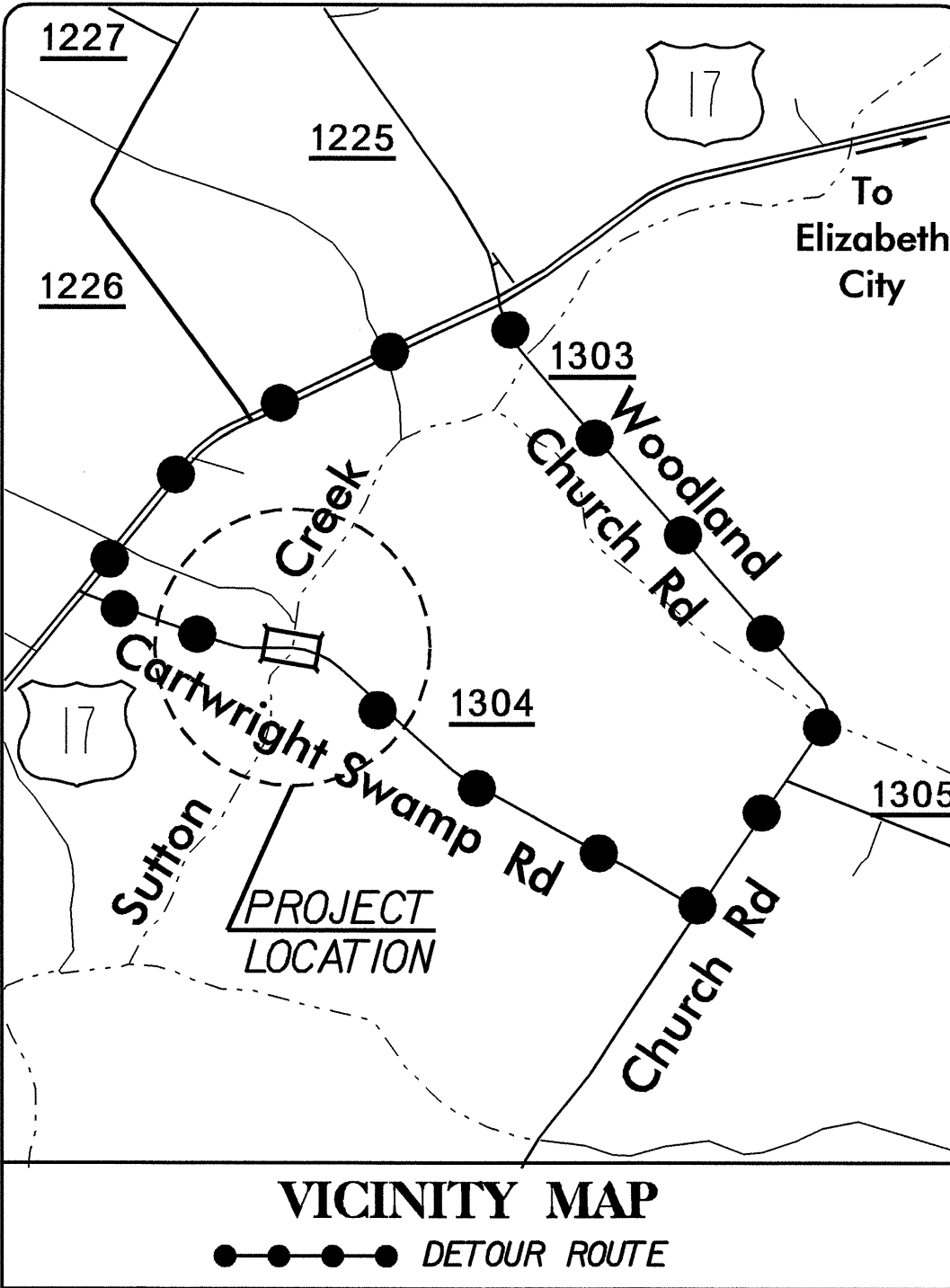


09/08/99

**CONTRACT: C201549 TIP PROJECT: B-4228**



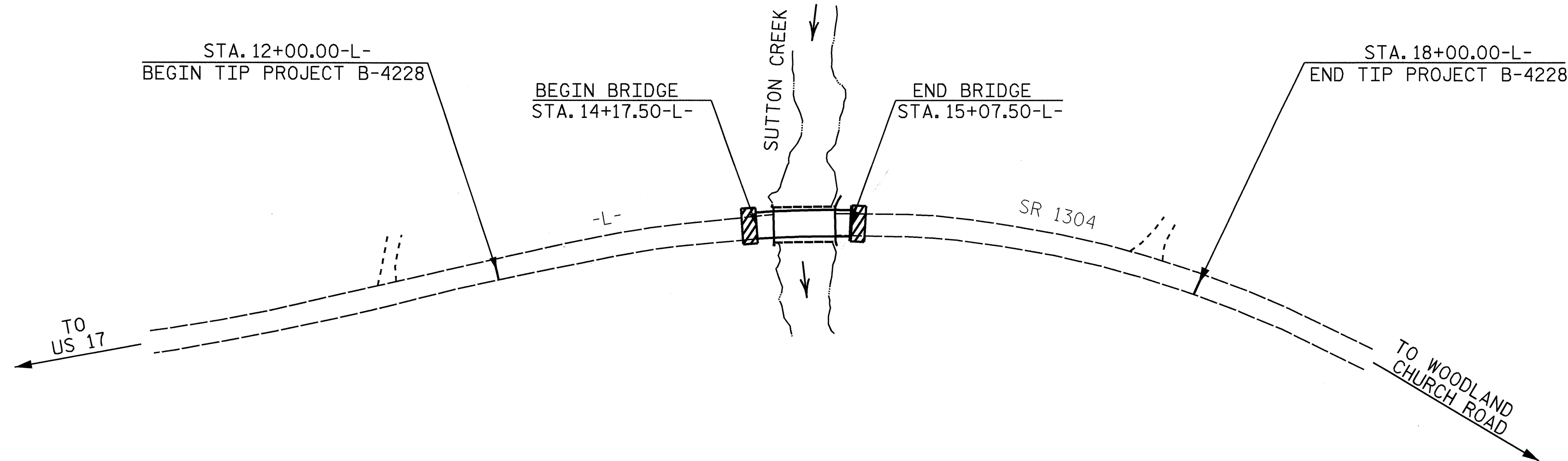
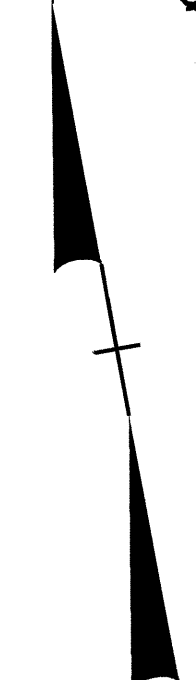
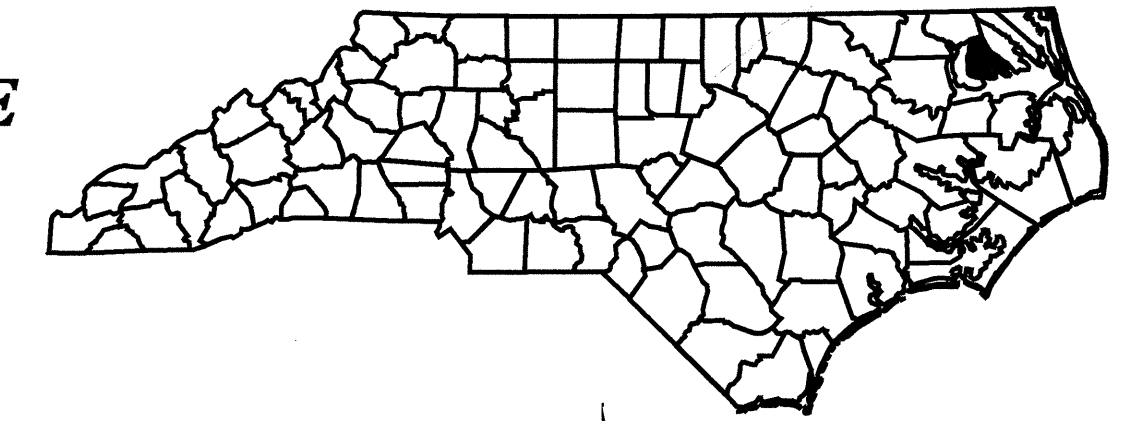
NEAREST SHIPPING POINT: CHAPANOKE ON CHESAPEAKE AND ALBEMARLE RAILWAY 5 MILES FROM BRIDGE.

STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

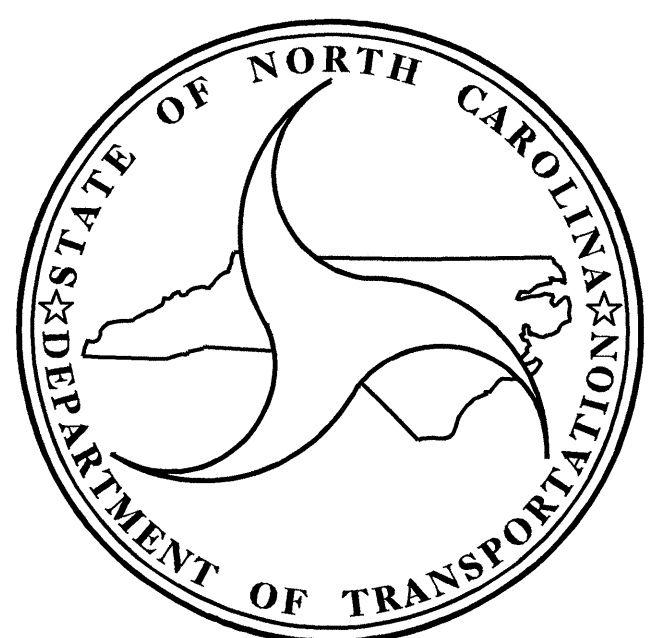
**PERQUIMANS COUNTY**

**LOCATION: BRIDGE 59 OVER SUTTON CREEK ON SR 1304**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, RESURFACING, STRUCTURE**



**STRUCTURE**



**DESIGN DATA**

ADT 2004 =	245
ADT 2025 =	700
DHV =	10 %
D =	60 %
T =	3 % *
**V =	60 MPH
* TTST 1% DUAL 2%	
FUNC CLASS =	LOCAL

**PROJECT LENGTH**

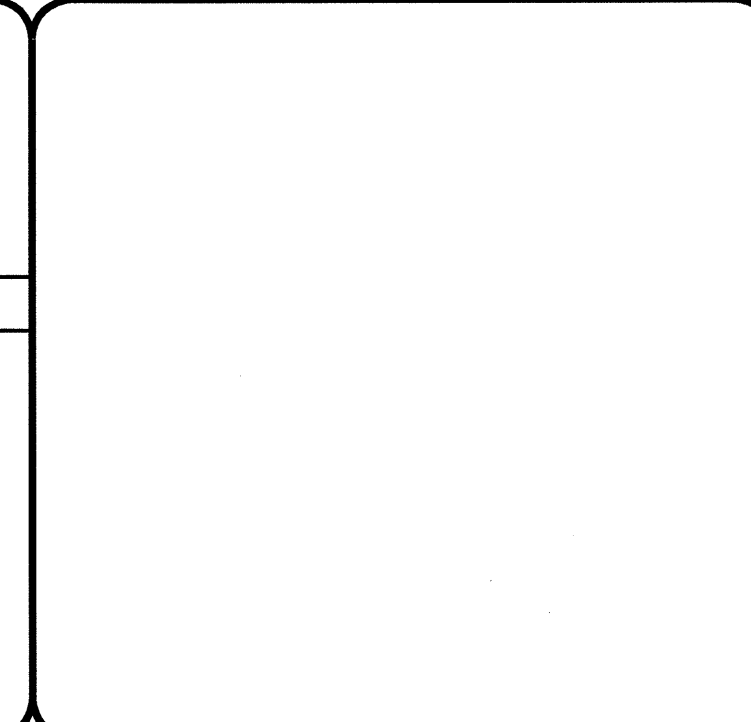
LENGTH ROADWAY TIP PROJECT B-4228	=	0.097 MILES
LENGTH STRUCTURE TIP PROJECT B-4228	=	0.017 MILES
TOTAL LENGTH TIP PROJECT B-4228	=	0.114 MILES

Plans prepared in the office of:  
**DIVISION OF HIGHWAYS**  
 1000 BIRCH RIDGE DRIVE, RALEIGH, N.C. 27610

---

for the North Carolina Department of Transportation

2006 STANDARD SPECIFICATIONS	<b>J. M. BAILEY, P.E.</b> PROJECT ENGINEER
<b>LETTING DATE:</b> FEBRUARY 19, 2008	<b>B. D. KLAPPENBACH, P.E.</b> PROJECT DESIGN ENGINEER



**DIVISION OF HIGHWAYS**  
 STATE OF NORTH CAROLINA

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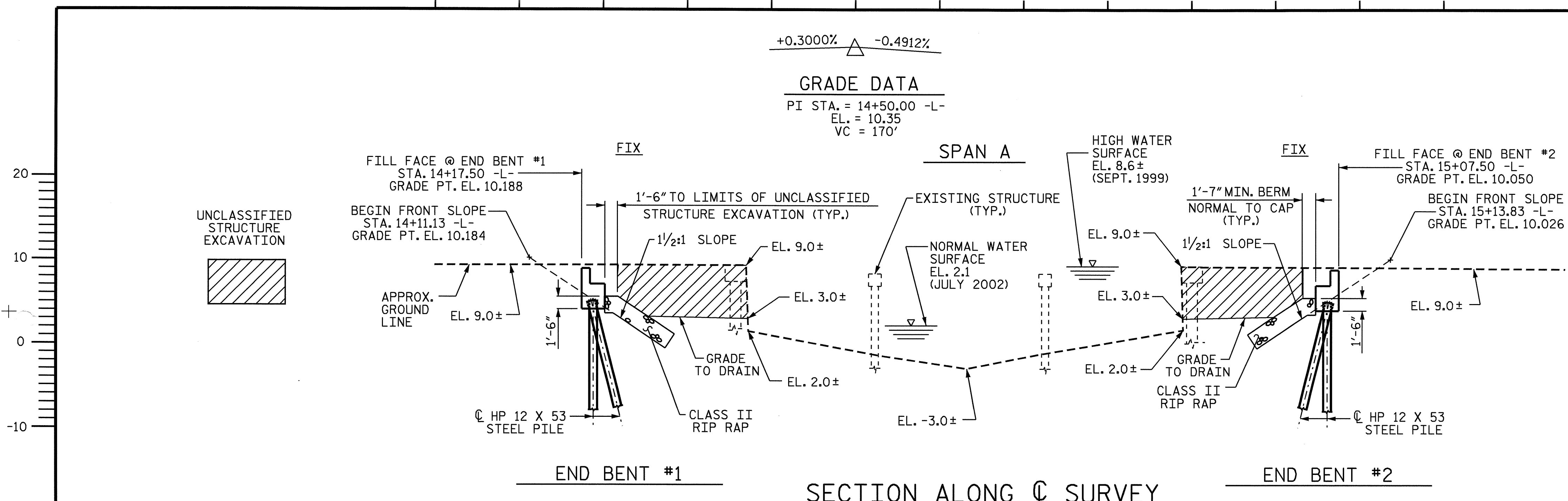
STATE DESIGN ENGINEER \_\_\_\_\_ P.E.  
**DEPARTMENT OF TRANSPORTATION**  
 FEDERAL HIGHWAY ADMINISTRATION

---

APPROVED \_\_\_\_\_ DATE \_\_\_\_\_  
 DIVISION ADMINISTRATOR

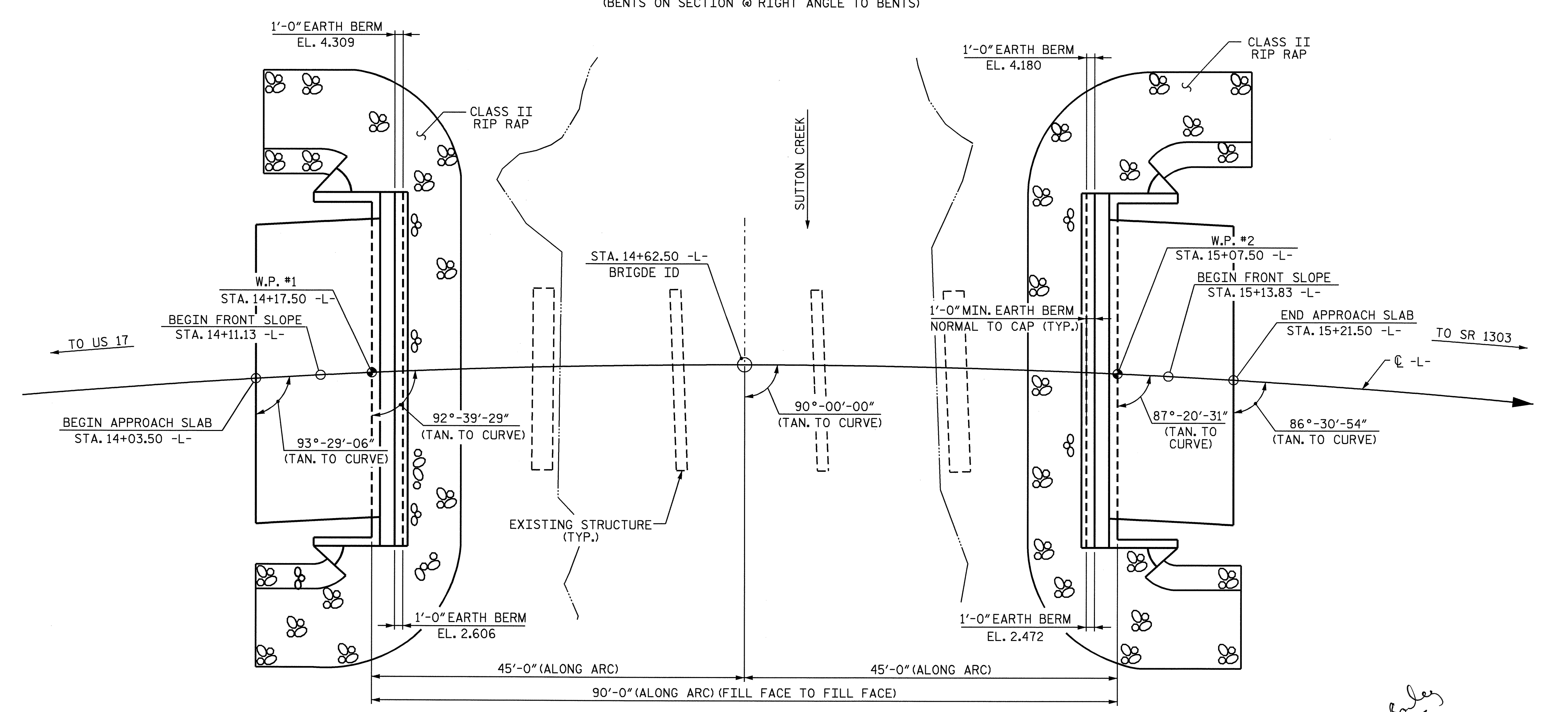
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4228		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33572.1.1	BRZ-1304(7)	PE	
33572.2.1	BRZ-1304(7)	RW, UTIL.	
33572.3.1	BRZ-1304(7)	CONST.	

20-DEC-2007 08:57  
 \*\*\*\*\*DCN\*\*\*\*\*  
 mshalkh



**HORIZONTAL CURVE DATA**

PI STA. = 16+61.93 -L-  
 $\Delta = 44^\circ-20'-05.3''$  (RT.)  
 L = 750.57'  
 T = 395.21'  
 R = 970.00'  
 D = 5°-54'-24.4"



DRAWN BY: J.B. WILSON/M.G.S. DATE: 7/5/05  
 CHECKED BY: H.T. BARBOUR DATE: 10/24/06

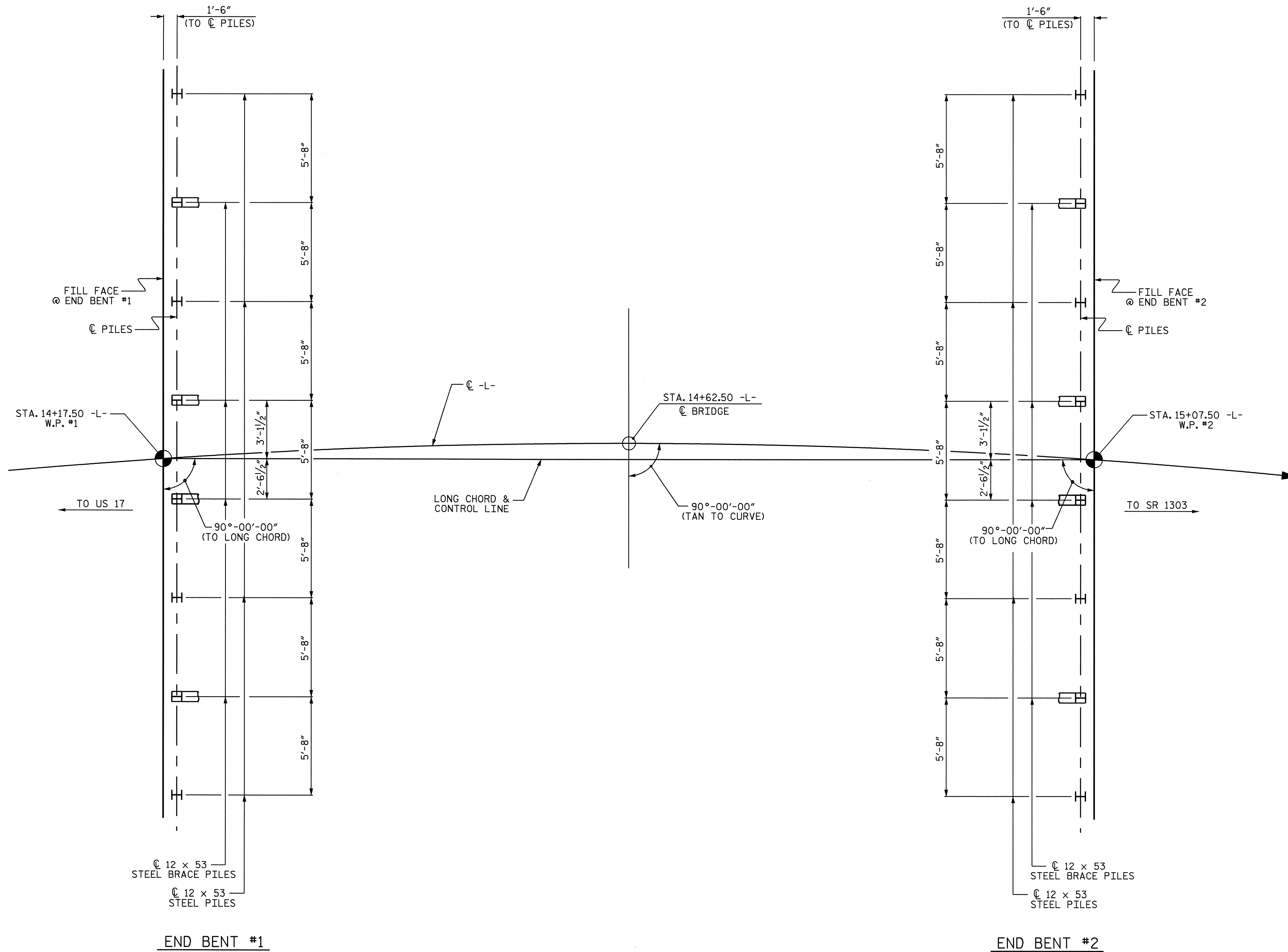
20-DEC-2007 15:29  
 I:\structures\final\br-4228.sd.gdn  
 mshakh

*James M. ...*  
 12/27/07  
 NORTH CAROLINA PROFESSIONAL SEAL 022506  
 D. KLAPPE  
 ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15875  
 D. KLAPPE  
 ENGINEER  
 12-20-07

PROJECT NO. B-4228  
PERQUIMANS COUNTY  
 STATION: 14+62.50 -L-  
 SHEET 1 OF 4 REPLACES BRIDGE No. 59

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GENERAL DRAWING FOR BRIDGE OVER SUTTON CREEK ON SR 1304 BETWEEN US 17 & SR 1303					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					19



**FOUNDATION LAYOUT**

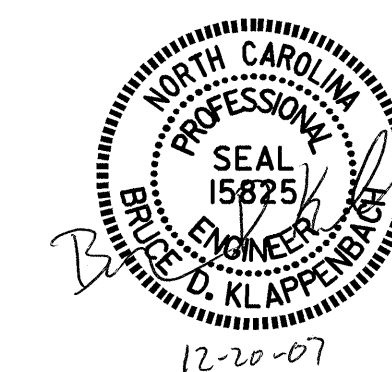
DIMENSIONS LOCATING PILES ARE TO PILE CENTERLINE.  
BRACE PILES AT END BENTS ARE BATTERED 3:12.

PROJECT NO. B-4228  
PERQUIMANS COUNTY  
 STATION: 14+62.50 -L-

SHEET 2 OF 4

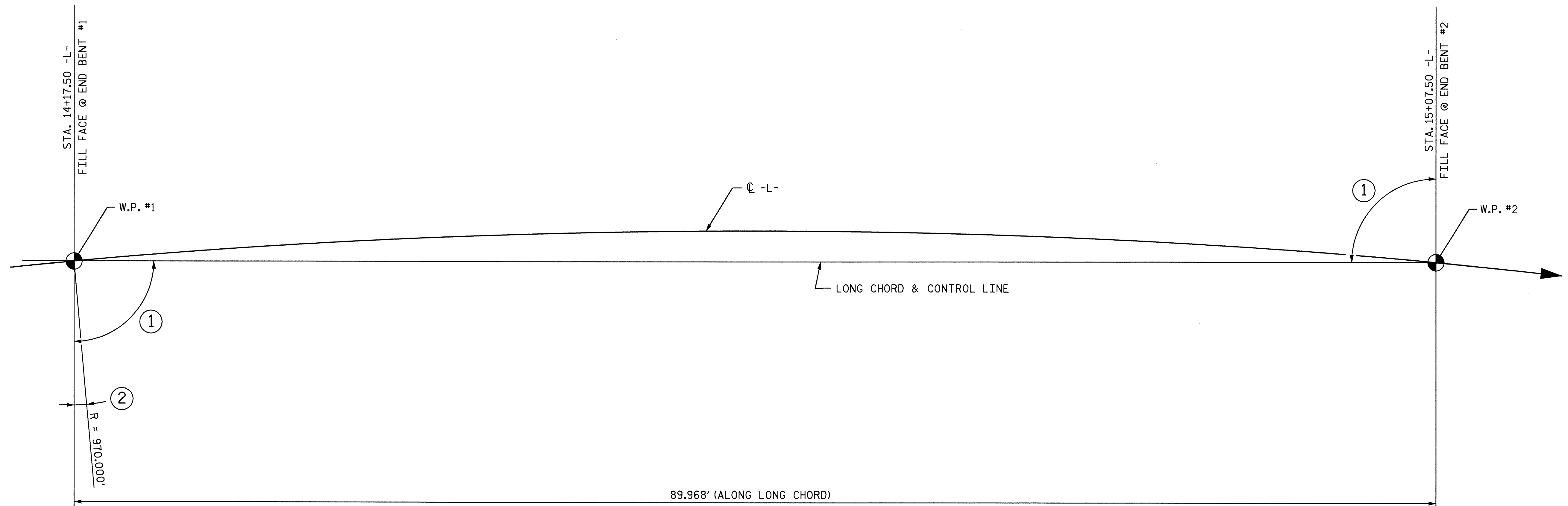
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE OVER  
 SUTTON CREEK  
 ON SR 1304 BETWEEN  
 US 17 & SR 1303



DRAWN BY : M.G. SHAIKH DATE : 10-28-05  
 CHECKED BY : H. T. BARBOUR DATE : 10-24-06

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



LONG CHORD LAYOUT

ANGLES

- ① 90°-00'-00"
- ② 2°-39'-29"

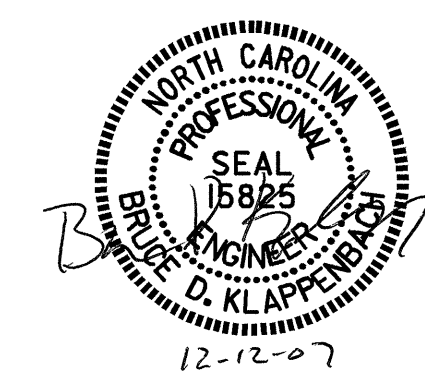
HORIZONTAL CURVE DATA -L-

P.I. STA. = 16+61.93 -L-  
 $\Delta = 44^\circ-20'-05.3''$  (RT.)  
 L = 750.57 FT.  
 T = 395.21 FT.  
 R = 970.000 FT.

