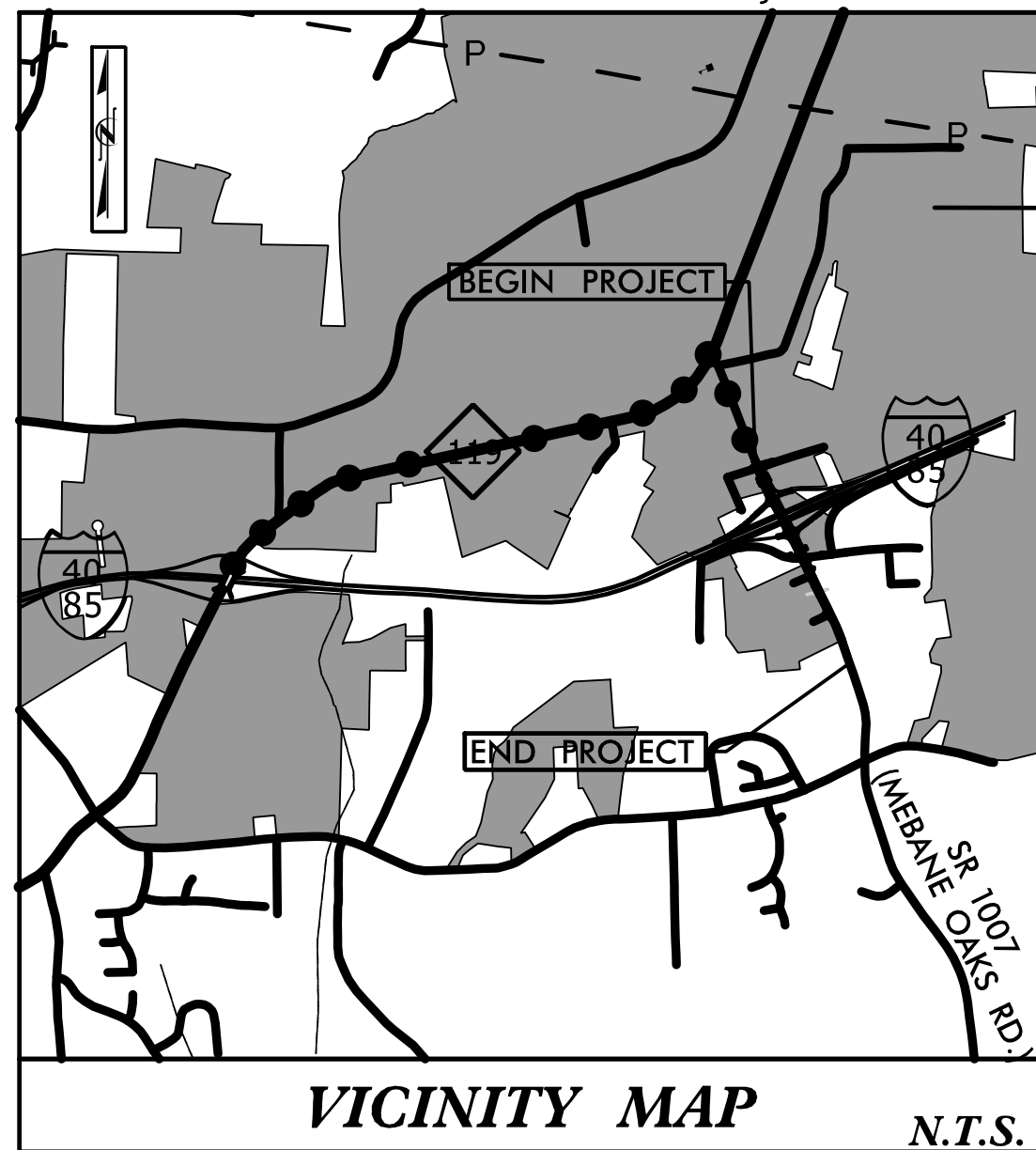


09/08/19

See Sheet 1-A for Index of Sheets  
See Sheet 1-B for Conventional Symbols



**TIP PROJECT: I-5711**

**CONTRACT: C204352**

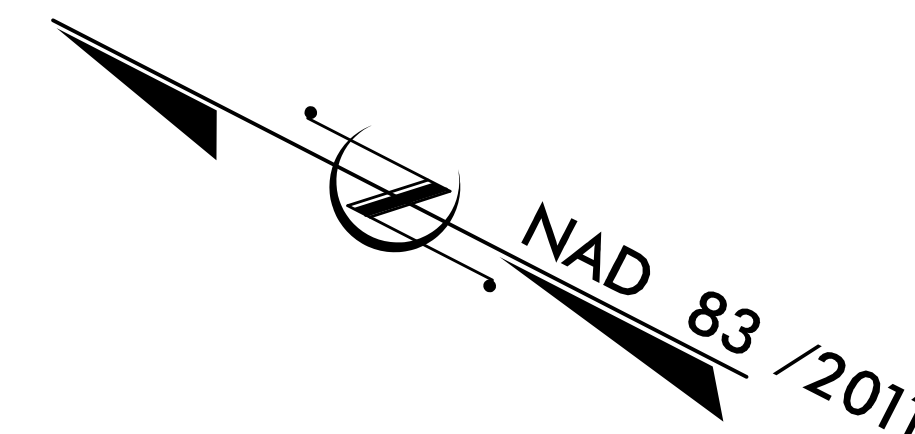
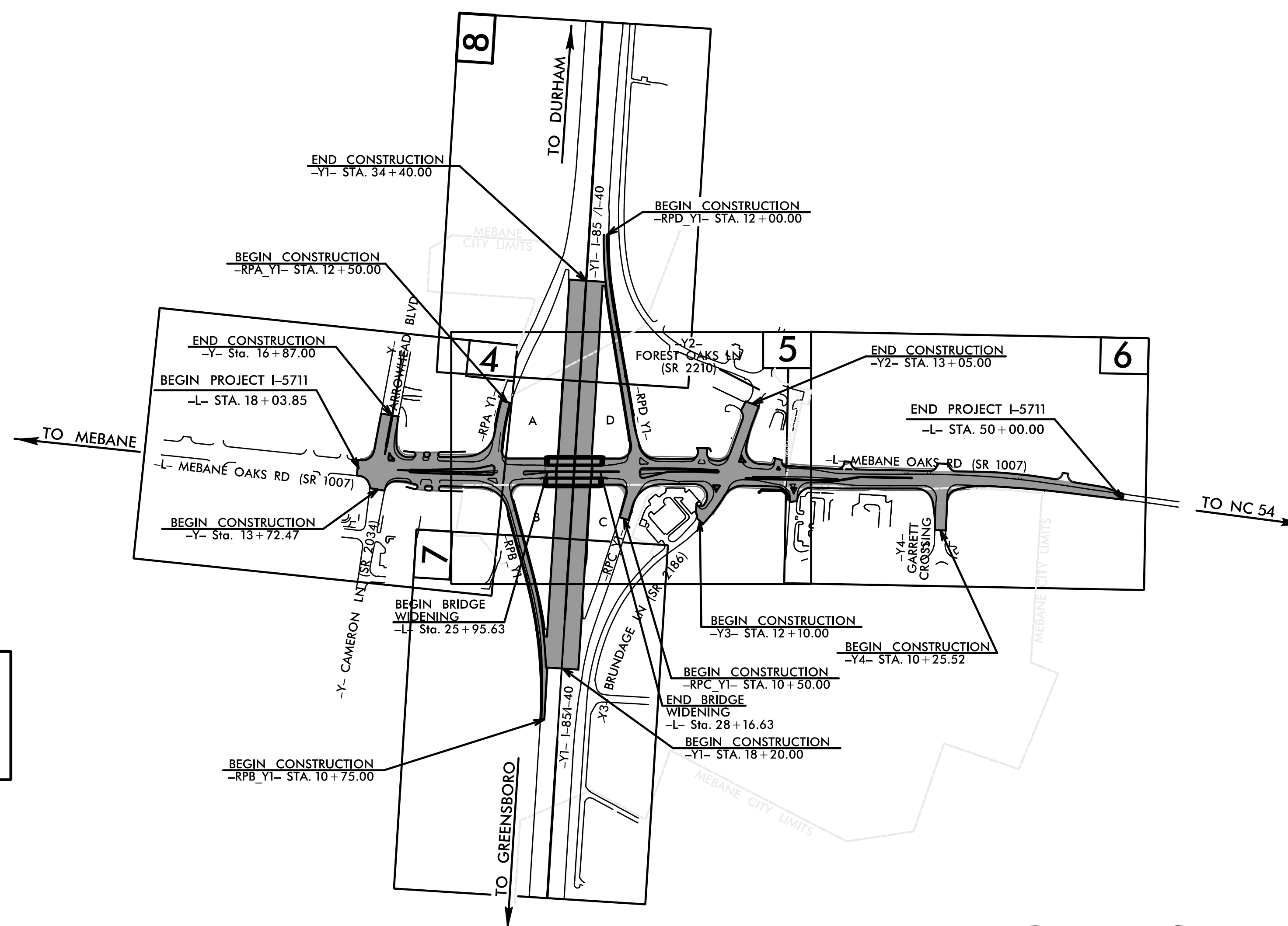
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**ALAMANCE COUNTY**

**LOCATION: INTERCHANGE IMPROVEMENTS AT I-40I-85  
AND SR 1007 (MEBANE OAKS RD) IN MEBANE**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE, SIGNALS AND PAVEMENT MARKINGS**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5711	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
50401.1.FS1	NHPP-040-4(161)220	PE	
50401.2.1	NHPP-040-4(161)220	RW, UTIL	
50401.3.GV1	NHPP-040-4(161)220	CONST.	

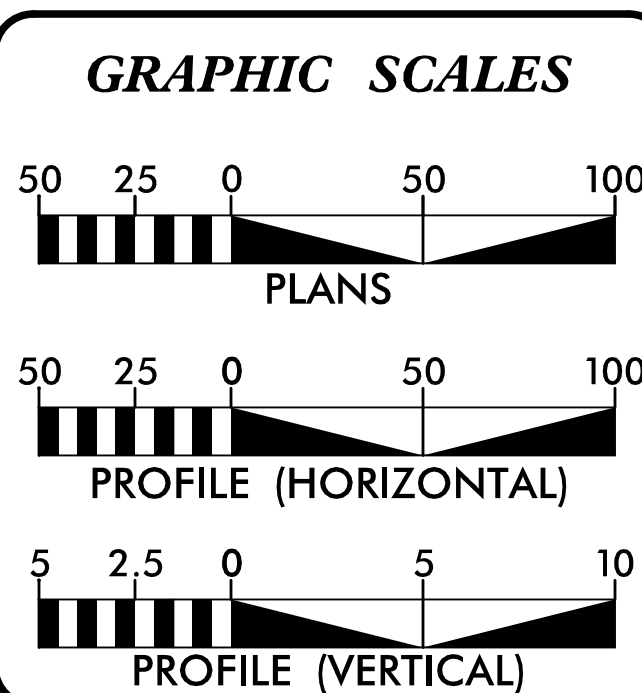


**THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGE**

**STRUCTURE**



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UNLESS ALL SIGNATURES COMPLETED



**DESIGN DATA**

ADT 2020 =	26,620
ADT 2040 =	30,200
K =	8 %
D =	55 %
T =	3 % *
V =	40 MPH
* TTST =	1 DUAL 2
FUNC CLASS =	MAJOR COLLECTOR
STATEWIDE TIER	

**PROJECT LENGTH**

<b>LENGTH ROADWAY PROJECT</b>	-	<b>0.563 mi</b>
<b>LENGTH BRIDGE PROJECT</b>	-	<b>0.042 mi</b>
<b>TOTAL LENGTH PROJECT</b>	-	<b>0.605 mi</b>

Prepared in the Office of:

**LOCHNER**  
H. W. LOCHNER, INC.  
2840 PLAZA PLACE, SUITE 202  
RALEIGH, NC 27612  
(919)257-7111

**vhb**  
VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

2018 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
SEPT. 28, 2018

**LETTING DATE:**  
MARCH 17, 2020

**BRIAN K. EASON, PE**  
PROJECT ENGINEER

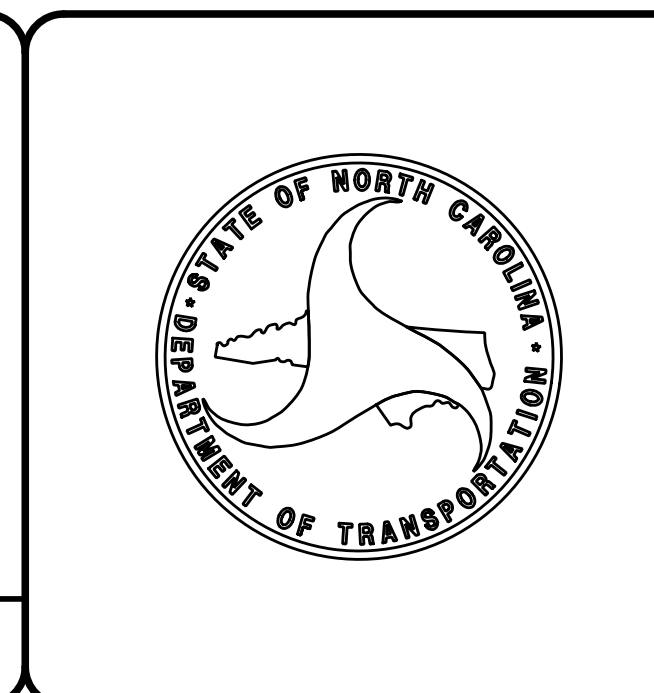
**RODNEY KNIGHT**  
PROJECT DESIGN ENGINEER

**LAURA SUTTON, PE**  
NCDOT CONTACT

**ENGINEER**

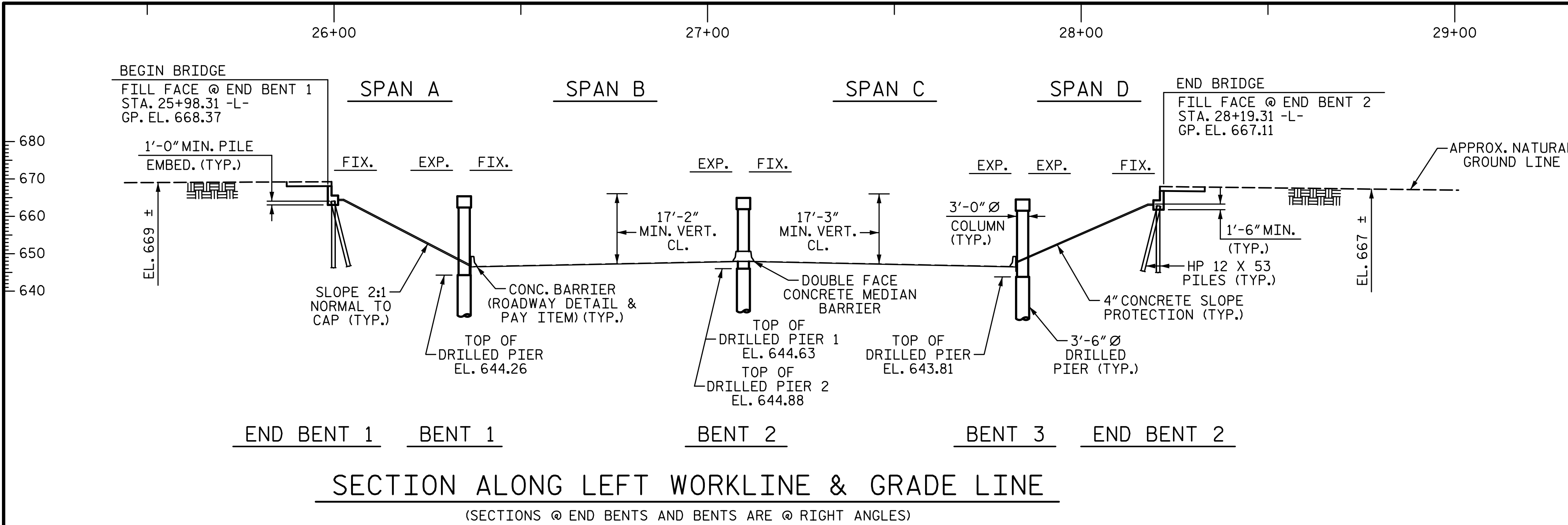
1/14/2020

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SEMPSON  
ENGINEERS  
& ASSOCIATES  
**SEA**





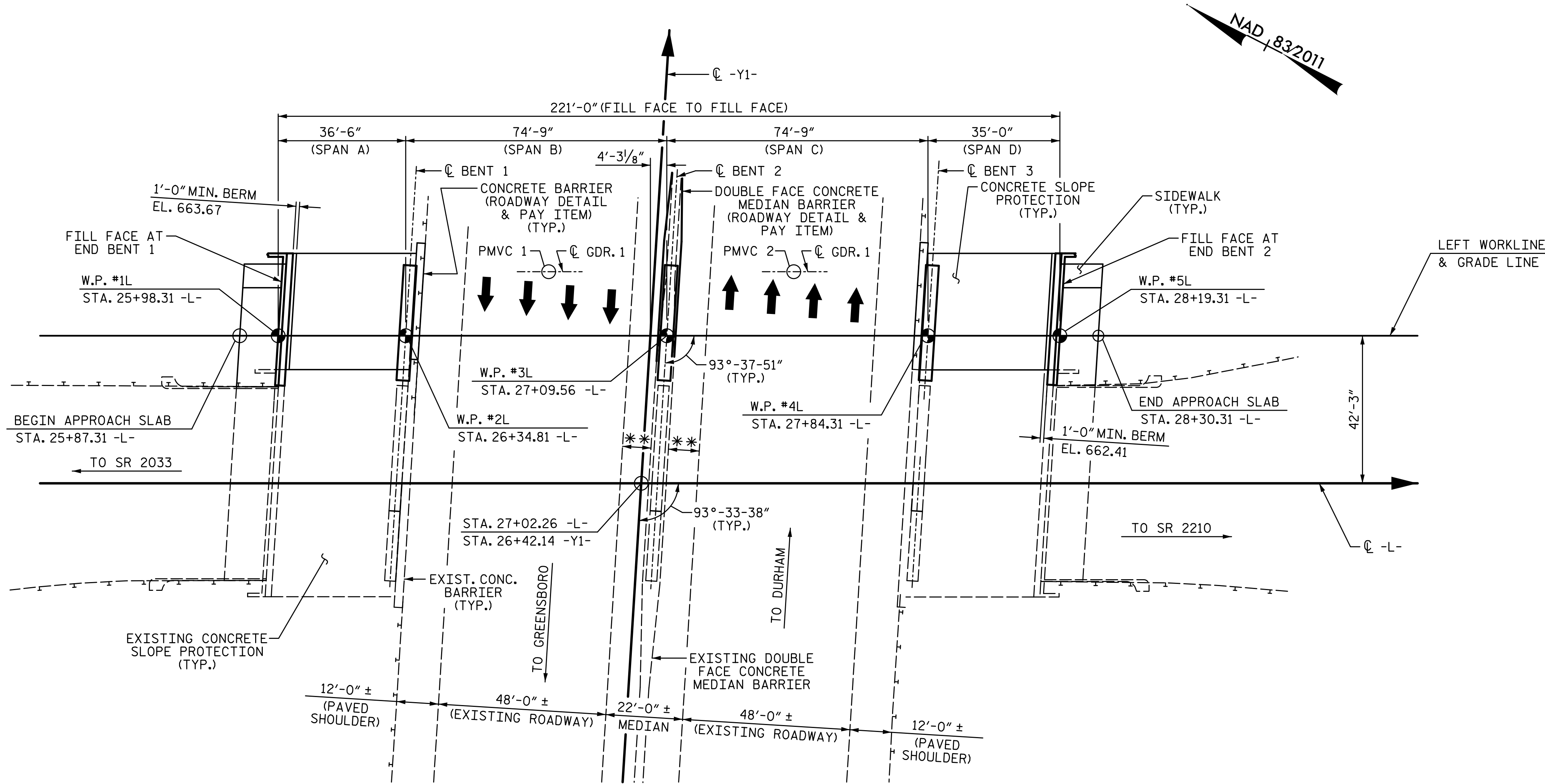
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PVI STA. 26+83.15 -L-  
EL. = 668.74  
VC = 160'

**\* LEFT GRADE DATA**  
(LEFT WORKLINE)  
(42'-3" LEFT OF C SURVEY -L-)

\* LEFT GRADE DATA SHOWN HAS BEEN DEVELOPED FOR THE PURPOSE OF MATCHING PROPOSED STRUCTURE TO EXISTING STRUCTURE AND CONSTRUCTION OF PROPOSED BRIDGE AND APPROACH SLABS. THE GRADE DATA SHOWN IS ONLY INTENDED FOR THE CONSTRUCTION OF PROPOSED STRUCTURE PORTIONS OF THIS PROJECT.

**SECTION ALONG LEFT WORKLINE & GRADE LINE**  
(SECTIONS @ END BENTS AND BENTS ARE @ RIGHT ANGLES)



**PLAN**

(PMVC = POINT OF MINIMUM VERTICAL CLEARANCE)  
(PROPOSED PILES AND DRILLED PIERS NOT SHOWN FOR CLARITY)  
(EXISTING PILES AND SPREAD FOOTINGS NOT SHOWN FOR CLARITY)

\*\* 8'-0" ± MINIMUM HORIZONTAL CLEARANCE FROM EDGE OF ROADWAY TO FACE OF BARRIER.

**PMVC 1**  
STA. 26+75.76 -L-  
OFFSET 60.58 FT. LT.  
EL. 647.23

**PMVC 2**  
STA. 27+45.90 -L-  
OFFSET 60.58 FT. RT.  
EL. 646.72

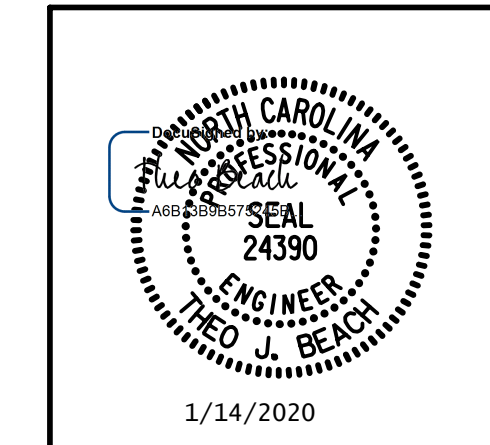
PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

SHEET 1 OF 4    WIDENING OF BRIDGE #177

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**GENERAL DRAWING**  
FOR BRIDGE ON MEBANE OAKS  
ROAD OVER I-40/I-85  
BETWEEN SR 2033 AND SR 2210  
**LEFT WIDENING**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			89

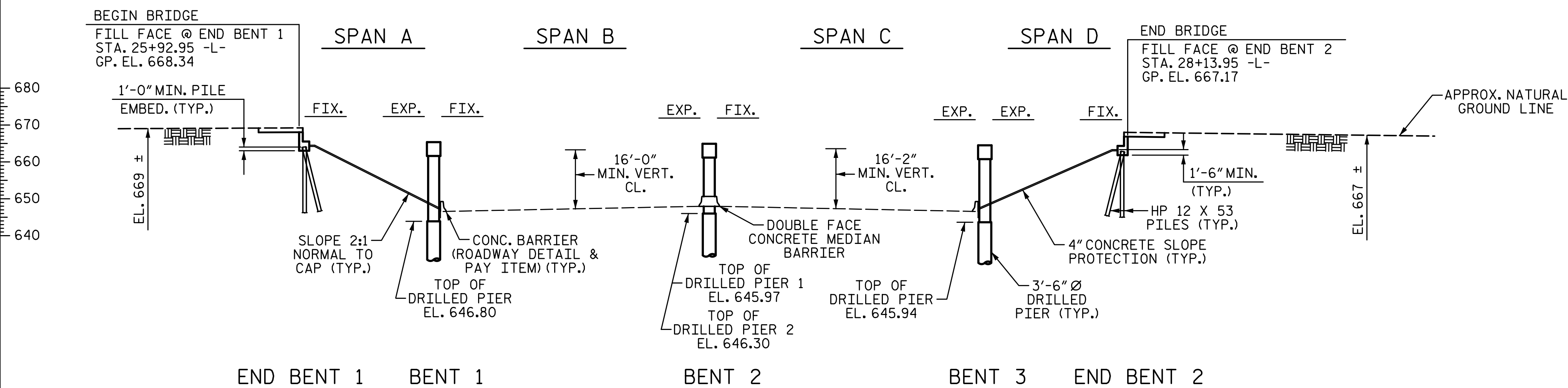
PLANS PREPARED BY:  
**SE & A**  
SIMPSON ENGINEERS & ASSOCIATES  
5640 Dillard Drive  
Suite 200  
Cary, NC 27518  
(919) 852-0468  
(919) 852-0598 (Fax)  
www.simpsonengr.com  
LICENSURE NO. C-2521



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DRAWN BY: S.D. COOPER    DATE: 1-20  
CHECKED BY: T. BEACH    DATE: 1-20  
DESIGN ENGINEER OF RECORD: T. BEACH    DATE: 1-20



### SECTION A LONG RIGHT WORKLINE & GRADE LINE

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



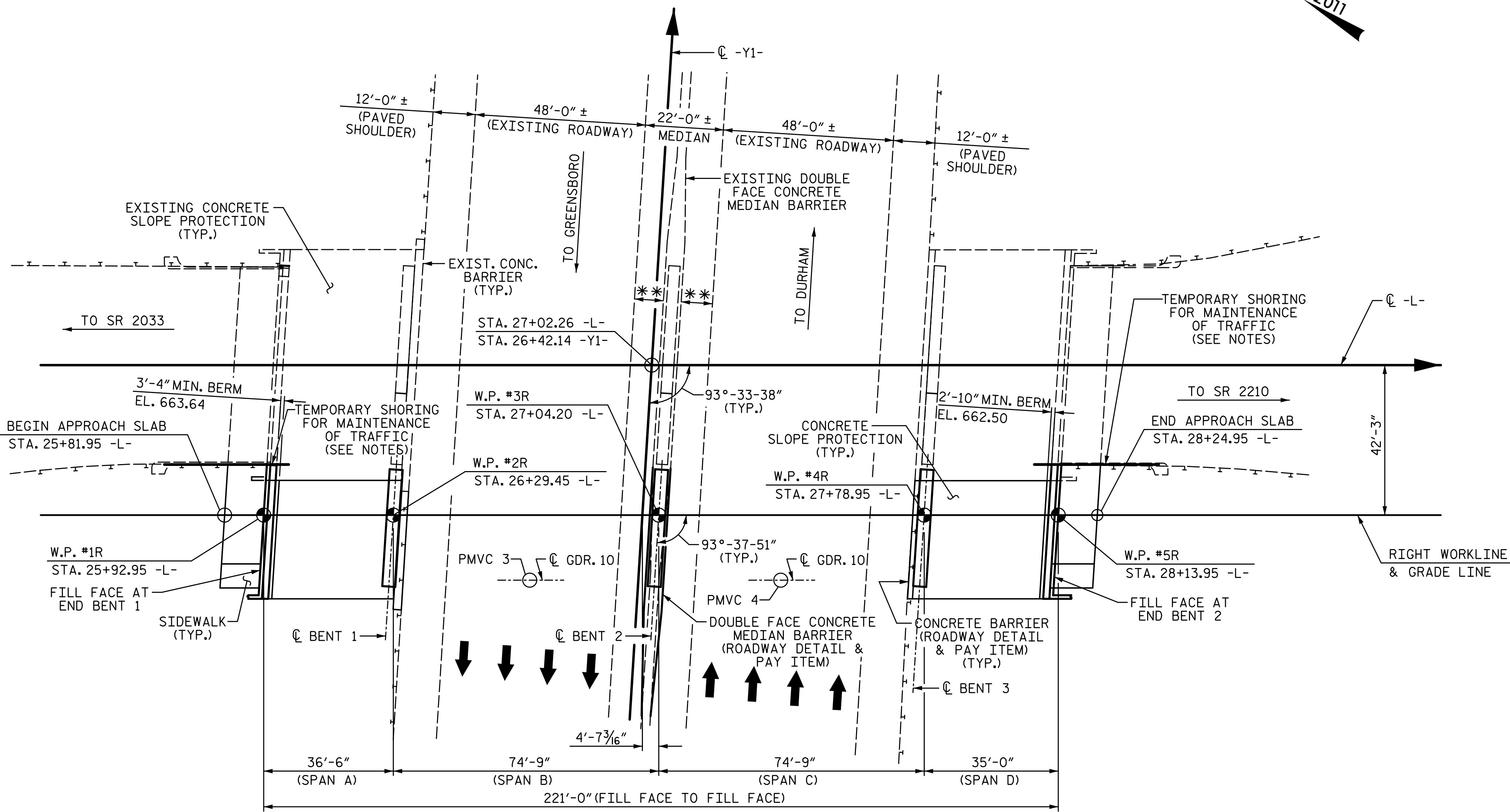
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PVI STA. 26+83.15 -L-  
EL. = 668.74  
VC = 160'

**\* RIGHT GRADE DATA**  
(RIGHT WORKLINE)  
(42'-3" RIGHT OF C SURVEY -L-)

\* RIGHT GRADE DATA SHOWN HAS BEEN DEVELOPED FOR THE PURPOSE OF MATCHING PROPOSED STRUCTURE TO EXISTING STRUCTURE AND CONSTRUCTION OF PROPOSED BRIDGE AND APPROACH SLABS. THE GRADE DATA SHOWN IS ONLY INTENDED FOR THE CONSTRUCTION OF PROPOSED STRUCTURE PORTIONS OF THIS PROJECT.

- PMVC 3**  
STA. 26+67.91 -L-  
OFFSET 60.58 FT. RT.  
EL. 648.95±
- PMVC 4**  
STA. 27+38.59 -L-  
OFFSET 60.58 FT. RT.  
EL. 648.42±



### PLAN

(PMVC = POINT OF MINIMUM VERTICAL CLEARANCE)  
(PROPOSED PILES AND DRILLED PIERS NOT SHOWN FOR CLARITY)  
(EXISTING PILES AND SPREAD FOOTINGS NOT SHOWN FOR CLARITY)

\*\* 8'-0" ± MINIMUM HORIZONTAL CLEARANCE FROM EDGE OF ROADWAY TO FACE OF BARRIER.

PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

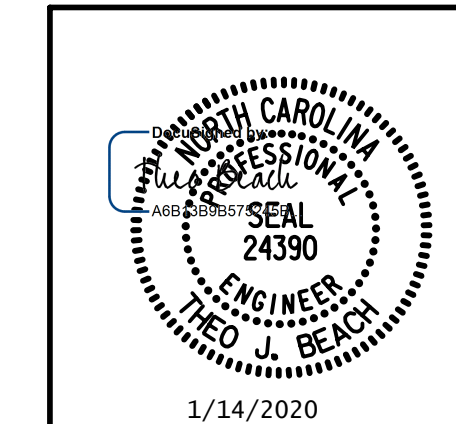
SHEET 2 OF 4    WIDENING OF BRIDGE #177

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**GENERAL DRAWING**

FOR BRIDGE ON MEBANE OAKS  
ROAD OVER I-40/I-85  
BETWEEN SR 2033 AND SR 2210

**RIGHT WIDENING**



PLANS PREPARED BY:  
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(919) 852-0598 (Fax)  
www.simpsonengr.com  
LICENSURE NO. C-2521

DRAWN BY: S.D. COOPER    DATE: 1-20  
CHECKED BY: T. BEACH    DATE: 1-20  
DESIGN ENGINEER OF RECORD: T. BEACH    DATE: 1-20

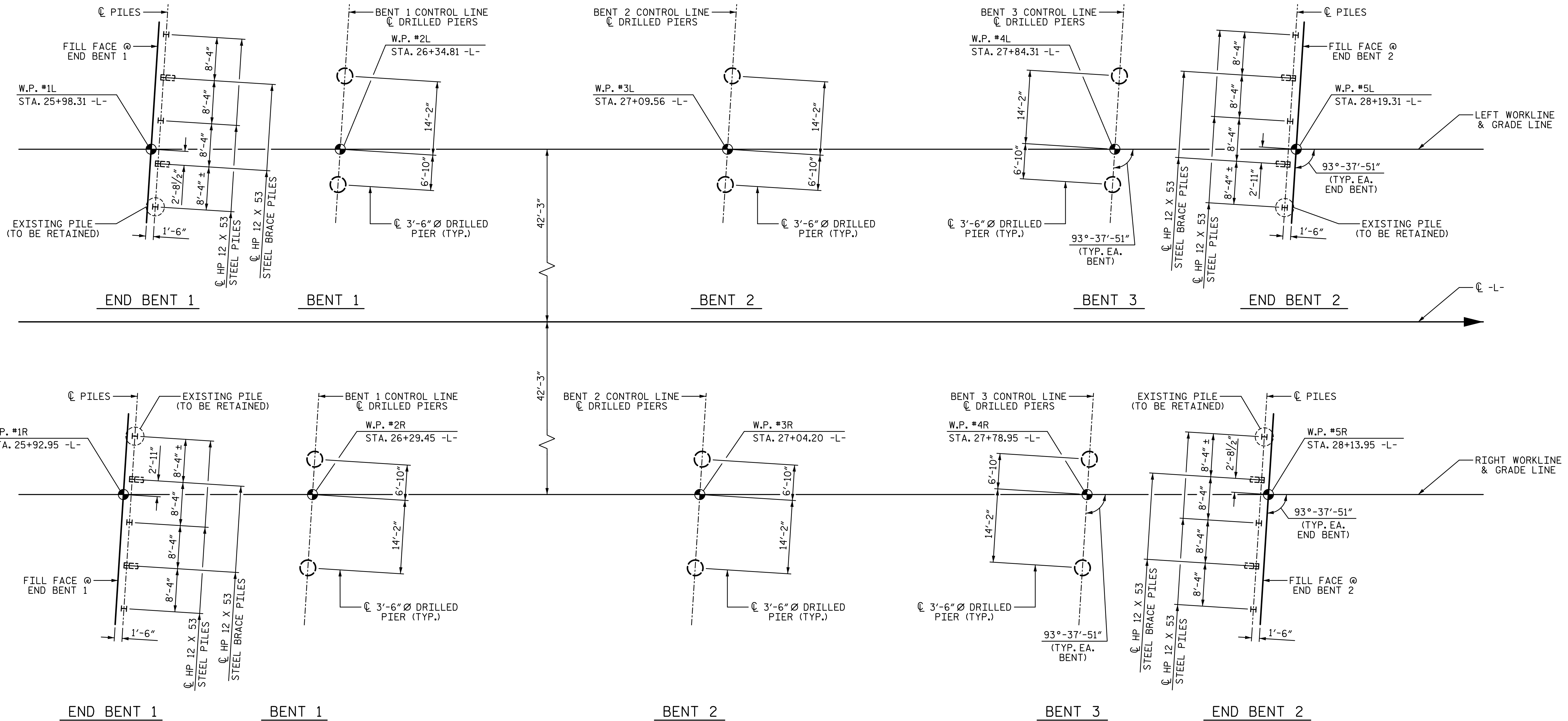
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			89

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### FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE TO THE PILE CENTERLINE AT THE BOTTOM OF THE END BENT CAP)

#### FOUNDATION NOTES:

- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 255 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 40 TSF.
- INSTALL DRILLED PIERS AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 623.7 FT LL, AND 631.2 FT RL AND WITH THE REQUIRED TIP RESISTANCE.
- DRILLED PIERS AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 360 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 40 TSF.
- INSTALL DRILLED PIERS AT BENT 2 TO A TIP ELEVATION NO HIGHER THAN 629.4 FT LL, AND 630.0 FT RL AND WITH THE REQUIRED TIP RESISTANCE.
- DRILLED PIERS AT BENT 3 ARE DESIGNED FOR A FACTORED RESISTANCE OF 255 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 40 TSF.

#### FOUNDATION NOTES (CONTINUED):

- INSTALL DRILL PIERS AT BENT 3 TO A TIP ELEVATION NO HIGHER THAN 632.3 FT LL, AND 631.9 FT RL AND WITH THE REQUIRED TIP RESISTANCE.
- SPT MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SPT. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 65 TONS PER PILE.

#### FOUNDATION NOTES (CONTINUED):

- DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 110 TONS PER PILE.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 65 TONS PER PILE.
- DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 110 TONS PER PILE.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 3 OF 4

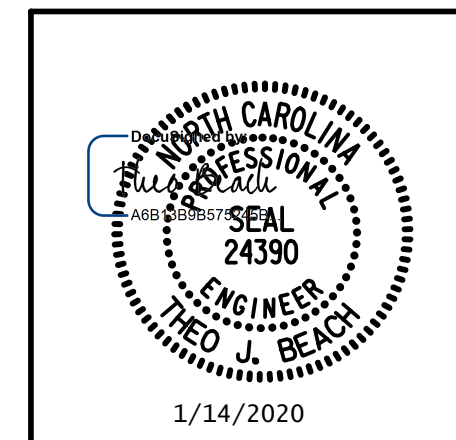
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

### GENERAL DRAWING

FOR BRIDGE ON MEBANE OAKS  
 ROAD OVER I40-85  
 BETWEEN SR 2033 AND SR 2210

PLANS PREPARED BY:

**S&E**  
 SIMPSON  
 ENGINEERS  
 & ASSOCIATES  
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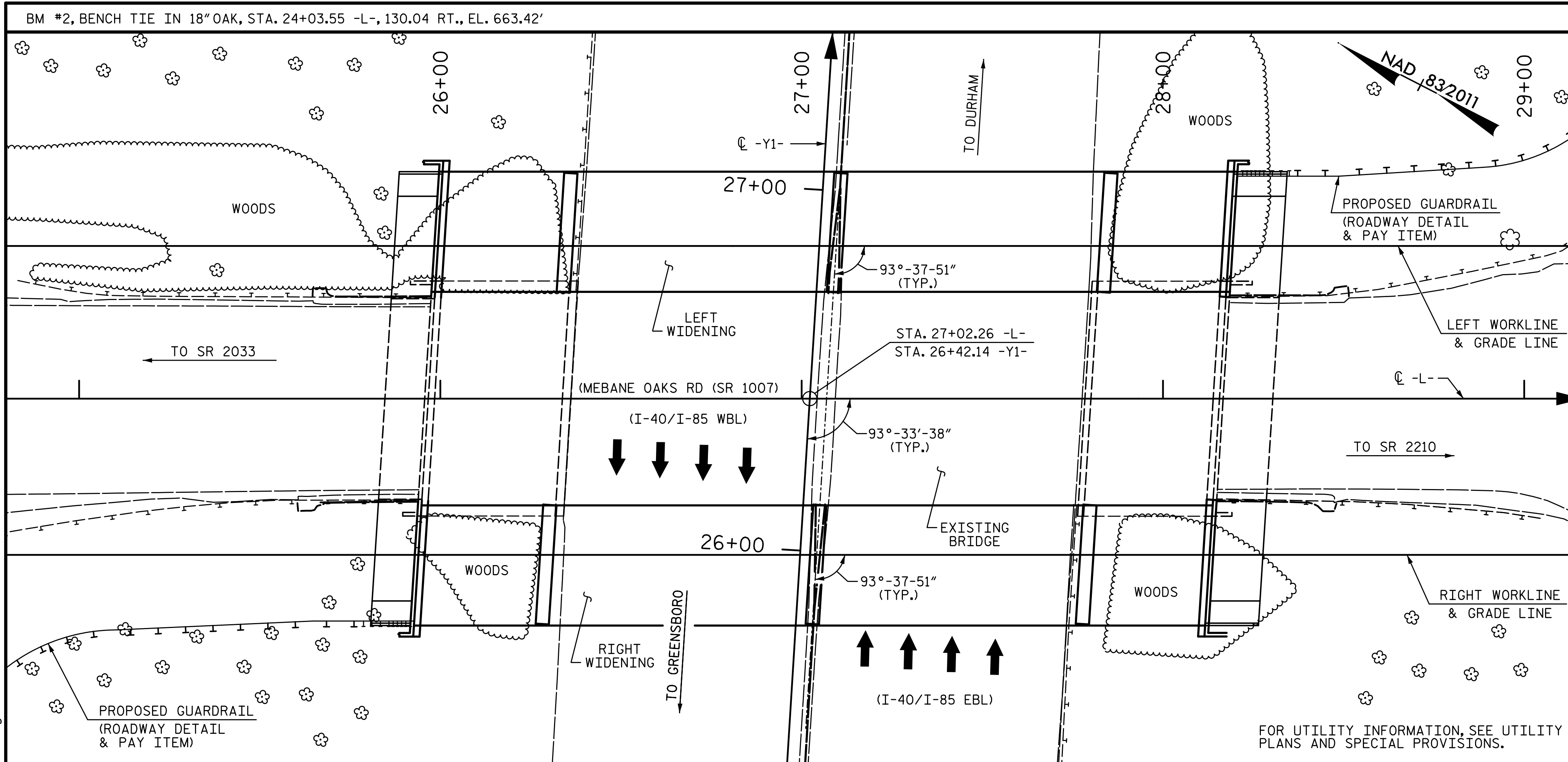
REVISIONS

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

SHEET NO.	S-3
TOTAL SHEETS	89

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LOCATION SKETCH

TOTAL BILL OF MATERIAL

	3'-6" DIA. DRILLED PIERS IN SOIL	3'-6" DIA. DRILLED PIERS NOT IN SOIL	SID INSPECTIONS	SPT TESTING	CSL TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	APPROX. 441,500 LBS STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP HP 12 X 53 STEEL PILES
	LF	LF	EA	EA	EA	SF	SF	CY	LS	LB	LB	LS	EA
SUPERSTRUCTURE						15,562	13,024		LS			LS	
END BENT 1								32.5		5,441			
BENT 1	38	36	1	2	1			55.5		13,045	2933		8
BENT 2	25	39	1	2	1			105.8		16,543	2267		
BENT 3	2	49	1	2	1			55.1		12,068	2430		
END BENT 2								32.3		5,439			8
TOTAL	65	124	3	6	3	15,562	13,024	281.2	LS	52,536	7630	LS	16

TOTAL BILL OF MATERIAL

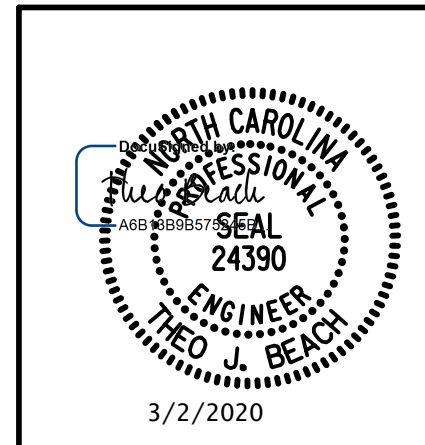
	HP 12x53 STEEL PILES	STEEL PILE POINTS	THREE BAR METAL RAIL	104" CHAIN LINK FENCE	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	ELECTRICAL CONDUIT SYSTEM FOR SIGNALS	POLYESTER POLYMER CONCRETE OVERLAY MATERIALS	PLACING AND FINISHING FOR POLYESTER POLYMER CONCRETE OVERLAY	SHOTBLASTING BRIDGE DECK
	NO.	LF	EA	LF	SY	LS	LS	LS	CY	SY	SY
SUPERSTRUCTURE				422.50	427.83	LS	LS	LS	21.4	770.0	770.0
END BENT 1	8	200	8		325						
BENT 1											
BENT 2											
BENT 3											
END BENT 2	8	160	8		310						
TOTAL	16	360	16	422.50	427.83	LS	LS	LS	21.4	770.0	770.0

SAMPLE BAR REPLACEMENT

SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

NOTE: SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND Fy = 60ksi.

PLANS PREPARED BY:  
**S&A** IMPSON ENGINEERS ASSOCIATES  
 5640 Dillard Drive  
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PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 4 OF 4  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON MEBANE OAKS ROAD OVER I-40/I-85 BETWEEN SR 2033 AND SR 2210

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS 89
2			4			

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NOTE: SEE SHEET S-76 FOR TOTAL BILL OF MATERIAL FOR PRESERVATION



**LOAD FACTORS:**

DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

**NOTES:**

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE II LIMIT STATES.  
 ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.  
 DISTANCE FROM LEFT END OF SPAN IS MEASURED FROM  $\bar{C}$  BEARING.  
 RATINGS INCLUDE GIRDERS FOR BOTH WIDENINGS AND THE EXISTING ROLLED BEAMS.

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS ( $\gamma_{LL}$ )	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 ( $\gamma_{LL}$ )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.38	--	1.75	0.650	<b>1.38</b>	B/C	ERT	37.4	0.767	1.76	B/C	ILT	0	1.30	0.620	1.59	B/C	IEXIST	37.4		
	HL-93 (OPERATING)	N/A		1.79	--	1.35	0.650	1.79	B/C	ERT	37.4	0.767	2.28	B/C	ILT	0	1.00	0.620	2.07	B/C	IEXIST	37.4		
	HS-20 (INVENTORY)	36.00	②	2.09	75.2	1.75	0.650	2.45	B/C	ERT	37.4	0.767	3.04	B/C	ILT	0	1.30	0.620	<b>2.09</b>	B/C	IEXIST	37.4		
	HS-20 (OPERATING)	36.00		3.18	114.5	1.35	0.650	3.18	B/C	ERT	37.4	0.767	3.94	B/C	ILT	0	1.00	0.620	2.72	B/C	IEXIST	37.4		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.75	64.1	1.40	0.650	5.56	B/C	ERT	37.4	0.767	7.35	B/C	ILT	0	1.30	0.620	4.75	B/C	IEXIST	37.4	
		SNGARBS2	20.000		3.53	70.6	1.40	0.650	4.13	B/C	ERT	37.4	0.767	5.19	B/C	ILT	0	1.30	0.620	3.53	B/C	IEXIST	37.4	
		SNAGRIS2	22.000		3.34	73.5	1.40	0.650	3.91	B/C	ERT	37.4	0.767	4.80	B/C	ILT	0	1.30	0.620	3.34	B/C	IEXIST	37.4	
		SNCOTTS3	27.250		2.36	64.3	1.40	0.650	2.77	B/C	ERT	37.4	0.767	3.67	B/C	ILT	0	1.30	0.620	2.36	B/C	IEXIST	37.4	
		SNAGGRS4	34.925		1.97	68.8	1.40	0.650	2.31	B/C	ERT	37.4	0.767	3.02	B/C	ILT	0	1.30	0.620	1.97	B/C	IEXIST	37.4	
		SNS5A	35.550		1.93	68.6	1.40	0.650	2.26	B/C	ERT	37.4	0.767	3.04	B/C	ILT	0	1.30	0.620	1.93	B/C	IEXIST	37.4	
		SNS6A	39.950		1.77	70.7	1.40	0.650	2.07	B/C	ERT	37.4	0.767	2.77	B/C	ILT	0	1.30	0.620	1.77	B/C	IEXIST	37.4	
	SNS7B	42.000		1.68	70.6	1.40	0.650	1.97	B/C	ERT	37.4	0.767	2.70	B/C	ILT	0	1.30	0.620	1.68	B/C	IEXIST	37.4		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.15	71.0	1.40	0.650	2.52	B/C	ERT	37.4	0.767	3.30	B/C	ILT	0	1.30	0.620	2.15	B/C	IEXIST	37.4	
		TNT4A	33.075		2.16	71.4	1.40	0.650	2.53	B/C	ERT	37.4	0.767	3.23	B/C	ILT	0	1.30	0.620	2.16	B/C	IEXIST	37.4	
		TNT6A	41.600		1.77	73.6	1.40	0.650	2.07	B/C	ERT	37.4	0.767	2.86	B/C	ILT	0	1.30	0.620	1.77	B/C	IEXIST	37.4	
		TNT7A	42.000		1.78	74.8	1.40	0.650	2.08	B/C	ERT	37.4	0.767	2.80	B/C	ILT	0	1.30	0.620	1.78	B/C	IEXIST	37.4	
		TNT7B	42.000		1.83	76.9	1.40	0.650	2.15	B/C	ERT	37.4	0.767	2.65	B/C	ILT	0	1.30	0.620	1.83	B/C	IEXIST	37.4	
		TNAGRIT4	43.000		1.75	75.3	1.40	0.650	2.04	B/C	ERT	37.4	0.767	2.57	B/C	ILT	0	1.30	0.620	1.75	B/C	IEXIST	37.4	
TNAGT5A		45.000		1.65	74.3	1.40	0.650	1.93	B/C	ERT	37.4	0.767	2.54	B/C	ILT	0	1.30	0.620	1.65	B/C	IEXIST	37.4		
TNAGT5B	45.000	③	1.63	73.4	1.40	0.650	1.91	B/C	ERT	37.4	0.767	2.44	B/C	ILT	0	1.30	0.620	<b>1.63</b>	B/C	IEXIST	37.4			
FATIGUE	HL-93 (INVENTORY)	$\gamma_{LL}=0.75$		3.05																				

③ CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

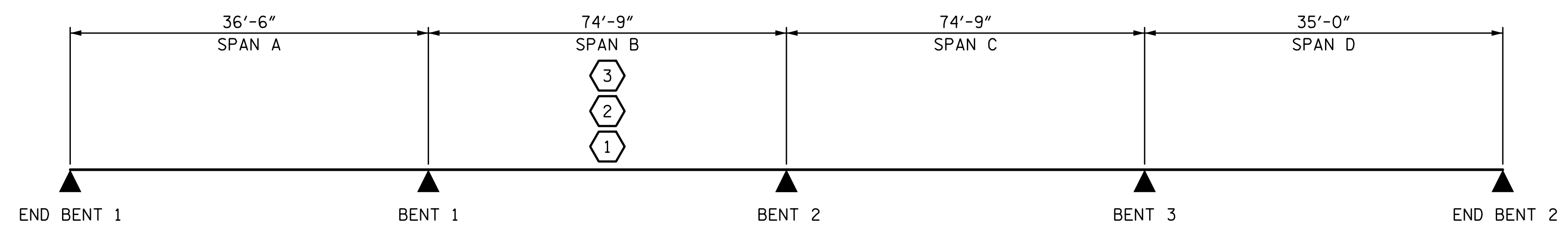
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

ERT - EXTERIOR GIRDER RT. WIDENING  
 ILT - INTERIOR GIRDER LT. WIDENING  
 IEXIST - EXISTING INTERIOR BEAM



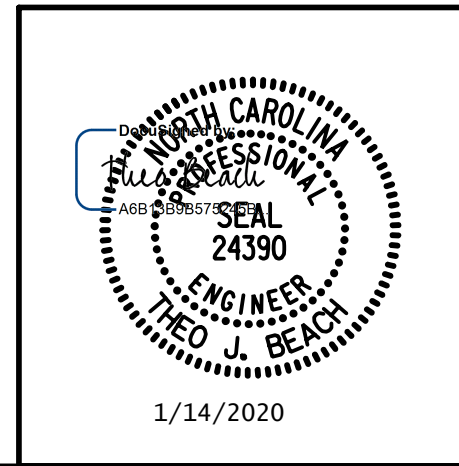
**LRFR SUMMARY**

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

1/14/2020 10:06:14 AM G:\Projects\2017\I-5711\Structures\Drawings\Final\401-I5711-SML\_LRFR\_000177.dgn

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 DESIGN ENGINEER OF RECORD: T. BEACH DATE: 1-20

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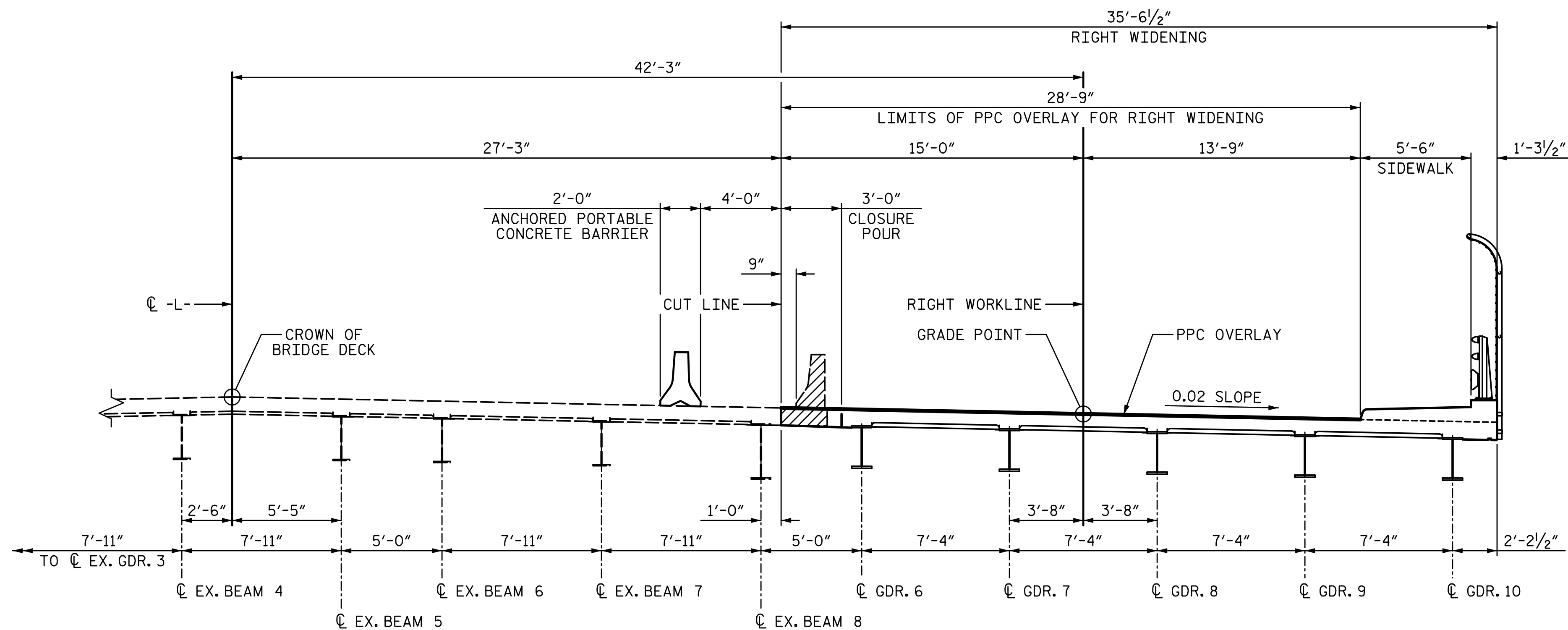
STATE OF NORTH CAROLINA  
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**LRFR SUMMARY FOR STEEL GIRDERS**  
 (NON-INTERSTATE TRAFFIC)

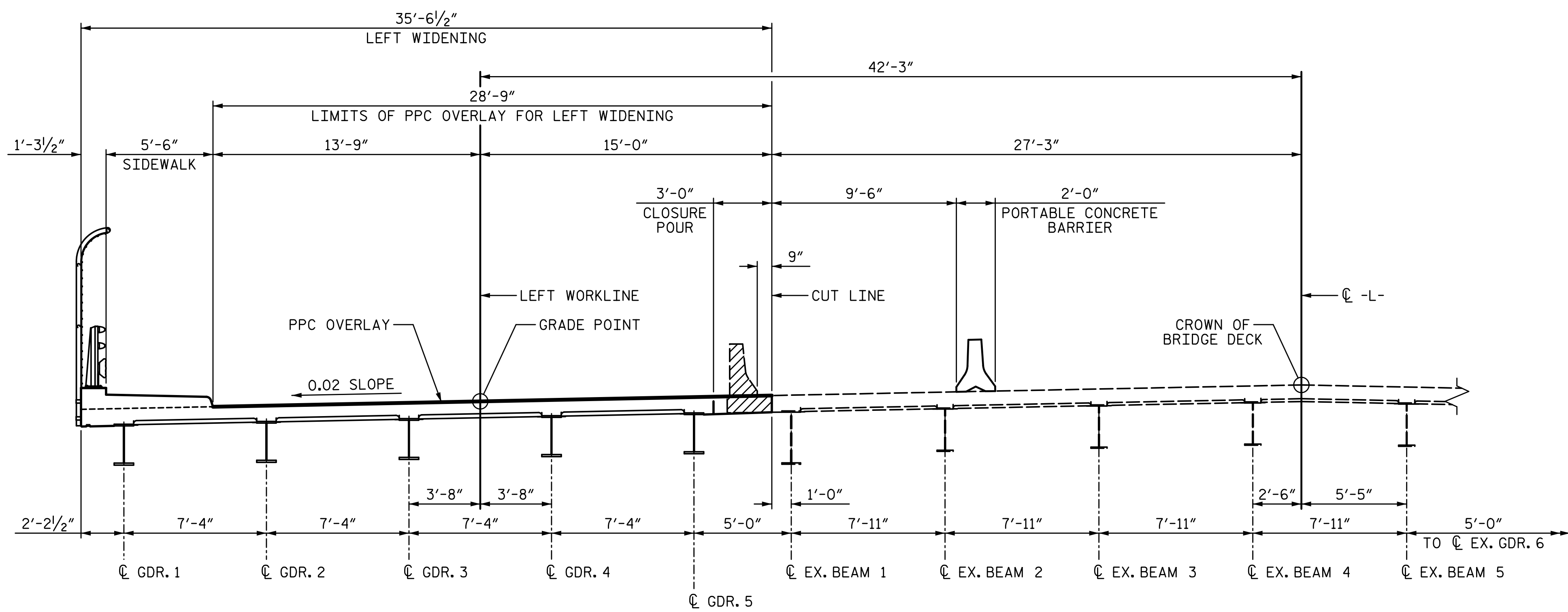
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1			3			TOTAL SHEETS
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**STAGE I CONSTRUCTION**  
 SEE TRAFFIC MANAGEMENT PLANS FOR LOCATION AND PAY LIMITS OF THE ANCHORED PORTABLE CONCRETE BARRIER.



**STAGE II CONSTRUCTION**  
 SEE TRAFFIC MANAGEMENT PLANS FOR LOCATION AND PAY LIMITS OF THE PORTABLE CONCRETE BARRIER.

**NOTES:**  
 FOR PHASING OF TRAFFIC DURING STAGE I AND II CONSTRUCTION SEQUENCE, SEE TRAFFIC MANAGEMENT PLANS.

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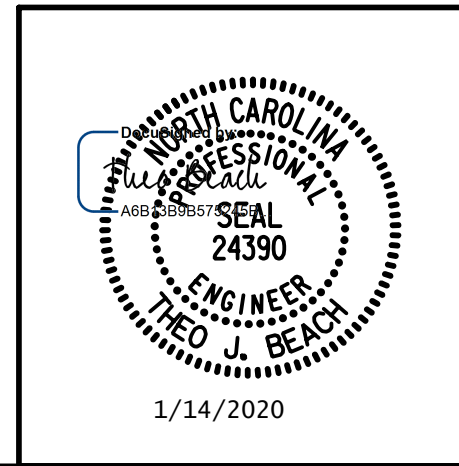
SHEET 1 OF 2

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**CONSTRUCTION SEQUENCE**

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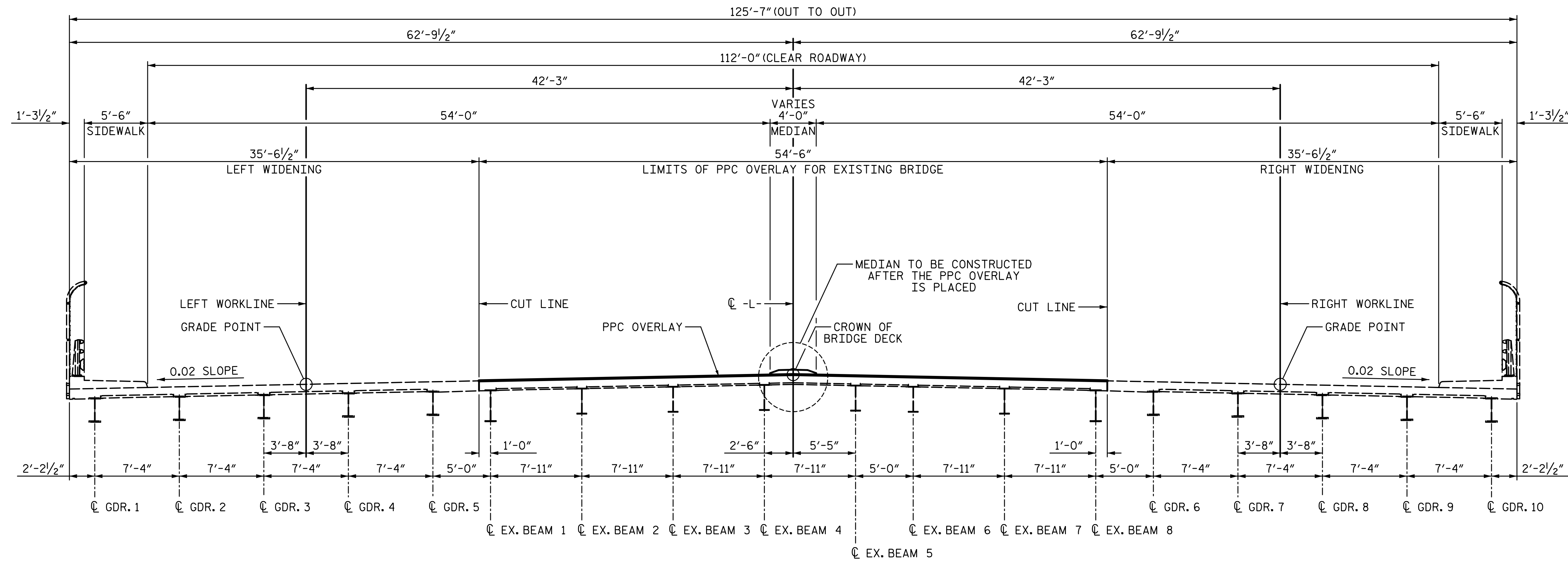
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**NOTES:**

FOR PHASING OF TRAFFIC DURING STAGE III CONSTRUCTION SEQUENCE, SEE TRAFFIC MANAGEMENT PLANS.



**STAGE III CONSTRUCTION**  
PRESERVATION OF EXISTING BRIDGE DECK, SEE PRESERVATION PLANS.

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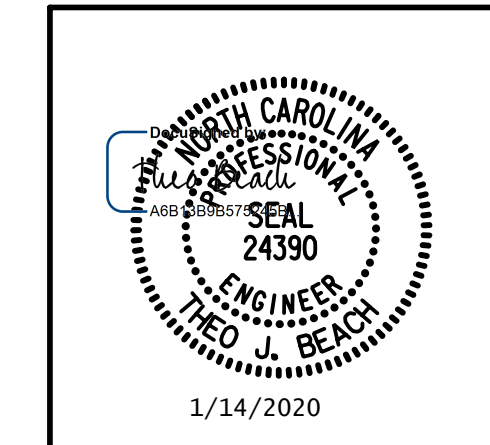
SHEET 2 OF 2

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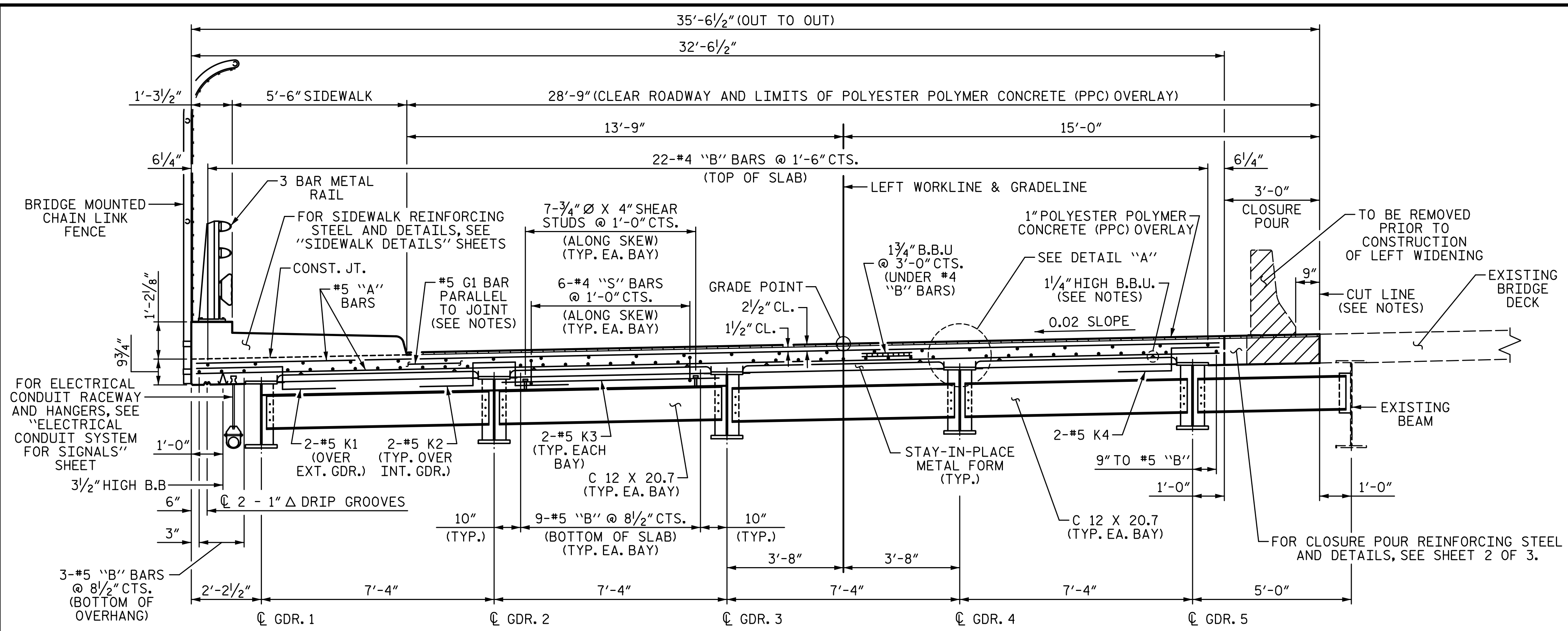


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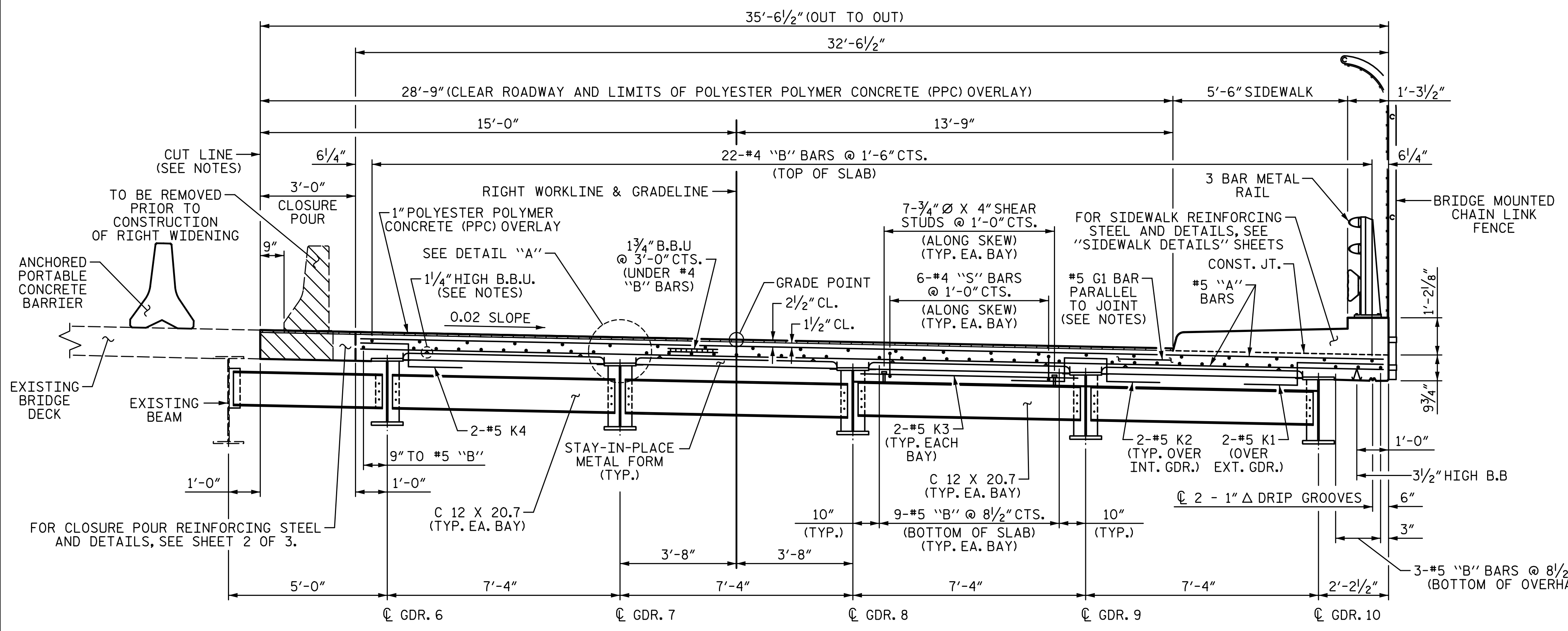




END BENT & BENT DIAPHRAGMS INTERMEDIATE DIAPHRAGMS

TYPICAL SECTION - LEFT WIDENING

(SPANS A & D LEFT WIDENING)



INTERMEDIATE DIAPHRAGMS END BENT & BENT DIAPHRAGMS

TYPICAL SECTION - RIGHT WIDENING

(SPANS A & D RIGHT WIDENING)

NOTES:

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

STAY-IN-PLACE METAL FORMS SHALL NOT BE WELDED TO GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.

END POSTS AND SIDEWALKS 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.

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE STAY-IN-PLACE METAL FORM WORKING DRAWINGS.

FOR BRIDGE MOUNTED CHAIN LINK FENCE DETAILS AND LOCATION, SEE "BRIDGE MOUNTED CHAIN LINK FENCE DETAILS" SHEETS.

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

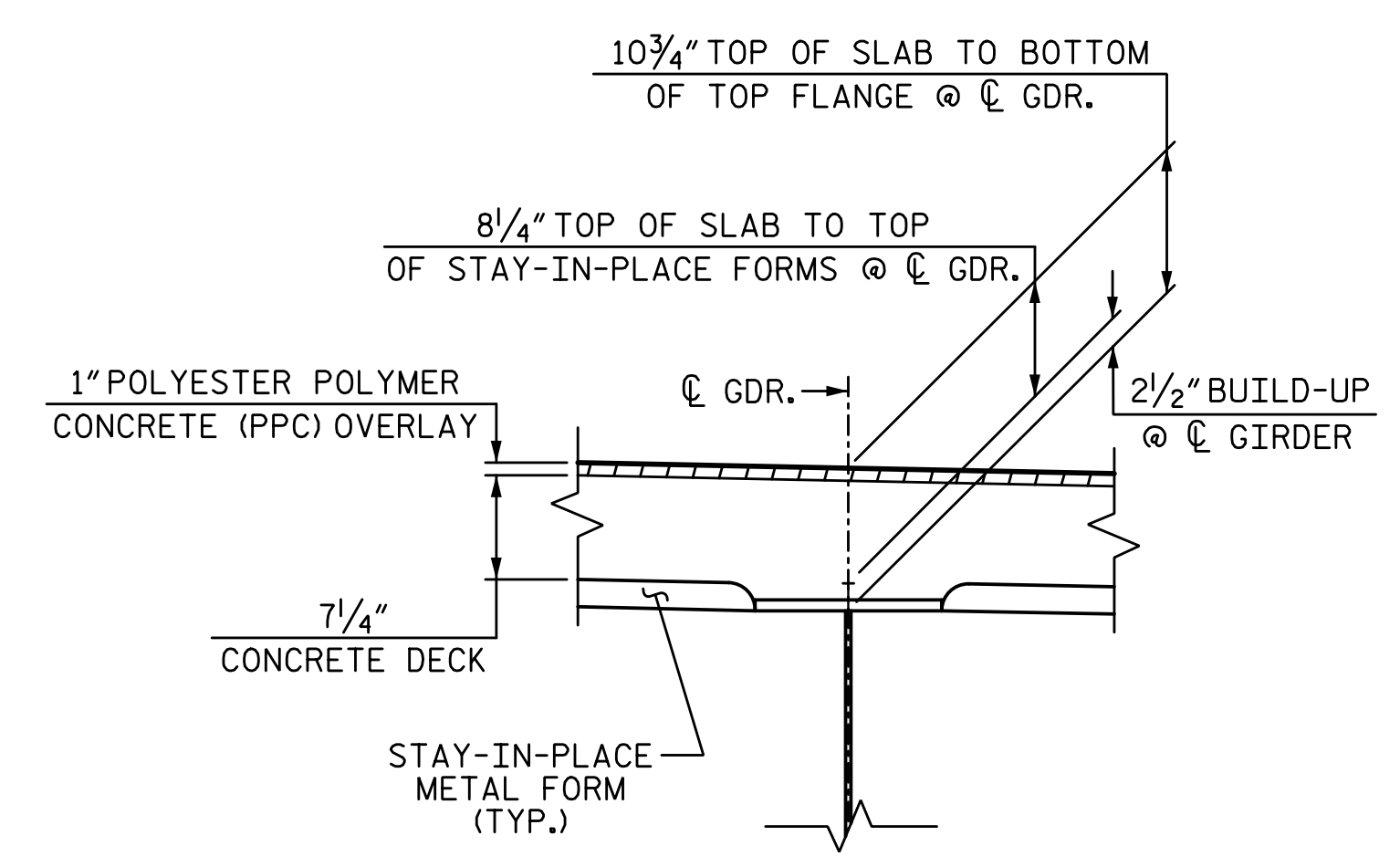
A FULL DEPTH SAW CUT SHALL BE MADE AND EXISTING CONCRETE REMOVED IN ACCORDANCE WITH PLAN DETAILS.

SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE ANCHORED PORTABLE CONCRETE BARRIER.

FOR OVERLAY SURFACE PREPARATION FOR POLYESTER POLYMER CONCRETE, SEE SPECIAL PROVISIONS.

FOR POLYESTER POLYMER CONCRETE BRIDGE DECK OVERLAY, SEE SPECIAL PROVISIONS.

THE TOTAL BRIDGE DECK THICKNESS IS 8 1/4" AND CONSISTS OF A 7 1/4" REINFORCED CONCRETE DECK AND A 1" POLYESTER POLYMER CONCRETE OVERLAY. THE REINFORCED CONCRETE DECK SHALL RECEIVE A BROOM FINISH THAT RUNS PERPENDICULAR TO THE DIRECTION OF TRAFFIC AND THE DECK SHALL BE SHOTBLASTED PRIOR TO OVERLAY. OVERLAY EACH WIDENING TO THE LIMITS OF THE PLANS AND MATCH THE DECK PROFILE OF THE EXISTING BRIDGE.



DETAIL "A"  
(TYP. EA. GIRDER)

PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

SHEET 1 OF 3

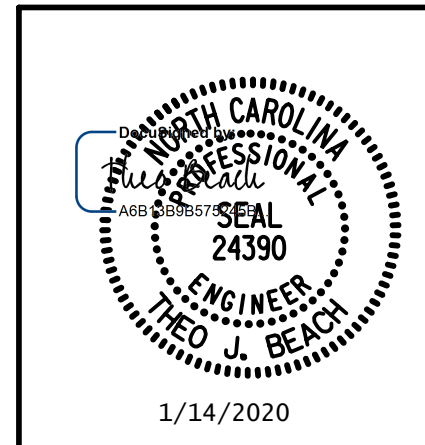
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SUPERSTRUCTURE

TYPICAL SECTION  
(SPANS A & D)

LEFT & RIGHT WIDENING

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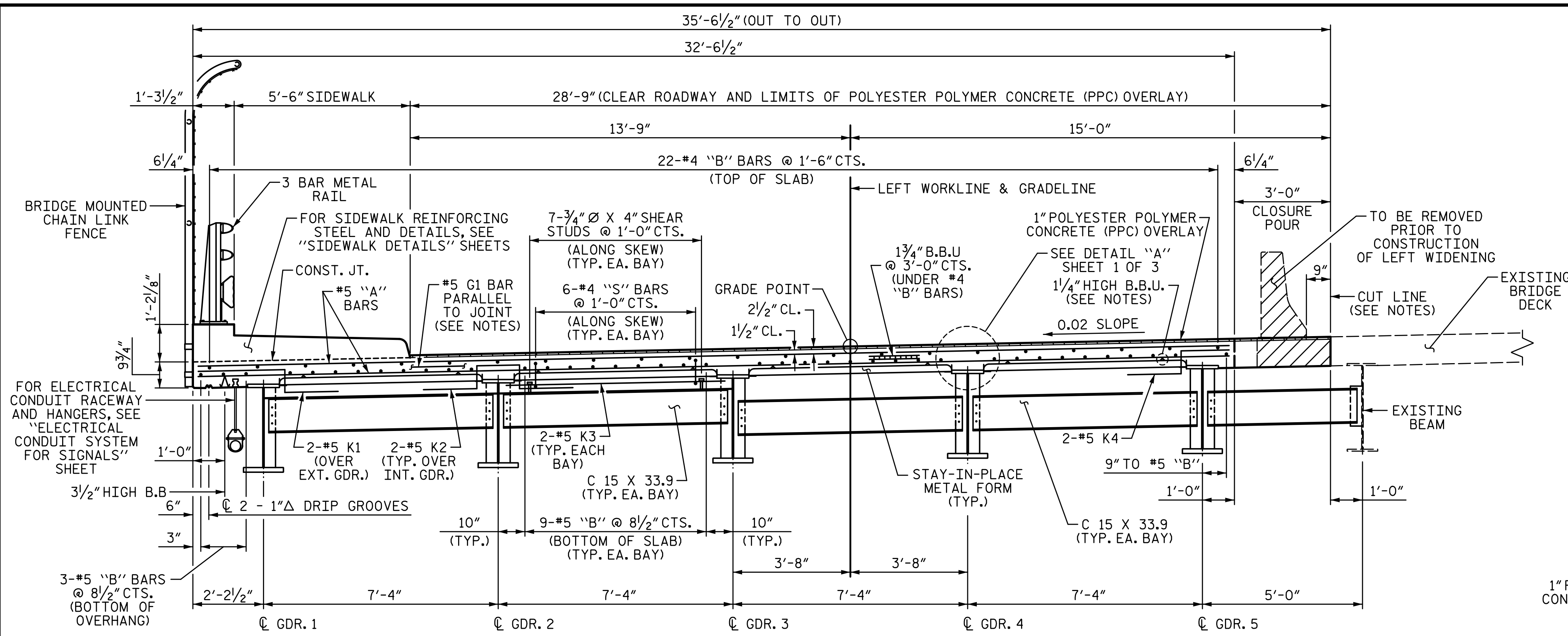


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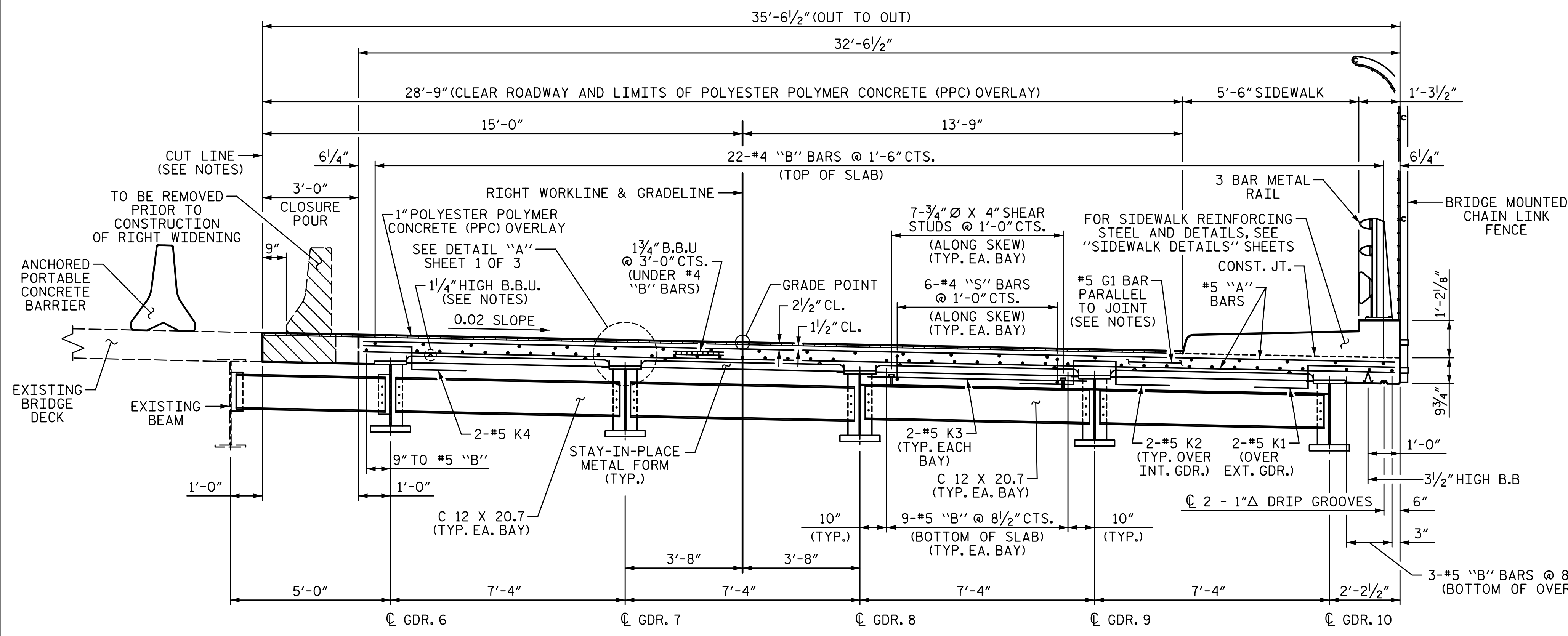
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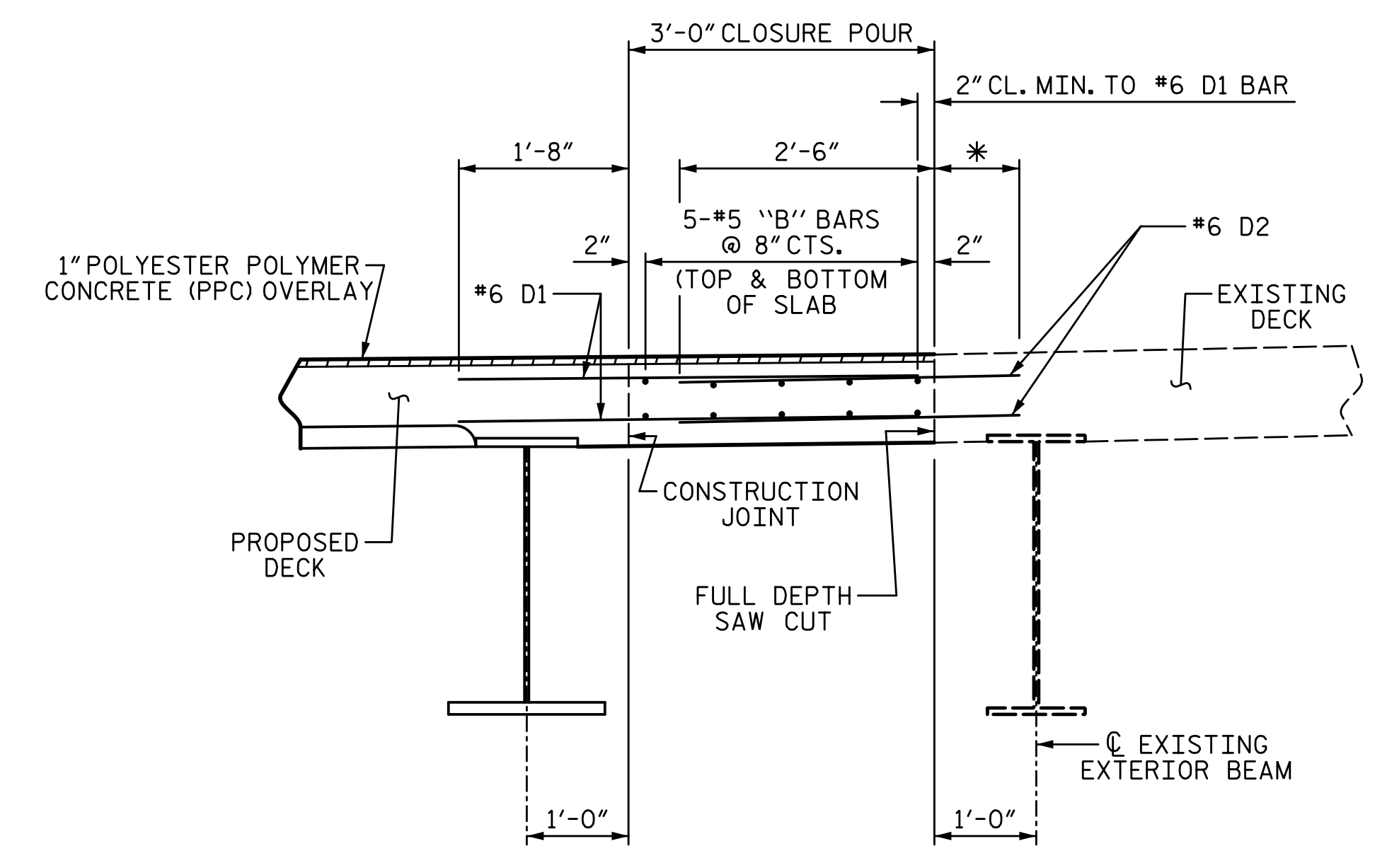


**BENT DIAPHRAGMS**      **INTERMEDIATE DIAPHRAGMS**  
**TYPICAL SECTION - LEFT WIDENING**  
 (SPANS B & C LEFT WIDENING)



**INTERMEDIATE DIAPHRAGMS**      **BENT DIAPHRAGMS**  
**TYPICAL SECTION - RIGHT WIDENING**  
 (SPANS B & C RIGHT WIDENING)

**NOTES:**  
 \* #6 D2 DOWELS PLACED IN THE EXISTING DECK SHALL BE INSTALLED USING AN ADHESIVE ANCHORING SYSTEM. LEVEL ONE FIELD TESTING IS REQUIRED AND THE YIELD LOAD OF THE DOWEL IS 13.2 KIPS. OVERALL LENGTH SHALL PROVIDE A 2'-6" MIN. EXTENSION INTO CLOSURE POUR. EMBEDMENT LENGTH TO BE DETERMINED BY THE MANUFACTURER OF THE ADHESIVELY ANCHORED ANCHOR SYSTEM. #6 D2 BAR LENGTH WAS BASED ON A 10" EMBEDMENT LENGTH. ADHESIVELY ANCHORED ANCHOR BOLT OR DOWEL TESTING SHALL BE IN ACCORDANCE WITH SECTION 420-13 OF THE STANDARD SPECIFICATIONS.  
 #6 D1 AND #6 D2 DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM SLAB REINFORCING STEEL.



**CLOSURE POUR**  
 (LEFT CLOSURE POUR SHOWN, RIGHT CLOSURE POUR SIMILAR)

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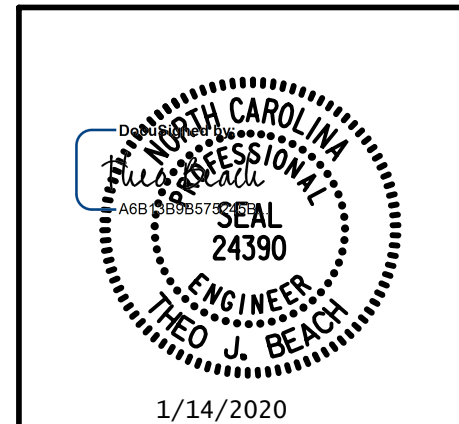
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ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
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**TYPICAL SECTION  
 (SPANS B & C)**

LEFT & RIGHT WIDENING



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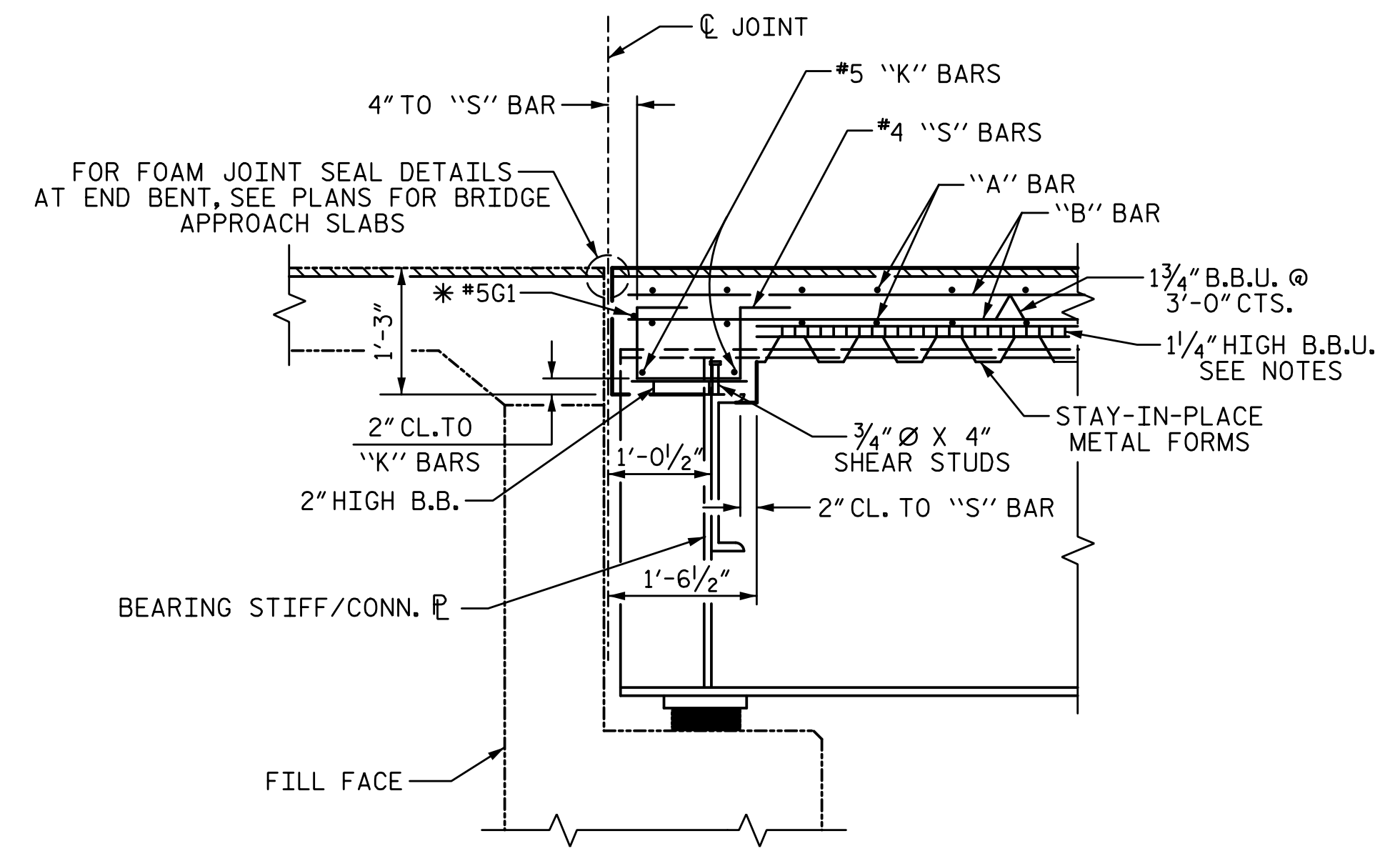
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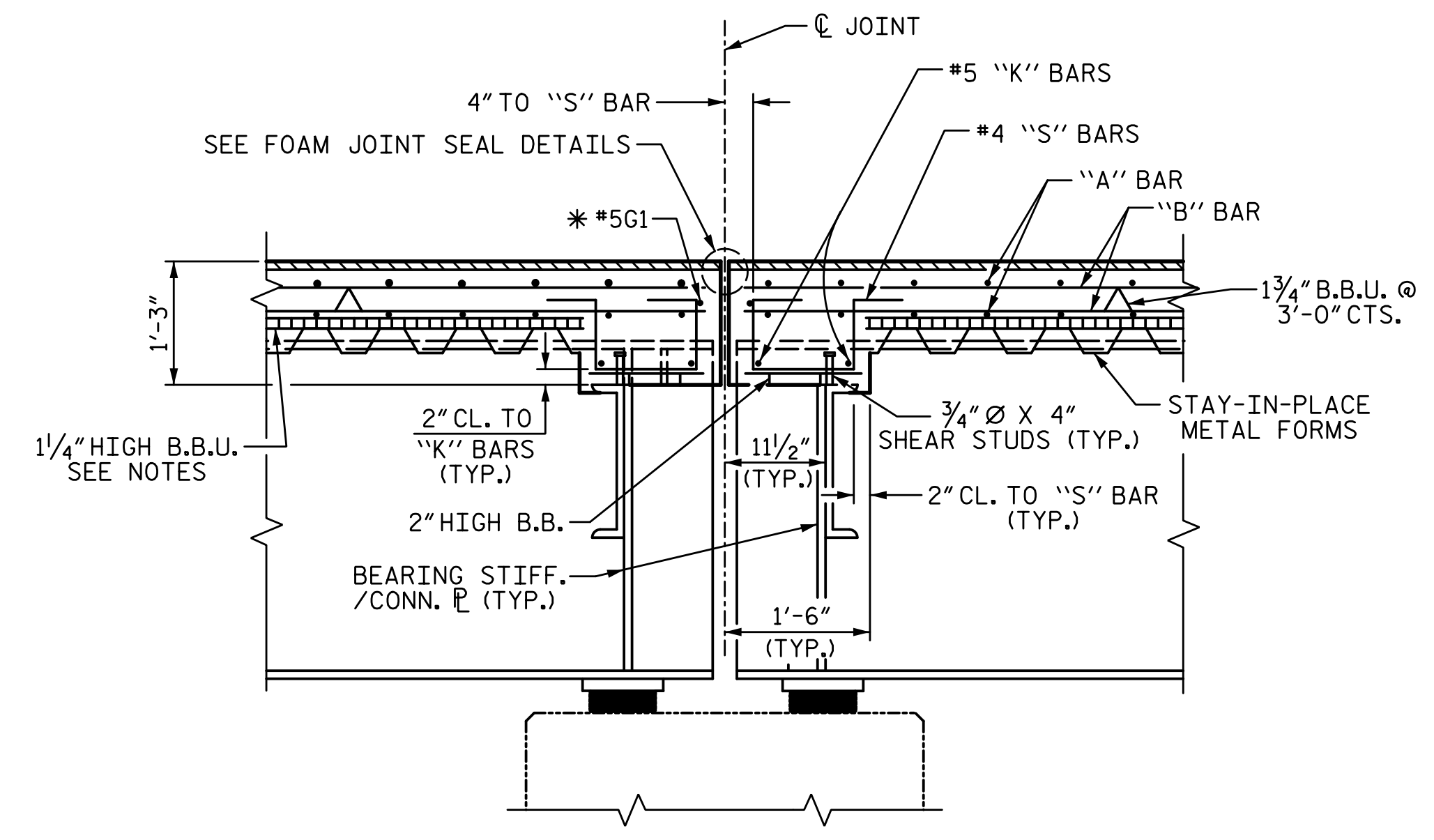
**NOTES:**

FOR FOAM JOINT SEAL DETAILS AT SIDEWALK SEE, "SIDEWALK DETAILS" SHEET 3 OF 3.  
 FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.  
 THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2" AT BENTS 1, 2 AND 3.



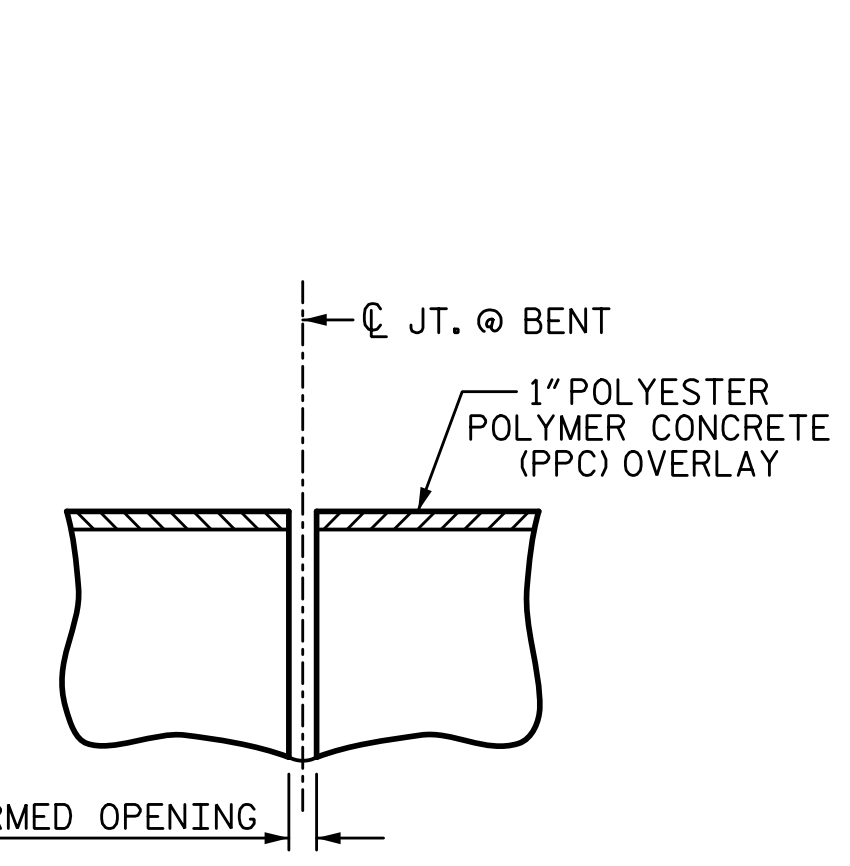
**SECTION THRU END BENT**

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

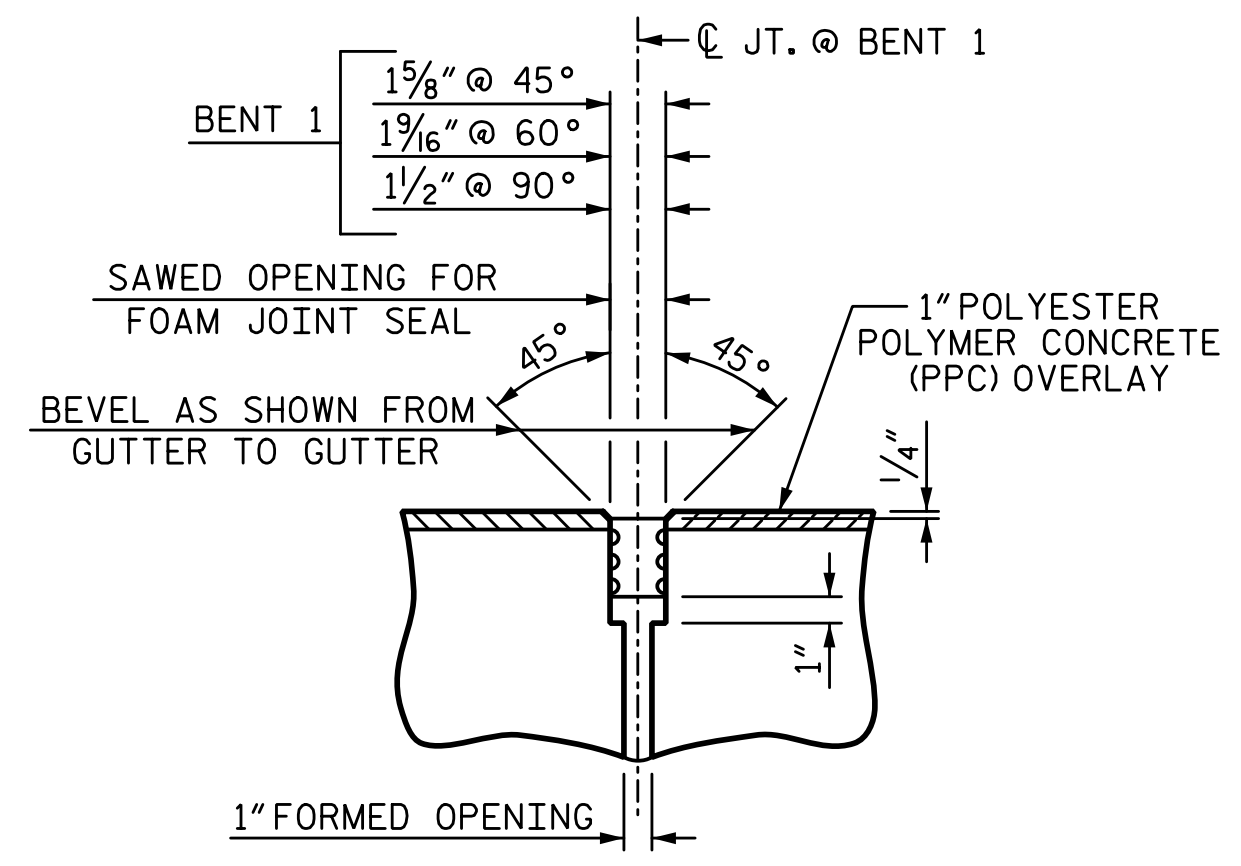


**SECTION THRU BENT**

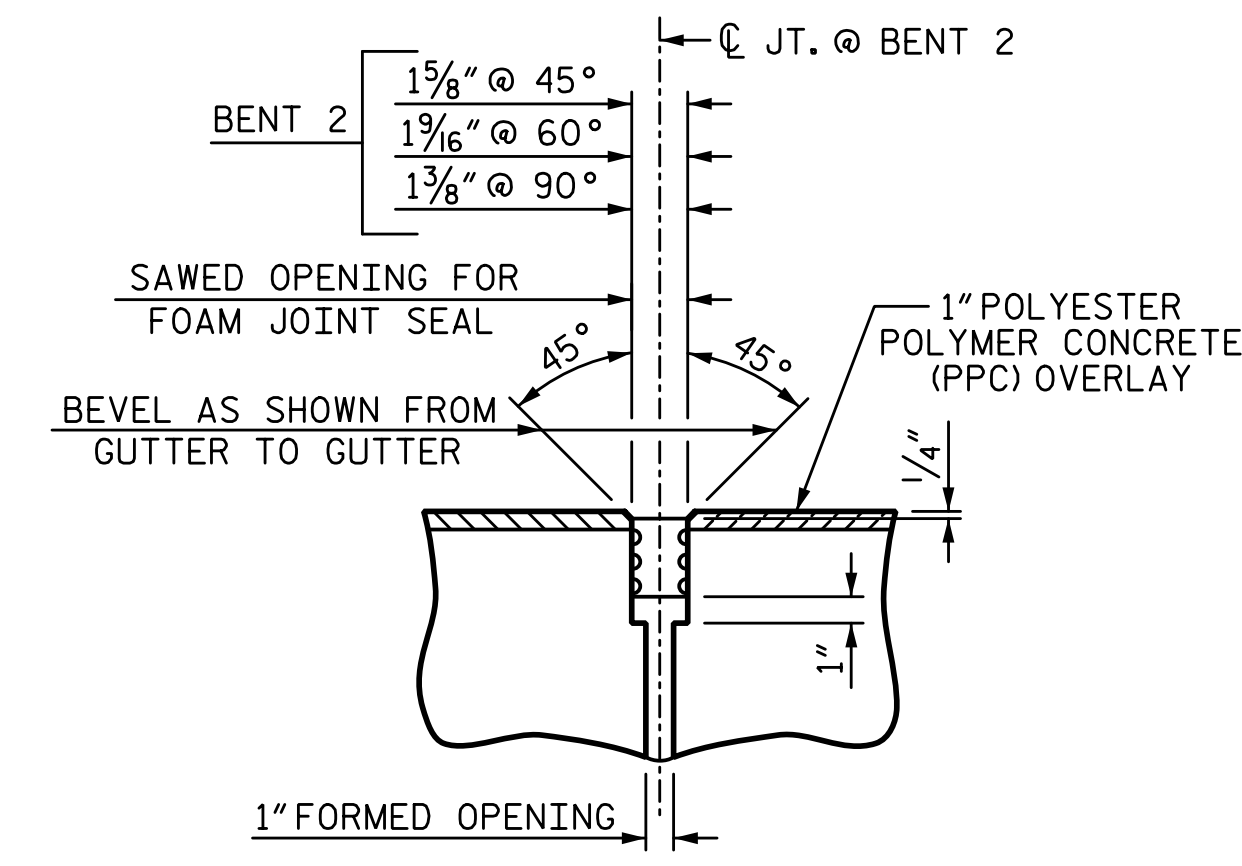
\* #5G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR DIAPHRAGM AND REINFORCING STEEL.



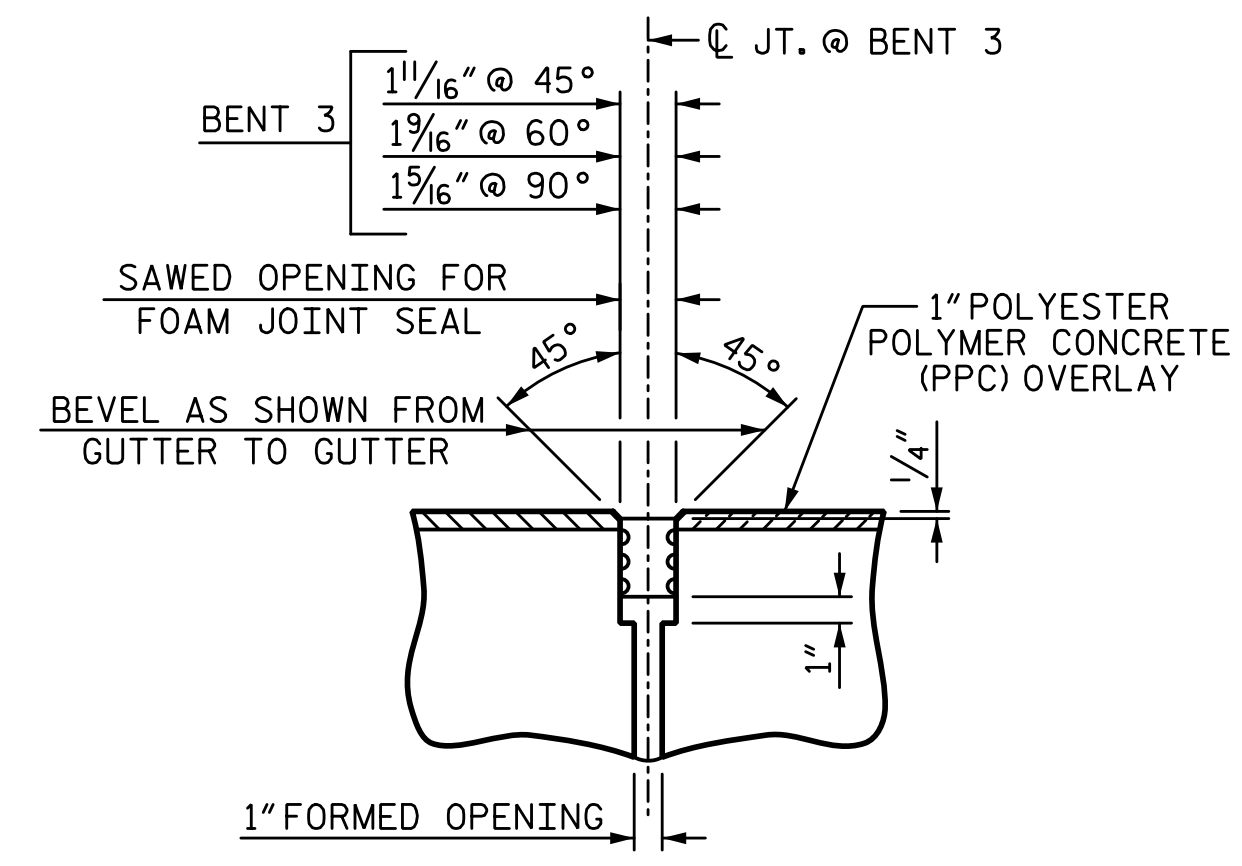
**PRE-SAWED FOAM JOINT SEAL**



**SECTION THRU JOINT @ BENT 1**  
FOAM JOINT SEAL (EXP.)



**SECTION THRU JOINT @ BENT 2**  
FOAM JOINT SEAL (EXP.)



**SECTION THRU JOINT @ BENT 3**  
FOAM JOINT SEAL (EXP.)

**FOAM JOINT SEAL DETAILS @ BENTS**

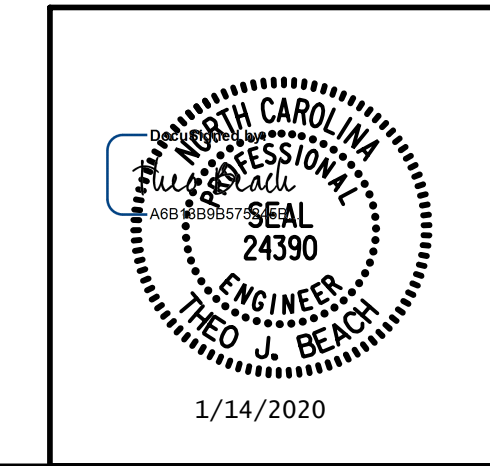
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SHEET 3 OF 3

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 DETAILS  
 LEFT & RIGHT WIDENING

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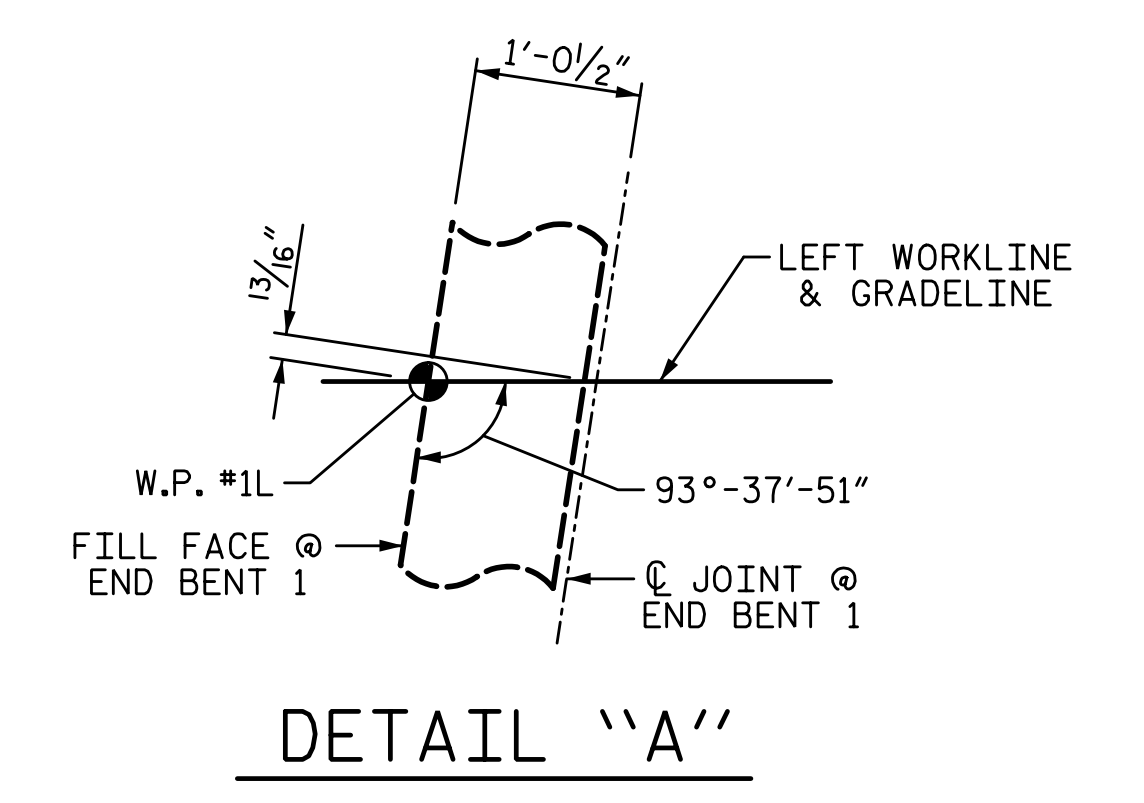
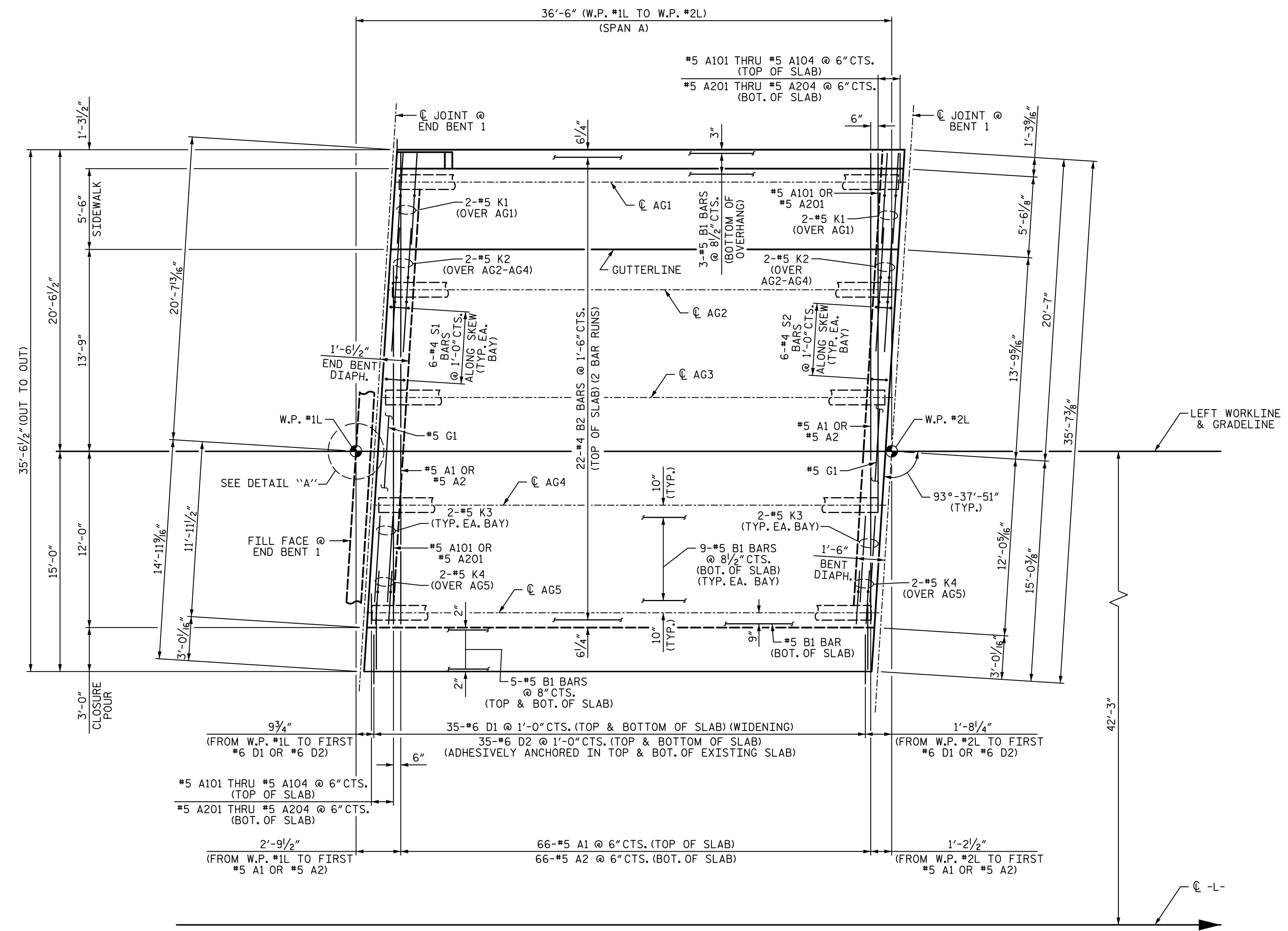
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**NOTES:**  
 FOR SIDEWALK REINFORCING STEEL, SEE "SIDEWALK DETAILS" SHEETS.

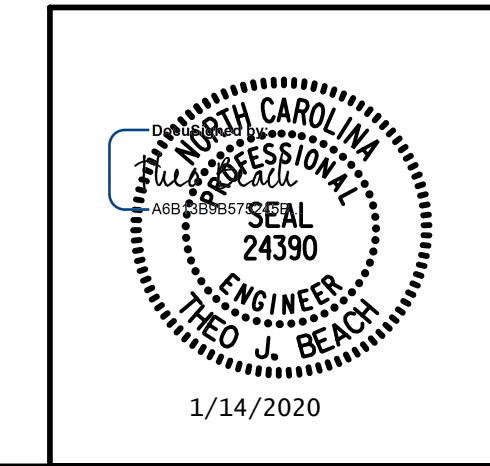


**PLAN OF SPAN A**

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA  
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**PLAN OF SPAN  
 (SPAN A)**  
 LEFT WIDENING



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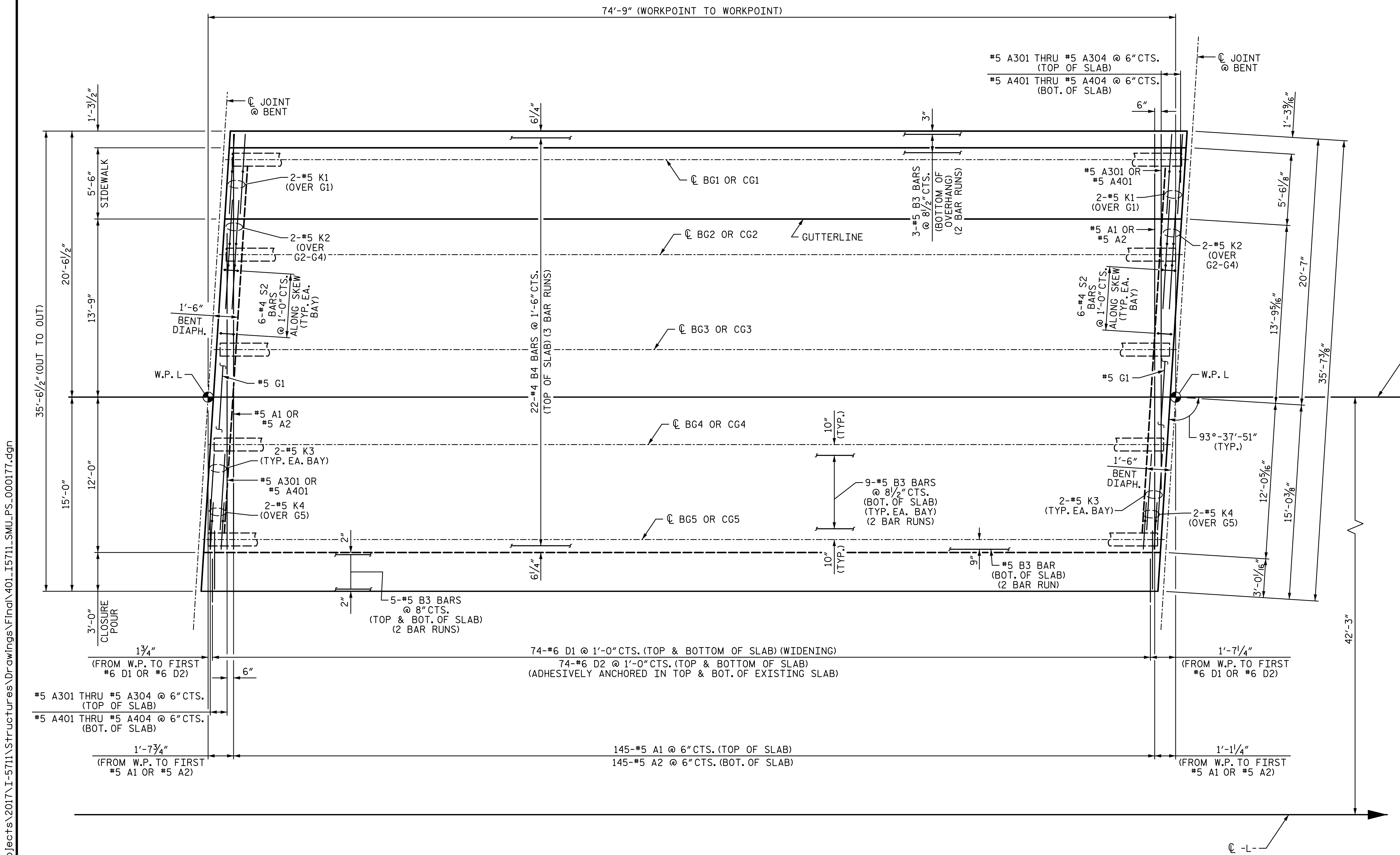
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NOTES:  
FOR SIDEWALK REINFORCING STEEL, SEE "SIDEWALK DETAILS"  
SHEETS.



### PLAN OF SPANS B OR C

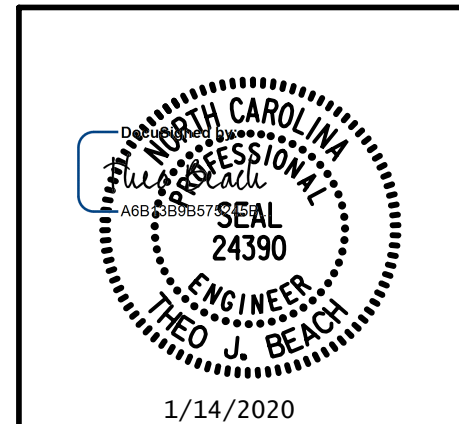
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SHEET 2 OF 6

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PLAN OF SPANS  
(SPANS B OR C)

LEFT WIDENING



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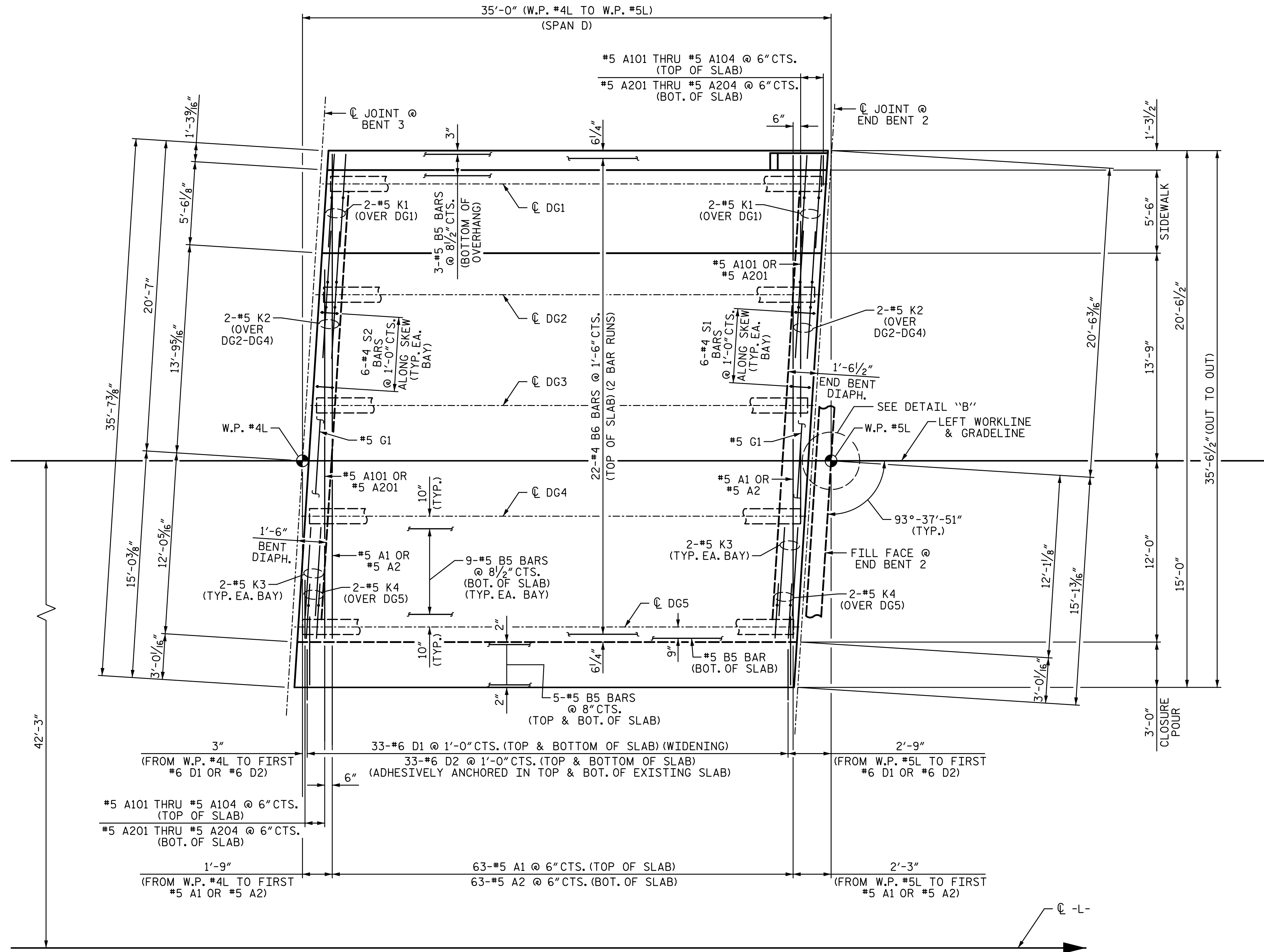
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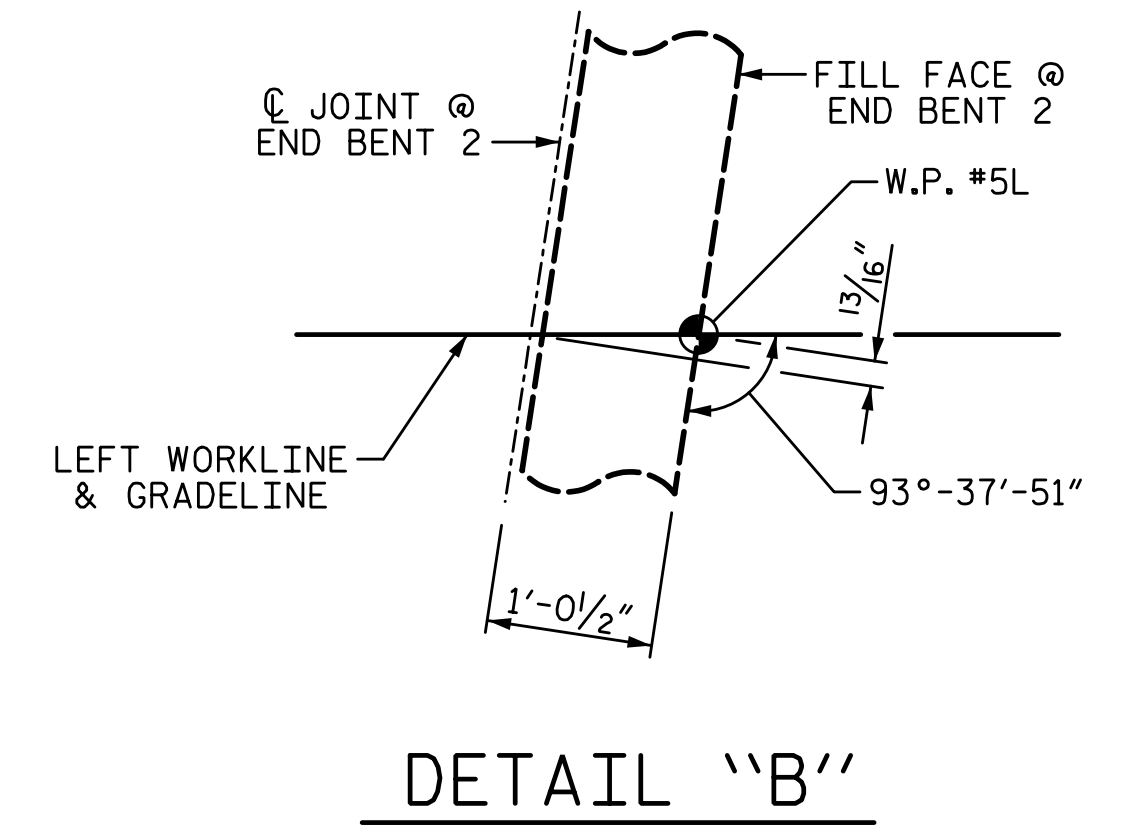
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CHECKED BY: <u>T. BEACH</u>	DATE: <u>1-20</u>
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**NOTES:**  
FOR SIDEWALK REINFORCING STEEL, SEE "SIDEWALK DETAILS" SHEETS.



**PLAN OF SPAN D**



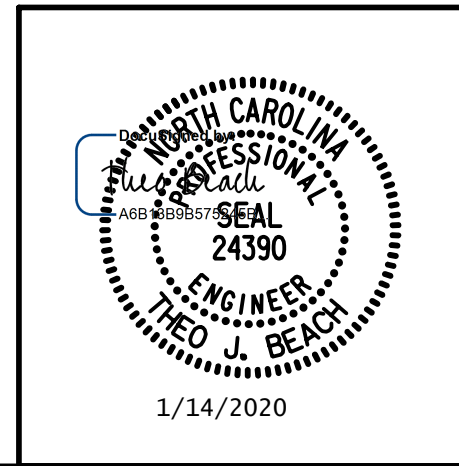
**DETAIL "B"**

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SHEET 3 OF 6

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**PLAN OF SPAN  
(SPAN D)**  
LEFT WIDENING

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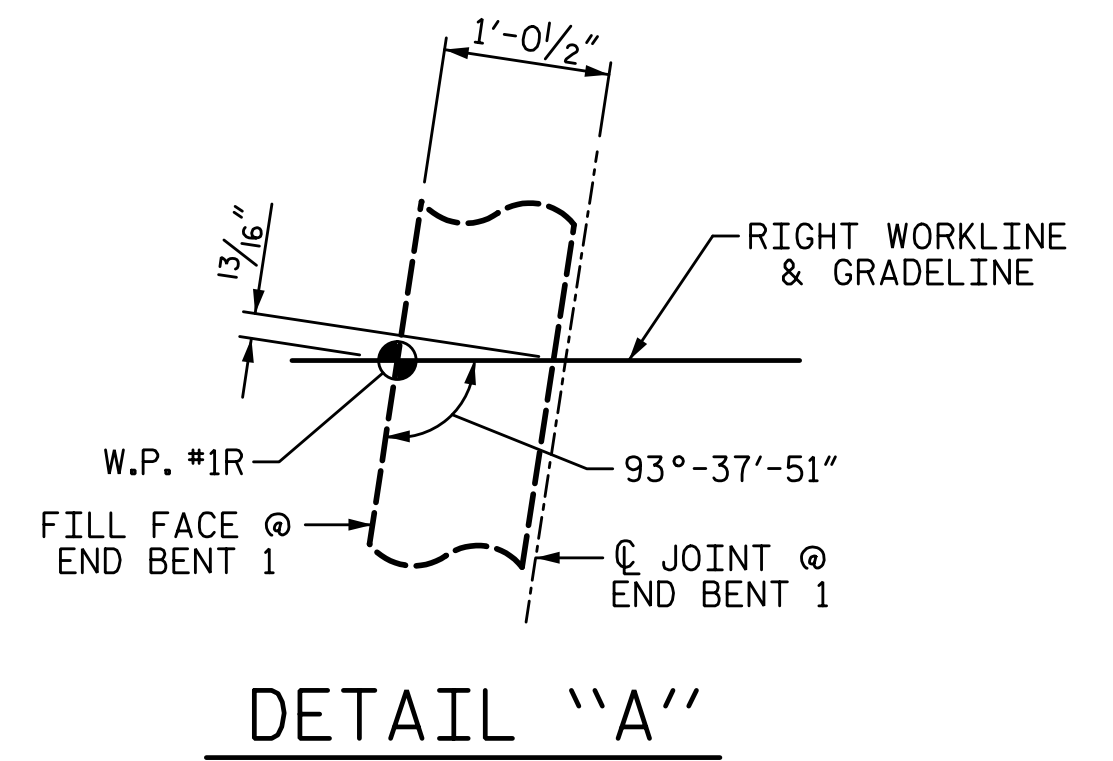
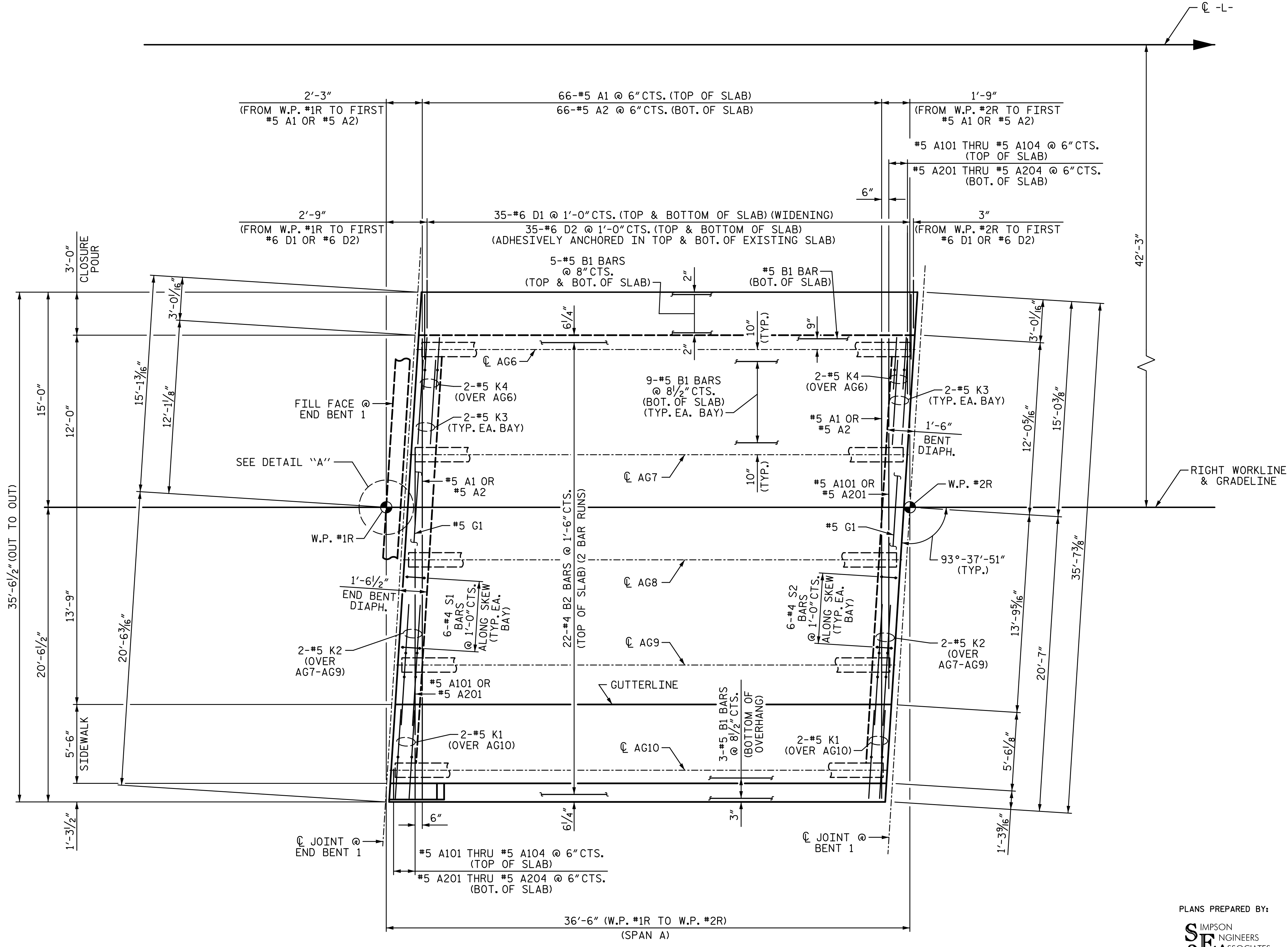
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**NOTES:**  
 FOR SIDEWALK REINFORCING STEEL, SEE "SIDEWALK DETAILS" SHEETS.



