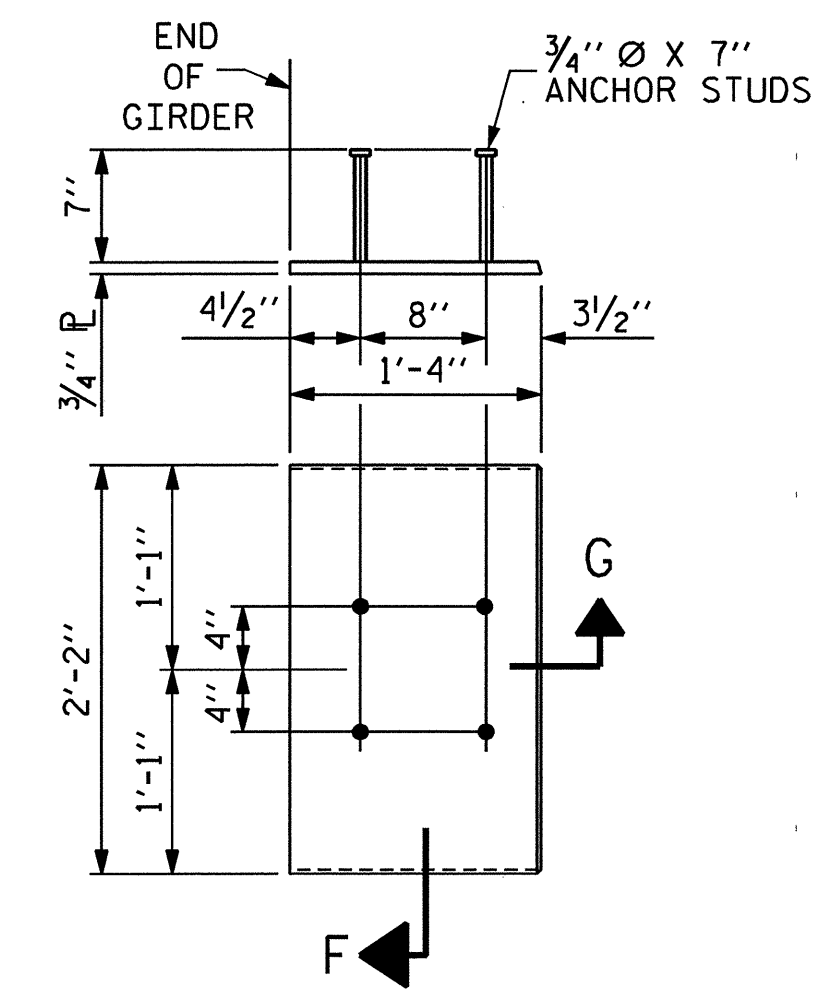
THE LOUIS BERGER GROUP, Inc.
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 Raleigh, NC 27605-3322

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS											
0.6" Ø LOW RELAXATION	SPAN A										
	GIRDERS AG1 & AG5										
	TENTH POINTS	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.084	0.148	0.195	0.223	0.274	0.232	0.223	0.195	0.084	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	0.000	0.026	0.051	0.071	0.083	0.088	0.083	0.071	0.051	0.026	0.000
FINAL CAMBER	0	1/16"	1 3/16"	1/2"	1 1/16"	1 3/4"	1 1/16"	1/2"	1 3/16"	1/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS											
0.6" Ø LOW RELAXATION	SPAN A										
	GIRDERS AG2, AG3 AND AG4										
	TENTH POINTS	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
CAMBER (GIRDER ALONE IN PLACE)	0	0.084	0.148	0.195	0.223	0.232	0.223	0.195	0.148	0.084	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	0	0.029	0.057	0.080	0.094	0.099	0.094	0.080	0.057	0.029	0
FINAL CAMBER	0	5/8"	1 1/16"	1 3/16"	1 9/16"	1 5/8"	1 9/16"	1 3/16"	1 1/16"	5/8"	0

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



EMBEDDED PLATE "B-1" DETAILS
63" MODIFIED BULB TEE
(2 REQ'D PER GIRDER)

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.

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. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5000 PSI. DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

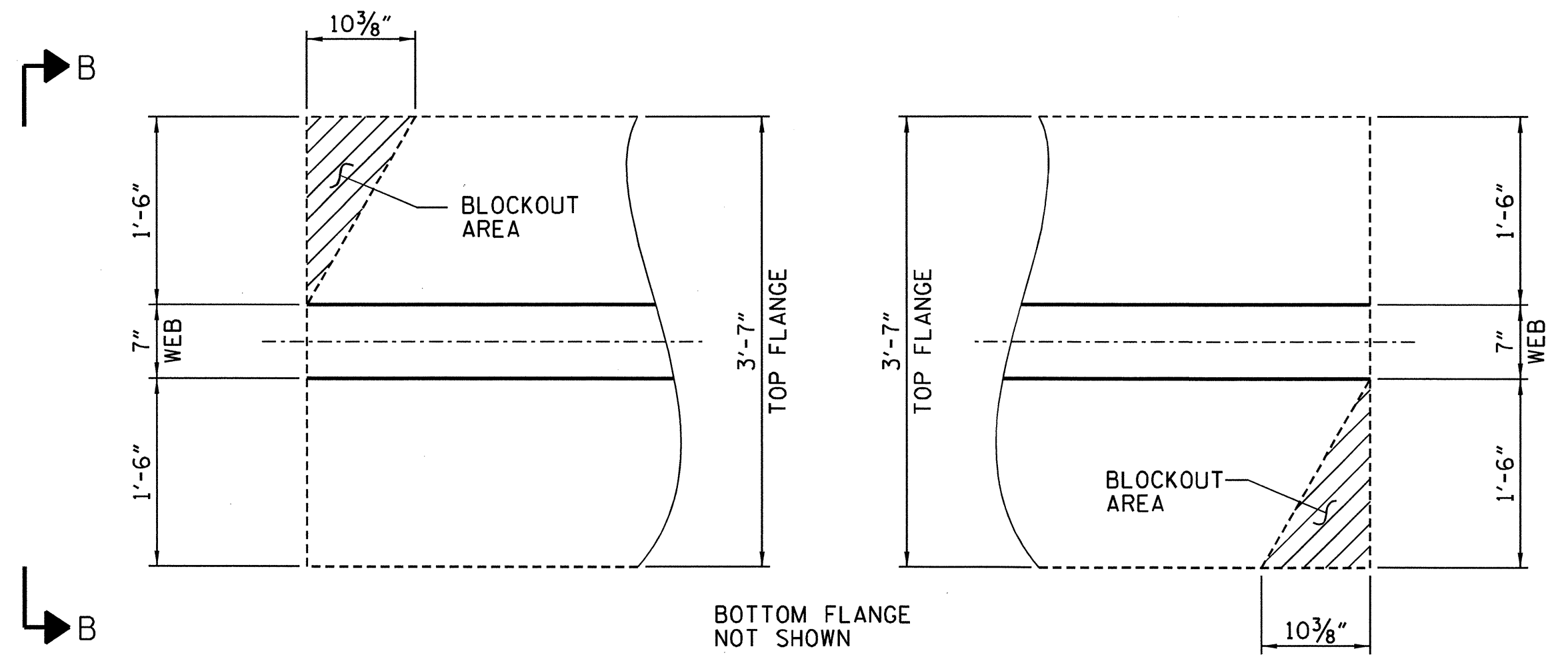
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

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

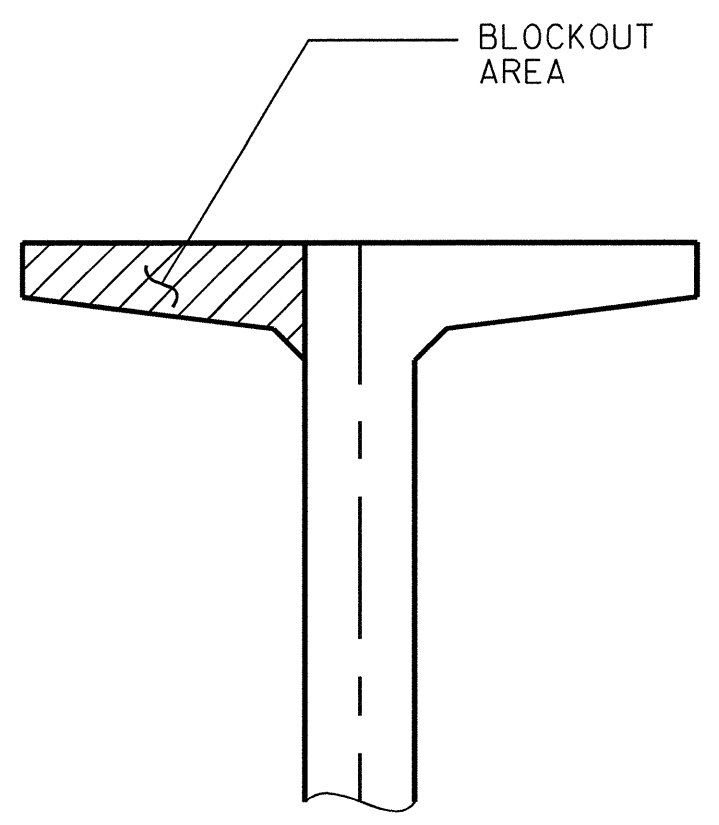
A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" MODIFIED BULB TEE.

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.

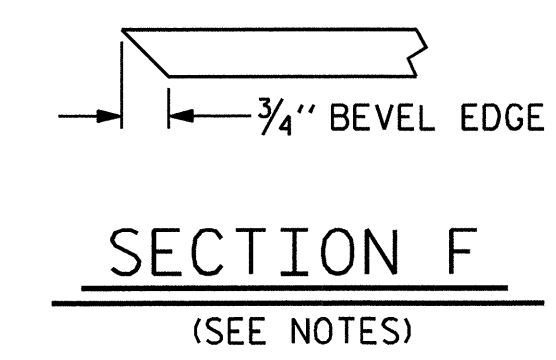
UPLIFT FORCE DUE TO DRAPED STRANDS IS 20.5 KIPS.



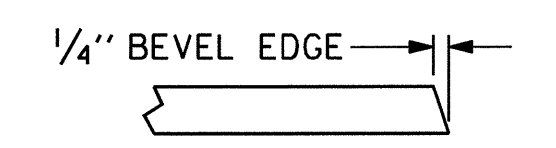
PLAN OF TOP FLANGE



VIEW B-B



SECTION F
(SEE NOTES)



SECTION G

TOP FLANGE BLOCKOUT DETAILS AT END BENTS

PROJECT NO. U-5204
CALDWELL COUNTY
STATION: 38+28.13 -L-

SHEET 2 OF 3
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
63" PRESTRESSED CONCRETE
MODIFIED BULB TEE GIRDER
DETAILS



THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

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1			3			TOTAL SHEETS	
2			4			48	

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ASSEMBLED BY : R. KNIGHT	DATE : 3/11
CHECKED BY : M. PAYNE	DATE : 7/11
DRAWN BY : ELR 11/91	REV. 10/17/00 RWW/LES
CHECKED BY : GRP 11/91	REV. 7/10/01RR LES/RDR
	REV. 5/1/06 TLA/GM

STRUCTURAL STEEL NOTES

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

TENSION ON THE AASHTO M164 BOLTS THROUGH THE ANGLE MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR DIRECT TENSION INDICATORS, SEE SPECIAL PROVISION.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

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

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISIONS AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

USE A MINIMUM 7/16" THICK PLATE WASHER WITH STANDARD HOLES UNDER EACH BOLT HEAD AND NUT. THE PLATE WASHERS SHALL HAVE SUFFICIENT SIZE TO COVER THE HOLES AFTER INSTALLATION. HARDENED WASHERS AND DIRECT TENSION INDICATORS ARE TO BE USED IN CONJUNCTION WITH THE PLATE WASHERS IN THE L 3 X 3 X 5/16 ANGLE MEMBER CONNECTION.

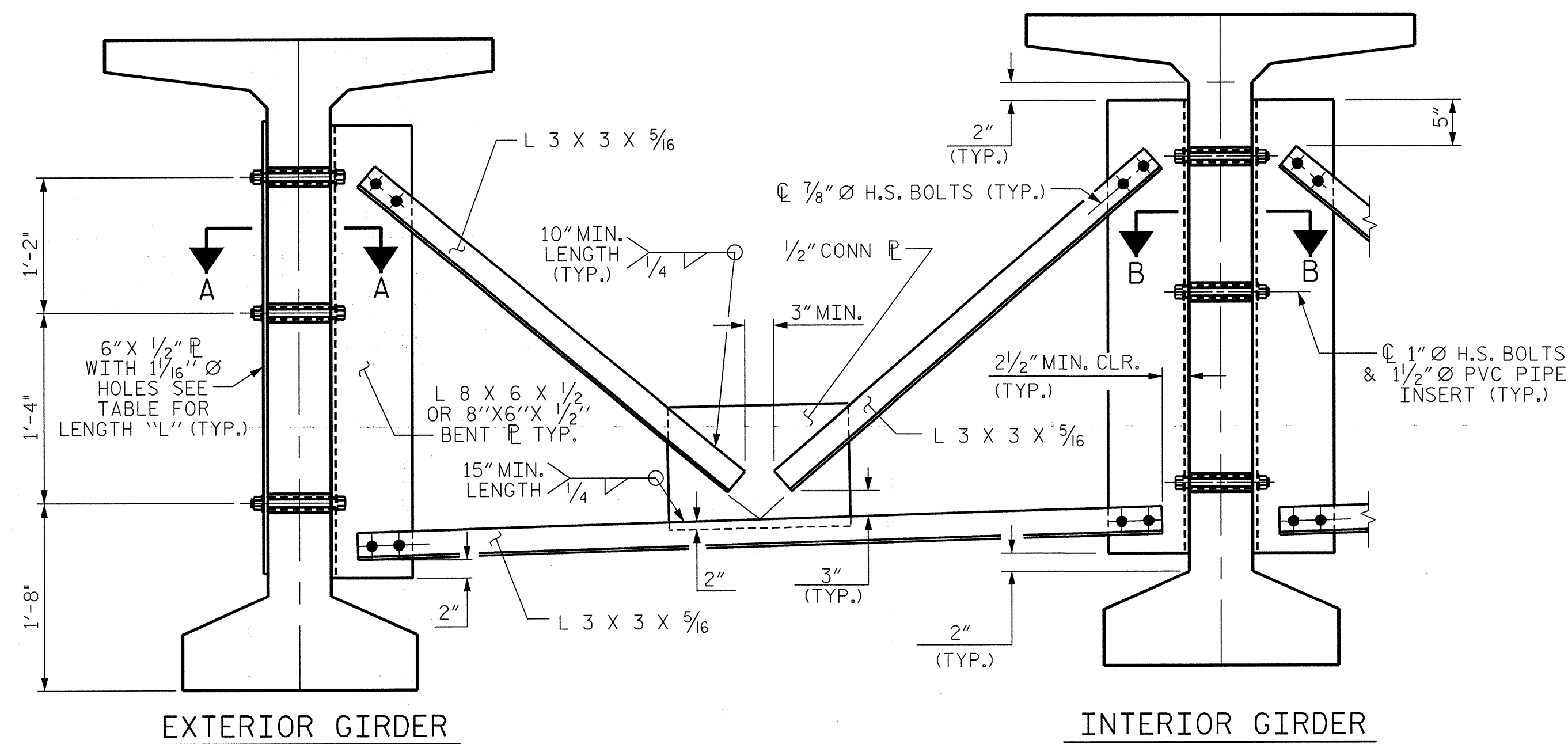
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

CONTRACTOR SHALL 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.

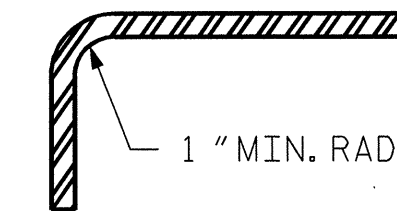
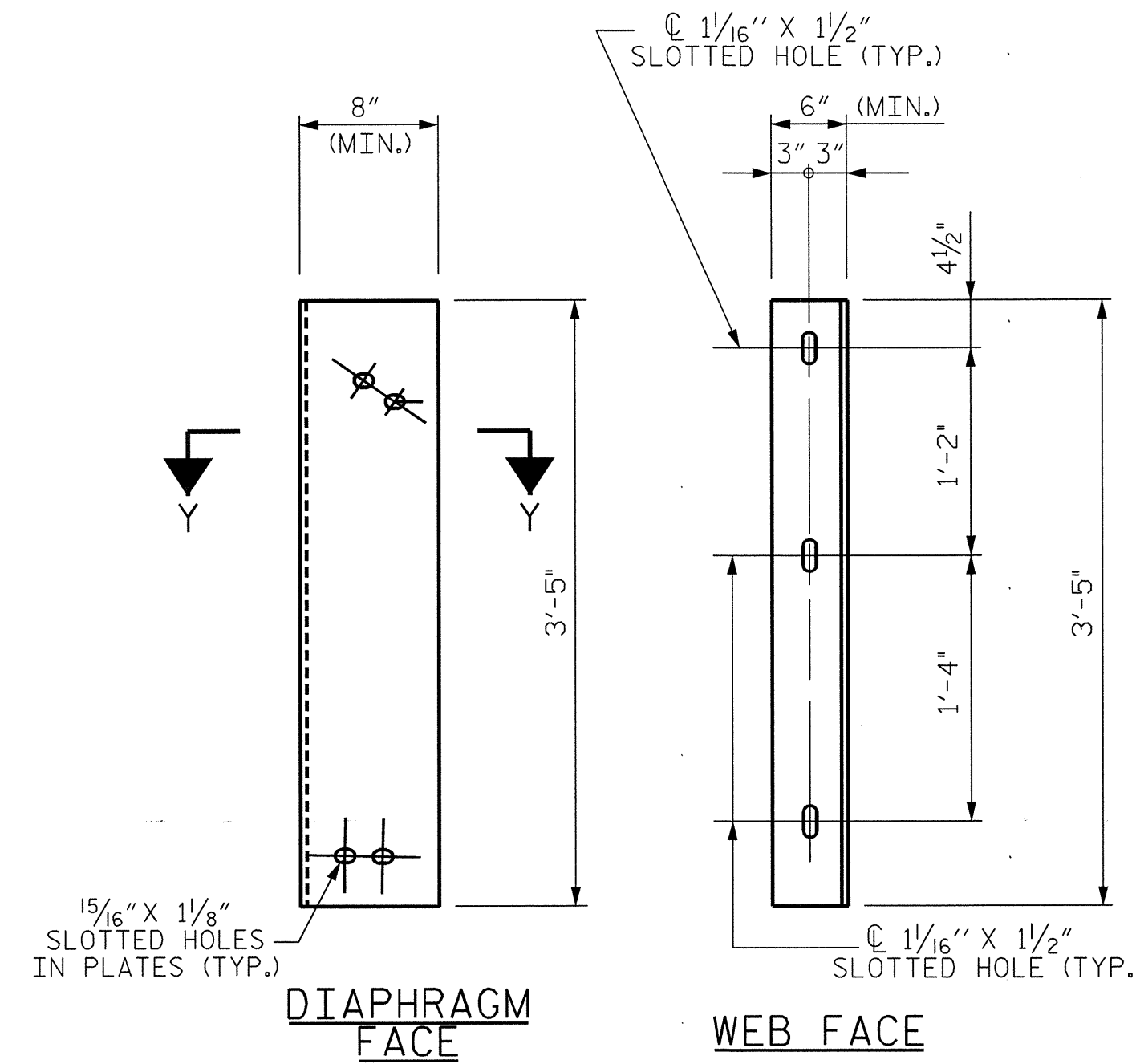
IN THE EXTERIOR BAYS, TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

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



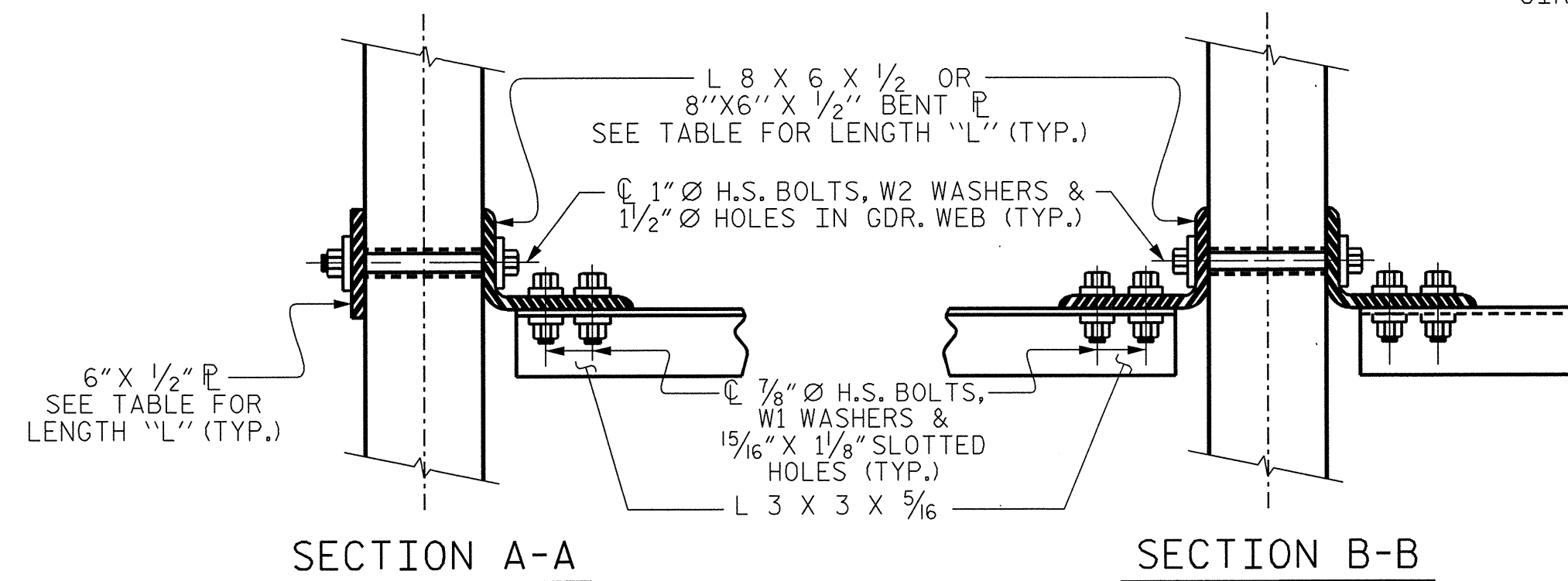
PART SECTION AT INTERMEDIATE DIAPHRAGM

(63" BULB TEE OR 72" BULB TEE GIRDER SHOWN)



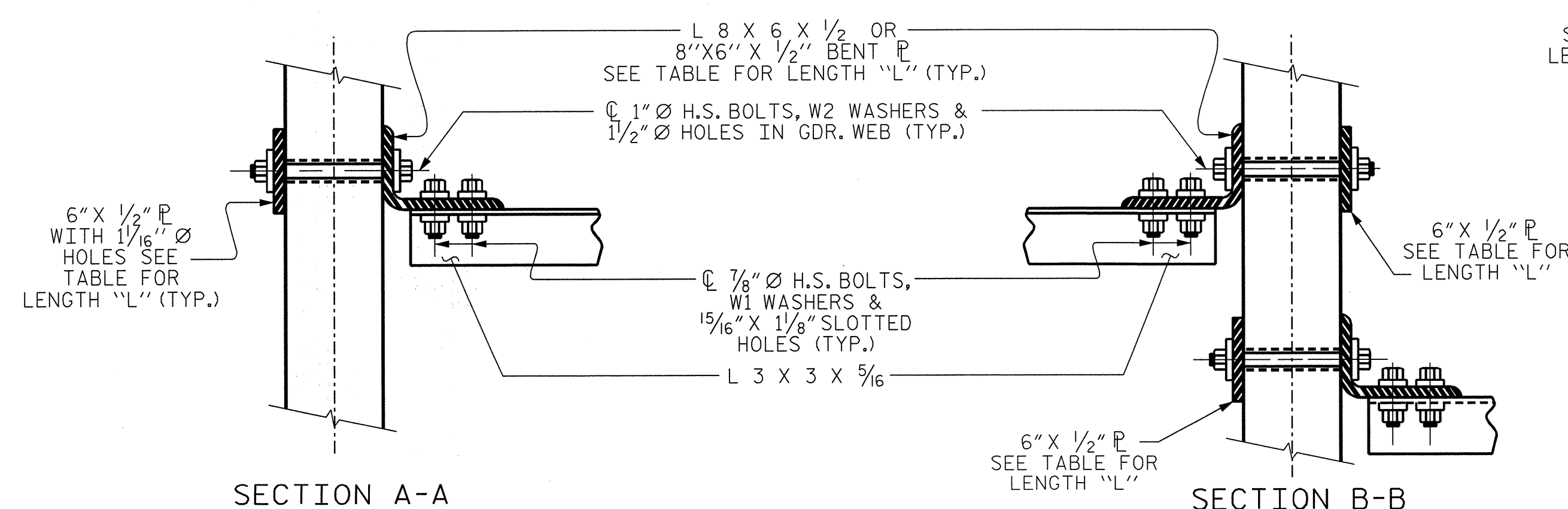
SECTION Y-Y

CONNECTOR PLATE DETAILS



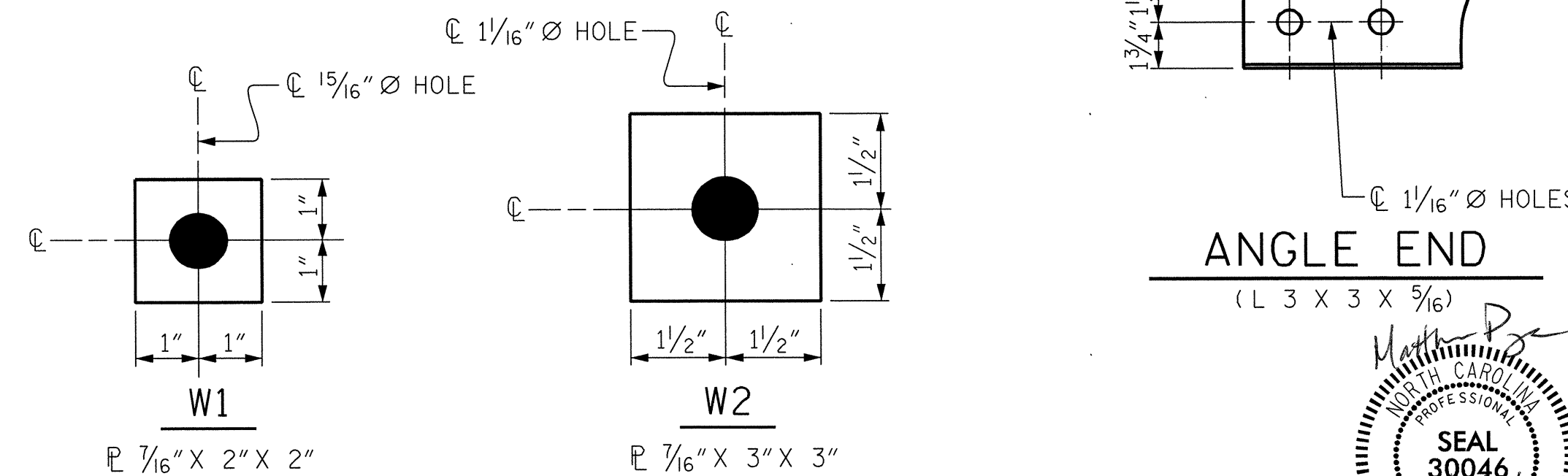
CONNECTION DETAILS

(FOR SKEW = 90°)



CONNECTION DETAILS

(FOR SKEW < 70° OR SKEW > 110°)



USE WITH 7/8" Ø HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT DIAPHRAGM ANGLE TO CONNECTOR PLATE CONNECTIONS

USE WITH 1" Ø HVY. HEX NUTS AT CONNECTOR PLATE TO GIRDER CONNECTIONS

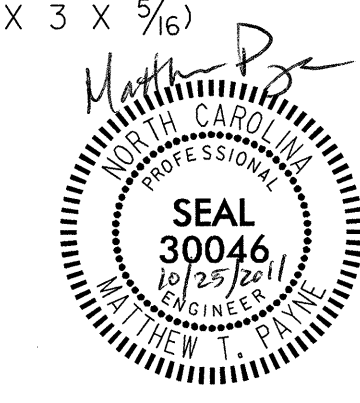
WASHER DETAILS

PROJECT NO. U-5204
CALDWELL COUNTY
STATION: 38+28.13 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
INTERMEDIATE STEEL
DIAPHRAGMS FOR 63"
MODIFIED BULB TEE
PRESTRESSED CONCRETE
GIRDERS



ASSEMBLED BY: R. KNIGHT	DATE: 3/11
CHECKED BY: M. PAYNE	DATE: 6/11
DRAWN BY: RWW 11/09	ADDED 11/23/09
CHECKED BY: GM 11/09	

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2			4		

SHEET NO. S1-10
TOTAL SHEETS 48

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.

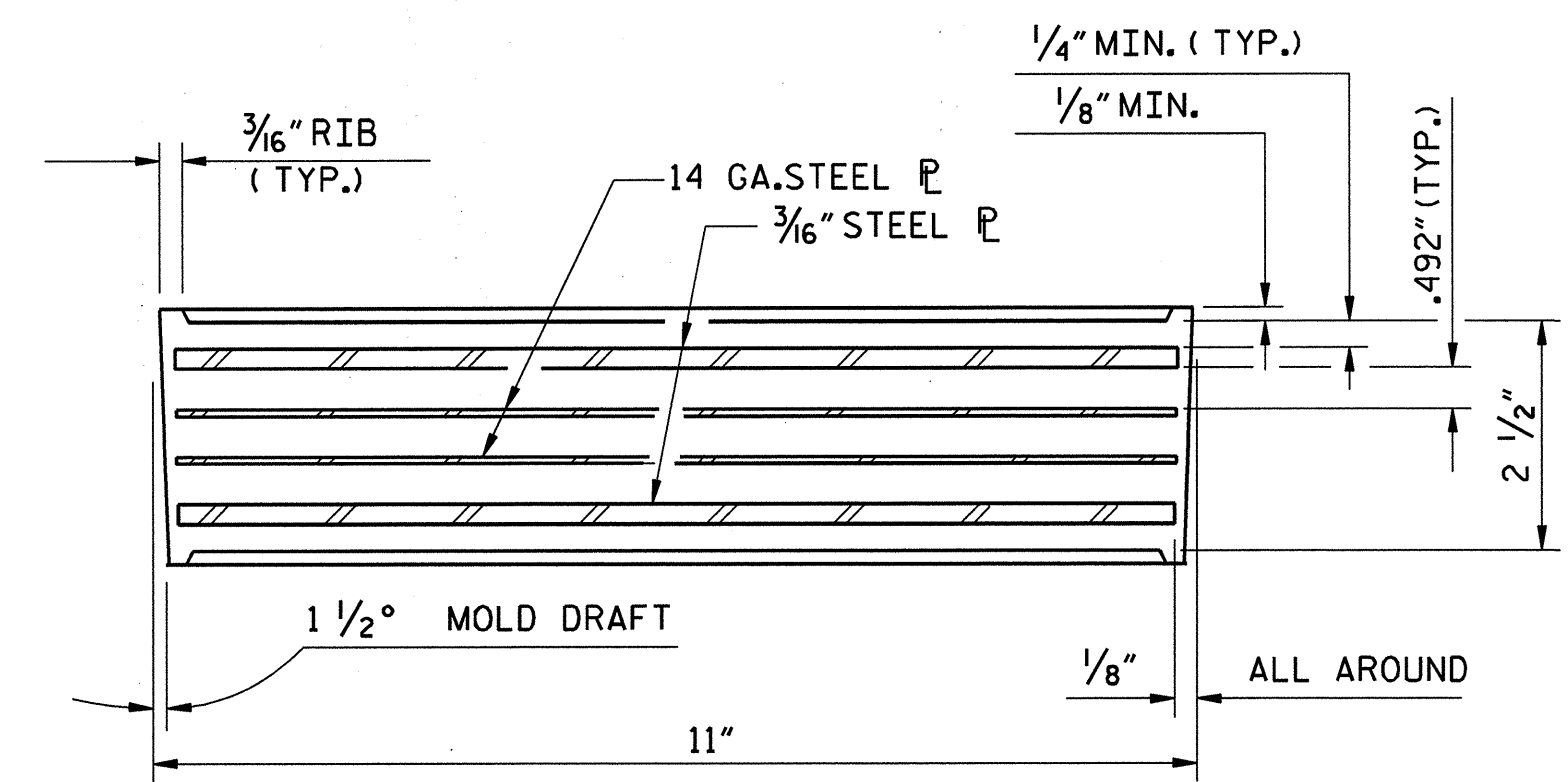
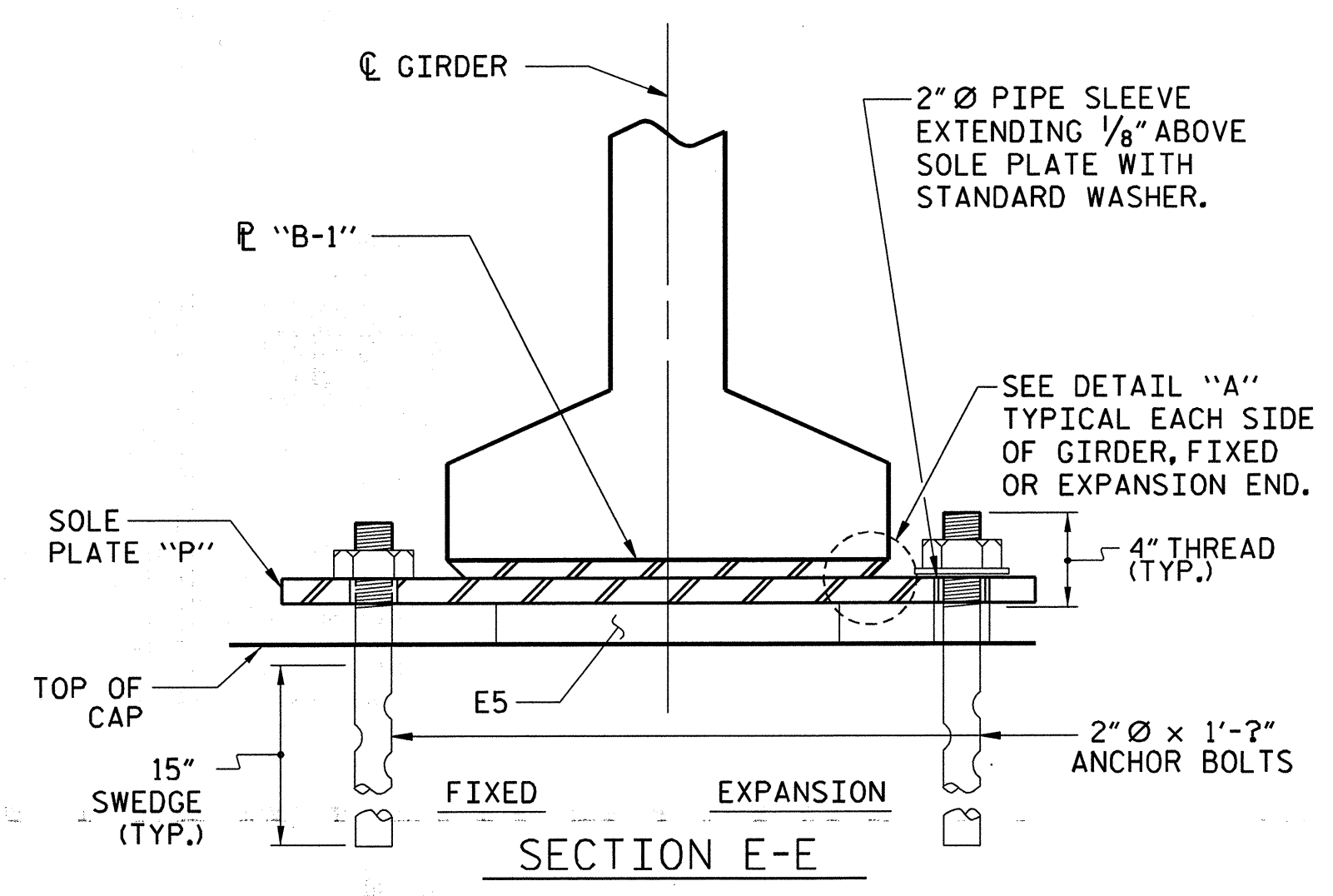
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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.

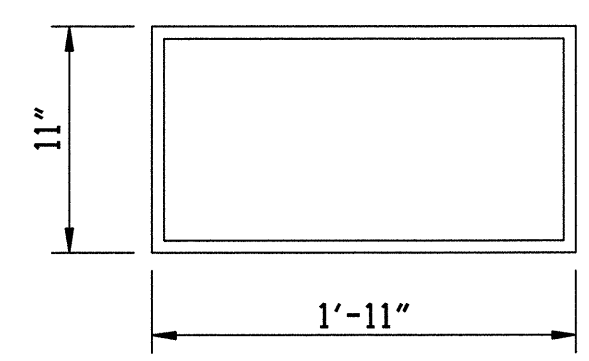
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

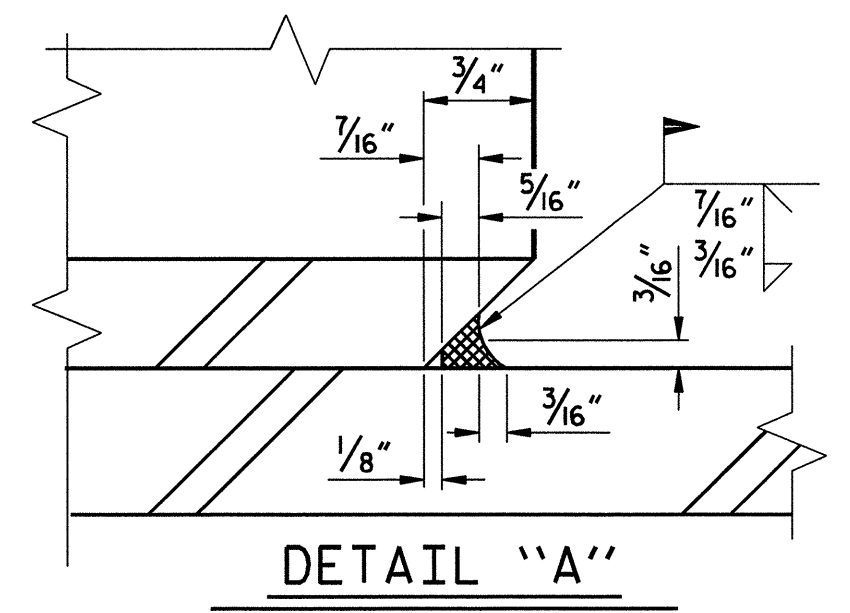
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.



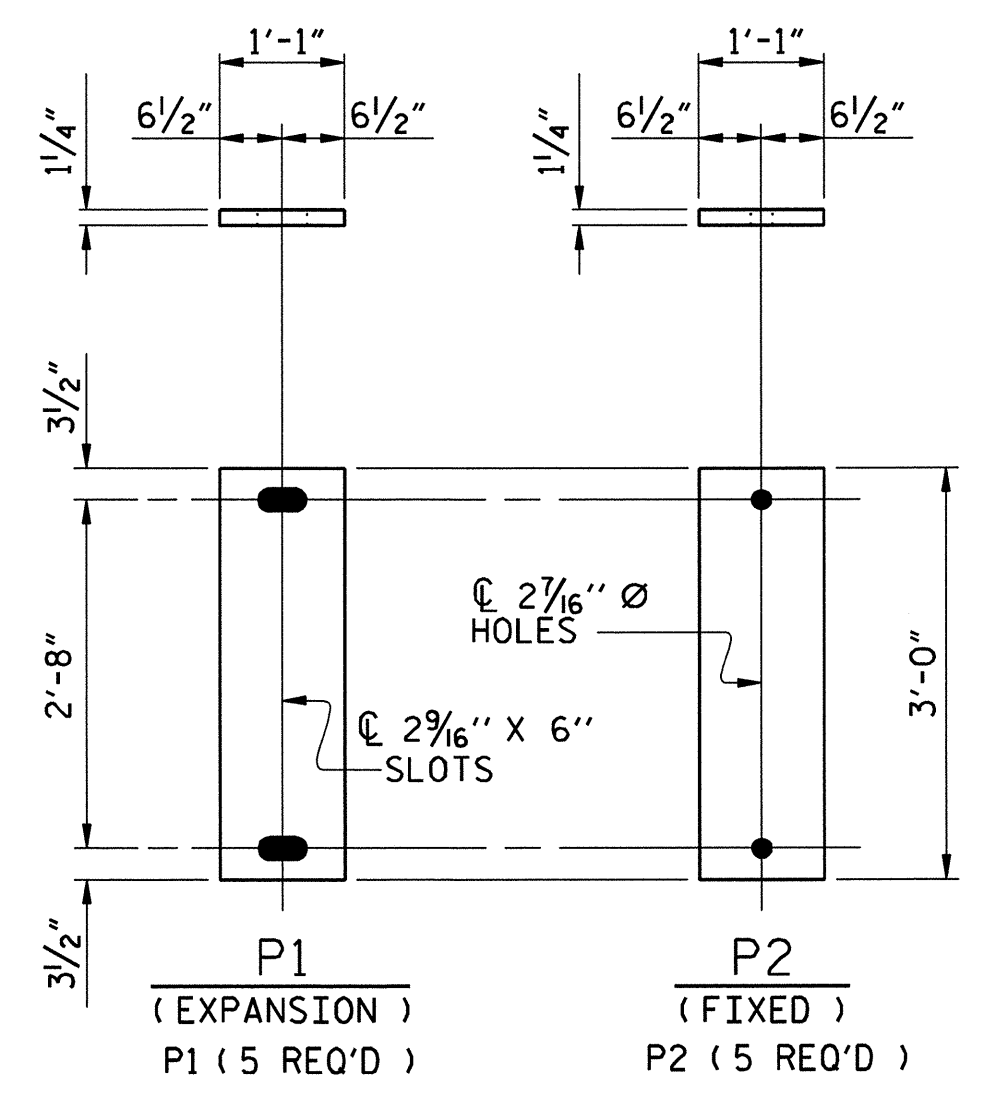
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E5 (10 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE VI



DETAIL "A"



SOLE PLATE DETAILS ("P")

— LOAD RATINGS —	
	MAX.D.L.+ L.L.
TYPE V	180 K
TYPE VI	211 K
TYPE VII	264 K

PROJECT NO. U-5204
CALDWELL COUNTY
STATION: 38+28.13 -L-



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

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2			4			46

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ASSEMBLED BY: A. DAWKINS	DATE: 3/11
CHECKED BY: M. PAYNE	DATE: 6/11
DRAWN BY: EEM 2/97	REV. 8/16/99 RWW/LES
CHECKED BY: VAP 2/97	REV. 10/17/00 RWW/LES
	REV. 5/11/06 TLA/GM

NOTES

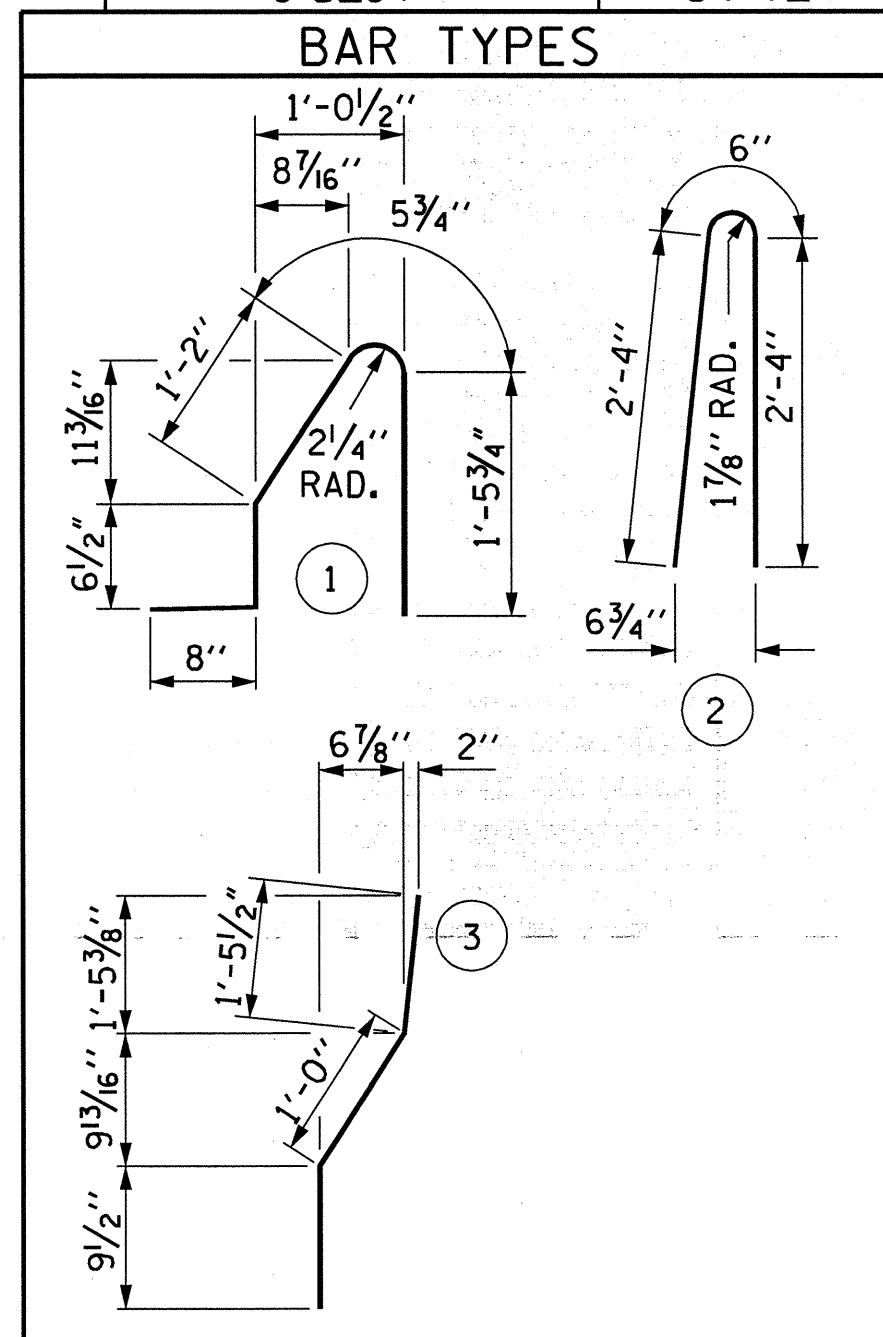
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3 AND #5 S4 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3 AND #5 S4 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

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



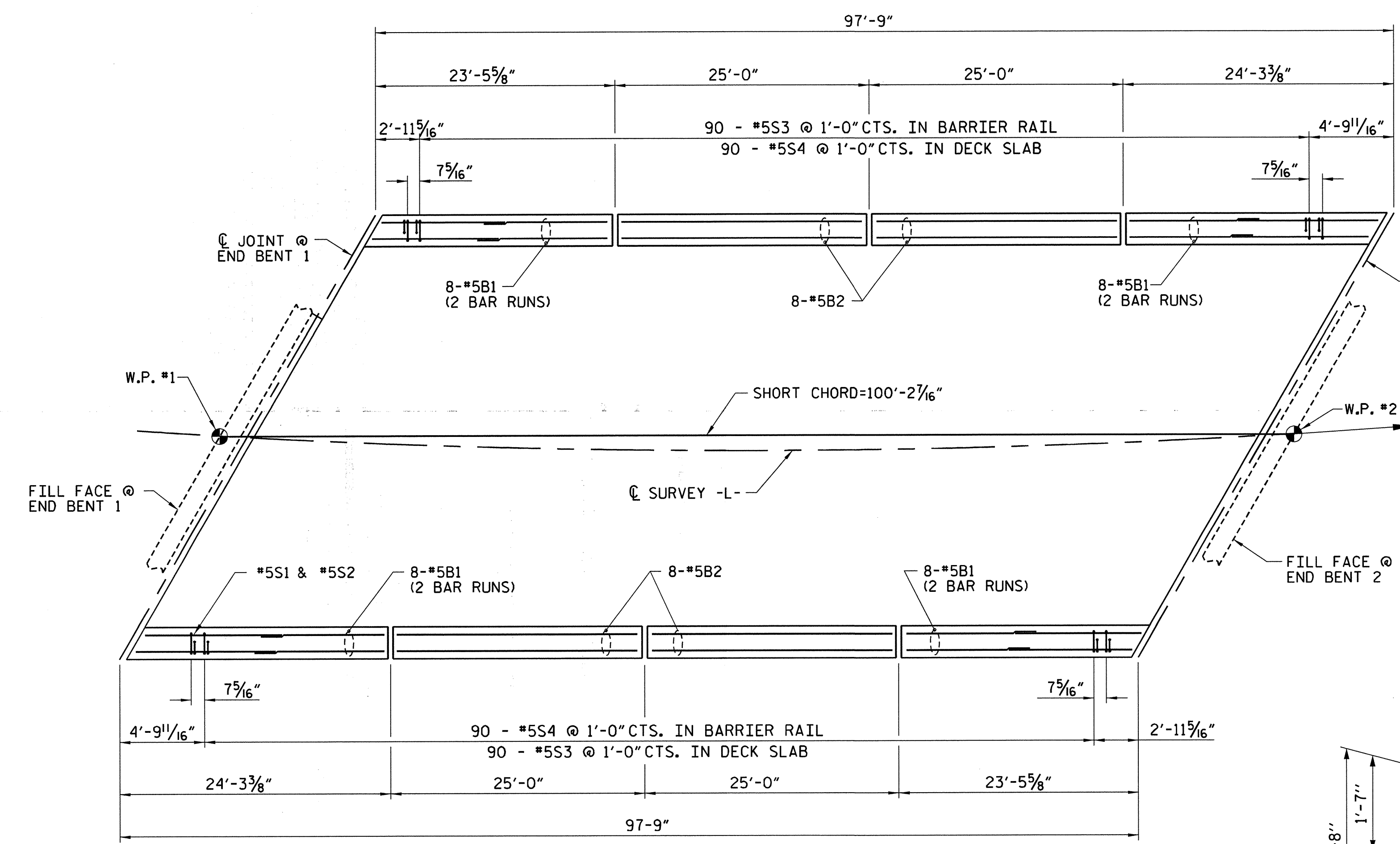
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

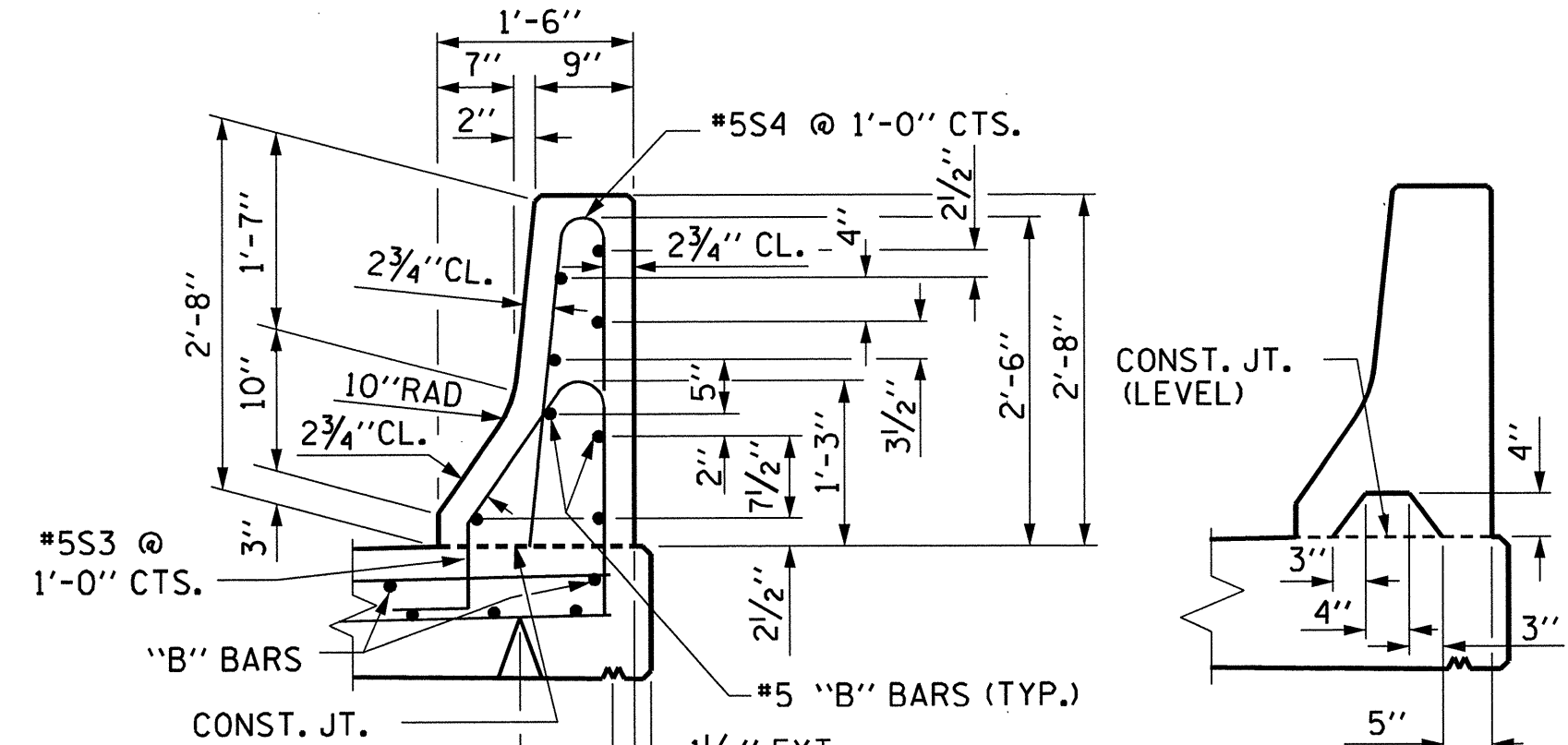
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	64	#5	STR	13'-7"	1,012
* B2	32	#5	STR	24'-6"	818
* S3	180	#5	1	4'-3"	798
* S4	180	#5	2	5'-2"	970
* S5	12	#5	3	3'-3"	41
* S6	12	#5	STR	3'-1"	39

* EPOXY COATED REINFORCING STEEL 3,677 LBS.
 CLASS AA CONCRETE 22.26 CU. YDS.
 CONCRETE BARRIER RAIL 195.17 LIN. FT.



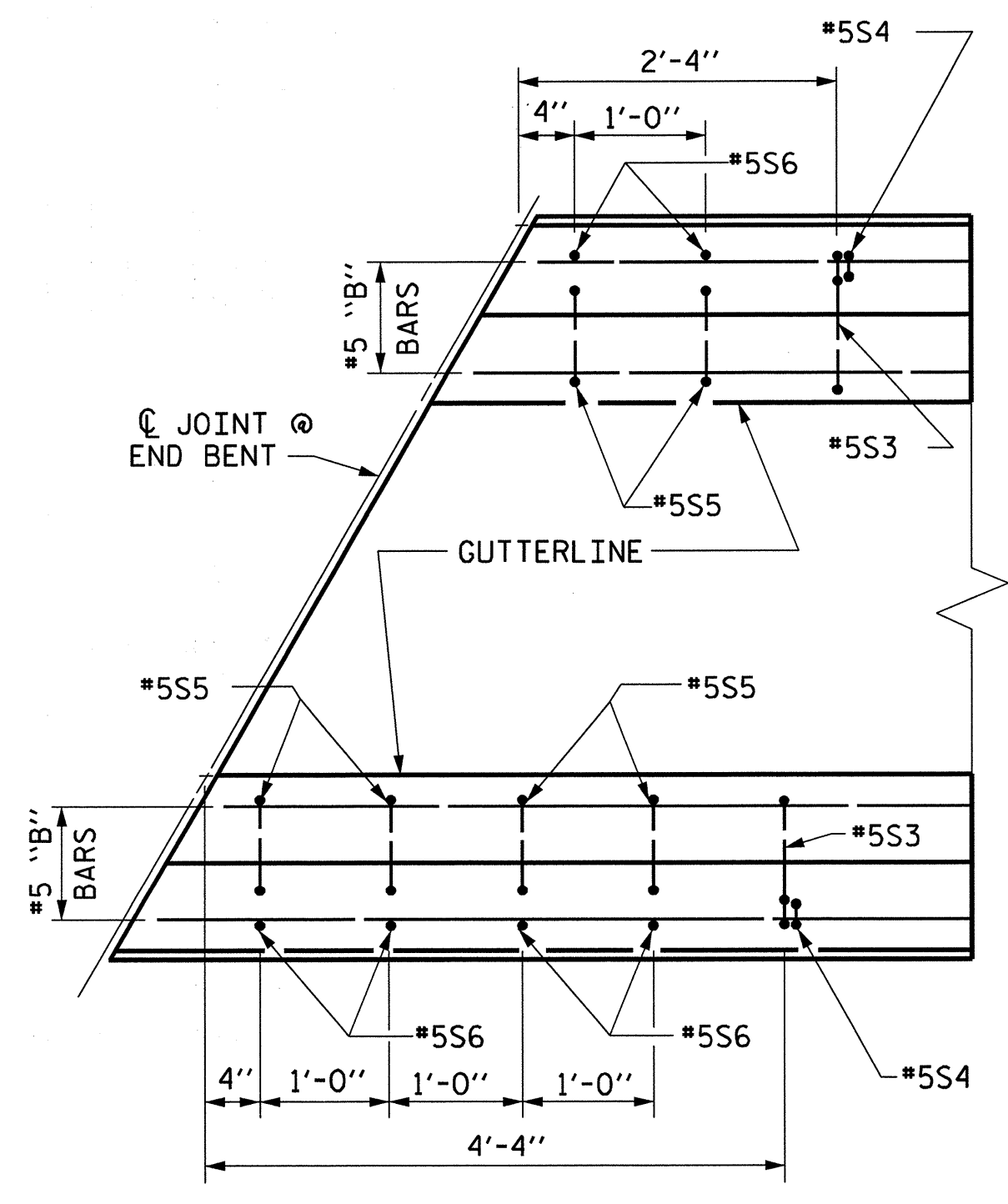
PLAN



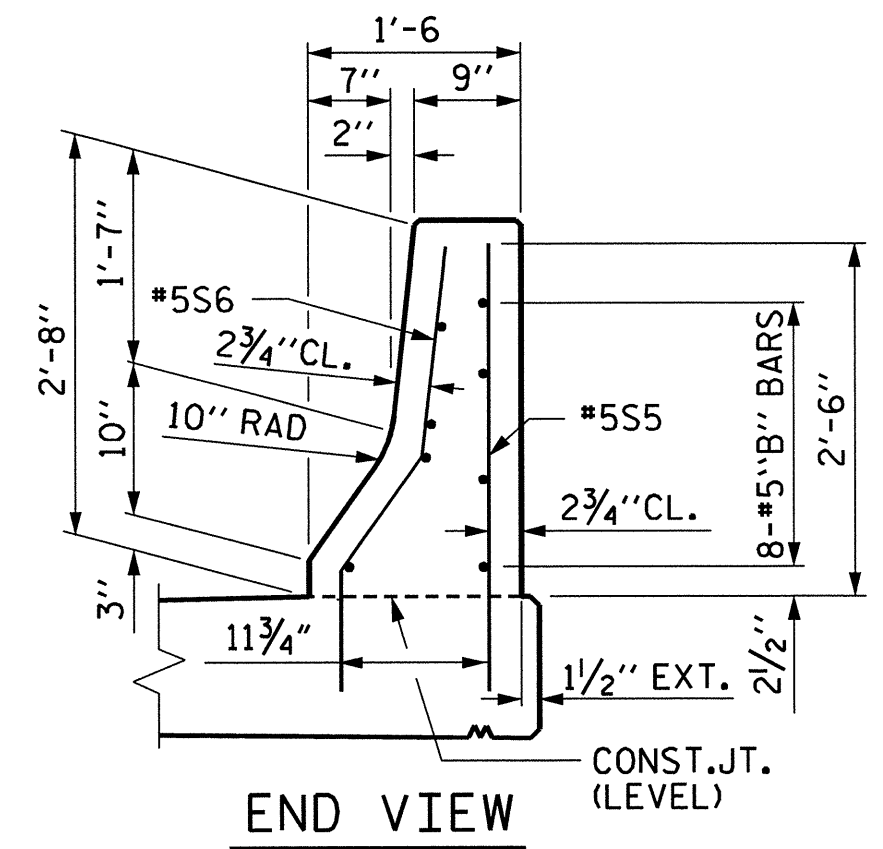
SECTION S-S

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

SECTION THRU RAIL

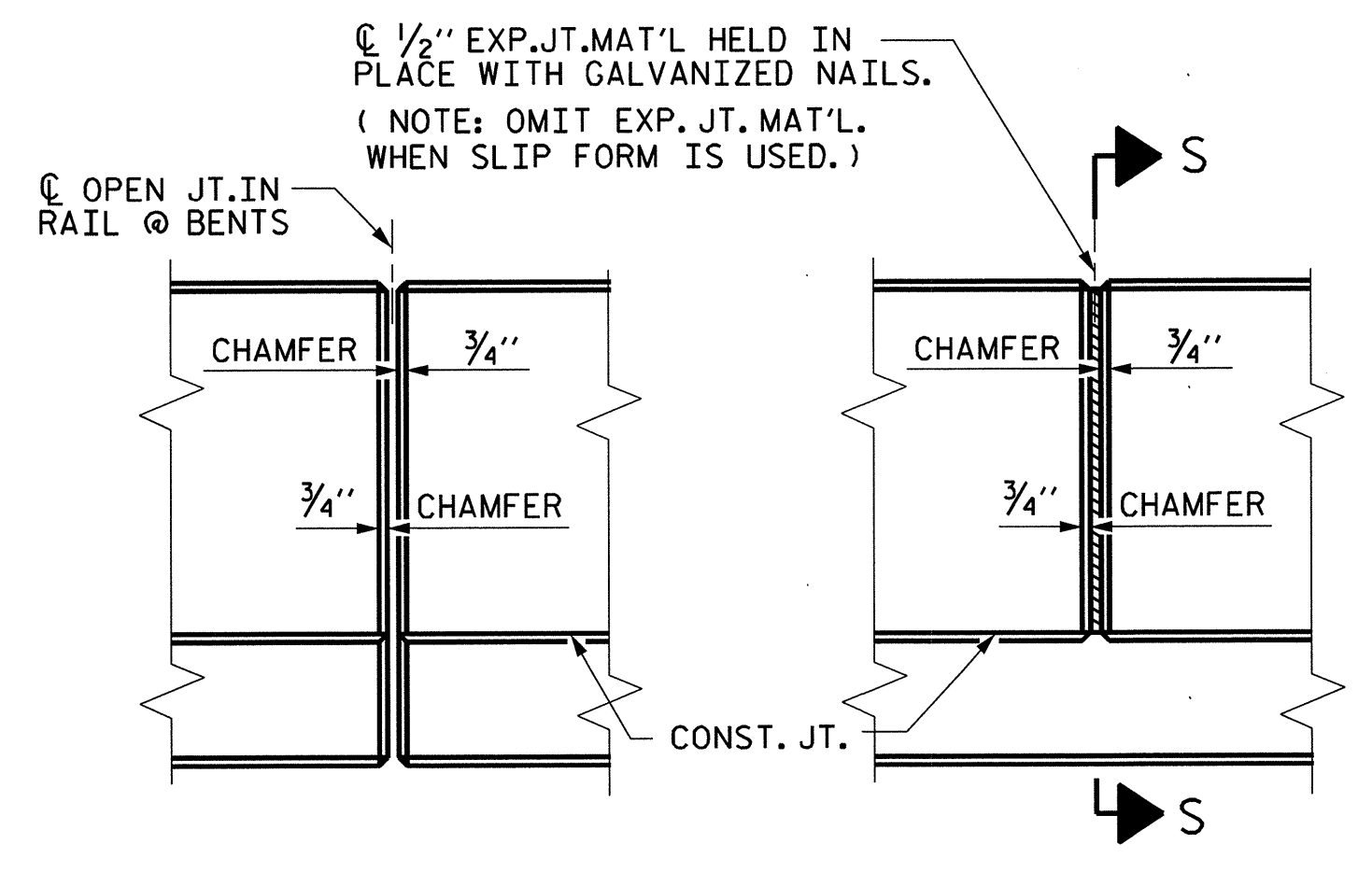


PLAN



END VIEW

END OF RAIL DETAILS FOR ADHESIVE ANCHORING AT SAWED JOINTS



ELEVATION AT EXPANSION JOINTS BARRIER RAIL DETAILS



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 CALDWELL COUNTY
 STATION: 38+28.13 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 CONCRETE
 BARRIER RAIL

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

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ASSEMBLED BY: R. KNIGHT	DATE: 3/11
CHECKED BY: M. PAYNE	DATE: 6/11
DRAWN BY: ARB 5/87	REV. 10/17/00 RWW/LES
CHECKED BY: SJD 9/87	REV. 5/17/03R RWW/JTE
	REV. 5/1/06R TLA/GM

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 4 - 3/8" Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