PROJECT NO. B-4228  
PERQUIMAMS COUNTY  
 STATION: 14+62.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 LONG CHORD LAYOUT



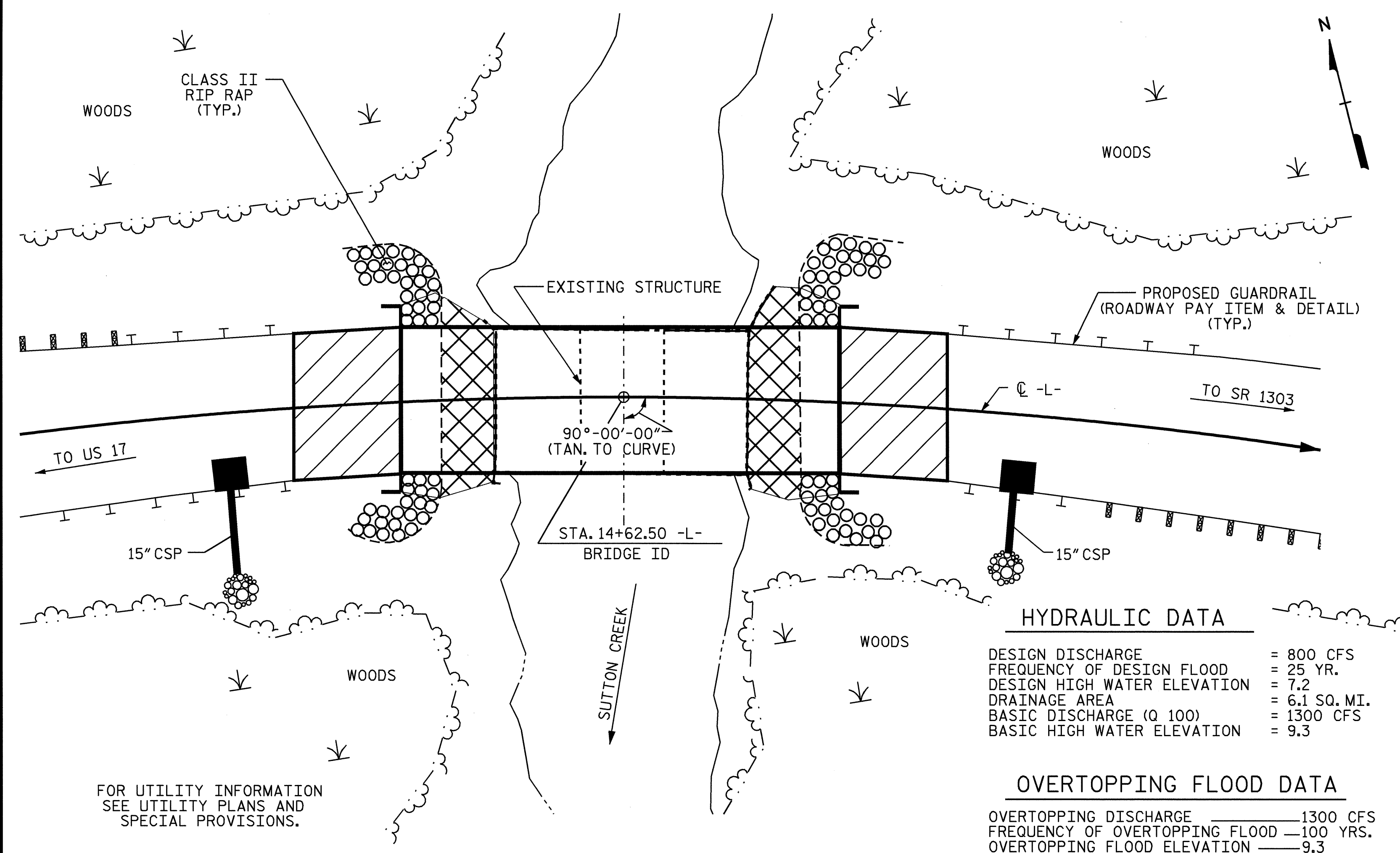
DRAWN BY : M. G. SHAIKH DATE : 10-28-05  
 CHECKED BY : H. T. BARBOUR DATE : 10-24-06

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

TOTAL SHEETS: 19



BENCH MARK: #10 STA. 12+68.70 -L-, 12.0518' RT.; RAILROAD SPIKE IN BASE OF 26" Ø SYCAMORE TREE, ELEV. 4.95', DATUM NAVD 88



LOCATION SKETCH

**HYDRAULIC DATA**

DESIGN DISCHARGE	= 800 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YR.
DESIGN HIGH WATER ELEVATION	= 7.2
DRAINAGE AREA	= 6.1 SQ. MI.
BASIC DISCHARGE (Q 100)	= 1300 CFS
BASIC HIGH WATER ELEVATION	= 9.3

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE	1300 CFS
FREQUENCY OF OVERTOPPING FLOOD	100 YRS.
OVERTOPPING FLOOD ELEVATION	9.3

FOR UTILITY INFORMATION SEE UTILITY PLANS AND SPECIAL PROVISIONS.

**NOTES**

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING, EXCEPT BOX BEAM UNITS HAVE BEEN DESIGNED FOR HS 25.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTING OF 3 SPANS 1 @ 17'-6", 1 @ 17'-1" AND 1 @ 17'-6", WITH A REINFORCED CONCRETE DECK ON 22 LINES OF 6 X 12 TIMBER JOISTS, ON TIMBER CAPS AND TIMBER PILES AT THE END BENTS AND INTERIOR BENTS, WITH A CLEAR ROADWAY WIDTH OF 27'-10" LOCATED AT THE SAME LOCATION AS THE PROPOSED STRUCTURE, SHALL BE REMOVED. SEE SPECIAL PROVISIONS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES FOR SEISMIC PERFORMANCE CATEGORY A.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 36 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION.

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

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

THIS BRIDGE SHALL BE CONSTRUCTED USING TOP-DOWN CONSTRUCTION METHODS. THE USE OF A TEMPORARY CAUSEWAY OR WORK BRIDGE IS NOT PERMITTED.

DRIVE PILES AT END BENT NO.1 AND NO.2 TO A REQUIRED BEARING CAPACITY OF 150 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.

THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT NO.1 AND END BENT NO.2 IS 75 TONS PER PILE.

TESTING PILES WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. SEE PILE DRIVING ANALYZER SPECIAL PROVISION.

PILE RESTRIKES FOR LRFD MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. SEE PILE RESTRIKES FOR LRFD SPECIAL PROVISION.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 35,000 TO 80,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE THE PILES AT END BENT NO.1 AND END BENT NO.2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM ARTICLE 450-6 OF THE STANDARD SPECIFICATIONS.

CLASS AA CONCRETE SHALL BE USED IN ALL CAST IN PLACE END BENT CAPS AND SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.

ALL BAR SUPPORTS USED IN THE BARRIER RAIL, END BENT CAPS, AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

FOR FALSEWORK & FORMWORK, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

THIS STRUCTURE CONTAINS THE NECESSARY CORROSION PROTECTION REQUIRED FOR A CORROSIVE SITE.

FOR PILE DRIVING ANALYZER, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

PILE RESTRIKES FOR LRFD MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. SEE PILE RESTRIKES FOR LRFD SPECIAL PROVISION.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS.

**TOTAL BILL OF MATERIAL**

	REMOVAL OF EXISTING STRUCTURE	PDA TESTING	PDA ASSISTANCE	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS AA CONCRETE	BRIDGE APPROACH SLABS	EPOXY COATED REINFORCING STEEL	HP 12 X 53 STEEL PILES	PILE REDRIVES	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAMS	
	LUMP SUM	EA.	EA.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	NO.	LIN.FT.	EA.	LIN.FT.	TONS	SQ. YDS.	LUMP SUM	LIN.FT.
SUPERSTRUCTURE															
END BENT NO. 1					19.9		2947	8	520	8		105			1052.62
END BENT NO. 2					19.9		2947	8	520	8		102			
TOTAL	LUMP SUM	1	1	LUMP SUM	39.8	LUMP SUM	5894	16	1040	16	175.44	186	207	LUMP SUM	1052.62

PROJECT NO. B-4228  
PERQUIMANS COUNTY  
 STATION: 14+62.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE OVER  
 SUTTON CREEK  
 ON SR 1304 BETWEEN  
 US 17 & SR 1303



DRAWN BY : J.B. WILSON / M.G.S. DATE : 10/31/05  
 CHECKED BY : H.T. BARBOUR DATE : 10/24/06

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

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 BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

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

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

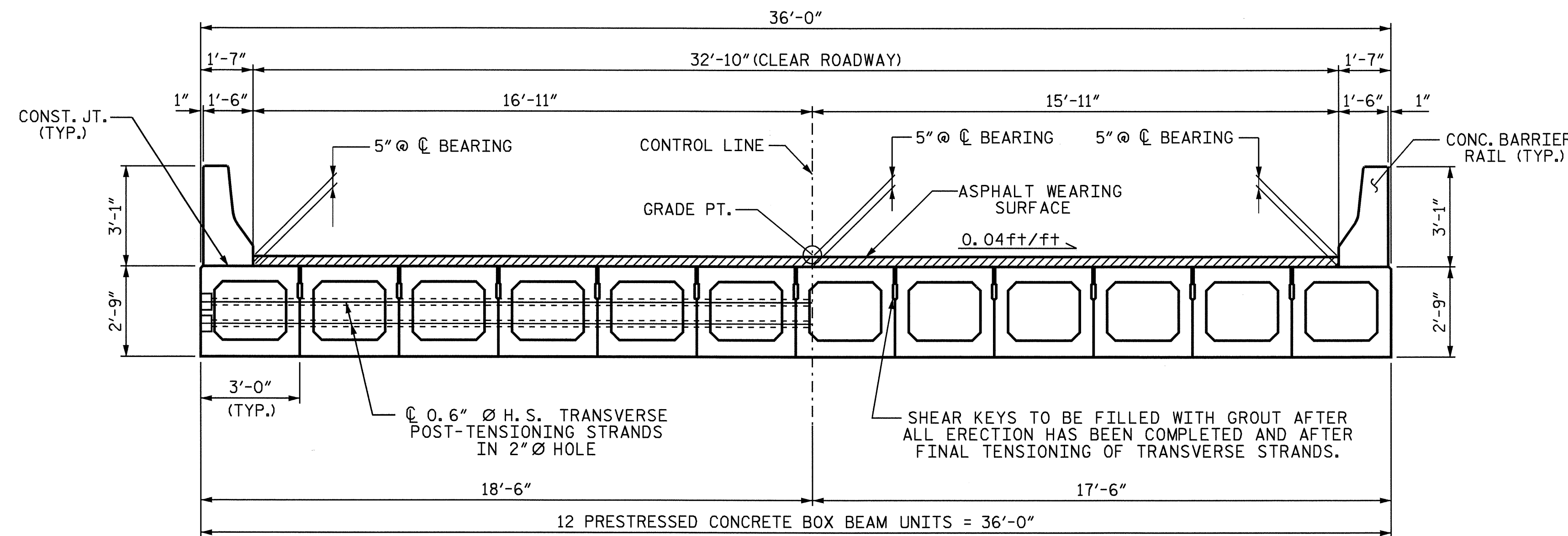
VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A VERTICAL CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION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

THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.

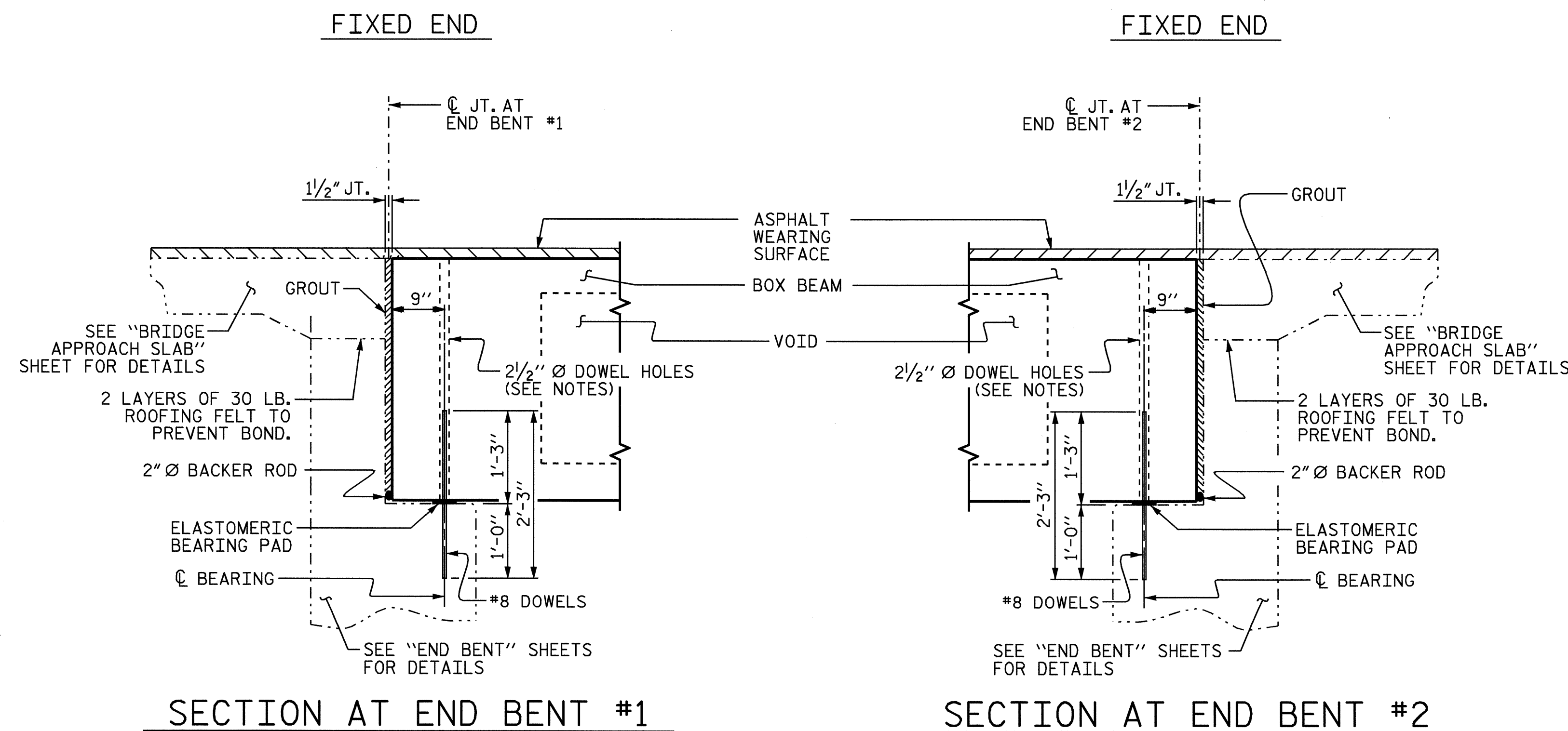
PRESTRESSED CONCRETE BOX BEAM ARE DESIGNED FOR 0 PSI TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

PRESTRESSED CONCRETE BOX BEAM SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.

THE 2" Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.



TYPICAL SECTION



SECTION AT END BENT #1

SECTION AT END BENT #2

ASSEMBLED BY : M. G. SHAIKH DATE : 6-14-05  
 CHECKED BY : D. A. GLADDEN DATE : 3-09-06  
 DRAWN BY : TLA 5/05  
 CHECKED BY : GM 6/05

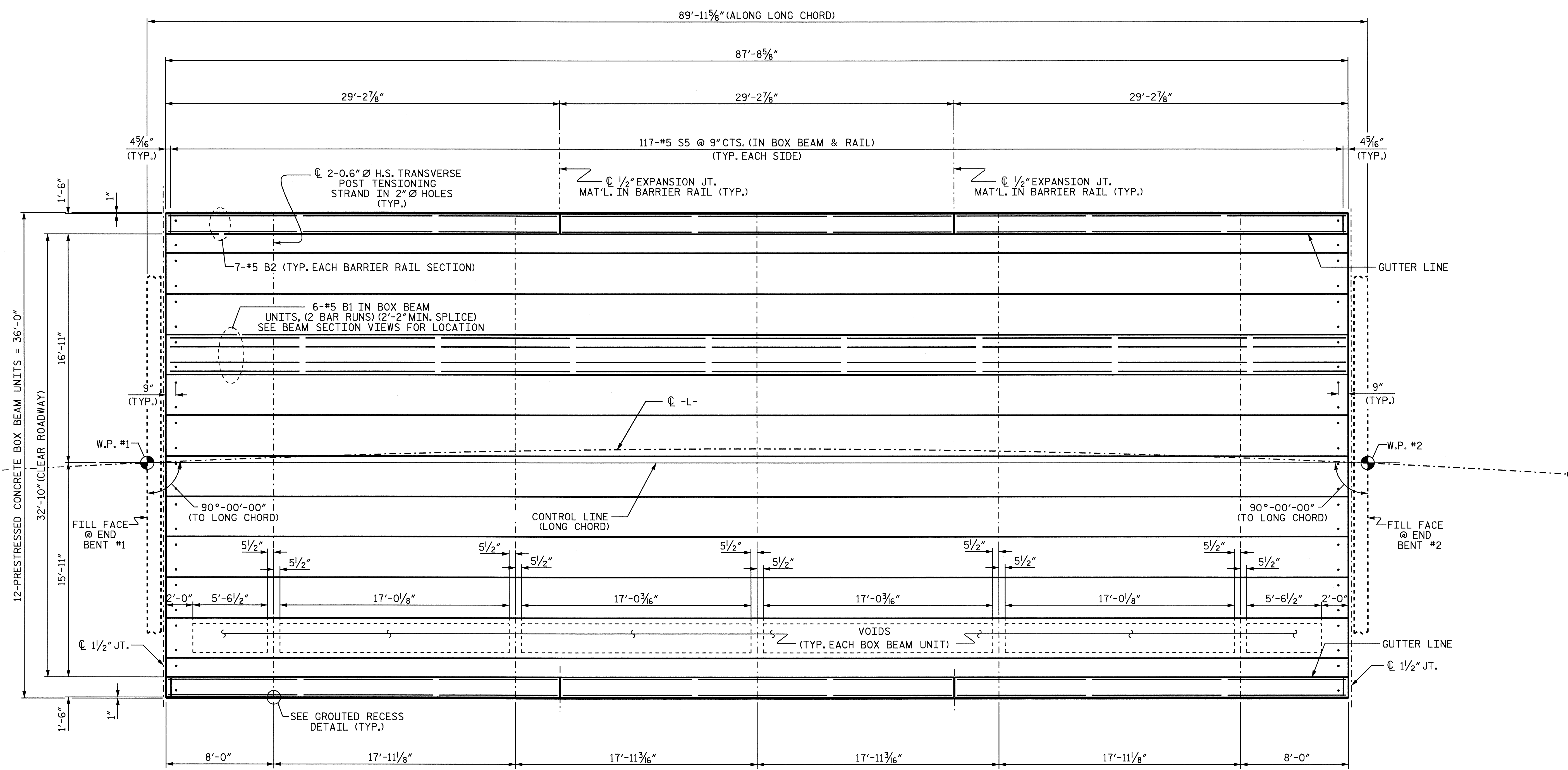
ADDED 7/11/05R  
 REV. 5/1/06R KMM/GM



PROJECT NO. B-4228  
PERQUIMANS COUNTY  
 STATION: 14+62.50 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
3'-0" X 2'-9"					
PRESTRESSED CONCRETE					
BOX BEAM UNIT					
MARCH				2005	
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-5
TOTAL SHEETS					19



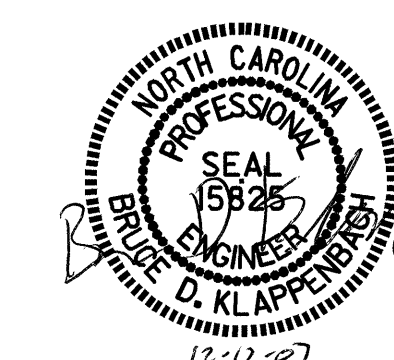
PLAN OF SPAN

PROJECT NO. B-4228  
 PERQUIMANS COUNTY  
 STATION: 14+62.50 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

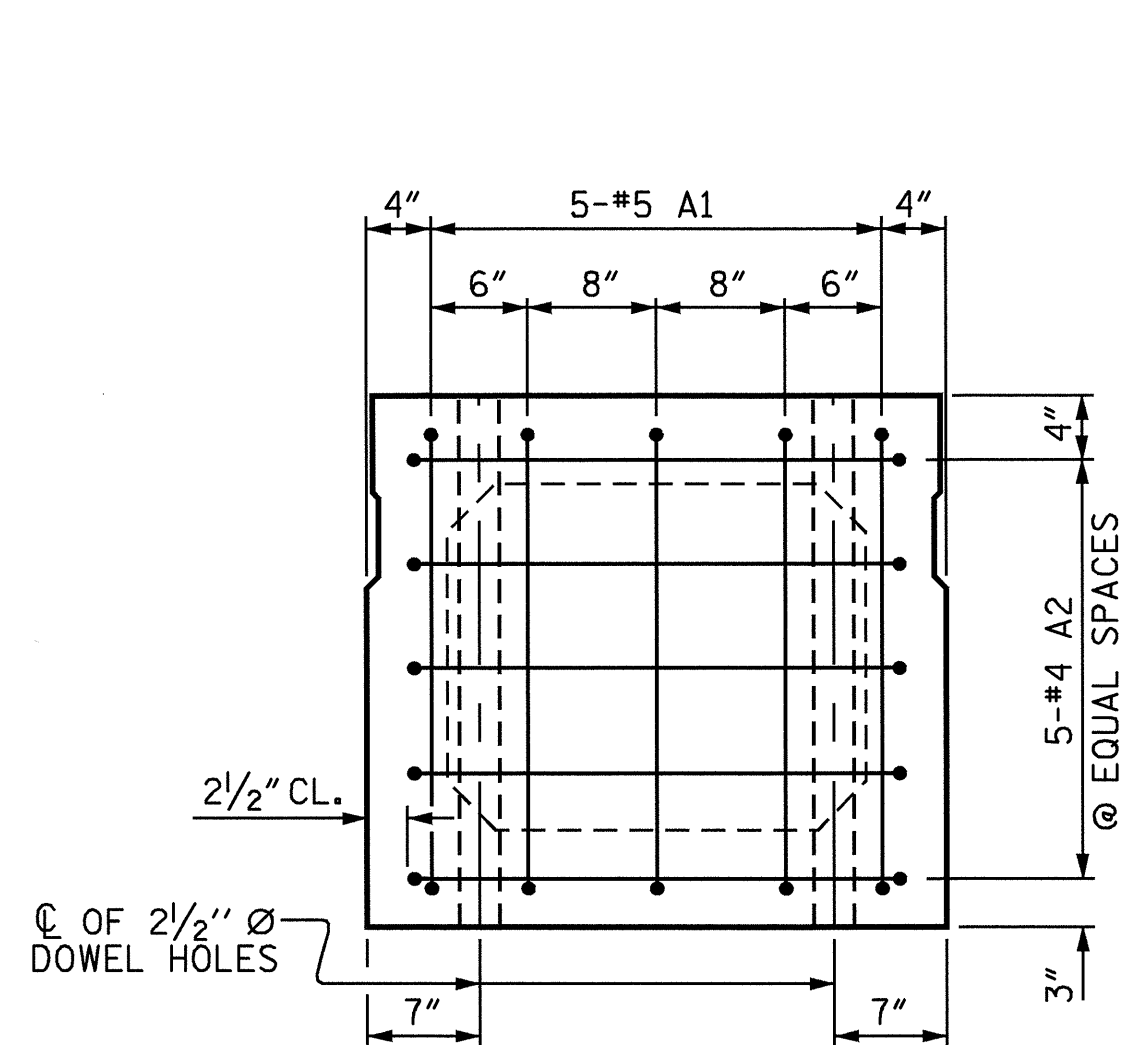
3'-0" x 2'-9"  
 PRESTRESSED CONCRETE  
 BOX BEAM UNIT



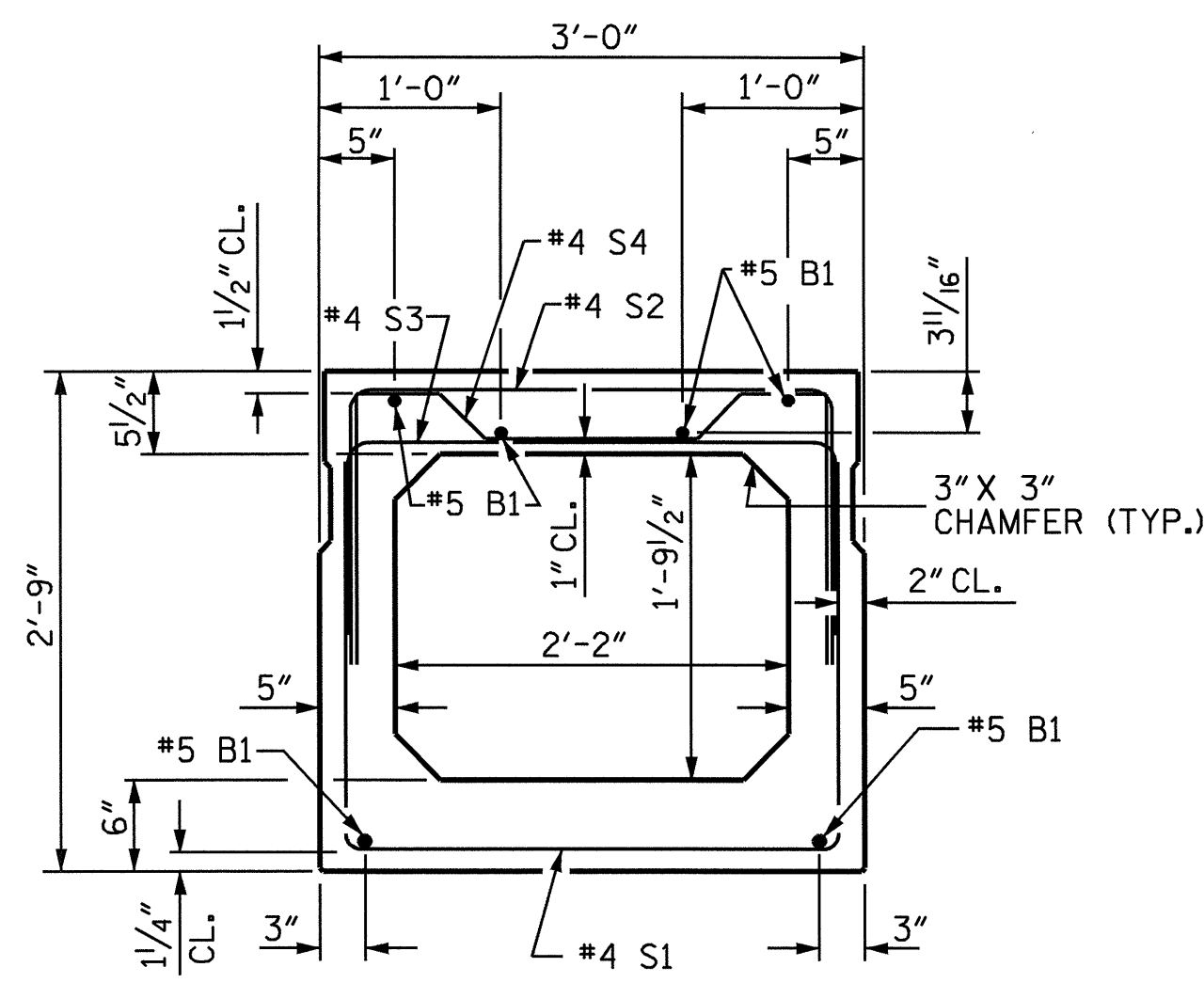
DRAWN BY : M. G. SHAIKH DATE : 6-14-05  
 CHECKED BY : D. A. GLADDEN DATE : 3-09-06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			19

