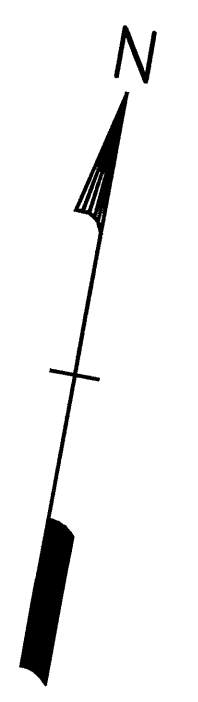
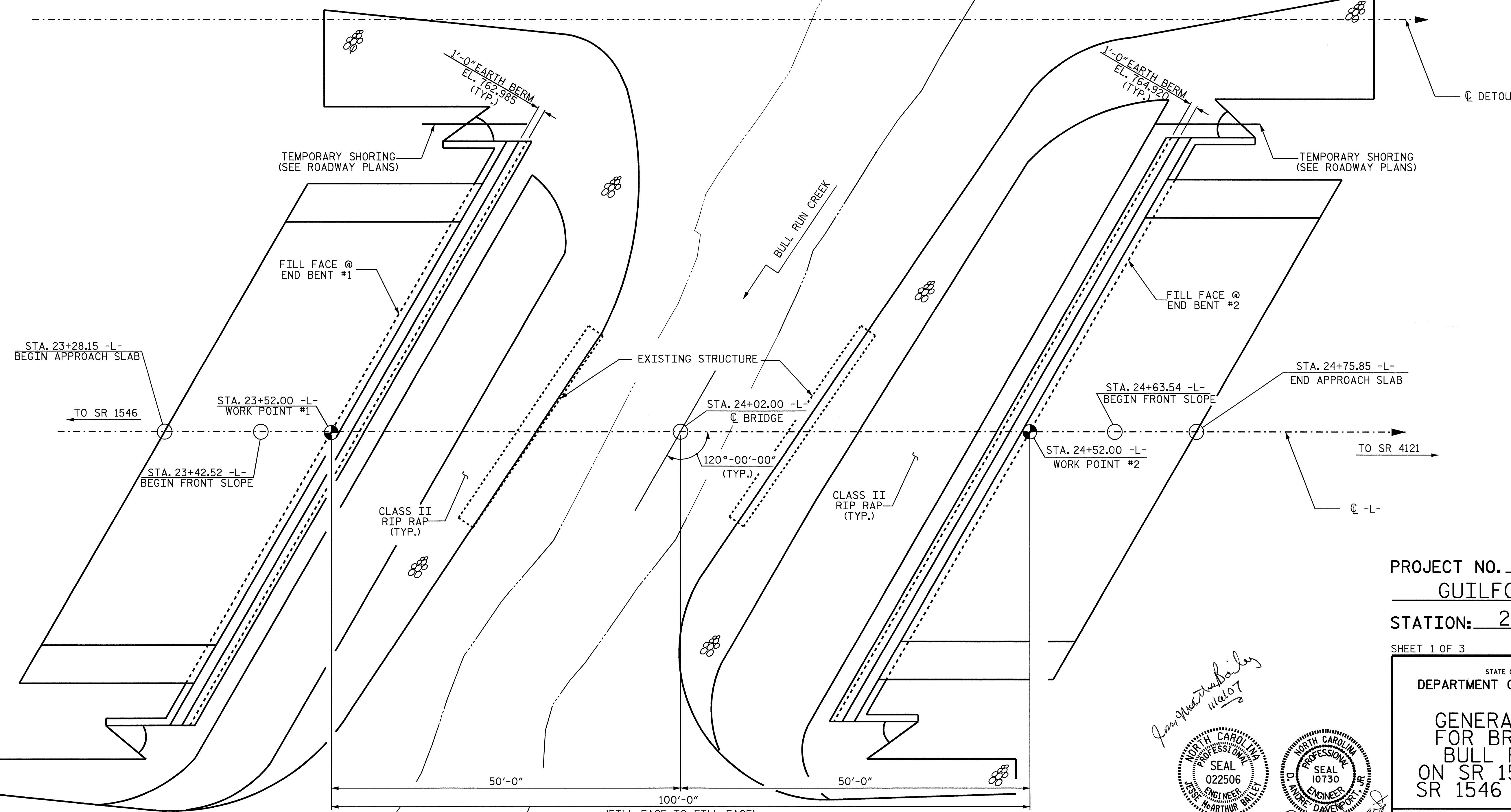
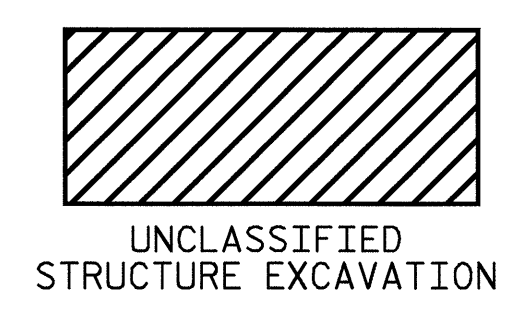


GRADE DATA  
 -6.5268% Δ +5.2812%  
 PI STA. = 22+70.00 -L-  
 EL = 764.100  
 VC = 490'



DRAWN BY : A. A. COLE DATE : 5/10/05  
 CHECKED BY : H.T. BARBOUR DATE : 8/06

PLAN  
 (PILES NOT SHOWN FOR CLARITY)

06-NOV-2007 11:54  
 f:\structures\acole\MICROSTATION\B4128.ed.GD.dgn  
 davenport

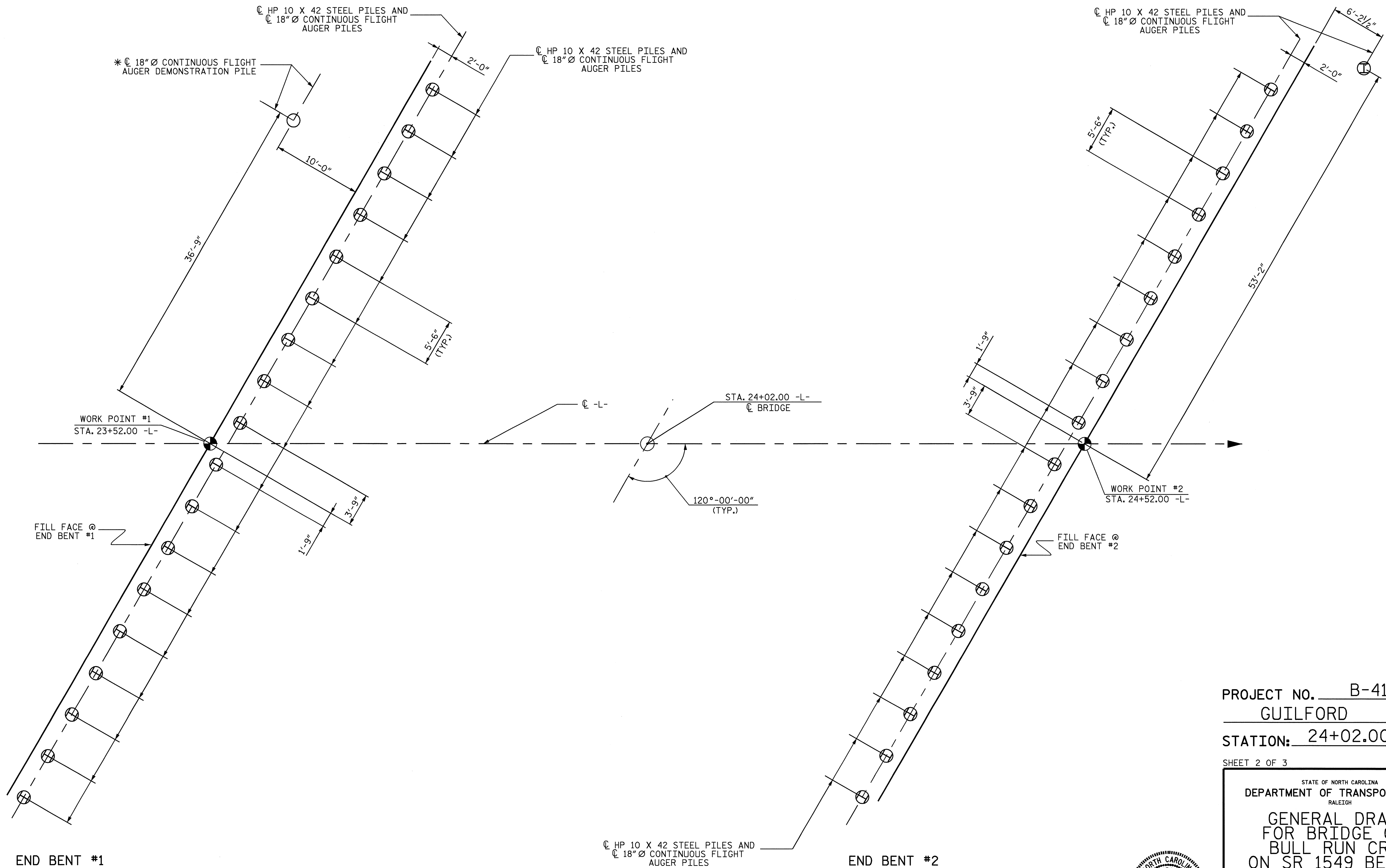
*Jan M. Bailey*  
 11/10/07  
 NORTH CAROLINA PROFESSIONAL SEAL 022506  
 CIVIL ENGINEER  
 DAVID ARTHUR BAILEY

NORTH CAROLINA PROFESSIONAL SEAL 10730  
 CIVIL ENGINEER  
 DAVID DAVENPORT  
 11-6-07

PROJECT NO. B-4128  
 GUILFORD COUNTY  
 STATION: 24+02.00 -L-  
 SHEET 1 OF 3 REPLACES BRIDGE #73

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR BRIDGE OVER  
 BULL RUN CREEK  
 ON SR 1549 BETWEEN  
 SR 1546 AND SR 4121

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



**FOUNDATION LAYOUT**

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE  
 \* THE 18" Ø CONTINUOUS FLIGHT AUGER DEMONSTRATION PILE LOCATION  
 MAY BE ALTERED IN THE FIELD AS DESIGNATED BY THE ENGINEER.

DRAWN BY : A. A. COLE DATE : 4-06  
 CHECKED BY : H.T. BARBOUR DATE : 8-06

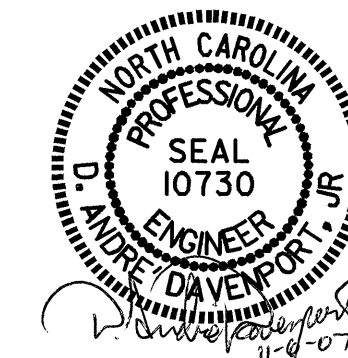
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 adavenport

PROJECT NO. B-4128  
GUILFORD COUNTY  
 STATION: 24+02.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

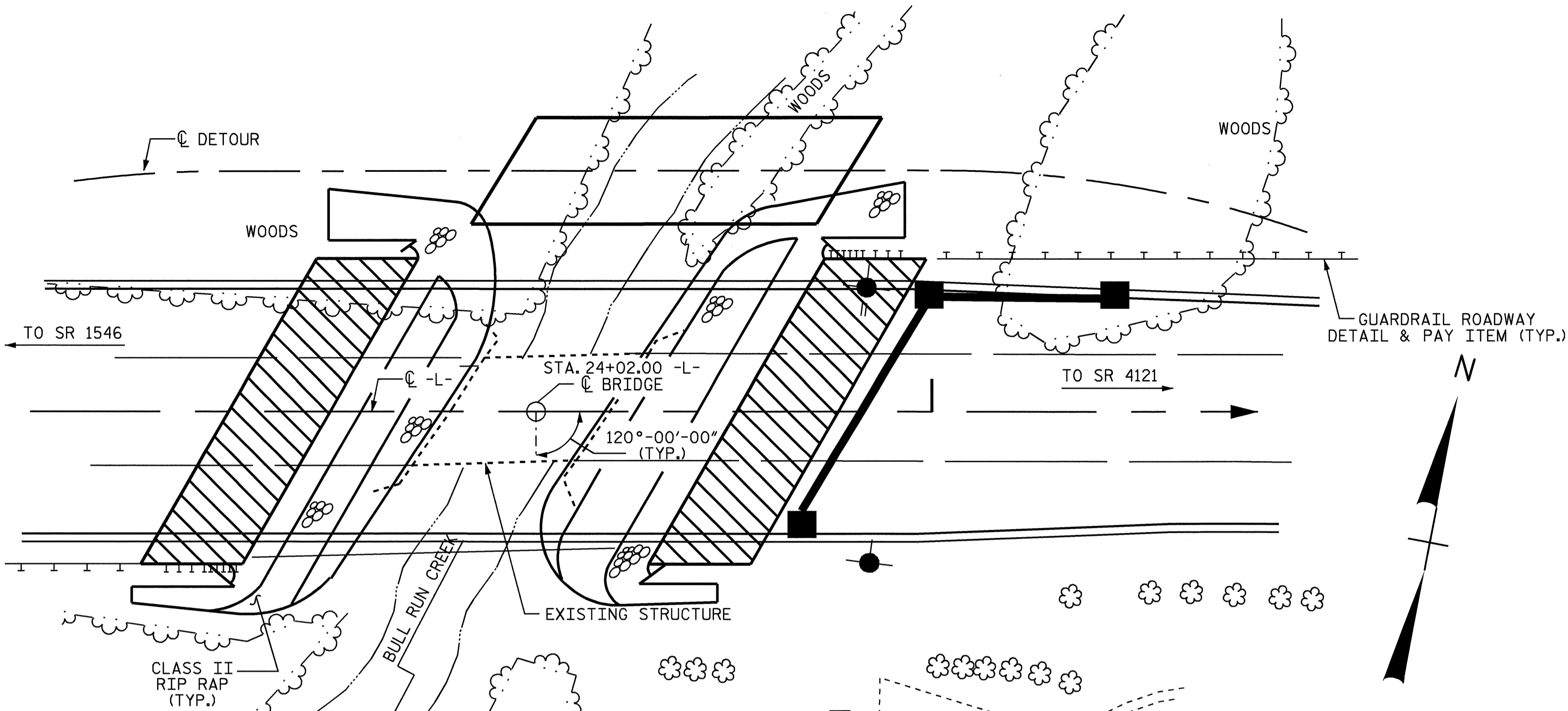
GENERAL DRAWING  
 FOR BRIDGE OVER  
 BULL RUN CREEK  
 ON SR 1549 BETWEEN  
 SR 1546 AND SR 4121



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

BENCH MARK #2: STA. 26+19.00-L-, 215.00' LEFT, EL. 769.140

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.  
 FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

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

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 BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 24+02.00-L-."

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.

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

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

THE EXISTING STRUCTURE CONSISTING OF ONE SPAN, 40'-3" IN LENGTH ON 10 LINES OF I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 22'-7" AND TIMBER DECK WITH A 1/2" ASPHALT WEARING SURFACE ON TIMBER CAPS AND CONCRETE ENCASED TIMBER PILES, AND TIMBER BULKHEADS LOCATED AT THE PROPOSED STRUCTURE, SHALL BE REMOVED.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

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

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 24+02.00-L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE.

CONTINUOUS FLIGHT AUGER (CFA) PILES AT BOTH END BENTS ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 50 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.

THE ALLOWABLE BEARING CAPACITY OF CONTINUOUS FLIGHT AUGER (CFA) PILES AT BOTH END BENTS IS 60 TONS PER PILE.

CONTINUOUS FLIGHT AUGER (CFA) PILES AT BOTH END BENTS ARE DESIGNED FOR A REQUIRED BEARING CAPACITY OF 150 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF 2.5.

CONTINUOUS FLIGHT AUGER (CFA) PILES AT END BENT NO. 1 AND END BENT NO. 2 SHALL EXTEND TO AT LEAST THE TOP OF THE CRYSTALLINE ROCK LAYER. THE TOP OF THE CRYSTALLINE ROCK LAYER ELEVATION AT END BENT NO. 1 AND END BENT NO. 2 IS ESTIMATED TO BE 749.500 FT. AND 751.500 FT. RESPECTIVELY.

NO DRILLING SPOILS OR GROUT SHALL BE ALLOWED IN THE STREAM.

FOR CONTINUOUS FLIGHT AUGER (CFA) PILES, SEE CONTINUOUS FLIGHT AUGER (CFA) PILES SPECIAL PROVISION.

FOR MONITORING VIBRATIONS, SEE CONTROL OF VIBRATION SPECIAL PROVISION.

HP 10 X 42 STEEL PILES SHALL EXTEND TO THE BOTTOM OF THE CFA PILE EXCAVATION.

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.

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.

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

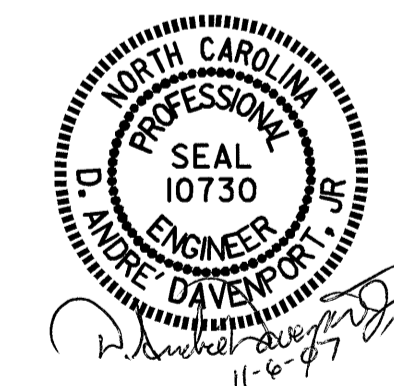
THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

A PILE DRIVING HAMMER IS NOT ALLOWED FOR INSTALLING AND ACHIEVING BEARING CAPACITY OF THE FOUNDATION TYPE CHOSEN TO SUPPORT THE TEMPORARY STRUCTURE AT STA. 24+02.00-L-.

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

STEEL SHEET PILING REQUIRED FOR SHORING SHALL BE HOT ROLLED.



**HYDRAULIC DATA**

DESIGN DISCHARGE	=	2100 C.F.S.
FREQUENCY OF DESIGN FLOOD	=	50 YR.
DESIGN HIGH WATER ELEVATION	=	767.190
DRAINAGE AREA	=	4.45 SQ. MI.
BASIC DISCHARGE (Q100)	=	2800 C.F.S.
BASIC HIGH WATER ELEVATION	=	768.660

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE	=	4500 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	=	200 YR.±
OVERTOPPING FLOOD ELEVATION	=	771.250

LOCATION SKETCH

TOTAL BILL OF MATERIAL

	CONSTRUCTION MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE	REMOVAL OF EXISTING STRUCTURE	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL	HP 10 X 42 STEEL PILES	THREE BAR METAL RAIL	RIP-RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	18" Ø CONTINUOUS FLIGHT AUGER PILES	18" Ø CONTINUOUS FLIGHT AUGER DEMONSTRATION PILES	VIBRATION MONITORING	
	LUMP SUM	LUMP SUM	CU. YDS.	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	APPROX.LBS.	NO.	LIN.FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	NO.	LIN.FT.	EACH	LUMP SUM
SUPERSTRUCTURE				7564	8750						178,425								
END BENT NO.1			785			57.7		8314		18	288	526	585			18	270		
END BENT NO.2			785			66.1		8772		19	304	536	595			19	285		
TOTAL	LUMP SUM	LUMP SUM	1570	7564	8750	123.8	LUMP SUM	17086	214100	37	592	1062	1180	LUMP SUM	LUMP SUM	37	555	1	LUMP SUM

DRAWN BY : H. T. BARBOUR DATE : 8-14-06  
 CHECKED BY : D. A. DAVENPORT DATE : 3-07

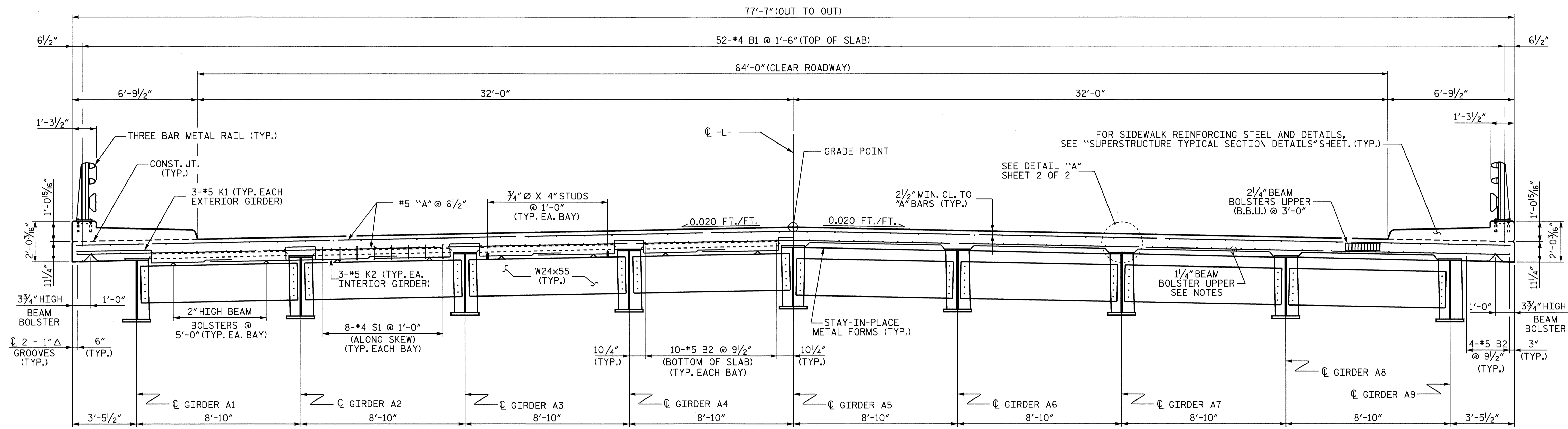
PROJECT NO. B-4128  
GUILFORD COUNTY  
 STATION: 24+02.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE OVER  
 BULL RUN CREEK  
 ON SR 1549 BETWEEN  
 SR 1546 AND SR 4121

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



AT END BENT DIAPHRAGM

AT INTERMEDIATE DIAPHRAGM

TYPICAL SECTION

NOTES

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

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

THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF THE SIDEWALK.

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

SIDEWALK SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

STRUCTURE STEEL ERECTION IN THE SPAN SHALL BE COMPLETE BEFORE FALSEWORK FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

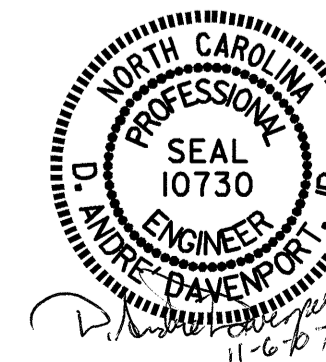
ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.

