

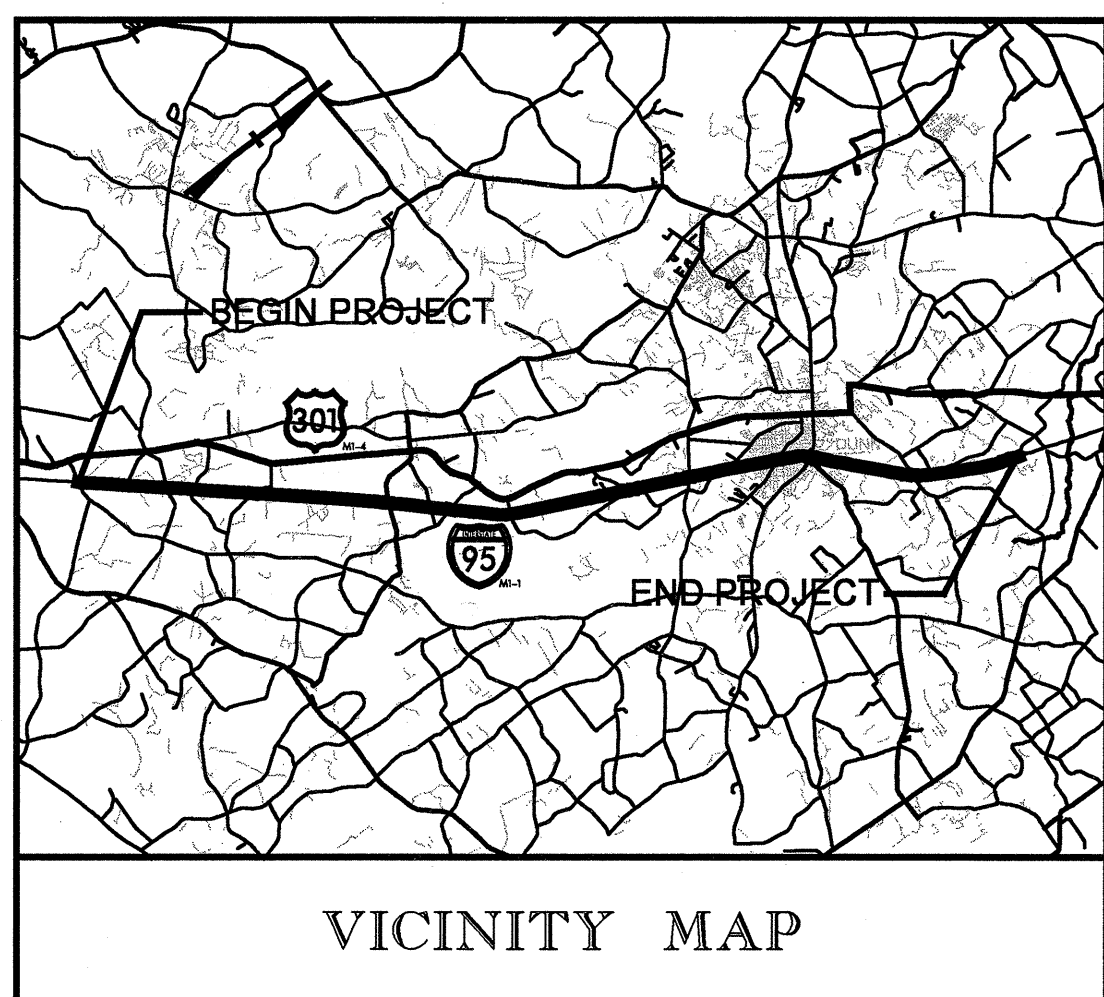
**CONTRACT: C202078 TIP PROJECT: B-5022**

See Sheets 1-12 For Bridge 153  
 See Sheets 13-24 For Bridge 154  
 See Sheets 25-34 For Bridge 155  
 See Sheets 35-44 For Bridge 81

STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

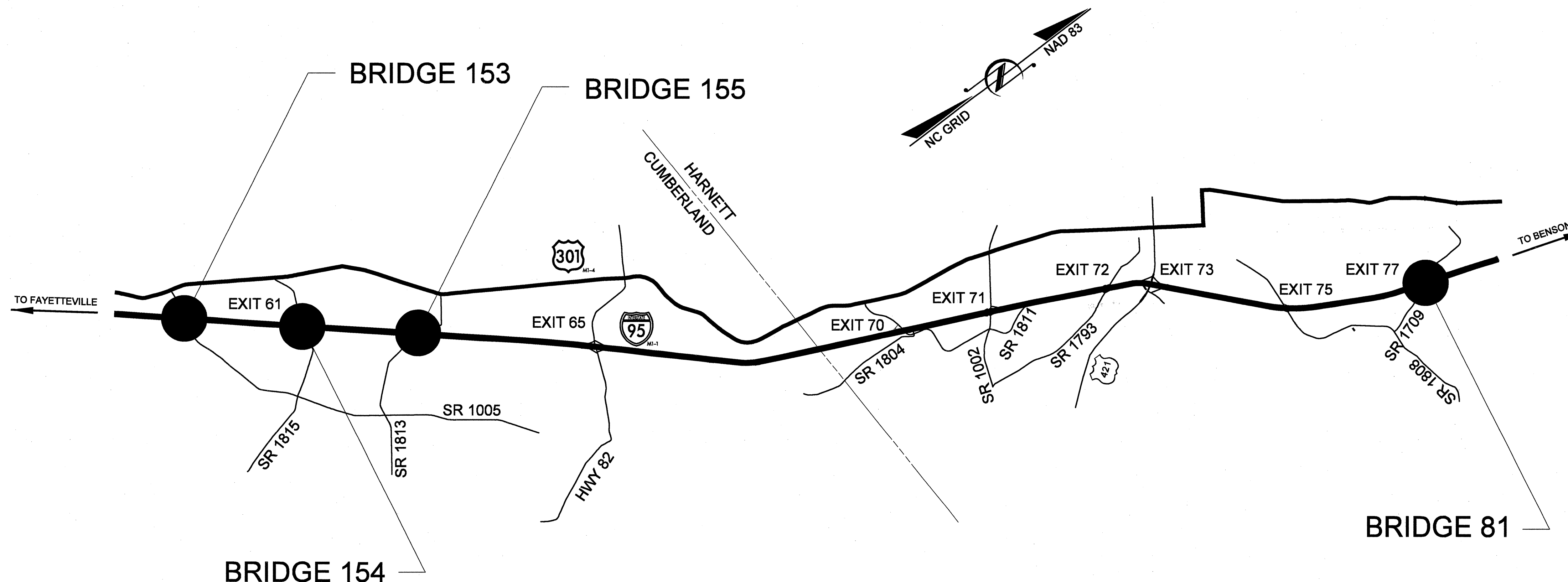
**HARNETT & CUMBERLAND COUNTIES**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5022	1	
WBS NO.	P.A. PROJ. NO.	DESCRIPTION	
41928.1.1	IMS-95-2(105)59	PE	
41928.2.1		RW & UTILITY	
41928.3.1	IMS-95-2(110)59	CONSTRUCTION	



**LOCATION: SPAN REPLACEMENTS ON BRIDGES 153 & 154  
 JACKING ON BRIDGES 155 & 81  
 LOCATED ALONG I-95**

**TYPE OF WORK: JACK STRUCTURES, SPAN REPLACEMENTS,  
 GRADING, PAVING, AND DRAINAGE**



**STRUCTURES**

**GRAPHIC SCALES**



PLANS



PROFILE (HORIZONTAL)



PROFILE (VERTICAL)

**DESIGN DATA**

V = 55 MPH

Prepared In the Office of:  
 STV / Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

for the North Carolina Department of Transportation

2006 STANDARD SPECIFICATIONS

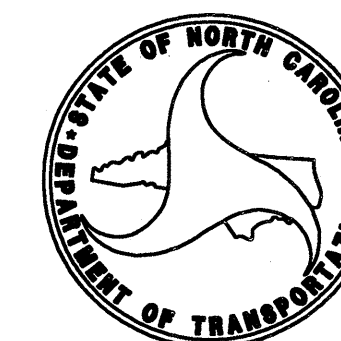
RIGHT OF WAY DATE:

**MARK F. ROBBINS, P.E.**  
 PROJECT ENGINEER

LETTING DATE:  
 JULY 15, 2008

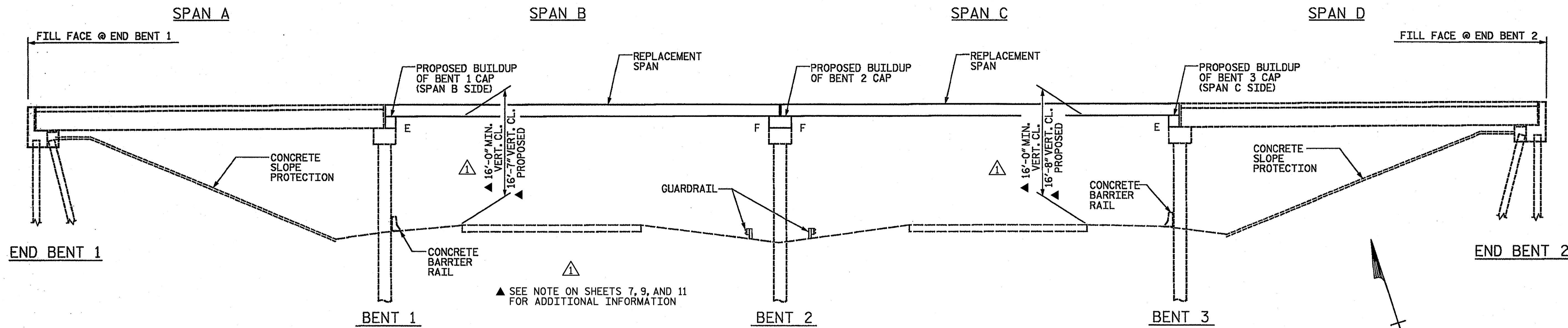
**KEVIN G. BAILEY, P.E.**  
 PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS  
 STATE OF NORTH CAROLINA



P.E.  
 STATE HIGHWAY DESIGN ENGINEER

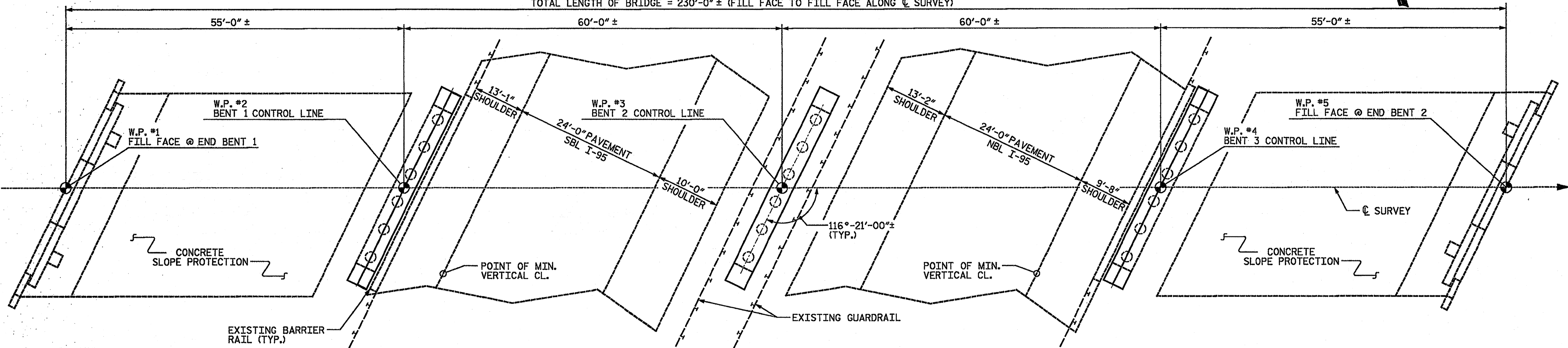
S:\2008\12513448\B5022\Roadway\Proj\B-5022\_RDY\_STRUCTURES.TSH.dgn



**ELEVATION**  
SECTIONS AT BENTS AND END BENTS ARE AT RIGHT ANGLES

ALL DIMENSIONS IN THESE PLANS ARE BASED ON BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL VERIFY DIMENSIONS IN FIELD PRIOR TO CONSTRUCTION AND ANY FABRICATION CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES SUCH THAT NECESSARY ADJUSTMENTS BE MADE BY THE CONTRACTOR.

TOTAL LENGTH OF BRIDGE = 230'-0" ± (FILL FACE TO FILL FACE ALONG C SURVEY)



**PLAN**

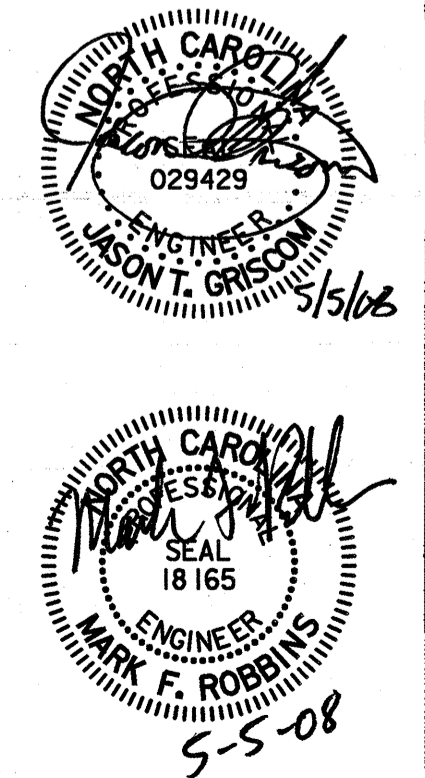
PILES IN END BENTS NOT SHOWN IN PLAN VIEW FOR CLARITY

REVISION #1: REVISED PER REVIEW COMMENTS  
BY: TJT DATE: 5-08  
CHK'D BY: KGB DATE: 5-08

- NOTES :**
- ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING.
  - FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
  - CORED SLABS HAVE BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.
  - SPAN B & C OF THE EXISTING STRUCTURE CONSISTING OF 60'-0" PRESTRESSED CONCRETE GIRDERS, 24'-0" CLEAR ROADWAY WIDTH, REINFORCED CONCRETE DECK SHALL BE REMOVED. FOR PARTIAL REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.
  - FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
  - FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
  - FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.
  - FOR MAINTENANCE & PROTECTION OF TRAFFIC BENEATH BRIDGE, SEE SPECIAL PROVISIONS.
  - FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL								
	PARTIAL REMOVAL OF EXISTING STRUCTURE	CLASS AA CONCRETE	REINFORCING STEEL	CONCRETE BRIDGE RAIL	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS	EPOXY RESIN INJECTION	EPOXY MORTAR REPAIRS
	LUMP SUM	CU. YDS.	LBS.	LIN. FT.	LUMP SUM	LIN. FT.	LIN. FT.	SQ. FT.
SUPERSTRUCTURE	LUMP SUM			239.50	LUMP SUM	1,077.75		1.0
END BENT 1							10.0	
BENT 1		6.2	979					
BENT 2		10.8	1,643					1.0
BENT 3		6.2	979				5.0	
END BENT 2							10.0	
TOTAL	LUMP SUM	23.2	3,601	239.50	LUMP SUM	1,077.75	25.0	2.0

PROJECT NO. **B-5022**  
CUMBERLAND COUNTY  
BRIDGE: **153**  
MODIFICATION OF BRIDGE 153



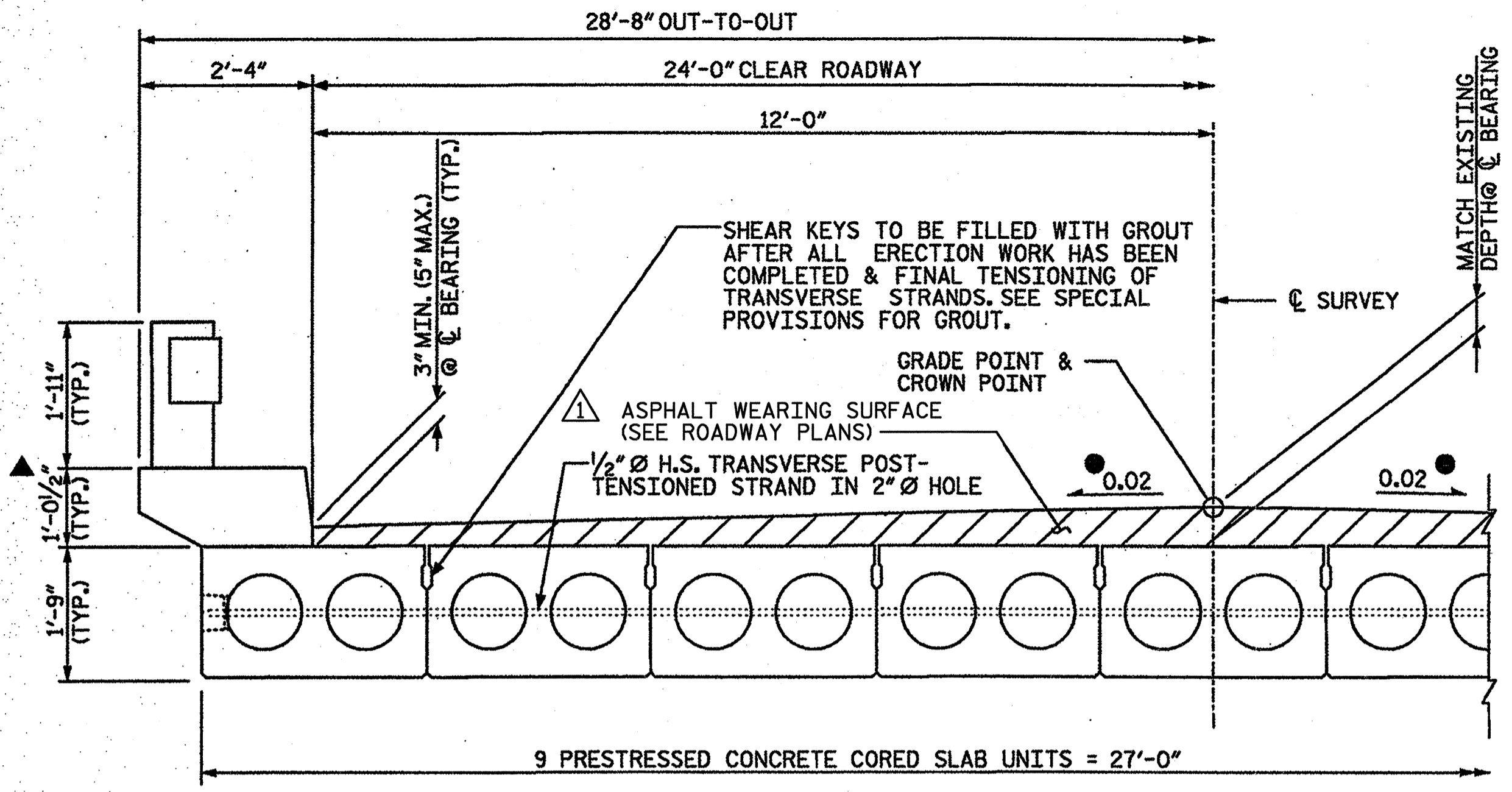
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**GENERAL DRAWING  
BRIDGE OVER I-95  
ON SR 1005**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	STV	5-08	3			S-1
2			4			TOTAL SHEETS 44

D-1810.1  
STV / Ralph Whitehead Associates, Inc.  
1000 West Morehead St., Ste. 200  
Charlotte, NC 28208

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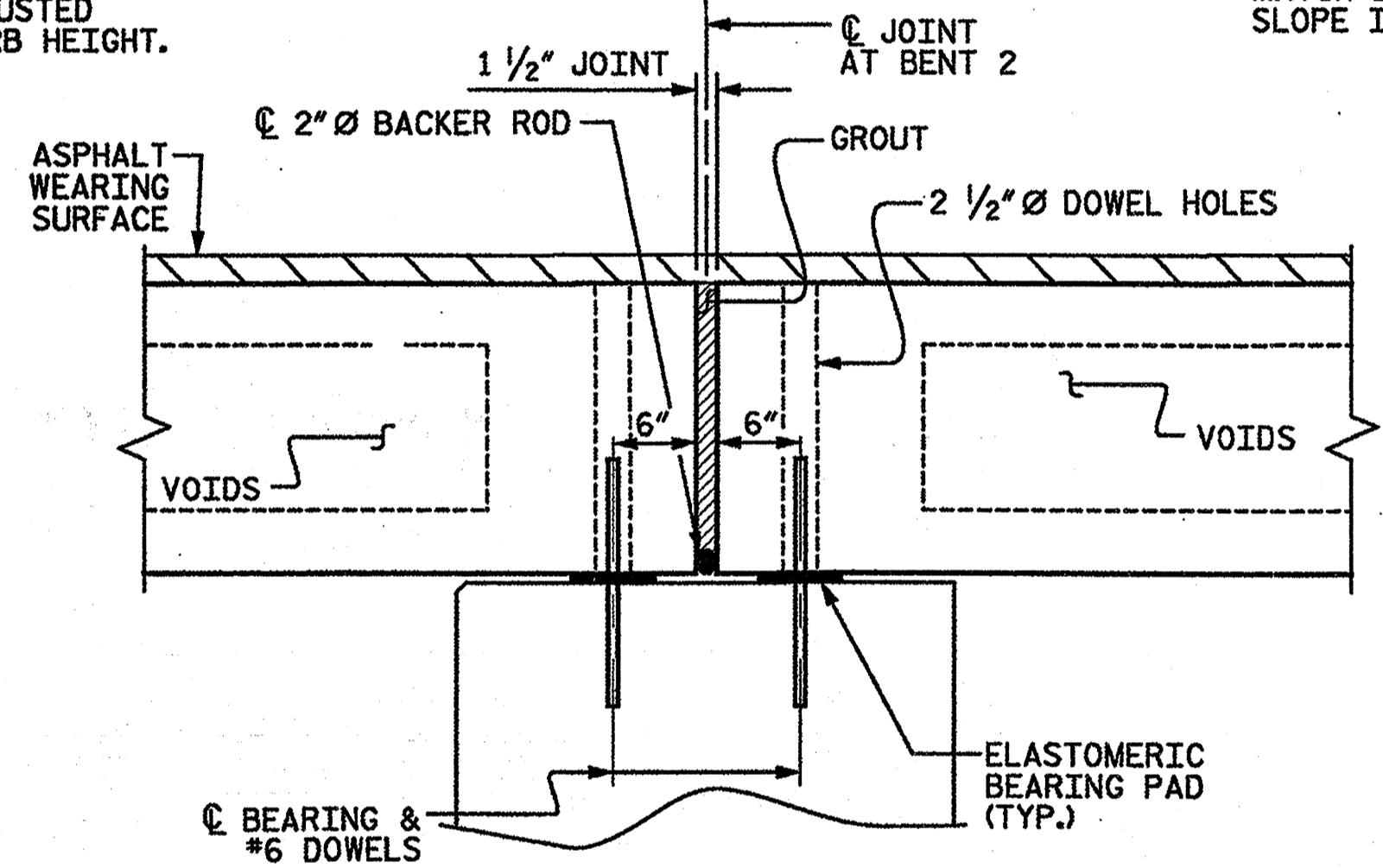




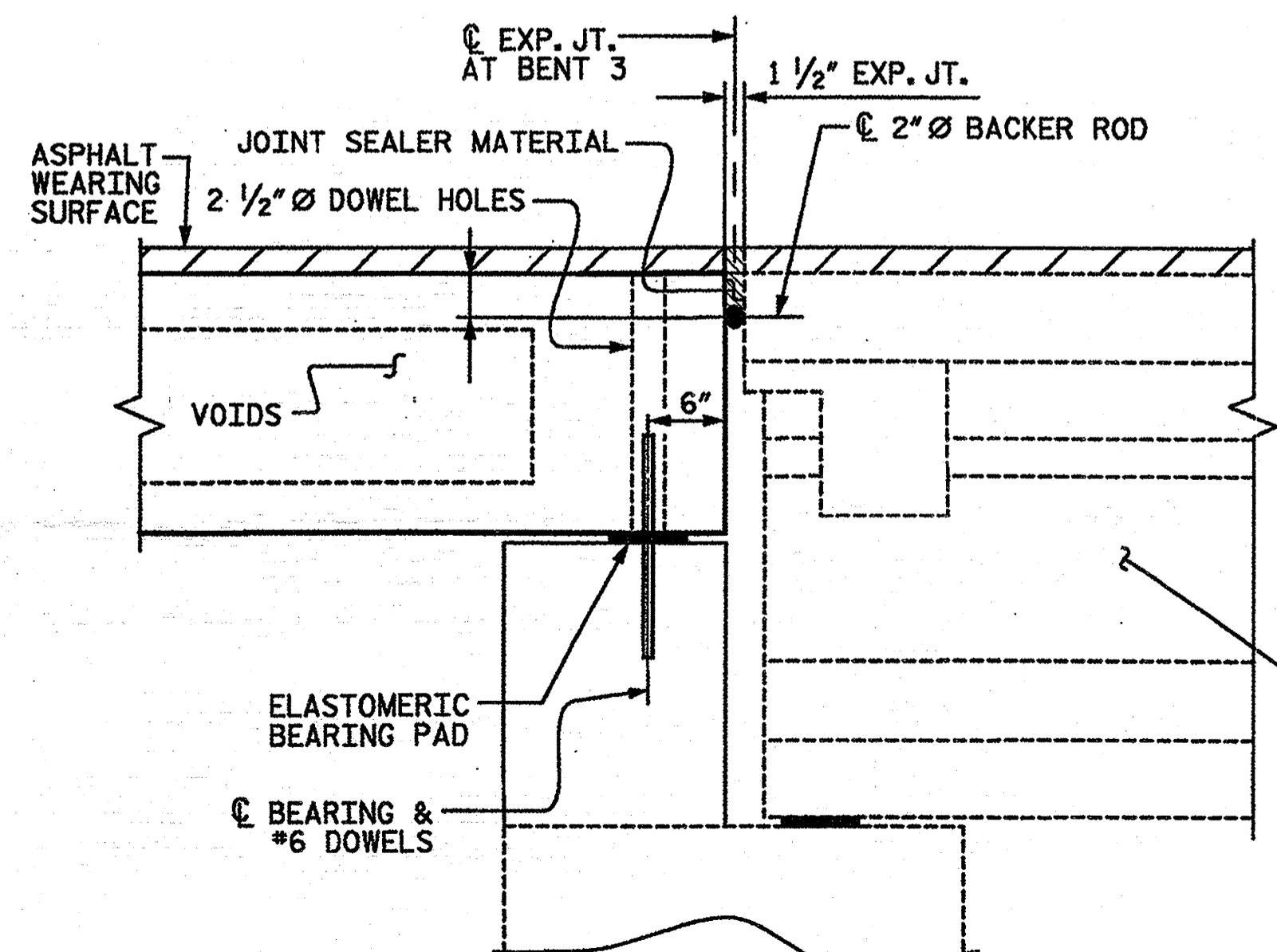
**TYPICAL HALF SECTION**  
(BRIDGE SYMMETRIC ABOUT C SURVEY)

▲ CURB HEIGHT MAY NEED TO BE ADJUSTED TO MATCH TOP OF CURB IN ADJACENT SPAN. REINFORCING SHALL BE ADJUSTED TO MATCH THE REVISED CURB HEIGHT.

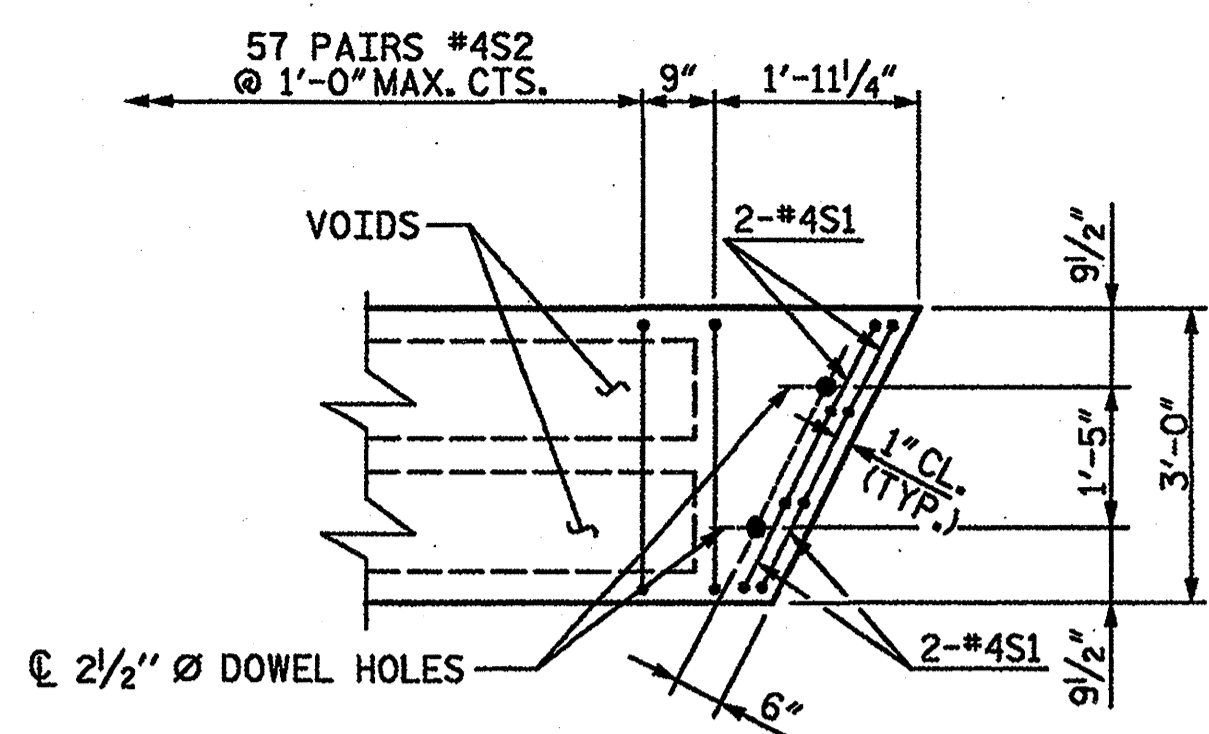
● CONTRACTOR SHALL MAKE A SMOOTH TRANSITION TO MATCH EXISTING CROSS SLOPE IN ADJACENT SPANS.



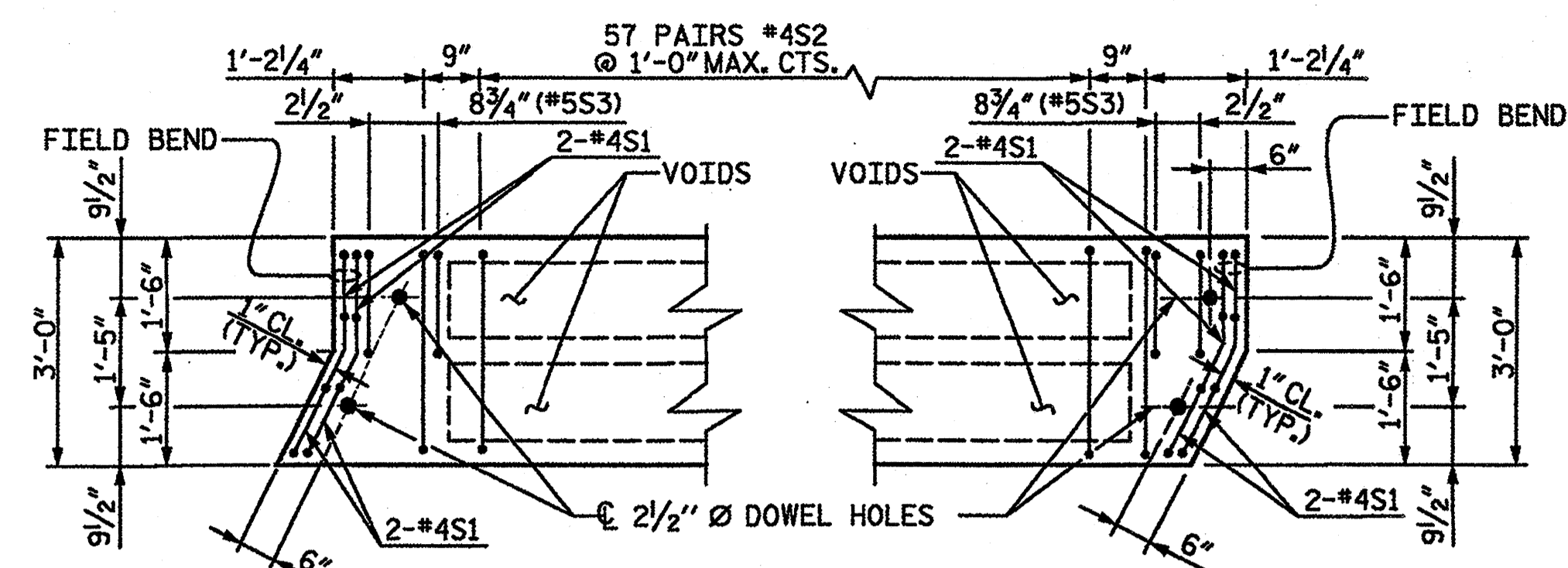
**SECTION AT BENT 2**



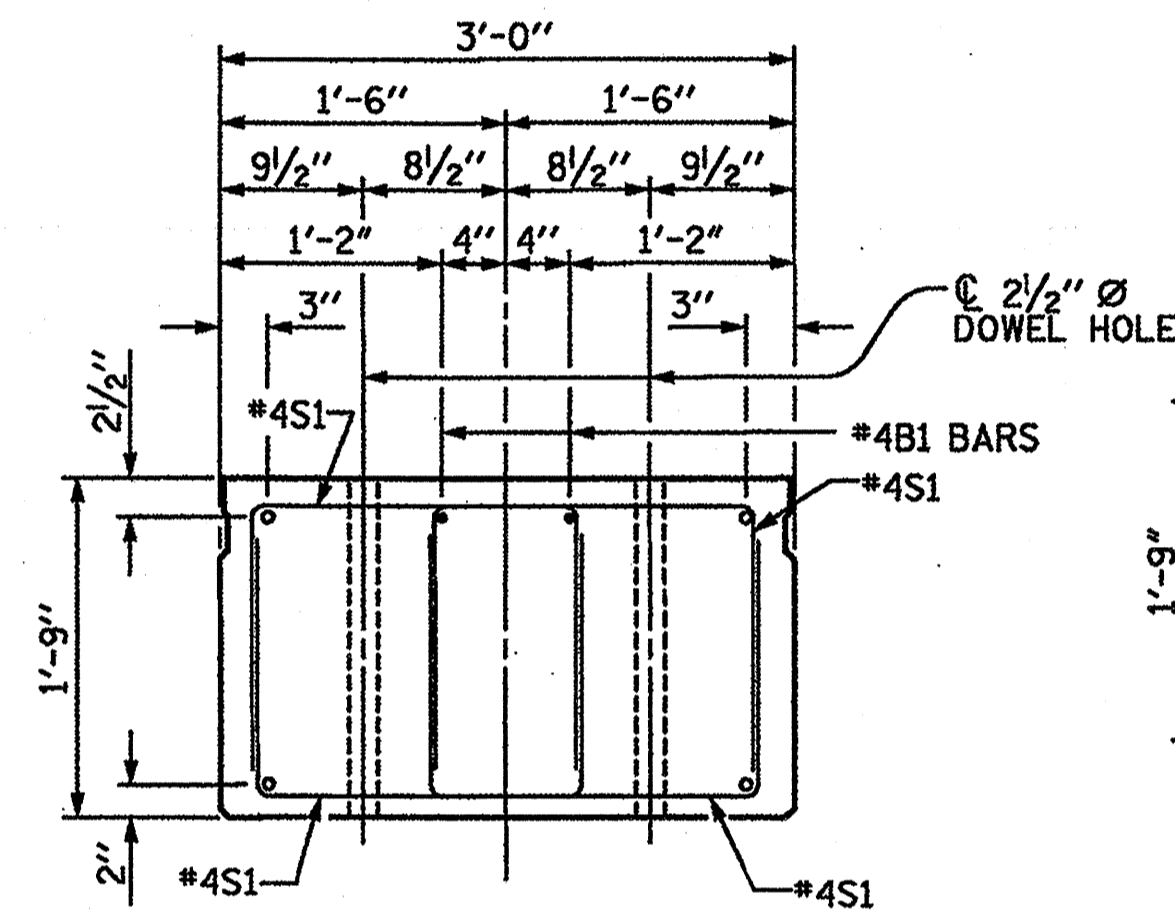
**SECTION AT BENT 3**  
(BENT 1 SIMILAR BY SYMMETRY)



**PART PLAN INTERIOR SLAB SECTION**  
(FAR END SHOWN, NEAR END SIMILAR BY SYMMETRY)



**PART PLAN EXTERIOR SLAB SECTION**  
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR BY SYMMETRY)

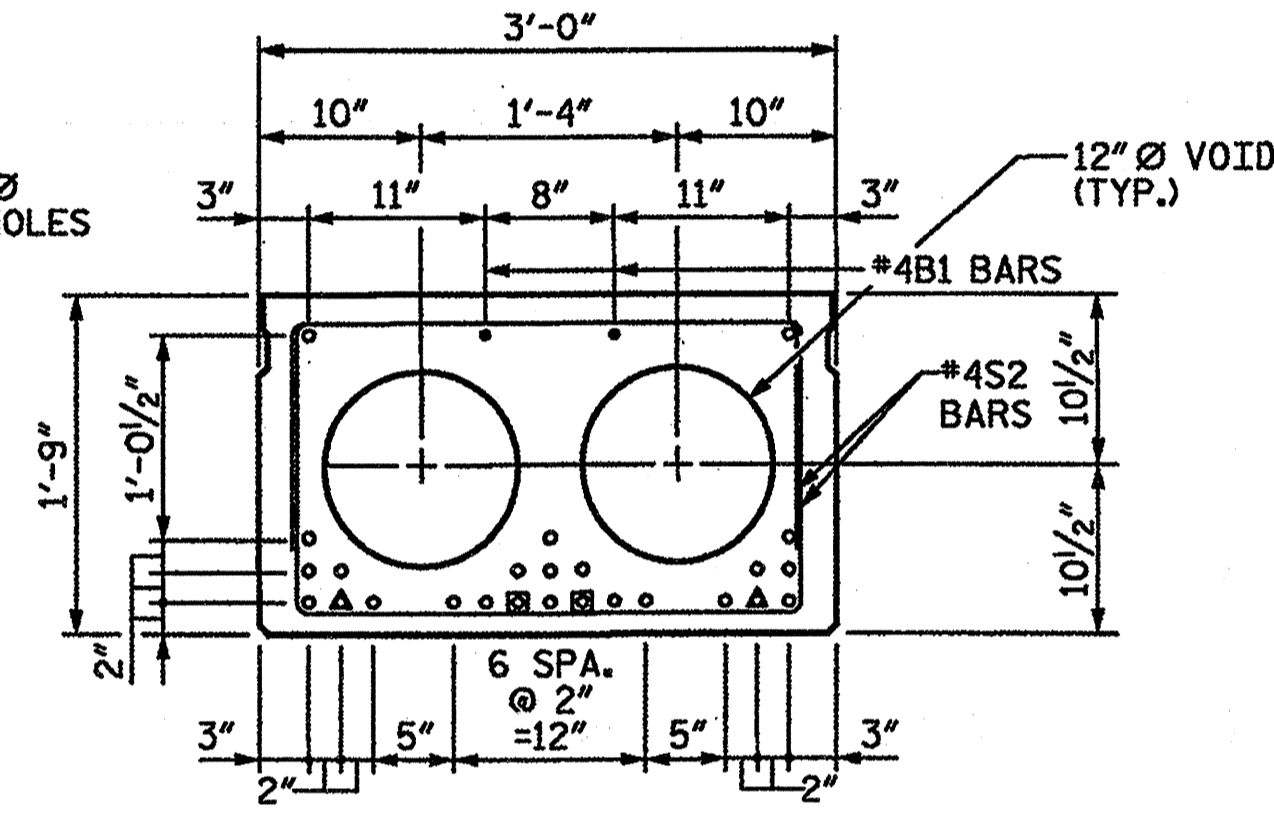


**SLAB END ELEVATION**

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES.

INTERIOR SLAB SECTION SHOWN, EXTERIOR SLAB SECTION SIMILAR EXCEPT SHEAR KEY LOCATION.

STRAND LAYOUT NOT SHOWN.

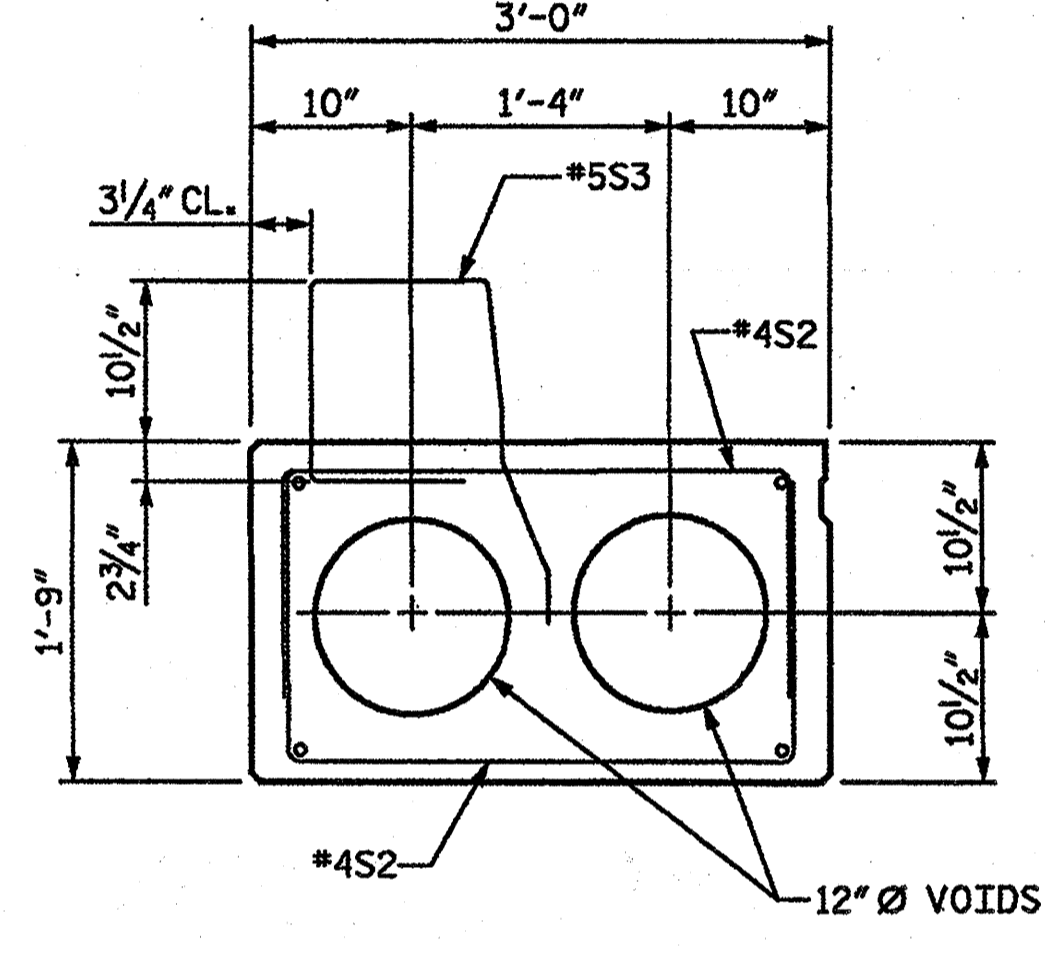


**INTERIOR SLAB SECTION**

(25 TOTAL STRANDS REQUIRED)

- DENOTES 1/2" Ø L.R. STRANDS
- ▲ DENOTES SHEATHED STRAND. BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4'-0" FROM END OF SLAB.
- DENOTES SHEATHED STRAND. BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF SLAB.

SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

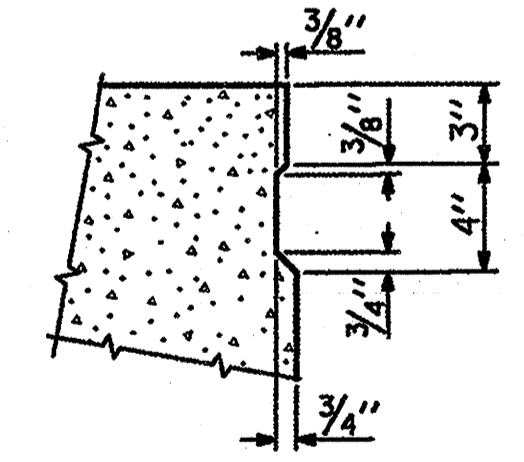


**EXTERIOR SLAB SECTION**

(FOR PRESTRESSED STRAND AND #4B1 BAR LAYOUT, SEE INTERIOR SLAB SECTION)

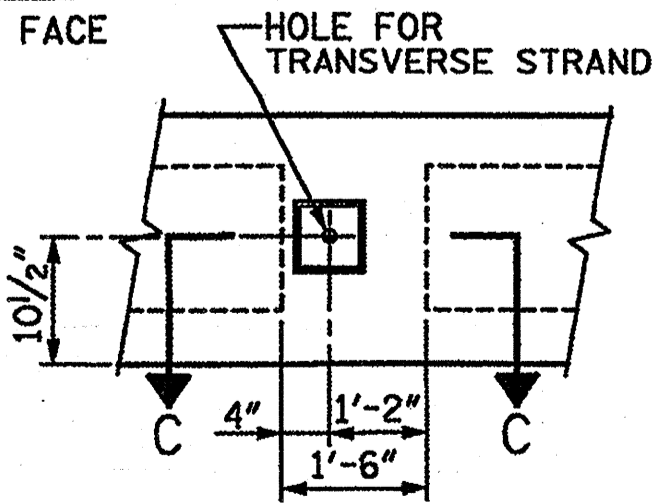
▲ NOTE: ASPHALT WEARING SURFACE IS INCLUDED IN THE QUANTITIES ON THE ROADWAY PLANS.

▲ REVISION #1: REVISED PER REVIEW COMMENTS  
BY: TJT DATE: 5-08  
CH'KD BY: KGB DATE: 5-08

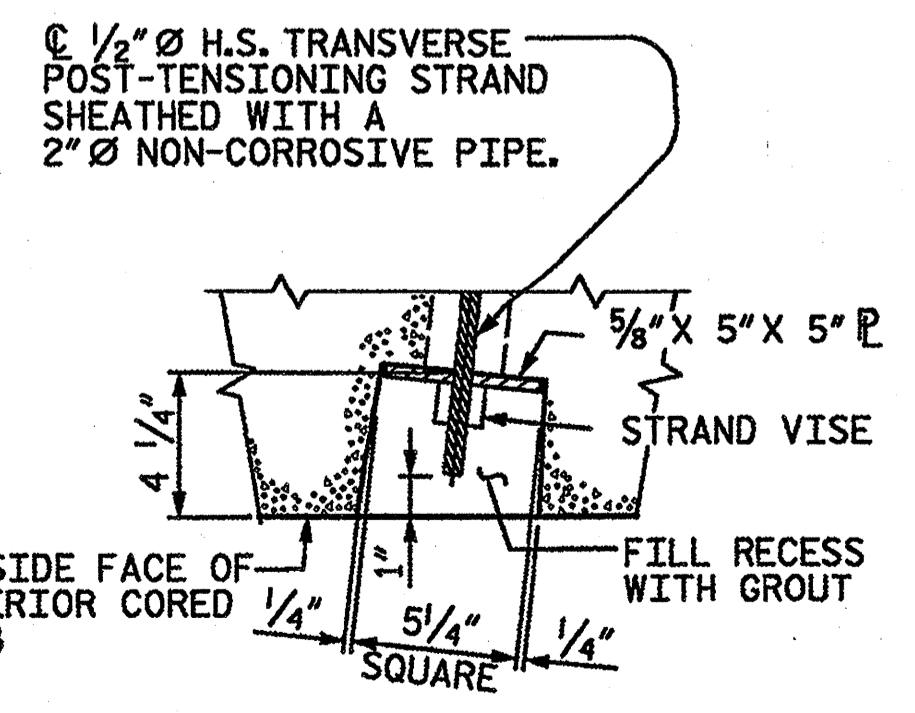


**SHEAR KEY DETAIL**

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLAB



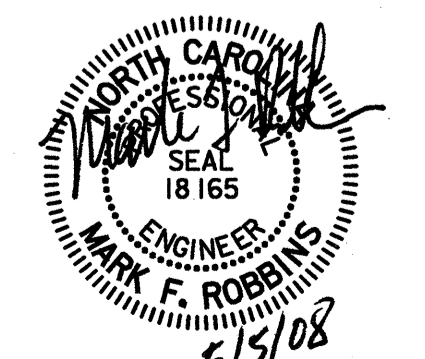
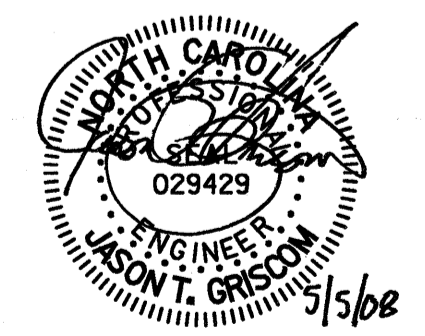
**ELEVATION VIEW**



**SECTION C-C**

**DETAIL A**

GRouted RECESS AT END OF POST-TENSIONED STRAND CORED SLABS



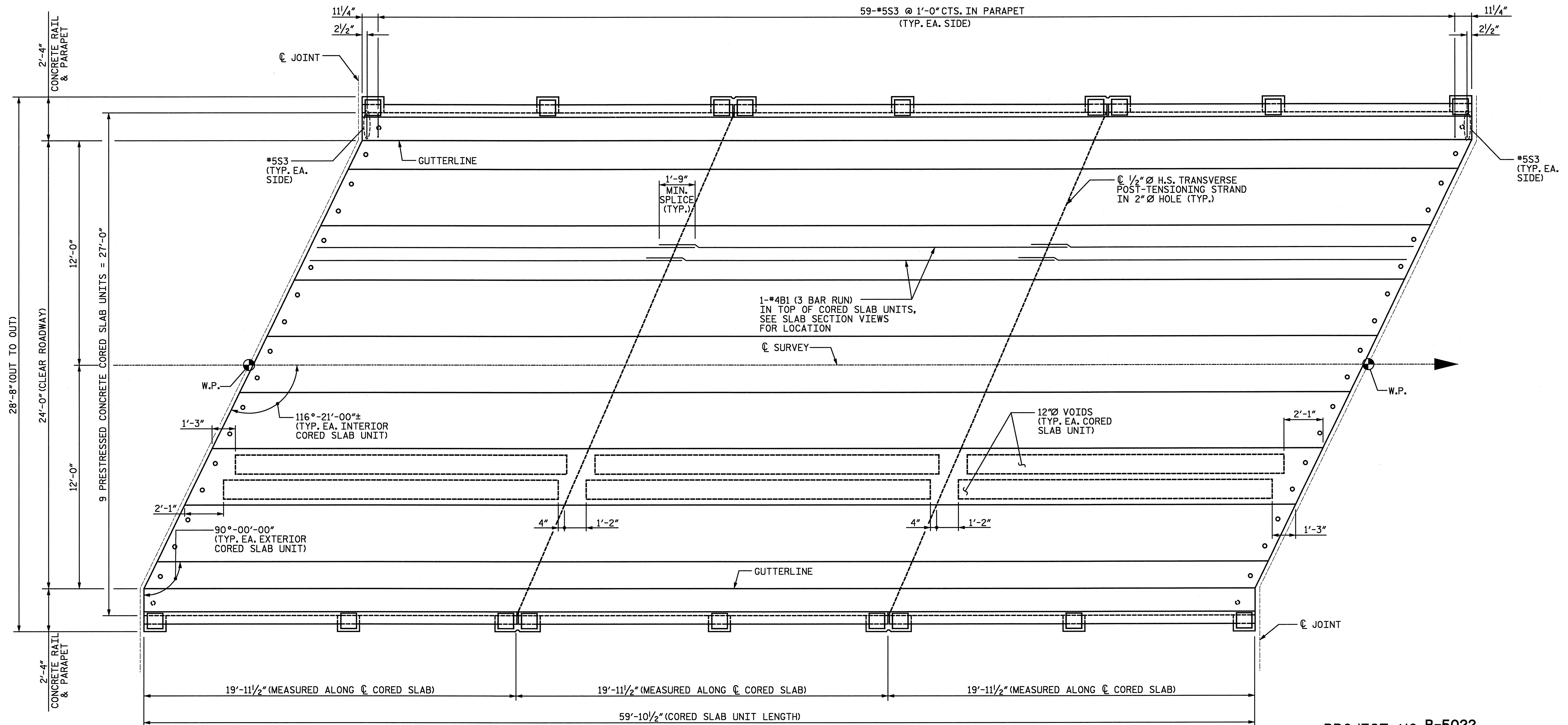
PROJECT NO. B-5022  
CUMBERLAND COUNTY  
BRIDGE: 153

SHEET 1 OF 4  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
3'-0" X 1'-9" PRESTRESSED CORED SLAB

REVISIONS				SHEET NO.			
NO.	BY	DATE	NO.	BY	DATE	S-2	
1	STV	5-08	3			TOTAL SHEETS	
2			4			44	

D-1810.2  
STV / Ralph Whitehead Associates, Inc.  
1000 West Morehead St., Ste. 200  
Charlotte, NC 28208

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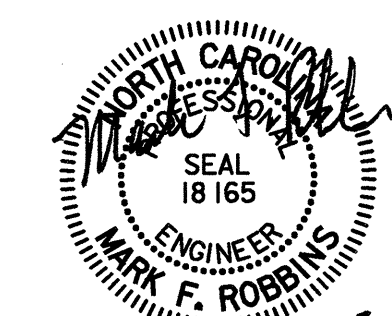
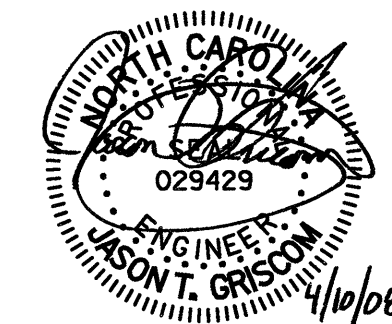


**PLAN OF SPAN B & C**

FOR ADDITIONAL CONCRETE RAIL REINFORCING STEEL & DETAILS, SEE "CONCRETE BRIDGE RAIL" SHEET.

PROJECT NO. **B-5022**  
**CUMBERLAND** COUNTY  
 BRIDGE: **153**

SHEET 2 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 PLAN OF SPAN B & C**

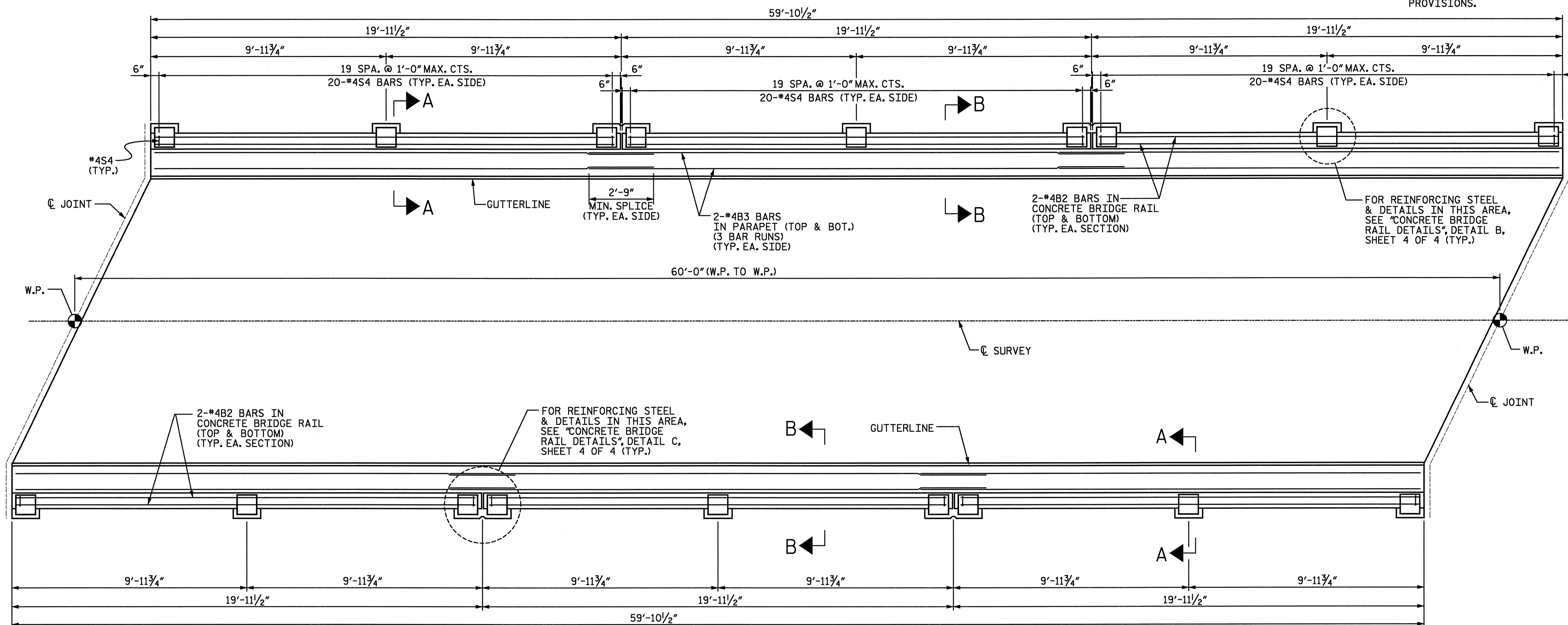
DRAWN BY : **JTG** DATE : **2-08**  
 CHECKED BY : **TBQ** DATE : **3-08**

D-1810.3  
 STV / Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

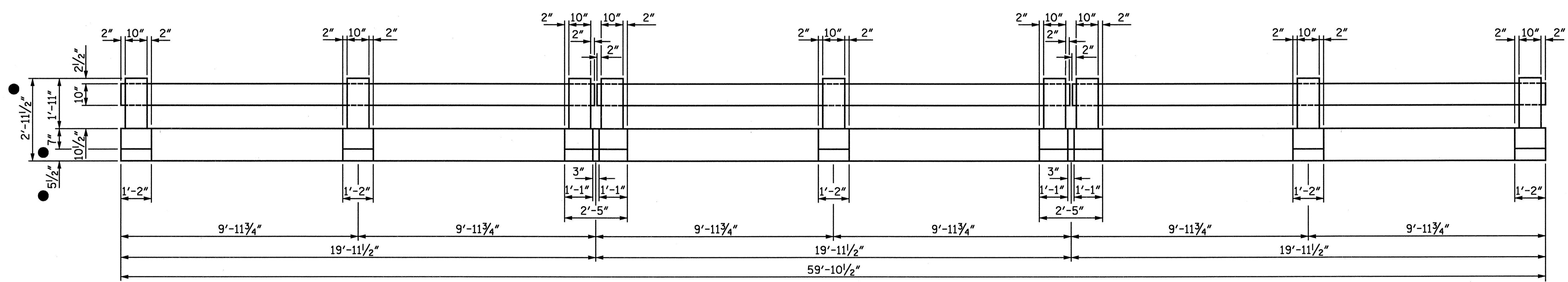
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			44



NOTE:  
FOR SECTION VIEWS, SEE SHEET 4 OF 4.  
CONCRETE BRIDGE RAIL SHALL BE CHAMFERED TO MATCH EXISTING RAIL. FOR CONCRETE BRIDGE RAIL, SEE SPECIAL PROVISIONS.

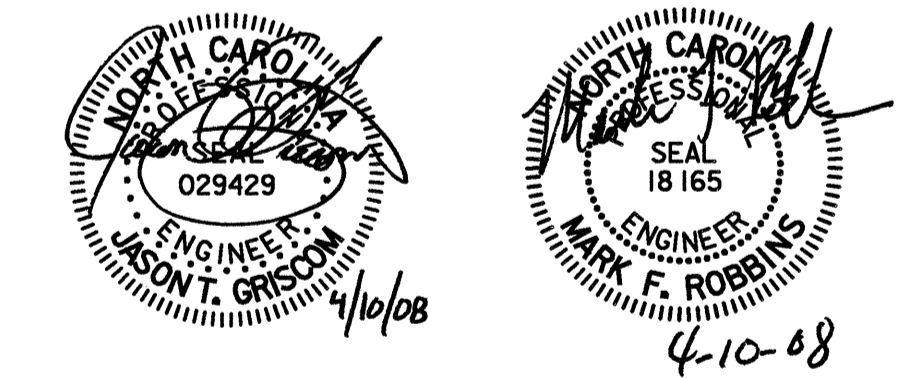


PLAN OF SPAN B & C CONCRETE BRIDGE RAIL



ELEVATION OF SPAN B & C CONCRETE BRIDGE RAIL  
(EXTERIOR OF RIGHT SIDE RAIL SHOWN, LEFT SIDE SIMILAR)  
(NOT TO SCALE)

● DIMENSION MAY NEED TO BE ADJUSTED TO MATCH TOP OF RAIL IN ADJACENT SPANS. REINFORCING SHALL BE ADJUSTED TO MATCH THE REVISED RAIL HEIGHT.



PROJECT NO. B-5022  
CUMBERLAND COUNTY  
BRIDGE: 153  
SHEET 3 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUPERSTRUCTURE  
CONCRETE  
BRIDGE RAIL**

DRAWN BY: JTG DATE: 3-08  
CHECKED BY: TBQ DATE: 3-08

D-1810.4  
STV/Ralph Whitehead Associates, Inc.  
1000 West Morehead St., Ste. 200  
Charlotte, NC 28208

REVISIONS						SHEET NO. S-4 TOTAL SHEETS 44
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

NOTES

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

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH GROUT. THE 2 1/2" Ø DOWEL HOLES AT EXPANSION ENDS OF SLAB SECTIONS SHALL BE FILLED WITH JOINT SEALER MATERIAL TO 1/2" ABOVE THE TOP OF DOWELS AND THEN FILLED WITH GROUT.

THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT. THE 2" Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS. PAYMENT FOR JOINT SEALER MATERIAL SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION OF THE BRIDGE.

WHEN CORED SLABS ARE CAST, A POSITIVE HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDWAYS. THIS SYSTEM SHALL BE DESIGNED TO BE LEFT IN PLACE UNTIL THE CONCRETE HAS REACHED RELEASE STRENGTH. AT LEAST THREE WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

WHEN A CONCRETE WEARING SURFACE IS DETAILED ON THE CORED SLAB BRIDGE TYPICAL SECTION, THE TOP SURFACE OF THE CORED SLAB UNITS SHALL HAVE A 3/8" RAKED FINISH.

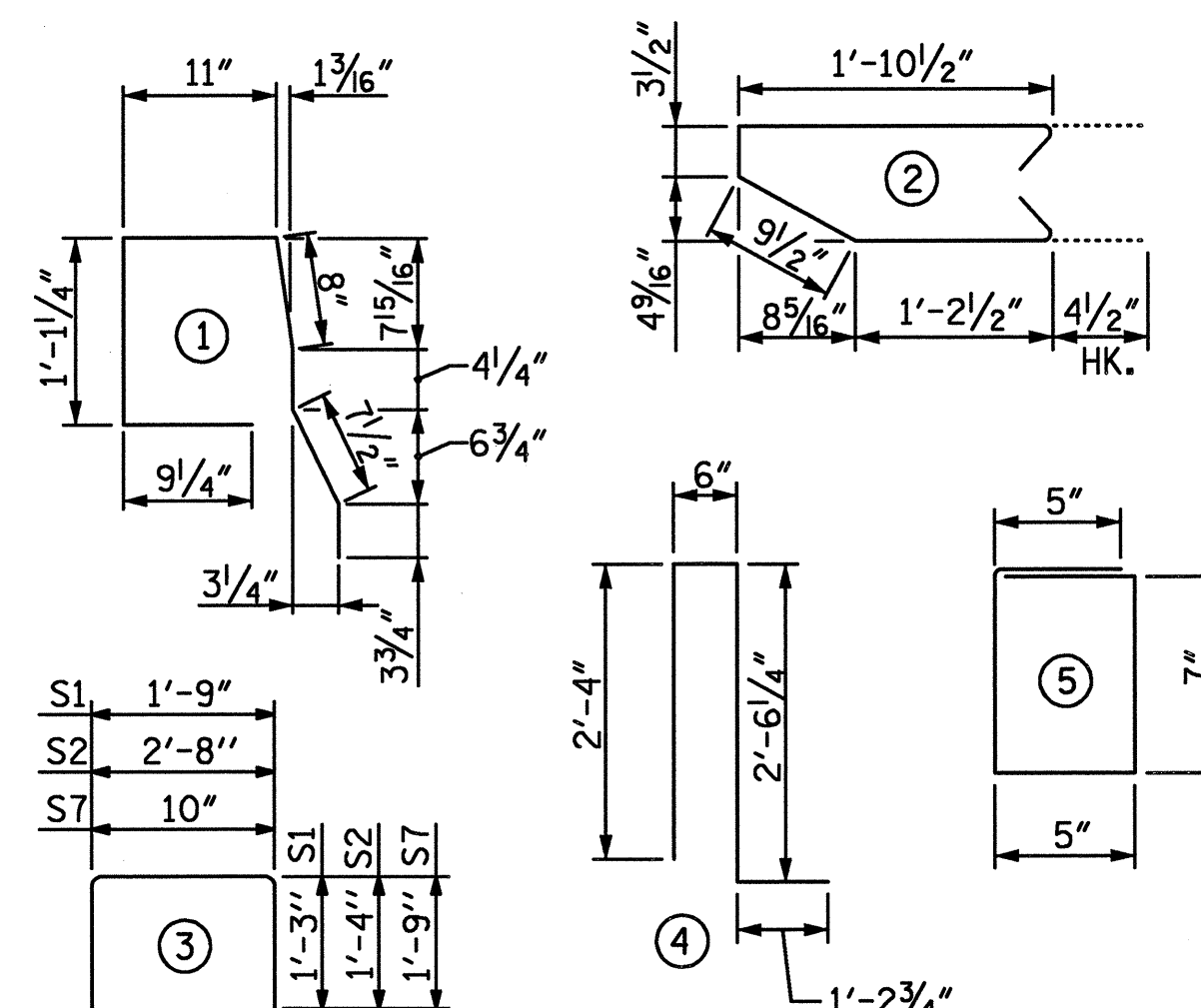
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5600 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED. PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR ONE CORED SLAB SECTION

BAR NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
			LENGTH	WEIGHT	LENGTH	WEIGHT
B1	6	#4 STR	21'-0"	84	21'-0"	84
S1	16	#4	4'-3"	45	4'-3"	45
S2	118	#4	5'-4"	420	5'-4"	420
* S3	61	#5	4'-9"	302		
REINFORCING STEEL				549 LBS.		549 LBS.
* EPOXY COATED REINFORCING STEEL				302 LBS.		
7000 P.S.I. CONCRETE						8.5 CY
1/2" Ø L.R. STRANDS			No.	25		25

DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 1'-9"
	1/2" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1 1/8"
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/2"
FINAL CAMBER	1 3/8"

\*\* INCLUDES FUTURE WEARING SURFACE

BILL OF MATERIAL FOR CONCRETE BRIDGE RAIL AND PARAPET

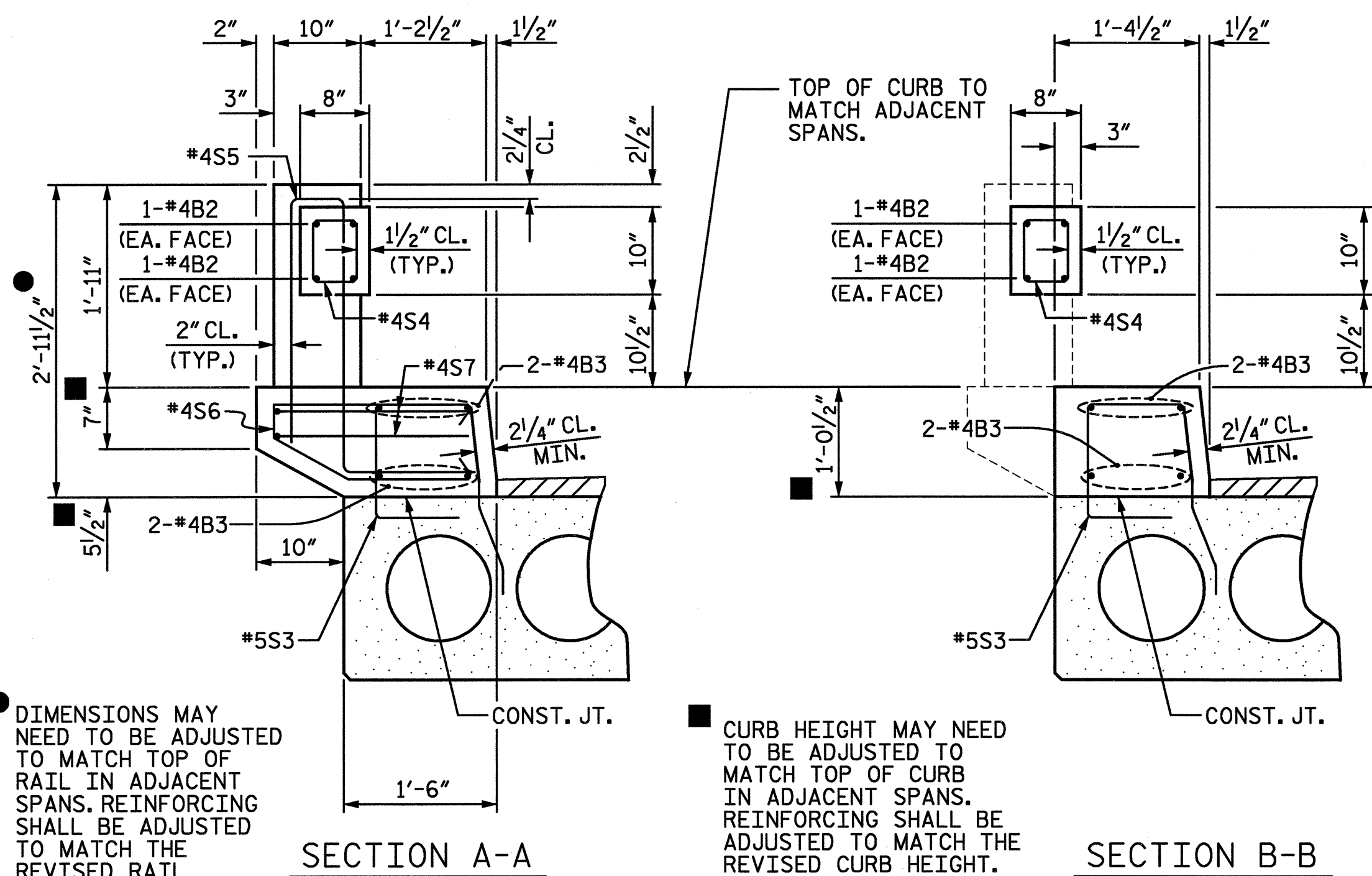
BAR	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
* B2	48	#4	STR	19'-2"	615
* B3	48	#4	STR	21'-9"	697
* S4	240	#4	5	2'-5"	387
* S5	72	#4	4	6'-7"	317
* S6	72	#4	2	4'-11"	236
* S7	72	#4	3	4'-4"	208
* EPOXY COATED REINFORCING STEEL					2,460 LBS.
CLASS AA CONCRETE					21.0 CY
TOTAL LIN. FT. OF CONCRETE BARRIER RAIL					239'-6"

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	4	59'-10 1/2"	239'-6"
INTERIOR C.S.	14	59'-10 1/2"	838'-3"
TOTAL	18		1077'-9"

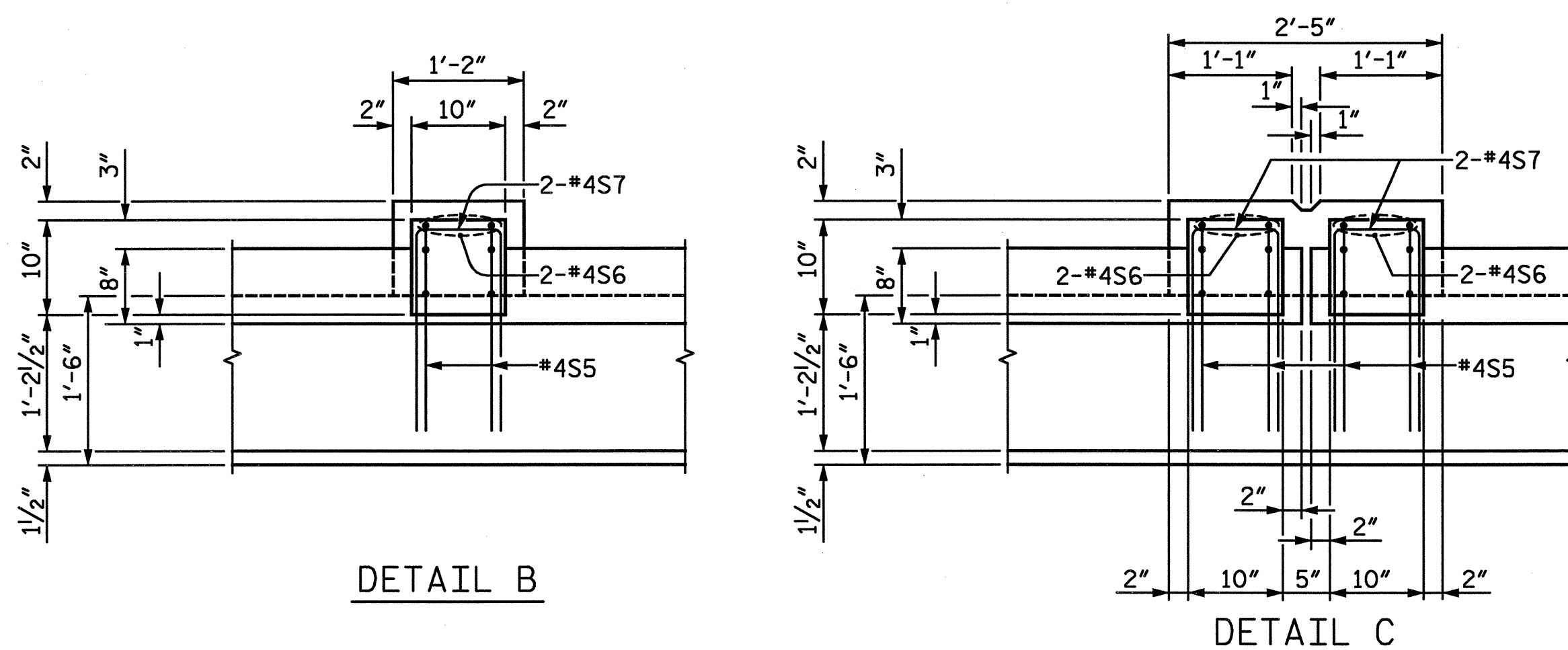
GRADE 270 STRANDS

	1/2" Ø L.R.
AREA (SQUARE INCHES)	0.153
ULTIMATE STRENGTH (LBS. PER STRAND)	41,300
APPLIED PRESTRESS (LBS. PER STRAND)	30,980

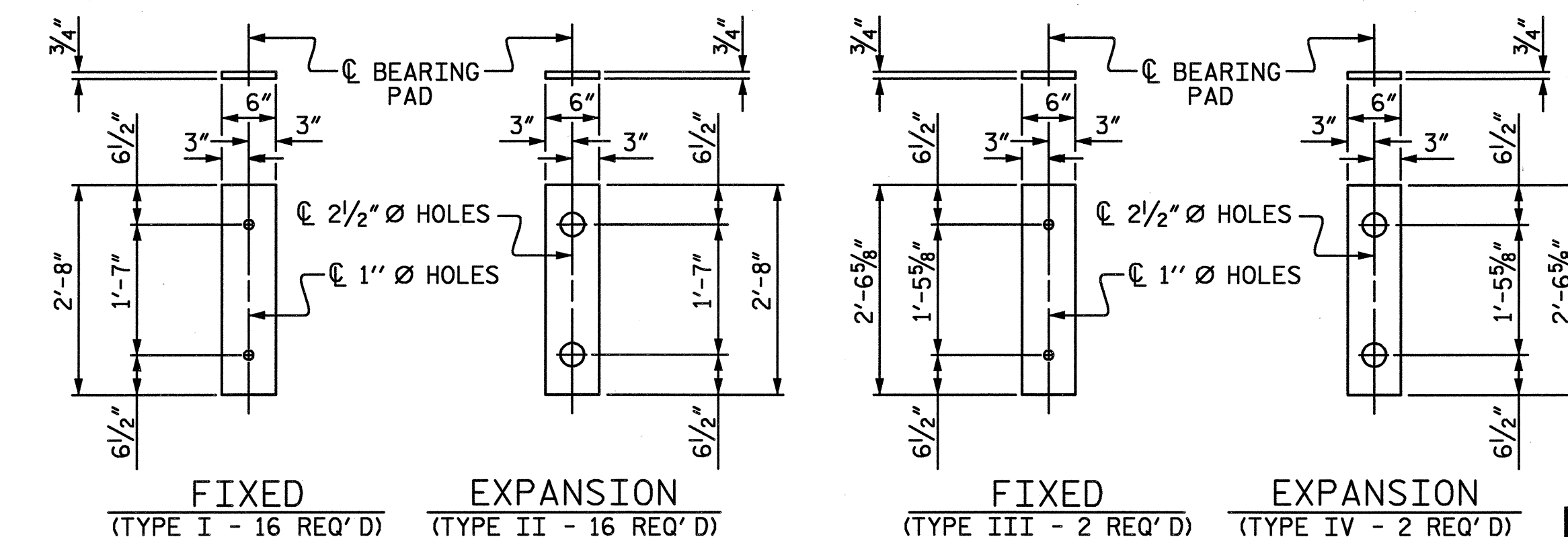


DIMENSIONS MAY NEED TO BE ADJUSTED TO MATCH TOP OF RAIL IN ADJACENT SPANS. REINFORCING SHALL BE ADJUSTED TO MATCH THE REVISED RAIL HEIGHT.

CURB HEIGHT MAY NEED TO BE ADJUSTED TO MATCH TOP OF CURB IN ADJACENT SPANS. REINFORCING SHALL BE ADJUSTED TO MATCH THE REVISED CURB HEIGHT.



CONCRETE BRIDGE RAIL DETAILS



ELASTOMERIC BEARING DETAILS

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

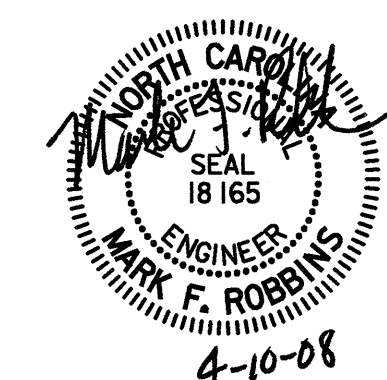
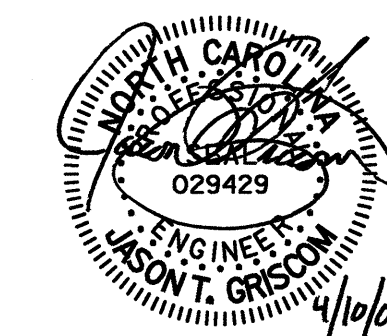
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

PROJECT NO. B-5022

CUMBERLAND COUNTY

BRIDGE: 153

SHEET 4 OF 4



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
CONCRETE  
BRIDGE RAIL  
DETAILS

REVISIONS

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

SHEET NO.

S-5
TOTAL SHEETS
44

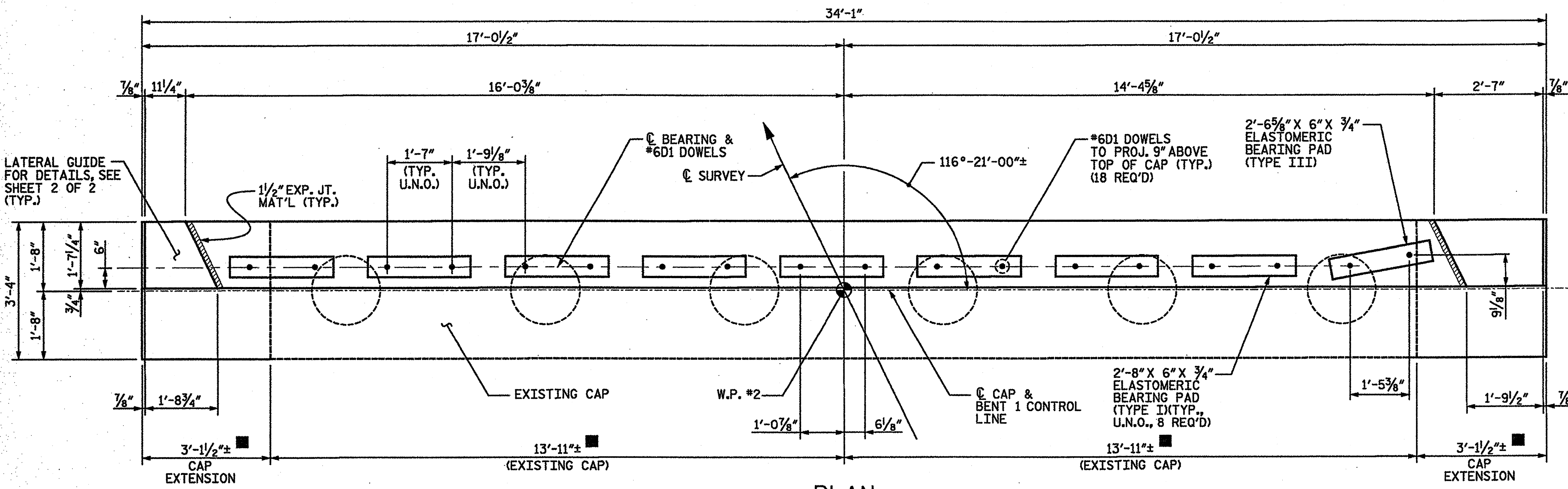
D-1810.5

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Charlotte, NC 28208

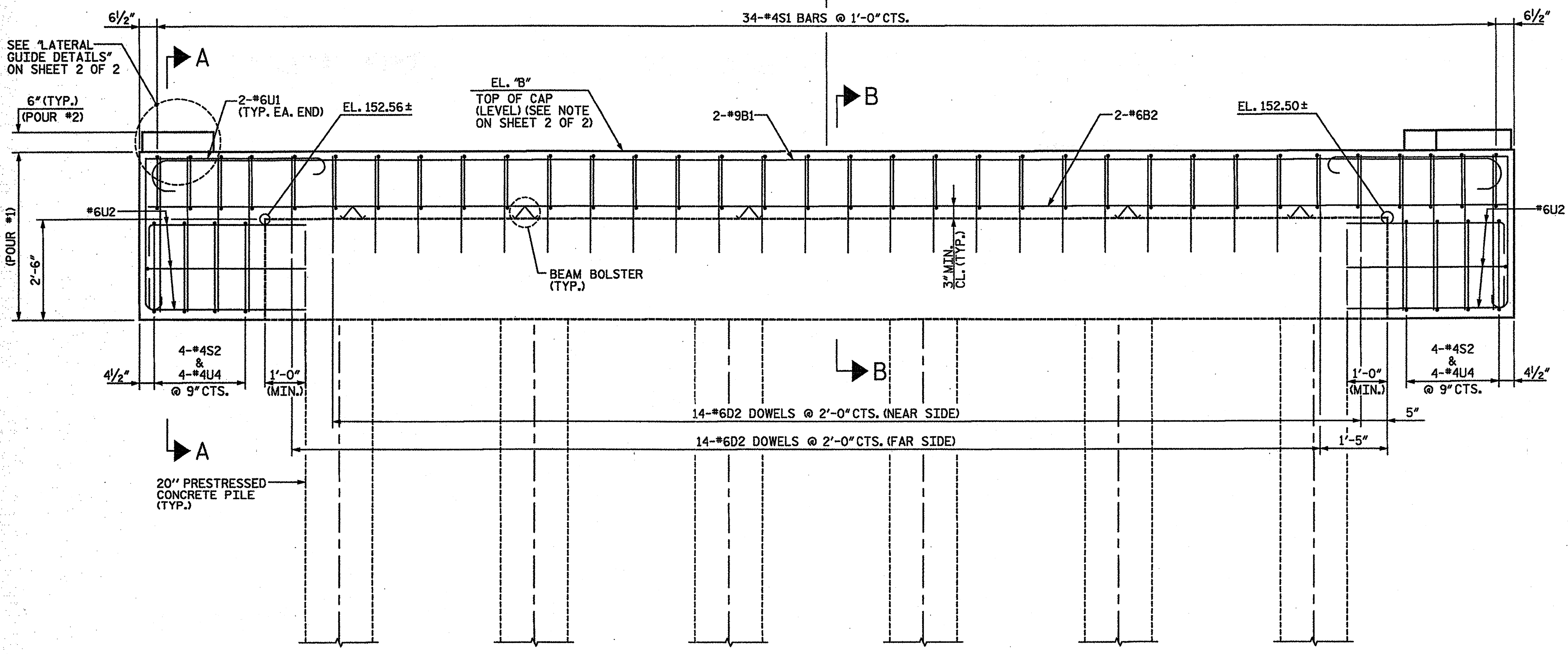
DRAWN BY: TRL DATE: 1-08  
CHECKED BY: TBQ DATE: 3-08



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 8:01:55 AM  
 Timothy.Townsend 5/2/2008



**PLAN**



**ELEVATION**  
(LOOKING UPSTATION)

**NOTES :**

REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.  
 THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.  
 ALL ELEVATIONS ARE TO BE VERIFIED BY THE ENGINEER.