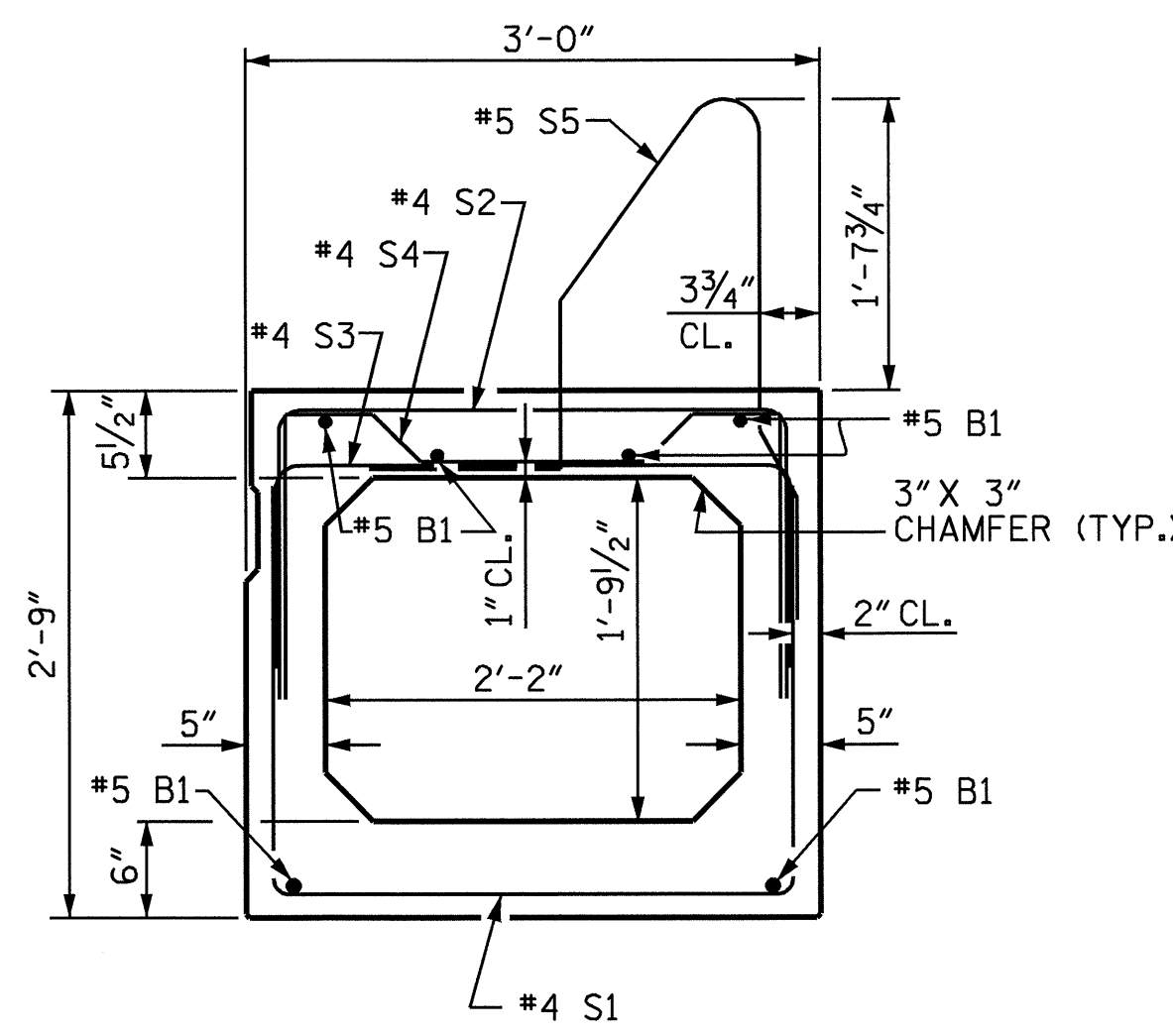




**END ELEVATION**  
SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)

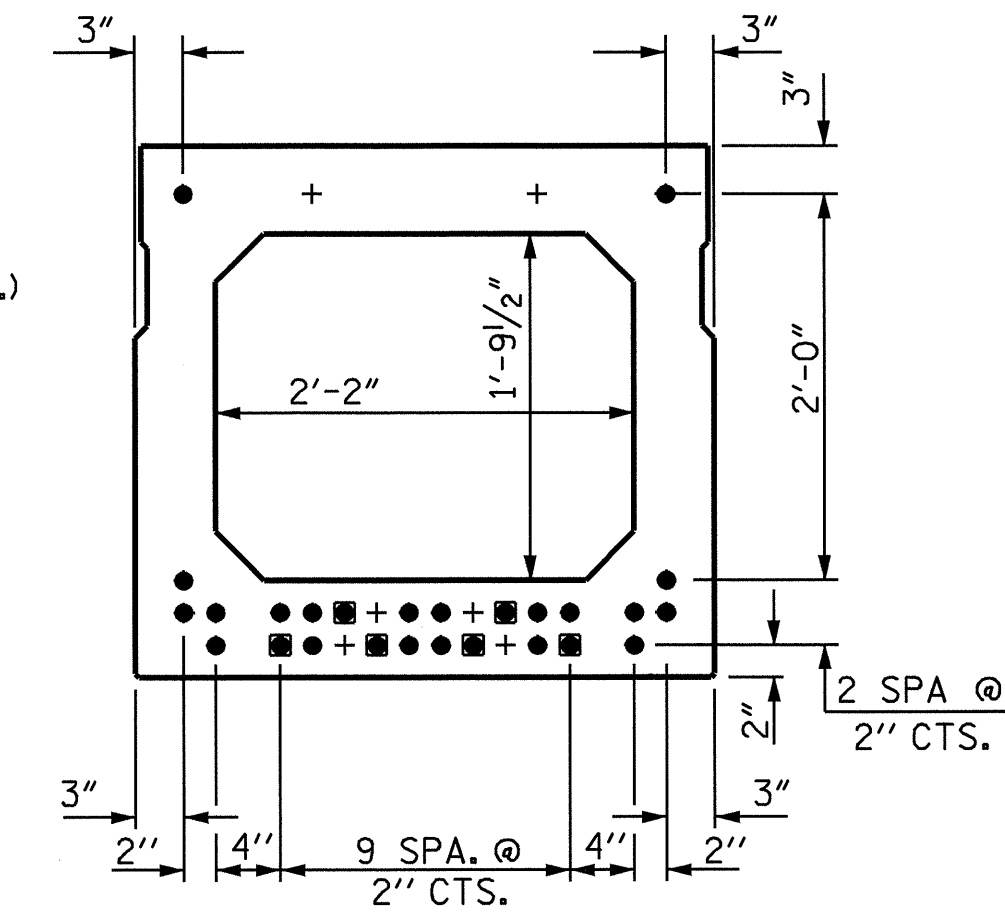


**INTERIOR BOX BEAM SECTION**  
(STRAND LAYOUT NOT SHOWN)



**EXTERIOR BOX BEAM SECTION**  
(STRAND LAYOUT NOT SHOWN)

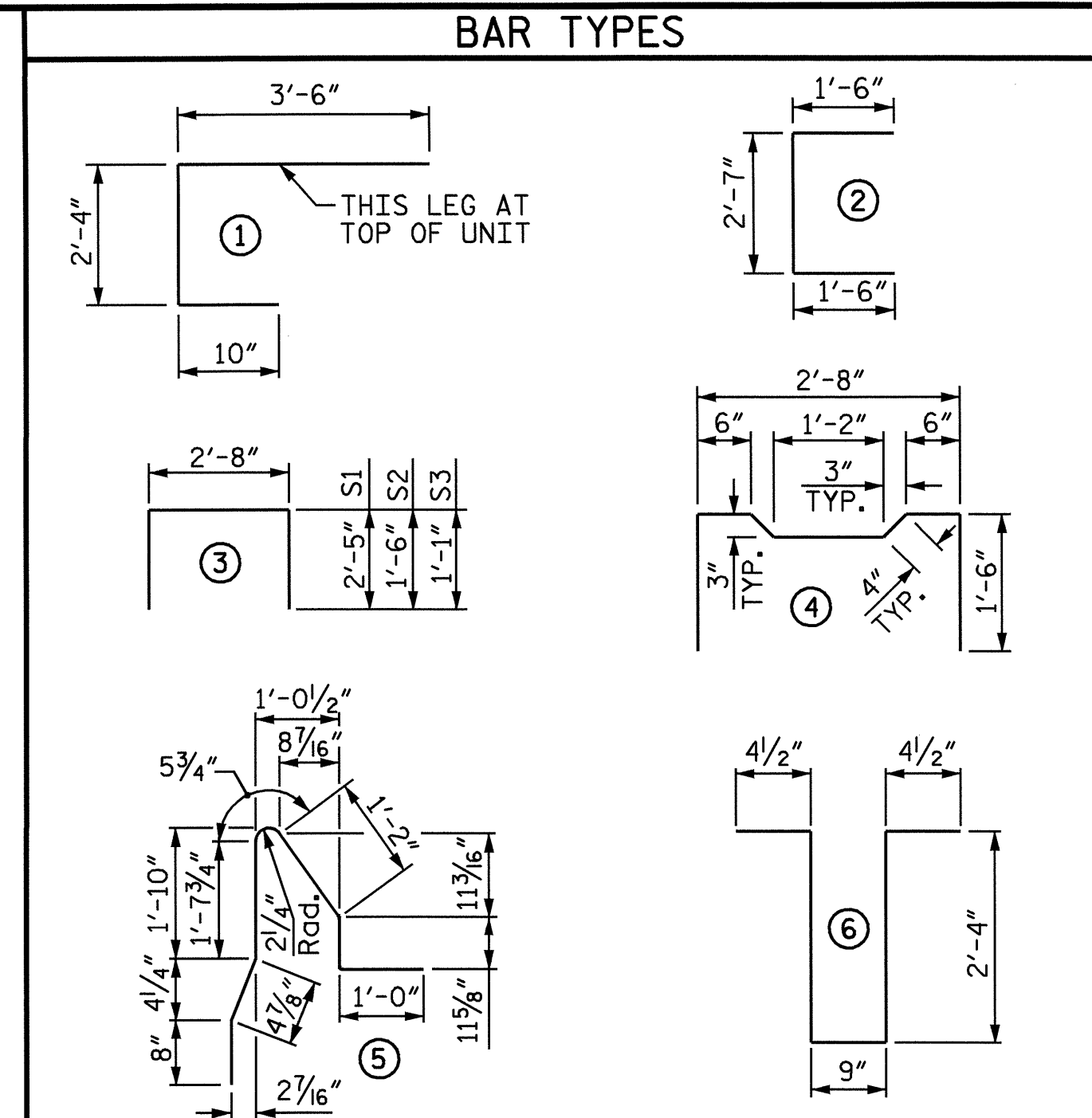
**0.6" Ø LOW RELAXATION STRAND LAYOUT**



**TYPICAL STRAND LOCATION**  
(26 STRANDS REQUIRED)  
(INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION)

**DEBONDING LEGEND**

- STRANDS DEBONDED FOR 12'-9" FROM END OF GIRDER



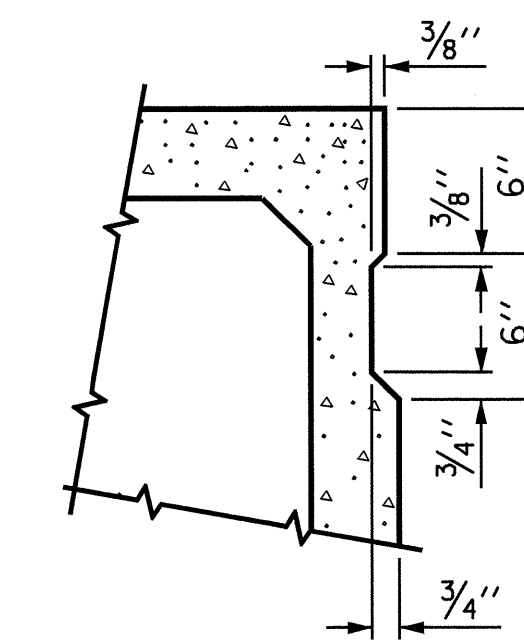
ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF MATERIAL FOR ONE BOX BEAM SECTION**

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	6'-8"	70	6'-8"	70
A2	40	#4	2	5'-7"	149	5'-7"	149
B1				44'-10"	561	44'-10"	561
K1				6'-2"	62	6'-2"	62
K2				2'-7"	17	2'-7"	17
S1				7'-6"	351	7'-6"	351
S2				5'-8"	265	5'-8"	265
S3				4'-10"	397	4'-10"	397
S4				5'-10"	207	5'-10"	207
* S5				6'-4"	773		
REINFORCING STEEL					2079 LBS.		2079 LBS.
* EPOXY COATED REINF. STEEL					773 LBS.		
6200 P.S.I. CONCRETE					15.6 CU. YDS.		15.5 CU. YDS.
0.6" Ø L.R. STRANDS				No.	26	No.	26

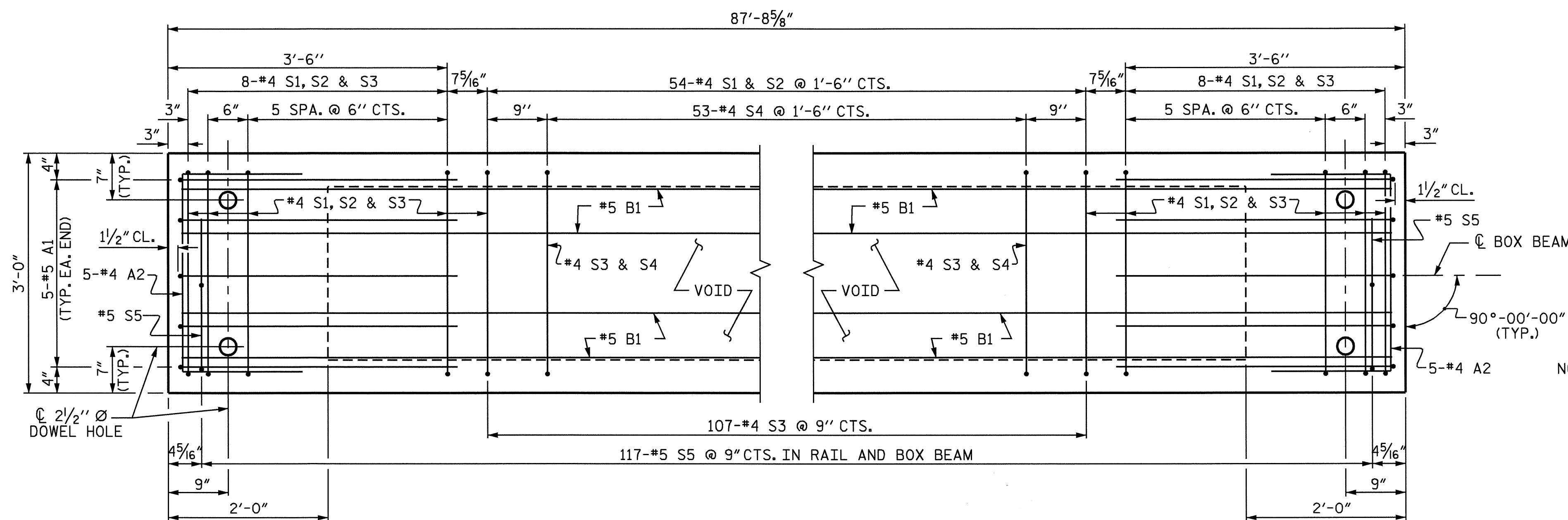
**GRADE 270 STRANDS**

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



**SHEAR KEY DETAIL**

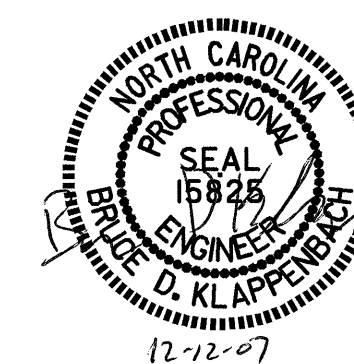
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.



**PLAN OF BOX BEAM**

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. FOR LOCATION OF DIAPHRAGMS, SEE PLAN OF SPANS. FOR REINFORCING STEEL IN DIAPHRAGMS, SEE DIAPHRAGM DETAILS.

ASSEMBLED BY : M. G. SHAIKH DATE : 6-15-05  
CHECKED BY : D. A. GLADDEN DATE : 3-09-06  
DRAWN BY : TLA 3/05 ADDED 1/31/05  
CHECKED BY :



PROJECT NO. B-4228  
PERQUIMANS COUNTY  
STATION: 14+62.50 -L-

SHEET 3 OF 5

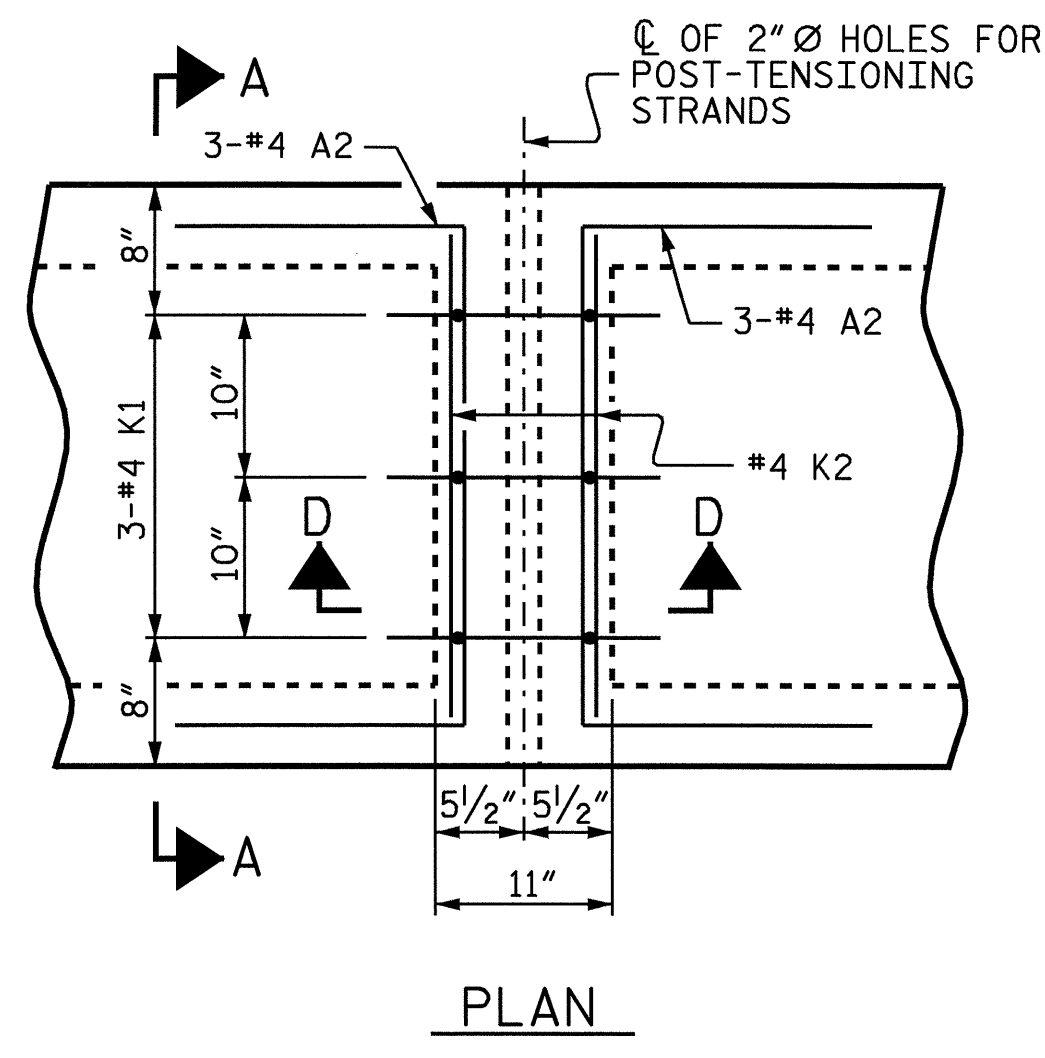
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

3'-0" X 2'-9"  
PRESTRESSED CONCRETE  
BOX BEAM UNIT

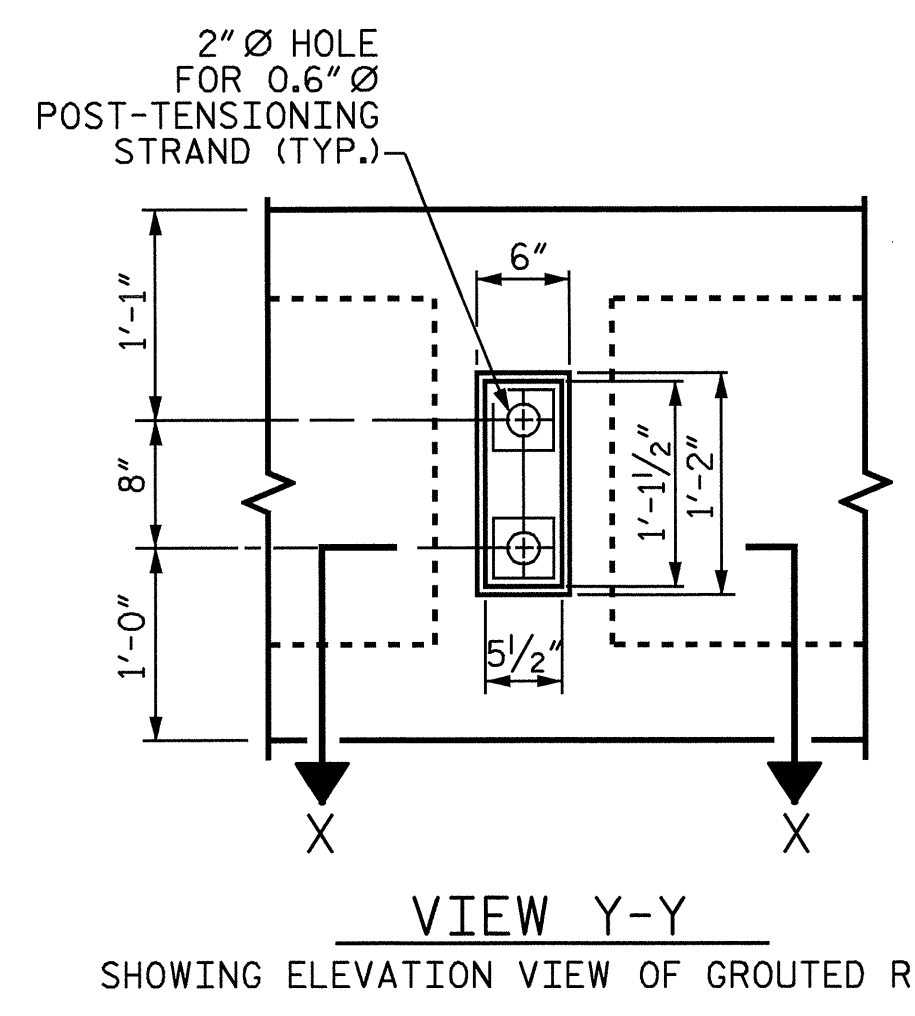
MARCH 2005

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			19

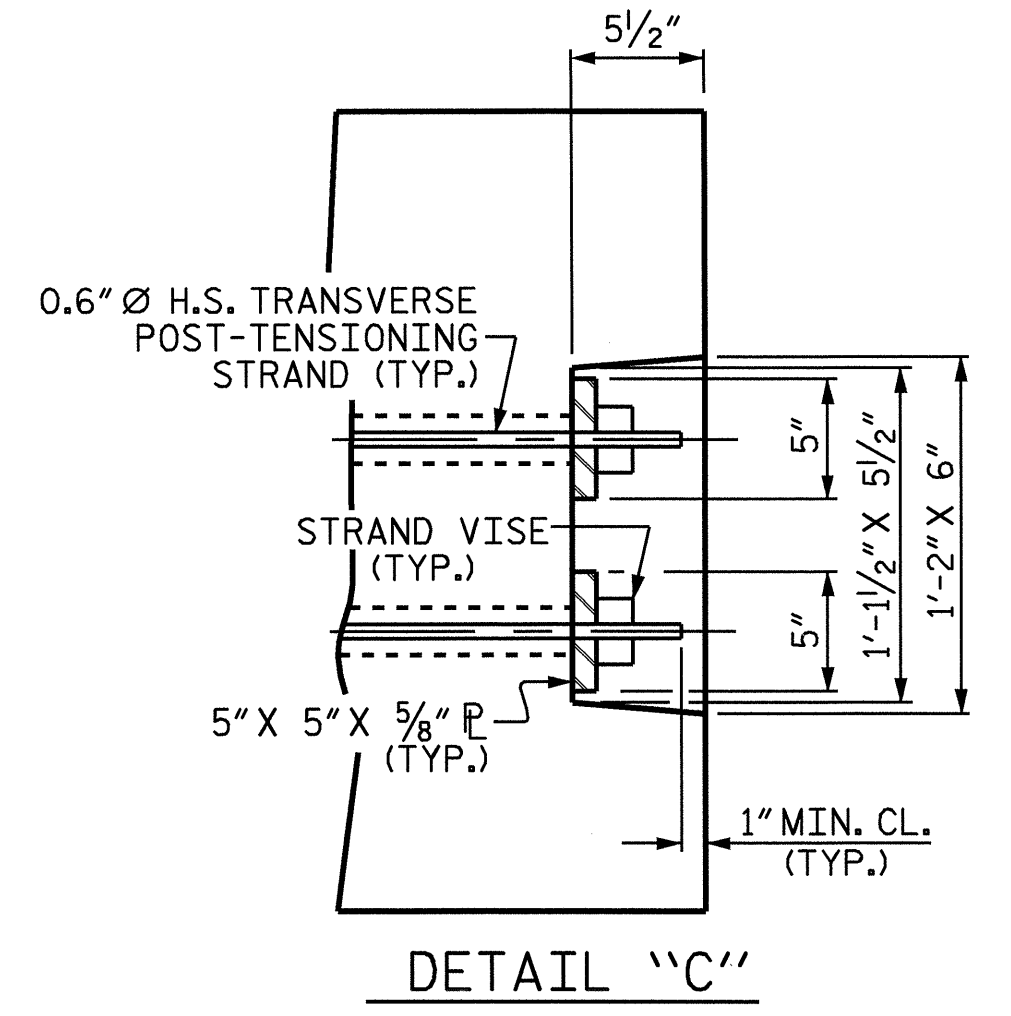




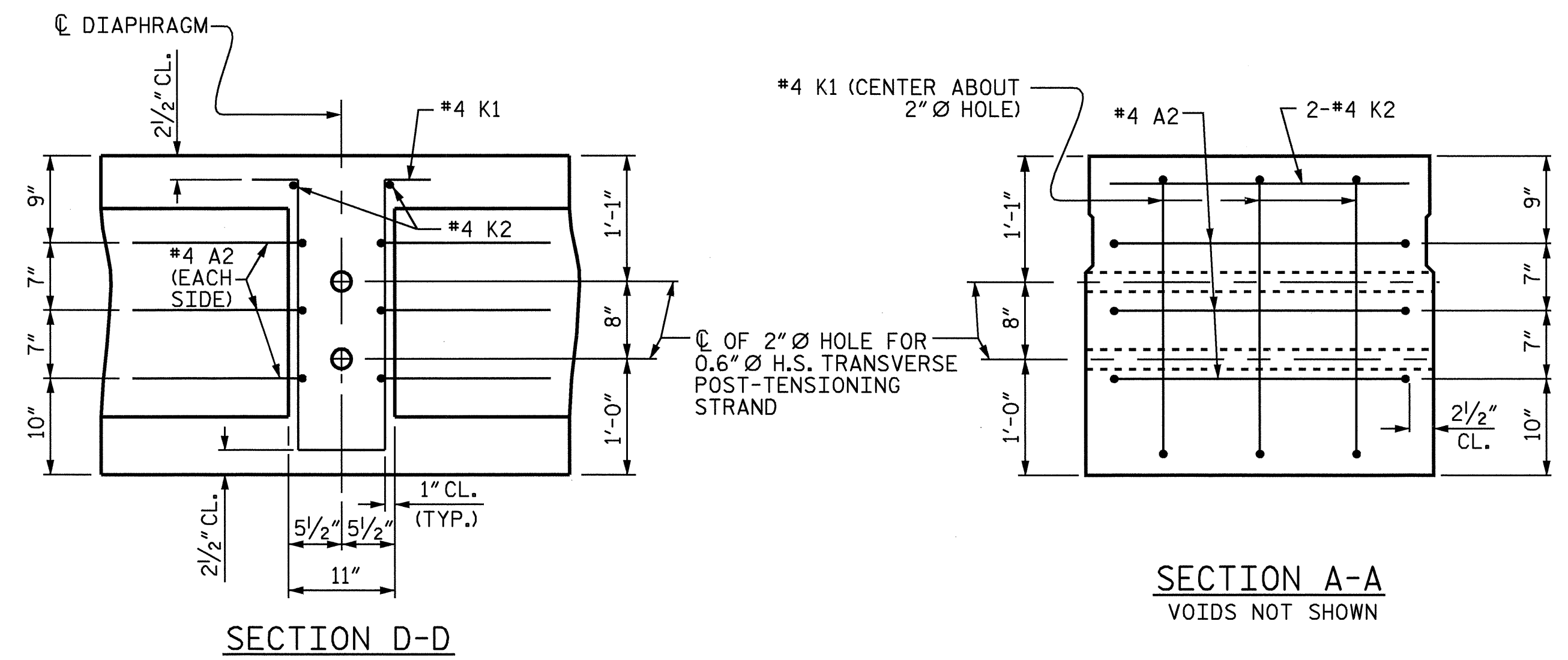
PLAN



VIEW Y-Y  
SHOWING ELEVATION VIEW OF GROUDED RECESS

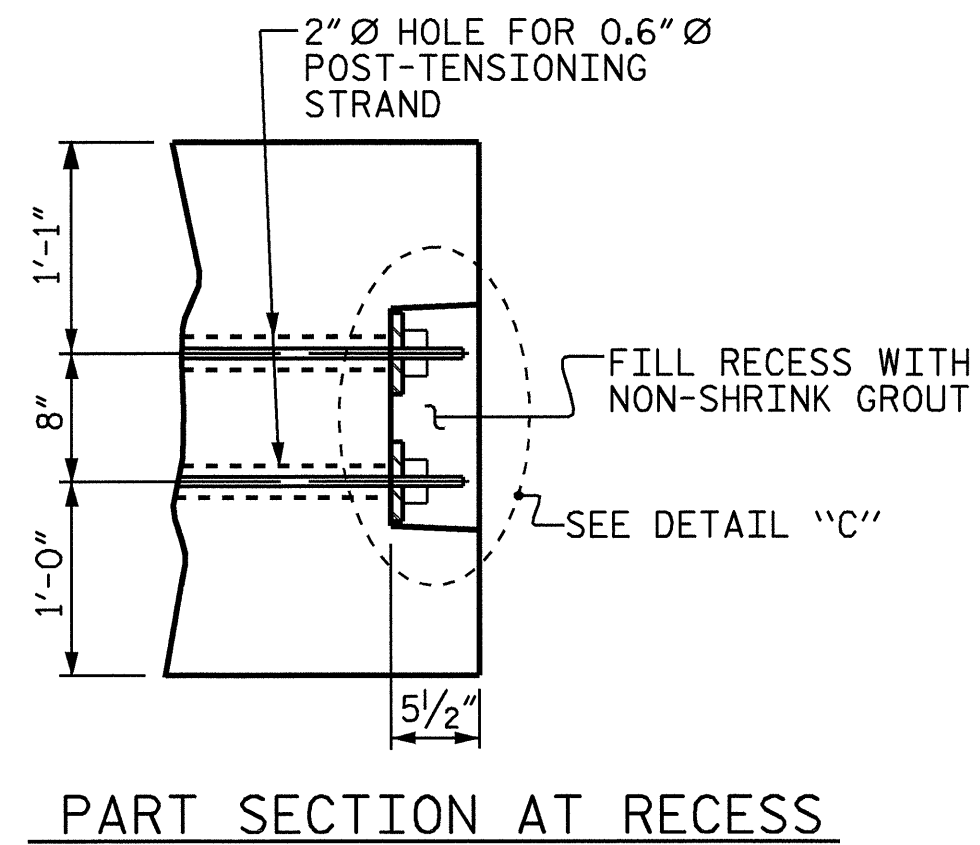


DETAIL "C"