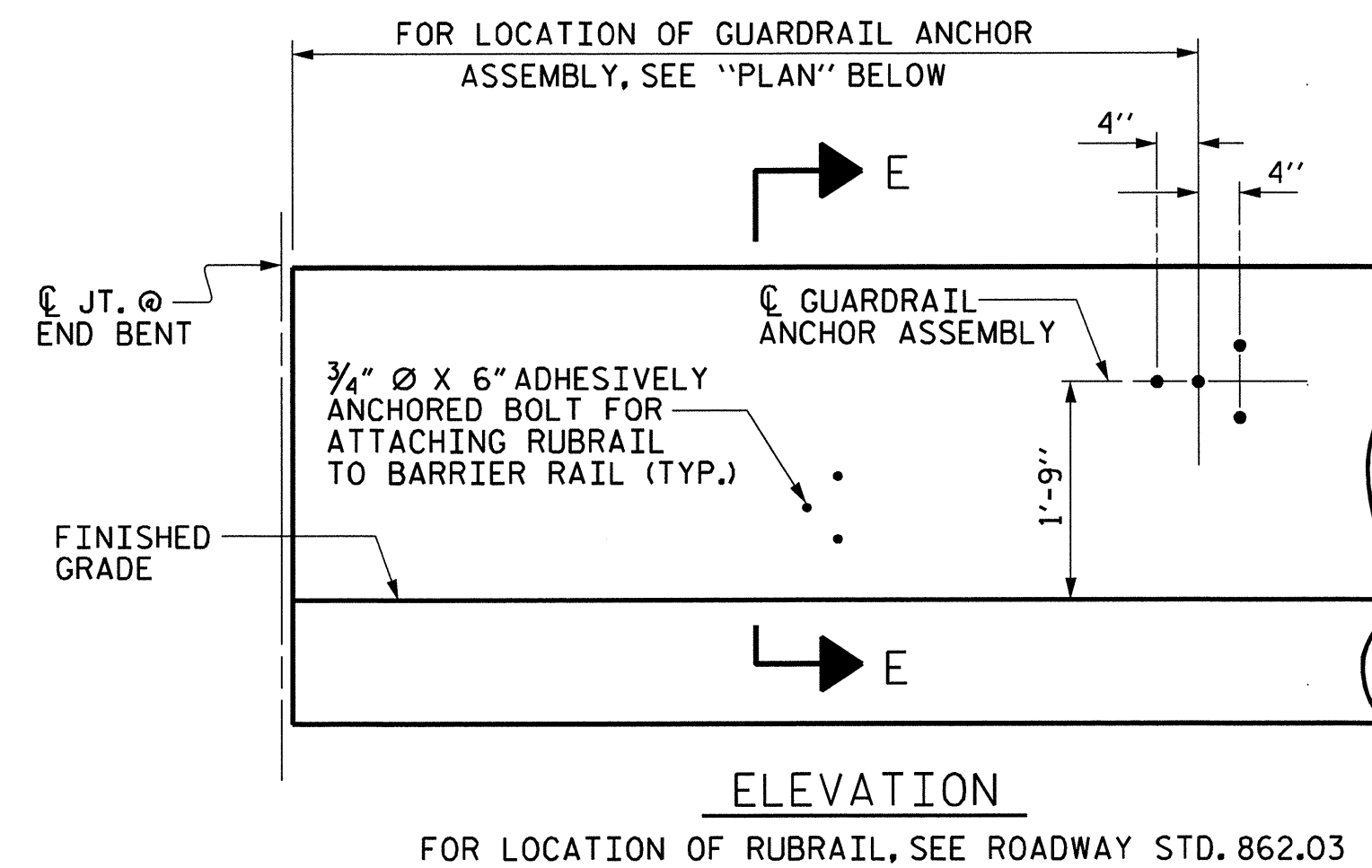
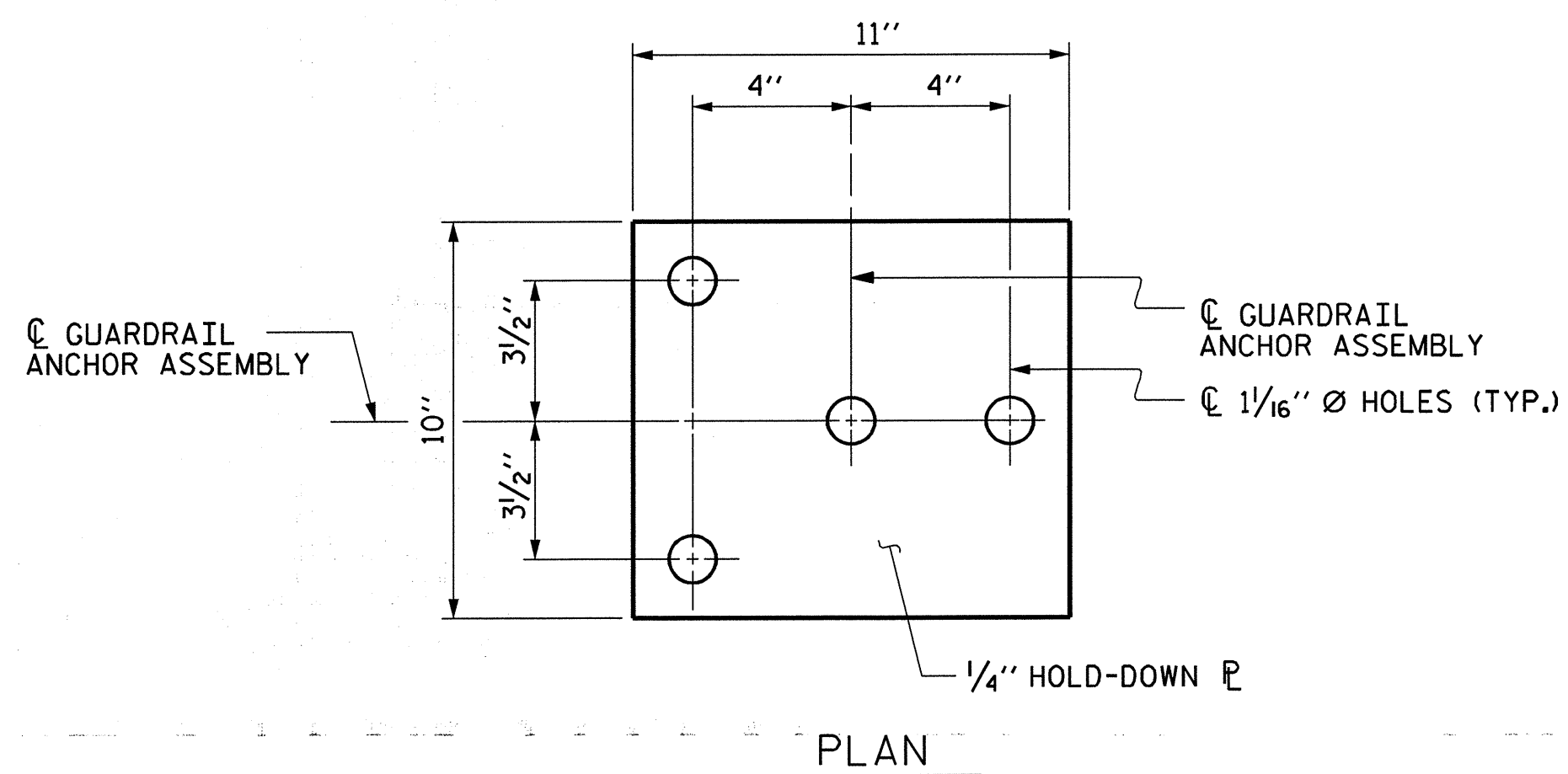
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

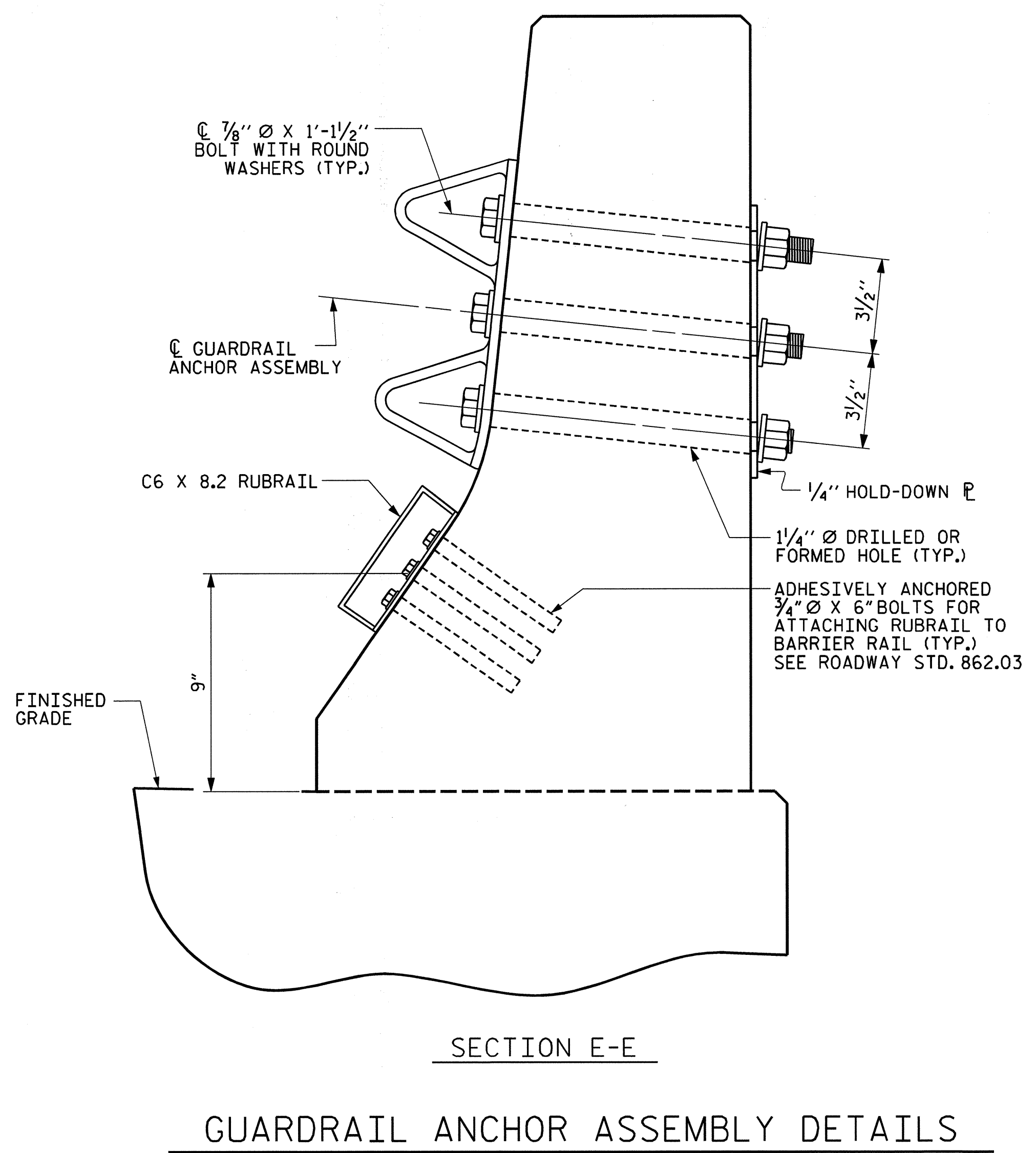
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

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

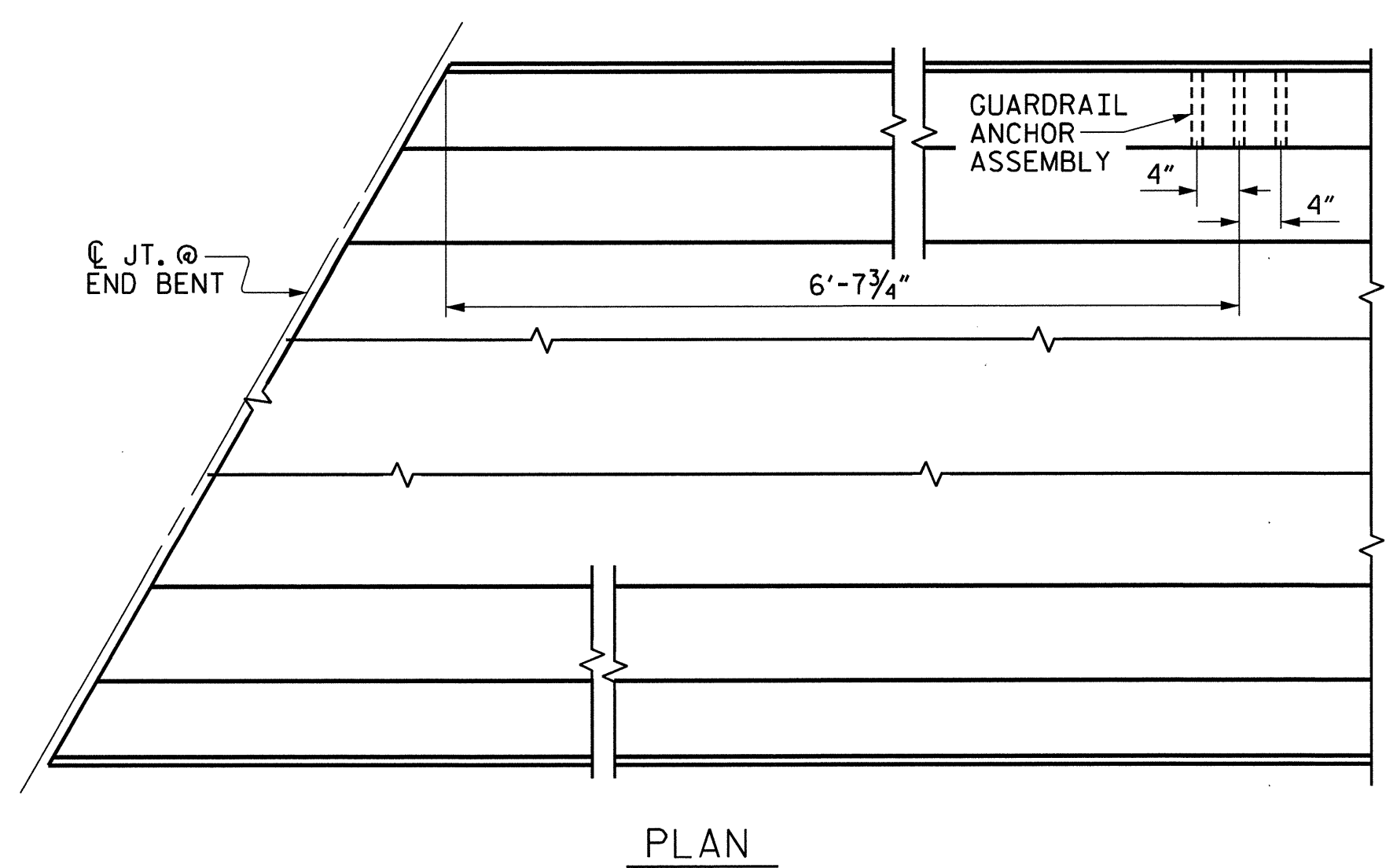


ELEVATION
FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



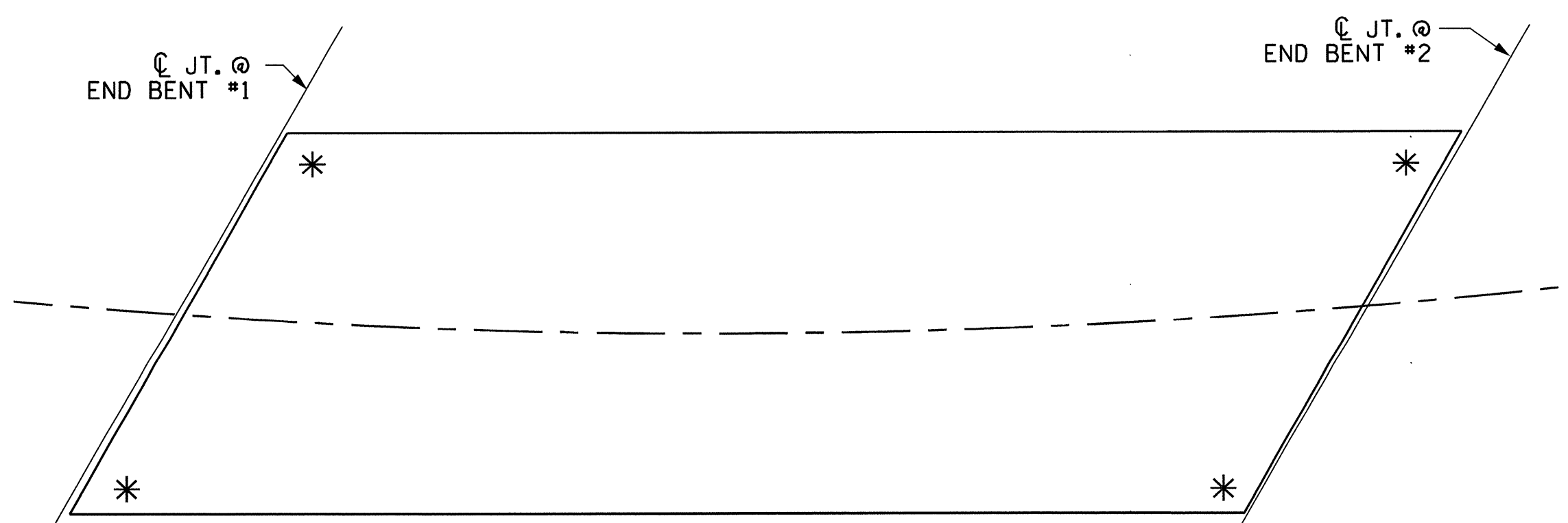
SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

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PROJECT NO. U-5204
CALDWELL COUNTY
STATION: 38+28.13 -L-

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

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1			3			TOTAL SHEETS
2			4			46

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DRAWN BY : R. KNIGHT DATE : 3/11
CHECKED BY : M. PAYNE DATE : 6/11

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	117	# 5	STR	41'-9"	5,095	A201	2	# 5	STR	40'-8"	85	* B1	124	# 4	STR	26'-7"	2,202
* A2	117	# 5	STR	41'-9"	5,095	A202	2	# 5	STR	39'-7"	83	B2	128	# 4	STR	26'-7"	3,549
* A101	2	# 5	STR	40'-8"	85	A203	2	# 5	STR	38'-6"	80	* C1	2	# 5	STR	48'-3"	101
* A102	2	# 5	STR	39'-7"	83	A204	2	# 5	STR	37'-5"	78	* K1	12	# 8	2	12'-4"	395
* A103	2	# 5	STR	38'-6"	80	A205	2	# 5	STR	36'-4"	76	* K2	8	# 8	1	12'-7"	269
* A104	2	# 5	STR	37'-5"	78	A206	2	# 5	STR	35'-3"	74	* K3	4	# 6	STR	48'-3"	290
* A105	2	# 5	STR	36'-4"	76	A207	2	# 5	STR	34'-2"	71	* K4	32	# 8	5	11'-2"	954
* A106	2	# 5	STR	35'-3"	74	A208	2	# 5	STR	33'-1"	69	* S1	88	# 5	3	6'-4"	581
* A107	2	# 5	STR	34'-2"	71	A209	2	# 5	STR	32'-0"	67	* S2	88	# 5	4	3'-2"	291
* A108	2	# 5	STR	33'-1"	69	A210	2	# 5	STR	30'-11"	64						
* A109	2	# 5	STR	32'-0"	67	A211	2	# 5	STR	29'-10"	62						
* A110	2	# 5	STR	30'-11"	64	A212	2	# 5	STR	28'-9"	60						
* A111	2	# 5	STR	29'-10"	62	A213	2	# 5	STR	27'-8"	58						
* A112	2	# 5	STR	28'-9"	60	A214	2	# 5	STR	26'-7"	55						
* A113	2	# 5	STR	27'-8"	58	A215	2	# 5	STR	25'-6"	53						
* A114	2	# 5	STR	26'-7"	55	A216	2	# 5	STR	24'-5"	51						
* A115	2	# 5	STR	25'-6"	53	A217	2	# 5	STR	23'-4"	49						
* A116	2	# 5	STR	24'-5"	51	A218	2	# 5	STR	22'-3"	46						
* A117	2	# 5	STR	23'-4"	49	A219	2	# 5	STR	21'-2"	44						
* A118	2	# 5	STR	22'-3"	46	A220	2	# 5	STR	20'-1"	42						
* A119	2	# 5	STR	21'-2"	44	A221	2	# 5	STR	19'-0"	40						
* A120	2	# 5	STR	20'-1"	42	A222	2	# 5	STR	17'-11"	37						
* A121	2	# 5	STR	19'-0"	40	A223	2	# 5	STR	16'-10"	35						
* A122	2	# 5	STR	17'-11"	37	A224	2	# 5	STR	15'-9"	33						
* A123	2	# 5	STR	16'-10"	35	A225	2	# 5	STR	14'-8"	31						
* A124	2	# 5	STR	15'-9"	33	A226	2	# 5	STR	13'-7"	28						
* A125	2	# 5	STR	14'-8"	31	A227	2	# 5	STR	12'-6"	26						
* A126	2	# 5	STR	13'-7"	28	A228	2	# 5	STR	11'-5"	24						
* A127	2	# 5	STR	12'-6"	26	A229	2	# 5	STR	10'-4"	22						
* A128	2	# 5	STR	11'-5"	24	A230	2	# 5	STR	9'-3"	19						
* A129	2	# 5	STR	10'-4"	22	A231	2	# 5	STR	8'-2"	17						
* A130	2	# 5	STR	9'-3"	19	A232	2	# 5	STR	7'-1"	15						
* A131	2	# 5	STR	8'-2"	17	A233	2	# 5	STR	6'-0"	13						
* A132	2	# 5	STR	7'-1"	15	A234	2	# 5	STR	4'-11"	10						
* A133	2	# 5	STR	6'-0"	13	A235	2	# 5	STR	3'-10"	8						
* A134	2	# 5	STR	4'-11"	10	A236	2	# 5	STR	2'-9"	6						
* A135	2	# 5	STR	3'-10"	8	A237	6	# 5	STR	1'-8"	10						
* A136	2	# 5	STR	2'-9"	6												
* A137	6	# 5	STR	1'-8"	10												

* DENOTES EPOXY COATED REINFORCING STEEL

1

	PROJECT REFERENCE NO. U-5204	SHEET NO. S1-14
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BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

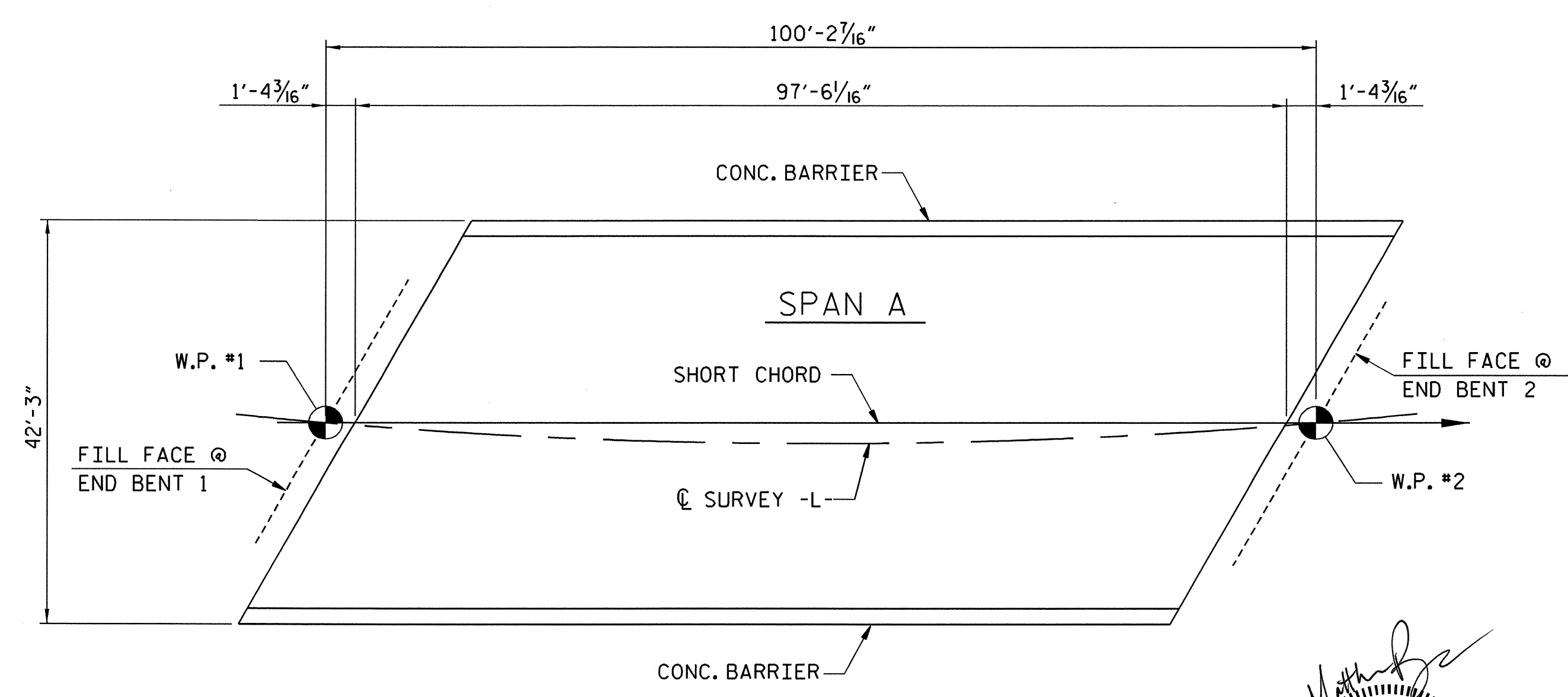
SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
SPAN A	126.40	10,284	11,487
TOTALS**	126.40	10,284	11,487

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

1

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 4,112)

GROOVING BRIDGE FLOORS	
APPROACH SLABS	1,020 SO.FT.
BRIDGE DECK	3,803 SO.FT.
TOTAL	4,823 SO.FT.



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Raleigh, NC 27605-3322

PROJECT NO. U-5204
CALDWELL COUNTY
STATION: 38+28.13 -L-

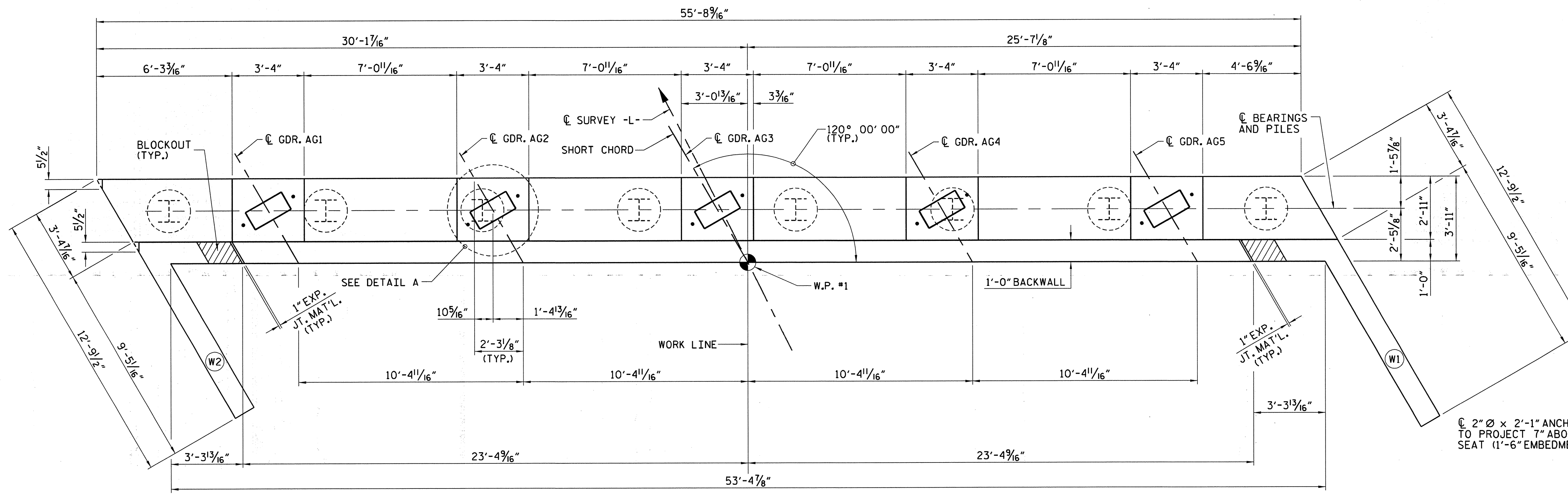
SHEET 1 OF 1

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

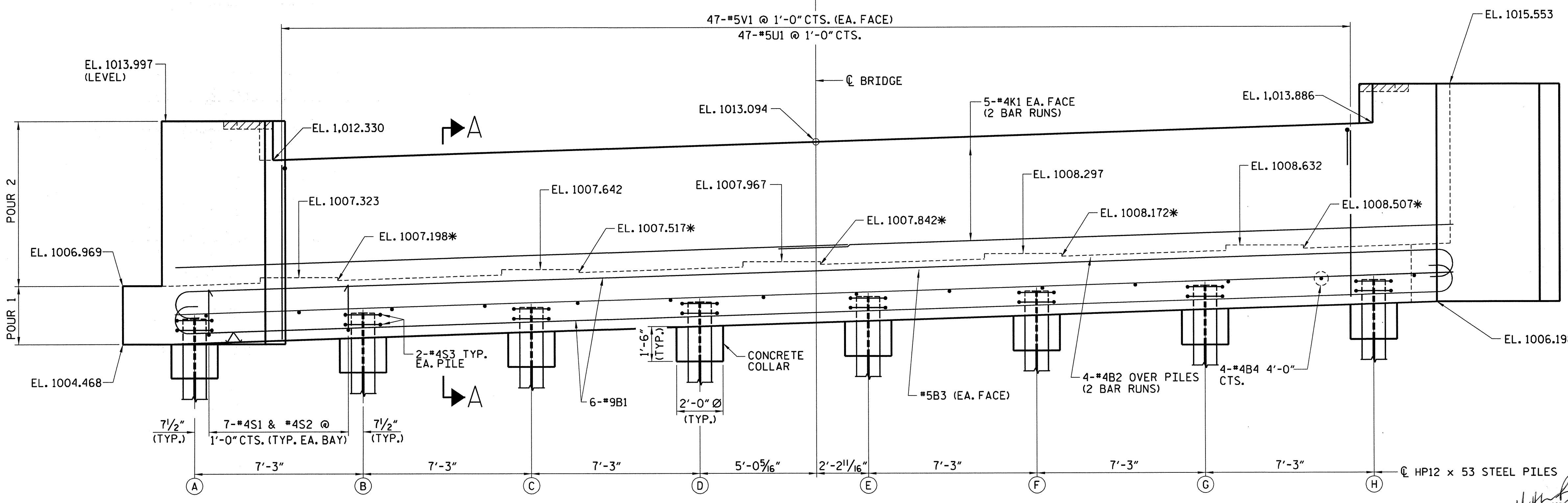
STANDARD SUPERSTRUCTURE BILL OF MATERIAL

REVISIONS						SHEET NO. S1-14
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
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2			4			46

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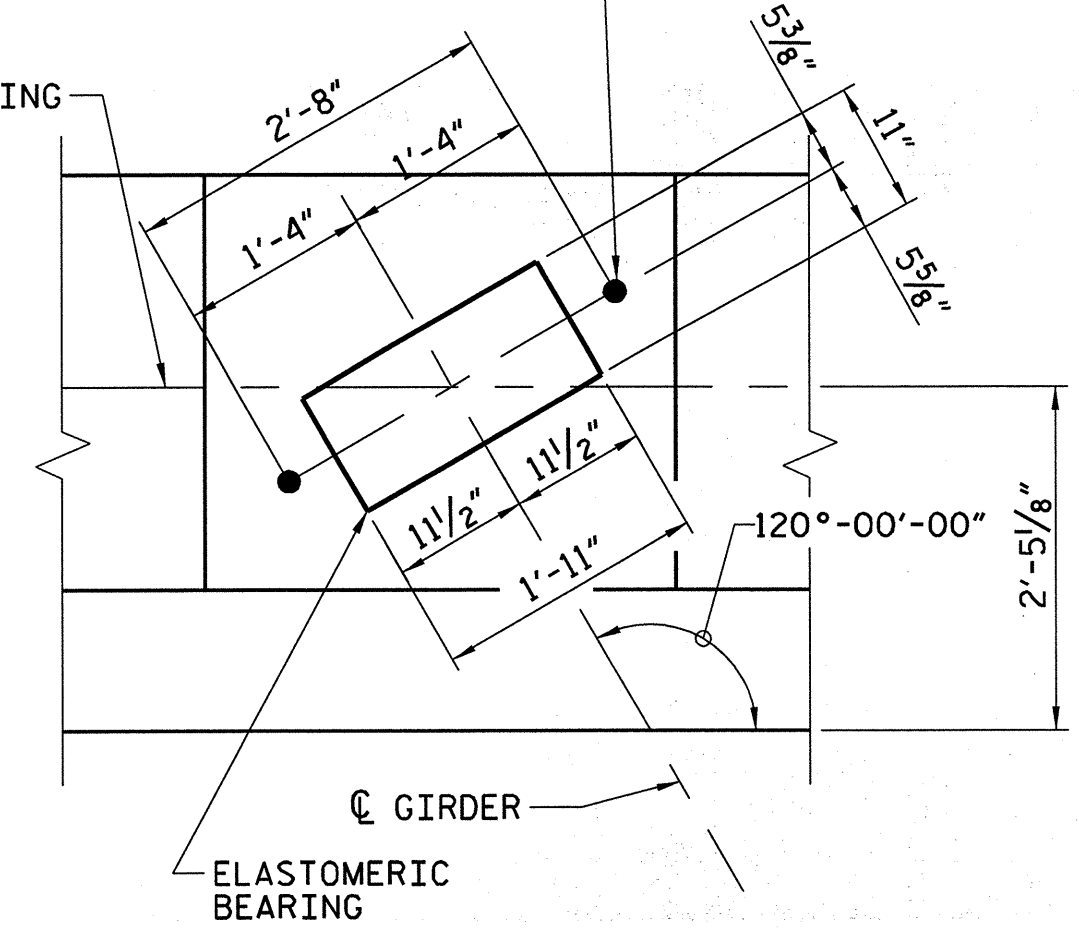


PLAN



ELEVATION

* TOP OF CAP BETWEEN BRIDGE SEATS BUILD-UPS IS 1/4" MINIMUM BELOW BRIDGE SEAT



DETAIL "A"

PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 38+28.13 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT 1**

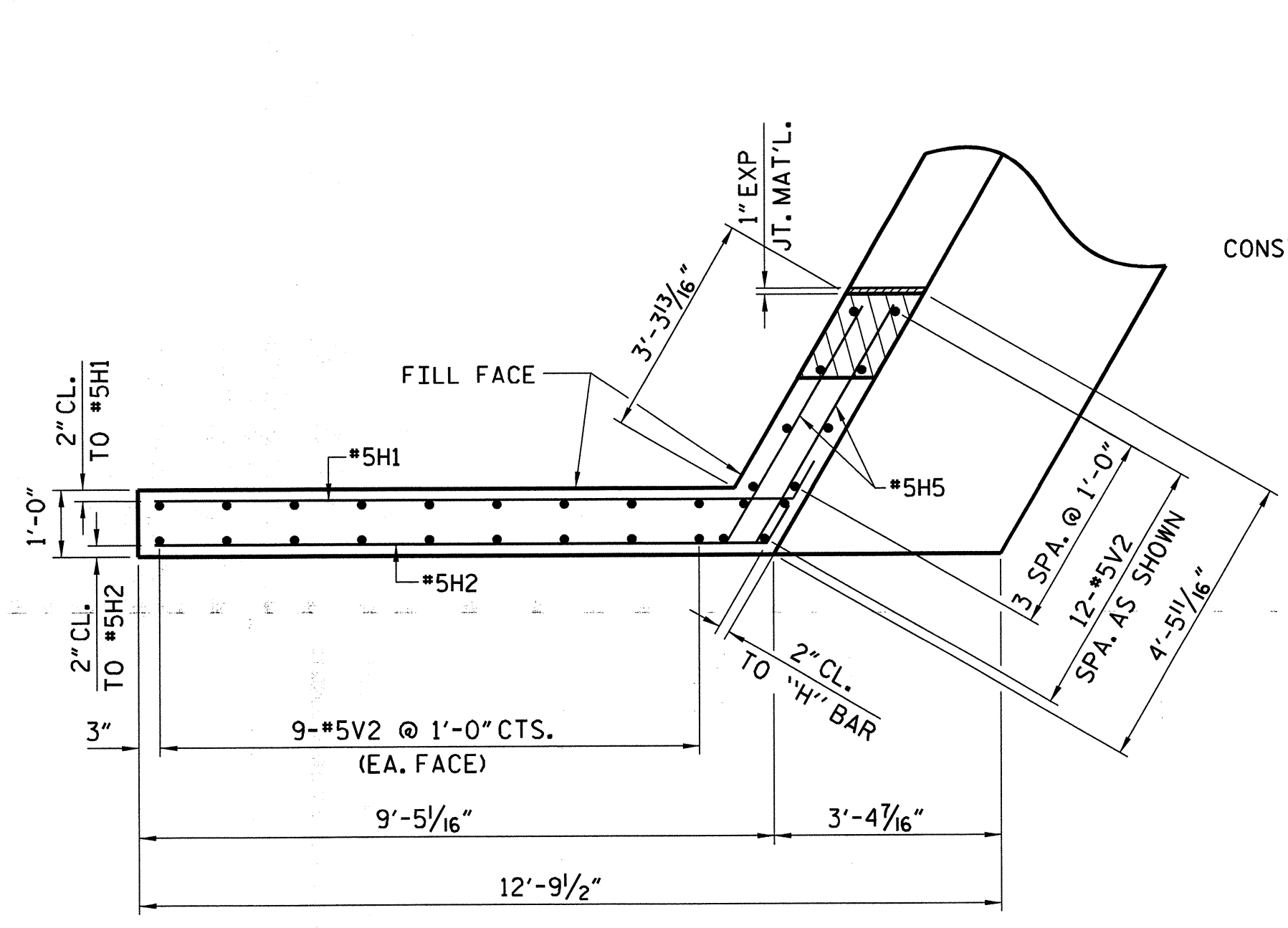


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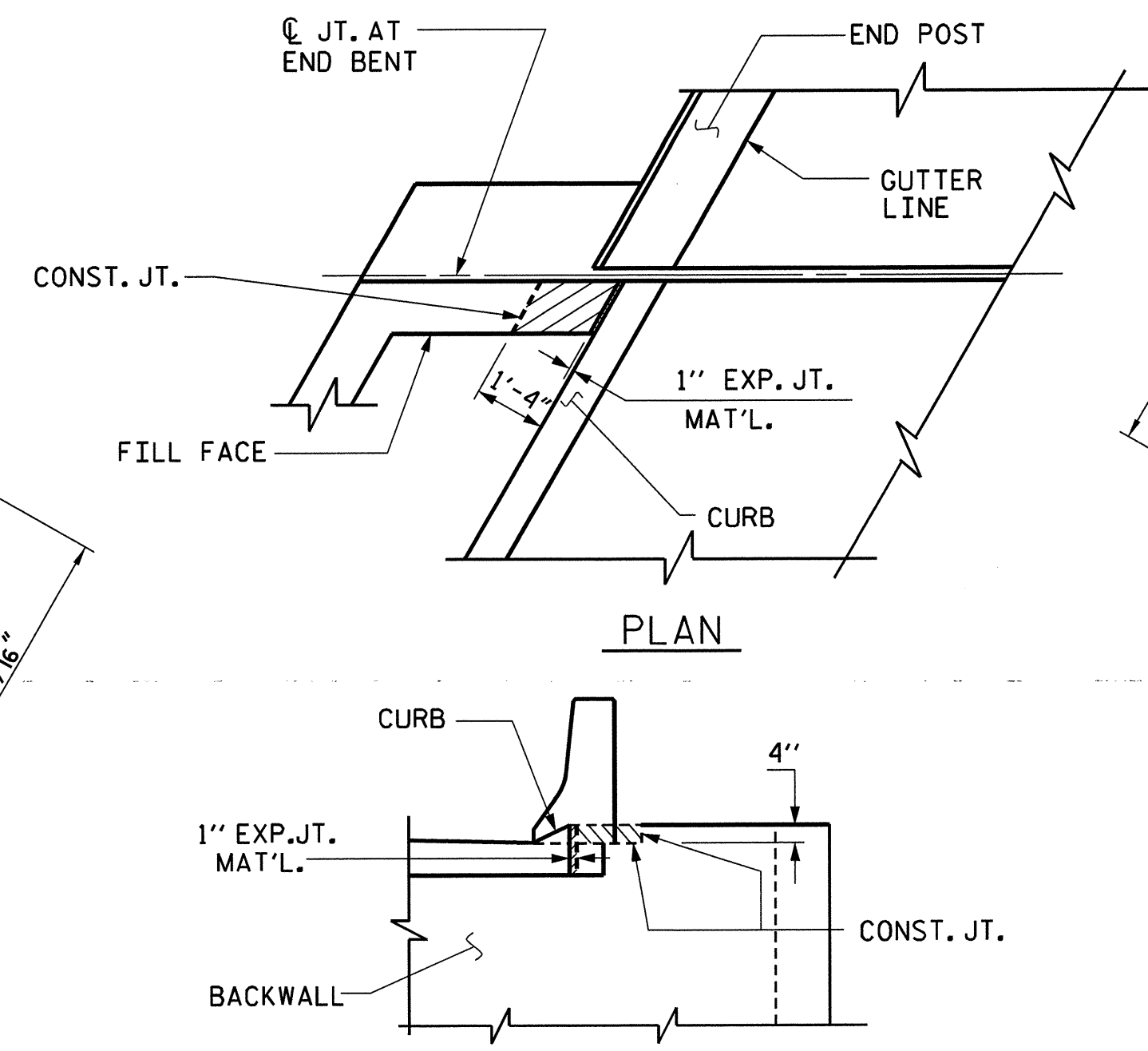
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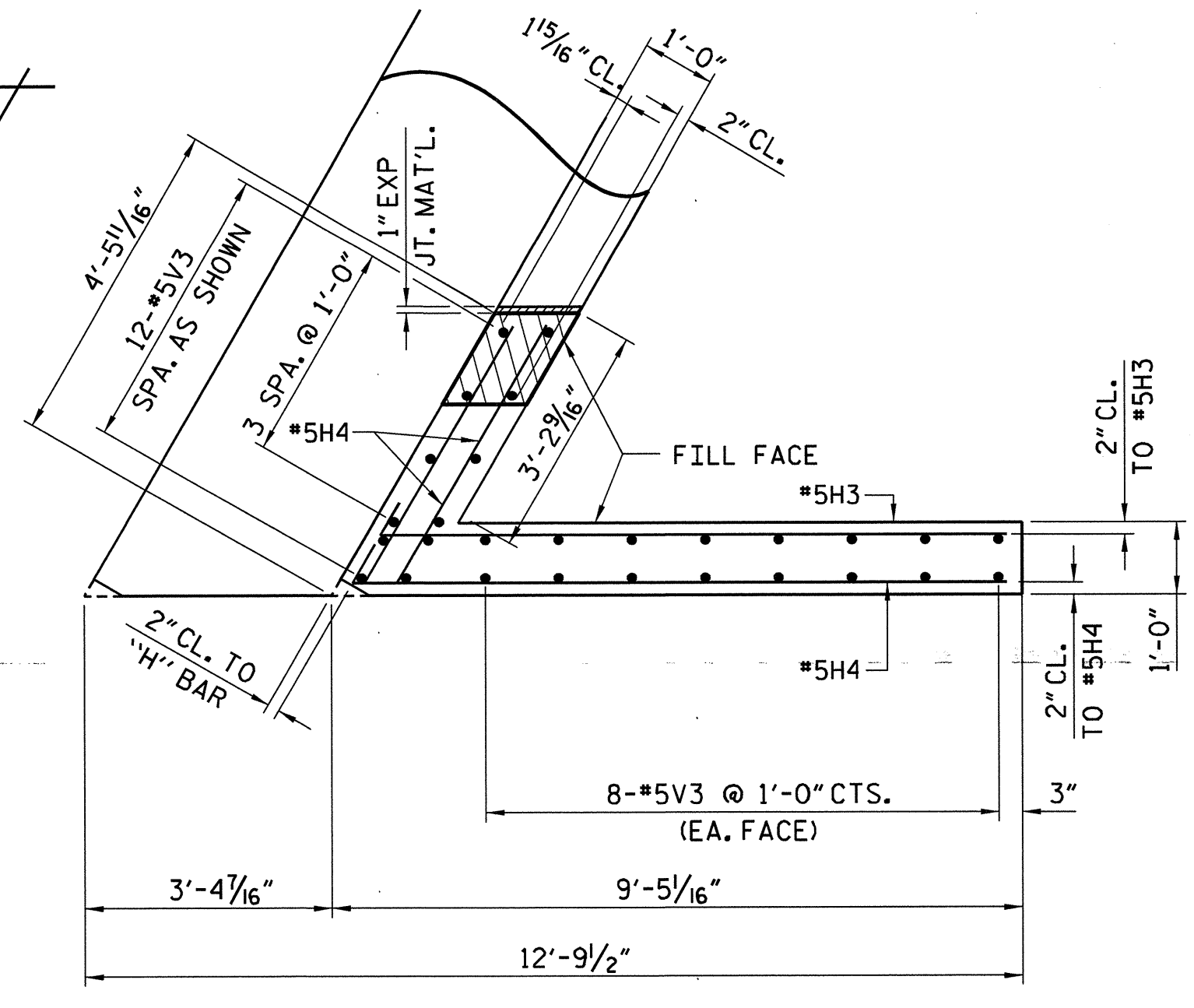
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PLAN - W1



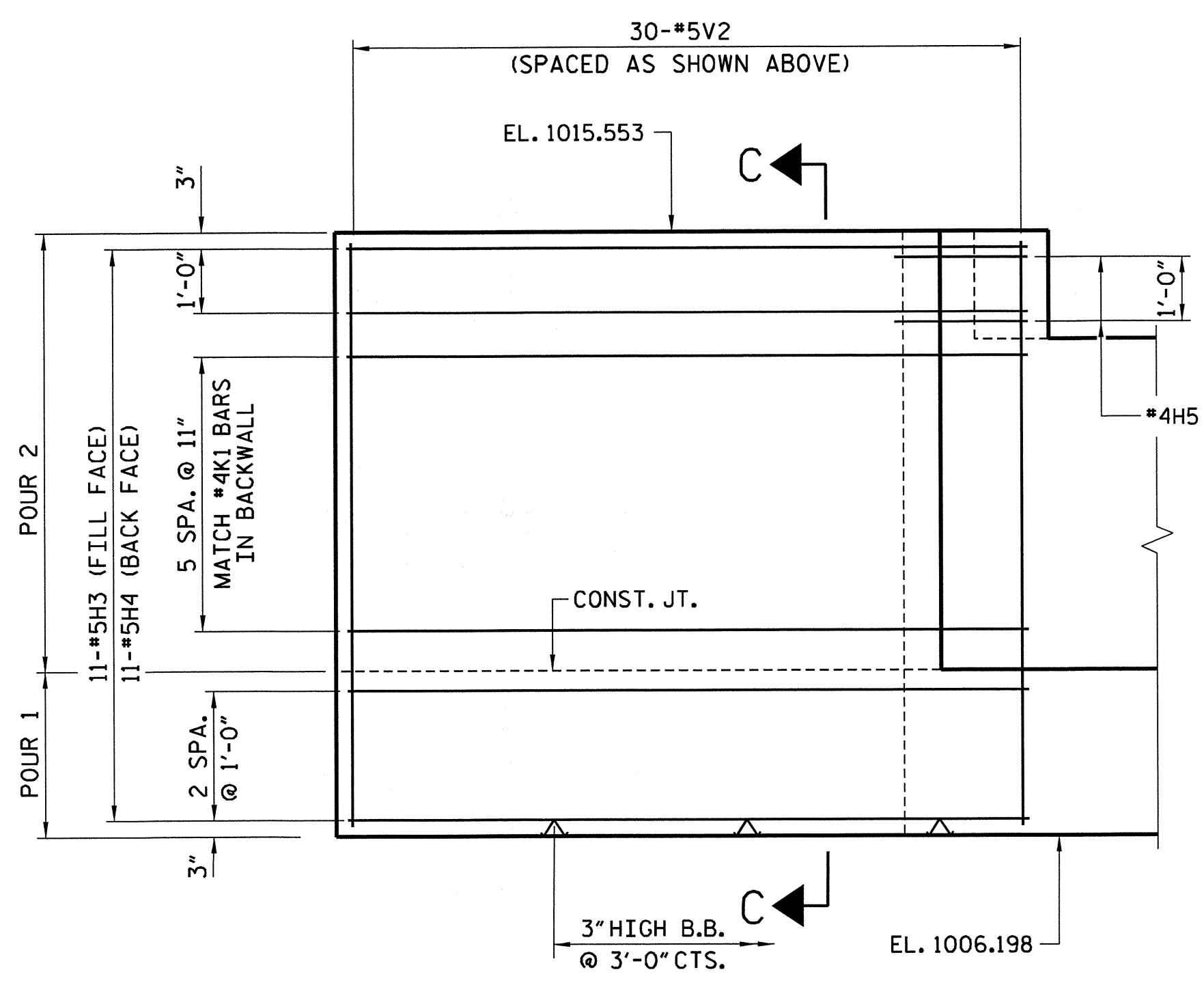
ELEVATION



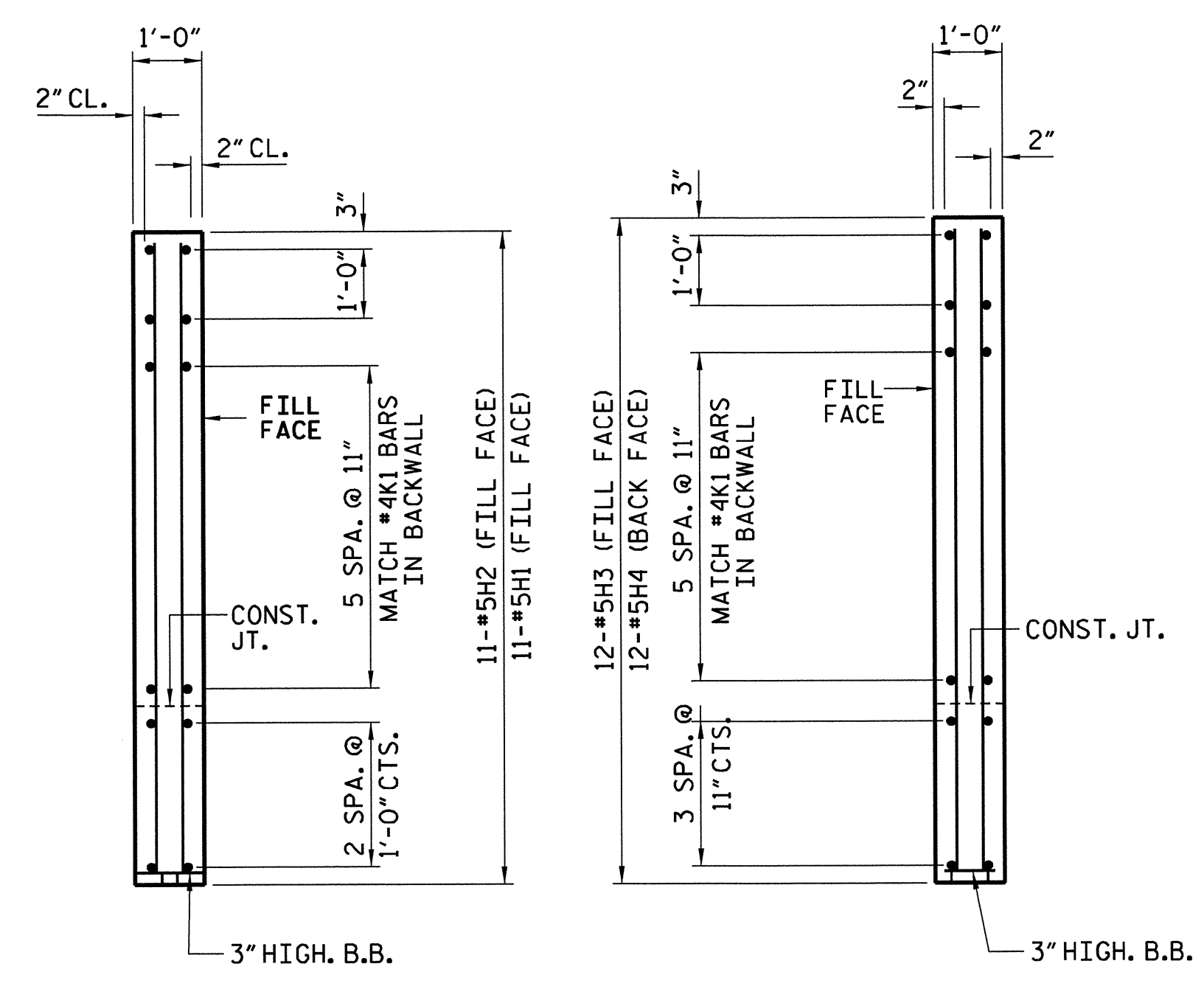
PLAN - W2

BLOCKOUT IN WING WALL

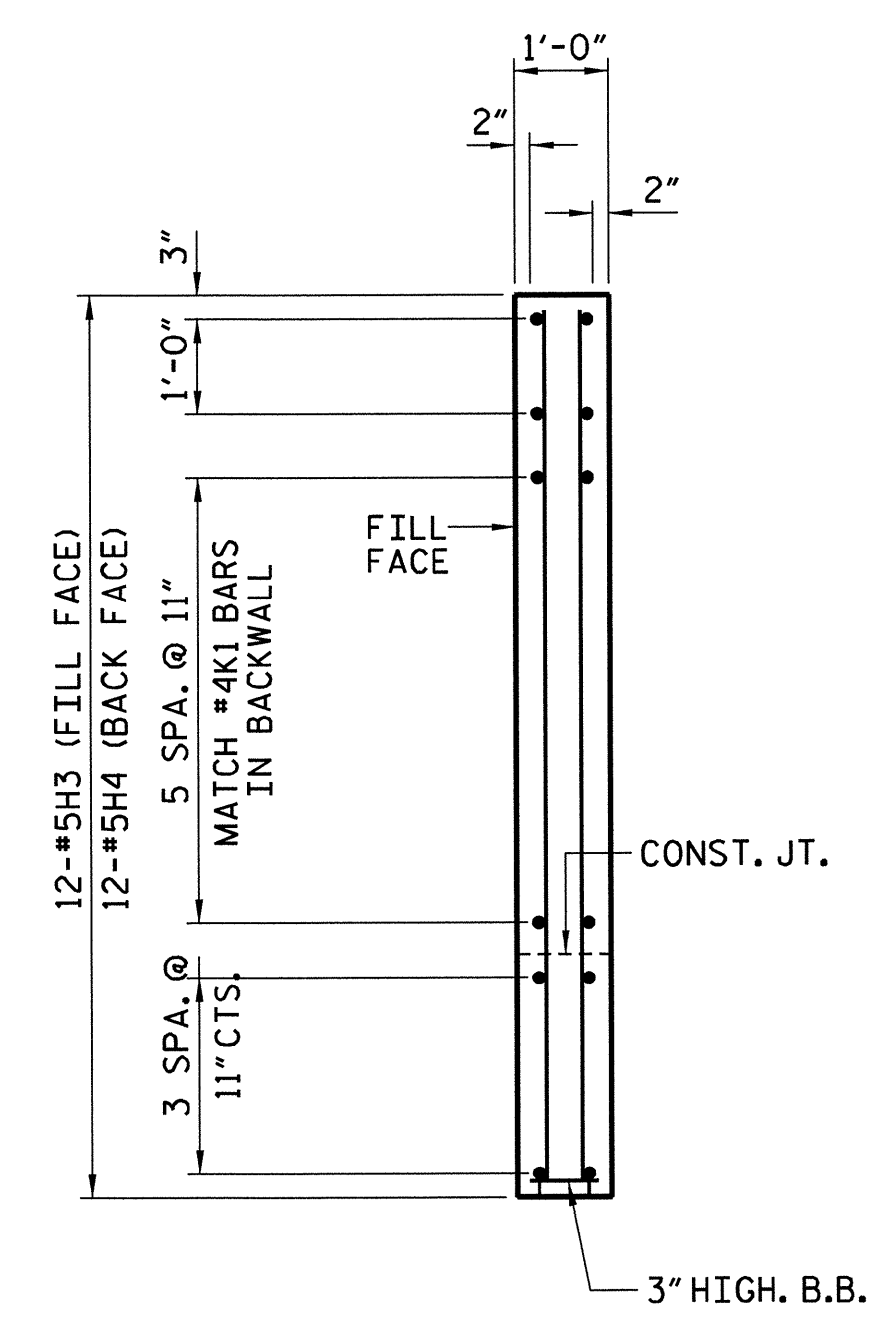
NOTE: THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



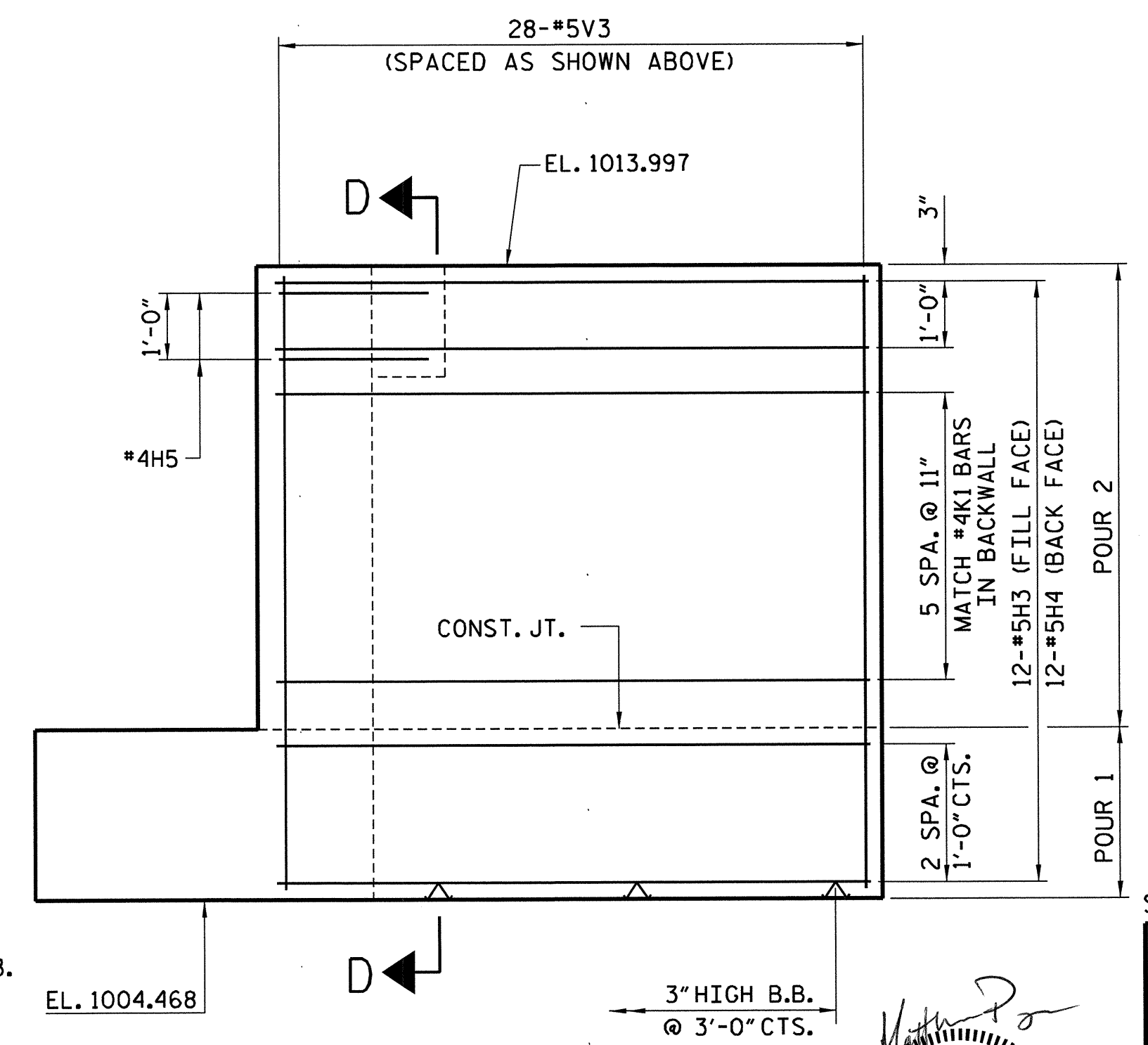
ELEVATION W1



SECTION C-C



SECTION D-D



ELEVATION W2

PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 38+28.13 -L-

SHEET 2 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT 1**



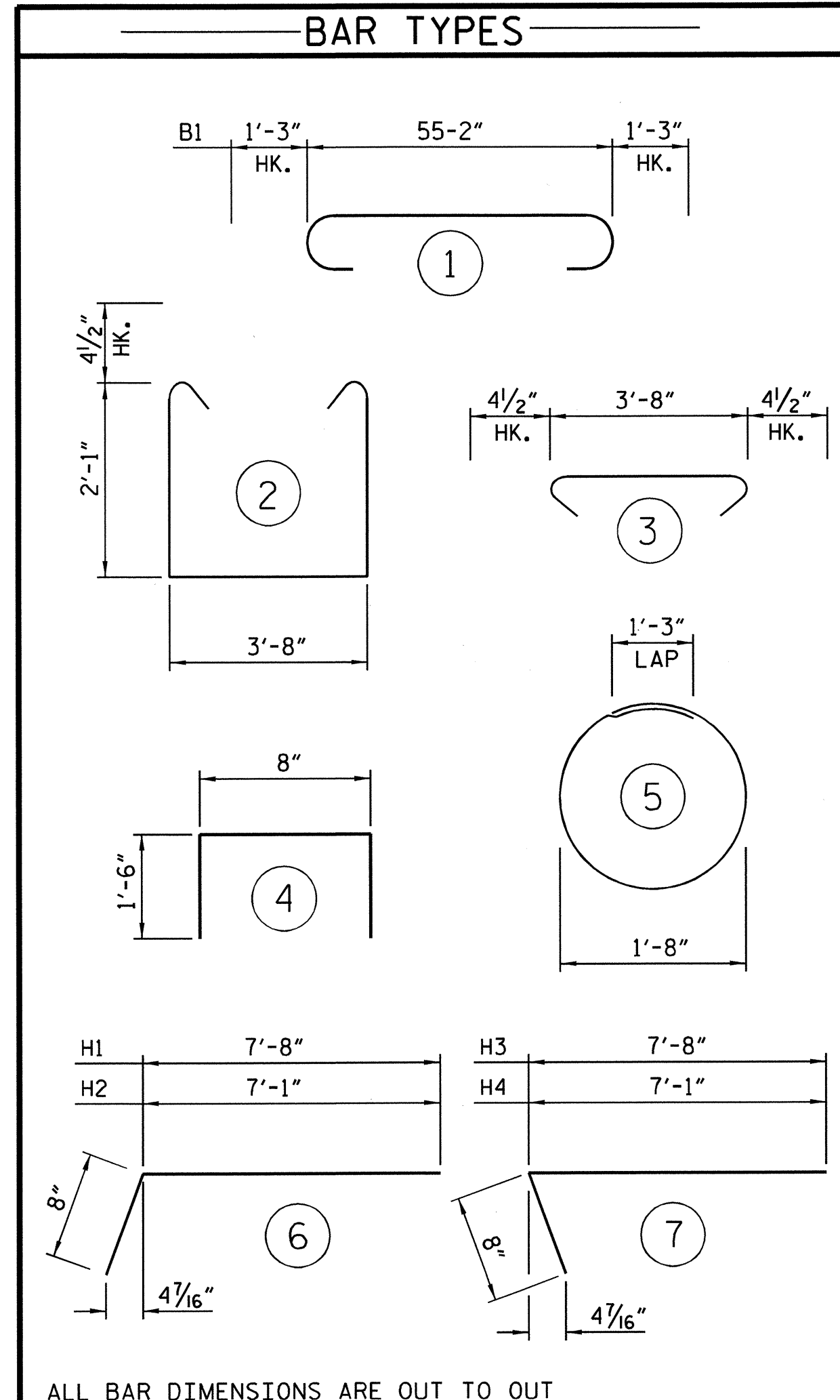
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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
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DRAWN BY: J. DAWKINS DATE: 3/11
 CHECKED BY: M. PAYNE DATE: 8/11

BAR TYPES



BILL OF REINFORCING

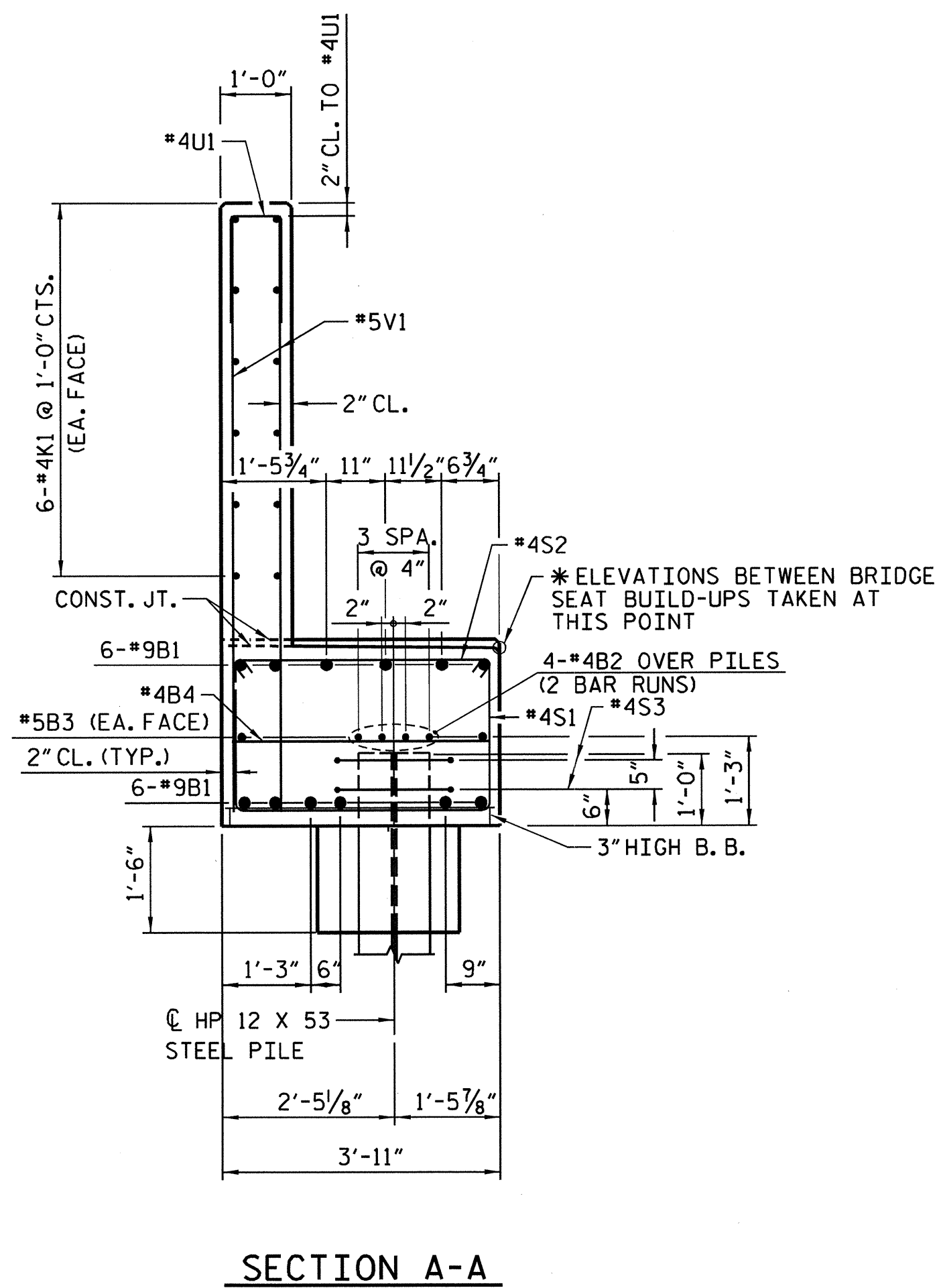
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	57'-8"	2,353
B2	8	#4	STR	30'-7"	163
B3	2	#5	STR	55'-7"	116
H1	11	5	5	8'-4"	96
H2	11	5	5	7'-9"	89
H3	12	5	8	8'-4"	104
H4	12	5	8	7'-9"	97
H5	8	4	STR.	3'-0"	16
K1	24	#4	STR	30'-7"	409
K2	4	#4	STR	2'-10"	8
S1	49	#4	2	8'-7"	281
S2	49	#4	3	4'-5"	145
S3	16	#4	5	6'-6"	69
V1	94	#5	STR	7'-5"	727
V2	30	#5	STR	8'-10"	276
V3	28	#5	STR	9'-0"	263
U1	47	#5	4	3'-8"	180

TOTAL REINFORCING STEEL		5,392
CLASS A CONCRETE BREAKDOWN		
POUR 1		C.Y. 24.1
POUR 2		C.Y. 19.4
TOTAL CLASS A CONCRETE		C.Y. 43.5
HP 12 x 53 STEEL PILES		8
		480 LIN. FT.

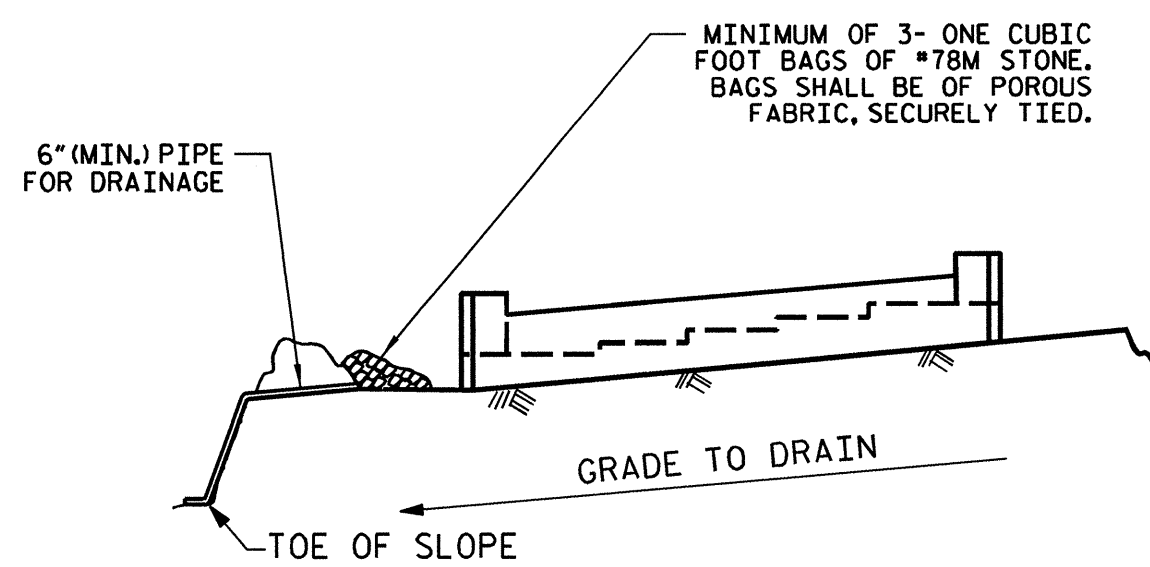
ALL BAR DIMENSIONS ARE OUT TO OUT

--- NOTES ---

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 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 EXCEPT 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%.
 THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN PLACED AND THE BARRIER AND CURB ARE CAST IF SLIP FORMING IS USED.
 THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4"Ø DRAIN PIPE THROUGH THE MSE WALL AS REQUIRED FOR THE REINFORCED BRIDGE APPROACH SLAB FILLS. SEE THE ROADWAY PLANS, REFER TO SPECIAL PROVISIONS AND MANUFACTURER RECOMENDATIONS FOR PLACEMENT OF DRAIN PIPE.



