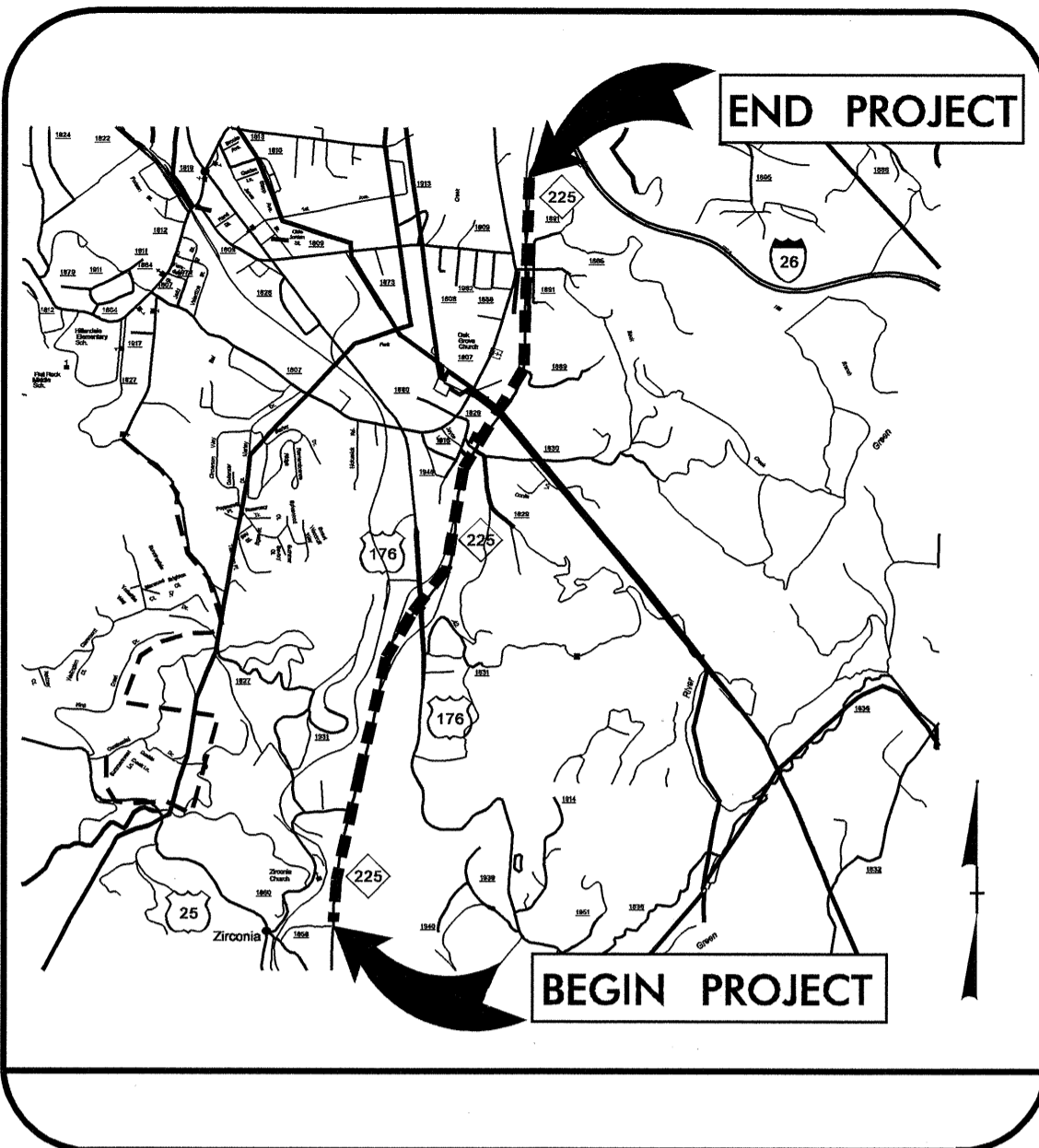


CONTRACT: C202087 TIP PROJECT: R-0505

**STRUCTURES**

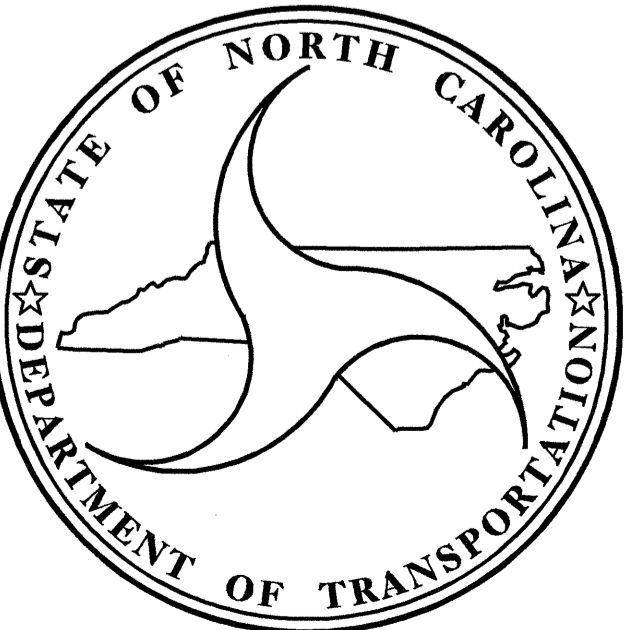
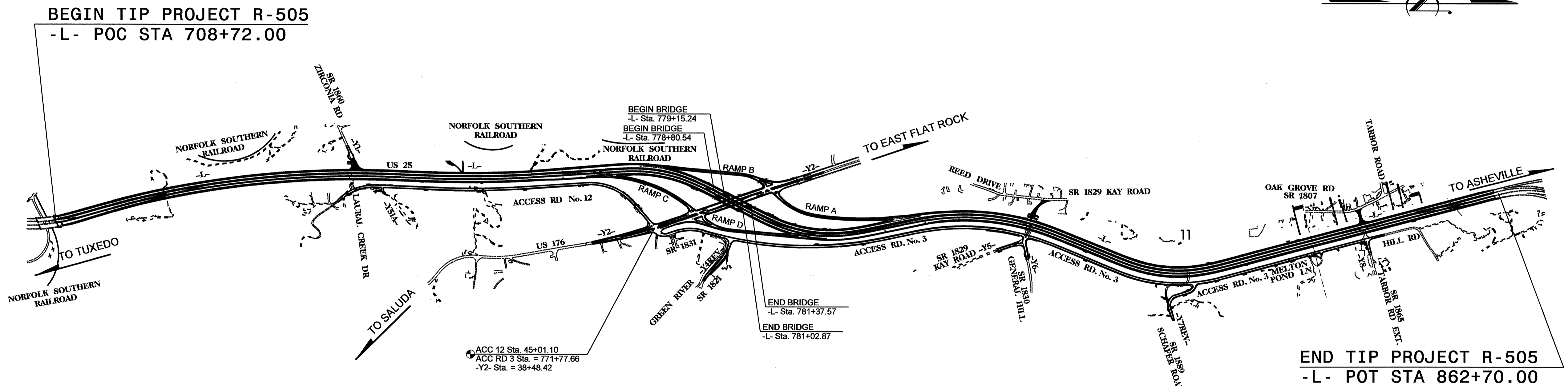


STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**HENDERSON COUNTY**

**LOCATION: NC 225-US 25/I-26 CONNECTOR FROM US 25  
AT ZIRCONIA TO I-26**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-0505		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34334.1.1	APD-1954 (1)	PE	
34334.3.1	APD-1954 (1)	UTIL. & R/W	
34334.2.3	APD-0025 (21)	CONST.	



**DESIGN DATA**

ADT 2009	= 11000
ADT 2029	= 17000
DHV	= 10 %
D	= 60 %
T	= 18 % *
V	= 60 MPH
FUN. CLASS	= RURAL MINOR ARTERIAL
* TTST	12% DUAL 6%

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT R-0505	= 2.874 MI
LENGTH STRUCTURE TIP PROJECT R-0505	= 0.042 MI
TOTAL LENGTH TIP PROJECT R-0505	= 2.916 MI

Prepared In the Office of:  
**DIVISION OF HIGHWAYS**  
2006 STANDARD SPECIFICATIONS

LETTING DATE :  
MAY 19, 2009

**STRUCTURE DESIGN UNIT**  
1000 BIRCH RIDGE DR.  
RALEIGH, N.C. 27610

J. C. FRYE, P.E.  
PROJECT ENGINEER

W.A. DAVIS, P.E.  
PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

P.E.  
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

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

DATE \_\_\_\_\_

STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS  

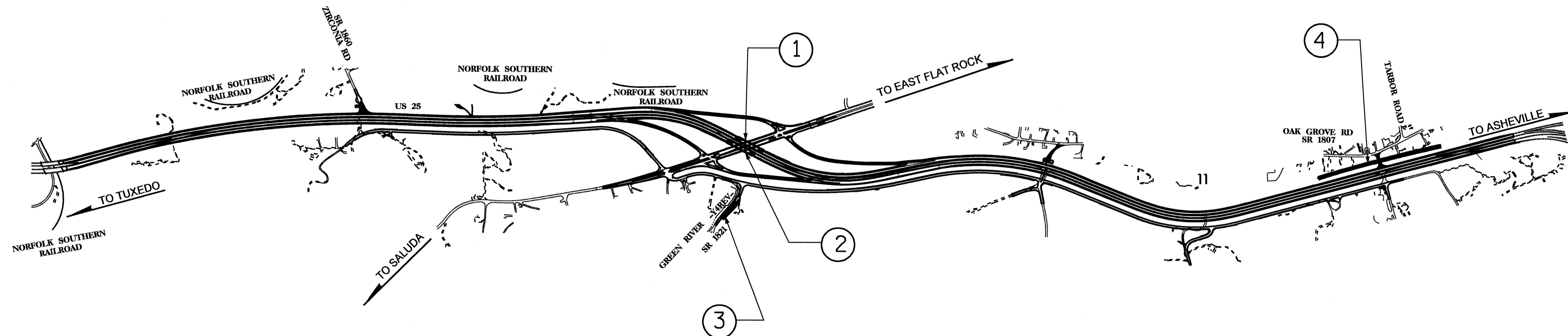

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**HENDERSON COUNTY**

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BRIDGES			
INDEX NUMBER	STATION	DESCRIPTION	SHEET NUMBERS
①	780+05.14 -L- 29+99.450-Y2-	BRIDGE CARRYING US 25/ I-26 OVER US 176 SBL	S-1 THRU S-28
②	780+05.14 -L- 29+99.450-Y2-	BRIDGE CARRYING US 25/ I-26 OVER US 176 NBL	S-29 THRU S-56
WALLS			
INDEX NUMBER	STATION	DESCRIPTION	SHEET NUMBERS
③	12+00.00 TO 14+35 -Y4 REV.-	RETAINING WALL 1	W-1 THRU W-2
④	841+00.00 -L-	SOUND BARRIER WALL	W-3 THRU W-4

PROJECT NO. R-0505  
HENDERSON COUNTY

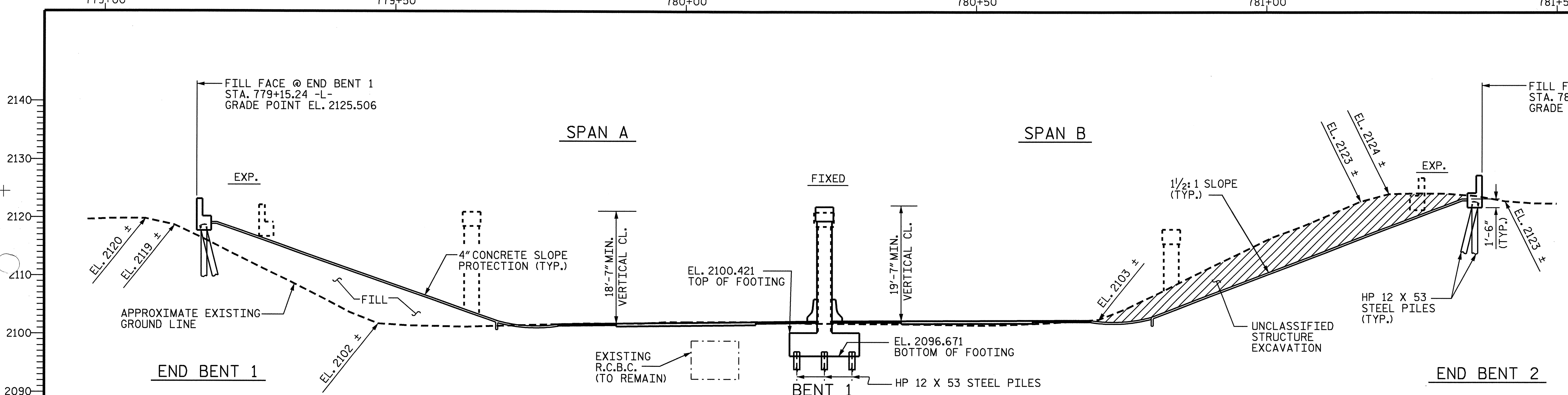
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

INDEX SHEET

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

DRAWN BY : QT NGUYEN DATE : 12-08  
 CHECKED BY : W.A. DAVIS DATE : 01-07-09

24-MAR-2009 07:12  
 y:\tpp\projects-r\0505\structures\final plans\r0505.sd..ls.dgn  
 qtnguyen



**GRADE DATA**

+1.9160 %  $\Delta$  + 4.0000 %

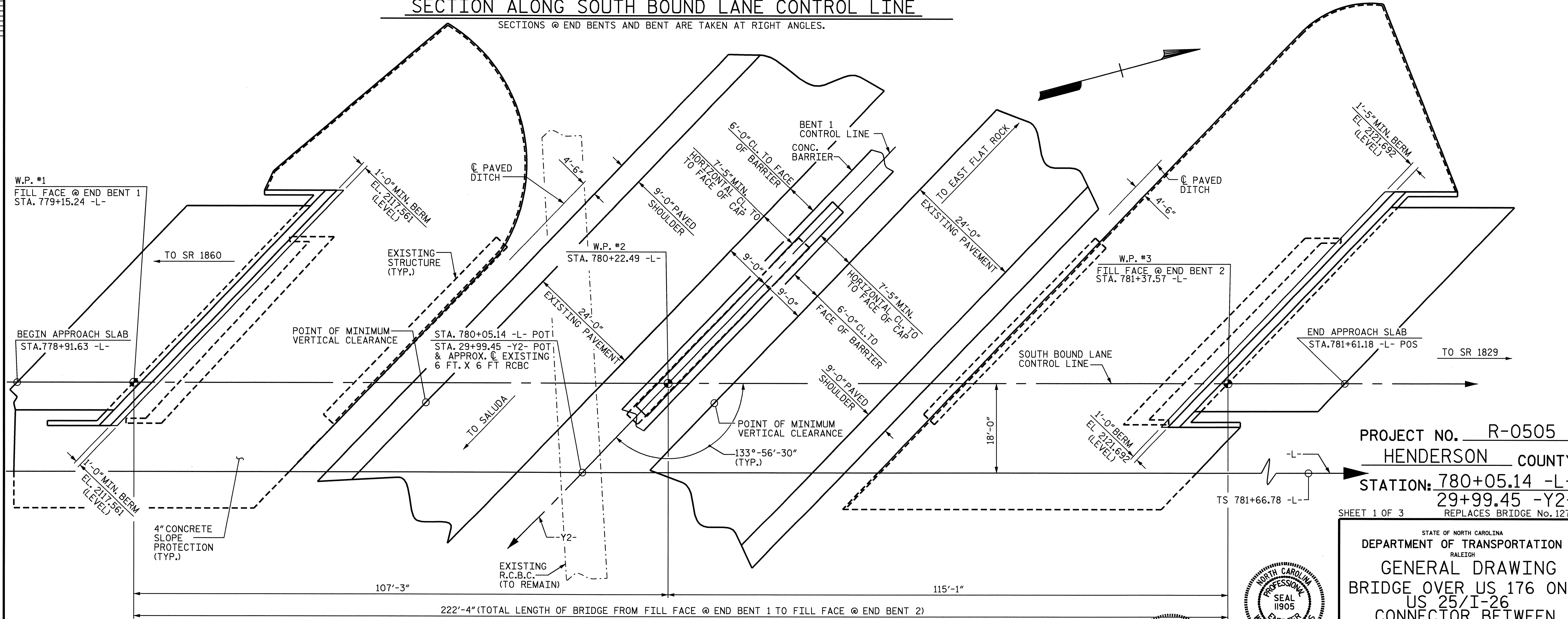
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 EL. 2135.790  
 VC = 300

**HORIZONTAL CURVE DATA**

PIs	STA. 784+67.17 -L-	PI	STA. 788+86.88 -L-
$\Theta_s$	= 9°-00'-00.0"	D	= 21°-21'-24.0" (LT)
LS	= 450'	D	= 4°-00'-00.0"
LT	= 300.39'	L	= 533.92'
ST	= 150.35'	T	= 270.09'
		R	= 1,432.39'

**SECTION ALONG SOUTH BOUND LANE CONTROL LINE**

SECTIONS @ END BENTS AND BENT ARE TAKEN AT RIGHT ANGLES.

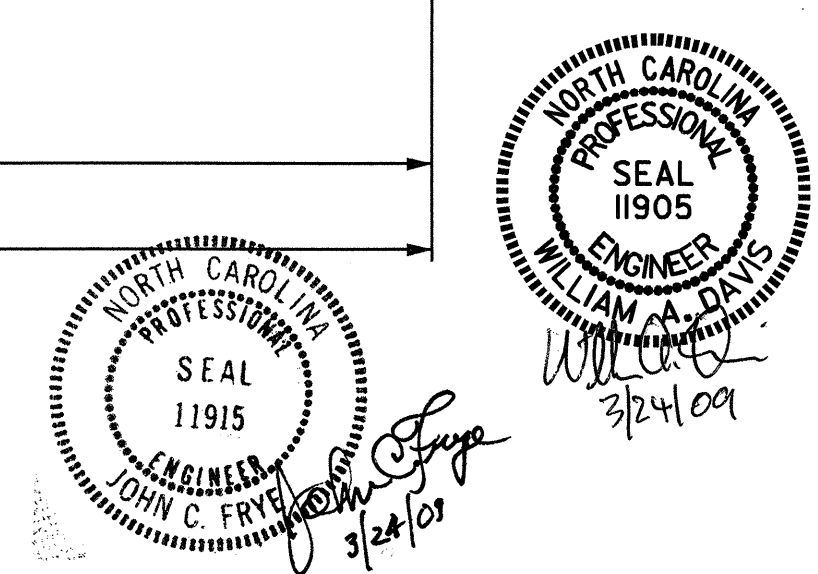


**PLAN**

PILES, COLUMNS & FOOTING NOT SHOWN FOR CLARITY

DRAWN BY : QT NGUYEN DATE : 11-08  
 CHECKED BY : W.A. DAVIS DATE : 01-23-09

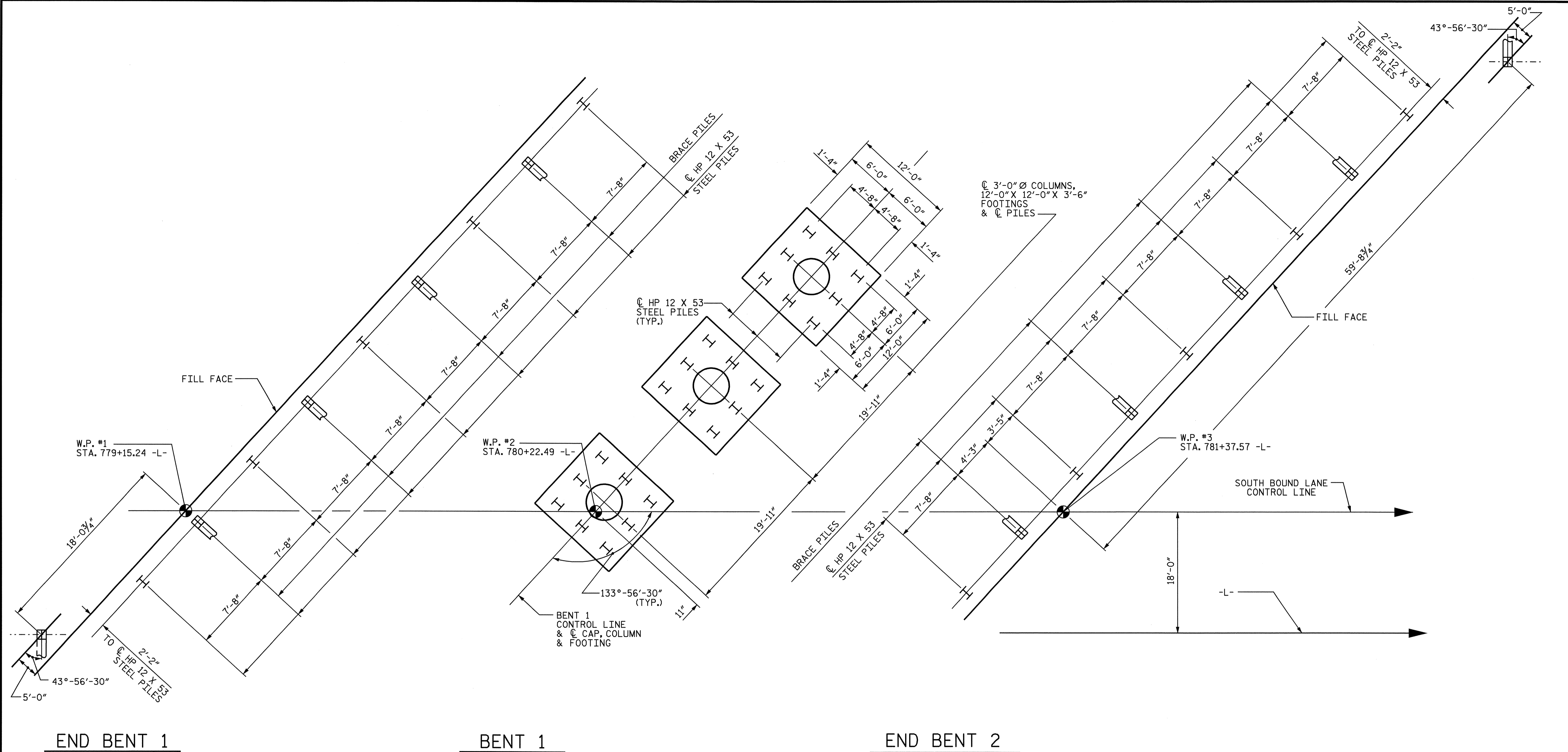
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 qtnguyen



PROJECT NO. R-0505  
 HENDERSON COUNTY  
 STATION: 780+05.14 -L-  
 29+99.45 -Y2-  
 SHEET 1 OF 3 REPLACES BRIDGE No. 127

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 BRIDGE OVER US 176 ON  
 US 25/I-26  
 CONNECTOR BETWEEN  
 SR 1860 AND SR 1829  
 (SOUTH BOUND LANE)

REVISIONS				SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			56



**FOUNDATION LAYOUT**

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.  
 HP 12 X 53 STEEL PILES AT END BENTS ARE BATTERED 3 TO 12.  
 FOOTING DIMENSIONS ARE TYPICAL AT BENT 1.

**NOTES**

DRIVE PILES AT END BENT NO.1 TO A REQUIRED BEARING CAPACITY OF 120 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 IS 60 TONS PER PILE.

DRIVE PILES AT BENT NO.1 TO A REQUIRED BEARING CAPACITY OF 120 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 BENT NO.1 IS 60 TONS PER PILE.

DRIVE PILES AT END BENT NO.2 TO A REQUIRED BEARING CAPACITY OF 120 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.2 IS 60 TONS PER PILE.

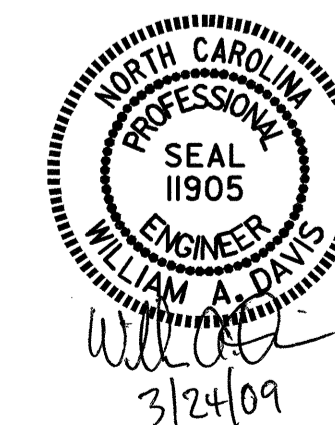
STEEL PILE POINTS ARE REQUIRED FOR STEEL PILES AT END BENT NO.2.

DRAWN BY : QT NGUYEN DATE : 11-08  
 CHECKED BY : W.A. DAVIS DATE : 01-23-09

24-MAR-2009 07:12  
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 qtnguyen

PROJECT NO. R-0505  
 HENDERSON COUNTY  
 STATION: 780+05.14 -L-

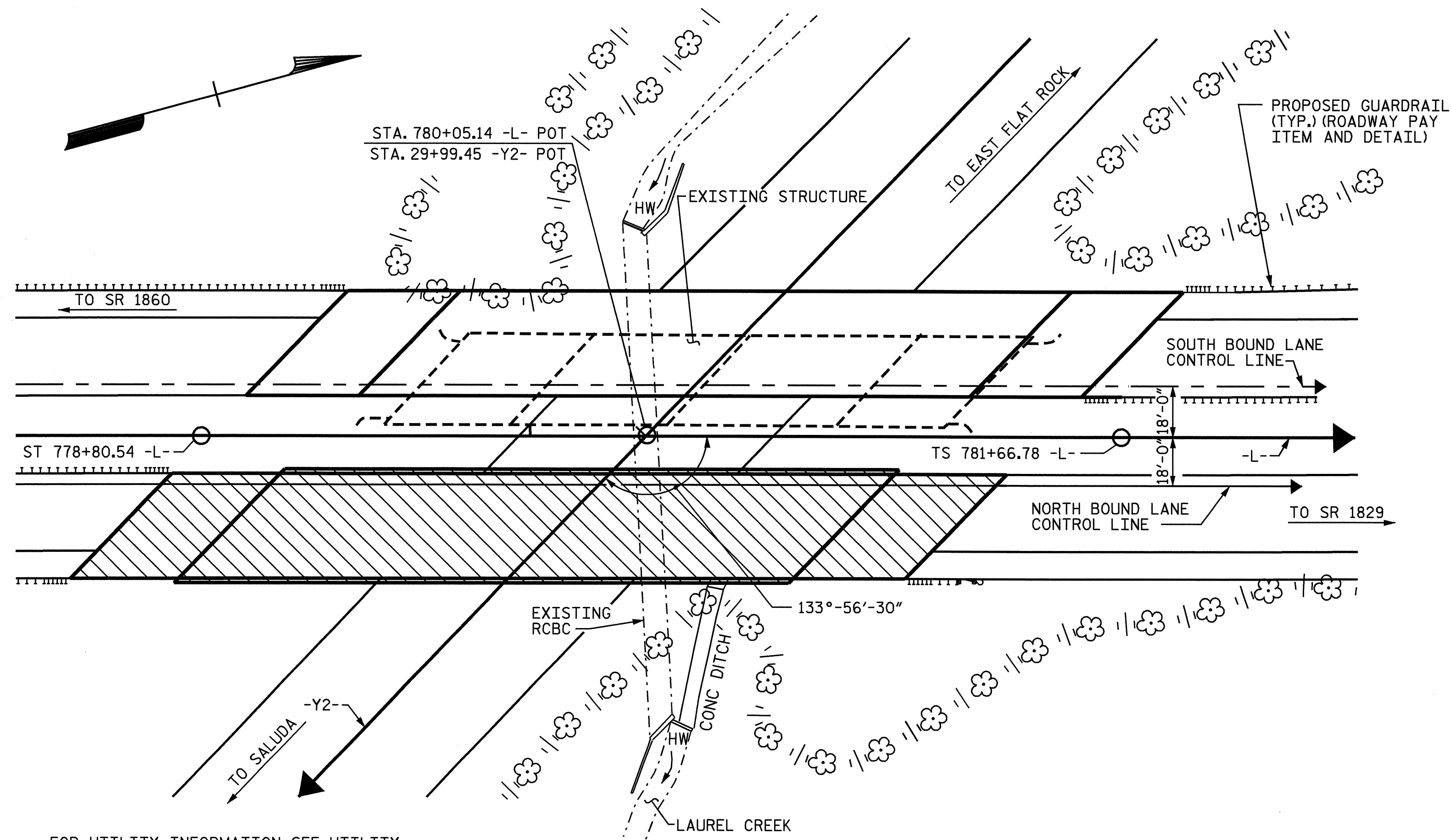
SHEET 2 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 BRIDGE OVER  
 US 176 ON US 25/I-26  
 CONNECTOR BETWEEN  
 SR 1860 AND SR 1829  
 (SOUTH BOUND LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			56

STR. #1



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES :

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING, EXCEPT THAT THE GIRDERS HAVE BEEN DESIGNED FOR HS 25.

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

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

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

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA AS SHOWN ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 84 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER CUBIC YARD FOR UNCLASSIFIED STRUCTURE EXCAVATION.

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 B.

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 SAMPLE 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.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE PRICE BID FOR "REMOVAL OF EXISTING STRUCTURE."

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 4 SPANS: 1 @ 38'-5" 2 @ 60'-2" AND 1 @ 45'-0", WITH CLEAR ROADWAY WIDTH OF 28' AND WITH A REINFORCED CONCRETE DECK SLAB ON I BEAMS AND RC END BENTS ON STEEL H PILES AND RC INTERIOR BENT WITH POST AND BEAM ON PILE FOOTINGS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

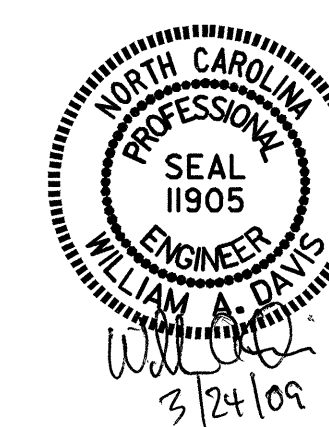
PILES SUPPORTING FOOTINGS OF BENT 2 AT THE EXISTING BRIDGE MAY BE IN CONFLICT WITH PILES SUPPORTING FOOTINGS OF BENT 1 AT THE PROPOSED BRIDGE. ALL EXISTING PILES IN CONFLICT WITH PROPOSED PILES SHALL BE REMOVED IN THEIR ENTIRETY OR AS DIRECTED BY THE ENGINEER.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	FOUNDATION EXCAVATION	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	APPROX. STRUCTURAL STEEL	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	POT BEARINGS	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS
											EA.	LIN. FT.						
	LUMP SUM	LUMP SUM	CU. YDS.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LBS.			EA.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE				9052	10799		LUMP SUM			297032				438.76		LUMP SUM	LUMP SUM	LUMP SUM
END BENT 1						39.7		6776			10	425			319			
BENT 1		LUMP SUM				97.3		14823	1124		24	900						
END BENT 2			1183			39.9		6787			10	575	10		371			
TOTAL	LUMP SUM	LUMP SUM	1183	9052	10799	176.9	LUMP SUM	28386	1124	297032	44	1900	10	438.76	690	LUMP SUM	LUMP SUM	LUMP SUM

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 BRIDGE OVER  
 US 176 ON US 25/I-26  
 CONNECTOR BETWEEN  
 SR 1860 AND SR 1829  
 (SOUTH BOUND LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS 56
2			4			

DRAWN BY : QT NGUYEN DATE : 11-08  
 CHECKED BY : W.A. DAVIS DATE : 01-23-09

**NOTES**

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

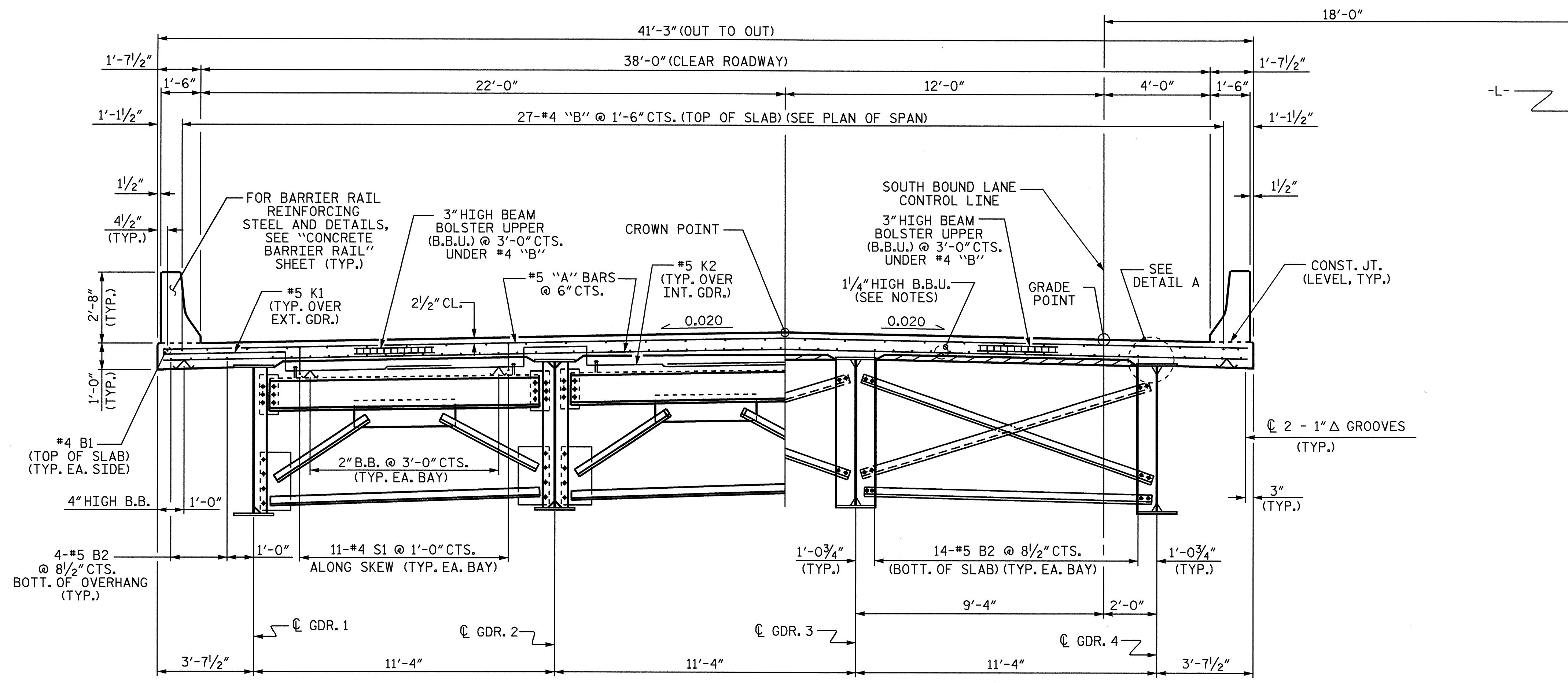
THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN STAY-IN-PLACE METAL FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE STAY-IN-PLACE METAL FORM WORKING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

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

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

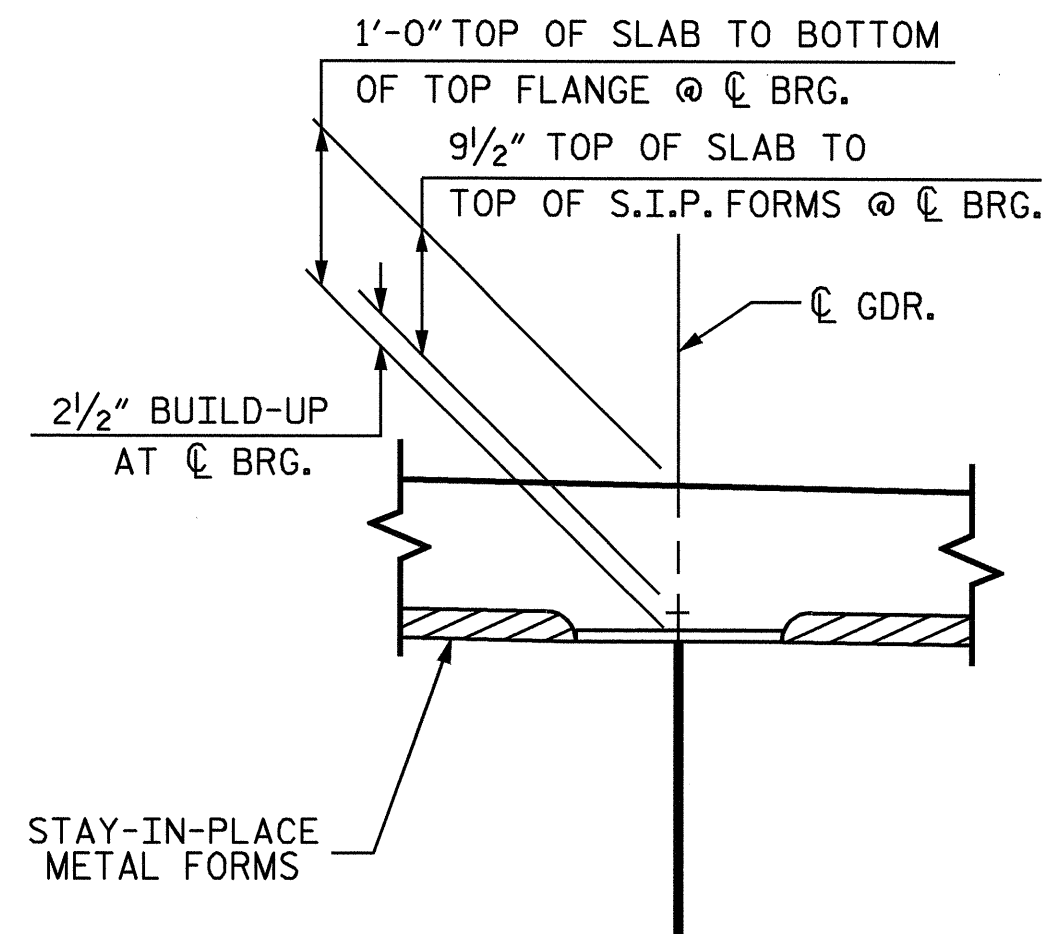
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

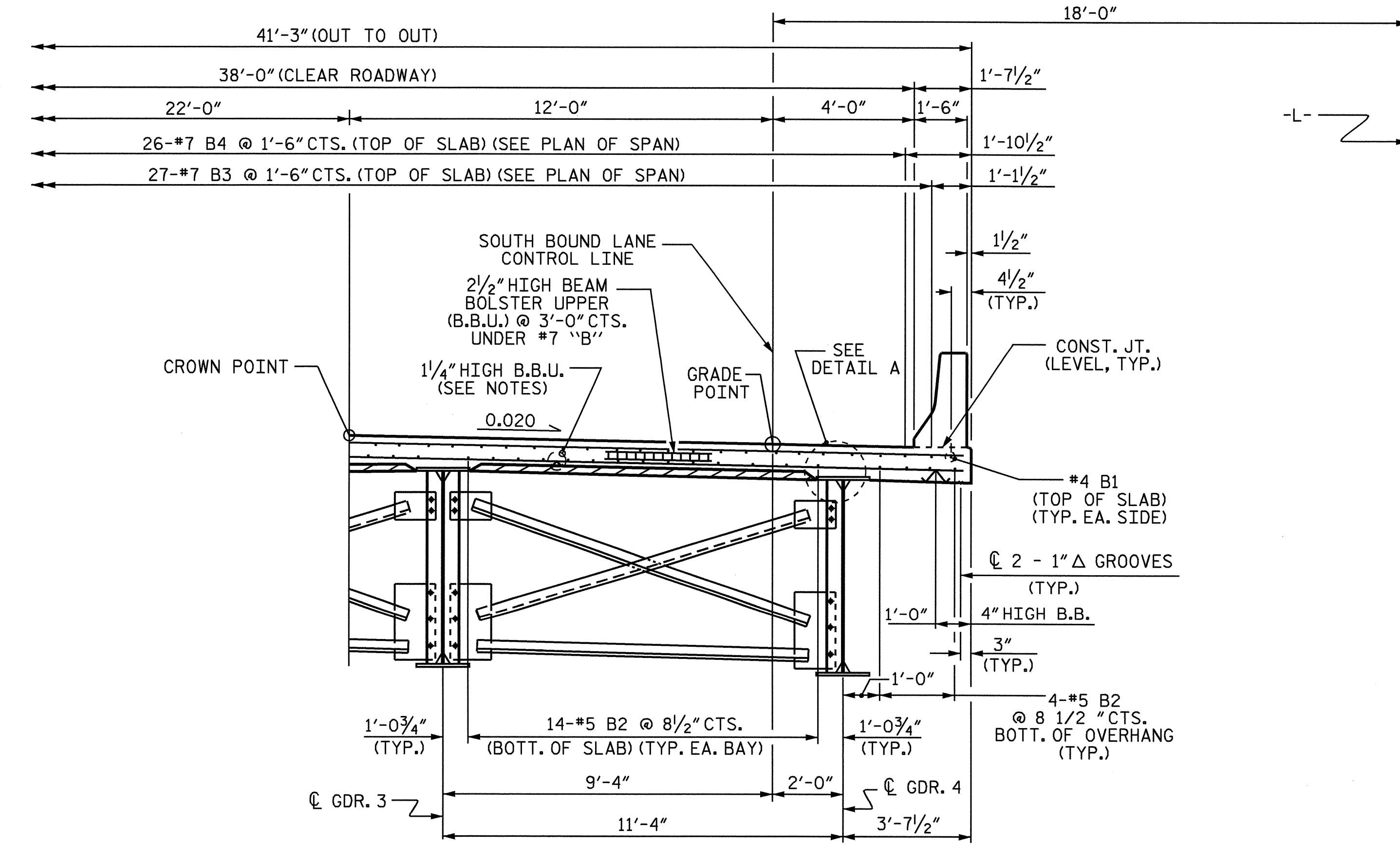


**PART TYPICAL SECTION**  
SHOWING END BENT DIAPHRAGMS

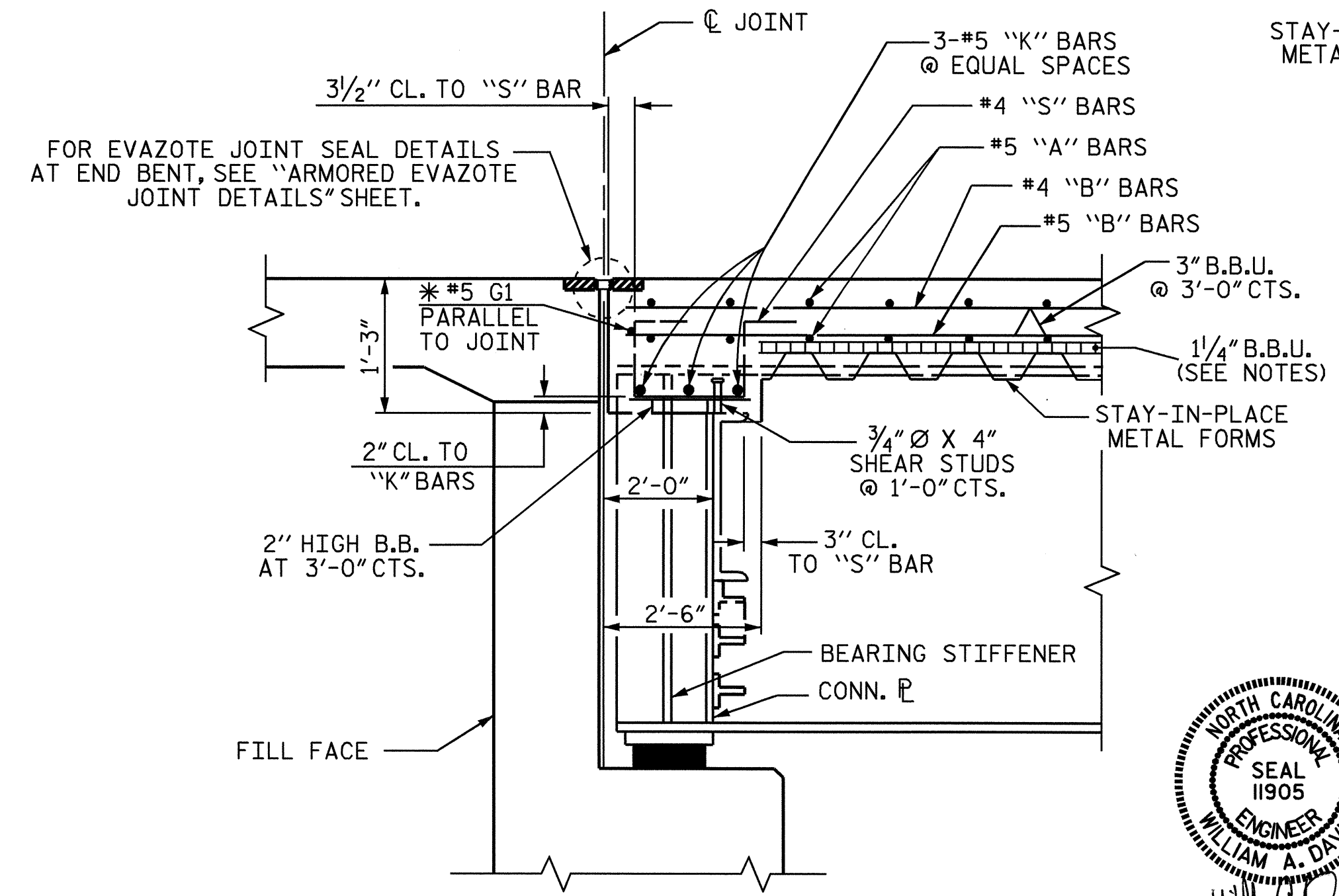
**PART TYPICAL SECTION**  
SHOWING INTERMEDIATE DIAPHRAGMS



**DETAIL A**



**PART TYPICAL SECTION**  
SHOWING BENT DIAPHRAGMS

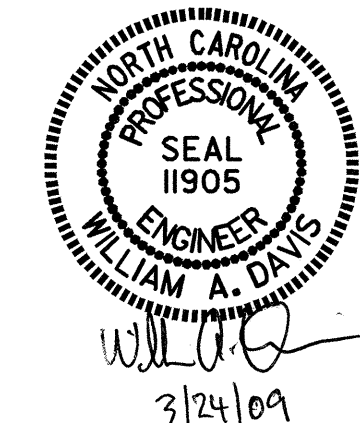


**SECTION @ END BENT**

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

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

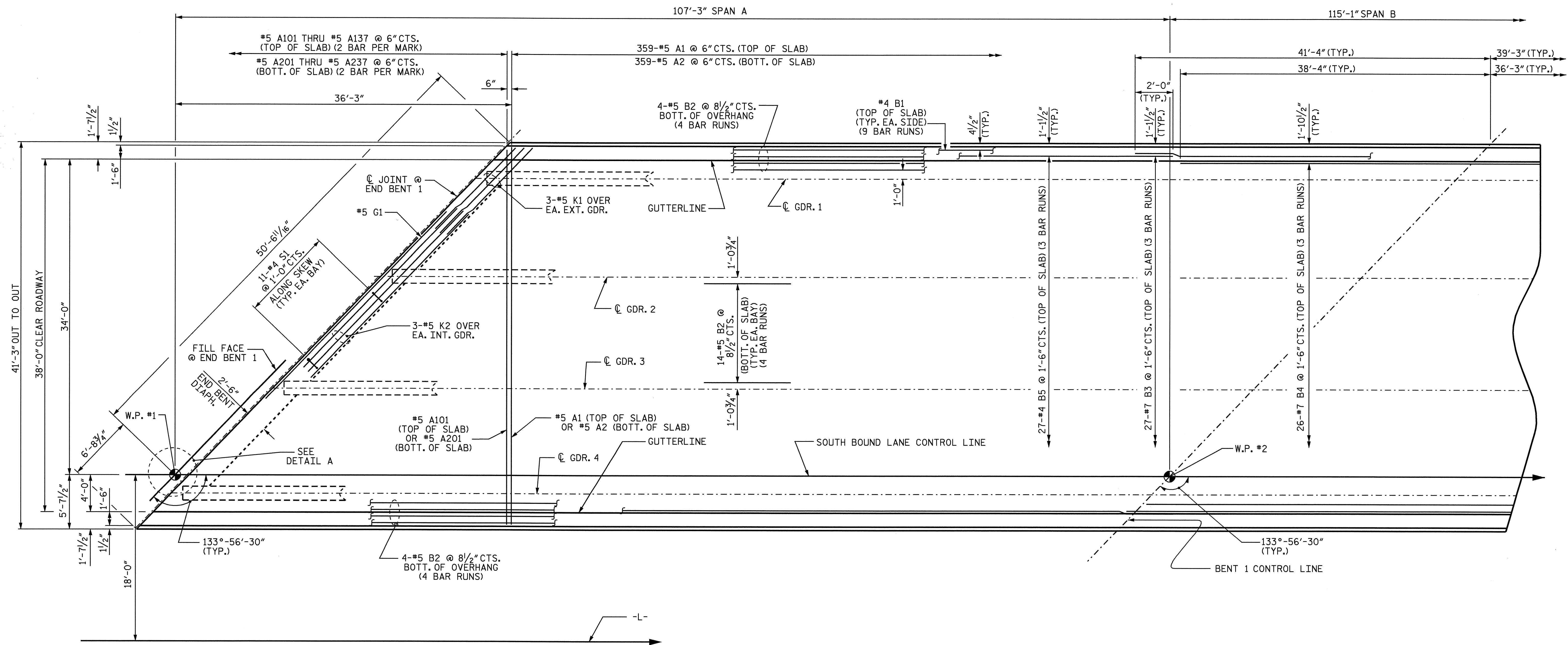
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION  
 (SBL)



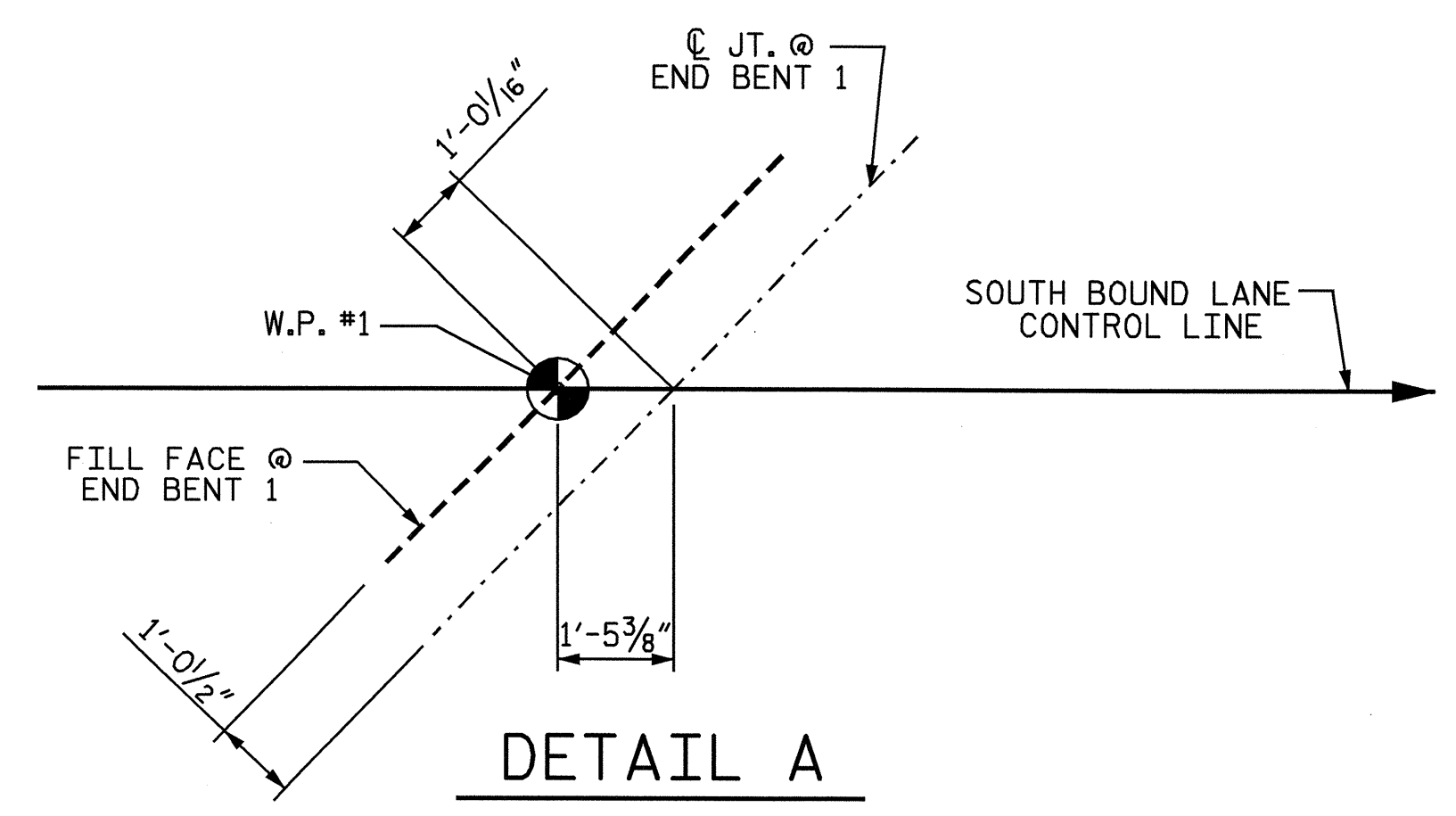
DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: A.R. CHESSON DATE: 10-08

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

TOTAL SHEETS: 56



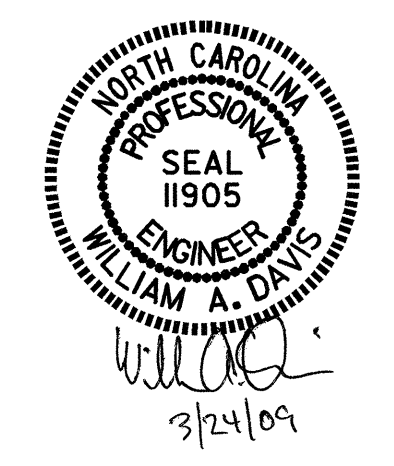
PLAN OF SPAN A



DETAIL A

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

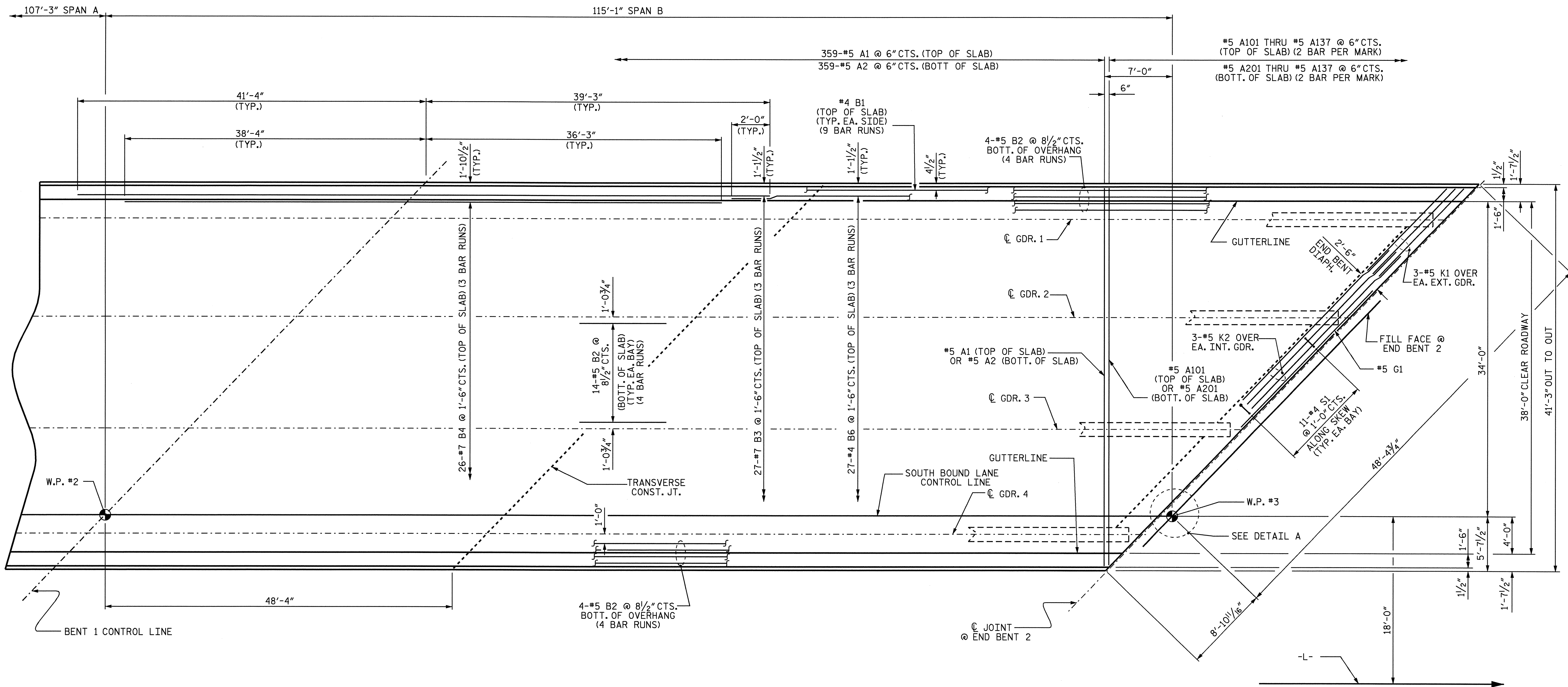
SHEET 1 OF 2



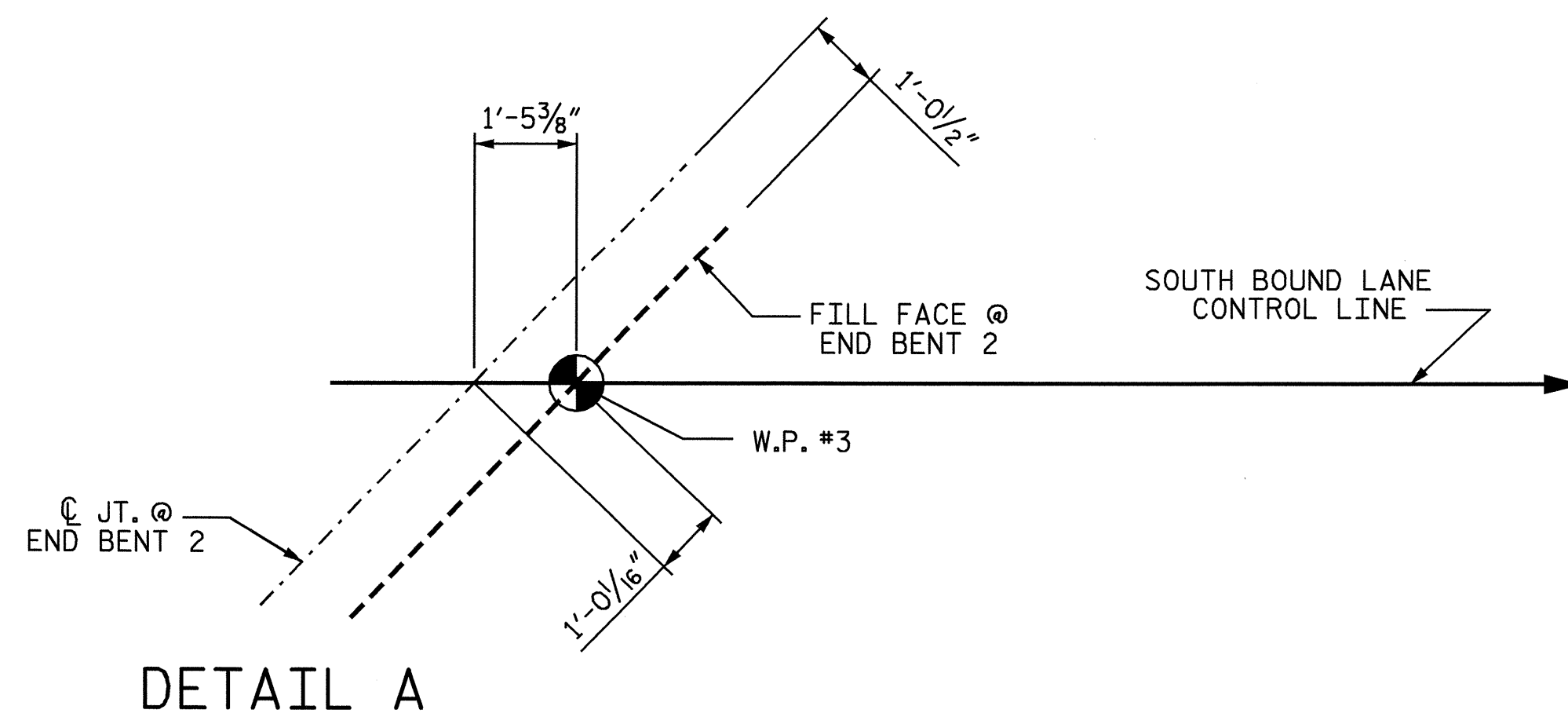
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPAN  
 (SBL)

DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: A.R. CHESSON DATE: 10-08

REVISIONS						SHEET NO. S-5
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 56
2			4			



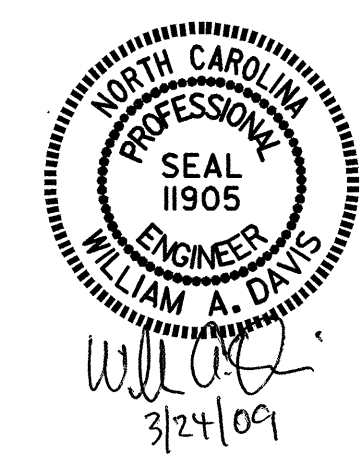
PLAN OF SPAN B



DETAIL A

PROJECT NO. R-0505  
 HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

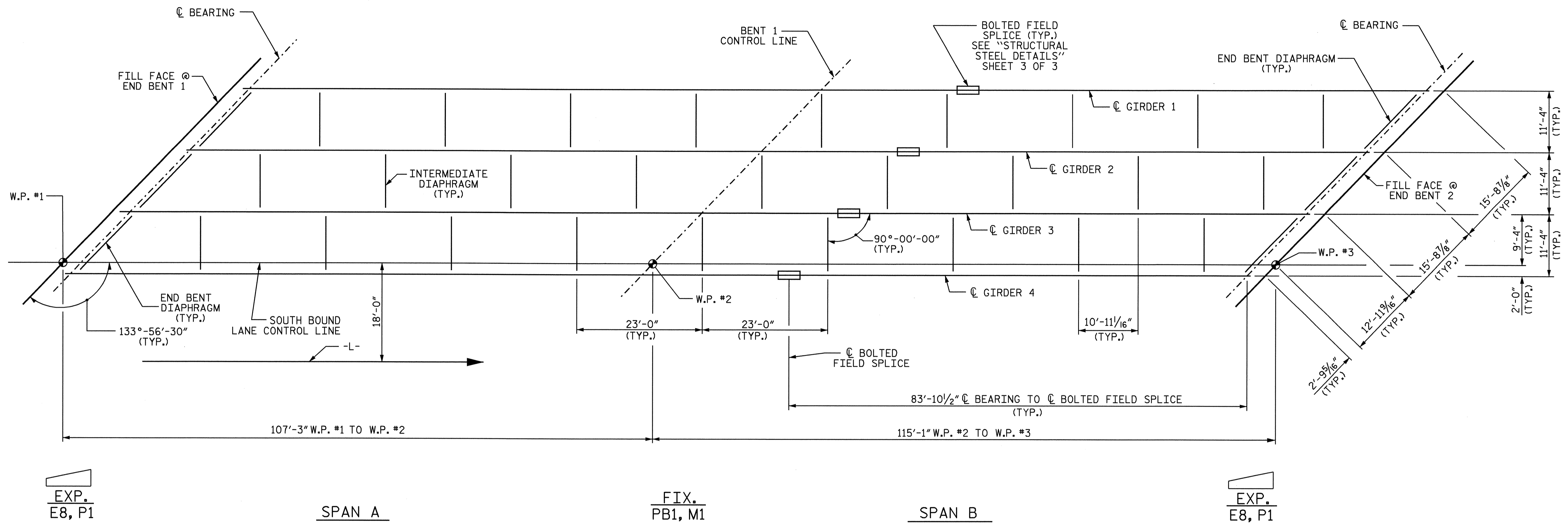
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 PLAN OF SPAN  
 (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			56

DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: A.R. CHESSON DATE: 10-08

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 qtnguyen





**FRAMING PLAN**

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

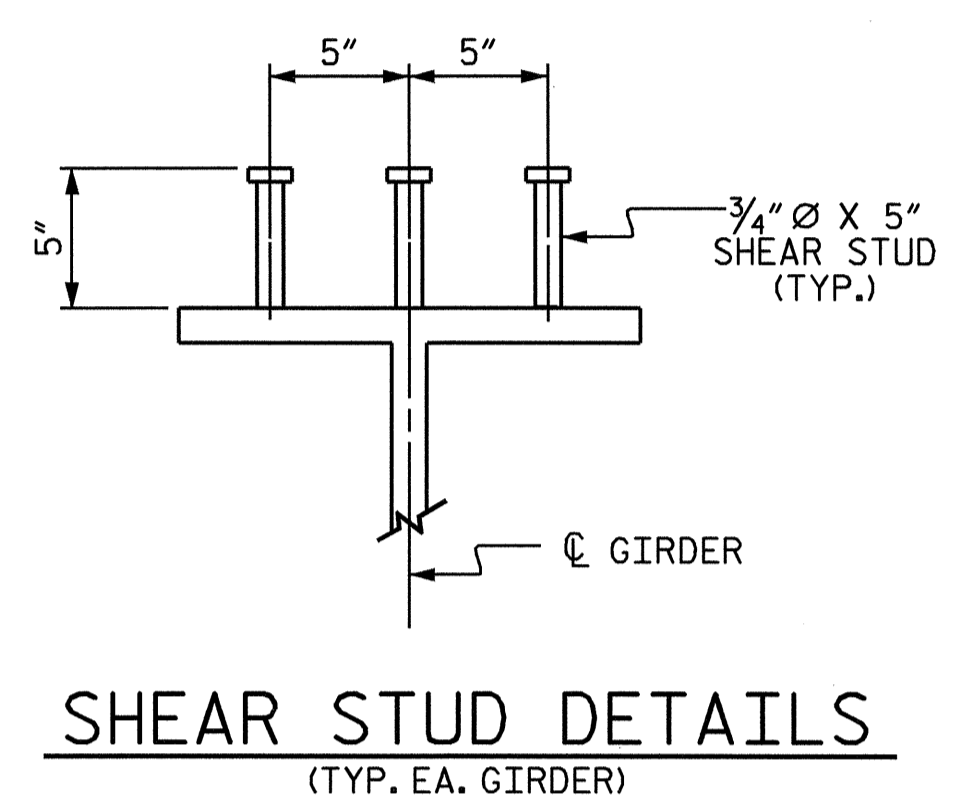
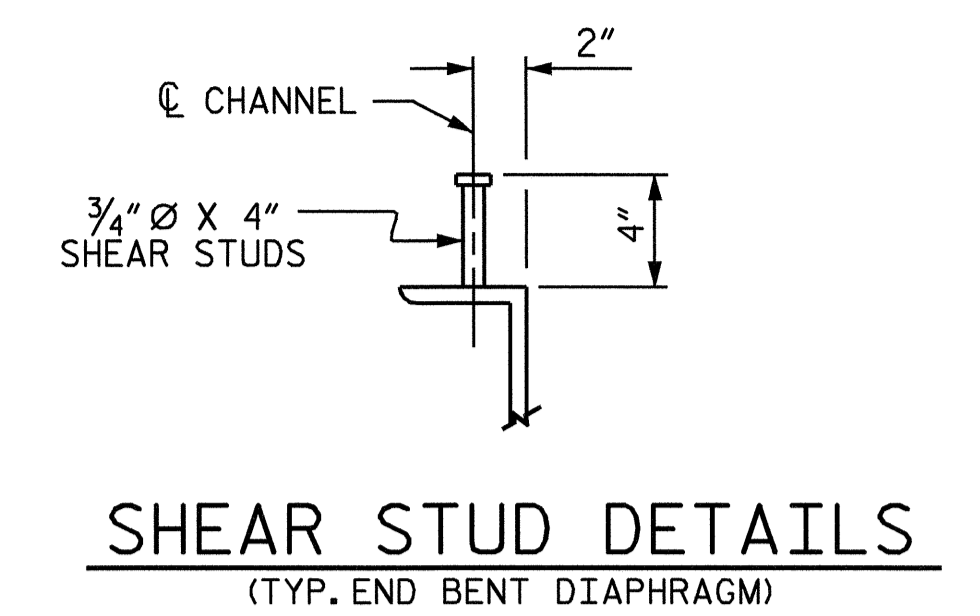
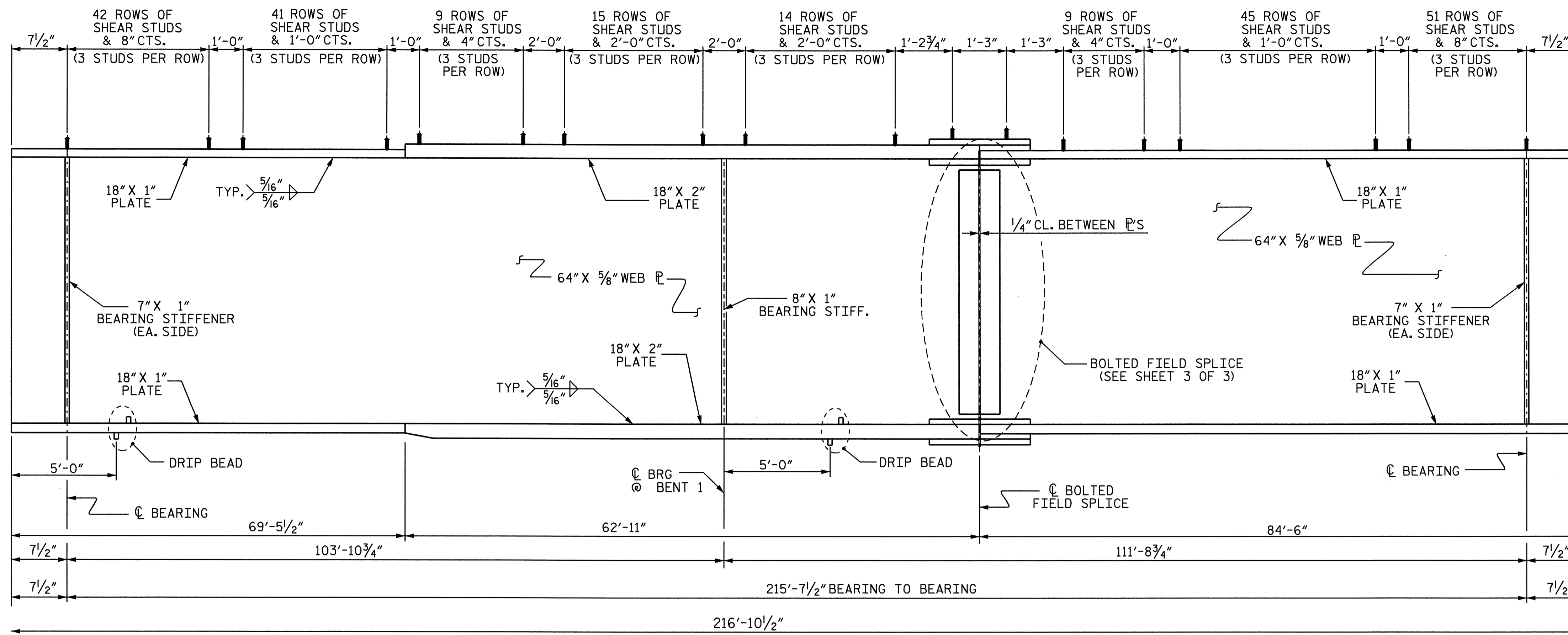


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 FRAMING PLAN  
 (SBL)

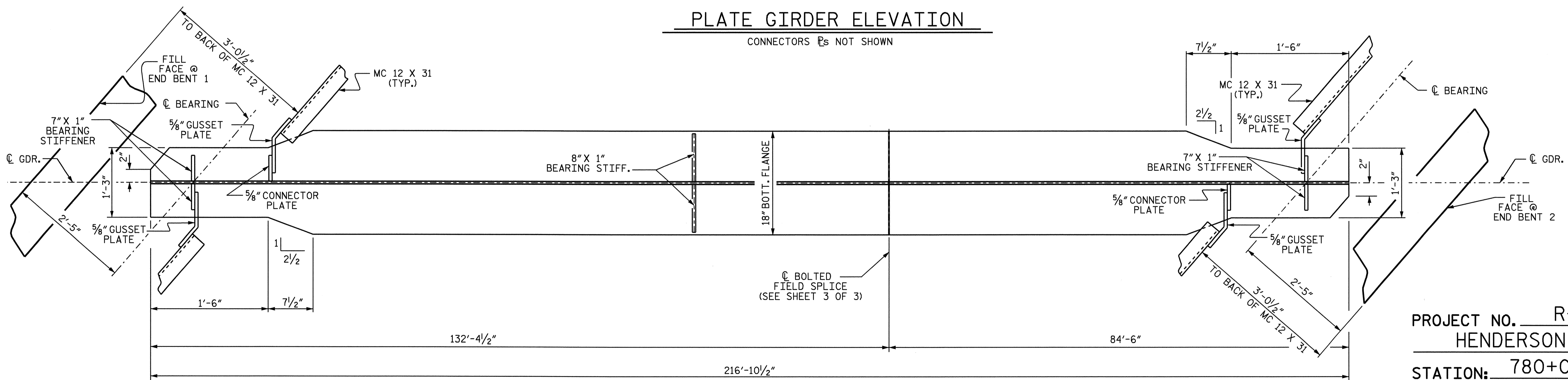
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			56

DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: A.R. CHESSON DATE: 10-08

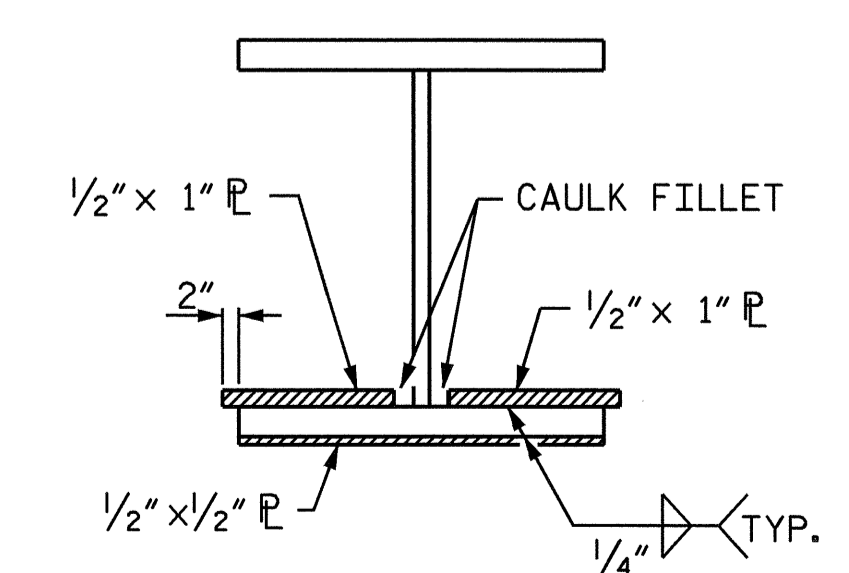
24-MAR-2009 07:10  
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 qtnguyen



**PLATE GIRDER ELEVATION**  
CONNECTORS P's NOT SHOWN



**BOTTOM FLANGE DETAIL**

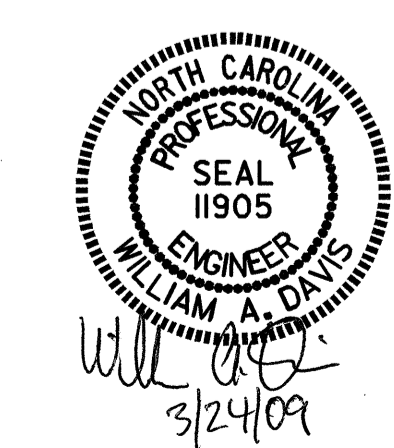


**DRIP BEAD DETAIL**  
FOR EXTERIOR GIRDERS ONLY

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-8
SUPERSTRUCTURE STRUCTURAL STEEL DETAILS (SBL)						
REVISIONS						TOTAL SHEETS 56
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			



DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: A.R. CHESSON DATE: 10-08

24-MAR-2009 07:08  
 y:\projects\11905\structures\finalplans\sbl-127 str1\11905.ed.ssi.dgn  
 qtnguyen

**NOTES**

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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

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

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 60 FEET AND WEB PIECE LENGTHS TO 45 FEET. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

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

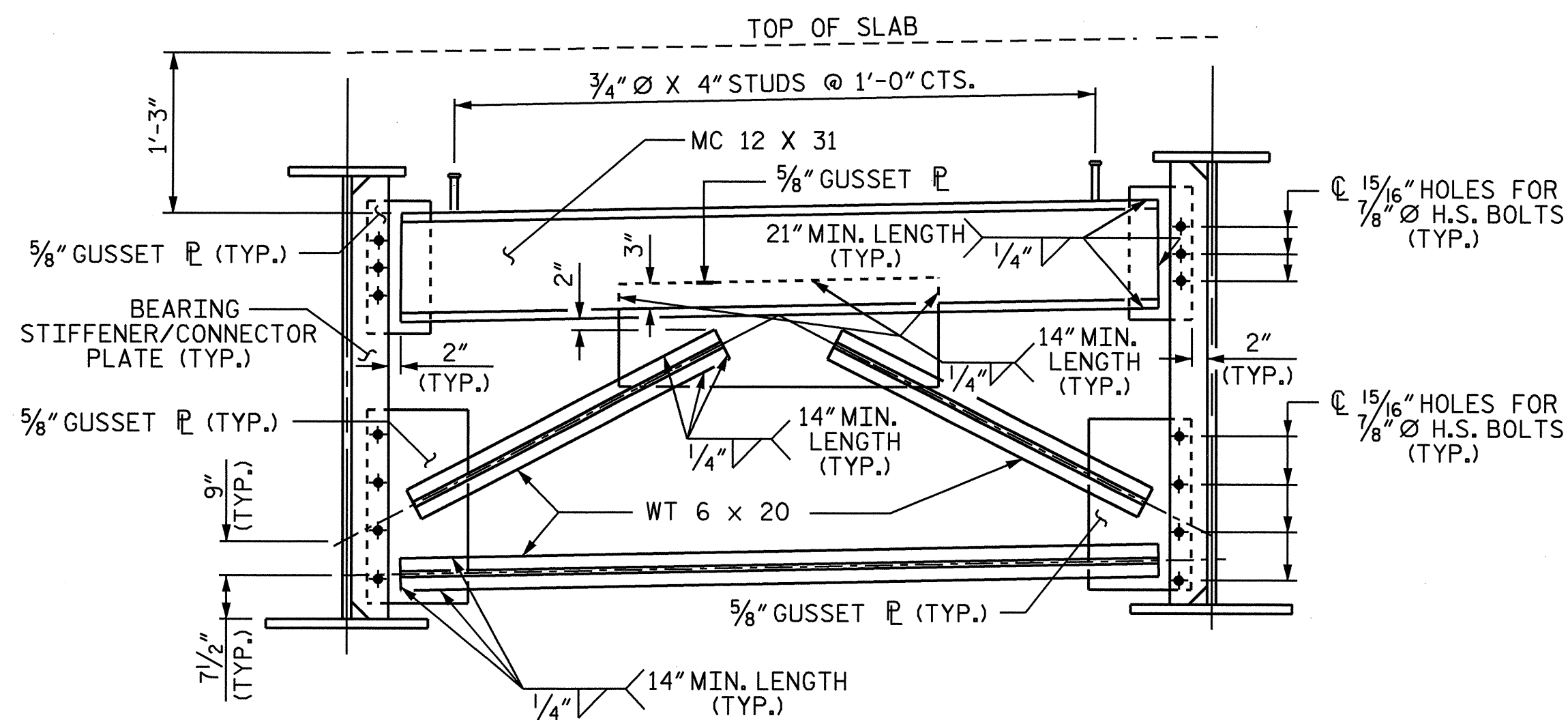
TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

END OF GIRDERS SHALL BE PLUMB.

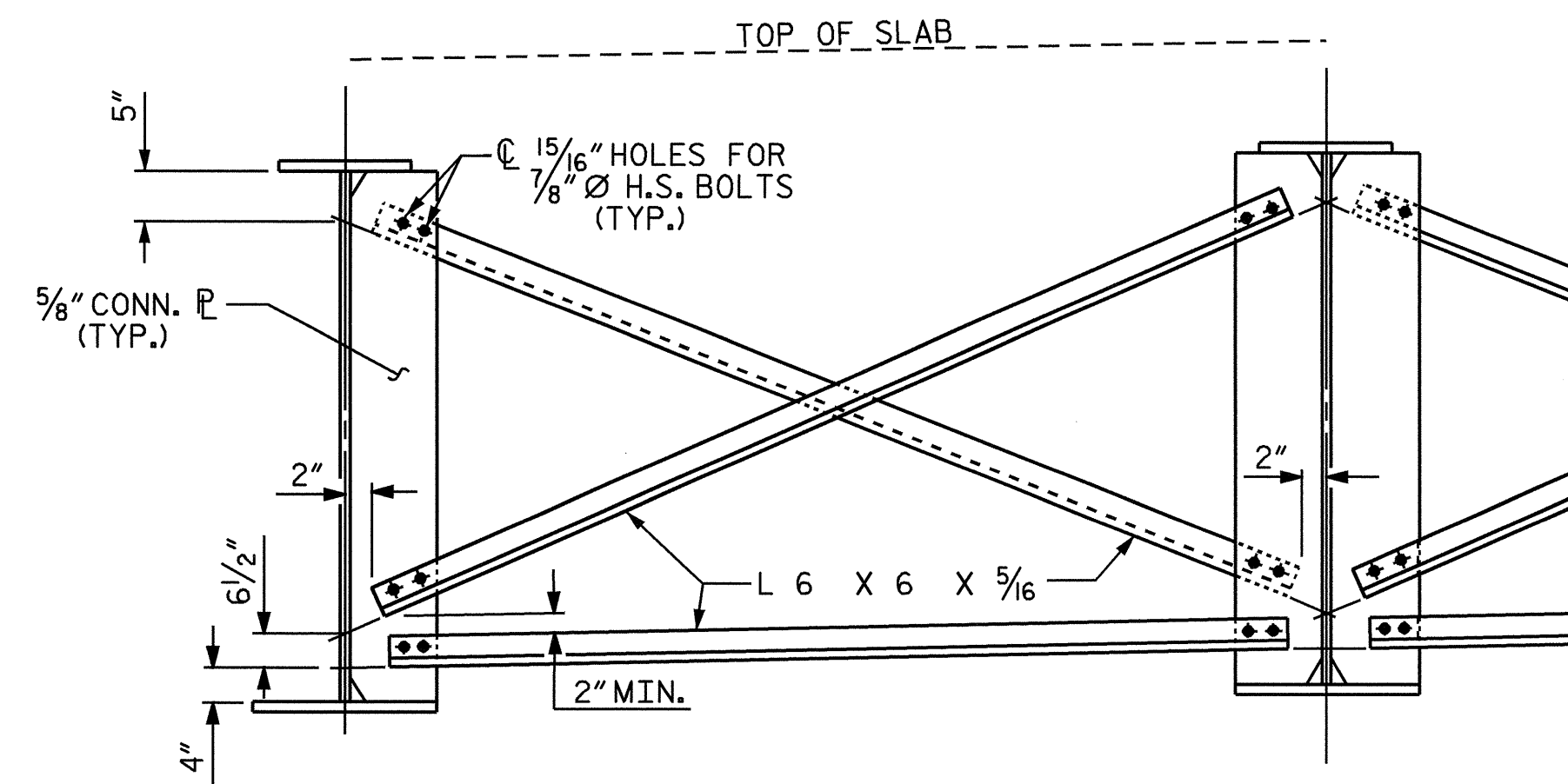
BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE TO AVOID INTERFERENCE WITH THE ANCHOR BOLT.

FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

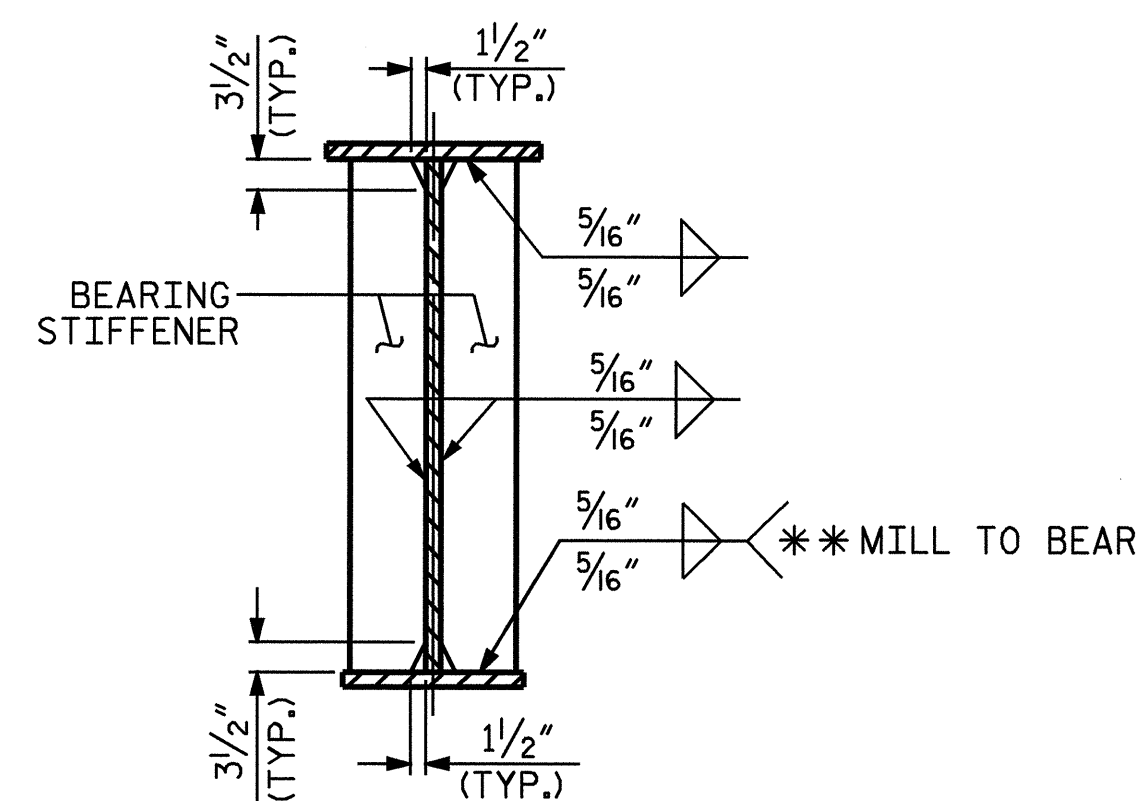
FOR SHIPPING STEEL STRUCTURAL MEMBERS, SEE SPECIAL PROVISIONS.



**END BENT DIAPHRAGM**

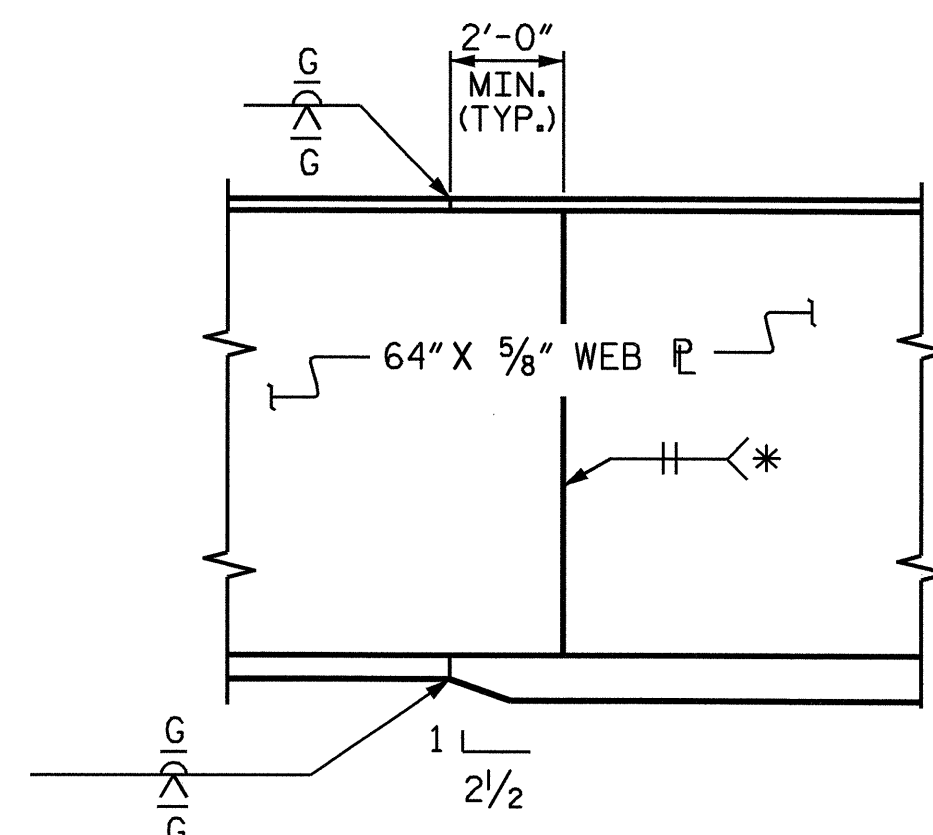


**TYPICAL INTERMEDIATE DIAPHRAGM**



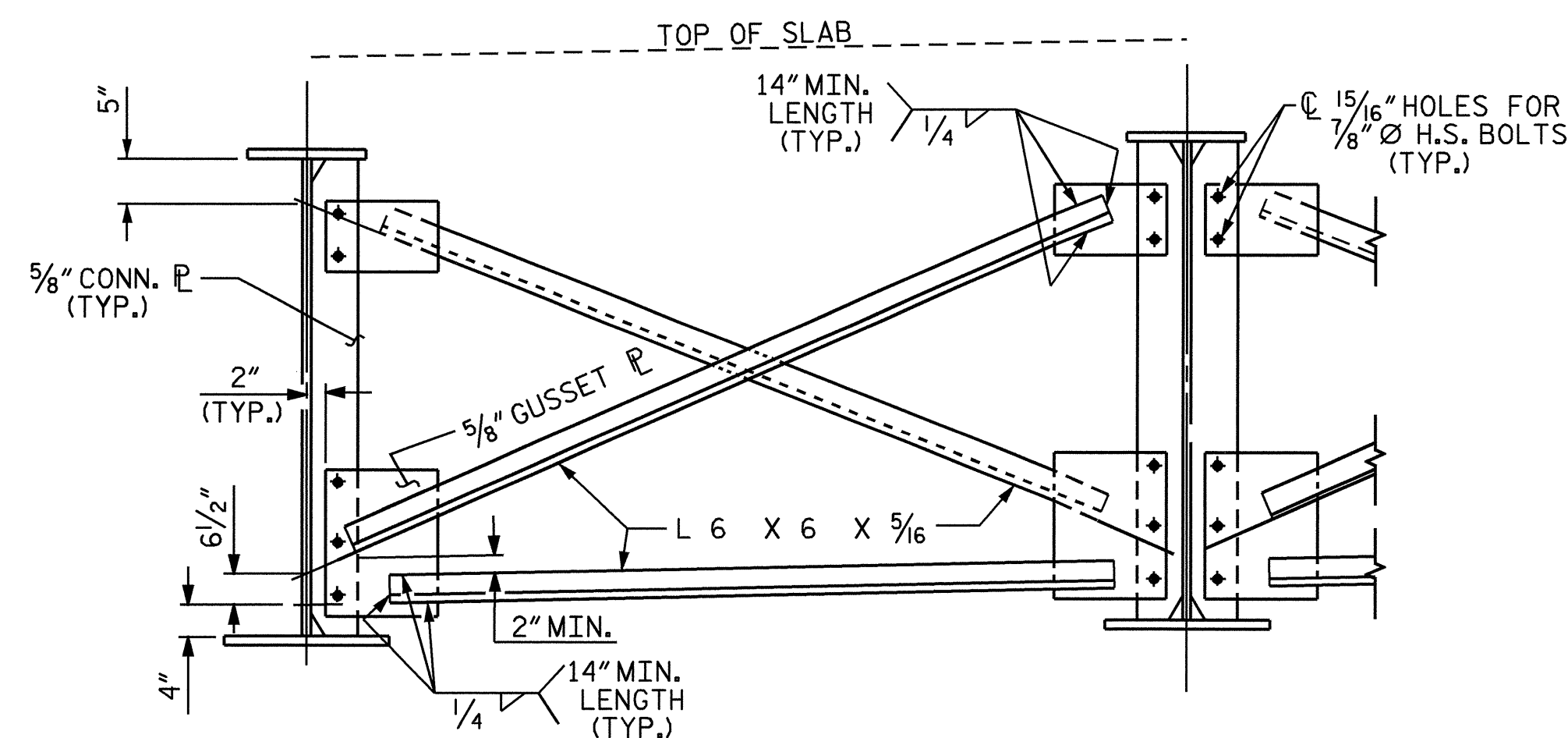
**BEARING STIFFENER**

\*\* WELD TO BOTTOM FLANGE IS ONLY REQUIRED WHEN BEARING STIFFENER IS ALSO CONNECTOR PLATE



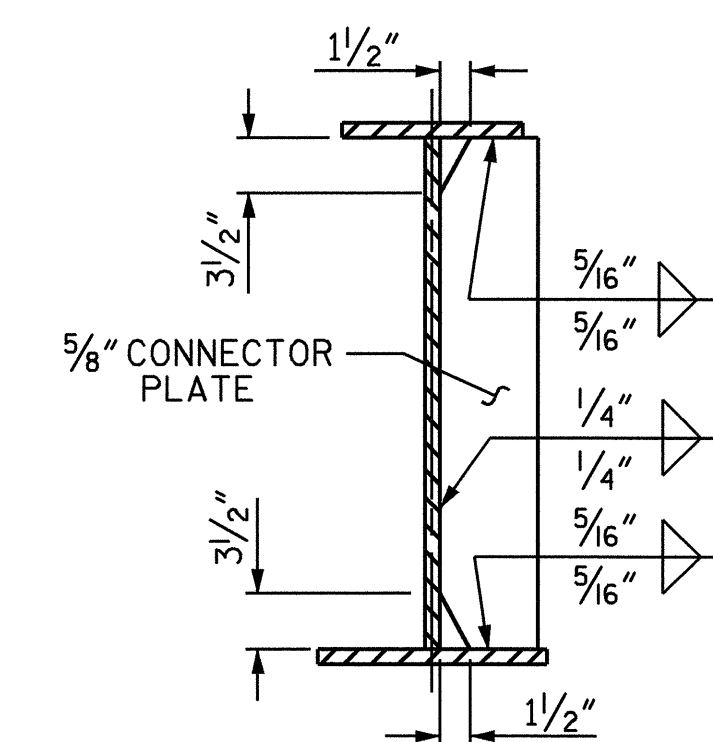
**PERMISSIBLE SHOP FLANGE & WEB SPLICE**

\* GRIND SMOOTH AND FLUSH ON OUTSIDE OF EXTERIOR GIRDERS

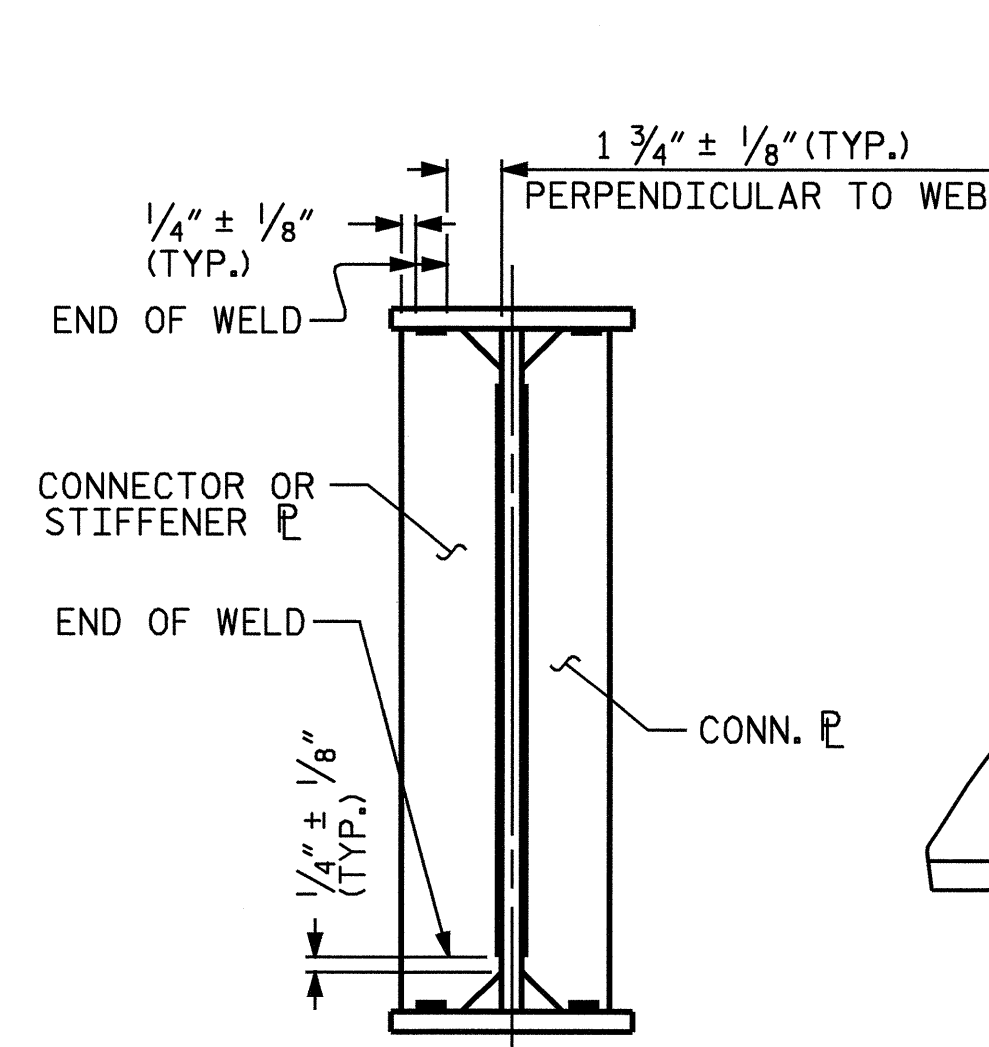


**TYPICAL OPTIONAL INTERMEDIATE DIAPHRAGM**

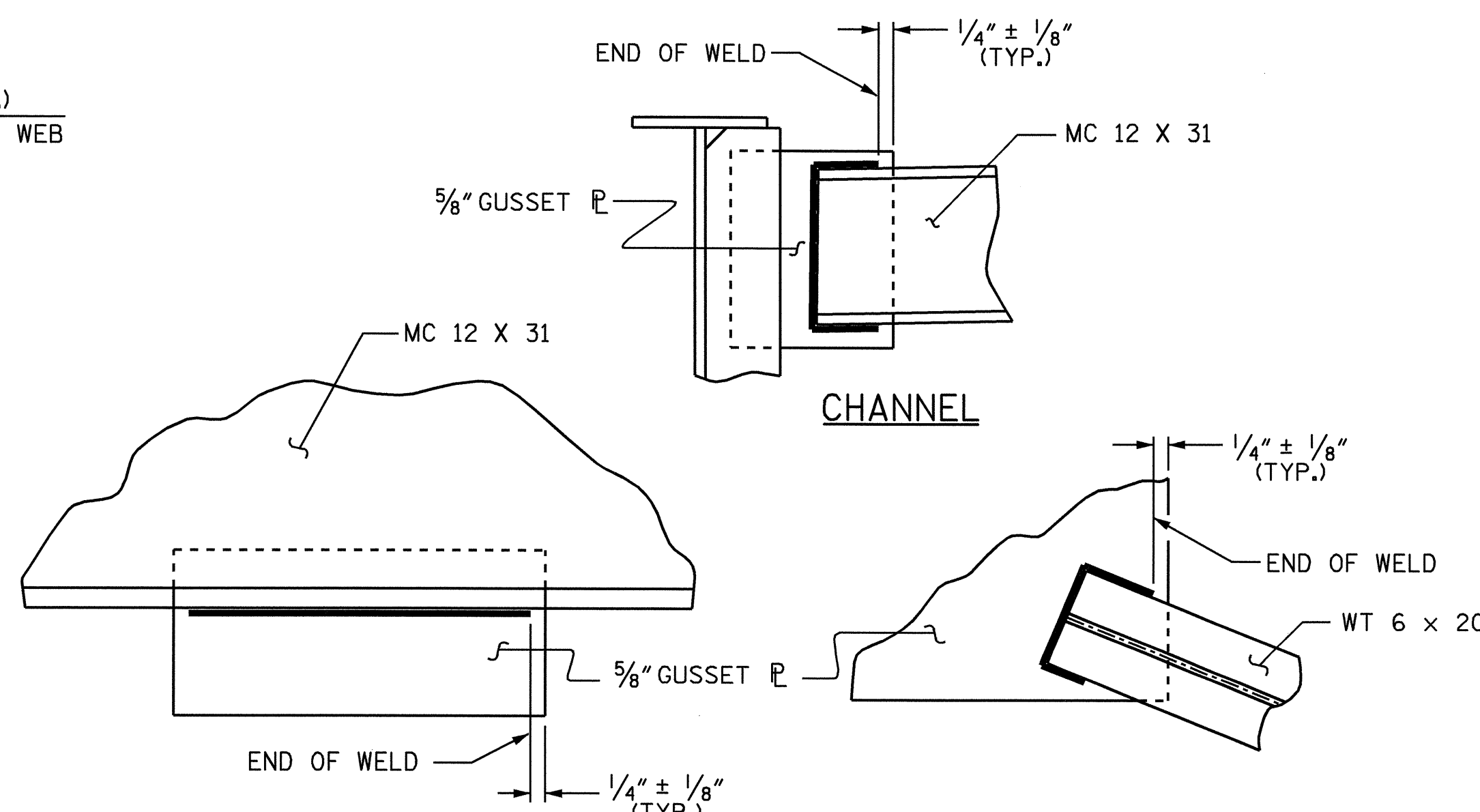
AT THE CONTRACTOR'S OPTION, THE DIAPHRAGM WITH THE WELDED GUSSET PLATES MAY BE USED IN LIEU OF THE DIAPHRAGM WITH BOLTED ANGLES AT NO ADDITIONAL COST TO THE DEPARTMENT.