PROJECT NO. B-4128  
GUILFORD COUNTY  
 STATION: 24+02.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

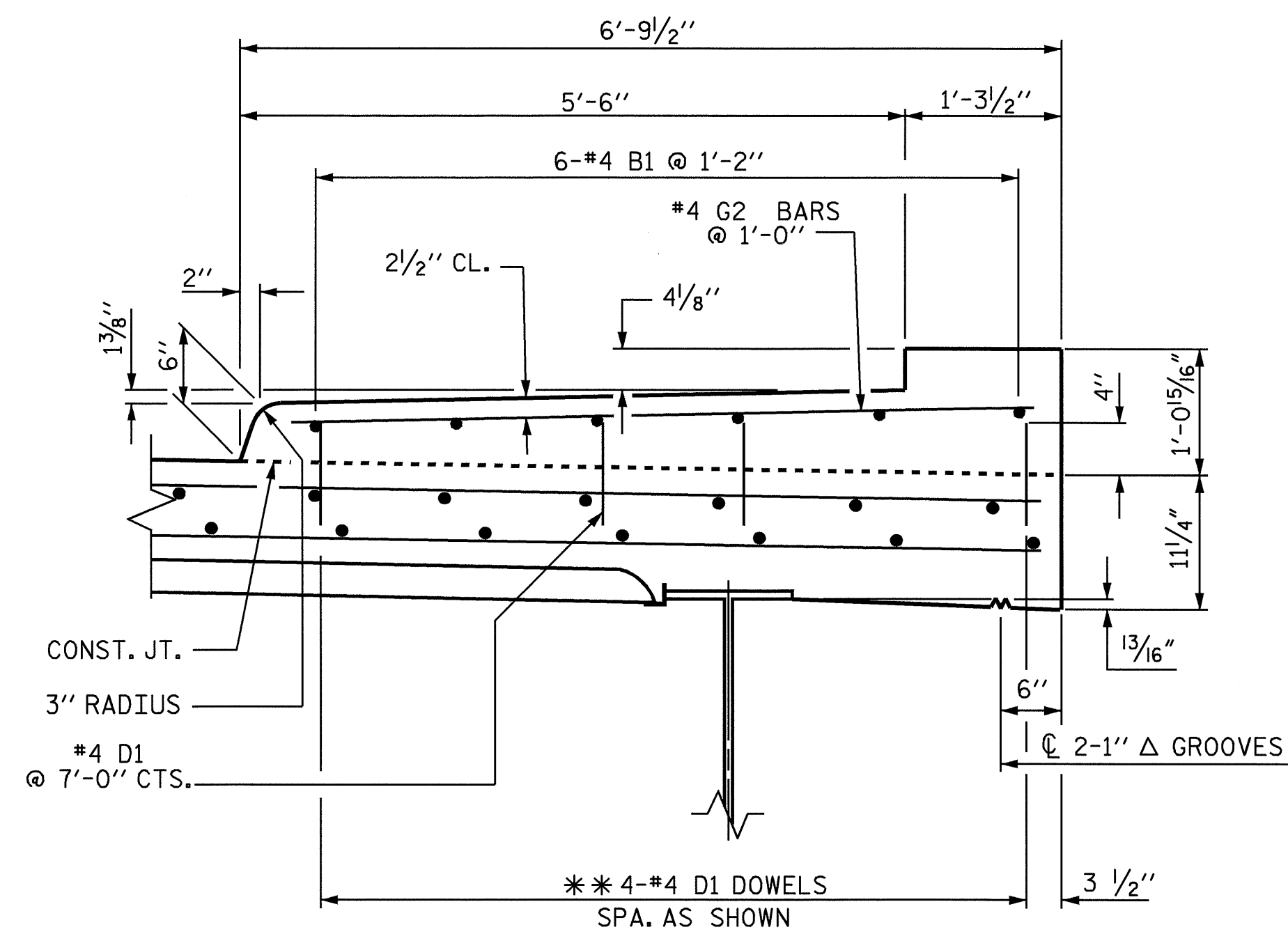
SUPERSTRUCTURE  
TYPICAL SECTION



DRAWN BY : A. A. COLE/A.S. DATE : 12/05  
 CHECKED BY : H. T. BARBOUR DATE : 1/06

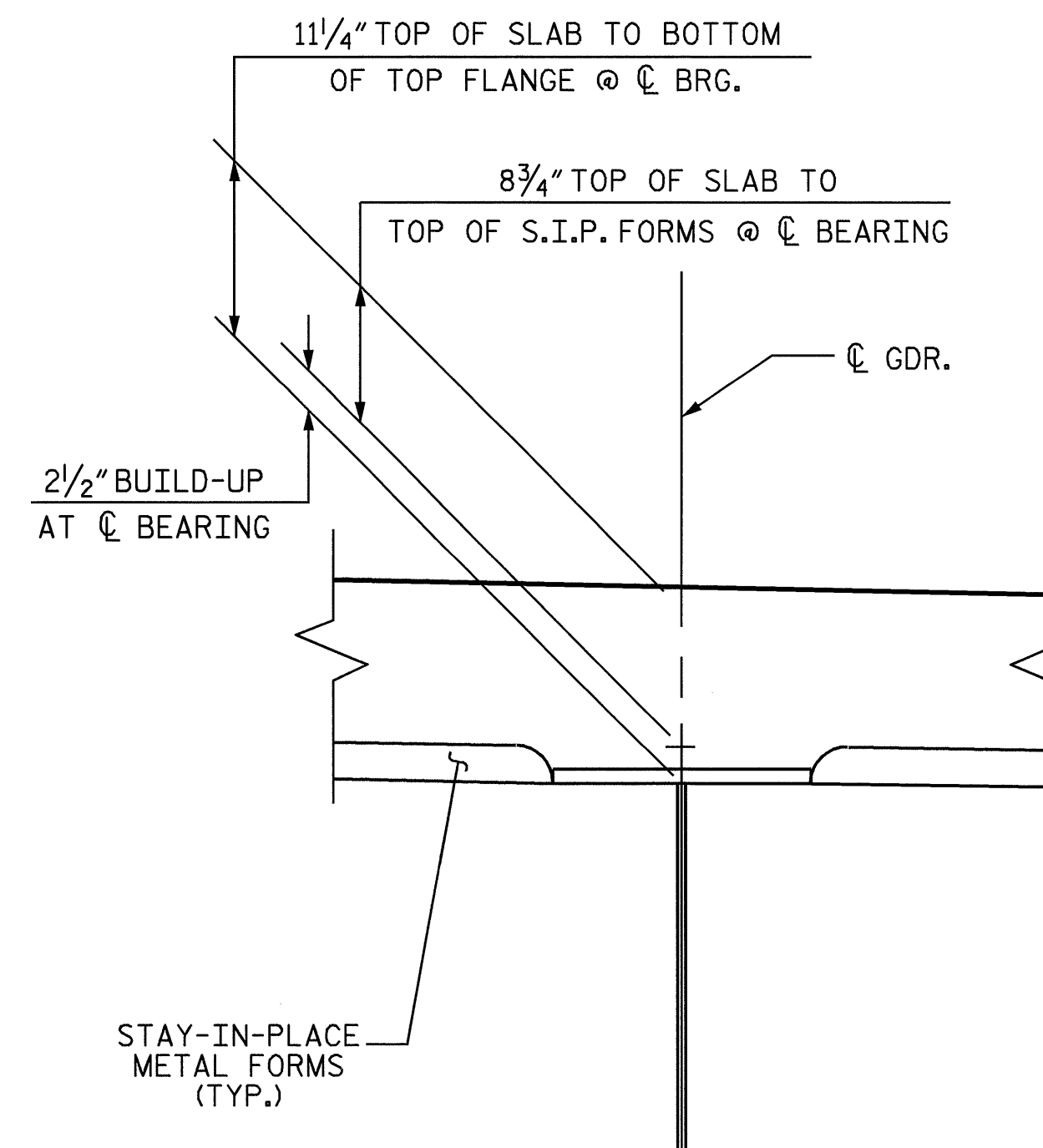
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			25

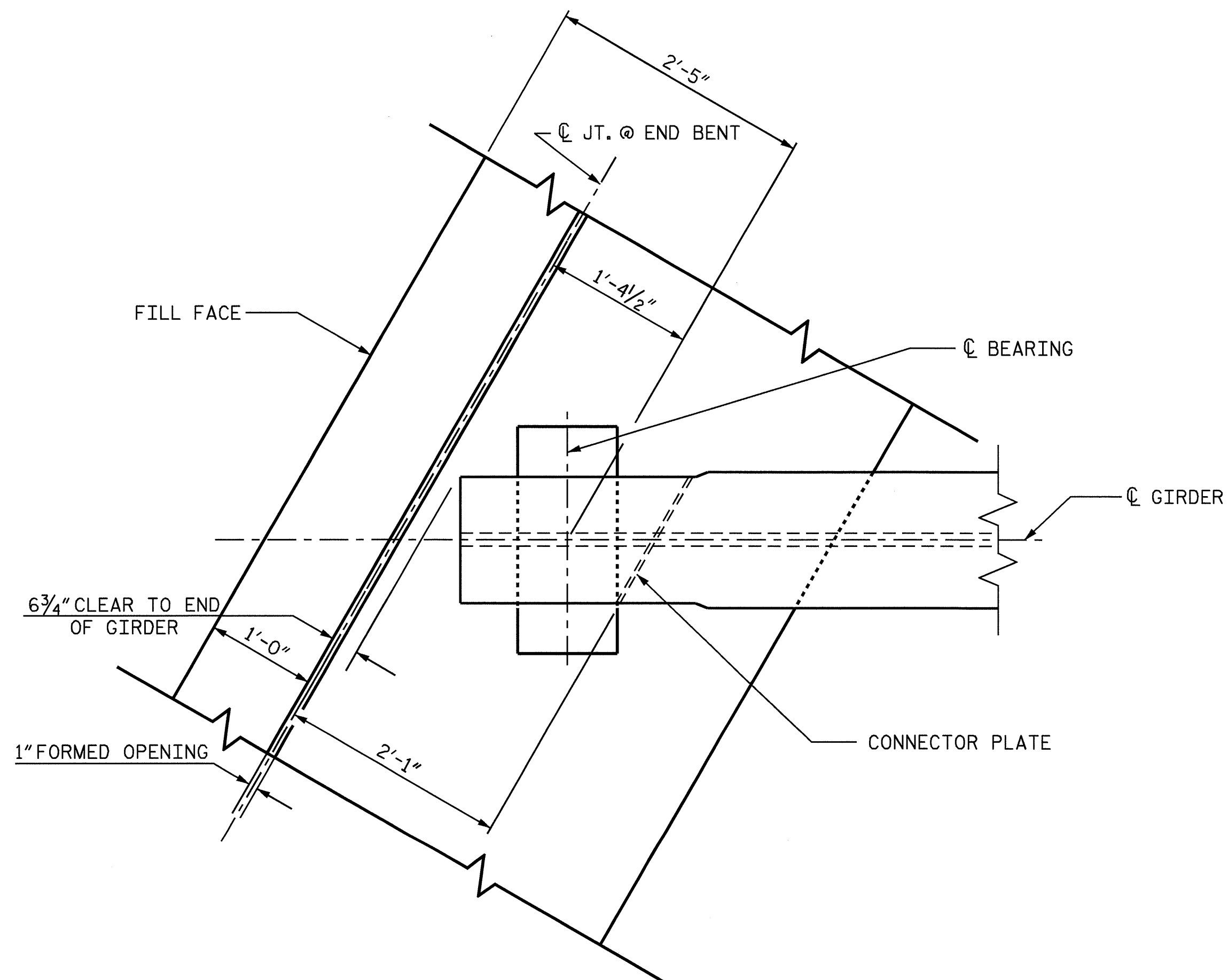


**SECTION THRU SIDEWALK**

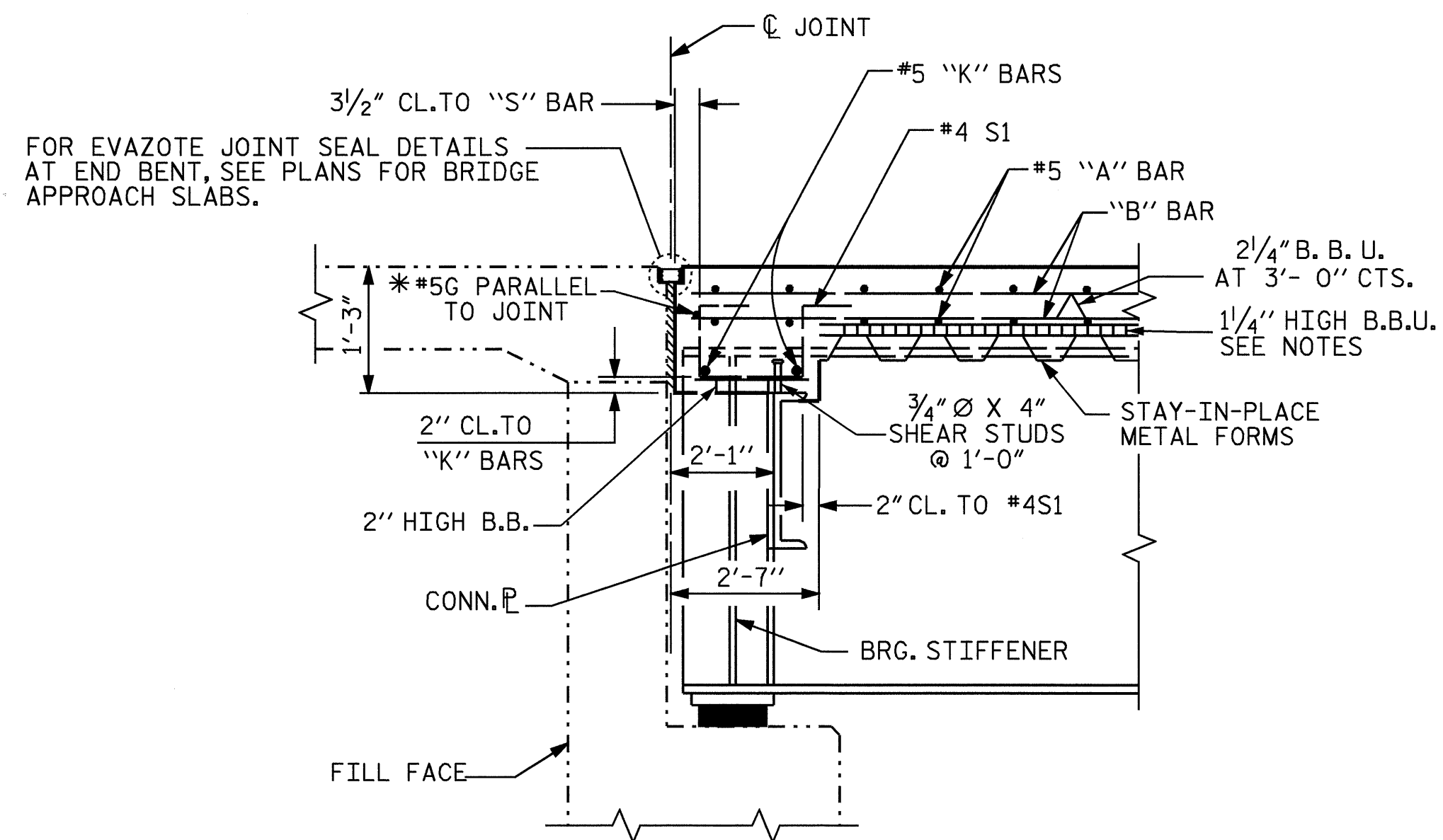
\*\* DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.



**DETAIL A**



**PLAN OF GIRDER AT END BENT JOINT**



**SECTION AT END BENT DIAPHRAGM**

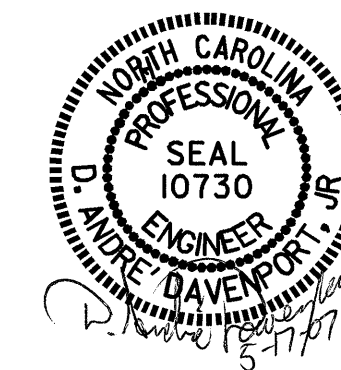
\* #5G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR DIAPHRAGM AND REINFORCING STEEL.

PROJECT NO. B-4128  
GUILFORD COUNTY  
 STATION: 24+02.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 TYPICAL SECTION  
 DETAILS**

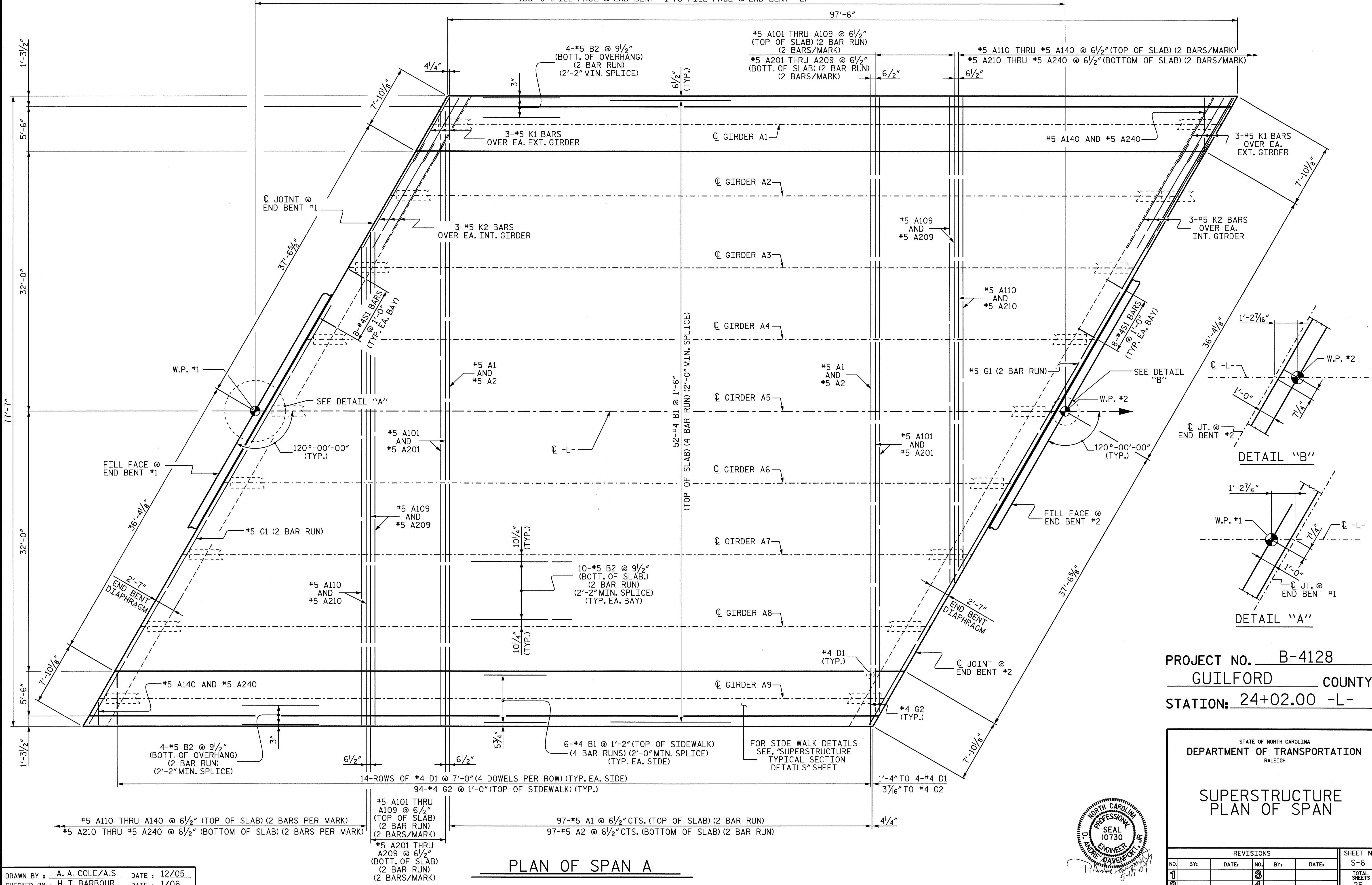


DRAWN BY: A. A. COLE/A.S. DATE: 12/05  
 CHECKED BY: H. T. BARBOUR DATE: 1/06

17-MAY-2007 15:25  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			25
2			4			

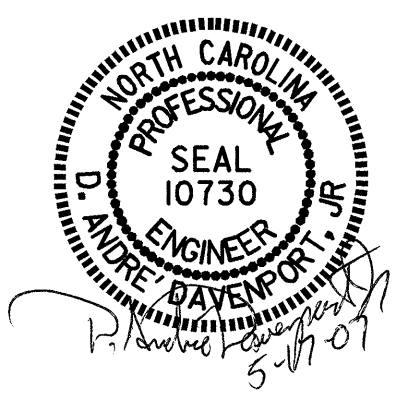
100'-0" (FILL FACE @ END BENT #1 TO FILL FACE @ END BENT #2)



### PLAN OF SPAN A

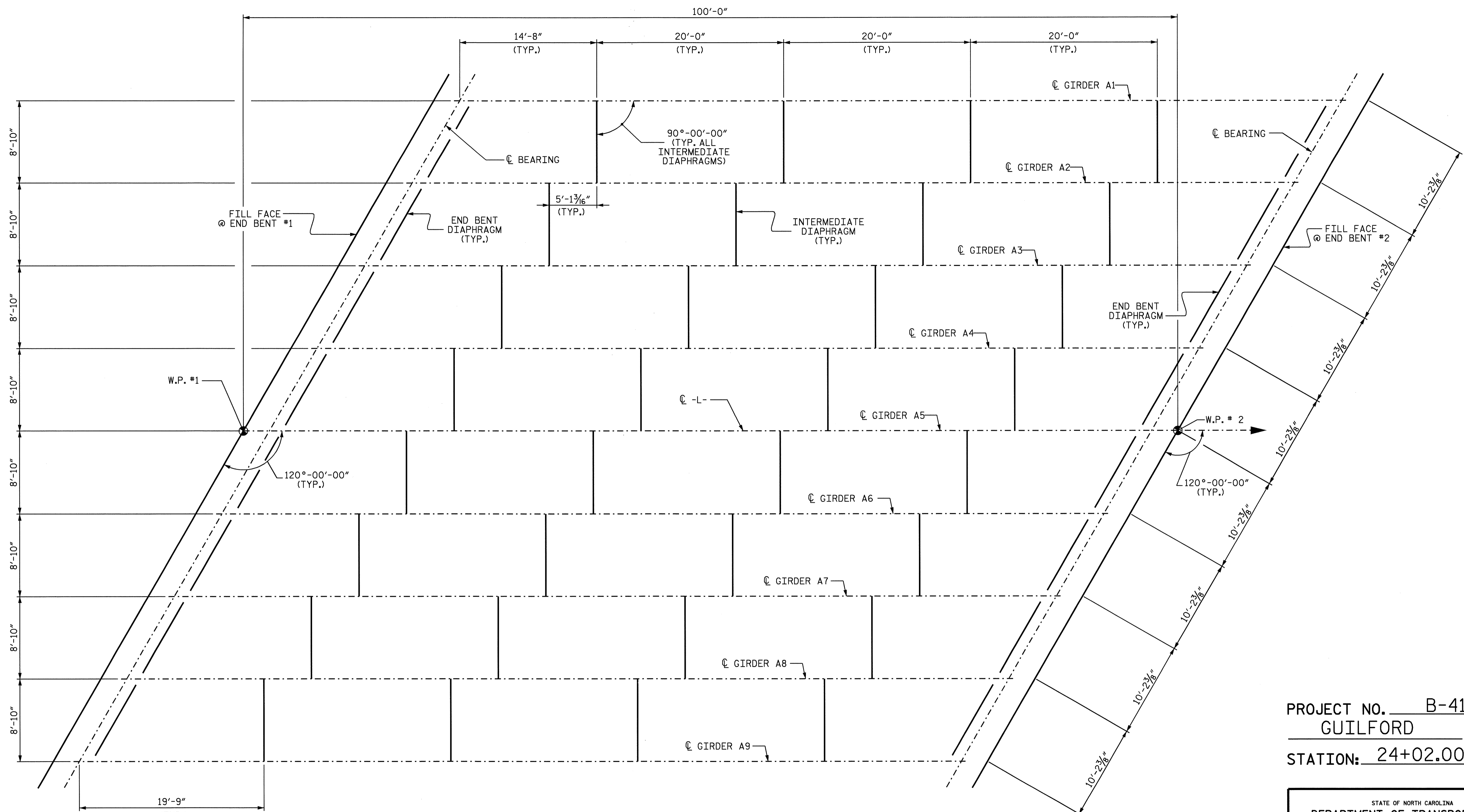
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 CHECKED BY: H. T. BARBOUR DATE: 1/06