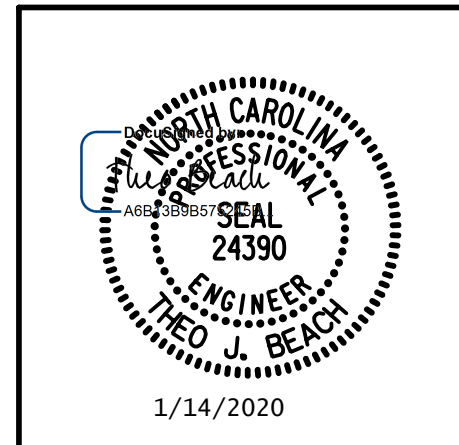
**PLAN OF SPAN A**

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**PLAN OF SPAN  
 (SPAN A)**  
 RIGHT WIDENING

PLANS PREPARED BY:  
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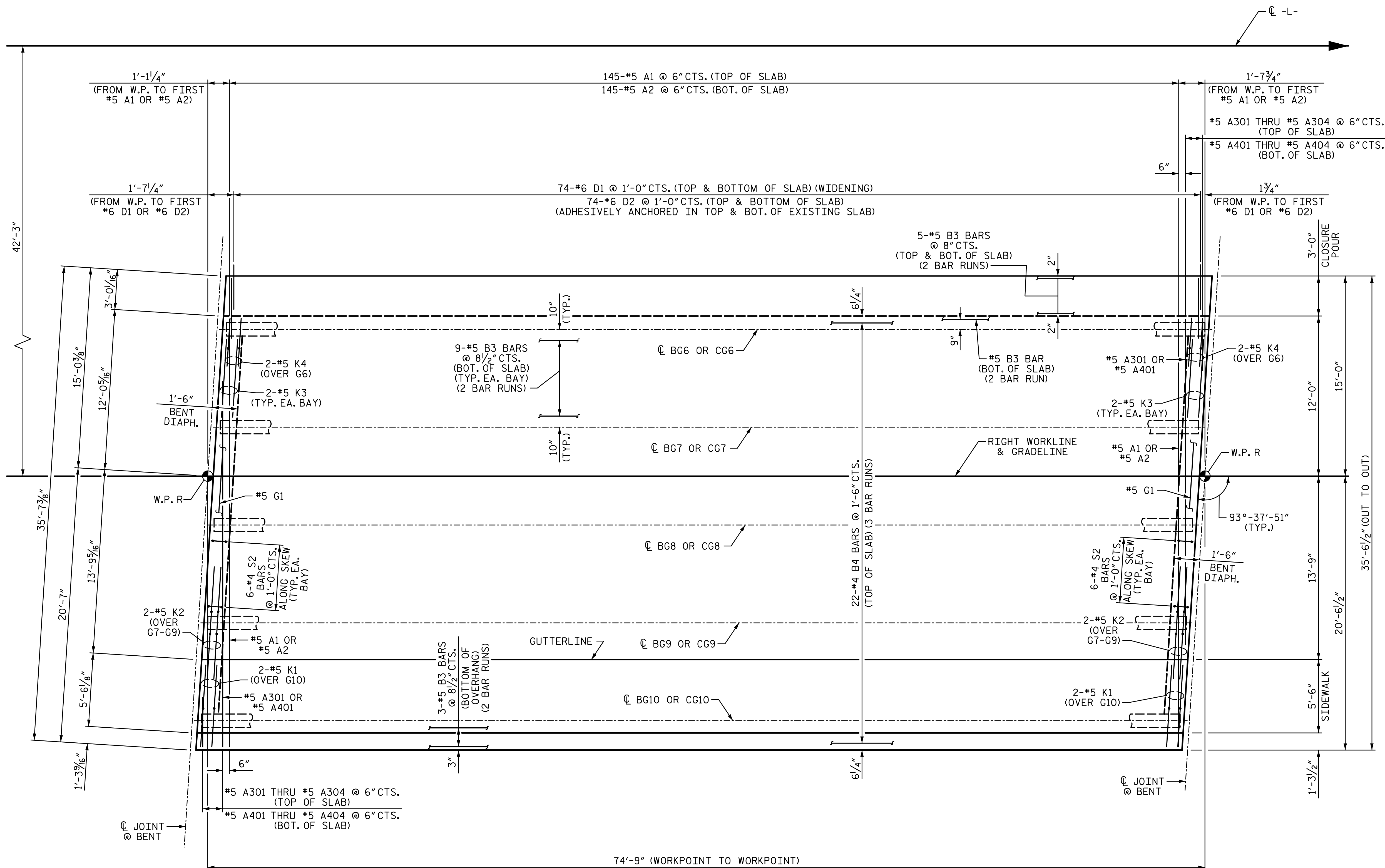
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**PLAN OF SPANS B OR C**

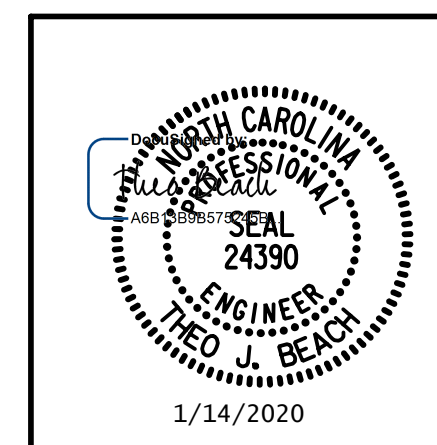
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SHEET 5 OF 6

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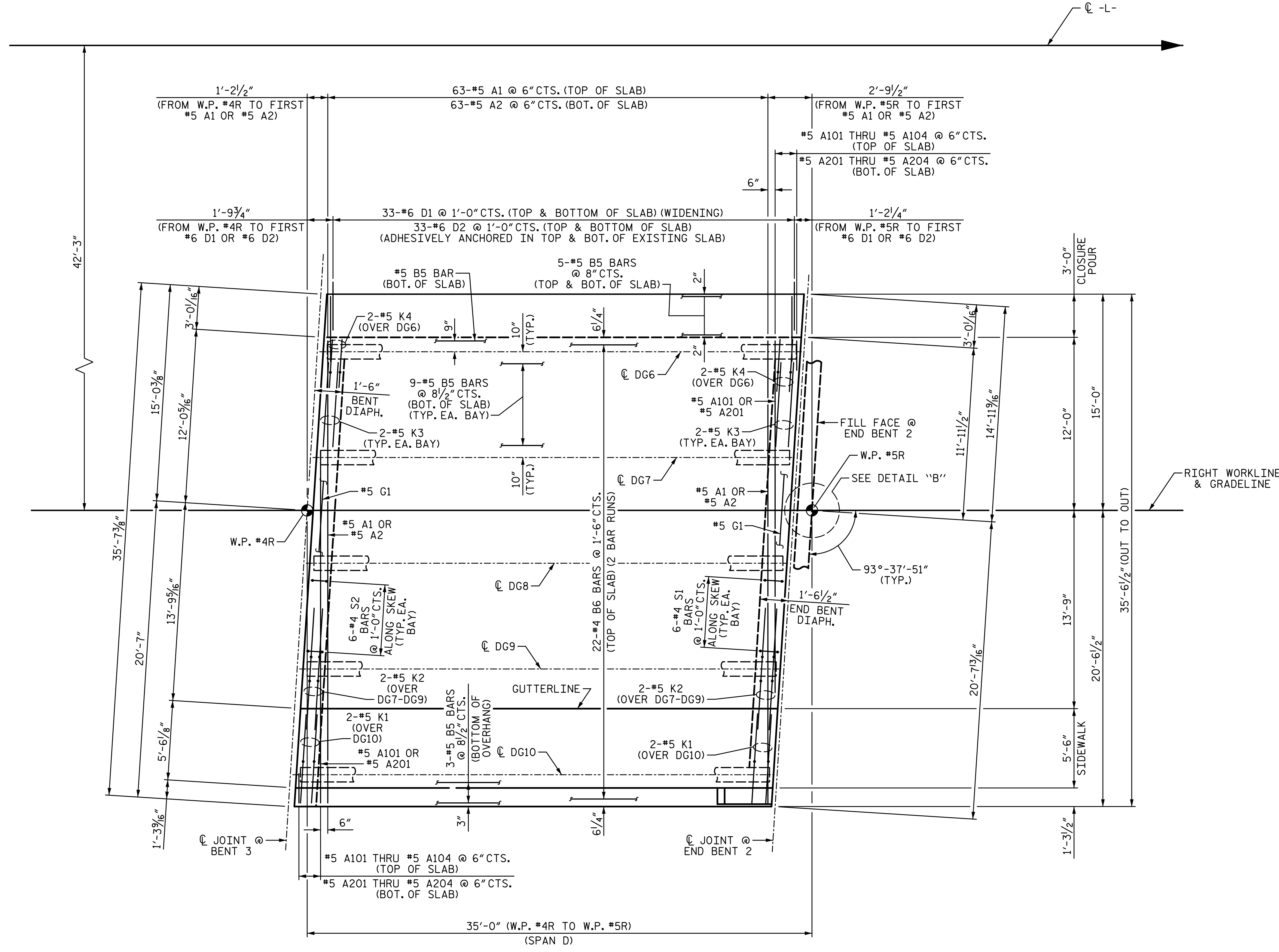
STATE OF NORTH CAROLINA  
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**PLAN OF SPANS  
 (SPANS B OR C)**  
 RIGHT WIDENING

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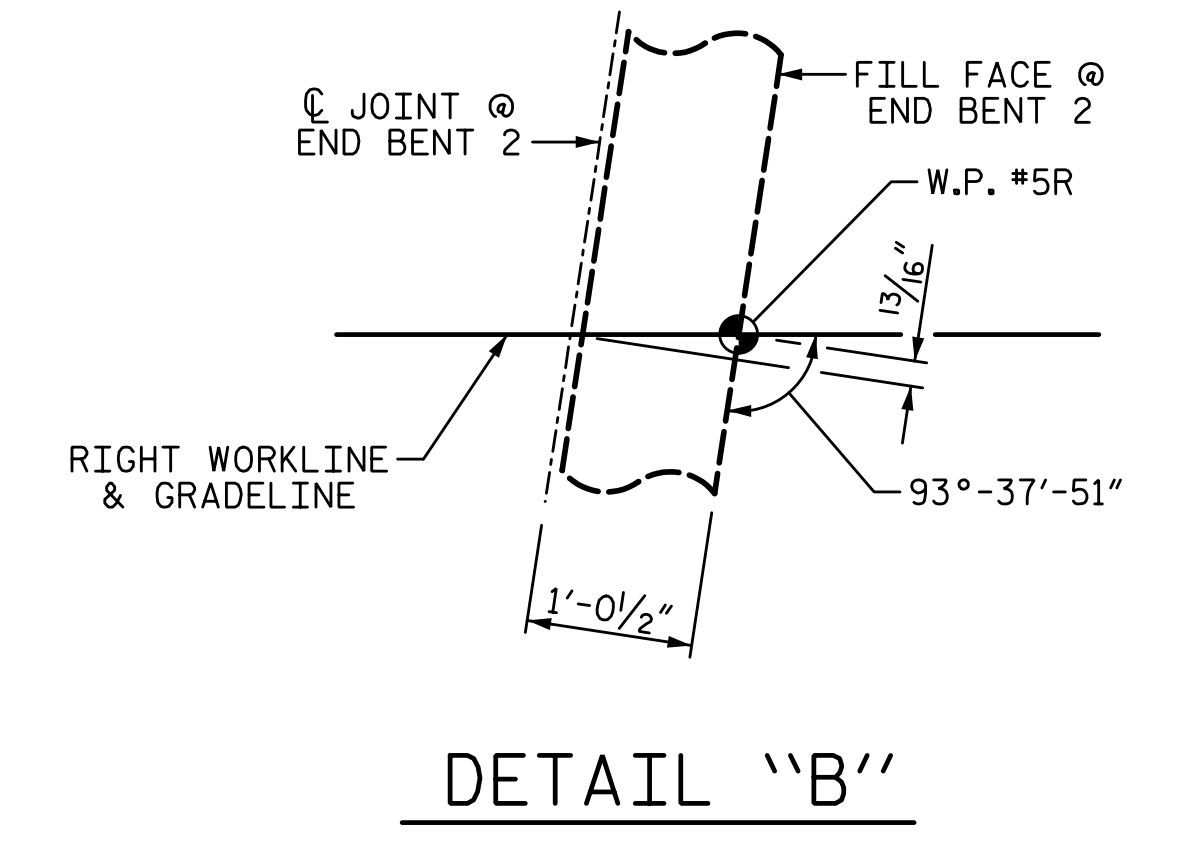
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**NOTES:**  
 FOR SIDEWALK REINFORCING STEEL, SEE "SIDEWALK DETAILS" SHEETS.



**PLAN OF SPAN D**



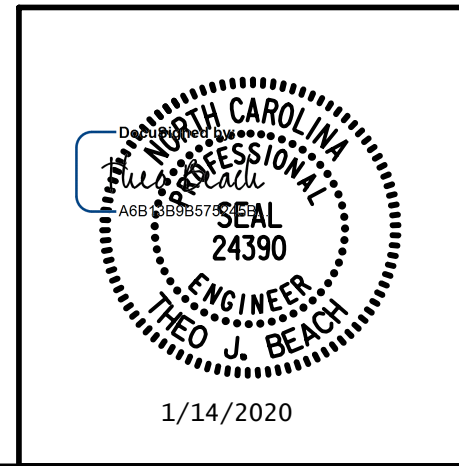
**DETAIL "B"**

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ALAMANCE COUNTY  
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SHEET 6 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
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**PLAN OF SPAN  
 (SPAN D)**  
 RIGHT WIDENING

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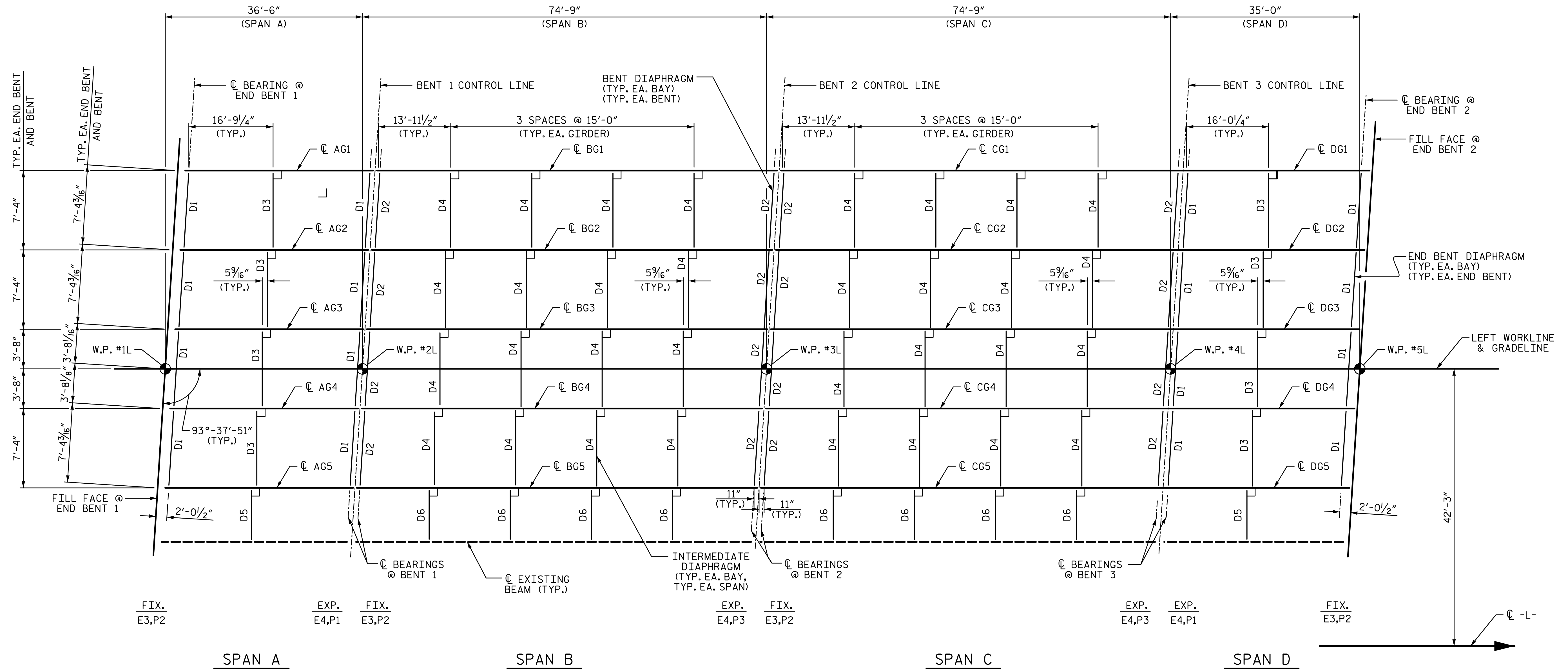
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**NOTES:**

FOR DIAPHRAGM DETAILS, SEE "STRUCTURAL STEEL DETAILS" SHEETS.

FOR ELASTOMERIC BEARINGS AND STEEL SOLE PLATE DETAILS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.



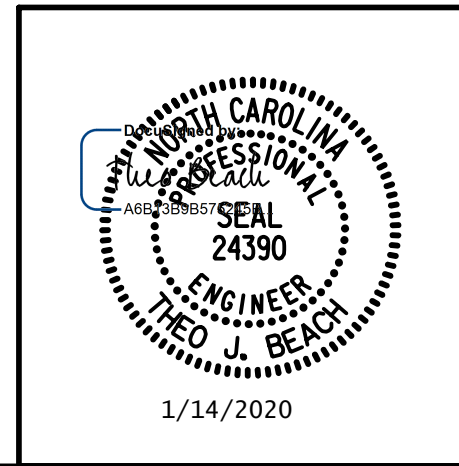
**PLAN**

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**FRAMING PLAN**  
 LEFT WIDENING

REVISIONS						SHEET NO.
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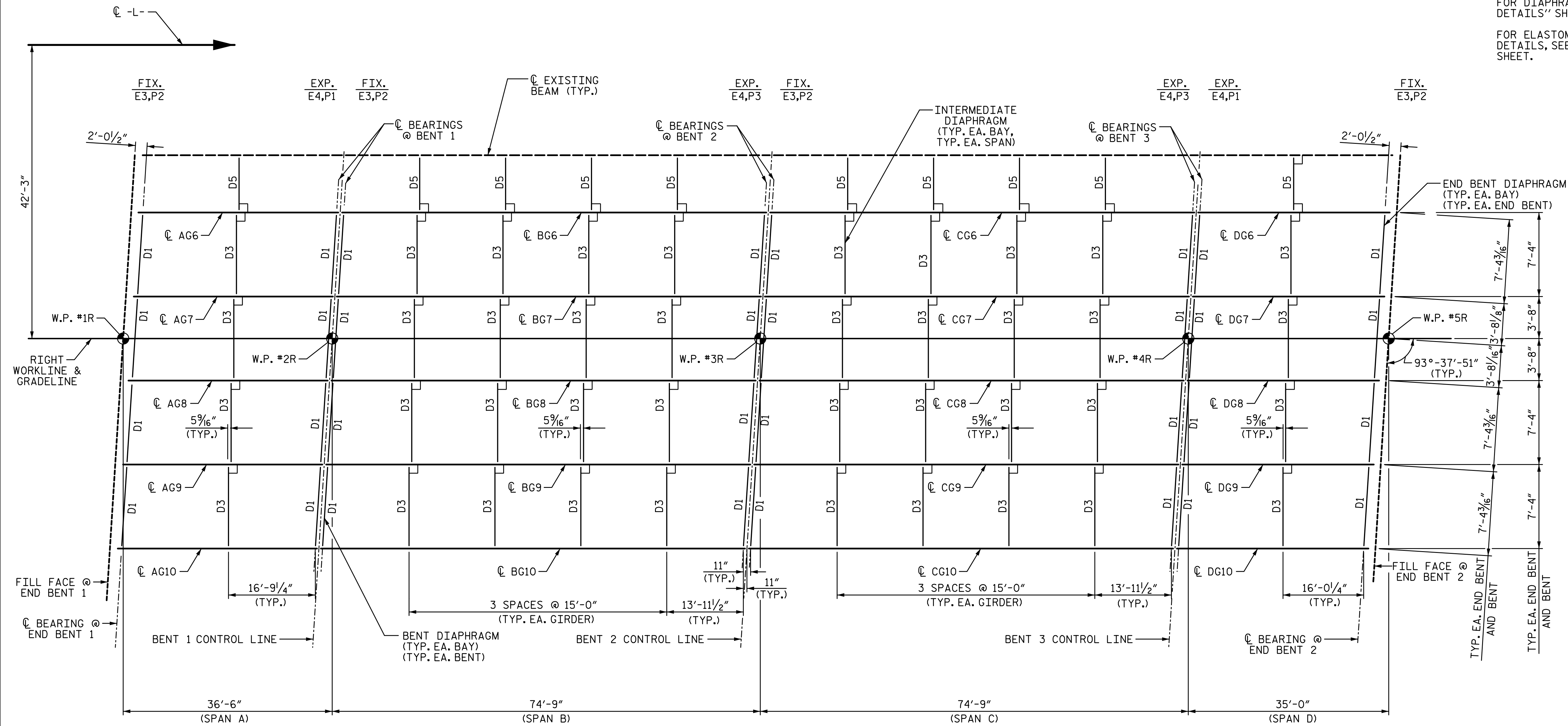
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SPAN A                      SPAN B                      SPAN C                      SPAN D

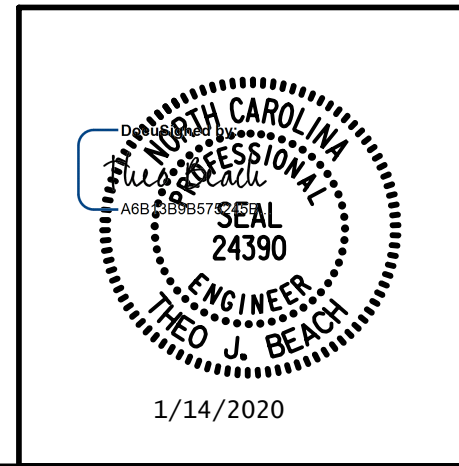
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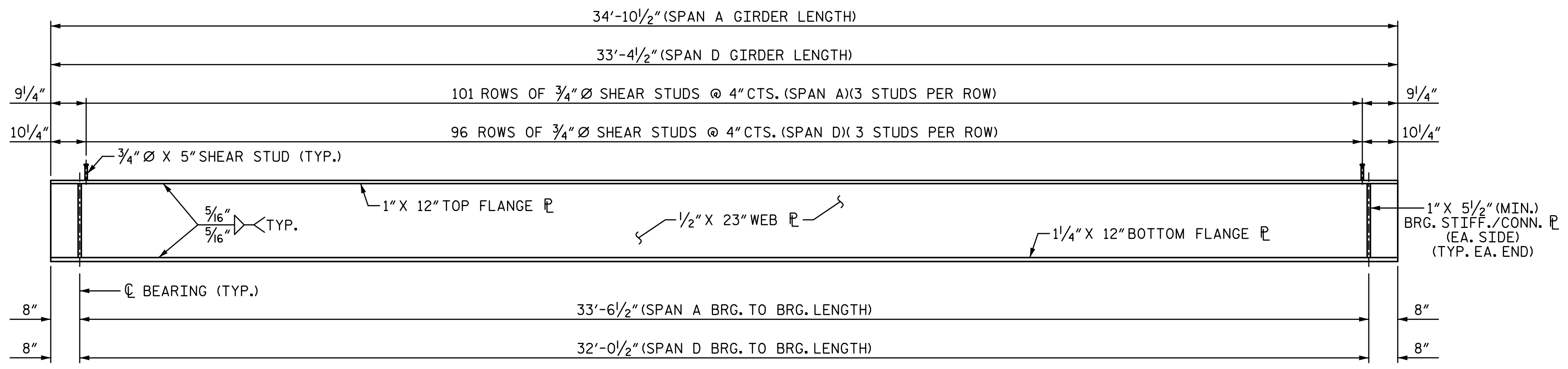
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**FRAMING PLAN**  
 RIGHT WIDENING

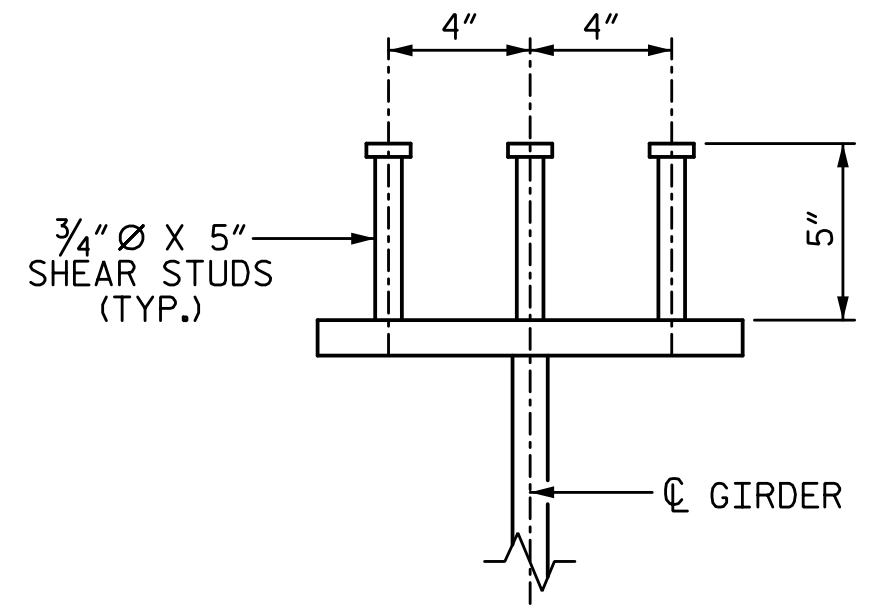
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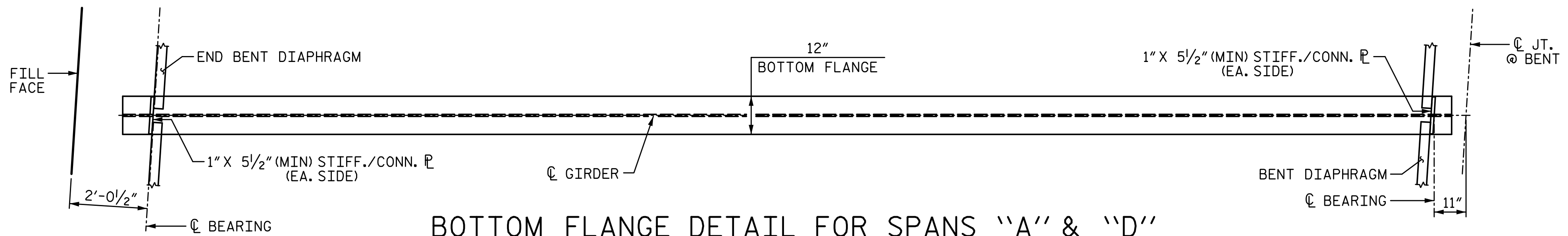


**ELEVATION OF GIRDER FOR SPANS "A" & "D"**

FOR CLARITY, CONNECTOR PLATES FOR INTERMEDIATE DIAPHRAGMS NOT SHOWN. SEE "FRAMING PLAN" SHEET FOR LOCATION.

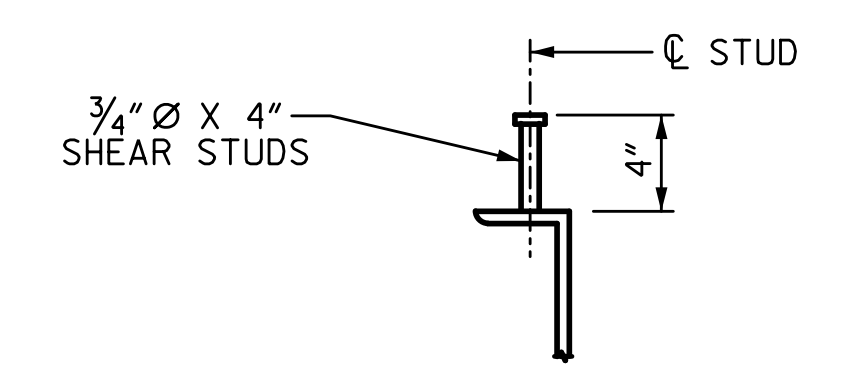


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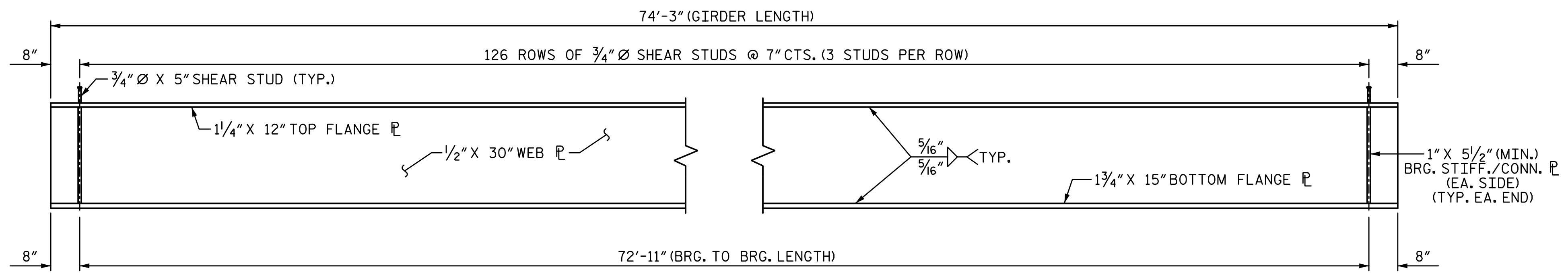


**BOTTOM FLANGE DETAIL FOR SPANS "A" & "D"**

(SPAN "A" SHOWN, SPAN "D" SIMILAR)  
FOR PLACEMENT OF INTERMEDIATE DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.

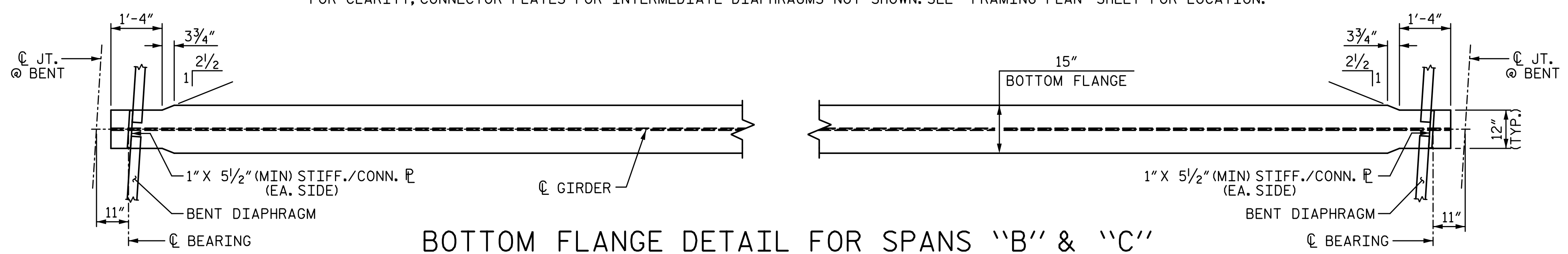


**SHEAR STUD DETAILS**



**ELEVATION OF GIRDER FOR SPANS "B" & "C"**

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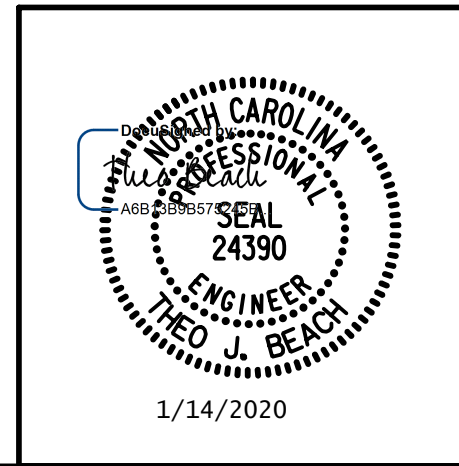
**BOTTOM FLANGE DETAIL FOR SPANS "B" & "C"**

FOR PLACEMENT OF INTERMEDIATE DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.

PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
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SUPERSTRUCTURE  
**STRUCTURAL STEEL DETAILS**  
LEFT WIDENING



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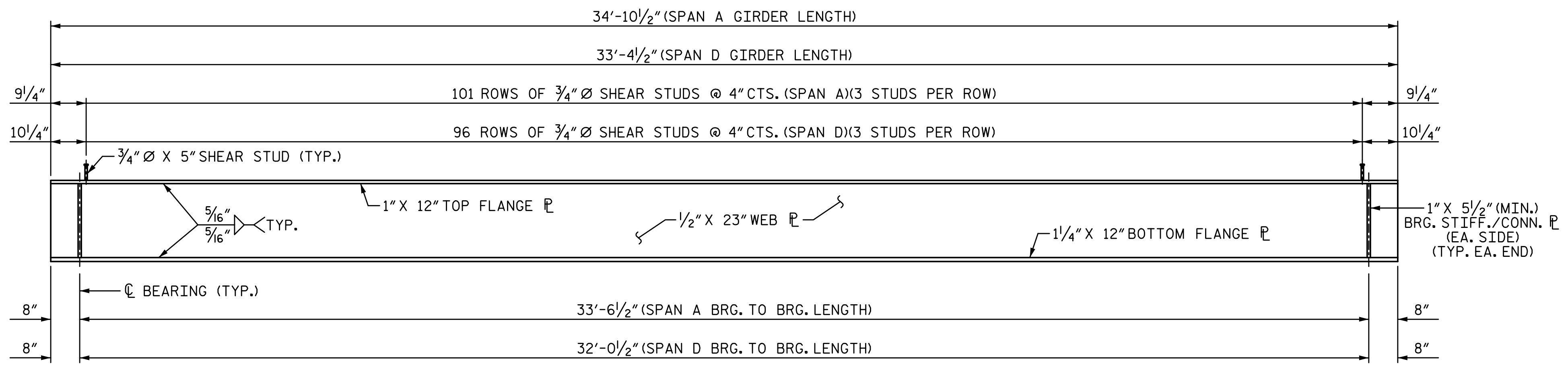
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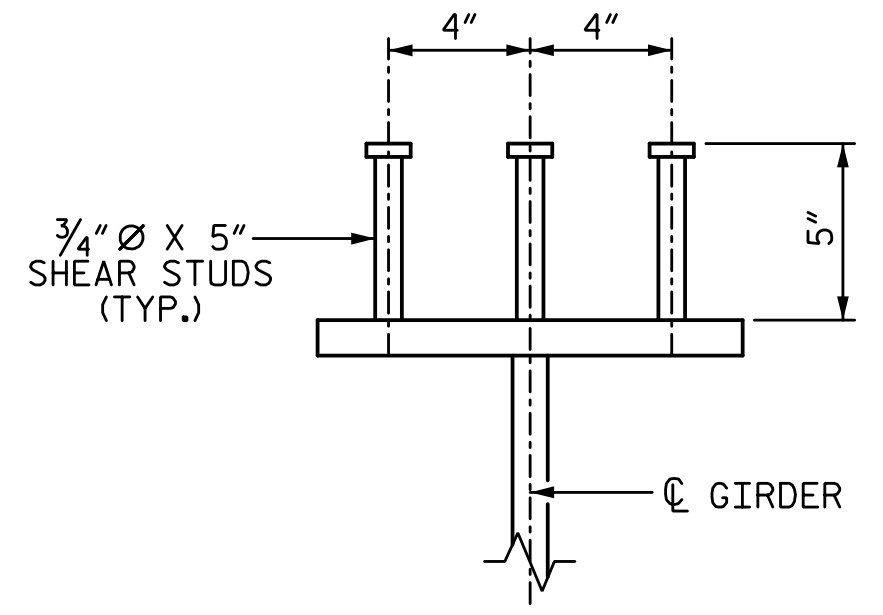
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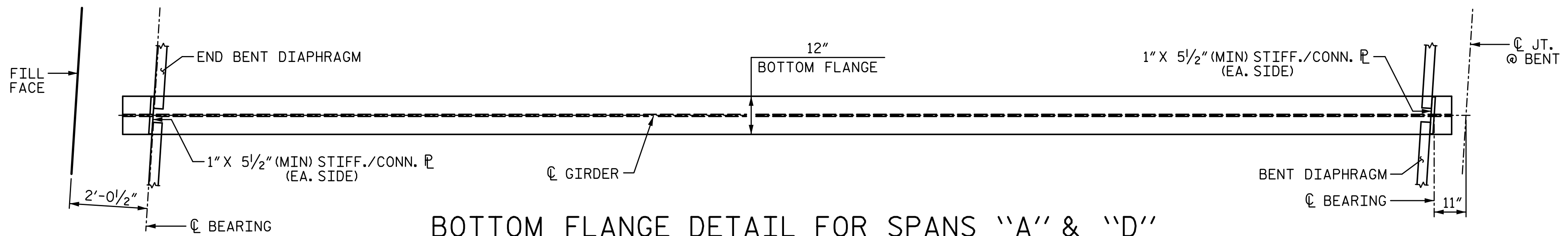


**ELEVATION OF GIRDER FOR SPANS "A" & "D"**

FOR CLARITY, CONNECTOR PLATES FOR INTERMEDIATE DIAPHRAGMS NOT SHOWN. SEE "FRAMING PLAN" SHEET FOR LOCATION.

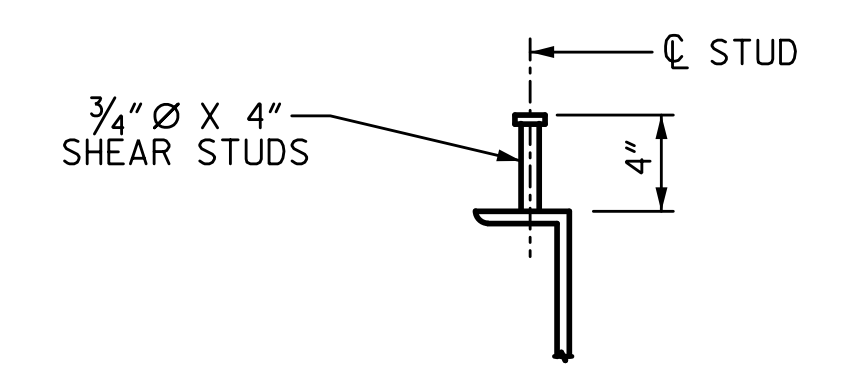


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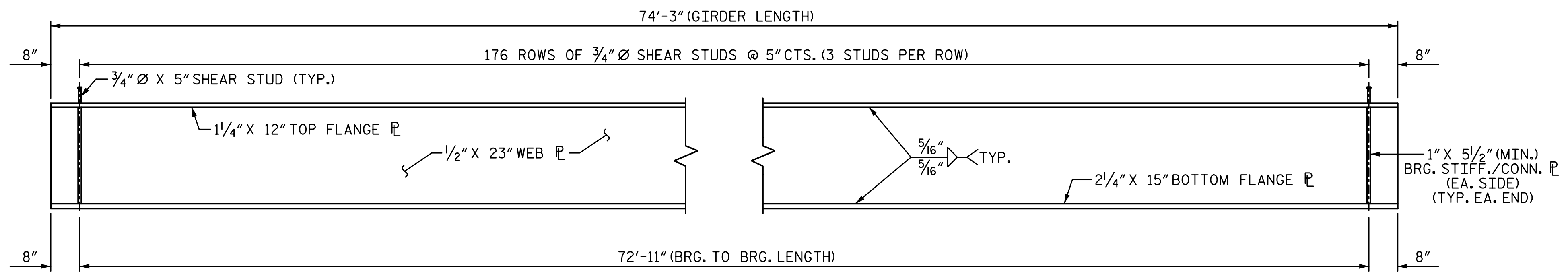


**BOTTOM FLANGE DETAIL FOR SPANS "A" & "D"**

(SPAN "A" SHOWN, SPAN "D" SIMILAR)  
FOR PLACEMENT OF INTERMEDIATE DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.

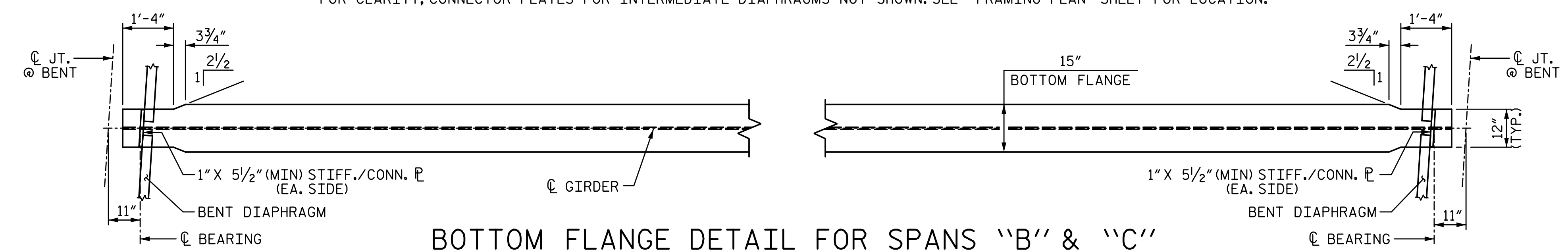


**SHEAR STUD DETAILS**



**ELEVATION OF GIRDER FOR SPANS "B" & "C"**

FOR CLARITY, CONNECTOR PLATES FOR INTERMEDIATE DIAPHRAGMS NOT SHOWN. SEE "FRAMING PLAN" SHEET FOR LOCATION.



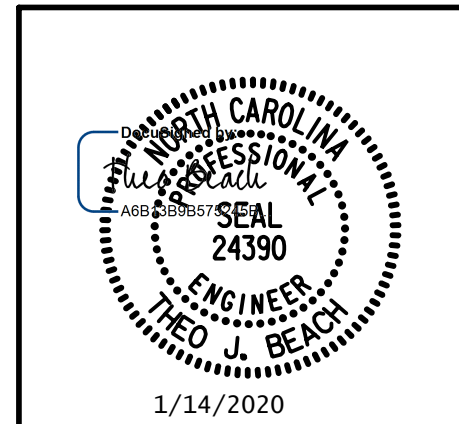
**BOTTOM FLANGE DETAIL FOR SPANS "B" & "C"**

FOR PLACEMENT OF INTERMEDIATE DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.

PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**STRUCTURAL STEEL DETAILS**  
RIGHT WIDENING



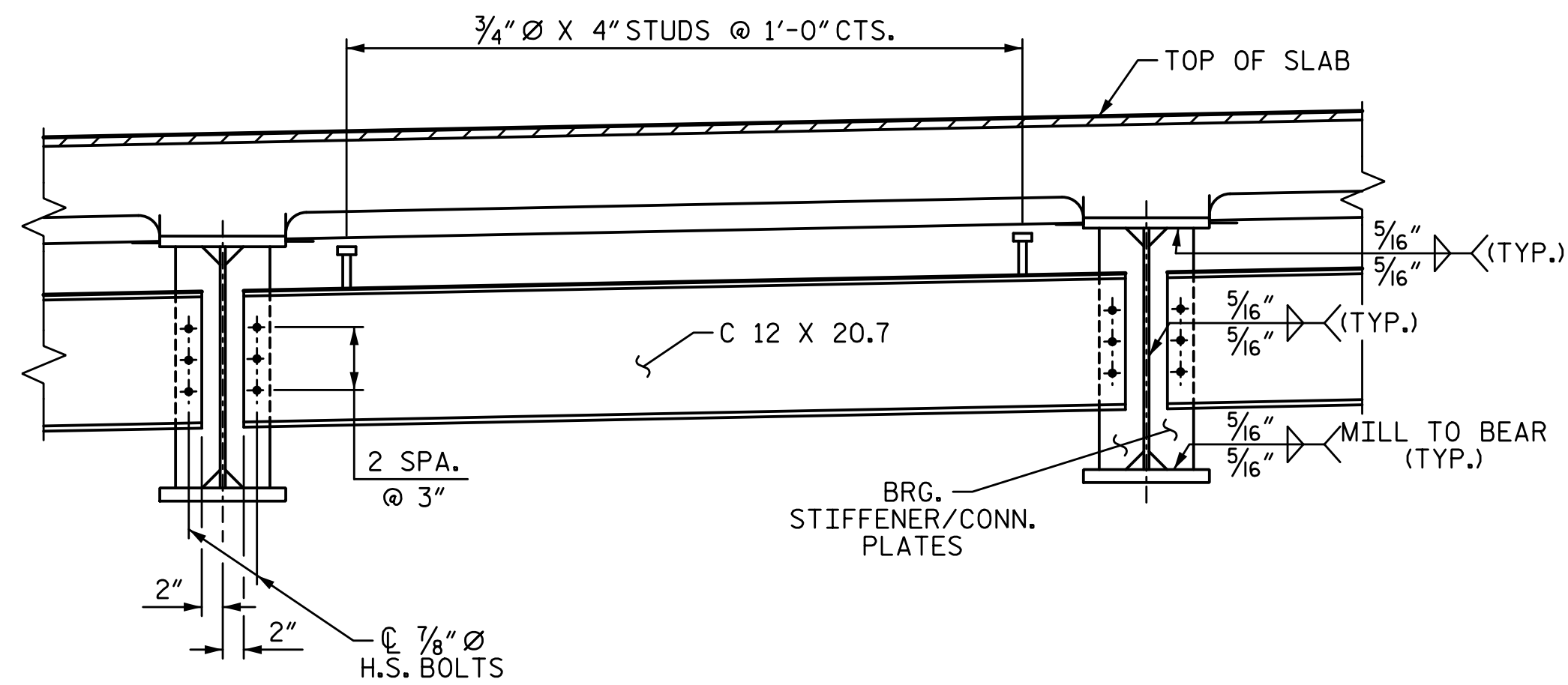
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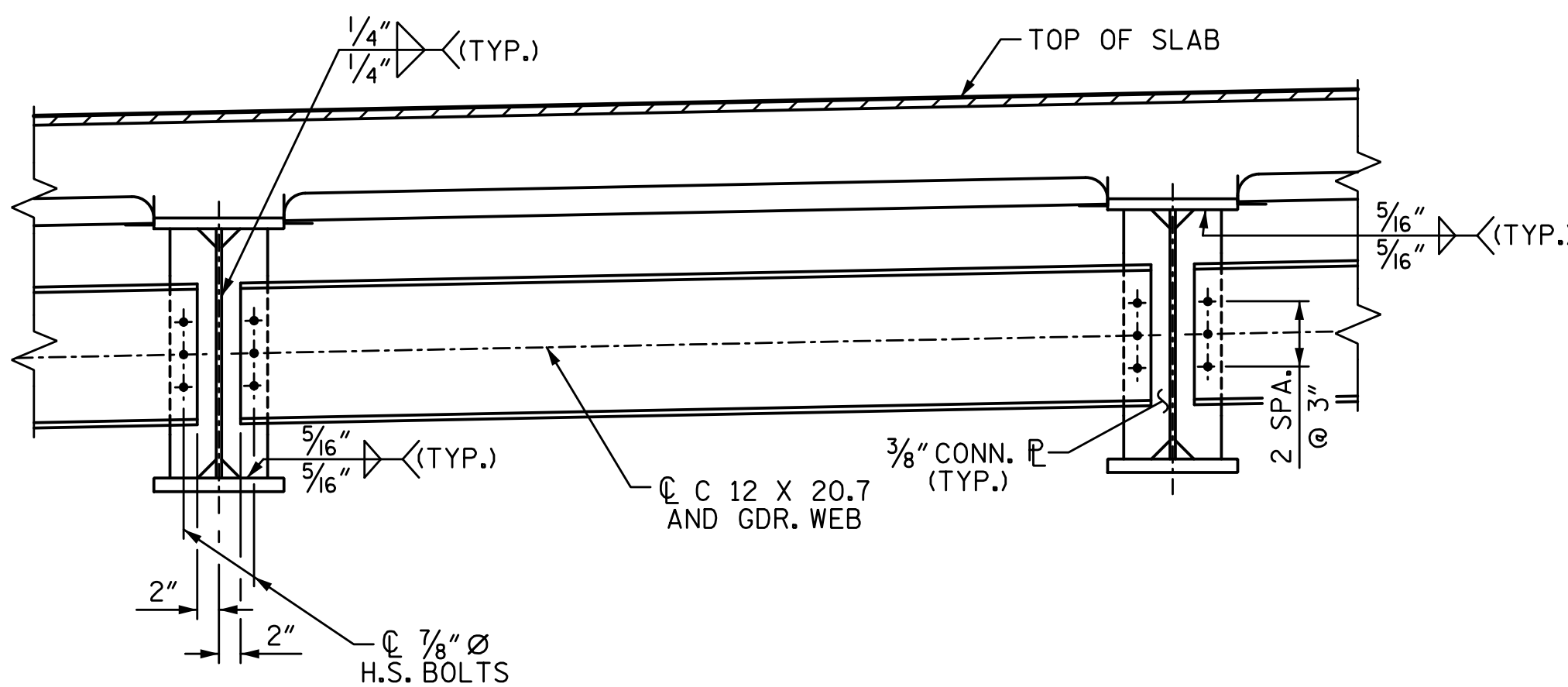
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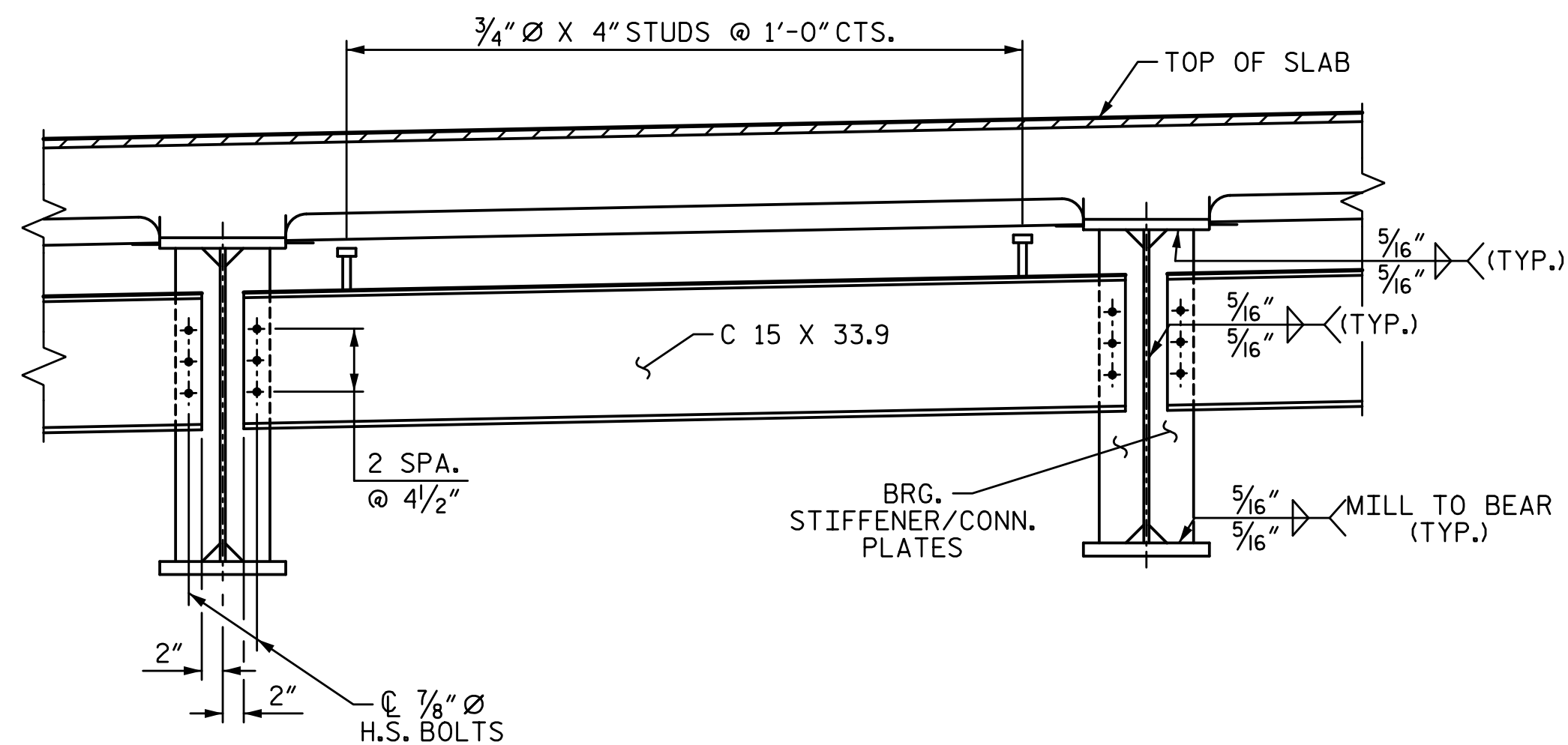
**END BENT & BENT DIAPHRAGM - D1**

SPANS A & D LEFT WIDENING, SPANS A, B, C & D RIGHT WIDENING



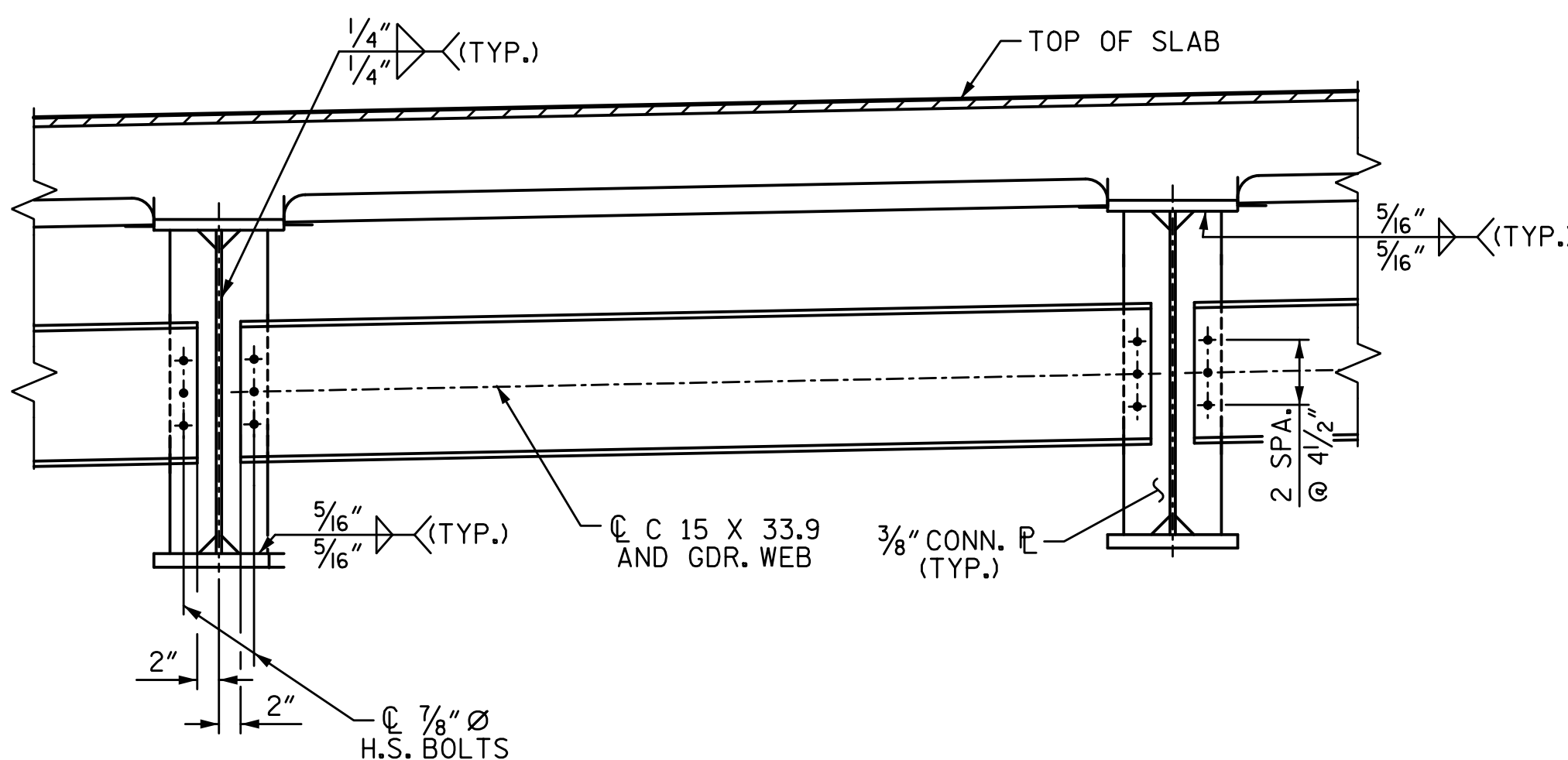
**INTERMEDIATE DIAPHRAGM - D3**

SPANS A & D LEFT WIDENING, SPANS A, B, C & D RIGHT WIDENING



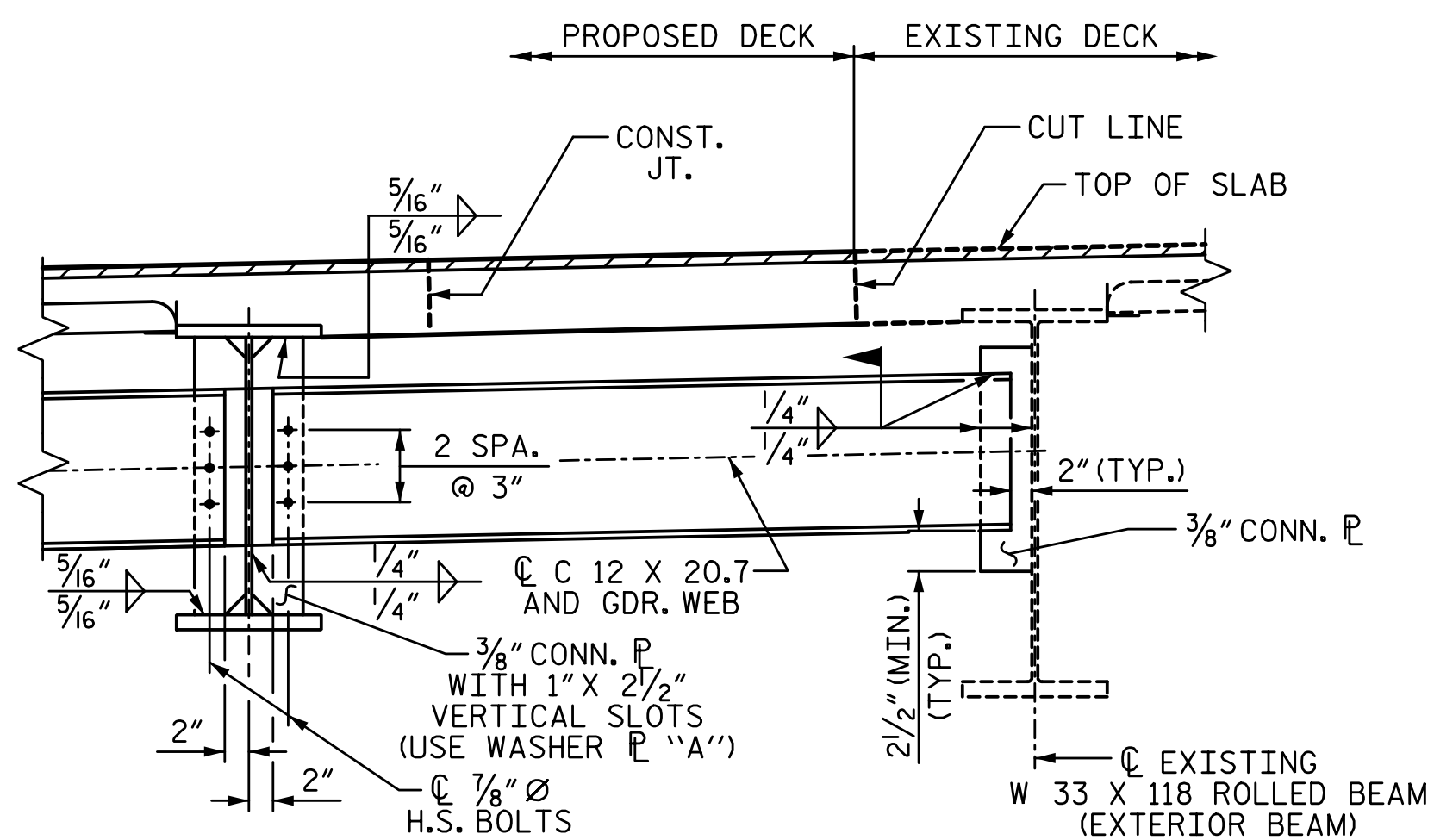
**BENT DIAPHRAGM - D2**

SPANS B & C LEFT WIDENING



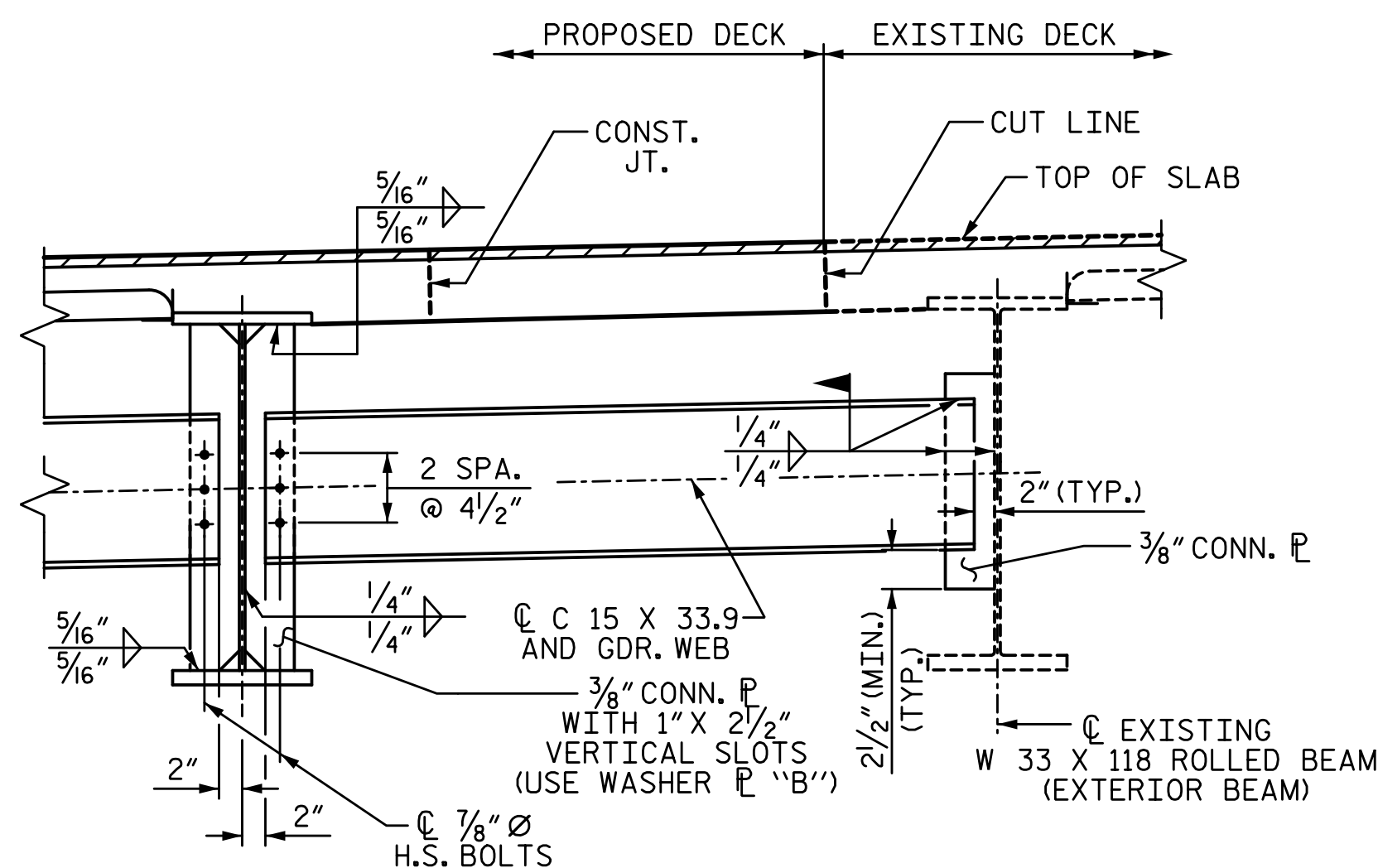
**INTERMEDIATE DIAPHRAGM - D4**

SPANS B & C LEFT WIDENING



**INTERMEDIATE DIAPHRAGM - D5**

SPANS A & D LEFT WIDENING, SPANS A, B, C, & D RIGHT WIDENING



**INTERMEDIATE DIAPHRAGM - D6**

SPANS B & C LEFT WIDENING

**NOTES:**

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

BEARING STIFFENERS/CONNECTOR PLATES ARE TO BE PLACED ALONG THE SKEW AND SHALL BE PLUMB.

CHARPY V-NOTCH TEST IS REQUIRED FOR WEB PLATES AND BOTTOM FLANGE PLATES FOR ALL GIRDERS AND IN ACCORDANCE WITH ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

CONNECTION BOLTS ARE TO BE LOCATED AT THE BOTTOM OF THE CONNECTION SLOTS AND TIGHTENED TO A SNUG FIT PRIOR TO FIELD WELDING OPPOSITE END OF DIAPHRAGM. AFTER WELDING DIAPHRAGM TO CONNECTION ANGLE AND PRIOR TO THE POURING OF THE SLAB, BACK OFF BOLTS 1/2 TURN TO ALLOW FOR VERTICAL DEFLECTION OF NEW BEAM. AFTER DEFLECTIONS HAVE OCCURRED, TIGHTEN BOLTS AS REQUIRED BY THE STANDARD SPECIFICATIONS.

PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

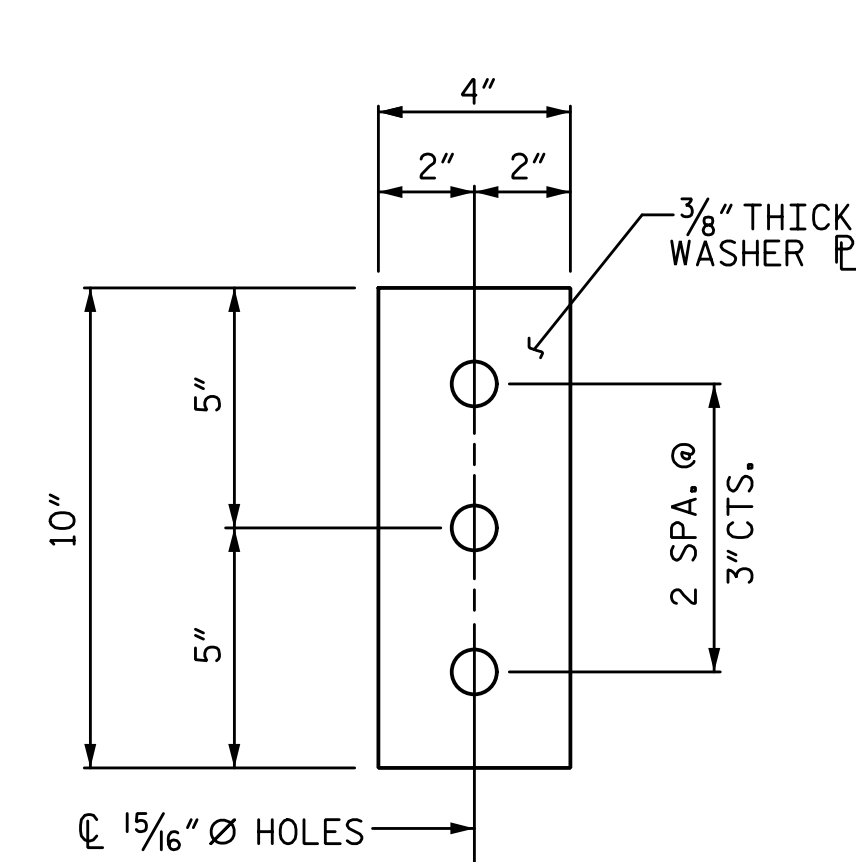
STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

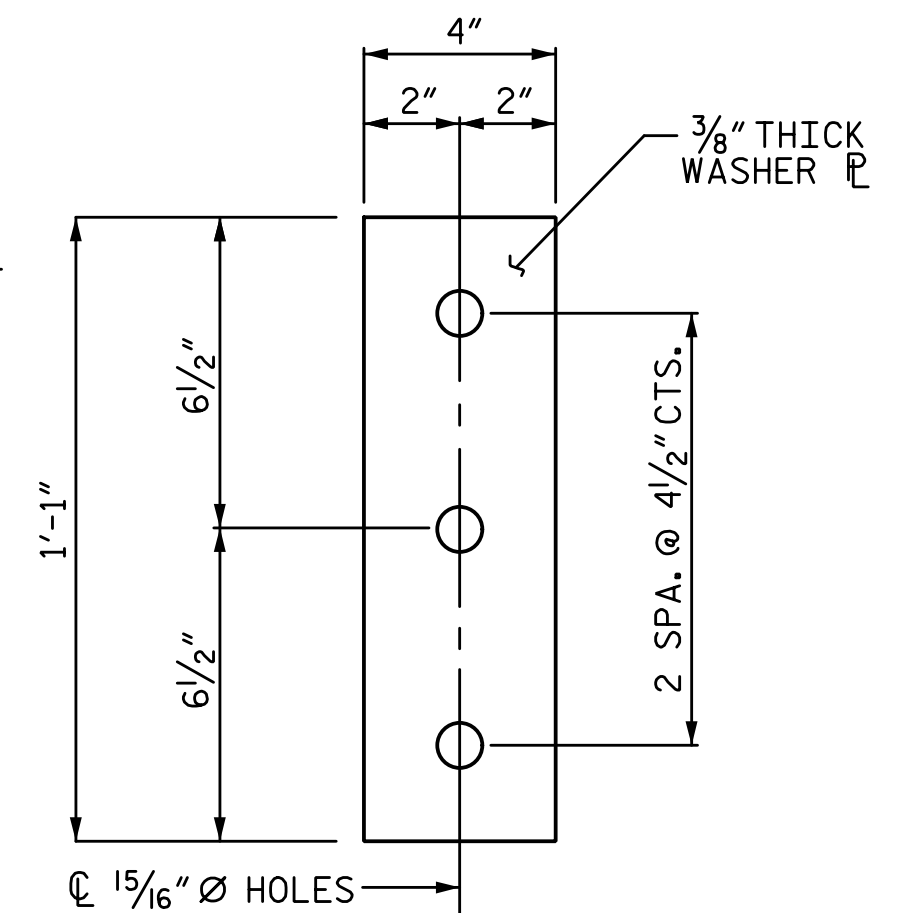
END OF GIRDERS SHALL BE PLUMB.

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHALL BE PLUMB AND AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.



WASHER P "A"



WASHER P "B"

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
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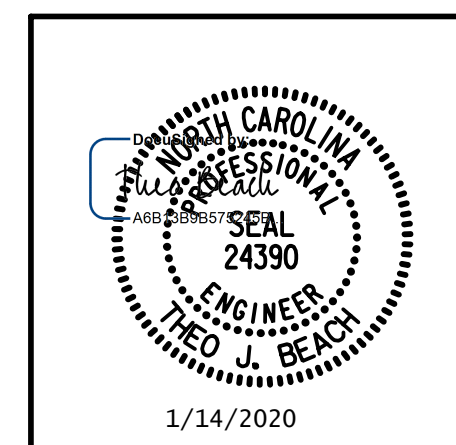
**STRUCTURAL STEEL  
 DETAILS**

**LEFT & RIGHT WIDENING**

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PLANS PREPARED BY:

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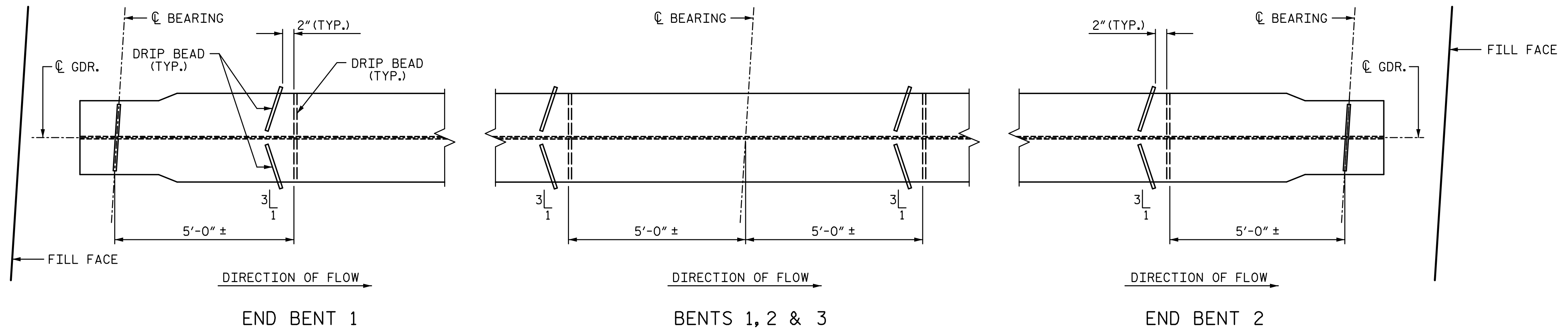


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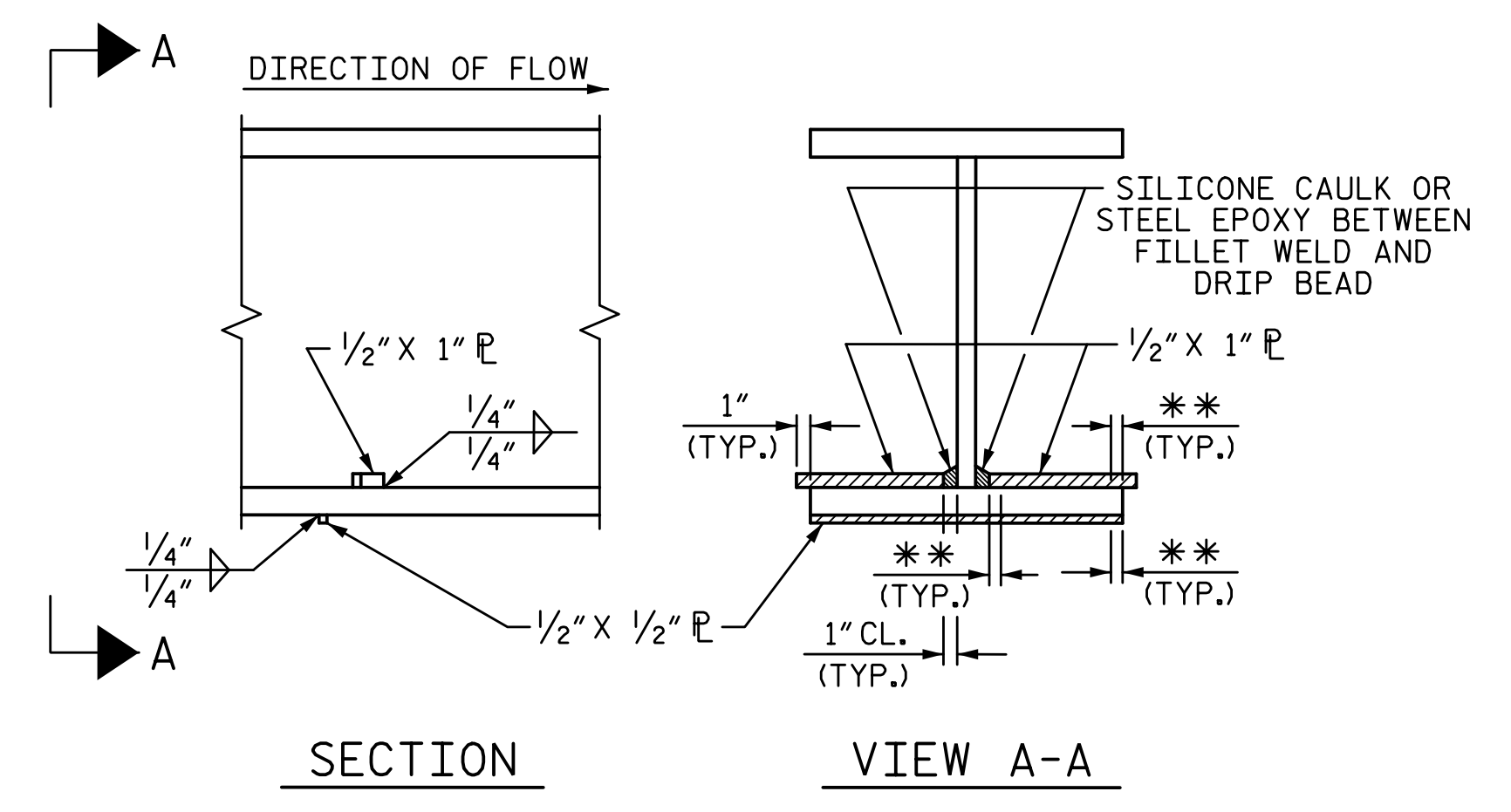
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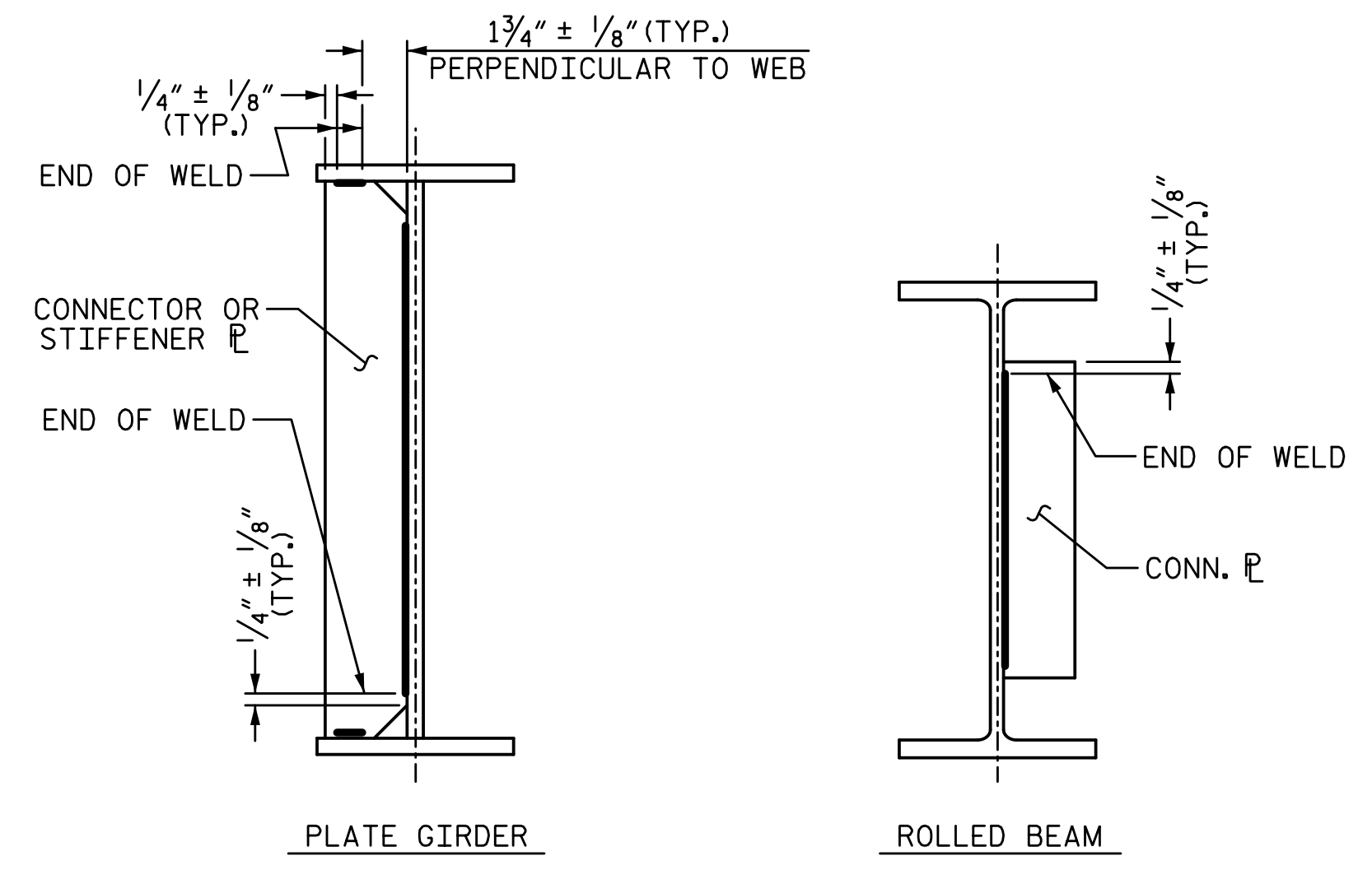




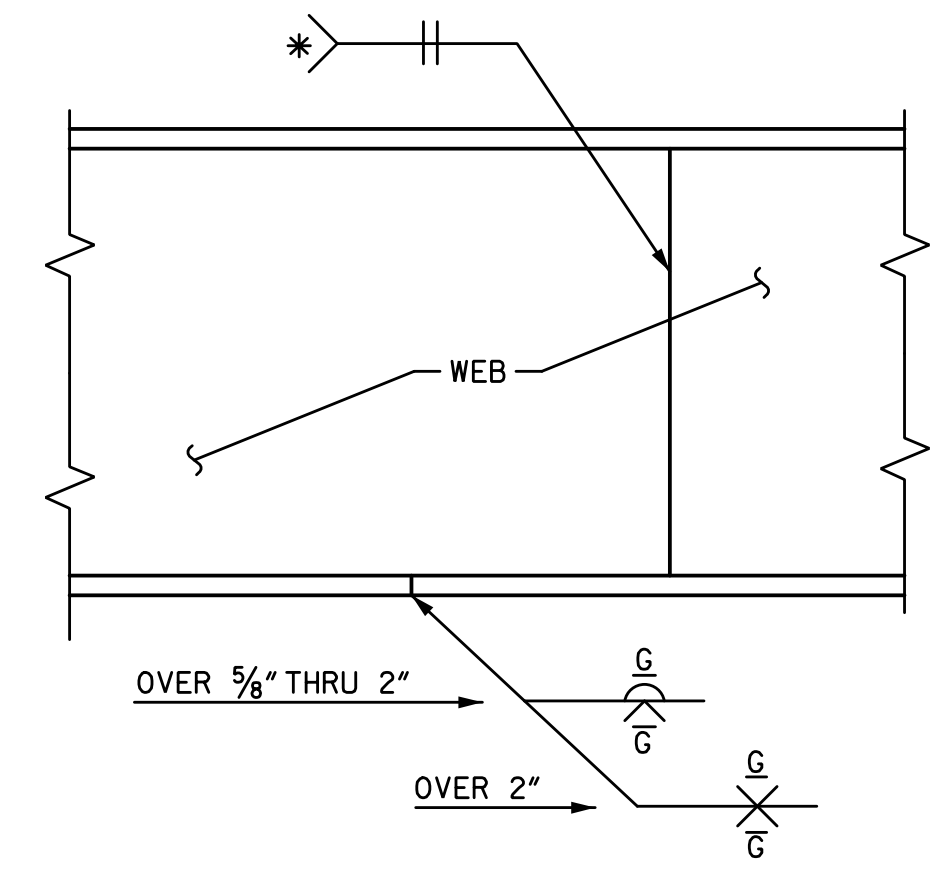
**BOTTOM FLANGE - DRIP BEAD DETAILS**



**DRIP BEAD DETAILS**

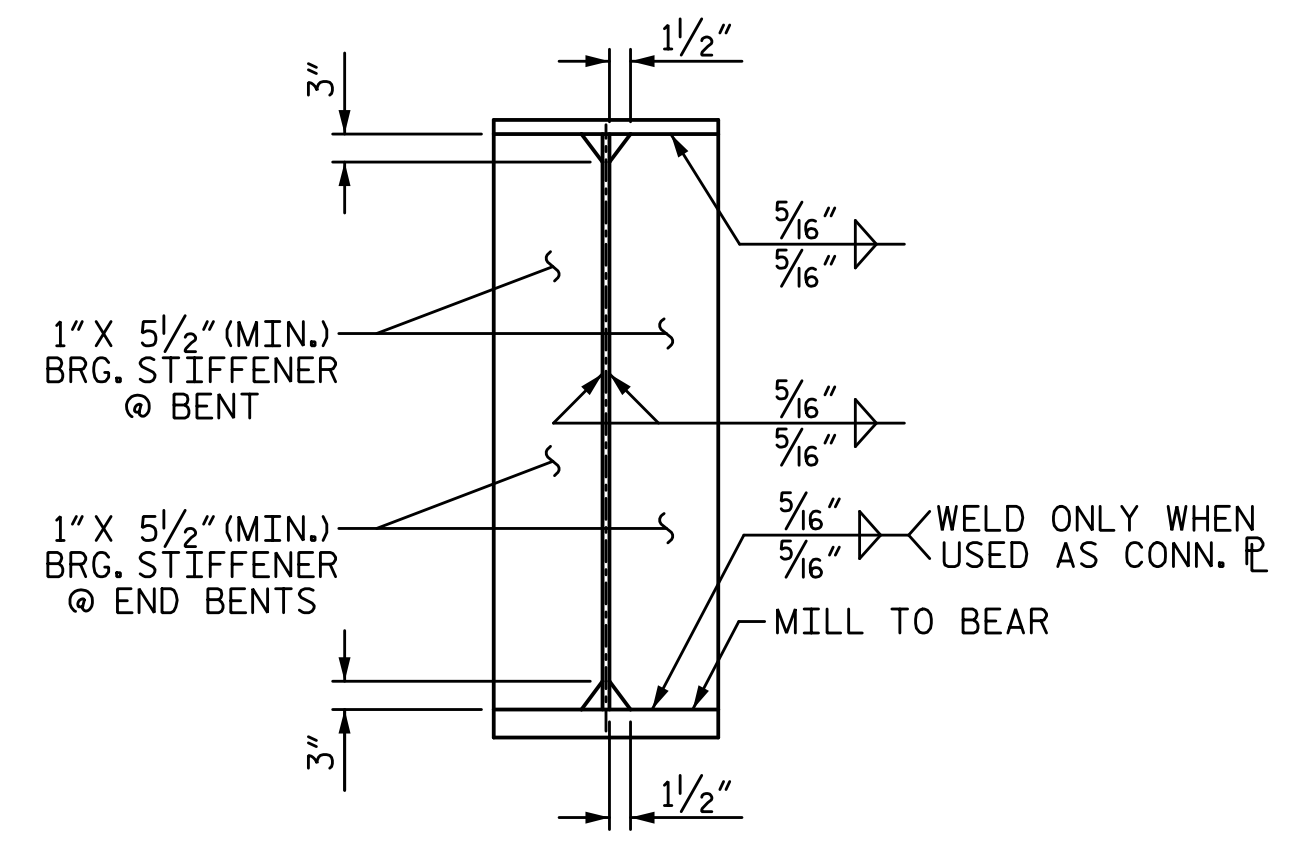


**TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTION  
WELD TERMINATION DETAILS**

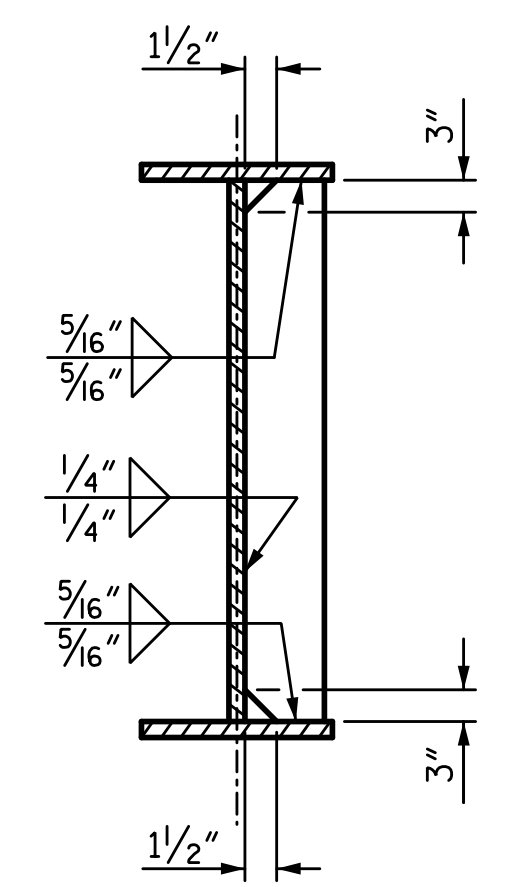


**TYPICAL FLANGE AND WEB BUTT JOINT**

\* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR GIRDERS

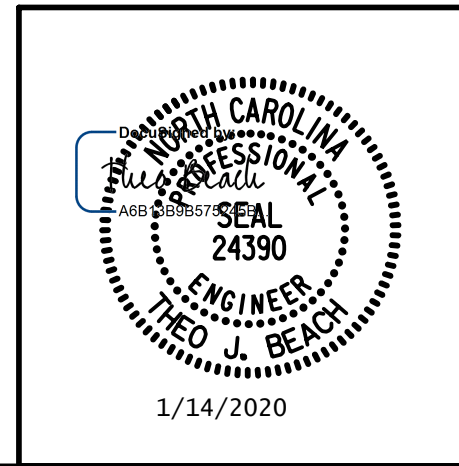


**BEARING STIFFENER**



**CONNECTOR PLATE DETAIL**

PLANS PREPARED BY:  
**SIMPSON ENGINEERS & ASSOCIATES**  
5640 Dillard Drive  
Suite 200  
Cary, NC 27518  
(919) 852-0468  
(919) 852-0598 (Fax)  
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PROJECT NO. I-5711  
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SHEET 4 OF 4

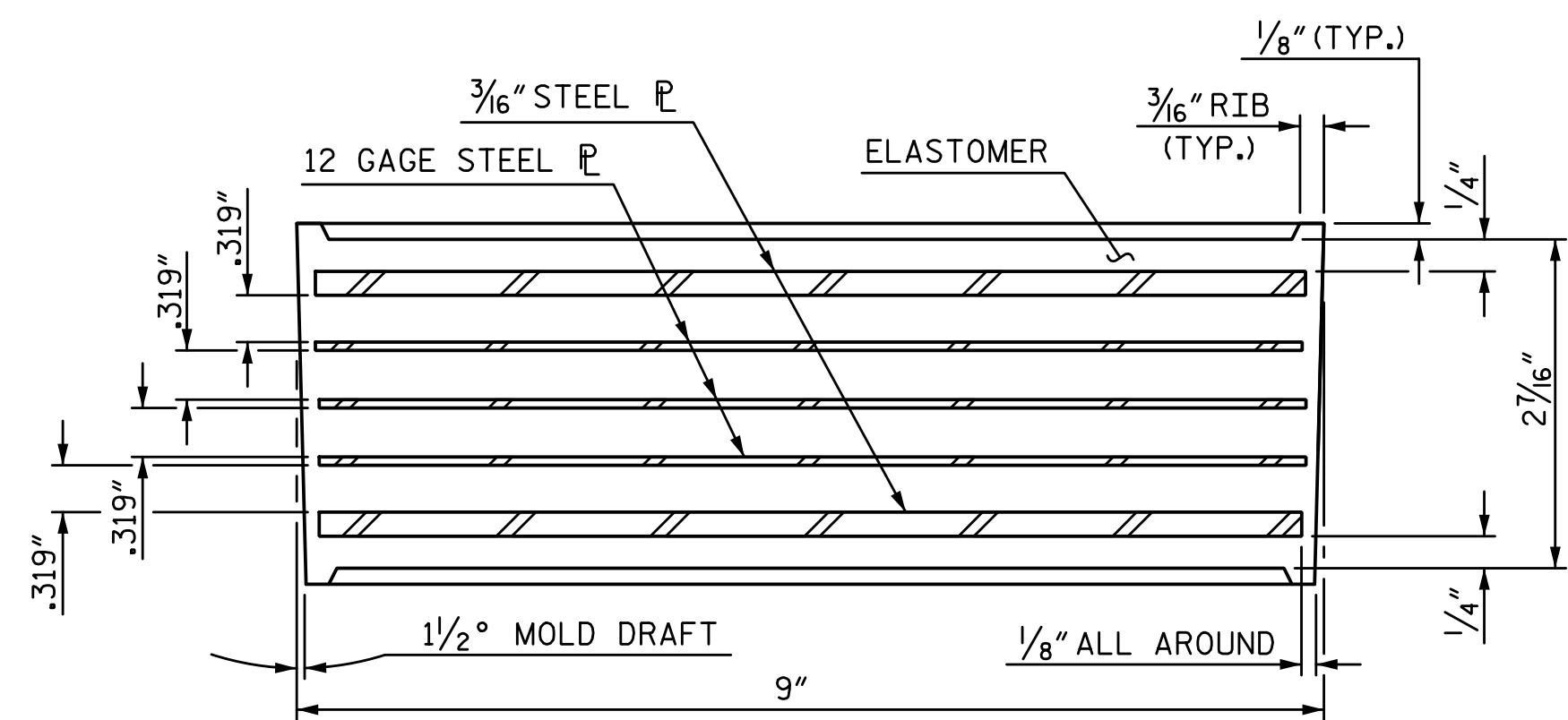
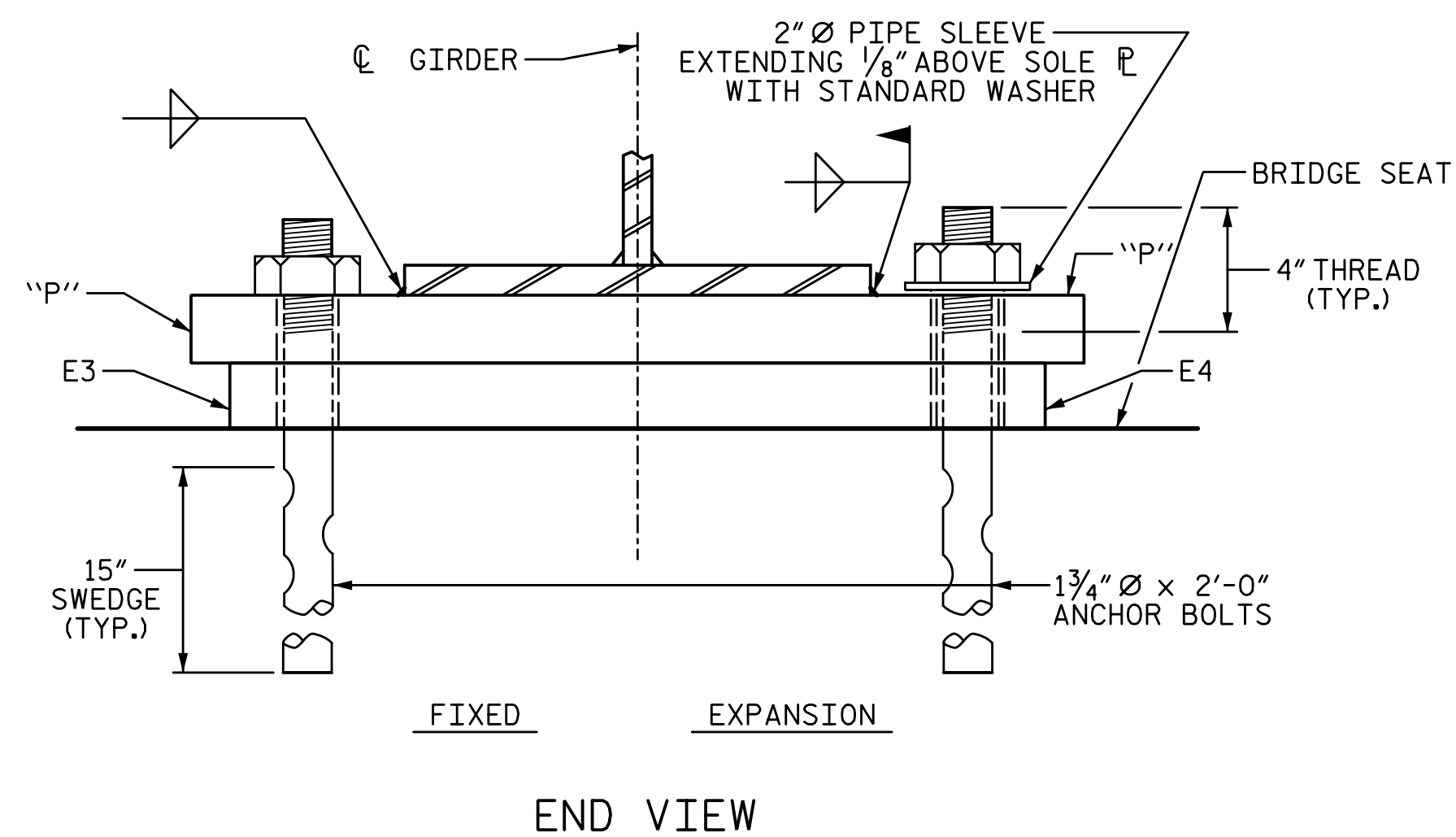
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DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**STRUCTURAL STEEL DETAILS**  
LEFT & RIGHT WIDENING

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			89

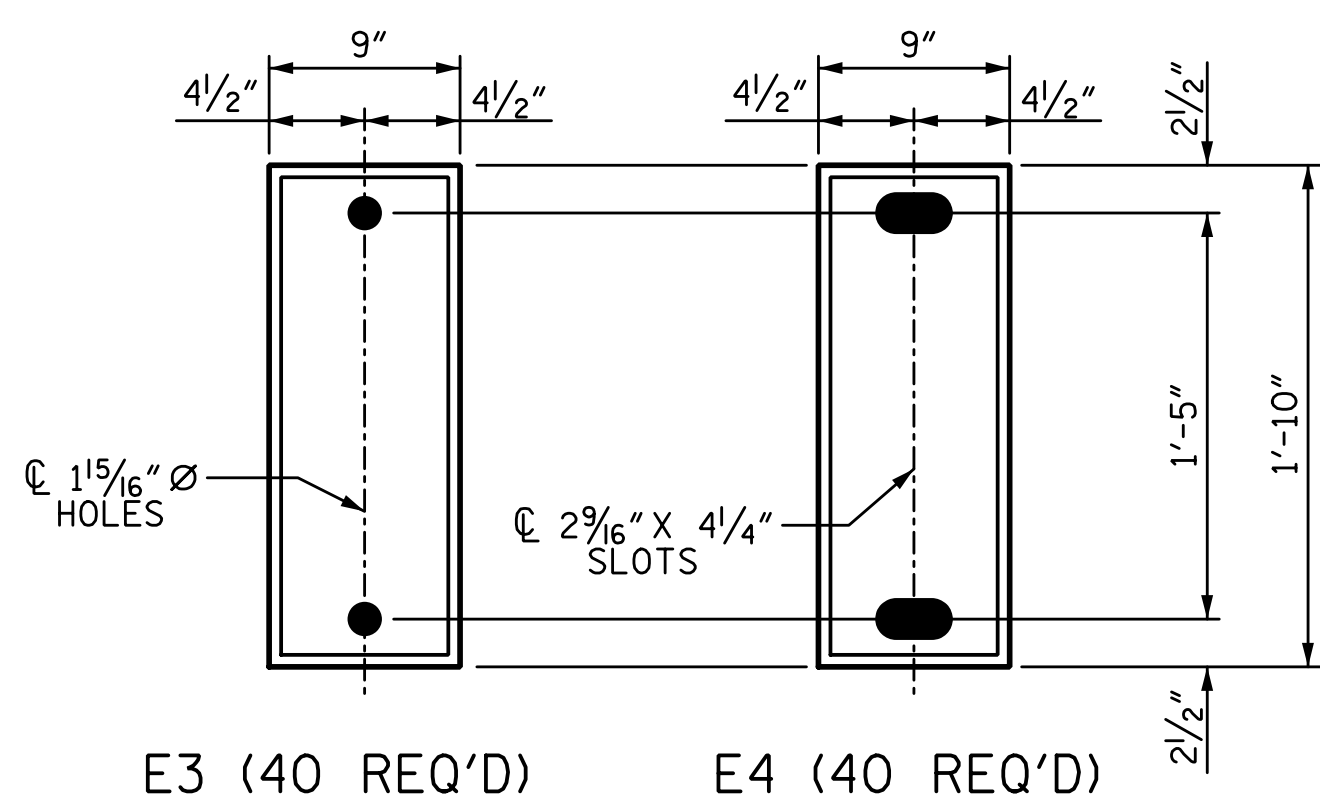
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DESIGN ENGINEER OF RECORD: T. BEACH DATE: 1-20

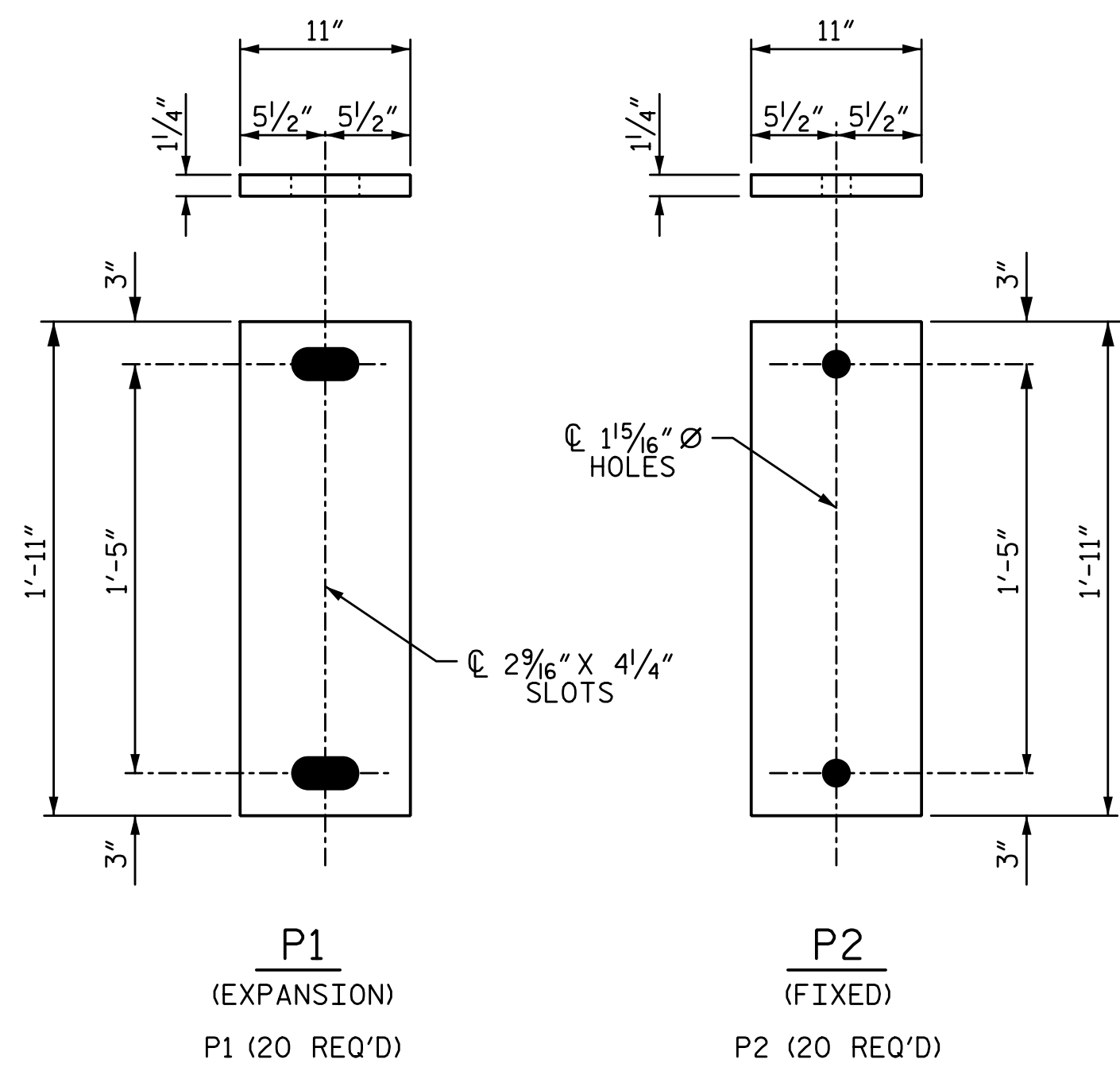


TYPICAL SECTION OF ELASTOMERIC BEARINGS



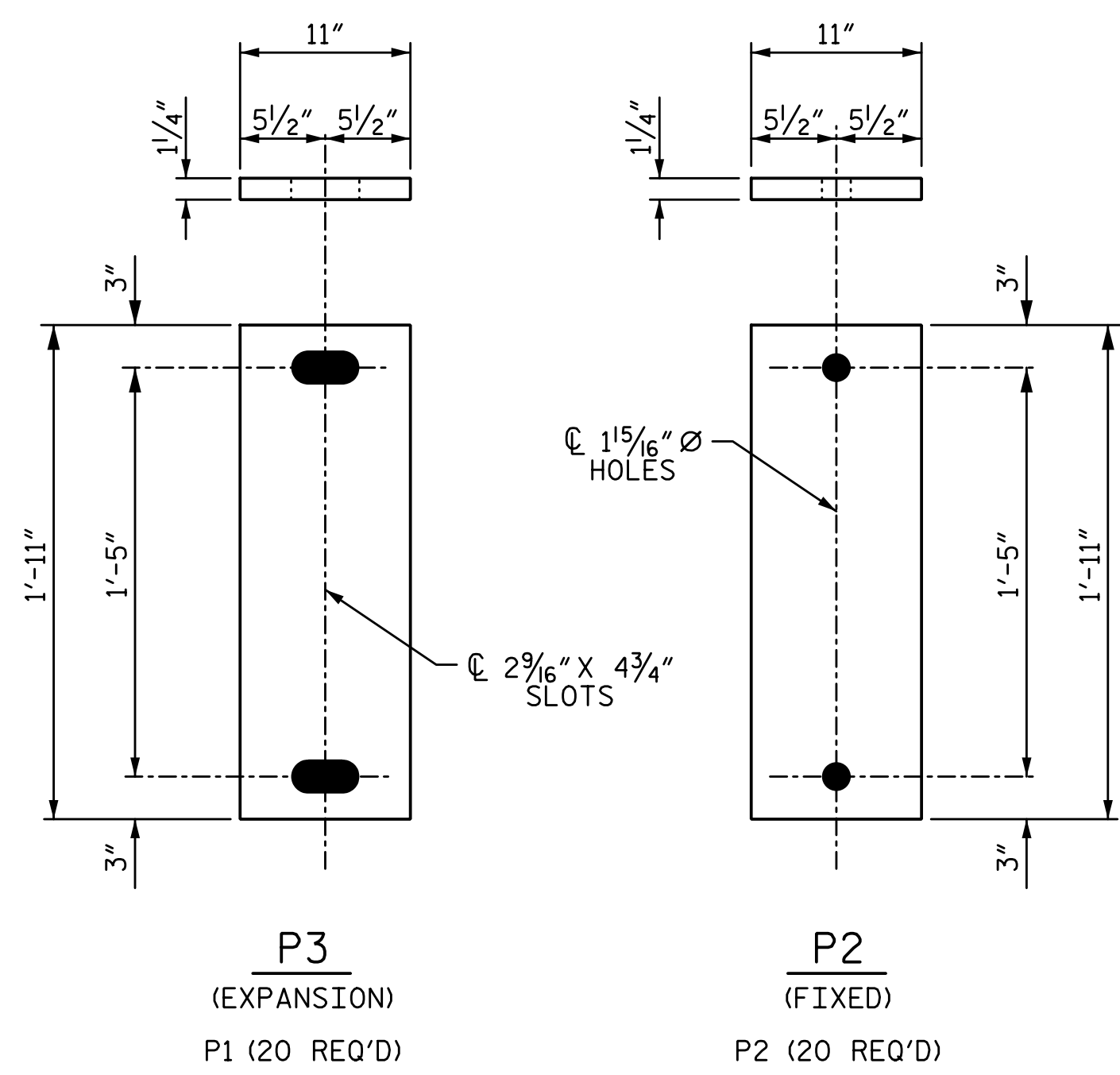
PLAN VIEW OF ELASTOMERIC BEARING

**TYPE II**  
(LEFT & RIGHT WIDENINGS)



SOLE PLATE DETAILS ('P')

(SPANS A & D)  
(LEFT & RIGHT WIDENINGS)



SOLE PLATE DETAILS ('P')

(SPANS B & C)  
(LEFT & RIGHT WIDENINGS)

**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.

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR PAINTED STRUCTURAL STEEL (EXCLUDING AASHTO M270 GRADE 50W), SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, 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.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURE, WHICH MAY BE REQUIRED BY THE ENGINEER, TO RESET ELASTOMERIC BEARINGS DUE TO GIRDER TRANSLATION AND END ROTATION:

- ONCE THE DECK HAS CURED, THE GIRDERS SHALL BE JACKED AND THE ELASTOMERIC BEARING SLOTS CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60° F.

THE CONTRACTOR MAY PROPOSE ALTERNATE METHODS, PROVIDED DETAILS ARE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE II	180 K

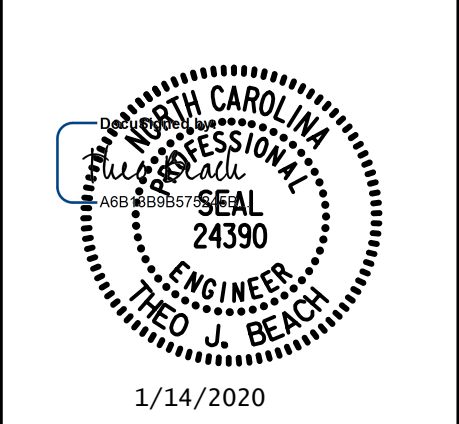
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ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**ELASTOMERIC BEARING DETAILS**  
LEFT & RIGHT WIDENING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			89

PLANS PREPARED BY:

**SE & A**  
SLIMPSON ENGINEERS & ASSOCIATES  
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www.slimpsonengr.com  
LICENSURE NO. C-2521



DRAWN BY: <u>S.D. COOPER</u>	DATE: <u>1-20</u>
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DESIGN ENGINEER OF RECORD: <u>T. BEACH</u>	DATE: <u>1-20</u>

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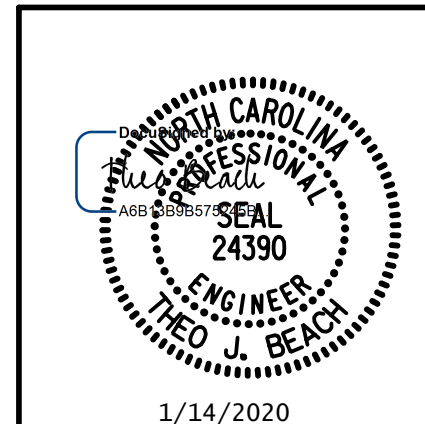
DEAD LOAD DEFLECTION TABLE FOR GIRDERS												
SPAN A												
0.6" Ø LOW RELAXATION GIRDER 1 & 10												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.001	.002	.003	.004	.004	.004	.003	.002	.001	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.002	.004	.007	.010	.011	.010	.007	.004	.002	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.001	.002	.004	.005	.005	.005	.004	.002	.001	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.004	.008	.014	.019	.020	.019	.014	.008	.004	0
VERTICAL CURVE ORDINATE	↑	0	.005	.009	.012	.014	.014	.014	.012	.009	.005	0
REQUIRED CAMBER	↑	0	1/8"	3/16"	5/16"	3/8"	7/16"	3/8"	5/16"	3/16"	1/8"	0
SPAN A												
0.6" Ø LOW RELAXATION GIRDER 2 & 9												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.001	.002	.003	.004	.004	.004	.003	.002	.001	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.002	.005	.008	.011	.012	.011	.008	.005	.002	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.001	.002	.003	.004	.004	.004	.003	.002	.001	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.004	.009	.014	.019	.020	.019	.014	.009	.004	0
VERTICAL CURVE ORDINATE	↑	0	.005	.009	.012	.014	.014	.014	.012	.009	.005	0
REQUIRED CAMBER	↑	0	1/8"	3/16"	5/16"	3/8"	7/16"	3/8"	5/16"	3/16"	1/8"	0
SPAN A												
0.6" Ø LOW RELAXATION GIRDER 3 & 8												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.001	.002	.003	.004	.004	.004	.003	.002	.001	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.002	.005	.008	.011	.012	.011	.008	.005	.002	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.001	.001	.002	.003	.003	.003	.002	.001	.001	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.004	.008	.013	.018	.019	.018	.013	.008	.004	0
VERTICAL CURVE ORDINATE	↑	0	.005	.009	.012	.014	.014	.014	.012	.009	.005	0
REQUIRED CAMBER	↑	0	1/8"	3/16"	5/16"	3/8"	3/8"	3/8"	5/16"	3/16"	1/8"	0
SPAN A												
0.6" Ø LOW RELAXATION GIRDER 4 & 7												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.001	.002	.003	.004	.004	.004	.003	.002	.001	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.002	.005	.008	.011	.012	.011	.008	.005	.002	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.000	.001	.001	.001	.002	.001	.001	.001	.000	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.003	.008	.012	.016	.018	.016	.012	.008	.003	0
VERTICAL CURVE ORDINATE	↑	0	.005	.009	.012	.014	.014	.014	.012	.009	.005	0
REQUIRED CAMBER	↑	0	1/8"	3/16"	5/16"	3/8"	3/8"	3/8"	5/16"	3/16"	1/8"	0
SPAN A												
0.6" Ø LOW RELAXATION GIRDER 5 & 6												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.001	.002	.003	.004	.004	.004	.003	.002	.001	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.001	.004	.007	.009	.010	.009	.007	.004	.001	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.000	.001	.001	.001	.001	.001	.001	.001	.000	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.002	.007	.011	.014	.015	.014	.011	.007	.002	0
VERTICAL CURVE ORDINATE	↑	0	.005	.009	.012	.014	.014	.014	.012	.009	.005	0
REQUIRED CAMBER	↑	0	1/16"	3/16"	1/4"	5/16"	3/8"	5/16"	1/4"	3/16"	1/16"	0

\* INCLUDES SLAB, BUILDUPS AND STAY-IN-PLACE FORMS. ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**DEAD LOAD DEFLECTION  
 AND GIRDER CAMBER  
 (SPAN A)**  
 (LEFT & RIGHT WIDENING)



PLANS PREPARED BY:  
**SIMPSON**  
**ENGINEERS**  
**& ASSOCIATES**  
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 (919) 852-0538 (Fax)  
 www.simpsonengr.com  
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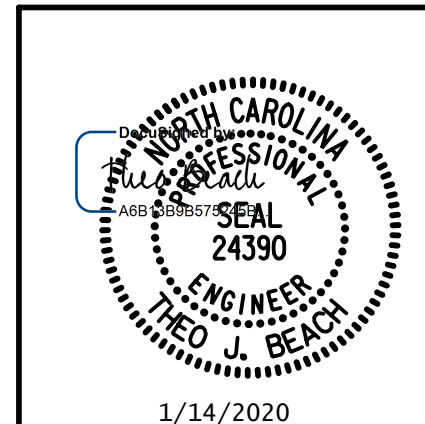
DEAD LOAD DEFLECTION TABLE FOR GIRDERS												
SPAN B & C												
0.6" Ø LOW RELAXATION GIRDER 1												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.012	.023	.032	.037	.039	.037	.032	.023	.012	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.011	.031	.051	.067	.072	.067	.051	.031	.011	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.005	.015	.026	.033	.036	.033	.026	.015	.005	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.028	.069	.109	.137	.147	.137	.109	.069	.028	0
VERTICAL CURVE ORDINATE	↑	0	.025	.044	.057	.065	.068	.065	.057	.044	.025	0
REQUIRED CAMBER	↑	0	5/8"	1 3/8"	2"	2 7/16"	2 9/16"	2 7/16"	2"	1 3/8"	5/8"	0
SPAN B & C												
0.6" Ø LOW RELAXATION GIRDER 2												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.012	.023	.032	.037	.039	.037	.032	.023	.012	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.012	.034	.056	.072	.078	.072	.056	.034	.012	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.004	.012	.020	.026	.028	.026	.020	.012	.004	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.028	.069	.108	.135	.145	.135	.108	.069	.028	0
VERTICAL CURVE ORDINATE	↑	0	.025	.044	.057	.065	.068	.065	.057	.044	.025	0
REQUIRED CAMBER	↑	0	5/8"	1 3/8"	2"	2 3/8"	2 9/16"	2 3/8"	2"	1 3/8"	5/8"	0
SPAN B & C												
0.6" Ø LOW RELAXATION GIRDER 3												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.012	.023	.032	.037	.039	.037	.032	.023	.012	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.012	.035	.058	.075	.081	.075	.058	.035	.012	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.003	.009	.015	.019	.020	.019	.015	.009	.003	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.027	.067	.105	.131	.140	.131	.105	.067	.027	0
VERTICAL CURVE ORDINATE	↑	0	.025	.044	.057	.065	.068	.065	.057	.044	.025	0
REQUIRED CAMBER	↑	0	5/8"	1 5/16"	1 15/16"	2 3/8"	2 1/2"	2 3/8"	1 15/16"	1 5/16"	5/8"	0
SPAN B & C												
0.6" Ø LOW RELAXATION GIRDER 4												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.012	.023	.032	.037	.039	.037	.032	.023	.012	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.012	.034	.056	.073	.078	.073	.056	.034	.012	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.002	.005	.009	.011	.012	.011	.009	.005	.002	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.026	.062	.097	.121	.129	.121	.097	.062	.026	0
VERTICAL CURVE ORDINATE	↑	0	.025	.044	.057	.065	.068	.065	.057	.044	.025	0
REQUIRED CAMBER	↑	0	5/8"	1 1/4"	1 7/8"	2 1/4"	2 3/8"	2 1/4"	1 7/8"	1 1/4"	5/8"	0
SPAN B & C												
0.6" Ø LOW RELAXATION GIRDER 5												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.012	.023	.032	.037	.039	.037	.032	.023	.012	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.009	.027	.044	.057	.062	.057	.044	.027	.009	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.001	.003	.004	.006	.006	.006	.004	.003	.001	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.022	.053	.080	.100	.107	.100	.080	.053	.022	0
VERTICAL CURVE ORDINATE	↑	0	.025	.044	.057	.065	.068	.065	.057	.044	.025	0
REQUIRED CAMBER	↑	0	9/16"	1 3/16"	1 5/8"	2"	2 1/8"	2"	1 5/8"	1 3/16"	9/16"	0

\* INCLUDES SLAB, BUILDUPS AND STAY-IN-PLACE FORMS. ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**DEAD LOAD DEFLECTION  
 AND GIRDER CAMBER  
 (SPANS B & C)**  
 (LEFT WIDENING)



PLANS PREPARED BY:  
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2			4			89

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DEAD LOAD DEFLECTION TABLE FOR GIRDERS												
SPAN B & C												
0.6" Ø LOW RELAXATION GIRDER 6												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.020	.038	.052	.061	.064	.061	.052	.038	.020	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.013	.038	.063	.082	.088	.082	.063	.038	.013	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.001	.004	.006	.008	.009	.008	.006	.004	.001	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.034	.080	.121	.151	.161	.151	.121	.080	.034	0
VERTICAL CURVE ORDINATE	↑	0	.025	.044	.057	.065	.068	.065	.057	.044	.025	0
REQUIRED CAMBER	↑	0	1 1/16"	1 1/2"	2 1/8"	2 9/16"	2 3/4"	2 9/16"	2 1/8"	1 1/2"	1 1/16"	0
SPAN B & C												
0.6" Ø LOW RELAXATION GIRDER 7												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.020	.038	.052	.061	.064	.061	.052	.038	.020	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.016	.048	.080	.104	.112	.104	.080	.048	.016	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.002	.007	.013	.016	.018	.016	.013	.007	.002	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.038	.093	.145	.181	.194	.181	.145	.093	.038	0
VERTICAL CURVE ORDINATE	↑	0	.025	.044	.057	.065	.068	.065	.057	.044	.025	0
REQUIRED CAMBER	↑	0	3/4"	1 5/8"	2 1/16"	2 15/16"	3 1/8"	2 15/16"	2 1/16"	1 5/8"	3/4"	0
SPAN B & C												
0.6" Ø LOW RELAXATION GIRDER 8												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.020	.038	.052	.061	.064	.061	.052	.038	.020	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.016	.049	.083	.108	.117	.108	.083	.049	.016	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.004	.013	.021	.027	.030	.027	.021	.013	.004	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.040	.100	.156	.196	.211	.196	.156	.100	.040	0
VERTICAL CURVE ORDINATE	↑	0	.025	.044	.057	.065	.068	.065	.057	.044	.025	0
REQUIRED CAMBER	↑	0	3/4"	1 3/4"	2 9/16"	3 1/8"	3 3/8"	3 1/8"	2 9/16"	1 3/4"	3/4"	0
SPAN B & C												
0.6" Ø LOW RELAXATION GIRDER 9												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.020	.038	.052	.061	.064	.061	.052	.038	.020	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.016	.048	.081	.105	.113	.105	.081	.048	.016	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.006	.017	.029	.038	.041	.038	.029	.017	.006	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.042	.103	.162	.204	.218	.204	.162	.103	.042	0
VERTICAL CURVE ORDINATE	↑	0	.025	.044	.057	.065	.068	.065	.057	.044	.025	0
REQUIRED CAMBER	↑	0	1 3/16"	1 3/4"	2 5/8"	3 1/4"	3 7/16"	3 1/4"	2 5/8"	1 3/4"	1 3/16"	0
SPAN B & C												
0.6" Ø LOW RELAXATION GIRDER 10												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.020	.038	.052	.061	.064	.061	.052	.038	.020	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.015	.044	.074	.097	.105	.097	.074	.044	.015	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.007	.022	.037	.048	.052	.048	.037	.022	.007	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.042	.104	.163	.206	.221	.206	.163	.104	.042	0
VERTICAL CURVE ORDINATE	↑	0	.025	.044	.057	.065	.068	.065	.057	.044	.025	0
REQUIRED CAMBER	↑	0	1 3/16"	1 3/4"	2 5/8"	3 1/4"	3 7/16"	3 1/4"	2 5/8"	1 3/4"	1 3/16"	0

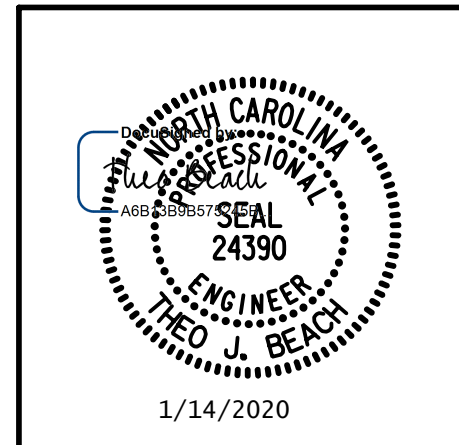
\* INCLUDES SLAB, BUILDUPS AND STAY-IN-PLACE FORMS. ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 3 OF 4

DRAWN BY: S.D. COOPER DATE: 1-20  
 CHECKED BY: T. BEACH DATE: 1-20  
 DESIGN ENGINEER OF RECORD: T. BEACH DATE: 1-20

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 LICENSURE NO. C-2521



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**DEAD LOAD DEFLECTION  
 AND GIRDER CAMBER  
 (SPANS B & C)  
 (RIGHT WIDENING)**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			89

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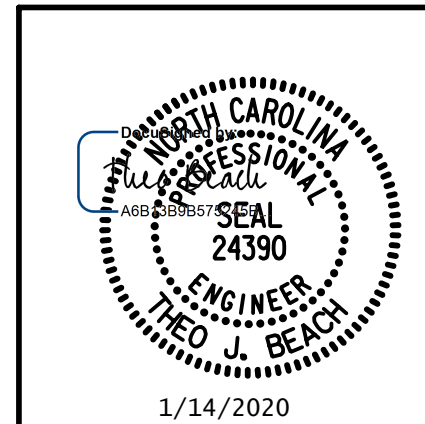
DEAD LOAD DEFLECTION TABLE FOR GIRDERS												
SPAN D												
0.6" Ø LOW RELAXATION GIRDER 1 & 10												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.001	.002	.003	.004	.004	.004	.003	.002	.001	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.001	.004	.006	.008	.009	.008	.006	.004	.001	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.001	.002	.003	.004	.005	.004	.003	.002	.001	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.003	.008	.012	.016	.018	.016	.012	.008	.003	0
VERTICAL CURVE ORDINATE	↑	0	.000	.000	.000	.000	.000	.000	.000	.000	.000	0
REQUIRED CAMBER	↑	0	1/16"	1/8"	1/8"	3/16"	3/16"	3/16"	1/8"	1/8"	1/16"	0
SPAN D												
0.6" Ø LOW RELAXATION GIRDER 2 & 9												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.001	.002	.003	.004	.004	.004	.003	.002	.001	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.001	.004	.007	.009	.010	.009	.007	.004	.001	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.001	.002	.003	.003	.004	.003	.003	.002	.001	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.003	.008	.013	.016	.018	.016	.013	.008	.003	0
VERTICAL CURVE ORDINATE	↑	0	.000	.000	.000	.000	.000	.000	.000	.000	.000	0
REQUIRED CAMBER	↑	0	1/16"	1/8"	1/8"	3/16"	3/16"	3/16"	1/8"	1/8"	1/16"	0
SPAN D												
0.6" Ø LOW RELAXATION GIRDER 3 & 8												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.001	.002	.003	.004	.004	.004	.003	.002	.001	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.002	.004	.007	.009	.010	.009	.007	.004	.002	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.000	.001	.002	.003	.003	.003	.002	.001	.000	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.003	.007	.012	.016	.017	.016	.012	.007	.003	0
VERTICAL CURVE ORDINATE	↑	0	.000	.000	.000	.000	.000	.000	.000	.000	.000	0
REQUIRED CAMBER	↑	0	1/16"	1/16"	1/8"	3/16"	3/16"	3/16"	1/8"	1/16"	1/16"	0
SPAN D												
0.6" Ø LOW RELAXATION GIRDER 4 & 7												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.001	.002	.003	.004	.004	.004	.003	.002	.001	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.002	.004	.007	.009	.010	.009	.007	.004	.002	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.000	.001	.001	.001	.001	.001	.001	.001	.000	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.003	.007	.011	.014	.015	.014	.011	.007	.003	0
VERTICAL CURVE ORDINATE	↑	0	.000	.000	.000	.000	.000	.000	.000	.000	.000	0
REQUIRED CAMBER	↑	0	1/16"	1/16"	1/8"	3/16"	3/16"	3/16"	1/8"	1/16"	1/16"	0
SPAN D												
0.6" Ø LOW RELAXATION GIRDER 5 & 6												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	.001	.002	.003	.004	.004	.004	.003	.002	.001	0
*DEFLECTION DUE TO WEIGHT OF SLAB	↓	0	.001	.004	.006	.008	.009	.008	.006	.004	.001	0
DEFLECTION DUE TO WEIGHT OF RAIL AND SIDEWALK	↓	0	.000	.000	.001	.001	.001	.001	.001	.000	.000	0
TOTAL DEAD LOAD DEFLECTION	↓	0	.002	.006	.010	.013	.014	.013	.010	.006	.002	0
VERTICAL CURVE ORDINATE	↑	0	.000	.000	.000	.000	.000	.000	.000	.000	.000	0
REQUIRED CAMBER	↑	0	0	1/16"	1/8"	1/8"	3/16"	1/8"	1/8"	1/16"	0	0

\* INCLUDES SLAB, BUILDUPS AND STAY-IN-PLACE FORMS. ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**DEAD LOAD DEFLECTION  
 AND GIRDER CAMBER  
 (SPAN D)**  
 (LEFT & RIGHT WIDENING)



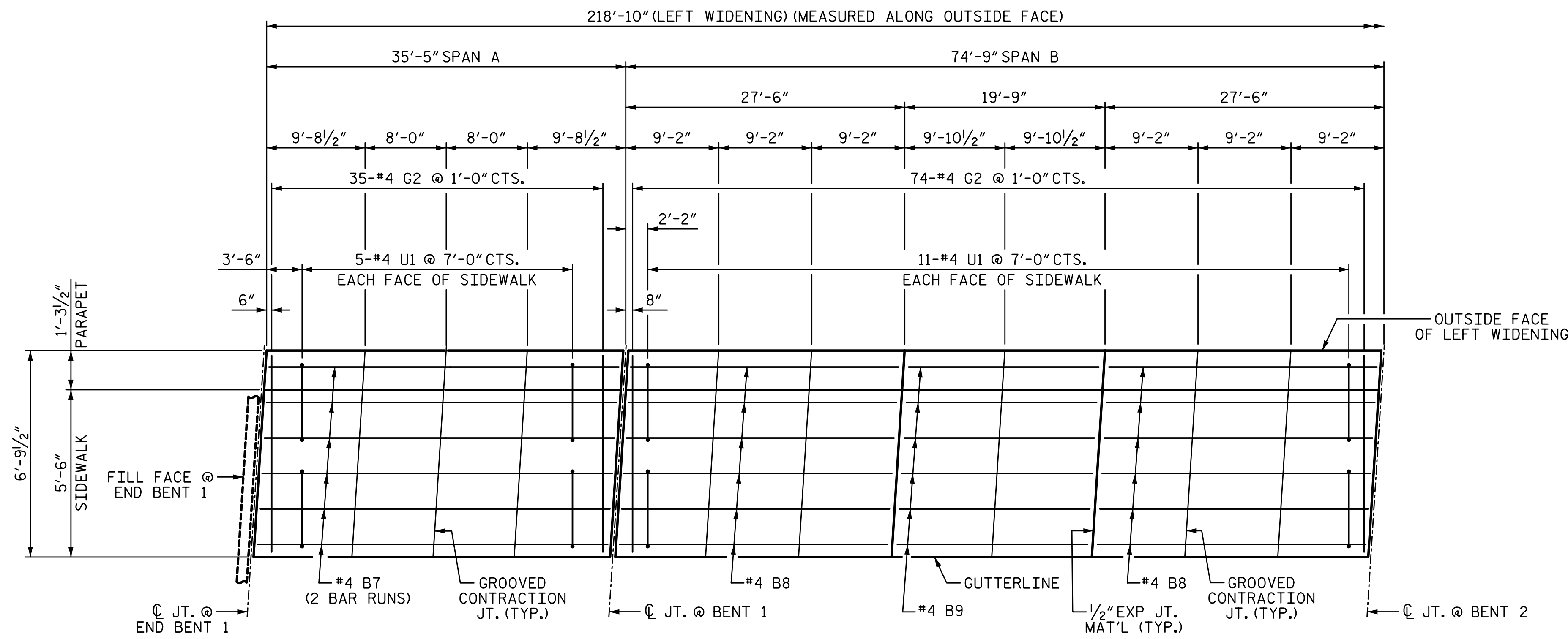
PLANS PREPARED BY:  
**SIMPSON**  
 ENGINEERS  
 & ASSOCIATES  
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 www.simpsonengr.com  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			89

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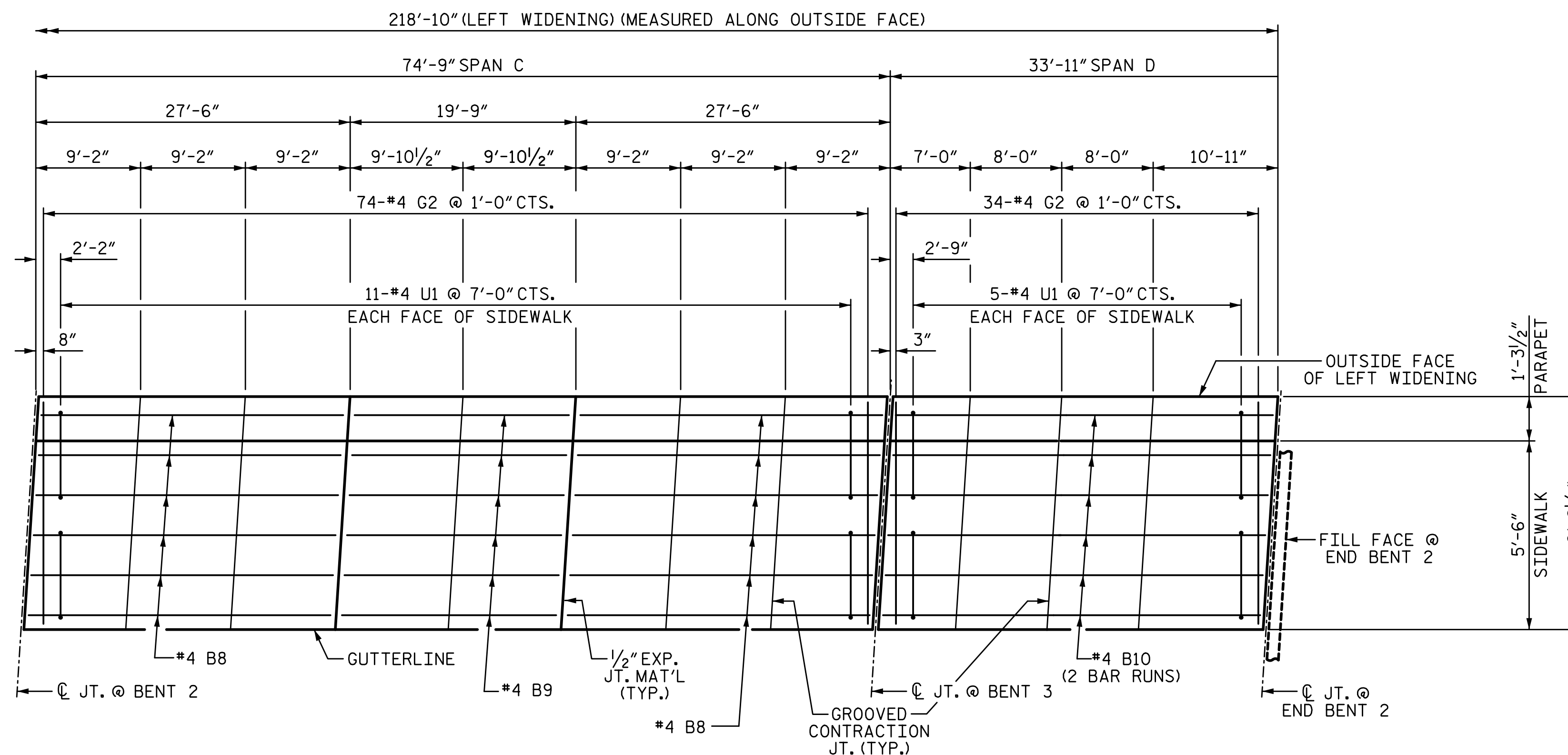
DRAWN BY: S.D. COOPER DATE: 1-20  
 CHECKED BY: T. BEACH DATE: 1-20  
 DESIGN ENGINEER OF RECORD: T. BEACH DATE: 1-20





**PLAN OF SIDEWALK**

SPAN A & B  
(END POSTS NOT SHOWN FOR CLARITY)



**PLAN OF SIDEWALK**

SPAN C & D  
(END POSTS NOT SHOWN FOR CLARITY)

**NOTES:**

SIDEWALK IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS.

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

SEE APPROACH SLAB SHEETS FOR SIDEWALK ON APPROACH SLABS.