A HIGH EARLY STRENGTH PORTLAND CEMENT CONCRETE SHALL BE USED TO ACHIEVE A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI PRIOR TO PLACING CORED SLAB UNITS. SEE STANDARD SPECIFICATION SECTION 1000 FOR DETAILS.

⚠️ #6D2 AND #6U2 DOWELS SHALL BE ADHESIVELY ANCHORED USING AN APPROVED ADHESIVE CONSIDERING LOAD RESISTANCE, IN-SERVICE AND INSTALLATION TEMPERATURE, AVAILABILITY OF COMPREHENSIVE INSTALLATION INSTRUCTIONS, AND CREEP. ANCHORS SHALL BE INSTALLED TO THE MINIMUM EMBEDMENT DEPTHS AS SHOWN ON PLANS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE DOWEL IS 26 KIPS. FOR ADHESIVELY ANCHORED DOWELS, SEE SPECIAL PROVISIONS.

U.N.O. = UNLESS NOTED OTHERWISE

■ DIMENSIONS AND ELEVATIONS ARE BASED ON AS-BUILT DIMENSIONS AND FIELD SURVEY INFORMATION. CONTRACTOR SHALL FIELD VERIFY DIMENSIONS PRIOR TO CONSTRUCTION. REINFORCING AND CONCRETE CAP EXTENSIONS SHALL BE ADJUSTED TO MATCH FIELD VERIFIED DIMENSIONS PROVIDED THAT THE OUT-TO-OUT DIMENSIONS REMAIN AS DETAILED.

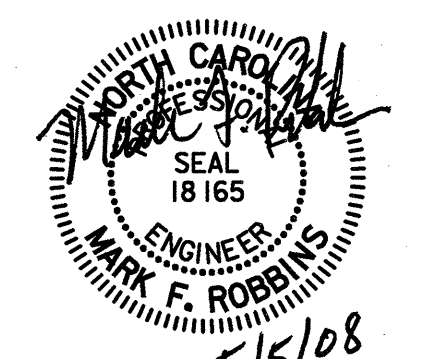
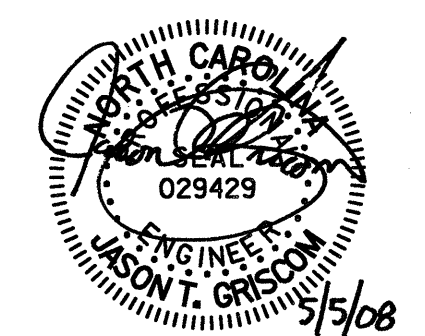
⚠️ REVISION #1: REVISED PER REVIEW COMMENTS  
 BY: TJT DATE: 5-08  
 CH'KD BY: KGB DATE: 5-08

**PROJECT NO. B-5022**  
**CUMBERLAND COUNTY**  
**BRIDGE: 153**

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

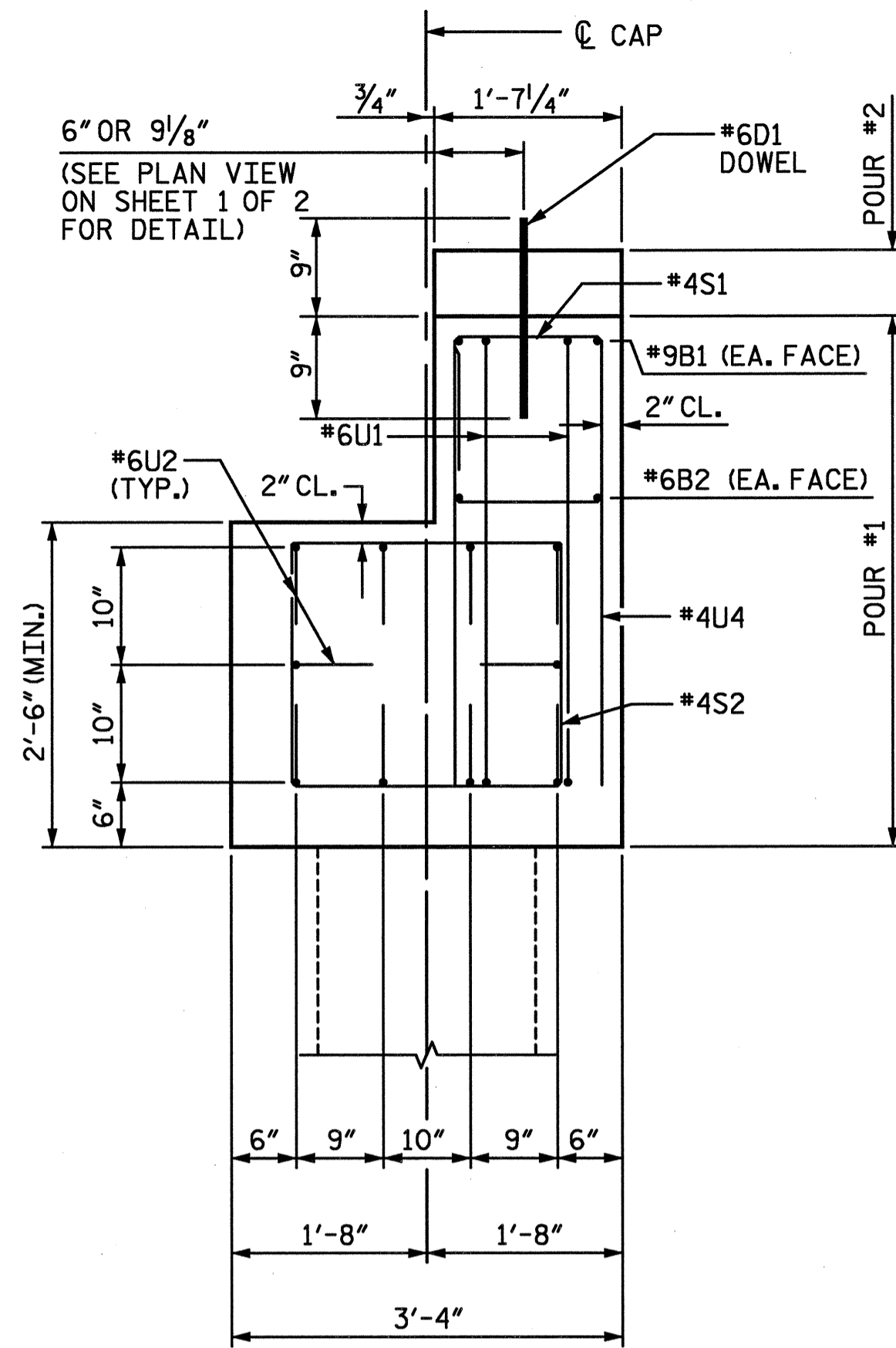
**SUBSTRUCTURE**  
**BENT 1**



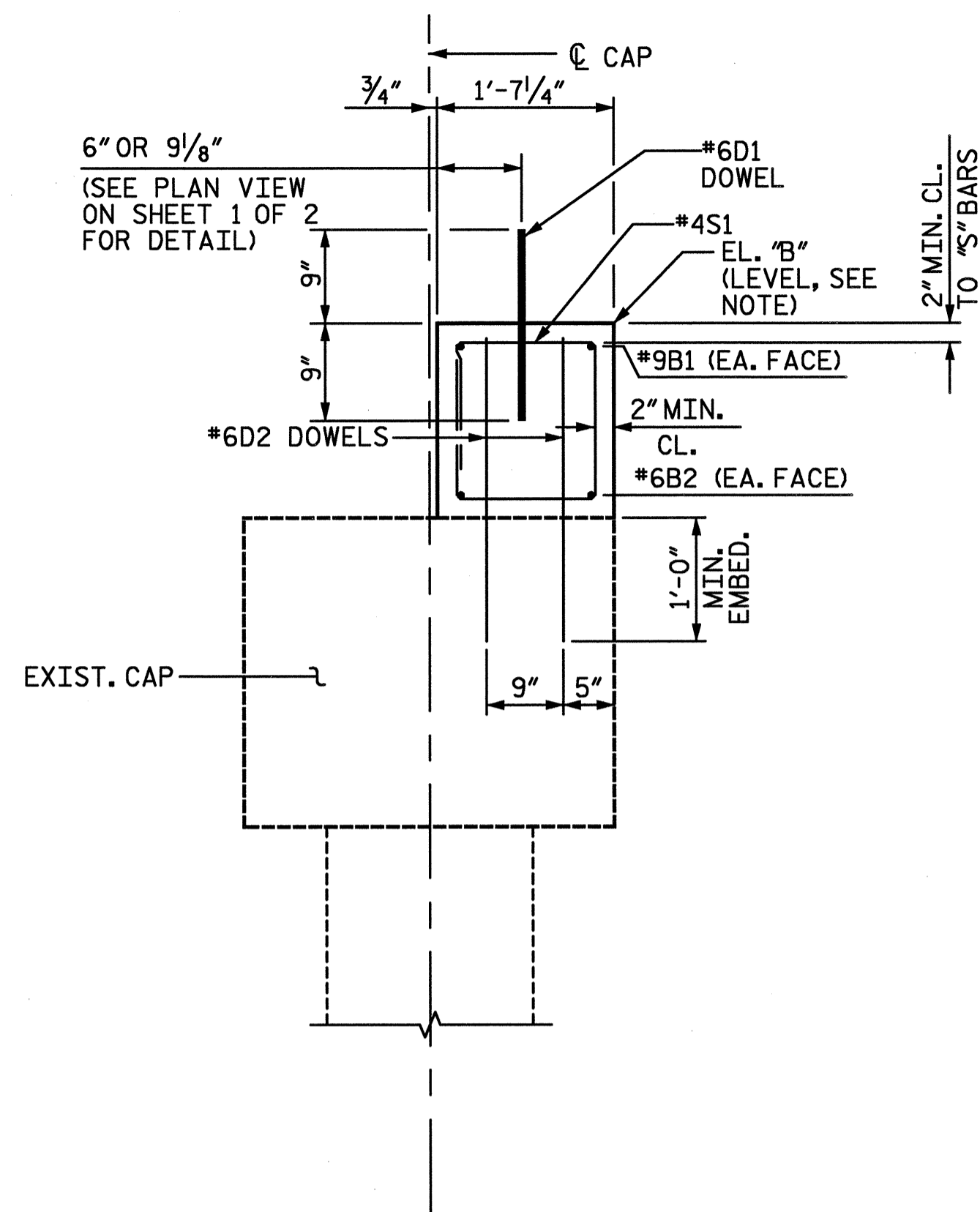
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D-1810.6  
 STV/Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

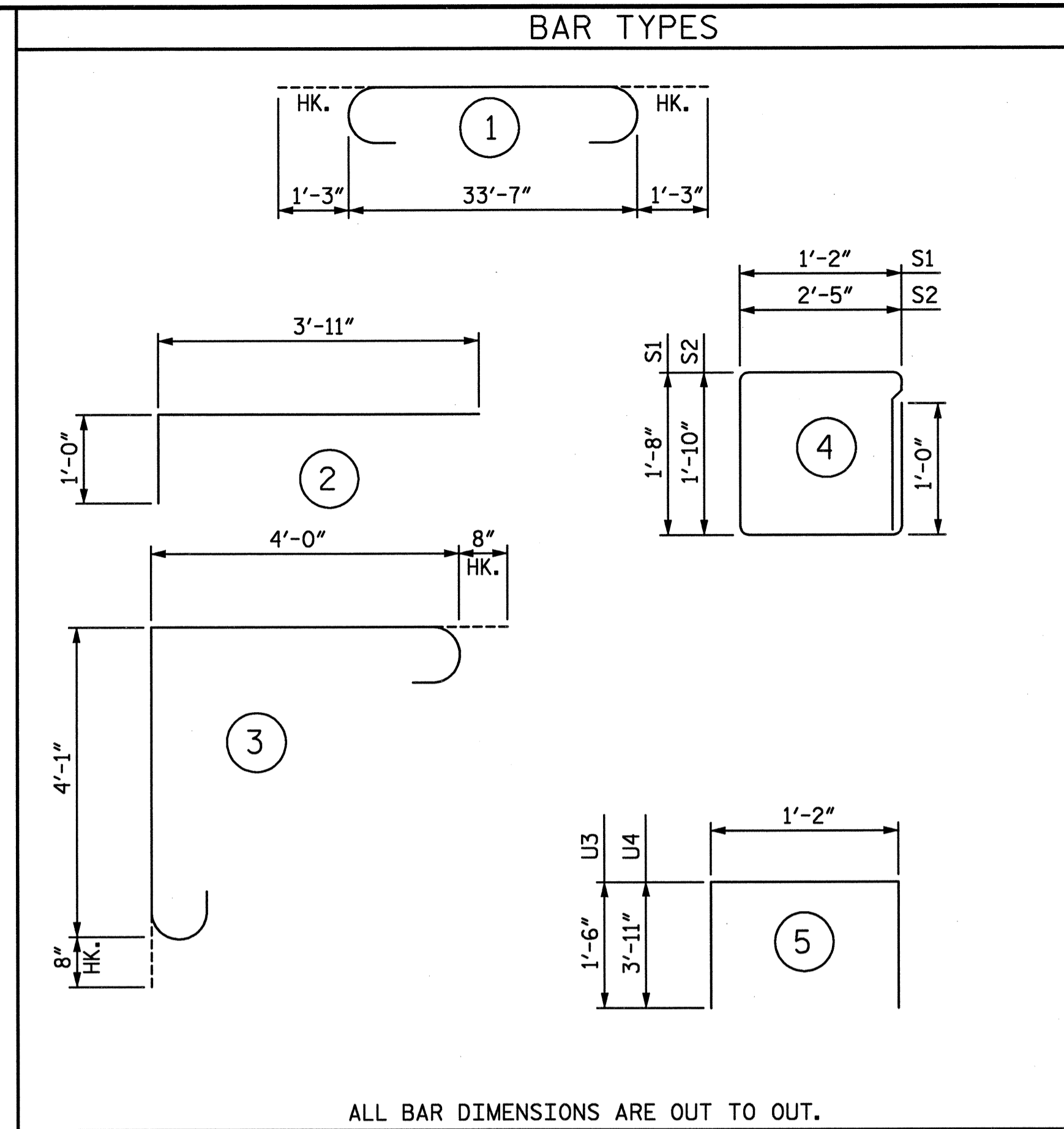
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-6
1	STV	5-08	3			TOTAL SHEETS
2			4			44



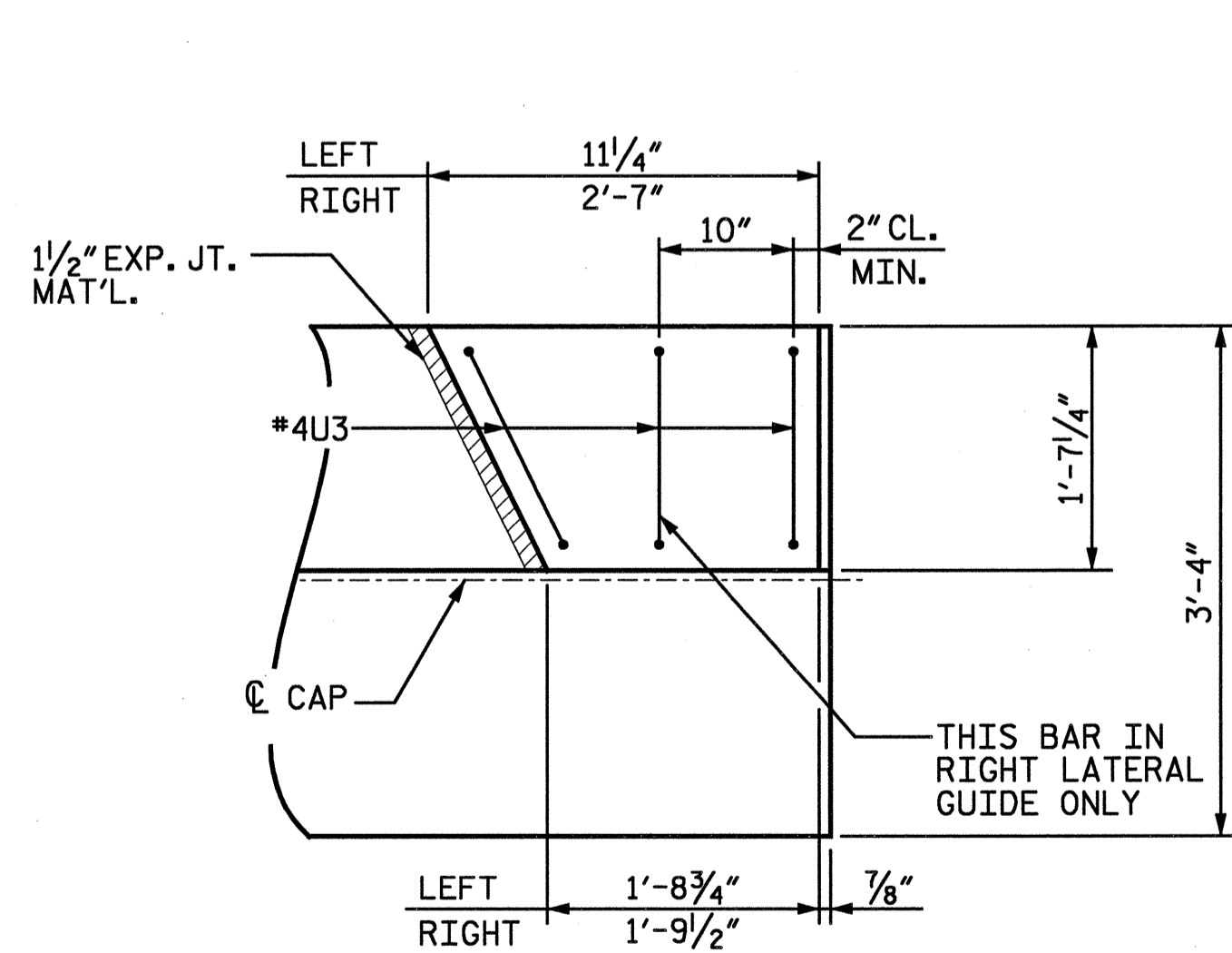
SECTION A-A



SECTION B-B



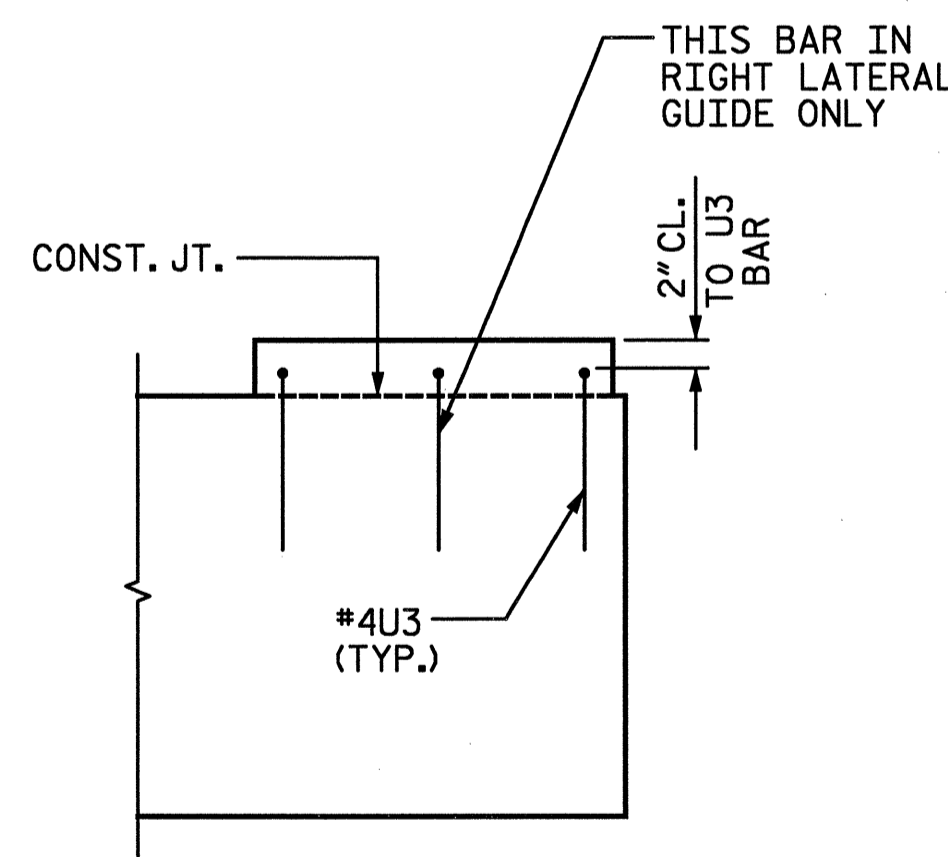
ALL BAR DIMENSIONS ARE OUT TO OUT.



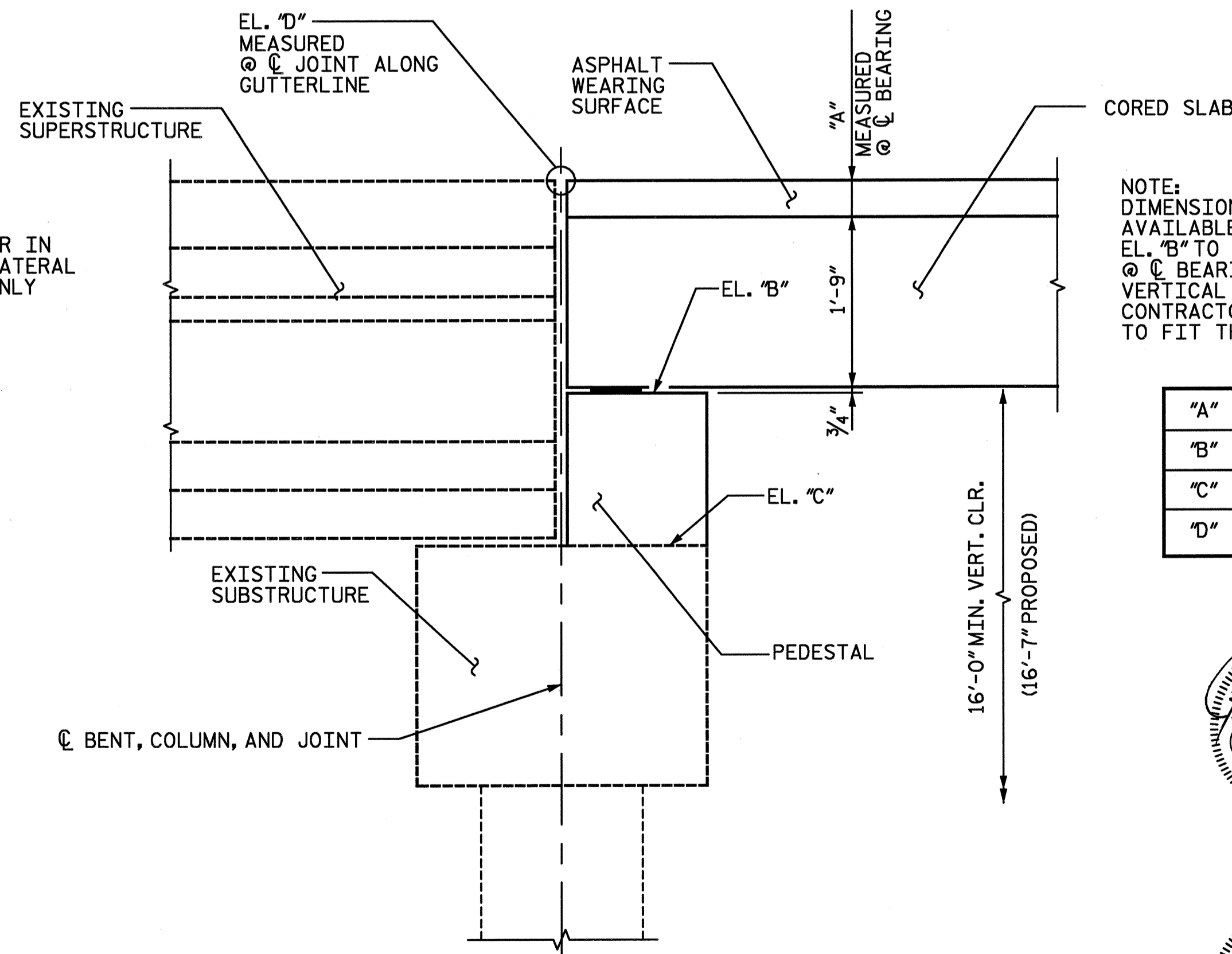
PLAN

LATERAL GUIDE DETAILS

(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)



ELEVATION



PEDESTAL HEIGHT

NOTE: DIMENSIONS AND ELEVATIONS SHOWN ARE FROM BEST INFORMATION AVAILABLE. CONTRACTOR SHALL MAKE ADJUSTMENTS TO PEDESTAL EL. 'B' TO MAINTAIN 3" (5" MAX.) ASPHALT WEARING SURFACE @ C BEARING, MATCH EL. 'D', AND TO MAINTAIN THE 16'-0" MIN. VERTICAL CLEARANCE. IF ANY ELEVATIONS ARE MODIFIED, THE CONTRACTOR IS RESPONSIBLE FOR ADJUSTING THE REINFORCING TO FIT THE PEDESTAL HEIGHT.

"A"	3"
"B"	154.51
"C"	152.50
"D"	156.57

BILL OF MATERIAL

BENT 1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	2	9	①	36'-1"	245	
B2	2	6	STR.	33'-7"	101	
D1	18	6	STR.	1'-6"	41	
D2	28	6	STR.	2'-11"	123	
S1	34	4	④	6'-8"	151	
S2	8	4	④	9'-6"	51	
U1	4	6	③	9'-5"	57	
U2	20	6	②	4'-11"	148	
U3	5	4	⑤	4'-2"	14	
U4	8	4	⑤	9'-0"	48	
REINFORCING STEEL					LBS.	979
CLASS AA CONCRETE BREAKDOWN						
POUR 1 (CAP)					CY	6.1
POUR 2 (LATERAL GUIDE)					CY	0.1
TOTAL					CY	6.2

PROJECT NO. B-5022  
 CUMBERLAND COUNTY  
 BRIDGE: 153

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT 1

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			5-7
2			4			TOTAL SHEETS 44

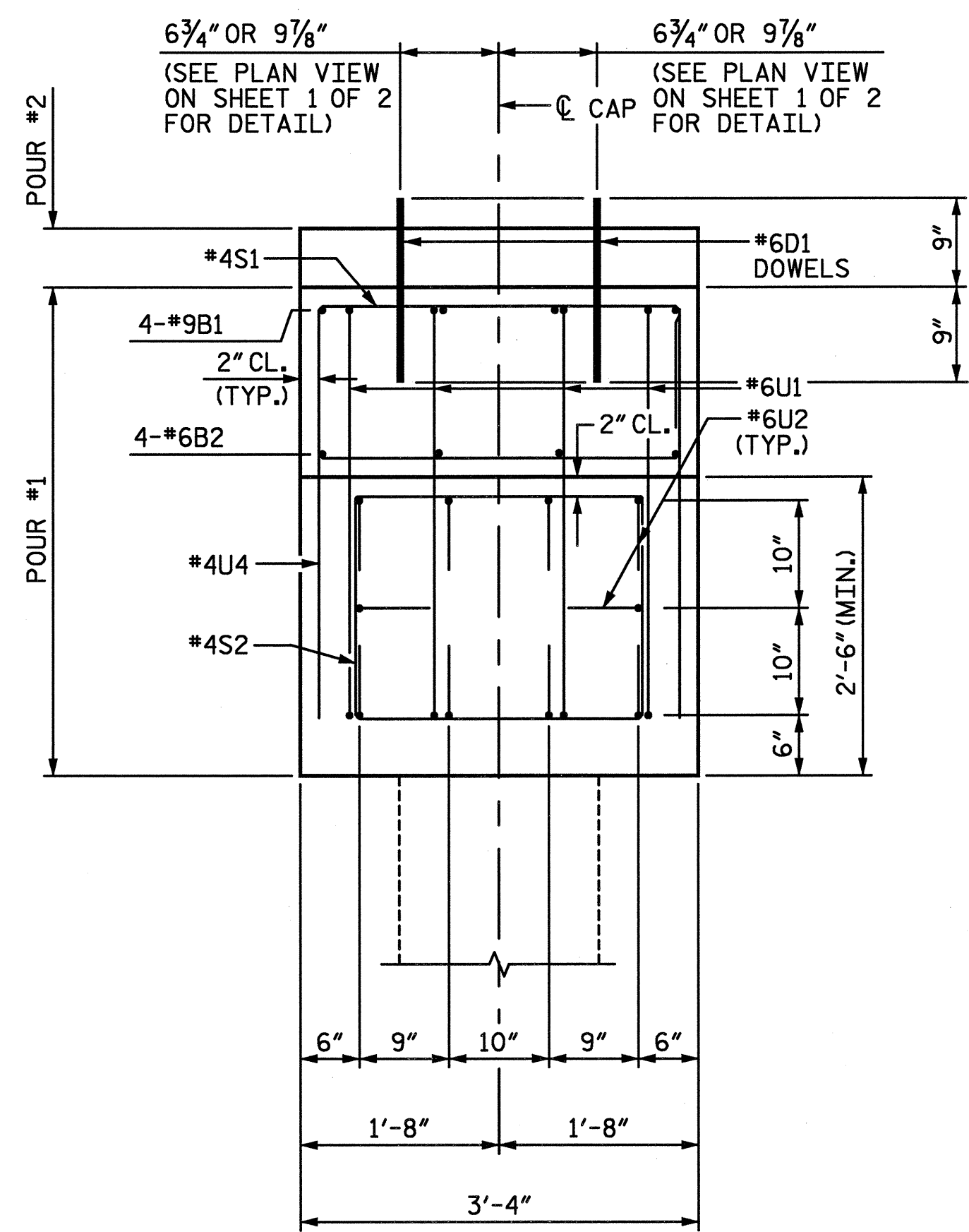
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 CHECKED BY: TBQ DATE: 3-08

D-1810.7

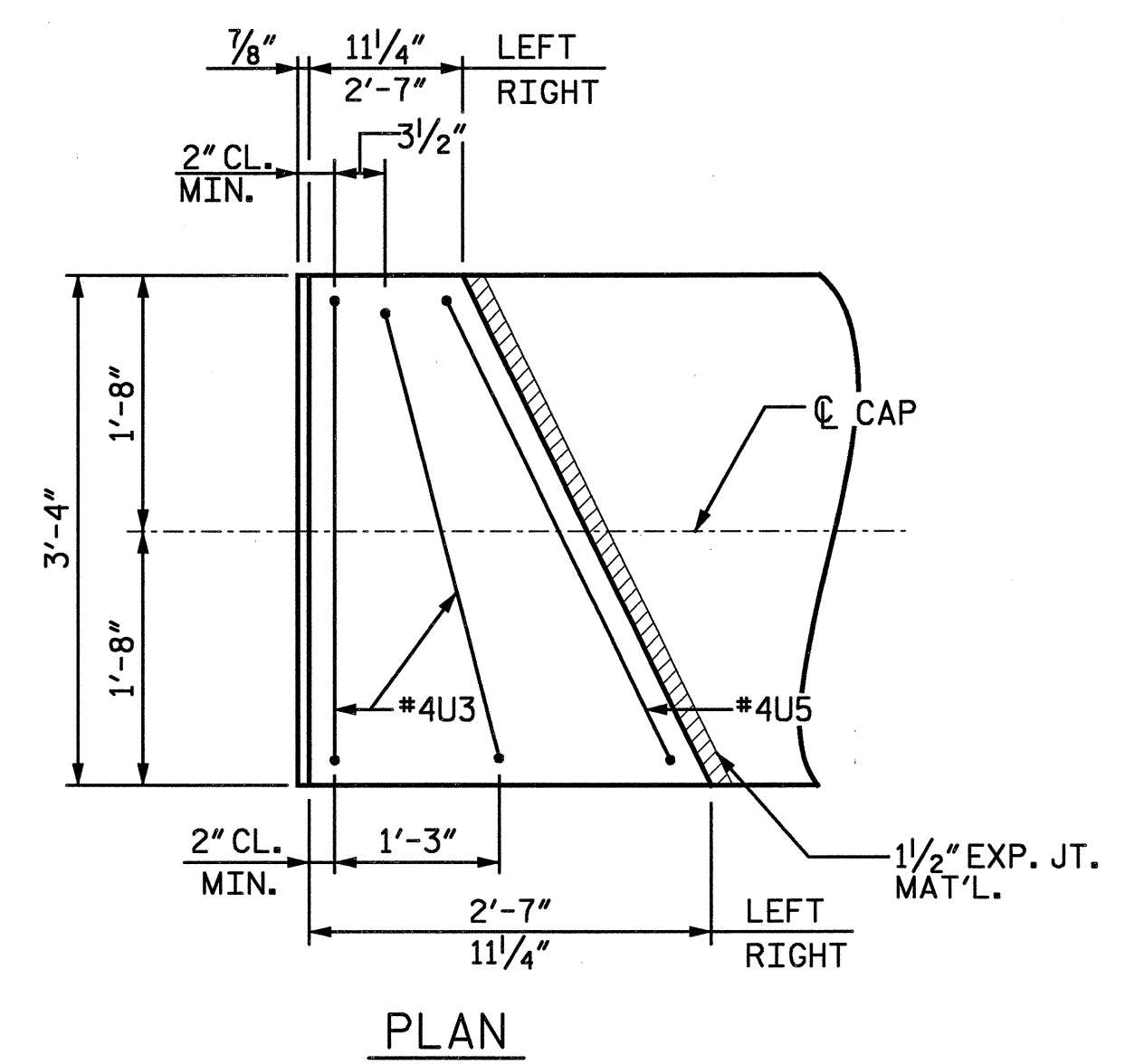
STV / Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208



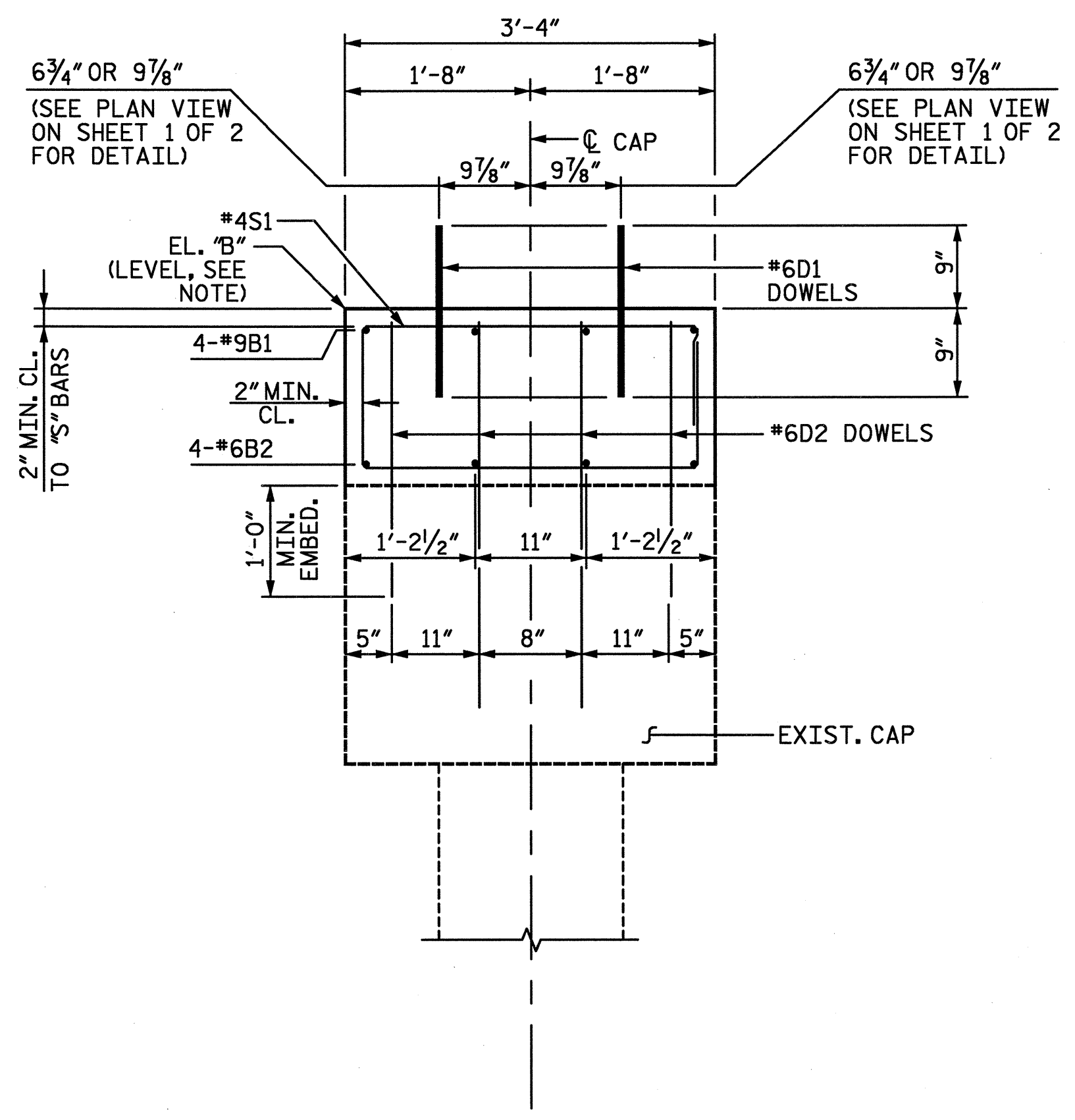




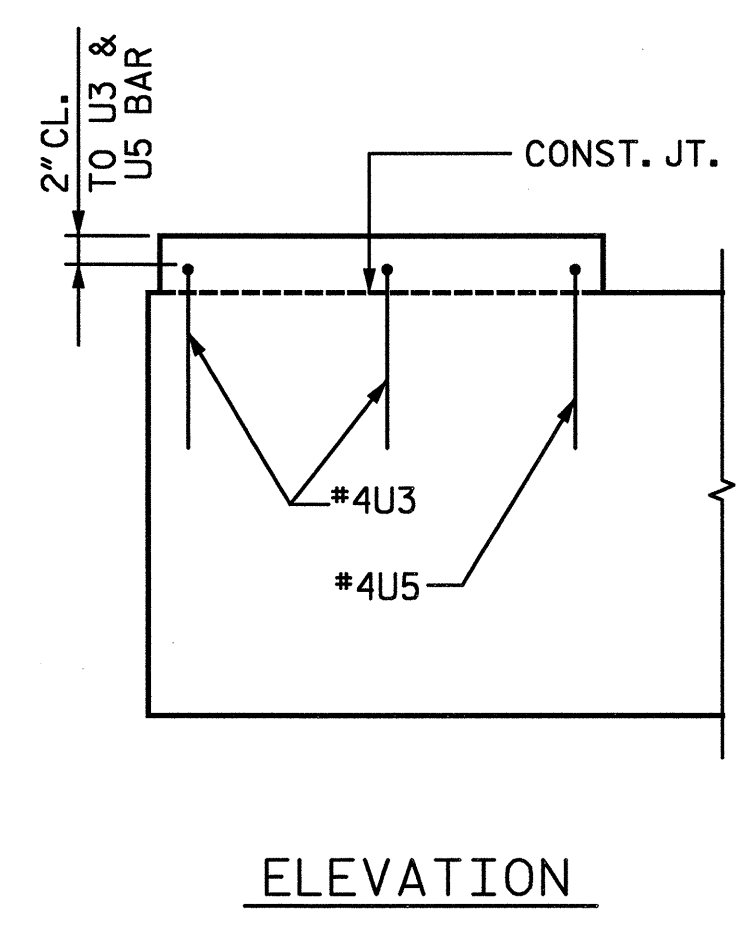
SECTION A-A



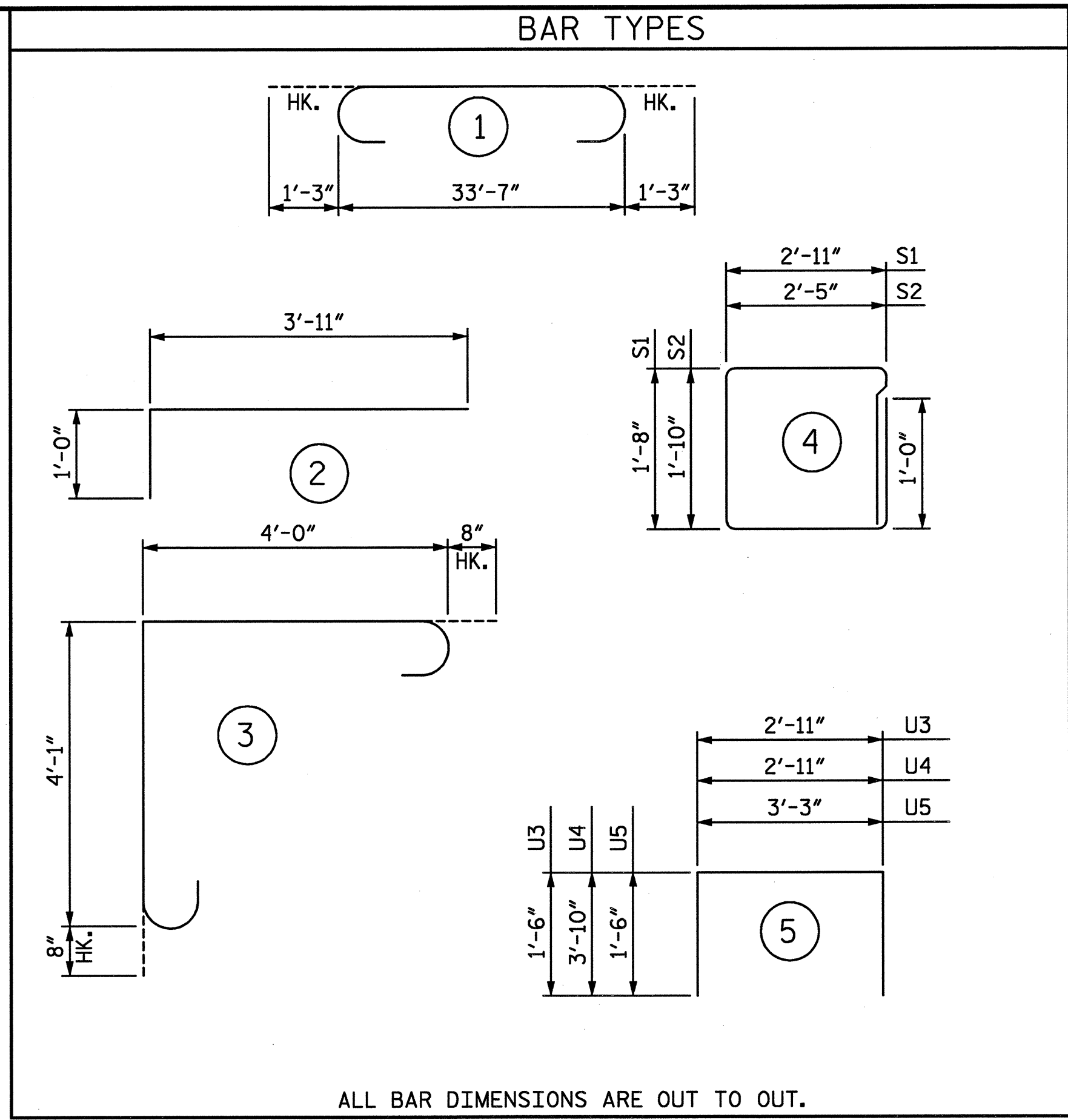
LATERAL GUIDE DETAILS  
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)



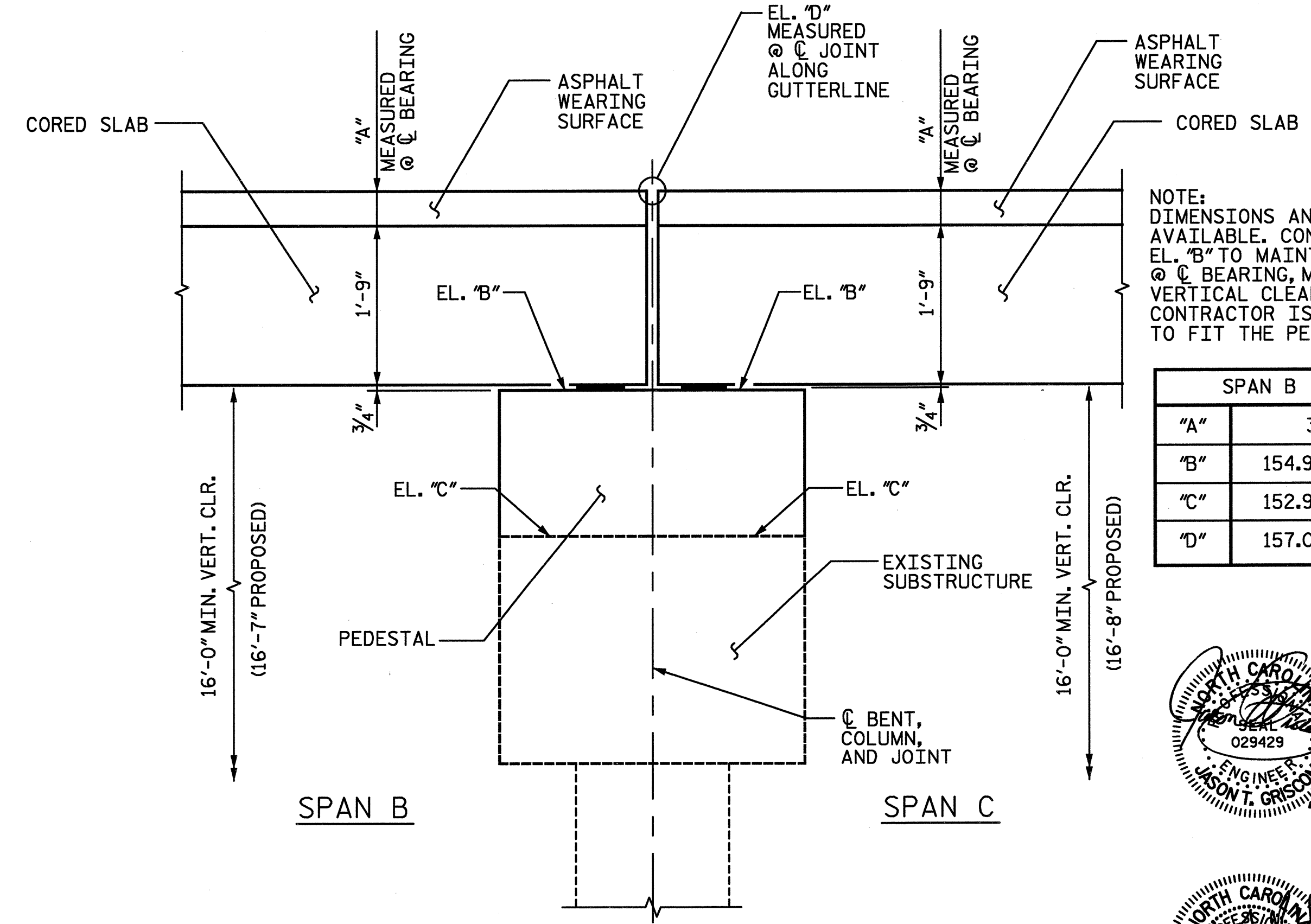
SECTION B-B



ELEVATION



ALL BAR DIMENSIONS ARE OUT TO OUT.

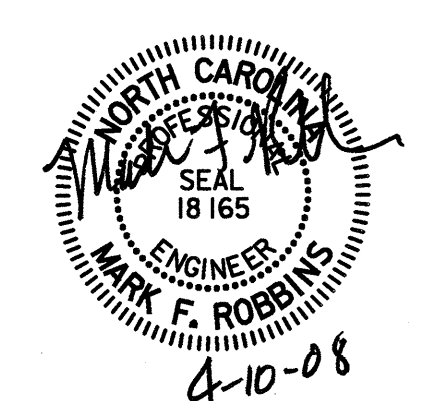
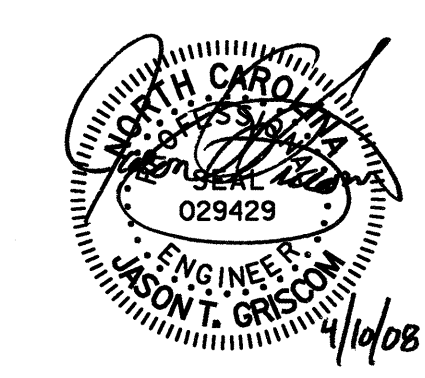


PEDESTAL HEIGHT

NOTE: DIMENSIONS AND ELEVATIONS SHOWN ARE FROM BEST INFORMATION AVAILABLE. CONTRACTOR SHALL MAKE ADJUSTMENTS TO PEDESTAL EL. "B" TO MAINTAIN 3" (5" MAX.) ASPHALT WEARING SURFACE @ C BEARING, MATCH EL. "D", AND TO MAINTAIN THE 16'-0" MIN. VERTICAL CLEARANCE. IF ANY ELEVATIONS ARE MODIFIED, THE CONTRACTOR IS RESPONSIBLE FOR ADJUSTING THE REINFORCING TO FIT THE PEDESTAL HEIGHT.

SPAN B		SPAN C	
"A"	3"	"A"	3"
"B"	154.94	"B"	154.94
"C"	152.90	"C"	152.90
"D"	157.00	"D"	157.00

PROJECT NO. **B-5022**  
**CUMBERLAND** COUNTY  
 BRIDGE: **153**  
 SHEET 2 OF 2



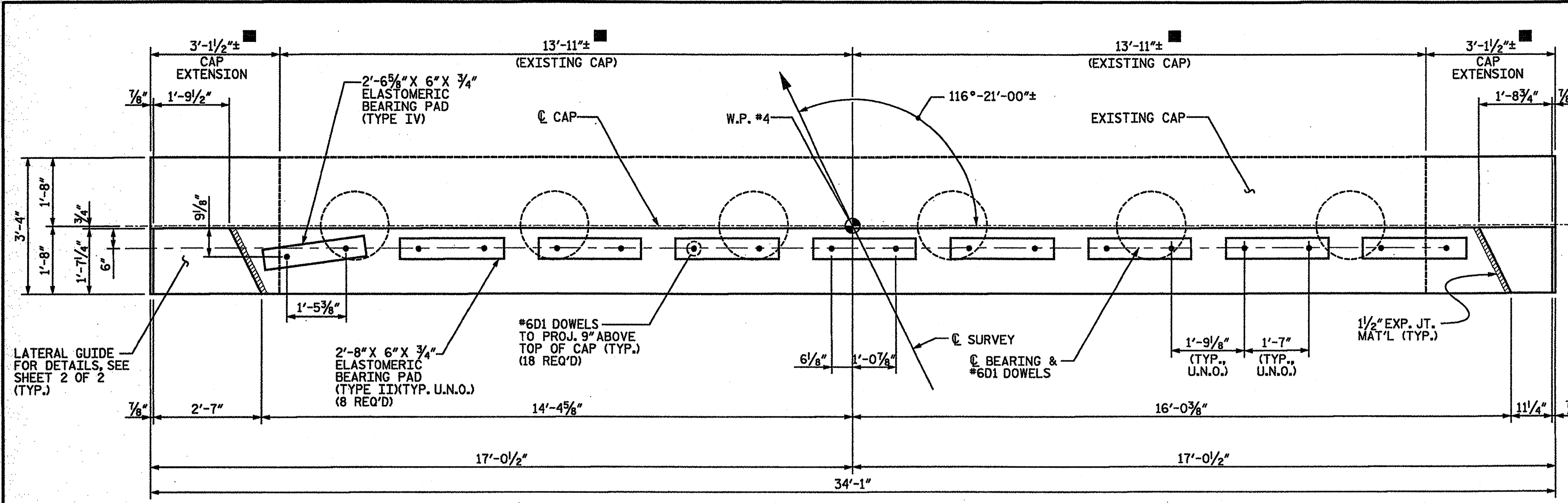
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE  
 BENT 2**

REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					44

DRAWN BY: **TRL** DATE: **1-08**  
 CHECKED BY: **TBQ** DATE: **3-08**

D-1810.9  
**STV / Ralph Whitehead Associates, Inc.**  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208





**NOTES :**

REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

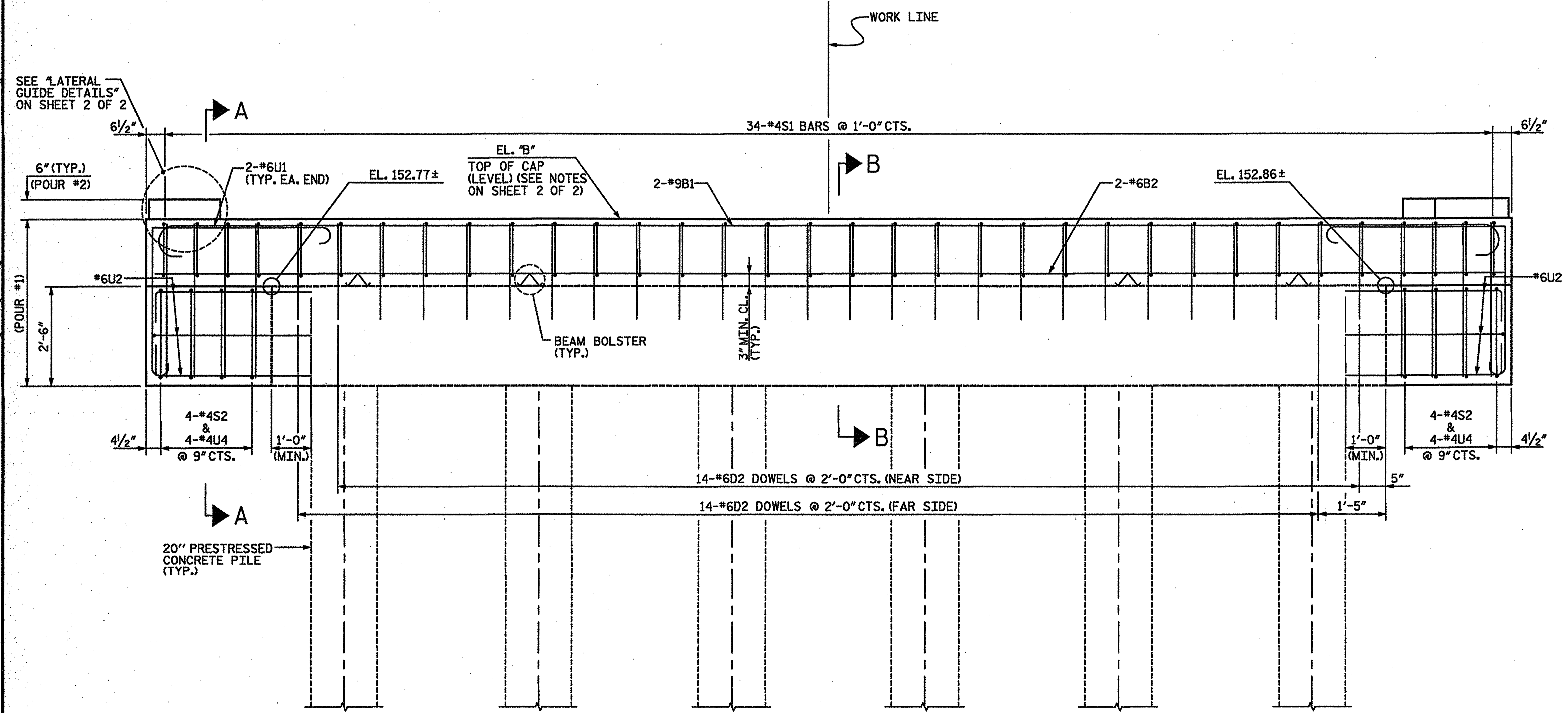
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\*6D2 AND \*6U2 DOWELS SHALL BE ADHESIVELY ANCHORED USING AN APPROVED ADHESIVE CONSIDERING LOAD RESISTANCE, IN-SERVICE AND INSTALLATION TEMPERATURE, AVAILABILITY OF COMPREHENSIVE INSTALLATION INSTRUCTIONS, AND CREEP. ANCHORS SHALL BE INSTALLED TO THE MINIMUM EMBEDED DEPTHS AS SHOWN ON PLANS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE DOWEL IS 26 KIPS. FOR ADHESIVELY ANCHORED DOWELS, SEE SPECIAL PROVISIONS.

U.N.O. = UNLESS NOTED OTHERWISE

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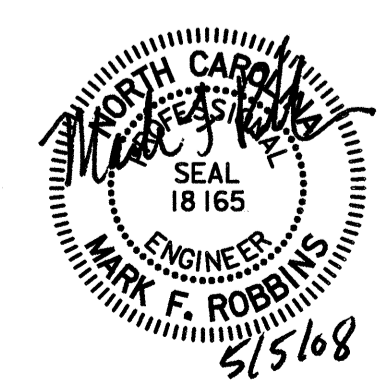
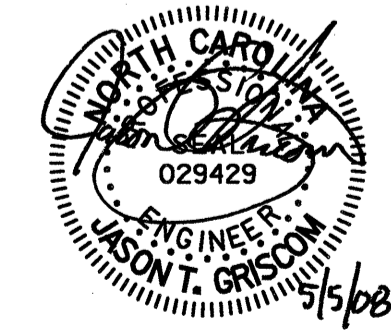
REVISION #1: REVISED PER REVIEW COMMENTS  
 BY: TJT DATE: 5-08  
 CH'KD BY: KGB DATE: 5-08

PROJECT NO. B-5022  
 CUMBERLAND COUNTY  
 BRIDGE: 153

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

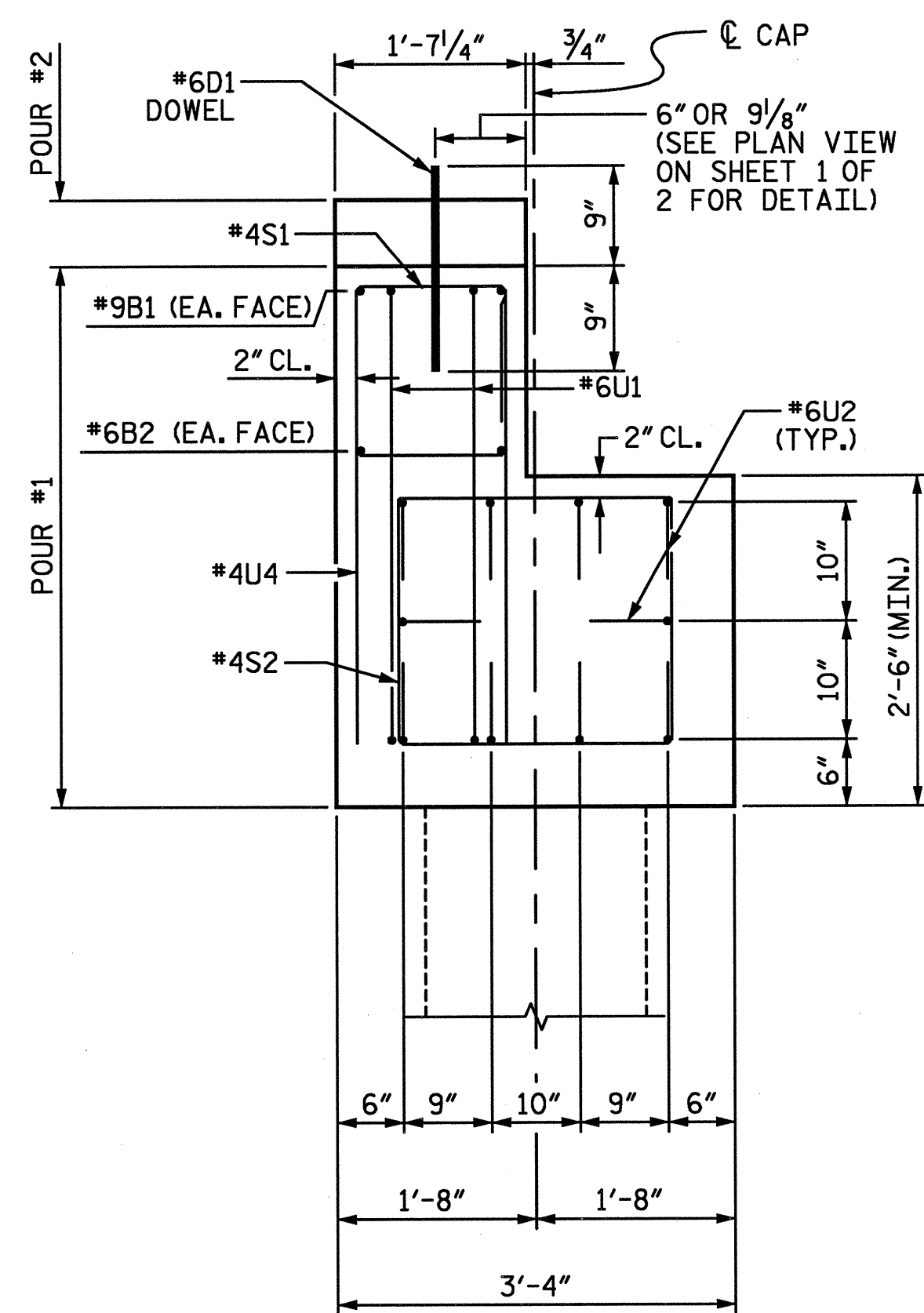
SUBSTRUCTURE  
 BENT 3



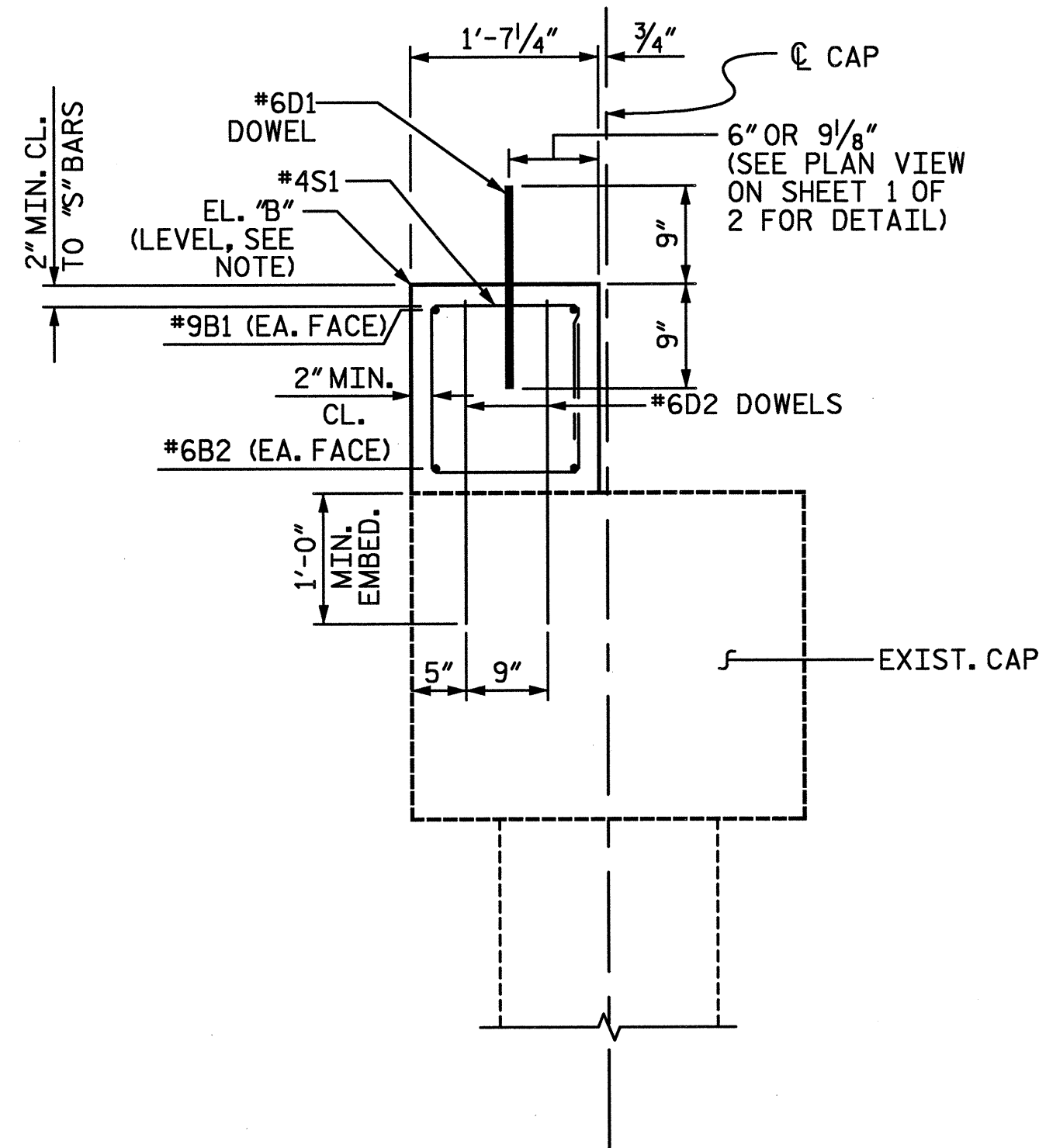
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1	STV	5-08	3			44
2			4			

D-1810.10  
 STV/Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

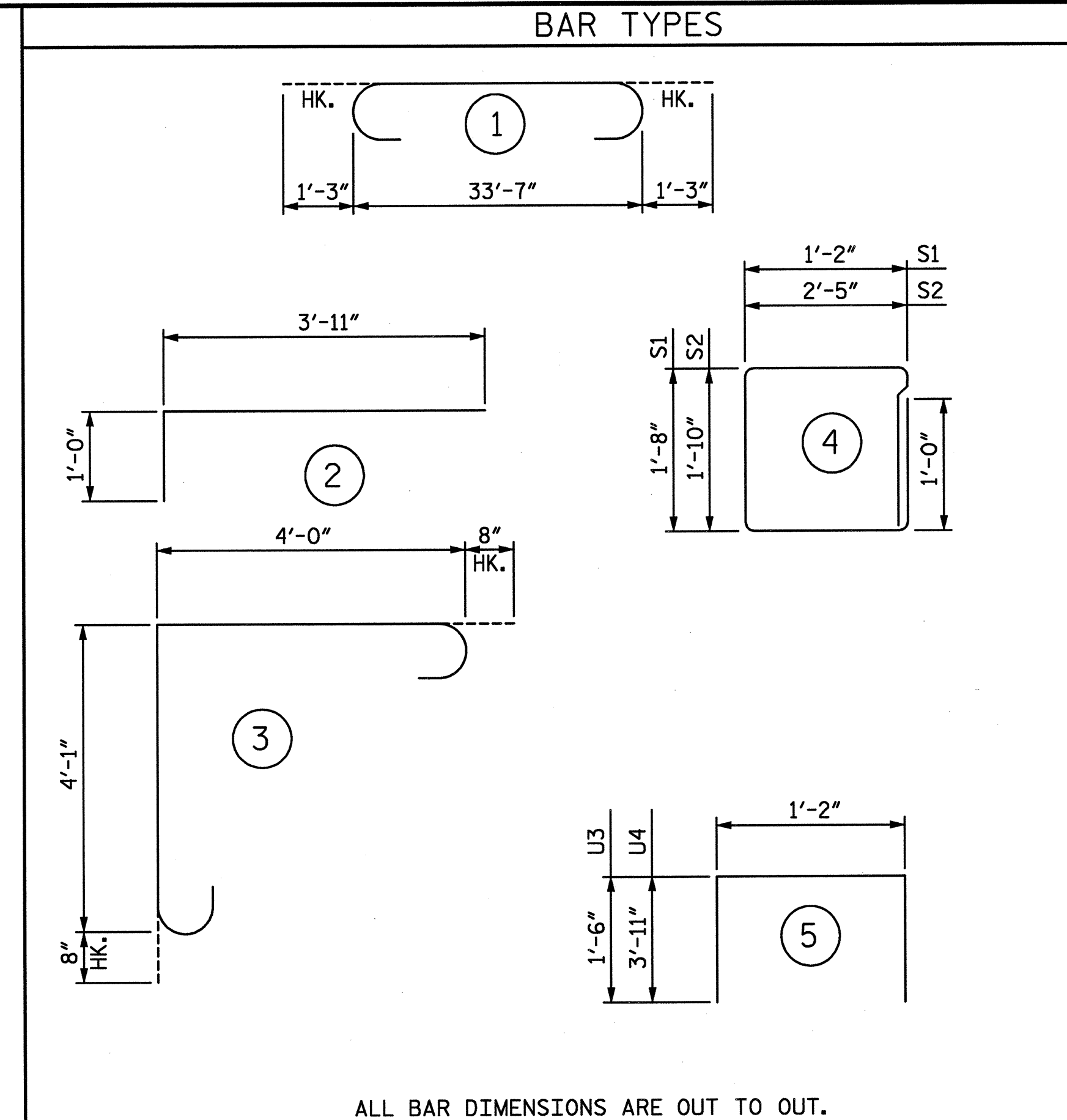
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 Timothy Townsend 5/2/2008



SECTION A-A



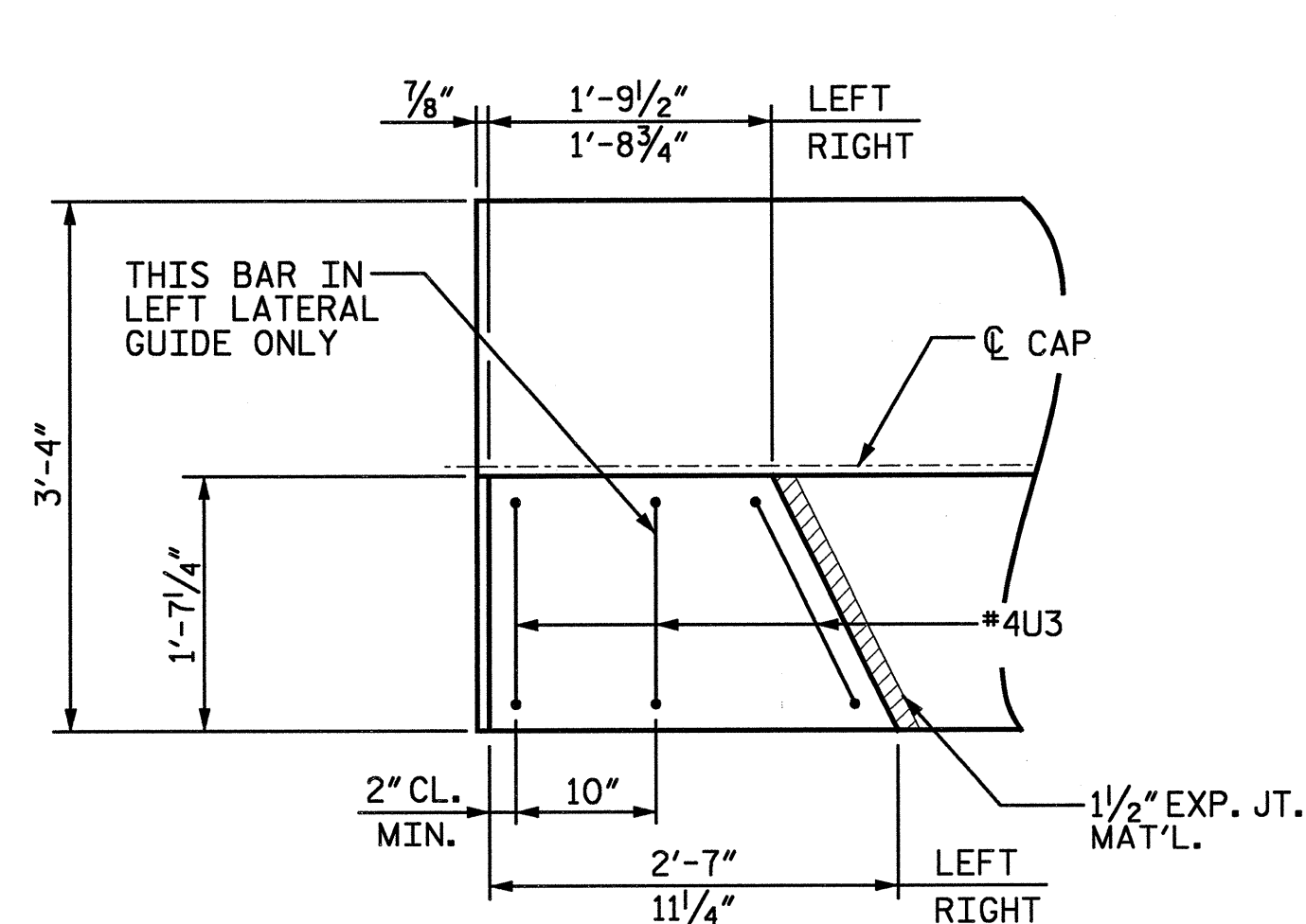
SECTION B-B



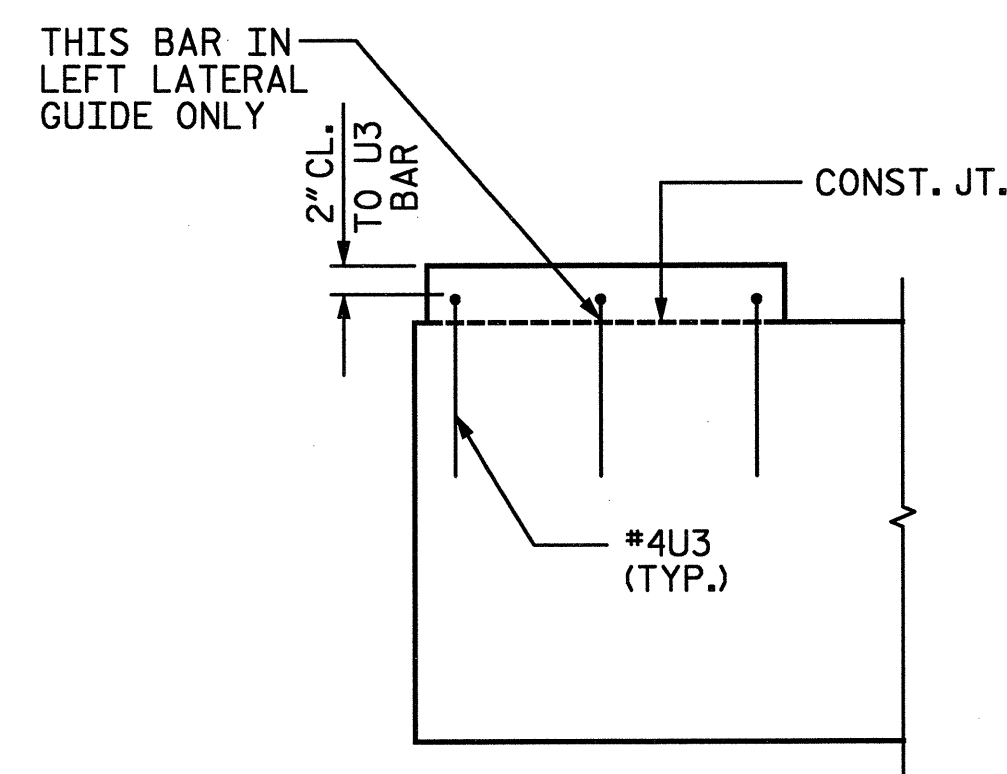
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 3					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	2	9	①	36'-1"	245
B2	2	6	STR.	33'-7"	101
D1	18	6	STR.	1'-6"	41
D2	28	6	STR.	2'-11"	123
S1	34	4	④	6'-8"	151
S2	8	4	④	9'-6"	51
U1	4	6	③	9'-5"	57
U2	20	6	②	4'-11"	148
U3	5	4	⑤	4'-2"	14
U4	8	4	⑤	9'-0"	48
REINFORCING STEEL					LBS. 979
CLASS AA CONCRETE BREAKDOWN					
POUR 1 (CAP)					CY 6.1
POUR 2 (LATERAL GUIDE)					CY 0.1
TOTAL					CY 6.2



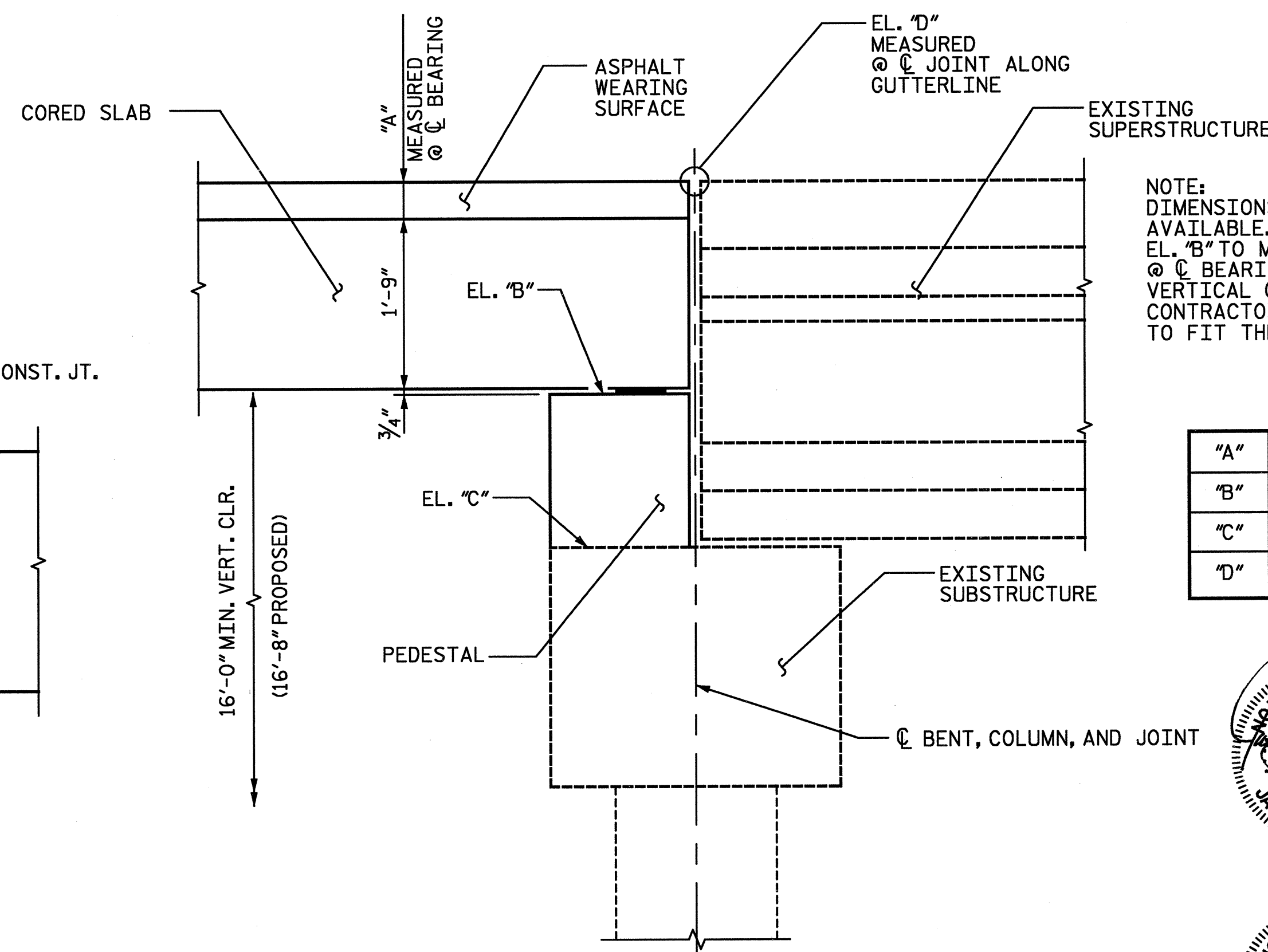
PLAN



ELEVATION

LATERAL GUIDE DETAILS

(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)



PEDESTAL HEIGHT

NOTE: DIMENSIONS AND ELEVATIONS SHOWN ARE FROM BEST INFORMATION AVAILABLE. CONTRACTOR SHALL MAKE ADJUSTMENTS TO PEDESTAL EL. 'B' TO MAINTAIN 3" (5" MAX.) ASPHALT WEARING SURFACE @ CL BEARING, MATCH EL. 'D', AND TO MAINTAIN THE 16'-0" MIN. VERTICAL CLEARANCE. IF ANY ELEVATIONS ARE MODIFIED, THE CONTRACTOR IS RESPONSIBLE FOR ADJUSTING THE REINFORCING TO FIT THE PEDESTAL HEIGHT.