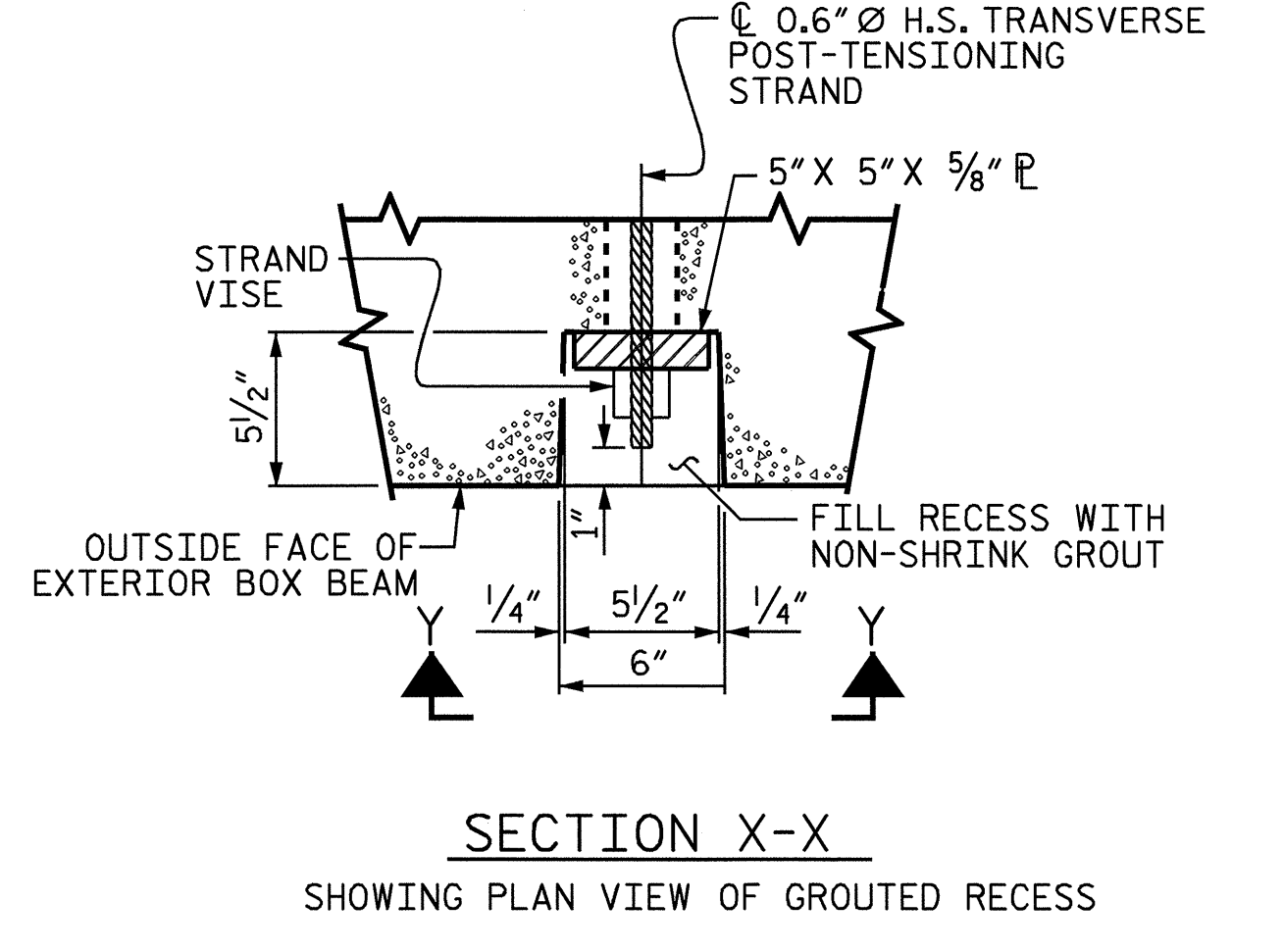


SECTION A-A  
VOIDS NOT SHOWN

SECTION D-D



PART SECTION AT RECESS

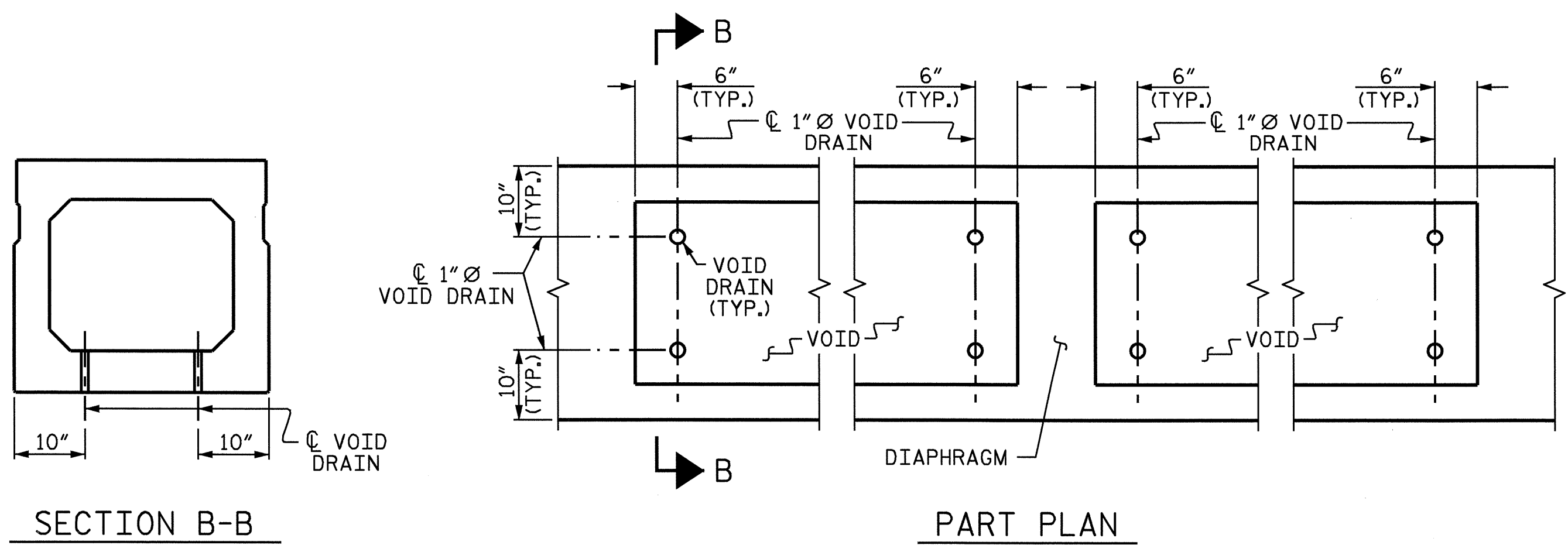


SECTION X-X  
SHOWING PLAN VIEW OF GROUDED RECESS

DOUBLE DIAPHRAGM DETAILS

\*4 "S" BARS NOT SHOWN. \*4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2" Ø HOLE.

GROUDED RECESS DETAIL AT  
END OF POST-TENSIONED STRANDS  
OF EXTERIOR BOX BEAM



SECTION B-B

PART PLAN

VOID DRAIN DETAILS

(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

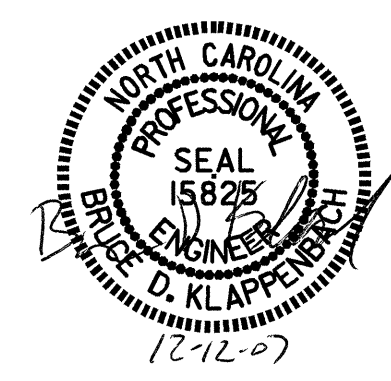
DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 2'-9"
	0.6" Ø L.R. STRAND
	SPAN A
CAMBER (BEAM ALONE IN PLACE)	↑ 4 3/16"
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	↓ 3/4"
FINAL CAMBER	↑ 3 7/16"

\*\* INCLUDES FUTURE WEARING SURFACE

PROJECT NO. B-4228  
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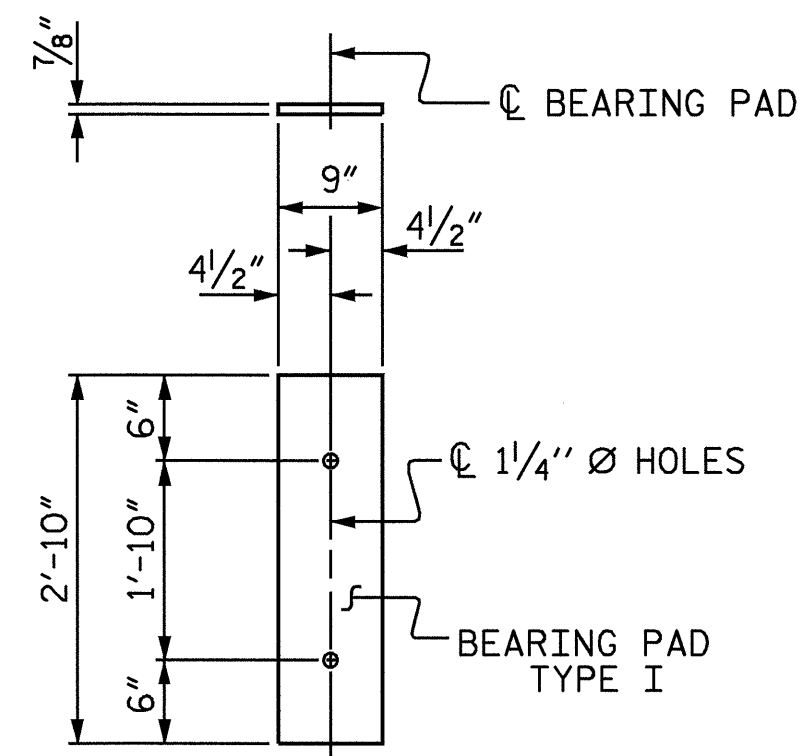
SHEET 4 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
3'-0" X 2'-9"  
PRESTRESSED CONCRETE  
BOX BEAM UNIT



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			19

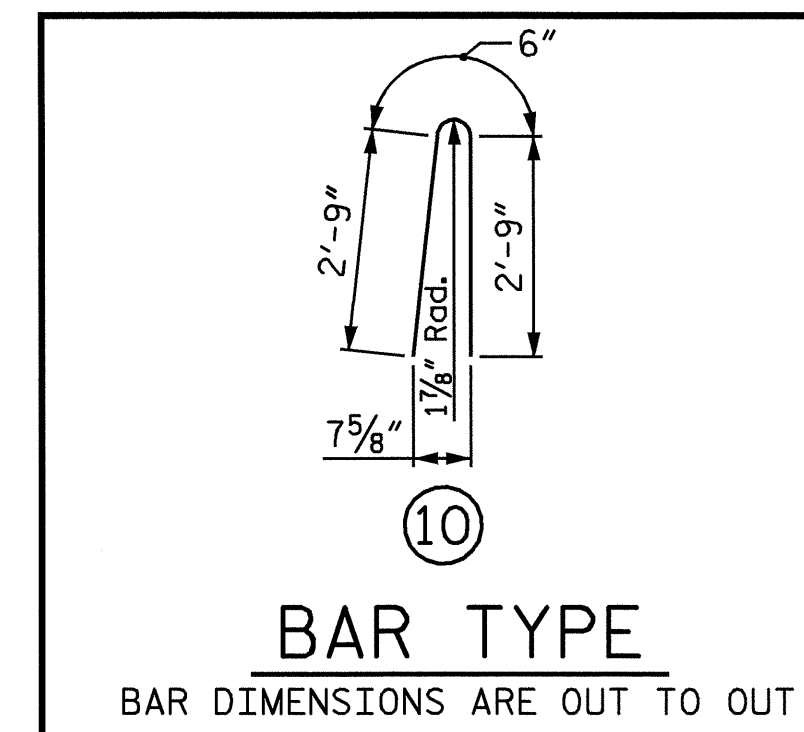
ASSEMBLED BY: M. G. SHAIKH DATE: 6-15-05  
CHECKED BY: D. A. GLADDEN DATE: 3-09-06  
DRAWN BY: TLA 3/05 ADDED  
CHECKED BY:



FIXED END (E1)  
(TYPE I - 24 REQ'D)

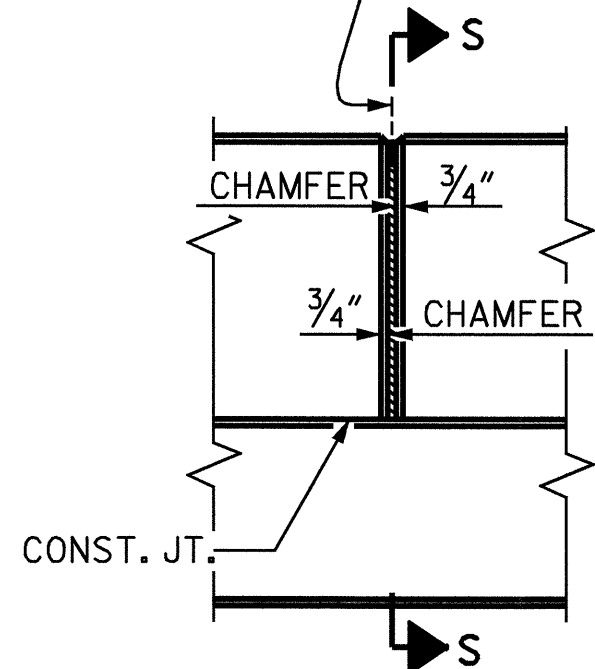
ELASTOMERIC BEARING DETAILS

BILL OF MATERIAL FOR CONCRETE BARRIER RAIL					
BAR	BARS PER SPAN	SIZE	TYPE	LENGTH	WEIGHT
*B2	42	#5	STR	28'-10"	1263
*S6	234	#5	10	6'-0"	1464
* EPOXY COATED REINFORCING STEEL				LBS.	2727
CLASS AA CONCRETE				CU.YDS.	21.6
TOTAL LIN. FT. OF CONCRETE BARRIER RAIL					175.44

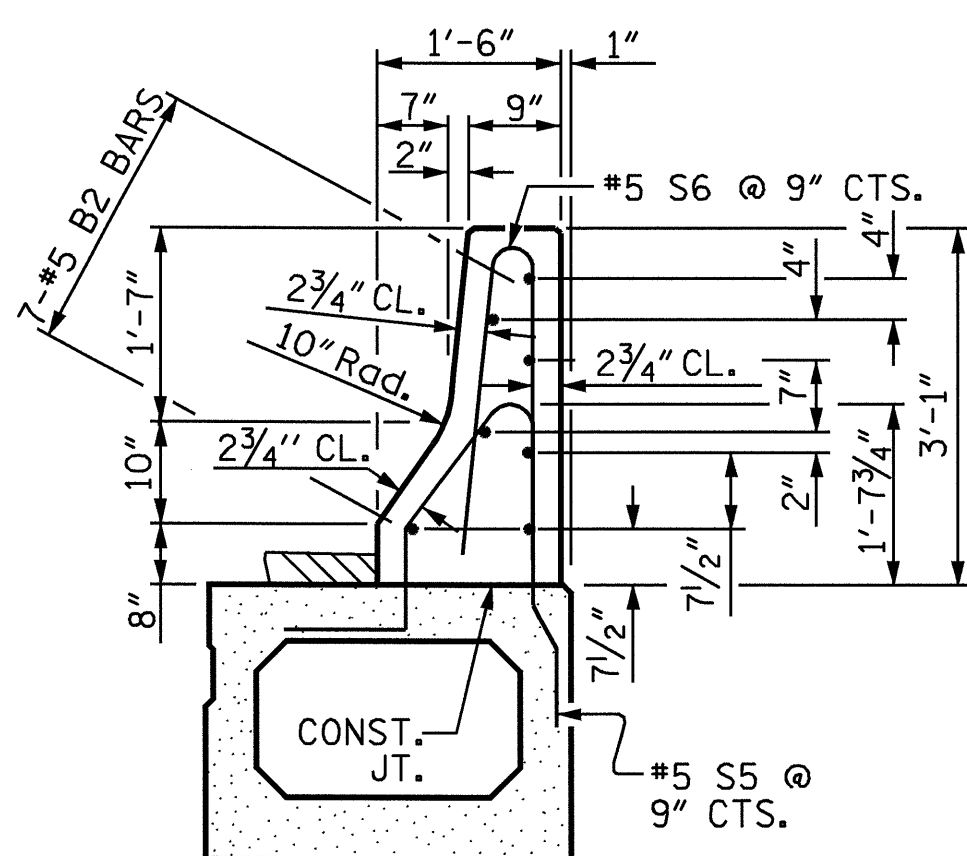


BOX BEAM UNITS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
12	87'-8 5/8"	1052'-7 1/2"

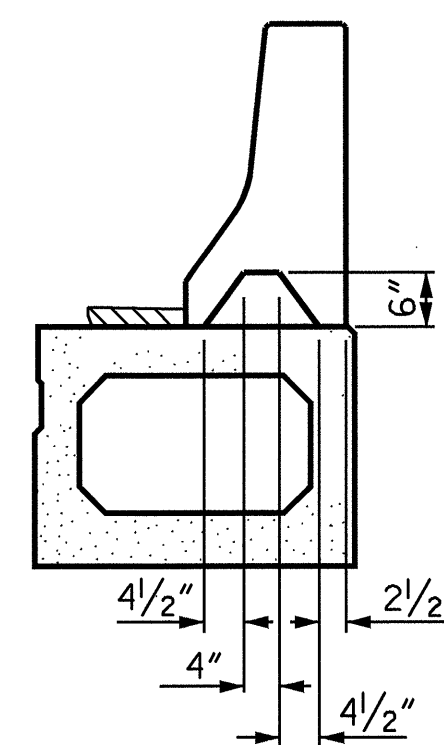
1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.  
(NOTE: OMIT EXP. JT. MAT'L WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS



SECTION THRU RAIL



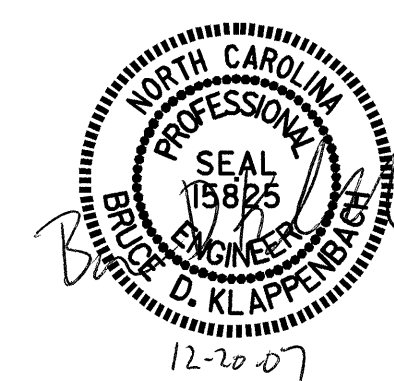
SECTION S-S  
AT DAM IN OPEN JOINT  
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

BARRIER RAIL DETAILS

PROJECT NO. B-4228  
PERQUIMANS COUNTY  
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SHEET 5 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
  
3'-0" X 2'-9"  
PRESTRESSED CONCRETE  
BOX BEAM UNIT



ASSEMBLED BY : M. G. SHAIKH DATE : 6-17-05  
CHECKED BY : D. A. GLADDEN DATE : 3-09-06  
DRAWN BY : TLA 3/05 ADDED  
CHECKED BY :

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			19

NOTES

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

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

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

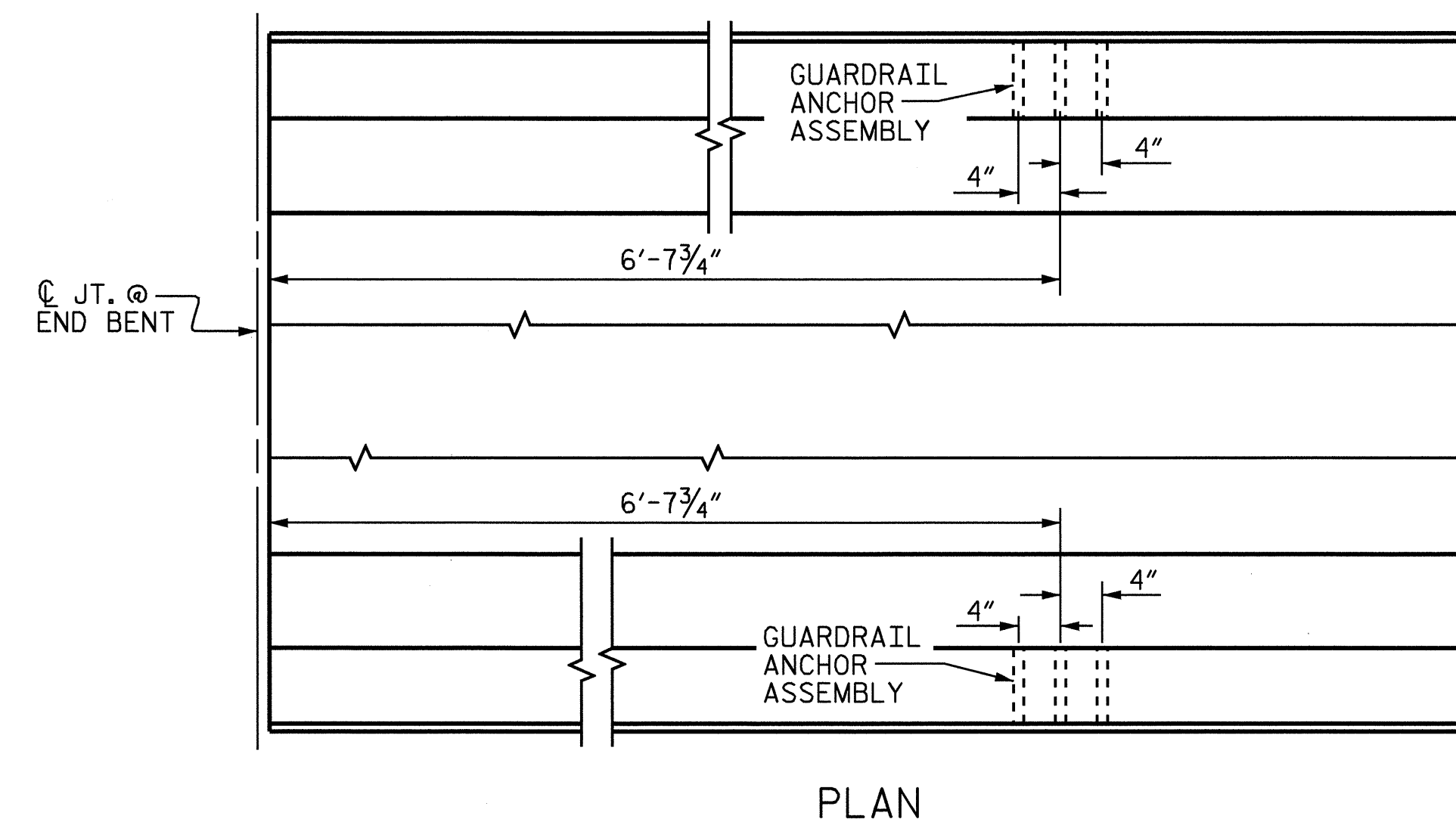
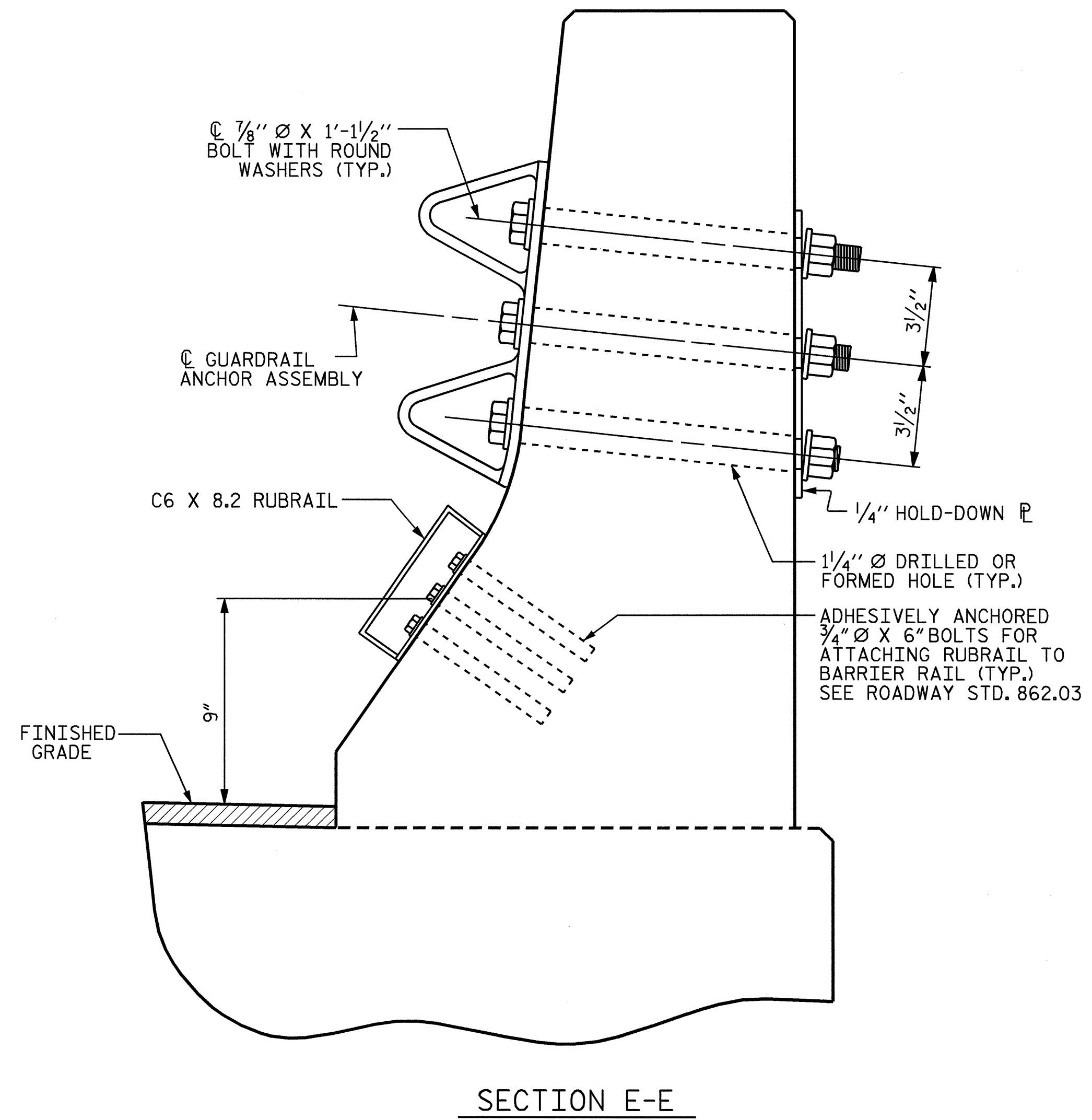
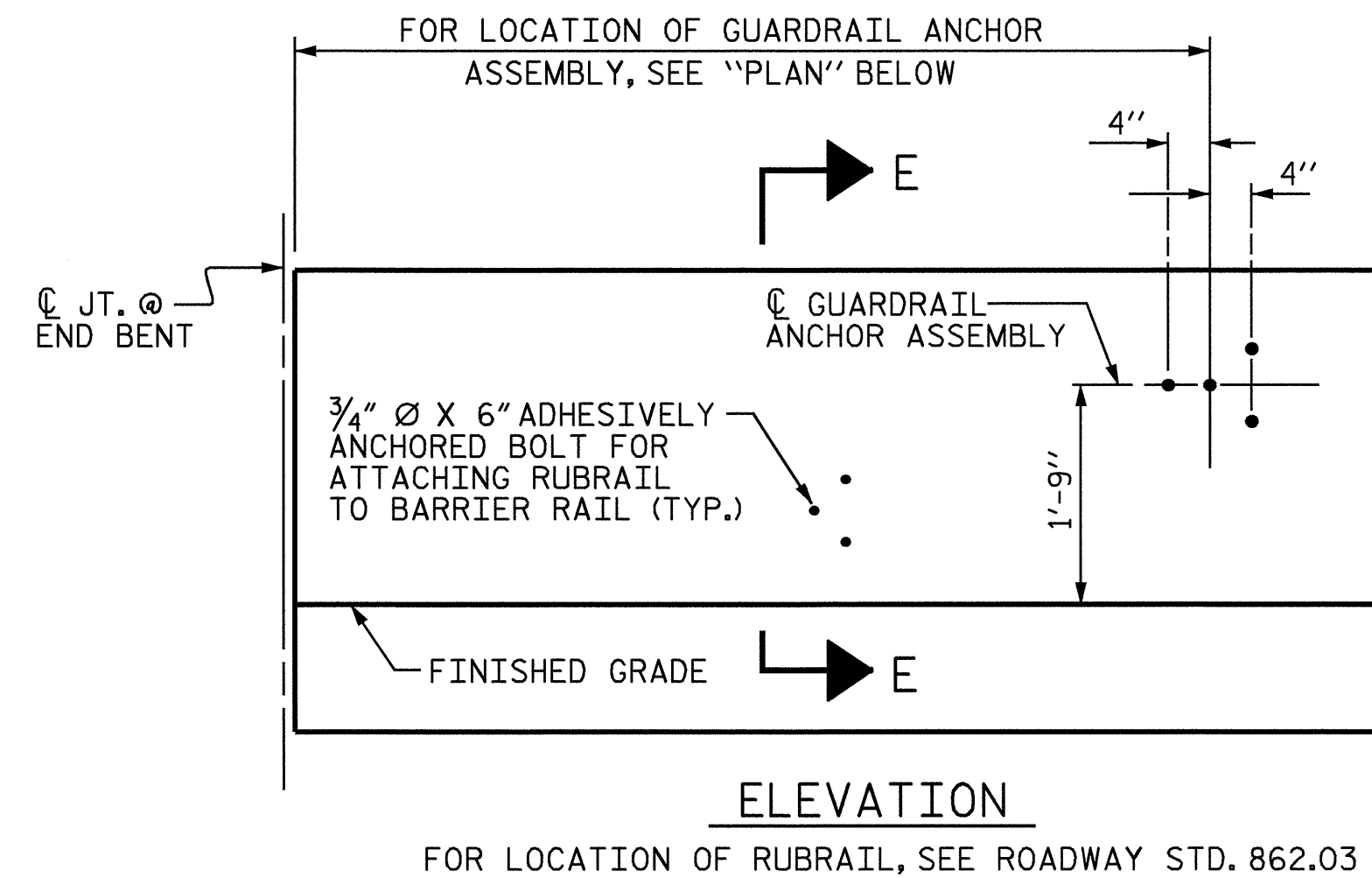
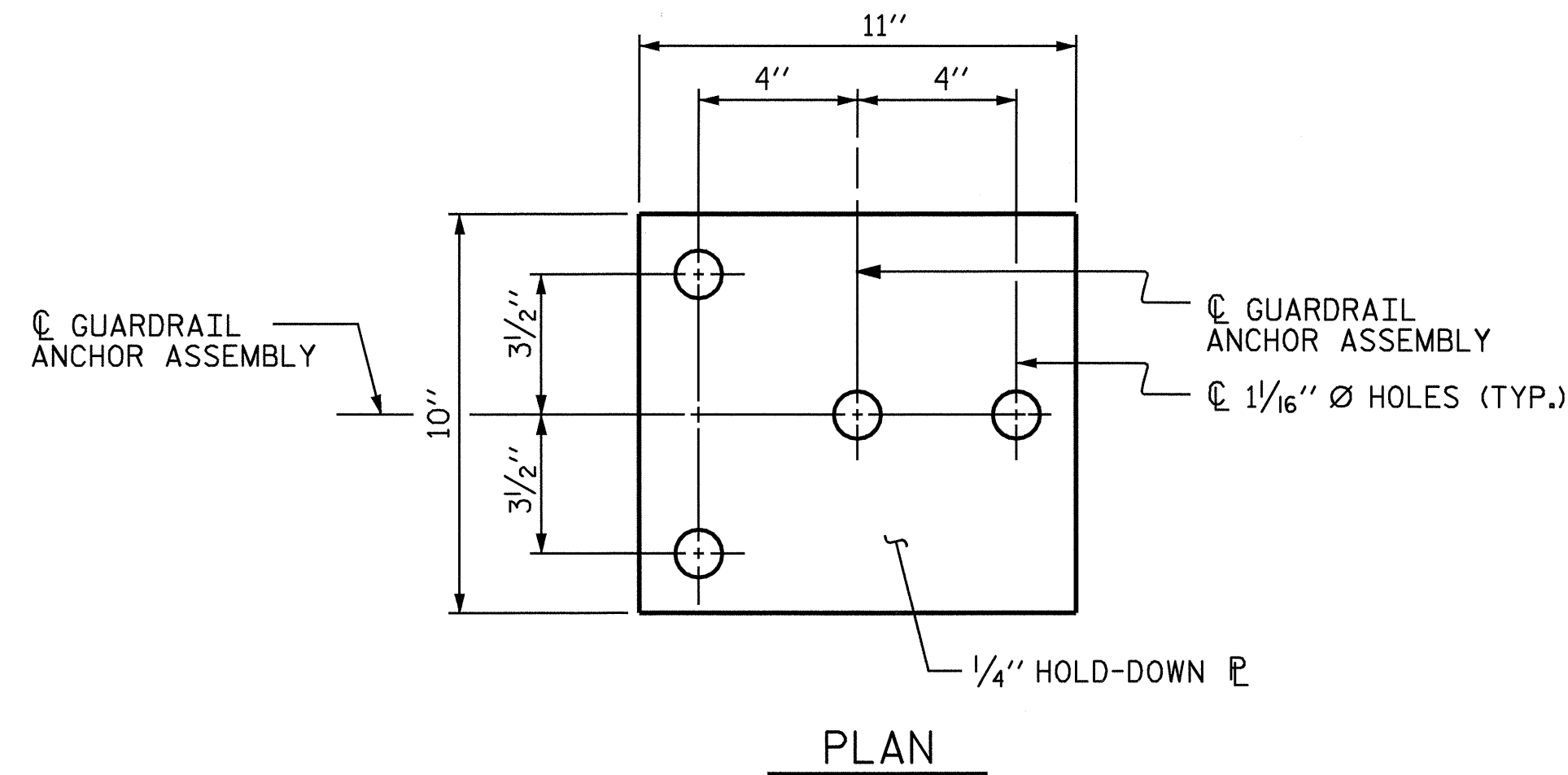
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