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

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PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**SIDEWALK DETAILS**

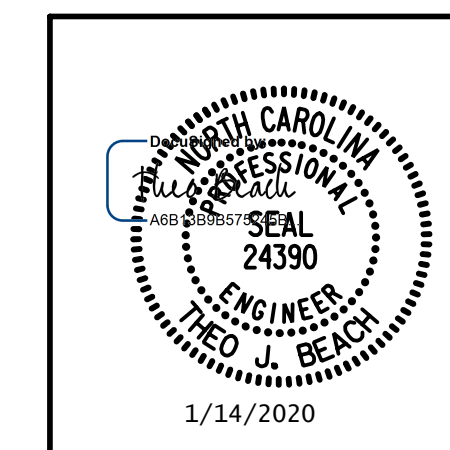
LEFT WIDENING

REVISIONS

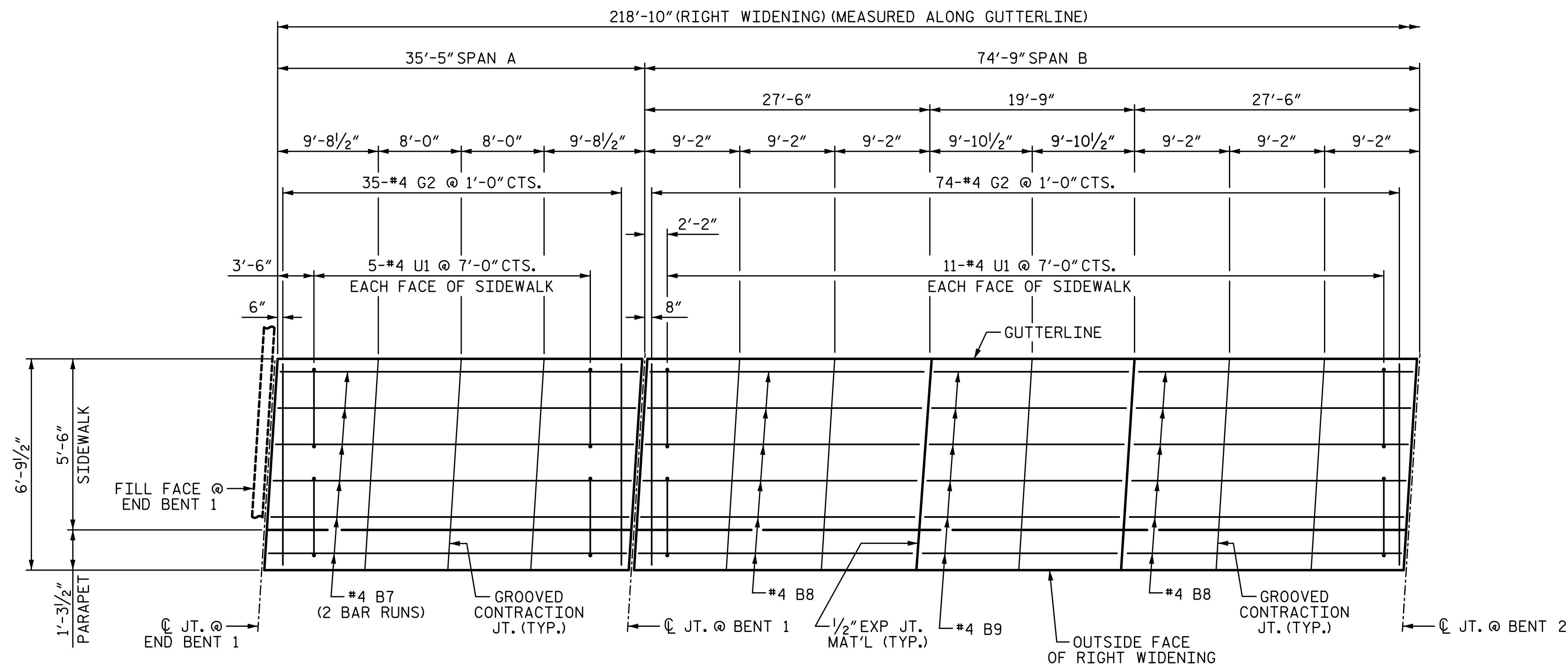
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-28
2			4			TOTAL SHEETS 89

PLANS PREPARED BY:

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 (919) 852-0598 (Fax)  
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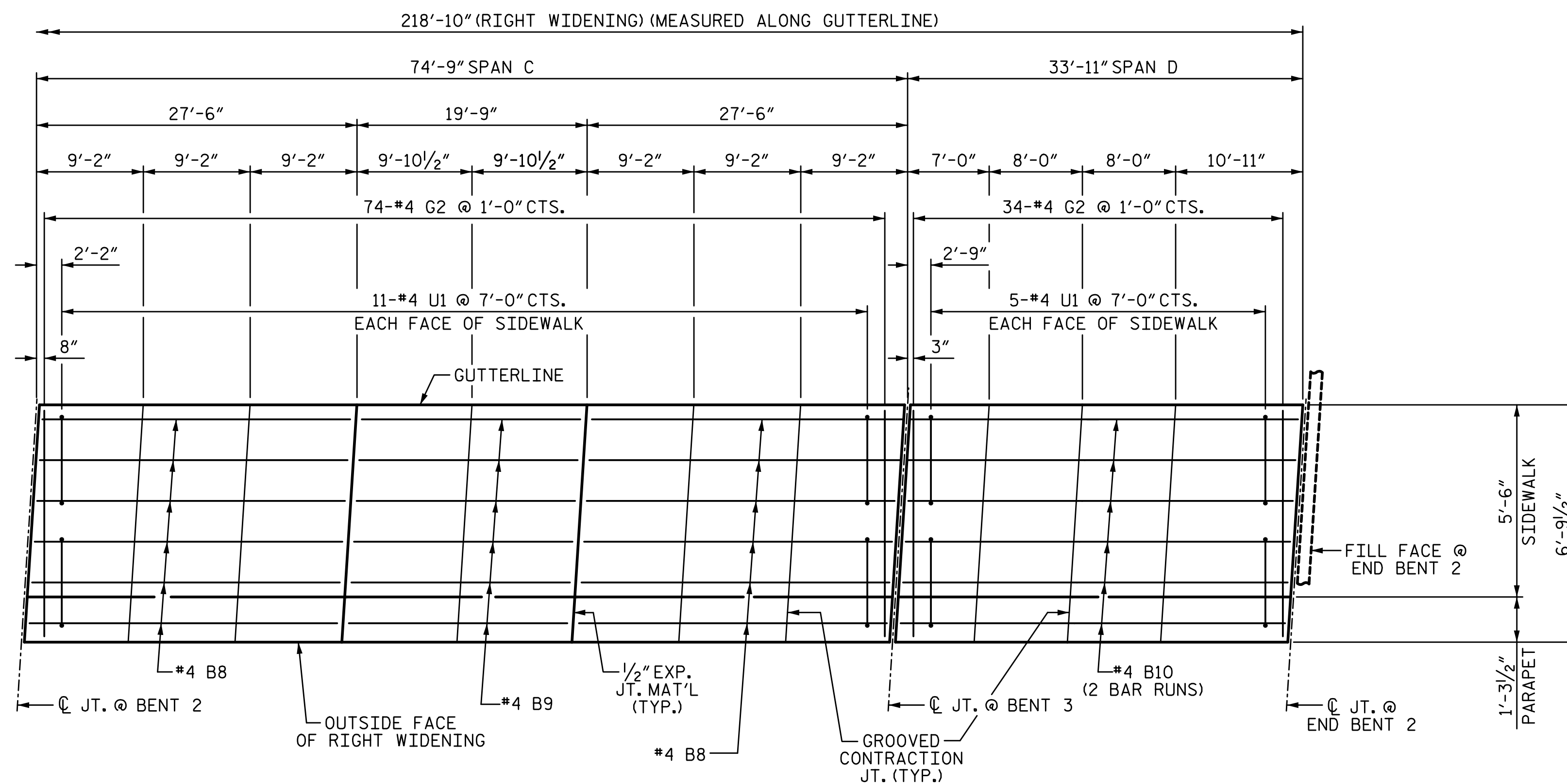


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**PLAN OF SIDEWALK**

SPAN A & B  
(END POSTS NOT SHOWN FOR CLARITY)



**PLAN OF SIDEWALK**

SPAN C & D  
(END POSTS NOT SHOWN FOR CLARITY)

**NOTES:**

SIDEWALK IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS.

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

SEE APPROACH SLAB SHEETS FOR SIDEWALK ON APPROACH SLABS.

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

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PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**SIDEWALK DETAILS**

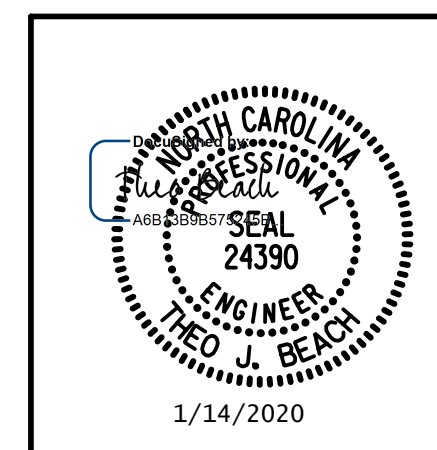
RIGHT WIDENING

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-29
2			4			TOTAL SHEETS 89

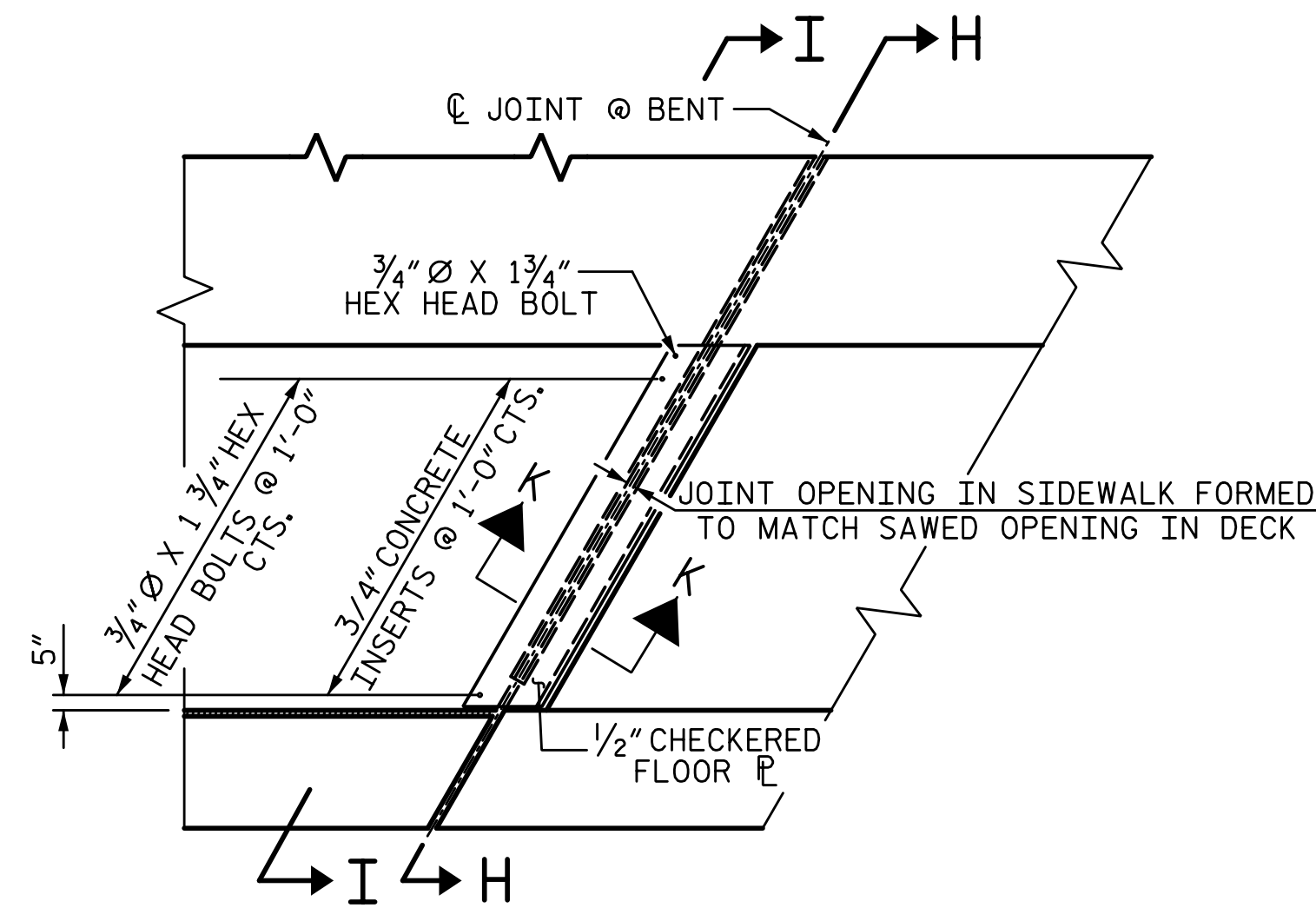
PLANS PREPARED BY:

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 (919) 852-0468  
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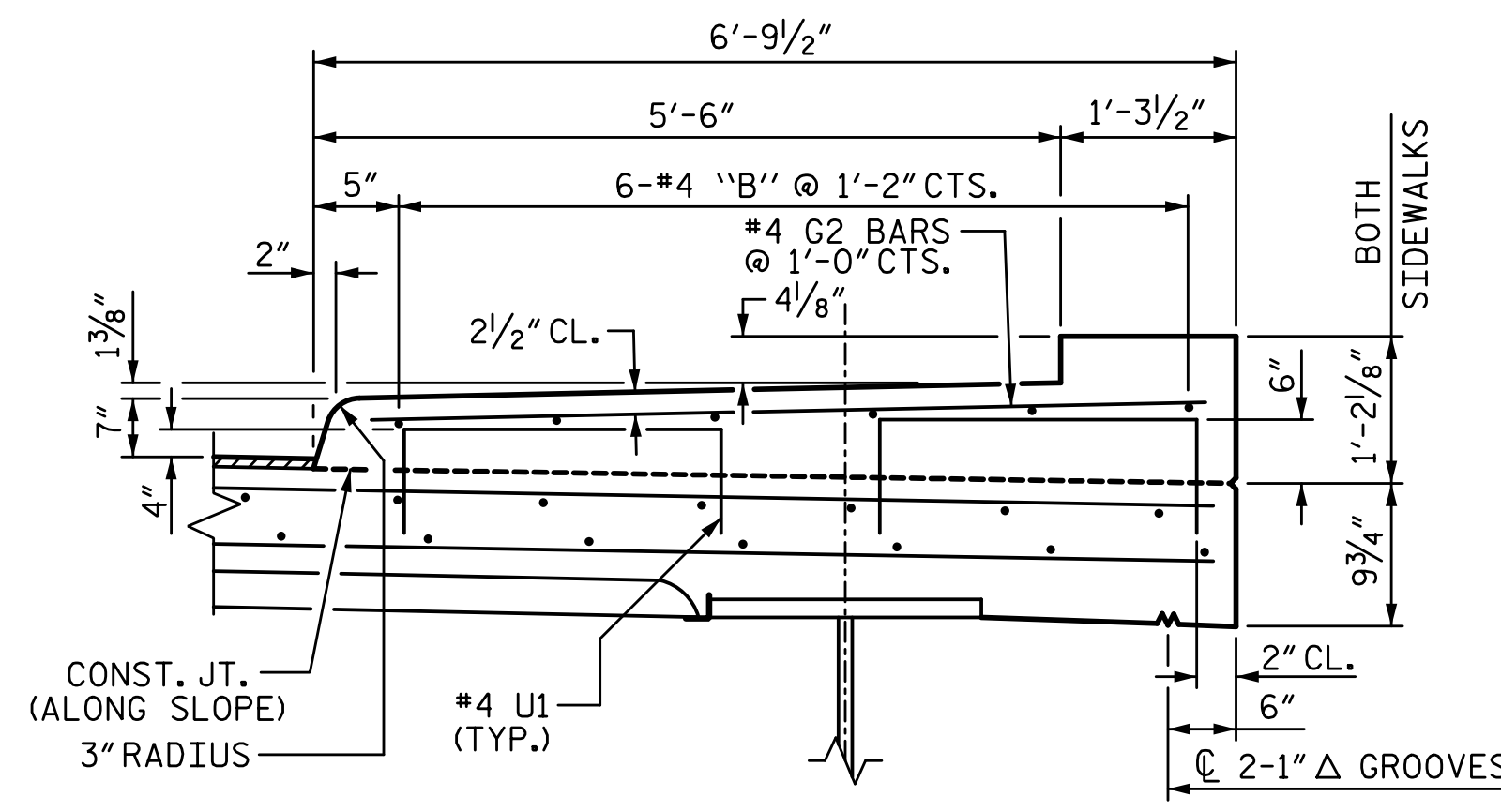


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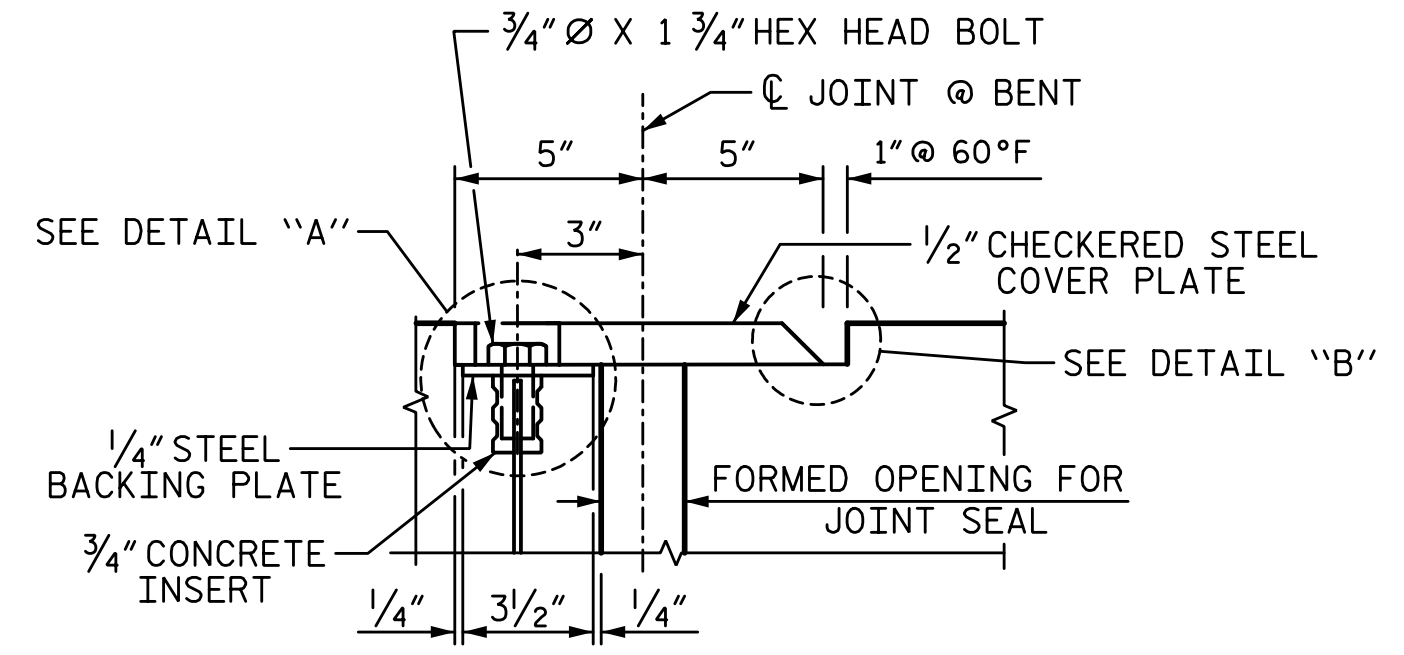




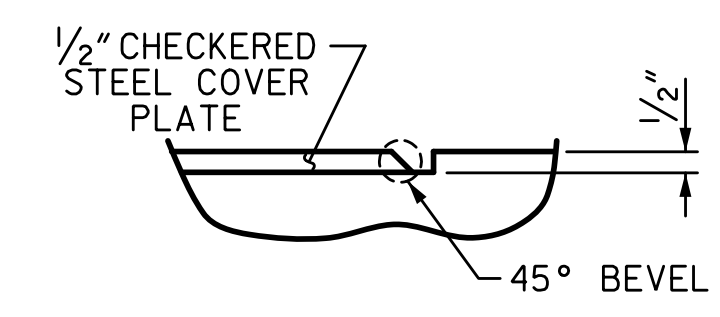
**PLAN OF FOAM JOINT SEAL WITH COVER PLATE**  
AT BENT 1, 2 AND 3



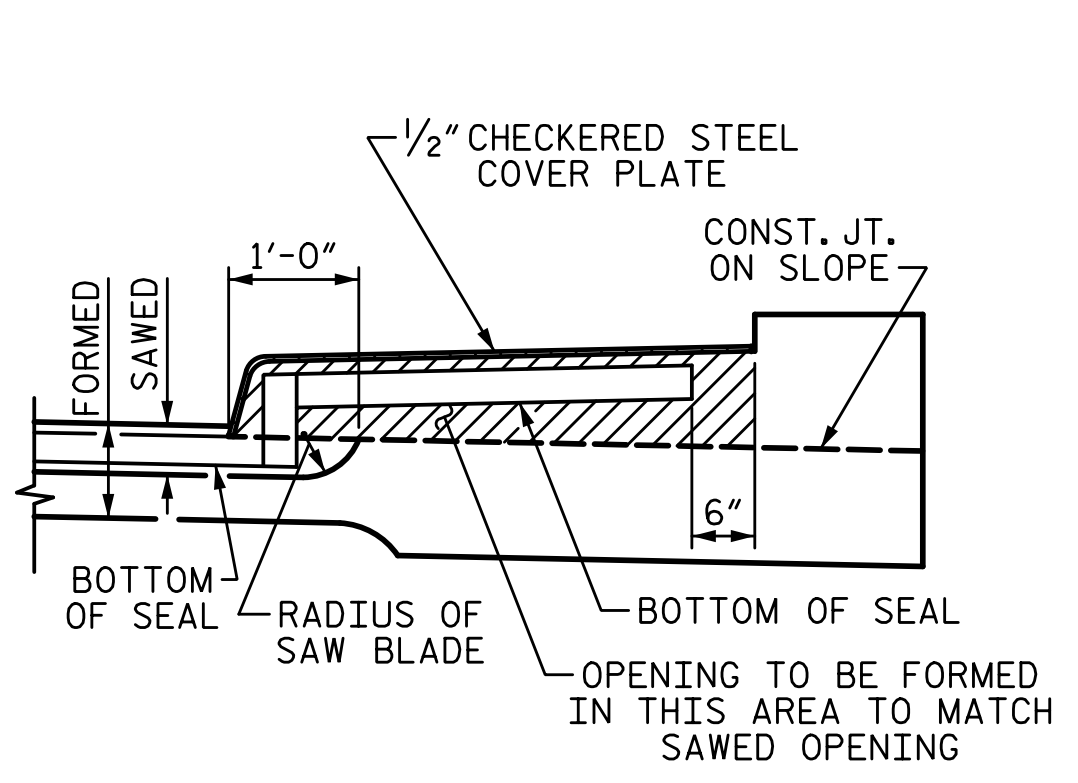
**SECTION THRU SIDEWALK**



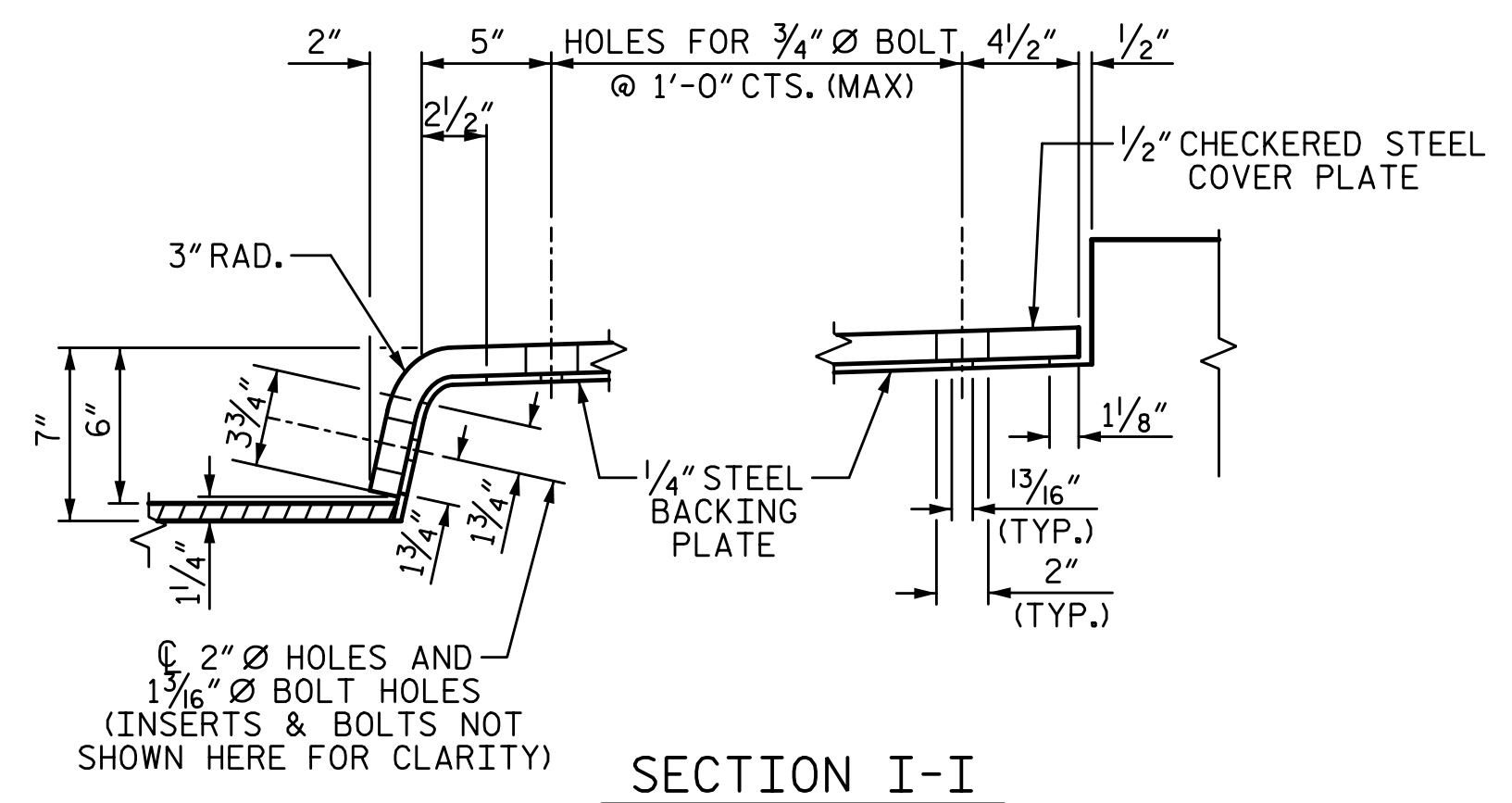
**SECTION K-K**



**DETAIL 'B'**



**SECTION H-H**



**SECTION I-I**

**SIDEWALK COVER PLATE DETAILS FOR FOAM JOINT SEALS @ BENTS**

**NOTES:**

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

THE 3/4" DIAMETER HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

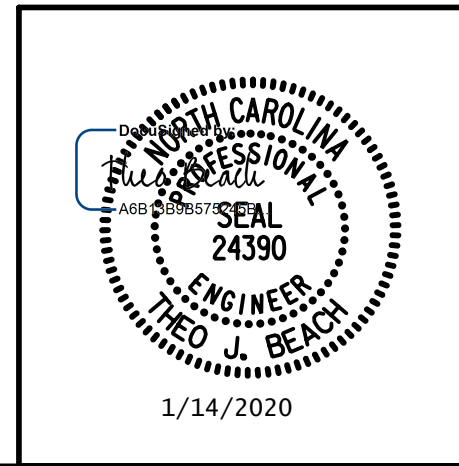
THE 3/4" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14, AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LBS.

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

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DRAWN BY: S.D. COOPER	DATE: 1-20
CHECKED BY: T. BEACH	DATE: 1-20
DESIGN ENGINEER OF RECORD: T. BEACH	DATE: 1-20

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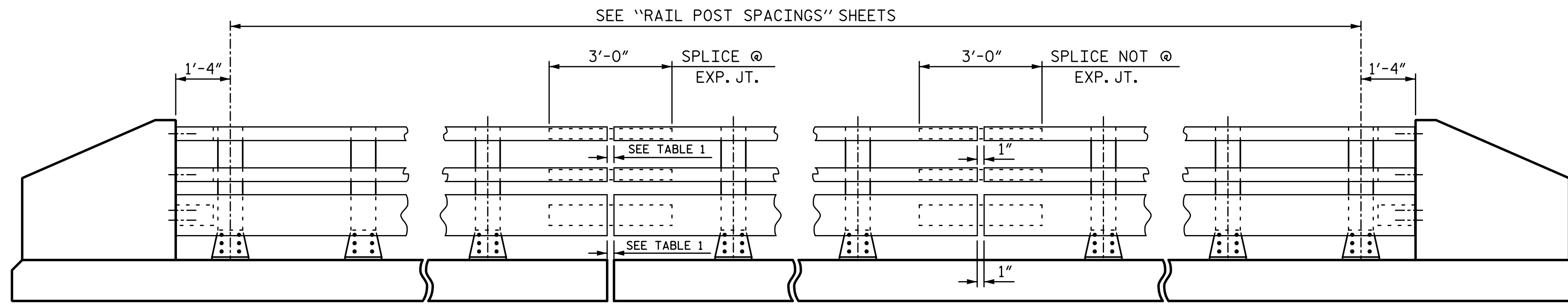
PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE					
<b>SIDEWALK DETAILS</b>					
LEFT & RIGHT WIDENING					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-30
					TOTAL SHEETS 89

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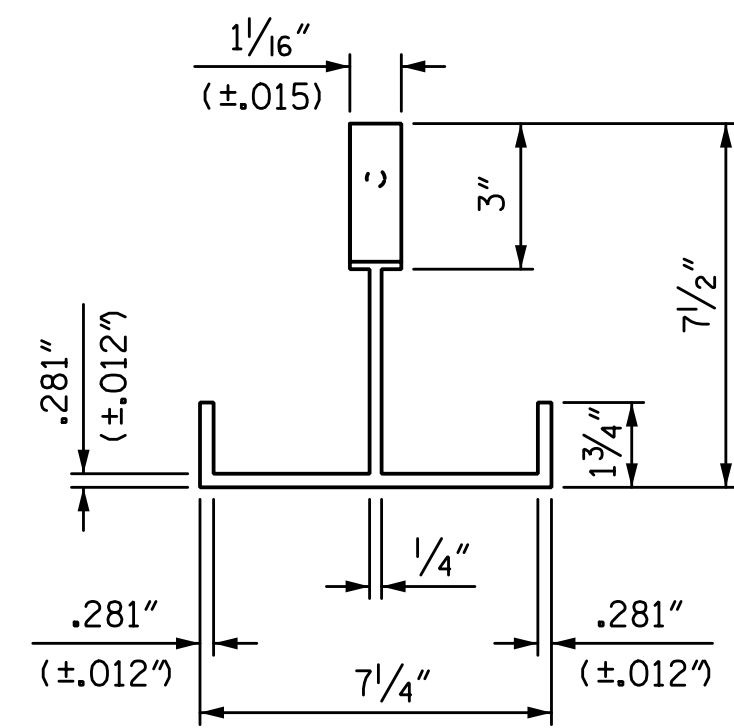




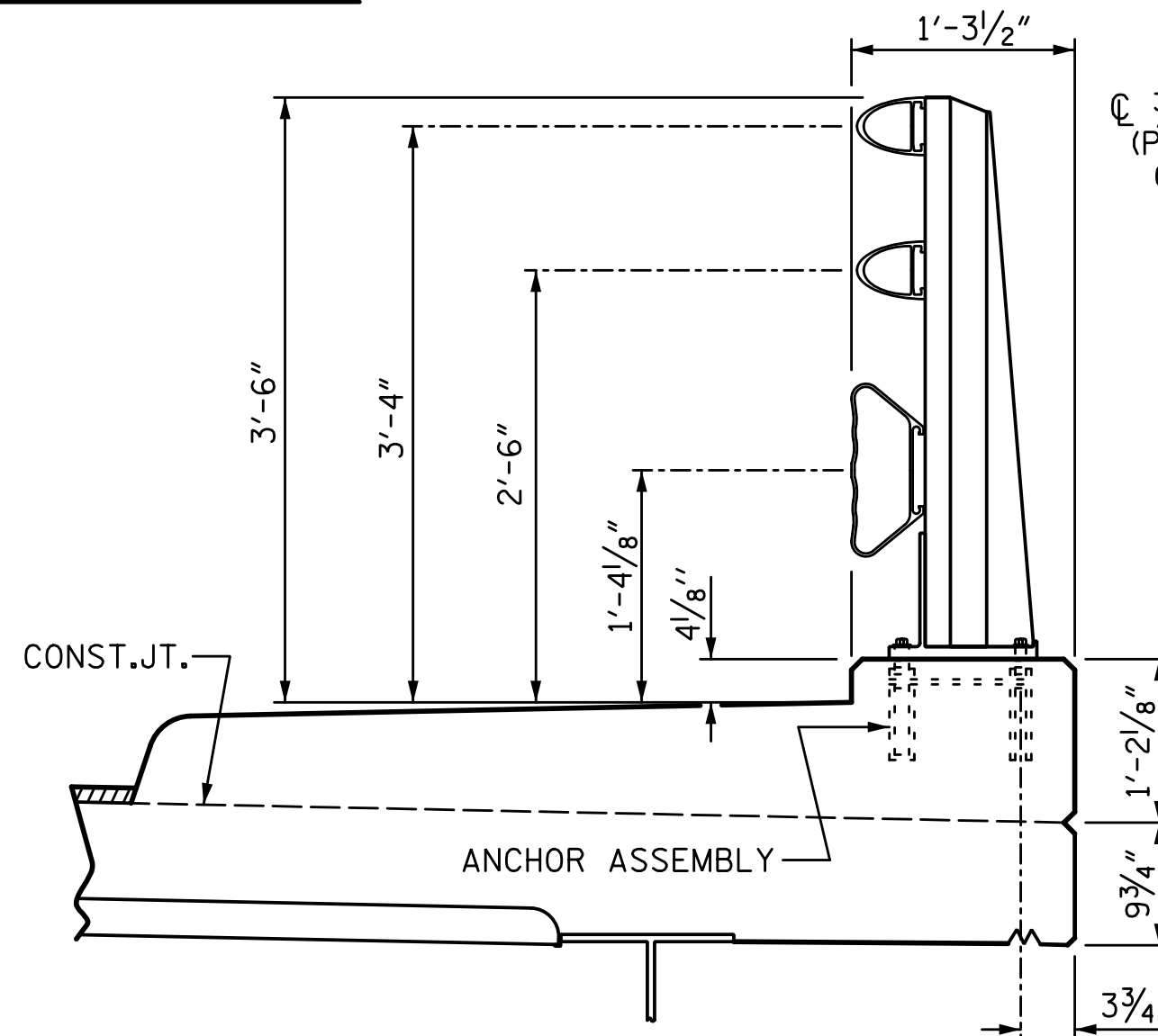
ELEVATION

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

TABLE 1	
EXP. JT. BENT	RAIL OPENING
BENT No. 1	1 7/16"
BENT No. 2	1 7/16"
BENT No. 3	1 7/16"

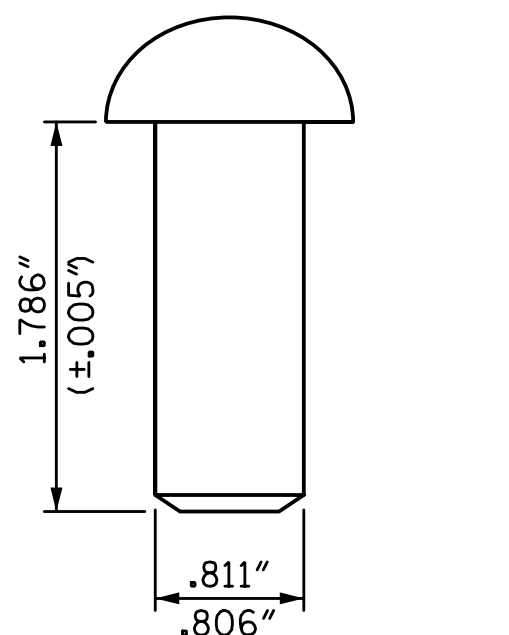


PLAN

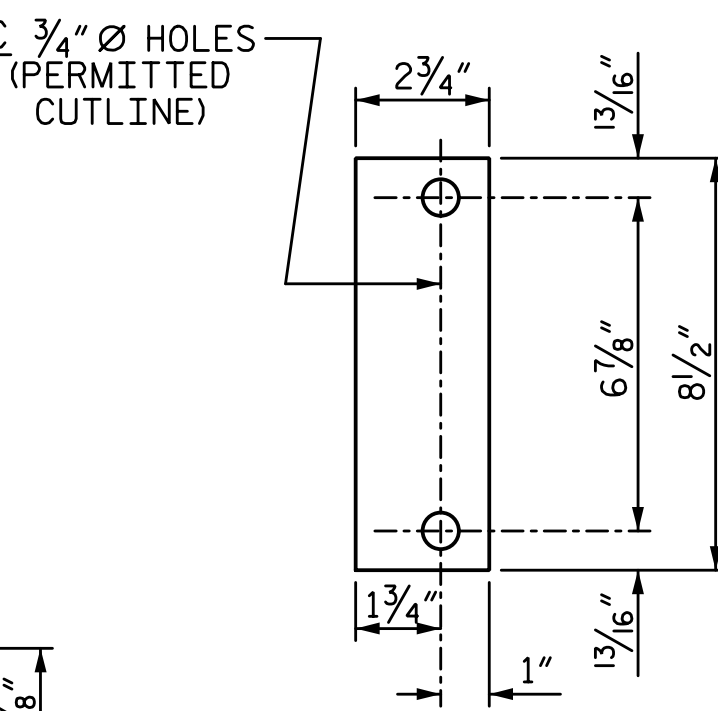


SECTION THRU RAIL

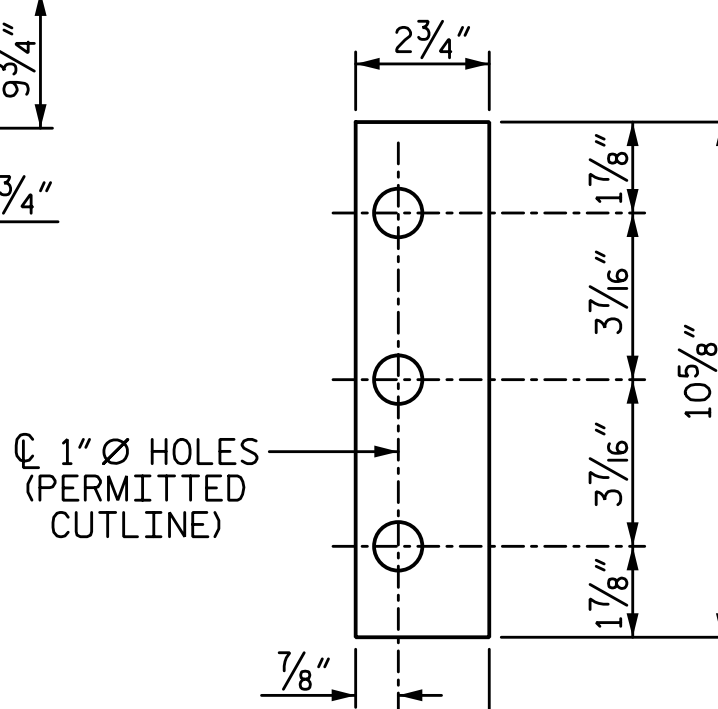
FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL"  
SHEET 2 OF 3.



RIVET DETAIL



REAR PLATE



FRONT PLATE

SHIM DETAILS

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

NOTES:

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

ALUMINUM RAILS

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

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

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES:

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

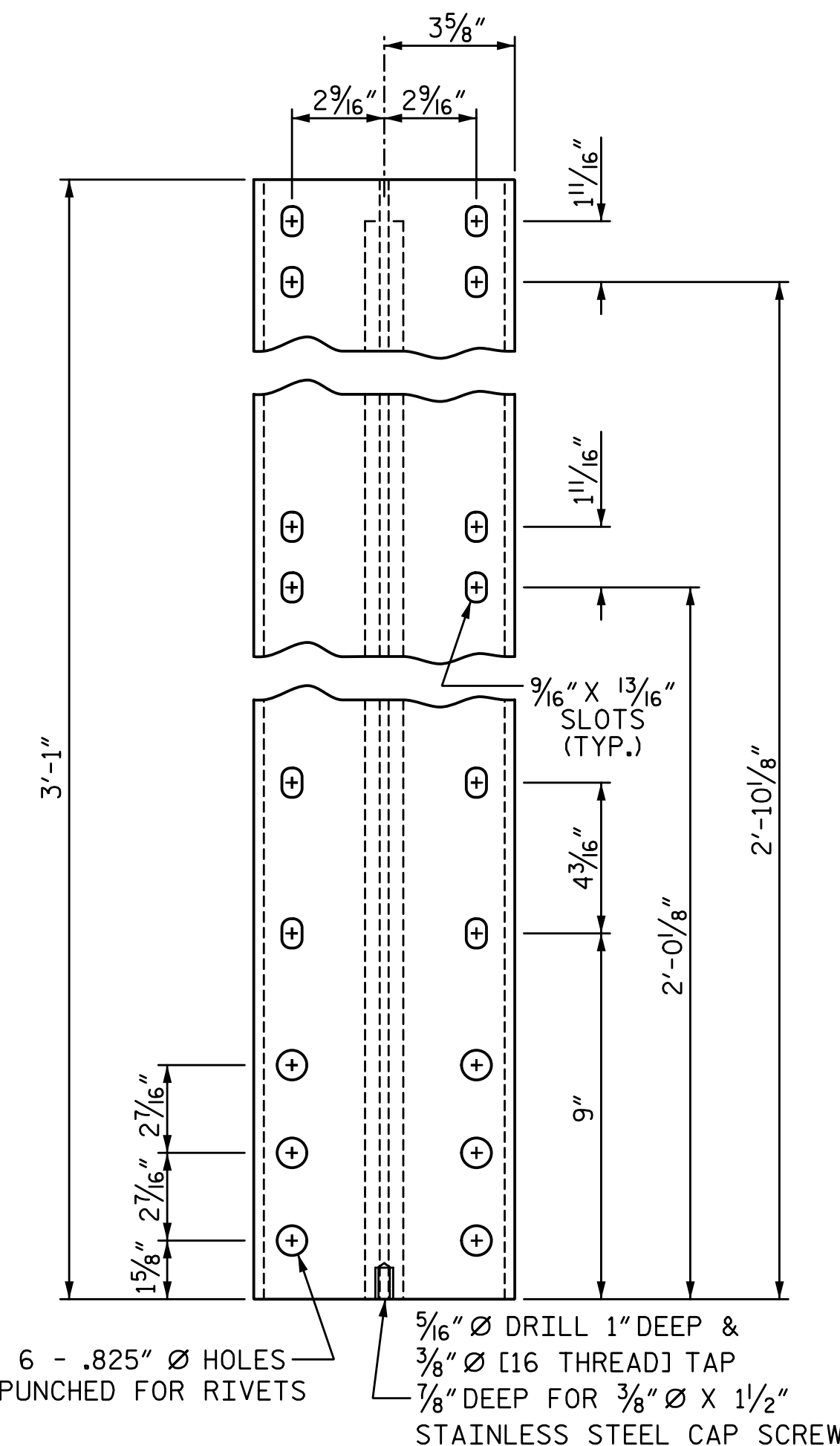
TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAIN VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

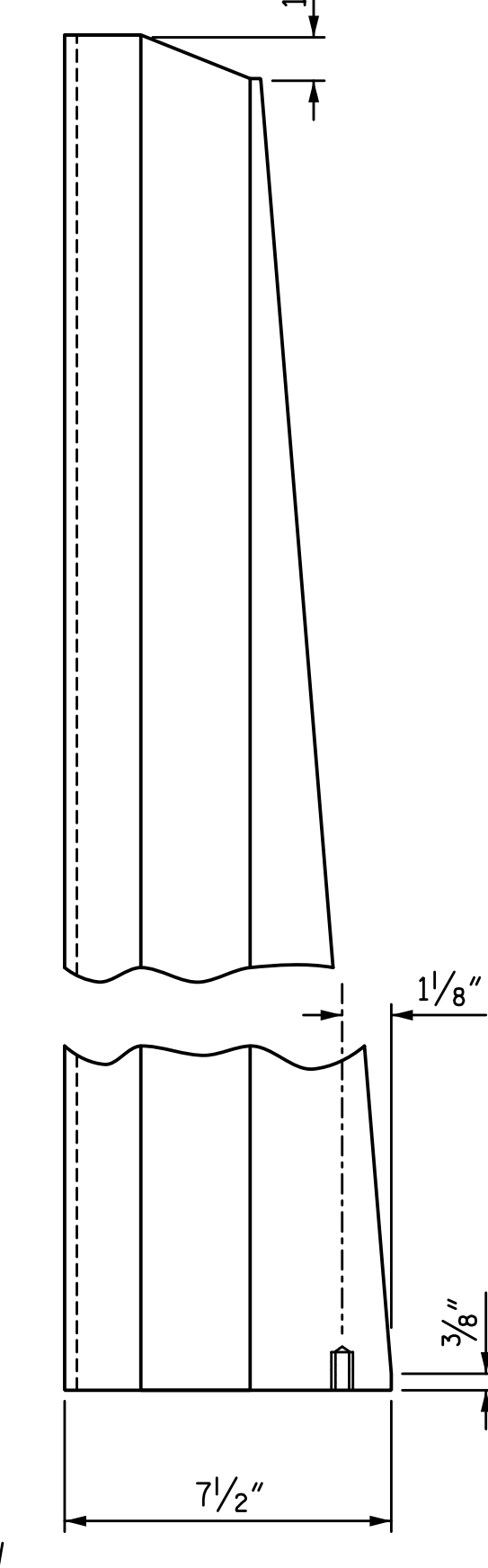
ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

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

PAY LENGTH = 422.50 LF

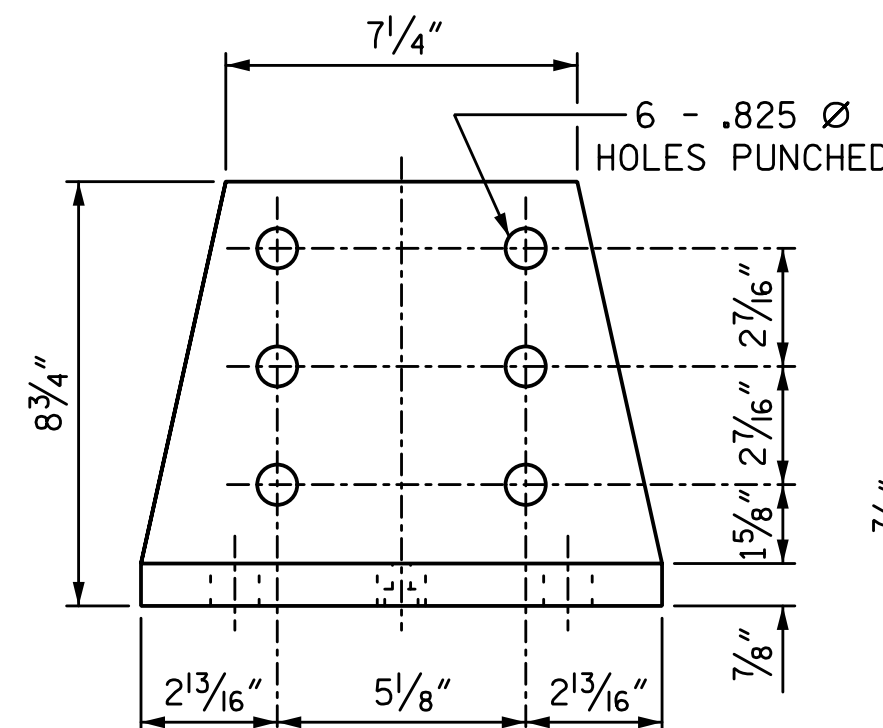


FRONT ELEVATION

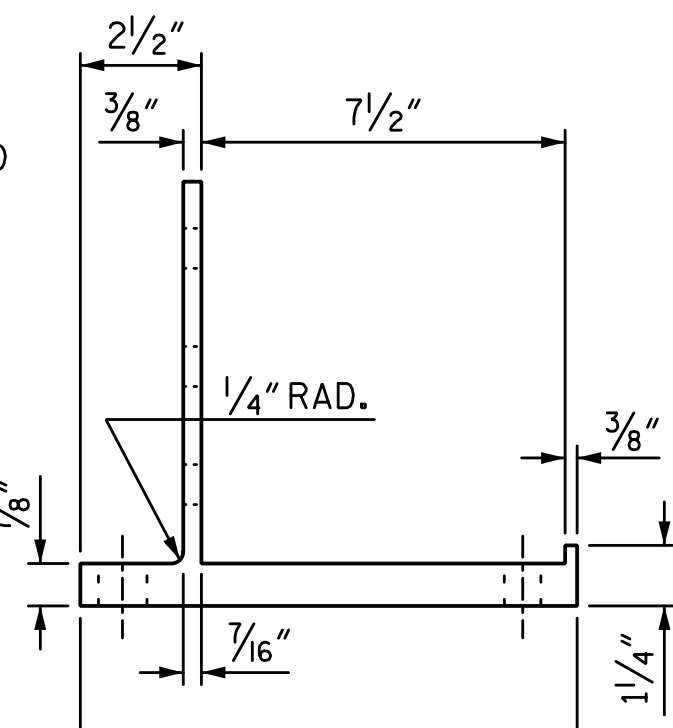


SIDE ELEVATION

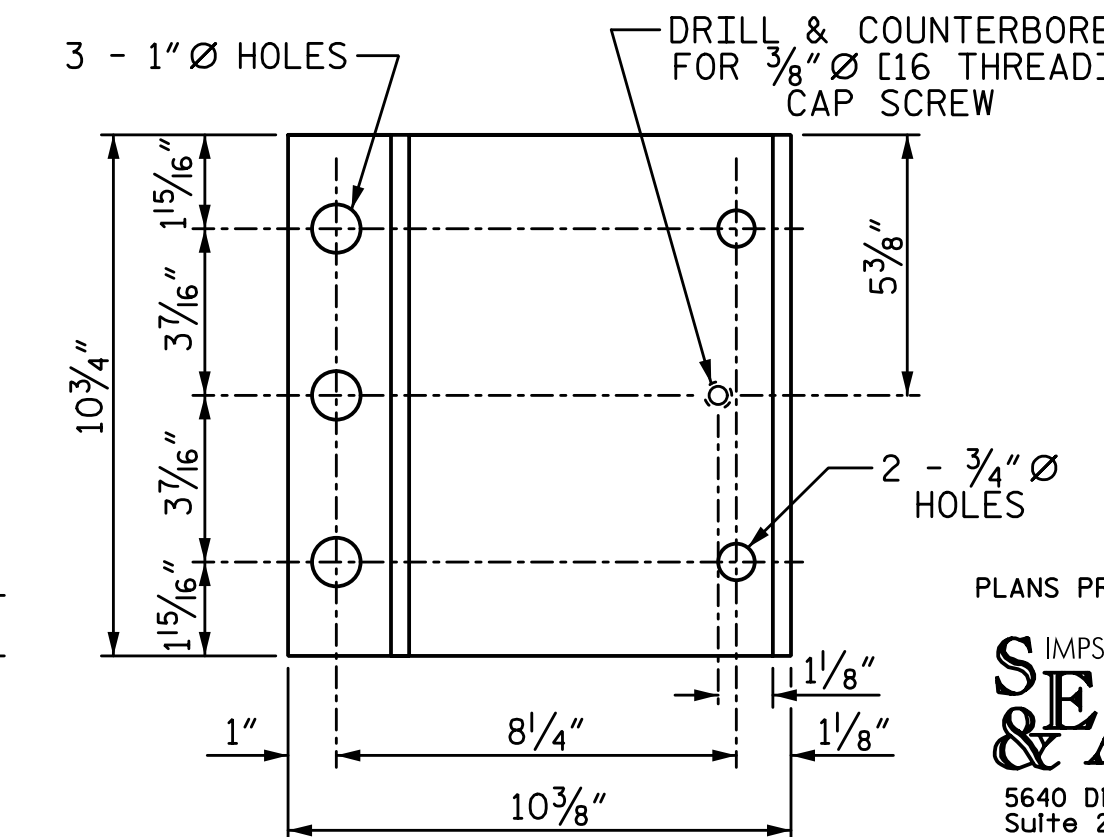
DETAILS OF POST



FRONT ELEVATION



SIDE ELEVATION

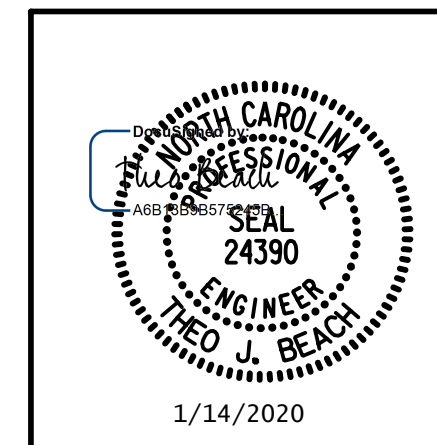


PLAN

POST BASE DETAILS

PLANS PREPARED BY:

SEMPSON  
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Suite 200  
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PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE

3 BAR METAL RAIL

LEFT & RIGHT WIDENING

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

S-31  
TOTAL SHEETS  
89

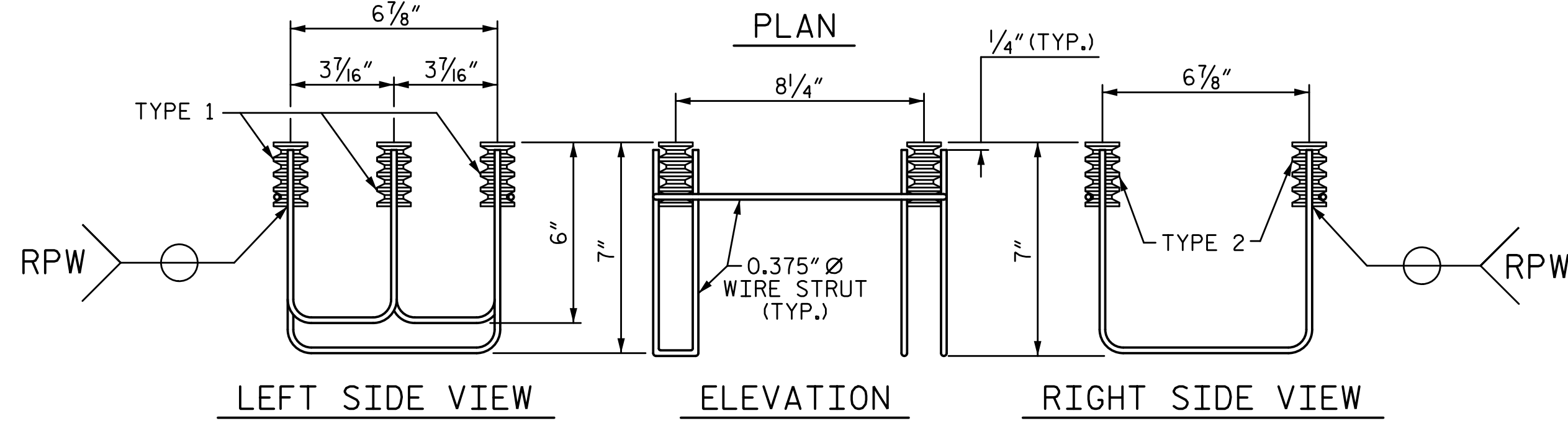
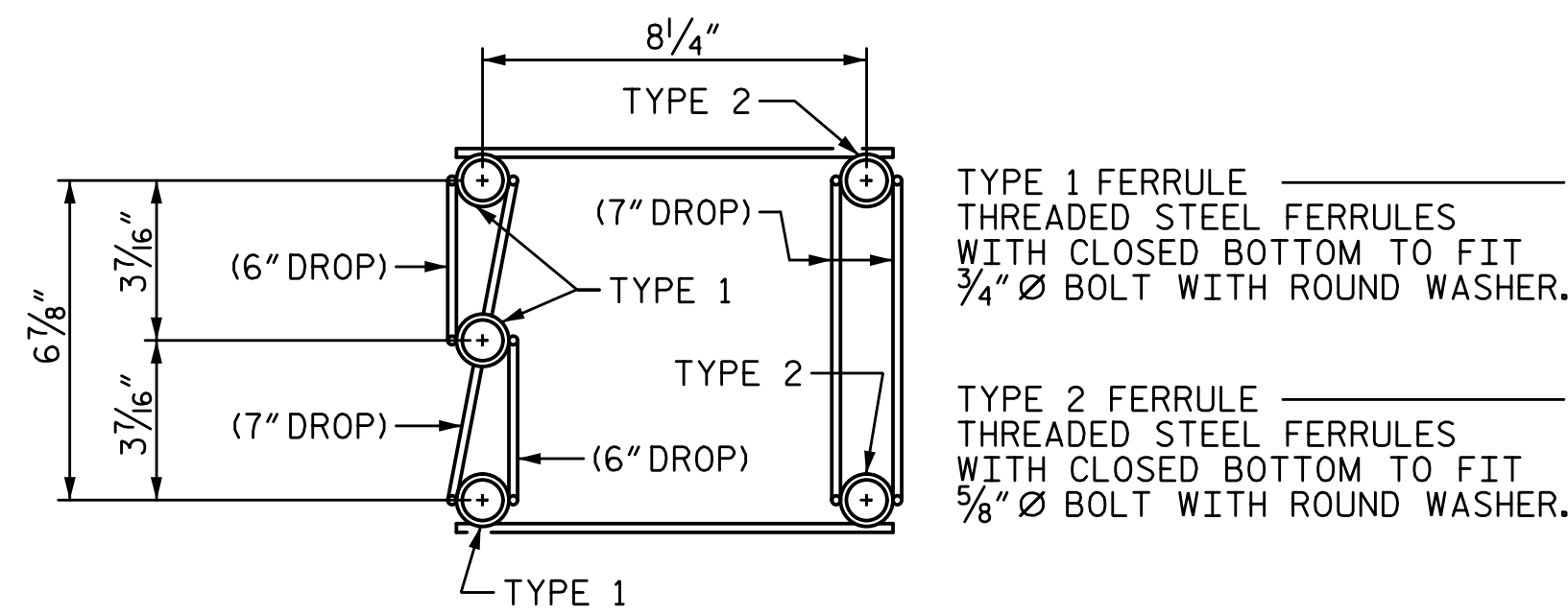
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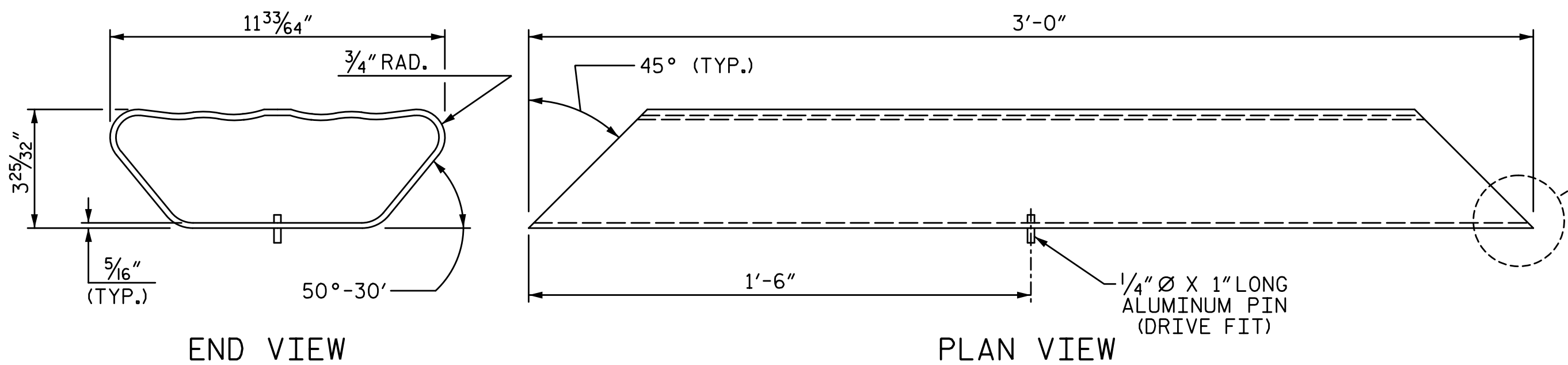
**NOTES:**

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

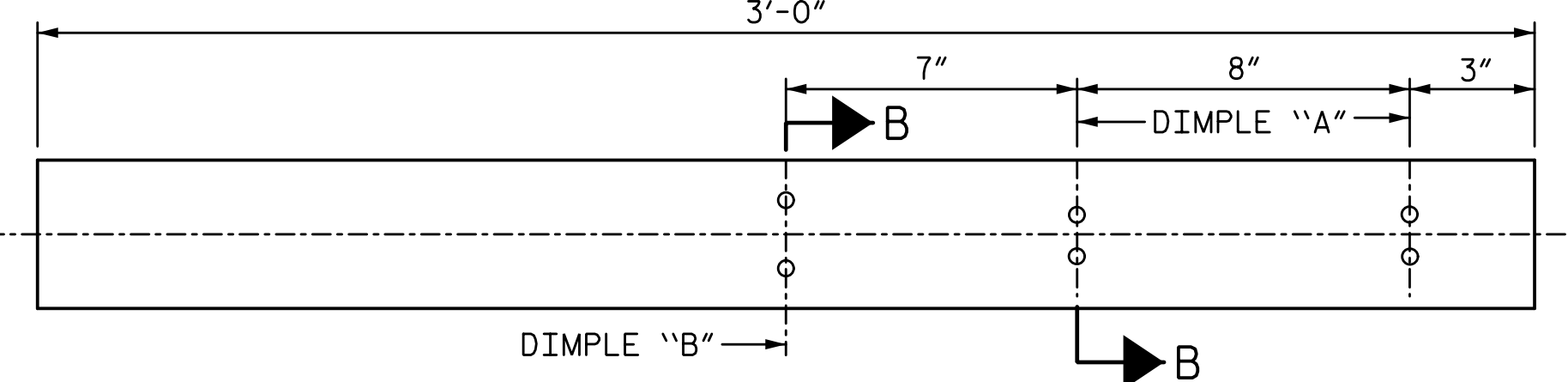
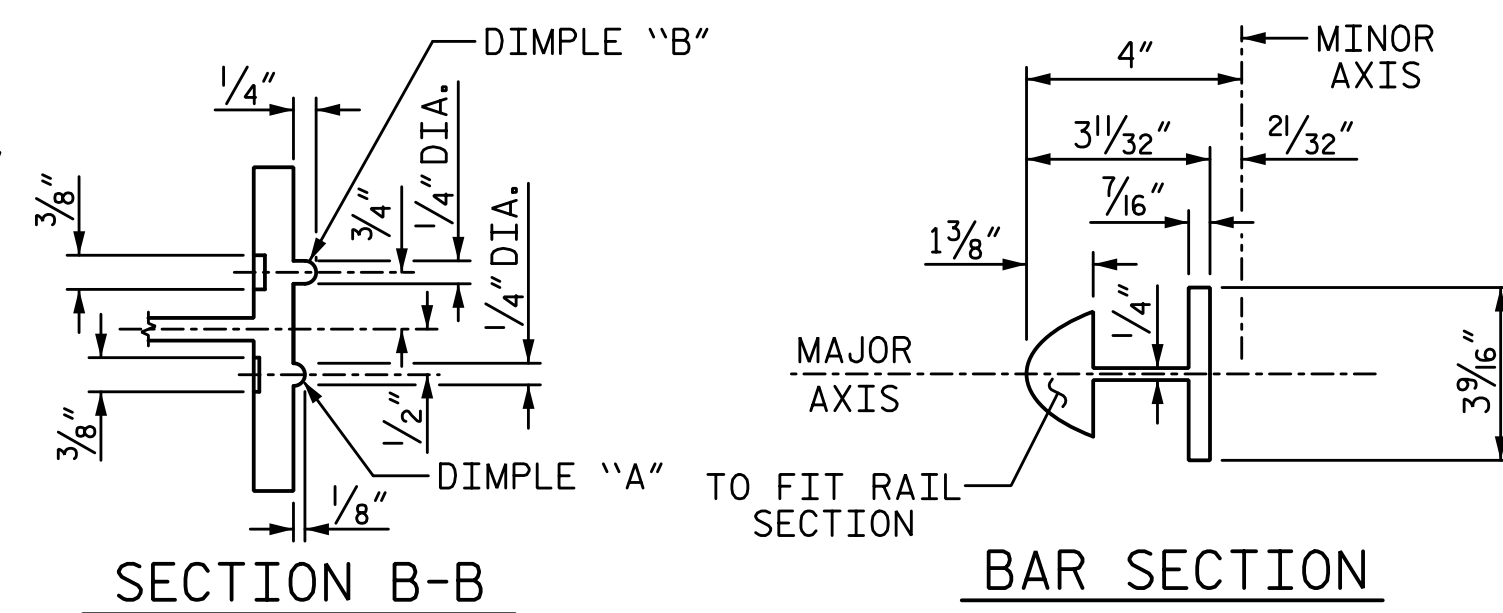
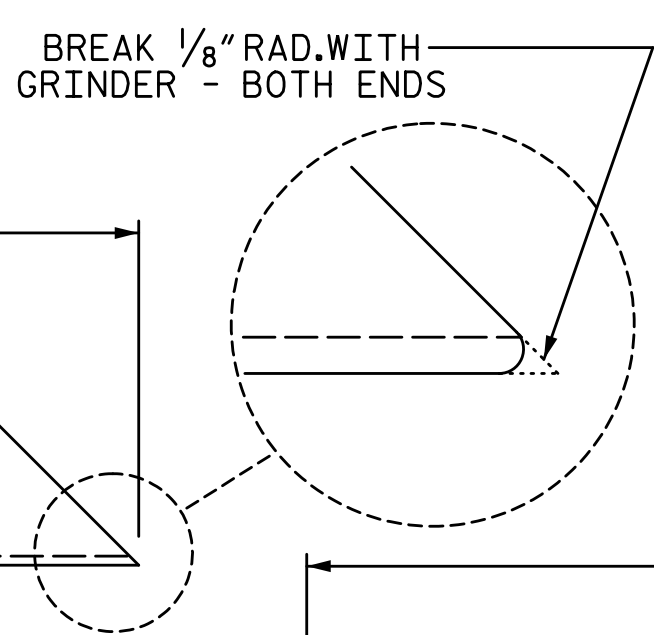
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES AND 1 3/4" FOR 5/8" FERRULES.
- B. 3 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. 2 - 5/8" Ø X 2 1/4" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 5/8" Ø X 2 1/4" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- D. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- E. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- F. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- G. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.



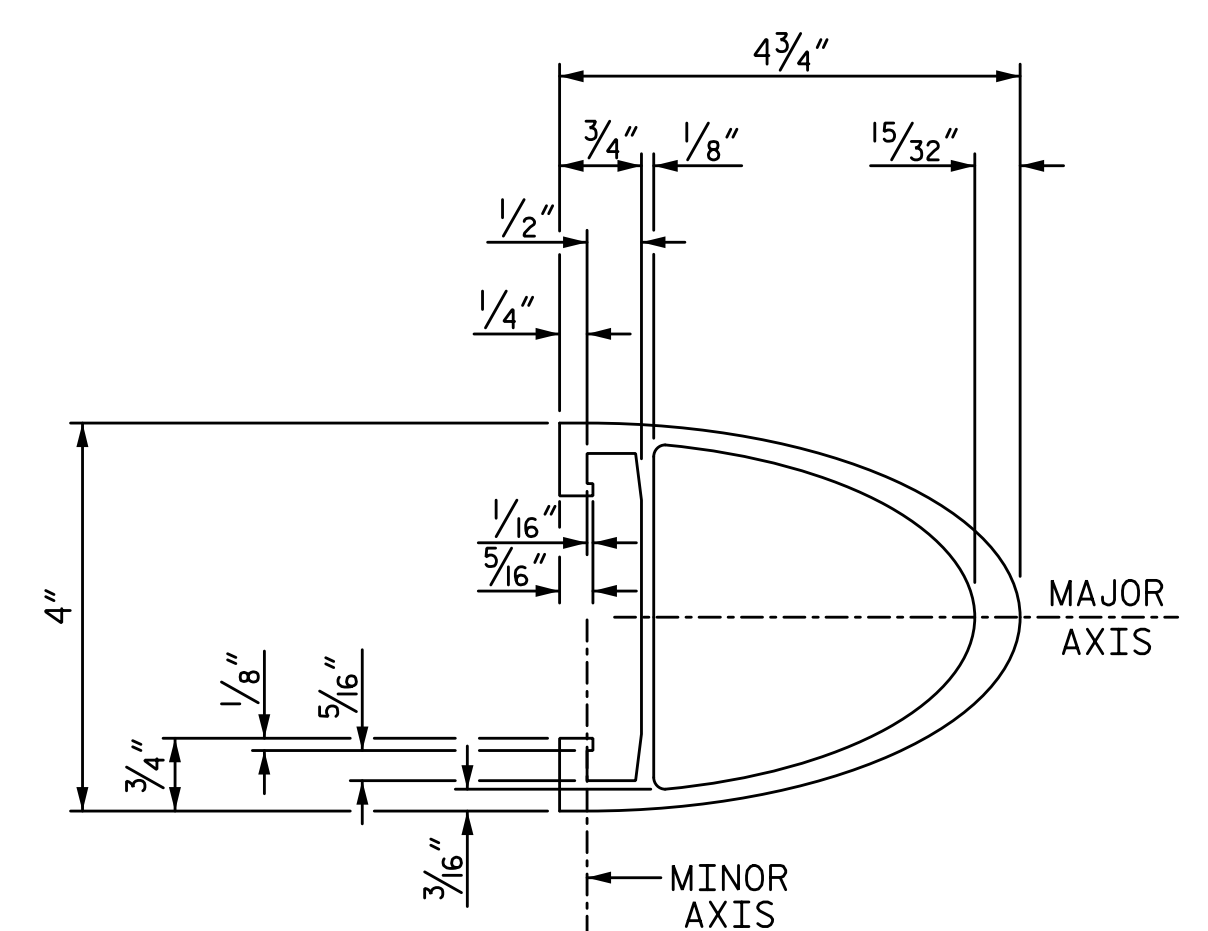
**5-BOLT METAL RAIL ANCHOR ASSEMBLY**  
(84 ASSEMBLIES REQUIRED)



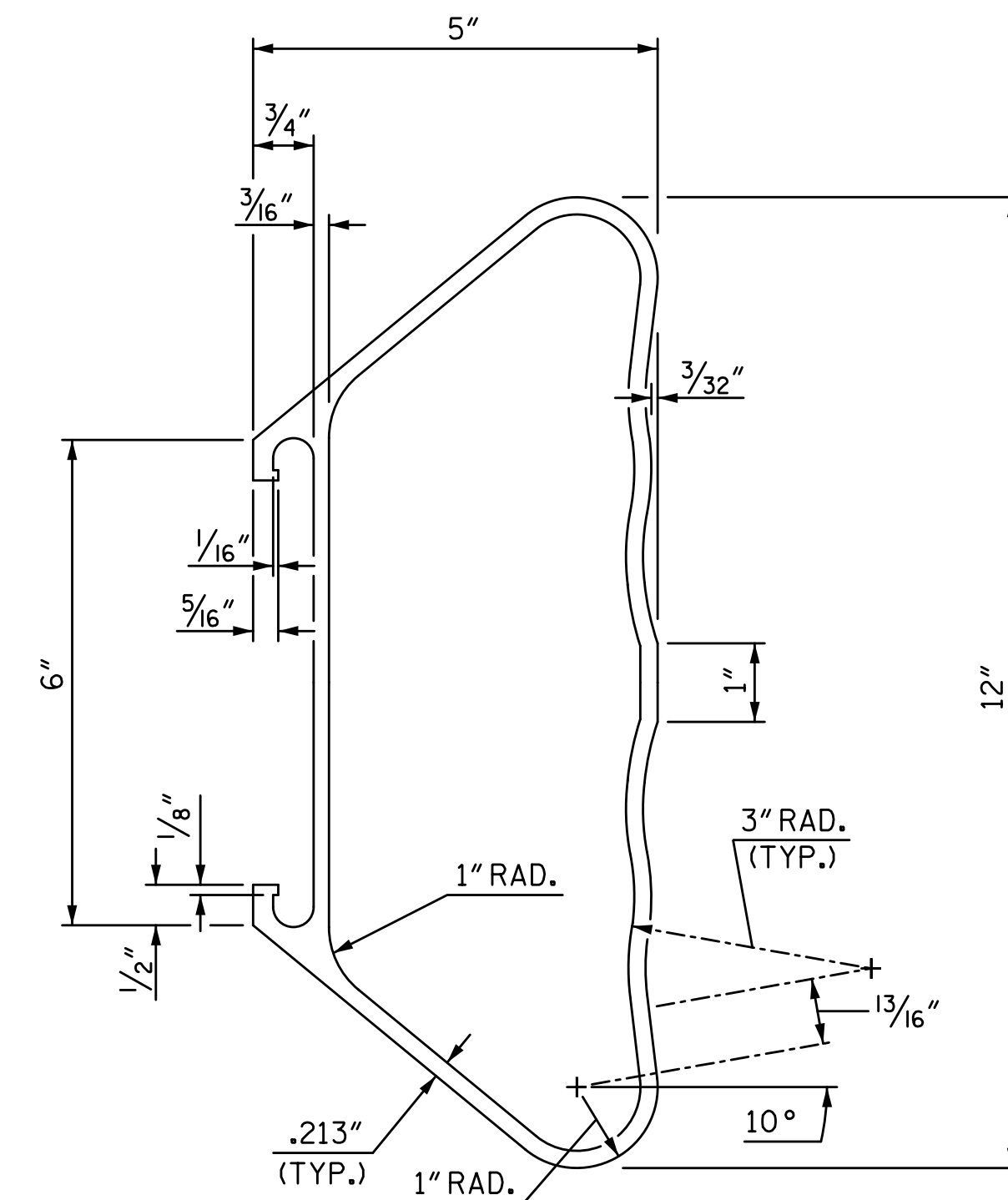
**BOTTOM RAIL EXPANSION BAR**



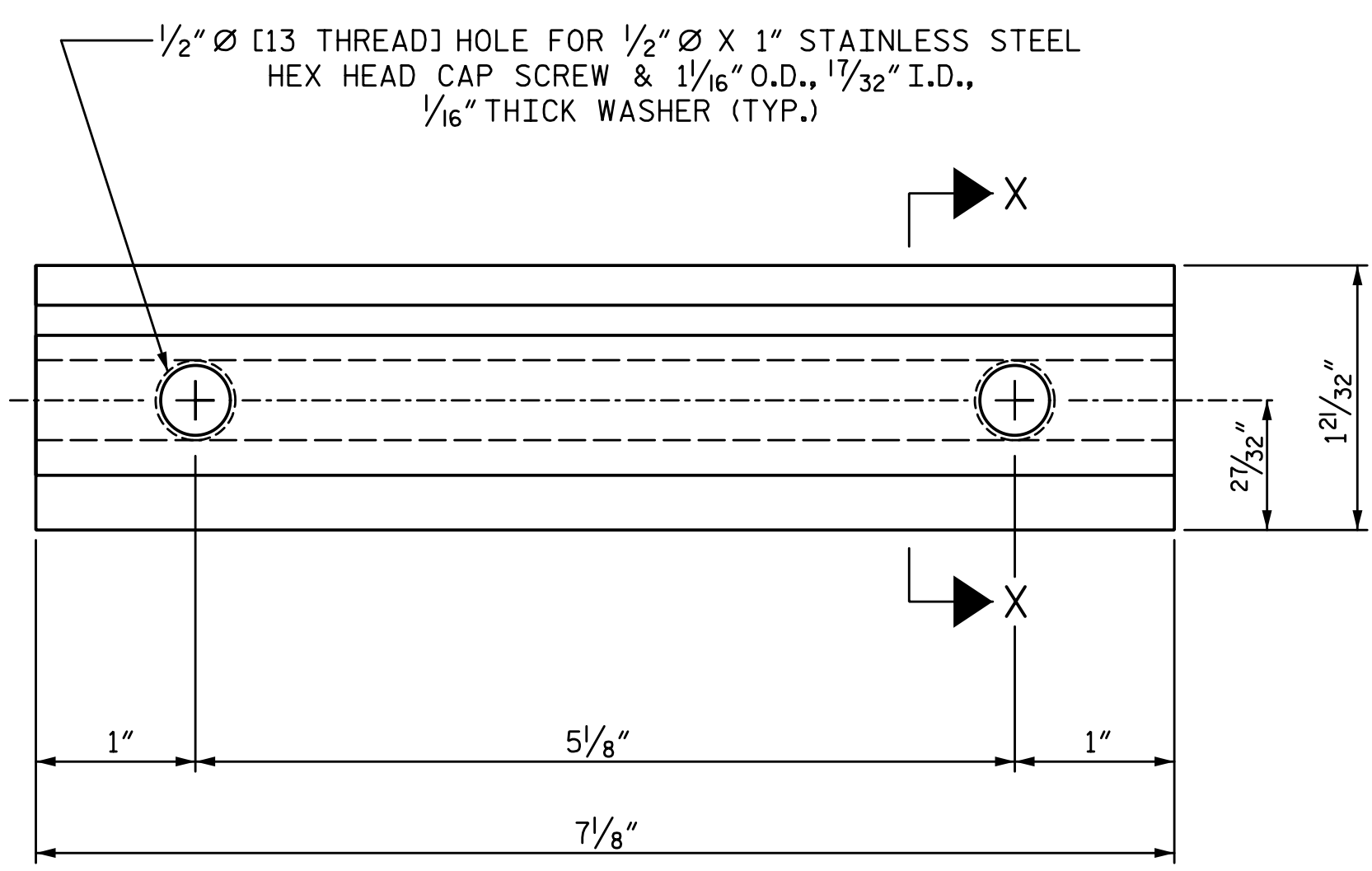
**TOP & MIDDLE RAIL EXPANSION BAR**



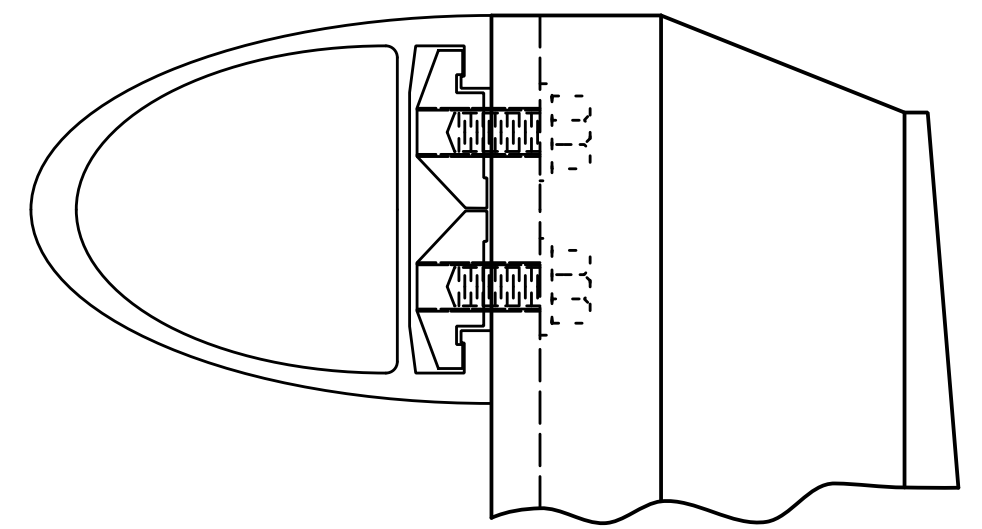
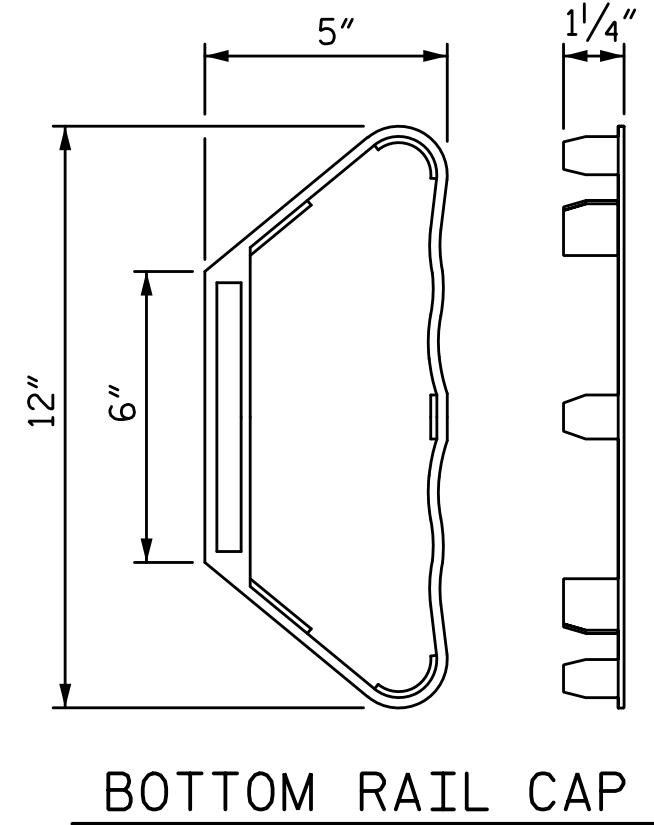
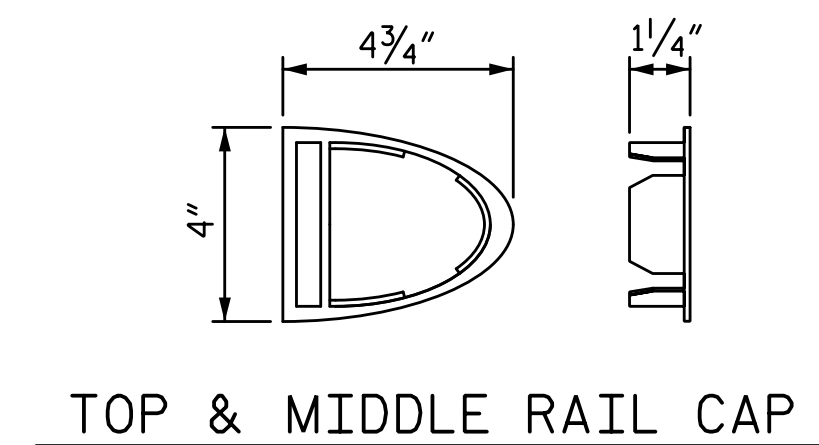
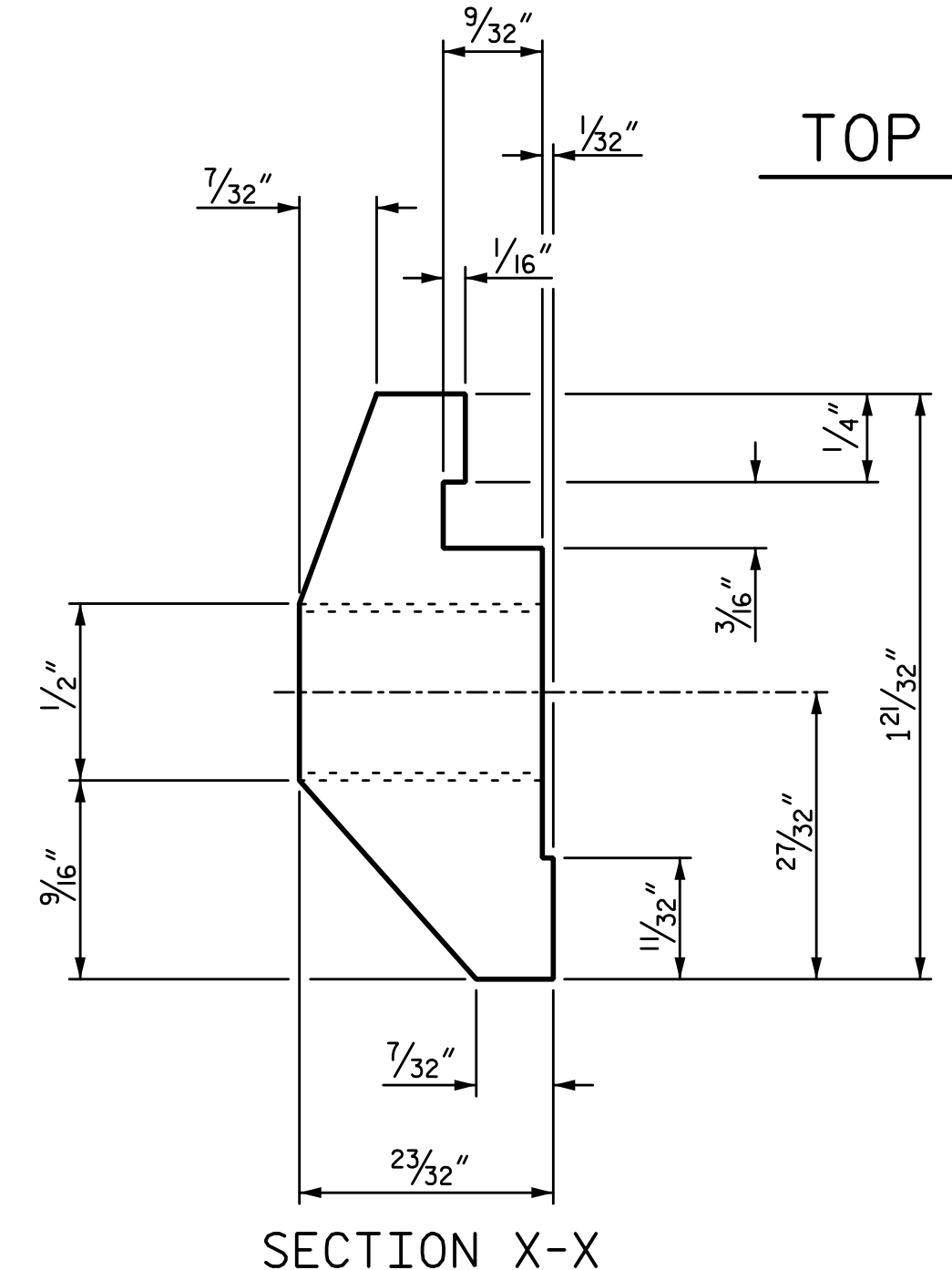
**TOP & MIDDLE RAIL SECTION**



**BOTTOM RAIL SECTION**

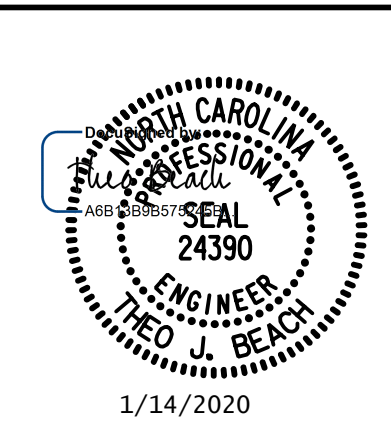


**CLAMP BAR DETAIL**  
(6 REQUIRED PER POST)



**CLAMP ASSEMBLY**  
(MIDDLE & BOTTOM RAIL ARE SIMILAR)

PLANS PREPARED BY:  
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LICENSURE NO. C-2521



PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**3 BAR METAL RAIL**  
LEFT & RIGHT WIDENING

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

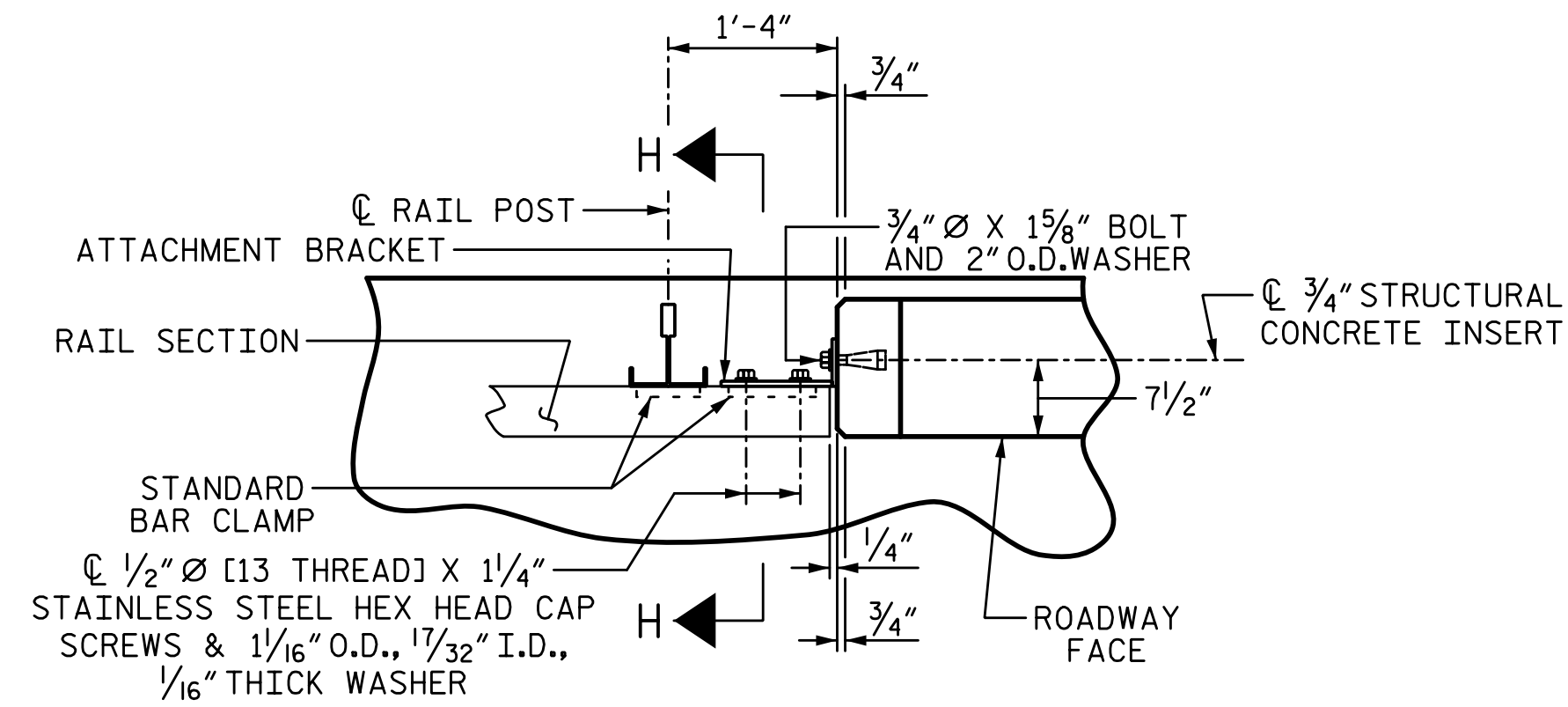
TOTAL SHEETS: 89

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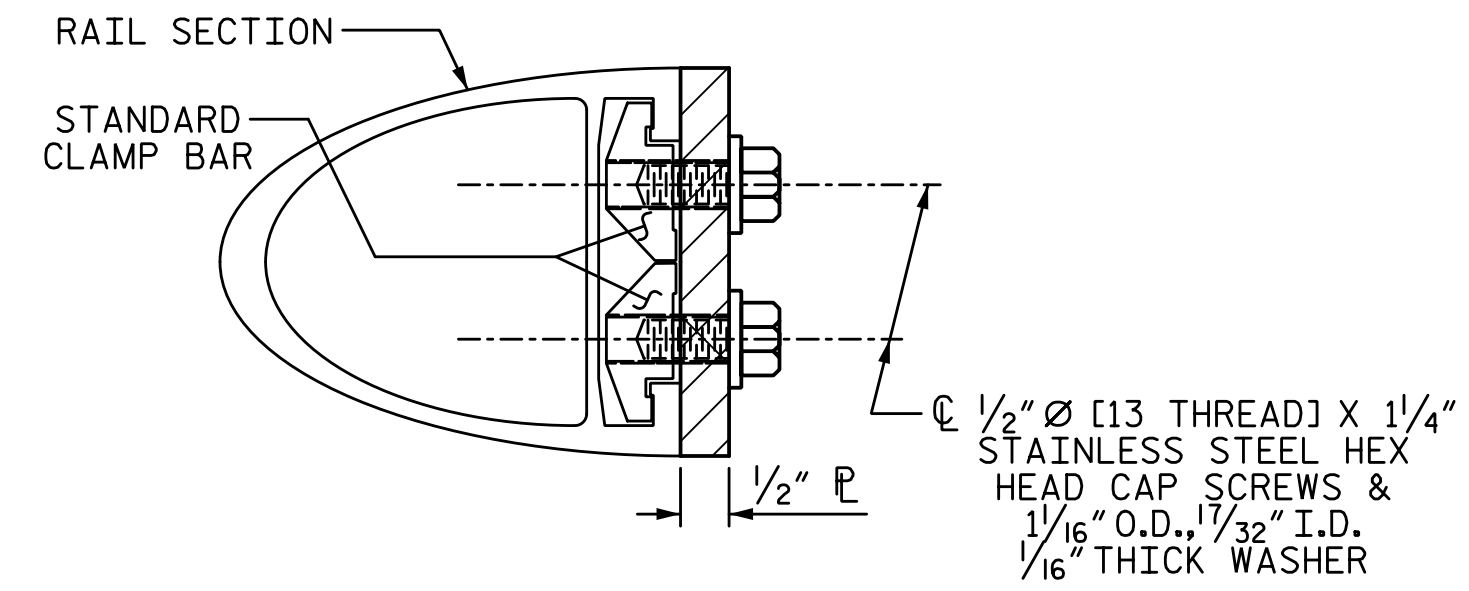
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CHECKED BY: T. BEACH      DATE: 1-20  
DESIGN ENGINEER OF RECORD: T. BEACH      DATE: 1-20

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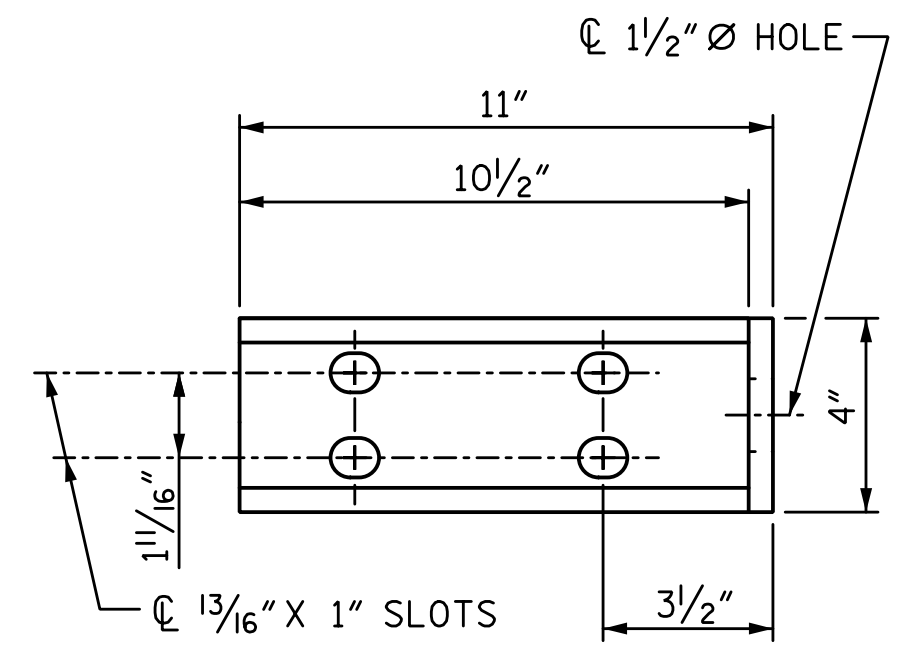




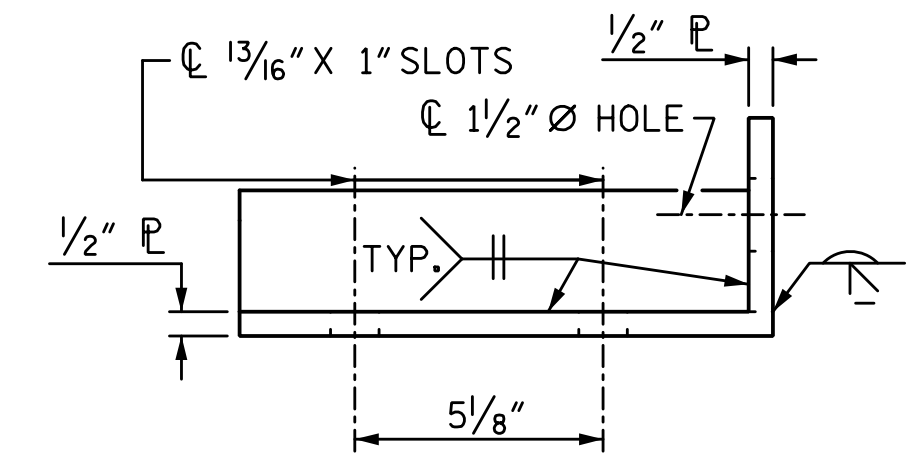
**PLAN OF RAIL AND END POST**  
(STIFFENER ON 1/2" R NOT SHOWN FOR CLARITY)



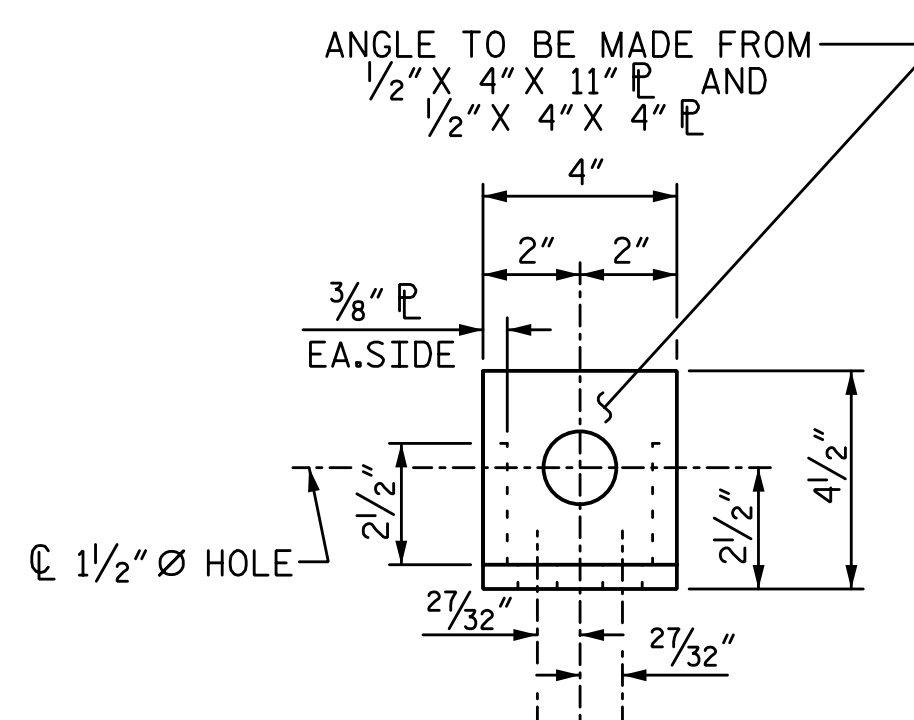
**SECTION H-H**  
(FOR TOP & MIDDLE RAIL)



**ELEVATION**

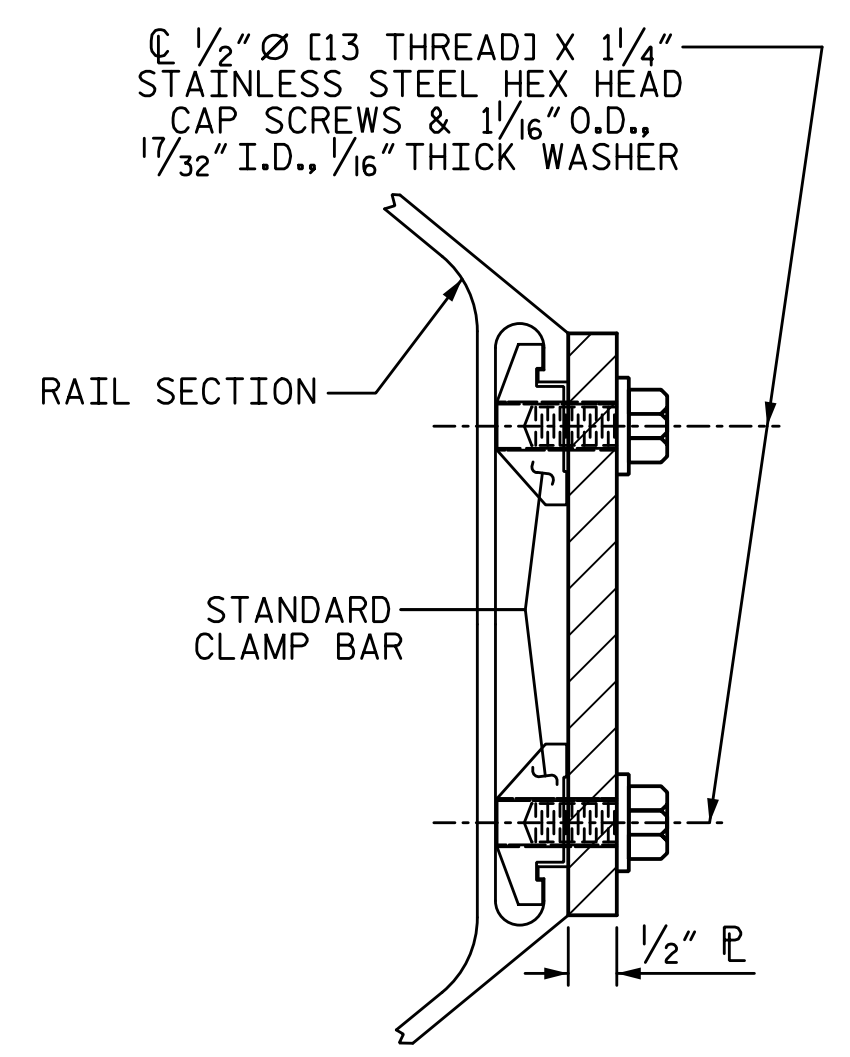


**PLAN**

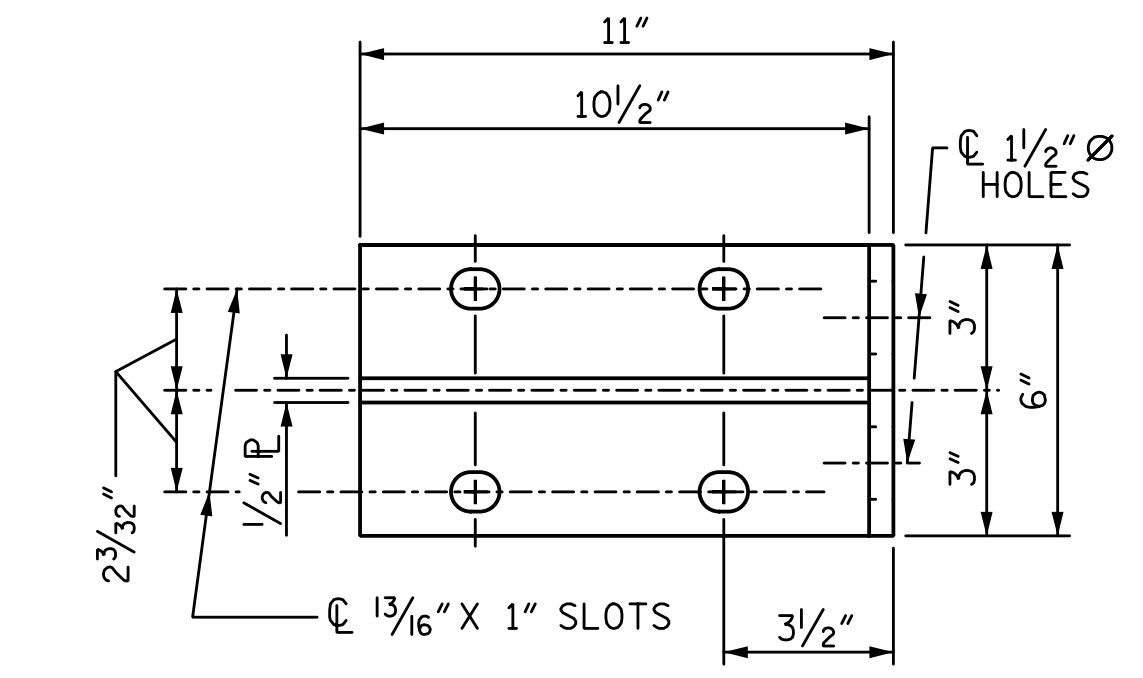


**END VIEW**  
(FIX. AND EXP.)

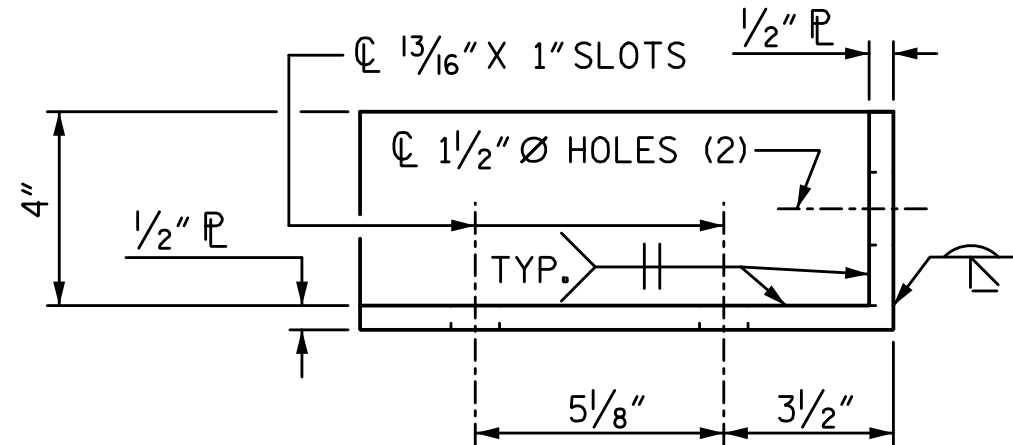
**DETAILS FOR ATTACHEMENT BRACKET**  
(TOP & MIDDLE RAIL ONLY)



**SECTION H-H**  
(FOR BOTTOM RAIL)

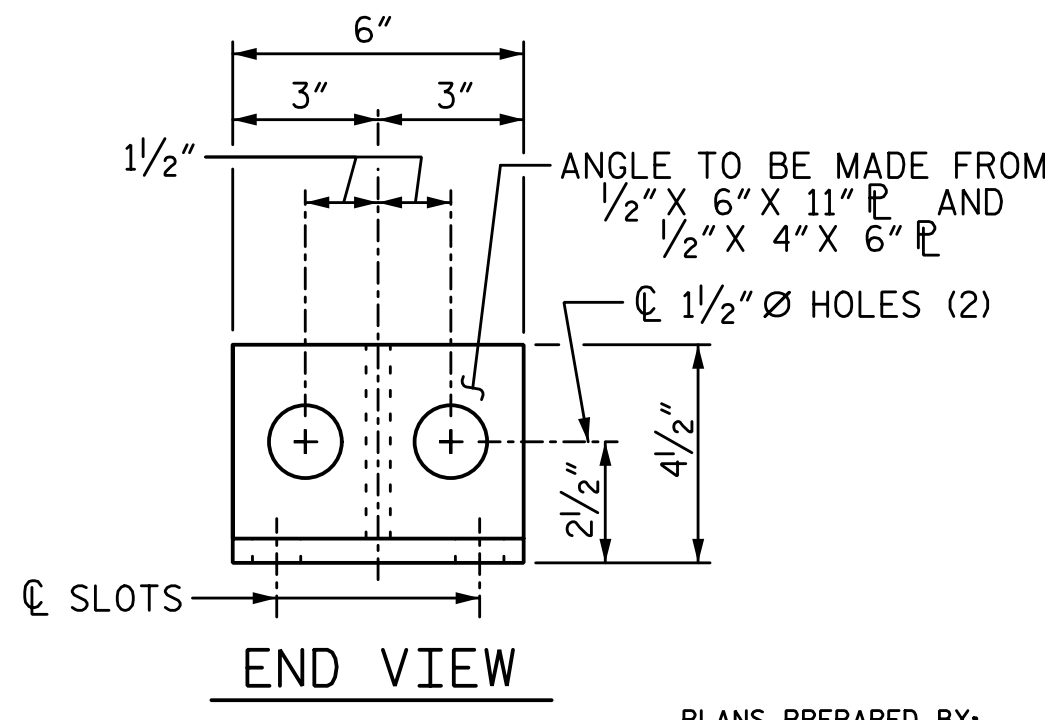


**ELEVATION**



**PLAN**

**DETAILS FOR ATTACHEMENT BRACKET**  
(BOTTOM RAIL ONLY)



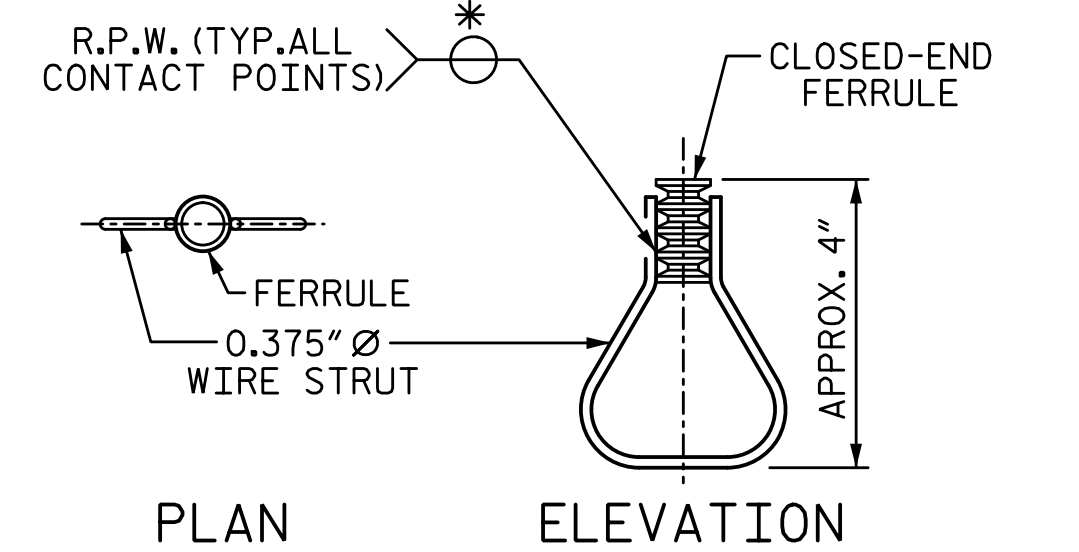
**END VIEW**

**NOTES:**

- METAL RAIL TO END POST CONNECTION
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
  - 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N. C. THREADS.
  - CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60° F. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.
  - STANDARD CLAMP BARS ("3 BAR METAL RAIL" SHEET 2 OF 3).
- THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 3 BAR METAL RAIL.
- THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.
- THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.
- THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

**NOTES:**

- STRUCTURAL CONCRETE INSERT
- THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1/2".
  - 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
  - WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.



**STRUCTURAL CONCRETE INSERT**

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

PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

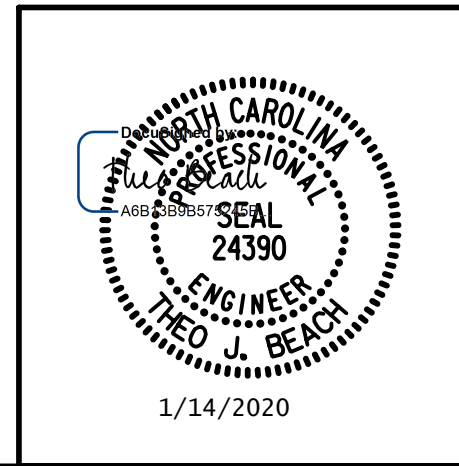
SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE

**3 BAR METAL RAIL**  
**LEFT & RIGHT WIDENING**

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					89

PLANS PREPARED BY:  
**S&A**  
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LICENSURE NO. C-2521

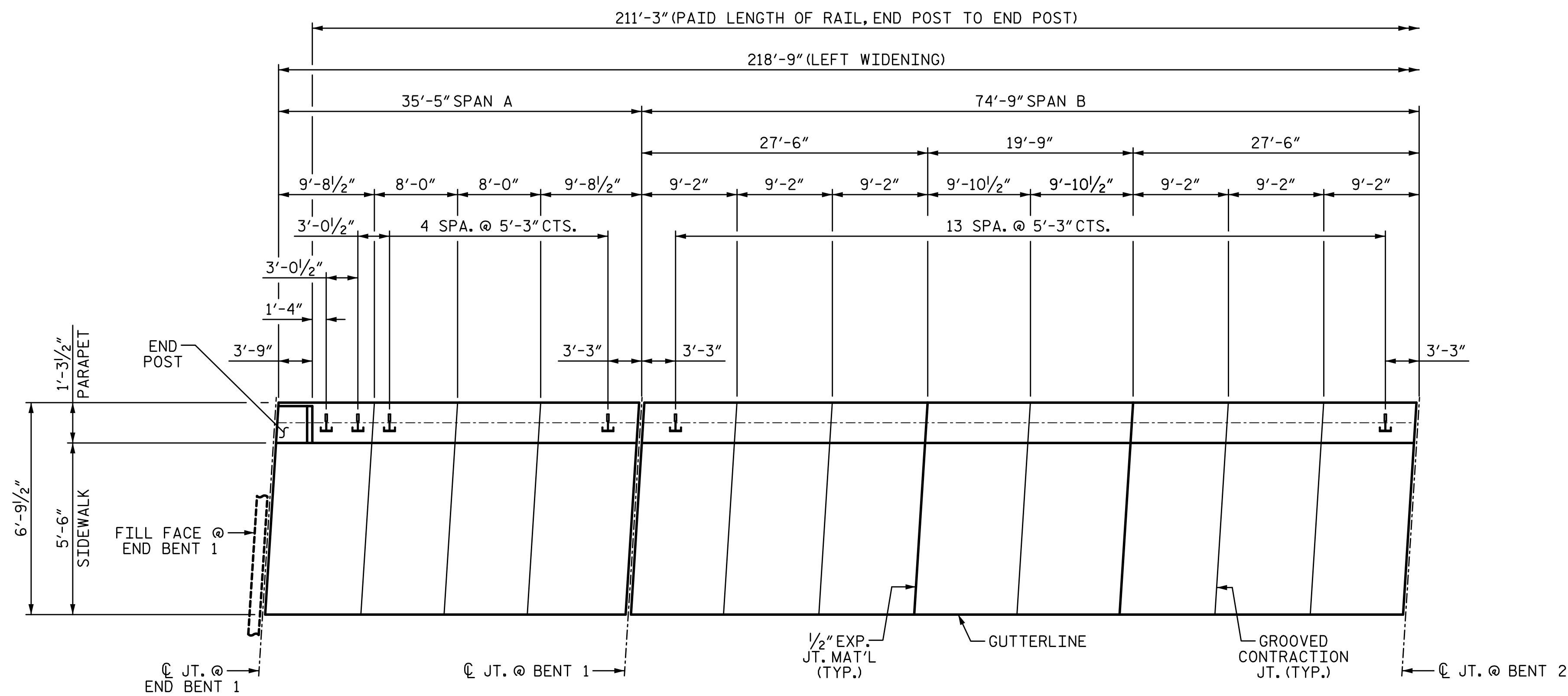


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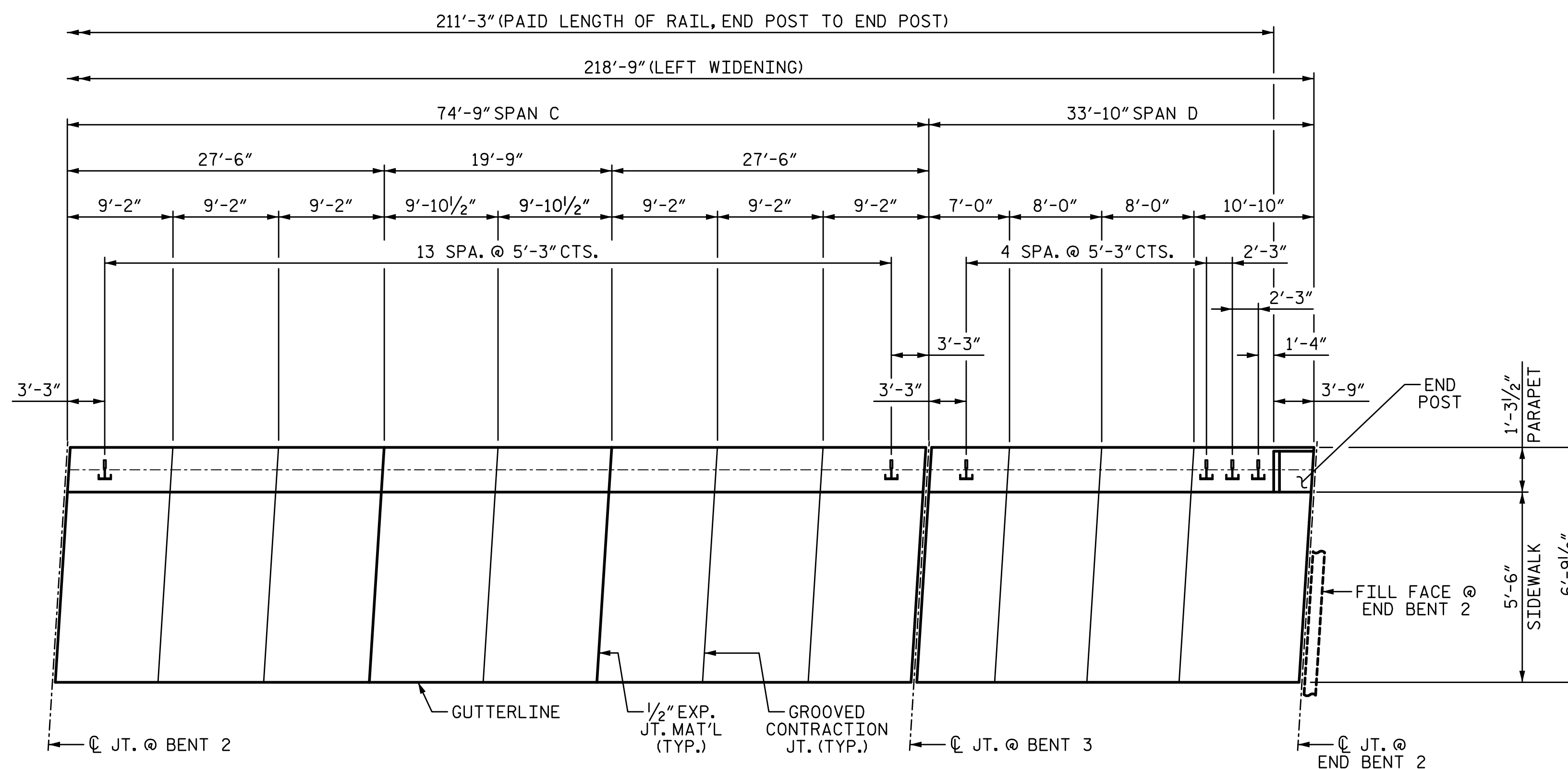
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DRAWN BY: <u>S.D. COOPER</u>	DATE: <u>1-20</u>
CHECKED BY: <u>T. BEACH</u>	DATE: <u>1-20</u>
DESIGN ENGINEER OF RECORD: <u>T. BEACH</u>	DATE: <u>1-20</u>





**PLAN OF RAIL POST SPACINGS**  
SPANS A & B

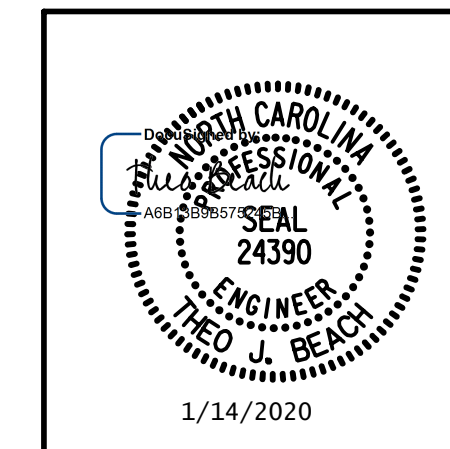


**PLAN OF RAIL POST SPACINGS**  
SPANS C & D

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DRAWN BY: S.D. COOPER DATE: 1-20  
 CHECKED BY: T. BEACH DATE: 1-20  
 DESIGN ENGINEER OF RECORD: T. BEACH DATE: 1-20

PLANS PREPARED BY:  
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PROJECT NO. I-5711  
 ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

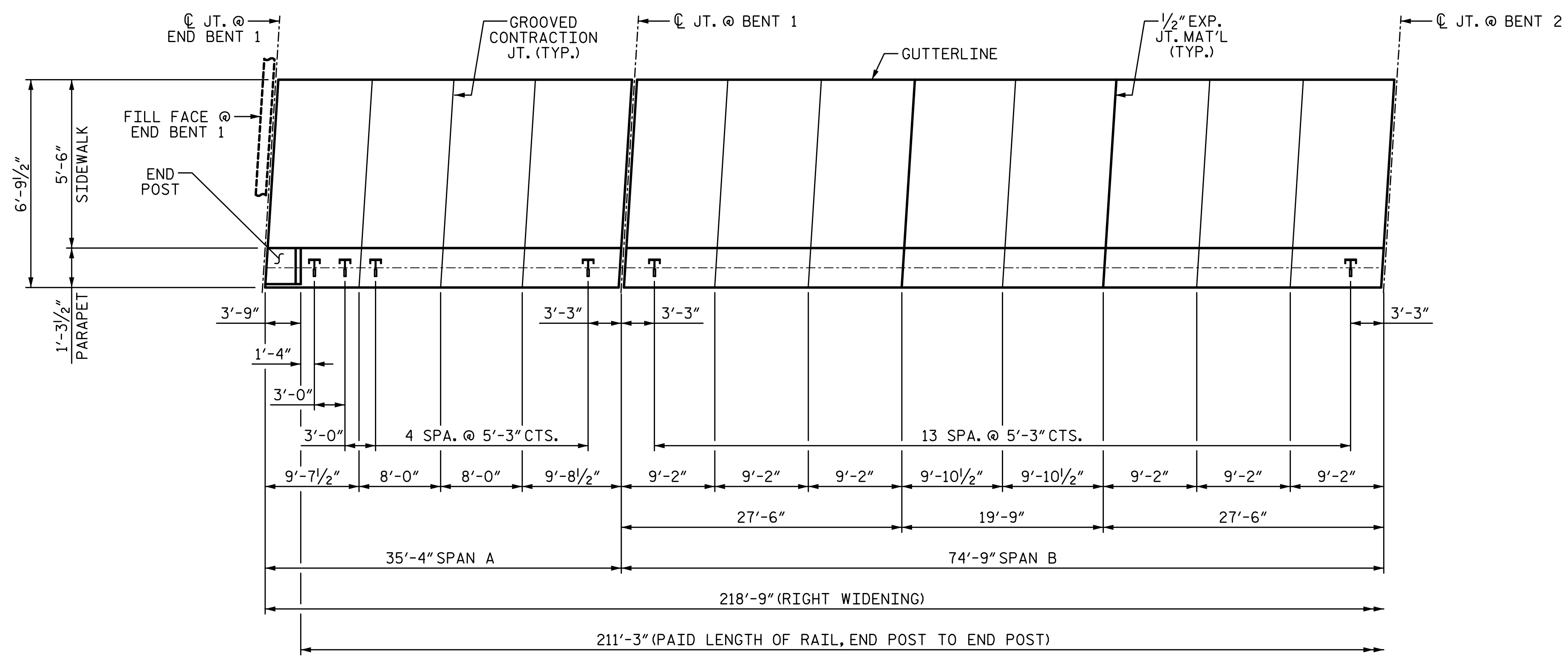
RAIL POST SPACING  
 LEFT WIDENING

REVISIONS

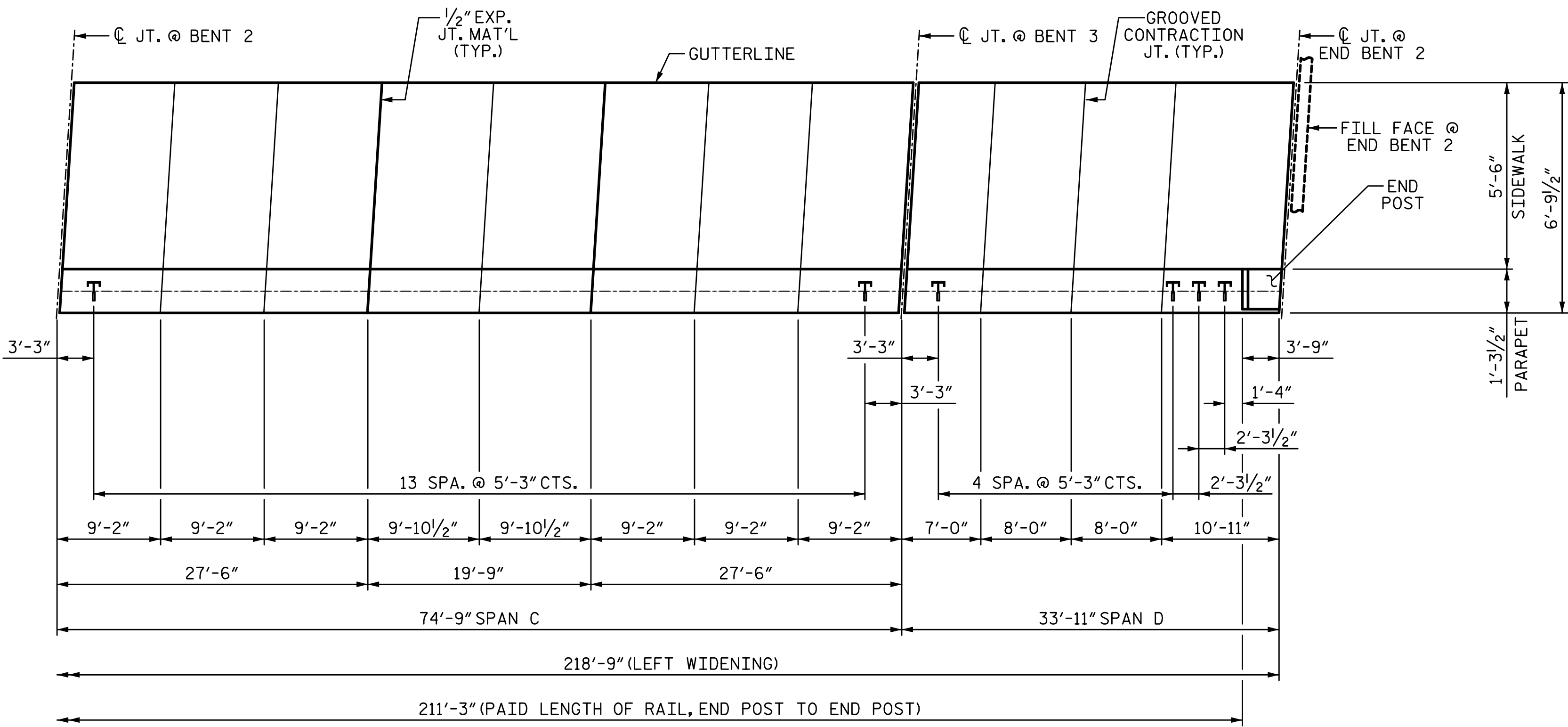
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-34
2			4			TOTAL SHEETS 89

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**PLAN OF SIDEWALK**  
SPANS A & B



**PLAN OF SIDEWALK**  
SPANS C & D

PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

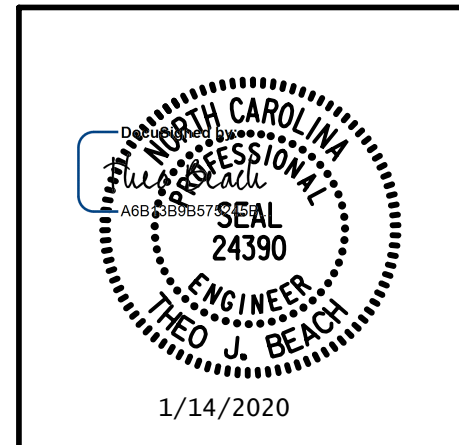
SHEET 2 OF 3

STATE OF NORTH CAROLINA  
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RALEIGH  
SUPERSTRUCTURE

**RAIL POST SPACING**

**RIGHT WIDENING**

PLANS PREPARED BY:  
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1			3			TOTAL SHEETS
2			4			89

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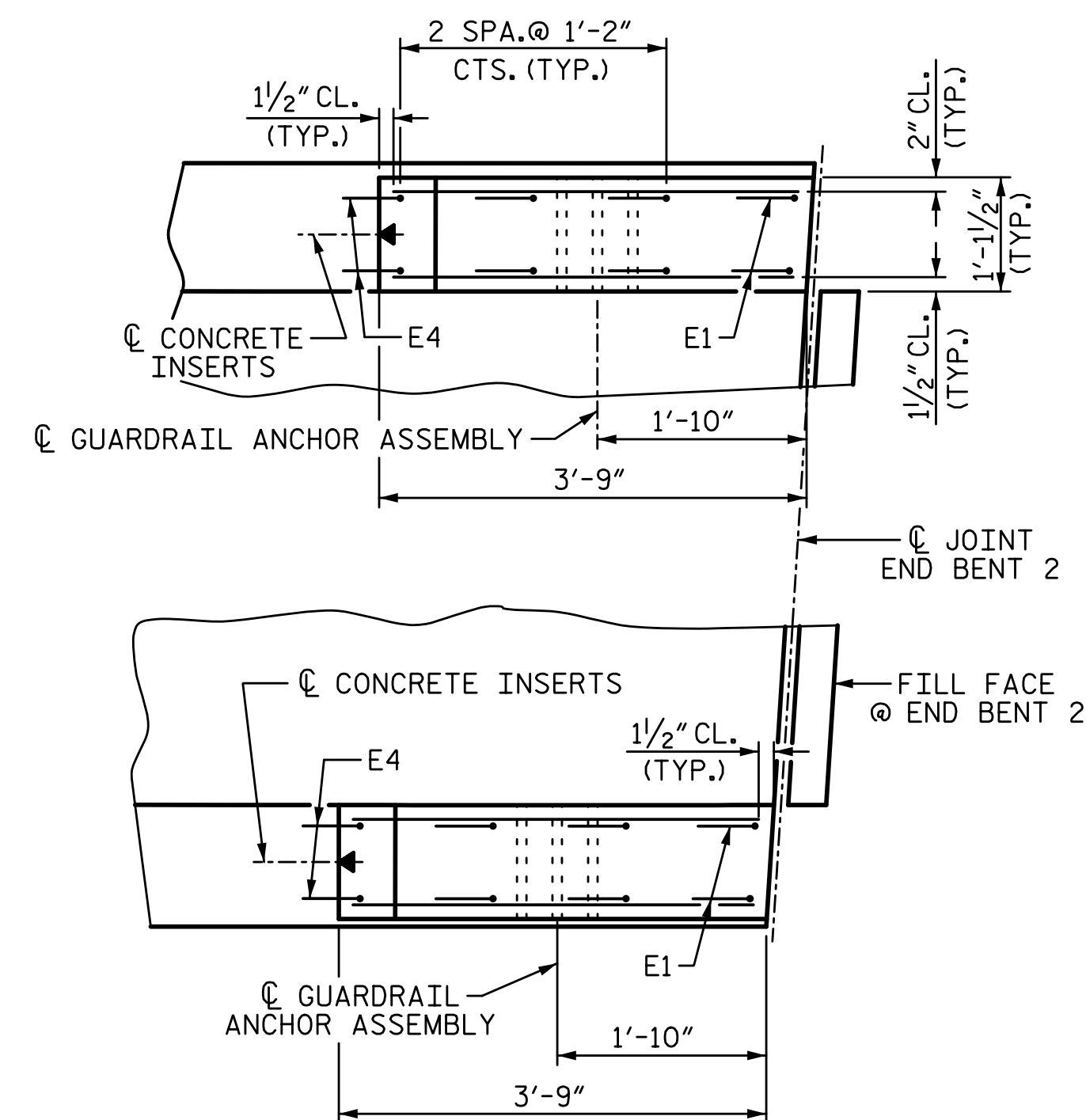
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**NOTES:**

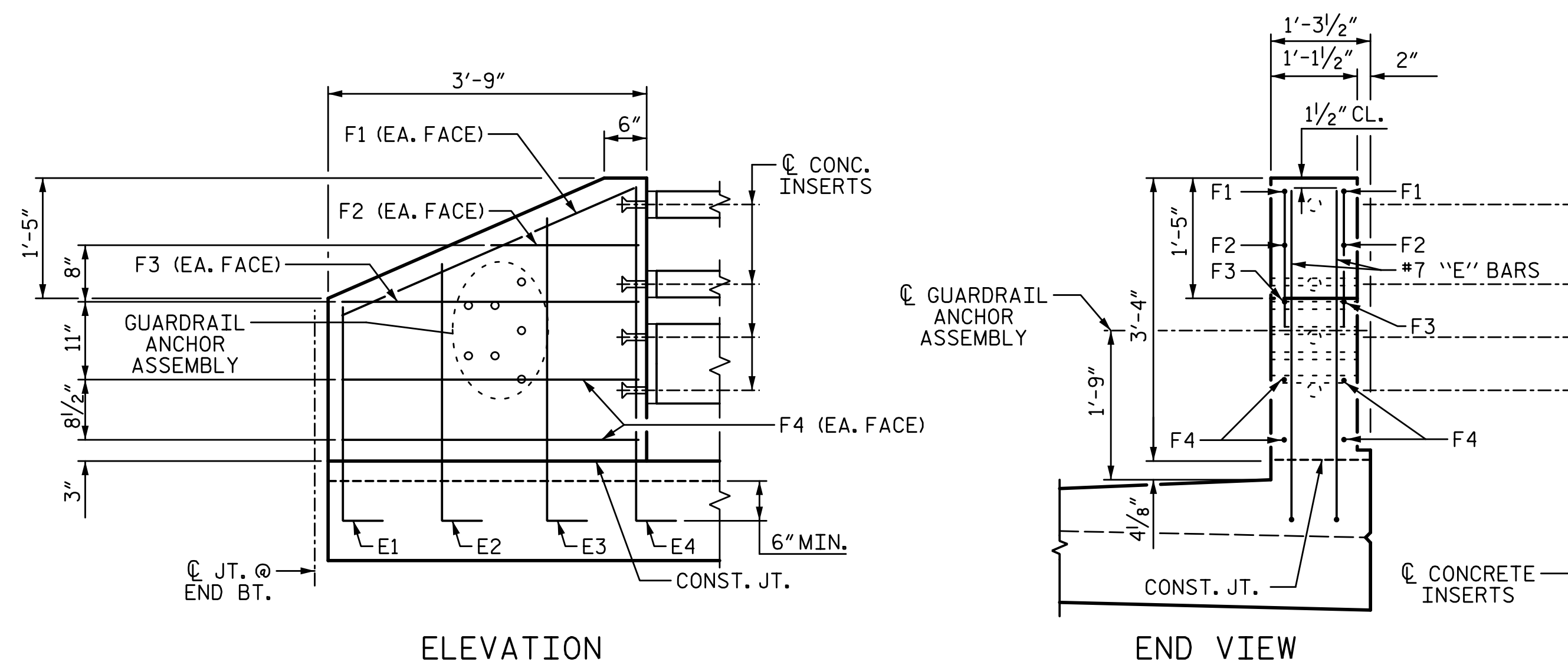
FOR END POSTS REINFORCING STEEL AND CONCRETE QUANTITIES, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

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



**PLAN**

END BENT 2 SHOWN  
(END BENT 1 SIMILAR EXCEPT NO GUARDRAIL ATTACHMENT @ END BENT 1 LEFT)



**ELEVATION**

**END VIEW**

**END POST DETAILS**

PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE

**END POST  
DETAILS**

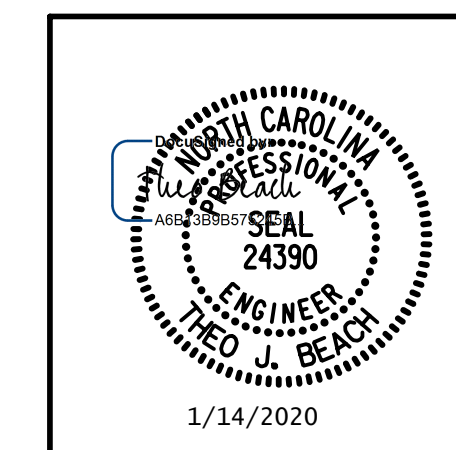
LEFT & RIGHT WIDENING

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-36
2			4			TOTAL SHEETS 89

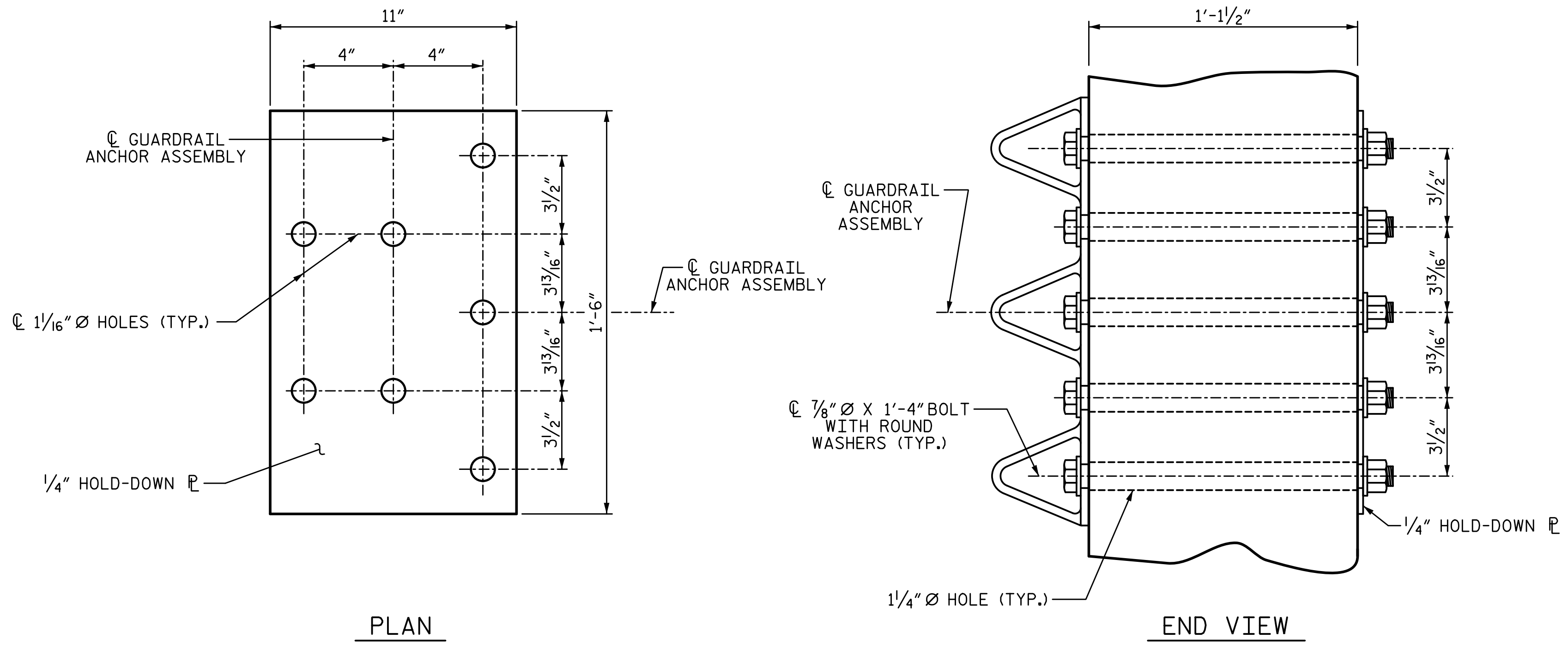
PLANS PREPARED BY:

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**GUARDRAIL ANCHOR ASSEMBLY DETAILS**

**NOTES:**

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

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

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

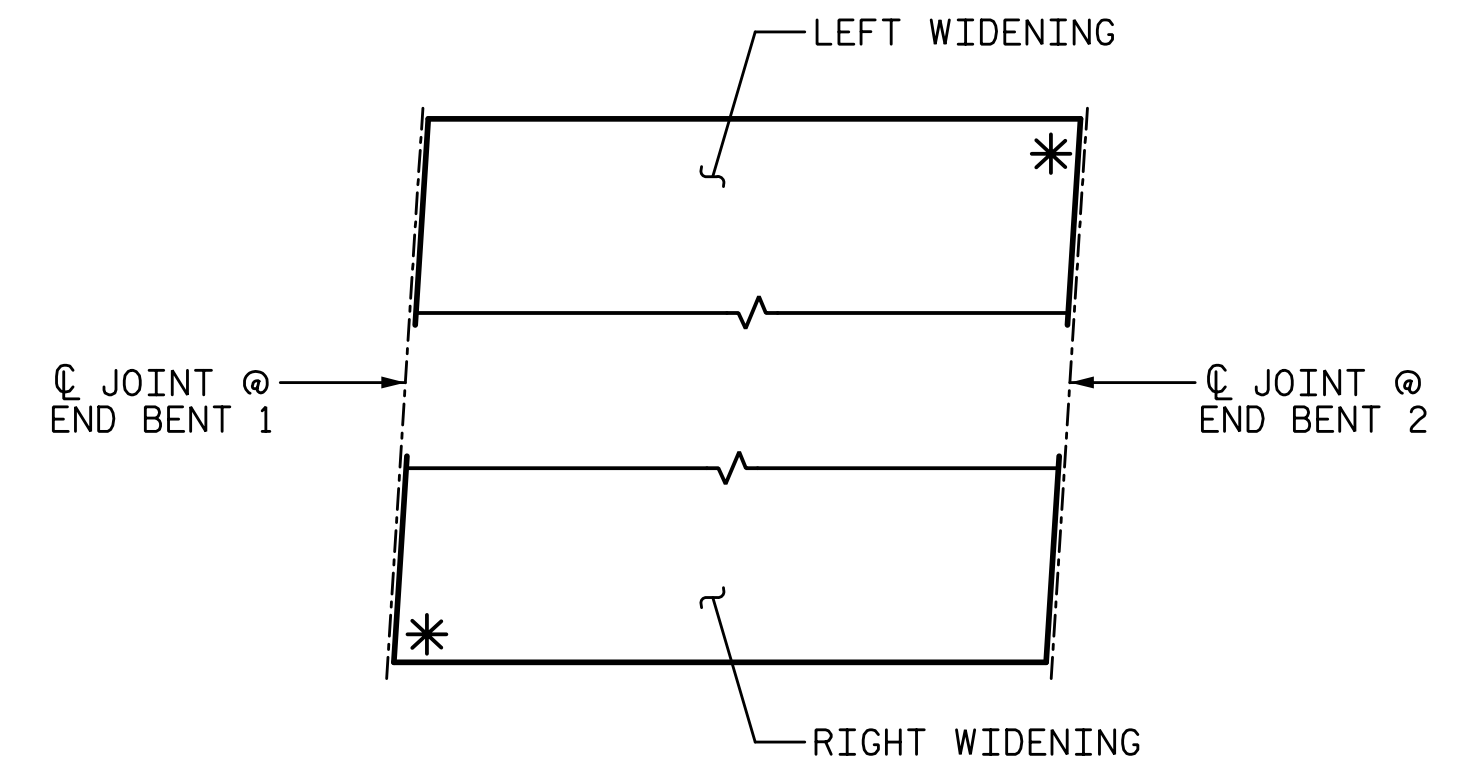
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

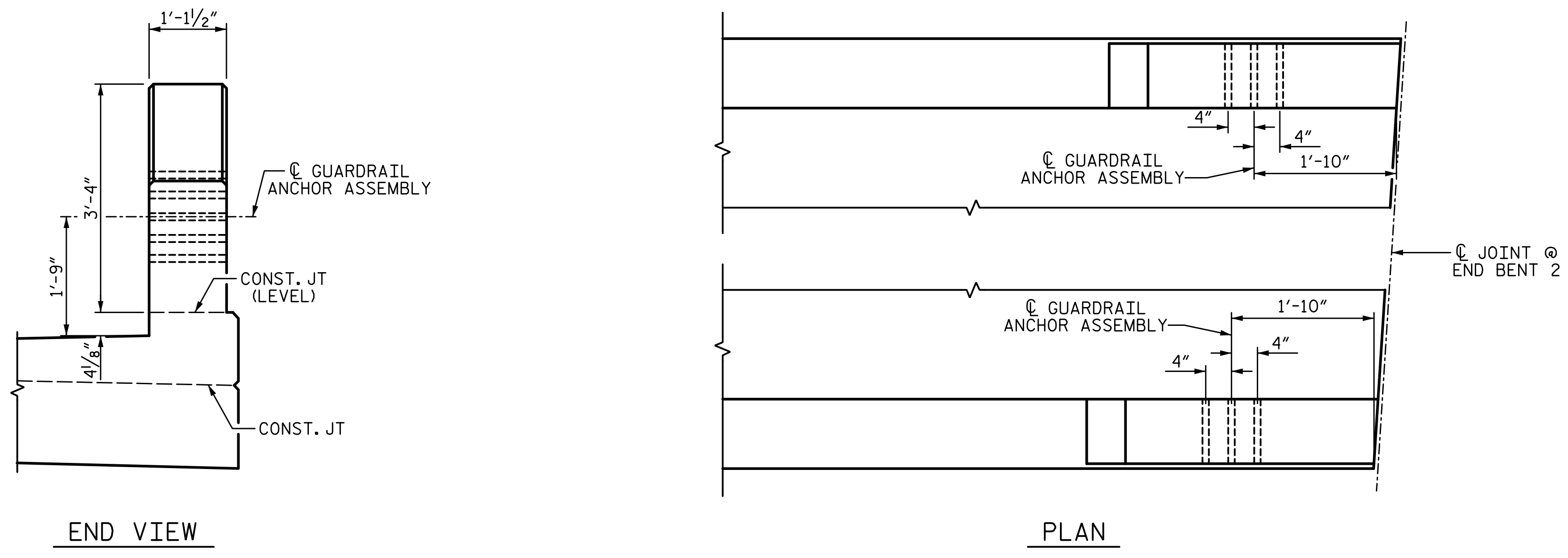
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

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



**SKETCH SHOWING POINTS OF ATTACHMENT**  
\* LOCATION OF GUARDRAIL ATTACHMENT



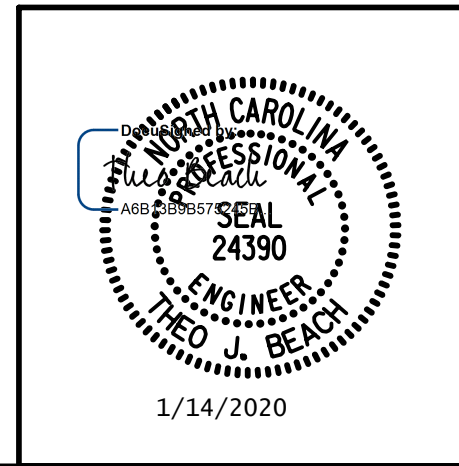
**LOCATION OF GUARDRAIL ANCHOR AT END POST**  
END BENT 2 SHOWN, END BENT 1 SIMILAR

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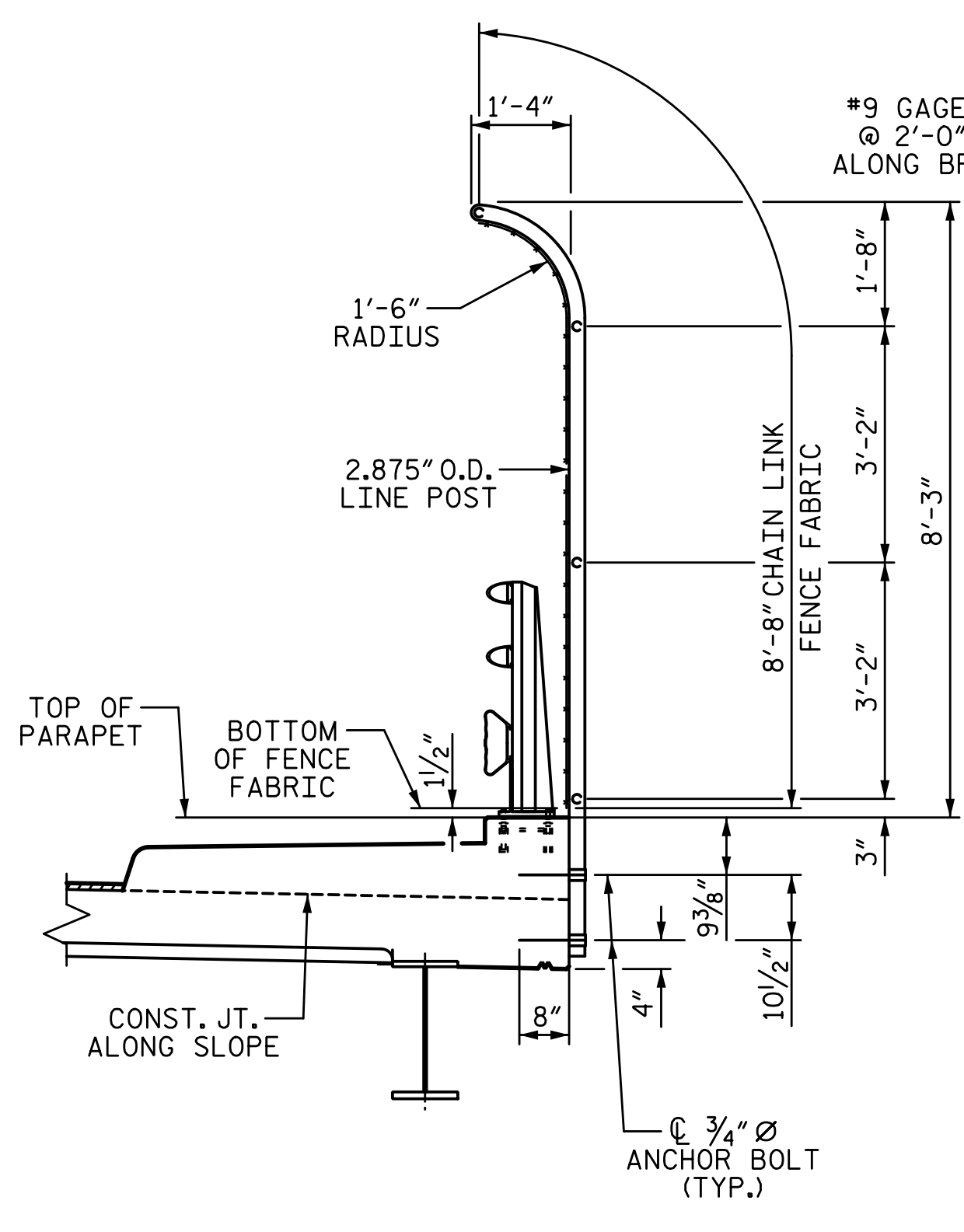
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**GUARDRAIL ANCHORAGE DETAILS**  
LEFT & RIGHT WIDENING

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			89

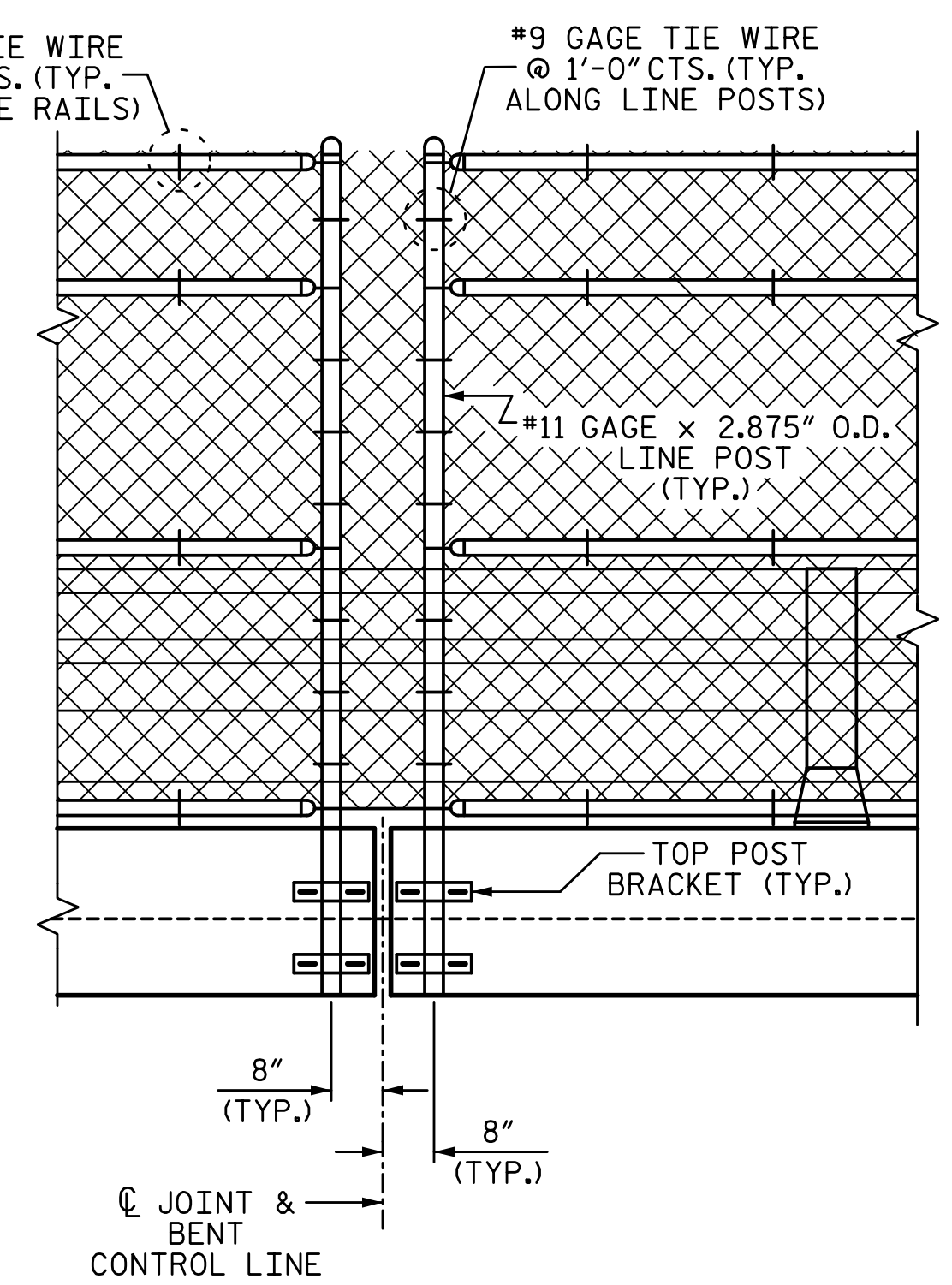
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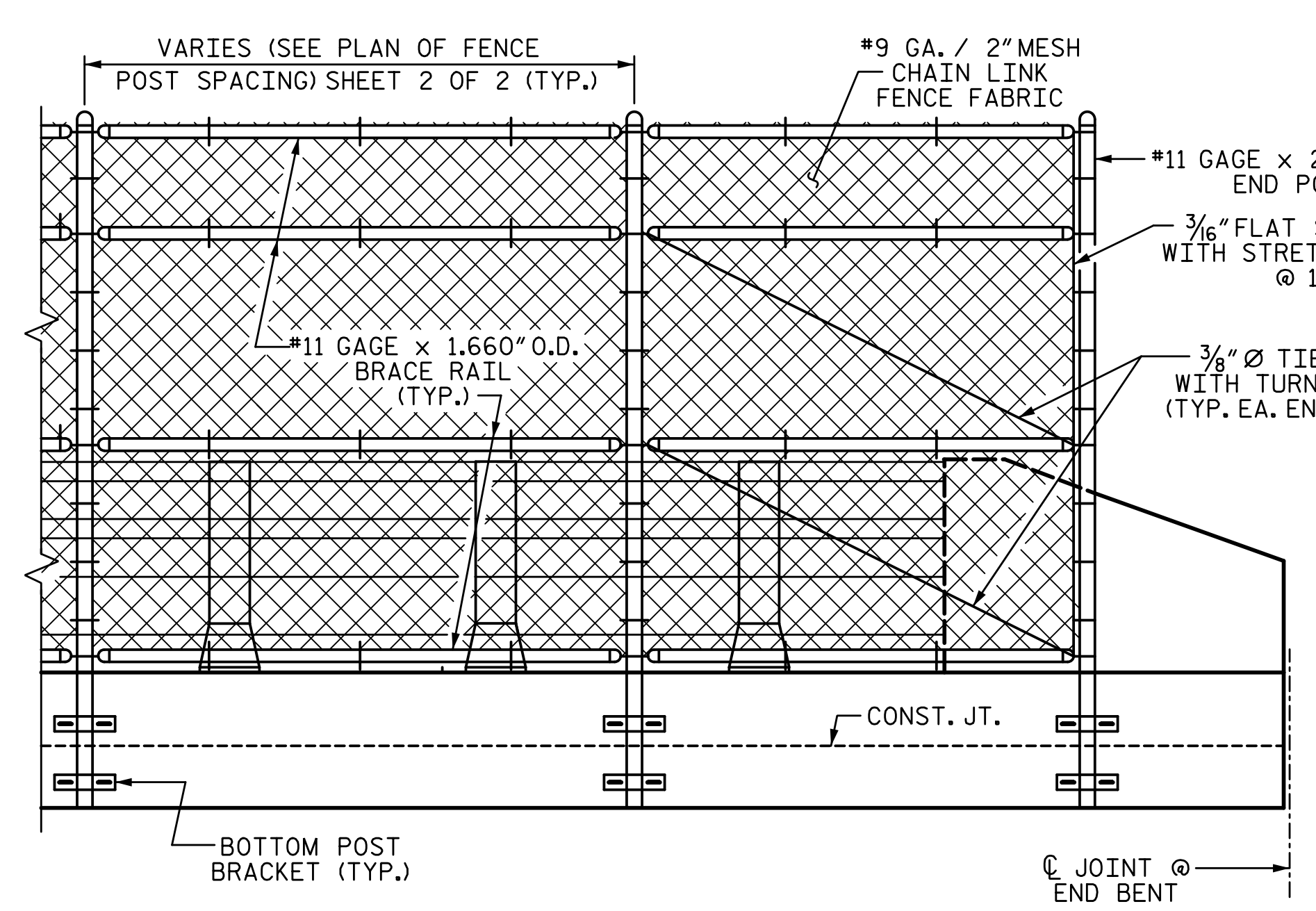
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**SECTION THRU FENCE**  
(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)



**PARTIAL ELEVATION**  
(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)



**NOTES:**

FOR BRIDGE MOUNTED CHAIN LINK FENCE, SEE SPECIAL PROVISIONS.