"A"	3"
"B"	154.87
"C"	152.77
"D"	156.93

PROJECT NO. **B-5022**  
**CUMBERLAND** COUNTY  
 BRIDGE: **153**

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT 3

REVISIONS

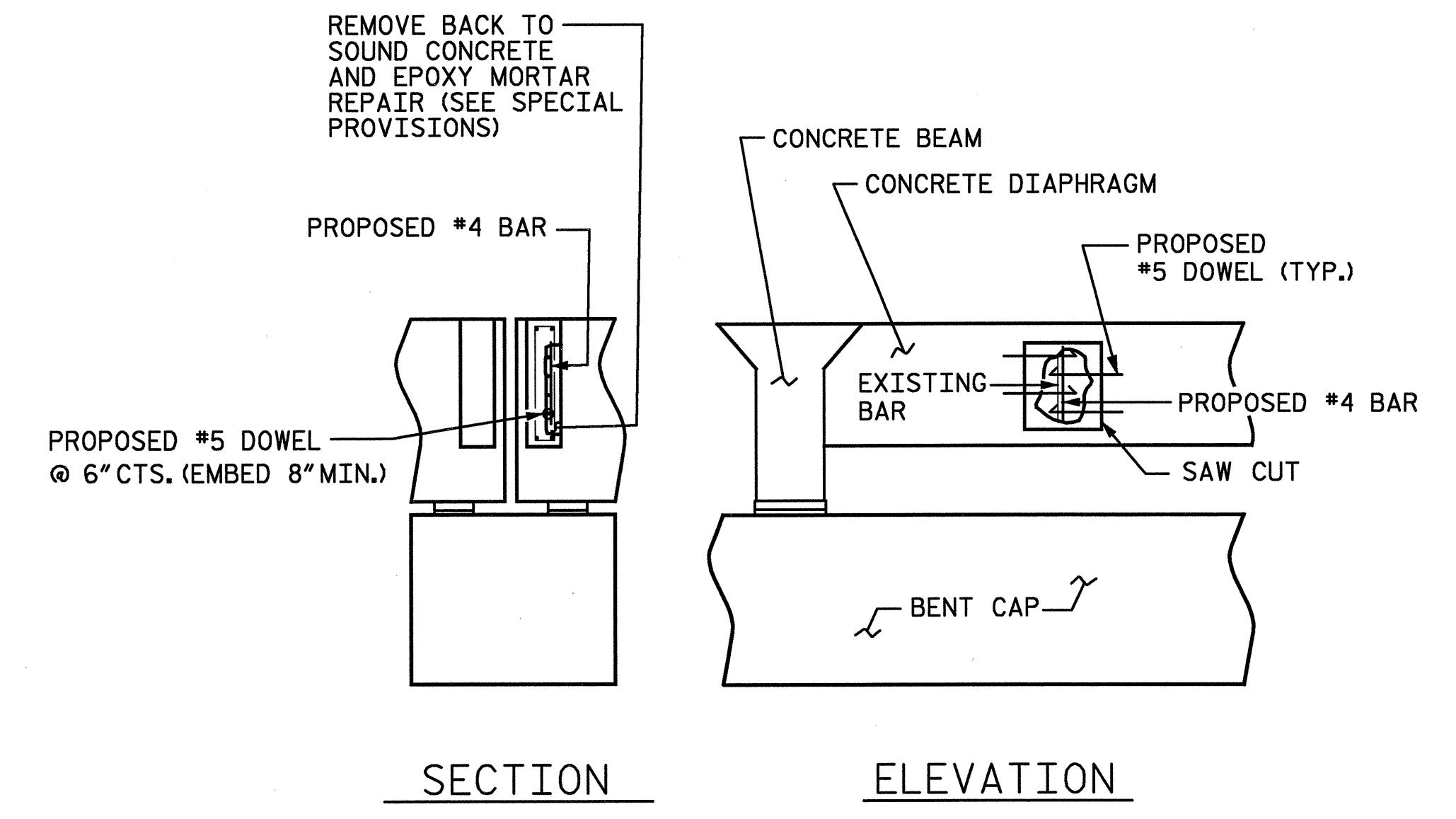
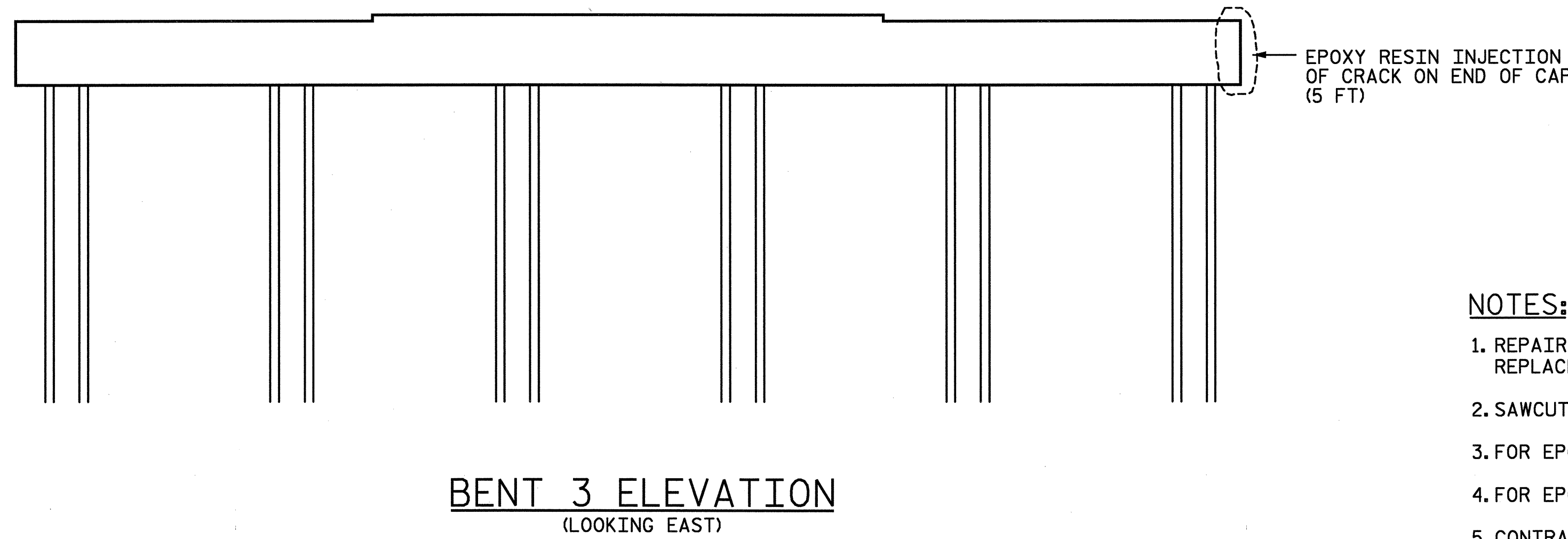
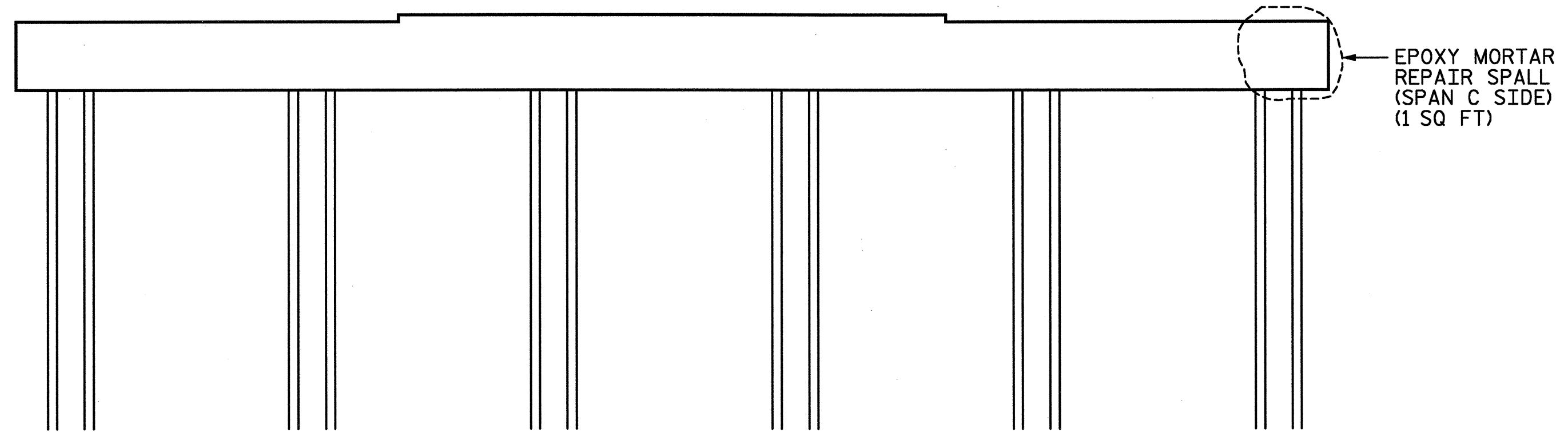
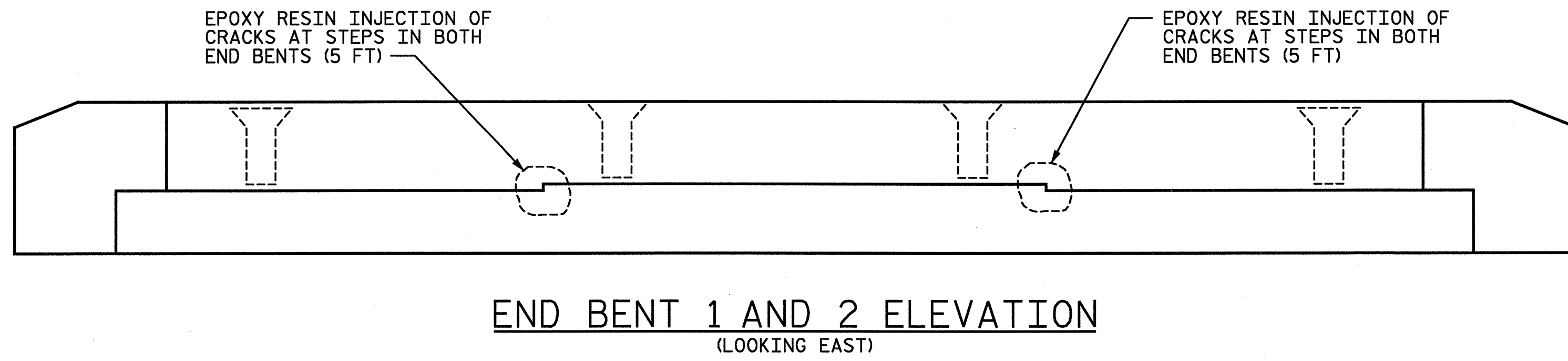
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-11
2			4			TOTAL SHEETS 44

D-1810.11

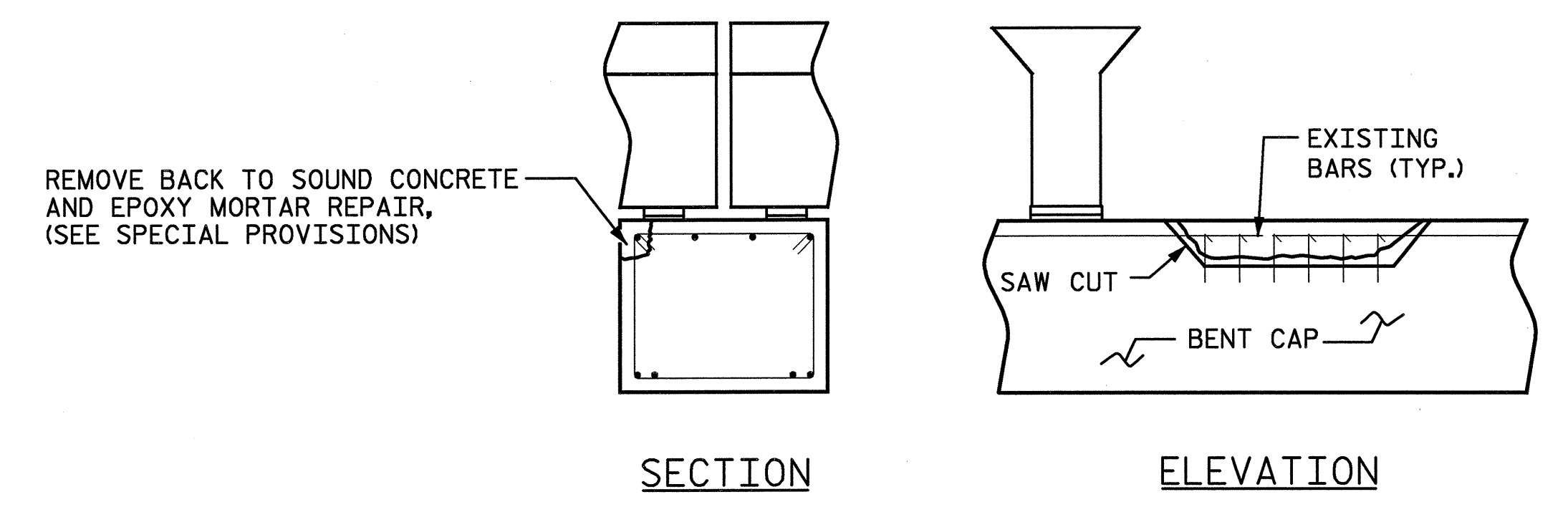
STV / Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

DRAWN BY: **TRL** DATE: **1-08**  
 CHECKED BY: **TBQ** DATE: **3-08**





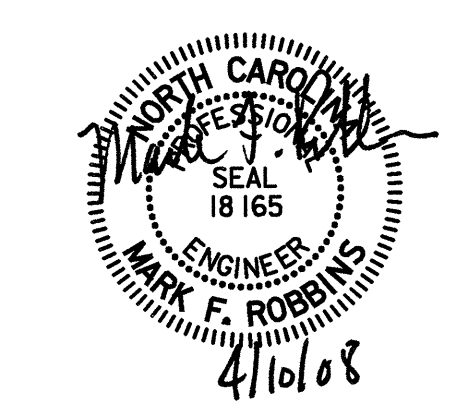
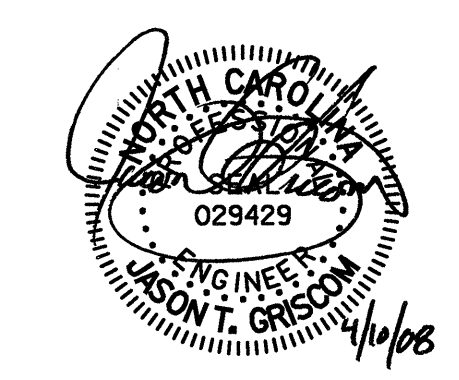
**TYPICAL END DIAPHRAGM REPAIR DETAIL**  
(@ SPAN D SIDE OF BENT 3, BAY 1)



**TYPICAL BENT REPAIR DETAIL**

**NOTES:**

- REPAIRS SHALL BE IMPLEMENTED DURING REPLACEMENT OF SPANS B AND C.
- SAWCUT 1/4" - 1/2" DEEP AROUND ALL SPALLS.
- FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.
- FOR EPOXY MORTAR REPAIR, SEE SPECIAL PROVISIONS.
- CONTRACTOR SHALL EPOXY MORTAR REPAIR MISCELLANEOUS SPALLS WITH EXPOSED REINFORCING AT VARIOUS LOCATIONS ALONG THE BOTTOM OF DECK FOR SPANS A & D. REPAIRS ARE ESTIMATED AT FOUR (4) LOCATIONS OF APPROXIMATELY ONE (1) SQUARE FOOT EACH.
- AFTER DEMOLITION OF THE SPAN, THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER FOR INSPECTION OF THE ENDS OF THE EXISTING GIRDER. CONTRACTOR SHALL ANTICIPATE SOME EPOXY MORTAR REPAIRS AND EPOXY RESIN INJECTIONS. ACTUAL QUANTITIES WILL BE DETERMINED IN THE FIELD. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE BID PRICES FOR EPOXY MORTAR REPAIRS AND EPOXY RESIN INJECTION.



PROJECT NO. **B-5021**  
**CUMBERLAND** COUNTY  
 BRIDGE: **153**

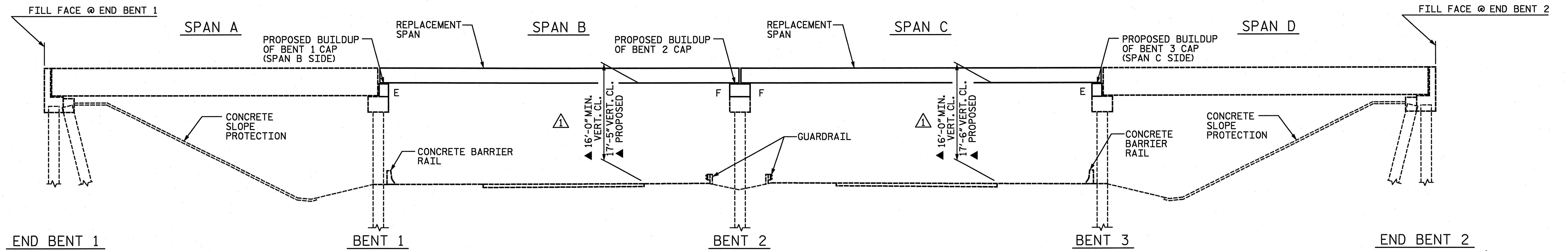
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE REPAIRS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-12
1			3			TOTAL SHEETS
2			4			44

D-1810.12  
**STV / Ralph Whitehead Associates, Inc.**  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

5:56:25 PM 4/9/2008  
 N:\PROJ\2513448\B5022\Bridg 153\Ustation\Final\substructure repairs.dgn  
 timothy.townsend

DRAWN BY : **JAD** DATE : **3-08**  
 CHECKED BY : DATE : **3-08**

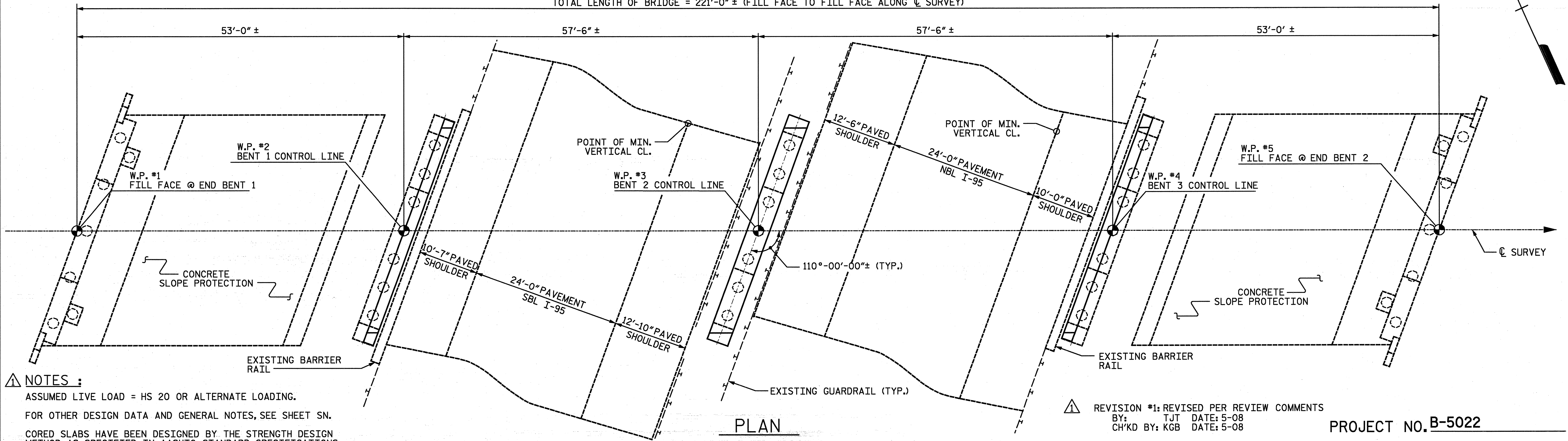


ALL DIMENSIONS IN THESE PLANS ARE BASED ON BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL VERIFY DIMENSIONS IN FIELD PRIOR TO CONSTRUCTION AND ANY FABRICATION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES SUCH THAT NECESSARY ADJUSTMENTS BE MADE BY THE CONTRACTOR.

**ELEVATION**  
(SECTIONS AT BENTS AND END BENTS ARE AT RIGHT ANGLES)

▲ SEE NOTE ON SHEETS 19, 21, AND 23 FOR ADDITIONAL INFORMATION

TOTAL LENGTH OF BRIDGE = 221'-0" ± (FILL FACE TO FILL FACE ALONG C SURVEY)

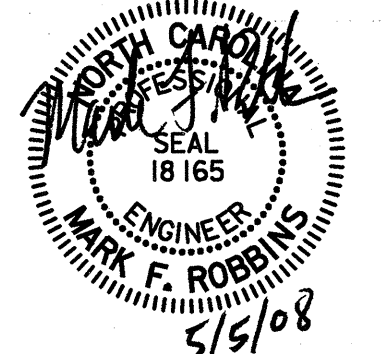
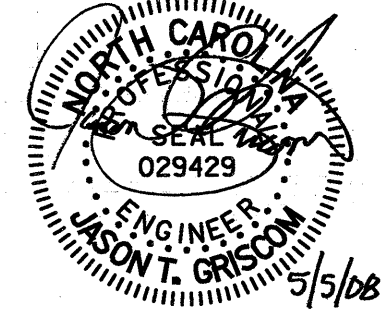


**NOTES :**  
 ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING.  
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.  
 CORED SLABS HAVE BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.  
 SPAN B & C OF THE EXISTING STRUCTURE CONSISTING OF 57'-6" PRESTRESSED CONCRETE GIRDERS, 28'-1" CLEAR ROADWAY WIDTH, REINFORCED CONCRETE DECK SHALL BE REMOVED. FOR PARTIAL REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.  
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
 FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.  
 PRIOR TO CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING DIMENSIONS. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCIES.  
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.  
 FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

REVISION #1: REVISED PER REVIEW COMMENTS  
 BY: TJT DATE: 5-08  
 CH'KD BY: KGB DATE: 5-08

**TOTAL BILL OF MATERIAL**

	PARTIAL REMOVAL OF EXISTING STRUCTURE	CLASS AA CONCRETE	REINFORCING STEEL	CONCRETE BRIDGE RAIL	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS	EPOXY RESIN INJECTION	EPOXY MORTAR REPAIRS
		LUMP SUM	CU. YDS.	LBS.	LIN. FT.	LUMP SUM	LIN. FT.	LIN. FT.
SUPERSTRUCTURE	LUMP SUM			229.50	LUMP SUM	1,262.25		5.0
END BENT 1							10.0	
BENT 1		8.6	997				25.0	
BENT 2		16.0	1,953				10.0	
BENT 3		8.6	997				15.0	
END BENT 2							15.0	
TOTAL	LUMP SUM	33.2	3,947	229.50	LUMP SUM	1,262.25	75.0	5.0



PROJECT NO. B-5022  
 CUMBERLAND COUNTY  
 BRIDGE: 154

MODIFICATION OF BRIDGE NO. 154

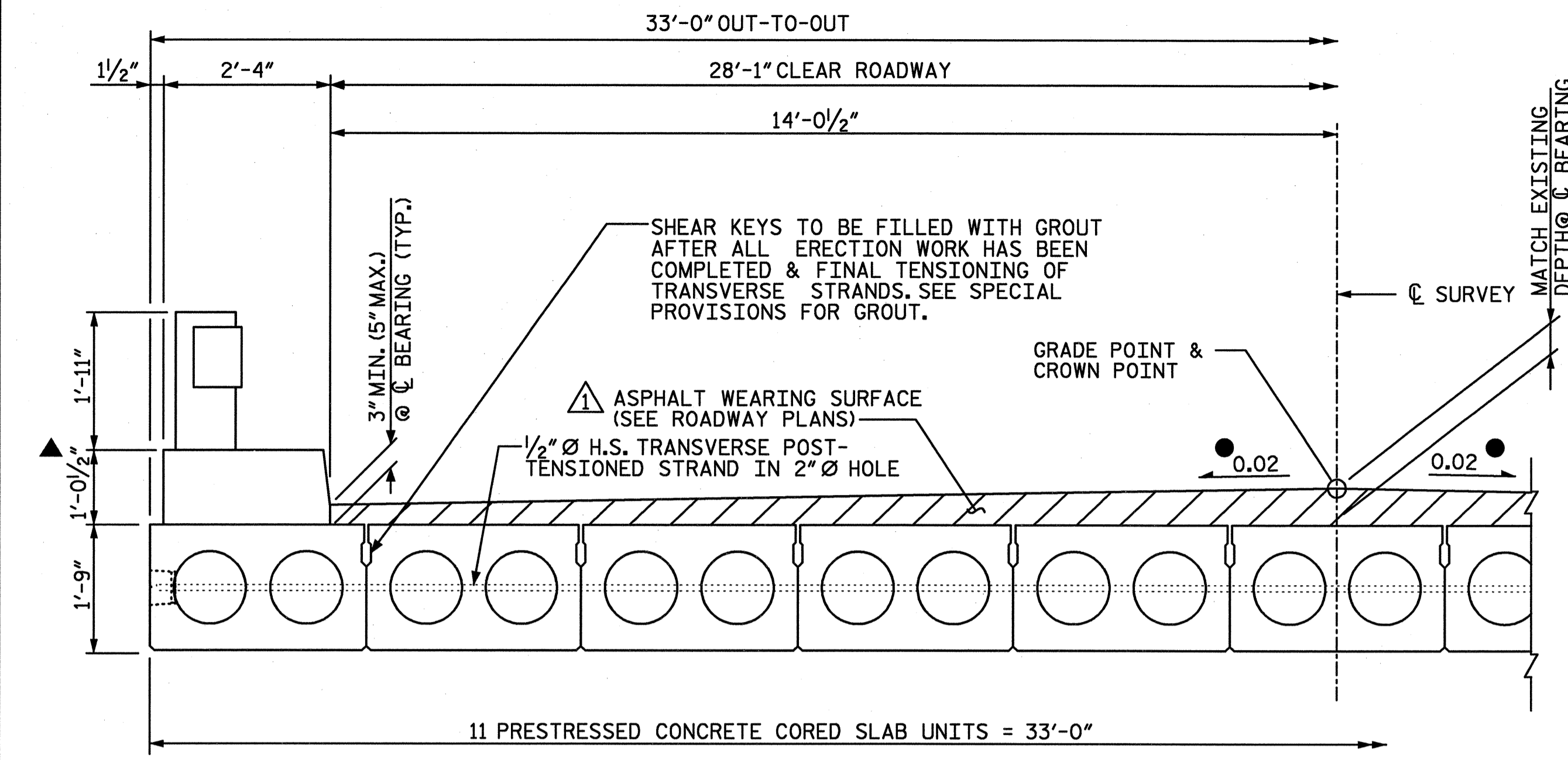
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 BRIDGE OVER I-95  
 ON SR 1815  
 BETWEEN SR 1005  
 AND SR 1813

REVISIONS				SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1	STV	5-08	3			TOTAL SHEETS 44
2			4			

DRAWN BY: LGH DATE: 3-08  
 CHECKED BY: TBQ DATE: 3-08

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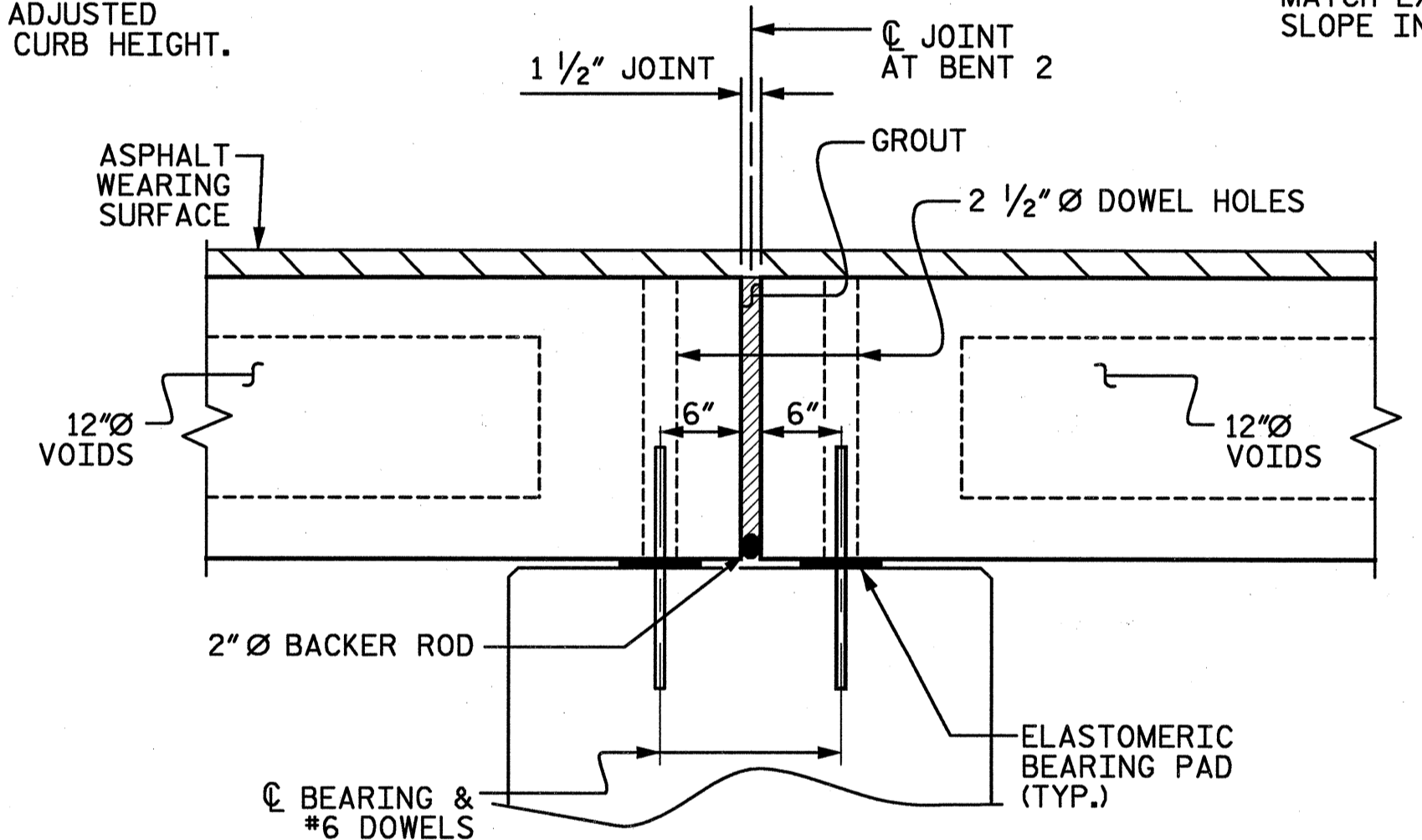




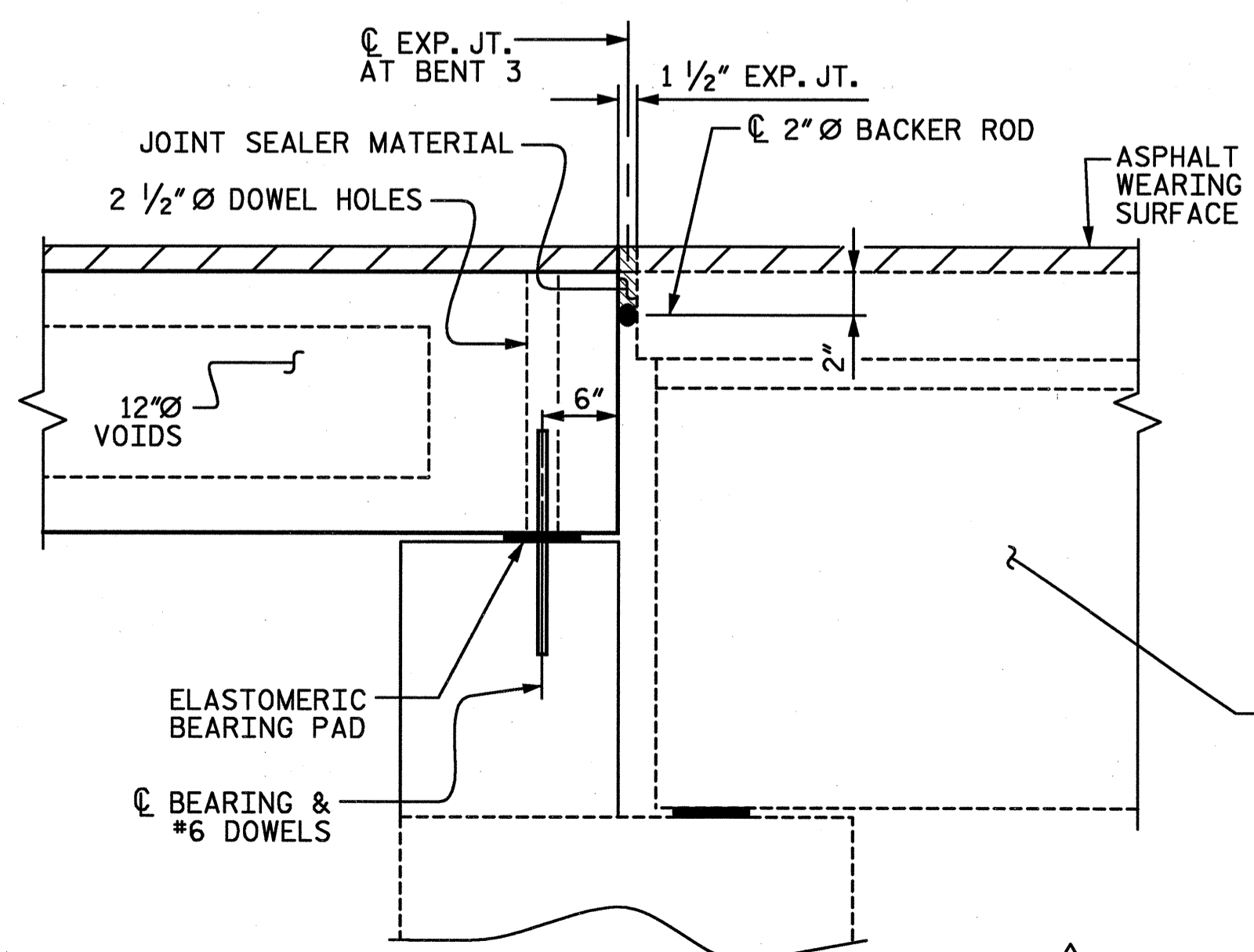
**TYPICAL HALF SECTION**  
(BRIDGE SYMMETRIC ABOUT C SURVEY)

▲ CURB HEIGHT MAY NEED TO BE ADJUSTED TO MATCH TOP OF CURB IN ADJACENT SPAN. REINFORCING SHALL BE ADJUSTED TO MATCH THE REVISED CURB HEIGHT.

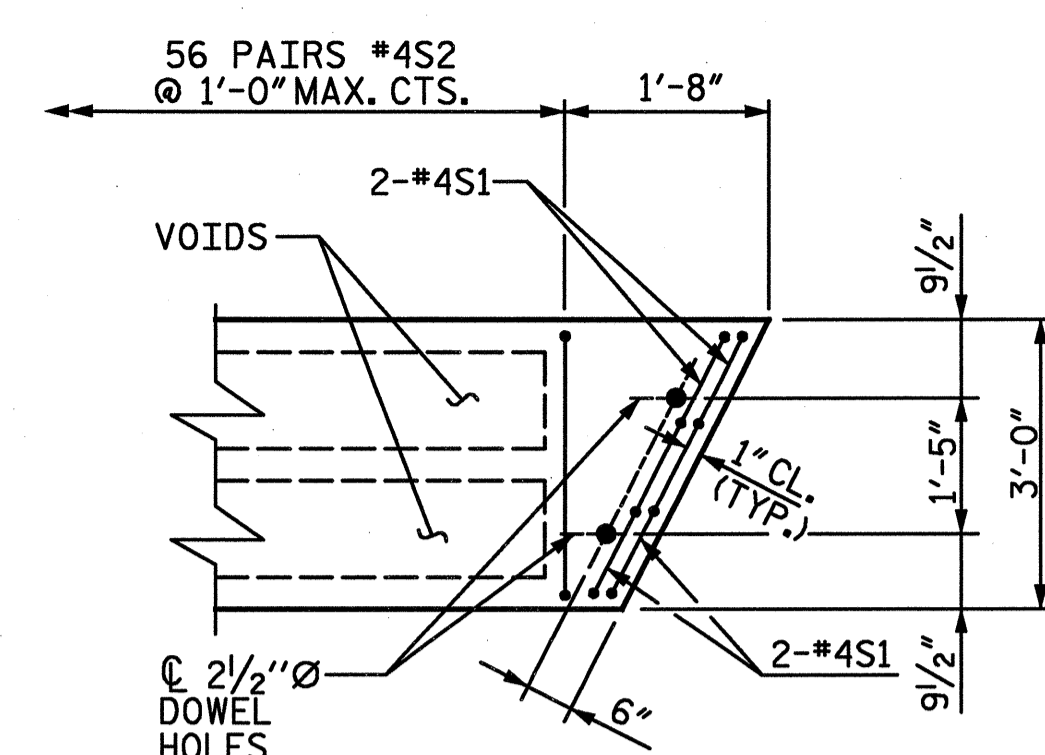
● CONTRACTOR SHALL MAKE A SMOOTH TRANSITION TO MATCH EXISTING CROSS SLOPE IN ADJACENT SPANS.



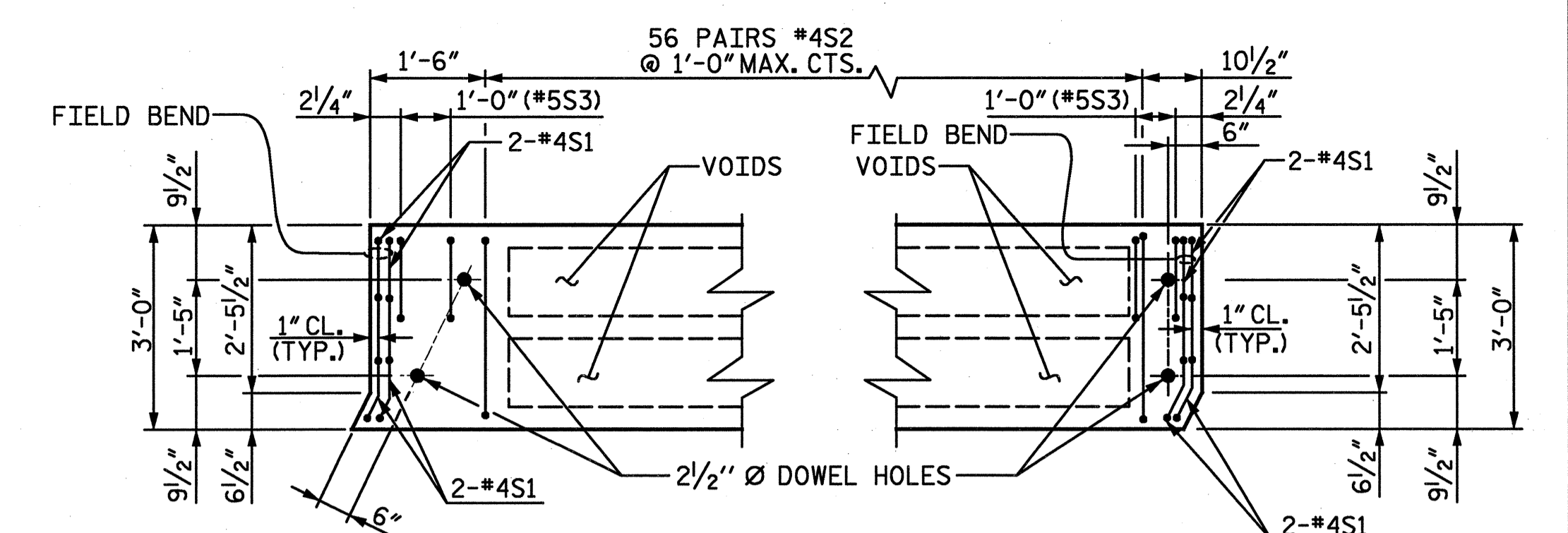
**SECTION AT BENT 2**



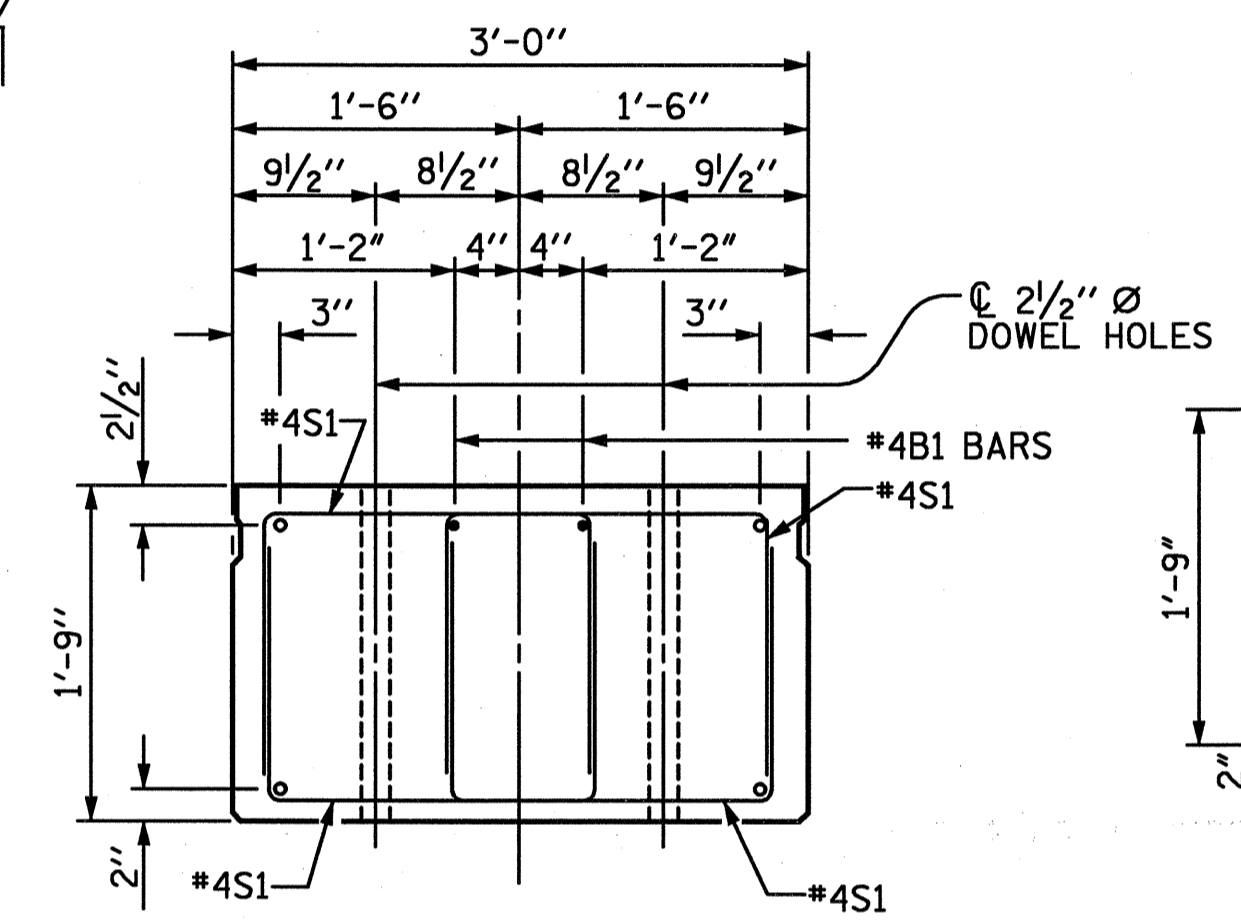
**SECTION AT BENT 3**  
(BENT 1 SIMILAR BY SYMMETRY)



**PART PLAN INTERIOR SLAB SECTION**  
(FAR END SHOWN, NEAR END SIMILAR BY SYMMETRY)



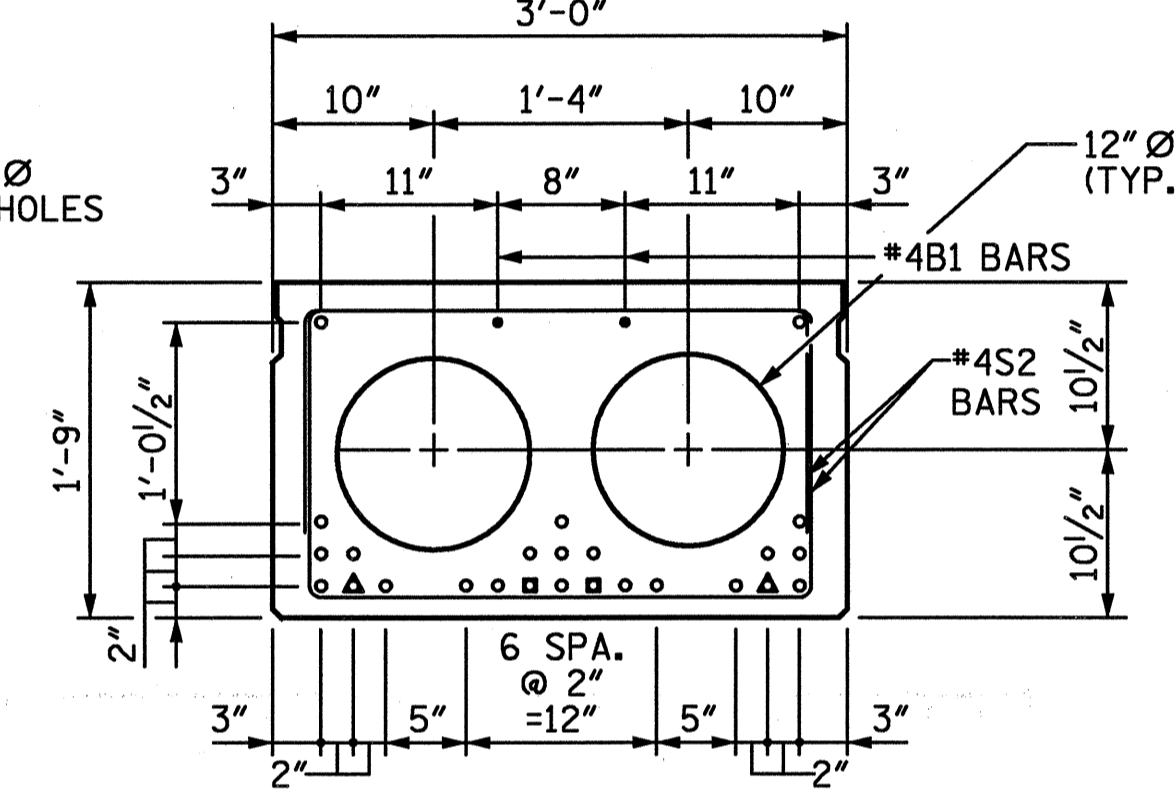
**PART PLAN EXTERIOR SLAB SECTION**  
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR BY SYMMETRY)



**SLAB END ELEVATION**  
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES.

INTERIOR SLAB SECTION SHOWN, EXTERIOR SLAB SECTION SIMILAR EXCEPT SHEAR KEY LOCATION.

STRAND LAYOUT NOT SHOWN.



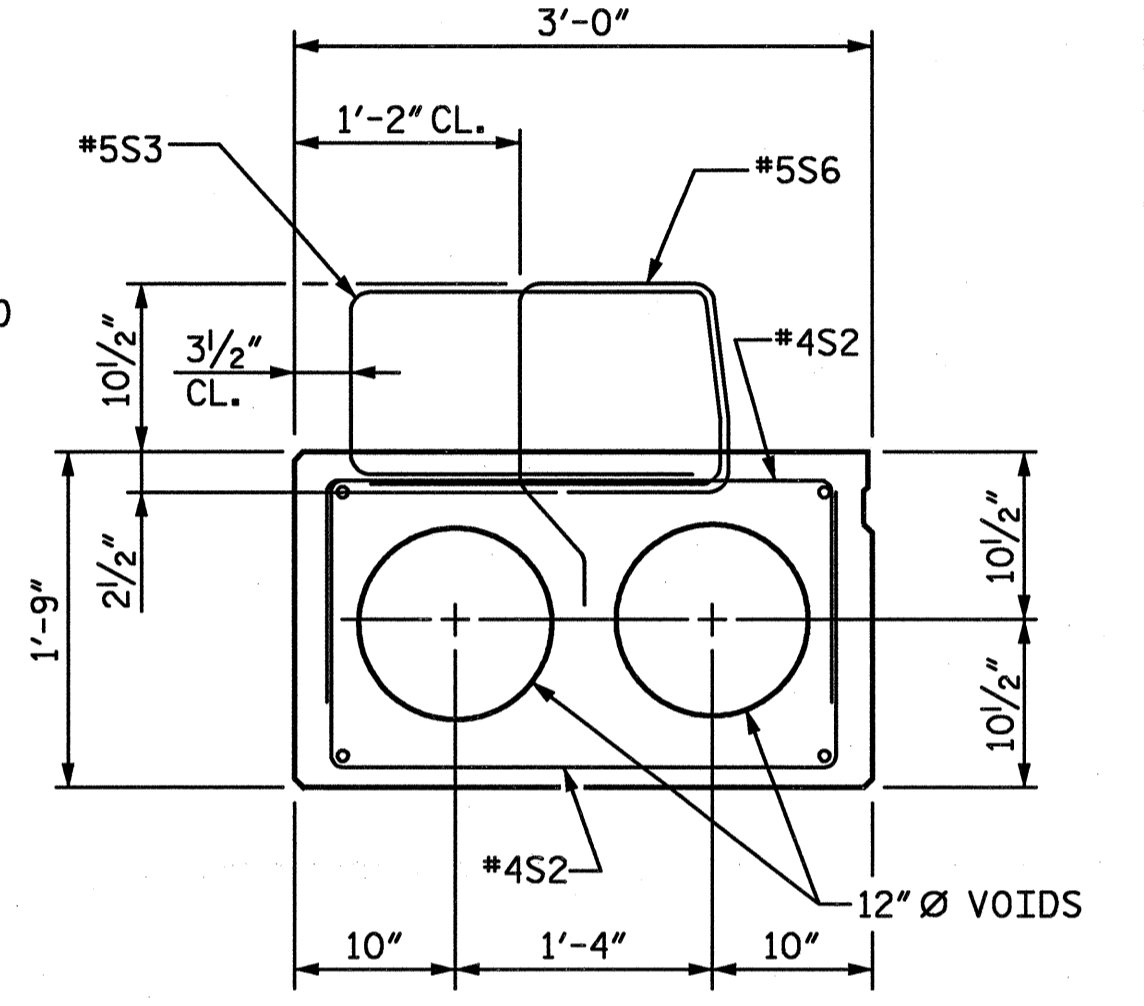
**INTERIOR SLAB SECTION**  
(25 TOTAL STRANDS REQUIRED)

○ DENOTES 1/2" Ø L.R. STRANDS

▲ DENOTES SHEATHED STRAND. BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4'-0" FROM END OF SLAB.

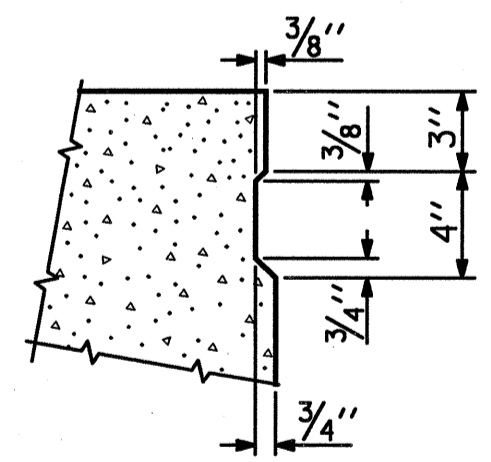
■ DENOTES SHEATHED STRAND. BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF SLAB.

SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.



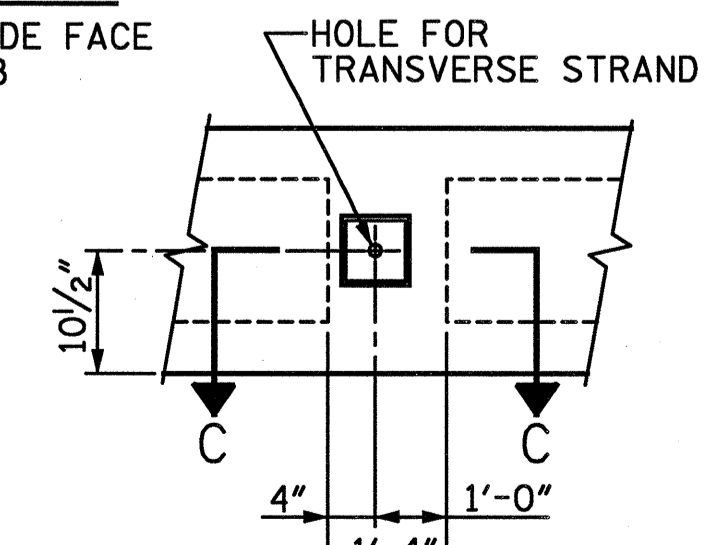
**EXTERIOR SLAB SECTION**  
(FOR PRESTRESSED STRAND AND #4B1 BAR LAYOUT, SEE INTERIOR SLAB SECTION)

▲ NOTE: ASPHALT WEARING SURFACE IS INCLUDED IN THE QUANTITIES ON THE ROADWAY PLANS.



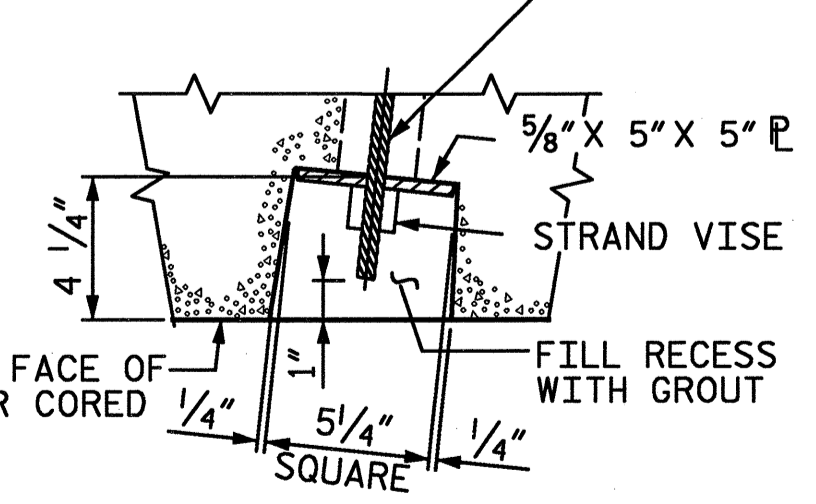
**SHEAR KEY DETAIL**

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLAB



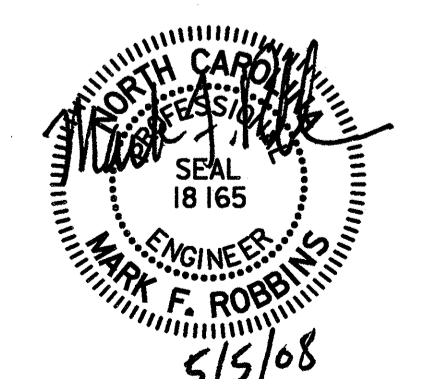
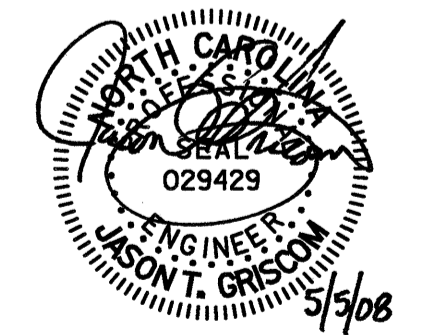
**ELEVATION VIEW**

○ 1/2" Ø H.S. TRANSVERSE POST-TENSIONING STRAND SHEATHED WITH A 2" Ø NON-CORROSIVE PIPE.



**SECTION C-C**

**DETAIL A**  
GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS



PROJECT NO. **B-5022**  
**CUMBERLAND** COUNTY  
BRIDGE: **154**

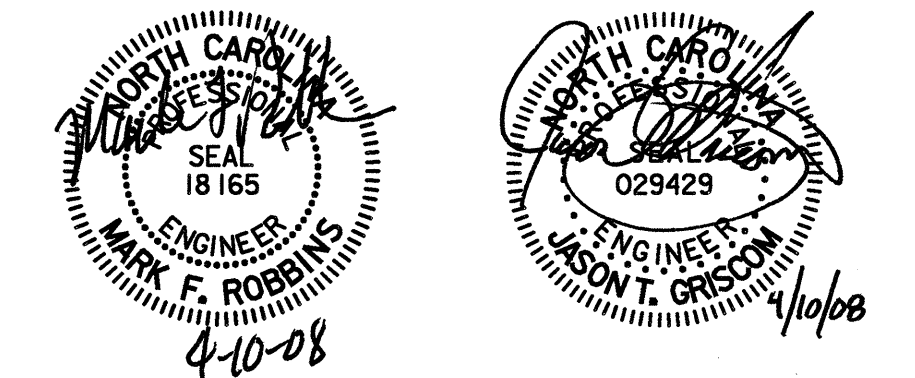
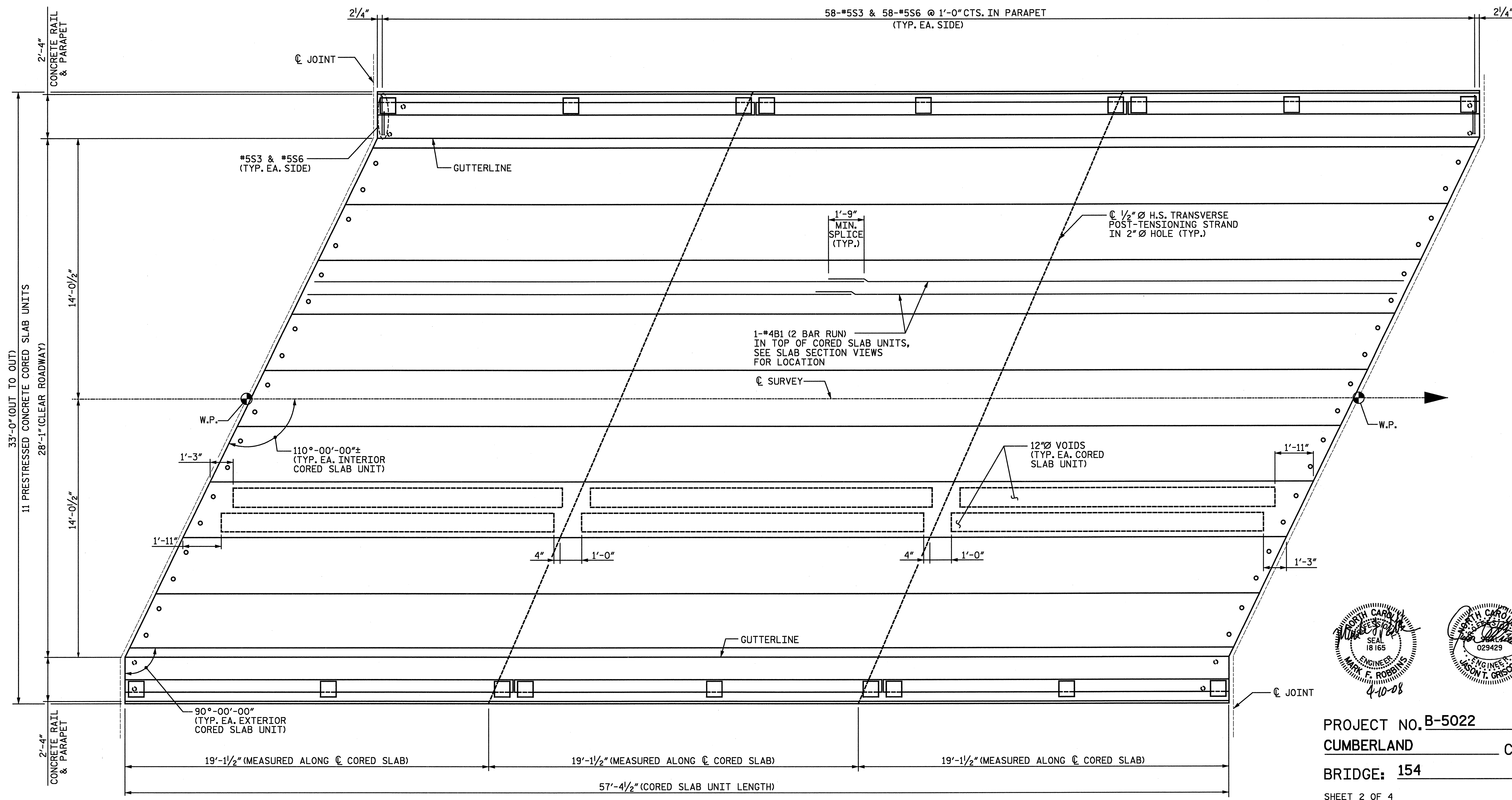
SHEET 1 OF 4  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**3'-0" X 1'-9" PRESTRESSED CORED SLAB**

DRAWN BY: JTG DATE: 2-08  
CHECKED BY: TBQ DATE: 3-08

REVISION #1: REVISED PER REVIEW COMMENTS  
BY: TJT DATE: 5-08  
CH'KD BY: KGB DATE: 5-08

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Charlotte, NC 28208

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-14
1	STV	5-08	3			TOTAL SHEETS
2			4			44



PROJECT NO. **B-5022**  
**CUMBERLAND** COUNTY  
 BRIDGE: **154**  
 SHEET 2 OF 4

**PLAN OF SPAN B & C**  
 FOR ADDITIONAL CONCRETE RAIL REINFORCING STEEL  
 & DETAILS, SEE "CONCRETE BRIDGE RAIL" SHEET.

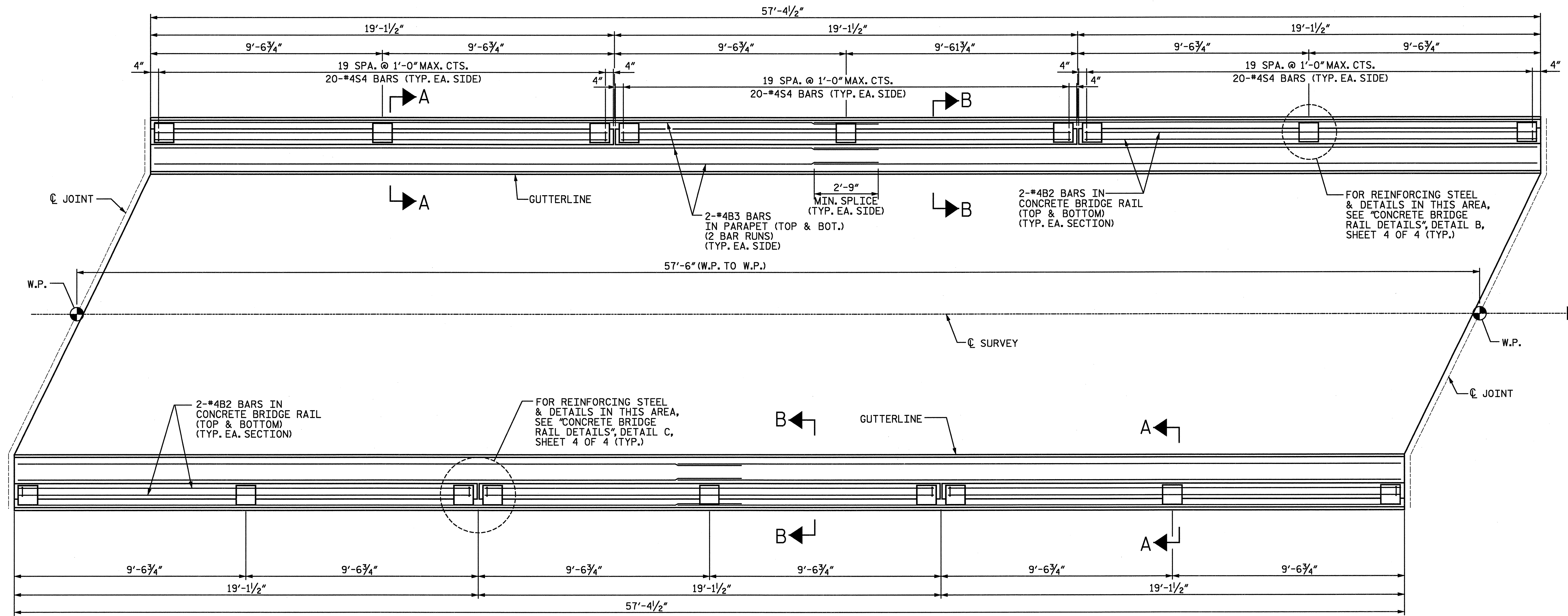
DRAWN BY: **JTG** DATE: **3-08**  
 CHECKED BY: **TBQ** DATE: **3-08**

4/9/2008  
 N:\PROJ\2513448\B5022\Bridg 154\Station\Final\plan of span.dgn

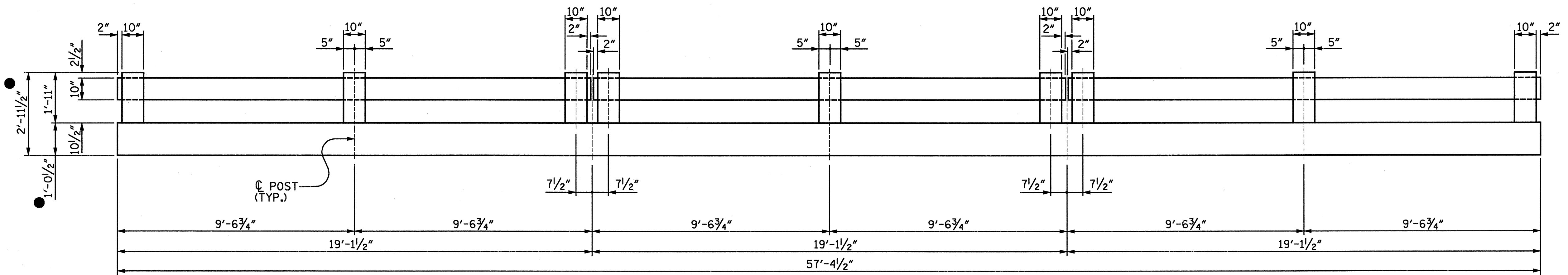
D-1810.15  
**STV / Ralph Whitehead Associates, Inc.**  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			44





PLAN



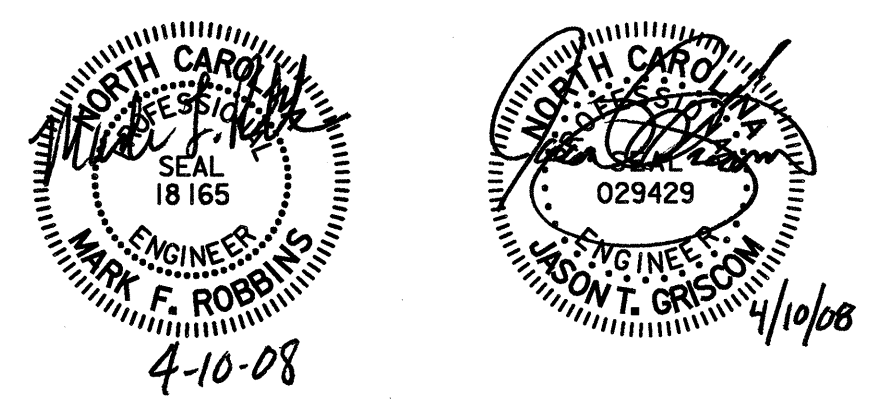
ELEVATION

(EXTERIOR OF RIGHT SIDE RAIL, LEFT SIDE SIMILAR)  
(NOT TO SCALE)

NOTE:  
FOR SECTION VIEWS, SEE SHEET 4 OF 4.

CONCRETE BRIDGE RAIL SHALL BE  
CHAMFERED TO MATCH EXISTING RAIL. FOR  
CONCRETE BRIDGE RAIL, SEE SPECIAL  
PROVISION.

● DIMENSION MAY NEED TO BE ADJUSTED TO MATCH  
TOP OF RAIL IN ADJACENT SPANS. REINFORCING  
SHALL BE ADJUSTED TO MATCH THE REVISED RAIL  
HEIGHT.



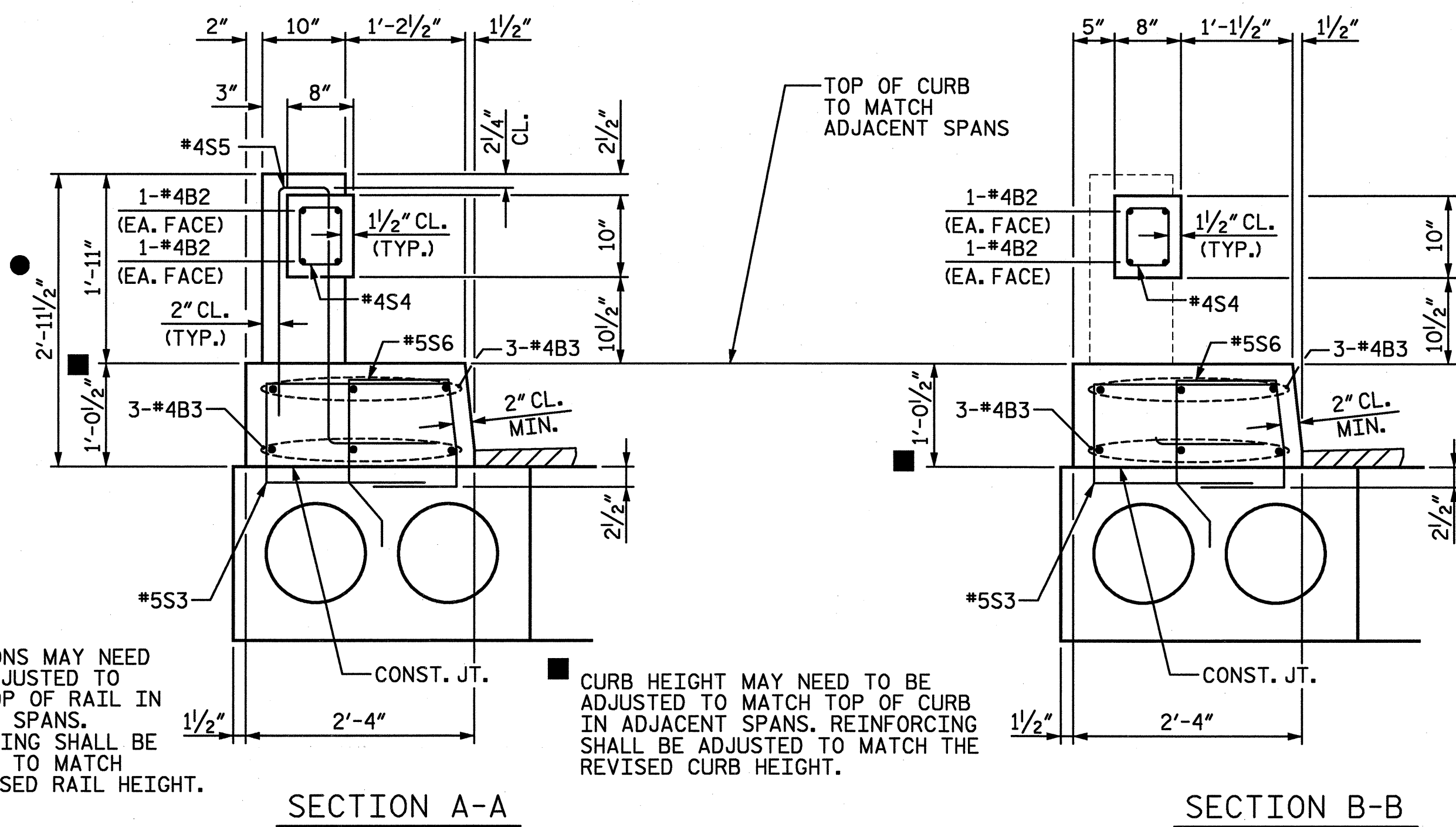
PROJECT NO. **B-5022**  
**CUMBERLAND** COUNTY  
 BRIDGE: **154**  
 SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUPERSTRUCTURE  
 CONCRETE BRIDGE  
 RAIL**

DRAWN BY: **JTG** DATE: **3-08**  
 CHECKED BY: **TBQ** DATE: **3-08**

D-1810.16  
**STV / Ralph Whitehead Associates, Inc.**  
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 Charlotte, NC 28208

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-16
1			3			TOTAL SHEETS
2			4			44

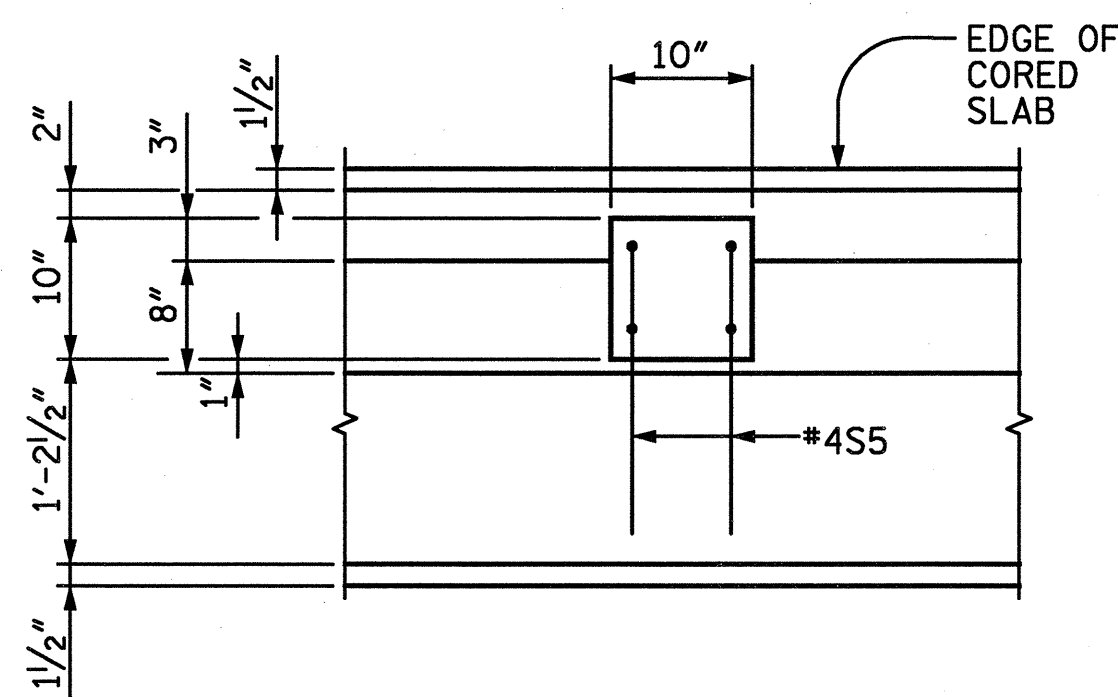


DIMENSIONS MAY NEED TO BE ADJUSTED TO MATCH TOP OF RAIL IN ADJACENT SPANS. REINFORCING SHALL BE ADJUSTED TO MATCH THE REVISED RAIL HEIGHT.

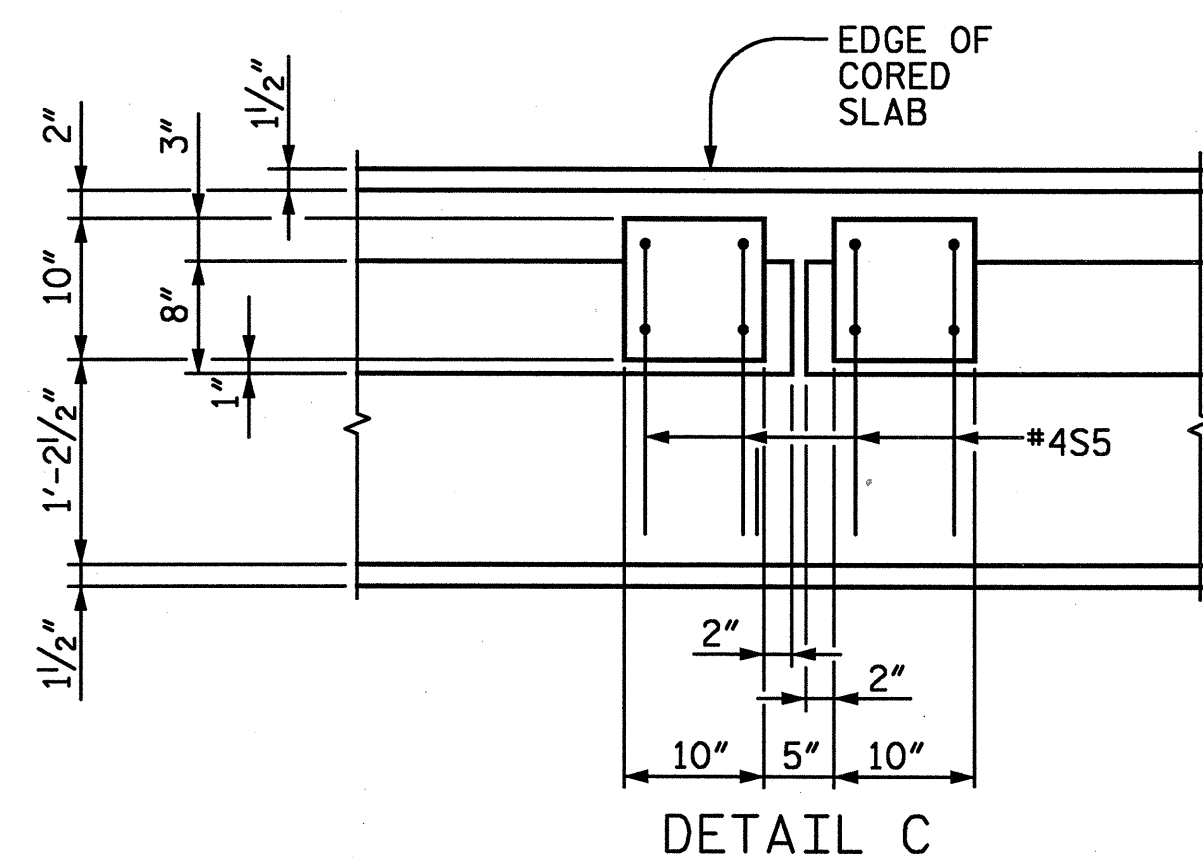
CURB HEIGHT MAY NEED TO BE ADJUSTED TO MATCH TOP OF CURB IN ADJACENT SPANS. REINFORCING SHALL BE ADJUSTED TO MATCH THE REVISED CURB HEIGHT.

SECTION A-A

SECTION B-B

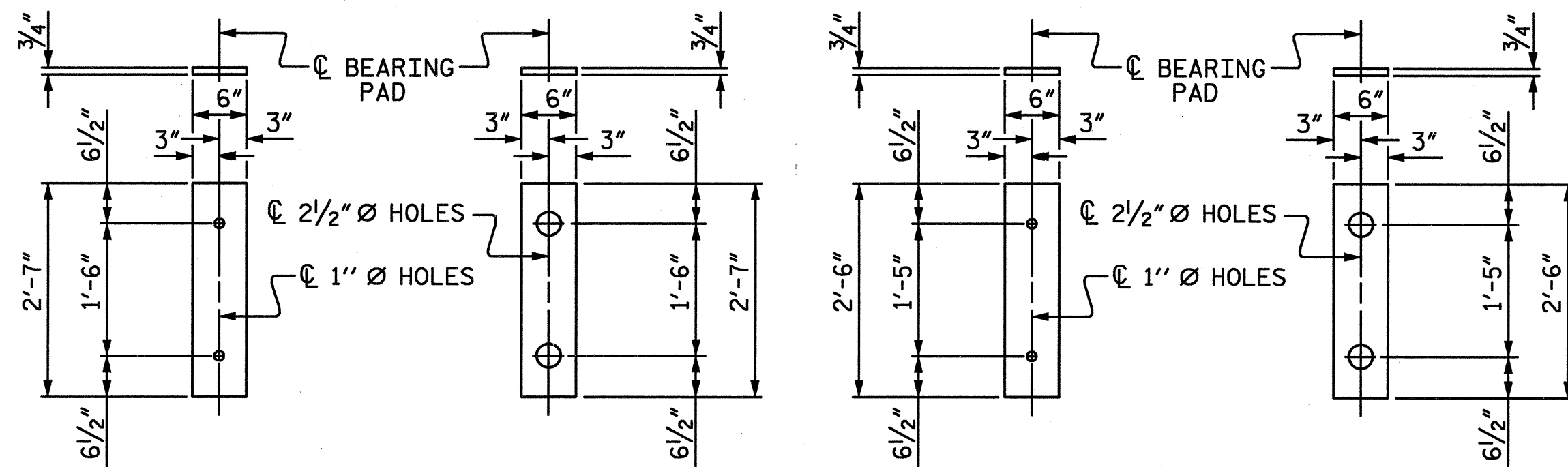


DETAIL B



DETAIL C

CONCRETE BRIDGE RAIL DETAILS

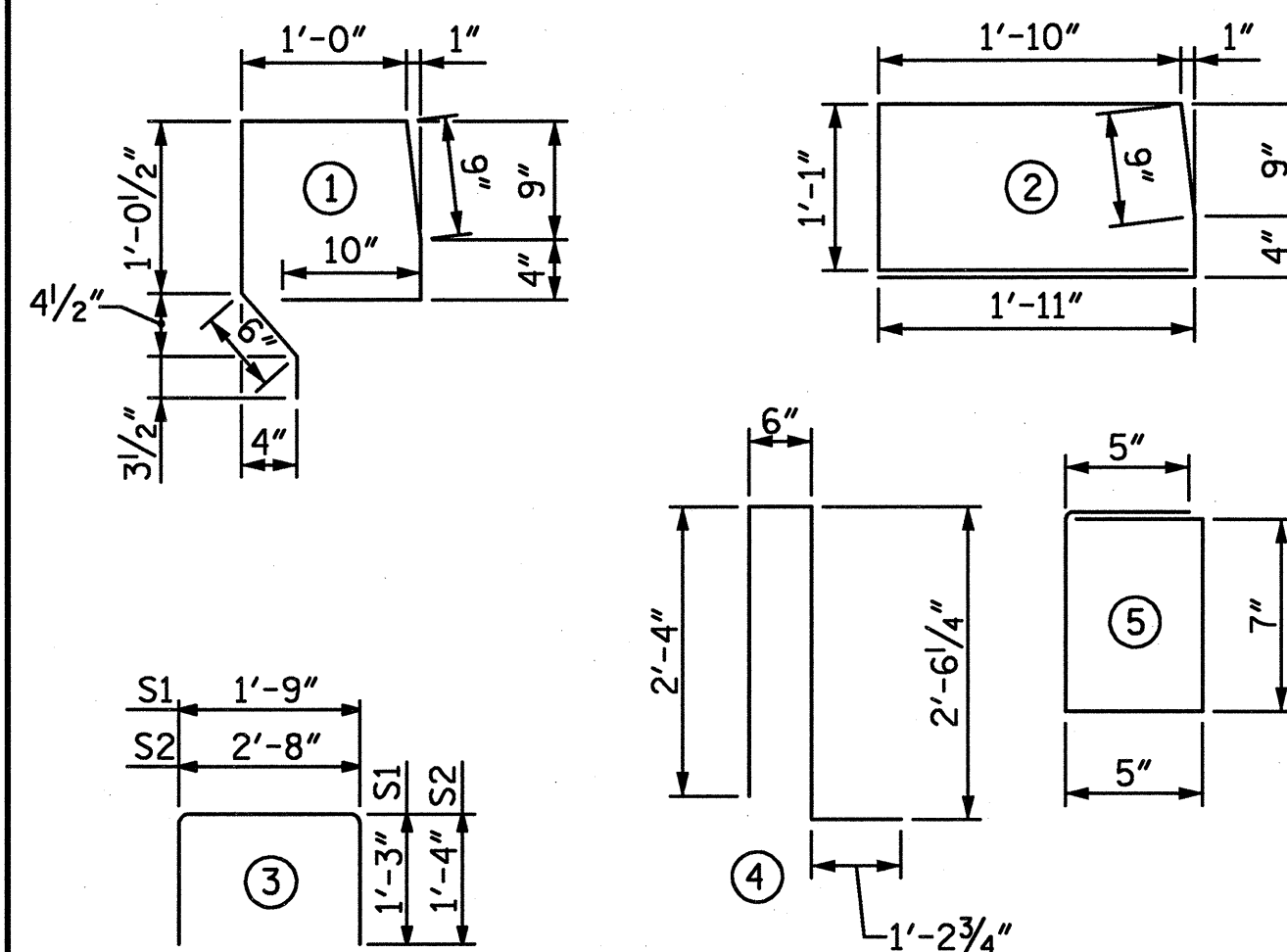


ELASTOMERIC BEARING DETAILS

REVISION #1: REVISED PER REVIEW COMMENTS  
 BY: TJT DATE: 5-08  
 CH'KD BY: KGB DATE: 5-08

DRAWN BY: JTG/LGH DATE: 3-08  
 CHECKED BY: TBQ DATE: 3-08

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE CORED SLAB SECTION

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
				LENGTH	WEIGHT	LENGTH	WEIGHT
B1	4	#4	STR	29'-4"	78	29'-4"	78
S1	16	#4	3	4'-3"	45	4'-3"	45
S2	112	#4	3	5'-4"	399	5'-4"	399
*S3	58	#5	1	4'-9"	287		
*S6	58	#5	2	7'-10"	474		
REINFORCING STEEL					522 LBS.		522 LBS.
* EPOXY COATED REINFORCING STEEL					761 LBS.		
7000 P.S.I. CONCRETE					8.2 CY		8.2 CY
1/2" Ø L.R. STRANDS				No.	25		25

DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 1'-9"
	1/2" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1/8"
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	3/8"
FINAL CAMBER	1/2"

\*\* INCLUDES FUTURE WEARING SURFACE

BILL OF MATERIAL FOR CONCRETE BRIDGE RAIL AND PARAPET

BAR	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
*B2	48	#4	STR	18'-8"	599
*B3	48	#4	STR	29'-11"	959
*S4	240	#4	5	2'-5"	387
*S5	72	#4	4	6'-7"	317
* EPOXY COATED REINFORCING STEEL					2,262 LBS.
CLASS AA CONCRETE					26.6 CY
TOTAL LIN. FT. OF CONCRETE BARRIER RAIL					229'-6"

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	4	57'-4 1/2"	229'-6"
INTERIOR C.S.	18	57'-4 1/2"	1032'-9"
TOTAL	22		1262'-3"

GRADE 270 STRANDS

	1/2" Ø L.R.
AREA (SQUARE INCHES)	0.153
ULTIMATE STRENGTH (LBS. PER STRAND)	41,300
APPLIED PRESTRESS (LBS. PER STRAND)	30,980

NOTES

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

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH GROUT. THE 2 1/2" Ø DOWEL HOLES AT EXPANSION ENDS OF SLAB SECTIONS SHALL BE FILLED WITH JOINT SEALER MATERIAL TO 1/2" ABOVE THE TOP OF DOWELS AND THEN FILLED WITH GROUT.

THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT. THE 2" Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS. PAYMENT FOR JOINT SEALER MATERIAL SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION OF THE BRIDGE.