SECTION A-A

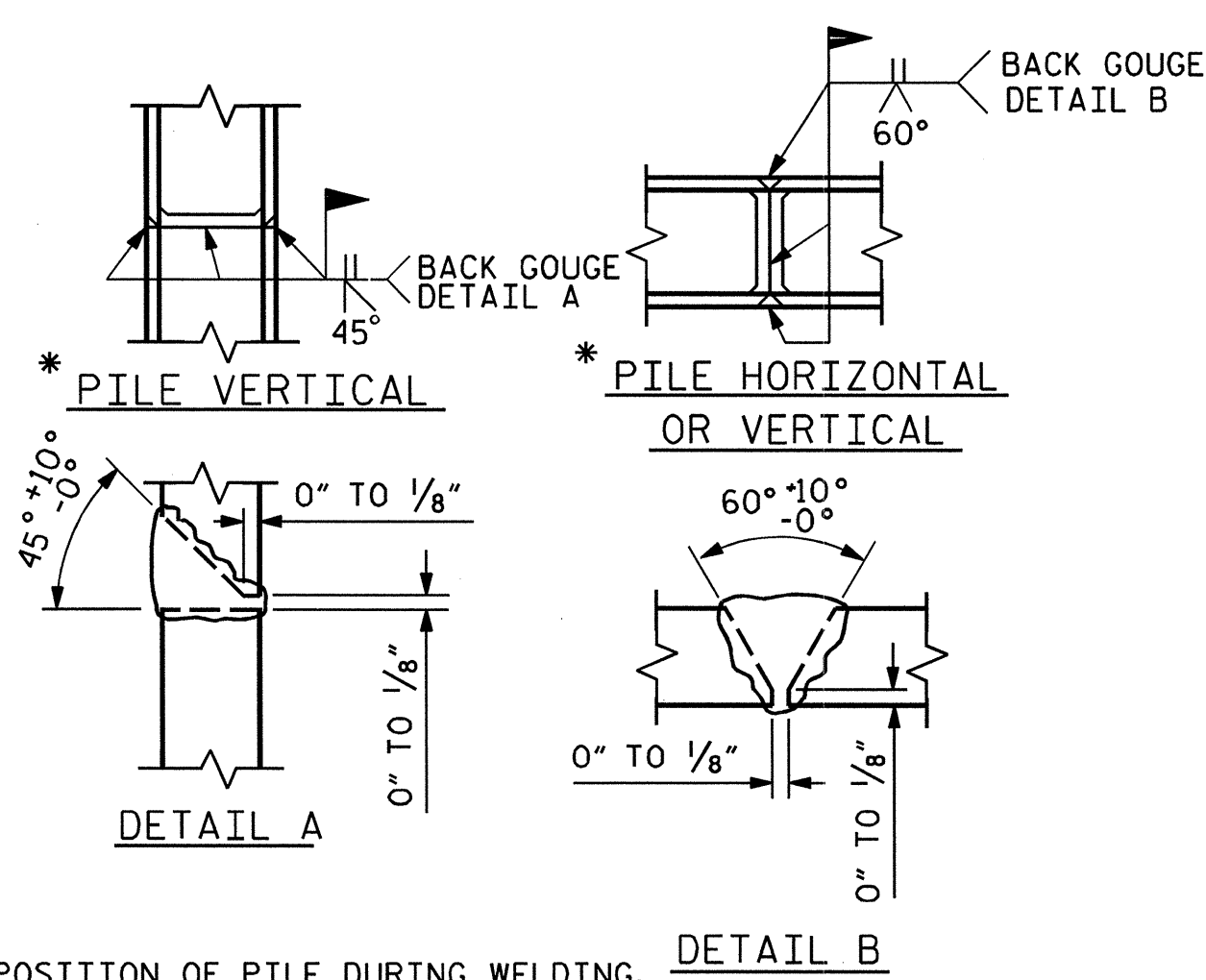


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 38+28.13 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 1

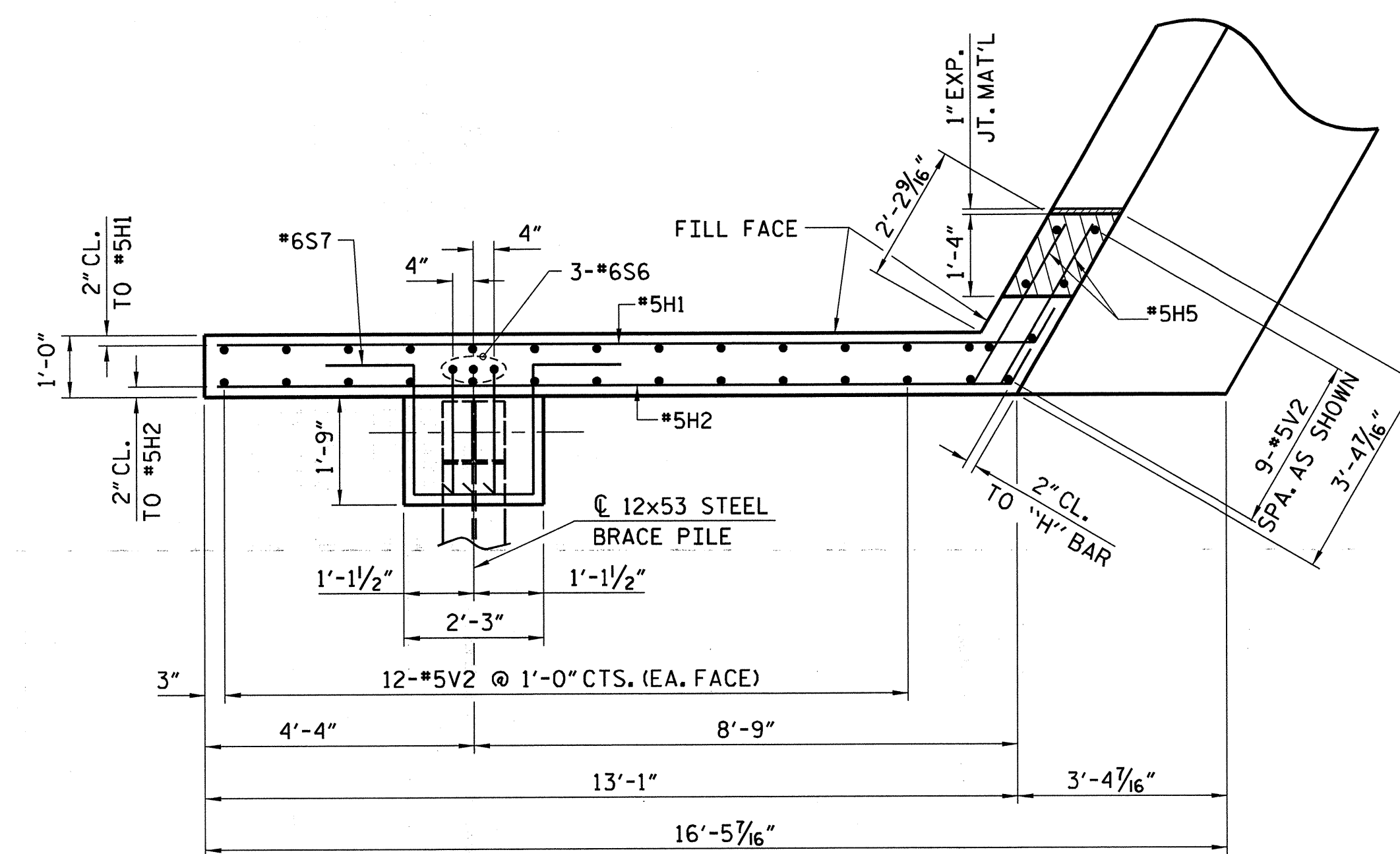


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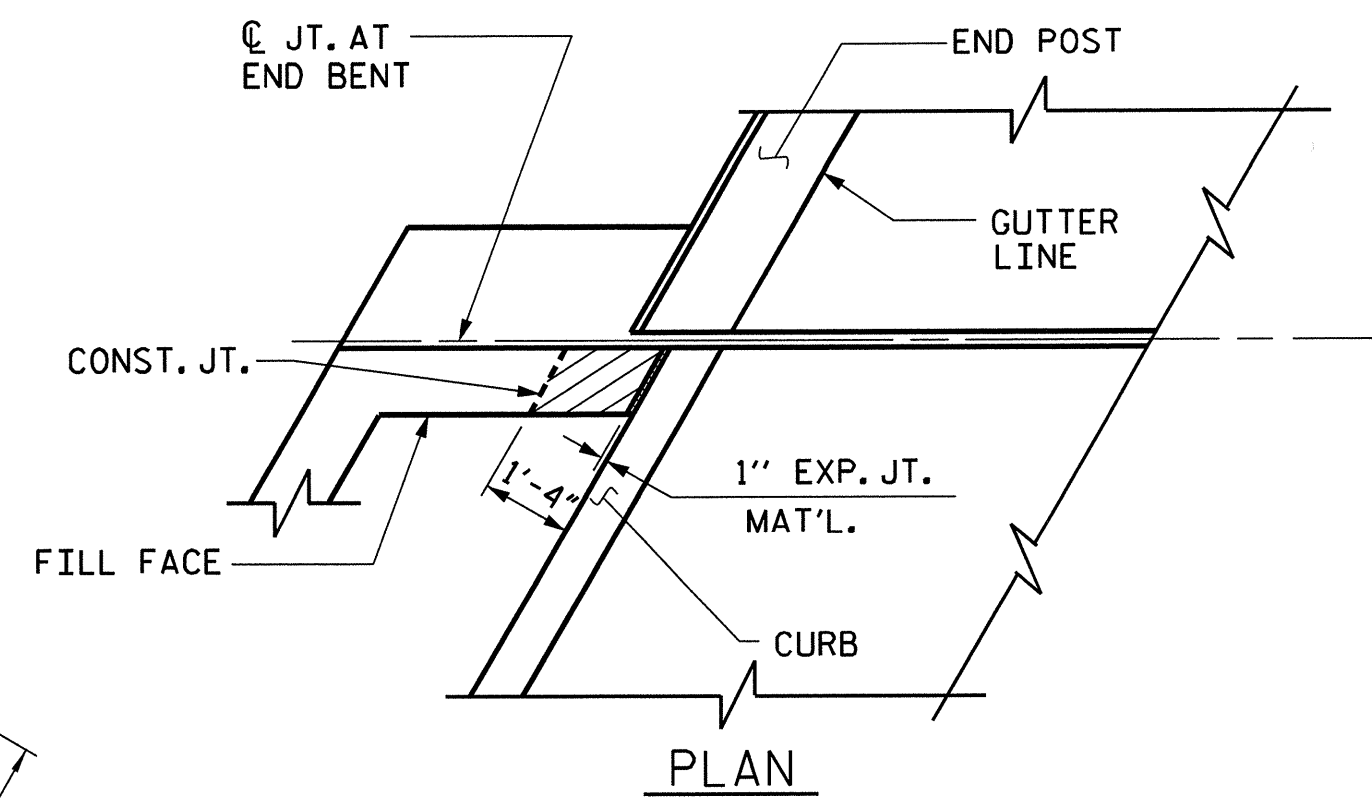
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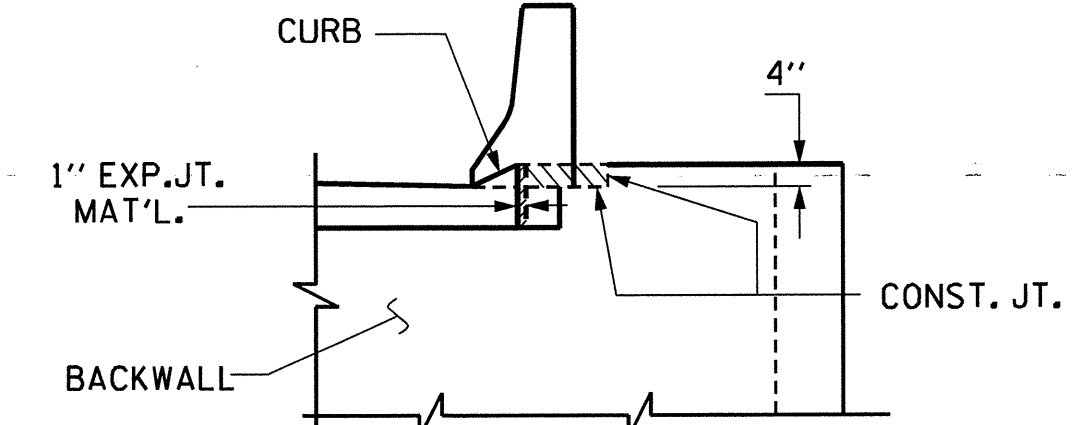
DRAWN BY: S. KAPLAN DATE: 2/11
 CHECKED BY: M. PAYNE DATE: 6/11



PLAN - W3



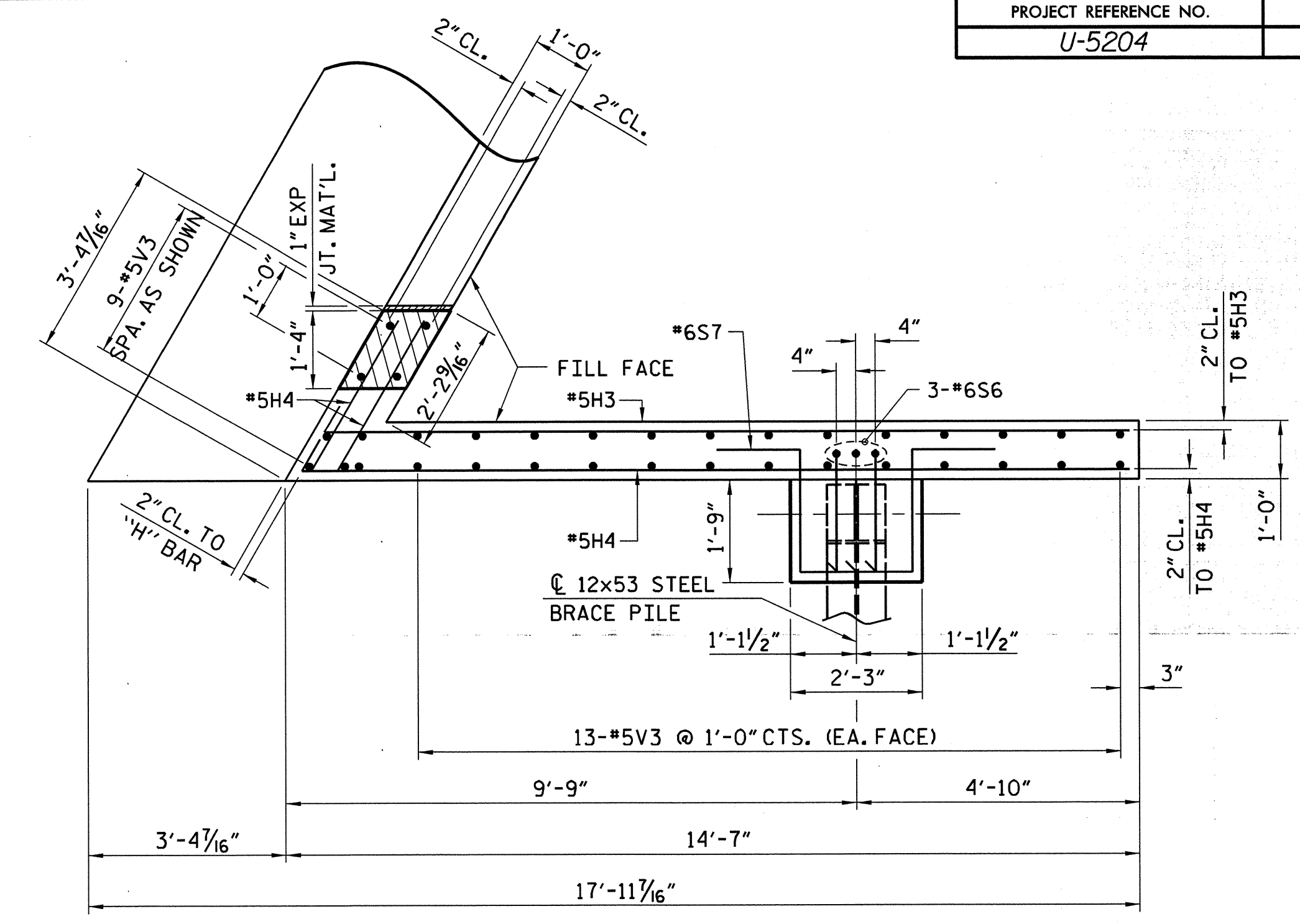
PLAN



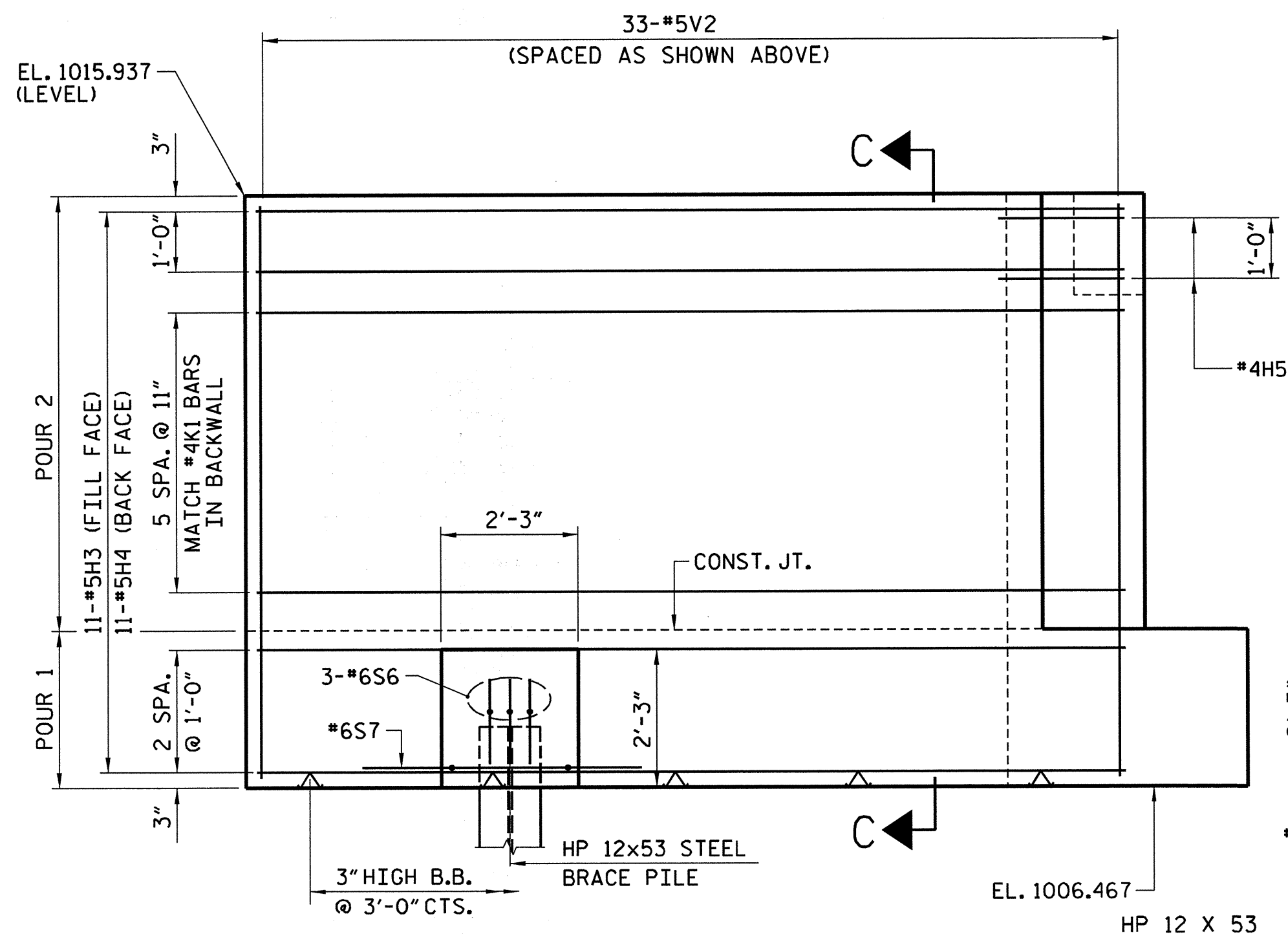
ELEVATION

BLOCKOUT IN WING WALL

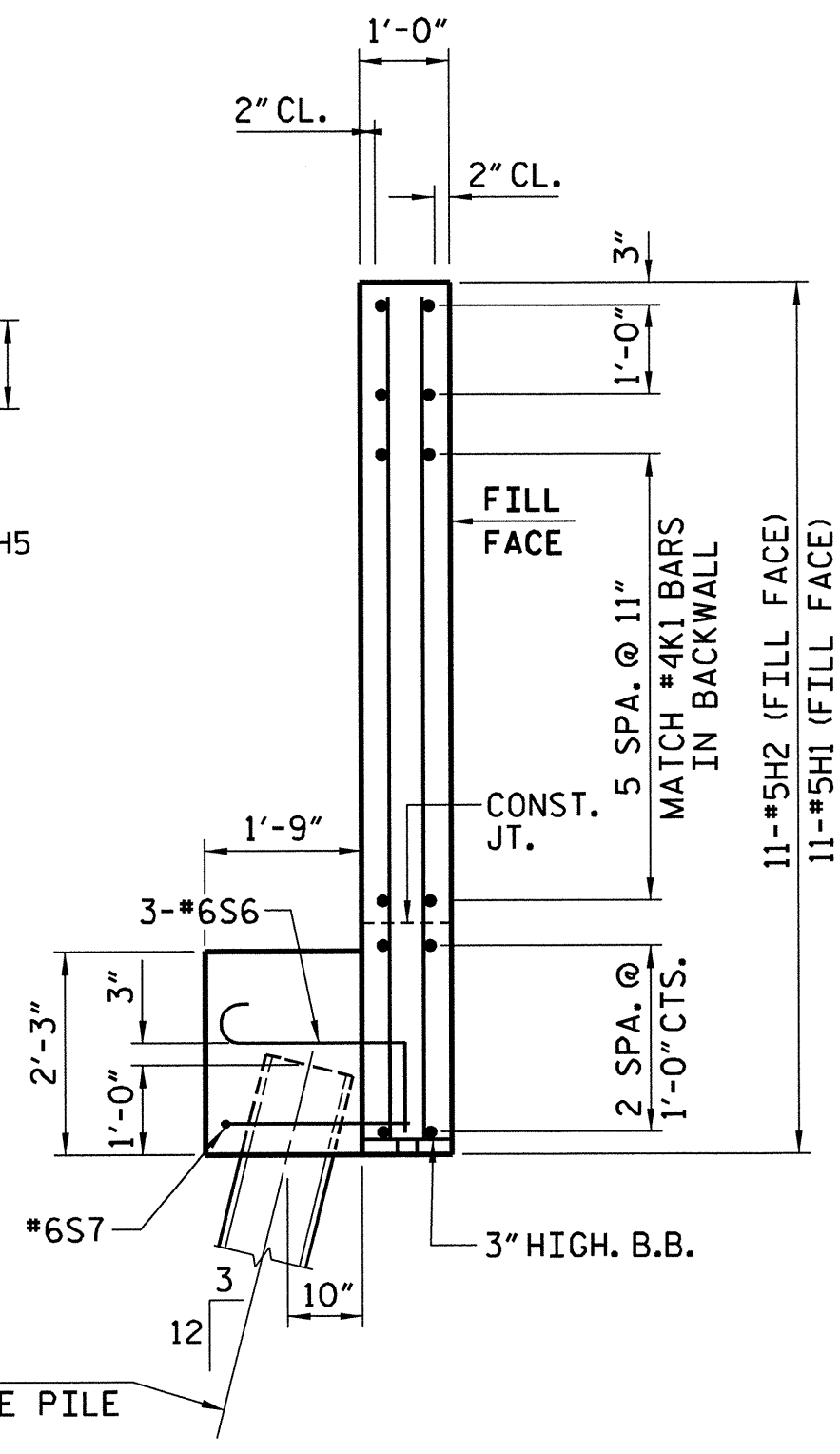
NOTE: THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



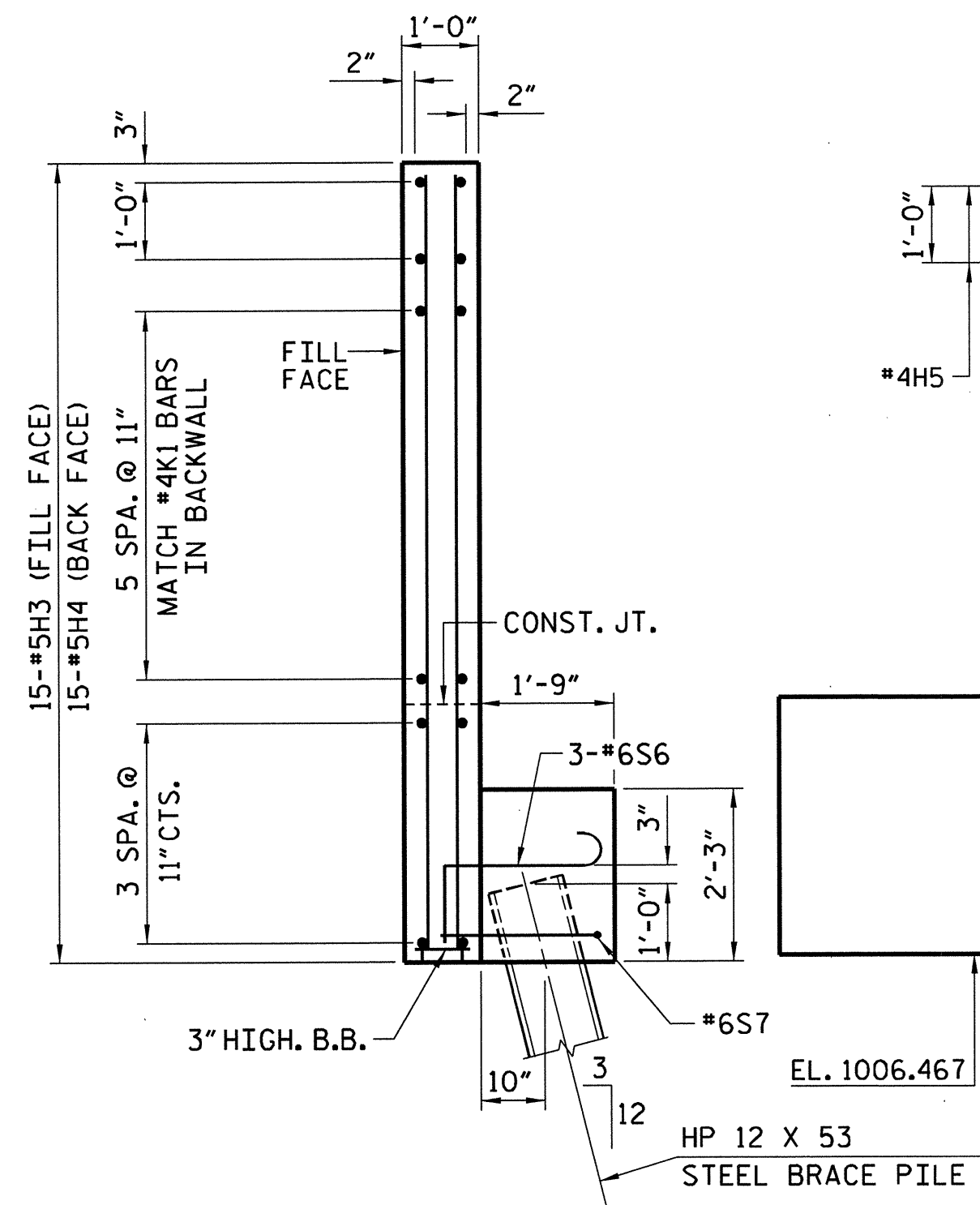
PLAN - W4



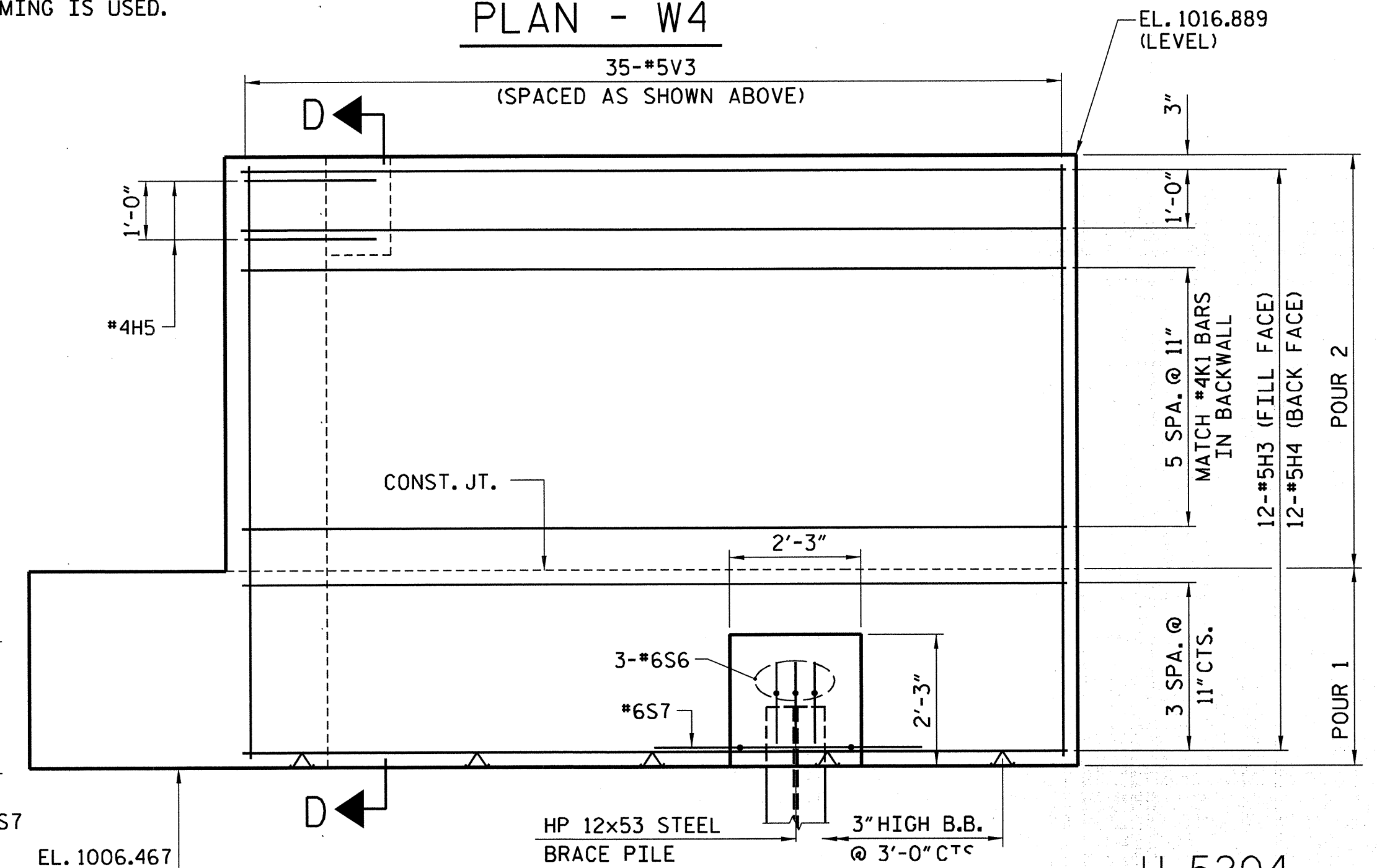
ELEVATION W3



SECTION C-C



SECTION D-D



ELEVATION W4

PROJECT NO. U-5204
CALDWELL COUNTY
STATION: 38+28.13 -L-

SHEET 2 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
**SUBSTRUCTURE
END BENT 2**

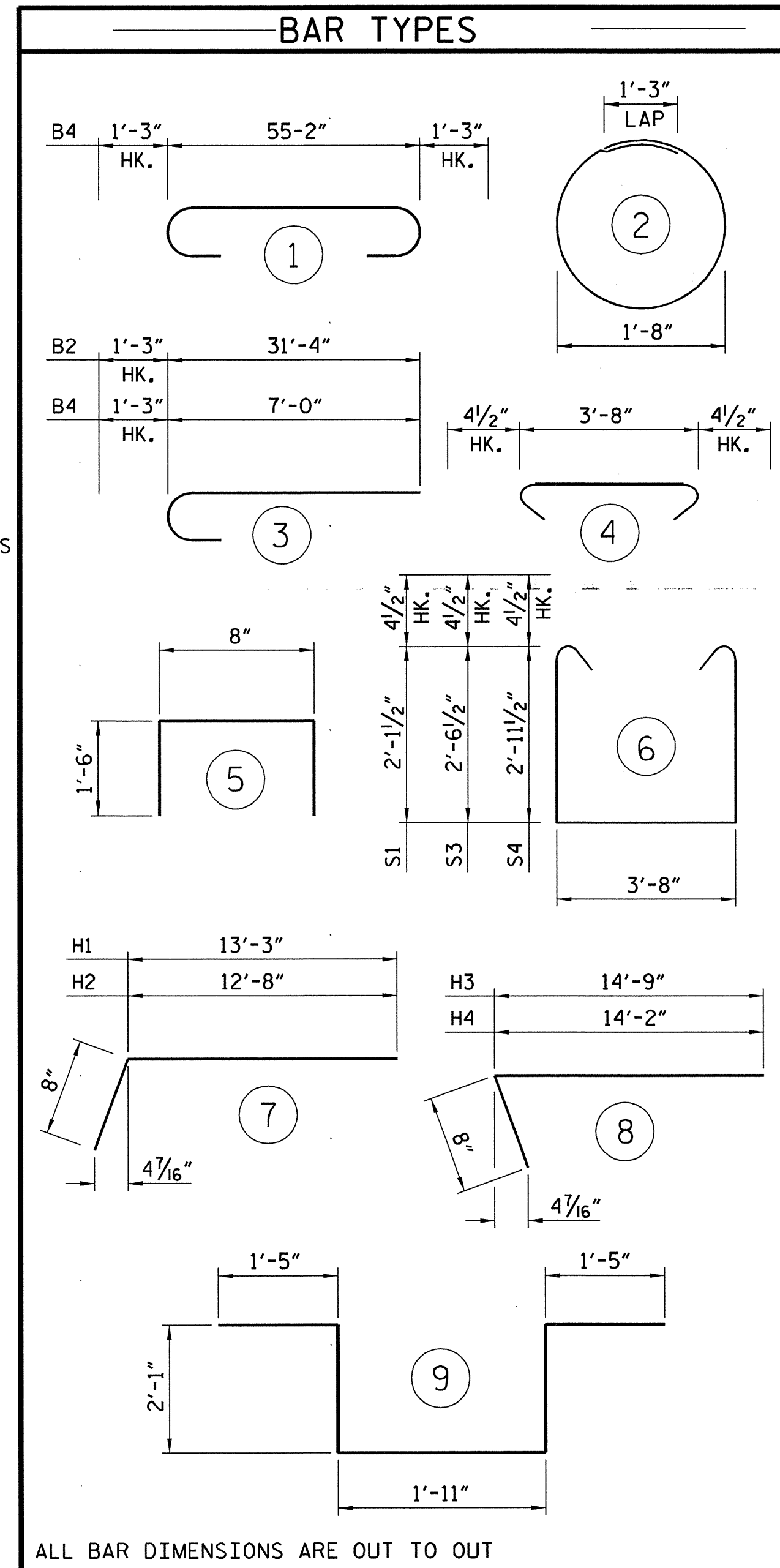
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DRAWN BY: J. DAWKINS DATE: 3/11
CHECKED BY: M. PAYNE DATE: 7/11

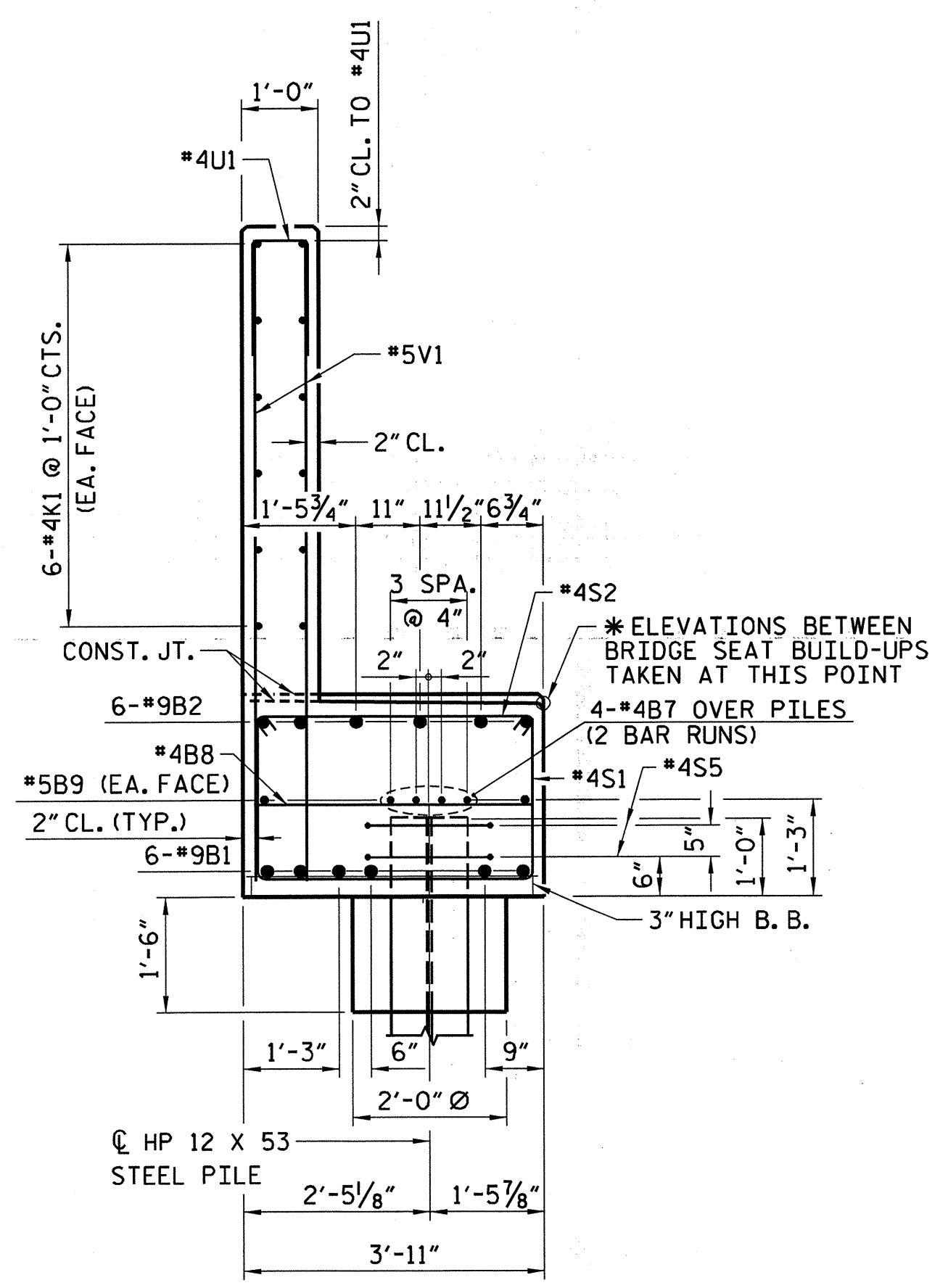
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Raleigh, NC 27605-3322

REVISIONS						TOTAL SHEETS
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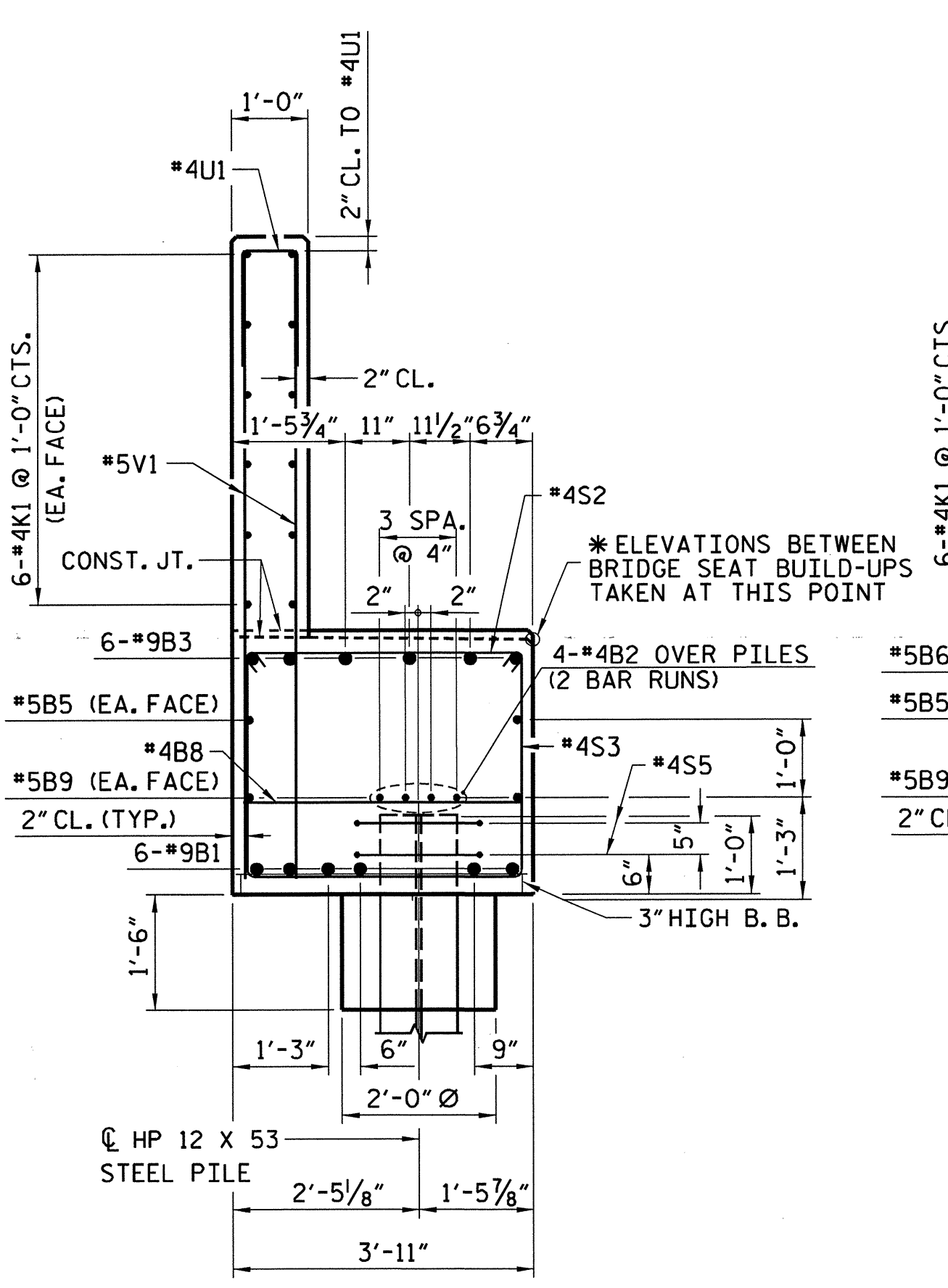
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S1-19



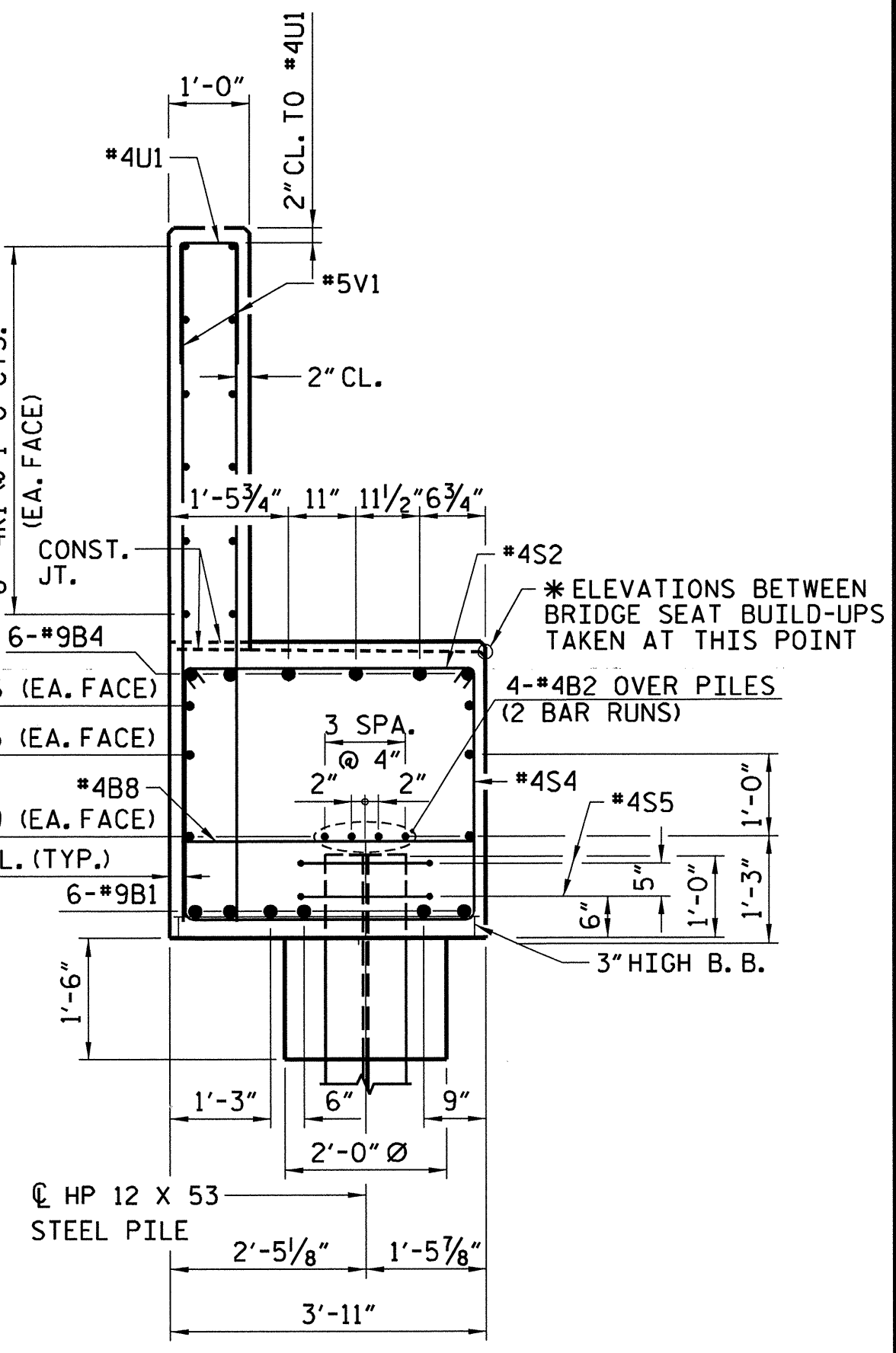
BILL OF REINFORCING					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	9	1	52'-8"	1,074
B2	6	9	1	32'-7"	665
B3	6	9	1	16'-5"	335
B4	6	9	STR.	26'-6"	845
B5	2	5	STR.	24'-10"	52
B6	2	5	STR.	16'-8"	35
B7	8	4	STR.	29'-1"	136
B8	14	4	STR.	3'-7"	34
H1	11	5	7	13'-11"	160
H2	11	5	7	13'-4"	153
H3	12	5	8	15'-5"	192
H4	12	5	8	14'-10"	186
H5	8	4	STR.	3'-0"	16
K1	24	4	STR.	29'-1"	466
S1	23	4	6	8'-7"	132
S2	46	4	4	4'-3"	133
S3	16	4	6	9'-5"	101
S4	7	4	6	10'-3"	48
S5	16	4	2	6'-6"	69
S6	6	6	10	3'-9"	34
S7	2	6	9	8'-11"	27
U1	88	4	3	3'-8"	184
V1	98	5	STR.	7'-2"	733
V2	33	5	STR.	9'-1"	313
V3	35	5	STR.	10'-1"	368
TOTAL REINFORCING STEEL					6,491 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR 1					C.Y. 33.5
POUR 2					C.Y. 19.5
TOTAL CLASS A CONCRETE					C.Y. 53.0
HP 12 x 53 STEEL PILES					10
					350 LIN. FT.



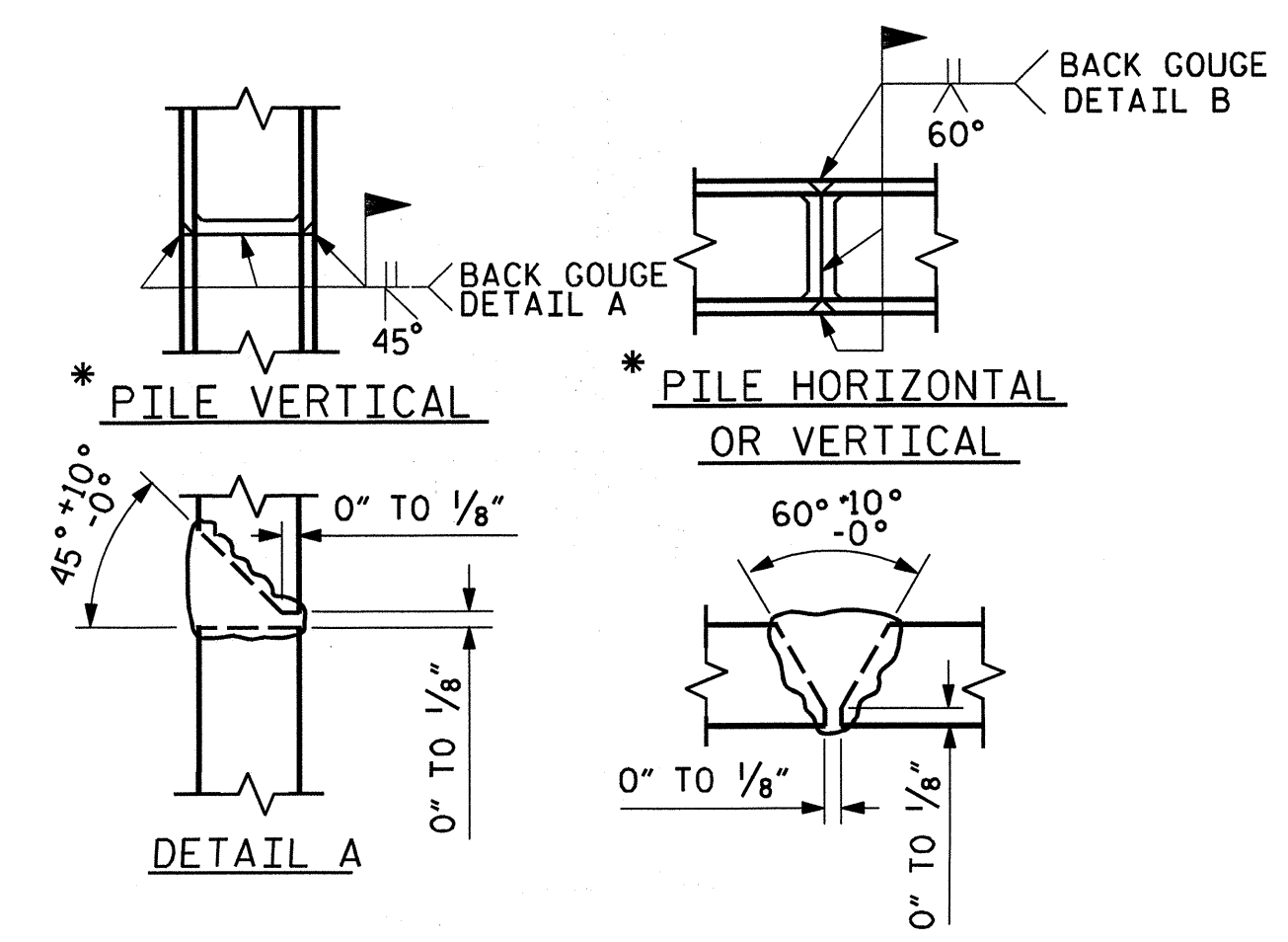
SECTION A-A



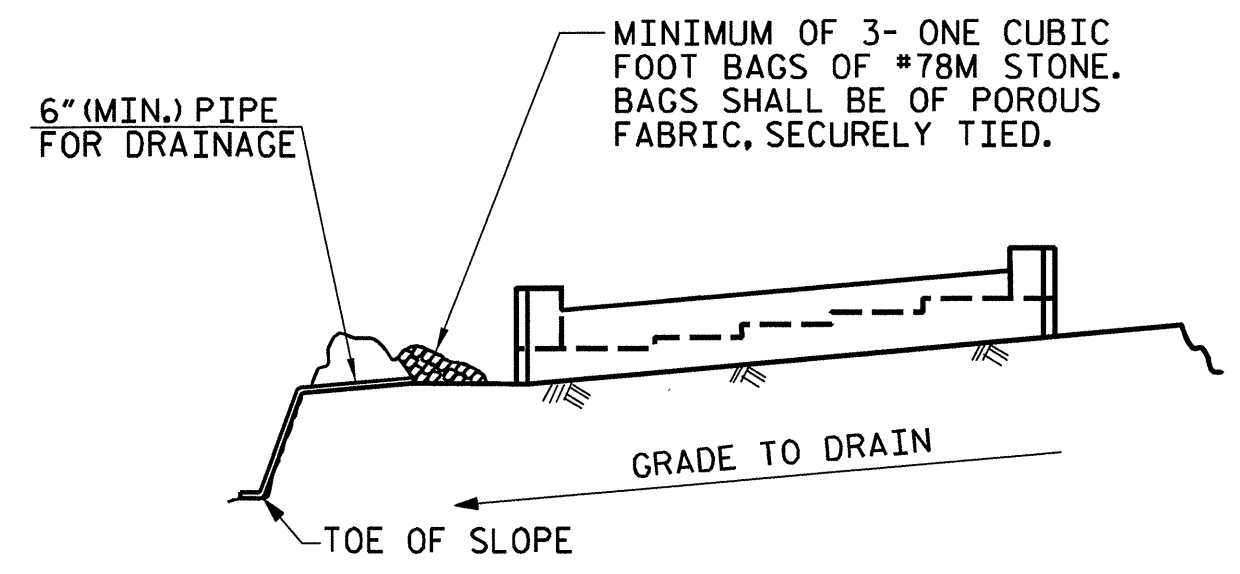
SECTION B-B



SECTION C-C



PILE SPLICE DETAILS



TEMPORARY DRAINAGE AT END BENT

--- NOTES ---

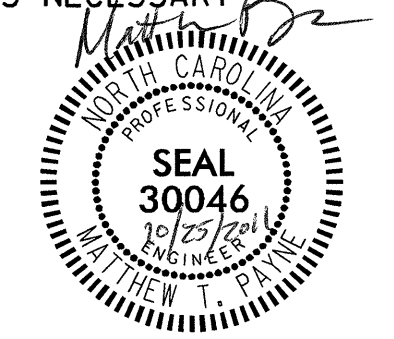
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT 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%.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN PLACED AND THE BARRIER AND CURB ARE CAST IF SLIP FORMING IS USED.
- THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" Ø DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR THE REINFORCED BRIDGE APPROACH SLAB FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 38+28.13 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT 2**

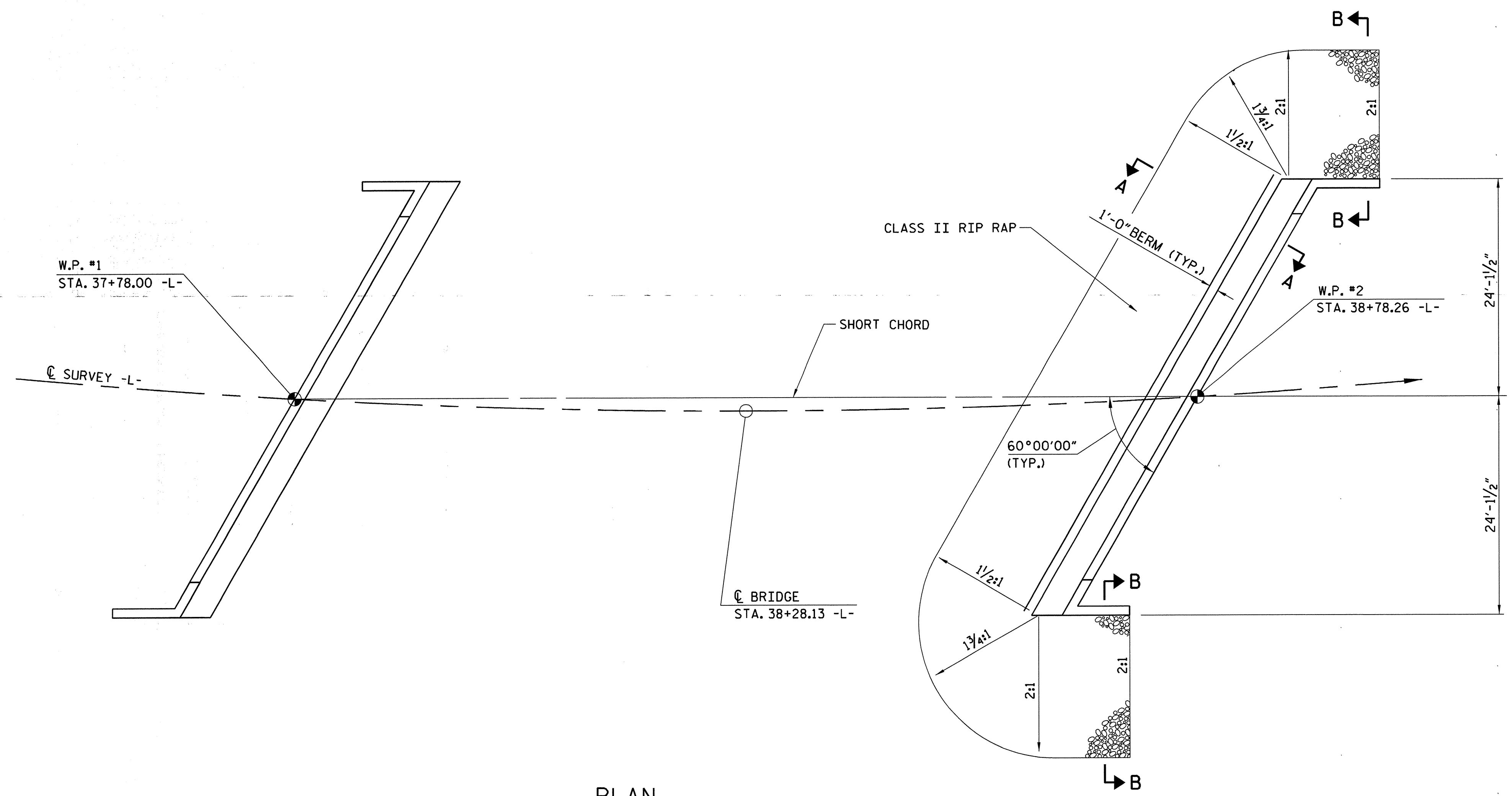


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REVISIONS						TOTAL SHEETS
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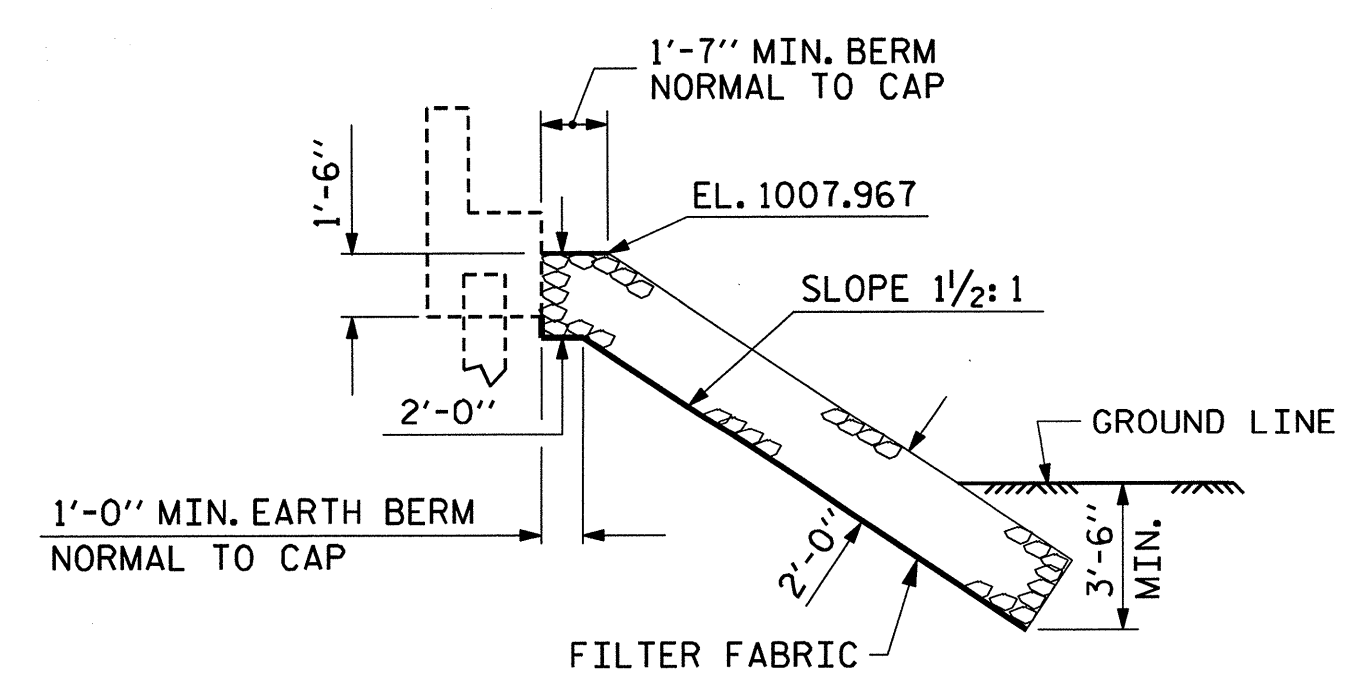
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DRAWN BY: S. KAPLAN DATE: 2/11
 CHECKED BY: M. PAYNE DATE: 7/11

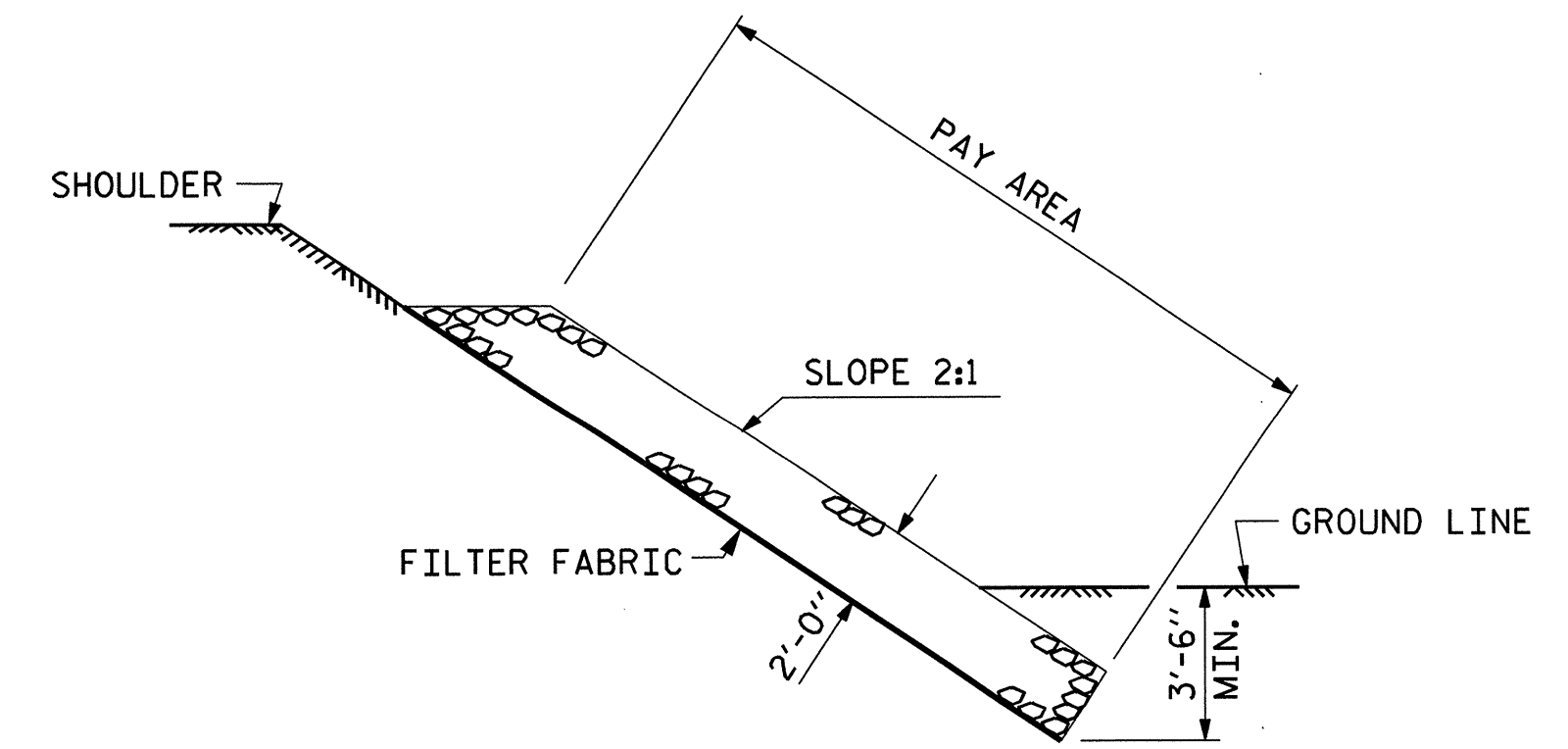


PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 38+28.13 -L-	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 2	183	170

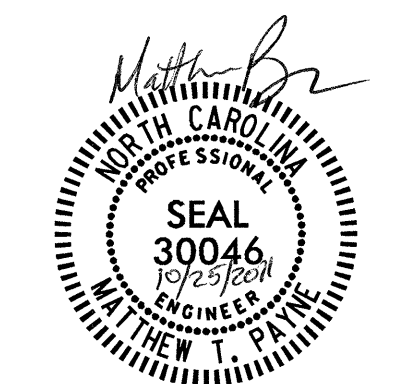


SECTION A-A



SECTION B-B


PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 38+28.13 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RIP RAP DETAILS

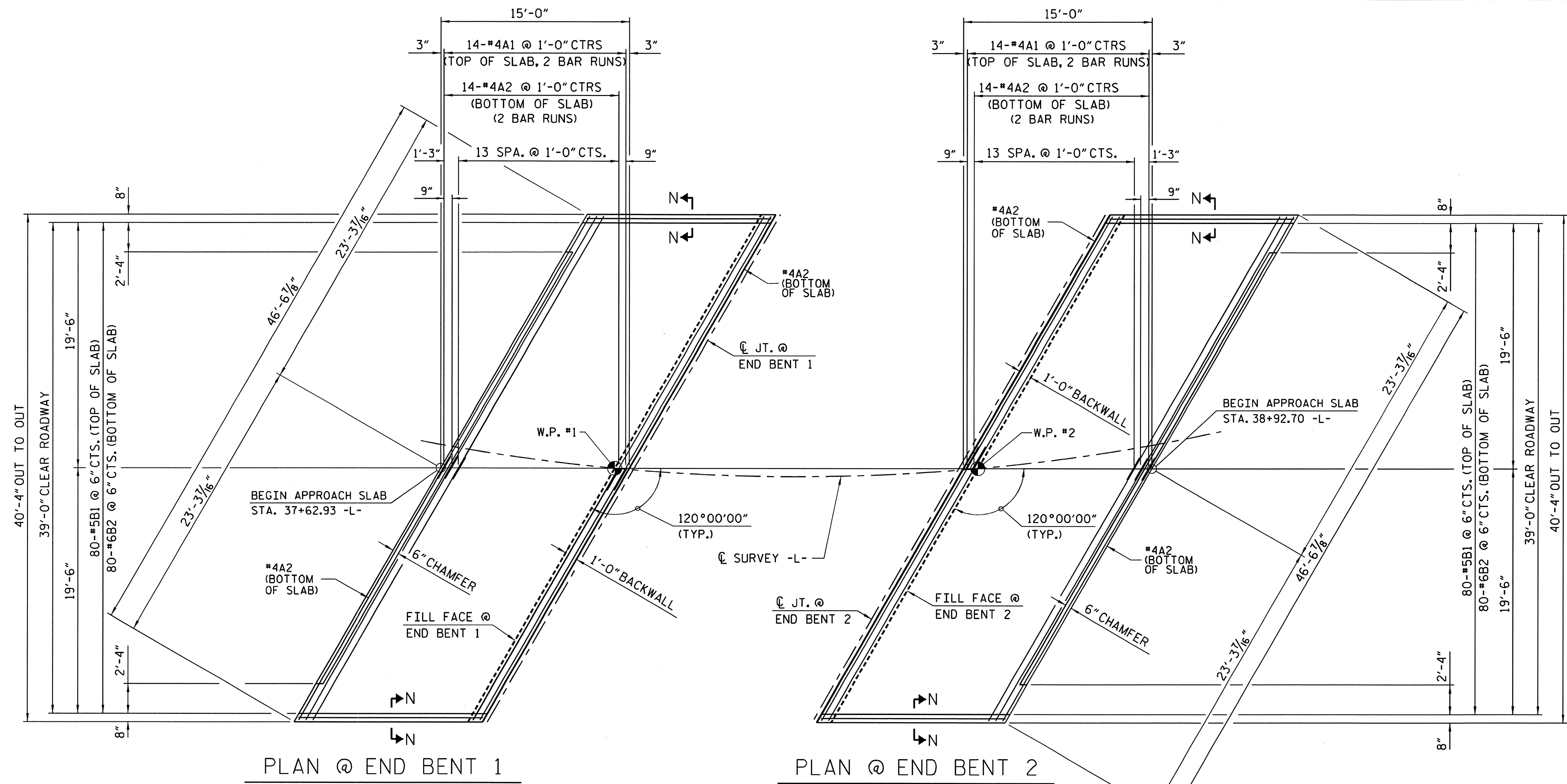
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ASSEMBLED BY : R. KNIGHT	DATE : 6/11
CHECKED BY : M. PAYNE	DATE : 6/11
DRAWN BY : REK 1/84	REV. 8/16/99 RWW/LES
CHECKED BY : RDU 1/84	REV. 10/17/00 RWW/LES
	REV. 5/1/06R TLA/GM


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 Raleigh, NC 27605-3322

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			51-21
2			4			48

PROJECT REFERENCE NO.		SHEET NO.		
U-5204		S1-22		
BILL OF MATERIAL				
FOR ONE APPROACH SLAB (2 REQ'D)				
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	28	#4	25'-0"	468
A2	30	#4	25'-0"	501
*B1	80	#5	14'-0"	1,168
B2	80	#6	14'-6"	1,742
REINFORCING STEEL			LBS.	2,243
* EPOXY COATED REINFORCING STEEL			LBS.	1,636
CLASS AA CONCRETE			C. Y.	26.4

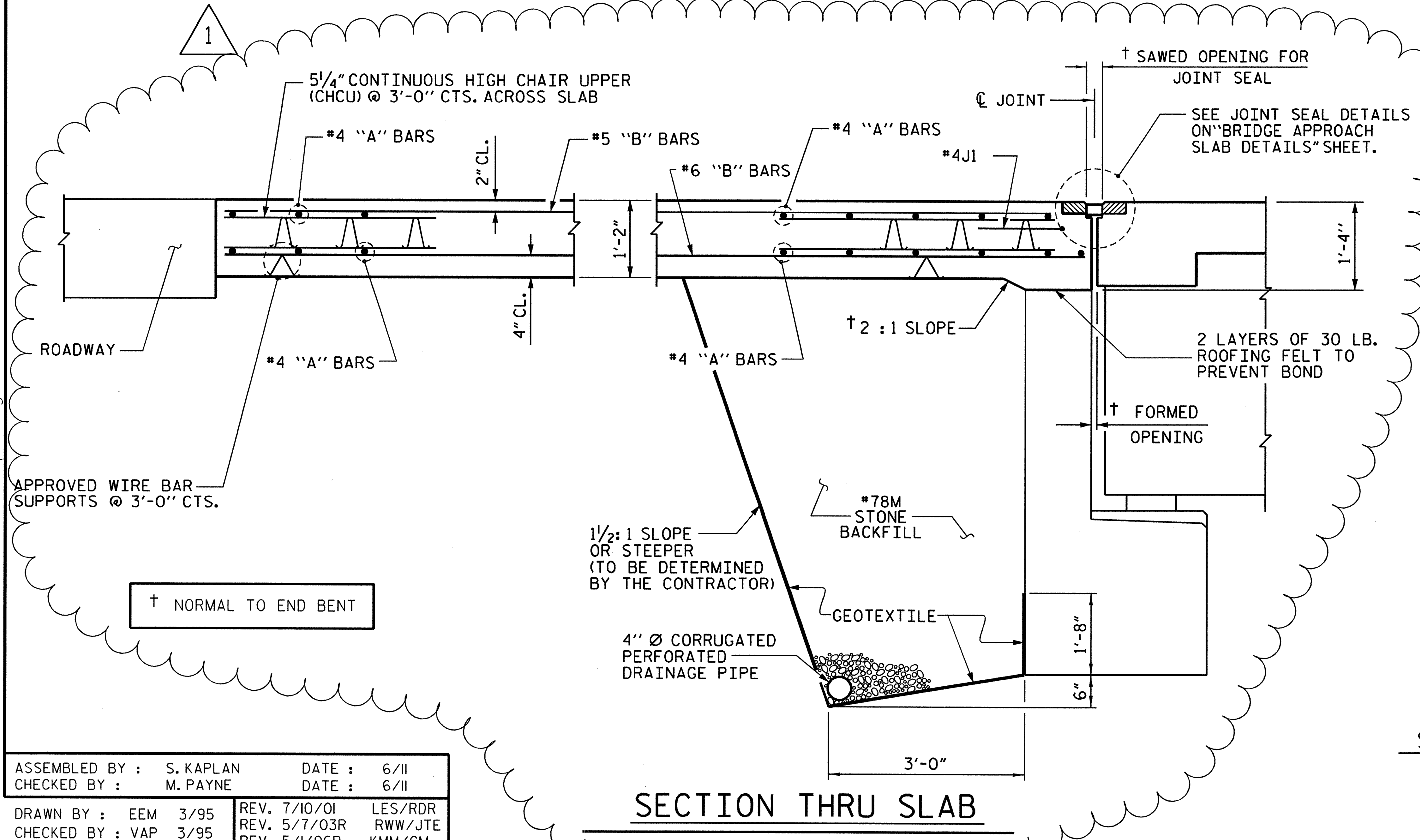


PLAN @ END BENT 1

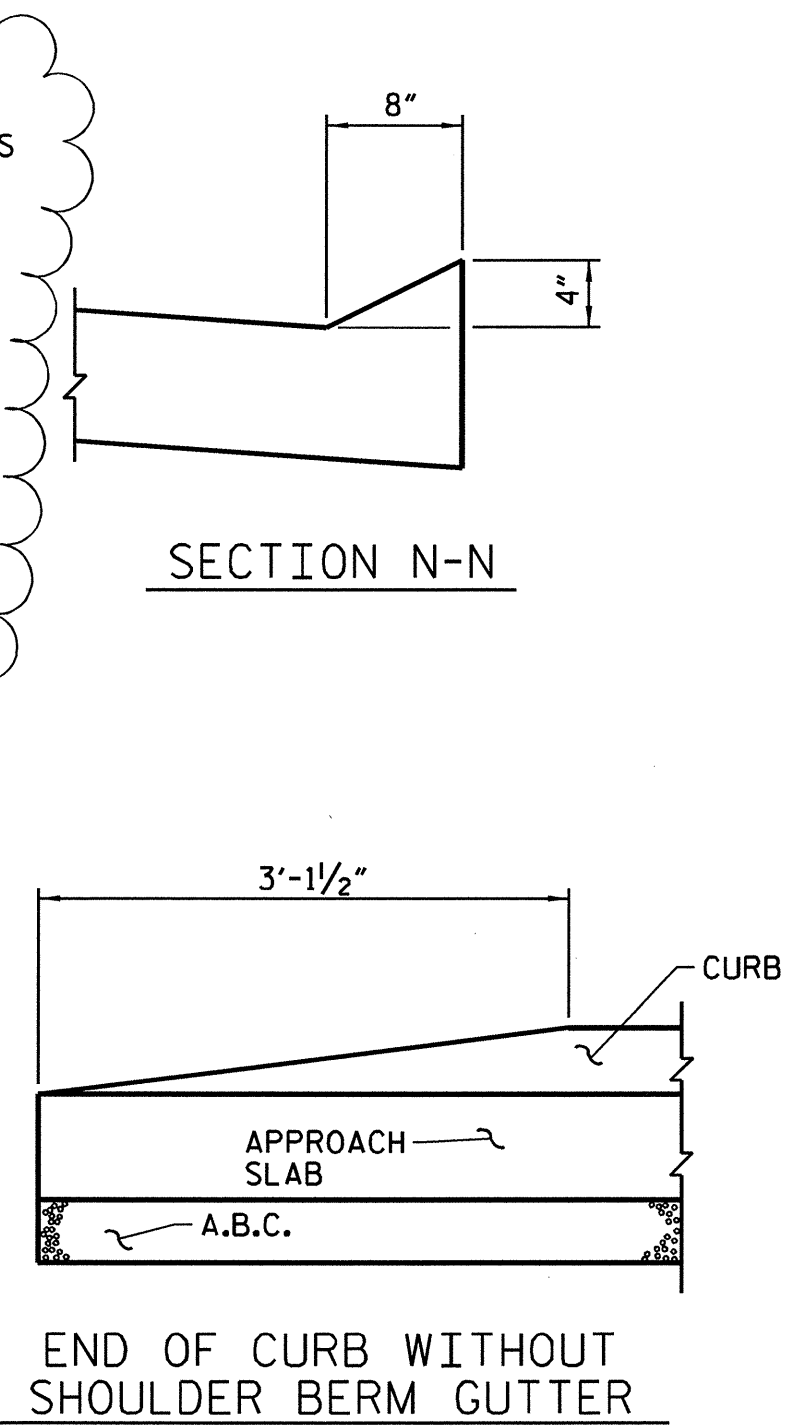
PLAN @ END BENT 2

NOTES

- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
- THE 6" COMP. A.B.C. SHALL EXTEND 10'-0" BEYOND THE END OF THE APPROACH SLAB AND 1'-0" OUTSIDE OF EACH EDGE OF SLAB.
- THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL EXTEND 1'-0" BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.
- THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL EXTEND 1'-0" BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.
- WITH EVAZOTE JOINT SEAL**
- FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.
- THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 1/2".
- FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.