17-MAY-2007 15:25  
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PROJECT NO. B-4128  
 GUILFORD COUNTY  
 STATION: 24+02.00 -L-

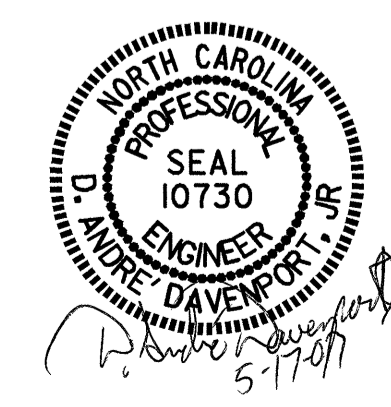
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN					
SHEET NO. S-6					
TOTAL SHEETS 25					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



**SPAN A**  
**FRAMING PLAN**

PROJECT NO. B-4128  
 GUILFORD COUNTY  
 STATION: 24+02.00 -L-

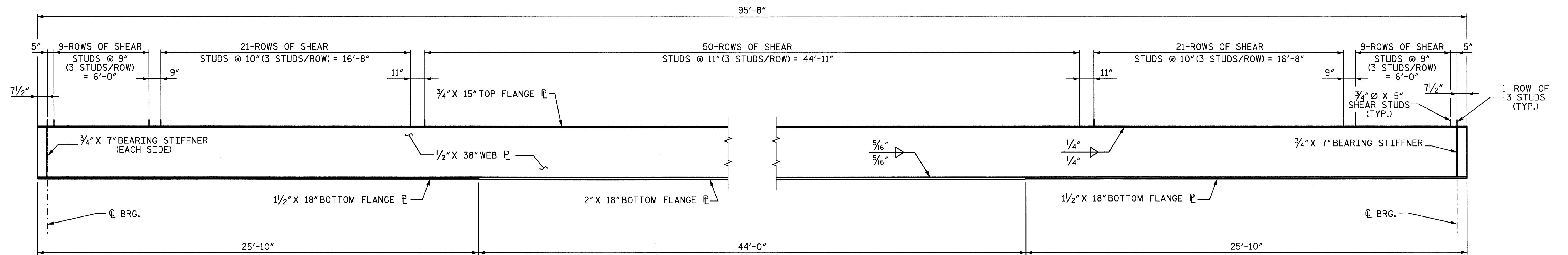
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUPERSTRUCTURE  
 FRAMING PLAN**



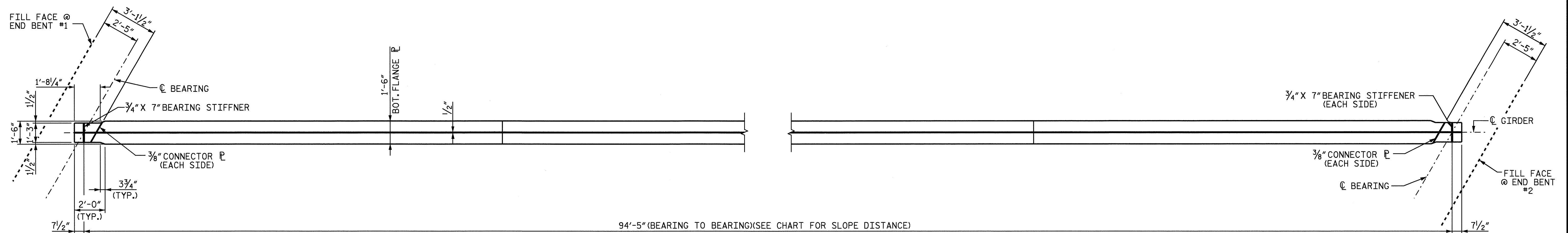
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : A.A. COLE/A.S DATE : 12/05  
 CHECKED BY : H. T. BARBOUR DATE : 1/06





**PLATE GIRDER ELEVATION**



**BOTTOM FLANGE DETAIL**

(CUT BACK DETAILS TYP. EACH END OF GIRDER)

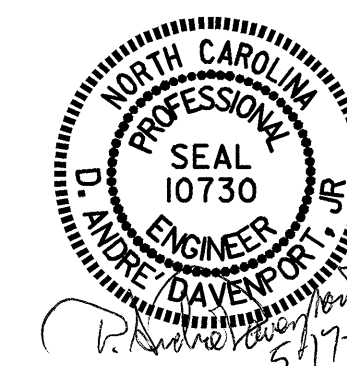
GIRDER #	SLOPED DISTANCE (BRG. TO BRG.)
A1	94'-5 <sup>9</sup> / <sub>16</sub> "
A2	94'-5 <sup>1</sup> / <sub>2</sub> "
A3	94'-5 <sup>1</sup> / <sub>2</sub> "
A4	94'-5 <sup>7</sup> / <sub>16</sub> "
A5	94'-5 <sup>3</sup> / <sub>8</sub> "
A6	94'-5 <sup>3</sup> / <sub>8</sub> "
A7	94'-5 <sup>9</sup> / <sub>16</sub> "
A8	94'-5 <sup>9</sup> / <sub>16</sub> "
A9	94'-5 <sup>1</sup> / <sub>4</sub> "

PROJECT NO. B-4128  
GUILFORD COUNTY  
 STATION: 24+02.00-L-

SHEET 1 OF 2

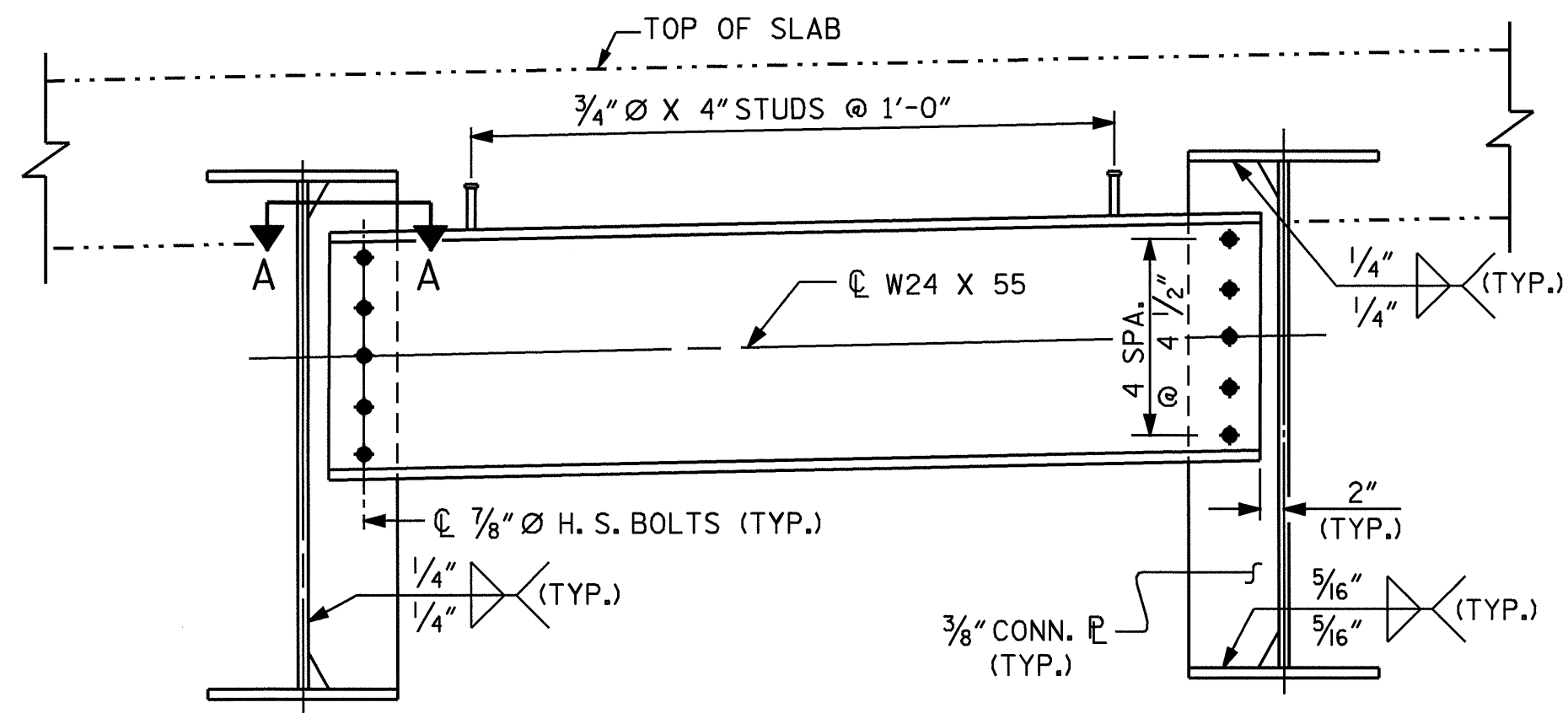
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS**

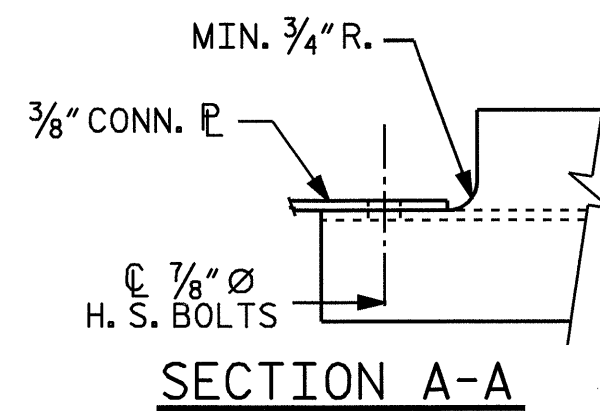


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			25

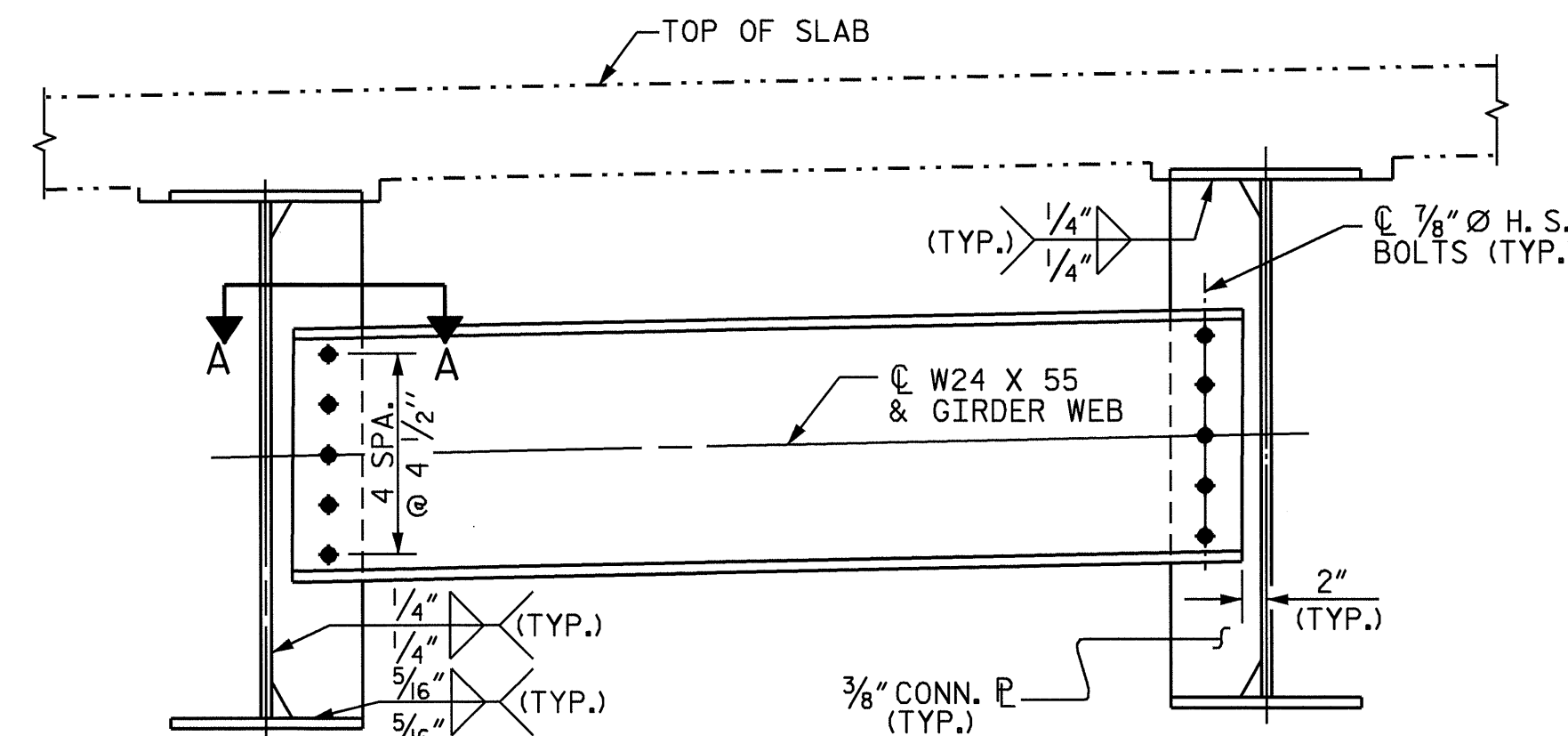
DRAWN BY : A. A. COLE/A.S. DATE : 12/05  
 CHECKED BY : H. T. BARBOUR DATE : 1/06