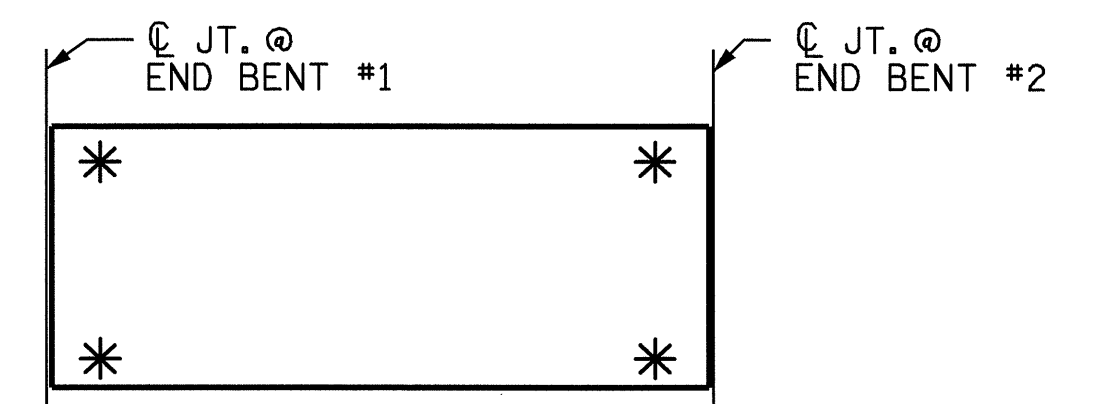
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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



LOCATION OF ANCHORS FOR GUARDRAIL

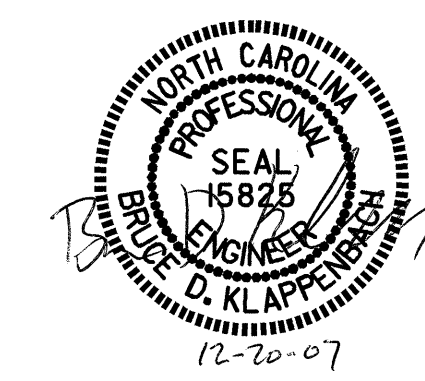
END BENT #1 SHOWN, END BENT #2 SIMILAR.



\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4228  
 PERQUIMANS COUNTY  
 STATION: 14+62.50 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-10
STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL						TOTAL SHEETS 19
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

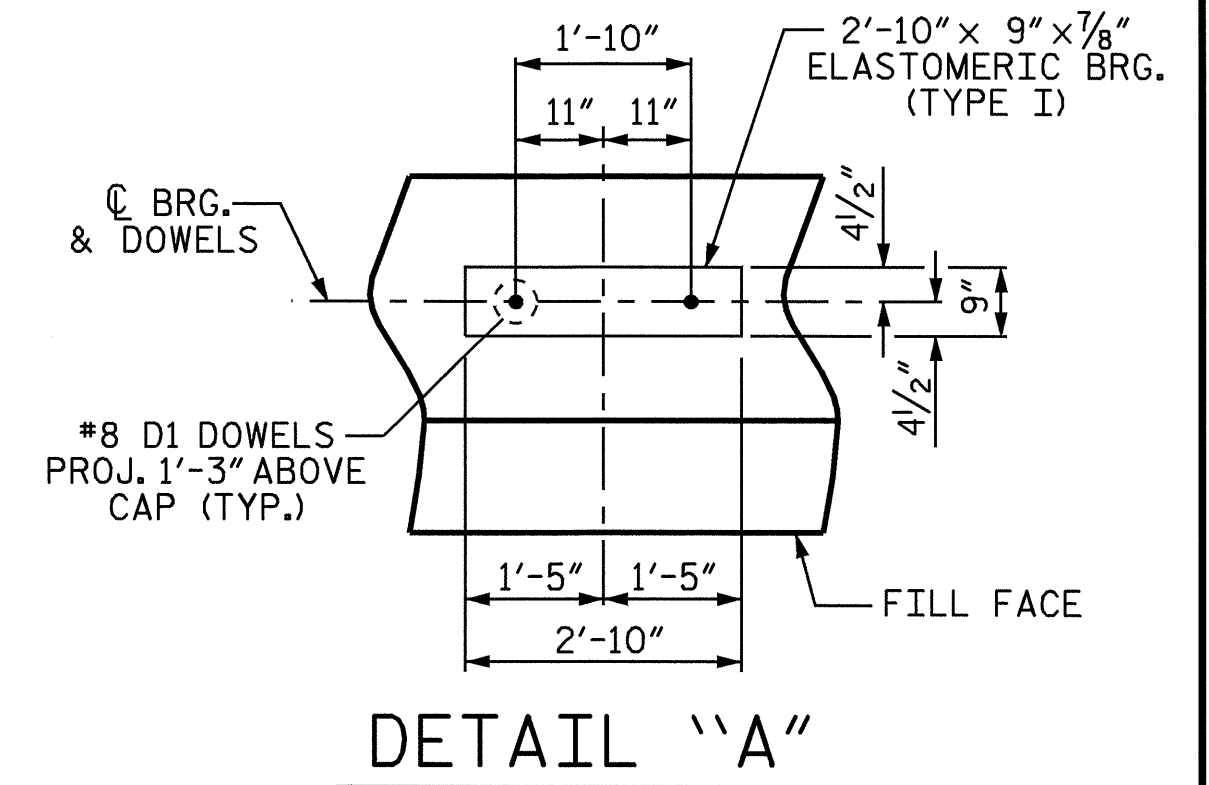
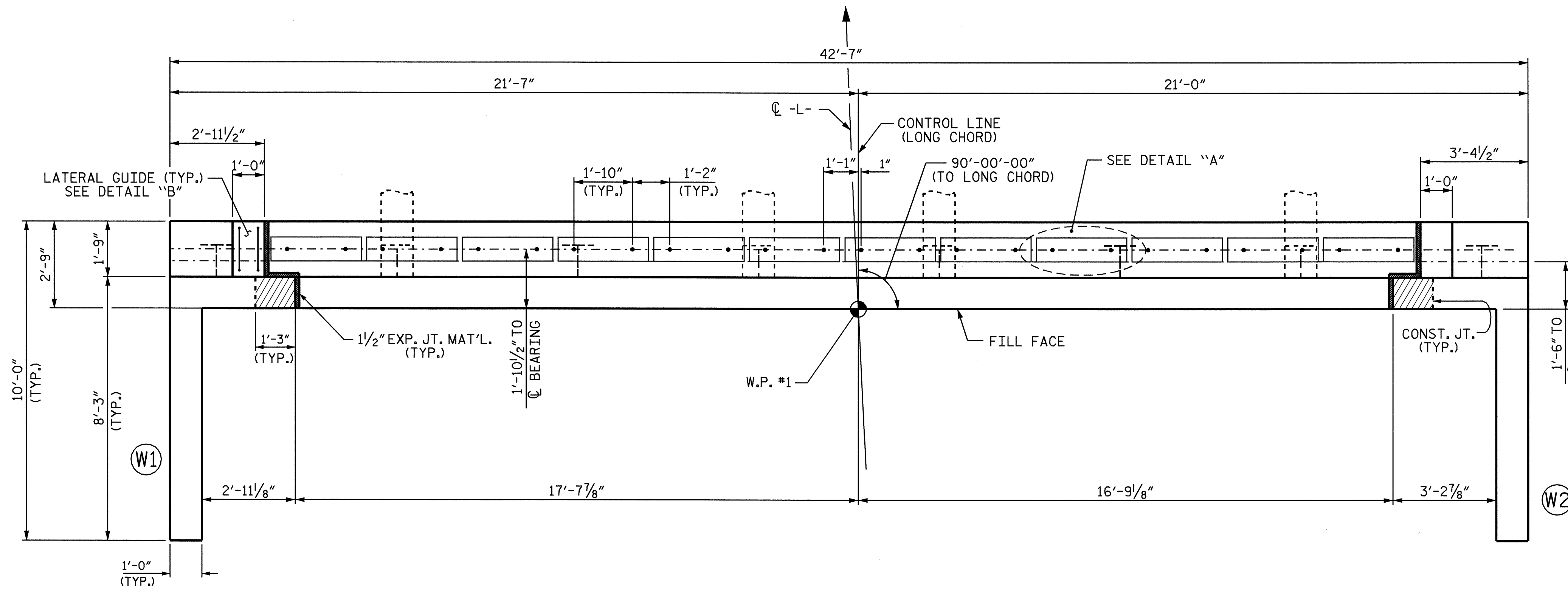


ASSEMBLED BY : M. G. SHAIKH	DATE : 08-13-07
CHECKED BY : D. A. GLADDEN	DATE : 08-20-07
DRAWN BY : TLA 5/06	ADDED 5/1/06R KMM/GM
CHECKED BY : GM 5/06	

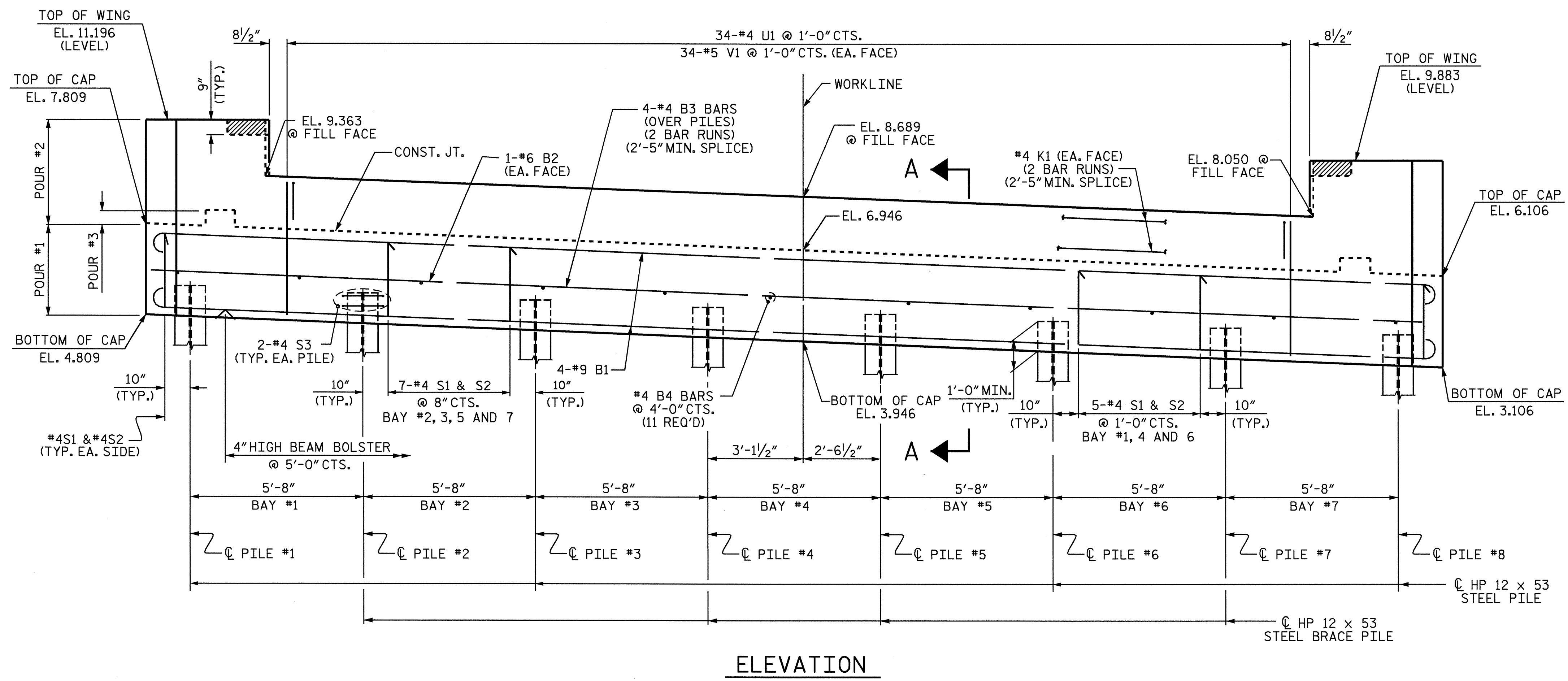
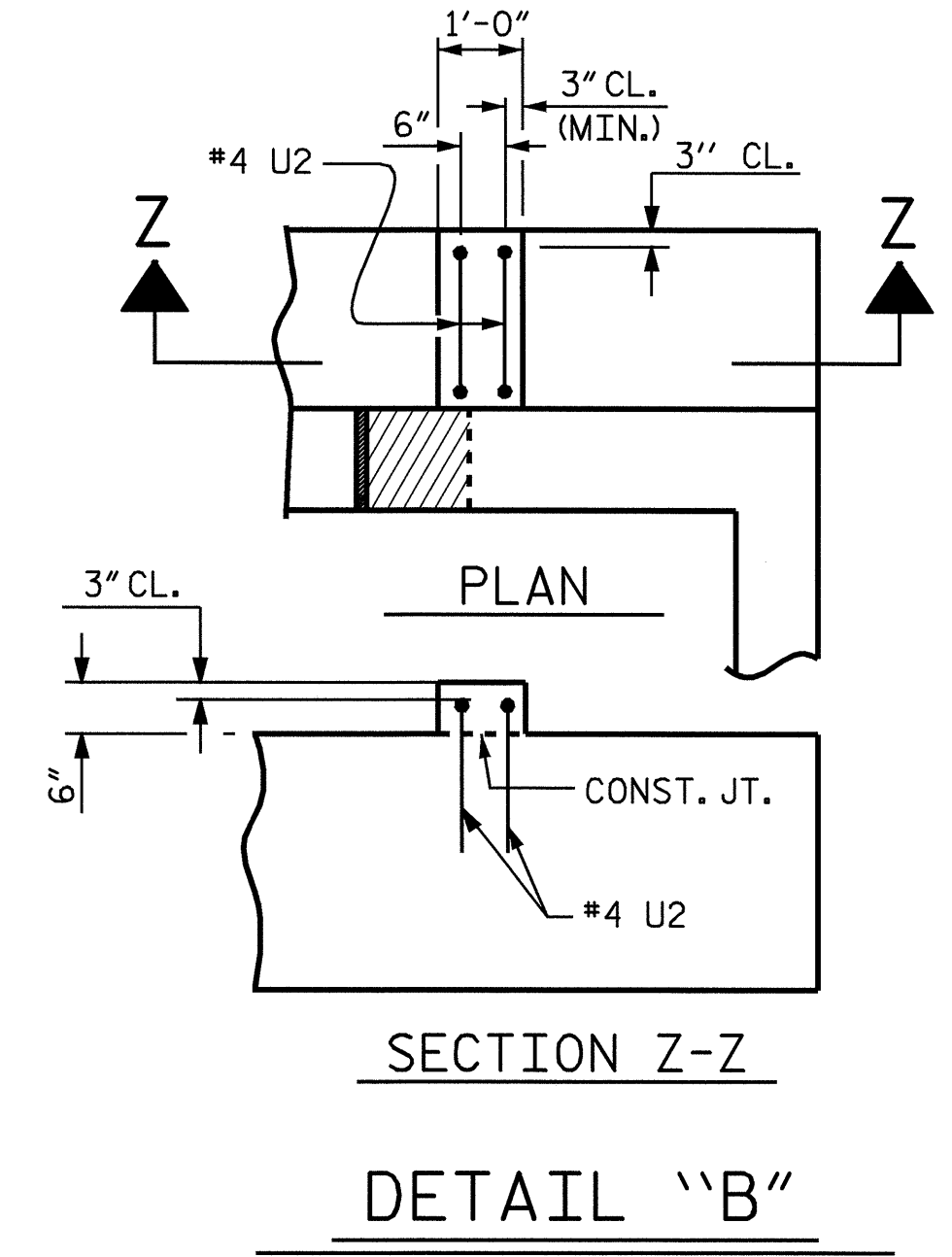


NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.  
 THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE BOX BEAM UNITS ARE IN PLACE.  
 THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.  
 THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.  
 THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



PILE #	ELEVATION
PILE #1	5.768
PILE #2	5.541
PILE #3	5.315
PILE #4	5.088
PILE #5	4.861
PILE #6	4.635
PILE #7	4.408
PILE #8	4.182



PROJECT NO. B-4228  
 PERQUIMANS COUNTY  
 STATION: 14+62.50 -L-

SHEET 1 OF 3

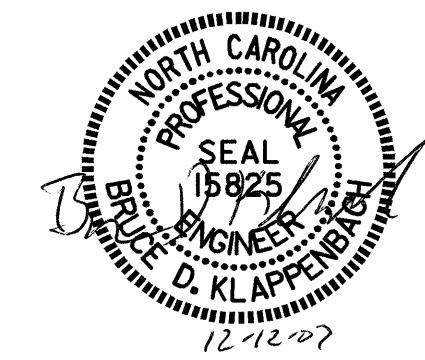
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