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

FOR SETTING ANCHOR BOLTS, THE CONTRACTOR SHALL USE AN ADHESIVE BONDING SYSTEM. SEE SECTION 420-13 OF THE STANDARD SPECIFICATIONS FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS. LEVEL ONE FIELD TESTING OF BONDING SYSTEM IS REQUIRED.

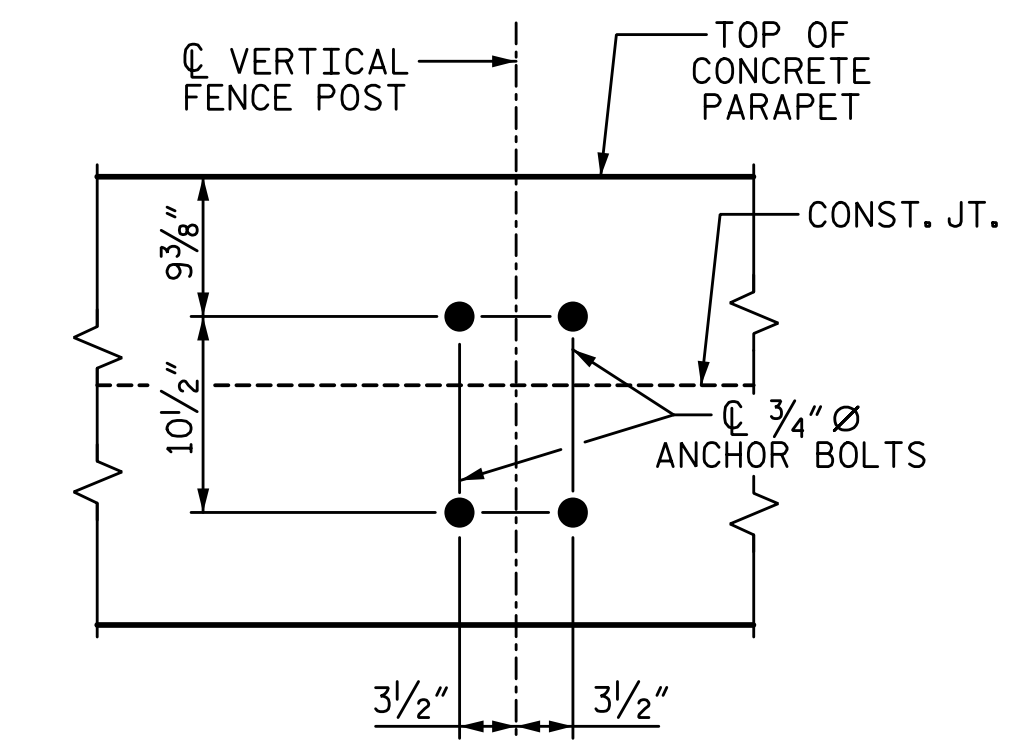
ALL FENCE MATERIAL SHALL MEET THE REQUIREMENTS OF SECTION 1050 OF THE STANDARD SPECIFICATIONS, GALVANIZE ALL STEEL PARTS AND HARDWARE IN ACCORDANCE WITH ARTICLE 1076 OF THE STANDARD SPECIFICATIONS.

FENCE POST LOCATIONS SHALL BE SHIFTED, AS NECESSARY, TO MAINTAIN 1'-0\"/>

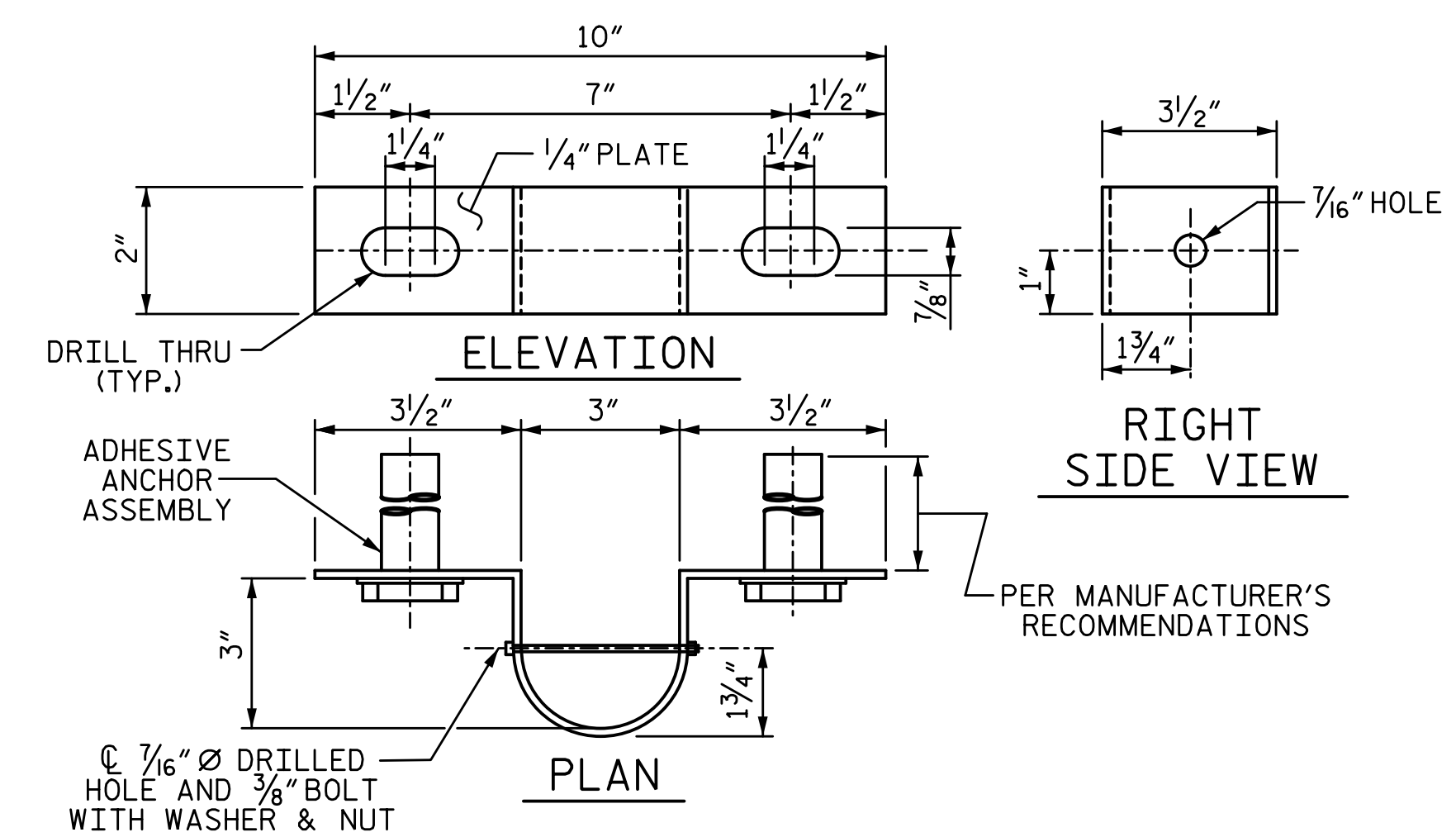
WELDING SHALL BE DONE IN ACCORDANCE WITH ARTICLE 1072-18 OF STANDARD SPECIFICATIONS.

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

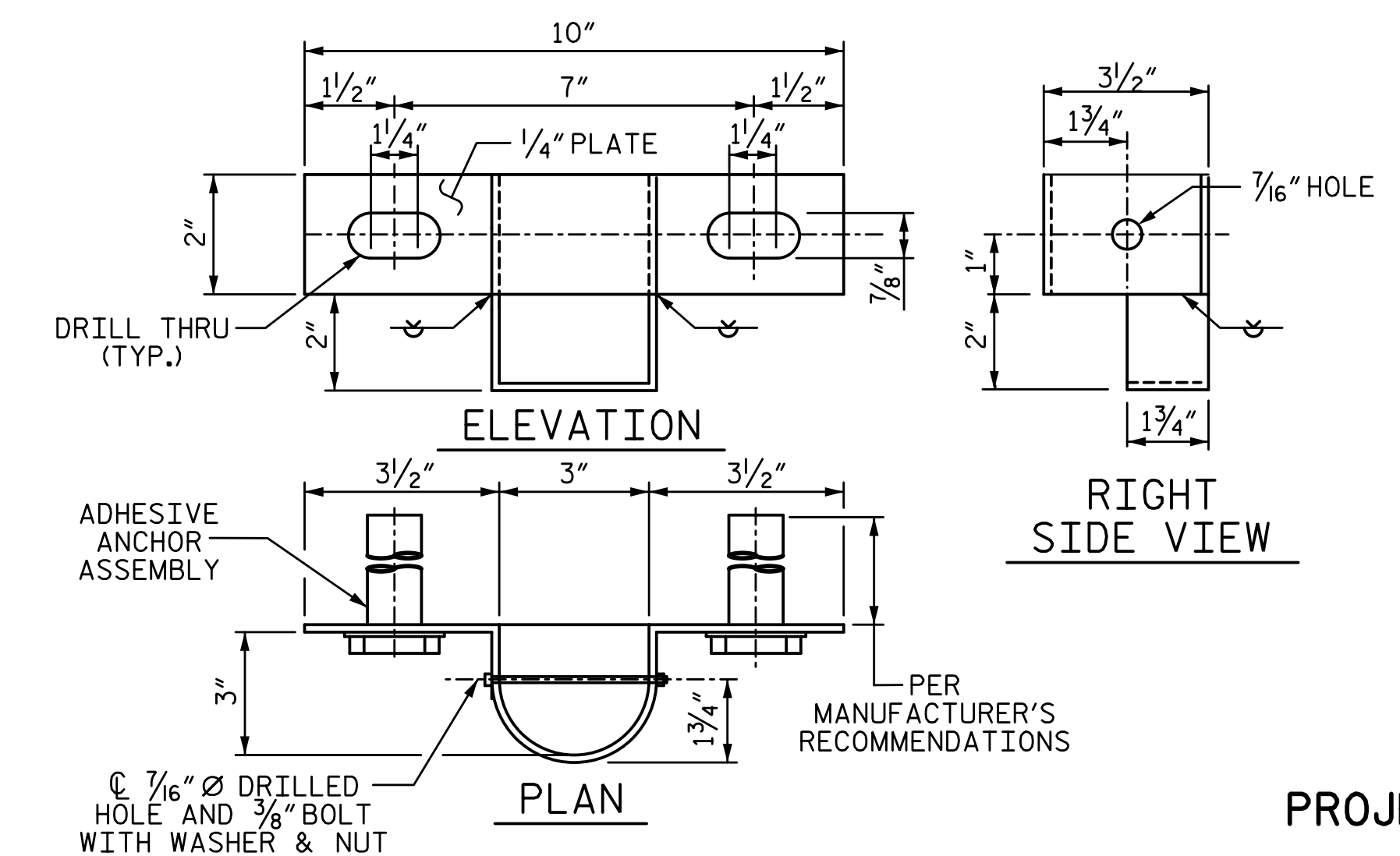
104\"/>



**BOLT SETTING DETAIL**



**TOP POST BRACKET**



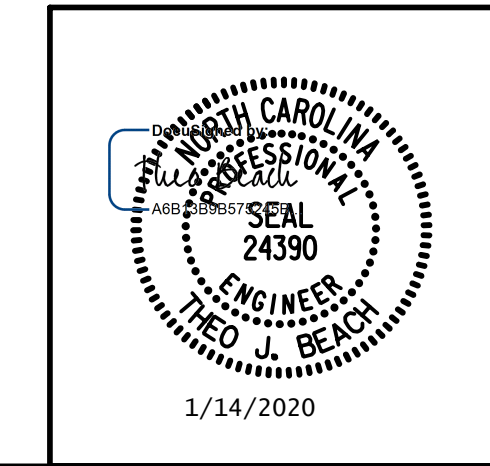
**BOTTOM POST BRACKET**

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SHEET 1 OF 2

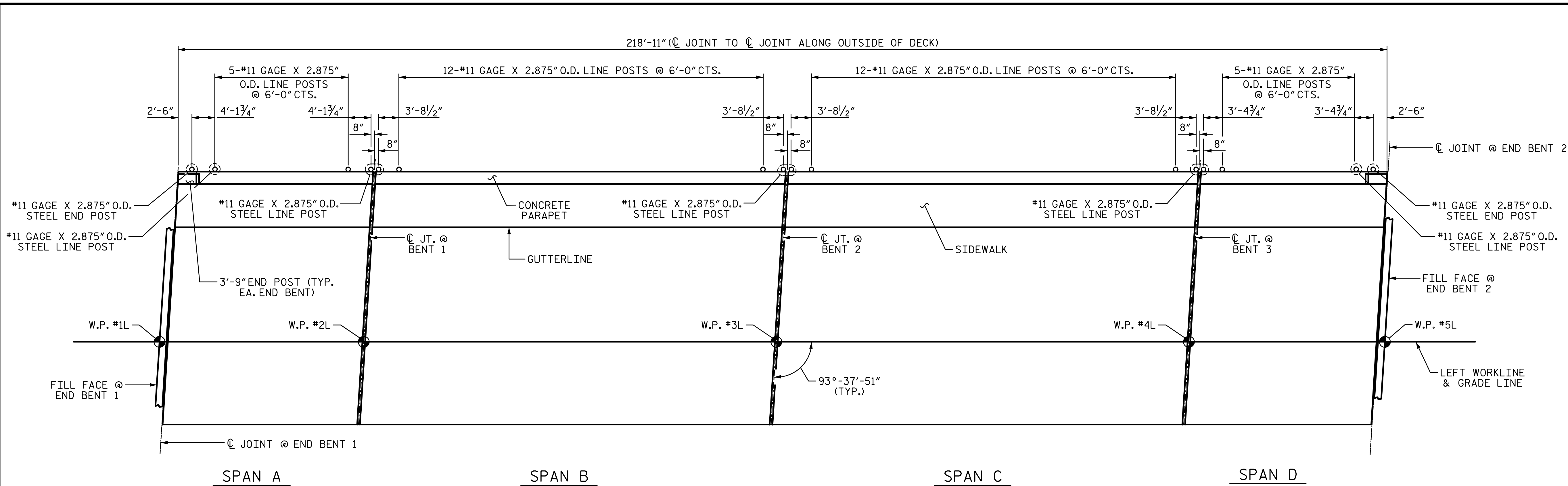
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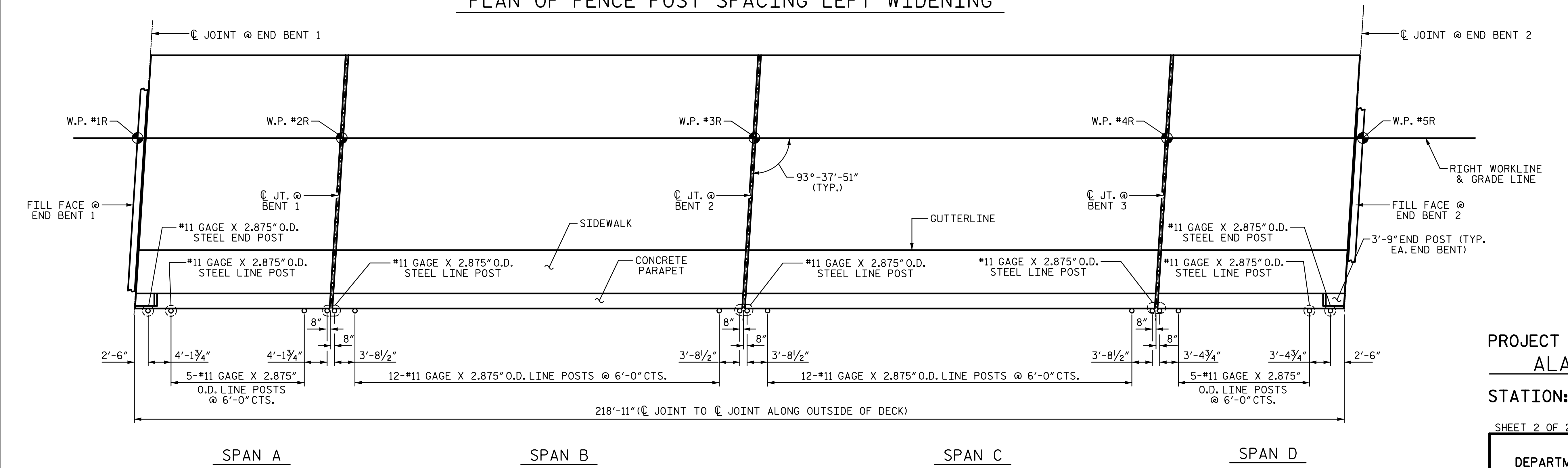


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE BRIDGE MOUNTED CHAIN LINK FENCE DETAILS LEFT & RIGHT WIDENING					
REVISIONS					
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1			3		
2			4		
					SHEET NO. S-38
					TOTAL SHEETS 89

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PLAN OF FENCE POST SPACING LEFT WIDENING

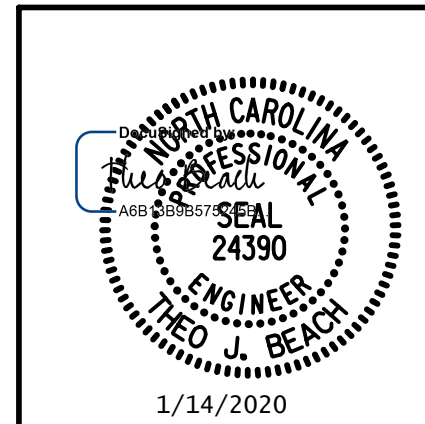


PLAN OF FENCE POST SPACING RIGHT WIDENING

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ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 BRIDGE MOUNTED  
 CHAIN LINK FENCE  
 DETAILS  
 LEFT & RIGHT WIDENING



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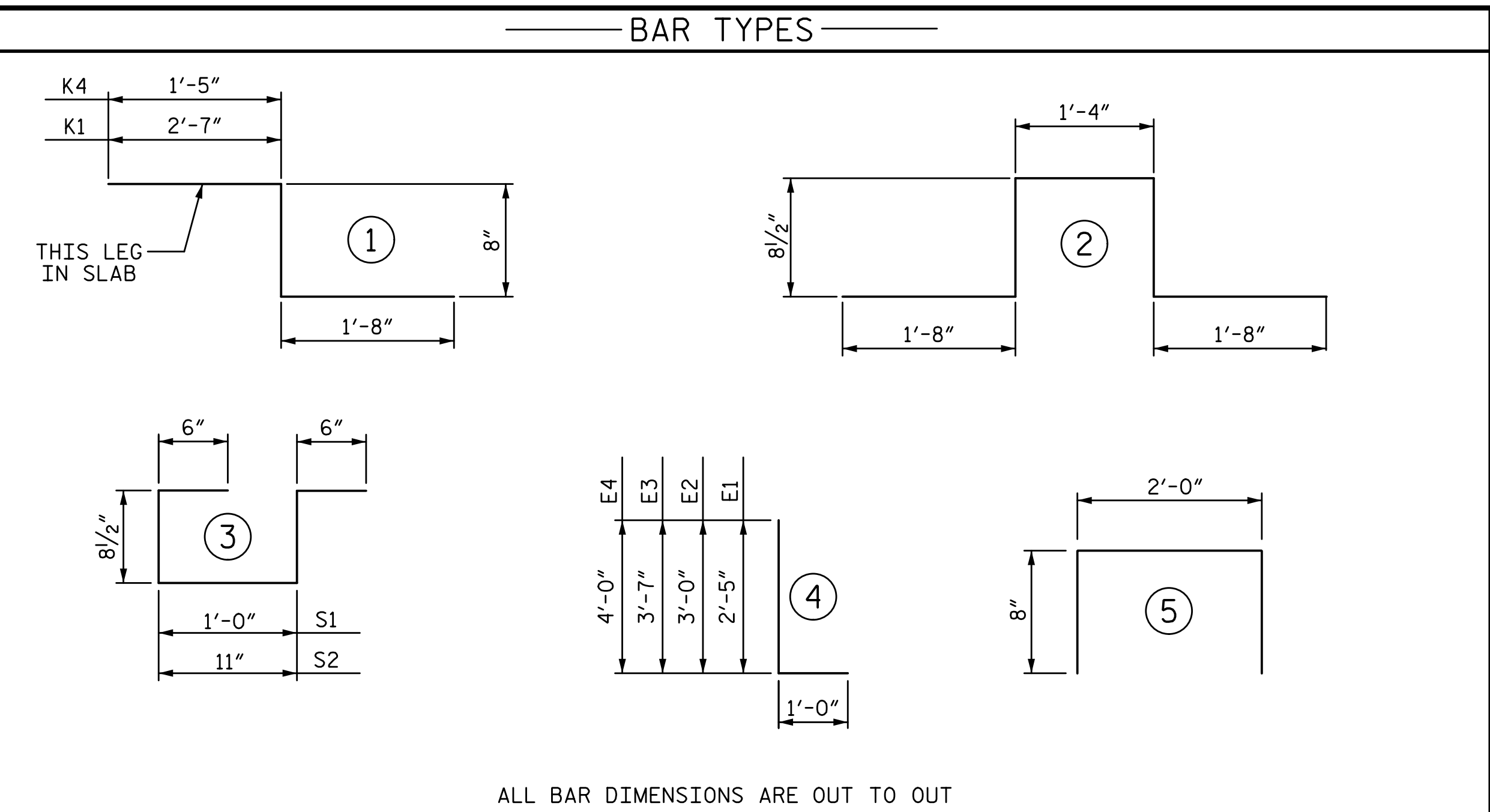
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BILL OF MATERIAL SPAN A (LEFT SIDE)						BILL OF MATERIAL SPAN B (LEFT SIDE)						BILL OF MATERIAL SPAN C (LEFT SIDE)						BILL OF MATERIAL SPAN D (LEFT SIDE)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	66	#5	STR	32'-2"	2214	*A1	145	#5	STR	32'-2"	4865	*A1	145	#5	STR	32'-2"	4865	*A1	63	#5	STR	32'-2"	2114
A2	66	#5	STR	32'-2"	2214	A2	145	#5	STR	32'-2"	4865	A2	145	#5	STR	32'-2"	4865	A2	63	#5	STR	32'-2"	2114
*A101	2	#5	STR	28'-2"	59	*A301	2	#5	STR	26'-7"	55	*A301	2	#5	STR	26'-7"	55	*A101	2	#5	STR	28'-2"	59
*A102	2	#5	STR	20'-4"	42	*A302	2	#5	STR	18'-8"	39	*A302	2	#5	STR	18'-8"	39	*A102	2	#5	STR	20'-4"	42
*A103	2	#5	STR	12'-5"	26	*A303	2	#5	STR	10'-10"	23	*A303	2	#5	STR	10'-10"	23	*A103	2	#5	STR	12'-5"	26
*A104	2	#5	STR	4'-7"	10	*A304	2	#5	STR	2'-11"	6	*A304	2	#5	STR	2'-11"	6	*A104	2	#5	STR	4'-7"	10
A201	2	#5	STR	28'-2"	59	A401	2	#5	STR	26'-7"	55	A401	2	#5	STR	26'-7"	55	A201	2	#5	STR	28'-2"	59
A202	2	#5	STR	20'-4"	42	A402	2	#5	STR	18'-8"	39	A402	2	#5	STR	18'-8"	39	A202	2	#5	STR	20'-4"	42
A203	2	#5	STR	12'-5"	26	A403	2	#5	STR	10'-10"	23	A403	2	#5	STR	10'-10"	23	A203	2	#5	STR	12'-5"	26
A204	2	#5	STR	4'-7"	10	A404	2	#5	STR	2'-11"	6	A404	2	#5	STR	2'-11"	6	A204	2	#5	STR	4'-7"	10
B1	50	#5	STR	35'-0"	1825	B3	100	#5	STR	38'-3"	3989	B3	100	#5	STR	38'-3"	3989	B5	50	#5	STR	33'-6"	1747
*B2	44	#4	STR	18'-6"	544	*B4	66	#4	STR	26'-2"	1154	*B4	66	#4	STR	26'-2"	1154	*B6	44	#4	STR	17'-9"	522
*B7	12	#4	STR	18'-6"	148	*B8	12	#4	STR	27'-1"	217	*B8	12	#4	STR	27'-1"	217	*B10	12	#4	STR	17'-9"	142
*D1	70	#6	STR	4'-6"	473	*D1	148	#6	STR	4'-6"	1000	*D1	148	#6	STR	4'-6"	1000	*D1	66	#6	STR	4'-6"	446
*D2	70	#6	STR	3'-4"	350	*D2	148	#6	STR	3'-4"	741	*D2	148	#6	STR	3'-4"	741	*D2	66	#6	STR	3'-4"	330
*E1	2	#7	4	3'-5"	14	*G1	2	#5	STR	32'-2"	67	*G1	2	#5	STR	32'-2"	67	*E1	2	#7	4	3'-5"	14
*E2	2	#7	4	4'-0"	16	*G2	74	#4	STR	6'-3"	309	*G2	74	#4	STR	6'-3"	309	*E2	2	#7	4	4'-0"	16
*E3	2	#7	4	4'-7"	19	*K1	4	#5	1	4'-11"	21	*K1	4	#5	1	4'-11"	21	*E3	2	#7	4	4'-7"	19
*E4	2	#7	4	5'-0"	20	*K2	12	#5	2	6'-1"	76	*K2	12	#5	2	6'-1"	76	*E4	2	#7	4	5'-0"	20
*F1	2	#6	STR	3'-8"	11	*K3	16	#5	STR	6'-10"	114	*K3	16	#5	STR	6'-10"	114	*F1	2	#6	STR	3'-8"	11
*F2	2	#6	STR	1'-8"	5	*K4	4	#5	1	3'-9"	16	*K4	4	#5	1	3'-9"	16	*F2	2	#6	STR	1'-8"	5
*F3	2	#6	STR	3'-3"	10	*S2	48	#4	3	3'-4"	107	*S2	48	#4	3	3'-4"	107	*F3	2	#6	STR	3'-3"	10
*F4	4	#6	STR	3'-5"	21	*U1	22	#4	5	3'-4"	49	*U1	22	#4	5	3'-4"	49	*F4	4	#6	STR	3'-5"	21
*G1	2	#5	STR	32'-2"	67													*G1	2	#5	STR	32'-2"	67
*G2	35	#4	STR	6'-3"	146													*G2	34	#4	STR	6'-3"	142
*K1	4	#5	1	4'-11"	21	REINFORCING STEEL				9091 LB		REINFORCING STEEL				9091 LB		*K1	4	#5	1	4'-11"	21
*K2	12	#5	2	6'-1"	76	EPOXY COATED						EPOXY COATED						*K2	12	#5	2	6'-1"	76
K3	16	#5	STR	6'-10"	114	REINFORCING STEEL				8822 LB		REINFORCING STEEL				8822 LB		K3	16	#5	STR	6'-10"	114
*K4	4	#5	1	3'-9"	16													*K4	4	#5	1	3'-9"	16
*S1	24	#4	3	3'-5"	55													*S1	24	#4	3	3'-5"	55
*S2	24	#4	3	3'-4"	53													*S2	24	#4	3	3'-4"	53
*U1	10	#4	5	3'-4"	22													*U1	10	#4	5	3'-4"	22
REINFORCING STEEL					4290 LB													REINFORCING STEEL					4112 LB
EPOXY COATED																		EPOXY COATED					
REINFORCING STEEL					4438 LB													REINFORCING STEEL					4259 LB



**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"			

**GROOVING BRIDGE FLOORS**

APPROACH SLABS	592	SQ. FT.
BRIDGE DECK	5,920	SQ. FT.
<b>TOTAL</b>	<b>6,512</b>	<b>SQ. FT.</b>

**CLASS AA CONCRETE BREAKDOWN**

	SPAN A	SPAN B	SPAN C	SPAN D
	CY	CY	CY	CY
DECK	32.4	66.3	66.3	30.1
CLOSURE POUR	3.2	6.7	6.7	3.1
END POSTS	1.2			1.2
SIDEWALK	6.9	14.6	14.6	6.6
<b>TOTAL</b>	<b>43.7</b>	<b>87.6</b>	<b>87.6</b>	<b>41.0</b>

**PPC OVERLAY QUANTITIES**

	QUANTITY
SHOTBLASTING BRIDGE DECK	770.0 SY
PPC MATERIALS	21.4 CY
PLACING AND FINISHING PPC OVERLAY	770.0 SY

PPC OVERLAY QUANTITIES INCLUDE APPROACH SLABS. FOR LIMITS OF APPROACH SLAB PPC OVERLAY, SEE BRIDGE APPROACH SLAB SHEET 1 OF 5

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SHEET 1 OF 2

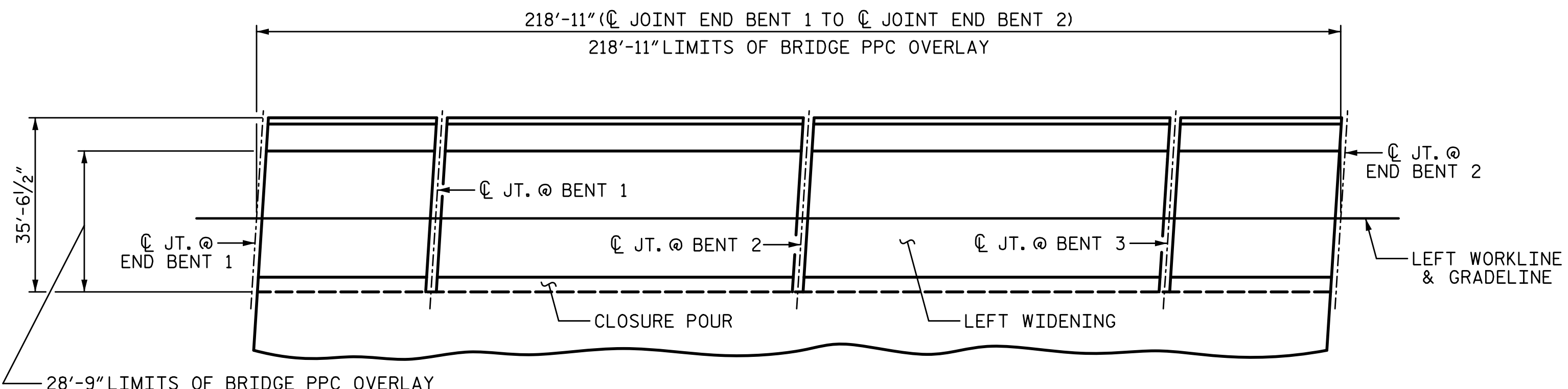
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 RALEIGH  
 SUPERSTRUCTURE

**BILL OF MATERIAL**

**LEFT WIDENING**

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

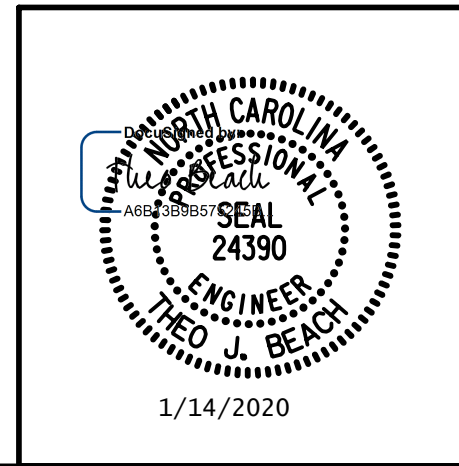
TOTAL SHEETS  
89



**LAYOUT FOR COMPUTING REINFORCED CONCRETE DECK SLAB AREA**  
 (SQ. FT. = 7781)

DRAWN BY: <u>S.D. COOPER</u>	DATE: <u>1-20</u>
CHECKED BY: <u>T. BEACH</u>	DATE: <u>1-20</u>
DESIGN ENGINEER OF RECORD: <u>T. BEACH</u>	DATE: <u>1-20</u>

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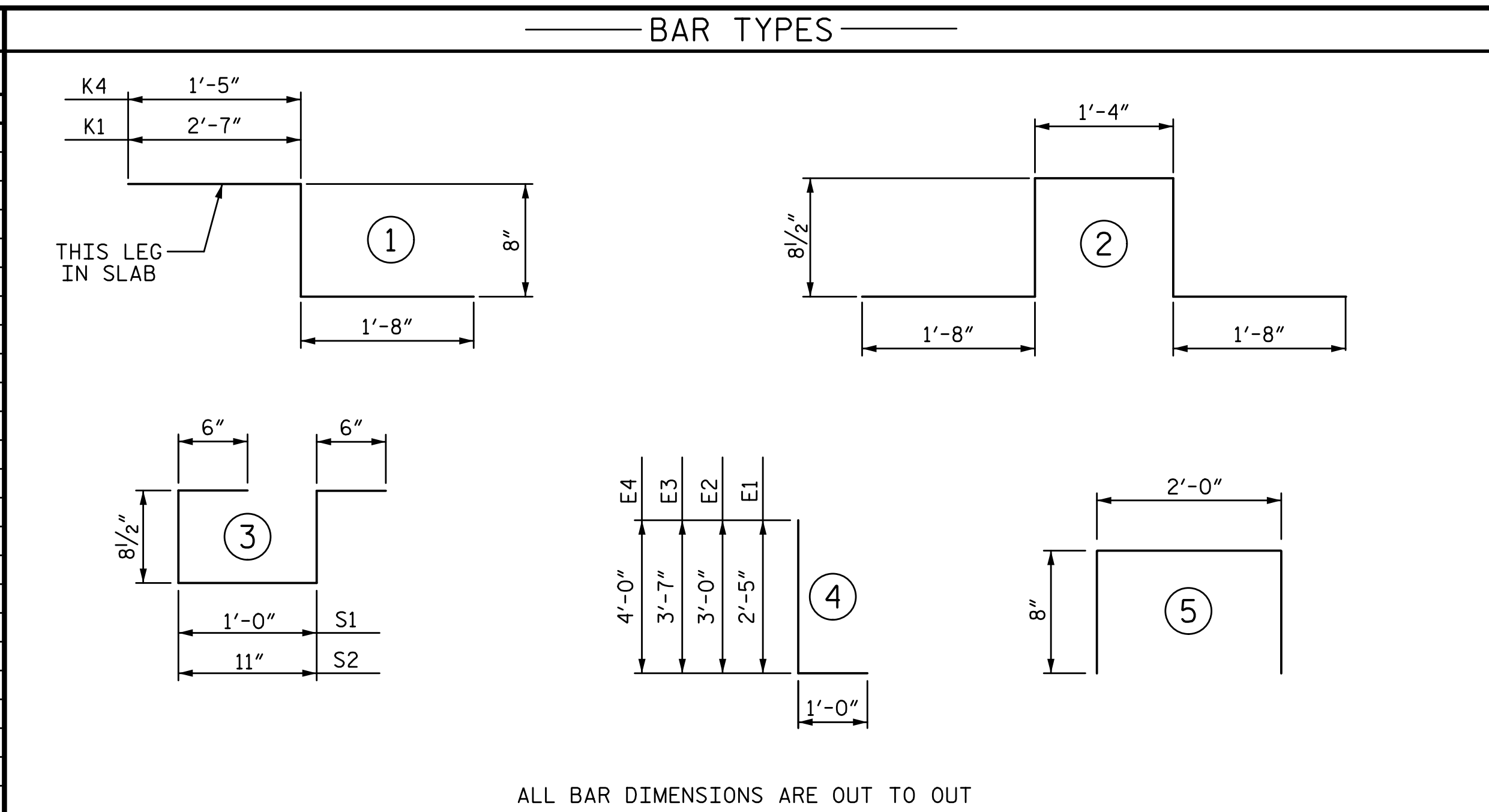


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BILL OF MATERIAL SPAN A (RIGHT SIDE)						BILL OF MATERIAL SPAN B (RIGHT SIDE)						BILL OF MATERIAL SPAN C (RIGHT SIDE)						BILL OF MATERIAL SPAN D (RIGHT SIDE)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	66	#5	STR	32'-2"	2214	*A1	145	#5	STR	32'-2"	4865	*A1	145	#5	STR	32'-2"	4865	*A1	63	#5	STR	32'-2"	2114
A2	66	#5	STR	32'-2"	2214	A2	145	#5	STR	32'-2"	4865	A2	145	#5	STR	32'-2"	4865	A2	63	#5	STR	32'-2"	2114
*A101	2	#5	STR	28'-2"	59	*A301	2	#5	STR	26'-7"	55	*A301	2	#5	STR	26'-7"	55	*A101	2	#5	STR	28'-2"	59
*A102	2	#5	STR	20'-4"	42	*A302	2	#5	STR	18'-8"	39	*A302	2	#5	STR	18'-8"	39	*A102	2	#5	STR	20'-4"	42
*A103	2	#5	STR	12'-5"	26	*A303	2	#5	STR	10'-10"	23	*A303	2	#5	STR	10'-10"	23	*A103	2	#5	STR	12'-5"	26
*A104	2	#5	STR	4'-7"	10	*A304	2	#5	STR	2'-11"	6	*A304	2	#5	STR	2'-11"	6	*A104	2	#5	STR	4'-7"	10
A201	2	#5	STR	28'-2"	59	A401	2	#5	STR	26'-7"	55	A401	2	#5	STR	26'-7"	55	A201	2	#5	STR	28'-2"	59
A202	2	#5	STR	20'-4"	42	A402	2	#5	STR	18'-8"	39	A402	2	#5	STR	18'-8"	39	A202	2	#5	STR	20'-4"	42
A203	2	#5	STR	12'-5"	26	A403	2	#5	STR	10'-10"	23	A403	2	#5	STR	10'-10"	23	A203	2	#5	STR	12'-5"	26
A204	2	#5	STR	4'-7"	10	A404	2	#5	STR	2'-11"	6	A404	2	#5	STR	2'-11"	6	A204	2	#5	STR	4'-7"	10
B1	50	#5	STR	35'-0"	1825	B3	100	#5	STR	38'-3"	3989	B3	100	#5	STR	38'-3"	3989	B5	50	#5	STR	33'-6"	1747
*B2	44	#4	STR	18'-6"	544	*B4	66	#4	STR	26'-2"	1154	*B4	66	#4	STR	26'-2"	1154	*B6	44	#4	STR	17'-9"	522
*B7	12	#4	STR	18'-6"	148	*B8	12	#4	STR	27'-1"	217	*B8	12	#4	STR	27'-1"	217	*B10	12	#4	STR	17'-9"	142
*D1	70	#6	STR	4'-6"	473	*D1	148	#6	STR	4'-6"	1000	*D1	148	#6	STR	4'-6"	1000	*D2	66	#6	STR	4'-6"	446
*D2	70	#6	STR	3'-4"	350	*D2	148	#6	STR	3'-4"	741	*D2	148	#6	STR	3'-4"	741	*D2	66	#6	STR	3'-4"	330
*E1	2	#7	4	3'-5"	14	*G1	2	#5	STR	32'-2"	67	*G1	2	#5	STR	32'-2"	67	*E1	2	#7	4	3'-5"	14
*E2	2	#7	4	4'-0"	16	*G2	74	#4	STR	6'-3"	309	*G2	74	#4	STR	6'-3"	309	*E2	2	#7	4	4'-0"	16
*E3	2	#7	4	4'-7"	19	*K1	4	#5	1	4'-11"	21	*K1	4	#5	1	4'-11"	21	*E3	2	#7	4	4'-7"	19
*E4	2	#7	4	5'-0"	20	*K2	12	#5	2	6'-1"	76	*K2	12	#5	2	6'-1"	76	*E4	2	#7	4	5'-0"	20
*F1	2	#6	STR	3'-8"	11	*K3	16	#5	STR	6'-10"	114	*K3	16	#5	STR	6'-10"	114	*F1	2	#6	STR	3'-8"	11
*F2	2	#6	STR	1'-8"	5	*K4	4	#5	1	3'-9"	16	*K4	4	#5	1	3'-9"	16	*F2	2	#6	STR	1'-8"	5
*F3	2	#6	STR	3'-3"	10	*S2	48	#4	3	3'-4"	107	*S2	48	#4	3	3'-4"	107	*F3	2	#6	STR	3'-3"	10
*F4	4	#6	STR	3'-5"	21	*U1	22	#4	5	3'-4"	49	*U1	22	#4	5	3'-4"	49	*F4	4	#6	STR	3'-5"	21
*G1	2	#5	STR	32'-2"	67													*G1	2	#5	STR	32'-2"	67
*G2	35	#4	STR	6'-3"	146													*G2	34	#4	STR	6'-3"	142
*K1	4	#5	1	4'-11"	21	REINFORCING STEEL				9091 LB		REINFORCING STEEL				9091 LB		*K1	4	#5	1	4'-11"	21
*K2	12	#5	2	6'-1"	76	EPOXY COATED						EPOXY COATED						*K2	12	#5	2	6'-1"	76
K3	16	#5	STR	6'-10"	114	REINFORCING STEEL				8822 LB		REINFORCING STEEL				8822 LB		K3	16	#5	STR	6'-10"	114
*K4	4	#5	1	3'-9"	16													*K4	4	#5	1	3'-9"	16
*S1	24	#4	3	3'-5"	55													*S1	24	#4	3	3'-5"	55
*S2	24	#4	3	3'-4"	53													*S2	24	#4	3	3'-4"	53
*U1	10	#4	5	3'-4"	22													*U1	10	#4	5	3'-4"	22
REINFORCING STEEL					4290 LB													REINFORCING STEEL					4112 LB
EPOXY COATED																		EPOXY COATED					
REINFORCING STEEL					4438 LB													REINFORCING STEEL					4259 LB



**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"			

**GROOVING BRIDGE FLOORS**

APPROACH SLABS	592	SQ. FT.
BRIDGE DECK	5,920	SQ. FT.
<b>TOTAL</b>	<b>6,512</b>	<b>SQ. FT.</b>

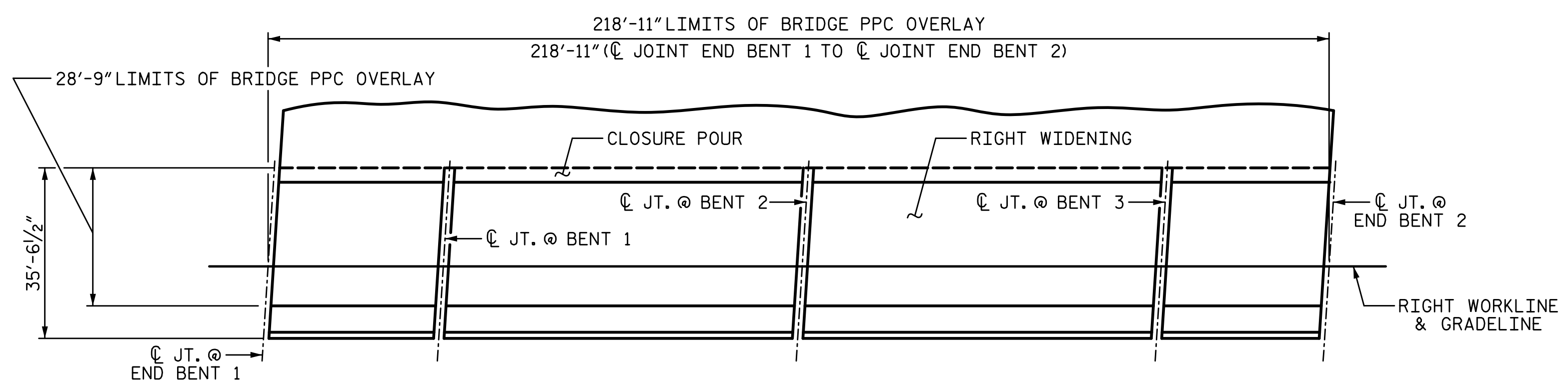
**CLASS AA CONCRETE BREAKDOWN**

	SPAN A	SPAN B	SPAN C	SPAN D
	CY	CY	CY	CY
DECK	32.4	66.3	66.3	30.1
CLOSURE POUR	3.2	6.7	6.7	3.1
END POSTS	1.2			1.2
SIDEWALK	6.9	14.6	14.6	6.6
<b>TOTAL</b>	<b>43.7</b>	<b>87.6</b>	<b>87.6</b>	<b>41.0</b>

**PPC OVERLAY QUANTITIES**

	QUANTITY
SHOTBLASTING BRIDGE DECK	770.0 SY
PPC MATERIALS	21.4 CY
PLACING AND FINISHING PPC OVERLAY	770.0 SY

PPC OVERLAY QUANTITIES INCLUDE APPROACH SLABS. FOR LIMITS OF APPROACH SLAB PPC OVERLAY, SEE BRIDGE APPROACH SLAB SHEET 2 OF 5

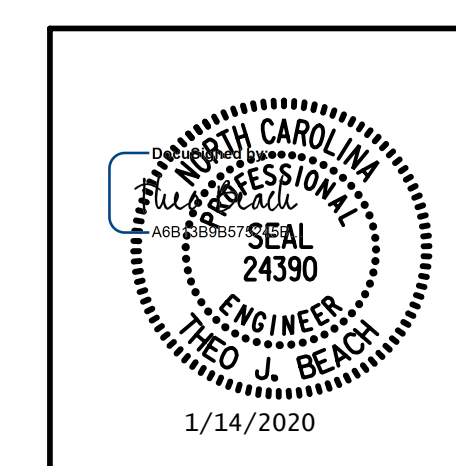


**LAYOUT FOR COMPUTING REINFORCED CONCRETE DECK SLAB AREA**  
(SQ. FT. = 7781)

PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-  
SHEET 2 OF 2

DRAWN BY: S.D. COOPER DATE: 1-20  
CHECKED BY: T. BEACH DATE: 1-20  
DESIGN ENGINEER OF RECORD: T. BEACH DATE: 1-20

PLANS PREPARED BY:  
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www.slmpsonengr.com  
LICENSURE NO. C-2521



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE

**BILL OF MATERIAL**

RIGHT WIDENING

REVISIONS						SHEET NO. S-41
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 89
2			4			

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**SPLICE CHART**

#4 B3 SPLICE LENGTH = 2'-5"  
 #4 K1 SPLICE LENGTH = 2'-5"

**NOTES:**

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

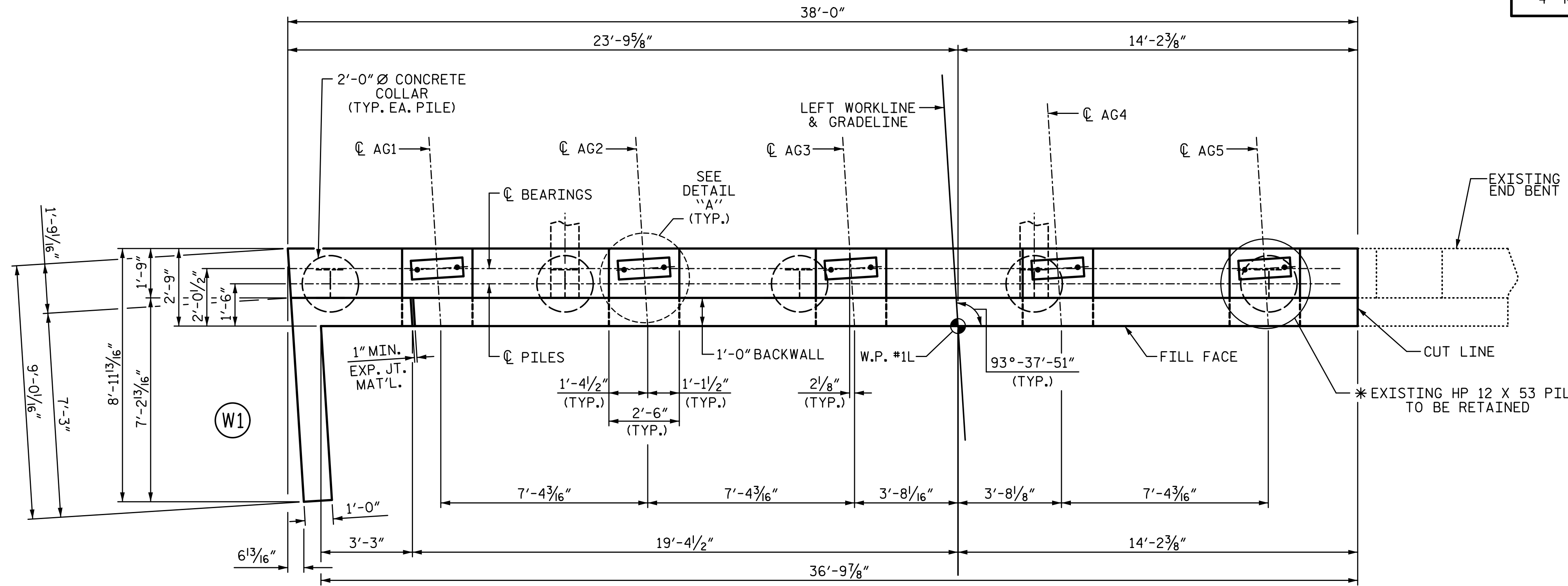
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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%.

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

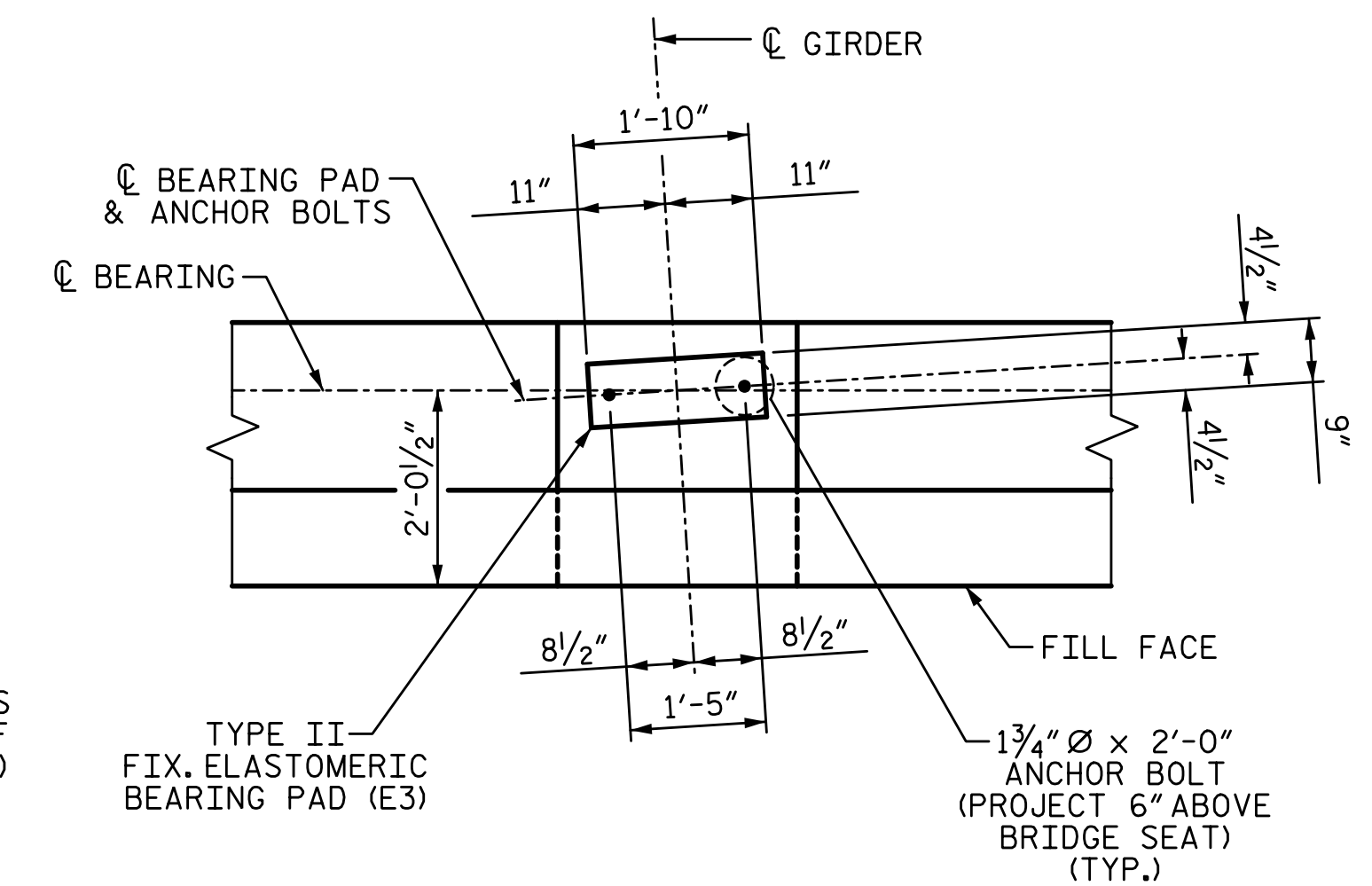
\* THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE EXISTING EXTERIOR PILE AND THE EXISTING "B" AND "K" BARS REINFORCING STEEL SHALL BE RETAINED PAST THE PROPOSED CUT LINE AND WILL BECOME PART OF THE WIDENED END BENT. THE EXISTING REINFORCING STEEL MAY BE BENT AS REQUIRED FOR FITTING AND TYING TO THE NEW REINFORCING STEEL.

\* FOR LOCATIONS BETWEEN BRIDGE SEATS BUILD-UPS, SEE SECTION A-A ON SHEET 3 OF 3.



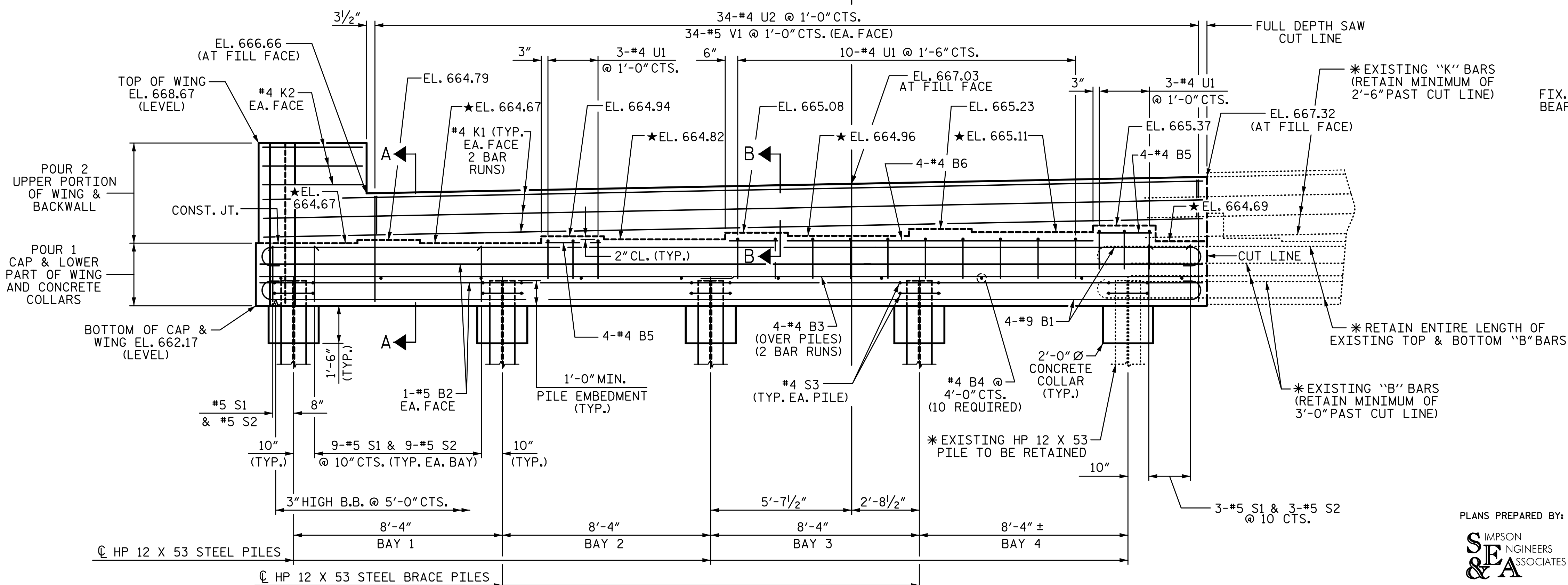
**PLAN**

WORKLINE →



**DETAIL "A"**

TYP. EA. GIRDER



**ELEVATION**

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

END BENT 1

LEFT WIDENING

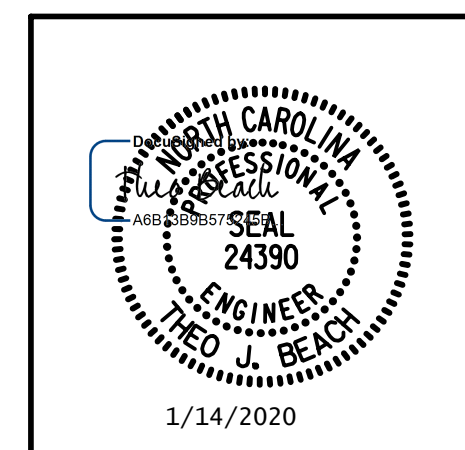
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NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.  
 S-42  
 TOTAL SHEETS  
 89

PLANS PREPARED BY:

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 (919) 852-0538 (Fax)  
 www.simpsonenr.com  
 LICENSURE NO. C-2521

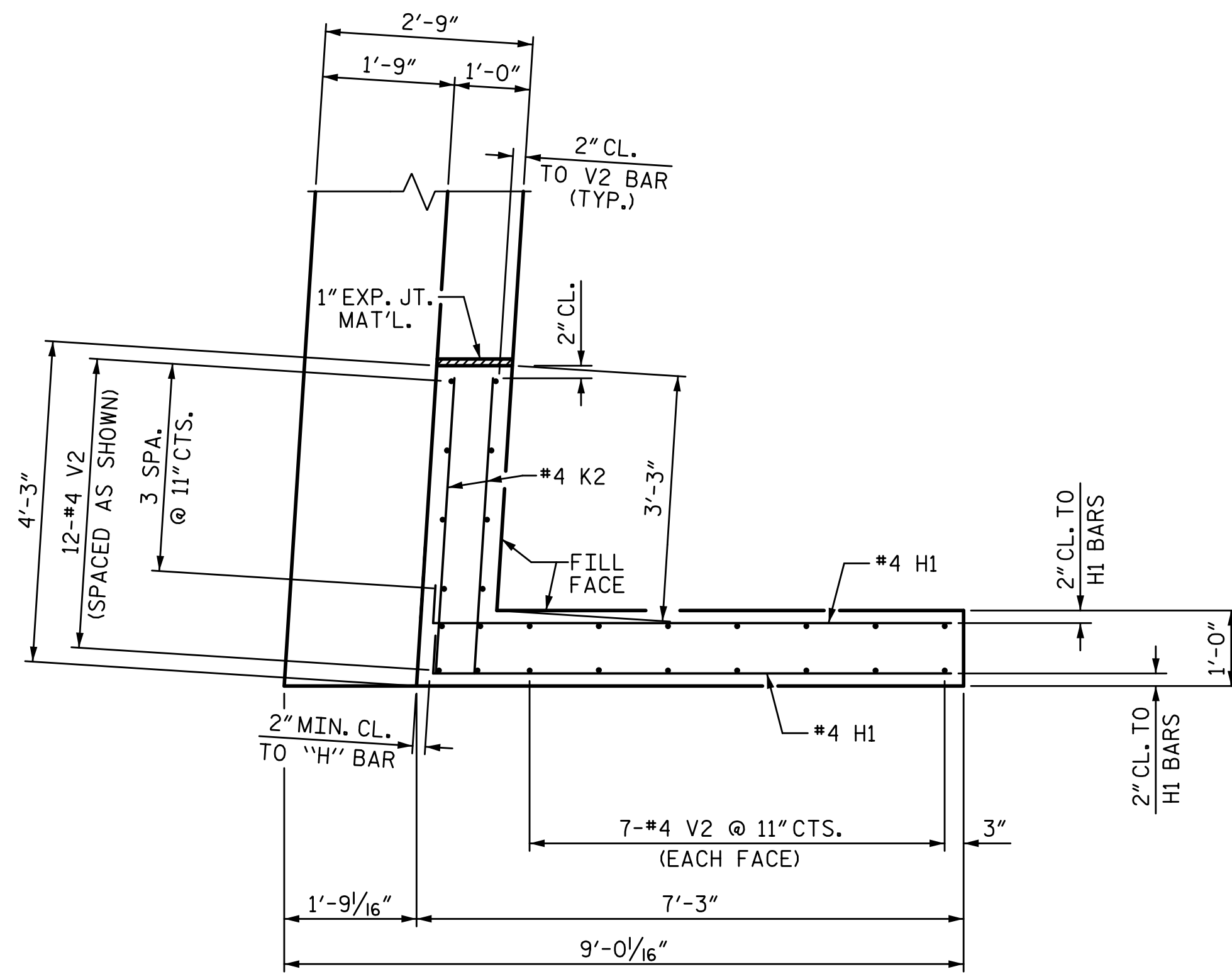


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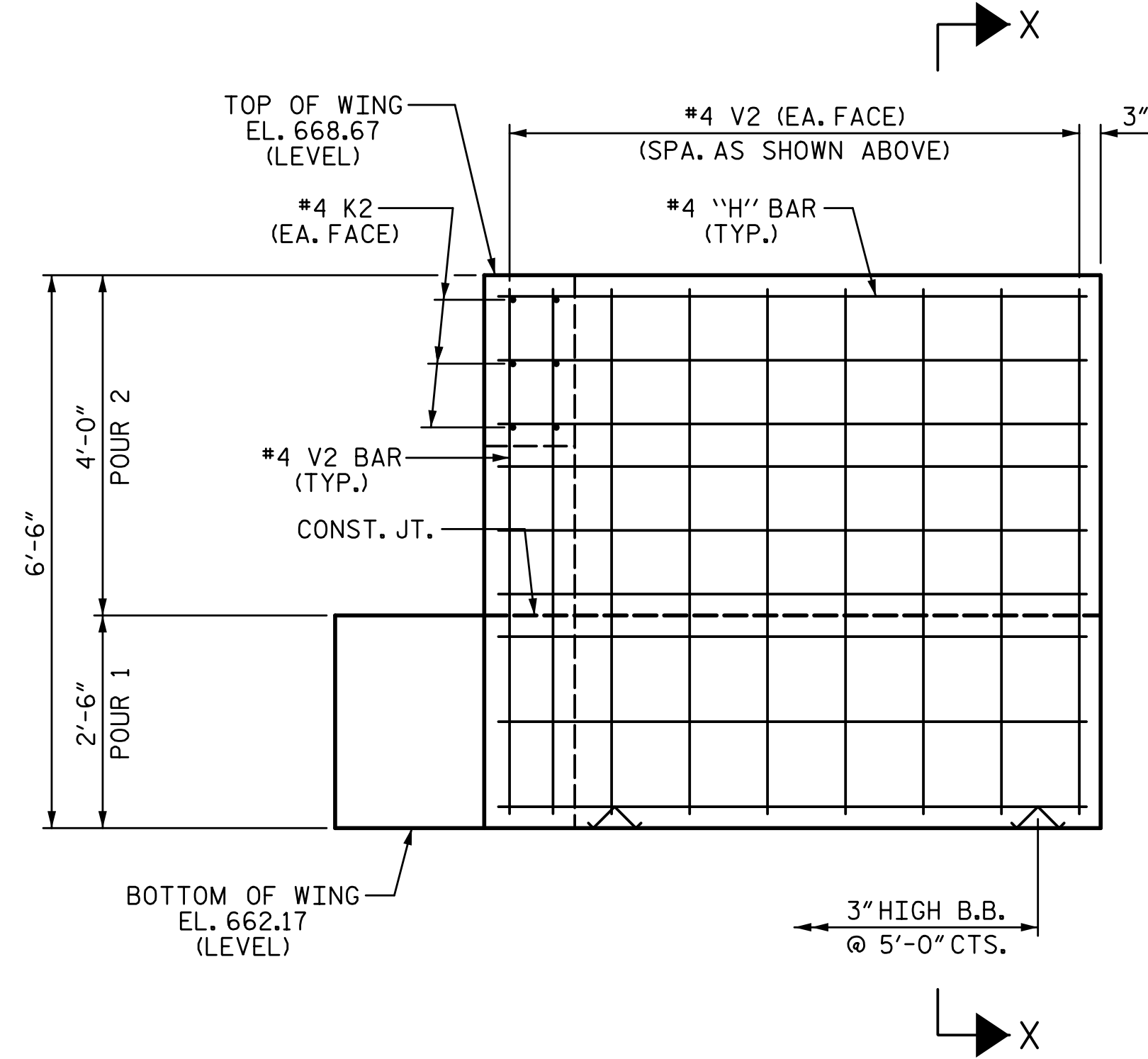
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 CHECKED BY: T. BEACH DATE: 1-20  
 DESIGN ENGINEER OF RECORD: T. BEACH DATE: 1-20

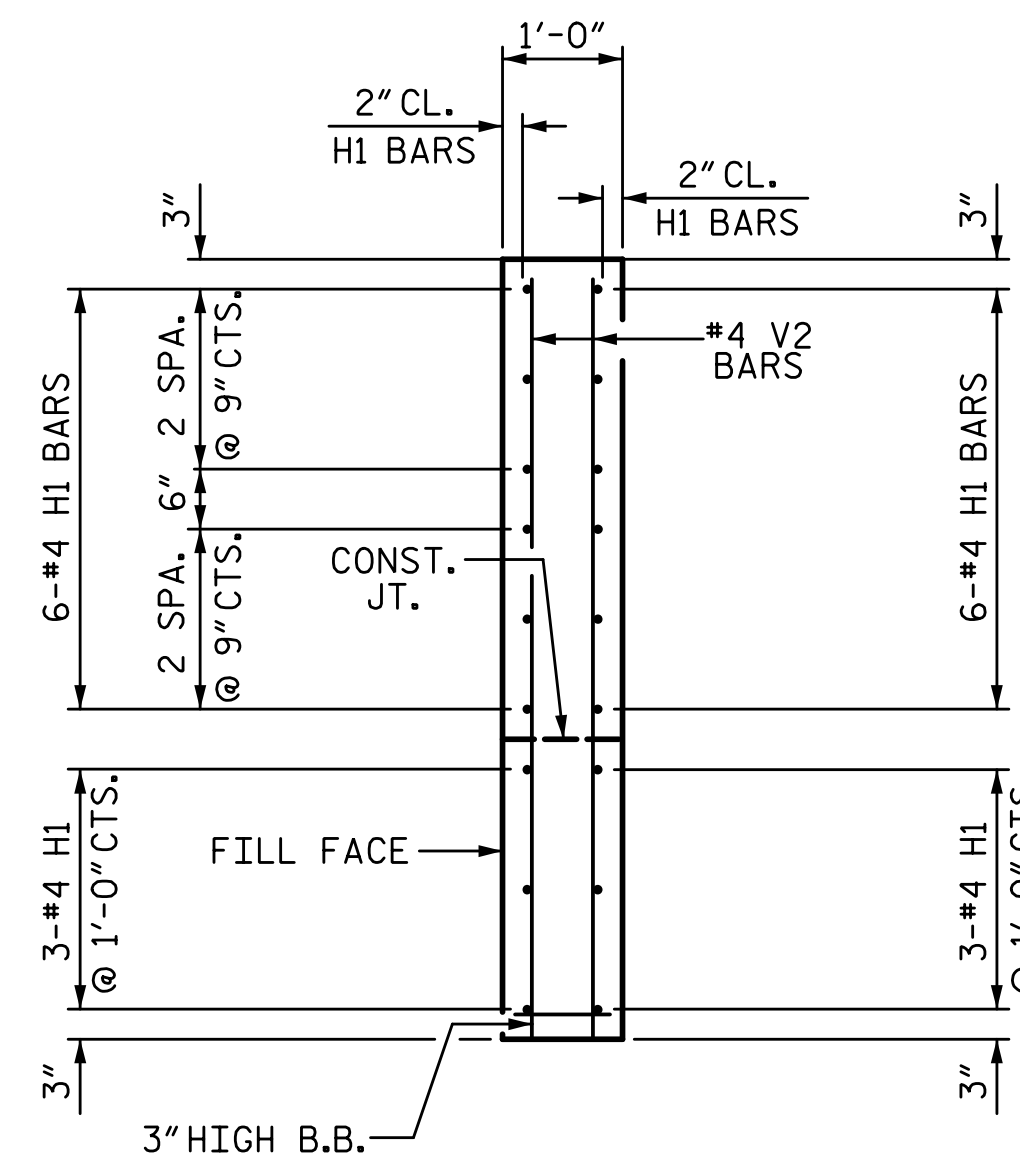
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PLAN OF WING (W1)



ELEVATION OF WING (W1)



SECTION X-X

PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

SHEET 2 OF 3

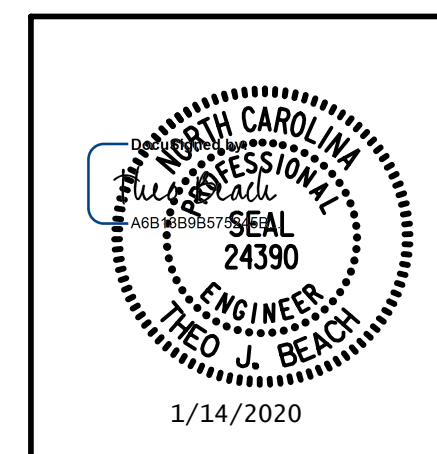
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE

END BENT 1

LEFT WIDENING

PLANS PREPARED BY:

**SE & A**  
SIMPSON ENGINEERS & ASSOCIATES  
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Cary, NC 27518  
(919) 852-0468  
(919) 852-0598 (Fax)  
www.simpsonengr.com  
LICENSURE NO. C-2521



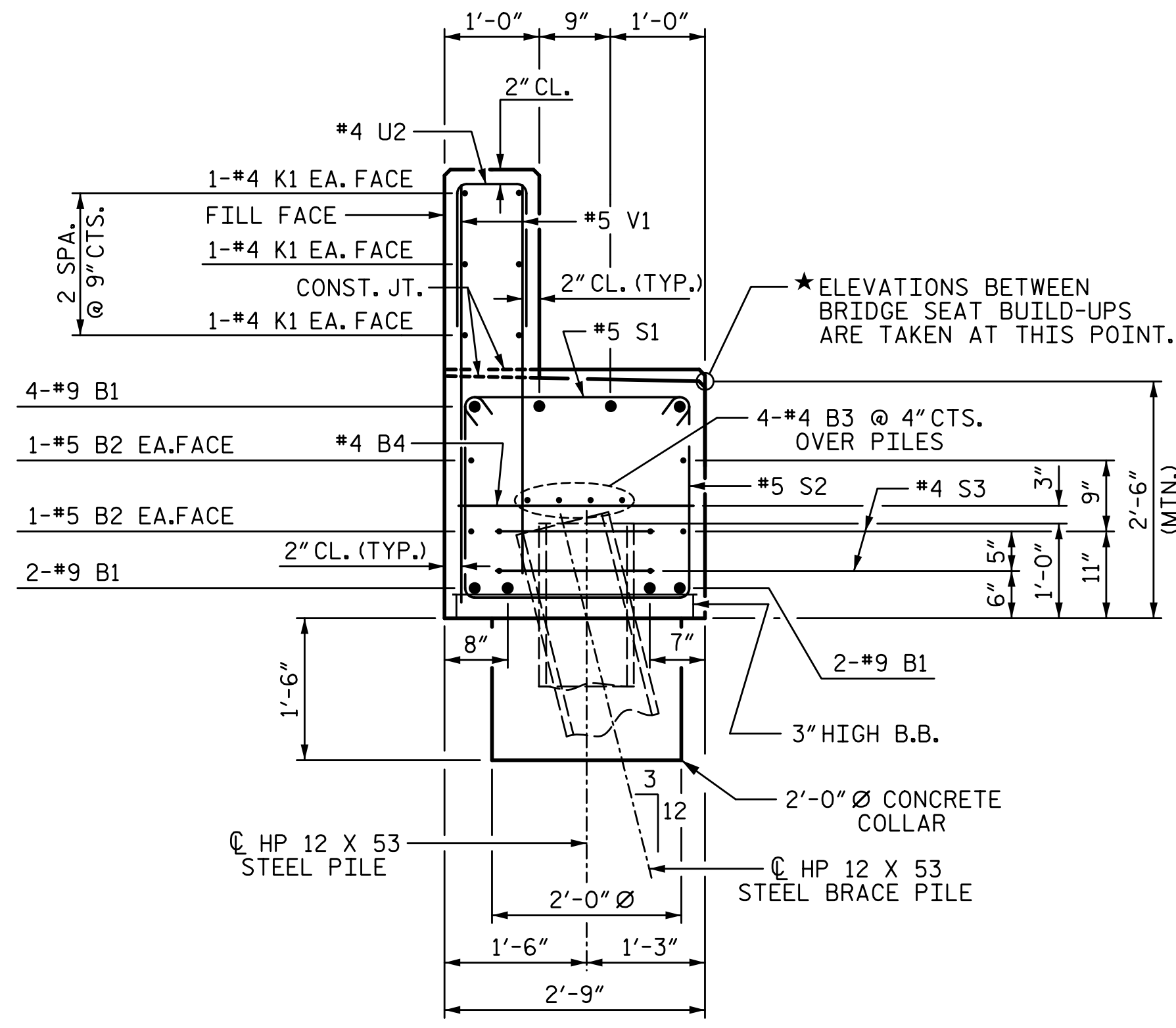
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			89

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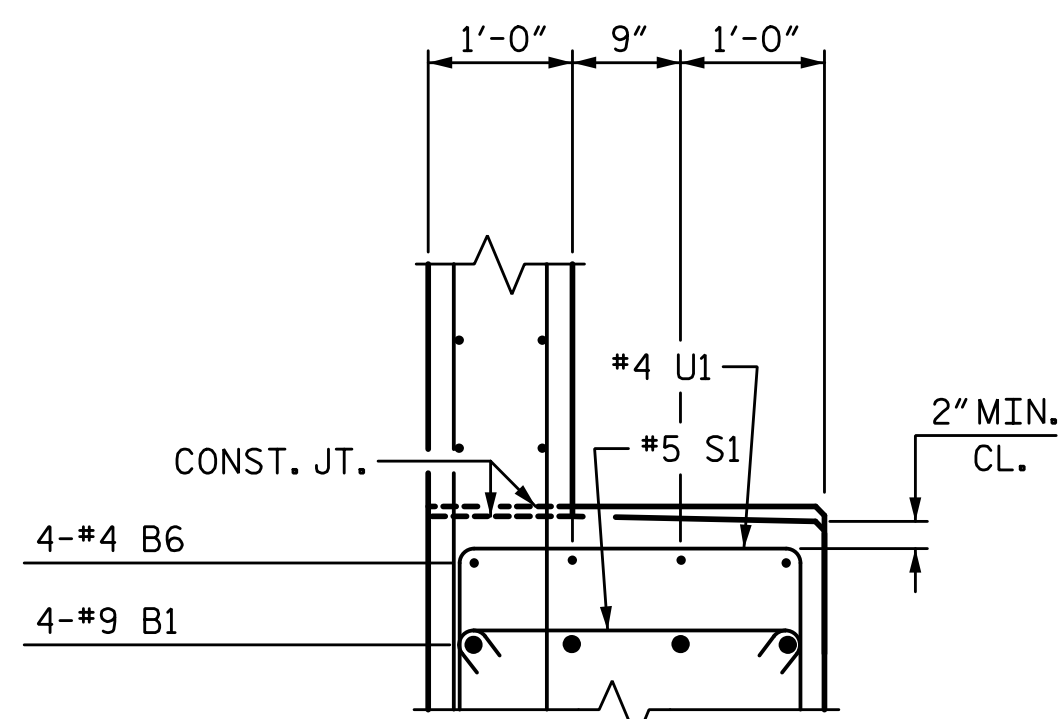
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DESIGN ENGINEER OF RECORD: <u>T. BEACH</u>	DATE: <u>1-20</u>



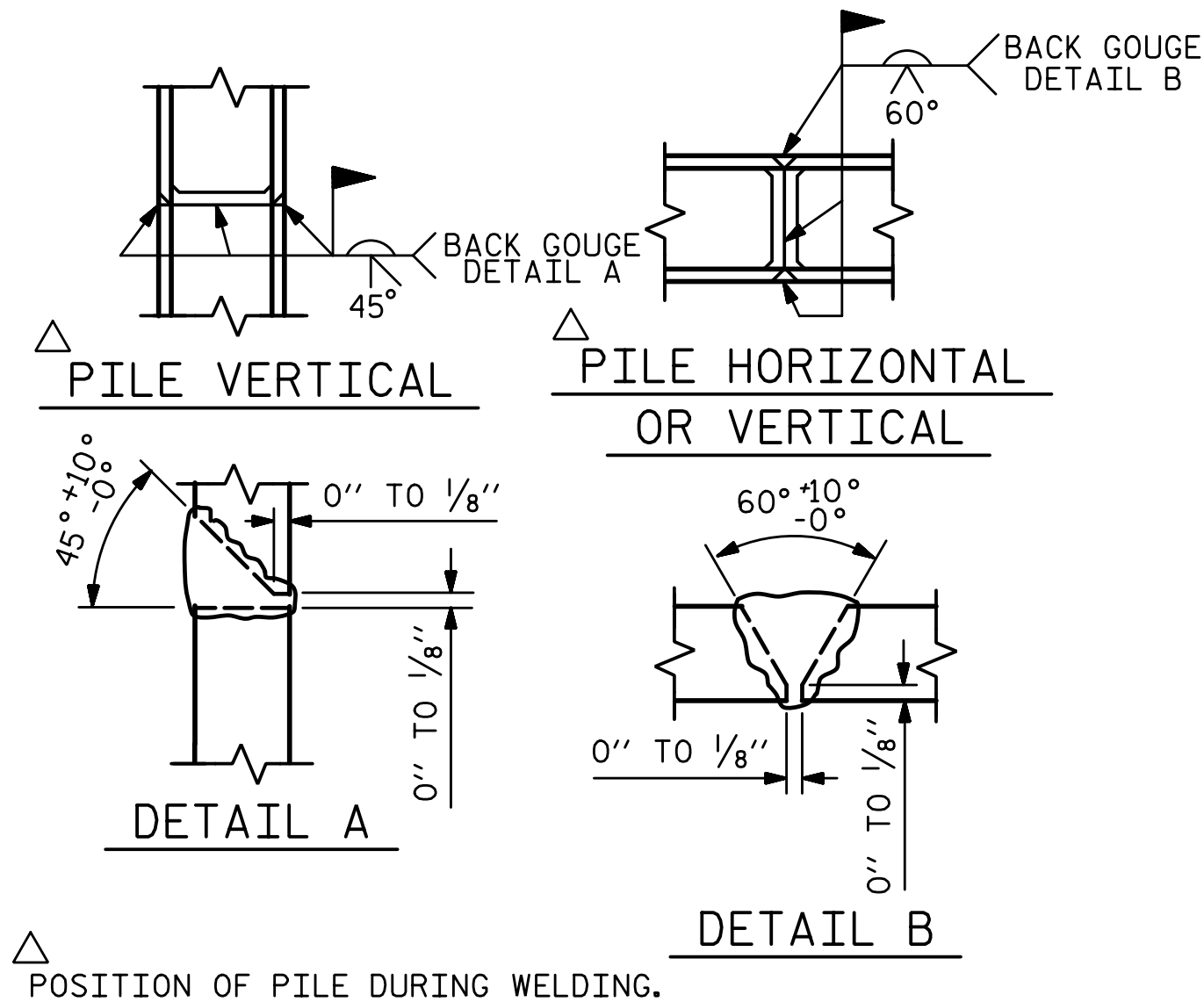
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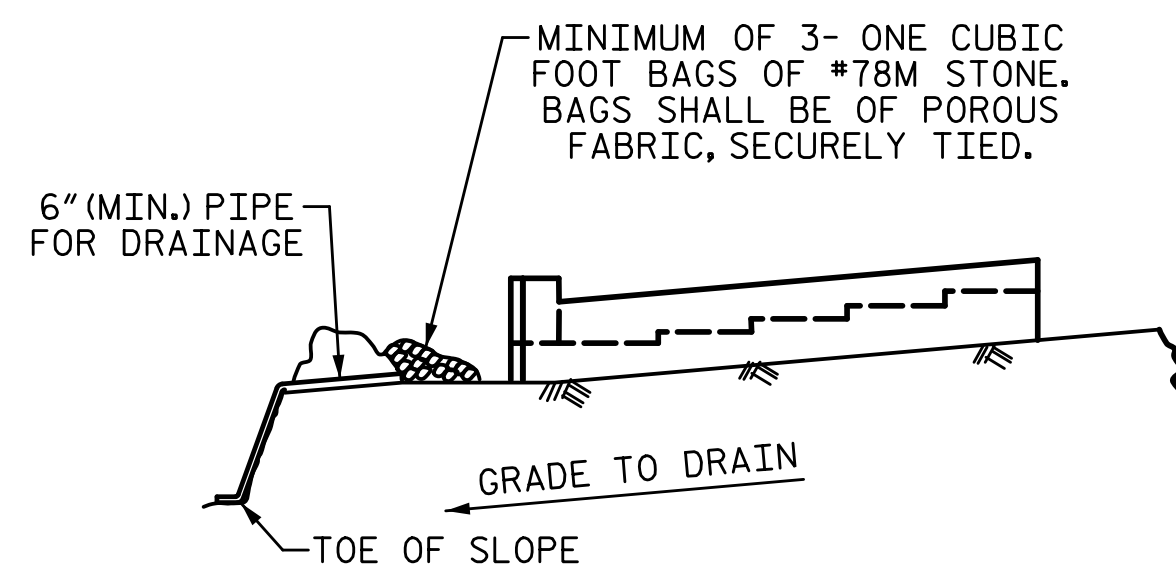
SECTION A-A



SECTION B-B



PILE SPLICE DETAILS

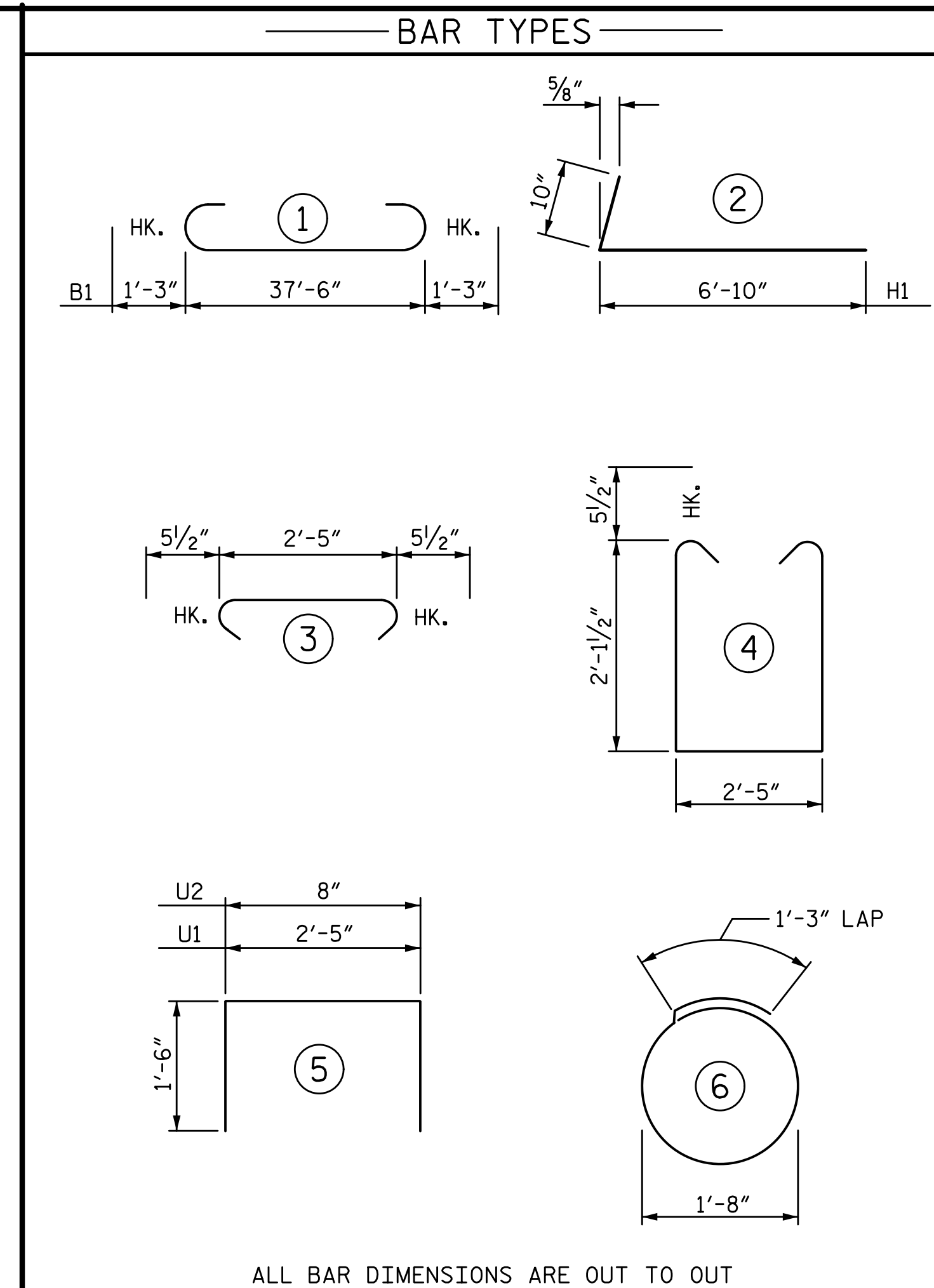


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

END BENT 1 - LEFT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	40'-0"	1088
B2	4	#5	STR	37'-7"	157
B3	8	#4	STR	20'-0"	107
B4	10	#4	STR	2'-5"	16
B5	8	#4	STR	2'-2"	12
B6	4	#4	STR	14'-6"	39
H1	18	#4	2	7'-8"	92
K1	12	#4	STR	20'-0"	160
K2	6	#4	STR	3'-10"	15
S1	40	#5	3	3'-4"	139
S2	40	#5	4	7'-7"	316
S3	10	#4	6	6'-6"	43
U1	16	#4	5	5'-5"	58
U2	34	#4	5	3'-8"	83
V1	68	#5	STR	4'-2"	296
V2	26	#4	STR	6'-1"	106
TOTAL REINFORCING STEEL				2727 LB	

CLASS A CONCRETE	
POUR 1 (CAP, COLLARS & LOWER WING)	12.2 CY
POUR 2 (BACKWALL & UPPER WING)	4.1 CY
TOTAL CLASS A CONCRETE	16.3 CY

HP 12 X 53 STEEL PILES	
NO. 4 STEEL PILE POINTS	100 LF / 4 EA.

PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	NO. 4
---	-------

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

END BENT 1

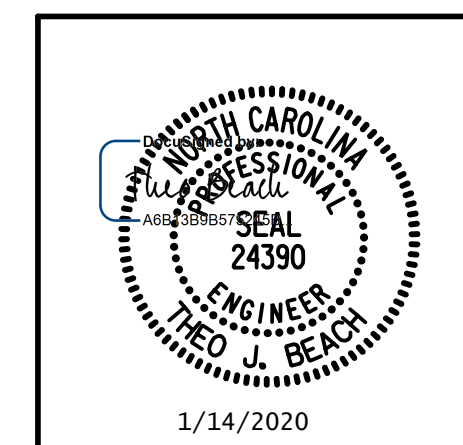
LEFT WIDENING

REVISIONS

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1			3			S-44
2			4			TOTAL SHEETS 89

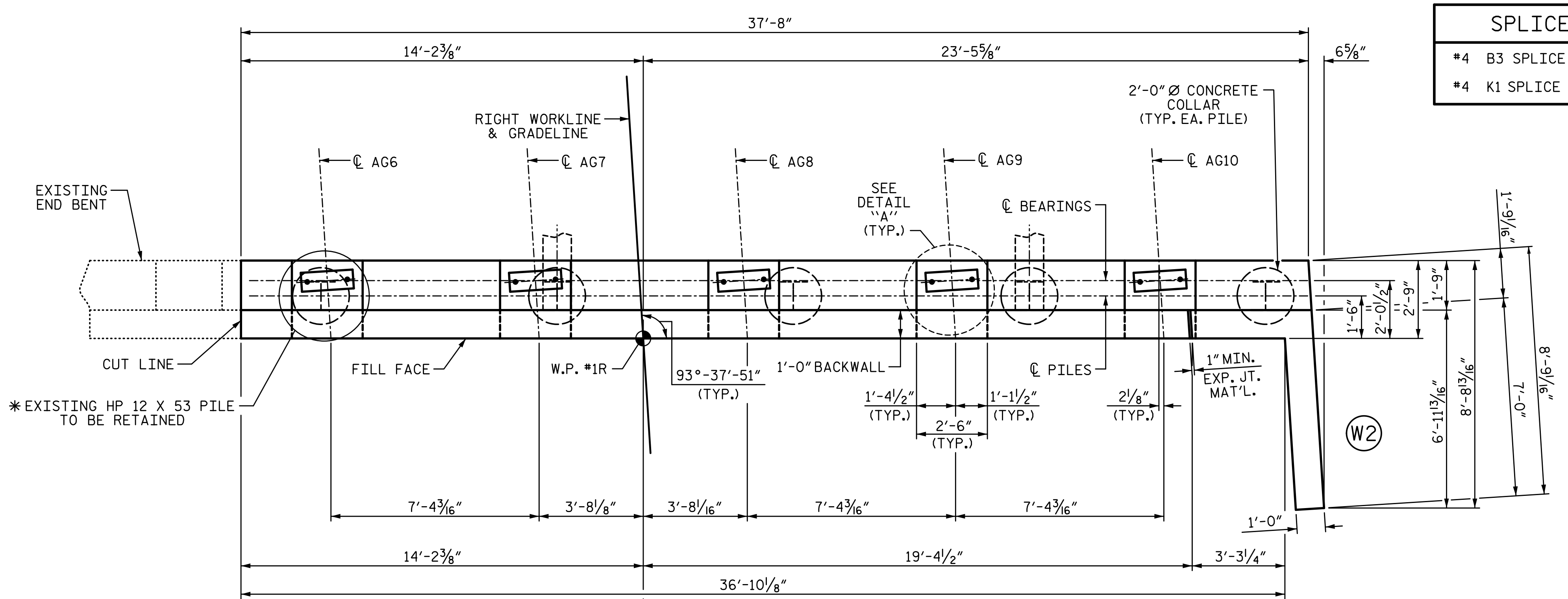
PLANS PREPARED BY:

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SPLICE CHART	
#4 B3 SPLICE LENGTH = 2'-5"	
#4 K1 SPLICE LENGTH = 2'-5"	

**NOTES:**

STIRRUPS AND "U" BARS 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.

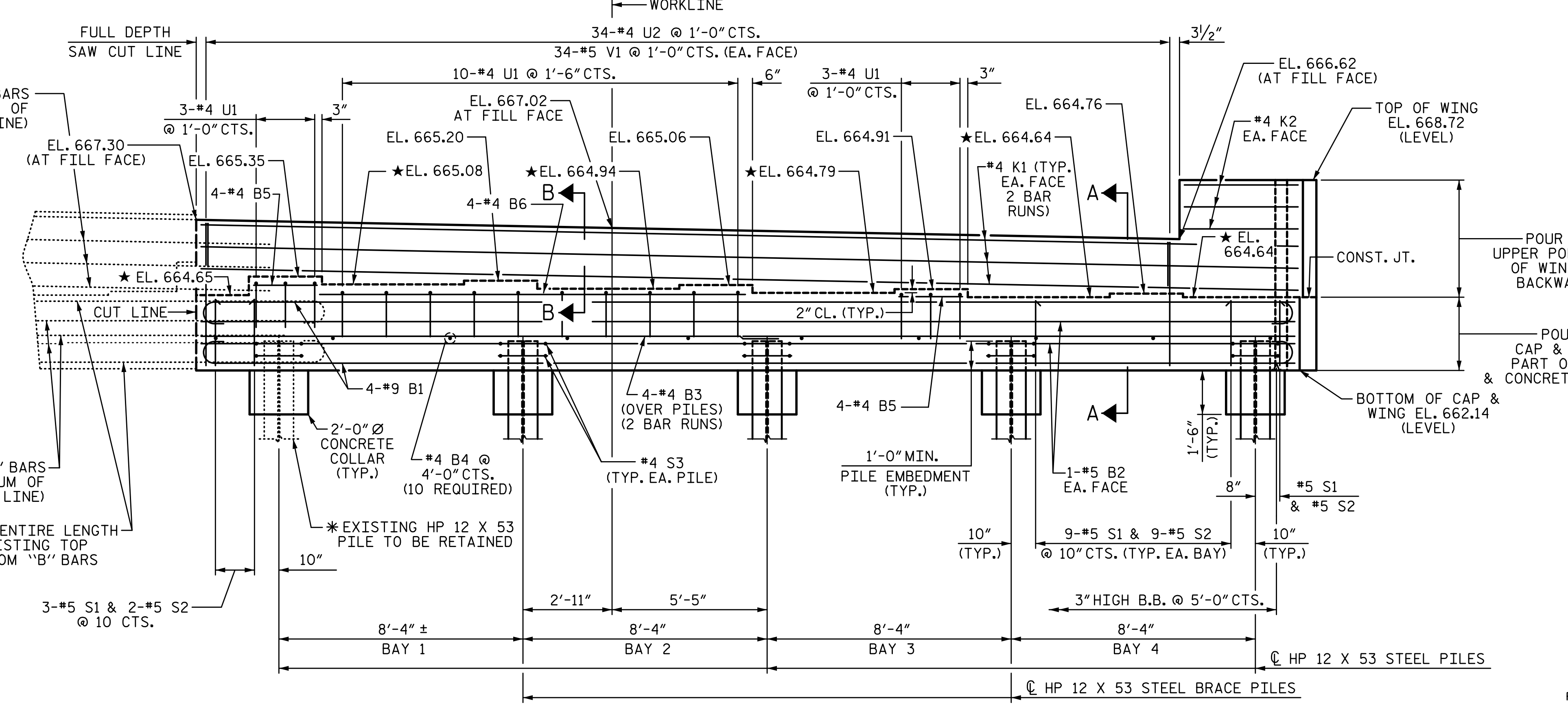
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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

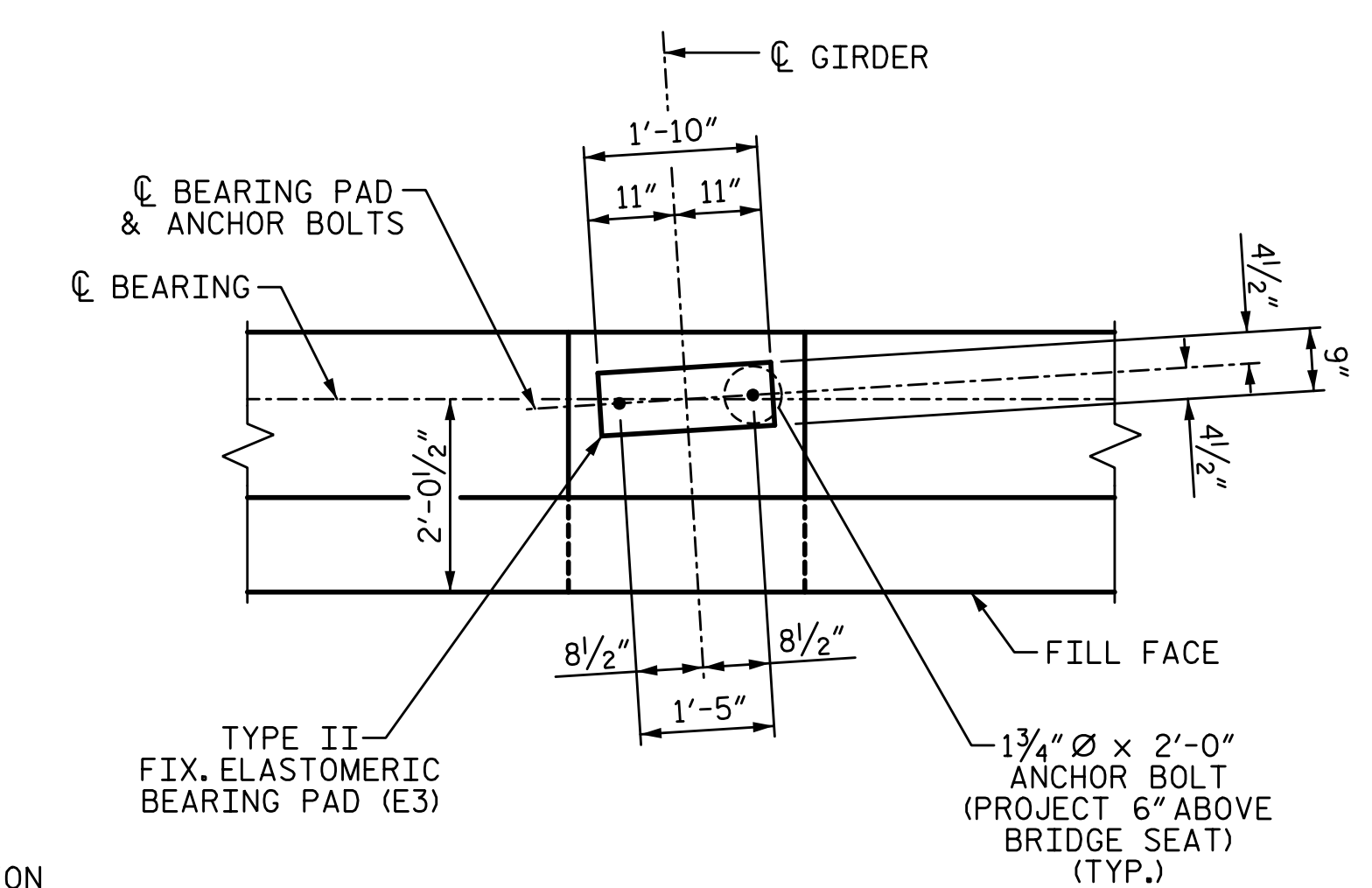
\* THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE EXISTING EXTERIOR PILE AND THE EXISTING "B" AND "K" BARS REINFORCING STEEL SHALL BE RETAINED PAST THE PROPOSED CUT LINE AND WILL BECOME PART OF THE WIDENED END BENT. THE EXISTING REINFORCING STEEL MAY BE BENT AS REQUIRED FOR FITTING AND TYING TO THE NEW REINFORCING STEEL.

★ FOR LOCATIONS BETWEEN BRIDGE SEATS BUILD-UPS, SEE SECTION A-A ON SHEET 3 OF 3.

**PLAN**



**ELEVATION**



**DETAIL "A"**  
TYP. EA. GIRDER

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**END BENT 1**

**RIGHT WIDENING**



PLANS PREPARED BY:  
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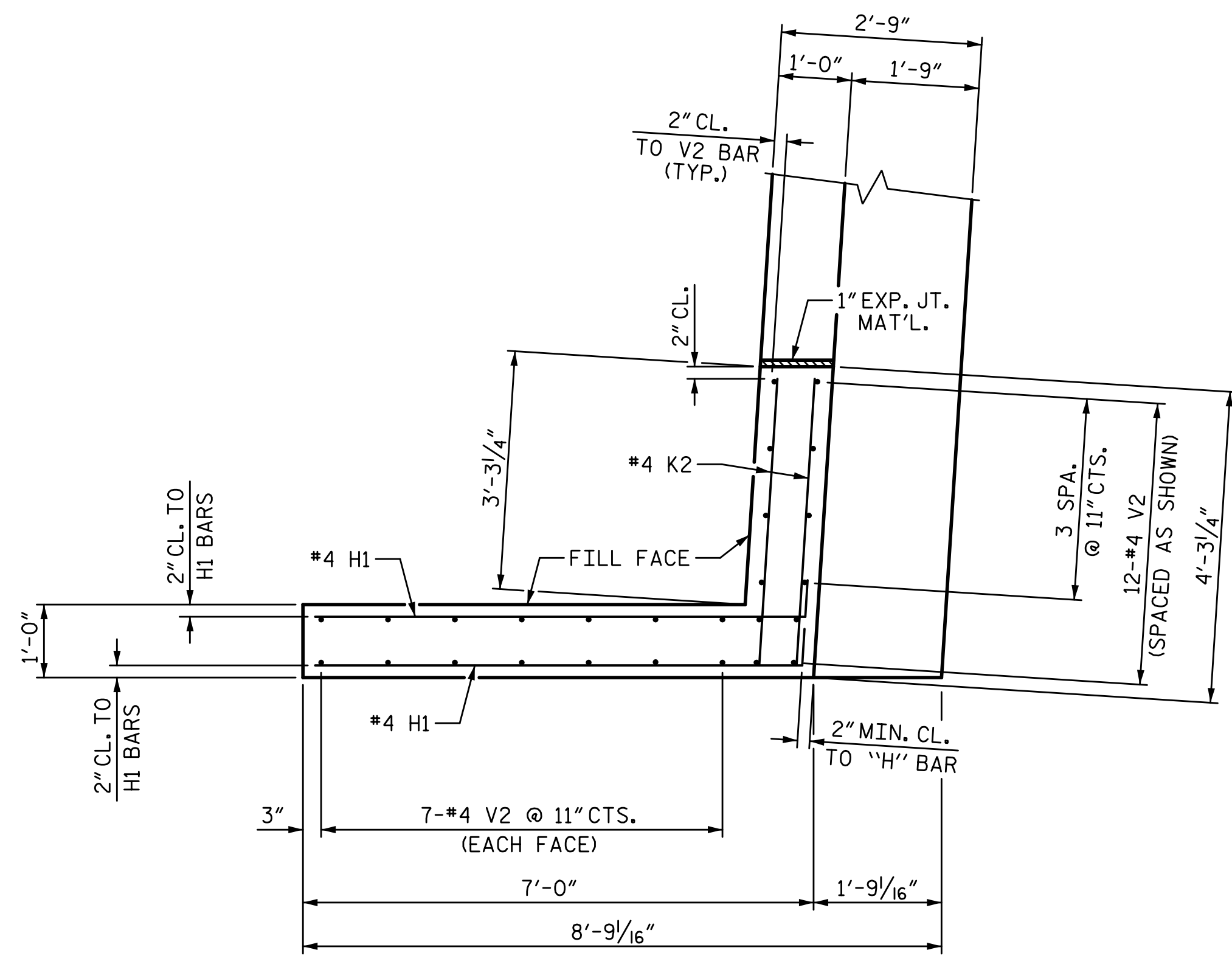
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DESIGN ENGINEER OF RECORD: <u>T. BEACH</u>	DATE: <u>1-20</u>

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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 89
2			4			

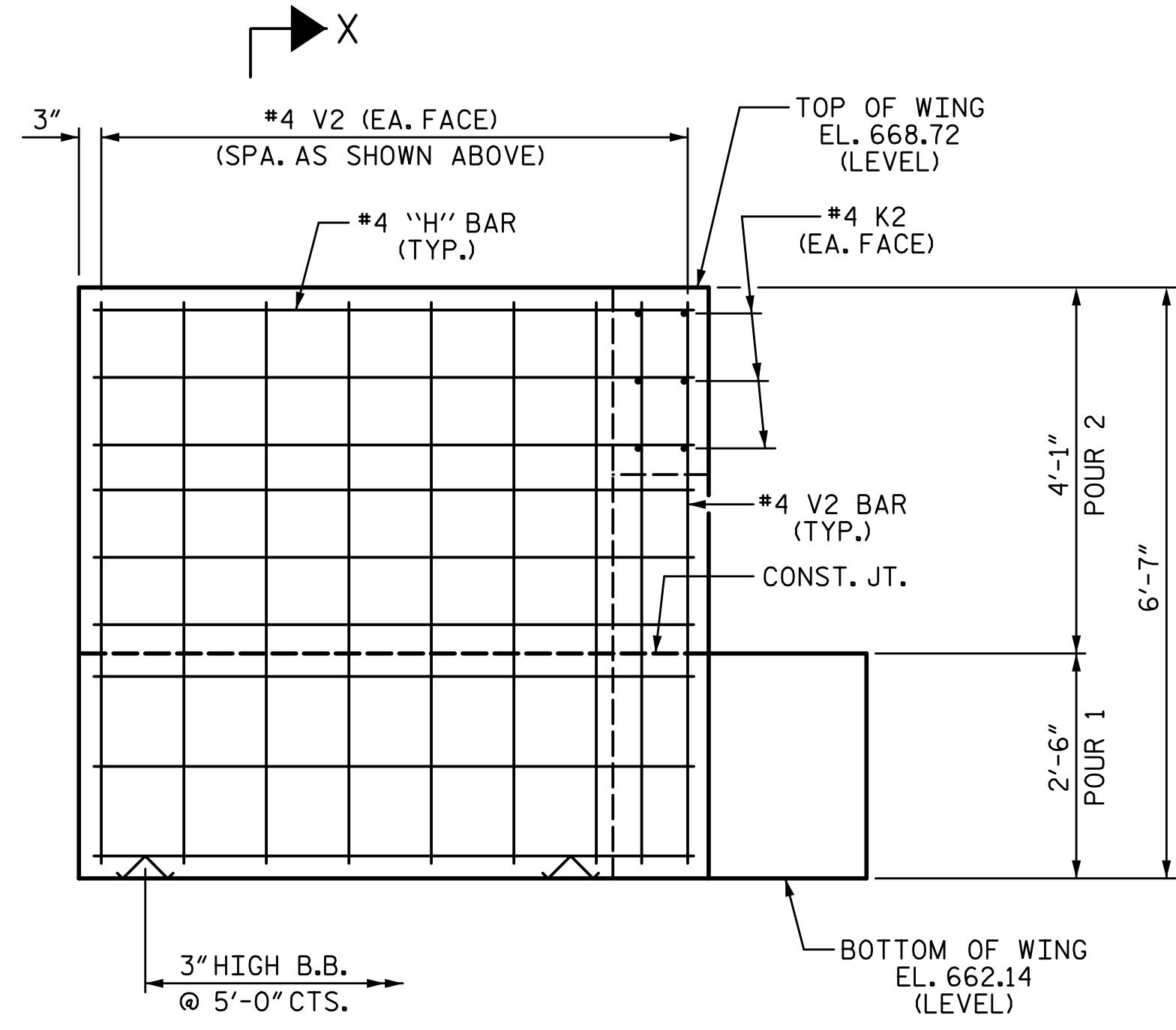
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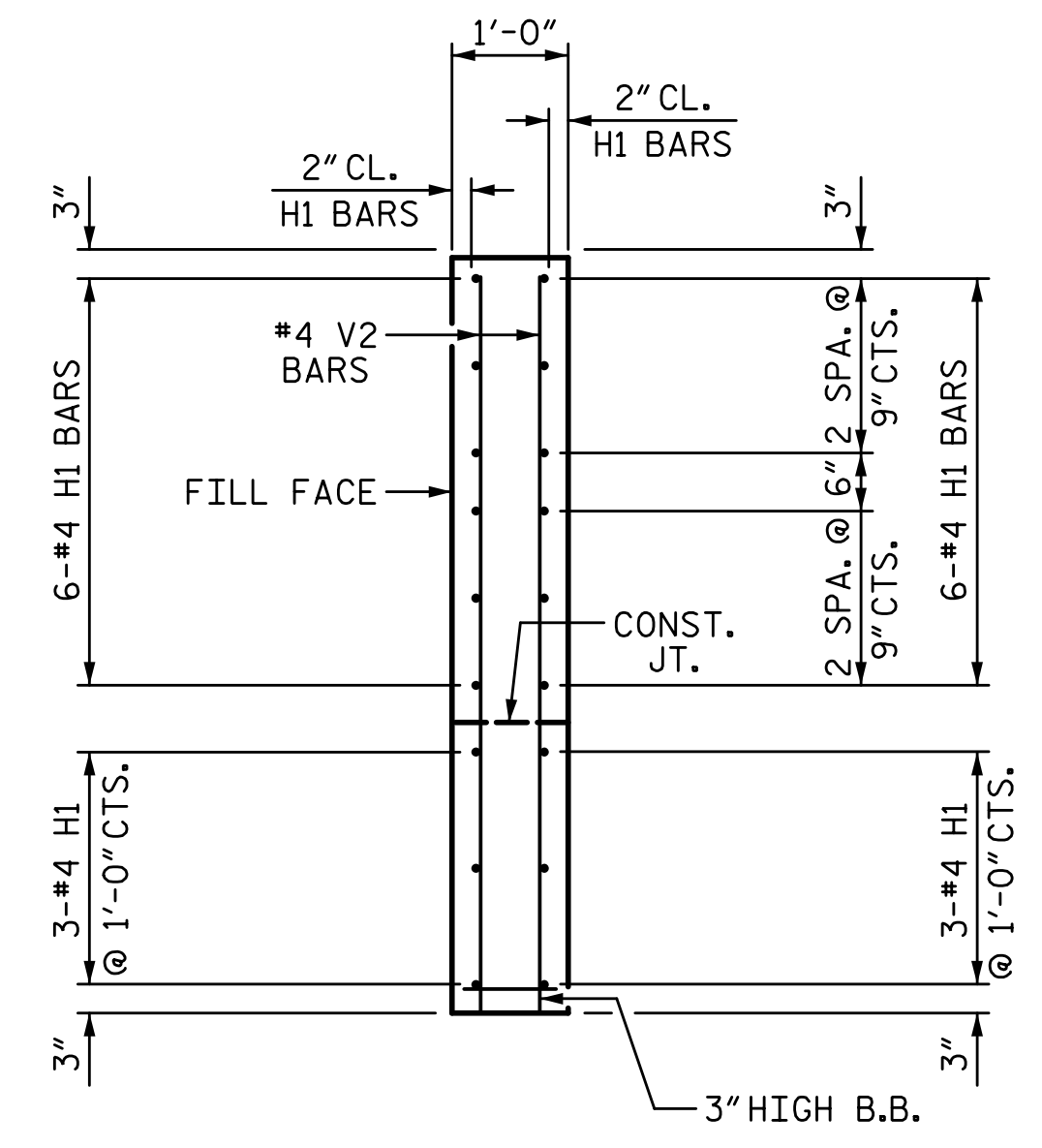
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PLAN OF WING (W2)



ELEVATION OF WING (W2)



SECTION X-X

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

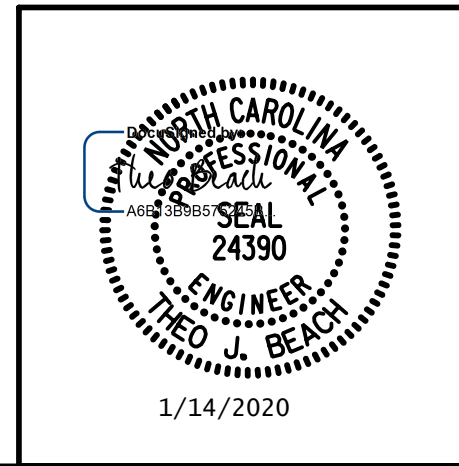
SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

END BENT 1  
 RIGHT WIDENING

PLANS PREPARED BY:

**S&A**  
 SIMPSON  
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 ASSOCIATES  
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 (919) 852-0468  
 (919) 852-0598 (Fax)  
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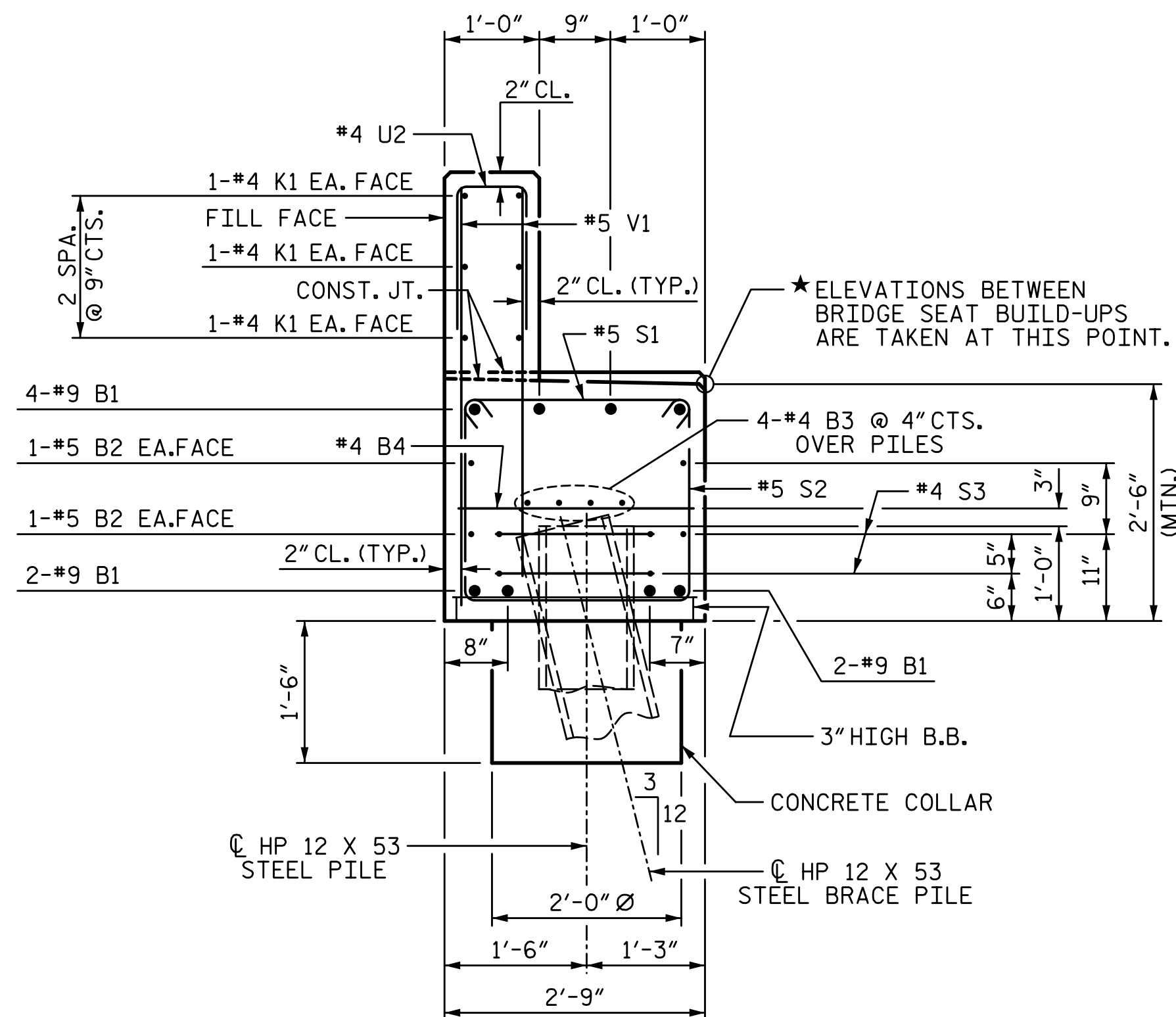


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NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
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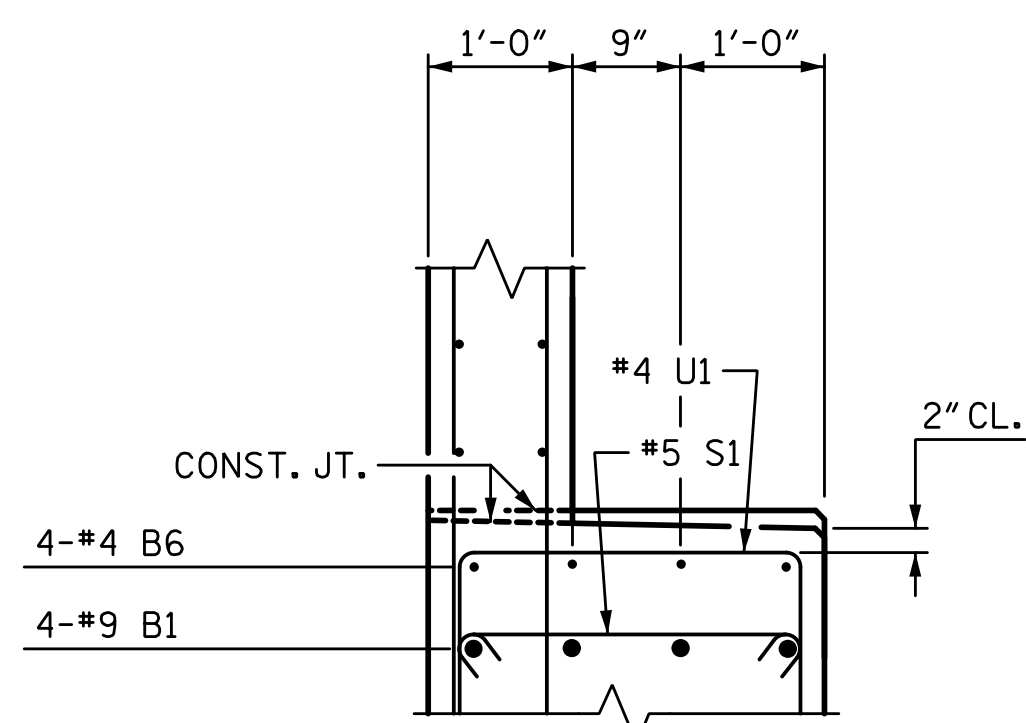
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CHECKED BY: <u>T. BEACH</u>	DATE: <u>1-20</u>
DESIGN ENGINEER OF RECORD: <u>T. BEACH</u>	DATE: <u>1-20</u>

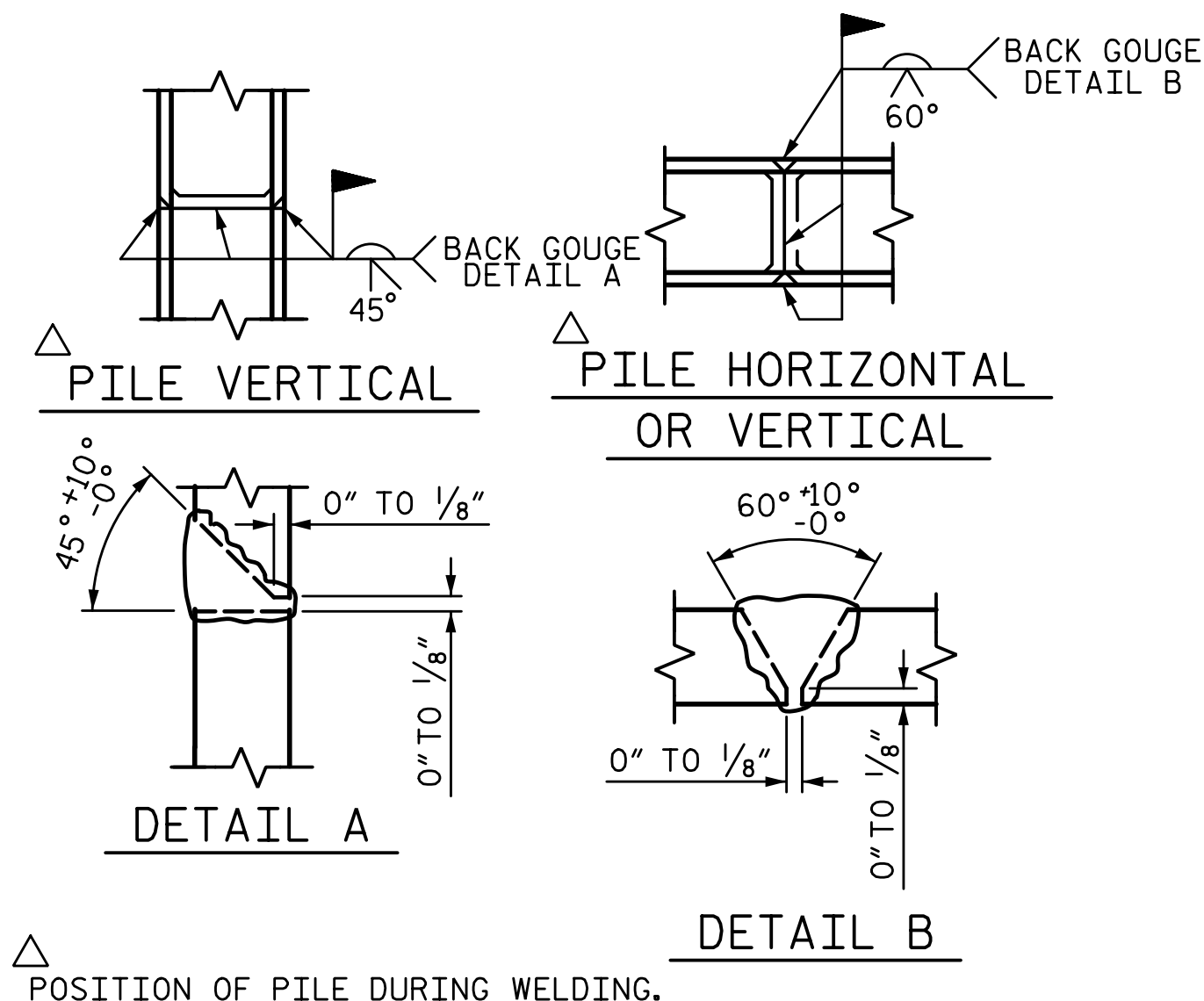
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SECTION A-A

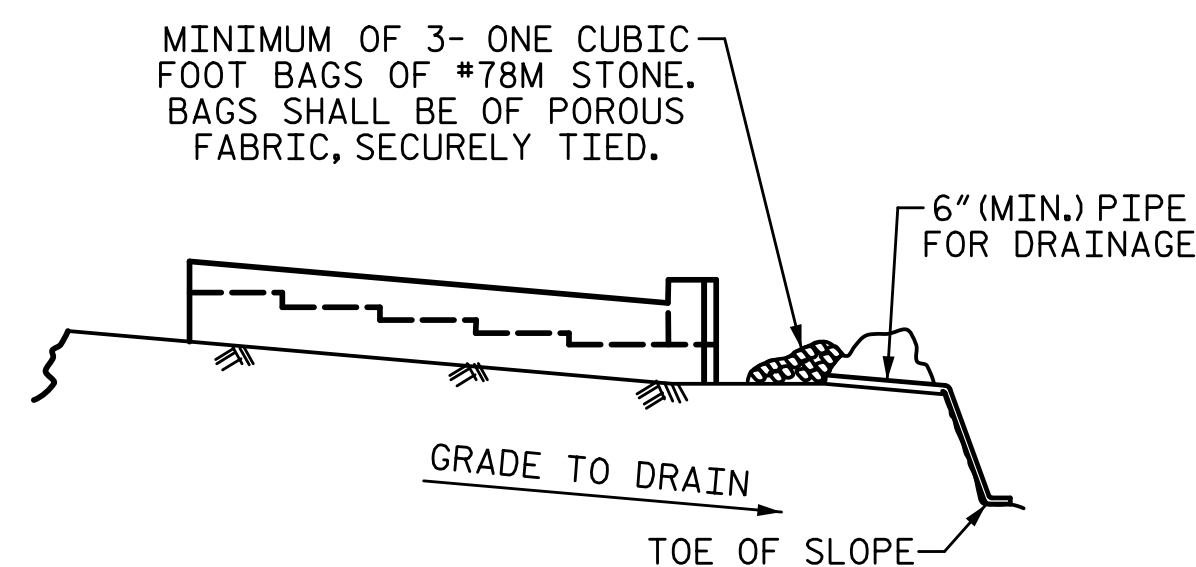


SECTION B-B



PILE SPLICE DETAILS

POSITION OF PILE DURING WELDING.