WHEN CORED SLABS ARE CAST, A POSITIVE HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. THIS SYSTEM SHALL BE DESIGNED TO BE LEFT IN PLACE UNTIL THE CONCRETE HAS REACHED RELEASE STRENGTH. AT LEAST THREE WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5600 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED. PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

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"			

PROJECT NO. B-5022

CUMBERLAND COUNTY

BRIDGE: 154

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE CONCRETE BRIDGE RAIL DETAILS

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1	STV	5-08	3		
2			4		

SHEET NO. S-17  
 TOTAL SHEETS 44

D-1810.17

STV/Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208



**NOTES :**

REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

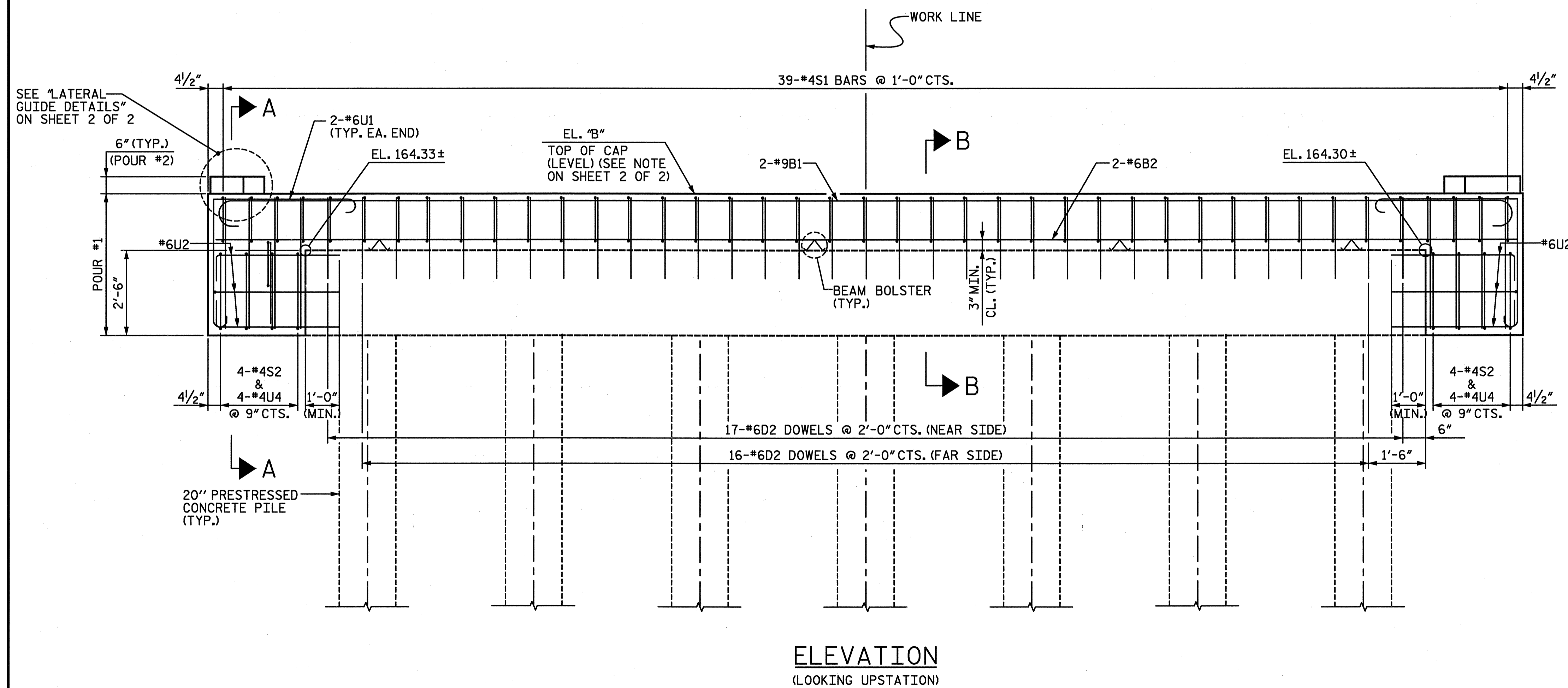
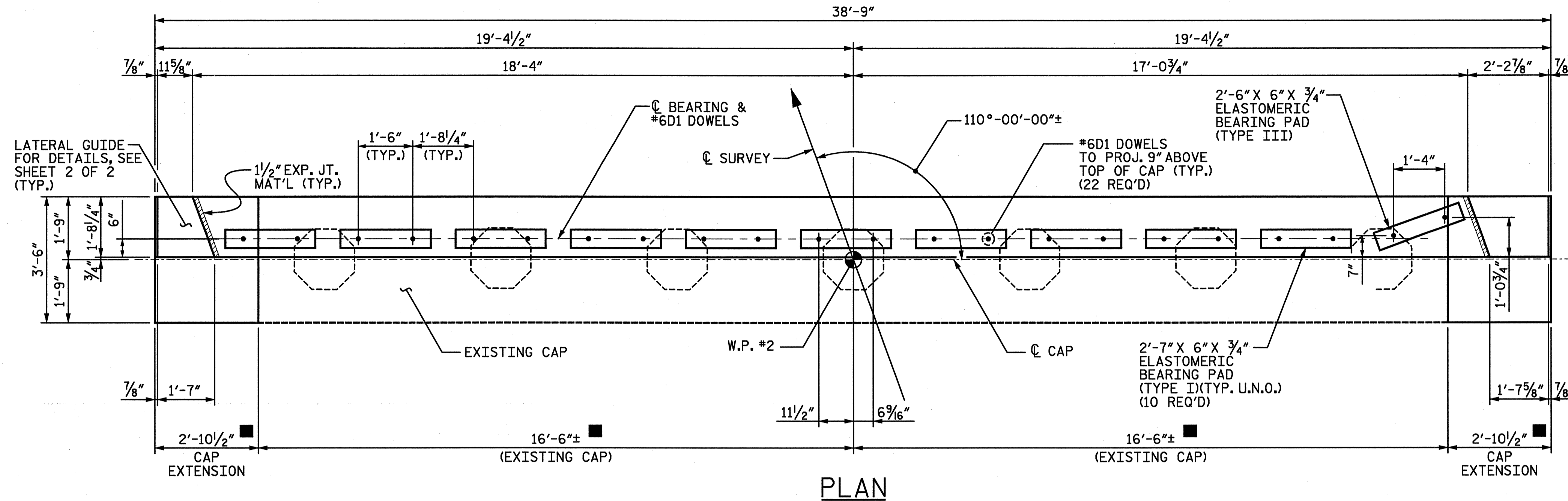
ALL ELEVATIONS ARE TO BE VERIFIED BY THE ENGINEER.

A HIGH EARLY STRENGTH PORTLAND CEMENT CONCRETE SHALL BE USED TO ACHIEVE A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI PRIOR TO PLACING CORED SLAB UNITS. SEE STANDARD SPECIFICATION SECTION 1000 FOR DETAILS.

▲ #6D2 AND #4U2 DOWELS SHALL BE ADHESIVELY ANCHORED USING AN APPROVED ADHESIVE CONSIDERING LOAD RESISTANCE, IN-SERVICE AND INSTALLATION TEMPERATURE, AVAILABILITY OF COMPREHENSIVE INSTALLATION INSTRUCTIONS, AND CREEP. ANCHORS SHALL BE INSTALLED TO THE MINIMUM EMBEDMENT DEPTHS AS SHOWN ON PLANS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE DOWEL IS 26 KIPS. FOR ADHESIVELY ANCHORED DOWELS, SEE SPECIAL PROVISIONS.

U.N.O. = UNLESS NOTED OTHERWISE.

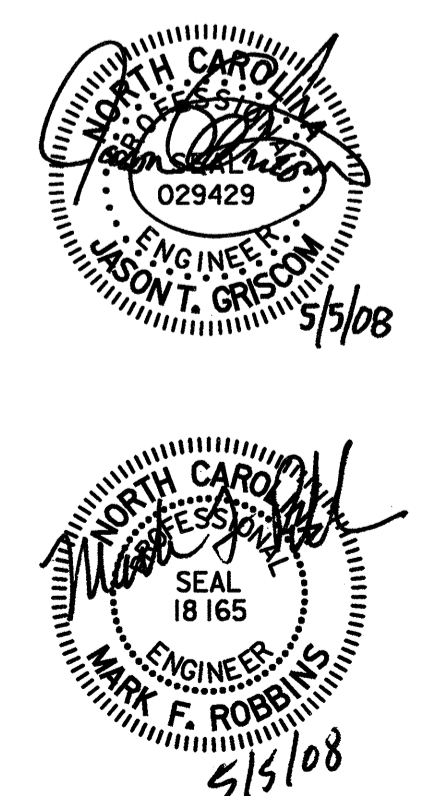
■ DIMENSIONS AND ELEVATIONS ARE BASED ON AS-BUILT DIMENSIONS AND FIELD SURVEY INFORMATION. CONTRACTOR SHALL FIELD VERIFY DIMENSIONS PRIOR TO CONSTRUCTION. REINFORCING AND CONCRETE CAP EXTENSIONS SHALL BE ADJUSTED TO MATCH FIELD VERIFIED DIMENSIONS PROVIDED THAT THE OUT-TO-OUT DIMENSIONS REMAIN AS DETAILED.



▲ REVISION #1: REVISED PER REVIEW COMMENTS  
 BY: TJT DATE: 5-08  
 CH'KD BY: KGB DATE: 5-08

DRAWN BY: LGH DATE: 3-08  
 CHECKED BY: TBQ DATE: 3-08

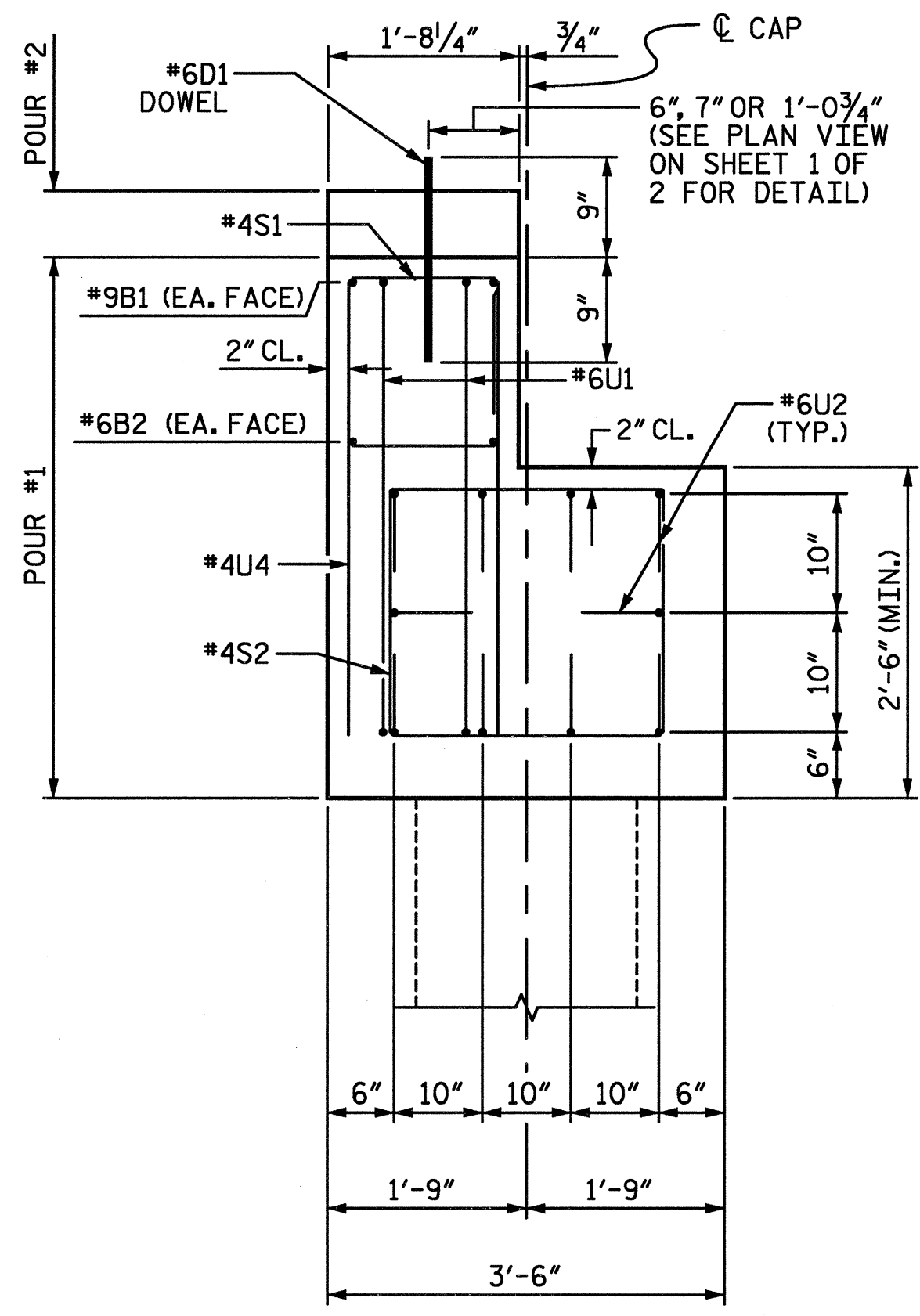
D-1810.18  
 STV/Ralph Whitehead Associates, Inc.  
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 Charlotte, NC 28208



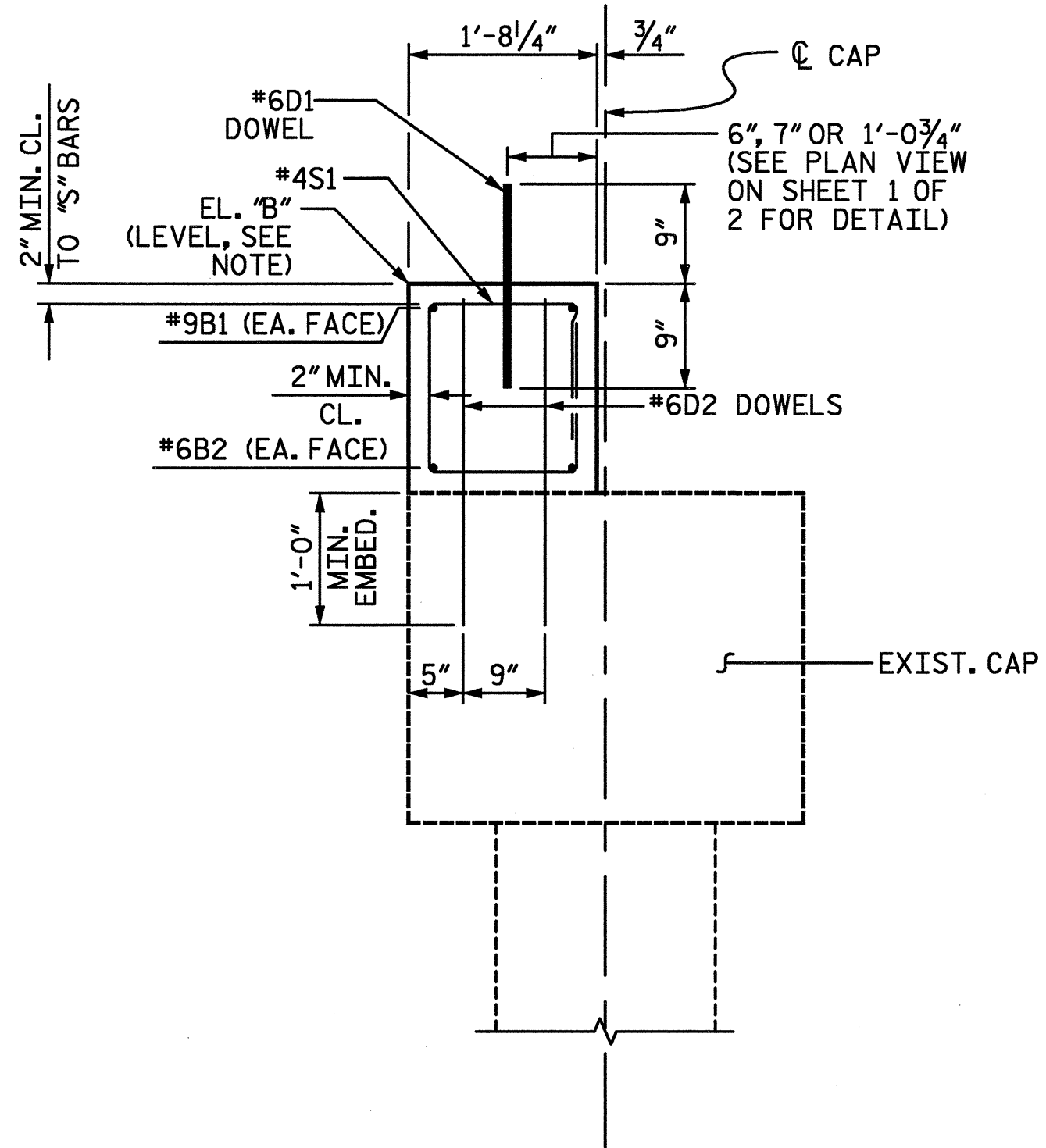
PROJECT NO. B-5022  
 CUMBERLAND COUNTY  
 BRIDGE: 154  
 SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1

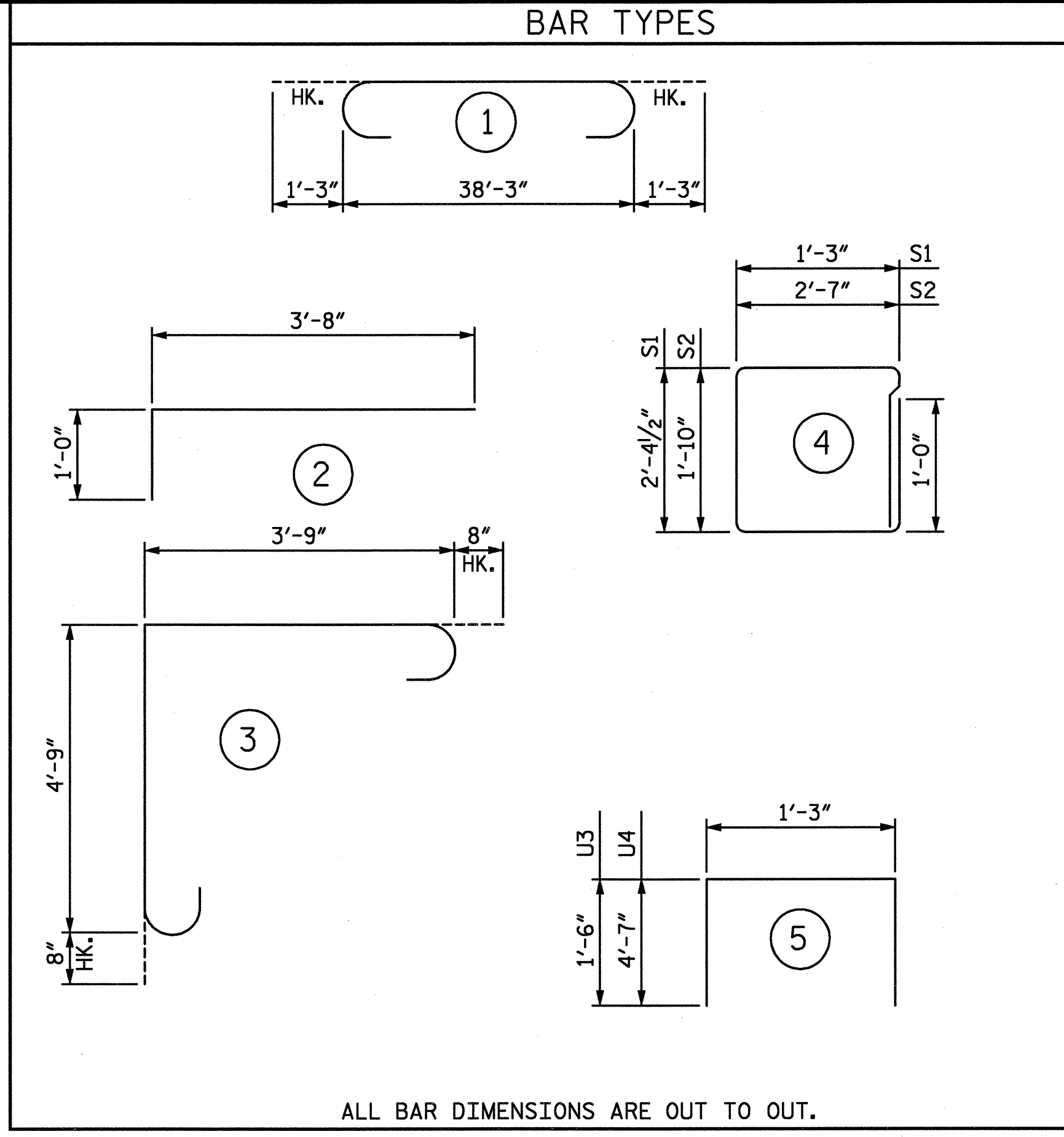
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1	STV	5-08	3			TOTAL SHEETS
2			4			44



SECTION A-A



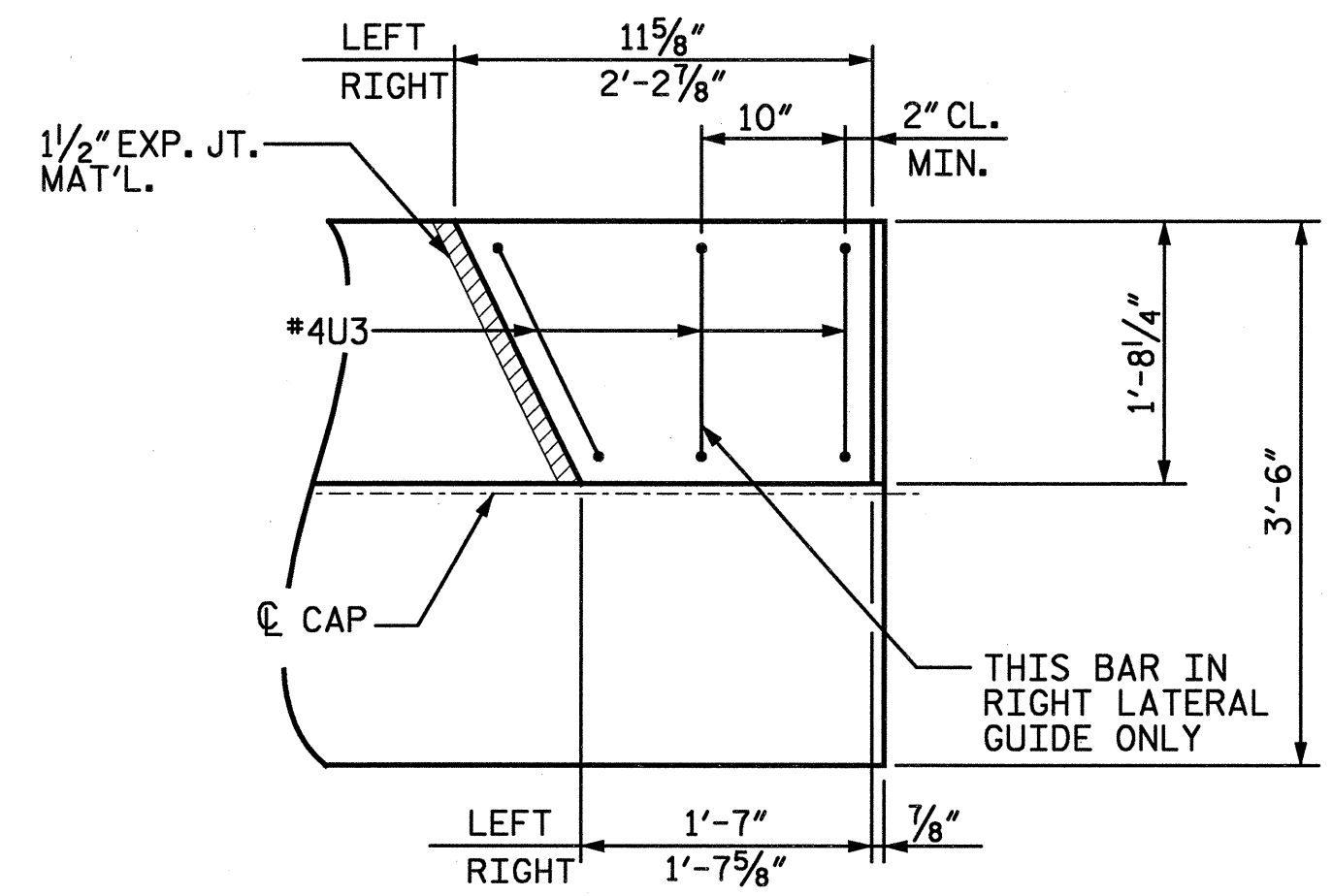
SECTION B-B



ALL BAR DIMENSIONS ARE OUT TO OUT.

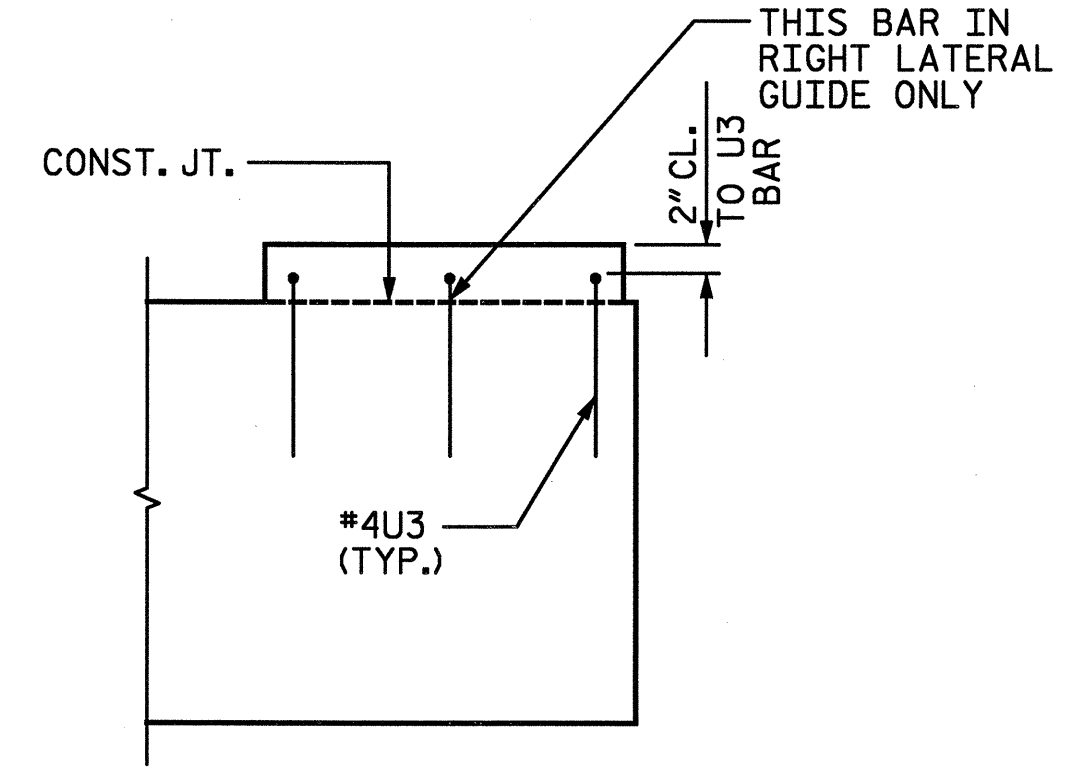
BILL OF MATERIAL

BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	2	9	①	40'-9"	277
B2	2	6	STR.	38'-3"	115
D1	22	6	STR.	1'-6"	50
D2	33	6	STR.	3'-7"	118
S1	39	4	④	8'-3"	215
S2	8	4	④	9'-10"	53
U1	4	6	③	9'-10"	59
U2	20	6	②	4'-8"	140
U3	5	4	⑤	4'-3"	14
U4	8	4	⑥	10'-5"	56
REINFORCING STEEL					LBS. 997
CLASS AA CONCRETE BREAKDOWN					
POUR 1 (CAP)					CY 8.5
POUR 2 (LATERAL GUIDE)					CY 0.1
TOTAL					CY 8.6

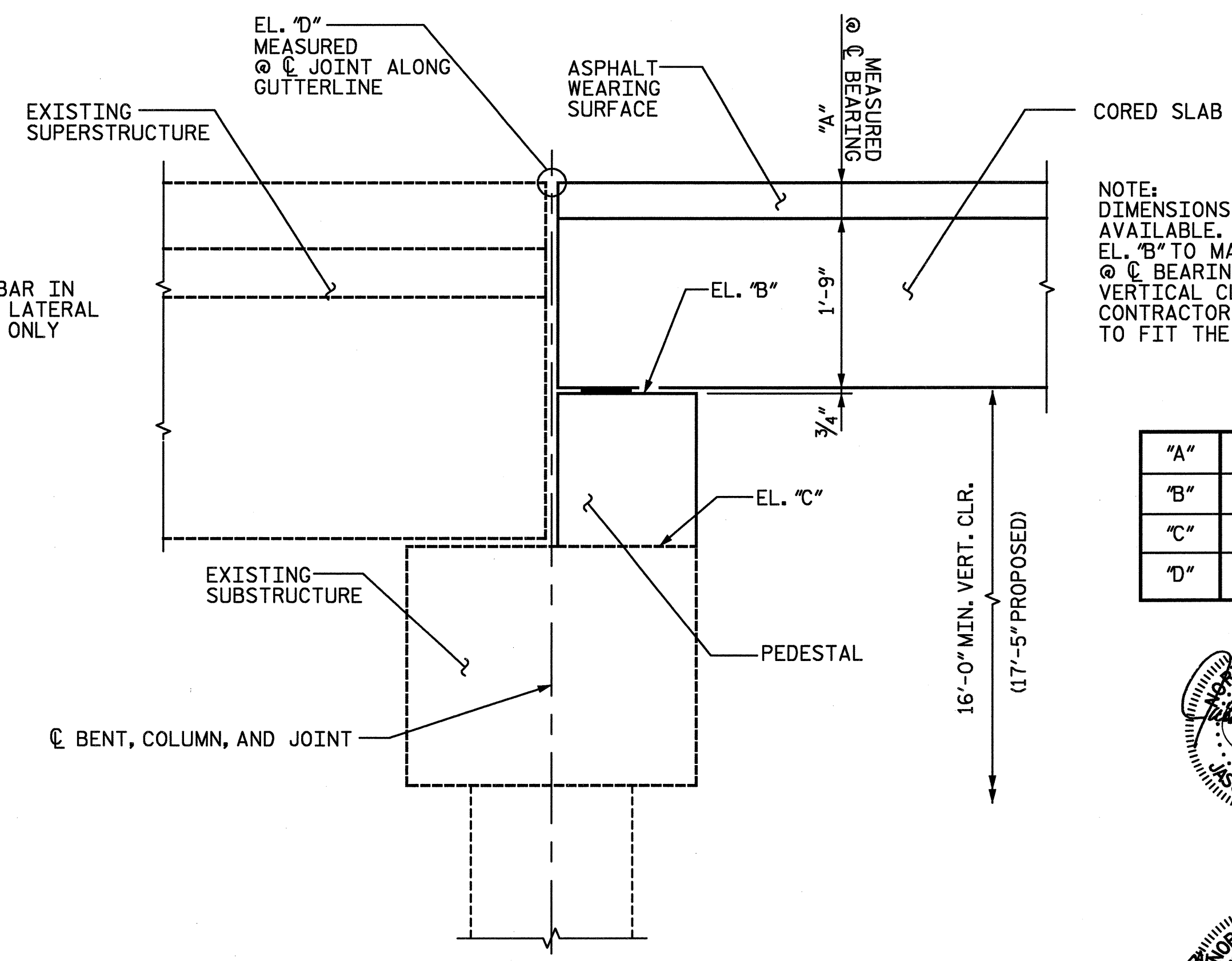


PLAN

LATERAL GUIDE DETAILS  
(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)



ELEVATION

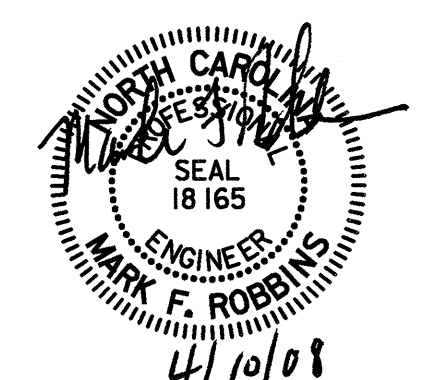
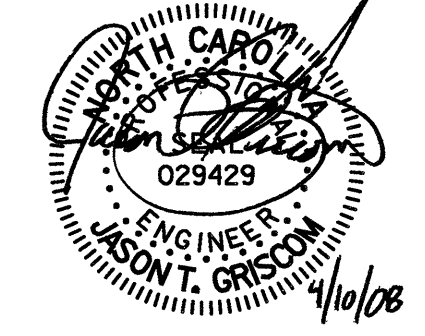


PEDESTAL HEIGHT

NOTE: DIMENSIONS AND ELEVATIONS SHOWN ARE FROM BEST INFORMATION AVAILABLE. CONTRACTOR SHALL MAKE ADJUSTMENTS TO PEDESTAL EL. "B" TO MAINTAIN 3" (5" MAX.) ASPHALT WEARING SURFACE @ CL BEARING, MATCH EL. "D", AND TO MAINTAIN THE 16'-0" MIN. VERTICAL CLEARANCE. IF ANY ELEVATIONS ARE MODIFIED, THE CONTRACTOR IS RESPONSIBLE FOR ADJUSTING THE REINFORCING TO FIT THE PEDESTAL HEIGHT.

"A"	3"
"B"	167.09
"C"	164.30
"D"	169.15

PROJECT NO. B-5022  
CUMBERLAND COUNTY  
BRIDGE: 154  
SHEET 2 OF 2



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

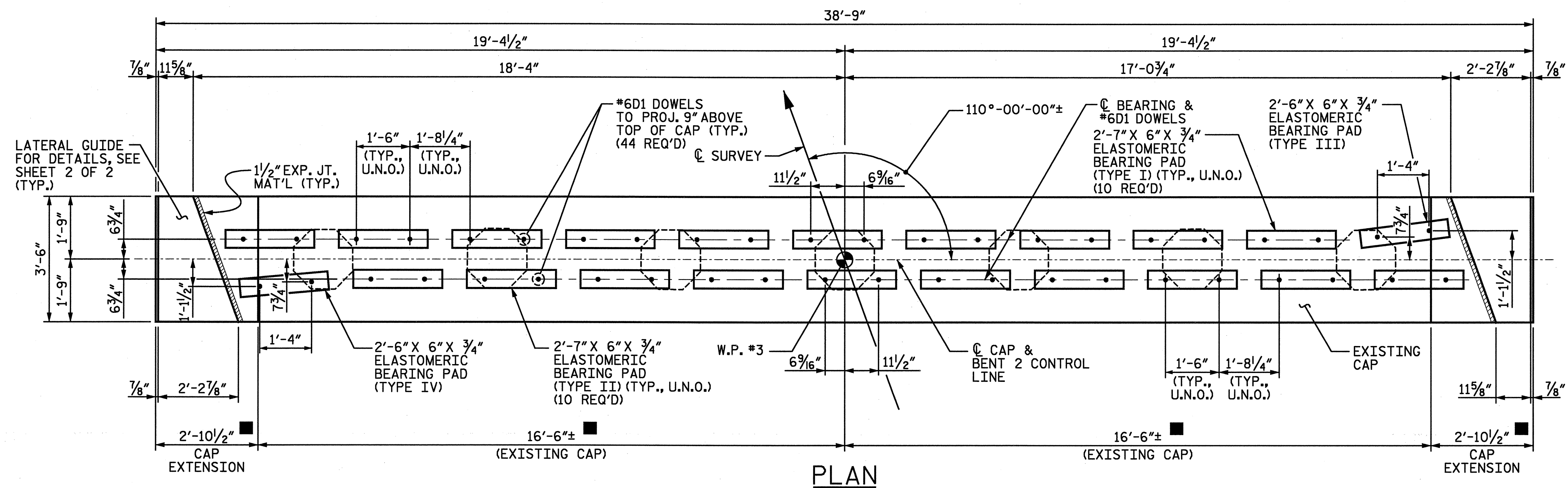
SUBSTRUCTURE  
BENT 1

DRAWN BY: LGH DATE: 3-08  
CHECKED BY: TBQ DATE: 3-08

D-1810.19  
STV/Ralph Whitehead Associates, Inc.  
1000 West Morehead St., Ste. 200  
Charlotte, NC 28208

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			44





**NOTES :**

REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

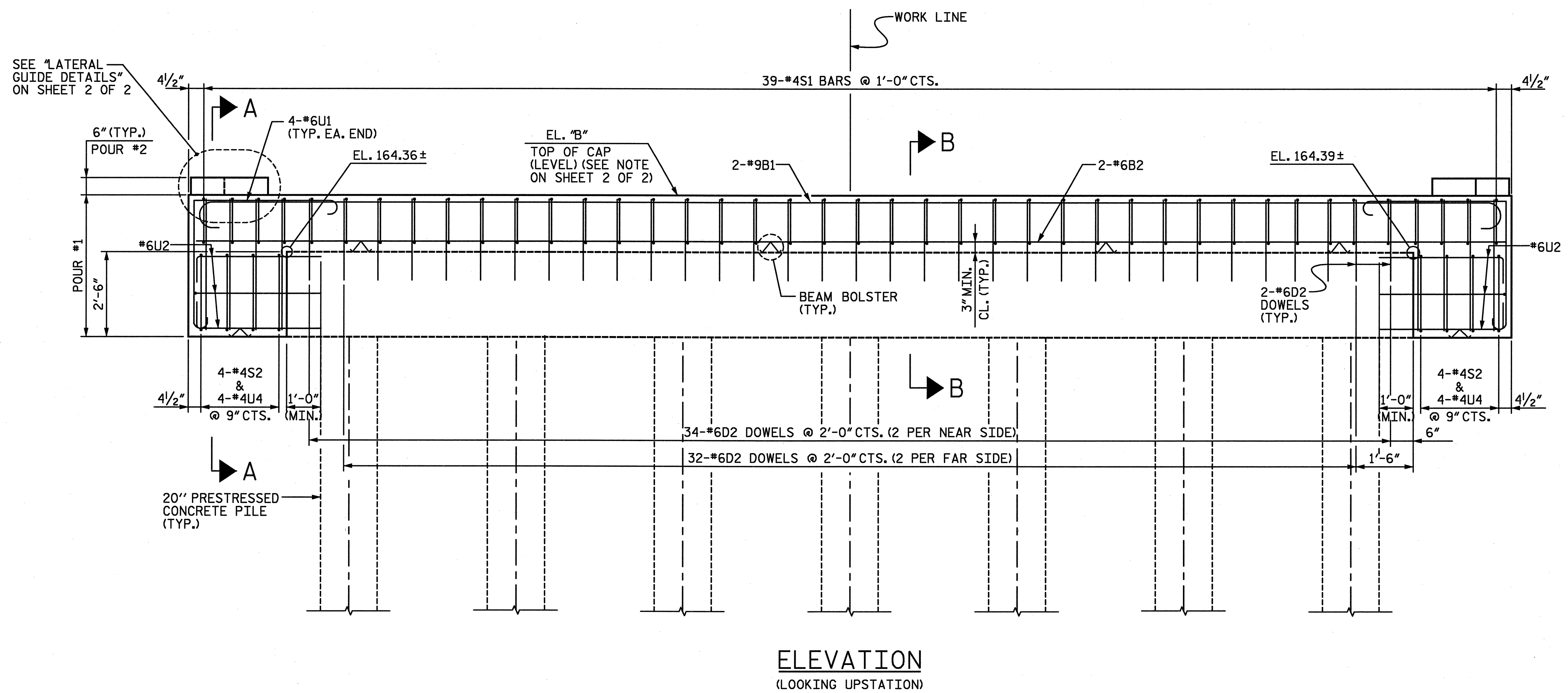
ALL ELEVATIONS ARE TO BE VERIFIED BY THE ENGINEER.

A HIGH EARLY STRENGTH PORTLAND CEMENT CONCRETE SHALL BE USED TO ACHIEVE A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI PRIOR TO PLACING CORED SLAB UNITS. SEE STANDARD SPECIFICATION SECTION 1000 FOR DETAILS.

▲ \*6D2 AND \*4U2 DOWELS SHALL BE ADHESIVELY ANCHORED USING AN APPROVED ADHESIVE CONSIDERING LOAD RESISTANCE, IN-SERVICE AND INSTALLATION TEMPERATURE, AVAILABILITY OF COMPREHENSIVE INSTALLATION INSTRUCTIONS, AND CREEP. ANCHORS SHALL BE INSTALLED TO THE MINIMUM EMBEDMENT DEPTHS AS SHOWN ON PLANS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE DOWEL IS 26 KIPS. FOR ADHESIVELY ANCHORED DOWELS, SEE SPECIAL PROVISIONS.

U.N.O. = UNLESS NOTED OTHERWISE.

■ DIMENSIONS AND ELEVATIONS ARE BASED ON AS-BUILT DIMENSIONS AND FIELD SURVEY INFORMATION. CONTRACTOR SHALL FIELD VERIFY DIMENSIONS PRIOR TO CONSTRUCTION. REINFORCING AND CONCRETE CAP EXTENSIONS SHALL BE ADJUSTED TO MATCH FIELD VERIFIED DIMENSIONS PROVIDED THAT THE OUT-TO-OUT DIMENSIONS REMAIN AS DETAILED.



▲ REVISION #1: REVISED PER REVIEW COMMENTS  
 BY: TJT DATE: 5-08  
 CH'KD BY: KGB DATE: 5-08

DRAWN BY: LGH DATE: 3-08  
 CHECKED BY: TBQ DATE: 3-08

D-1810.20

STV / Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

PROJECT NO. B-5022  
 CUMBERLAND COUNTY  
 BRIDGE: 154

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT 2

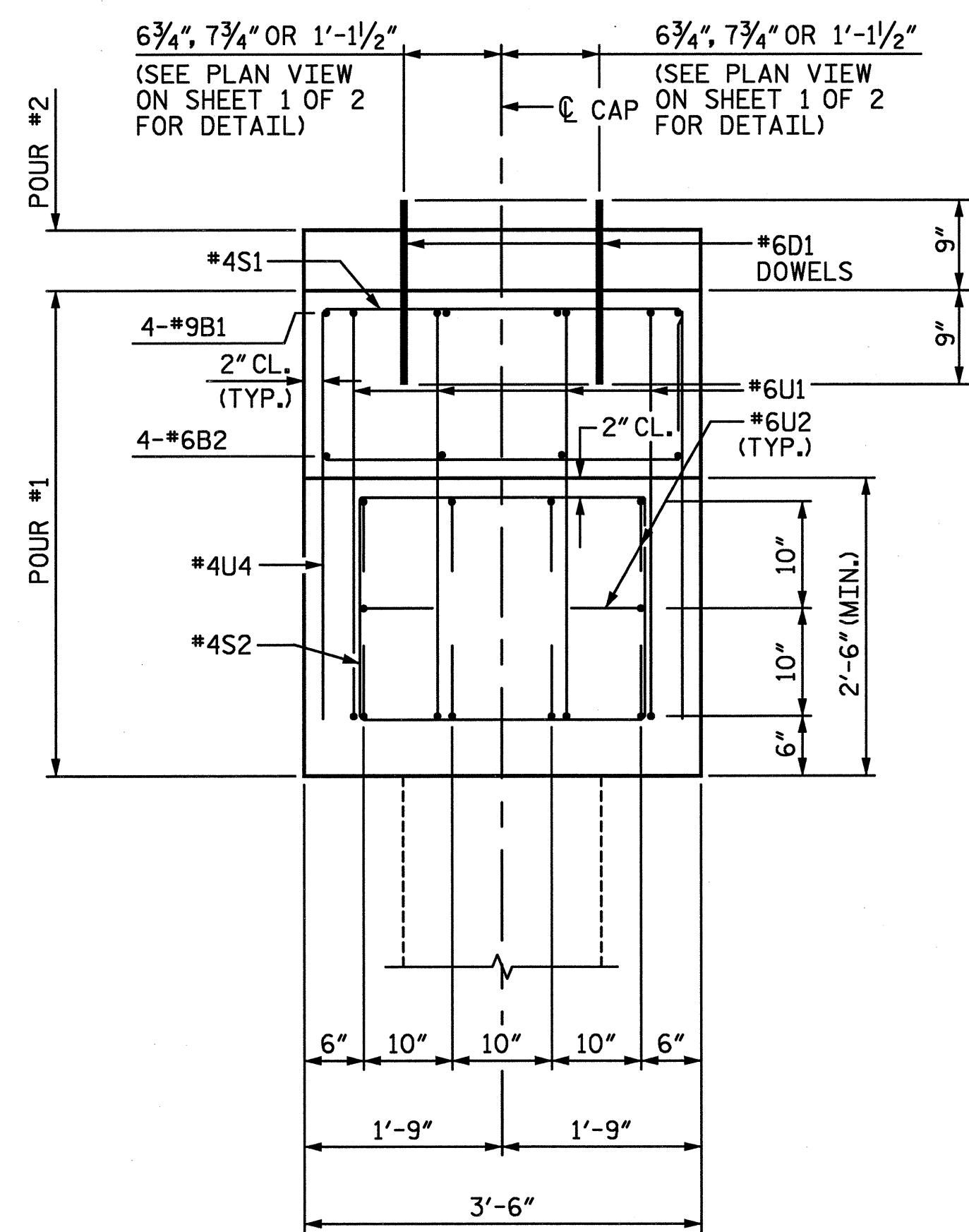
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1	STV	5-08	3		
2			4		

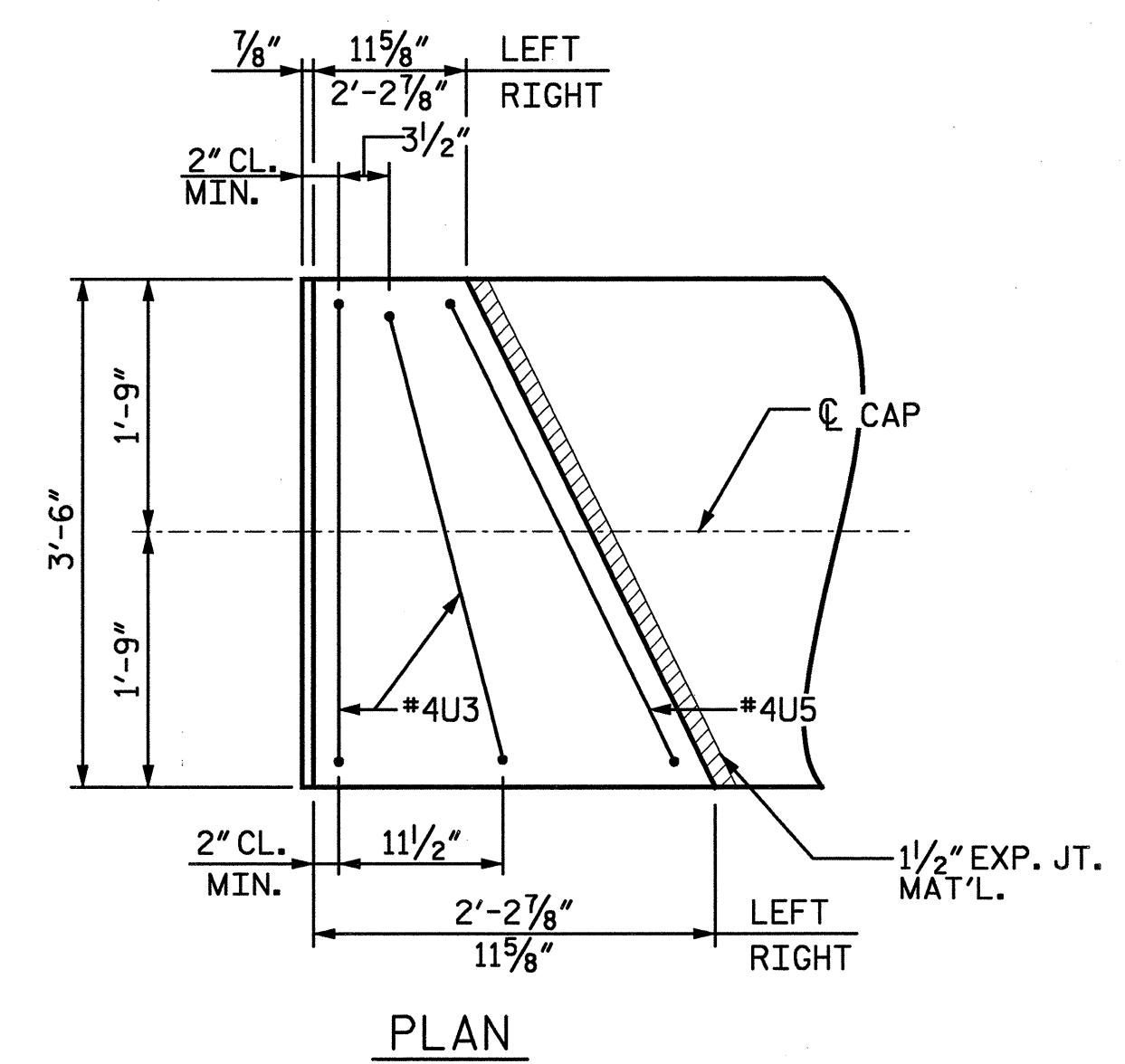
SHEET NO.

S-20

TOTAL SHEETS  
44

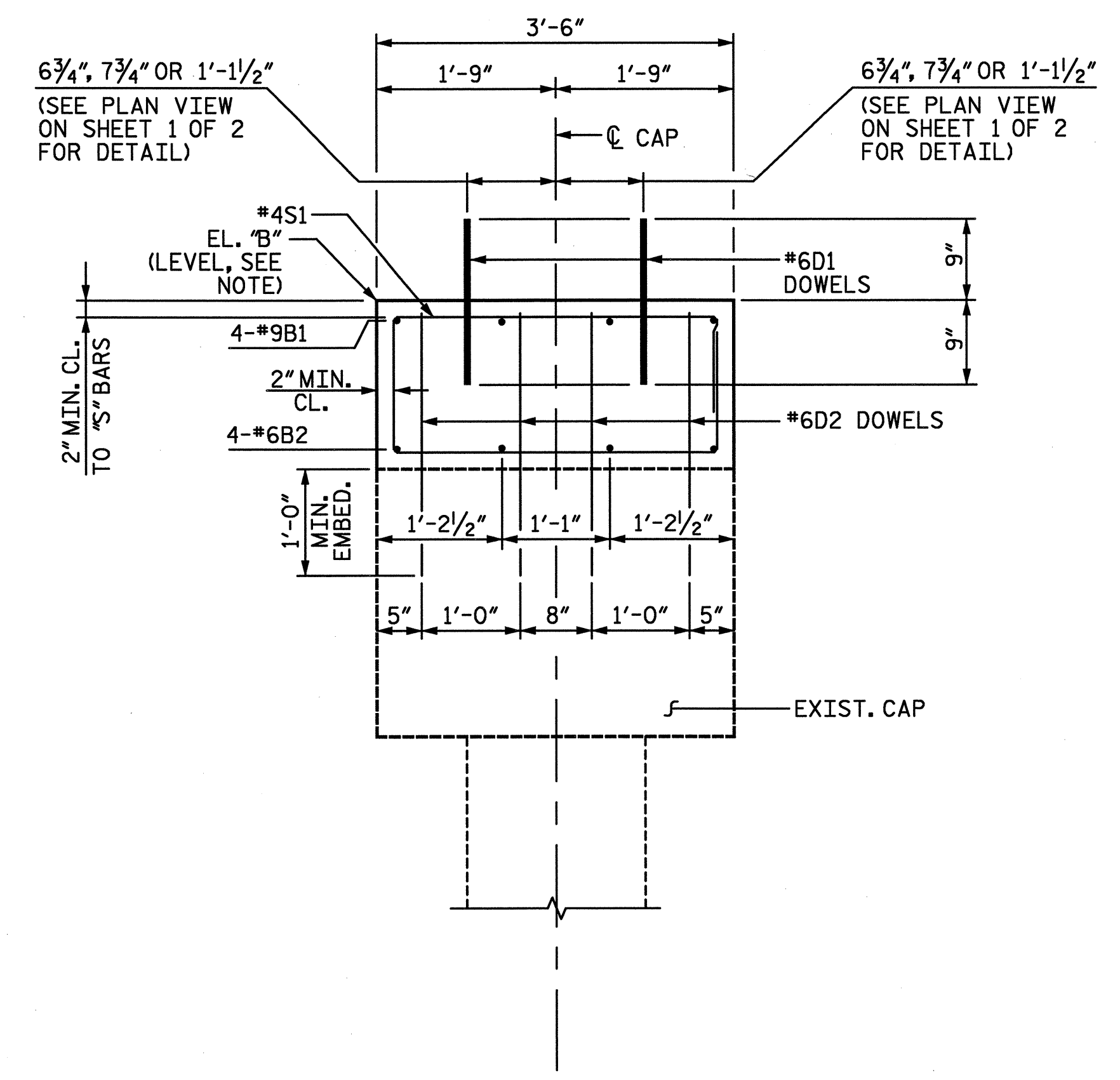


SECTION A-A

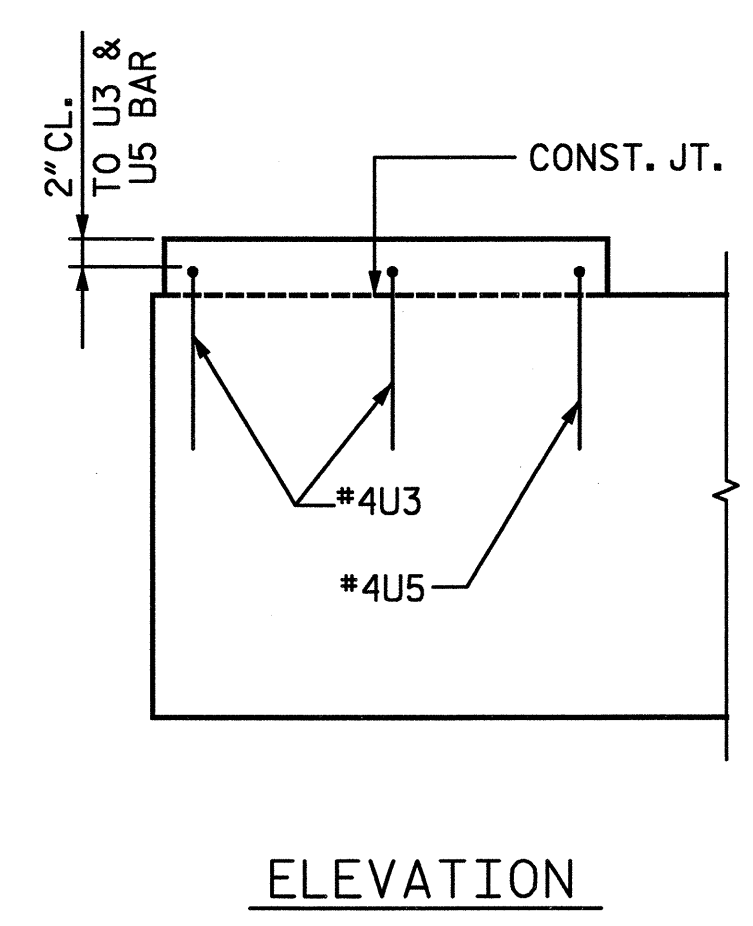


PLAN

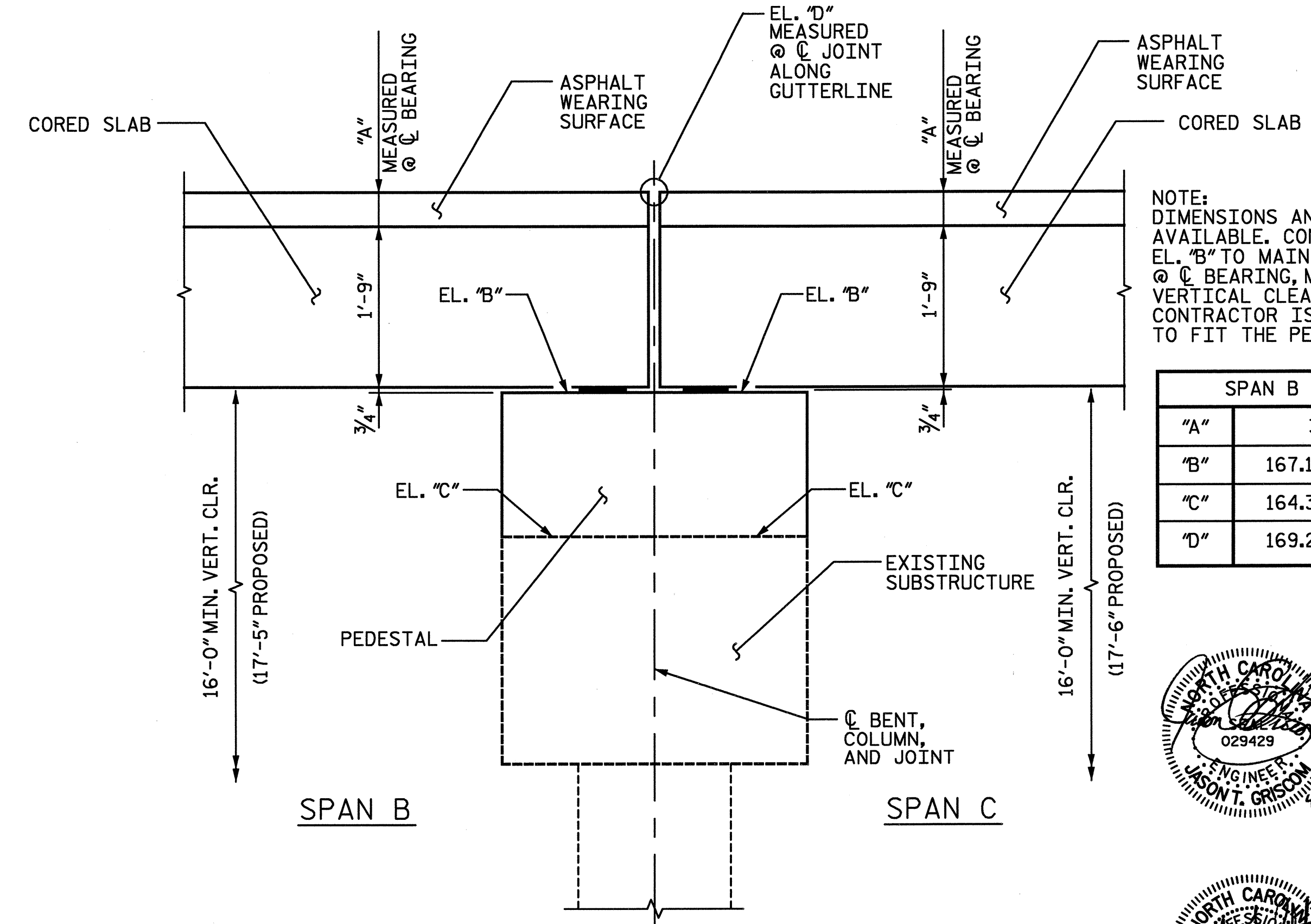
LATERAL GUIDE DETAILS  
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)



SECTION B-B



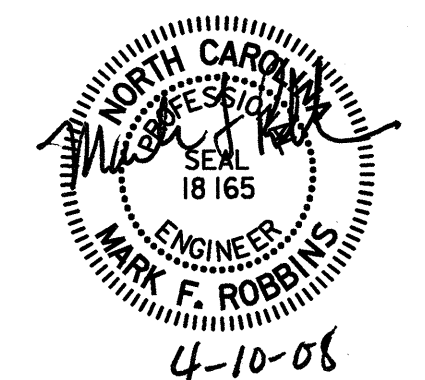
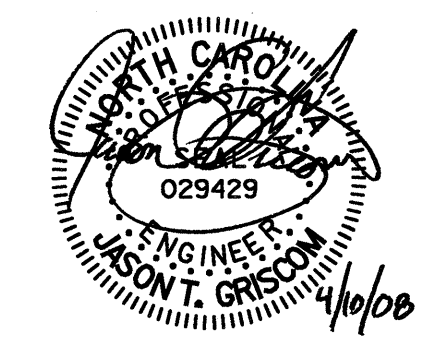
ELEVATION



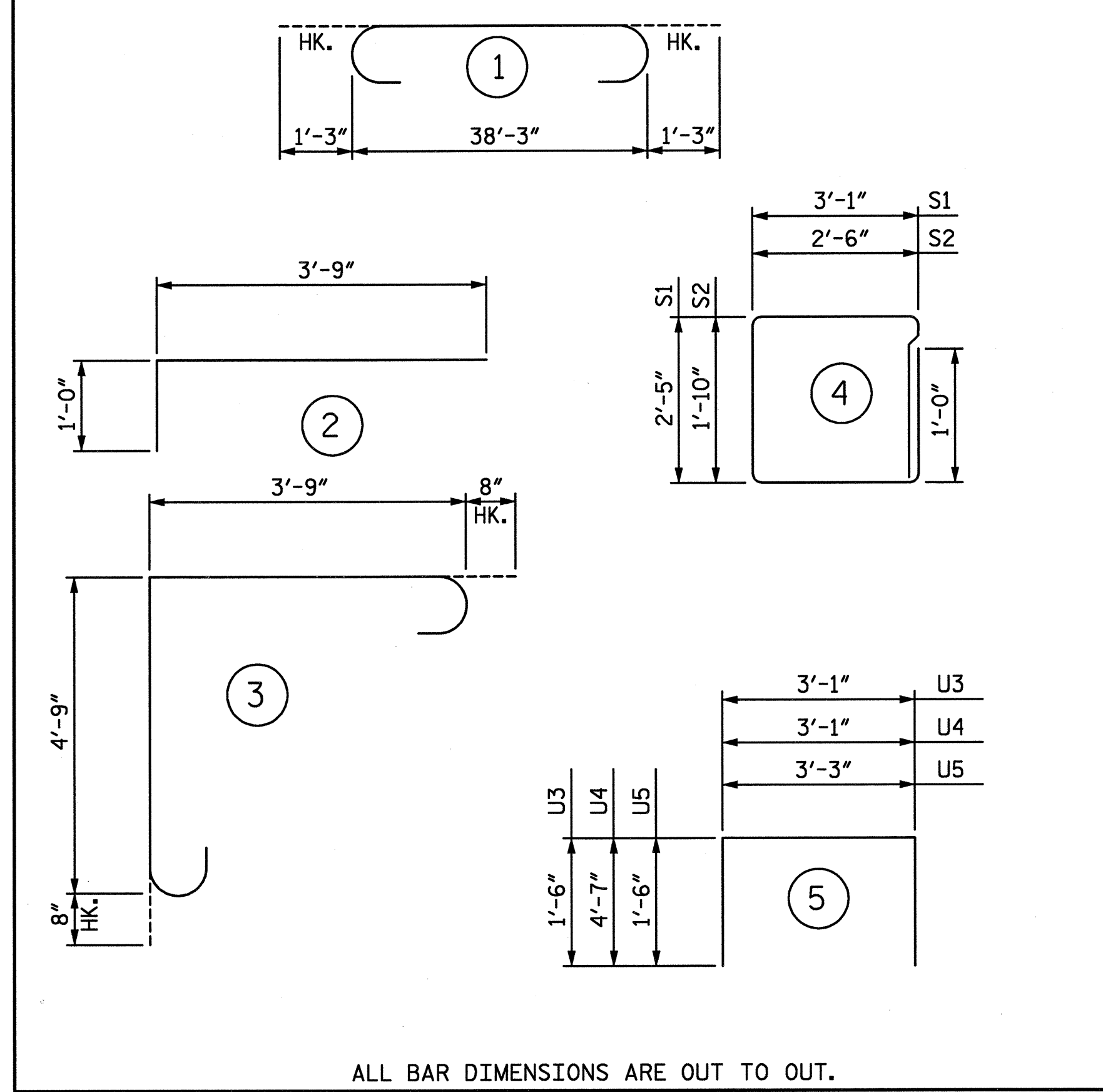
PEDESTAL HEIGHT

NOTE:  
DIMENSIONS AND ELEVATIONS SHOWN ARE FROM BEST INFORMATION AVAILABLE. CONTRACTOR SHALL MAKE ADJUSTMENTS TO PEDESTAL EL. "B" TO MAINTAIN 3" (5" MAX.) ASPHALT WEARING SURFACE @ C BEARING, MATCH EL. "D", AND TO MAINTAIN THE 16'-0" MIN. VERTICAL CLEARANCE. IF ANY ELEVATIONS ARE MODIFIED, THE CONTRACTOR IS RESPONSIBLE FOR ADJUSTING THE REINFORCING TO FIT THE PEDESTAL HEIGHT.

	SPAN B	SPAN C	
"A"	3"	"A"	3"
"B"	167.14	"B"	167.14
"C"	164.36	"C"	164.36
"D"	169.20	"D"	169.20



BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	4	9	①	40'-9"	554	
B2	4	6	STR.	38'-3"	230	
D1	44	6	STR.	1'-6"	99	
D2	66	6	STR.	3'-7"	355	
S1	39	4	④	12'-0"	313	
S2	8	4	④	9'-8"	52	
U1	8	6	③	9'-10"	118	
U2	20	6	②	4'-9"	143	
U3	4	4	⑤	6'-1"	16	
U4	8	4	⑤	12'-3"	65	
U5	2	4	⑤	6'-3"	8	
REINFORCING STEEL					LBS.	1,953
CLASS AA CONCRETE BREAKDOWN						
POUR 1 (CAP)					CY	15.8
POUR 2 (LATERAL GUIDE)					CY	0.2
TOTAL					CY	16.0

DRAWN BY: LGH DATE: 3-08  
CHECKED BY: TBQ DATE: 3-08

D-1810.21  
STV / Ralph Whitehead Associates, Inc.  
1000 West Morehead St., Ste. 200  
Charlotte, NC 28208

PROJECT NO. B-5022  
CUMBERLAND COUNTY  
BRIDGE: 154  
SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
BENT 2

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



**NOTES :**

REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

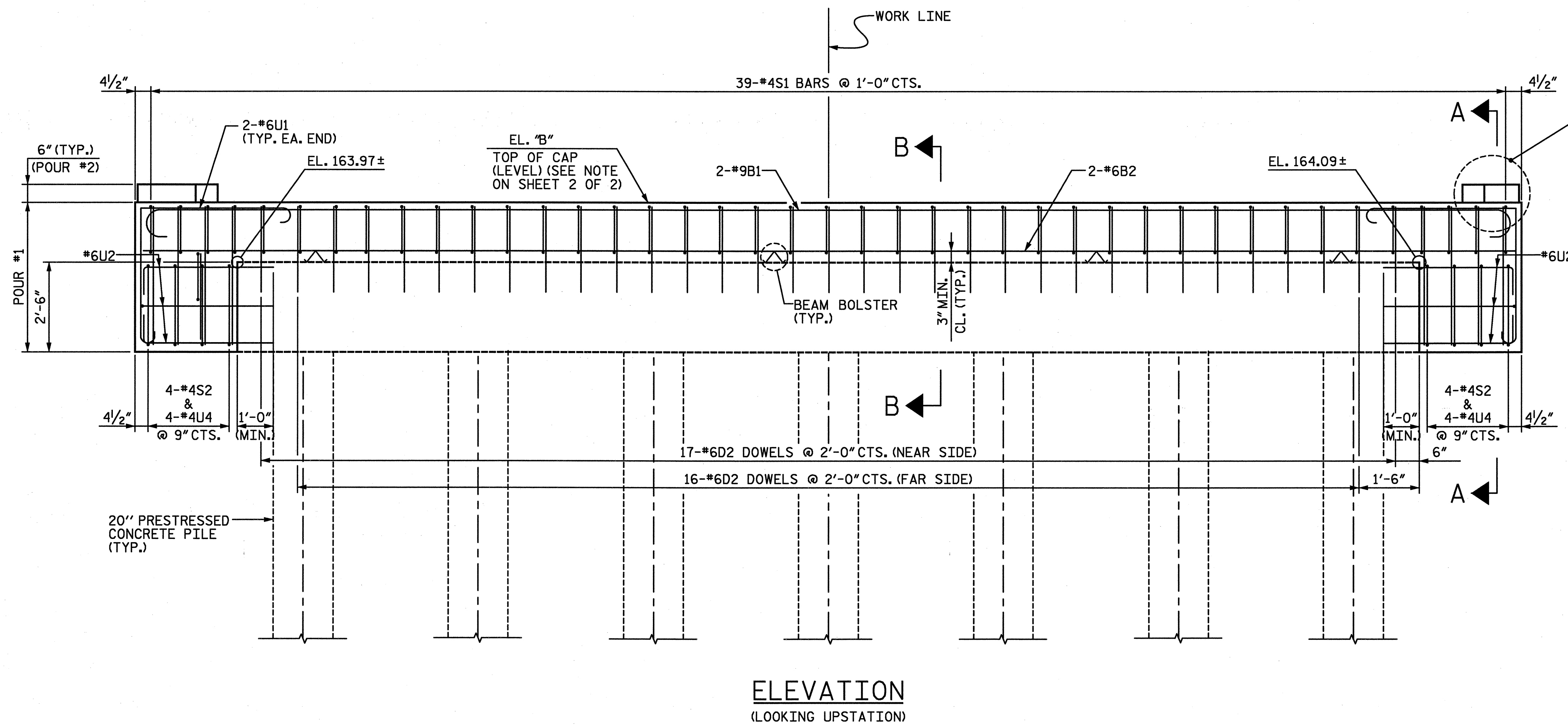
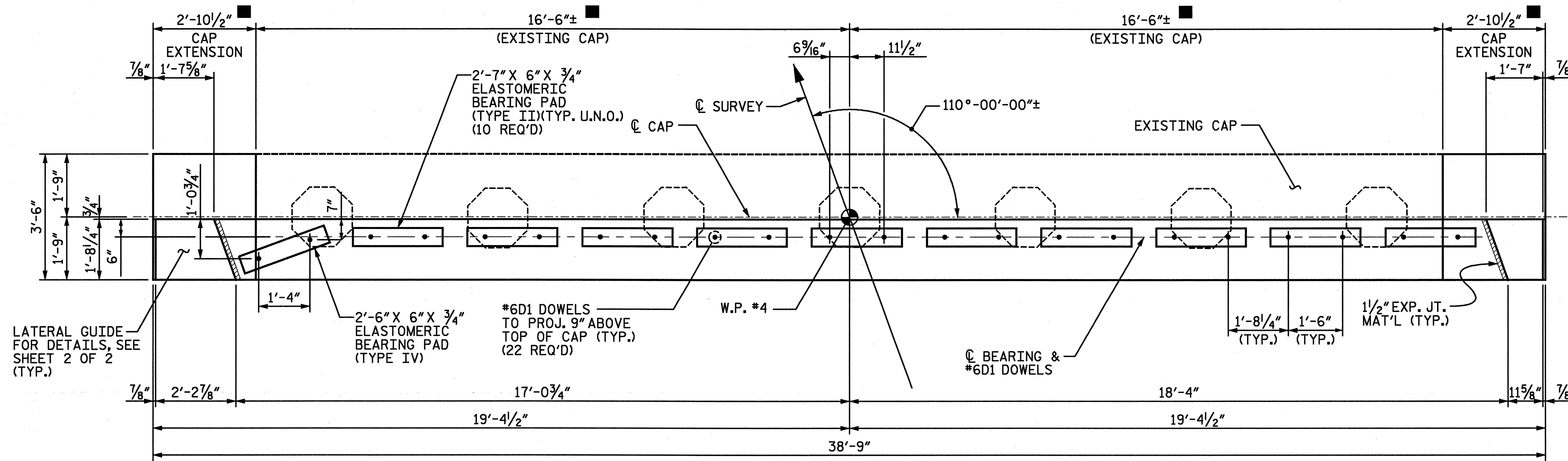
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 BY: TJT DATE: 5-08  
 CH'KD BY: KGB DATE: 5-08

DRAWN BY: LGH DATE: 3-08  
 CHECKED BY: TBQ DATE: 3-08

D-1810.22

STV / Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

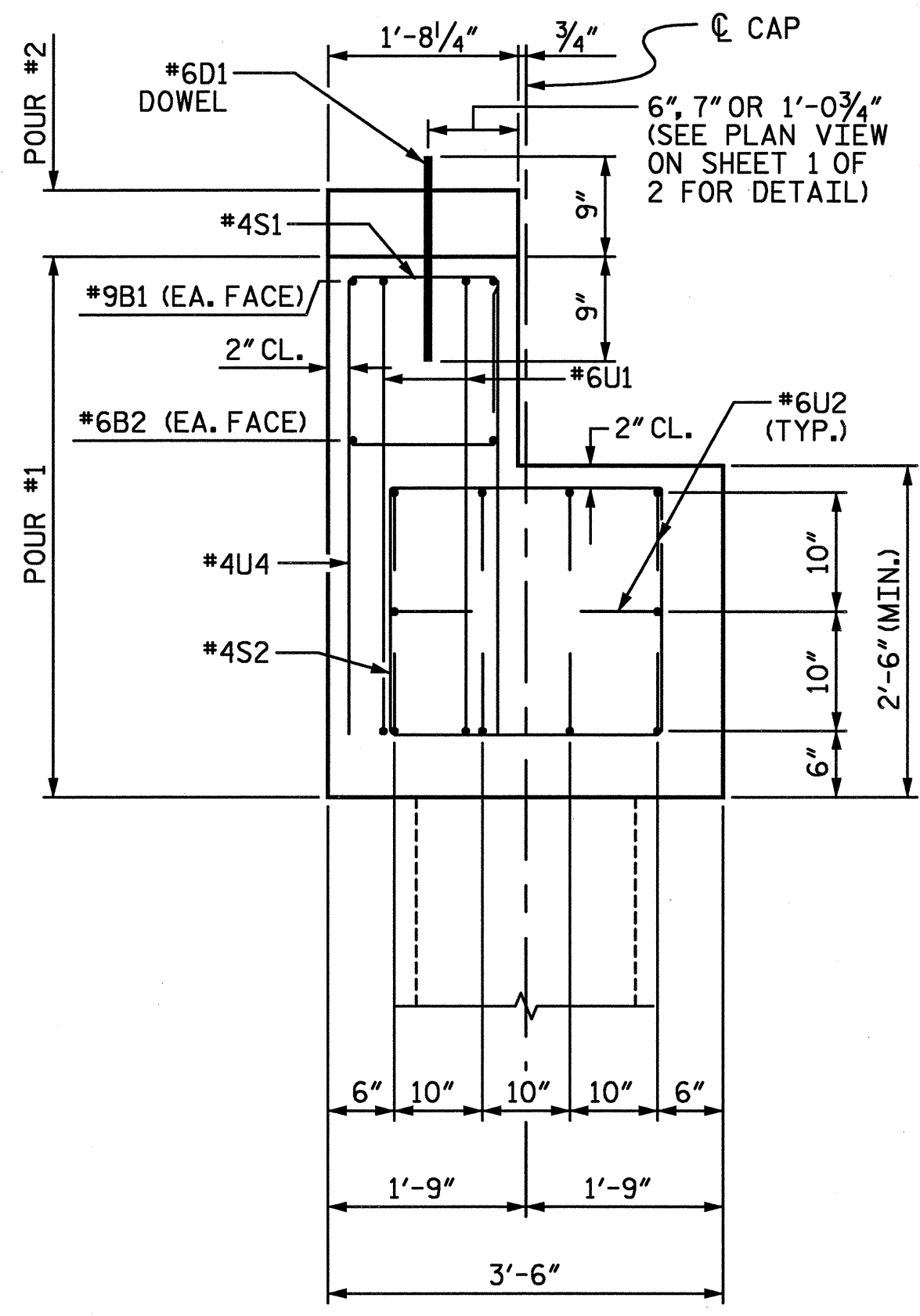
PROJECT NO. **B-5022**  
 CUMBERLAND COUNTY  
 BRIDGE: **154**

SHEET 1 OF 2

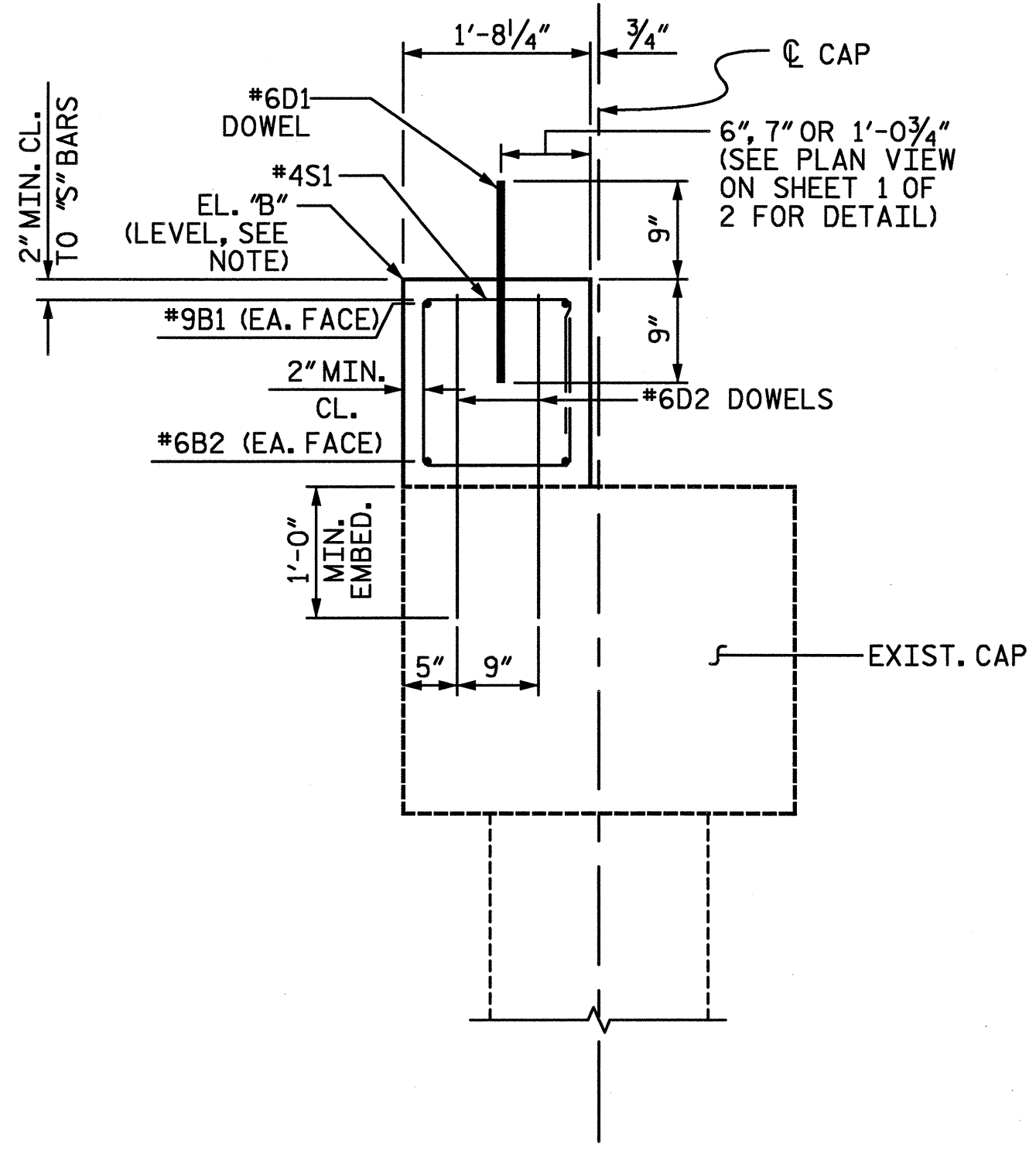
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT 3

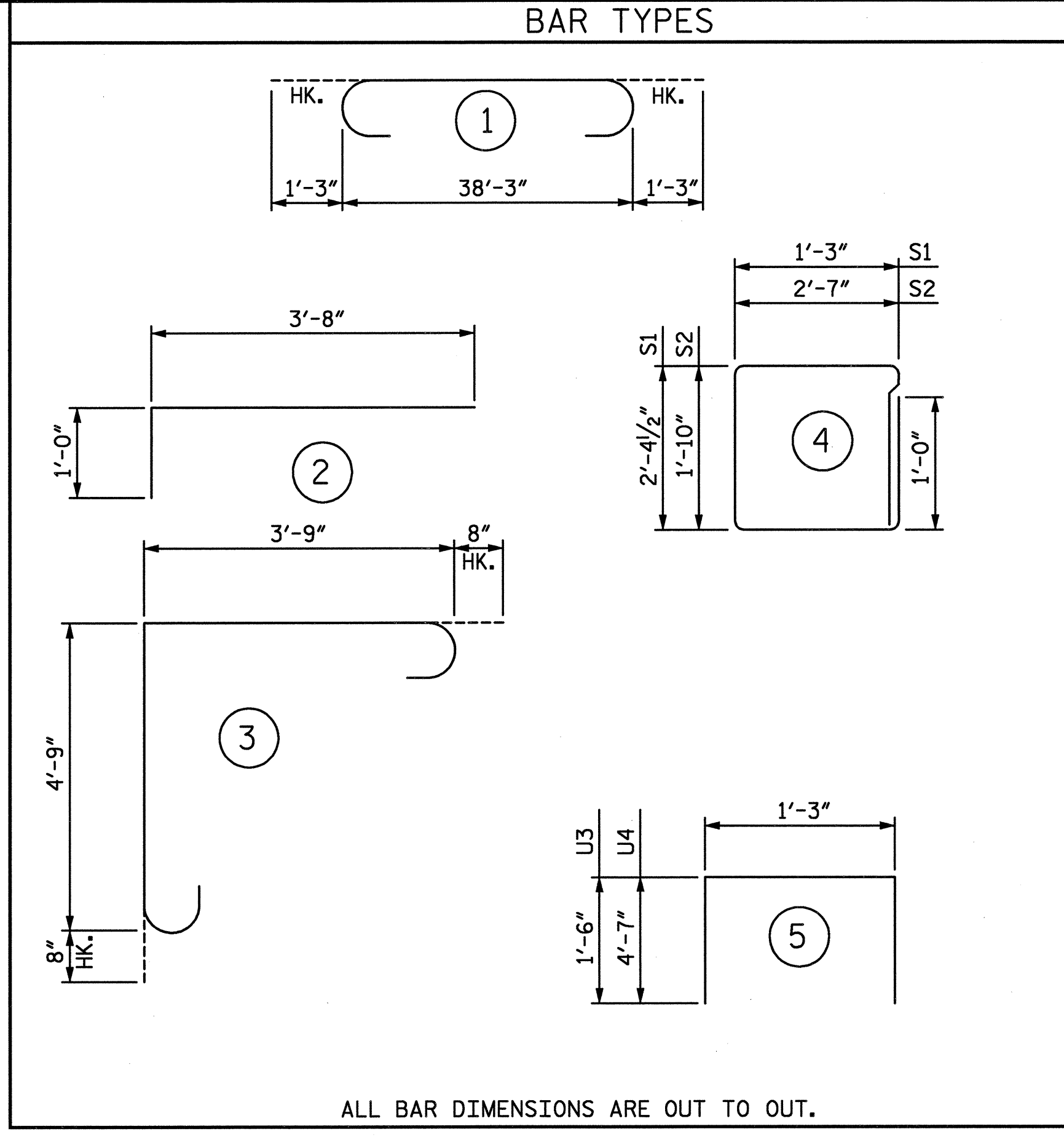
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1	STV	5-08	3			TOTAL SHEETS
2			4			44



SECTION A-A

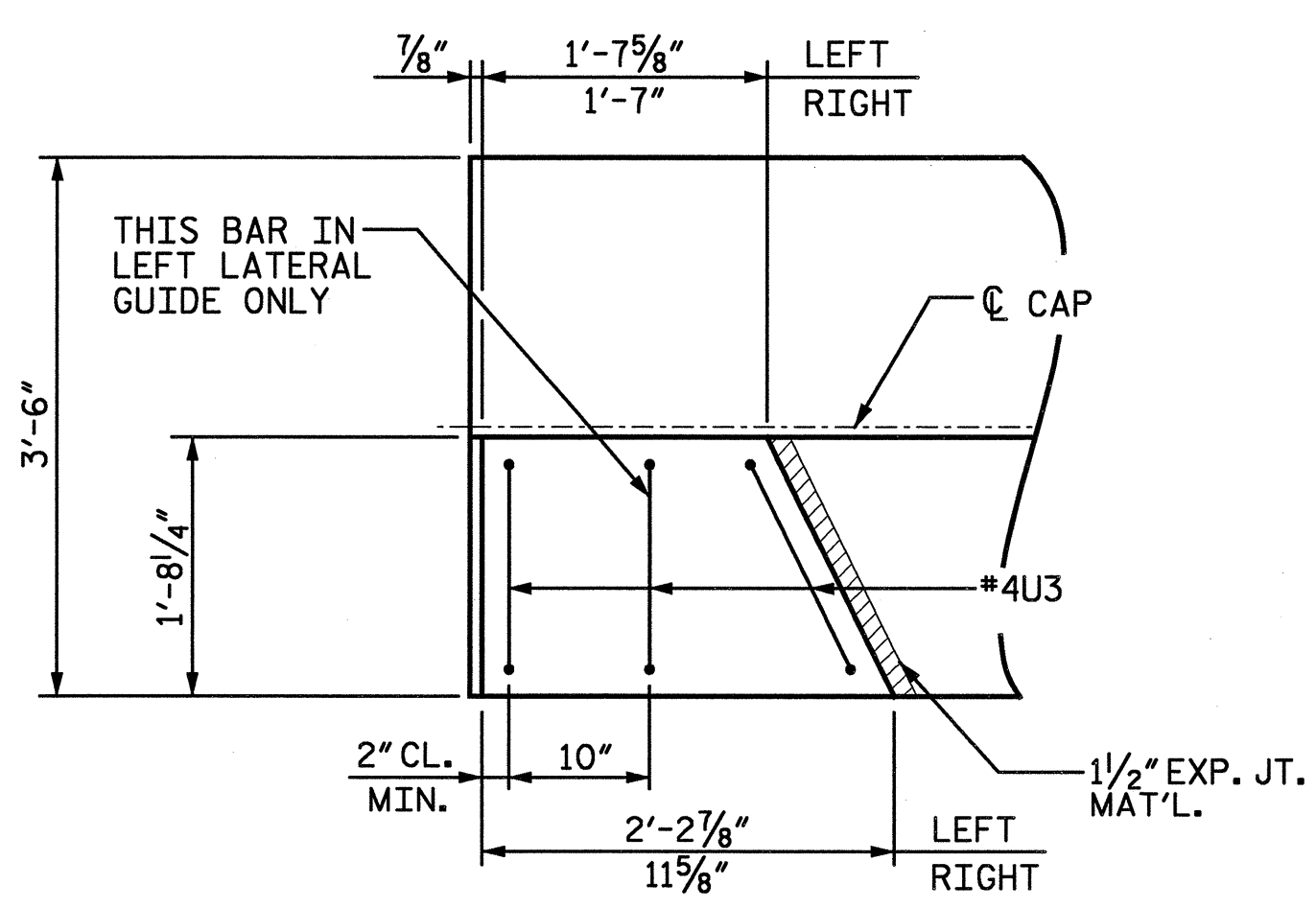


SECTION B-B

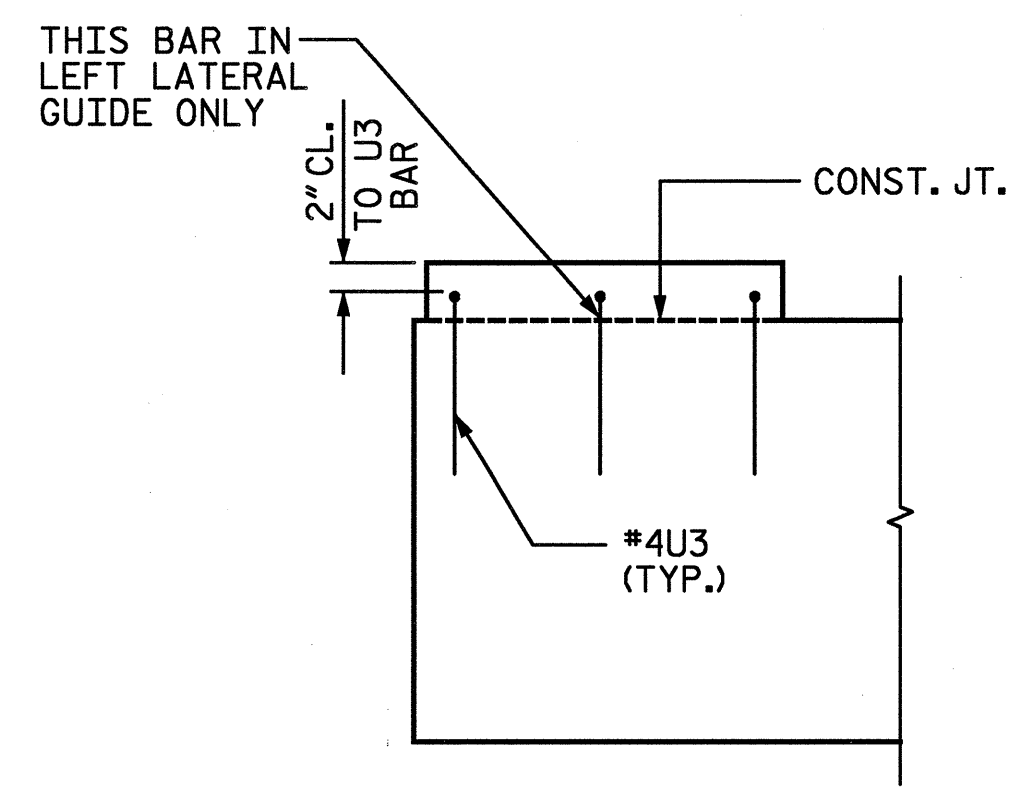


ALL BAR DIMENSIONS ARE OUT TO OUT.