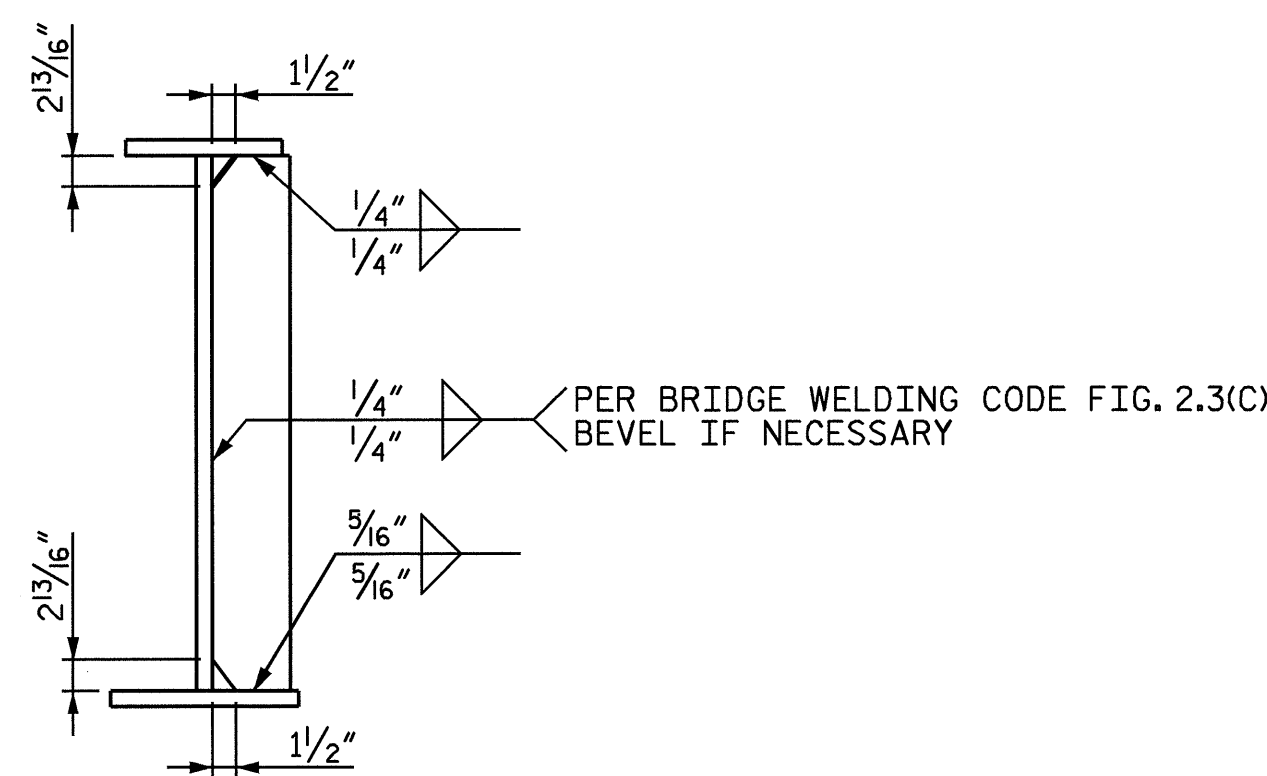
TYPICAL END BENT DIAPHRAGM



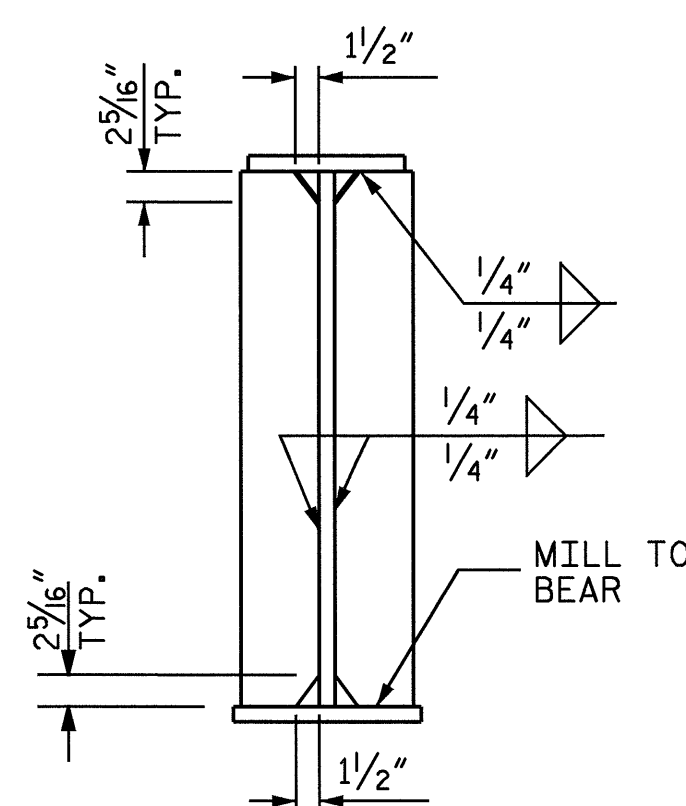
SECTION A-A



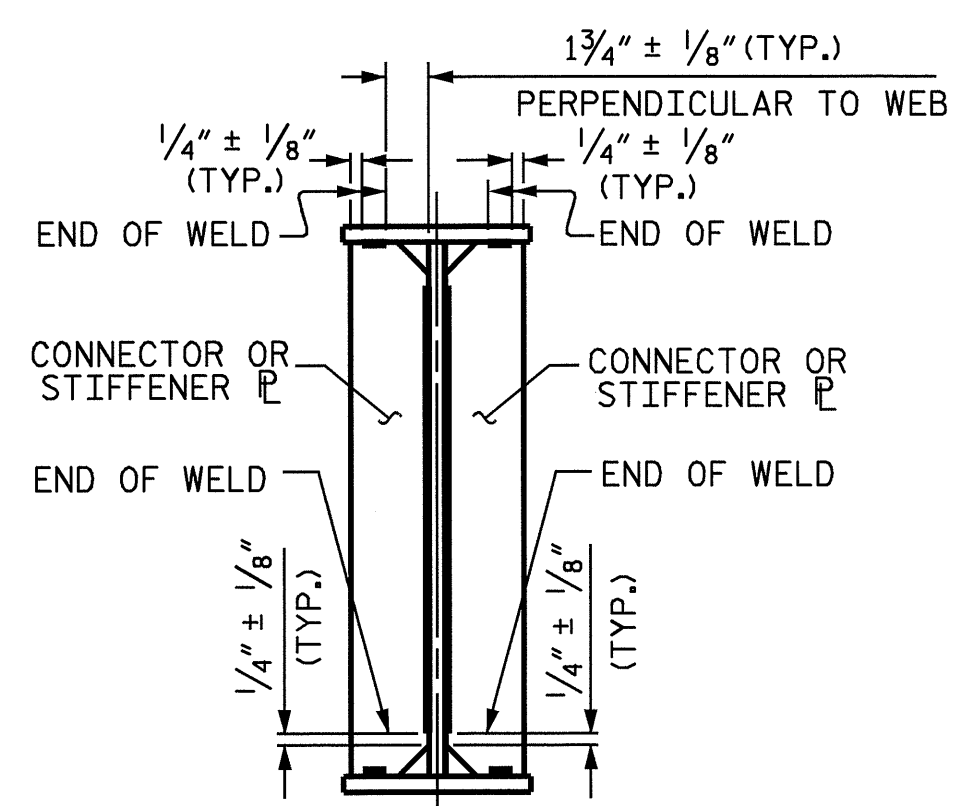
INTERMEDIATE DIAPHRAGM



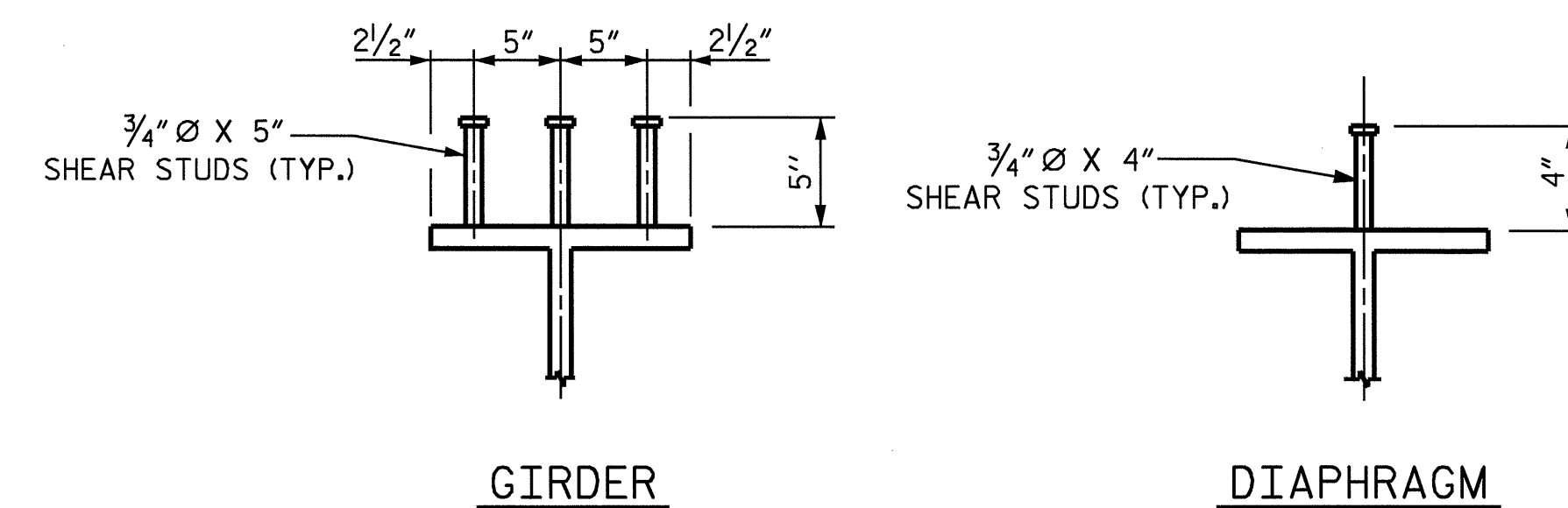
CONNECTOR PLATE DETAIL



BEARING STIFFENER



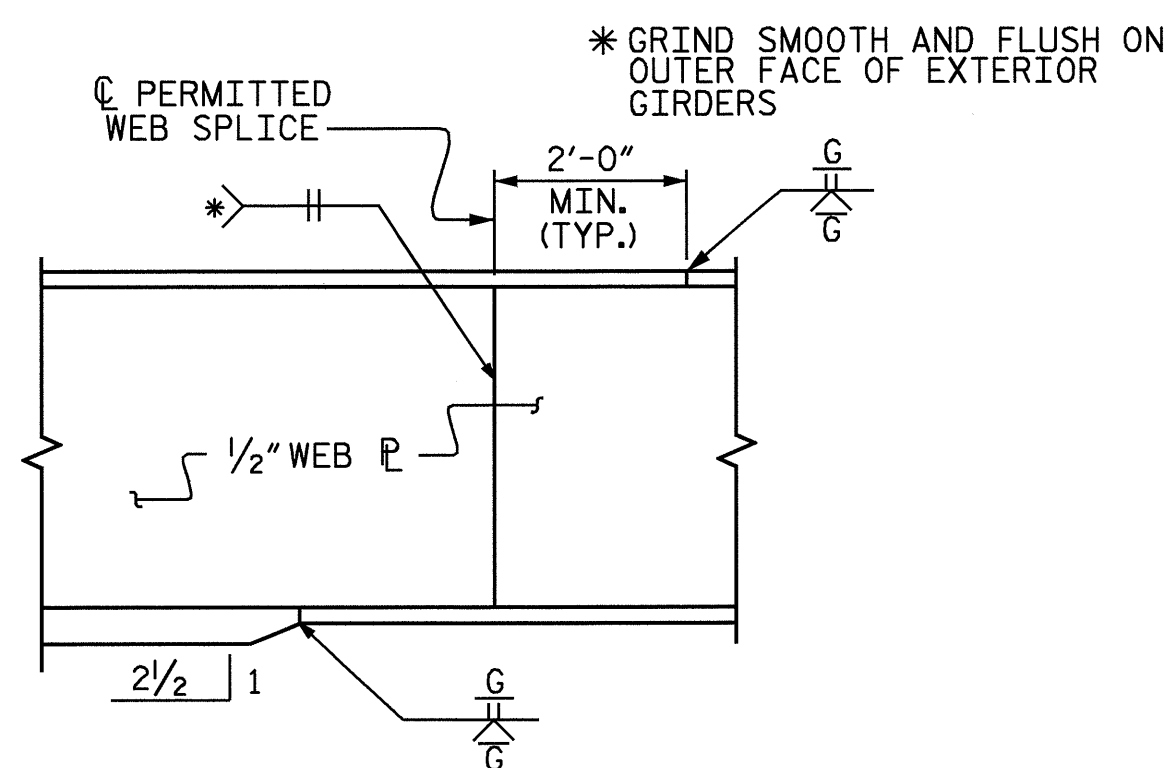
WELD TERMINATION DETAIL



GIRDER

DIAPHRAGM

SHEAR STUD DETAILS



ELEVATION

TYPICAL FLANGE AND WEB BUTT JOINT

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" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

CONNECTOR PLATES ARE NOT REQUIRED ON THE OUTSIDE OF EXTERIOR GIRDERS.

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

A CHARTY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, BOTTOM FLANGE PLATES, FOR ALL GIRDERS AND IN ACCORDANCE WITH ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

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 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 440-10 OF THE STANDARD SPECIFICATIONS.

FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

FOR SHIPPING STEEL STRUCTURAL MEMBERS, SEE SPECIAL PROVISIONS.

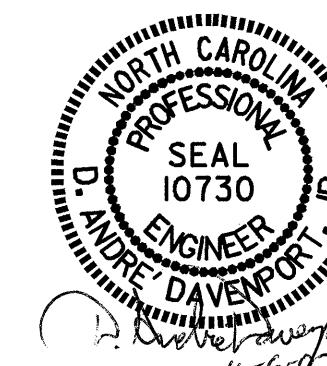
END OF GIRDERS SHALL BE PLUMB.

PROJECT NO. B-4128  
GUILFORD COUNTY  
 STATION: 24+02.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS**



DRAWN BY: A. A. COLE/A.S DATE: 12/05  
 CHECKED BY: H. T. BARBOUR DATE: 1/06

06-NOV-2007 13:47  
 f:\structures\asors\eng\h\B4128.sd.S\*.dgn  
 adavenport

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			25

**NOTES**

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

**ALUMINUM RAILS**

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

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

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

**GALVANIZED STEEL RAILS**

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

**GENERAL NOTES**

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

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR7.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

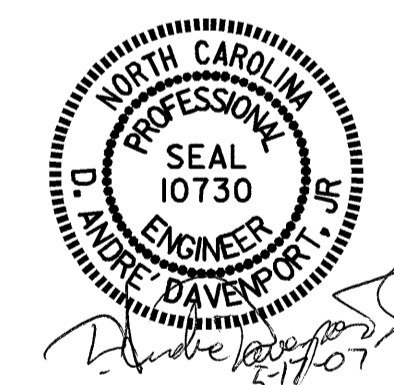
TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAIN VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

PAY LENGTH = 178.425 LIN. FT.



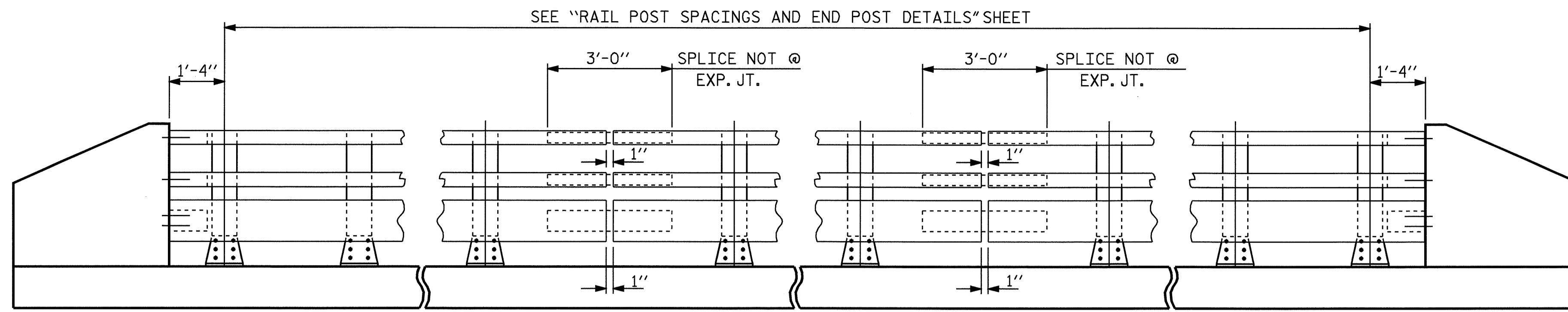
PROJECT NO. B-4128  
GUILFORD COUNTY  
 STATION: 24+02.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

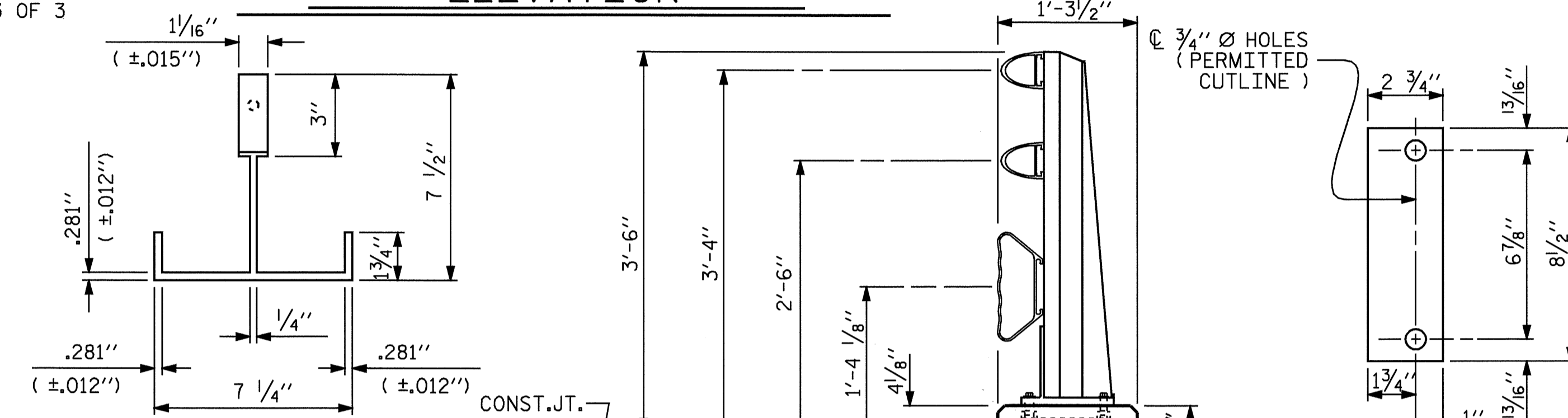
**3 BAR METAL RAIL**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			25

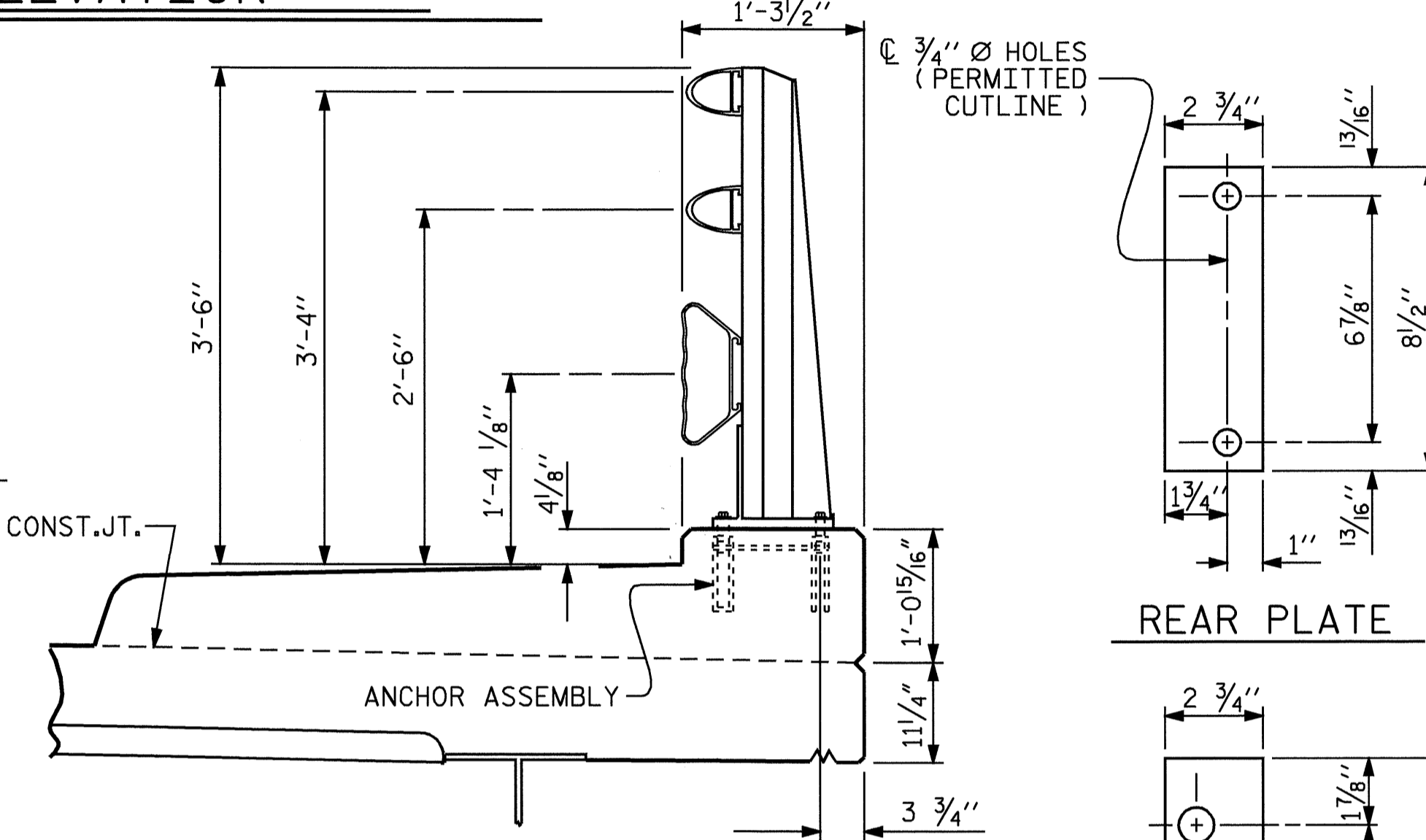


NOTE:  
 FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "3 BAR METAL RAIL" SHEET 3 OF 3

**ELEVATION**



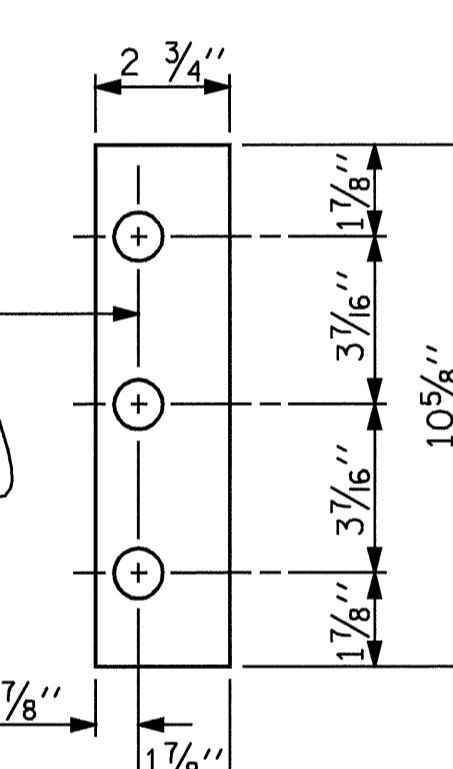
**PLAN**



**SECTION THRU RAIL**

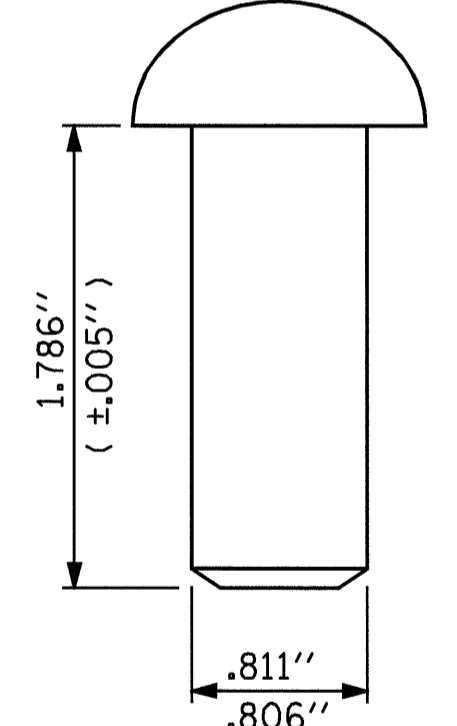
FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL" STD.No.BMR6

**REAR PLATE**

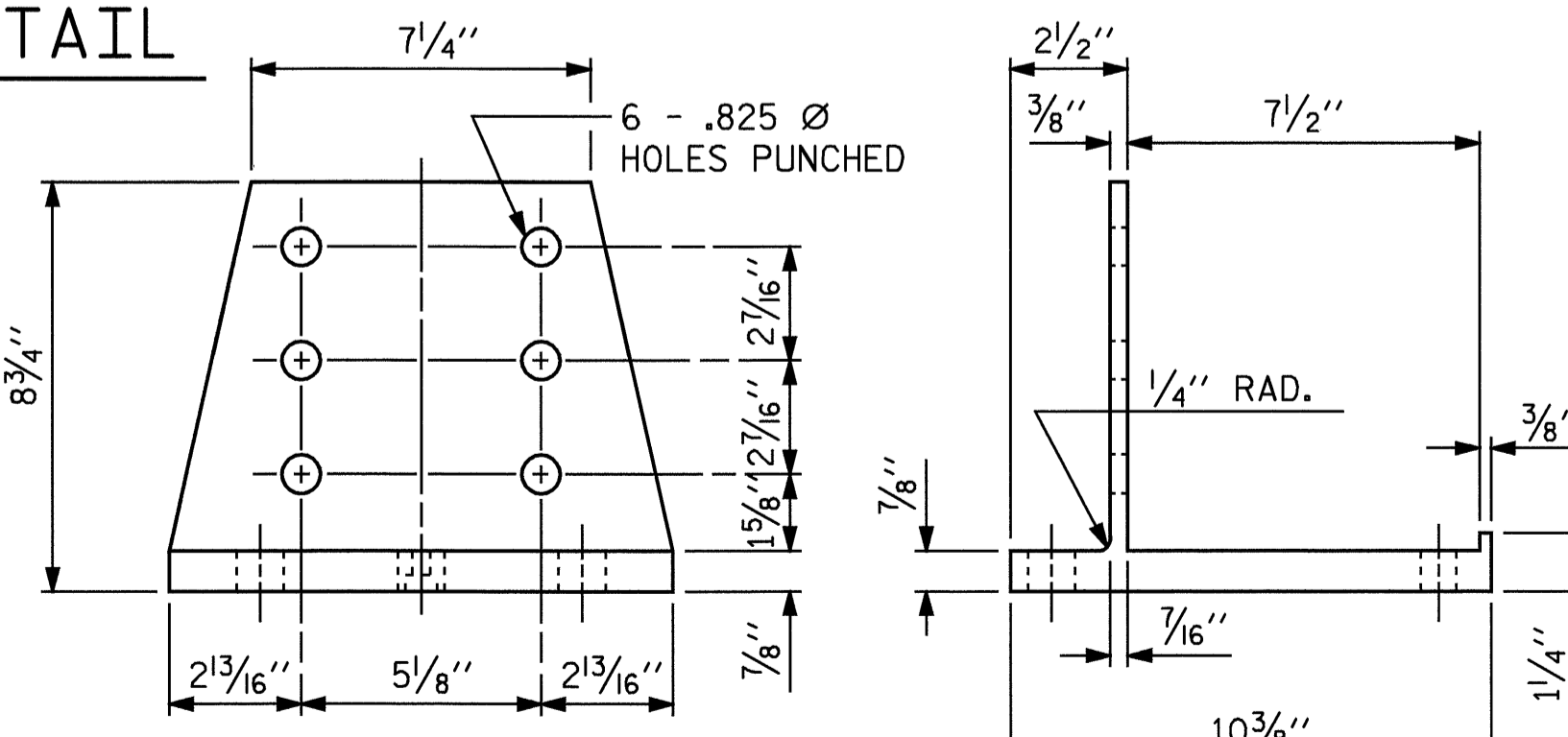


**FRONT PLATE SHIM DETAILS**

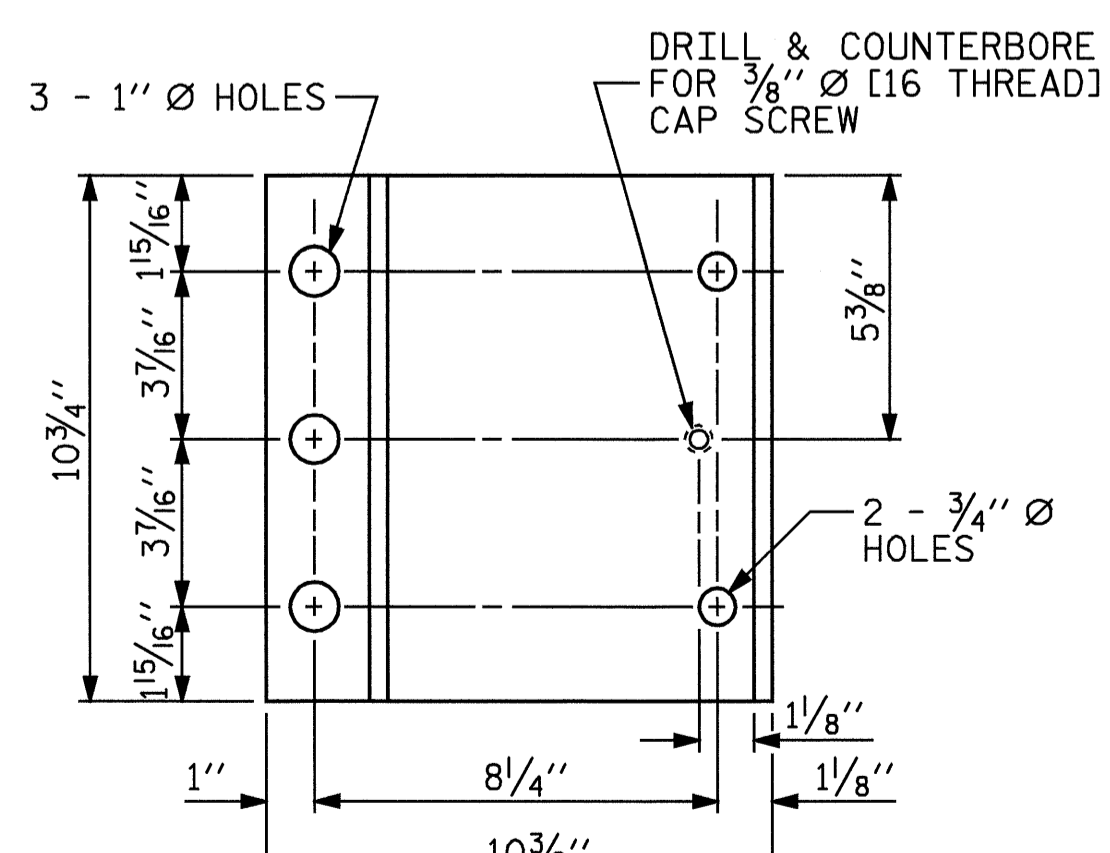
NOTE:  
 SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