**CONNECTOR PLATE DETAILS**

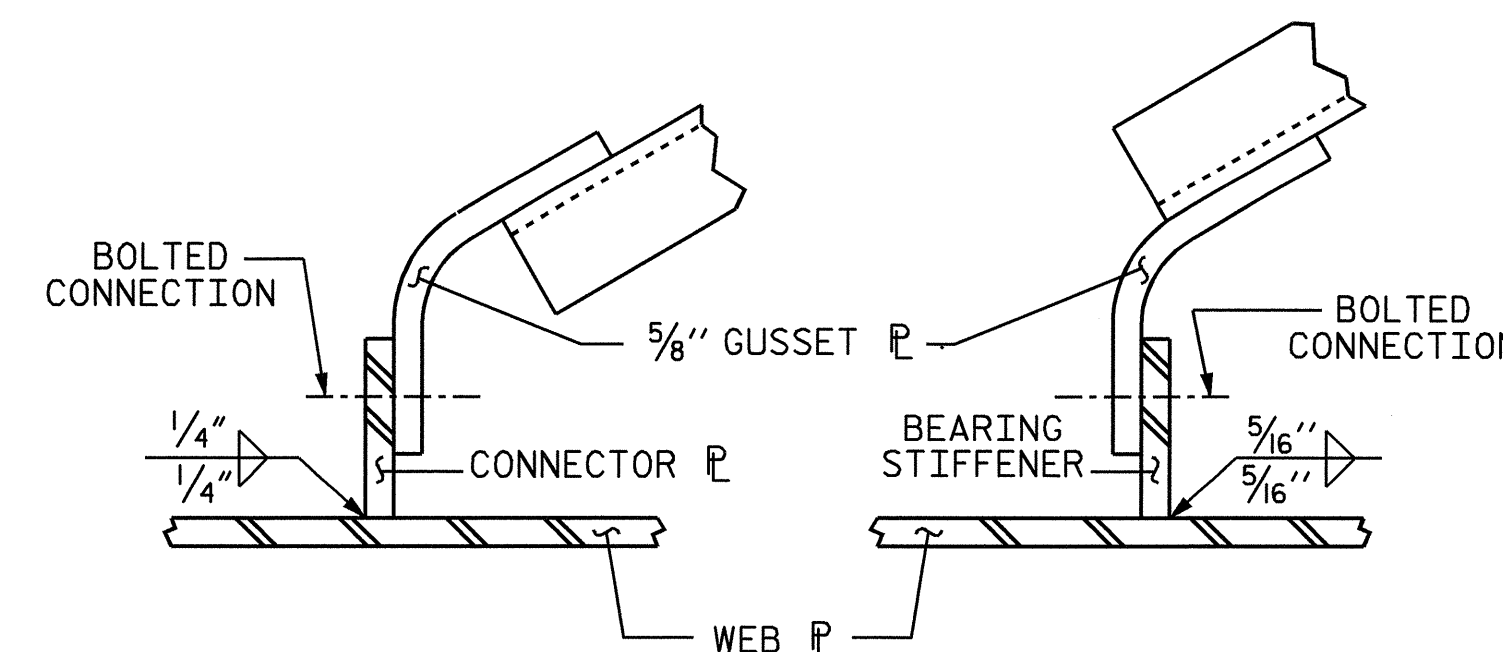


**TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS**



**GUSSET PLATE CONNECTIONS**

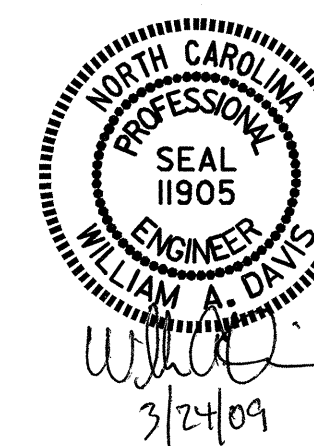
**WELD TERMINATION DETAILS**



**GUSSET PLATE DETAIL**

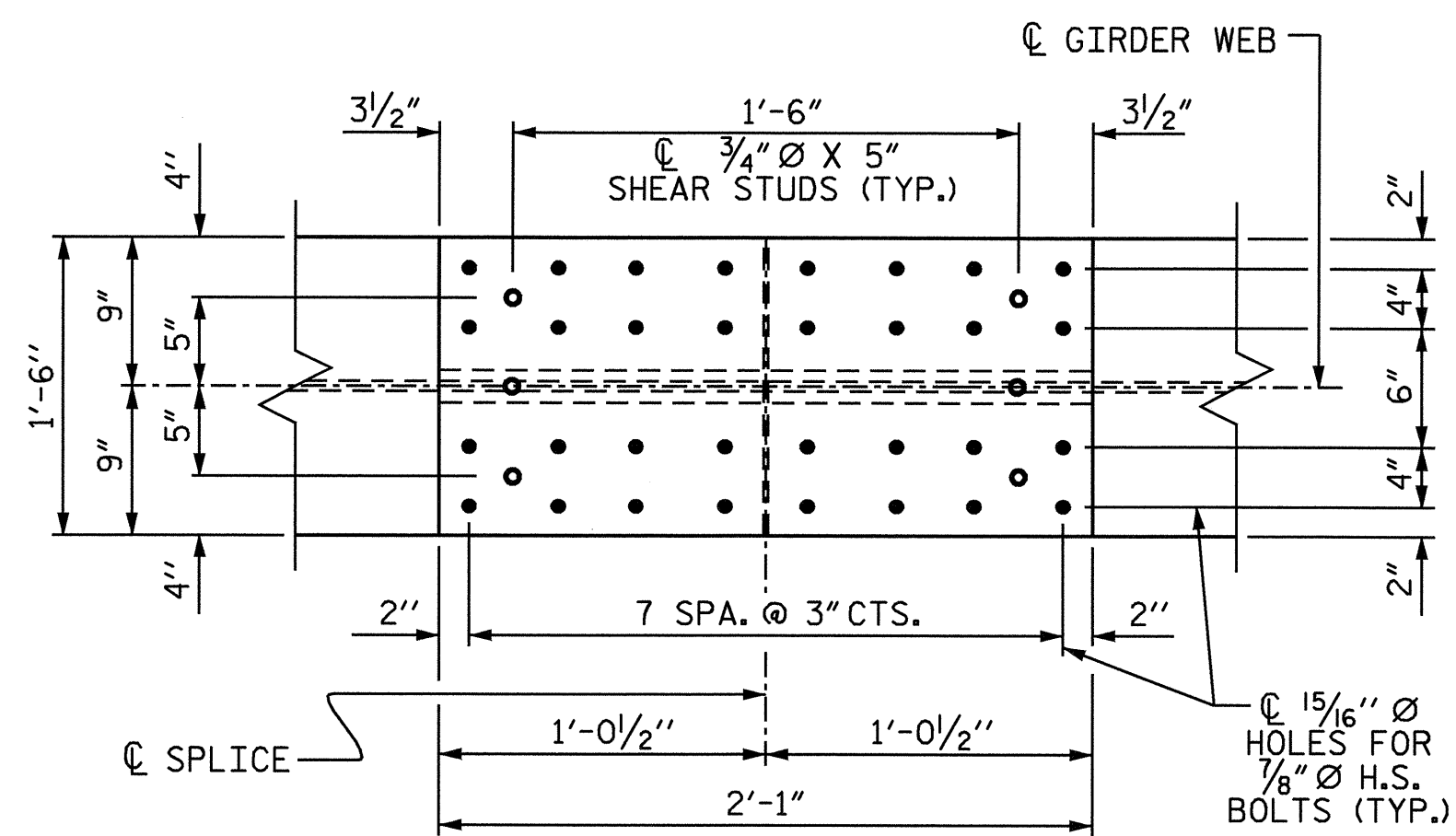
PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 178+05.14 -L-

SHEET 2 OF 3

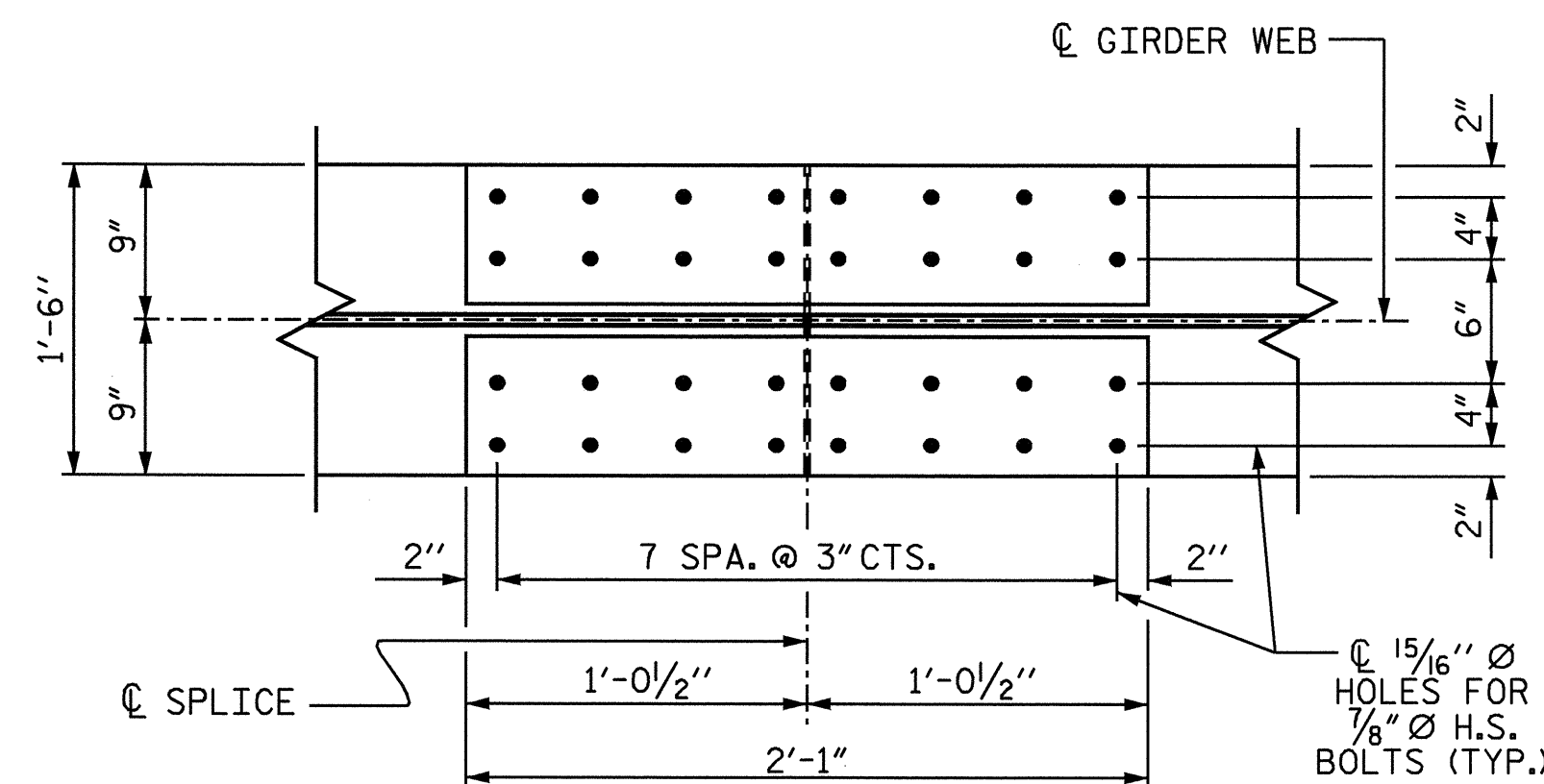


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-9
SUPERSTRUCTURE STRUCTURAL STEEL DETAILS (SBL)						TOTAL SHEETS 56
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

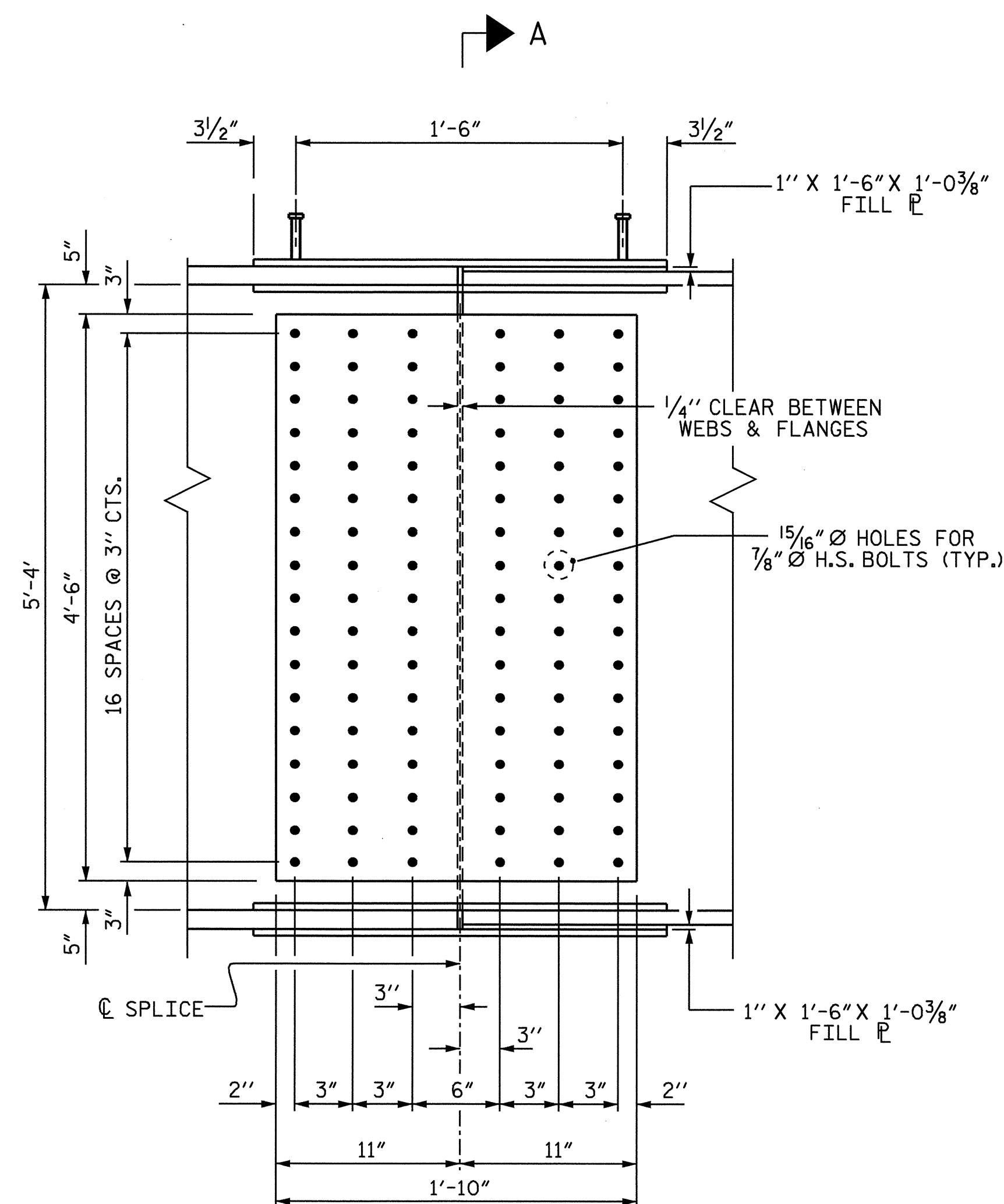
DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: A.R. CHESSON DATE: 10-08



PLAN (TOP OF TOP FLANGE)

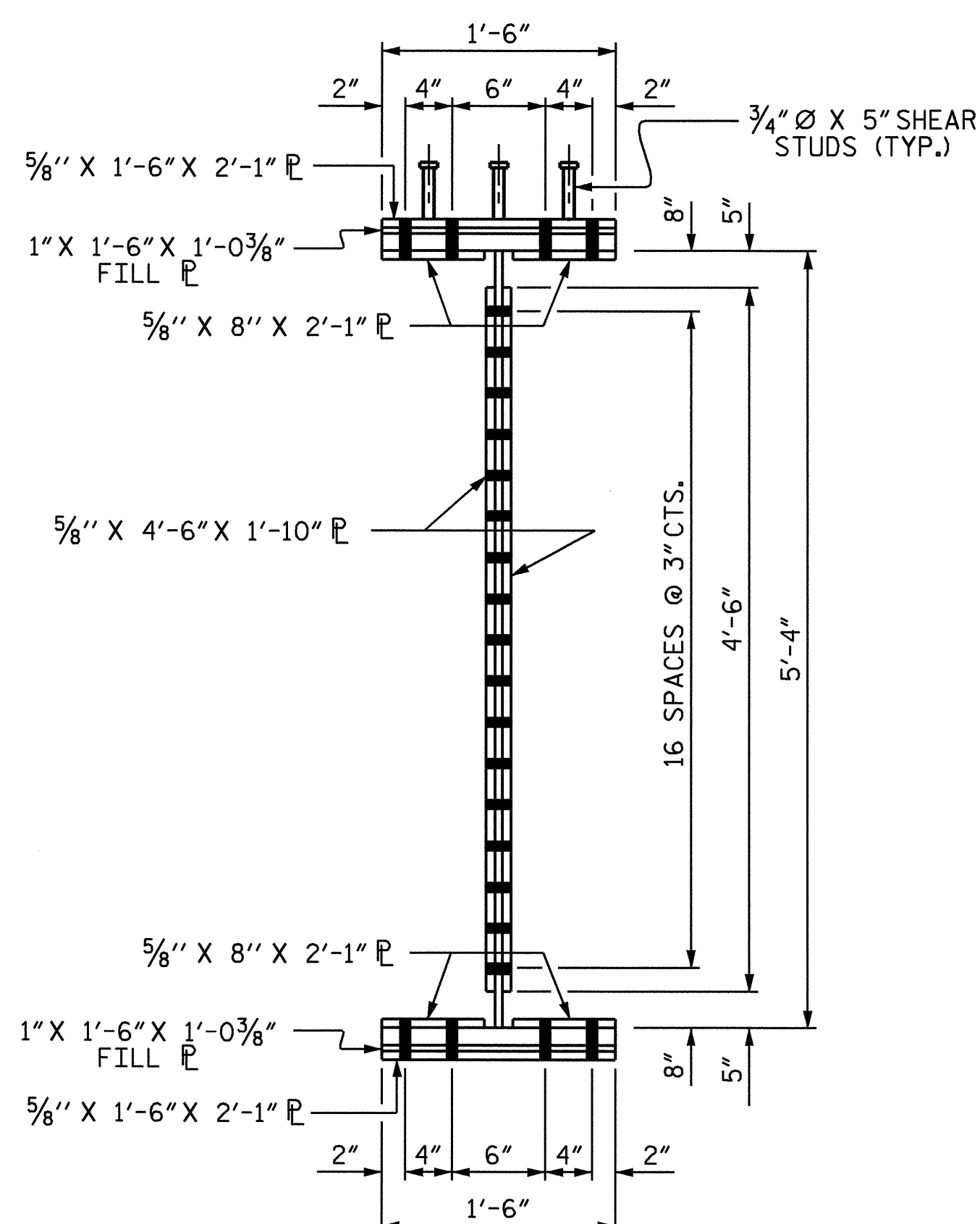


PLAN (TOP OF BOTTOM FLANGE)

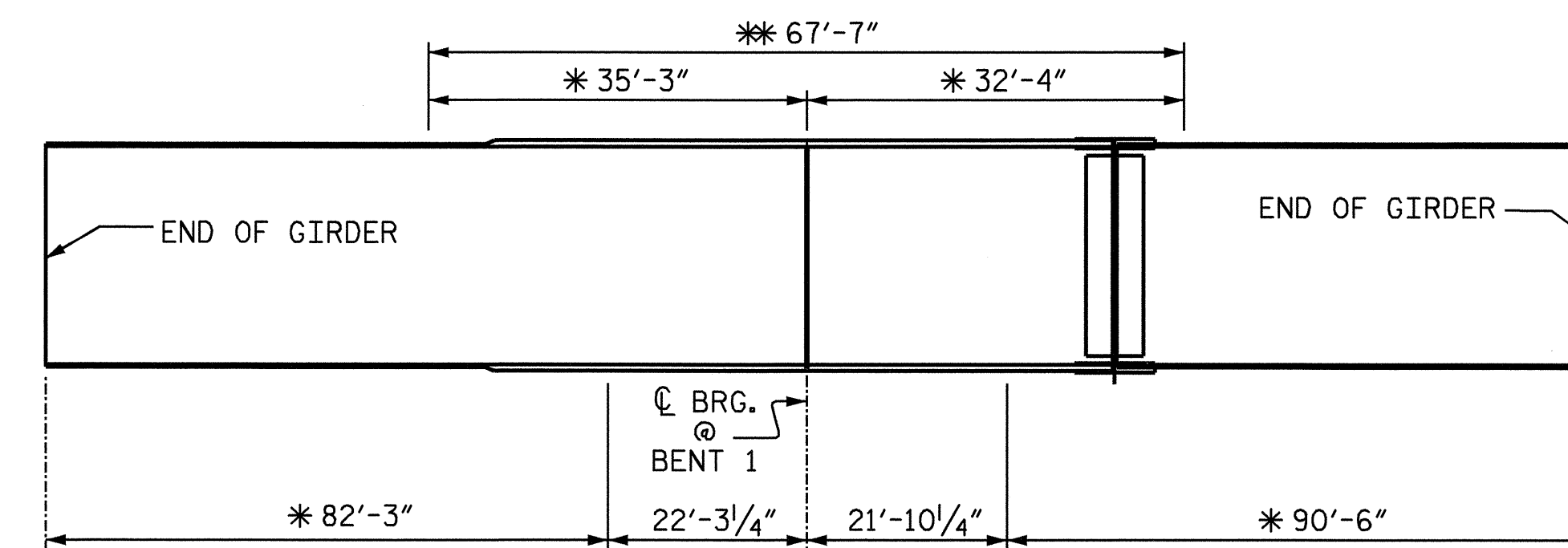


ELEVATION

BOLTED FIELD SPLICE DETAILS



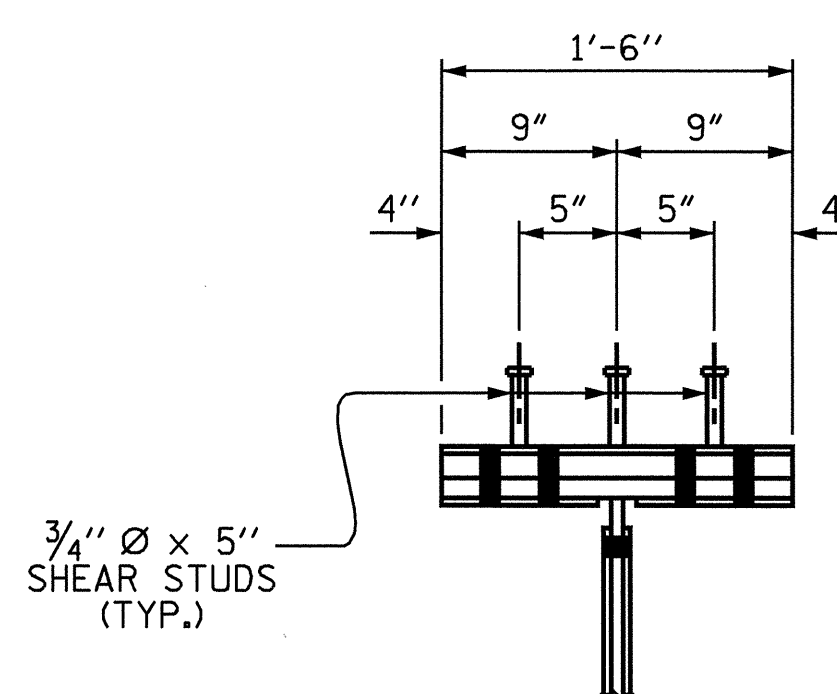
SECTION A-A



CHARPY V-NOTCH TEST FOR PLATE GIRDERS

\* CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALLS WITHIN THESE LIMITS, INCLUDING ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE TOP FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

\*\* NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.



SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE



PROJECT NO. R-0505  
 HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS  
 (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			56

DRAWN BY: QI NGUYEN DATE: 10-08  
 CHECKED BY: A.R. CHESSON DATE: 10-08

NOTES

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

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

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

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

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

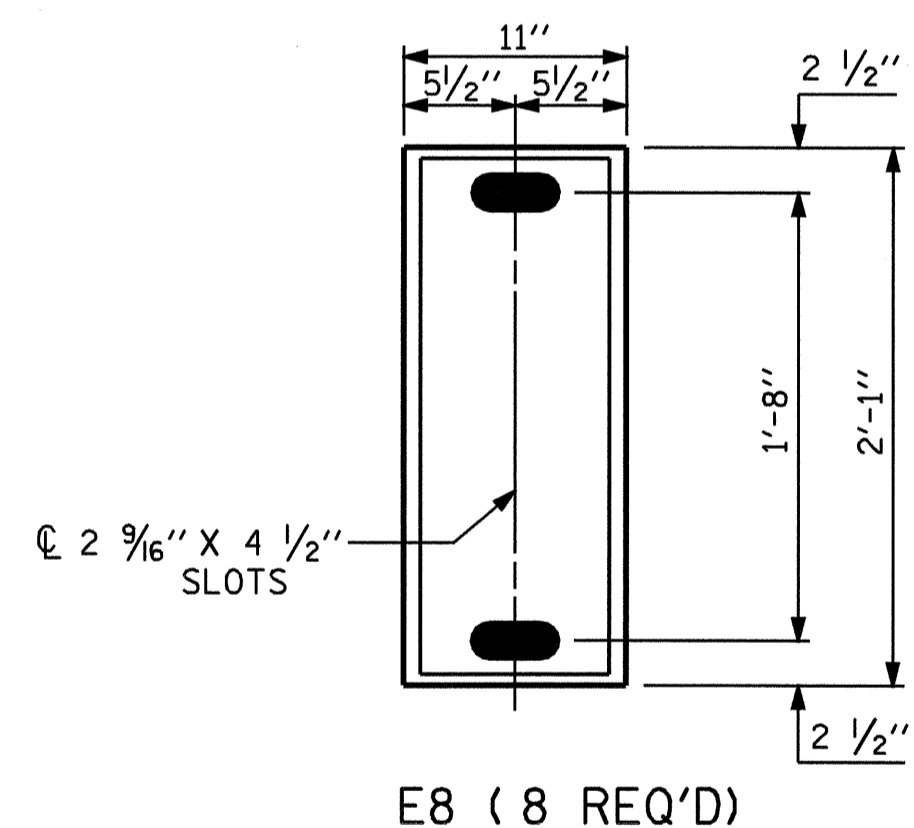
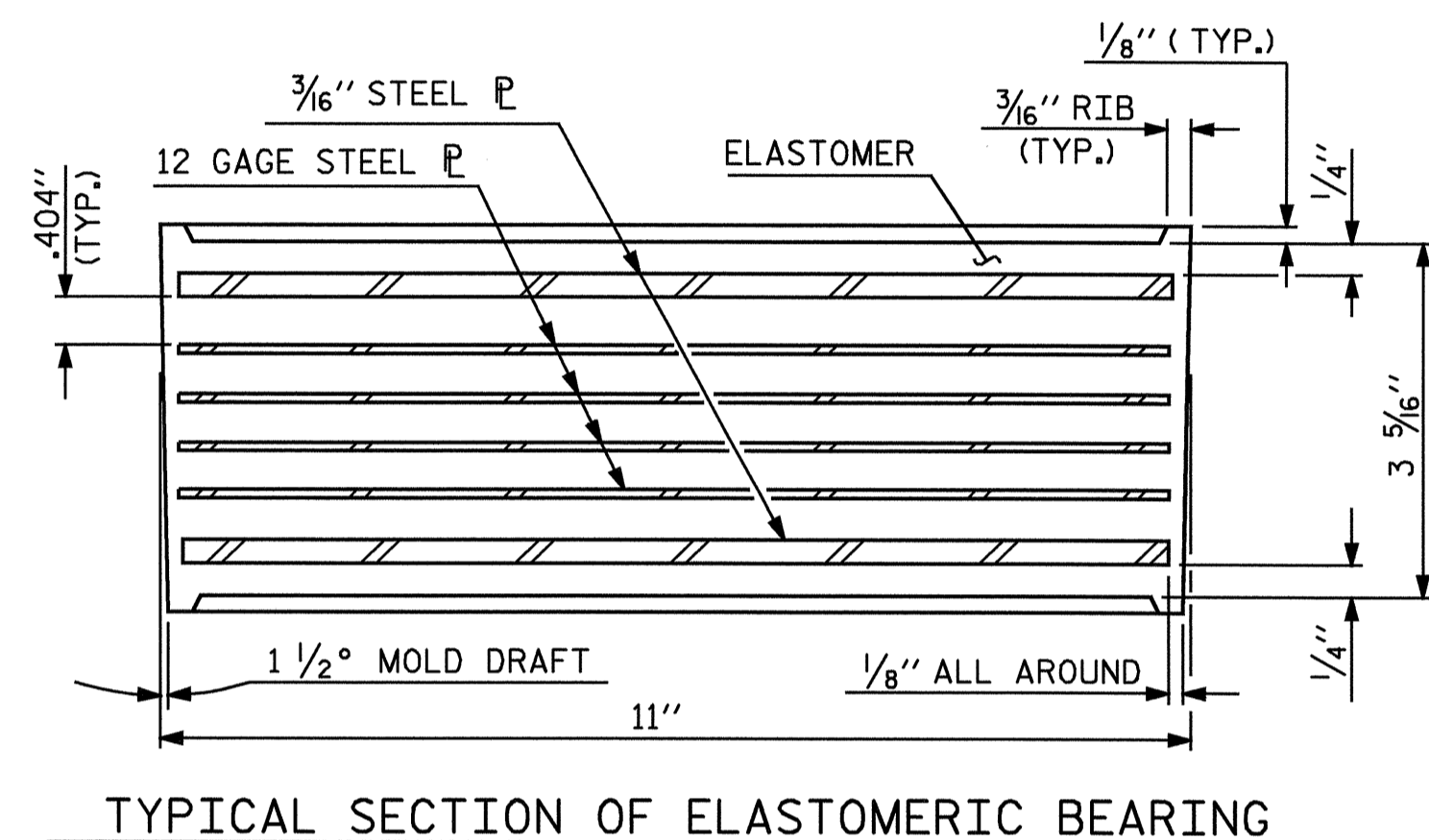
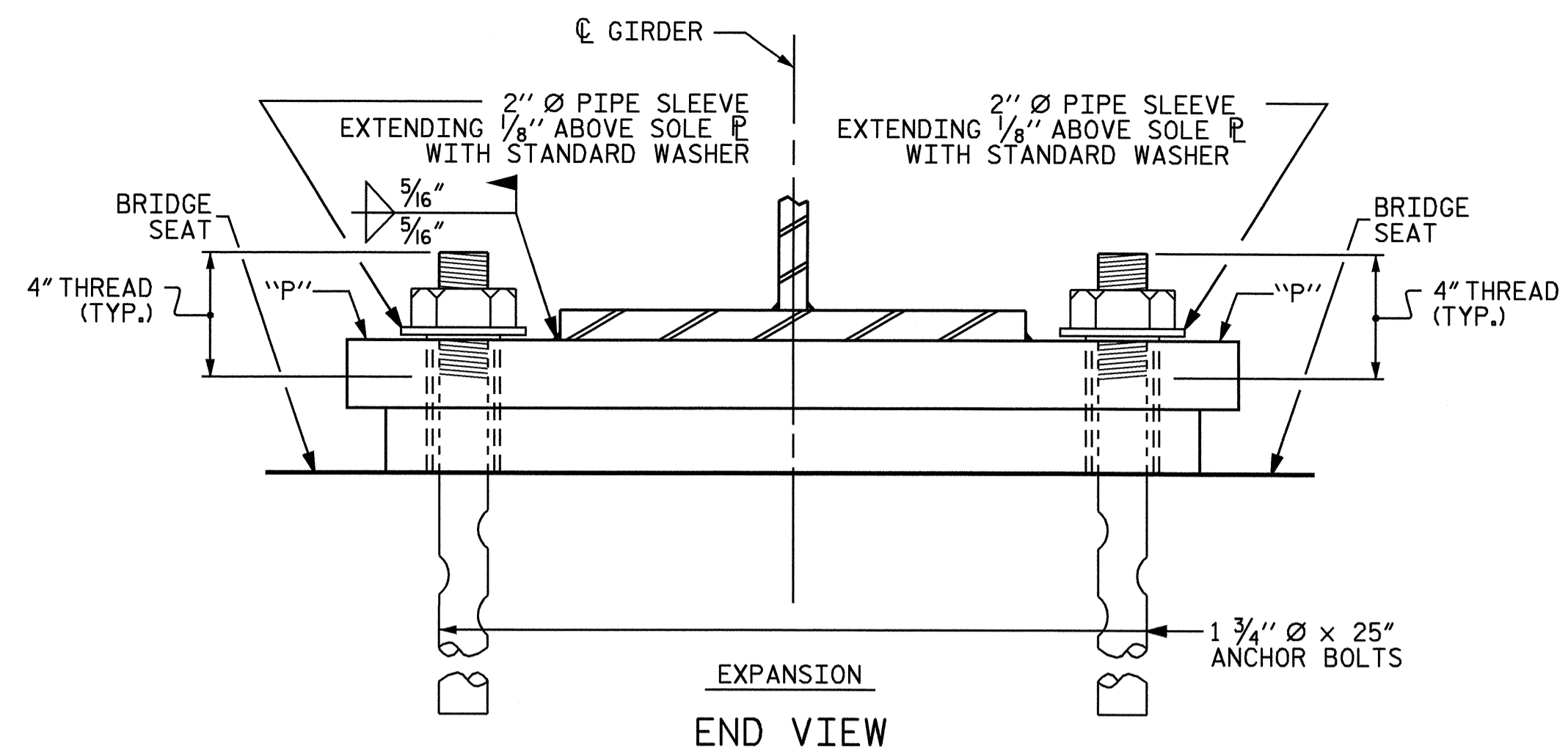
WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

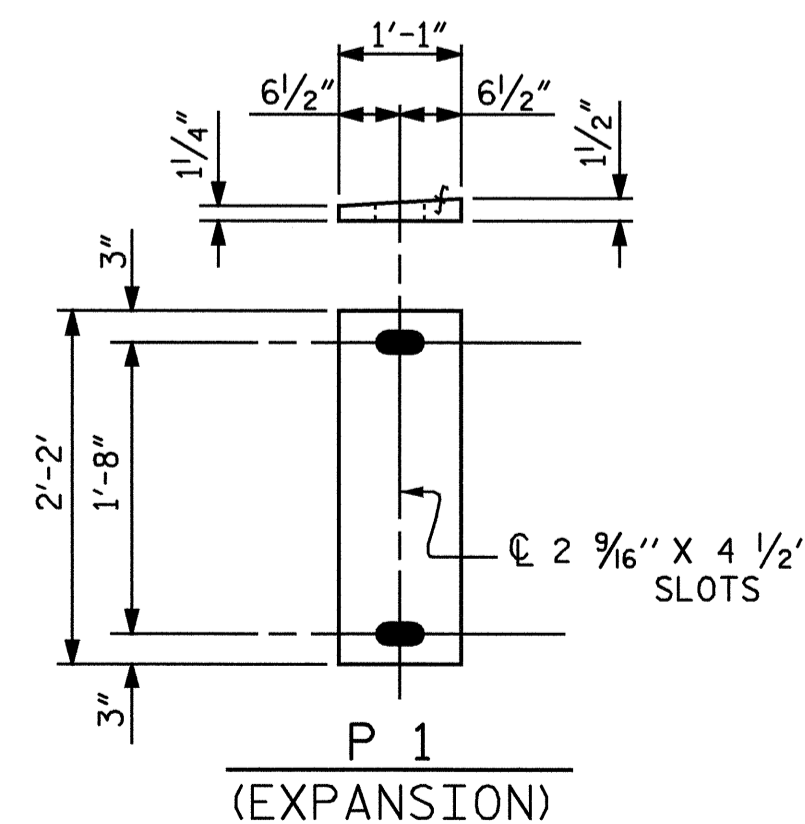
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURE, WHICH MAY BE REQUIRED BY THE ENGINEER, TO RESET ELASTOMERIC BEARINGS DUE TO GIRDER TRANSLATION AND END ROTATION:

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

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



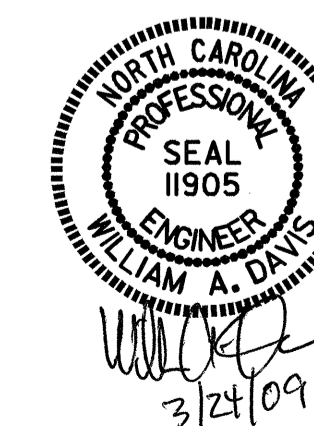
-LOAD RATINGS-	
	MAX.D.L.+ L.L.
TYPE IV	184 K



SOLE PLATE DETAILS ("P")

INCREASING STATIONS →

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 ELASTOMERIC BEARING  
 DETAILS  
 (SBL)  
 (STEEL SUPERSTRUCTURE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			56

ASSEMBLED BY :	QT NGUYEN	DATE :	10-08
CHECKED BY :	A.R. CHESSON	DATE :	10-08
DRAWN BY :	EEM	10/95	REV. 10/17/00 RWW/LES
CHECKED BY :	PEK	10/95	REV. 7/10/01 LES/RDR
			REV. 5/1/06 TLA/GM

NOTES

FOR POT BEARINGS, SEE SPECIAL PROVISIONS.

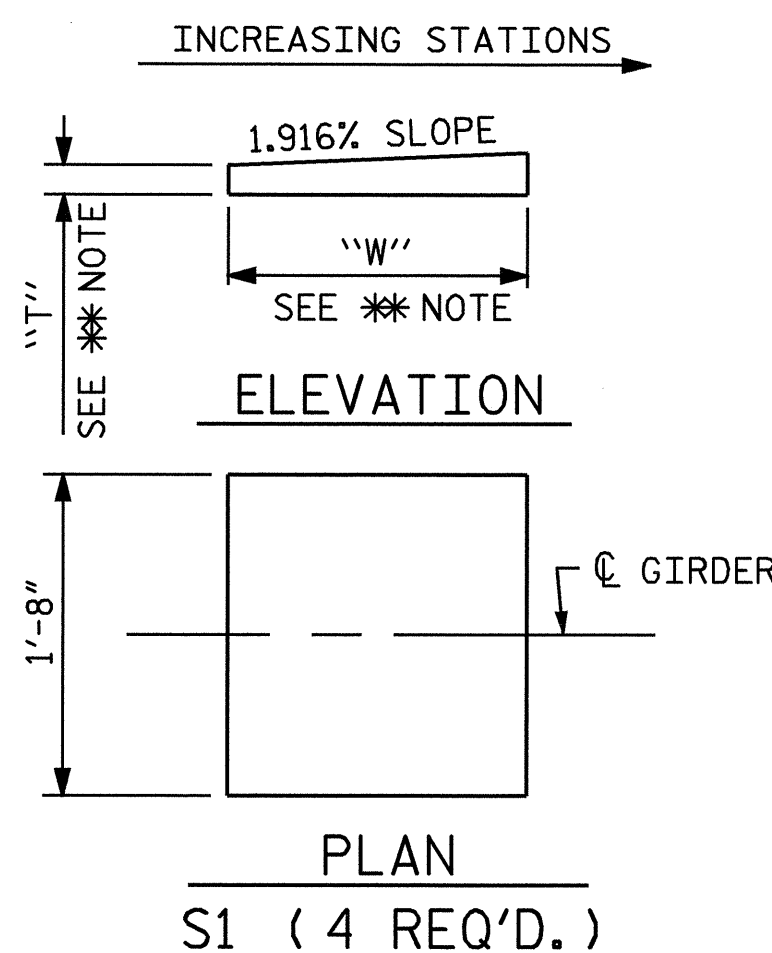
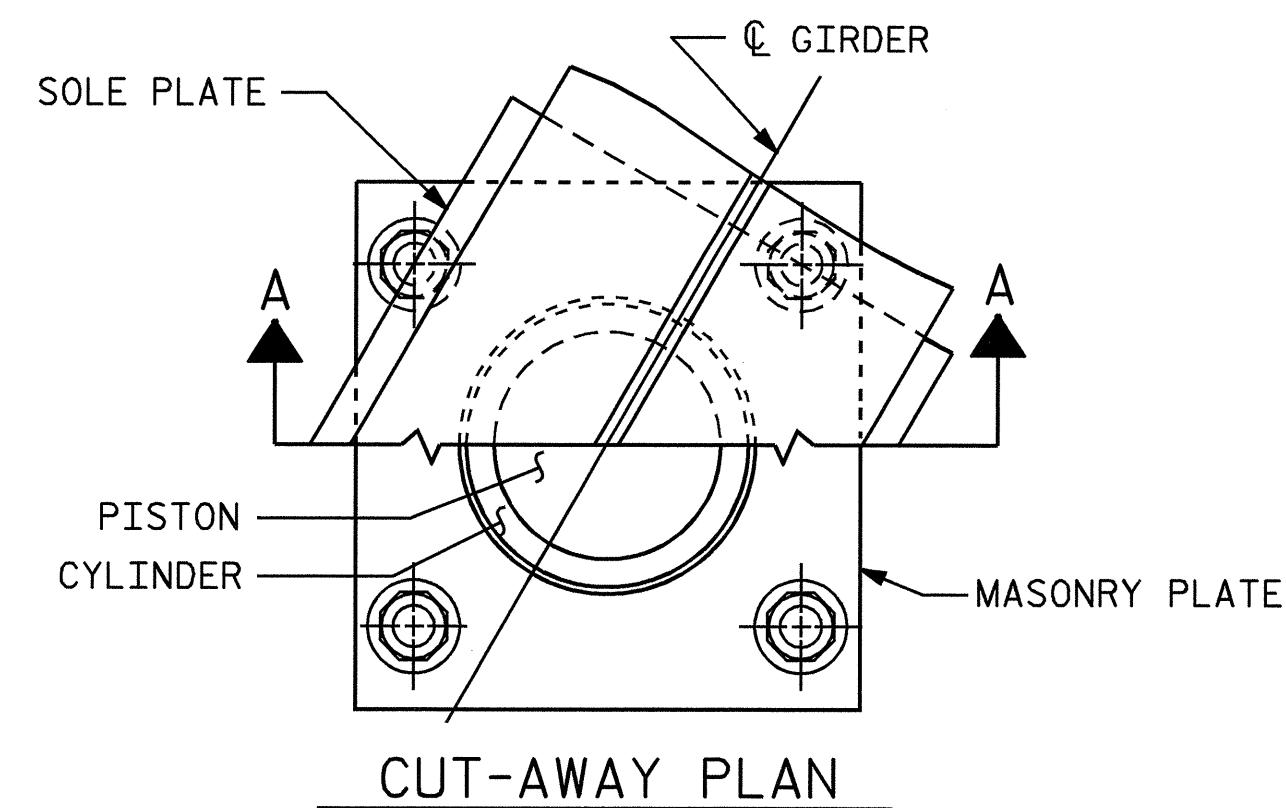
AT ALL POINTS OF SUPPORT IN SPANS A & B, NUTS FOR ANCHOR BOLTS SHALL BE TIGHTENED FINGER TIGHT AND GIVEN AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR ELASTOMER.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

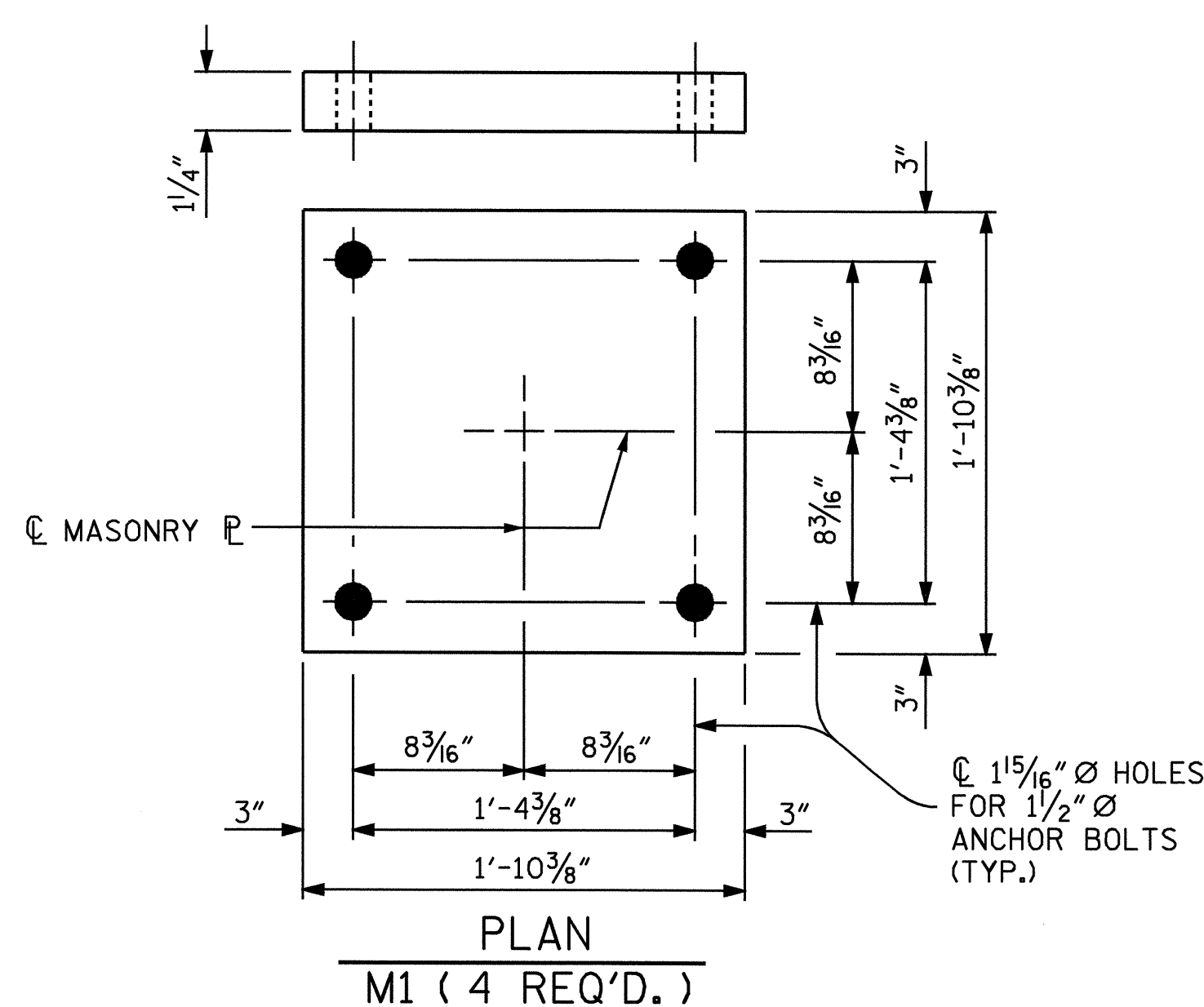
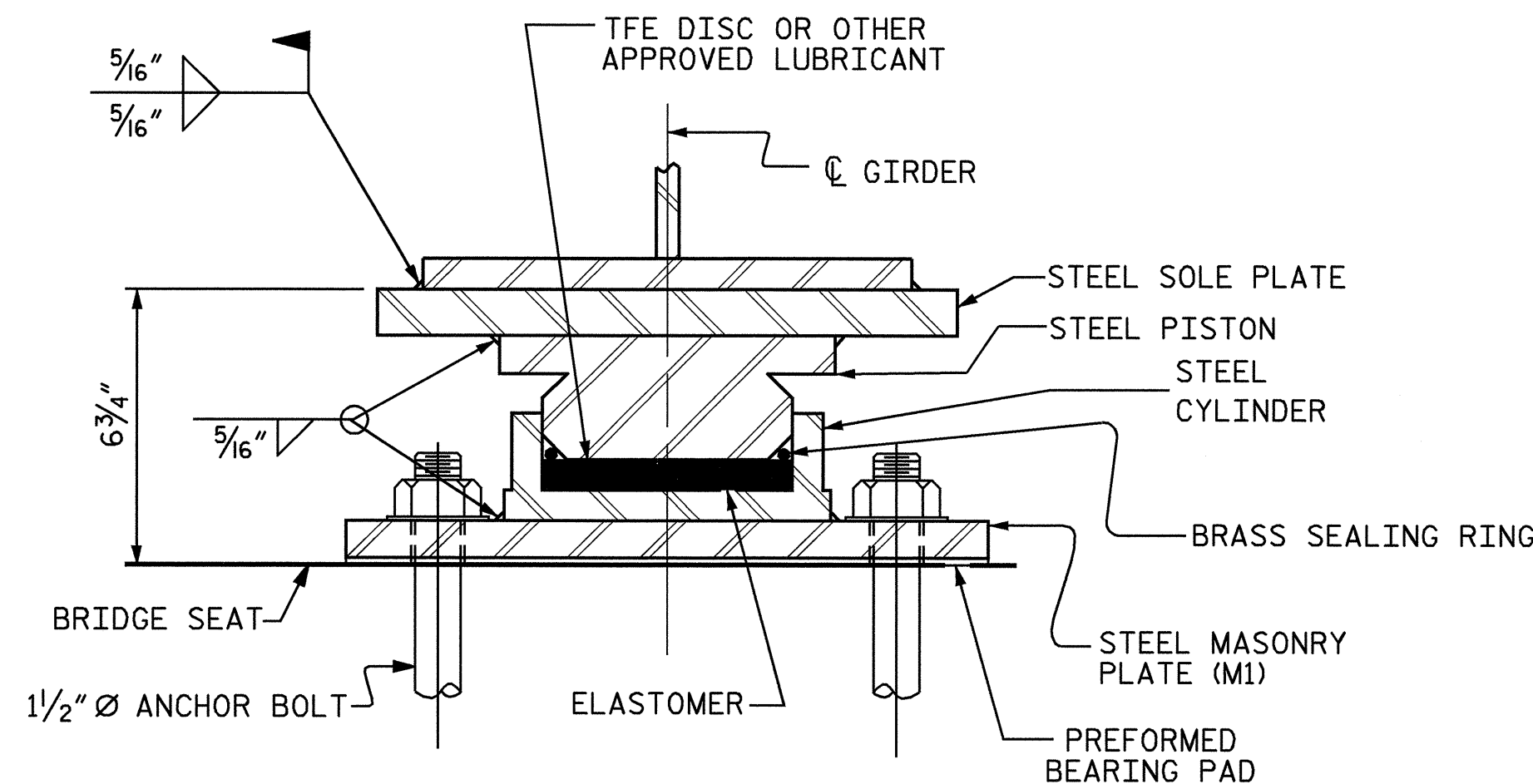
FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE CONTRACTOR MAY SUBSTITUTE DISC BEARINGS FOR THE POT BEARINGS SHOWN. FOR OPTIONAL DISC BEARINGS, SEE SPECIAL PROVISIONS.



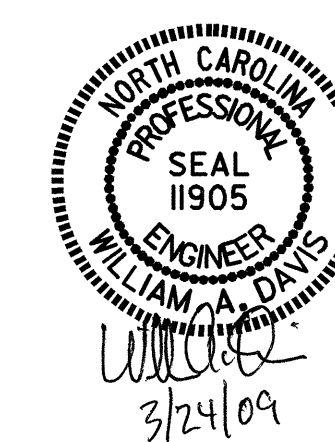
\*\* NOTE: DIMENSIONS "W" AND "T" ARE TO BE DETERMINED BY THE MANUFACTURER.

SOLE PLATE DETAILS



BEARING	LOCATION	VERTICAL LOAD (KIPS)			LATERAL LOAD (KIPS)	TOTAL MOVEMENT (INCHES)
		DEAD	LIVE	TOTAL		
PB1 (FIXED)	BENT 1	330.55	146.85	477.40	—	—

PROJECT NO. R-0505  
 HENDERSON COUNTY  
 STATION: 780+05.14 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 POT BEARING  
 DETAILS  
 (SBL)

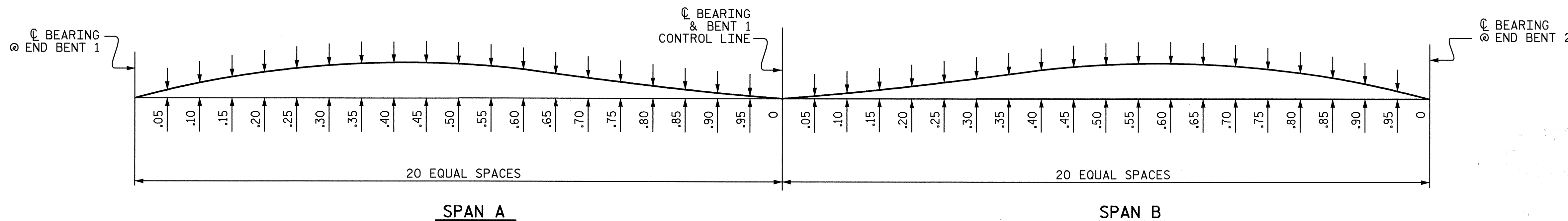
REVISIONS						SHEET NO. S-12
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 56
2			4			

ASSEMBLED BY : QT NGUYEN DATE : 10-08  
 CHECKED BY : A.R. CHESSON DATE : 10-08  
 DRAWN BY : RWW 8/99 REV. 7/10/01 LES/RDR  
 CHECKED BY : LES 8/99 REV. 5/7/03 RWW/JTE  
 REV. 5/1/06 TLA/GM

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
	SPAN A																				
	GIRDER 1, 2, 3, & 4																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.003	0.006	0.009	0.012	0.014	0.015	0.016	0.016	0.016	0.015	0.013	0.012	0.010	0.008	0.006	0.004	0.002	0.001	0.000	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.012	0.023	0.033	0.042	0.049	0.054	0.057	0.057	0.056	0.052	0.047	0.041	0.034	0.026	0.019	0.012	0.006	0.002	0.001	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.001	0.002	0.003	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.003	0.003	0.002	0.001	0.001	0.000	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.016	0.031	0.045	0.058	0.068	0.074	0.078	0.078	0.077	0.072	0.064	0.057	0.047	0.037	0.027	0.017	0.009	0.003	0.001	0.000
REQUIRED CAMBER	0	3/16"	3/8"	9/16"	1 1/16"	1 3/16"	7/8"	1 5/16"	1 5/16"	1 5/16"	7/8"	3/4"	1 1/16"	9/16"	7/16"	5/16"	3/16"	1/8"	0	0	0

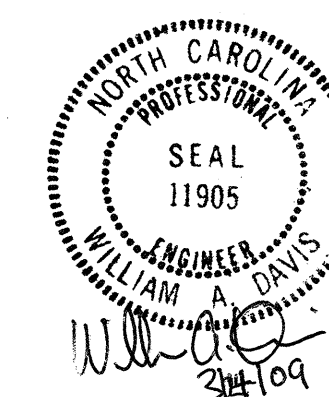
DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
	SPAN B																				
	GIRDER 1, 2, 3, & 4																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.001	0.003	0.005	0.008	0.011	0.014	0.017	0.020	0.022	0.024	0.025	0.025	0.024	0.023	0.020	0.017	0.014	0.009	0.005	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.004	0.011	0.021	0.032	0.044	0.056	0.068	0.079	0.087	0.094	0.098	0.098	0.096	0.090	0.081	0.069	0.054	0.037	0.019	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.009	0.009	0.009	0.008	0.008	0.006	0.005	0.003	0.002	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.005	0.015	0.028	0.043	0.059	0.075	0.091	0.106	0.117	0.127	0.132	0.132	0.129	0.121	0.109	0.092	0.073	0.049	0.026	0.000
REQUIRED CAMBER	0	1/16"	3/16"	5/16"	1/2"	1 1/16"	7/8"	1 1/16"	1 1/4"	1 7/16"	1 1/2"	1 3/16"	1 3/16"	1 3/16"	1 7/16"	1 5/16"	1 1/8"	7/8"	9/16"	5/16"	0

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



**SCHEMATIC OF CAMBER ORDINATES**  
 FOR CAMBER VALUES AT EACH GIRDER TWENTIETH POINTS, SEE TABLE ABOVE.  
 SLOPE FOR ZERO CAMBER BASE LINE VARIES.

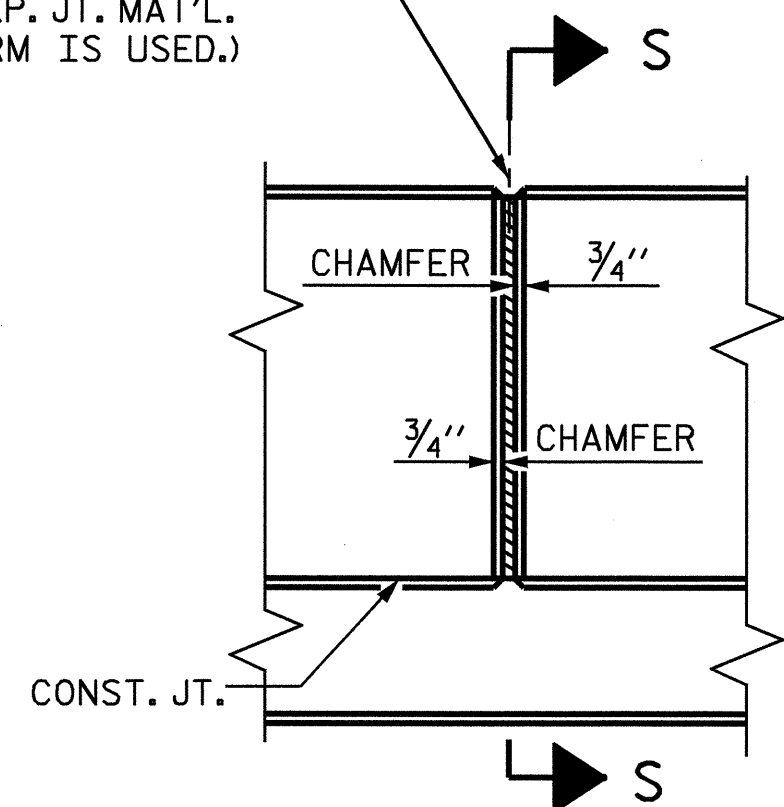
PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-



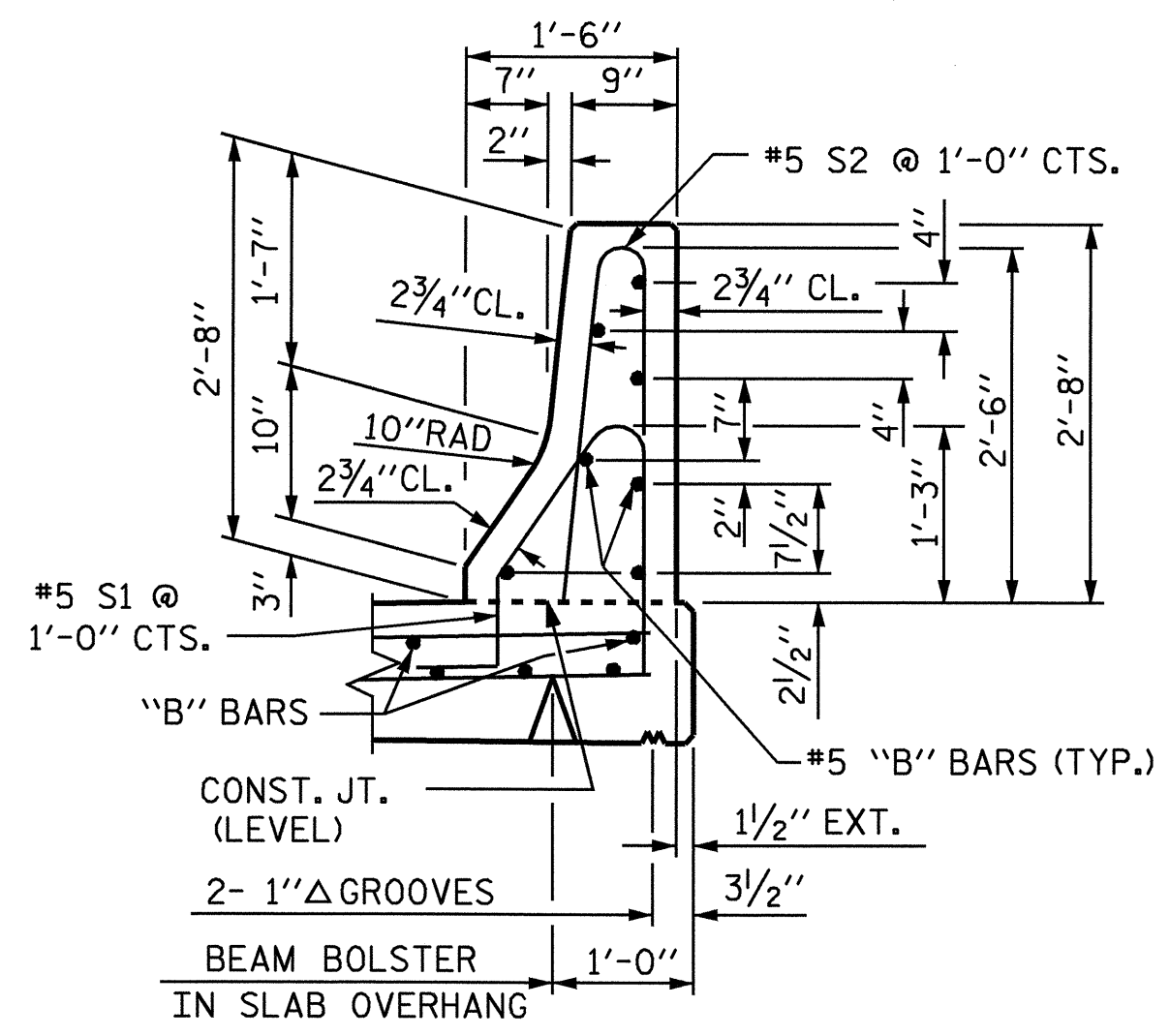
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-13
SUPERSTRUCTURE DEAD LOAD DEFLECTIONS (SBL)						
REVISIONS						TOTAL SHEETS 56
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DRAWN BY : QT NGUYEN DATE : 10-08  
 CHECKED BY : A.R. CHESSON DATE : 10-08

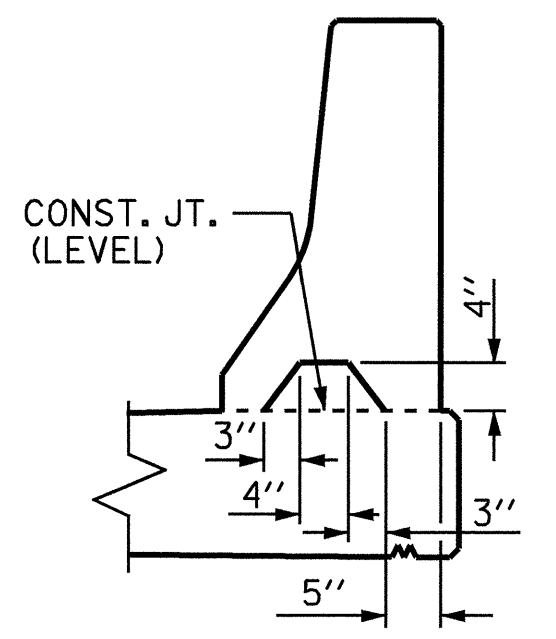
① 1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.  
(NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)



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)

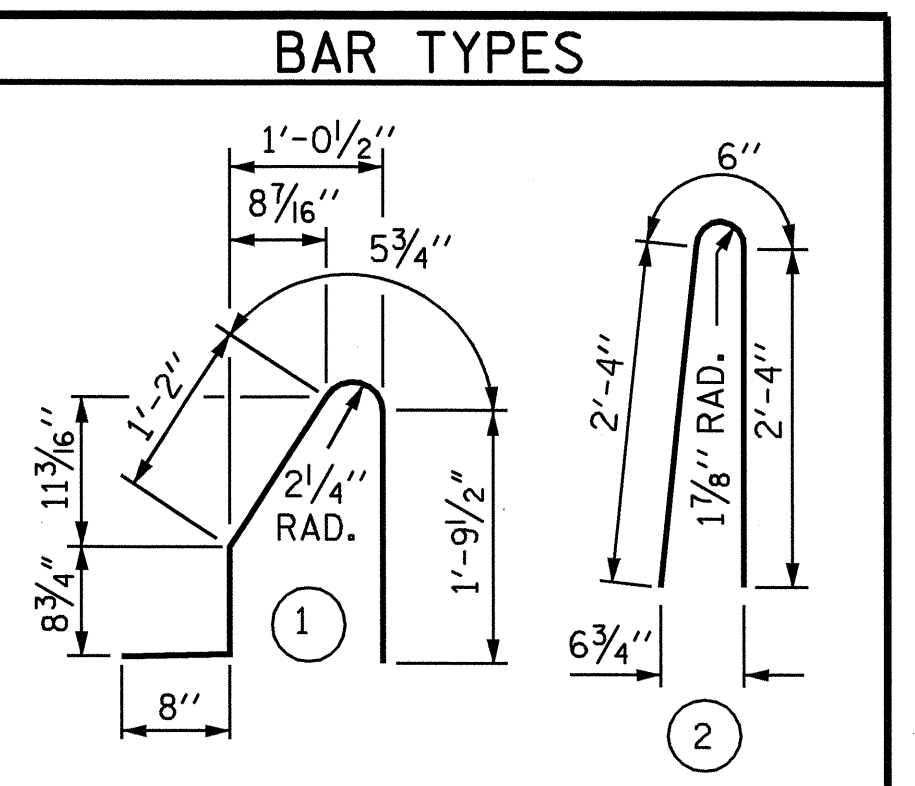
BARRIER RAIL DETAILS

NOTES

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

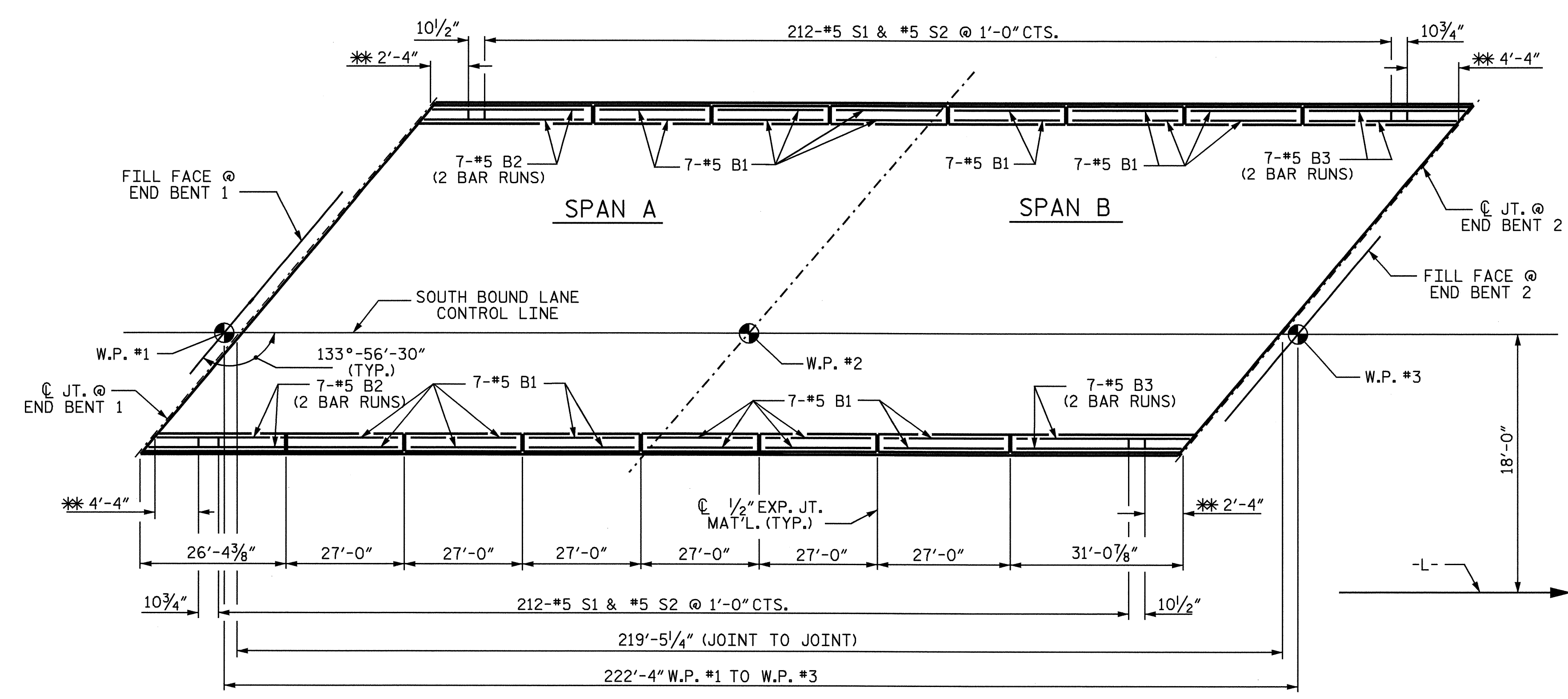
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.



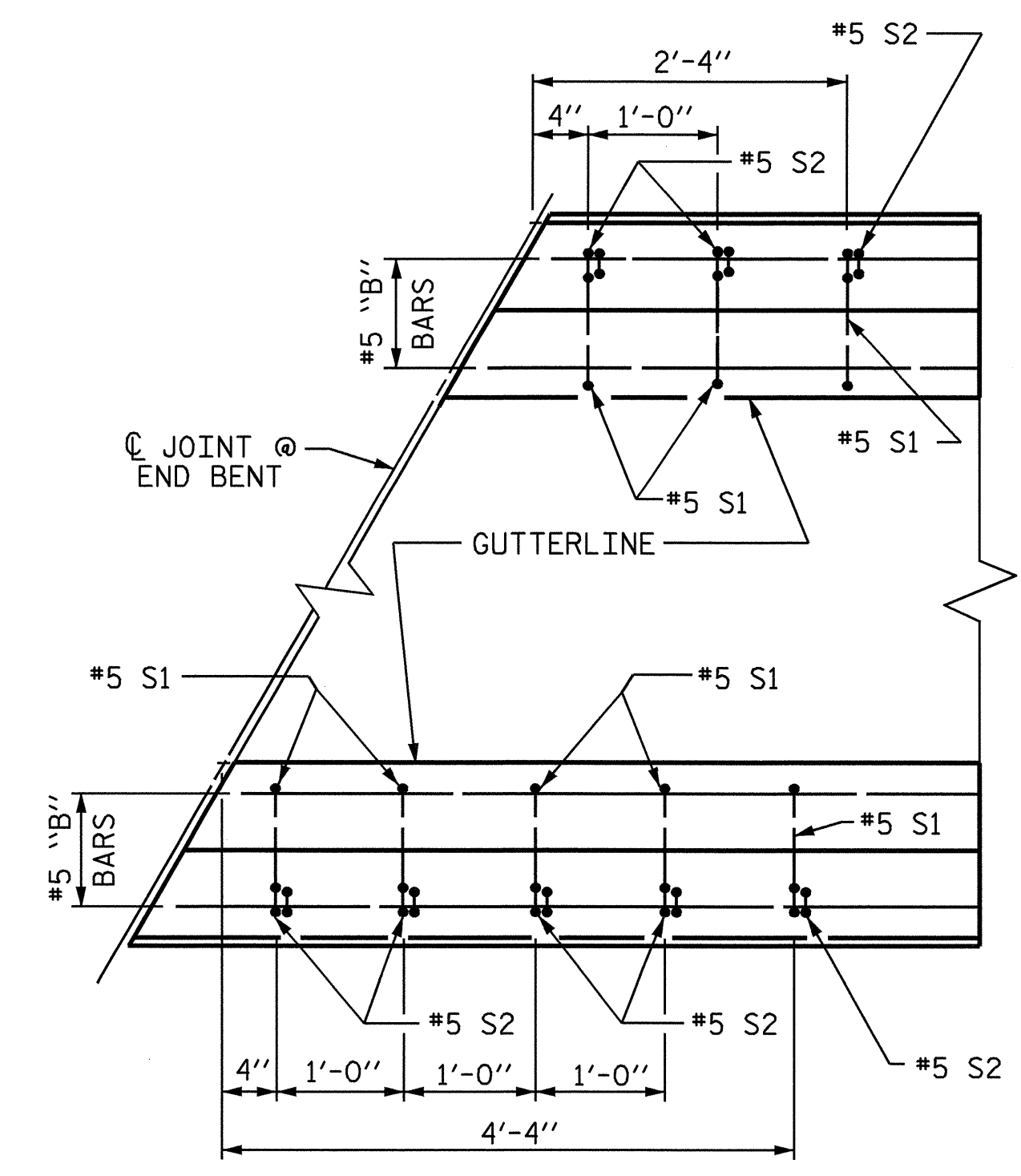
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	84	#5	STR	26'-8"	2336
* B2	28	#5	STR	14'-2"	414
* B3	28	#5	STR	17'-11"	523
* S1	440	#5	1	4'-10"	2218
* S2	440	#5	2	5'-2"	2371
* EPOXY COATED REINFORCING STEEL					7862 LBS.
CLASS AA CONCRETE					43.7 CU. YDS.
CONCRETE BARRIER RAIL					438.76 LIN. FT.



PLAN OF BARRIER RAIL

\*\* SEE "END OF RAIL DETAILS - PLAN VIEW" FOR ADDITIONAL REINFORCING STEEL.  
DIMENSIONS SHOWN ARE TYPICAL FOR EACH SIDE.



END OF RAIL DETAILS



PROJECT NO. R-0505  
HENDERSON COUNTY  
STATION: 780+05.14 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
CONCRETE  
BARRIER RAIL  
(SBL)

ASSEMBLED BY :	QT NGUYEN	DATE :	10-08
CHECKED BY :	A.R. CHESSON	DATE :	10-08
DRAWN BY :	ARB 5/87	REV. 10/17/00	RWW/LES
CHECKED BY :	SJD 9/87	REV. 5/7/03R	RWW/JTE
		REV. 5/1/06	TLA/GM

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



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.)

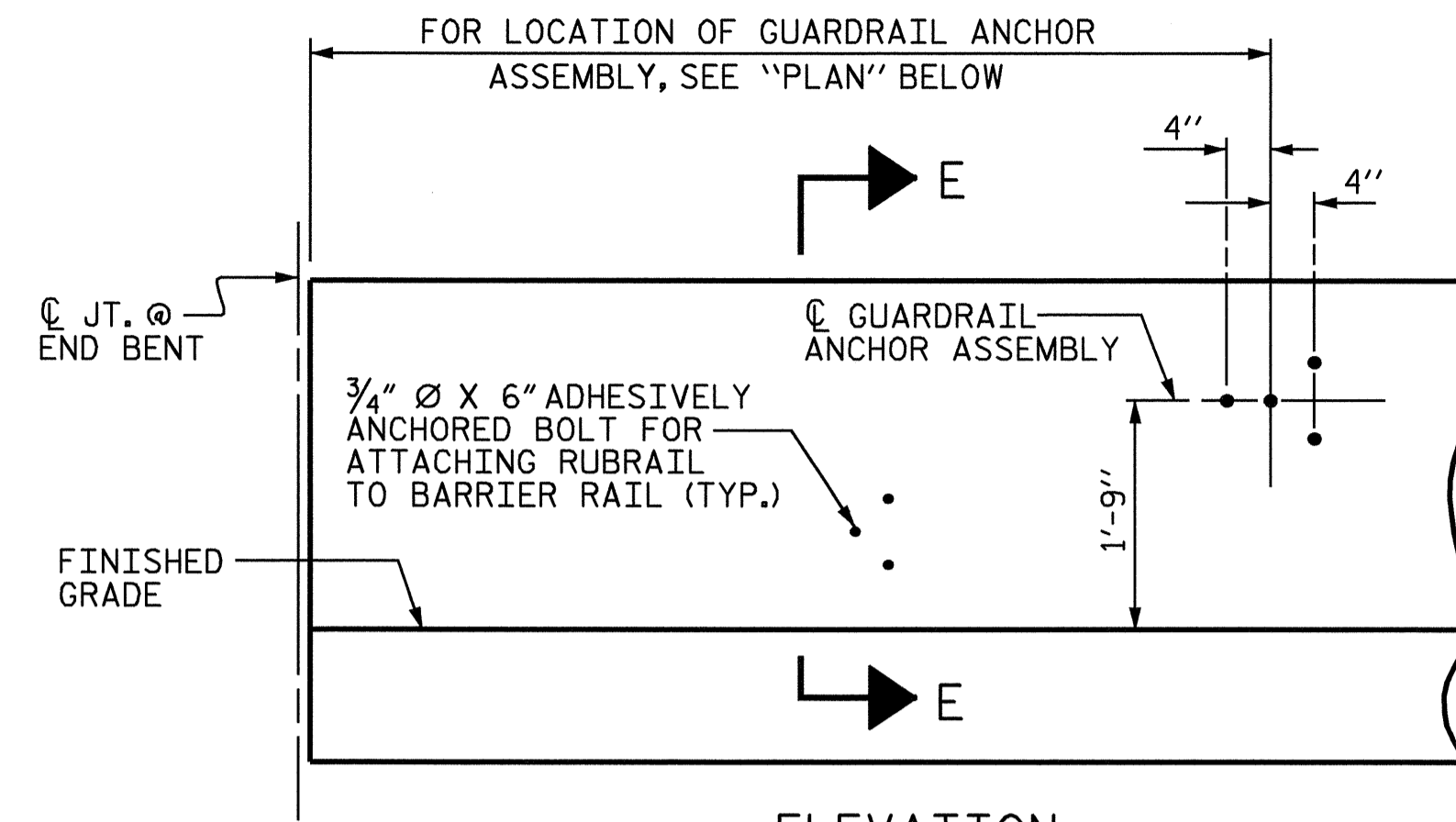
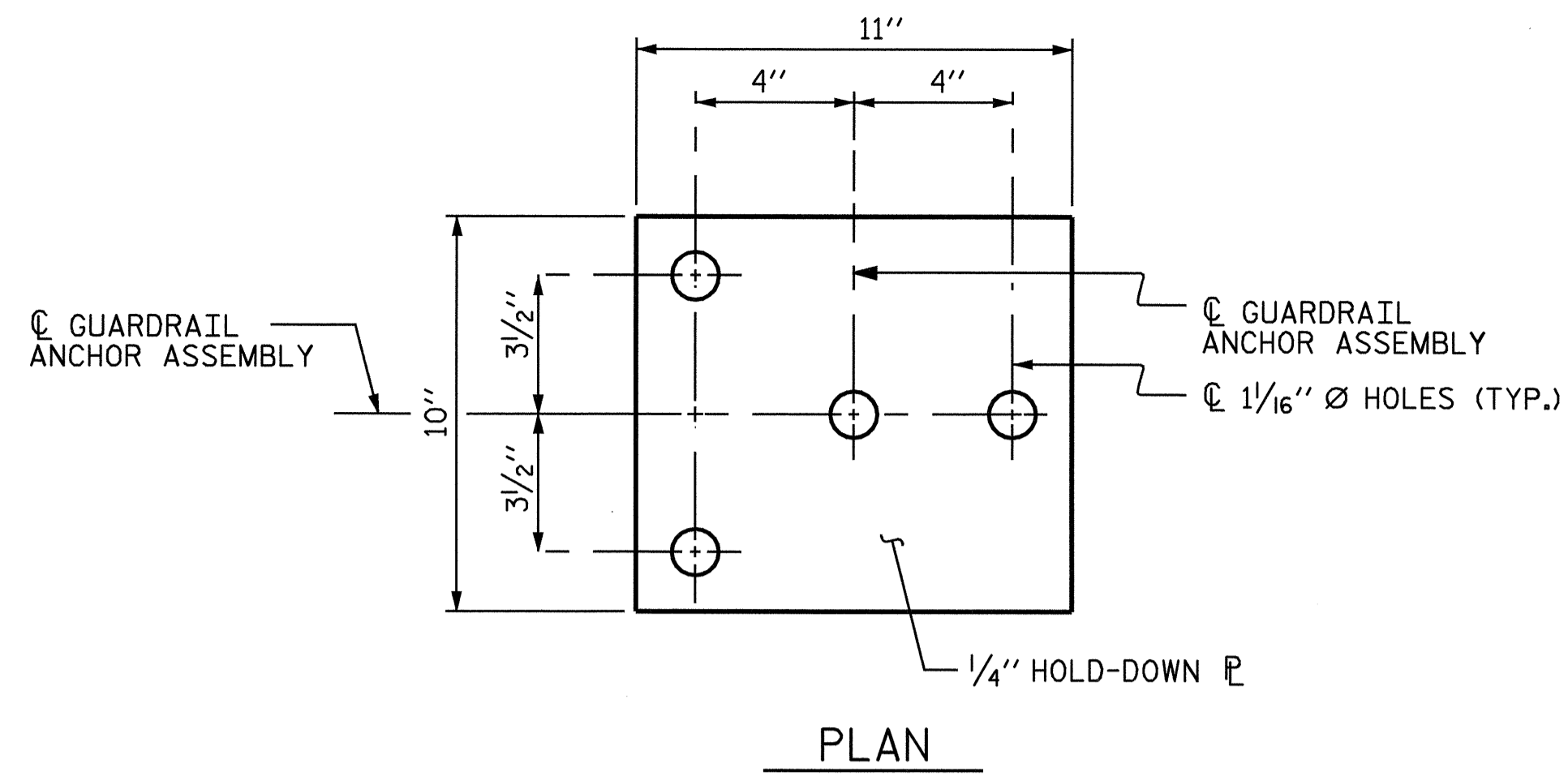
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

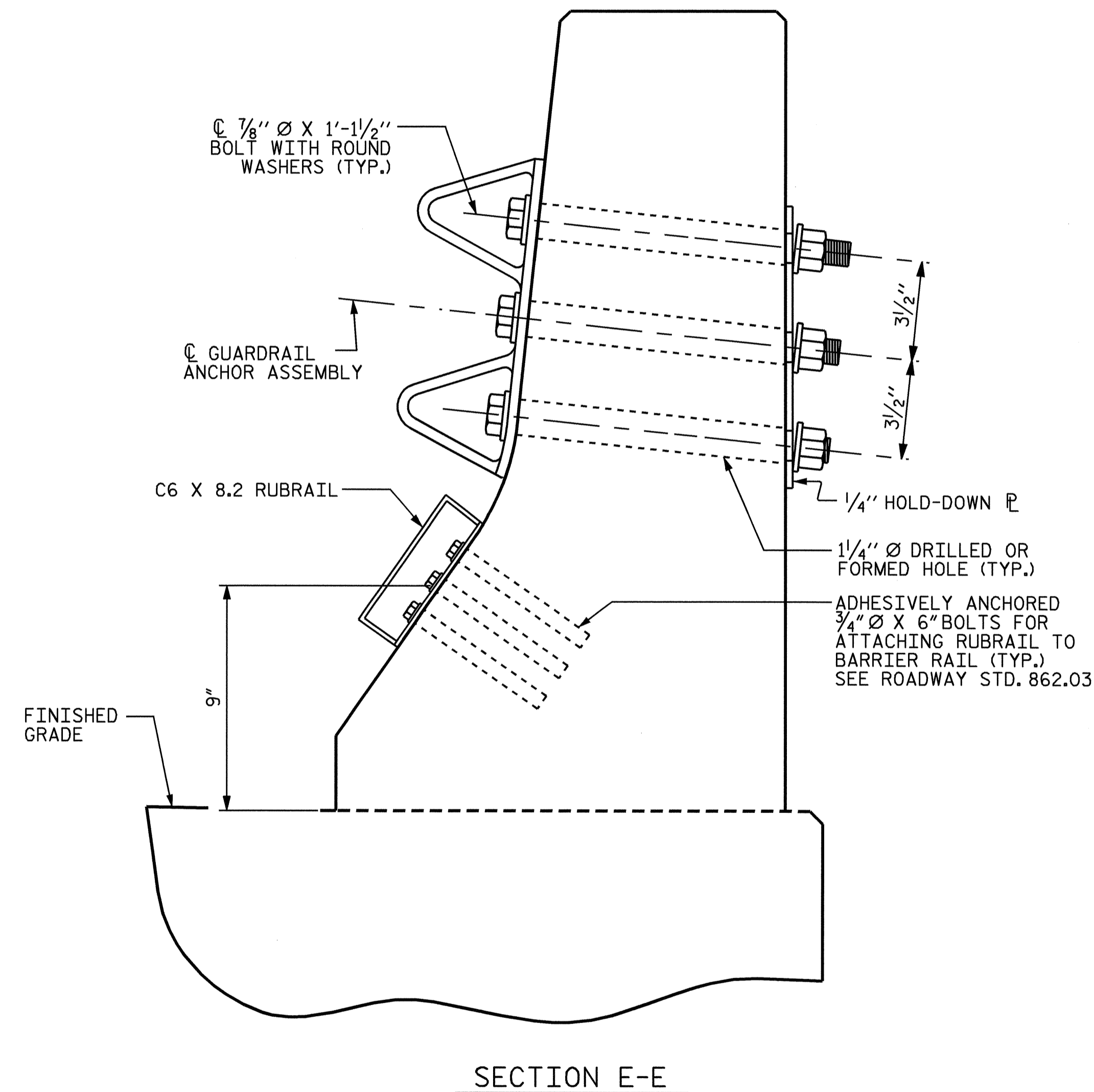
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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.

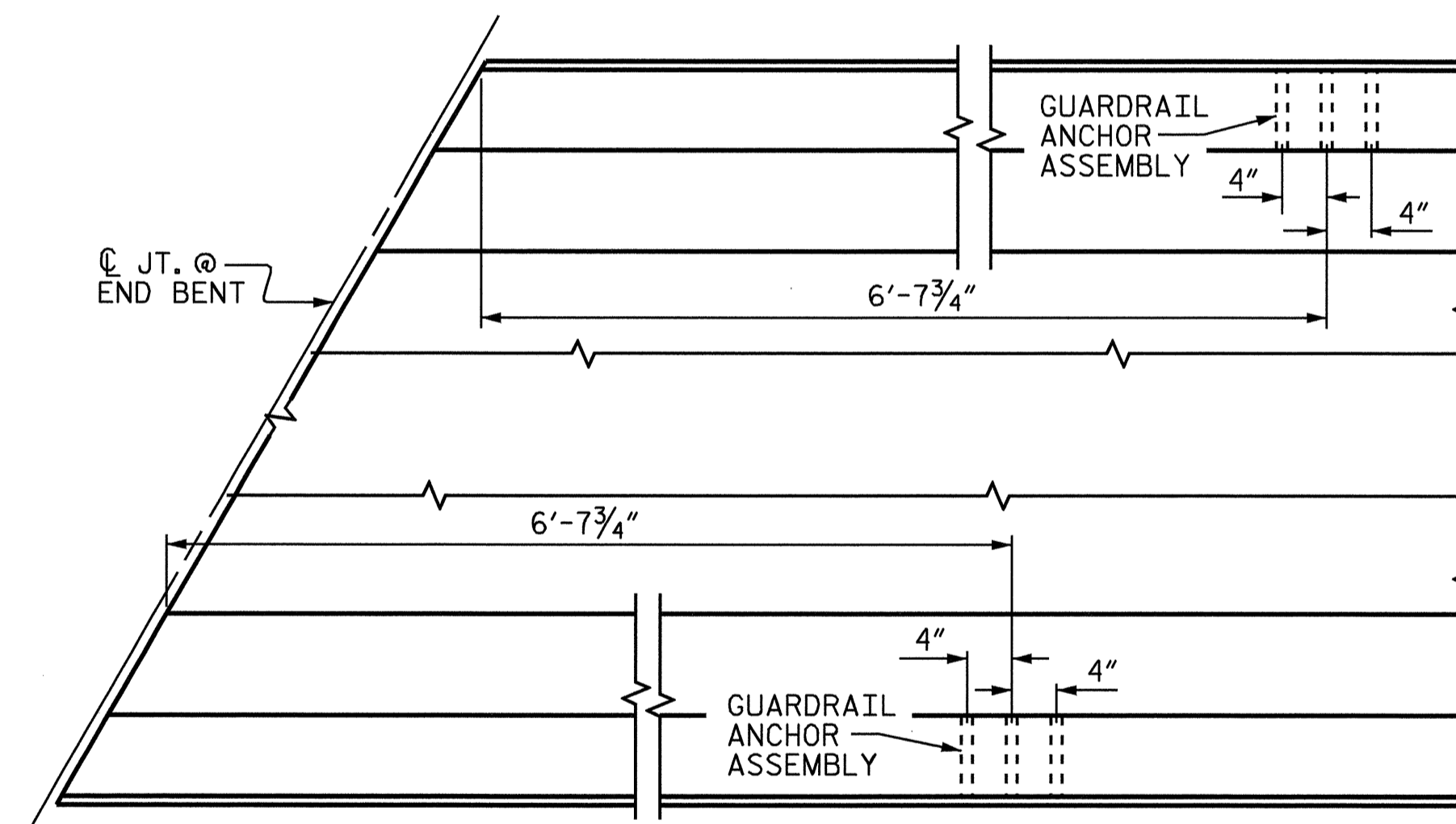
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS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



FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03

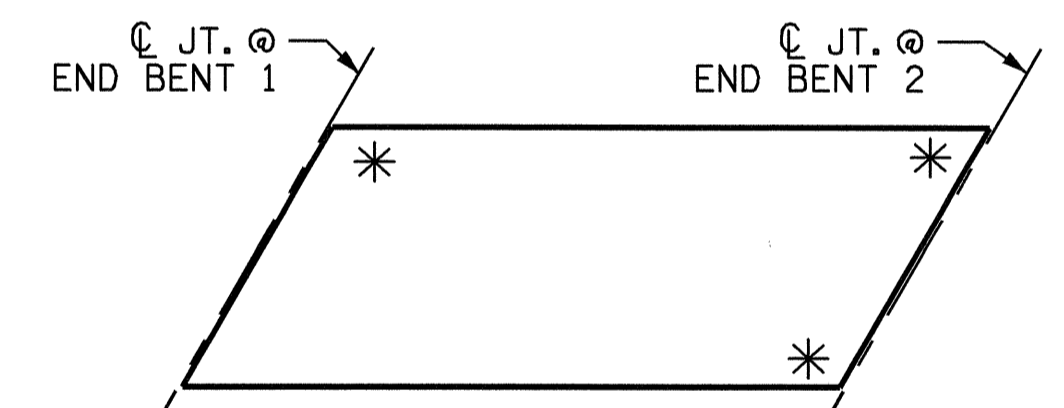


GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

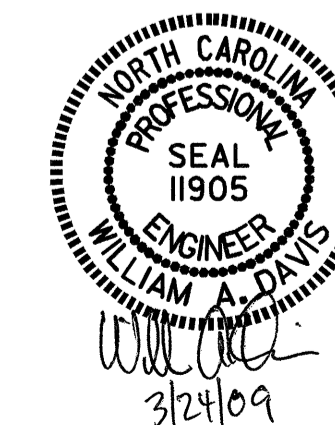
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-



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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			56

ASSEMBLED BY : QT NGUYEN DATE : 10-08  
 CHECKED BY : A.R. CHESSON DATE : 10-08  
 DRAWN BY : TLA 5/06  
 CHECKED BY : GM 5/06

NOTES

ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169 GRADES 1010 THRU 1020 OR APPROVED EQUAL.

STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON THE PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.

UPON COMPLETION OF SHOP FABRICATION, THE ENTIRE ANCHOR ASSEMBLY SHALL BE METALLIZED. THE 1/2" Ø STUD ANCHORS AND ANCHOR TABS NEED NOT BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

ANCHOR ASSEMBLY SHALL BE MADE CONTINUOUS THE LENGTH OF THE JOINT FROM GUTTER TO GUTTER. FOR FIELD SPLICES AT ALL CROWN BREAK POINTS, THE ENDS OF THE STEEL ANGLES SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE. FINISHED FIELD WELDS SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

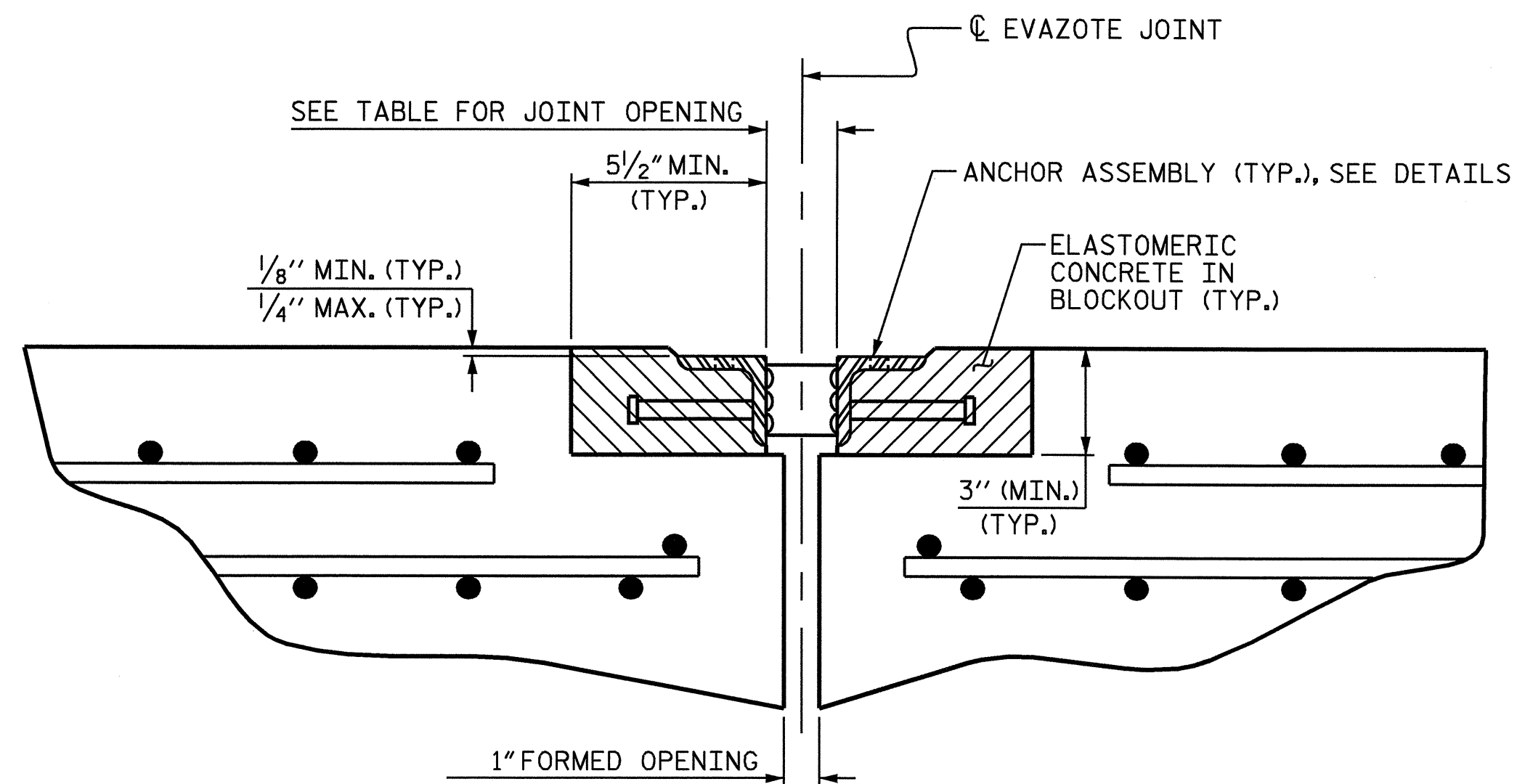
ANCHOR ASSEMBLY SEGMENTS SHALL NOT BE LESS THAN 12 FEET NOR MORE THAN 20 FEET IN LENGTH. SHORTER SEGMENTS MAY BE USED AT THE EDGE OF ROADWAY OR AT POINTS OF STAGED CONSTRUCTION.

THE ANCHOR ASSEMBLY SHALL BE SECURED AND LEVELLED AS SHOWN IN THE "ARMORED JOINT ANCHOR ASSEMBLY DETAILS". NO SUBMITTALS ARE REQUIRED FOR 3/8" Ø EXPANSION ANCHORS, NUTS OR WASHERS. THE CONTRACTOR MAY SUBMIT FOR APPROVAL AN ALTERNATE METHOD OF ALIGNING AND LEVELING THE ANGLES. THE ALTERNATE METHOD SHALL NOT INCLUDE ANY WELDING TO THE OUTSIDE FACE OF THE ANGLES.

AFTER THE ELASTOMERIC CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE ANY EXCESS CONCRETE THAT COMES THROUGH THE WEEP HOLES AND THOROUGHLY CLEAN THE ANGLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM OF 4 MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

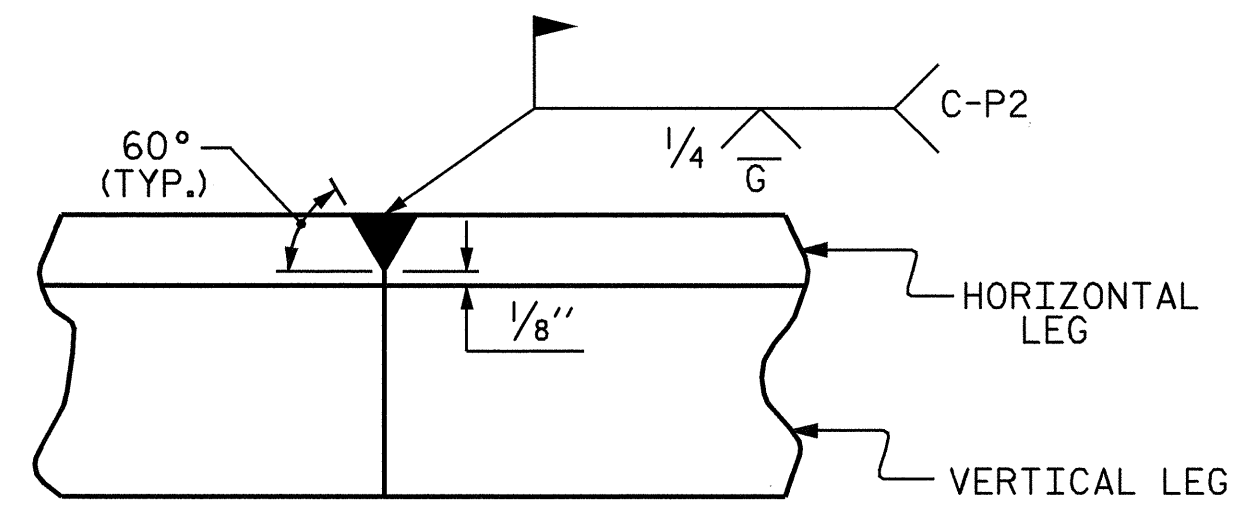
SEE SPECIAL PROVISIONS FOR EVAZOTE JOINT SEALS.

SEE SPECIAL PROVISIONS FOR ELASTOMERIC CONCRETE.

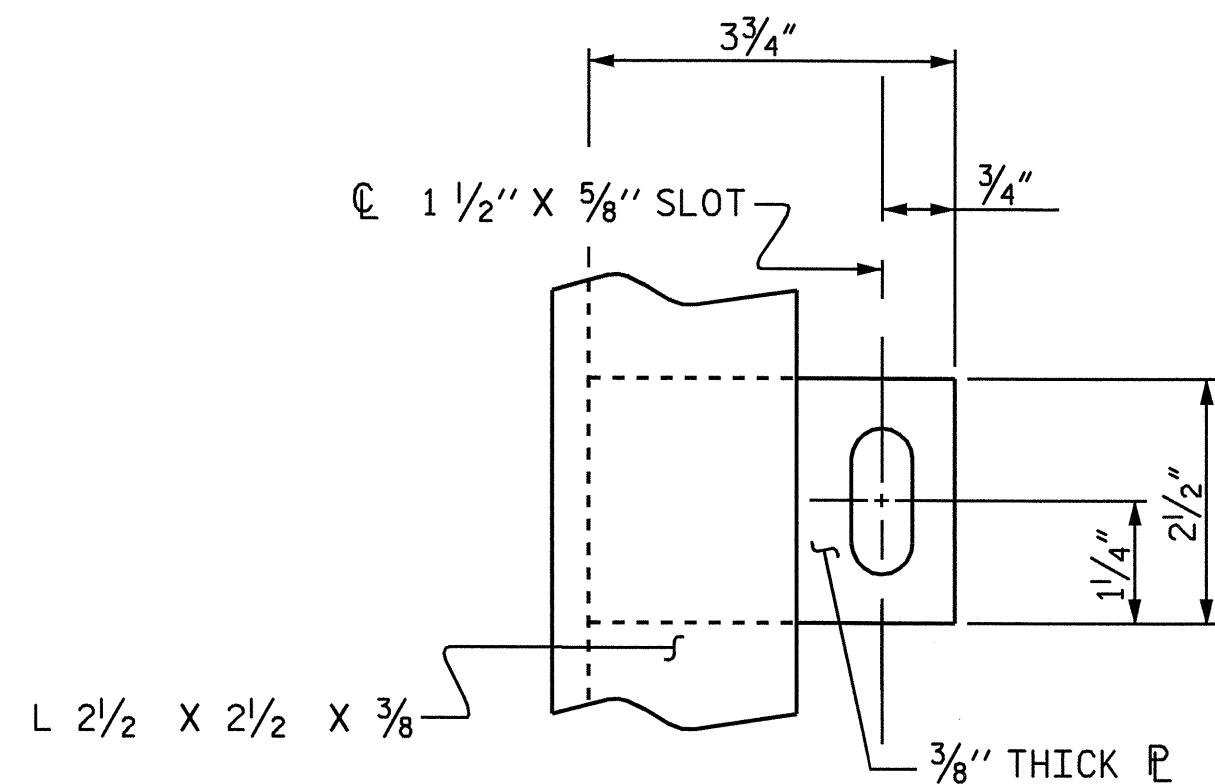


ARMORED JOINT DETAILS

SECTION NORMAL TO JOINT AT BENT



DETAIL- FIELD WELD SPLICE OF ANGLE



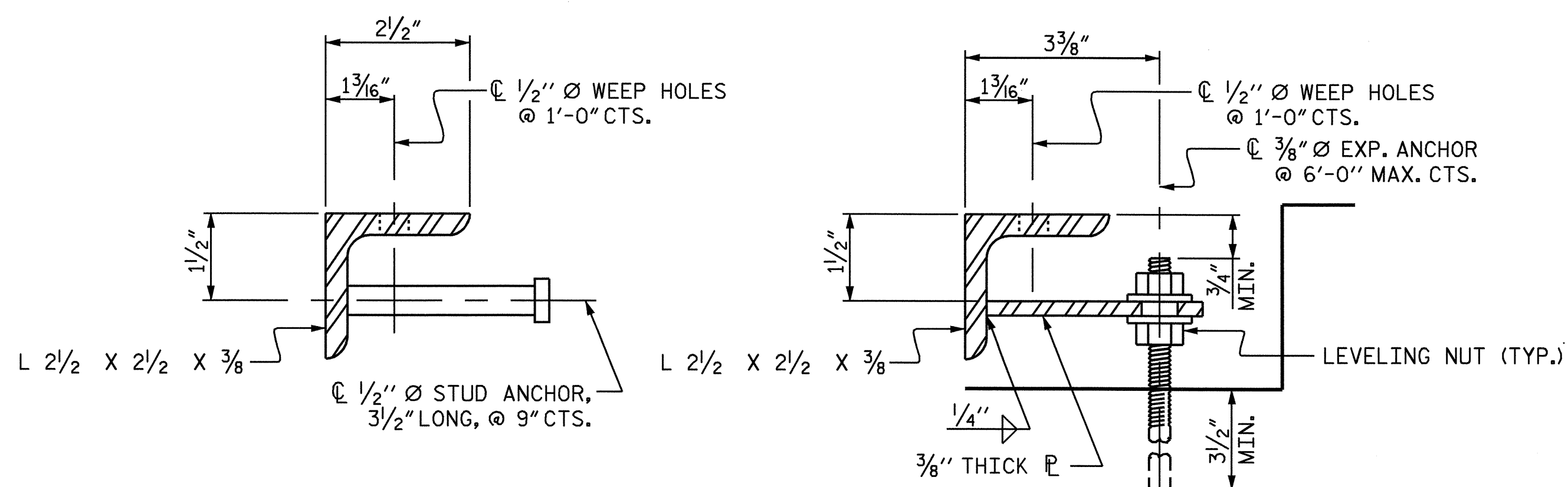
PLAN VIEW OF TAB

MOVEMENT AND SETTING AT EVAZOTE JOINT						
END BENT NO.	SKEW ANGLE	NOMINAL UNCOMPRESSED SEAL WIDTH	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	133°-56'-30"	2 1/2"	3/4"	2"	1 7/8"	1 5/8"
2	133°-56'-30"	2 1/2"	13/16"	2"	1 7/8"	1 5/8"

TOTAL MOVEMENT IS CALCULATED ALONG THE CENTERLINE OF ROADWAY. JOINT OPENINGS ARE MEASURED PERPENDICULAR TO THE JOINT.

BILL OF MATERIAL		
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)	TOTAL LENGTH OF ANGLE (F T)
1	12.1	105'-6 1/2"
2	12.1	105'-6 1/2"

\* BASED ON THE MINIMUM BLOCKOUT SHOWN.