SECTION THRU SLAB



CURB DETAILS

PROJECT NO. U-5204
CALDWELL COUNTY
 STATION: 38+28.13 -L-

SHEET 1 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 FOR FLEXIBLE PAVEMENT

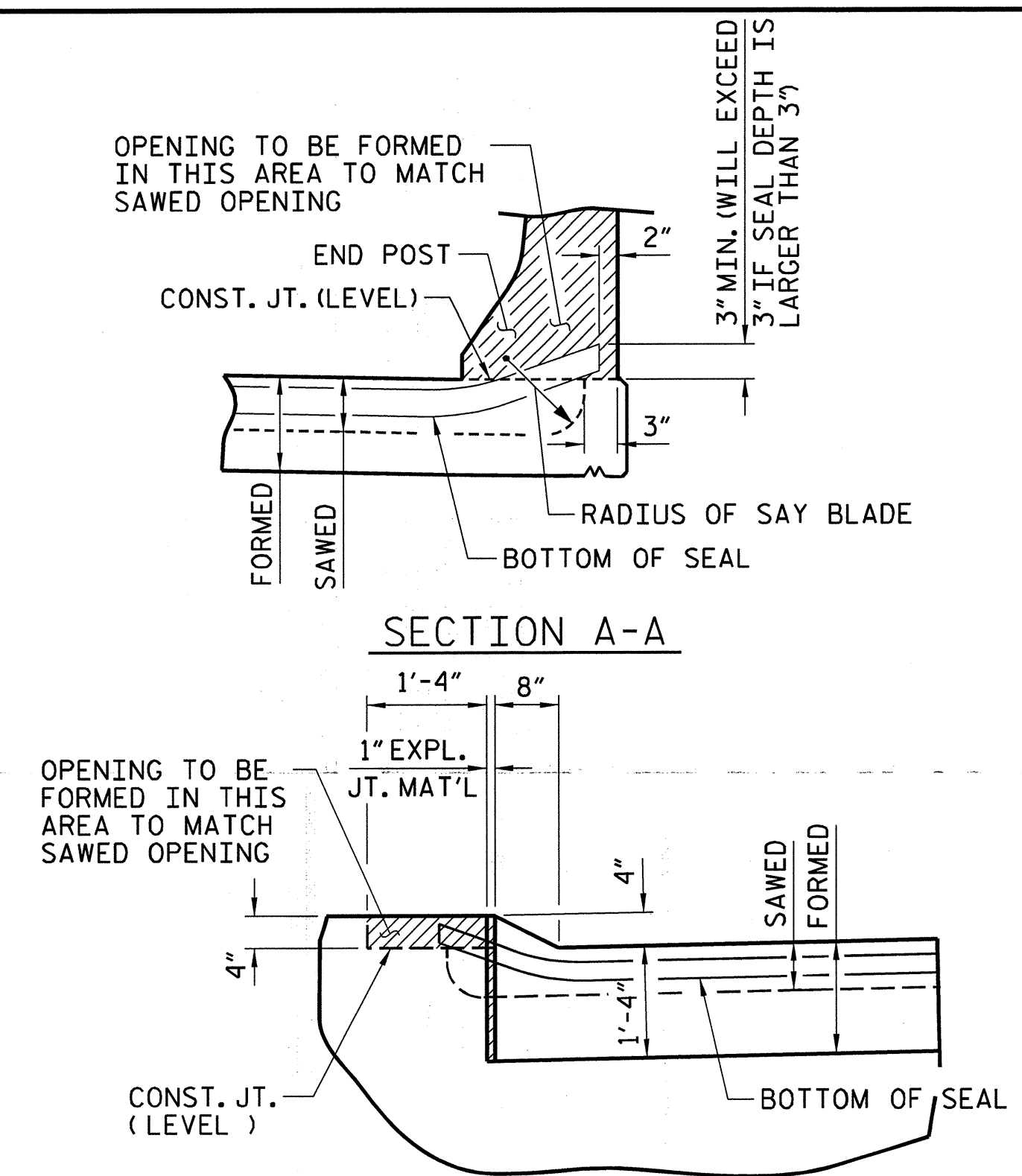


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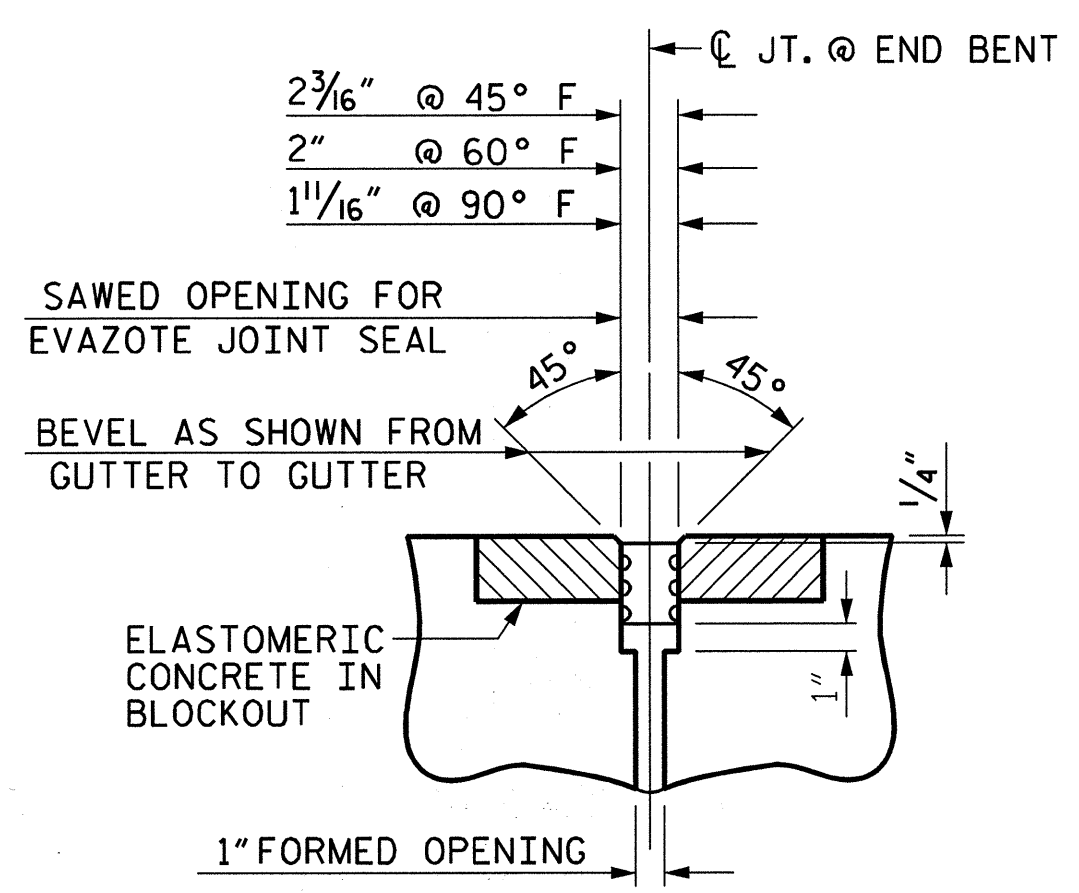
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-22	
1	MTP	12/2011	3			TOTAL SHEETS	
2			4			46	

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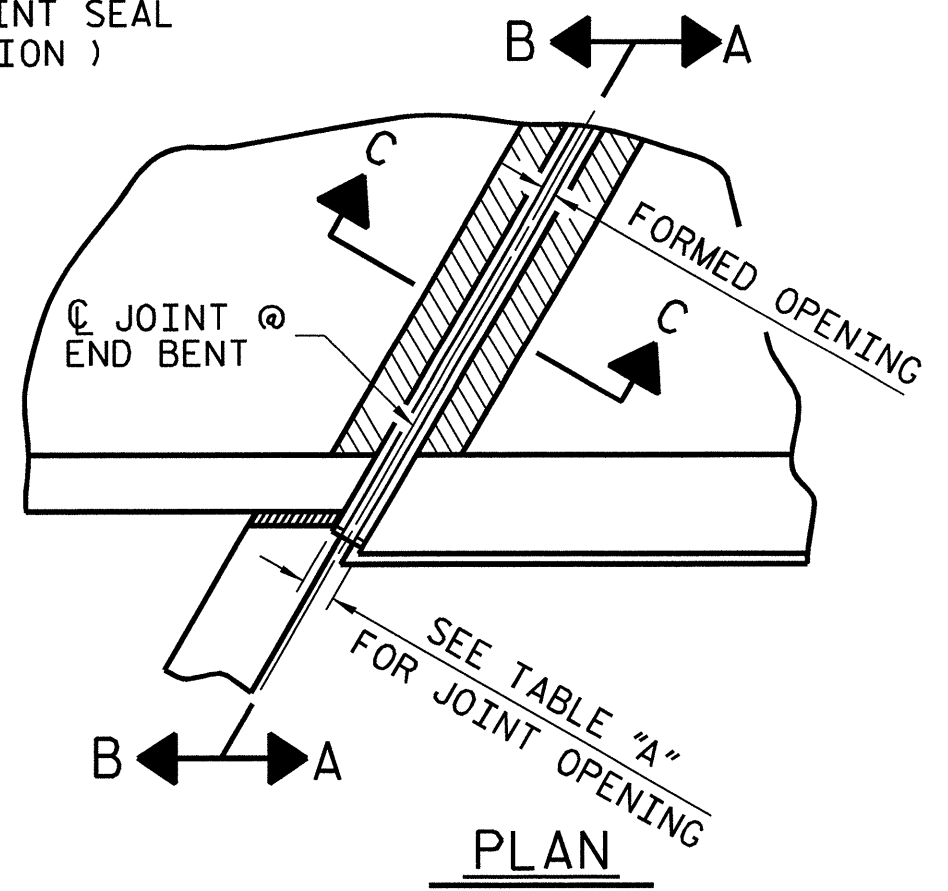
ASSEMBLED BY: S. KAPLAN DATE: 6/11
 CHECKED BY: M. PAYNE DATE: 6/11
 DRAWN BY: EEM 3/95 REV. 7/10/01 LES/RDR
 CHECKED BY: VAP 3/95 REV. 5/1/03R RWW/JTE
 REV. 5/1/06R KMM/GM



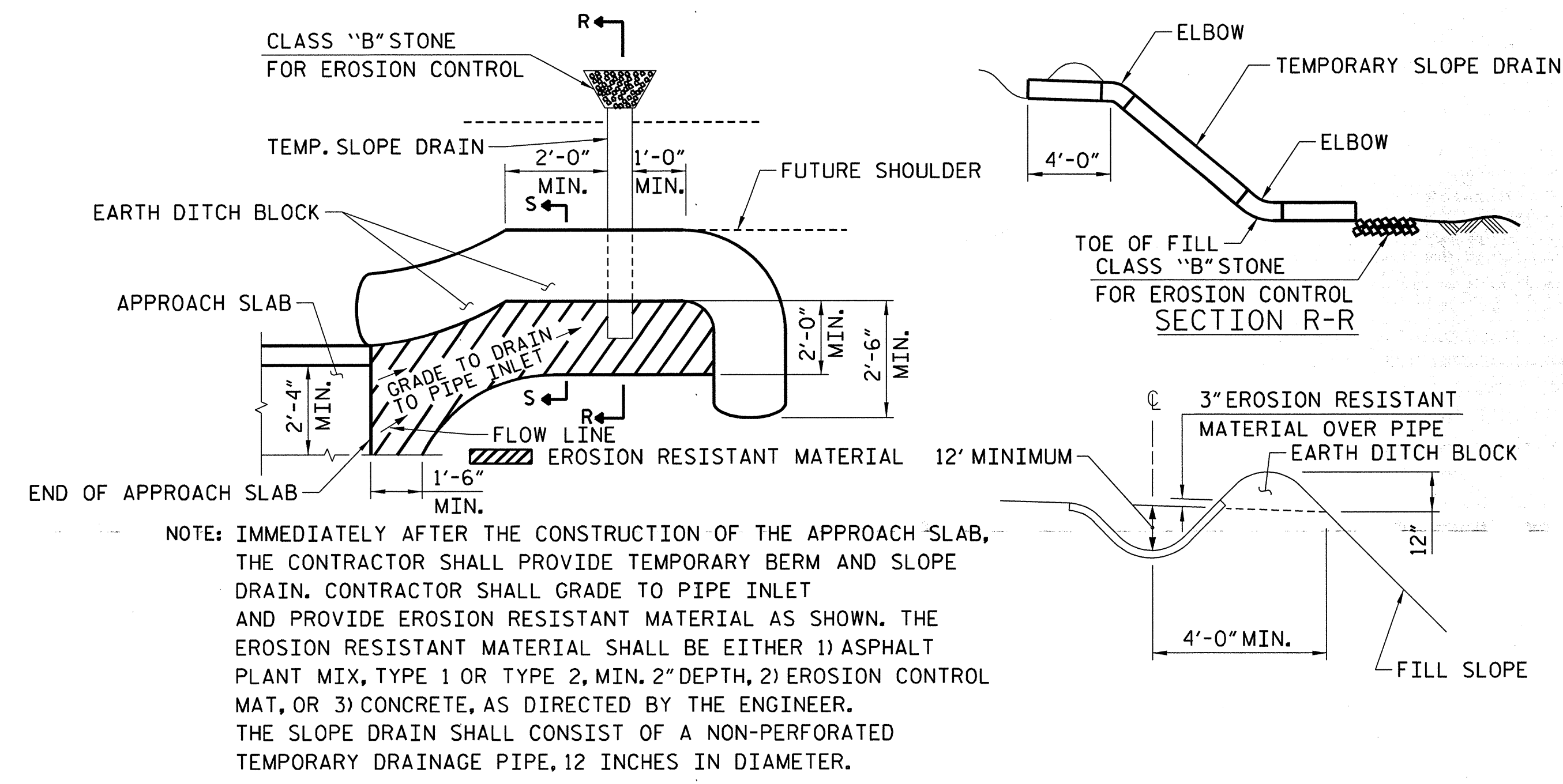
SECTION B-B
JOINT SEAL DETAILS @ END BENT
 (FOR METAL RAILS WITH CURB)



SECTION C-C
 EVAZOTE JOINT SEAL
 (EXPANSION)

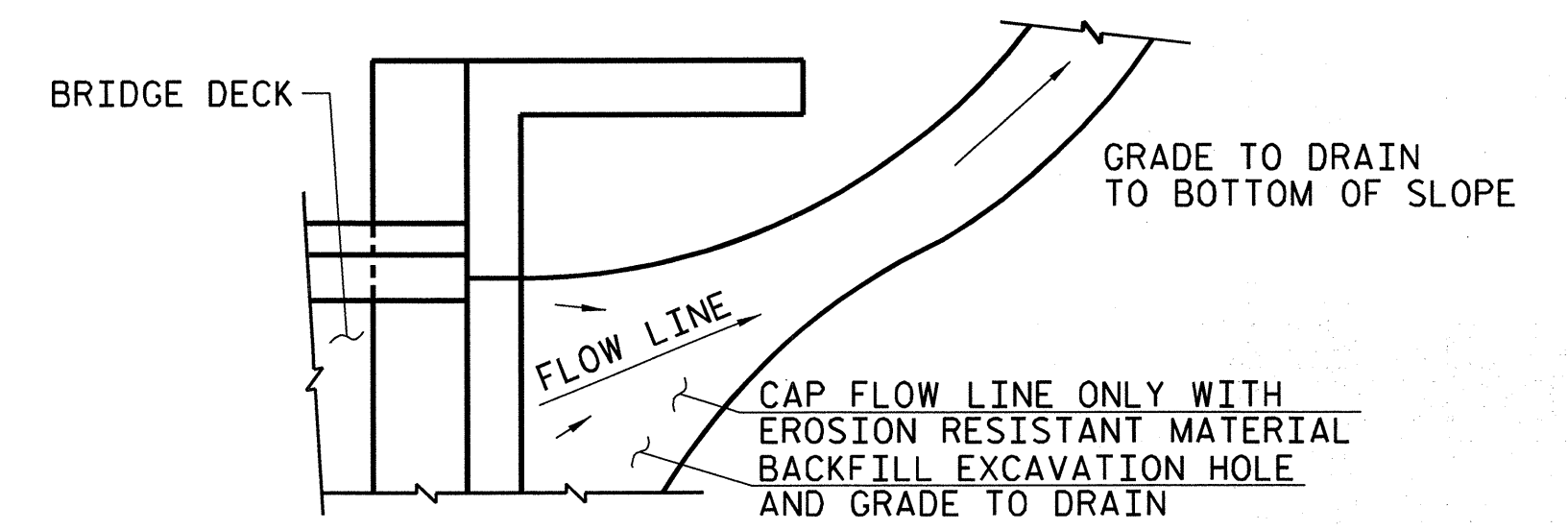


PLAN



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\"/>

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-5204
CALDWELL COUNTY
 STATION: 38+28.13 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 DETAILS FOR FLEXIBLE
 PAVEMENT WITH BARRIER RAIL



THE LOUIS BERGER GROUP, Inc.
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-23
1			3			TOTAL SHEETS
2			4			48

STD. NO. BAS10

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ASSEMBLED BY: S. KAPLAN	DATE: 6/11
CHECKED BY: M. PAYNE	DATE: 6/11
DRAWN BY: LES 8/01	REV. 5/7/03R RWW/JTE
CHECKED BY: RDR 8/01	REV. 5/1/06 TLA/GM

NOTES

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.

FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

USE COARSE AGGREGATE IN THE REINFORCED ZONE FOR RETAINING WALL NO. 1.

USE AN MSE WALL SYSTEM WITH PRECAST CONCRETE PANELS FOR RETAINING WALL NO. 1.

VERTICAL EXPANSION JOINTS SHALL BE PROVIDED FOR RETAINING WALL NO. 1 AT A MINIMUM SPACING OF 20'-0" BETWEEN STA. 37+68.38 AND STA. 38+02.07 TO ALLOW FOR DIFFERENTIAL SETTLEMENT OF UP TO 2".

CAST-IN-PLACE REINFORCED CONCRETE COPING IS REQUIRED FOR RETAINING WALL NO. 1.

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 1.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. 1, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALL NO. 1 FOR WALL HEIGHTS EQUAL TO THE DESIGN HEIGHT PLUS EMBEDMENT.

DESIGN RETAINING WALL NO. 1 FOR THE FOLLOWING:

- 1) MINIMUM DESIGN LIFE = 100 YEARS
- 2) MAXIMUM FACTORED RESISTANCE = 35 PSF
- 3) MINIMUM REINFORCEMENT LENGTH = 20 FT
- 4) AGGREGATE PARAMETERS:

STANDARD SIZE NO. (IN ACCORDANCE WITH SECTION 1005 OF THE STANDARD SPECIFICATIONS)	UNIT WEIGHT (gamma) (pcf)	FRICTION ANGLE (phi) DEGREES	COHESION (c) (kPa)
1S, 2S, 2MS AND 4S (FINE AGGREGATE)	125	34	0
5, 57, 57M, 6M, 67 AND 78M (COARSE AGGREGATE)	110	38	0

- 5) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (gamma) (pcf)	FRICTION ANGLE (phi) DEGREES	COHESION (c) (kPa)
BACKFILL	110	38	0
FOUNDATION	110	25	0

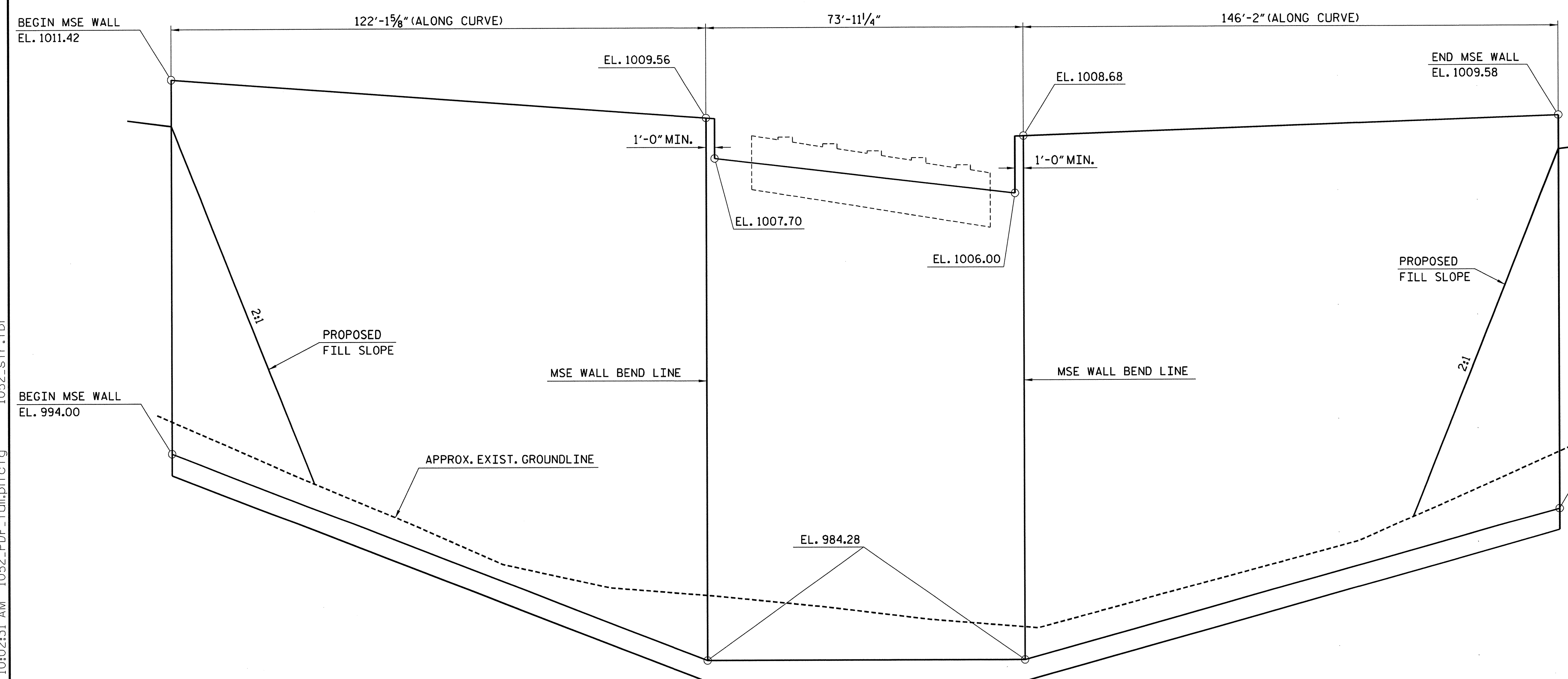
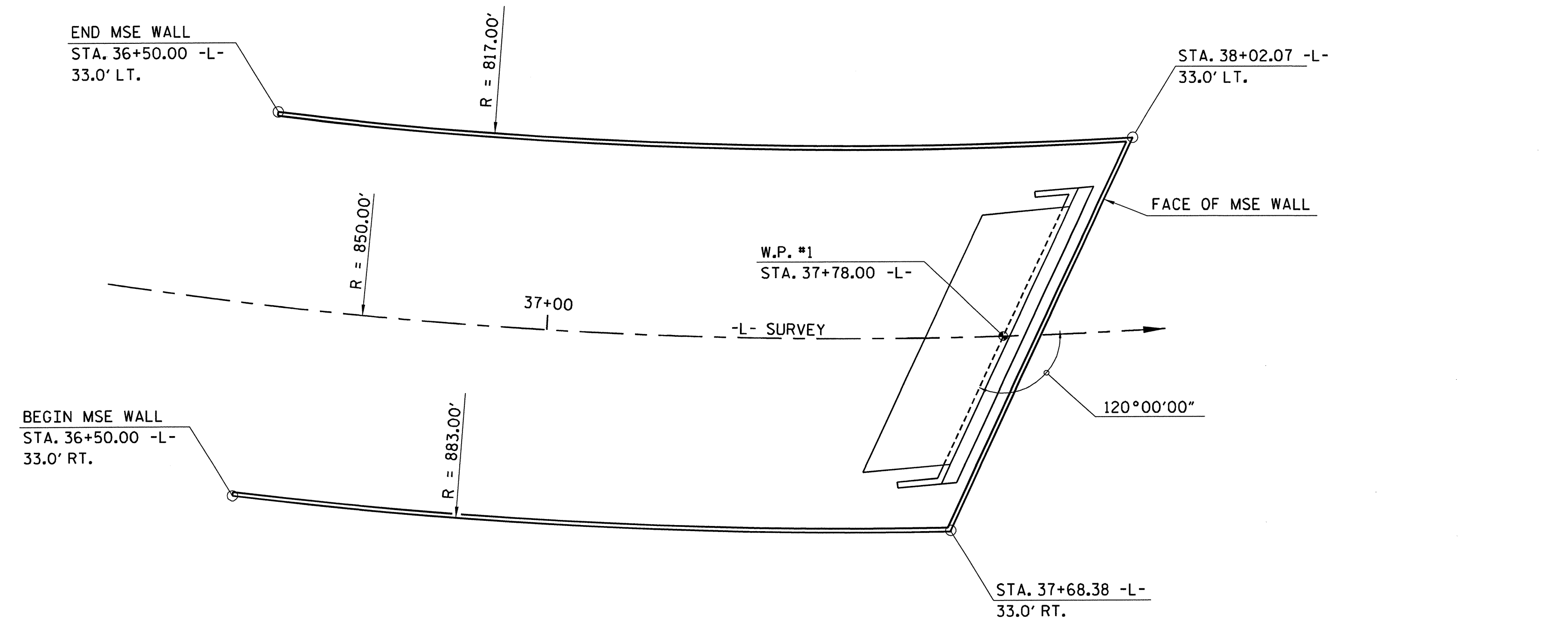
DESIGN RETAINING WALL NO. 1 FOR A LIVE LOAD SURCHARGE.

FOUNDATIONS FOR END BENT NO. 1 LOCATED AT STATION 37+78.00 -L- MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

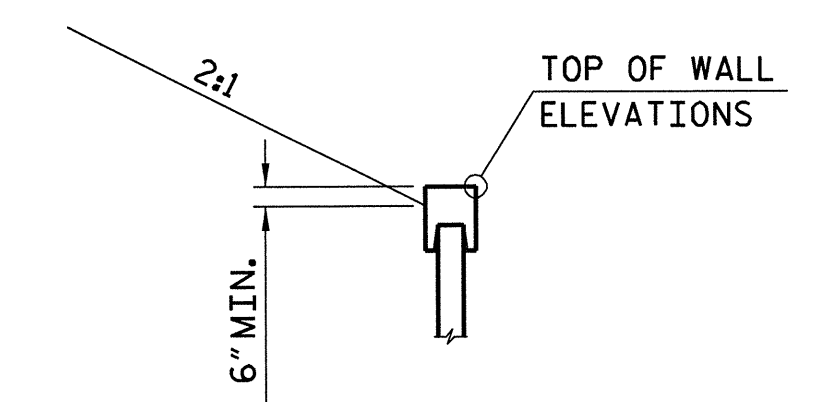
DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO. 1 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

SCOUR CRITICAL ELEVATION OF THE MSE WALL SHALL BE 984.00.

CURVE DATA -L-
 PI STA. 36+35.83
 $\Delta = 45^\circ 30' 07.7''$ (LT)
 $D = 6^\circ 44' 26.4''$
 $L = 675.04'$
 $T = 356.45'$
 $R = 850.00'$



ELEVATION



DETAIL

PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 38+28.13 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

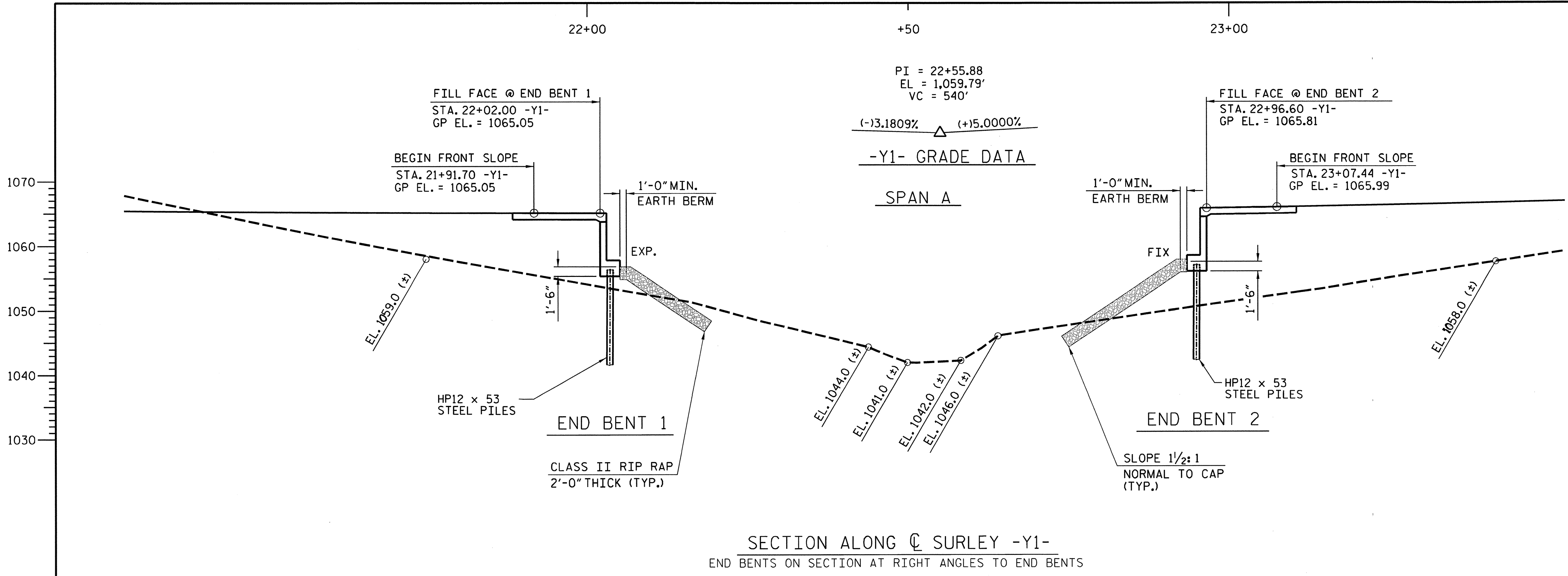
MSE WALL DETAILS

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DRAWN BY: R. KNIGHT DATE: 8/11
 CHECKED BY: M. PAYNE DATE: 8/11

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	51-24	
1			3			TOTAL SHEETS	46
2			4				



HYDRAULIC DATA

DESIGN DISCHARGE	= 190 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YRS
DESIGN HIGH WATER ELEVATION	= 1043.8 FT
DRAINAGE AREA	= 74 AC
BASE DISCHARGE (Q100)	= 260 CFS
BASE HIGH WATER ELEVATION	= 1044.3 FT

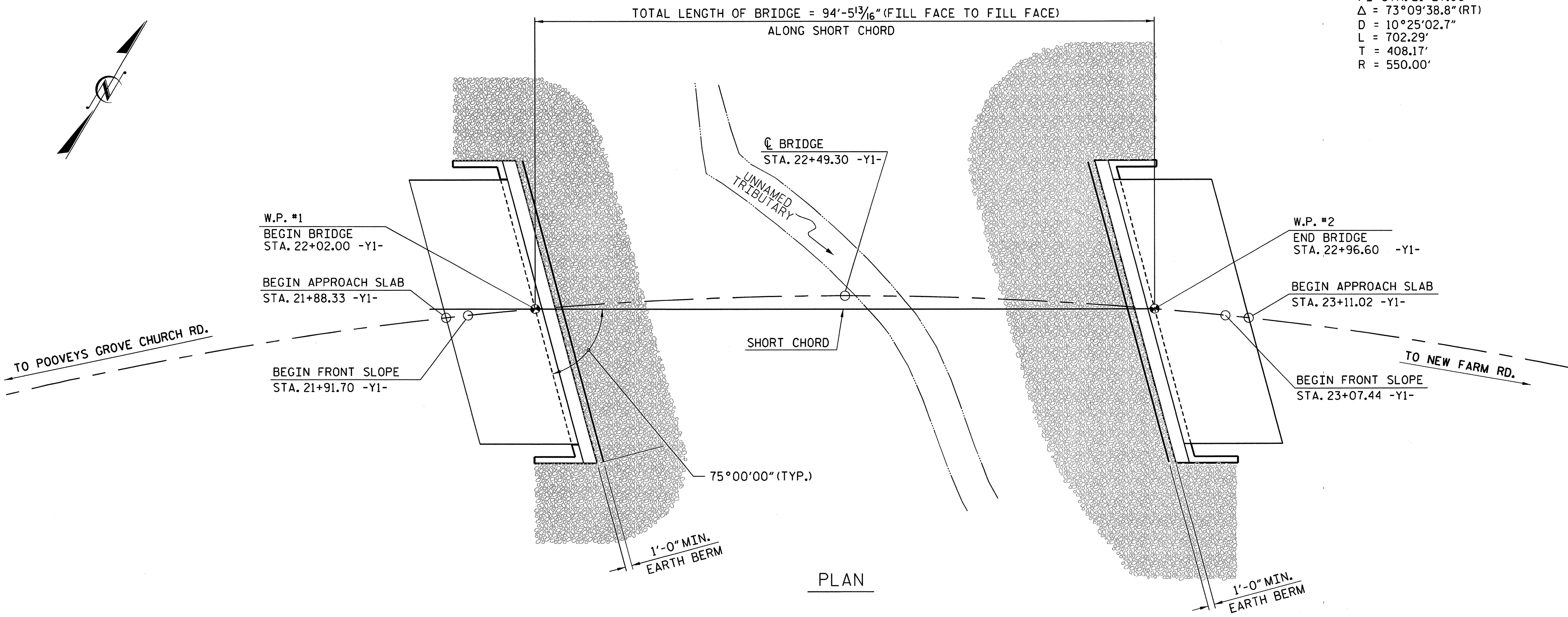
OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= N/A
FREQUENCY OF OVERTOPPING FLOOD	= N/A
OVERTOPPING FLOOD ELEVATION	= N/A

CURVE DATA -Y1-

PI STA.	21+27.06
Δ	73°09'38.8" (RT)
D	10°25'02.7"
L	702.29'
T	408.17'
R	550.00'

TOTAL LENGTH OF BRIDGE = 94'-5 13/16" (FILL FACE TO FILL FACE)
ALONG SHORT CHORD



PROJECT NO. U-5204
CALDWELL COUNTY
STATION: 22+49.30 -Y1-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
UNNAMED TRIBUTARY ON
ALEX LEE BLVD. BETWEEN
POOVEYS GROVE CH. RD.
AND NEW FARM RD.

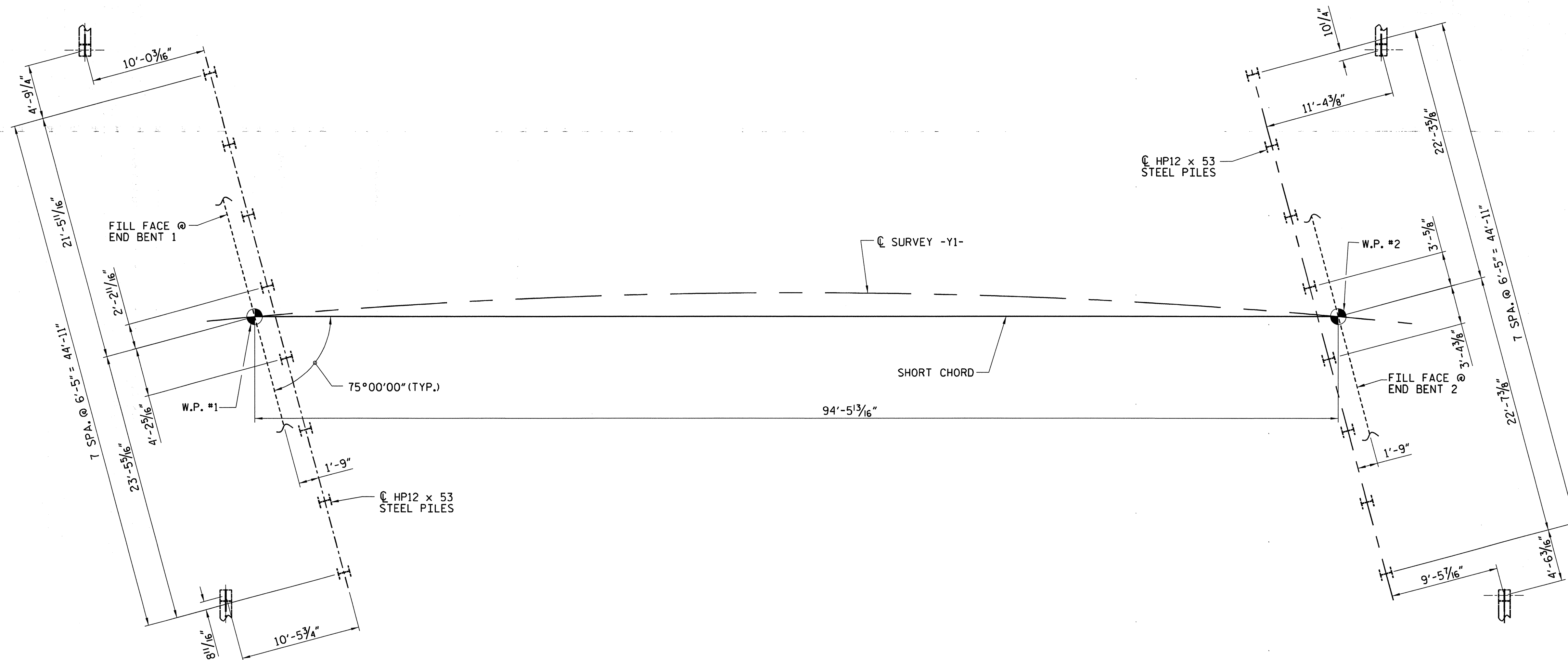


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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-1	
1			3			TOTAL SHEETS	
2			4			48	

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DRAWN BY: J. DAWKINS DATE: 2/11
CHECKED BY: M. PAYNE DATE: 7/11



END BENT 1

I DENOTES VERTICAL PILES
 H DENOTES WINGWALL BRACE PILE

END BENT 2

I DENOTES VERTICAL PILES
 H DENOTES WINGWALL BRACE PILE


FOUNDATION LAYOUT
 END BENTS AND BENTS ARE PARALLEL
 DIMENSIONS TO PILES ARE MEASURED TO C PILES

PROJECT NO. U-5204
CALDWELL COUNTY
 STATION: 22+49.30 -Y1-

SHEET 2 OF 4



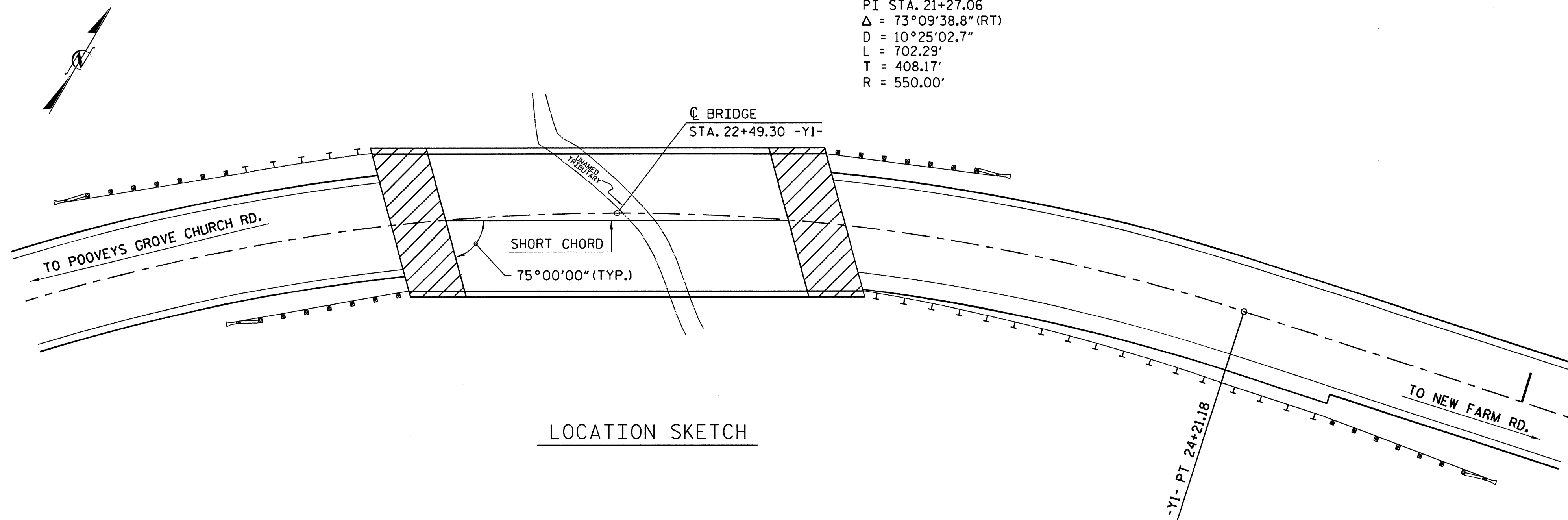
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER
 UNAMED TRIBUTARY ON
 ALEX LEE BLVD. BETWEEN
 POOVEYS GROVE CH. RD.
 AND NEW FARM RD.

 **THE LOUIS BERGER GROUP, Inc.**
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			46
2			4			

BM - PIN IN 24" OAK TREE 41.49' RT OF -Y2- 16+53.54, EL. 1102.19

CURVE DATA -Y1-
 PI STA. 21+27.06
 $\Delta = 73^{\circ}09'38.8''$ (RT)
 D = $10^{\circ}25'02.7''$
 L = 702.29'
 T = 408.17'
 R = 550.00'



LOCATION SKETCH

PROJECT REFERENCE NO. U-5204	SHEET NO. S2-3
---------------------------------	-------------------

NOTES:

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE SPECIFICATIONS FOR SEISMIC ZONE 1.
- FOR ADDITIONAL DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.
- THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE (1) 30 INCH SAMPLE OF EACH BARS SIZE USED. FOR PROJECTS REQUIRING MORE THAN 400 TONS OF REINFORCING STEEL, TWO (2) 30 INCH SAMPLES OF EACH BAR SIZE USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN SHALL BE SPICED WITH REPLACEMENT BARS OF SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPICE OF THIRTY (30) BAR DIAMETERS. PAYMENT FOR SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.
- FOR PILES, SEE SPECIAL PROVISIONS.
- PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR 120 TONS PER PILE. DRIVE PILES TO THE REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.
- STEEL PILE POINTS (WITH TEETH) ARE REQUIRED FOR ALL PILES.
- TESTING THE FIRST PRODUCTION PILE WITH PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING, OR REDRIVING IS REQUIRED. FOR PDA, SEE SPECIAL PROVISIONS.
- OBSERVE A ONE MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT, END BENT, AND REINFORCED EARTH FILL PRIOR TO CONSTRUCTING APPROACH SLAB AT END BENT LOCATIONS.
- PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT 2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 1,037 FEET. FOR PILE EXCAVATION, SEE SPECIAL PROVISIONS.
- CONCRETE IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT 2. SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- NO KNOWN UTILITY CONFLICTS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR FALSEWORKS AND FORMWORK, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLAB	REINFORCING STEEL	63" MODIFIED PRESTRESSED CONCRETE GIRDER	PDA TESTING	HP 12 x 53 STEEL PILES	STEEL PILE POINTS	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	CONCRETE BARRIER RAIL	CLASS II RIP RAP (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS
	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LIN. FT.	EA.	NO.	LIN. FT.	EA.	LIN. FT.	LIN. FT.	TONS	SO. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	3,716	4,526				453.75	1					208.7				
END BENT 1			39.2		4,103			10	200	10			210	156		
END BENT 2			38.7		5,605			10	300	10	150	150	316	234		
TOTAL	3,716	4,526	77.9	LUMP SUM	9,708	453.75	1	20	500	20	150	150	208.7	390	LUMP SUM	LUMP SUM

PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 22+49.30 -Y1-

SHEET 3 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING FOR
 BRIDGE OVER
 UNAMED TRIBUTARY ON
 ALEX LEE BLVD. BETWEEN
 POOVEYS GROVE CH. RD.
 AND NEW FARM RD.

THE LOUIS BERGER GROUP, Inc.
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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-3	
1			3			TOTAL SHEETS	40
2			4				

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DRAWN BY: J. DAWKINS DATE: 2/11
 CHECKED BY: M. PAYNE DATE: 7/11

LOAD FACTORS:

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

NOTES:

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

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

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS																								
LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE								COMMENT NUMBER
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.16	--	1.75	0.75	1.20	A	I	44.92	0.93	1.16	A	I	72.29	0.8	0.75	1.29	A	I	44.92		
	HL-93 (OPERATING)	N/A		1.51	--	1.35	0.75	1.56	A	I	44.92	0.93	1.51	A	I	72.29	N/A	--	--	A	I	44.92		
	HS-20 (INVENTORY)	36.00	②	1.64	59.04	1.75	0.75	1.64	A	I	44.92	0.93	1.81	A	I	81.42	0.8	0.75	1.75	A	I	44.92		
	HS-20 (OPERATING)	36.00		2.12	76.32	1.35	0.75	2.12	A	I	44.92	0.93	2.34	A	I	81.42	N/A	--	--	A	I	44.92		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.50		4.10	51.25	1.40	0.75	4.78	A	I	44.92	0.93	5.85	A	I	81.42	0.8	0.75	4.10	A	I	44.92	
		S3C	21.50		2.38	51.17	1.40	0.75	2.77	A	I	44.92	0.93	3.29	A	I	81.42	0.8	0.75	2.38	A	I	44.92	
		S3A	22.75		2.10	47.78	1.40	0.75	2.45	A	I	44.92	0.93	2.87	A	I	81.42	0.8	0.75	2.10	A	I	44.92	
		S4A	26.75		1.84	49.22	1.40	0.75	2.14	A	I	44.92	0.93	2.48	A	I	81.42	0.8	0.75	1.84	A	I	44.92	
		S5A	30.50		1.64	50.02	1.40	0.75	1.92	A	I	44.92	0.93	2.26	A	I	81.42	0.8	0.75	1.64	A	I	44.92	
		S6A	34.50		1.50	51.75	1.40	0.75	1.75	A	I	44.92	0.93	2.03	A	I	63.17	0.8	0.75	1.50	A	I	44.92	
		S7B	38.50	③	1.42	54.67	1.40	0.75	1.65	A	I	44.92	0.93	1.90	A	I	63.17	0.8	0.75	1.42	A	I	44.92	
		S7A	40.00		1.45	58.00	1.40	0.75	1.69	A	I	44.92	0.93	2.09	A	I	81.42	0.8	0.75	1.45	A	I	44.92	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.25		1.83	51.70	1.40	0.75	2.13	A	I	44.92	0.93	2.42	A	I	81.42	0.8	0.75	1.83	A	I	44.92	
		T5B	32.00		1.62	51.84	1.40	0.75	1.89	A	I	44.92	0.93	2.26	A	I	81.42	0.8	0.75	1.62	A	I	44.92	
		T6A	36.00		1.49	53.64	1.40	0.75	1.73	A	I	44.92	0.93	2.09	A	I	81.42	0.8	0.75	1.49	A	I	44.92	
		T7A	40.00		1.49	59.60	1.40	0.75	1.74	A	I	44.92	0.93	2.08	A	I	81.42	0.8	0.75	1.49	A	I	44.92	
		T7B	40.00		1.53	61.20	1.40	0.75	1.78	A	I	44.92	0.93	1.85	A	I	63.17	0.8	0.75	1.53	A	I	44.92	

① CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

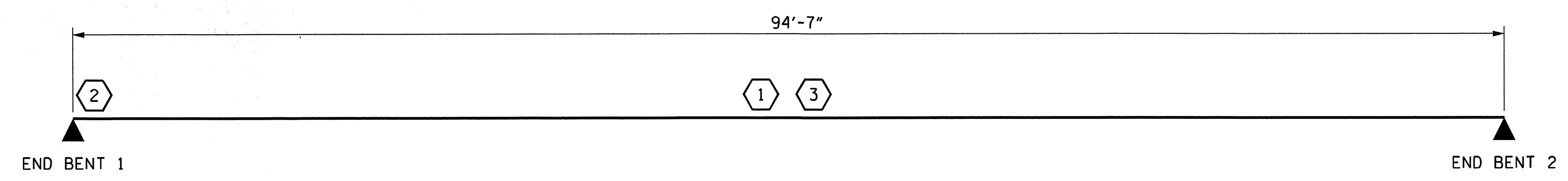
② DESIGN LOAD RATING (HS-20)

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-5204
CALDWELL COUNTY
STATION: 22+49.30 -Y1-

SHEET 4 OF 4



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-4	
1			3			TOTAL SHEETS	
2			4			48	