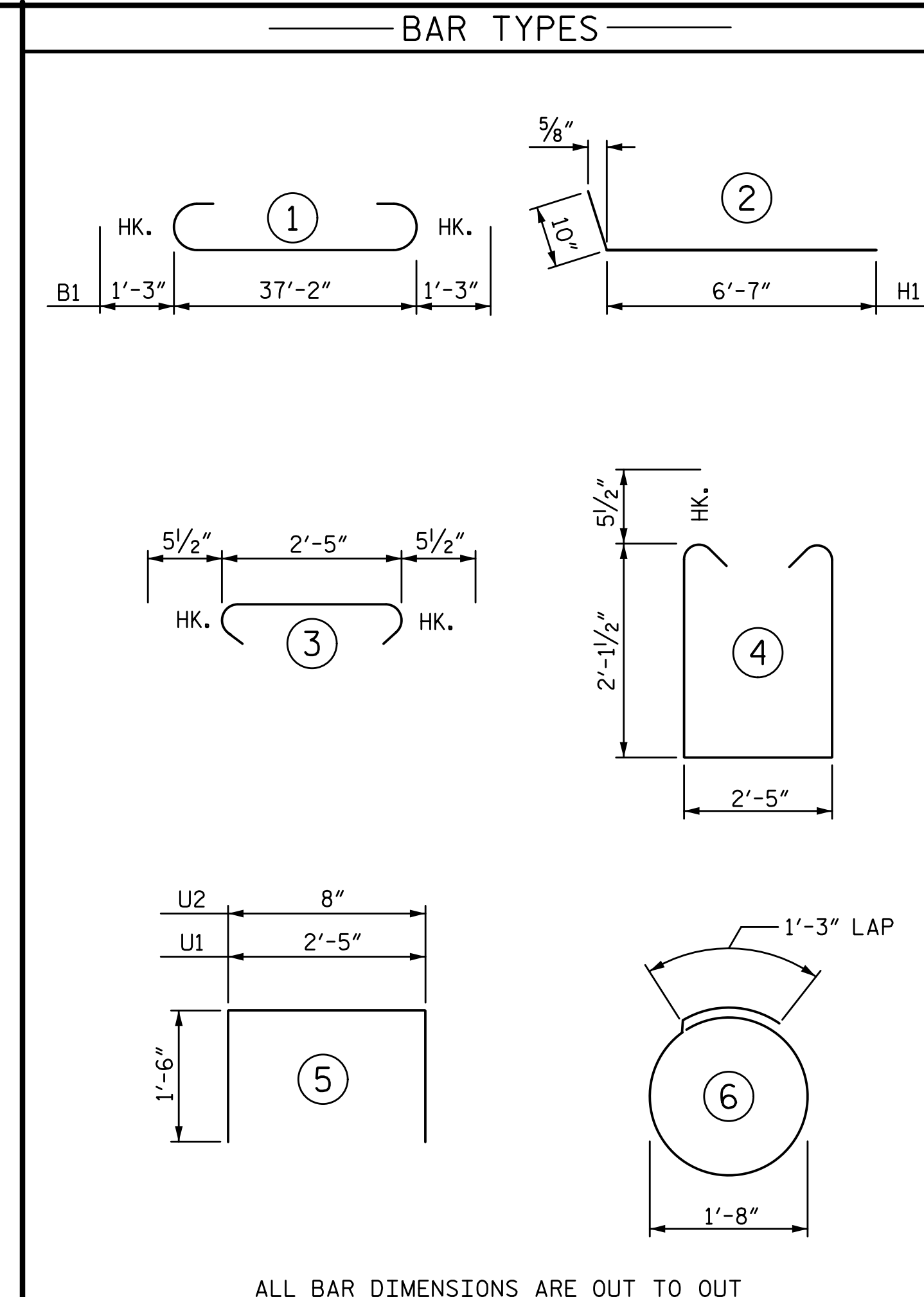


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	39'-8"	1079
B2	4	#5	STR	37'-4"	156
B3	8	#4	STR	19'-11"	106
B4	10	#4	STR	2'-5"	16
B5	8	#4	STR	2'-2"	12
B6	4	#4	STR	14'-6"	39
H1	18	#4	2	7'-5"	89
K1	12	#4	STR	19'-11"	160
K2	6	#4	STR	3'-10"	15
S1	40	#5	3	3'-4"	139
S2	40	#5	4	7'-7"	316
S3	10	#4	6	6'-6"	43
U1	16	#4	5	5'-5"	58
U2	34	#4	5	3'-8"	83
V1	68	#5	STR	4'-2"	296
V2	26	#4	STR	6'-2"	107
TOTAL REINFORCING STEEL				2714 LB	

CLASS A CONCRETE

POUR 1 (CAP, COLLARS & LOWER WING)	12.1 CY
POUR 2 (BACKWALL & UPPER WING)	4.1 CY
TOTAL CLASS A CONCRETE	16.2 CY

HP 12 X 53 STEEL PILES	
NO. 4	100 LF
STEEL PILE POINTS	4 EA.

PILE DRIVING EQUIPMENT	
SETUP FOR	
HP 12 X 53 STEEL PILES	NO. 4

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

END BENT 1

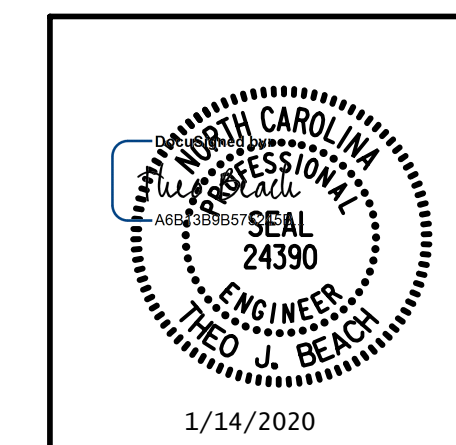
RIGHT WIDENING

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-47
2			4			TOTAL SHEETS 89

PLANS PREPARED BY:

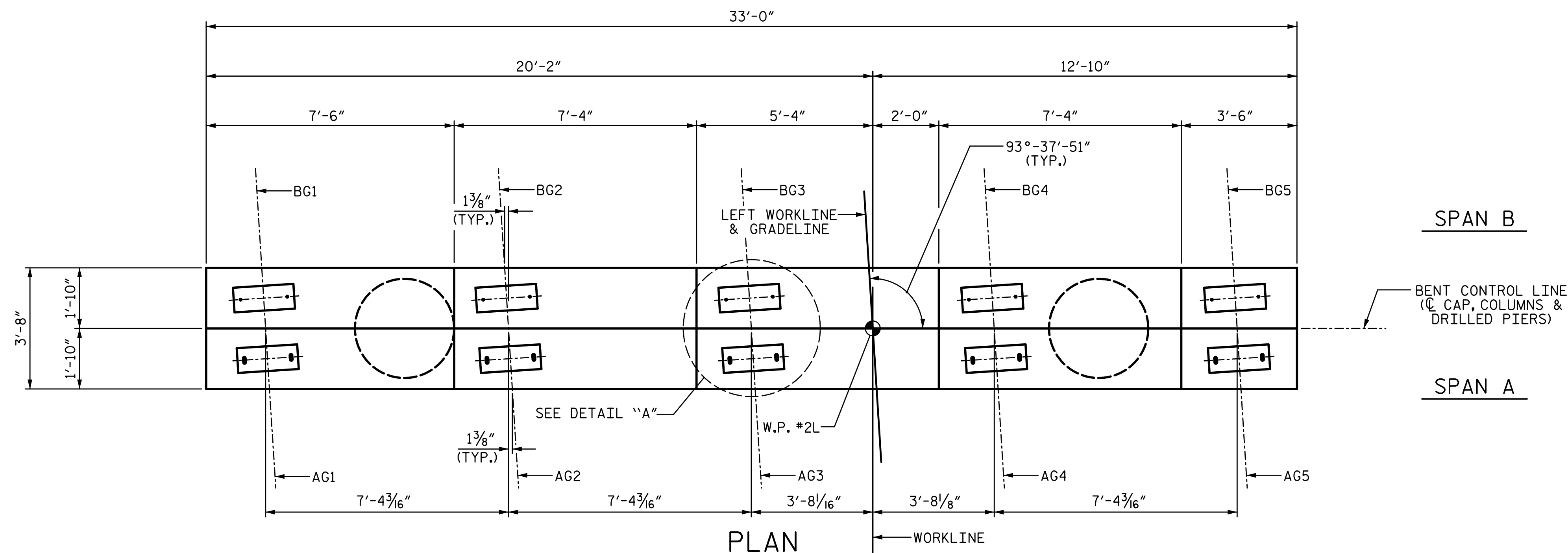
**SE & A**  
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**NOTES:**

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

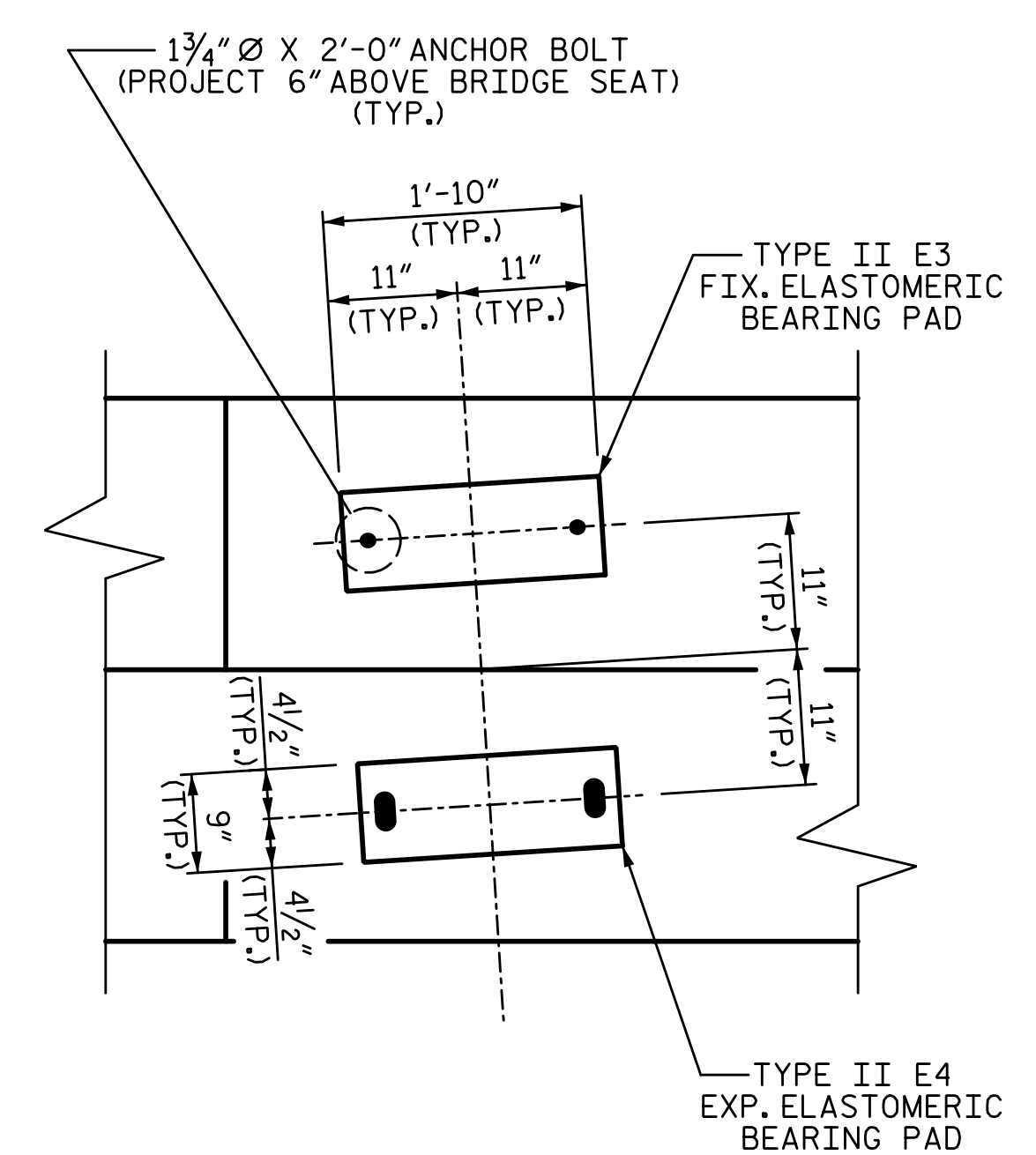
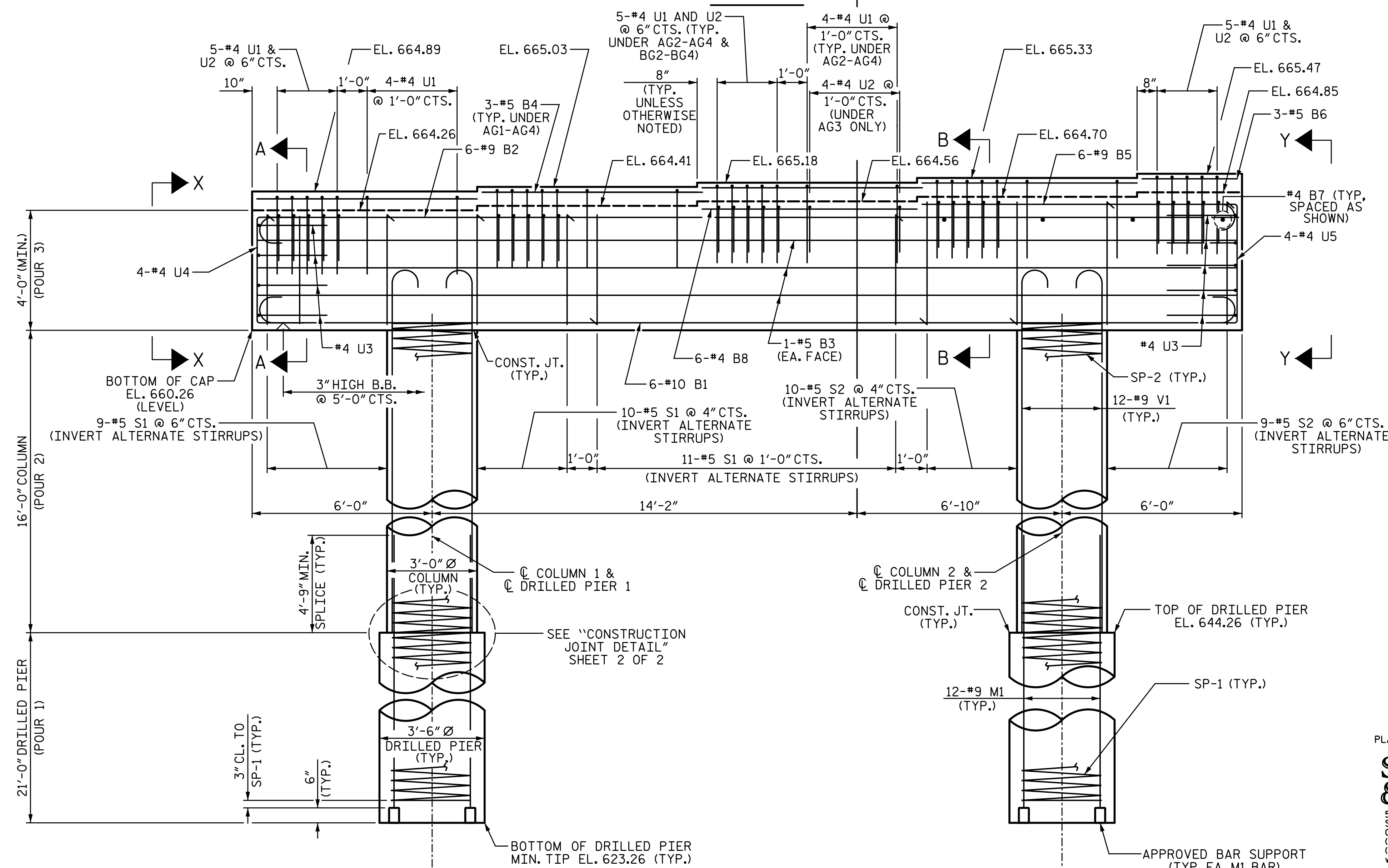
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON THE APPROXIMATE PAVED SHOULDER ELEVATION. THE TOP OF DRILLED PIER SHALL BE ADJUSTED AS REQUIRED TO MAINTAIN THE DRILLED PIER 1 FOOT BELOW THE PAVED SHOULDER ELEVATION.



**DETAIL "A"**  
TYP. EA. BEARING

PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE

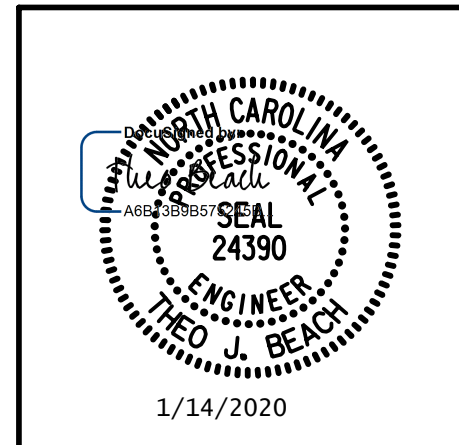
**BENT 1**

**LEFT WIDENING**

REVISIONS				SHEET NO.	
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2			4		

S-48  
TOTAL SHEETS  
89

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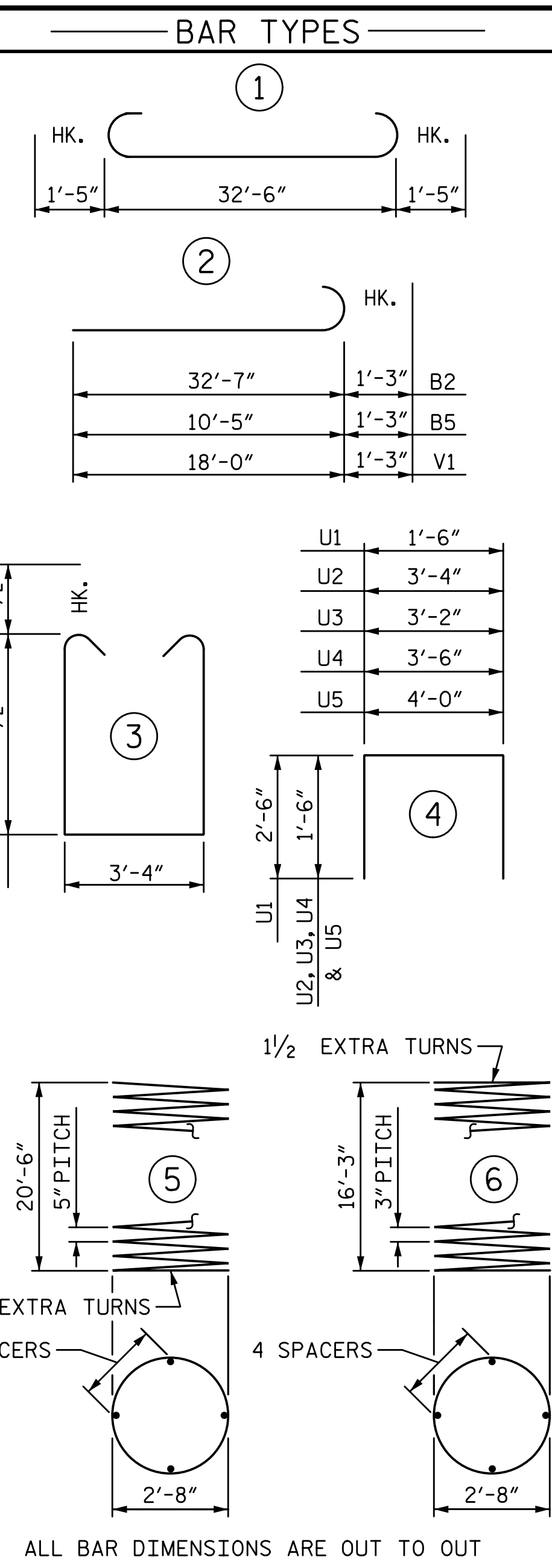
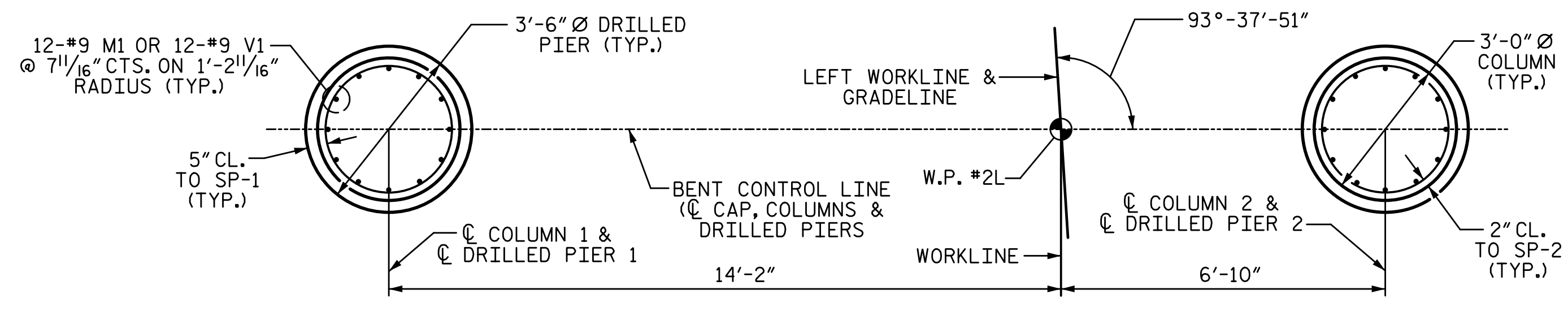
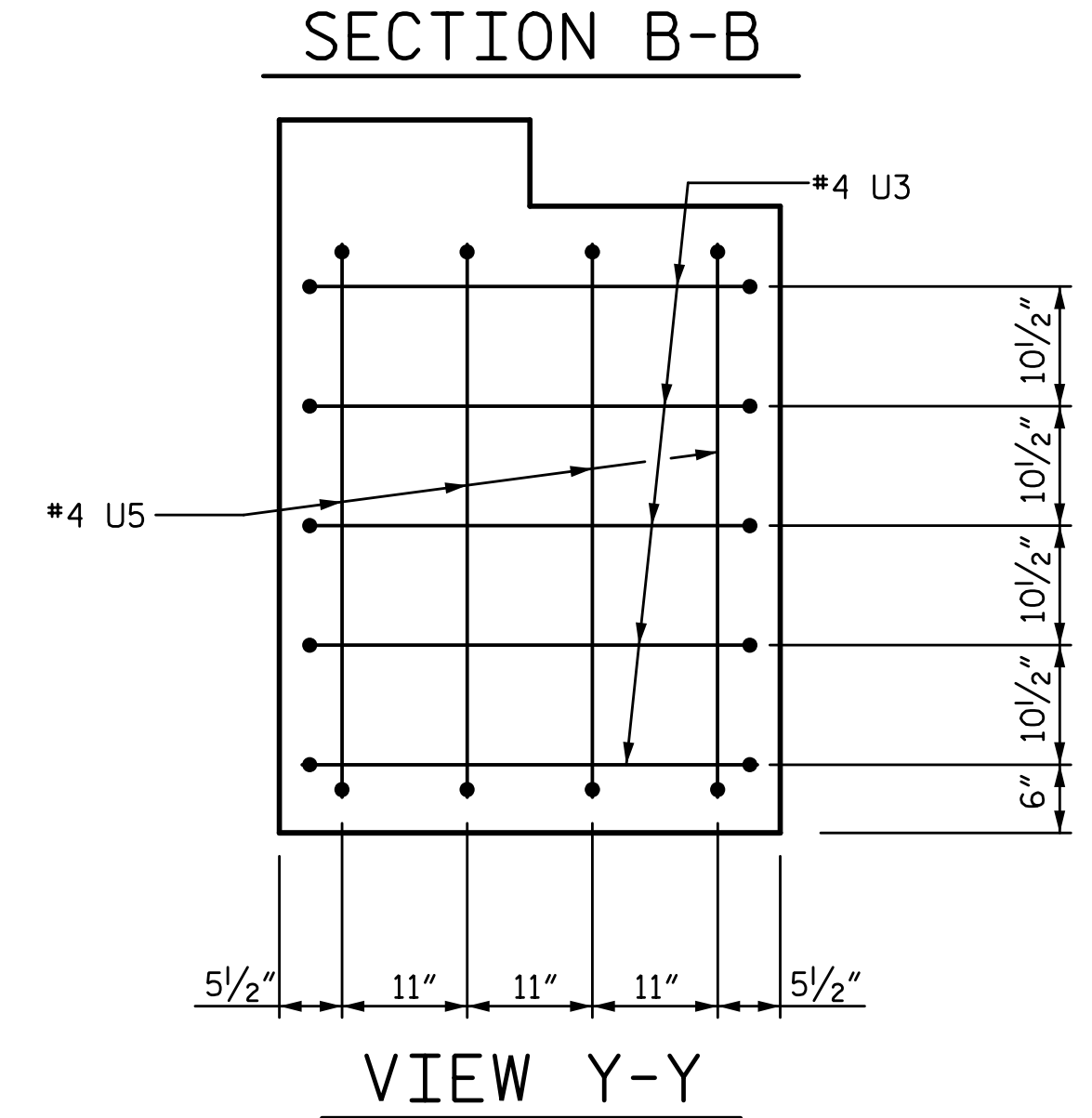
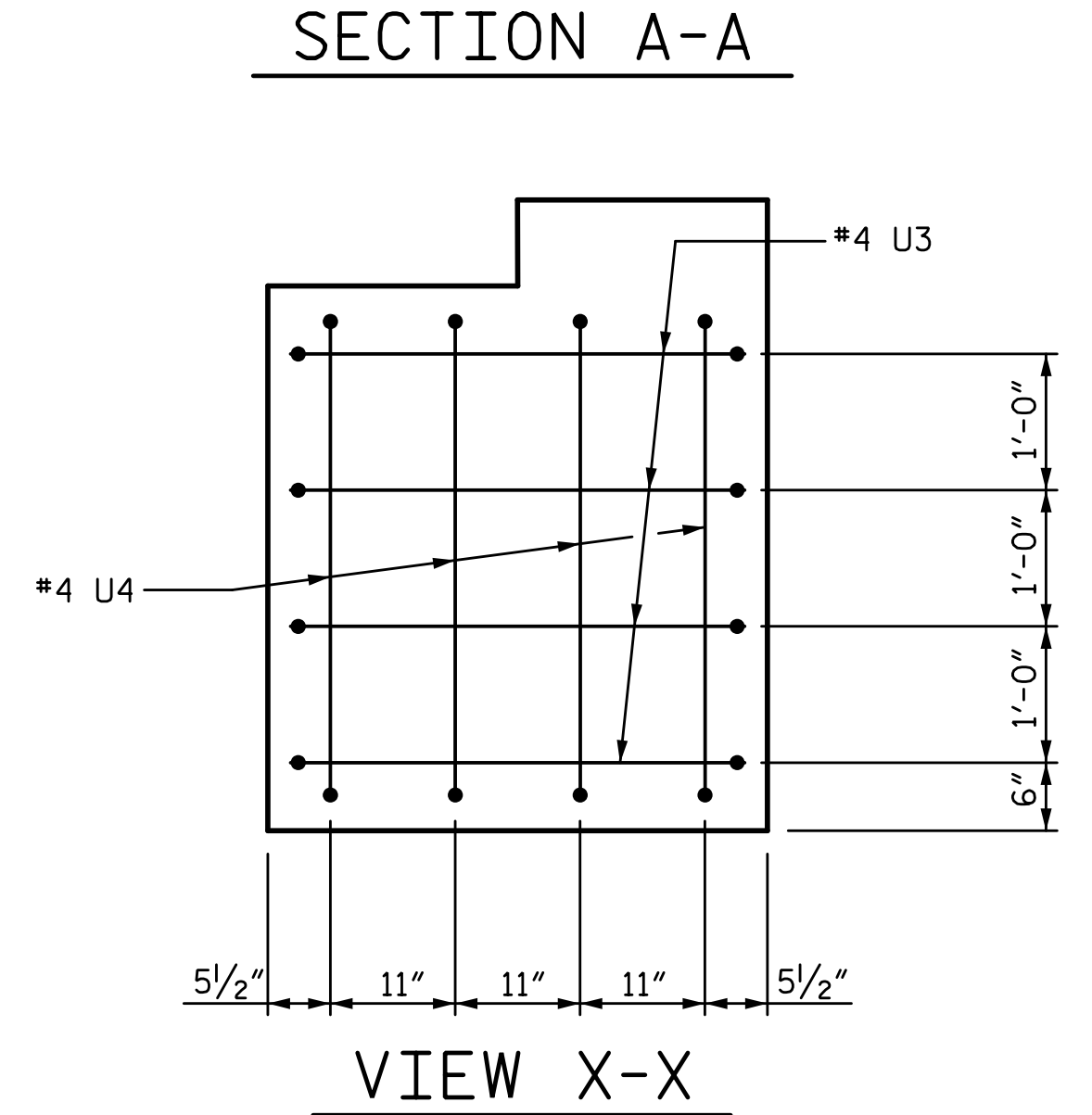
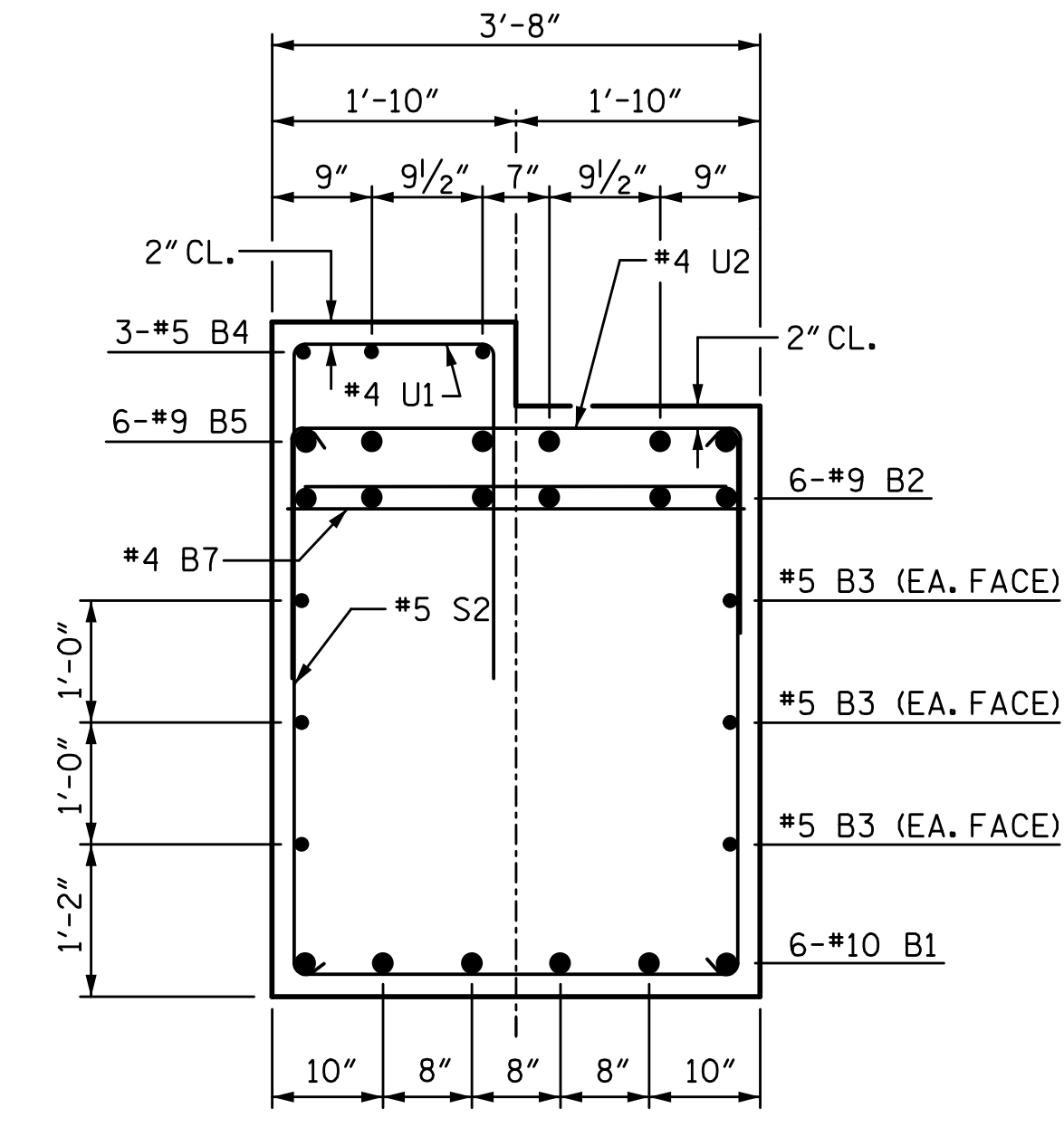
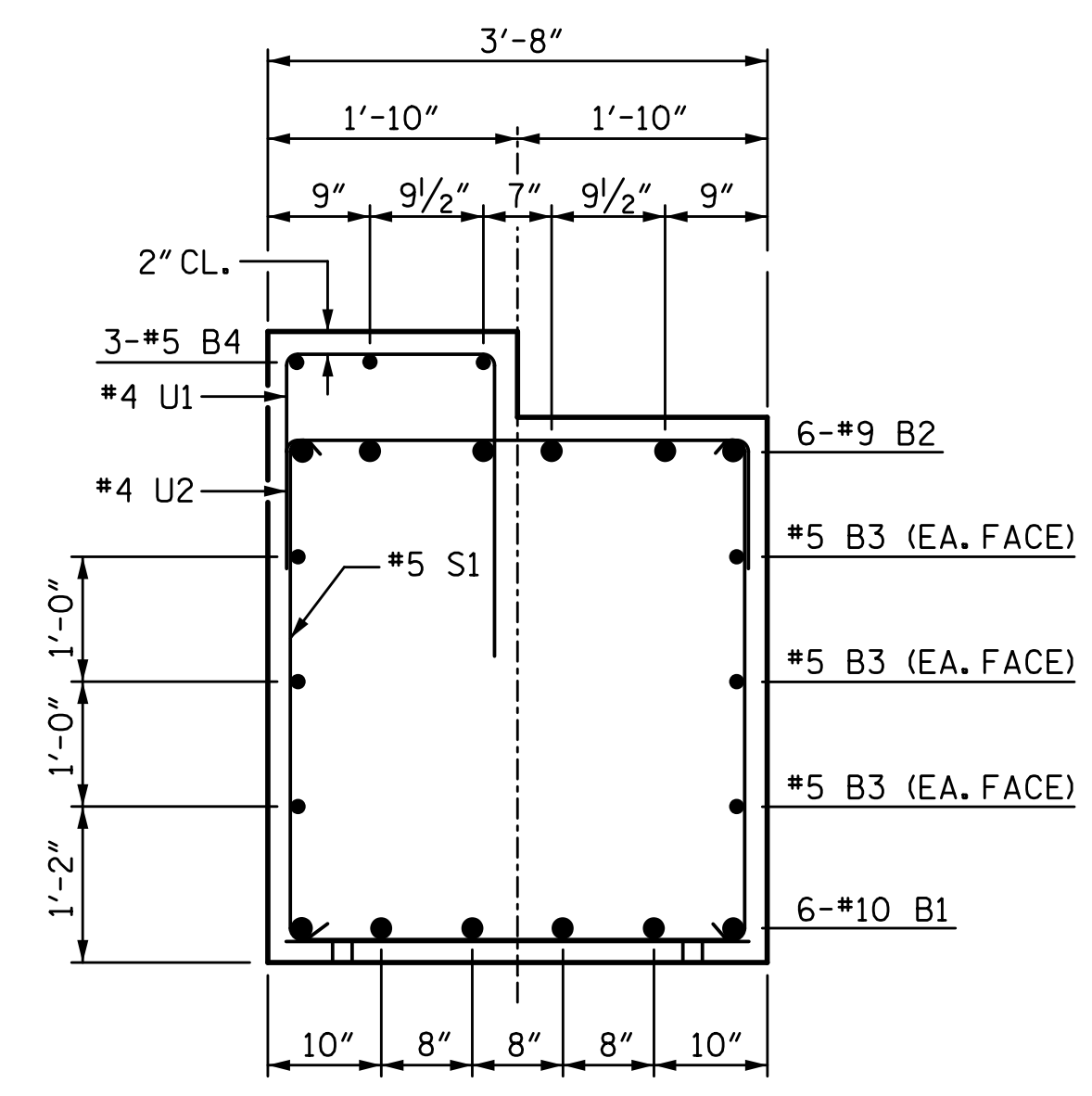
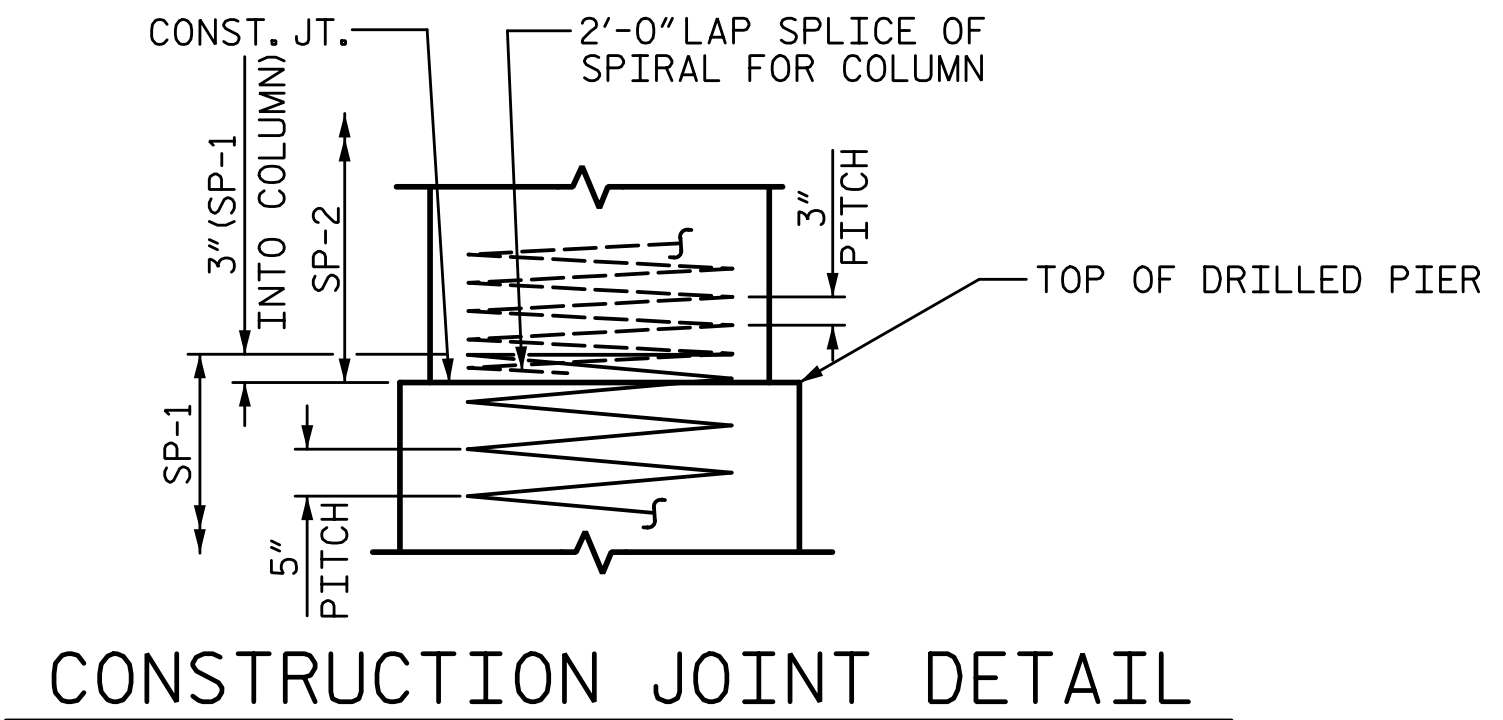
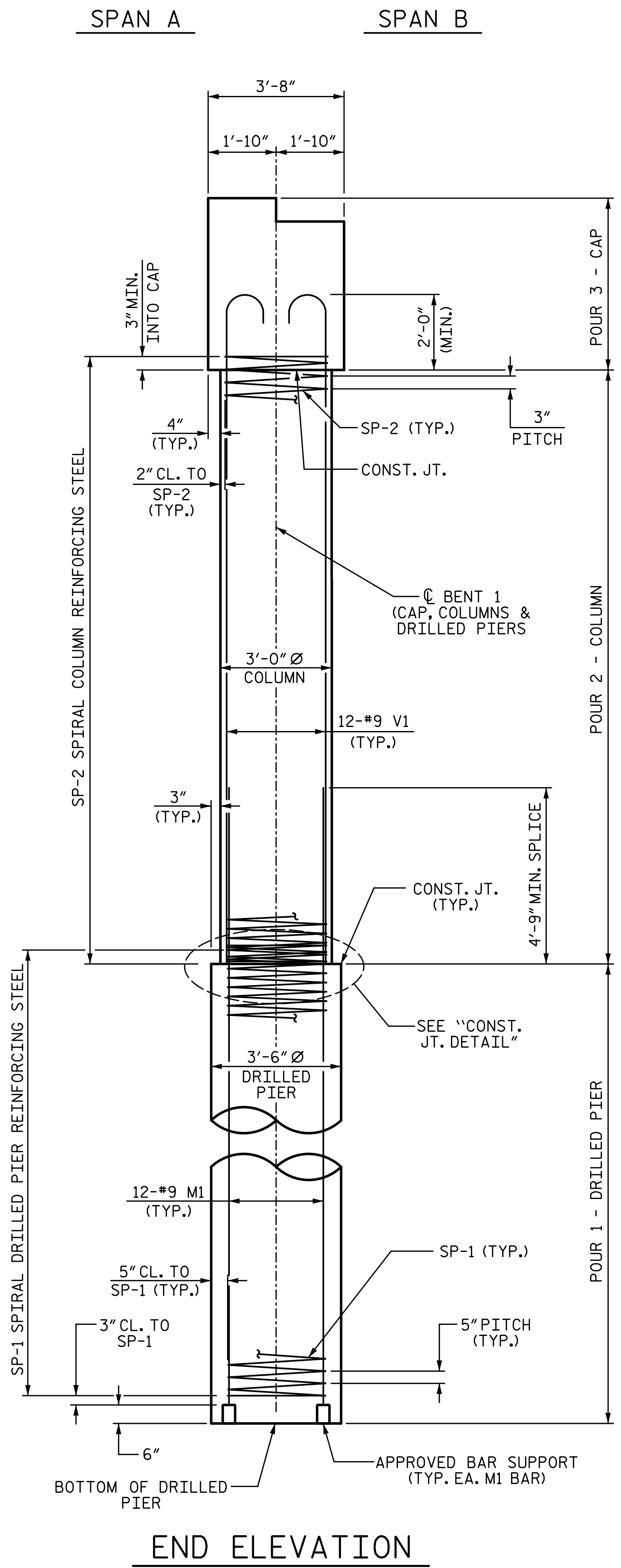
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**ELEVATION**

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BILL OF MATERIAL					
BENT 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#10	1	35'-4"	912	
B2	#9	2	33'-10"	690	
B3	#5	STR	32'-8"	204	
B4	#5	STR	7'-4"	92	
B5	#9	2	11'-8"	238	
B6	#5	STR	3'-2"	10	
B7	#4	STR	3'-4"	9	
B8	#4	STR	7'-4"	29	
M1	#9	2	28'-3"	2305	
S1	#5	3	11'-6"	360	
S2	#5	3	12'-4"	244	
U1	#4	4	6'-6"	178	
U2	#4	4	6'-4"	123	
U3	#4	4	6'-2"	37	
U4	#4	4	6'-6"	17	
U5	#4	4	7'-0"	19	
V1	#9	2	19'-3"	1571	
SP-1	**	5	419'-6"	875	
SP-2	*	6	552'-10"	739	
REINFORCING STEEL				7038	LB
SPIRAL COL. REINF. STEEL				1614	LB
CLASS "A" CONCRETE BREAKDOWN					
POUR 2 (COLUMNS)				8.4	CY
POUR 3 (CAP)				20.6	CY
TOTAL				29.0	CY
DRILLED PIERS:					
DRILLED PIER CONCRETE					
POUR 1 (DRILLED PIERS)				15.0	CY
3'-6" Ø DRILLED PIER NOT IN SOIL				14	LF
3'-6" Ø DRILLED PIER IN SOIL				28	LF
CSL TUBES				180	LF

\* THE "SP-1" SPIRAL REINFORCING STEEL SHALL BE W21 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.  
 \* THE "SP-2" SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

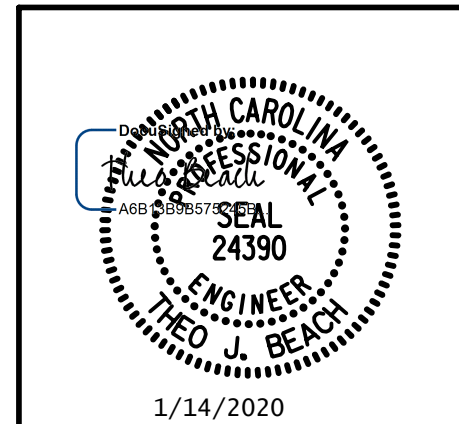
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ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**BENT 1**

LEFT WIDENING



PLANS PREPARED BY:  
**S.E.A.**  
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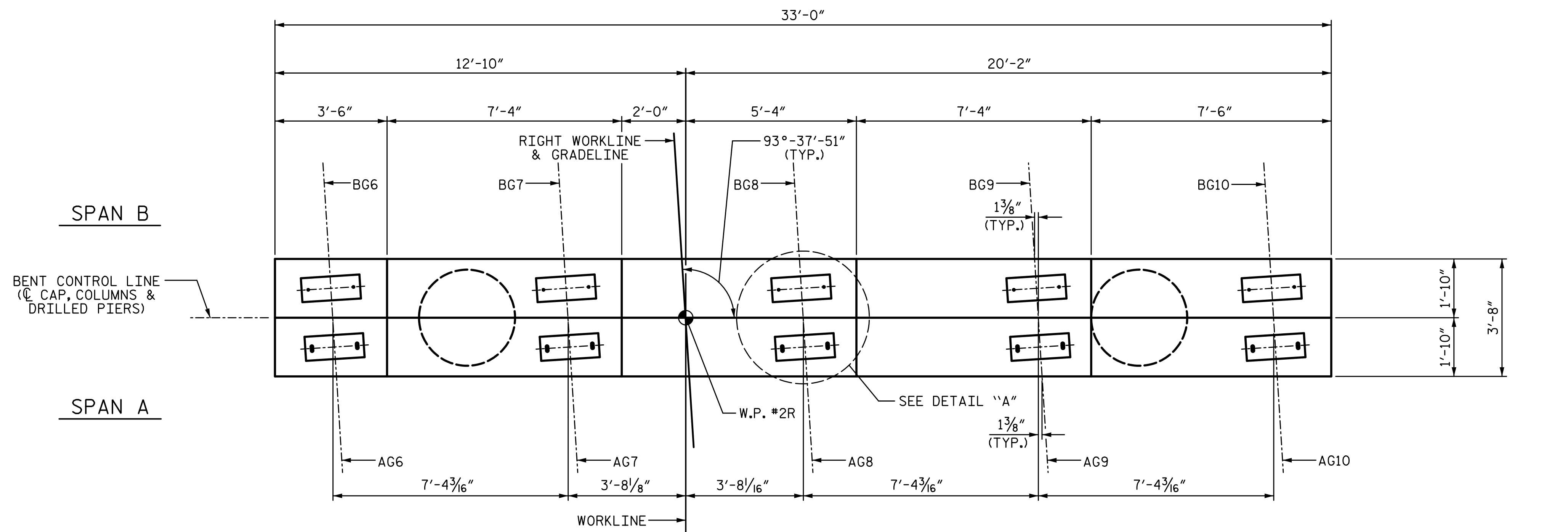
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TOTAL SHEETS 89			



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**NOTES:**

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

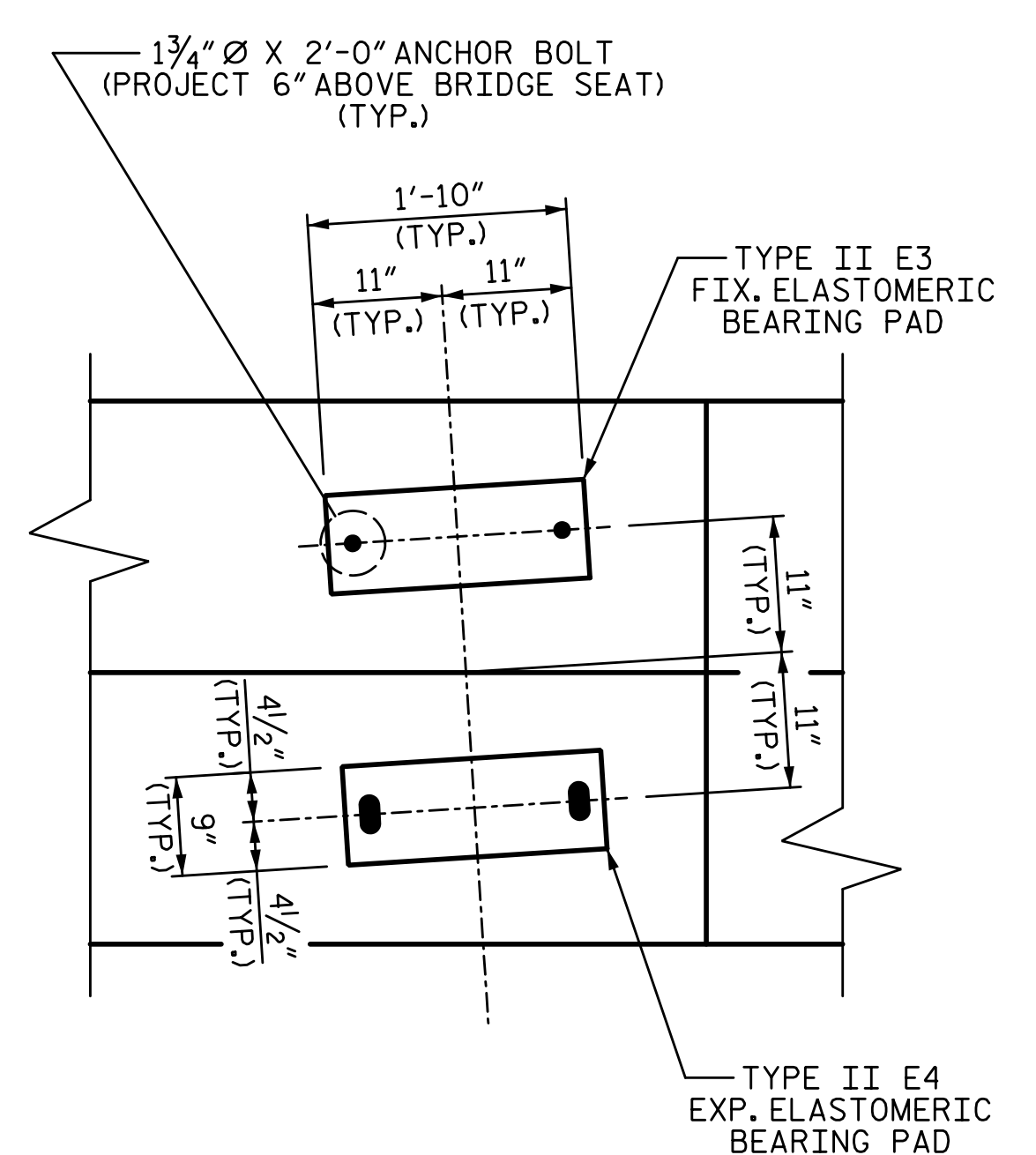
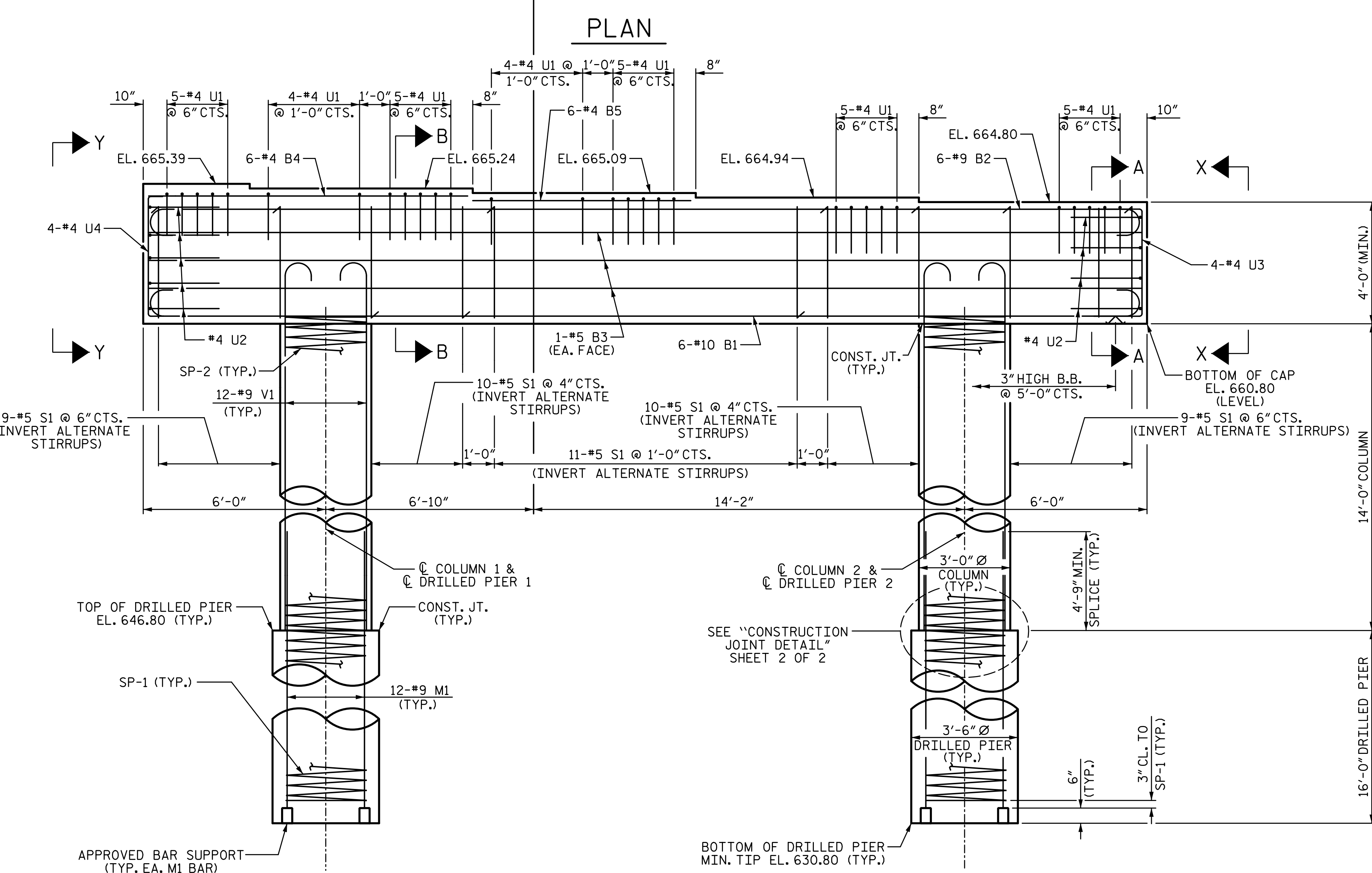
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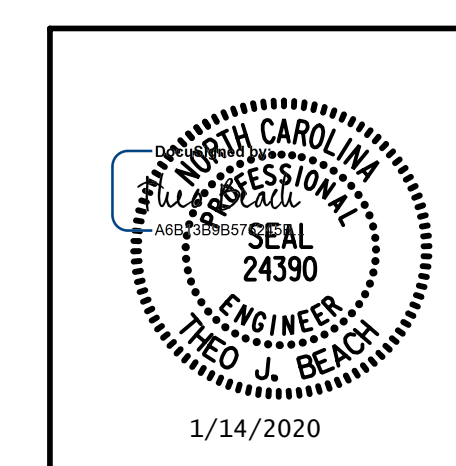
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PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 1 OF 2

PLANS PREPARED BY:  
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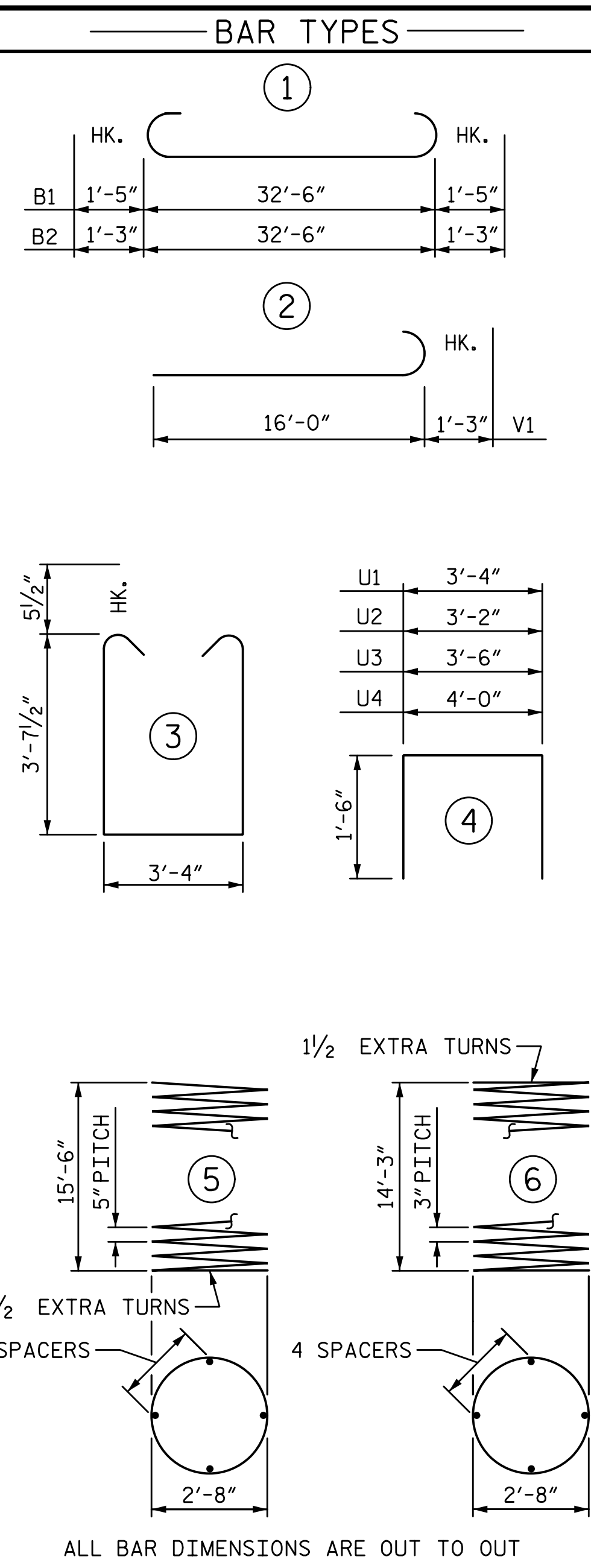
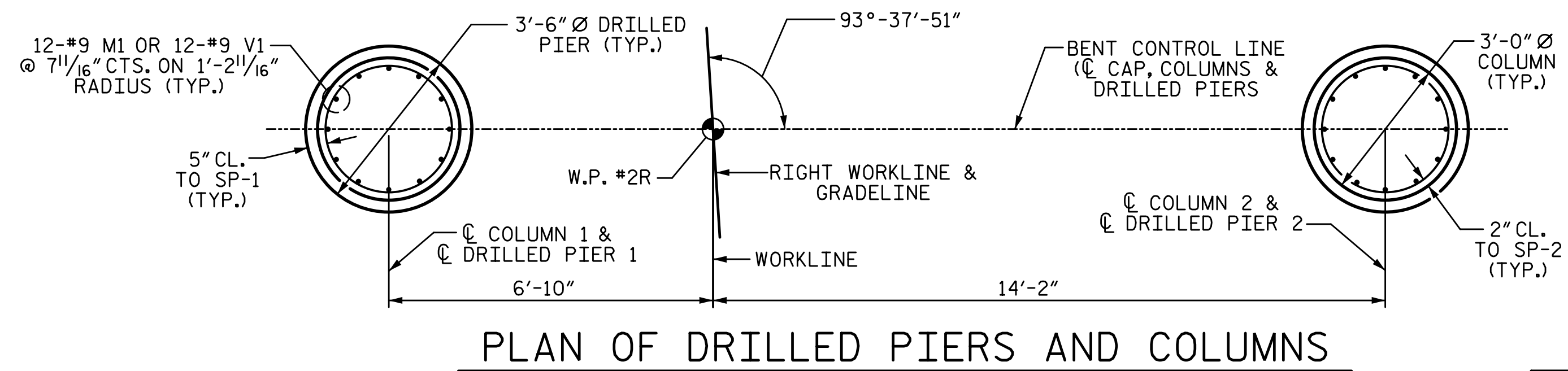
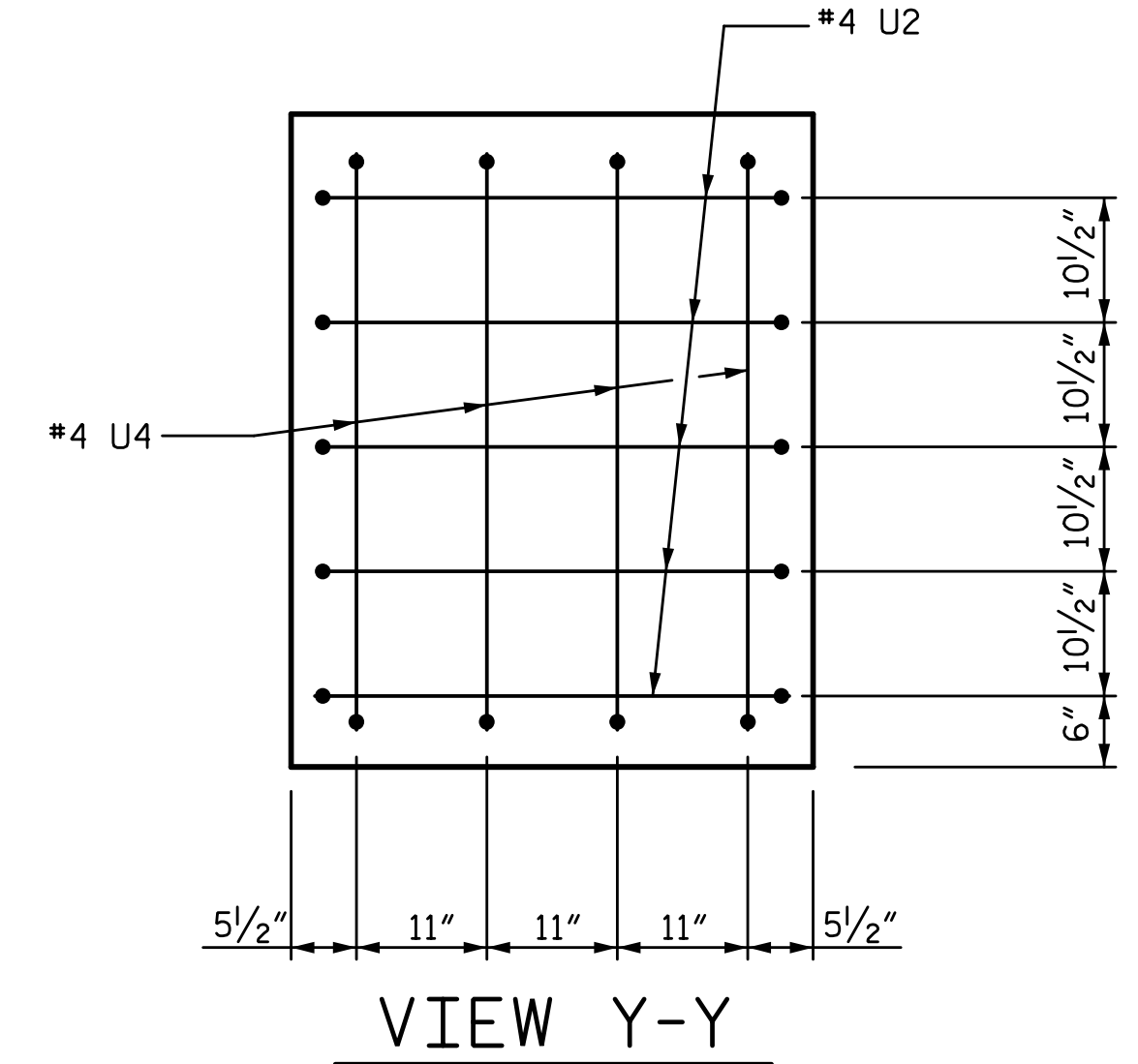
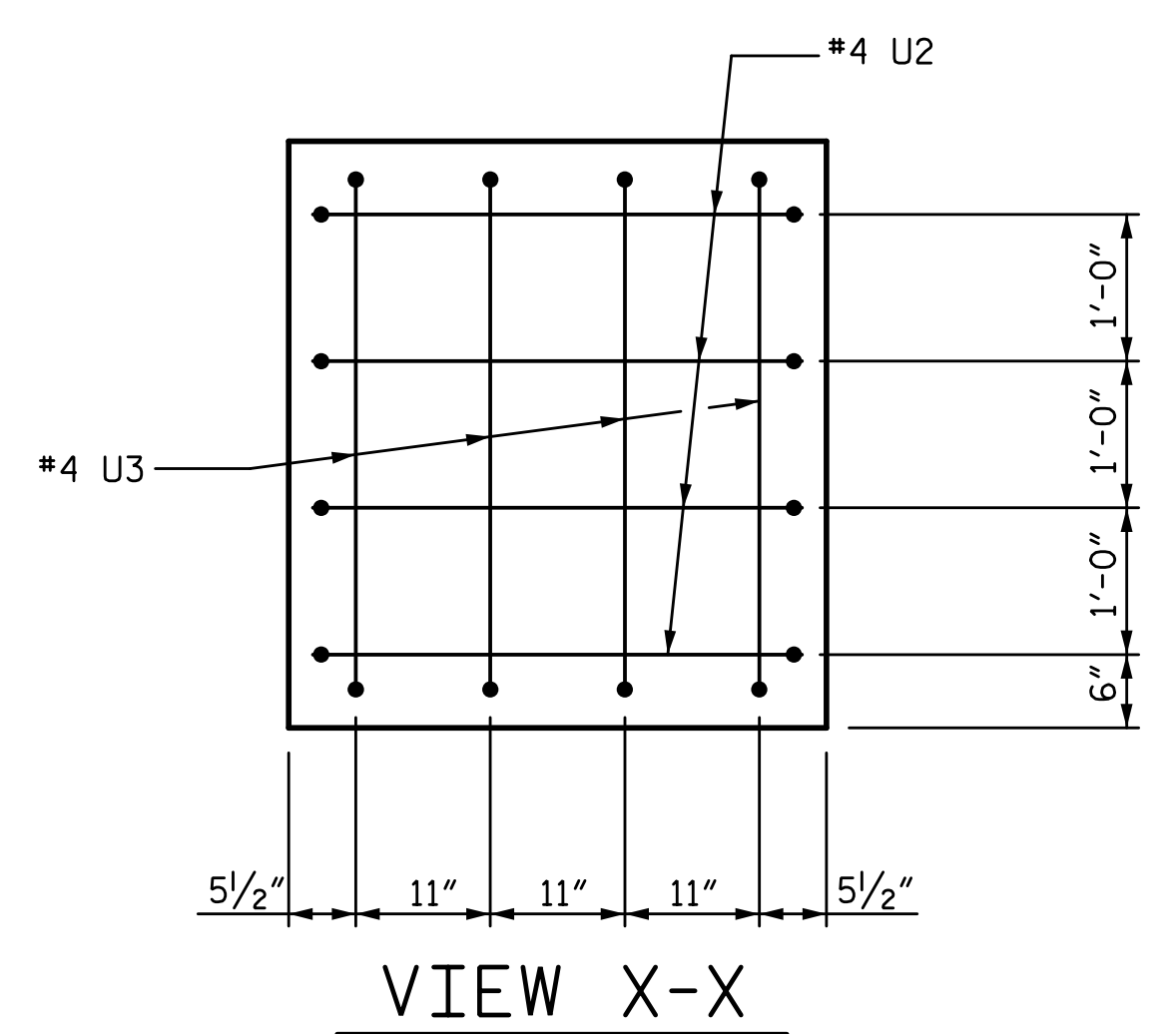
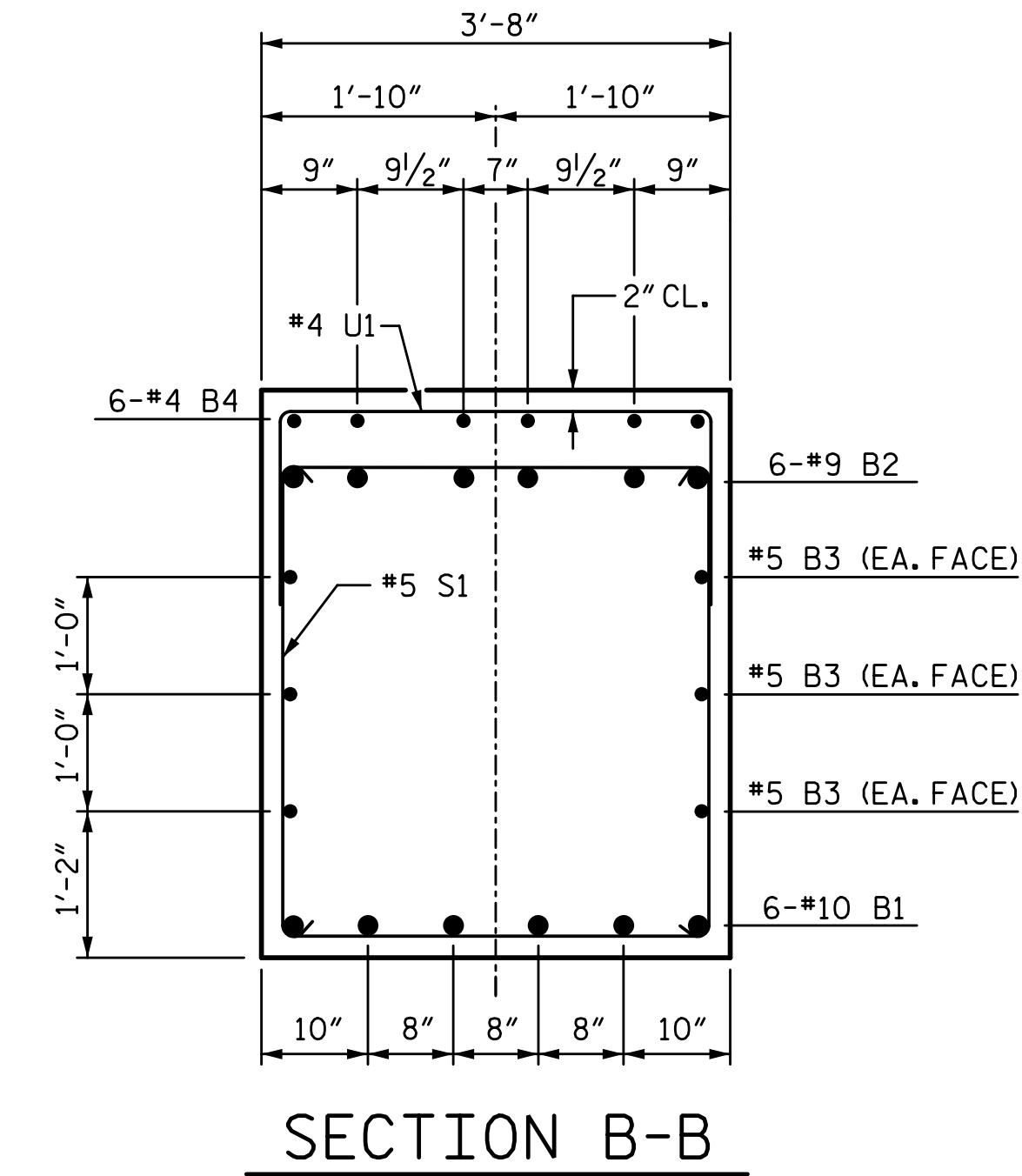
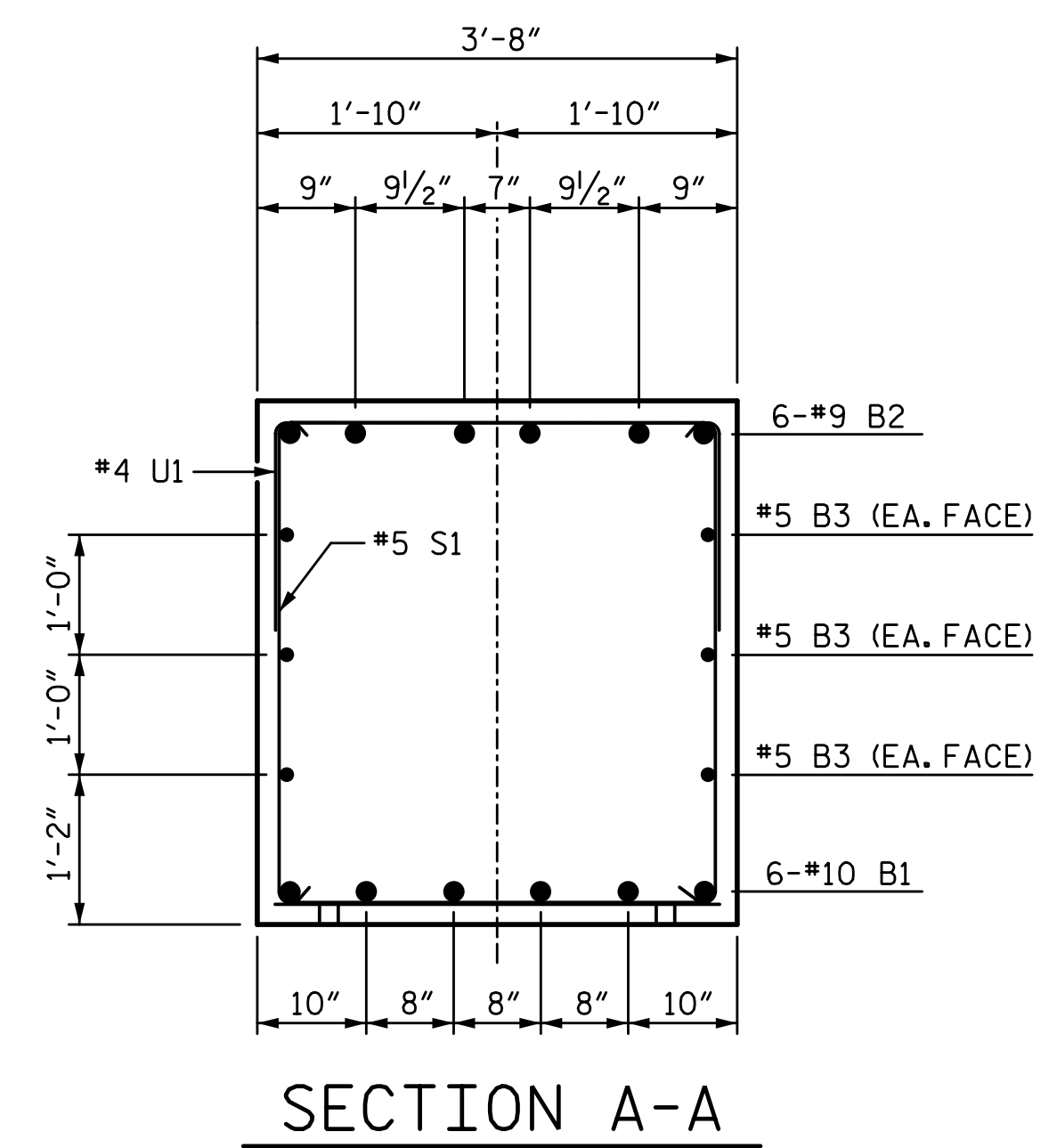
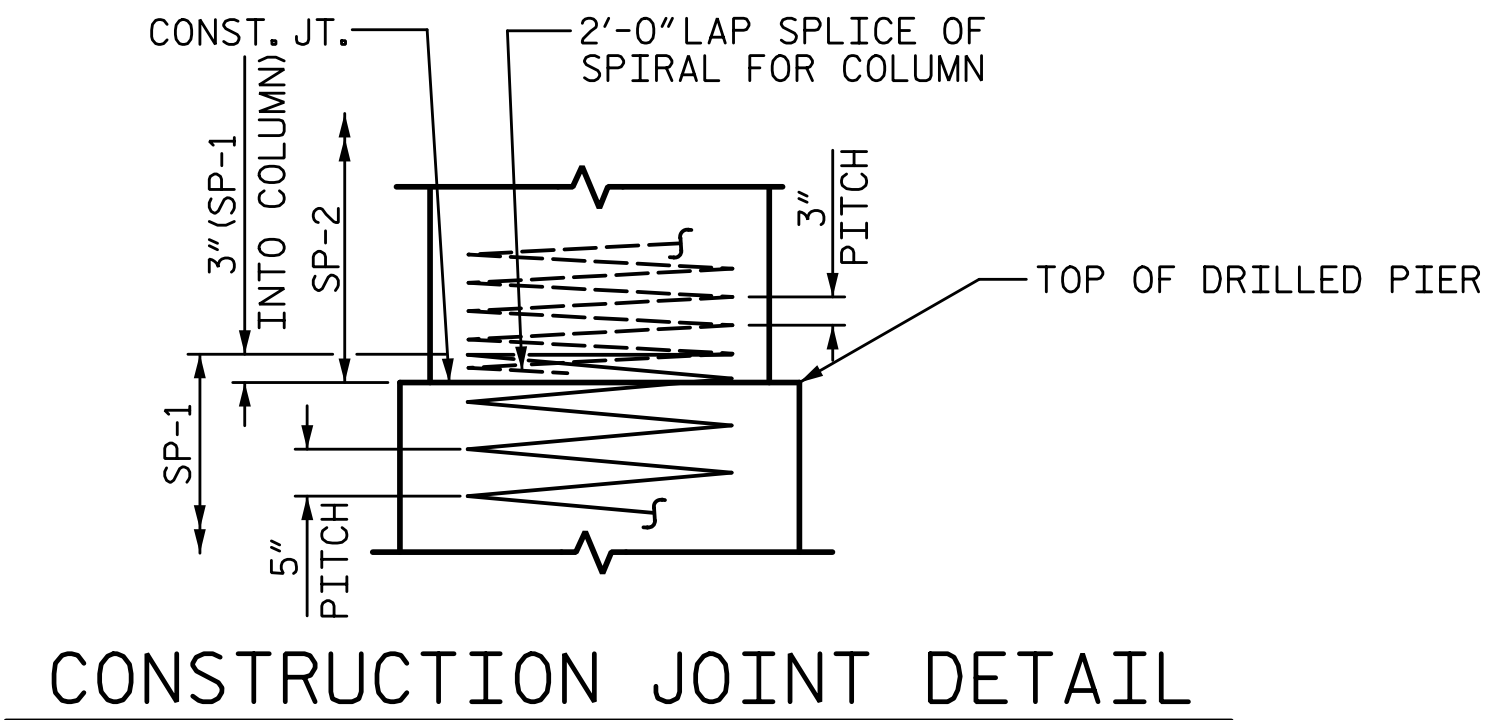
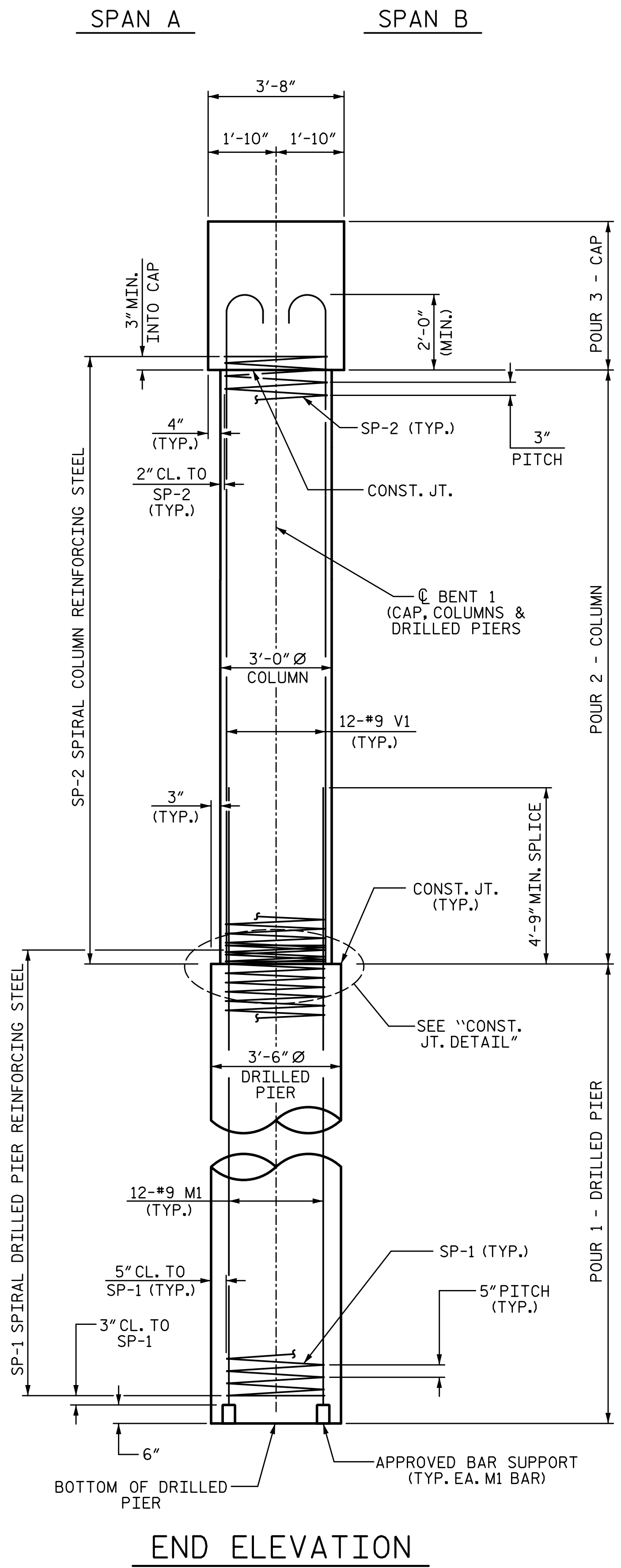


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUBSTRUCTURE					
<b>BENT 1</b>					
<b>RIGHT WIDENING</b>					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-50
					TOTAL SHEETS 89

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BILL OF MATERIAL					
BENT 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#10	1	35'-4"	912	
B2	#9	1	35'-0"	714	
B3	#5	STR	32'-8"	204	
B4	#4	STR	10'-6"	42	
B5	#4	STR	7'-4"	29	
M1	#9	STR	23'-3"	1897	
S1	#5	3	11'-6"	588	
U1	#4	4	6'-4"	140	
U2	#4	4	6'-2"	37	
U3	#4	4	6'-6"	17	
U4	#4	4	7'-0"	19	
V1	#9	2	17'-3"	1408	
SP-1	**	5	320'-10"	669	
SP-2	*	6	486'-10"	650	
REINFORCING STEEL				6007	LB
SPIRAL COL. REINF. STEEL				1319	LB
CLASS "A" CONCRETE BREAKDOWN					
POUR 2 (COLUMNS)				7.4	CY
POUR 3 (CAP)				19.1	CY
TOTAL				26.5	CY
DRILLED PIERS:					
DRILLED PIER CONCRETE					
POUR 1 (DRILLED PIERS)				11.5	CY
3'-6" Ø DRILLED PIER NOT IN SOIL					
				22	LF
3'-6" Ø DRILLED PIER IN SOIL					
				10	LF
CSL TUBES					
				140	LF

\* THE "SP-1" SPIRAL REINFORCING STEEL SHALL BE W21 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

\* THE "SP-2" SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. I-5711

ALAMANCE COUNTY

STATION: STA. 27+02.26 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE

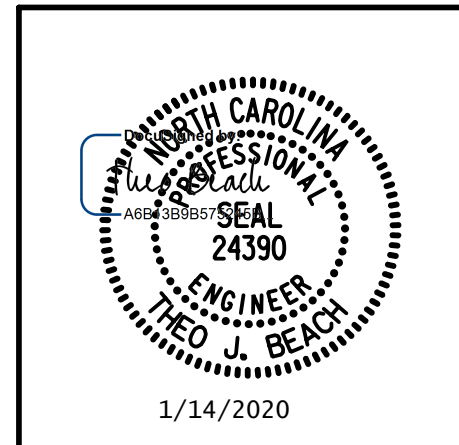
**BENT 1**

RIGHT WIDENING

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

SHEET NO. S-51  
TOTAL SHEETS 89

PLANS PREPARED BY:  
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DRAWN BY: S.D. COOPER DATE: 1-20

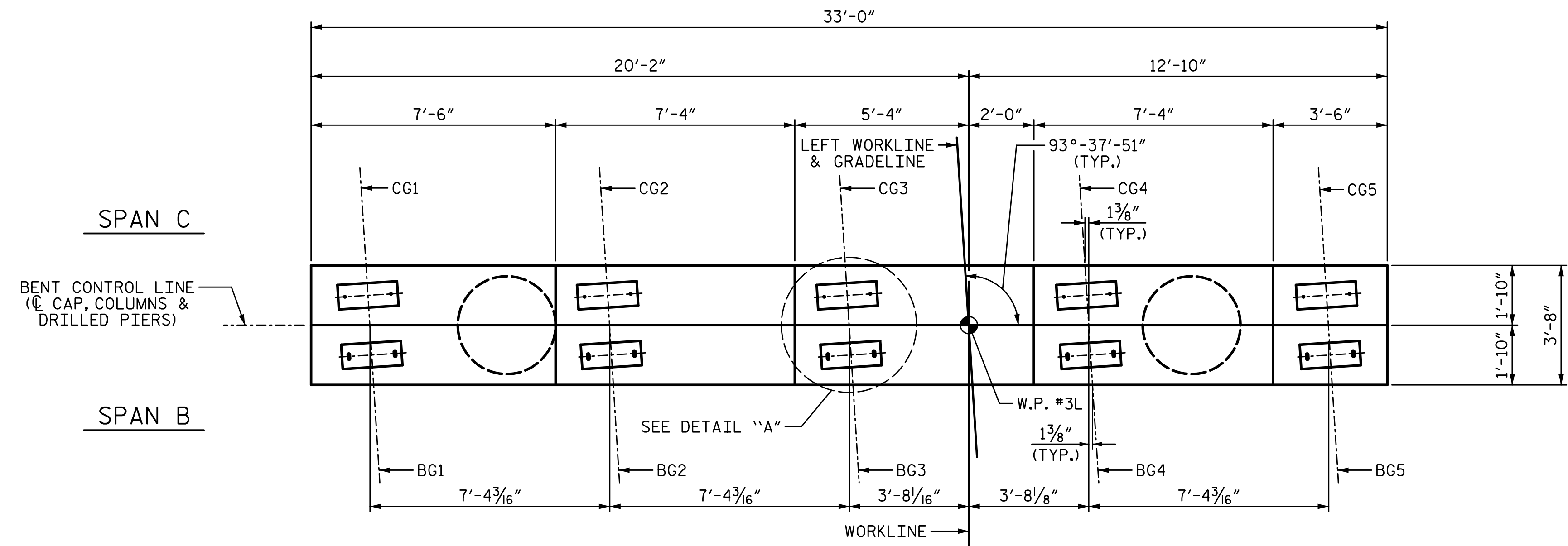
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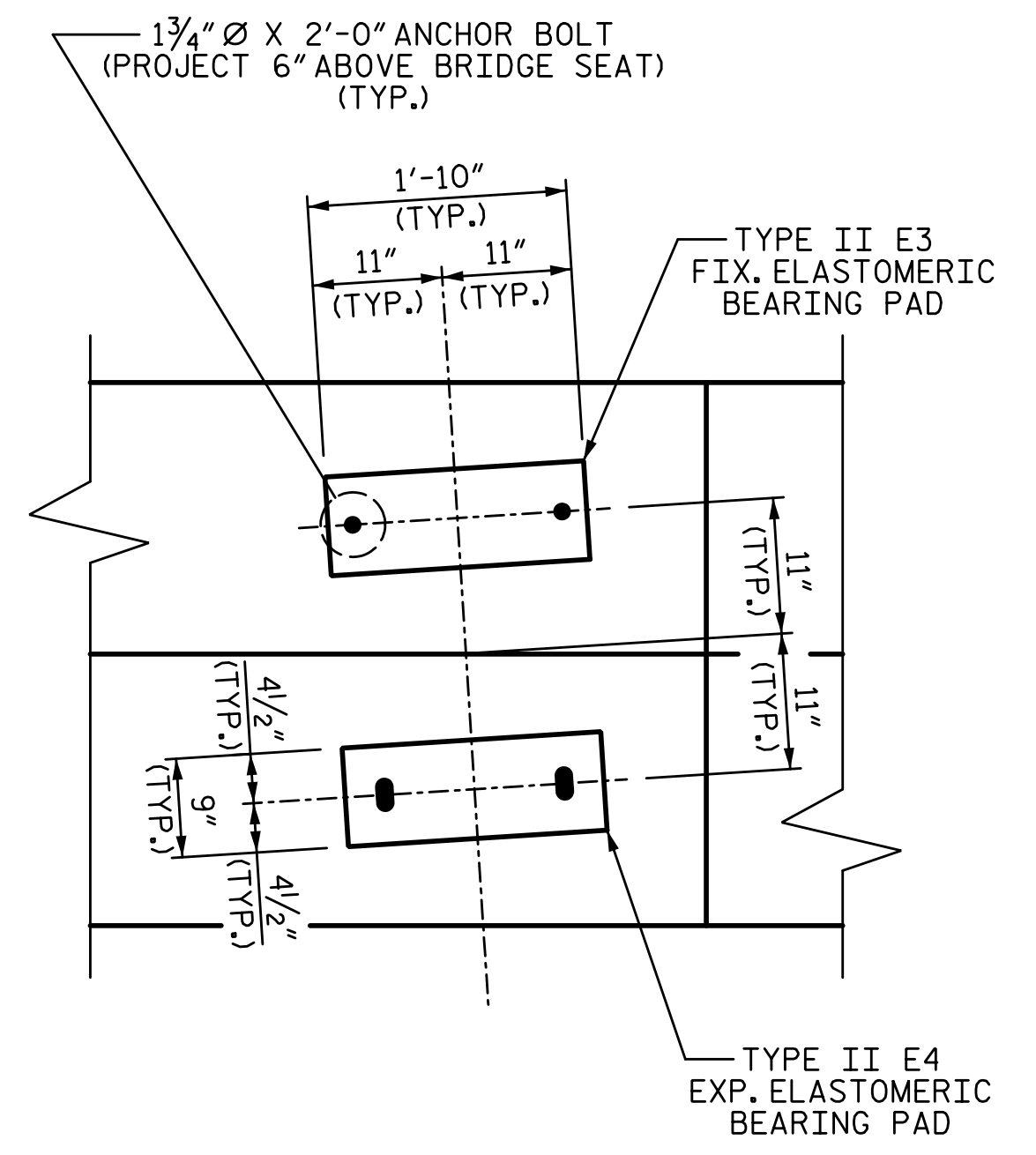
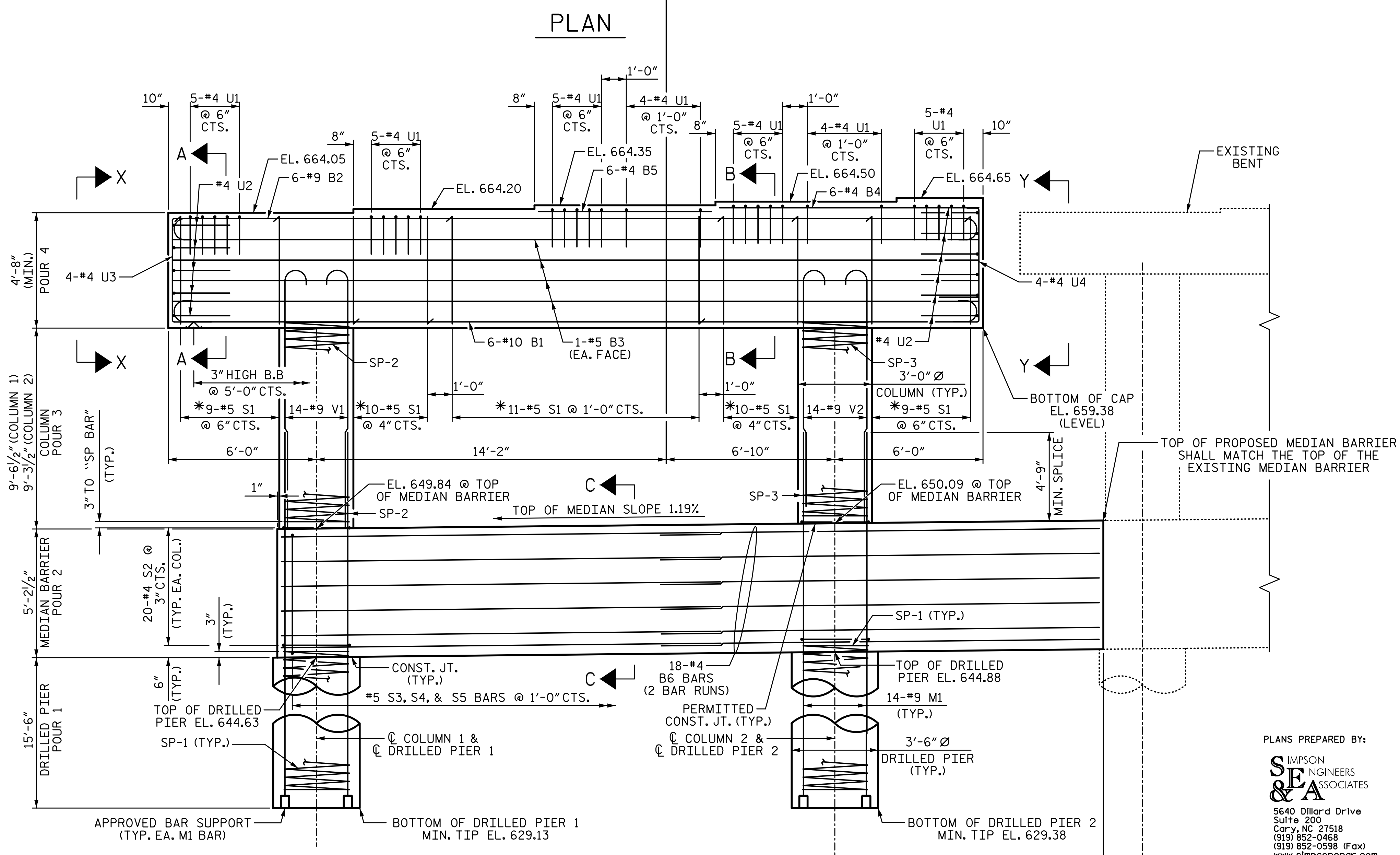
THE TOP SURFACES AREAS OF THE BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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\*INVERT ALTERNATE STIRRUPS.



PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

SHEET 1 OF 2

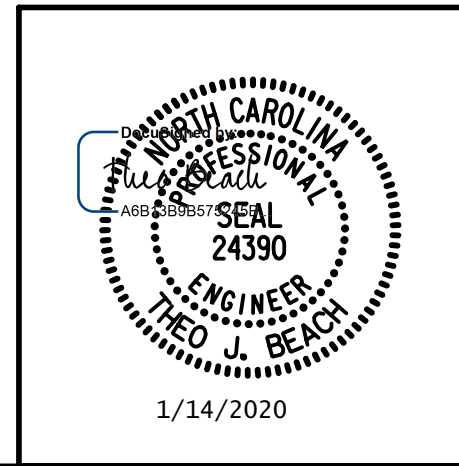
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE

**BENT 2**

**LEFT WIDENING**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-52
1			3			TOTAL SHEETS
2			4			89

PLANS PREPARED BY:  
**SIMPSON ENGINEERS & ASSOCIATES**  
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Suite 200  
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(919) 852-0468  
(919) 852-0598 (Fax)  
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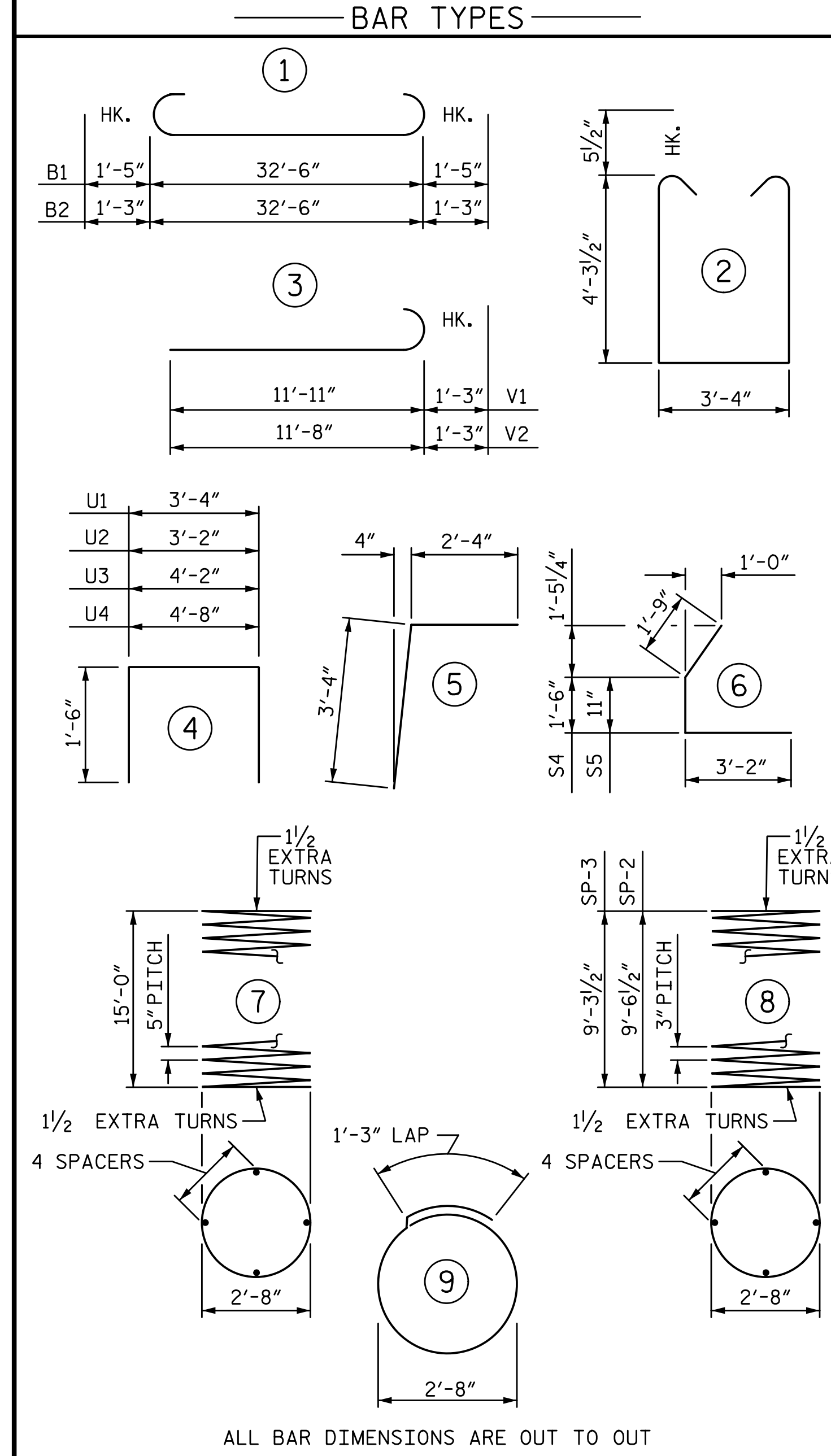
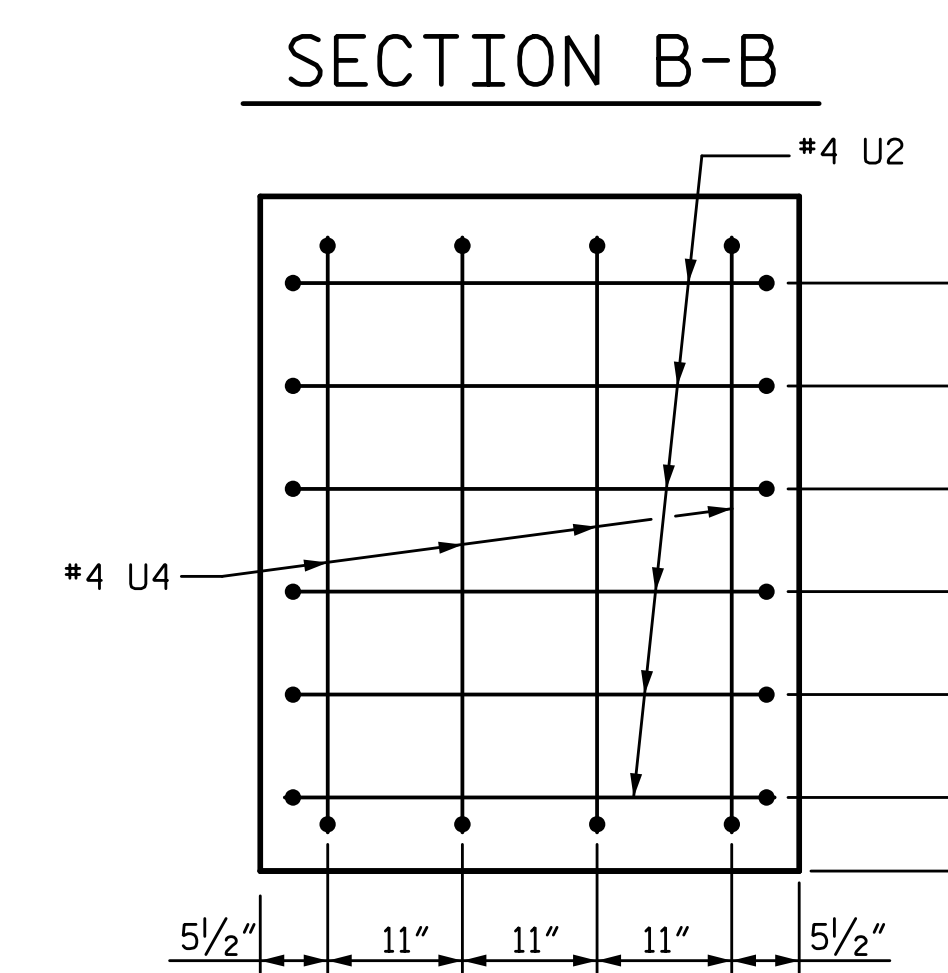
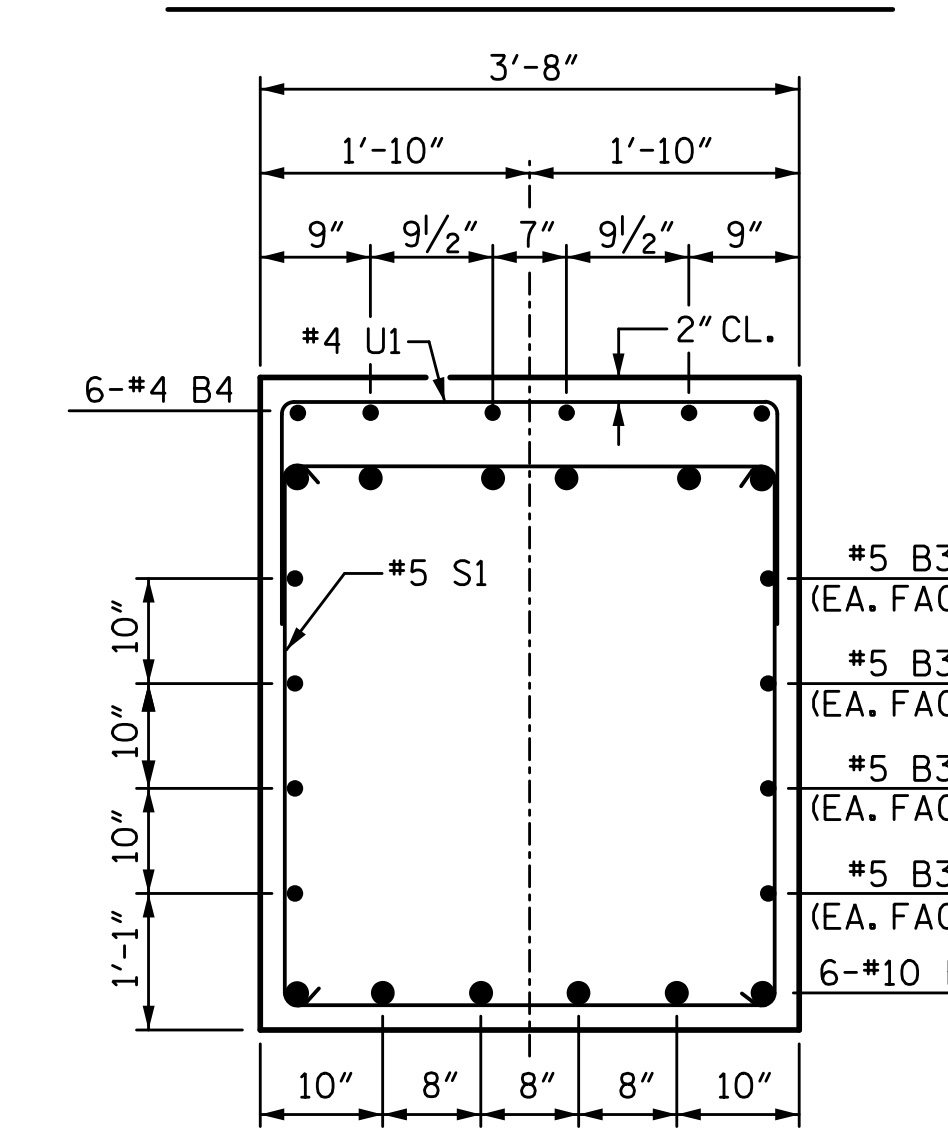
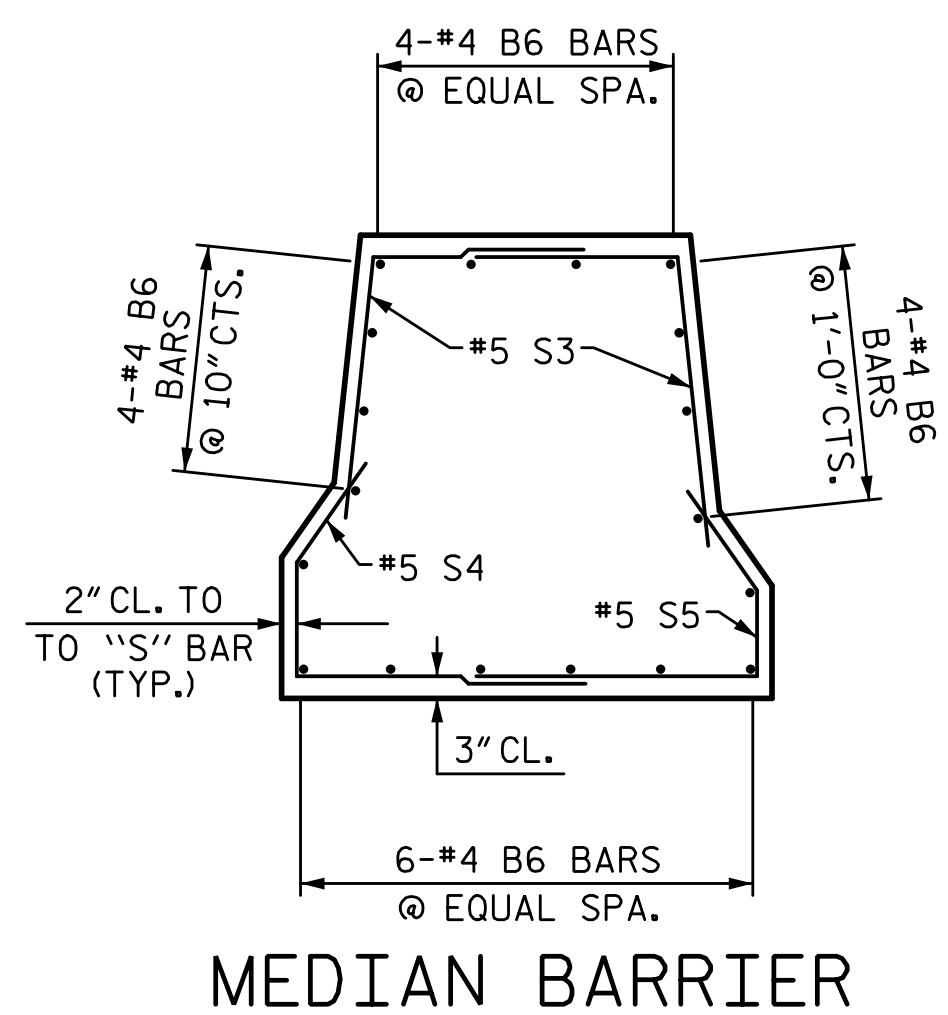
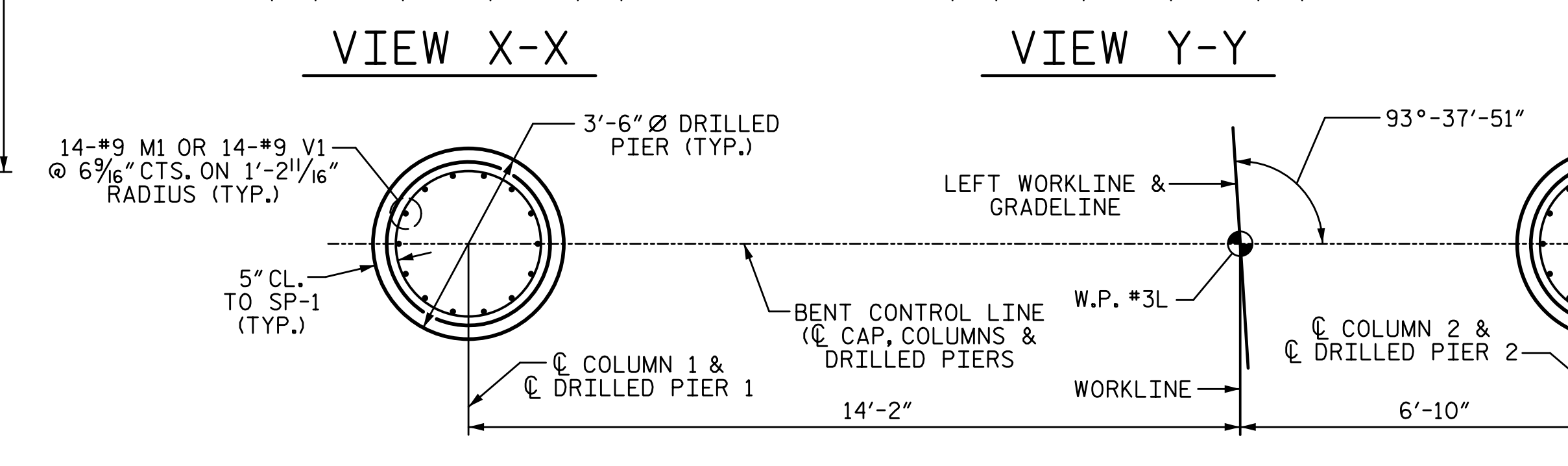
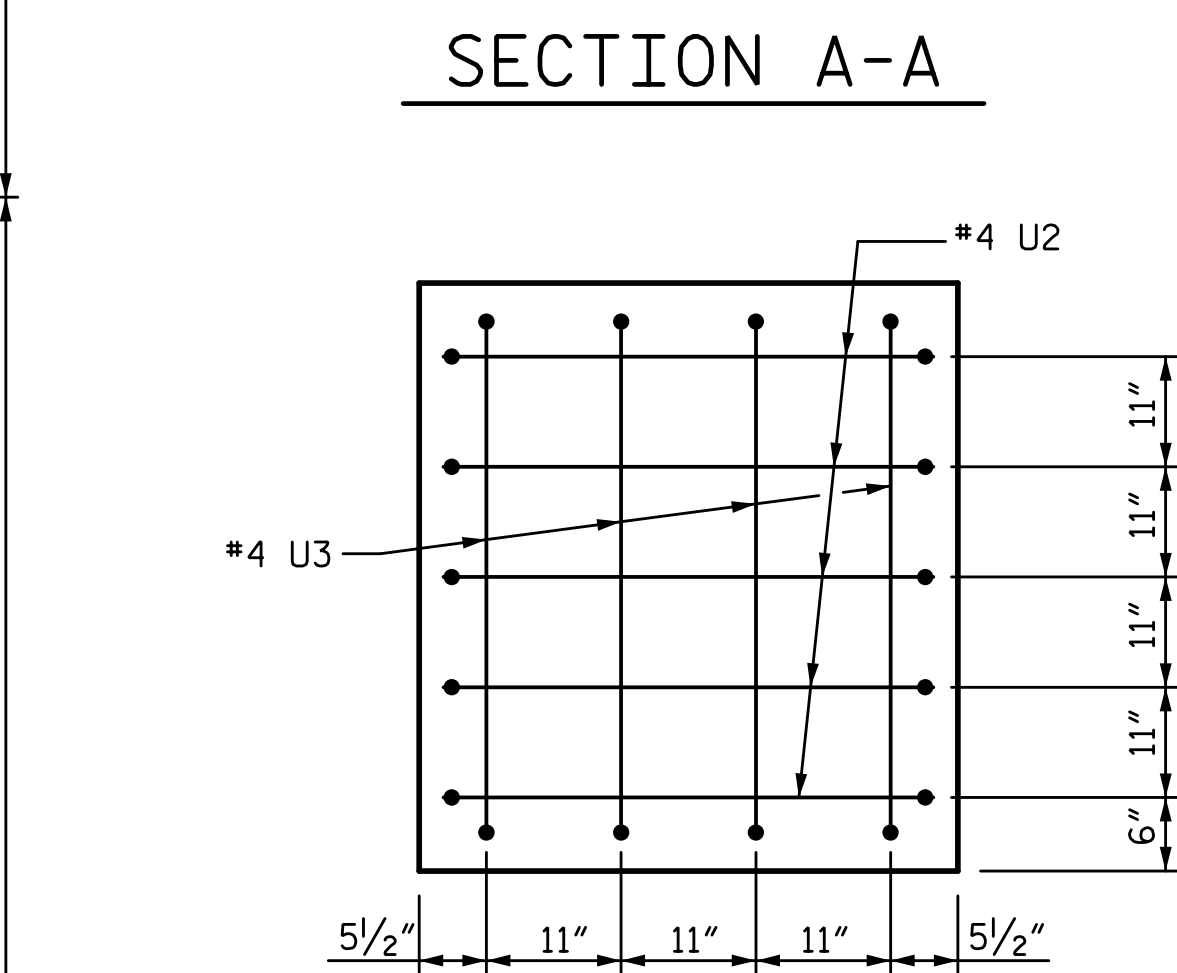
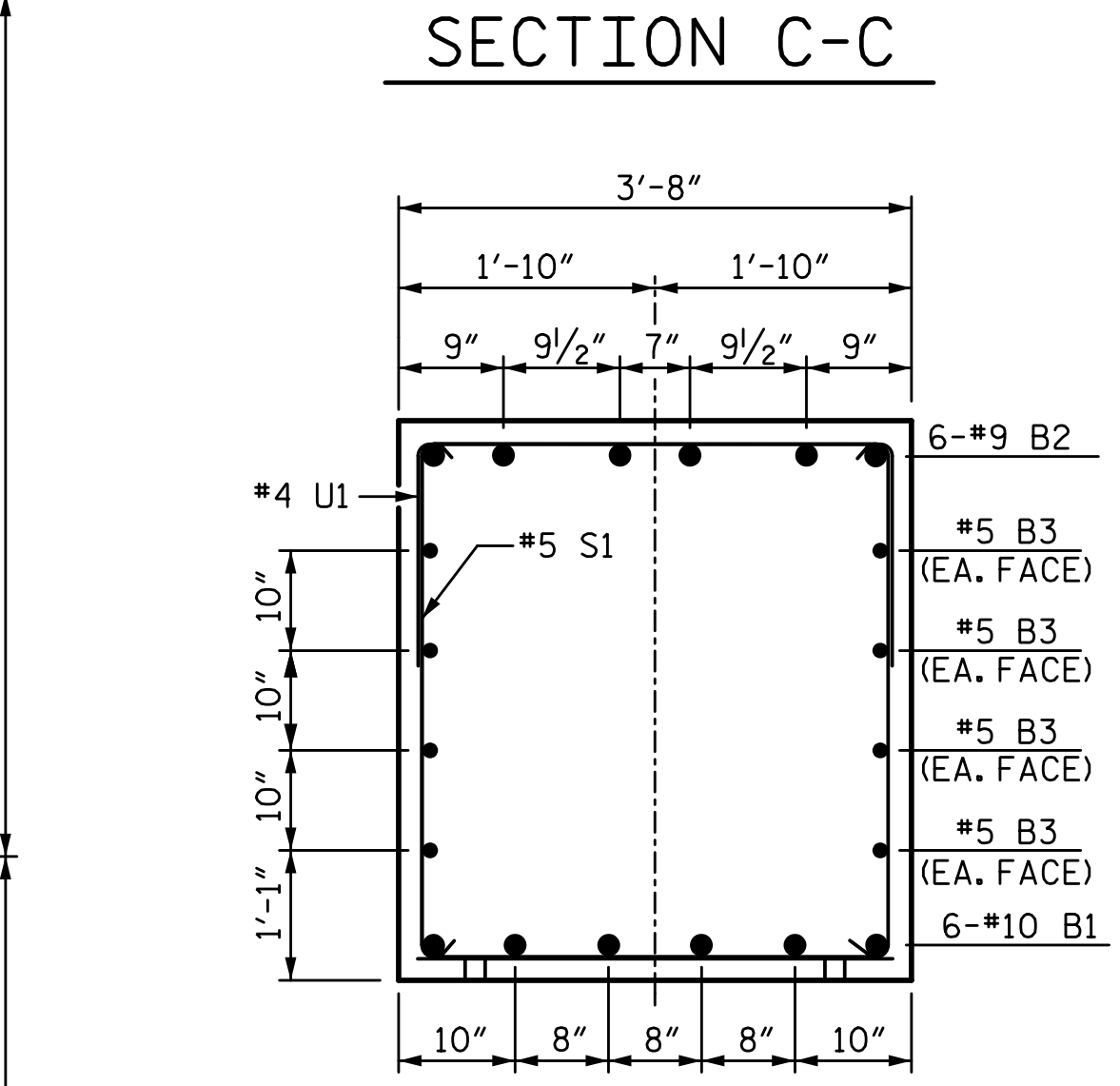
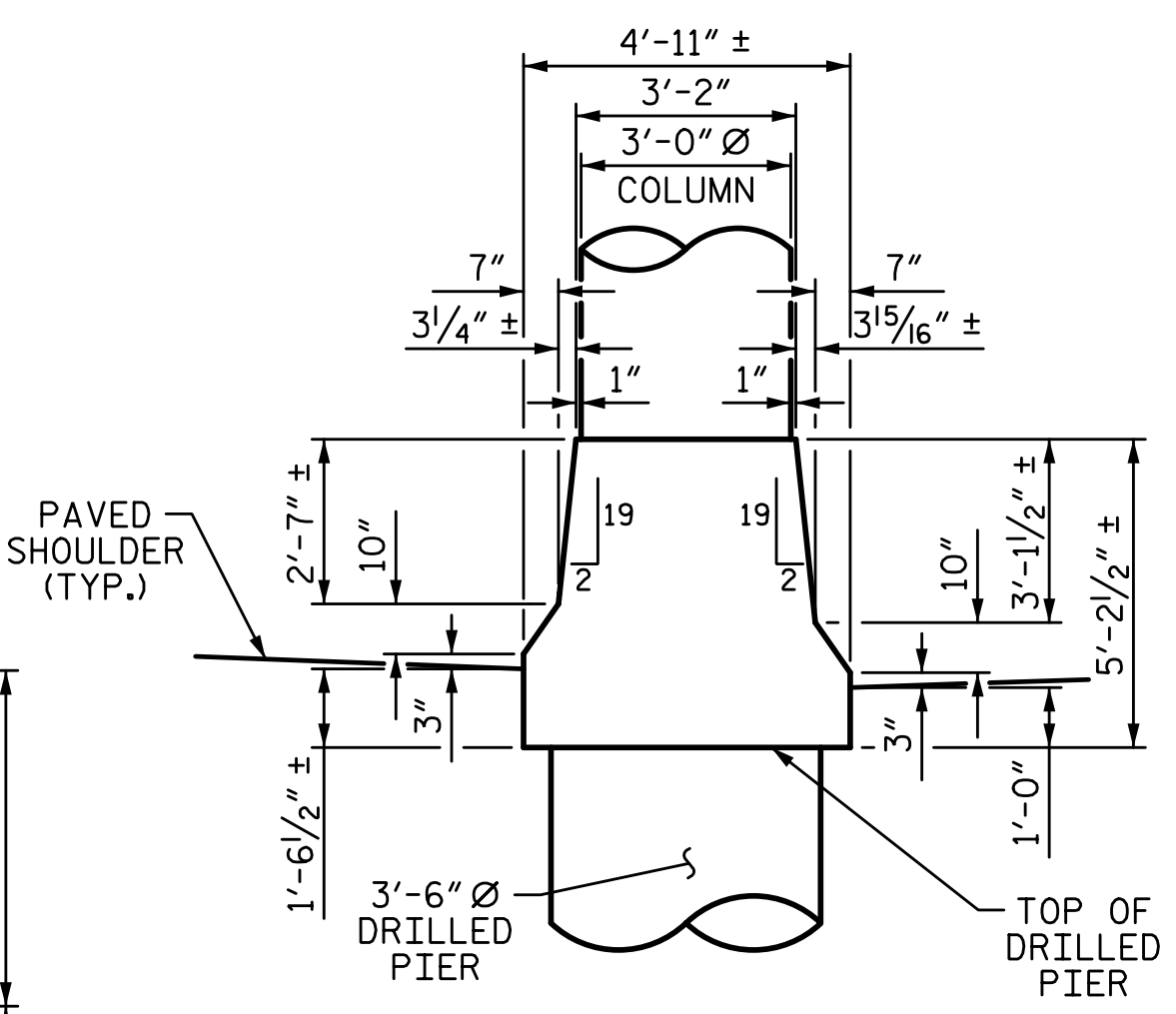
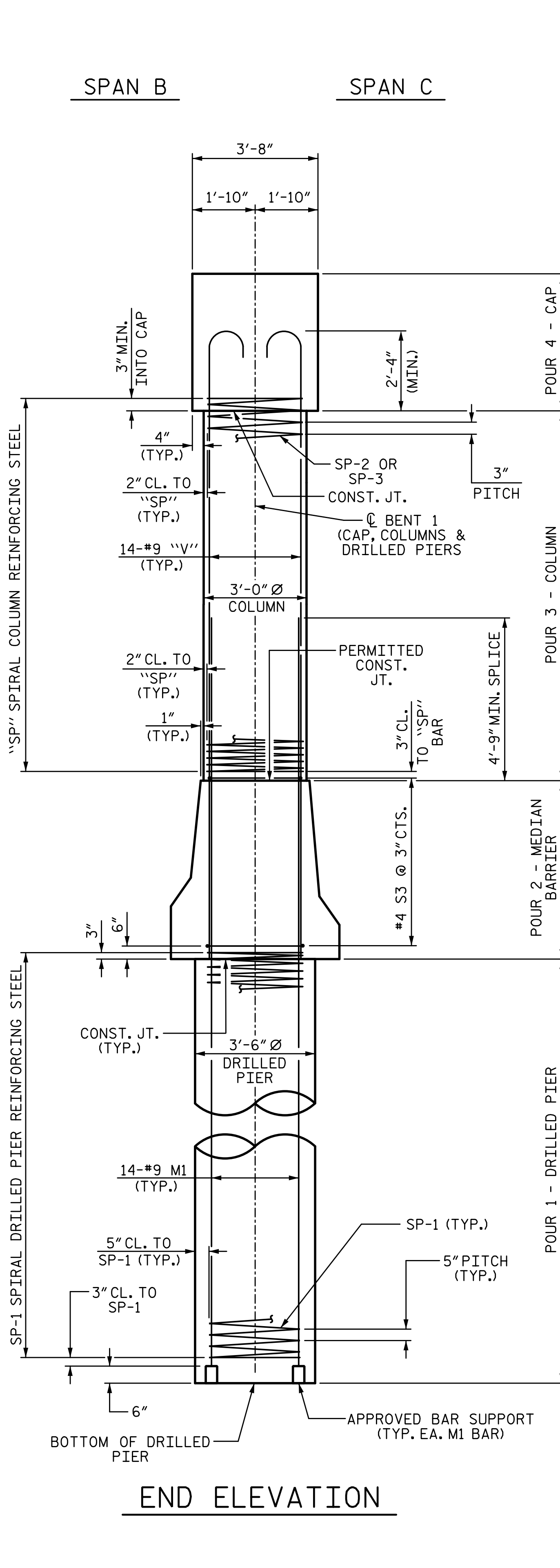


DRAWN BY: S.D. COOPER DATE: 1-20  
CHECKED BY: T. BEACH DATE: 1-20  
DESIGN ENGINEER OF RECORD: T. BEACH DATE: 1-20

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ALL BAR DIMENSIONS ARE OUT TO OUT

\*\* THE "SP-1" SPIRAL REINFORCING STEEL SHALL BE W21 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

\* THE "SP-2" SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL					
BENT 2					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#6		35'-4"	912	
B2	#9		35'-0"	714	
B3	#5	STR	32'-8"	273	
B4	#4	STR	10'-6"	42	
B5	#4	STR	7'-4"	29	
B6	#4	STR	17'-9"	427	
M1	#9	STR	28'-0"	2666	
S1	#5		12'-10"	656	
S2	#4		9'-8"	258	
S3	#5		5'-6"	390	
S4	#5		6'-5"	228	
S5	#5		5'-8"	201	
U1	#4		6'-4"	140	
U2	#4		6'-2"	45	
U3	#4		7'-2"	19	
U4	#4		7'-8"	20	
V1	#9		13'-2"	627	
V2	#9		12'-11"	615	
SP-1	*		320'-9"	669	
SP-2	*		346'-7"	232	
SP-3	*		338'-4"	226	
REINFORCING STEEL				8262	LB
SPIRAL COL. REINF. STEEL				1127	LB
CLASS "A" CONCRETE BREAKDOWN					
POUR 2 (MEDIAN BARRIER)				26.0	CY
POUR 3 (COLUMNS)				5.0	CY
POUR 4 (CAP)				22.2	CY
TOTAL				53.2	CY
DRILLED PIERS:					
DRILLED PIER CONCRETE					
POUR 1 (DRILLED PIERS)				11.1	CY
3'-6" Ø DRILLED PIER NOT IN SOIL				23	LF
3'-6" Ø DRILLED PIER IN SOIL				8	LF
CSL TUBES				136	LF

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**BENT 2**

LEFT WIDENING

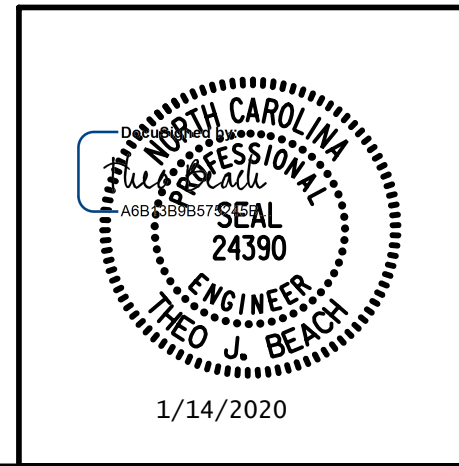
REVISIONS

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

SHEET NO. S-53  
 TOTAL SHEETS 89

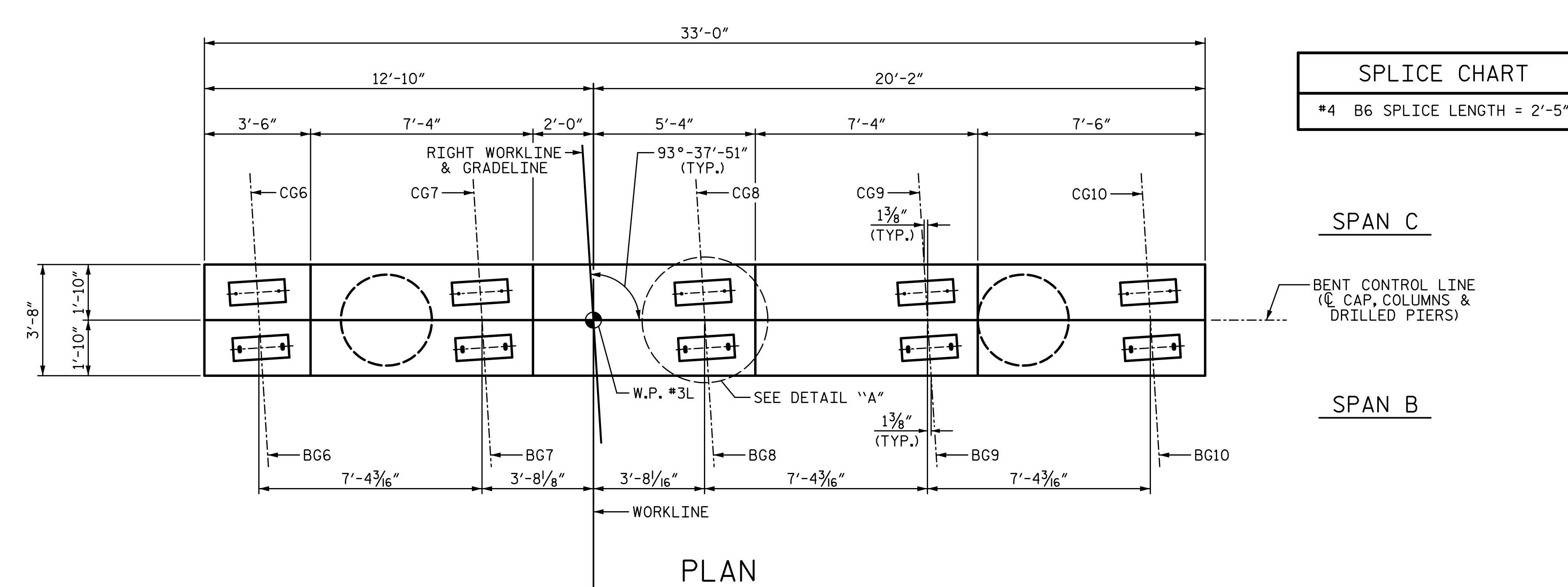
DRAWN BY: S.D. COOPER      DATE: 1-20  
 CHECKED BY: T. BEACH      DATE: 1-20  
 DESIGN ENGINEER OF RECORD: T. BEACH      DATE: 1-20

PLANS PREPARED BY:  
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 Cary, NC 27518  
 (919) 852-0468  
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**NOTES:**

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

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

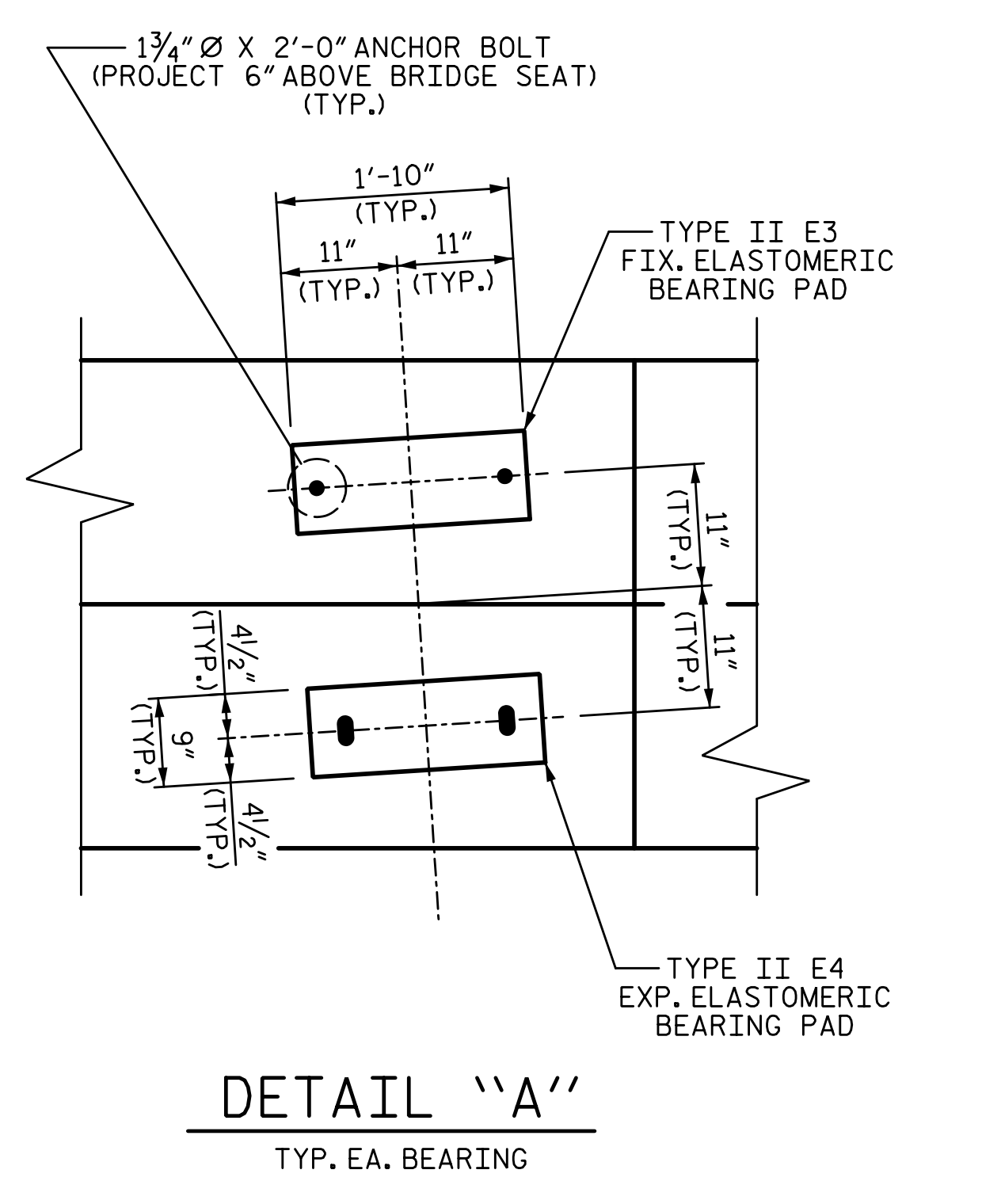
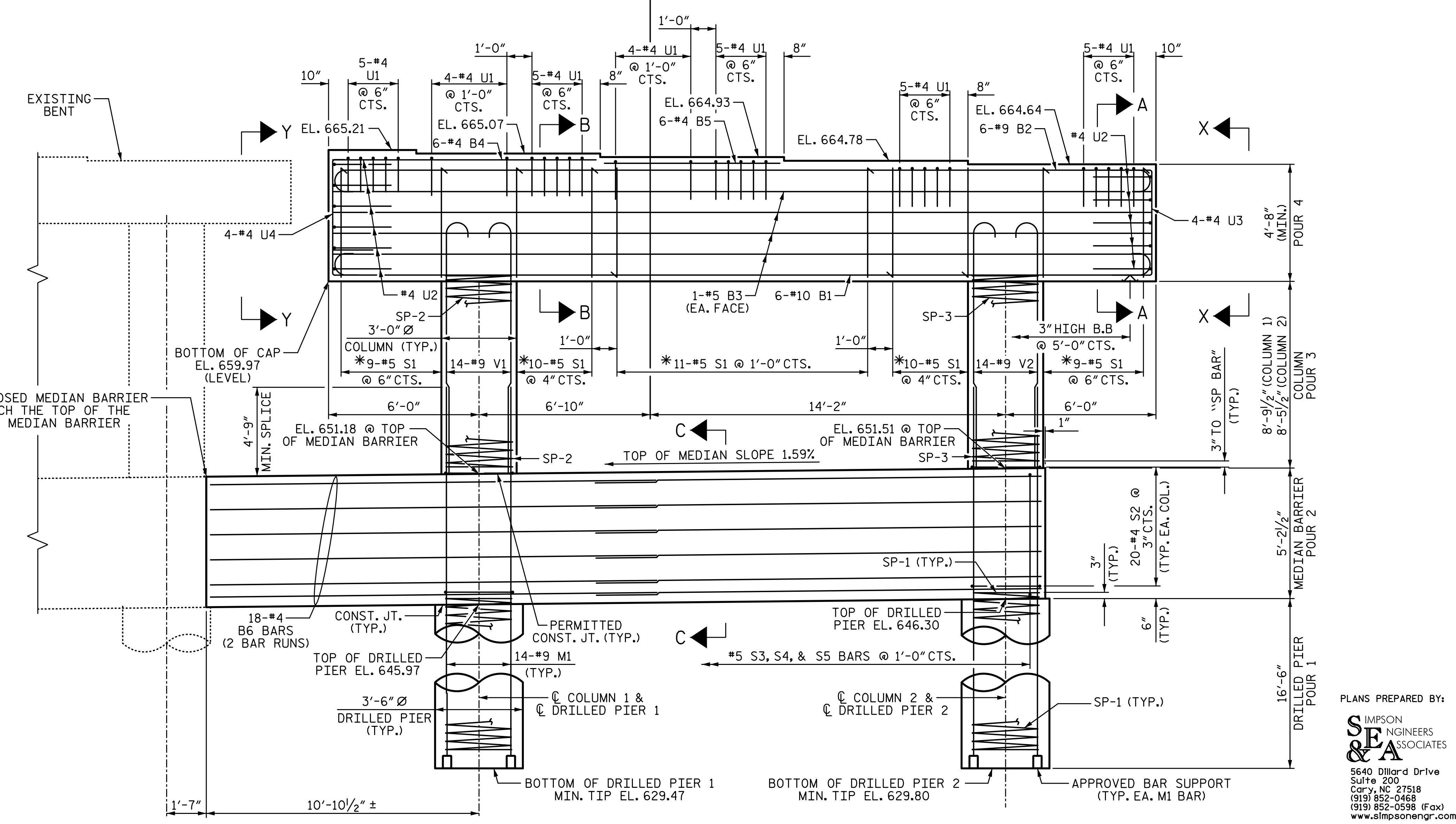
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\*INVERT ALTERNATE STIRRUPS.



PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 1 OF 2

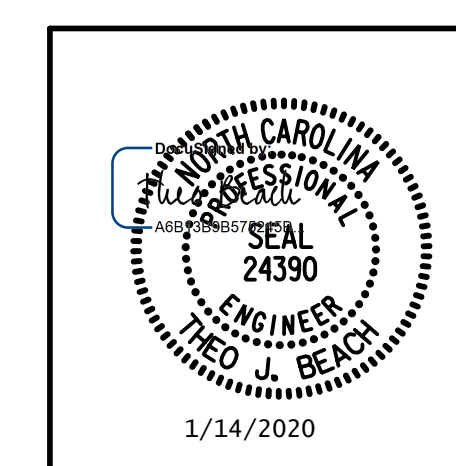
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**BENT 2**

RIGHT WIDENING

REVISIONS						SHEET NO. S-54
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 89
2			4			

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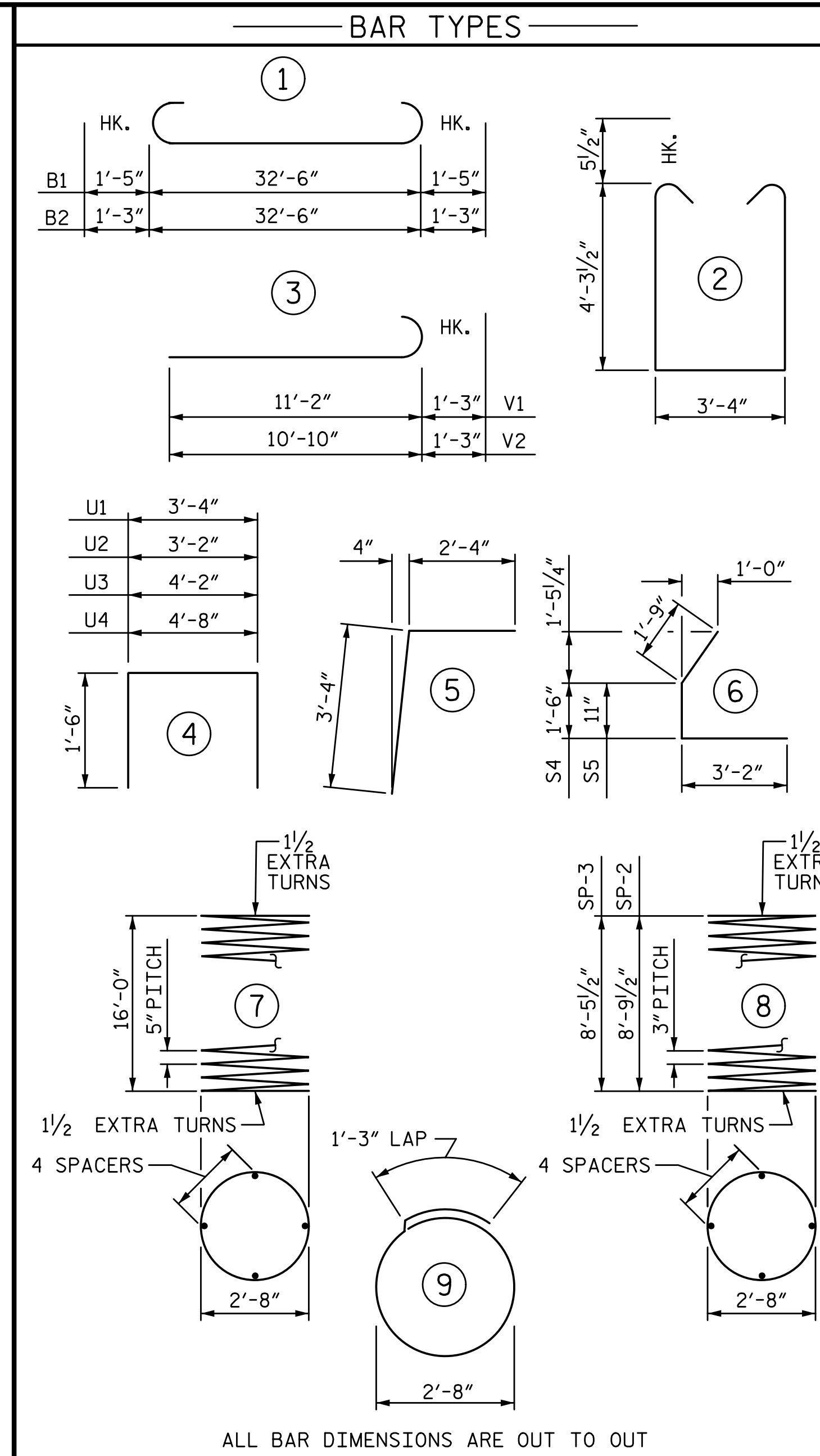
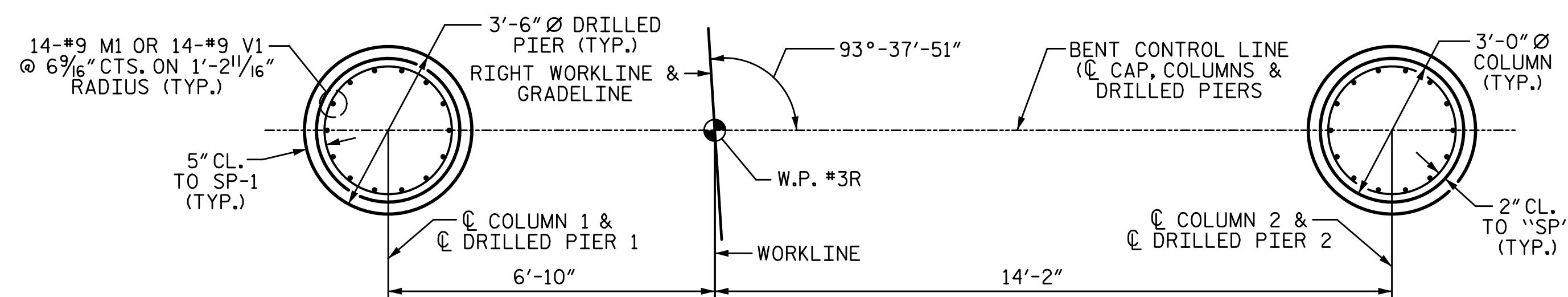
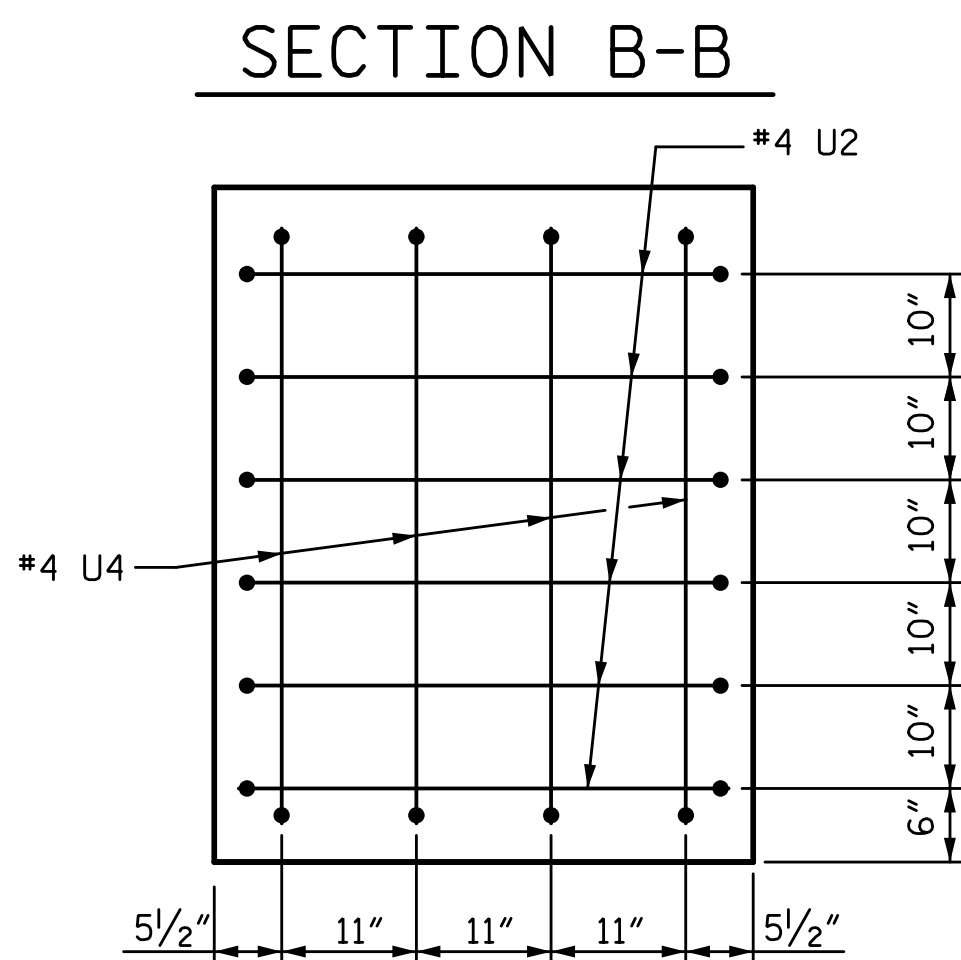
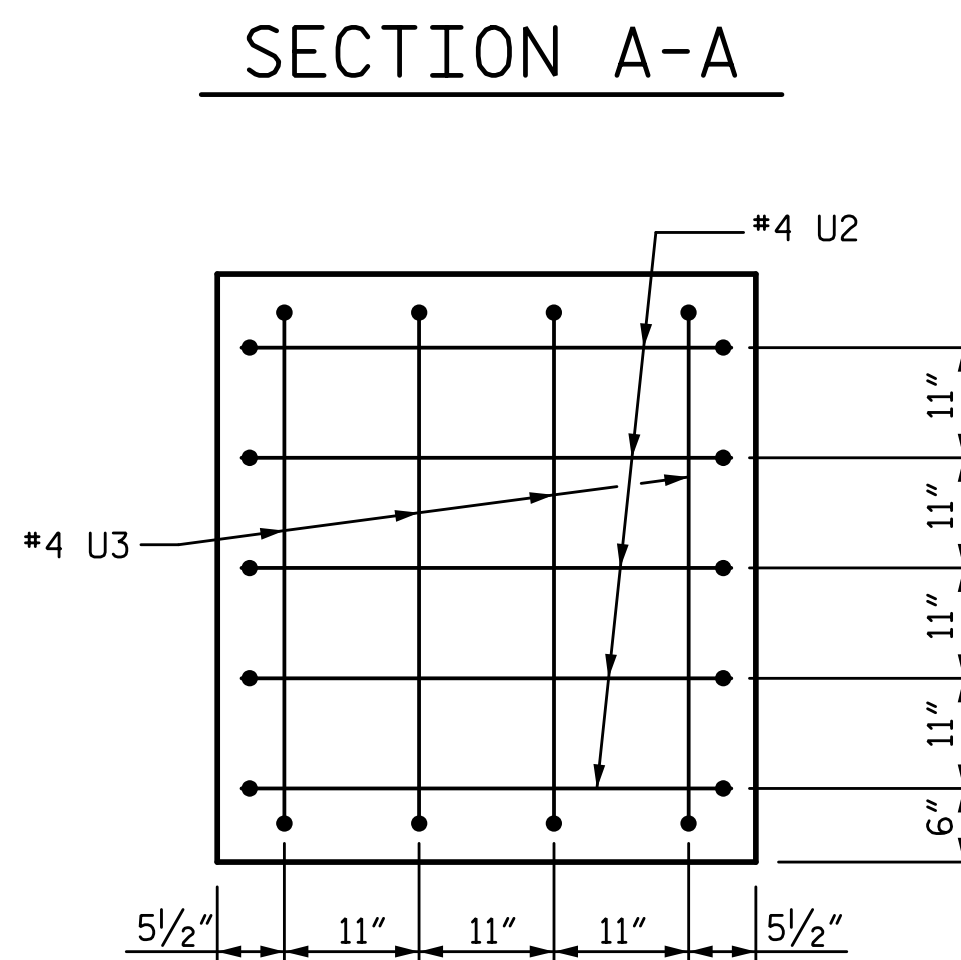
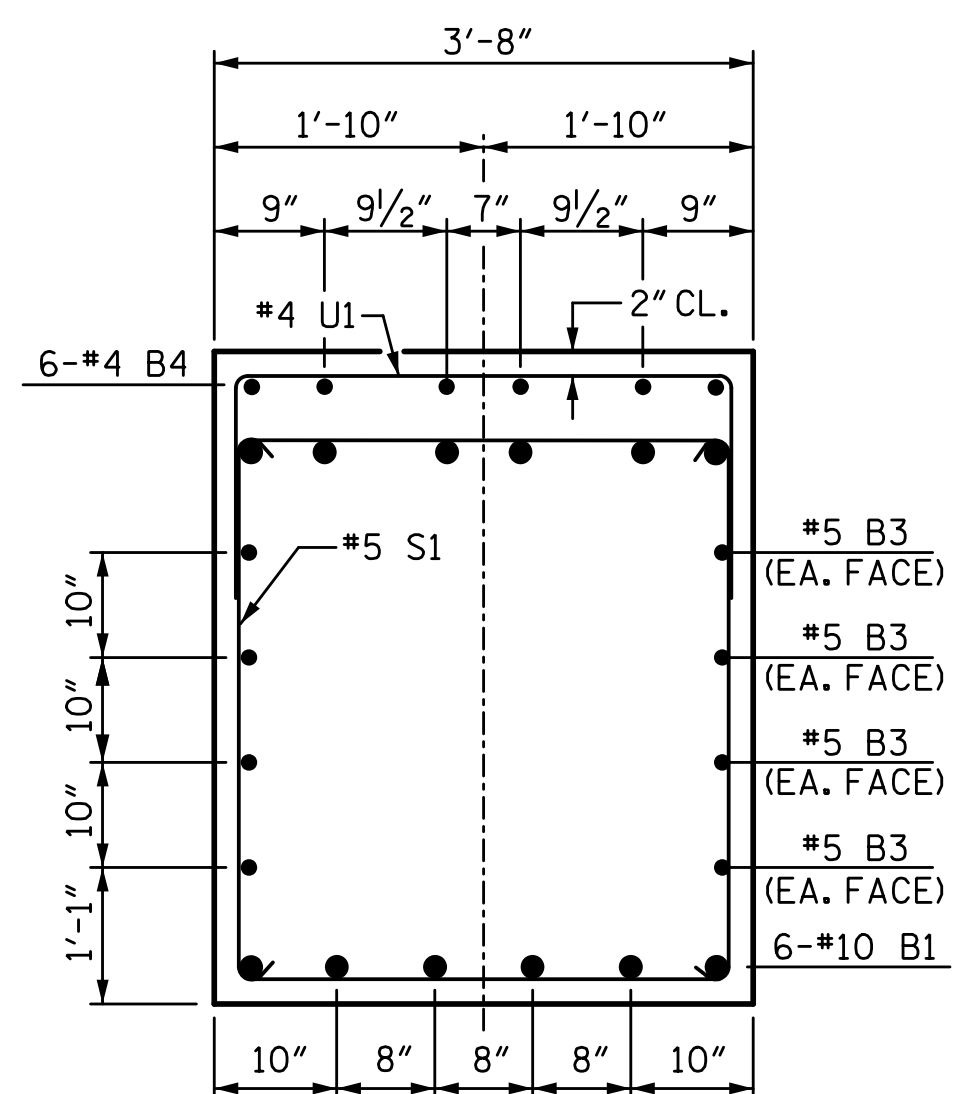
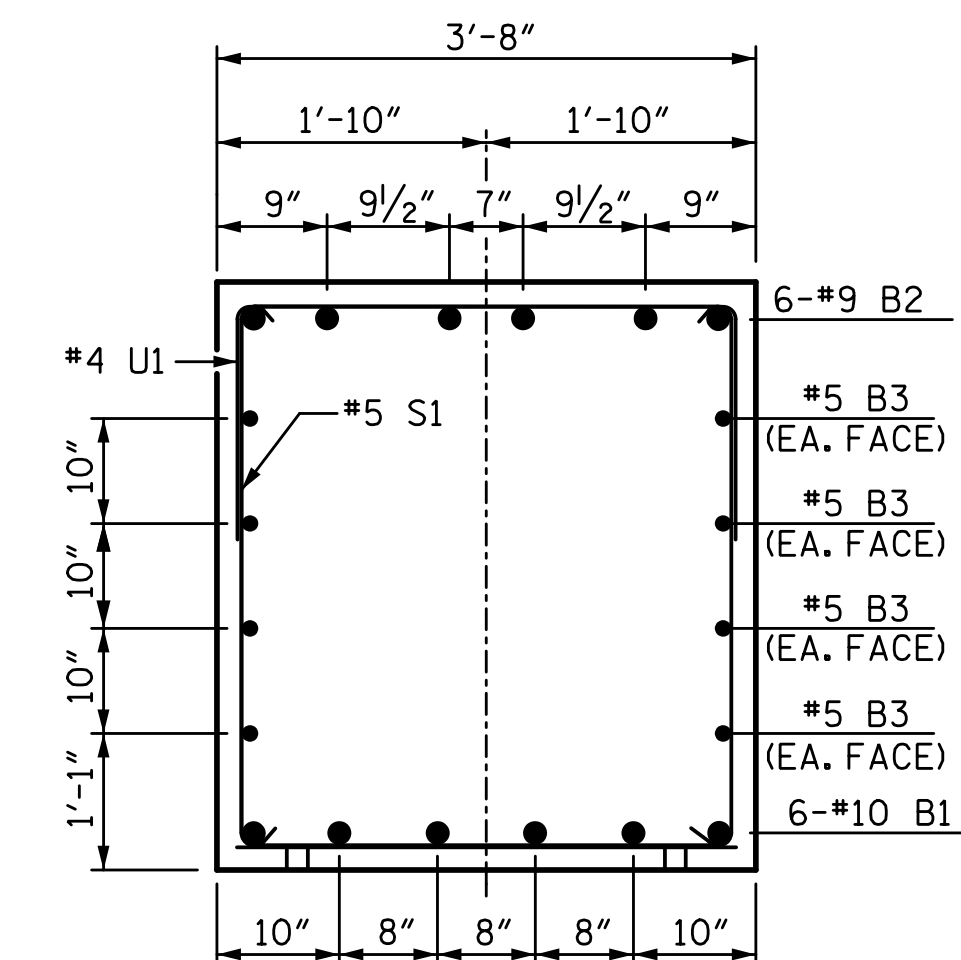
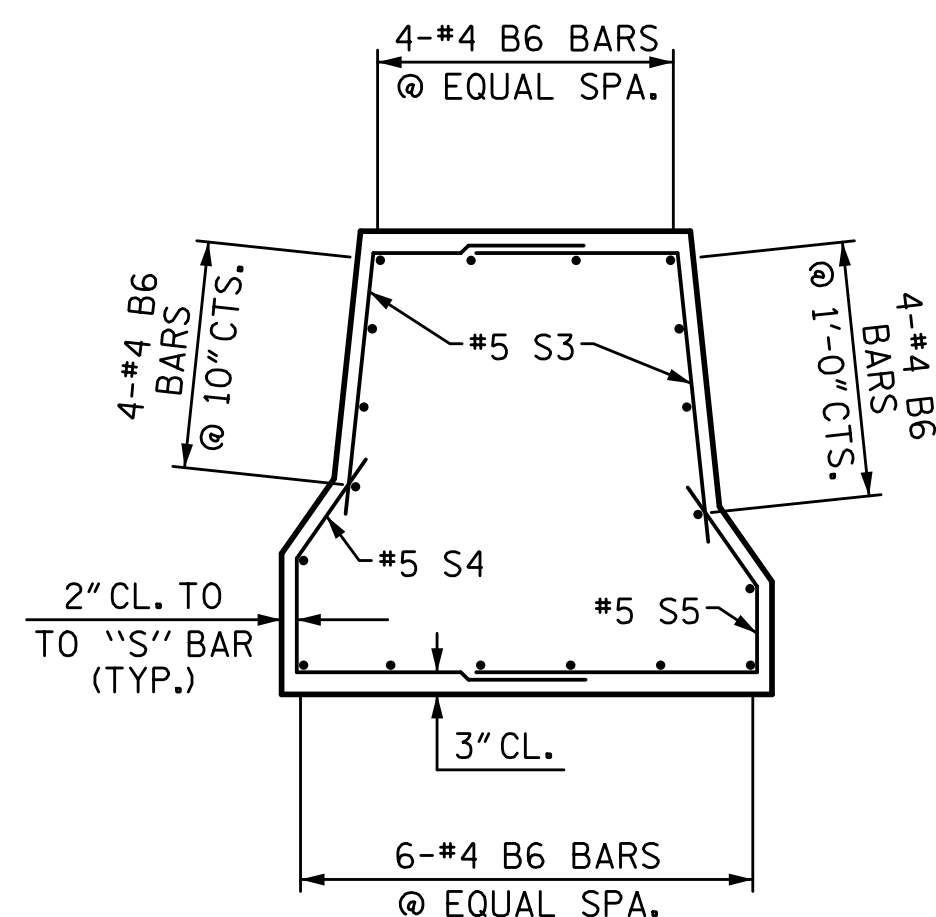
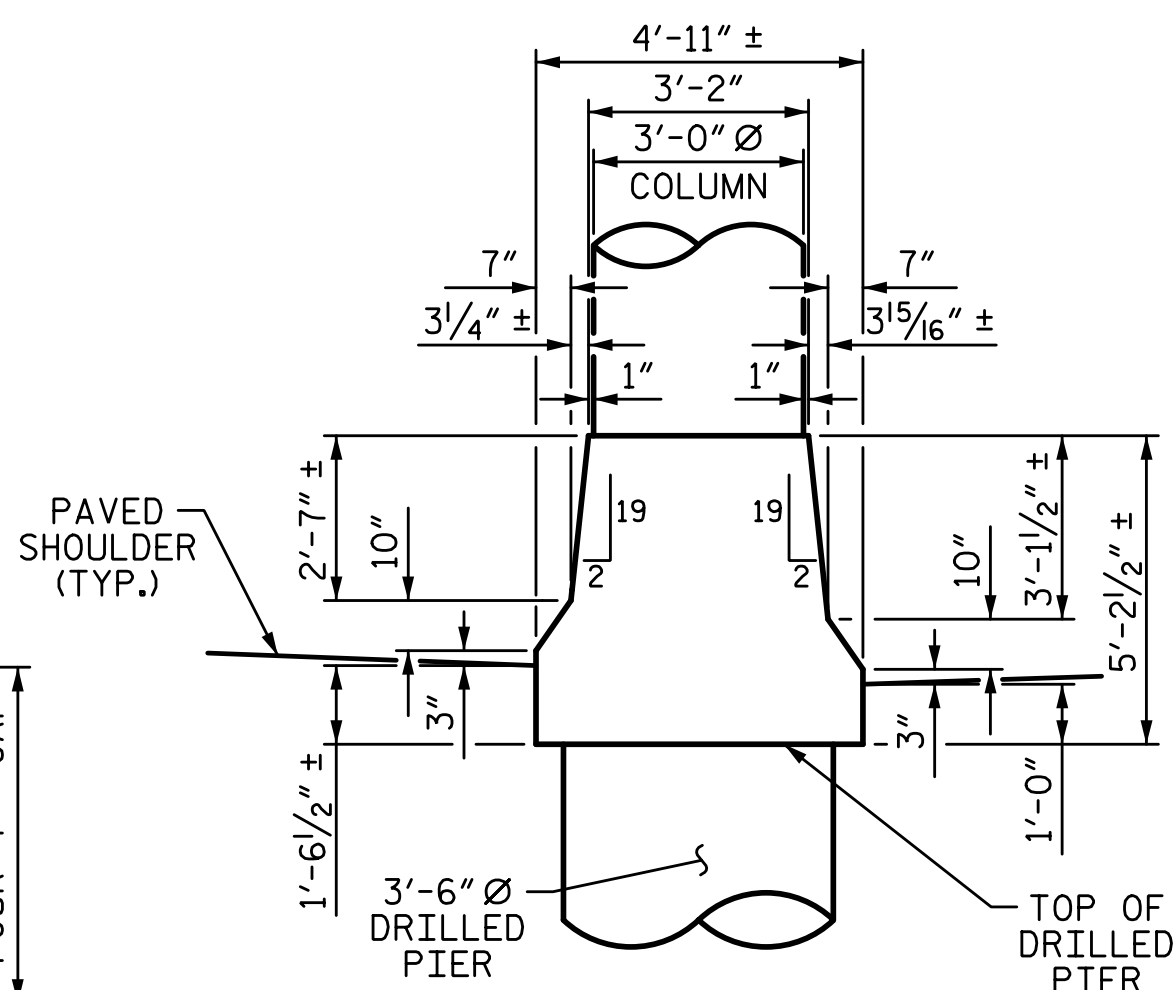
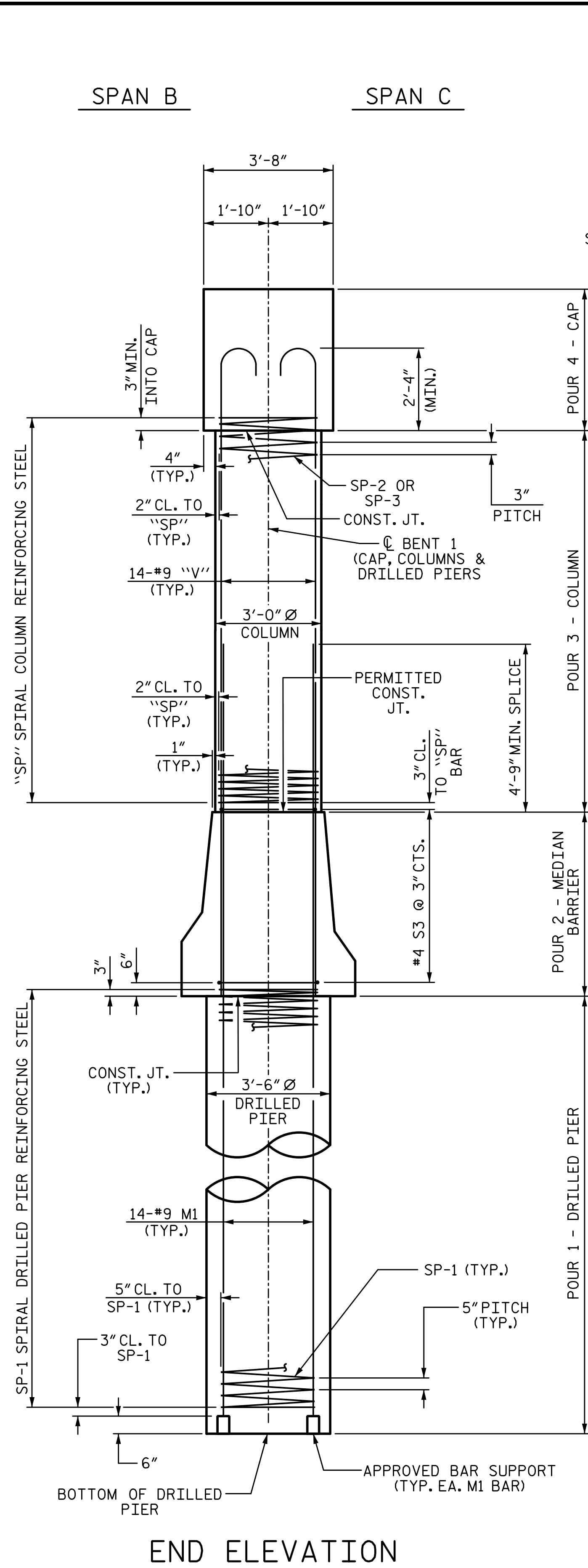
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DRAWN BY: S.D. COOPER DATE: 1-20  
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 DESIGN ENGINEER OF RECORD: T. BEACH DATE: 1-20

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ALL BAR DIMENSIONS ARE OUT TO OUT

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\* THE "SP-2" SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL					
BENT 2					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#6	#10	1	35'-4"	912
B2	#6	#9	1	35'-0"	714
B3	#8	#5	STR	32'-8"	273
B4	#6	#4	STR	10'-6"	42
B5	#6	#4	STR	7'-4"	29
B6	36	#4	STR	17'-9"	427
M1	28	#9	STR	29'-0"	2761
S1	49	#5	2	12'-10"	656
S2	40	#4	9	9'-8"	258
S3	68	#5	5	5'-6"	390
S4	34	#5	6	6'-5"	228
S5	34	#5	6	5'-8"	201
U1	33	#4	4	6'-4"	140
U2	11	#4	4	6'-2"	45
U3	4	#4	4	7'-2"	19
U4	4	#4	4	7'-8"	20
V1	14	#9	3	12'-5"	591
V2	14	#9	3	12'-1"	575
SP-1	2	*	7	345'-6"	721
SP-2	1	*	8	321'-10"	215
SP-3	1	*	8	305'-4"	204
REINFORCING STEEL					8281 LB
SPIRAL COL. REINF. STEEL					1140 LB
CLASS "A" CONCRETE BREAKDOWN					
POUR 2 (MEDIAN BARRIER)					26.0 CY
POUR 3 (COLUMNS)					4.6 CY
POUR 4 (CAP)					22.1 CY
TOTAL					52.6 CY
DRILLED PIERS:					
DRILLED PIER CONCRETE					
POUR 1 (DRILLED PIERS)					11.8 CY
3'-6" Ø DRILLED PIER NOT IN SOIL					16 LF
3'-6" Ø DRILLED PIER IN SOIL					17 LF
CSL TUBES					144 LF

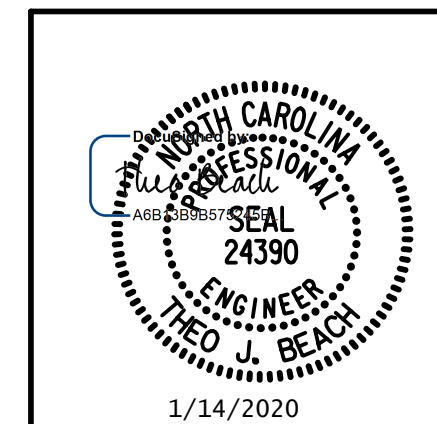
PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUBSTRUCTURE					
BENT 2					
RIGHT WIDENING					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY: S.D. COOPER      DATE: 1-20  
 CHECKED BY: T. BEACH      DATE: 1-20  
 DESIGN ENGINEER OF RECORD: T. BEACH      DATE: 1-20

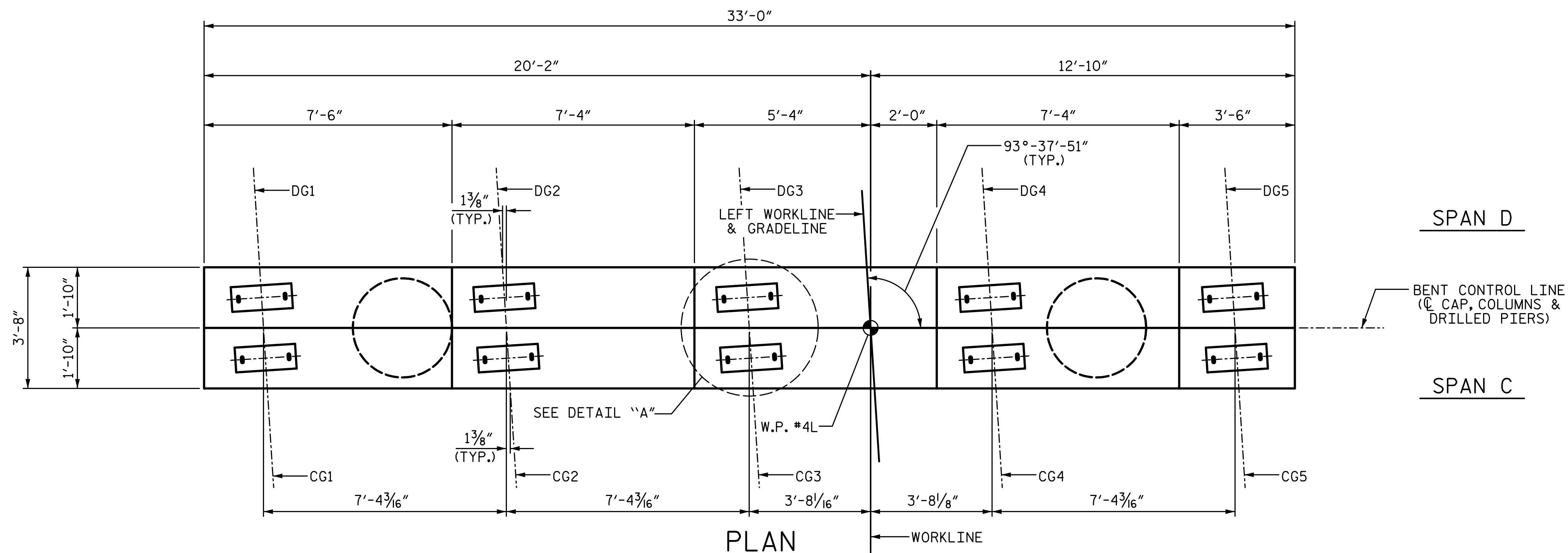
PLANS PREPARED BY:  
**SEA & ASSOCIATES**  
 5640 Dillard Drive  
 Suite 200  
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 (919) 852-0468  
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SHEET NO. S-55  
 TOTAL SHEETS 89





**NOTES:**

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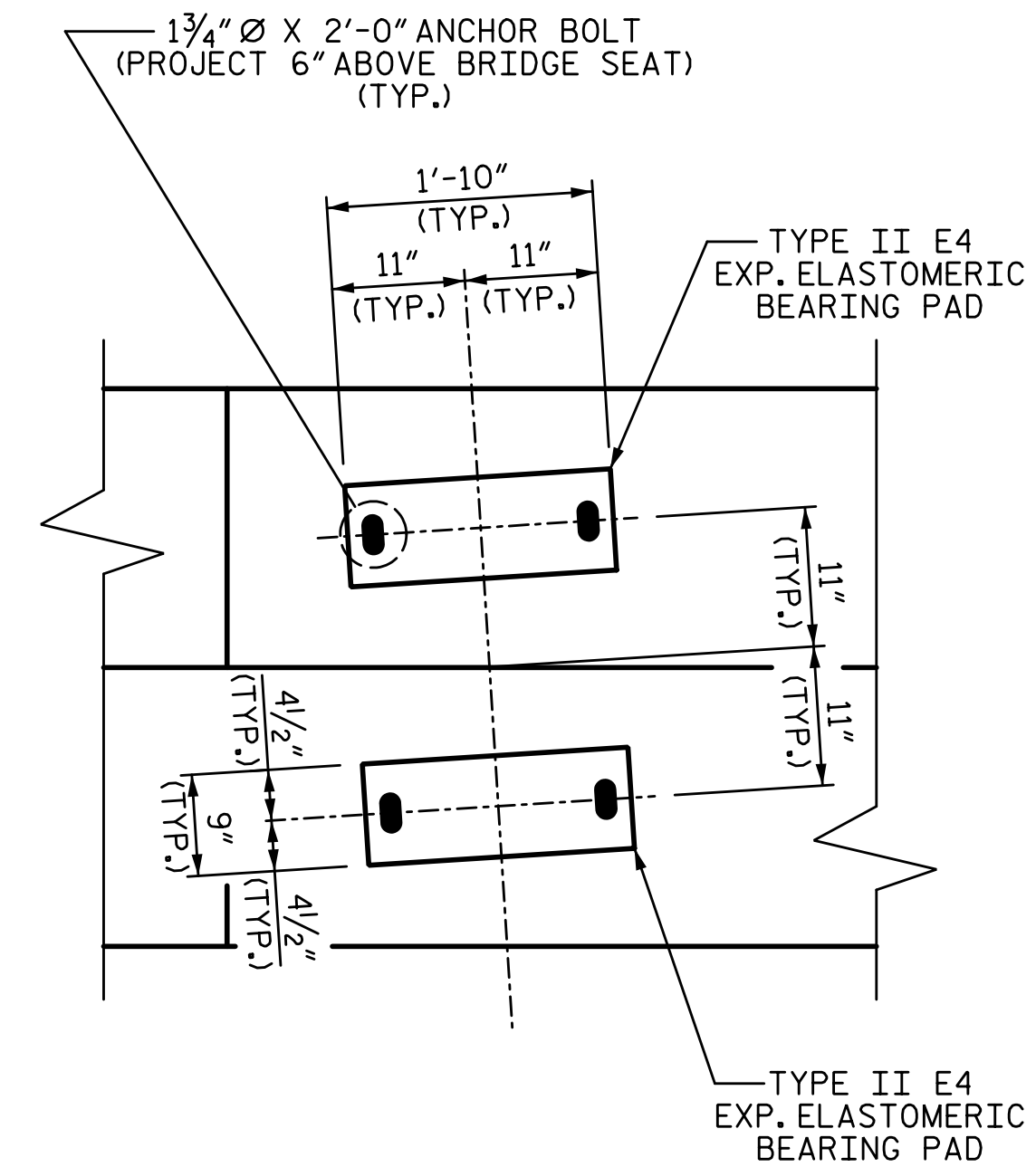
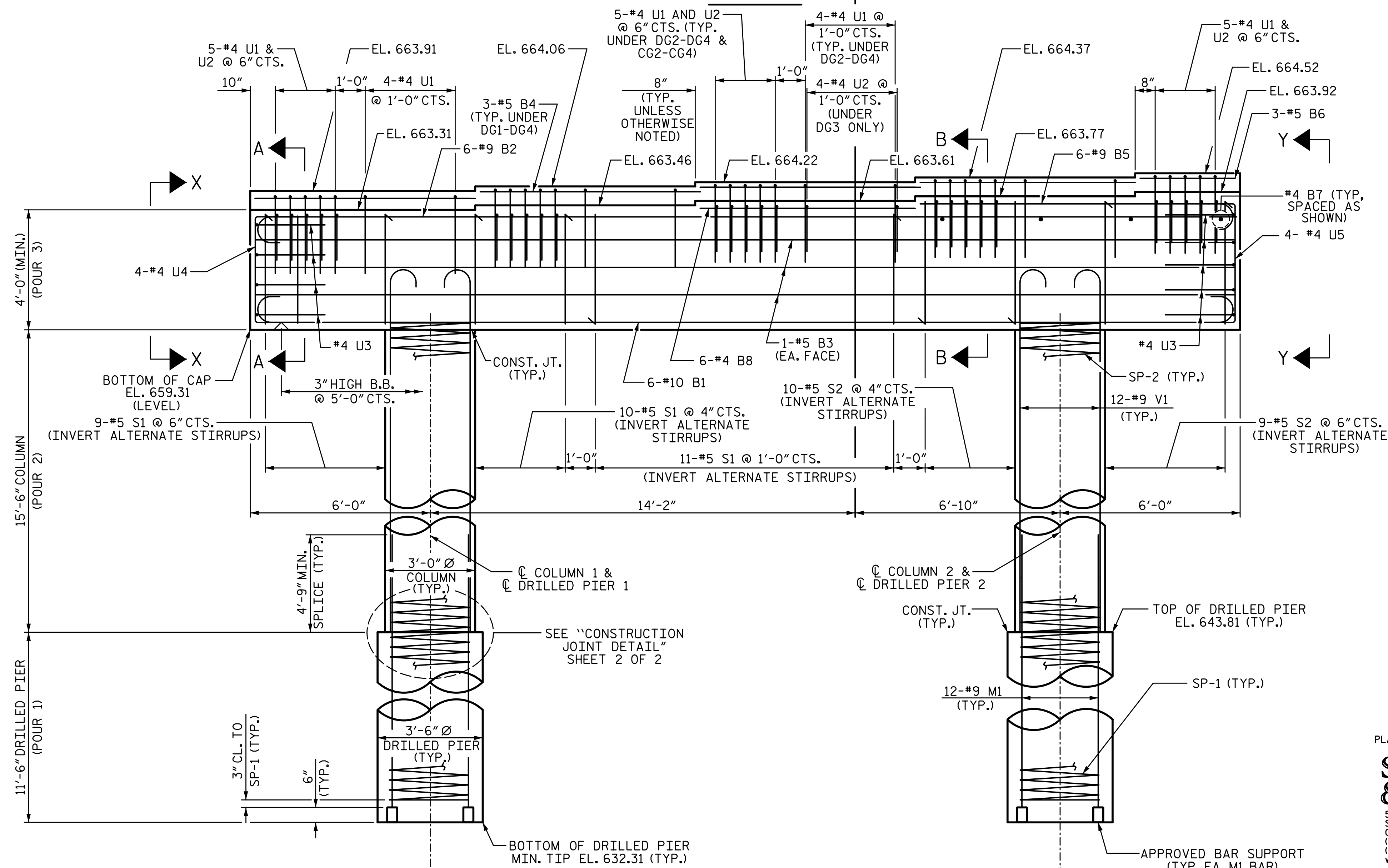
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**DETAIL "A"**  
TYP. EA. BEARING

PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

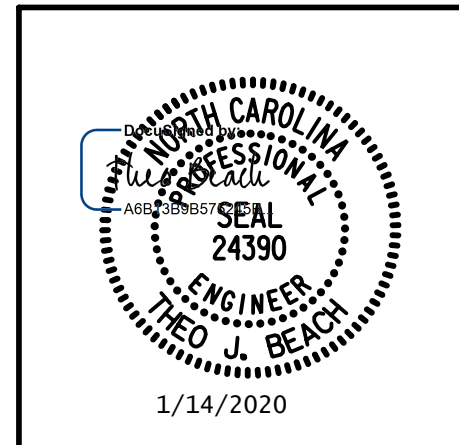
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE

**BENT 3**

LEFT WIDENING

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

TOTAL SHEETS: 89

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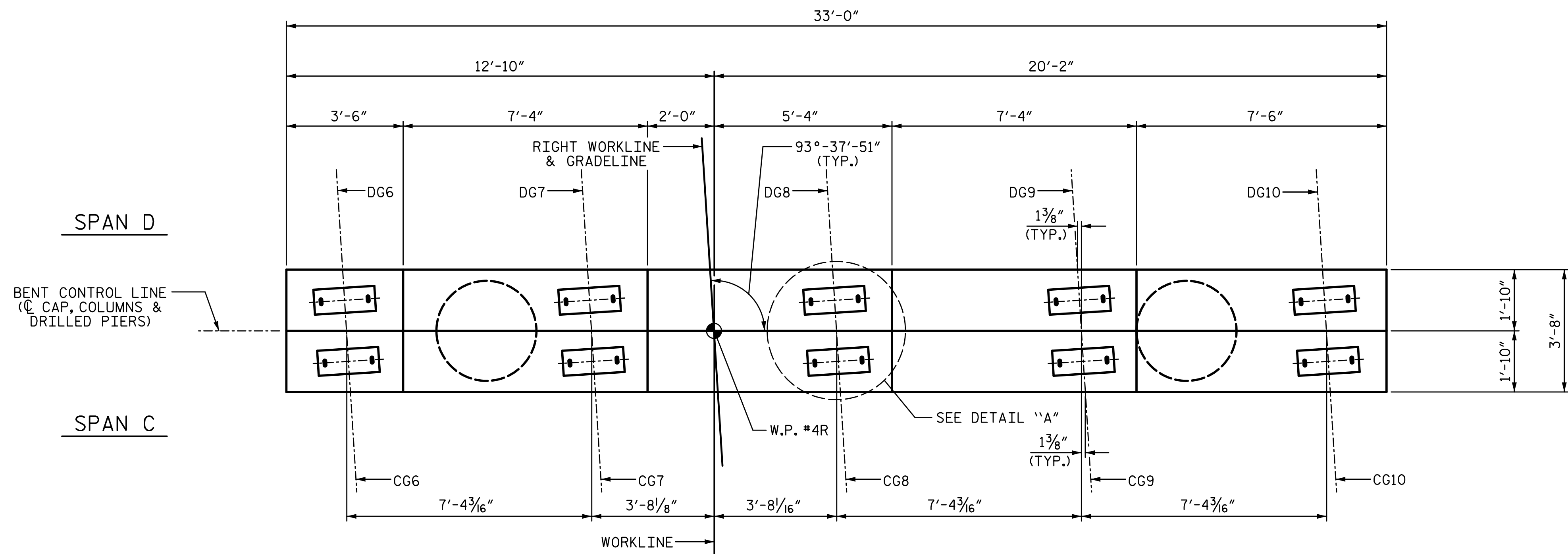
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CHECKED BY: T. BEACH DATE: 1-20  
DESIGN ENGINEER OF RECORD: T. BEACH DATE: 1-20

**ELEVATION**





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**NOTES:**

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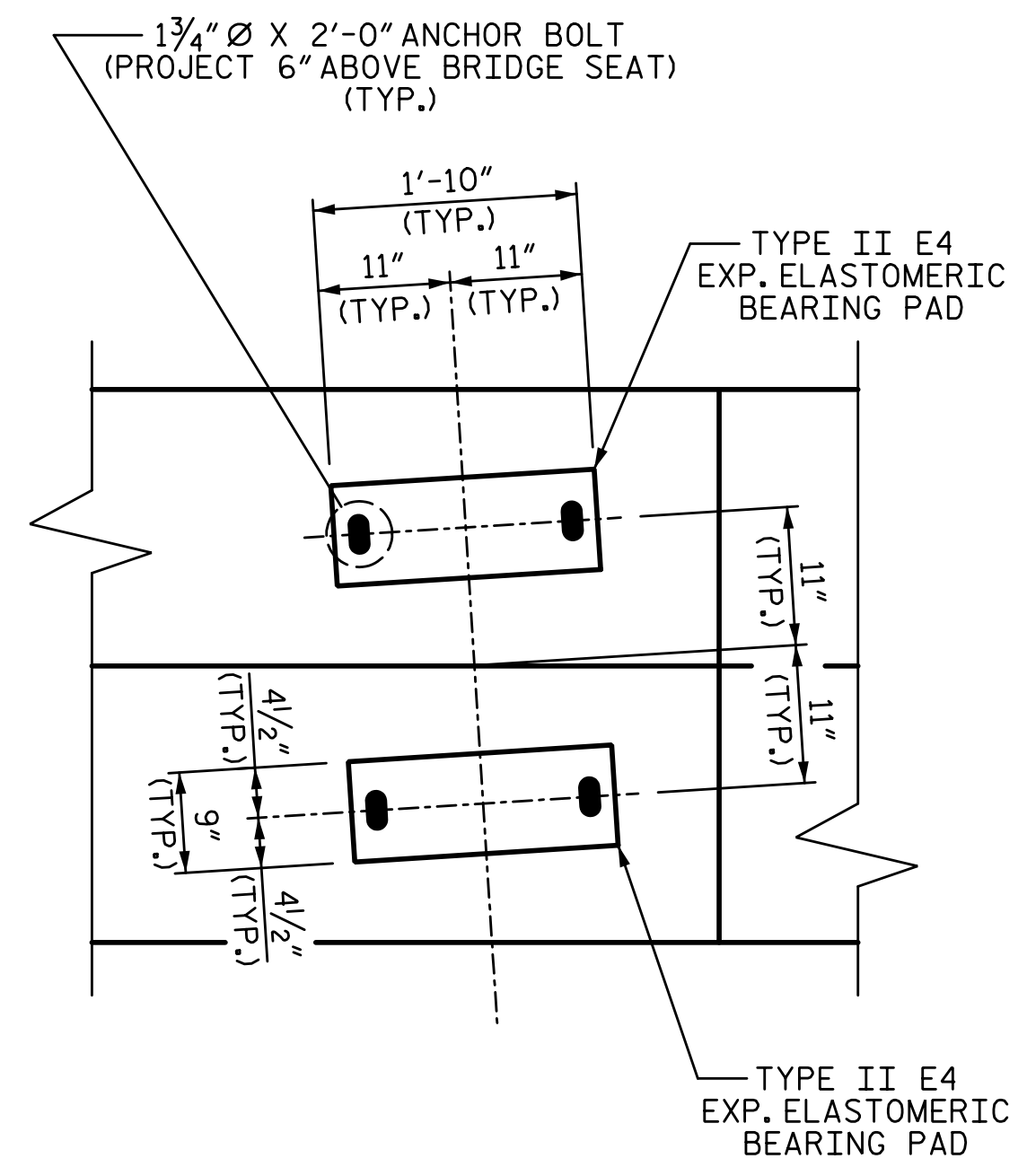
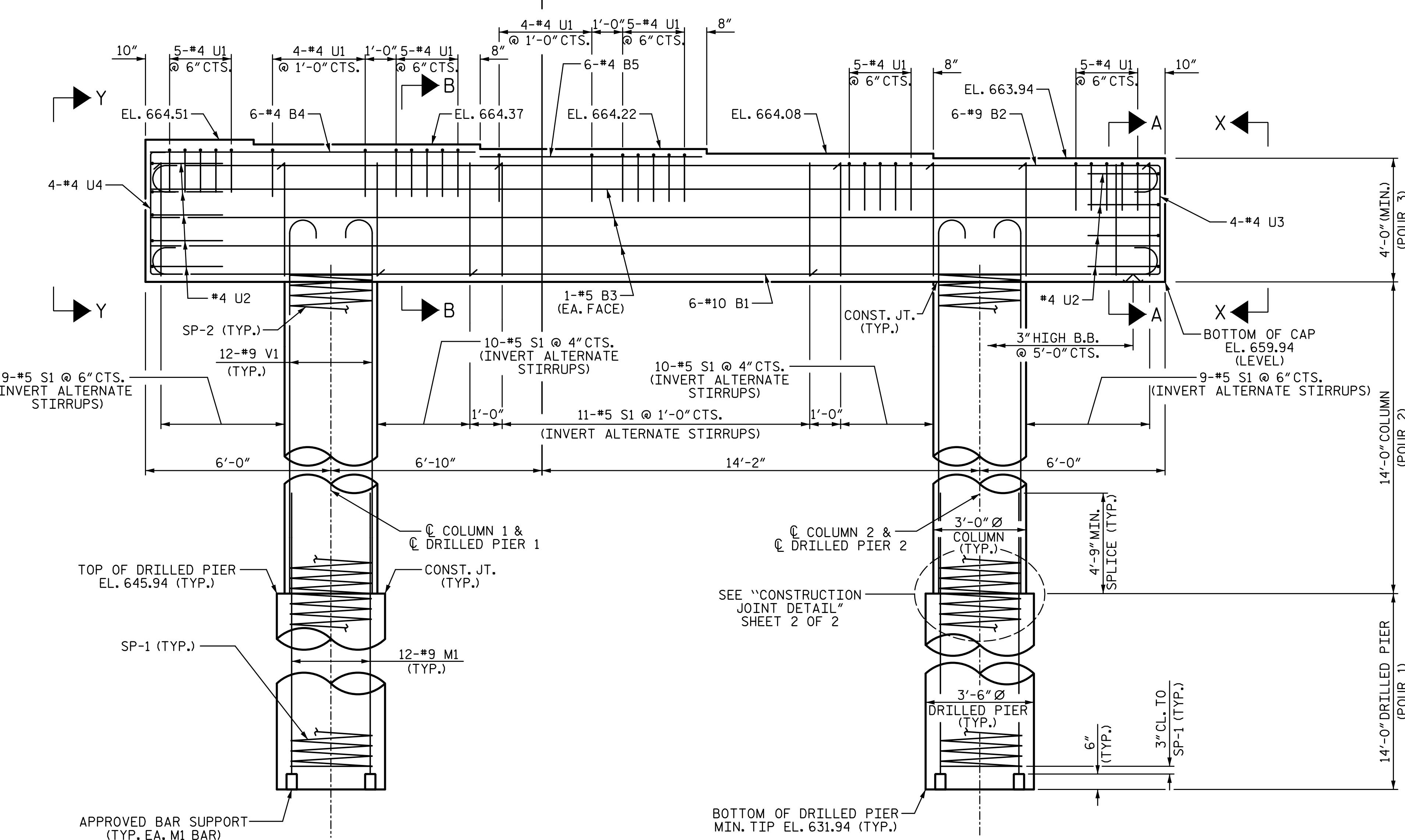
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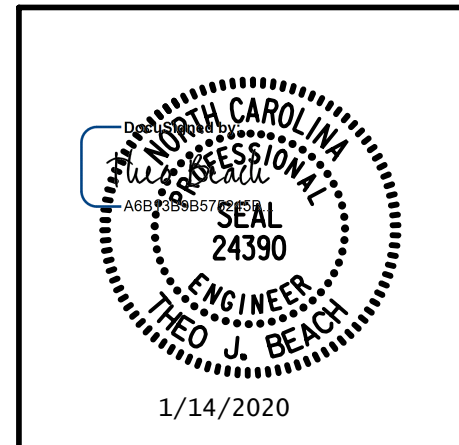


**DETAIL "A"**  
TYP. EA. BEARING

PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

SHEET 1 OF 2

PLANS PREPARED BY:  
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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE

**BENT 3**

**RIGHT WIDENING**

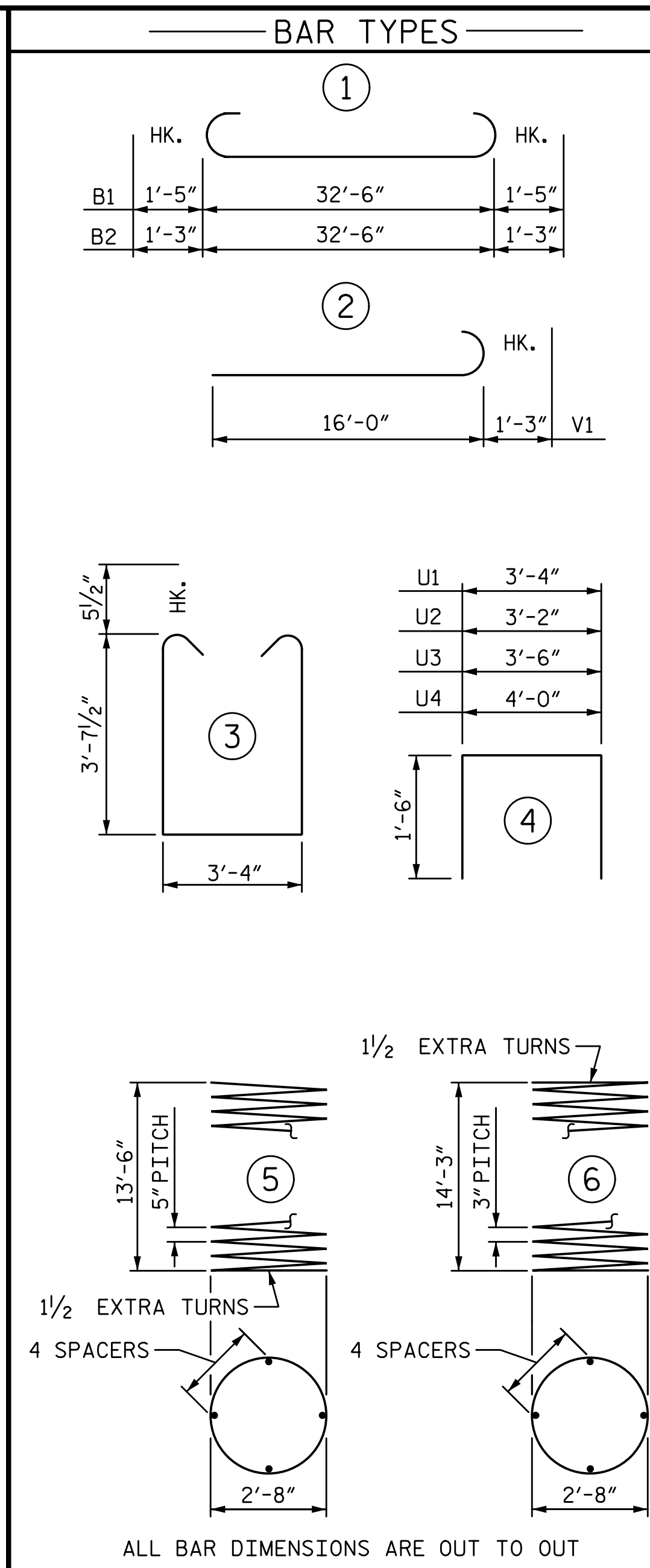
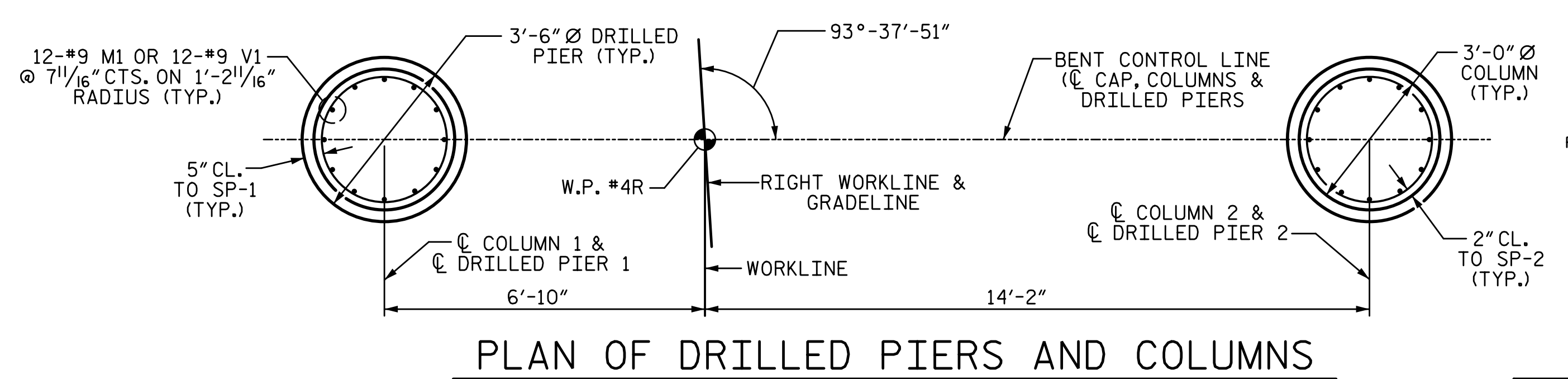
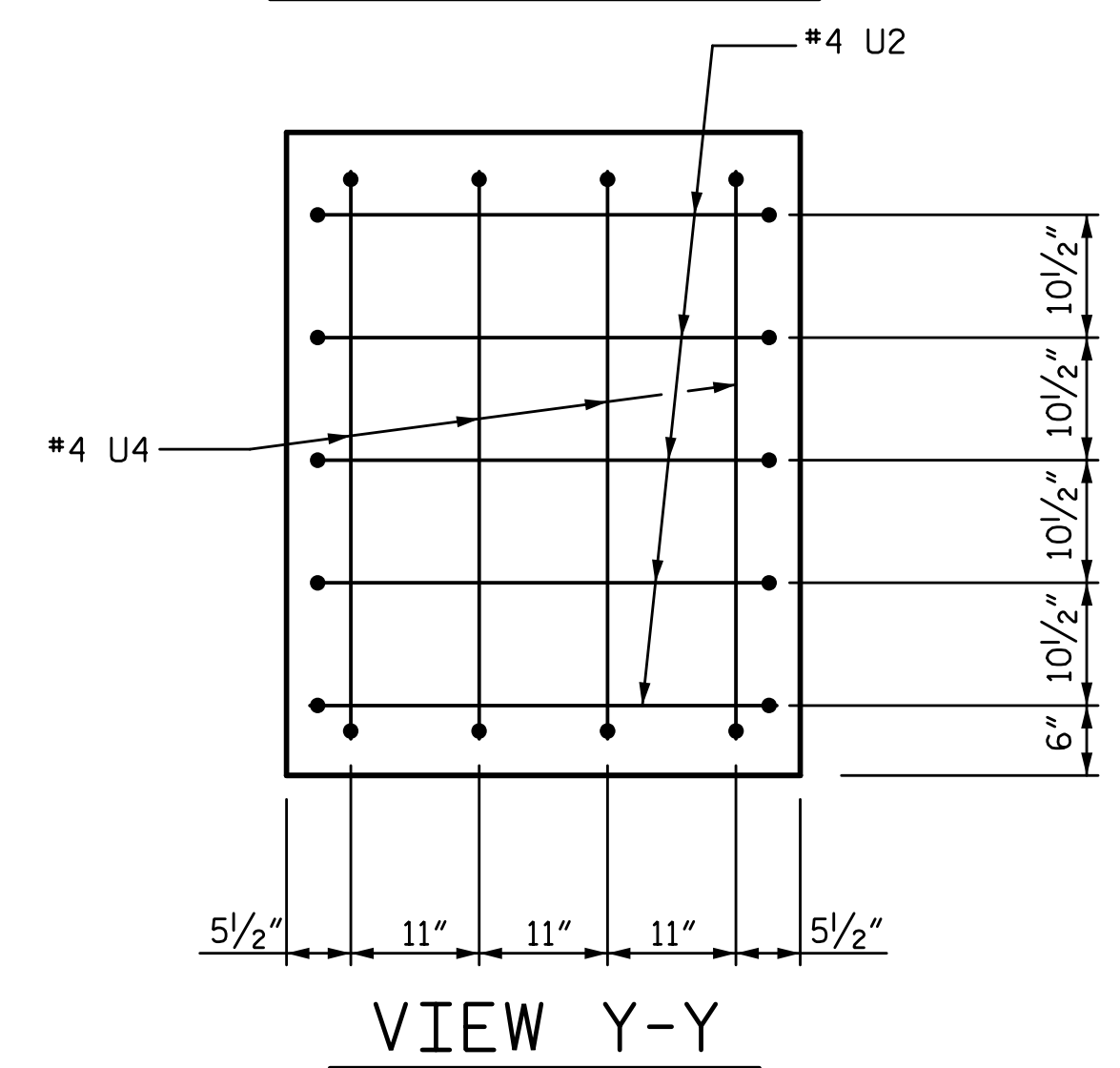
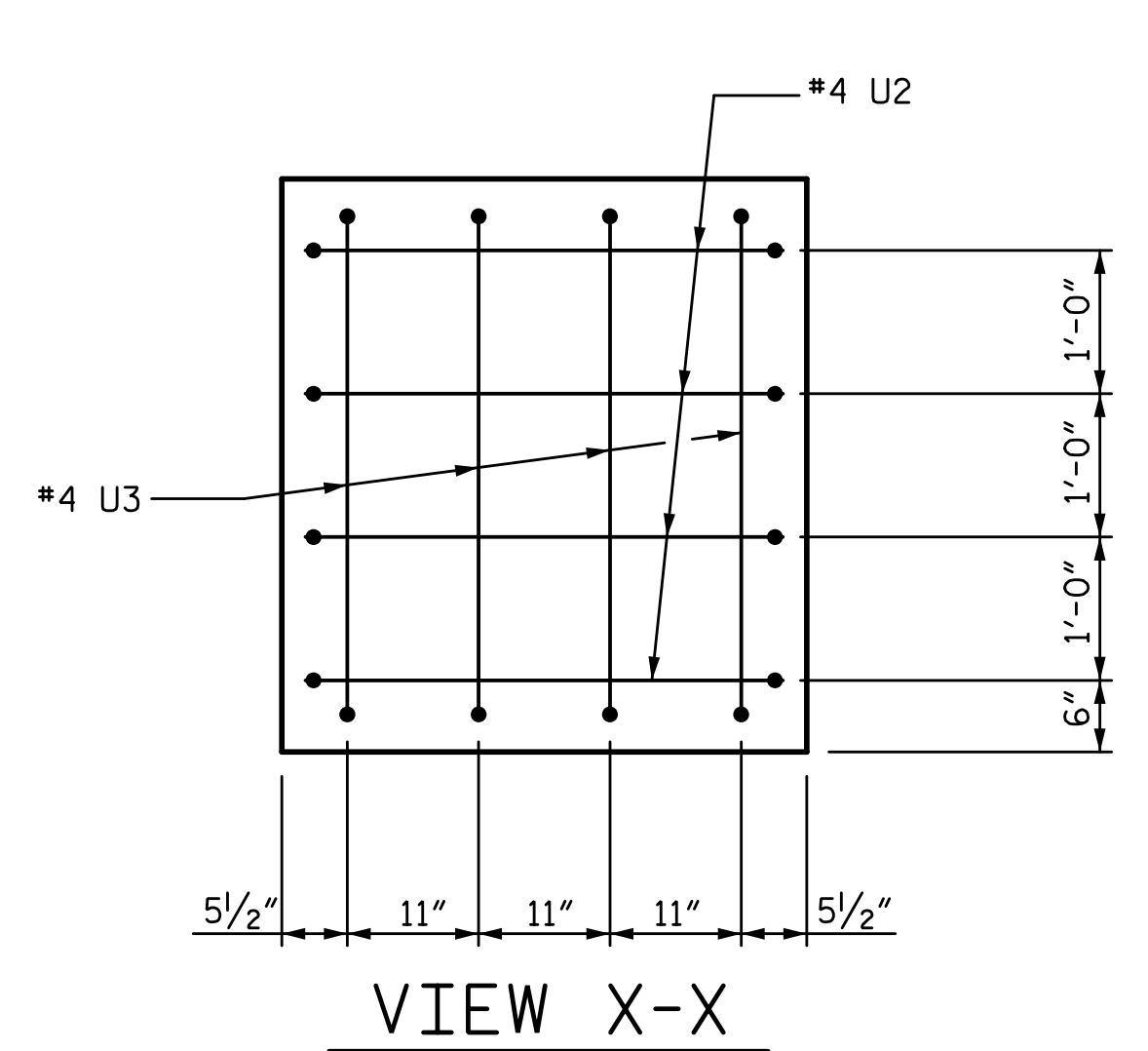
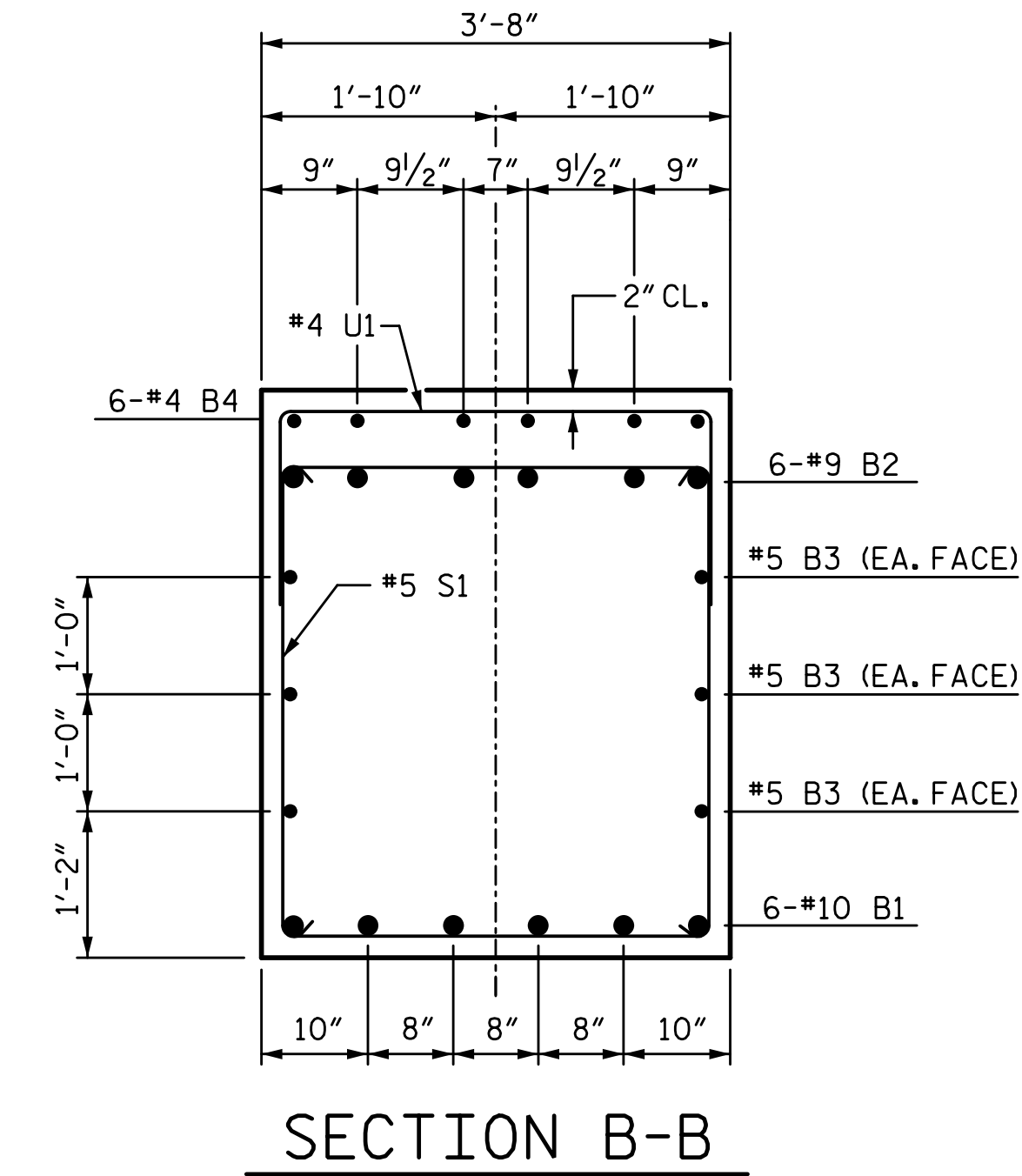
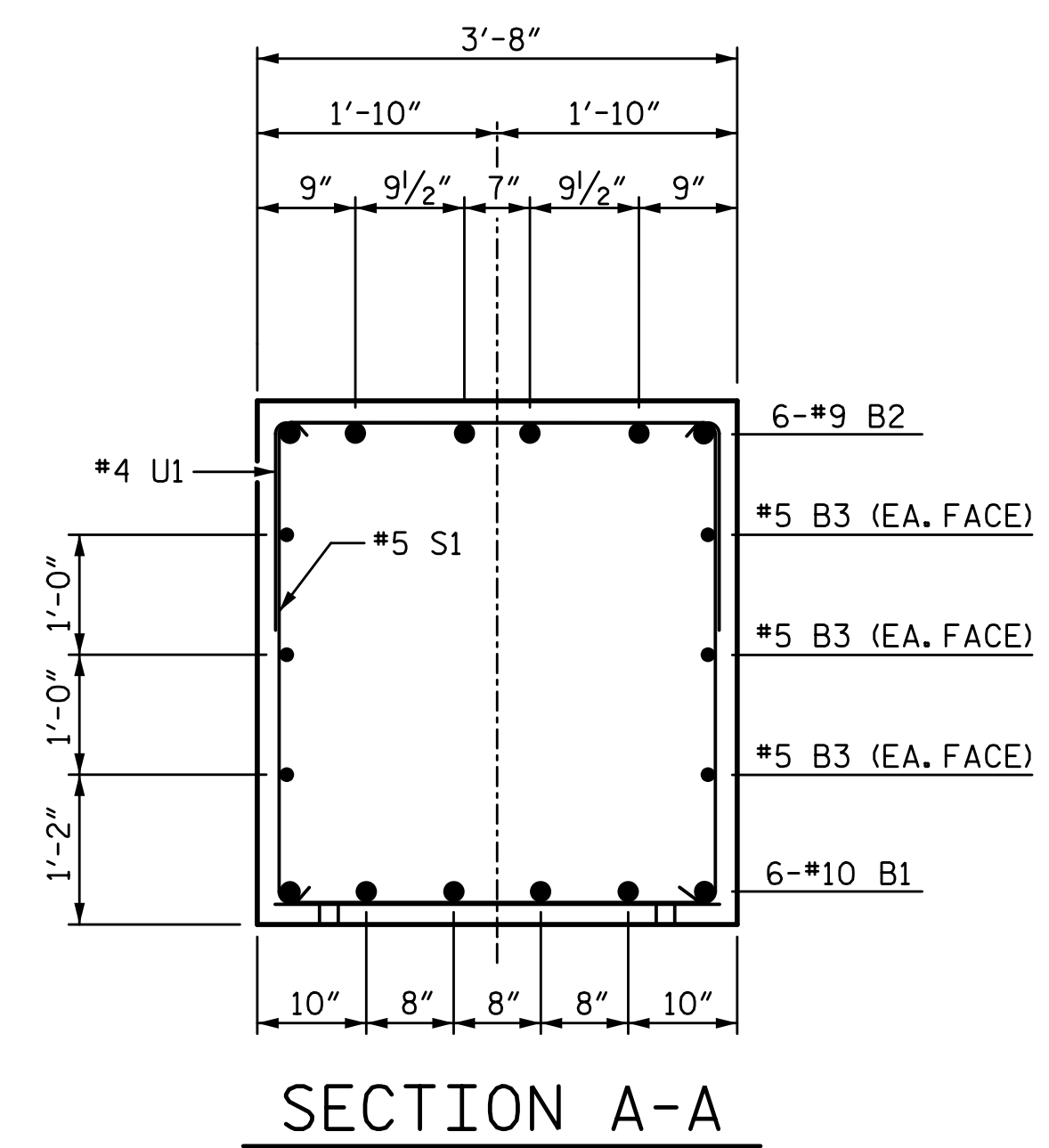
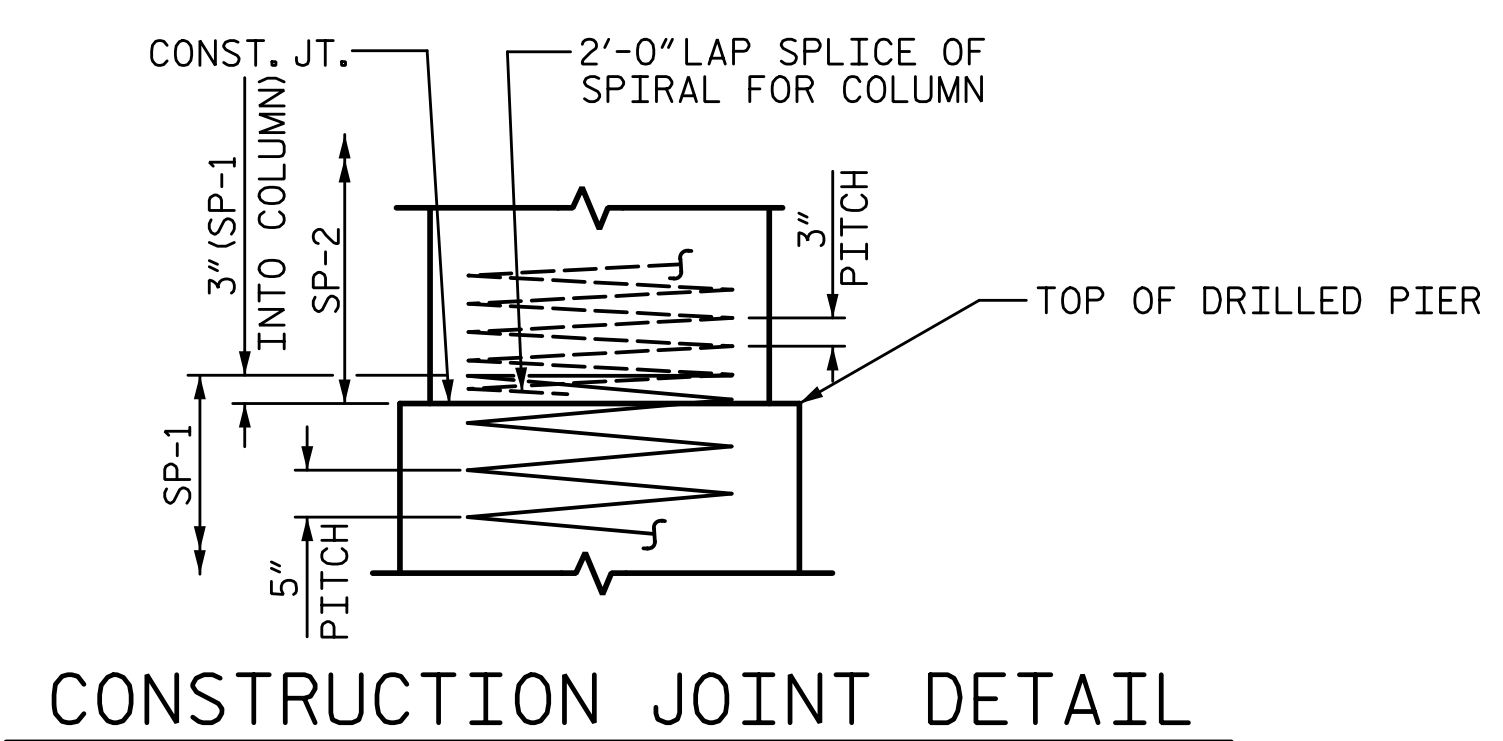
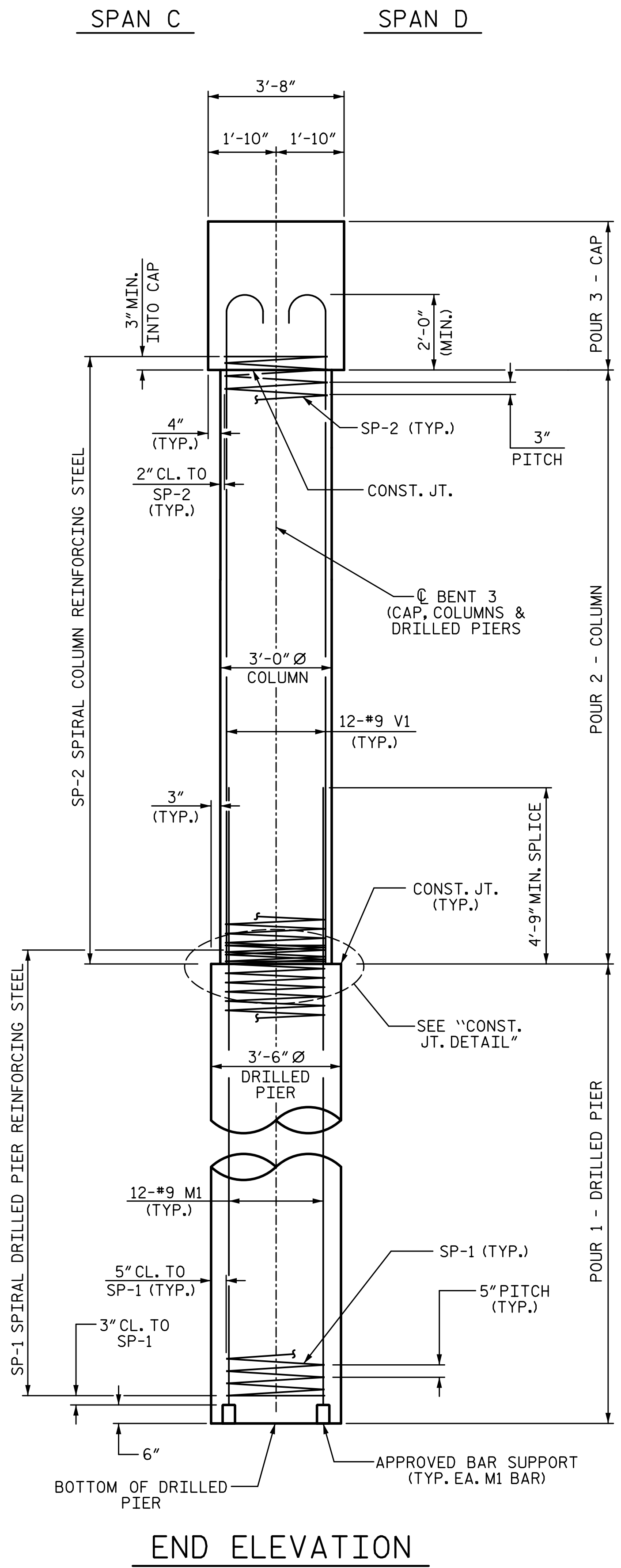
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 89

DRAWN BY: S.D. COOPER DATE: 1-20  
CHECKED BY: T. BEACH DATE: 1-20  
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BILL OF MATERIAL					
BENT 3					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	1	35'-4"	912
B2	6	#9	2	35'-0"	714
B3	6	#5	STR	32'-8"	204
B4	6	#4	STR	10'-6"	42
B5	6	#4	STR	7'-4"	29
M1	24	#9	STR	21'-3"	1734
S1	49	#5	3	11'-6"	588
U1	33	#4	4	6'-4"	140
U2	9	#4	4	6'-2"	37
U3	4	#4	4	6'-6"	17
U4	4	#4	4	7'-0"	19
V1	24	#9	2	17'-3"	1408
SP-1	2	**	5	279'-8"	583
SP-2	2	*	6	486'-10"	650
REINFORCING STEEL					5844 LB
SPIRAL COL. REINF. STEEL					1233 LB
CLASS "A" CONCRETE BREAKDOWN					
POUR 2 (COLUMNS)					7.4 CY
POUR 3 (CAP)					19.0 CY
TOTAL					26.4 CY
DRILLED PIERS:					
DRILLED PIER CONCRETE					
POUR 1 (DRILLED PIERS)					10.0 CY
3'-6" Ø DRILLED PIER NOT IN SOIL					26 LF
3'-6" Ø DRILLED PIER IN SOIL					2 LF
CSL TUBES					124 LF

\* THE "SP-1" SPIRAL REINFORCING STEEL SHALL BE W21 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

\* THE "SP-2" SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

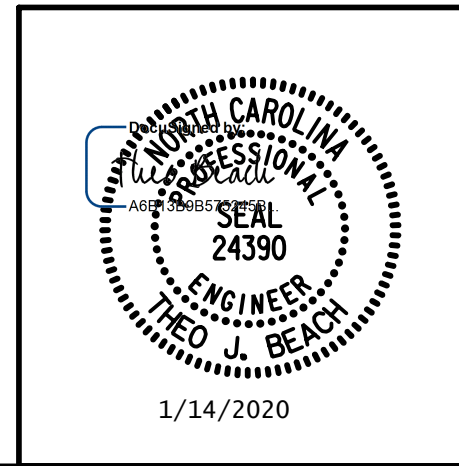
**BENT 3**

**RIGHT WIDENING**

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

SHEET NO. S-59  
 TOTAL SHEETS 89

PLANS PREPARED BY:  
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 (919) 852-0538 (Fax)  
 www.simpsonengr.com  
 LICENSURE NO. C-2521



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 CHECKED BY: T. BEACH      DATE: 1-20  
 DESIGN ENGINEER OF RECORD: T. BEACH      DATE: 1-20

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SPLICE CHART	
#4 B3 SPLICE LENGTH = 2'-5"	
#4 K1 SPLICE LENGTH = 2'-5"	

**NOTES:**

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

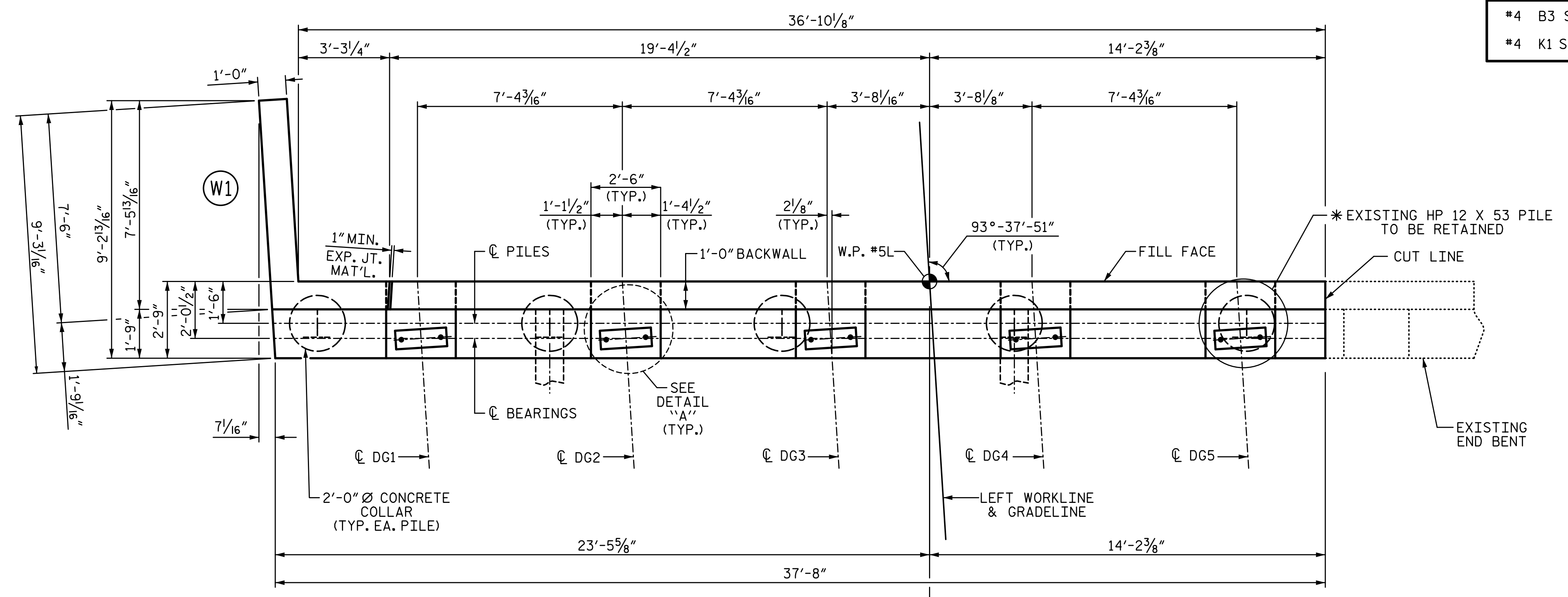
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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%.

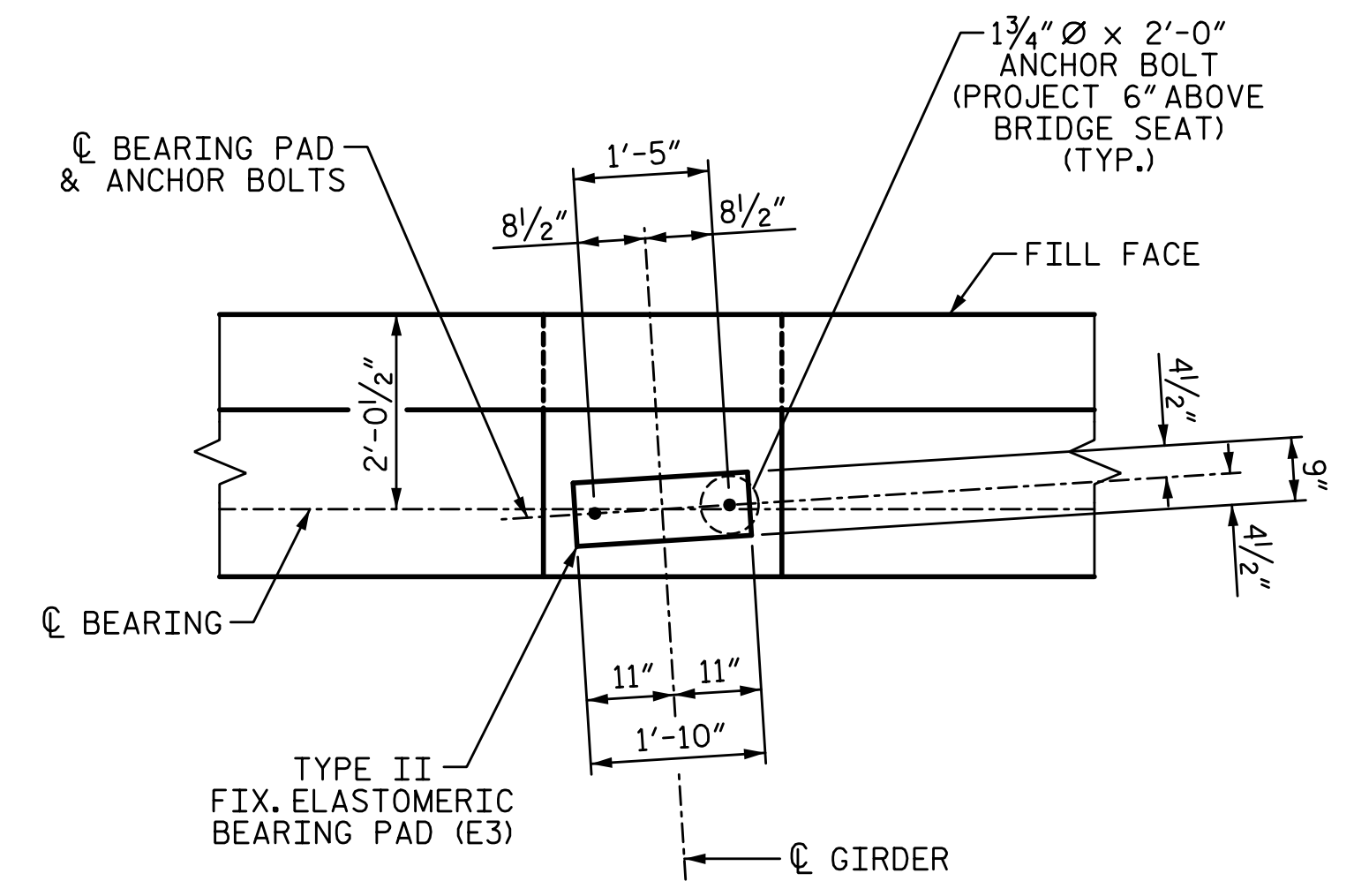
SEE GENERAL DRAWING "FOUNDATION LAYOUT" FOR ADDITIONAL NOTES FOR DRIVING PILES.

\* THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE EXISTING EXTERIOR PILE AND THE EXISTING "B" AND "K" BARS REINFORCING STEEL SHALL BE RETAINED PAST THE PROPOSED CUT LINE AND WILL BECOME PART OF THE WIDENED END BENT. THE EXISTING REINFORCING STEEL MAY BE BENT AS REQUIRED FOR FITTING AND TYING TO THE NEW REINFORCING STEEL.

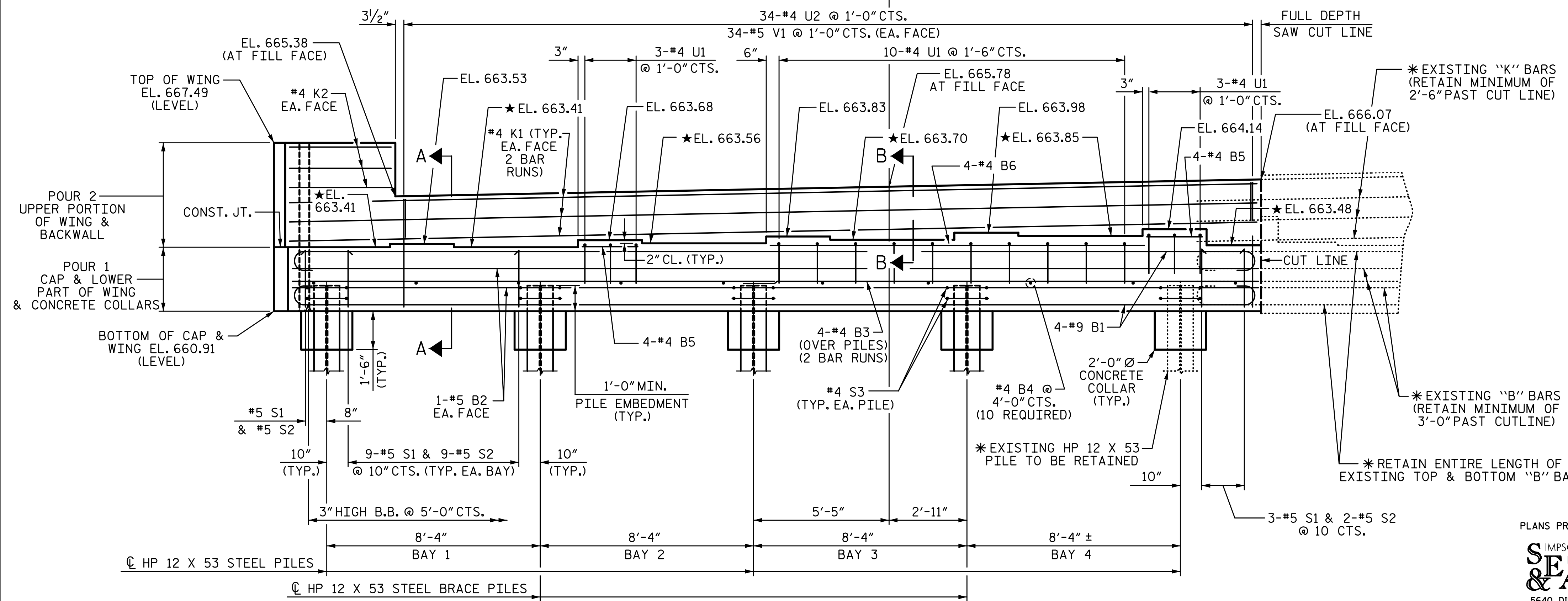
\* FOR LOCATIONS BETWEEN BRIDGE SEATS BUILD-UPS, SEE SECTION A-A ON SHEET 3 OF 3.



**PLAN**



**DETAIL "A"**  
TYP. EA. GIRDER



**ELEVATION**

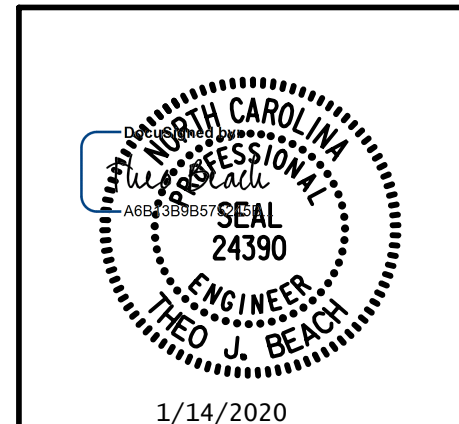
PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**END BENT 2**

**LEFT WIDENING**



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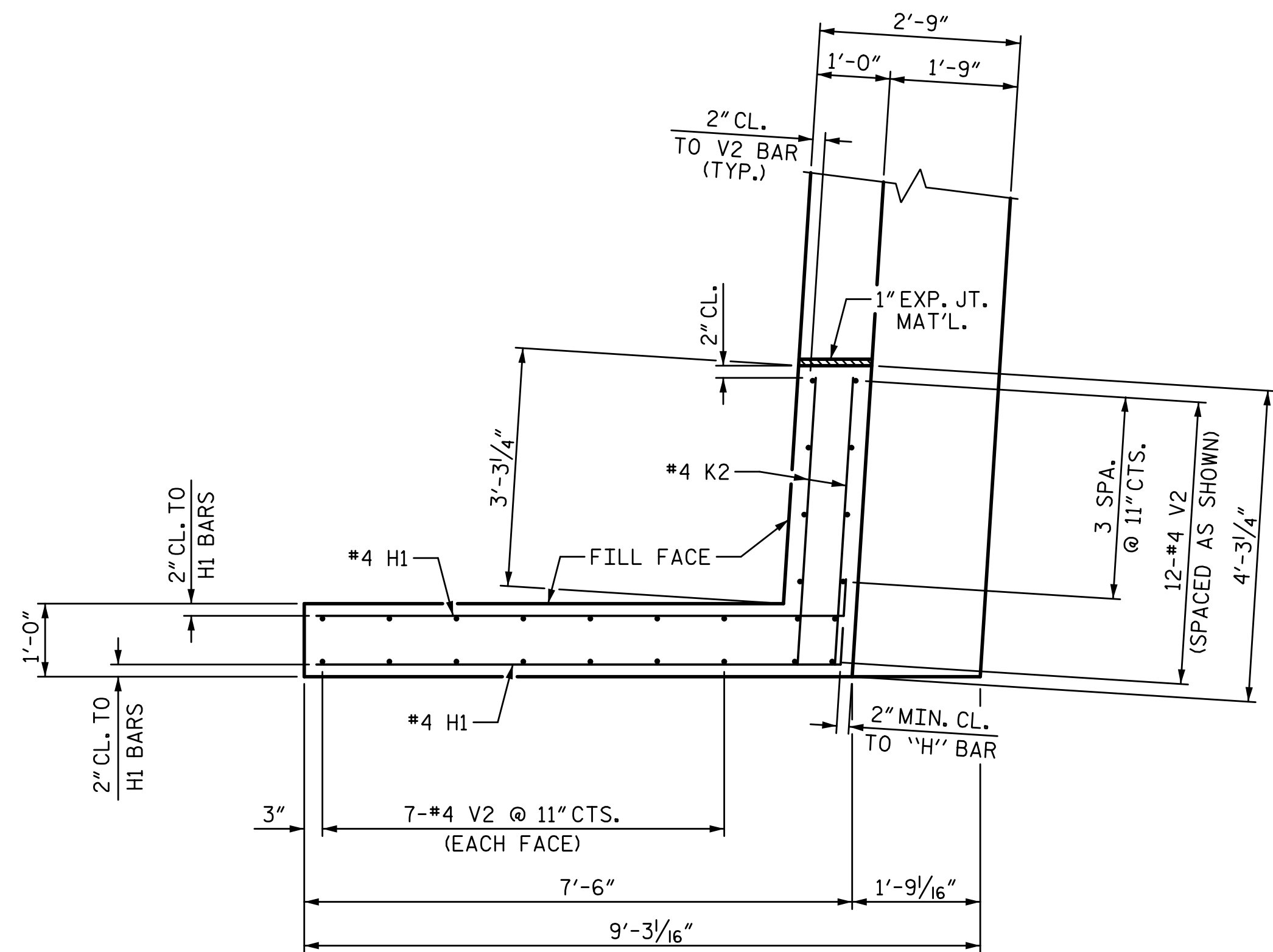
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-60
1			3			TOTAL SHEETS
2			4			89

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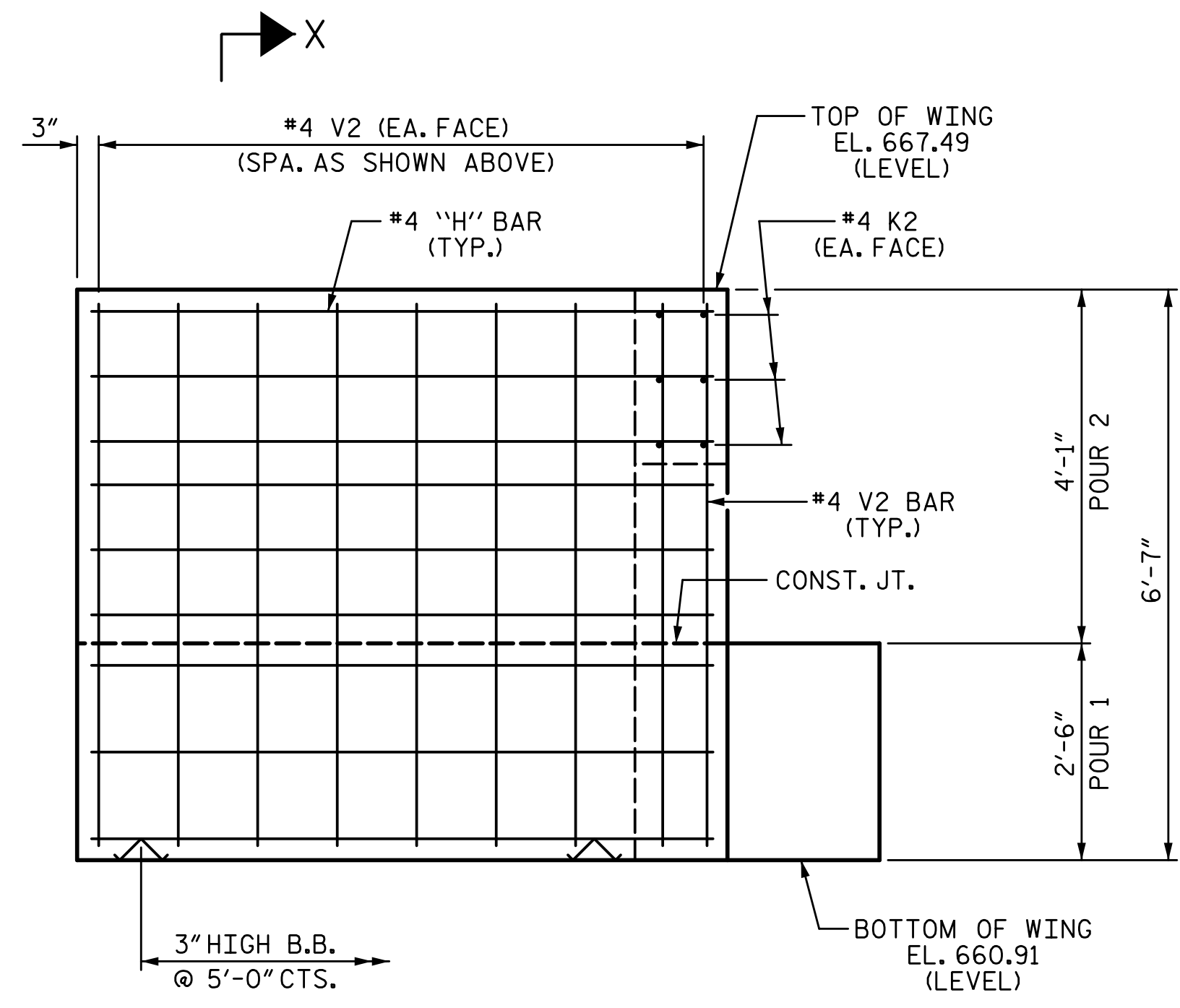
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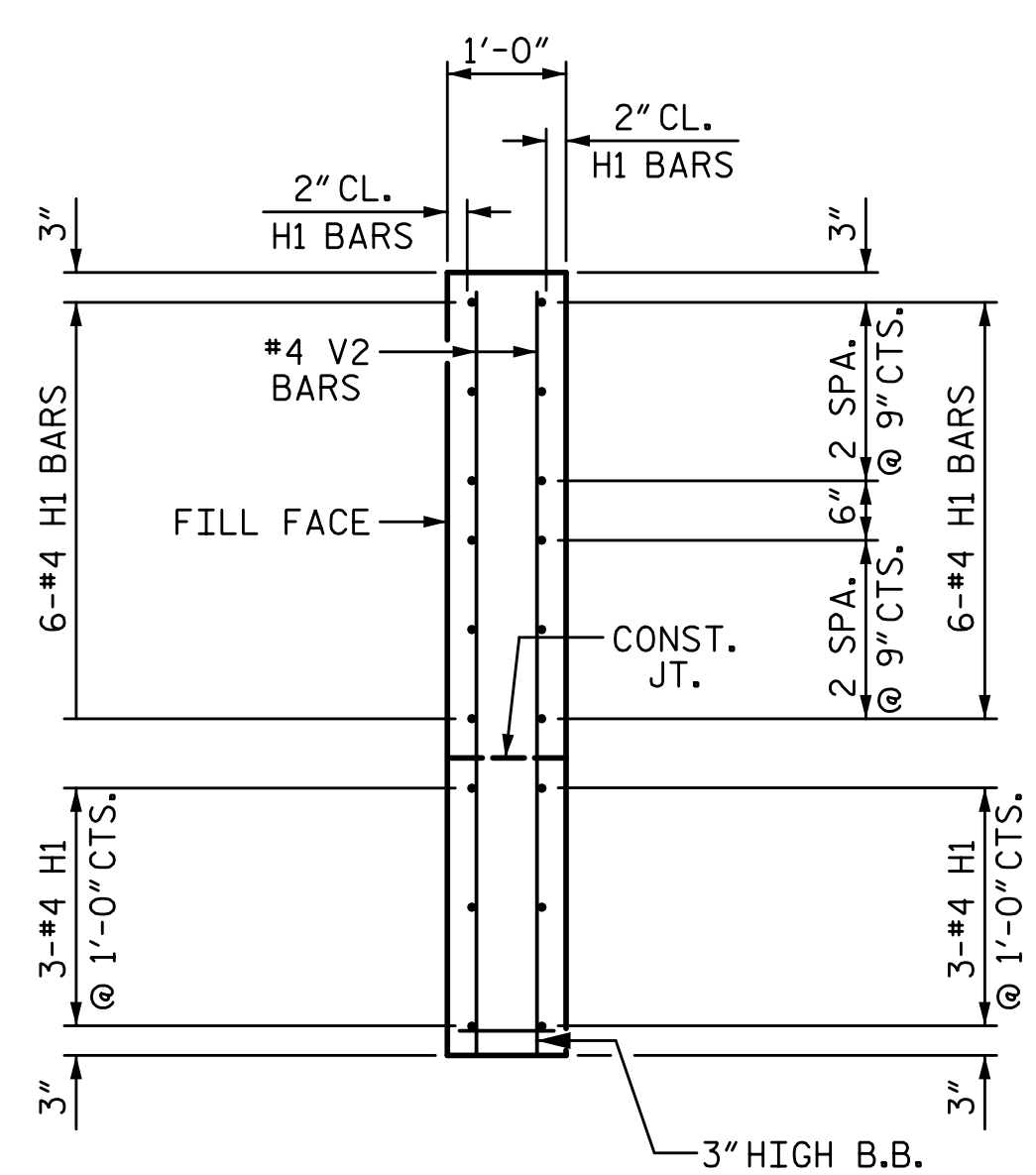
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PLAN OF WING (W1)



ELEVATION OF WING (W1)



SECTION X-X

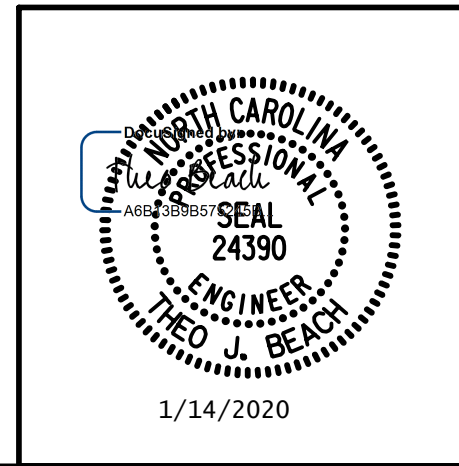
PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE

END BENT 2  
LEFT WIDENING

PLANS PREPARED BY:  
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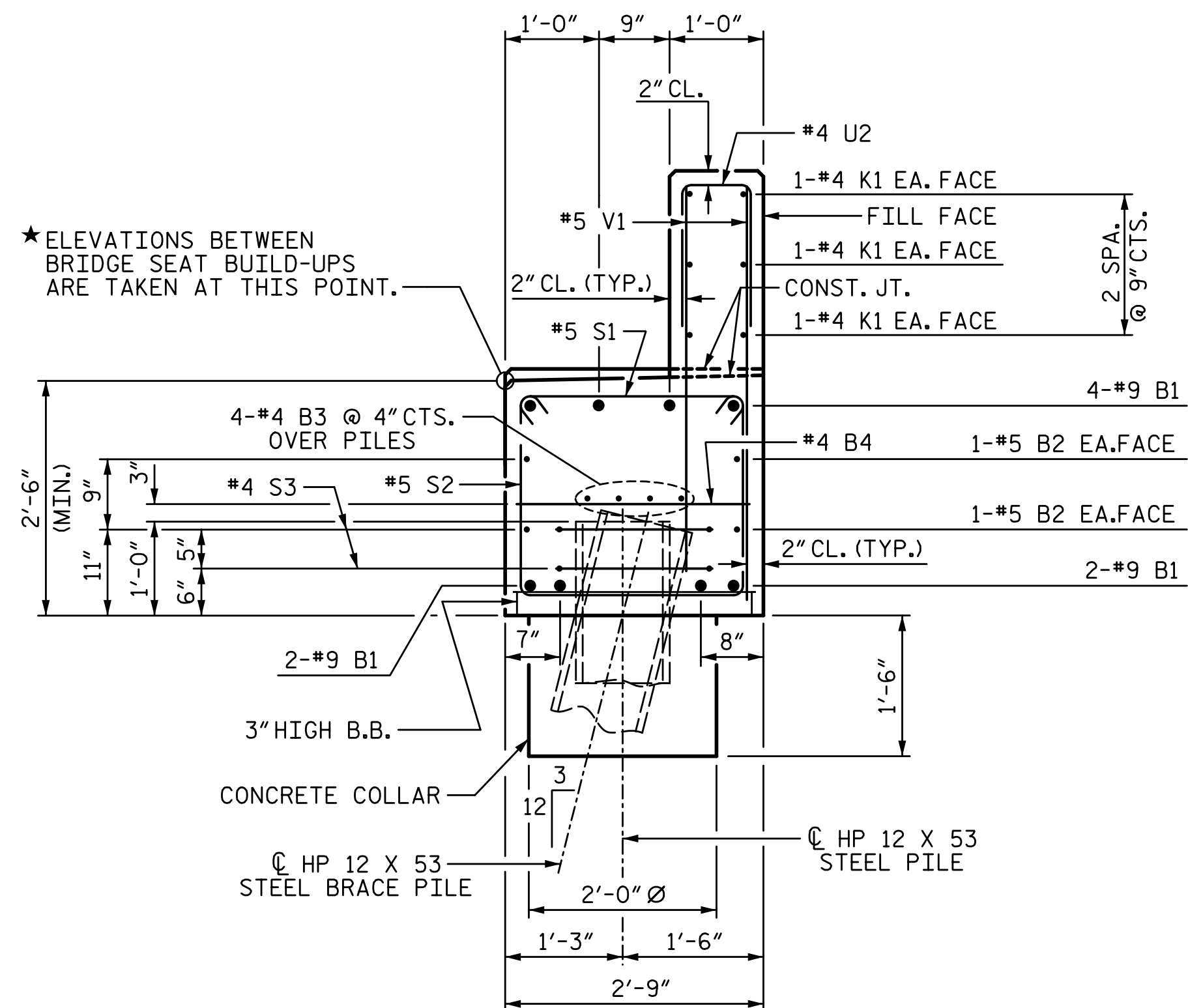
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-61
1			3			TOTAL SHEETS
2			4			89

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CHECKED BY: T. BEACH	DATE: 1-20
DESIGN ENGINEER OF RECORD: T. BEACH	DATE: 1-20

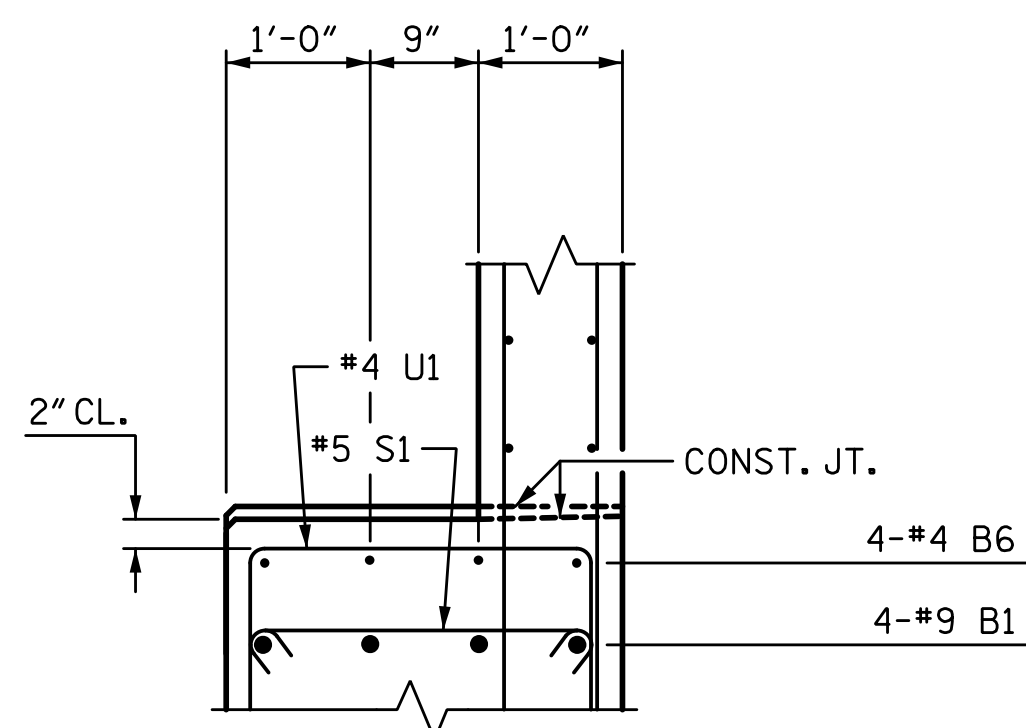
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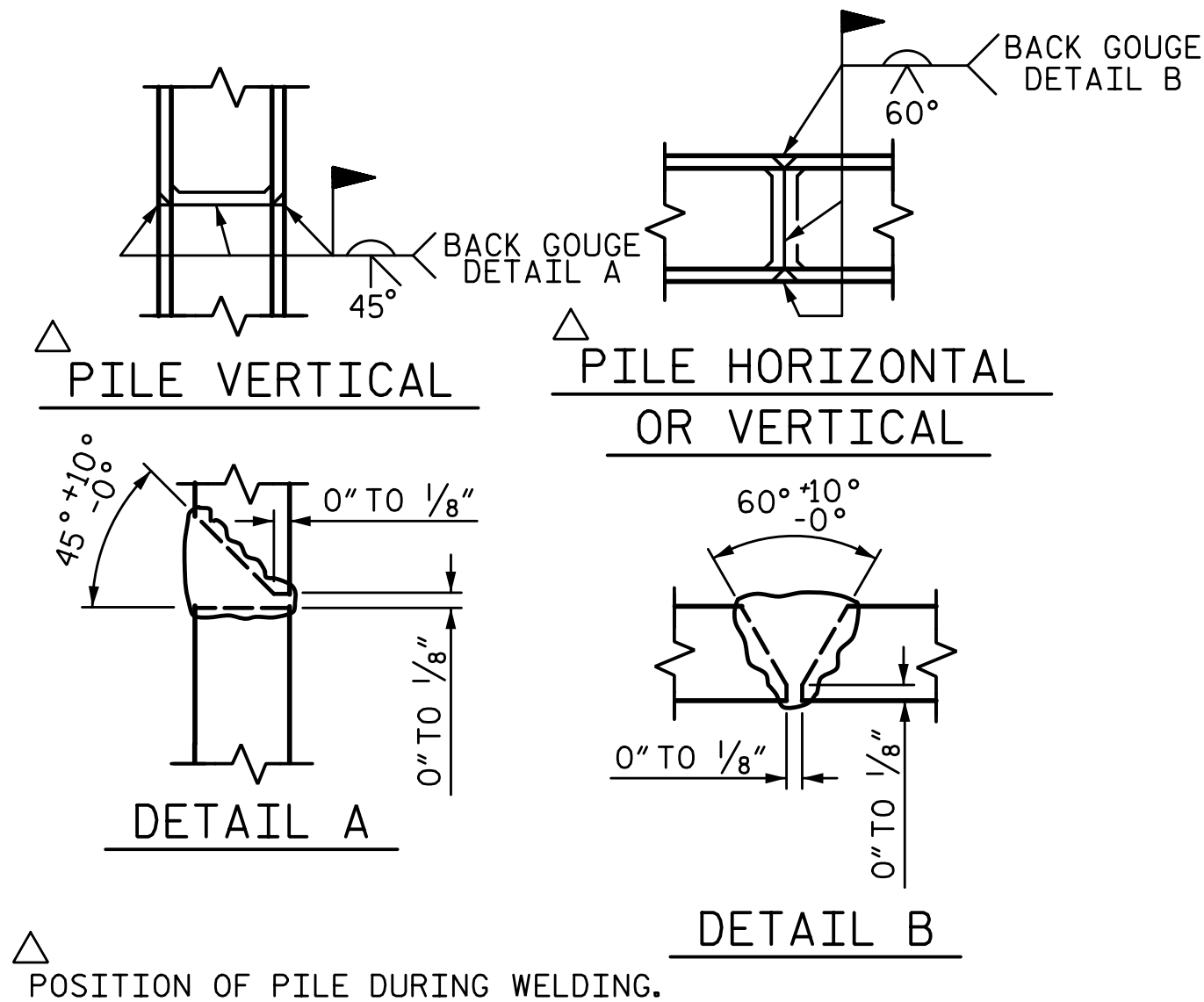
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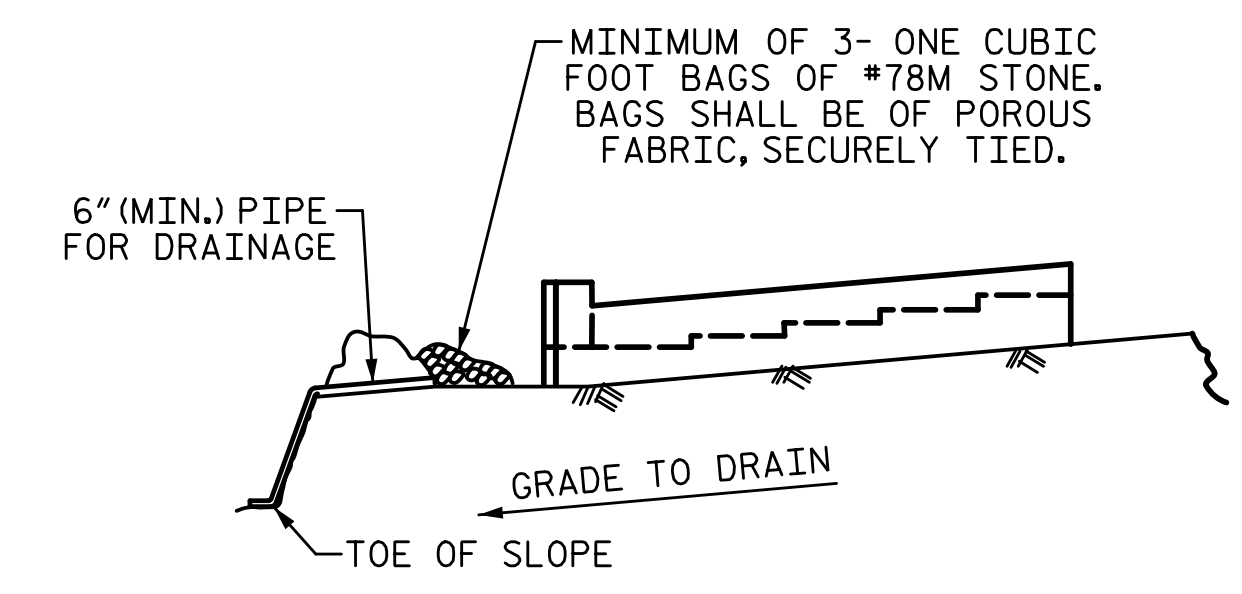
SECTION A-A



SECTION B-B



PILE SPLICE DETAILS

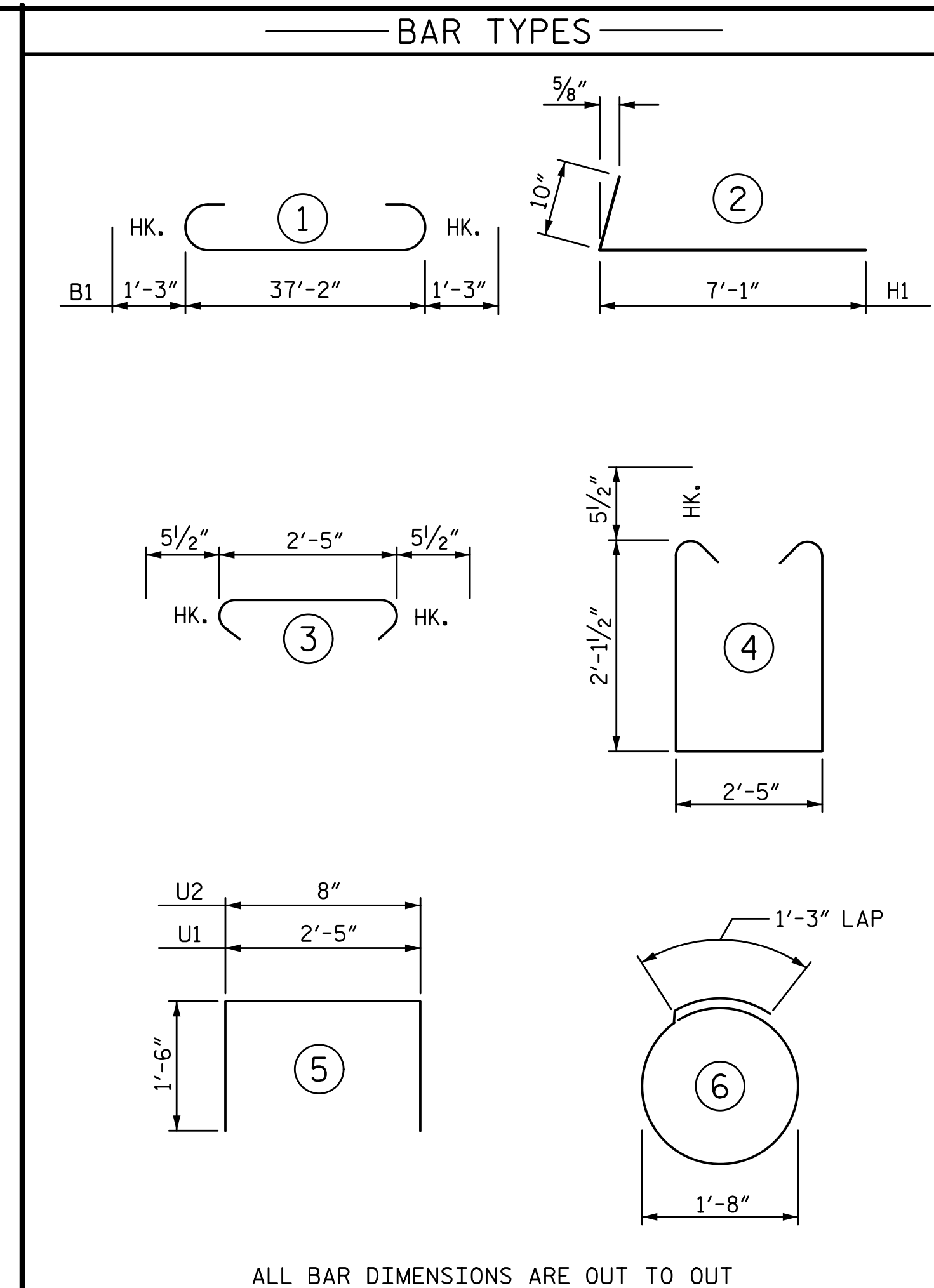


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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TEMPORARY DRAINAGE AT END BENT

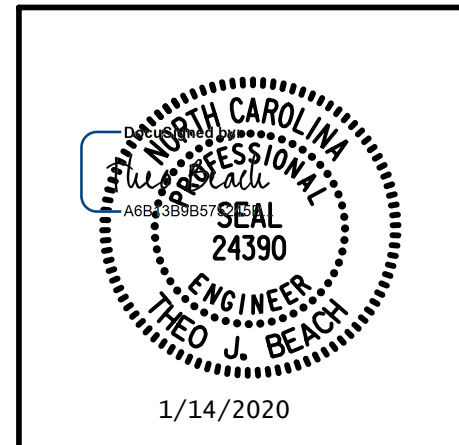


ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	39'-8"	1079
B2	4	#5	STR	37'-4"	156
B3	8	#4	STR	19'-11"	106
B4	10	#4	STR	2'-5"	16
B5	8	#4	STR	2'-2"	12
B6	4	#4	STR	14'-6"	39
H1	18	#4	2	7'-11"	95
K1	12	#4	STR	19'-11"	160
K2	6	#4	STR	3'-10"	15
S1	40	#5	3	3'-4"	139
S2	40	#5	4	7'-7"	316
S3	10	#4	6	6'-6"	43
U1	16	#4	5	5'-5"	58
U2	34	#4	5	3'-8"	83
V1	68	#5	STR	4'-1"	290
V2	26	#4	STR	6'-2"	107
TOTAL REINFORCING STEEL					2714 LB
CLASS A CONCRETE					
POUR 1 (CAP, COLLARS & LOWER WING)				12.0 CY	
POUR 2 (BACKWALL & UPPER WING)				4.1 CY	
TOTAL CLASS A CONCRETE				16.1 CY	
HP 12 X 53 STEEL PILES					
NO. 4				80 LF	
STEEL PILE POINTS				4 EA.	
PILE DRIVING EQUIPMENT					
SETUP FOR HP 12 X 53 STEEL PILES				NO. 4	

DRAWN BY: S.D. COOPER DATE: 1-20  
 CHECKED BY: T. BEACH DATE: 1-20  
 DESIGN ENGINEER OF RECORD: T. BEACH DATE: 1-20

PLANS PREPARED BY:  
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 LICENSURE NO. C-2521



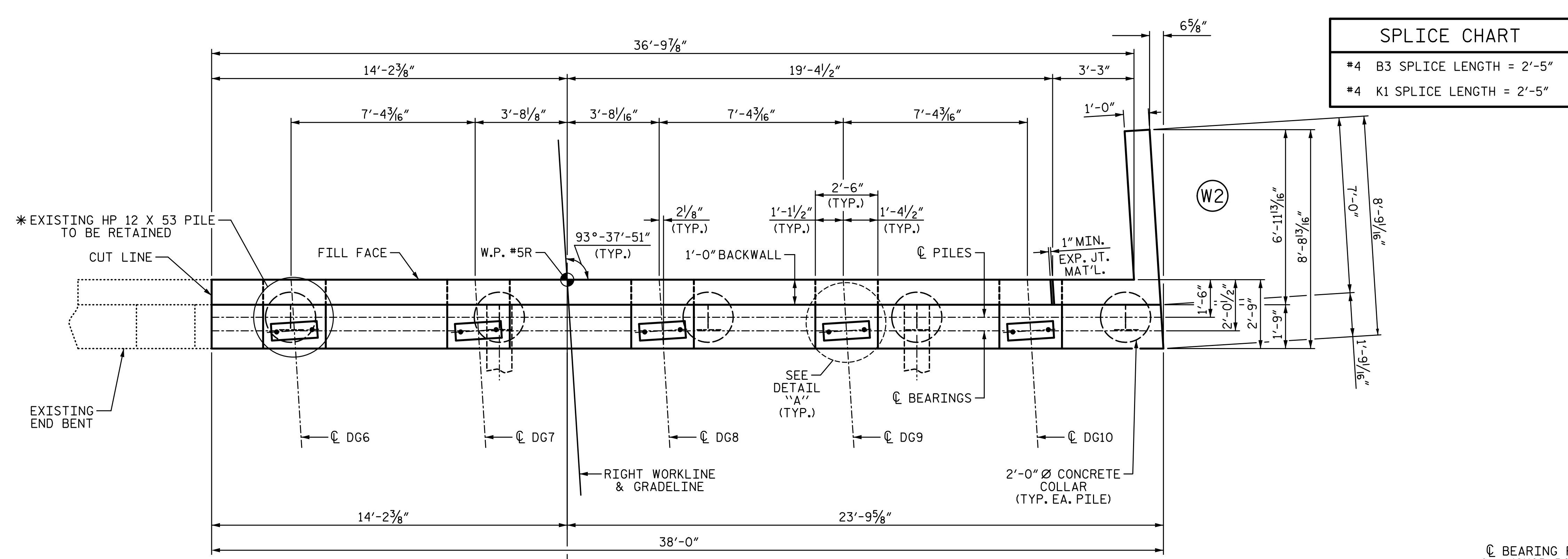
PROJECT NO. I-5711  
 ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUBSTRUCTURE					
END BENT 2					
LEFT WIDENING					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-62
					TOTAL SHEETS 89

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**NOTES:**

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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.

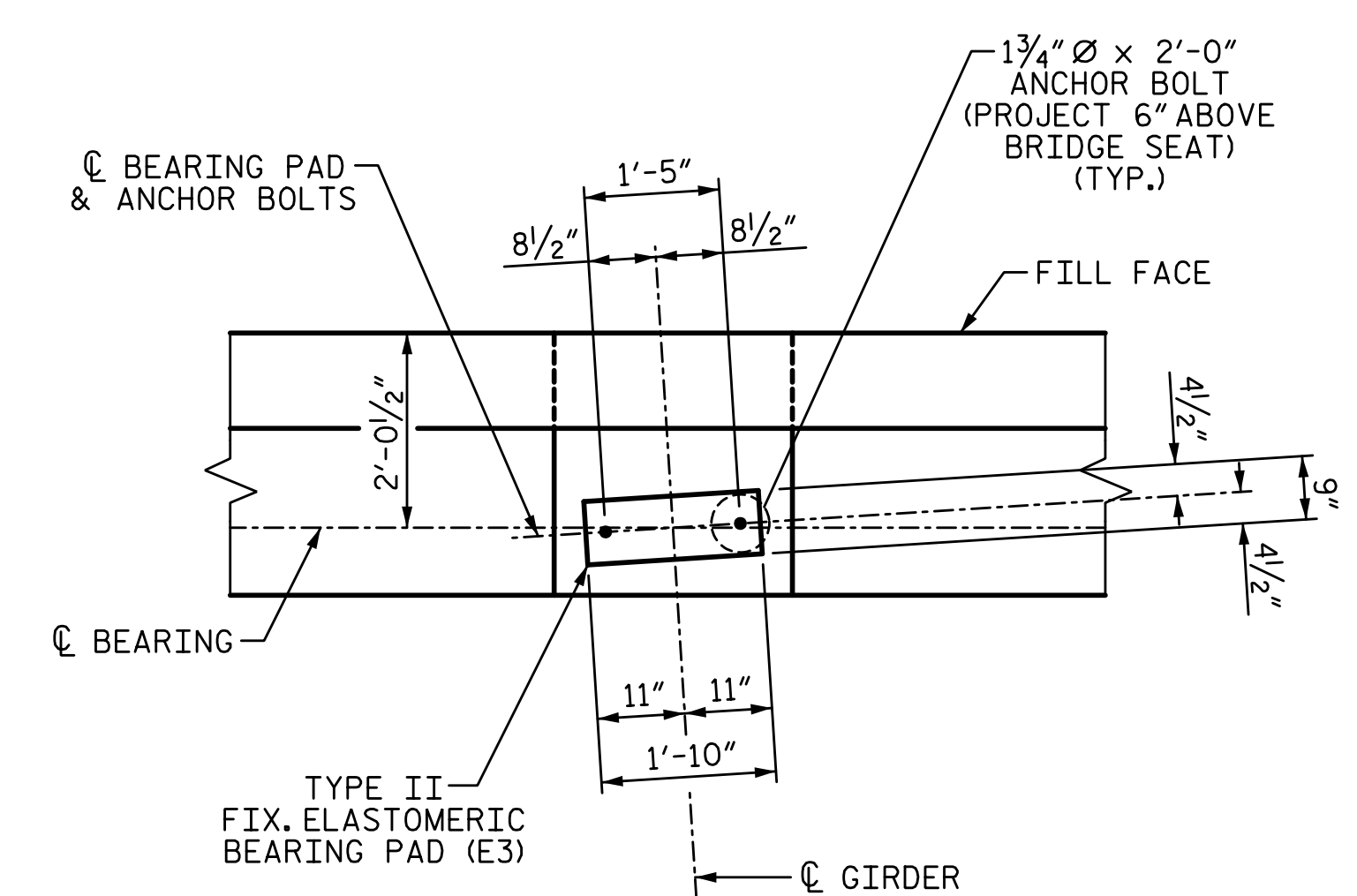
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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

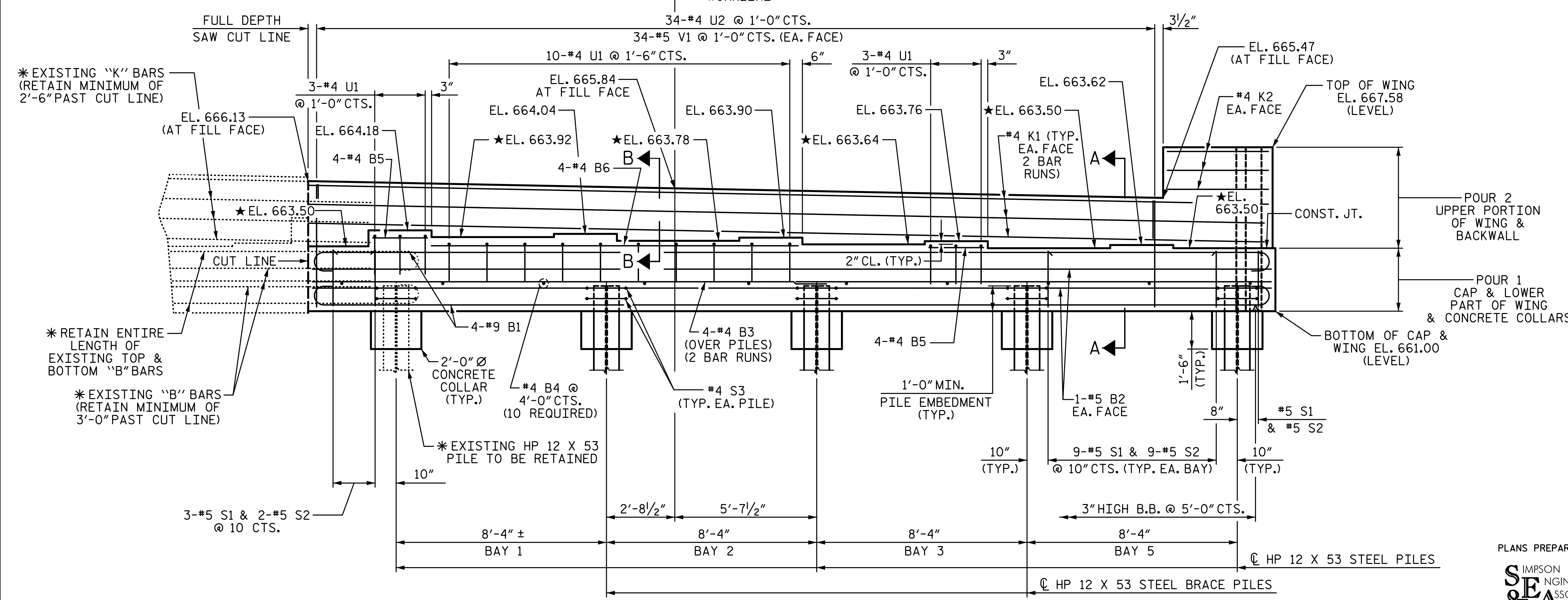
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\* FOR LOCATIONS BETWEEN BRIDGE SEATS BUILD-UPS, SEE SECTION A-A ON SHEET 3 OF 3.