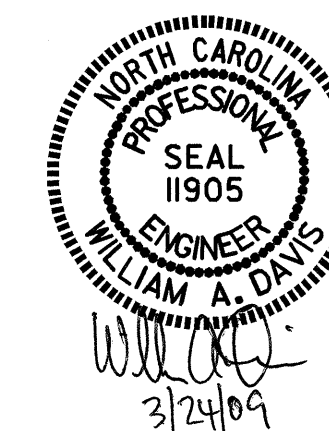


SECTION VIEW OF STUD

SECTION VIEW OF TAB

ARMORED JOINT ANCHOR ASSEMBLY DETAILS

PROJECT NO. R-0505  
 HENDERSON COUNTY  
 STATION: 780+05.14 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD ARMORED EVAZOTE JOINT DETAILS (SBL)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-16
					TOTAL SHEETS 56

ASSEMBLED BY : QT NGUYEN	DATE : 3-18-09
CHECKED BY : W.A. DAVIS	DATE : 3-18-09
DRAWN BY : EEM 1/96	REV. 7/10/01 LES/RDR
CHECKED BY : RGW 1/96	REV. 5/7/03RR RWW/JTE
	REV. 5/1/06 TLA/GM

### BILL OF MATERIAL SPAN A & SPAN B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	359	#5	STR	40'-11"	15321	A209	2	#5	STR	31'-10"	66
A2	359	#5	STR	40'-11"	15321	A210	2	#5	STR	30'-9"	64
						A211	2	#5	STR	29'-8"	62
* A101	2	#5	STR	40'-6"	84	A212	2	#5	STR	28'-7"	60
* A102	2	#5	STR	39'-5"	82	A213	2	#5	STR	27'-6"	57
* A103	2	#5	STR	38'-4"	80	A214	2	#5	STR	26'-5"	55
* A104	2	#5	STR	37'-3"	78	A215	2	#5	STR	25'-4"	53
* A105	2	#5	STR	36'-2"	75	A216	2	#5	STR	24'-3"	51
* A106	2	#5	STR	35'-1"	73	A217	2	#5	STR	23'-2"	48
* A107	2	#5	STR	34'-0"	71	A218	2	#5	STR	22'-1"	46
* A108	2	#5	STR	32'-11"	69	A219	2	#5	STR	21'-0"	44
* A109	2	#5	STR	31'-10"	66	A220	2	#5	STR	19'-11"	42
* A110	2	#5	STR	30'-9"	64	A221	2	#5	STR	18'-10"	39
* A111	2	#5	STR	29'-8"	62	A222	2	#5	STR	17'-9"	37
* A112	2	#5	STR	28'-7"	60	A223	2	#5	STR	16'-8"	35
* A113	2	#5	STR	27'-6"	57	A224	2	#5	STR	15'-7"	33
* A114	2	#5	STR	26'-5"	55	A225	2	#5	STR	14'-6"	30
* A115	2	#5	STR	25'-4"	53	A226	2	#5	STR	13'-5"	28
* A116	2	#5	STR	24'-3"	51	A227	2	#5	STR	12'-4"	26
* A117	2	#5	STR	23'-2"	48	A228	2	#5	STR	11'-3"	23
* A118	2	#5	STR	22'-1"	46	A229	2	#5	STR	10'-2"	21
* A119	2	#5	STR	21'-0"	44	A230	2	#5	STR	9'-1"	19
* A120	2	#5	STR	19'-11"	42	A231	2	#5	STR	8'-0"	17
* A121	2	#5	STR	18'-10"	39	A232	2	#5	STR	6'-11"	14
* A122	2	#5	STR	17'-9"	37	A233	2	#5	STR	5'-7"	12
* A123	2	#5	STR	16'-8"	35	A234	2	#5	STR	4'-9"	10
* A124	2	#5	STR	15'-7"	33	A235	2	#5	STR	3'-8"	8
* A125	2	#5	STR	14'-6"	30	A236	2	#5	STR	2'-7"	5
* A126	2	#5	STR	13'-5"	28	A237	2	#5	STR	1'-6"	3
* A127	2	#5	STR	12'-4"	26						
* A128	2	#5	STR	11'-3"	23	* B1	18	#4	STR	26'-1"	314
* A129	2	#5	STR	10'-2"	21	B2	200	#5	STR	56'-5"	11769
* A130	2	#5	STR	9'-1"	19	* B3	81	#7	STR	30'-5"	5030
* A131	2	#5	STR	8'-0"	17	* B4	78	#7	STR	28'-5"	4531
* A132	2	#5	STR	6'-11"	14	* B5	81	#4	STR	23'-5"	1267
* A133	2	#5	STR	5'-7"	12	* B6	81	#4	STR	26'-9"	1447
* A134	2	#5	STR	4'-9"	10						
* A135	2	#5	STR	3'-8"	8	* G1	2	#5	STR	56'-10"	119
* A136	2	#5	STR	2'-7"	5						
* A137	2	#5	STR	1'-6"	3	* K1	12	#5	1	14'-7"	183
						* K2	12	#5	2	19'-10"	248
A201	2	#5	STR	40'-6"	84	* S1	66	#4	3	4'-6"	198
A202	2	#5	STR	39'-5"	82						
2103	2	#5	STR	38'-4"	80						
2104	2	#5	STR	37'-3"	78						
A205	2	#5	STR	36'-2"	75						
A206	2	#5	STR	35'-1"	73						
A207	2	#5	STR	34'-0"	71						
A208	2	#5	STR	32'-11"	69						

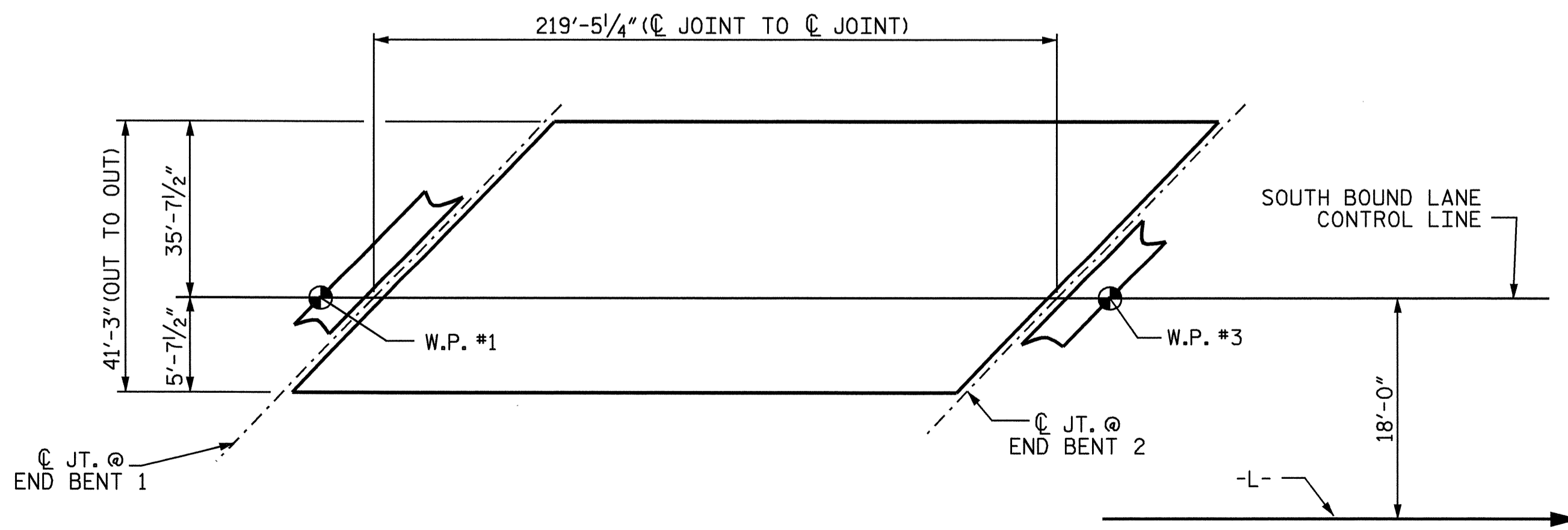
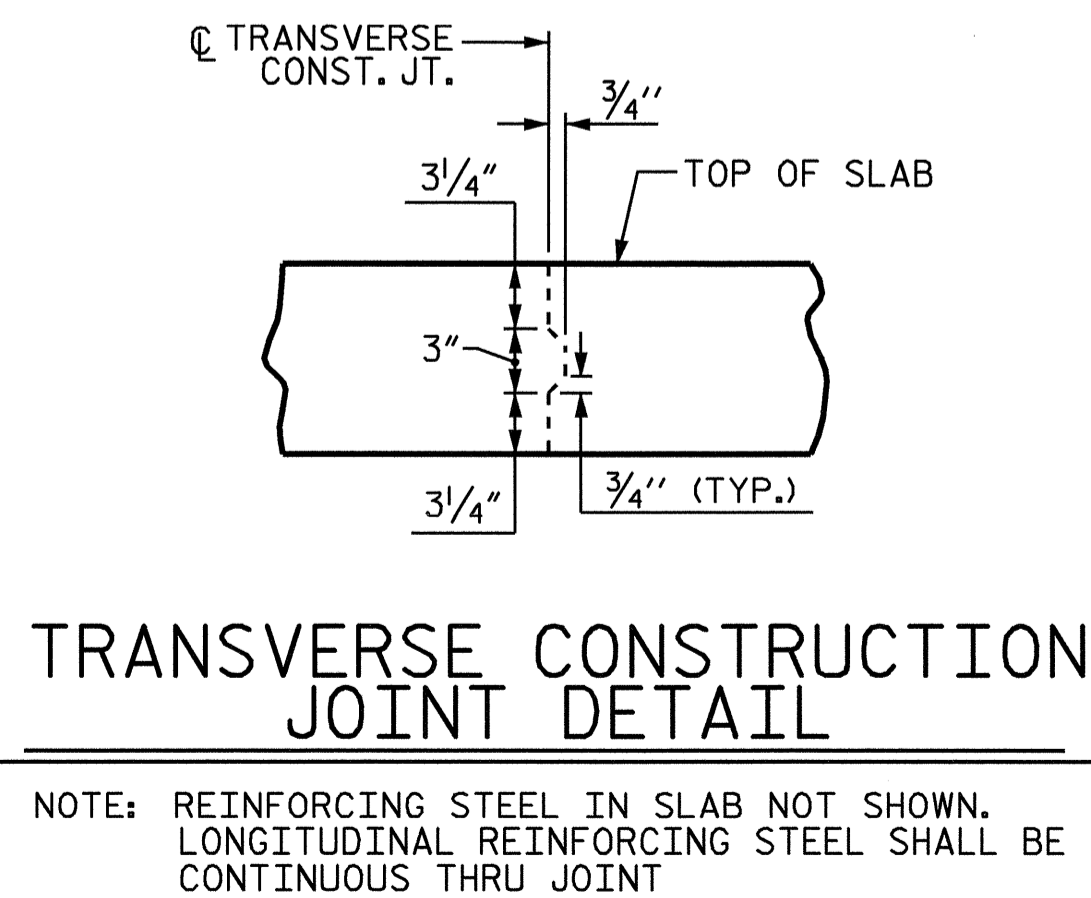
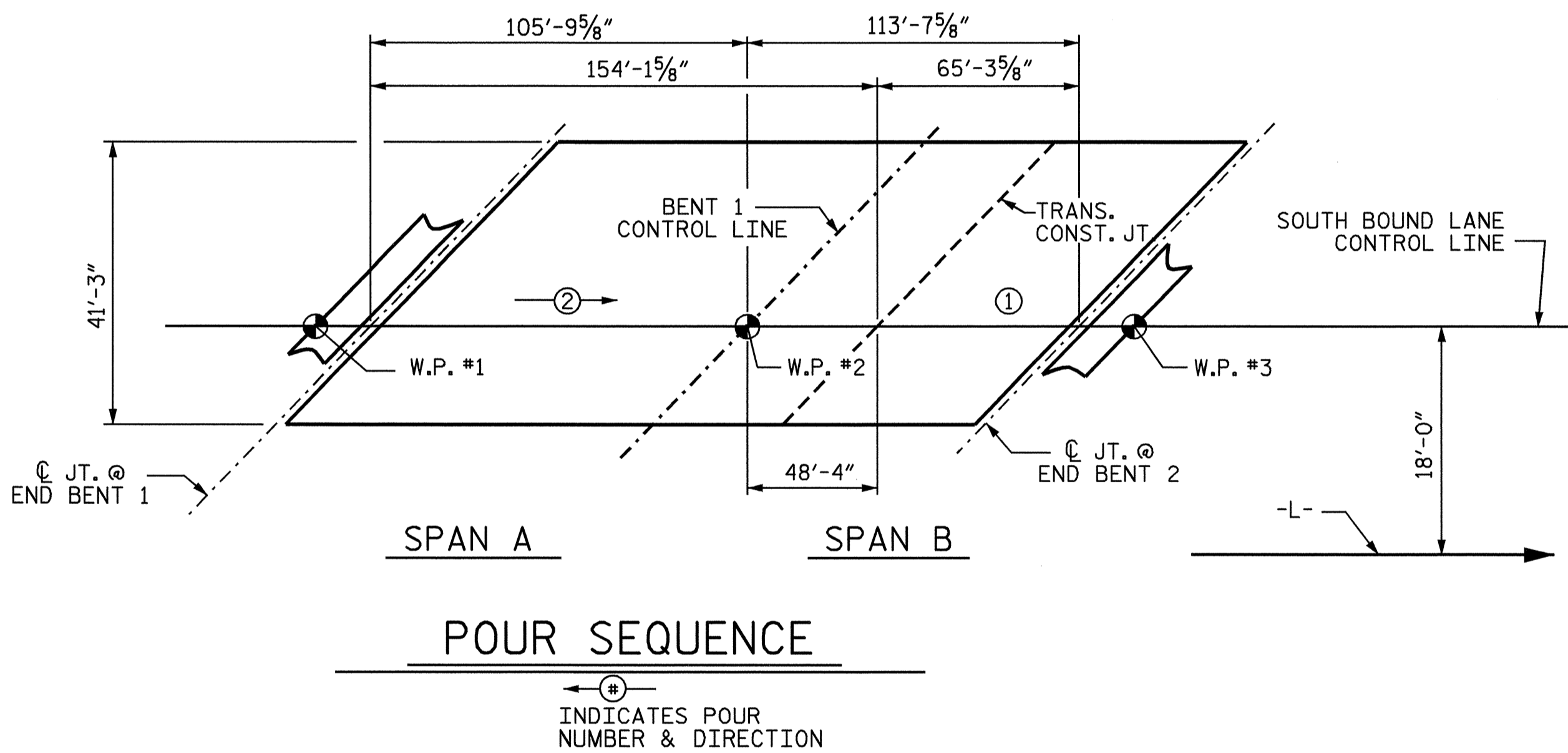
REINFORCING STEEL = 21710 LBS  
\* EPOXY COATED REINF. STEEL = 30278 LBS

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

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

### GROOVING BRIDGE FLOORS

APPROACH SLABS	1819 SQ.FT.
BRIDGE DECK	8980 SQ.FT.
<b>TOTAL</b>	<u>10799 SQ.FT.</u>



ASSEMBLED BY: QT NGUYEN	DATE: 10-08
CHECKED BY: A.R. CHESSON	DATE: 10-08
DRAWN BY: JMB 5/87	REV. 6/1/94 EEM/GRP
CHECKED BY: SJD 9/87	REV. 8/16/99 RWW/LES
	REV. 5/1/06 TLA/GM

24-MAR-2009 07:04  
y:\flproj\projects-r\0505\structures\final plans\sbl-127 str1\0505.sd.bml.dgn  
qtnguyen

### BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

### — SUPERSTRUCTURE BILL OF MATERIAL —

	CLASS AA CONCRETE ( CU.YDS.)	REINFORCING STEEL ( LBS.)	* EPOXY COATED REINFORCING STEEL ( LBS.)
(POUR #1)	91.8		
(POUR #2)	212.9		
<b>TOTALS**</b>	<b>304.7</b>	<b>21710</b>	<b>30278</b>

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. R-0505  
HENDERSON COUNTY  
STATION: 780+05.14 -L-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
SUPERSTRUCTURE  
BILL OF MATERIAL  
(SBL)

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

TOTAL SHEETS: 56

STD. NO. BOM1

**NOTES**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

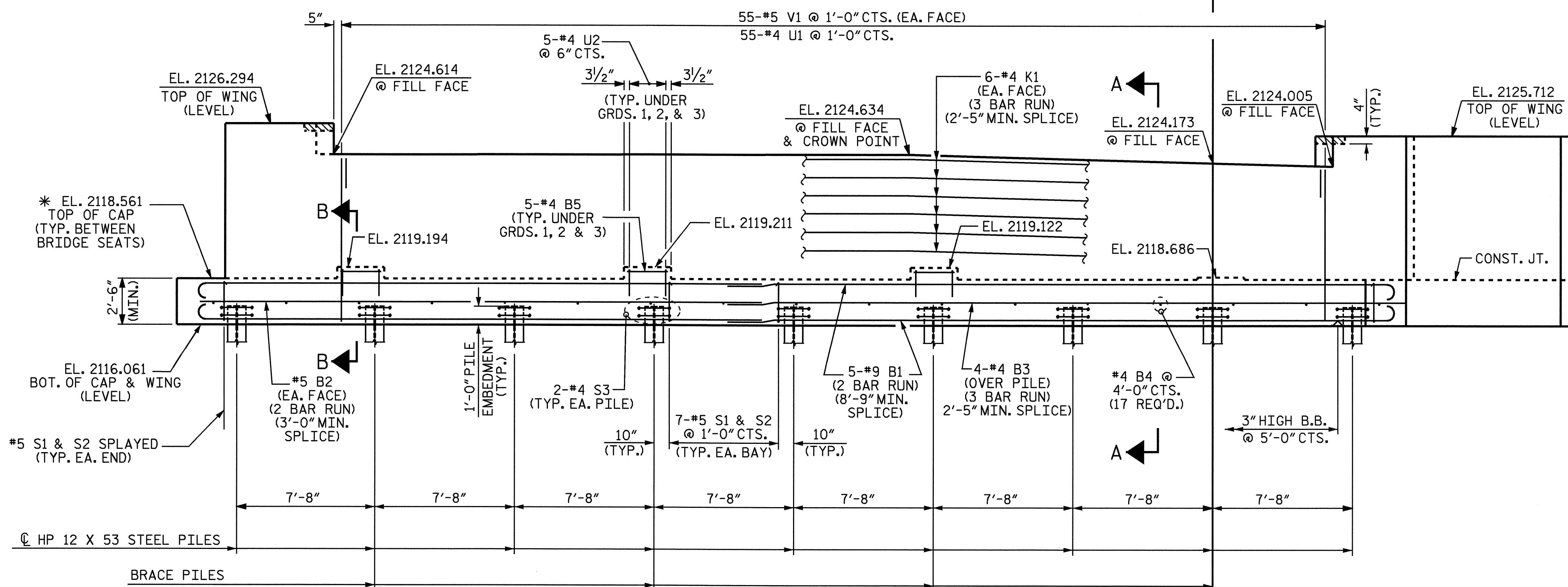
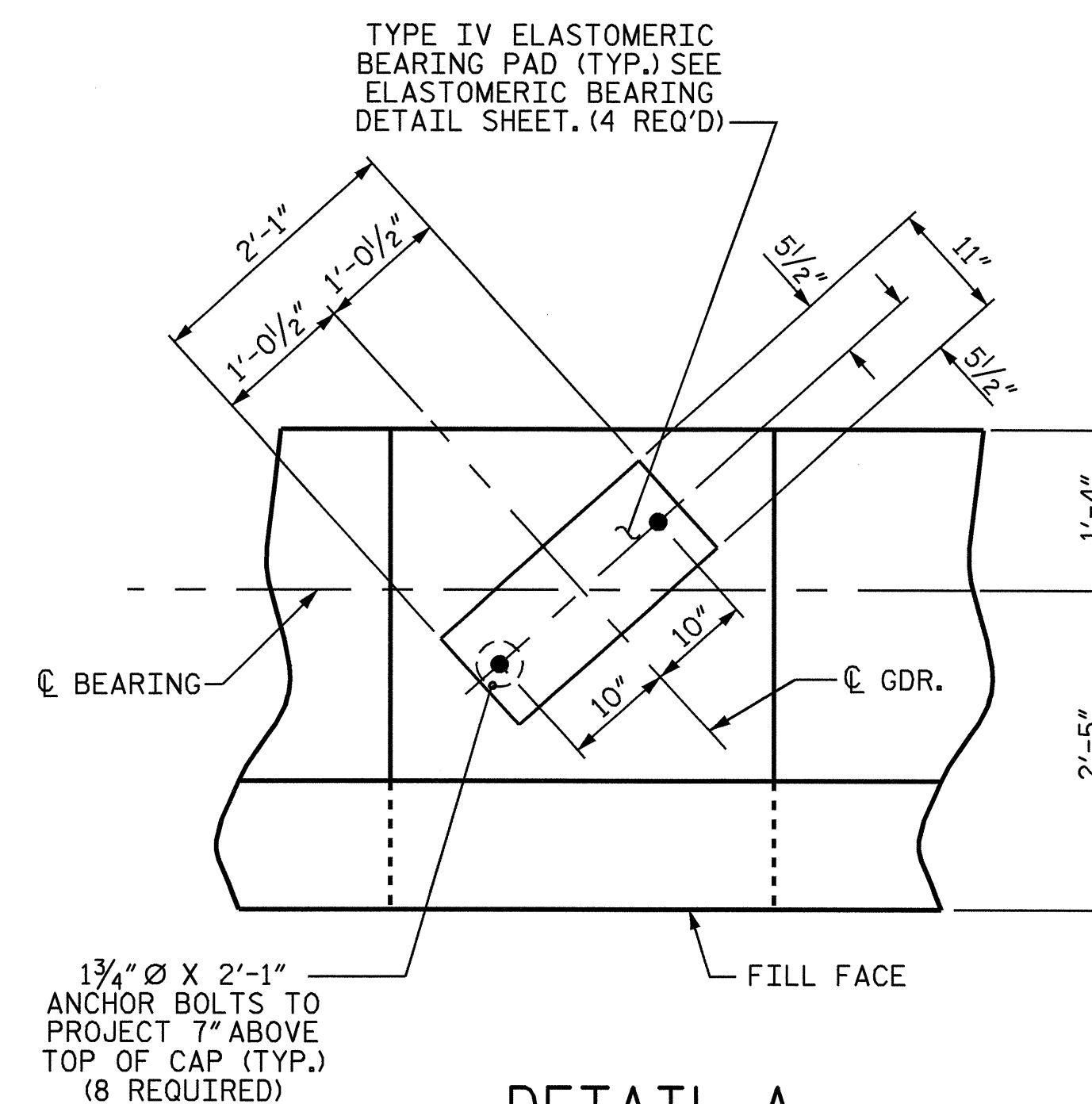
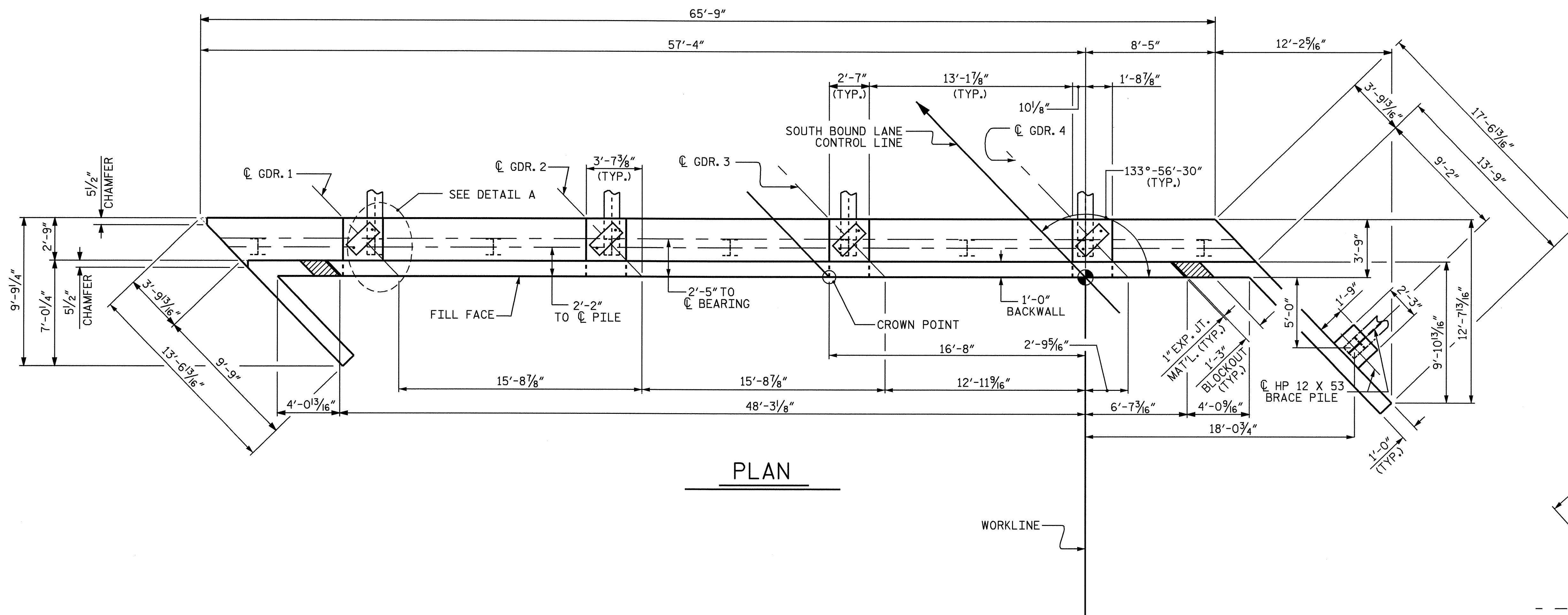
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

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



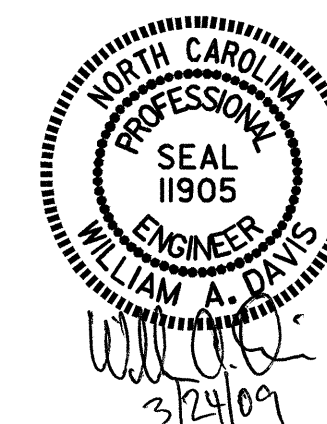
\* FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 3 OF 3

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 1 OF 3

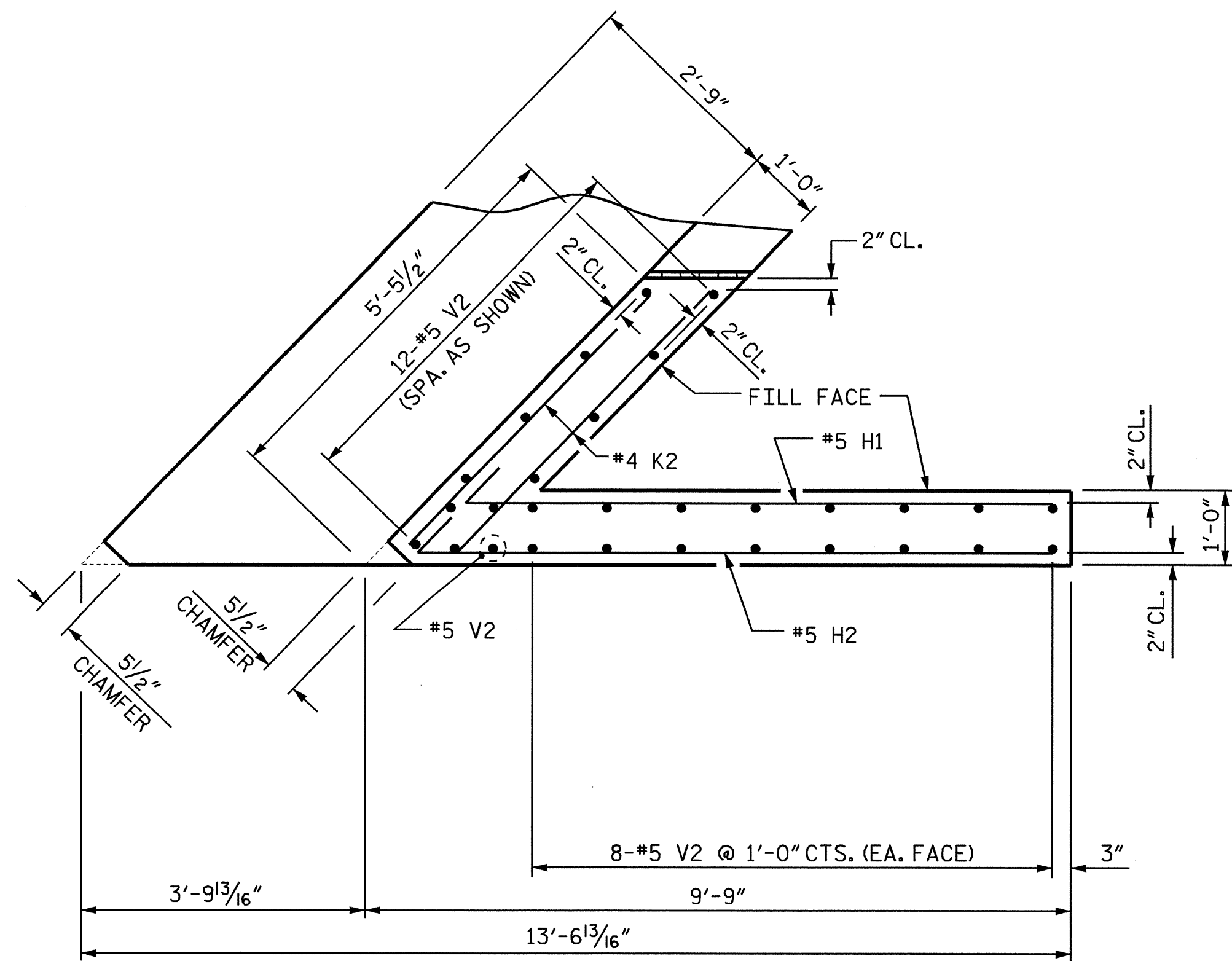
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 1  
 (SBL)

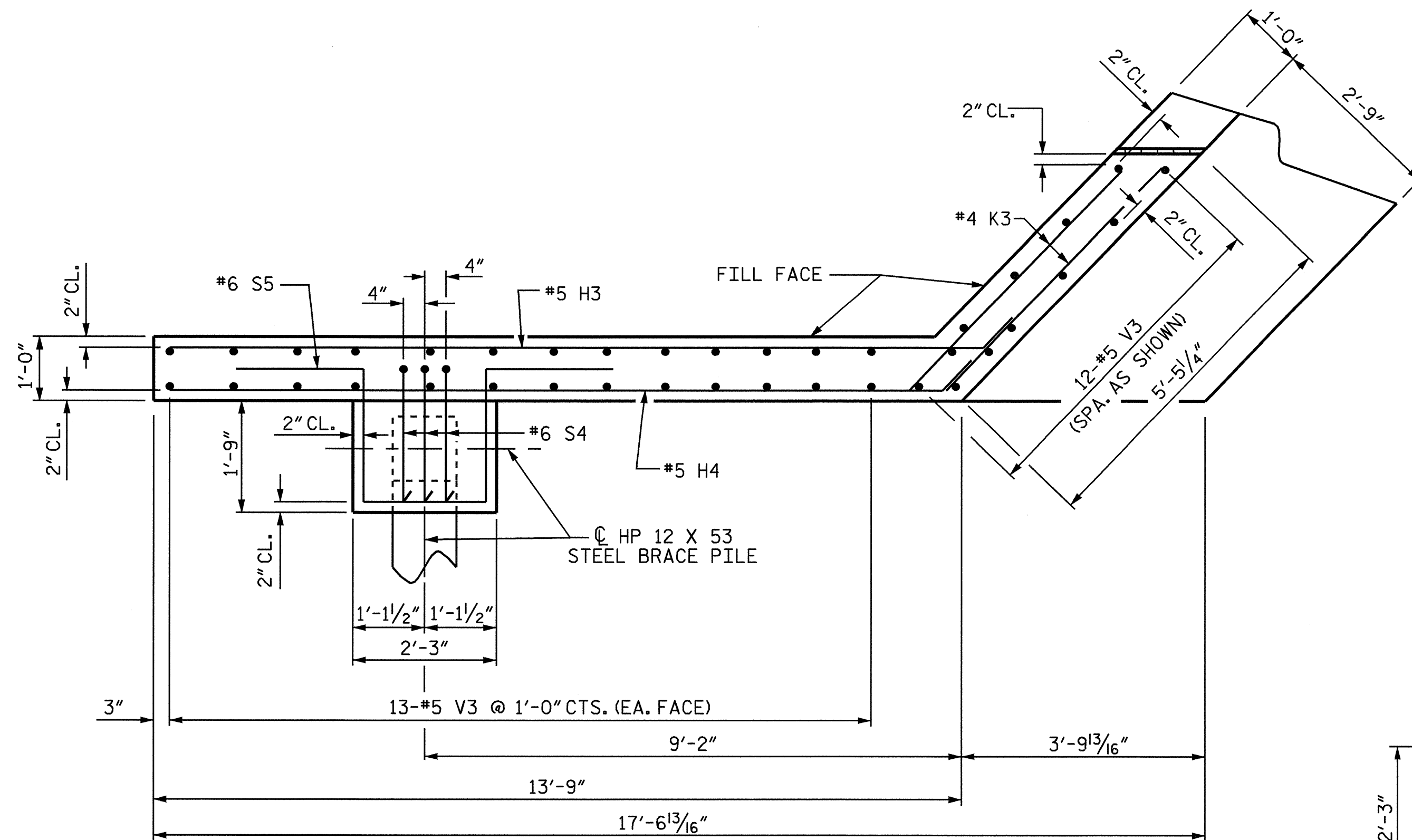


REVISIONS						SHEET NO. S-18
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 56
2			4			

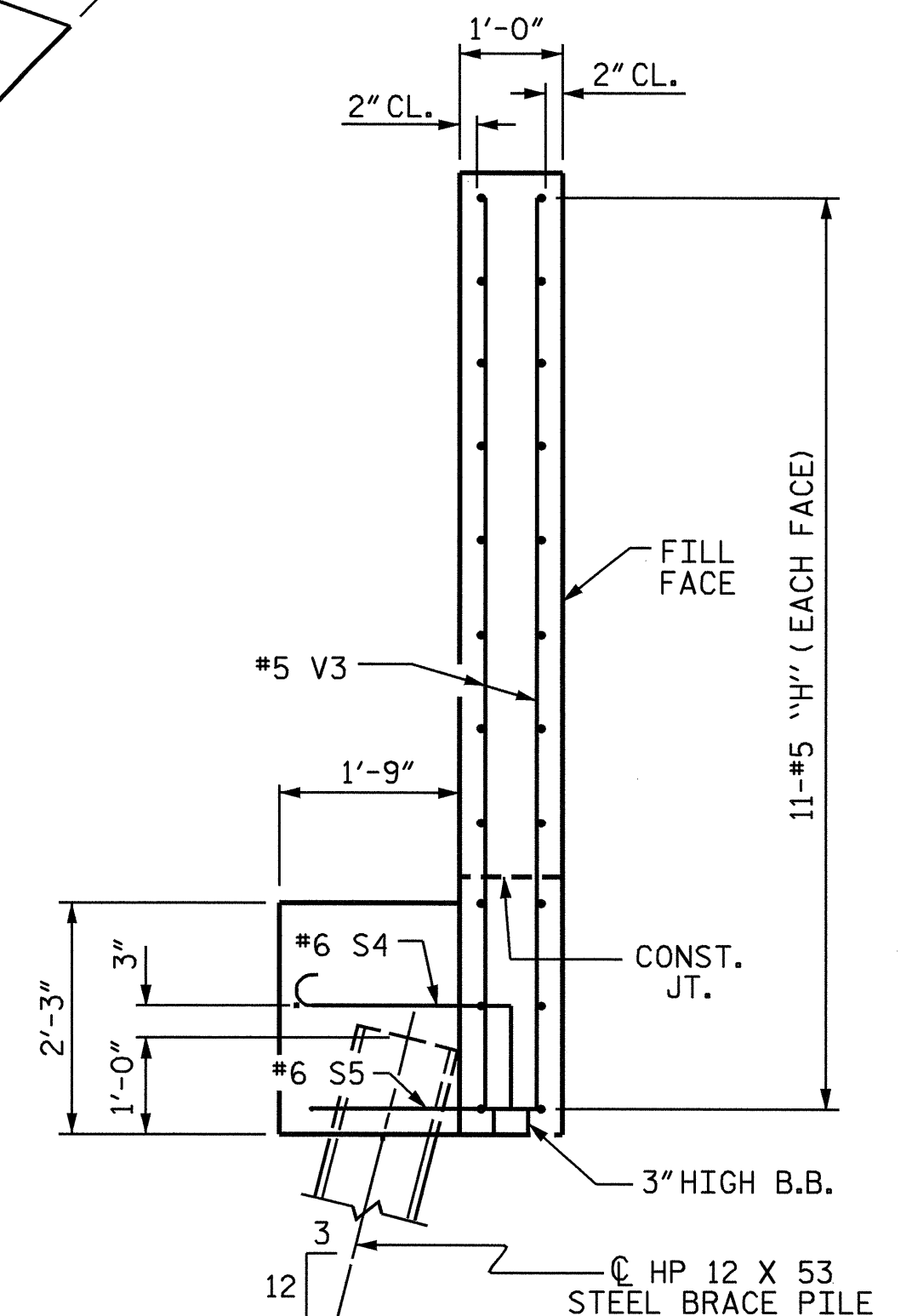
DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: S. DOMBROWSKI DATE: 12-08



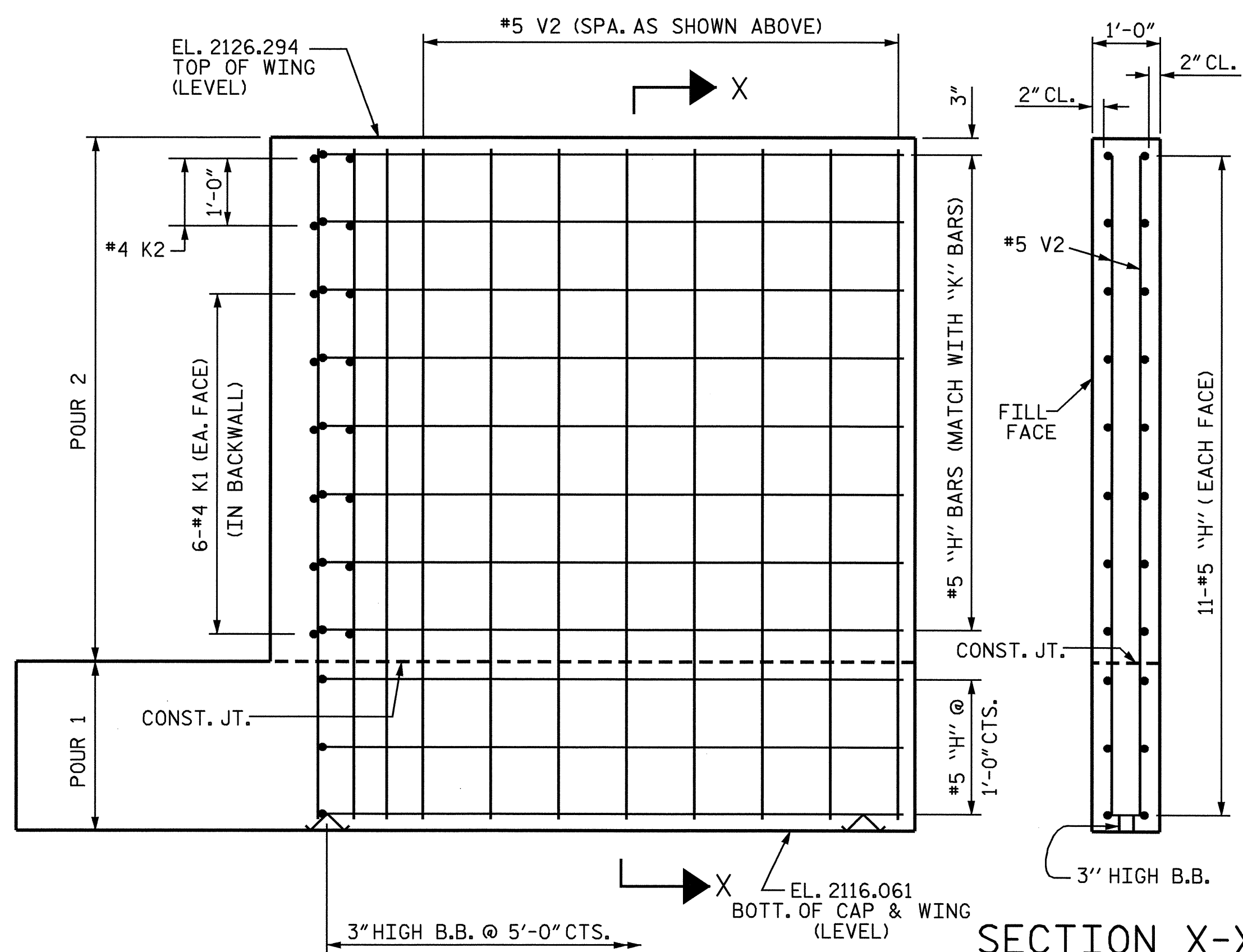
PLAN OF LEFT WING W1



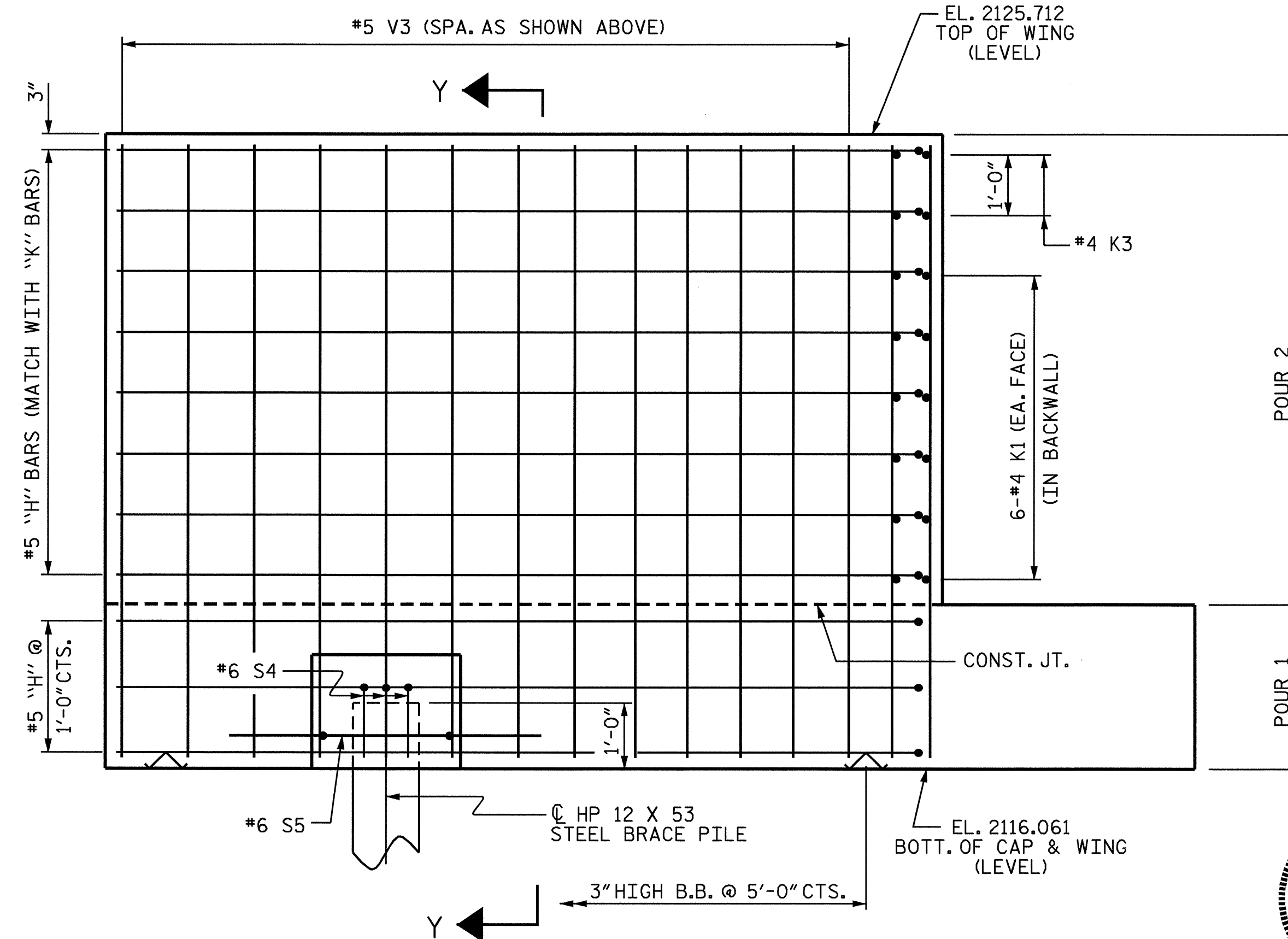
PLAN OF RIGHT WING W2



SECTION Y-Y



ELEVATION OF LEFT WING W1



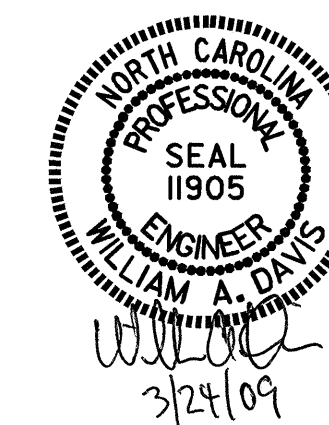
ELEVATION OF RIGHT WING W2

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 2 OF 3

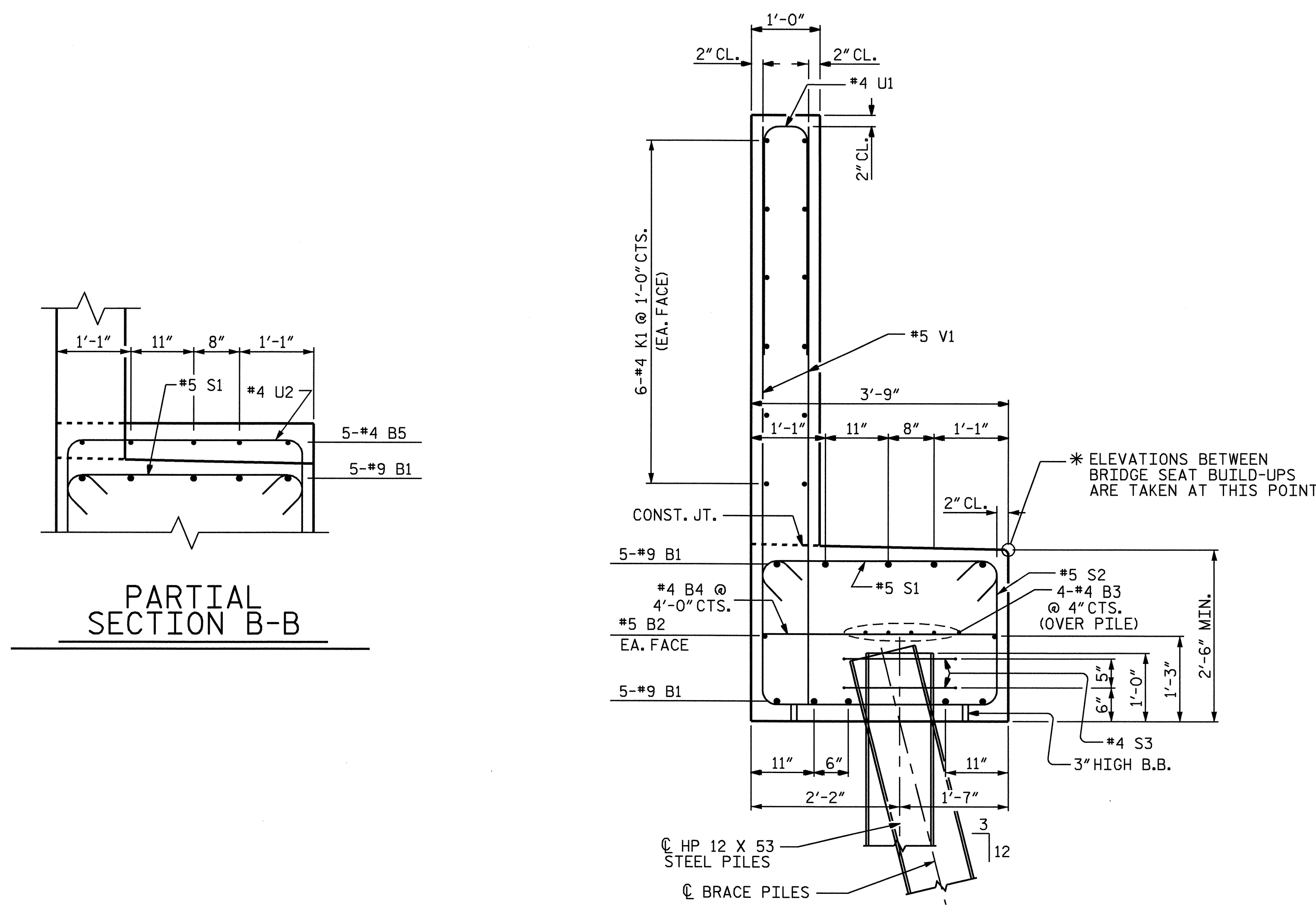
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 1  
 (SBL)

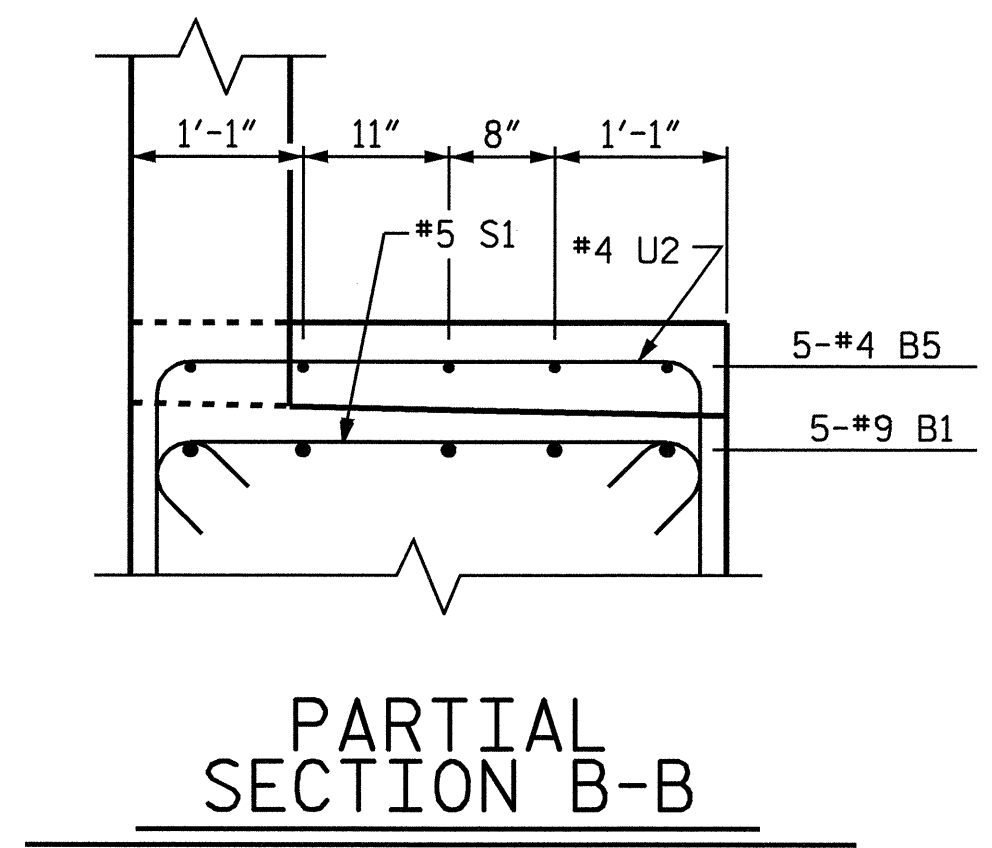


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			56

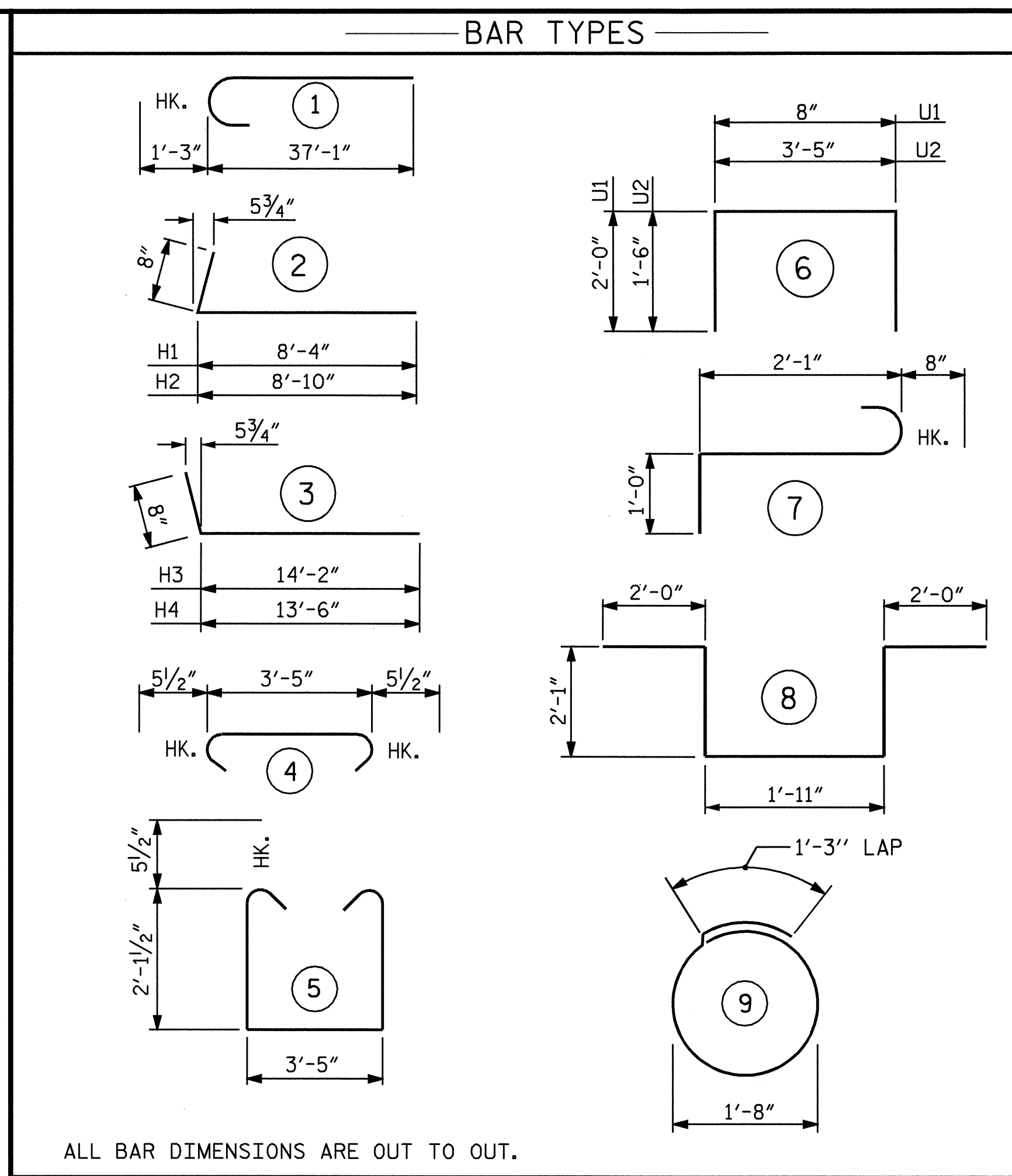
DRAWN BY : QT NGUYEN DATE : 10-08  
 CHECKED BY : S. DOMBROWSKI DATE : 12-08



SECTION A-A

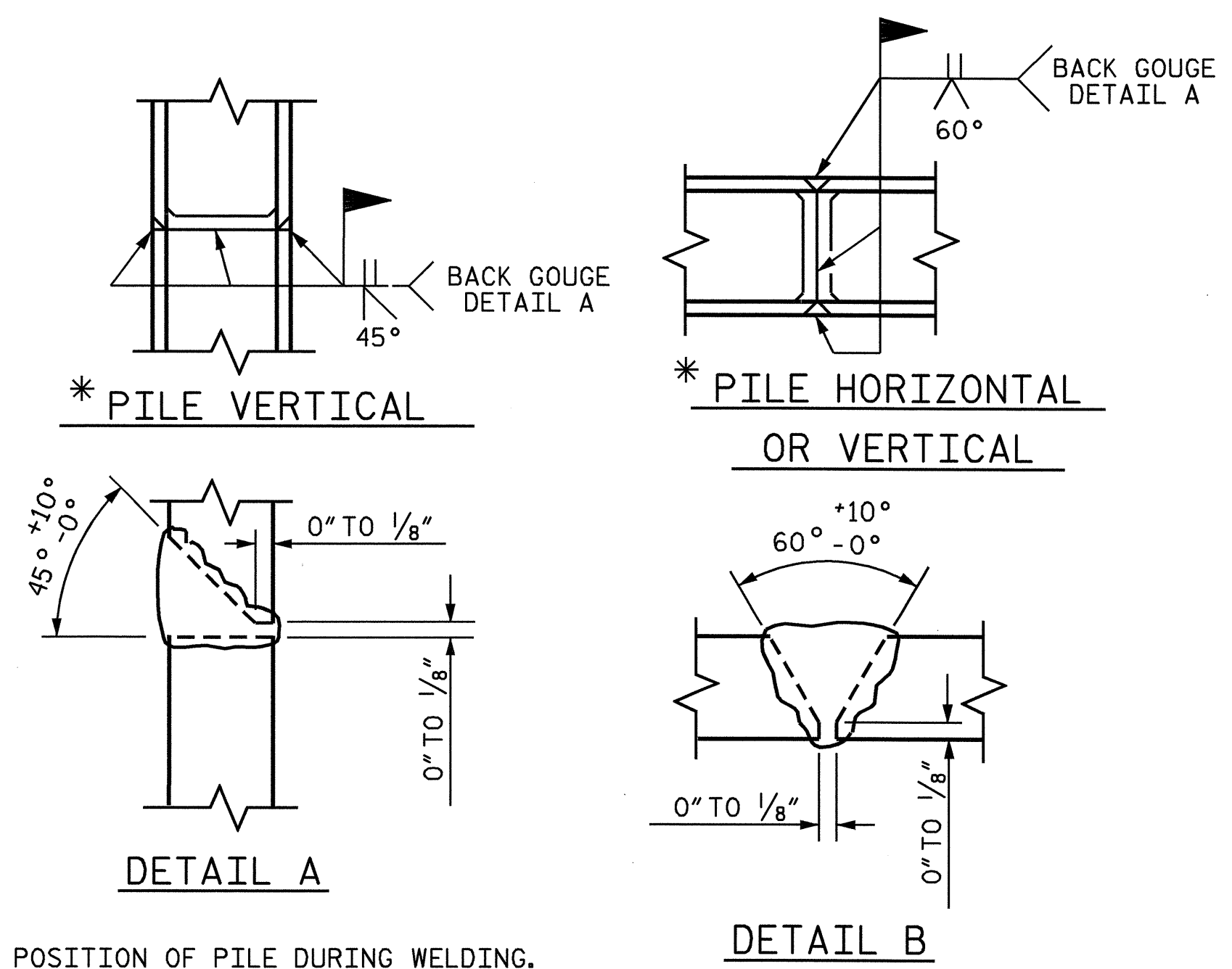


PARTIAL SECTION B-B

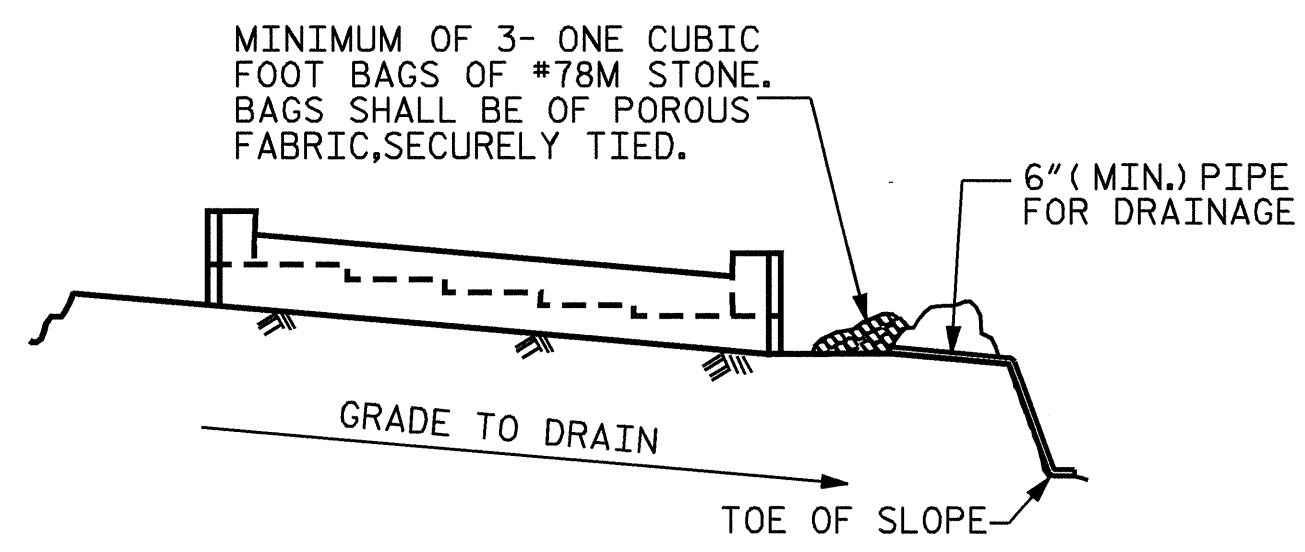


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	20	#9	1	38'-4"	2607
B2	4	#5	STR	34'-3"	143
B3	12	#4	STR	23'-5"	188
B4	17	#4	STR	3'-5"	39
B5	15	#4	STR	2'-3"	23
H1	11	#5	2	9'-0"	103
H2	11	#5	2	9'-6"	109
H3	11	#5	3	14'-10"	170
H4	11	#5	3	14'-3"	163
K1	36	#4	STR	23'-4"	561
K2	4	#4	STR	4'-9"	13
K3	4	#4	STR	5'-2"	14
S1	58	#5	4	4'-4"	262
S2	58	#5	5	8'-7"	519
S3	18	#4	9	6'-5"	77
S4	3	#6	7	3'-9"	17
S5	1	#6	8	10'-1"	15
U1	55	#4	6	4'-8"	171
U2	15	#4	6	6'-5"	64
V1	110	#5	STR	7'-6"	860
V2	29	#5	STR	9'-9"	295
V3	38	#5	STR	9'-2"	363
REINFORCING STEEL					= LBS 6776
CLASS A CONCRETE					
POUR 1: CAP & LOWER WINGS				C.Y.	19.3
POUR 2: BACKWALL & UPPER WINGS				C.Y.	20.4
CLASS A CONCRETE TOTAL				C.Y.	39.7
HP 12 X 53 STEEL PILES					
NO. 10				LIN. FT.	425



PILE SPLICE DETAILS



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

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

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

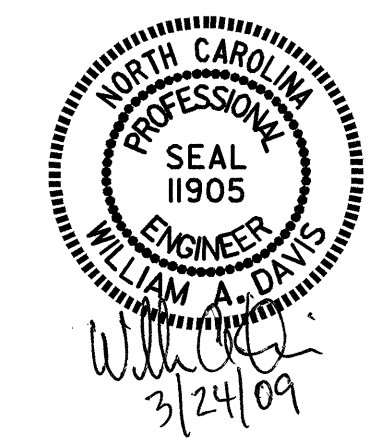
TEMPORARY DRAINAGE AT END BENT

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 1  
 (SBL)



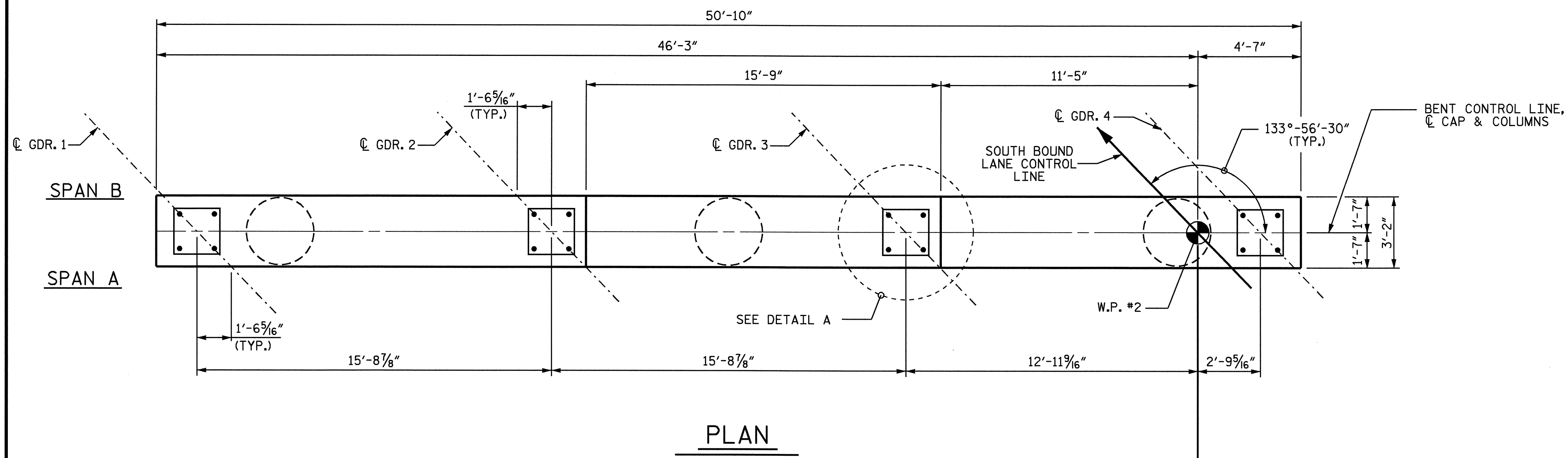
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			56

DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: S. DOMBROWSKI DATE: 12-08

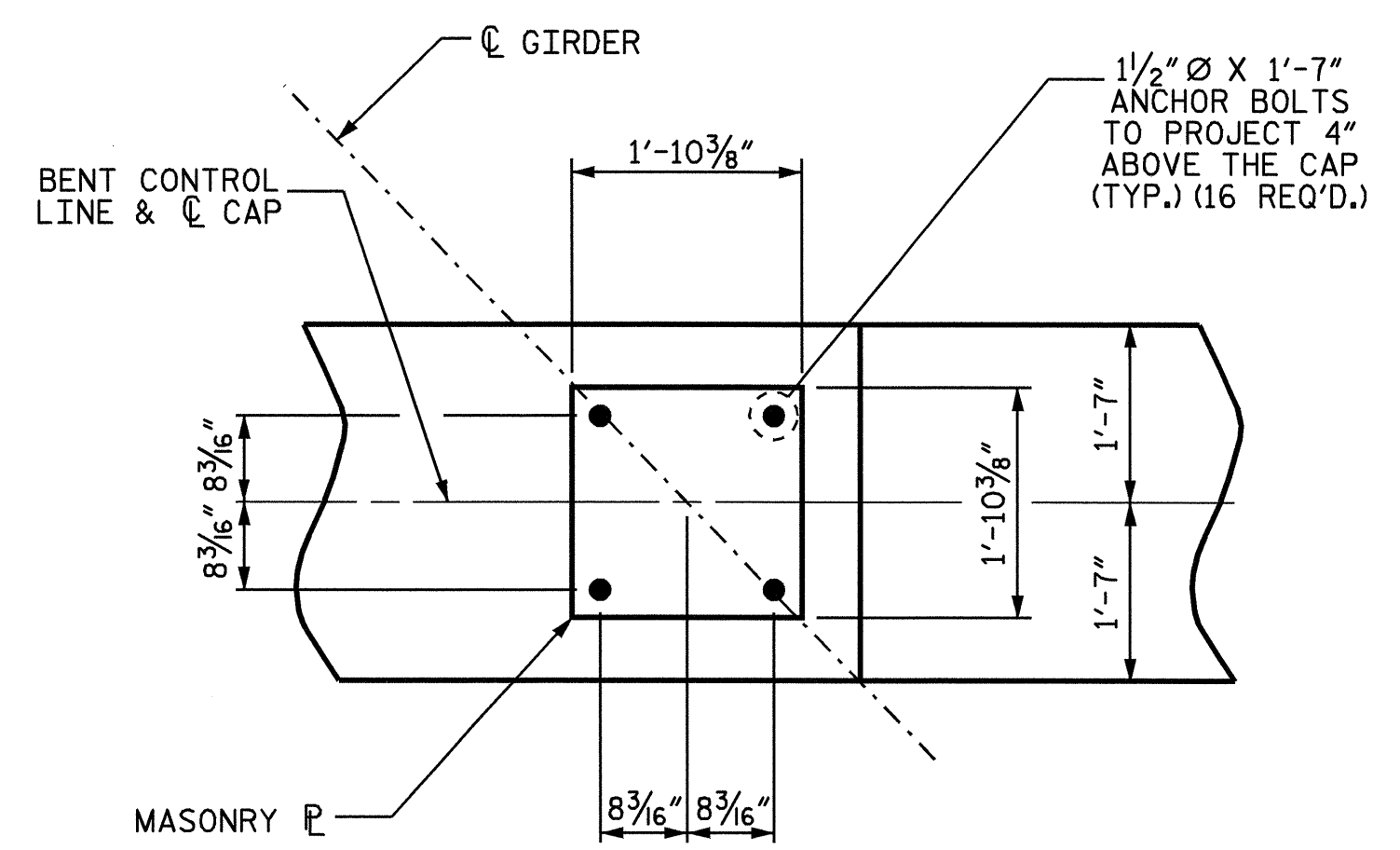
**NOTES:**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

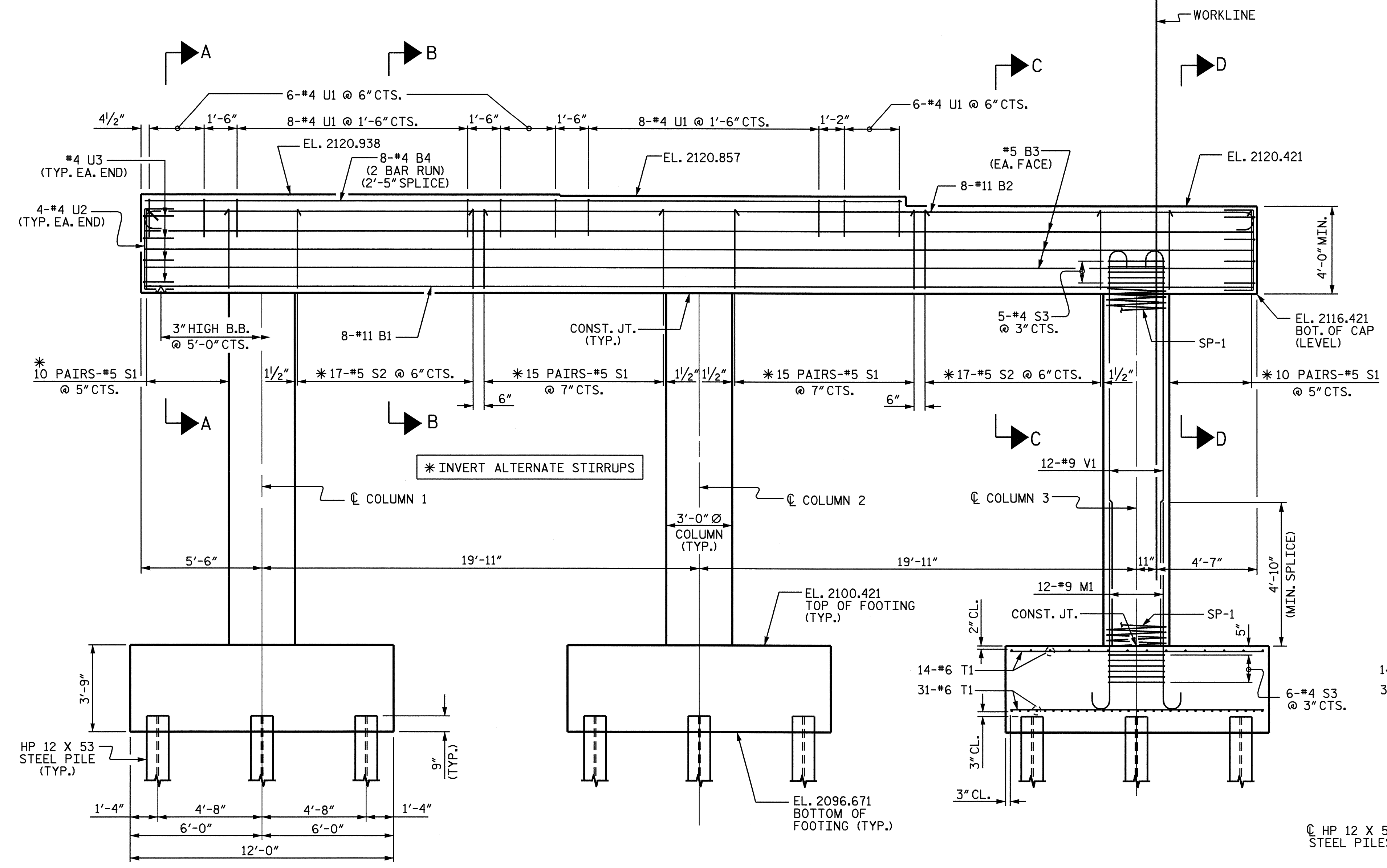
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.



**PLAN**

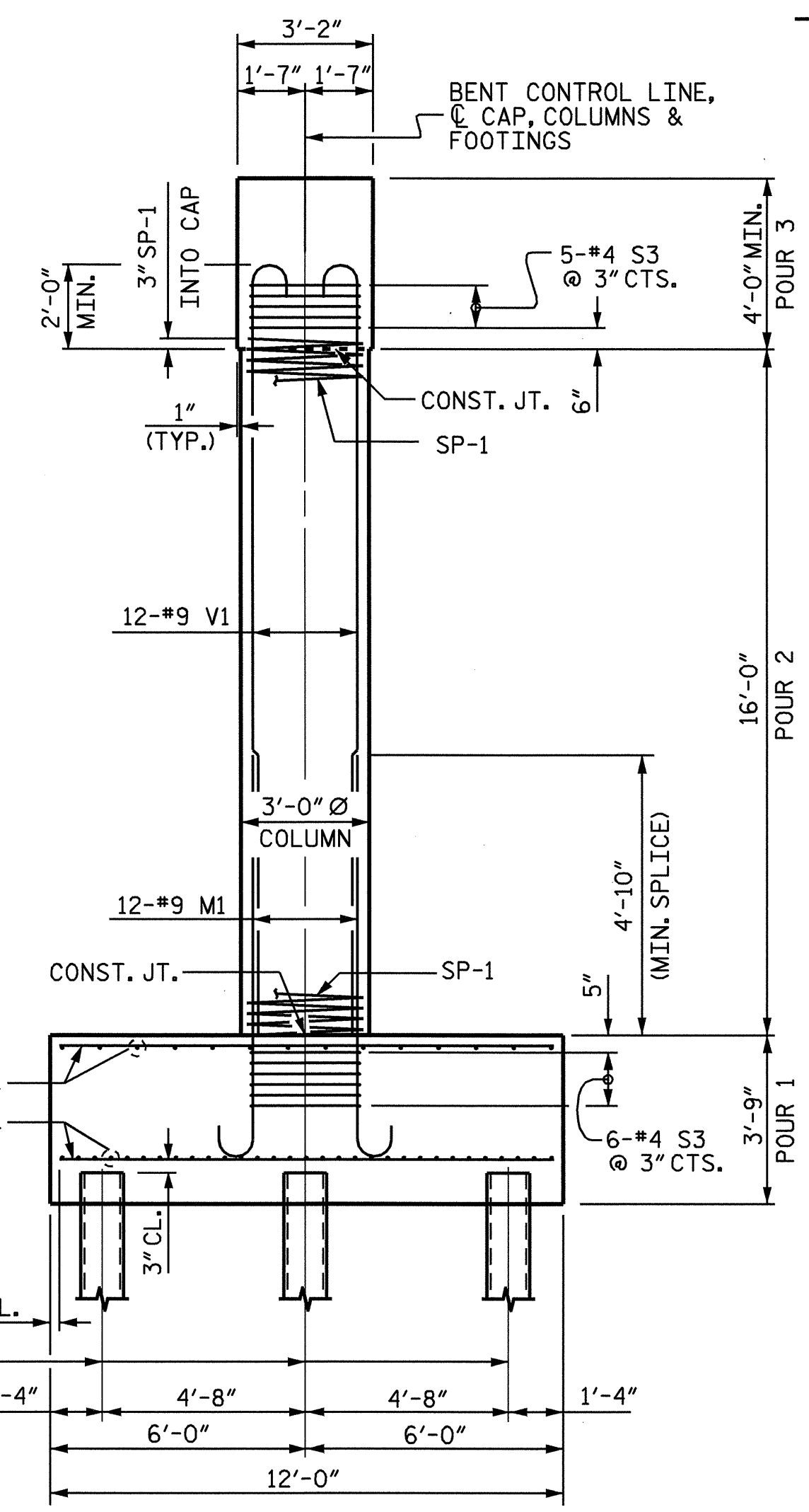


**DETAIL A**

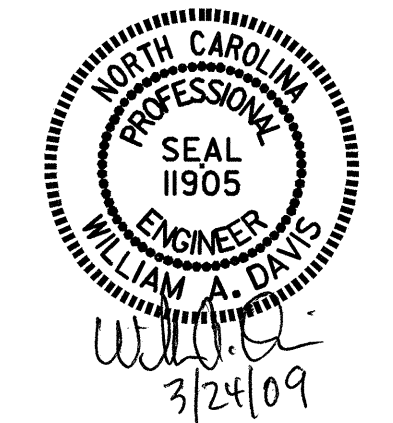


**ELEVATION**

(REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL COLUMNS AND PILE FOOTINGS)



**END ELEVATION**



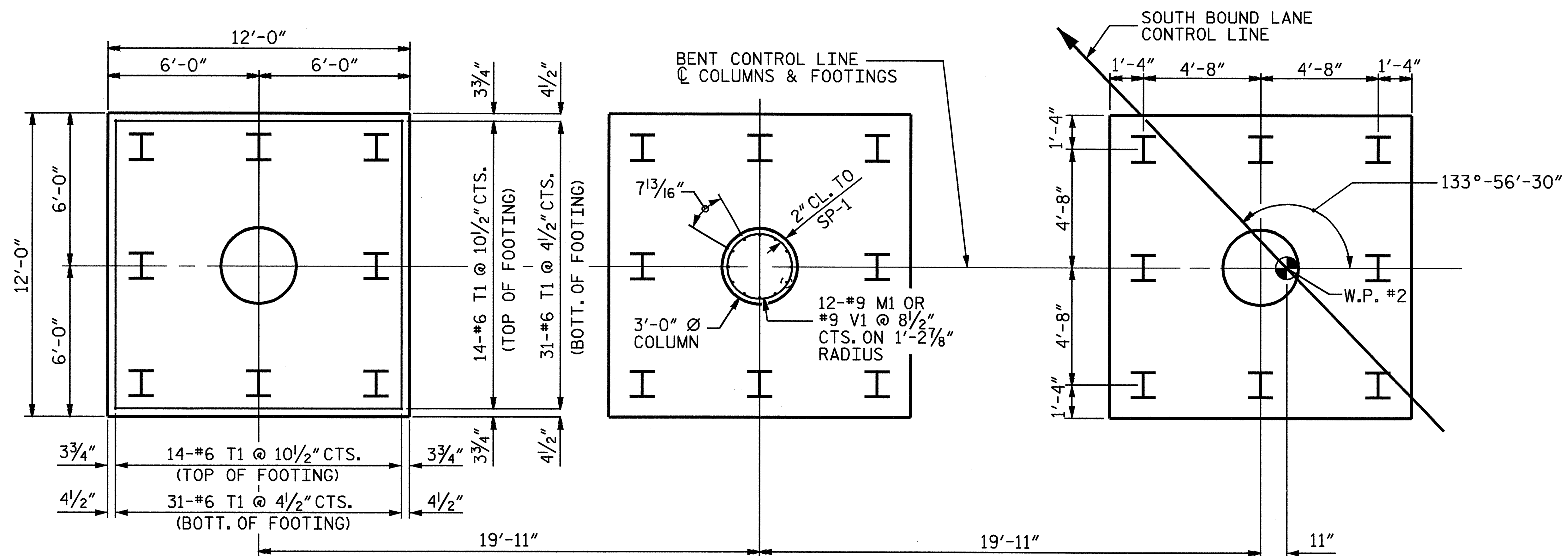
PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
**BENT 1 (SBL)**

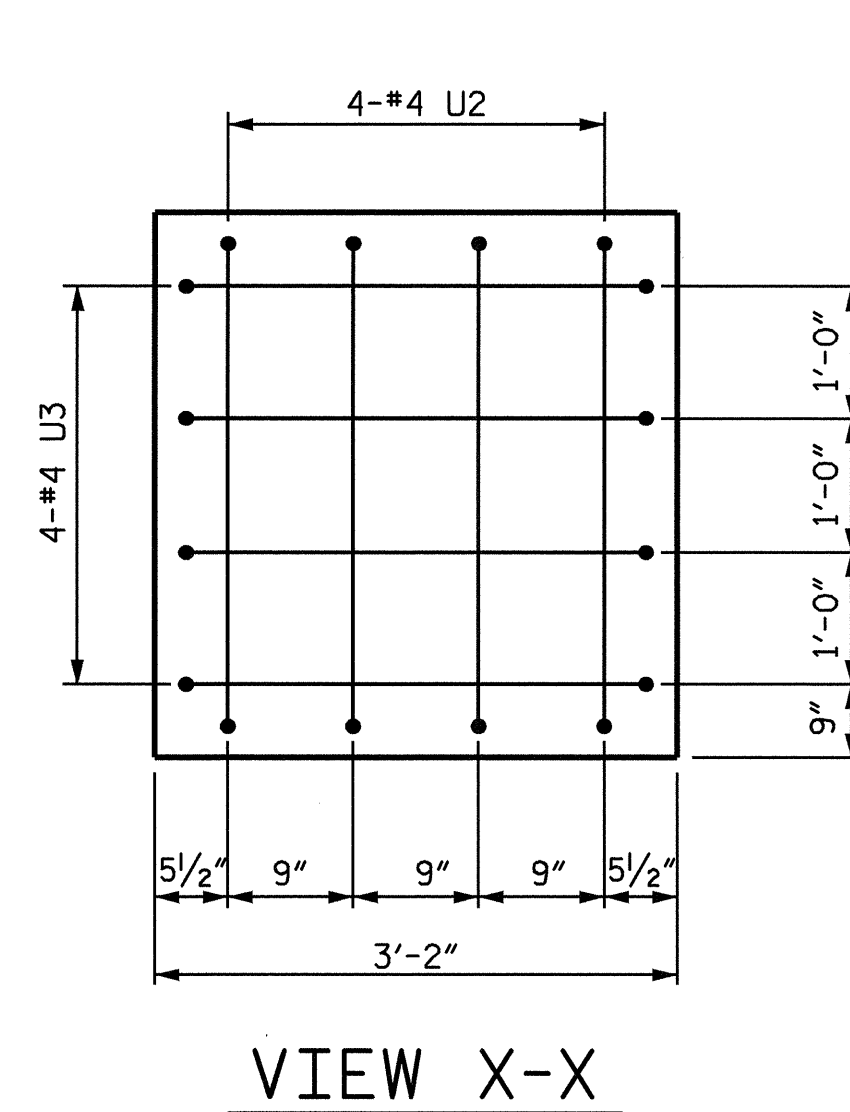
DRAWN BY: Q.T. NGUYEN DATE: 11-08  
 CHECKED BY: S. DOMBROWSKI DATE: 12-08

REVISIONS						SHEET NO. S-21
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			56

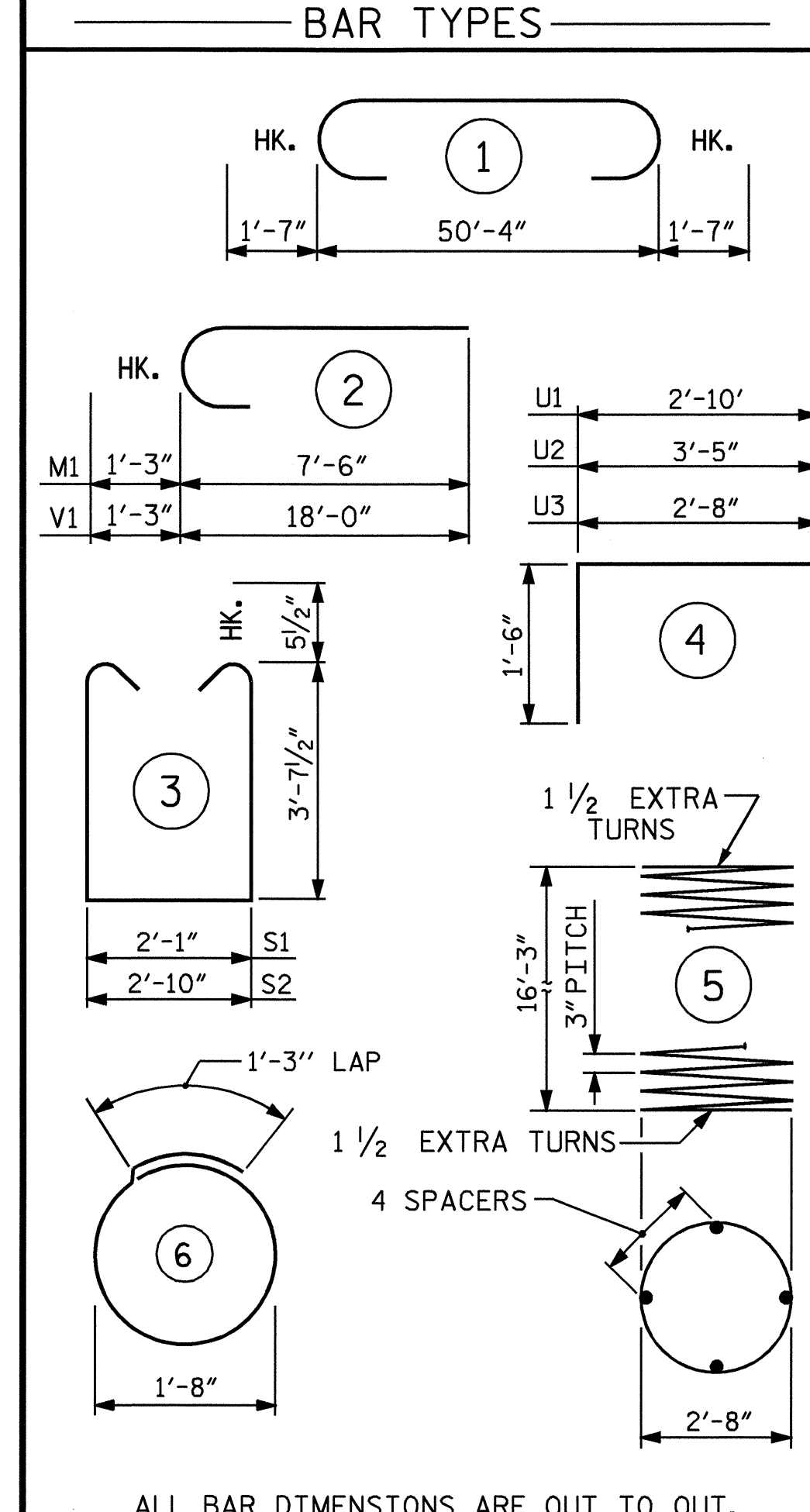


**PLAN OF FOOTINGS & COLUMNS**

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND PILE FOOTING UNLESS OTHERWISE NOTED

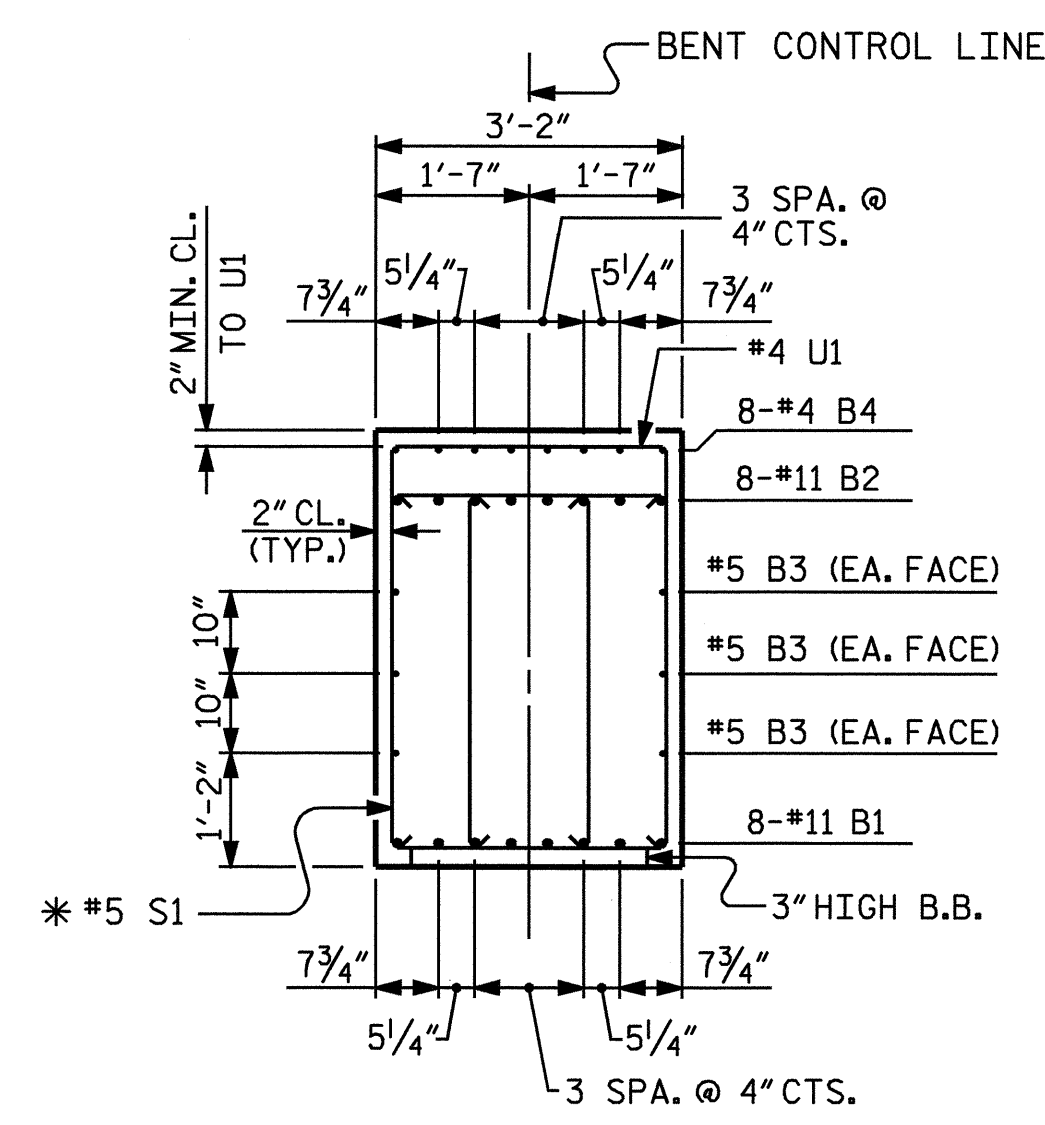


**VIEW X-X**

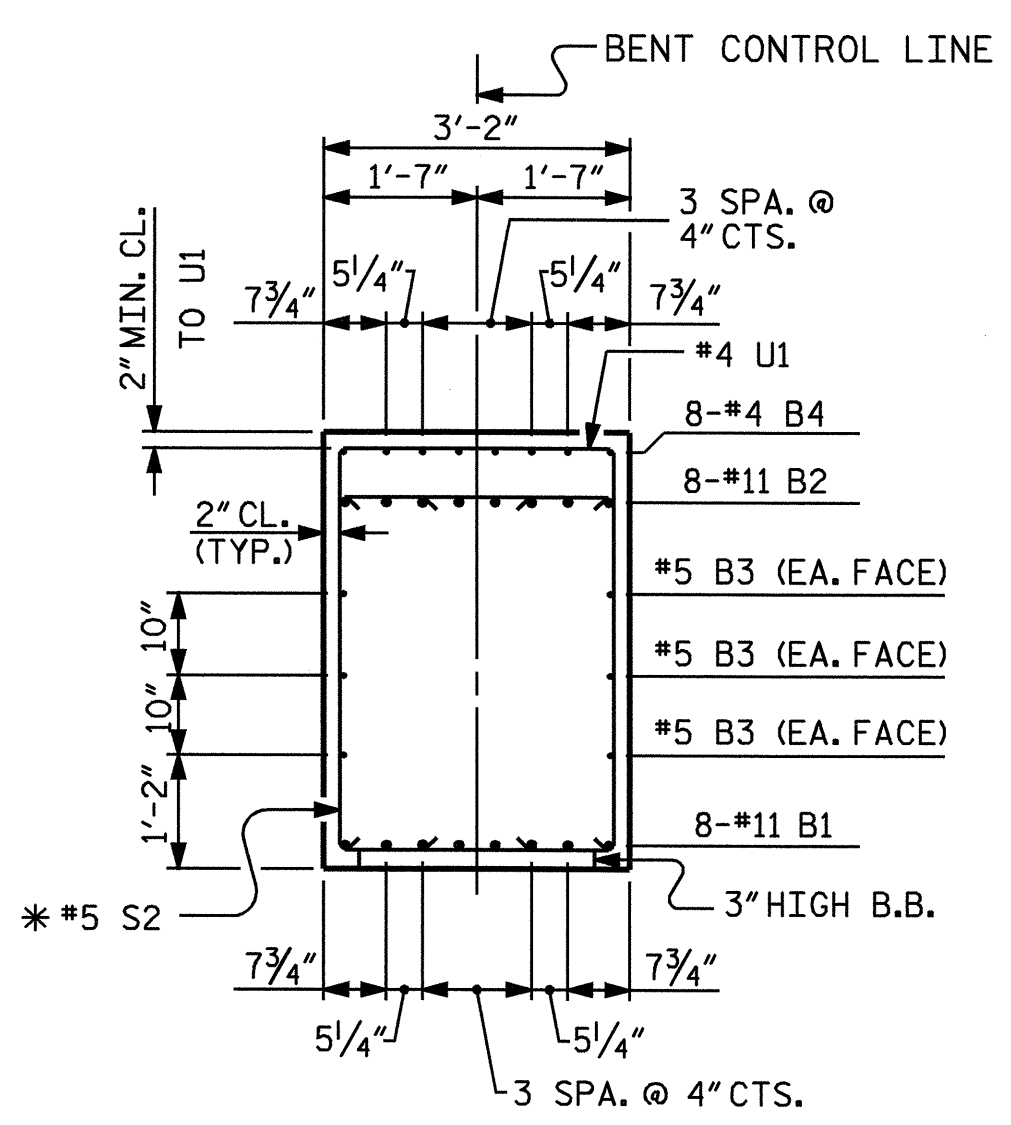


**BILL OF MATERIAL BENT 1**

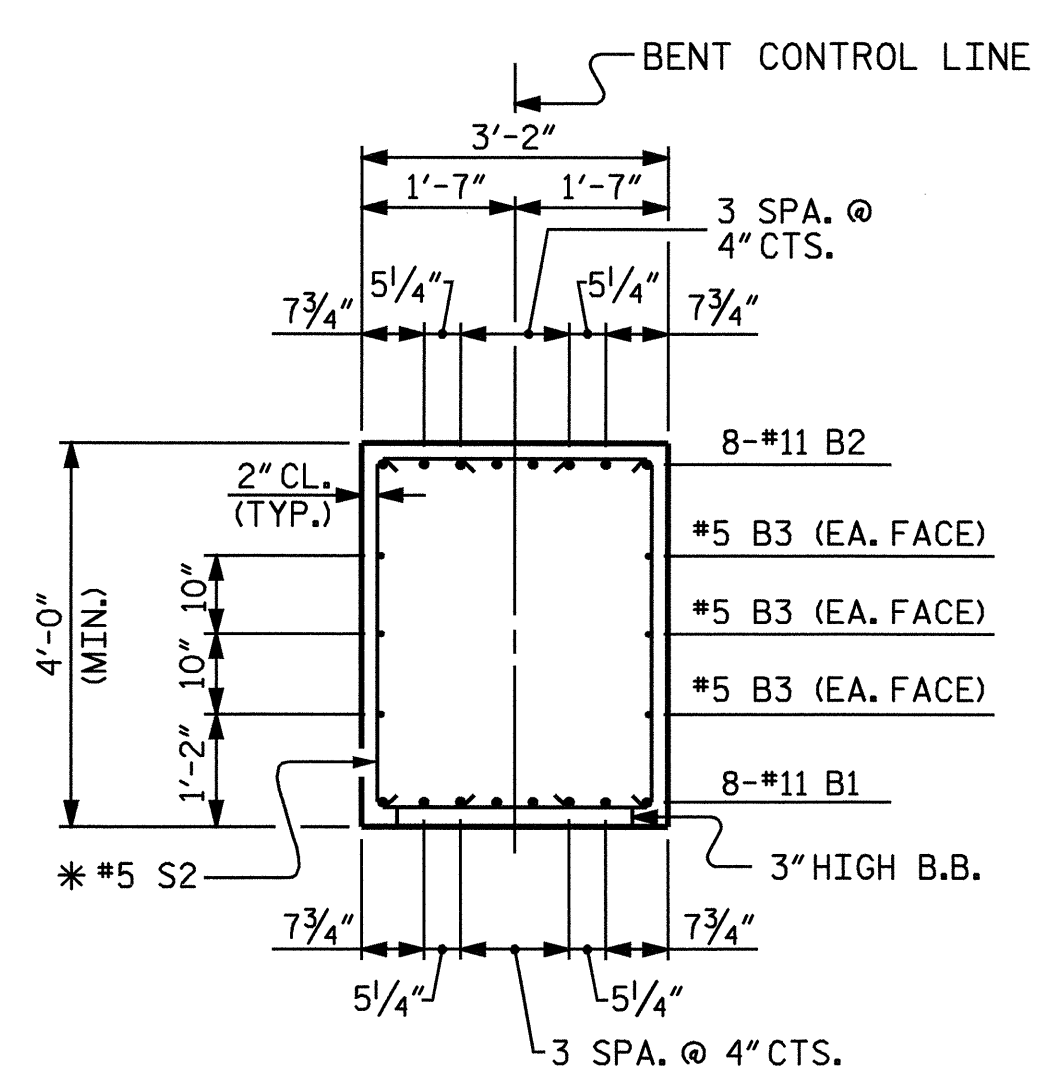
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#11	STR	50'-6"	2146
B2	8	#11	1	53'-6"	2274
B3	6	#5	STR	50'-6"	316
B4	16	#4	STR	18'-6"	198
M1	36	#9	2	8'-9"	1071
S1	100	#5	3	10'-3"	1069
S2	34	#5	3	11'-0"	390
S3	33	#4	6	6'-6"	143
T1	270	#6	STR	11'-6"	4664
U1	34	#4	4	5'-10"	132
U2	8	#4	4	6'-5"	34
U3	8	#4	4	5'-8"	30
V1	36	#9	2	19'-3"	2356
REINFORCING STEEL				14823	LBS.
SP-1	3	**	5	561'-1"	1124
SPIRAL COLUMN REINFORCING STEEL (SP-1)				=	1124 LBS
CLASS A CONCRETE BREAKDOWN:					
POUR #1 (FOOTINGS)				60.0	C.Y.
POUR #2 (COLUMNS)				11.5	C.Y.
POUR #3 (CAP)				25.8	C.Y.
TOTAL CLASS A CONCRETE				97.3	C.Y.
HP 12 X 53 STEEL PILES				No. 24	LIN. FT. 900
** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W-20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.					