STD. NO. LRFR1

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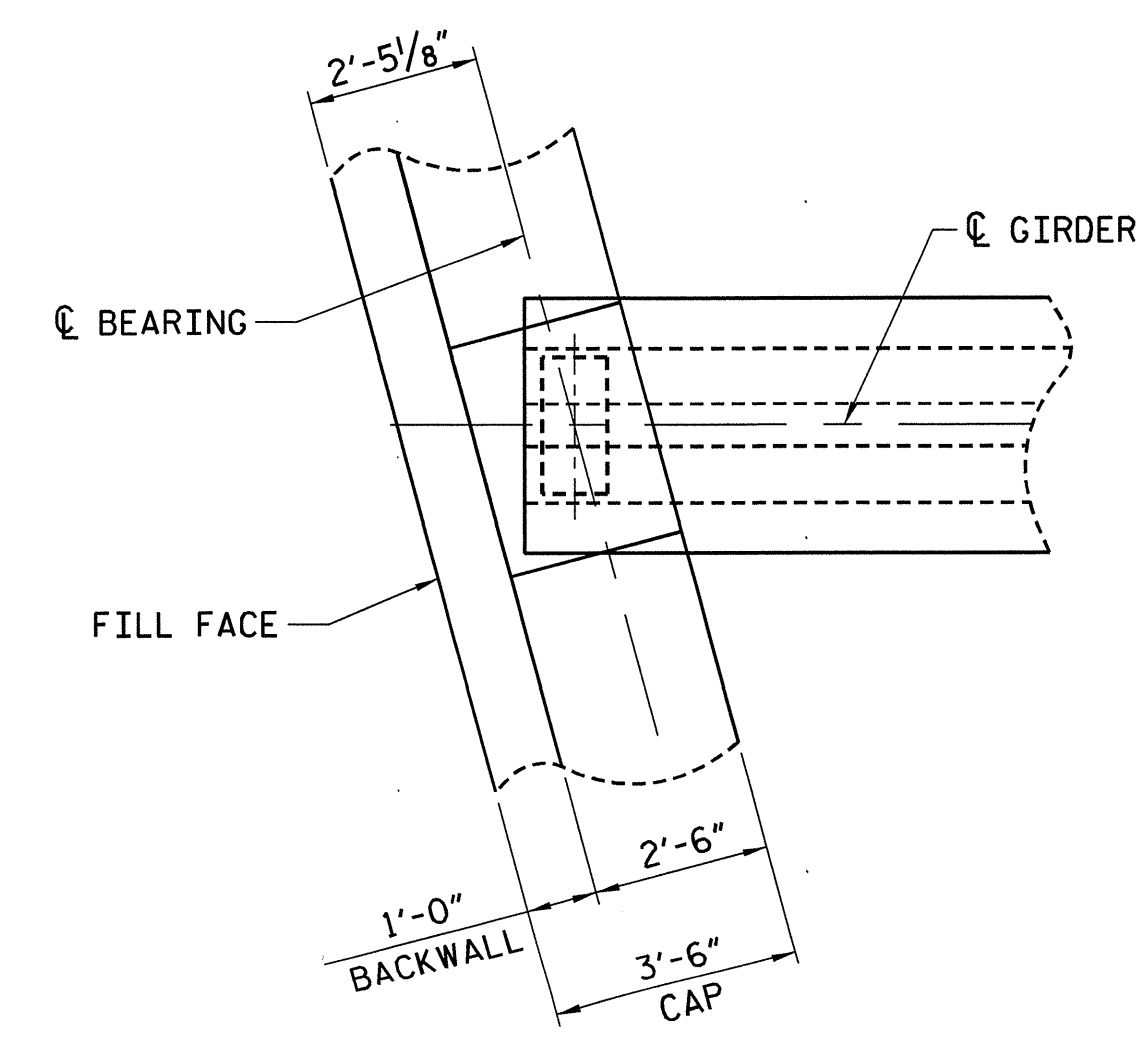
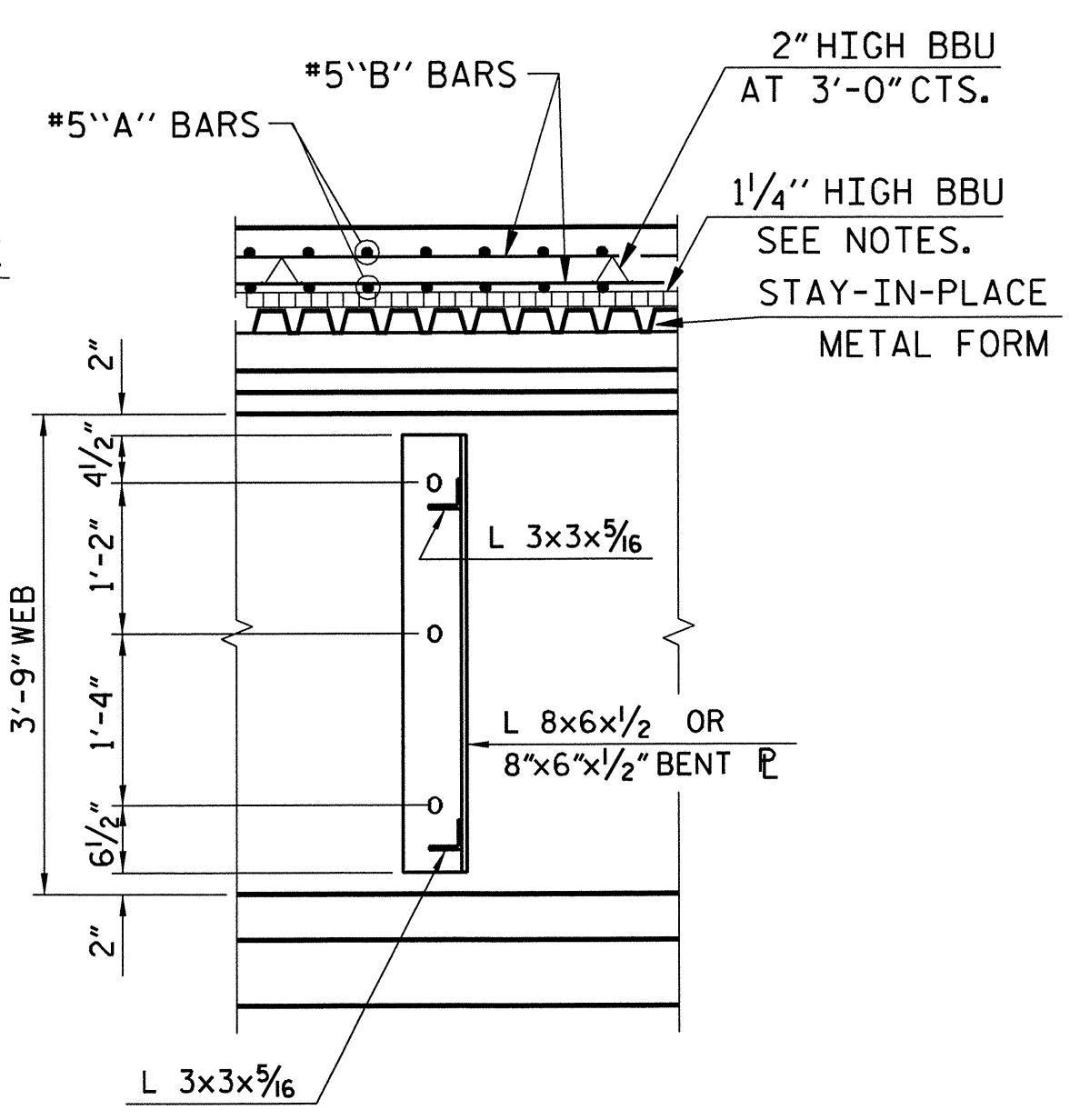
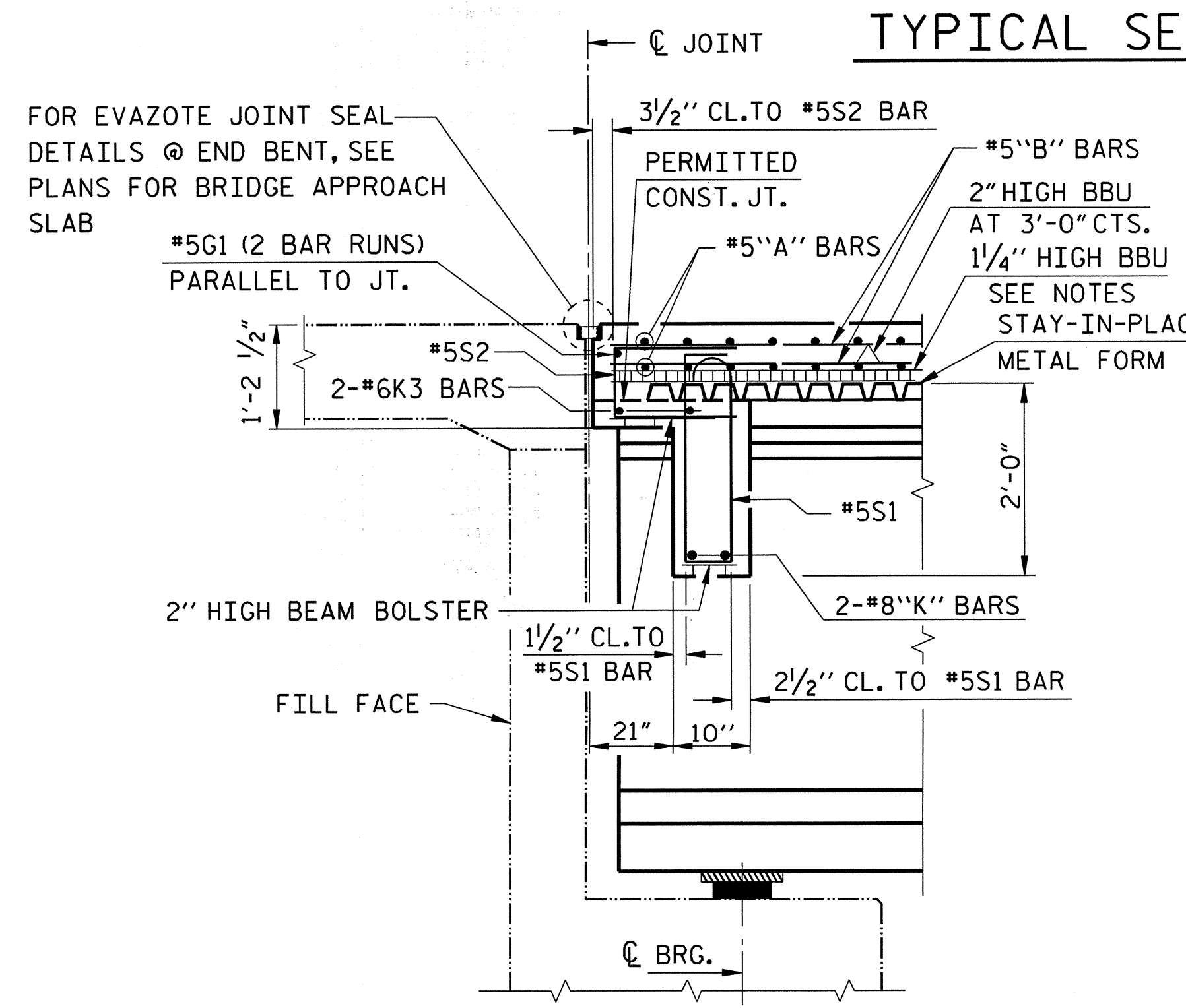
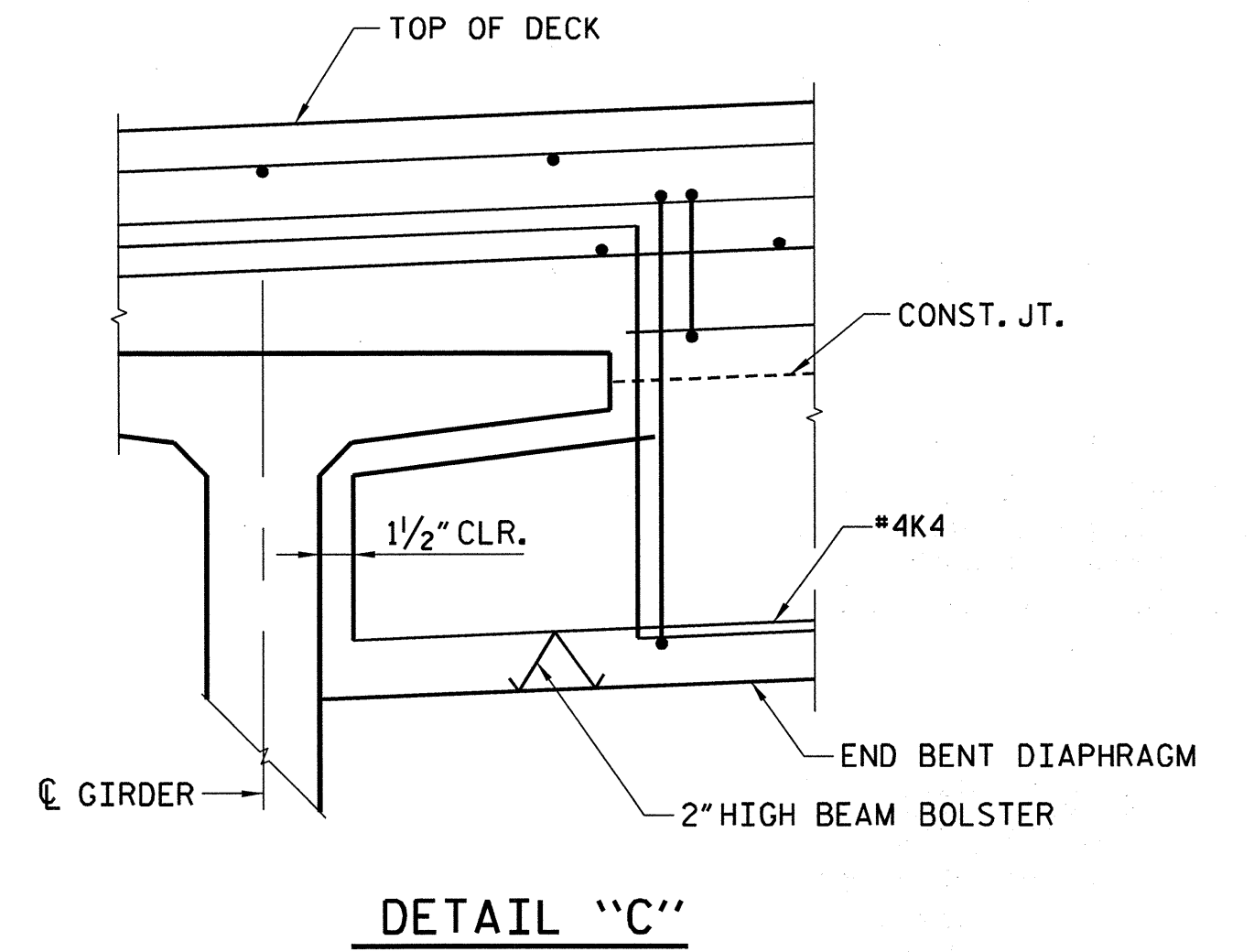
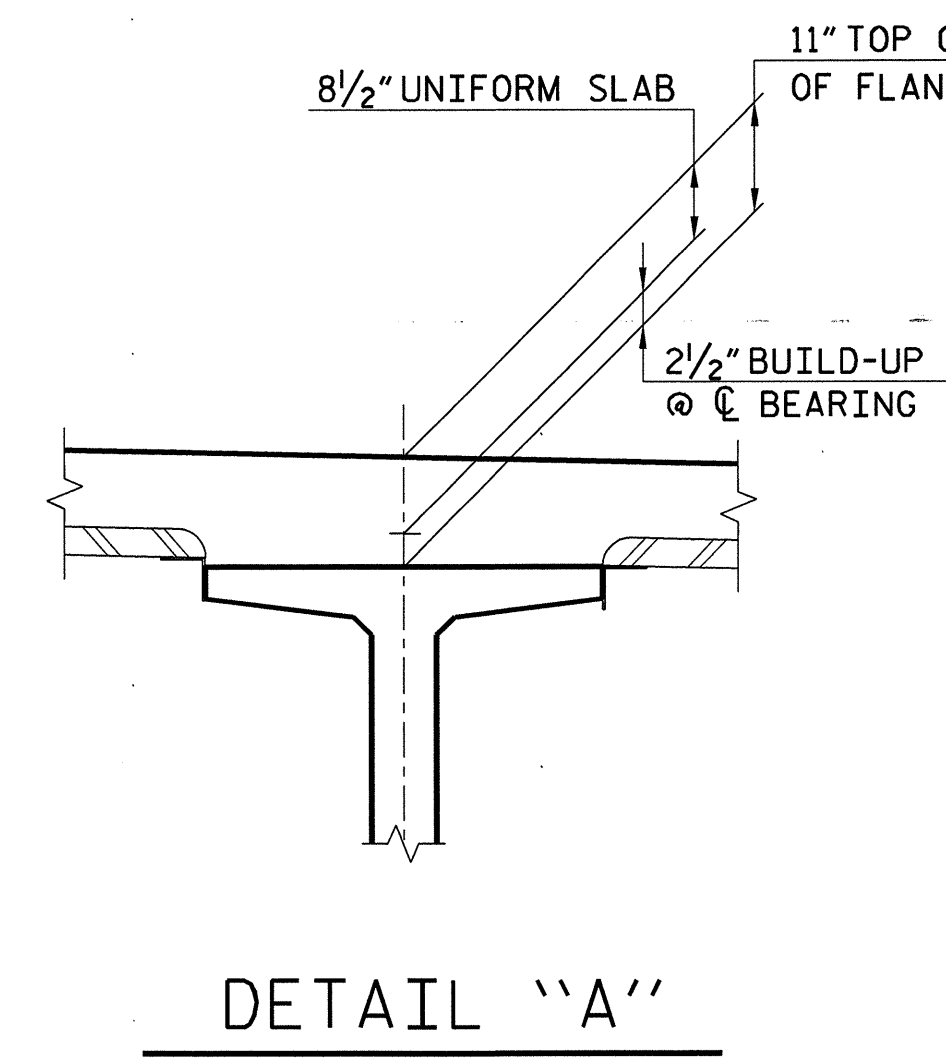
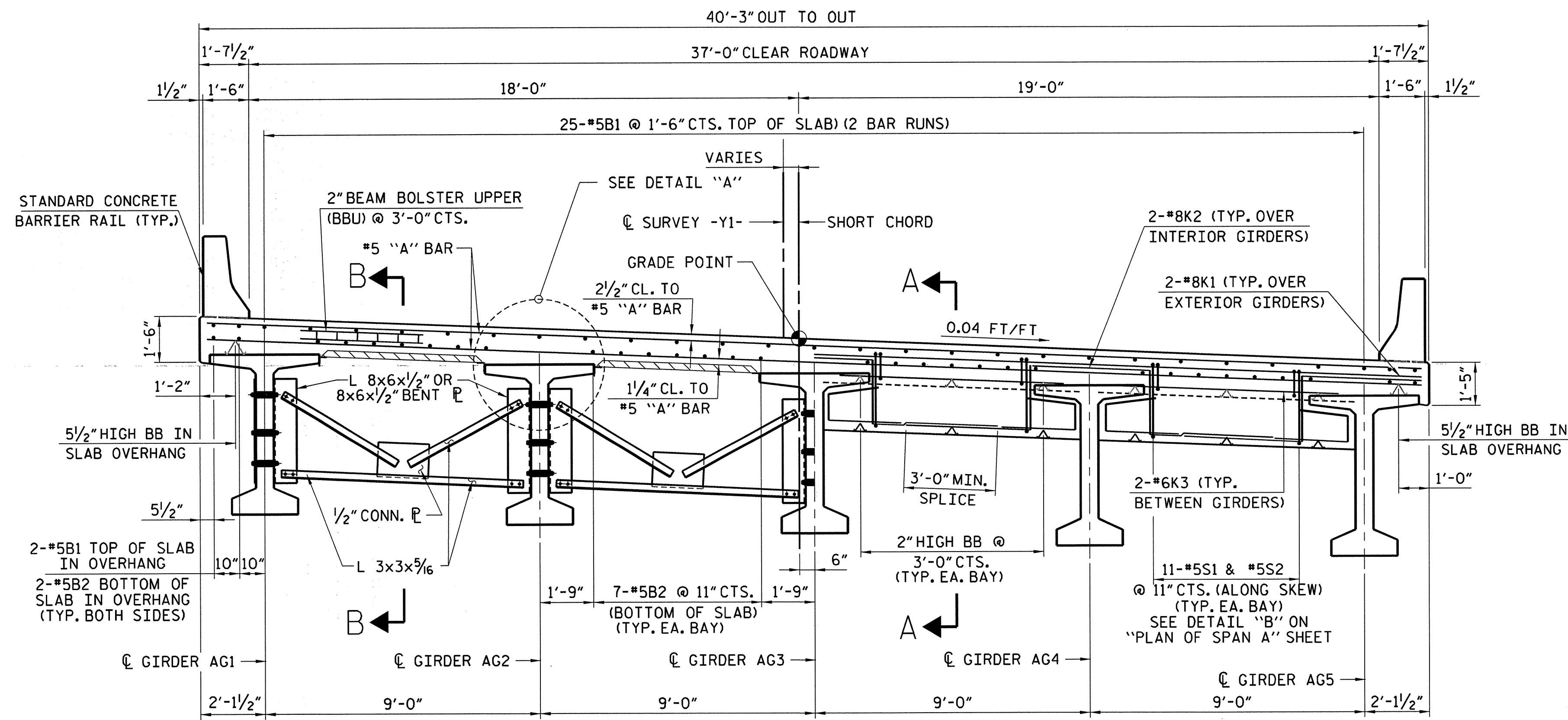
ASSEMBLED BY : J. DAWKINS	DATE : 7/11
CHECKED BY : M. PAYNE	DATE : 7/11
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : CM/DI 2/08	

NOTES:

PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS, WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

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

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2" AT END BENT #2. FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.



PROJECT NO. U-5204
CALDWELL COUNTY
STATION: 22+49.30 -Y1-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

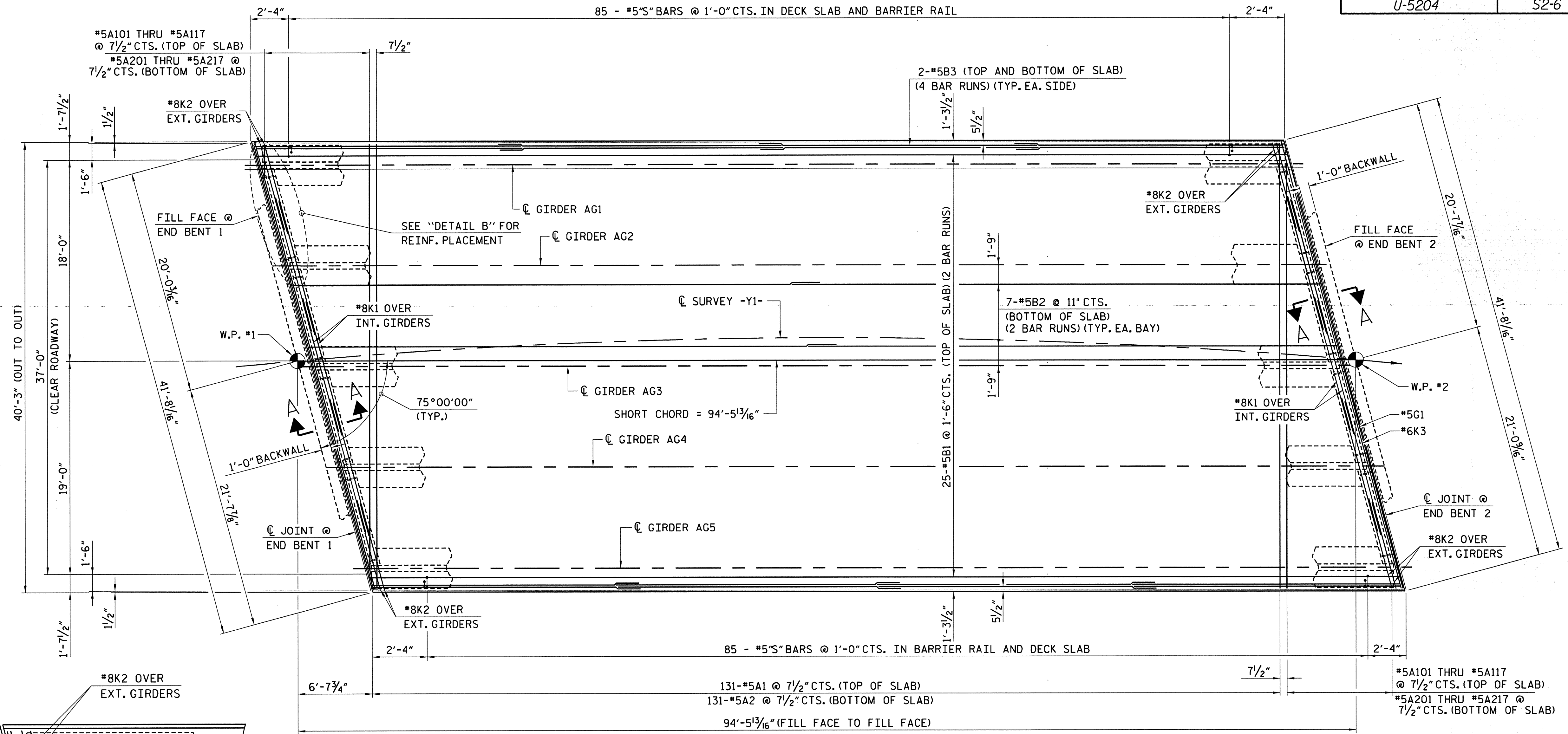
**SUPERSTRUCTURE
TYPICAL SECTION**

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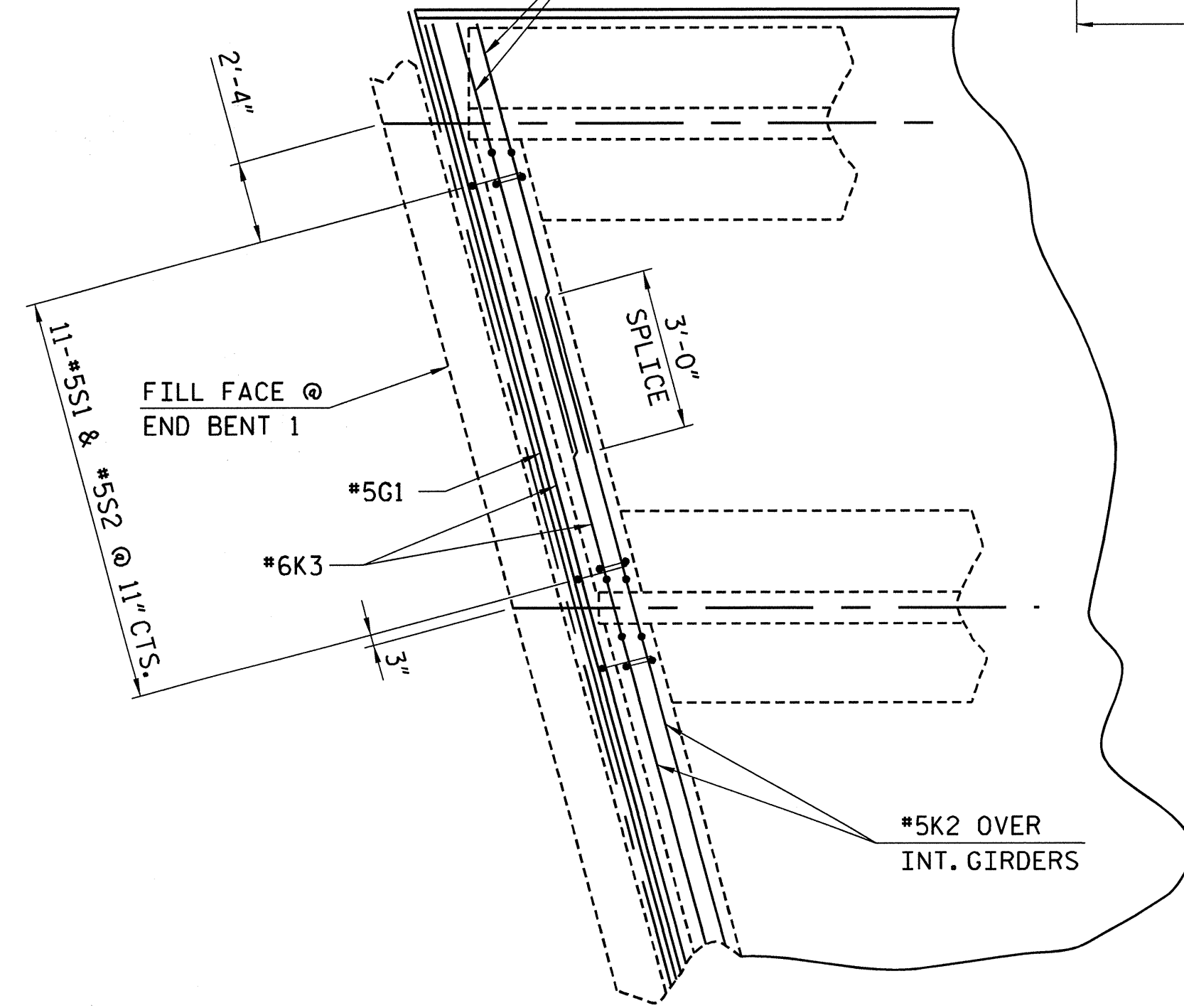
DRAWN BY: R. KNIGHT DATE: 3/11
CHECKED BY: M. PAYNE DATE: 7/11

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-5	
1			3			TOTAL SHEETS	46
2			4				



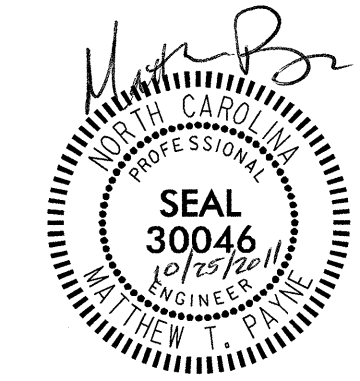
PLAN OF SPAN A



DETAIL "B"
END BENT 1 SHOWN, END BENT 2 SIMILAR

PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 22+49.30 -Y1-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPAN A

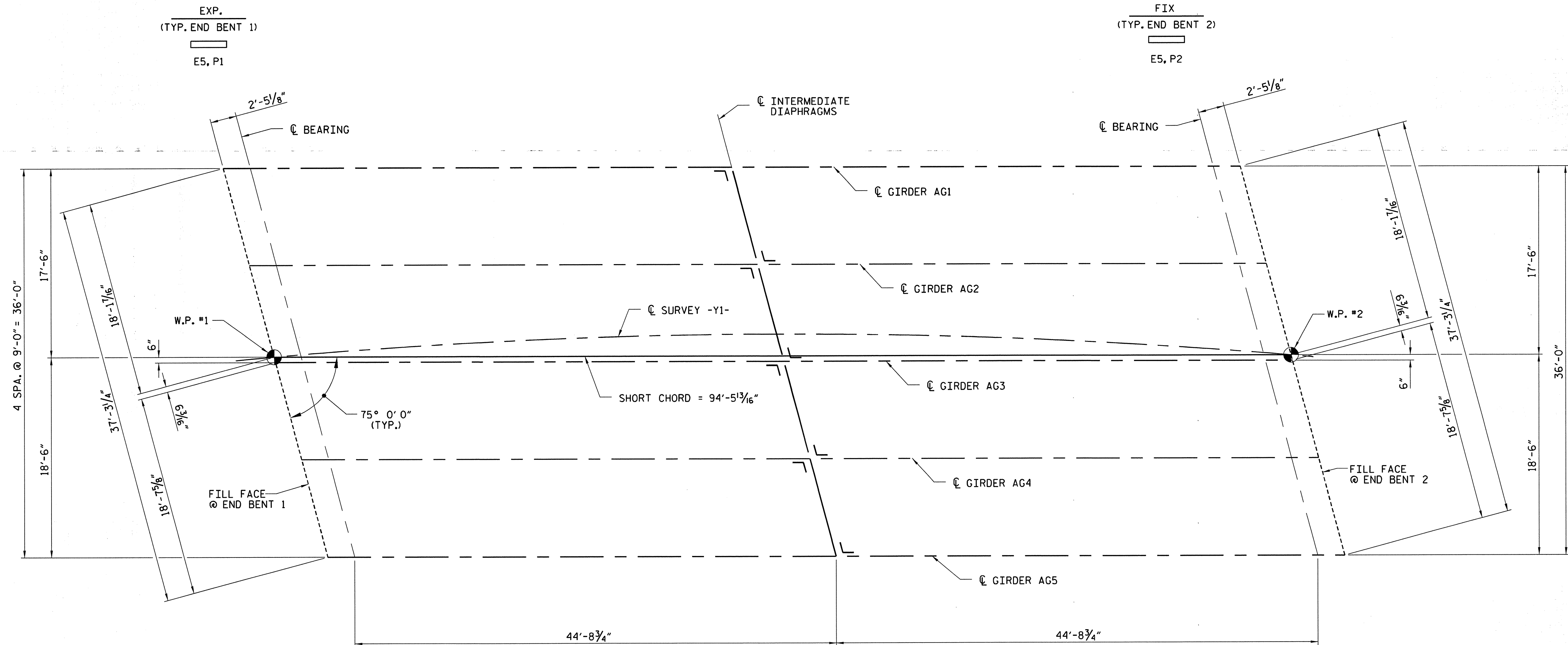


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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			46
2			4			

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DRAWN BY: R. KNIGHT DATE: 3/11
 CHECKED BY: M. PAYNE DATE: 7/11



SPAN A
FRAMING PLAN

PROJECT NO. U-5204
CALDWELL COUNTY
 STATION: 22+49.30 -Y1-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
FRAMING PLAN



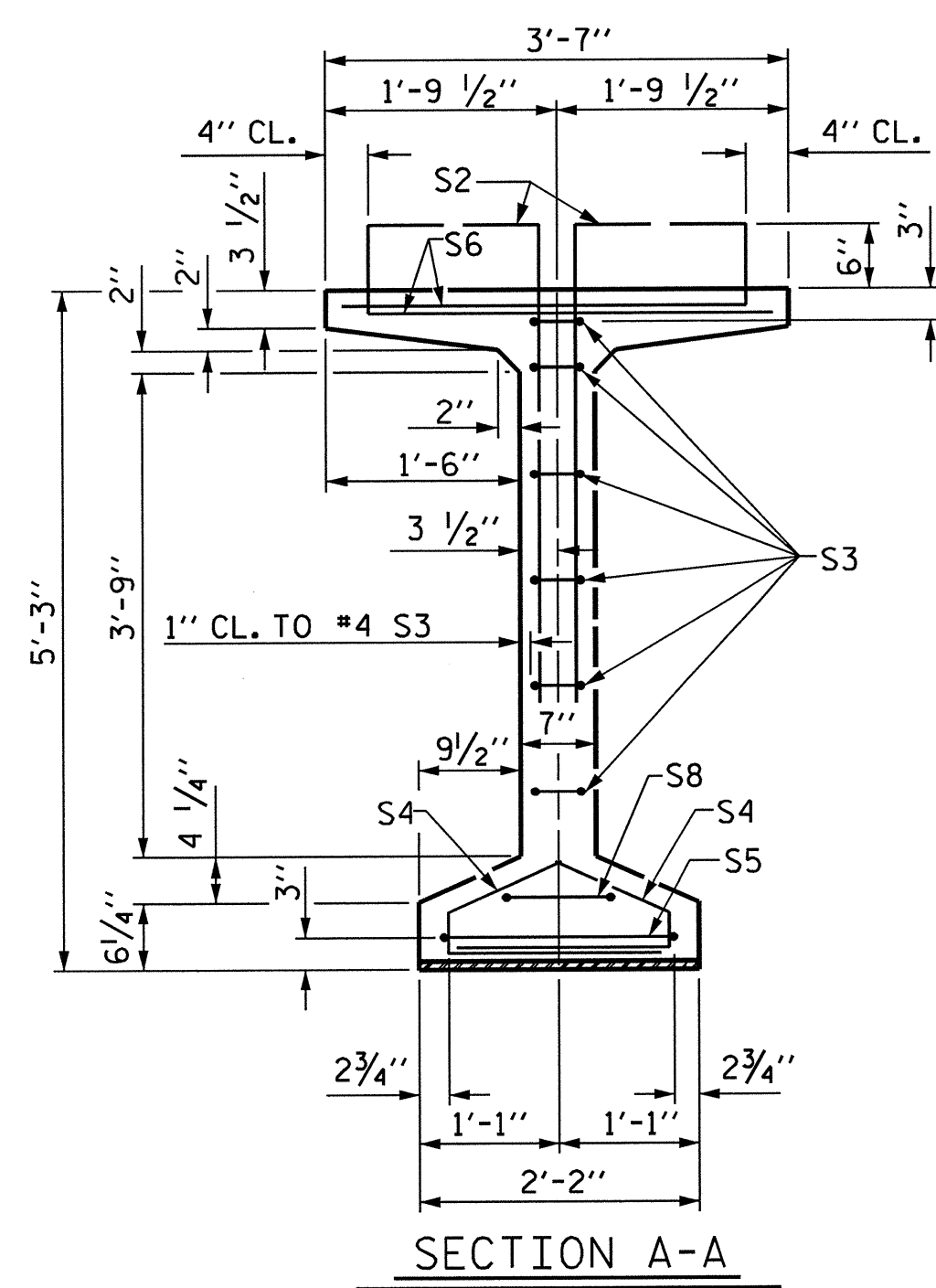
THE LOUIS BERGER GROUP, Inc.
 1001 Wade Avenue, Suite 400
 Raleigh, NC 27605-3322

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-7	
1			3			TOTAL SHEETS	48
2			4				

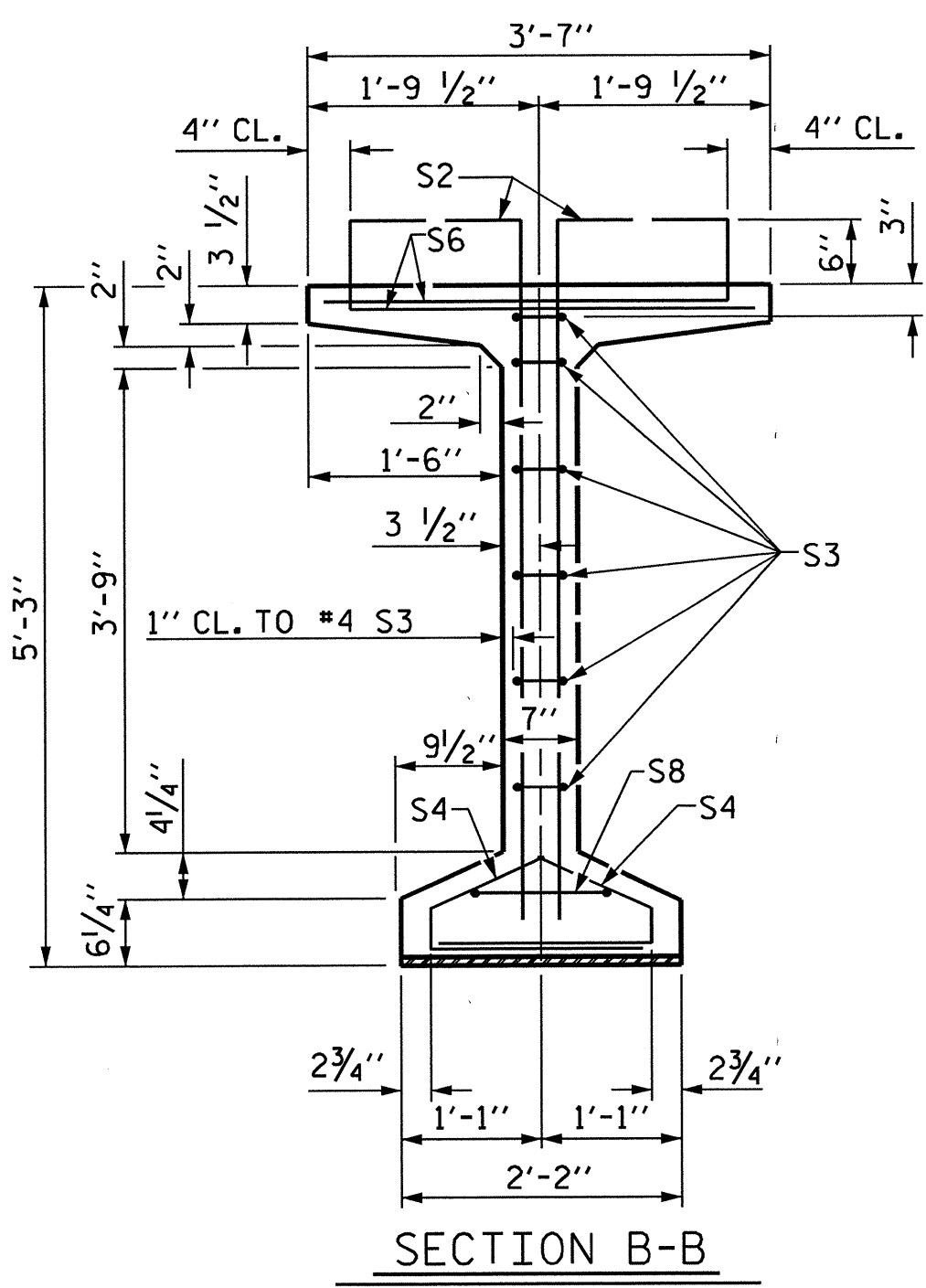
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DRAWN BY : S. KAPLAN DATE : 2/11
 CHECKED BY : M. PAYNE DATE : 7/11

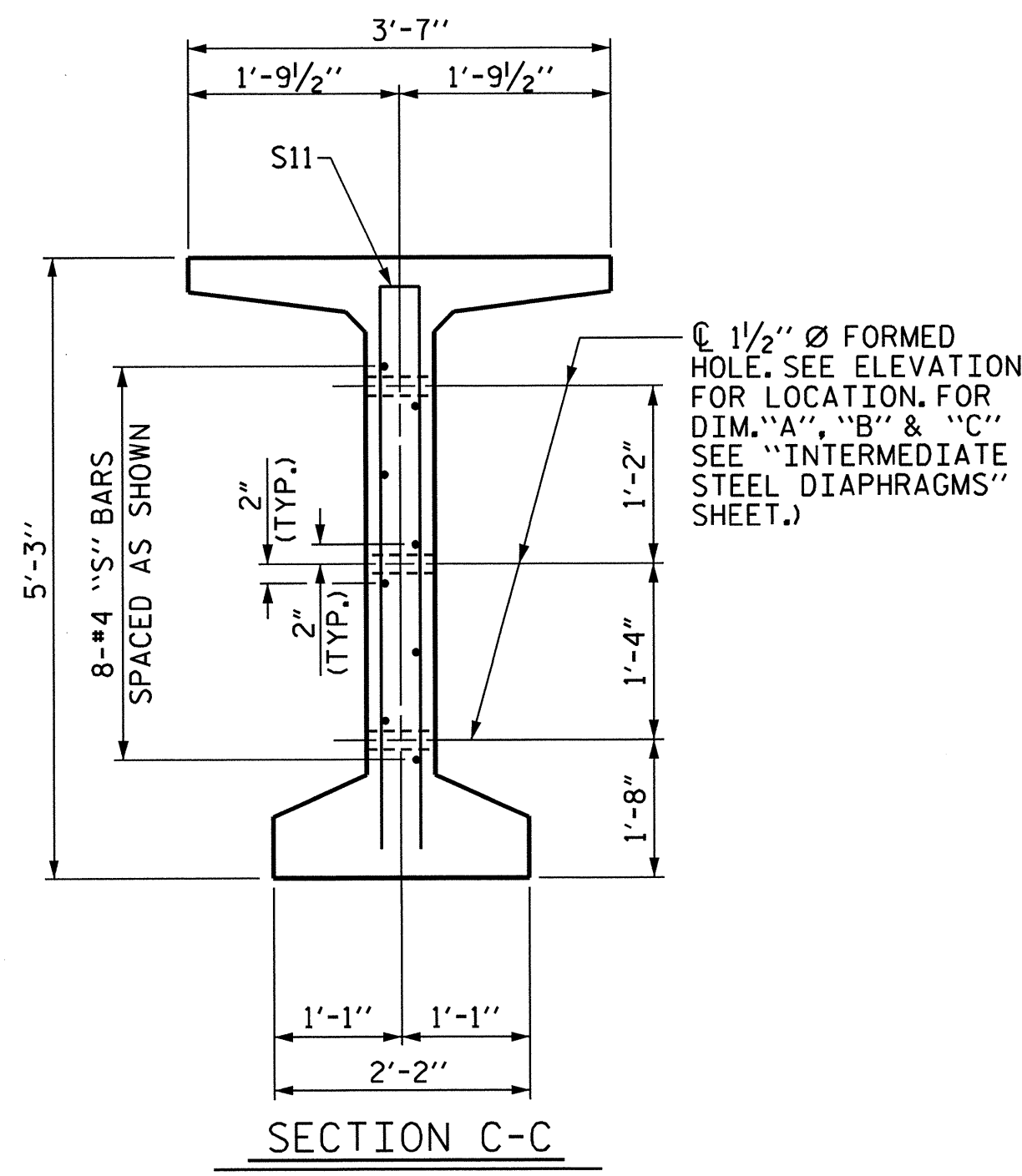
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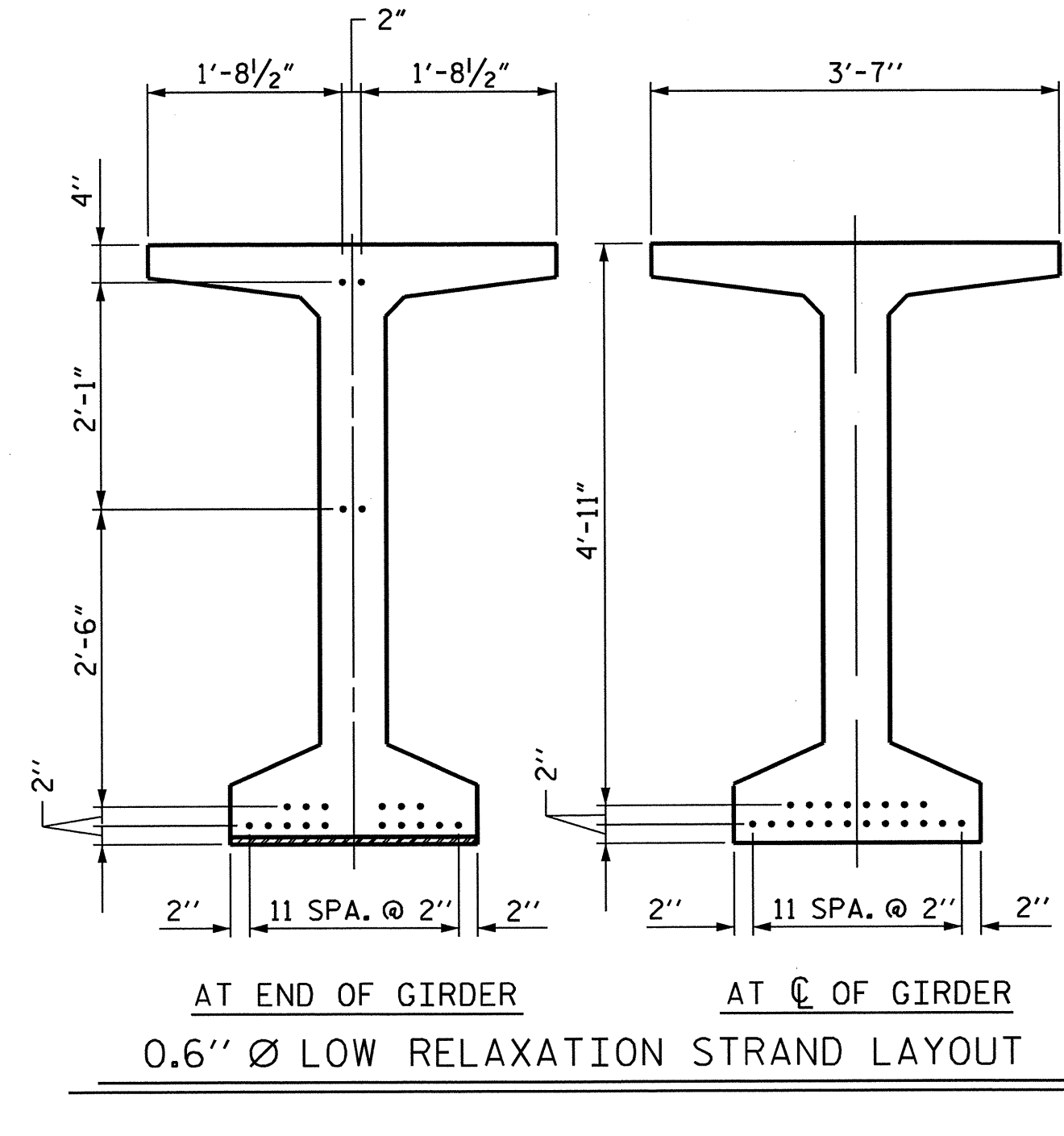
SECTION A-A



SECTION B-B

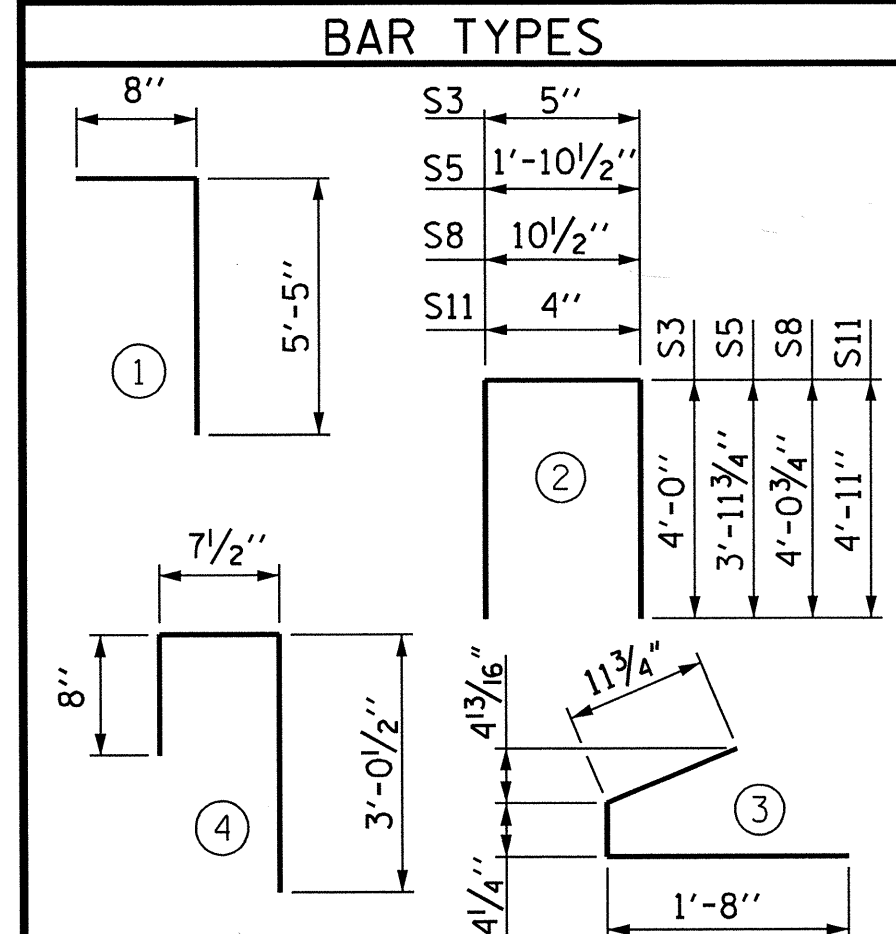


SECTION C-C
 (S1, S6 AND S9 BARS NOT SHOWN)



AT END OF GIRDER AT C. OF GIRDER
 0.6" Ø LOW RELAXATION STRAND LAYOUT

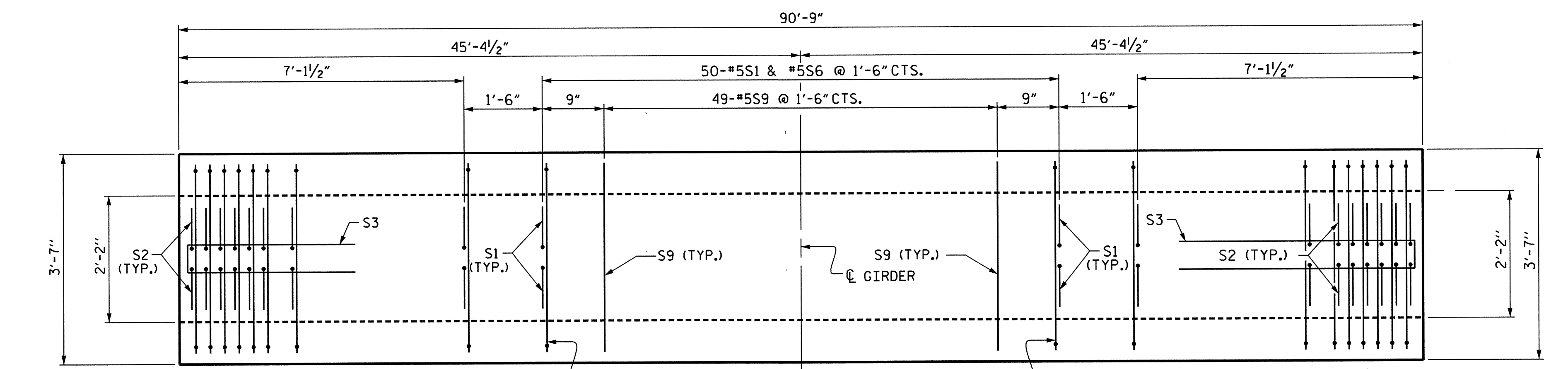
AG1 & AG5	S10	4	#4	2	10'-2"	27
AG2, AG3 & AG4	S11	12	#4	2	10'-2"	81
AG1 & AG5	S12	8	#3	STR	8'-0"	24
AG2, AG3 & AG4	S13	8	#3	STR	13'-2"	40



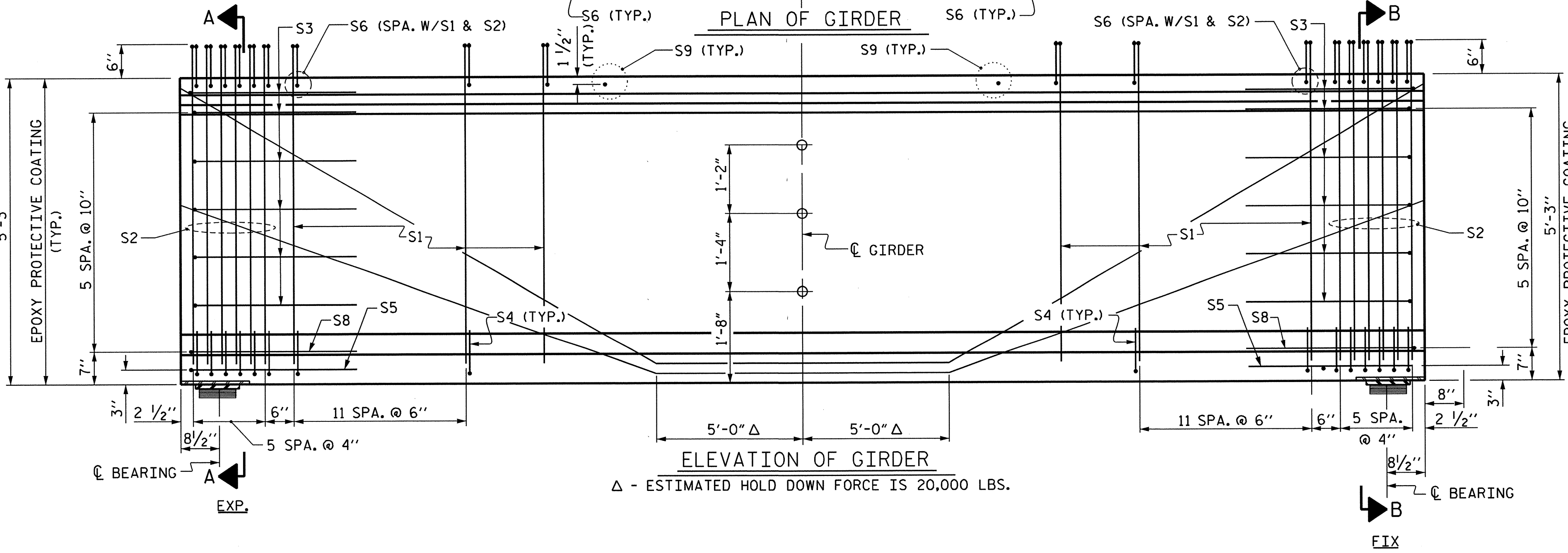
ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER			
REINFORCING STEEL	6000 PST CONCRETE	0.6" Ø L.R. STRANDS	
LB.	C.Y.	No.	
AG1 & AG5	1,694	18.0	20
AG2, AG3&AG4	1,764	18.0	20

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
5	90'-9"	453'-9"

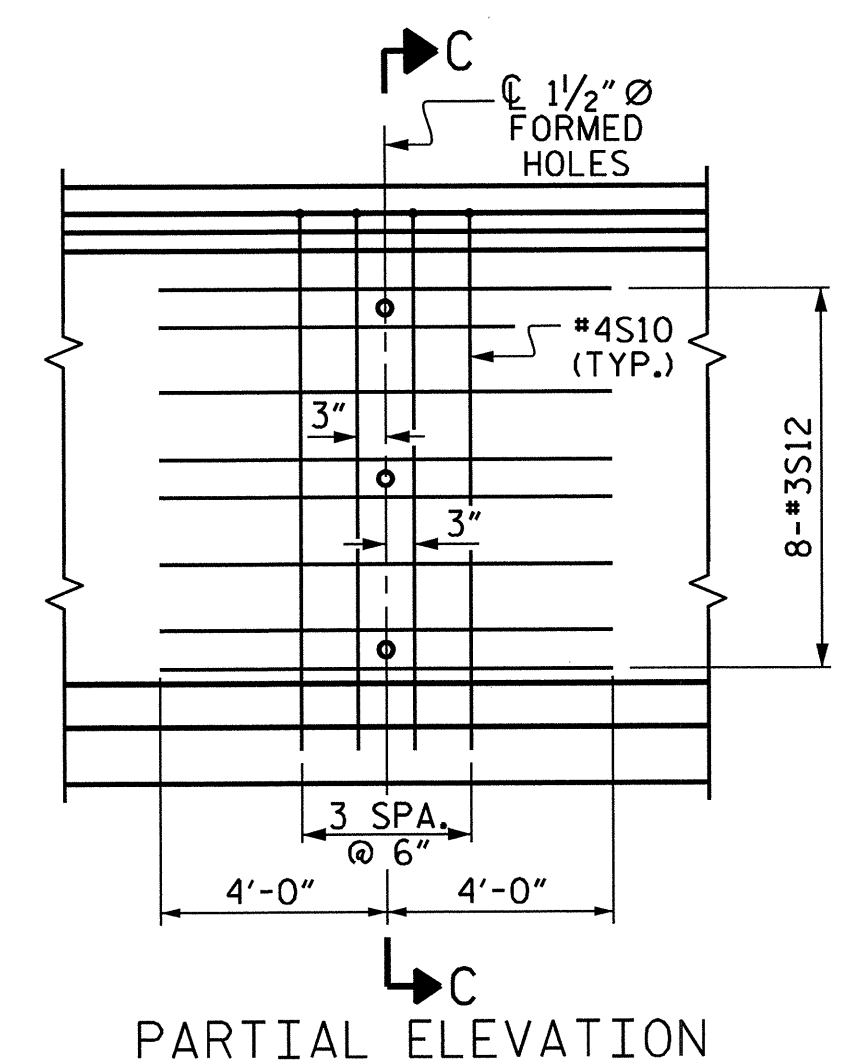


PLAN OF GIRDER



ELEVATION OF GIRDER

Δ - ESTIMATED HOLD DOWN FORCE IS 20,000 LBS.



PARTIAL ELEVATION
 SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. AG1 & AG5



THE LOUIS BERGER GROUP, Inc.
 1001 Wade Avenue, Suite 400
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PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 22+49.30 -Y1-

SHEET 1 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 63" PRESTRESSED CONCRETE
 MODIFIED BULB TEE

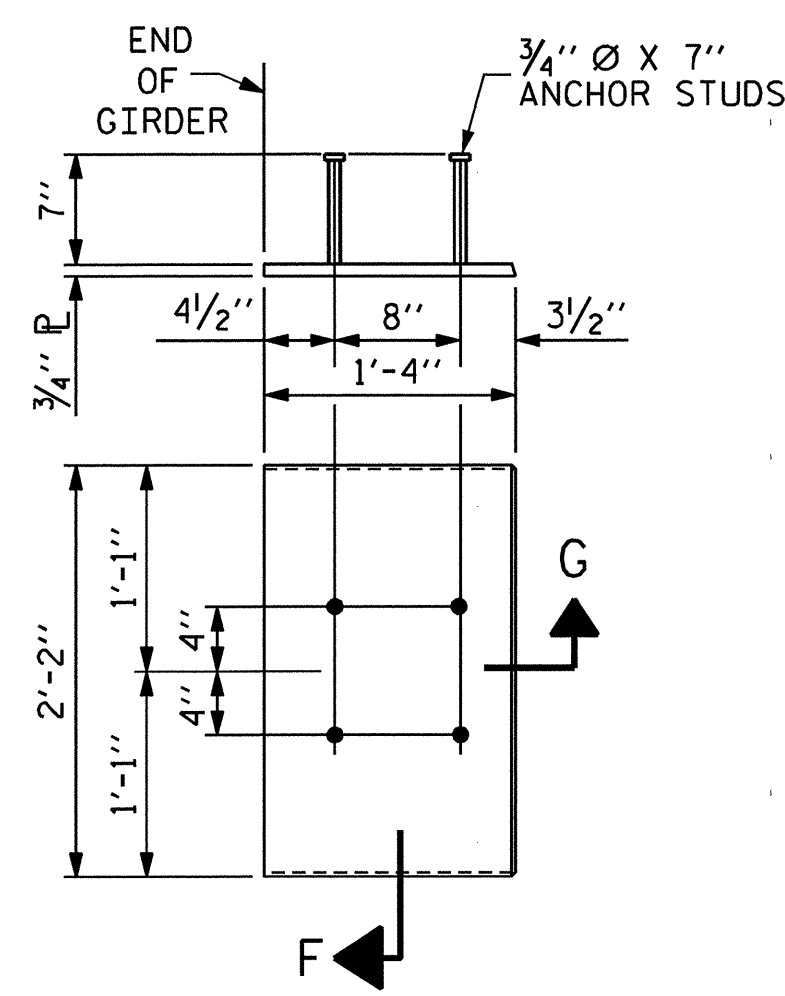
ASSEMBLED BY : R. KNIGHT	DATE : 3/11
CHECKED BY : M. PAYNE	DATE : 7/11
DRAWN BY : EEM 2/6/97	REV. 8/16/99 RWW/LES
CHECKED BY : VAP 2/6/97	REV. 10/11/00 RWW/LES
	REV. 5/1/06R TLA/GM

REVISIONS				SHEET NO.	
BY:	DATE:	NO.	BY:	DATE:	S2-8
		3			TOTAL SHEETS
		4			48

DEAD LOAD DEFLECTION TABLE FOR GIRDERS											
0.6" Ø LOW RELAXATION	SPAN A										
	GIRDERS AG1 & AG5										
TENTH POINTS	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
CAMBER (GIRDER ALONE IN PLACE)	0	0.063	0.112	0.147	0.168	0.174	0.168	0.147	0.112	0.063	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	0	0.019	0.038	0.052	0.061	0.065	0.061	0.052	0.038	0.019	0
FINAL CAMBER	0	1/2"	7/8"	1 1/8"	1 1/4"	1 5/16"	1 1/4"	1 1/8"	7/8"	1/2"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS											
0.6" Ø LOW RELAXATION	SPAN A										
	GIRDERS AG2, AG3 AND AG4										
TENTH POINTS	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
CAMBER (GIRDER ALONE IN PLACE)	0	0.063	0.112	0.147	0.168	0.174	0.168	0.147	0.112	0.063	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	0	0.024	0.047	0.064	0.076	0.080	0.076	0.064	0.047	0.024	0
FINAL CAMBER	0	1/2"	13/16"	1"	1 1/8"	1 1/8"	1 1/8"	1"	13/16"	1/2"	0

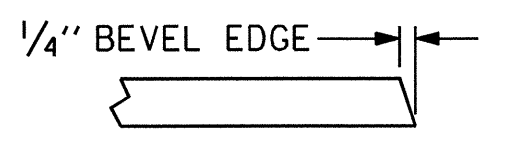
* INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES (FRACTION FORM).



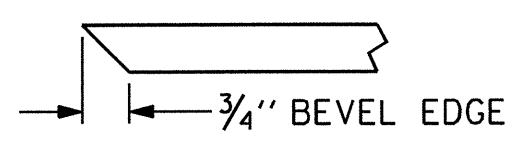
EMBEDDED PLATE "B-1" DETAILS
63" MODIFIED BULB TEE
(2 REQ'D PER GIRDER)

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.
- 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. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.
- ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.
- AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.
- THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5000 PSI. DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.
- THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".
- WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.
- A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" MODIFIED BULB TEE.
- 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 G

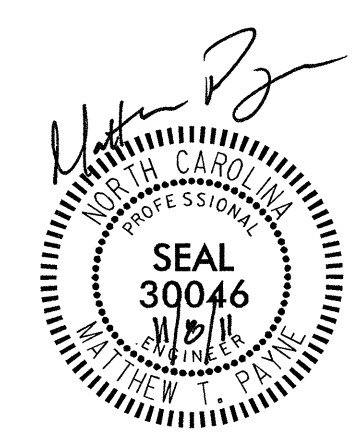


SECTION F

(SEE NOTES)

PROJECT NO. U-5204
CALDWELL COUNTY
STATION: 22+49.30 -Y1-

SHEET 2 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
PRESTRESSED CONCRETE GIRDER
DETAILS

ASSEMBLED BY : R. KNIGHT	DATE : 3/11
CHECKED BY : M. PAYNE	DATE : 7/11
DRAWN BY : ELR 11/91	REV. 10/17/00 RWW/LES
CHECKED BY : GRP 11/91	REV. 7/10/01RR LES/RDR
	REV. 5/1/06 TLA/GM

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-9
1			3			TOTAL SHEETS
2			4			40

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STRUCTURAL STEEL NOTES

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

TENSION ON THE AASHTO M164 BOLTS THROUGH THE ANGLE MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR DIRECT TENSION INDICATORS, SEE SPECIAL PROVISION.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

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

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISIONS AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

USE A MINIMUM 7/16" THICK PLATE WASHER WITH STANDARD HOLES UNDER EACH BOLT HEAD AND NUT. THE PLATE WASHERS SHALL HAVE SUFFICIENT SIZE TO COVER THE HOLES AFTER INSTALLATION. HARDENED WASHERS AND DIRECT TENSION INDICATORS ARE TO BE USED IN CONJUNCTION WITH THE PLATE WASHERS IN THE L 3 X 3 X 5/16 ANGLE MEMBER CONNECTION.

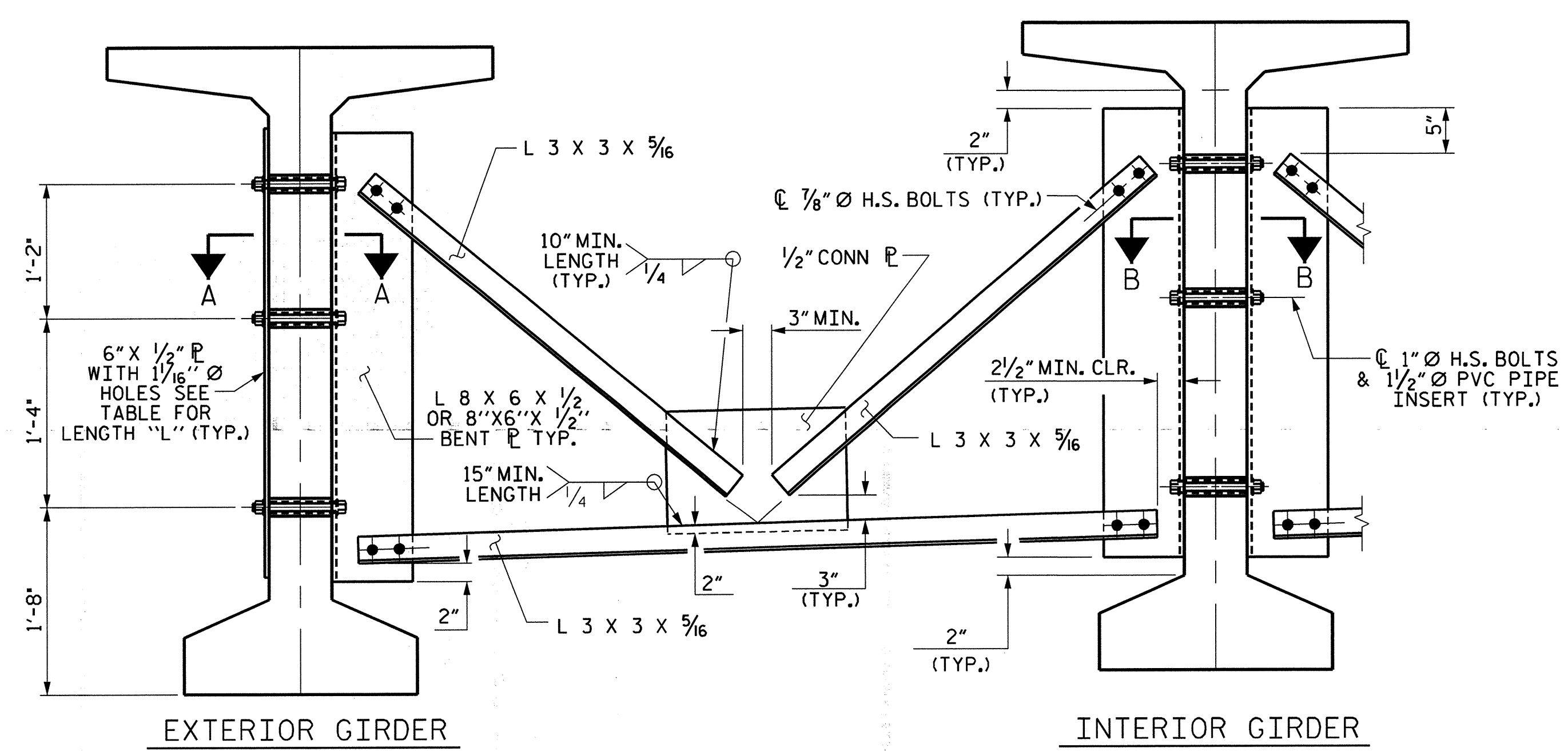
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

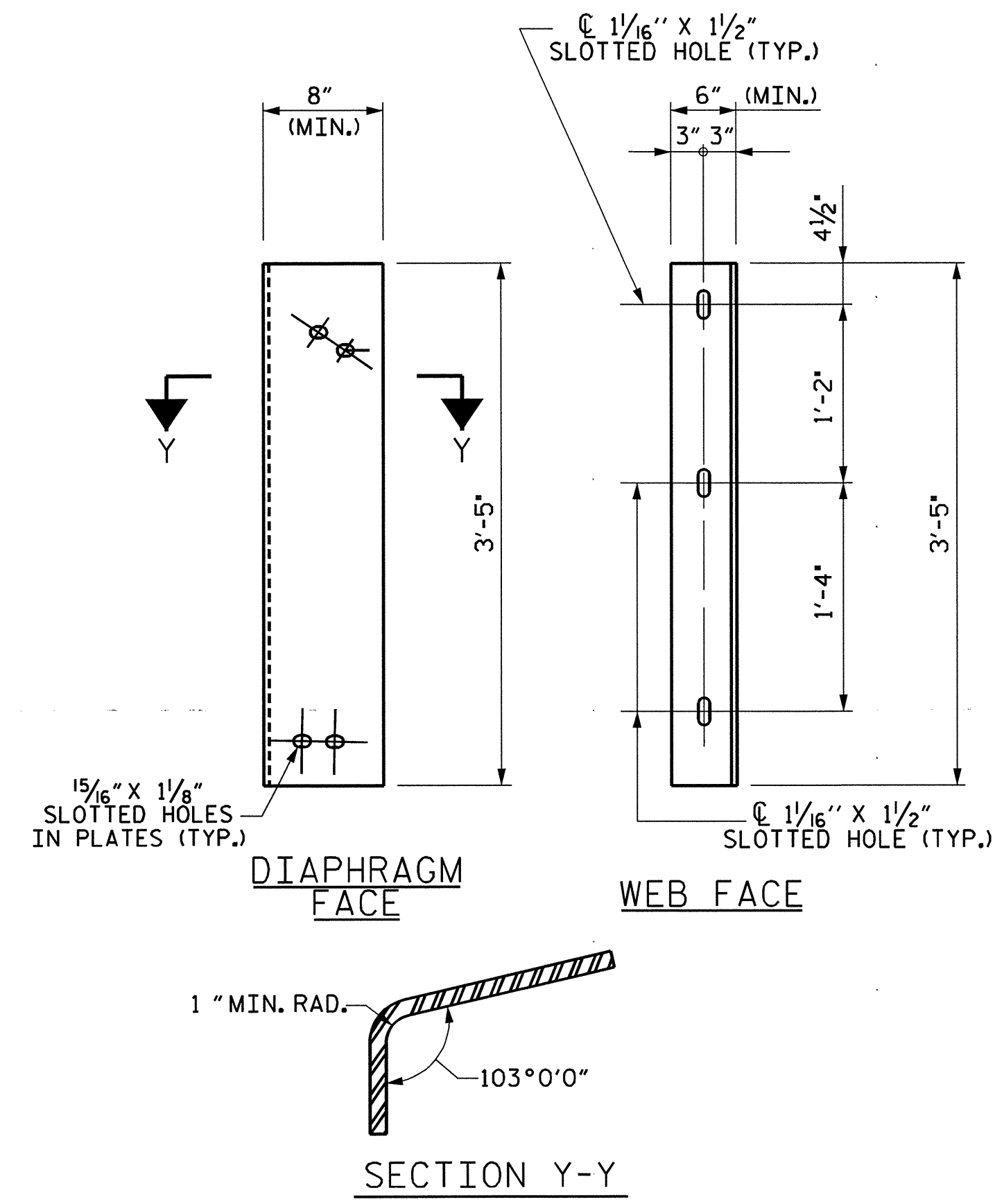
CONTRACTOR SHALL SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. ALL AASHTO M164 H.S. BOLTS SHALL BE FULLY TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

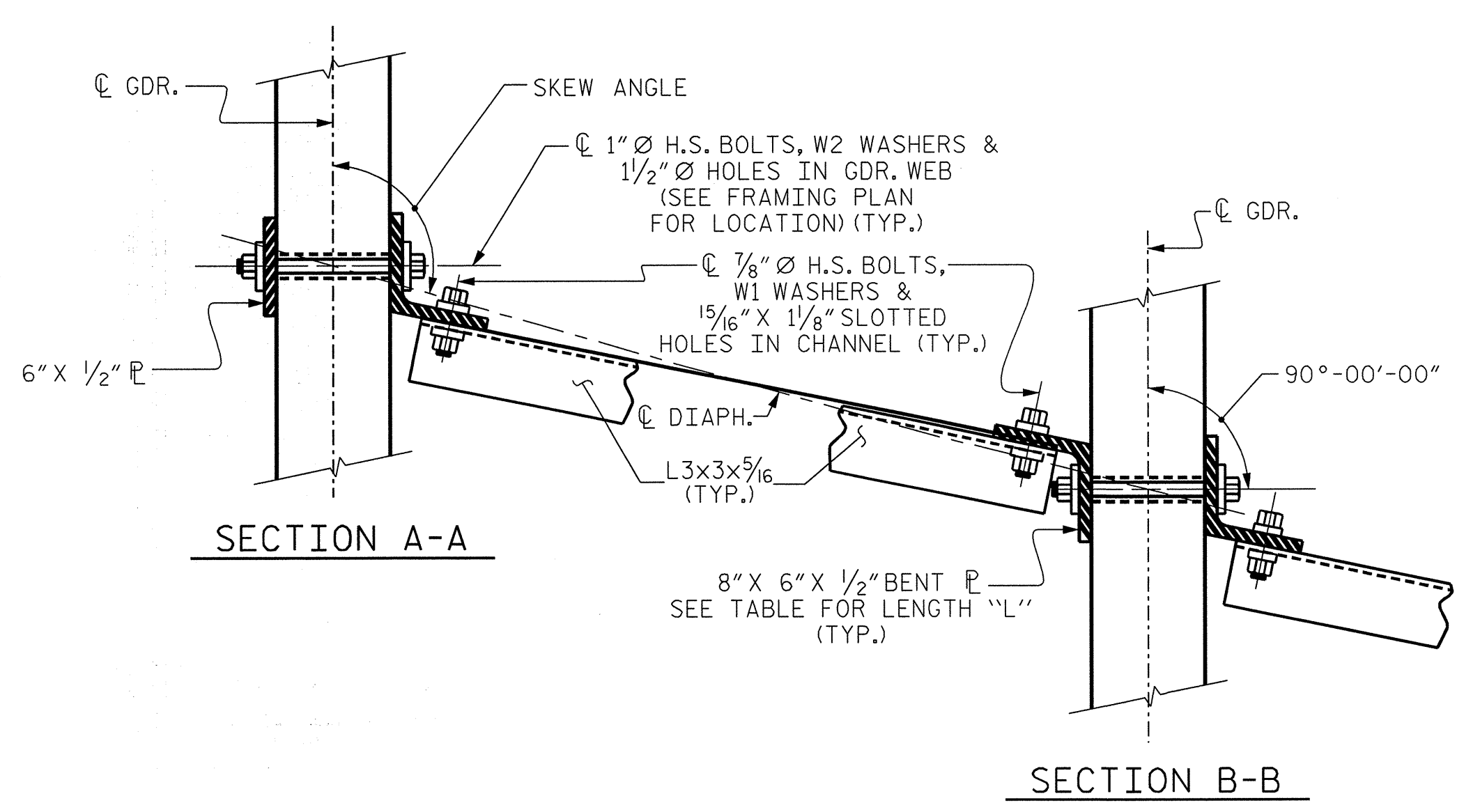
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



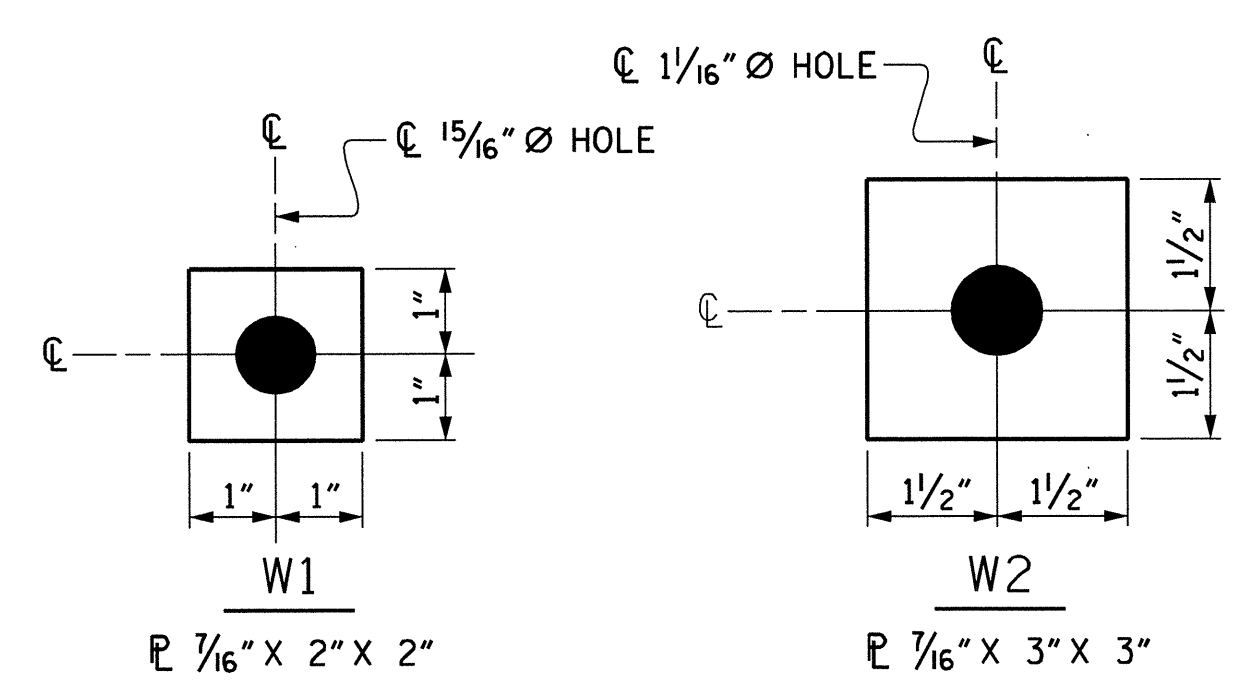
PART SECTION AT INTERMEDIATE DIAPHRAGM
(63" BULB TEE OR 72" BULB TEE GIRDER SHOWN)



CONNECTOR PLATE DETAILS



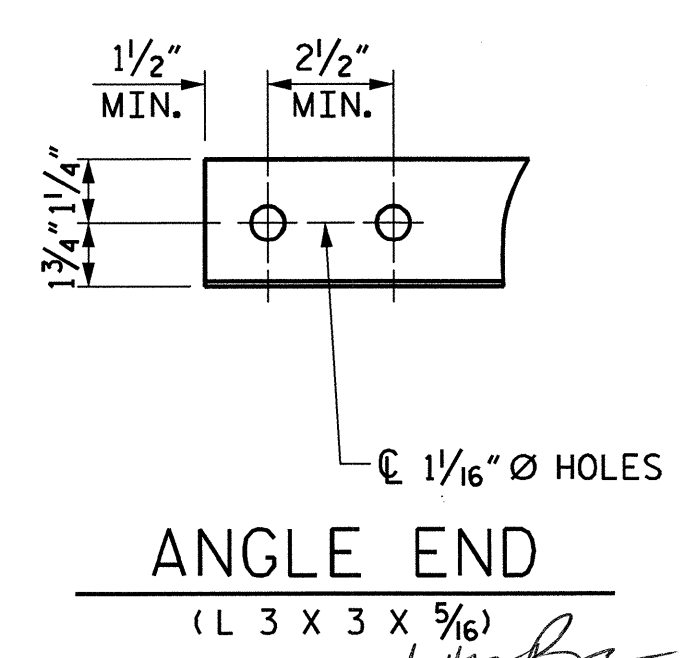
CONNECTION DETAILS
(FOR 70° ≤ SKEW < 90° OR 90° < SKEW ≤ 110°)



USE WITH 7/8" Ø HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT DIAPHRAGM ANGLE TO CONNECTOR PLATE CONNECTIONS

USE WITH 1" Ø HVY. HEX NUTS AT CONNECTOR PLATE TO GIRDER CONNECTIONS

WASHER DETAILS



ANGLE END
(L 3 X 3 X 5/16)



PROJECT NO. U-5204
CALDWELL COUNTY
STATION: 22+49.30 -Y1-
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
INTERMEDIATE
STEEL DIAPHRAGMS
FOR 63" MODIFIED BULB TEE
PRESTRESSED CONCRETE
GIRDERS

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-10	
1			3			TOTAL SHEETS	48
2			4				

THE LOUIS BERGER GROUP, Inc.
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Raleigh, NC 27605-3322

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ASSEMBLED BY : R. KNIGHT	DATE : 3/11
CHECKED BY : M. PAYNE	DATE : 7/11
DRAWN BY : RWW 11/09	ADDED 11/23/09
CHECKED BY : GM 11/09	

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.