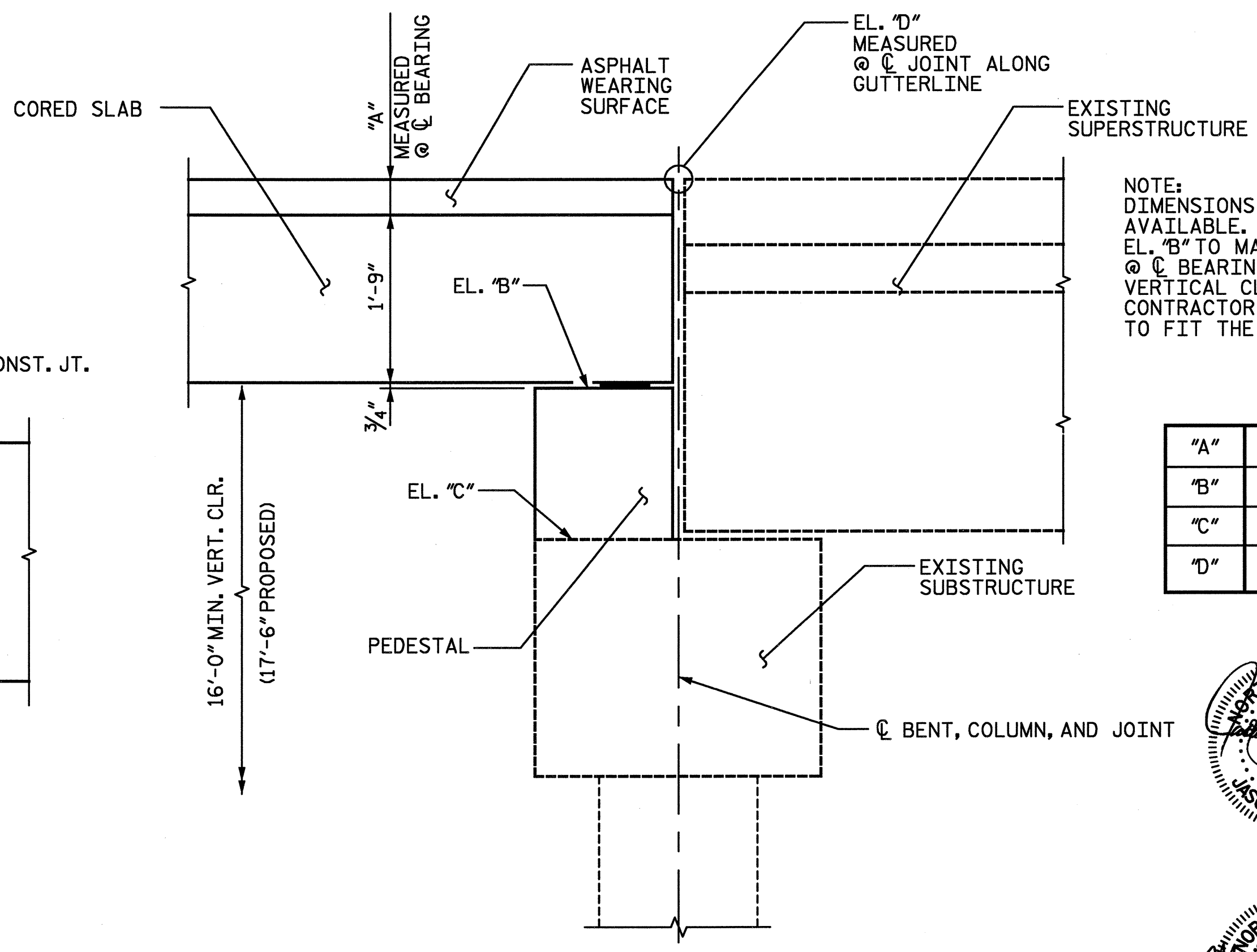
BILL OF MATERIAL					
BENT 3					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	2	9	①	40'-9"	277
B2	2	6	STR.	38'-3"	115
D1	22	6	STR.	1'-6"	50
D2	33	6	STR.	3'-7"	118
S1	39	4	④	8'-3"	215
S2	8	4	④	9'-10"	53
U1	4	6	③	9'-10"	59
U2	20	6	②	4'-8"	140
U3	5	4	⑤	4'-3"	14
U4	8	4	⑤	10'-5"	56
REINFORCING STEEL					LBS. 997
CLASS AA CONCRETE BREAKDOWN					
POUR 1 (CAP)				CY	8.5
POUR 2 (LATERAL GUIDE)				CY	0.1
TOTAL					CY 8.6



PLAN

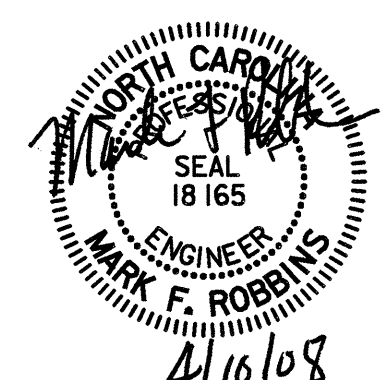
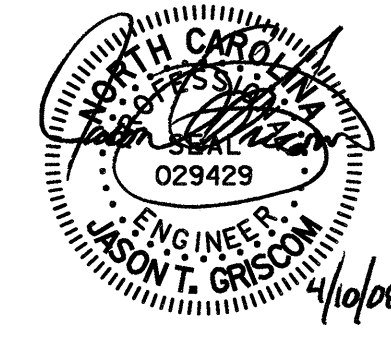


ELEVATION



PEDESTAL HEIGHT

"A"	3"
"B"	166.72
"C"	163.97
"D"	168.78



PROJECT NO. **B-5022**  
**CUMBERLAND** COUNTY  
 BRIDGE: **154**  
 SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

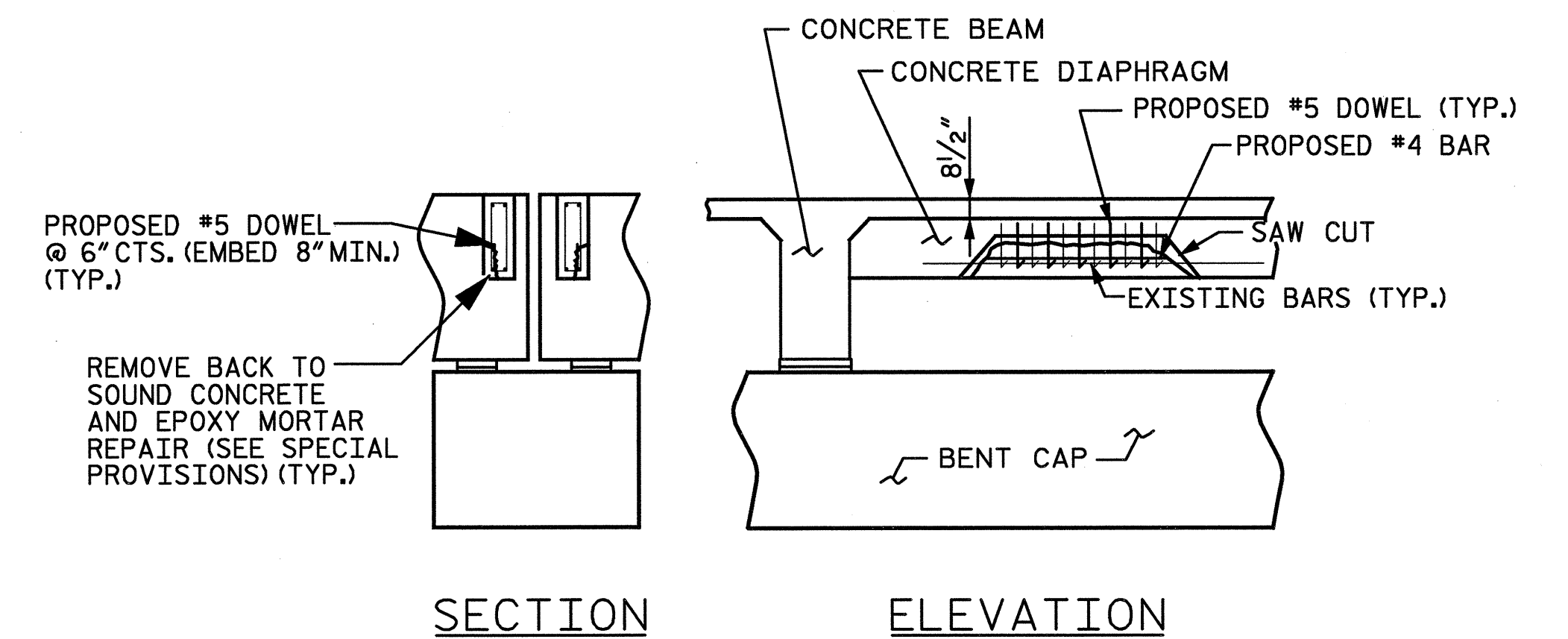
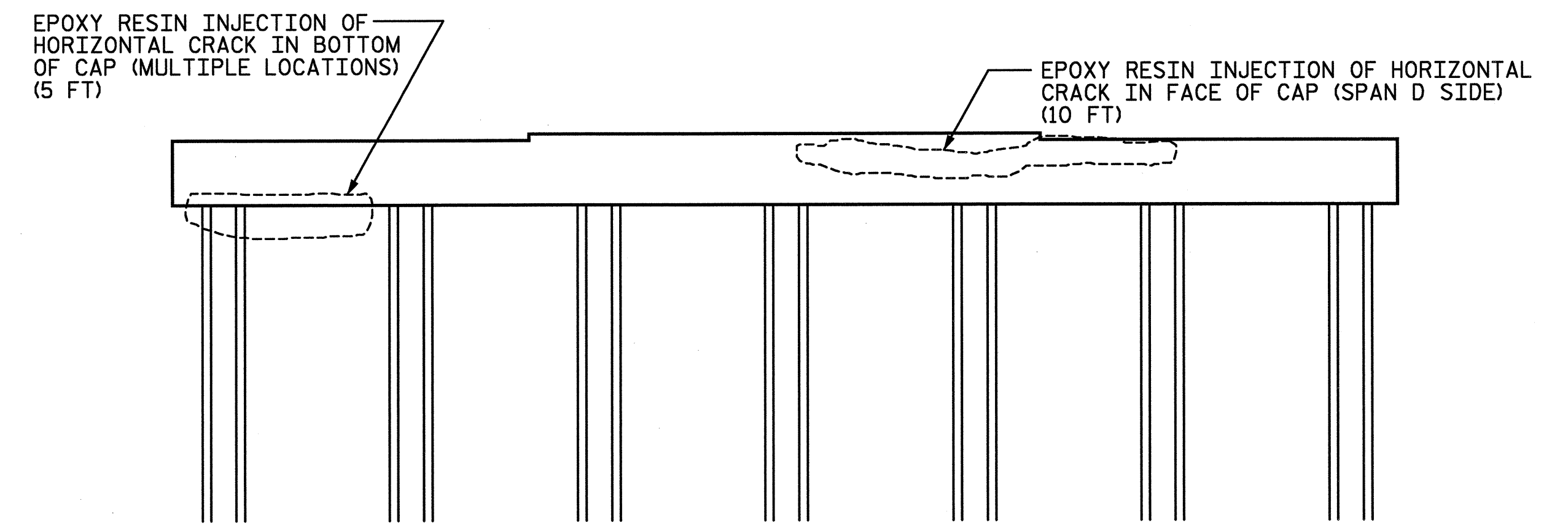
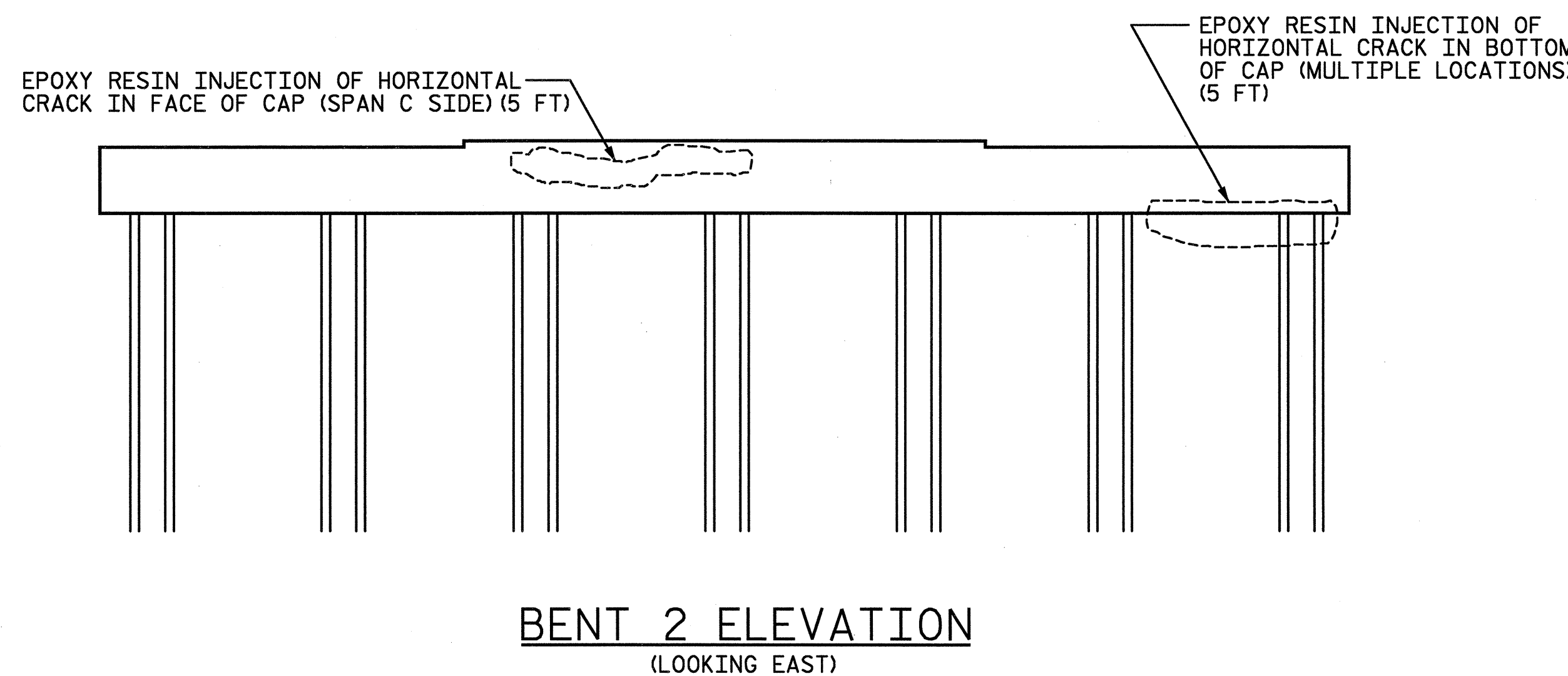
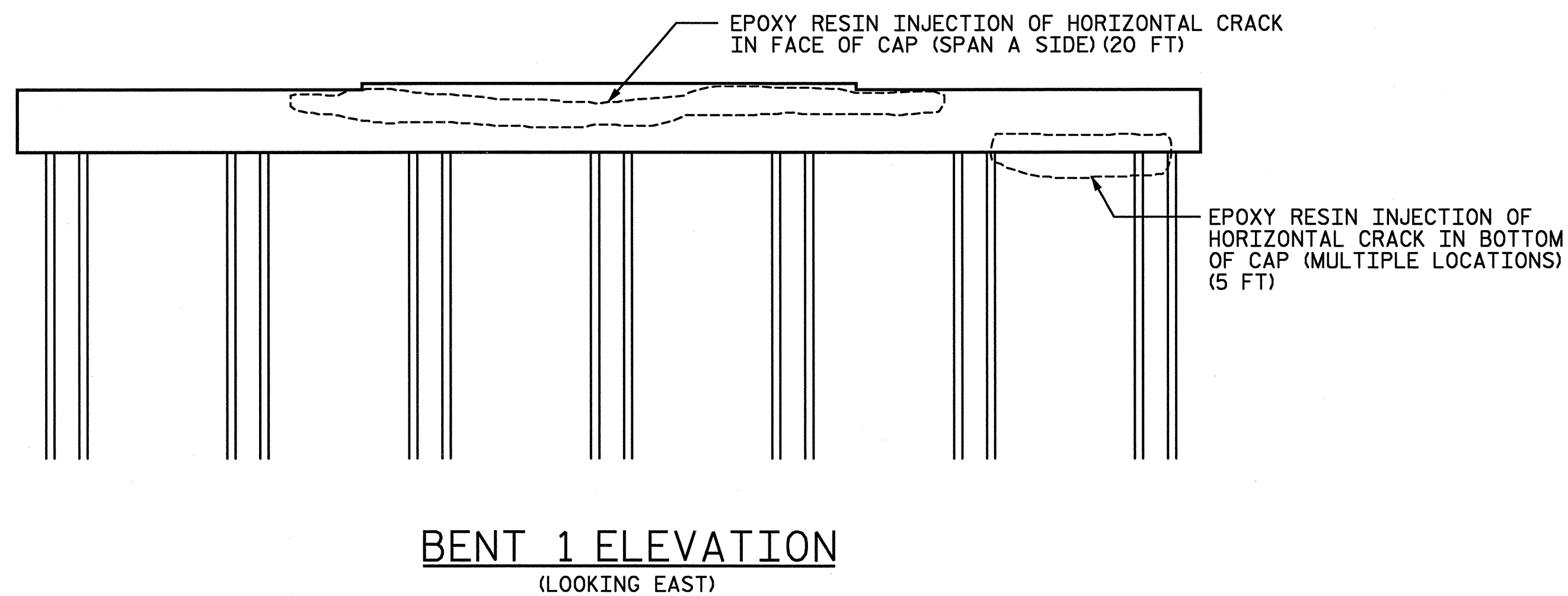
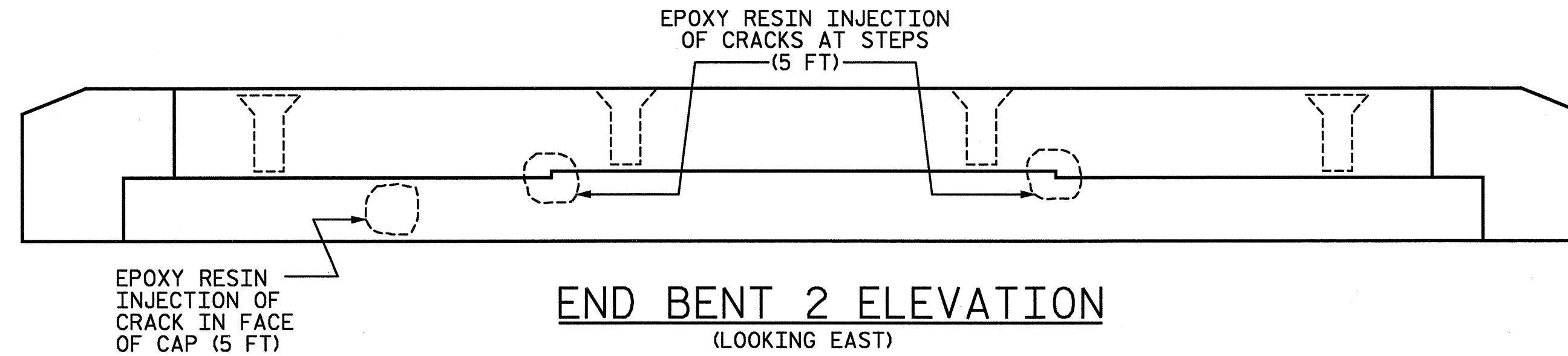
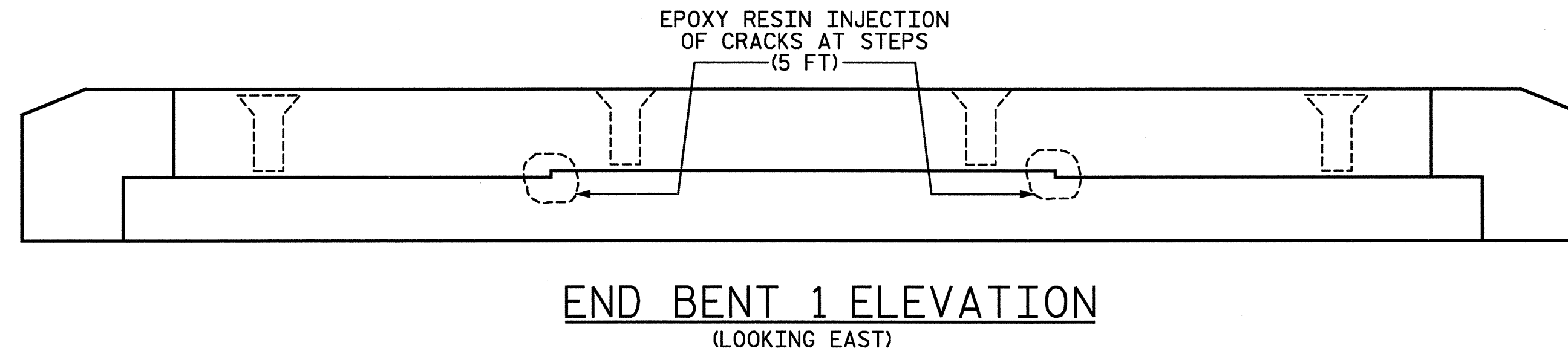
**SUBSTRUCTURE  
 BENT 3**

DRAWN BY: **LGH** DATE: **3-08**  
 CHECKED BY: **TBQ** DATE: **3-08**

D-1810.23  
 STV/Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			44



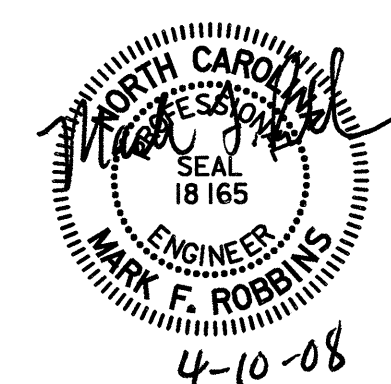
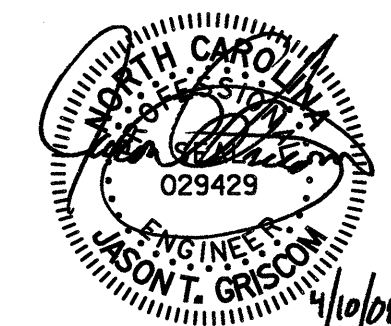


**TYPICAL END DIAPHRAGM REPAIR DETAIL**  
(@ SPAN A SIDE OF BENT 1, BAY 1)  
(@ SPAN B SIDE OF BENT 1, BAY 2)

**NOTES:**

- REPAIRS SHALL BE IMPLEMENTED DURING REPLACEMENT OF SPANS 2 AND 3.
- SAW CUT 1/4" - 1/2" DEEP AROUND ALL SPALLS.
- FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.
- FOR EPOXY MORTAR REPAIR, SEE SPECIAL PROVISIONS.
- CONTRACTOR SHALL EPOXY MORTAR REPAIR MISCELLANEOUS SPALLS WITH EXPOSED REINFORCING AT VARIOUS LOCATIONS ALONG THE BOTTOM OF DECK FOR SPANS A & D. REPAIRS ARE ESTIMATED AT FOUR (4) LOCATIONS OF APPROXIMATELY ONE (1) SQUARE FOOT EACH.
- AFTER DEMOLITION OF THE SPAN, THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER FOR INSPECTION OF THE ENDS OF THE EXISTING GIRDER. CONTRACTOR SHALL ANTICIPATE SOME EPOXY MORTAR REPAIRS AND EPOXY RESIN INJECTIONS. ACTUAL QUANTITIES WILL BE DETERMINED IN THE FIELD. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE BID PRICES FOR EPOXY MORTAR REPAIRS AND EPOXY RESIN INJECTION.

PROJECT NO. **B-5022**  
CUMBERLAND COUNTY  
BRIDGE: **154**



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUBSTRUCTURE REPAIRS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			44

D-1810.24

STV / Ralph Whitehead Associates, Inc.  
1000 West Morehead St., Ste. 200  
Charlotte, NC 28208

NOTES

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

ALL DIMENSIONS IN THESE PLANS ARE BASED UPON BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL VERIFY DIMENSIONS IN FIELD PRIOR TO CONSTRUCTION AND ANY FABRICATION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES SUCH THAT NECESSARY ADJUSTMENTS BE MADE BY THE CONTRACTOR.

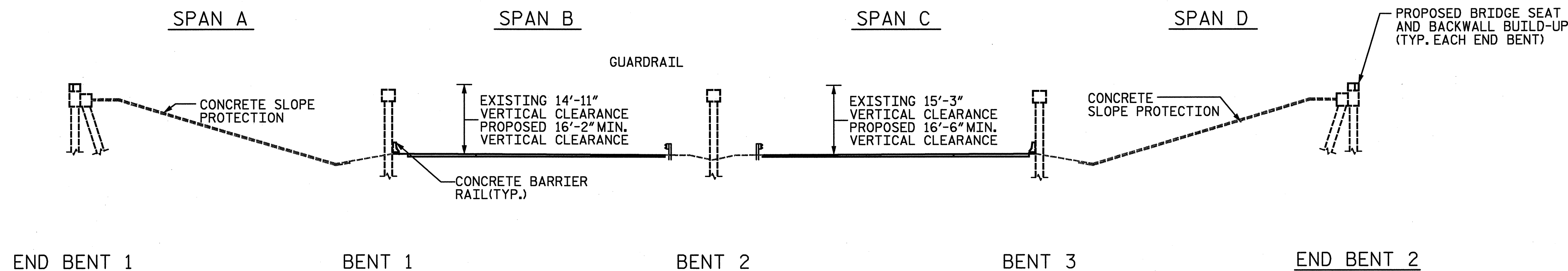
FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH BRIDGE, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

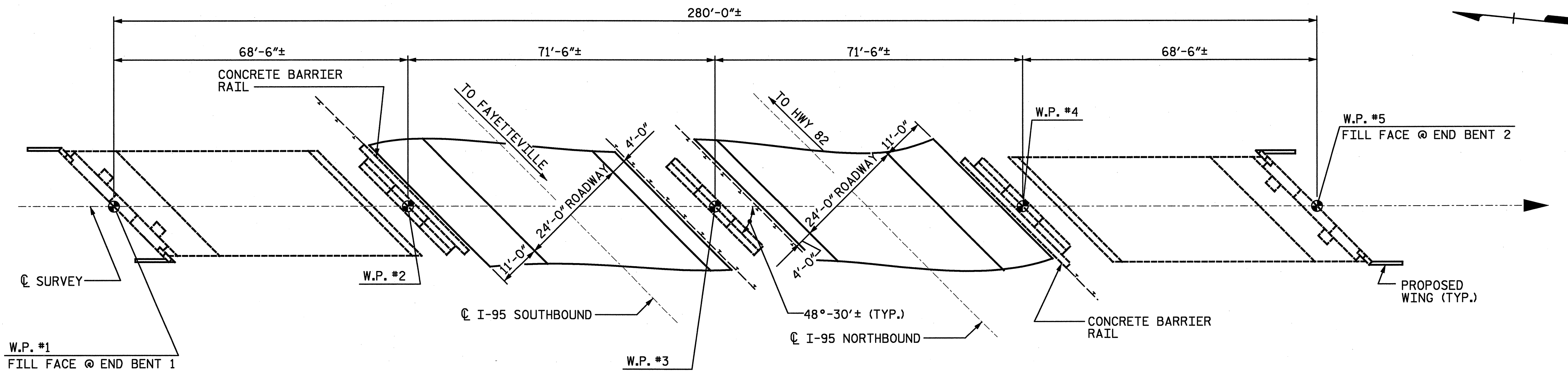
FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

ALL STRUCTURAL STEEL SHALL BE ASTM A36 MIN.

ALL WELDING SHALL BE IN ACCORDANCE WITH CURRENT AWS SPECIFICATIONS.



ELEVATION

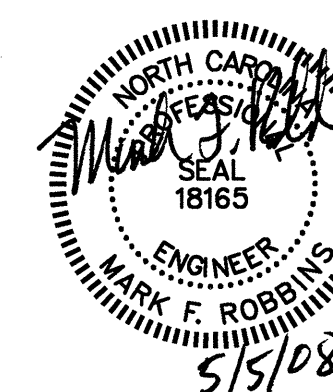
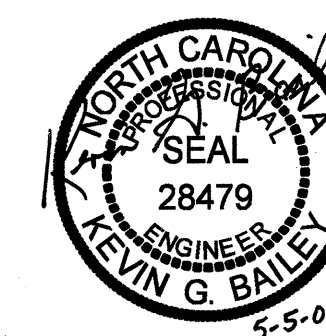


PLAN

REVISION #1: REVISED PER REVIEW COMMENTS  
 BY: TJT DATE: 5-08  
 CH'KD BY: KGB DATE: 5-08

PROJECT NO. B-5022  
CUMBERLAND COUNTY  
 BRIDGE: 155

MODIFICATION OF BRIDGE NO. 155



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 BRIDGE OVER I-95  
 ON SR 1813  
 BETWEEN SR 1815  
 AND HWY 82

TOTAL BILL OF MATERIAL								
	PARTIAL REMOVAL OF EXISTING STRUCTURE	CLASS AA CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL *	EPOXY RESIN INJECTION	EPOXY MORTAR REPAIRS	BRIDGE JACKING
	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	APPROX. LBS.	LINEAR FT.	SQ. FT.	LUMP SUM
SUPERSTRUCTURE					6582	20	1	
END BENT 1		12.2		1771	80	5		
BENT 1						6		
BENT 2								
BENT 3						2		
END BENT 2		12.2		1771	80	15		
TOTAL	LUMP SUM	24.4	LUMP SUM	3542	6742	48	1	LUMP SUM

\* INCLUDES WEIGHT OF ANCHOR BOLTS AND ANCHOR HARDWARE

D-1810.25

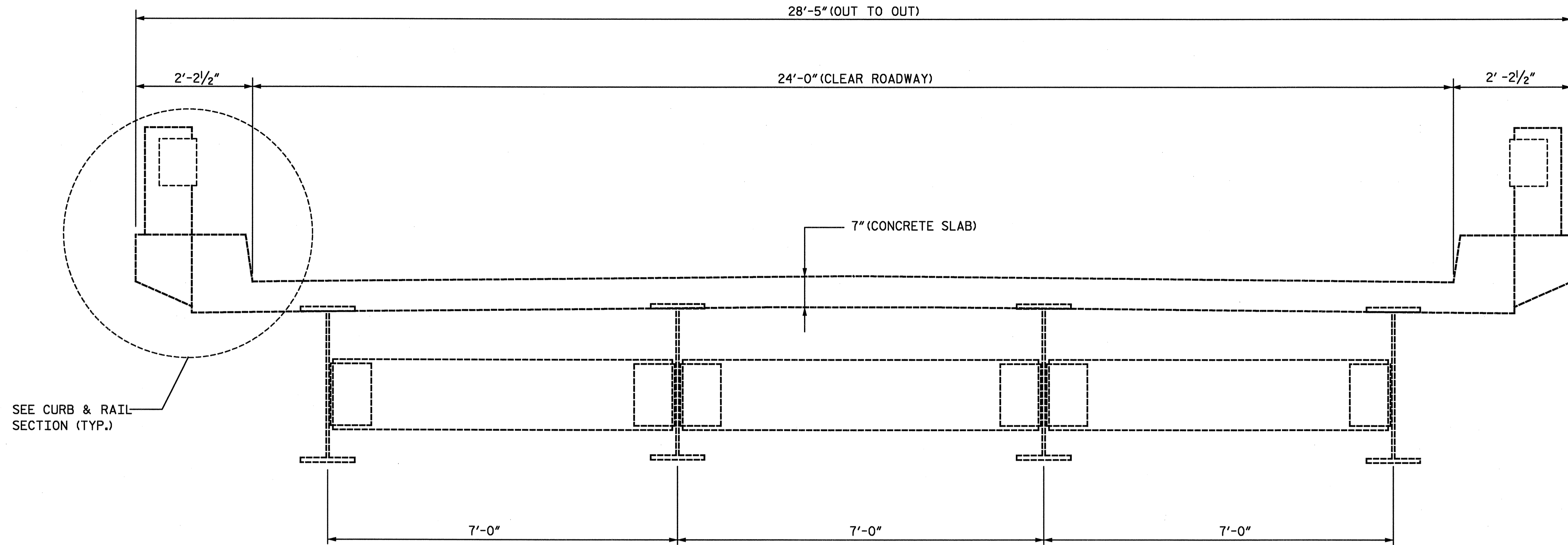
STV / Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1	STV	5-08	3			TOTAL SHEETS
2			4			44

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 10:23:10 AM  
 5/2/2008  
 timothy.townsend

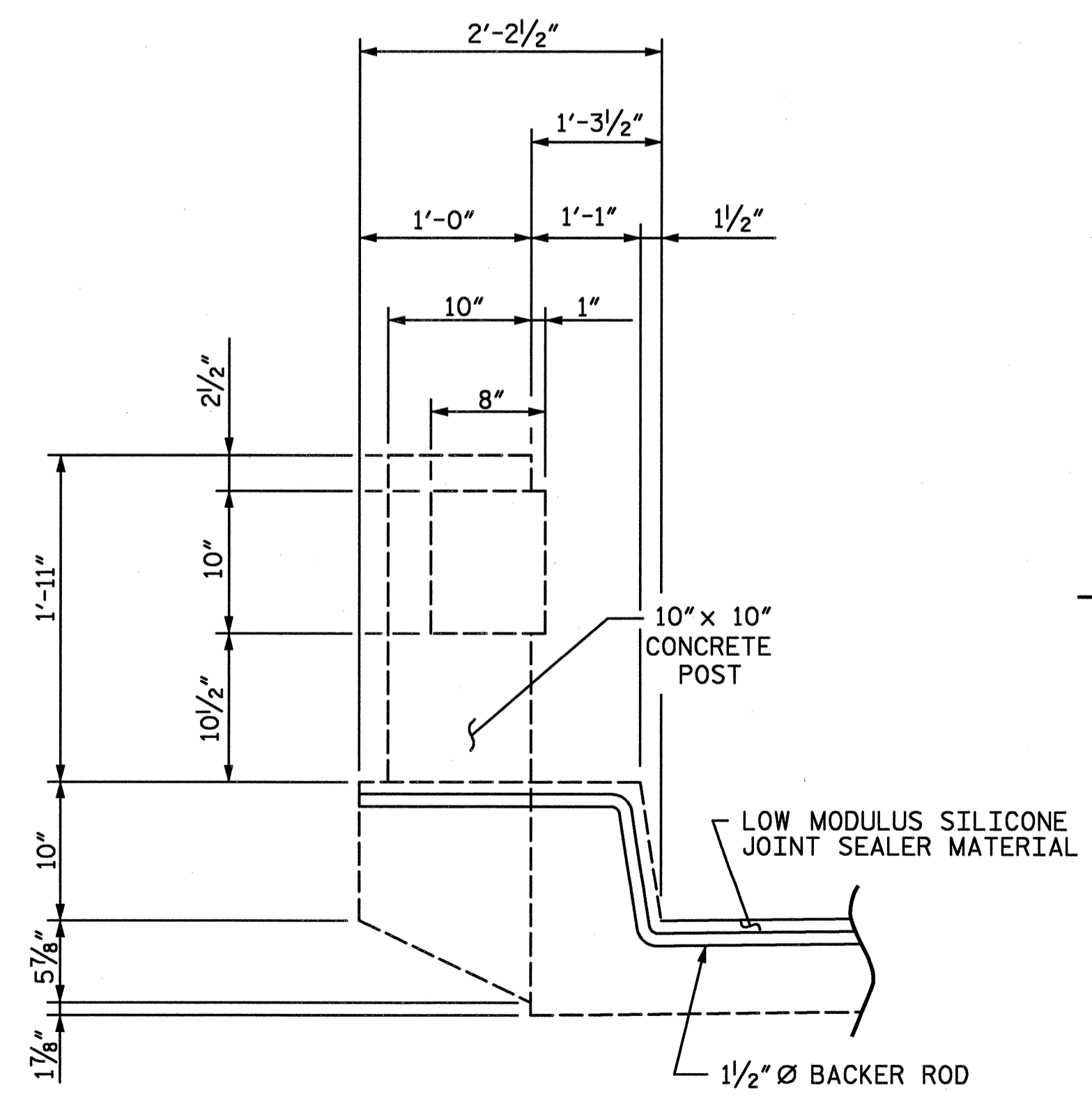
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 CHECKED BY: PEK DATE: 3-08





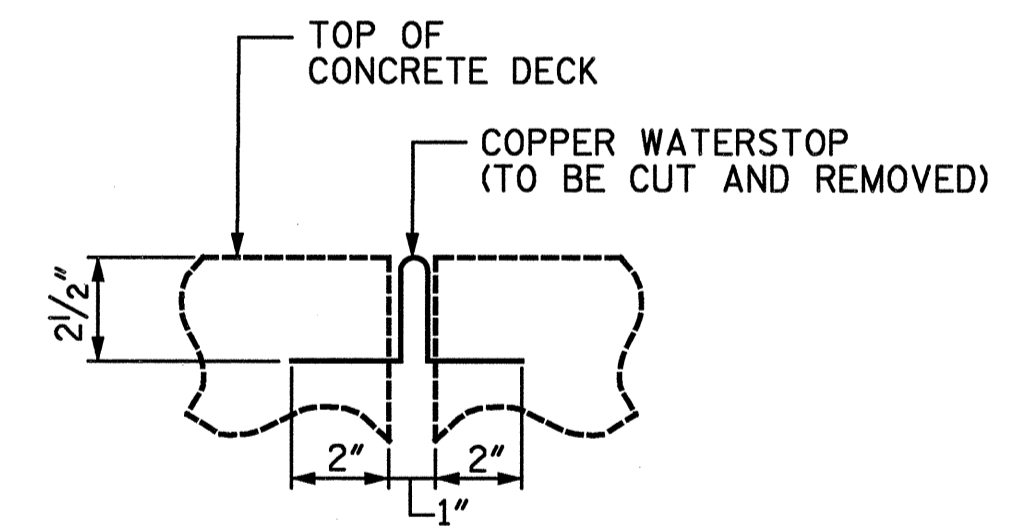
SEE CURB & RAIL SECTION (TYP.)

TYPICAL SECTION



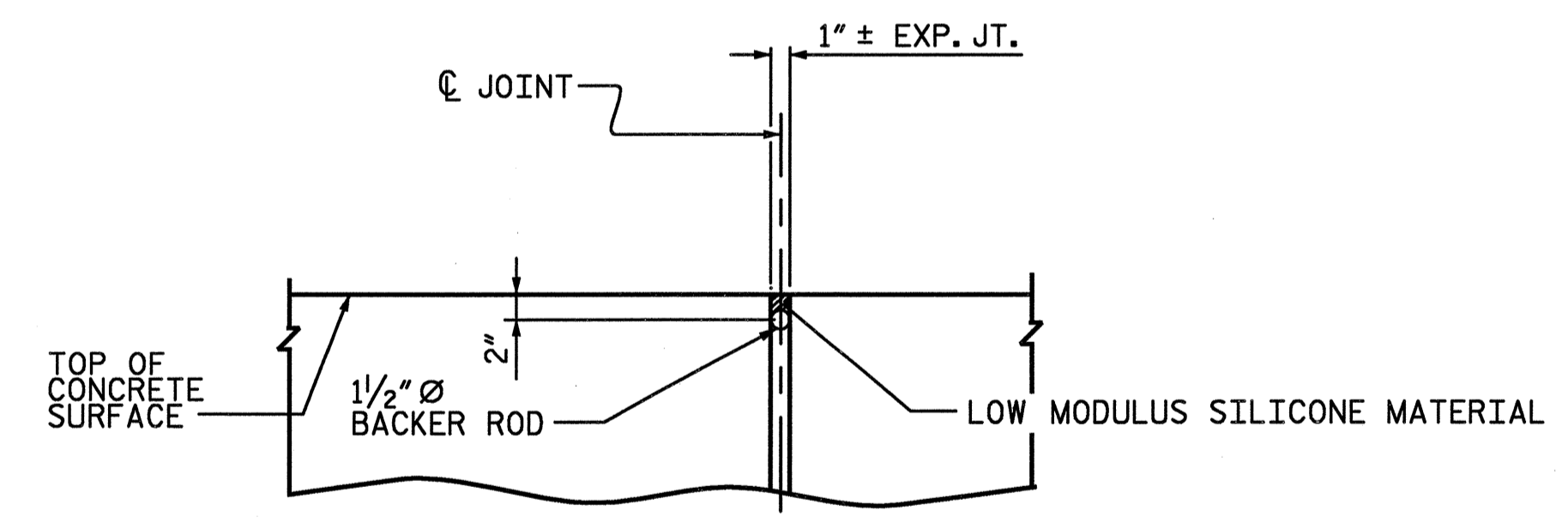
CURB AND RAIL SECTION \*

\* PER SIDE, THERE ARE 9 POSTS PER SPAN WITH 280' ± OF CONCRETE RAILING.

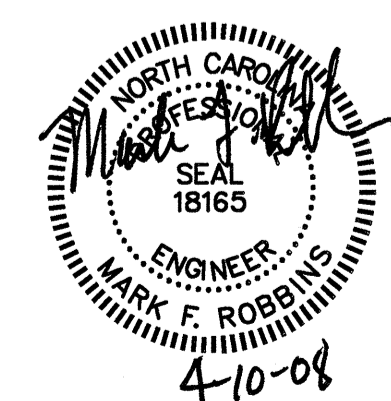
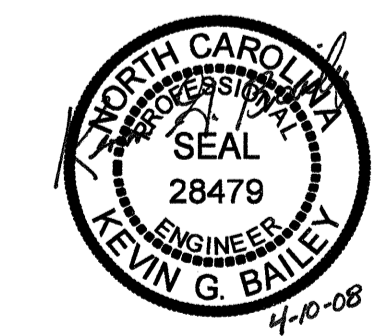


EXISTING EXPANSION JOINT DETAIL

**NOTES:**  
 PAYMENT FOR INSTALLATION OF THE 1/2" Ø BACKER ROD & LOW MODULUS SILICONE JOINT SEALER MATERIAL SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION OF THE BRIDGE.



TYPICAL JOINT REPLACEMENT



PROJECT NO. B-5022  
 CUMBERLAND COUNTY  
 BRIDGE: 155

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 EXISTING SUPERSTRUCTURE  
 TYPICAL SECTION

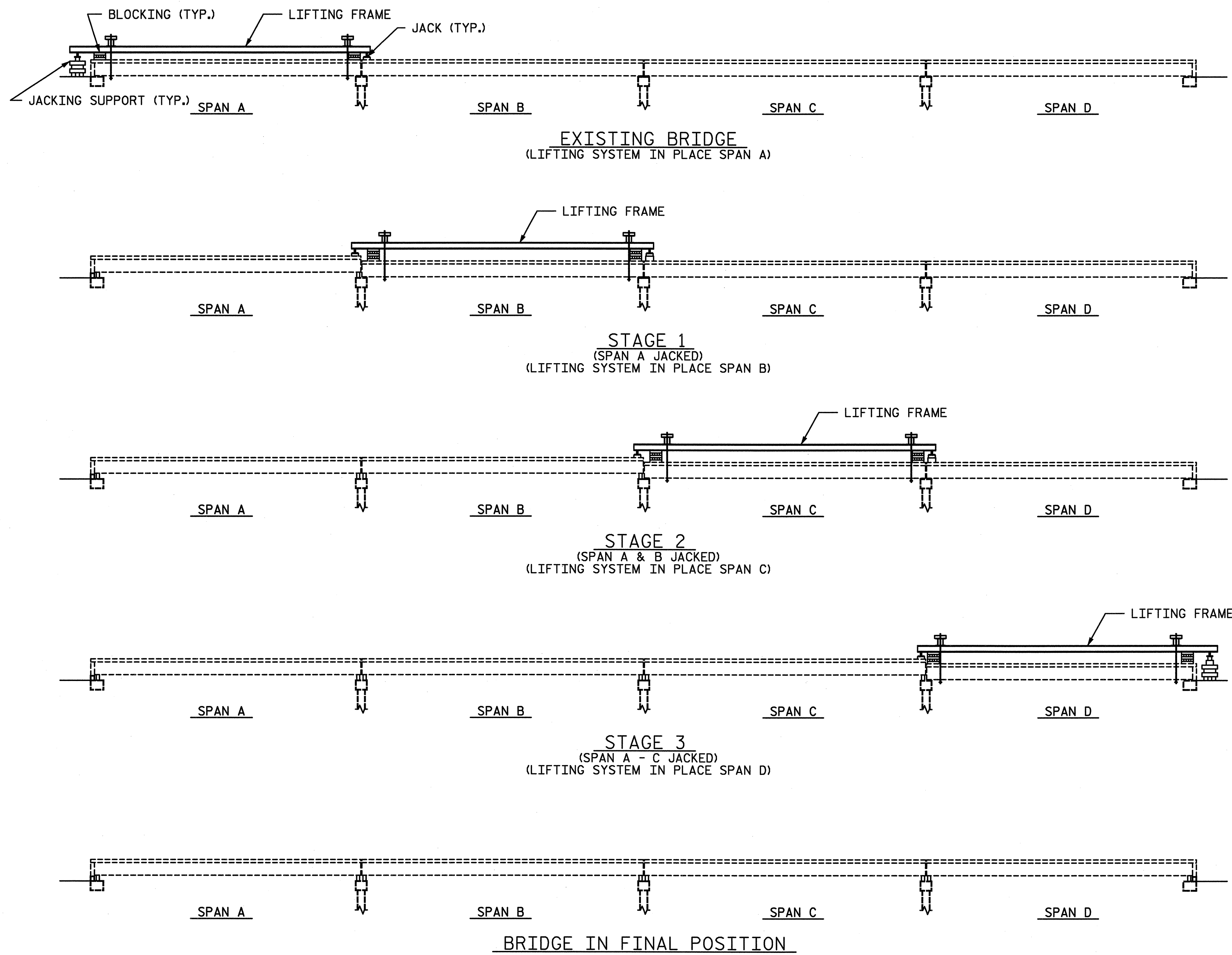
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-26
2			4			44

NOT TO SCALE

D-1810.26  
 STV/Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

timothy.townsend 4/9/2008 5:56:08 PM N:\PROJ\2513448\B5022\Bridg 155\station\Finals\Typical Section.dgn

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 Timothy.Townsend 4/9/2008



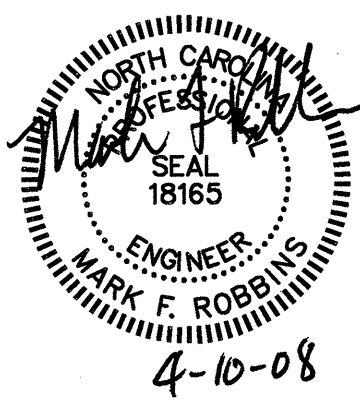
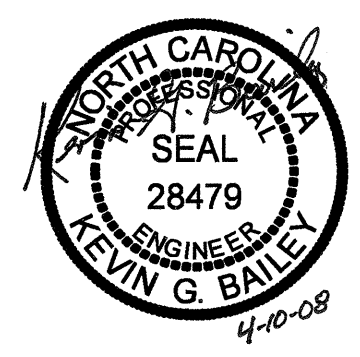
**JACKING SEQUENCE FOR BRIDGE 155**

**NOTES:**

1. THE CONTRACTOR SHALL JACK ALL BEAMS IN ANY ONE SPAN SIMULTANEOUSLY.
2. TRAFFIC SHALL NOT BE ALLOWED ON THE STRUCTURE UNTIL THE WORK REQUIRED BY THE CONTRACT DOCUMENTS IS COMPLETE.
3. PRIOR TO INSTALLING BEARING PEDESTALS AND NEW BEARINGS, CONTRACTOR SHALL MAKE ANY REPAIRS TO BENTS AS REQUIRED IN THE CONTRACT DOCUMENTS.
4. CONTRACTOR SHALL SUBMIT JACKING PLANS AND CALCULATIONS SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA FOR REVIEW AND APPROVAL PRIOR TO MATERIAL PURCHASE OR FABRICATION OF JACKING SYSTEM.
5. FOR ADDITIONAL INFORMATION ON JACKING SEE SPECIAL PROVISION "BRIDGE JACKING."
6. LIFTING FRAME SHALL EXTEND BEYOND THE LENGTH OF THE LIFTED SPAN AND PROVIDE BEARINGS AT THE SAME LOCATION AS THE ADJACENT GIRDER BEARINGS.
7. CONTRACTOR SHALL SHIM BRIDGE SPAN DURING JACKING SUCH THAT THE MAXIMUM UNSHIMMED LIFT IS 1".
8. CONTRACTOR SHALL PROVIDE SPAN LIFT POINTS AS CLOSE AS POSSIBLE TO THE FACE OF BENT CAP.
9. HYDRAULIC SYSTEM SHALL BE CONNECTED SUCH THAT ALL JACKS LIFT SIMULTANEOUSLY.
10. CONTRACTOR SHALL DESIGN LIFTING SYSTEM SUCH THAT HORIZONTAL POSITION OF THE LIFTED SPAN CAN BE MAINTAINED.

**CONSTRUCTION SEQUENCE:**

1. CONSTRUCT JACKING SUPPORT AT END BENT. CONTRACTOR SHALL MAKE SURE CURTAIN WALL IS FULLY DETACHED FROM END BENT CAP, WINGS, AND FILL.
2. CONSTRUCT THE LIFTING FRAME (FOR SPAN A) MAKING SURE SYSTEM IS LEVEL. INSTALL BLOCKING AS NECESSARY.
3. LIFT SPAN A TO REQUIRED ELEVATION AND INSTALL BEARING PEDESTALS AND NEW BEARINGS. PRIOR TO INSTALLING BEARING PEDESTALS AND NEW BEARINGS, CONTRACTOR SHALL MAKE ANY REPAIRS TO BENTS AS REQUIRED IN THE CONTRACT DOCUMENTS.
4. CONSTRUCT END BENT AND BENT MODIFICATIONS AS SHOWN IN THE CONTRACT DOCUMENTS. END BENT MODIFICATIONS NECESSARY TO ANCHOR THE SPAN SHALL BE COMPLETED PRIOR TO PROCEEDING.
5. SHIFT LIFT SYSTEM TO SPAN B AND REPEAT STEPS 2 THROUGH 4.
6. SHIFT LIFT SYSTEM TO SPAN C AND REPEAT STEPS 2 THROUGH 4.
7. SHIFT LIFT SYSTEM TO SPAN D AND REPEAT STEPS 1 THROUGH 4.
8. FINISH REMAINING REPAIRS AND MODIFICATIONS AS INDICATED IN CONTRACT DOCUMENTS. REMOVE TRAFFIC CONTROL MEASURES AND OPEN BRIDGE TO TRAFFIC.



PROJECT NO. B-5022  
 CUMBERLAND COUNTY  
 BRIDGE: 155

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
  
**BRIDGE JACKING SEQUENCE**

DRAWN BY : TJT      DATE : 3-08  
 CHECKED BY : KGB      DATE : 3-08

D-1810.27  
 STV / Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-27
1			3			TOTAL SHEETS
2			4			44



NOTES

THE EXISTING ANCHOR BOLTS SHALL BE CUT FLUSH WITH THE EXISTING TOP OF CAP. ANCHOR BOLTS SHALL BE DRILLED AND ADHESIVELY ANCHORED INTO THE EXISTING CAP. CONTRACTOR SHALL CORE DRILL THE EXISTING ANCHOR BOLTS USING A CORE BIT WITH INSIDE DIAMETER MATCHING THAT OF THE EXISTING ANCHOR BOLT DIAMETER. THE ANCHOR BOLT HOLES IN THE PROPOSED TOP AND BOTTOM PLATE DETAIL SHALL MATCH THE ANCHOR BOLT HOLES IN THE EXISTING BEAMS. THIS MATCH SHALL FACILITATE THE PROPER ALIGNMENT OF THE PEDESTAL. THE ANCHOR BOLT LENGTH IS BASED ON AN 12" EMBEDMENT INTO THE EXISTING CAP AND MAY BE ADJUSTED BASED ON THE MINIMUM EMBEDMENT SPECIFIED BY THE MANUFACTURER OF THE EPOXY ADHESIVE BONDING SYSTEM. FOR ADHESIVELY ANCHORED ANCHOR BOLTS, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL FIELD VERIFY PROPOSED ANCHOR BOLT LOCATIONS PRIOR TO FABRICATION OF THE TOP AND BOTTOM PLATES FOR THE PROPOSED PEDESTALS.

FOR CLEANING AND PAINTING EXISTING BEARING PLATES, SEE SPECIAL PROVISION.

\* THE PROPOSED PEDESTAL HEIGHT ASSUMES THAT THE TOTAL HEIGHT OF THE EXISTING BEARING ASSEMBLIES IS 2 1/2". THE CONTRACTOR SHALL MEASURE THE HEIGHT OF ALL BEARING ASSEMBLIES AND ADJUST THE HEIGHT OF THE PROPOSED PEDESTALS ACCORDINGLY.

ALL THREADS OF BOLTS/ANCHOR BOLTS SHALL BE BURRED AFTER TIGHTENING NUTS.

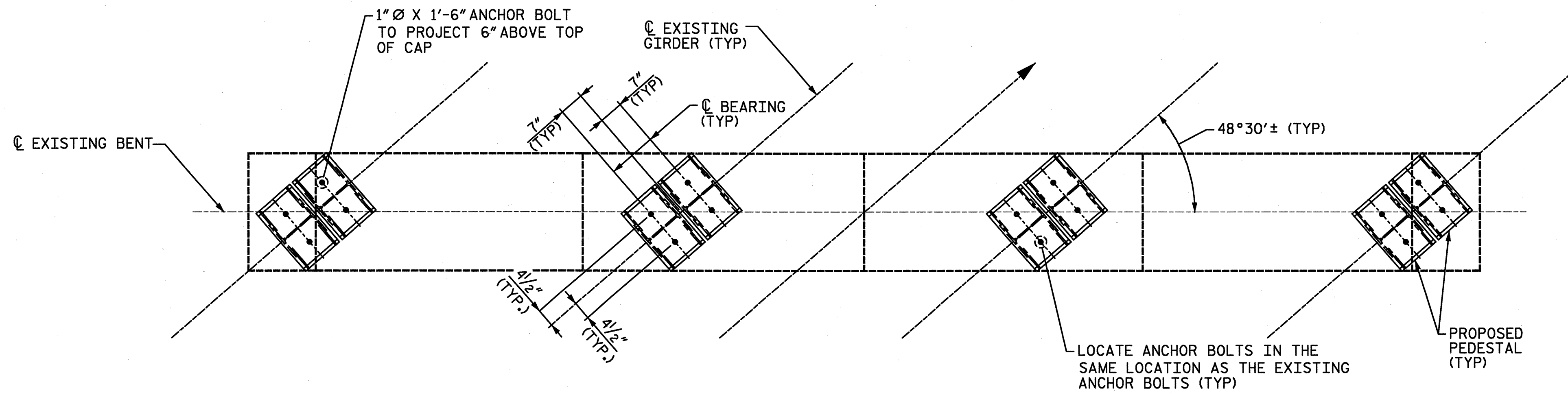
CONTRACTOR SHALL CLIP PLATES AS NECESSARY TO PREVENT PROJECTION BEYOND BENT CAP.

1" Ø BOLTS IN TOP PLATE SHALL CONFORM TO ASTM A325.

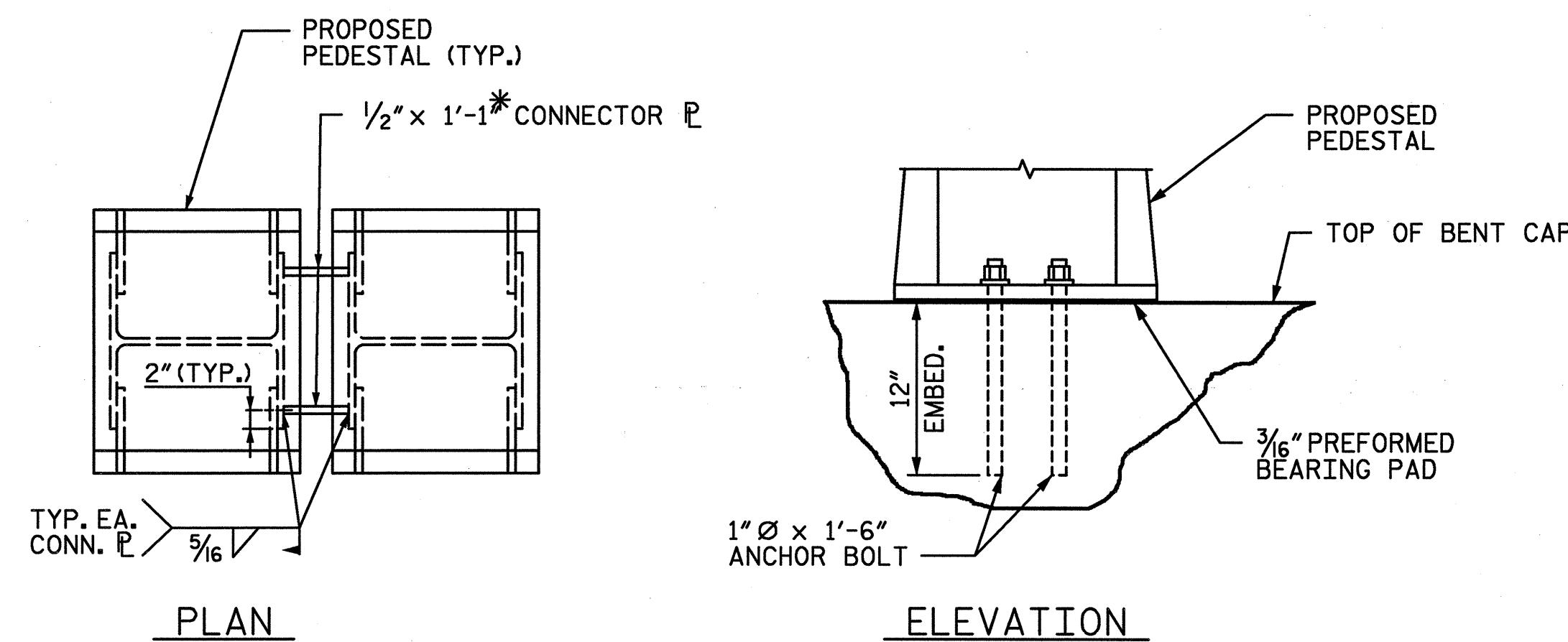
1" Ø ANCHOR BOLTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. CONTRACTOR SHALL VERIFY ANCHOR BOLT DIAMETER AND ADJUST AS NECESSARY TO MATCH EXISTING ANCHOR BOLT DIAMETER.

PROPOSED PEDESTALS SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. AREAS TO BE WELDED SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

STRUCTURAL STEEL (APPROX. LBS.) 6582

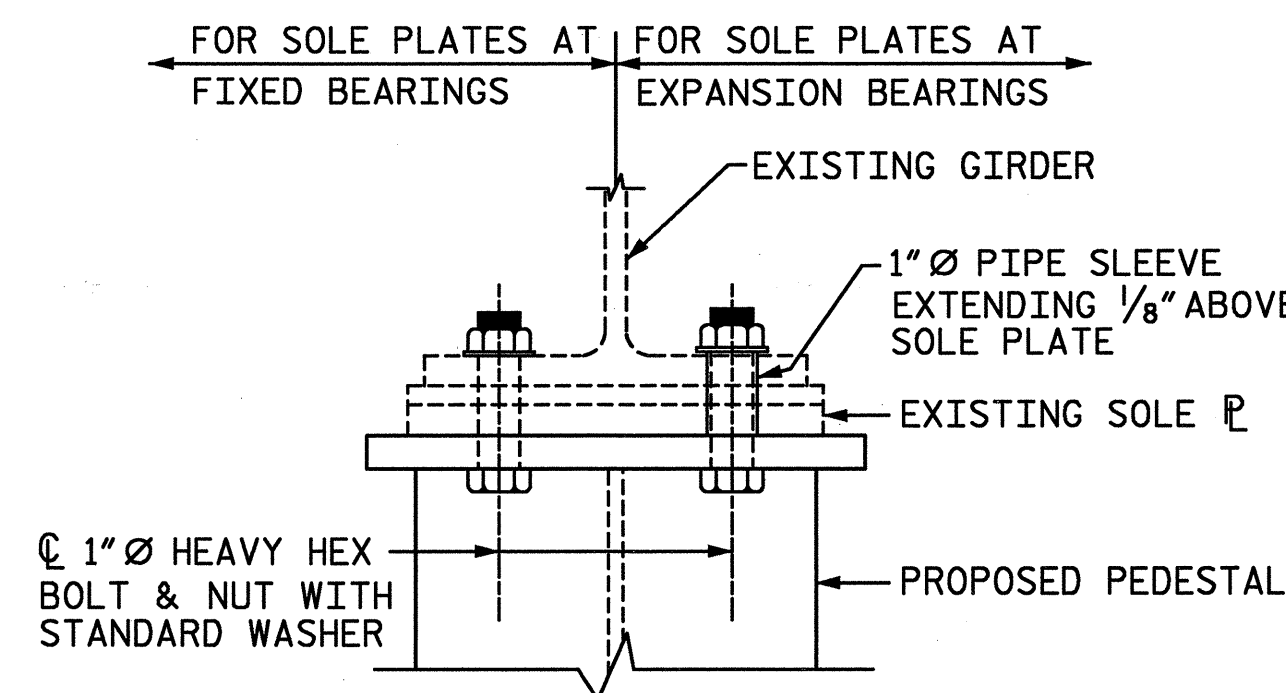


PLAN OF EXISTING BENT



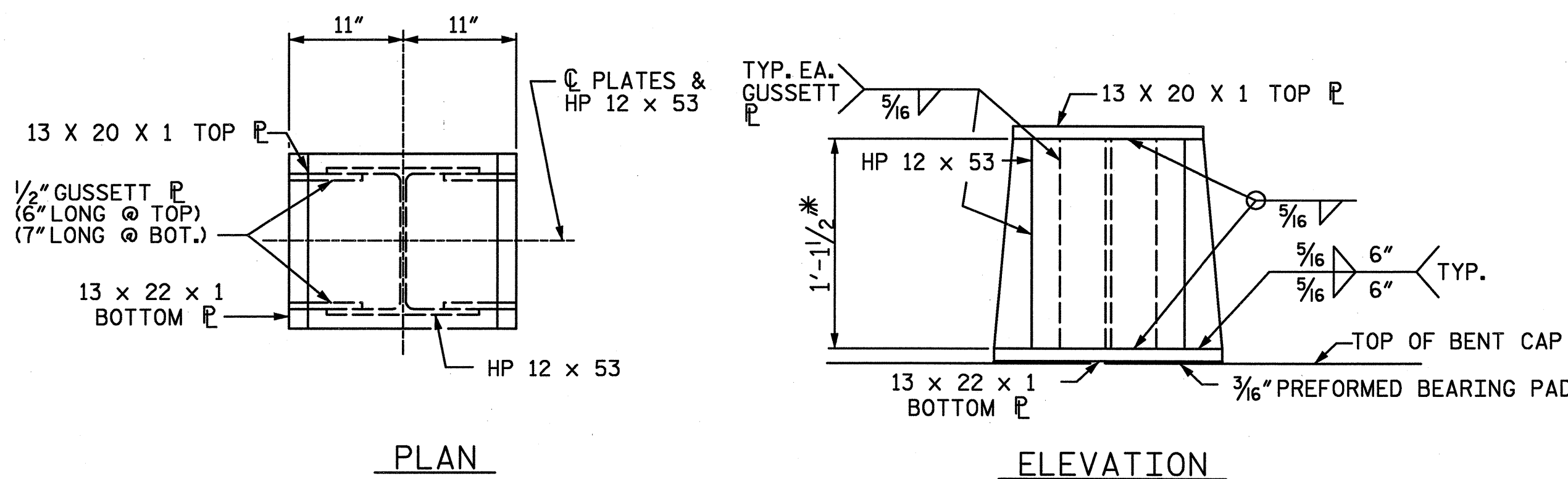
PEDESTAL ATTACHMENT DETAIL

(CONNECTOR PLATES SHALL BE INSTALLED AFTER BEARING ASSEMBLIES HAVE BEEN INSTALLED)



BEARING ATTACHMENT DETAIL

(CONTRACTOR SHALL VERIFY BOLT DIMENSION AND ADJUST HOLE DIAMETER AS NECESSARY PRIOR TO PEDESTAL FABRICATION)



PEDESTAL DETAILS

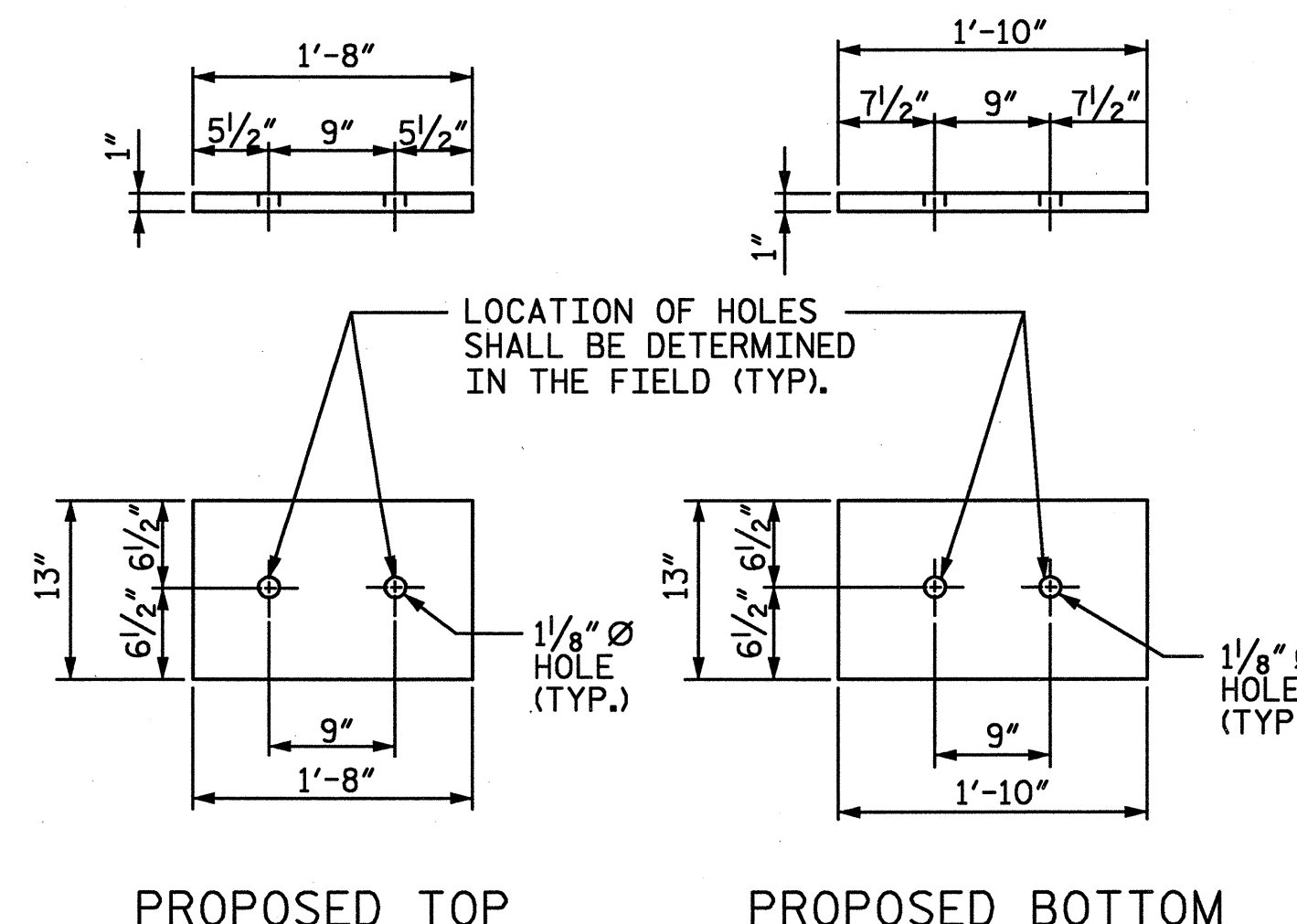
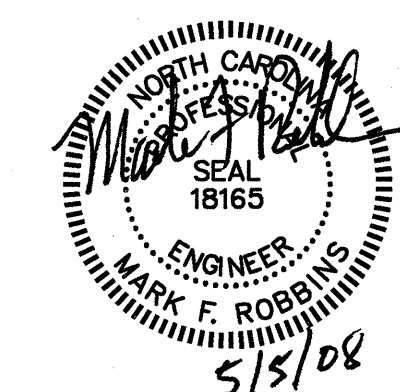
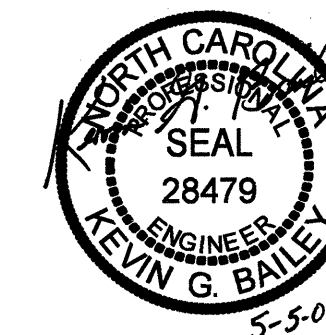


PLATE DETAIL

REVISION #1: REVISED PER REVIEW COMMENTS  
 BY: TJT DATE: 5-08  
 CH'KD BY: KGB DATE: 5-08

PROJECT NO. B-5022  
CUMBERLAND COUNTY  
 BRIDGE: 155



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 INTERIOR BENT  
 BEARING MODIFICATIONS

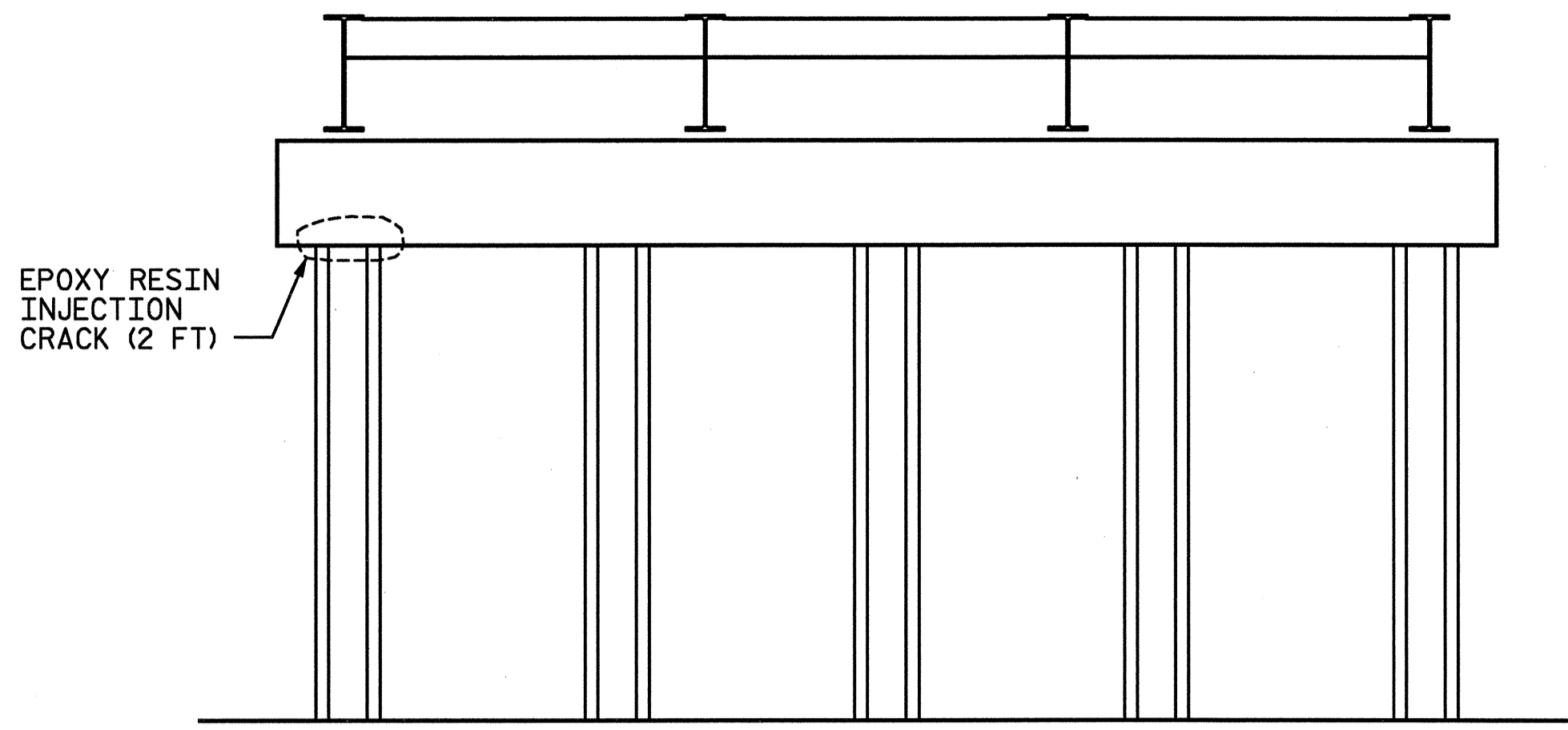
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-28
1	STV	5-08	3			TOTAL SHEETS
2			4			44

D-1810.28

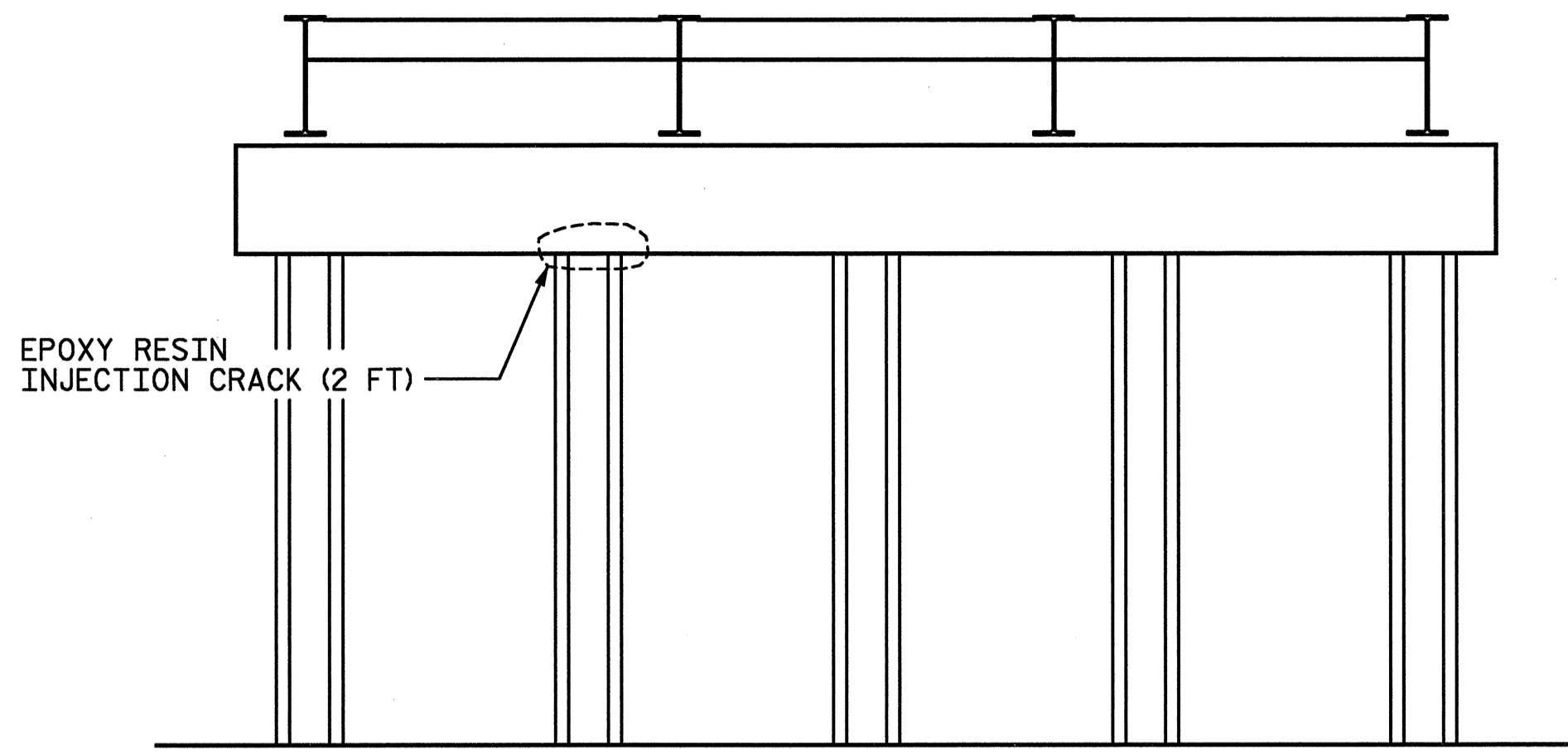
STV/Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

NOT TO SCALE

Timothy.townsend 5/2/2008 10:22:58 AM N:\PROJ\2513448\B5022\Roadway\Proj\Bridg\55\Structures\Istation\Final\Substructure Interior Bent.dgn



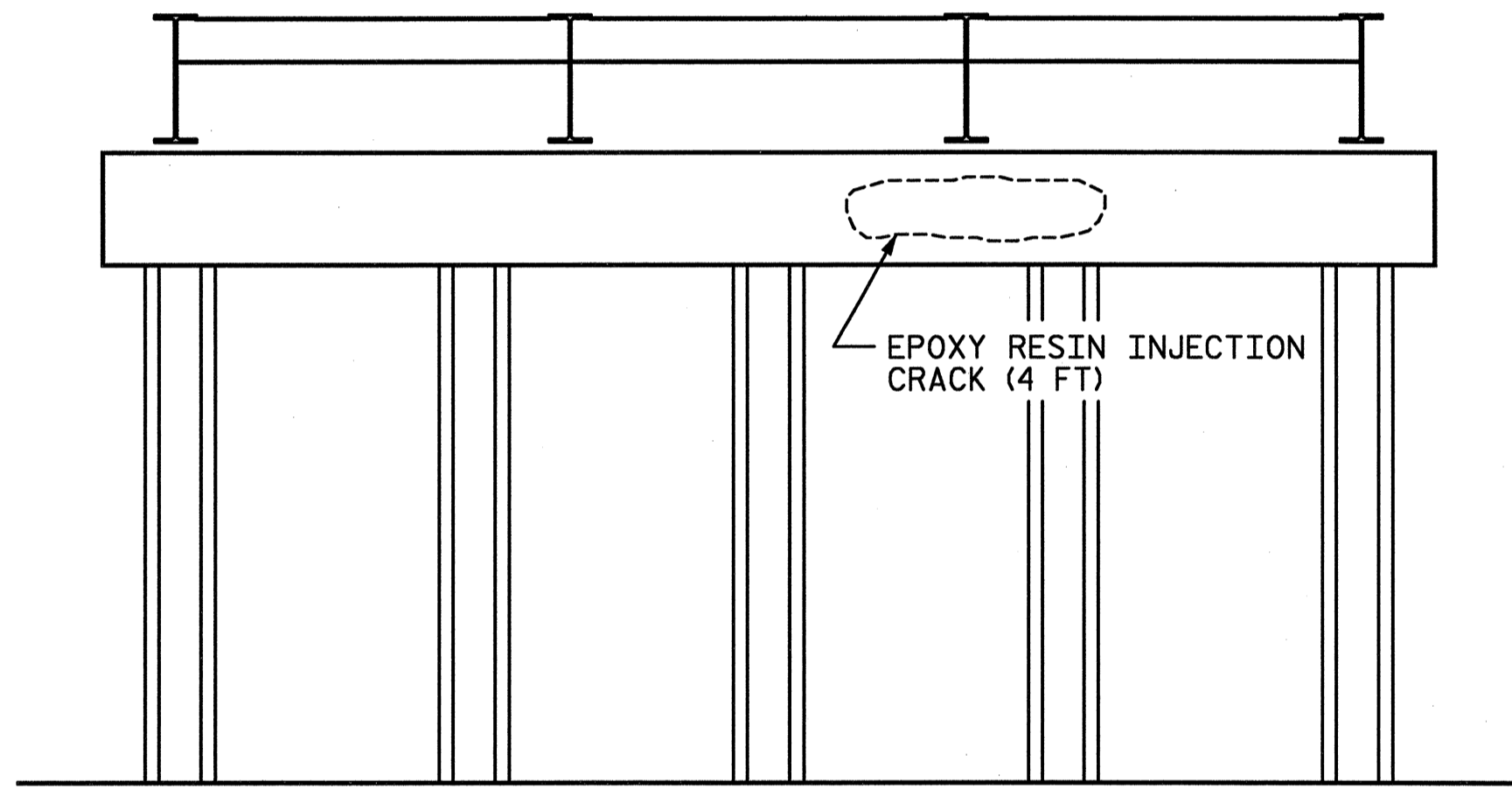
**BENT 1 ELEVATION**  
(LOOKING EAST)



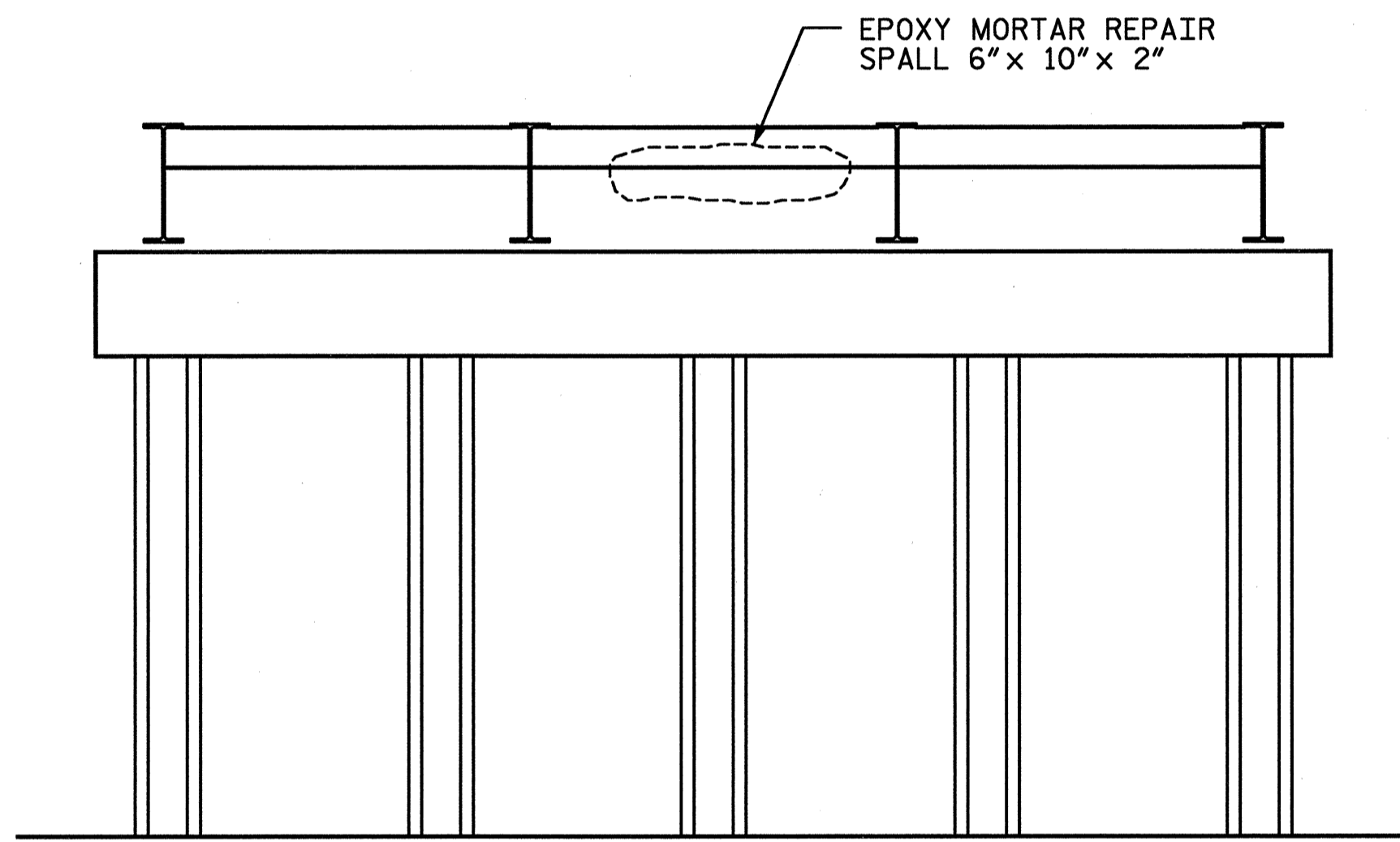
**BENT 3 ELEVATION**  
(LOOKING EAST)

**NOTES:**

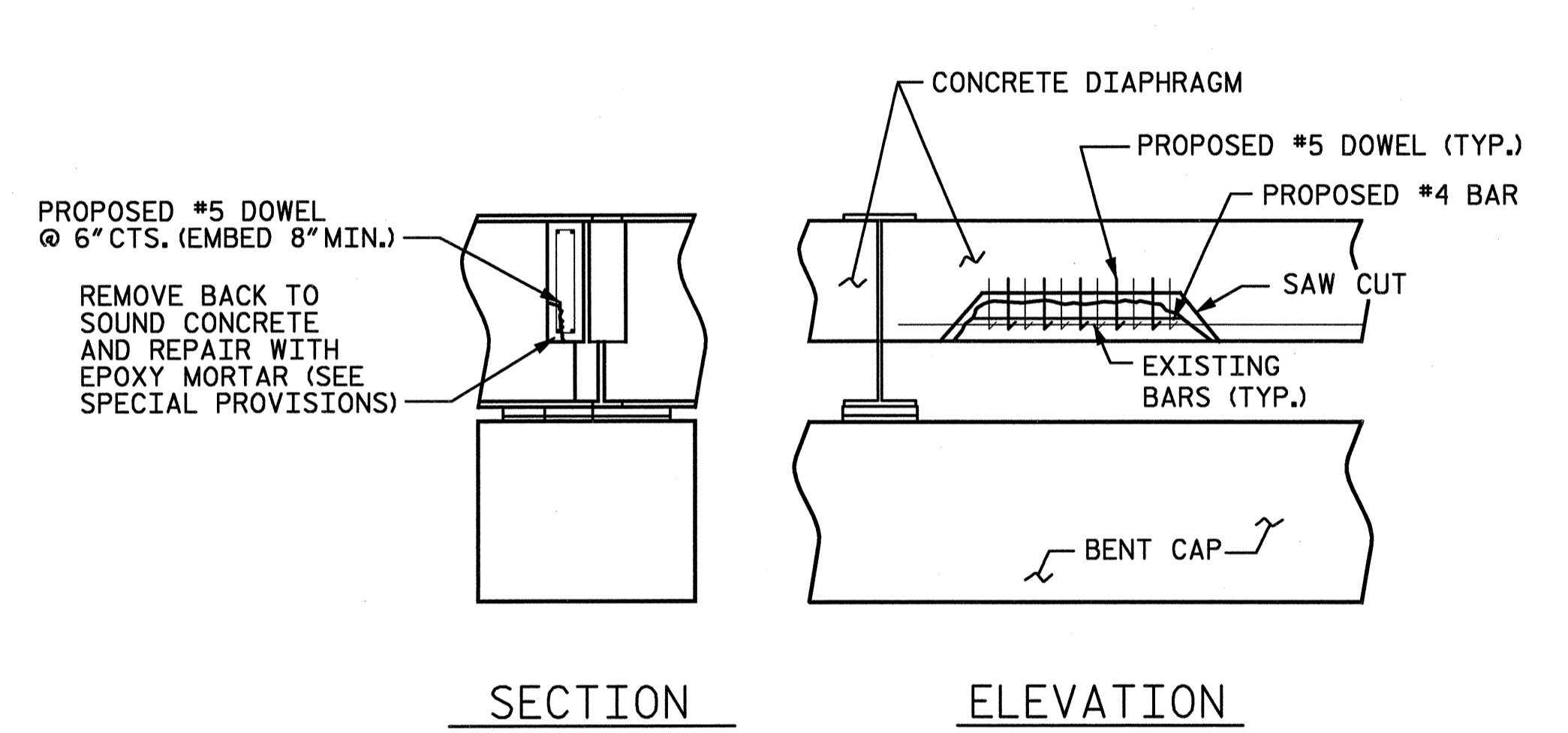
1. REPAIRS SHALL BE IMPLEMENTED WHEN BRIDGE IS RAISED ABOVE REPAIR.
2. BLOCKING SHALL NOT BE POSITIONED OVER REPAIR UNTIL REPAIR HAS CURED.
3. SAWCUT 1/4" - 1/2" DEEP AROUND ALL SPALLS.
4. FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.
5. FOR EPOXY MORTAR REPAIR, SEE SPECIAL PROVISIONS.