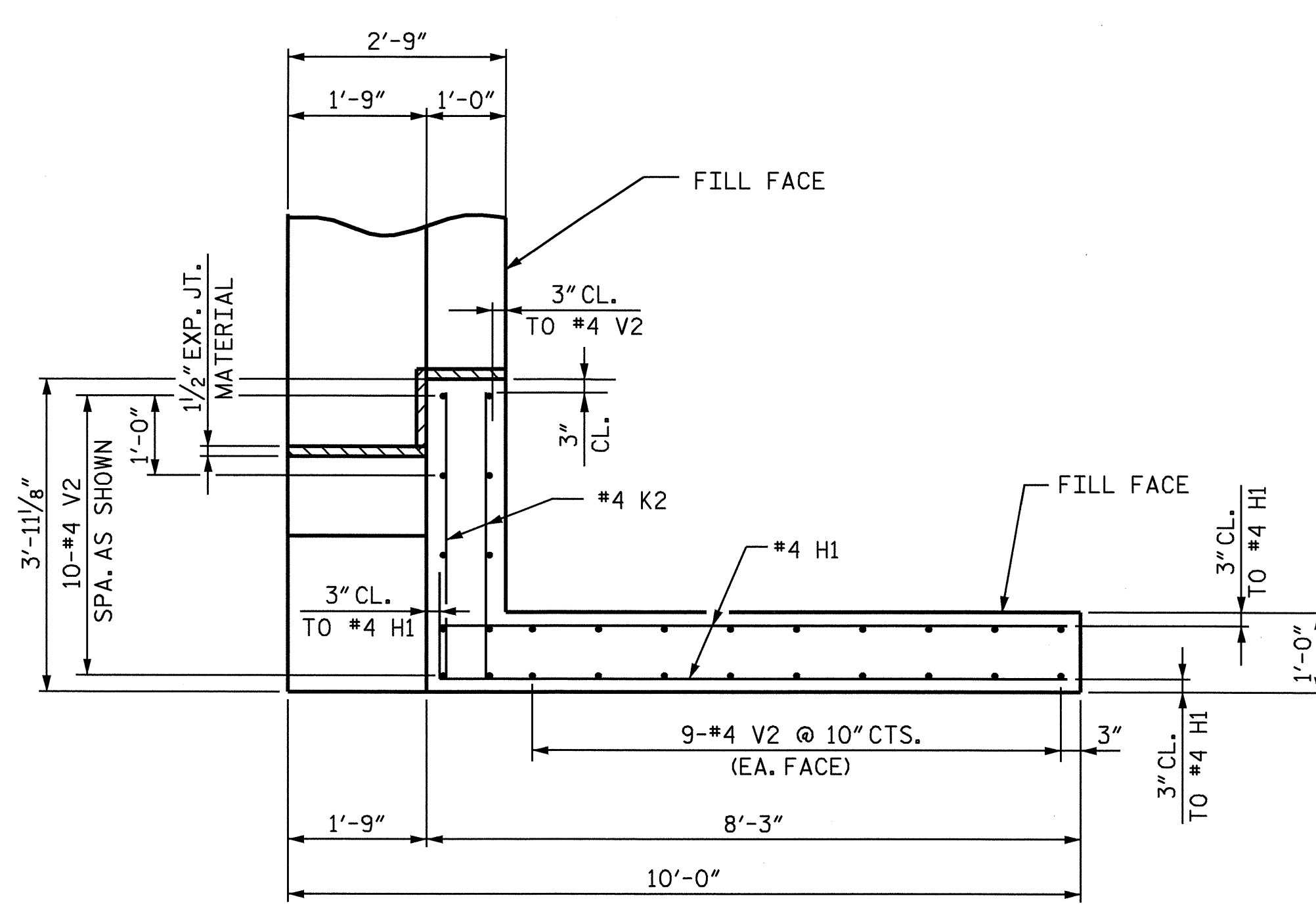
SUBSTRUCTURE  
 END BENT #1

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

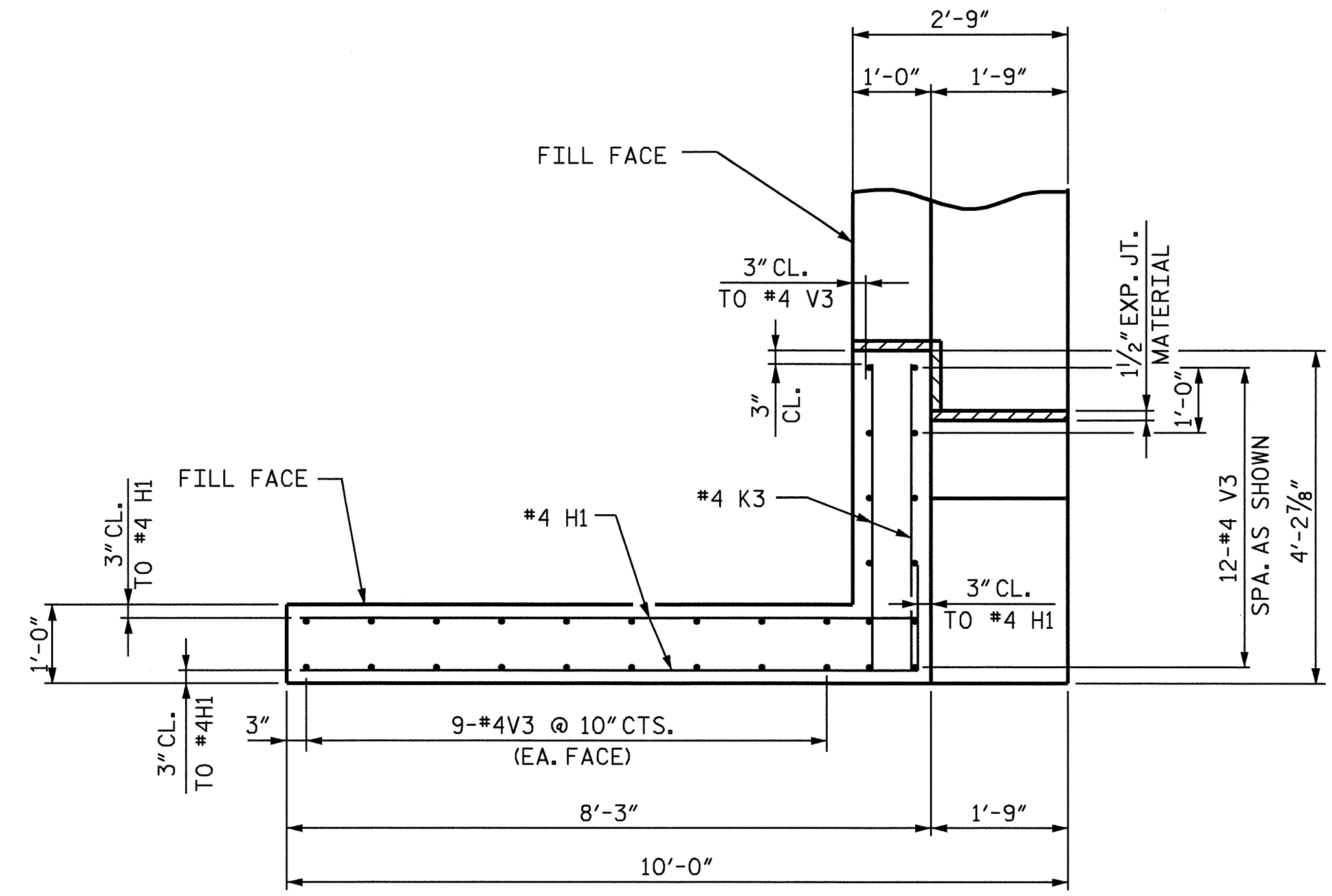
S-11  
 TOTAL SHEETS 19

DRAWN BY : M. G. SHAIKH DATE : 03-30-07  
 CHECKED BY : D. A. GLADDEN DATE : 05-29-07

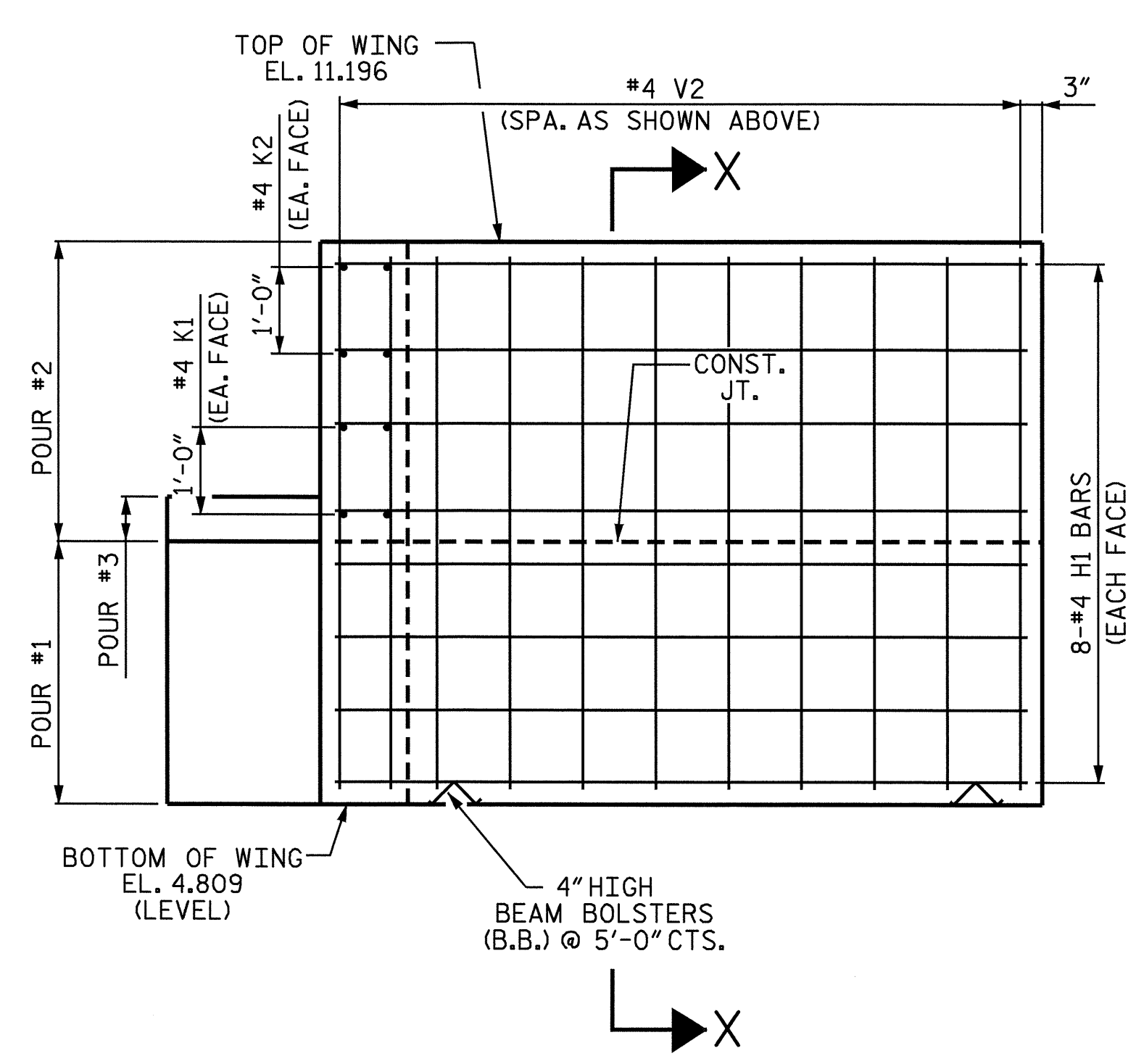




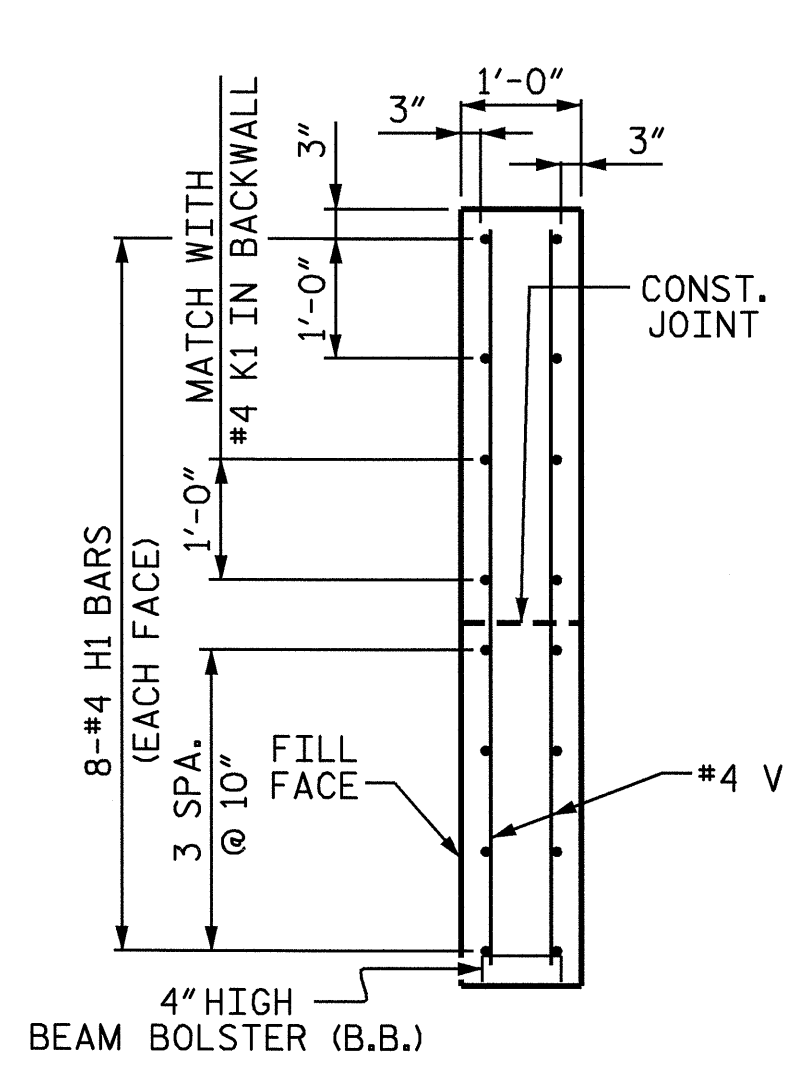
PLAN OF LEFT WING (W1)



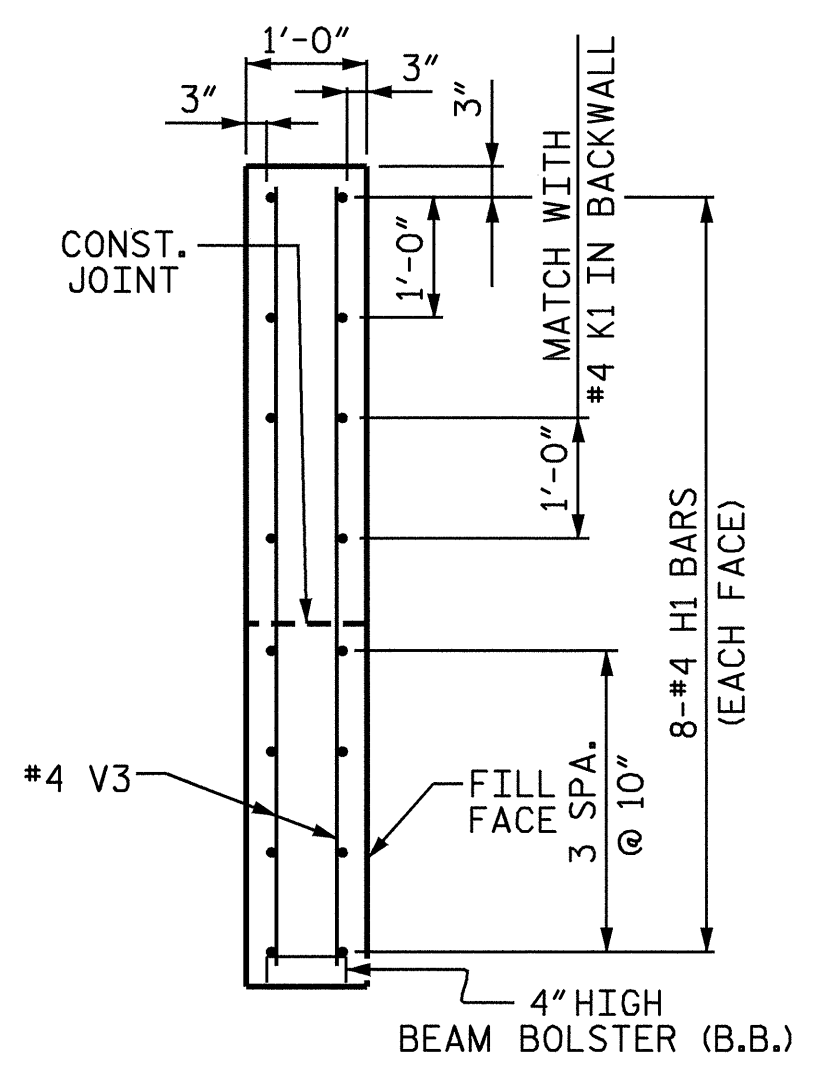
PLAN OF RIGHT WING (W2)



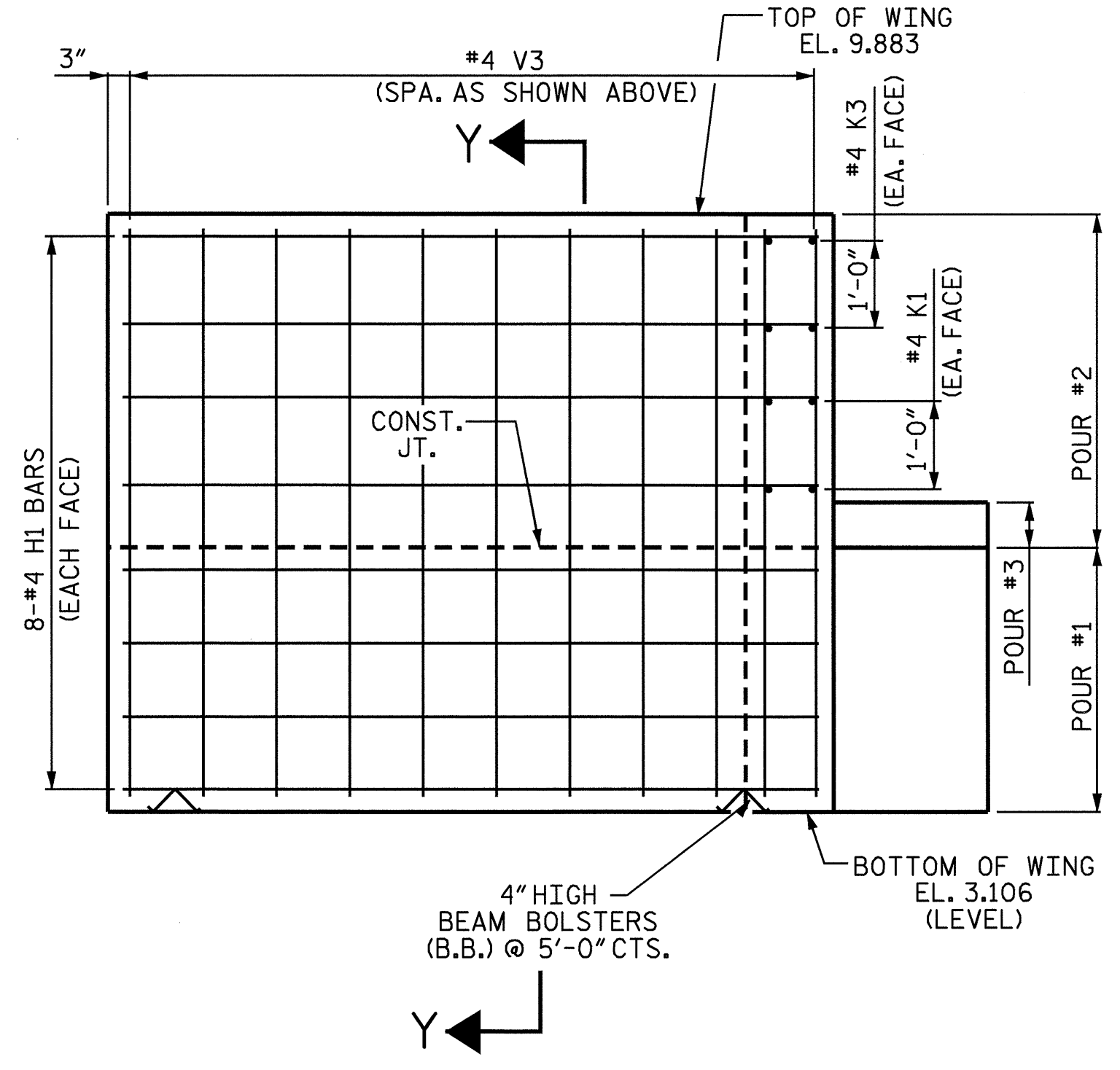
ELEVATION OF LEFT WING (W1)



SECTION X-X



SECTION Y-Y



ELEVATION OF RIGHT WING (W2)

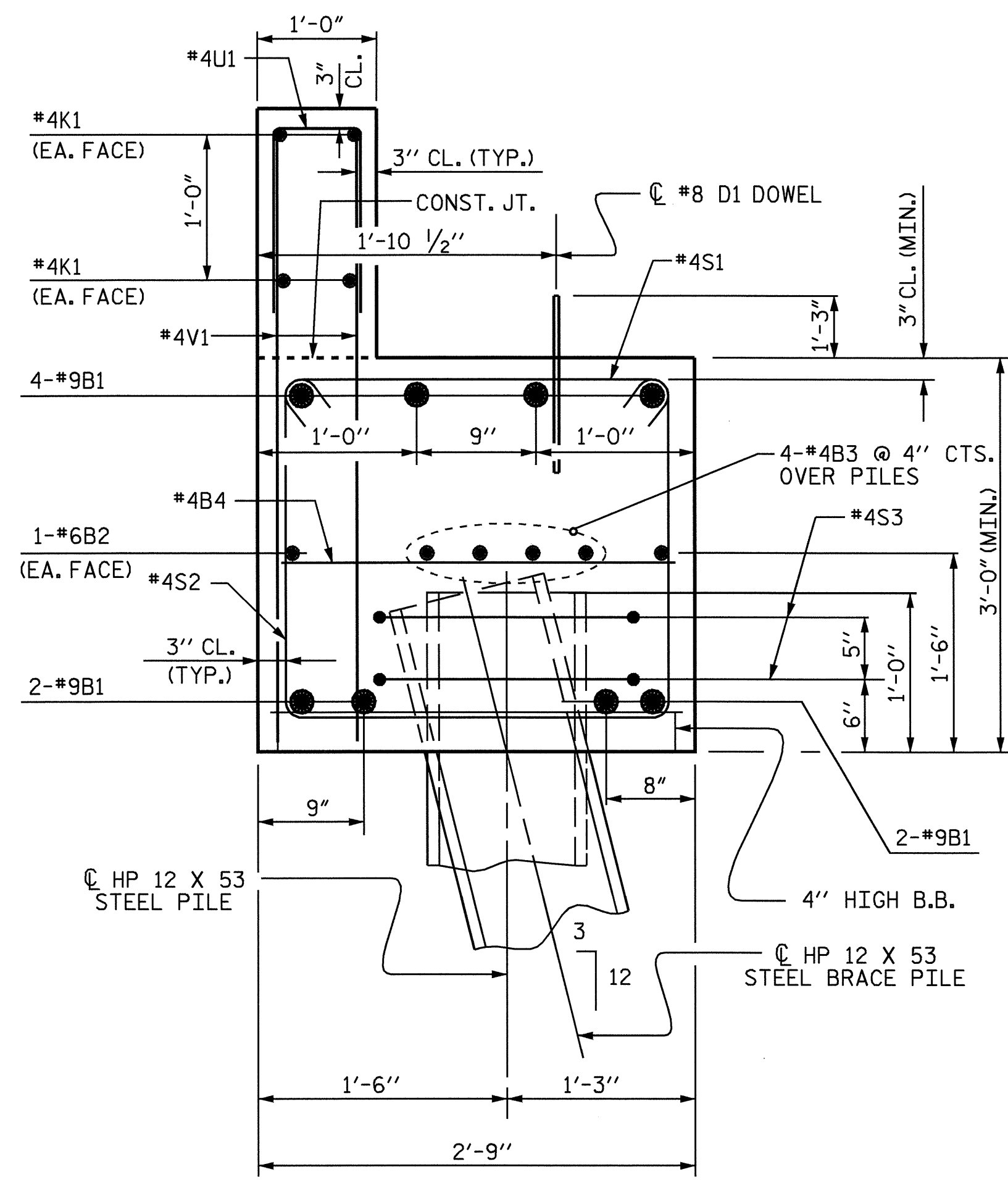
PROJECT NO. B-4228  
PERQUIMANS COUNTY  
STATION: 14+62.50 -L-  
SHEET 2 OF 3

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

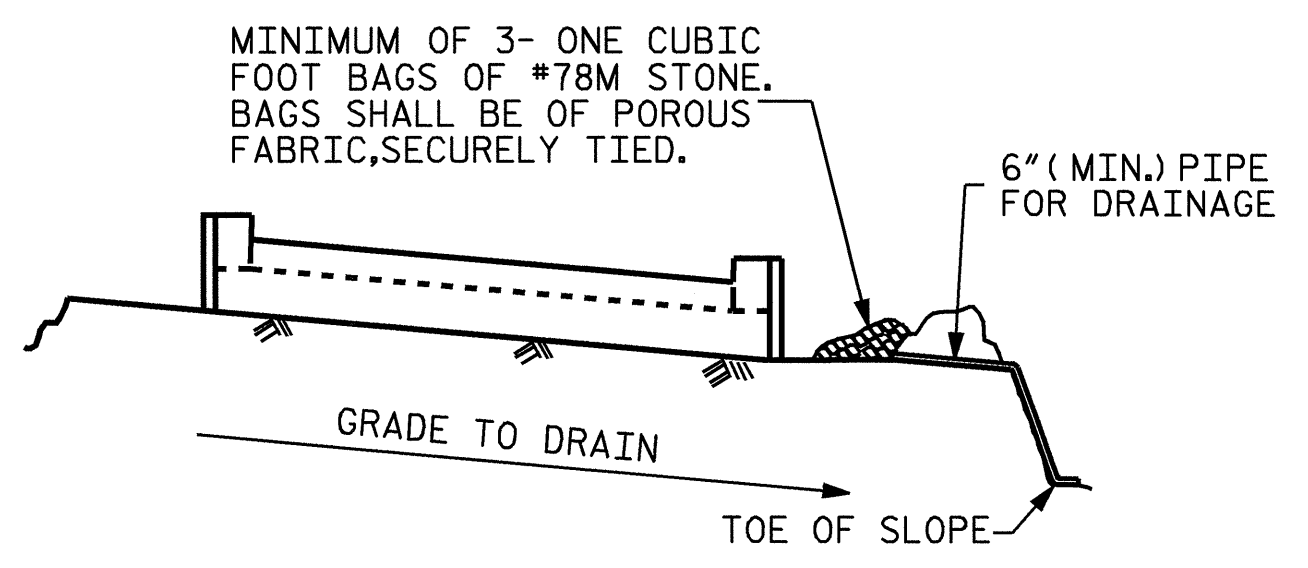


DRAWN BY: M. G. SHAIKH DATE: 03-30-07  
CHECKED BY: D. A. GLADDEN DATE: 05-29-07

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12	
1			3			TOTAL SHEETS	
2			4			19	



**SECTION A-A**



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

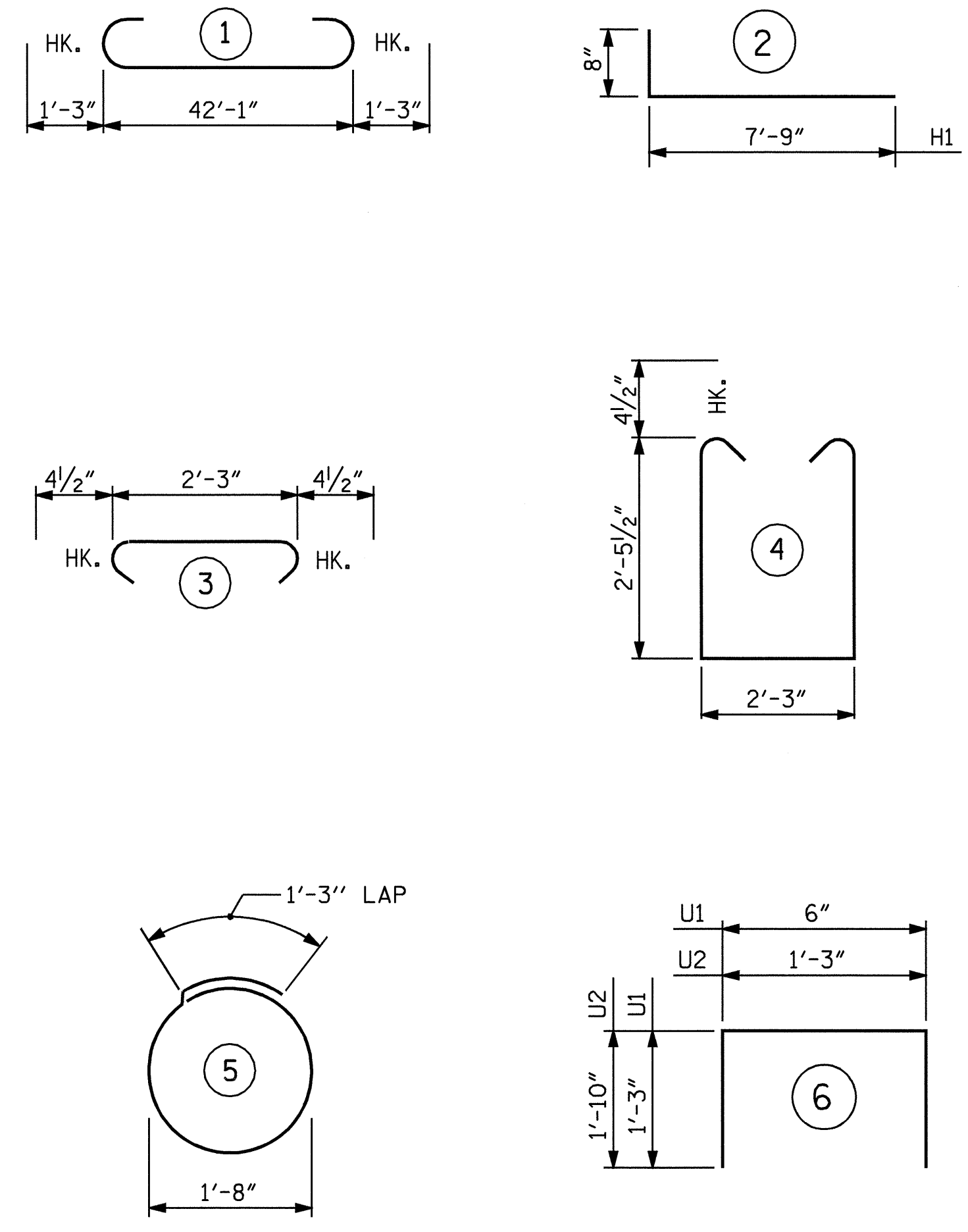
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

**TEMPORARY DRAINAGE AT END BENT**

DRAWN BY : M. G. SHAIKH DATE : 04-02-07  
CHECKED BY : D. A. GLADDEN DATE : 05-29-07

**BAR TYPE**



ALL BAR DIMENSIONS ARE OUT TO OUT.

**BILL OF MATERIAL**

**FOR END BENT #1**

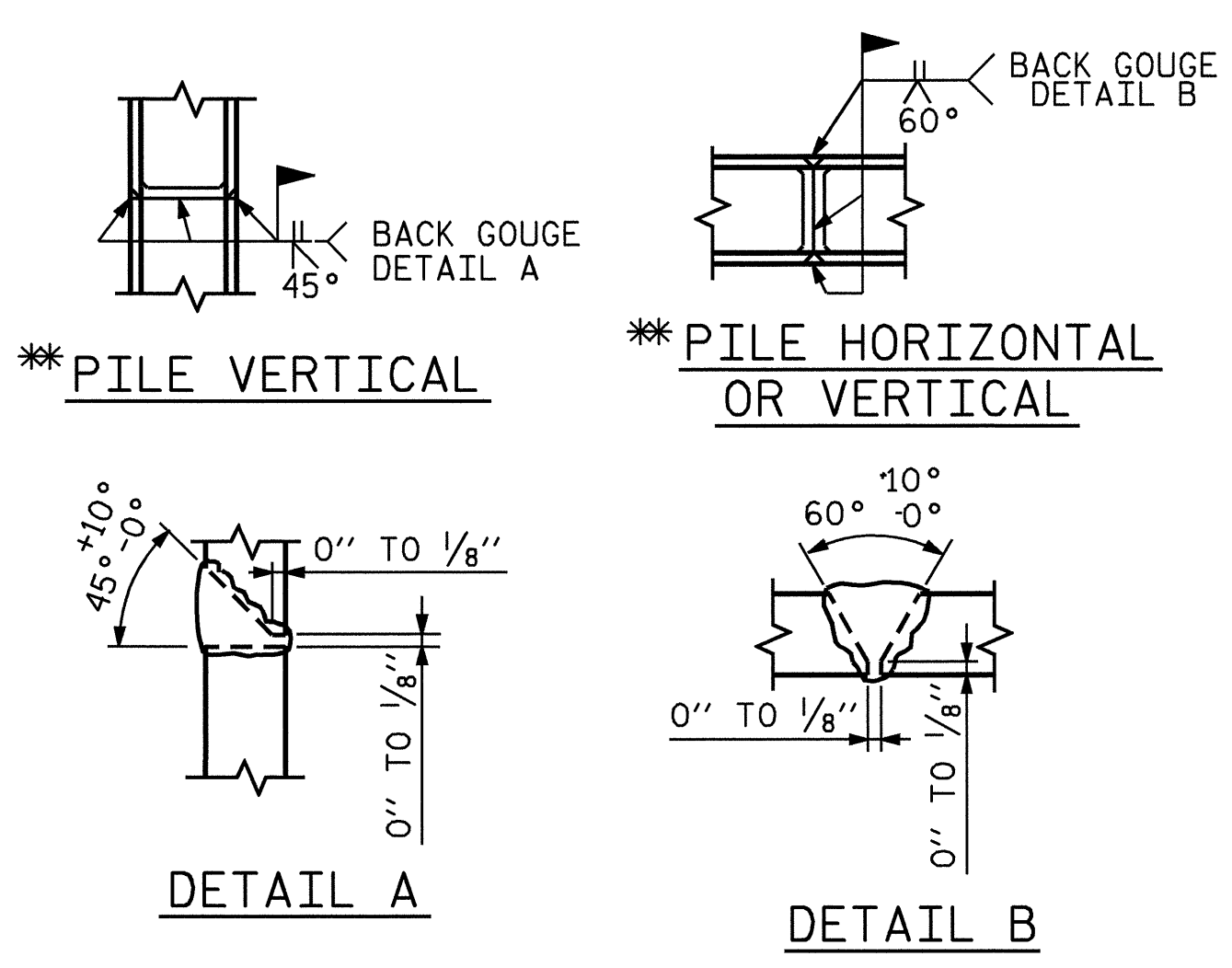
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	8	#9	1	44'-7"	1213
*B2	2	#6	STR	42'-1"	126
*B3	8	#4	STR	22'-3"	119
*B4	11	#4	STR	2'-3"	17
*D1	24	#8	STR	2'-3"	144
*H1	32	#4	2	8'-5"	180
*K1	8	#4	STR	22'-3"	119
*K2	4	#4	STR	3'-5"	9
*K3	4	#4	STR	3'-8"	10
*S1	45	#4	3	3'-0"	90
*S2	45	#4	4	7'-11"	238
*S3	16	#4	5	6'-6"	69
*U1	34	#4	6	3'-0"	68
*U2	4	#4	6	4'-11"	13
*V1	68	#5	STR	4'-2"	296
*V2	28	#4	STR	5'-11"	111
*V3	30	#4	STR	6'-3"	125

\*EPOXY COATED REINFORCING STEEL = 2947 LBS.

**CLASS AA CONCRETE BREAKDOWN**

POUR	DESCRIPTION	C.Y.	WEIGHT
POUR #1	CAP & LOWER PART OF WINGS		
	C.Y.	14.6	
POUR #2	UPPER PART OF WINGS & BACKWALL		
	C.Y.	5.2	
POUR #3	LATERAL GUIDES		
	C.Y.	0.1	
TOTAL CLASS AA CONCRETE	C.Y.	19.9	

HP 12 X 53 STEEL PILES	NO. 8	LIN. FT.	WEIGHT
HP 12 X 53 STEEL PILES	NO. 8	LIN. FT.	520



\* POSITION OF PILE DURING WELDING.