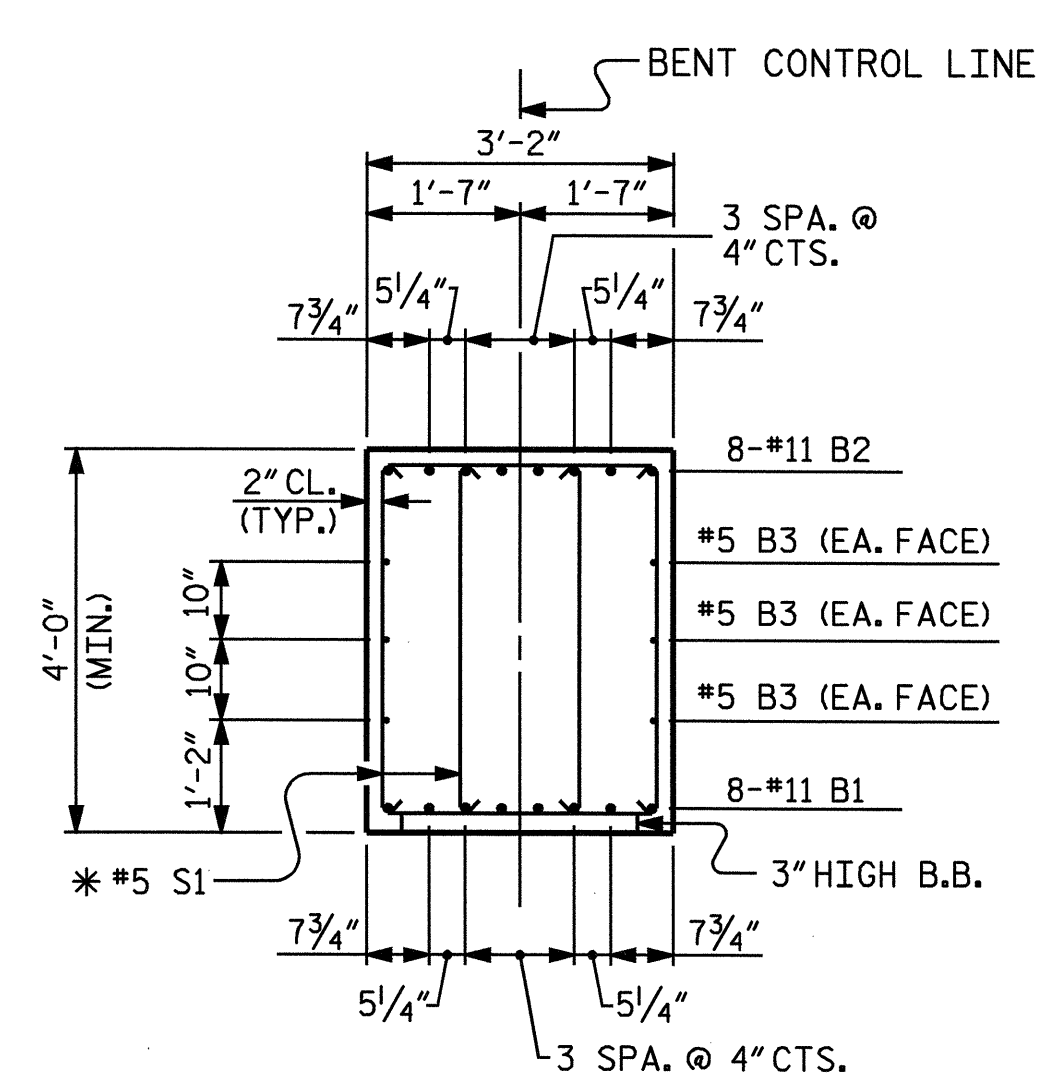
**SECTION A-A**



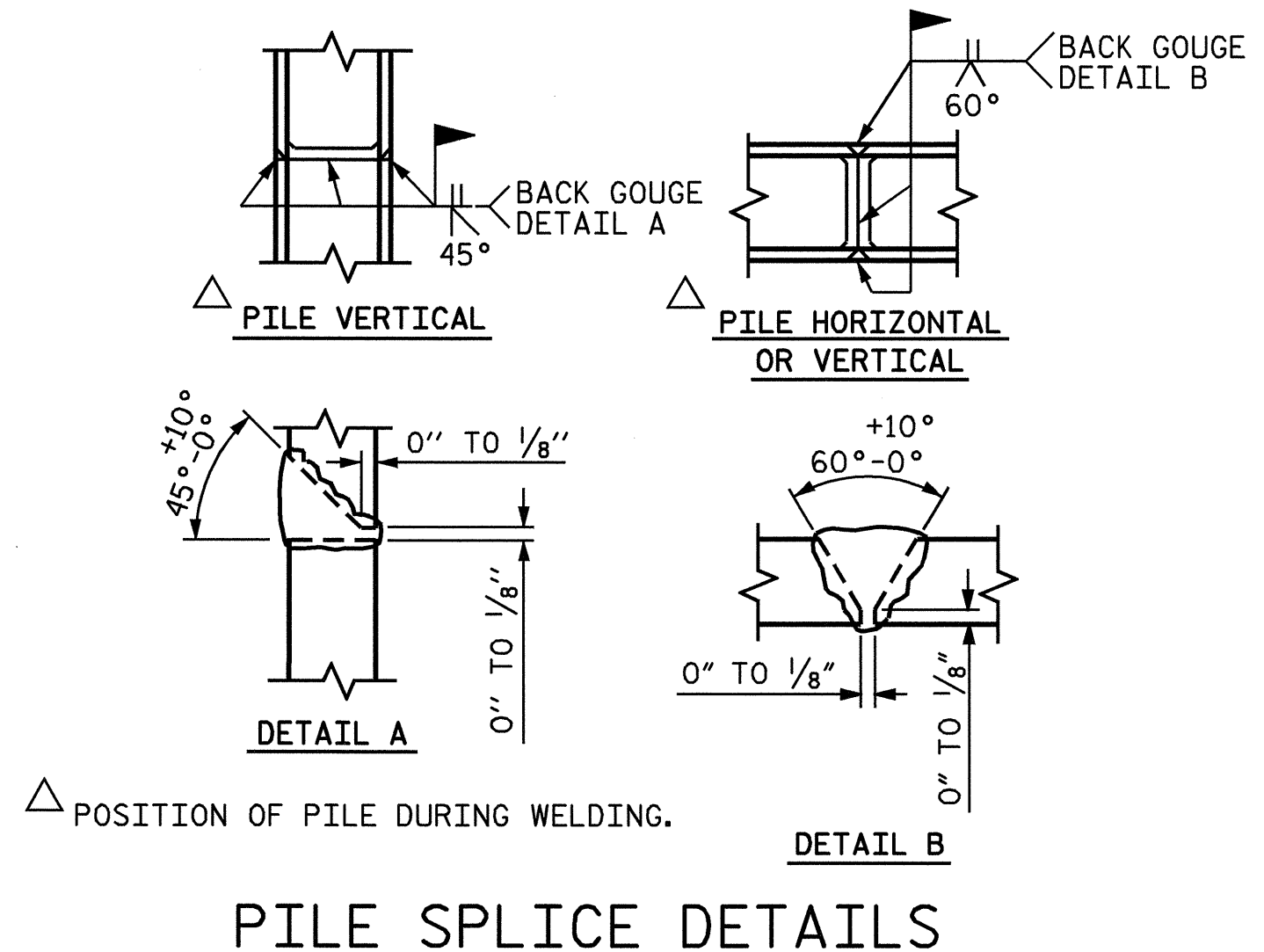
**SECTION B-B**



**SECTION C-C**



**SECTION D-D**



**PILE SPLICE DETAILS**

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1  
 (SBL)



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

DRAWN BY: O.T. NGUYEN DATE: 11-08  
 CHECKED BY: S. DOMBROWSKI DATE: 12-08

\* INVERT ALTERNATE STIRRUPS



**NOTES**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

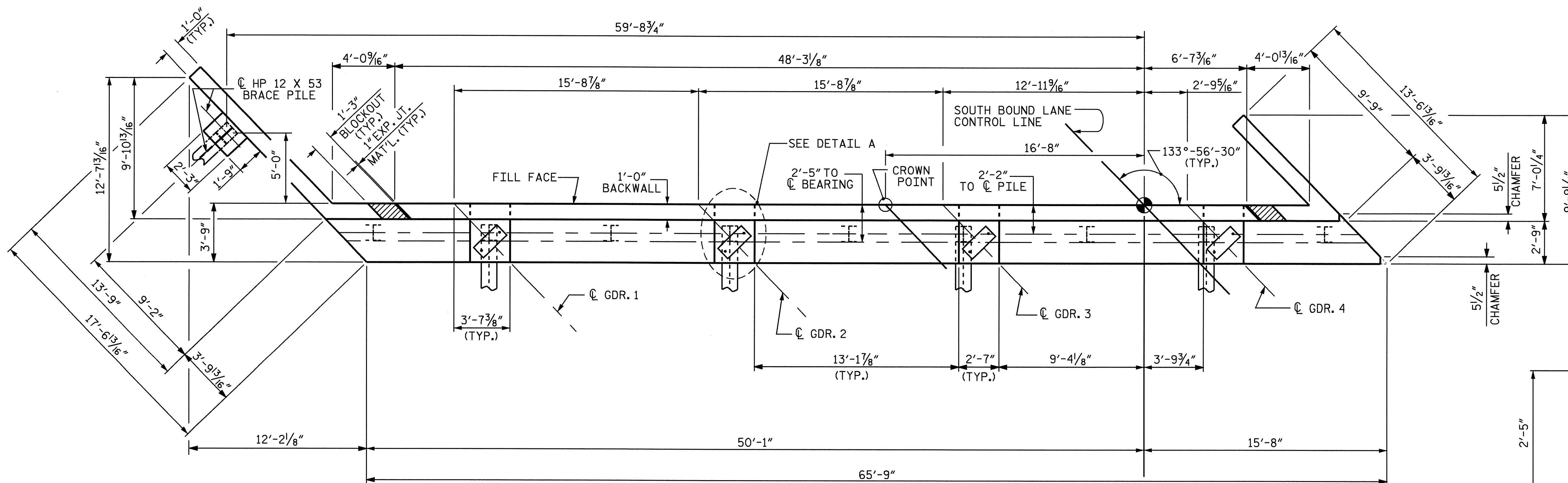
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

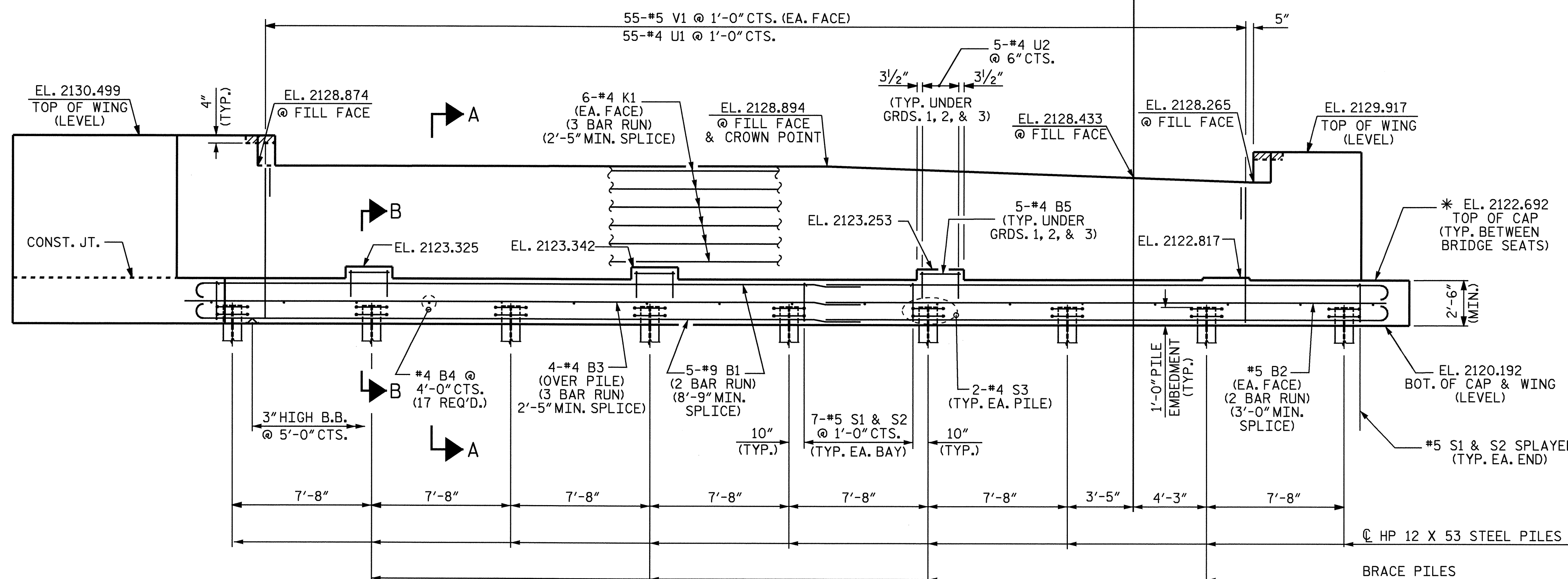
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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

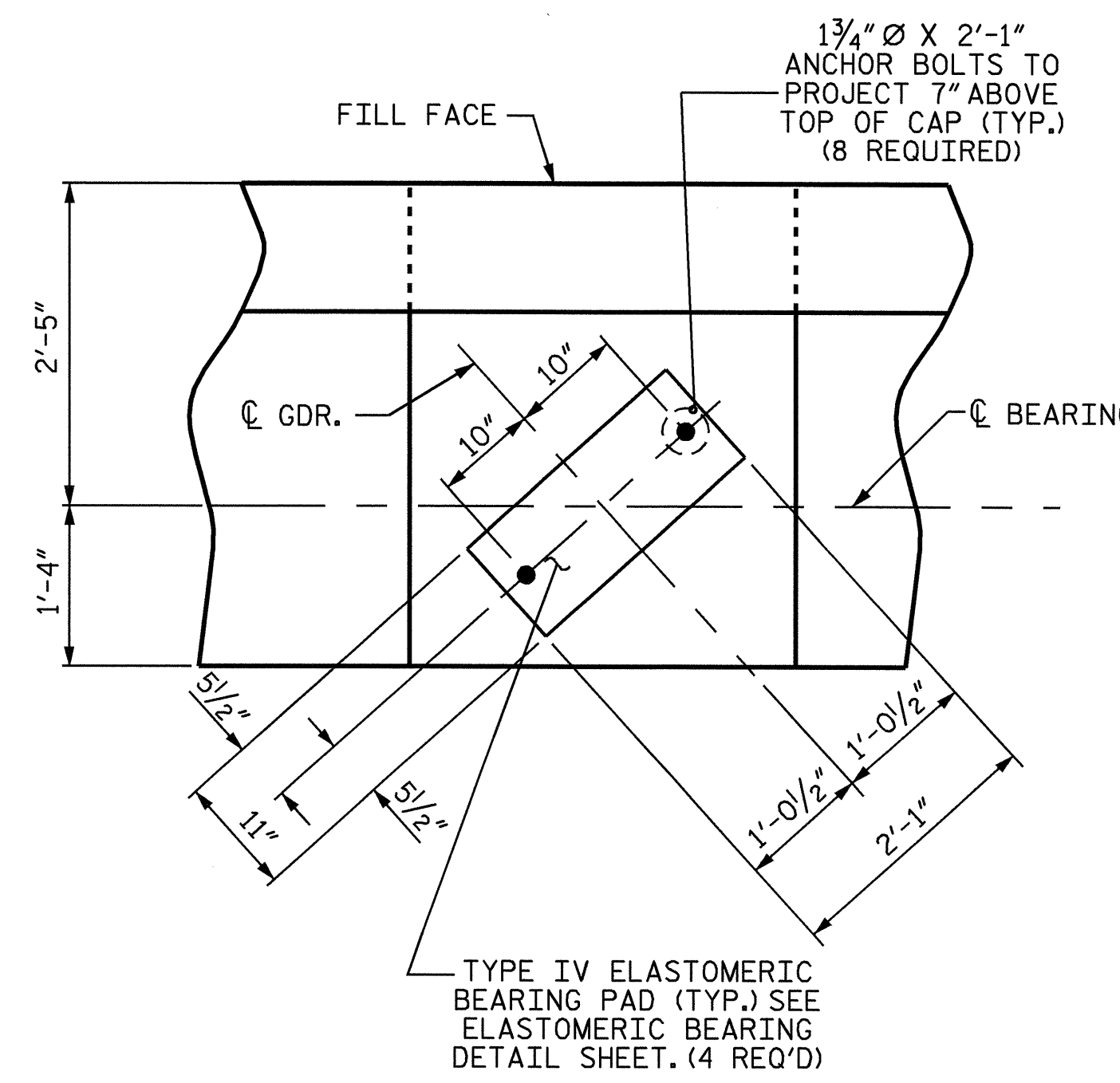


**PLAN**



**ELEVATION**

RIGHT WING NOT SHOWN FOR CLARITY  
BRACE PILE IN WING NOT SHOWN FOR CLARITY

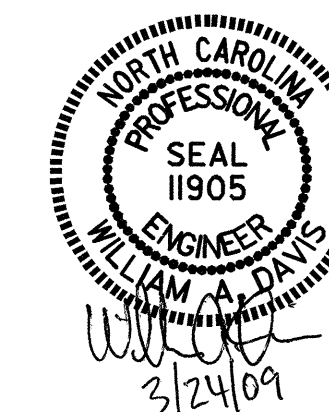


**DETAIL A**

\* FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 3 OF 3

PROJECT NO. R-0505  
HENDERSON COUNTY  
STATION: 780+05.14 -L-

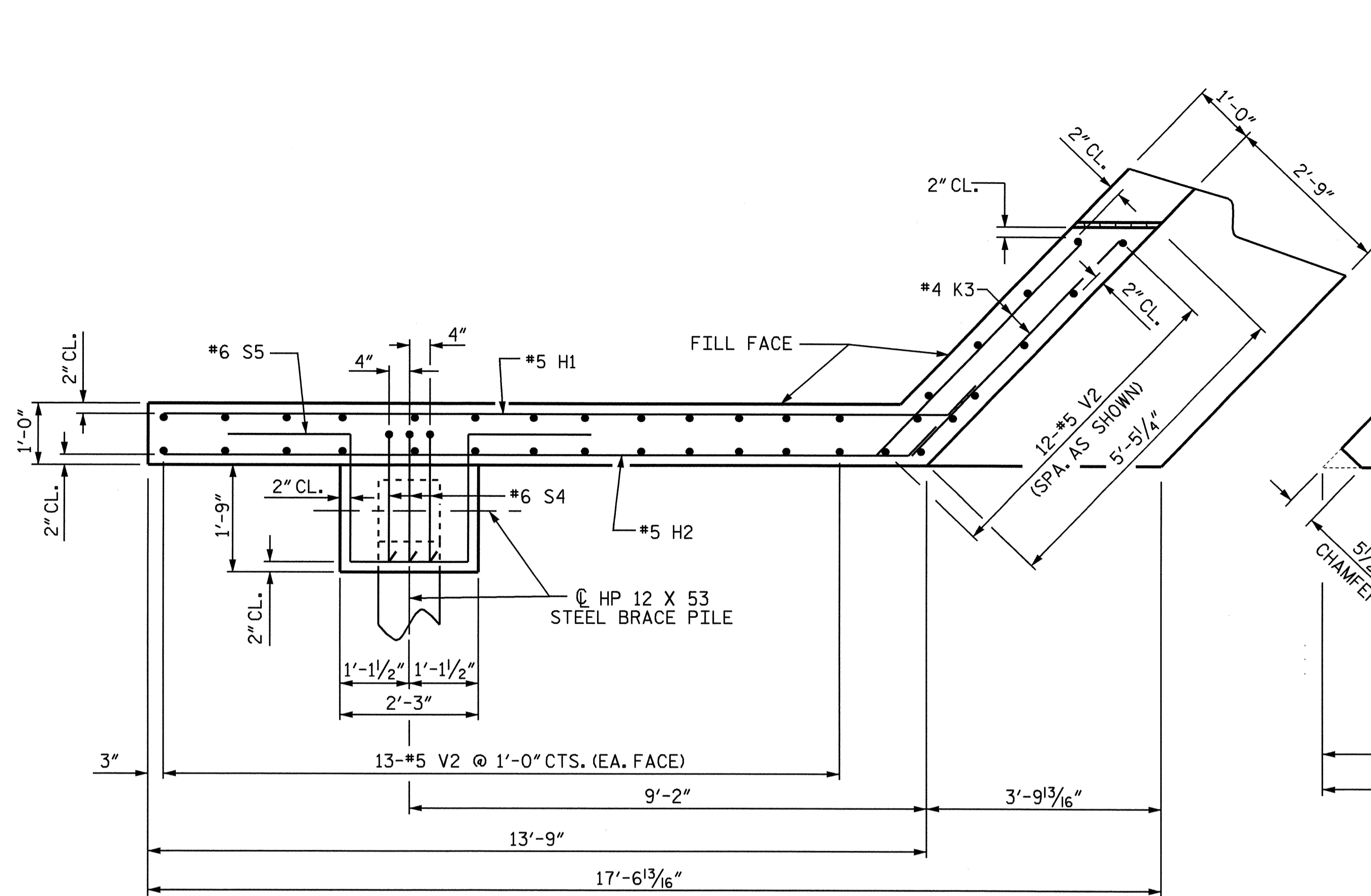
SHEET 1 OF 3



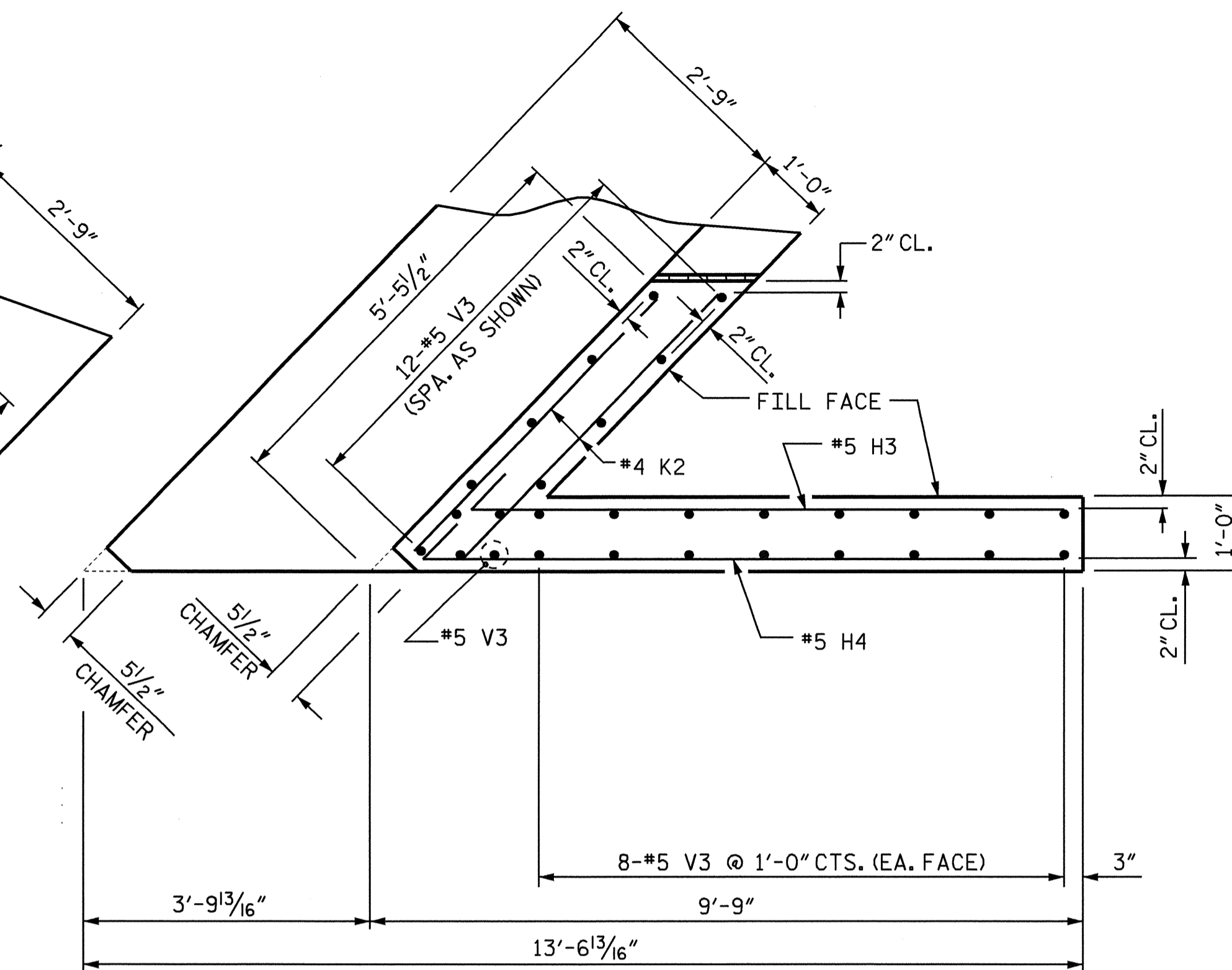
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
END BENT 2  
(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			56

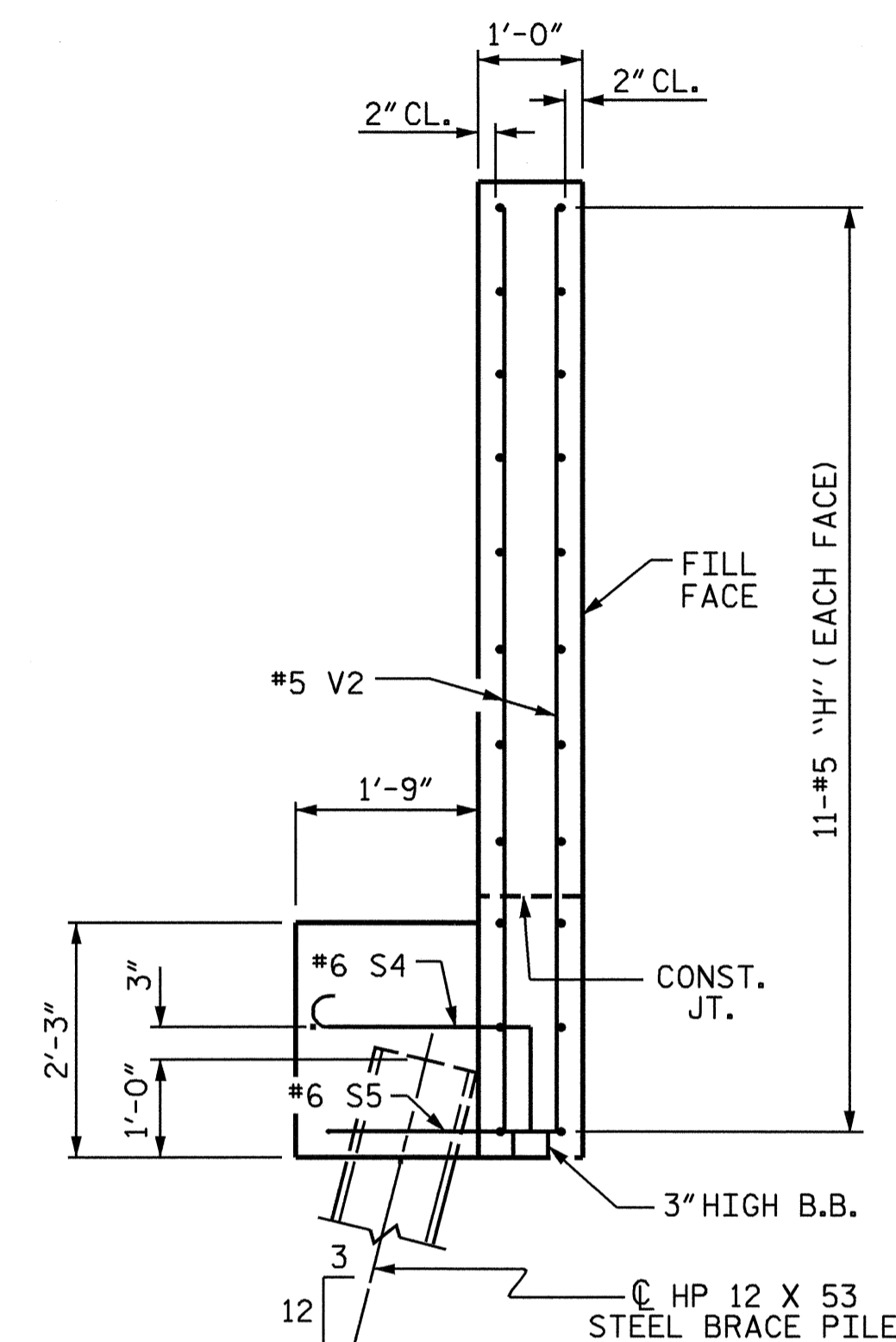
DRAWN BY: QT NGUYEN DATE: 10-08  
CHECKED BY: S. DOMBROWSKI DATE: 12-08



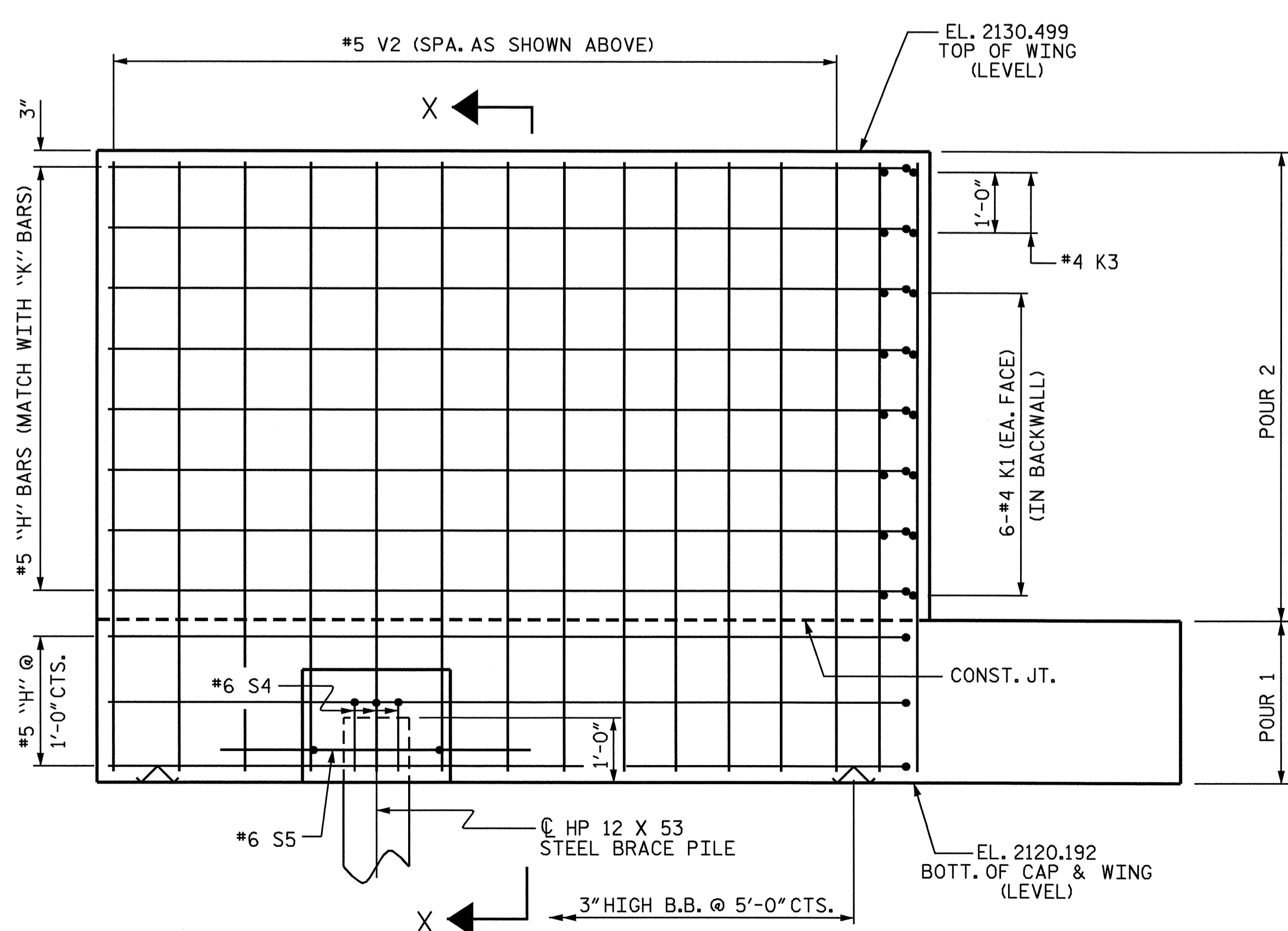
PLAN OF LEFT WING W1



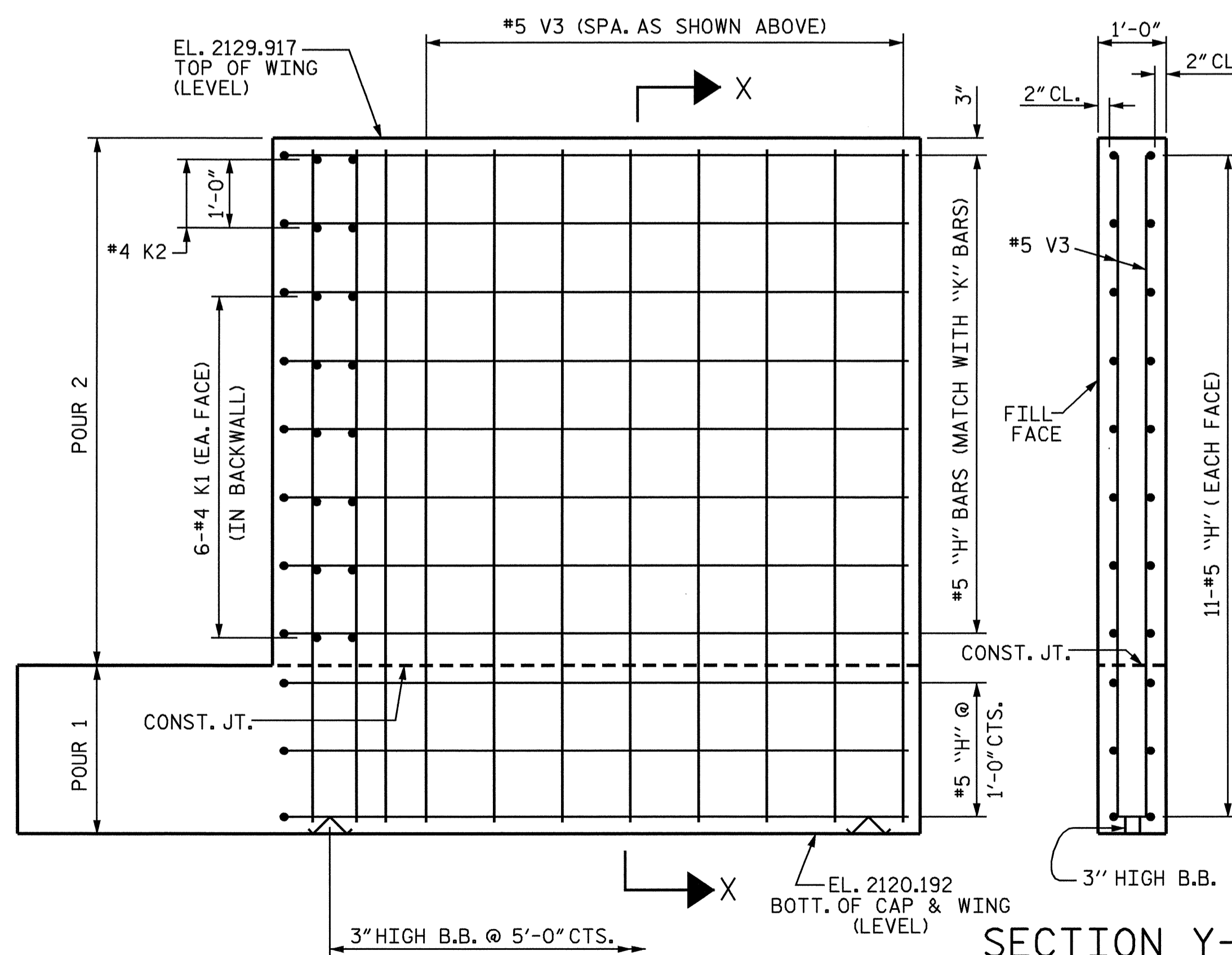
PLAN OF RIGHT WING W2



SECTION X-X

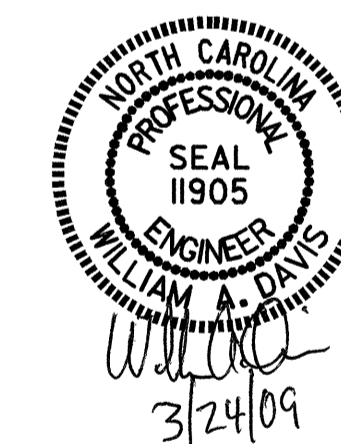


ELEVATION OF LEFT WING W1



ELEVATION OF RIGHT WING W2

SECTION Y-Y



PROJECT NO. R-0505  
 HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 2  
 (SBL)

REVISIONS						SHEET NO. S-24
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 56
2			4			

DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: S. DOMBROWSKI DATE: 12-08

24-MAR-2009 07:02  
 y:\p\projects-r\0505\structures\final plans\sbl-127 str1\0505.ed.e1\*.dgn  
 qtnguyen

**BILL OF MATERIAL**

**END BENT 2**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	20	#9	1	38'-4"	2607
B2	4	#5	STR	34'-3"	143
B3	12	#4	STR	23'-5"	188
B4	17	#4	STR	3'-5"	39
B5	15	#4	STR	2'-3"	23
H1	11	#5	2	14'-10"	170
H2	11	#5	2	14'-3"	163
H3	11	#5	3	9'-0"	103
H4	11	#5	3	9'-6"	109
K1	36	#4	STR	23'-4"	561
K2	4	#4	STR	4'-9"	13
K3	4	#4	STR	5'-2"	14
S1	58	#5	4	4'-4"	262
S2	58	#5	5	8'-7"	519
S3	18	#4	9	6'-5"	77
S4	3	#6	7	3'-9"	17
S5	1	#6	8	10'-1"	15
U1	55	#4	6	4'-8"	171
U2	15	#4	6	6'-5"	64
V1	110	#5	STR	7'-6"	860
V2	38	#5	STR	9'-10"	390
V3	29	#5	STR	9'-3"	279

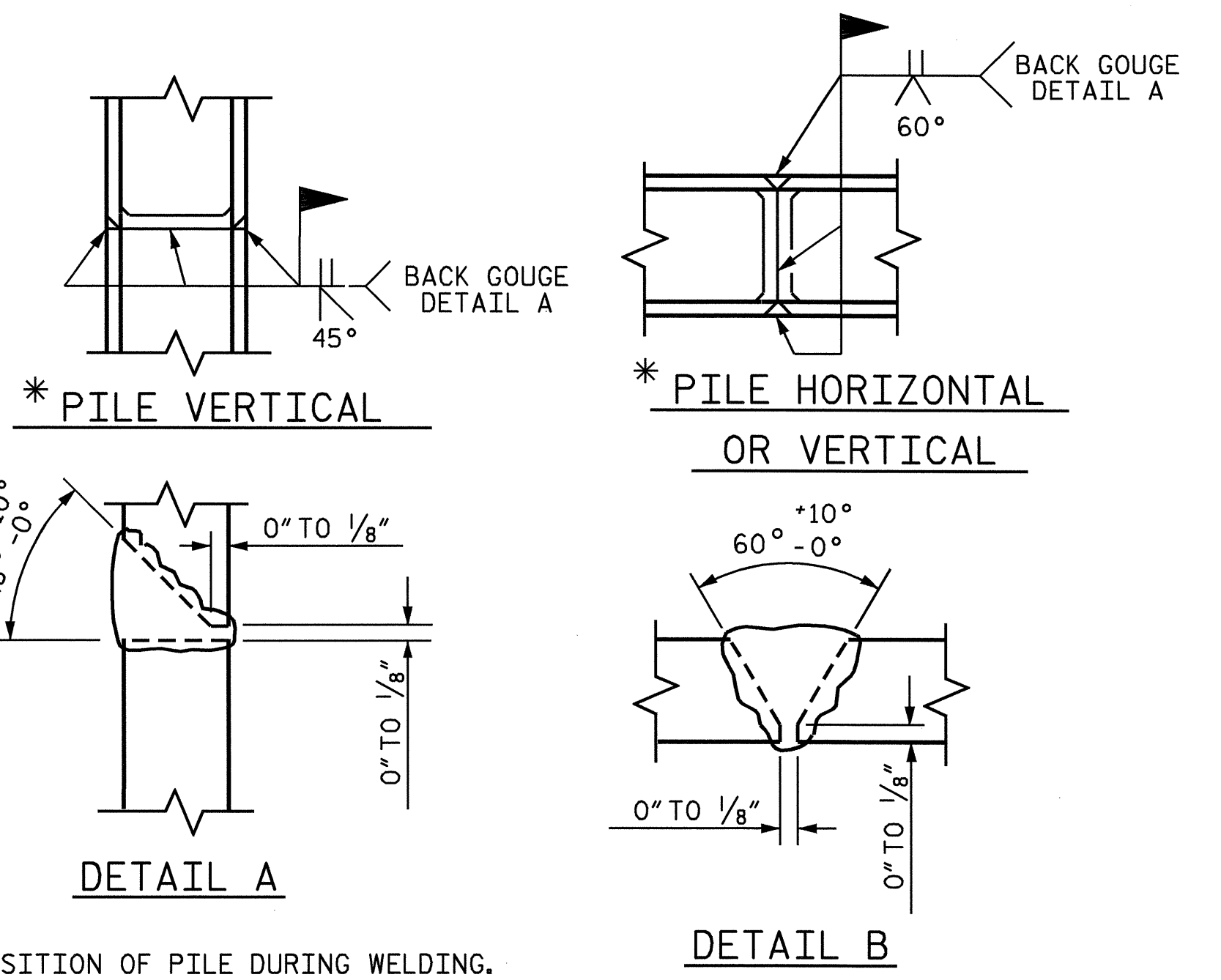
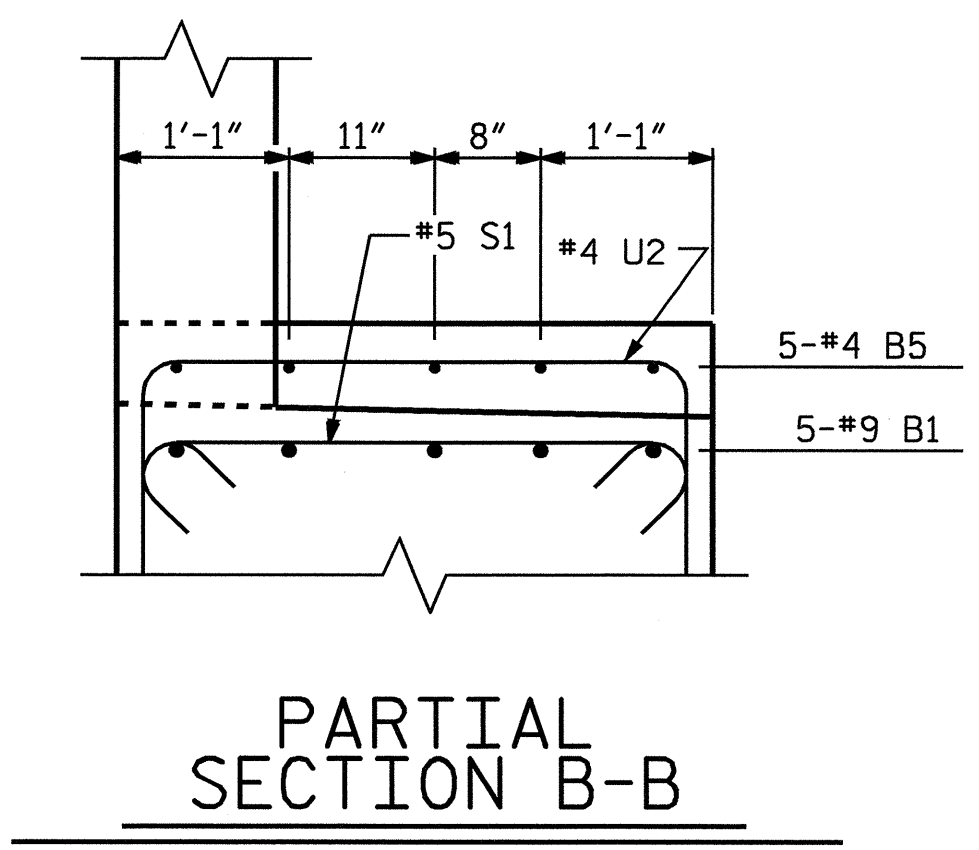
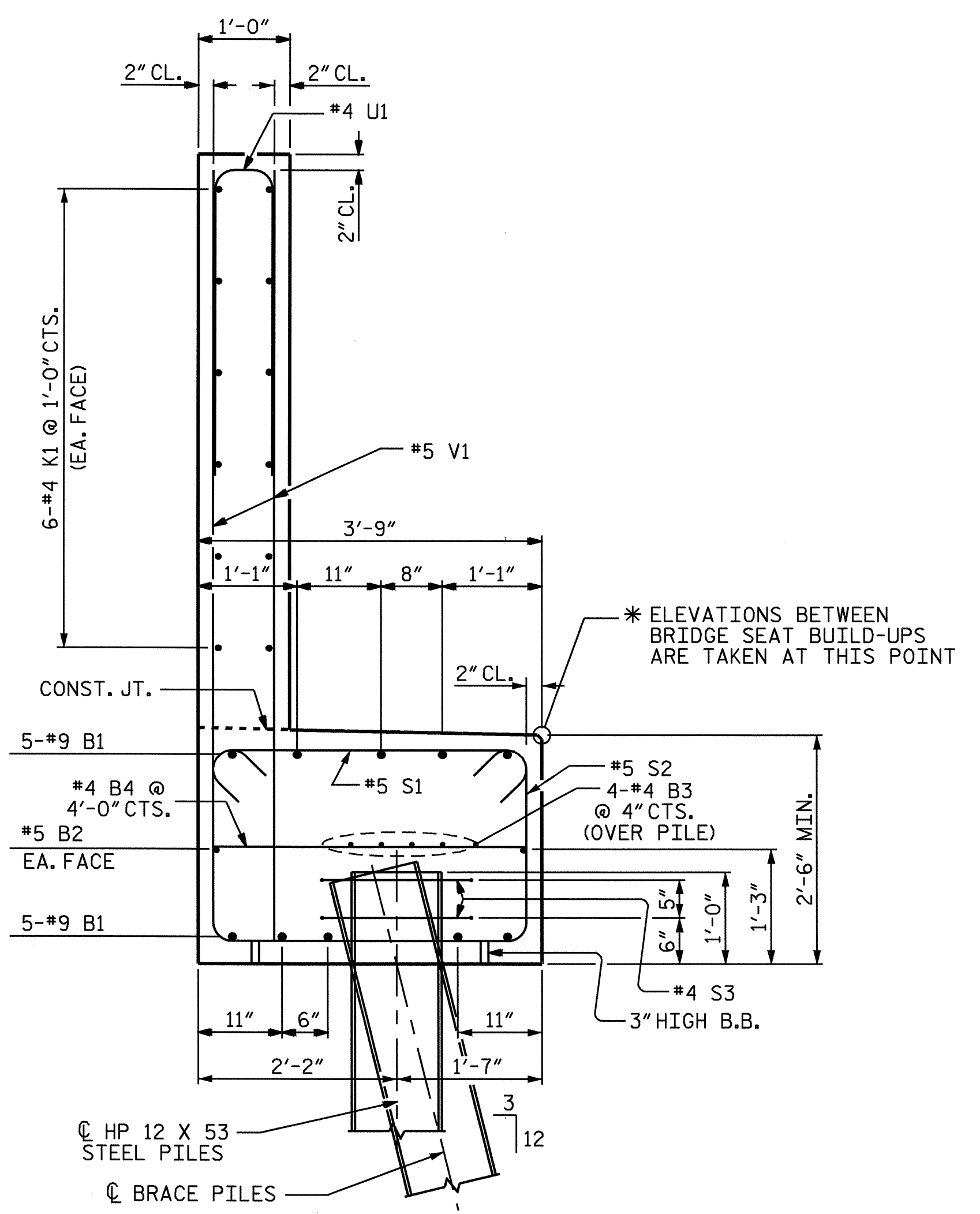
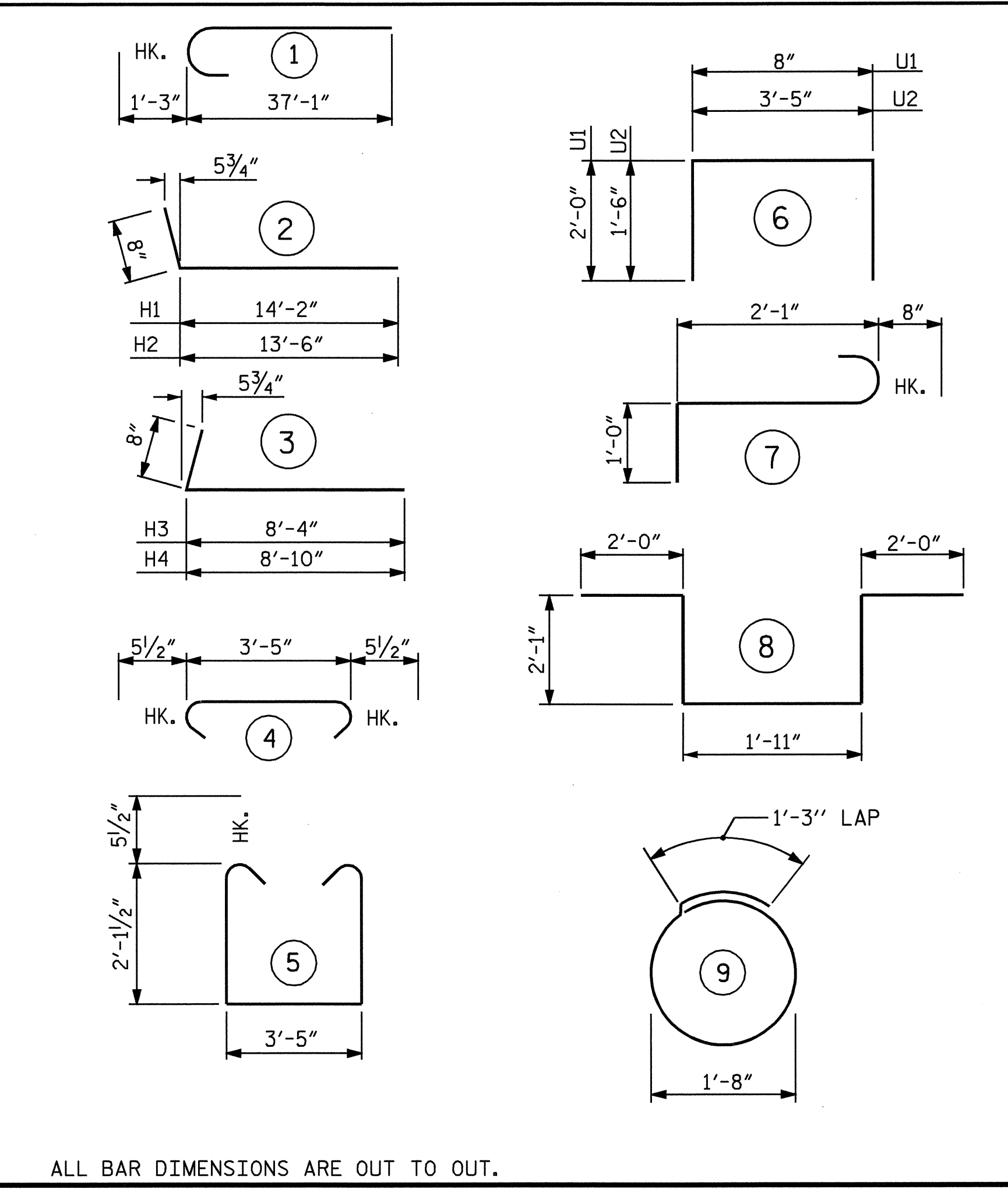
REINFORCING STEEL = LBS 6787

CLASS A CONCRETE  
 POUR 1: CAP & LOWER WINGS C.Y. 19.3  
 POUR 2: BACKWALL & UPPER WINGS C.Y. 20.6  
 CLASS A CONCRETE TOTAL C.Y. 39.9

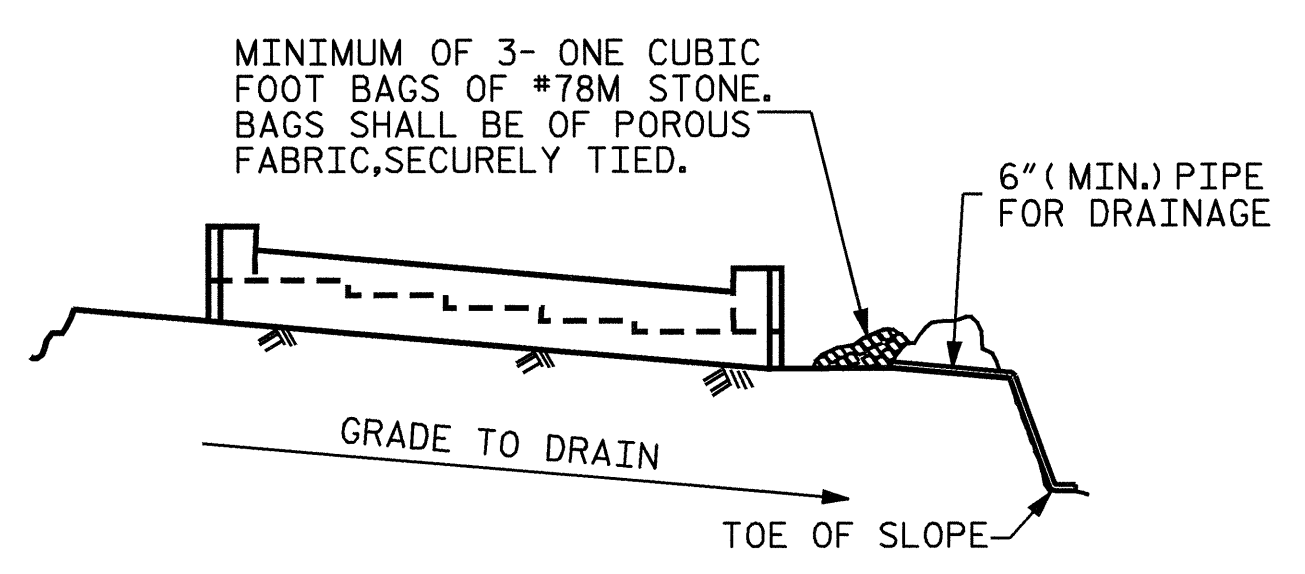
HP 12 X 53 STEEL PILES  
 NO. 10 LIN. FT. 575

STEEL PILE POINTS EA. 10

**BAR TYPES**



**PILE SPLICE DETAILS**



MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

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**

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2  
 (SBL)



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

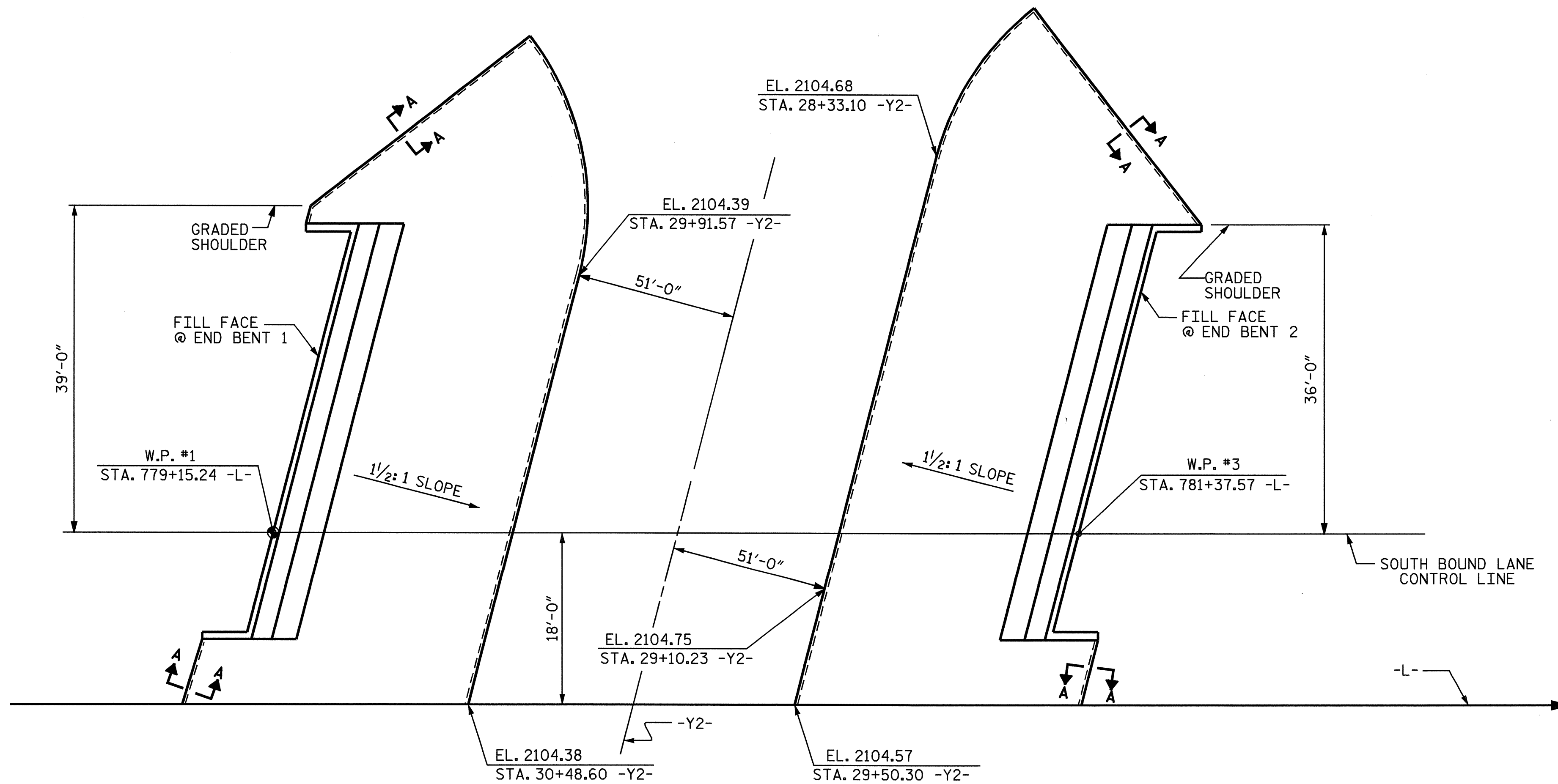
DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: S. DOMBROWSKI DATE: 12-08

**GENERAL NOTES**

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

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

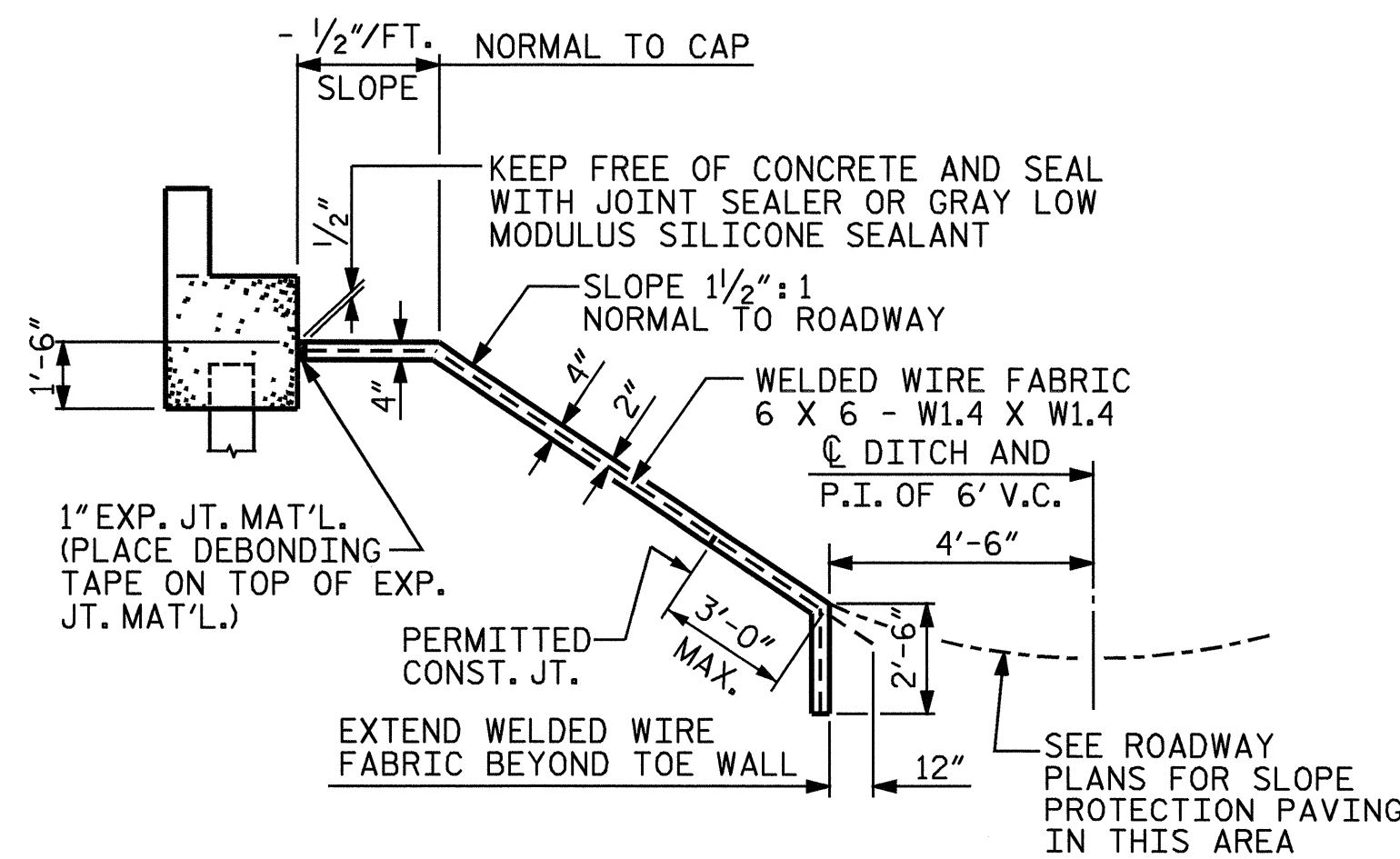
FOR BERM WIDTH AND ELEVATIONS, SEE GENERAL DRAWINGS.



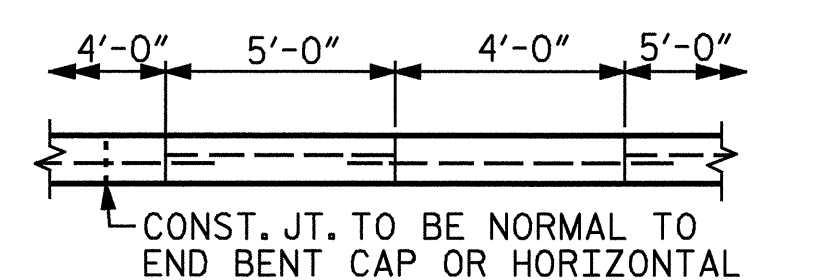
**PLAN**

BRIDGE @ STA. 780+05.14 -L- (SBL)	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	319	638
END BENT 2	371	742

\* QUANTITY SHOWN IS BASED ON 5' POURS.

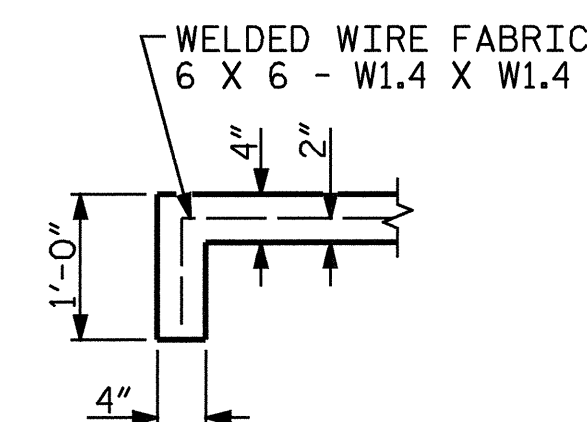


**SECTION ALONG C ROADWAY**

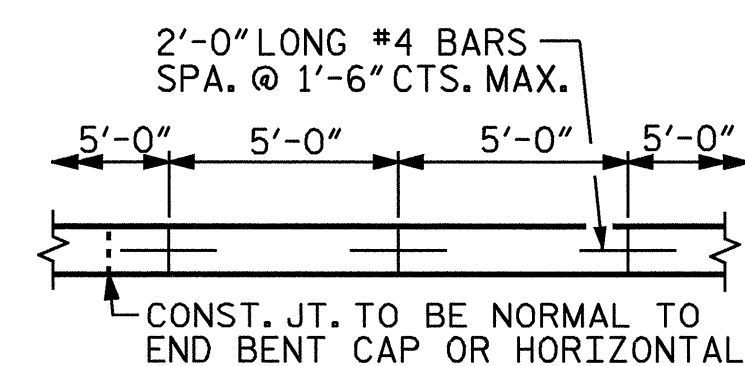


POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

**OPTIONAL POURING DETAIL**



**SECTION A-A**



STRIP WIDTHS MAY VARY IN CURVED PORTION.

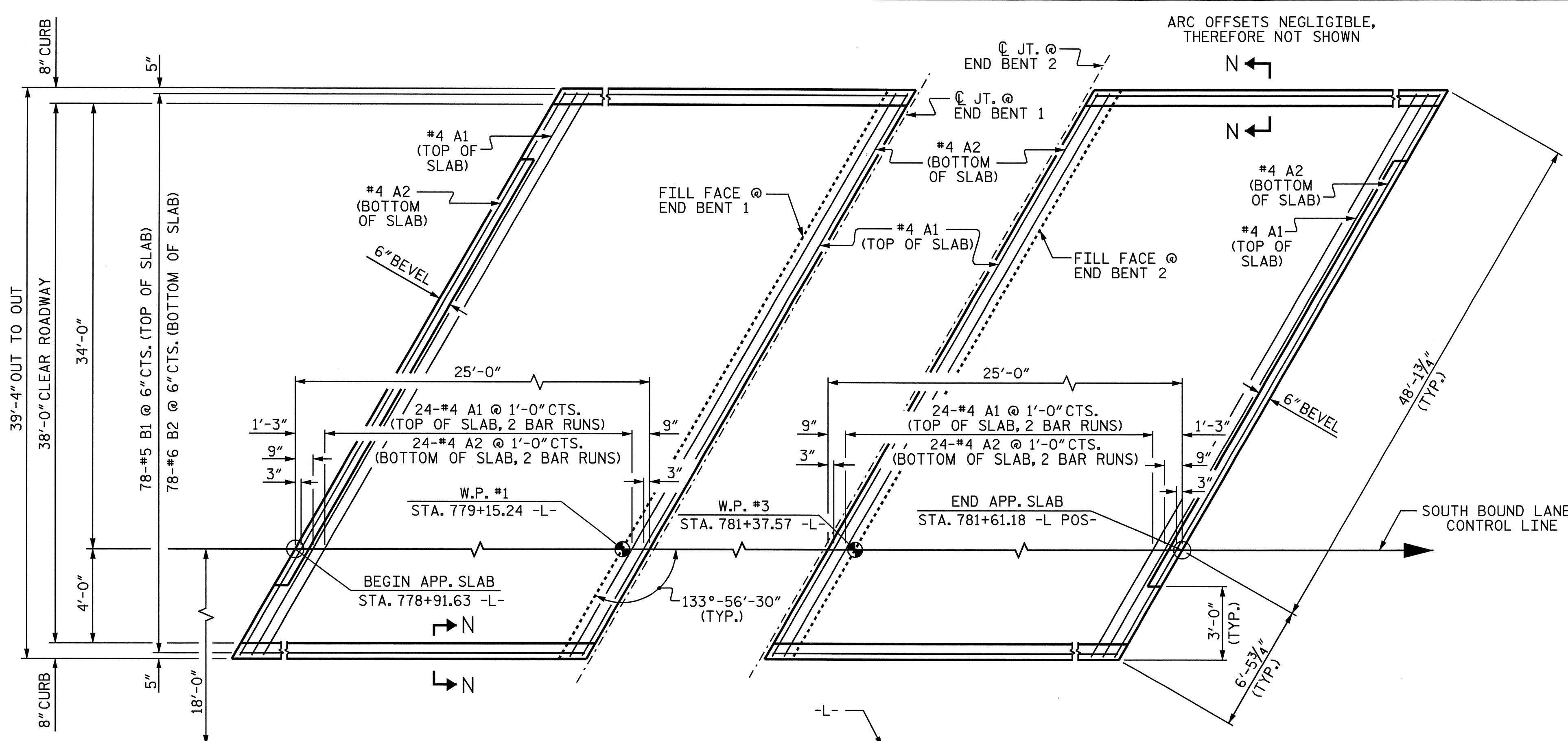
**POURING DETAIL**

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

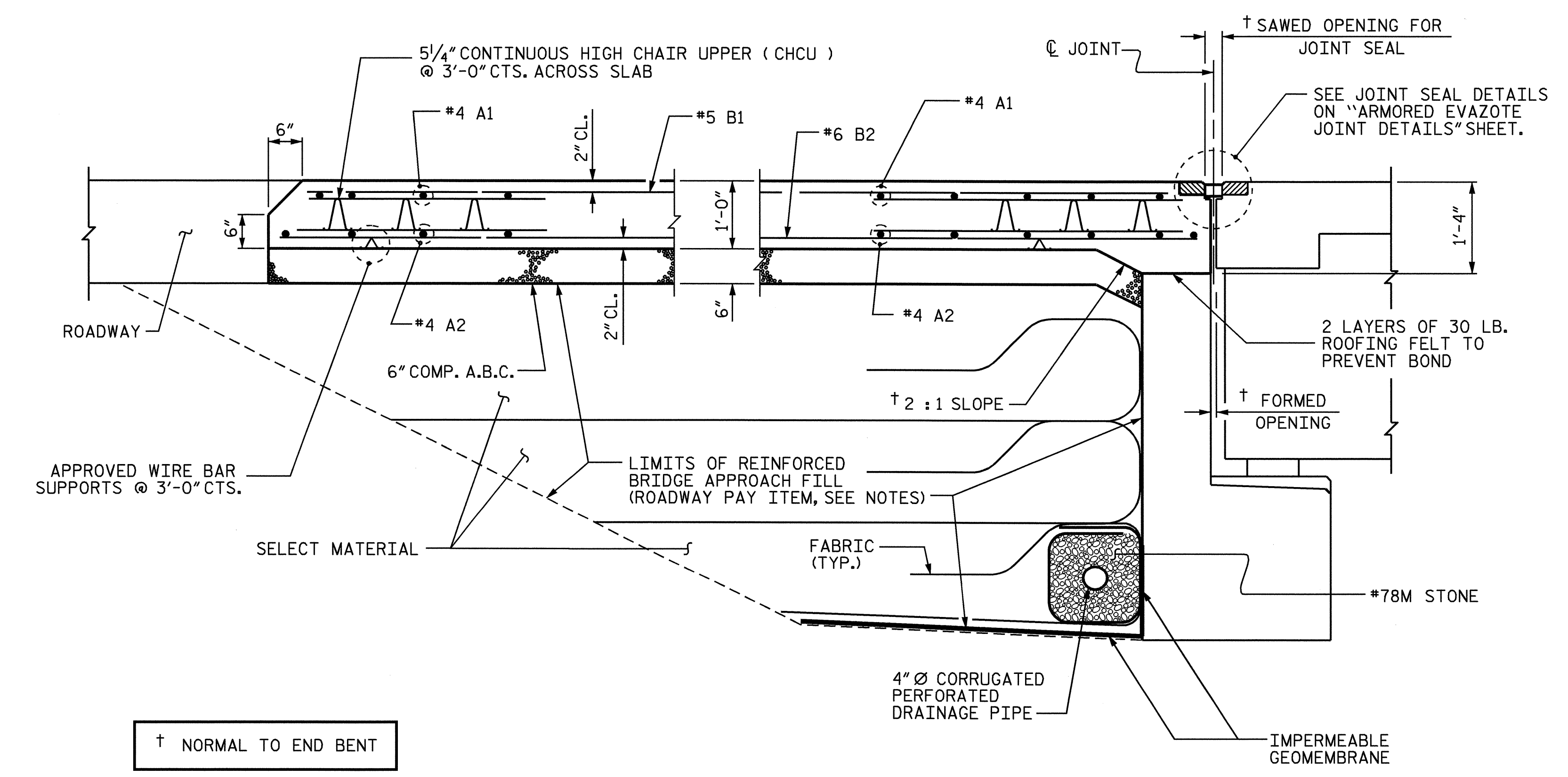


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-26
STANDARD SLOPE PROTECTION DETAILS (SBL)						TOTAL SHEETS 56
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

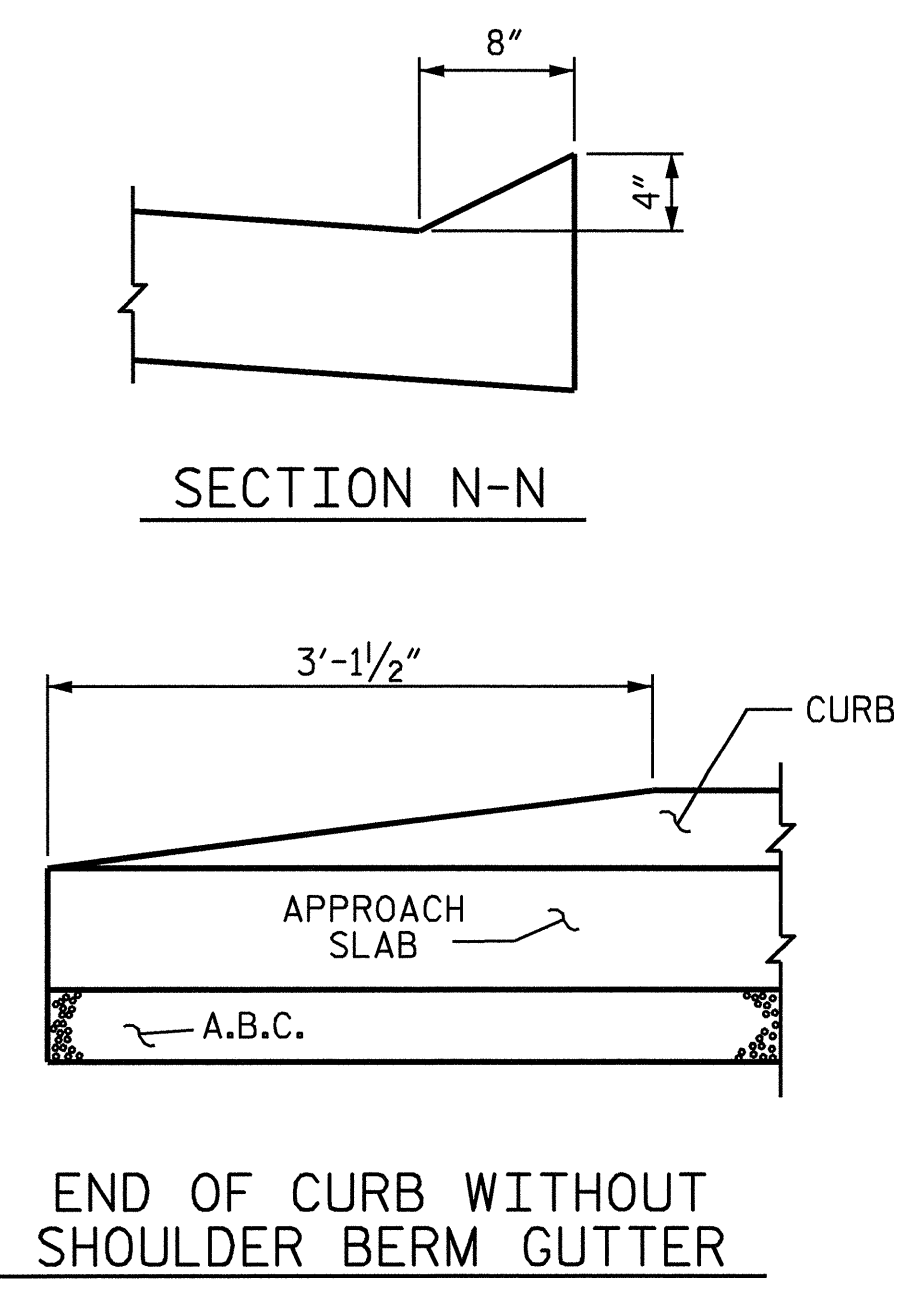
ASSEMBLED BY : QT NGUYEN DATE : 11-08  
 CHECKED BY : J. A. YANNAACONE DATE : 11-08  
 DRAWN BY : ELR 5/92 REV. 7/10/01 LES/RDR  
 CHECKED BY : GRP 6/92 REV. 5/7/03 RWW/JTE  
 REV. 5/1/06 TLA/GM



PLAN @ END BENT 1      PLAN @ END BENT 2  
 DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB



END OF CURB WITHOUT SHOULDER BERM GUTTER

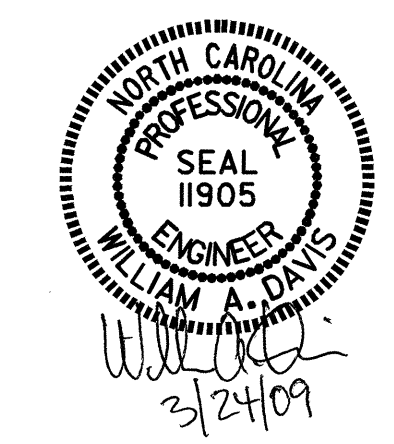
BILL OF MATERIAL					
APPROACH SLAB AT EBT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	28'-1"	976
A2	52	#4	STR	27'-11"	970
				REINFORCING STEEL	LBS. 3840
				*EPOXY COATED REINFORCING STEEL	LBS. 2928
				CLASS AA CONCRETE	C. Y. 49.7
APPROACH SLAB AT EBT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	28'-1"	976
A2	52	#4	STR	27'-11"	970
				REINFORCING STEEL	LBS. 3840
				*EPOXY COATED REINFORCING STEEL	LBS. 2928
				CLASS AA CONCRETE	C. Y. 49.7

NOTES

- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- 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.
- FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.
- THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 1/2".
- FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

PROJECT NO. R-0505  
 HENDERSON COUNTY  
 STATION: 780+05.14 -L-  
 SHEET 1 OF 2

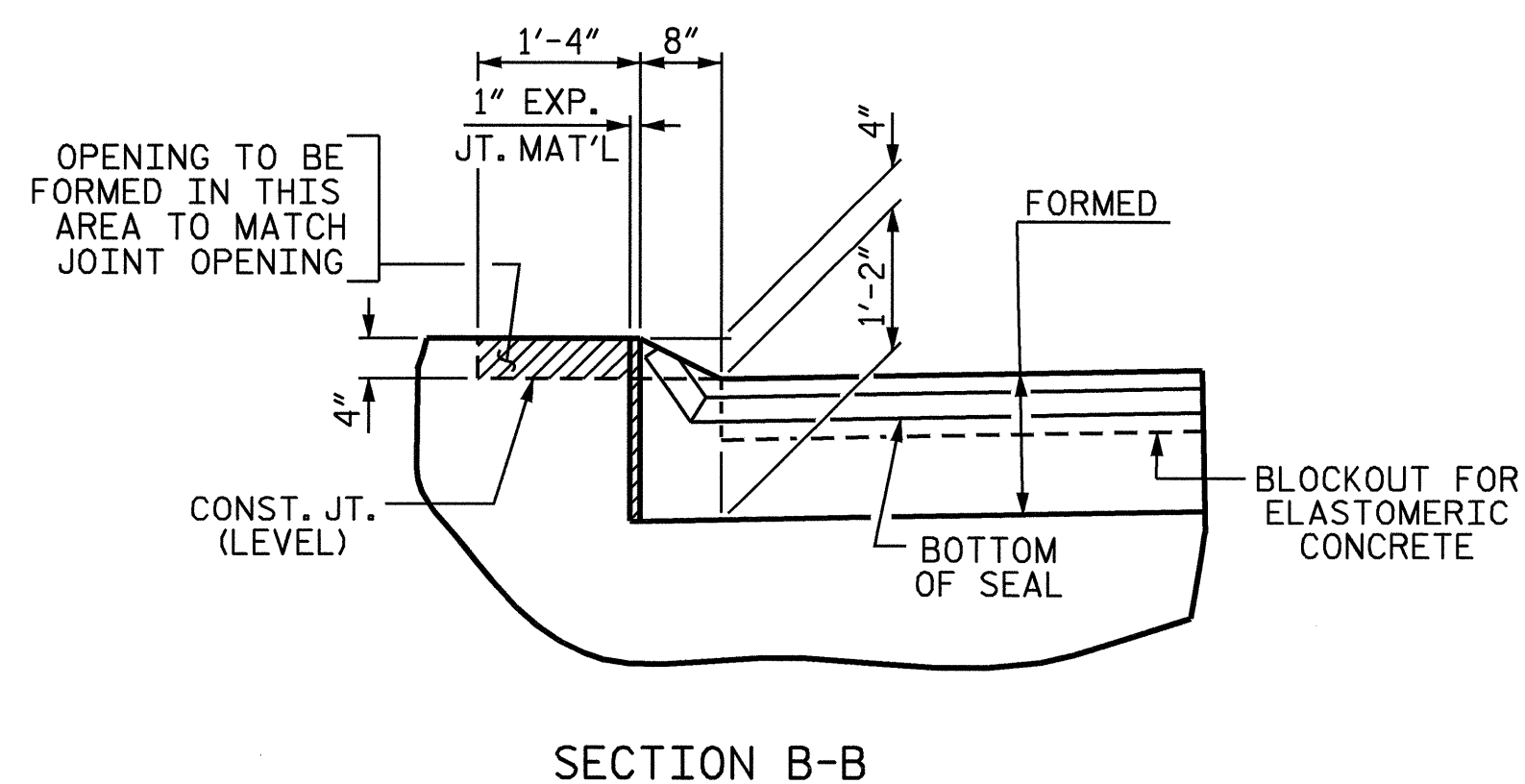
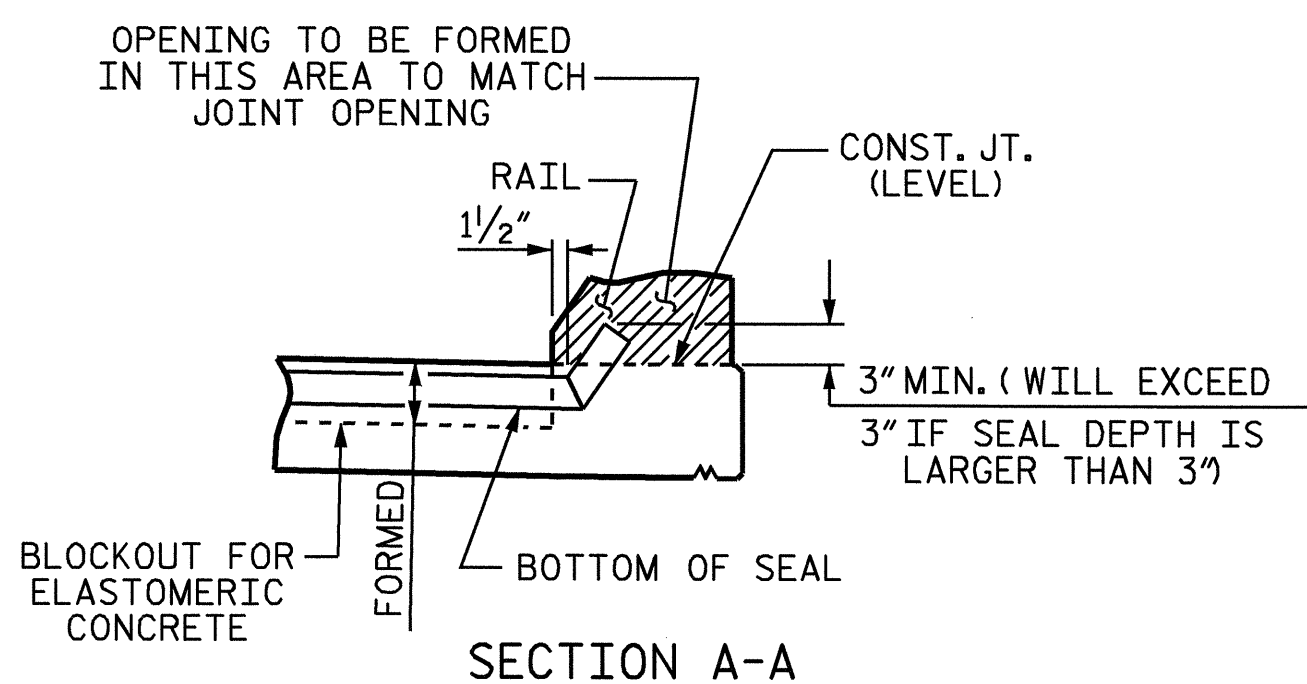
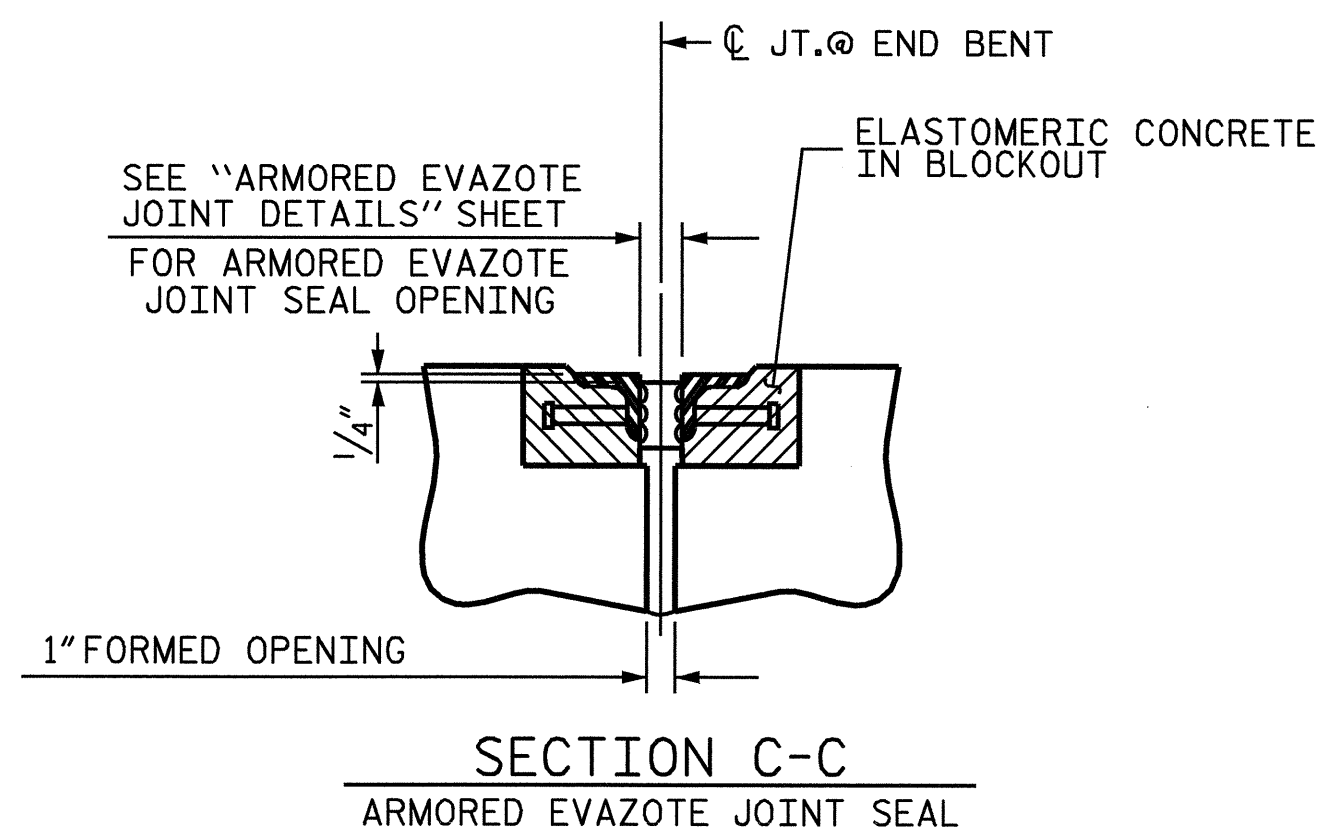
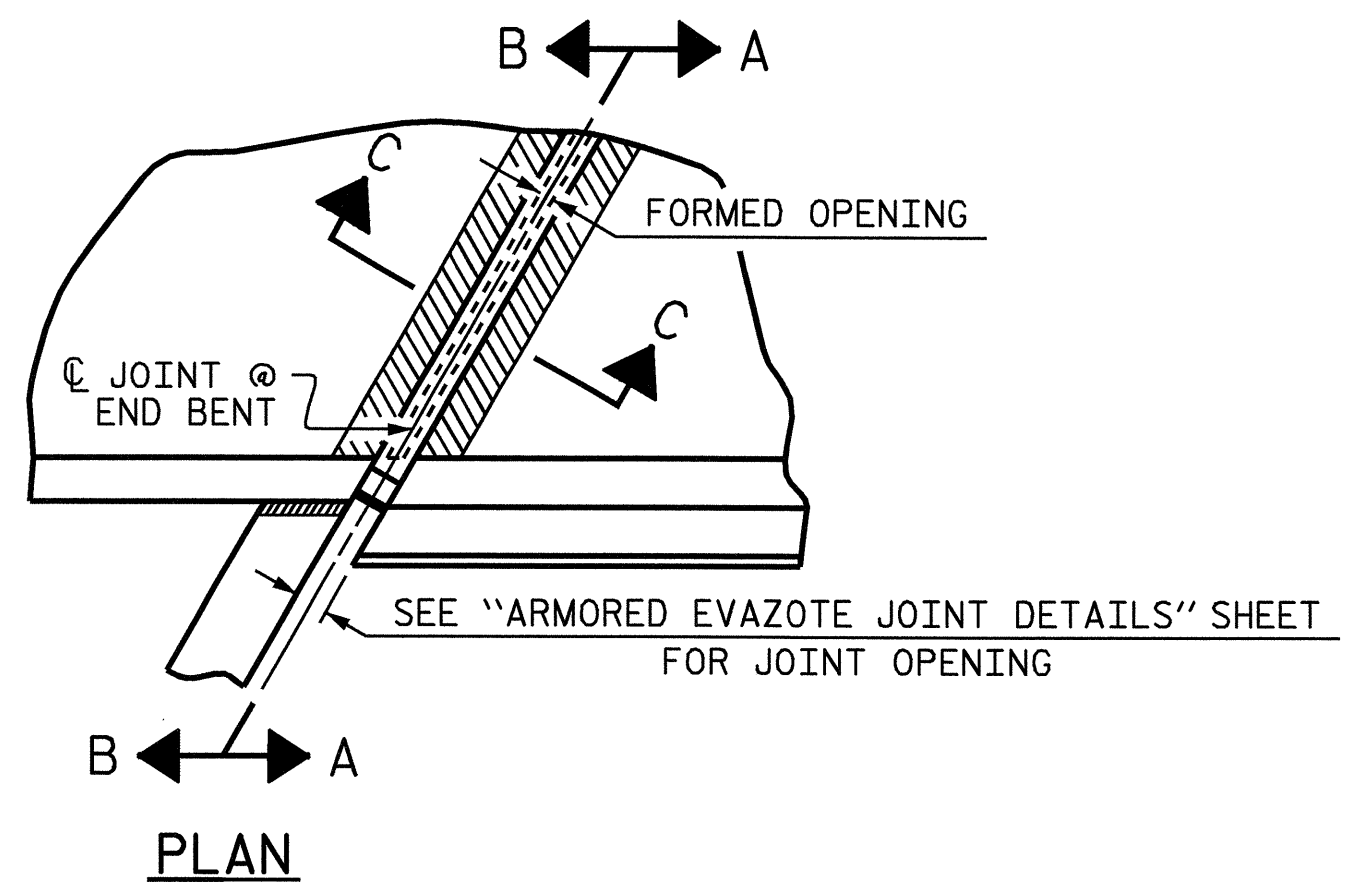
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR FLEXIBLE PAVEMENT (SBL)



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

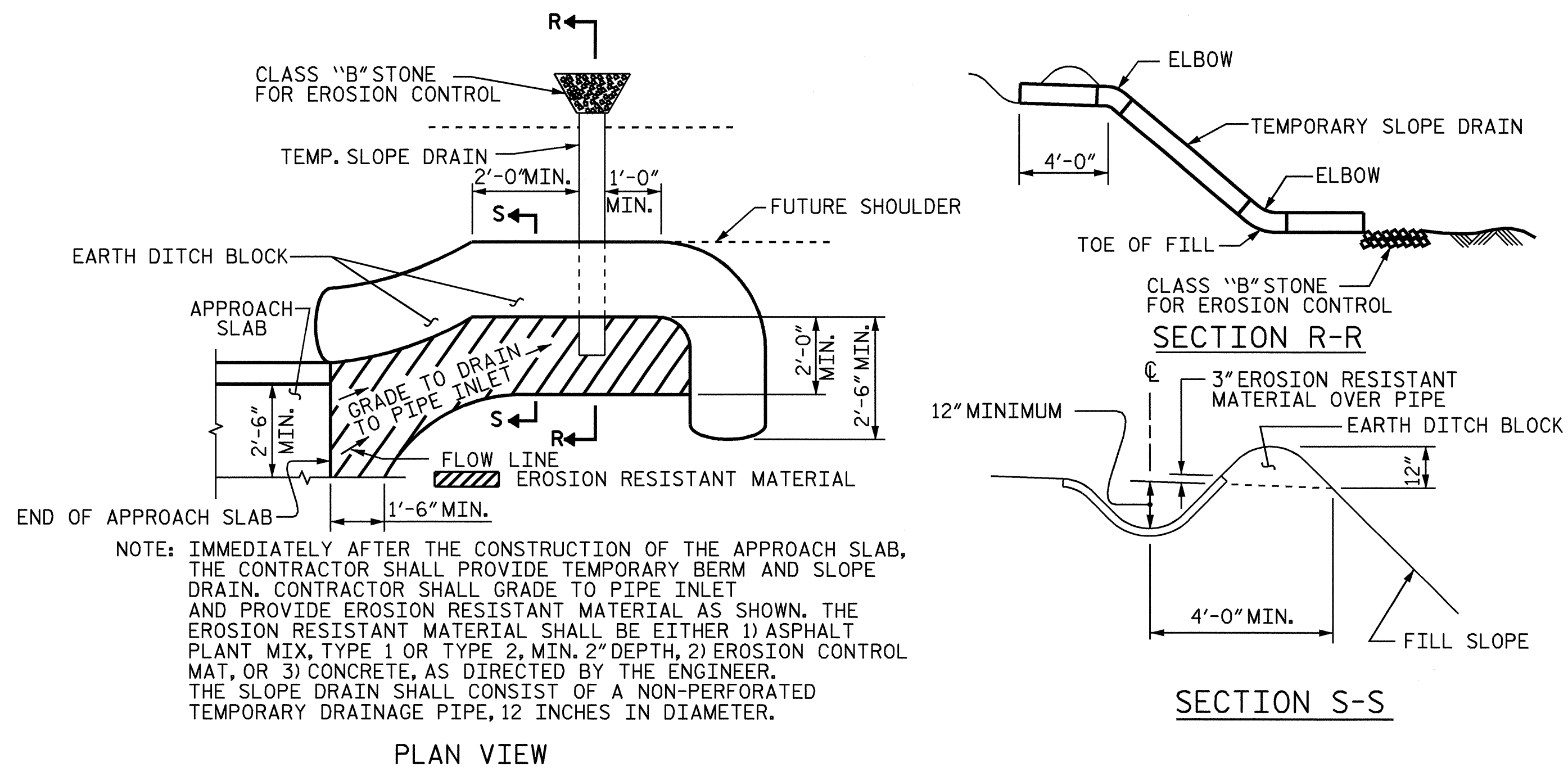
TOTAL SHEETS: 56

ASSEMBLED BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: A.R. CHESSON DATE: 12-08  
 DRAWN BY: EEM 3/95 REV. 1/10/01 LES/RDR  
 CHECKED BY: VAP 3/95 REV. 5/17/03R RWW/JTE  
 REV. 5/1/06R KMM/GM



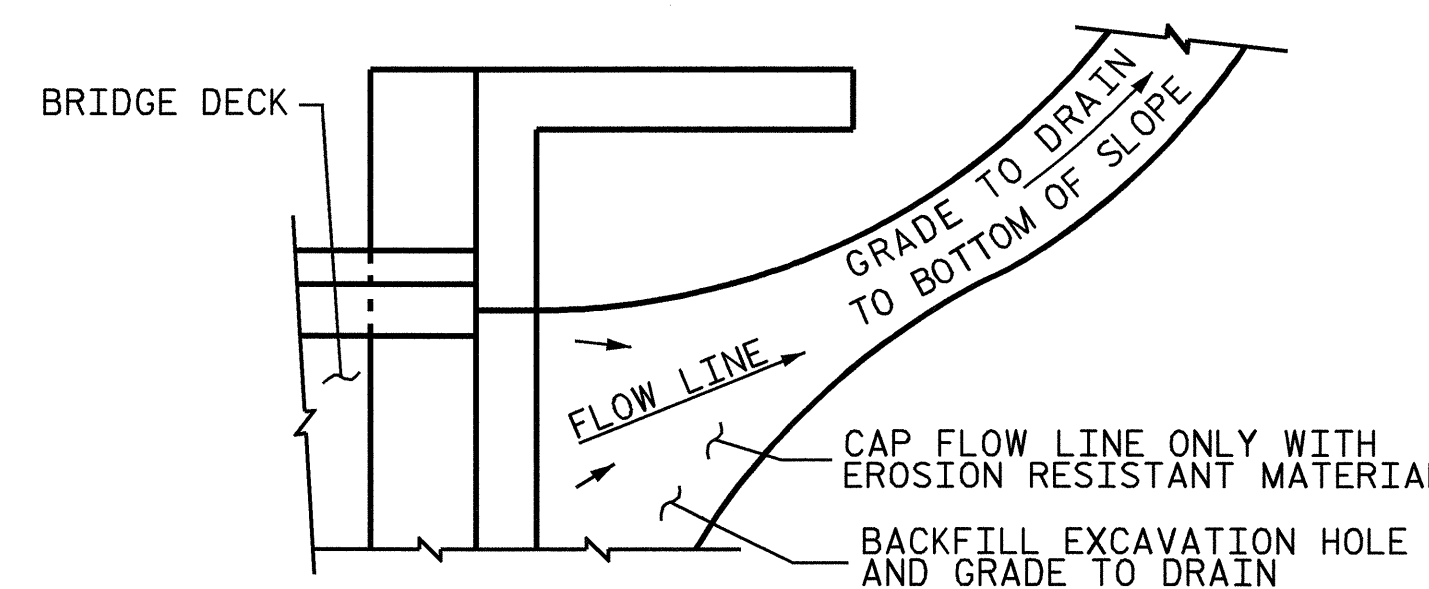
**SECTION B-B**  
**JOINT SEAL DETAILS @ END BENT**

EVAZOTE JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.



**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

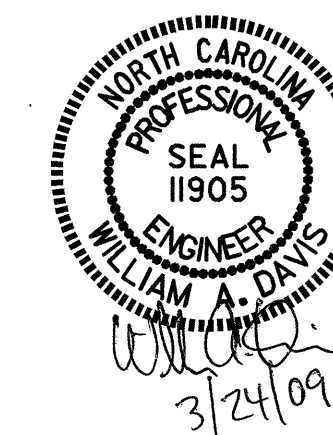


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

**TEMPORARY DRAINAGE DETAIL**

PROJECT NO. R-0505  
HENDERSON COUNTY  
STATION: 780+05.14 -L-

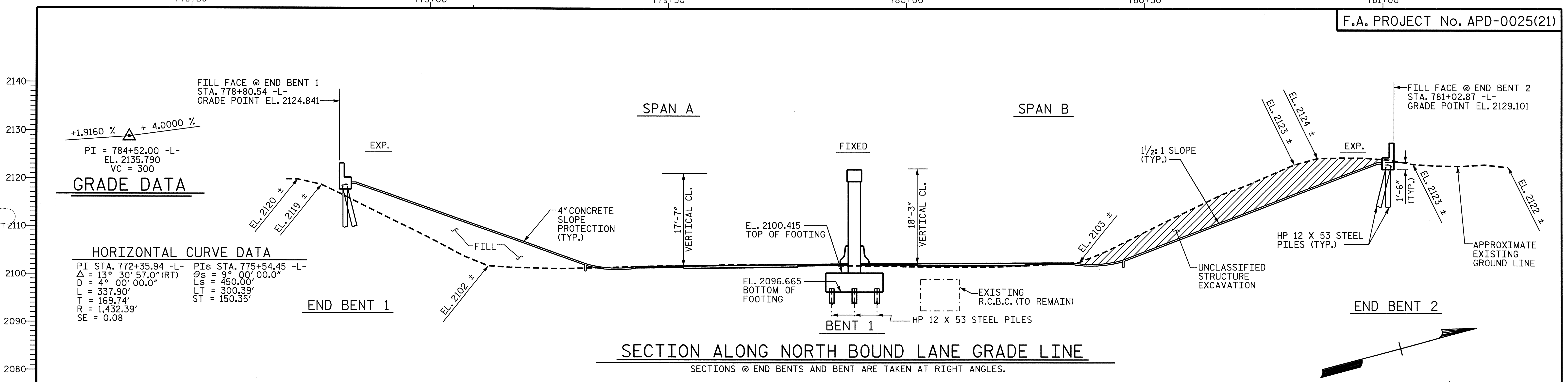
SHEET 2 OF 2



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
BRIDGE APPROACH  
SLAB DETAILS  
(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			56

ASSEMBLED BY :	QT NGUYEN	DATE :	10-08
CHECKED BY :	A.R. CHESSON	DATE :	12-08
DRAWN BY :	FCJ 11/88	REV. 10/17/00	RWW/LES
CHECKED BY :	ARB 11/88	REV. 5/7/03	RWW/JTE
		REV. 5/1/06R	MAA/KMM

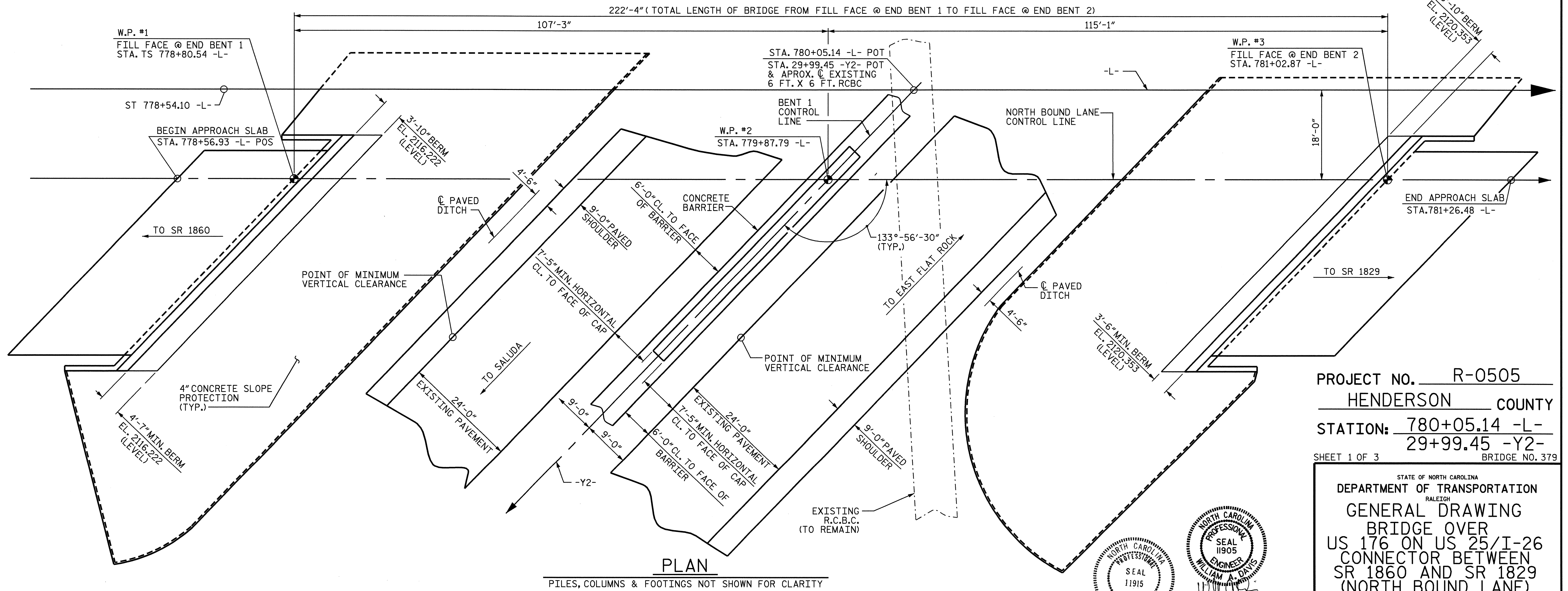


**GRADE DATA**  
 +1.9160 %  $\Delta$  + 4.0000 %  
 PI = 784+52.00 -L-  
 EL. 2135.790  
 VC = 300

**HORIZONTAL CURVE DATA**  
 PI STA. 772+35.94 -L- PIs STA. 775+54.45 -L-  
 $\Delta = 13^\circ 30' 57.0''$  (RT)  $\theta_s = 9^\circ 00' 00.0''$   
 D = 4° 00' 00.0" Ls = 450.00'  
 L = 337.90' LT = 300.39'  
 T = 169.74' ST = 150.35'  
 R = 1,432.39'  
 SE = 0.08

**SECTION ALONG NORTH BOUND LANE GRADE LINE**

SECTIONS @ END BENTS AND BENT ARE TAKEN AT RIGHT ANGLES.



**PLAN**

PILES, COLUMNS & FOOTINGS NOT SHOWN FOR CLARITY

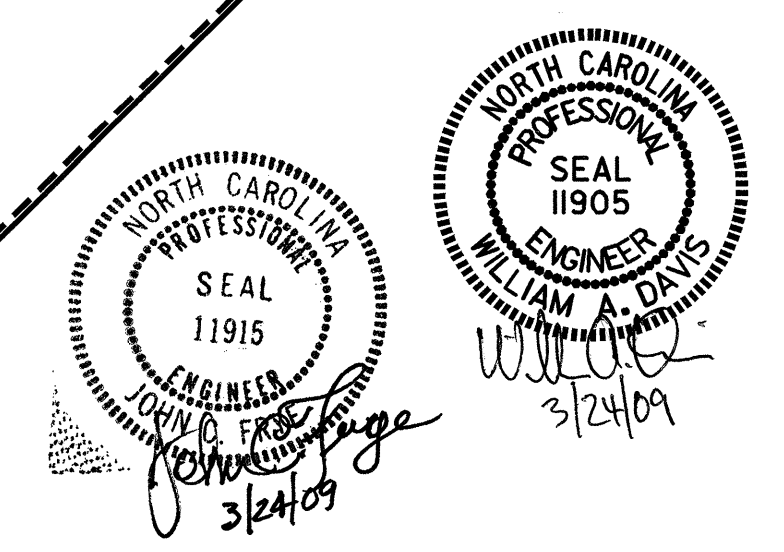
PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-  
29+99.45 -Y2-  
 SHEET 1 OF 3 BRIDGE NO. 379

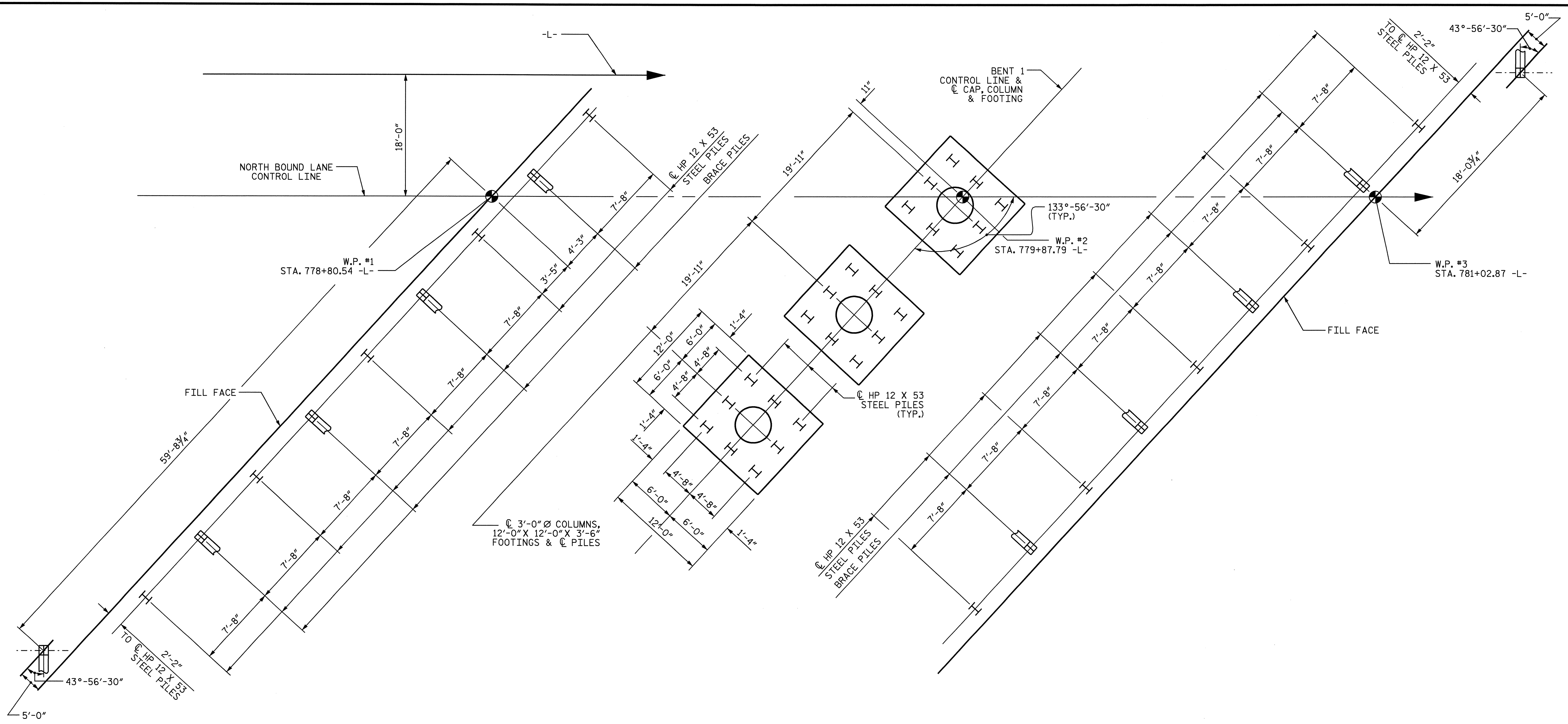
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 BRIDGE OVER  
 US 176 ON US 25/I-26  
 CONNECTOR BETWEEN  
 SR 1860 AND SR 1829  
 (NORTH BOUND LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			56

DRAWN BY: QT NGUYEN DATE: 11-08  
 CHECKED BY: W.A. DAVIS DATE: 01-07-09

24-MAR-2009 07:00  
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 qtnghuyen





**BENT 1**

**BENT 2**

**FOUNDATION LAYOUT**

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.  
 HP 12 X 53 STEEL PILES AT END BENTS ARE BATTERED 3 TO 12.  
 FOOTING DIMENSIONS ARE TYPICAL AT BENT 1.

**NOTES**

DRIVE PILES AT END BENT NO.1 TO A REQUIRED BEARING CAPACITY OF 120 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 IS 60 TONS PER PILE.

DRIVE PILES AT BENT NO.1 TO A REQUIRED BEARING CAPACITY OF 120 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 BENT NO.1 IS 60 TONS PER PILE.

STEEL PILE POINTS ARE REQUIRED FOR STEEL PILES AT BENT NO.1.

DRIVE PILES AT END BENT NO.2 TO A REQUIRED BEARING CAPACITY OF 120 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.2 IS 60 TONS PER PILE.

STEEL PILE POINTS ARE REQUIRED FOR STEEL PILES AT END BENT NO.2.

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-  
 SHEET 2 OF 3



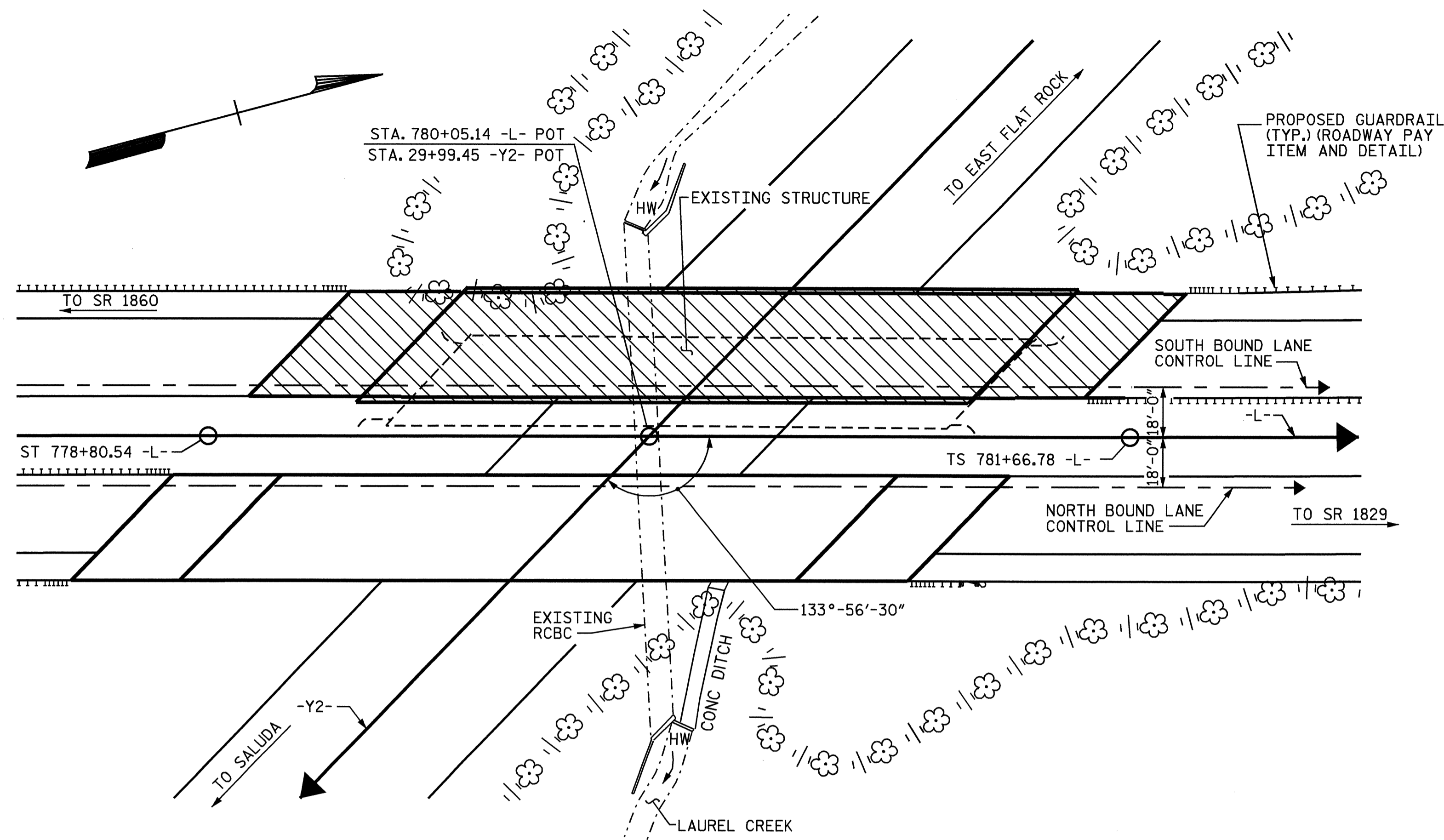
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 BRIDGE OVER  
 US 176 ON US 25/I-26  
 CONNECTOR BETWEEN  
 SR 1860 AND SR 1829  
 (NORTH BOUND LANE)

DRAWN BY: QT NGUYEN DATE: 11-08  
 CHECKED BY: W.A. DAVIS DATE: 01-07-09

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

S-30  
TOTAL SHEETS  
56





FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES :

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING, EXCEPT THAT THE GIRDERS HAVE BEEN DESIGNED FOR HS 25.

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

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

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

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA AS SHOWN ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 84 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER CUBIC YARD FOR UNCLASSIFIED STRUCTURE EXCAVATION.

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 B.