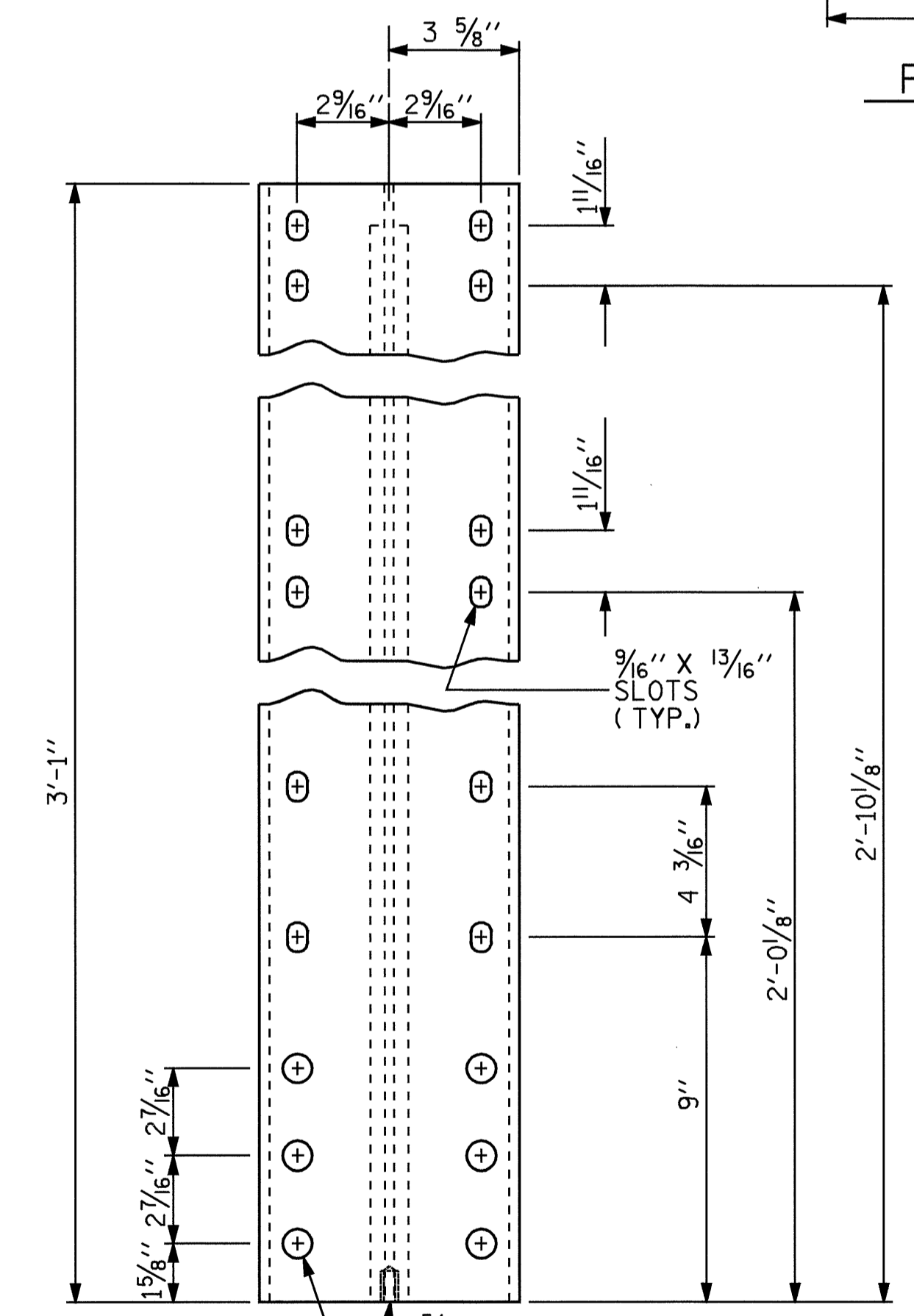
**RIVET DETAIL**



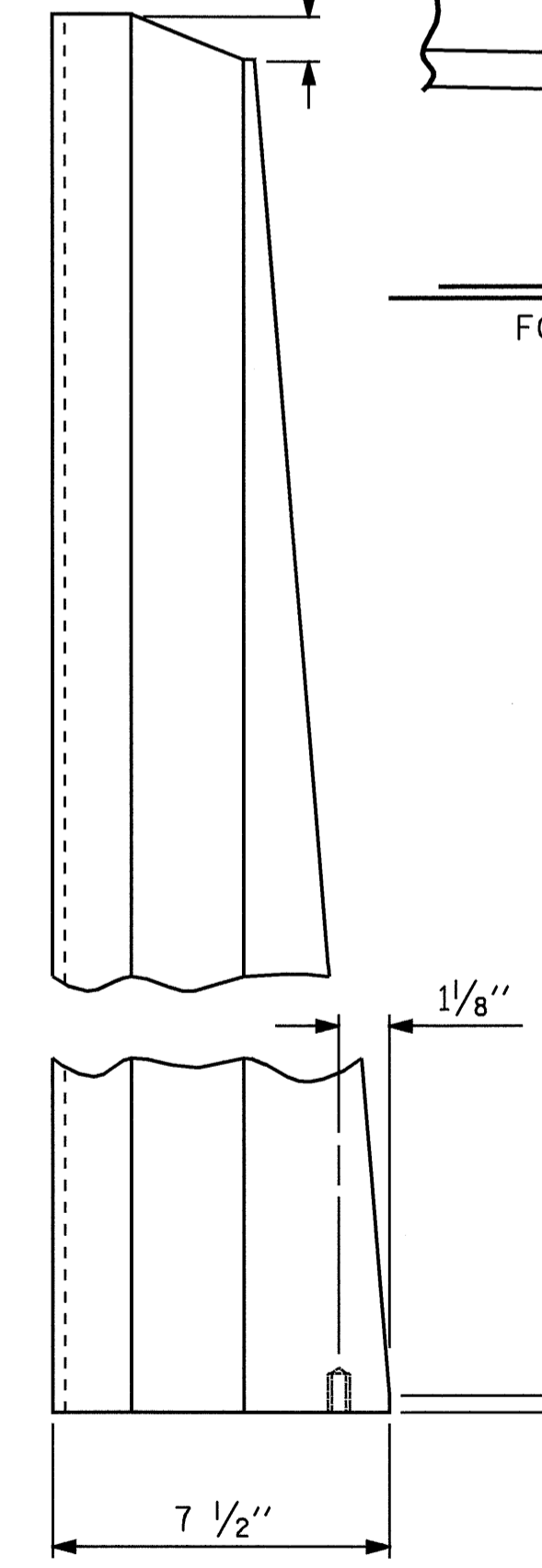
**POST BASE DETAILS**



**PLAN**



**FRONT ELEVATION**



**SIDE ELEVATION**

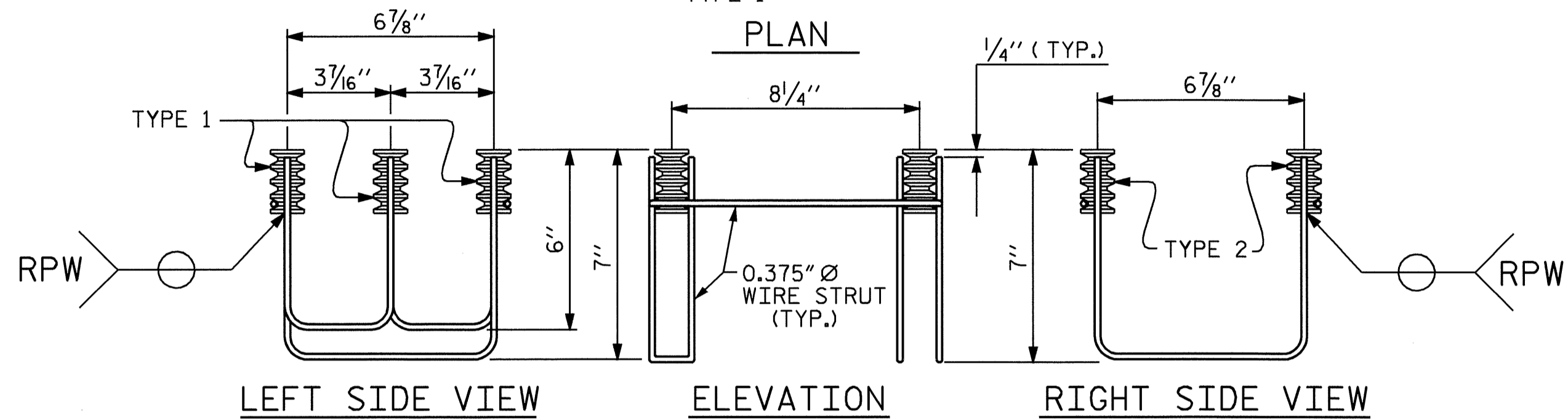
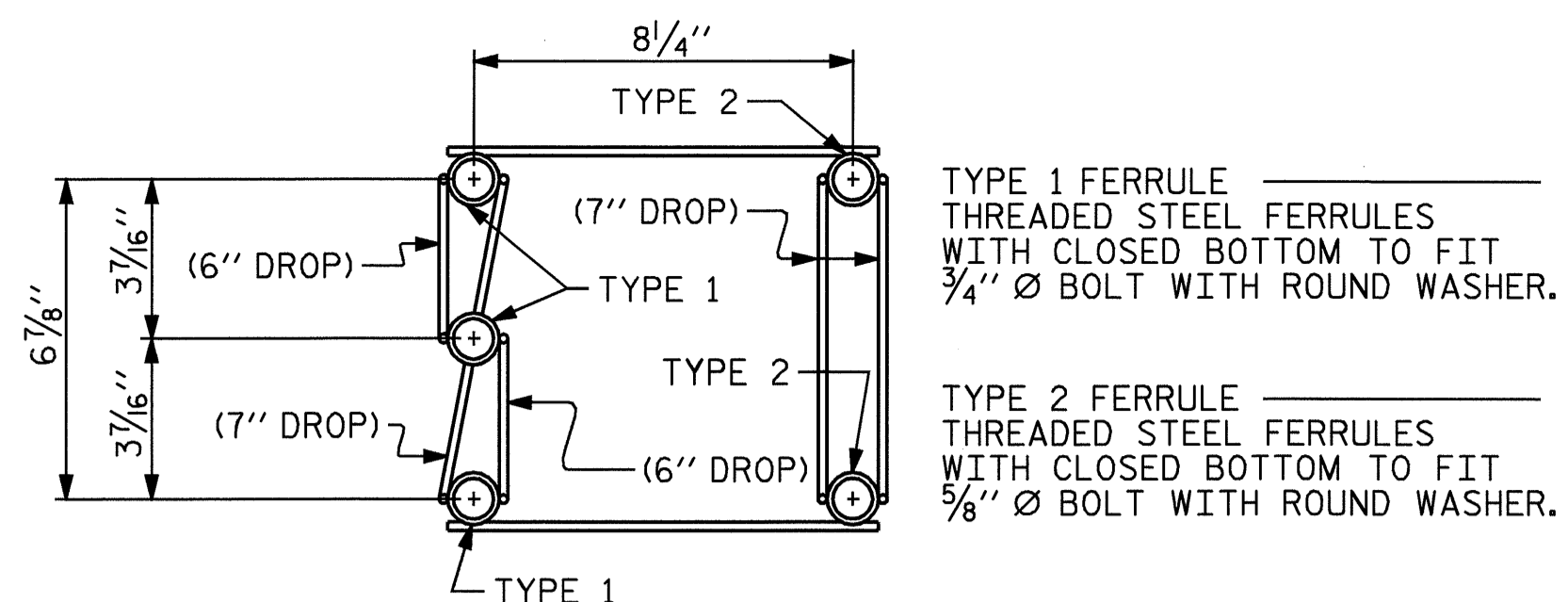
**DETAILS OF POST**

ASSEMBLED BY: A. A. COLE/A.S DATE: 12/05  
 CHECKED BY: H. T. BARBOUR DATE: 1/06  
 DRAWN BY: JMB 1/88 REV. 10/17/00 RWW/LES  
 CHECKED BY: GGH 1/88 REV. 5/1/03 RWW/JTE  
 REV. 5/1/06 TLA/GM

**NOTES**

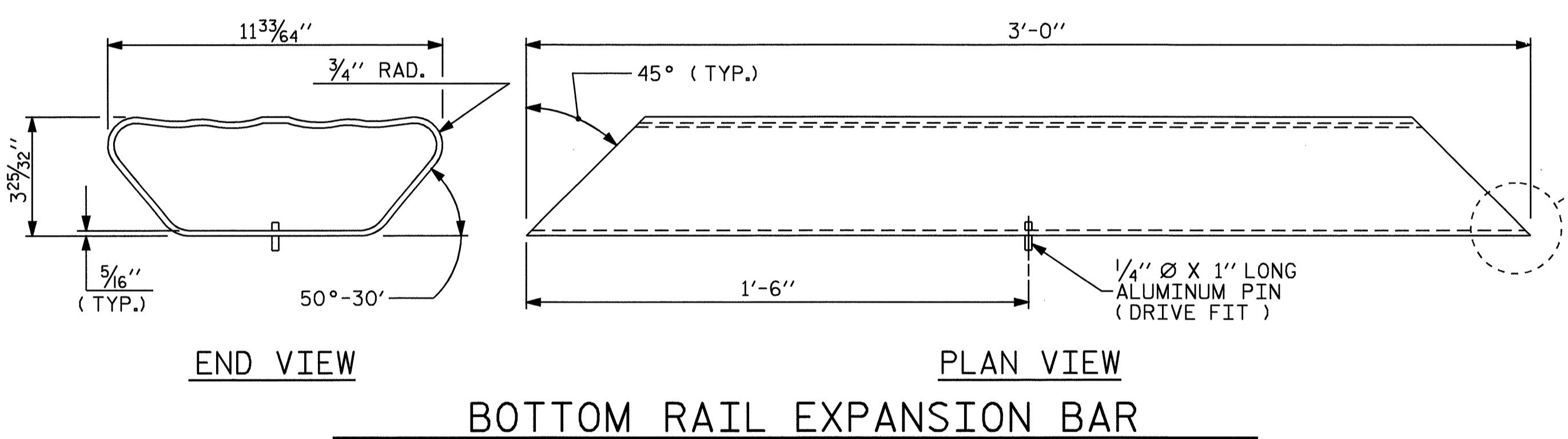
**STRUCTURAL CONCRETE ANCHOR ASSEMBLY**

- THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES AND 1 1/4" FOR 5/8" FERRULES.
  - 3 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
  - 2 - 5/8" Ø X 2 1/4" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 5/8" Ø X 2 1/4" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
  - WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
  - THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
  - THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
  - BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

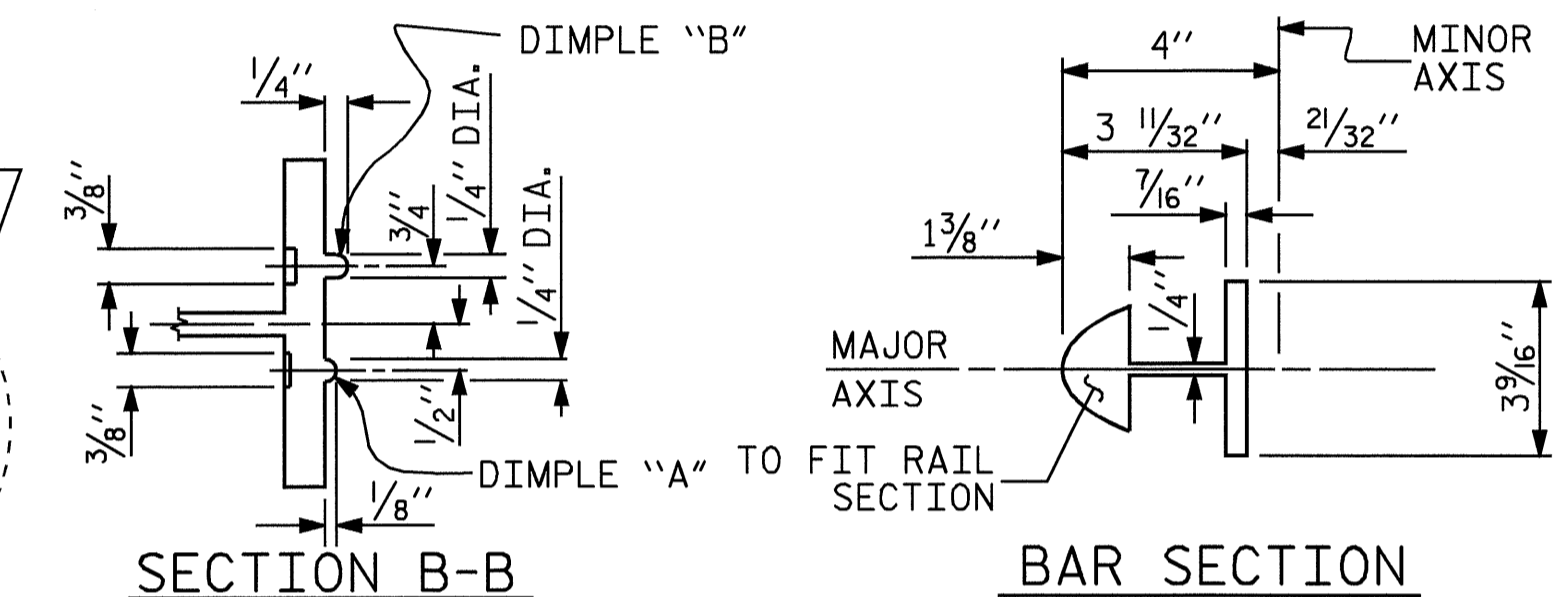
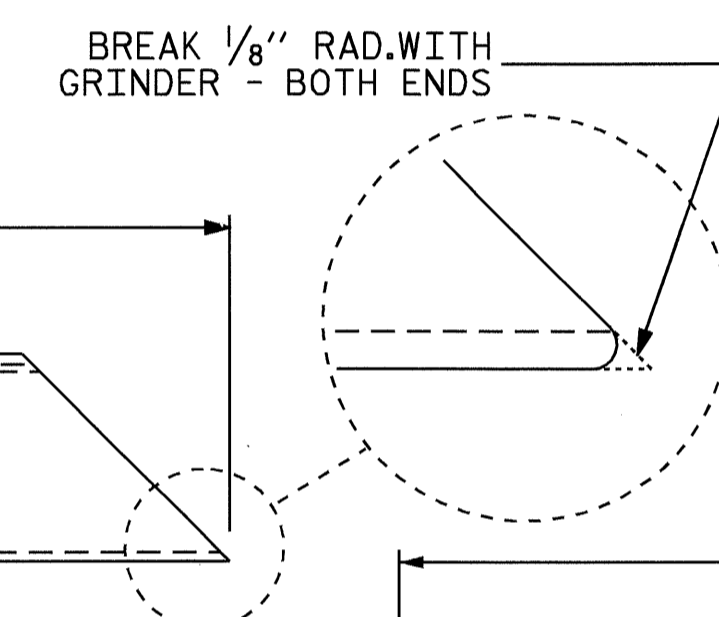