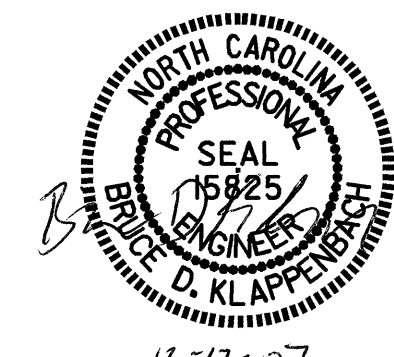
**PILE SPLICE DETAILS**

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STATION: 14+62.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUBSTRUCTURE  
END BENT #1**



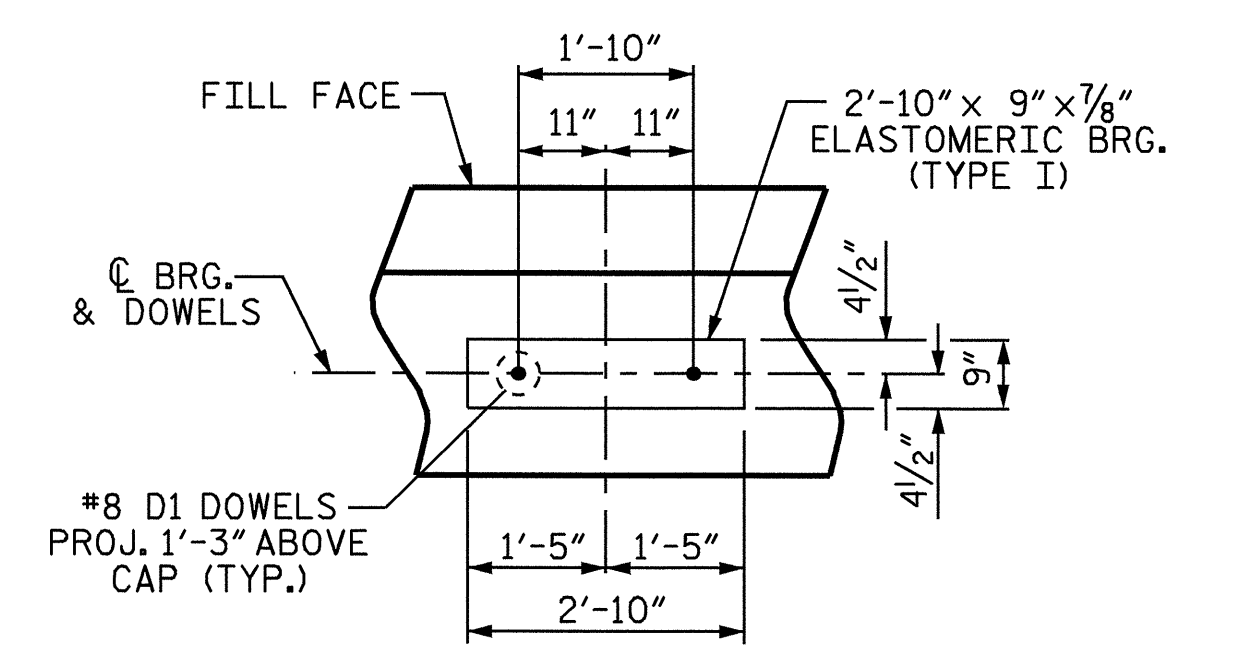
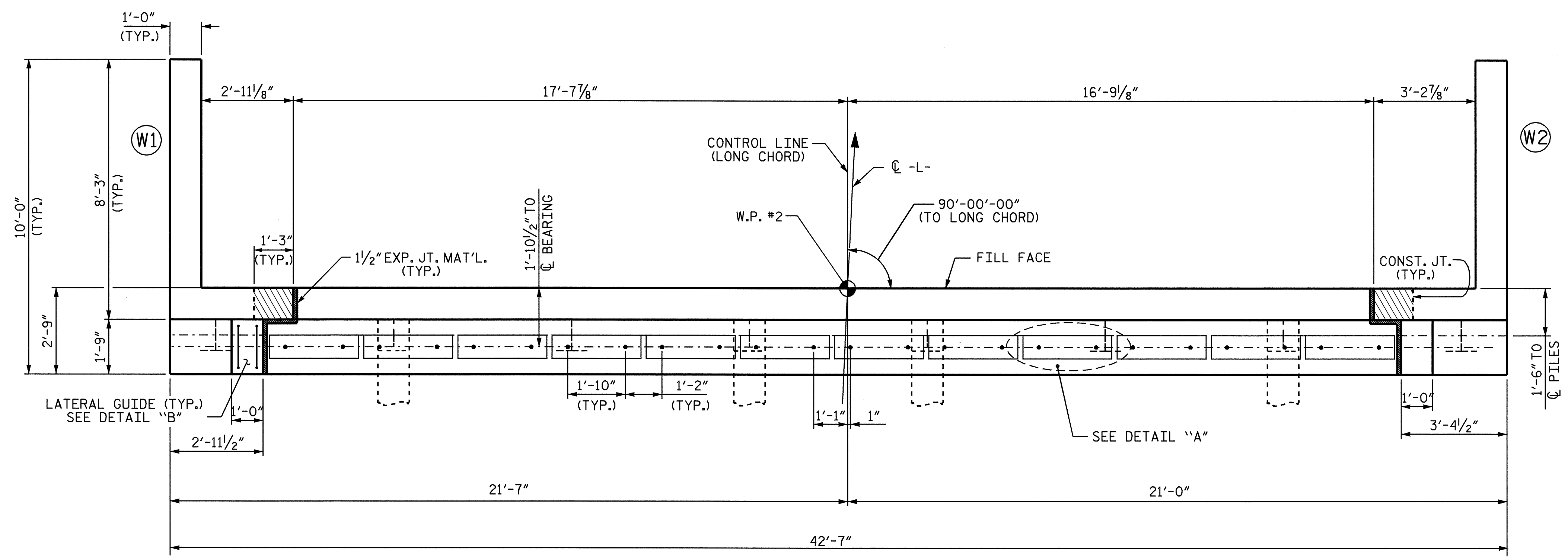
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			19

11-12-07

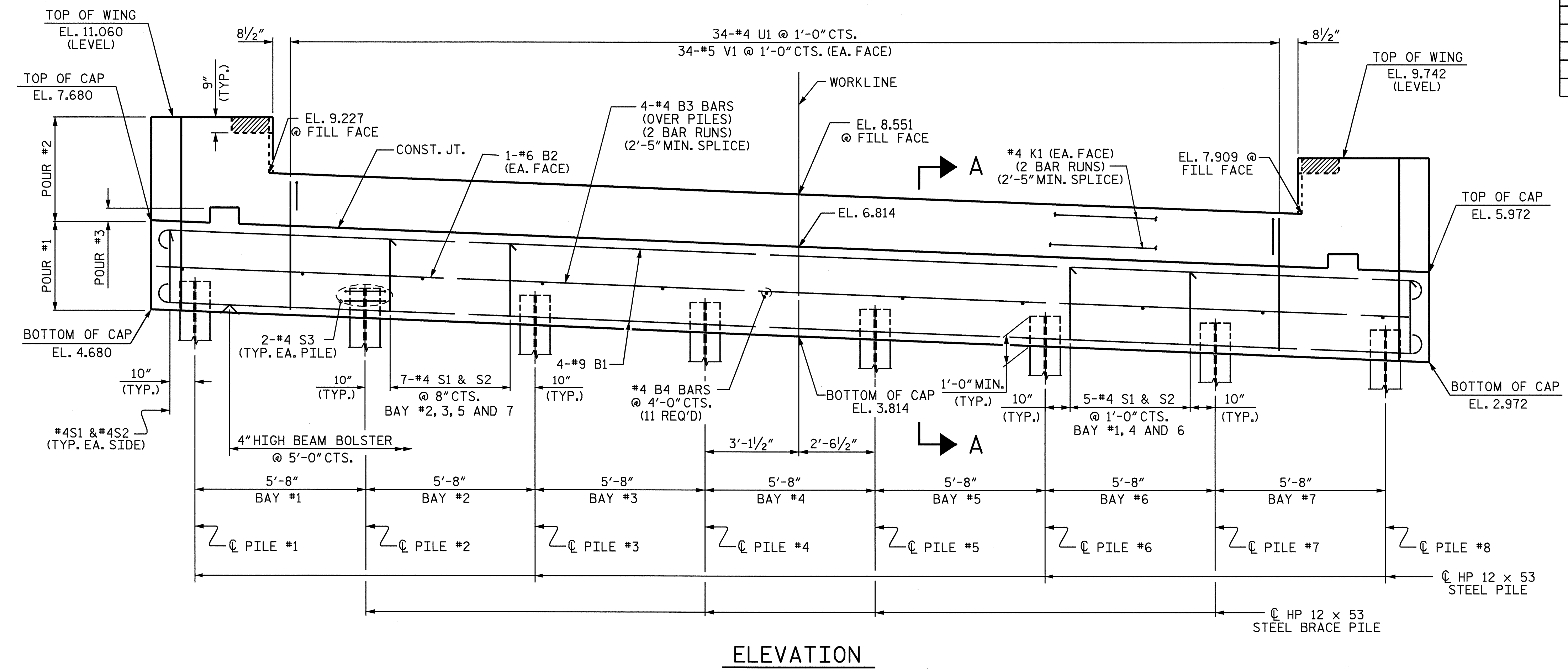
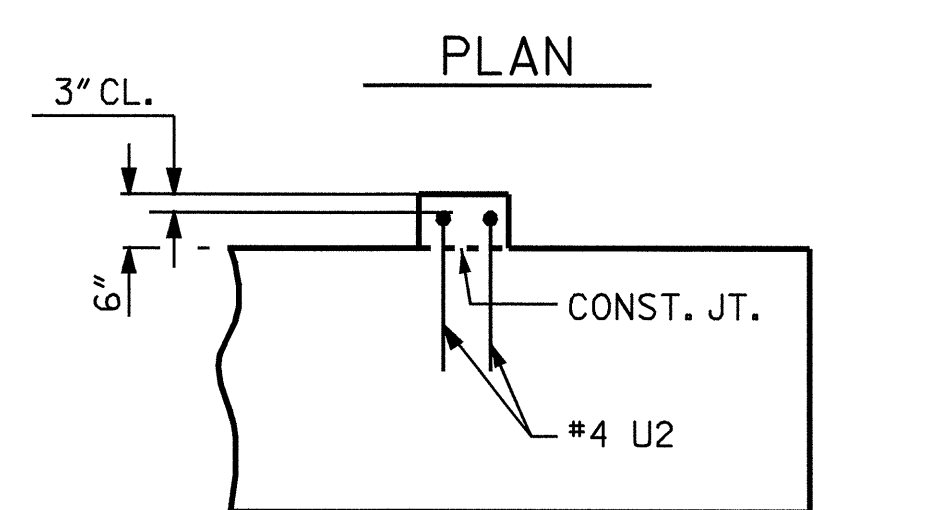
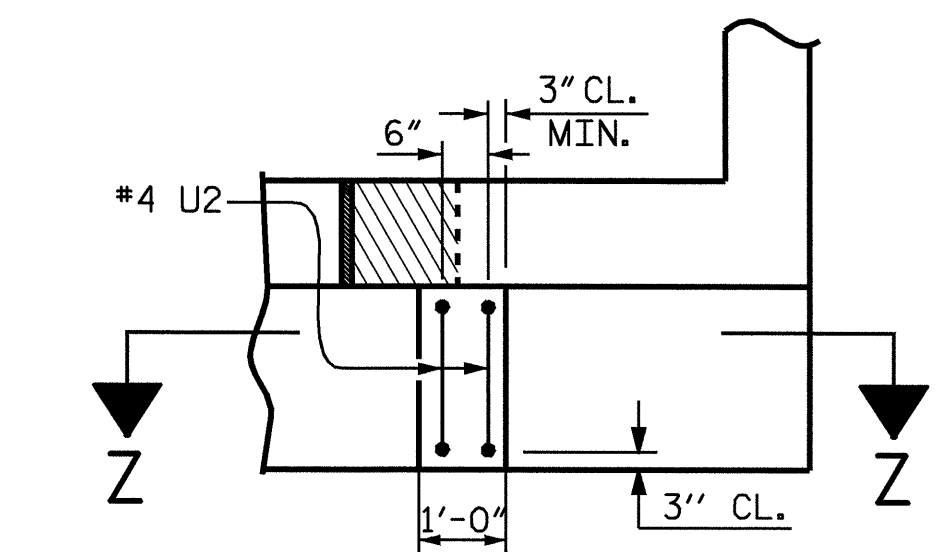


NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.  
 THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE BOX BEAM UNITS ARE IN PLACE.  
 THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.  
 THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.  
 THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



TOP OF PILE ELEVATIONS	ELEVATION
PILE #1	5.639
PILE #2	5.412
PILE #3	5.184
PILE #4	4.957
PILE #5	4.730
PILE #6	4.503
PILE #7	4.276
PILE #8	4.048



PROJECT NO. B-4228  
 PERQUIMANS COUNTY  
 STATION: 14+62.50 -L-

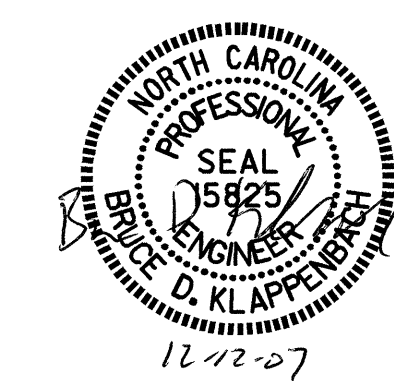
SHEET 1 OF 3

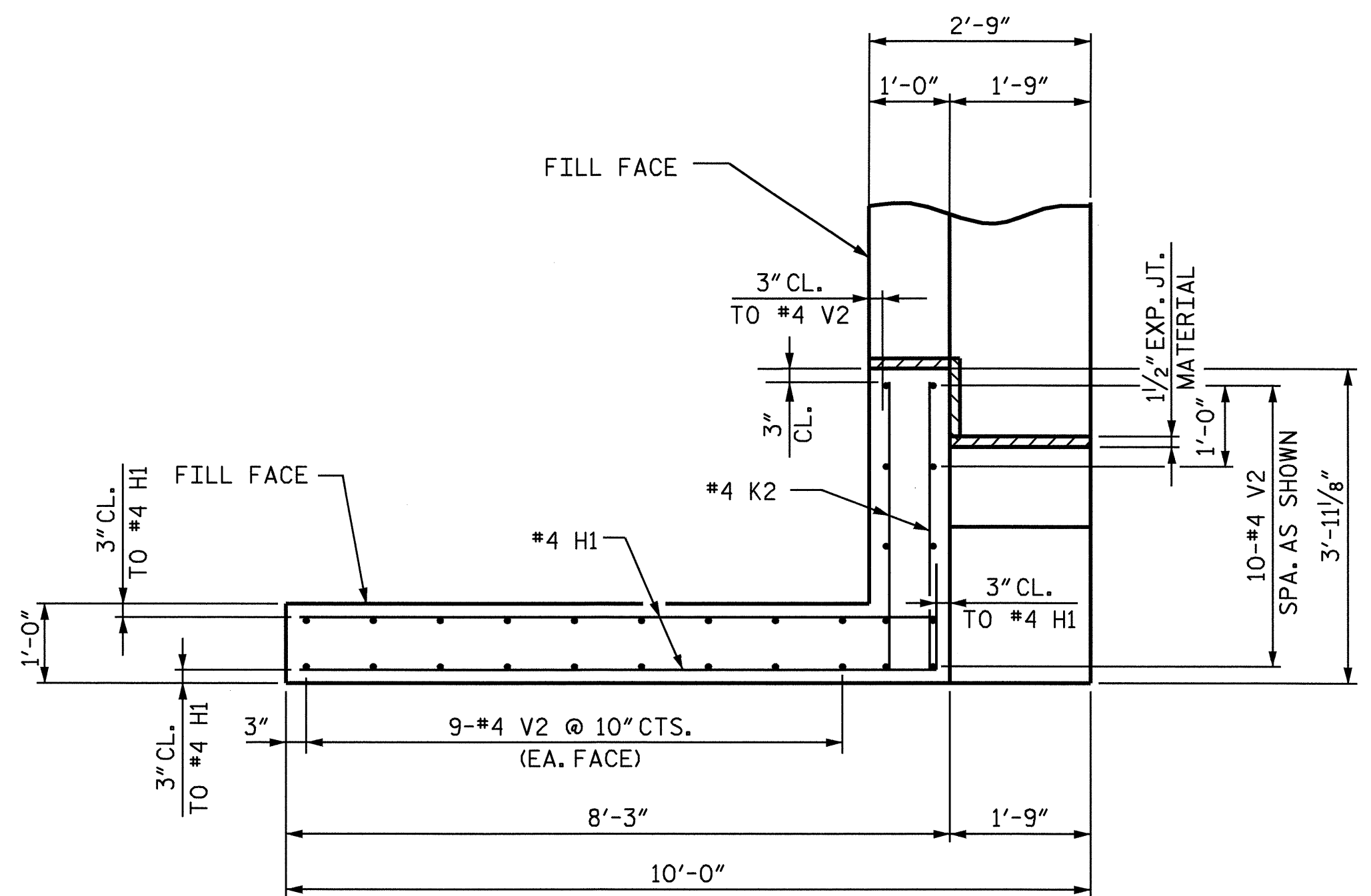
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT #2

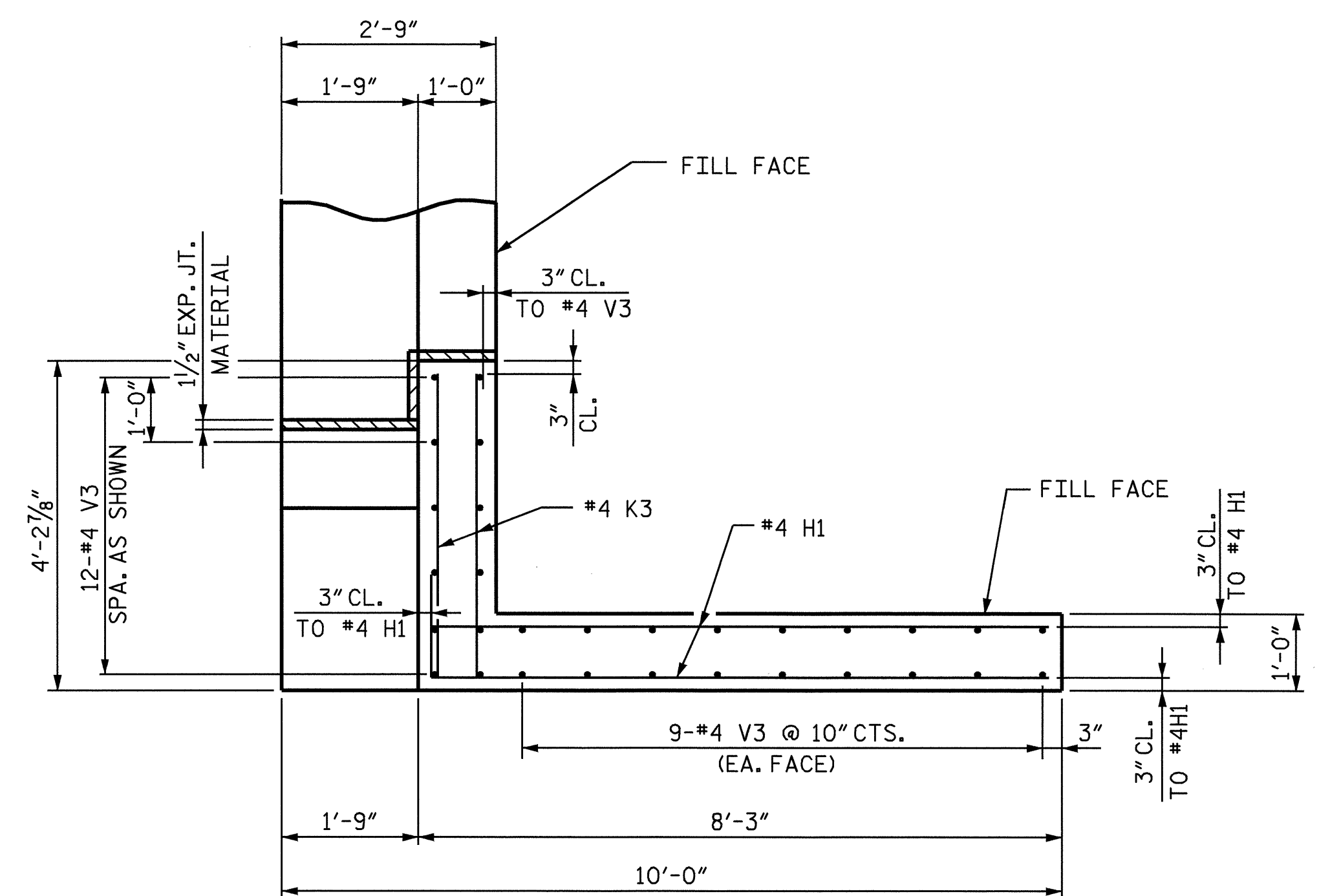
REVISIONS						SHEET NO. S-14
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 19
2			4			