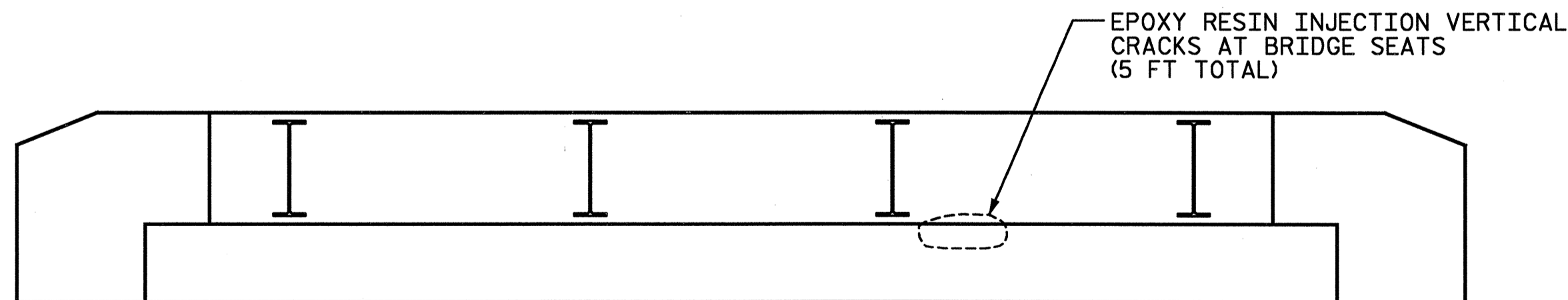
**BENT 1 ELEVATION**  
(LOOKING WEST)



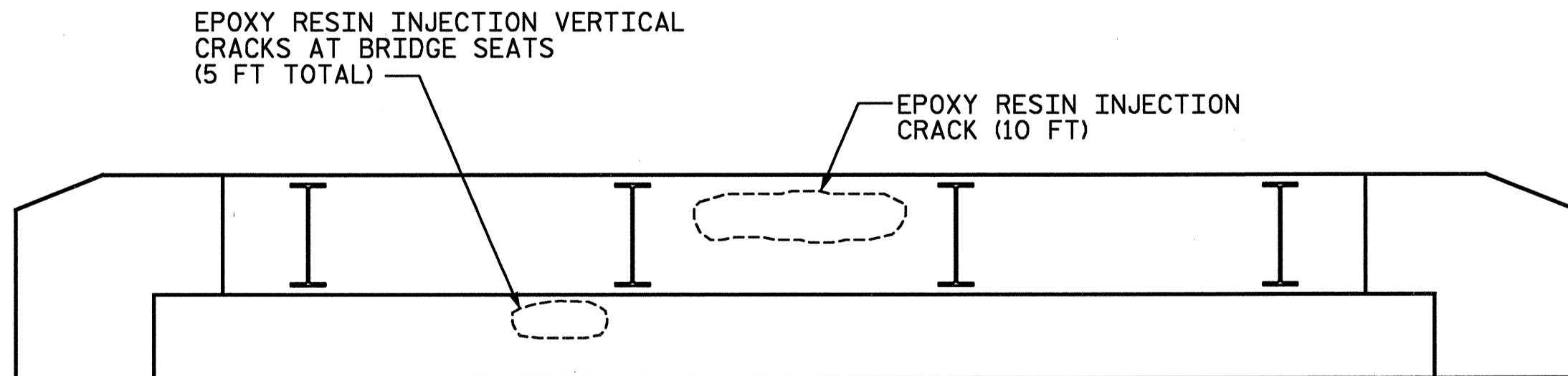
**BENT 3 ELEVATION**  
(LOOKING WEST)



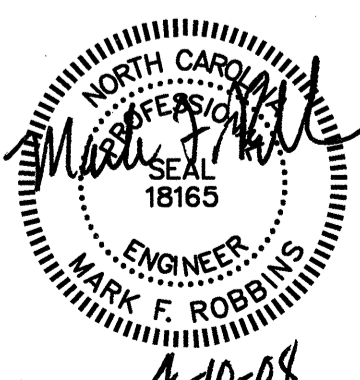
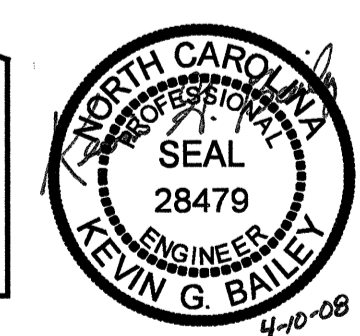
**TYPICAL DIAPHRAGM REPAIR DETAIL**



**END BENT 1 ELEVATION**  
(FACING END BENT)



**END BENT 2 ELEVATION**  
(FACING END BENT)



PROJECT NO. B-5022  
CUMBERLAND COUNTY  
 BRIDGE: 155

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 REPAIRS

5:56:04 PM N:\PROJ\2513448\B5022\Bridg 155\Station\Final\Substructure Repairs.dgn  
 timothy.townsend 4/9/2008

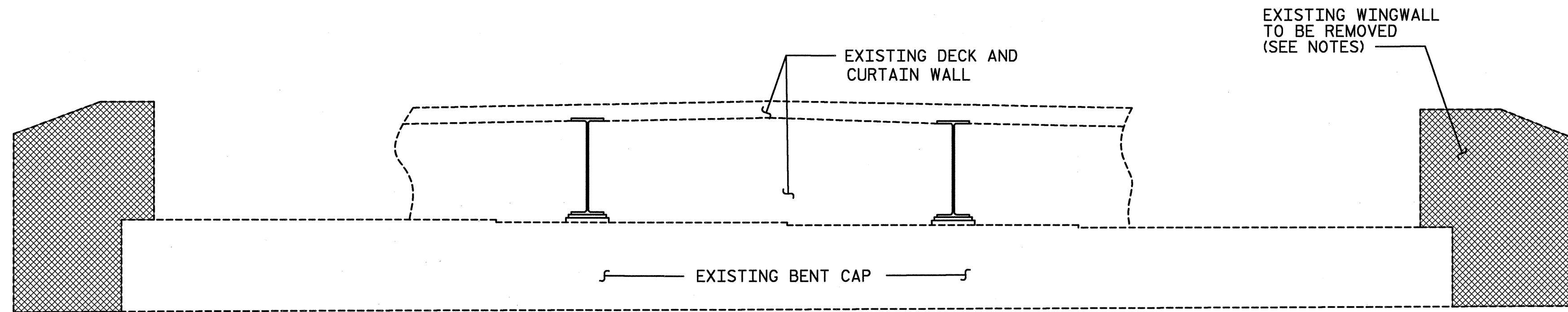
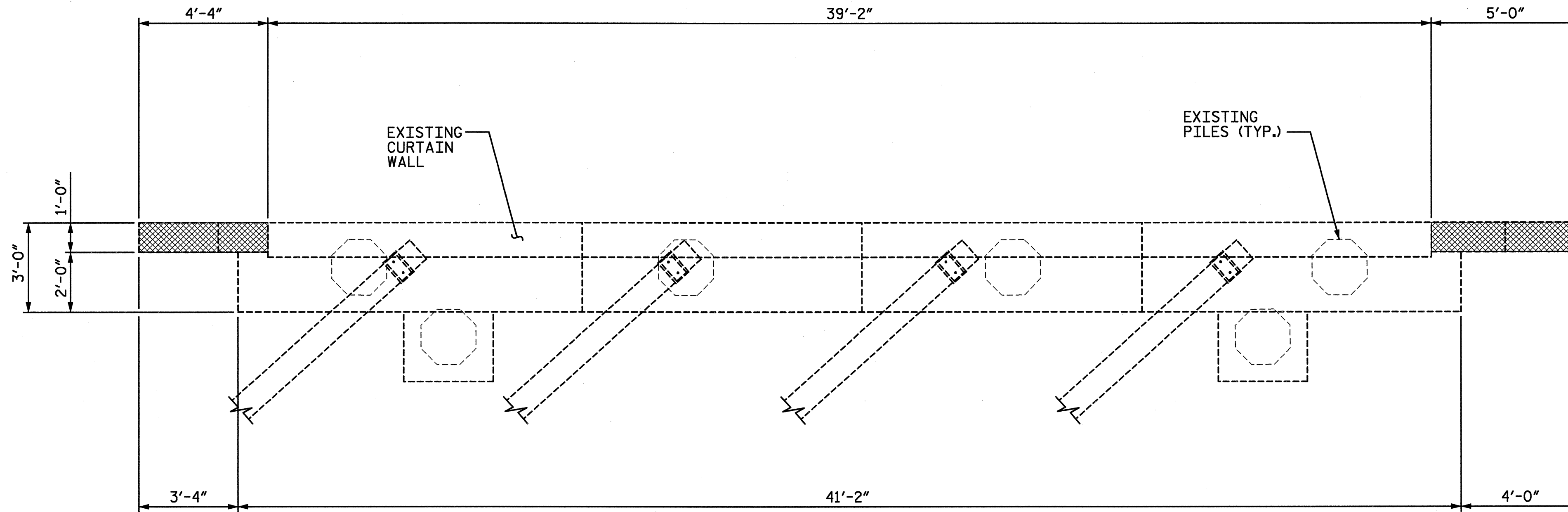
DRAWN BY: KGB DATE: 3-08  
 CHECKED BY: MFR DATE: 3-08

D-1810.29  
 STV / Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-29
2			4			44



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NOTES

DIMENSIONS ARE BASED ON BEST AVAILABLE INFORMATION CONTRACTOR SHALL FIELD VERIFY DIMENSIONS PRIOR TO CONSTRUCTION.

PORTIONS OF EXISTING END BENT SHOWN IN CROSS-HATCHED AREAS SHALL BE REMOVED.

VERTICAL AND HORIZONTAL REINFORCING STEEL EXTENDING FROM THE END BENT CAP INTO THE EXISTING WINGWALLS SHALL BE CLEANED AND STRAIGHTENED. CUT EXISTING REINFORCING STEEL TO MAINTAIN REQUIRED CONCRETE COVER. MINIMUM 14" EXTENSION INTO THE PROPOSED WINGWALL.

BARS DAMAGED DURING THE CONCRETE REMOVAL SHALL BE REPLACED BY #6 DOWELS SECURED IN THE EXISTING END BENT CAP WITH EPOXY ADHESIVE AT NO ADDITIONAL PAYMENT.

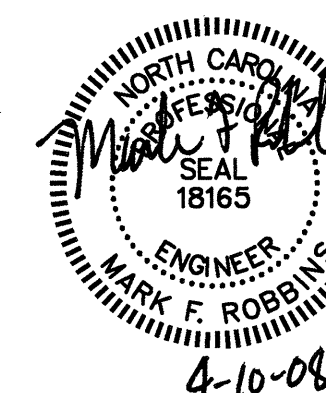
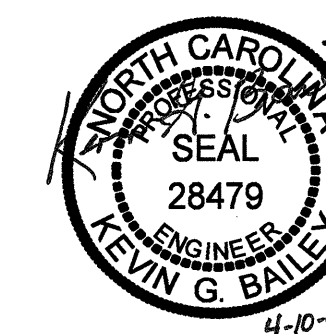
THE #6 DOWEL LENGTH SHALL BE BASED ON A 9" EMBEDMENT INTO EXISTING CONCRETE AND MAY BE ADJUSTED BASED ON THE MINIMUM EMBEDMENT SPECIFIED BY THE MANUFACTURER OF THE EPOXY ADHESIVE BONDING SYSTEM. SEE SPECIAL PROVISION FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS.

EXISTING ANCHOR BOLTS ARE TO BE CUT FLUSH WITH THE EXISTING TOP OF CAP.

THE EXISTING CURTAIN WALL CONCRETE AROUND ANCHOR BOLTS AND BEARING ASSEMBLIES SHALL BE REMOVED, USING HAND TOOLS, AS NECESSARY TO FREE ANCHOR BOLTS AND BEARING ASSEMBLIES. THE CONTRACTOR SHALL EXERCISE CARE DURING THE REMOVAL OF EXISTING CONCRETE TO INSURE THAT EXISTING GIRDERS, BEARING ASSEMBLIES AND CURTAIN WALL STEEL REMAIN UNDAMAGED.

CONTRACTOR SHALL REMOVE EXISTING APPROACH SLAB BRACKET AS NECESSARY TO ACCOMMODATE PROPOSED APPROACH SLAB BRACKET. EXISTING APPROACH SLAB BRACKET NOT SHOWN FOR CLARITY.

ALL WORK ON THIS SHEET WILL BE PAID FOR UNDER THE LUMP SUM BID PRICE FOR PARTIAL REMOVAL OF EXISTING STRUCTURE.



PROJECT NO. B-5022  
 CUMBERLAND COUNTY  
 BRIDGE: 155

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
 END BENT  
 CONCRETE REMOVAL

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			5-30
2			4			TOTAL SHEETS 44

D-1810.30

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 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

DRAWN BY: KGB DATE: 1-08  
 CHECKED BY: PEK DATE: 3-08

NOTES

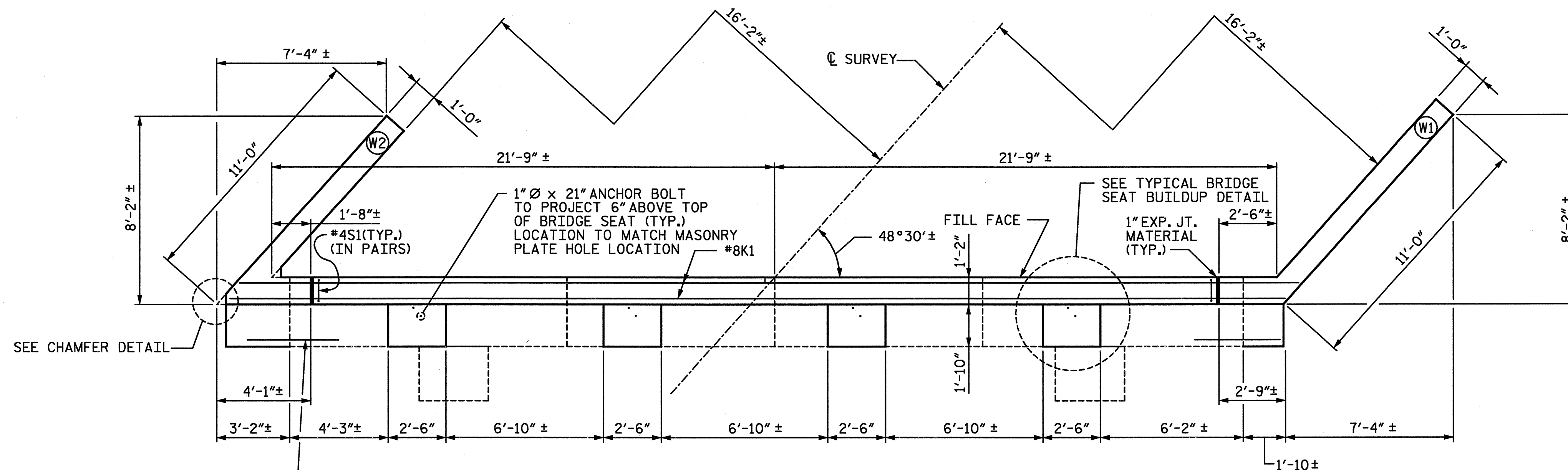
THE #6D1 & #4K2 BARS SHALL BE SECURED IN EXISTING CONCRETE WITH EPOXY ADHESIVE. FOR ADHESIVELY ANCHORED ANCHOR BOLTS AND DOWELS SEE SPECIAL PROVISIONS.

THE VERTICAL LEG LENGTH OF THE #6D1 & #4K2 BARS AND #4V2 BARS IS BASED ON A 9" EMBEDMENT INTO EXISTING CONCRETE AND MAY BE ADJUSTED BASED ON THE MINIMUM EMBEDMENT SPECIFIED BY THE MANUFACTURER OF THE EPOXY ADHESIVE BONDING SYSTEM.

THE AREAS OF THE CURTAIN WALL AROUND ANCHOR BOLTS AND BEARING ASSEMBLIES PREVIOUSLY REMOVED SHALL BE RECAST TO PRODUCE SMOOTH, STRAIGHT FINISHED SURFACES USING CLASS AA CONCRETE.

FOR CLEANING AND PAINTING EXISTING BEARING PLATES, SEE SPECIAL PROVISION.

FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.



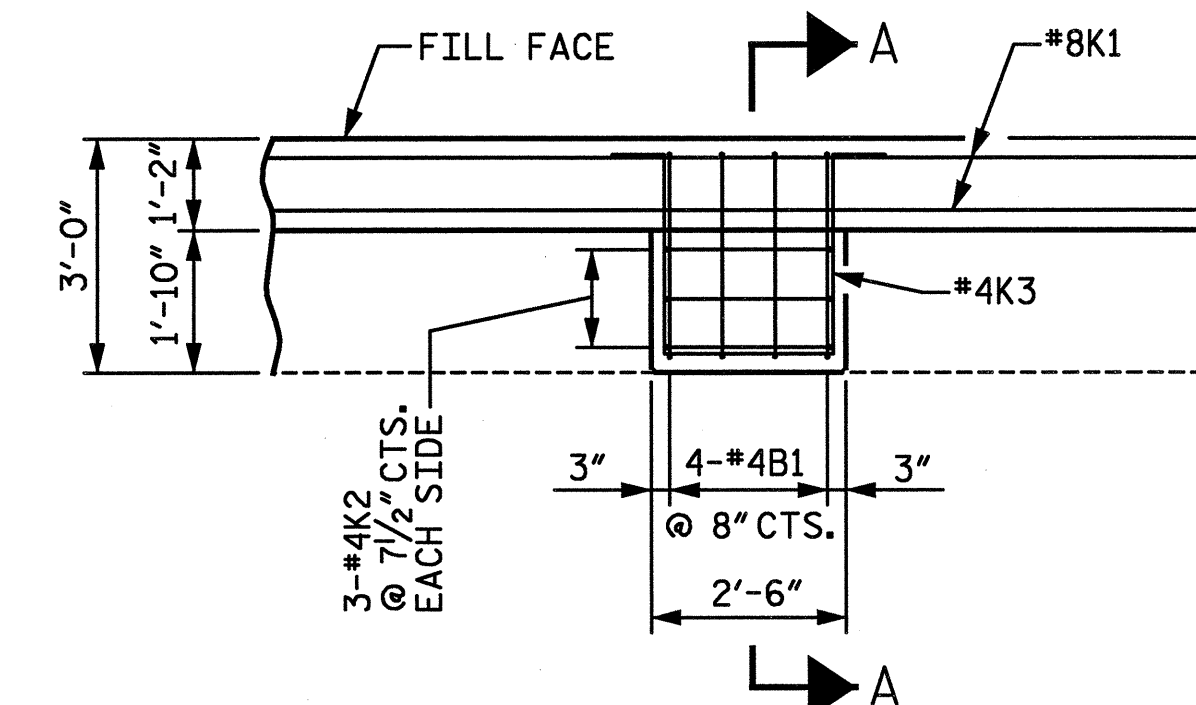
ADHESIVELY ANCHOR 6-#6D2 INTO END OF EXISTING CAP FOR CAP EXTENSION. D2 BARS ARE TO BE EQUALLY SPACED AT END OF EXISTING CAP WITH 6" CLEAR FROM EDGES OF CAP. TYPICAL EACH END OF CAP. EMBEDMENT PER MANUFACTURER'S RECOMMENDATIONS

NOTE: DIMENSIONS ARE BASED ON BEST AVAILABLE INFORMATION. VERIFY DIMENSIONS IN FIELD AND ADJUST AS NECESSARY SUCH THAT THE 2'-6" BRIDGE SEAT BUILDUP IS CENTERED ABOUT ANCHOR BOLTS.

CONTRACTOR SHALL VERIFY ANCHOR BOLT DIAMETER AND ADJUST AS NECESSARY TO MATCH EXISTING ANCHOR BOLT DIAMETER.

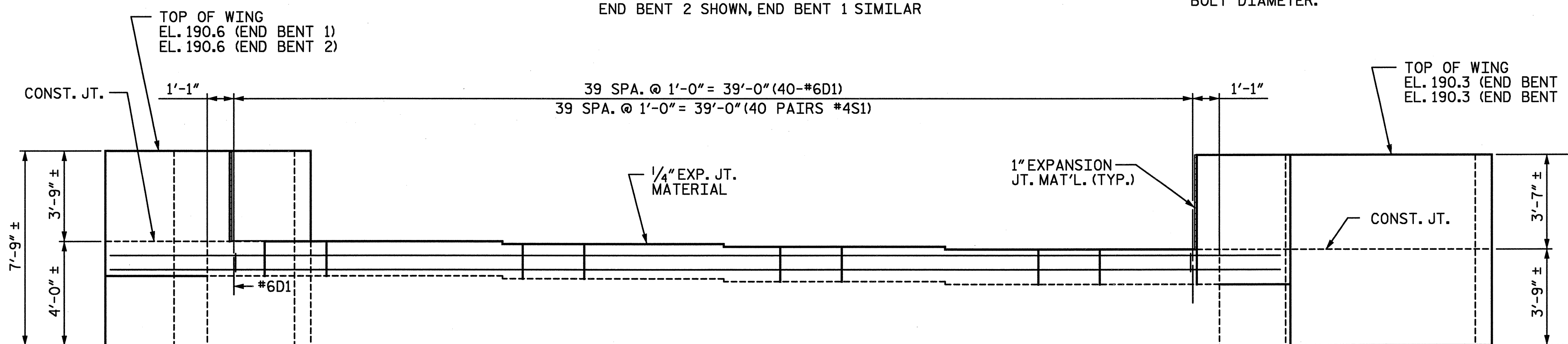
PLAN OF CAP MODIFICATION

END BENT 2 SHOWN, END BENT 1 SIMILAR



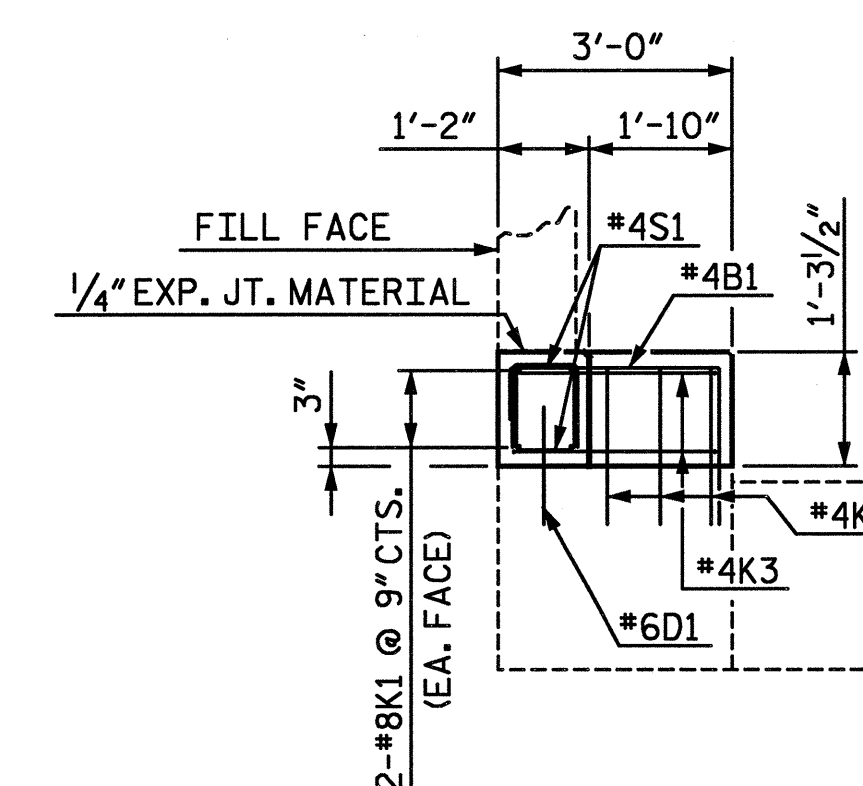
TYPICAL BRIDGE SEAT BUILDUP

#4S1 STIRRUPS & #6D1 DOWELS NOT SHOWN FOR CLARITY

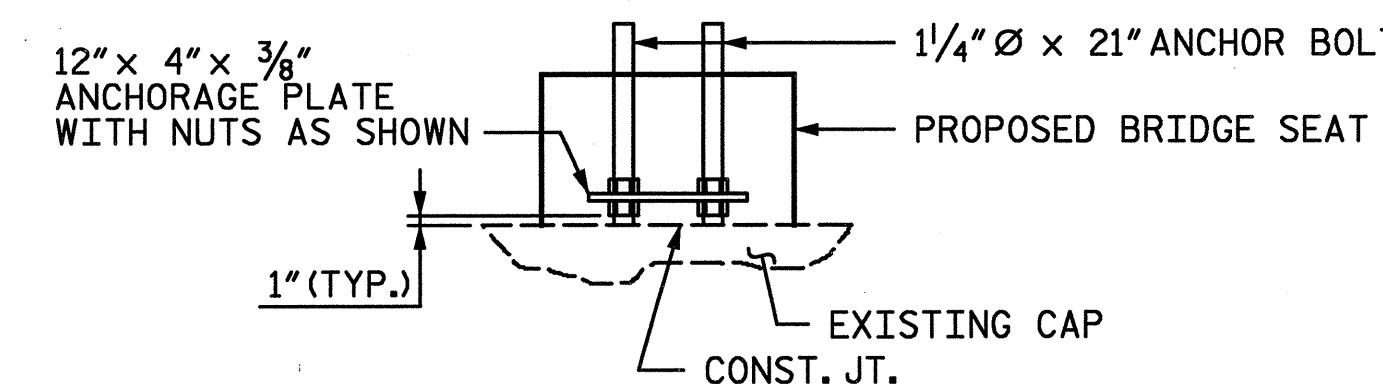


ELEVATION OF CAP MODIFICATION

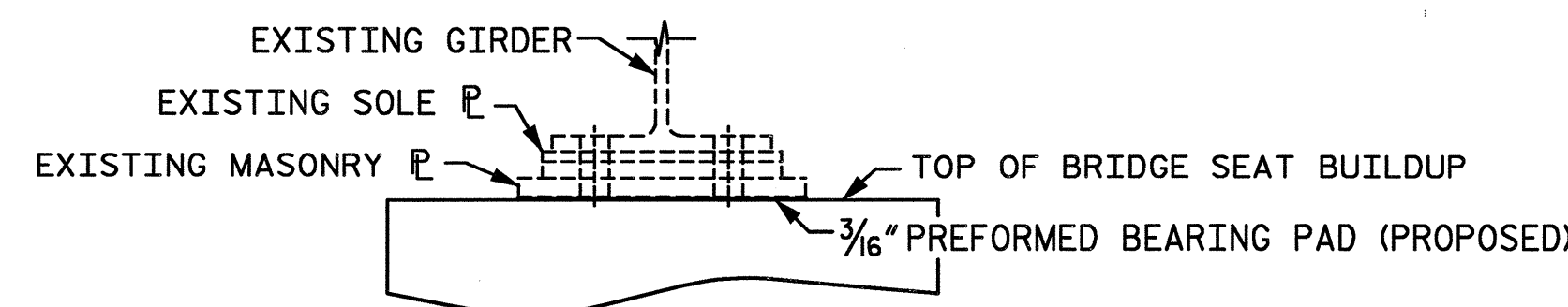
END BENT 2 SHOWN, END BENT 1 SIMILAR



SECTION A-A

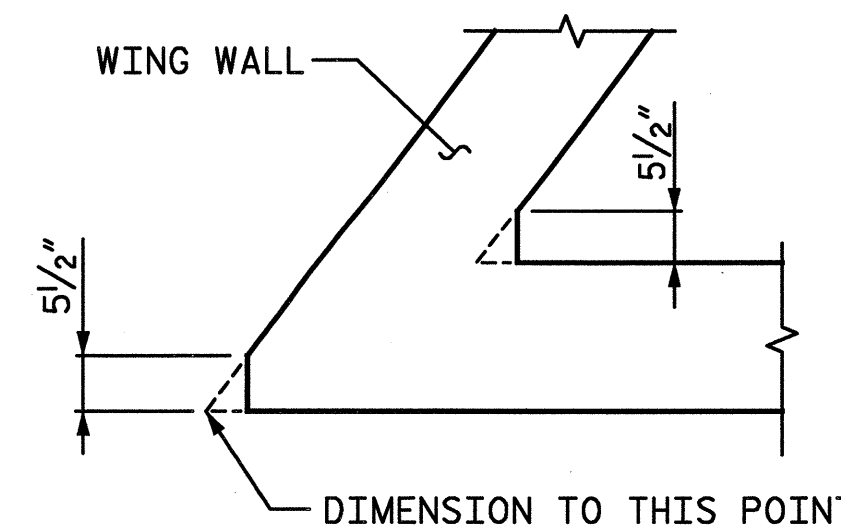


END BENT ANCHOR BOLT DETAIL

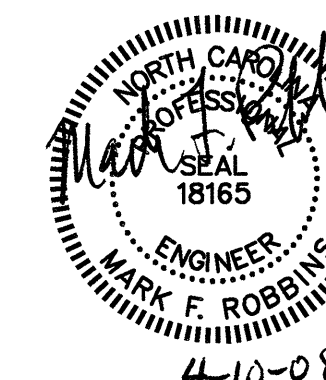
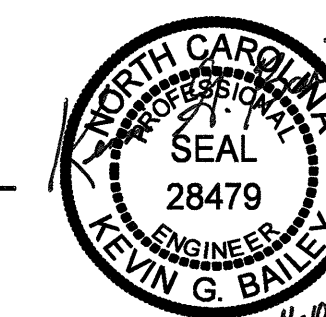


TYPICAL BEARING ASSEMBLY

END BENTS 1 & 2



CHAMFER DETAIL



PROJECT NO. B-5022  
 CUMBERLAND COUNTY  
 BRIDGE: 155

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT  
 CAP MODIFICATIONS

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

TOTAL SHEETS: 44

D-1810.31

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 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

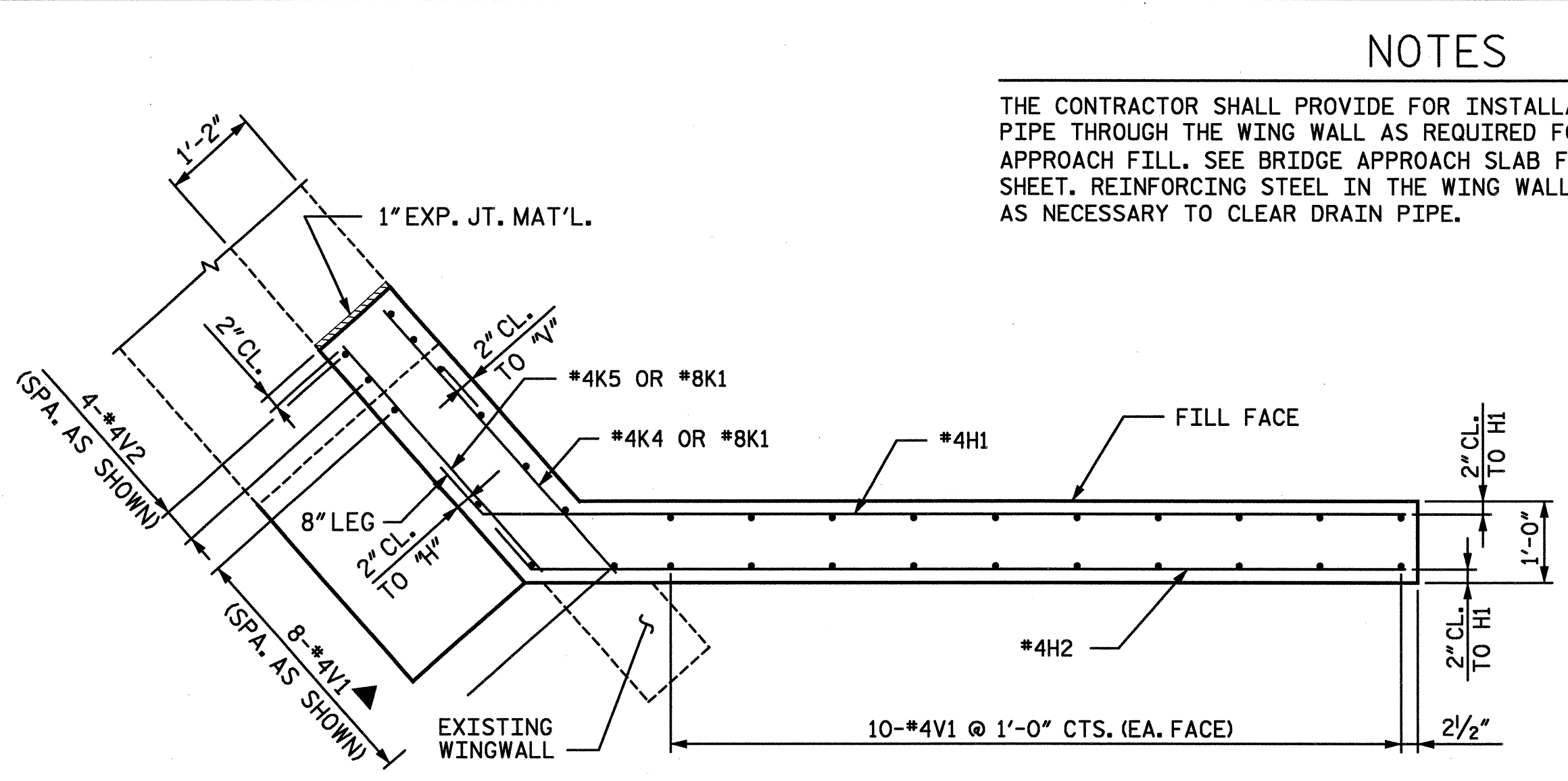
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 4/10/2008 timothy.townsend

DRAWN BY: TJT DATE: 3-08  
 CHECKED BY: KGB DATE: 3-08



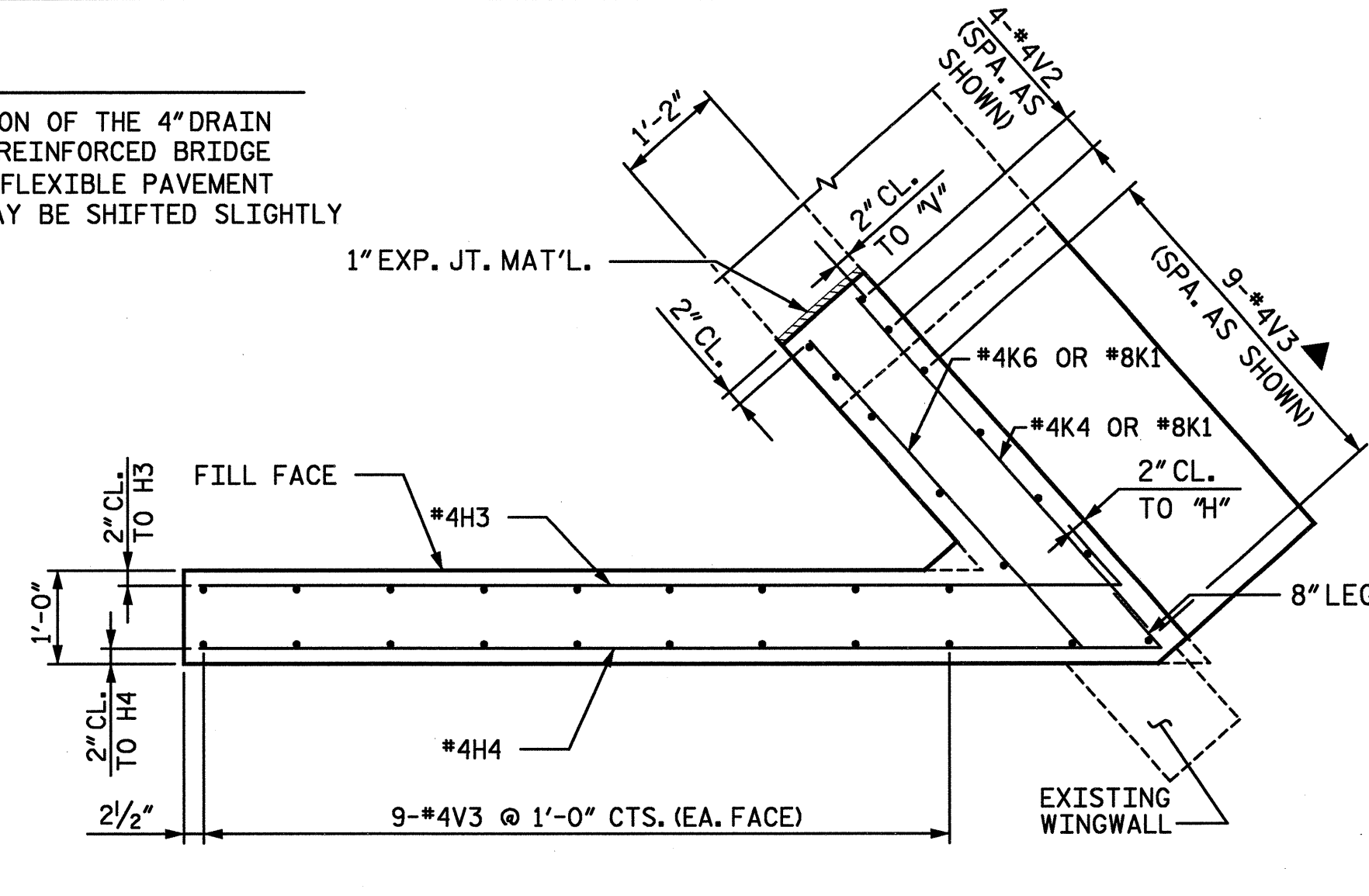
**NOTES**

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILL. SEE BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT SHEET. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR DRAIN PIPE.



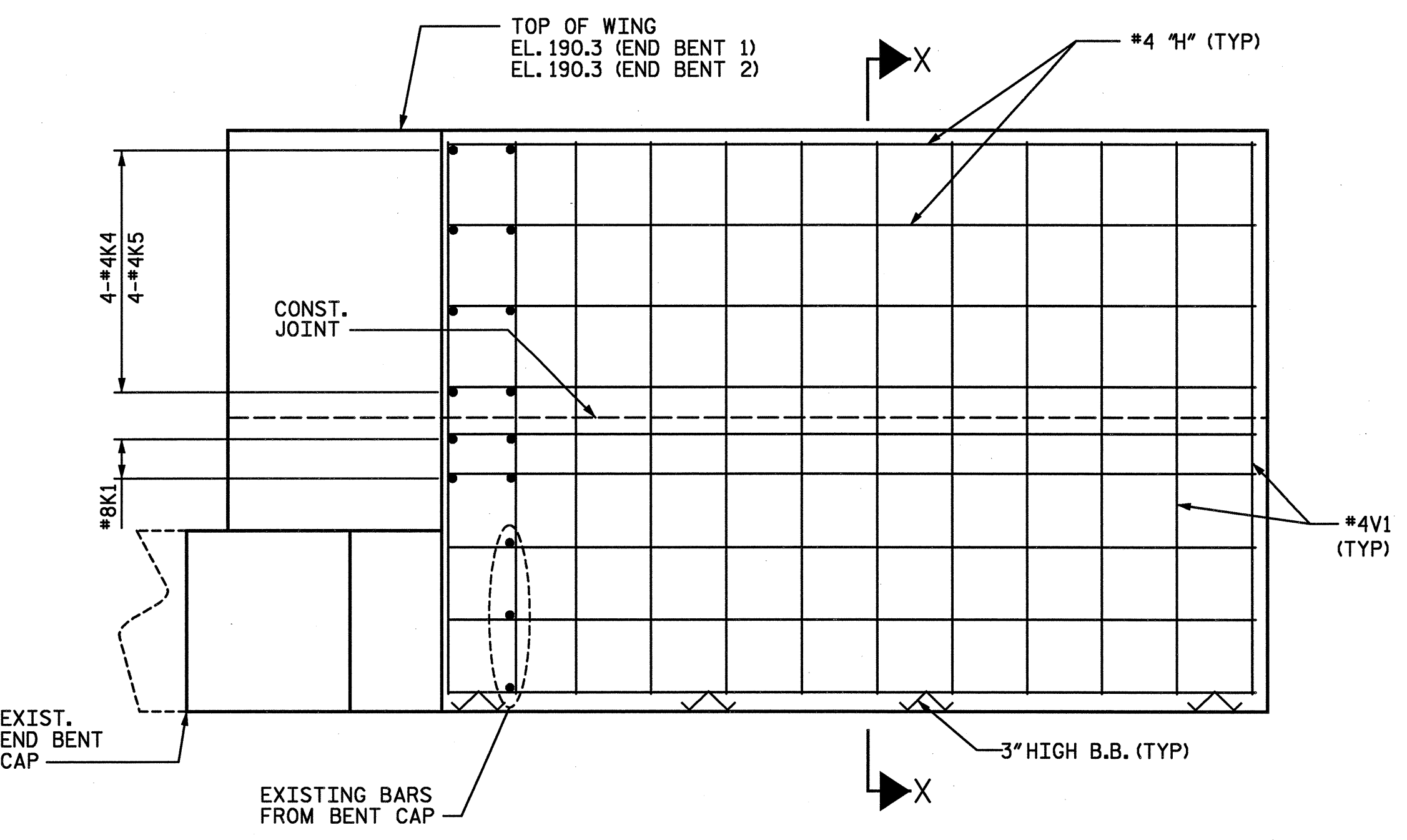
**PLAN OF RIGHT WING - W1**

▲ #4V1, WHERE APPLICABLE, AND #4V3 BARS SHALL BE CAST WITH PROPOSED END BENT CAP EXTENSION, POUR 1.

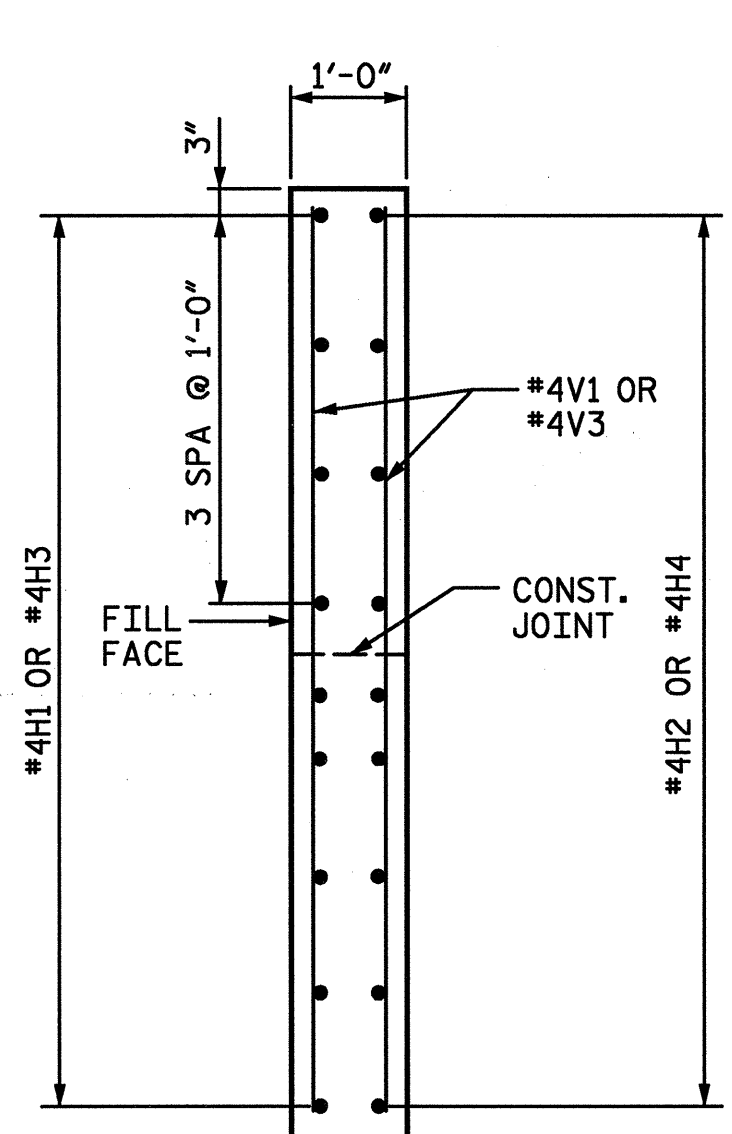


**PLAN OF LEFT WING - W2**

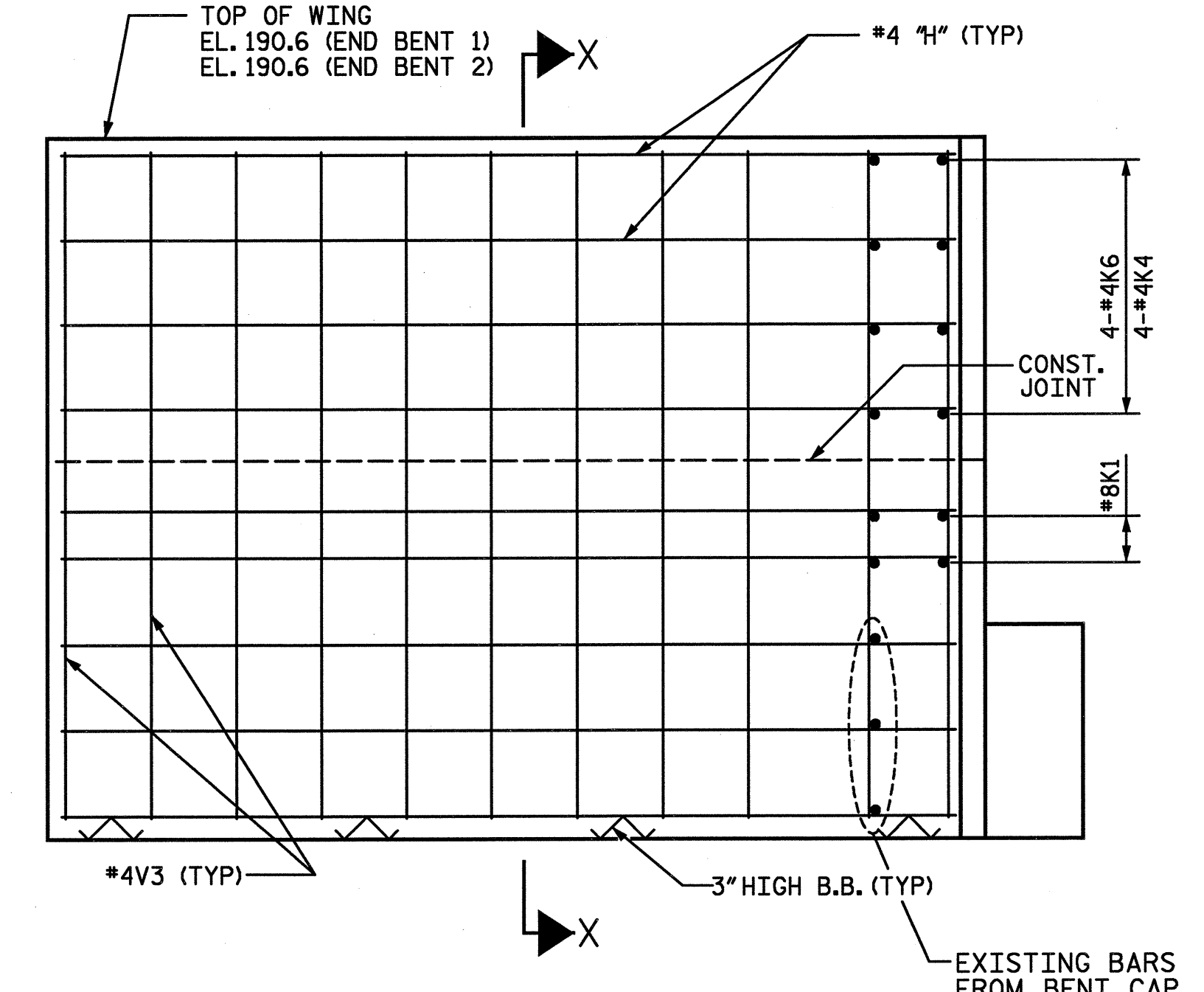
NOTE: #4V2 BARS SHALL BE EPOXIED INTO EXISTING BENT CAP.



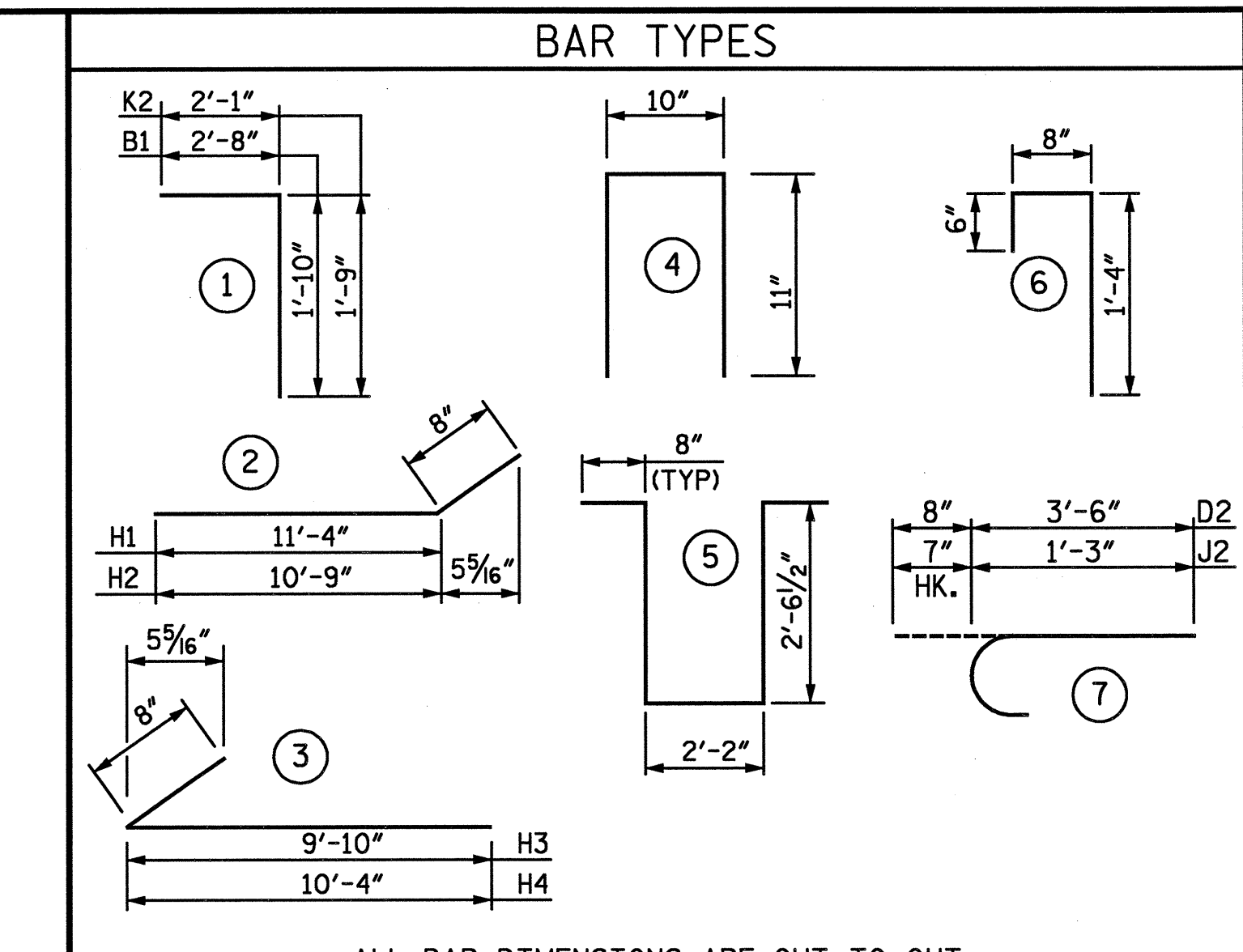
**ELEVATION OF RIGHT WING**



**SECTION X-X**



**ELEVATION OF LEFT WING**



**BILL OF MATERIAL FOR ONE END BENT (2 REQ'D)**

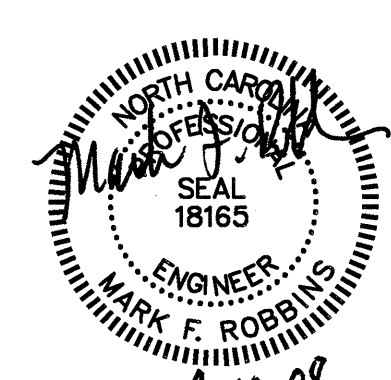
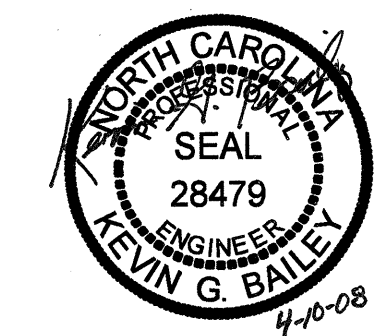
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#4	1	4'-6"	48
D1	40	#6	STR	1'-6"	90
D2	12	#6	7	4'-2"	75
H1	9	#4	2	12'-0"	72
H2	9	#4	2	11'-5"	69
H3	9	#4	3	10'-6"	63
H4	9	#4	3	11'-0"	66
J1	35	#5	6	2'-6"	91
J2	35	#5	7	1'-10"	67
K1	4	#8	STR	45'-7"	487
K2	24	#4	1	3'-10"	62
K3	8	#4	5	8'-7"	46
K4	8	#4	STR	3'-3"	17
K5	4	#4	STR	2'-7"	7
K6	4	#4	STR	2'-9"	7
K7	2	#5	STR	34'-2"	71
S1	80	#4	4	2'-8"	143
V1	28	#4	STR	6'-11"	129
V2	8	#4	STR	5'-4"	29
V3	27	#4	STR	7'-4"	132
REINFORCING STEEL				LBS.	1,771

NOTE: CUT D2 AT W1 LOCATION AS NECESSARY

**CLASS AA CONCRETE BREAKDOWN FOR ONE END BENT (2 REQ'D)**

POUR	DESCRIPTION	C. Y.	WT.
POUR 1	CAP AND LOWER WINGWALLS	C. Y.	6.7
POUR 2	BRIDGE SEATS AND UPPER WINGWALLS	C. Y.	4.5
POUR 3	APPROACH SLAB BRACKETS	C. Y.	1.0
CLASS AA CONCRETE		C. Y.	12.2

**REINFORCING FOR TURNED BACK WINGS**  
 END BENT 2 SHOWN, END BENT 1 SIMILAR



PROJECT NO. **B-5022**  
 CUMBERLAND COUNTY  
 BRIDGE: **155**

SHEET 3 OF 4  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE END BENT  
 WINGWALL MODIFICATIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-32
1			3			TOTAL SHEETS
2			4			44

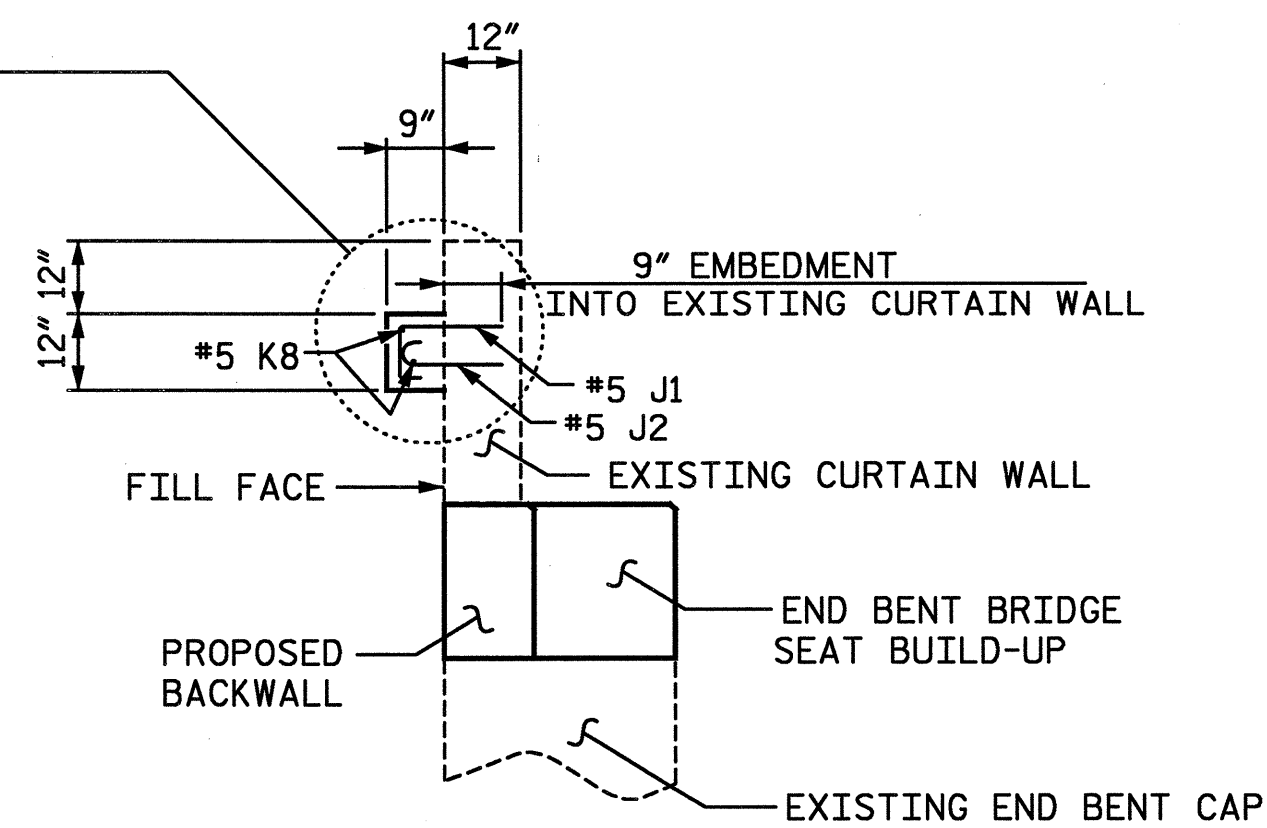
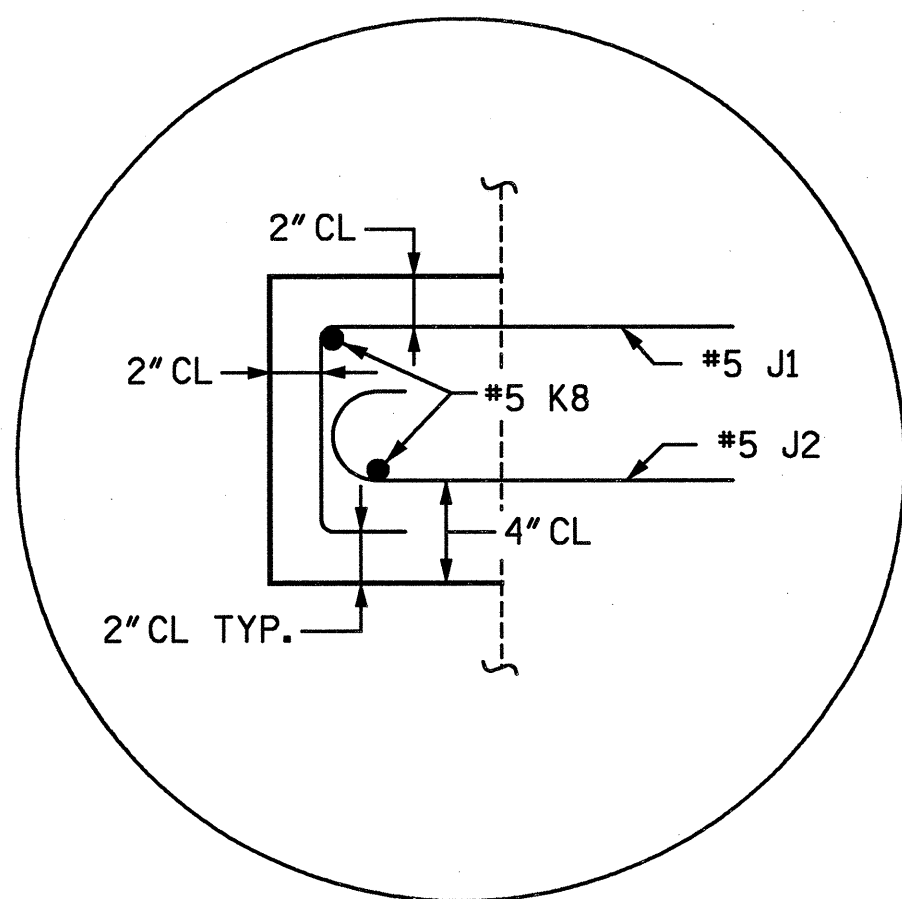
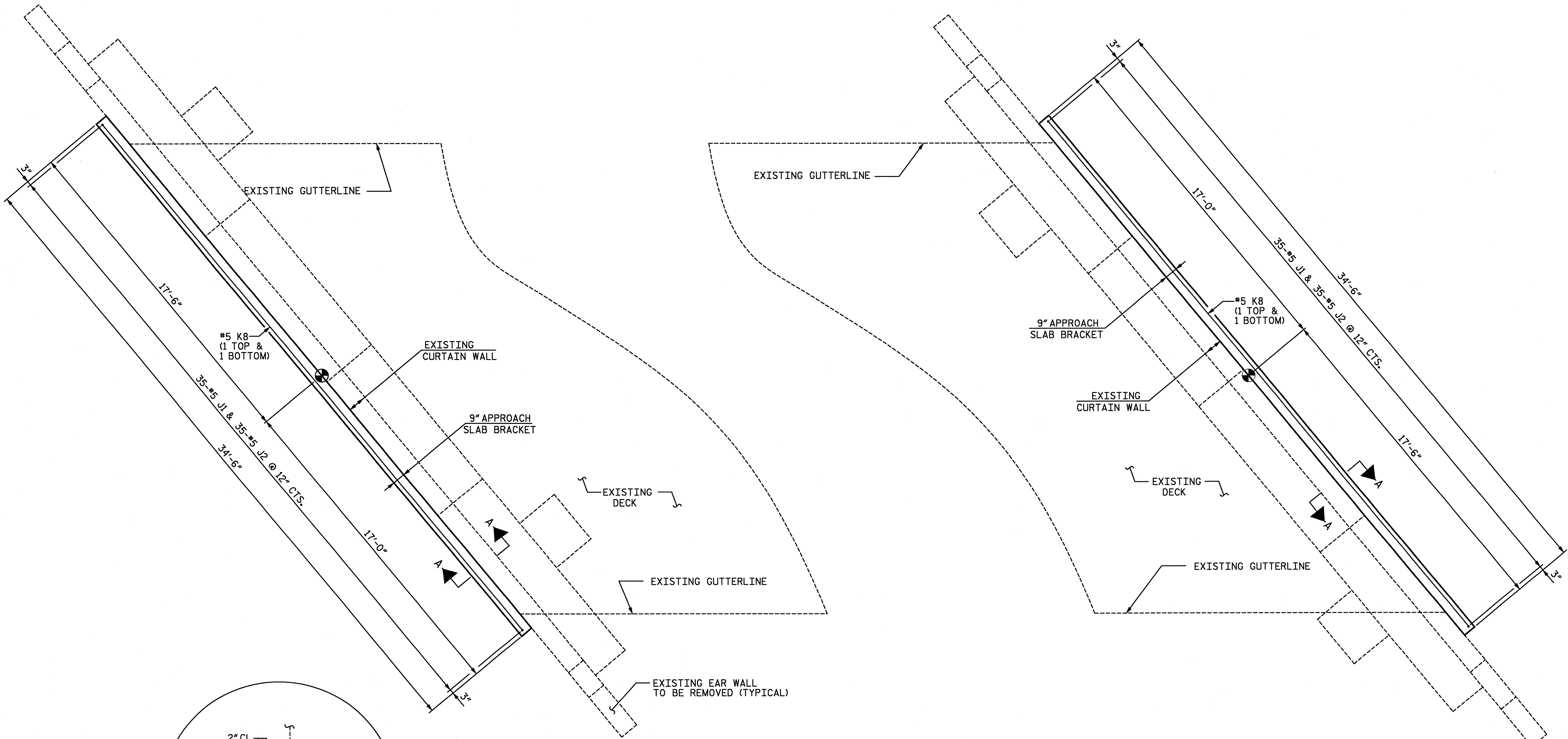
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D-1810.32  
 STV/ Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

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 4/9/2008  
 timothy.townsend

DRAWN BY: **TJT** DATE: **3-08**  
 CHECKED BY: **KGB** DATE: **3-08**

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 timothy.townsend



SECTION A-A

**PLACEMENT OF APPROACH SLAB BRACKETS**

(PROPOSED WING WALLS OMITTED FOR CLARITY)

**NOTES**

THE #5J1 AND #5J2 BARS SHALL BE SECURED INTO THE EXISTING CONCRETE WITH EPOXY ADHESIVE.

THE LEG LENGTH OF THE #5J1 AND #5J2 BAR IS BASED ON A 9" EMBEDMENT INTO THE EXISTING CONCRETE AND MAY BE ADJUSTED BASED ON THE MINIMUM EMBEDMENT SPECIFIED BY THE MANUFACTURER OF THE EPOXY ADHESIVE BONDING SYSTEM.

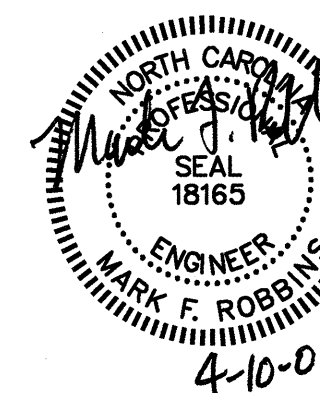
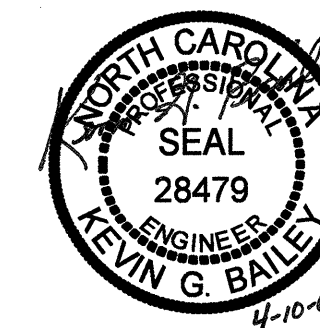
INSTALL #5J2 BARS AND THEN INSTALL #5J1 BARS TO ALLOW FOR BAR ROTATION DURING INSTALLATION.

#5J1 AND #5J2 BARS SHALL BE EPOXIED INTO EXISTING CURTAIN WALL AS DETAILED. THE COST OF DRILLING IN AND EPOXYING THE #5J1 AND #5J2 BARS SHALL BE CONSIDERED INCIDENTAL AND INCLUDED IN THE COST OF THE REINFORCING STEEL.

FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

D-1810.33

NOT TO SCALE



PROJECT NO. B-5022  
 CUMBERLAND COUNTY  
 BRIDGE: 155

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT  
 APPROACH SLAB BRACKETS

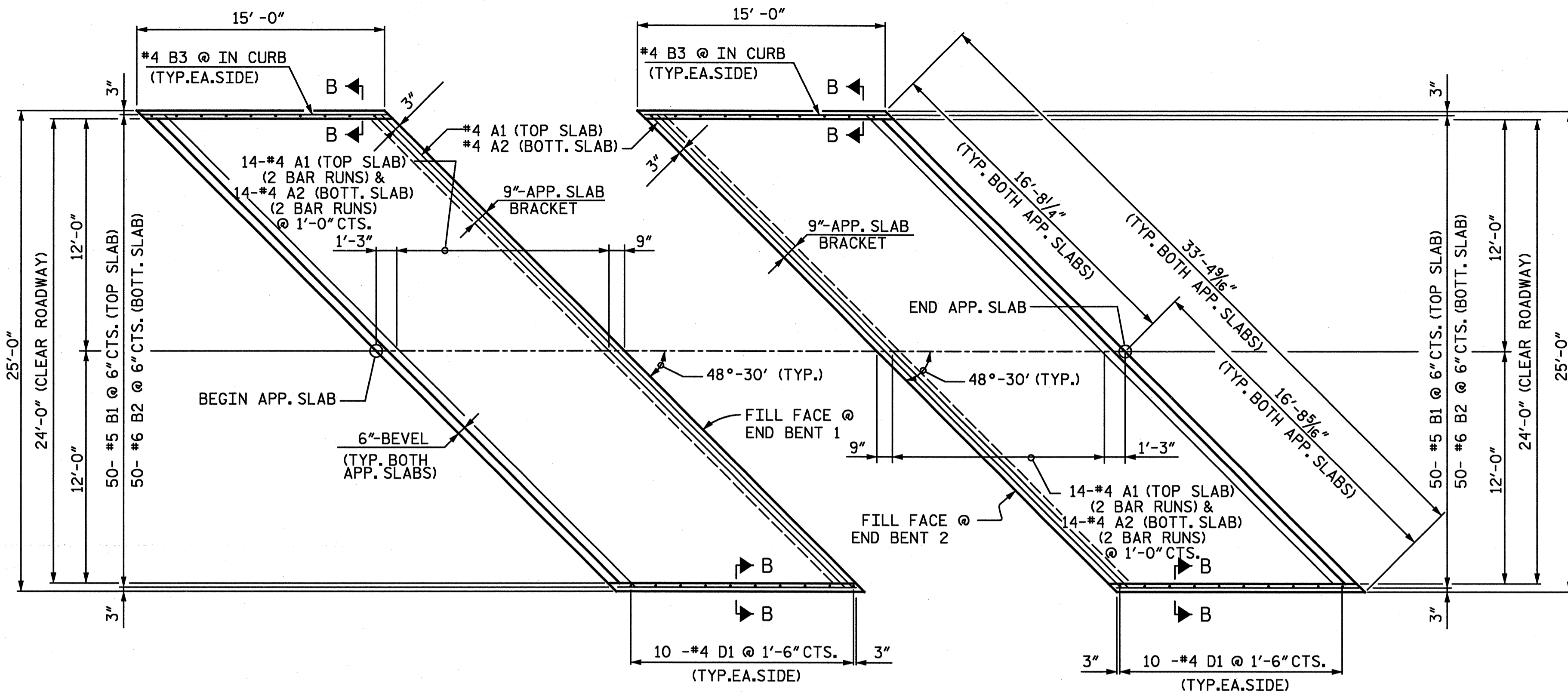
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-33
2			4			44

DRAWN BY: KGB DATE: 1-08  
 CHECKED BY: PEK DATE: 3-08

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PLAN @ END BENT 1                      PLAN @ END BENT 2

**NOTES**

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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

THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE EACH EDGE OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

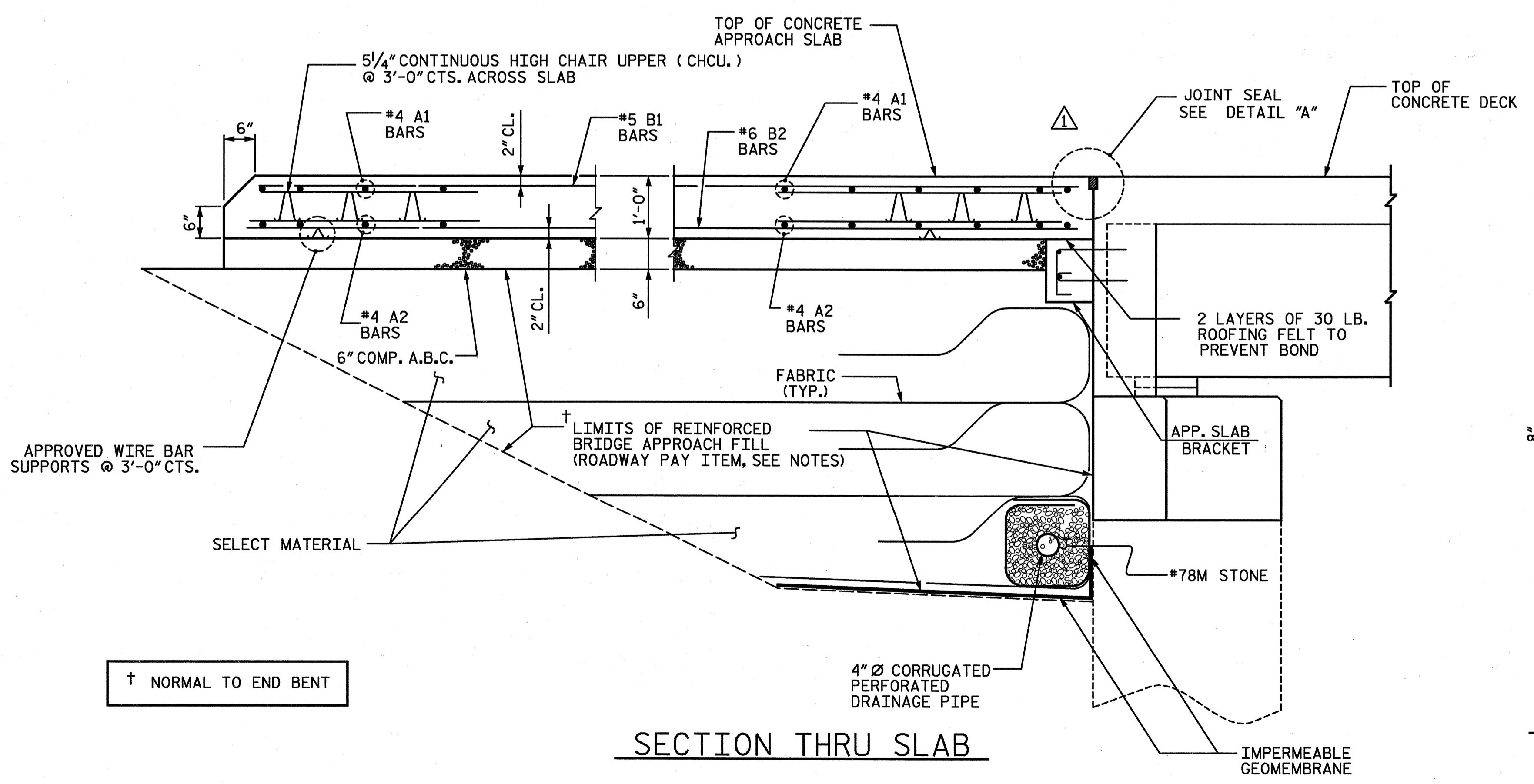
THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

THE 6" BEVEL AT THE END OF THE APPROACH SLAB SHALL EXTEND FROM FRONT FACE OF CURB TO FRONT FACE OF CURB.

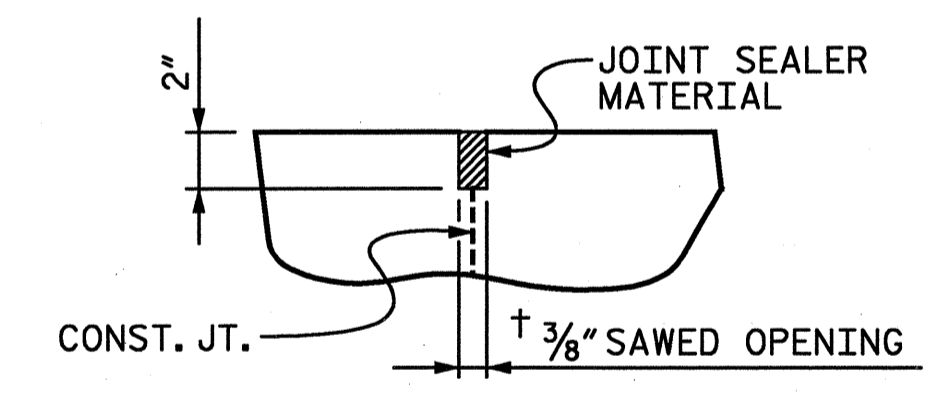
THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE FORMED. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT.