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 SAMPLE 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.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

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

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

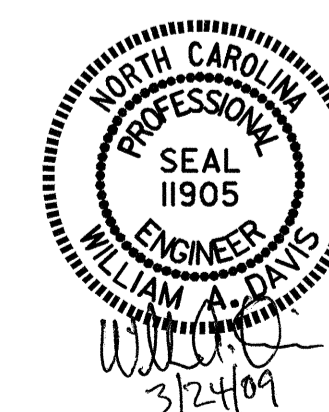
ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	APPROX. STRUCTURAL STEEL	HP 12 X 53 STEEL PILES	STEEL PILE POINTS	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	POT BEARINGS	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	
	LUMP SUM	CU. YDS.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LBS.	EA.	LIN. FT.	EA.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			9052	10799		LUMP SUM			297032			438.76		LUMP SUM	LUMP SUM	LUMP SUM	
END BENT 1					38.6		6783			10	425			411			
BENT 1	LUMP SUM				97.3		14660	996		24	480	24					
END BENT 2		1183			38.6		6801			10	650	10	201				
TOTAL	LUMP SUM	1183	9052	10799	174.5	LUMP SUM	28244	996	297032	44	1555	34	438.76	612	LUMP SUM	LUMP SUM	LUMP SUM

PROJECT NO. R-0505  
 HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 BRIDGE OVER  
 US 176 ON US 25/I-26  
 CONNECTOR BETWEEN  
 SR 1860 AND SR 1829  
 (NORTH BOUND LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS 56
2			4			

DRAWN BY : QT NGUYEN DATE : 11-08  
 CHECKED BY : W.A. DAVIS DATE : 01-07-09

**NOTES**

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

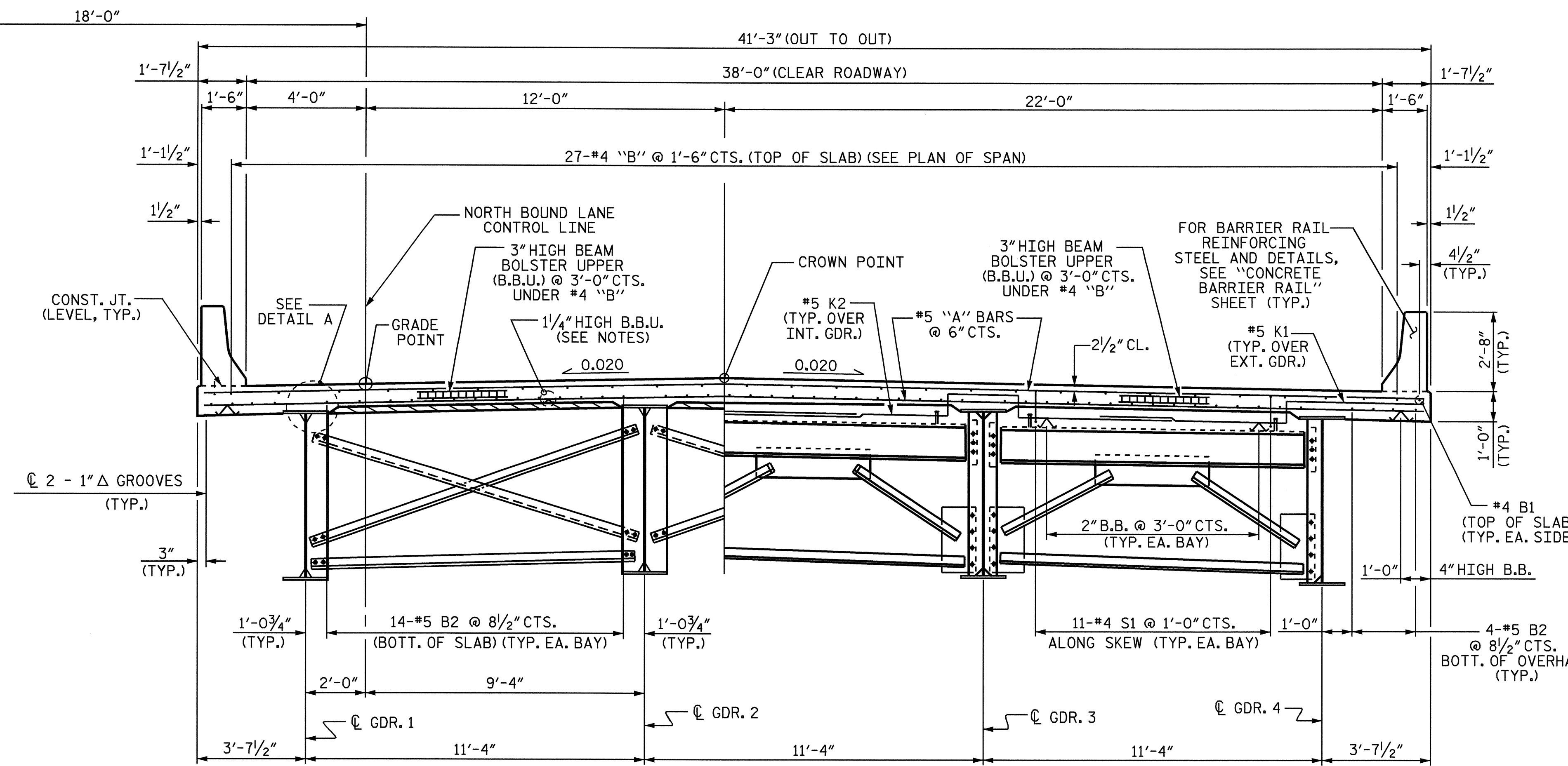
THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN STAY-IN-PLACE METAL FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE STAY-IN-PLACE METAL FORM WORKING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

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

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

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

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

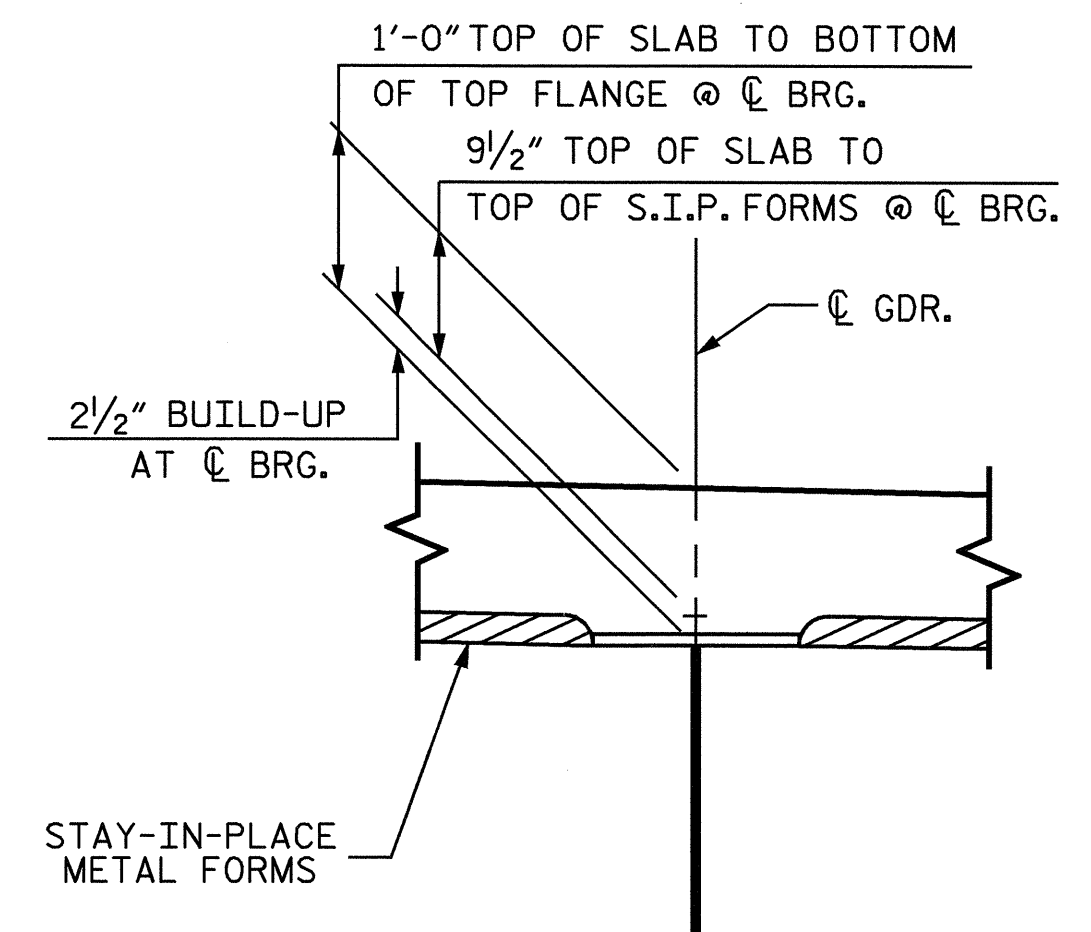


**PART TYPICAL SECTION**

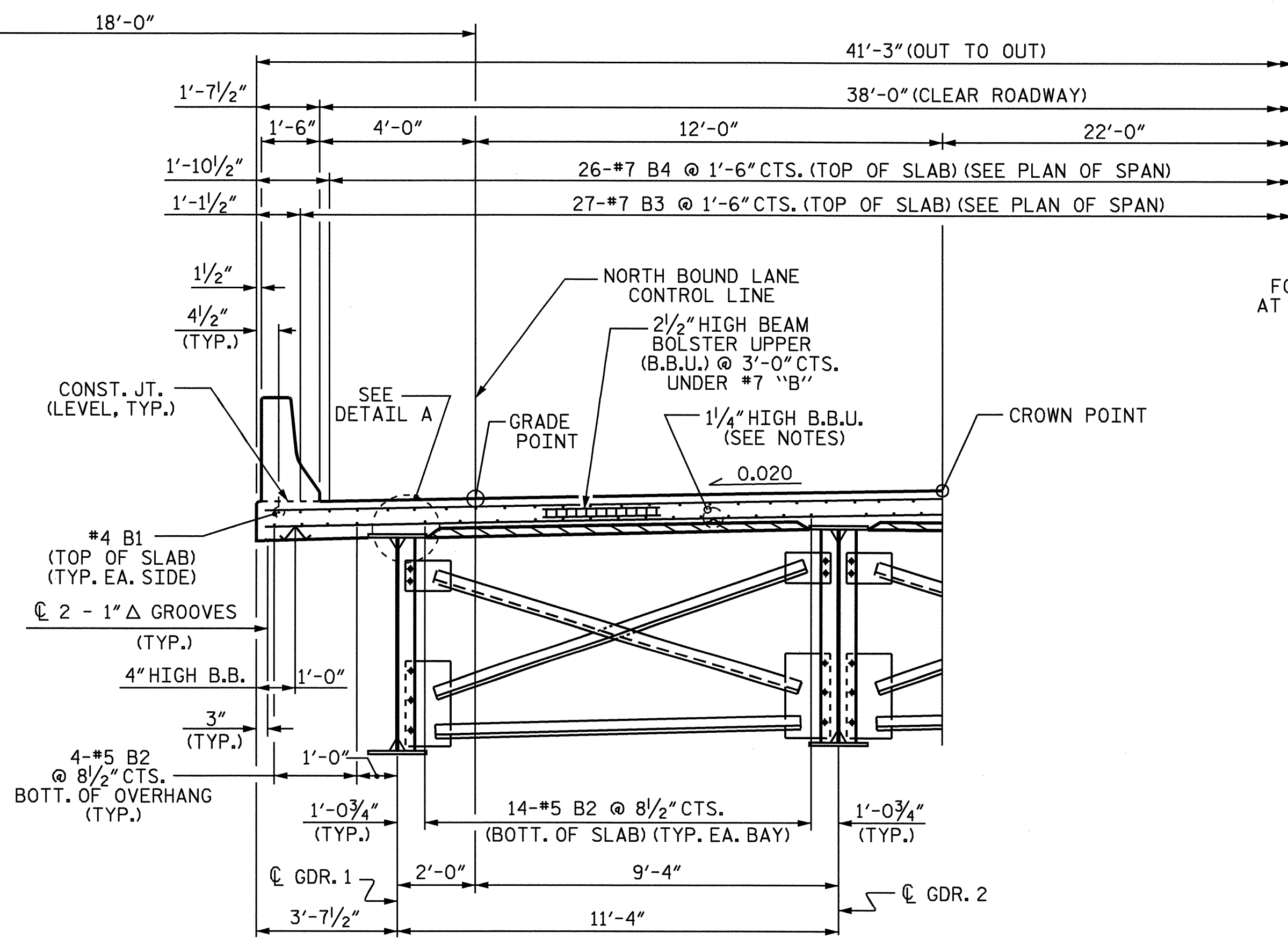
SHOWING INTERMEDIATE DIAPHRAGMS

**PART TYPICAL SECTION**

SHOWING END BENT DIAPHRAGMS

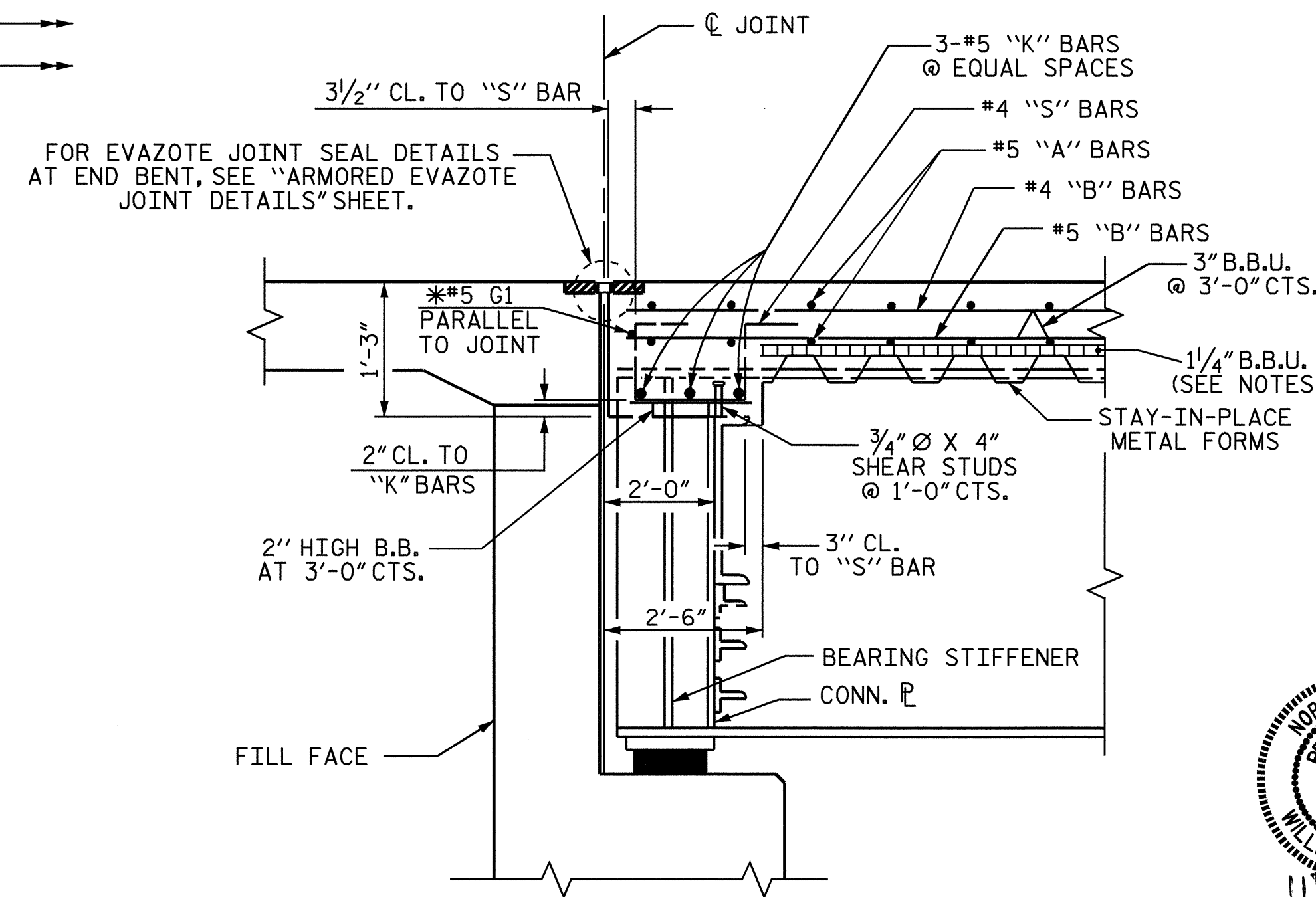


**DETAIL A**



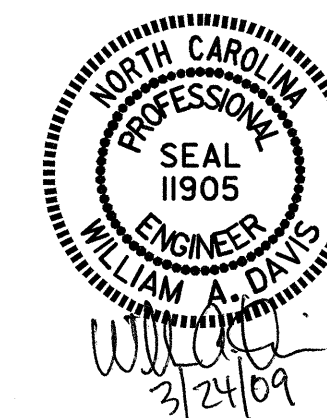
**PART TYPICAL SECTION**

SHOWING BENT DIAPHRAGMS



**SECTION @ END BENT**

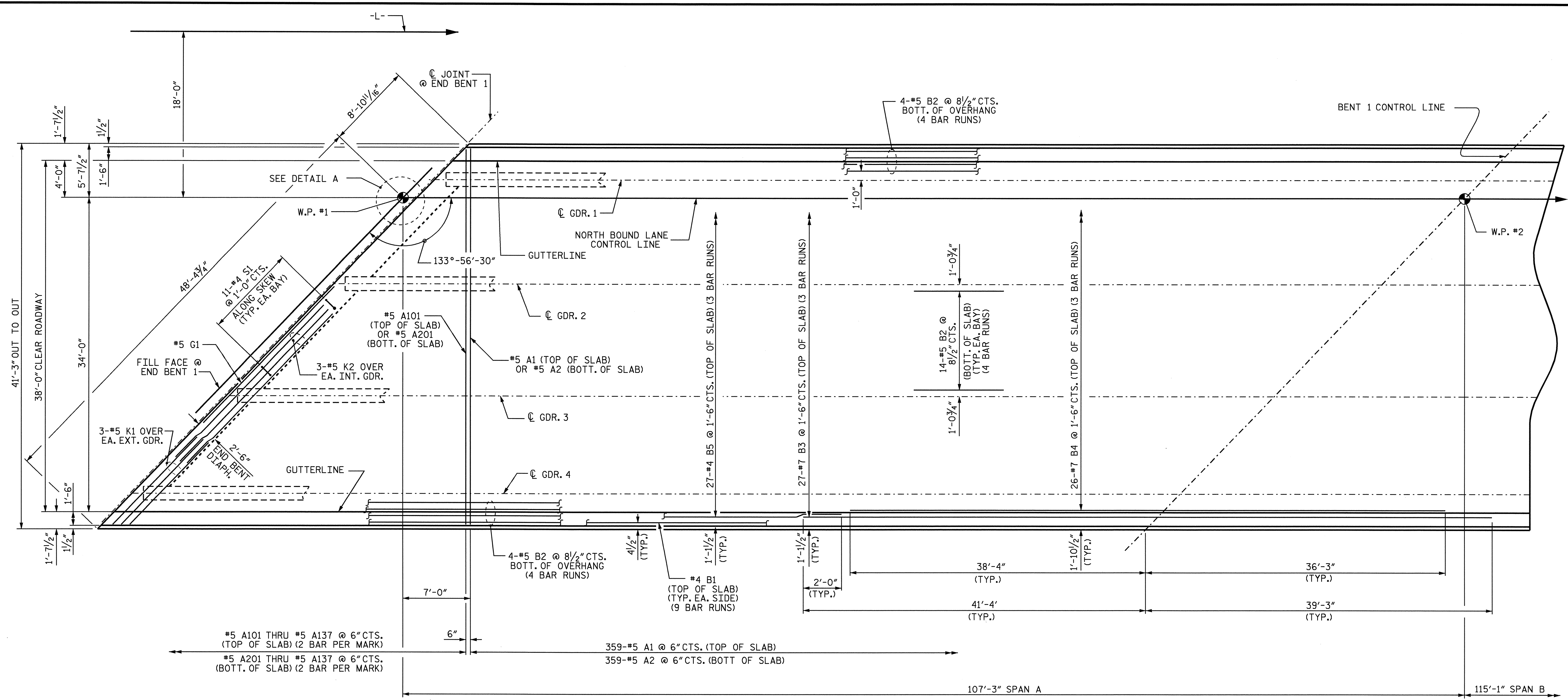
\* #5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR DIAPHRAGM AND REINFORCING STEEL.



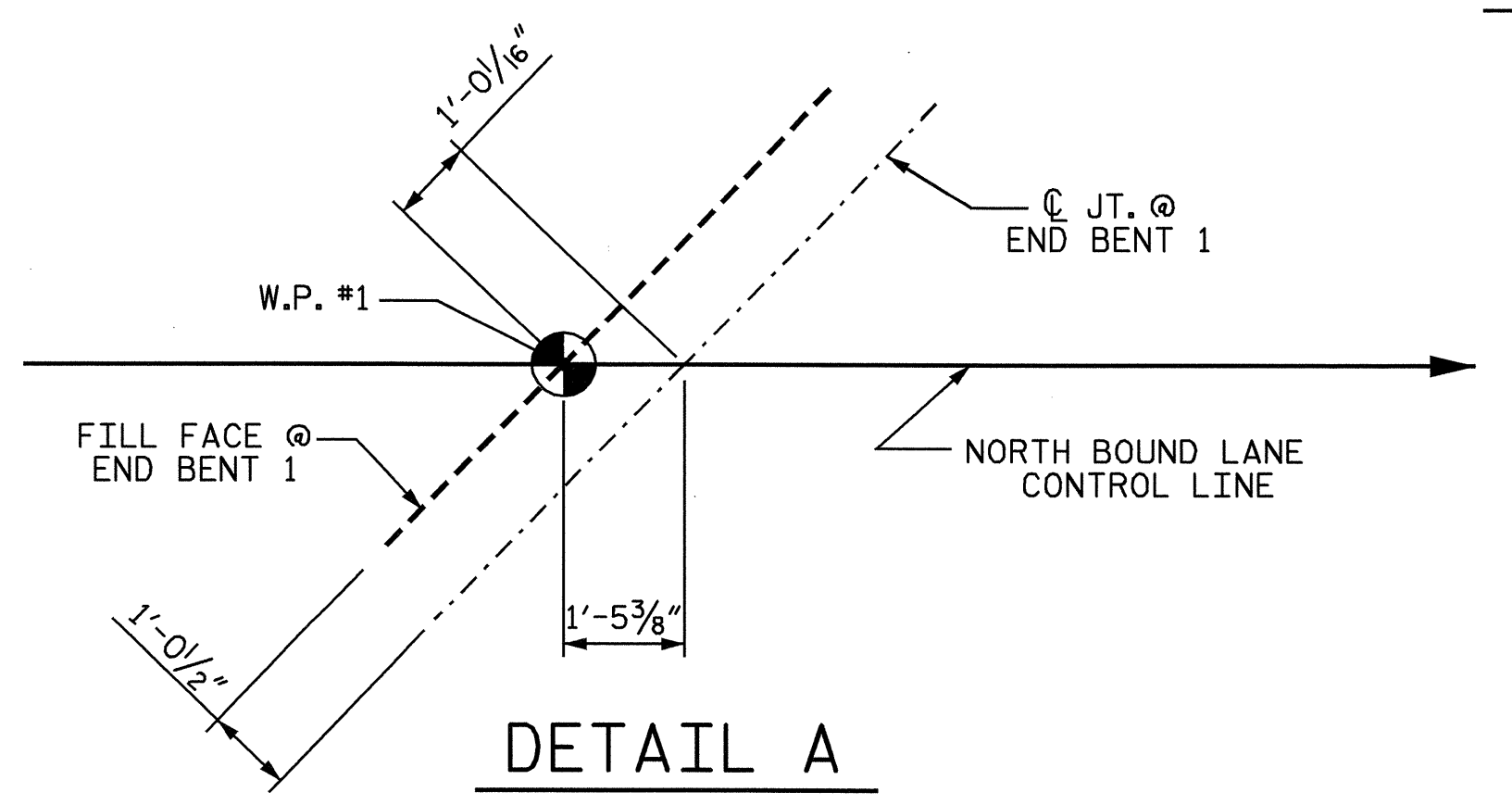
PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				SUPERSTRUCTURE TYPICAL SECTION (NBL)		SHEET NO. S-32
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			56
2			4			

DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: A.R. CHESSON DATE: 10-08



PLAN OF SPAN A



DETAIL A

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-  
 SHEET 1 OF 2

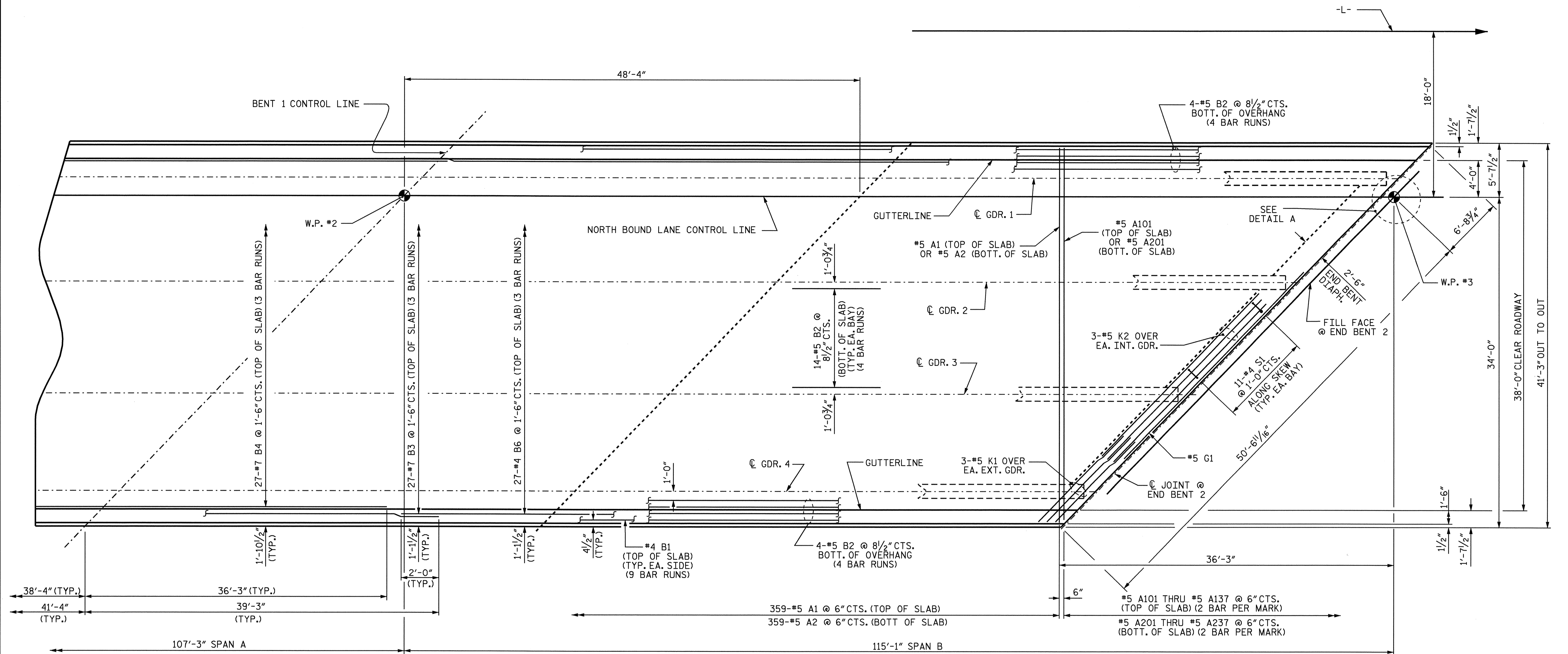


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPAN  
 (NBL)

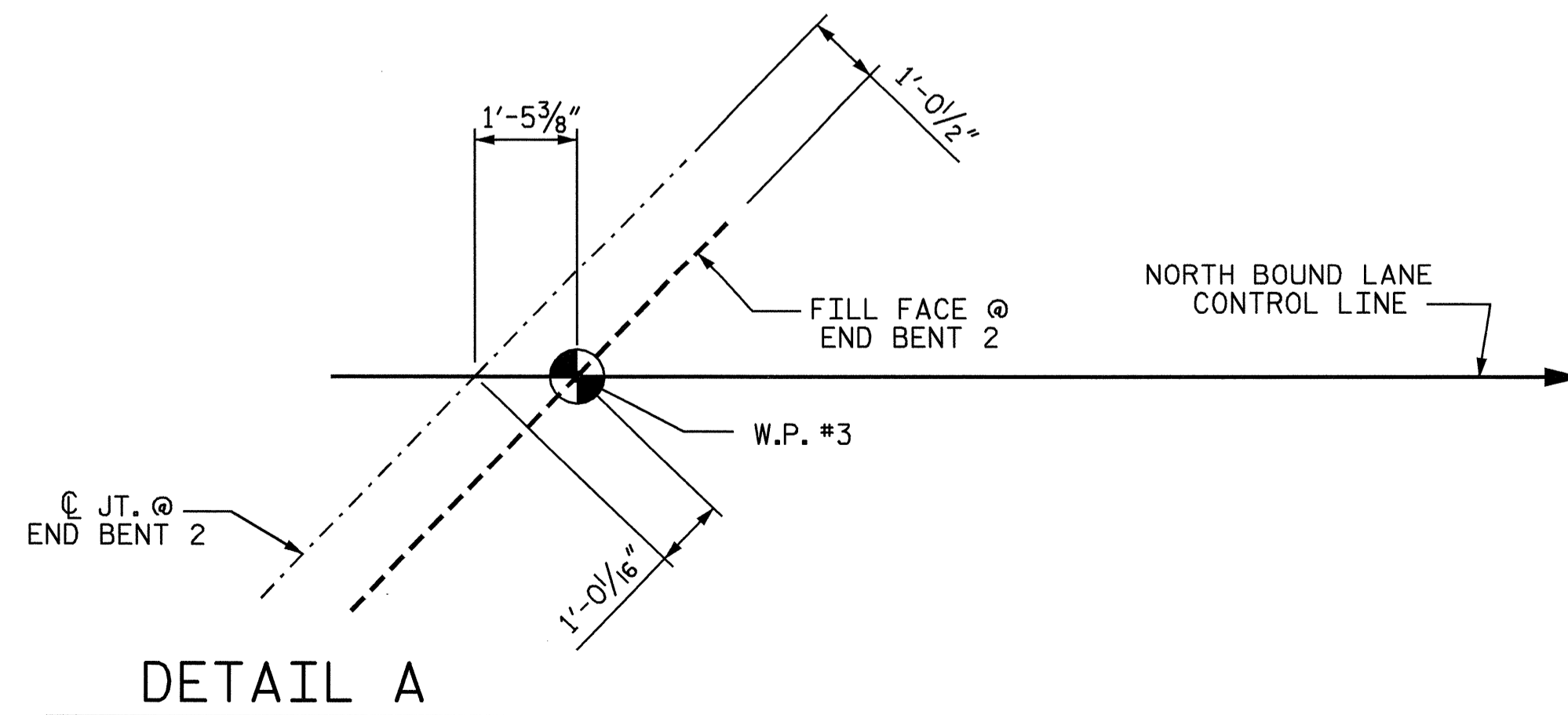
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			56

DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: A.R. CHESSON DATE: 10-08

24-MAR-2009 06:58  
 y:\projects-r\0505\structures\finalplans\nbl-379 str2\0505.sd.s2\*.dgn  
 qtnguyen



PLAN OF SPAN B



PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

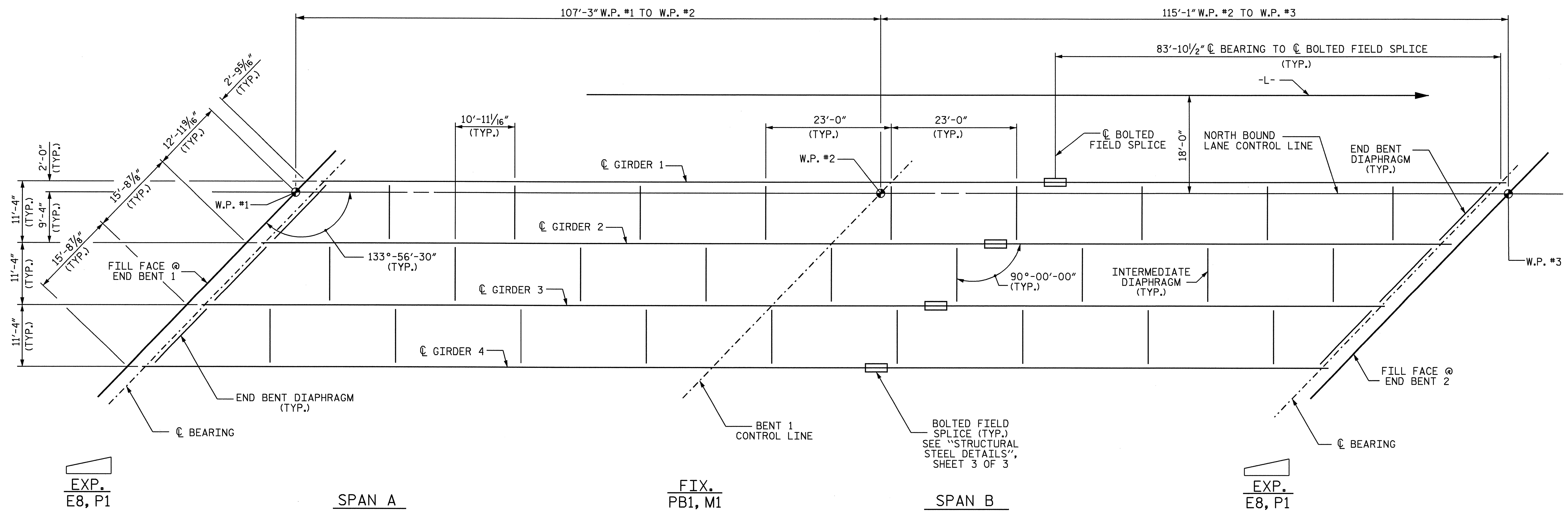
SHEET 2 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPAN  
 (NBL)

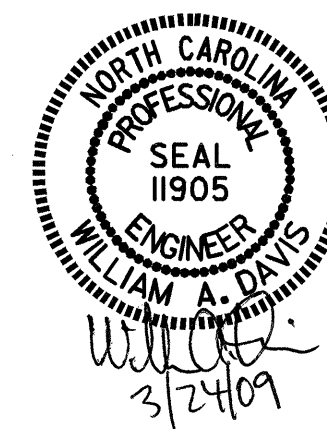
DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: A.R. CHESSON DATE: 10-08

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34	
1			3			TOTAL SHEETS	56
2			4				



FRAMING PLAN

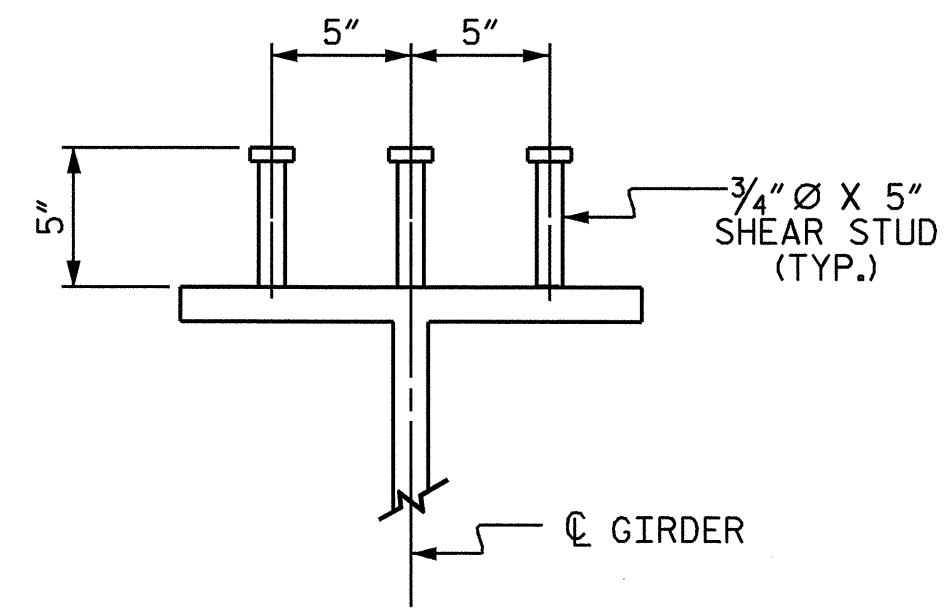
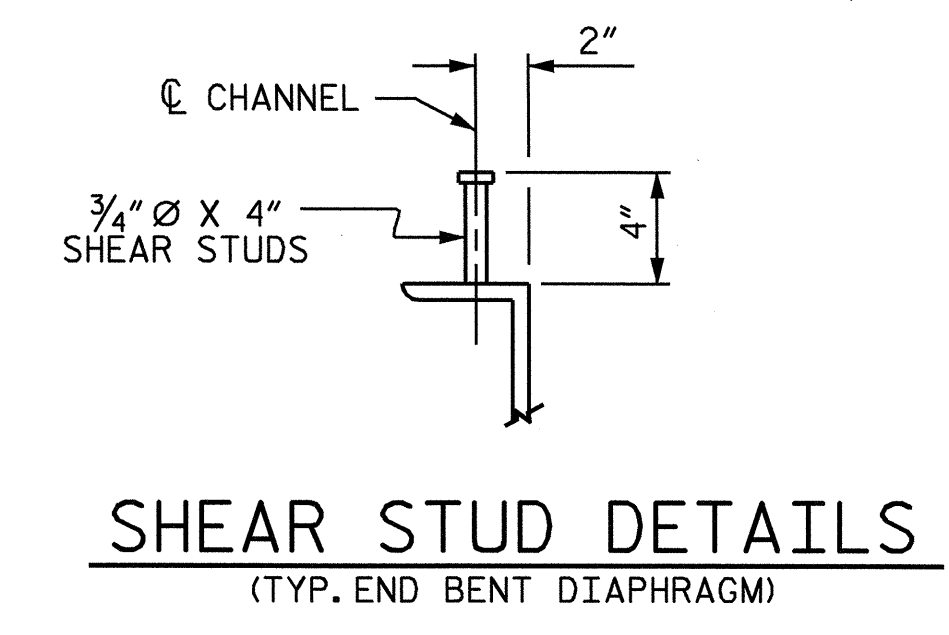
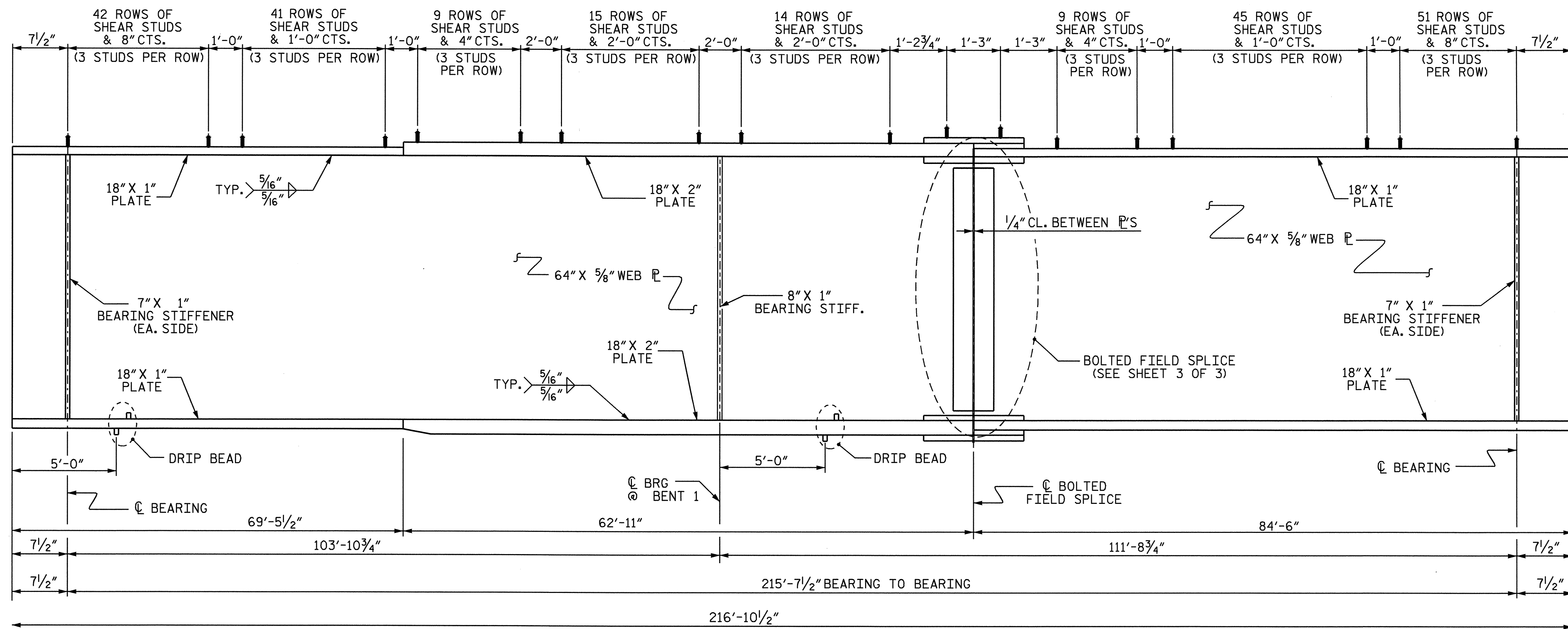
PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 FRAMING PLAN  
 (NBL)

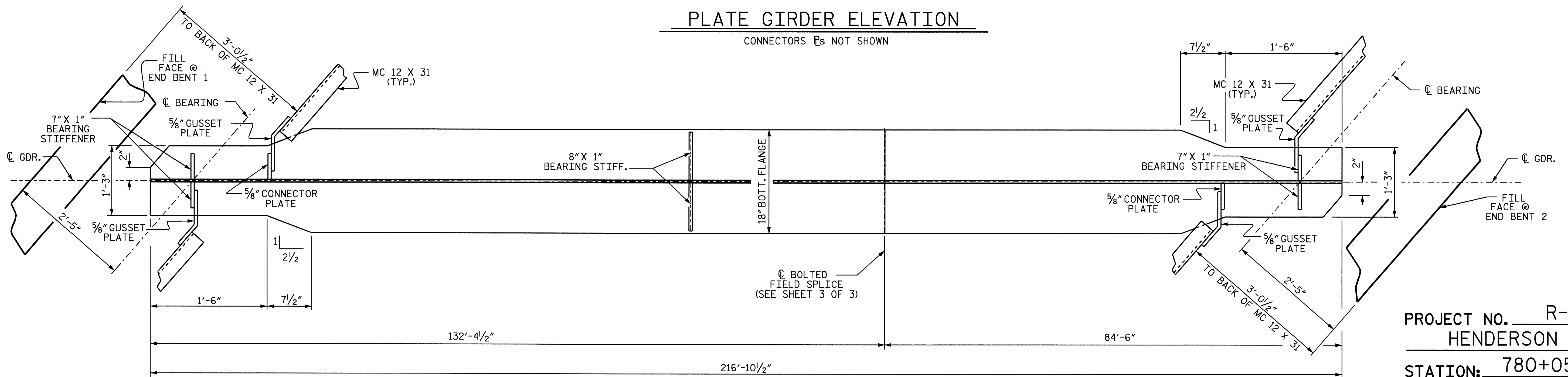
DRAWN BY : QT NGUYEN DATE : 10-08  
 CHECKED BY : A.R. CHESSON DATE : 10-08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			56

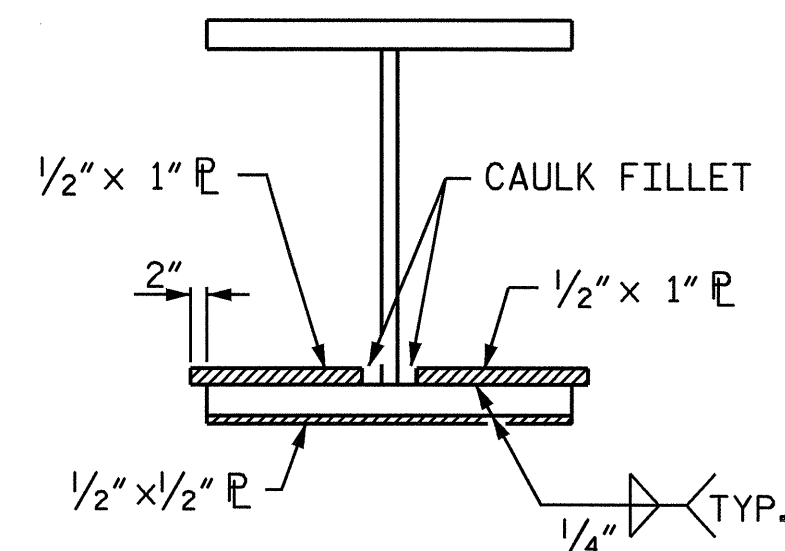


**PLATE GIRDER ELEVATION**

CONNECTORS P's NOT SHOWN



**BOTTOM FLANGE DETAIL**



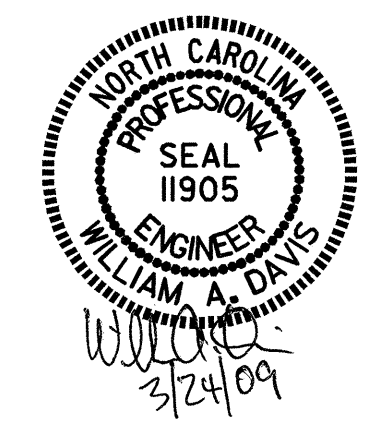
**DRIP BEAD DETAIL**  
FOR EXTERIOR GIRDERS ONLY

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS  
 (NBL)

REVISIONS						SHEET NO. S-36
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 56
2			4			



DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: A.R. CHESSON DATE: 10-08

24-MAR-2009 06:56  
 y:\projects\11905\structures\finalplans\nbl-379 str2\0505.ed.ss2.dgn  
 qtnguyen

**NOTES**

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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

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

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 60 FEET AND WEB PIECE LENGTHS TO 45 FEET. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

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

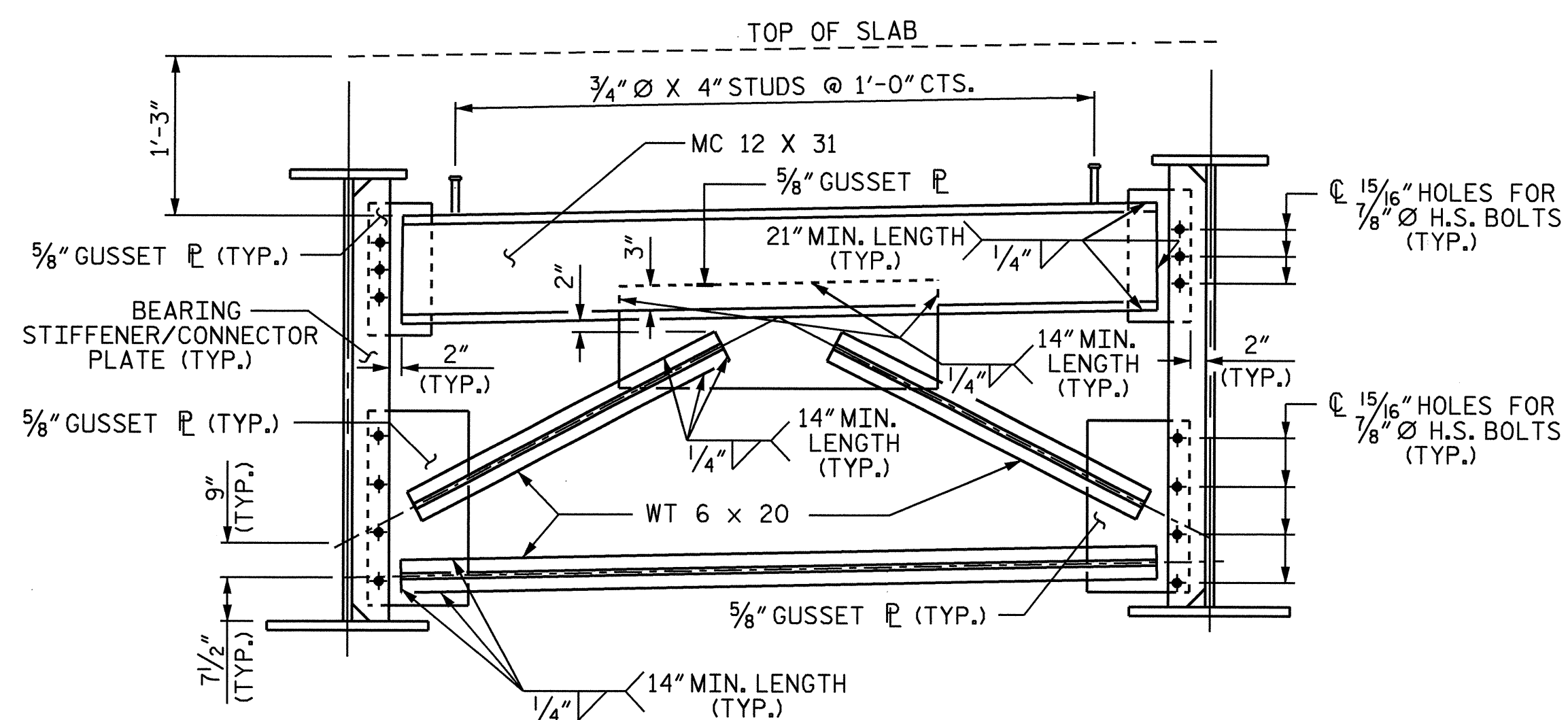
TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

END OF GIRDERS SHALL BE PLUMB.

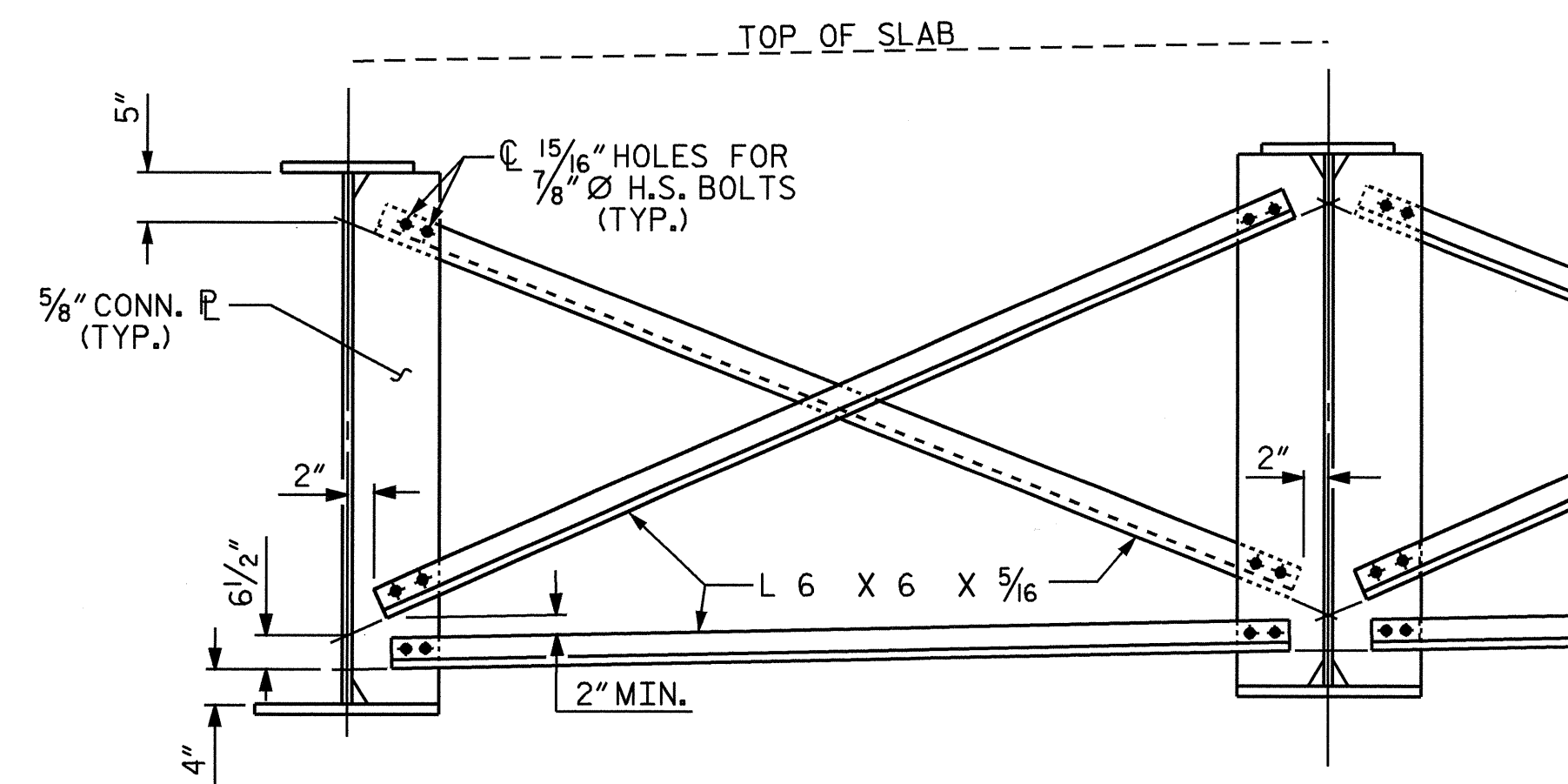
BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE TO AVOID INTERFERENCE WITH THE ANCHOR BOLT.

FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

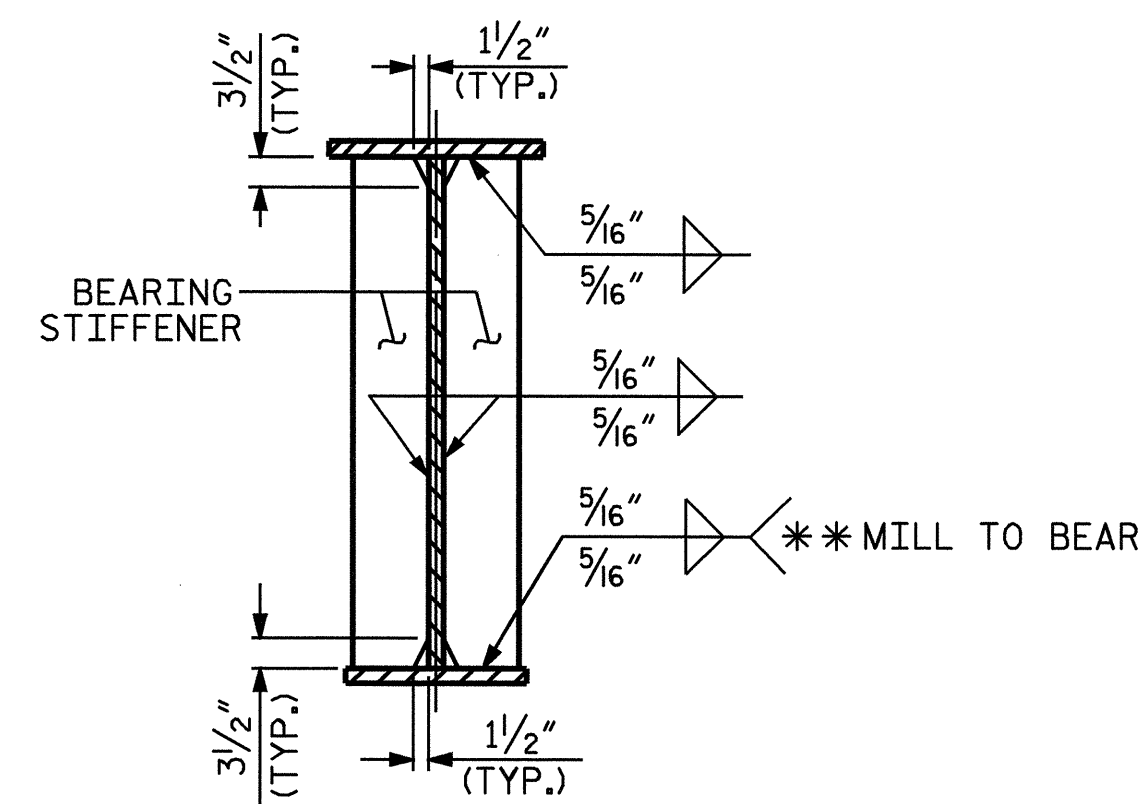
FOR SHIPPING STEEL STRUCTURAL MEMBERS, SEE SPECIAL PROVISIONS.



**END BENT DIAPHRAGM**

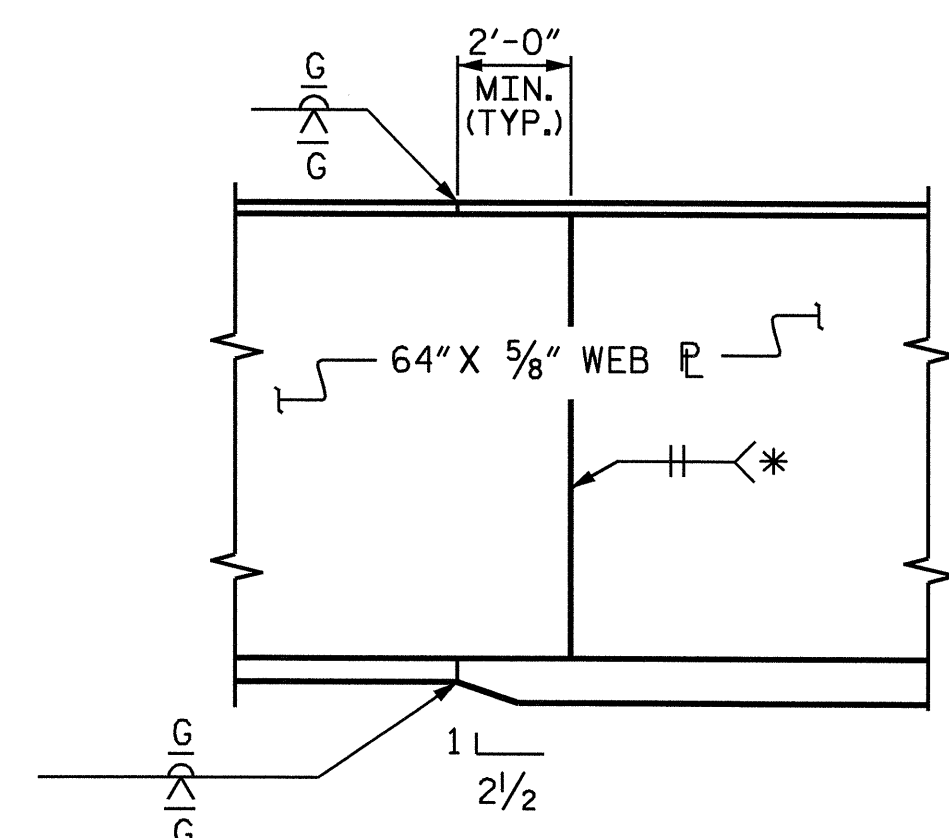


**TYPICAL INTERMEDIATE DIAPHRAGM**



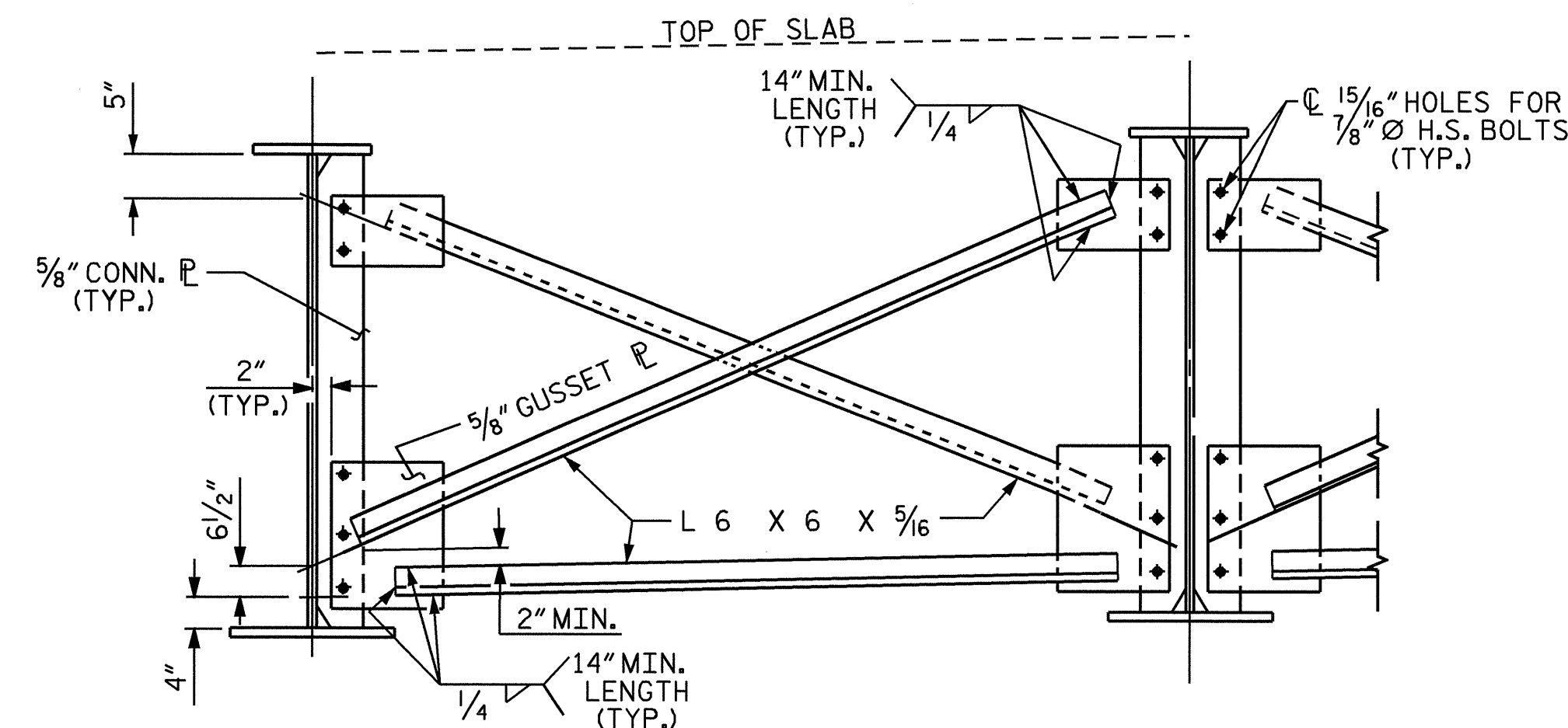
**BEARING STIFFENER**

\* \* WELD TO BOTTOM FLANGE IS ONLY REQUIRED WHEN BEARING STIFFENER IS ALSO CONNECTOR PLATE



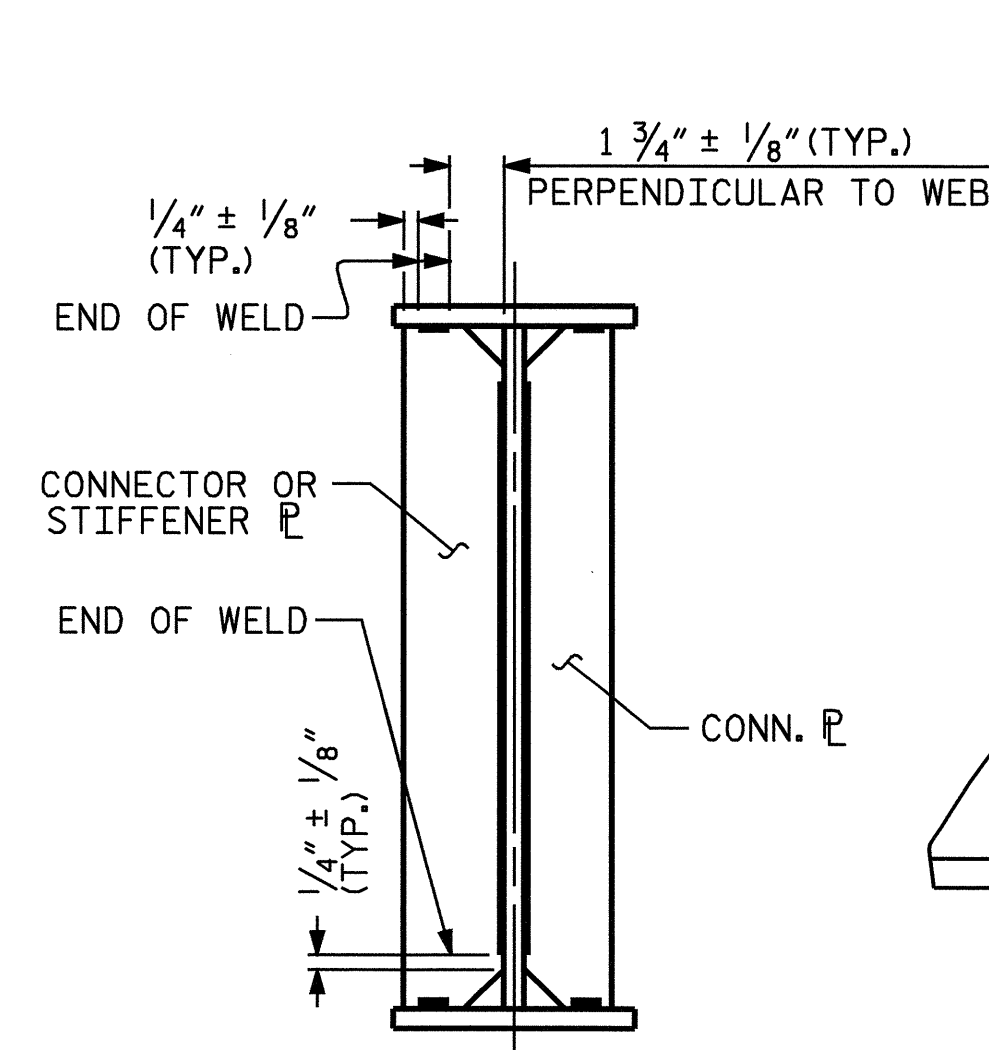
**PERMISSIBLE SHOP FLANGE & WEB SPLICE**

\* GRIND SMOOTH AND FLUSH ON OUTSIDE OF EXTERIOR GIRDERS

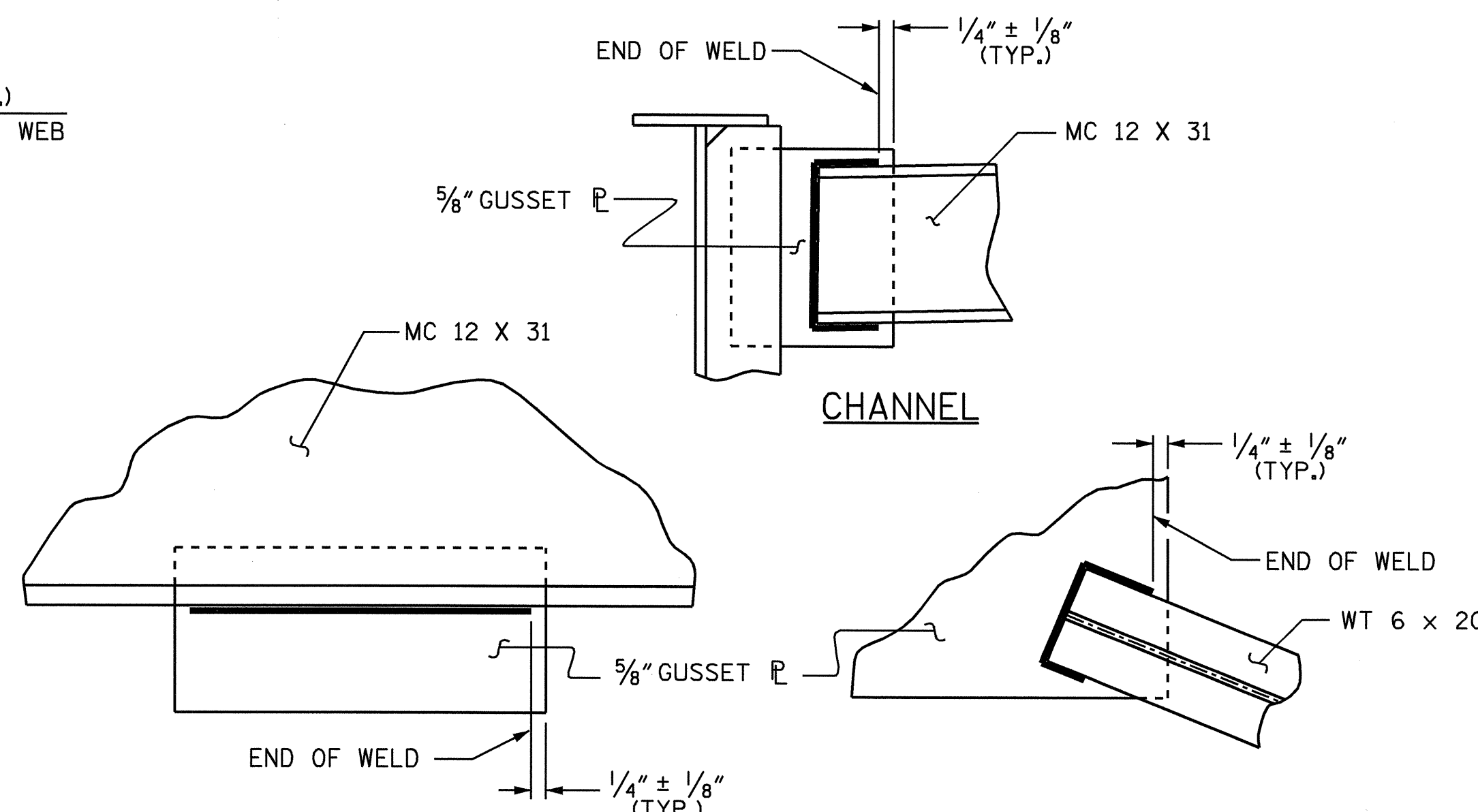


**TYPICAL OPTIONAL INTERMEDIATE DIAPHRAGM**

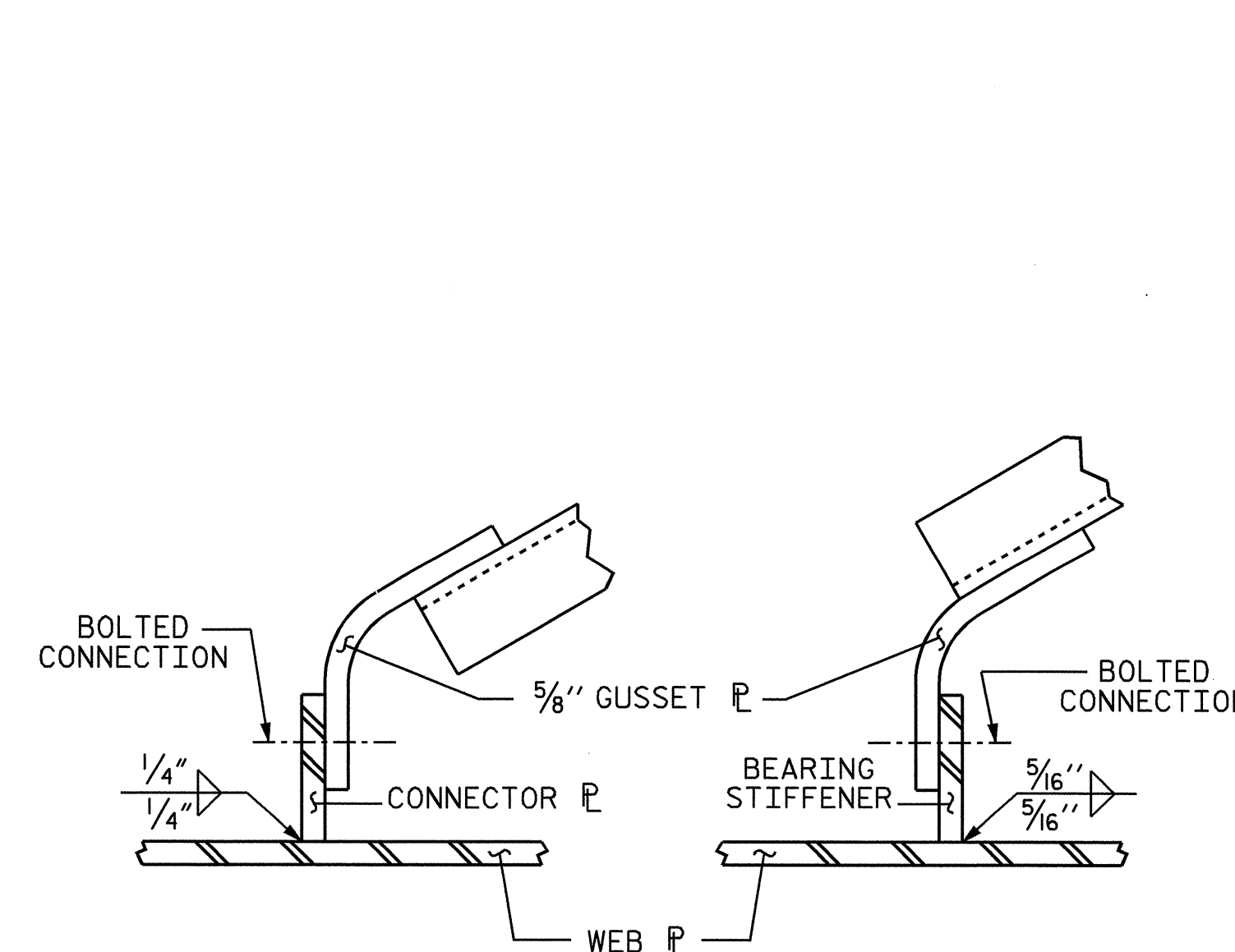
AT THE CONTRACTOR'S OPTION, THE DIAPHRAGM WITH THE WELDED GUSSET PLATES MAY BE USED IN LIEU OF THE DIAPHRAGM WITH BOLTED ANGLES AT NO ADDITIONAL COST TO THE DEPARTMENT.



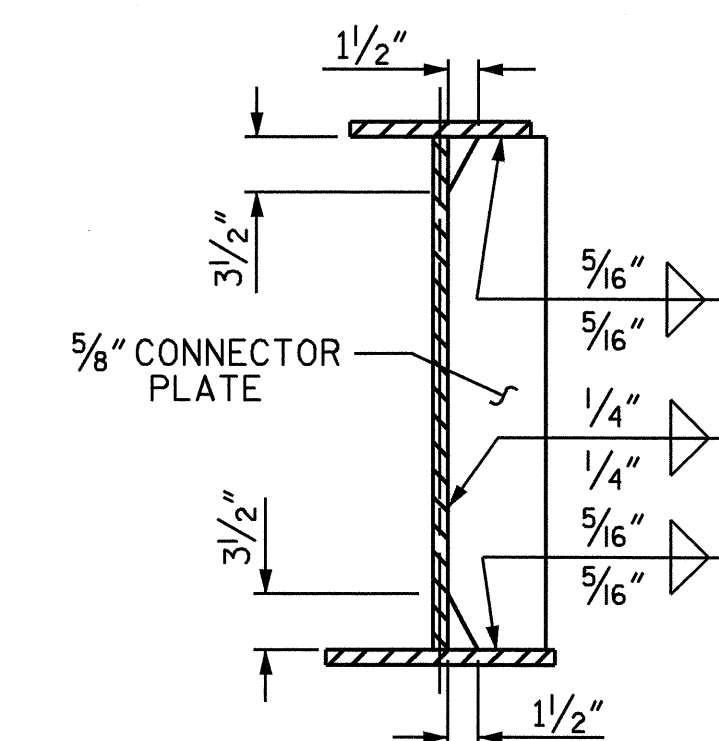
**TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS**



**GUSSET PLATE CONNECTIONS**



**GUSSET PLATE DETAIL**



**CONNECTOR PLATE DETAILS**

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 178+05.14 -L-

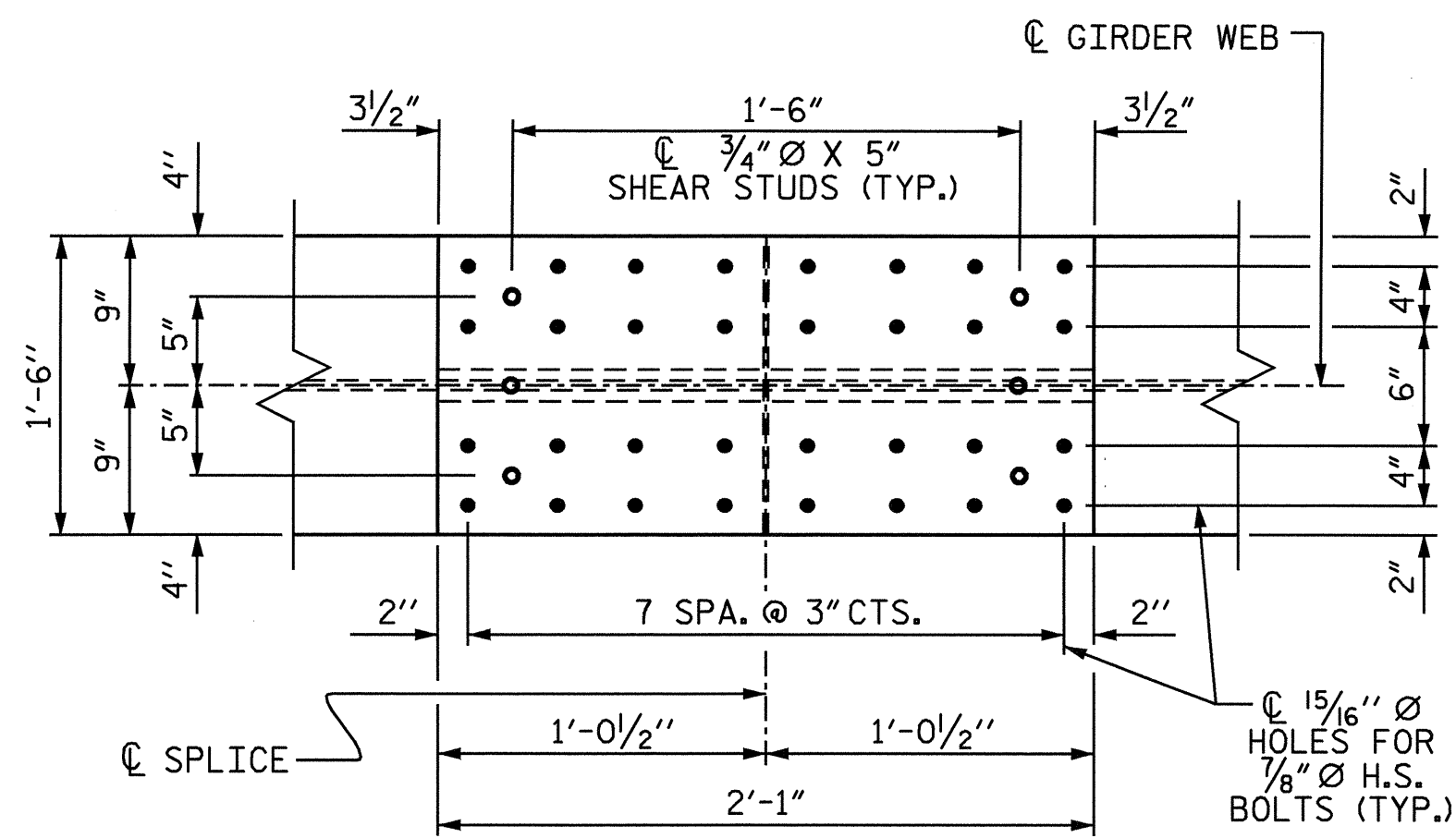
SHEET 2 OF 3



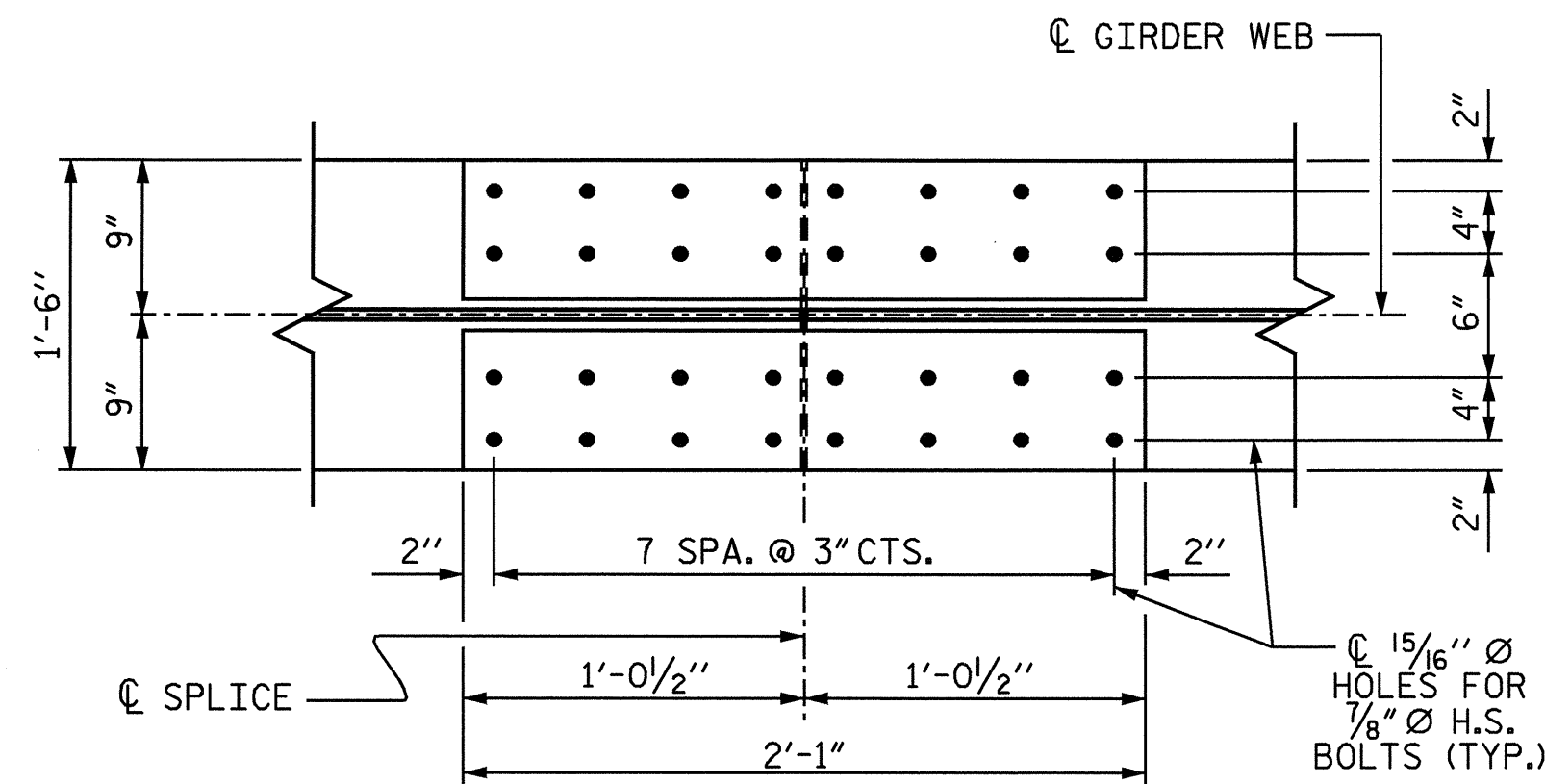
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS  
 (NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			56

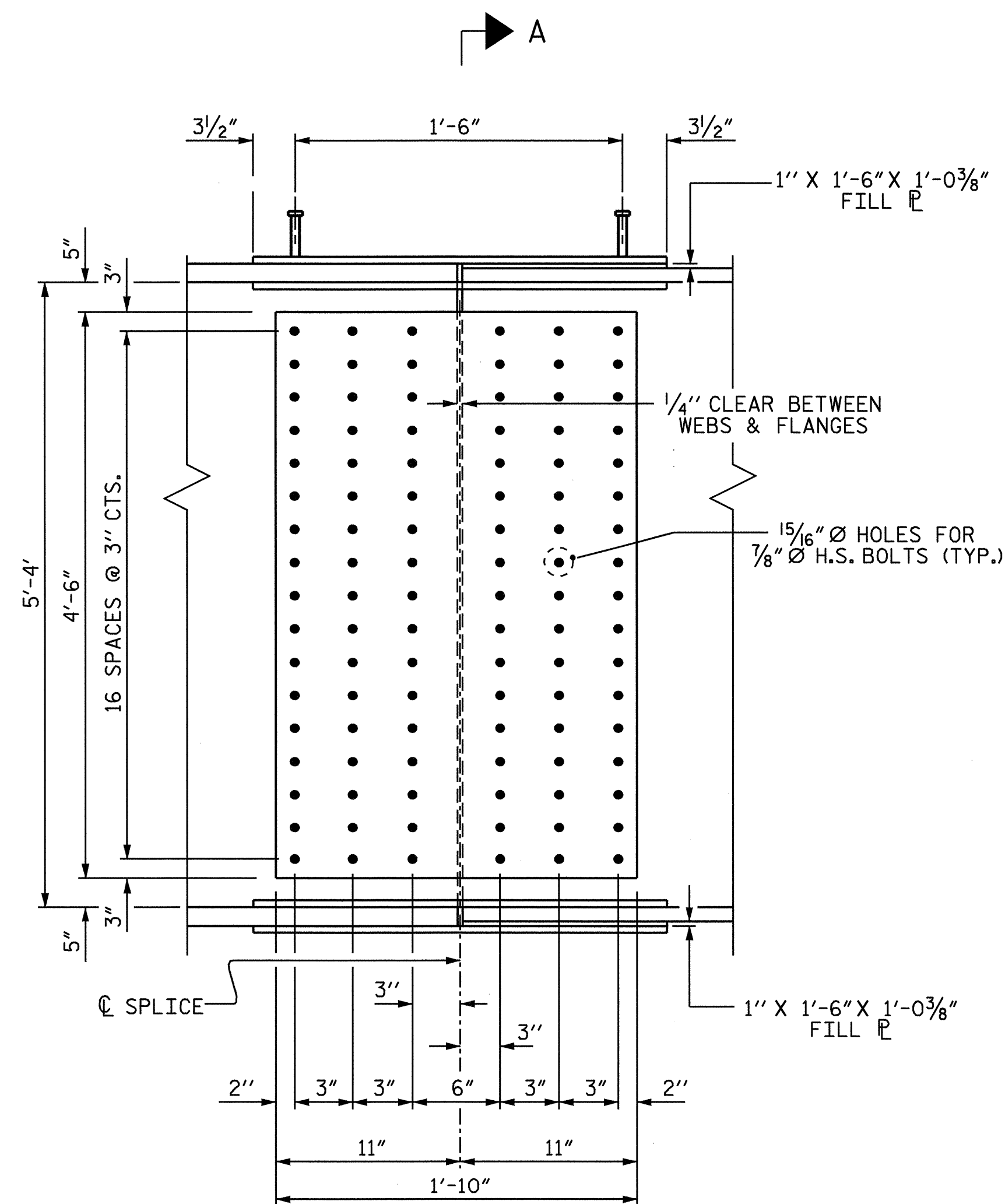
DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: A.R. CHESSON DATE: 10-08



PLAN (TOP OF TOP FLANGE)

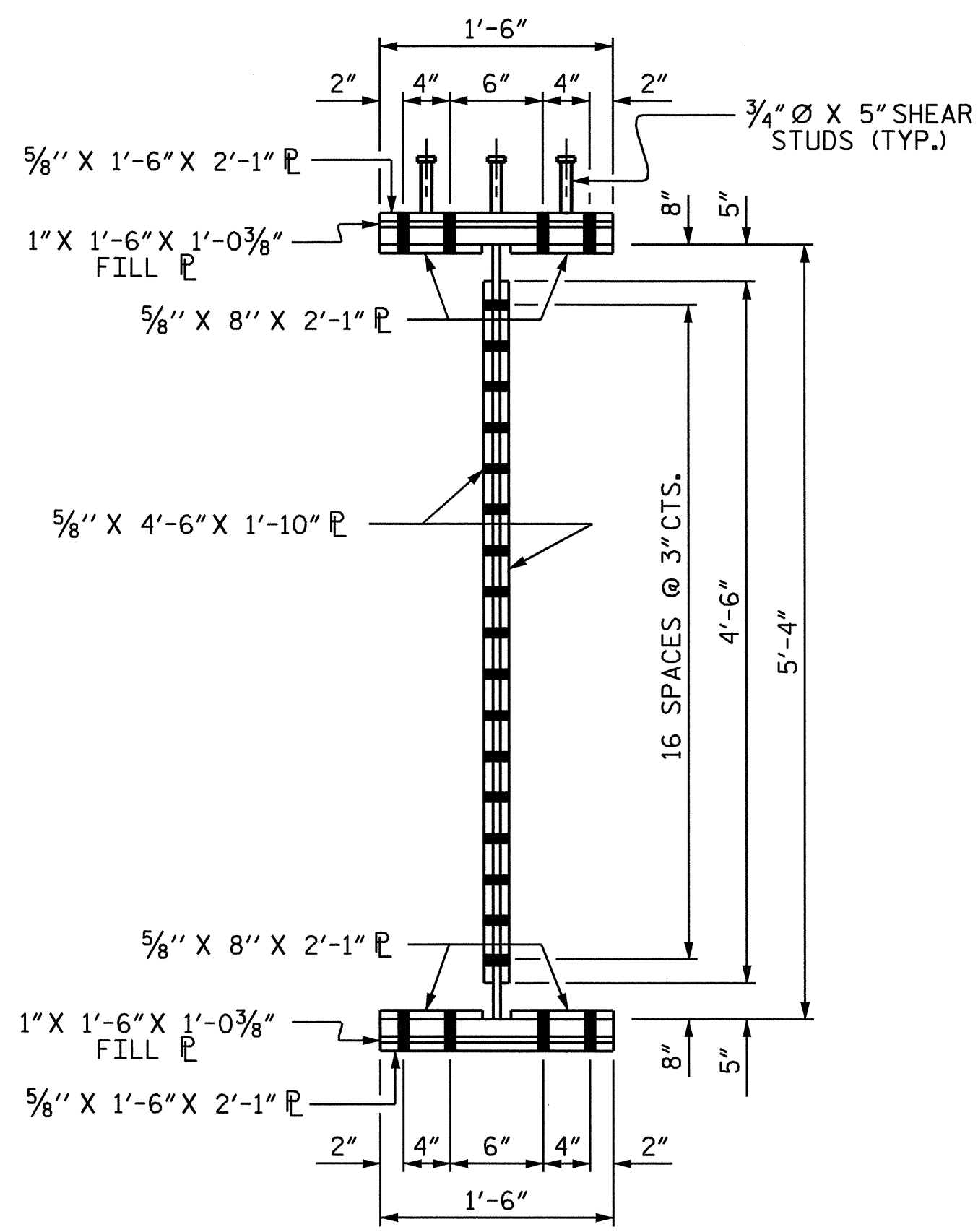


PLAN (TOP OF BOTTOM FLANGE)

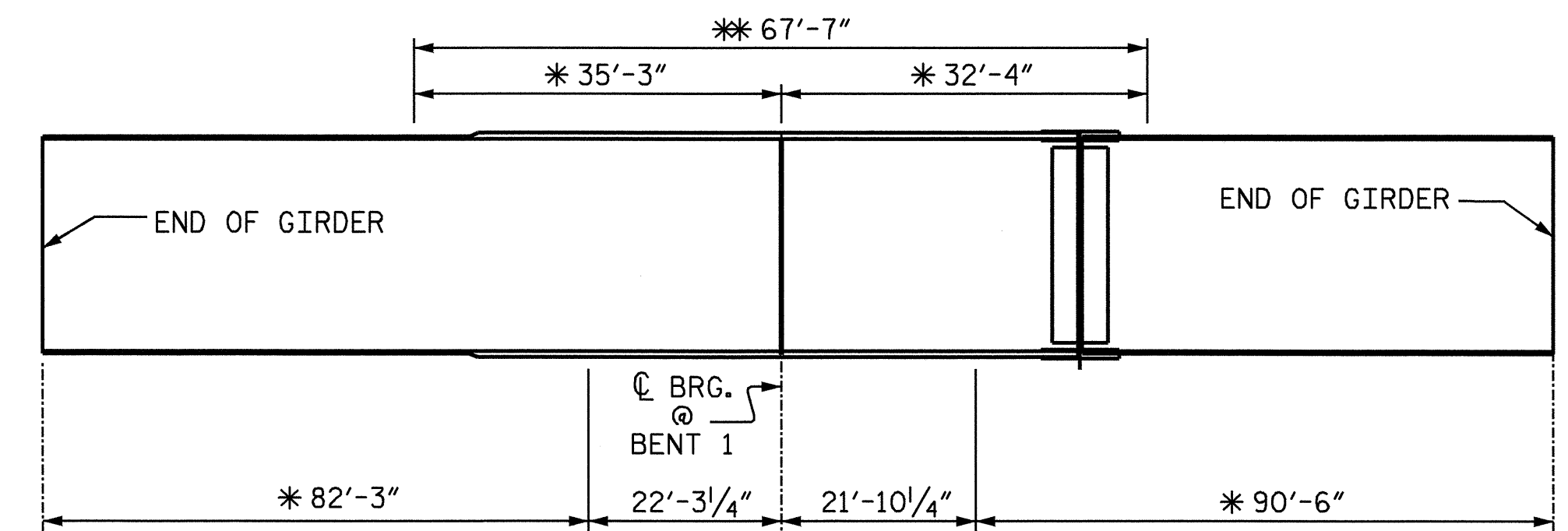


ELEVATION

BOLTED FIELD SPLICE DETAILS



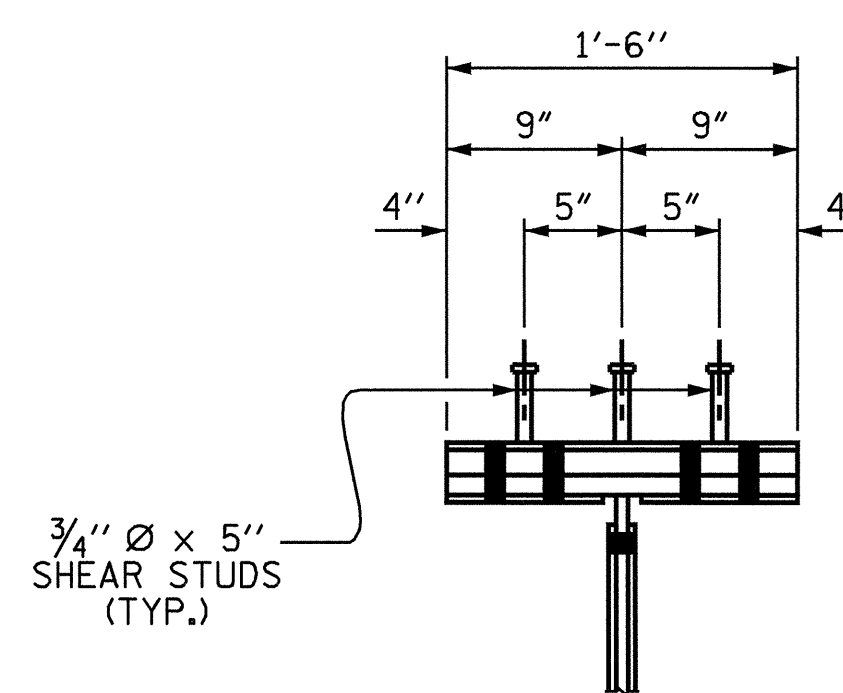
SECTION A-A



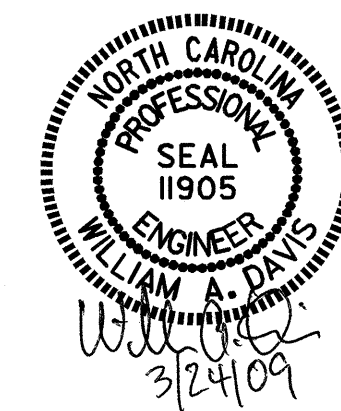
CHARPY V-NOTCH TEST FOR PLATE GIRDERS

\* CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALLS WITHIN THESE LIMITS, INCLUDING ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE TOP FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

\*\* NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.



SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE



PROJECT NO. R-0505  
 HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS  
 (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			56

DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: A.R. CHESSON DATE: 10-08

24-MAR-2009 06:55  
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 qtnguyen



NOTES

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

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

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

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

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

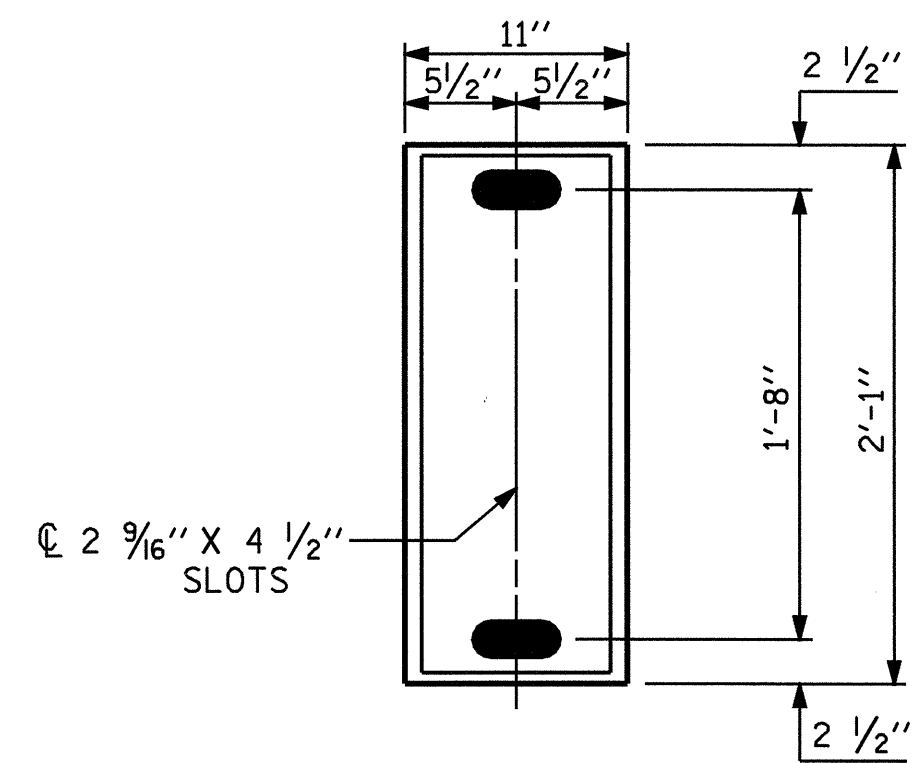
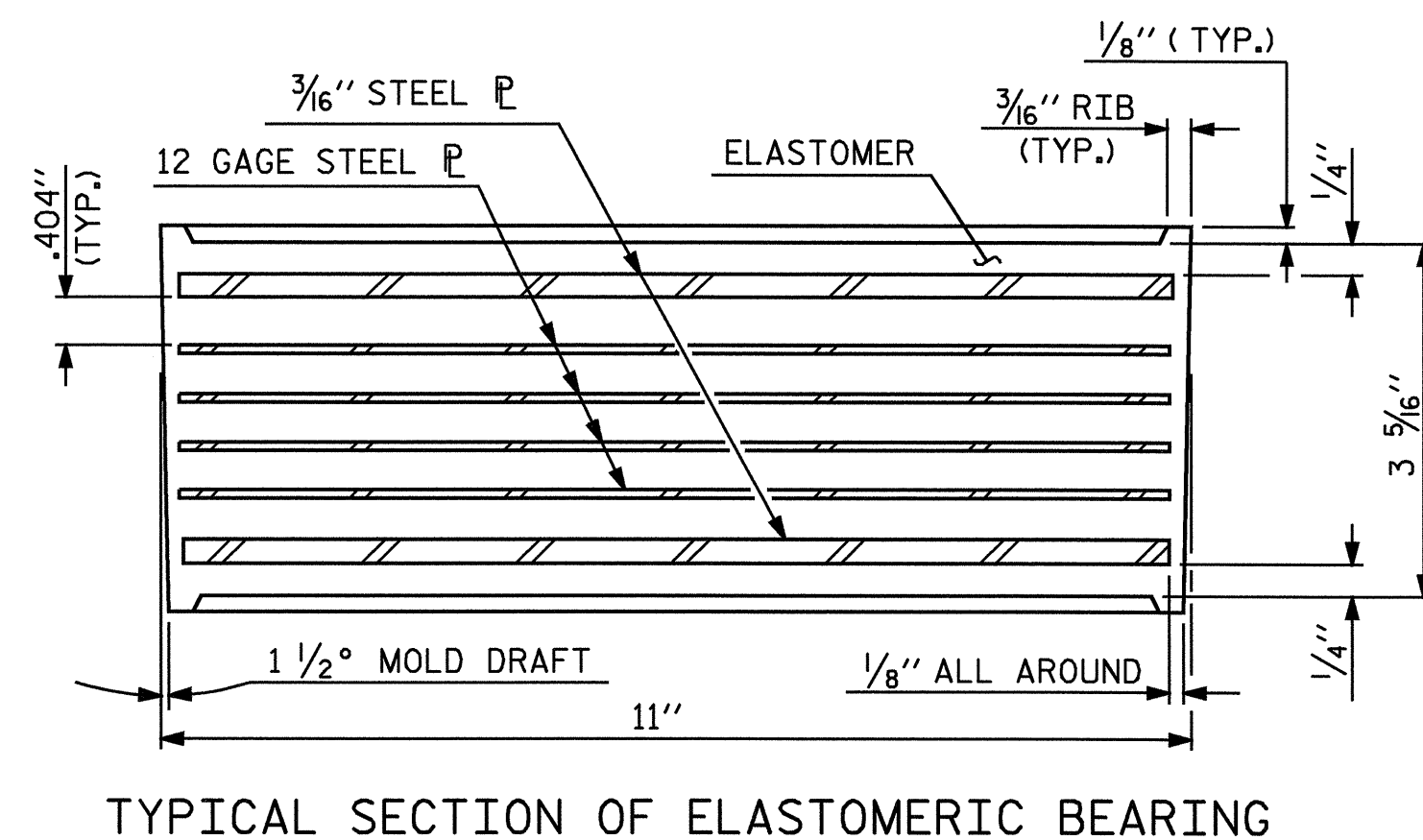
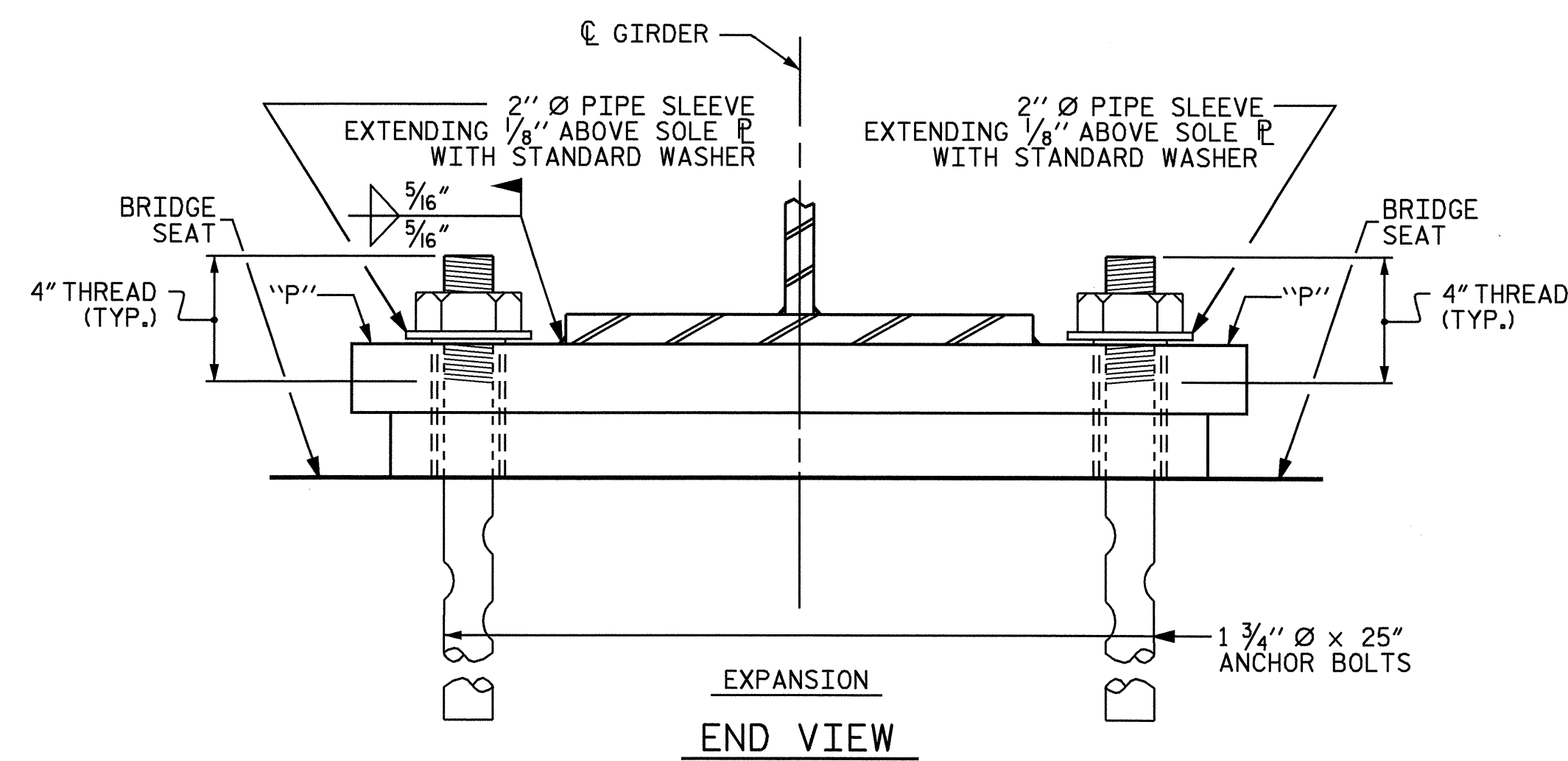
WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

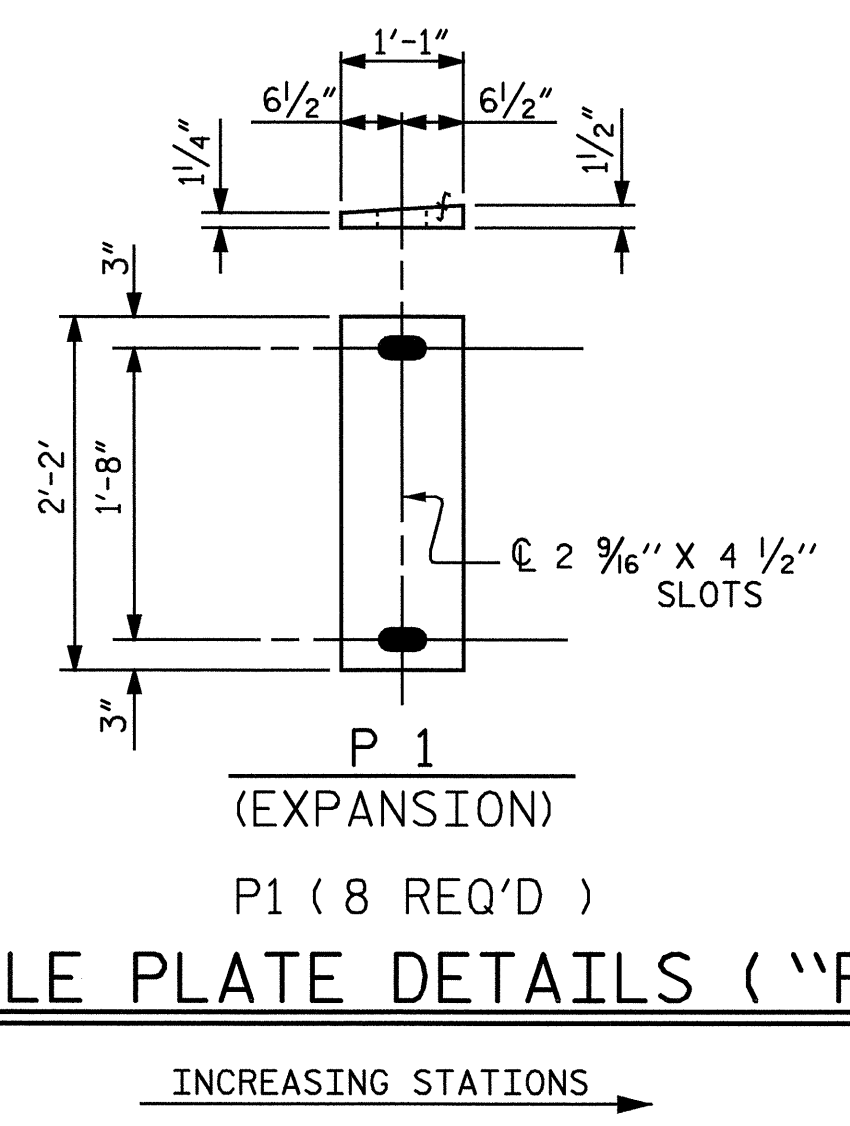
1. ONCE THE DECK HAS CURED, THE GIRDERS SHALL BE JACKED AND THE ELASTOMERIC BEARING SLOTS CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60<sup>3</sup>/<sub>64</sub> F.

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



E8 (8 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING  
TYPE IV

-LOAD RATINGS-	
	MAX.D.L.+ L.L.
TYPE IV	184 K



P1 (8 REQ'D)  
SOLE PLATE DETAILS ("P")

PROJECT NO. R-0505  
HENDERSON COUNTY  
STATION: 780+05.14 -L-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
ELASTOMERIC BEARING  
DETAILS  
(NBL)  
(STEEL SUPERSTRUCTURE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			56

ASSEMBLED BY :	QT NGUYEN	DATE :	10-08
CHECKED BY :	A.R. CHESSON	DATE :	10-08
DRAWN BY :	EEM	10/95	REV. 10/17/00 RWW/LES
CHECKED BY :	PEK	10/95	REV. 7/10/01 LES/ADR
			REV. 5/1/06 TLA/GM

NOTES

FOR POT BEARINGS, SEE SPECIAL PROVISIONS.