DRAWN BY : M. G. SHAIKH DATE : 09-08-05  
 CHECKED BY : D. A. GLADDEN DATE : 05-29-07

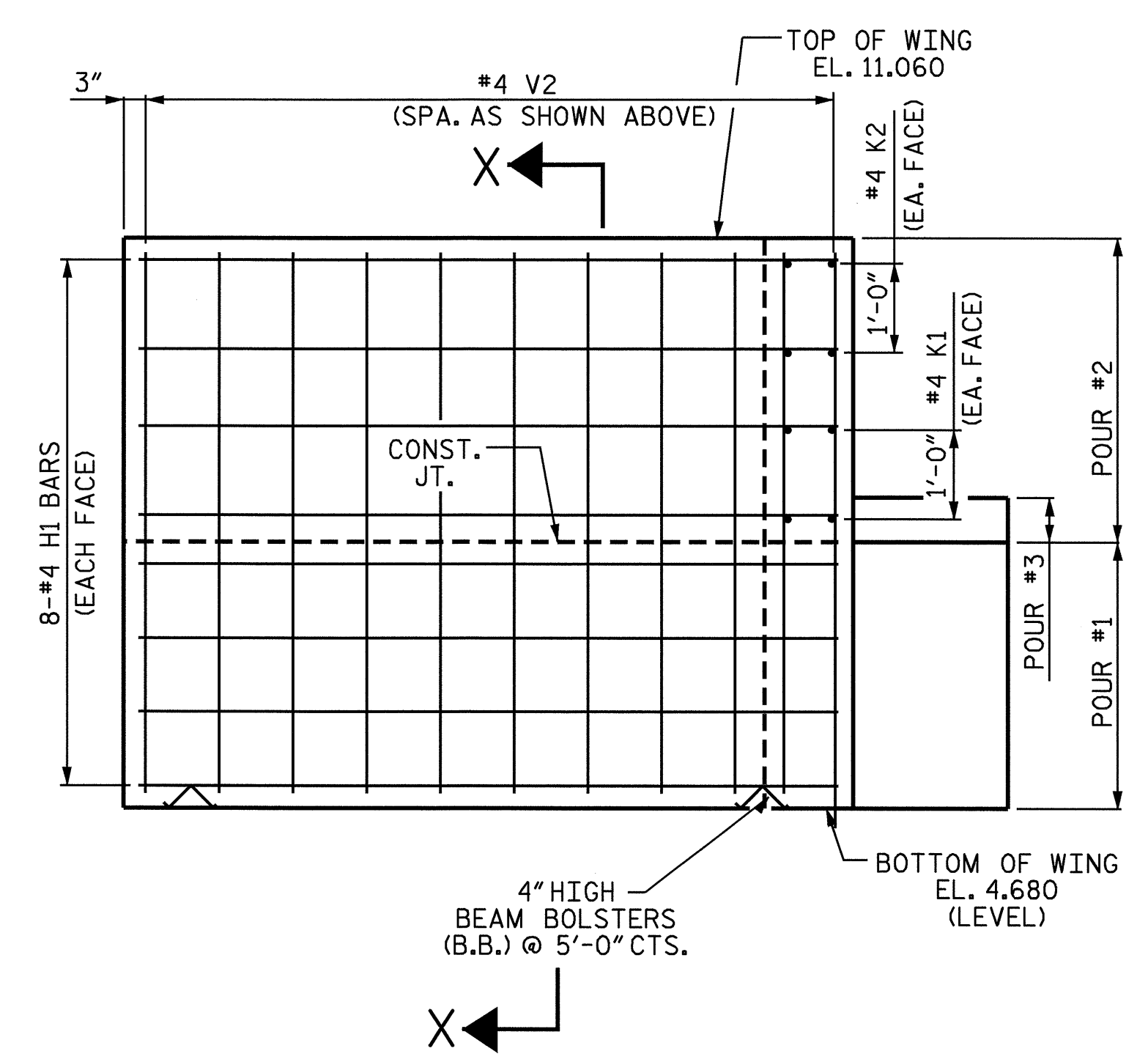




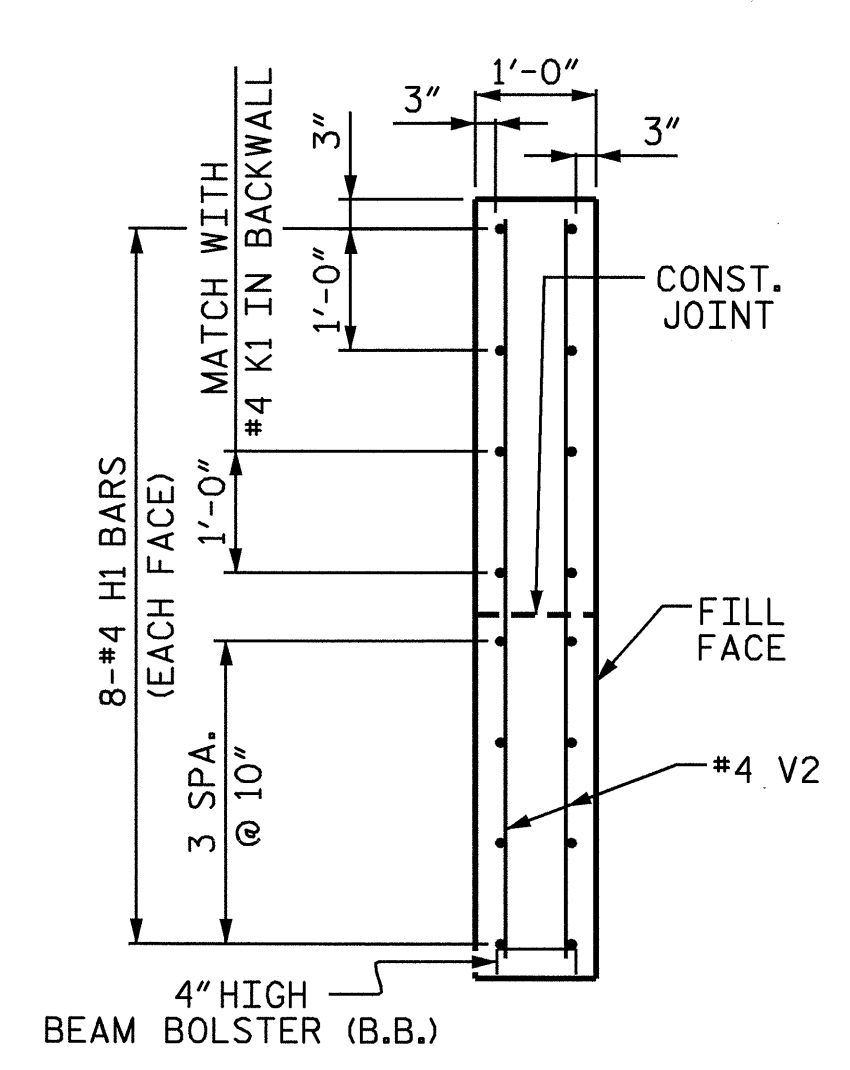
**PLAN OF LEFT WING (W1)**



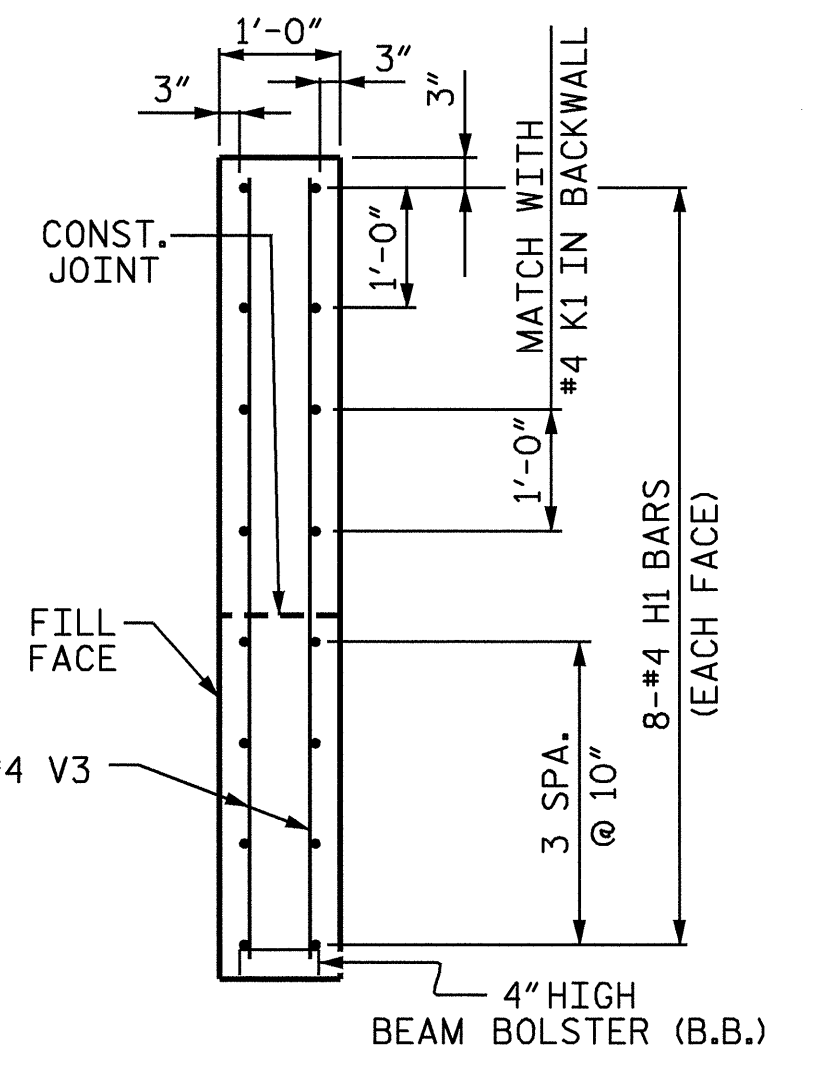
**PLAN OF RIGHT WING (W2)**



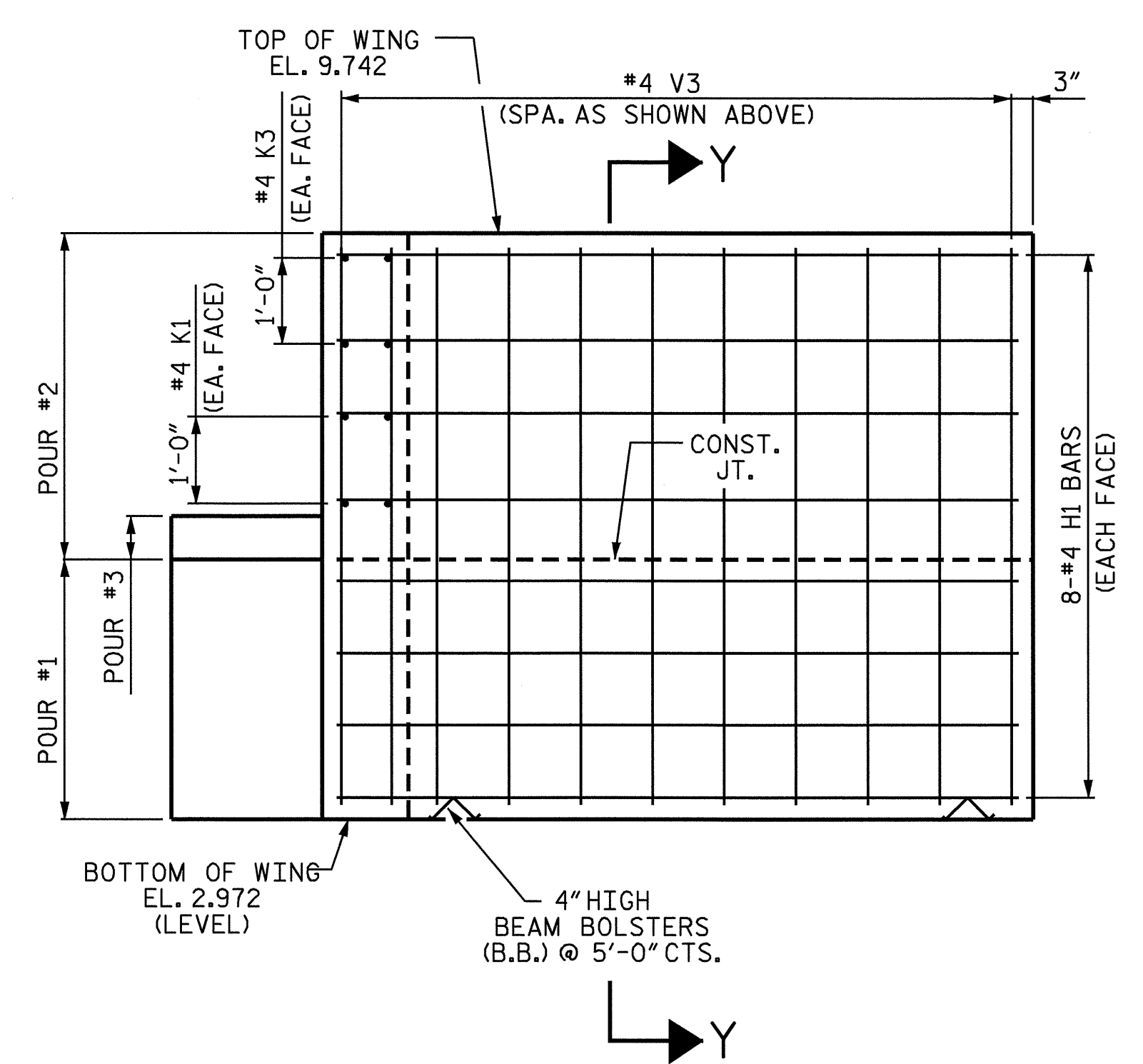
**ELEVATION OF LEFT WING (W1)**



**SECTION X-X**



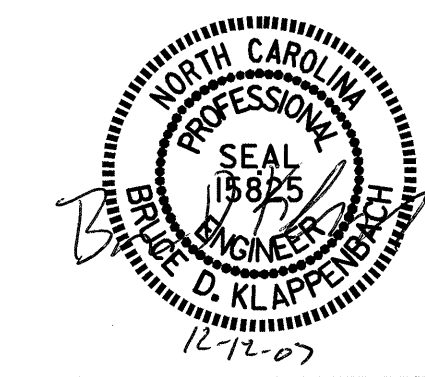
**SECTION Y-Y**



**ELEVATION OF RIGHT WING (W2)**

PROJECT NO. B-4228  
PERQUIMANS COUNTY  
 STATION: 14+62.50 -L-  
 SHEET 2 OF 3

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



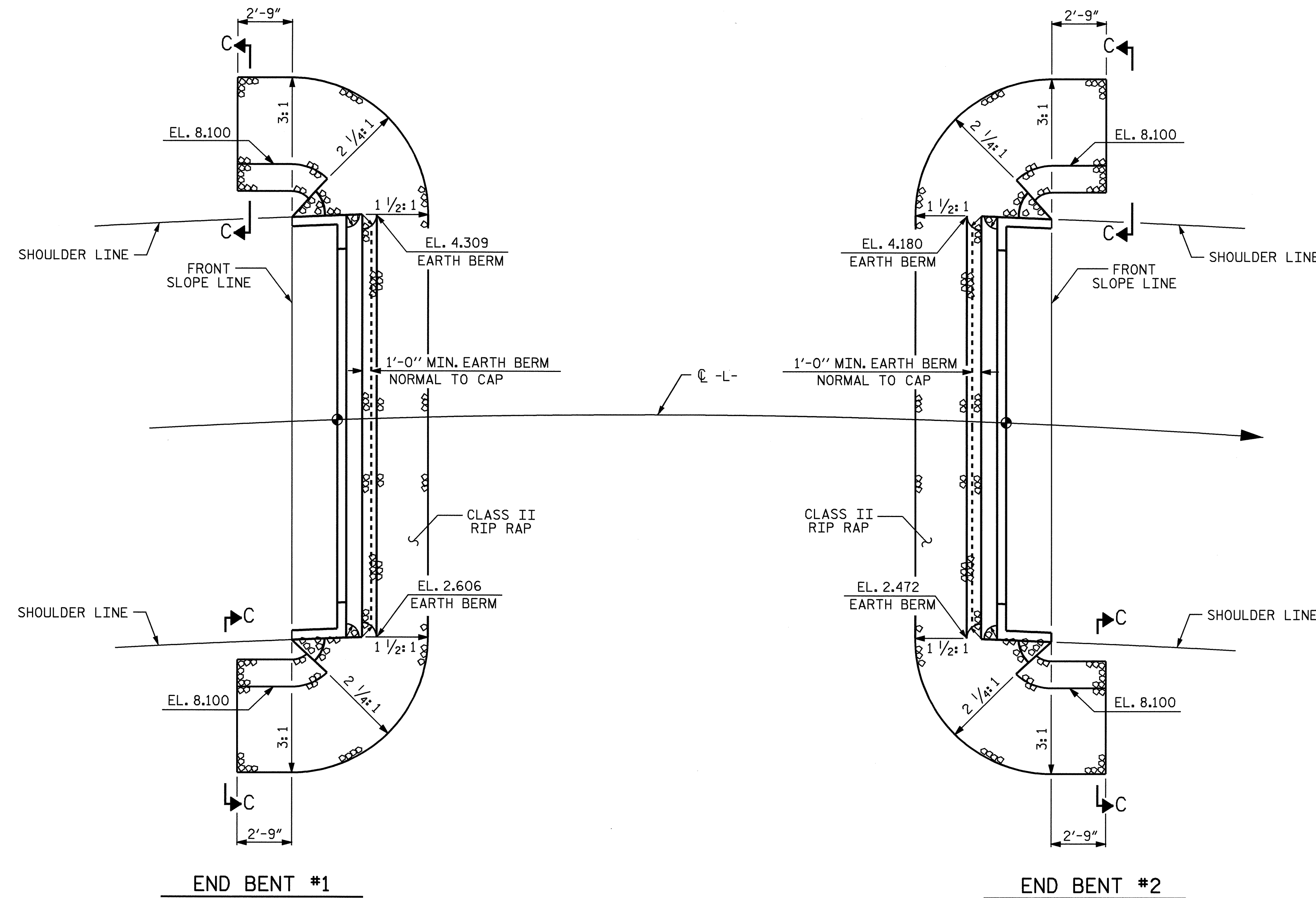
DRAWN BY: M. G. SHAIKH DATE: 04-02-07  
 CHECKED BY: D. A. GLADDEN DATE: 05-29-07

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15	
1			3			TOTAL SHEETS	
2			4			19	



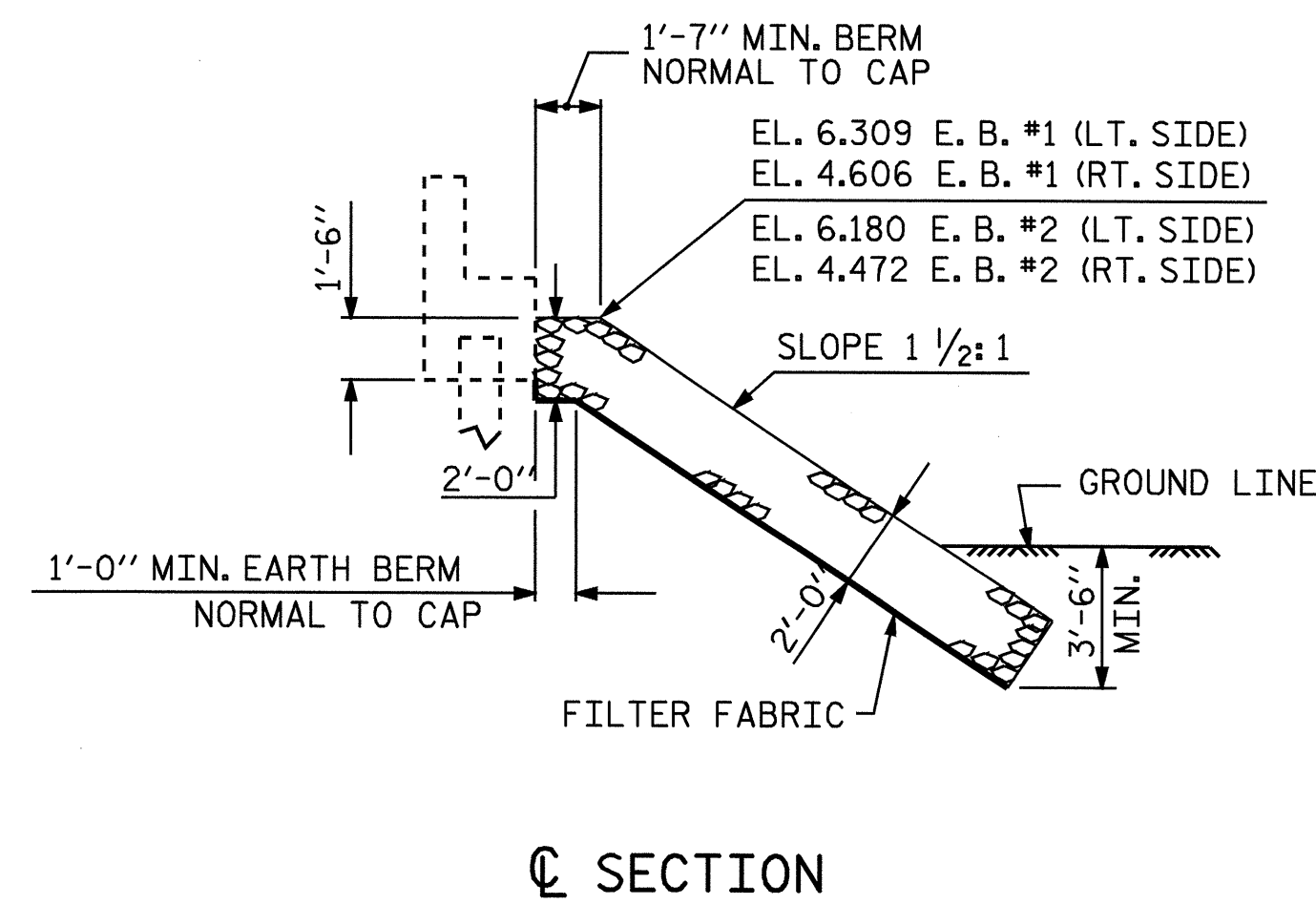


NOTES :  
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

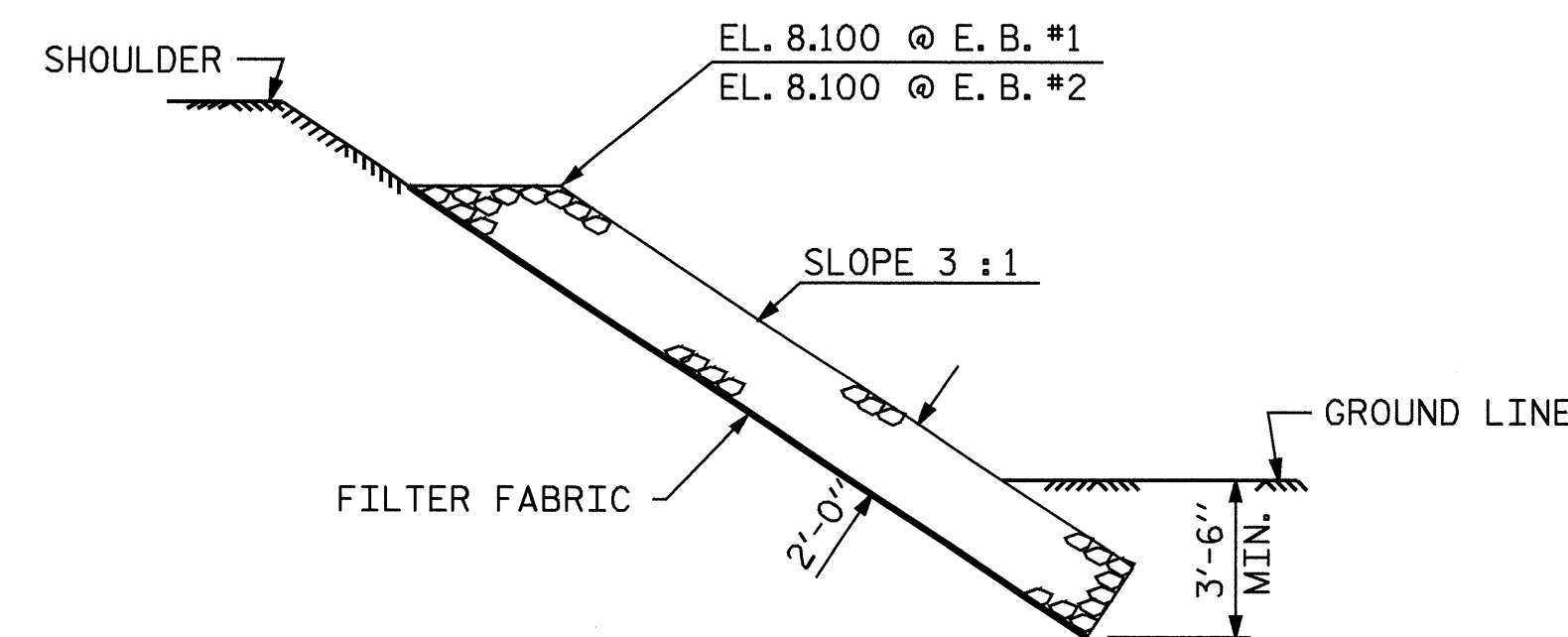


PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 14+62.50 -L-	RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	94	105
END BENT 2	92	102
TOTAL	186	207



SECTION C-C



SECTION C-C

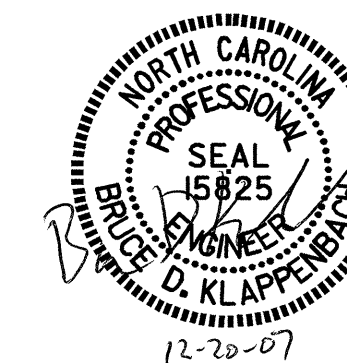
BERM RIP RAPPED

PROJECT NO. B-4228  
PERQUIMANS COUNTY  
STATION: 14+62.50 -L-

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

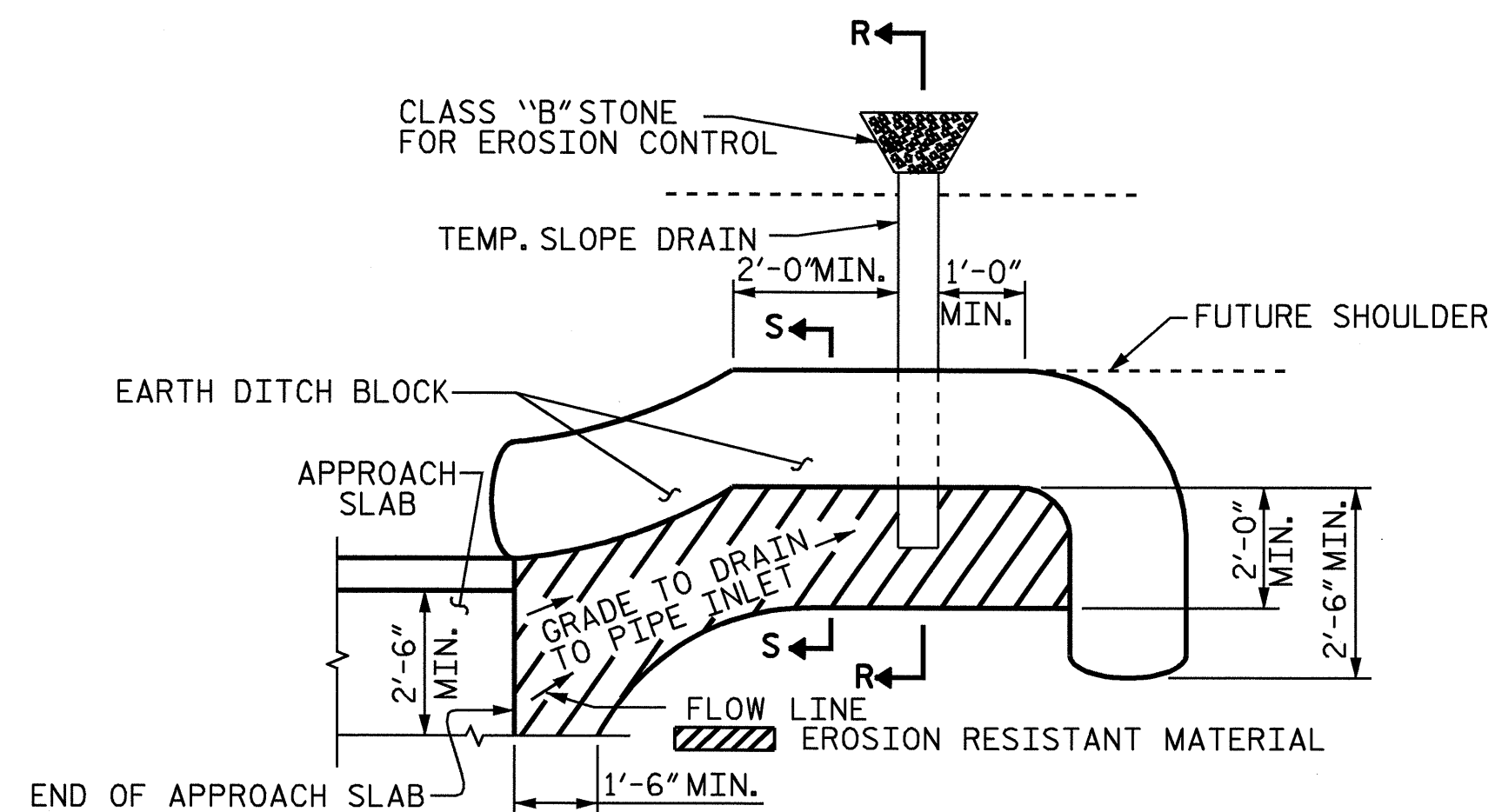
ASSEMBLED BY : M. G. SHAIKH DATE : 10-20-05  
CHECKED BY : A. SORSENGINH DATE : 2-27-07  
DRAWN BY : FCJ 2/88 REV. 7/17/98 REK/RWW  
CHECKED BY : ARB 8/88 REV. 8/16/99 RWW/LES  
REV. 10/17/00 RWW/LES

20-DEC-2007 09:00  
I:\structures\final\B-4228.sd.RR.dgn  
mshalkh



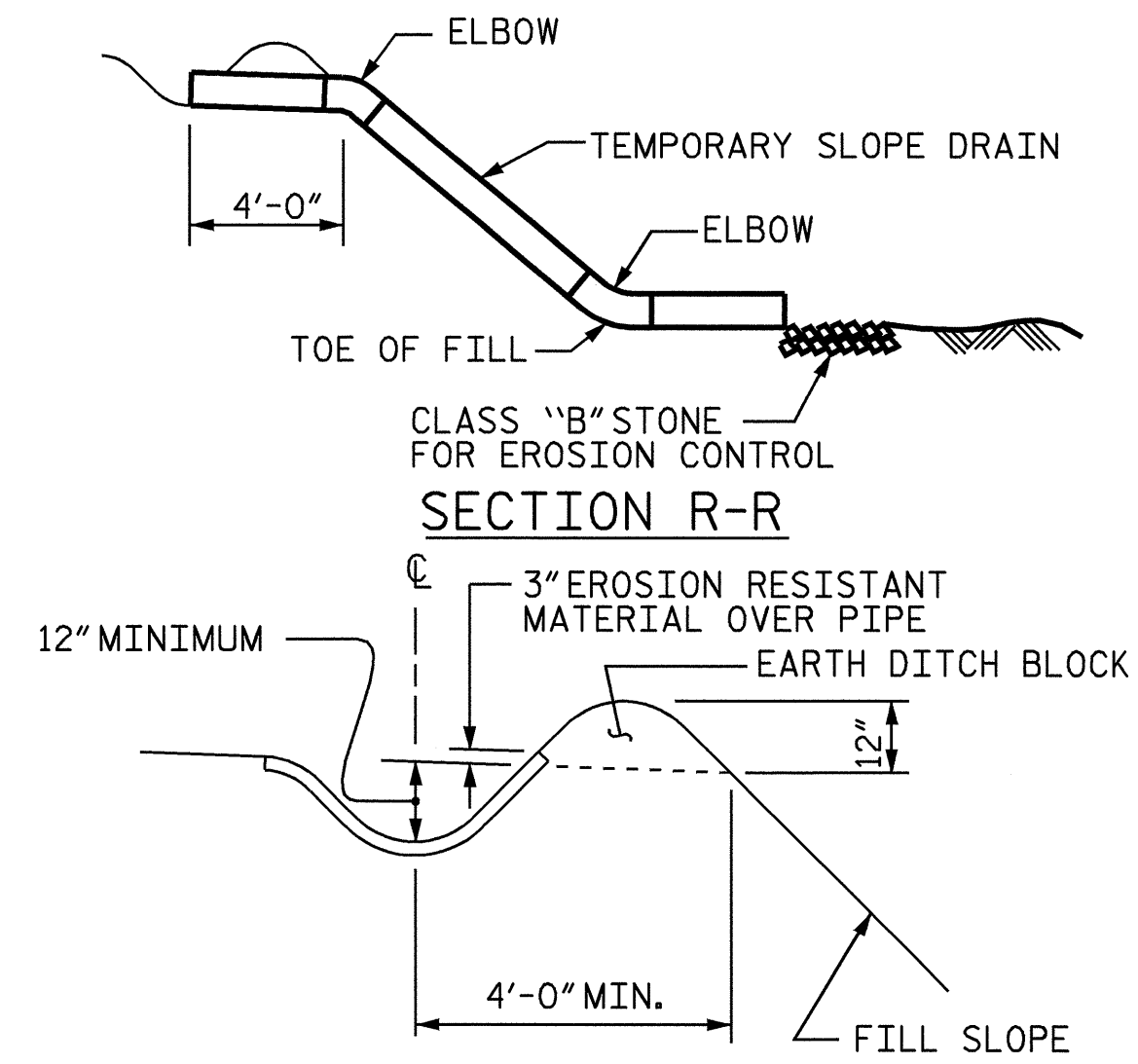
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS 19
2			4			





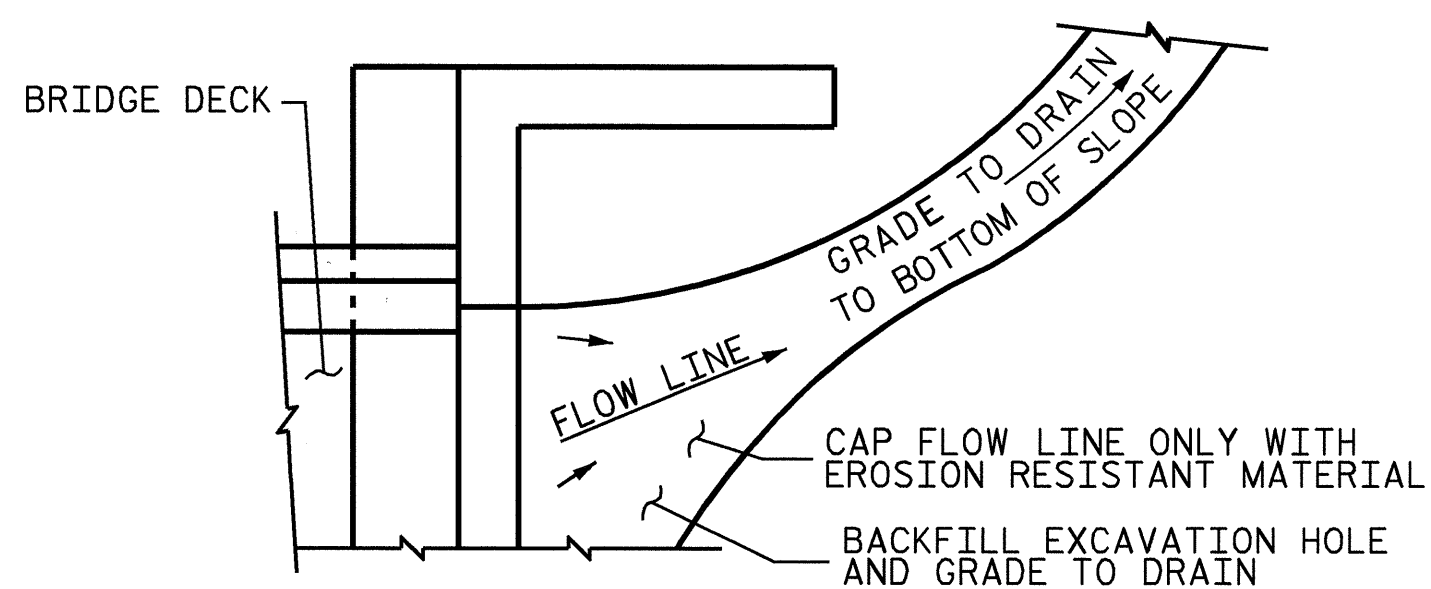
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS



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

TEMPORARY DRAINAGE DETAIL

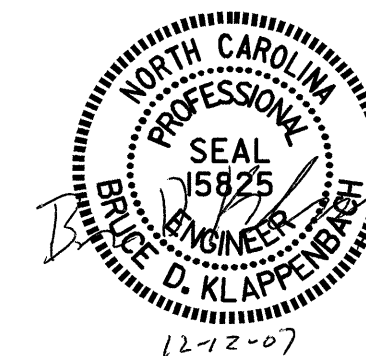
PROJECT NO. B-4228  
PERQUIMANS COUNTY  
 STATION: 14+62.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

BRIDGE APPROACH  
 SLAB DETAILS

ASSEMBLED BY :	C.R. YARBROUGH	DATE :	11/06
CHECKED BY :	A. SORSENGINH	DATE :	02/07
DRAWN BY :	FCJ	11/88	REV. 8/16/99 MAB/LES
CHECKED BY :	ARB	11/88	REV. 10/17/00 RWW/LES
			REV. 5/7/03 RWW/JTE



REVISIONS						1988
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-19
2			4			TOTAL SHEETS 19

STD. NO. BAS10