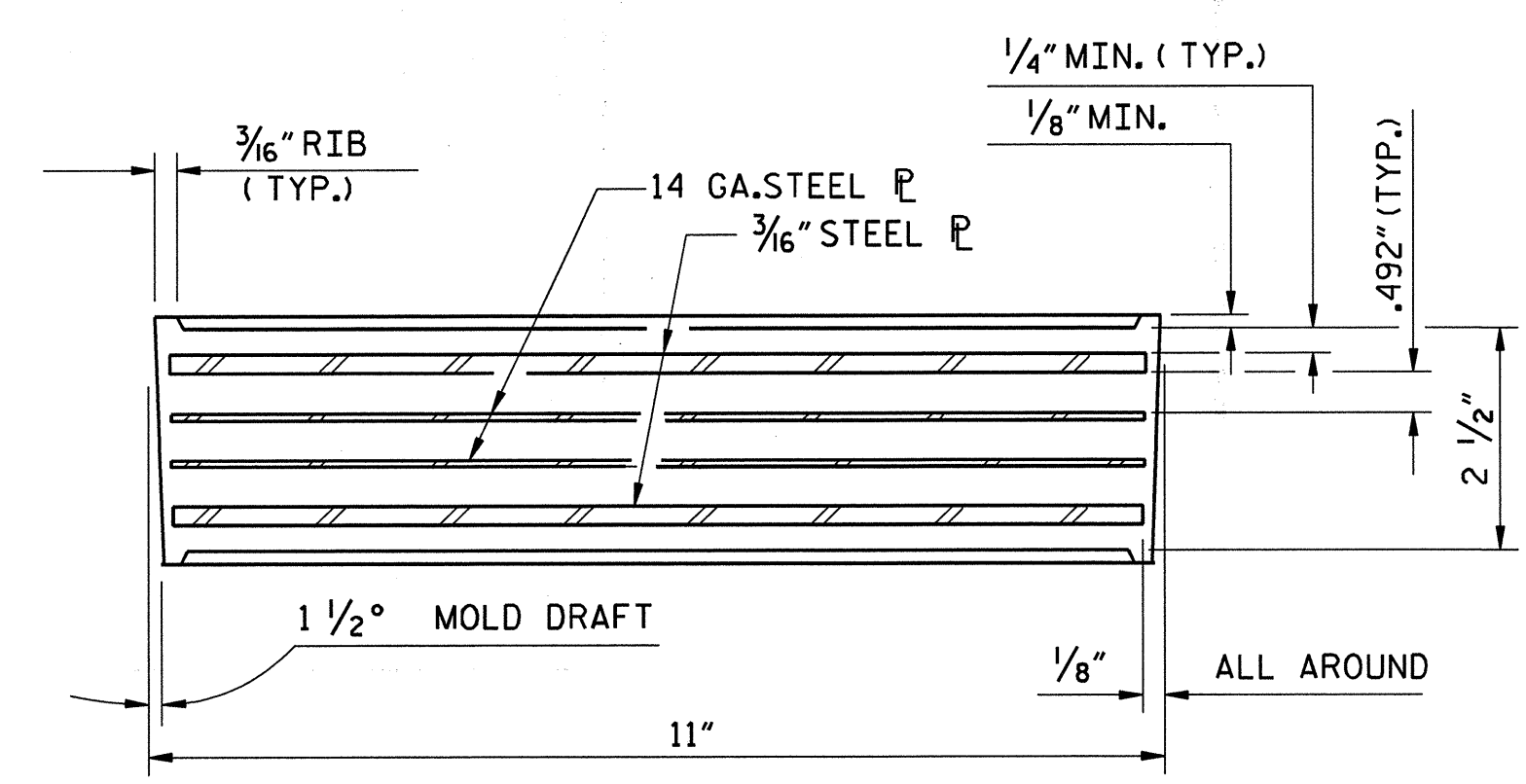
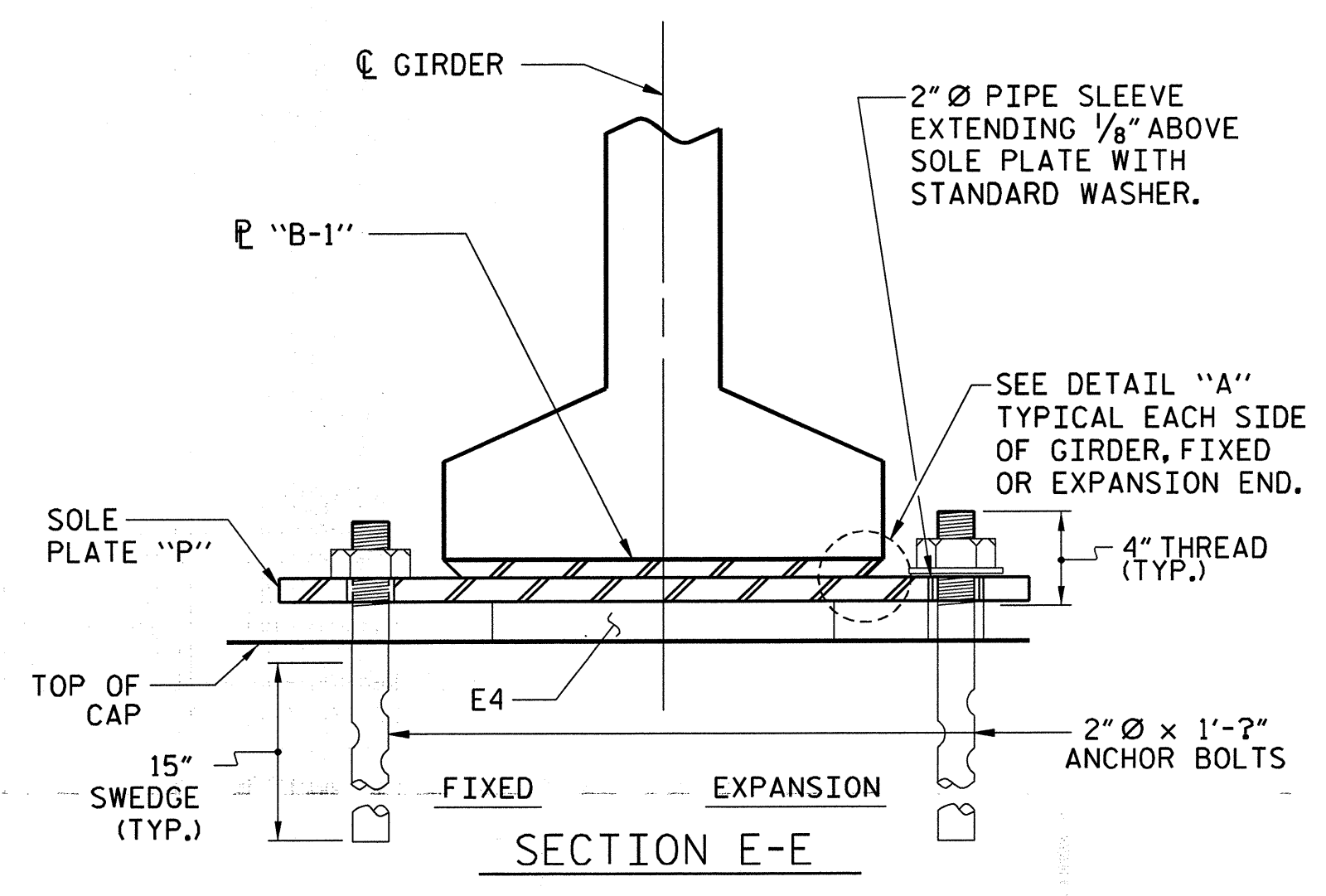
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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.

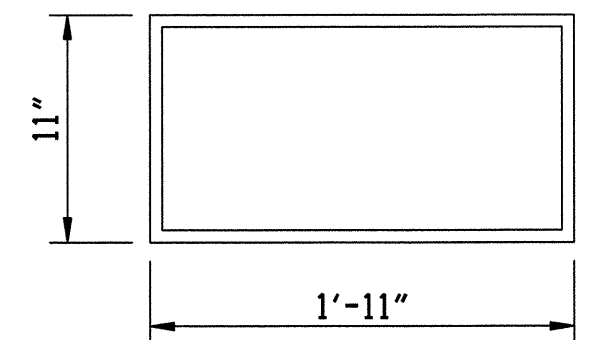
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

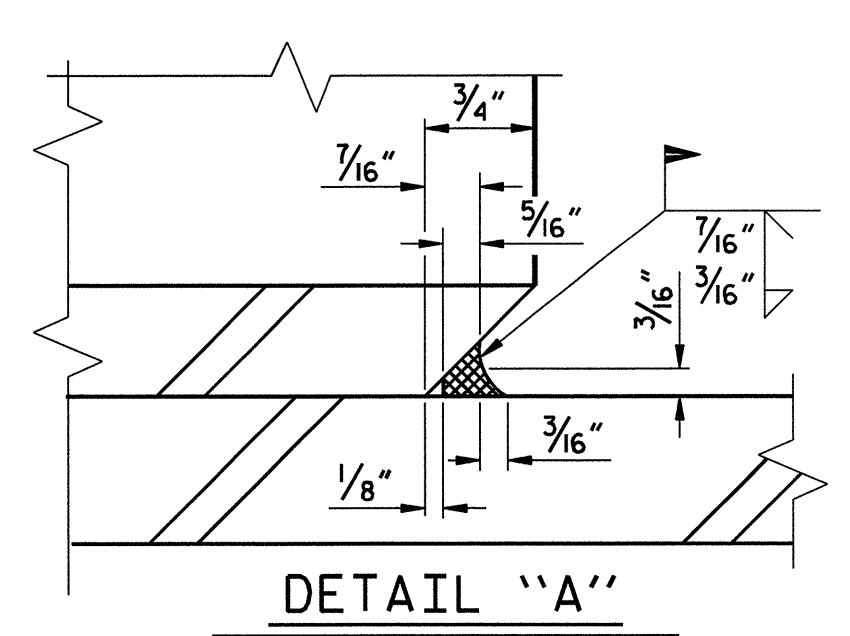
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.



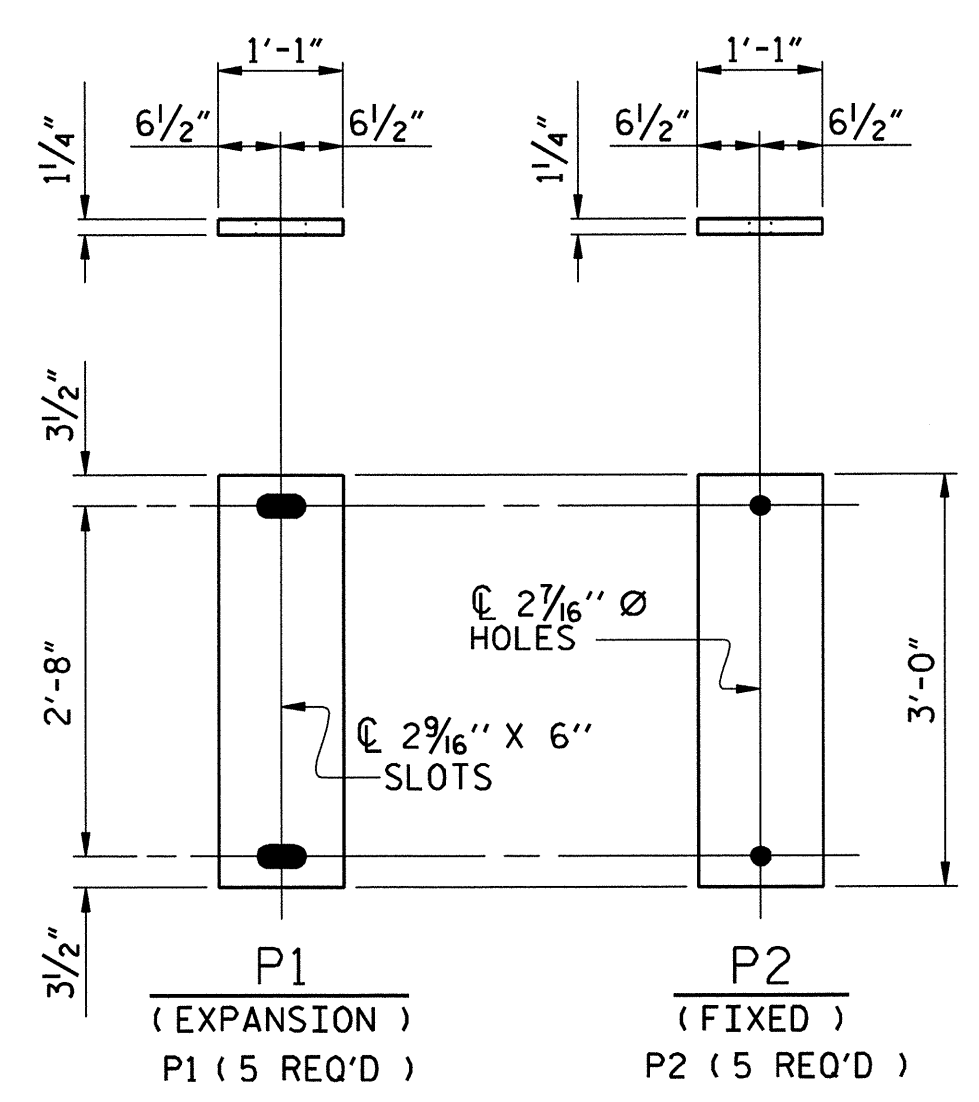
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E5 (10 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE VI



DETAIL "A"



SOLE PLATE DETAILS ("P")

— LOAD RATINGS —	
	MAX.D.L.+ L.L.
TYPE V	180 K
TYPE VI	211 K
TYPE VII	264 K

PROJECT NO. U-5204
CALDWELL COUNTY
STATION: 22+49.30 -Y1-



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

G:\OR Projects\OR1052-US 321 Connector\Structures\OR1052_SD_Y_BRG.dgn 10/25/2011 8:27:00 AM 1072_PDF_full.plt:cf 1052_str.tbl

ASSEMBLED BY : S. KAPLAN	DATE : 3/11
CHECKED BY : M. PAYNE	DATE : 7/11
DRAWN BY : EEM 2/97	REV. 8/16/99 RWW/LES
CHECKED BY : VAP 2/97	REV. 10/17/00 RWW/LES
	REV. 5/1/06 TLA/GM

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-11	
1			3			TOTAL SHEETS	46
2			4				

NOTES

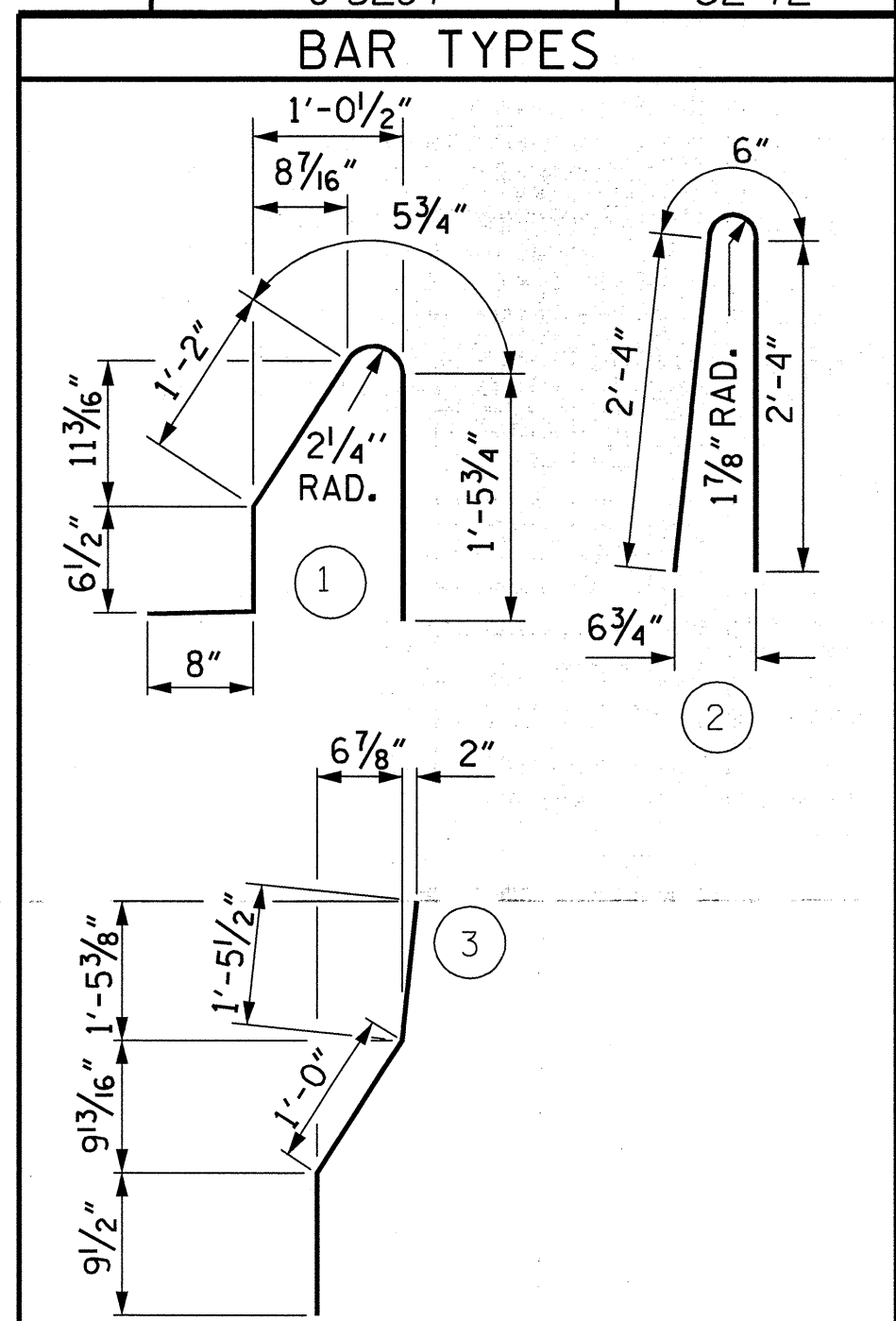
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5S3 AND #5S4 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5S3 AND #5S4 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

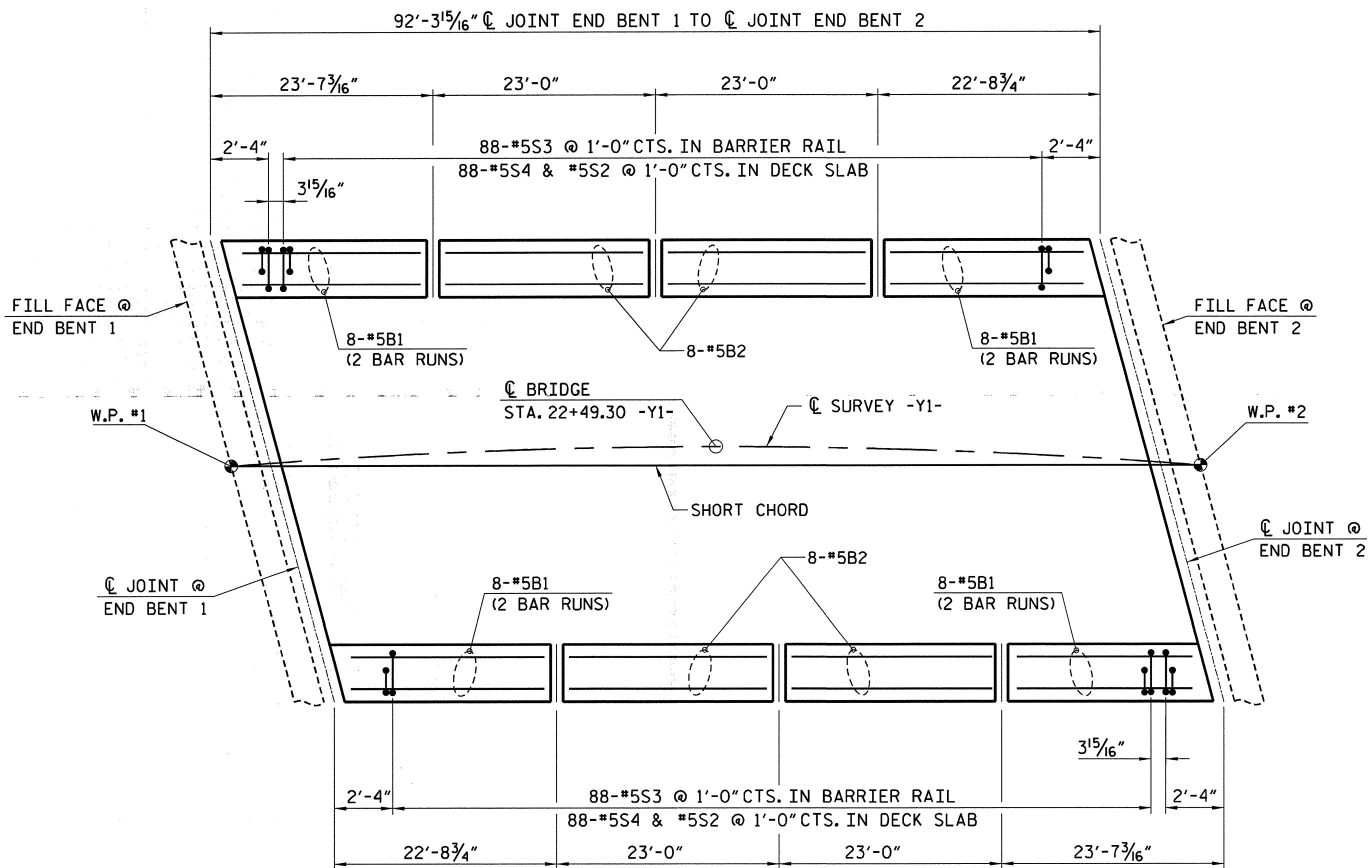
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS, THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS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



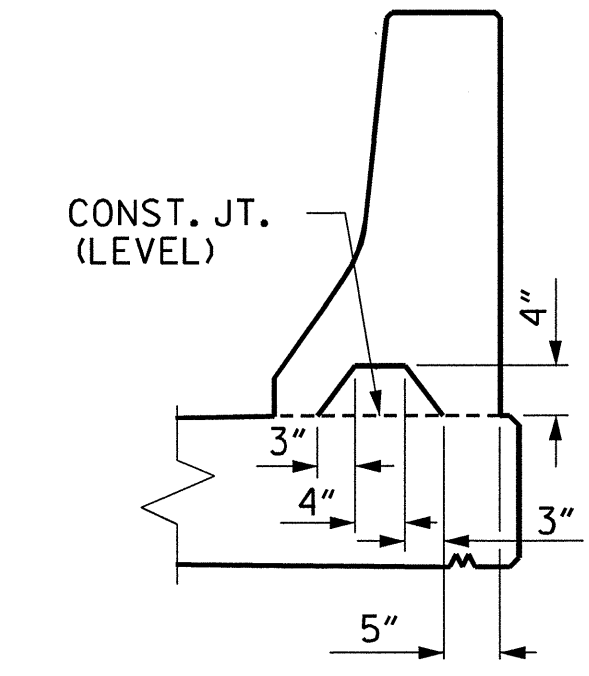
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	64	#5	STR	15'-0"	1,001
* B2	32	#5	STR	22'-6"	751
* S3	176	#5	1	4'-6"	780
* S4	176	#5	2	5'-2"	948
* S5	8	#5	3	3'-4"	27
* S6	8	#5	STR	3'-2"	26
* EPOXY COATED REINFORCING STEEL					3,534 LBS.
CLASS AA CONCRETE					18.6 CU. YDS.
CONCRETE BARRIER RAIL					184.6 LIN. FT.

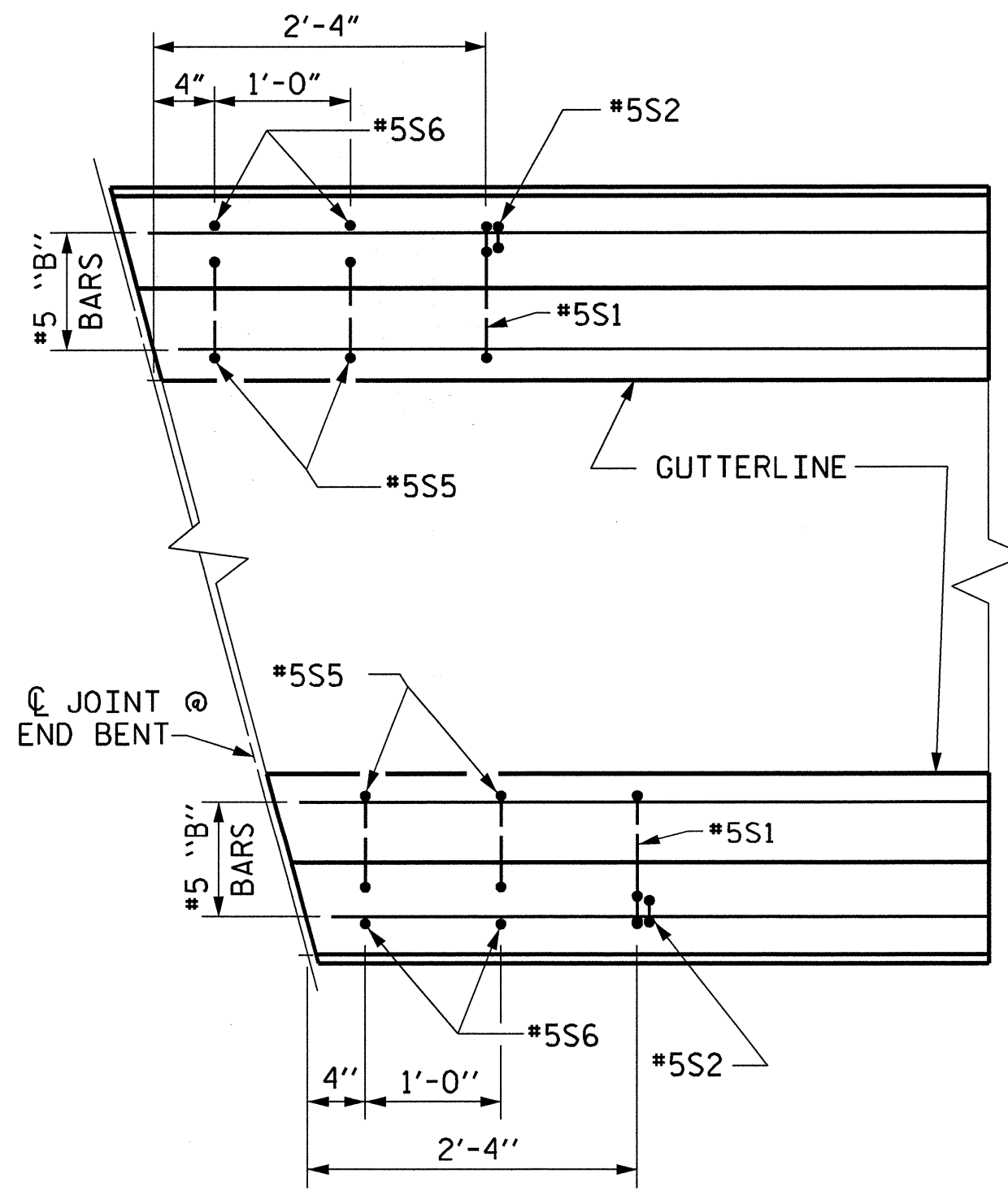


PLAN

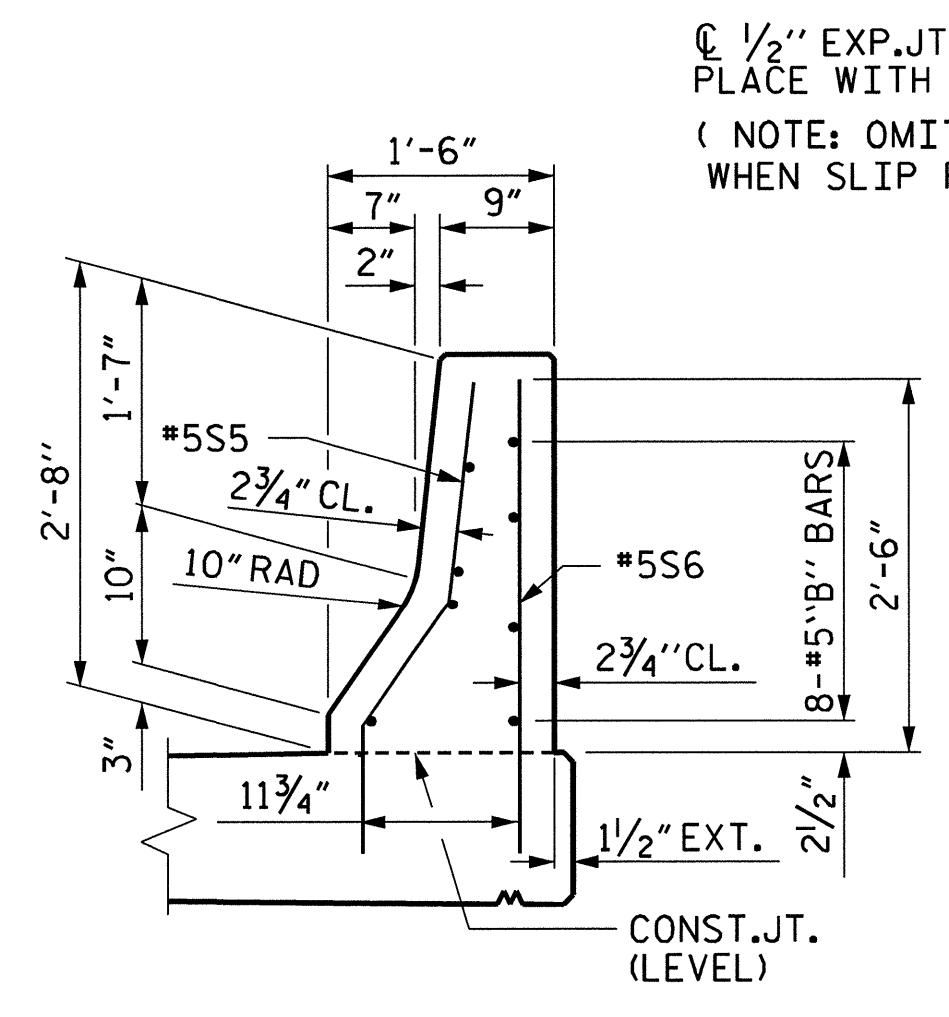


SECTION S-S

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

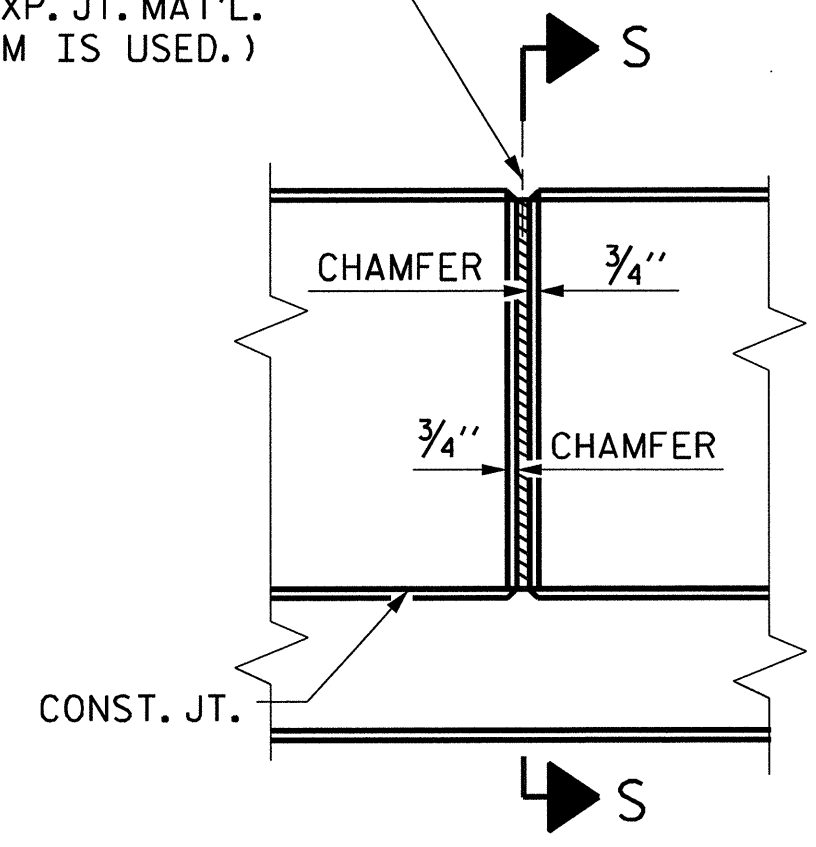


PLAN



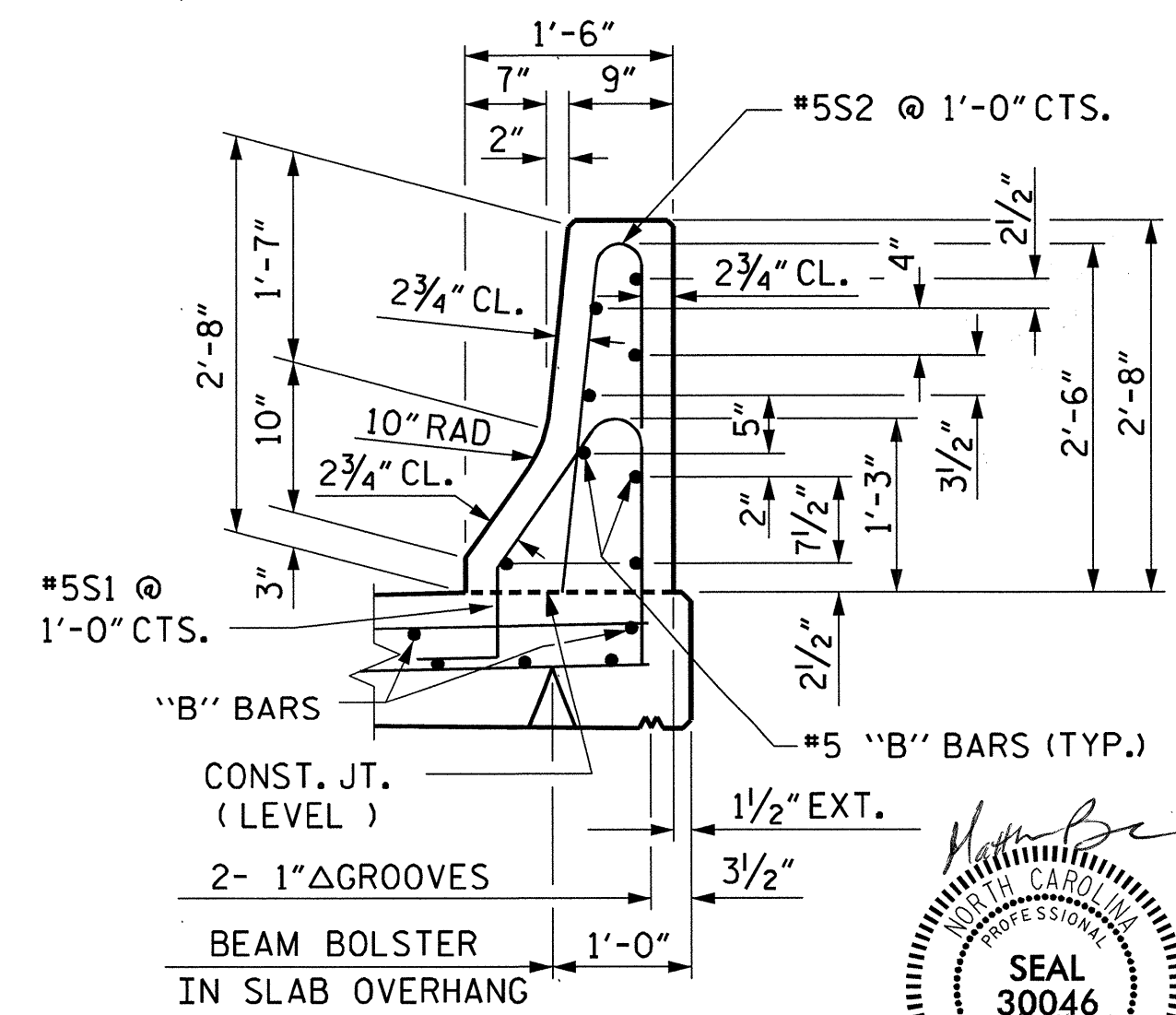
END VIEW

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

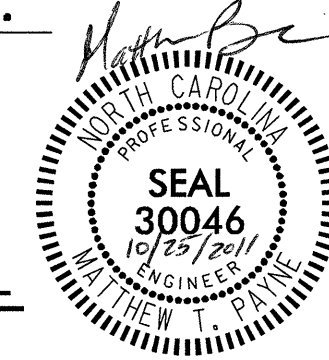


ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS



SECTION THRU RAIL



PROJECT NO. U-5204
CALDWELL COUNTY
STATION: 22+49.30 -Y1-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
CONCRETE
BARRIER RAIL

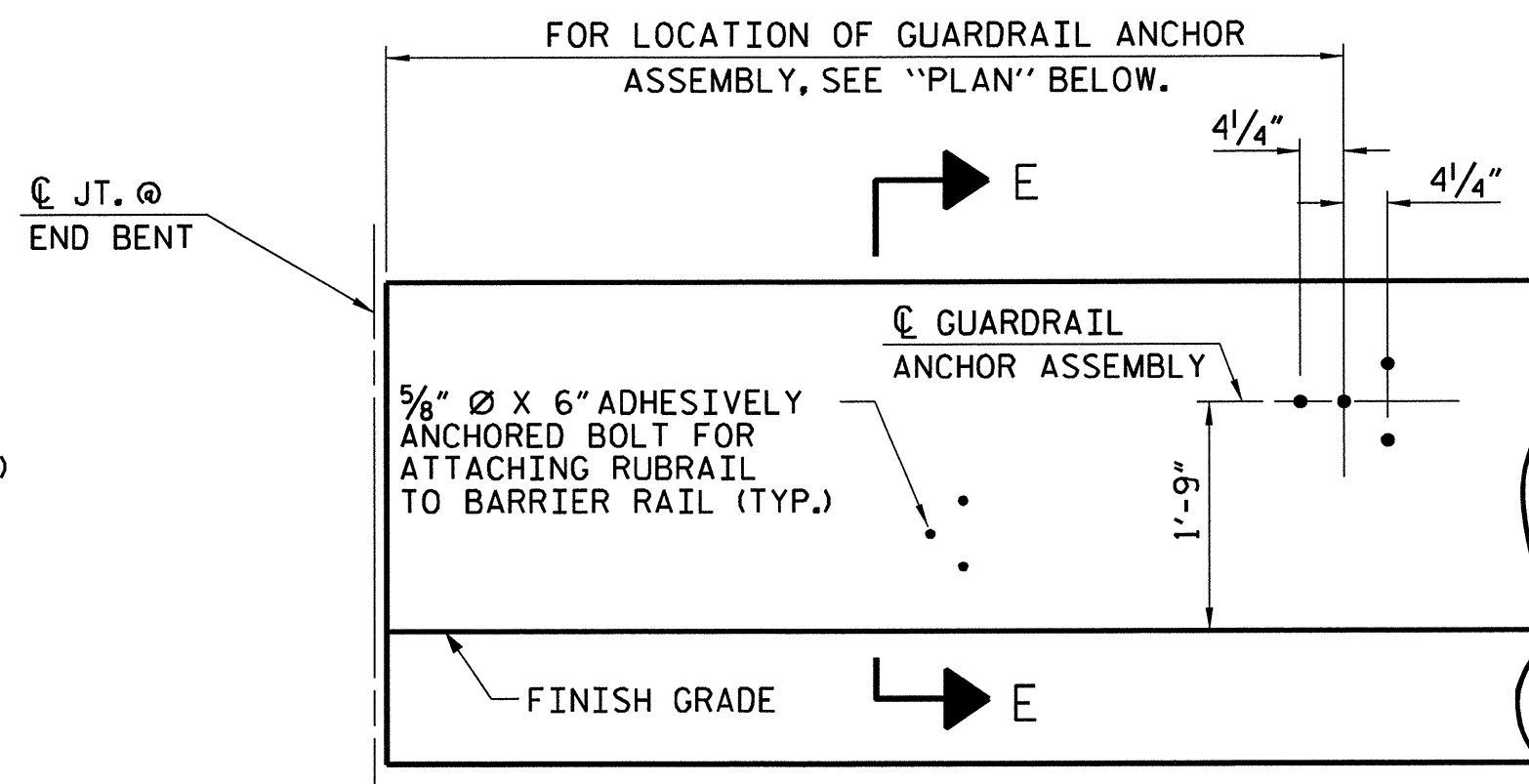
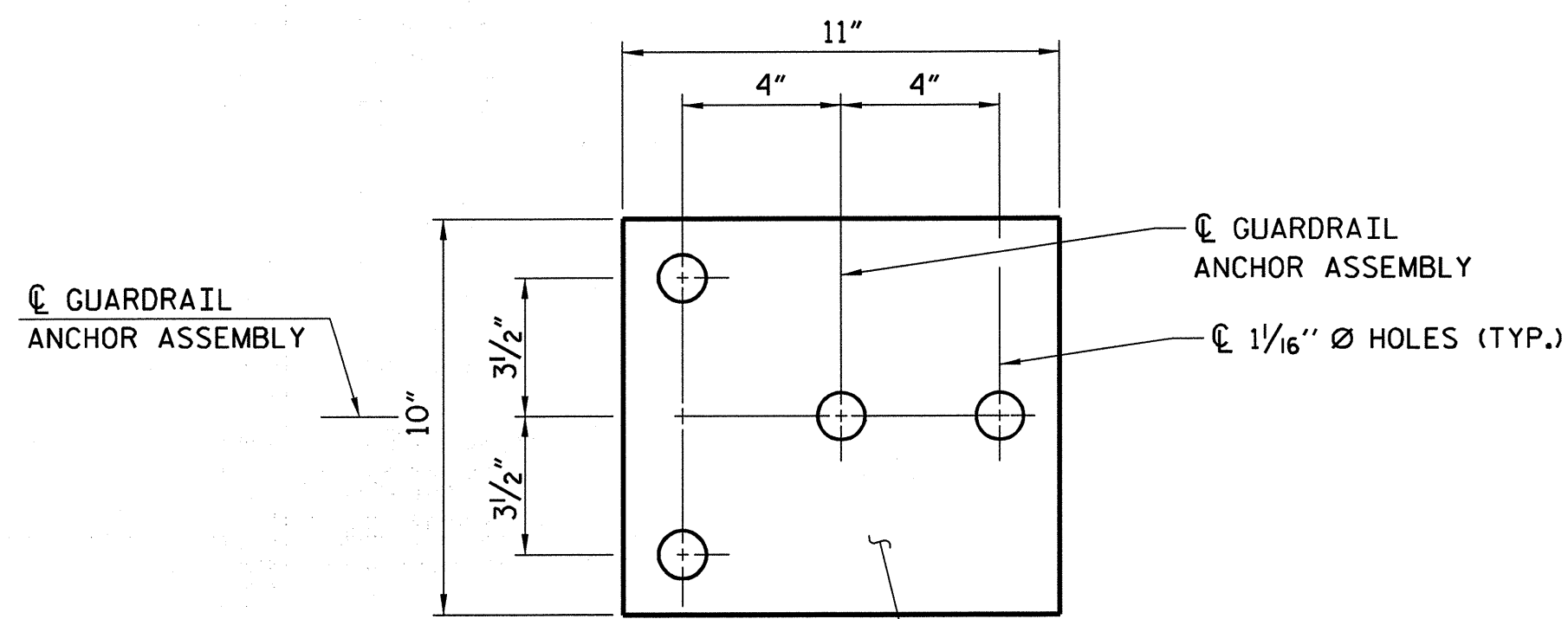
ASSEMBLED BY :	J. DAWKINS	DATE :	3/11
CHECKED BY :	M. PAYNE	DATE :	7/11
DRAWN BY :	ARB 5/87	REV. 10/17/00	RWW/LES
CHECKED BY :	SJD 9/87	REV. 5/7/03R	RWW/JTE
		REV. 5/1/06R	TLA/GM

END OF RAIL DETAILS
FOR ADHESIVE ANCHORING AT SAWED JOINTS

REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	48
1			3			
2			4			

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FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 4 - 5/8" Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 5/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS, THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

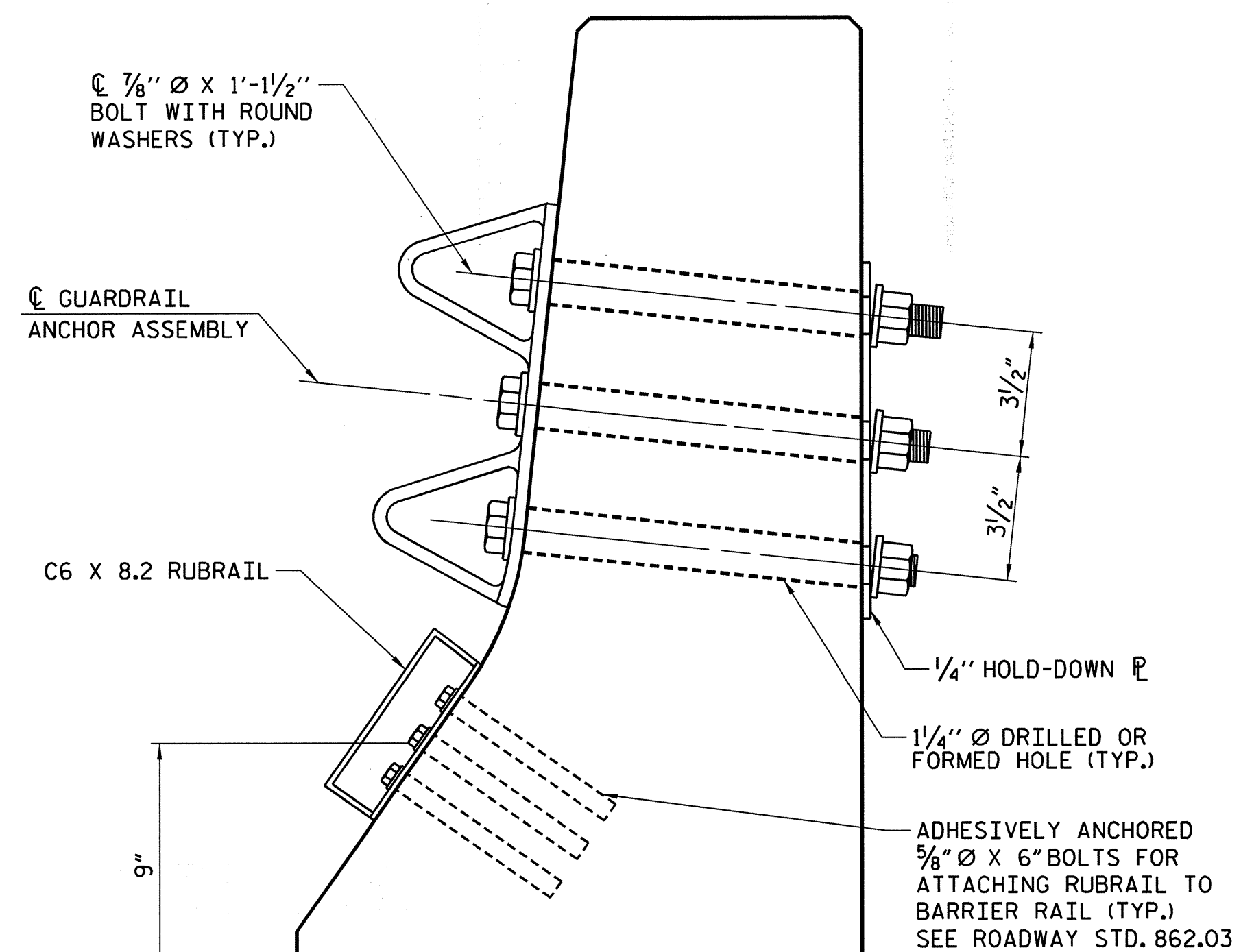
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

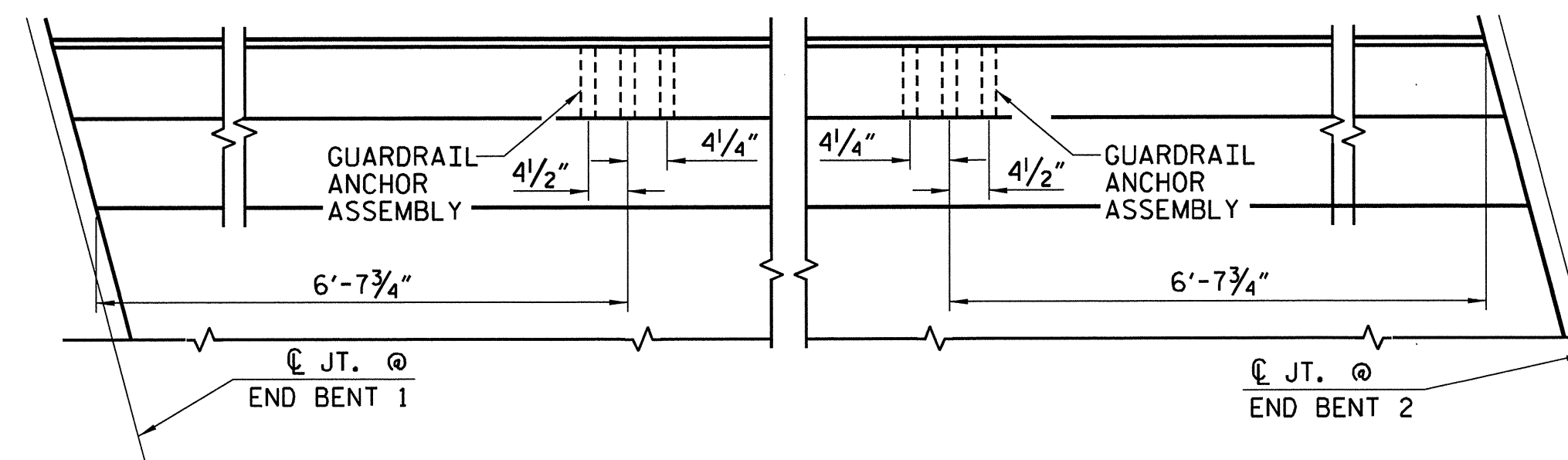
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

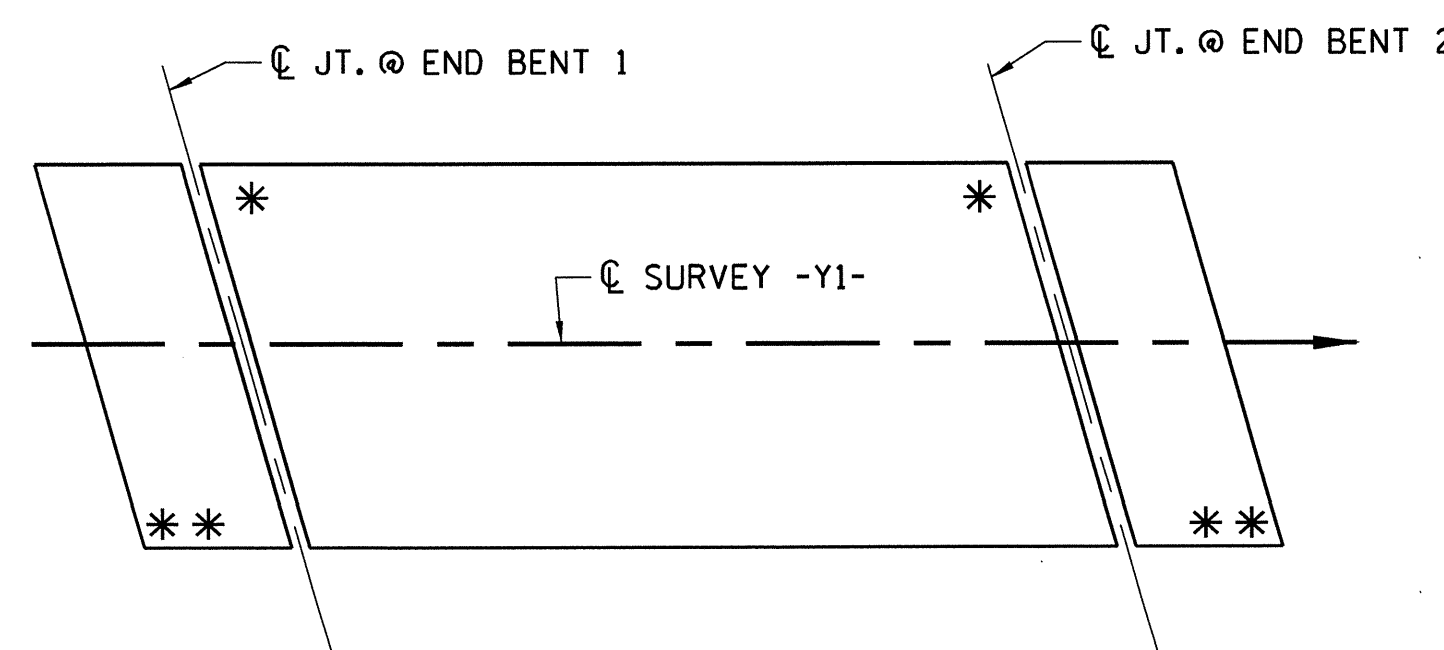
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 5/8" Ø X 6" BOLTS WITH WASHERS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL. LEVEL I FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE BOLT IS 9.2 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.



GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL



* INDICATES POINTS OF ATTACHMENT TO BARRIER RAIL ON BRIDGE
 ** INDICATES POINTS OF ATTACHMENT TO BARRIER RAIL EXTENSION ON APPROACH SLAB, SEE BRIDGE APPROACH SLAB DETAILS SHEET

PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 22+49.30 -Y1-



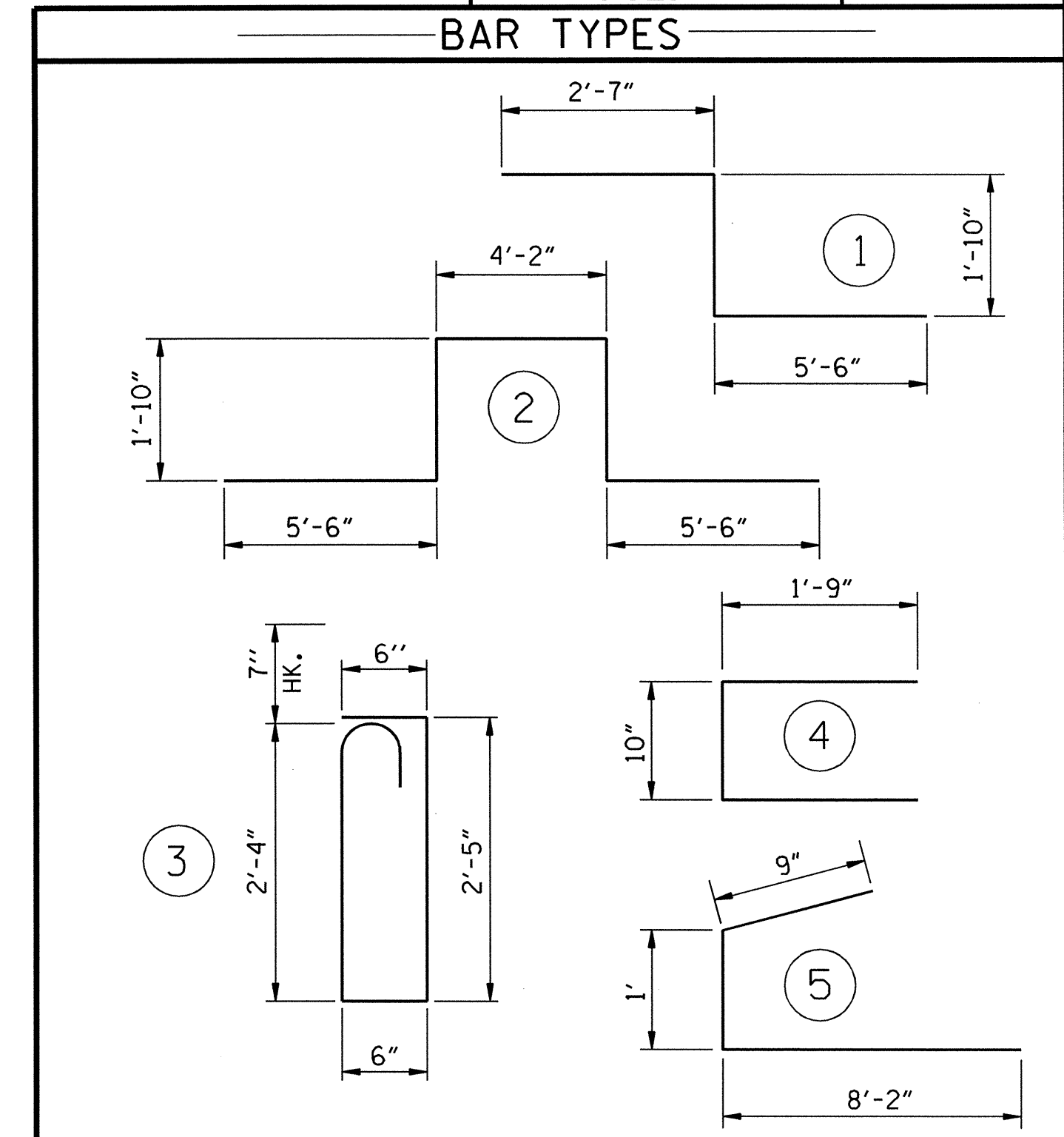
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 FOR BARRIER RAIL

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-13	
1			3			TOTAL SHEETS	
2			4			48	

BILL OF REINFORCING											
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	131	5	STR	39'-9"	4,851	* B1	58	5	STR	48'-5"	1,876
A2	131	5	STR	39'-9"	4,851	B2	64	5	STR	48'-5"	3,232
						B3	16	5	STR	25'-5"	424
* A101	2	5	STR	38'-1"	79	* G1	4	5	STR	23'-1"	96
* A102	2	5	STR	35'-9"	75	* K1	4	8	1	9'-11"	106
* A103	2	5	STR	33'-5"	70	* K2	12	8	2	18'-10"	603
* A104	2	5	STR	31'-1"	65	* K3	16	6	STR	8'-6"	204
* A105	2	5	STR	28'-9"	60	* K4	32	8	5	9'-11"	847
* A106	2	5	STR	26'-5"	55	* S1	88	5	3	6'-4"	581
* A107	2	5	STR	24'-1"	50	* S2	88	5	4	4'-4"	398
* A108	2	5	STR	21'-9"	45						
* A109	2	5	STR	19'-5"	41						
* A110	2	5	STR	17'-1"	36						
* A111	2	5	STR	14'-9"	31						
* A112	2	5	STR	12'-5"	26						
* A113	2	5	STR	10'-1"	21						
* A114	2	5	STR	9'-7"	16						
* A115	2	5	STR	5'-5"	11						
* A116	2	5	STR	3'-1"	6						
* A117	2	5	STR	0'-6"	1						
A201	2	5	STR	38'-1"	79						
A202	2	5	STR	35'-9"	75						
A203	2	5	STR	33'-5"	70						
A204	2	5	STR	31'-1"	65						
A205	2	5	STR	28'-9"	60						
A206	2	5	STR	26'-5"	55						
A207	2	5	STR	24'-1"	50						
A208	2	5	STR	21'-9"	45						
A209	2	5	STR	19'-5"	41						
A210	2	5	STR	17'-1"	36						
A211	2	5	STR	14'-9"	31						
A212	2	5	STR	12'-5"	26						
A213	2	5	STR	10'-1"	21						
A214	2	5	STR	9'-7"	16						
A215	2	5	STR	5'-5"	11						
A216	2	5	STR	3'-1"	6						
A217	2	5	STR	0'-6"	1						

* DENOTES EPOXY COATED REINFORCING STEEL



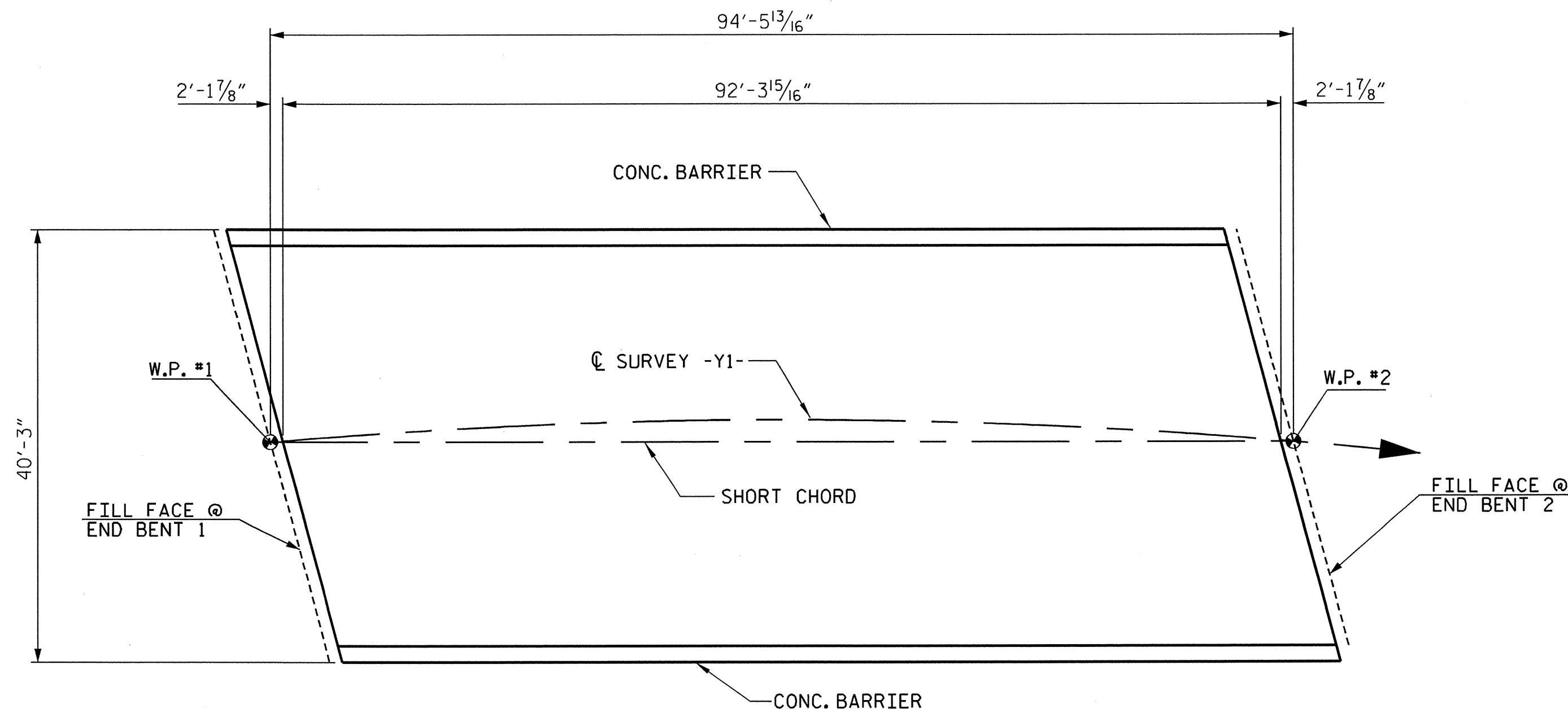
ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
SPAN A	113.11	9,195	10,250
TOTALS**	113.11	9,195	10,250

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS	
APPROACH SLABS	1,110 SQ.FT.
BRIDGE DECK	3,416 SQ.FT.
TOTAL	4,526 SQ.FT.