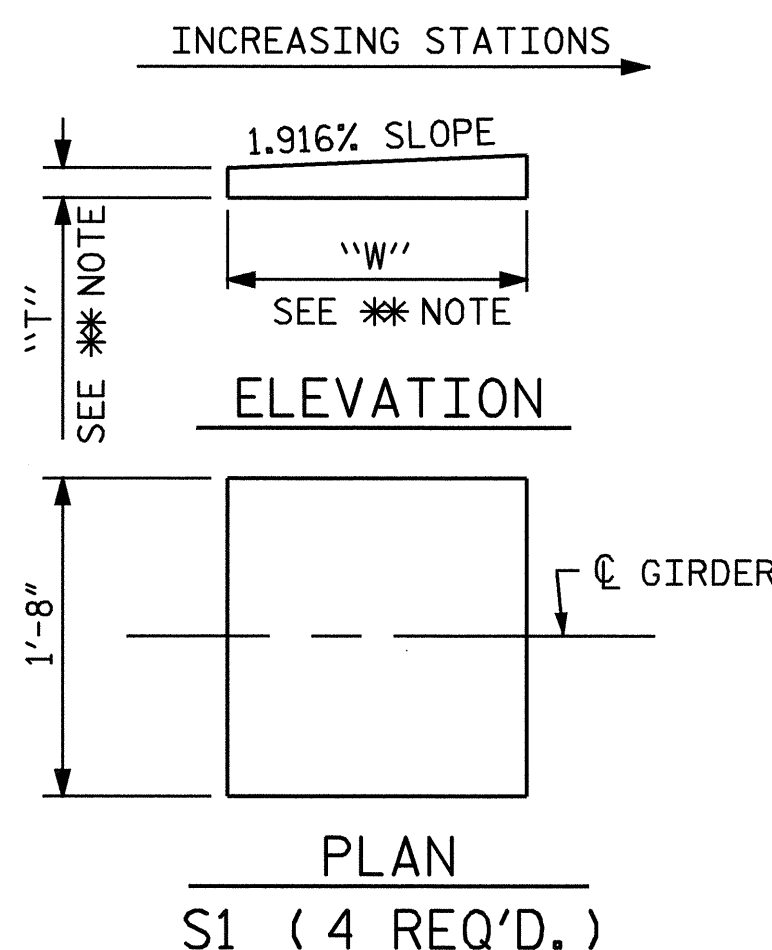
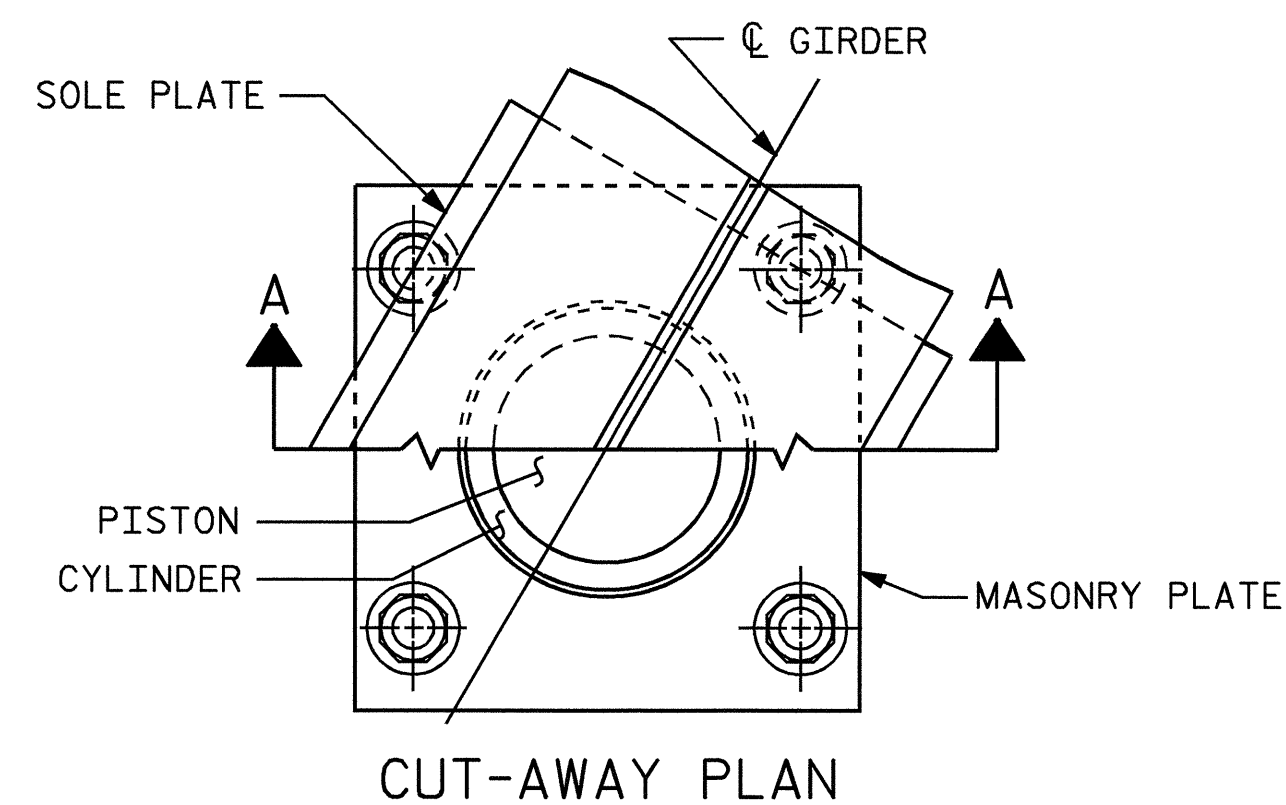
AT ALL POINTS OF SUPPORT IN SPANS A & B, NUTS FOR ANCHOR BOLTS SHALL BE TIGHTENED FINGER TIGHT AND GIVEN AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR ELASTOMER.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

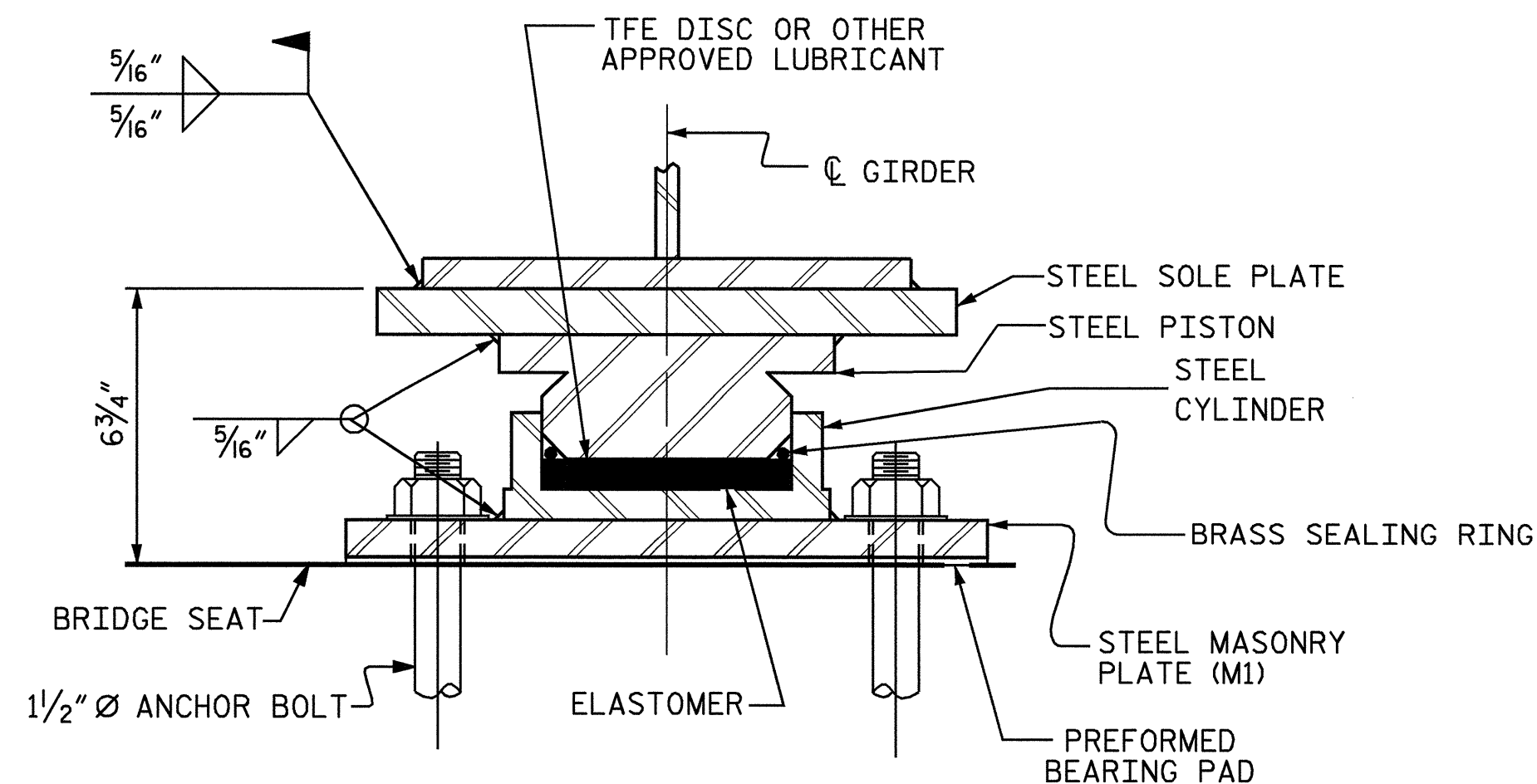
FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE CONTRACTOR MAY SUBSTITUTE DISC BEARINGS FOR THE POT BEARINGS SHOWN. FOR OPTIONAL DISC BEARINGS, SEE SPECIAL PROVISIONS.



\*\* NOTE: DIMENSIONS "W" AND "T" ARE TO BE DETERMINED BY THE MANUFACTURER.

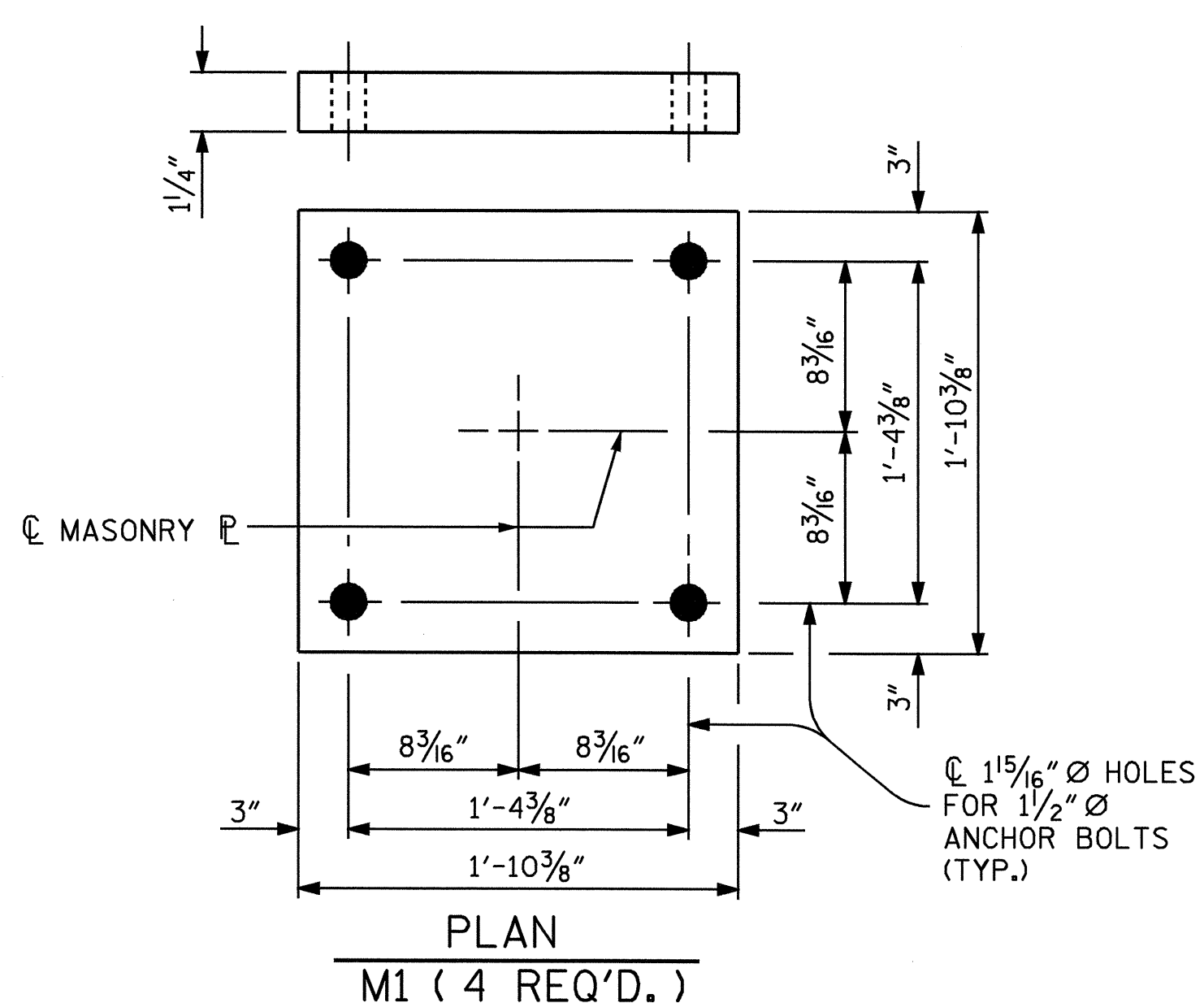
SOLE PLATE DETAILS



SECTION A-A

PB1, FIXED  
( 4 REQ'D. )

POT BEARING DETAILS



MASONRY PLATE DETAILS

BEARING	LOCATION	VERTICAL LOAD (KIPS)			LATERAL LOAD (KIPS)	TOTAL MOVEMENT (INCHES)
		DEAD	LIVE	TOTAL		
PB1 (FIXED)	BENT 1	330.55	146.85	477.40	—	—

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 POT BEARING  
 DETAILS  
 (NBL)



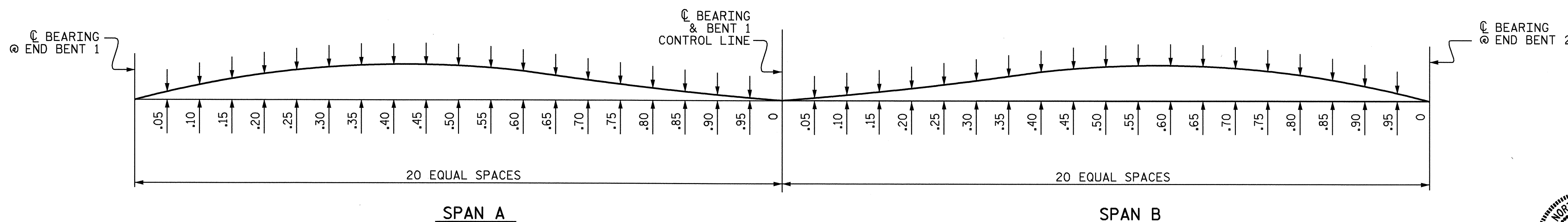
REVISIONS						SHEET NO. S-40
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 56
2			4			

ASSEMBLED BY : QT NGUYEN DATE : 10-08  
 CHECKED BY : A.R. CHESSON DATE : 10-08  
 DRAWN BY : RWW 8/99 REV. 7/10/01 LES/RDR  
 CHECKED BY : LES 8/99 REV. 5/7/03 RWW/JTE  
 REV. 5/1/06 TLA/GM

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
	SPAN A																				
	GIRDER 1, 2, 3, & 4																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.003	0.006	0.009	0.012	0.014	0.015	0.016	0.016	0.016	0.015	0.013	0.012	0.010	0.008	0.006	0.004	0.002	0.001	0.000	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.012	0.023	0.033	0.042	0.049	0.054	0.057	0.057	0.056	0.052	0.047	0.041	0.034	0.026	0.019	0.012	0.006	0.002	0.001	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.001	0.002	0.003	0.004	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.003	0.003	0.002	0.001	0.001	0.000	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.016	0.031	0.045	0.058	0.068	0.074	0.078	0.078	0.077	0.072	0.064	0.057	0.047	0.037	0.027	0.017	0.009	0.003	0.001	0.000
REQUIRED CAMBER	0	3/16"	3/8"	9/16"	1 1/16"	1 3/16"	7/8"	1 5/16"	1 5/16"	1 5/16"	7/8"	3/4"	1 1/16"	9/16"	7/16"	5/16"	3/16"	1/8"	0	0	0

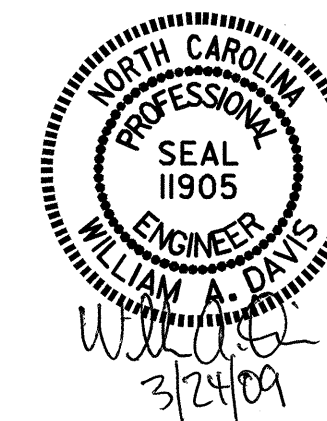
DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
	SPAN B																				
	GIRDER 1, 2, 3, & 4																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.001	0.003	0.005	0.008	0.011	0.014	0.017	0.020	0.022	0.024	0.025	0.025	0.024	0.023	0.020	0.017	0.014	0.009	0.005	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.004	0.011	0.021	0.032	0.044	0.056	0.068	0.079	0.087	0.094	0.098	0.098	0.096	0.090	0.081	0.069	0.054	0.037	0.019	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.009	0.009	0.009	0.008	0.008	0.006	0.005	0.003	0.002	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.005	0.015	0.028	0.043	0.059	0.075	0.091	0.106	0.117	0.127	0.132	0.132	0.129	0.121	0.109	0.092	0.073	0.049	0.026	0.000
REQUIRED CAMBER	0	1/16"	3/16"	5/16"	1/2"	1 1/16"	7/8"	1 1/16"	1 1/4"	1 7/16"	1 1/2"	1 9/16"	1 9/16"	1 9/16"	1 7/16"	1 5/16"	1 1/8"	7/8"	9/16"	5/16"	0

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



SCHEMATIC OF CAMBER ORDINATES  
 FOR CAMBER VALUES AT EACH GIRDER TWENTIETH POINTS, SEE TABLE ABOVE.  
 SLOPE FOR ZERO CAMBER BASE LINE VARIES.

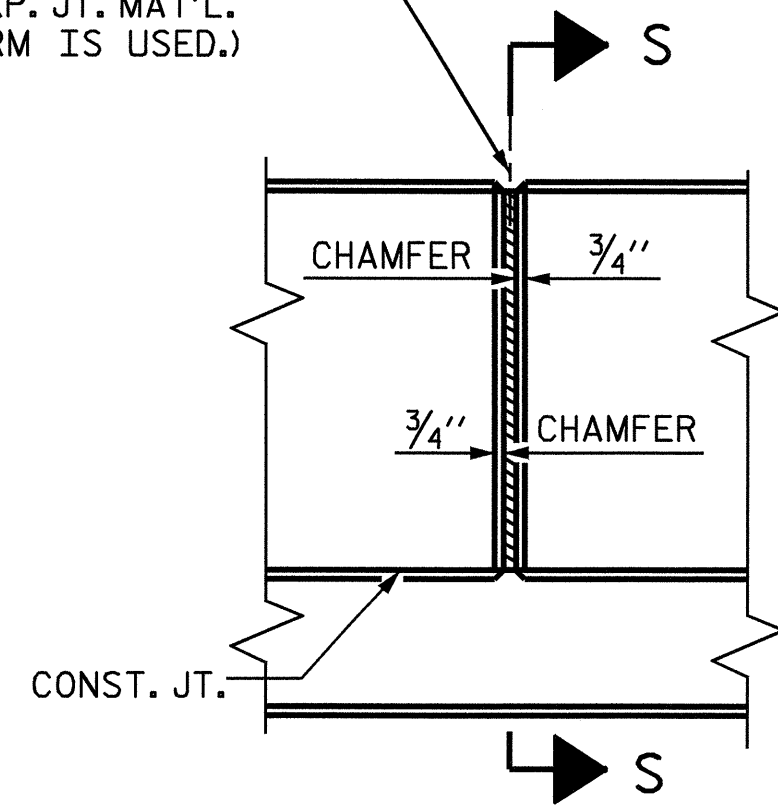
PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-



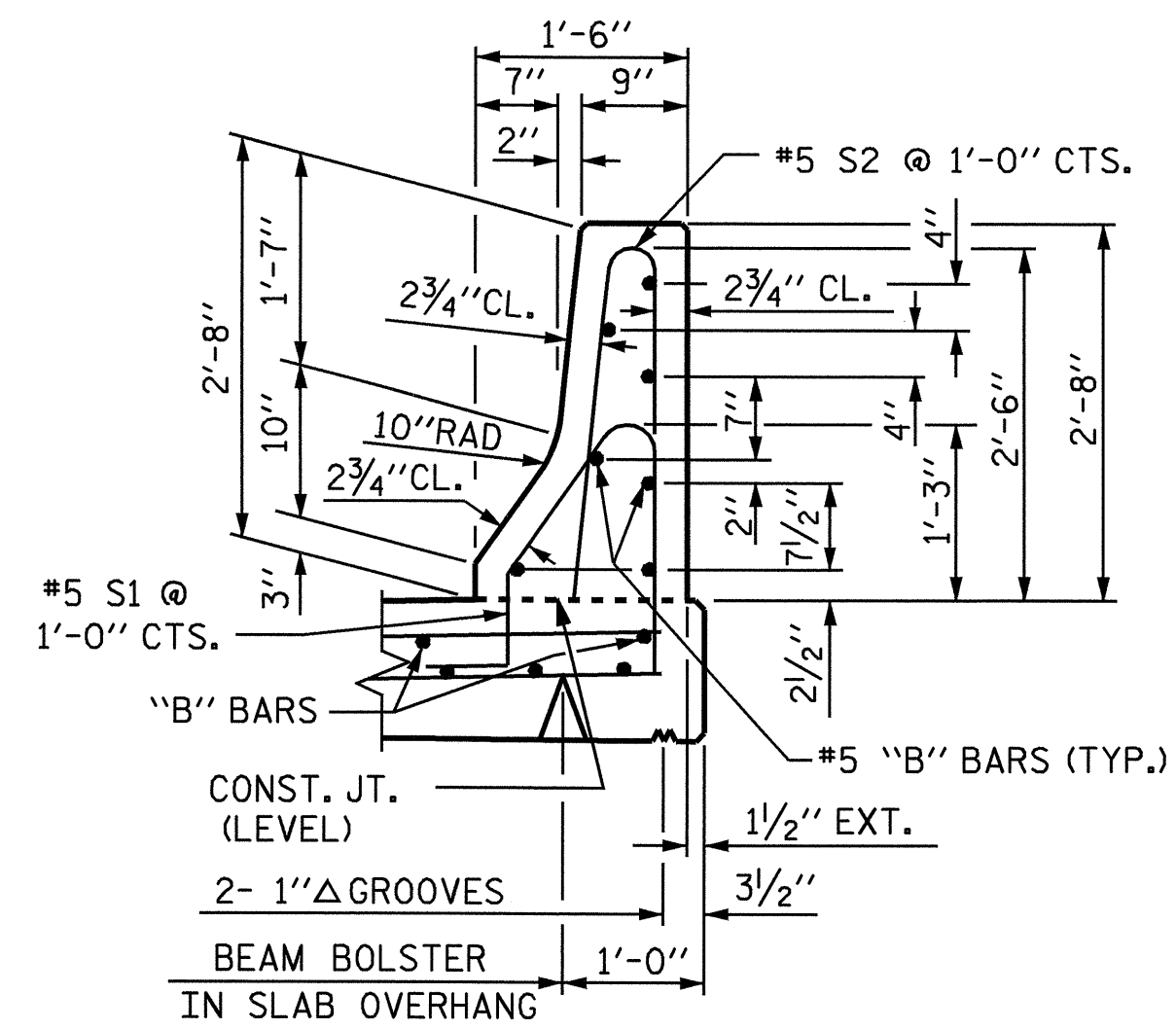
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-41	
SUPERSTRUCTURE DEAD LOAD DEFLECTIONS (NBL)						TOTAL SHEETS 56	
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: A.R. CHESSON DATE: 12-08

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

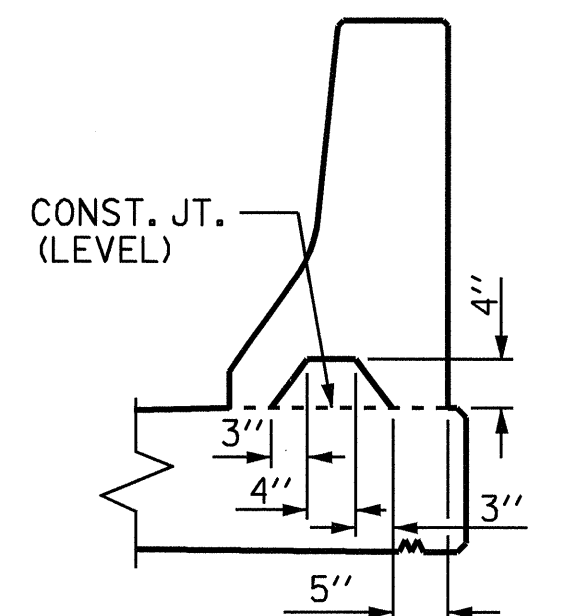


ELEVATION AT EXPANSION JOINTS



SECTION THRU RAIL

BARRIER RAIL DETAILS



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

NOTES

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

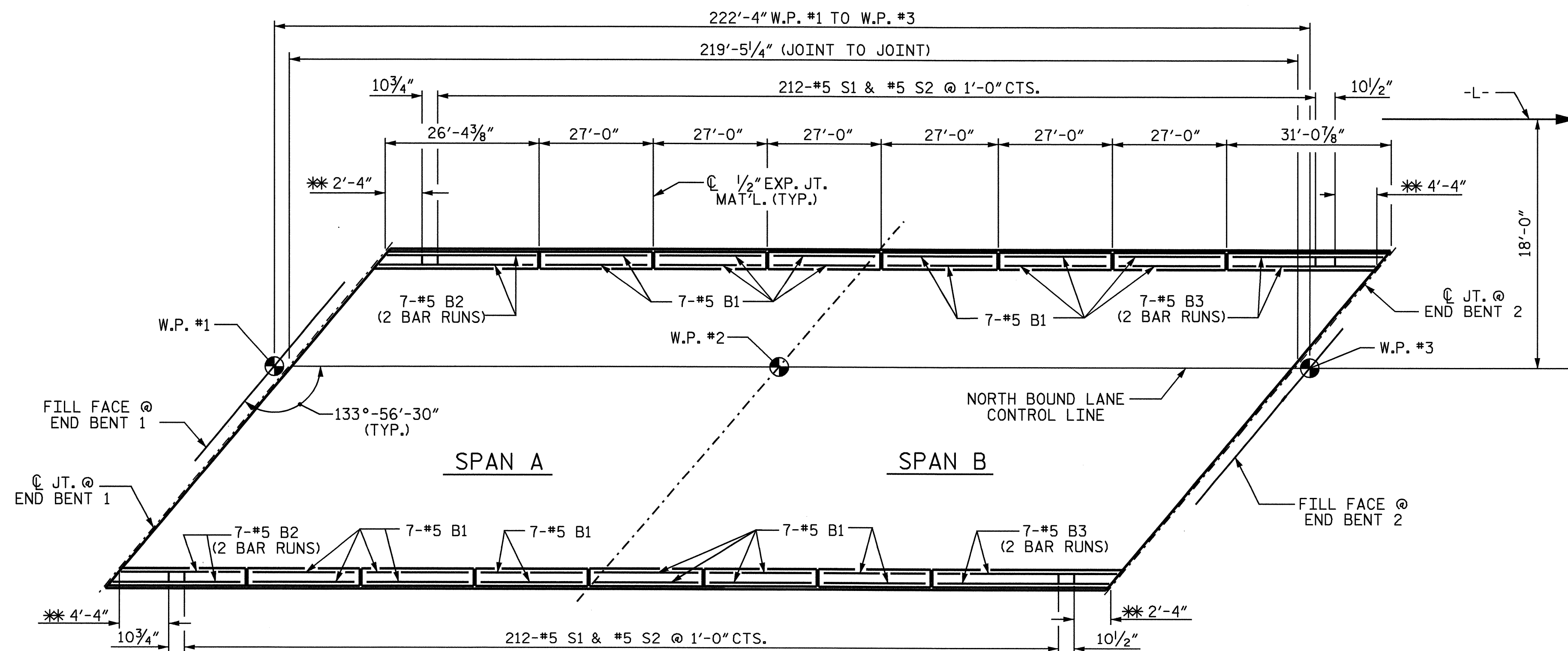
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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, THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

**BAR TYPES**

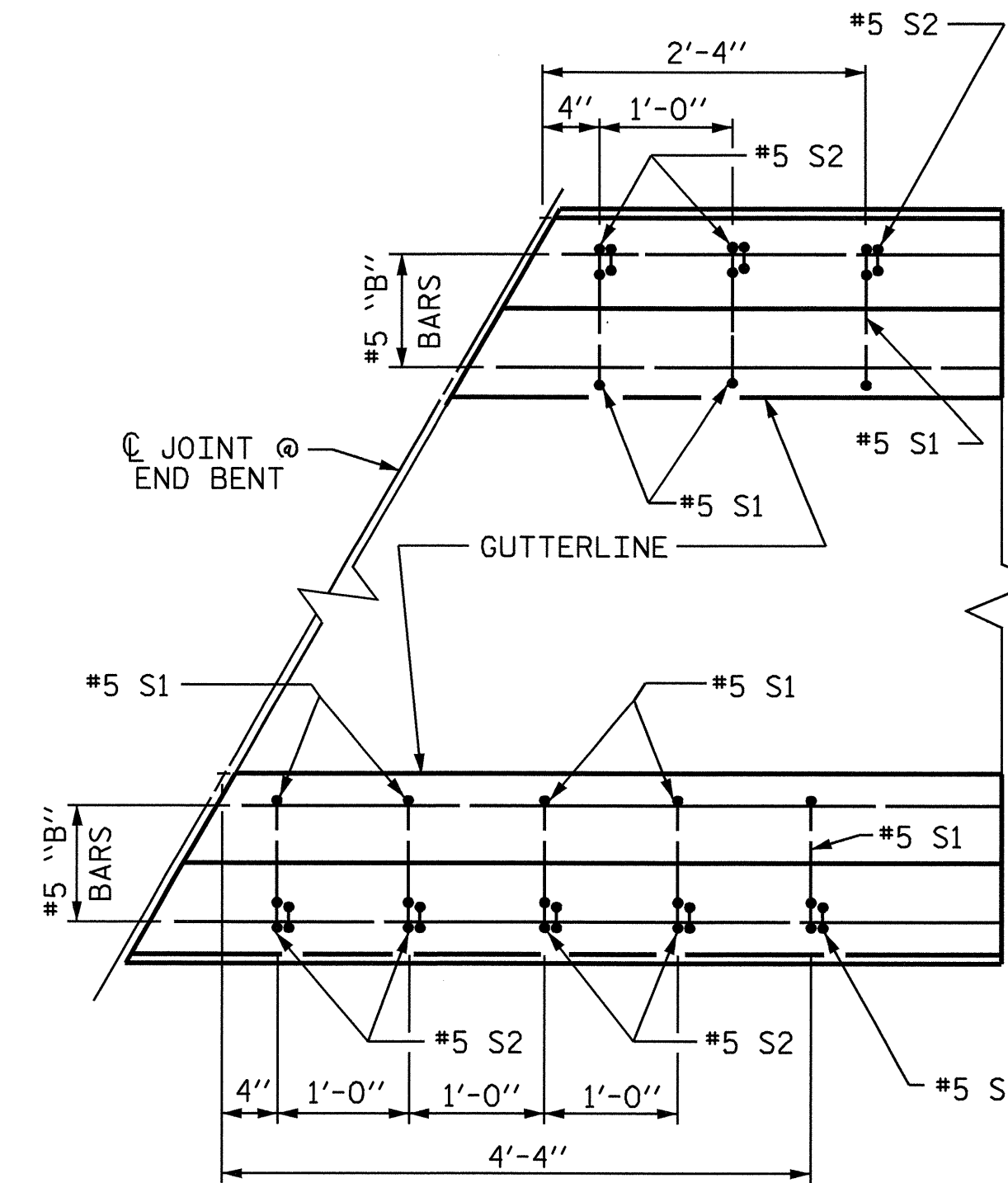
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	84	#5	STR	26'-8"	2336
* B2	28	#5	STR	14'-2"	414
* B3	28	#5	STR	17'-11"	523
* S1	440	#5	1	4'-10"	2218
* S2	440	#5	2	5'-2"	2371
* EPOXY COATED REINFORCING STEEL				7862 LBS.	
CLASS AA CONCRETE				43.7 CU. YDS.	
CONCRETE BARRIER RAIL				438.76 LIN. FT.	



PLAN OF BARRIER RAIL

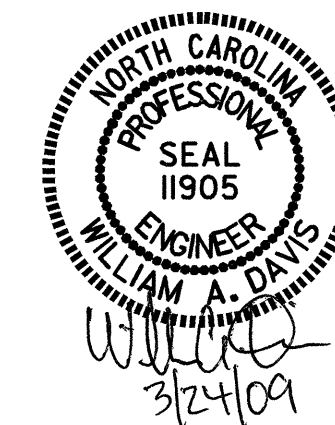
\*\* SEE "END OF RAIL DETAILS - PLAN VIEW" FOR ADDITIONAL REINFORCING STEEL. DIMENSIONS SHOWN ARE TYPICAL FOR EACH SIDE.



PLAN  
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

END OF RAIL DETAILS

PROJECT NO. R-0505  
 HENDERSON COUNTY  
 STATION: 780+05.14 -L-



ASSEMBLED BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: A.R. CHESSON DATE: 10-08  
 DRAWN BY: ARB 5/87 REV. 10/17/00 RWW/LES  
 CHECKED BY: SJD 9/87 REV. 5/7/03R RWW/JTE  
 REV. 5/1/06 TLA/GM

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD CONCRETE BARRIER RAIL (NBL)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 56

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.)

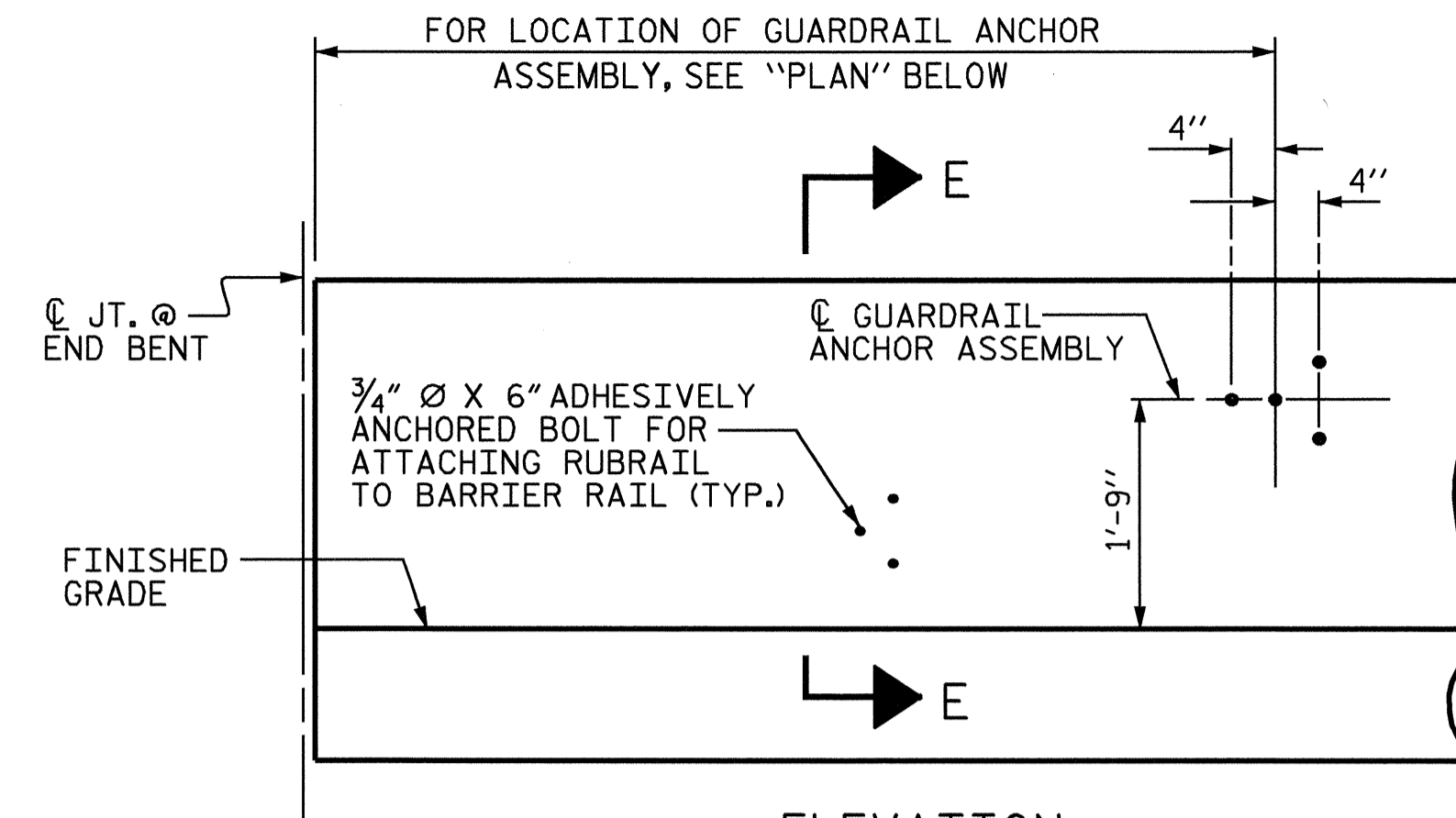
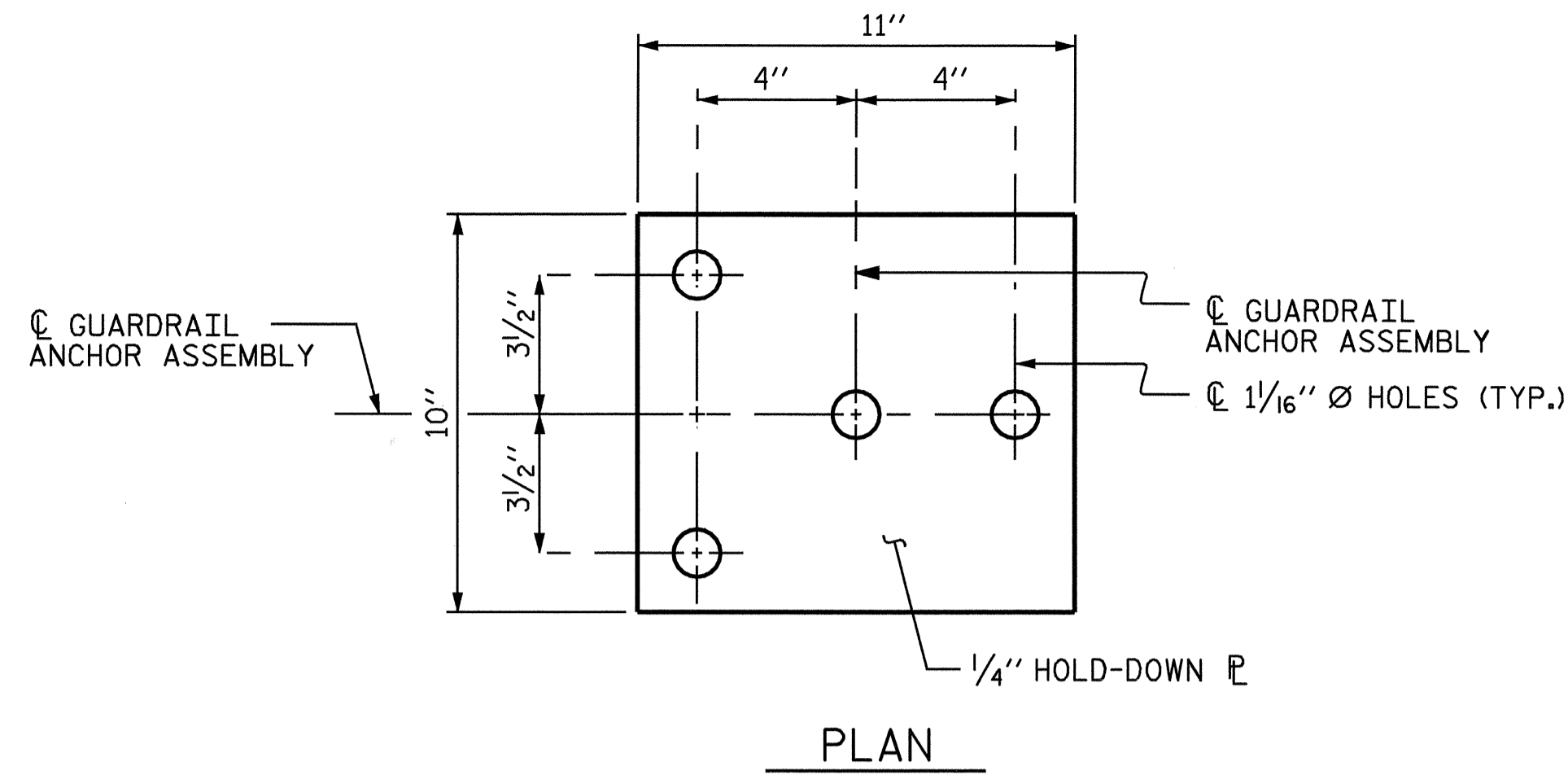
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

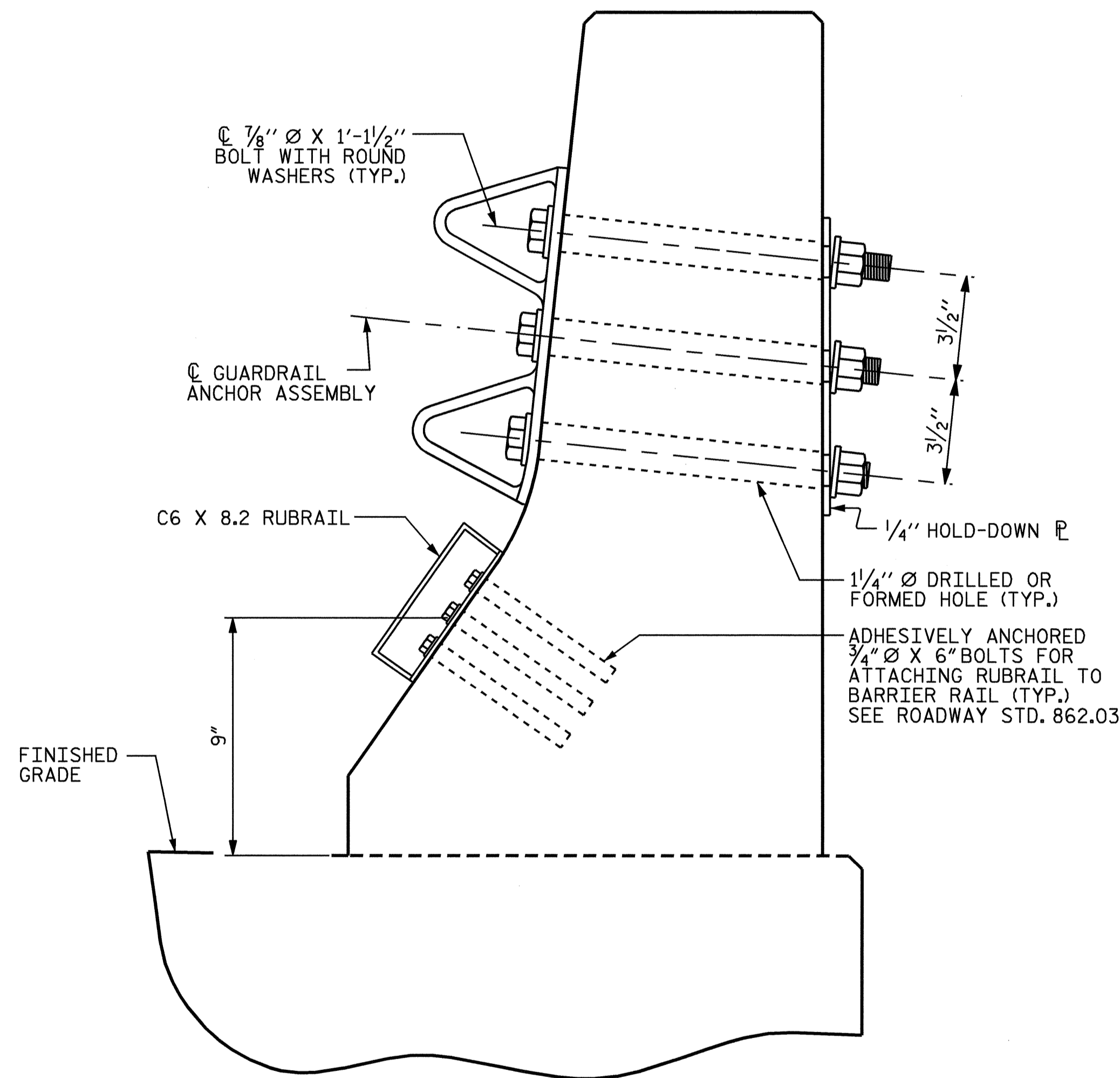
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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.

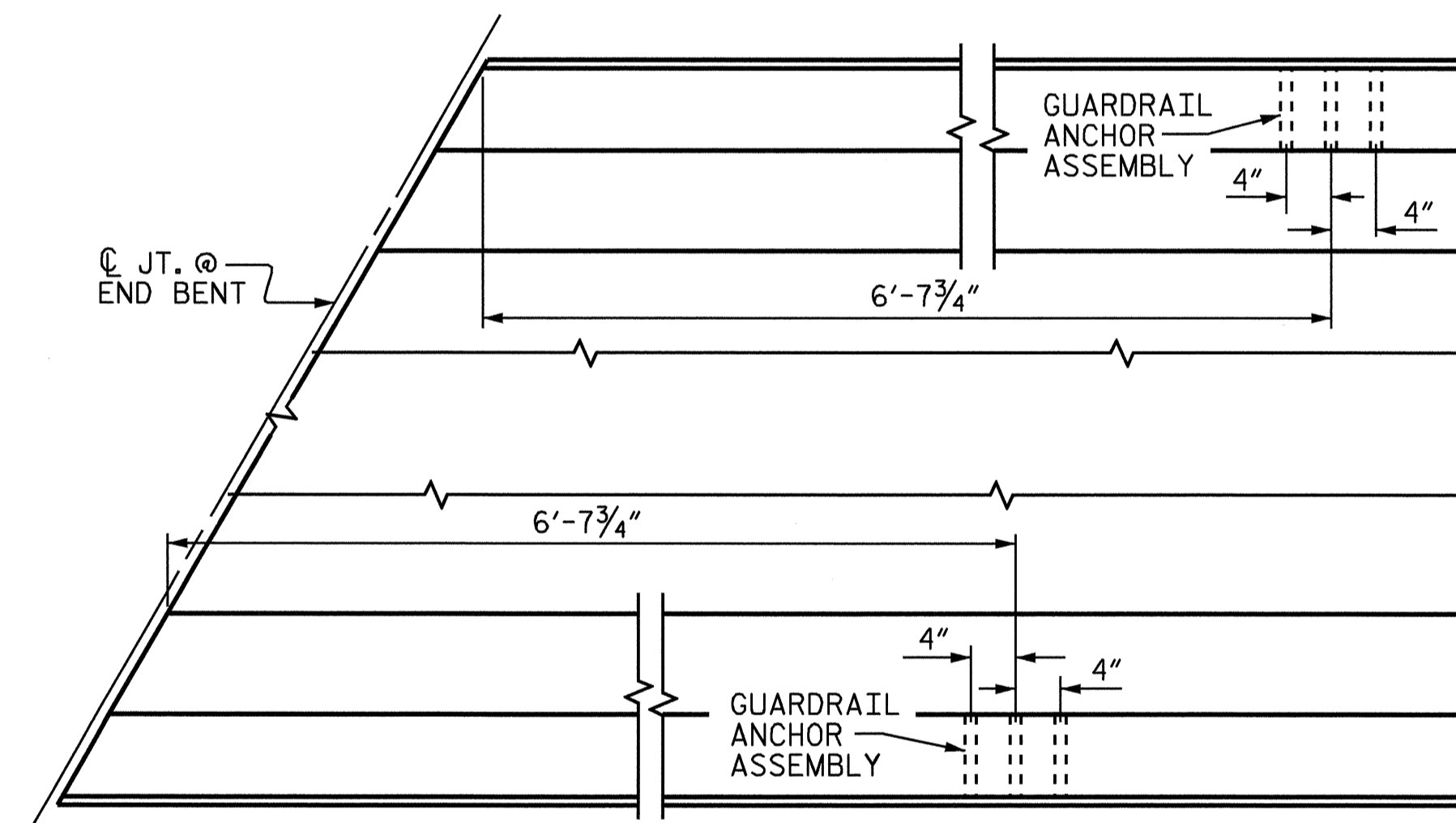


ELEVATION  
FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



SECTION E-E

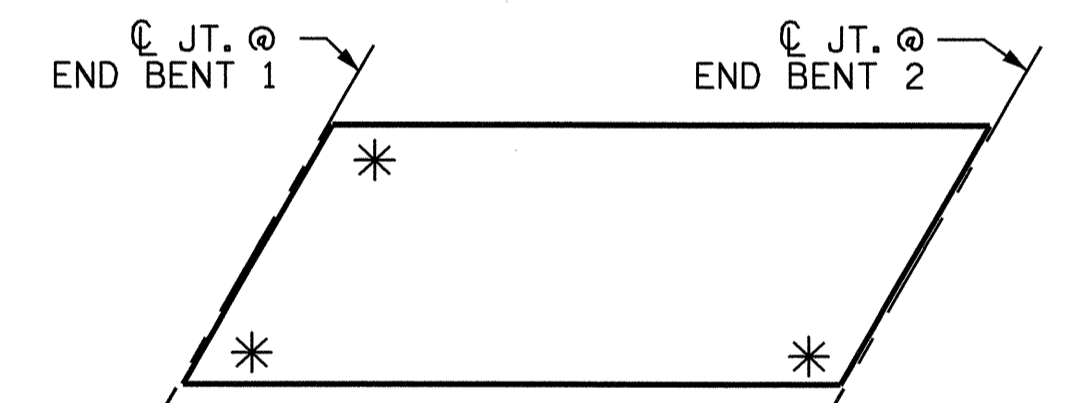
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

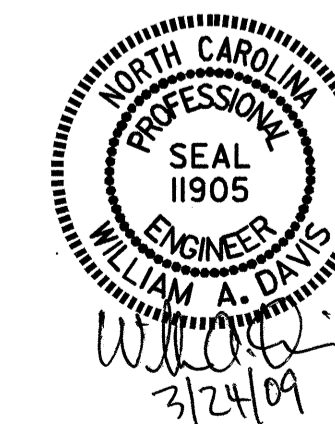
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-



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

ASSEMBLED BY : QT NGUYEN	DATE : 10-08
CHECKED BY : A.R. CHESSON	DATE : 10-08
DRAWN BY : TLA 5/06	ADDED 5/1/06R KMM/GM
CHECKED BY : GM 5/06	

REVISIONS						SHEET NO. S-43
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 56
2			4			

NOTES

ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169 GRADES 1010 THRU 1020 OR APPROVED EQUAL.

STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON THE PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.

UPON COMPLETION OF SHOP FABRICATION, THE ENTIRE ANCHOR ASSEMBLY SHALL BE METALLIZED. THE 1/2" Ø STUD ANCHORS AND ANCHOR TABS NEED NOT BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

ANCHOR ASSEMBLY SHALL BE MADE CONTINUOUS THE LENGTH OF THE JOINT FROM GUTTER TO GUTTER. FOR FIELD SPLICES AT ALL CROWN BREAK POINTS, THE ENDS OF THE STEEL ANGLES SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE. FINISHED FIELD WELDS SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

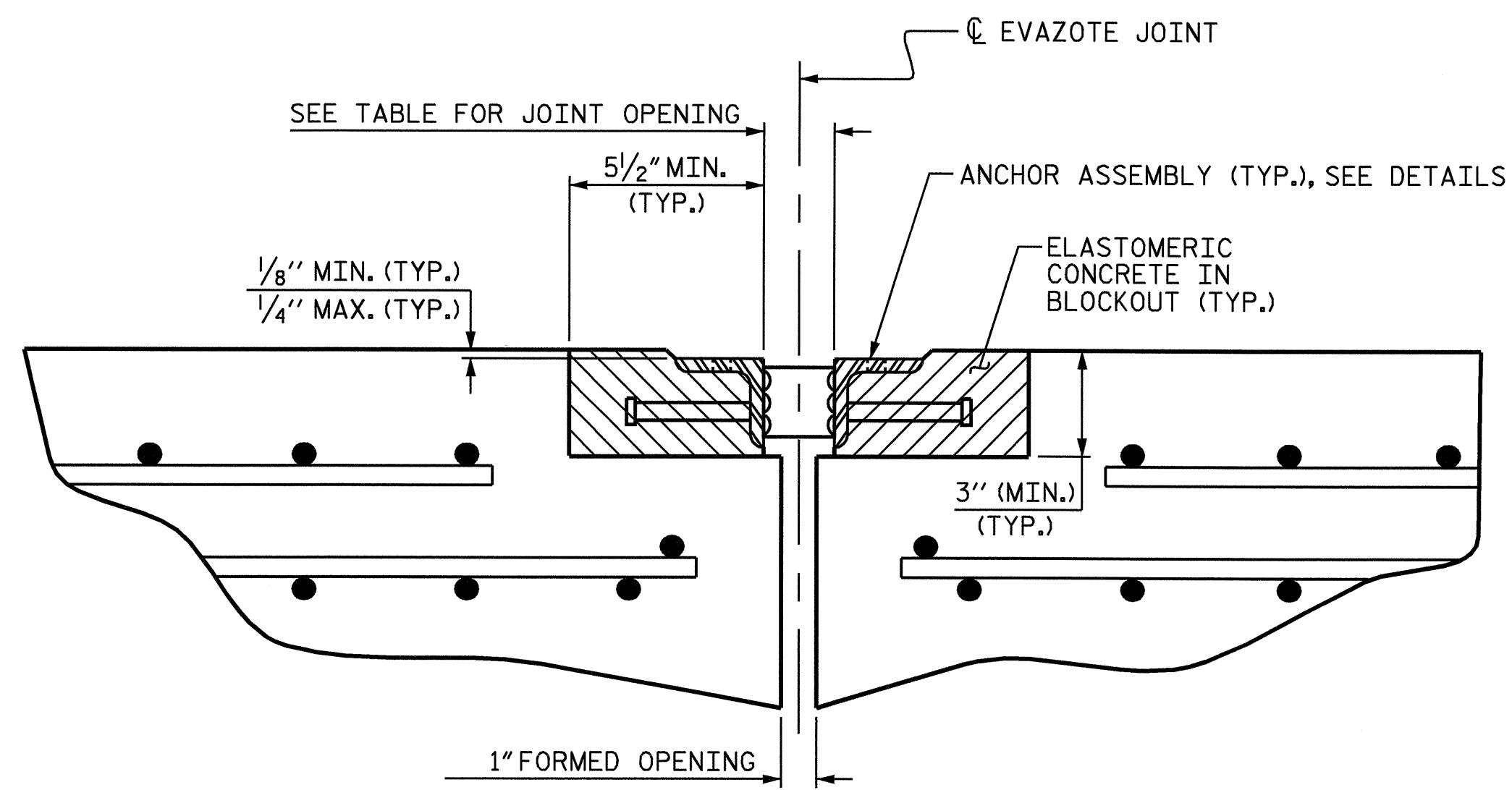
ANCHOR ASSEMBLY SEGMENTS SHALL NOT BE LESS THAN 12 FEET NOR MORE THAN 20 FEET IN LENGTH. SHORTER SEGMENTS MAY BE USED AT THE EDGE OF ROADWAY OR AT POINTS OF STAGED CONSTRUCTION.

THE ANCHOR ASSEMBLY SHALL BE SECURED AND LEVELED AS SHOWN IN THE "ARMORED JOINT ANCHOR ASSEMBLY DETAILS". NO SUBMITTALS ARE REQUIRED FOR 3/8" Ø EXPANSION ANCHORS, NUTS OR WASHERS. THE CONTRACTOR MAY SUBMIT FOR APPROVAL AN ALTERNATE METHOD OF ALIGNING AND LEVELING THE ANGLES. THE ALTERNATE METHOD SHALL NOT INCLUDE ANY WELDING TO THE OUTSIDE FACE OF THE ANGLES.

AFTER THE ELASTOMERIC CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE ANY EXCESS CONCRETE THAT COMES THROUGH THE WEEP HOLES AND THOROUGHLY CLEAN THE ANGLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM OF 4 MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

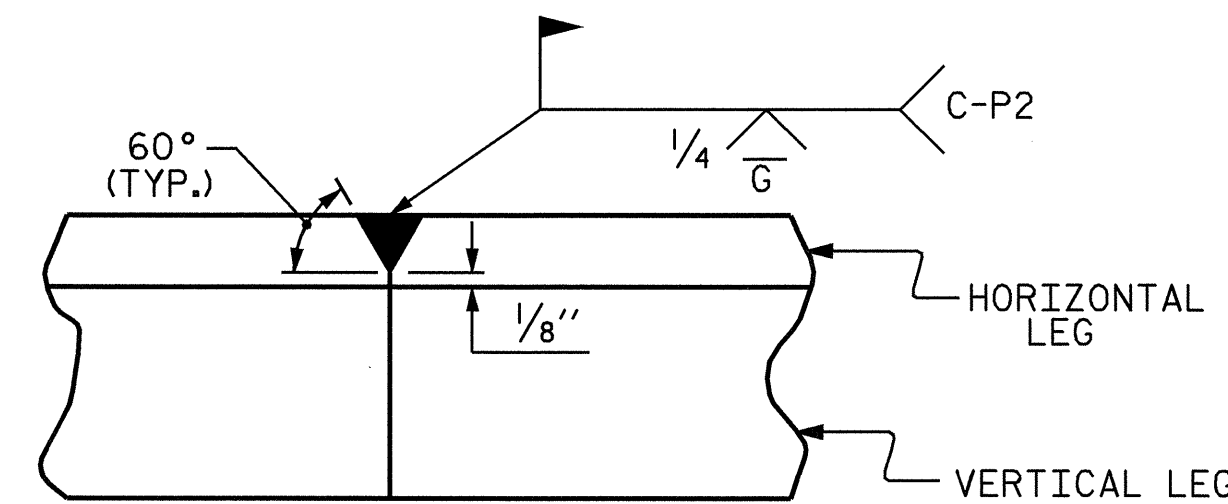
SEE SPECIAL PROVISIONS FOR EVAZOTE JOINT SEALS.

SEE SPECIAL PROVISIONS FOR ELASTOMERIC CONCRETE.

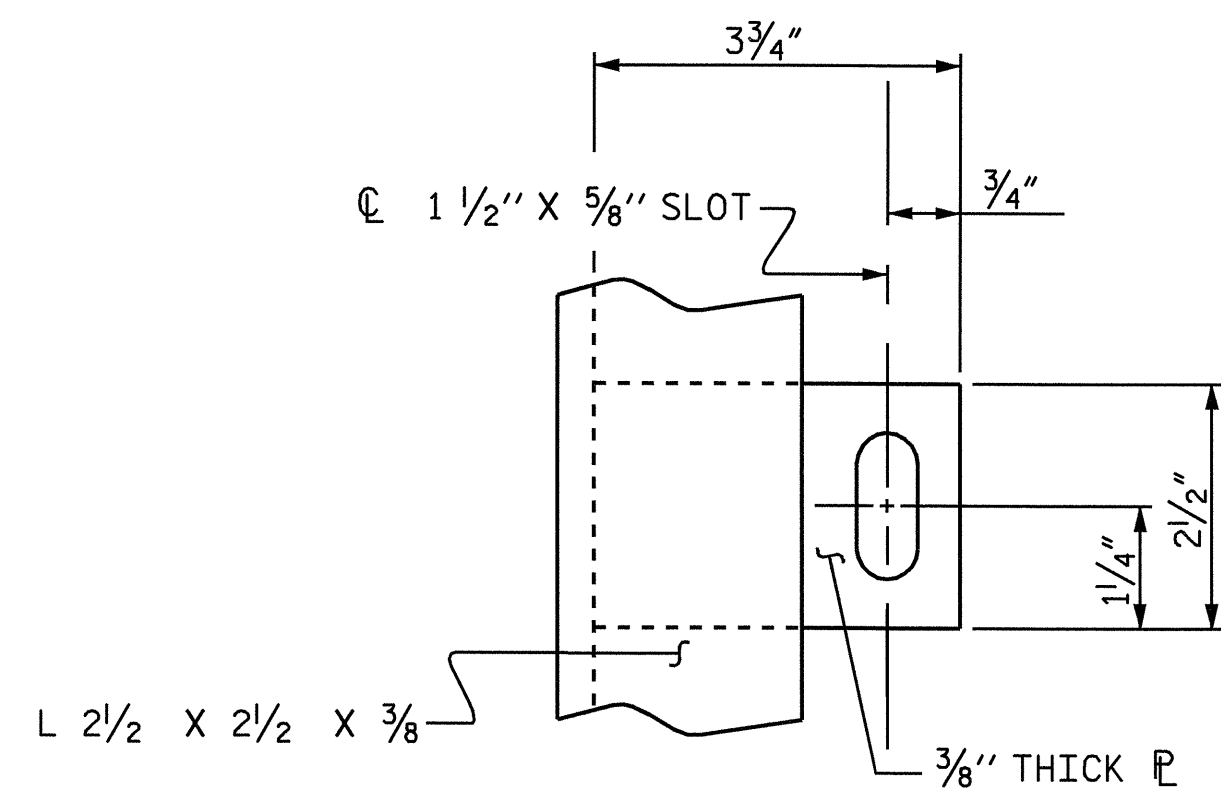


ARMORED JOINT DETAILS

SECTION NORMAL TO JOINT AT BENT



DETAIL- FIELD WELD SPLICE OF ANGLE



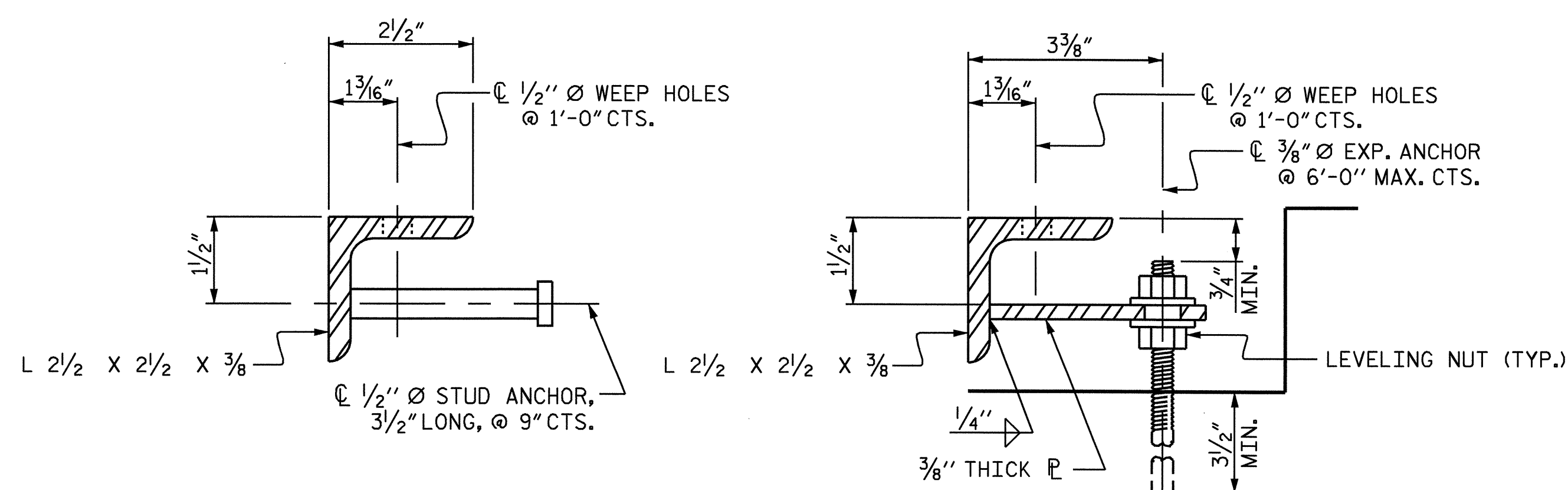
PLAN VIEW OF TAB

END BENT NO.	SKEW ANGLE	NOMINAL UNCOMPRESSED SEAL WIDTH	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	133°-56'-30"	2 1/2"	3/4"	2"	1 7/8"	1 5/8"
2	133°-56'-30"	2 1/2"	13/16"	2"	1 7/8"	1 5/8"

TOTAL MOVEMENT IS CALCULATED ALONG THE CENTERLINE OF ROADWAY. JOINT OPENINGS ARE MEASURED PERPENDICULAR TO THE JOINT.

END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)	TOTAL LENGTH OF ANGLE (FT)
1	12.1	105'-6 1/2"
2	12.1	105'-6 1/2"

\* BASED ON THE MINIMUM BLOCKOUT SHOWN.

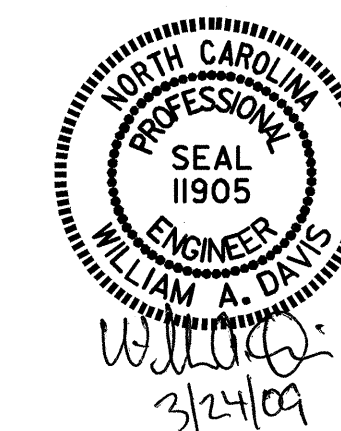


SECTION VIEW OF STUD

SECTION VIEW OF TAB

ARMORED JOINT ANCHOR ASSEMBLY DETAILS

PROJECT NO. R-0505  
 HENDERSON COUNTY  
 STATION: 780+05.14 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 ARMORED EVAZOTE JOINT DETAILS  
 (NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			56

ASSEMBLED BY : QT NGUYEN DATE : 3-18-09  
 CHECKED BY : W.A. DAVIS DATE : 3-18-09  
 DRAWN BY : EEM 1/96 REV. 7/10/01 LES/RDR  
 CHECKED BY : RGW 1/96 REV. 5/7/03RR RWW/JTE  
 REV. 5/1/06 TLA/GM

**BILL OF MATERIAL  
SPAN A & SPAN B**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	359	#5	STR	40'-11"	15321	A209	2	#5	STR	31'-10"	66
A2	359	#5	STR	40'-11"	15321	A210	2	#5	STR	30'-9"	64
						A211	2	#5	STR	29'-8"	62
* A101	2	#5	STR	40'-6"	84	A212	2	#5	STR	28'-7"	60
* A102	2	#5	STR	39'-5"	82	A213	2	#5	STR	27'-6"	57
* A103	2	#5	STR	38'-4"	80	A214	2	#5	STR	26'-5"	55
* A104	2	#5	STR	37'-3"	78	A215	2	#5	STR	25'-4"	53
* A105	2	#5	STR	36'-2"	75	A216	2	#5	STR	24'-3"	51
* A106	2	#5	STR	35'-1"	73	A217	2	#5	STR	23'-2"	48
* A107	2	#5	STR	34'-0"	71	A218	2	#5	STR	22'-1"	46
* A108	2	#5	STR	32'-11"	69	A219	2	#5	STR	21'-0"	44
* A109	2	#5	STR	31'-10"	66	A220	2	#5	STR	19'-11"	42
* A110	2	#5	STR	30'-9"	64	A221	2	#5	STR	18'-10"	39
* A111	2	#5	STR	29'-8"	62	A222	2	#5	STR	17'-9"	37
* A112	2	#5	STR	28'-7"	60	A223	2	#5	STR	16'-8"	35
* A113	2	#5	STR	27'-6"	57	A224	2	#5	STR	15'-7"	33
* A114	2	#5	STR	26'-5"	55	A225	2	#5	STR	14'-6"	30
* A115	2	#5	STR	25'-4"	53	A226	2	#5	STR	13'-5"	28
* A116	2	#5	STR	24'-3"	51	A227	2	#5	STR	12'-4"	26
* A117	2	#5	STR	23'-2"	48	A228	2	#5	STR	11'-3"	23
* A118	2	#5	STR	22'-1"	46	A229	2	#5	STR	10'-2"	21
* A119	2	#5	STR	21'-0"	44	A230	2	#5	STR	9'-1"	19
* A120	2	#5	STR	19'-11"	42	A231	2	#5	STR	8'-0"	17
* A121	2	#5	STR	18'-10"	39	A232	2	#5	STR	6'-11"	14
* A122	2	#5	STR	17'-9"	37	A233	2	#5	STR	5'-7"	12
* A123	2	#5	STR	16'-8"	35	A234	2	#5	STR	4'-9"	10
* A124	2	#5	STR	15'-7"	33	A235	2	#5	STR	3'-8"	8
* A125	2	#5	STR	14'-6"	30	A236	2	#5	STR	2'-7"	5
* A126	2	#5	STR	13'-5"	28	A237	2	#5	STR	1'-6"	3
* A127	2	#5	STR	12'-4"	26						
* A128	2	#5	STR	11'-3"	23	* B1	18	#4	STR	26'-1"	314
* A129	2	#5	STR	10'-2"	21	B2	200	#5	STR	56'-5"	11769
* A130	2	#5	STR	9'-1"	19	* B3	81	#7	STR	30'-5"	5030
* A131	2	#5	STR	8'-0"	17	* B4	78	#7	STR	28'-5"	4531
* A132	2	#5	STR	6'-11"	14	* B5	81	#4	STR	23'-5"	1267
* A133	2	#5	STR	5'-7"	12	* B6	81	#4	STR	26'-9"	1449
* A134	2	#5	STR	4'-9"	10						
* A135	2	#5	STR	3'-8"	8	* G1	2	#5	STR	56'-10"	119
* A136	2	#5	STR	2'-7"	5						
* A137	2	#5	STR	1'-6"	3	* K1	12	#5	1	14'-7"	183
						* K2	12	#5	2	19'-10"	248
A201	2	#5	STR	40'-6"	84						
A202	2	#5	STR	39'-5"	82	* S1	66	#4	3	4'-6"	198
2103	2	#5	STR	38'-4"	80						
2104	2	#5	STR	37'-3"	78						
A205	2	#5	STR	36'-2"	75						
A206	2	#5	STR	35'-1"	73						
A207	2	#5	STR	34'-0"	71						
A208	2	#5	STR	32'-11"	69						

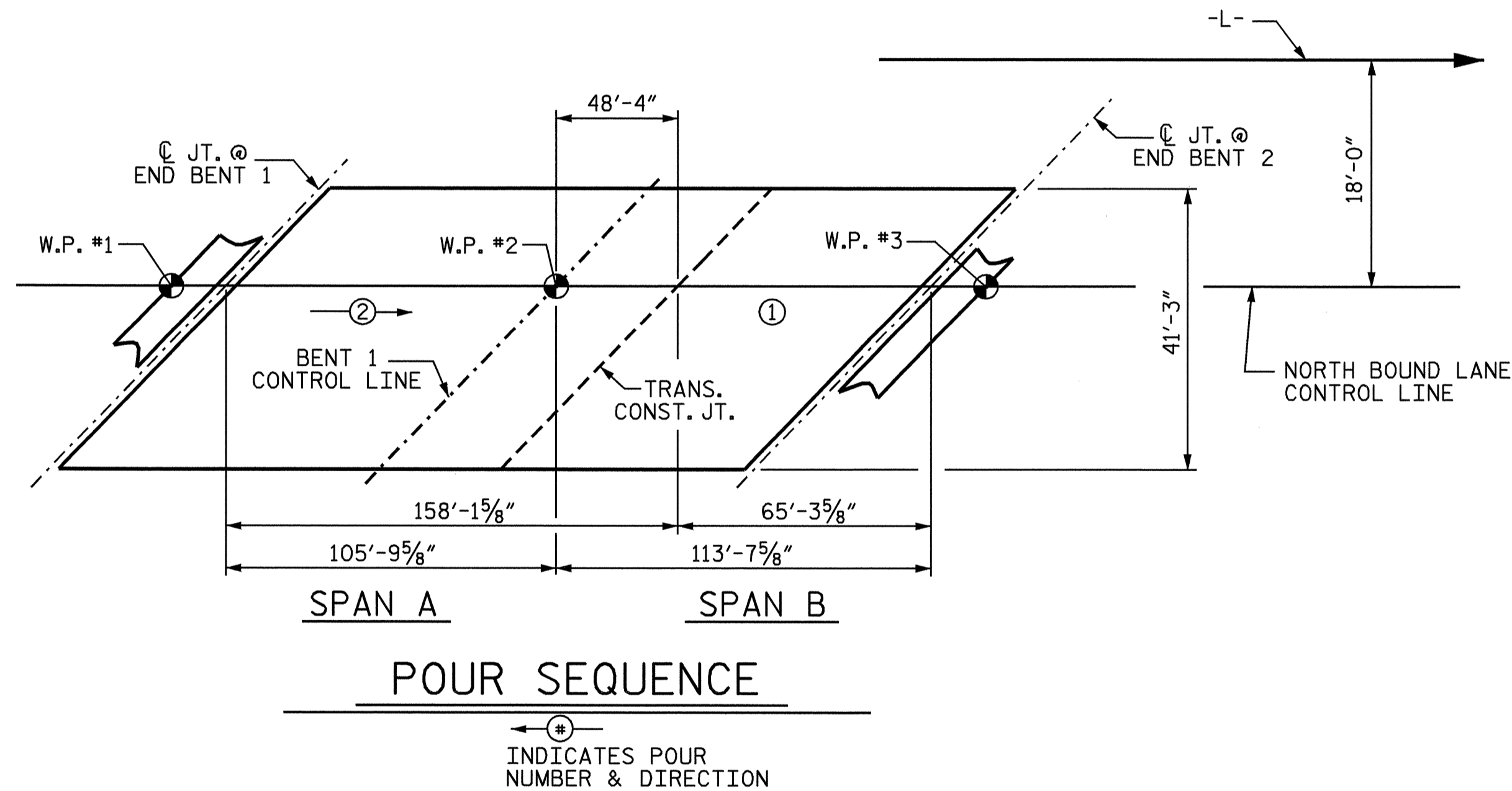
REINFORCING STEEL = 21710 LBS  
\* EPOXY COATED REINF. STEEL = 30278 LBS

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

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

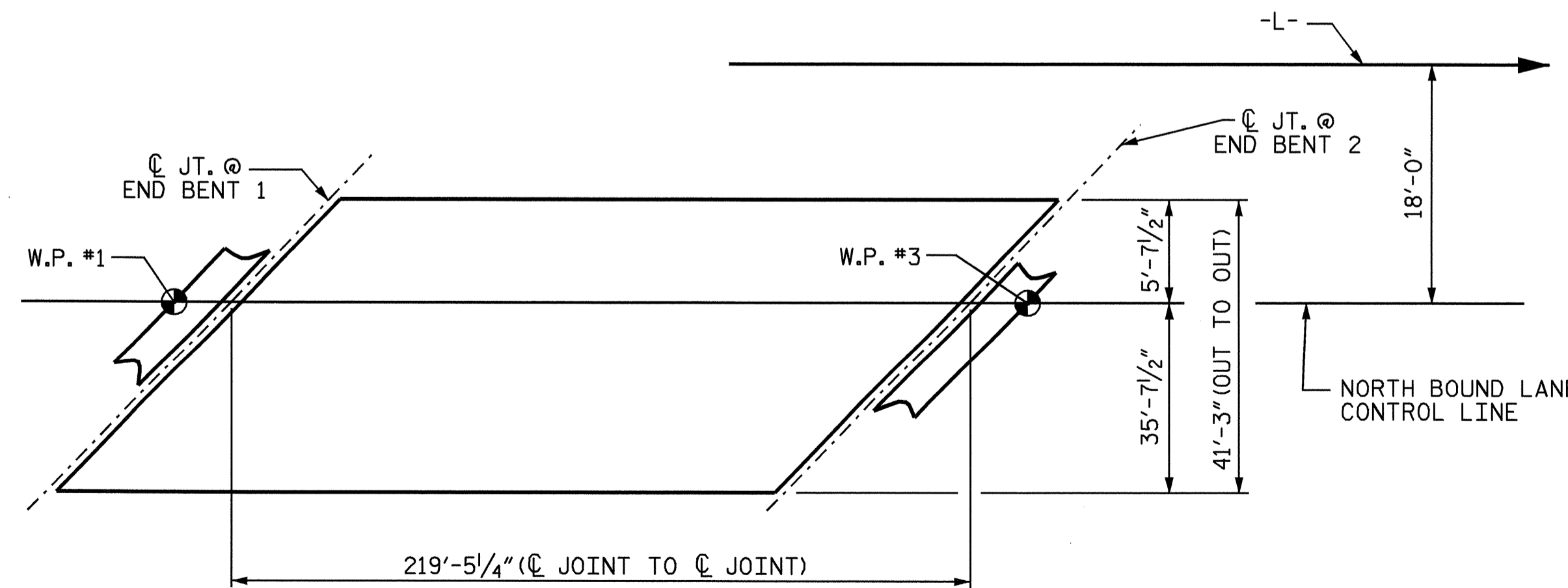
**GROOVING BRIDGE FLOORS**

APPROACH SLABS	1819 SQ.FT.
BRIDGE DECK	8980 SQ.FT.
TOTAL	10799 SQ.FT.



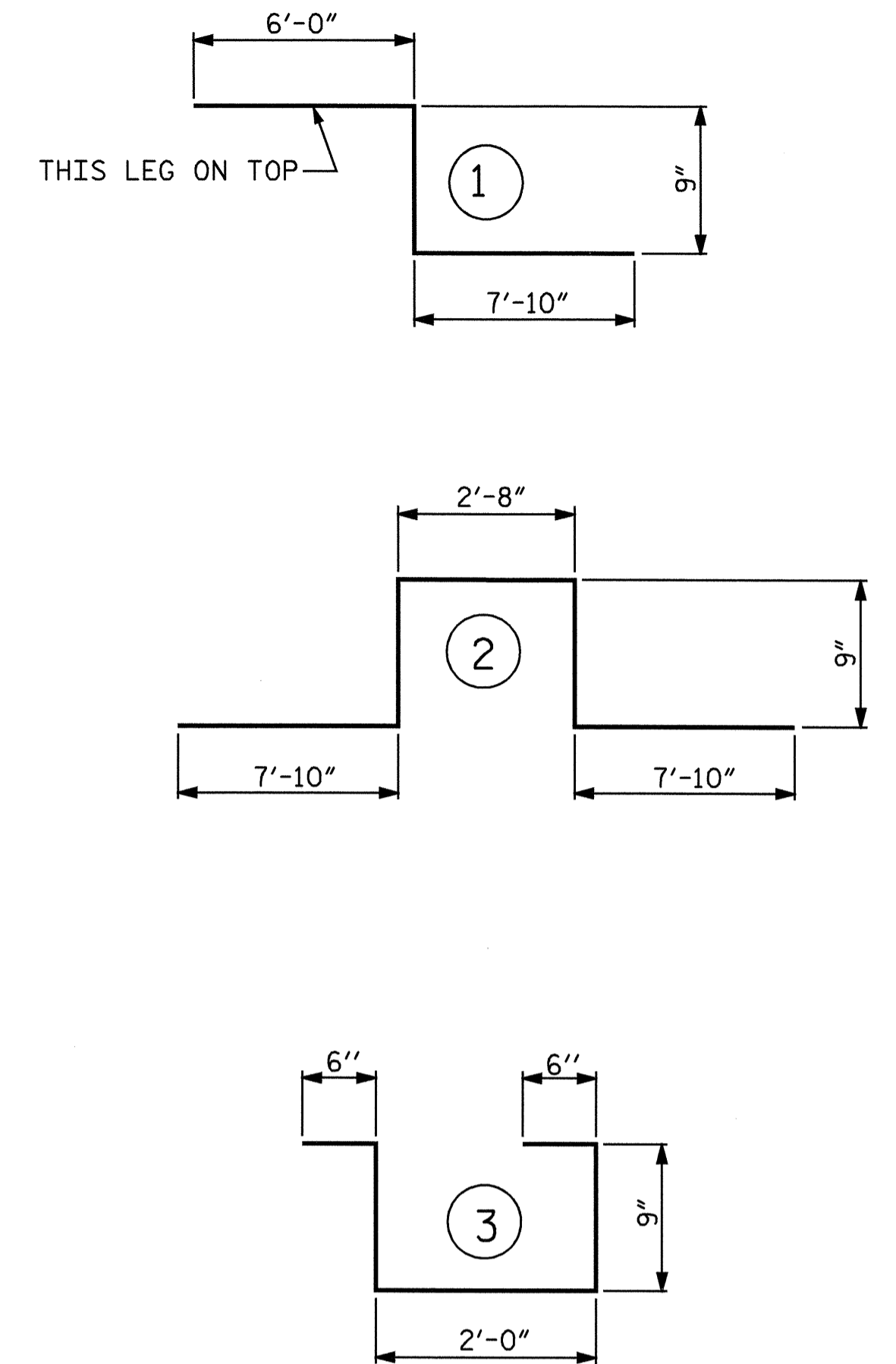
**POUR SEQUENCE**

INDICATES POUR NUMBER & DIRECTION



LAYOUT FOR COMPUTING AREA  
OF REINFORCED CONCRETE DECK SLAB  
(SQ. FT. = 9052)

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT

**— SUPERSTRUCTURE BILL OF MATERIAL —**

	CLASS AA CONCRETE (CU.YDS.)	REINFORCING STEEL (LBS.)	* EPOXY COATED REINFORCING STEEL (LBS.)
(POUR #1)	91.8		
(POUR #2)	212.9		
TOTALS **	304.7	21710	30278

\*\* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. R-0505  
HENDERSON COUNTY  
STATION: 780+05.14 -L-

**TRANSVERSE CONSTRUCTION  
JOINT DETAIL**

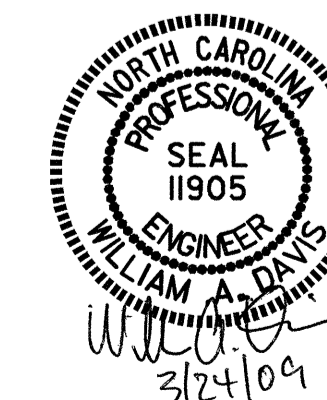
NOTE: REINFORCING STEEL IN SLAB NOT SHOWN.  
LONGITUDINAL REINFORCING STEEL SHALL BE  
CONTINUOUS THRU JOINT

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
SUPERSTRUCTURE  
BILL OF MATERIAL  
(NBL)

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

TOTAL SHEETS  
56



ASSEMBLED BY :	QT NGUYEN	DATE :	10-08
CHECKED BY :	A.R. CHESSON	DATE :	10-08
DRAWN BY :	JMB 5/87	REV. 6/1/94	EEM/GRP
CHECKED BY :	SJD 9/87	REV. 8/16/99	RWW/LES
		REV. 5/1/06	TLA/GM

**NOTES**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

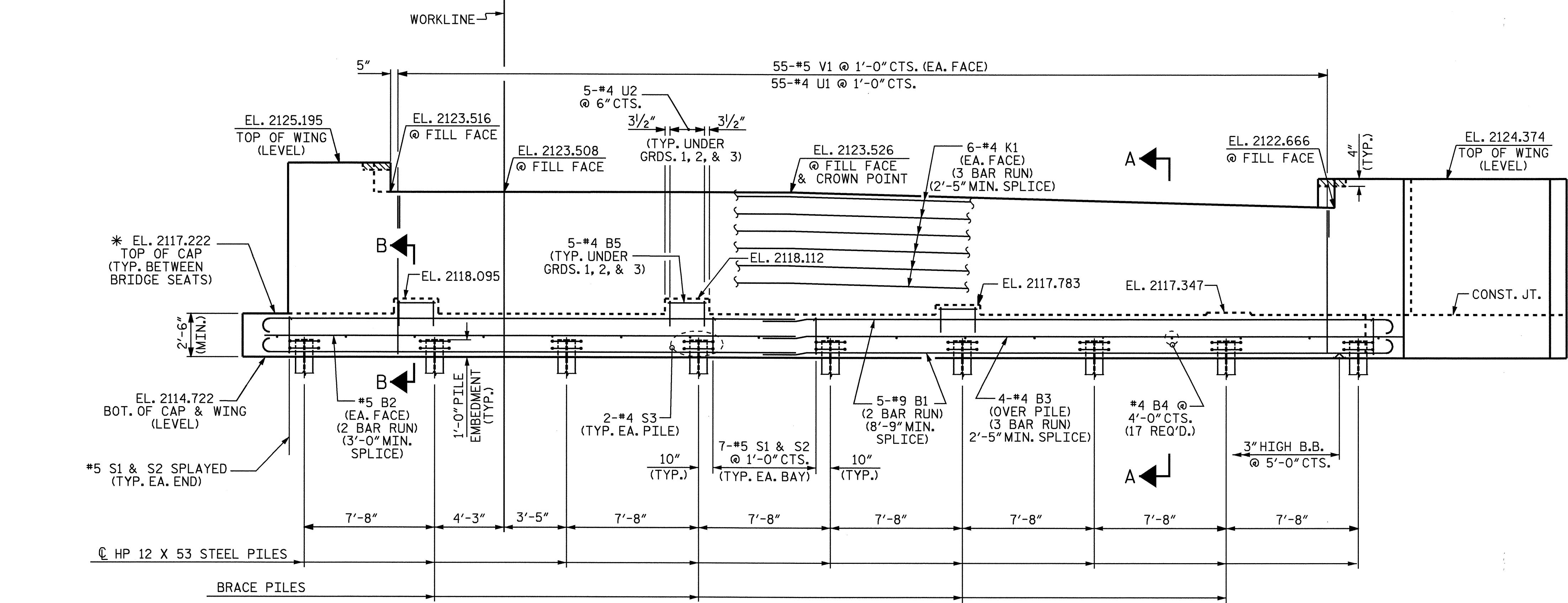
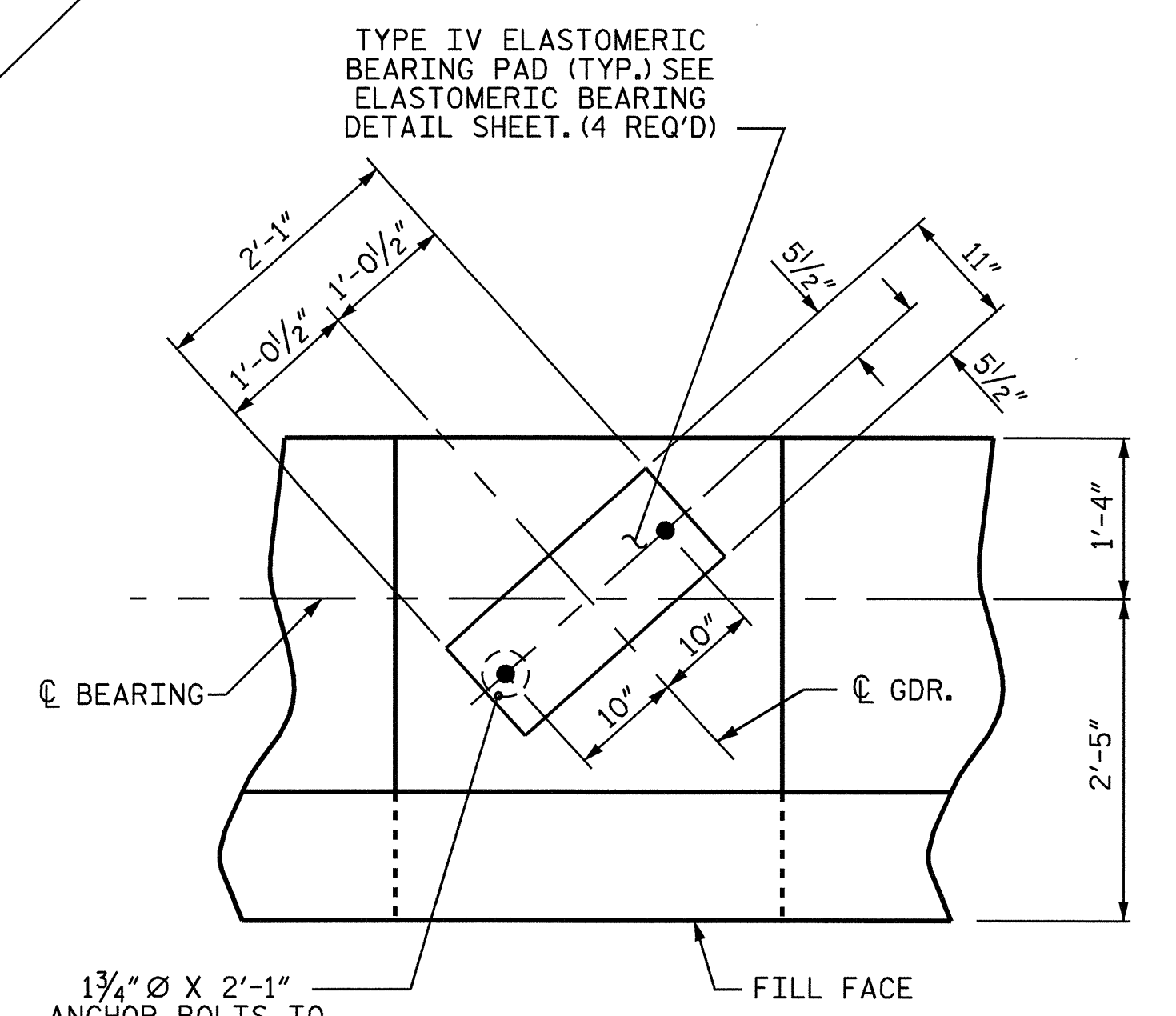
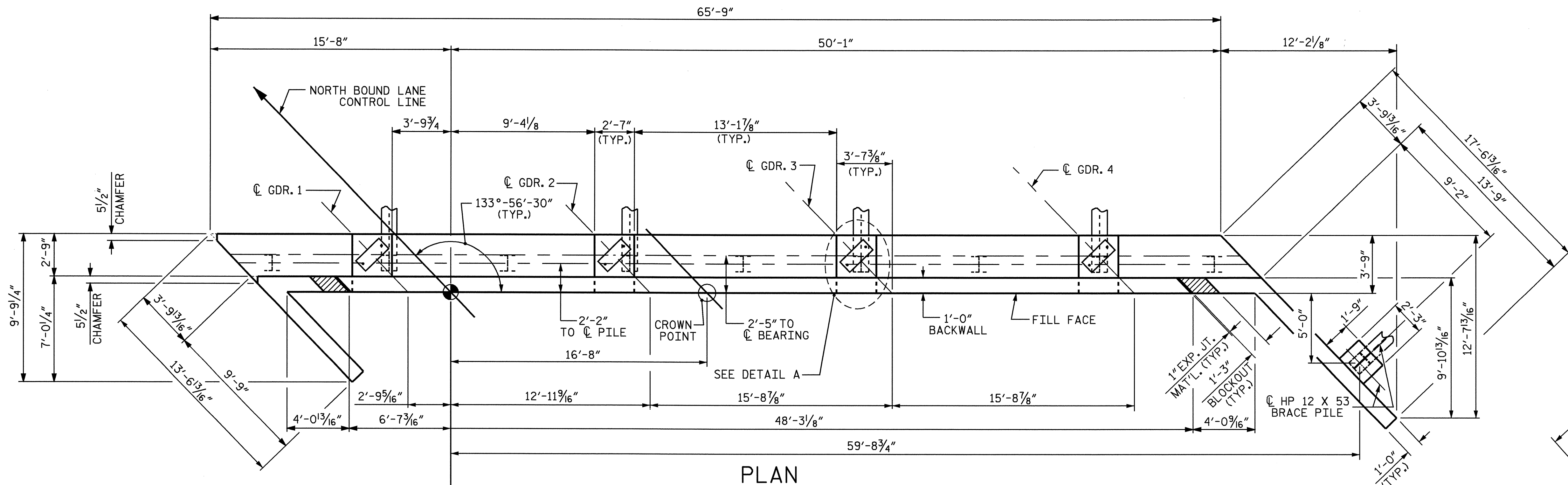
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

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



\* FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 3 OF 3

**ELEVATION**  
LEFT WING NOT SHOWN FOR CLARITY  
BRACE PILE IN WING NOT SHOWN FOR CLARITY

PROJECT NO. R-0505  
HENDERSON COUNTY  
STATION: 780+05.14 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

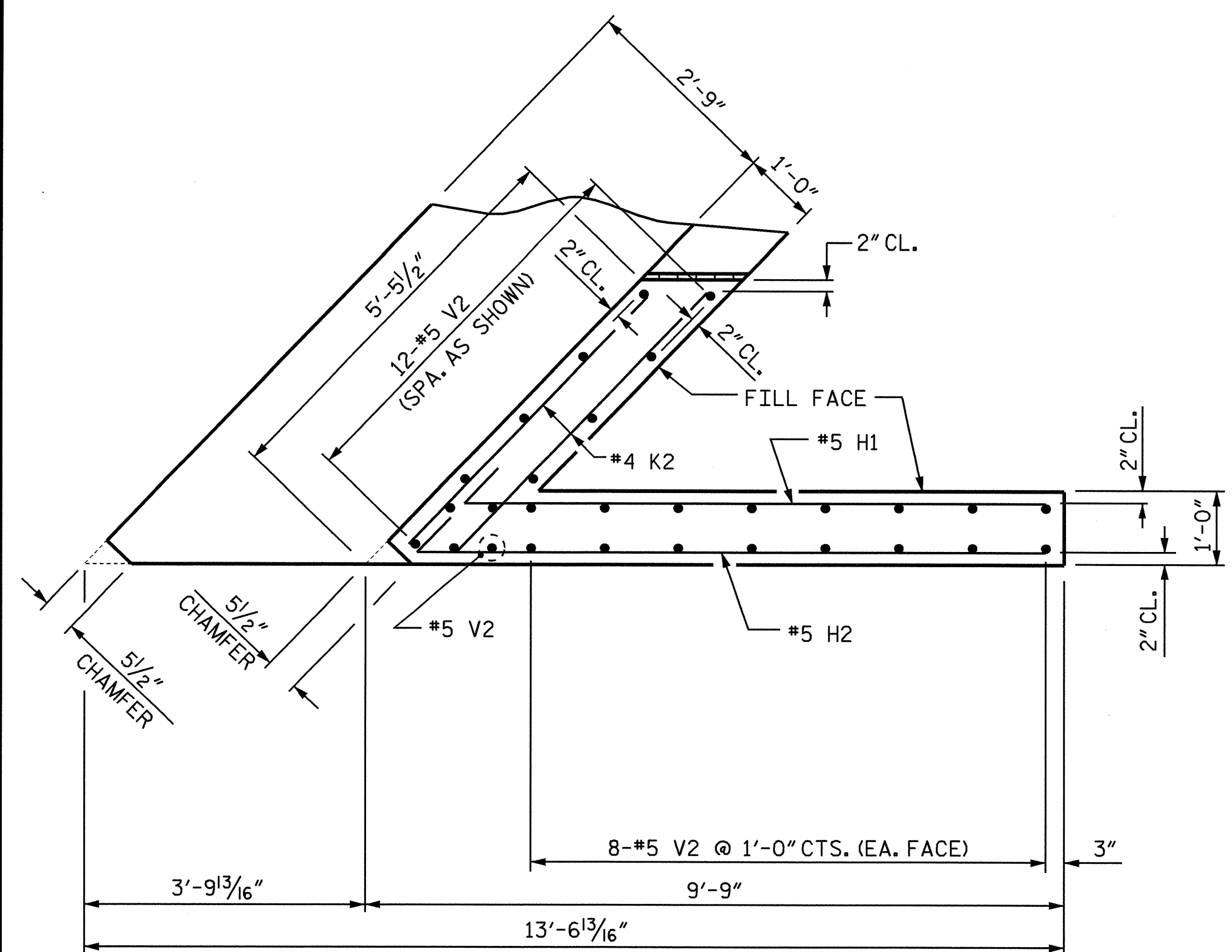
SUBSTRUCTURE  
END BENT 1  
(NBL)

REVISIONS						SHEET NO. S-46
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			56

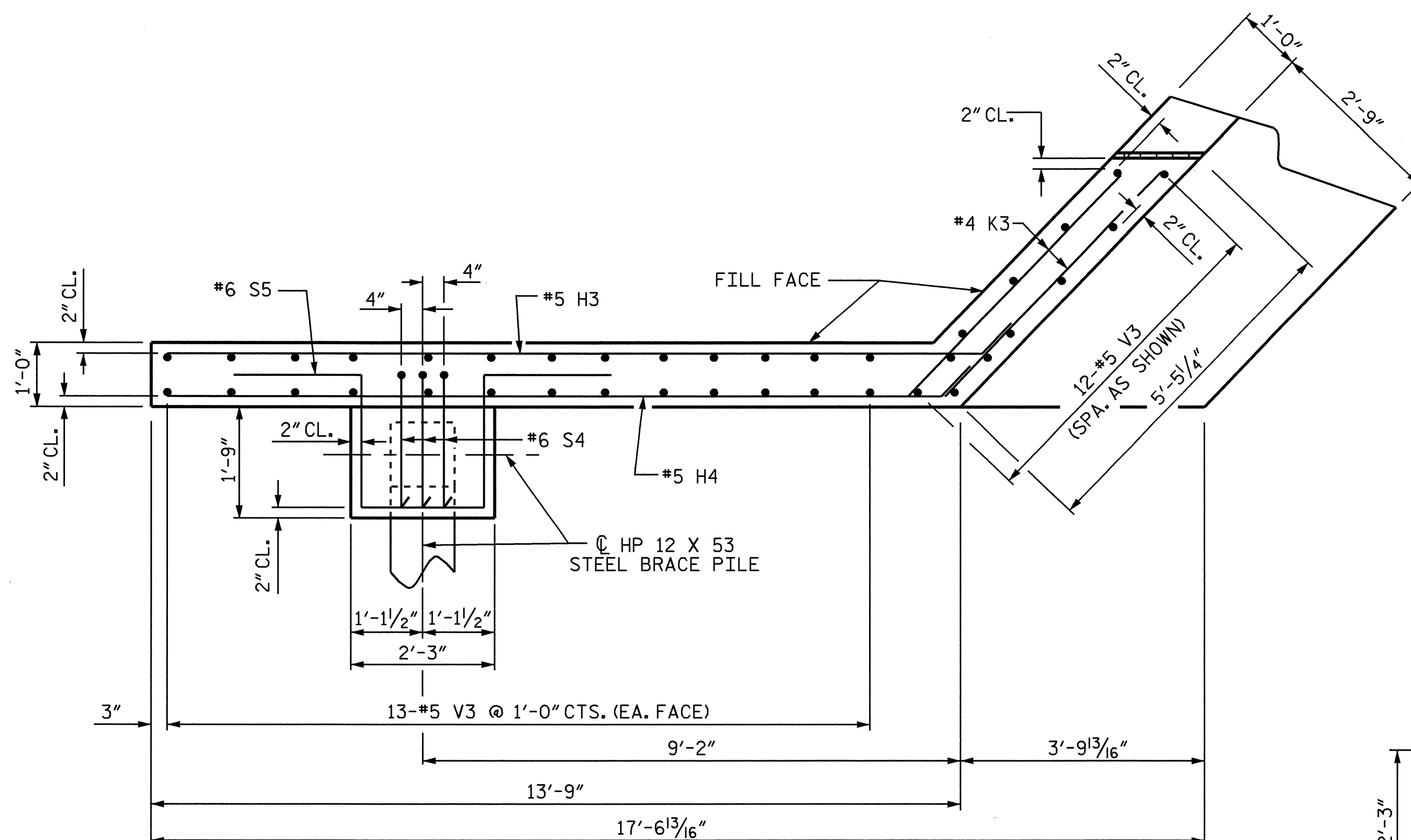


DRAWN BY: QT NGUYEN DATE: 10-08  
CHECKED BY: S. DOMBROWSKI DATE: 12-08

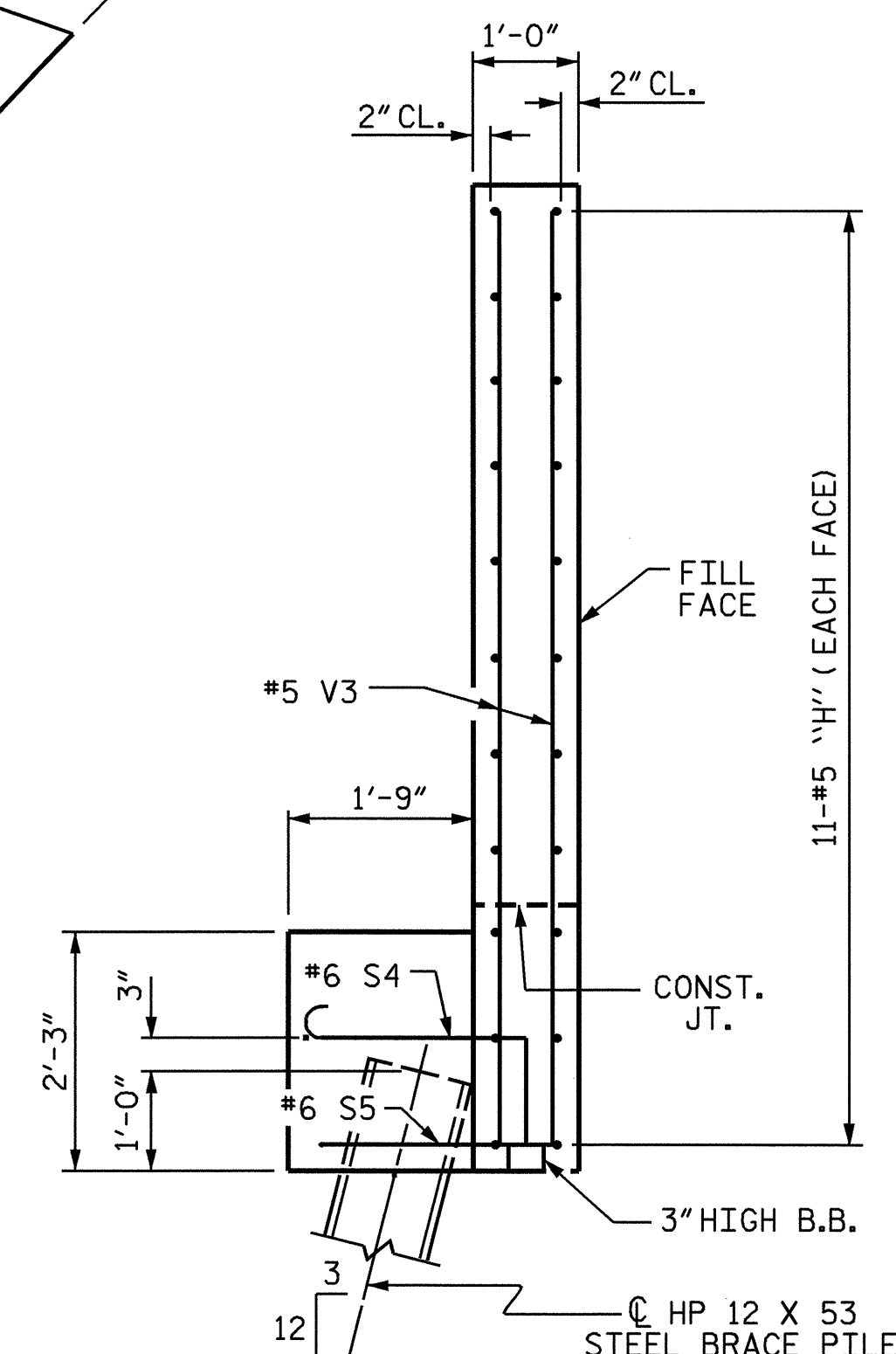




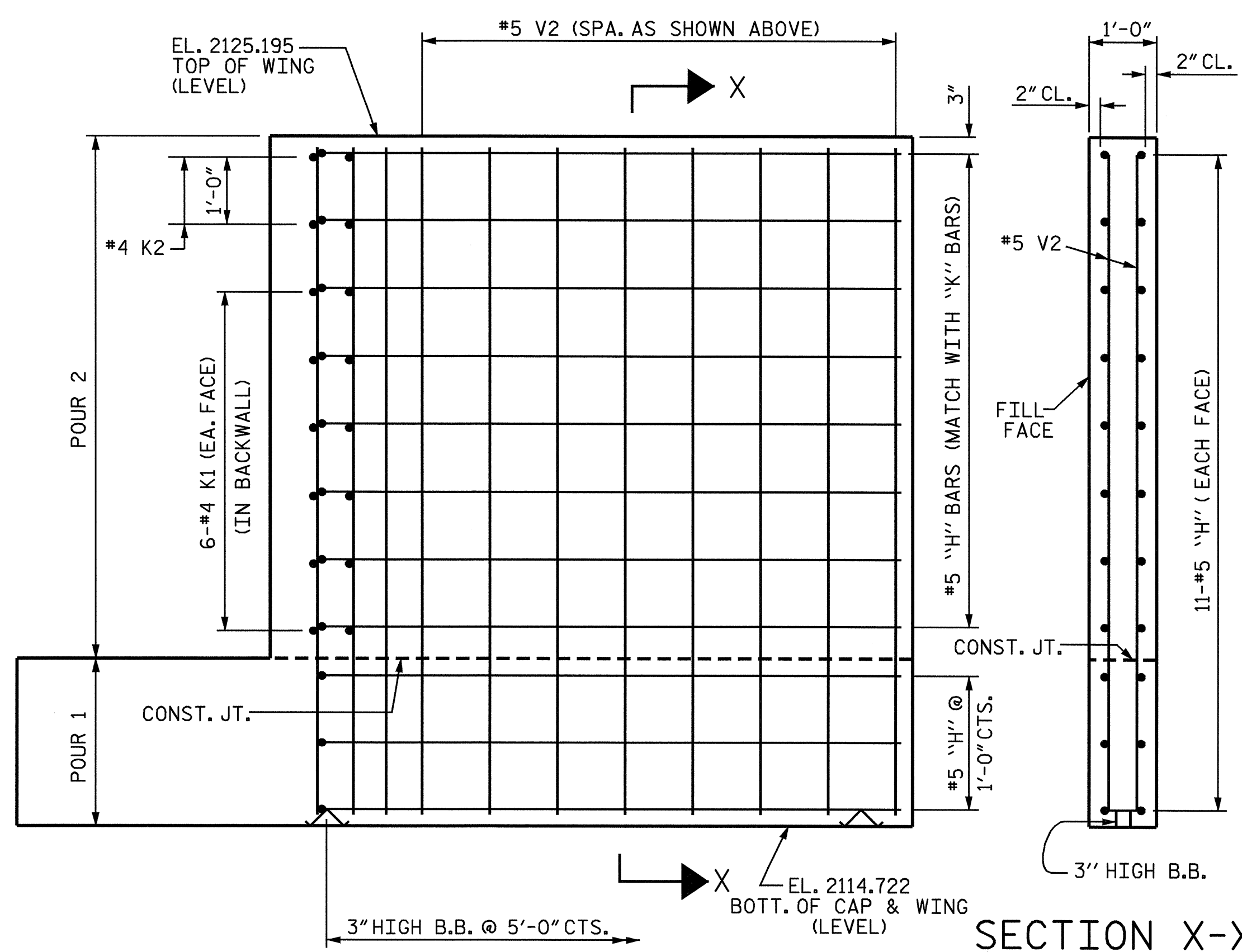
PLAN OF LEFT WING W1



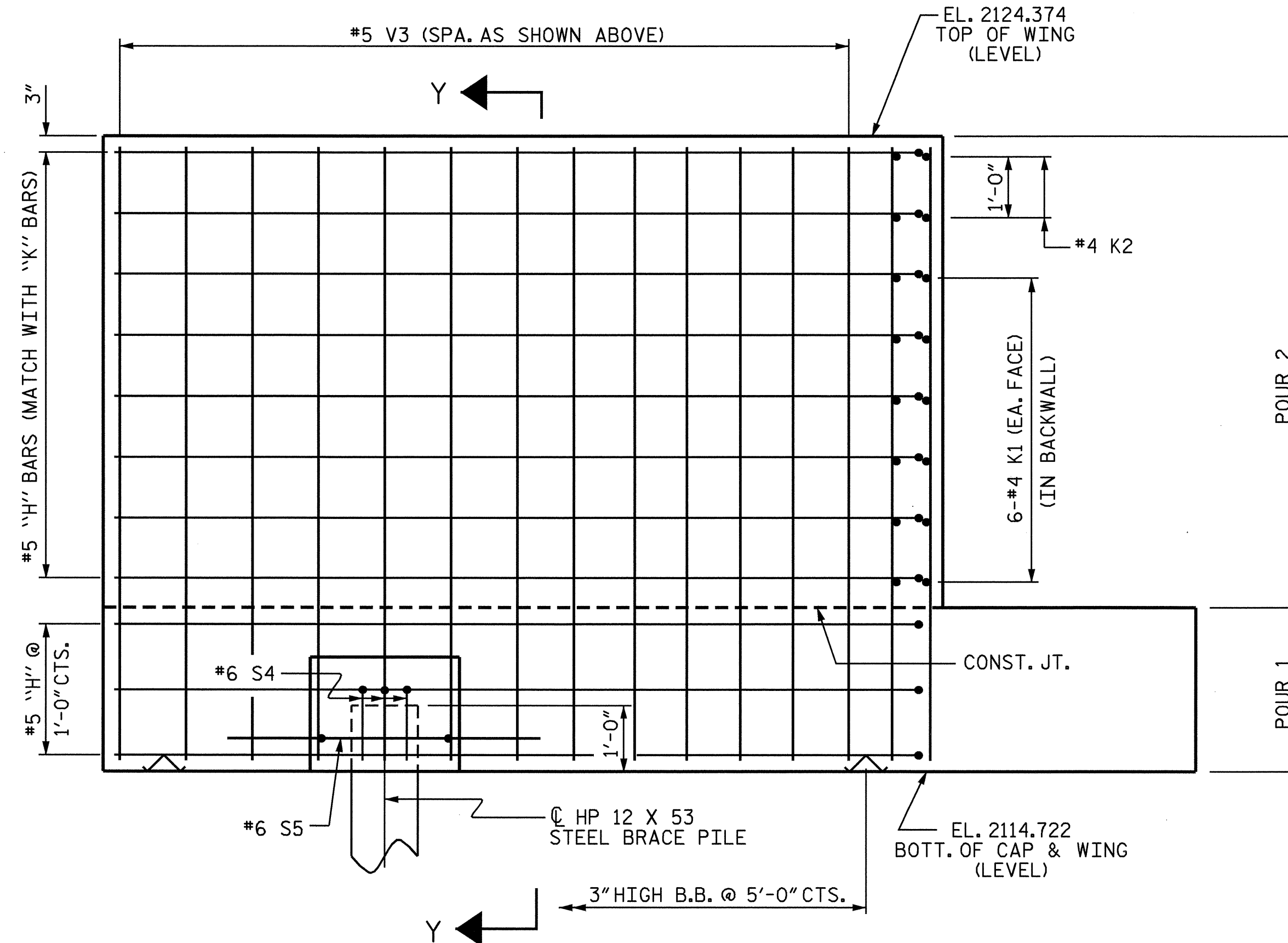
PLAN OF RIGHT WING W2



SECTION Y-Y



ELEVATION OF LEFT WING W1

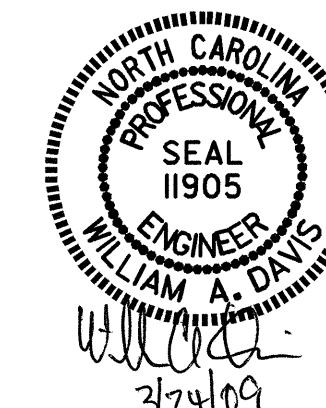


ELEVATION OF RIGHT WING W2

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 1  
 (NBL)