**PLAN**



**DETAIL "A"**  
TYP. EA. GIRDER



**ELEVATION**

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

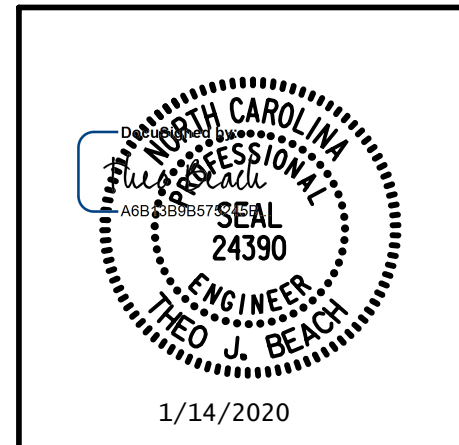
**END BENT 2**

**RIGHT WIDENING**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-63
1			3			TOTAL SHEETS
2			4			89

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 DESIGN ENGINEER OF RECORD: T. BEACH DATE: 1-20

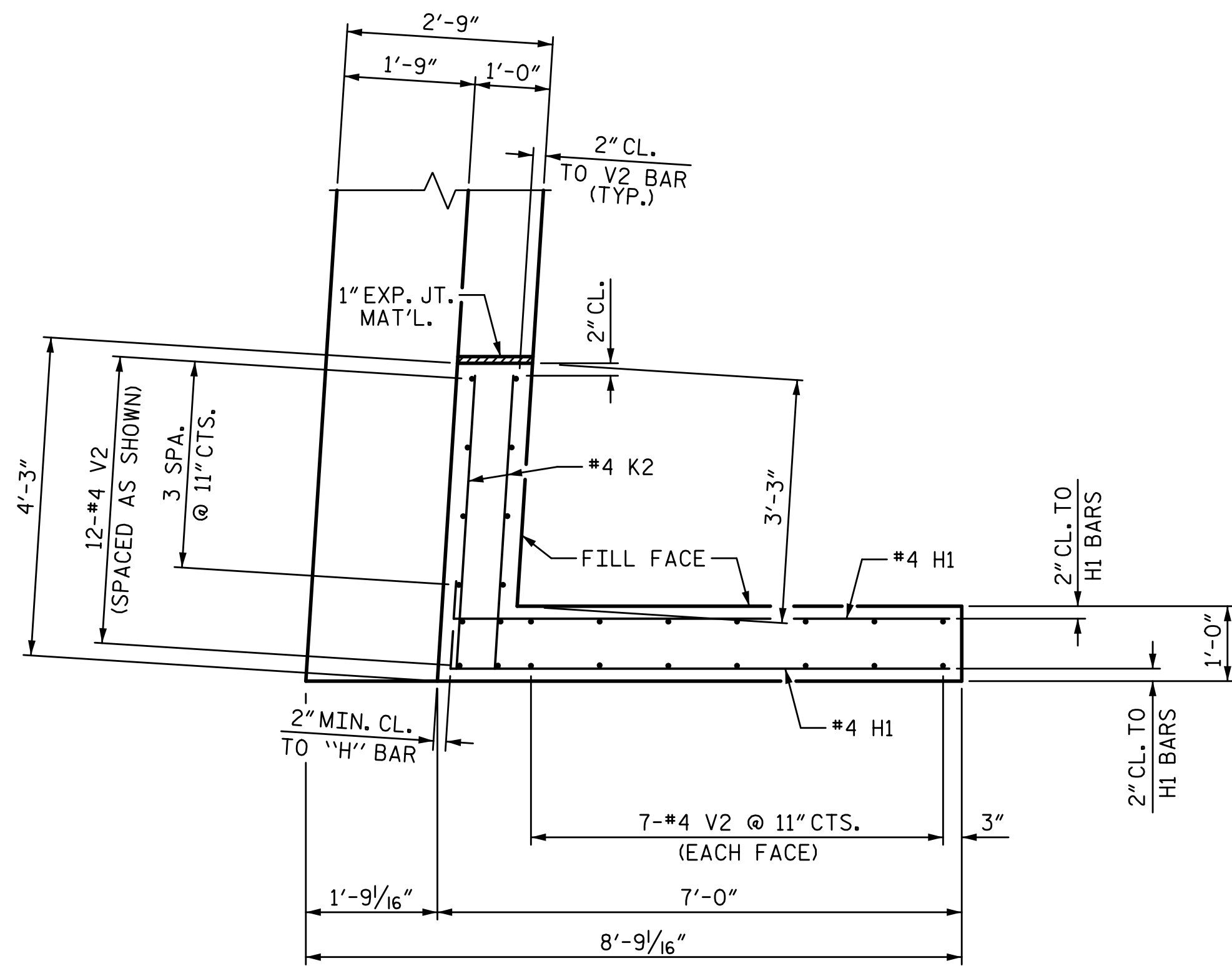
PLANS PREPARED BY:  
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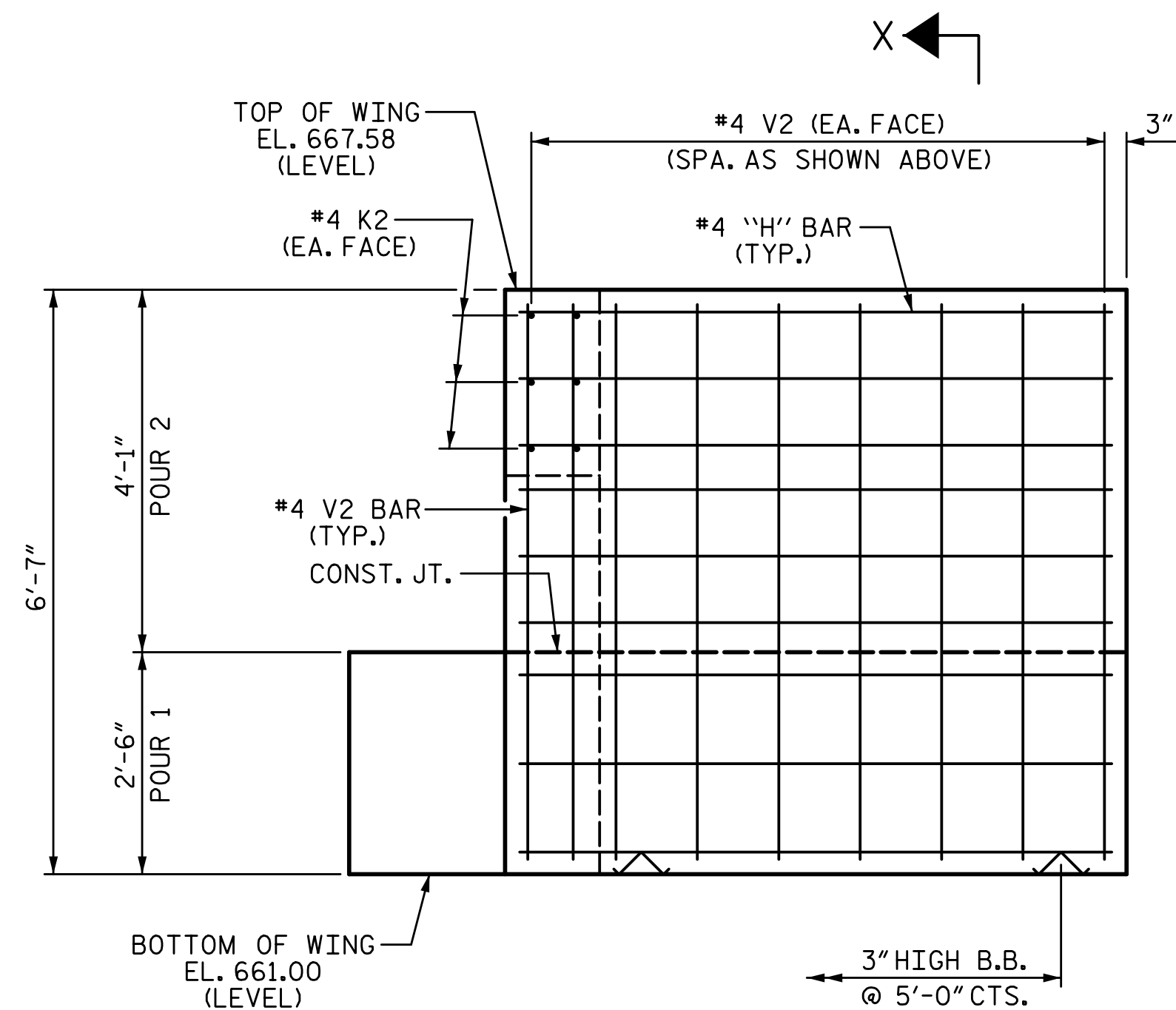
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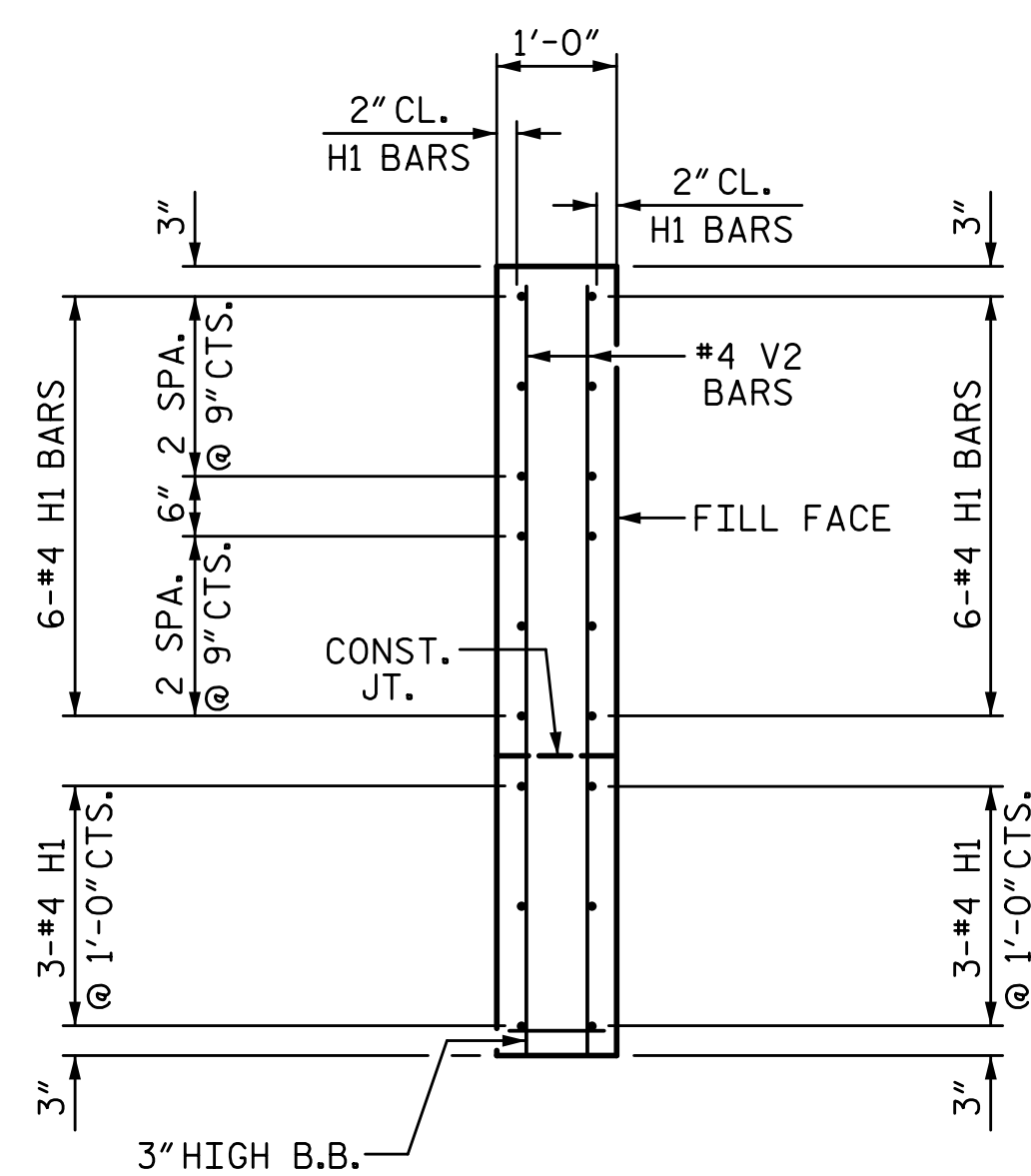
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PLAN OF WING (W2)



ELEVATION OF WING (W2)



SECTION X-X

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

END BENT 2

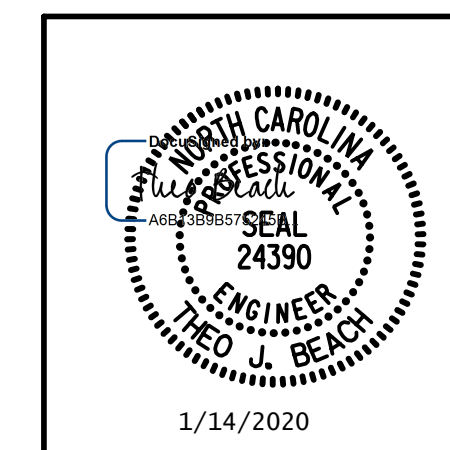
RIGHT WIDENING

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS
2			4			89

PLANS PREPARED BY:

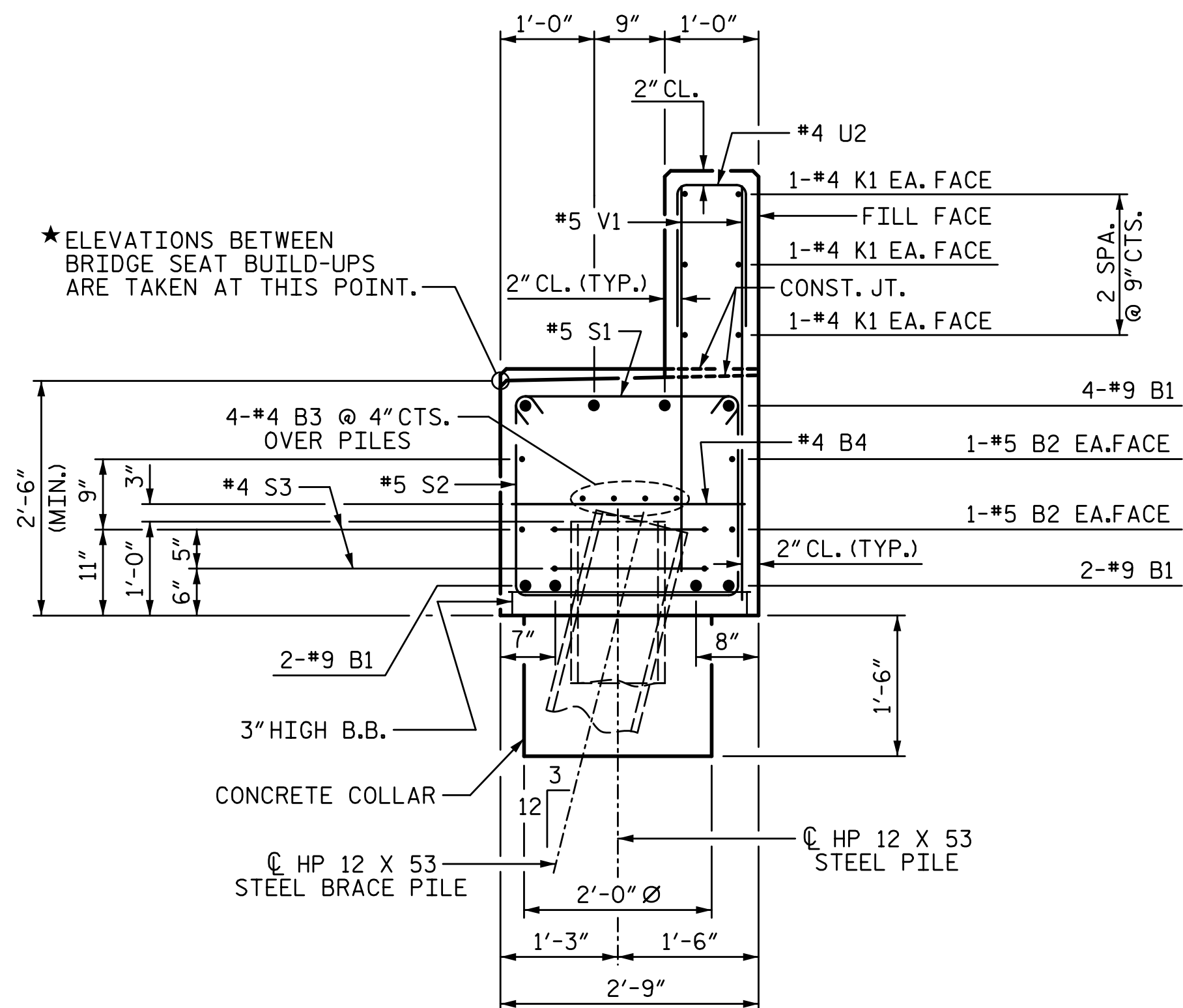
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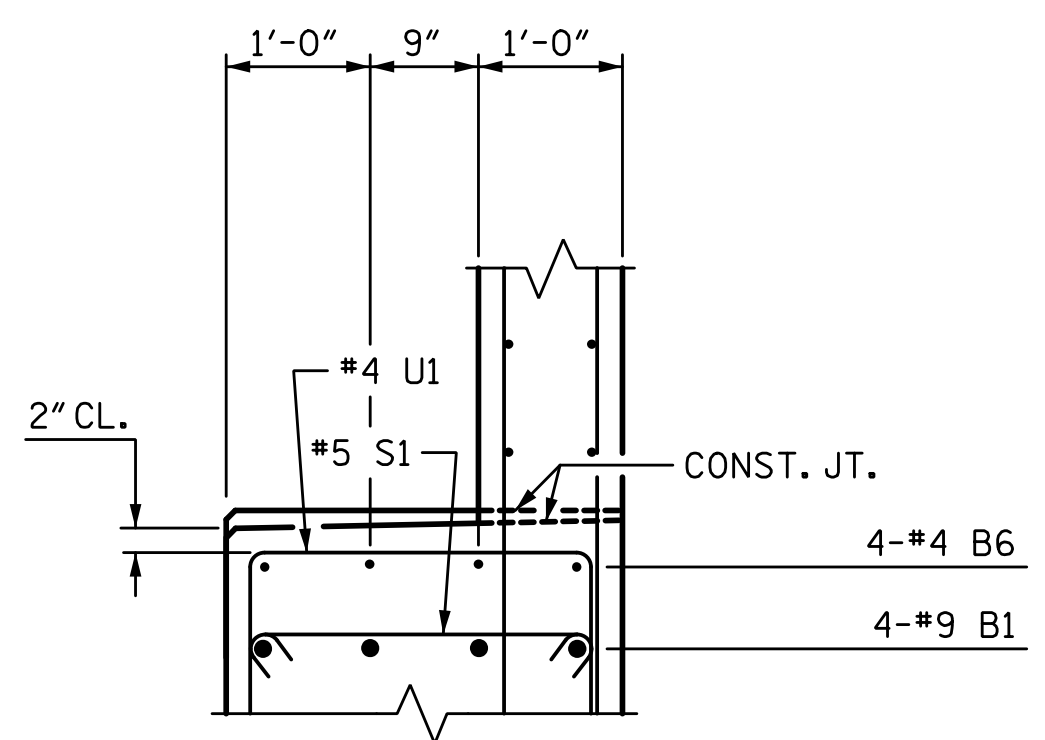
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CHECKED BY: <u>T. BEACH</u>	DATE: <u>1-20</u>
DESIGN ENGINEER OF RECORD: <u>T. BEACH</u>	DATE: <u>1-20</u>

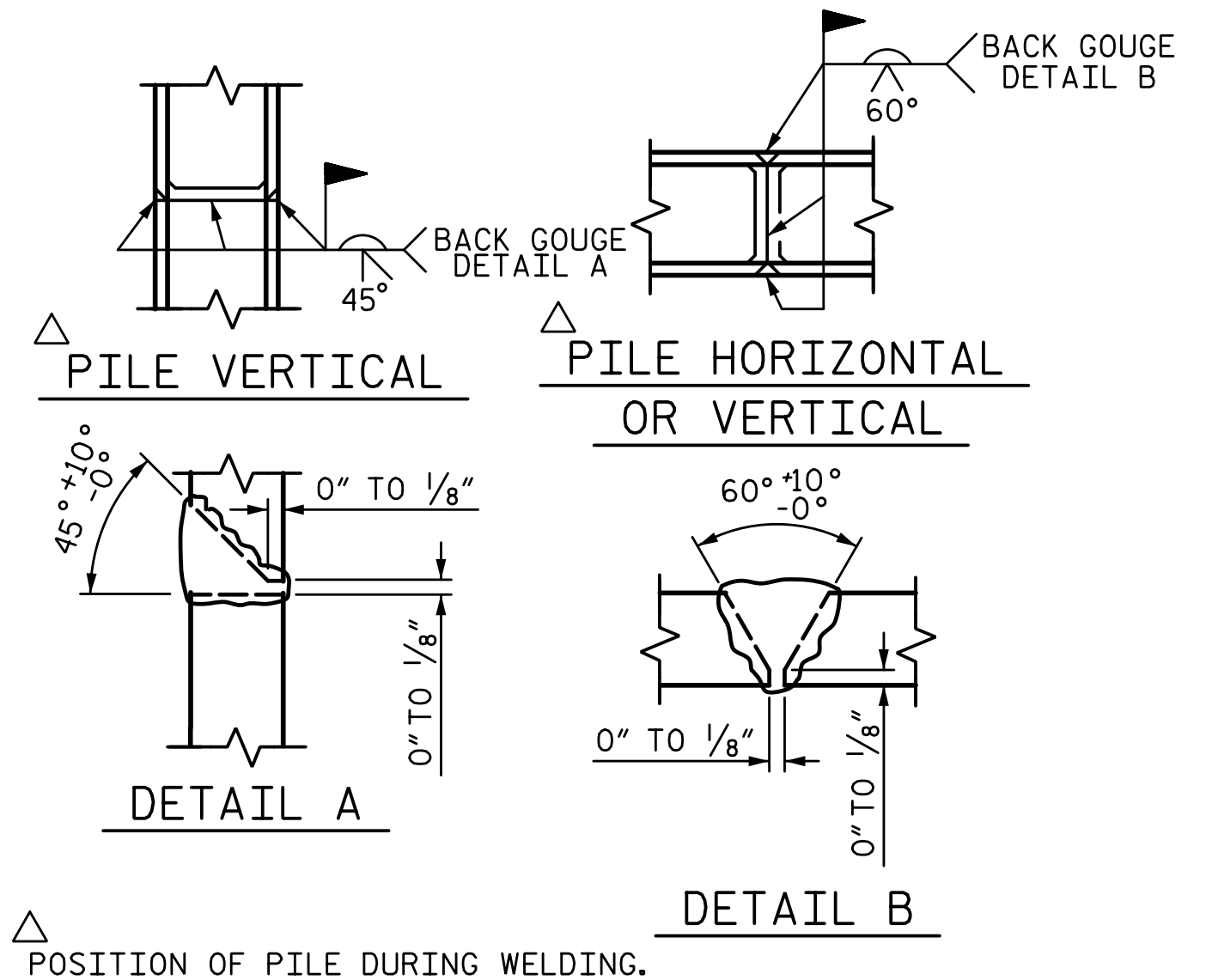
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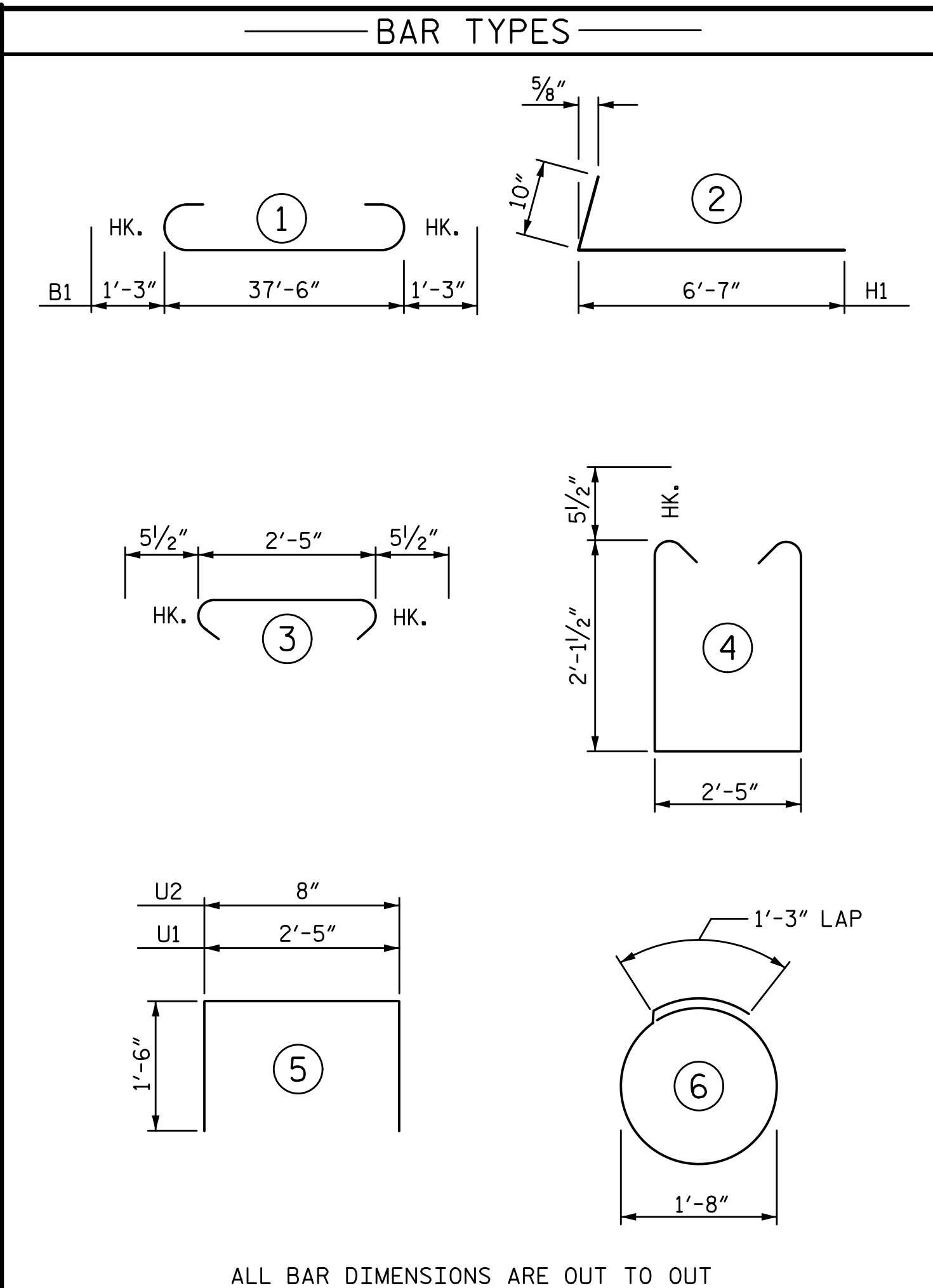
SECTION A-A



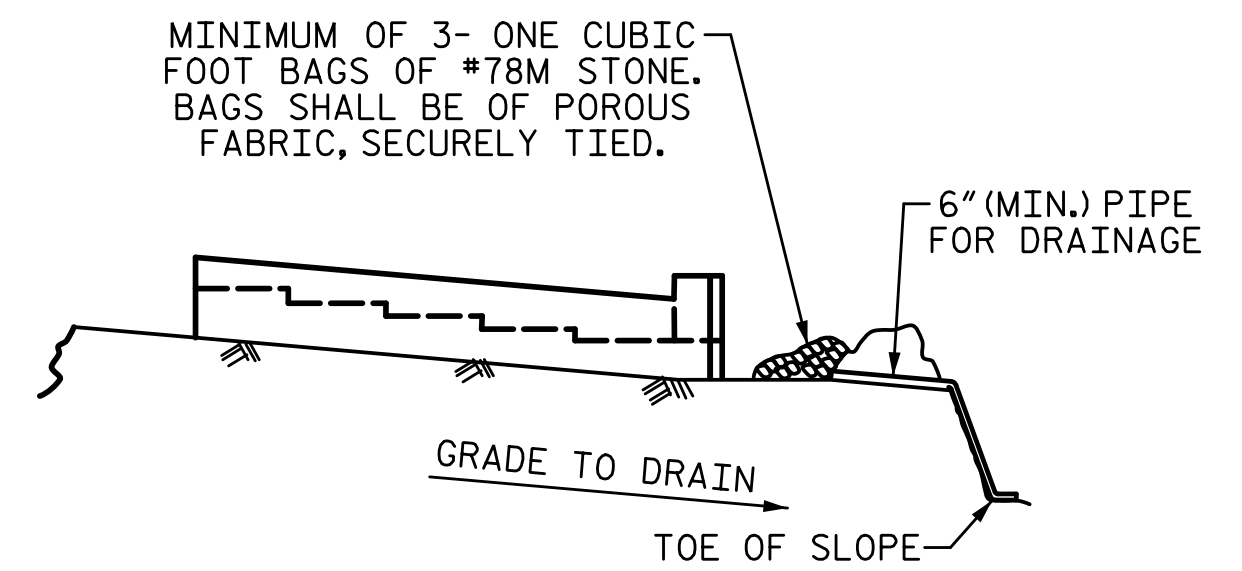
SECTION B-B



PILE SPLICE DETAILS



BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	40'-0"	1088
B2	4	#5	STR	37'-7"	157
B3	8	#4	STR	20'-0"	107
B4	10	#4	STR	2'-5"	16
B5	8	#4	STR	2'-2"	12
B6	4	#4	STR	14'-6"	39
H1	18	#4	2	7'-5"	89
K1	12	#4	STR	20'-0"	160
K2	6	#4	STR	3'-10"	15
S1	40	#5	3	3'-4"	139
S2	40	#5	4	7'-7"	316
S3	10	#4	6	6'-6"	43
U1	16	#4	5	5'-5"	58
U2	34	#4	5	3'-8"	83
V1	68	#5	STR	4'-2"	296
V2	26	#4	STR	6'-2"	107
TOTAL REINFORCING STEEL				2725	LB
CLASS A CONCRETE					
POUR 1 (CAP, COLLARS & LOWER WING)				12.2	CY
POUR 2 (BACKWALL & UPPER WING)				4.0	CY
TOTAL CLASS A CONCRETE				16.2	CY
HP 12 X 53 STEEL PILES					
NO. 4				80	LF
STEEL PILE POINTS				4	EA.
PILE DRIVING EQUIPMENT					
SETUP FOR HP 12 X 53 STEEL PILES				NO. 4	



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.

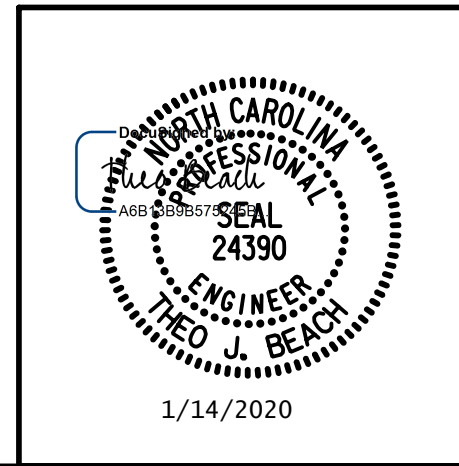
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TEMPORARY DRAINAGE AT END BENT

DRAWN BY: S.D. COOPER	DATE: 1-20
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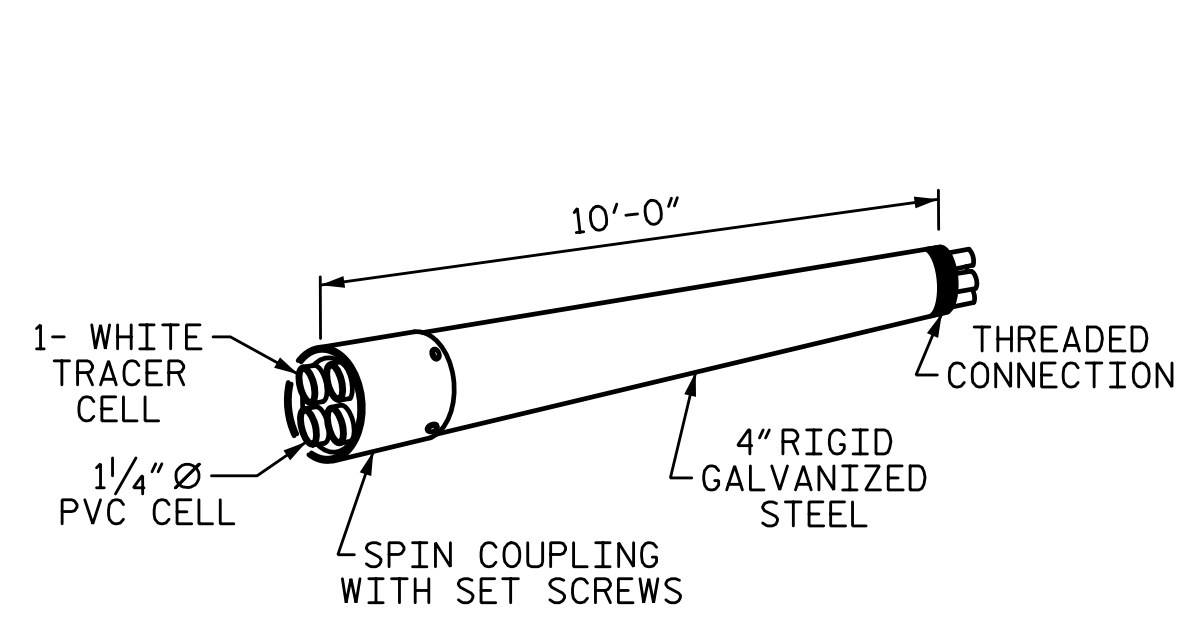


PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

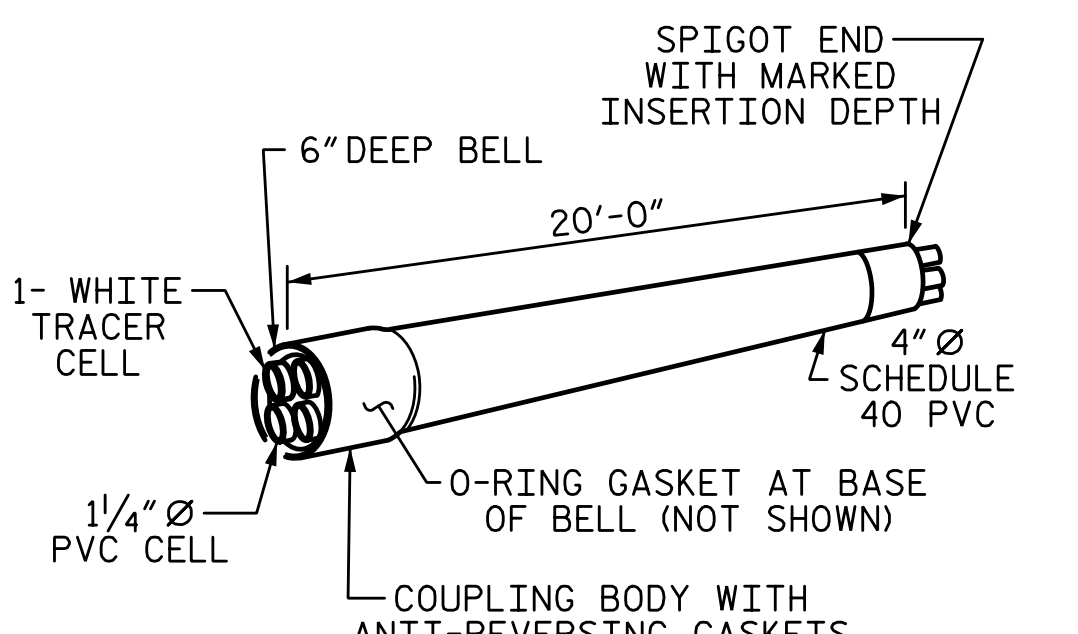
STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
SUBSTRUCTURE					
END BENT 2					
RIGHT WIDENING					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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SHEET NO. S-65					TOTAL SHEETS 89

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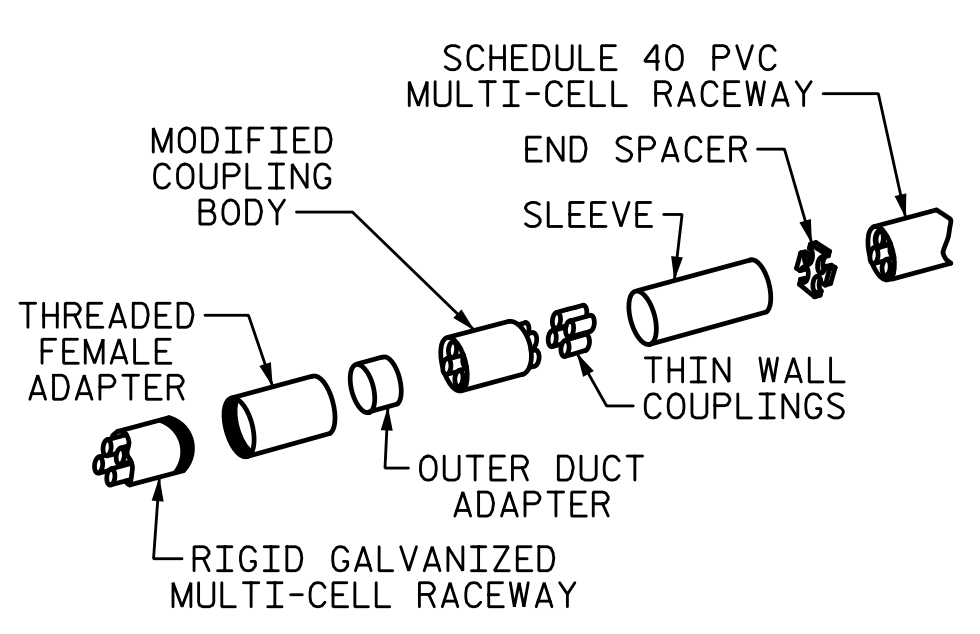




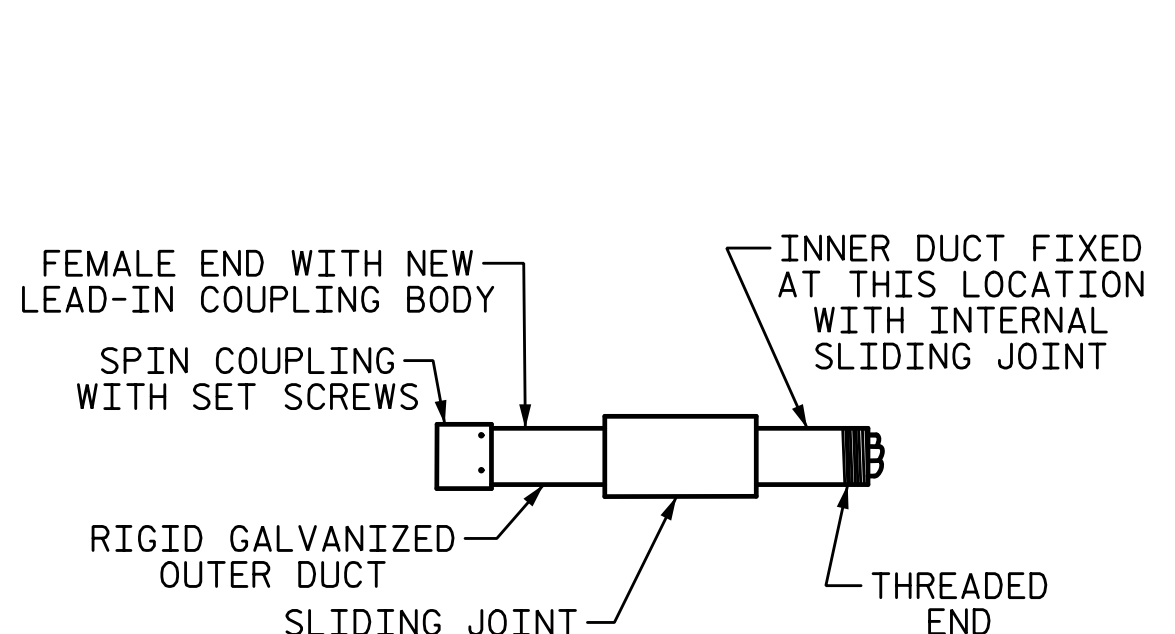
RIGID GALVANIZED (RGC) MULTI-CELL RACEWAY



SCHEDULE 40 PVC MULTI-CELL RACEWAY



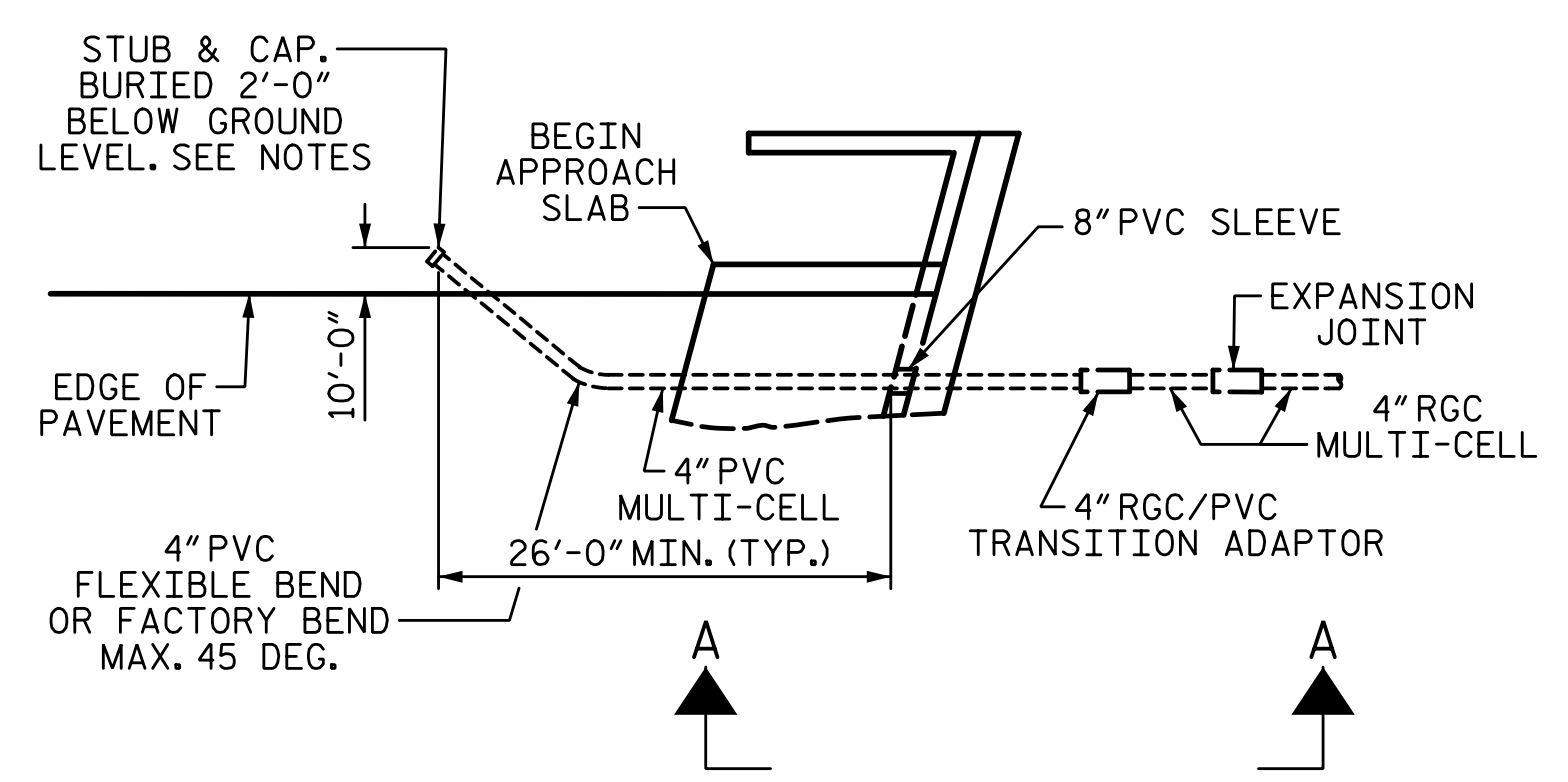
TRANSITION ADAPTER



EXPANSION JOINT FITTING

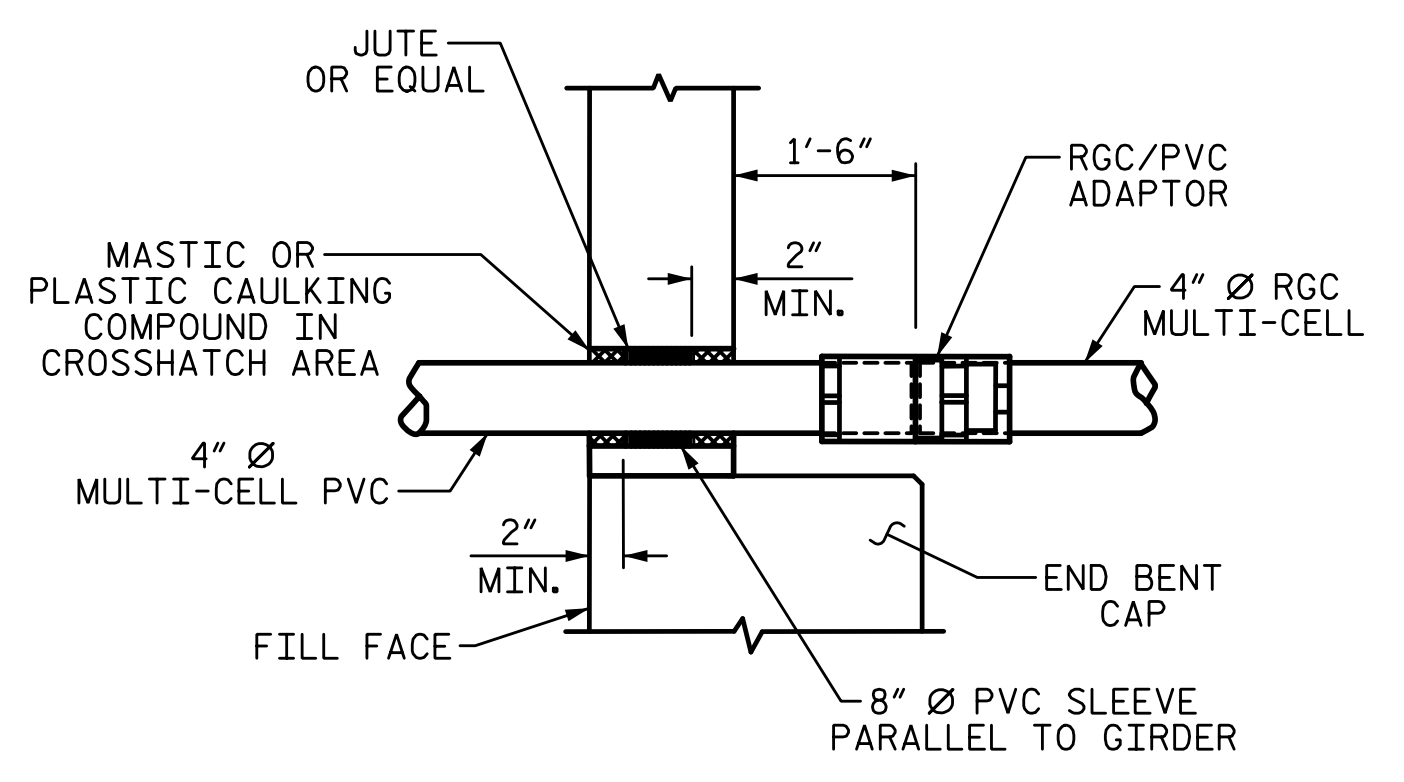
**NOTES:**

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE TOTAL QUANTITY OF CONDUIT NEEDED TO COMPLETE THE WORK AND THAT THE CONDUIT(S) ARE PLACED AT THE NOTED DIMENSION AND ABOVE THE BOTTOM OF THE GIRDER.
- THE INSTALLATION OF THE CONDUIT SYSTEM SHALL BE PAID FOR AS LUMP SUM. THE PRICE SHALL INCLUDE ALL CONDUIT, HANGERS, STABILIZERS, EXPANSION JOINTS, CONCRETE INSERTS, PVC SLEEVES AND ALL NECESSARY HARDWARE TO COMPLETE THE WORK.
- THE CONTRACTOR SHALL FIELD VERIFY THAT THE CONDUIT SYSTEM IS NOT IN CONFLICT WITH THE GUARDRAIL POSTS.
- SEE DETAIL "C" FOR HANGER ASSEMBLY INSTALLATION.
- INSTALL SLEEVES PARALLEL TO GIRDERS. SEE DETAIL "B" FOR SLEEVE INSTALLATION.
- PROVIDE TRANSITION ADAPTOR (AND EXPANSION JOINT) FOR CONDUIT AT END BENT 1 (AND END BENT 2).
- INSTALL STABILIZER'S MIDWAY BETWEEN DECK EXPANSION JOINTS. STABILIZER CAN NOT BE USED INSTEAD OF A HANGER ASSEMBLY.
- INSTALL EXPANSION JOINTS AT BENT 1, BENT 2, AND BENT 3.
- THE CONCRETE SCREW INSERT SHALL HAVE A ROD SIZE OF 5/8" AND A PULL FORCE OF 1260 LBS.
- FOR ELECTRICAL CONDUIT SYSTEM FOR SIGNALS, SEE SPECIAL PROVISIONS.



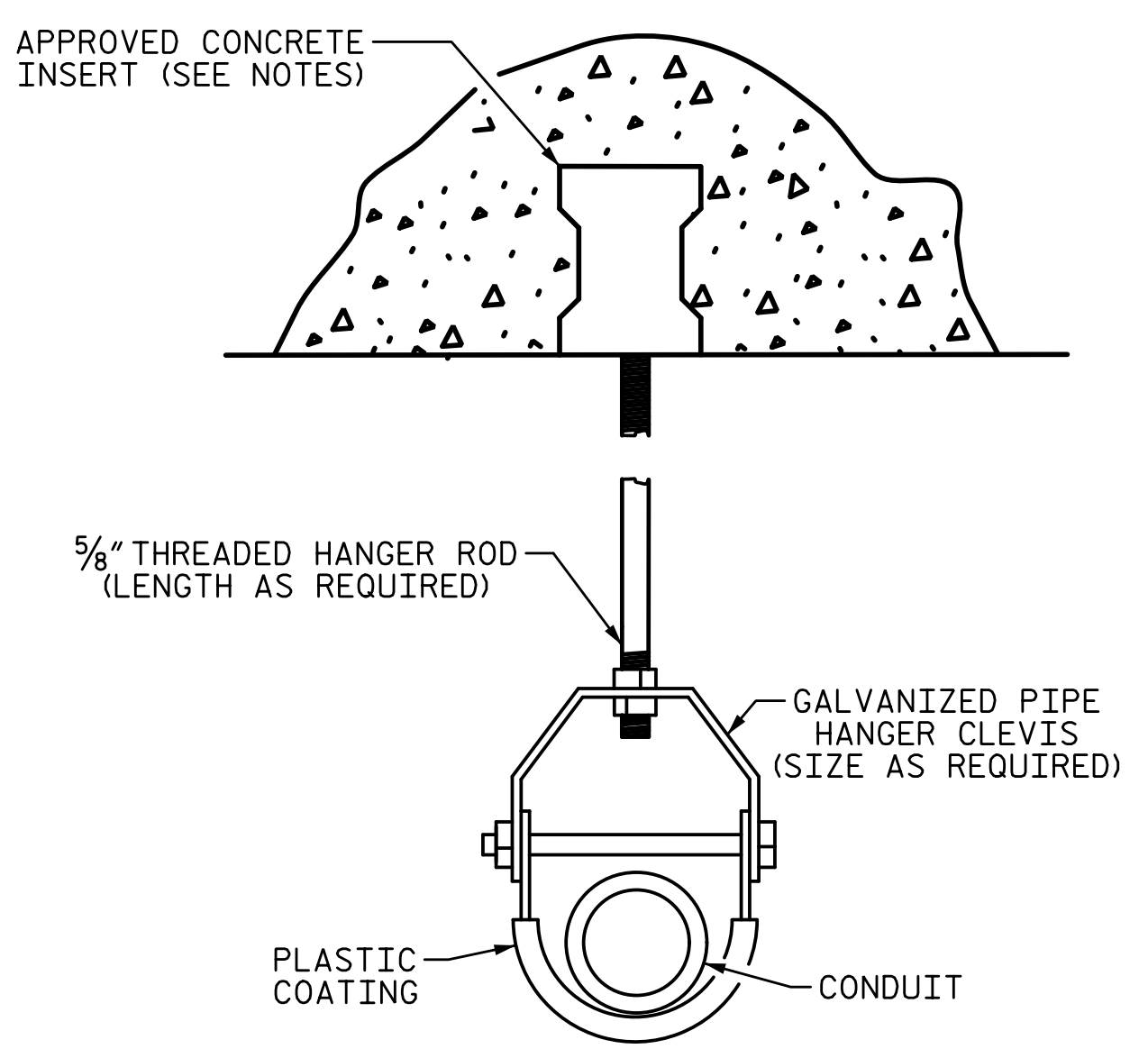
DETAIL "A"

TERMINATION OF CONDUIT AT WING WALL END BENT 1 SHOWN, END BENT 2 SIMILAR



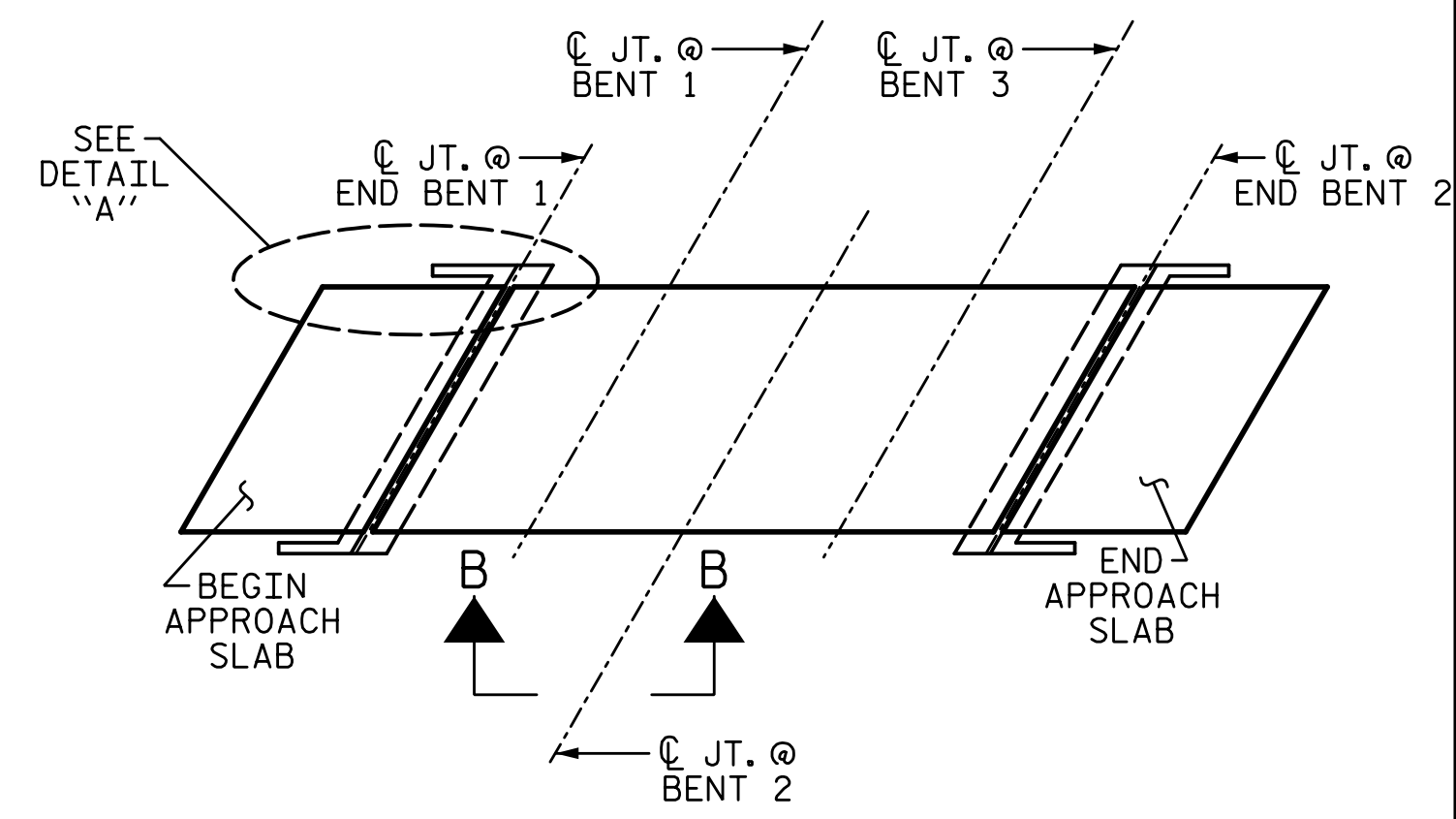
DETAIL "B"

PVC SLEEVE INSTALLATION & RGC/PVC ADAPTOR AT BACKWALL.

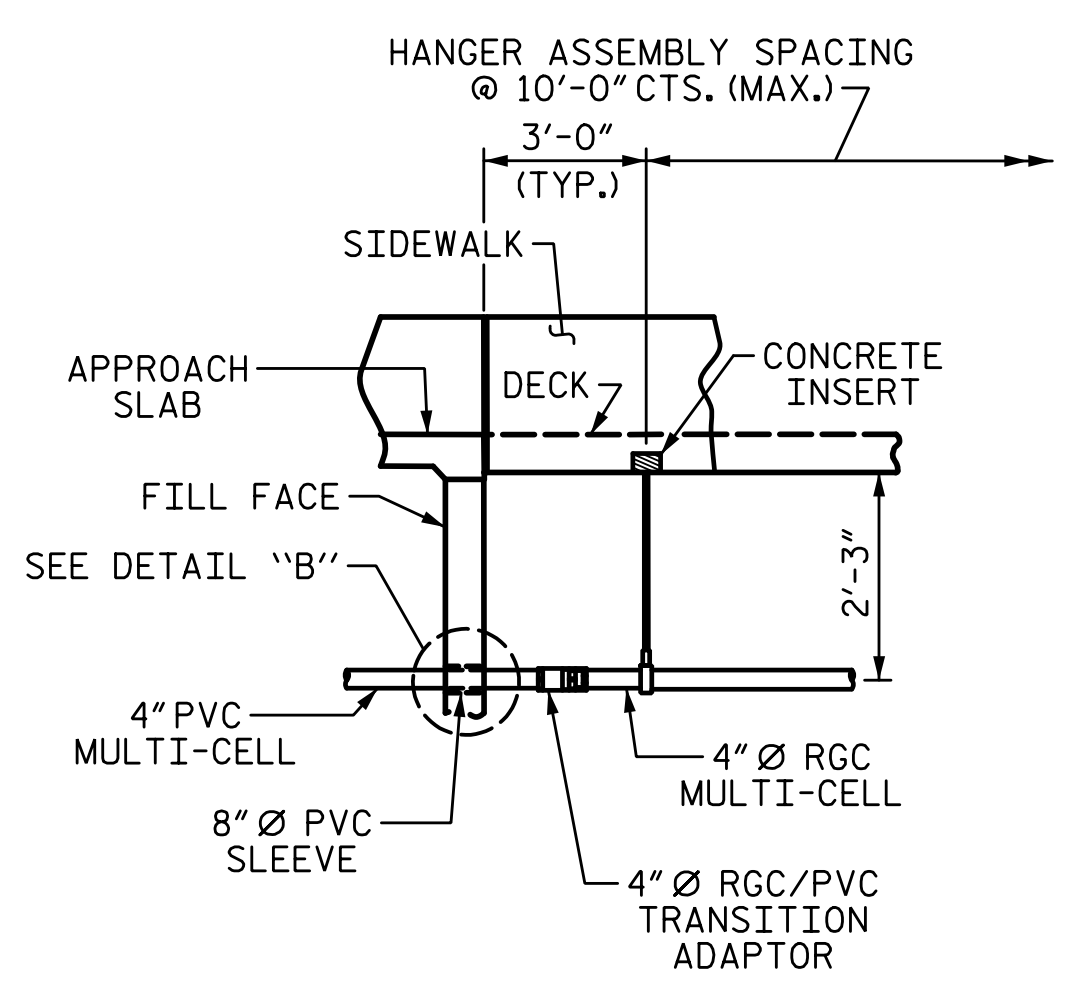


DETAIL "C"

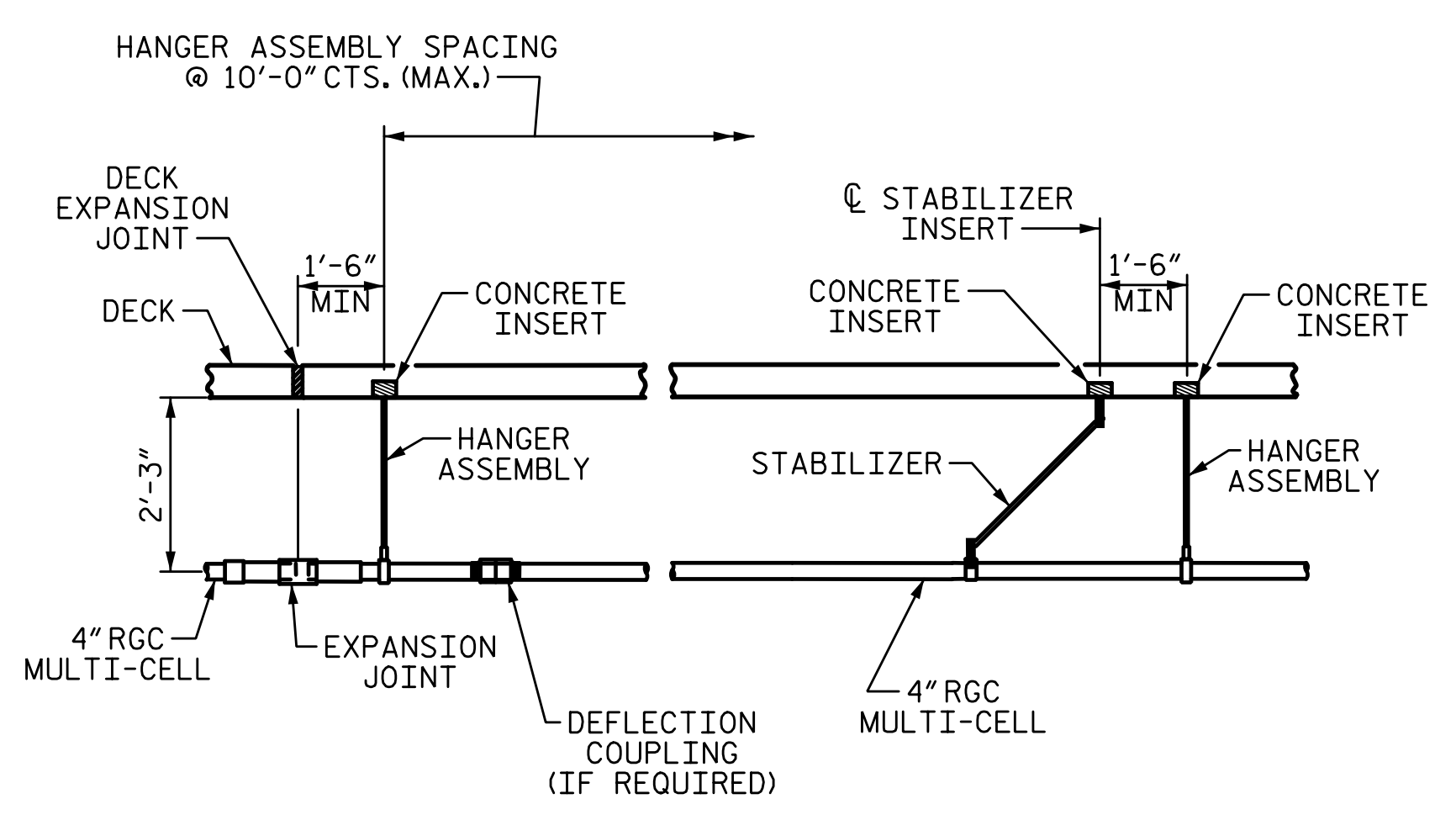
HANGER ASSEMBLY



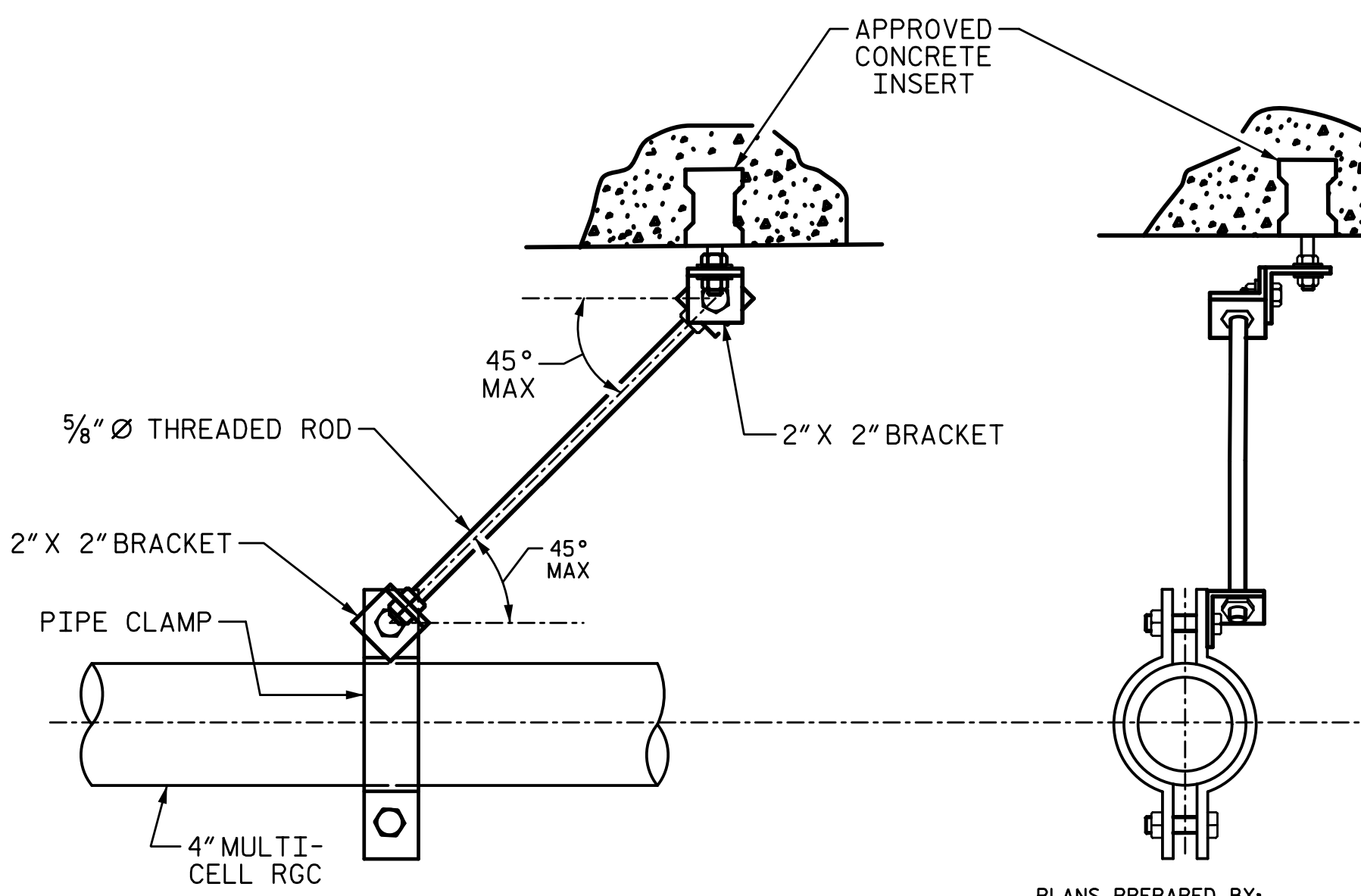
CONDUIT LAYOUT



VIEW A-A



VIEW B-B



DETAIL "E"

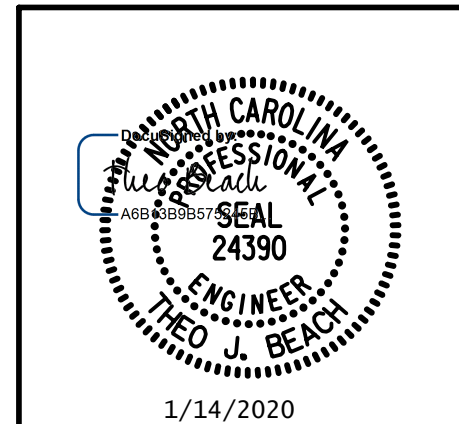
STABILIZER

PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**ELECTRICAL CONDUIT SYSTEM FOR SIGNALS**

LEFT WIDENING



PLANS PREPARED BY:  
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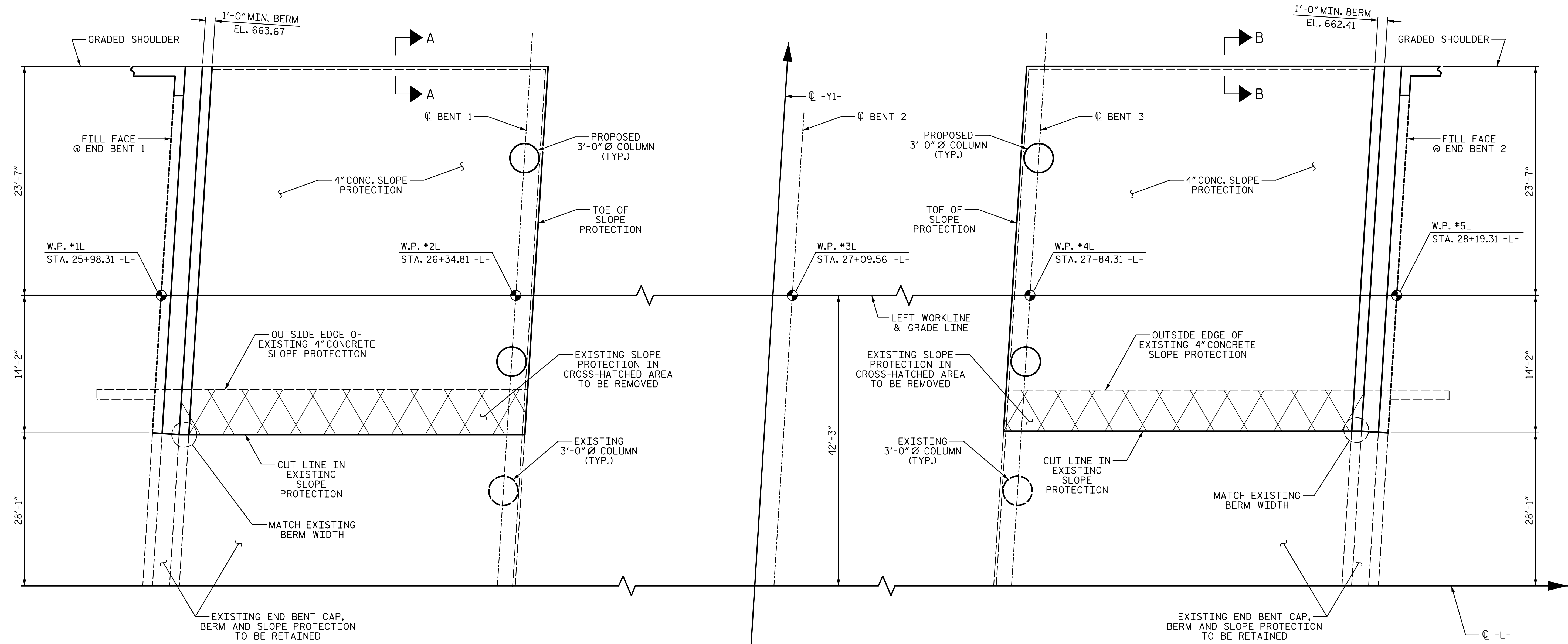
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**ELECTRIC CONDUIT DETAILS**

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END BENT 1

END BENT 2

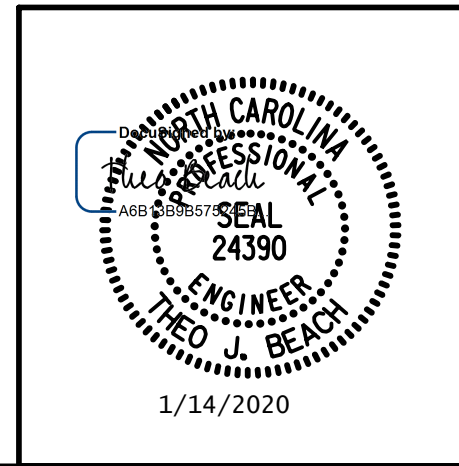
**PLAN OF SLOPE PROTECTION**  
(FOR SECTIONS A-A & B-B, SEE SHEET 3 OF 3)

PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

BRIDGE @ STA. 27+02.26 -L-	4" SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SY	APPROX. LF
END BENT 1 LEFT	165	300
END BENT 2 LEFT	150	270

\* QUANTITY SHOWN IS BASED ON 5'-0" POURS.

PLANS PREPARED BY:  
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**SLOPE PROTECTION  
DETAILS**

LEFT WIDENING

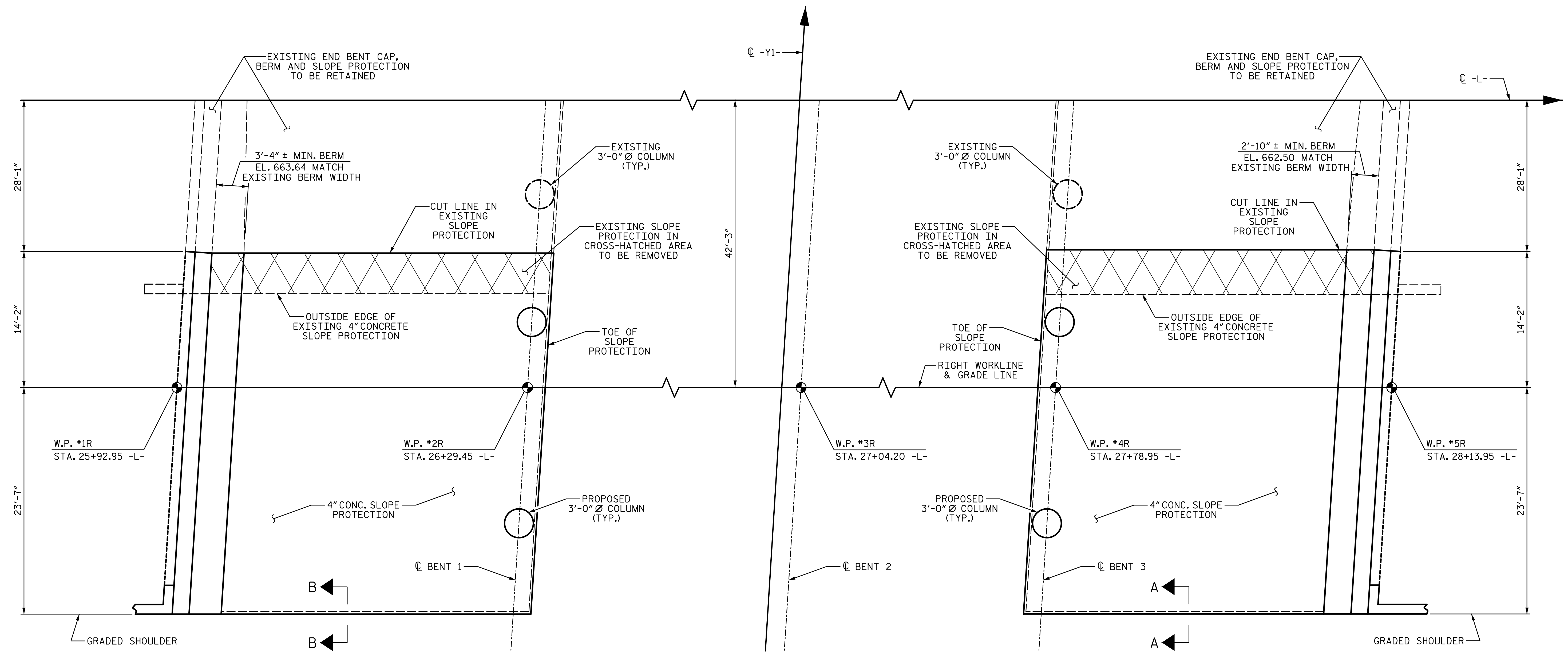
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-67
1			3			TOTAL SHEETS
2			4			89

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Ⓞ END BENT 1

Ⓞ END BENT 2

**PLAN OF SLOPE PROTECTION**  
(FOR SECTIONS A-A & B-B, SEE SHEET 3 OF 3)

PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

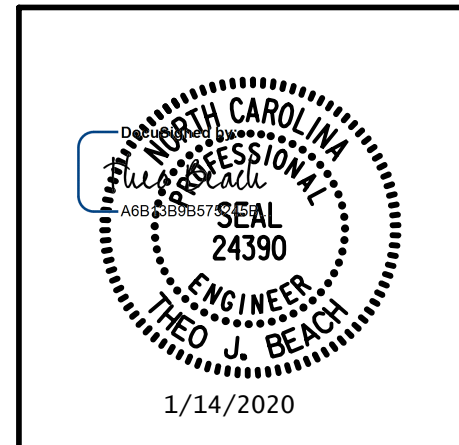
SHEET 2 OF 3

BRIDGE @ STA. 27+04.20 -L-	4" SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SY	APPROX. LF
END BENT 1 RIGHT	160	300
END BENT 2 RIGHT	160	300

\* QUANTITY SHOWN IS BASED ON 5'-0" POURS.

PLANS PREPARED BY:

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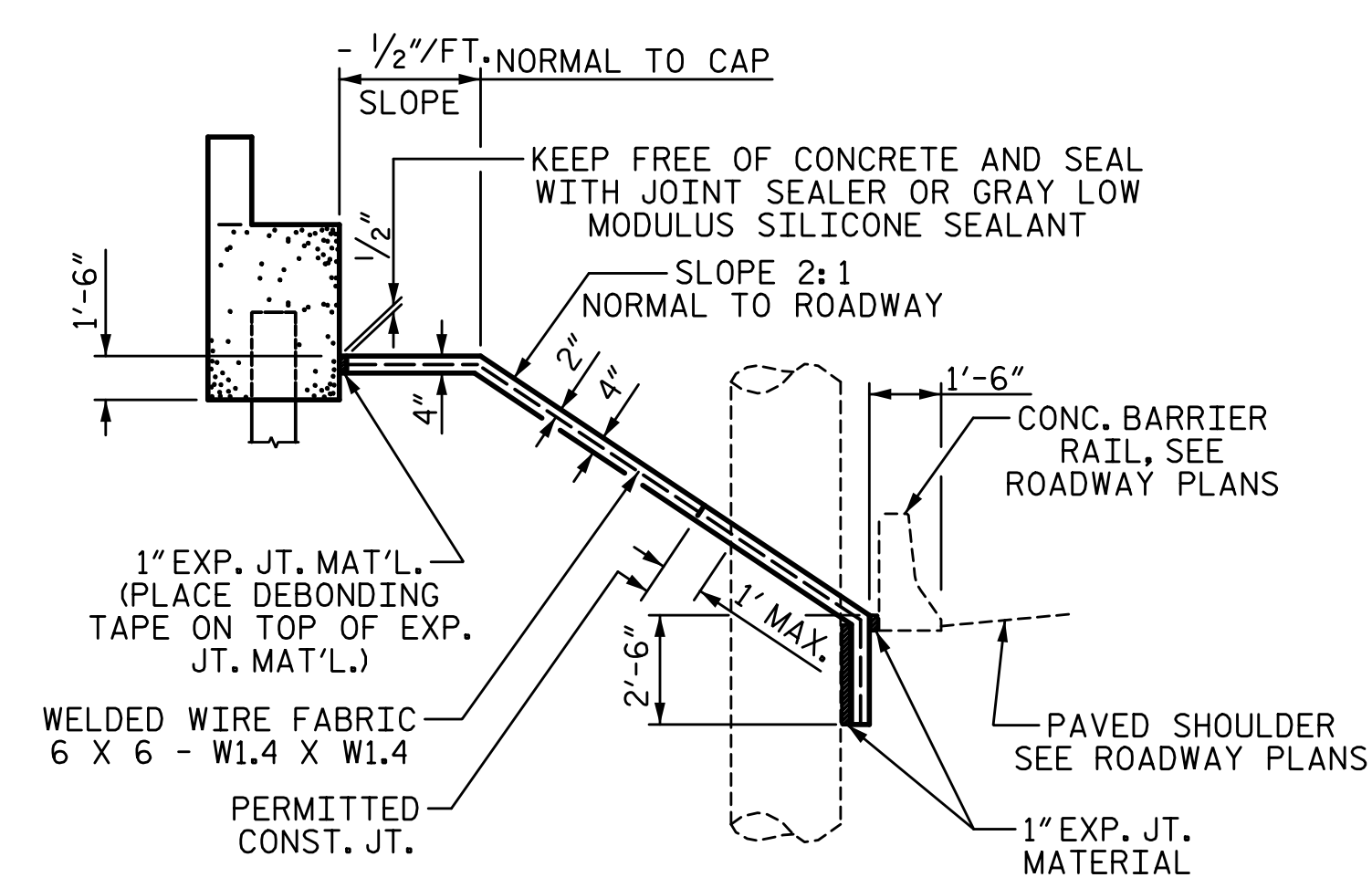
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RALEIGH

**SLOPE PROTECTION  
DETAILS**  
RIGHT WIDENING

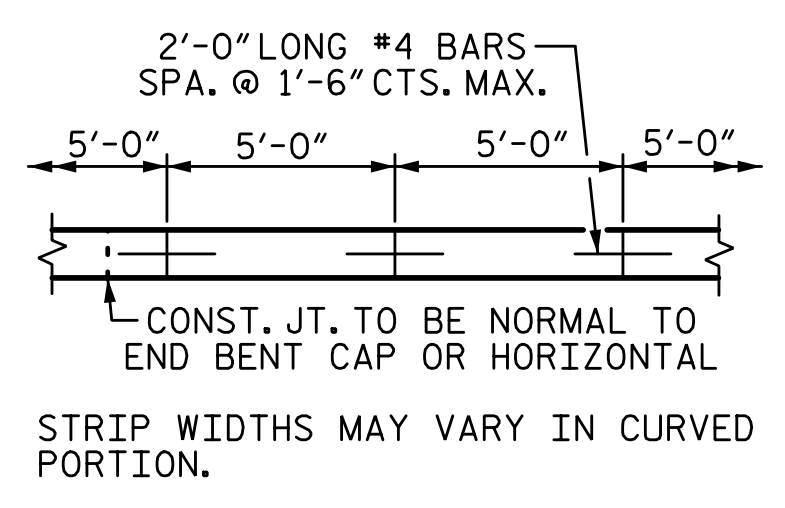
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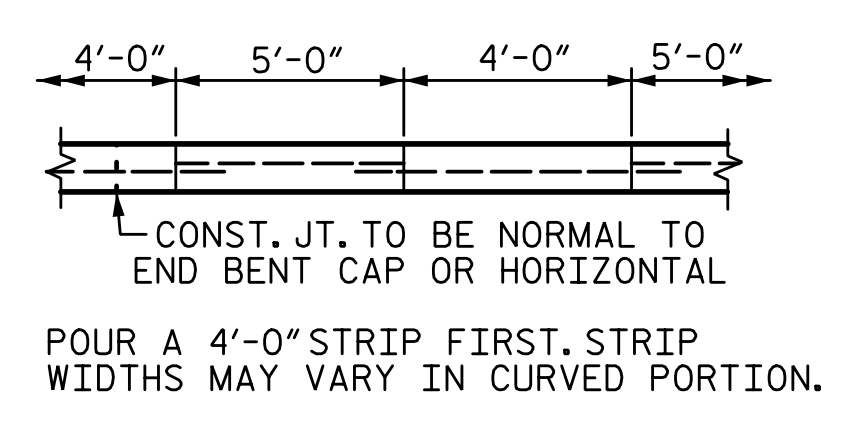
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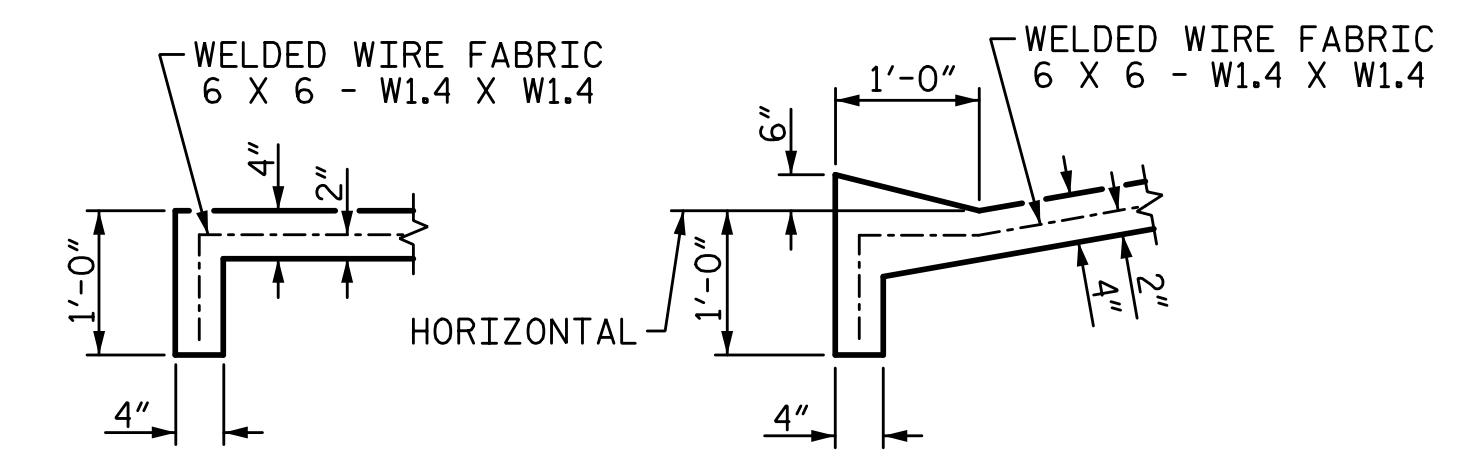
SECTION ALONG C SURVEY WITH SHOULDER PIER



POURING DETAIL

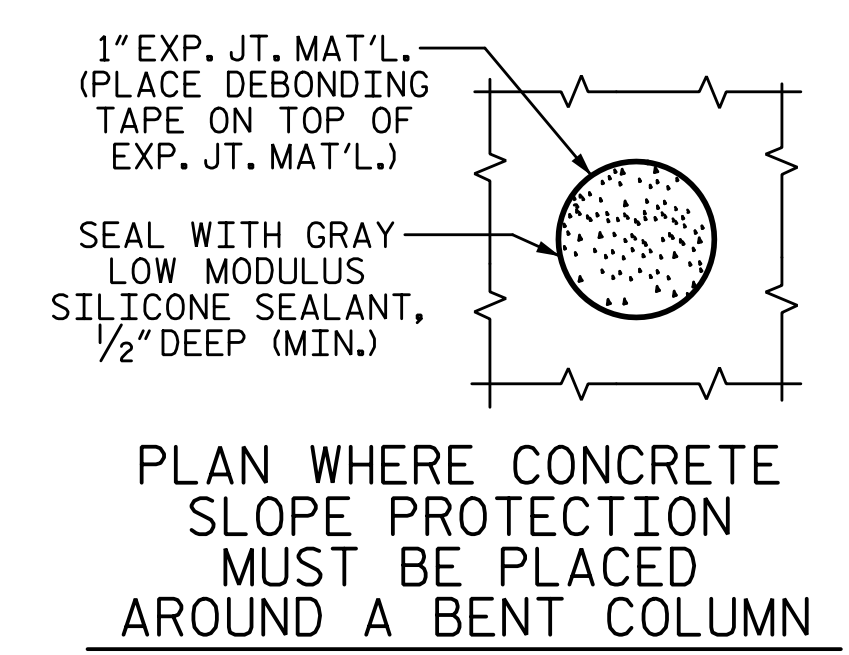


OPTIONAL POURING DETAIL



SECTION A-A

SECTION B-B



**GENERAL NOTES:**

BERM AND SLOPE PROTECTION MAY BE ADJUSTED SLIGHTLY AS NECESSARY IN ORDER TO MATCH THE EXISTING SITE CONDITIONS. THE CONTRACTOR SHALL PROVIDE AS SMOOTH A TRANSITION AS POSSIBLE BETWEEN THE EXISTING AND PROPOSED SLOPE AS DIRECTED BY THE ENGINEER.

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE. EXISTING SLOPE PROTECTION DAMAGED BY CONSTRUCTION SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE ENGINEER. ANY COST ASSOCIATED WITH REPAIR OR REPLACEMENT OF EXISTING SLOPE PROTECTION SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

**SLOPE PROTECTION:**

THE SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

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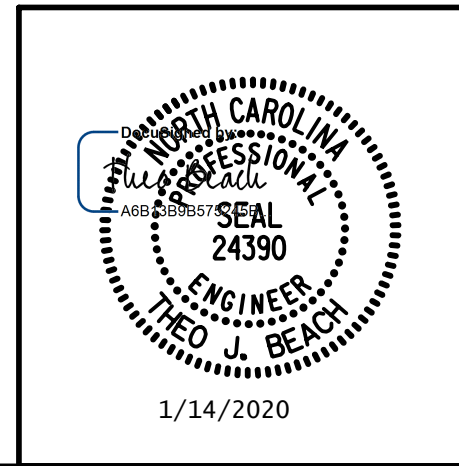
SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SLOPE PROTECTION  
 DETAILS**  
 LEFT & RIGHT WIDENING

REVISIONS						SHEET NO.
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PLANS PREPARED BY:  
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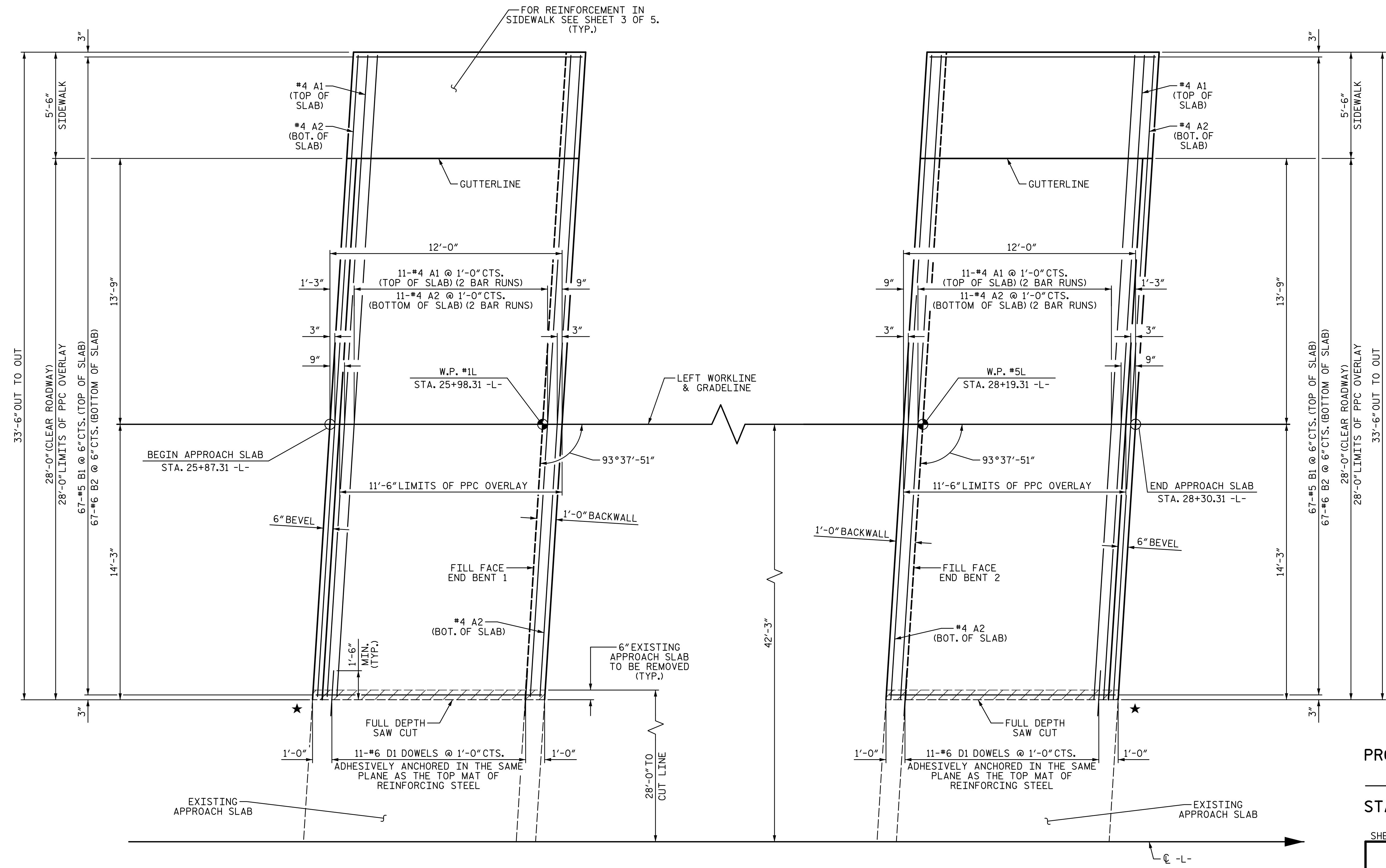


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**NOTES:**  
 FOR PPC OVERLAY QUANTITIES,  
 SEE BILL OF MATERIAL SHEET  
 1 OF 2.



**PLAN @ END BENT 1**

★ REMOVE EXISTING CONCRETE FLUME.  
 NOT SHOWN FOR CLARITY.

**PLAN @ END BENT 2**

★ REMOVE EXISTING CONCRETE FLUME.  
 NOT SHOWN FOR CLARITY.

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 1 OF 5

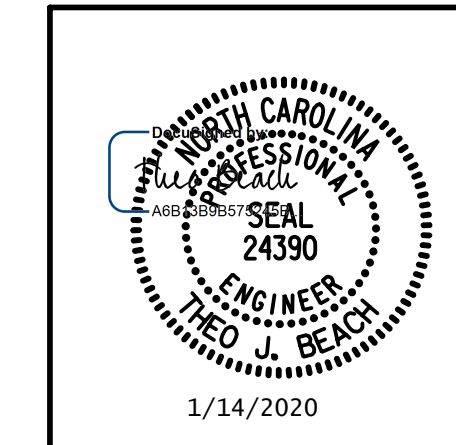
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**BRIDGE APPROACH SLAB**

LEFT WIDENING

REVISIONS						SHEET NO.
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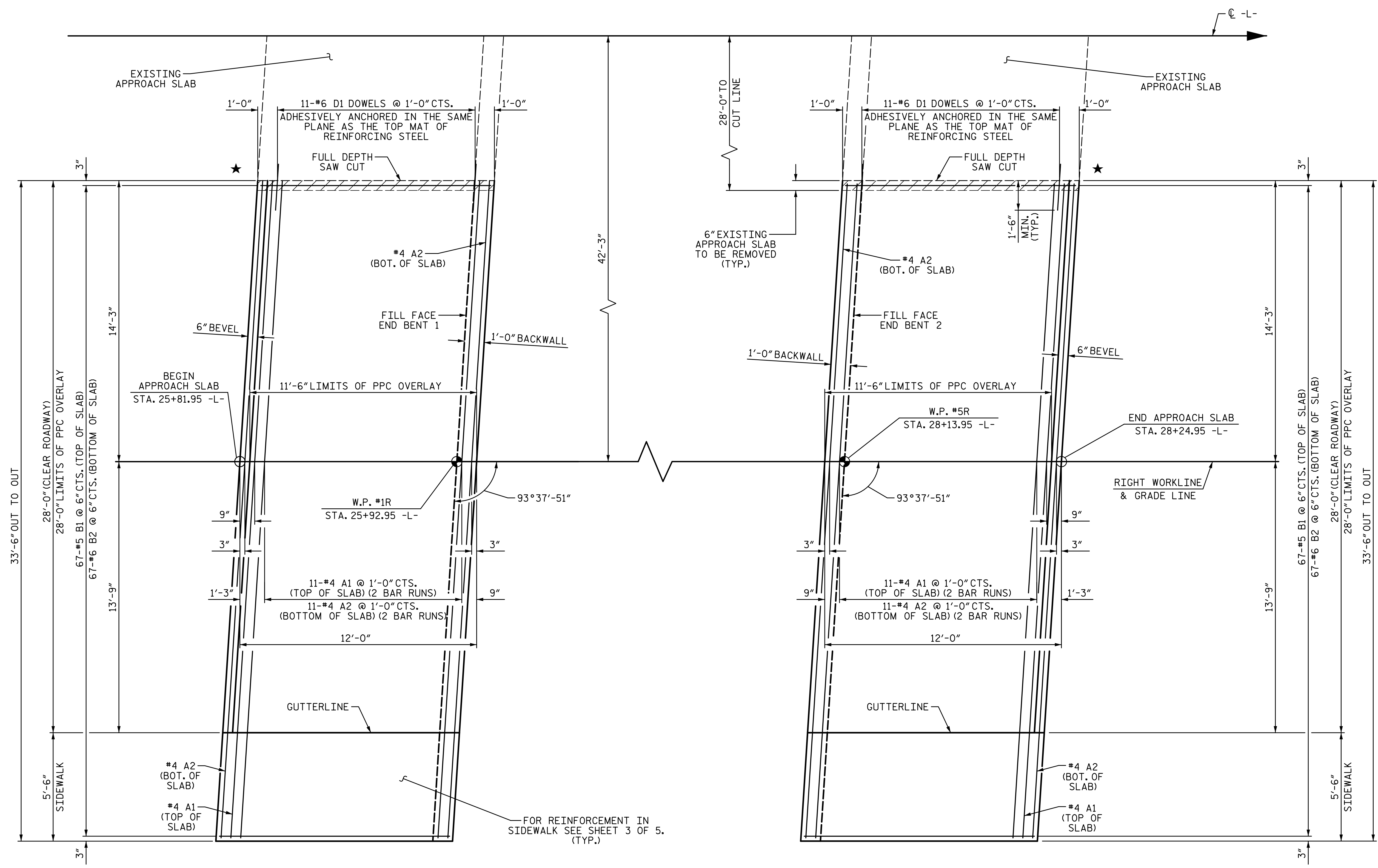


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**NOTES:**  
 FOR PPC OVERLAY QUANTITIES,  
 SEE BILL OF MATERIAL SHEET  
 2 OF 2.



**PLAN @ END BENT 1**

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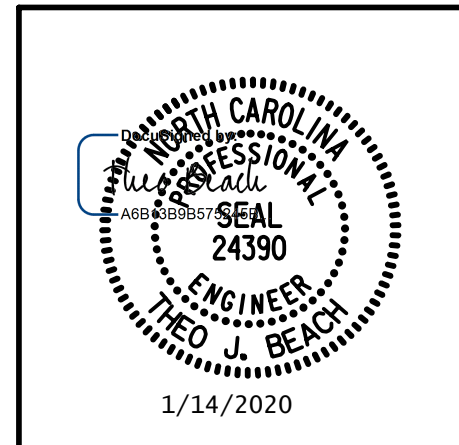
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PROJECT NO. I-5711  
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SHEET 2 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
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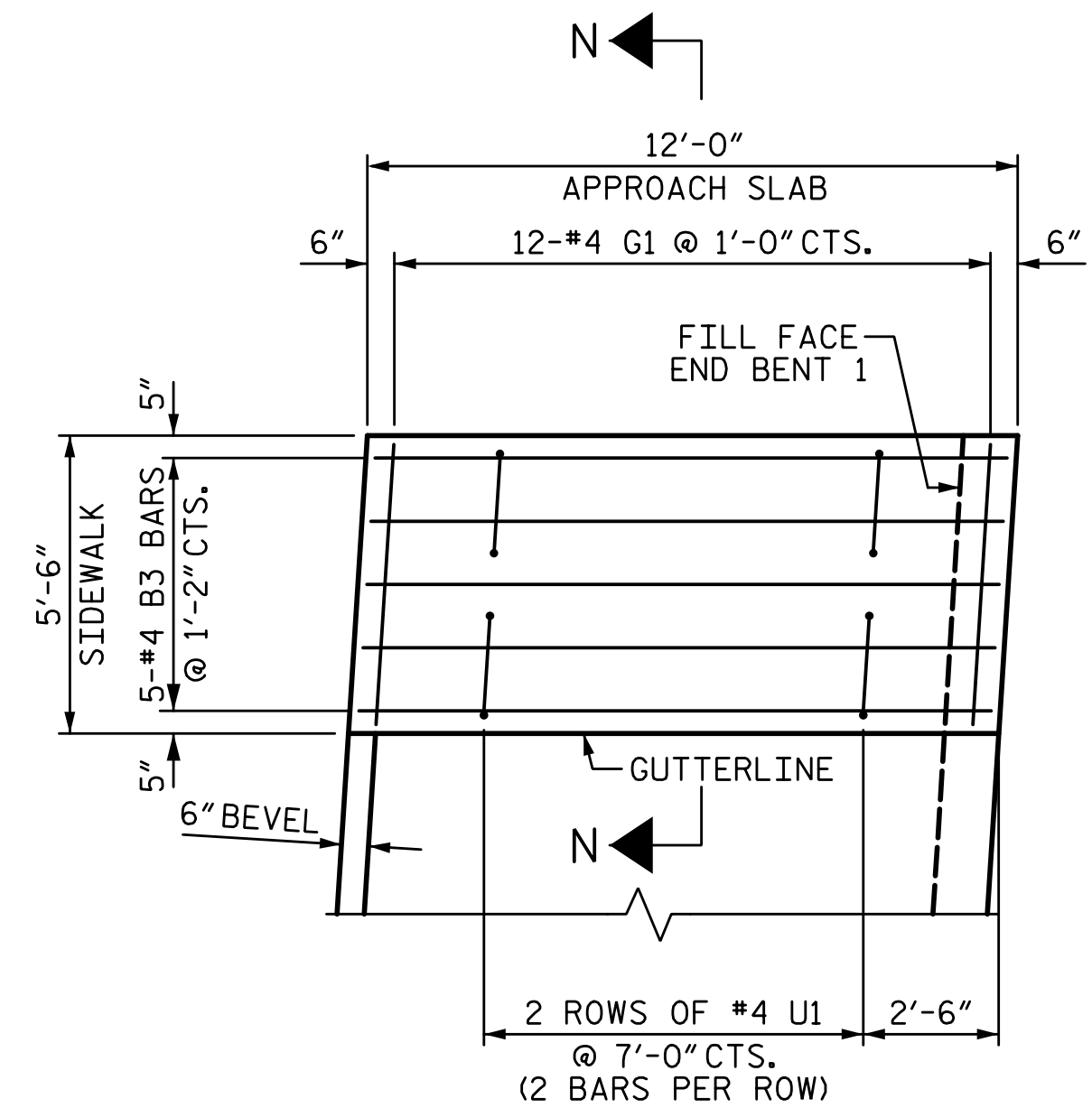
**BRIDGE APPROACH SLAB**

**RIGHT WIDENING**

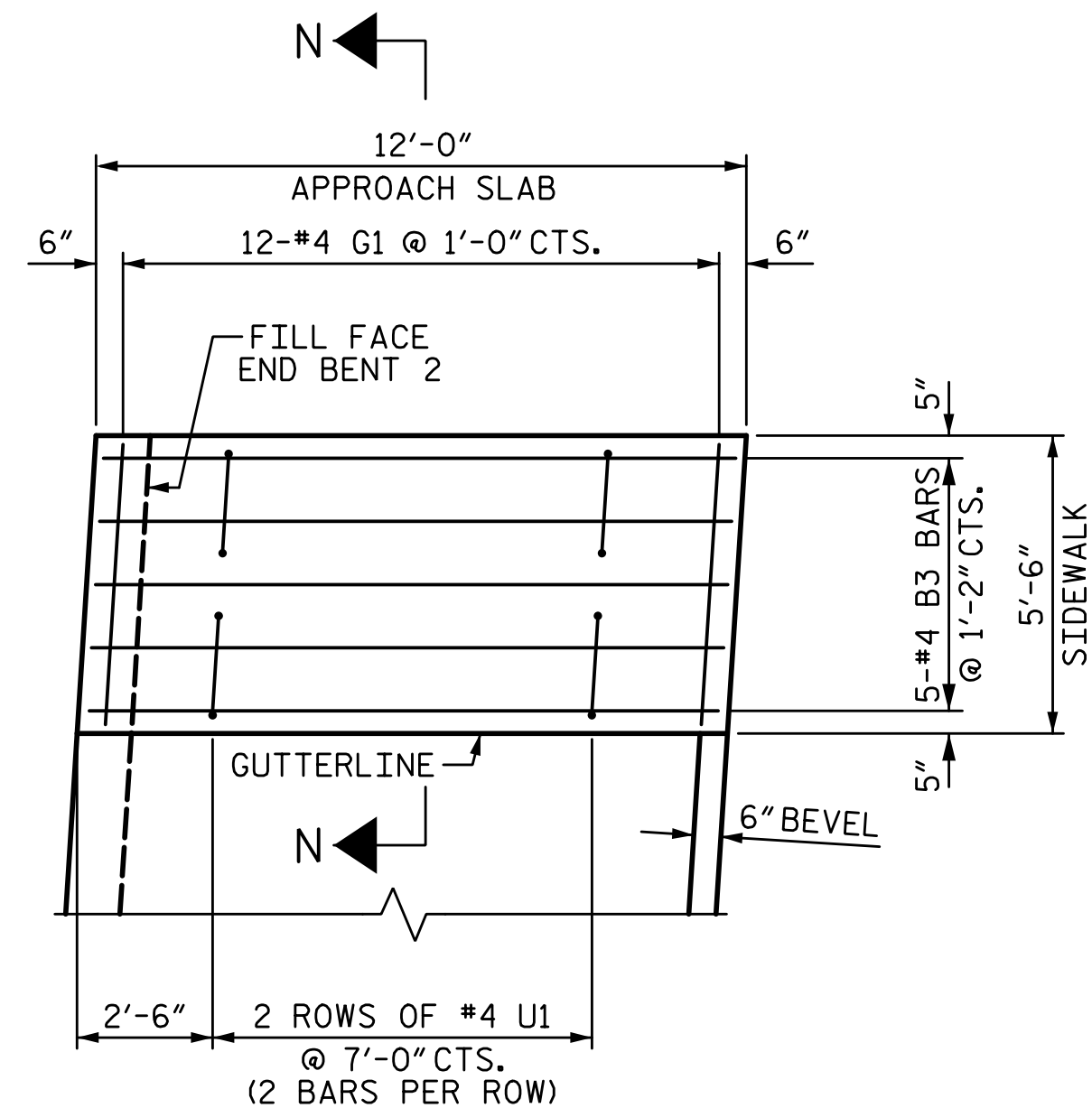
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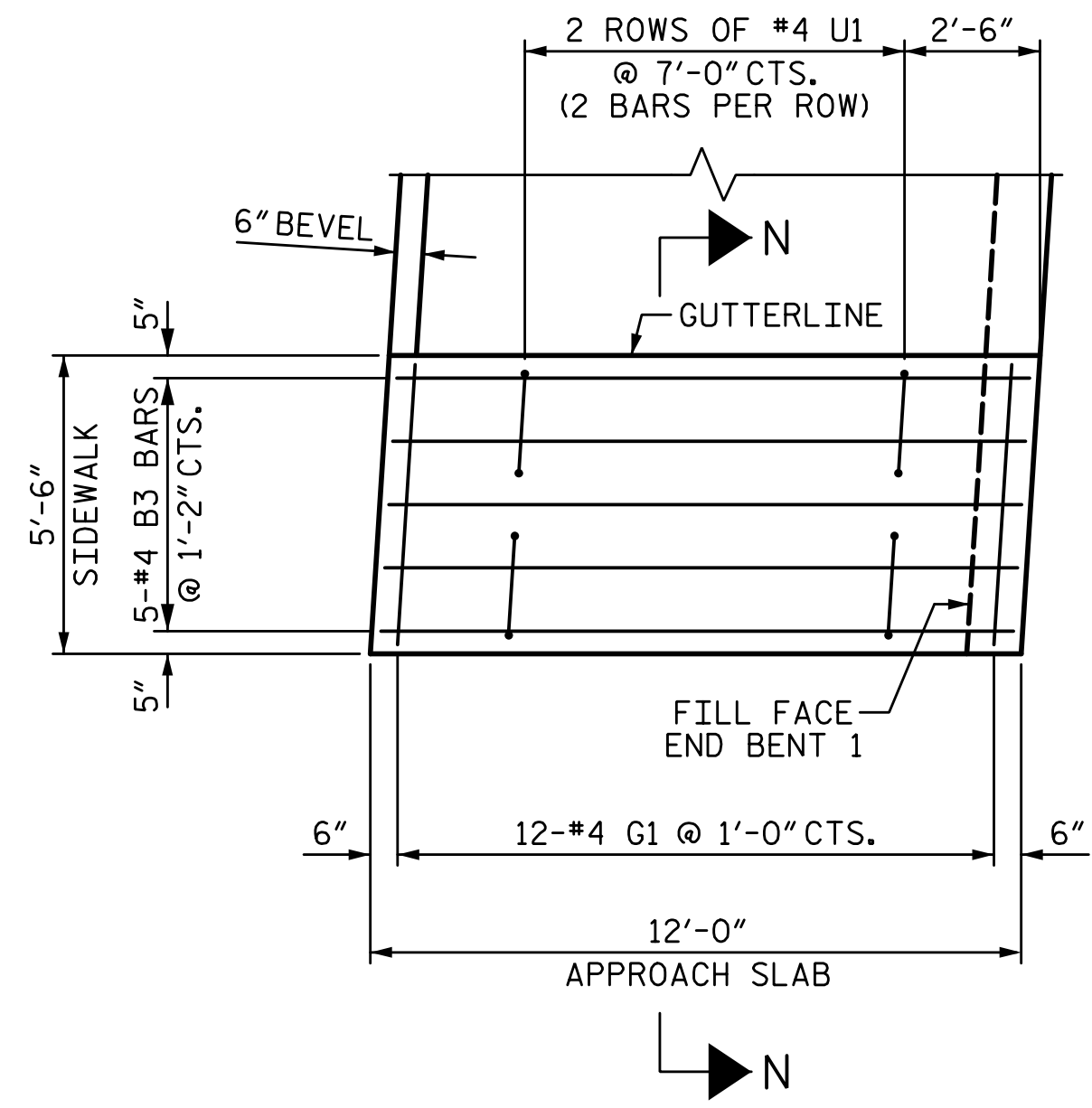
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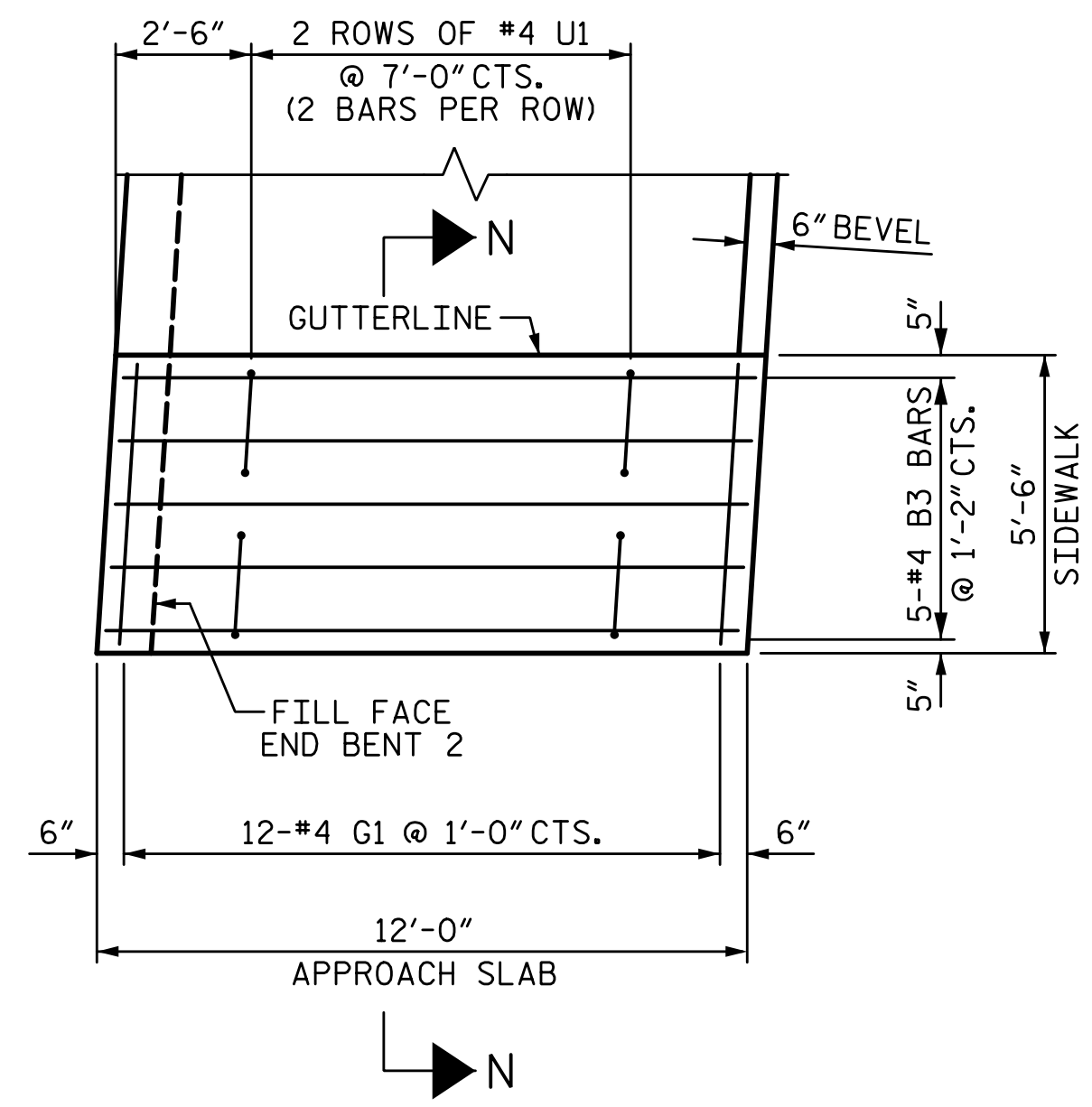
APPROACH SLAB @ END BENT 2

PLAN OF SIDEWALKS

(LEFT WIDENING)



APPROACH SLAB @ END BENT 1



APPROACH SLAB @ END BENT 2

PLAN OF SIDEWALKS

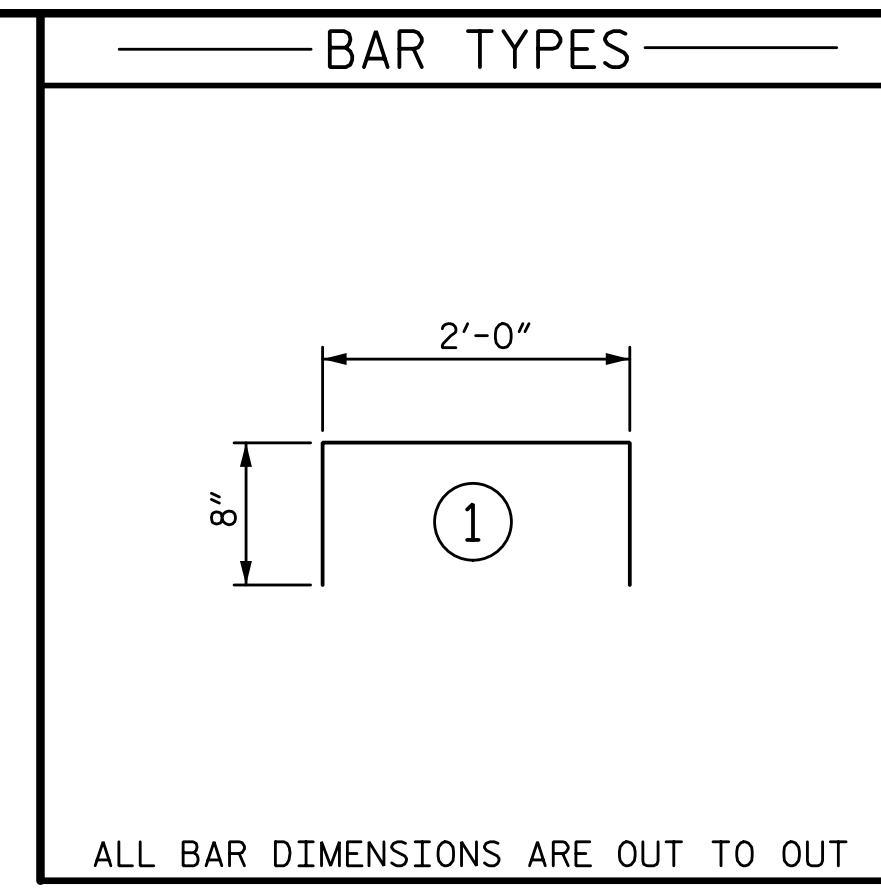
(RIGHT WIDENING)

NOTES:

ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.

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

U1 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER THE APPROACH SLAB HAS BEEN SCREEDED OFF.

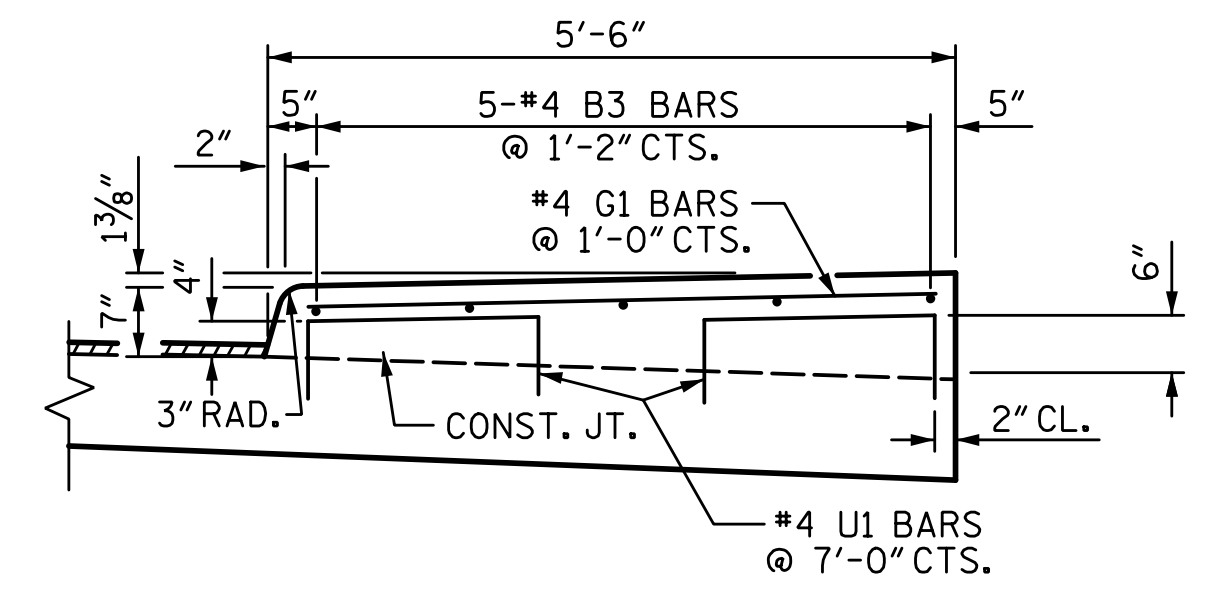


ALL BAR DIMENSIONS ARE OUT TO OUT

SPLICE CHART		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

BILL OF MATERIAL					
FOR ONE APPROACH SLAB @ END BENT 1 (2 REQ'D)					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	24	#4	STR	17'-7"	282
A2	26	#4	STR	17'-6"	304
*B1	67	#5	STR	11'-2"	780
B2	67	#6	STR	11'-8"	1174
*B3	5	#4	STR	11'-8"	39
*D1	11	#6	STR	2'-4"	39
*G1	12	#4	STR	5'-2"	41
*U1	4	#4	1	3'-4"	9
REINFORCING STEEL					1478 LB
* EPOXY COATED REINFORCING STEEL					1190 LB
CLASS "AA" CONCRETE BREAKDOWN					
POUR 1 (SLAB)					16.6 CY
POUR 2 (SIDEWALK)					1.7 CY
TOTAL					18.3 CY

BILL OF MATERIAL					
FOR ONE APPROACH SLAB @ END BENT 2 (2 REQ'D)					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	24	#4	STR	17'-7"	282
A2	26	#4	STR	17'-6"	304
*B1	67	#5	STR	11'-2"	780
B2	67	#6	STR	11'-8"	1174
*B3	5	#4	STR	11'-8"	39
*D1	11	#6	STR	2'-4"	39
*G1	12	#4	STR	5'-2"	41
*U1	4	#4	1	3'-4"	9
REINFORCING STEEL					1478 LB
* EPOXY COATED REINFORCING STEEL					1190 LB
CLASS "AA" CONCRETE BREAKDOWN					
POUR 1 (SLAB)					16.6 CY
POUR 2 (SIDEWALK)					1.7 CY
TOTAL					18.3 CY



SECTION N-N  
SIDEWALK DETAILS

BILL OF MATERIAL					
FOR ONE APPROACH SLAB @ END BENT 2 (2 REQ'D)					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	24	#4	STR	17'-7"	282
A2	26	#4	STR	17'-6"	304
*B1	67	#5	STR	11'-2"	780
B2	67	#6	STR	11'-8"	1174
*B3	5	#4	STR	11'-8"	39
*D1	11	#6	STR	2'-4"	39
*G1	12	#4	STR	5'-2"	41
*U1	4	#4	1	3'-4"	9
REINFORCING STEEL					1478 LB
* EPOXY COATED REINFORCING STEEL					1190 LB
CLASS "AA" CONCRETE BREAKDOWN					
POUR 1 (SLAB)					16.6 CY
POUR 2 (SIDEWALK)					1.7 CY
TOTAL					18.3 CY

\* INDICATES EPOXY COATED REINFORCING STEEL

PROJECT NO. I-5711  
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SHEET 3 OF 5

STATE OF NORTH CAROLINA  
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BRIDGE APPROACH  
 SLAB DETAILS

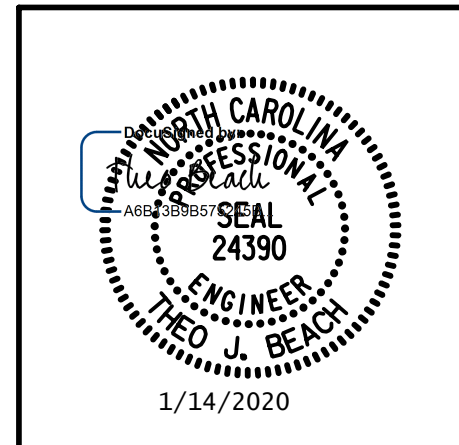
LEFT & RIGHT WIDENING

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TOTAL SHEETS	89

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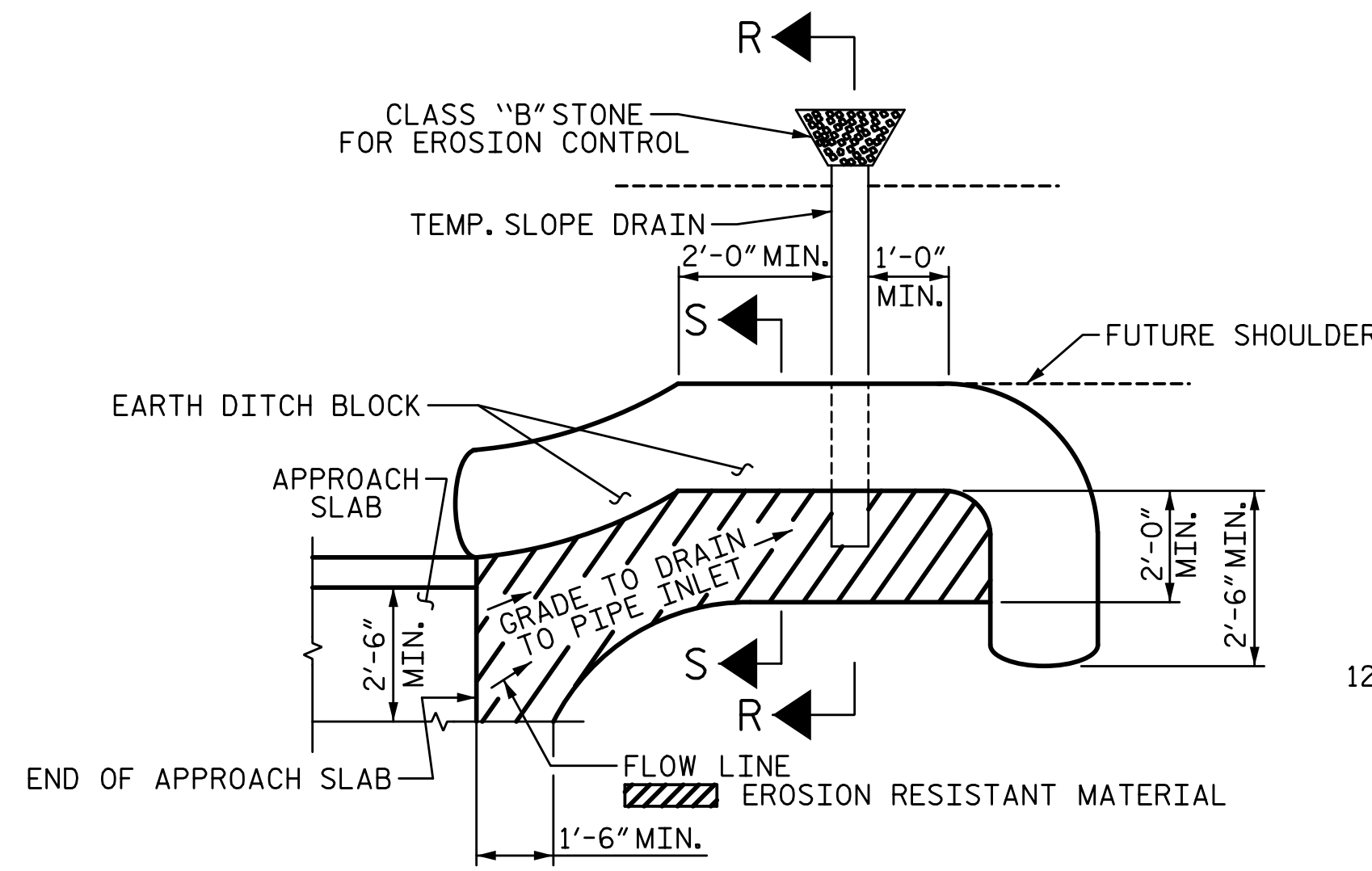
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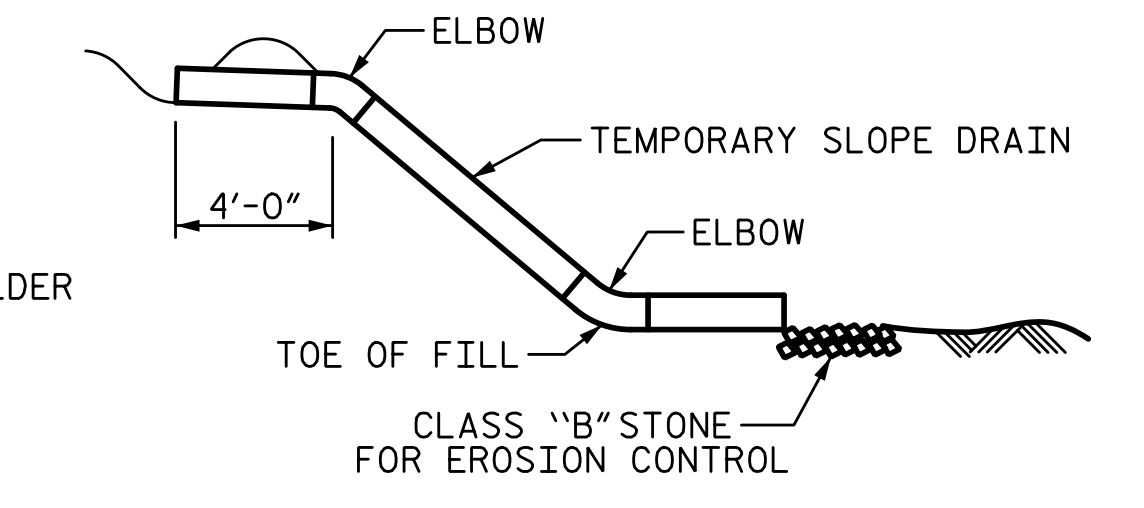
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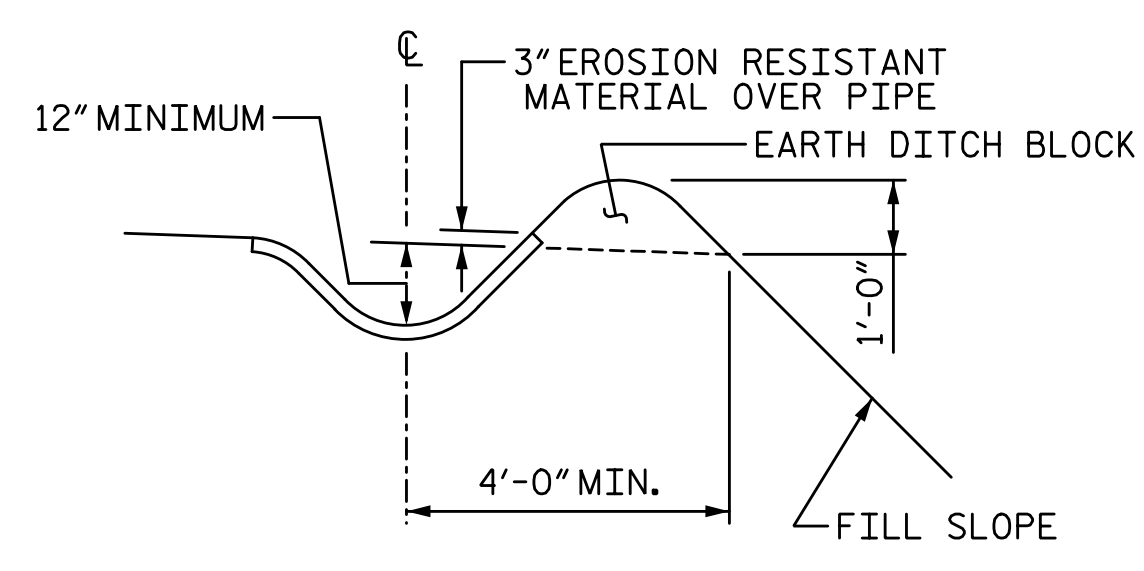


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

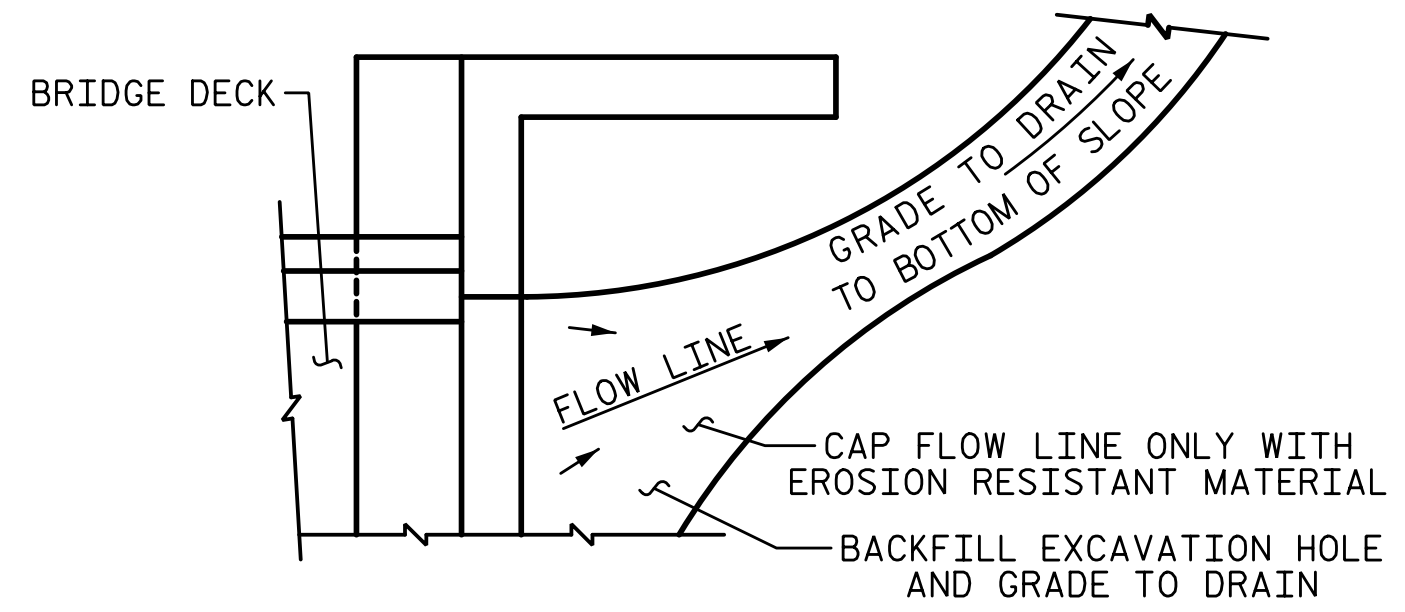
PLAN VIEW



SECTION R-R



SECTION S-S

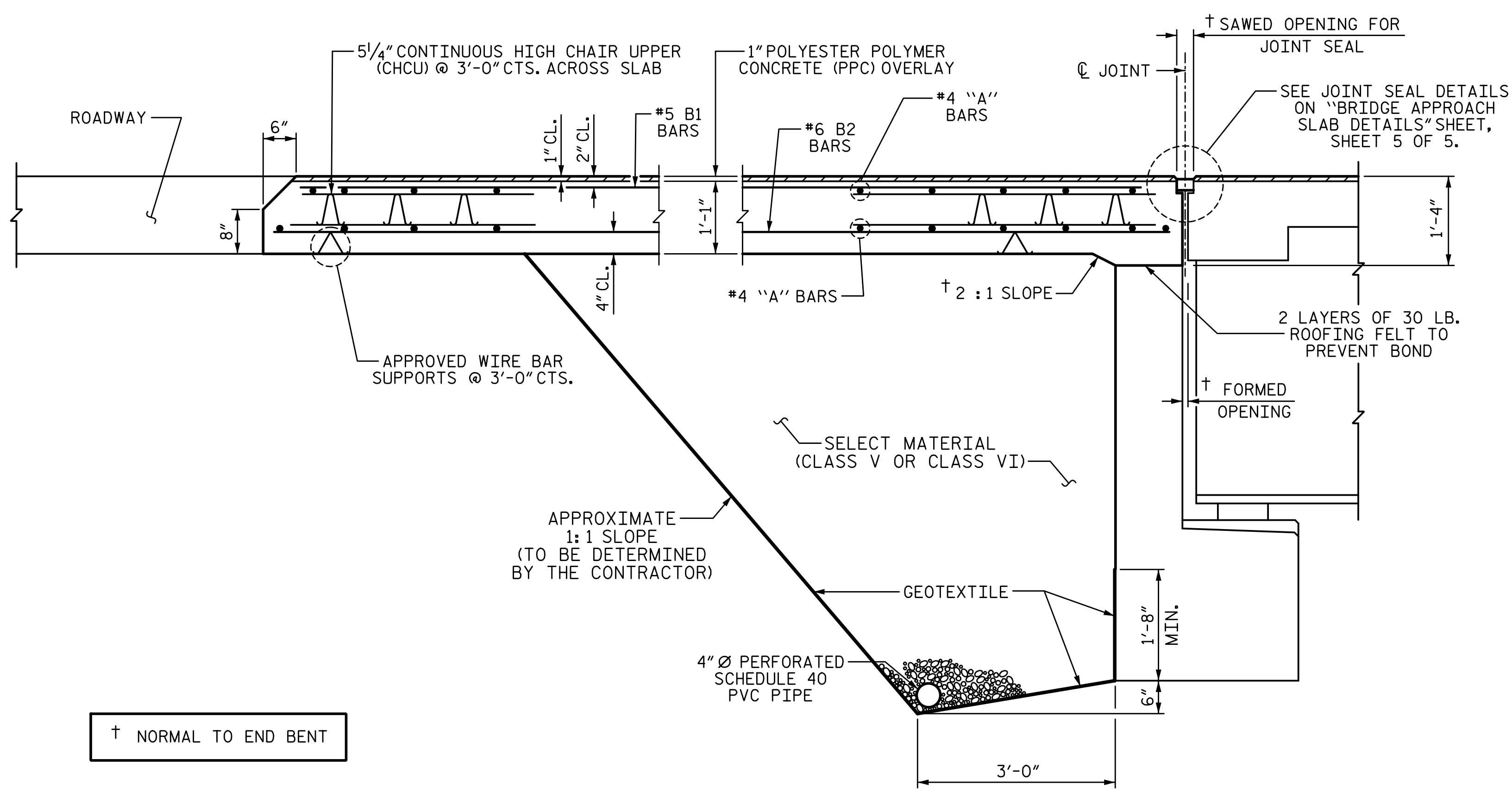


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)

NOTES:

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

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

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

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

THE JOINT SHALL BE SAWS PRIOR TO THE CASTING OF THE SIDEWALK AND END POST.