BILL OF MATERIAL					
ONE APP. SLAB (2 REQ'D)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	30	#4	STR	17'-7"	352
A2	30	#4	STR	17'-6"	351
*B1	50	#5	STR	14'-2"	739
B2	50	#6	STR	14'-8"	1102
*B3	2	#4	STR	14'-8"	20
*D1	20	#4	STR	1'-0"	13
REINFORCING STEEL			lbs.		1453
*EPOXY COATED REINFORCING STEEL			lbs.		1124
CLASS AA CONCRETE					
POUR 1	SLAB		C. Y.		13.8
POUR 2	CURB		C. Y.		0.4
TOTAL CONCRETE					C. Y. 14.2
SPLICE CHART					
BAR SIZE	EPOXY COATED	UNCOATED			
#4	2'-0"	1'-9"			
#5	2'-6"	2'-2"			
#6	3'-10"	2'-7"			

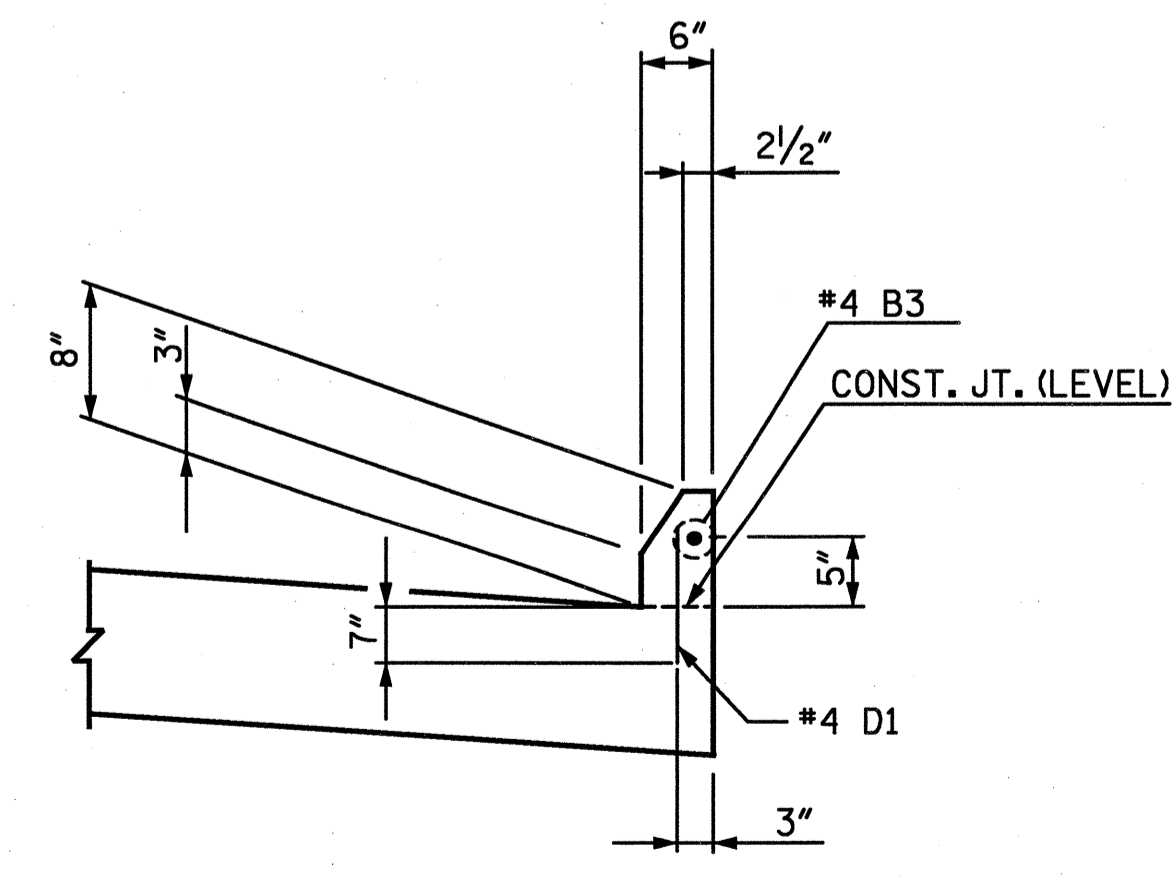
REVISION #1: REVISED PER REVIEW COMMENTS  
 BY: TJT DATE: 5-08  
 CH'KD BY: KGB DATE: 5-08



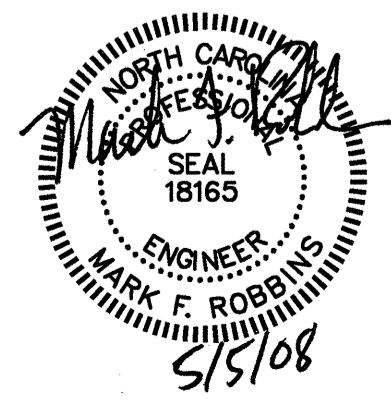
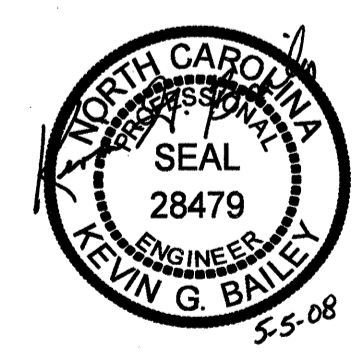
SECTION THRU SLAB



DETAIL "A"



SECTION B-B (THRU CURB)



PROJECT NO. **B-5022**  
**CUMBERLAND** COUNTY  
 BRIDGE: **155**

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 BRIDGE APPROACH SLAB  
 FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-34
1	STV	5-08	3			TOTAL SHEETS
2			4			44

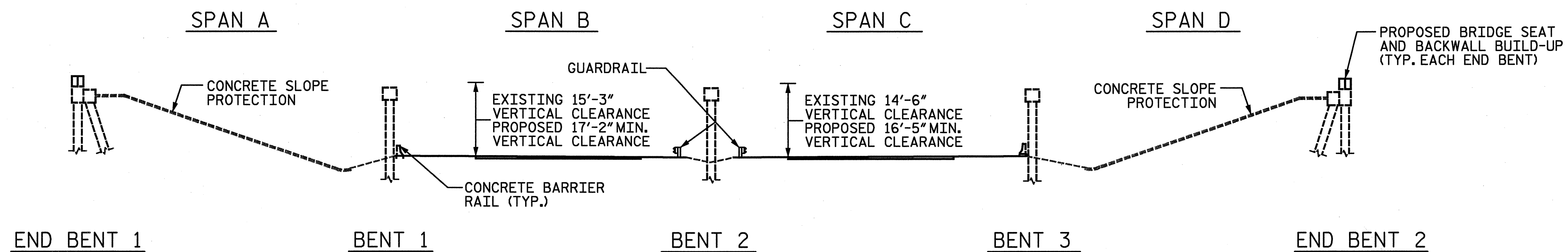
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 Charlotte, NC 28208

NOT TO SCALE

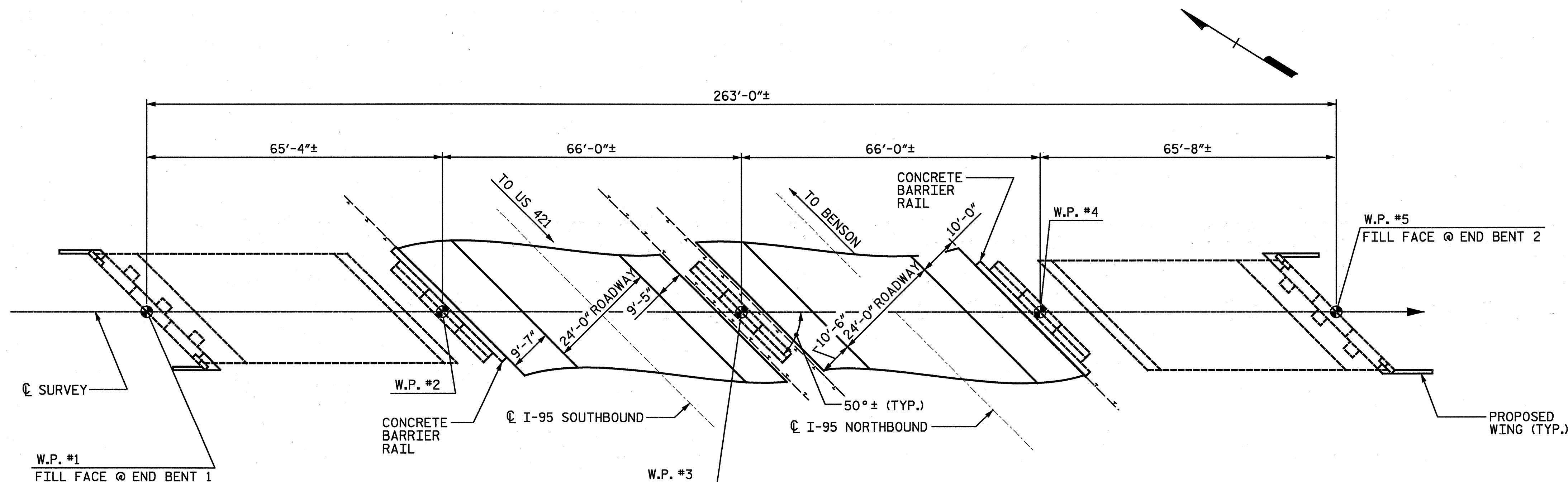
DRAWN BY: **KGB** DATE: **1-08**  
 CHECKED BY: **PEK** DATE: **3-08**

NOTES

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
 ALL DIMENSIONS IN THESE PLANS ARE BASED ON BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL VERIFY DIMENSIONS IN FIELD PRIOR TO CONSTRUCTION AND ANY FABRICATION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES SUCH THAT NECESSARY ADJUSTMENTS BE MADE BY THE CONTRACTOR.  
 FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH BRIDGE, SEE SPECIAL PROVISIONS.  
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.  
 ALL STRUCTURAL STEEL SHALL BE ASTM A36 MIN.  
 ALL WELDING SHALL BE IN ACCORDANCE WITH CURRENT AWS SPECIFICATIONS.



ELEVATION



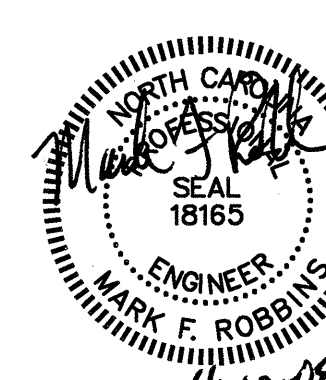
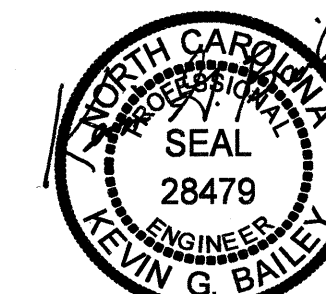
PLAN

TOTAL BILL OF MATERIAL									
	PARTIAL REMOVAL OF EXISTING STRUCTURE	CLASS AA CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL *	EPOXY RESIN INJECTION	EPOXY MORTAR REPAIRS	BRIDGE JACKING	EVAZOTE JOINT SEALS
	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	APPROX. LBS.	LINEAR FT.	SQ. FT.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			LUMP SUM		17200	20		LUMP SUM	LUMP SUM
END BENT 1		18.1		2390	84	14	2		
BENT 1						12			
BENT 2						18			
BENT 3						2			
END BENT 2		18.1		2390	84	4			
TOTAL	LUMP SUM	36.2	LUMP SUM	4780	17,368	70	2	LUMP SUM	LUMP SUM

\* INCLUDES WEIGHT OF ANCHOR BOLTS AND ANCHOR HARDWARE

PROJECT NO. B-5022  
 HARNETT COUNTY  
 BRIDGE: 81

MODIFICATION OF BRIDGE NO. 81



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
**BRIDGE OVER I-95**  
**ON SR 1709**  
**BETWEEN BENSON**  
**AND US 421**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-35
2			4			TOTAL SHEETS 44

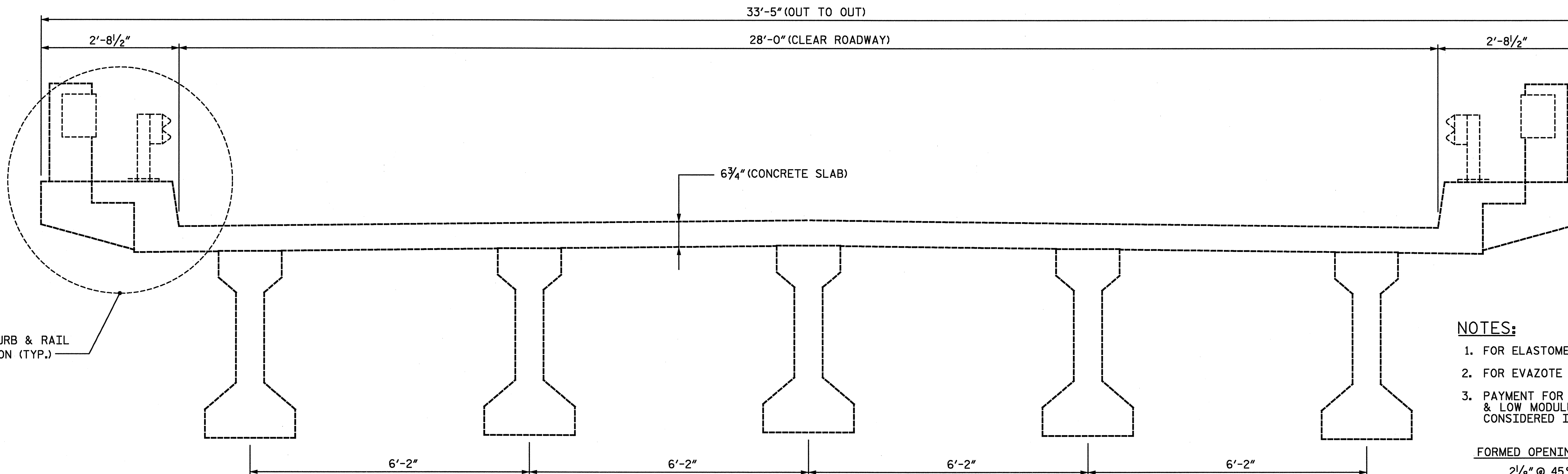
D-1810.35  
 STV / Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208

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 timothy.townsend

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 CHECKED BY: PEK      DATE: 3-08

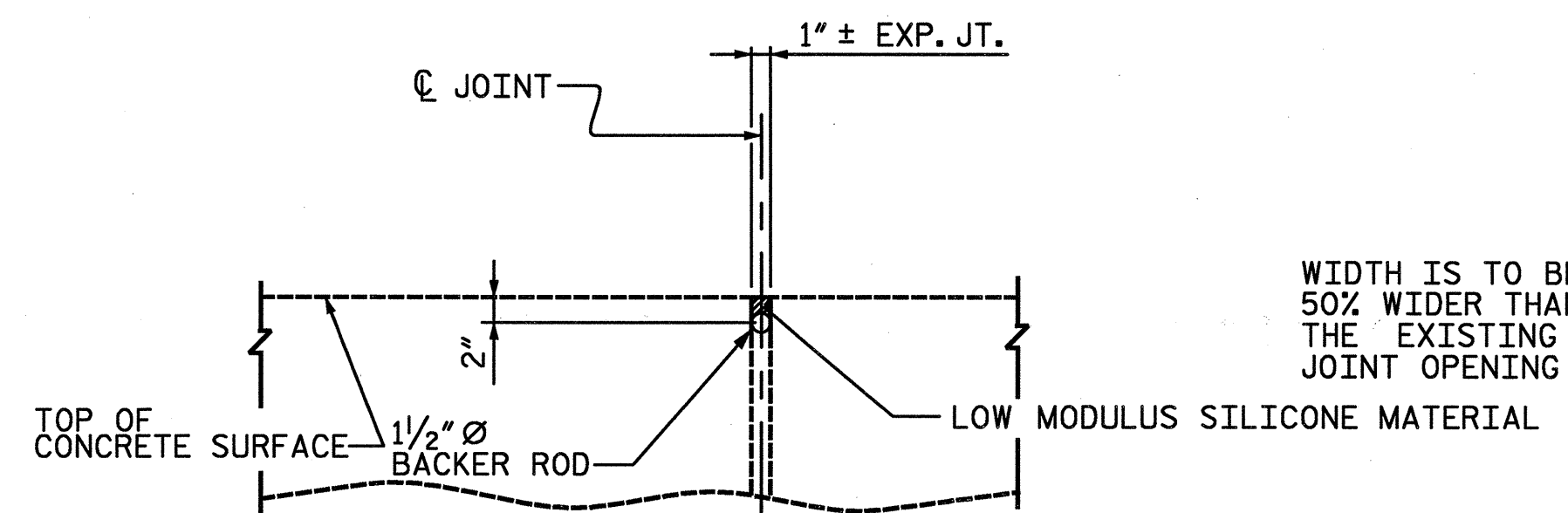


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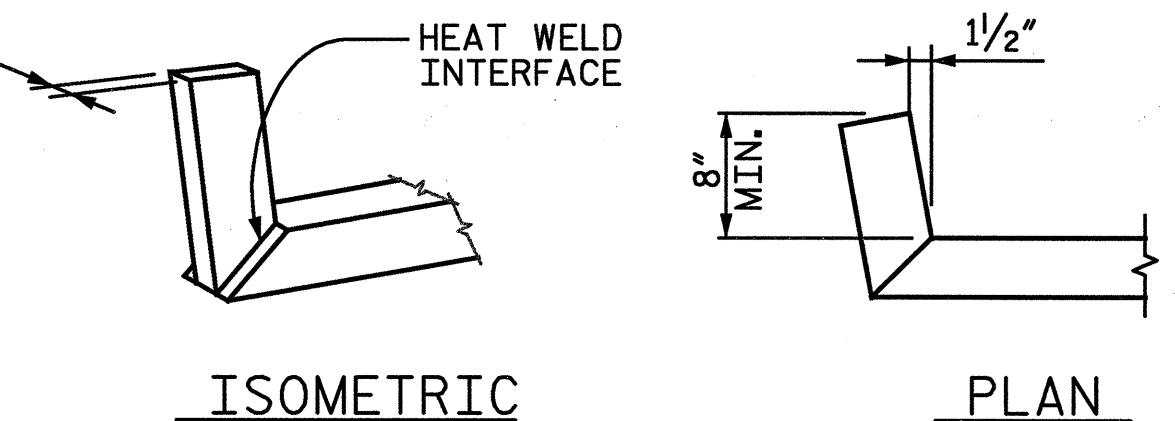


**TYPICAL SECTION**

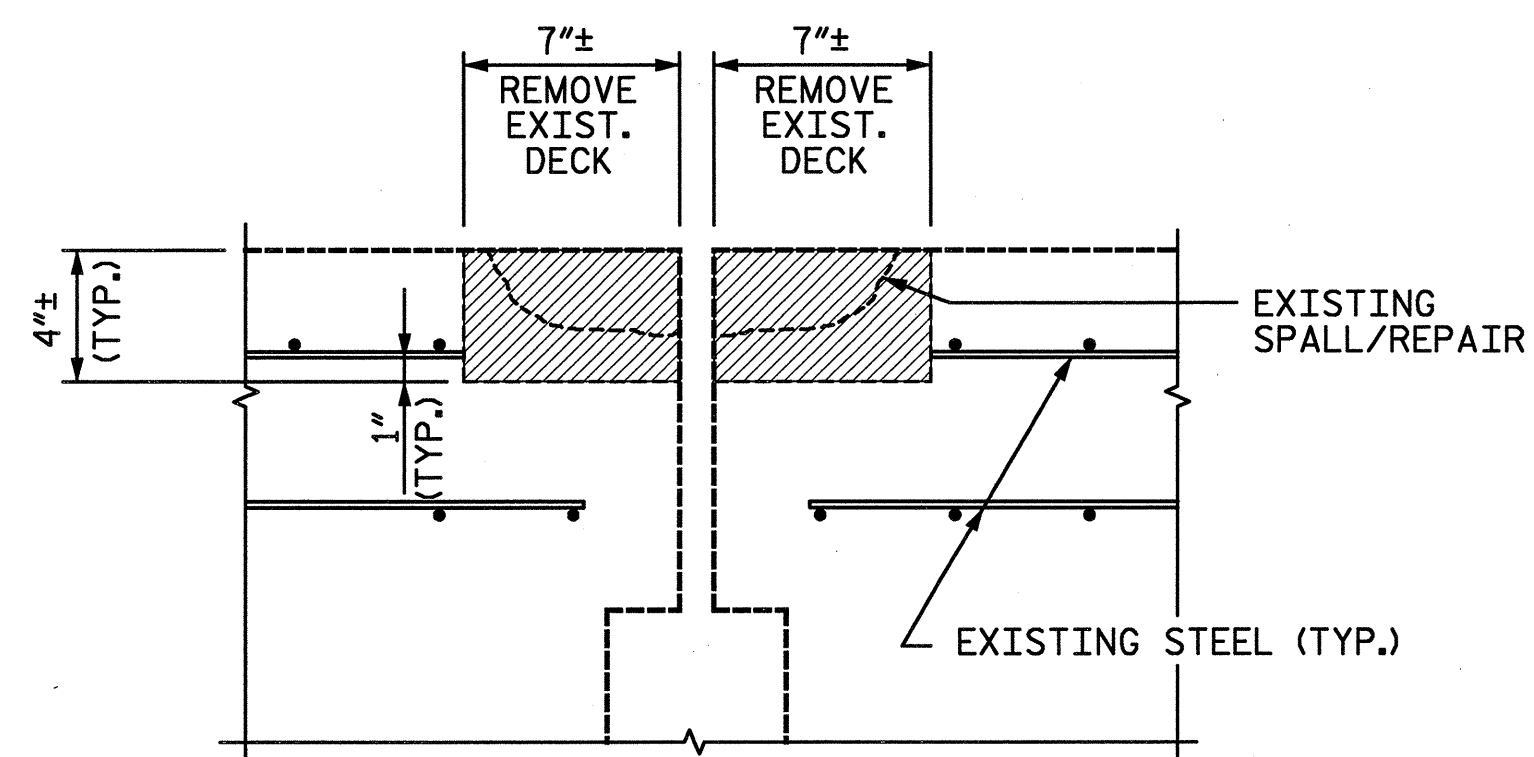
- NOTES:**
- FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.
  - FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.
  - PAYMENT FOR INSTALLATION OF THE 1/2" Ø BACKER ROD & LOW MODULUS SILICONE JOINT SEALER MATERIAL SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION OF THE BRIDGE.



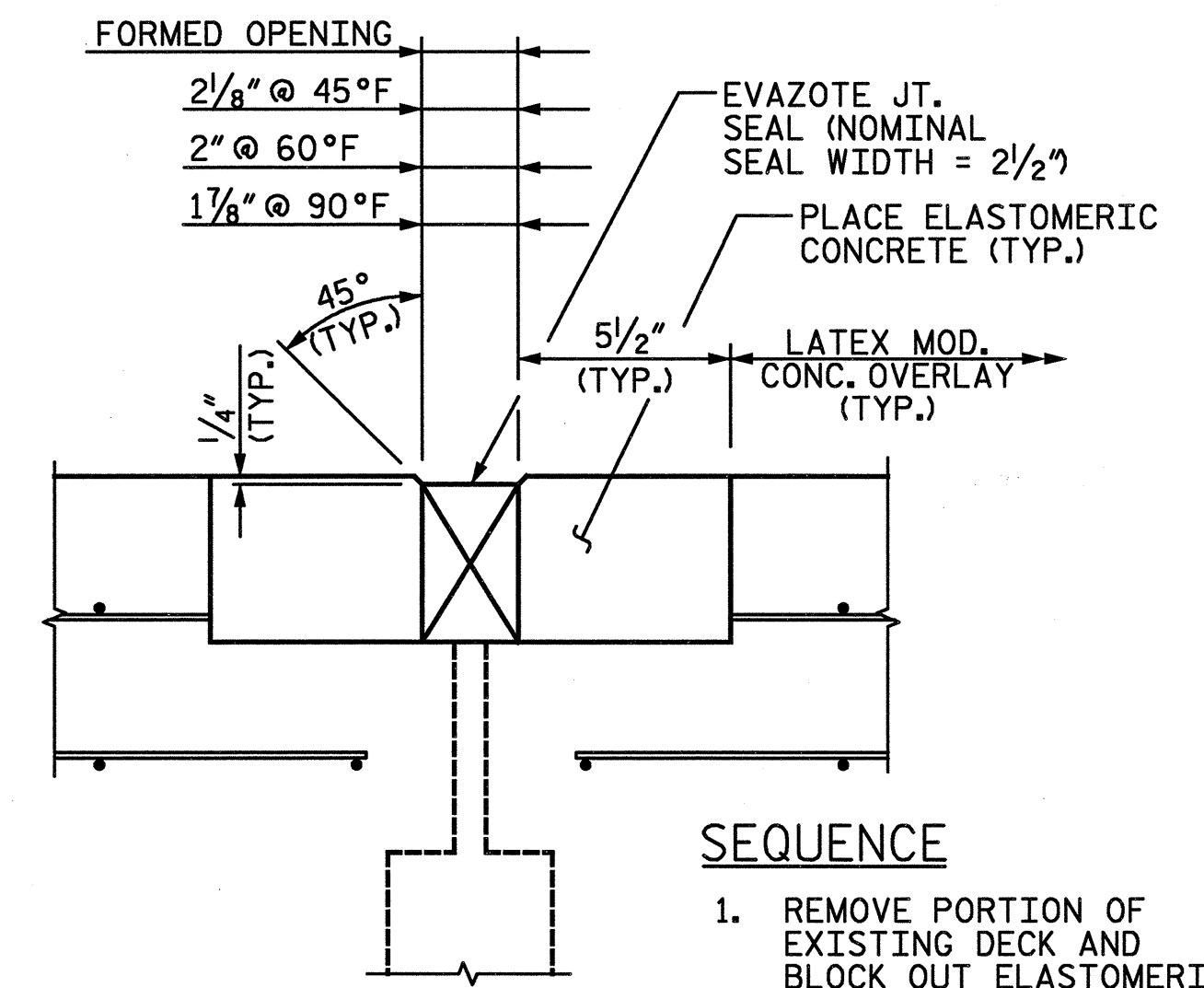
**TYPICAL JOINT REPLACEMENT (AT BENTS 1 & 2)**



**EVAZOTE JOINT DIRECTIONAL CHANGE DETAIL**

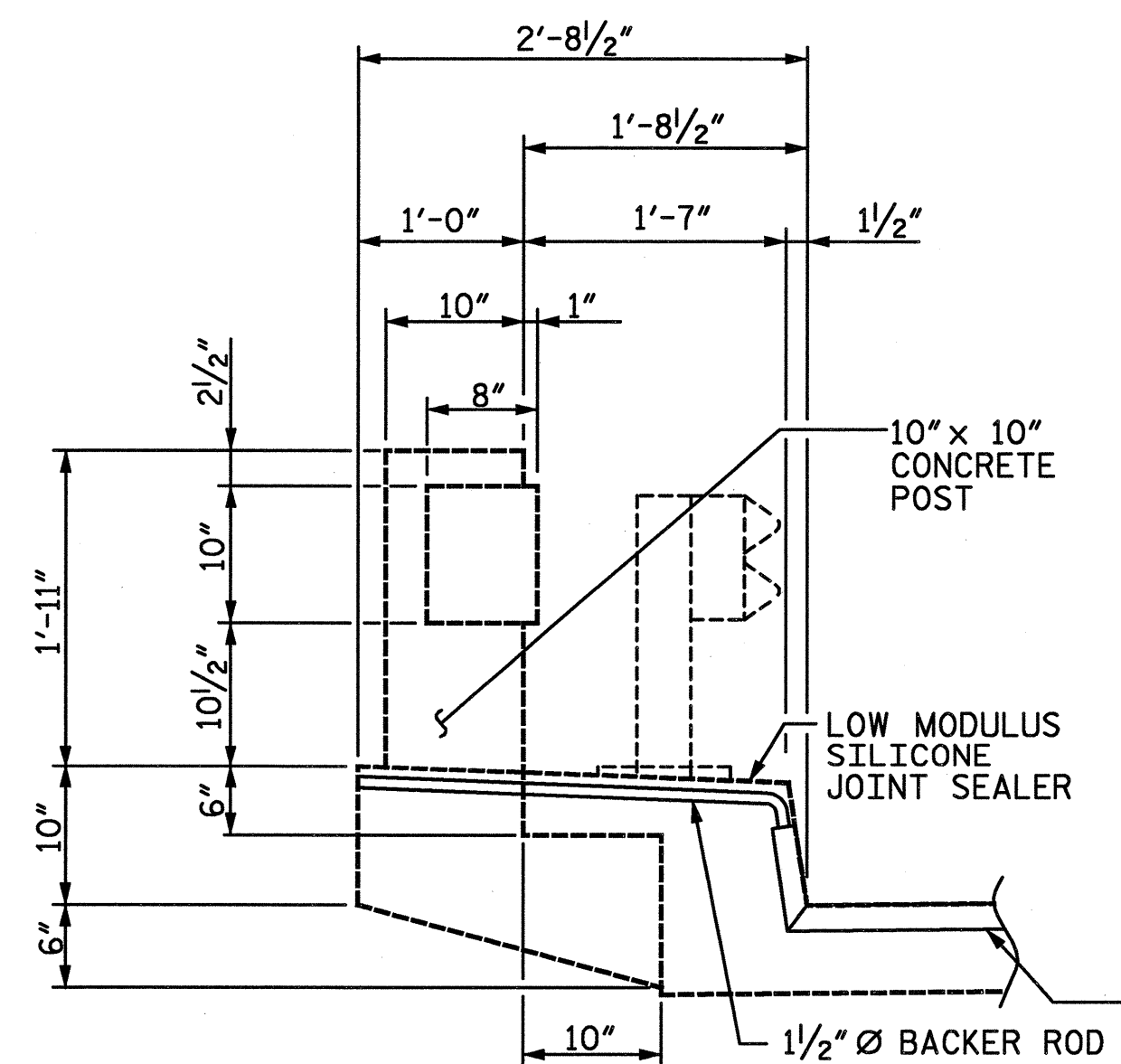


**REMOVAL SECTION**



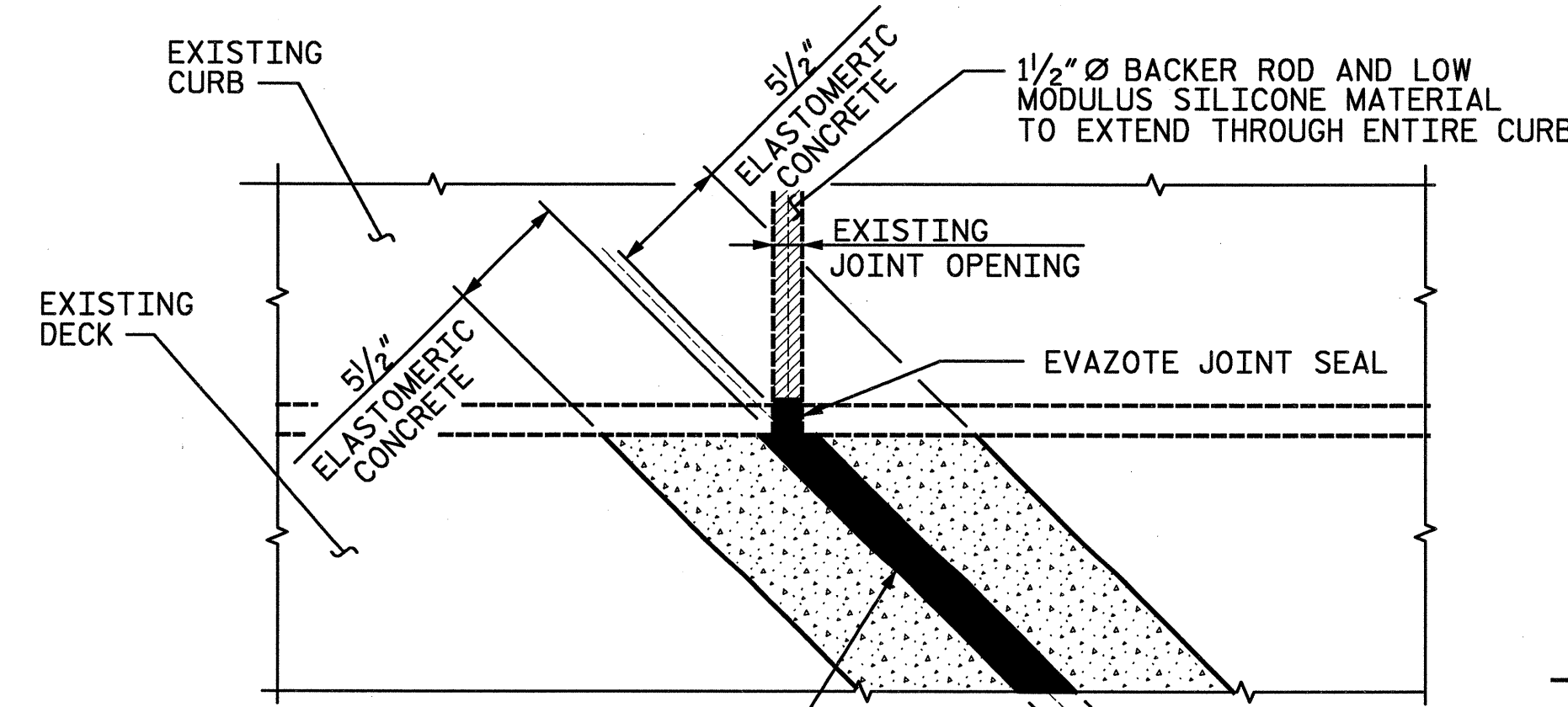
**PROPOSED SECTION**

- SEQUENCE**
- REMOVE PORTION OF EXISTING DECK AND BLOCK OUT ELASTOMERIC AREA.
  - FORM JOINT AND POUR ELASTOMERIC CONCRETE.
  - REMOVE JOINT FORM.
  - INSTALL EVAZOTE JOINT.

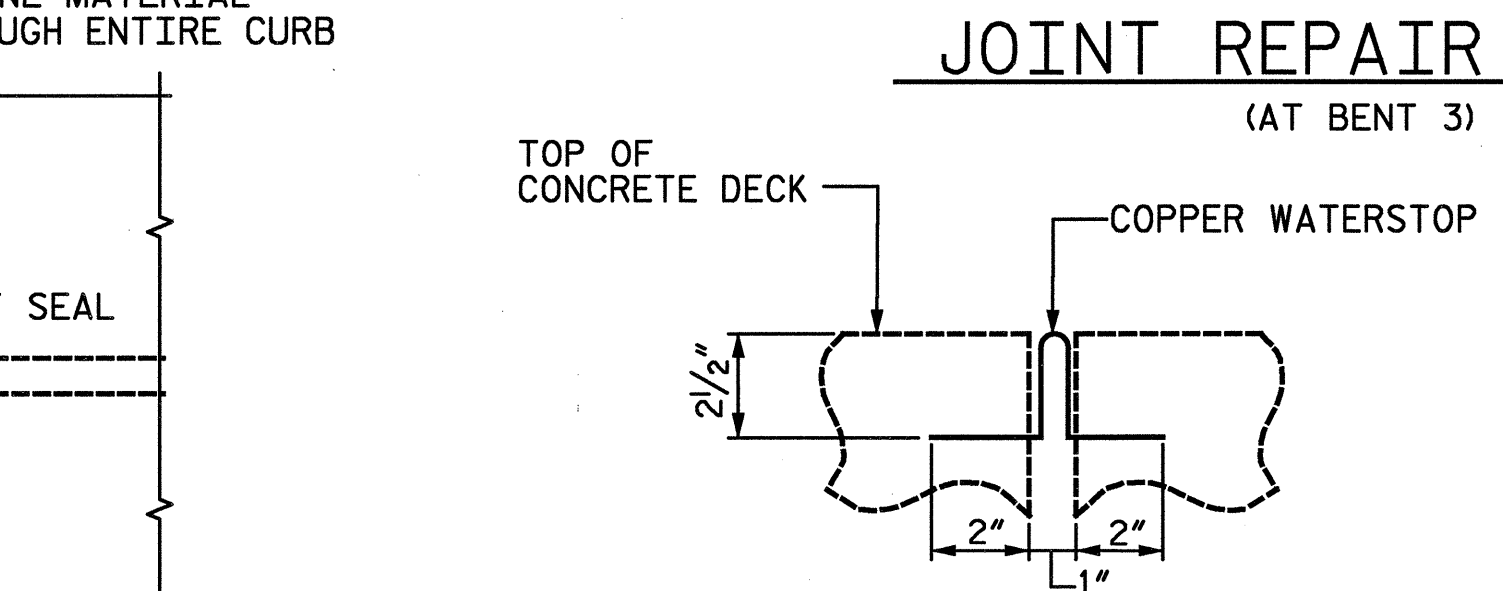


**CURB AND RAIL SECTION \***

\*PER SIDE, THERE ARE 9 POSTS PER SPAN  
 TOTAL RAIL LENGTH = 280' ± PER SIDE  
 (EVAZOTE JOINT SEAL BENT 3)  
 (1/2" Ø BACKER ROD BENTS 1&2)



**PLAN VIEW OF EVAZOTE JOINT @ GUTTERLINE**

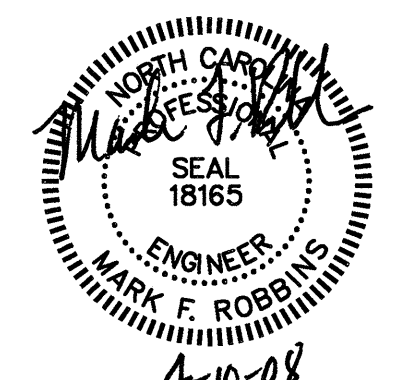
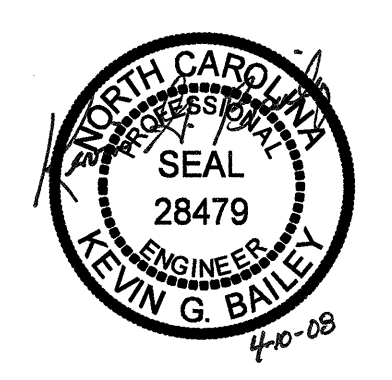


**JOINT REPAIR DETAIL (AT BENT 3)**

**EXISTING EXPANSION JOINT DETAIL**

BILL OF MATERIAL	
BENT NO.	ELASTOMERIC CONCRETE (CU. FT.) *
3	11.2

\* BASED ON MINIMUM BLOCKOUT SHOWN  
 NOTE: SEE APPROACH SLAB FOR ELASTOMERIC CONCRETE AT END BENTS



PROJECT NO. **B-5022**  
**HARNETT** COUNTY  
 BRIDGE: **81**

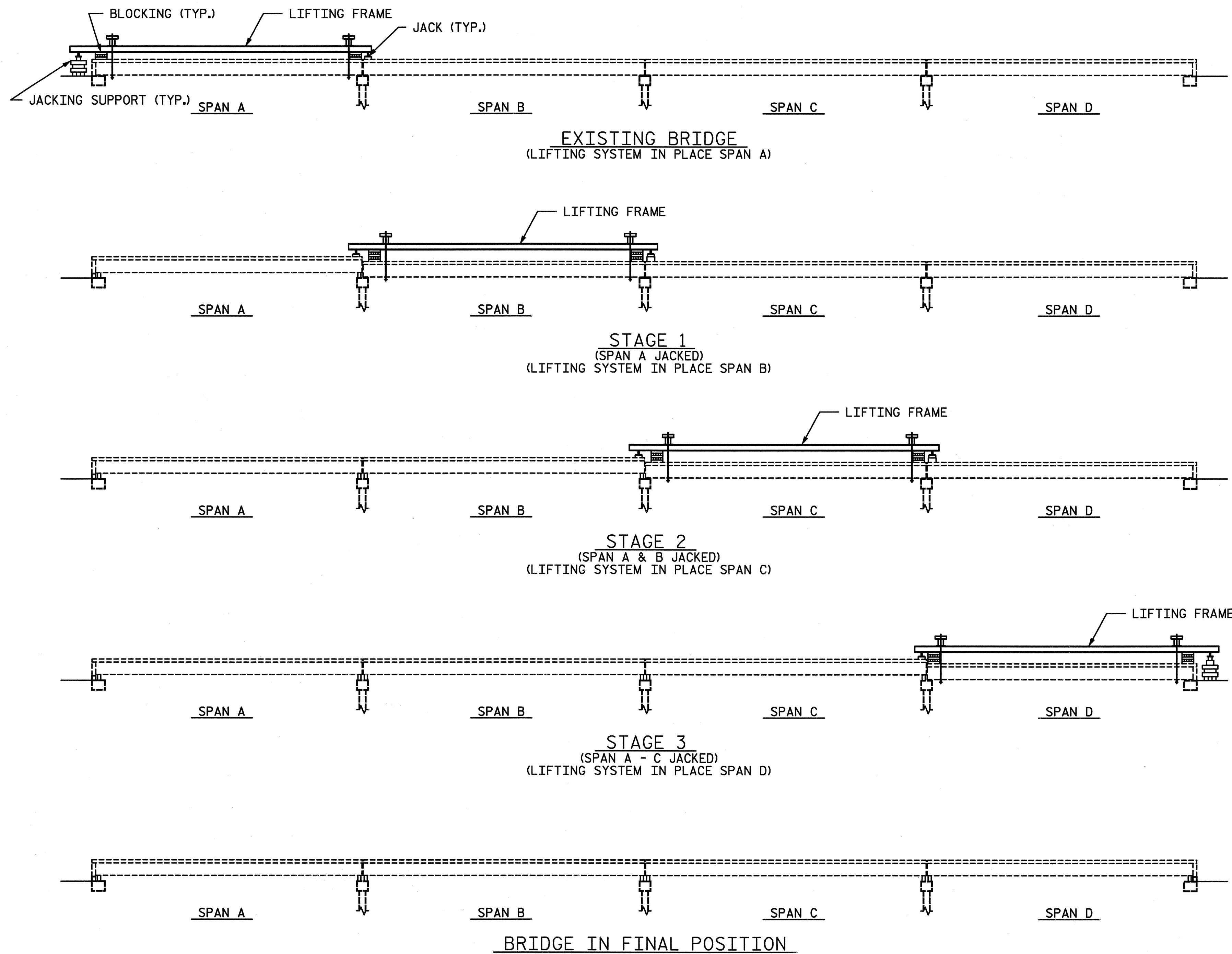
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
EXISTING SUPERSTRUCTURE TYPICAL SECTION					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.	5-36
TOTAL SHEETS	44

DRAWN BY: **TRL** DATE: **3-08**  
 CHECKED BY: **KGB** DATE: **3-08**

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 Charlotte, NC 28208



**JACKING SEQUENCE FOR BRIDGE 81**

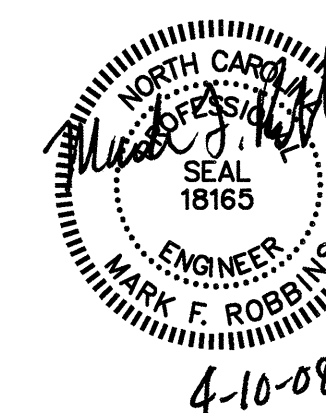
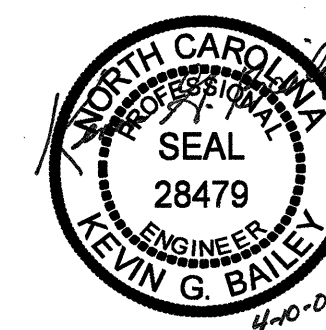
**NOTES:**

1. THE CONTRACTOR SHALL JACK ALL BEAMS IN ANY ONE SPAN SIMULTANEOUSLY.
2. TRAFFIC SHALL NOT BE ALLOWED ON THE STRUCTURE UNTIL THE WORK REQUIRED BY THE CONTRACT DOCUMENTS IS COMPLETE.
3. PRIOR TO INSTALLING BEARING PEDESTALS AND NEW BEARINGS, CONTRACTOR SHALL MAKE ANY REPAIRS TO BENTS AS REQUIRED IN THE CONTRACT DOCUMENTS.
4. CONTRACTOR SHALL SUBMIT JACKING PLANS AND CALCULATIONS SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA FOR REVIEW AND APPROVAL PRIOR TO MATERIAL PURCHASE OR FABRICATION OF JACKING SYSTEM.
5. FOR ADDITIONAL INFORMATION ON JACKING SEE SPECIAL PROVISION "BRIDGE JACKING".
6. LIFTING FRAME SHALL EXTEND BEYOND THE LENGTH OF THE LIFTED SPAN AND PROVIDE BEARINGS AT THE SAME LOCATION AS THE ADJACENT GIRDER BEARINGS.
7. CONTRACTOR SHALL SHIM BRIDGE SPAN DURING JACKING SUCH THAT THE MAXIMUM UNSHIMMED LIFT IS 1".
8. CONTRACTOR SHALL PROVIDE SPAN LIFT POINTS AS CLOSE AS POSSIBLE TO THE FACE OF BENT CAP.
9. HYDRAULIC SYSTEM SHALL BE CONNECTED SUCH THAT ALL JACKS LIFT SIMULTANEOUSLY.
10. CONTRACTOR SHALL DESIGN LIFTING SYSTEM SUCH THAT HORIZONTAL POSITION OF THE LIFTED SPAN CAN BE MAINTAINED.

**CONSTRUCTION SEQUENCE:**

1. CONSTRUCT JACKING SUPPORT AT END BENT. CONTRACTOR SHALL MAKE SURE CURTAIN WALL IS FULLY DETACHED FROM END BENT CAP, WINGS, AND FILL.
2. CONSTRUCT THE LIFTING FRAME (FOR SPAN A) MAKING SURE SYSTEM IS LEVEL. INSTALL BLOCKING AS NECESSARY.
3. LIFT SPAN A TO REQUIRED ELEVATION AND INSTALL BEARING PEDESTALS AND NEW BEARINGS. PRIOR TO INSTALLING BEARING PEDESTALS AND NEW BEARINGS, CONTRACTOR SHALL MAKE ANY REPAIRS TO BENTS AS REQUIRED IN THE CONTRACT DOCUMENTS.
4. CONSTRUCT END BENT AND BENT MODIFICATIONS AS SHOWN IN THE CONTRACT DOCUMENTS. END BENT MODIFICATIONS NECESSARY TO ANCHOR THE SPAN SHALL BE COMPLETED PRIOR TO PROCEEDING.
5. SHIFT LIFT SYSTEM TO SPAN B AND REPEAT STEPS 2 THROUGH 4.
6. SHIFT LIFT SYSTEM TO SPAN C AND REPEAT STEPS 2 THROUGH 4.
7. SHIFT LIFT SYSTEM TO SPAN D AND REPEAT STEPS 1 THROUGH 4.
8. FINISH REMAINING REPAIRS AND MODIFICATIONS AS INDICATED IN CONTRACT DOCUMENTS. REMOVE TRAFFIC CONTROL MEASURES AND OPEN BRIDGE TO TRAFFIC.

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PROJECT NO. B-5022  
 HARNETT COUNTY  
 BRIDGE: 81

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**BRIDGE JACKING SEQUENCE**

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			5-37
2			4			TOTAL SHEETS 44

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 Charlotte, NC 28208

DRAWN BY : TJT      DATE : 3-08  
 CHECKED BY : KGB      DATE : 3-08



NOTES

THE EXISTING ANCHOR BOLTS SHALL BE CUT FLUSH WITH THE EXISTING TOP OF CAP. ANCHOR BOLTS SHALL BE DRILLED AND ADHESIVELY ANCHORED INTO THE EXISTING CAP. CONTRACTOR SHALL CORE DRILL THE EXISTING ANCHOR BOLTS USING A CORE BIT WITH INSIDE DIAMETER MATCHING THAT OF THE EXISTING ANCHOR BOLT DIAMETER. THE ANCHOR BOLT HOLES IN THE PROPOSED TOP AND BOTTOM PLATE DETAIL SHALL MATCH THE ANCHOR BOLT HOLES IN THE EXISTING BEAMS. THIS MATCH SHALL FACILITATE THE PROPER ALIGNMENT OF THE PEDESTAL. THE ANCHOR BOLT LENGTH IS BASED ON AN 12" EMBEDMENT INTO THE EXISTING CAP AND MAY BE ADJUSTED BASED ON THE MINIMUM EMBEDMENT SPECIFIED BY THE MANUFACTURER OF THE EPOXY ADHESIVE BONDING SYSTEM. FOR ADHESIVELY ANCHORED ANCHOR BOLTS, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL FIELD VERIFY PROPOSED ANCHOR BOLT LOCATIONS PRIOR TO FABRICATION OF THE TOP AND BOTTOM PLATES FOR THE PROPOSED PEDESTALS.

FOR CLEANING AND PAINTING EXISTING BEARING PLATES, SEE SPECIAL PROVISION.

THE PROPOSED PEDESTAL HEIGHT ASSUMES THAT THE TOTAL HEIGHT OF THE EXISTING BEARING ASSEMBLIES IS 2 1/2". THE CONTRACTOR SHALL MEASURE THE HEIGHT OF ALL BEARING ASSEMBLIES AND ADJUST THE HEIGHT OF THE PROPOSED PEDESTALS ACCORDINGLY.

CONTRACTOR SHALL CLIP PLATES AS NECESSARY TO PREVENT PROJECTION BEYOND BENT CAP.

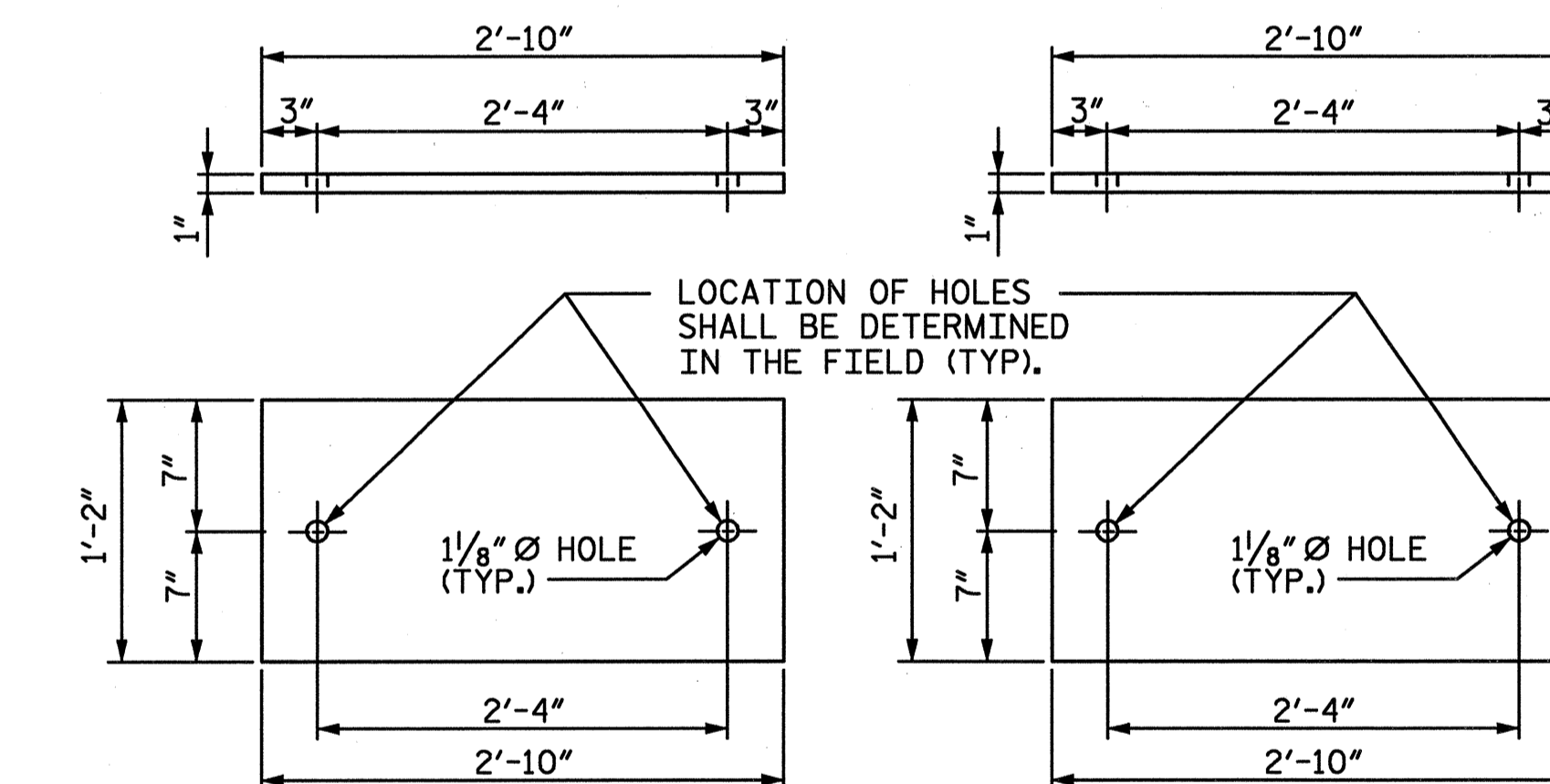
ALL THREADS OF BOLTS/ANCHOR BOLTS SHALL BE BURRED AFTER TIGHTENING NUTS.

1" Ø BOLTS IN TOP PLATE SHALL CONFORM TO ASTM A325.

1" Ø ANCHOR BOLTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. CONTRACTOR SHALL VERIFY ANCHOR BOLT DIAMETER AND ADJUST AS NECESSARY TO MATCH EXISTING ANCHOR BOLT DIAMETER.

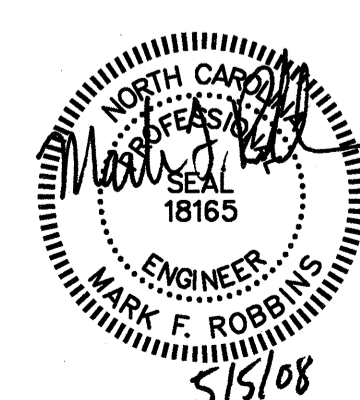
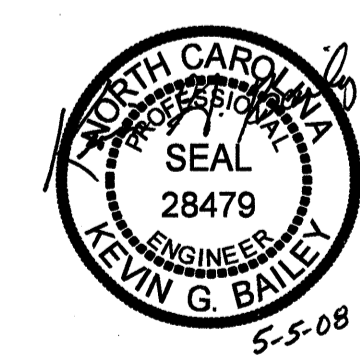
PROPOSED PEDESTALS SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. AREAS TO BE WELDED SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

STRUCTURAL STEEL  
(APPROX. LBS.) 17200



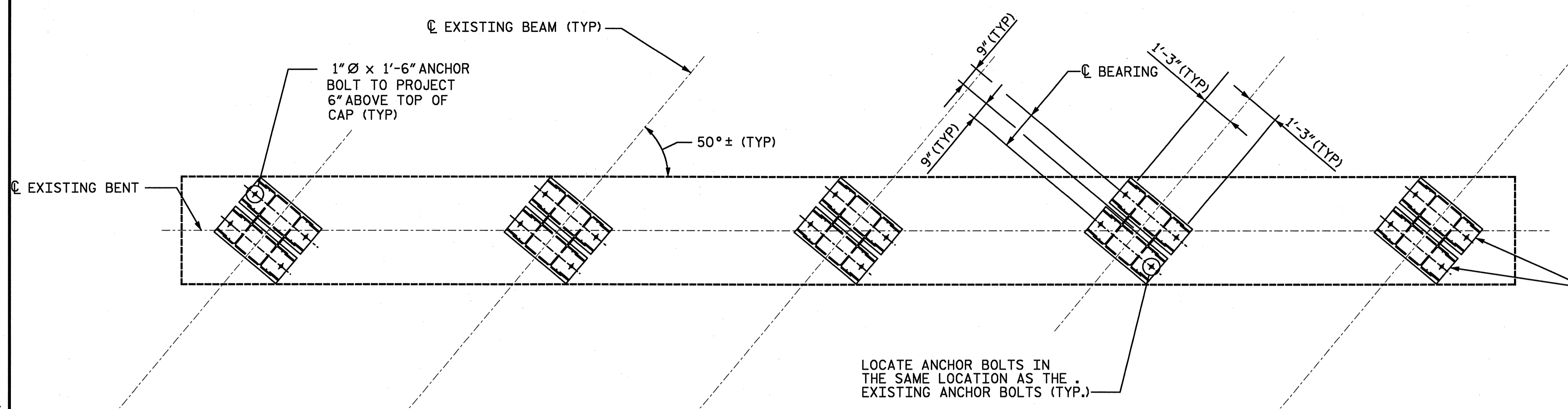
PROPOSED TOP PLATE DETAIL PROPOSED BOTTOM PLATE DETAIL

PROJECT NO. **B-5022**  
HARNETT COUNTY  
BRIDGE: **81**

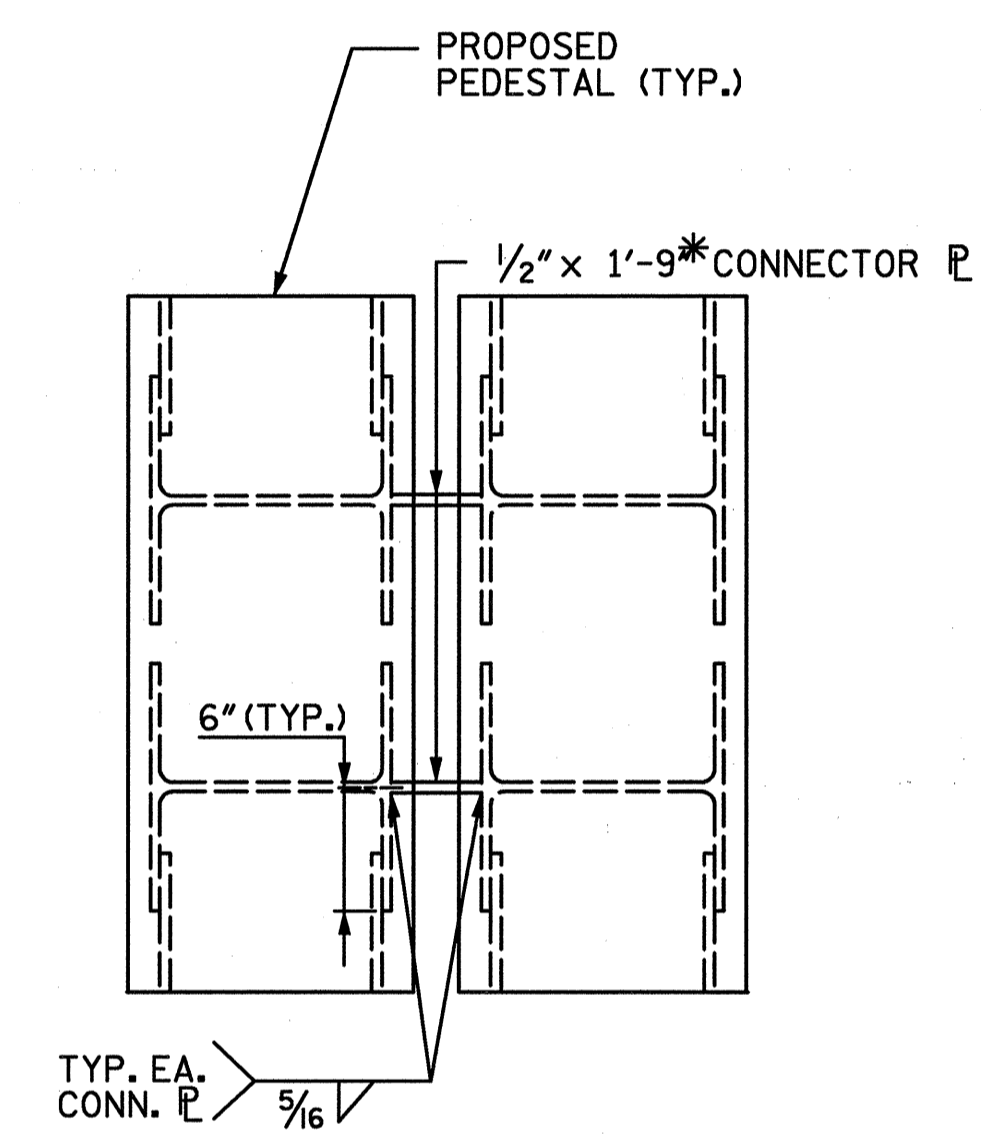


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
INTERIOR BENT  
BEARING MODIFICATIONS

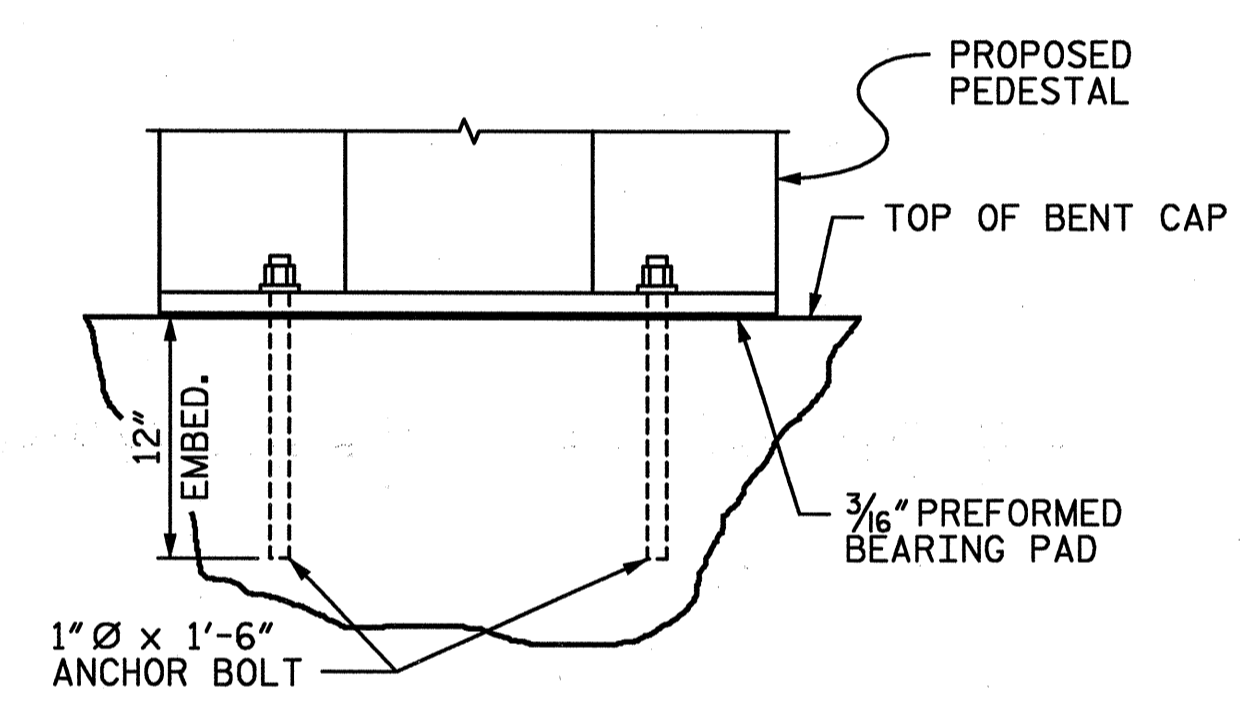
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1	STV	5-08	3			44
2			4			



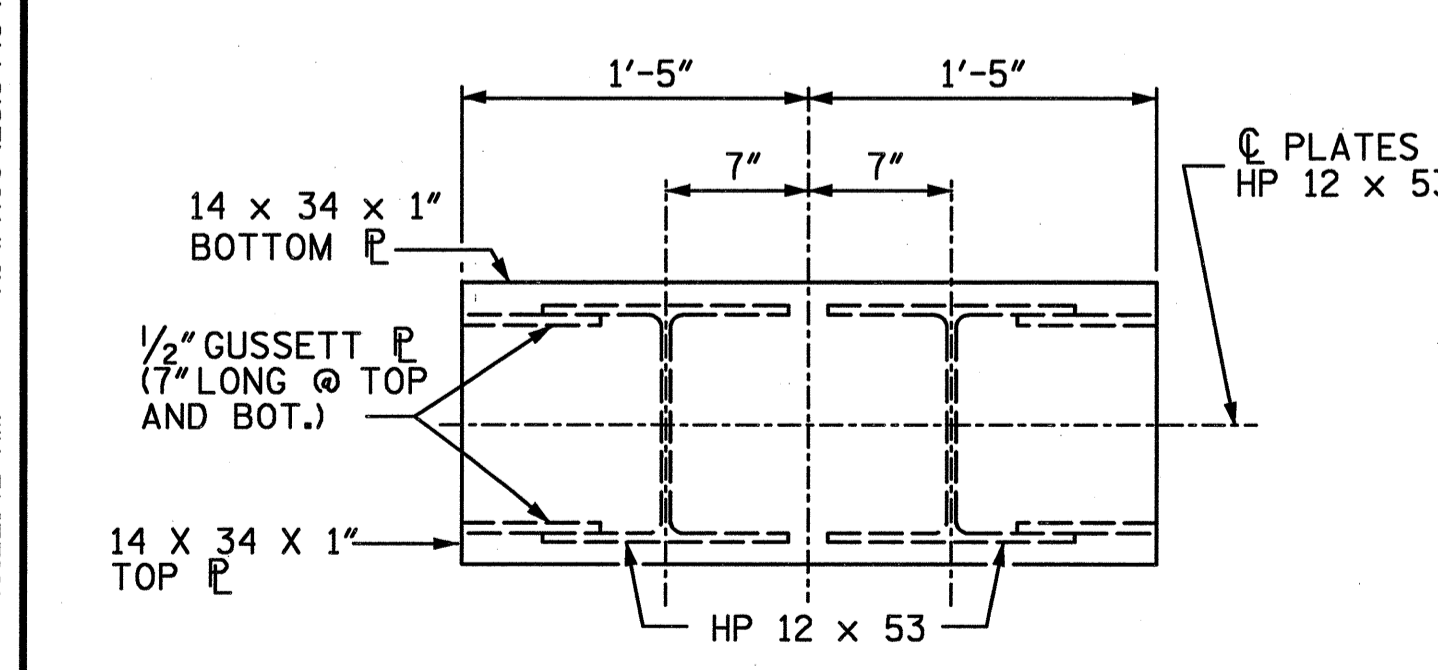
PLAN OF EXISTING BENT



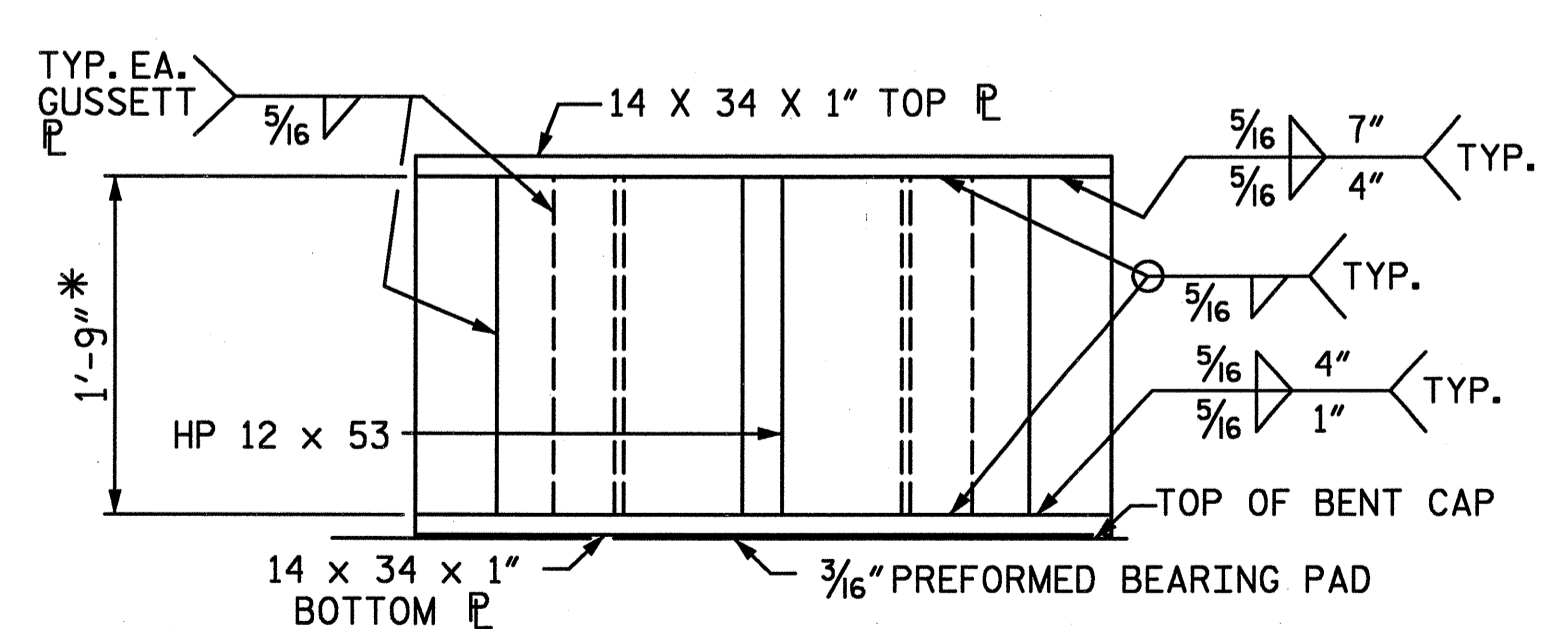
PEDESTAL ATTACHMENT DETAIL



BEARING ATTACHMENT DETAIL



PEDESTAL DETAILS



ELEVATION

REVISION #1: REVISED PER REVIEW COMMENTS  
BY: TJT DATE: 5-08  
CH'KD BY: KGB DATE: 5-08

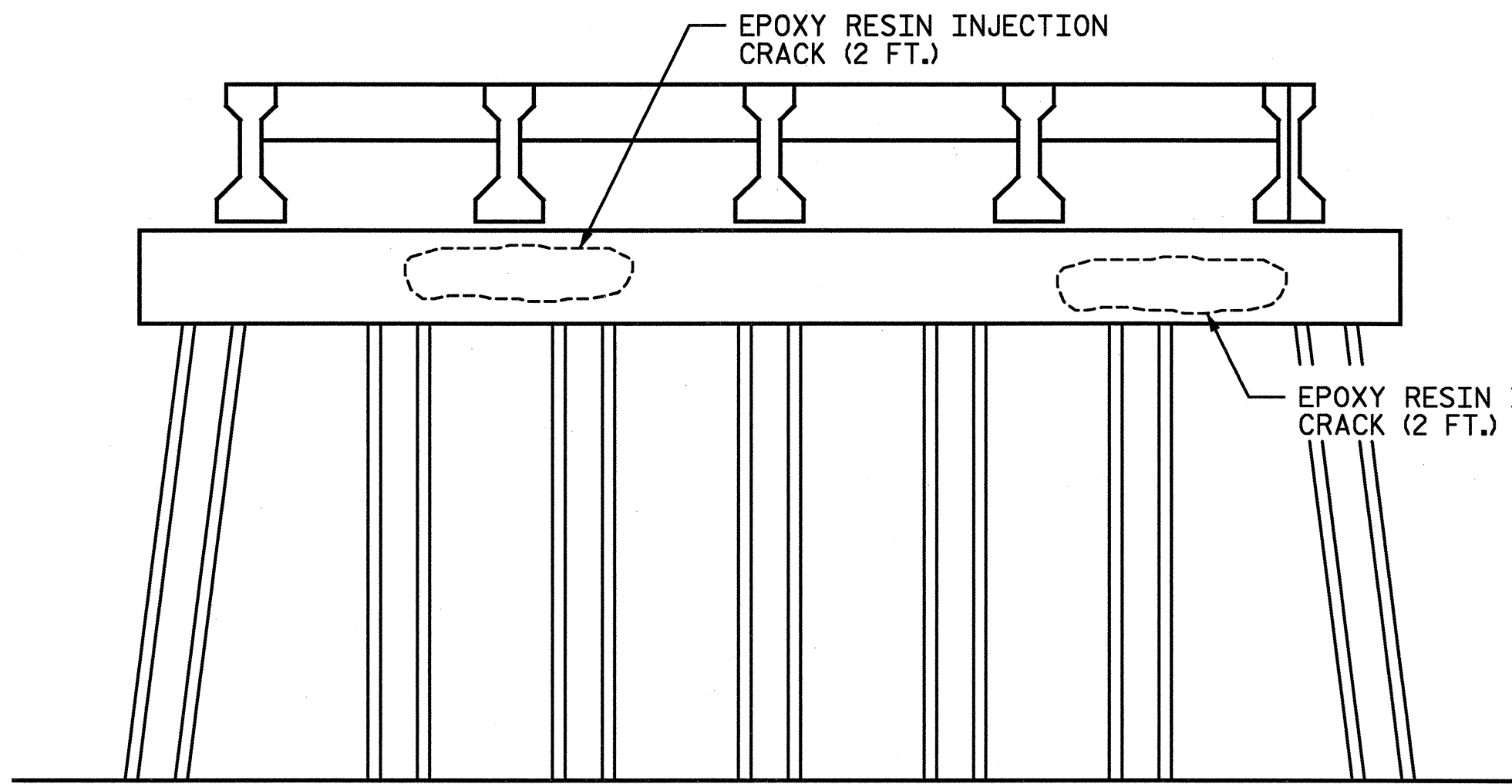
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Charlotte, NC 28208

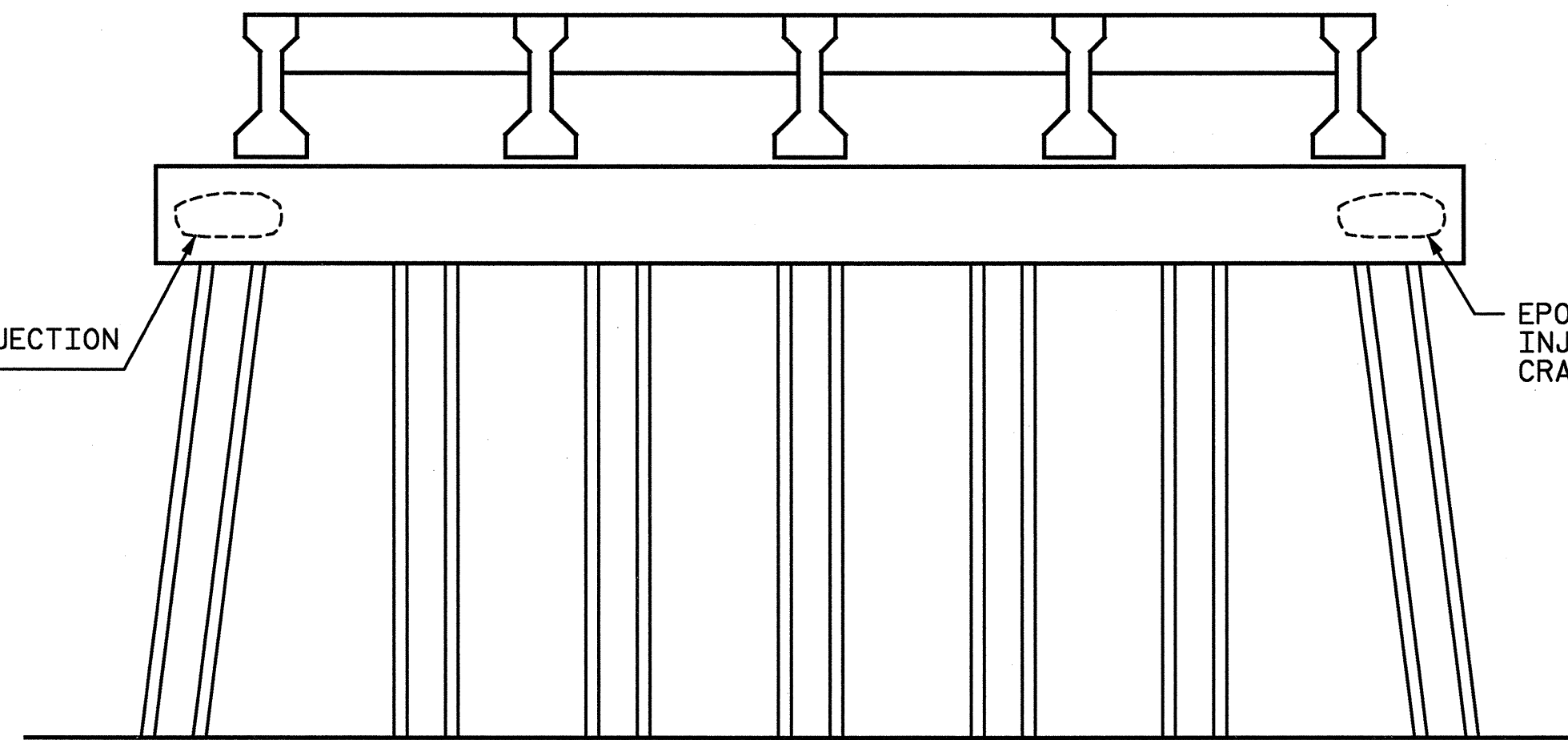
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 timothy.townsend 5/2/2008

DRAWN BY: TRL DATE: 3-08  
CHECKED BY: KGB DATE: 3-08

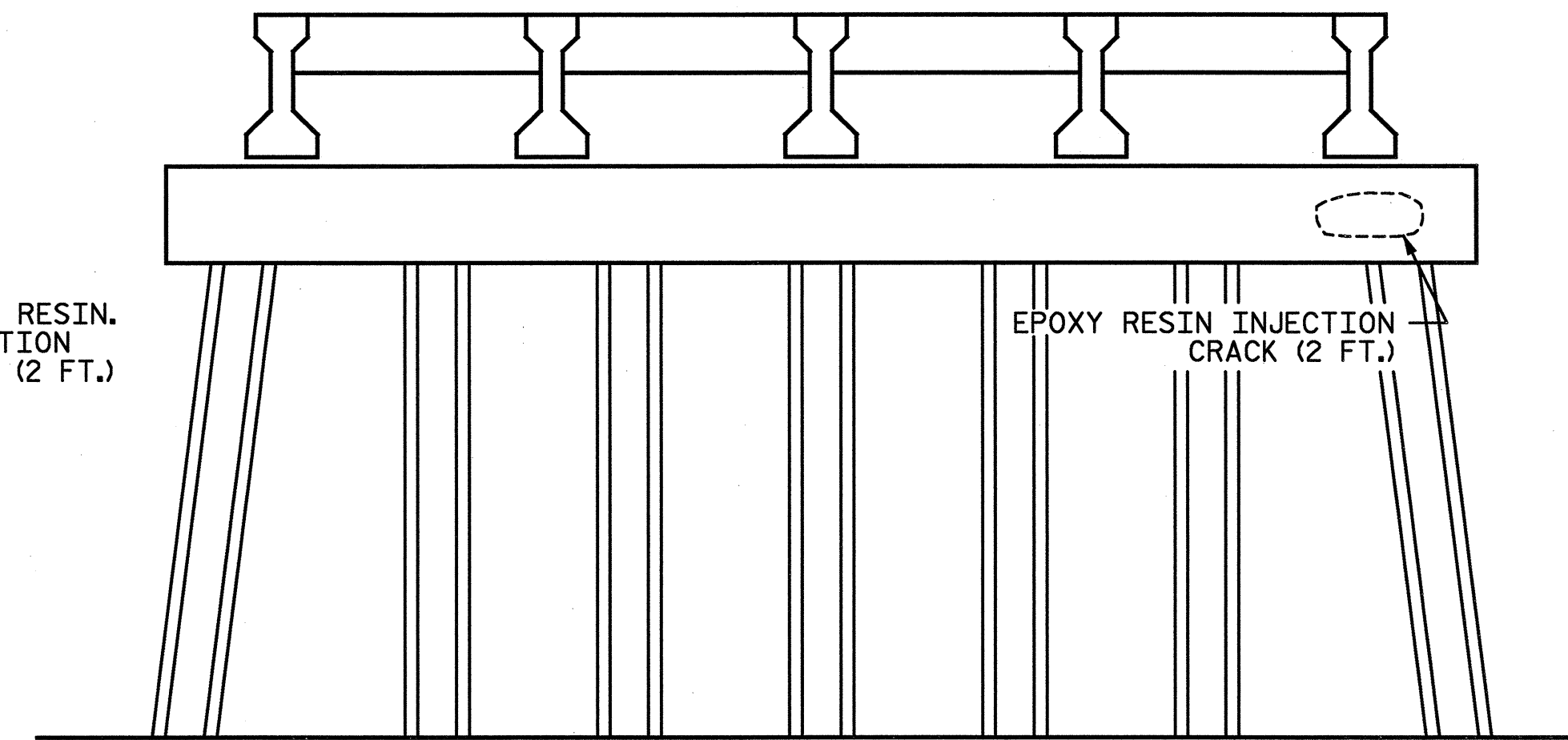
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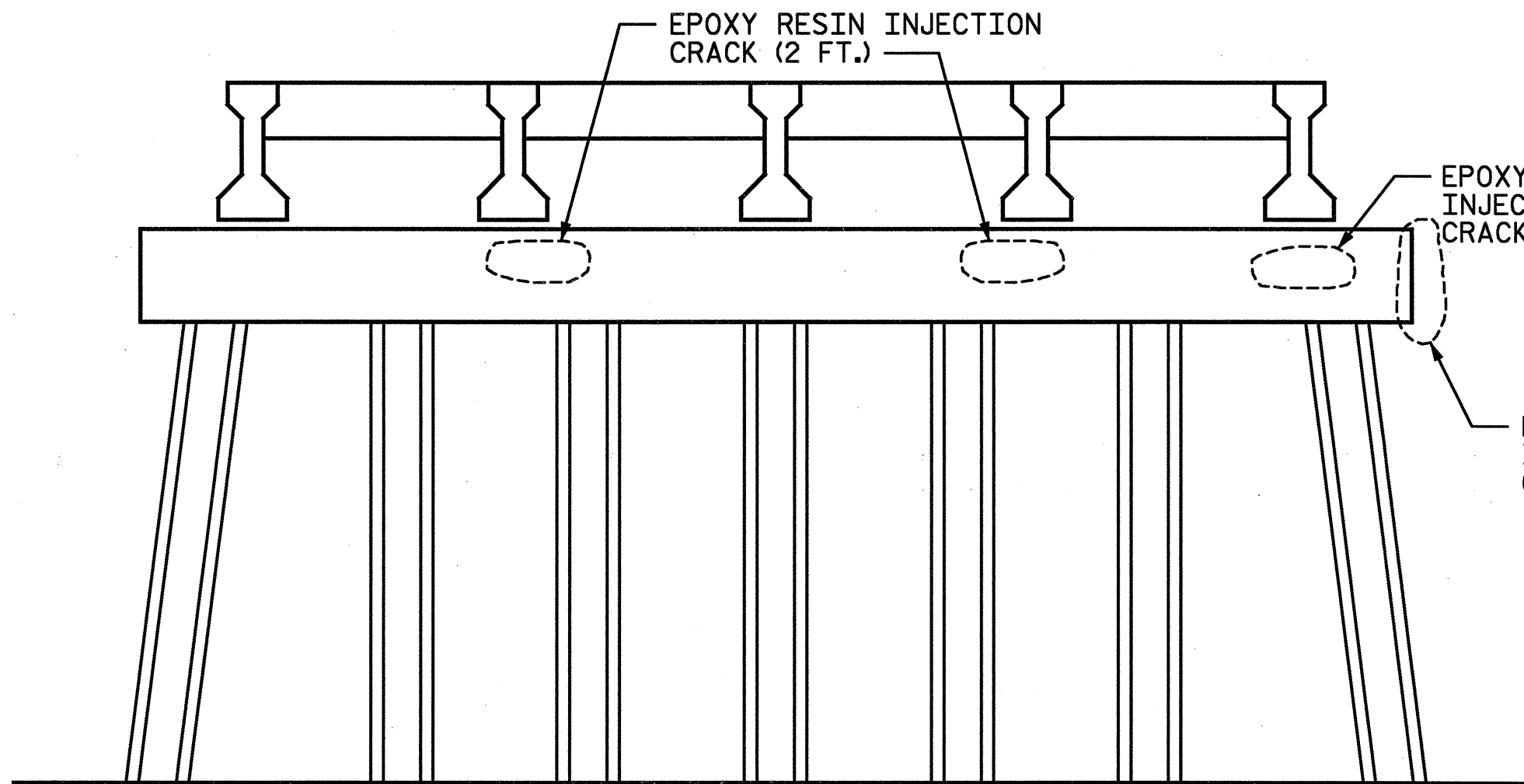
**BENT 1 ELEVATION**  
(LOOKING WEST)



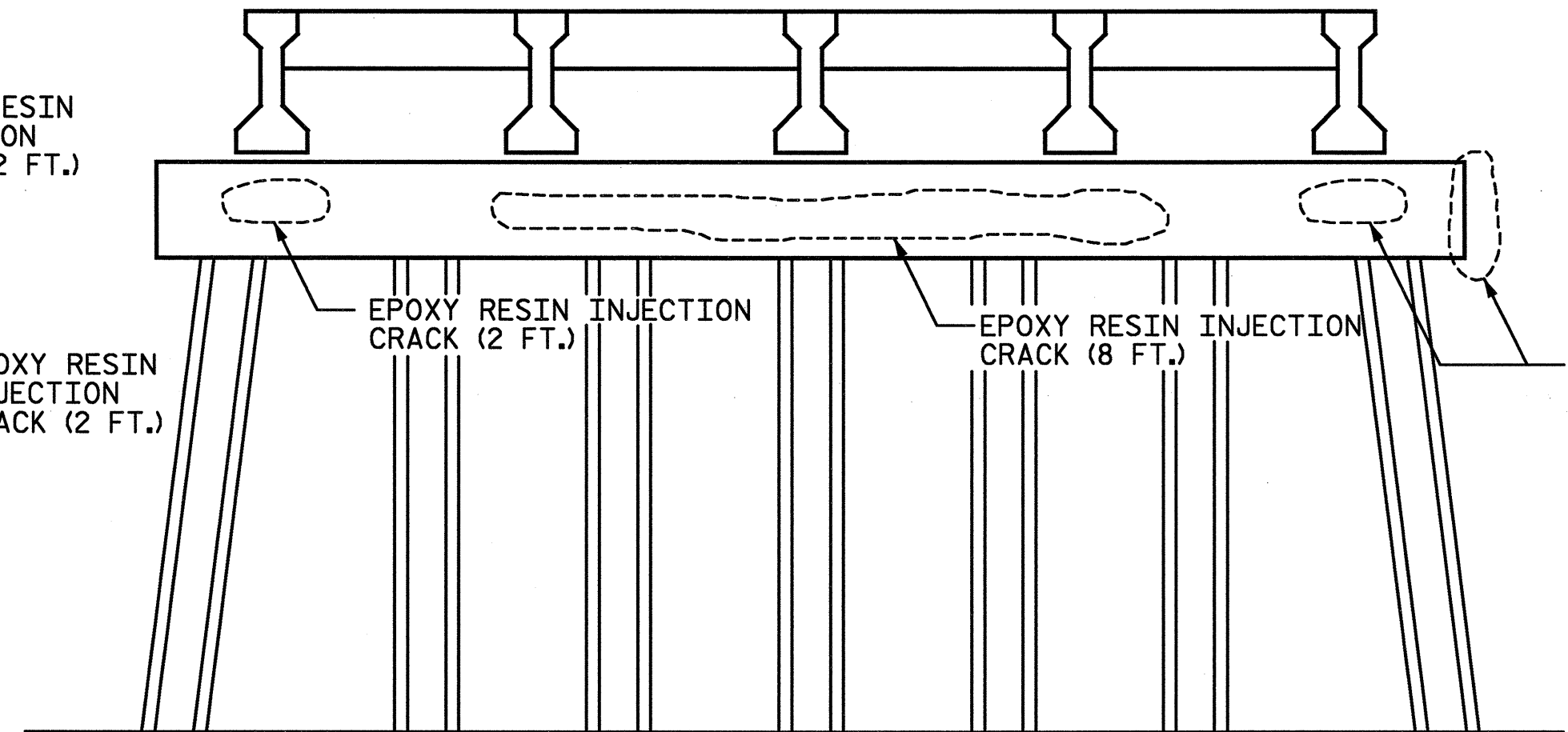
**BENT 2 ELEVATION**  
(LOOKING WEST)



**BENT 3 ELEVATION**  
(LOOKING WEST)

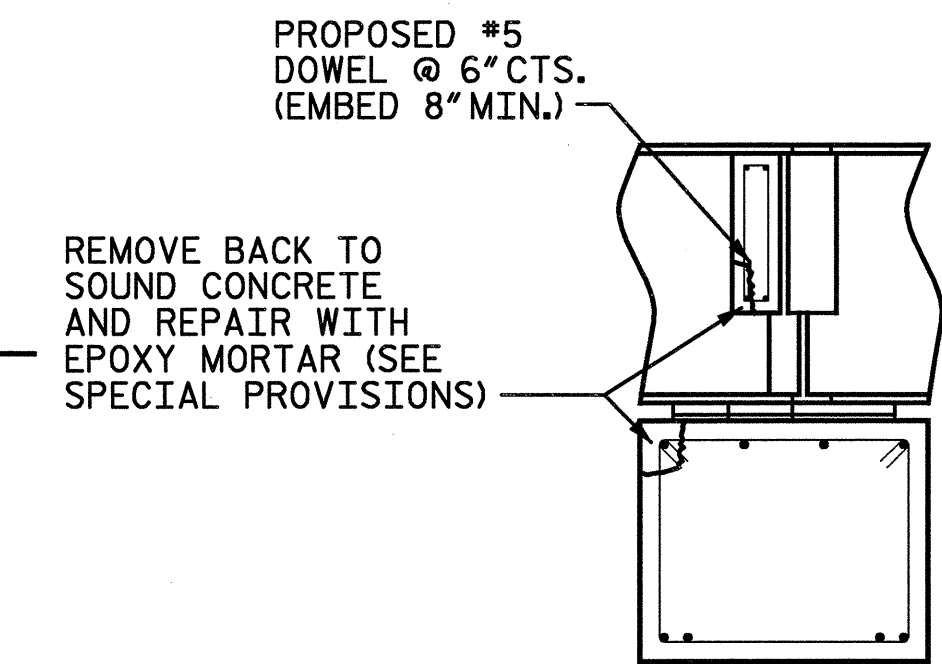


**BENT 1 ELEVATION**  
(LOOKING EAST)

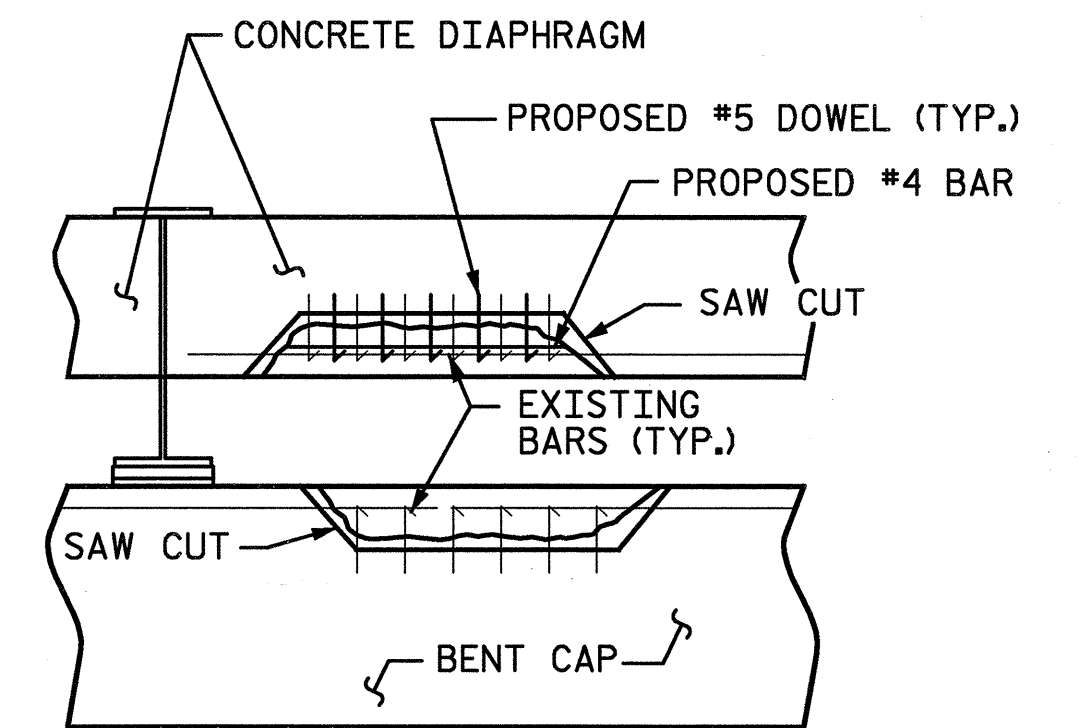


**BENT 2 ELEVATION**  
(LOOKING EAST)

- NOTES:**
1. REPAIRS SHALL BE IMPLEMENTED WHEN BRIDGE IS RAISED ABOVE REPAIR.
  2. BLOCKING SHALL NOT BE POSITIONED OVER REPAIR UNTIL REPAIR HAS CURED.
  3. SAWCUT 1/4" - 1/2" DEEP AROUND ALL SPALLS.
  4. FOR EPOXY RESIN INJECTION CRACKS, SEE SPECIAL PROVISIONS.
  5. FOR EPOXY MORTAR REPAIR, SEE SPECIAL PROVISIONS.