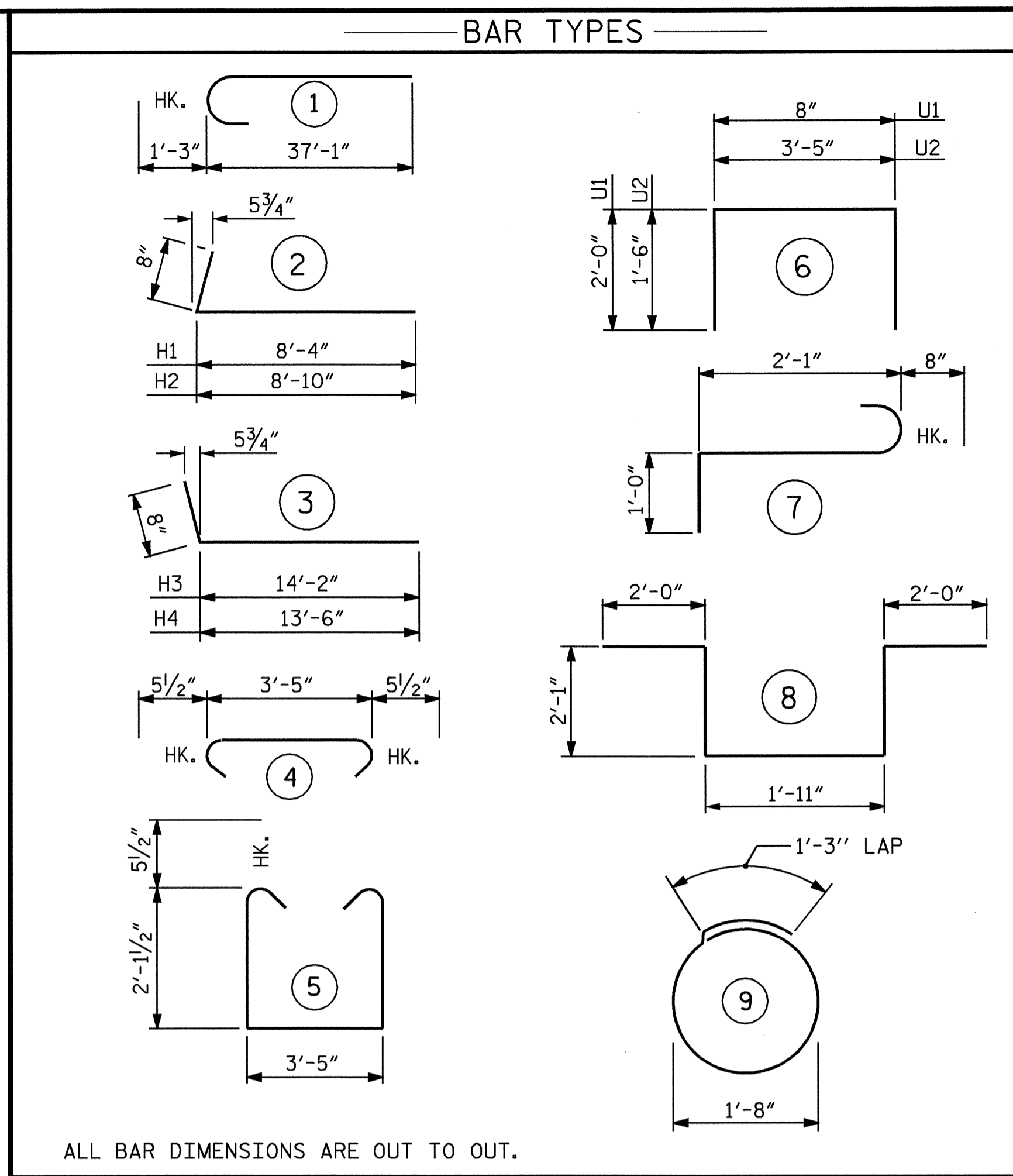
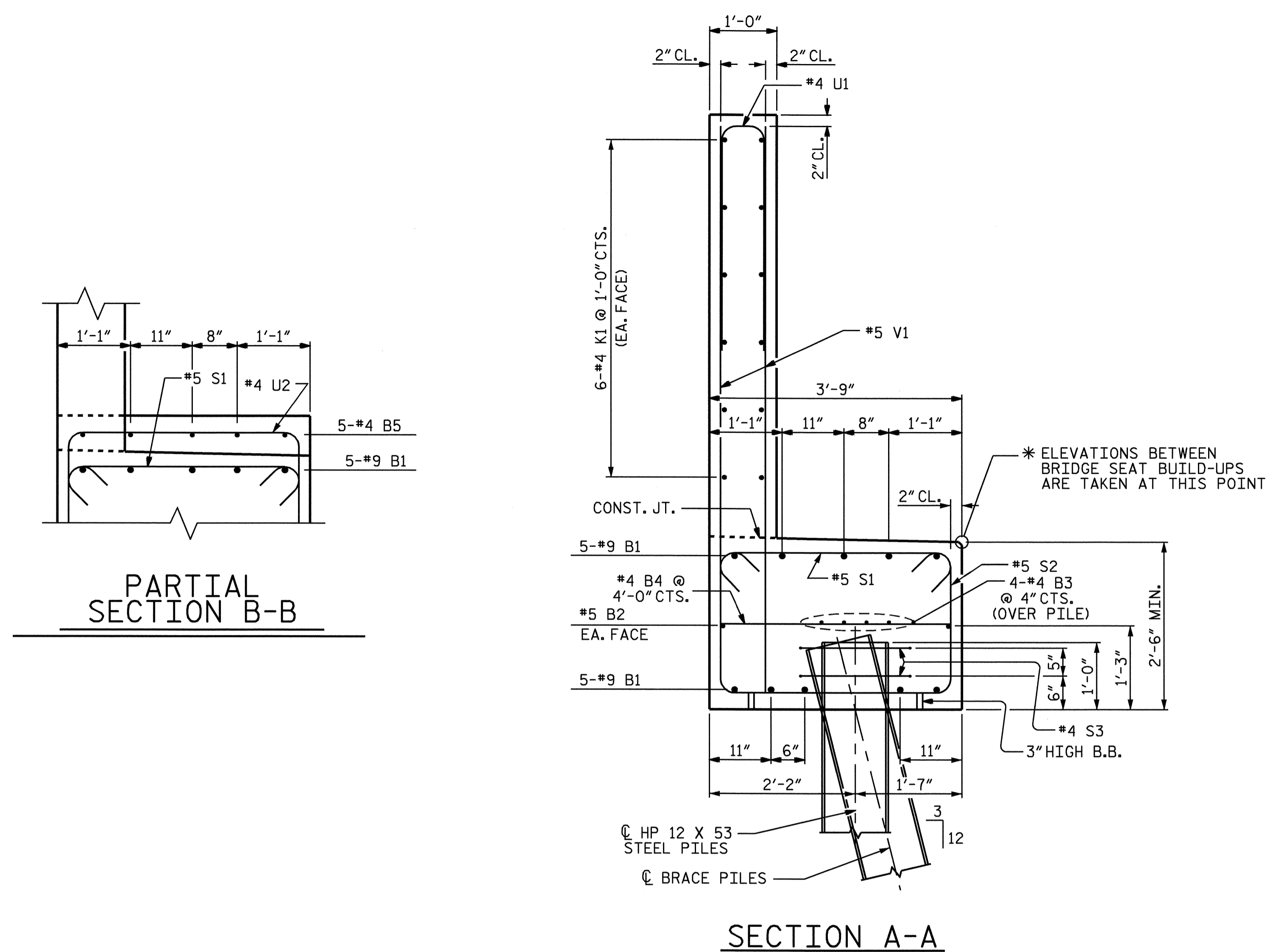


DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: S. DOMBROWSKI DATE: 12-08

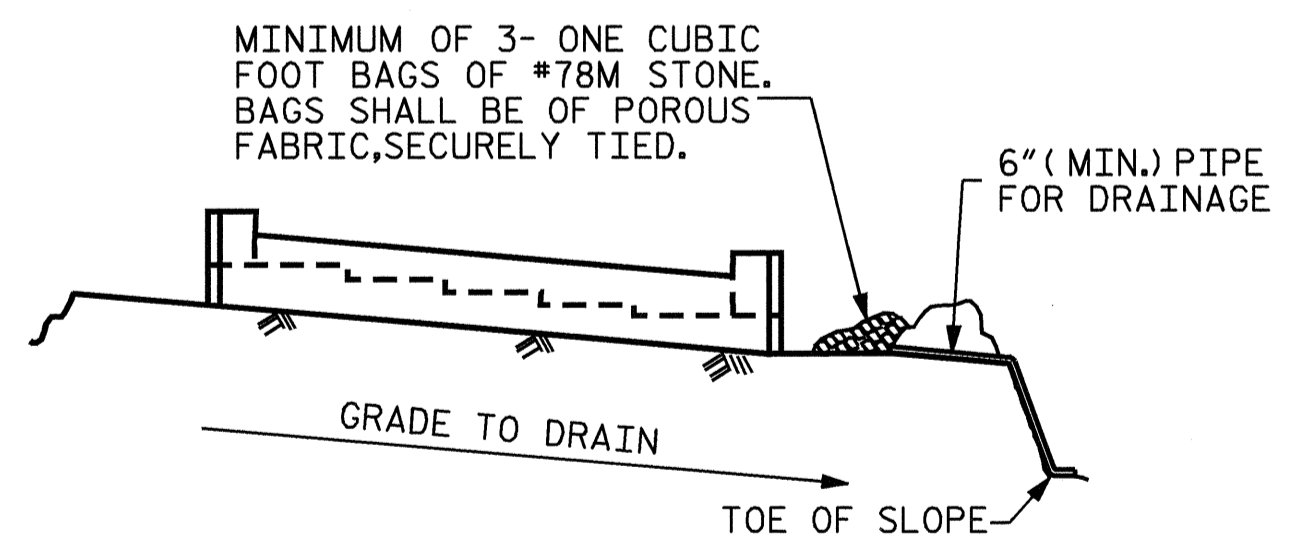
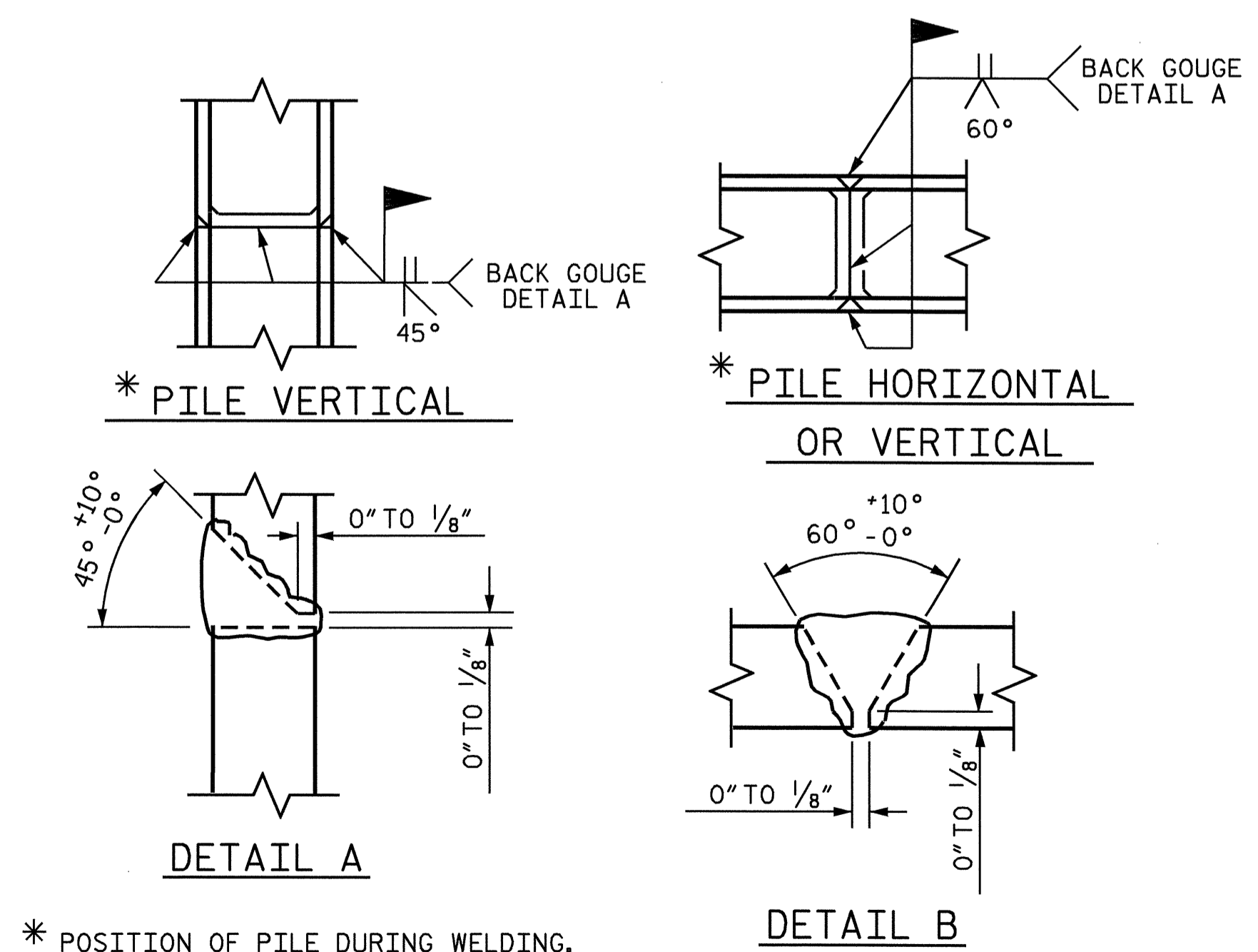
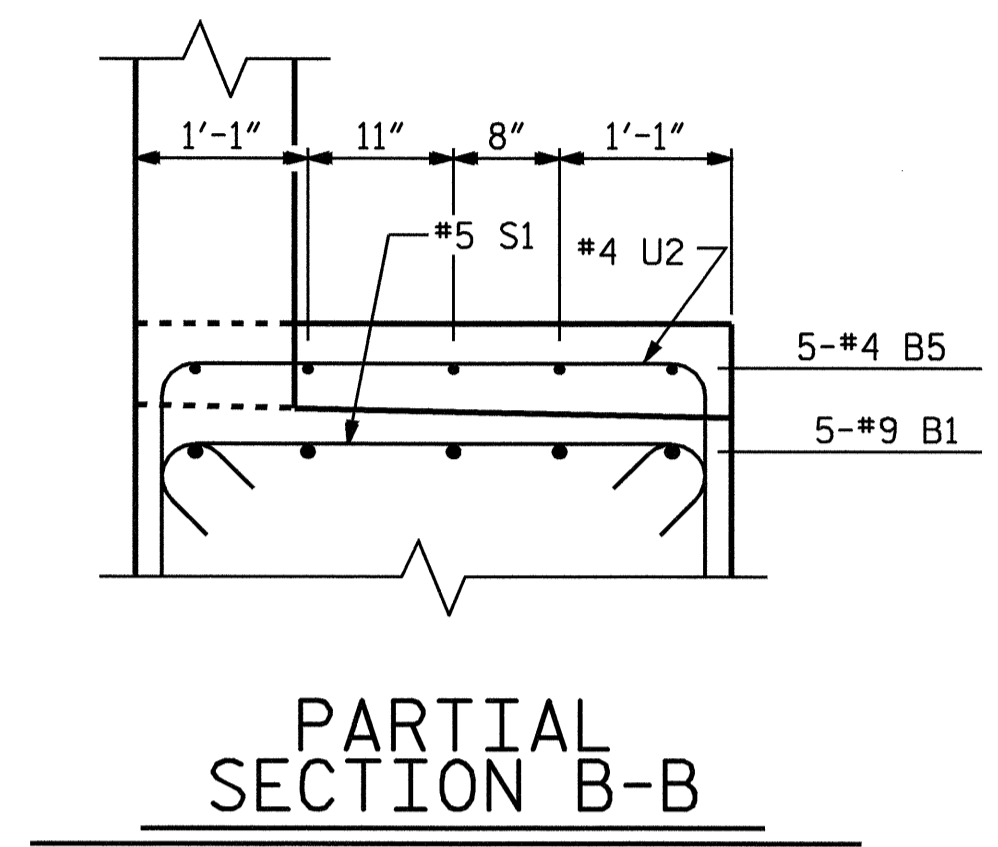
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 qtnguyen

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

TOTAL SHEETS: 56



BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	20	#9	1	38'-4"	2607
B2	4	#5	STR	34'-3"	143
B3	12	#4	STR	23'-5"	188
B4	17	#4	STR	3'-5"	39
B5	15	#4	STR	2'-3"	23
H1	11	#5	2	9'-0"	103
H2	11	#5	2	9'-6"	109
H3	11	#5	3	14'-10"	170
H4	11	#5	3	14'-2"	163
K1	36	#4	STR	23'-4"	561
K2	4	#4	STR	4'-9"	13
K3	4	#4	STR	5'-2"	14
S1	58	#5	4	4'-4"	262
S2	58	#5	5	8'-7"	519
S3	18	#4	9	6'-5"	77
S4	3	#6	7	3'-9"	17
S5	1	#6	8	10'-1"	15
U1	55	#4	6	4'-8"	171
U2	15	#4	6	6'-5"	64
V1	110	#5	STR	7'-6"	860
V2	29	#5	STR	10'-0"	302
V3	38	#5	STR	9'-2"	363
REINFORCING STEEL					= LBS 6783
CLASS A CONCRETE					
POUR 1: CAP & LOWER WINGS					C.Y. 18.8
POUR 2: BACKWALL & UPPER WINGS					C.Y. 19.8
CLASS A CONCRETE TOTAL					C.Y. 38.6
HP 12 X 53 STEEL PILES					LIN. FT. 425
NO. 10					



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.

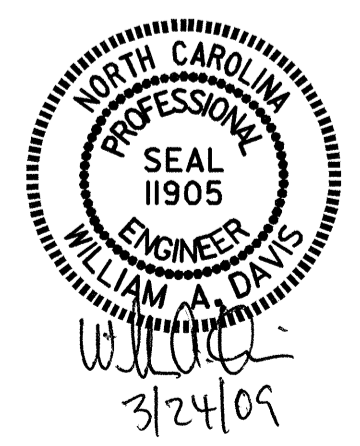
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
SUBSTRUCTURE					
END BENT 1					
(NBL)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-48
TOTAL SHEETS					56

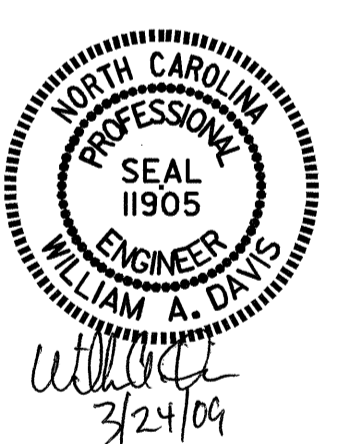
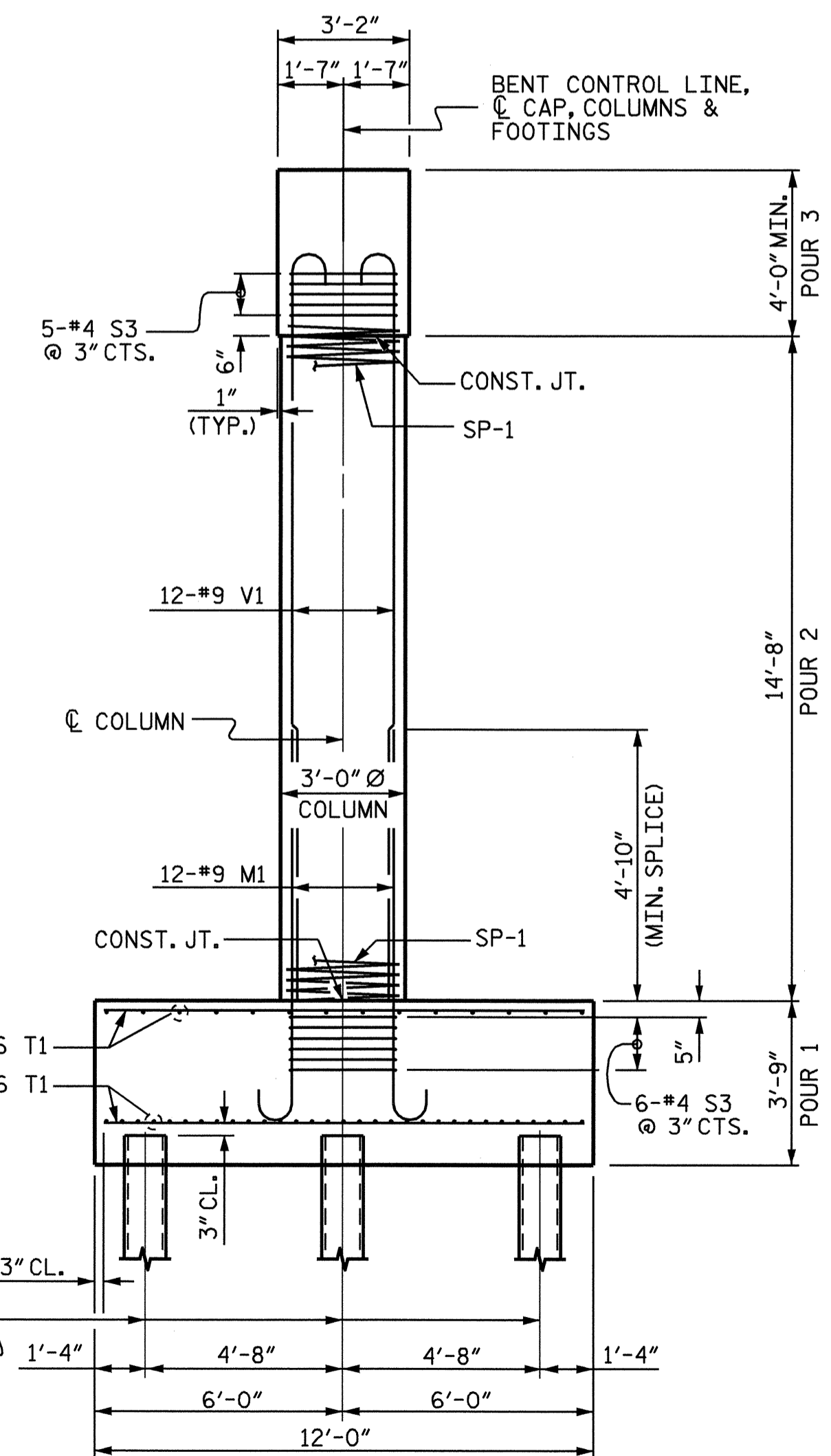
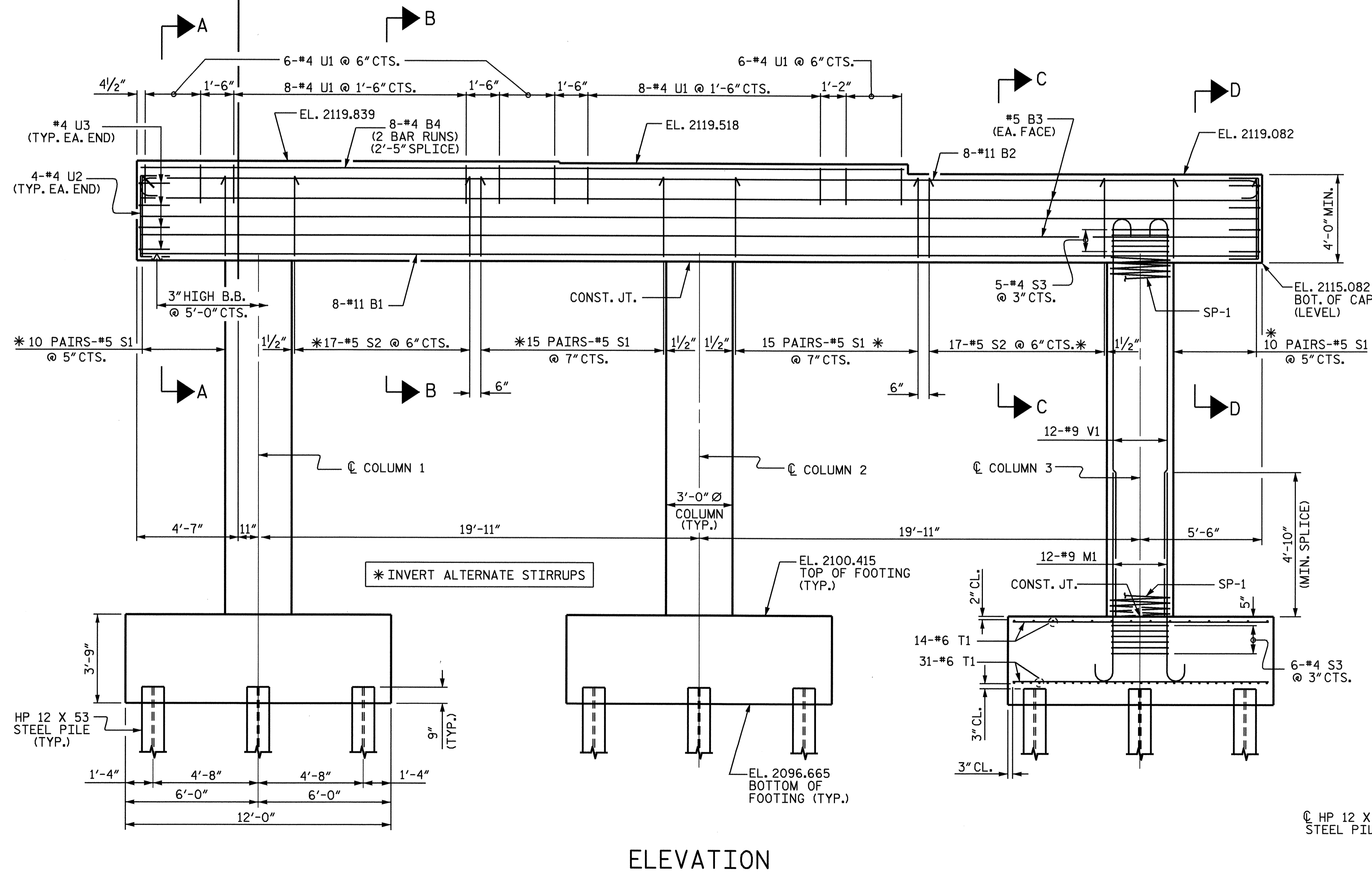
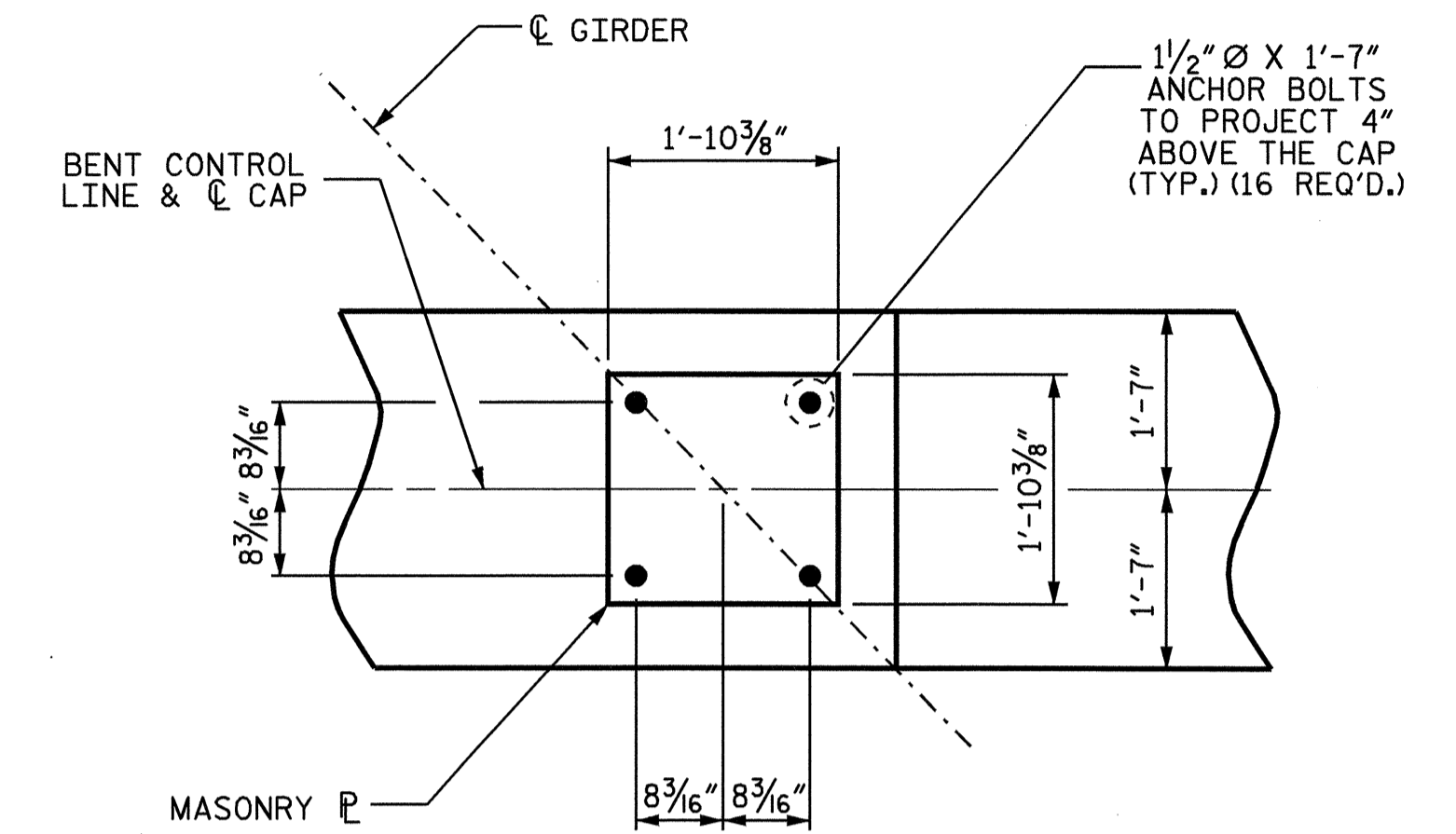
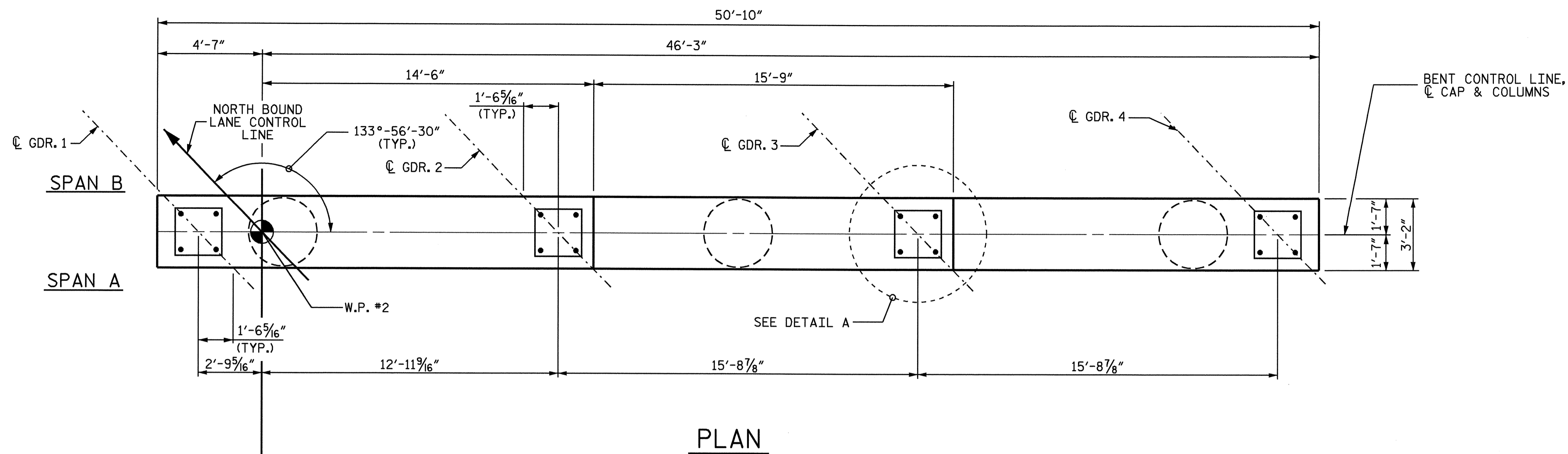


DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: S. DOMBROWSKI DATE: 12-08

**NOTES:**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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



PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 1 OF 2

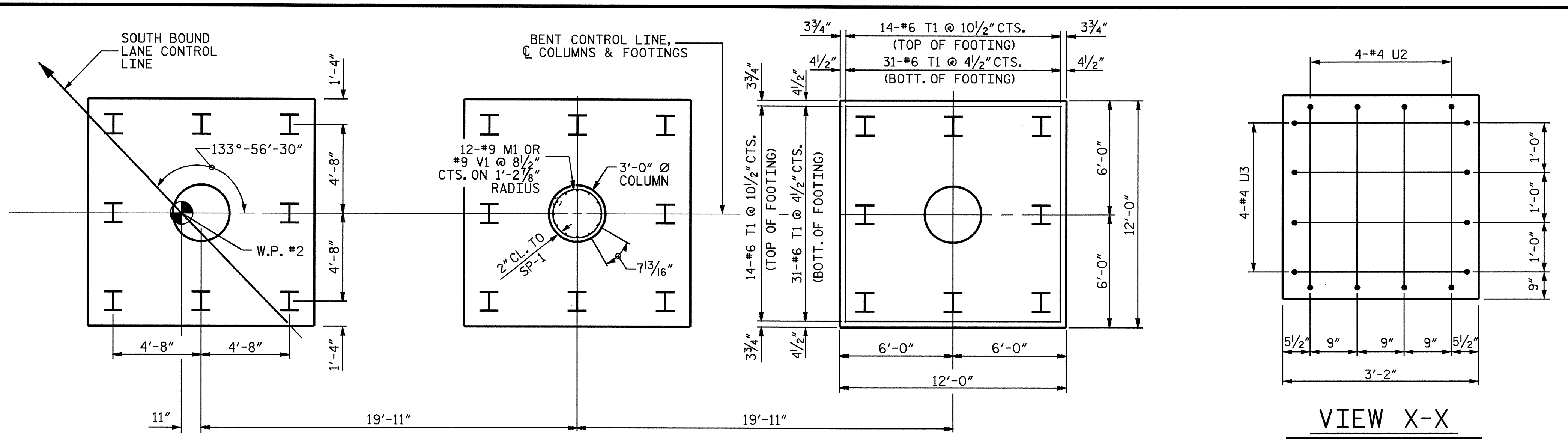
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
**BENT 1 (NBL)**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			56

DRAWN BY: QT NGUYEN DATE: 11-08  
 CHECKED BY: S. DOMBROWSKI DATE: 12-08

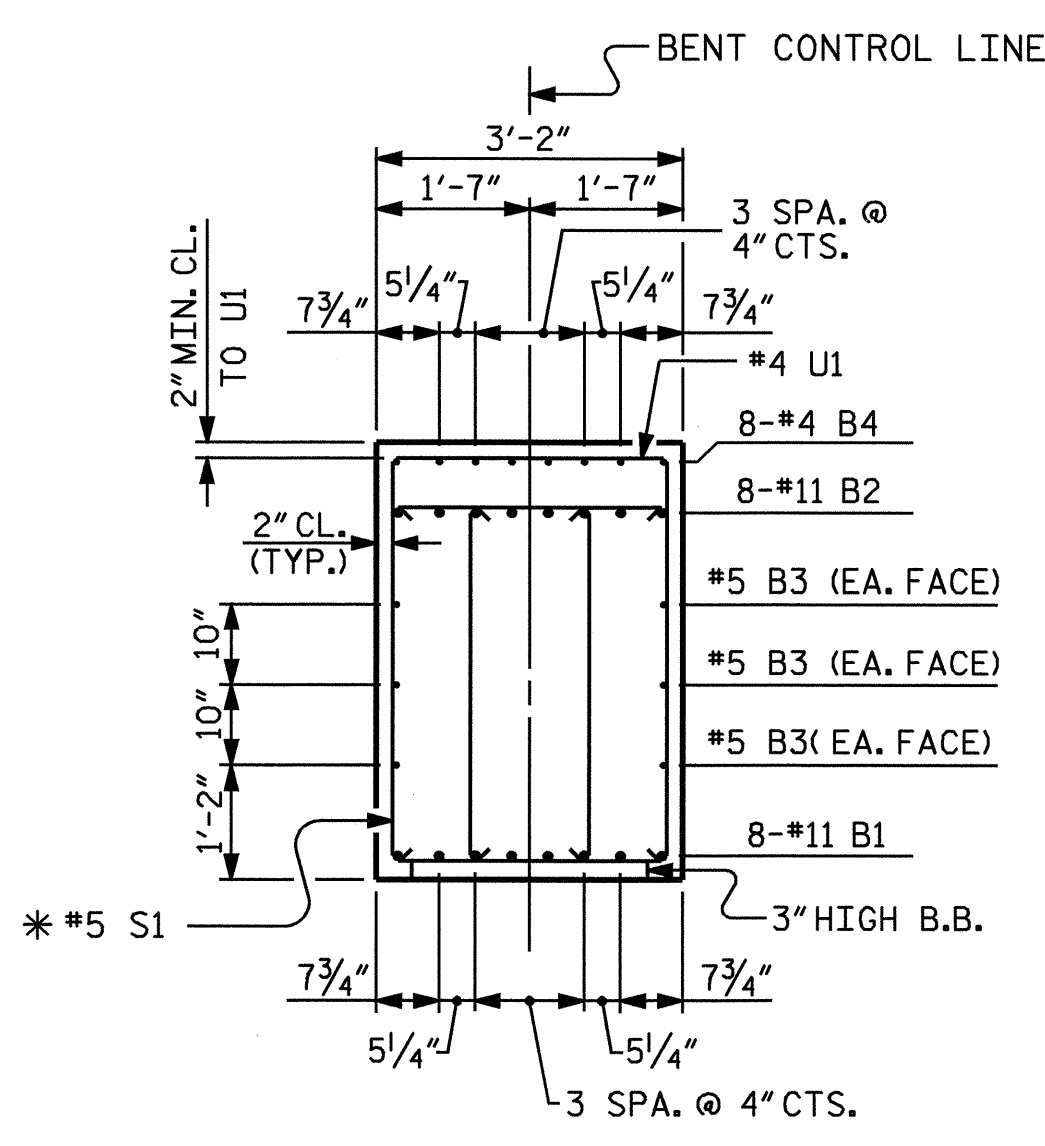
(REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL COLUMNS AND PILE FOOTINGS)

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED

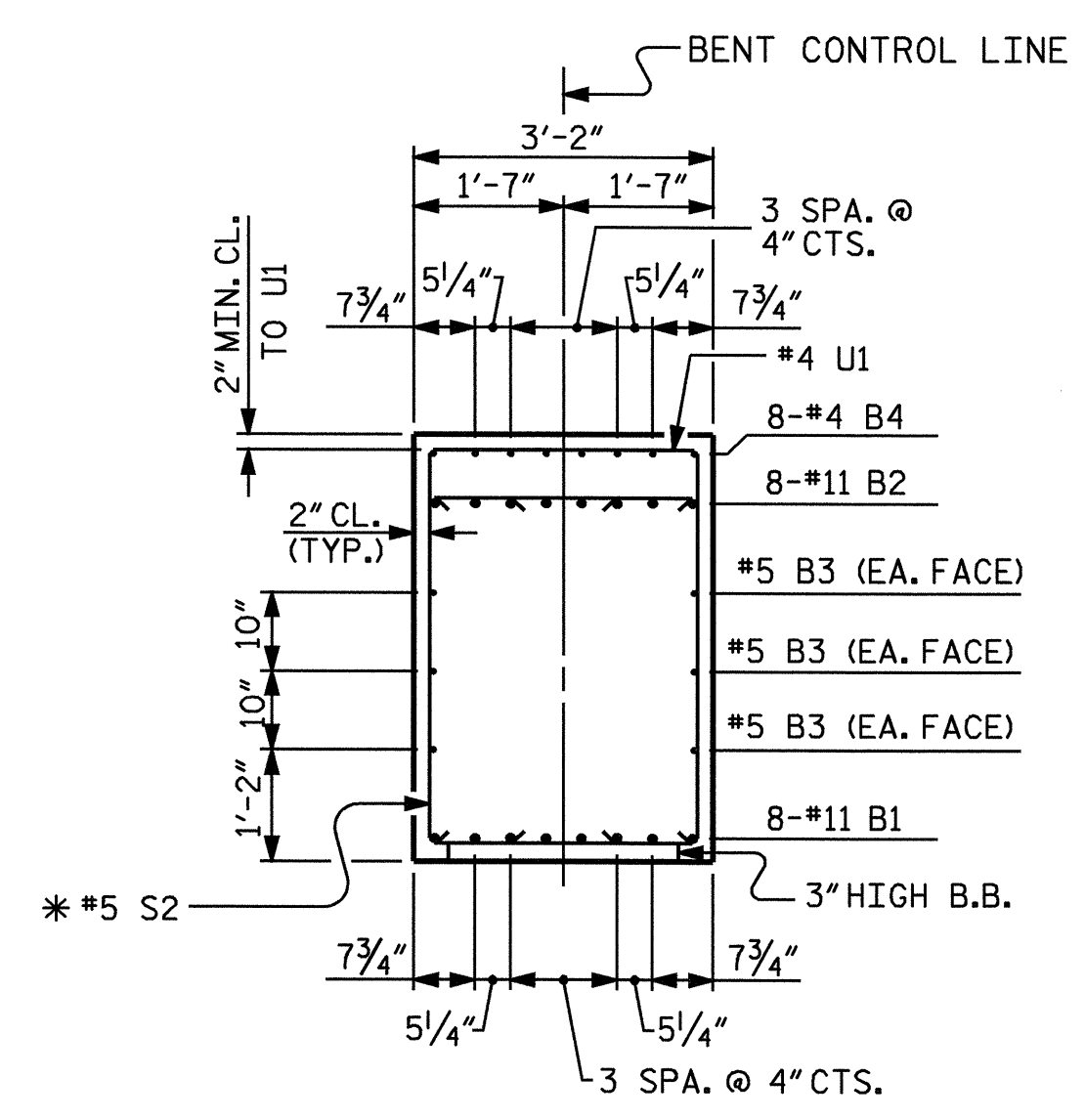


**PLAN OF FOOTINGS & COLUMNS**

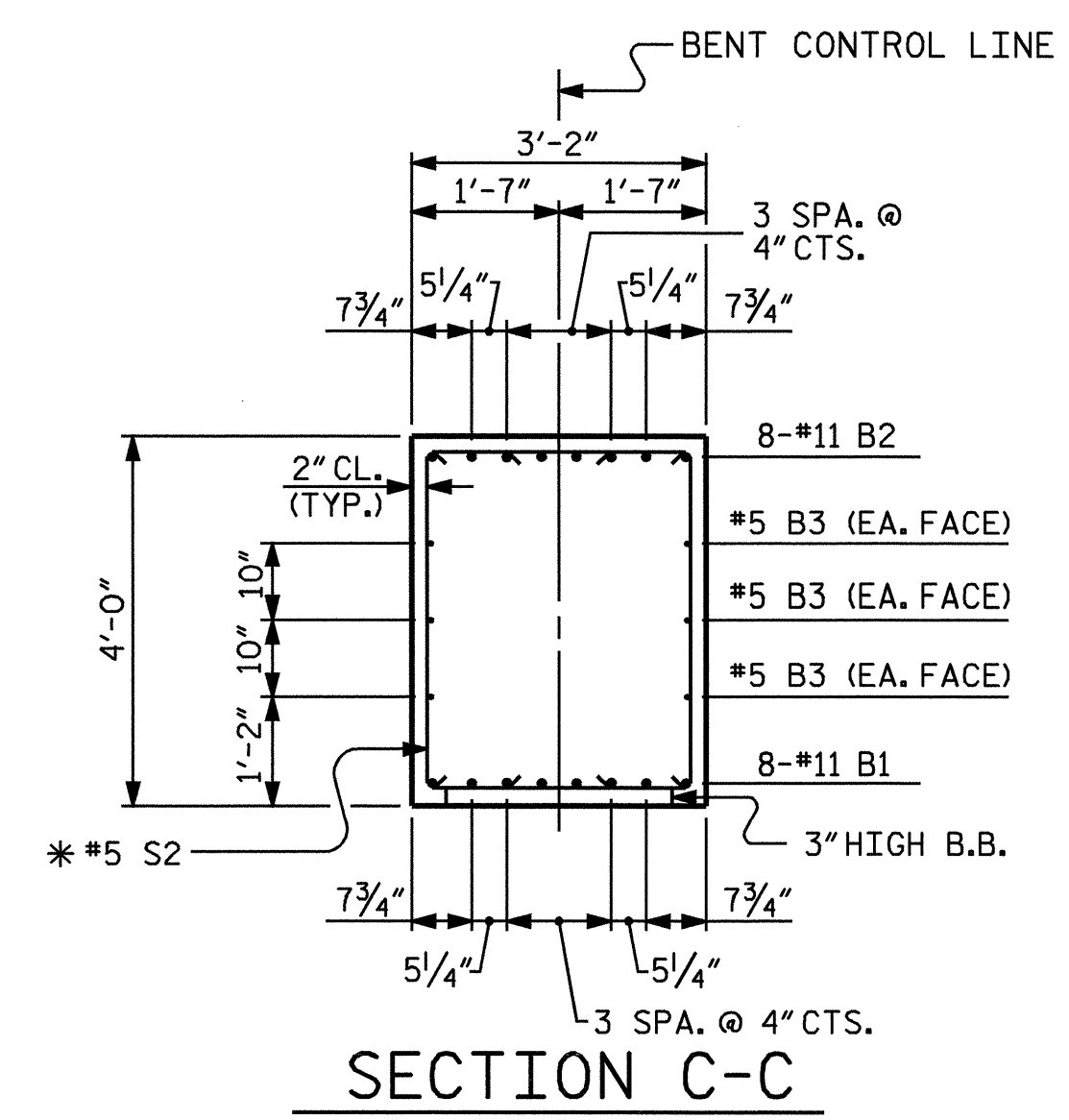
REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND PILE FOOTING UNLESS OTHERWISE NOTED



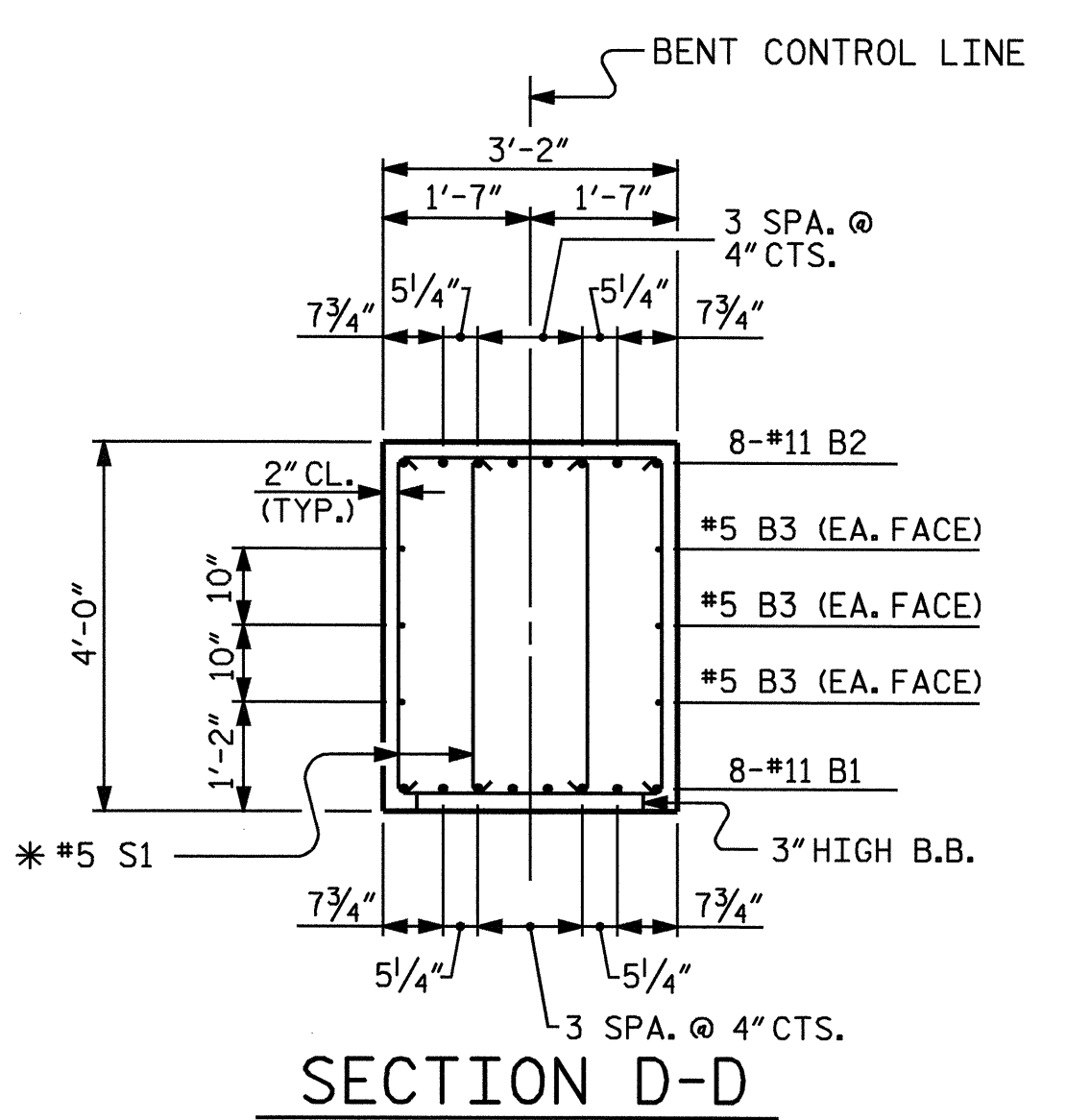
**SECTION A-A**



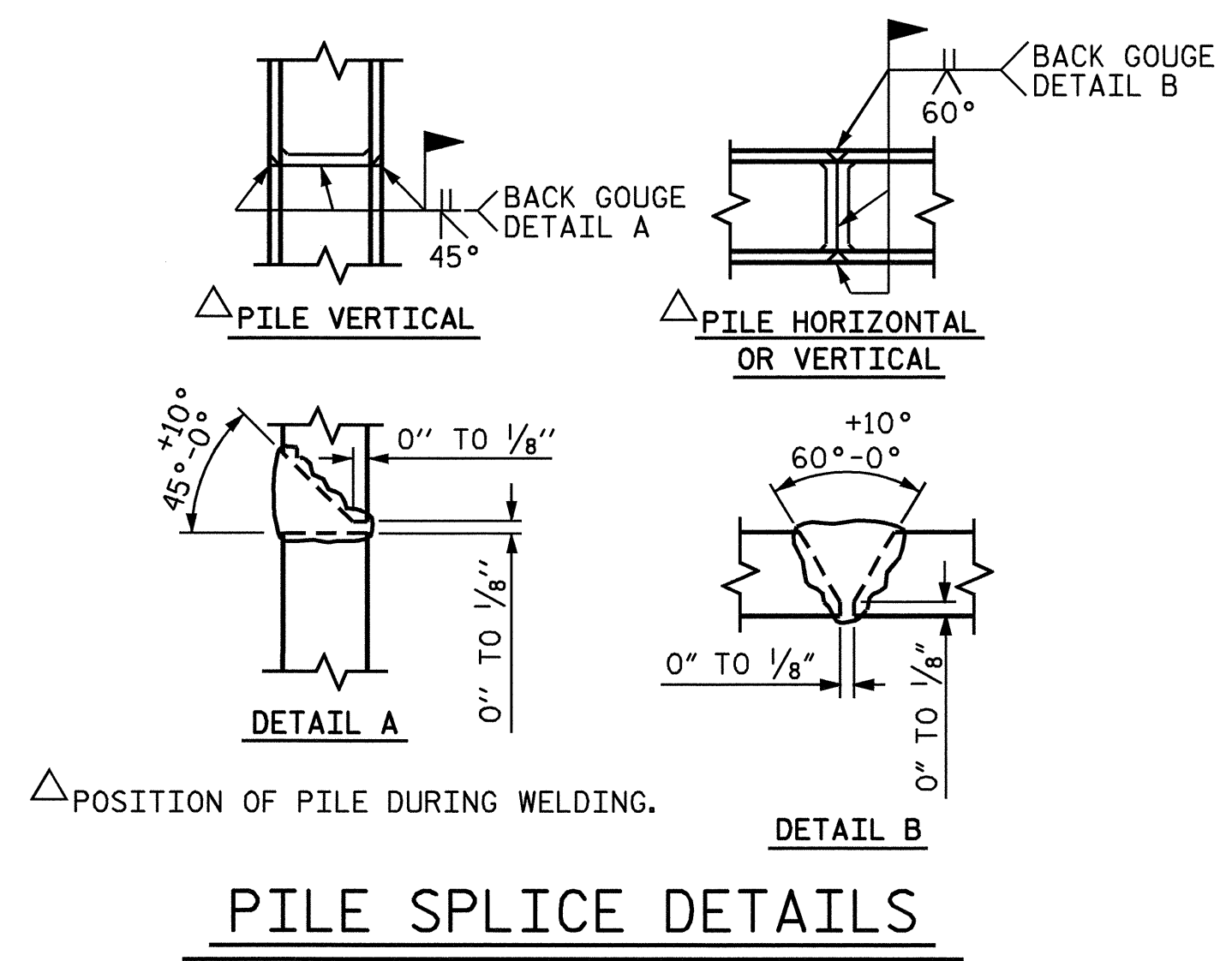
**SECTION B-B**



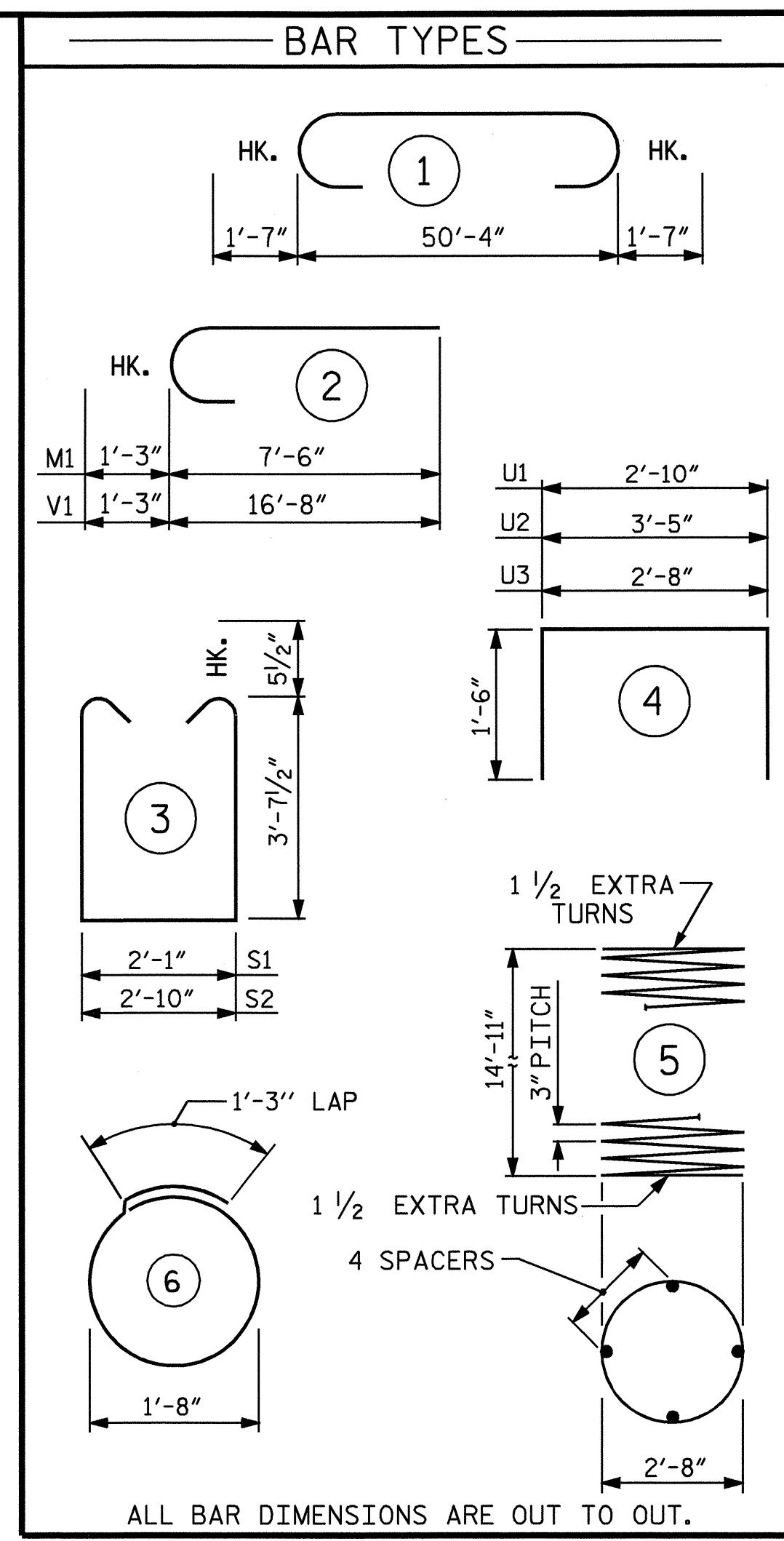
**SECTION C-C**



**SECTION D-D**



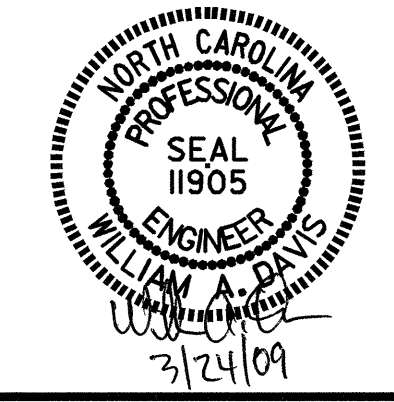
**PILE SPLICE DETAILS**



BILL OF MATERIAL BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#11	STR	50'-6"	2146
B2	8	#11	1	53'-6"	2274
B3	6	#5	STR	50'-6"	316
B4	16	#4	STR	18'-6"	198
M1	36	#9	2	8'-9"	1071
S1	100	#5	3	10'-3"	1069
S2	34	#5	3	11'-0"	390
S3	33	#4	6	6'-6"	143
T1	270	#6	STR	11'-6"	4664
U1	34	#4	4	5'-10"	132
U2	8	#4	4	6'-5"	34
U3	8	#4	4	5'-8"	30
V1	36	#9	2	17'-11"	2193
REINFORCING STEEL					14660 LBS.
SP-1	3	**	5	497'-2"	996
SPIRAL COLUMN REINFORCING STEEL (SP-1)					= 996 LBS
CLASS A CONCRETE BREAKDOWN:					
POUR #1 (FOOTINGS)					60.0 C.Y.
POUR #2 (COLUMNS)					11.5 C.Y.
POUR #3 (CAP)					25.8 C.Y.
TOTAL CLASS A CONCRETE					97.3 C.Y.
HP 12 X 53 STEEL PILES					
No. 24					LIN. FT. 480
** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W-20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.					
STEEL PILE POINTS					EA. 24

DRAWN BY: QT NGUYEN DATE: 11-08  
 CHECKED BY: S. DOMBROWSKI DATE: 12-08

\* INVERT ALTERNATE STIRRUPS



PROJECT NO. R-0505  
 HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				SUBSTRUCTURE	
BENT 1 (NBL)				SHEET NO. S-50	
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 56

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

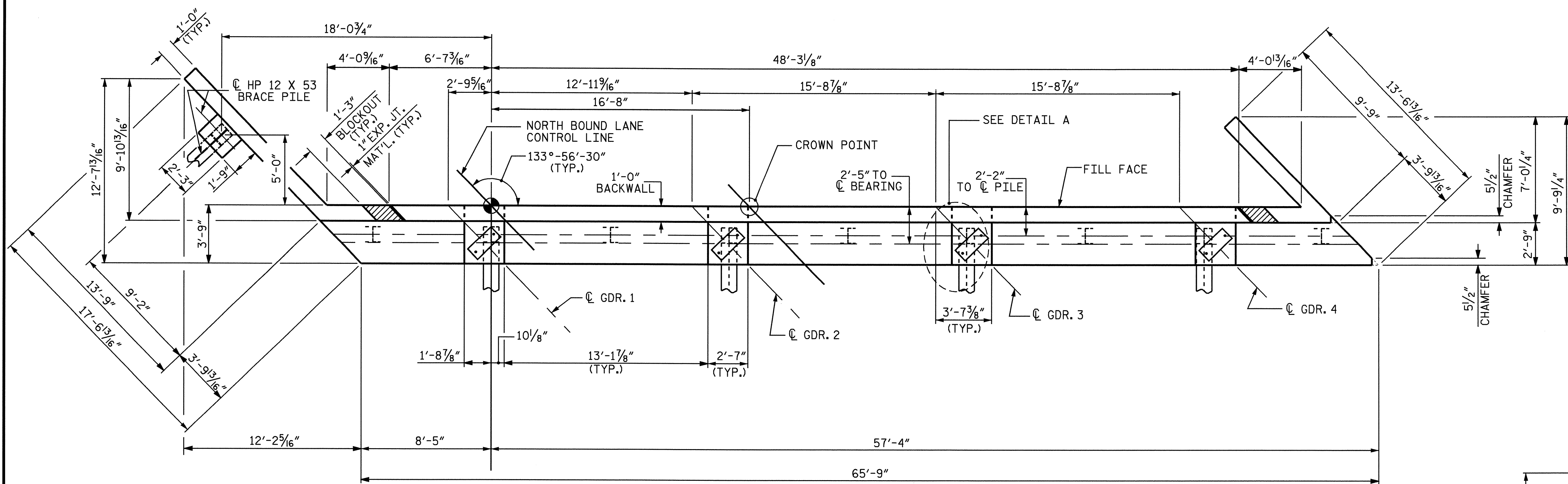
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

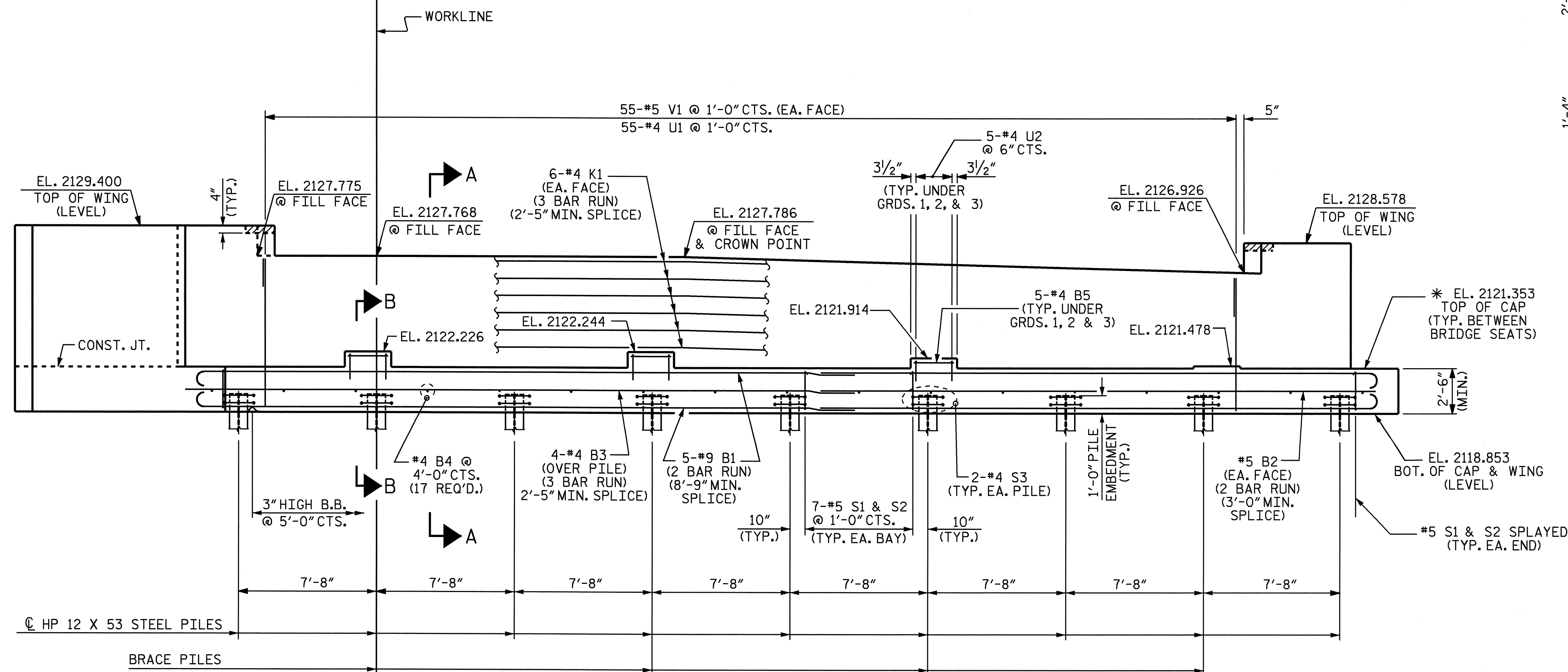
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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

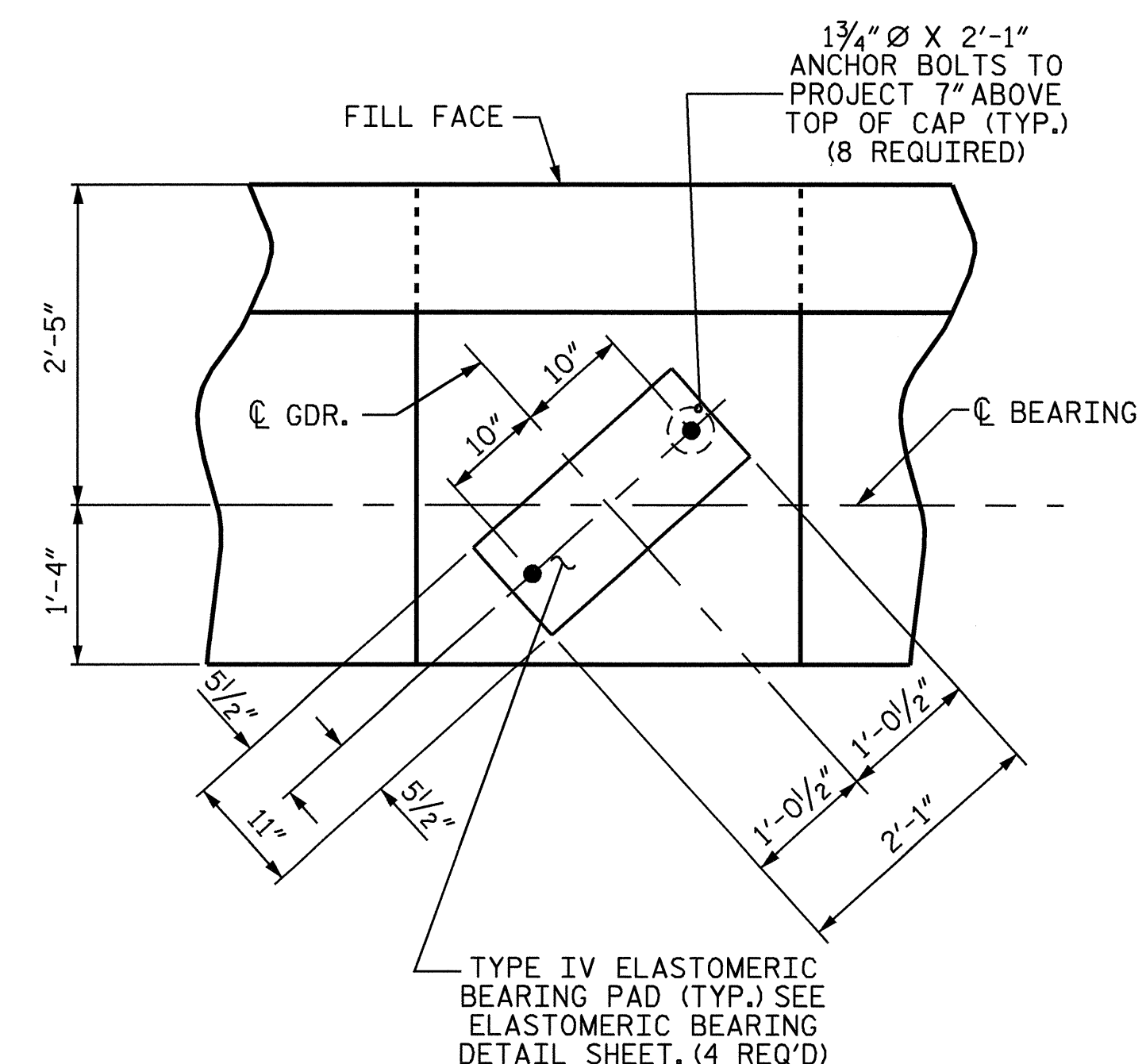


PLAN



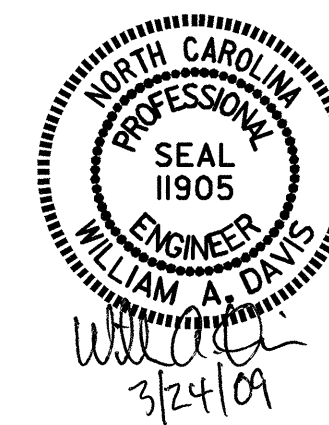
ELEVATION

RIGHT WING NOT SHOWN FOR CLARITY  
BRACE PILE IN WING NOT SHOWN FOR CLARITY



DETAIL A

\* FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 3 OF 3



DRAWN BY: QT NGUYEN DATE: 10-08  
CHECKED BY: S. DOMBROWSKI DATE: 12-08

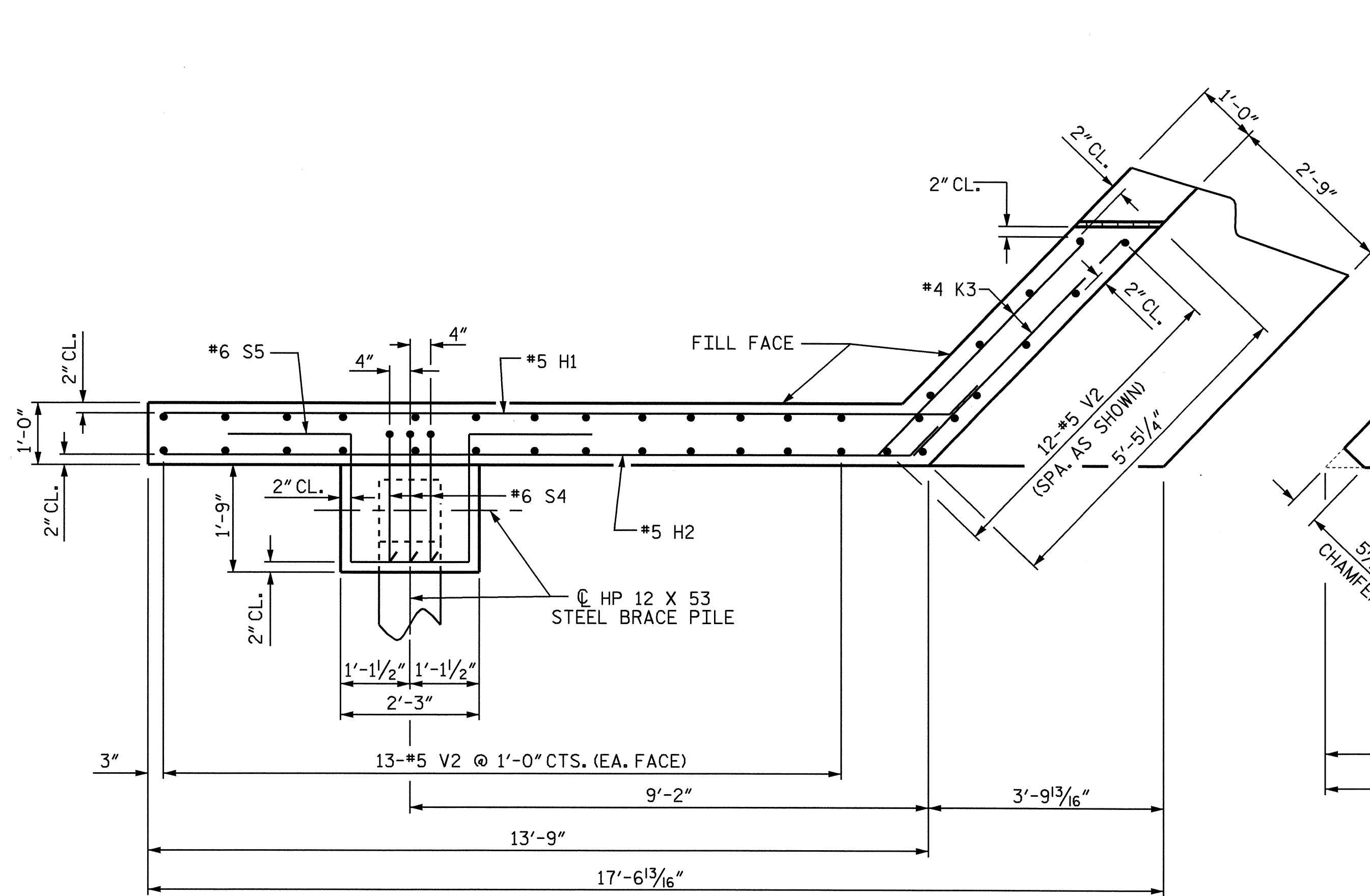
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qtnghuyen

PROJECT NO. R-0505  
HENDERSON COUNTY  
STATION: 780+05.14 -L-

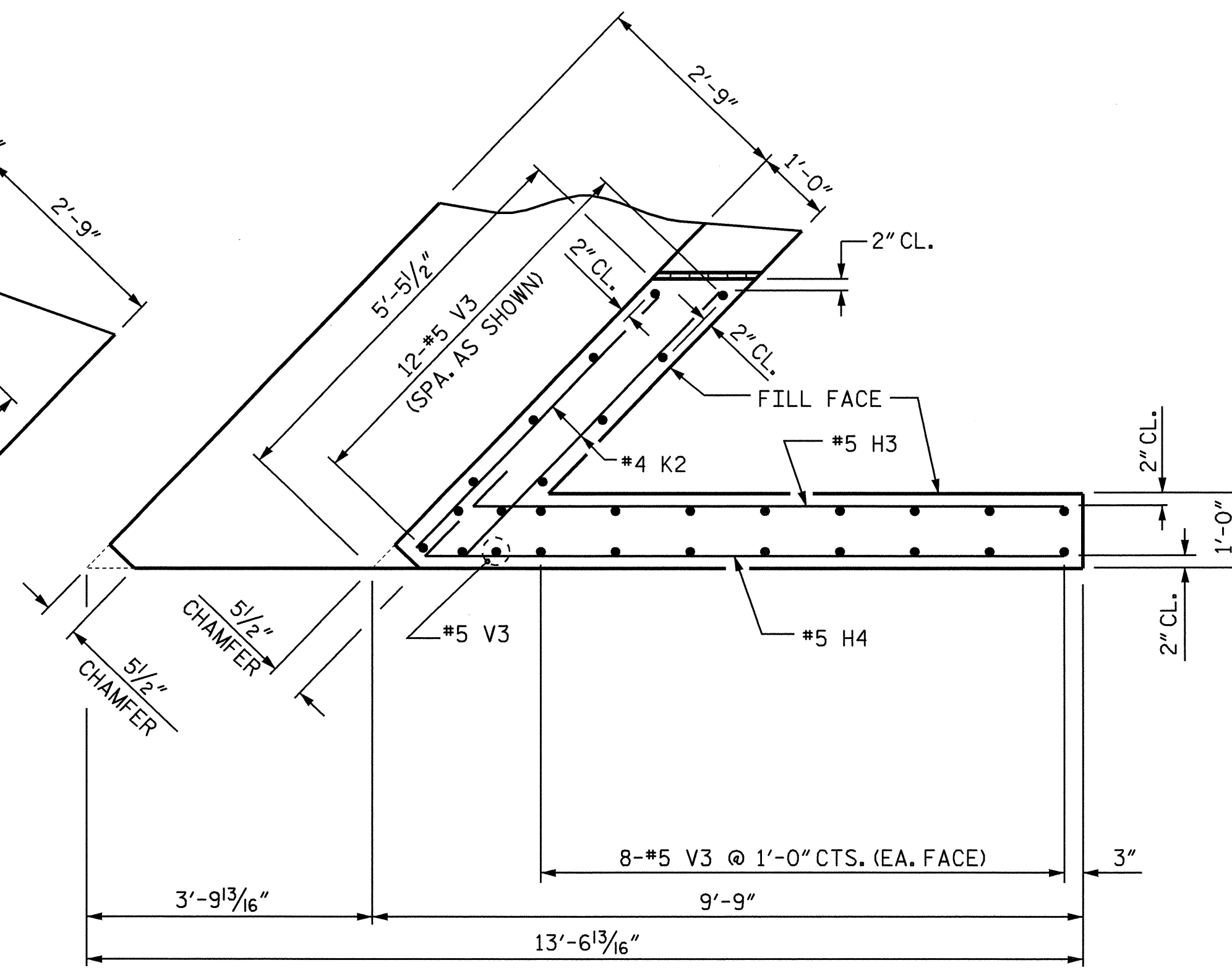
SHEET 1 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
END BENT 2  
(NBL)

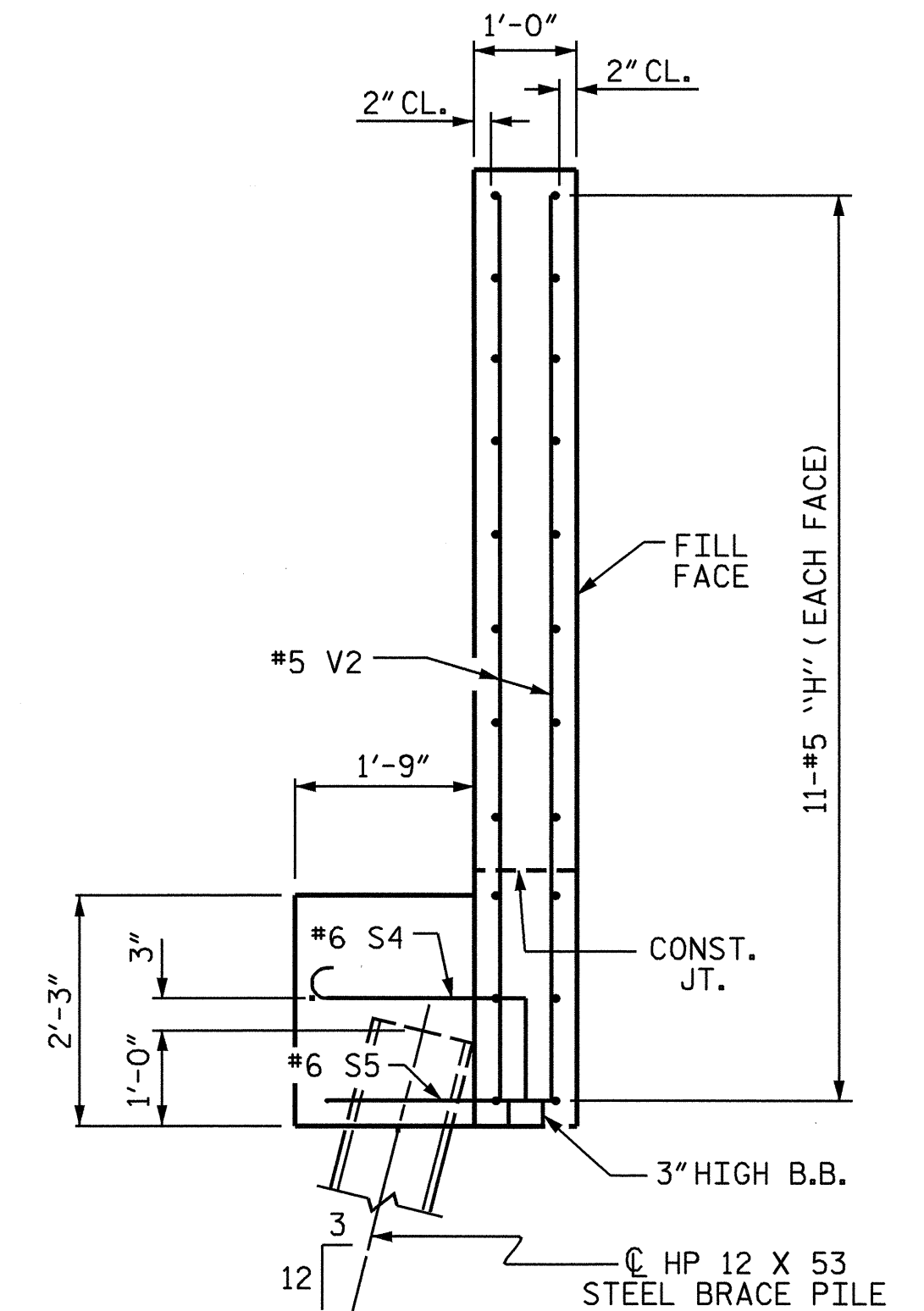
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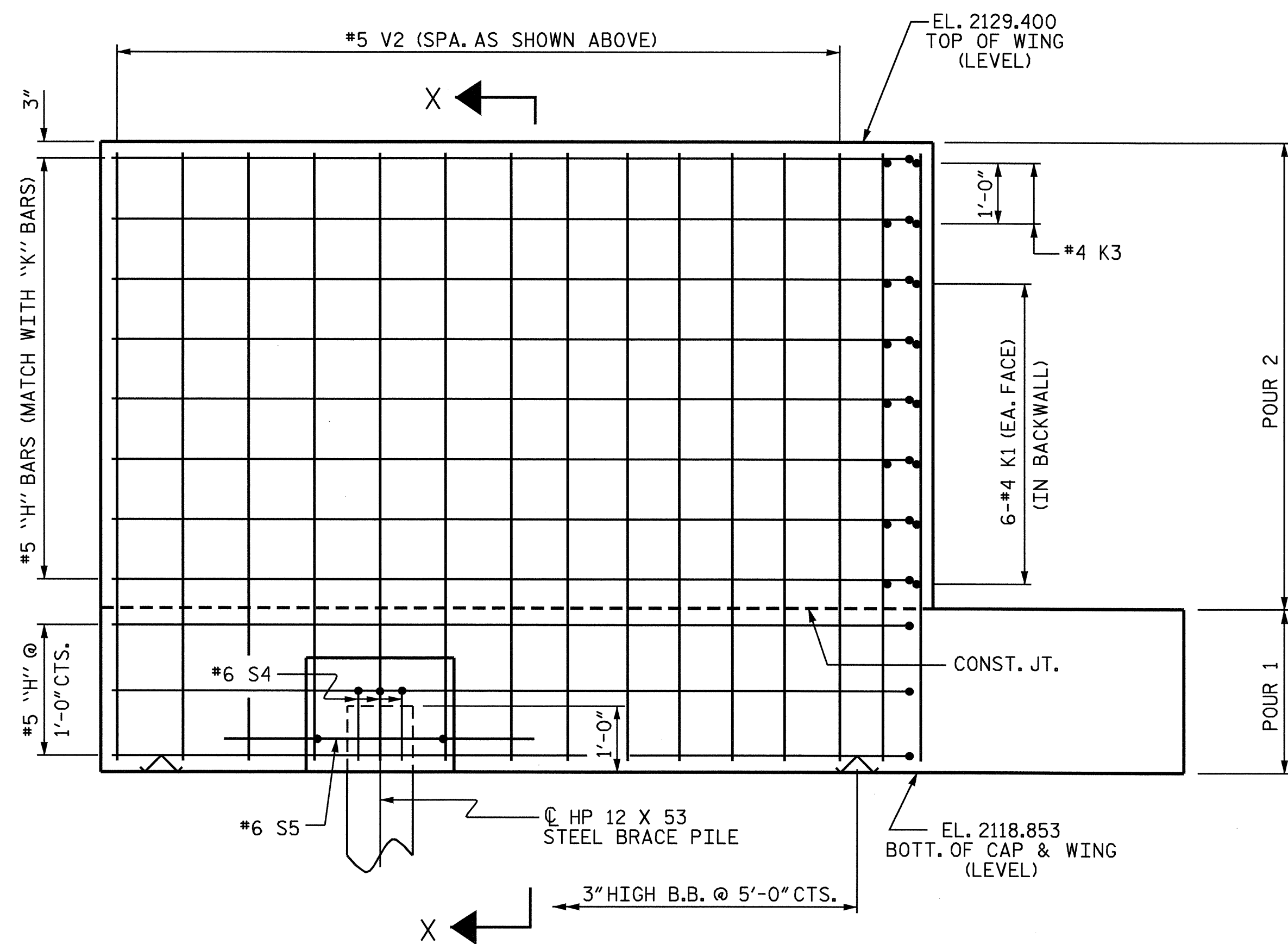
PLAN OF LEFT WING W1



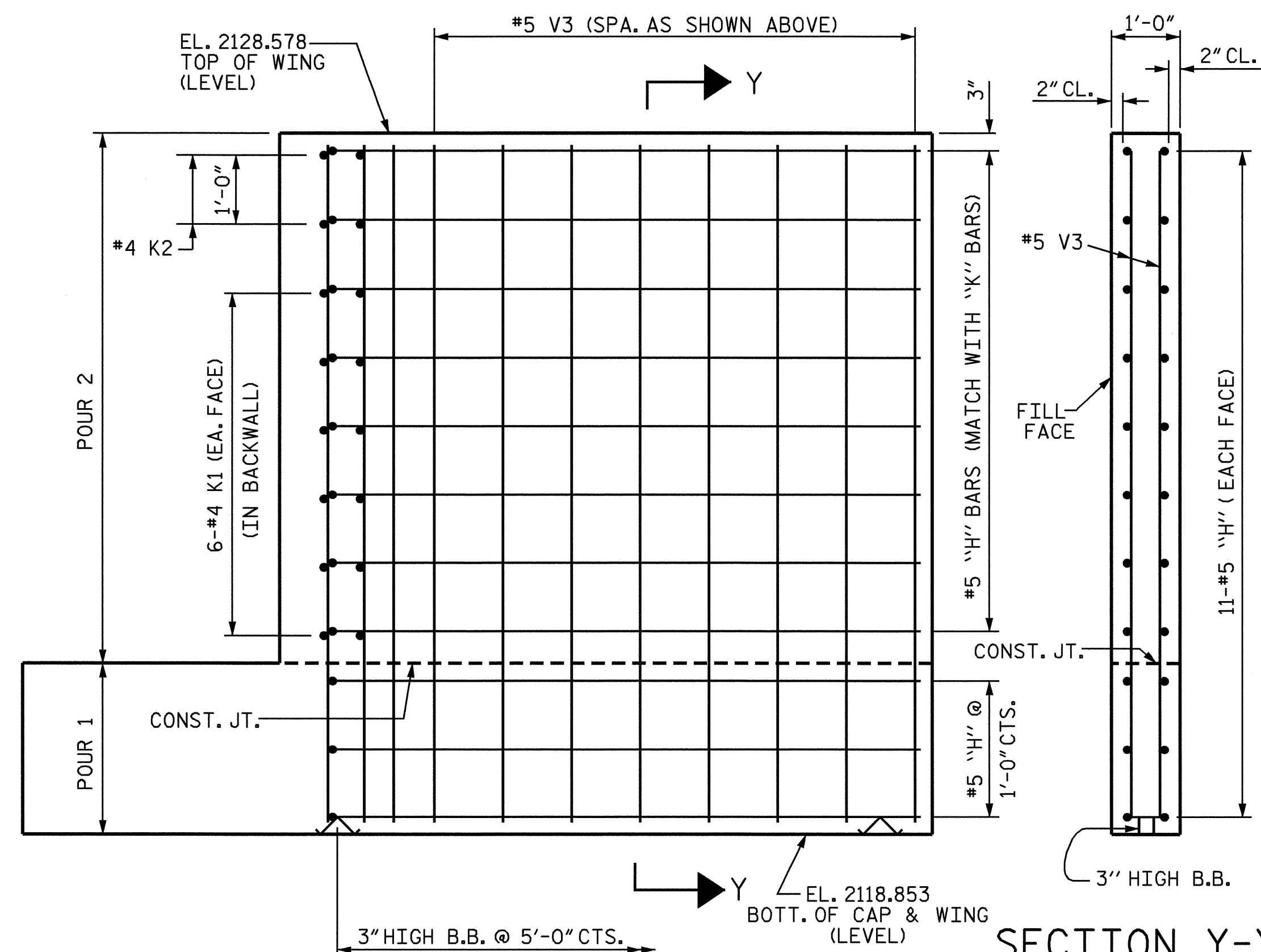
PLAN OF RIGHT WING W2



SECTION X-X



ELEVATION OF LEFT WING W1



ELEVATION OF RIGHT WING W2

SECTION Y-Y



PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

SHEET 2 OF 3

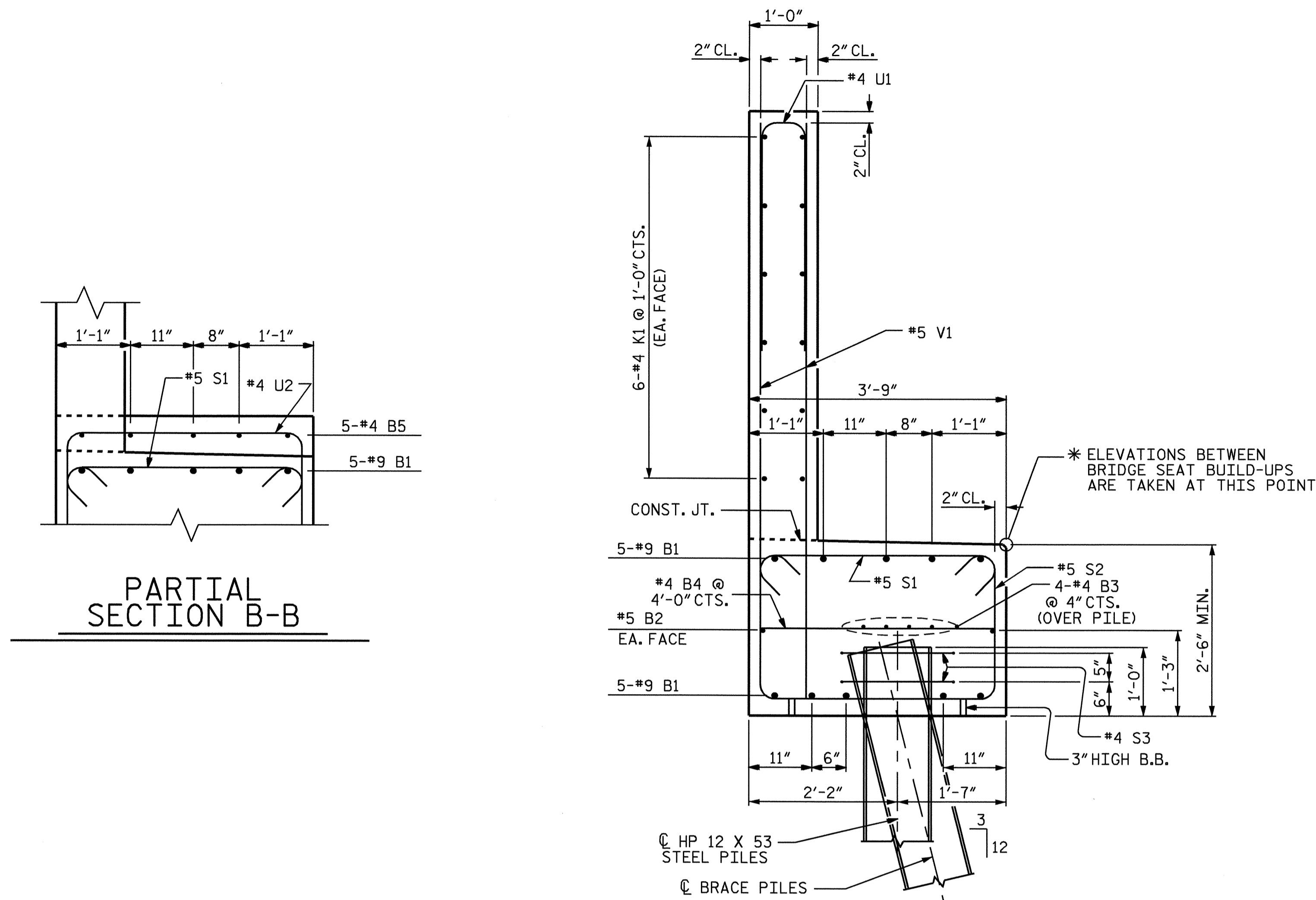
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 2  
 (NBL)

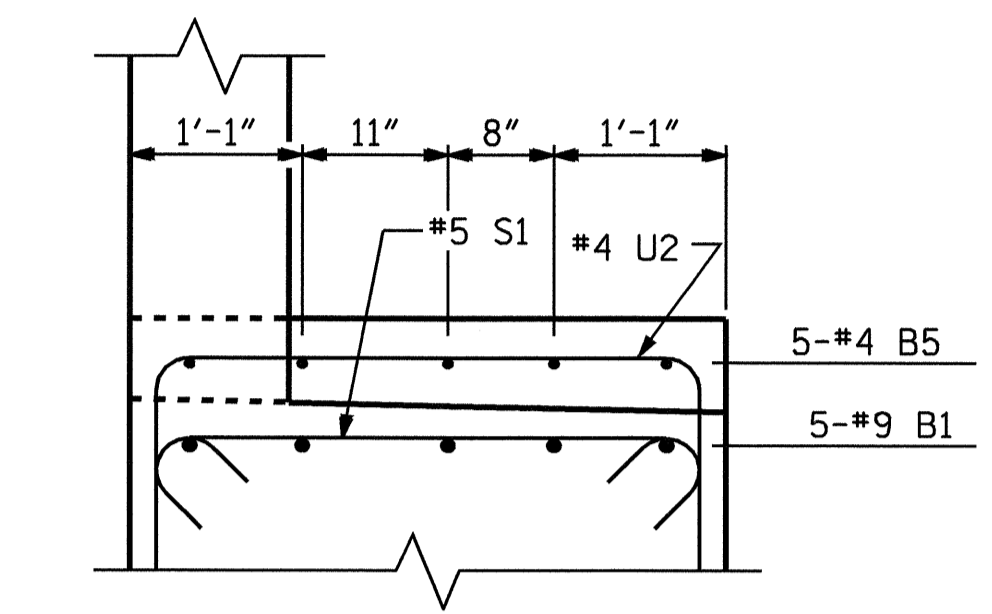
REVISIONS						SHEET NO. S-52
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 56
2			4			

DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: S. DOMBROWSKI DATE: 12-08

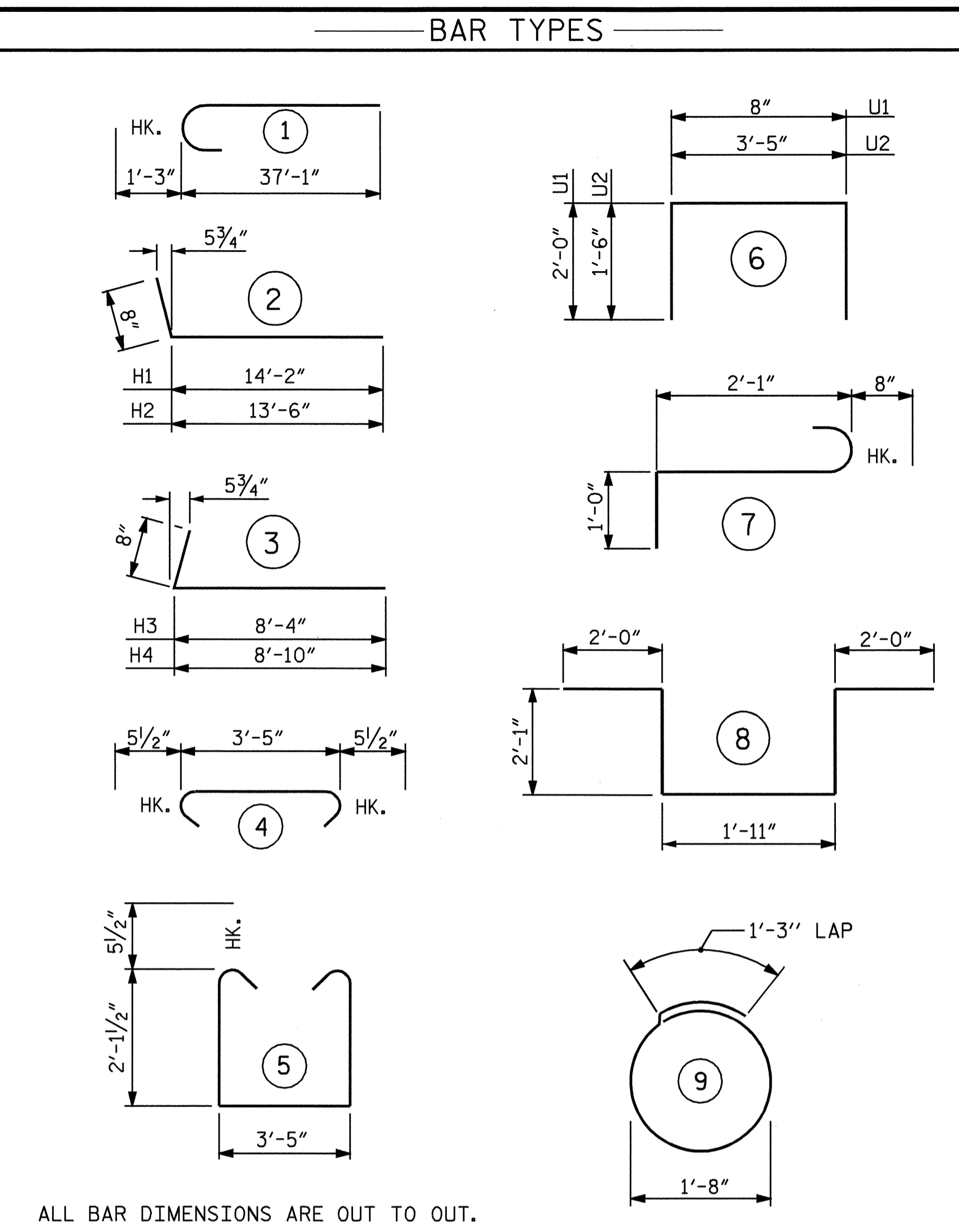
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 qtnguyen



SECTION A-A

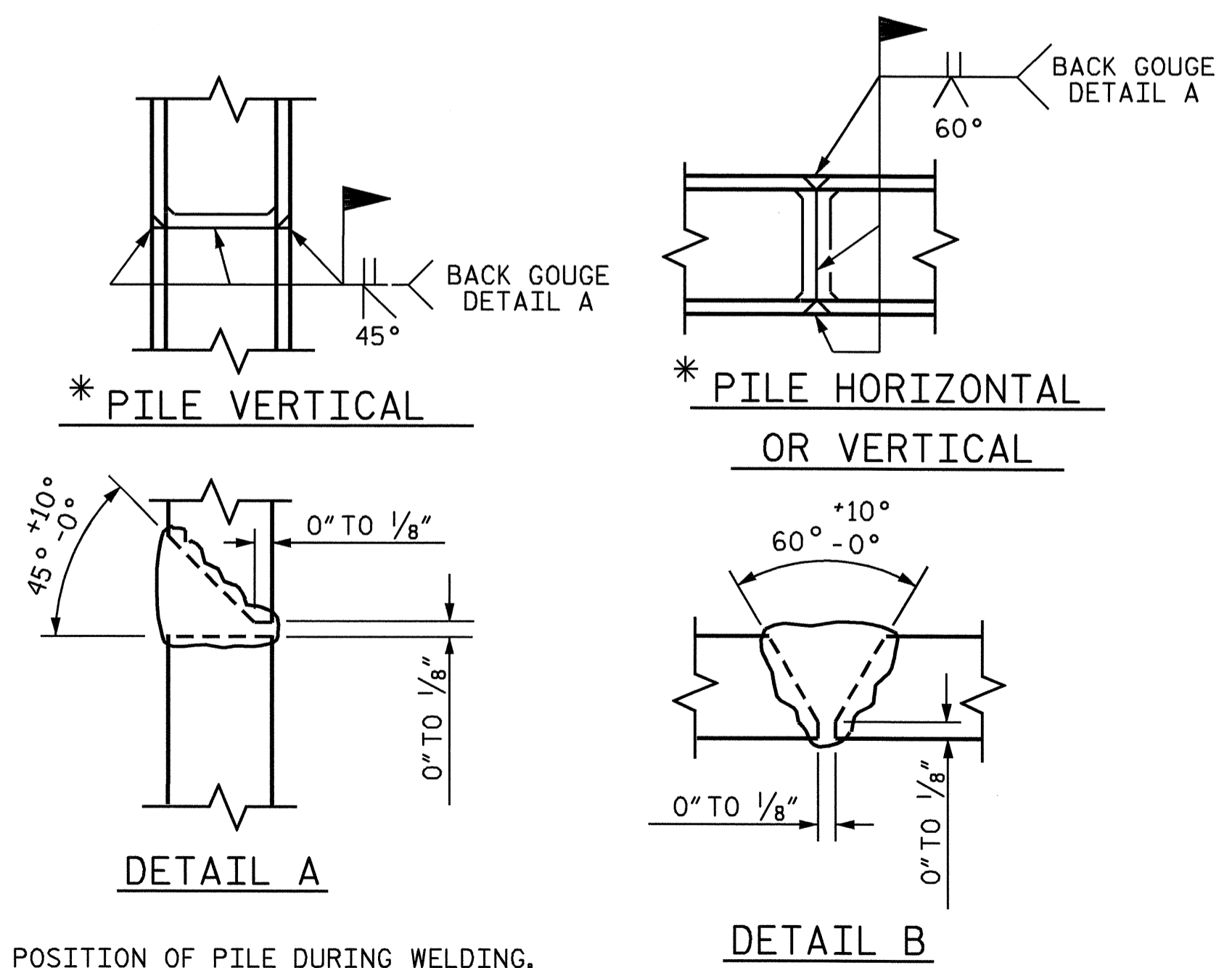


PARTIAL SECTION B-B

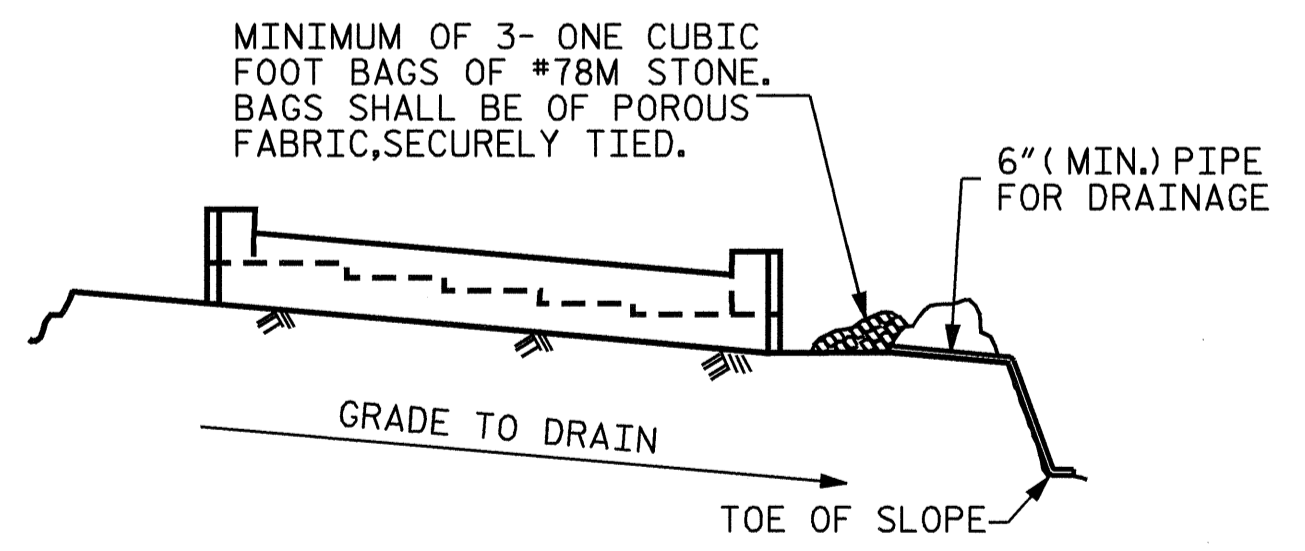


BAR TYPES

BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	20	#9	1	38'-4"	2607
B2	4	#5	STR	34'-3"	143
B3	12	#4	STR	23'-5"	188
B4	17	#4	STR	3'-5"	39
B5	15	#4	STR	2'-3"	23
H1	11	#5	2	14'-10"	170
H2	11	#5	2	14'-2"	163
H3	11	#5	3	9'-0"	103
H4	11	#5	3	9'-6"	109
K1	36	#4	STR	23'-4"	561
K2	4	#4	STR	4'-9"	13
K3	4	#4	STR	5'-2"	14
S1	58	#5	4	4'-4"	262
S2	58	#5	5	8'-7"	519
S3	18	#4	9	6'-0"	77
S4	3	#6	7	3'-9"	17
S5	1	#6	8	10'-1"	15
U1	55	#4	6	4'-8"	171
U2	15	#4	6	6'-5"	64
V1	110	#5	STR	7'-7"	870
V2	38	#5	STR	10'-0"	396
V3	29	#5	STR	9'-2"	277
REINFORCING STEEL = LBS					6801
CLASS A CONCRETE					
POUR 1: CAP & LOWER WINGS					
				C.Y.	18.8
POUR 2: BACKWALL & UPPER WINGS					
				C.Y.	19.8
CLASS A CONCRETE TOTAL					C.Y. 38.6
HP 12 X 53 STEEL PILES					
				LIN. FT.	650
STEEL PILE POINTS					EA. 10



PILE SPLICE DETAILS



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

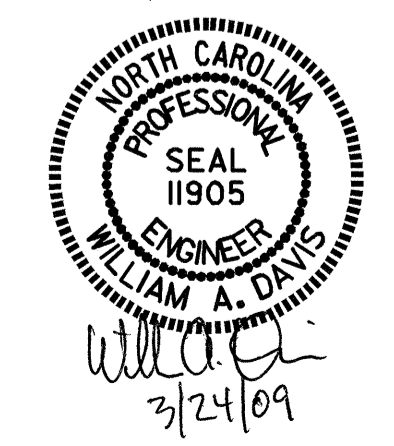
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

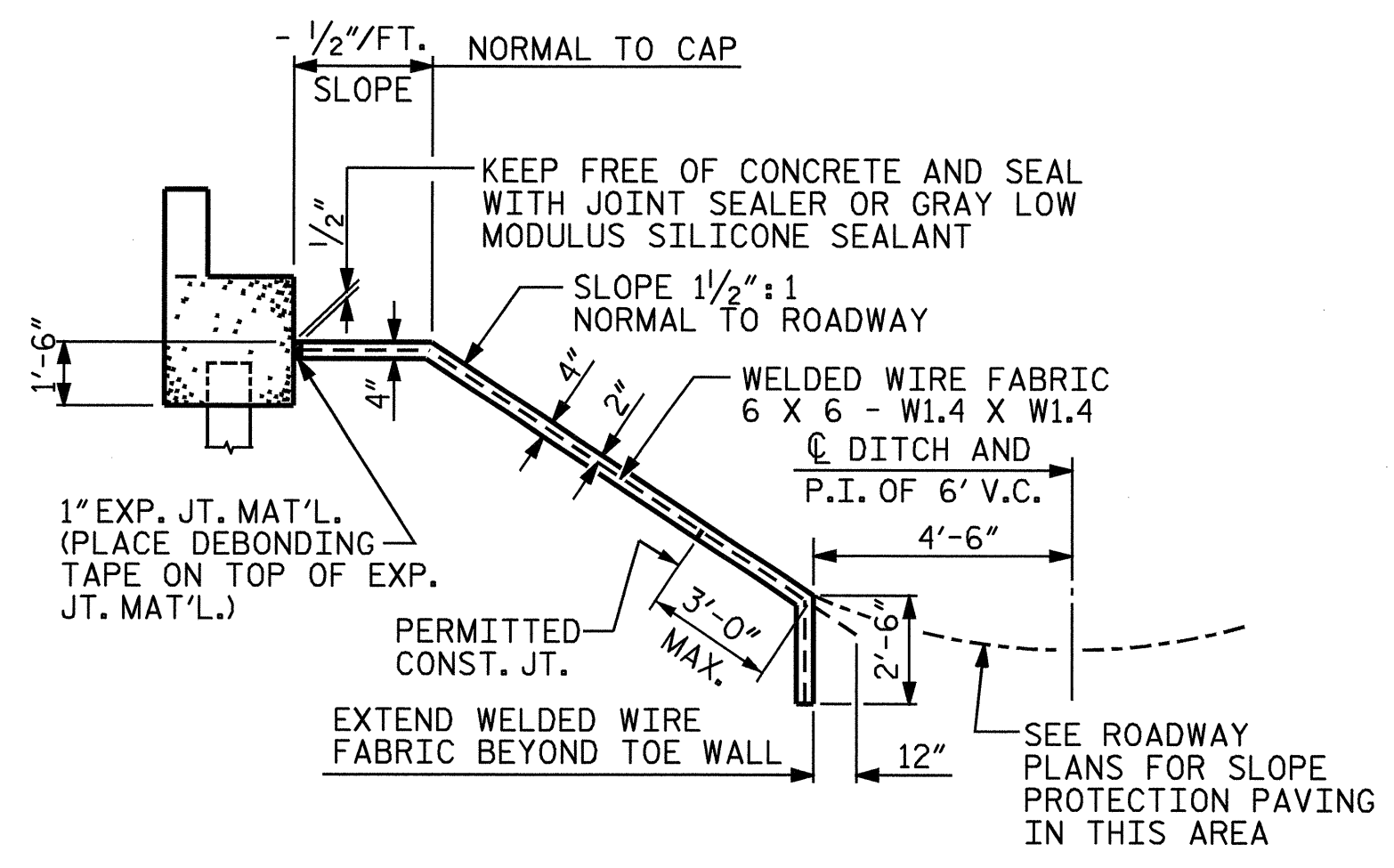
TEMPORARY DRAINAGE AT END BENT

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-  
 SHEET 3 OF 3

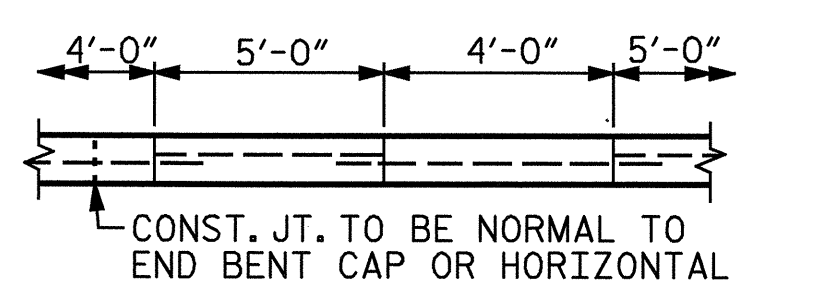
STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
SUBSTRUCTURE					
END BENT 2					
(NBL)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-53
TOTAL SHEETS					56



DRAWN BY: QT NGUYEN DATE: 10-08  
 CHECKED BY: S. DOMBROWSKI DATE: 12-08

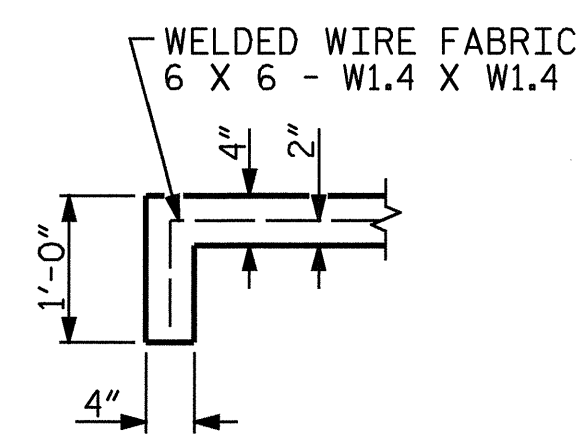


SECTION ALONG C ROADWAY

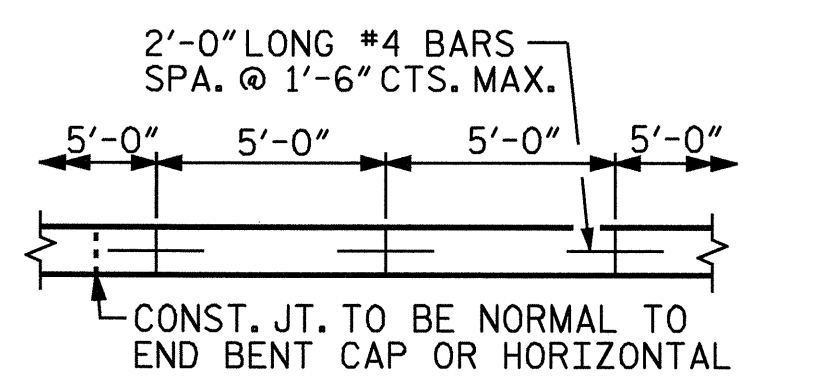


POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL



SECTION A-A



STRIP WIDTHS MAY VARY IN CURVED PORTION.