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 3,716)

ASSEMBLED BY: R. KNIGHT DATE: 3/11
 CHECKED BY: M. PAYNE DATE: 7/11
 DRAWN BY: JMB 5/87 REV. 6/1/94 EEM/GRP
 CHECKED BY: SJD 9/87 REV. 8/16/99 RWW/LES
 REV. 5/1/06 TLA/GM

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PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 22+49.30 -Y1-
 SHEET 1 OF 1

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

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1	MTP	12/2011	3		
2			4		

TOTAL SHEETS: 48

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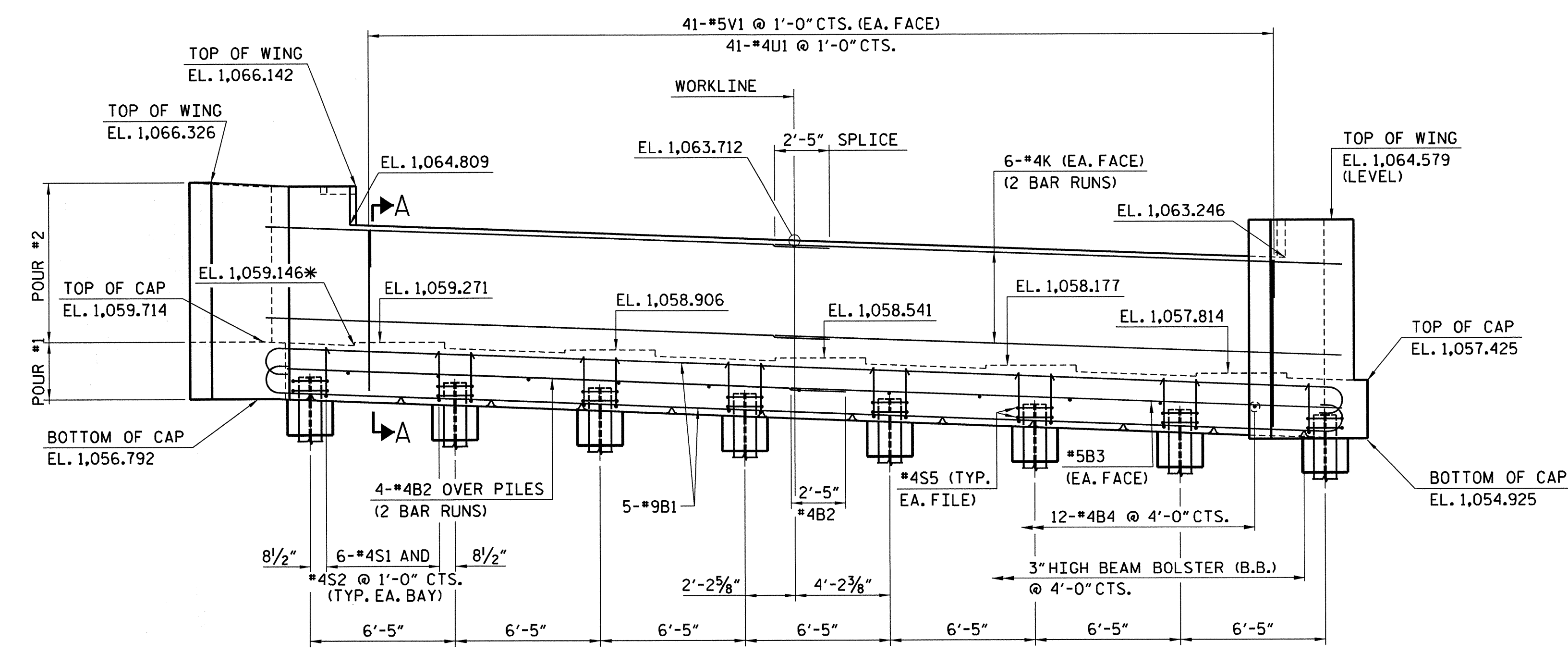
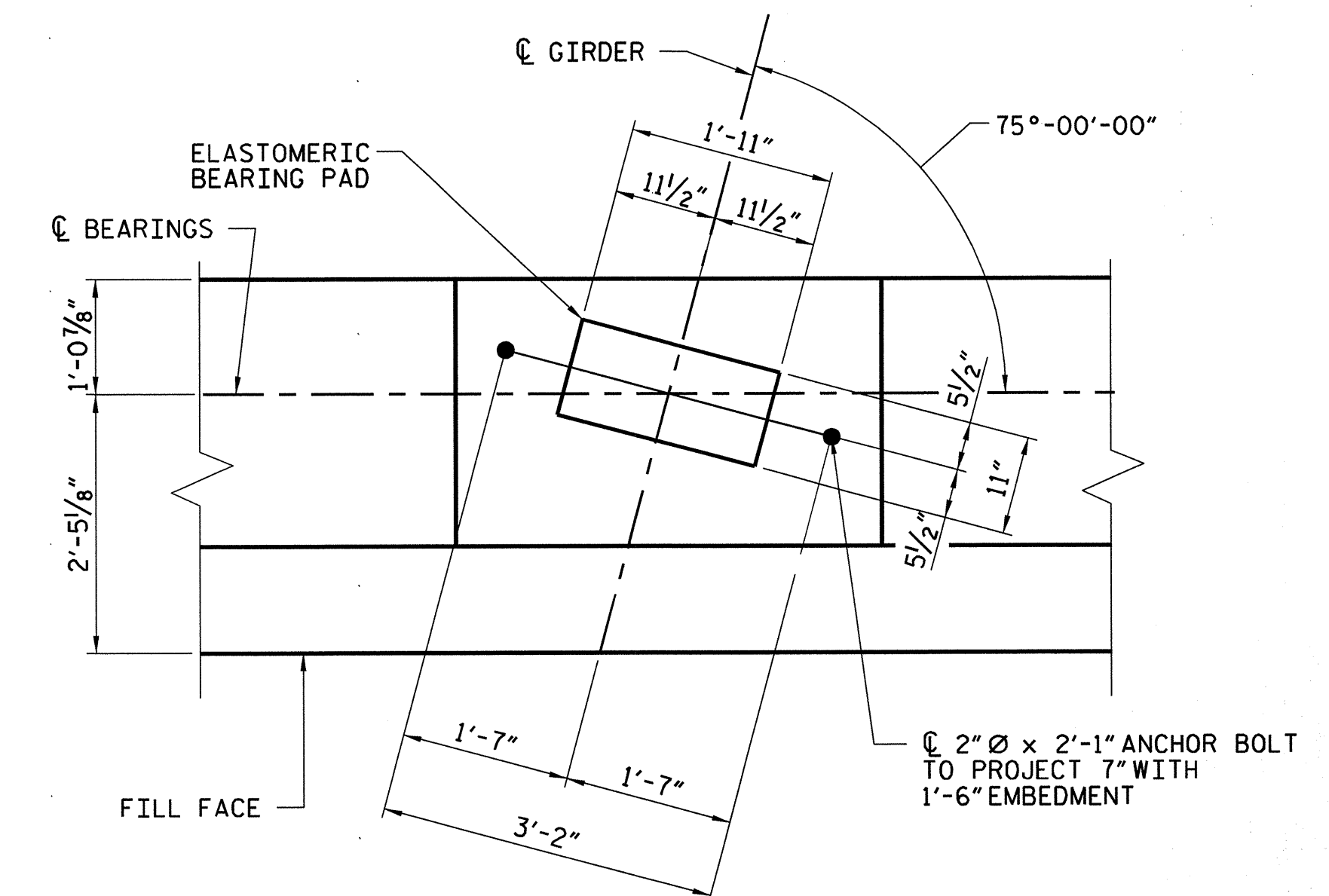
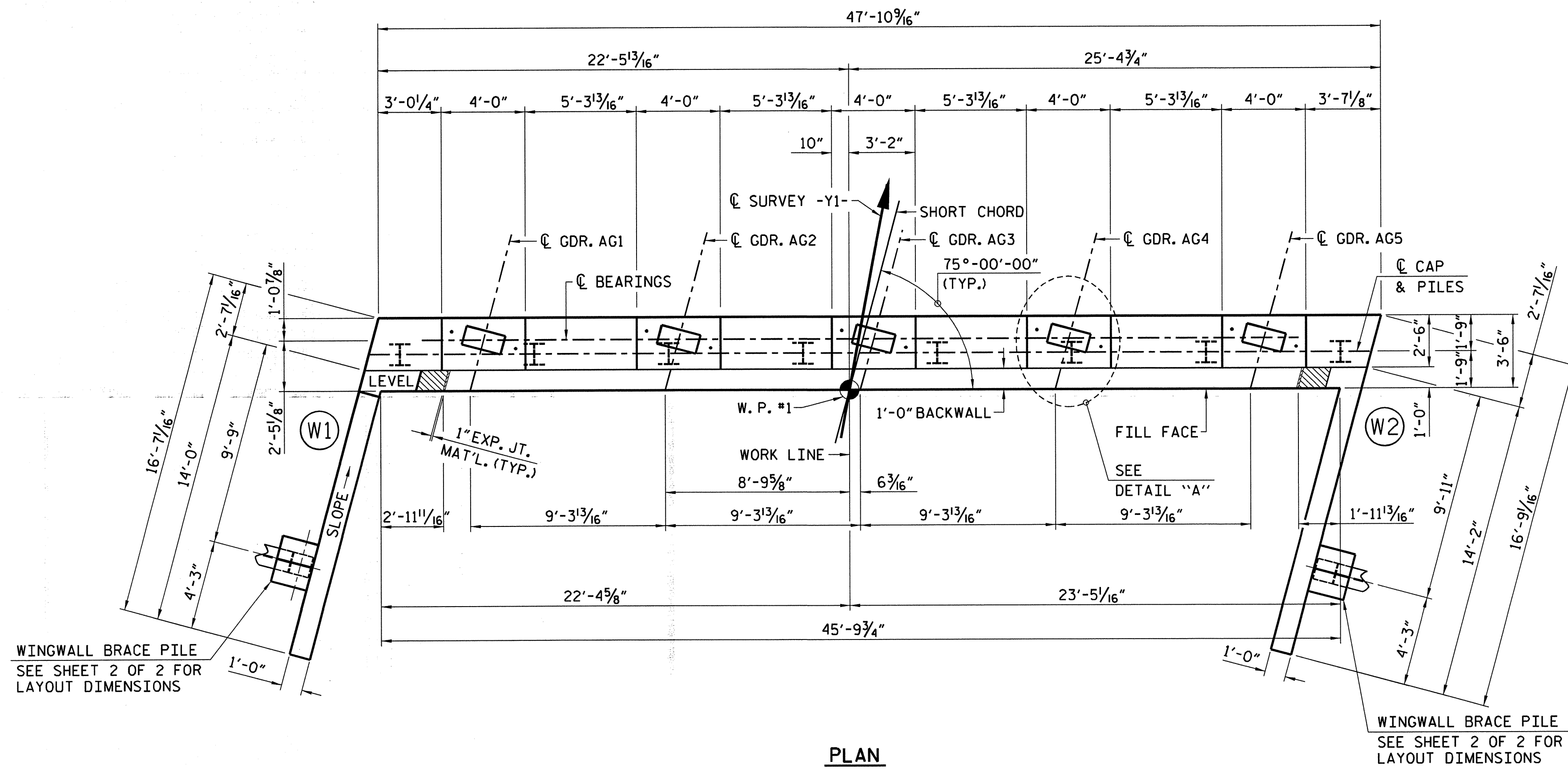
NOTES:

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

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

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

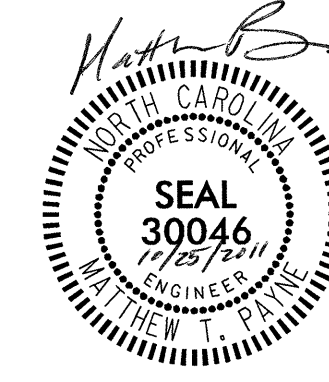


PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 22+49.30 -Y1-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 1

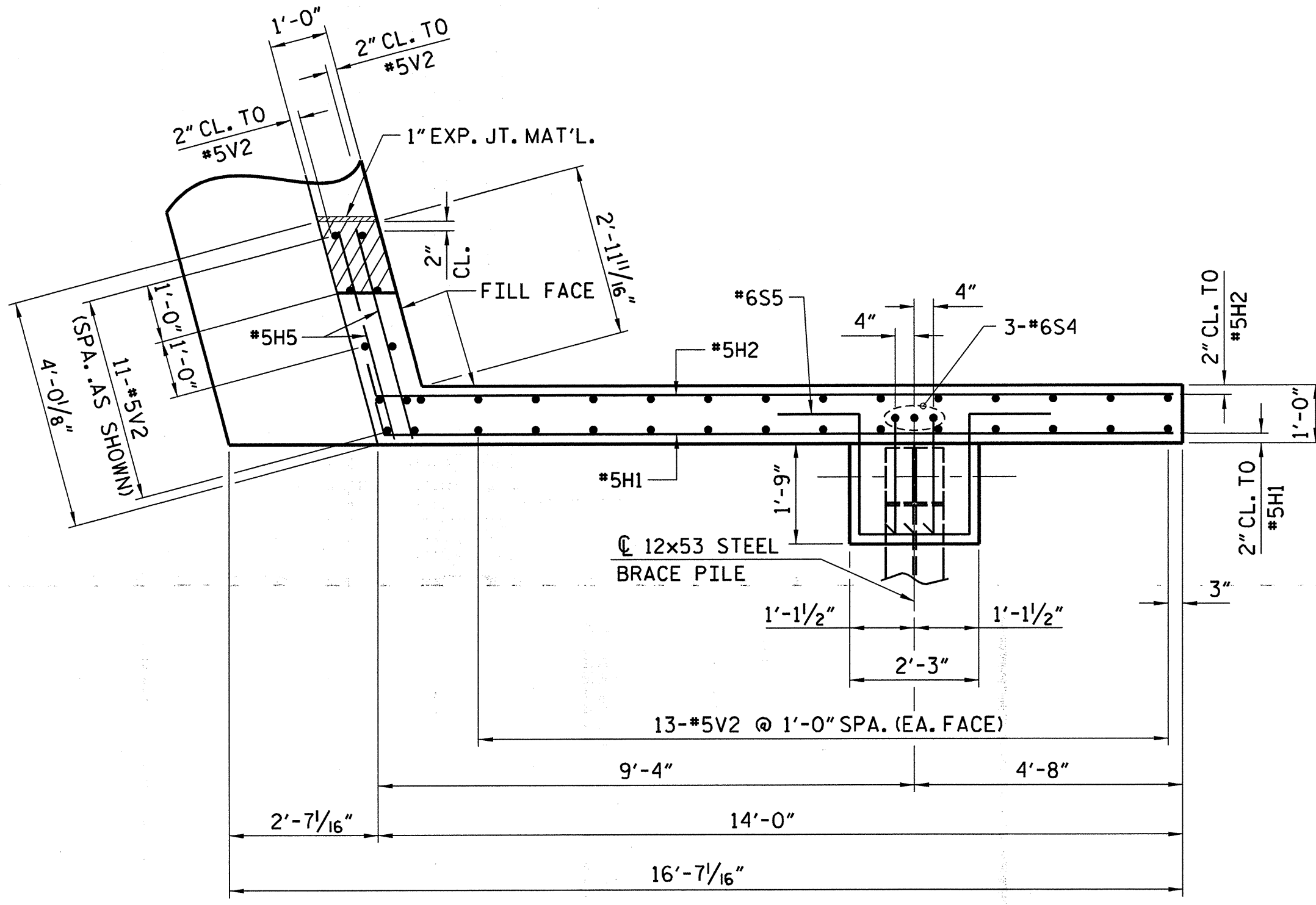


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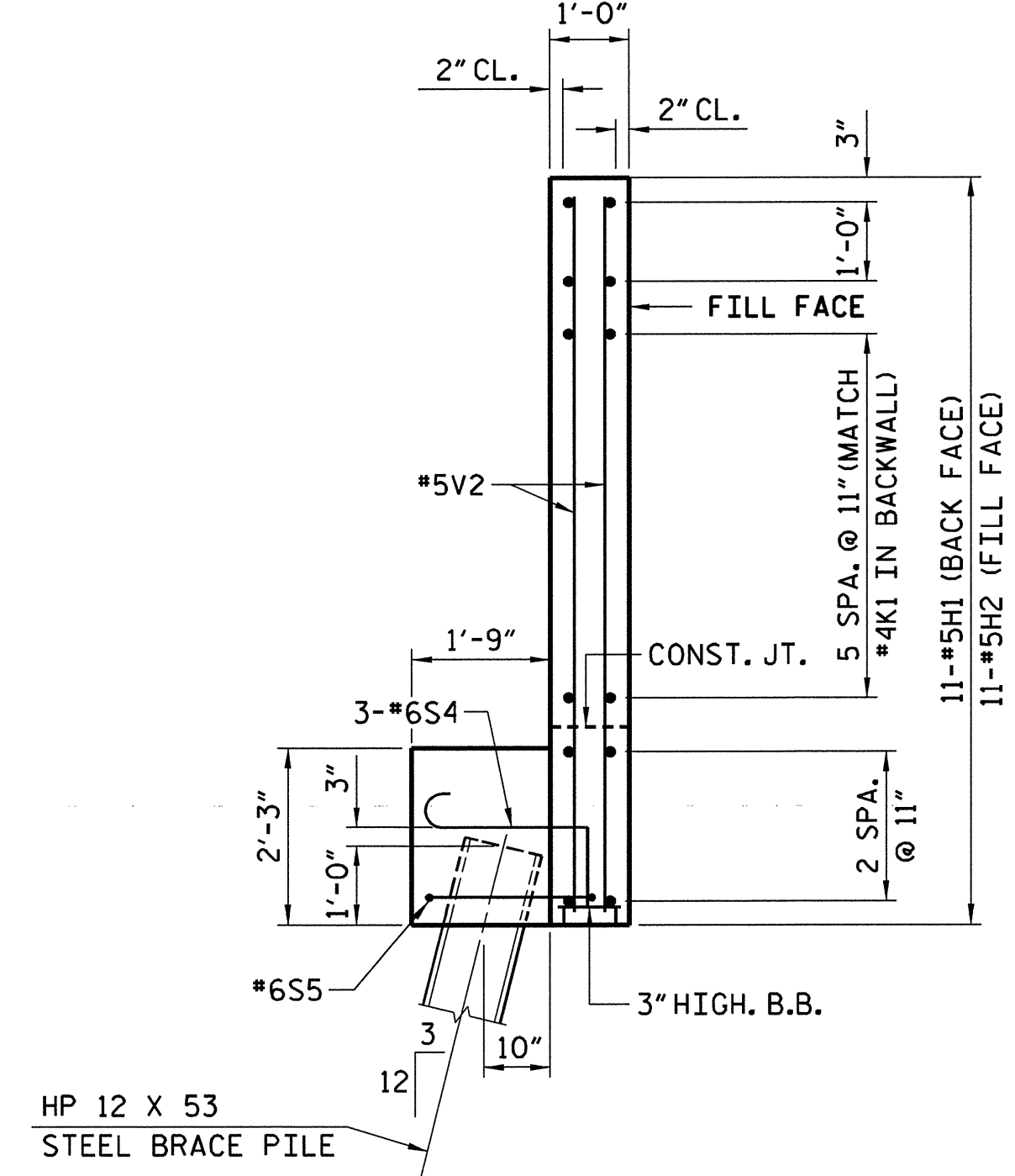
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NO.	BY:	DATE:	NO.	BY:	DATE:	S2-15	
1			3			TOTAL SHEETS	
2			4			48	

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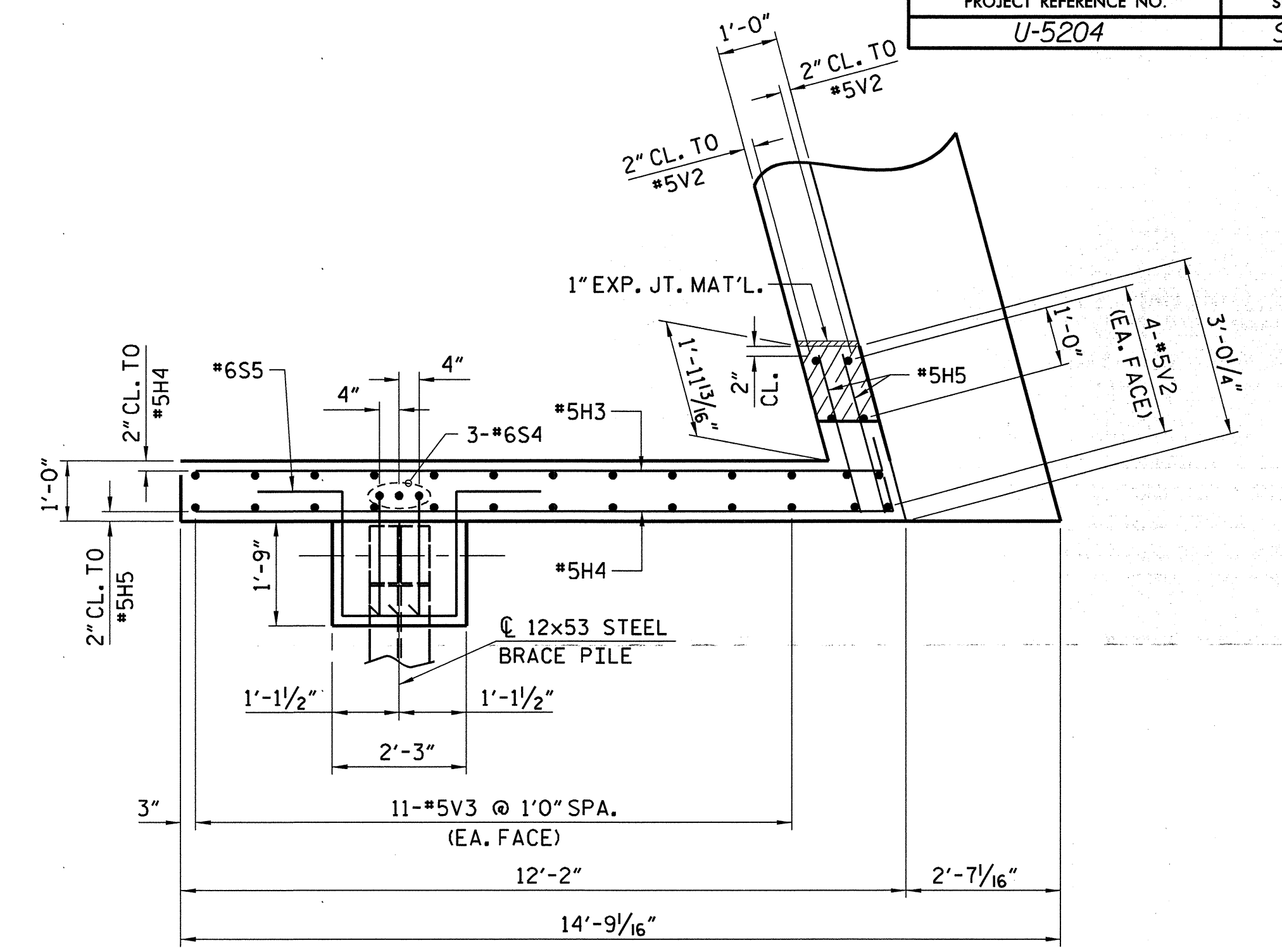
DRAWN BY: S. KAPLAN DATE: 2/11
 CHECKED BY: M. PAYNE DATE: 7/11



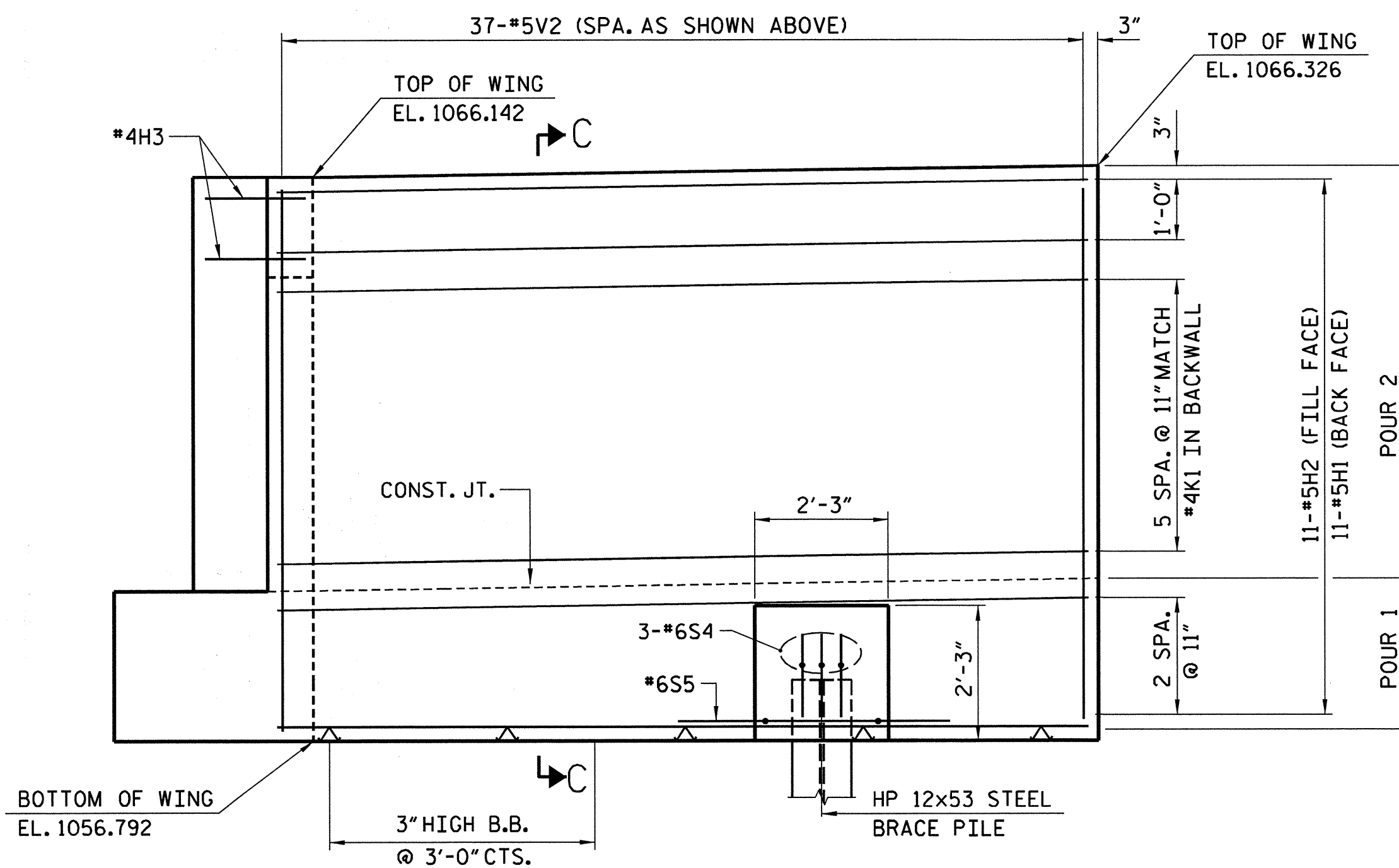
PLAN - W1



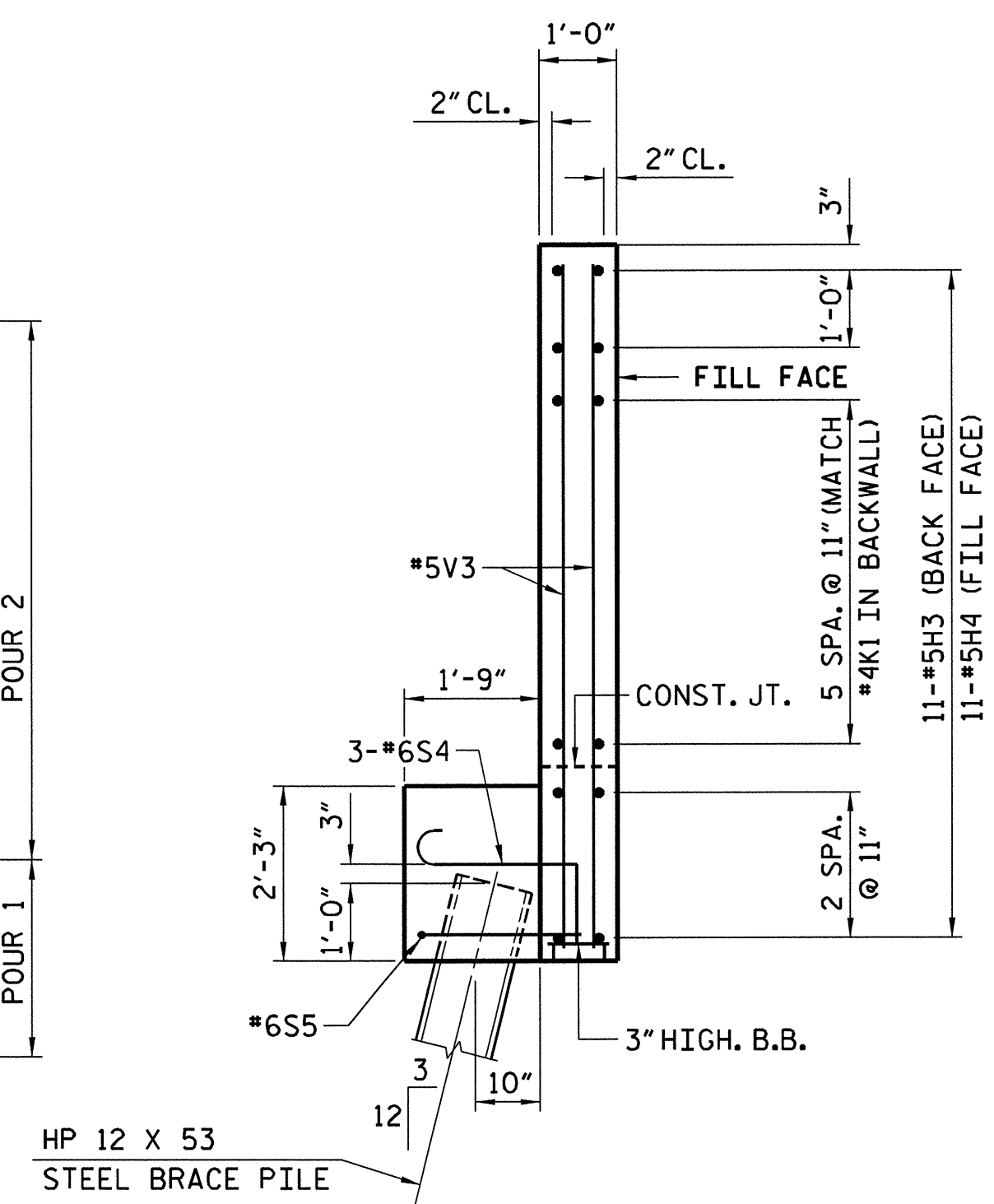
SECTION C-C



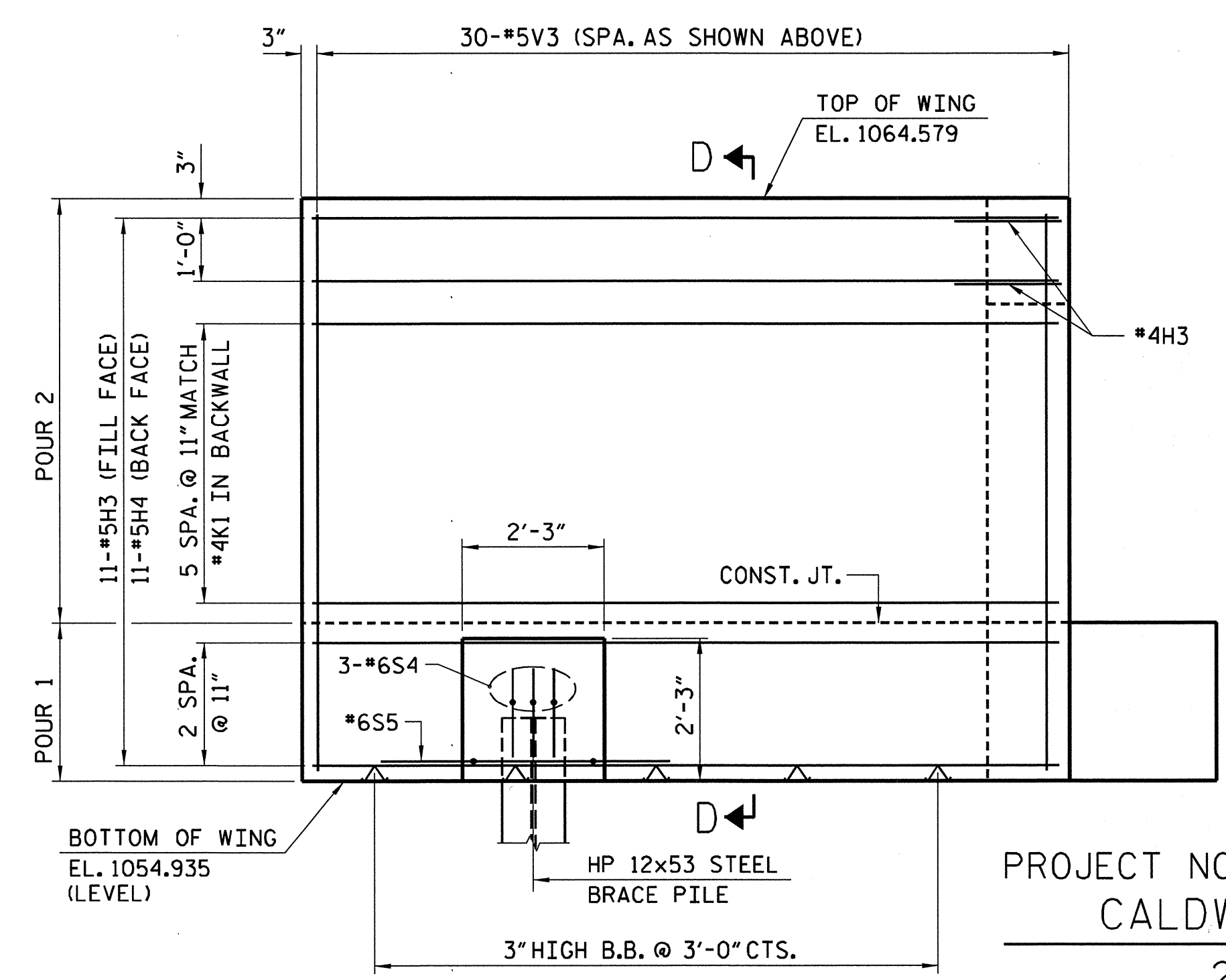
PLAN - W2



ELEVATION W1



SECTION D-D



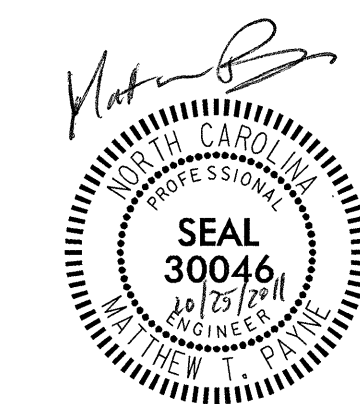
ELEVATION W2

PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 22+49.30 -Y1-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
END BENT 1

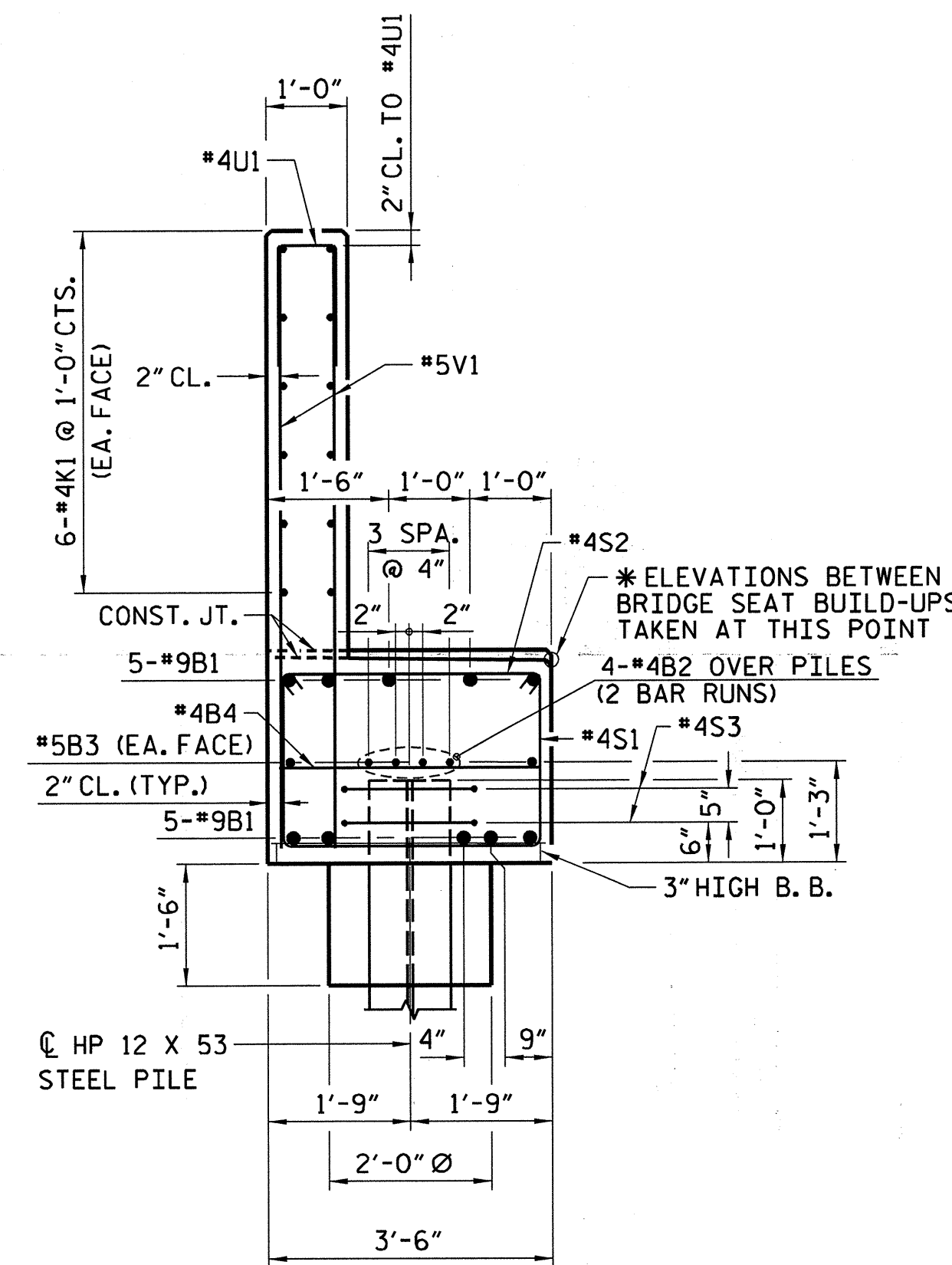


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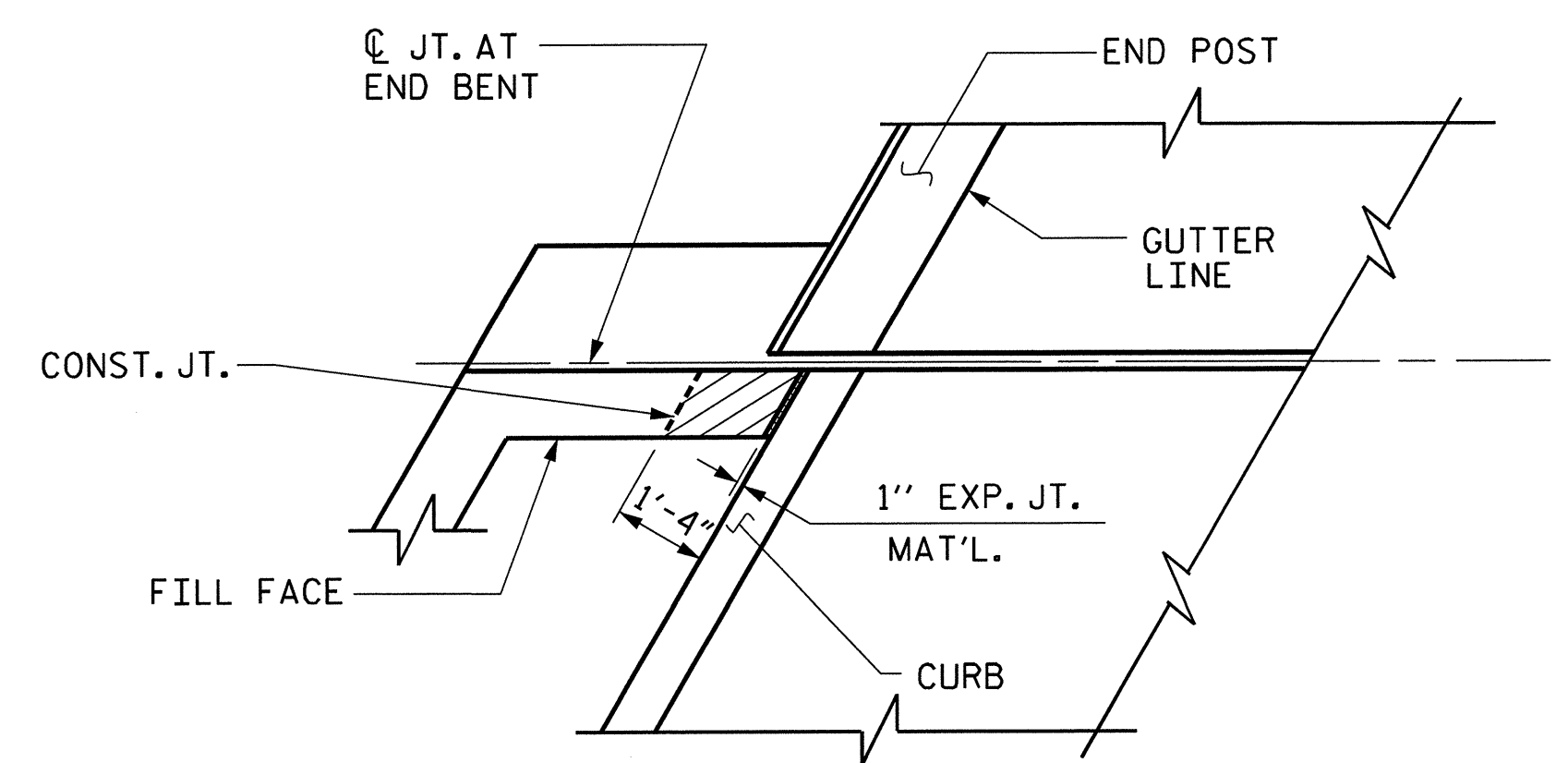
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-16	
1			3			TOTAL SHEETS	48
2			4				

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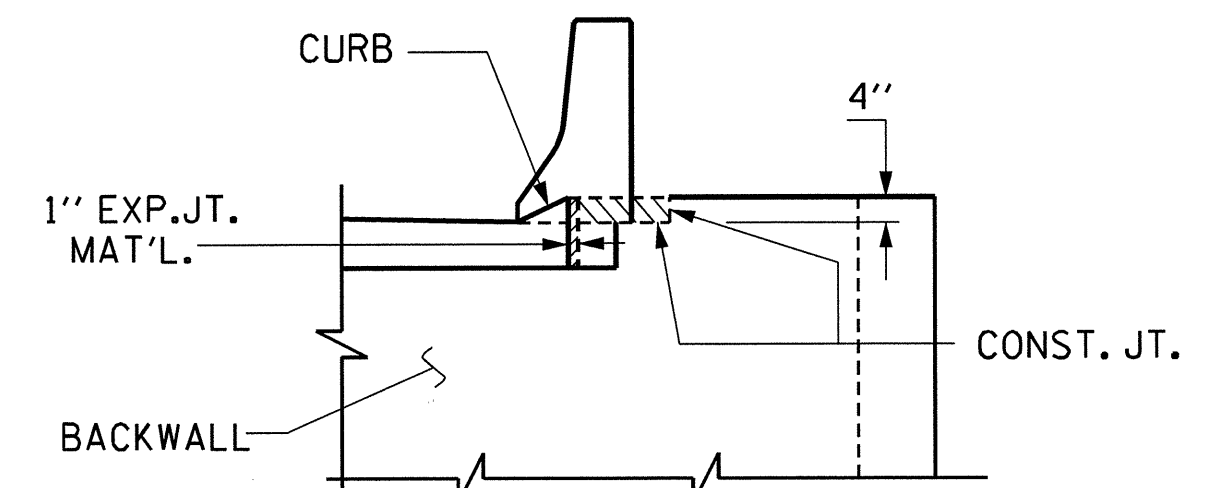
DRAWN BY: S. KAPLAN DATE: 2/11
 CHECKED BY: M. PAYNE DATE: 7/11



SECTION A-A



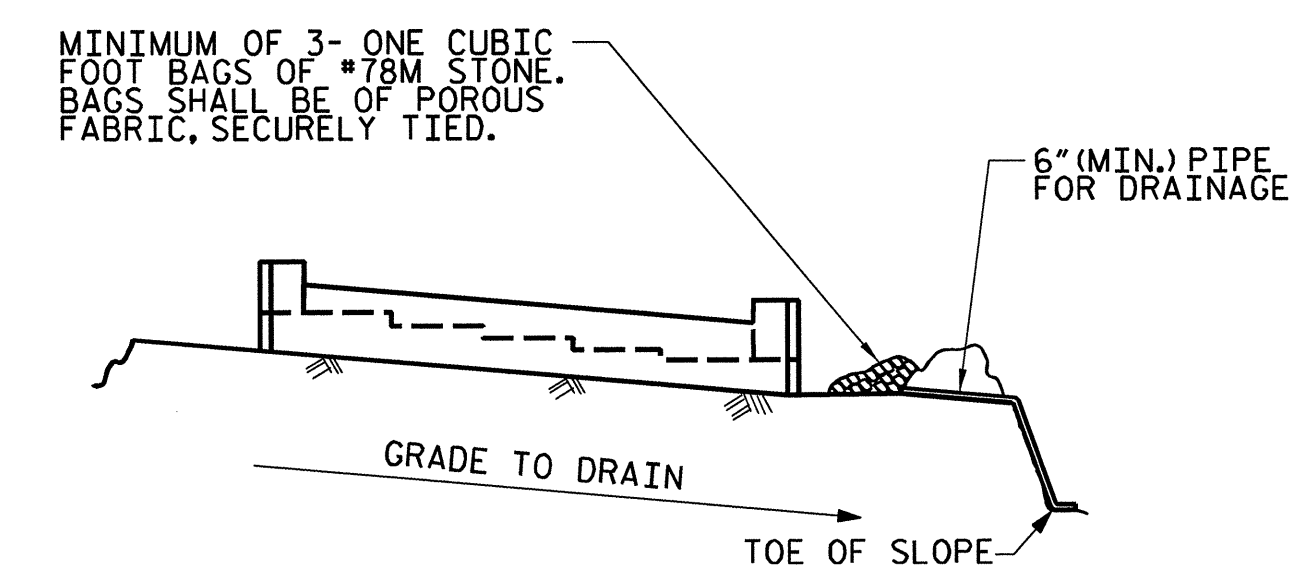
PLAN



ELEVATION

BLOCKOUT IN WING WALL

NOTE: THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

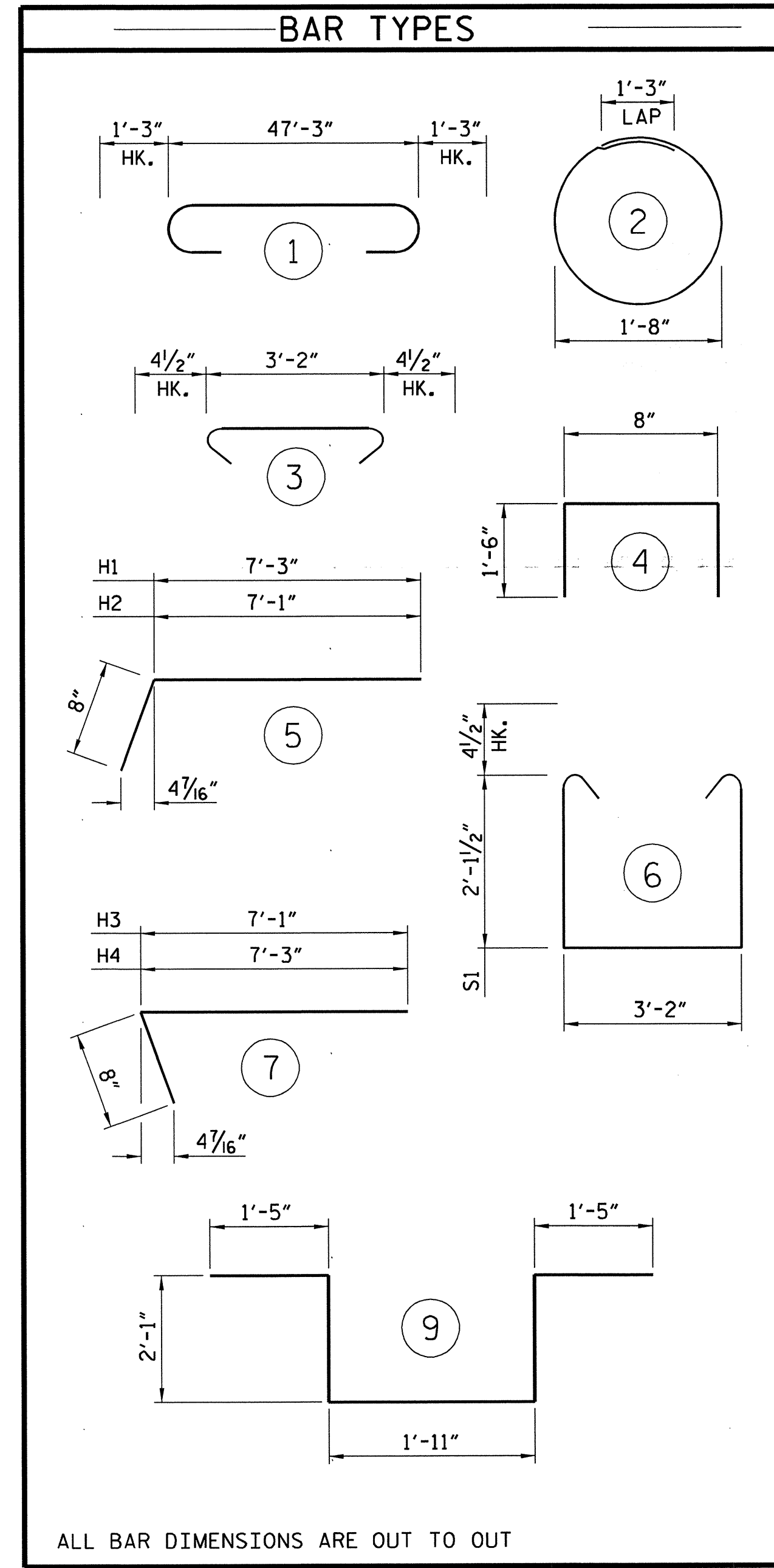


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

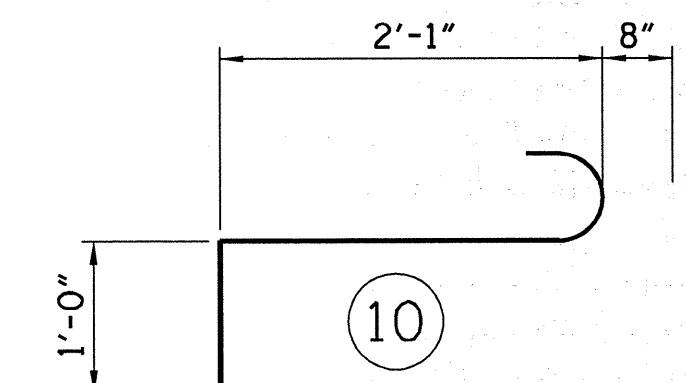


ALL BAR DIMENSIONS ARE OUT TO OUT

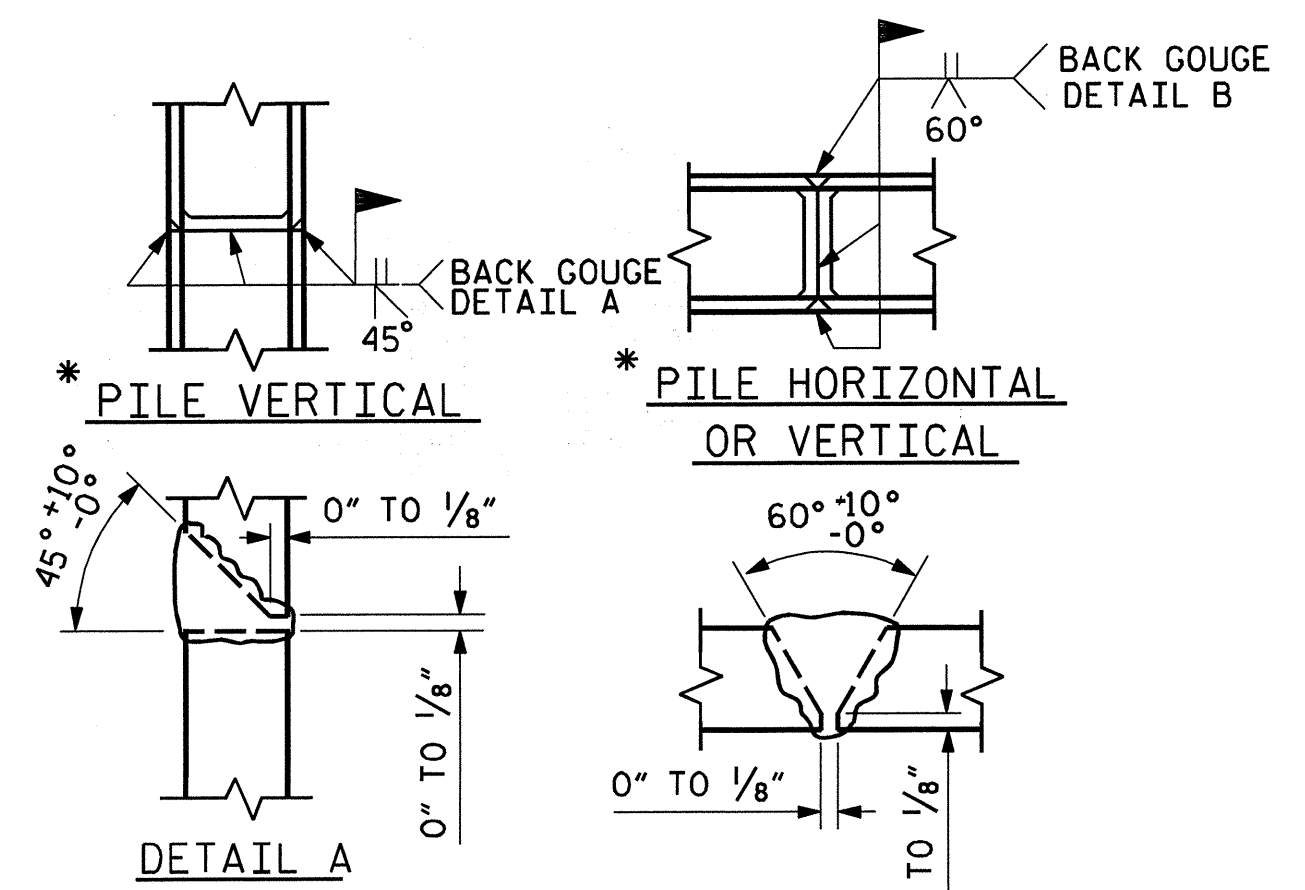
--- NOTES ---

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- 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 EXCEPT 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%.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN PLACED AND THE BARRIER AND CURB ARE CAST IF SLIP FORMING IS USED.
- THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" Ø DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR THE REINFORCED BRIDGE APPROACH SLAB FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

BILL OF REINFORCING					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	1	49'-9"	1,692
B2	8	4	STR	26'-1"	139
B3	2	5	STR	47'-3"	99
B4	12	4	STR	3'-2"	25
H1	11	4	5	14'-5"	106
H2	11	4	5	14'-3"	105
H3	11	4	7	14'-5"	106
H4	11	4	7	14'-7"	107
H5	8	5	STR	3'-4"	28
K1	12	4	STR	26'-0"	208
S1	42	4	6	8'-2"	229
S2	42	4	3	3'-11"	110
S3	16	4	2	6'-6"	69
S4	6	6	10	3'-9"	34
S5	2	6	9	8'-11"	27
U1	39	4	4	3'-8"	96
V1	39	5	STR	7'-3"	295
V2	37	5	STR	8'-11"	344
V3	30	5	STR	9'-1"	284
TOTAL REINFORCING STEEL					4,103 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR 1				C.Y.	18.2
POUR 2				C.Y.	21.0
TOTAL CLASS A CONCRETE				C.Y.	39.2
HP 12 x 53 STEEL PILES					10
					200 LIN. FT.



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PILE SPLICE DETAILS

DRAWN BY: S. KAPLAN DATE: 2/11
 CHECKED BY: M. PAYNE DATE: 7/11

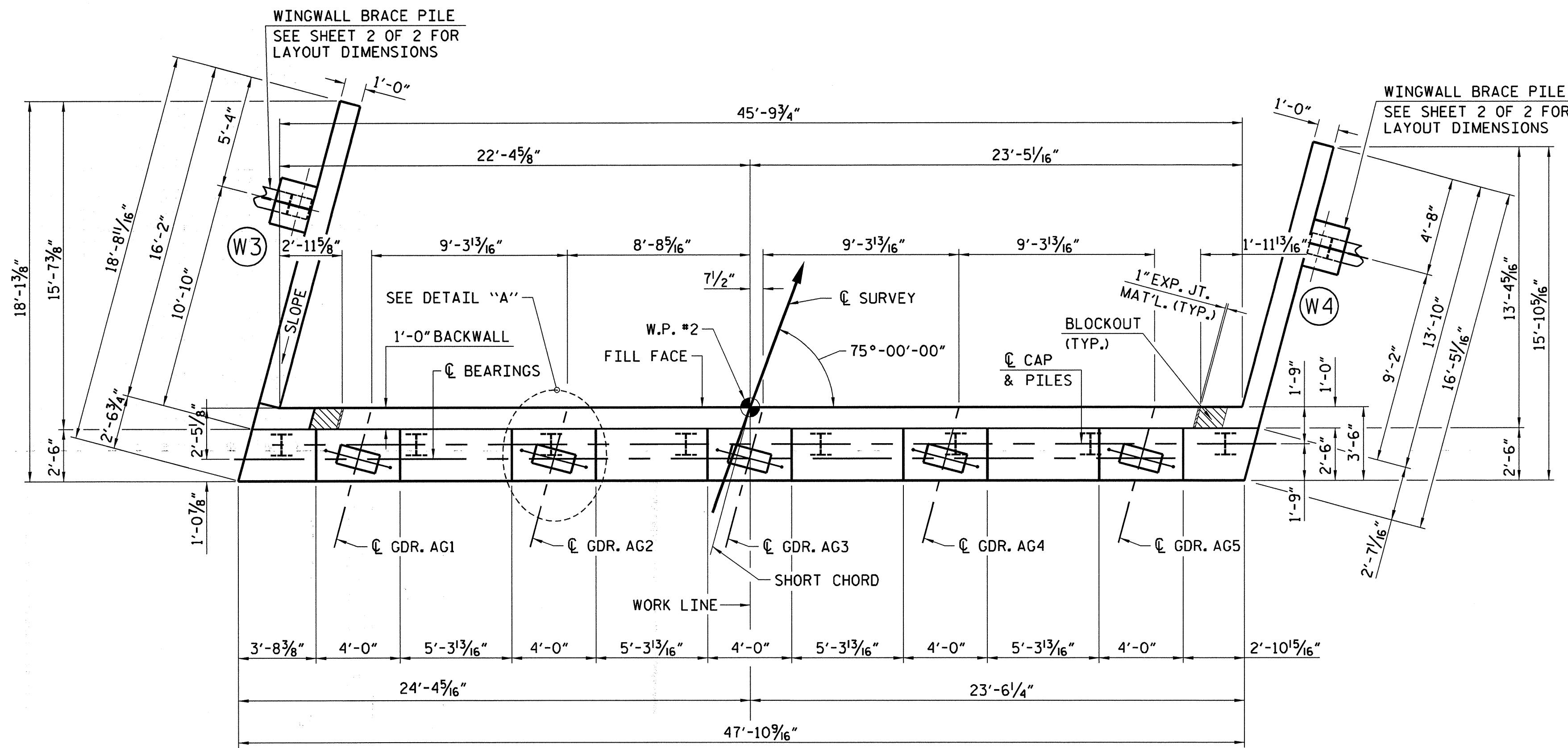
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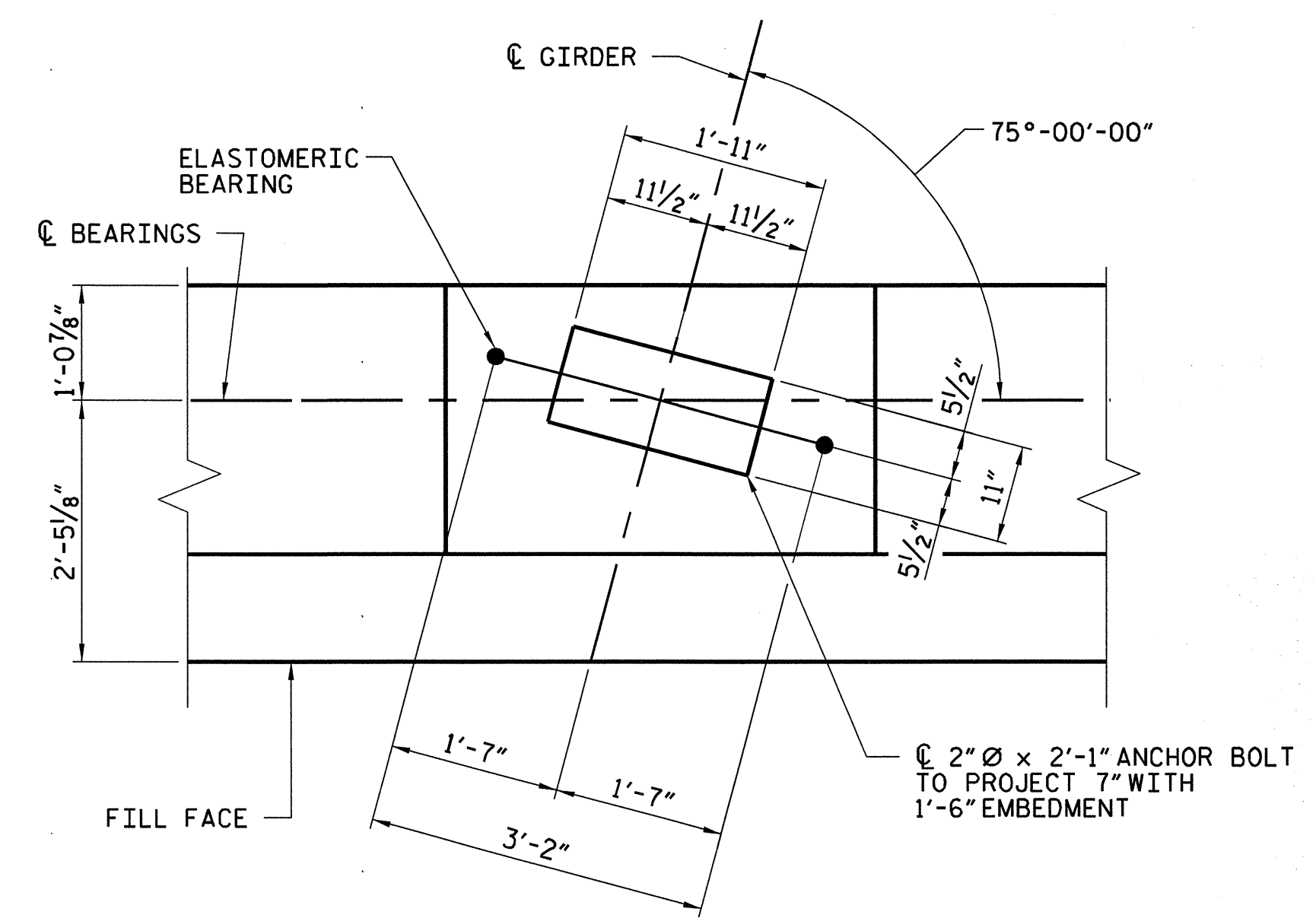
PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 22+49.30 -Y1-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1

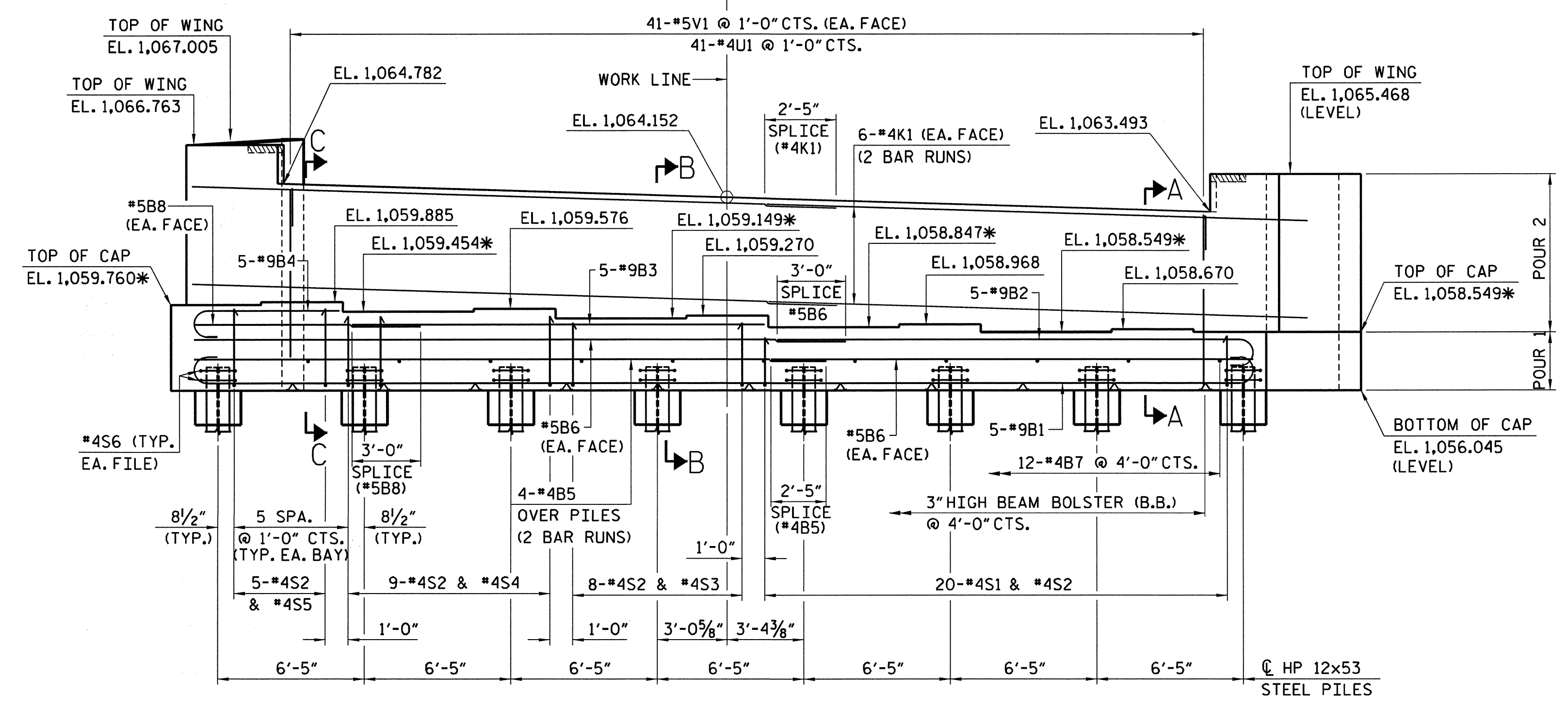
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-17
1			3			TOTAL SHEETS 48
2			4			



PLAN



DETAIL "A"