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

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

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

FOR FOAM JOINT SEALS, SEE PROJECT SPECIAL PROVISIONS.

\*6 D1 DOWELS TO BE ADHESIVELY ANCHORED IN THE EXISTING APPROACH SLAB. LEVEL ONE FIELD TESTING IS REQUIRED AND THE YIELD LOAD OF THE DOWELS IS 13.2 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS SEE SECTION 420-13 OF STANDARD SPECIFICATIONS. OVERALL DOWEL LENGTH SHALL PROVIDE FOR 1'-6" MIN. EXTENSION INTO NEW APPROACH SLAB. EMBEDMENT LENGTH TO BE DETERMINED BY THE MANUFACTURER OF THE ADHESIVELY ANCHORED ANCHOR SYSTEM. PLAN LENGTH OF \*6 D1 DOWELS BASED ON 10" EMBEDMENT.

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SHEET 4 OF 5

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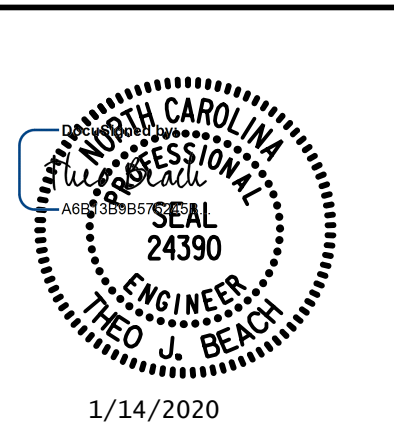
BRIDGE APPROACH  
 SLAB DETAILS

LEFT & RIGHT WIDENING

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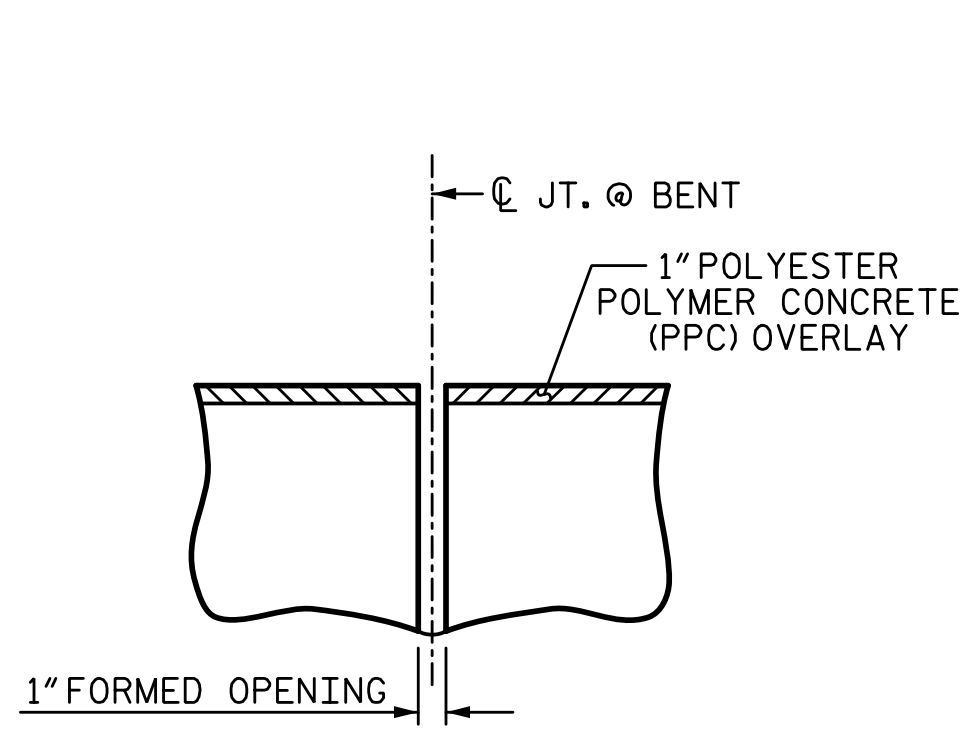
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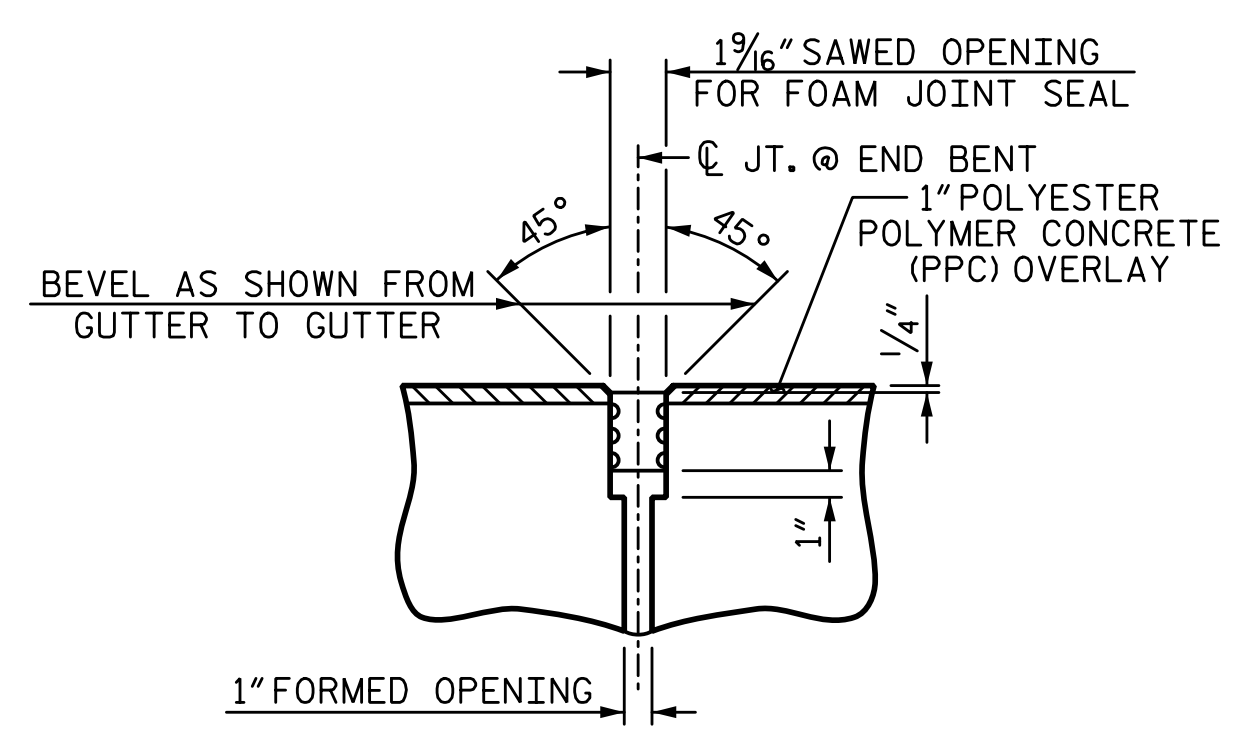
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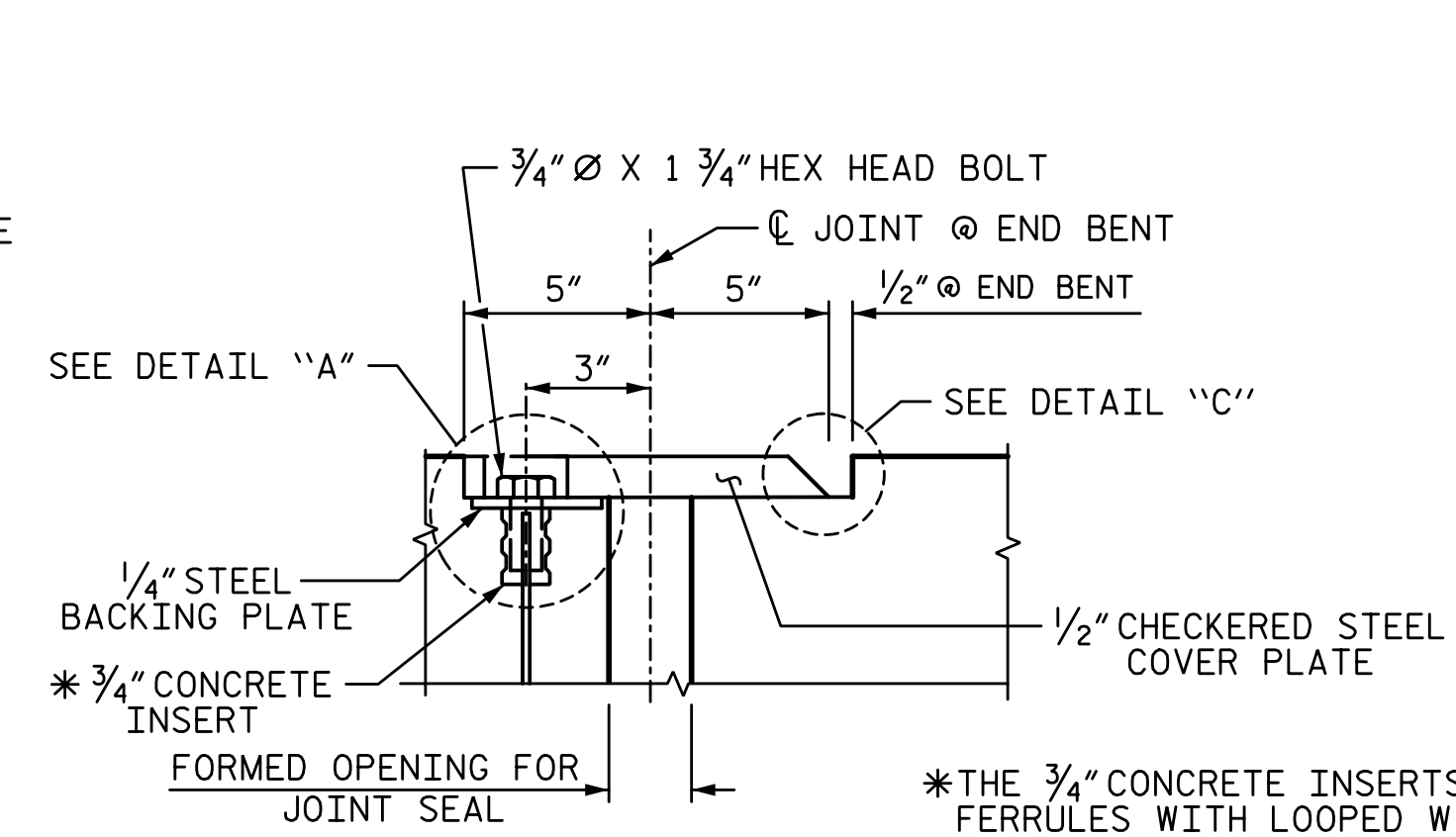




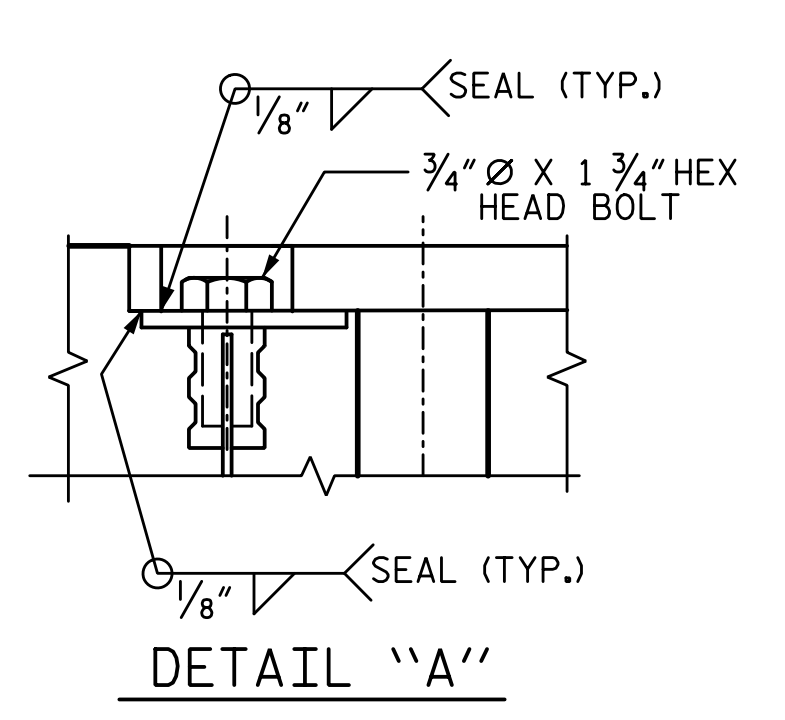
**SECTION C-C**  
FOAM JOINT SEAL  
(PRE-SAWED ELASTOMERIC  
CONCRETE DIMENSIONS)



**SECTION C-C**  
FOAM JOINT SEAL  
(FIXED)

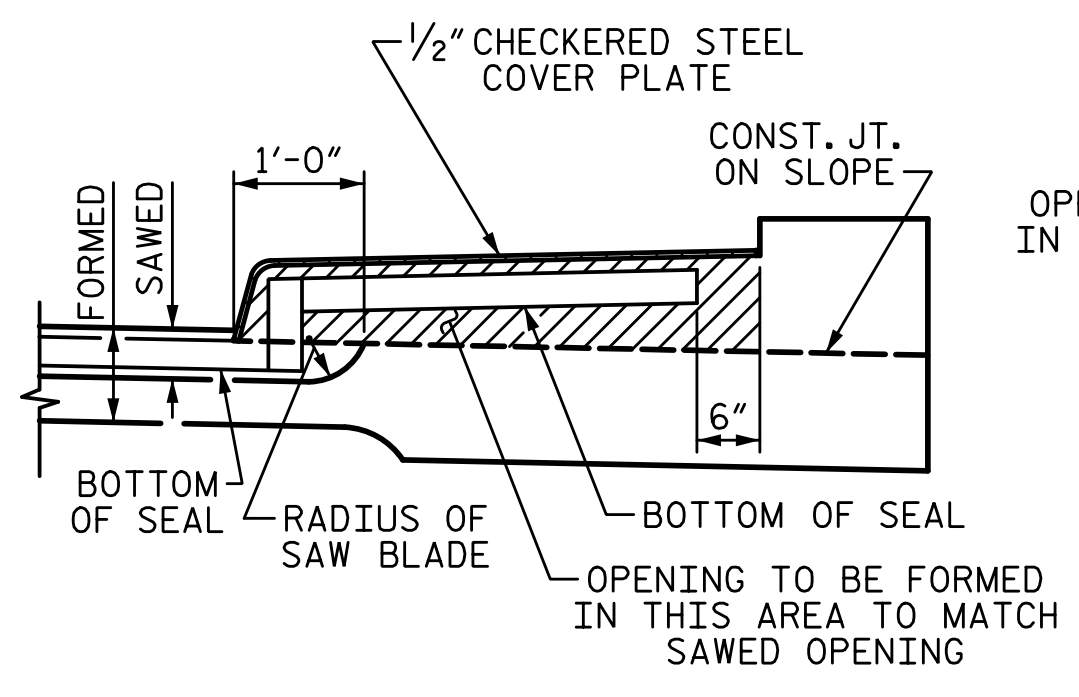


**SECTION K-K**

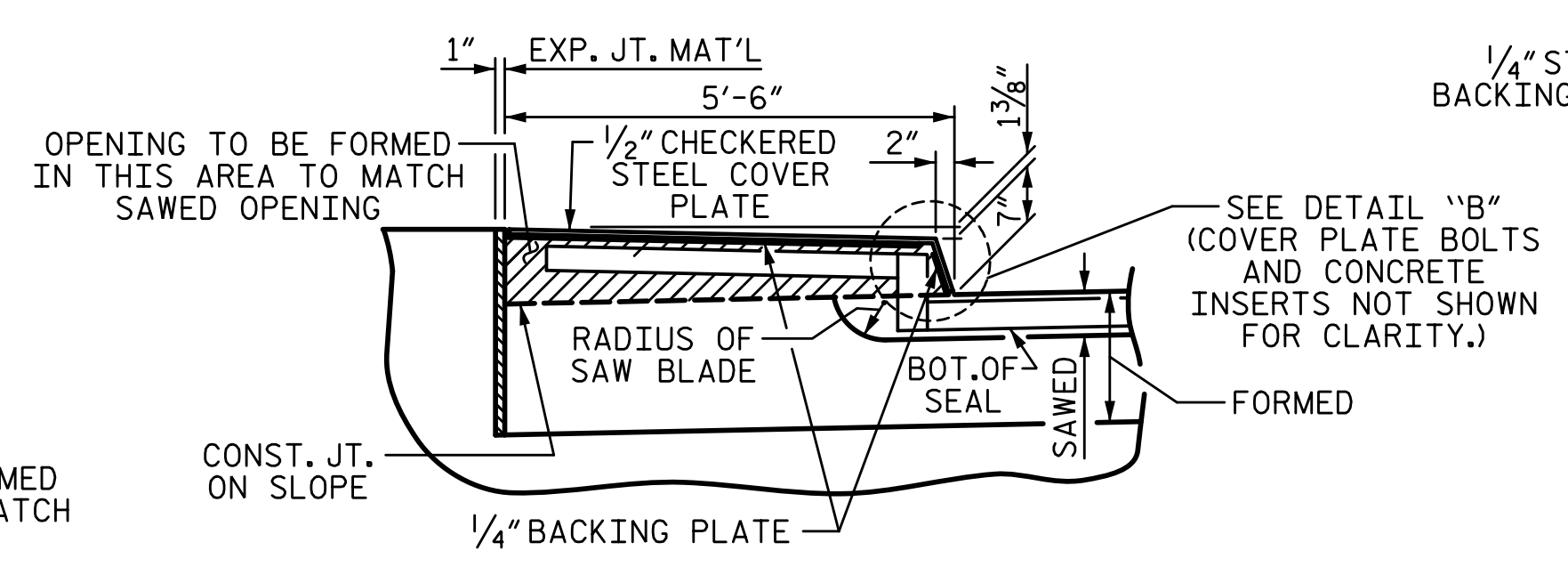


**DETAIL "A"**

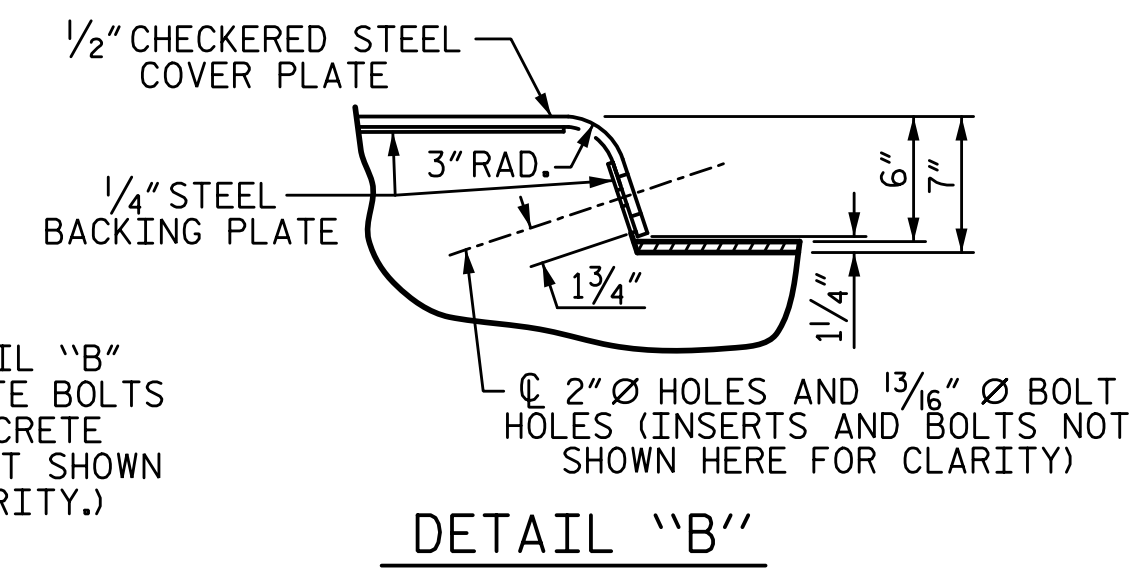
\*THE 3/4" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14 AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LBS.



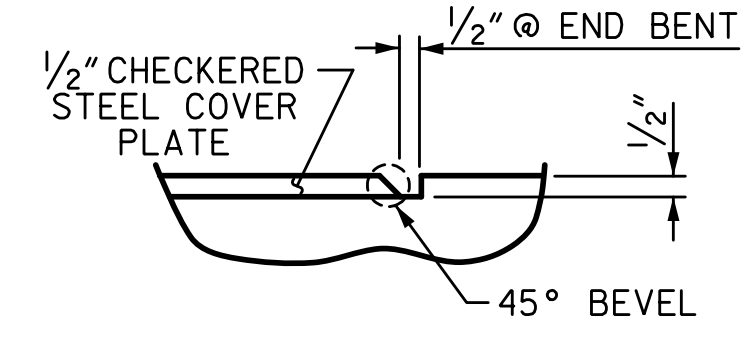
**SECTION H-H**



**SECTION I-I**



**DETAIL "B"**



**DETAIL "C"**

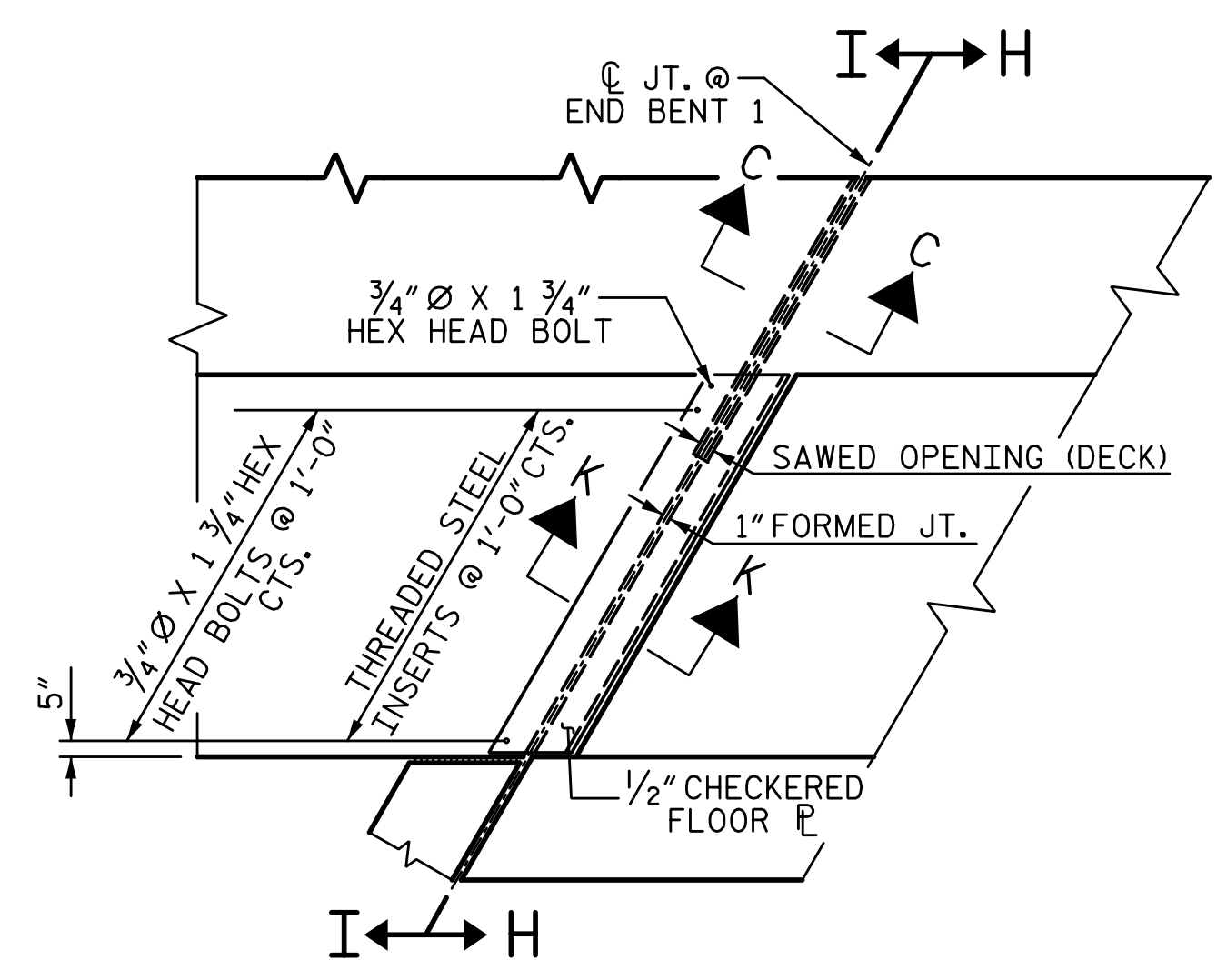
**JOINT SEAL DETAILS @ END BENT**

**NOTES:**

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

THE 3/4" DIAMETER HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

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



**PLAN VIEW OF FOAM JOINT SEAL @ END BENT FOR SIDEWALK**  
(PLAN VIEW @ END BENT 1 SHOWN, END BENT 2 SIMILAR)

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ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

SHEET 5 OF 5

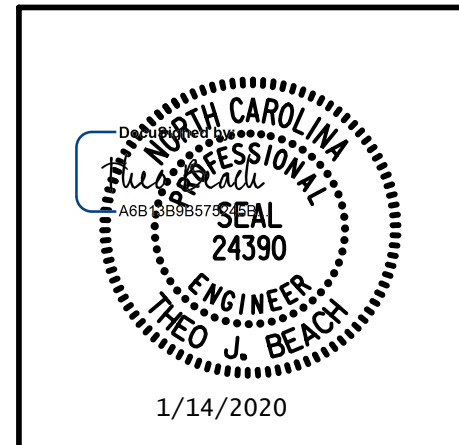
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RALEIGH

**BRIDGE APPROACH  
SLAB DETAILS**  
LEFT & RIGHT WIDENING

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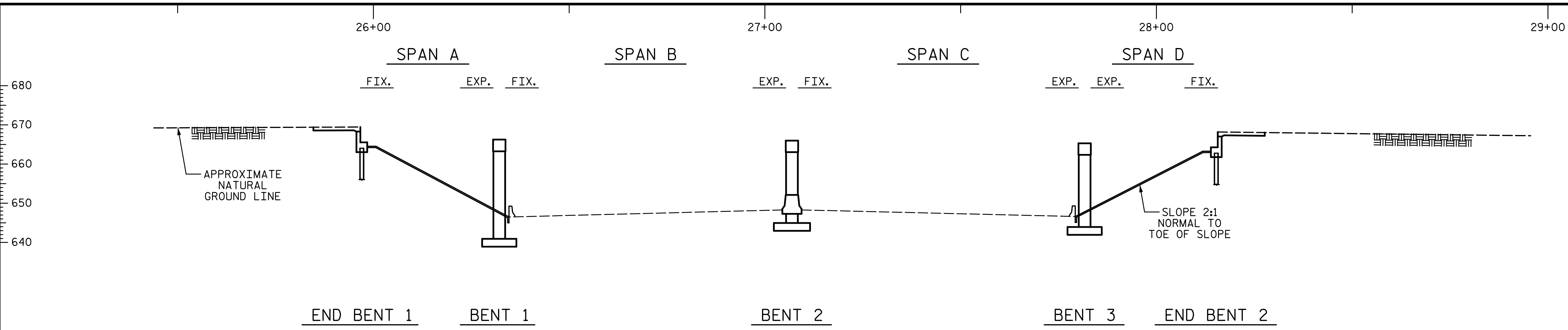
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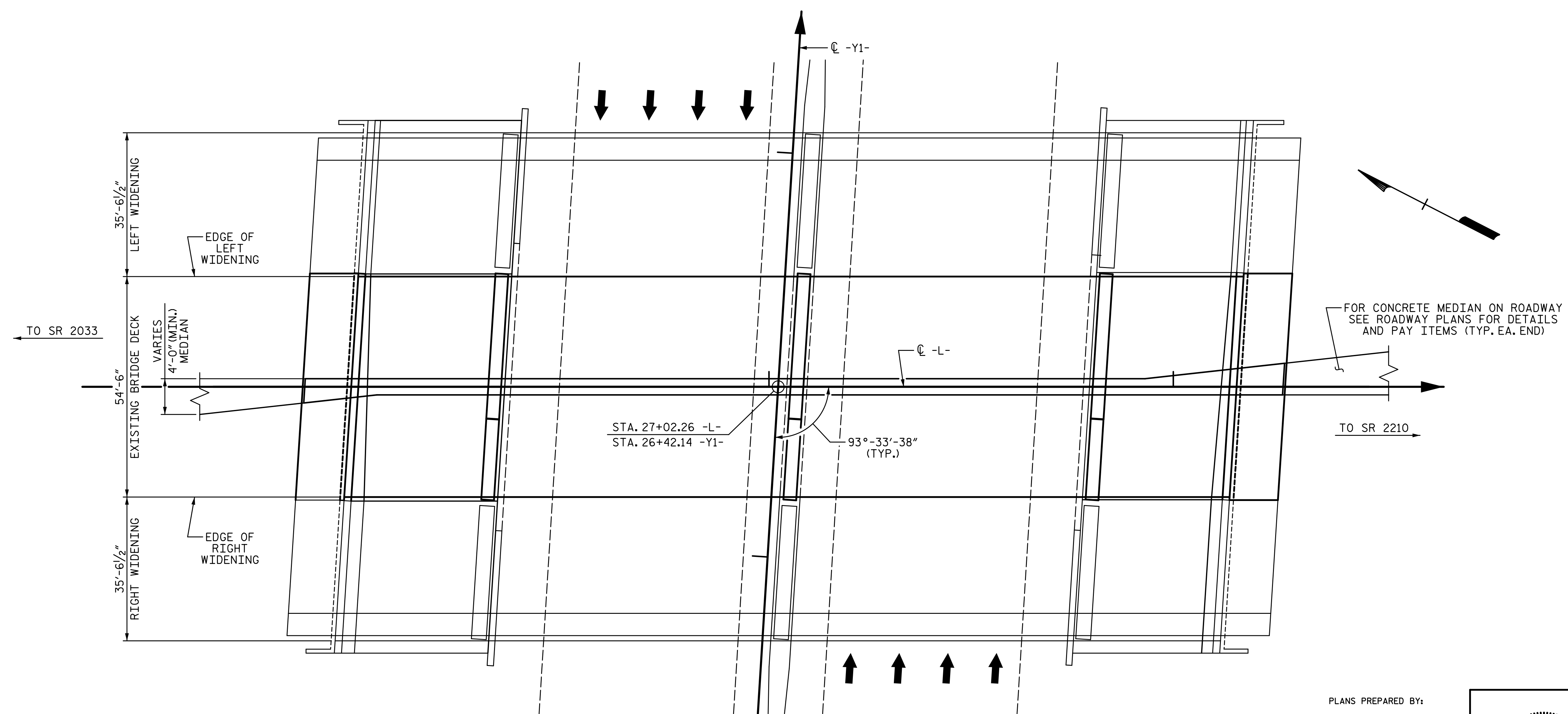
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**SECTION ALONG  $\bar{C}$  SURVEY -L-**  
 (SECTIONS @ END BENTS AND BENTS ARE @ RIGHT ANGLES)

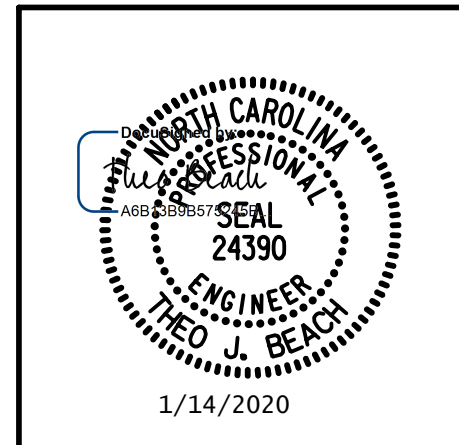


**PLAN**

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PROJECT NO. I-5711  
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SHEET 1 OF 2  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
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**GENERAL DRAWING**  
 FOR BRIDGE ON MEBANE OAKS  
 ROAD OVER I-40/I-85  
 BETWEEN SR 2033 AND SR 2210

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**NOTES:**

EXISTING DIMENSIONS AND BRIDGE CONDITION ARE FROM BEST INFORMATION AVAILABLE. THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER.

EXISTING JOINTS SHALL BE SEALED PRIOR TO PPC OVERLAY

LONGITUDINAL CONTRUCTION JOINTS FOR PPC OVERLAY SHALL BE LOCATE ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CONCRETE DECK REPAIR FOR PPC OVERLAY, PPC MATERIALS, PLACING AND FINISHING PPC OVERLAY, SEE "POLYESTER POLYMER CONCRETE BRIDGE DECK OVERLAY" SPECIAL PROVISION.

FOR SCARIFYING BRIDGE DECK, SHOTBLASTING BRIDGE DECK, AND CLASS II SURFACE PROTECTION, SEE "OVERLAY SURFACE PREPARATION FOR POLYESTER POLYMER CONCRETE" SPECIAL PROVISION.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

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

FOR OTHER DESIGN DATA AND GENERAL NOTES. SEE STANDARD NOTES.

**TOTAL BILL OF MATERIAL**

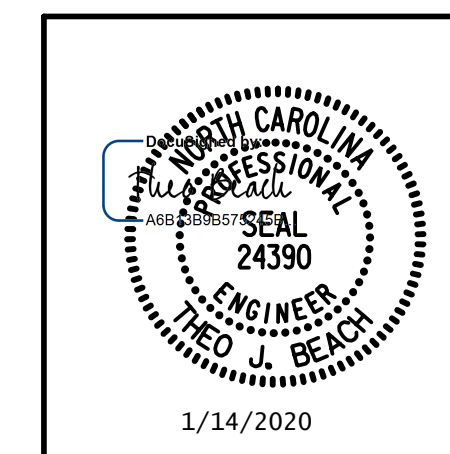
BRIDGE NO.	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	EPOXY COATED REINFORCING STEEL	CLASS II SURFACE PREPARATION	SHOTCRETE REPAIRS	EPOXY RESIN INJECTION	FOAM JOINT SEAL	POLYESTER POLYMER CONCRETE MATERIALS	EPOXY COATING	CONCRETE DECK REPAIR FOR POLYESTER POLYMER CONCRETE OVERLAY	PLACING AND FINISHING POLYESTER POLYMER CONCRETE OVERLAY	SCARIFYING BRIDGE DECK	SHOTBLASTING BRIDGE DECK
	SF	SY	LB	SY	CF	LF	LS	CY	SF	SY	SY	SY	SY
000177	12,377.6	16.2	911	4.2	6.4	1,112.0	LS	40.7	647.4	4.2	1,464.5	1,464.5	1,464.5
<b>TOTAL</b>	<b>12,377.6</b>	<b>16.2</b>	<b>911</b>	<b>4.2</b>	<b>6.4</b>	<b>1,112.0</b>	<b>LS</b>	<b>40.7</b>	<b>647.4</b>	<b>4.2</b>	<b>1,464.5</b>	<b>1,464.5</b>	<b>1,464.5</b>

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ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 2 OF 2

PLANS PREPARED BY:

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**GENERAL DRAWING**  
 FOR BRIDGE ON MEBANE OAKS  
 ROAD OVER I-40/I-85  
 BETWEEN SR 2033 AND SR 2211

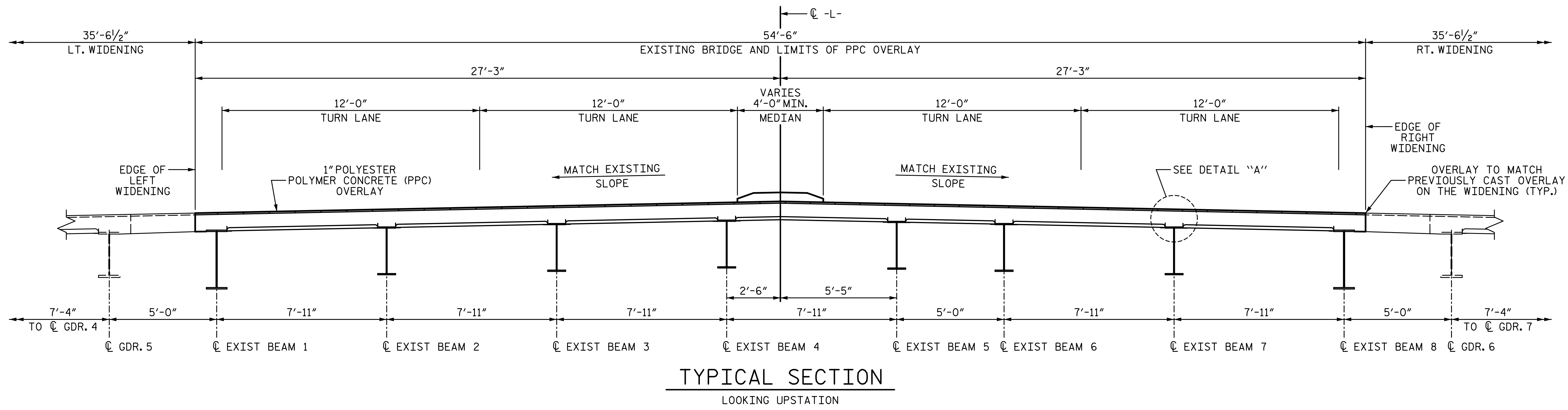
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2			4			TOTAL SHEETS 89

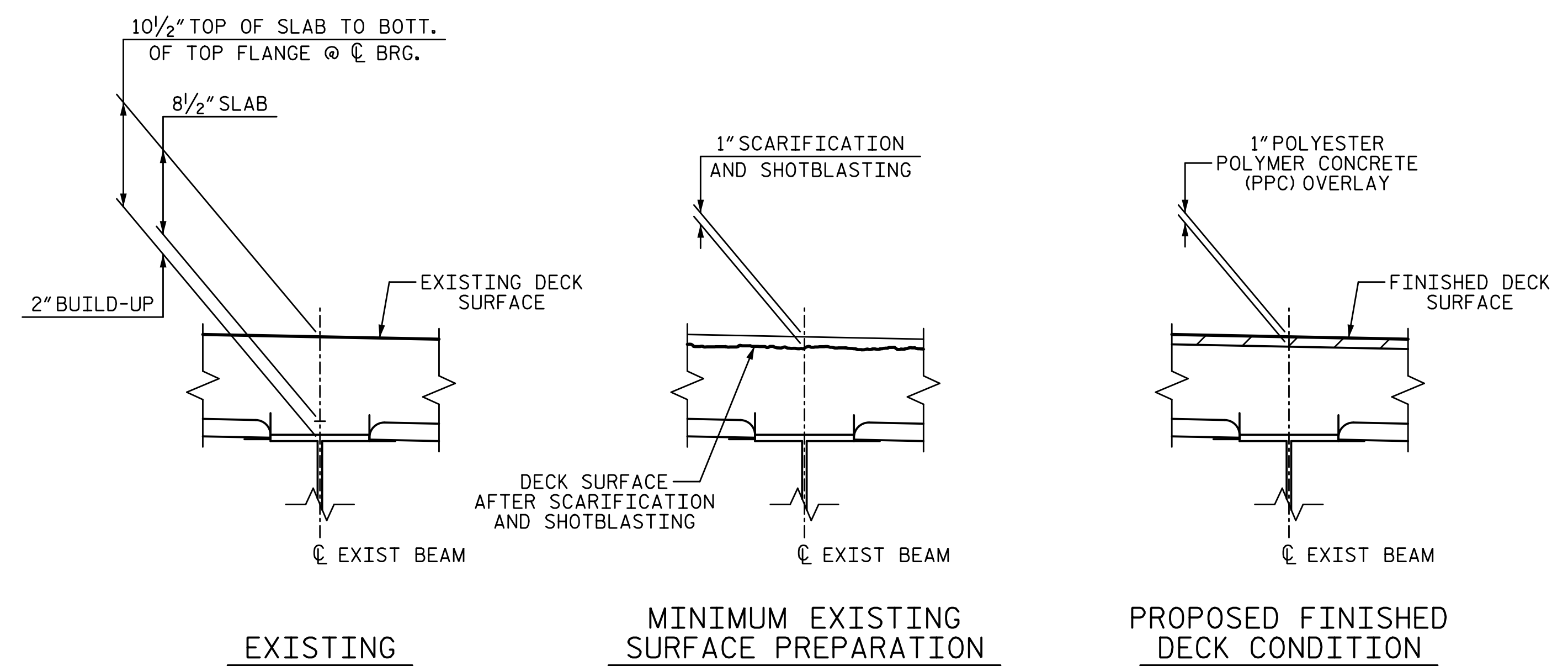
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**NOTES:**  
 SEE TRAFFIC MANAGEMENT PLANS FOR LANE WIDTHS, SEQUENCING AND OTHER TRAFFIC CONTROL MEASURES FOR STAGING OF POLYESTER POLYMER CONCRETE OVERLAY AND SURFACE PREPARATION.  
 FOR LIMITS OF SHOTBLASTING AND CLASS II REPAIR AND EPOXY OVERLAY, SEE SURFACE PREPARATION SHEETS.



**TYPICAL SECTION**  
 LOOKING UPSTATION



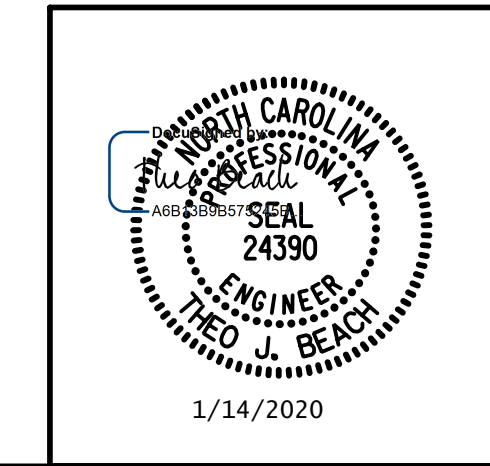
**DETAIL "A"**  
 DETAILS FOR POLYESTER POLYMER CONCRETE OVERLAY ON EXISTING DECK

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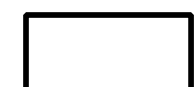
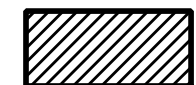
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**SURFACE PREPARATION  
 TYPICAL SECTION  
 & DETAILS**

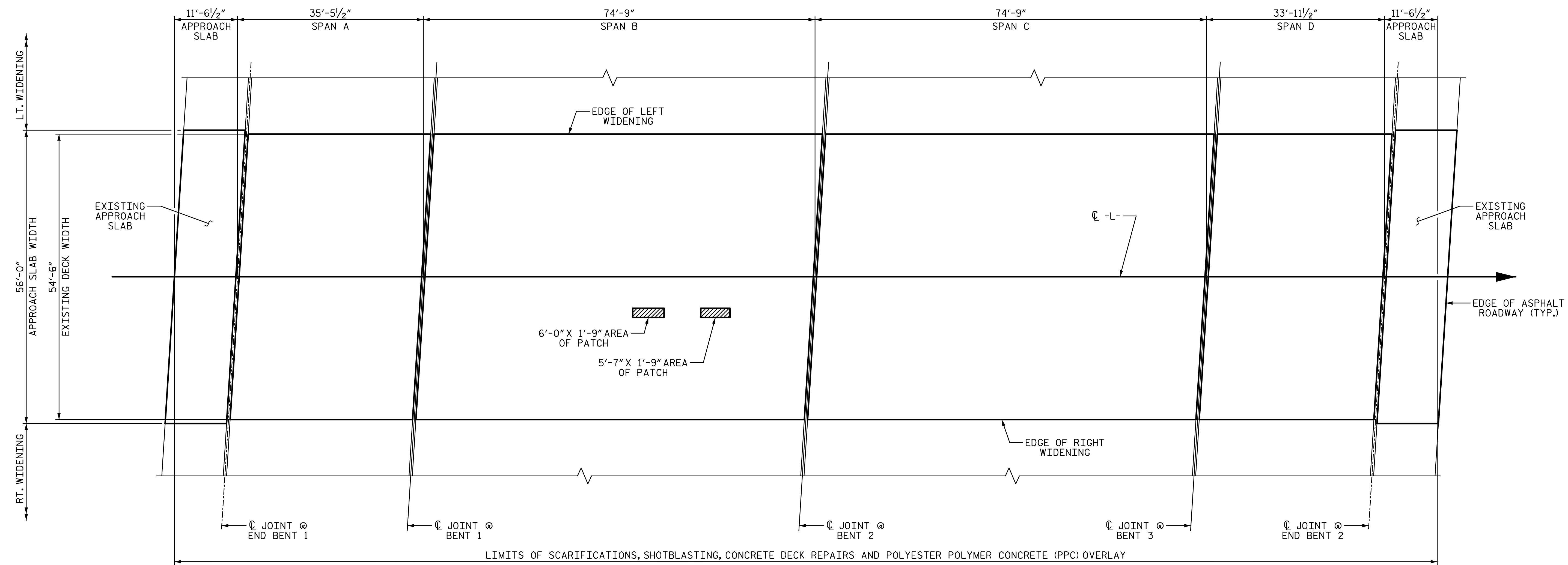
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TOTAL BRIDGE DECK QUANTITIES		
	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	1464.5 SY	
CLASS II SURFACE PREPARATION	4.2 SY	
CONCRETE DECK REPAIR FOR PPC OVERLAY	4.2 SY	
SHOTBLASTING BRIDGE DECK	1464.5 SY	
PPC MATERIALS	40.7 CY	
PLACING AND FINISHING PPC OVERLAY	1464.5 SY	
GROOVING BRIDGE FLOORS	12377.6 SF	

 SCARIFICATION, SHOTBLASTING, AND POLYESTER POLYMER CONCRETE OVERLAY  
 CLASS II SURFACE PREPARATION AND CONCRETE DECK REPAIR FOR PPC OVERLAY



SPAN A
SPAN B
SPAN C
SPAN D

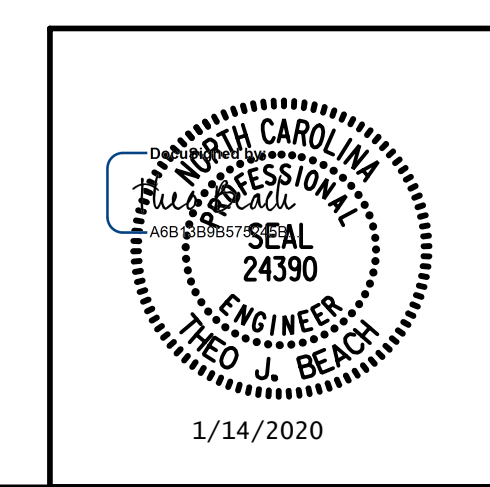
**PLAN OF BRIDGE DECK & APPROACH SLABS**

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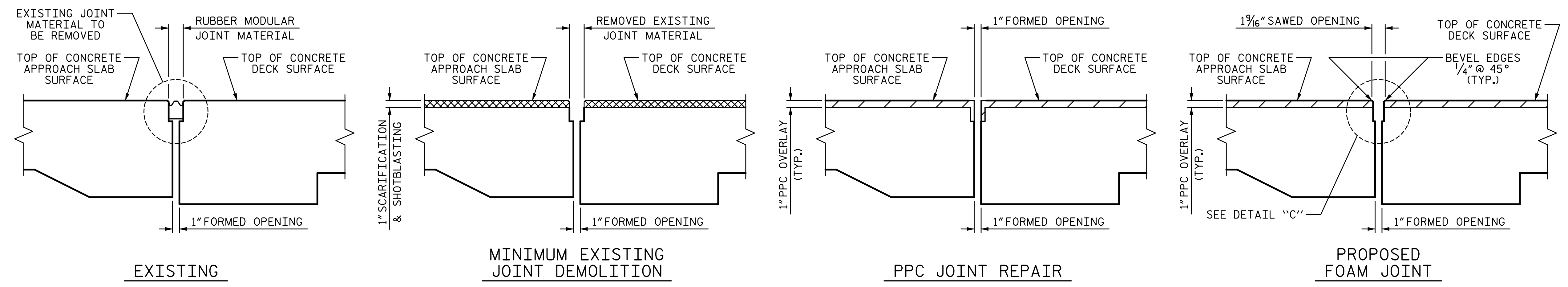


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**SURFACE PREPARATION**

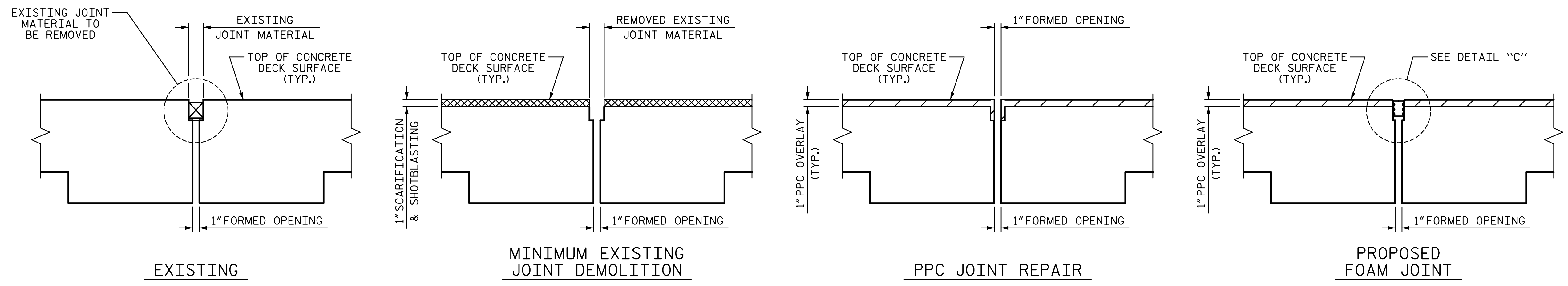
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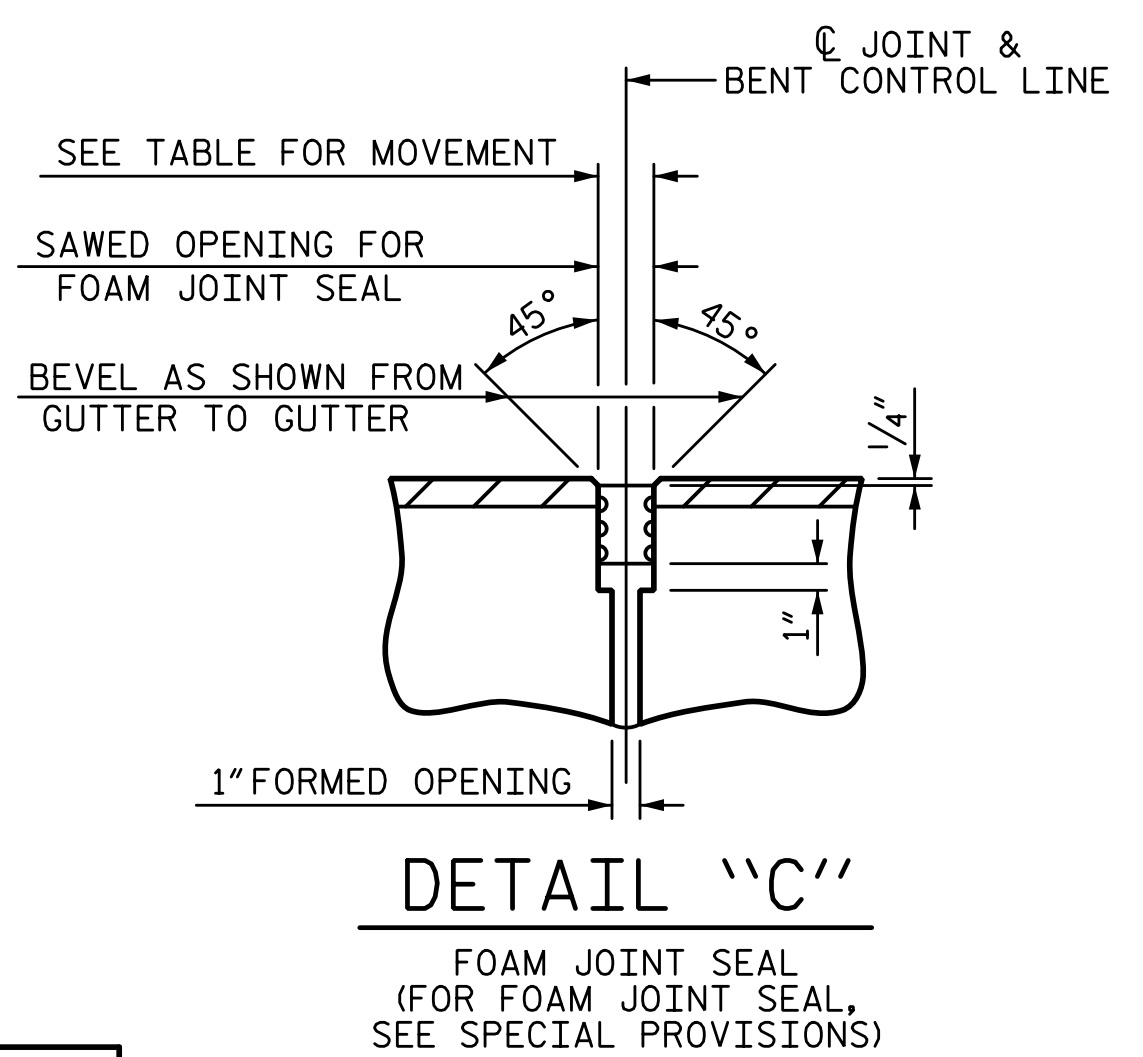
**NOTES:**  
 FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.  
 THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2" AT THE END BENTS, AND BENTS 1, 2 AND 3.



**JOINT INSTALLATION SEQUENCE AT END BENTS**  
 END BENT 1 SHOWN, END BENT 2 SIMILAR



**JOINT INSTALLATION SEQUENCE AT BENTS**  
 BENTS 1, 2, & 3



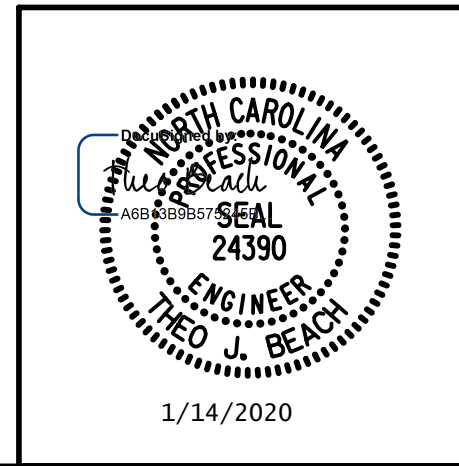
MOVEMENT AND SETTING AT JOINT			
LOCATION	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
BENT 1	1 5/8"	1 7/8"	1 11/16"
BENT 2	1 9/8"	1 9/16"	1 9/16"
BENT 3	1 1/2"	1 3/8"	1 5/16"

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

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DRAWN BY: T. BANKOVICH DATE: 1-20  
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 DESIGN ENGINEER OF RECORD: T. BEACH DATE: 1-20

PLANS PREPARED BY:  
**SE & A**  
 SIMPSON ENGINEERS & ASSOCIATES  
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 (919) 852-0538 (Fax)  
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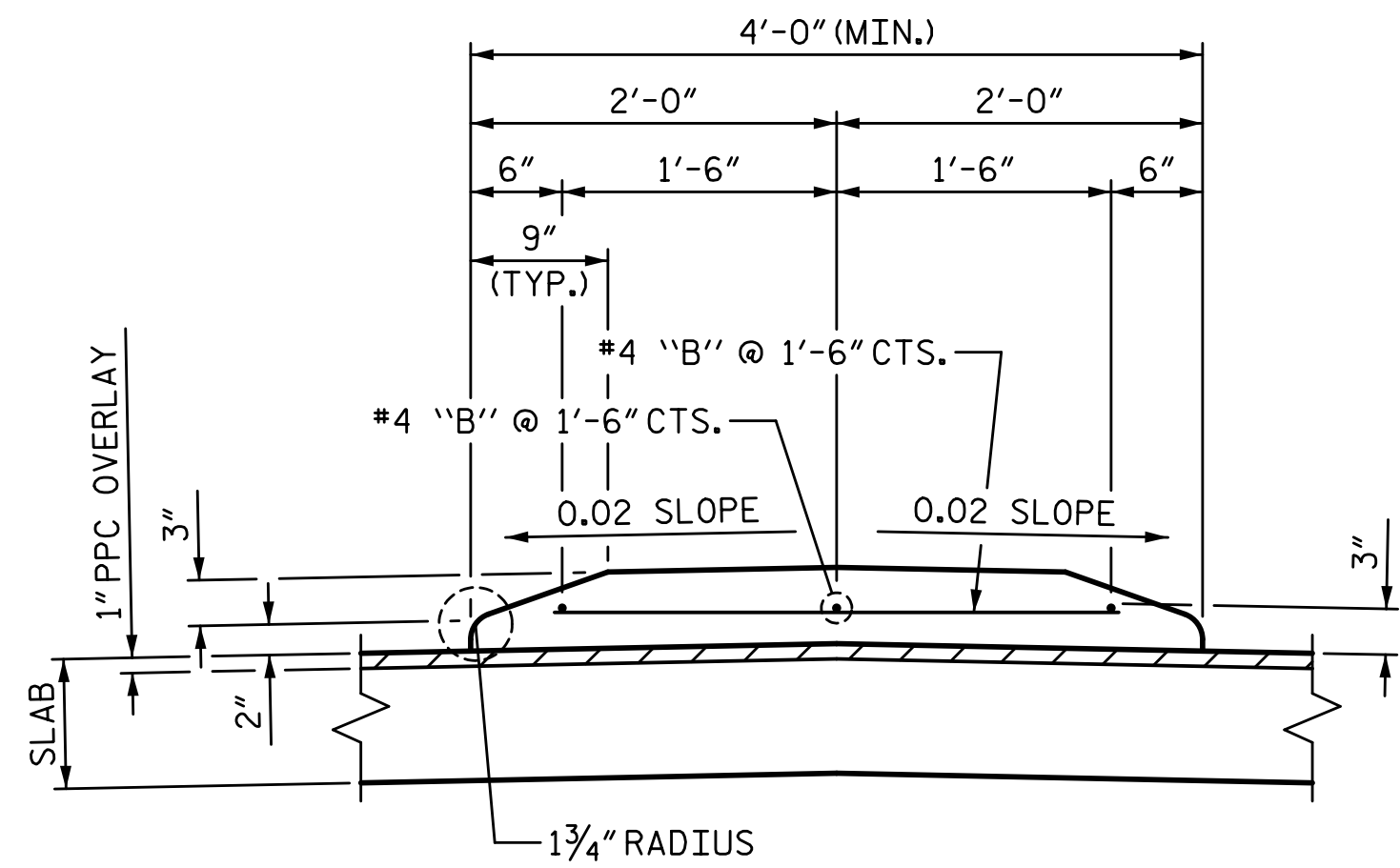
**JOINT REPAIR DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-79
1			3			TOTAL SHEETS
2			4			89

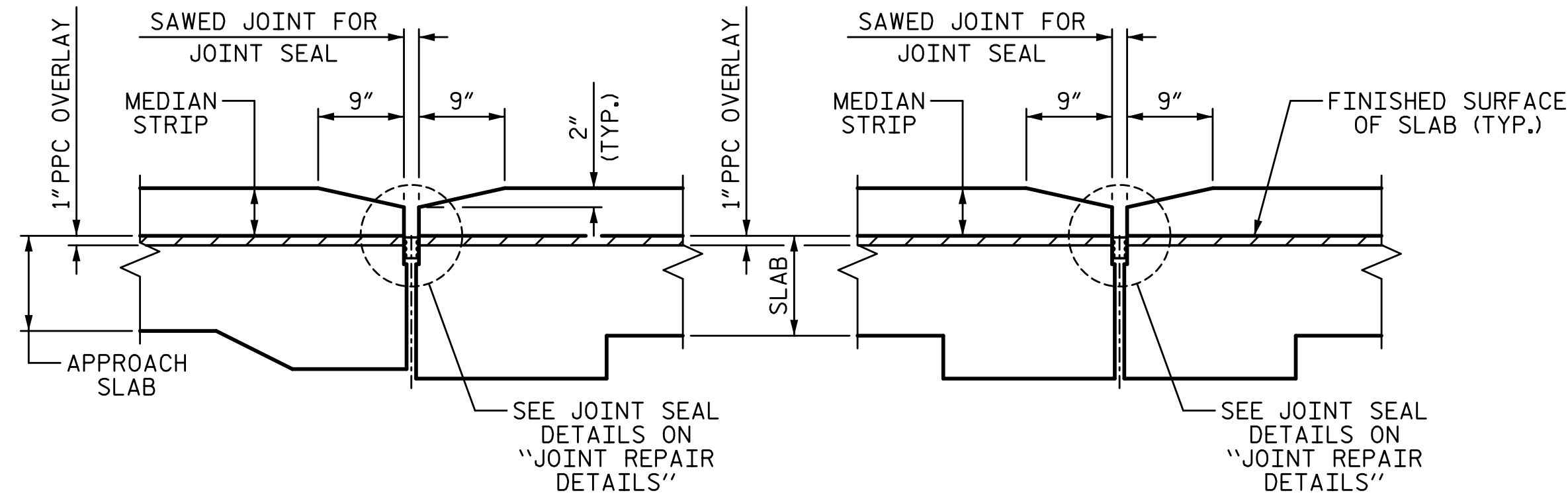
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**SECTION A-A**  
SECTION THRU MONOLITHIC CONCRETE ISLAND



**APPROACH SLAB**  
END BENT 1 SHOWN, END BENT 2 SIMILAR

**BENT**  
BENTS 1, 2, & 3

**DETAILS AT JOINT**

**NOTES:**

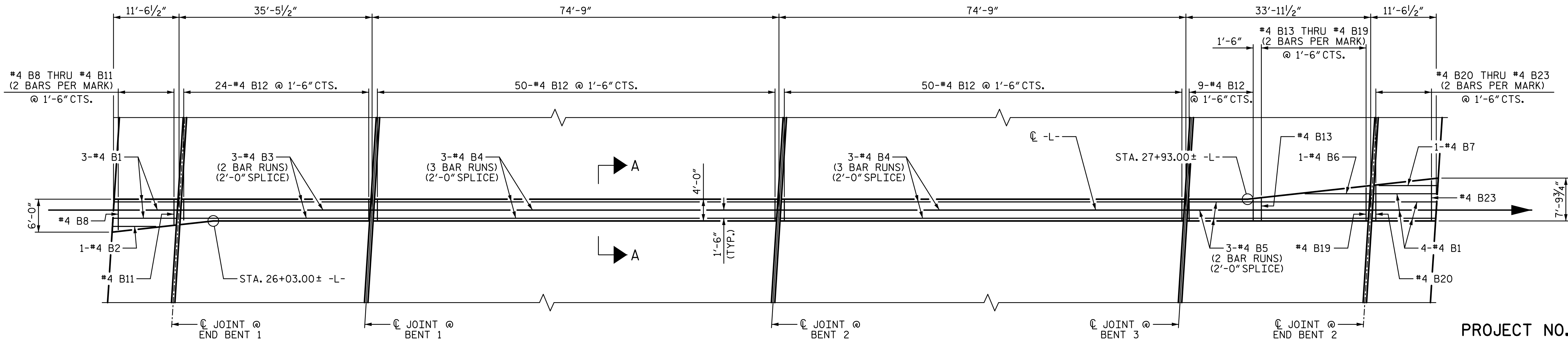
ALL REINFORCING STEEL IN MONOLITHIC CONCRETE ISLAND SHALL BE EPOXY COATED.

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

THE MONOLITHIC CONCRETE ISLAND TO BE INSTALLED AFTER THE POLYESTER POLYMER OVERLAY HAS BEEN COMPLETED AND CURED.

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	7	#4	STR	11'-2"	52
*B2	1	#4	STR	7'-3"	5
*B3	6	#4	STR	18'-6"	74
*B4	18	#4	STR	26'-1"	314
*B5	6	#4	STR	17'-9"	71
*B6	1	#4	STR	11'-9"	8
*B7	1	#4	STR	10'-1"	7
*B8	2	#4	STR	4'-11"	7
*B9	2	#4	STR	4'-7"	6
*B10	2	#4	STR	4'-3"	6
*B11	2	#4	STR	3'-11"	5
*B12	133	#4	STR	3'-2"	281
*B13	2	#4	STR	3'-5"	5
*B14	2	#4	STR	3'-9"	5
*B15	2	#4	STR	4'-1"	5
*B16	2	#4	STR	4'-5"	6
*B17	2	#4	STR	4'-9"	6
*B18	2	#4	STR	5'-1"	7
*B19	2	#4	STR	5'-5"	7
*B20	2	#4	STR	5'-9"	8
*B21	2	#4	STR	6'-0"	8
*B22	2	#4	STR	6'-5"	9
*B23	2	#4	STR	6'-9"	9
EPOXY COATED REINFORCING STEEL					911 LB
CLASS A CONCRETE SUPERSTRUCTURE					14.0 CY
APPROACH SLAB					2.2 CY
TOTAL					16.2 CY

\* INDICATES EPOXY COATED REINFORCING STEEL



**SPAN A**                      **SPAN B**                      **SPAN C**                      **SPAN D**

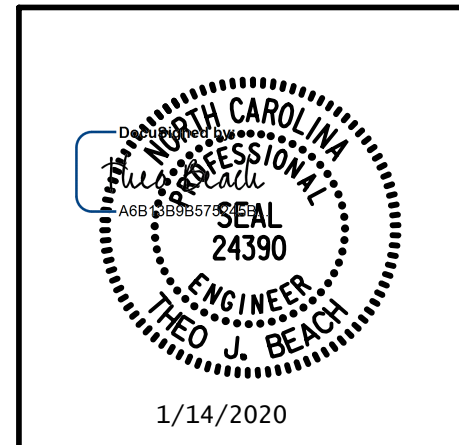
**PLAN OF MONOLITHIC CONCRETE ISLAND**

SEE ROADWAY PLANS FOR MEDIAN DETAILS AND PAY ITEMS BEYOND THE LIMITS OF THE BRIDGE

PROJECT NO. I-5711  
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 DESIGN ENGINEER OF RECORD: T. BEACH                      DATE: 1-20

PLANS PREPARED BY:  
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**MONOLITHIC CONCRETE ISLAND DETAILS**

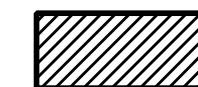
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NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

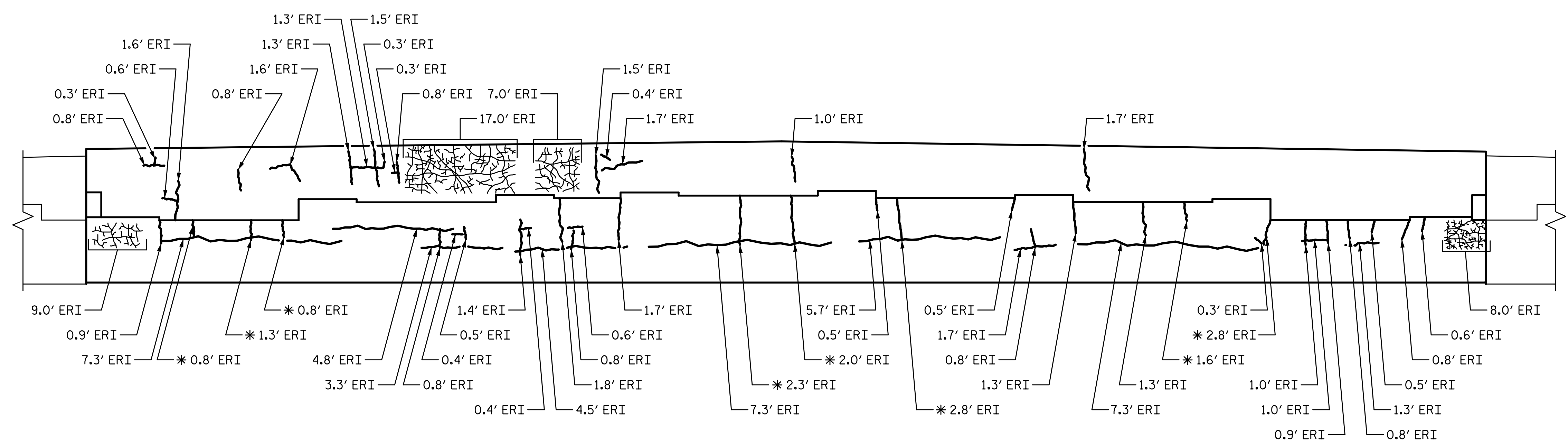
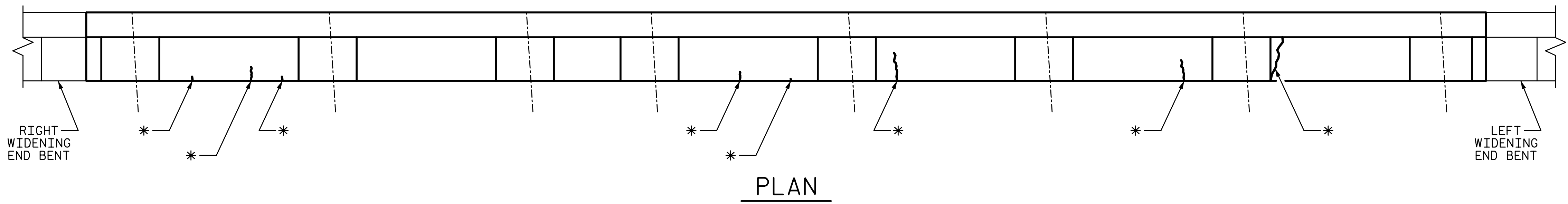
SHEET NO. S-80  
 TOTAL SHEETS 89

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### REPAIR QUANTITY TABLE

REPAIRS END BENT 1	QUANTITIES				
	ESTIMATE		ACTUAL		
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	DEPTH FT	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0			
CAP (HORIZONTAL, CORNER)	0.0	0.0			
EPOXY RESIN INJECTION		LF			LF
CAP		135.7			
EPOXY COATING		AREA SF			AREA SF
TOP OF CAP		83.0			

 SHOTCRETE REPAIR  
 ERI — EPOXY RESIN INJECTION



\* QUANTITIES INCLUDE TOP & FACE OF END BENT CAP

**NOTES:**

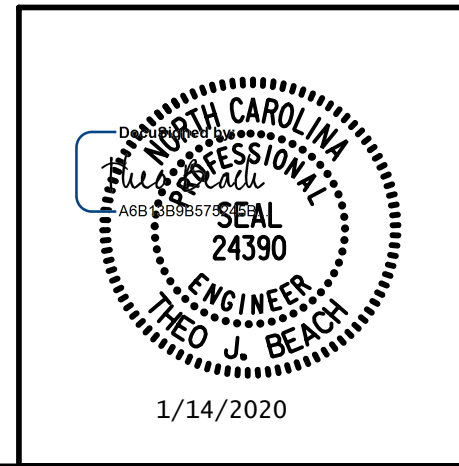
- REPAIR LOCATIONS AND ESTIMATE OF THE QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE INSPECTOR OR ENGINEER THE CONTRACTOR SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE REPAIR QUANTITY TABLE.
- FOR EPOXY COATING, SEE SPECIAL PROVISIONS.
- FOR SUBSTRUCTURE REPAIR DETAIL, SEE "SUBSTRUCTURE REPAIR DETAIL" SHEET.
- FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.
- FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.
- SHOTCRETE REPAIR MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.
- THE CONTRACTOR SHALL CLEAN AND EPOXY COAT PAINT THE TOP SURFACE OF BENT CAP.
- FOR EPOXY COATING, SEE SPECIAL PROVISIONS.
- VALUES IN CHART REPRESENT ESTIMATE REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 2" CL. TO SAWCUT. SEE REPAIR DETAILS.

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## END BENT 1

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 SHOTCRETE REPAIR  
 ERI — EPOXY RESIN INJECTION

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FOR SUBSTRUCTURE REPAIR DETAIL, SEE "SUBSTRUCTURE REPAIR DETAIL" SHEET.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

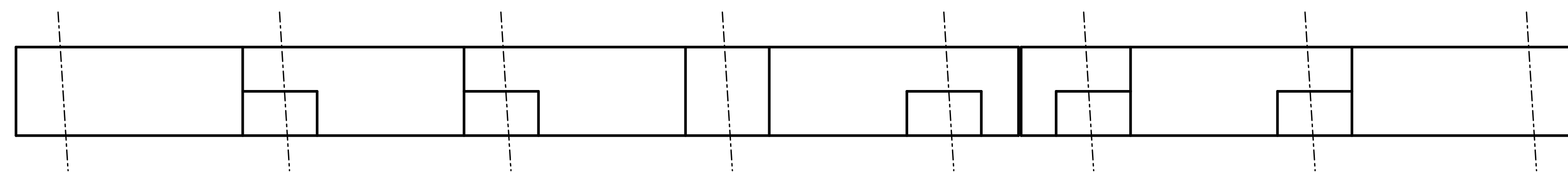
SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL CLEAN AND EPOXY COAT PAINT THE TOP SURFACE OF BENT CAPS.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

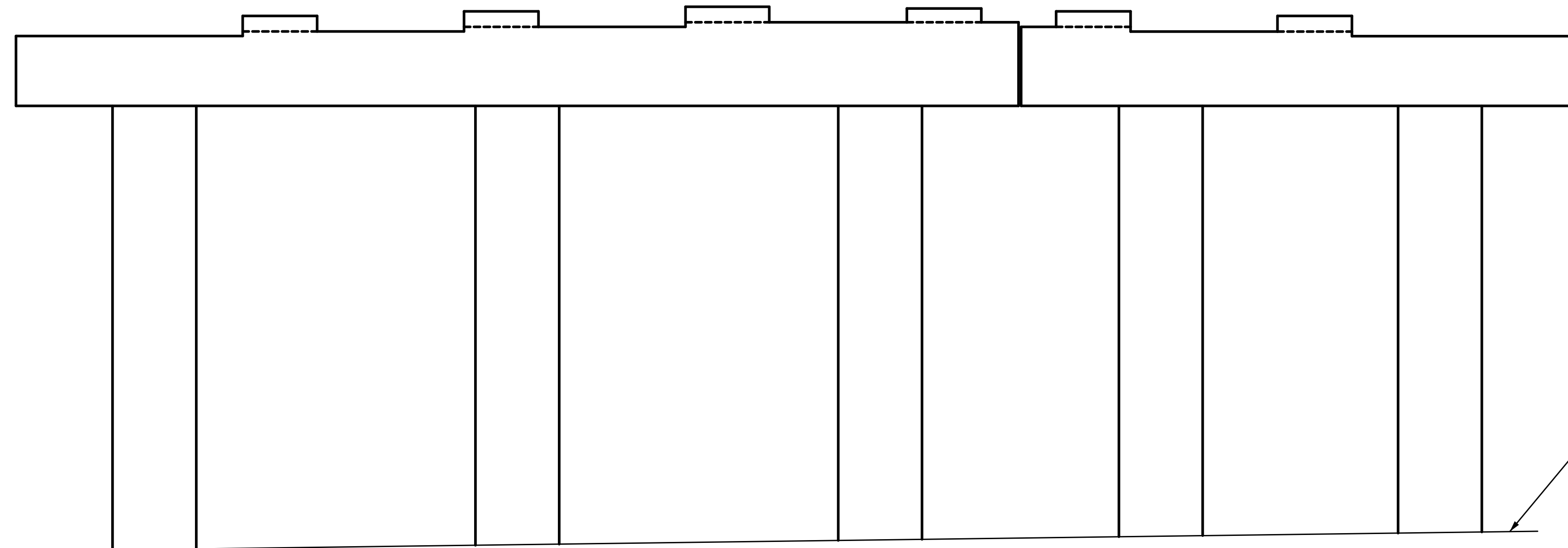
SEE SHEET 2 OF 2 FOR "REPAIR QUANTITY TABLE".



SPAN B

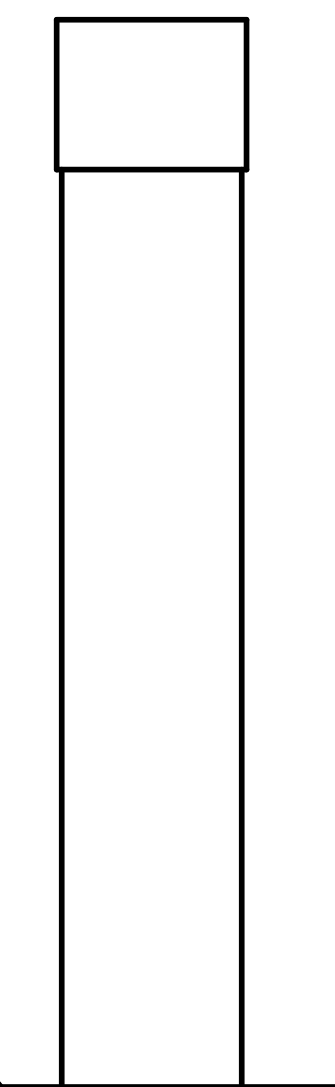
SPAN A

PLAN  
TOP OF CAP



ELEVATION  
SPAN A FACE

CONCRETE  
SLOPE  
PROTECTION



END VIEW  
WEST FACE

PROJECT NO. I-5711  
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 STATION: STA. 27+02.26 -L-

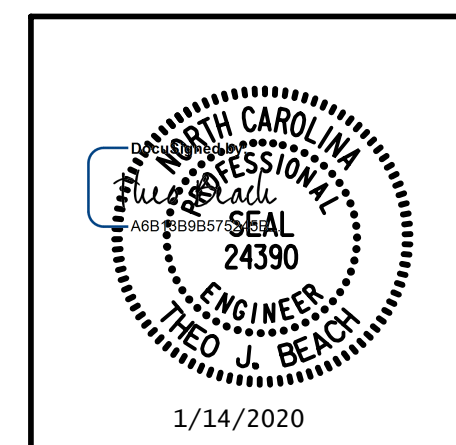
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
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BENT 1

PLANS PREPARED BY:

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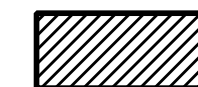
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1			3			S-82
2			4			TOTAL SHEETS 89

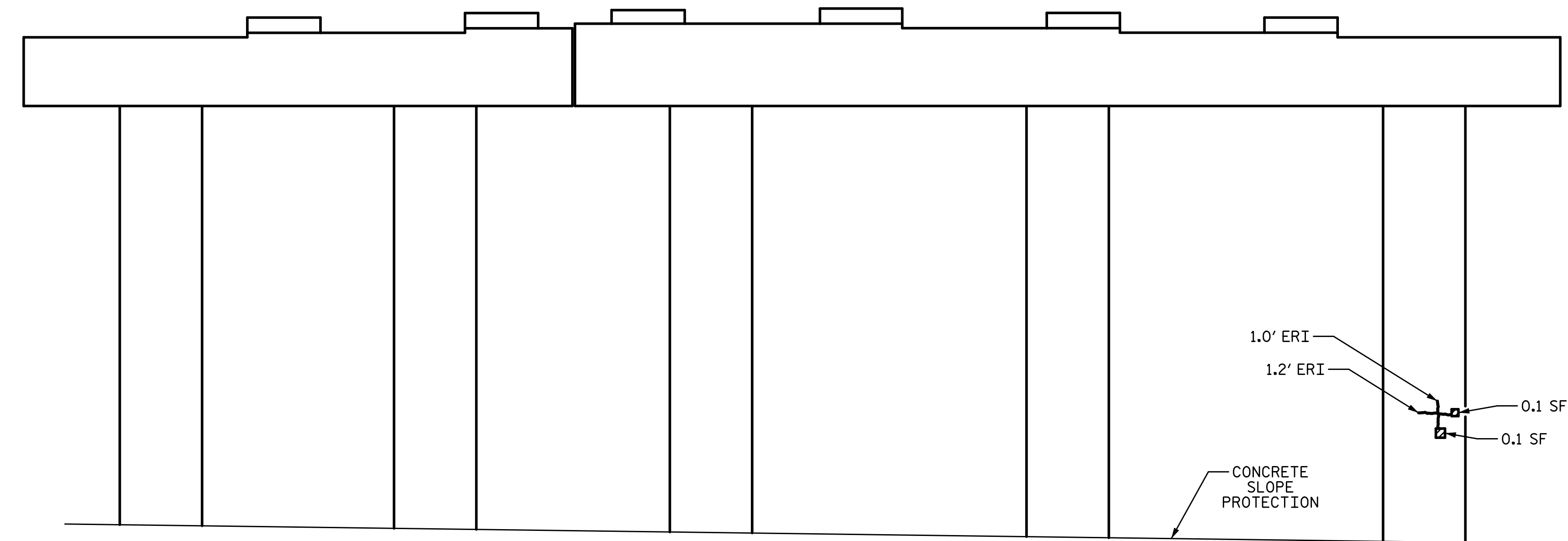
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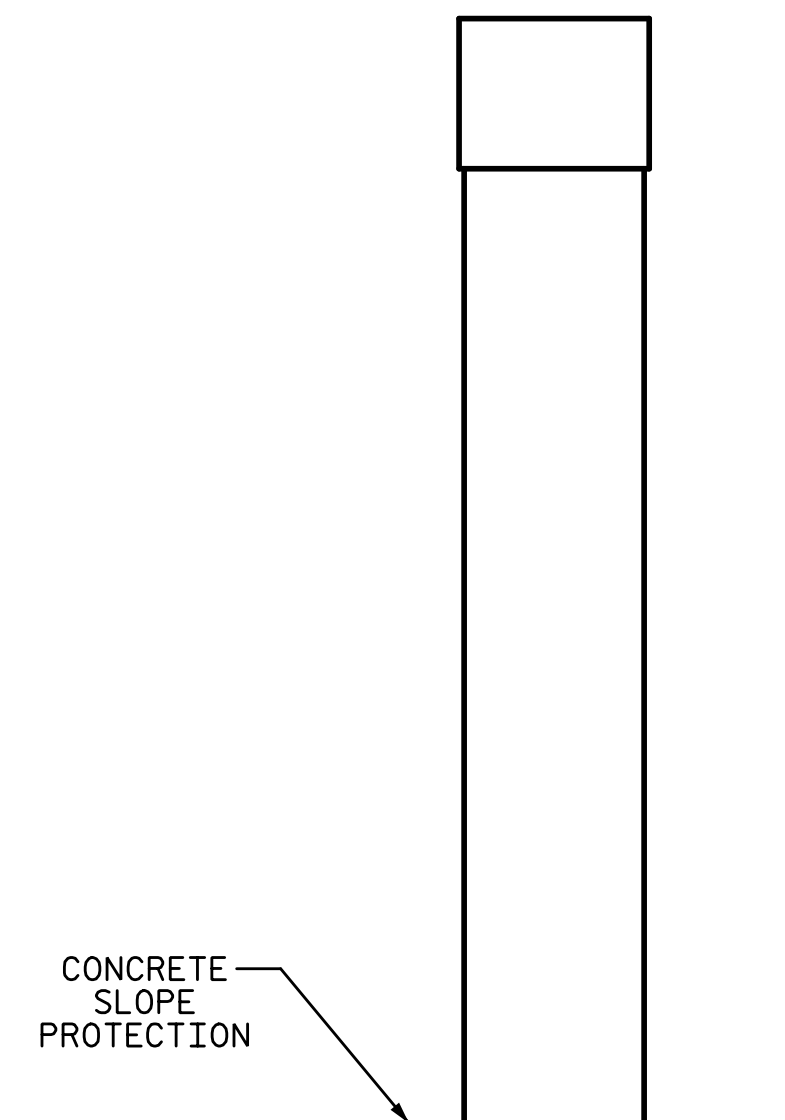
 SHOTCRETE REPAIR  
 ERI — EPOXY RESIN INJECTION

REPAIRS BENT 1					
SHOTCRETE REPAIRS	QUANTITIES				
	ESTIMATE		ACTUAL		
	AREA SF	VOLUME CF	AREA SF	DEPTH FT	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0			
CAP (HORIZONTAL, CORNER)	0.0	0.0			
COLUMN	0.2	0.1			
EPOXY RESIN INJECTION		LF			LF
CAP		0.0			
COLUMN		2.2			
EPOXY COATING		AREA SF			AREA SF
TOP OF CAP		161.5			

**NOTES:**  
 VALUES IN CHART REPRESENT ESTIMATE REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 2" CL. TO SAWCUT. SEE REPAIR DETAILS.

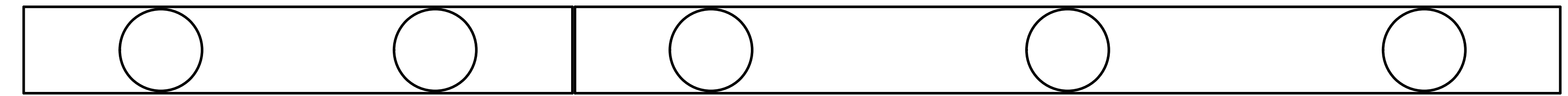


**ELEVATION**  
SPAN B FACE



**END VIEW**  
EAST FACE

SPAN A



SPAN B

**PLAN**  
BOTTOM OF CAP  
LOOKING UP

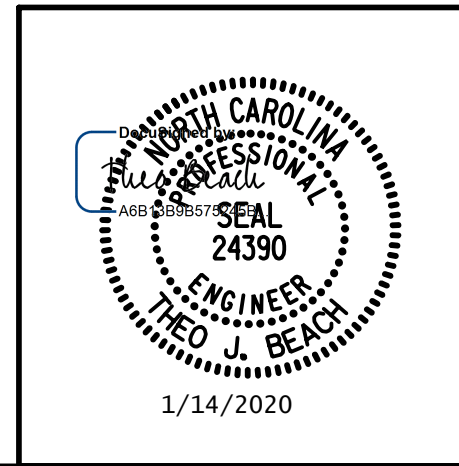
PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
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**BENT 1**

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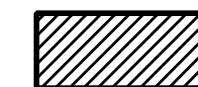
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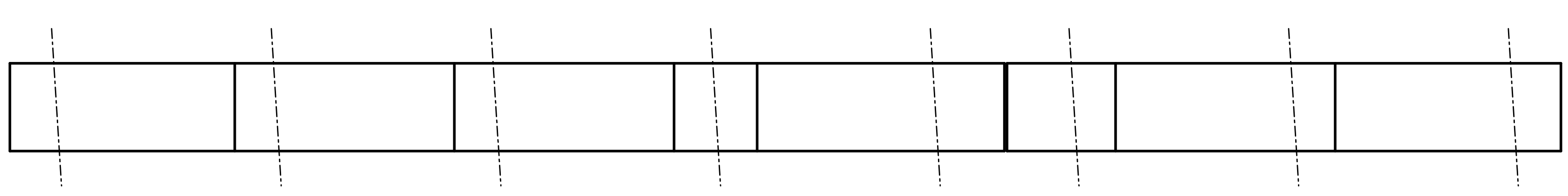
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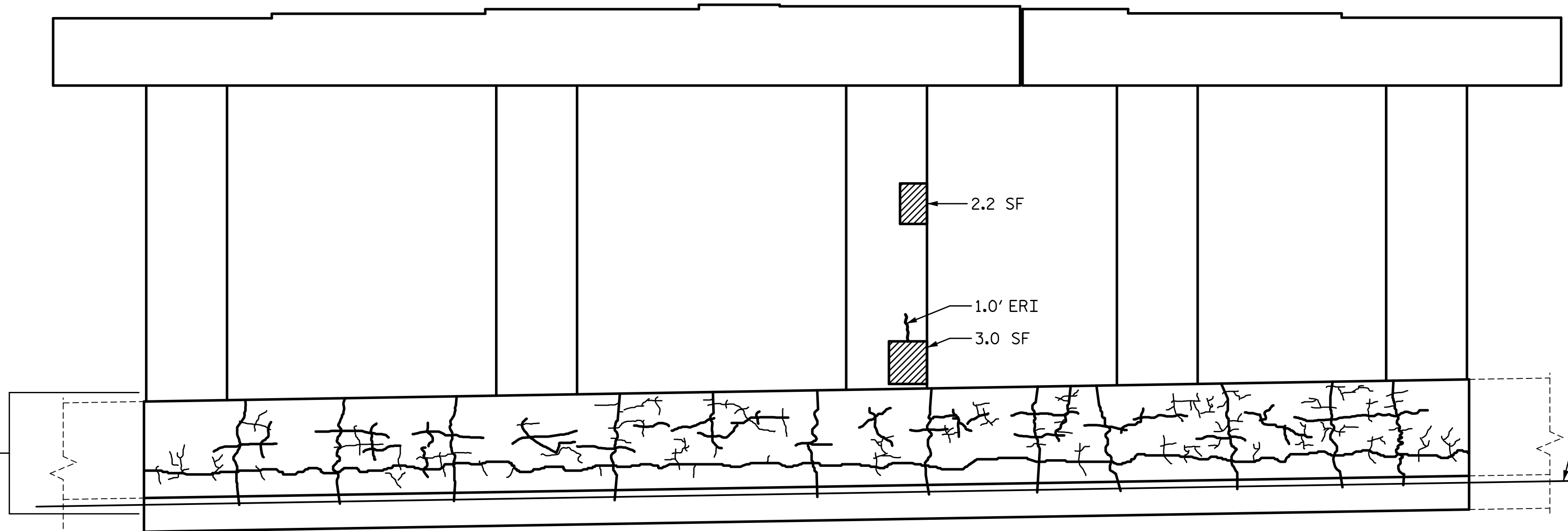
 SHOTCRETE REPAIR  
 ERI — EPOXY RESIN INJECTION

**NOTES:**  
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 FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.  
 FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.  
 SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.  
 FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.  
 THE CONTRACTOR SHALL CLEAN AND EPOXY COAT PAINT THE TOP SURFACE OF BENT CAPS.  
 FOR EPOXY COATING, SEE SPECIAL PROVISIONS.  
 SEE SHEET 2 OF 2 FOR "REPAIR QUANTITY TABLE".



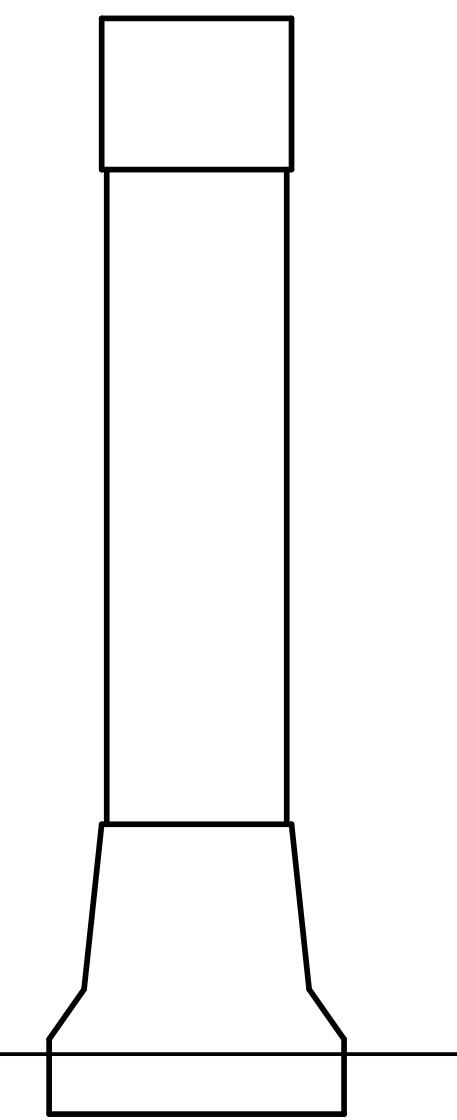
**PLAN**  
TOP OF CAP

SPAN C  
 SPAN B



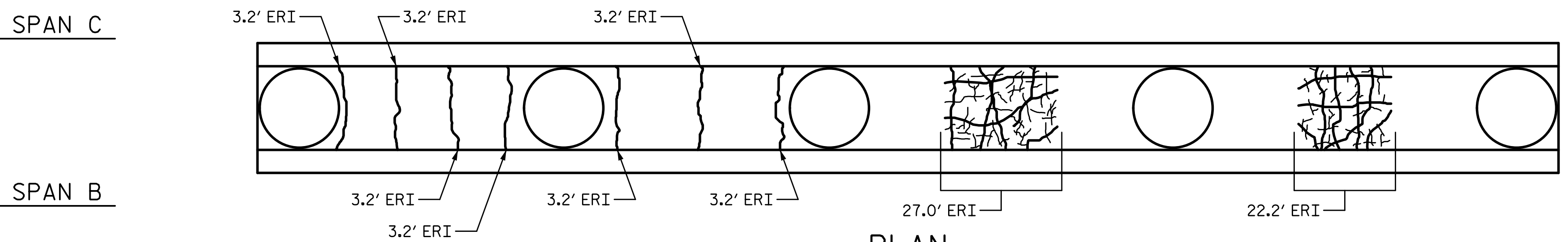
**ELEVATION**

SPAN B FACE  
 MAP CRACKING IS SHOWN FOR REPRESENTATION PURPOSES



**END VIEW**  
WEST FACE

APPROXIMATE SURFACE ELEVATION FOR ASPHALT WEARING SURFACE



**PLAN**

TOP OF DOUBLE FACE CONCRETE MEDIAN BARRIER  
 LOOKING DOWN

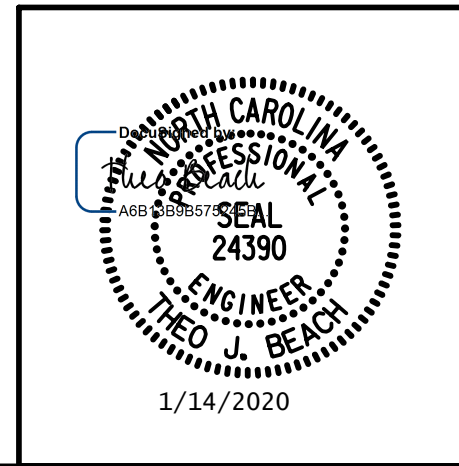
PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
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**BENT 2**

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### REPAIR QUANTITY TABLE

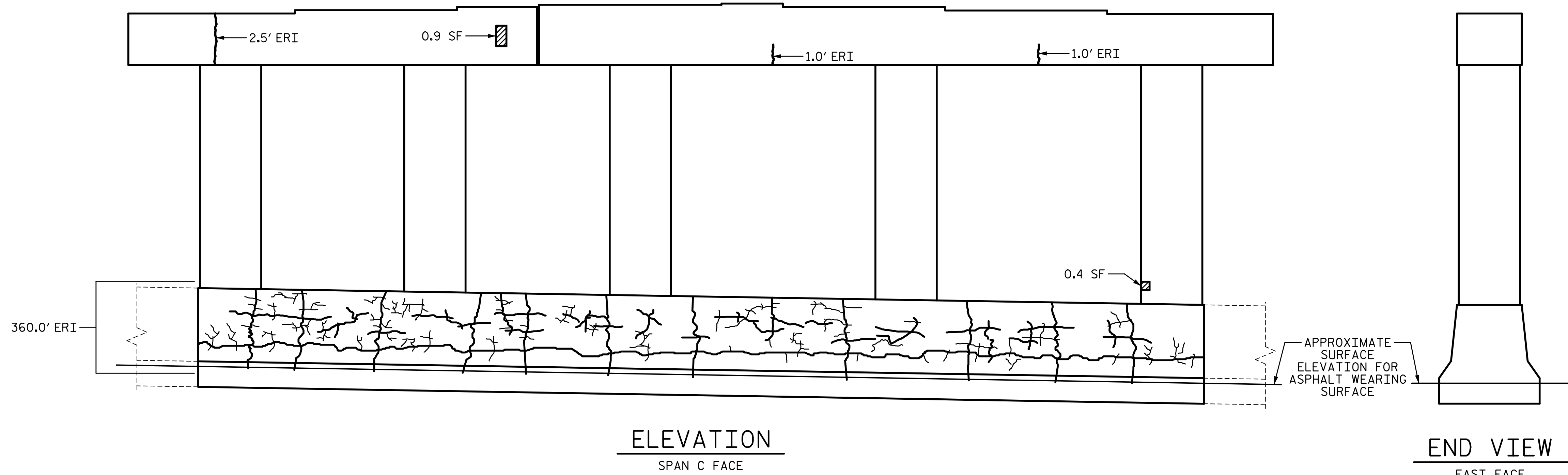
REPAIRS BENT 2	QUANTITIES				
	ESTIMATE		ACTUAL		
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	DEPTH FT	VOLUME CF
CAP (VERTICAL FACE)	0.9	0.2			
CAP (HORIZONTAL, CORNER)	0.0	0.0			
COLUMN	5.6	1.6			
DOUBLE FACE CONC. MEDIAN BARRIER	0.0	0.0			
EPOXY RESIN INJECTION		LF			LF
CAP		8.0			
COLUMN		1.0			
DOUBLE FACE CONC. MEDIAN BARRIER		791.6			
EPOXY COATING		AREA SF			AREA SF
TOP OF CAP		158.4			

 SHOTCRETE REPAIR

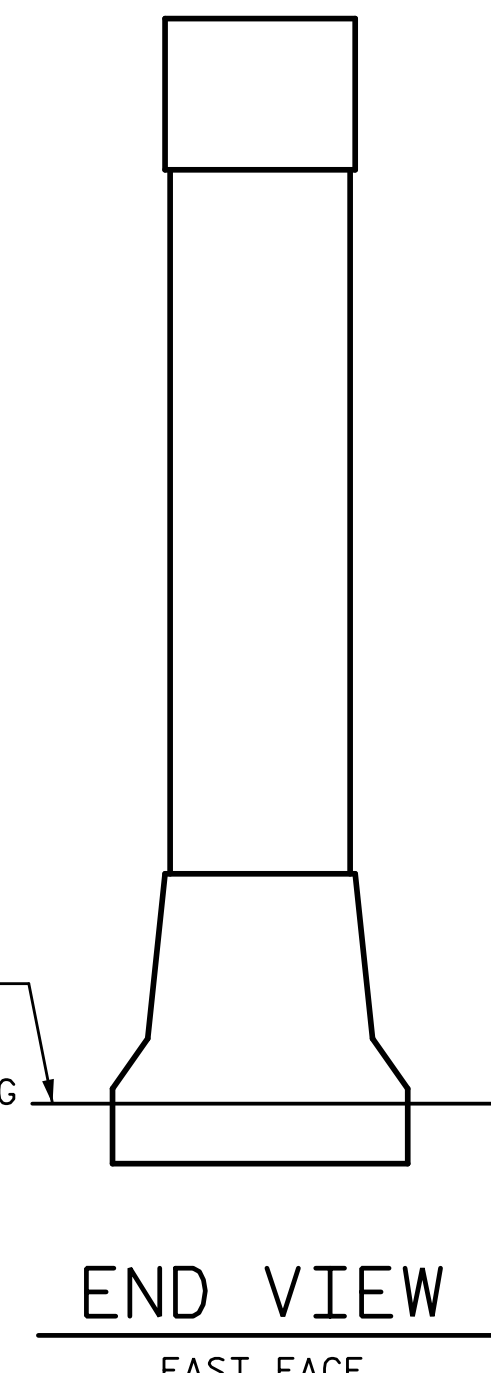
ERI — EPOXY RESIN INJECTION

**NOTES:**

VALUES IN CHART REPRESENT ESTIMATE REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 2" CL. TO SAWCUT. SEE REPAIR DETAILS.

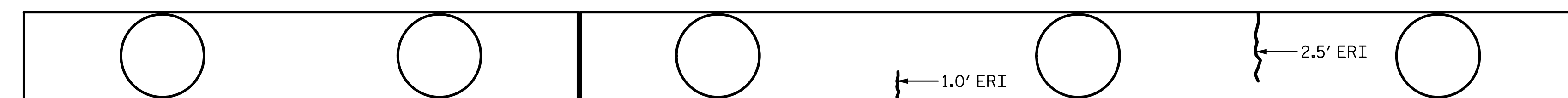


**ELEVATION**  
SPAN C FACE



**END VIEW**  
EAST FACE

SPAN B



**PLAN**  
BOTTOM OF CAP  
LOOKING UP

SPAN C

PROJECT NO. I-5711  
ALAMANCE COUNTY  
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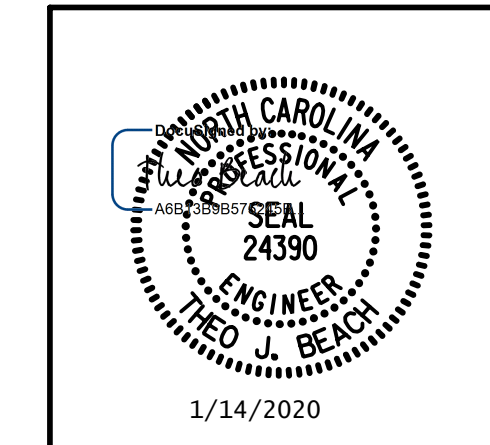
SHEET 2 OF 2

STATE OF NORTH CAROLINA  
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RALEIGH  
PRESERVATION

**BENT 2**

PLANS PREPARED BY:

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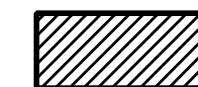
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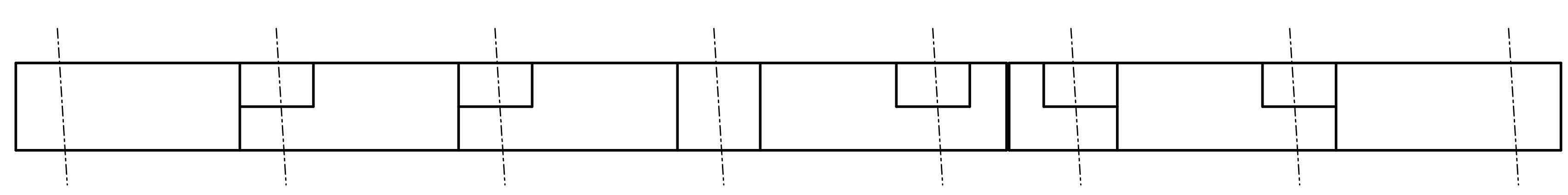
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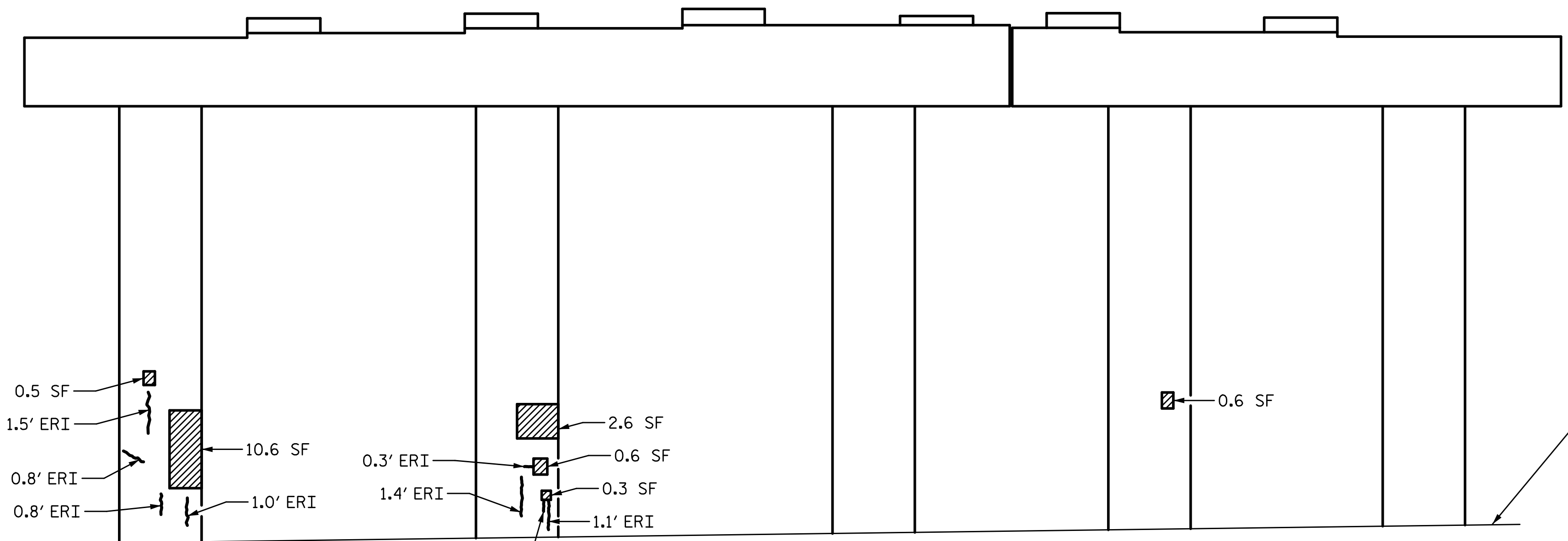
 SHOTCRETE REPAIR  
 ERI — EPOXY RESIN INJECTION

**NOTES:**  
 REPAIR LOCATIONS AND ESTIMATE OF THE QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE INSPECTOR OR ENGINEER THE CONTRACTOR SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE REPAIR QUANTITY TABLE.  
 FOR SUBSTRUCTURE REPAIR DETAIL, SEE "SUBSTRUCTURE REPAIR DETAIL" SHEET.  
 FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.  
 FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.  
 SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.  
 FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.  
 THE CONTRACTOR SHALL CLEAN AND EPOXY COAT PAINT THE TOP SURFACE OF BENT CAPS.  
 FOR EPOXY COATING, SEE SPECIAL PROVISIONS.  
 SEE SHEET 2 OF 2 FOR "REPAIR QUANTITY TABLE".

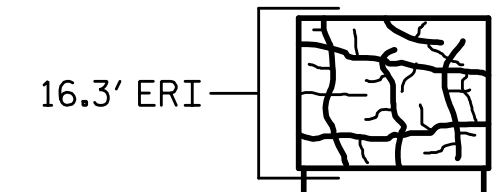


SPAN D  
  
SPAN C

PLAN  
TOP OF CAP



ELEVATION  
SPAN C FACE



CONCRETE SLOPE PROTECTION

END VIEW  
WEST FACE

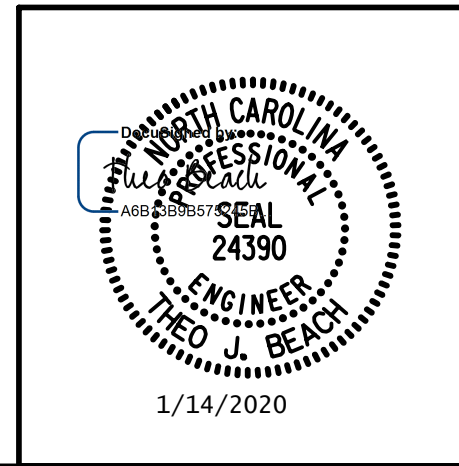
PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 PRESERVATION

**BENT 3**


PLANS PREPARED BY:  
  
 5640 Dillard Drive  
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 www.simpsonengr.com  
 LICENSURE NO. C-2521



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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-86
1			3			TOTAL SHEETS
2			4			89

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 SHOTCRETE REPAIR

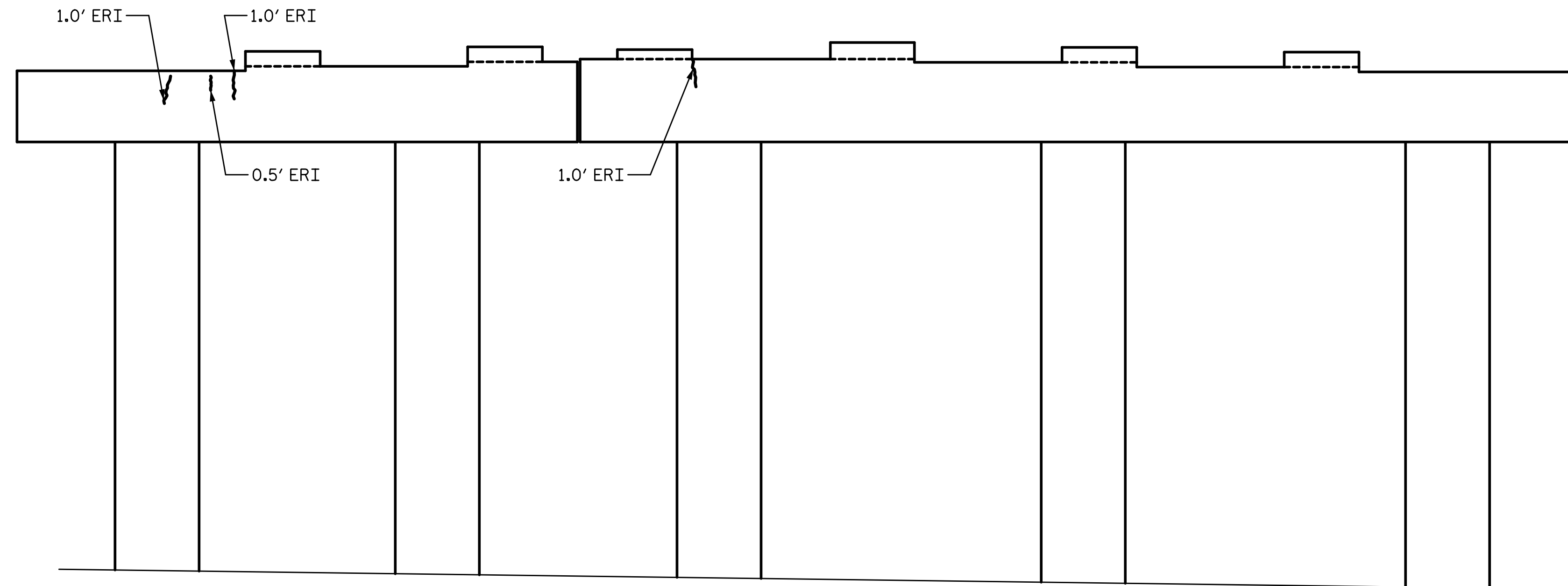
ERI — EPOXY RESIN INJECTION

### REPAIR QUANTITY TABLE

REPAIRS BENT 3	QUANTITIES				
	ESTIMATE		ACTUAL		
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	DEPTH FT	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0			
CAP (HORIZONTAL, CORNER)	0.0	0.0			
COLUMN	15.2	4.5			
EPOXY RESIN INJECTION		LF			LF
CAP		21.6			
COLUMN		7.3			
EPOXY COATING		AREA SF			AREA SF
TOP OF CAP		161.5			

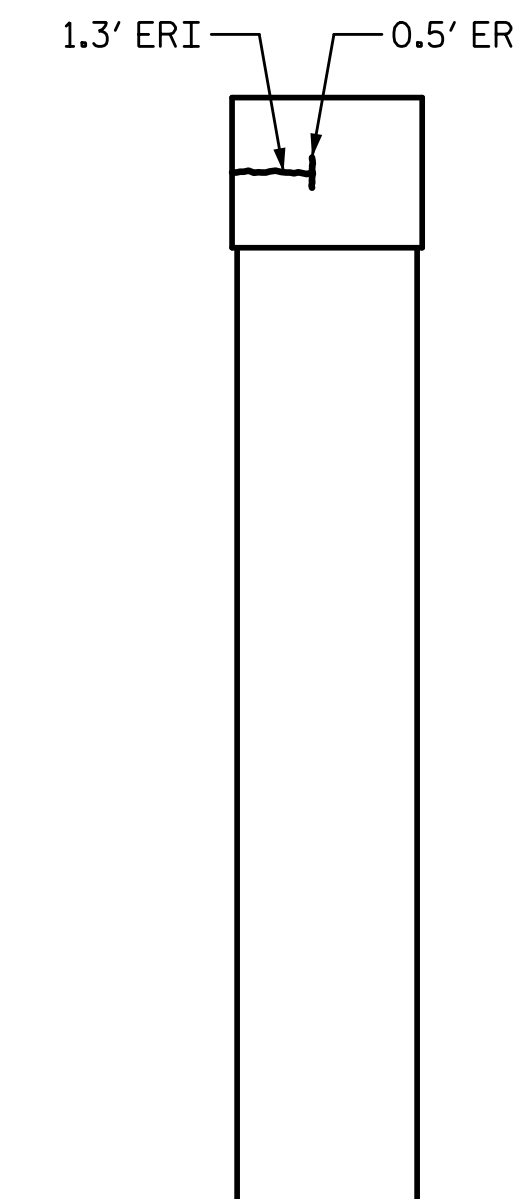
**NOTES:**

VALUES IN CHART REPRESENT ESTIMATE REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 2" CL. TO SAWCUT. SEE REPAIR DETAILS.



**ELEVATION**

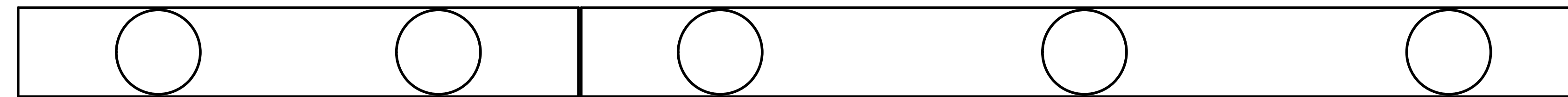
SPAN D FACE



**END VIEW**

EAST FACE

SPAN C



**PLAN**

BOTTOM OF CAP  
LOOKING UP

SPAN D

PROJECT NO. I-5711  
ALAMANCE COUNTY  
 STATION: STA. 27+02.26 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
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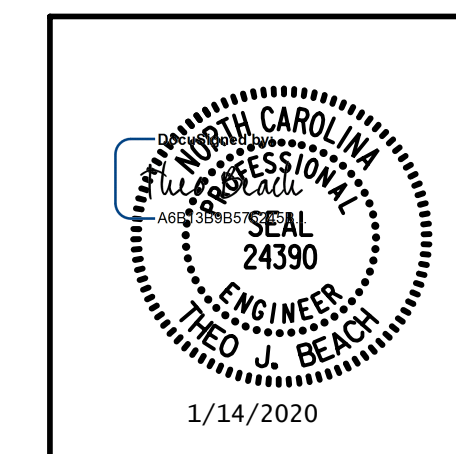
**BENT 3**

PLANS PREPARED BY:

**SEA & A**  
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2			4			TOTAL SHEETS 89

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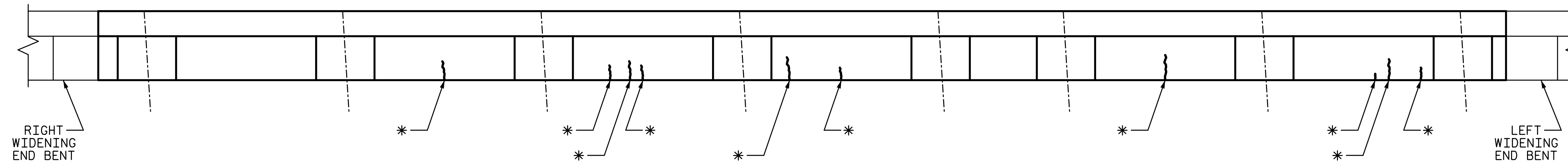


### REPAIR QUANTITY TABLE

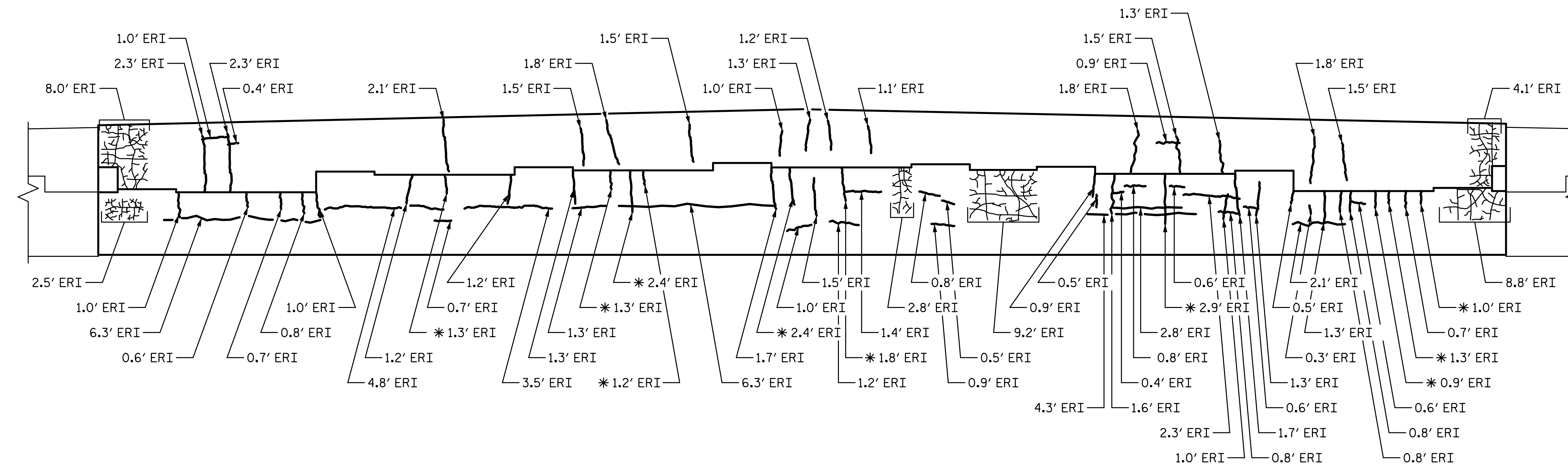
REPAIRS END BENT 2	QUANTITIES				
	ESTIMATE		ACTUAL		
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	DEPTH FT	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0			
CAP (HORIZONTAL, CORNER)	0.0	0.0			
EPOXY RESIN INJECTION			LF		LF
CAP			144.6		
EPOXY COATING			AREA SF		AREA SF
TOP OF CAP			83.0		

 SHOTCRETE REPAIR

ERI — EPOXY RESIN INJECTION



PLAN



ELEVATION

\* QUANTITIES INCLUDE TOP & FACE OF END BENT CAP

**NOTES:**

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FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

FOR SUBSTRUCTURE REPAIR DETAIL, SEE "SUBSTRUCTURE REPAIR DETAIL" SHEET.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

SHOTCRETE REPAIR MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

THE CONTRACTOR SHALL CLEAN AND EPOXY COAT PAINT THE TOP SURFACE OF BENT CAP.

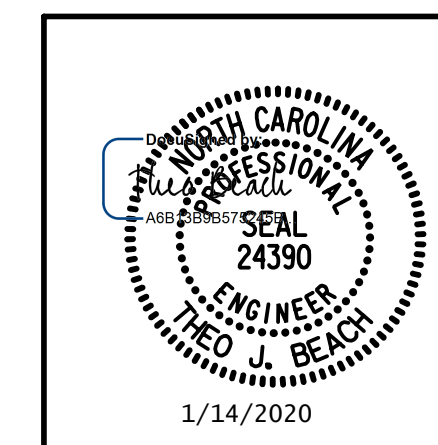
FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

VALUES IN CHART REPRESENT ESTIMATE REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 2" CL. TO SAWCUT. SEE REPAIR DETAILS.

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 STATION: STA. 27+02.26 -L-

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 END BENT 2

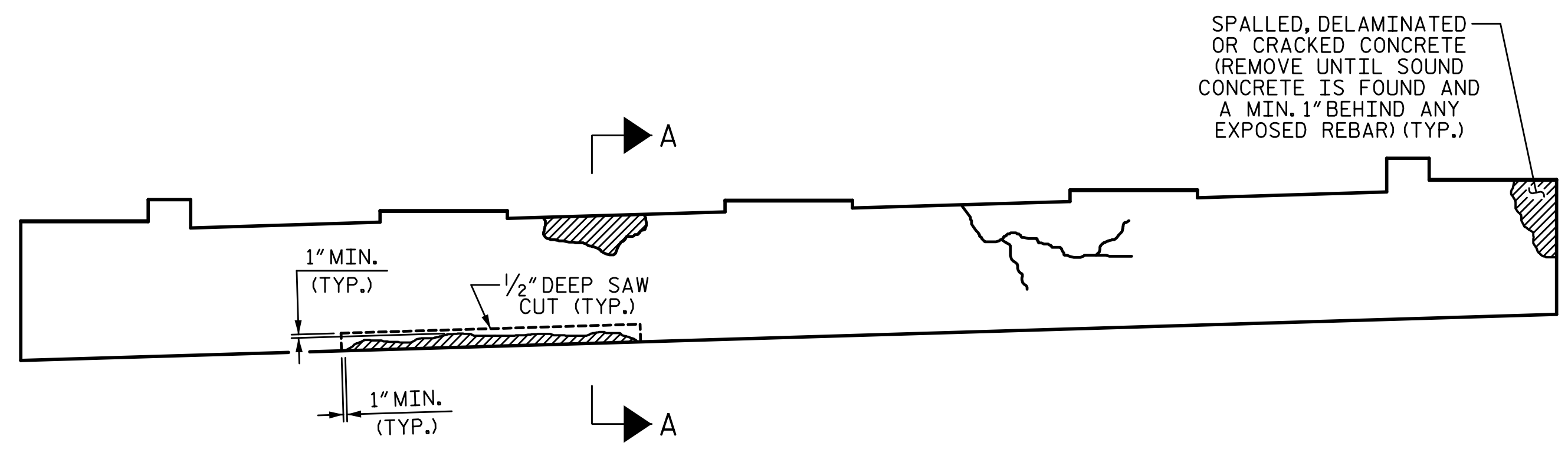
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NO.	BY:	DATE:	NO.	BY:	DATE:	5-88
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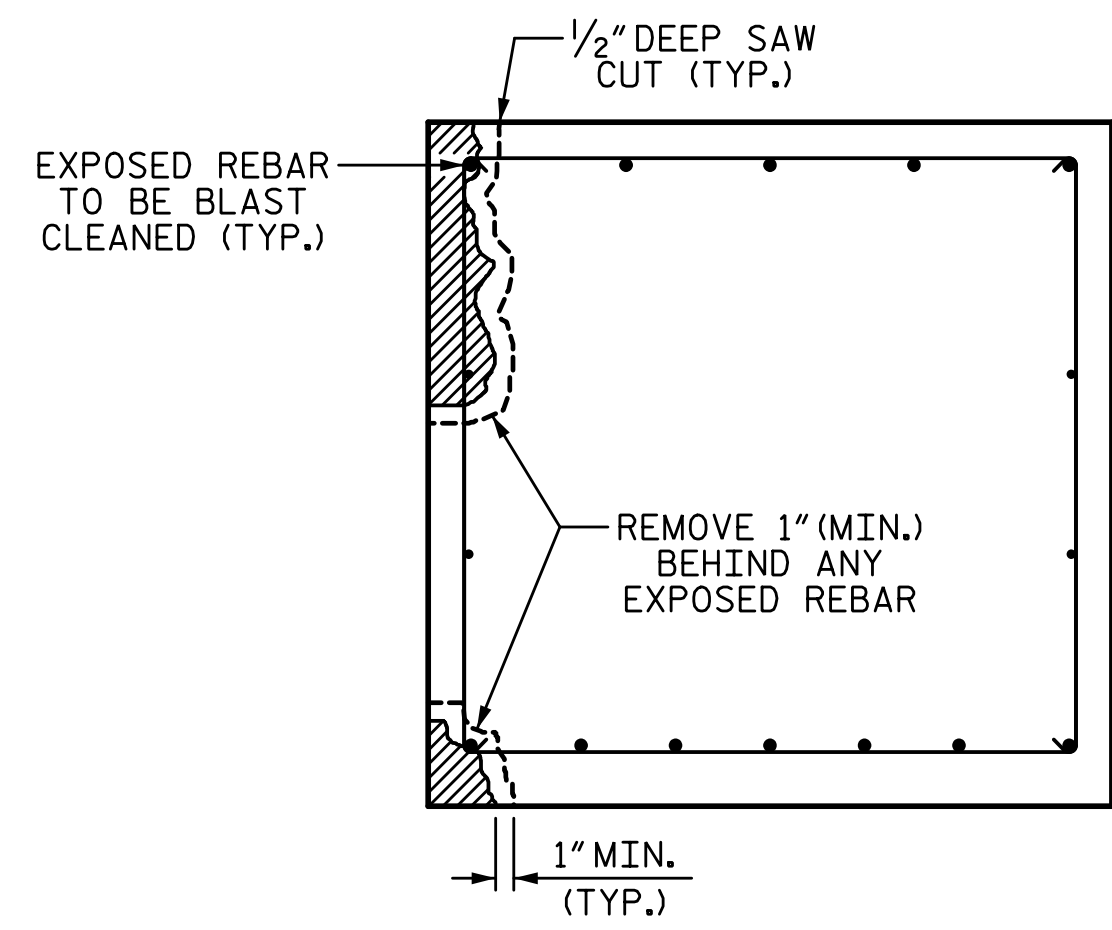
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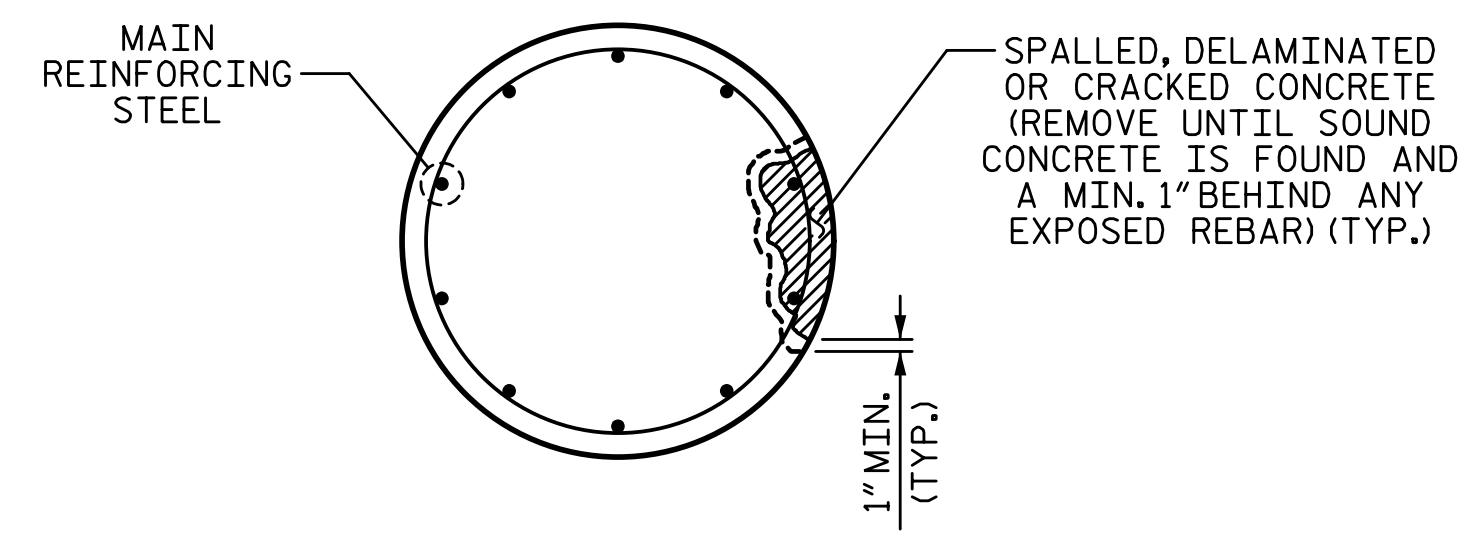
**CAP REPAIRS**  
BENT SHOWN, END BENT CAP SIMILAR



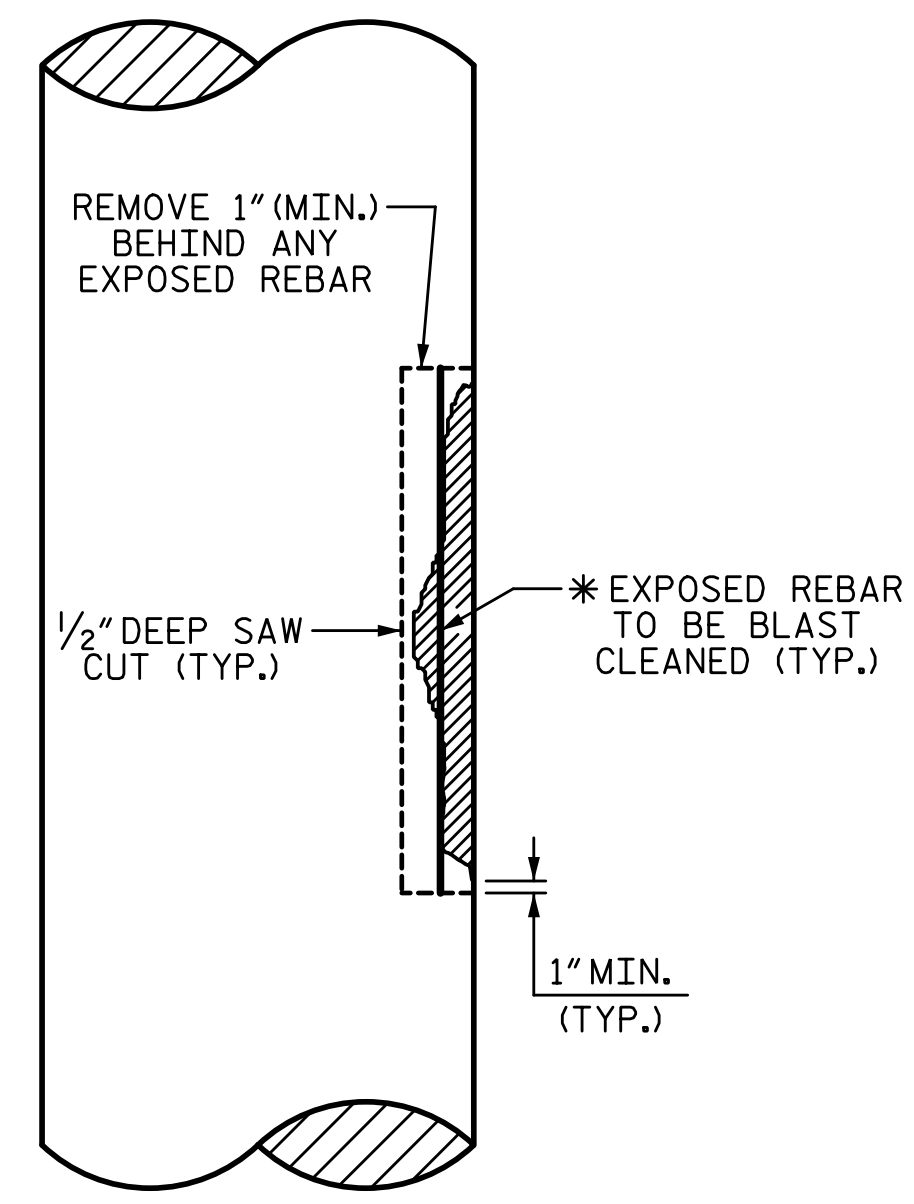
**SECTION A-A**  
BENT SHOWN, END BENT CAP SIMILAR

**CAP REPAIR**

SPALLED, DELAMINATED OR CRACKED CONCRETE (REMOVE UNTIL SOUND CONCRETE IS FOUND AND A MIN. 1" BEHIND ANY EXPOSED REBAR) (TYP.)



**PLAN OF COLUMN**



**ELEVATION OF COLUMN**  
\* IF CONFINEMENT STEEL IS NOT PRESENT, THEN REPAIR LENGTH SHALL NOT EXCEED 10 FEET

**COLUMN REPAIR**

SPLICE LENGTH TABLE	
BAR SIZE	MIN. SPLICE LENGTH
#4	2'-4"
#5	2'-9"
#6	4'-0"
#7	5'-3"
#8	6'-9"
#9	8'-6"
#10	10'-11"
#11	13'-4"

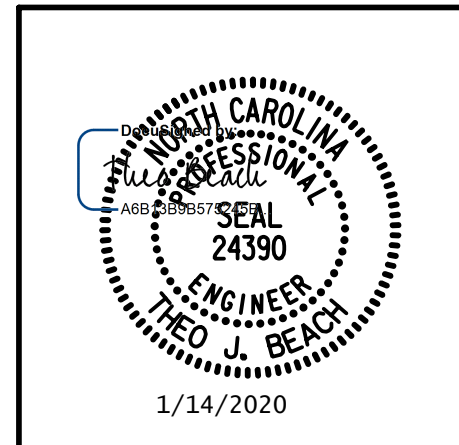
**NOTES:**

- TYPICAL BENT CAP REPAIRS ARE SHOWN, REPAIR DETAILS SIMILAR FOR END BENT CAPS AND STRUTS.
- THE METHOD USED TO DELINEATE THE AREAS OF UNSOUND CONCRETE TO BE REPAIRED SHALL NOT PERMANENTLY MARK THE CONCRETE, LEAVE ANY RESIDUE AFTER REMOVAL OF REQUIRE HARSH CHEMICALS TO REMOVE.
- THE CONTRACTOR SHALL REMOVE THE DETERIORATED CONCRETE IN ACCORDANCE WITH THE GUIDELINES SET IN THESE NOTES, IN THE SPECIAL PROVISIONS AND THE STANDARD SPECIFICATIONS.
- REMOVE UNSOUND CONCRETE TO THE EXTENT NECESSARY, MINIMUM OF 1" BEHIND REBAR AND MINIMUM OF 2" CLEARANCE TO SAWCUT.
- NO MORE THAN ONE-THIRD OF THE CAP OR COLUMN CROSS SECTIONAL AREA SHALL BE REMOVED AT ONE TIME. SHOULD IT BECOME NECESSARY TO REMOVE MORE THAN 30% OF A CAP OR COLUMN CROSS SECTIONAL AREA, NOTIFY THE ENGINEER PRIOR TO PROCEEDING.
- SIMULTANEOUS REMOVAL OF UNSOUND CONCRETE MAY BE PERMITTED ON MORE THAN ONE FACE OF A CAP AND/OR COLUMN, IF THE AREAS OF REMOVAL ARE NOT ADJACENT TO OR DIRECTLY OPPOSITE ONE ANOTHER. IF REMOVAL EXTENDS MORE THAN 1/2" BEHIND THE MAIN REINFORCING BARS. NOTIFY THE ENGINEER PRIOR TO PROCEEDING.
- REINFORCING STEEL WHICH IS DETERMINED BY THE ENGINEER TO BE REPLACED, SHALL BE REMOVED TO A POINT WHERE IT IS SOUND. THE PATCH SHALL EXTEND A SUFFICIENT DISTANCE BEYOND THIS POINT TO DEVELOP A SPLICE LENGTH SPECIFIED IN THE TABLE ON THIS SHEET.
- FOR ADHESIVELY ANCHORED ANCHOR BOLTS OF DOWEL, SEE STANDARD SPECIFICATIONS.
- COAT ALL REPAIR SURFACE AREAS ON THE TOP OF CAPS, INCLUDING CHAMFERS, WITH EPOXY COATING, OVERLAPPING THE REPAIR ARE BY A MINIMUM OF 3" ON ALL POSSIBLE SIDES.
- FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.
- FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.
- FOR EPOXY COATING, SEE SPECIAL PROVISIONS.
- FOR EPOXY RESIN INJECTION (ERI), SEE SPECIAL PROVISIONS.

PROJECT NO. I-5711  
ALAMANCE COUNTY  
STATION: STA. 27+02.26 -L-

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DESIGN ENGINEER OF RECORD: T. BEACH DATE: 1-20

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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
PRESERVATION  
**SUBSTRUCTURE REPAIR DETAILS**

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1			3			TOTAL SHEETS
2			4			89

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## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

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

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

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

### REINFORCING STEEL:

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

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

### STRUCTURAL STEEL:

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

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

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

### HANDRAILS AND POSTS:

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

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

### SPECIAL NOTES:

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

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# ENGLISH

JANUARY, 1990