**5-BOLT METAL RAIL ANCHOR ASSEMBLY**

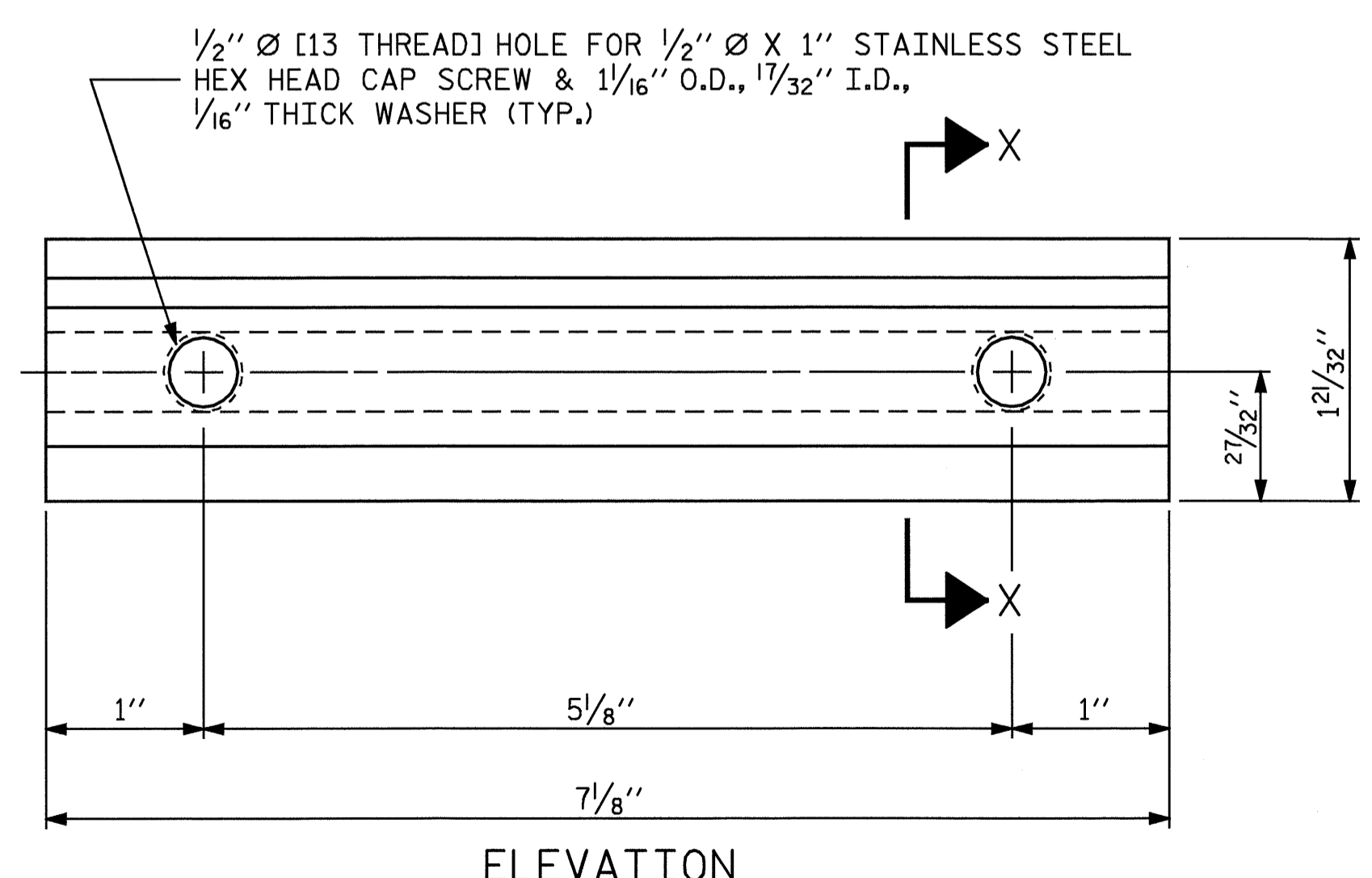
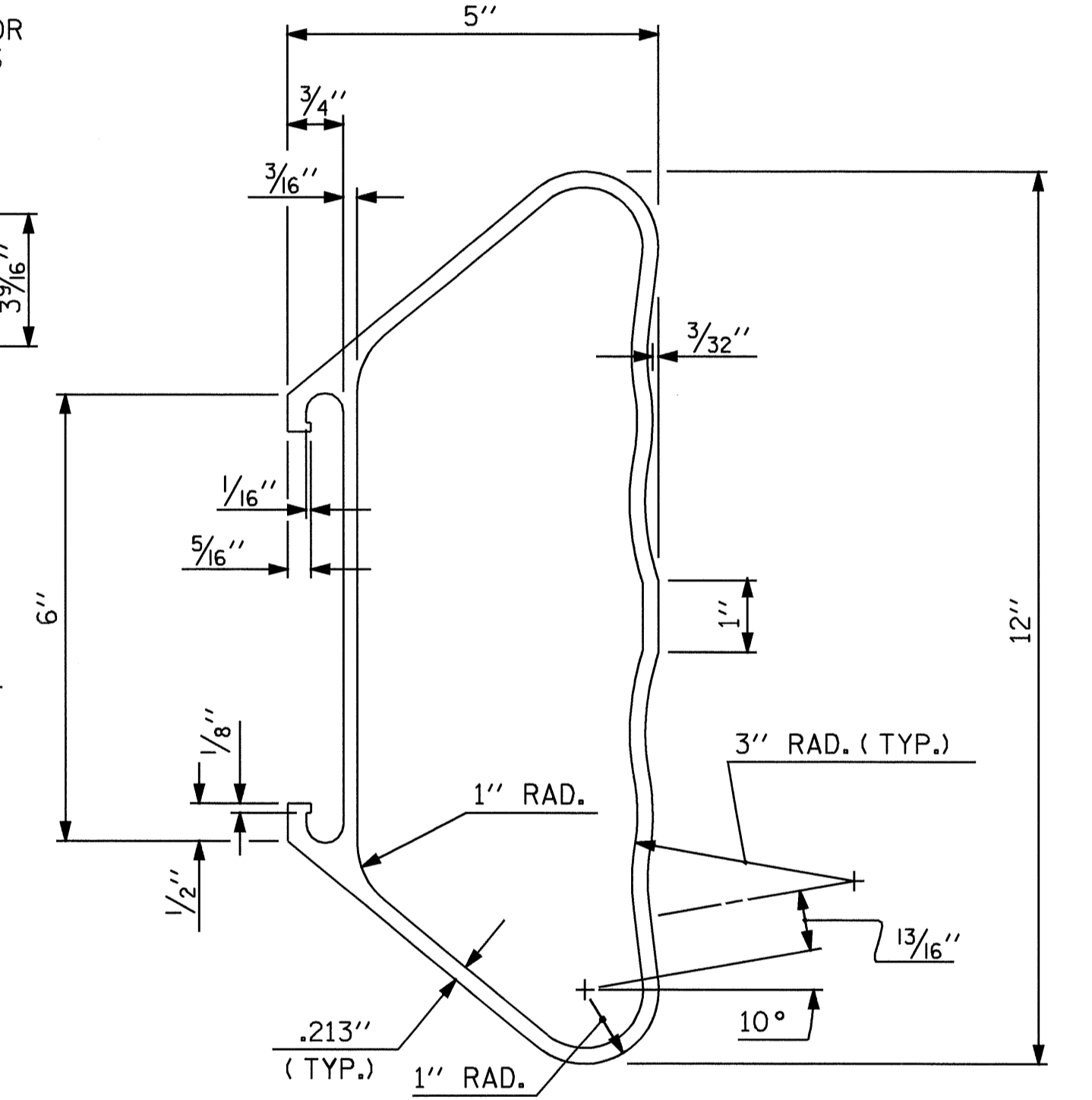
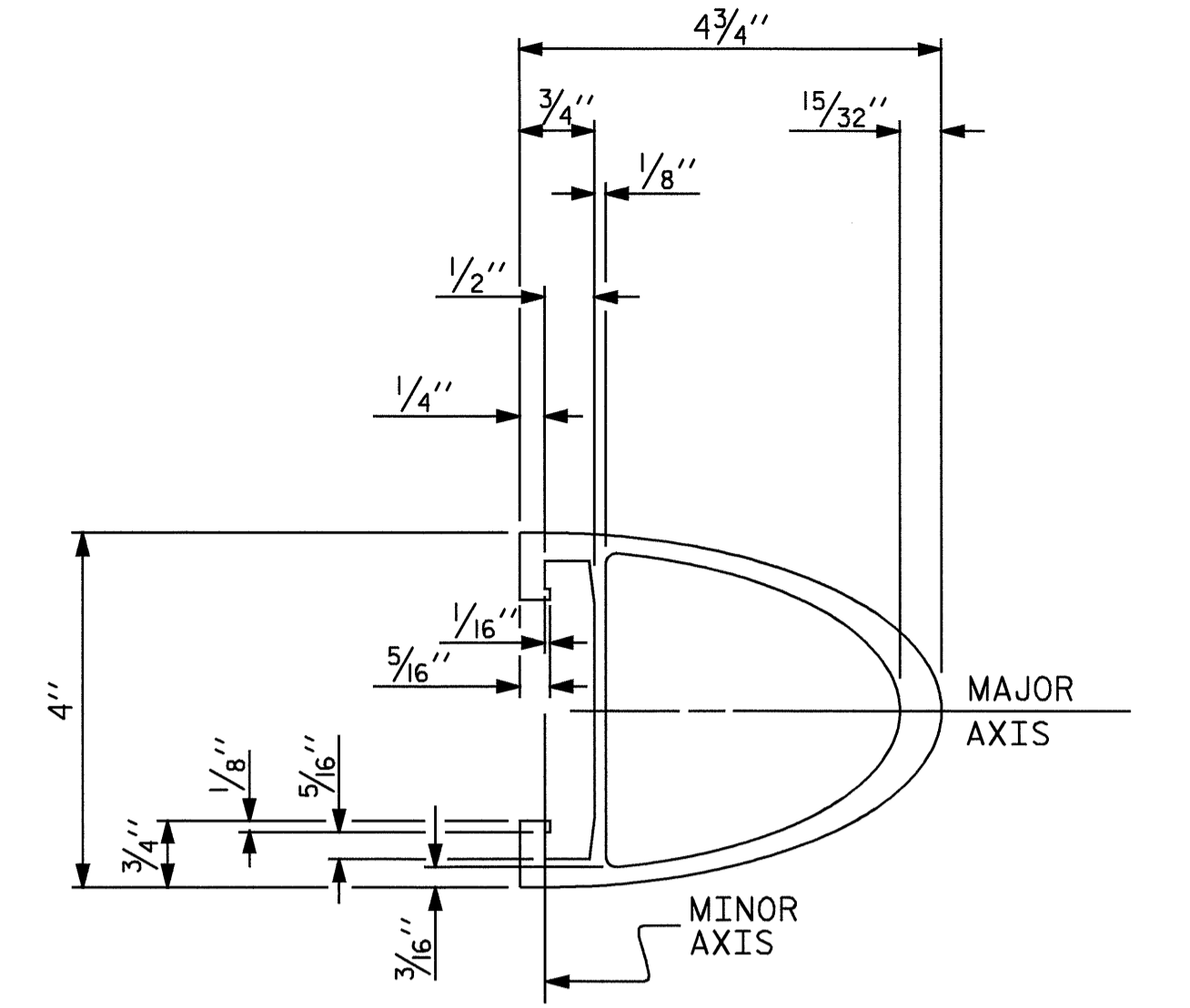
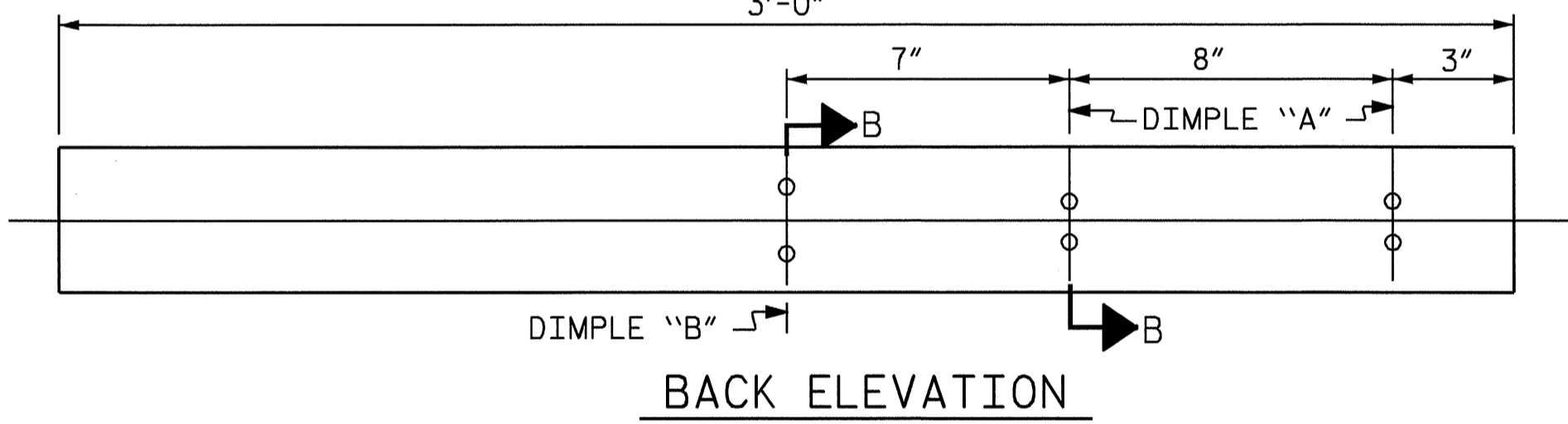
(34 ASSEMBLIES REQUIRED)



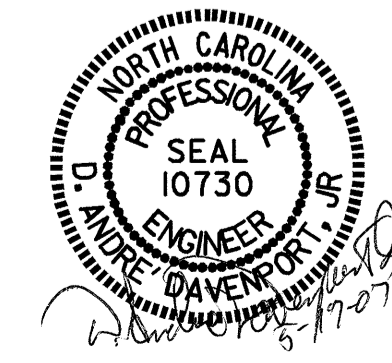
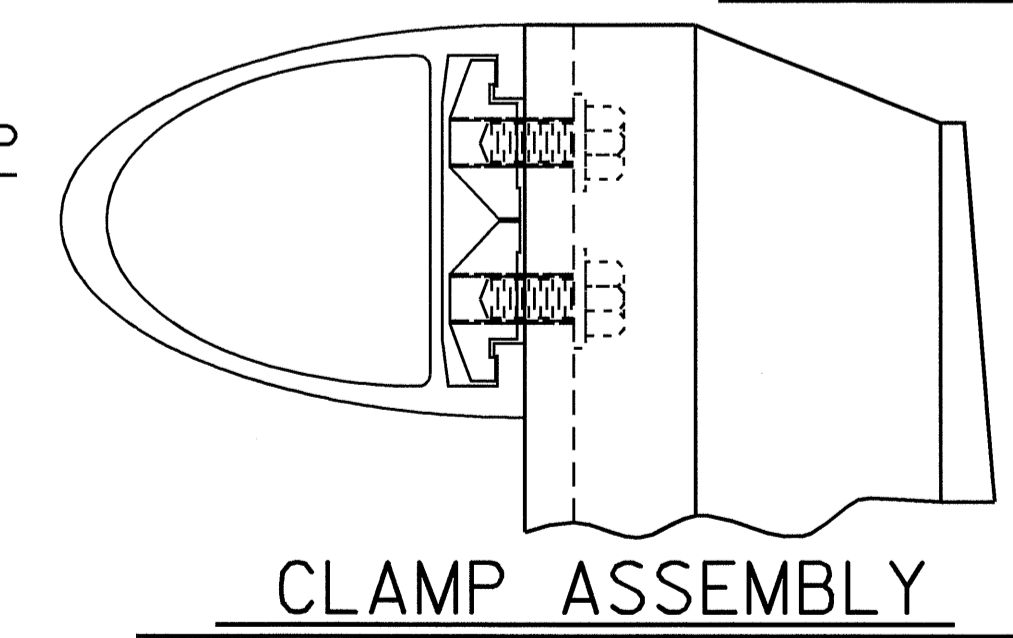
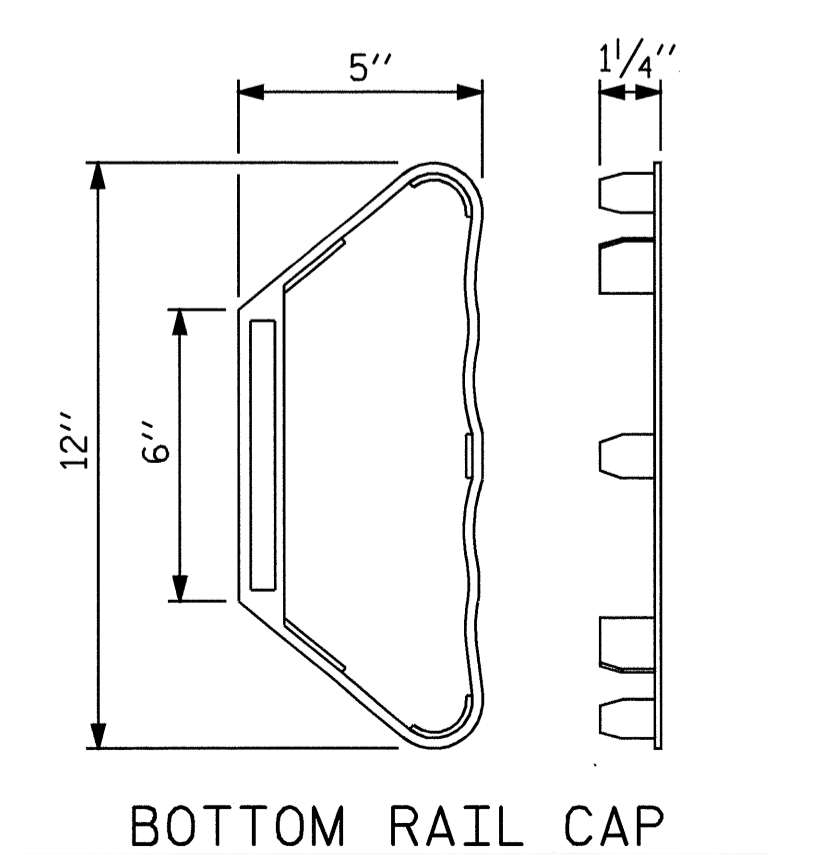
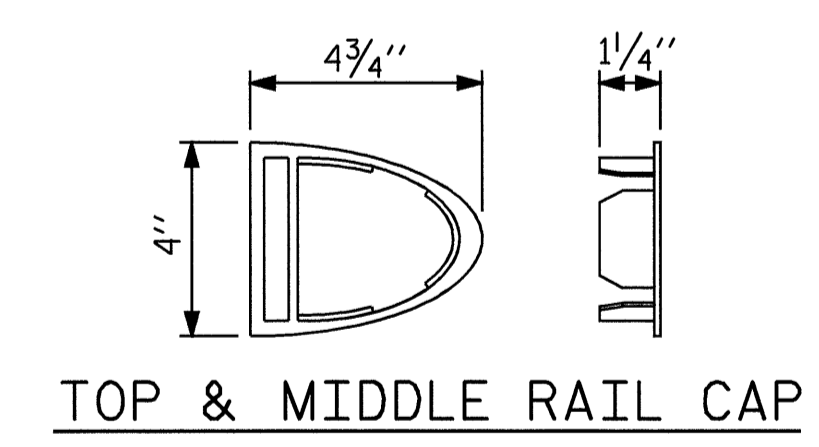
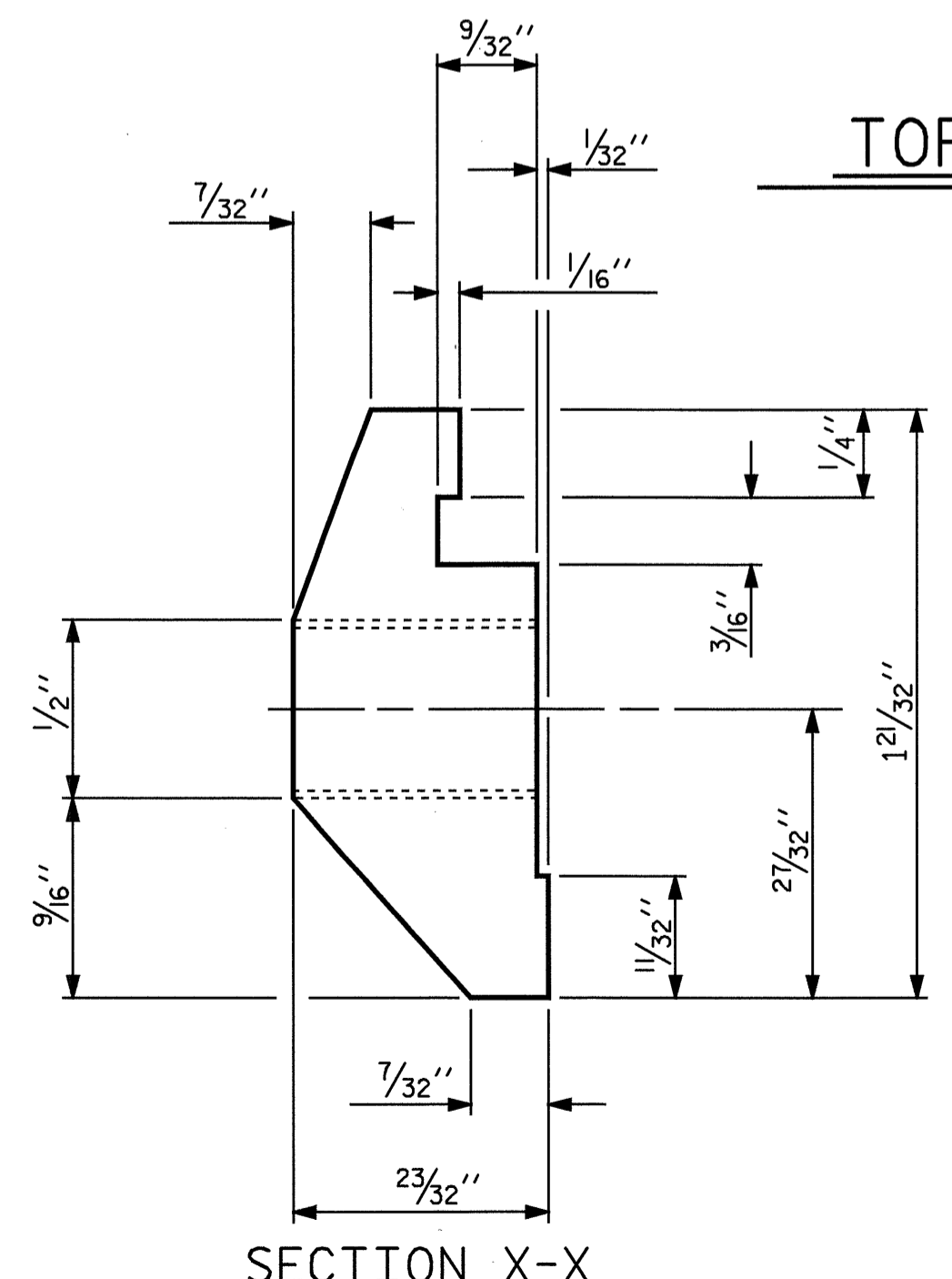
**BOTTOM RAIL EXPANSION BAR**



**TOP & MIDDLE RAIL EXPANSION BAR**



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



PROJECT NO. B-4128  
GUILFORD COUNTY  
STATION: 24+02.00 -L-

SHEET 2 OF 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			25

ASSEMBLED BY :	A. A. COLE/A.S	DATE :	12/05
CHECKED BY :	H. T. BARBOUR	DATE :	1/06
DRAWN BY :	JMB	1/88	REV. 10/17/00 RWW/LES
CHECKED BY :	GGH	1/88	REV. 5/7/03 RWW/JTE
			REV. 5/1/06 TLA/GM

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N. C. THREADS.
- C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.
- D. STANDARD CLAMP BARS (SEE "3 BAR METAL RAIL" SHEET 2 OF 3).

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 3 BAR METAL RAIL.

THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

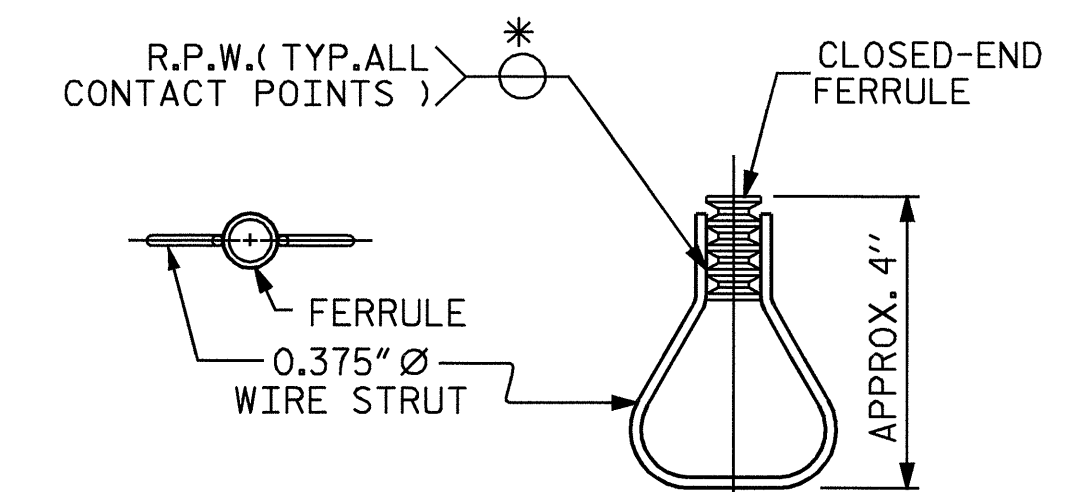
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

NOTES

STRUCTURAL CONCRETE INSERT

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

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



PLAN ELEVATION  
STRUCTURAL CONCRETE INSERT

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

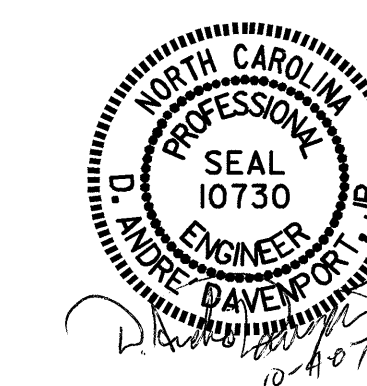
PROJECT NO. B-4128  
GUILFORD COUNTY  
STATION: 24+02.00 -L-

SHEET 3 OF 3

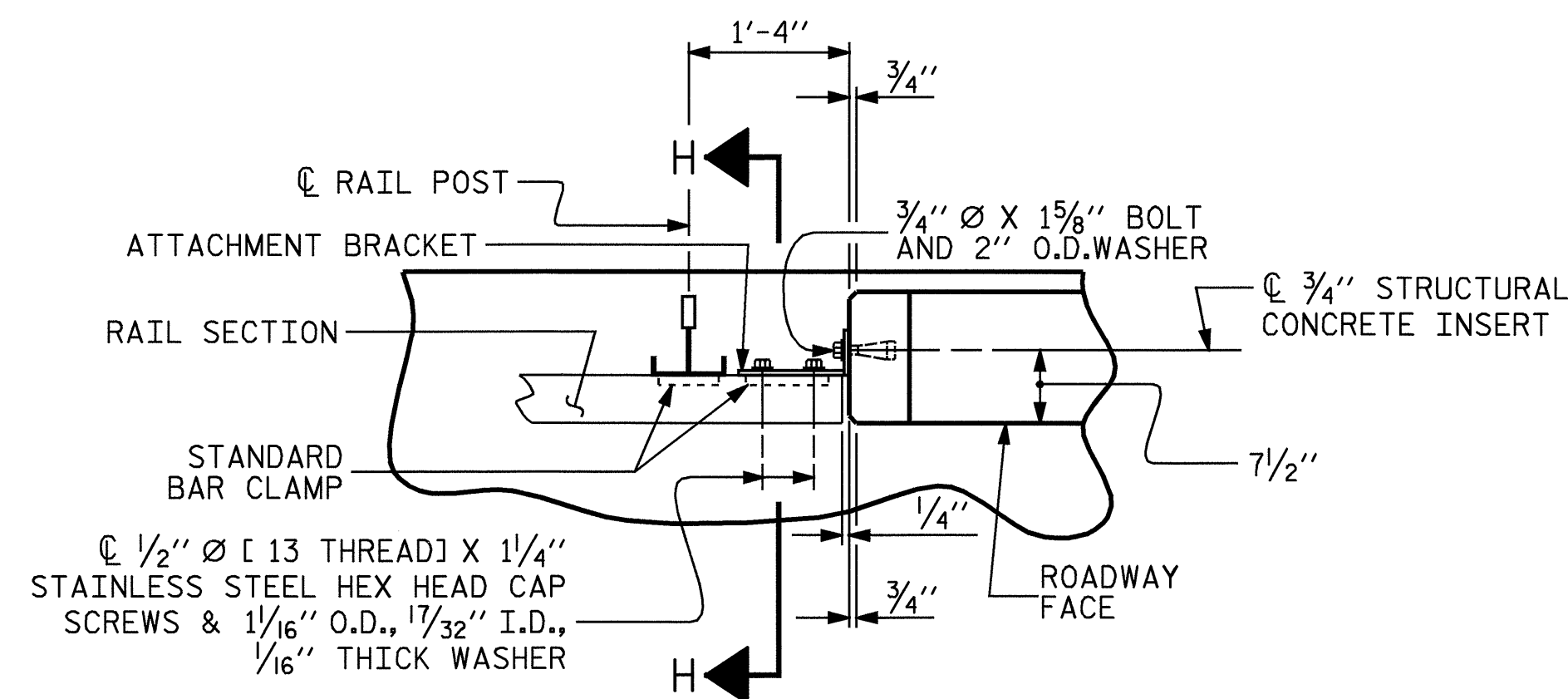
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

3 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS 25
2			4			

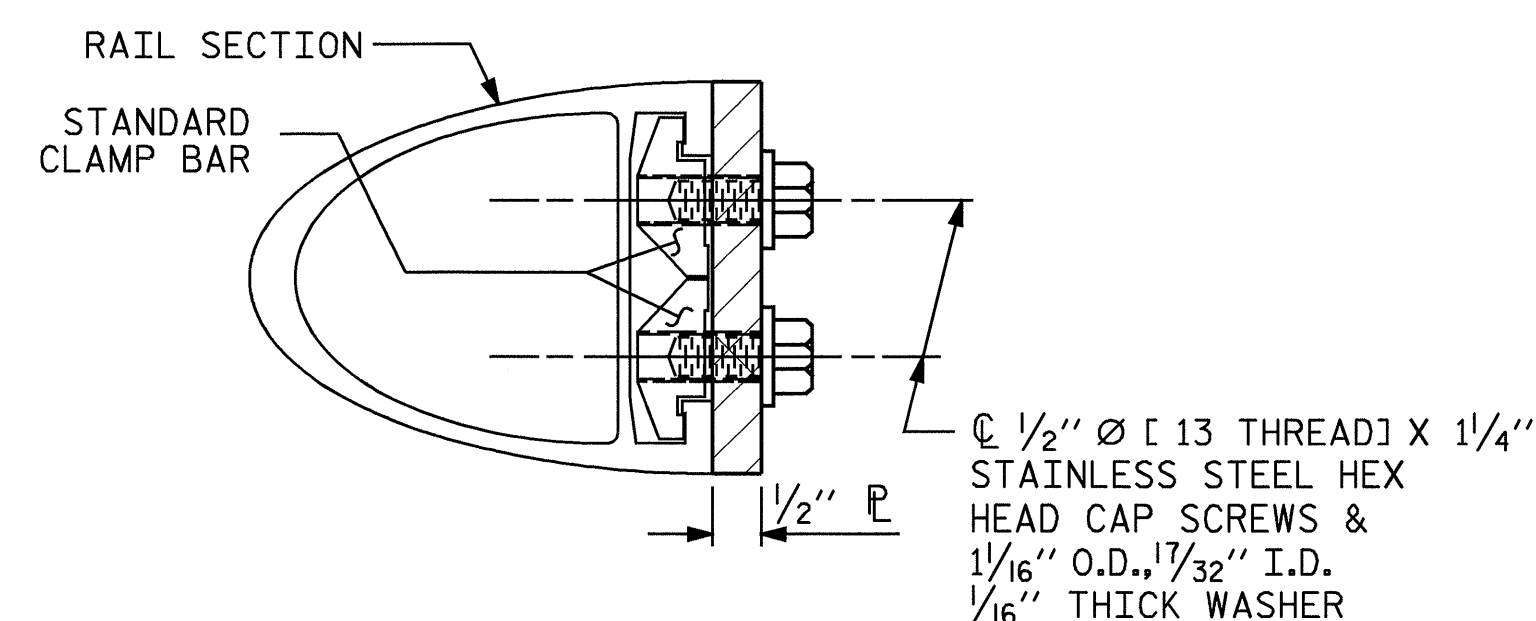


STD. NO. BMR7



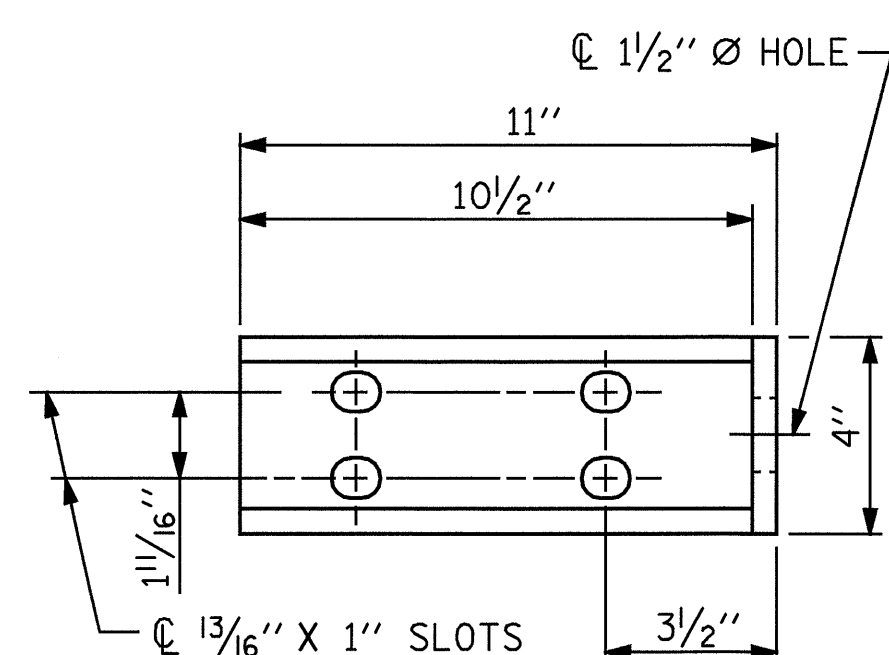
PLAN OF RAIL AND END POST

(STIFFENER ON 1/2" P NOT SHOWN FOR CLARITY)

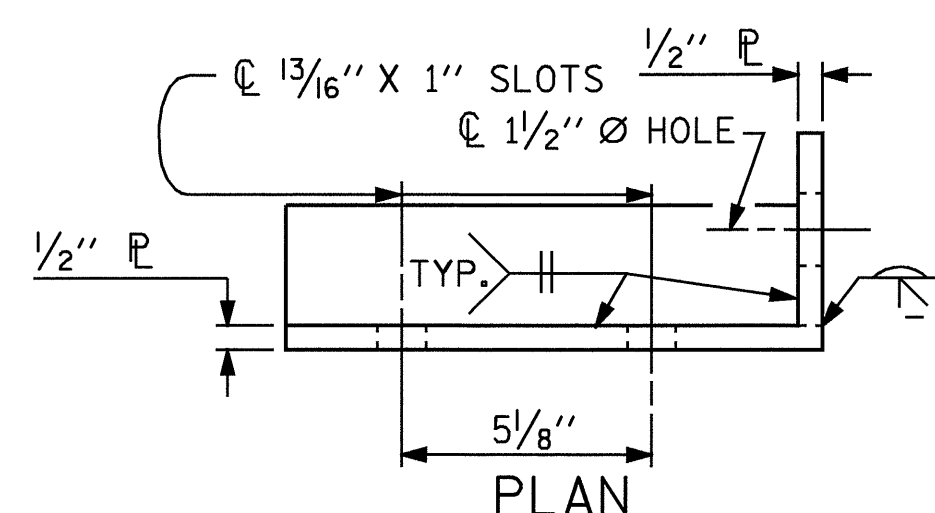


SECTION H-H

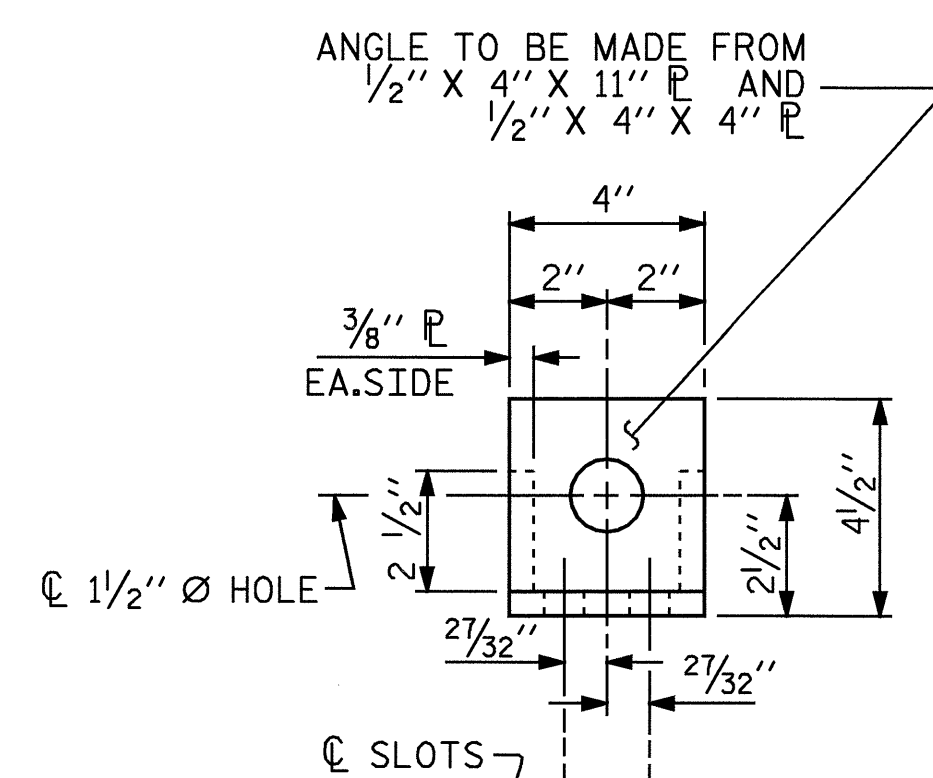
(FOR TOP & MIDDLE RAIL)



ELEVATION



PLAN

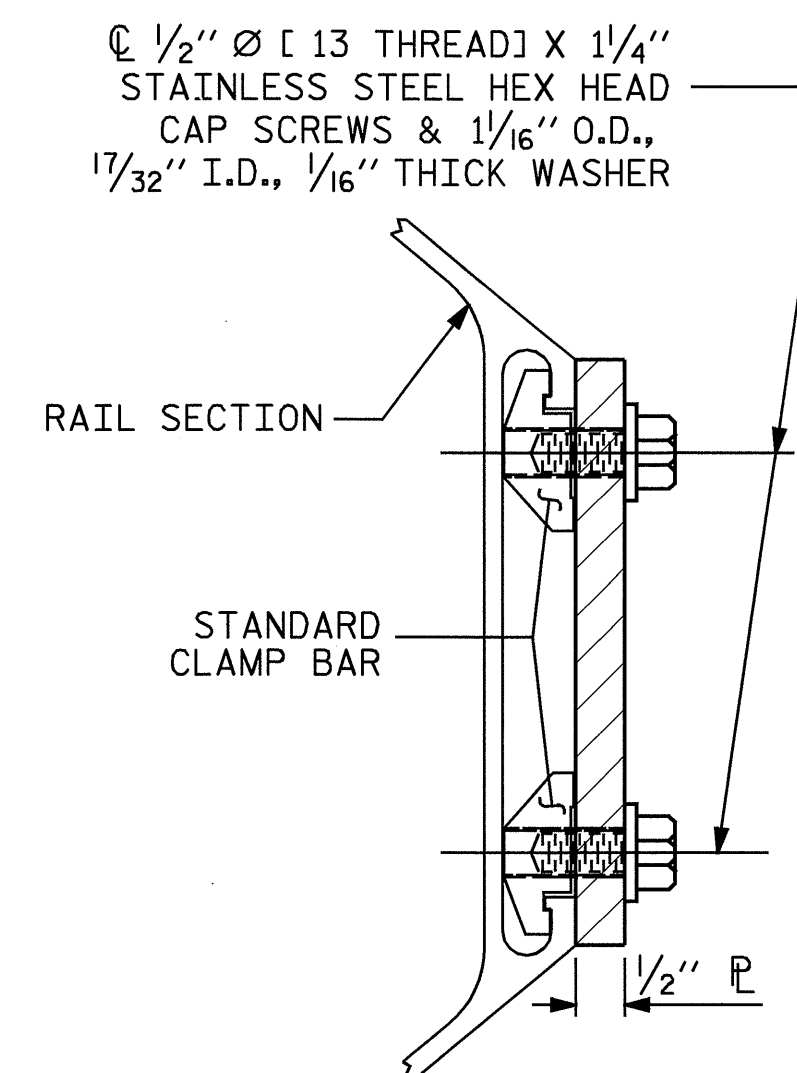


END VIEW

(FIX. AND EXP.)

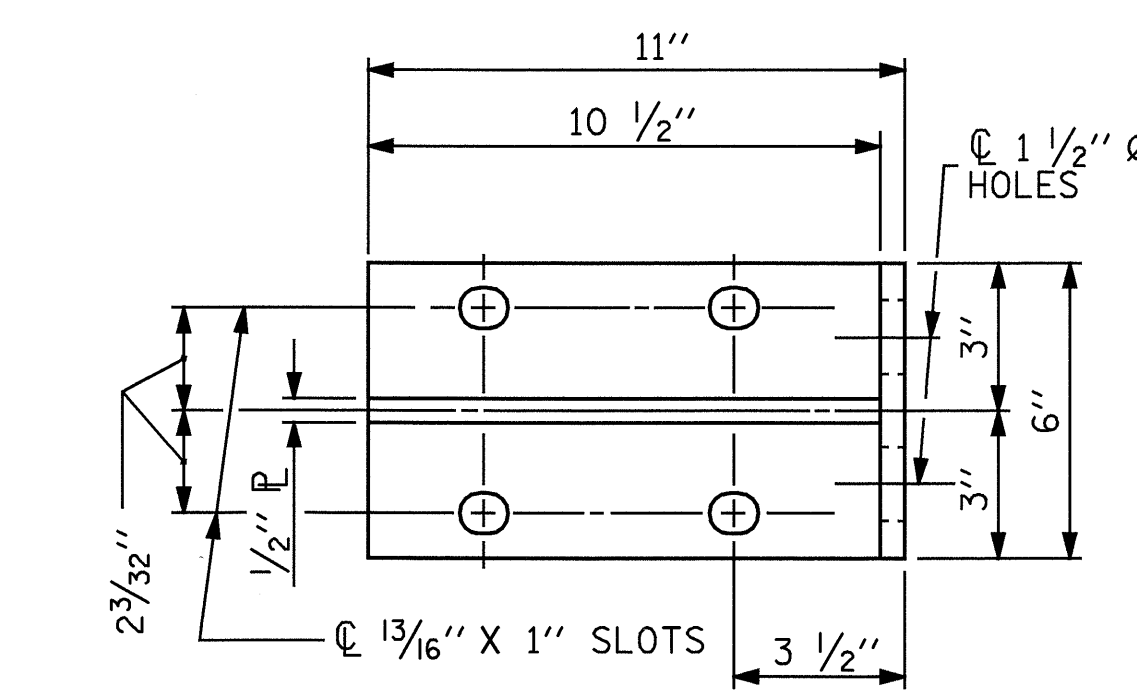
DETAILS FOR ATTACHMENT BRACKET

(TOP & MIDDLE RAIL ONLY)

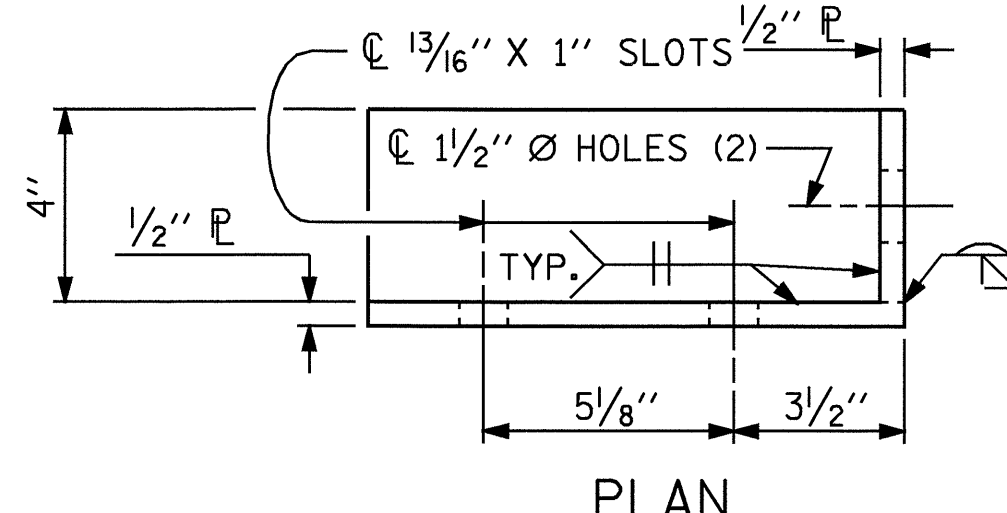


SECTION H-H

(FOR BOTTOM RAIL)



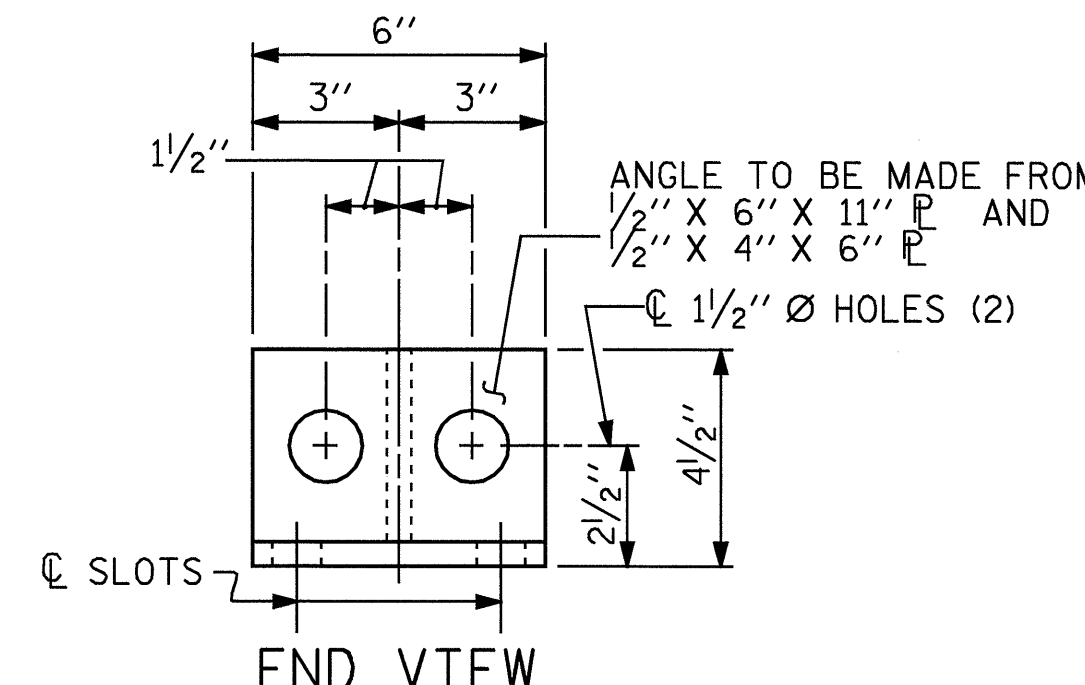
ELEVATION



PLAN

DETAILS FOR ATTACHMENT BRACKET

(BOTTOM RAIL ONLY)



END VIEW

ASSEMBLED BY : A. A. COLE/A.S	DATE : 12/05
CHECKED BY : H. T. BARBOUR	DATE : 1/06
DRAWN BY : JMB	1/88
CHECKED BY : GGH	1/88
REV. 10/17/00	RWW/LES
REV. 5/7/03	RWW/JTE
REV. 5/1/06	TLA/GM

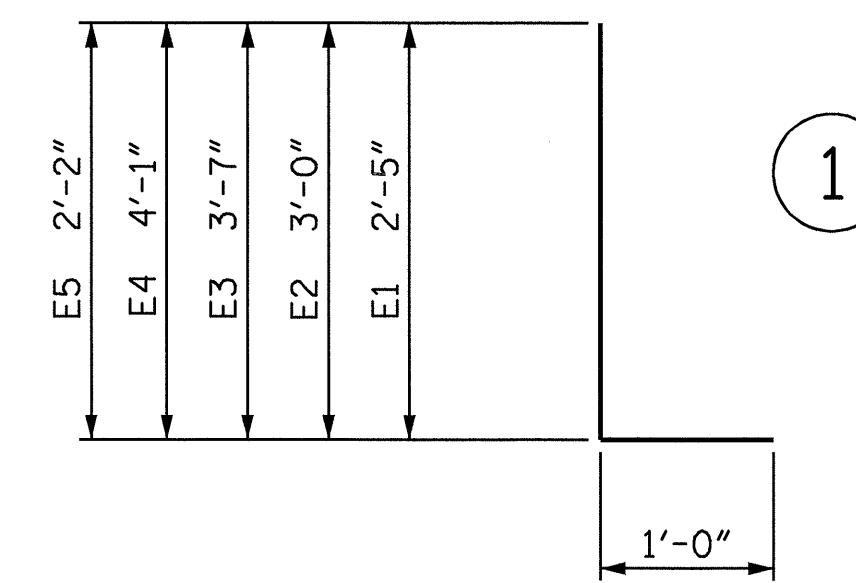
**BILL FOR ONE END POST**

**(4 REQUIRED)**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*E1	2	#7	1	3'-5"	14
*E2	2	#7	1	4'-0"	16
*E3	2	#7	1	4'-7"	19
*E4	2	#7	1	5'-1"	21
*E5	1	#7	1	3'-2"	6
*F1	2	#6	STR	3'-2"	10
*F2	2	#6	STR	3'-5"	10
*F3	1	#6	STR	3'-6"	5
*F4	2	#6	STR	3'-11"	12
*F5	1	#6	STR	4'-1"	6

\* EPOXY COATED REINFORCING STEEL 119  
 CLASS AA CONCRETE 0.5 CY

**BAR TYPE**



ALL BAR DIMENSIONS ARE OUT TO OUT

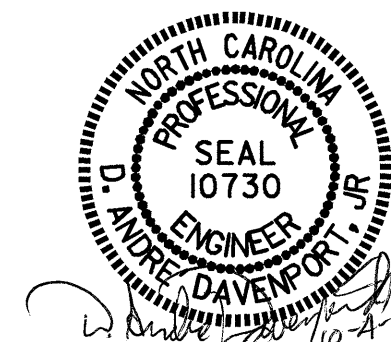
**NOTES**

FOR DETAILS OF CONCRETE INSERTS, GUARDRAILS AND ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" & "3 BAR METAL RAIL" SHEETS.