ELEVATION

PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 22+49.30 -Y1-

SHEET 1 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 2

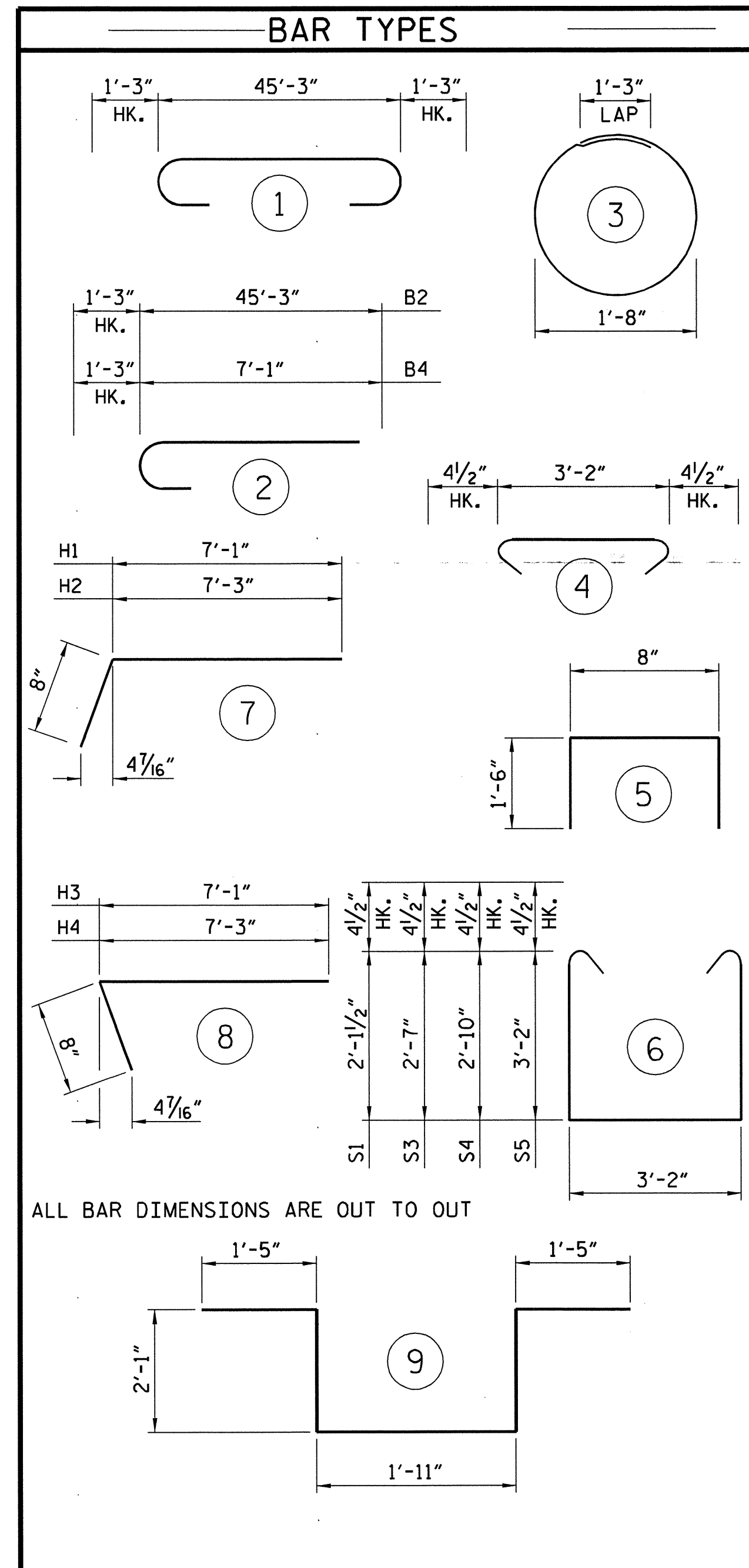
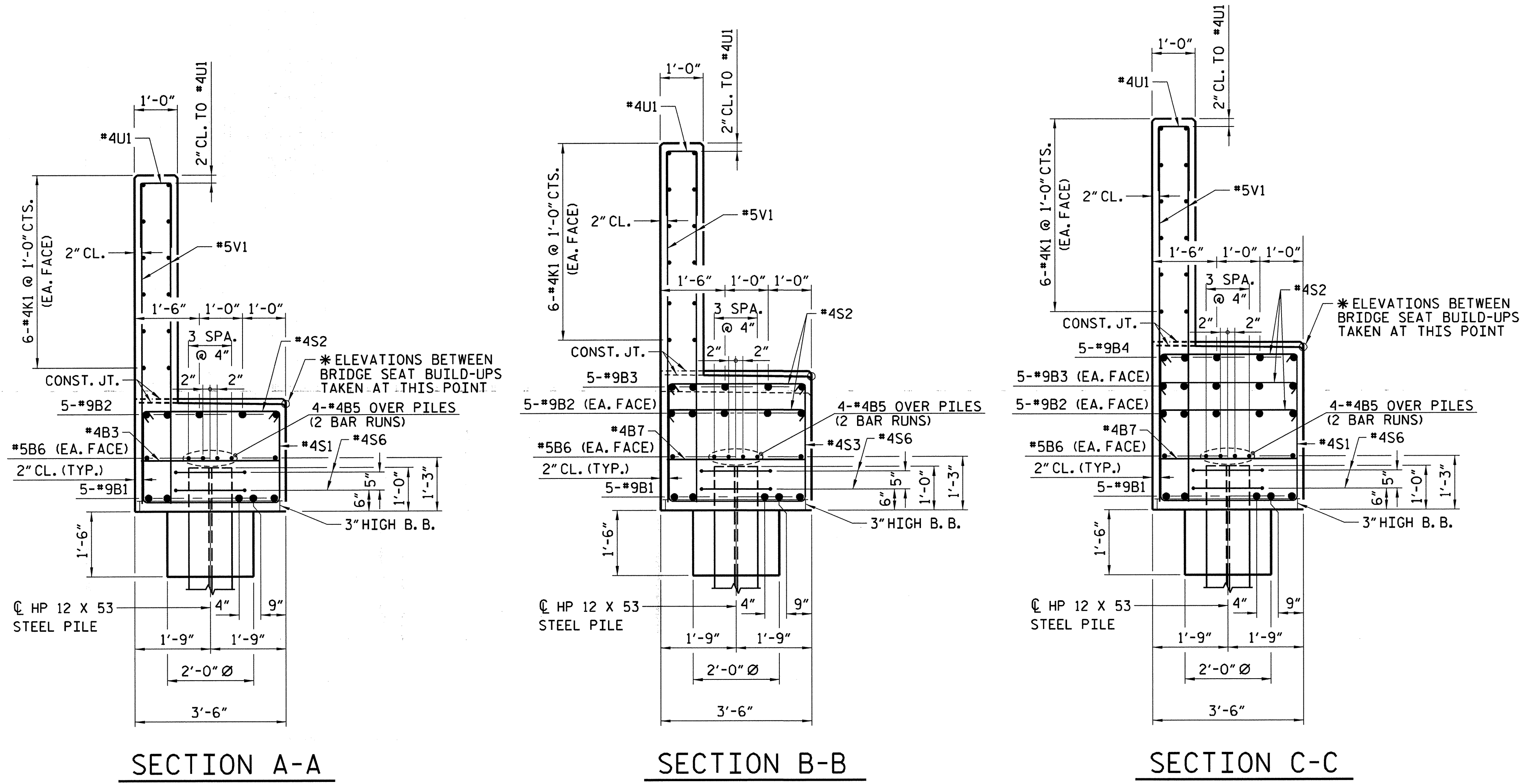


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REVISIONS						TOTAL SHEETS
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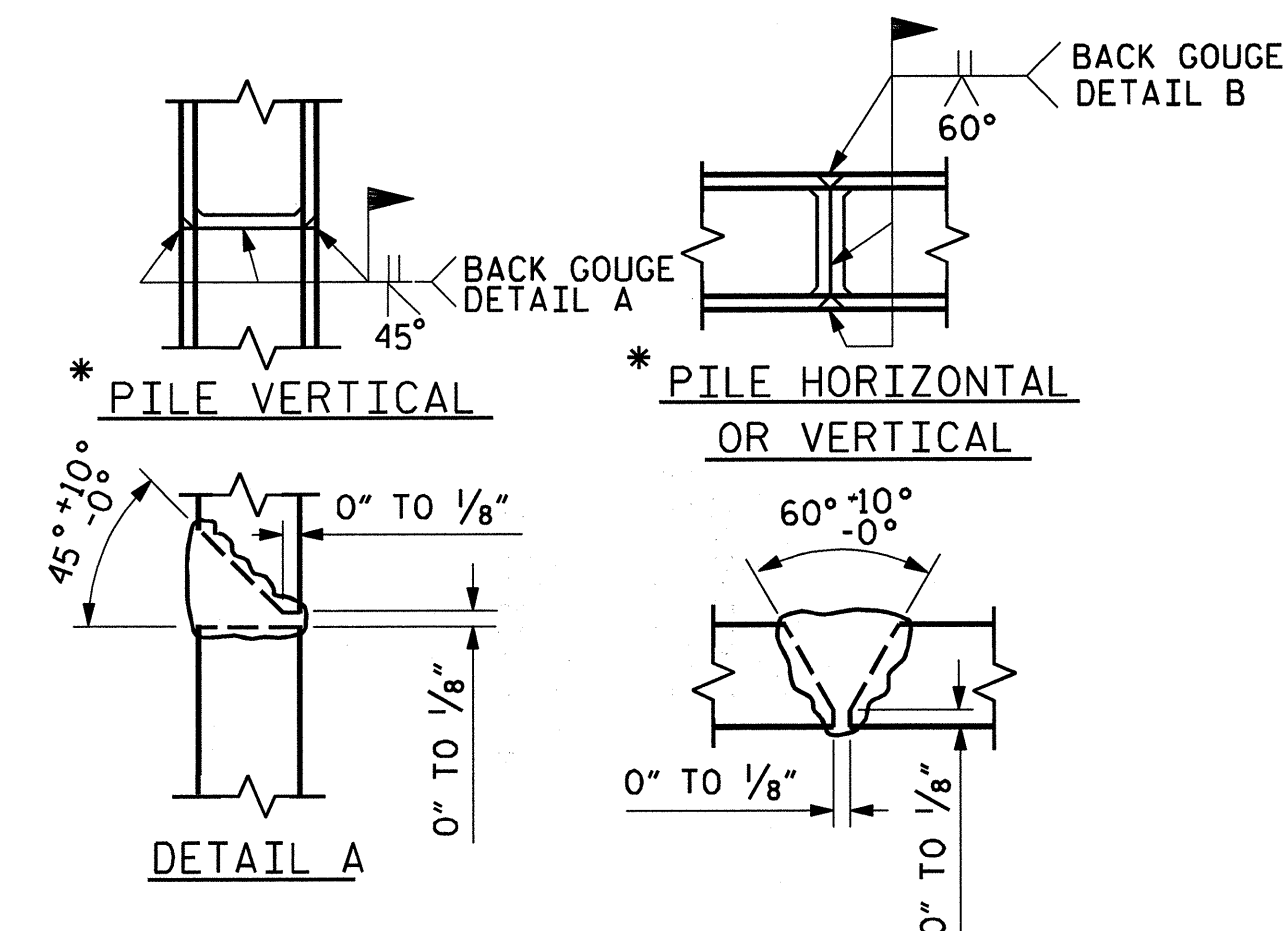
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DRAWN BY : S. KAPLAN DATE : 2/11
 CHECKED BY : M. PAYNE DATE : 7/11

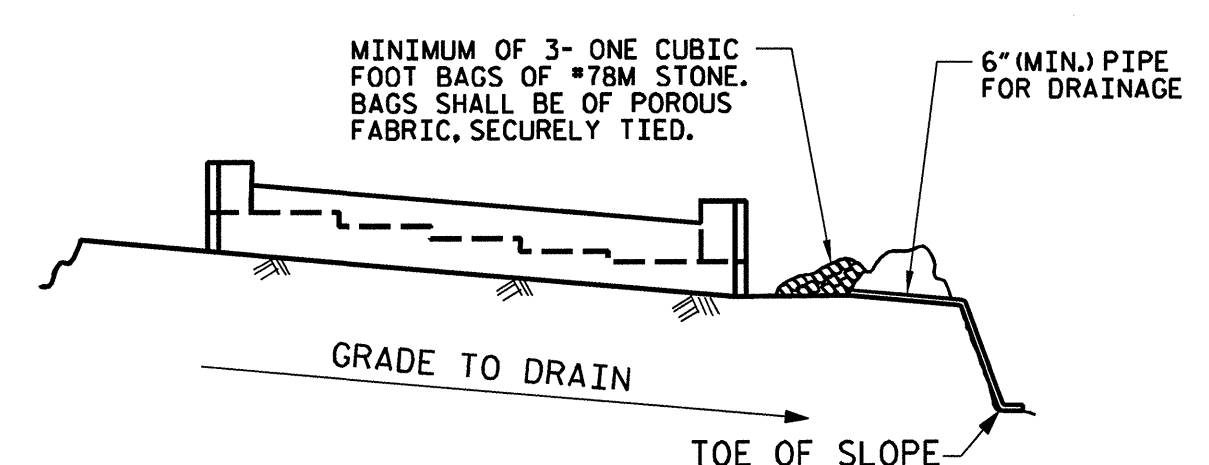


BILL OF REINFORCING					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	9	1	47'-9"	812
B2	5	9	2	46'-6"	791
B3	5	9	STR	25'-7"	435
B4	5	9	2	8'-4"	142
B5	8	4	STR	25'-0"	134
B6	4	5	STR	25'-8"	107
B7	12	5	STR	3'-0"	38
B8	2	5	STR	9'-11"	21
H1	12	5	7	7'-9"	176
H2	12	5	7	7'-11"	178
H3	10	9	8	7'-9"	171
H4	10	5	8	7'-11"	173
H5	44	5	STR	2'-5"	111
K1	24	4	STR	25'-0"	401
S1	20	4	6	8'-2"	109
S2	42	4	4	3'-11"	110
S3	8	4	6	9'-1"	49
S4	9	4	6	9'-7"	58
S5	5	4	6	10'-3"	34
S6	16	4	3	6'-5"	69
S7	6	6	10	3'-9"	27
S8	2	6	9	8'-11"	34
V1	82	5	STR	6'-11"	592
V2	34	5	STR	10'-2"	361
V3	40	5	STR	8'-11"	372
U1	41	4	5	3'-8"	100
TOTAL REINFORCING STEEL					5,605 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR 1					C.Y. 20.8
POUR 2					C.Y. 17.9
TOTAL CLASS A CONCRETE					C.Y. 38.7
HP 12 x 53 STEEL PILES					11
					330 LIN. FT.
PREDRILL PILE LENGTH					165 LIN. FT.

ALL BAR DIMENSIONS ARE OUT TO OUT



PILE SPLICE DETAILS



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

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

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

TEMPORARY DRAINAGE AT END BENT

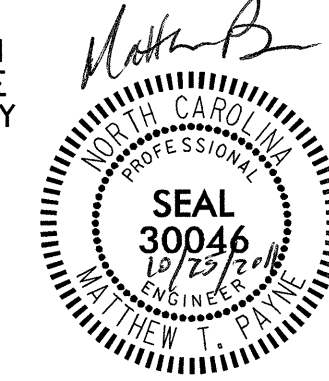
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT 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%.
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- THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" Ø DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR THE REINFORCED BRIDGE APPROACH SLAB FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

PROJECT NO. U-5204
CALDWELL COUNTY
STATION: 22+49.30 -Y1-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

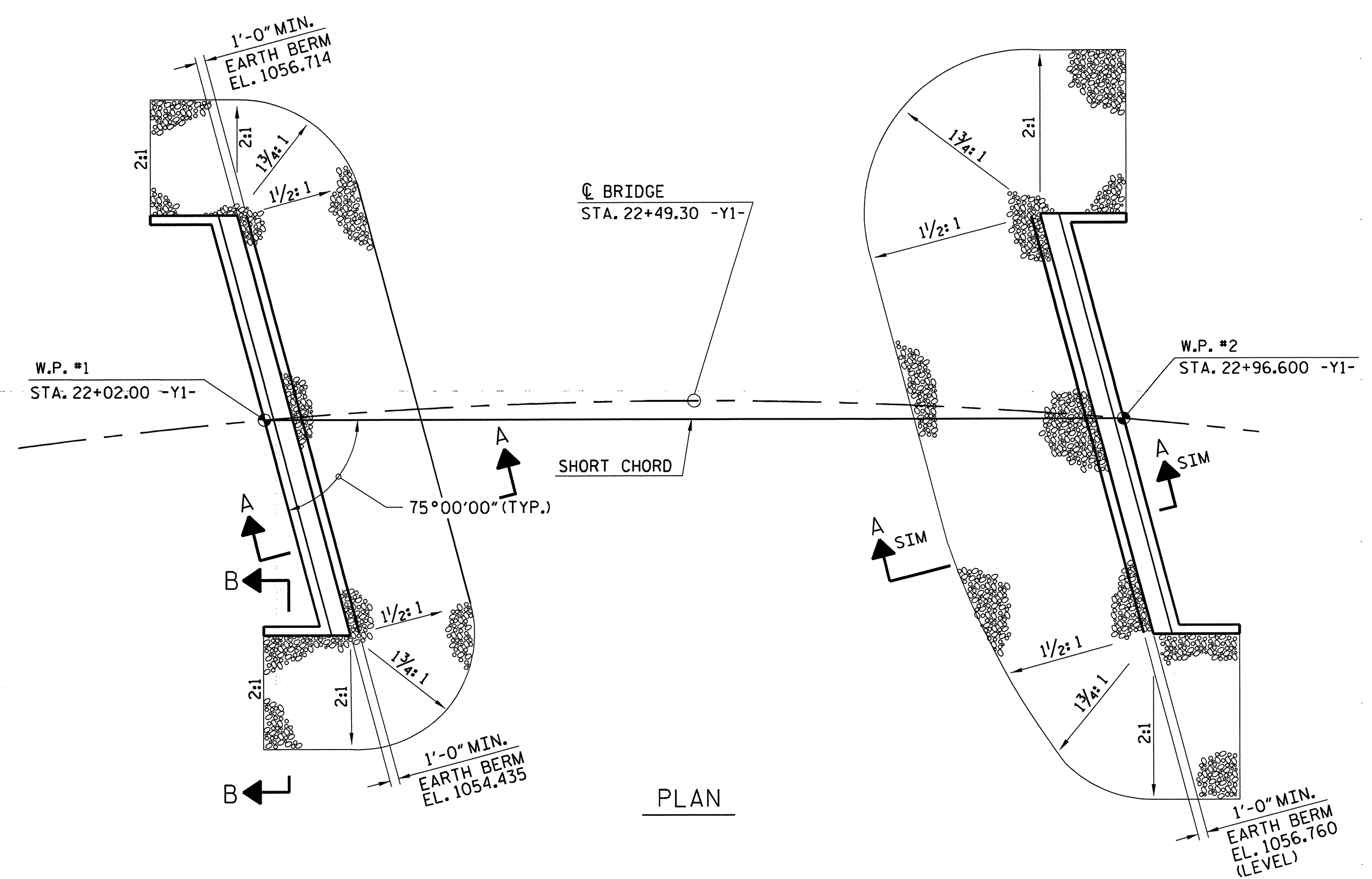
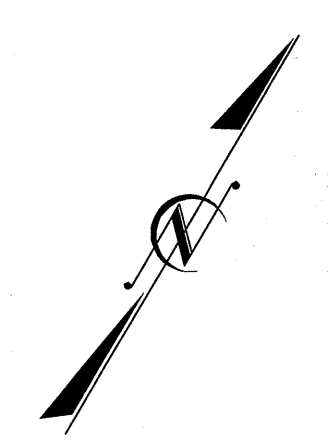


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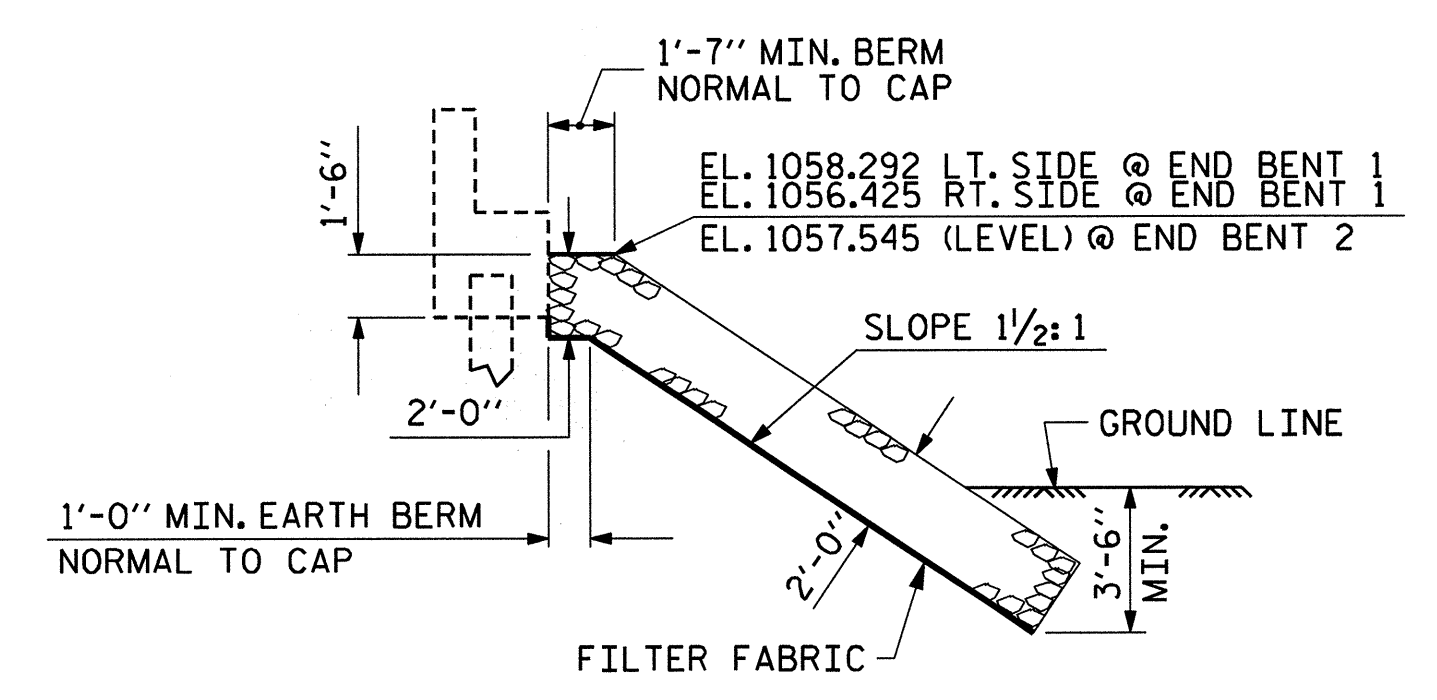
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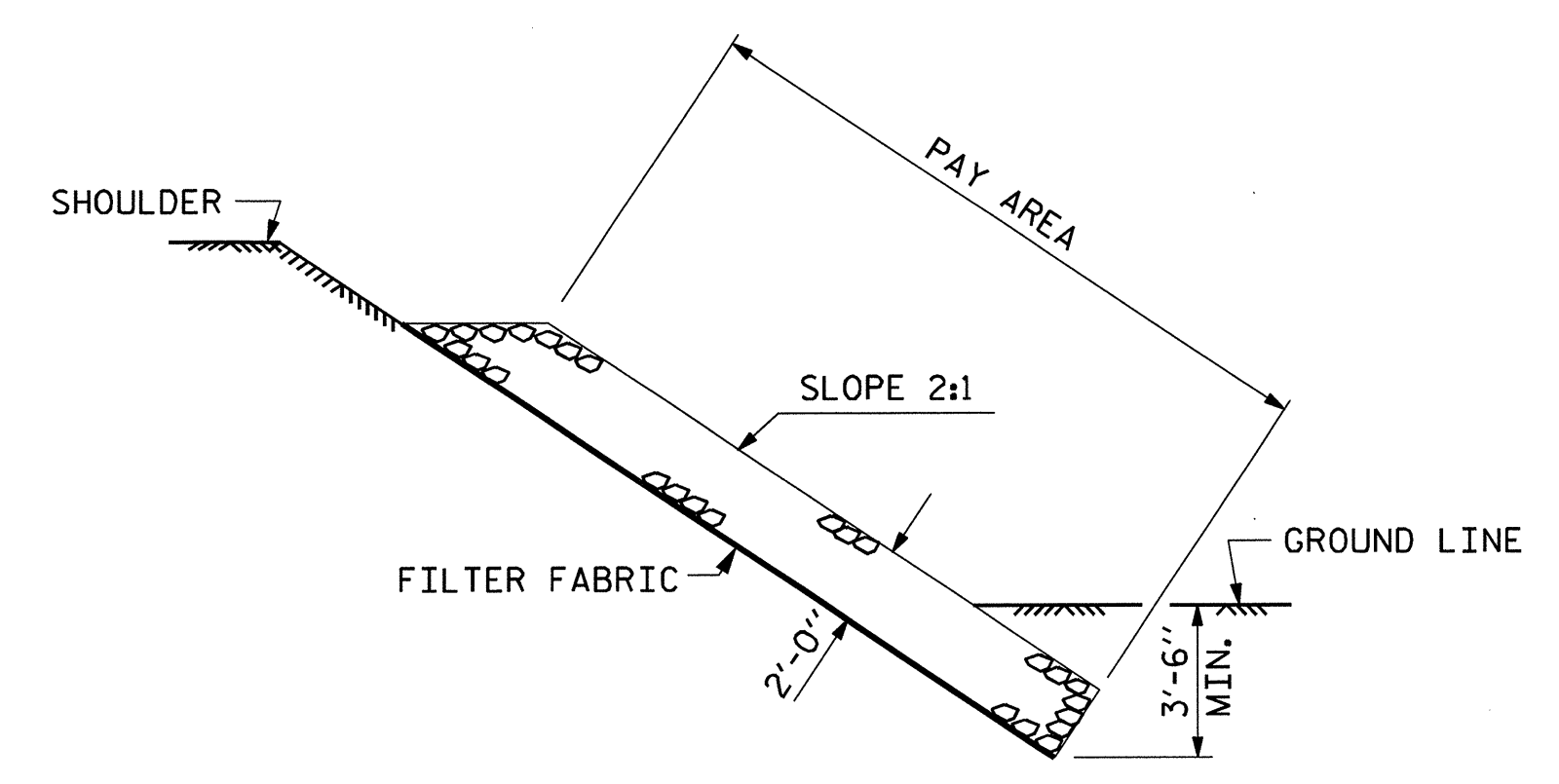
DRAWN BY: R. KNIGHT DATE: 2/11
CHECKED BY: M. PAYNE DATE: 7/11



PLAN



SECTION A-A



SECTION B-B

ESTIMATED QUANTITIES		
BRIDGE @ STA. 22+49.30 -Y1-	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	210	155.6
END BENT 2	316	234.2
TOTAL	526	389.8


PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 22+49.30 -Y1-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RIP RAP DETAILS

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ASSEMBLED BY : R. KNIGHT	DATE : 6/11
CHECKED BY : M. PAYNE	DATE : 6/11
DRAWN BY : REK 1/84	REV. 8/16/99 RWW/LES
CHECKED BY : RDU 1/84	REV. 10/17/00 RWW/LES
	REV. 5/1/06R TLA/GM


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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			43

BILL OF MATERIAL

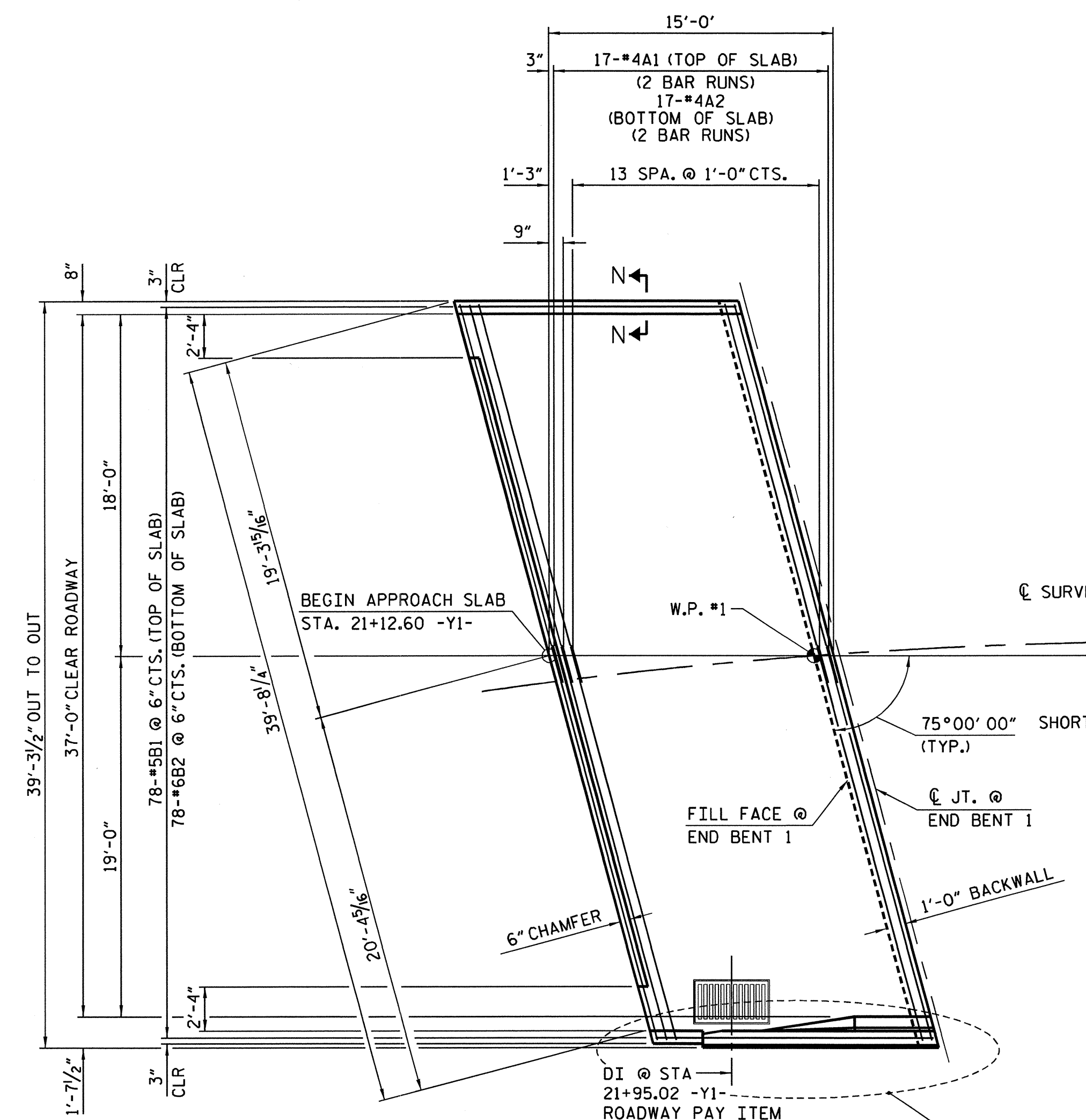
FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	34	#4	STR	22'-2"	503
A2	34	#4	STR	22'-1"	503
*B1	78	#5	STR	14'-0"	1,139
B2	78	#6	STR	14'-3"	1,669
*B3	14	#5	STR	12'-6"	183
*B4	1	#5	3	6'-4"	7
*B5	1	#5	3	6'-10"	7
*S1	48	#5	STR	3'-3"	163
*S2	48	#5	1	4'-1"	204
*S3	20	#4	2	2'-3"	30

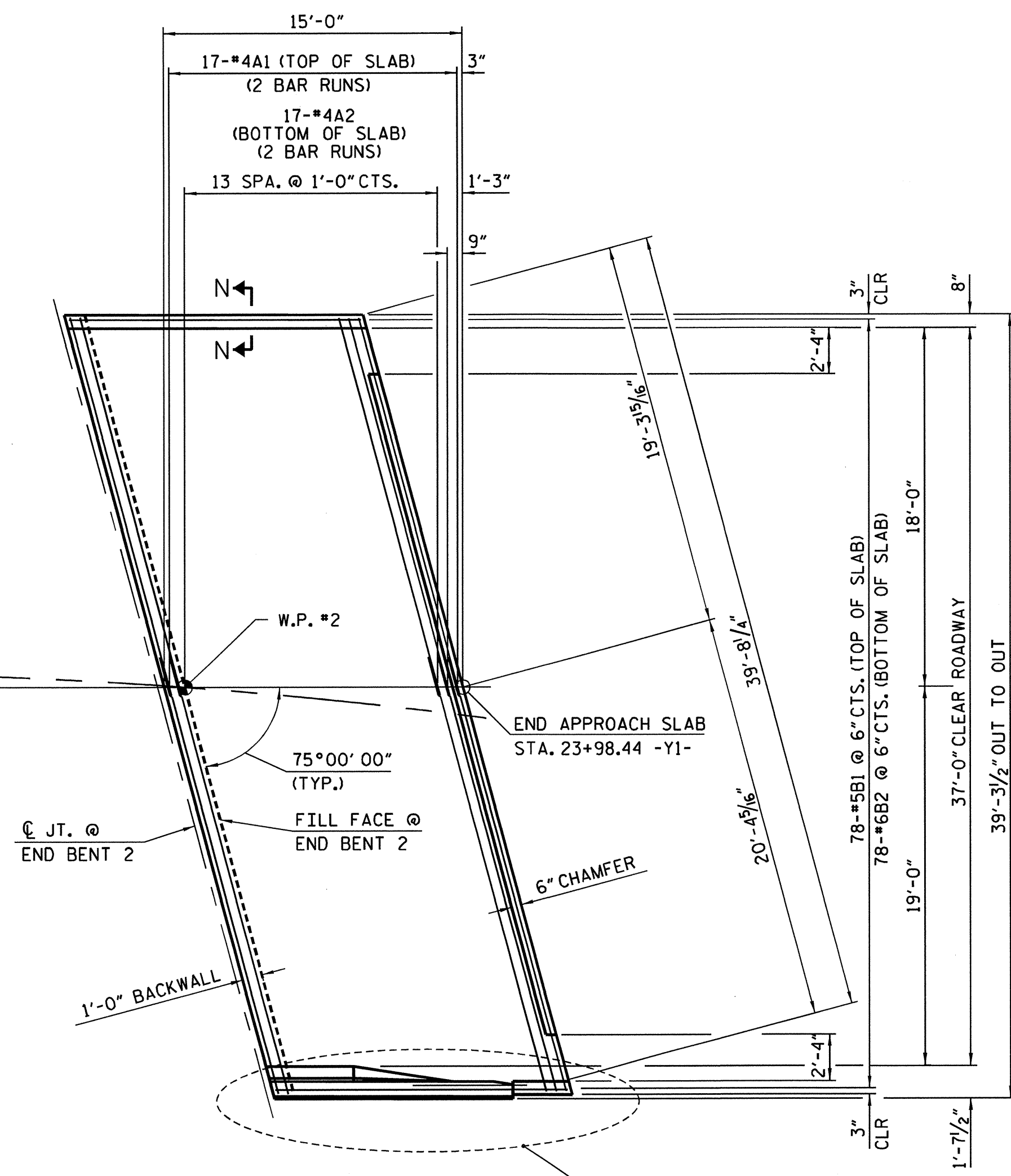
REINFORCING STEEL	LBS.	
*EPOXY COATED REINFORCING STEEL	LBS.	2,237

CLASS AA CONCRETE BREAKDOWN		
POUR 1 SLAB AND CURB	C. Y.	22.4
POUR 2 RAIL	C. Y.	2.3

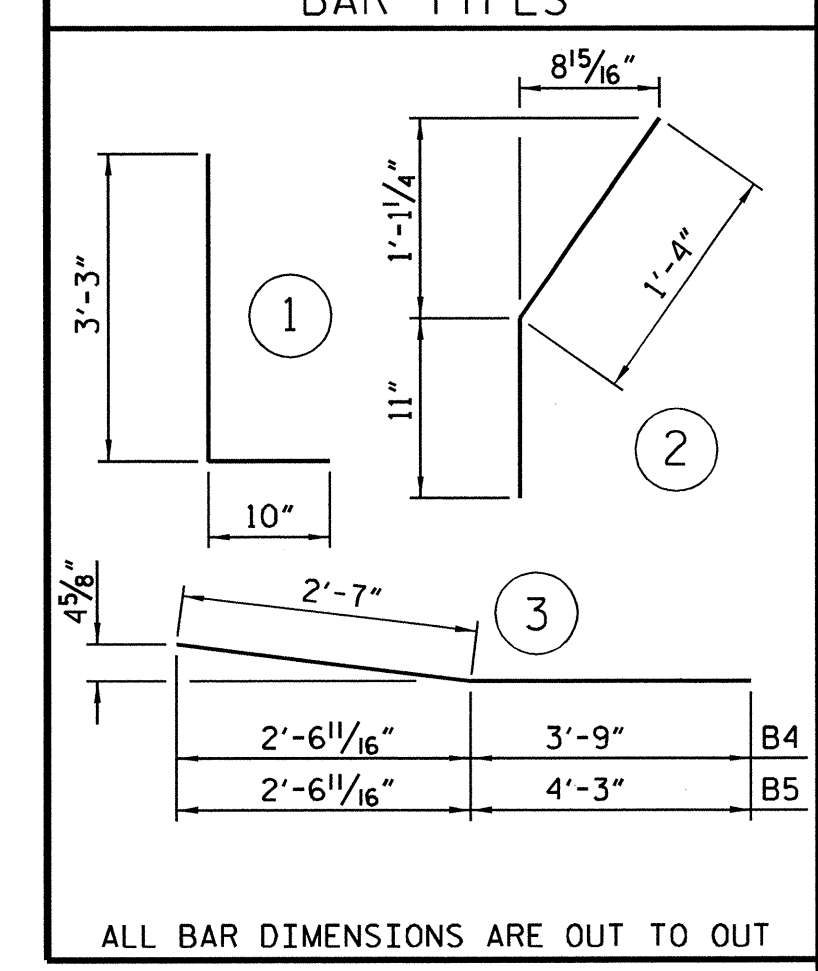
CLASS AA CONCRETE	C. Y.	
		26.7



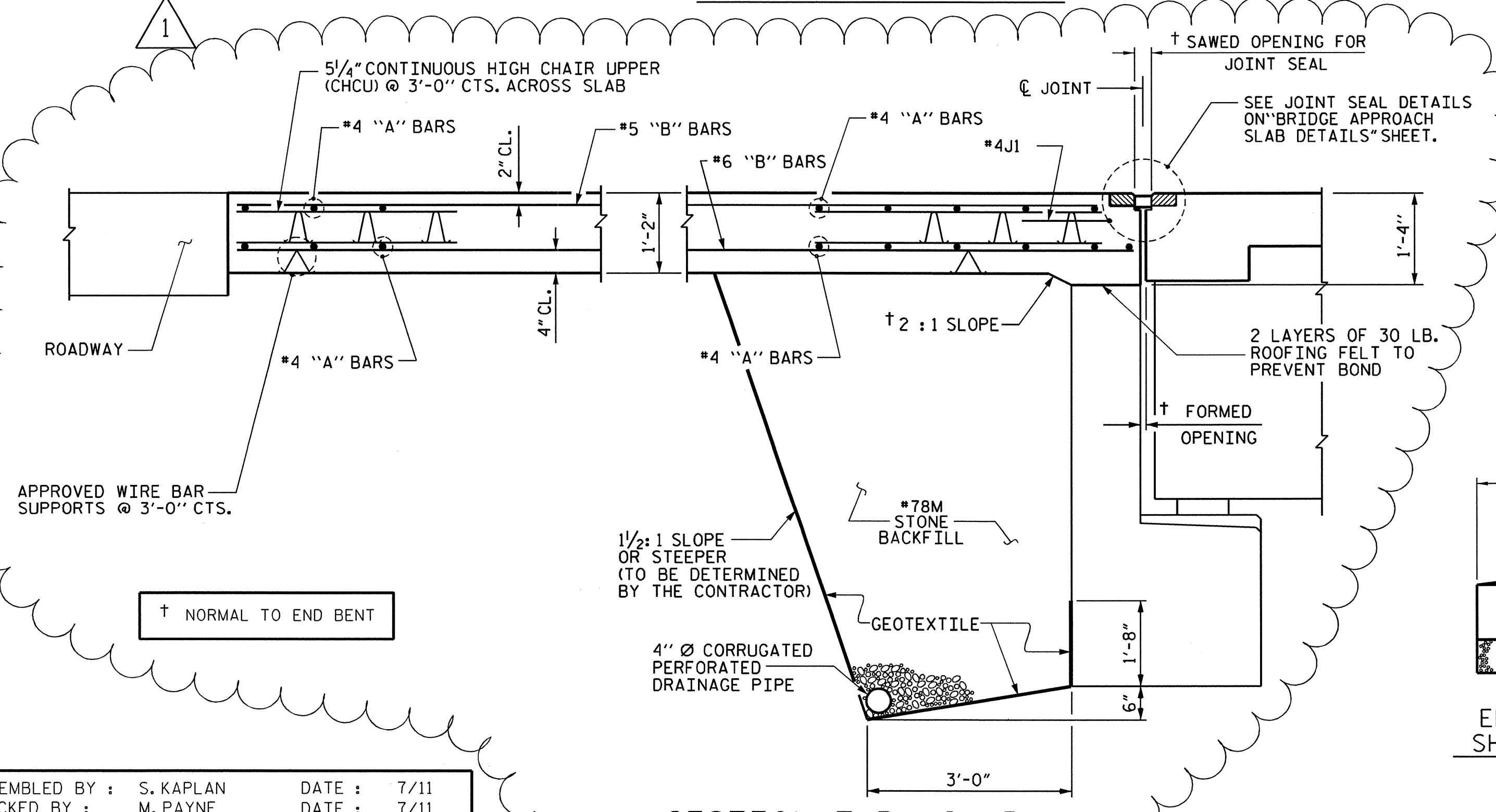
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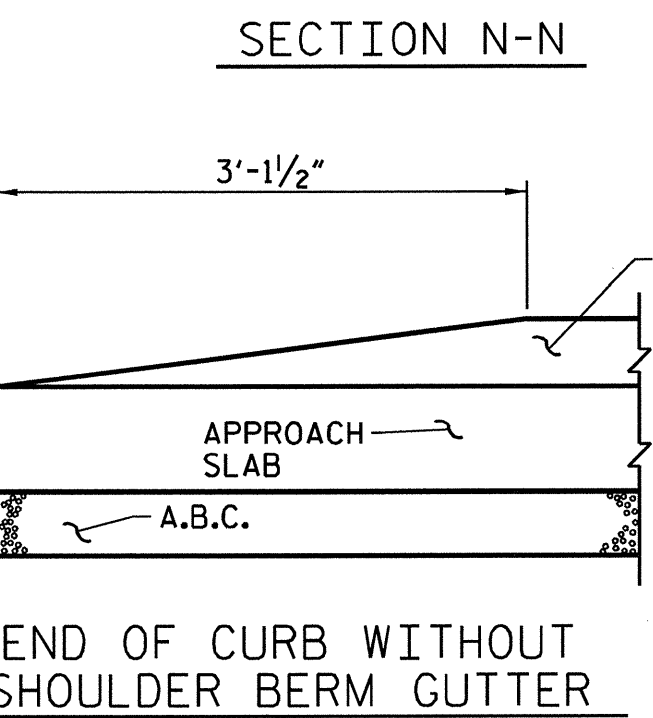
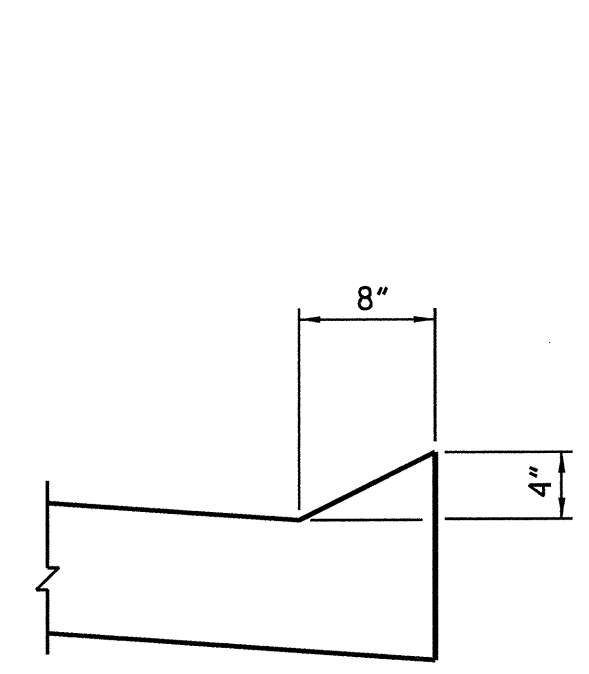
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ALL BAR DIMENSIONS ARE OUT TO OUT



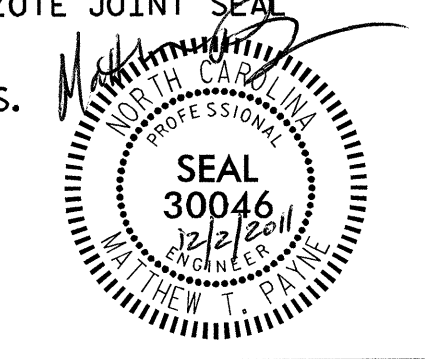
SECTION THRU SLAB



CURB DETAILS

NOTES

- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
- THE 6" COMP. A.B.C. SHALL EXTEND 10'-0" BEYOND THE END OF THE APPROACH SLAB AND 1'-0" OUTSIDE OF EACH EDGE OF SLAB.
- THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL EXTEND 1'-0" BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.
- THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL EXTEND 1'-0" BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.
- REFER TO STANDARD DRAWING 840.13 FOR CONCRETE BRIDGE APPROACH DROP INLET WITH EVAZOTE JOINT SEAL
- FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.
- THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 1/2".
- FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.



PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 22+49.30 -Y1-

SHEET 1 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
STANDARD BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

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ASSEMBLED BY : S. KAPLAN	DATE : 7/11
CHECKED BY : M. PAYNE	DATE : 7/11
DRAWN BY : LES 8/01	REV. 5/7/03R RWW/JTE
CHECKED BY : RDR 8/01	REV. 5/1/06R KMM/GM

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1	MTP	12/2011	3			TOTAL SHEETS 48
2			4			

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 1/8" 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.

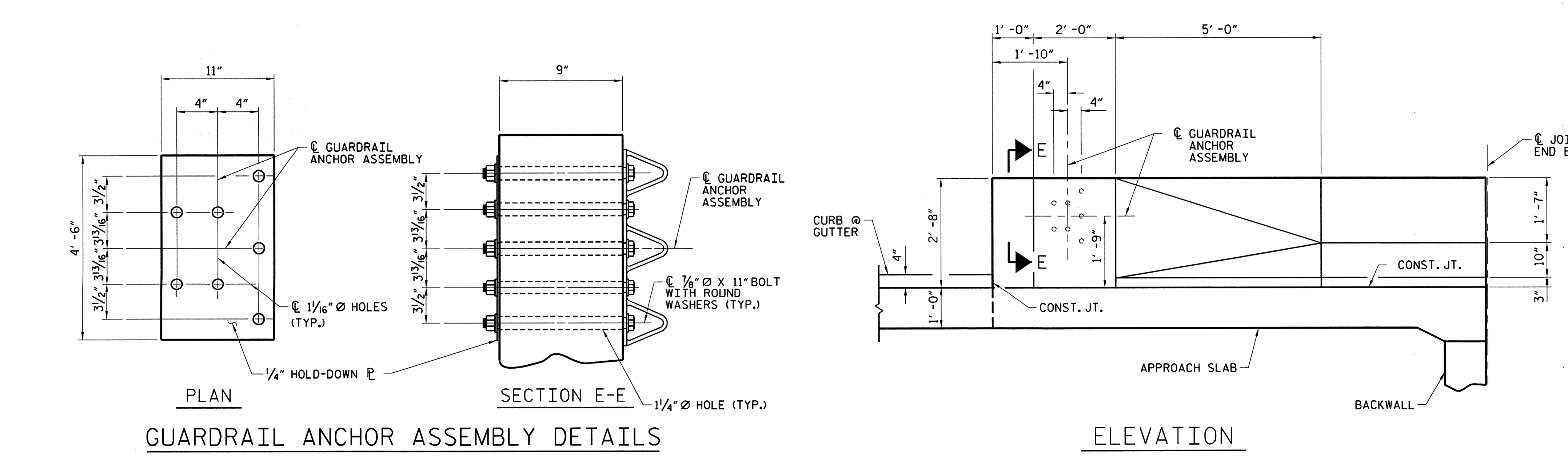
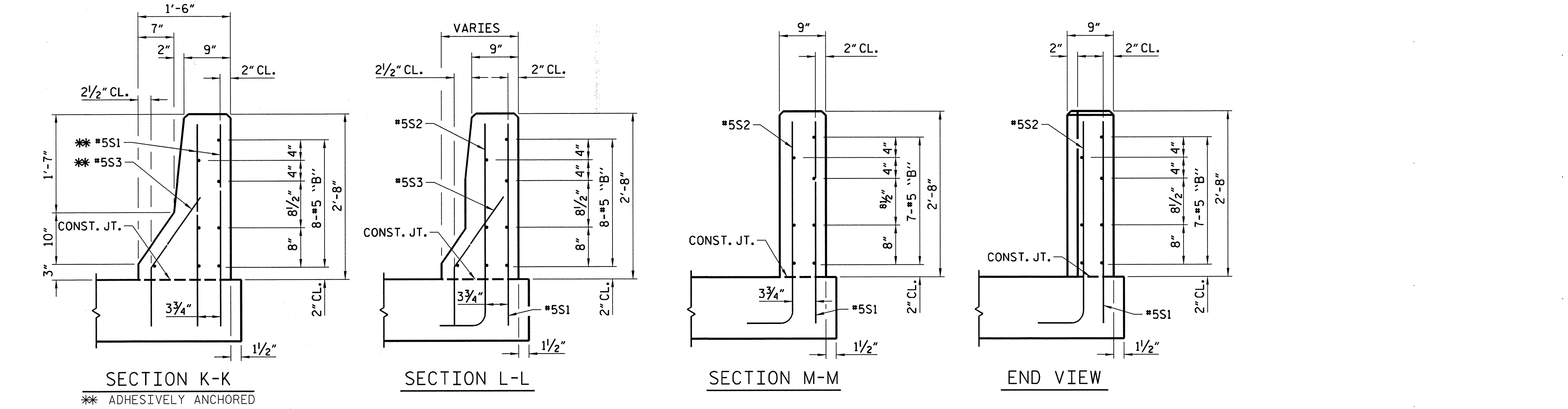
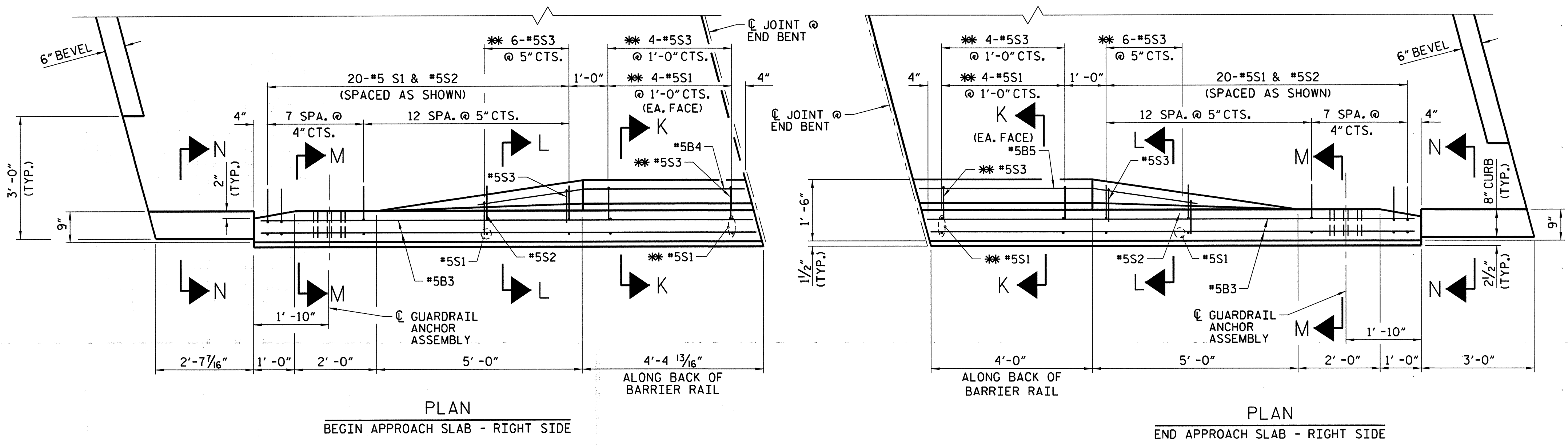
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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 LUMP SUM CONTRACT PRICE BID FOR BRIDGE APPROACH SLABS.

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

THE #5S1 AND #5S3 BARS SHALL BE INSTALLED, WHERE NOTED ON THE PLANS, USING AN ADHESIVE ANCHORING SYSTEM AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5S1 AND #5S3 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



PROJECT NO. U-5204
 CALDWELL COUNTY
 STATION: 22+49.30 -Y1-

SHEET 2 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 DETAILS FOR FLEXIBLE
 PAVEMENT WITH BARRIER RAIL

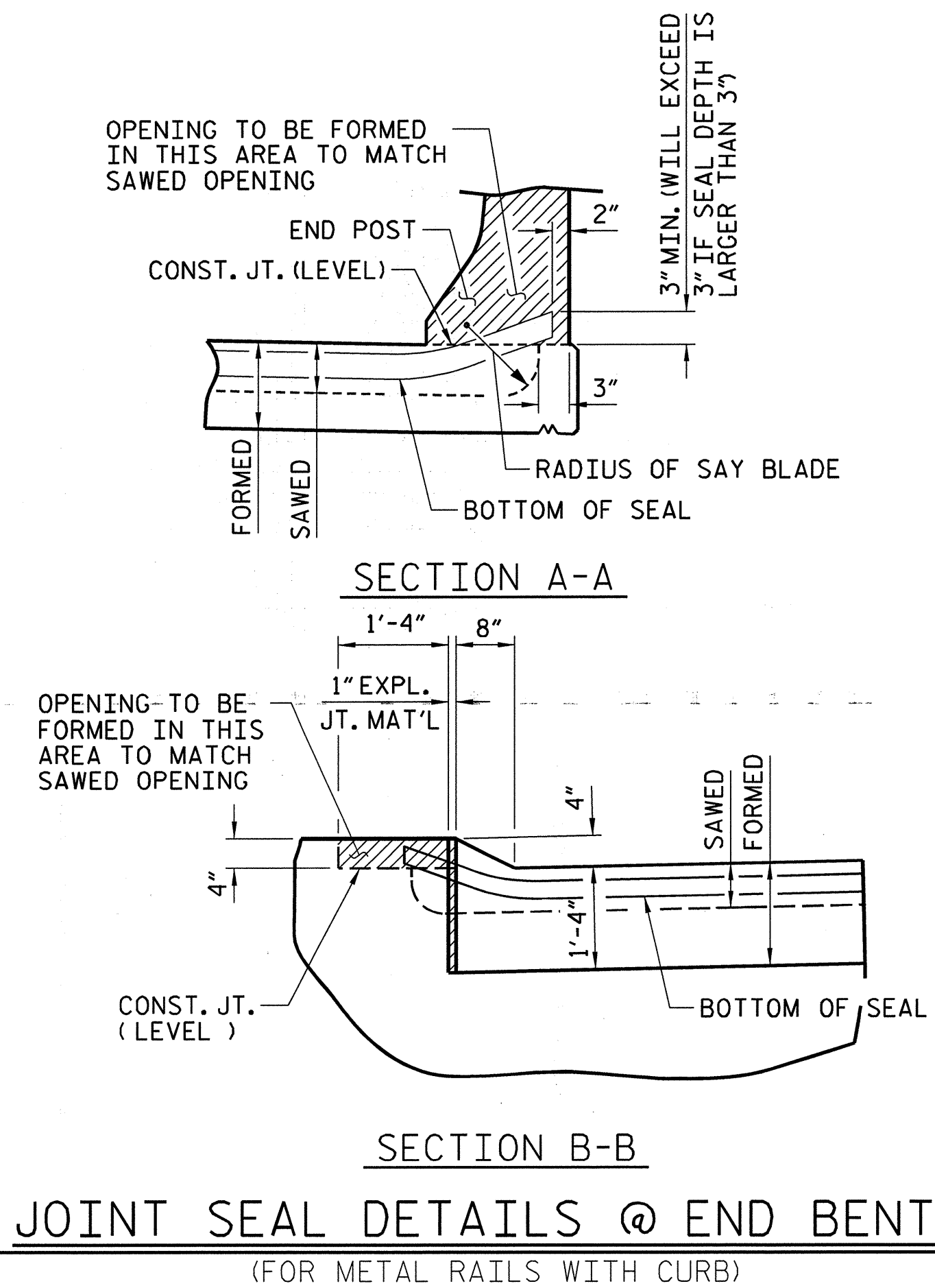


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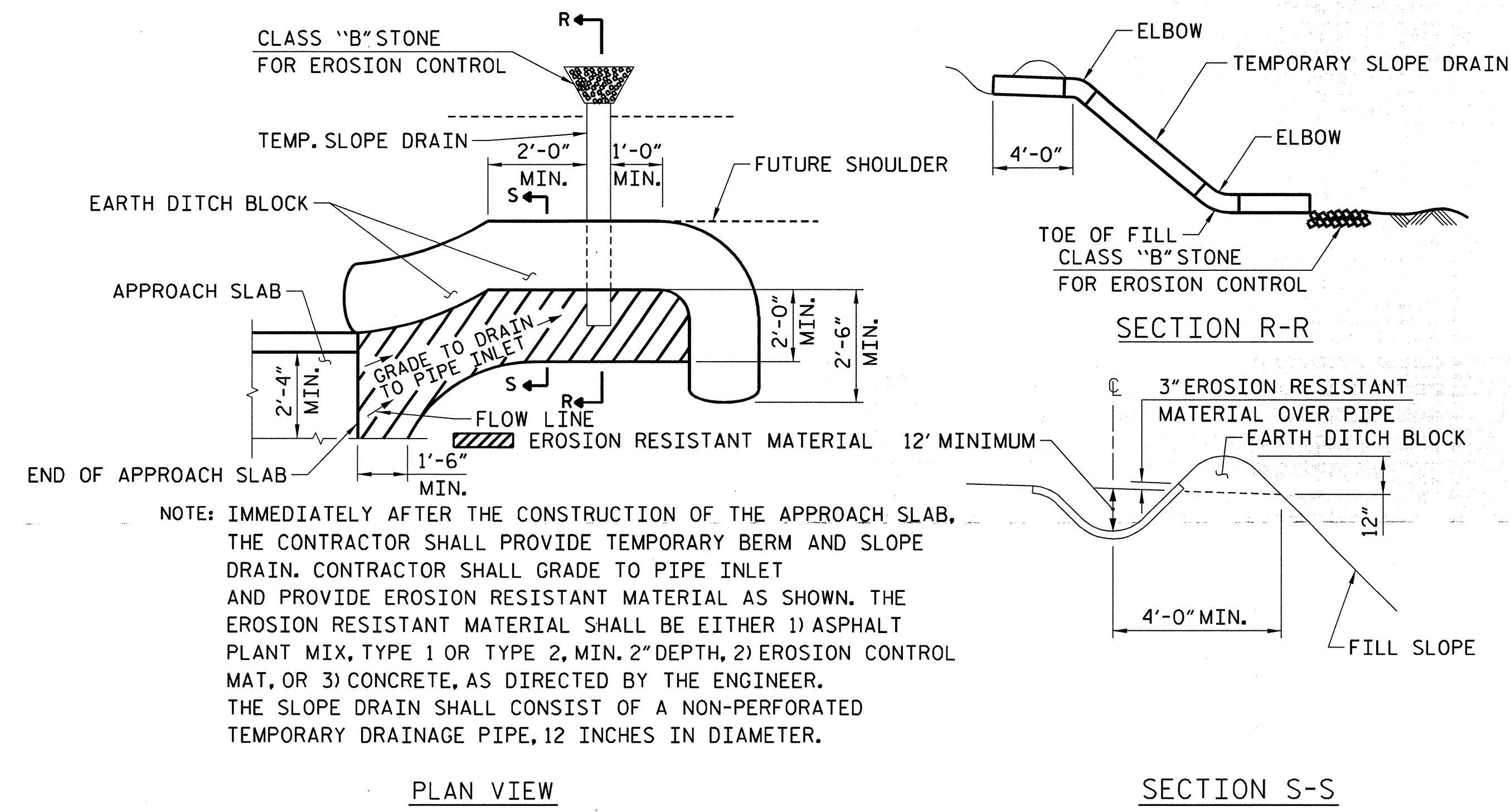
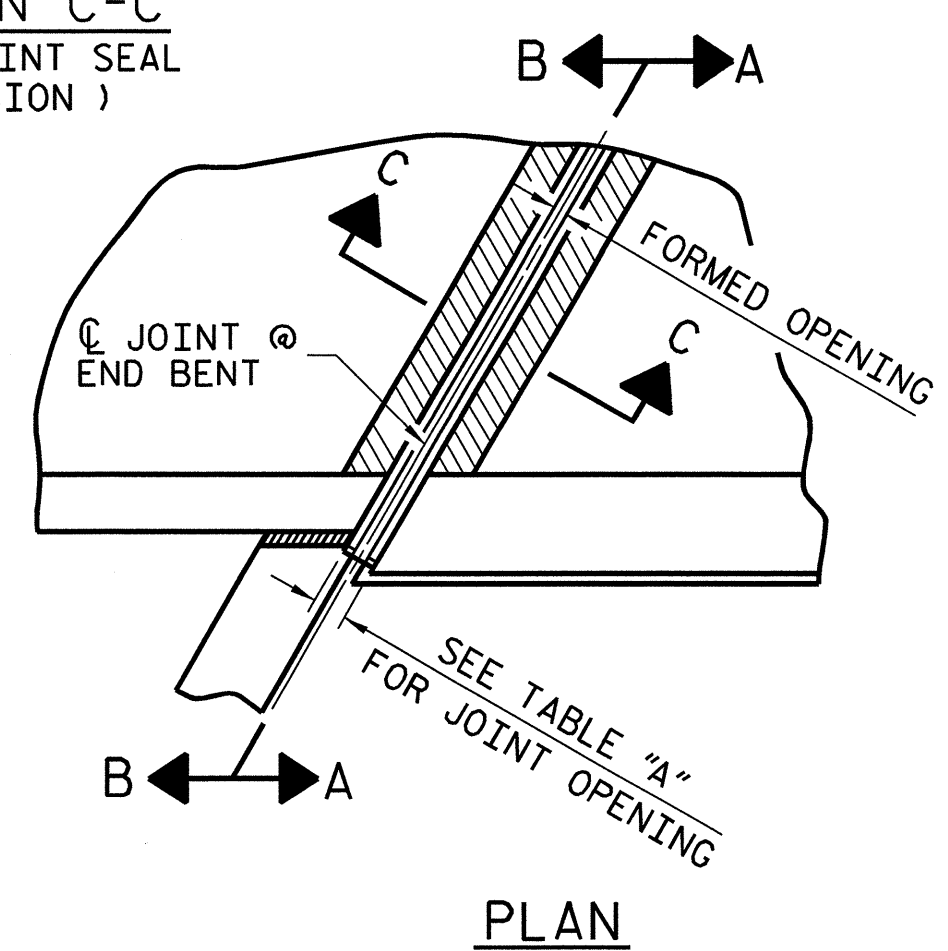
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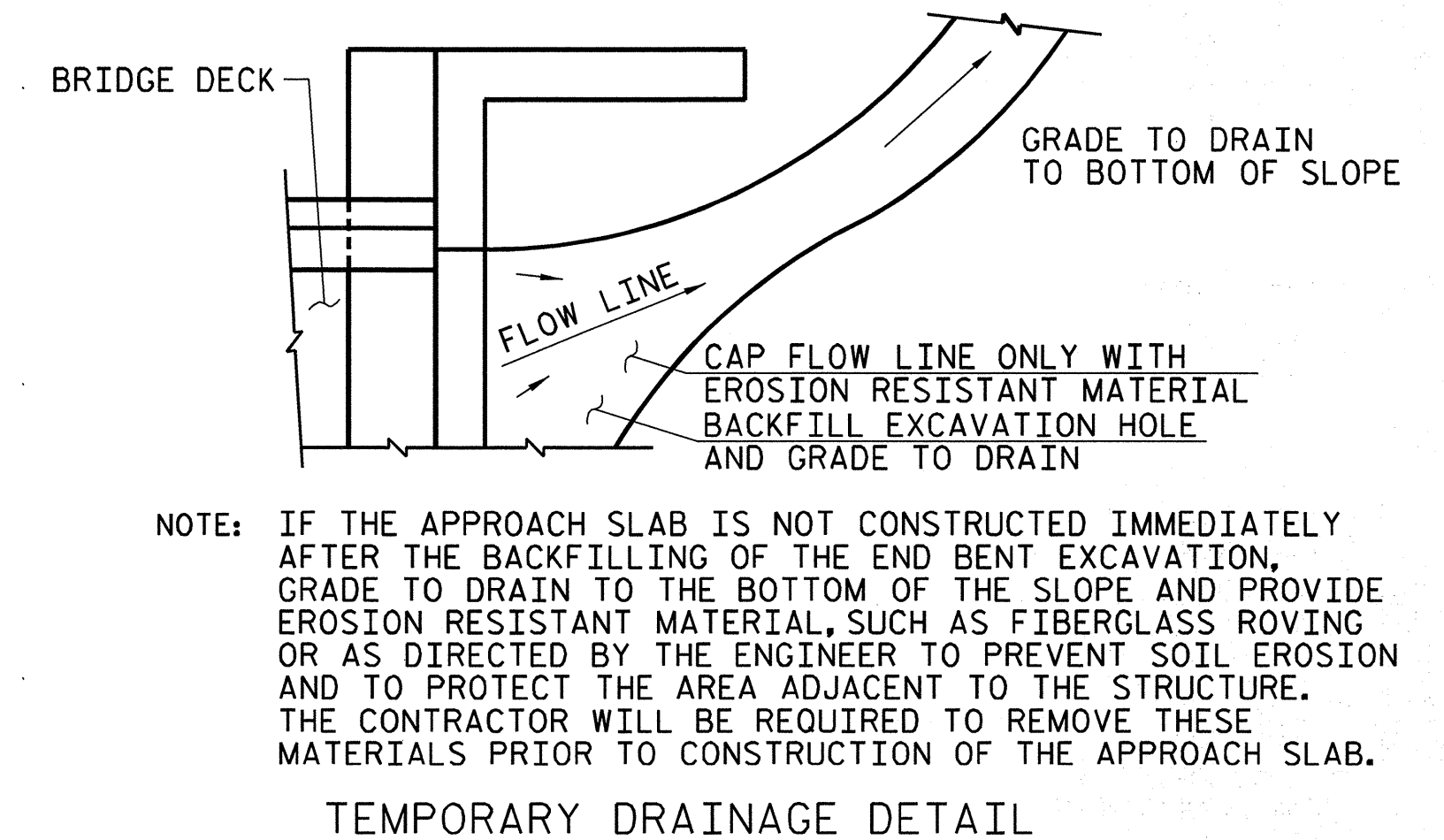
ASSEMBLED BY: S. KAPLAN DATE: 7/11
 CHECKED BY: M. PAYNE DATE: 8/11
 DRAWN BY: LES 8/01
 CHECKED BY: RDR 8/01
 REV. 5/7/03R RWW/JTE
 REV. 5/1/06 TLA/GM



JOINT SEAL DETAILS @ END BENT
 (FOR METAL RAILS WITH CURB)

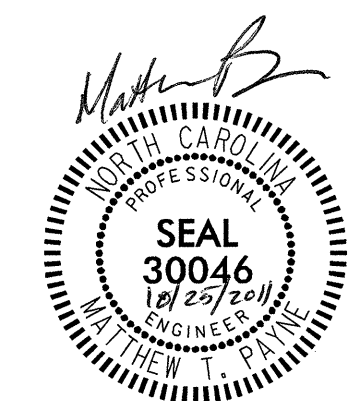


TEMPORARY BERM AND SLOPE DRAIN DETAILS
 (TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



PROJECT NO. U-5204
CALDWELL COUNTY
 STATION: 22+49.30 -Y1-

SHEET 3 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 DETAILS FOR FLEXIBLE
 PAVEMENT WITH BARRIER RAIL



THE LOUIS BERGER GROUP, Inc.
 1001 Wade Avenue, Suite 400
 Raleigh, NC 27605-3322

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-24
1			3			TOTAL SHEETS
2			4			48

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 10/25/2011 8:27:46 AM 1072.PDF_full.pltcfgr 1052_str.tbl

ASSEMBLED BY: S. KAPLAN	DATE: 7/11
CHECKED BY: M. PAYNE	DATE: 7/11
DRAWN BY: LES 8/01	REV. 5/7/03R RWW/JTE
CHECKED BY: RDR 8/01	REV. 5/1/06 TLA/GM