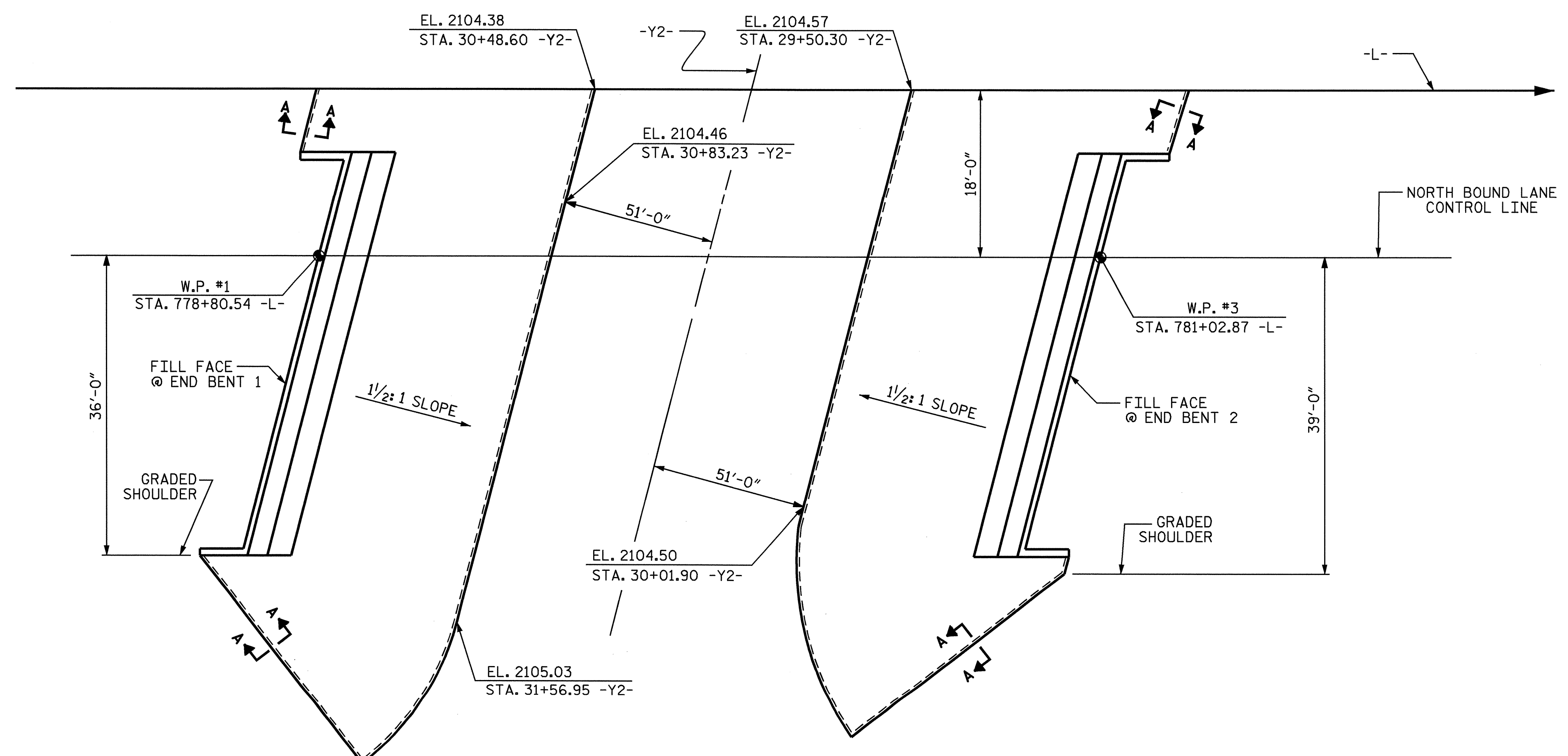
POURING DETAIL

GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

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

FOR BERM WIDTH AND ELEVATIONS, SEE GENERAL DRAWINGS.

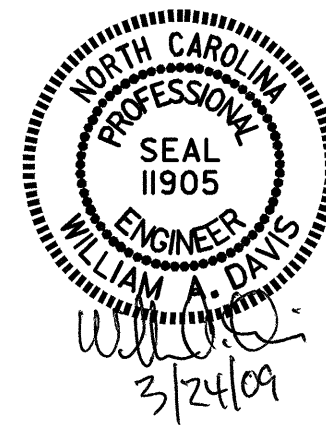


PLAN

BRIDGE @ STA. 780+05.14 -L- (NBL)	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	411	822
END BENT 2	201	402

\* QUANTITY SHOWN IS BASED ON 5' POURS.

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 SLOPE PROTECTION  
 DETAILS  
 (NBL)

REVISIONS						SHEET NO. S-54
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 56
2			4			

ASSEMBLED BY : QT NGUYEN DATE : 11-08  
 CHECKED BY : J. A. YANNACCONE DATE : 11-08  
 DRAWN BY : ELR 5/92 REV. 7/10/01 LES/RDR  
 CHECKED BY : GRP 6/92 REV. 5/17/03 RWW/JTE  
 REV. 5/1/06 TLA/GM



BILL OF MATERIAL					
APPROACH SLAB AT EBT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	28'-1"	976
A2	52	#4	STR	27'-11"	970
*B1	78	#5	STR	24'-0"	1952
B2	78	#6	STR	24'-6"	2870
REINFORCING STEEL				LBS.	3840
* EPOXY COATED REINFORCING STEEL				LBS.	2928
CLASS AA CONCRETE				C. Y.	49.7
APPROACH SLAB AT EBT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	28'-1"	976
A2	52	#4	STR	27'-11"	970
*B1	78	#5	STR	24'-0"	1952
B2	78	#6	STR	24'-6"	2870
REINFORCING STEEL				LBS.	3840
* EPOXY COATED REINFORCING STEEL				LBS.	2928
CLASS AA CONCRETE				C. Y.	49.7

**NOTES**

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

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.

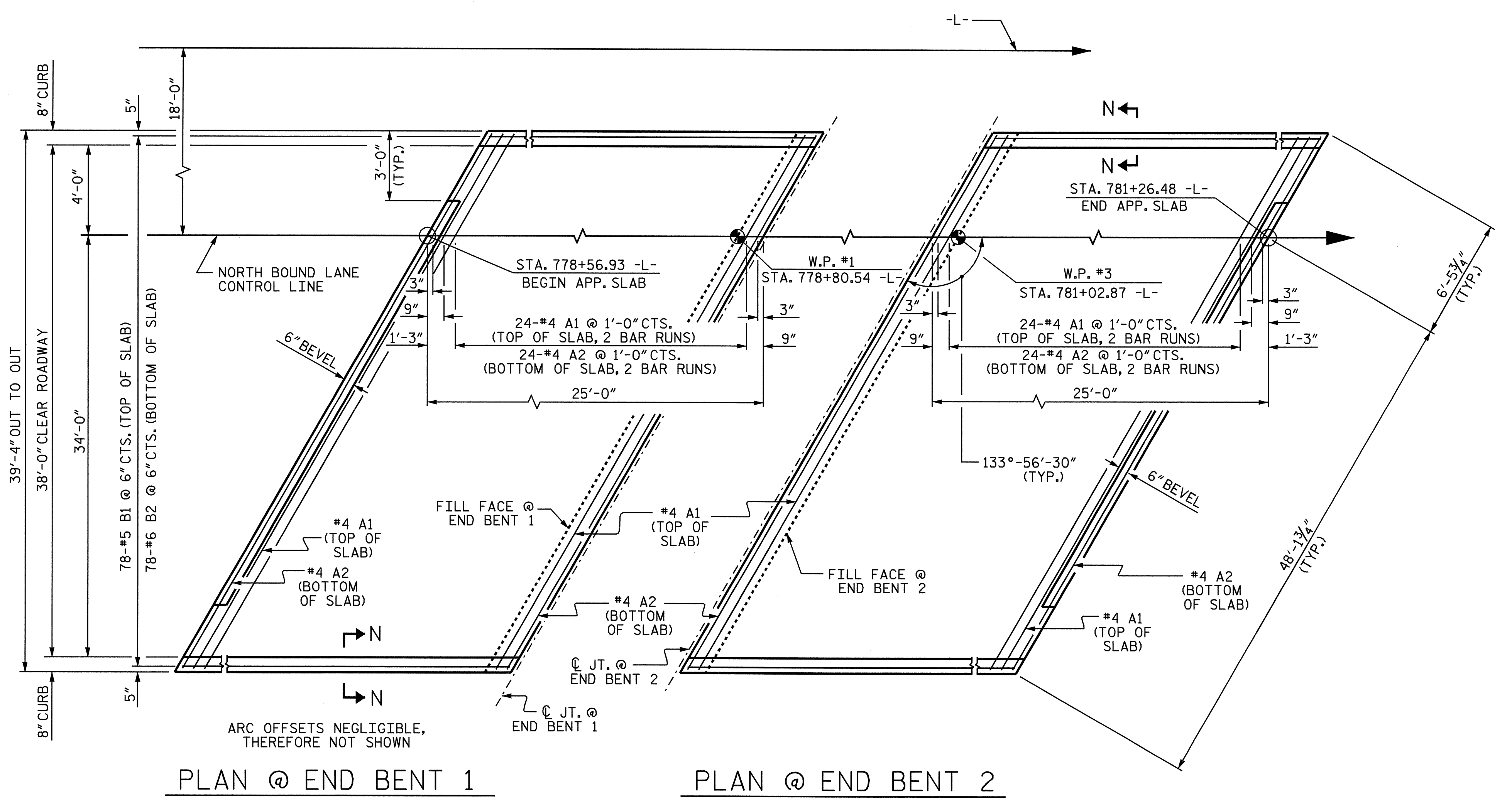
THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

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.

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

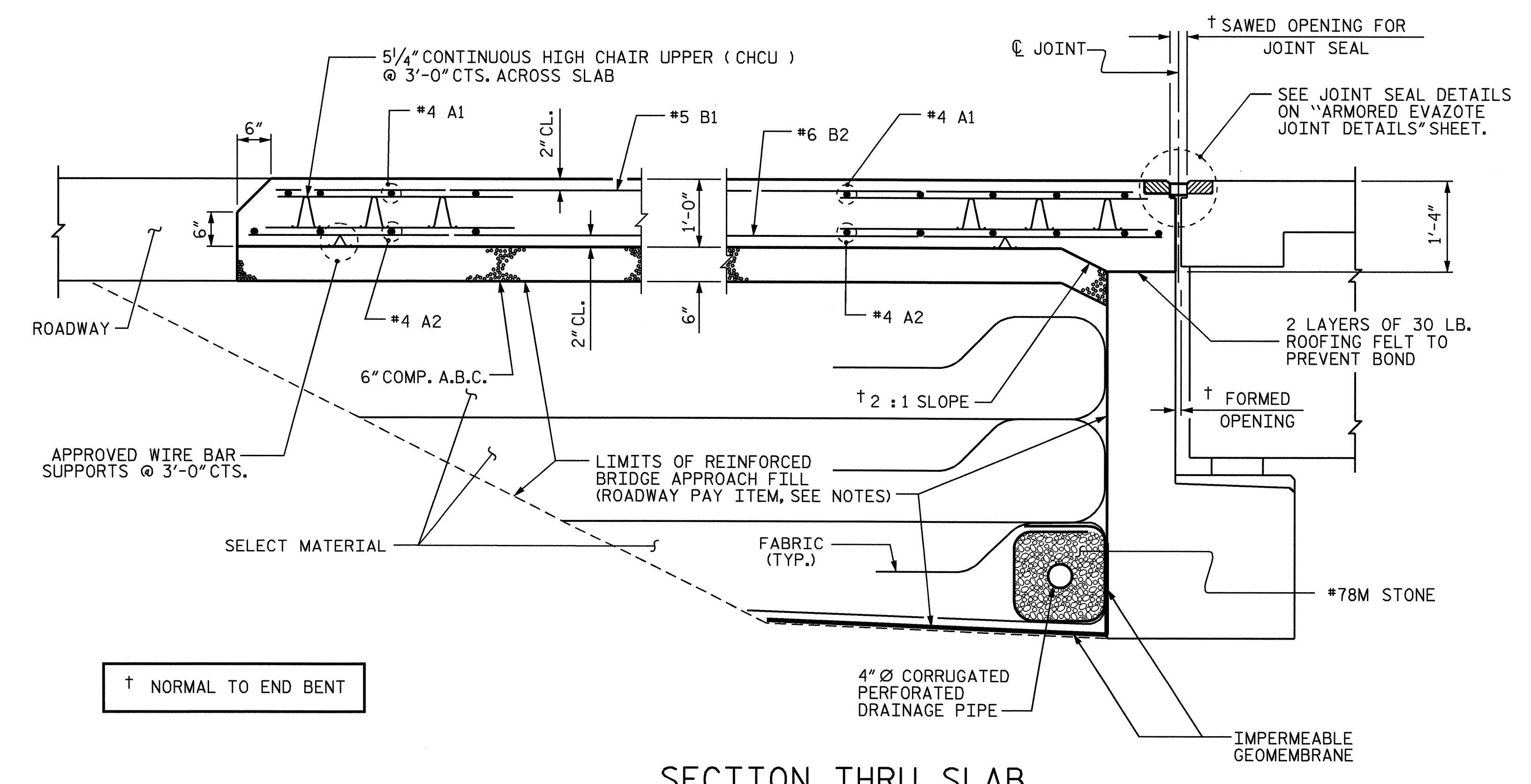
THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 1/2".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

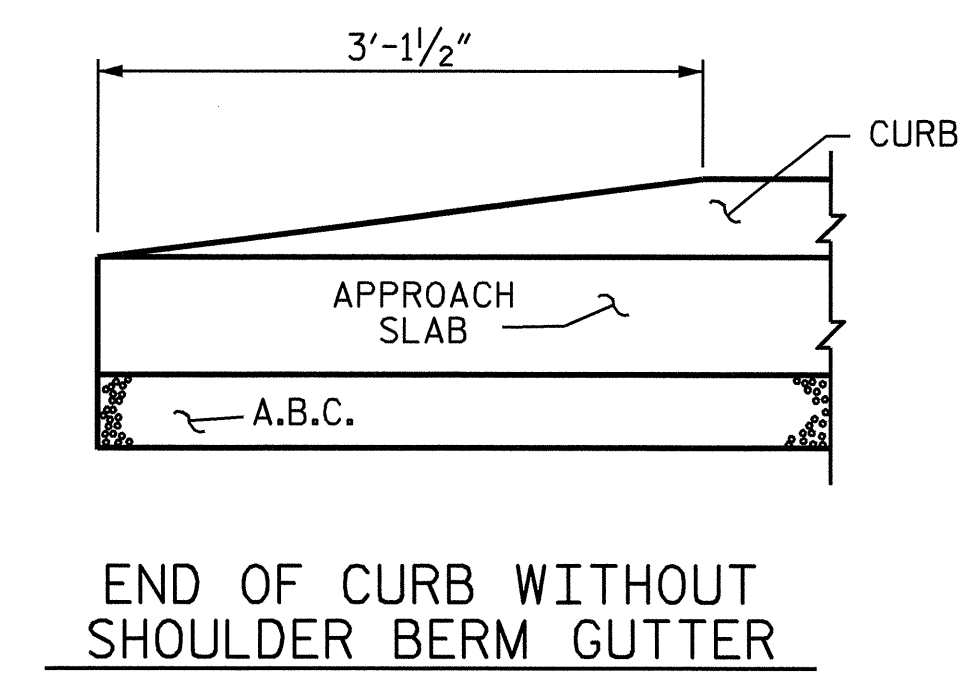
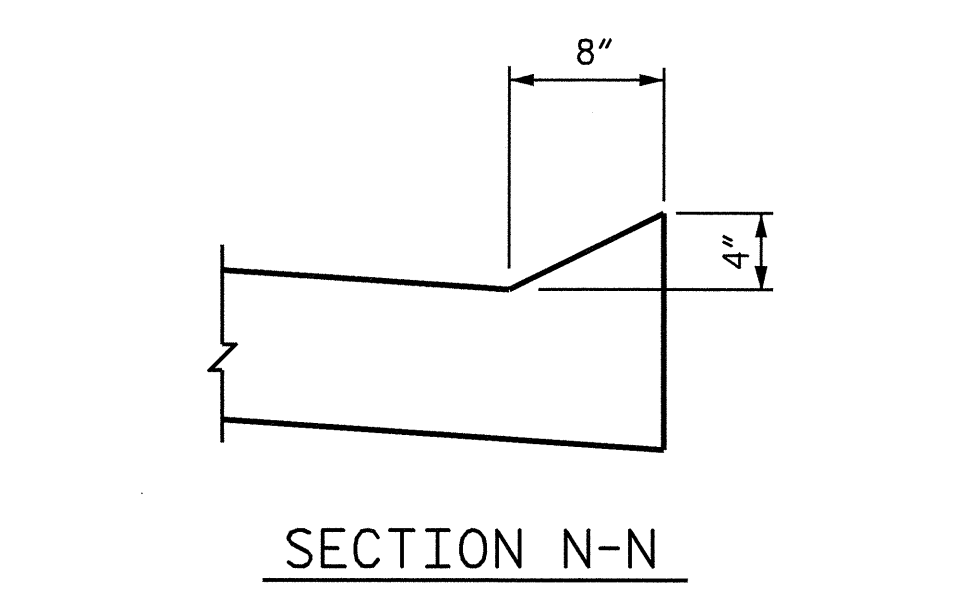


**PLAN @ END BENT 1**      **PLAN @ END BENT 2**

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



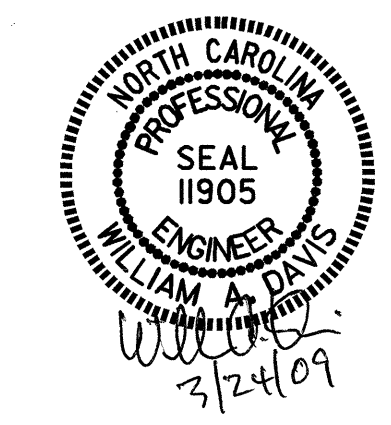
**SECTION THRU SLAB**



ASSEMBLED BY :	QT NGUYEN	DATE :	10-08
CHECKED BY :	A.R. CHESSON	DATE :	12-08
DRAWN BY :	EEM 3/95	REV. 7/10/01	LES/RDR
CHECKED BY :	VAP 3/95	REV. 5/1/03R	RWW/JTE
		REV. 5/1/06R	KMM/GM

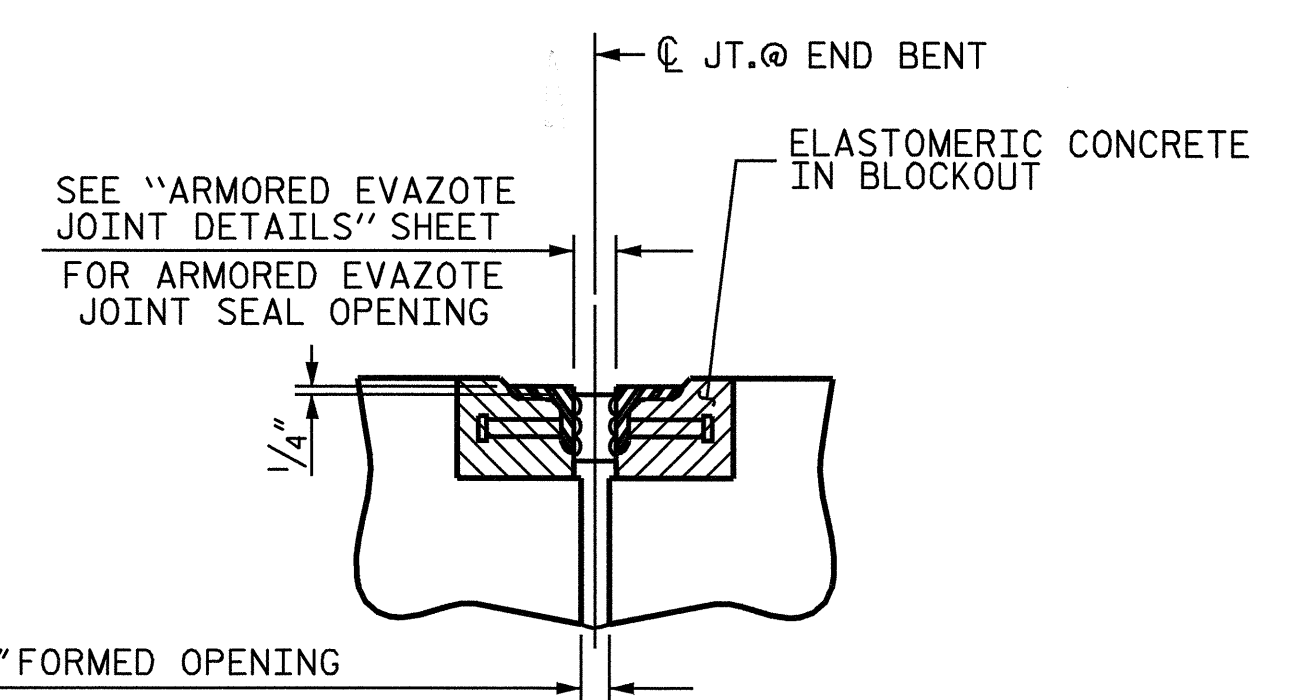
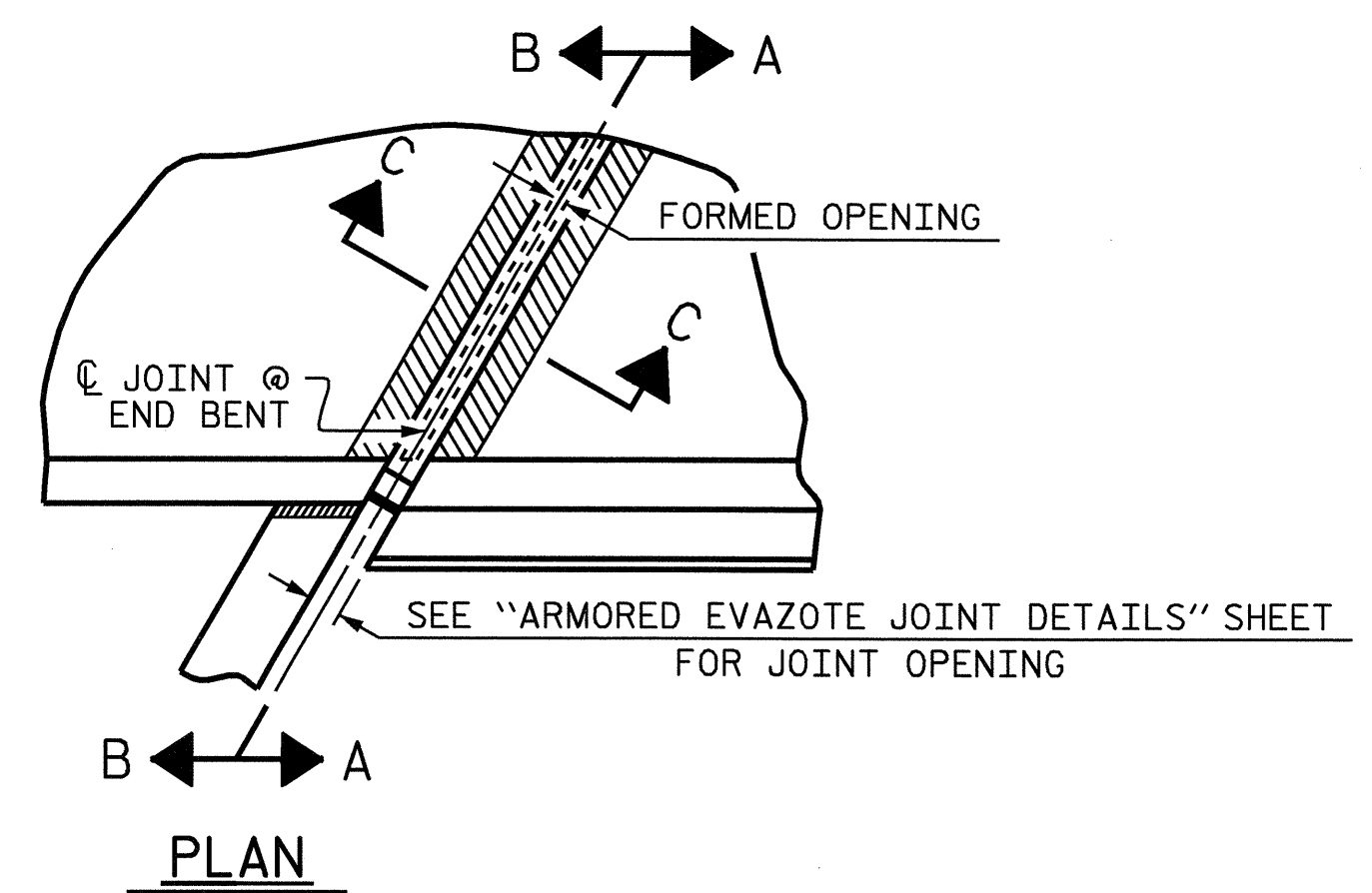
PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+04.15 -L-

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

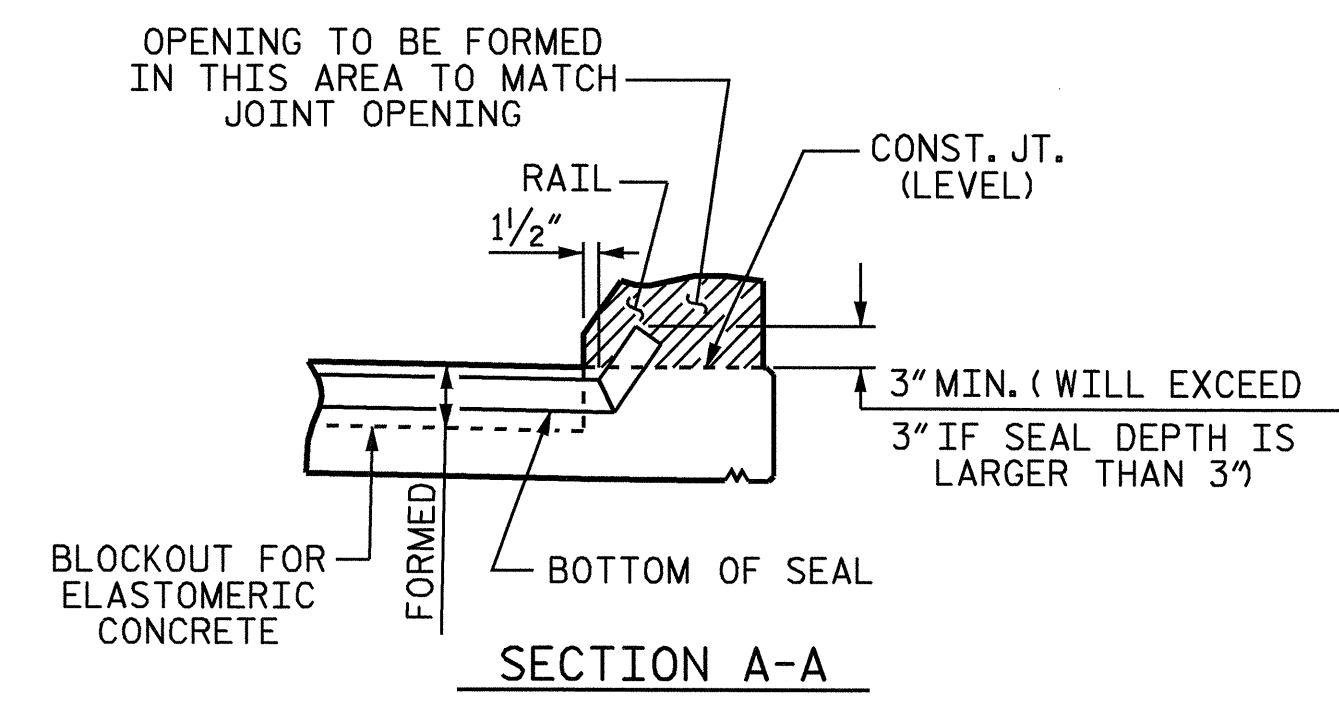


REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

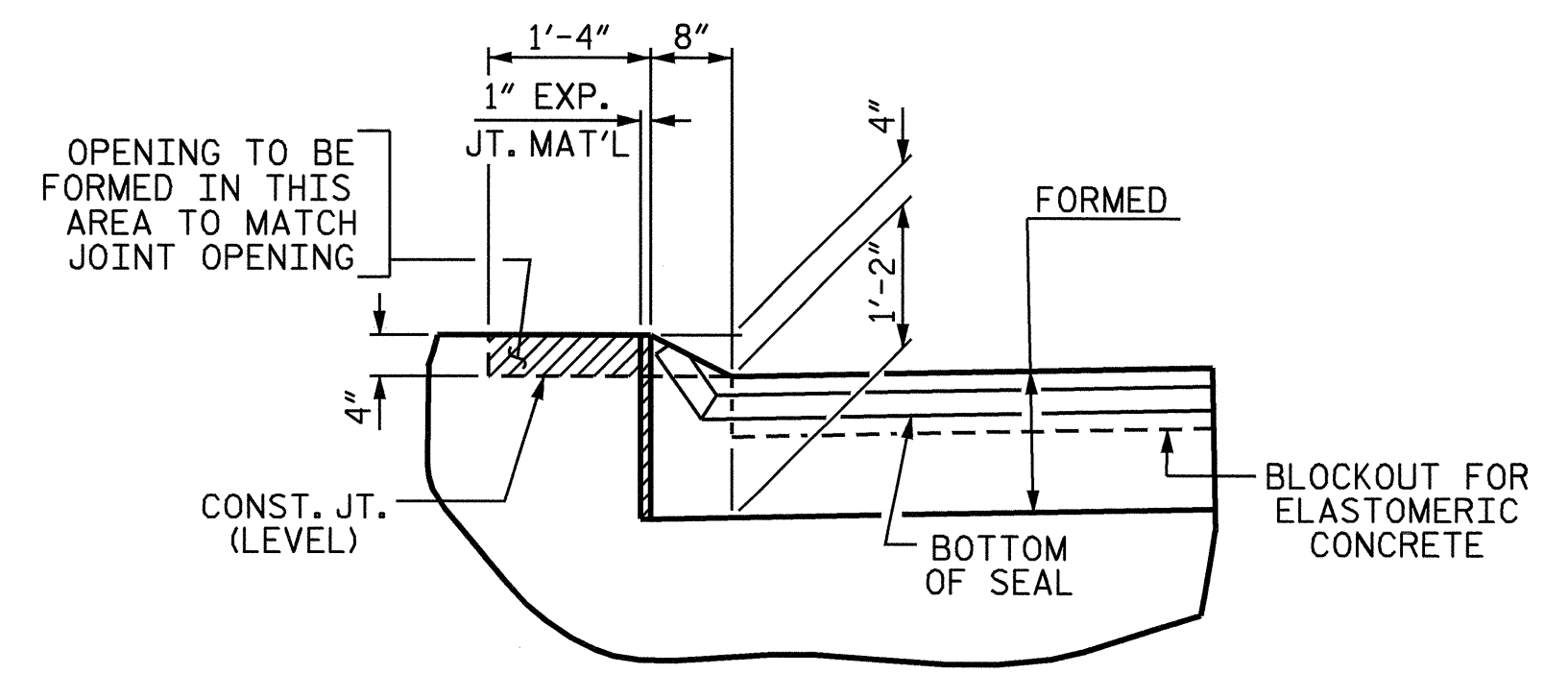
TOTAL SHEETS: 56



SECTION C-C  
ARMORED EVAZOTE JOINT SEAL



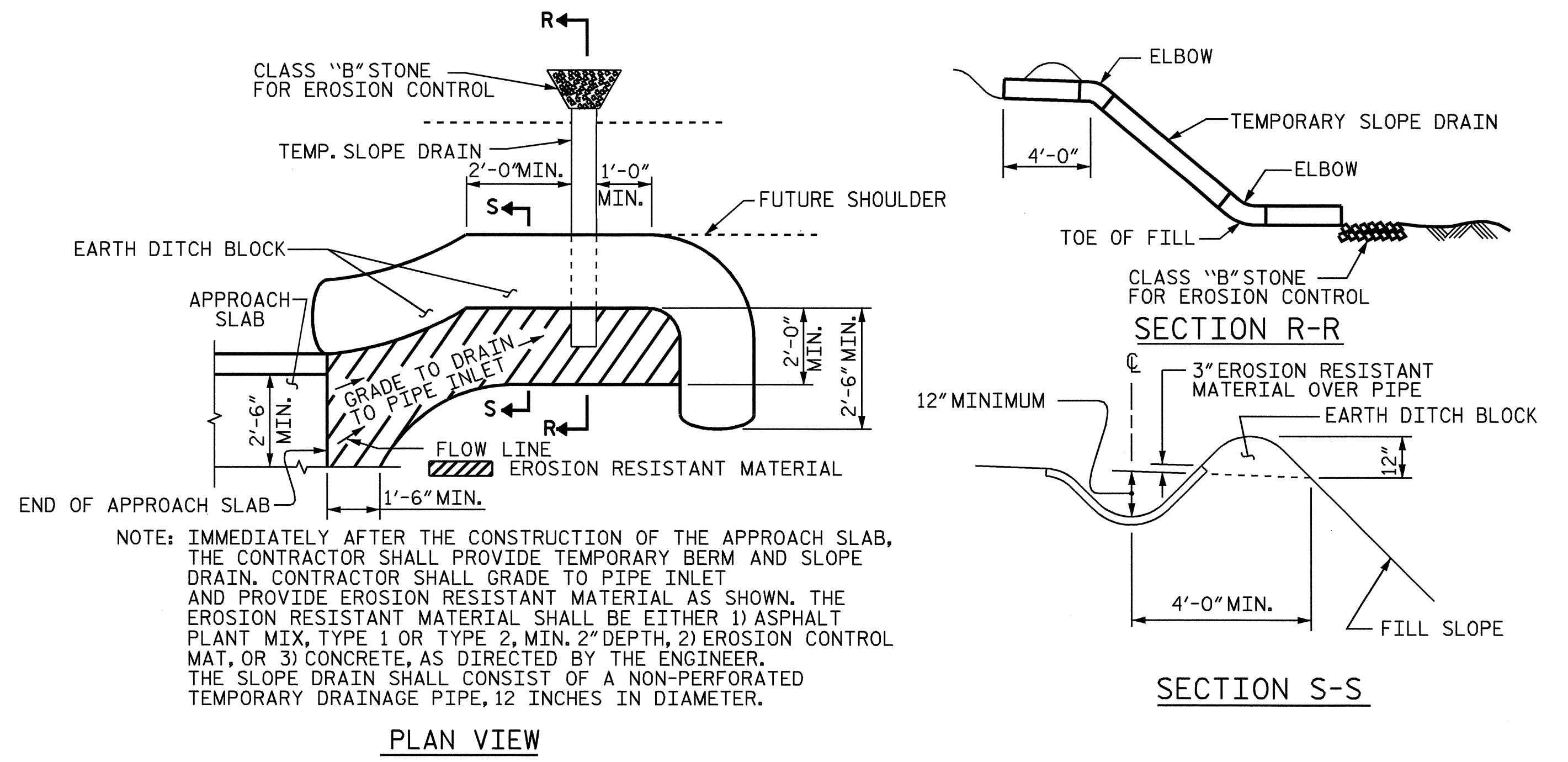
SECTION A-A



SECTION B-B

**JOINT SEAL DETAILS @ END BENT**

EVAZOTE JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.

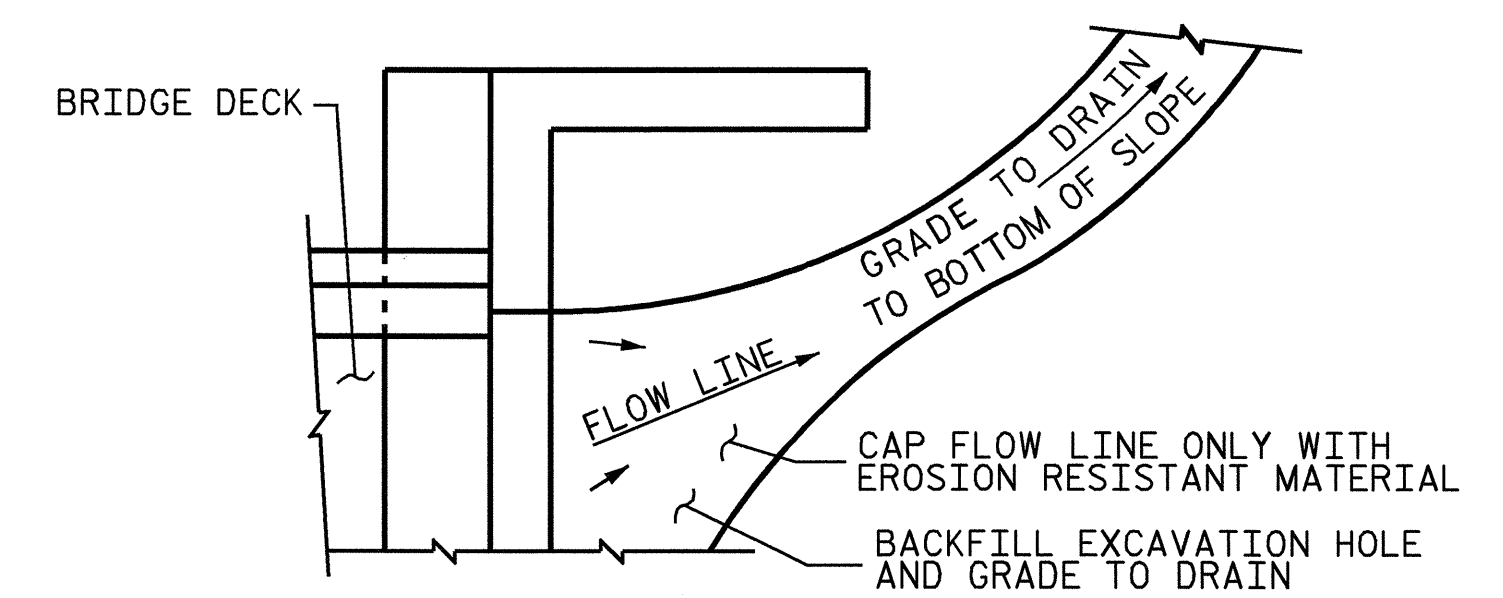


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2\"/>

PLAN VIEW

**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

**TEMPORARY DRAINAGE DETAIL**

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 780+05.14 -L-

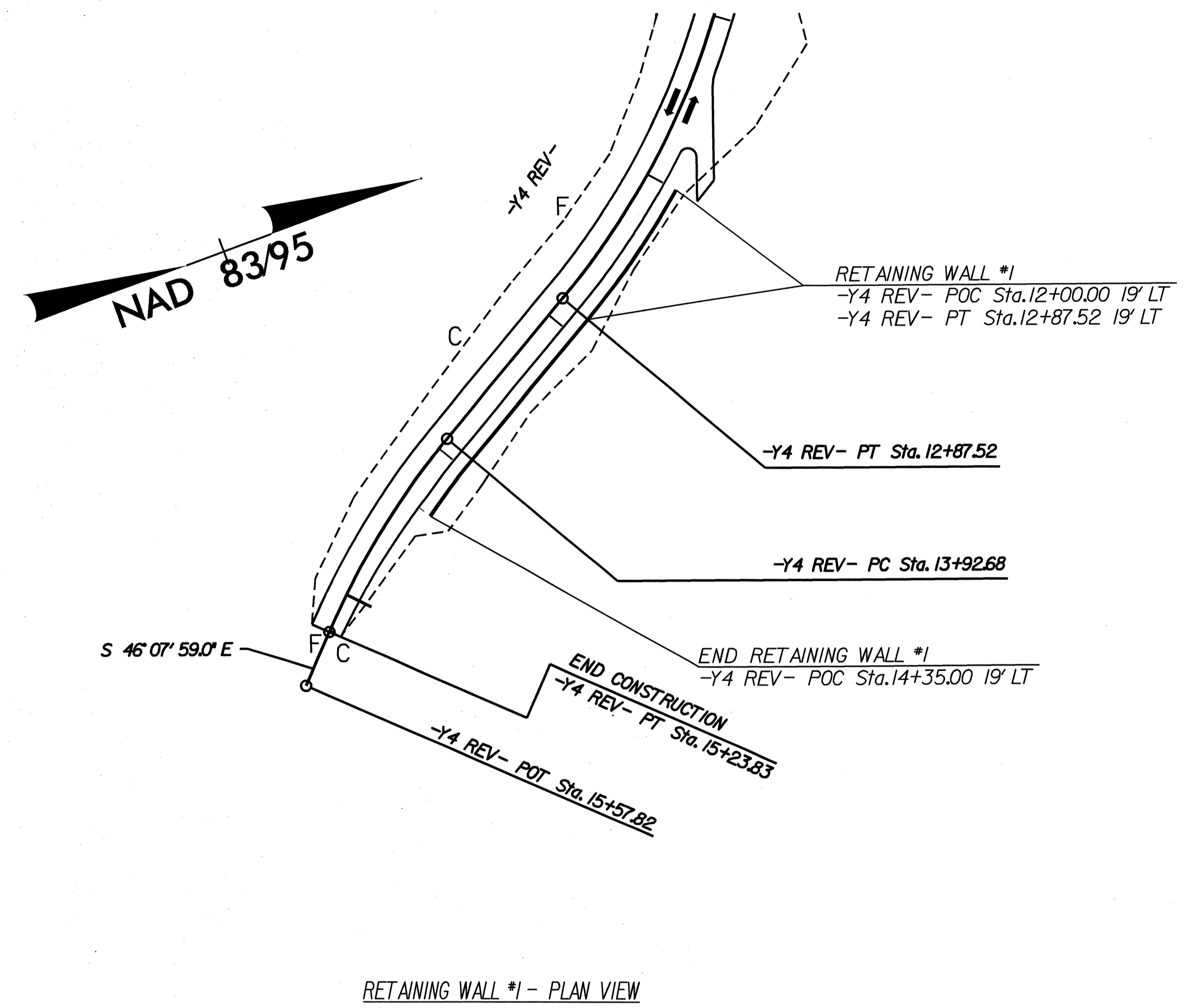
SHEET 2 OF 2



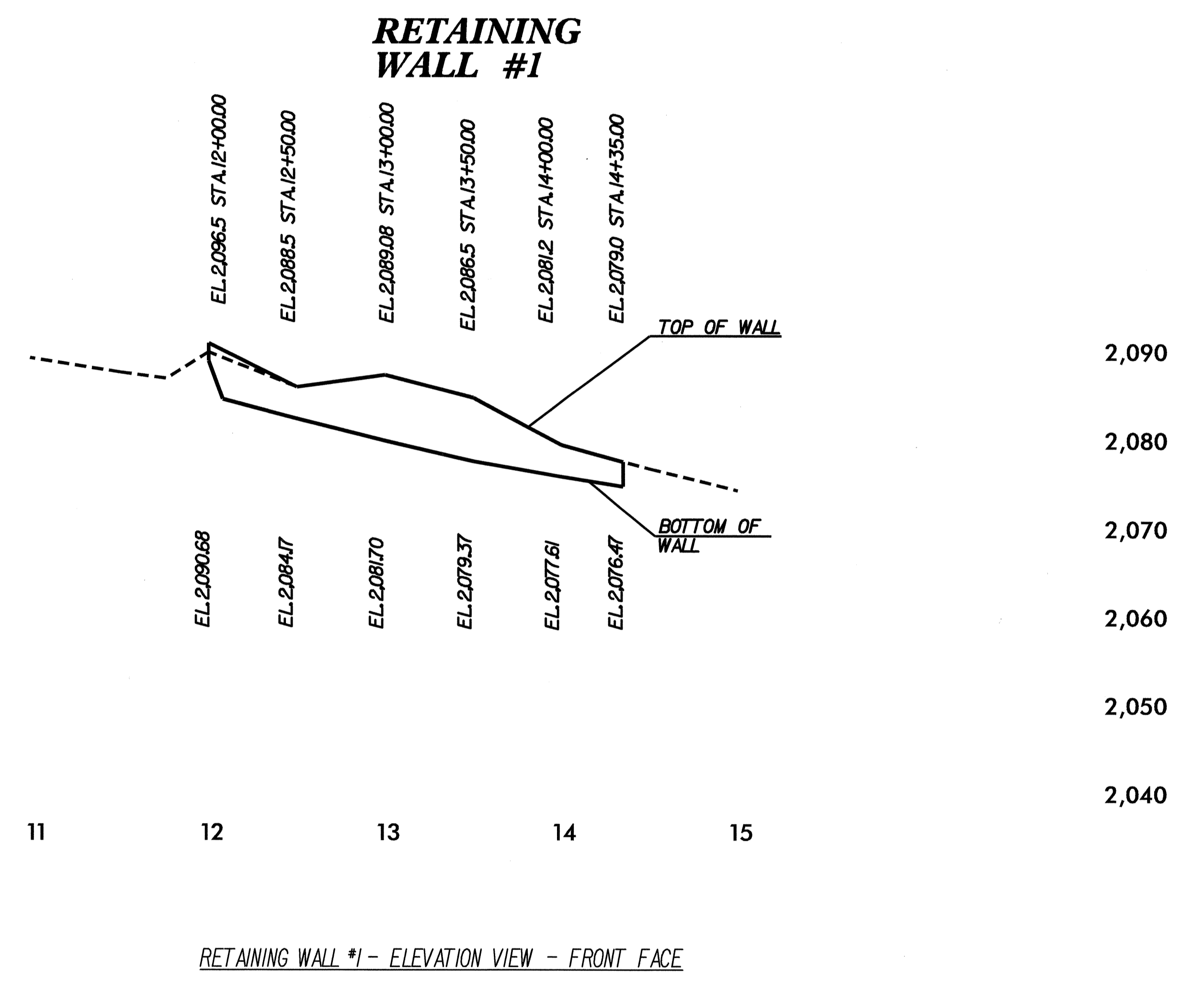
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH  
 SLAB DETAILS  
 (NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-56
1			3			TOTAL SHEETS
2			4			56

ASSEMBLED BY :	QT NGUYEN	DATE :	10-08
CHECKED BY :	A.R. CHESSON	DATE :	12-08
DRAWN BY :	FCJ 11/88	REV. 10/17/00	RWW/LRS
CHECKED BY :	ARB 11/88	REV. 5/1/03	RWW/JTE
		REV. 5/1/06R	MAA/KMM



ESTIMATED WALL FACE AREA = 1,090 SQ.FT.



**PROJECT NO.:** R-0505 (34334.1.1)  
**HENDERSON COUNTY**  
**STATION:** 12+00 TO 14+35 -Y4REV-  
 SHEET 1 OF 2

**GEOTECHNICAL ENGINEERING UNIT**

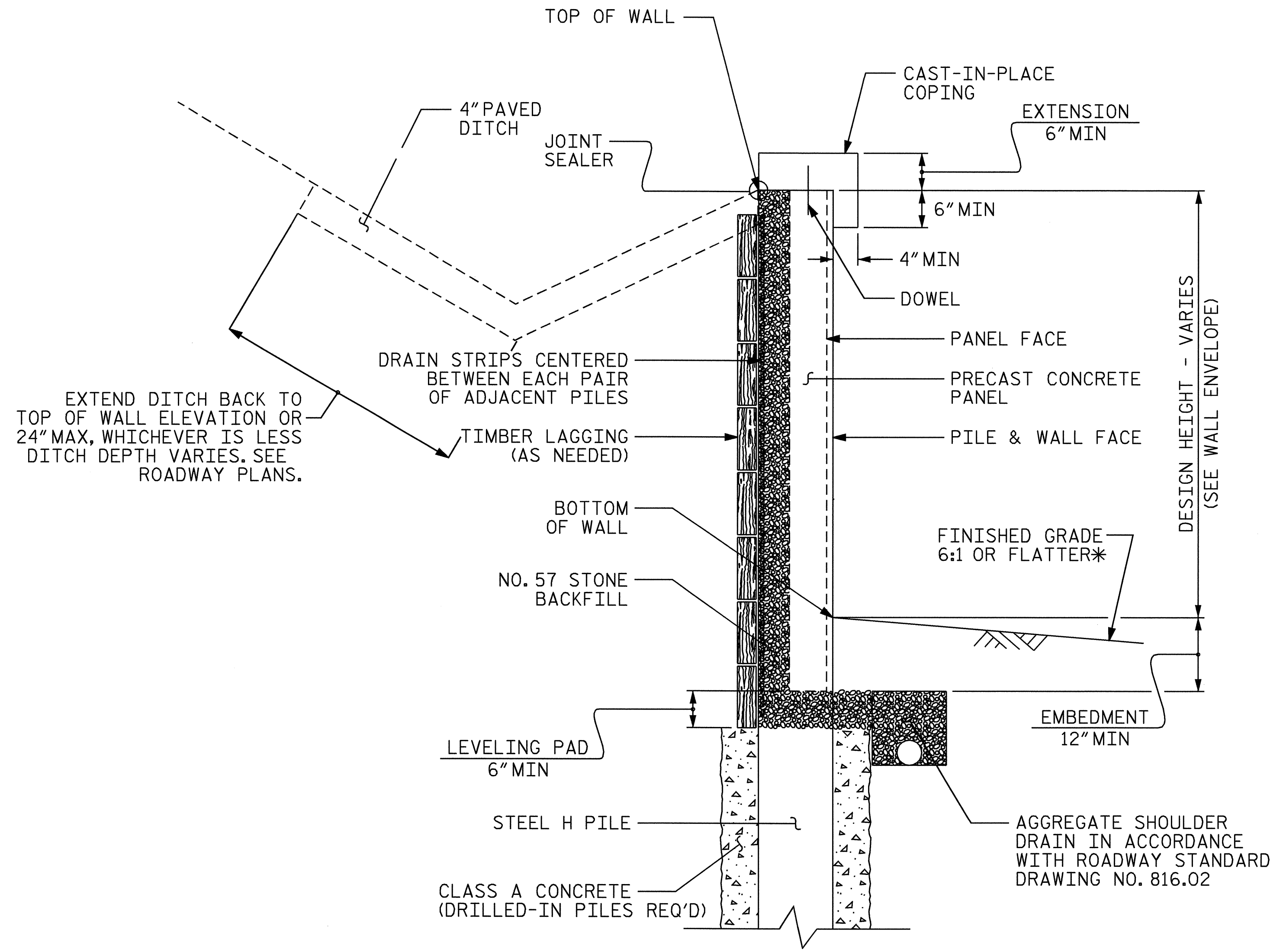
- EASTERN REGIONAL OFFICE
- WESTERN REGIONAL OFFICE
- CONTRACT OFFICE

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-1
1			3			TOTAL SHEETS
2			4			4

NOTES ON PLANS

- FOR SOLDIER PILE RETAINING WALLS, SEE SOLDIER PILE RETAINING WALL SPECIAL PROVISION.
- PILE EXCAVATION IS REQUIRED TO INSTALL H PILES FOR RETAINING WALL NO.1.
- USE A SOLDIER PILE RETAINING WALL WITH PRECAST CONCRETE PANELS FOR RETAINING WALL NO.1.
- BEFORE BEGINNING SOLDIER PILE WALL DESIGN FOR RETAINING WALL NO.1, SURVEY ALL EXISTING GROUND ELEVATIONS SHOWN ON THE PLANS AND SUBMIT A REVISED WALL ENVELOPE FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THIS ENVELOPE IS ACCEPTED.
- DESIGN RETAINING WALL NO.1 FOR A WALL HEIGHT EQUAL TO THE DESIGN HEIGHT (DIFFERENCE BETWEEN GRADE ELEVATION AND BOTTOM OF WALL ELEVATION) PLUS EMBEDMENT (DIFFERENCE BETWEEN BOTTOM OF WALL ELEVATION AND TOP OF LEVELING PAD ELEVATION).
  - MINIMUM SERVICE LIFE = 75 YEARS
  - IN-SITU ASSUMED MATERIAL PARAMETERS ABOVE WEATHERED ROCK/ HARD ROCK:
    - UNIT WEIGHT = 120 PCF
    - FRICTION ANGLE = 30 DEGREES
    - COHESION = 0 PSF



RETAINING WALL #1  
TYPICAL SECTION

\*SEE ROADWAY TYPICAL SECTIONS FOR FINISHED GRADE DETAILS.

PROJECT NO.: R-0505 (34334.1.1)  
 HENDERSON COUNTY  
 STATION: 12+00 TO 14+35 -Y4REV-  
 SHEET 2 OF 2

**GEOTECHNICAL ENGINEERING UNIT**

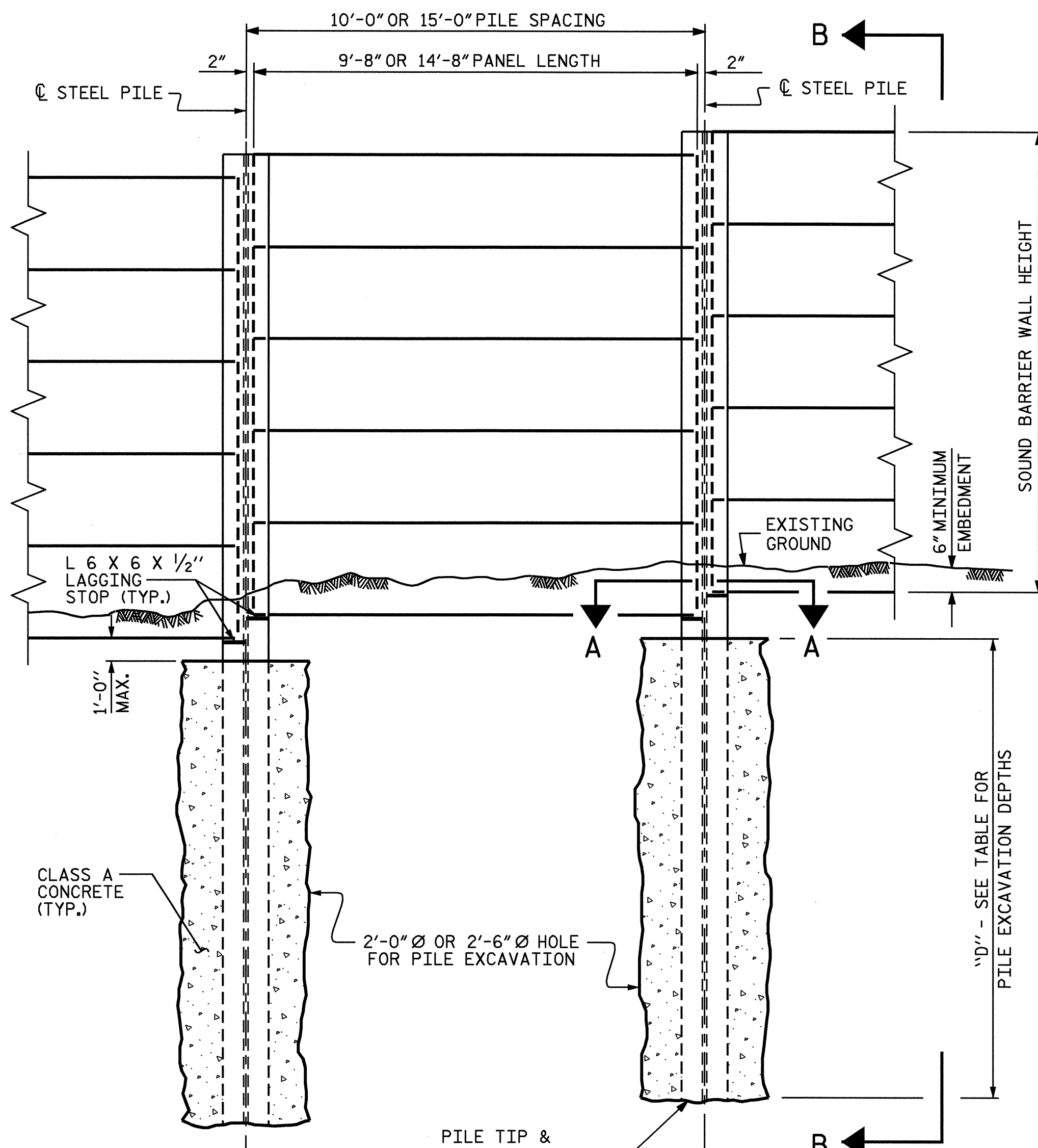
EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

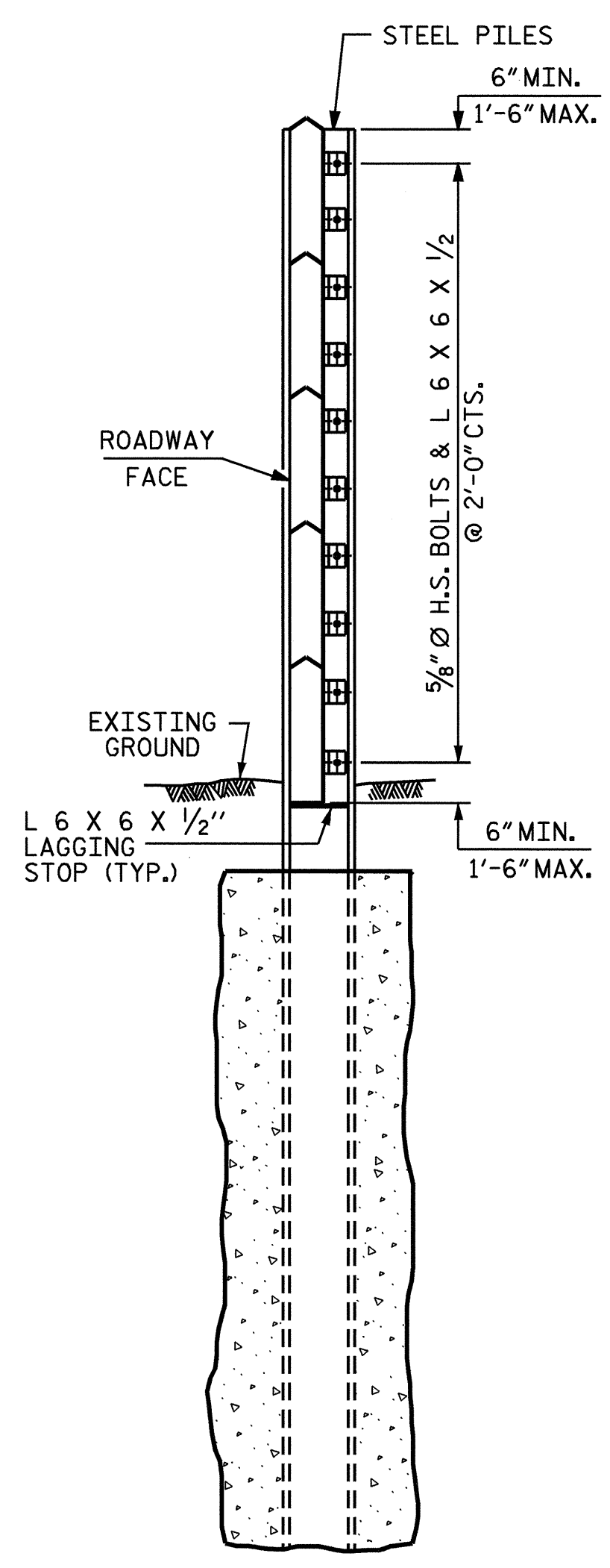
RETAINING WALL #1  
SOLDIER PILE RETAINING WALL  
TYPICAL SECTION AND NOTES

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

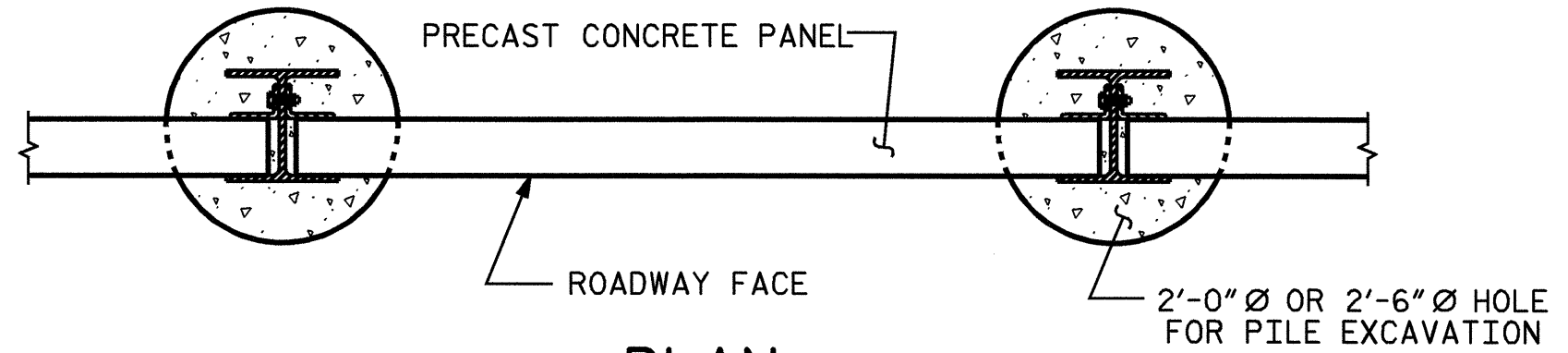
PREPARED BY: D. TEAGUE	DATE: 11/08
REVIEWED BY: E. WILLIAMS	DATE: 11/08



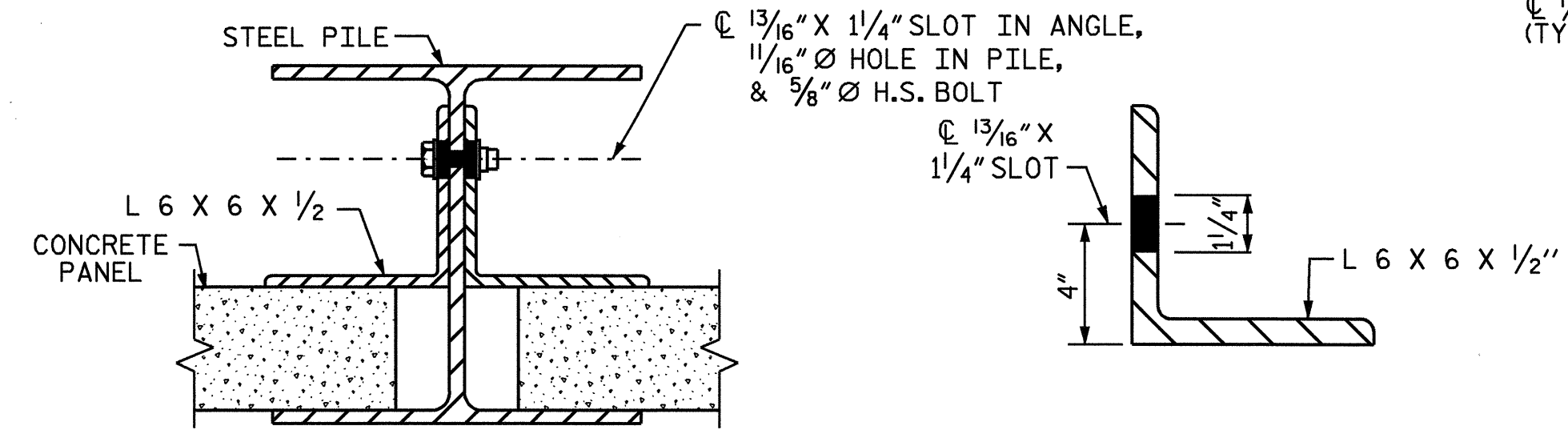
ELEVATION



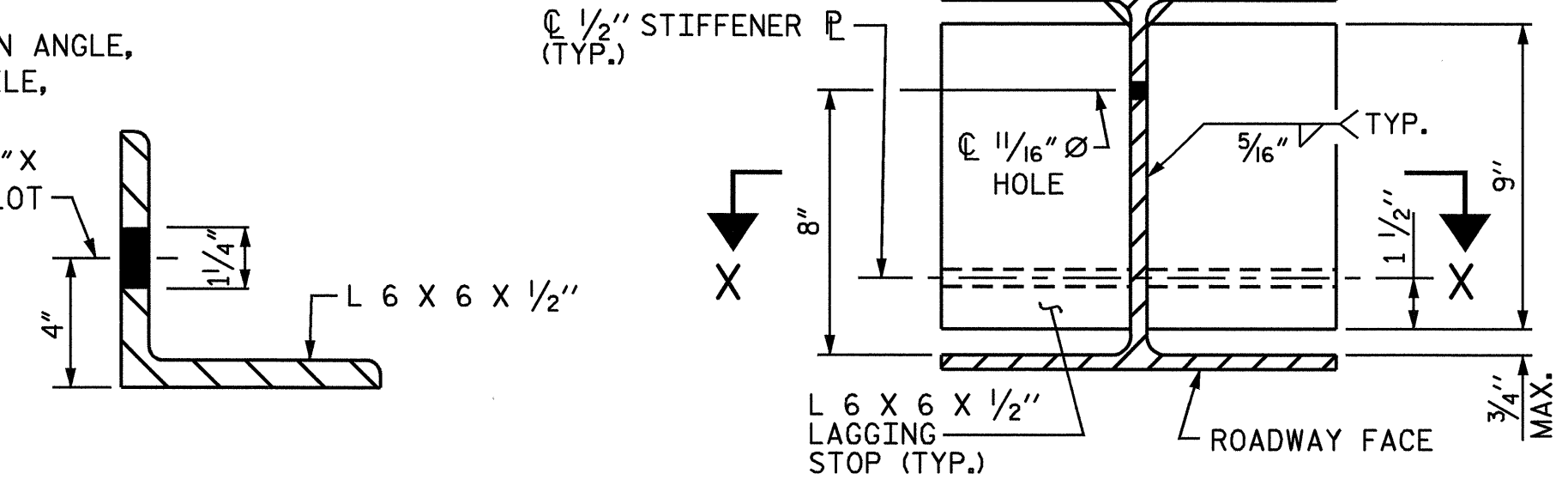
SECTION B-B



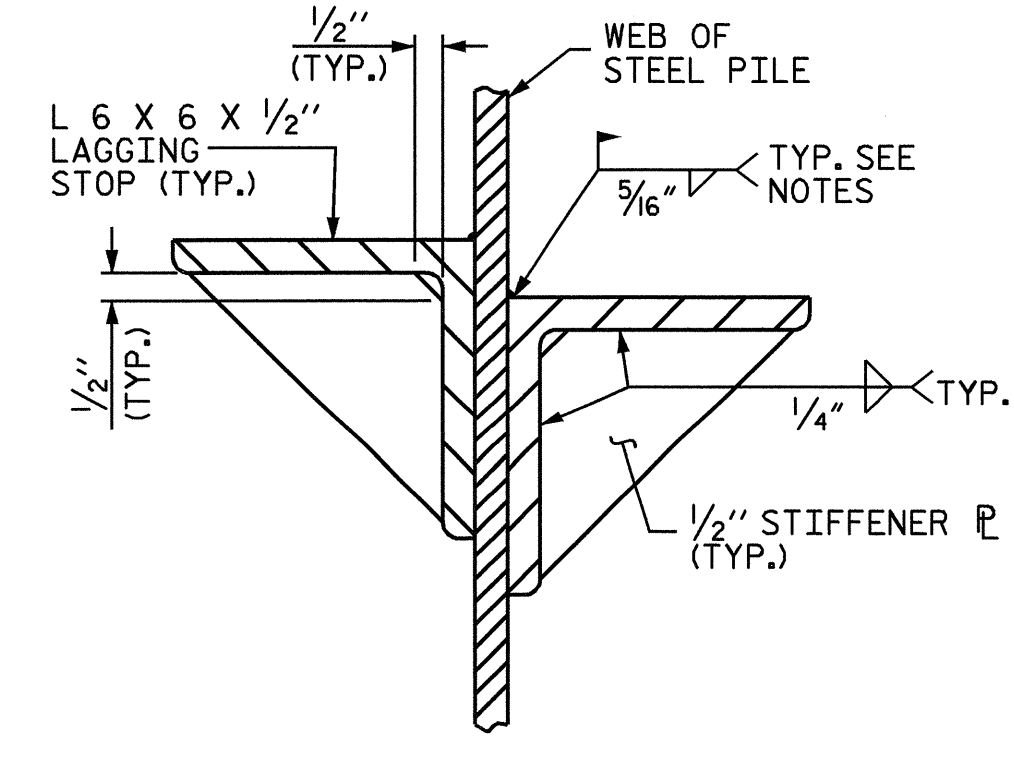
PLAN



CONNECTION DETAIL



SECTION A-A



SECTION X-X

PILE EXCAVATION DEPTHS (FOR 2'-0" OR 2'-6" Ø HOLES)		
LOCATION	HOLE DEPTH FOR PILES SPACED @ 10'-0"	HOLE DEPTH FOR PILES SPACED @ 15'-0"
FROM: STA. 841+00 -L-, 110' LEFT TO: STA. 842+00 -L-, 110' LEFT	7.0'	8.0'
FROM: STA. 842+00 -L-, 110' LEFT TO: STA. 845+15 -L-, 110' LEFT	8.0'	10.0'
FROM: STA. 845+15 -L-, 110' LEFT TO: STA. 846+00 -L-, 115' LEFT	8.5'	12.5'
FROM: STA. 846+00 -L-, 115' LEFT TO: STA. 847+75 -L-, 115' LEFT	14.0'	16.5'
FROM: STA. 847+75 -L-, 115' LEFT TO: STA. 851+00 -L-, 115' LEFT	15.0'	17.5'
FROM: STA. 851+00 -L-, 115' LEFT TO: STA. 852+00 -L-, 110' LEFT	15.5'	19.0'
FROM: STA. 852+00 -L-, 110' LEFT TO: STA. 853+00 -L-, 110' LEFT	20.0'	23.5'
FROM: STA. 853+00 -L-, 110' LEFT TO: STA. 853+50 -L-, 110' LEFT	15.5'	19.0'
FROM: STA. 853+50 -L-, 110' LEFT TO: STA. 854+00 -L-, 110' LEFT	16.0'	19.0'

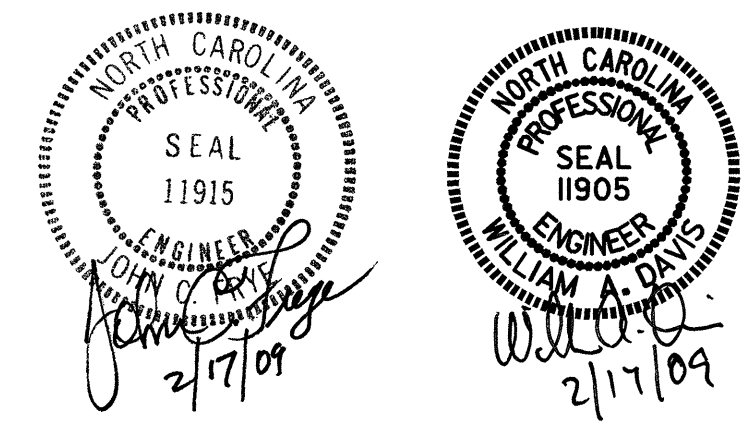
NOTES

- FOR SOUND BARRIER WALL, SEE SPECIAL PROVISIONS.
- CONSTRUCT SOUND BARRIER WALL TO LINES AND GRADES SHOWN ON THE ROADWAY PLANS.
- PROVIDE PANELS WITH A FLAT BOTTOM.
- USE STEEL PILES, ANGLES, AND LAGGING STOPS MEETING THE REQUIREMENTS OF AASHTO M270, GRADE 50. GALVANIZE ALL STEEL COMPONENTS INCLUDING PILES, ANGLES, LAGGING STOPS, BOLTS, NUTS, AND WASHERS IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. REPAIR ANY DAMAGED GALVANIZATION IN ACCORDANCE WITH ARTICLE 1076-6 OF THE STANDARD SPECIFICATIONS.
- VERIFY THE LOCATION OF UNDERGROUND UTILITIES BEFORE DRILLING HOLES TO ENSURE SUFFICIENT CLEARANCE IS AVAILABLE.
- AT THE CONTRACTOR'S OPTION, USE AN APPROVED NON-SHRINK NON-METALLIC GROUT BETWEEN THE FLANGES OF THE STEEL PILES TO SUPPORT THE BOTTOM PANEL IN LIEU OF LAGGING STOPS.
- ADJUST PILE EXCAVATION ELEVATIONS TO MAINTAIN 6" MINIMUM EMBEDMENT OF THE BOTTOM PANEL.
- USE CLASS AA AND CLASS A CONCRETE FOR PANELS AND PILES EXCAVATION, RESPECTIVELY, IN ACCORDANCE WITH ARTICLE 1000-4 OF THE STANDARD SPECIFICATIONS.
- PROVIDE PLATES AND ANGLES TO SECURE PANELS 6" LONG AS MEASURED ALONG THE STEEL PILE.
- AT THE CONTRACTOR'S OPTION, USE EITHER 'W' OR 'HP' PILES THAT SATISFY THE MINIMUM PILE SIZE REQUIRED IN THE "EXPOSURE CATEGORY" TABLE. PILES SMALLER THAN W12 OR HP12 ARE NOT PERMITTED. AT TURNS WITH A 3 FOOT DIAMETER HOLE FOR PILE EXCAVATION, USE ONLY W12 OR HP12 PILES, AS SHOWN.
- AT THE CONTRACTOR'S OPTION, USE EITHER 10 FOOT OR 15 FOOT PILE SPACINGS, AND EITHER 2 FOOT OR 2 1/2 FOOT DIAMETER HOLES FOR PILE EXCAVATION, EXCEPT FOR WALL TURNS.
- FOR WALL TURNS, PROVIDE HOLES FOR PILE EXCAVATION AS SHOWN ON THE PLANS. A 2 FOOT DIAMETER HOLE FOR PILE EXCAVATION IS NOT AN OPTION.
- DO NOT SPLICE STEEL PILES.
- AT THE CONTRACTOR'S OPTION, USE CONTINUOUS FLIGHT AUGER PILES IN LIEU OF PILE EXCAVATION FOR SOUND BARRIER WALL FOUNDATIONS. SEE CONTINUOUS FLIGHT AUGER PILES FOR SOUND BARRIER WALLS SPECIAL PROVISION.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE PRESENCE OF A 16 INCH DIP RUNNING PERPENDICULAR TO THE WALL AT APPROXIMATE STATION 847+75 -L- AT AN APPROXIMATE ELEVATION OF 2179 FEET. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR LOCATING AND PROTECTING THE WATERLINE DURING CONSTRUCTION OF THE SOUND BARRIER WALL.

EXPOSURE CATEGORY B

DESIGN WIND PRESSURE = 20 PSF (0' < H ≤ 14'); 25 PSF (14' < H ≤ 29')			
PILE SPACING	MAXIMUM WALL HEIGHT (H)	MINIMUM W SIZE STEEL PILES	MINIMUM HP SIZE STEEL PILES
10'-0"	H ≤ 29'	W 12 X 40 W 14 X 48	HP 12 X 53 HP 14 X 73
	25' < H ≤ 29'	W 12 X 50 W 14 X 48	HP 12 X 53 HP 14 X 73

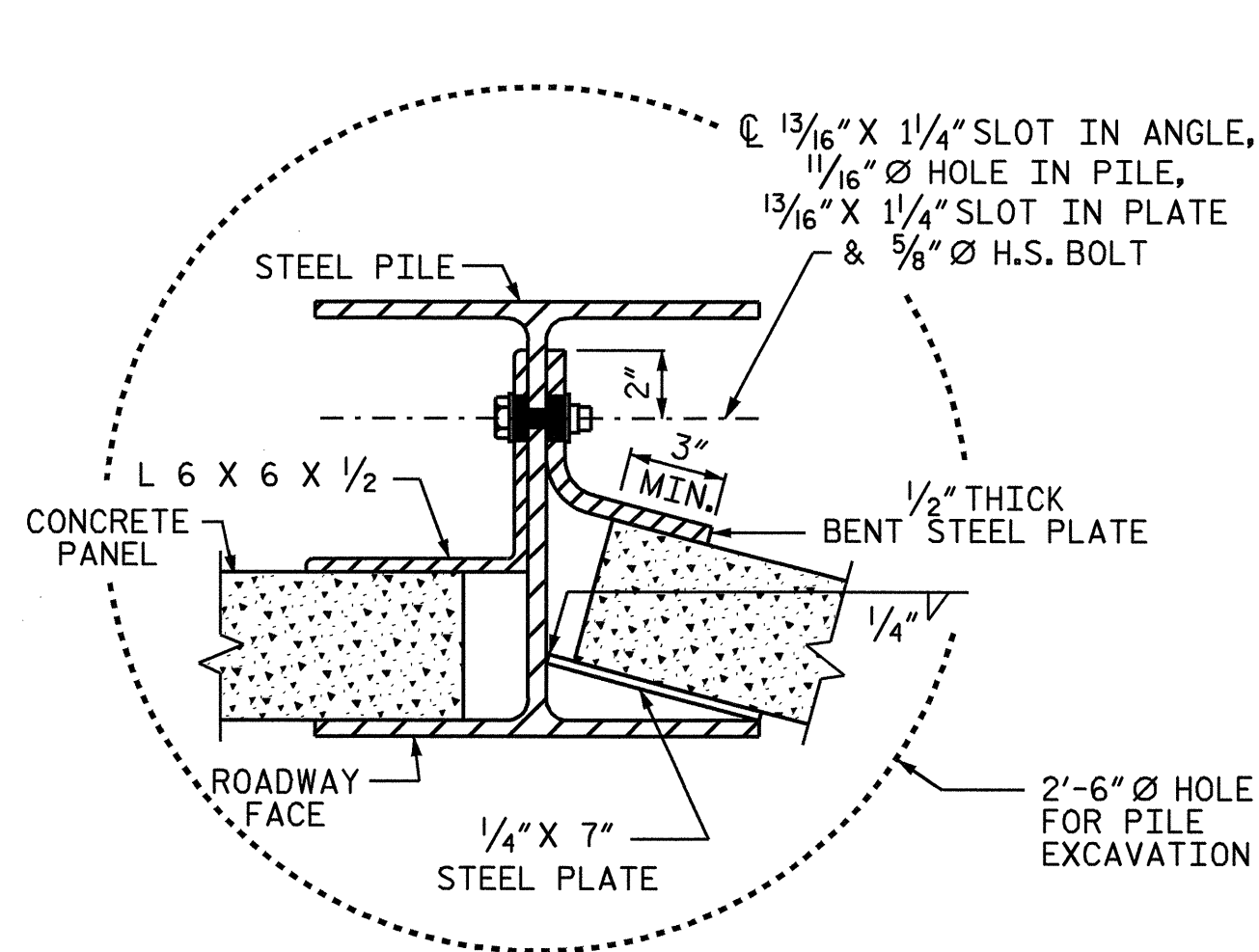
PROJECT NO. R-0505  
HENDERSON COUNTY  
STATION: 841+00.00 -L-  
SHEET 1 OF 2



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD SOUND BARRIER WALL					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					W-3
					TOTAL SHEETS 4

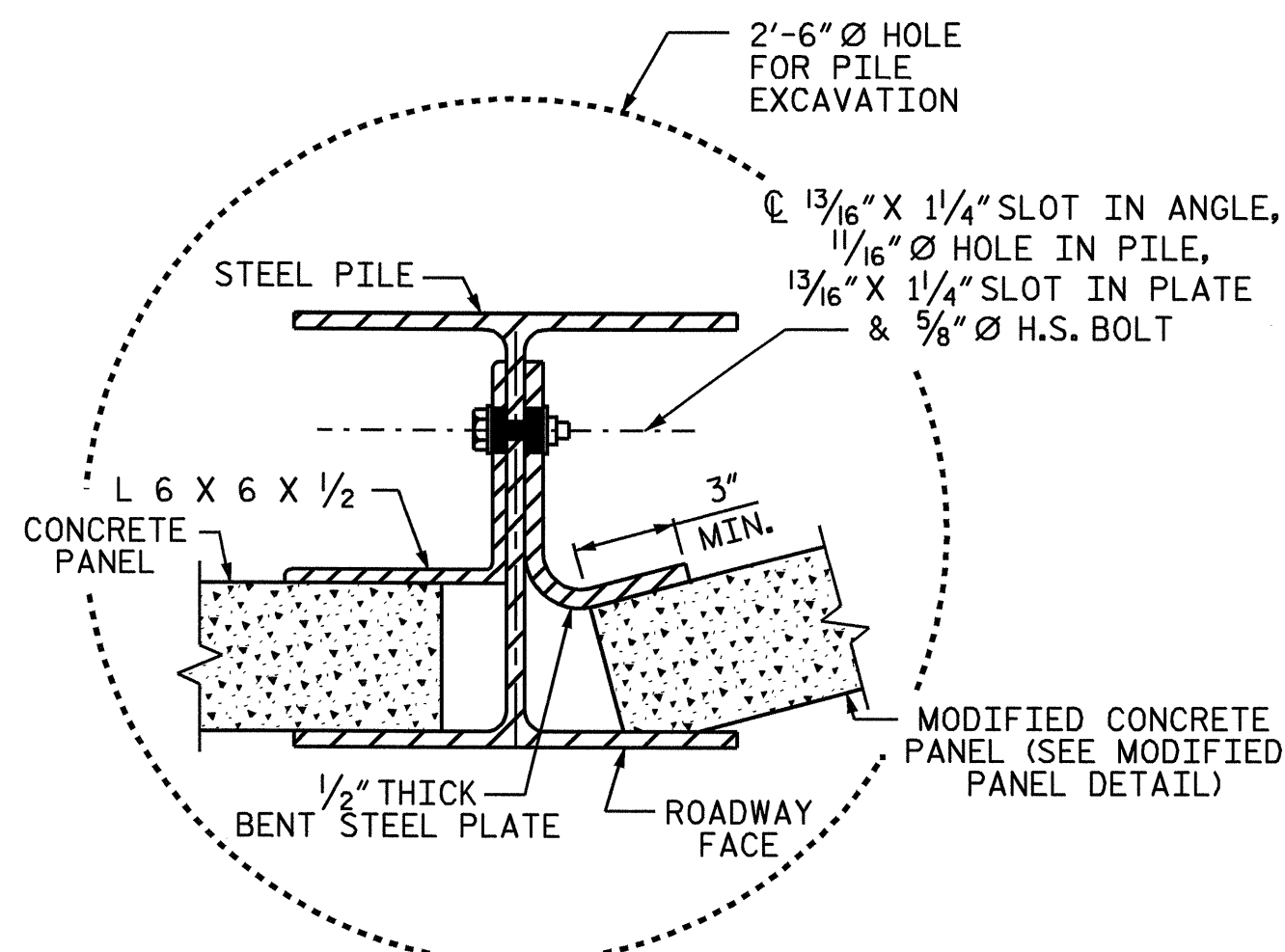
ASSEMBLED BY : P. K. NEWTON	DATE : 12/19/08
CHECKED BY : W. A. DAVIS	DATE : 12/19/08
DRAWN BY : JAD 5/01	REV. 2/4/03 RWW/CVC
CHECKED BY : RDR 5/01	REV. 5/7/03 RWW/JTE
	REV. 5/1/06R KMM/GM

BILL OF MATERIAL	
SOUND BARRIER WALL	20416 S.F.
QUANTITIES PROVIDED ARE APPROXIMATE AND ARE FOR BID PURPOSES ONLY.	



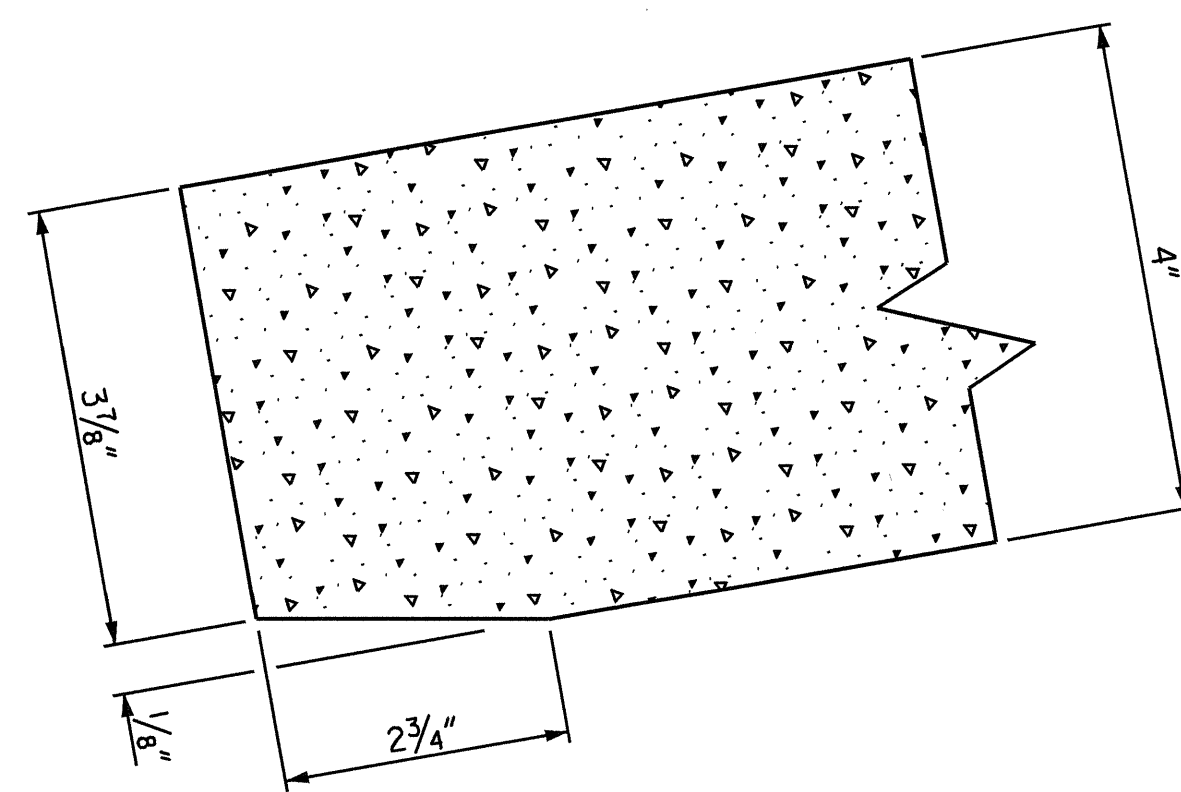
**TYPICAL WALL TURN DETAIL**

(USE ONLY FOR TURNS 15° OR LESS, CONCAVE TOWARD ROADWAY)



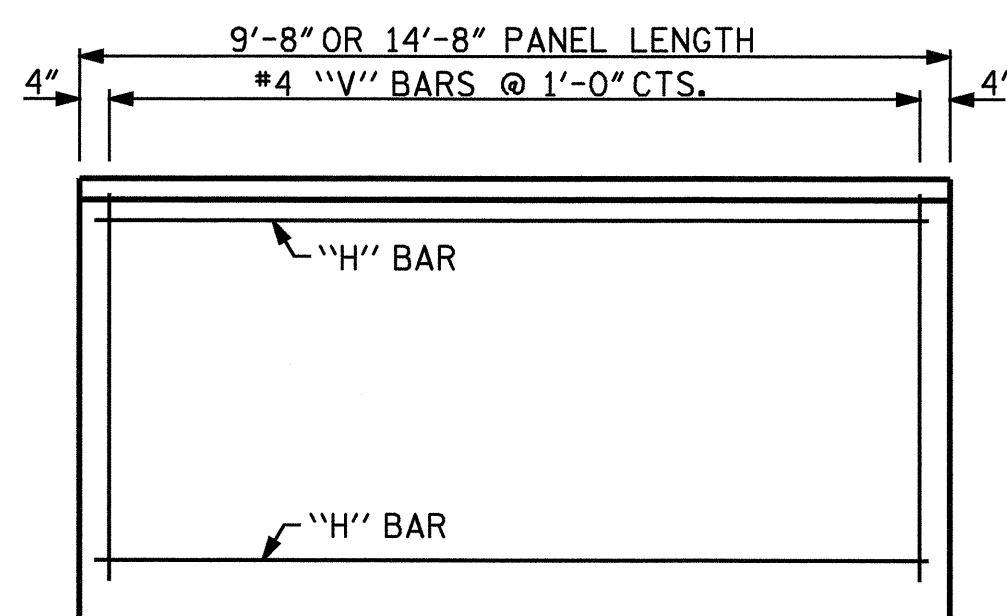
**TYPICAL WALL TURN DETAIL**

(USE ONLY FOR TURNS 15° OR LESS, CONVEX TOWARD ROADWAY)

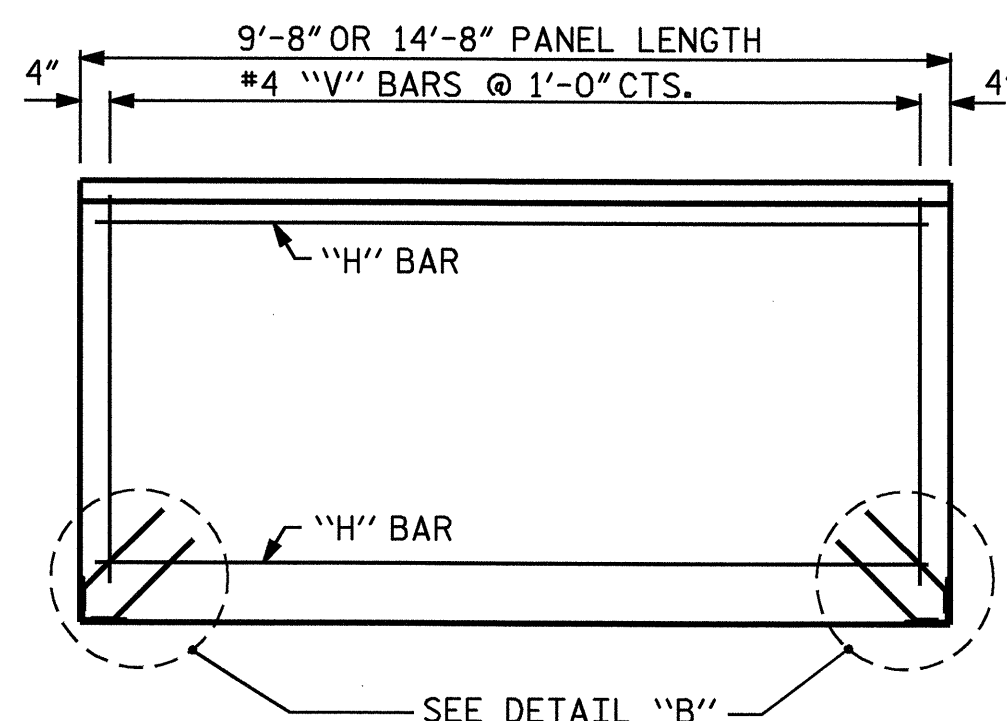


**MODIFIED PANEL DETAIL**

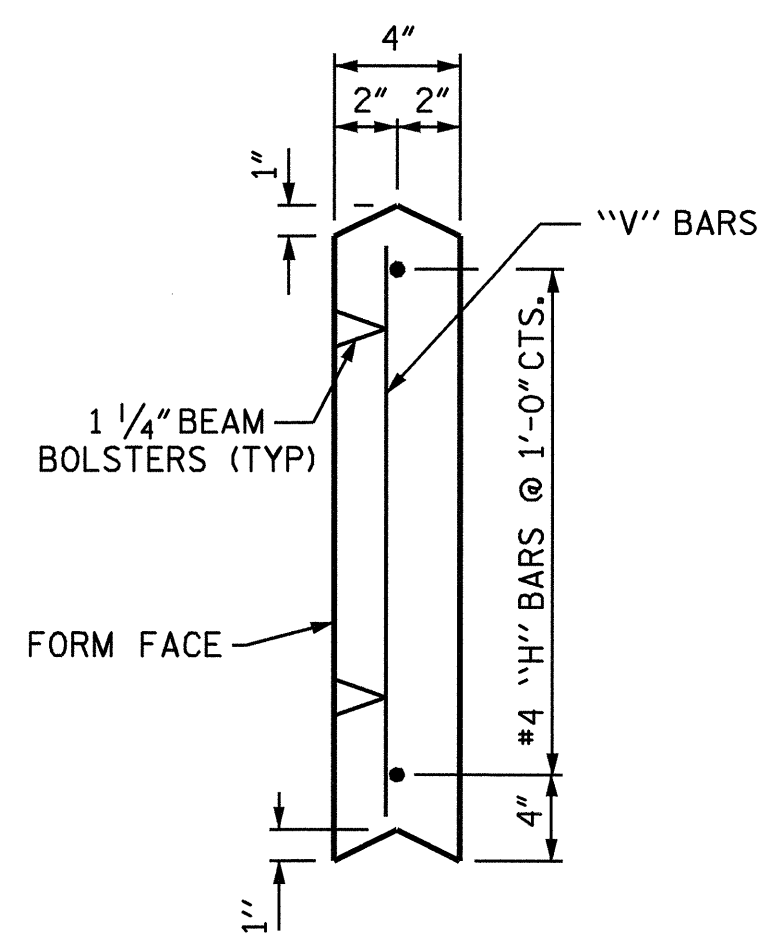
(USE ONLY FOR TURNS 15° OR LESS, CONVEX TOWARD ROADWAY)



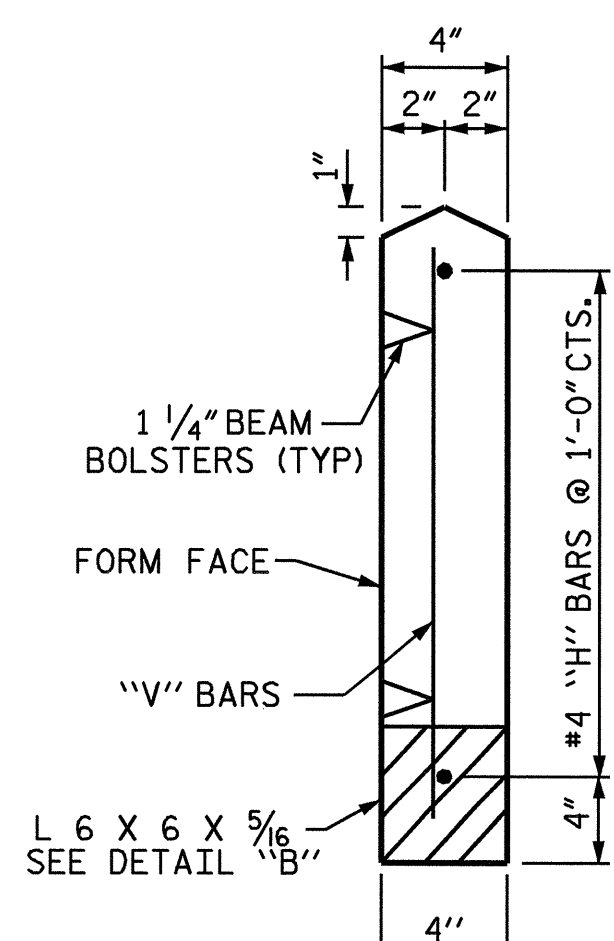
**FRONT ELEVATION OF UPPER PRECAST PANELS**



**FRONT ELEVATION OF BOTTOM PRECAST PANEL**

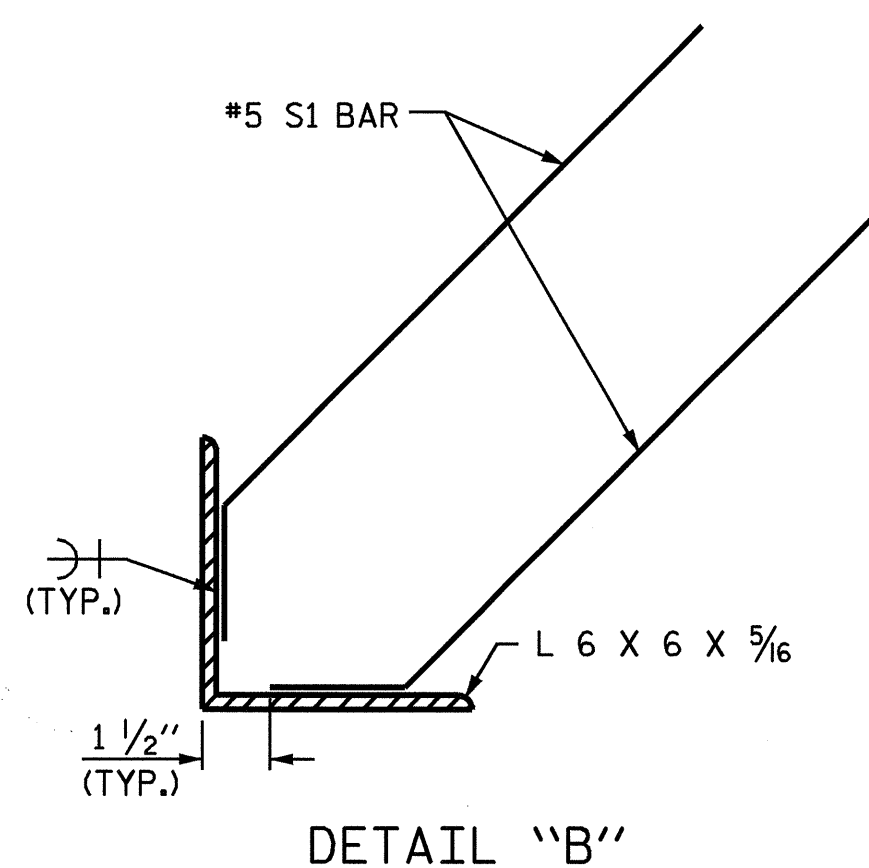


**UPPER PANEL**



**BOTTOM PANEL**

**SECTION THROUGH PRECAST PANELS**



**DETAIL "B"**

ADDITIONAL BARS FOR ONE BOTTOM PANEL					
NO.	BAR SIZE	TYPE	LENGTH	WEIGHT (lb)	
4	S1	#5	1	1'-6"	6

**BAR TYPE**

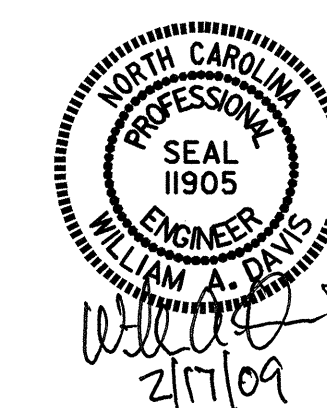
Diagram of bar type showing dimensions: 10 5/8" vertical, 10 5/8" horizontal, 1'-3" diagonal, and 3" offset.

QUANTITIES FOR ONE PRECAST PANEL (FOR 10'-0" PILE SPACING)													
PANEL HEIGHT	CLASS AA CONCRETE	BAR TYPES											
		HORIZONTAL					VERTICAL						
		C.Y.	NO.	BAR SIZE	TYPE	LENGTH	WEIGHT (lb)	NO.	BAR SIZE	TYPE	LENGTH	WEIGHT (lb)	
2'-0"	0.24	3	H1	#4	STR	9'-4"	19	10	V1	#4	STR	1'-8"	11
3'-0"	0.36	4	H2	#4	STR	9'-4"	25	10	V2	#4	STR	2'-8"	18
4'-0"	0.48	5	H3	#4	STR	9'-4"	31	10	V3	#4	STR	3'-8"	24

QUANTITIES FOR ONE PRECAST PANEL (FOR 15'-0" PILE SPACING)													
PANEL HEIGHT	CLASS AA CONCRETE	BAR TYPES											
		HORIZONTAL					VERTICAL						
		C.Y.	NO.	BAR SIZE	TYPE	LENGTH	WEIGHT (lb)	NO.	BAR SIZE	TYPE	LENGTH	WEIGHT (lb)	
3'-0"	0.54	4	H1	#4	STR	14'-4"	38	15	V1	#4	STR	2'-8"	27
4'-0"	0.72	5	H2	#4	STR	14'-4"	48	15	V2	#4	STR	3'-8"	37
5'-0"	0.91	6	H3	#4	STR	14'-4"	57	15	V3	#4	STR	4'-8"	47
6'-0"	1.09	7	H4	#4	STR	14'-4"	67	15	V4	#4	STR	5'-8"	57

PROJECT NO. R-0505  
HENDERSON COUNTY  
 STATION: 841+00.00 -L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 SOUND BARRIER WALL  
 DETAILS

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

ASSEMBLED BY : P. K. NEWTON	DATE : 12/19/08
CHECKED BY : W. A. DAVIS	DATE : 12/19/08
DRAWN BY : JAD 5/01	REV. 7/10/01 RWW/LES
CHECKED BY : RDR 5/01	REV. 5/7/03 RWW/JTE
	REV. 5/1/06R KMM/GM

## 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 2006 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

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

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.  
DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

### REINFORCING STEEL:

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

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

### STRUCTURAL STEEL:

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

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

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

### HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.  
METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

### SPECIAL NOTES:

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

# ENGLISH

JANUARY, 1990

STD. NO. SN