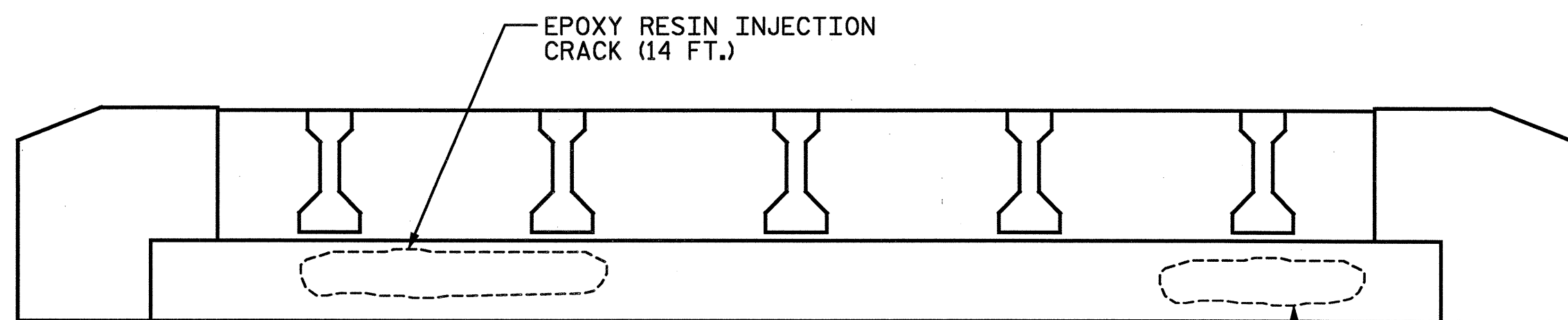


**SECTION**



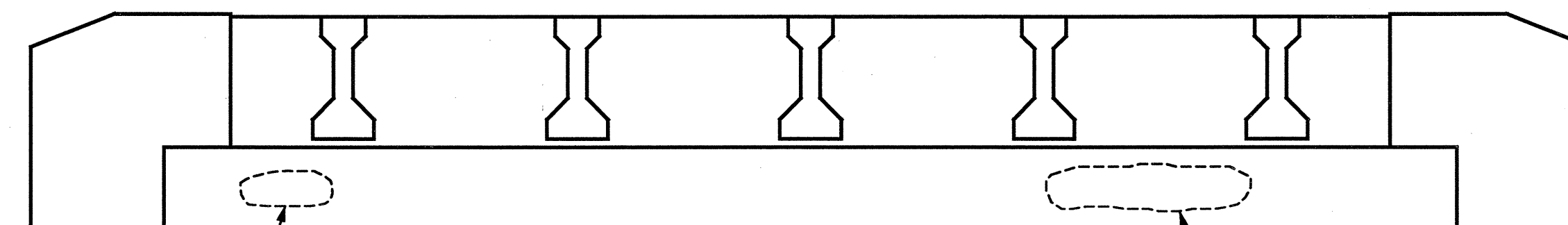
**ELEVATION**

**TYPICAL BENT AND DIAPHRAGM REPAIR DETAIL**



**END BENT 1 ELEVATION**  
(FACING END BENT)

EPOXY MORTAR REPAIR  
3'-6" X 4" X 4"  
DELAMINATION



**END BENT 2 ELEVATION**  
(FACING END BENT)

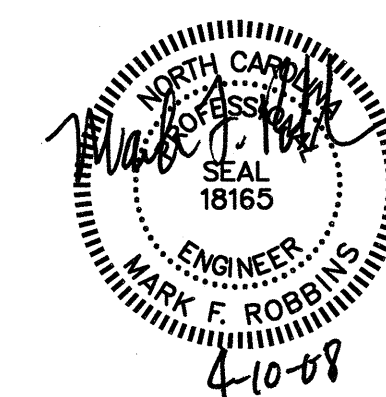
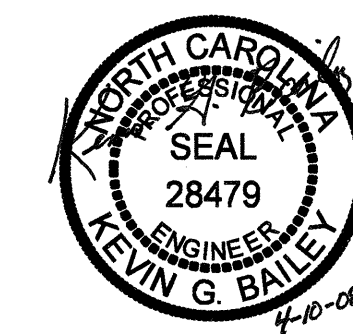
EPOXY RESIN INJECTION  
CRACK (2 FT.)

EPOXY RESIN INJECTION  
CRACK (2 FT.)

PROJECT NO. **B-5022**  
**HARNETT** COUNTY  
 BRIDGE: **81**

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 REPAIRS



D-1810.39

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 Charlotte, NC 28208

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-39
2			4			TOTAL SHEETS 44

DRAWN BY: **KGB** DATE: **3-08**  
 CHECKED BY: **PEK** DATE: **3-08**



NOTES

DIMENSIONS ARE BASED ON BEST AVAILABLE INFORMATION. CONTRACTOR SHALL FIELD VERIFY DIMENSIONS PRIOR TO CONSTRUCTION.

PORTIONS OF EXISTING END BENT SHOWN IN CROSS-HATCHED AREAS SHALL BE REMOVED.

VERTICAL AND HORIZONTAL REINFORCING STEEL EXTENDING FROM THE END BENT CAP INTO THE EXISTING EARWALLS SHALL BE CLEANED AND STRAIGHTENED. CUT EXISTING REINFORCING STEEL TO MAINTAIN REQUIRED CONCRETE COVER. MINIMUM 14" EXTENSION INTO THE PROPOSED WINGWALL.

BARS DAMAGED DURING THE CONCRETE REMOVAL SHALL BE REPLACED BY #6 DOWELS SECURED IN THE EXISTING END BENT CAP WITH EPOXY ADHESIVE AT NO ADDITIONAL PAYMENT.

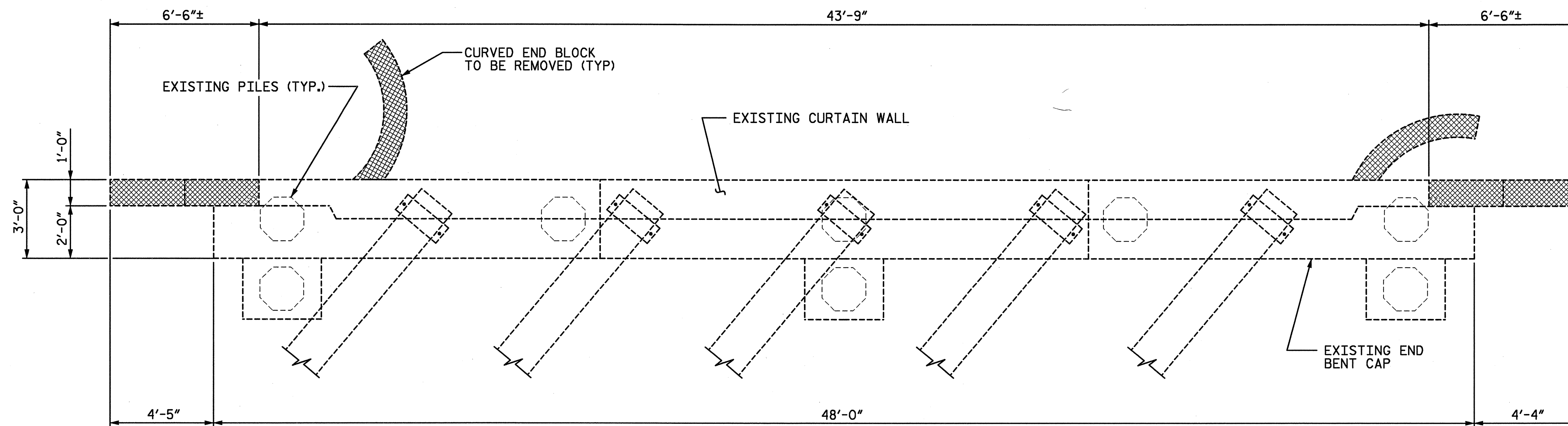
THE #6 DOWEL LENGTH SHALL BE BASED ON A 9" EMBEDMENT INTO EXISTING CONCRETE AND MAY BE ADJUSTED BASED ON THE MINIMUM EMBEDMENT SPECIFIED BY THE MANUFACTURER OF THE EPOXY ADHESIVE BONDING SYSTEM. SEE SPECIAL PROVISION FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS.

EXISTING ANCHOR BOLTS ARE TO BE CUT FLUSH WITH THE EXISTING TOP OF CAP.

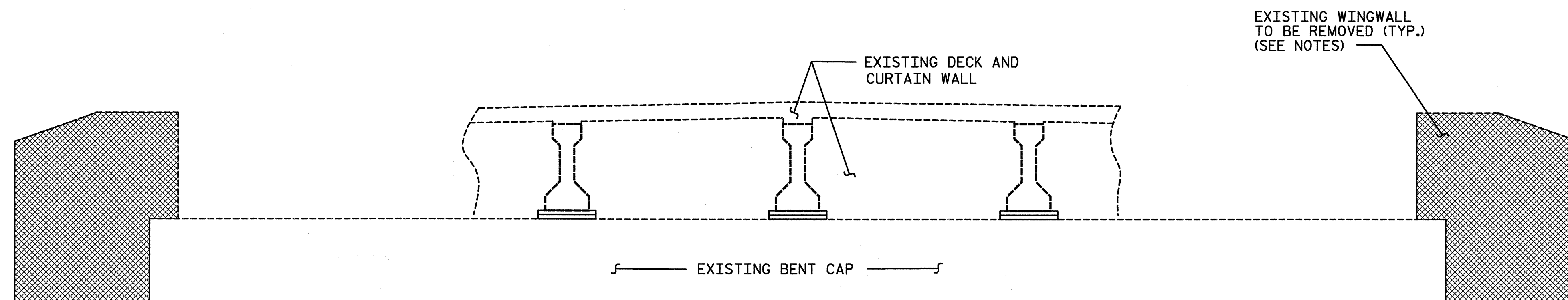
THE EXISTING CURTAIN WALL CONCRETE AROUND ANCHOR BOLTS AND BEARING ASSEMBLIES SHALL BE REMOVED, USING HAND TOOLS, AS NECESSARY TO FREE ANCHOR BOLTS AND BEARING ASSEMBLIES. THE CONTRACTOR SHALL EXERCISE CARE DURING THE REMOVAL OF EXISTING CONCRETE TO INSURE THAT EXISTING GIRDERS, BEARING ASSEMBLIES AND CURTAIN WALL STEEL REMAIN UNDAMAGED.

CONTRACTOR SHALL REMOVE EXISTING APPROACH SLAB BRACKET AS NECESSARY TO ACCOMMODATE PROPOSED APPROACH SLAB BRACKET. EXISTING APPROACH SLAB BRACKET NOT SHOWN FOR CLARITY.

ALL WORK ON THIS SHEET WILL BE PAID FOR UNDER THE LUMP SUM BID PRICE FOR PARTIAL REMOVAL OF EXISTING STRUCTURE.



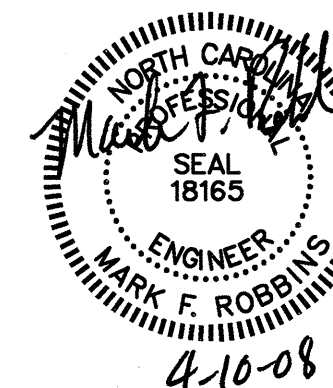
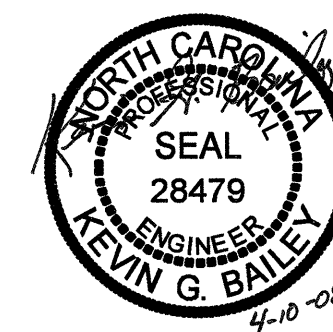
PLAN OF EXISTING CAP  
END BENT 2 SHOWN, END BENT 1 SIMILAR



ELEVATION OF EXISTING CAP  
END BENT 2 SHOWN, END BENT 1 SIMILAR  
CURVED END BLOCK NOT SHOWN

PROJECT NO. B-5022  
HARNETT COUNTY  
BRIDGE: 81

SHEET 1 OF 4



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
END BENT  
CONCRETE REMOVAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-40
2			4			TOTAL SHEETS 44

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DRAWN BY: TRL DATE: 3-08  
CHECKED BY: PEK DATE: 3-08

NOTES

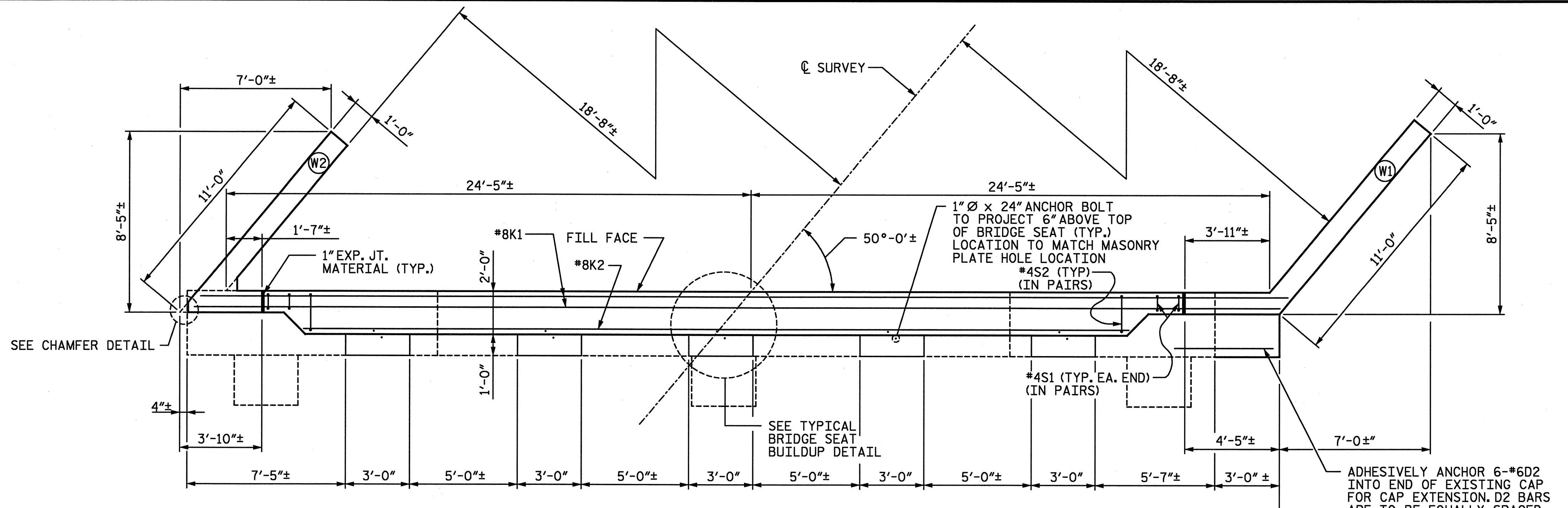
THE #6D1 & #4K2 BARS SHALL BE SECURED IN EXISTING CONCRETE WITH EPOXY ADHESIVE. FOR ADHESIVELY ANCHORED BOLTS AND DOWELS, SEE SPECIAL PROVISIONS.

THE VERTICAL LEG LENGTH OF THE #6D1, #4K3, & #4V2 BARS IS BASED ON A 9" EMBEDMENT INTO EXISTING CONCRETE AND MAY BE ADJUSTED BASED ON THE MINIMUM EMBEDMENT SPECIFIED BY THE MANUFACTURER OF THE EPOXY ADHESIVE BONDING SYSTEM.

THE AREAS OF THE CURTAIN WALL AROUND ANCHOR BOLTS AND BEARING ASSEMBLIES PREVIOUSLY REMOVED SHALL BE RECAST TO PRODUCE SMOOTH, STRAIGHT FINISHED SURFACES USING CLASS AA CONCRETE.

FOR CLEANING AND PAINTING EXISTING BEARING PLATES, SEE SPECIAL PROVISION.

FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

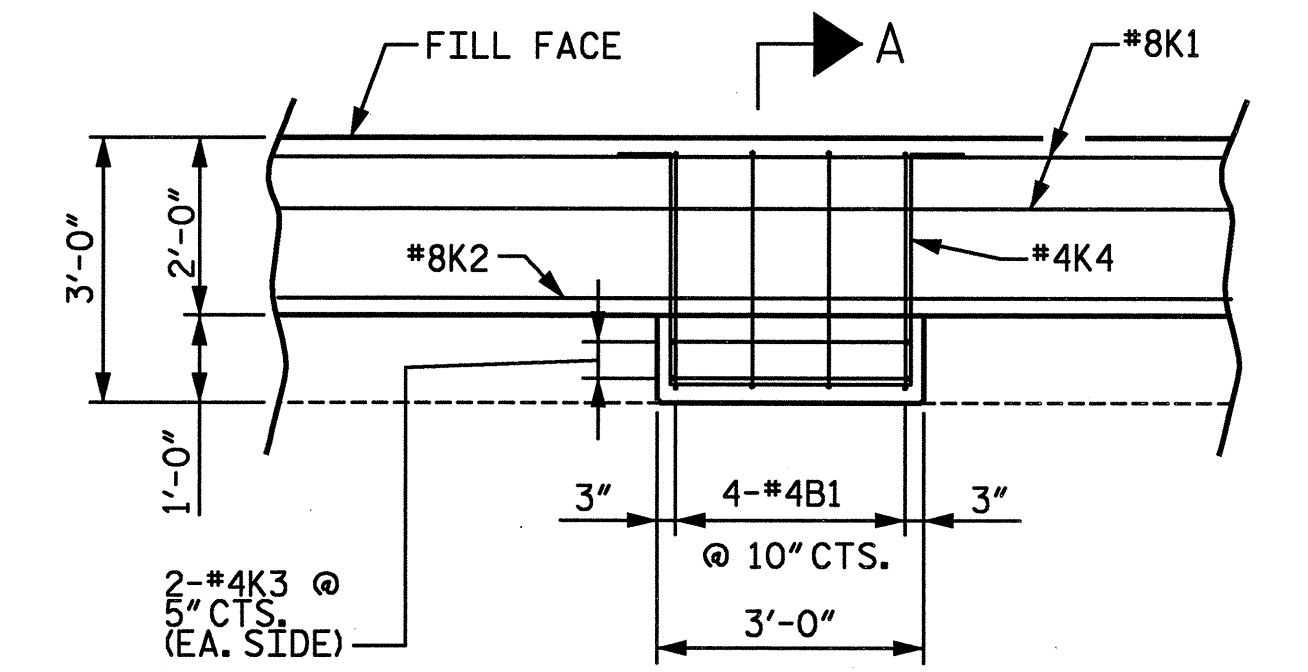


PLAN OF CAP MODIFICATION  
(END BENT 2 SHOWN, END BENT 1 SIMILAR)

NOTE: DIMENSIONS ARE BASED ON BEST AVAILABLE INFORMATION. VERIFY DIMENSIONS IN FIELD AND ADJUST AS NECESSARY SUCH THAT THE 3'-0" BRIDGE SEAT BUILDUP IS CENTERED ABOUT ANCHOR BOLTS.

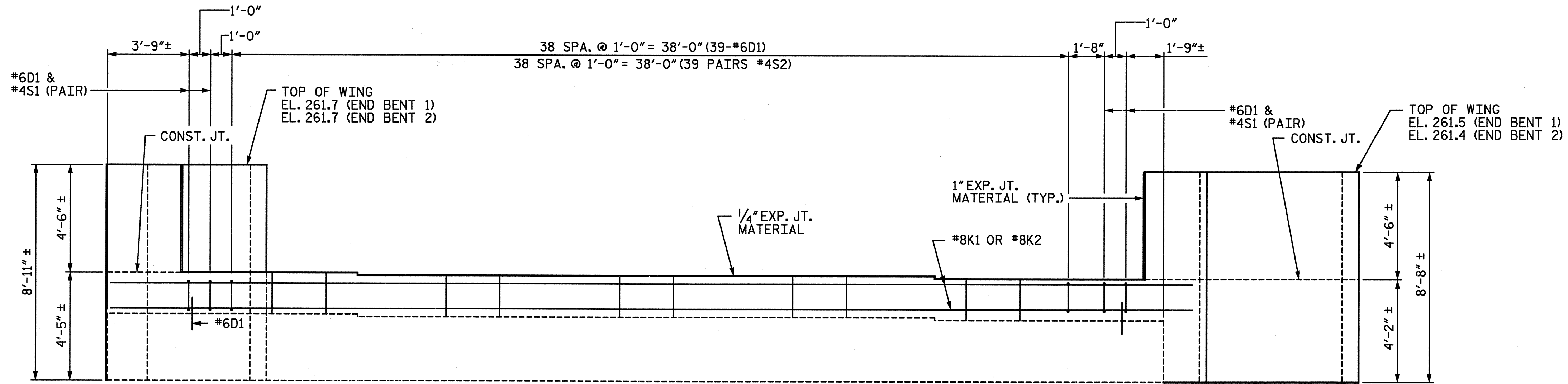
CONTRACTOR SHALL VERIFY ANCHOR BOLT DIAMETER AND ADJUST AS NECESSARY TO MATCH EXISTING ANCHOR BOLT DIAMETER.

ADHESIVELY ANCHOR 6-#6D2 INTO END OF EXISTING CAP FOR CAP EXTENSION. D2 BARS ARE TO BE EQUALLY SPACED AT END OF EXISTING CAP WITH 6" CLEAR FROM EDGES OF CAP. EMBEDMENT PER MANUFACTURER'S RECOMMENDATIONS.

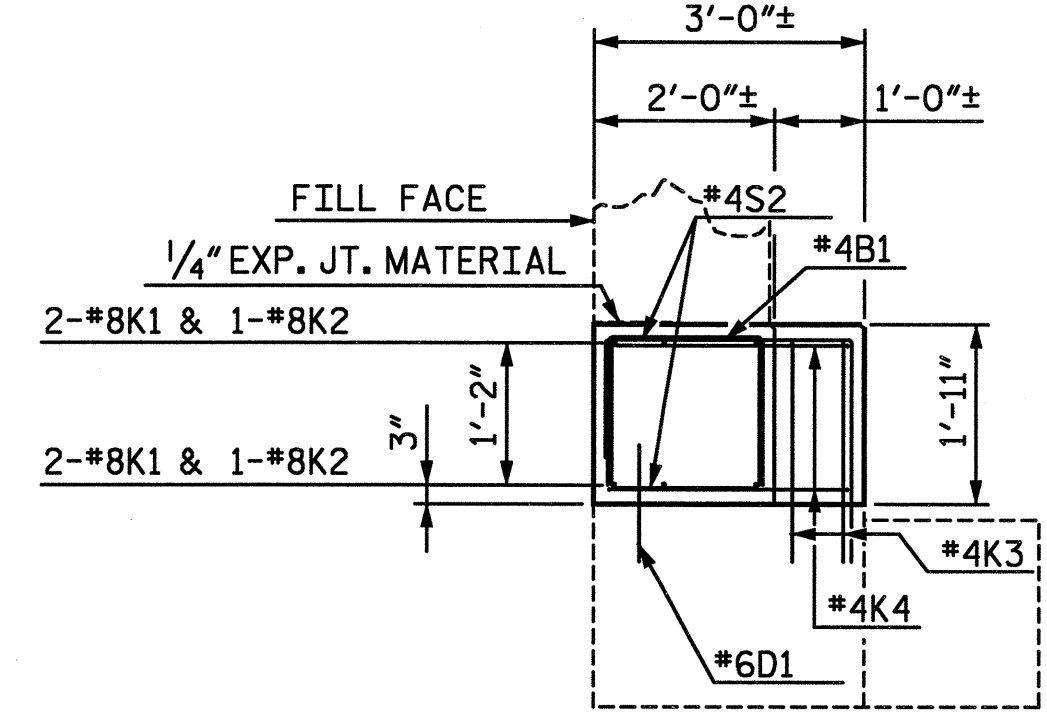


TYPICAL BRIDGE SEAT BUILDUP

#4S1 STIRRUPS & #6D1 DOWELS NOT SHOWN FOR CLARITY



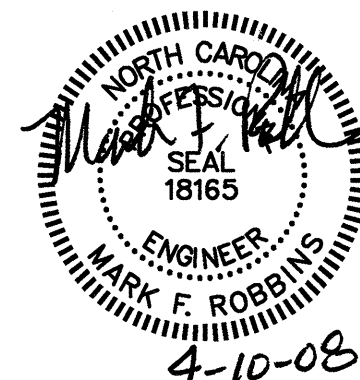
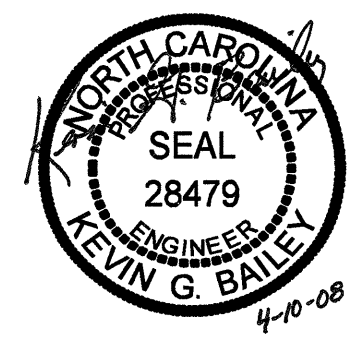
ELEVATION OF CAP MODIFICATION  
(END BENT 2 SHOWN, END BENT 1 SIMILAR)



SECTION A-A

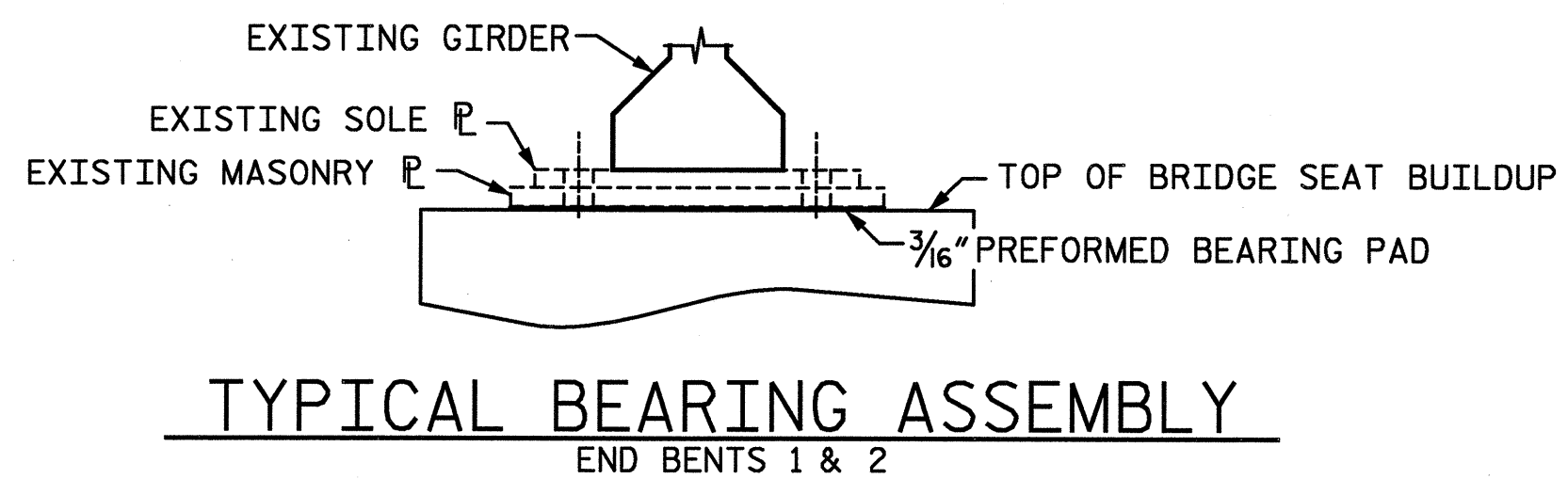
PROJECT NO. **B-5022**  
HARNETT COUNTY  
BRIDGE: **81**

SHEET 2 OF 4

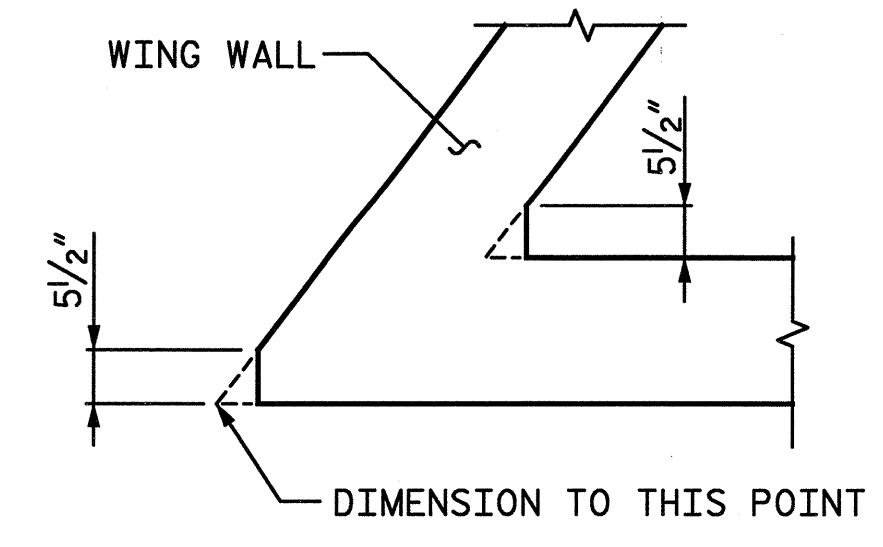


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
END BENT  
CAP MODIFICATIONS

REVISIONS						SHEET NO. 5-41
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 44
2			4			



TYPICAL BEARING ASSEMBLY  
END BENTS 1 & 2



CHAMFER DETAIL

NOT TO SCALE

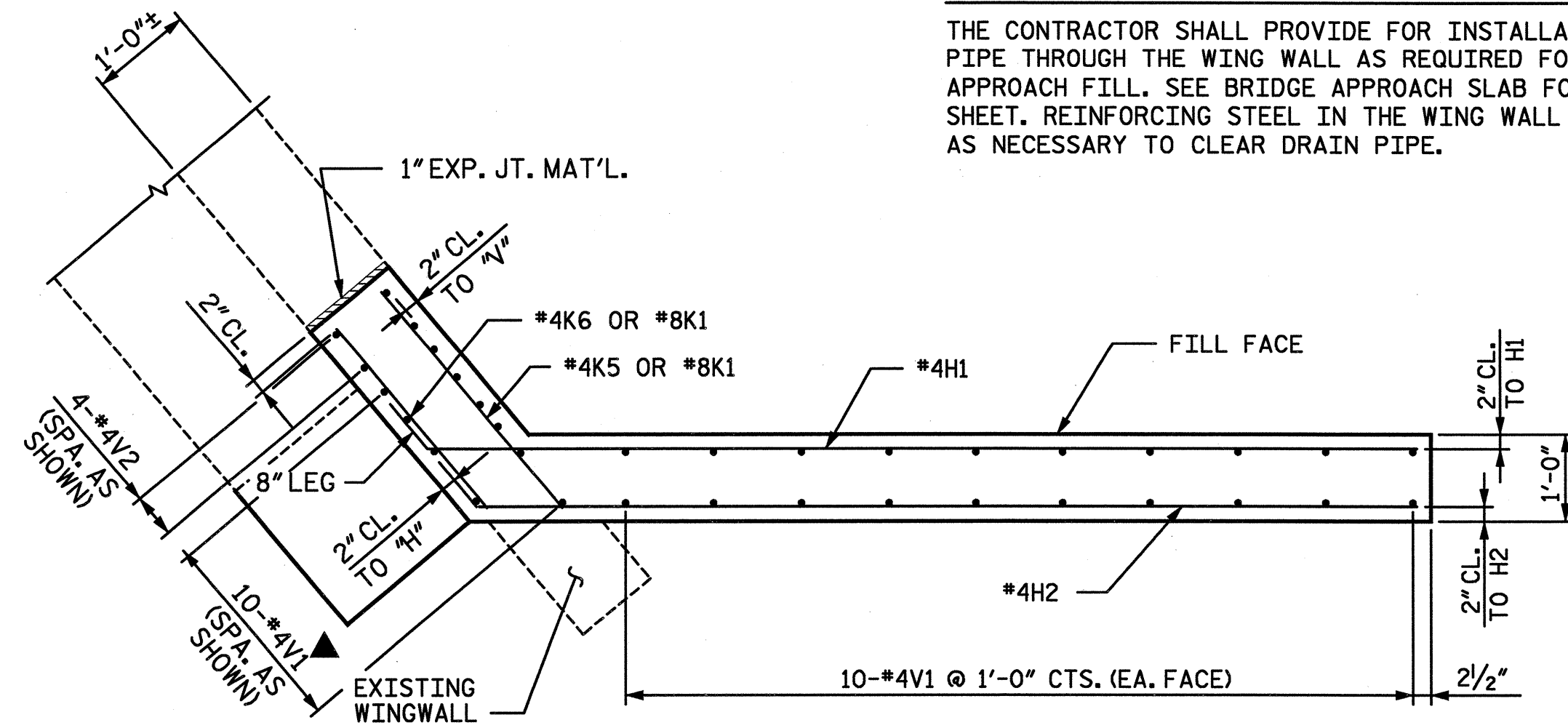
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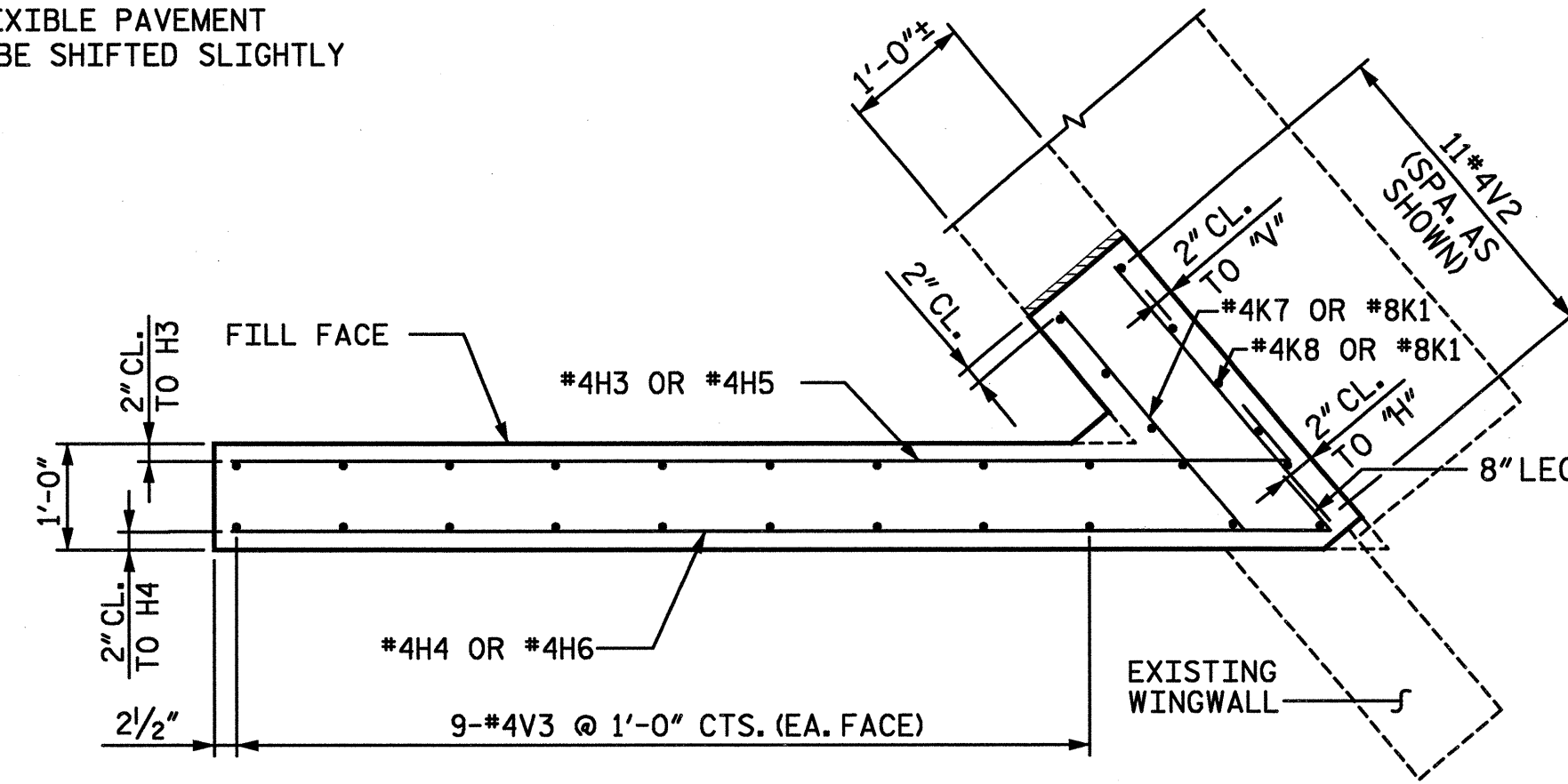


**NOTES**

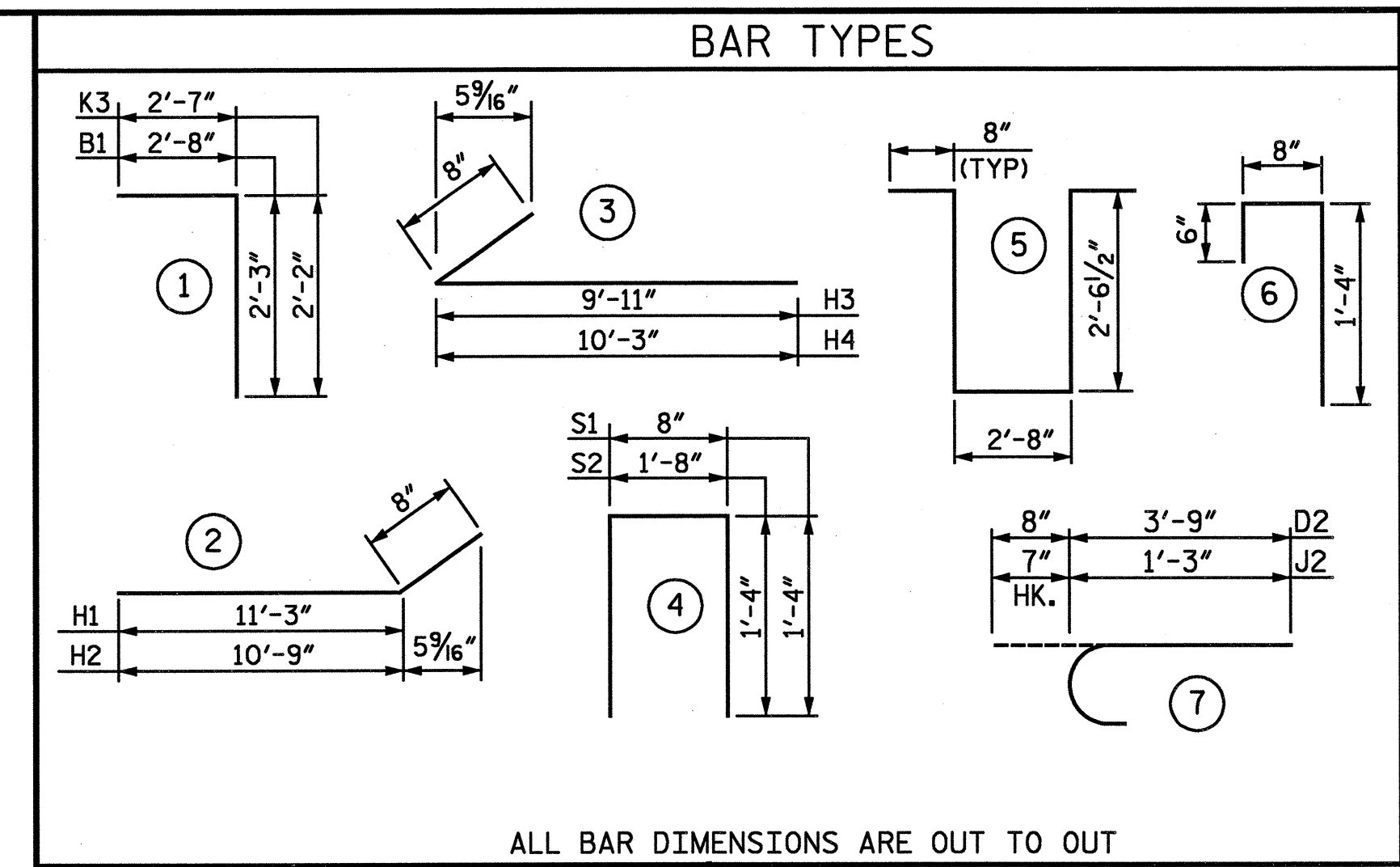
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILL. SEE BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT SHEET. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR DRAIN PIPE.



PLAN OF RIGHT WING - W1



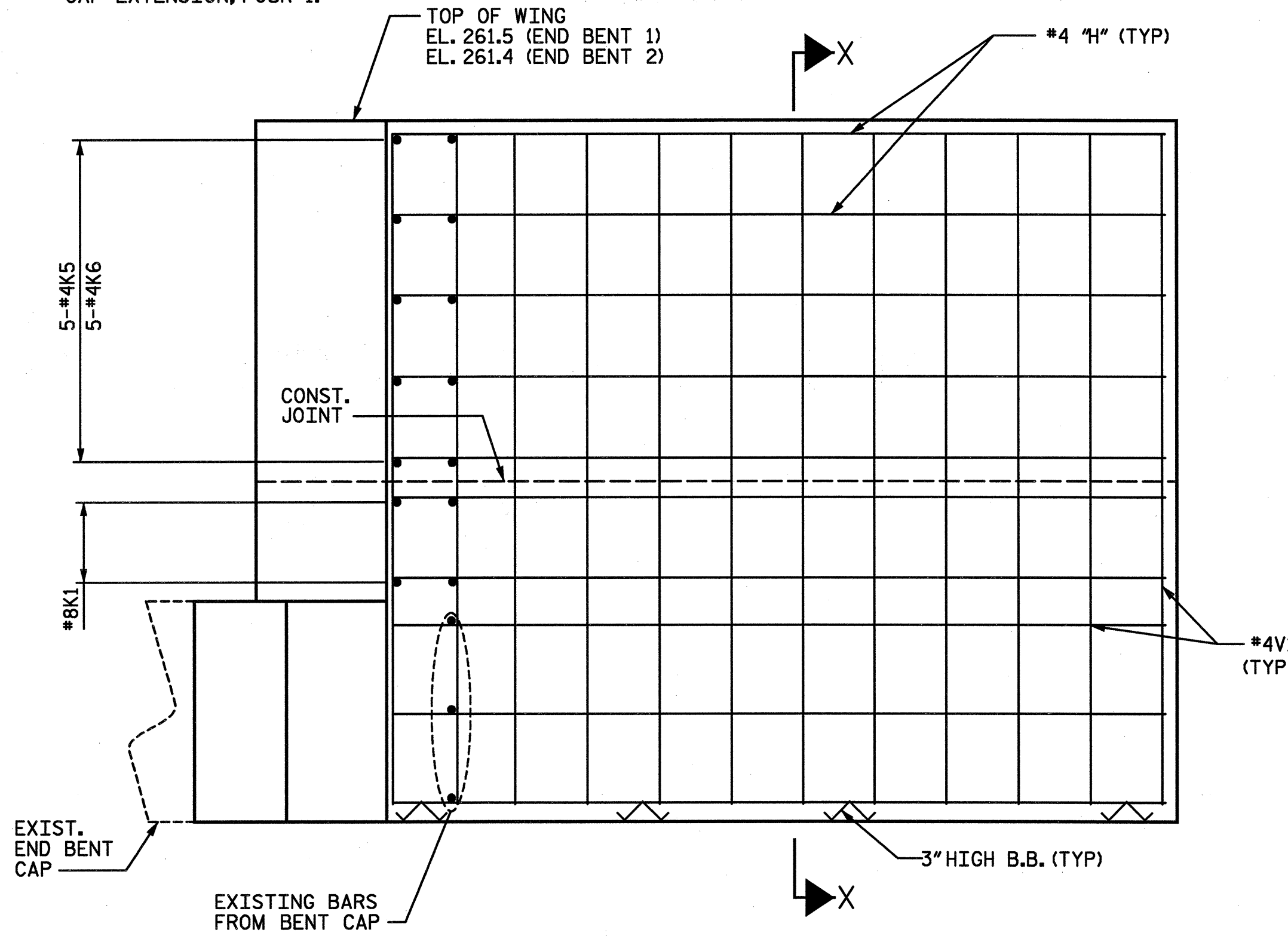
PLAN OF LEFT WING - W2



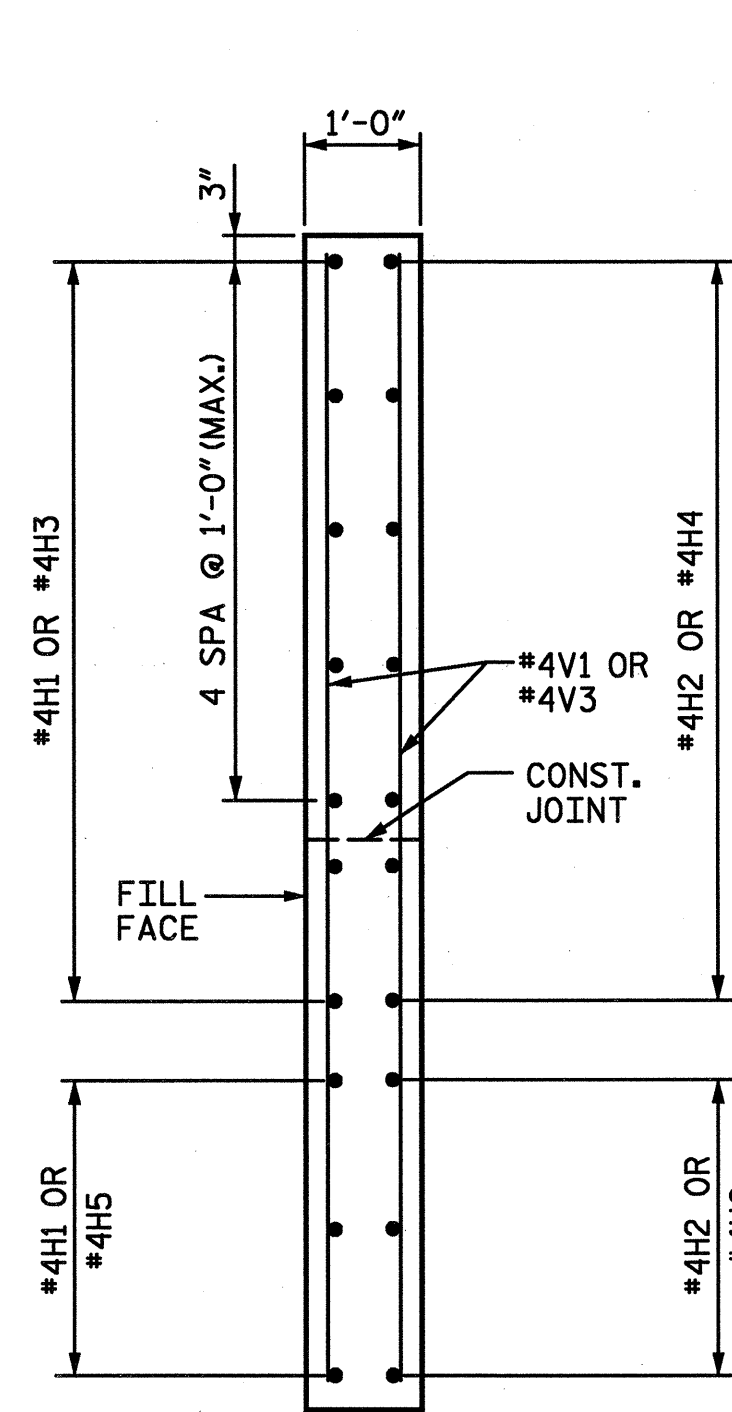
ALL BAR DIMENSIONS ARE OUT TO OUT

NOTE: #4V2 BARS SHALL BE EPOXIED INTO EXISTING BENT CAP.

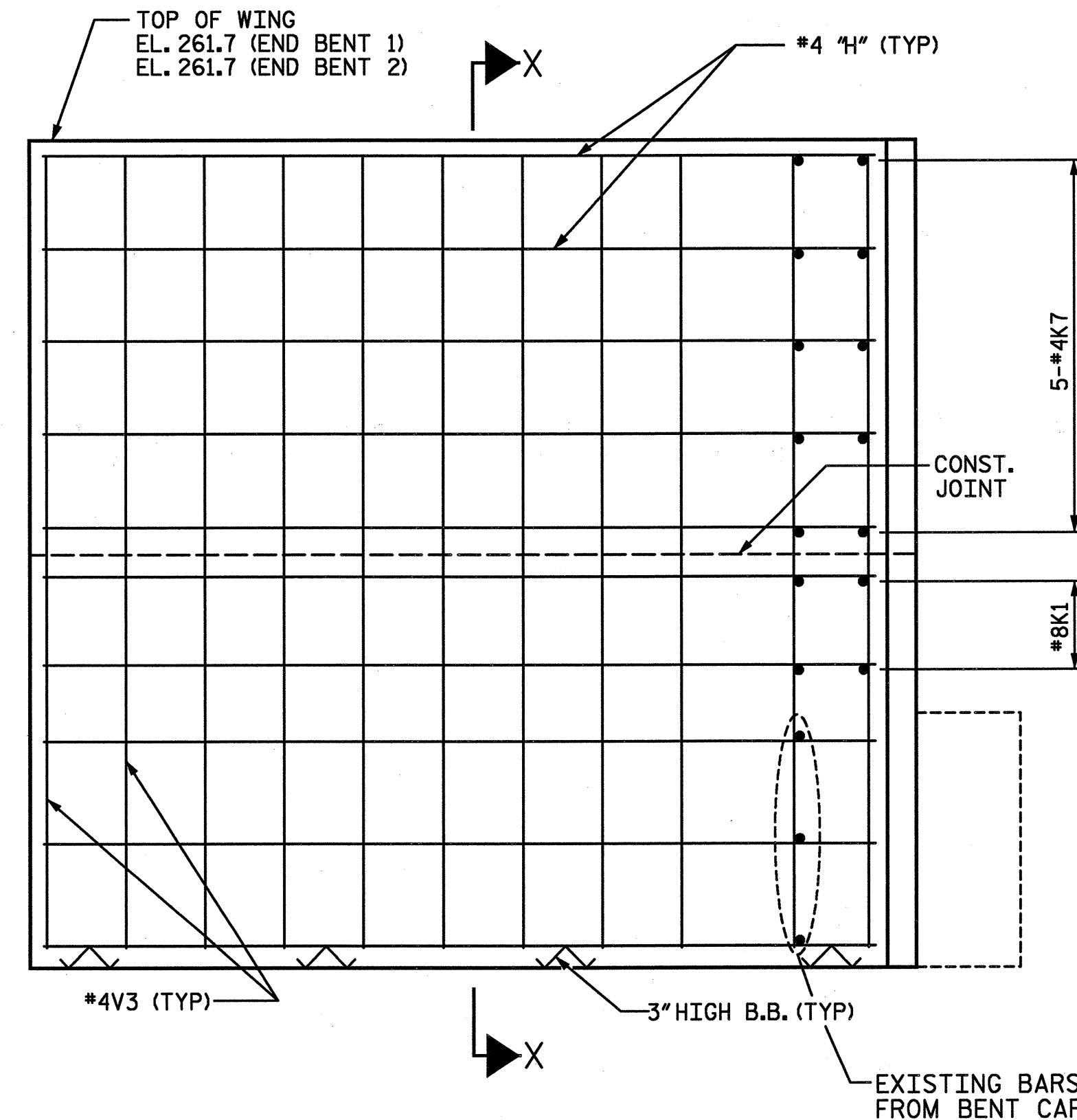
▲ #4V1 BARS SHALL BE CAST WITH PROPOSED END BENT CAP EXTENSION, POUR 1.



ELEVATION OF RIGHT WING



SECTION X-X



ELEVATION OF LEFT WING

CLASS AA CONCRETE BREAKDOWN FOR ONE END BENT (2 REQ'D)		
POUR 1 CAP AND LOWER WINGWALLS	C. Y.	11.5
POUR 2 BRIDGE SEATS AND UPPER WINGWALLS	C. Y.	5.5
POUR 3 APPROACH SLAB BRACKETS	C. Y.	1.1
CLASS AA CONCRETE	C. Y.	18.1

**REINFORCING FOR TURNED BACK WINGS**  
(END BENT 2 SHOWN, END BENT 1 SIMILAR)

NOTE: CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT #4 BARS IN THE CAP AND WINGS ARE DETAILED WITH 3'-0" ADDITIONAL LENGTH. CONTRACTOR SHALL CUT BARS AS NECESSARY IN FIELD.  
H5 AND H6 BARS SHALL BE EPOXIED INTO EXISTING BENT CAP. FIELD BEND AS NECESSARY.

**BILL OF MATERIAL**

FOR ONE END BENT (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	20	#4	1	4'-11"	66
D1	43	#6	STR	1'-6"	97
D2	12	#6	7	4'-5"	80
H1	10	#4	2	11'-11"	80
H2	10	#4	2	11'-5"	76
H3	7	#4	3	10'-7"	50
H4	7	#4	3	10'-11"	51
H5	3	#4	STR	9'-10"	20
H6	3	#4	STR	10'-4"	21
J1	39	#5	6	2'-6"	102
J2	39	#5	7	1'-10"	75
K1	4	#8	STR	53'-10"	575
K2	2	#8	STR	41'-7"	222
K3	20	#4	1	4'-9"	64
K4	10	#4	5	9'-1"	61
K5	5	#4	STR	7'-8"	26
K6	5	#4	STR	7'-2"	24
K7	5	#4	STR	5'-8"	19
K8	5	#4	STR	6'-0"	20
K9	2	#5	STR	38'-8"	81
S1	8	#4	4	3'-4"	18
S2	78	#4	4	4'-4"	226
V1	30	#4	STR	8'-6"	170
V2	15	#4	STR	6'-8"	67
V3	18	#4	STR	8'-3"	99
REINFORCING STEEL				LBS.	2390

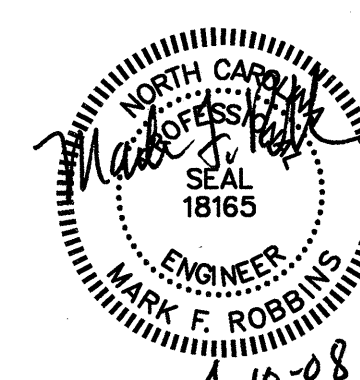
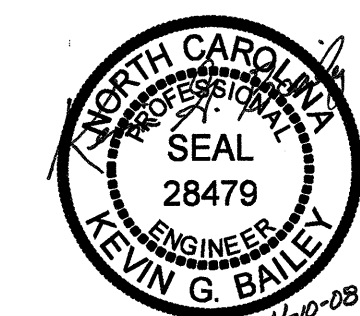
PROJECT NO. **B-5022**  
HARNETT COUNTY  
BRIDGE: **81**

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT  
WINGWALL MODIFICATIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-42
1			3			TOTAL SHEETS
2			4			44

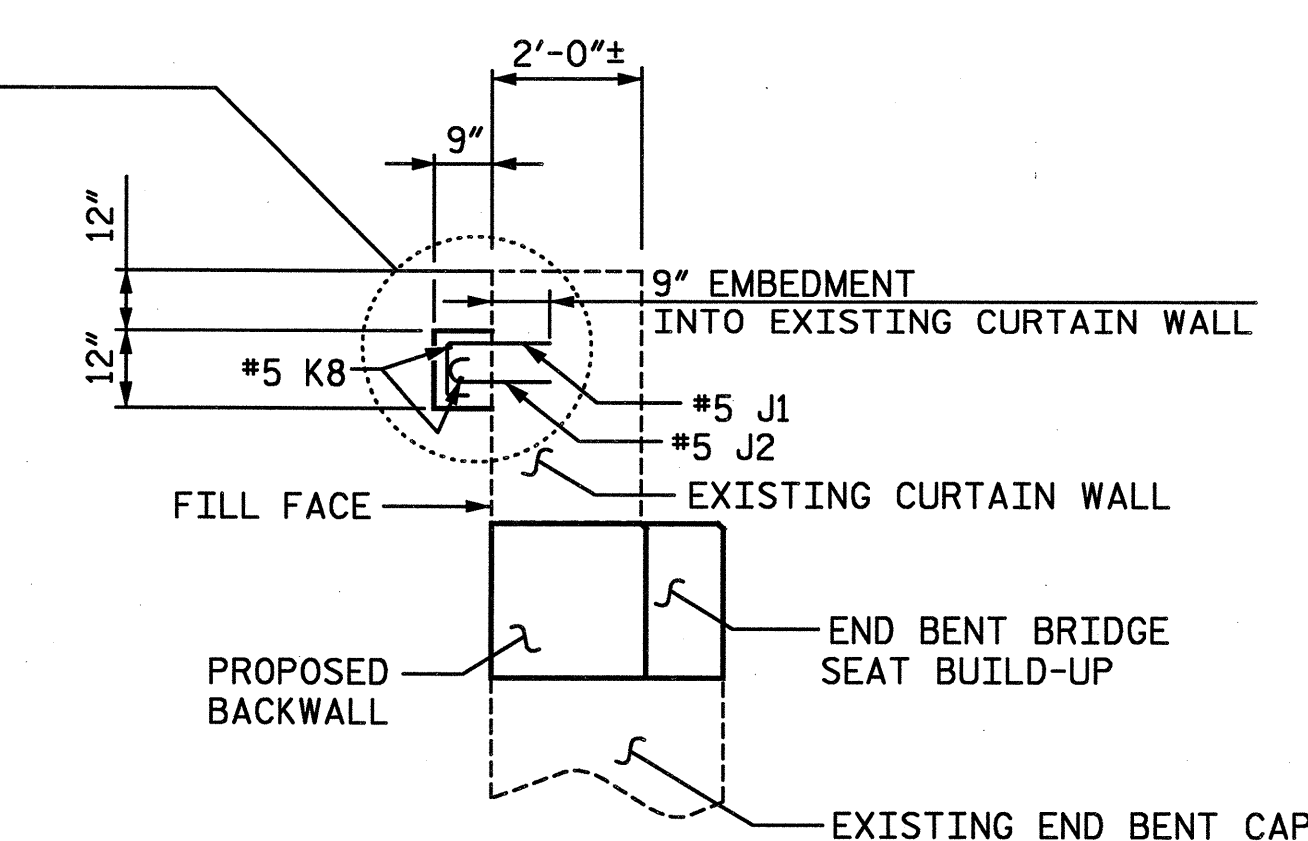
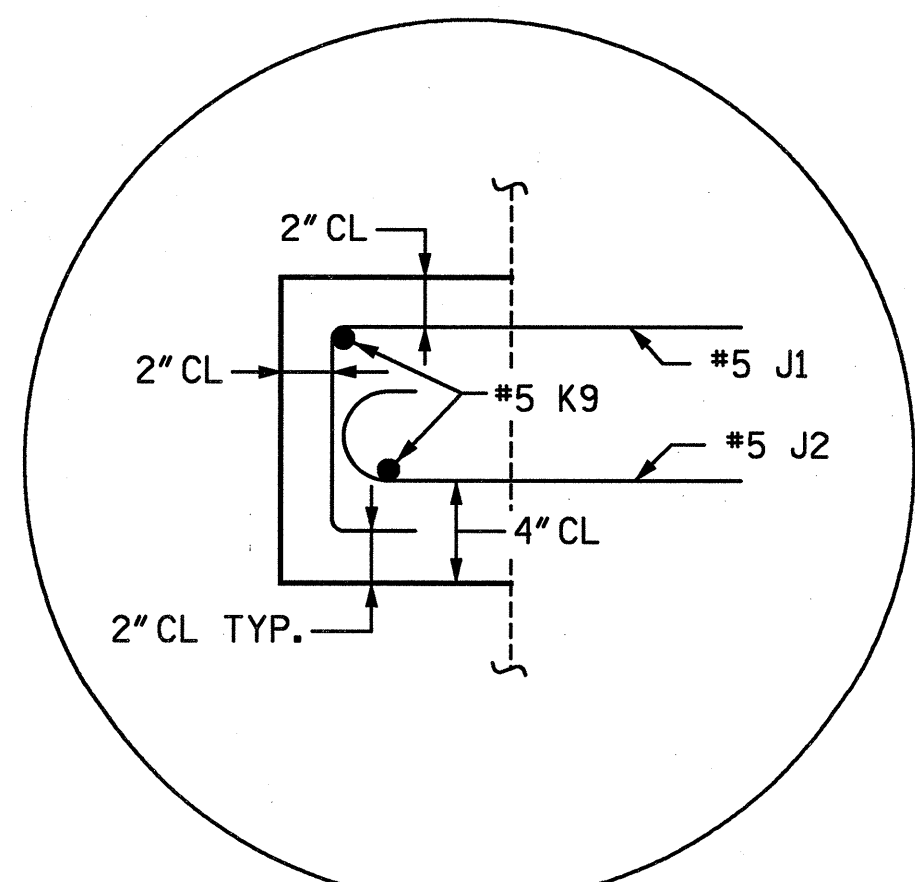
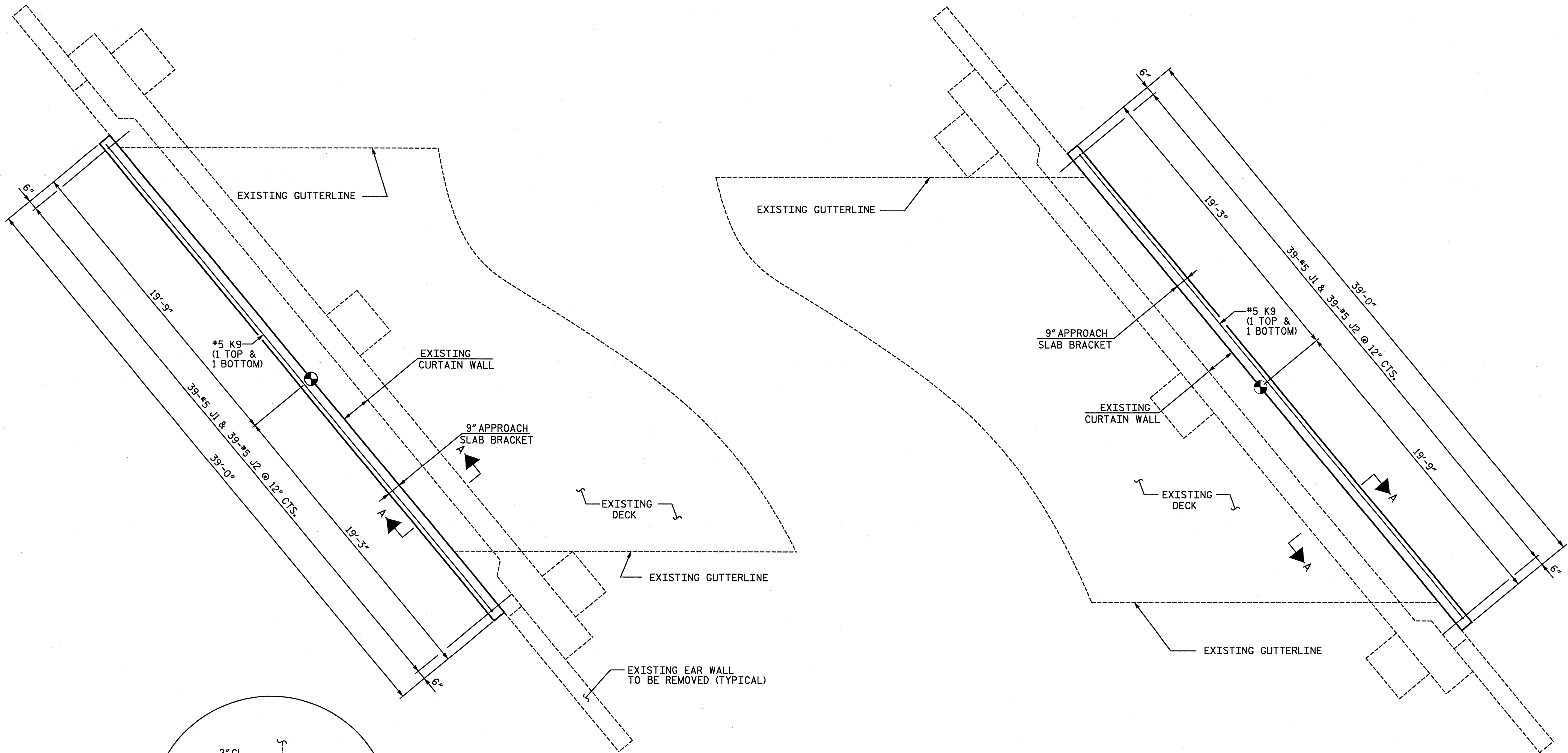


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Charlotte, NC 28208

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 4/9/2008  
 timothy.townsend



**SECTION A-A**

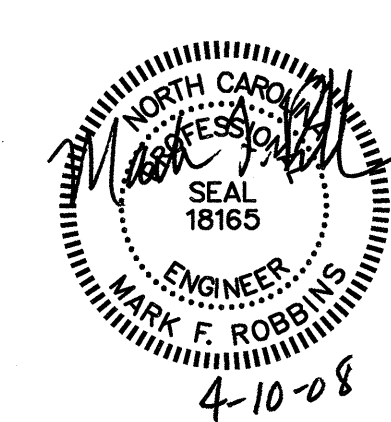
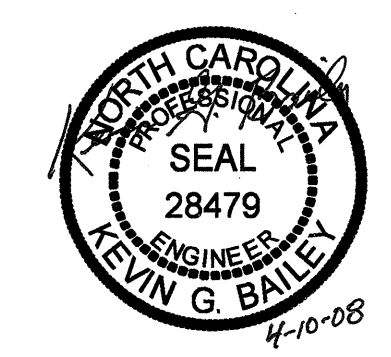
**PLACEMENT OF APPROACH SLAB BRACKETS**

(PROPOSED WING WALLS OMITTED FOR CLARITY)

**NOTES**

- THE #5J1 AND #5J2 BARS SHALL BE SECURED INTO THE EXISTING CONCRETE WITH EPOXY ADHESIVE.
- THE LEG LENGTH OF THE #5J1 AND #5J2 BAR IS BASED ON A 9" EMBEDMENT INTO THE EXISTING CONCRETE AND MAY BE ADJUSTED BASED ON THE MINIMUM EMBEDMENT SPECIFIED BY THE MANUFACTURER OF THE EPOXY ADHESIVE BONDING SYSTEM.
- INSTALL #5J2 BARS AND THEN INSTALL #5J1 BARS TO ALLOW FOR BAR ROTATION DURING INSTALLATION.
- #5J1 AND #5J2 BARS SHALL BE EPOXIED INTO EXISTING CURTAIN WALL AS DETAILED. THE COST OF DRILLING IN AND EPOXYING THE #5J1 AND #5J2 BARS SHALL BE CONSIDERED INCIDENTAL AND INCLUDED IN THE COST OF THE REINFORCING STEEL.
- FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

NOT TO SCALE



PROJECT NO. **B-5022**  
 HARNETT COUNTY  
 BRIDGE: **81**  
 SHEET 4 OF 4

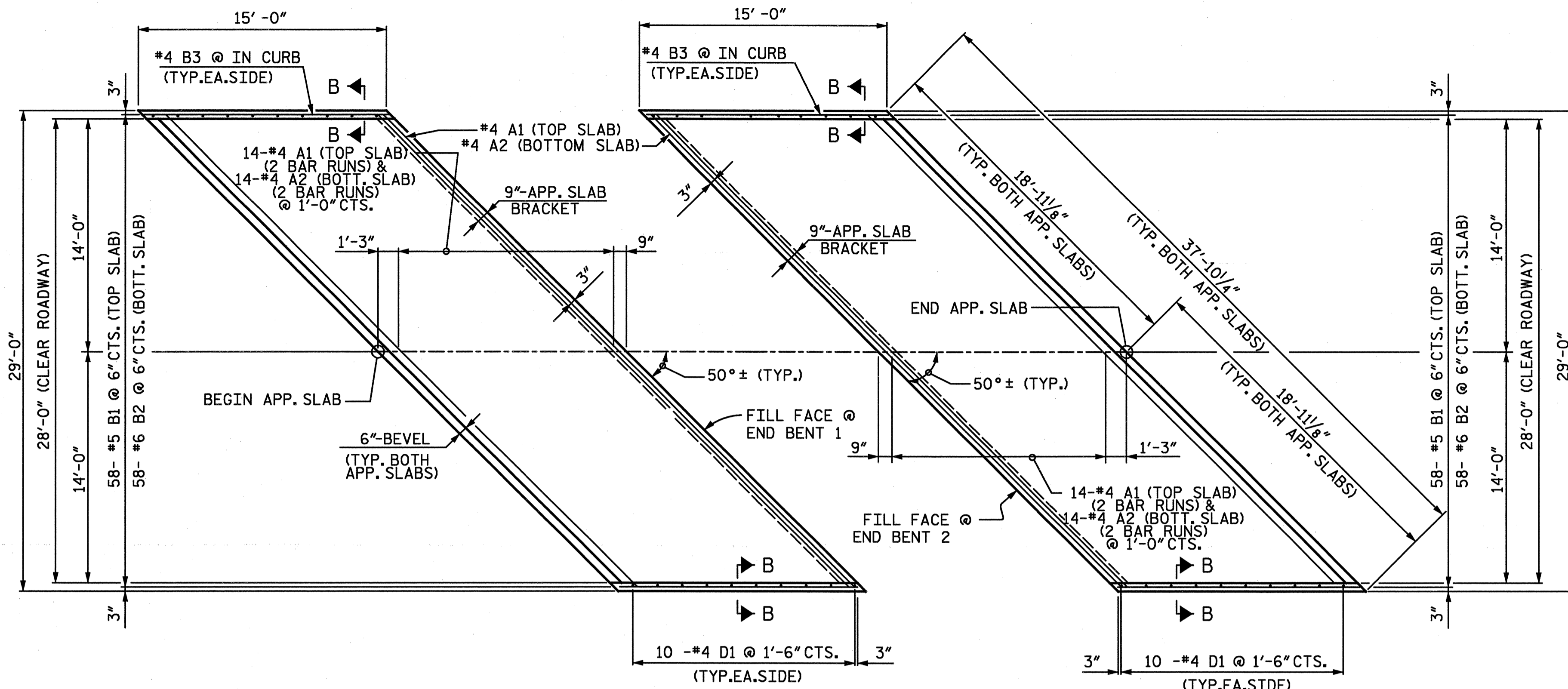
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT  
 APPROACH SLAB BRACKETS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			44

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PLAN @ END BENT 1

PLAN @ END BENT 2

**NOTES**

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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

THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE EACH EDGE OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

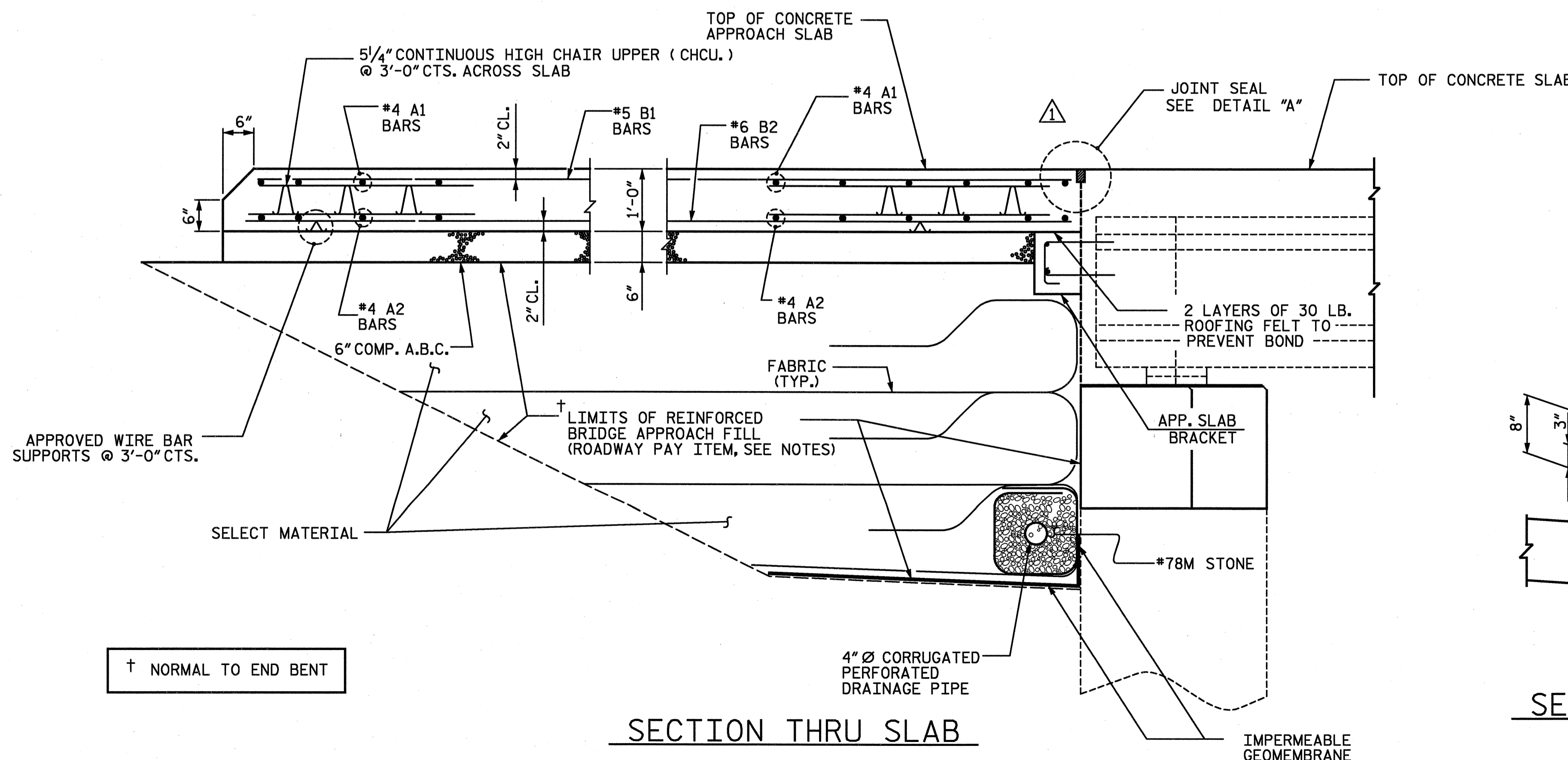
THE 6" BEVEL AT THE END OF THE APPROACH SLAB SHALL EXTEND FROM FRONT FACE OF CURB TO FRONT FACE OF CURB.

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE FORMED. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT.

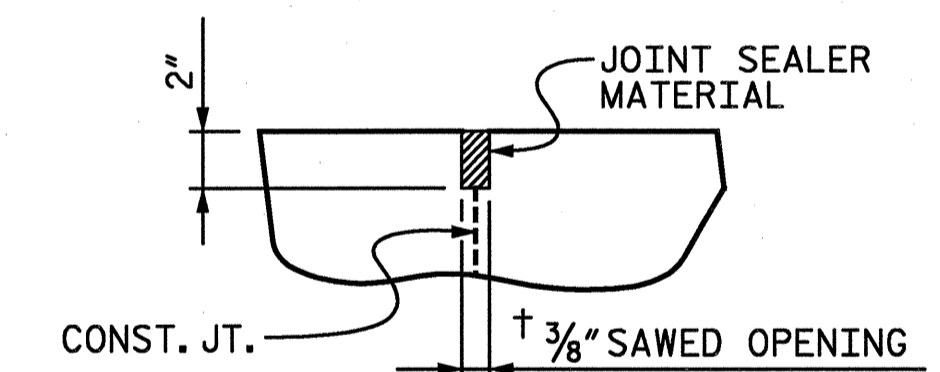
REVISION #1: REVISED PER REVIEW COMMENTS  
 BY: TJT DATE: 5-08  
 CH'KD BY: KGB DATE: 5-08

**BILL OF MATERIAL**

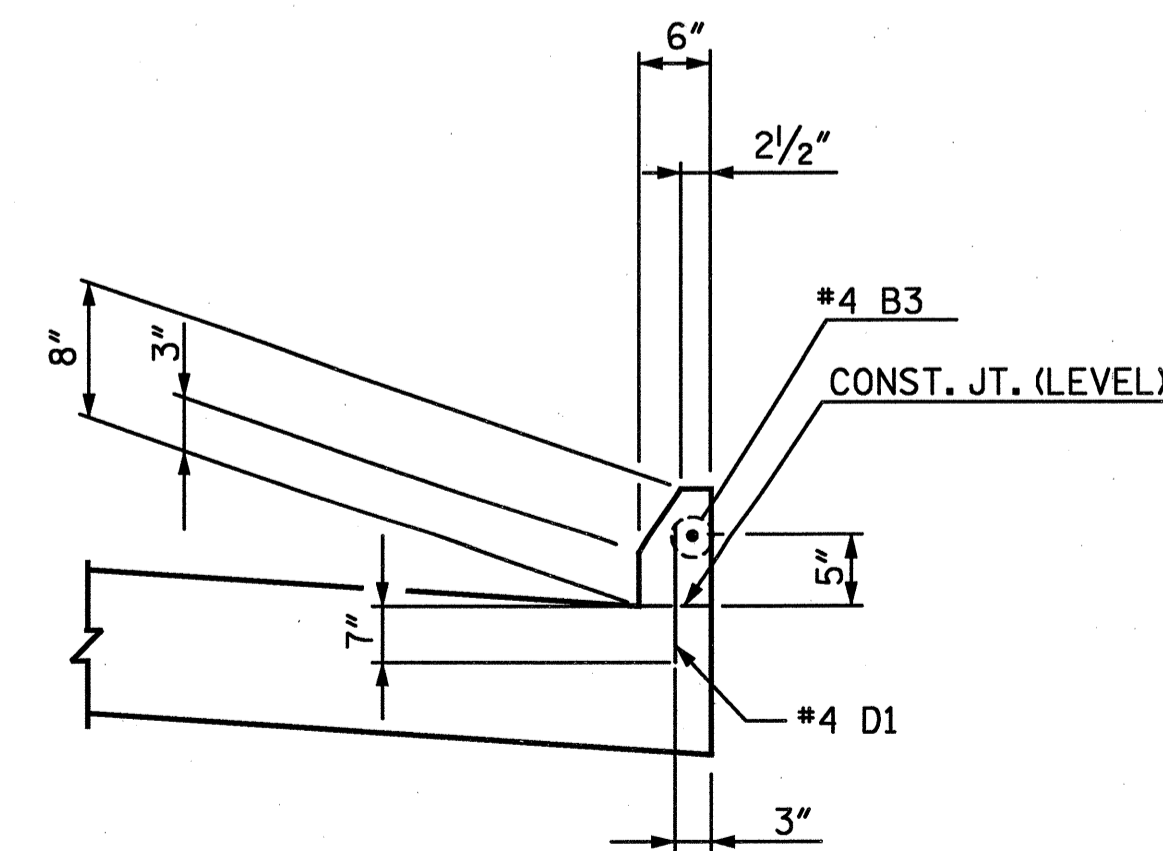
ONE APP. SLAB (2 REQ'D)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	30	#4	STR	19'-8"	394
A2	30	#4	STR	19'-8"	394
*B1	58	#5	STR	14'-2"	857
B2	58	#6	STR	14'-8"	1278
*B3	2	#4	STR	14'-8"	20
*D1	20	#4	STR	1'-0"	13
REINFORCING STEEL				lbs.	1672
*EPOXY COATED REINFORCING STEEL				lbs.	1284
CLASS AA CONCRETE					
POUR 1	SLAB		C. Y.	15.8	
POUR 2	CURB		C. Y.	0.4	
TOTAL CONCRETE				C. Y.	16.2
SPLICE CHART					
BAR SIZE	EPOXY COATED	UNCOATED			
#4	2'-0"	1'-9"			
#5	2'-6"	2'-2"			
#6	3'-10"	2'-7"			



SECTION THRU SLAB

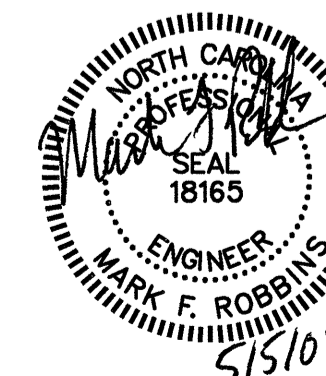
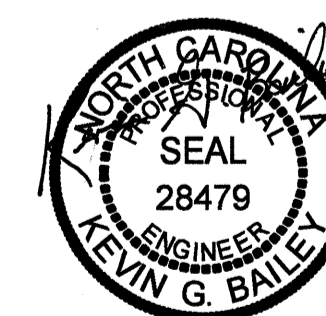


DETAIL "A"



SECTION B-B (THRU CURB)

PROJECT NO. **B-5022**  
**HARNETT** COUNTY  
 BRIDGE: **81**



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 BRIDGE APPROACH SLAB  
 FOR FLEXIBLE PAVEMENT

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1	STV	5-08	3		
2			4		

SHEET NO. **S-44**  
 TOTAL SHEETS **44**

D-1810.44

NOT TO SCALE

STV / Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28205

DRAWN BY: **KGB** DATE: **1-08**  
 CHECKED BY: **PEK** DATE: **3-08**

## 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 2002 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; CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP; AND CLASS S SHALL BE USED FOR UNDERWATER FOOTING SEALS.

### 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 WITH THE EXCEPTION OF #2 BARS WHICH MAY BE FABRICATED FROM COLD DRAWN STEEL WIRE. 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.

PLACEMENT OF BEAM OR GIRDER MEMBERS ON TRUCKS FOR HAULING SHALL BE DONE IN COMPLIANCE WITH LIMITS SHOWN ON SKETCHES PROVIDED TO THE MATERIALS AND TEST UNIT APPROVED BY THE STRUCTURE DESIGN UNIT DATED MAY 8, 1991. THESE SKETCHES PRIMARILY LIMIT THE UNSUPPORTED CANTILEVER LENGTH OF MEMBERS. WHEN THE CONTRACTOR WISHES TO PLACE MEMBERS ON TRUCKS NOT IN ACCORDANCE WITH THESE LIMITS, TO SHIP BY RAIL, TO ATTACH SHIPPING RESTRAINTS TO THE MEMBERS OR TO INVERT MEMBERS, HE SHALL SUBMIT A SKETCH FOR APPROVAL PRIOR TO SHIPPING. SEE ALSO ARTICLE 1072-11.

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.

# ENGLISH

JANUARY, 1990

STD. NO. SN