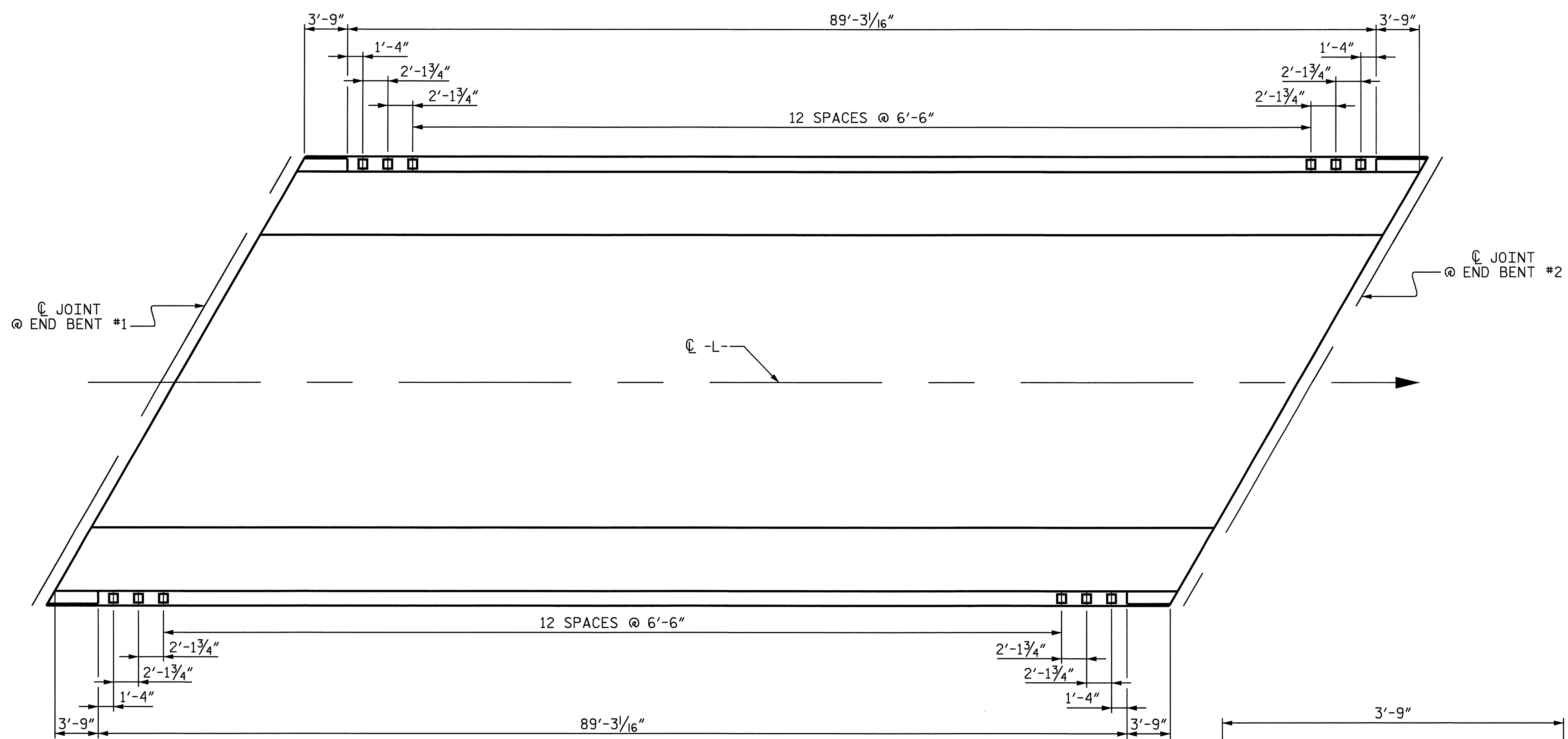
PROJECT NO. B-4128  
GUILFORD COUNTY  
 STATION: 24+02.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

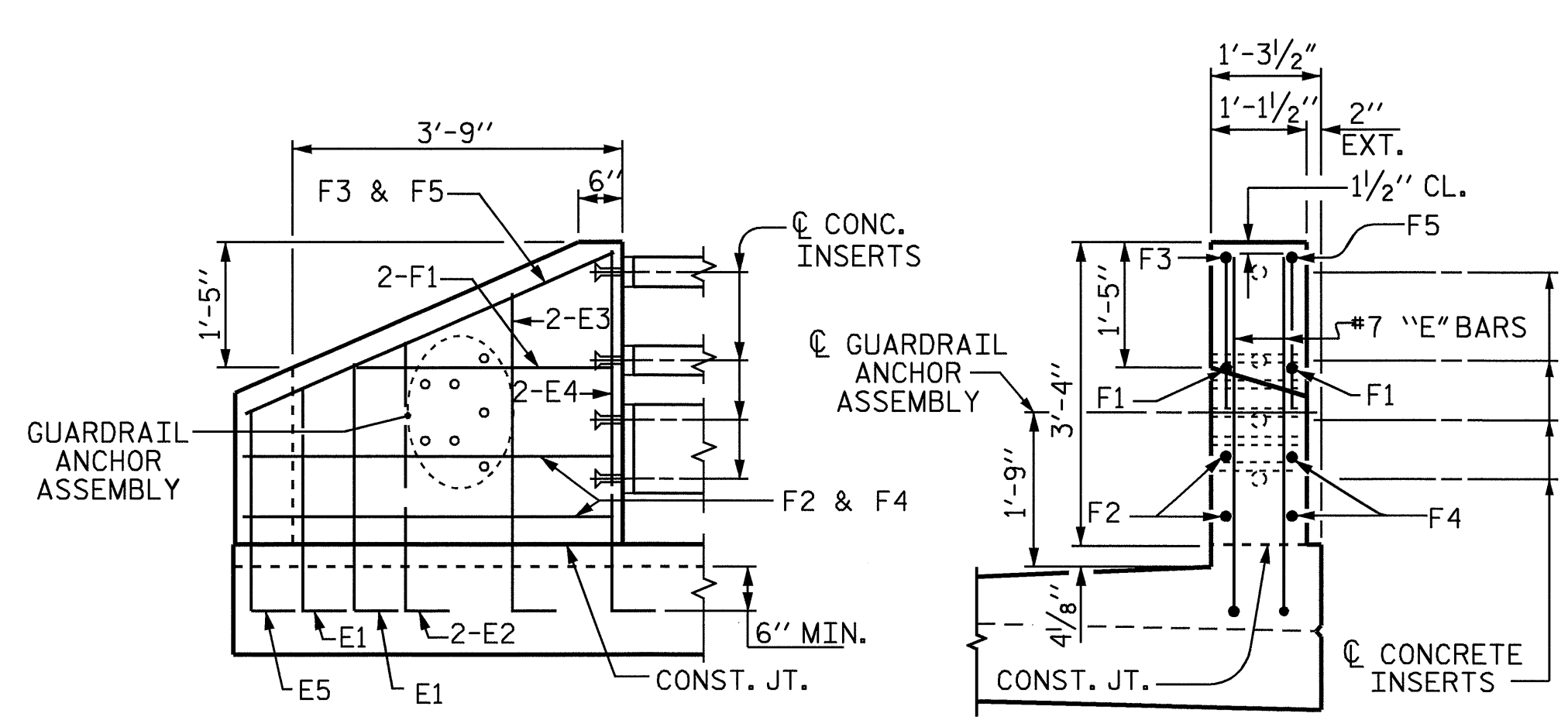
**RAIL POST SPACING AND END POST DETAILS**



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS 25
2			4			

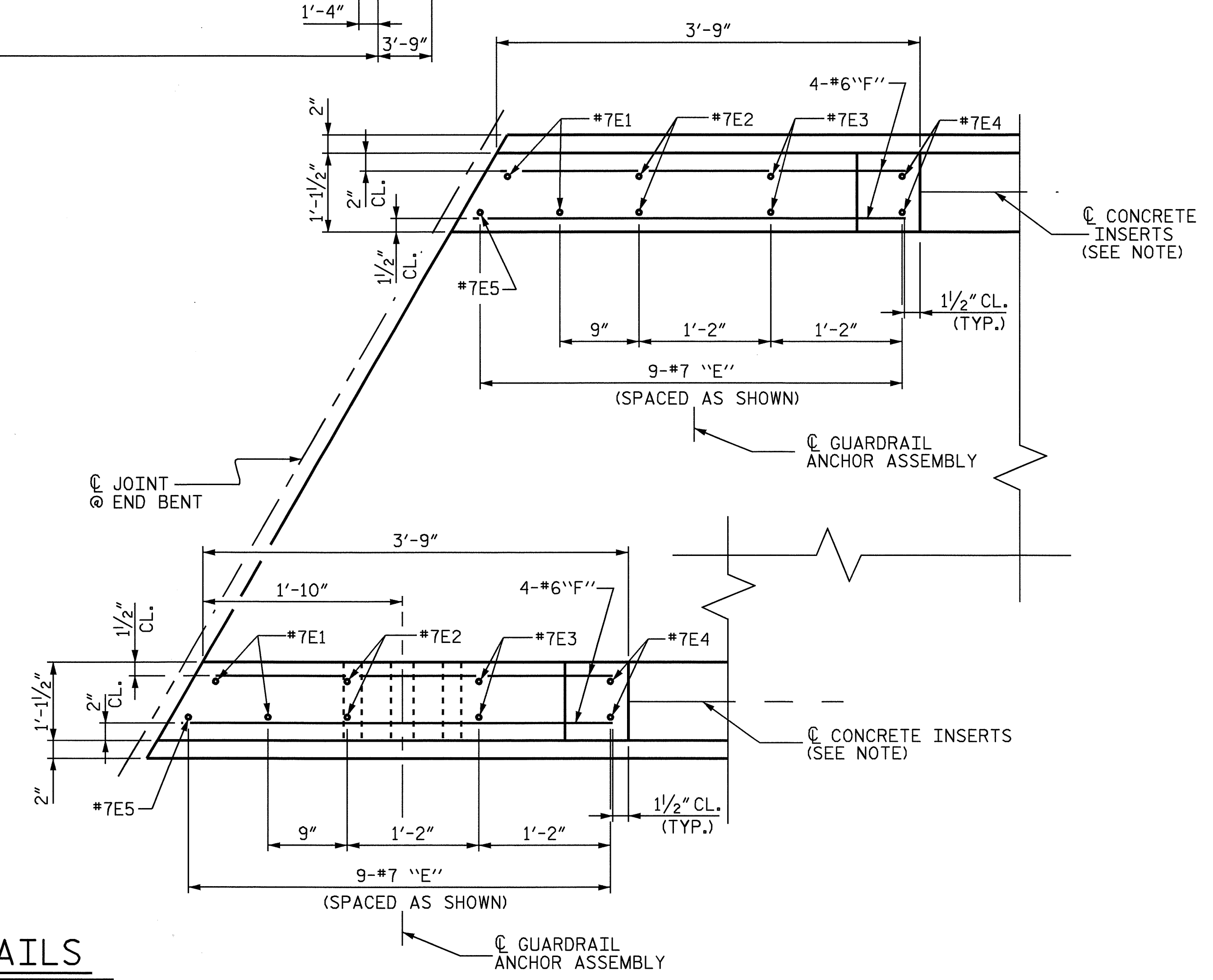


**PLAN**  
**RAIL POST SPACING**



**ELEVATION**

**END VIEW**



**PLAN**

DRAWN BY: A. A. COLE/A.S. DATE: 12/05  
 CHECKED BY: H. T. BARBOUR DATE: 1/06

04-OCT-2007 14:46  
 g:\structures\asor\eng\h\B4128.sd.s\*.dgn  
 ddavenport

NOTES

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

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

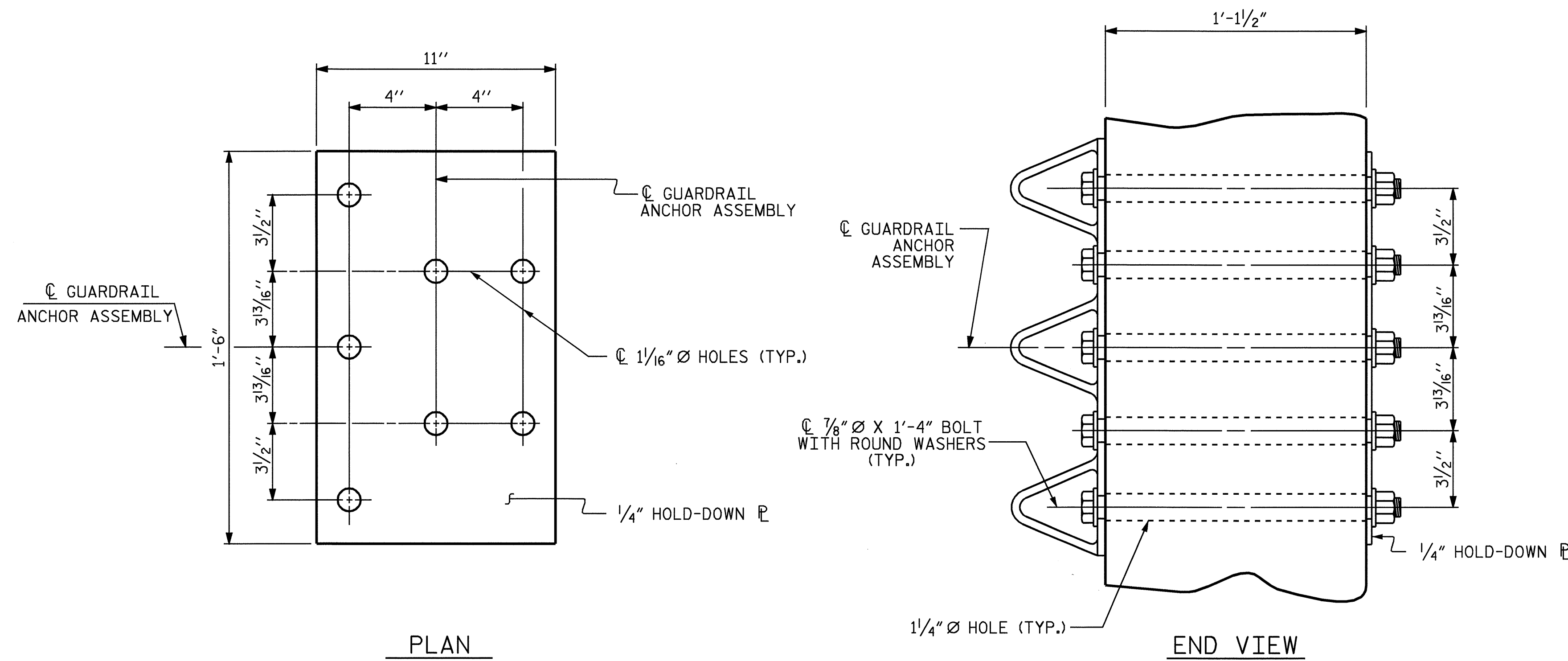
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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

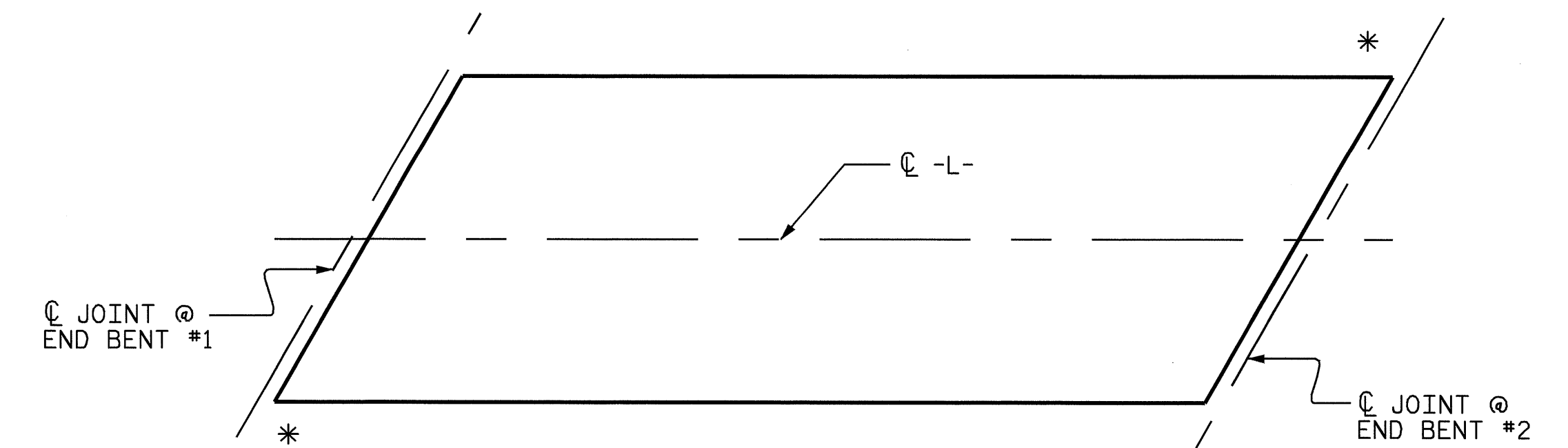
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

THE 1 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.

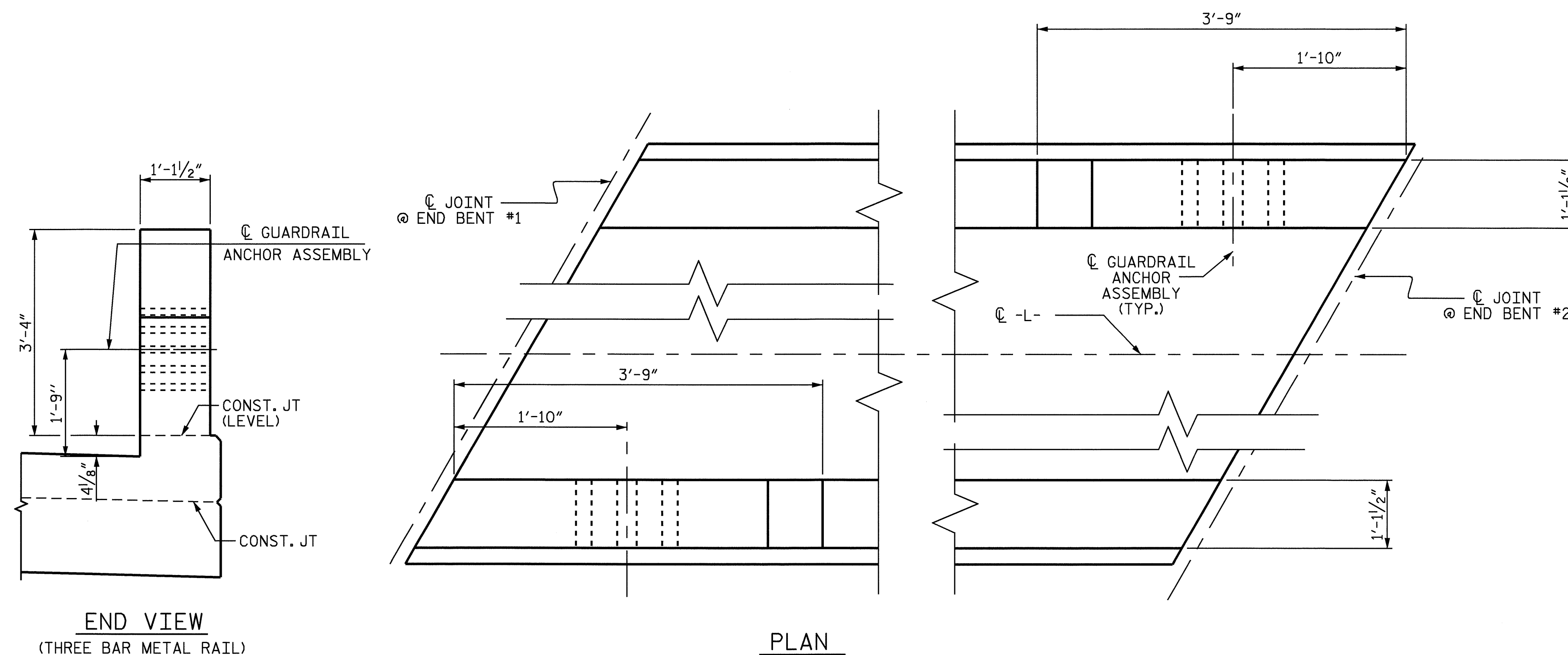


GUARDRAIL ANCHOR ASSEMBLY DETAILS



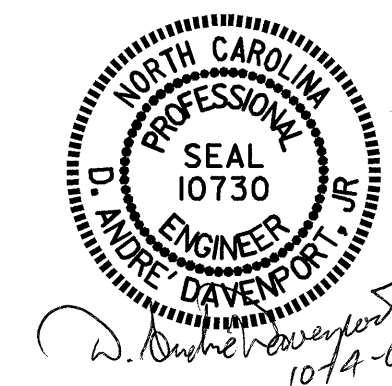
SKETCH SHOWING POINTS OF ATTACHMENT

\* LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4128  
GUILFORD COUNTY  
 STATION: 24+02.00 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-14
TOTAL SHEETS					25

ASSEMBLED BY : A. A. COLE/A.S	DATE : 12/05
CHECKED BY : H. T. BARBOUR	DATE : 1/06
DRAWN BY : EEM	6/94
CHECKED BY : RGW	6/94
REV. 8/16/99	RWW/LES
REV. 10/17/00	RWW/LES
REV. 5/7/03	RWW/JTE

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.

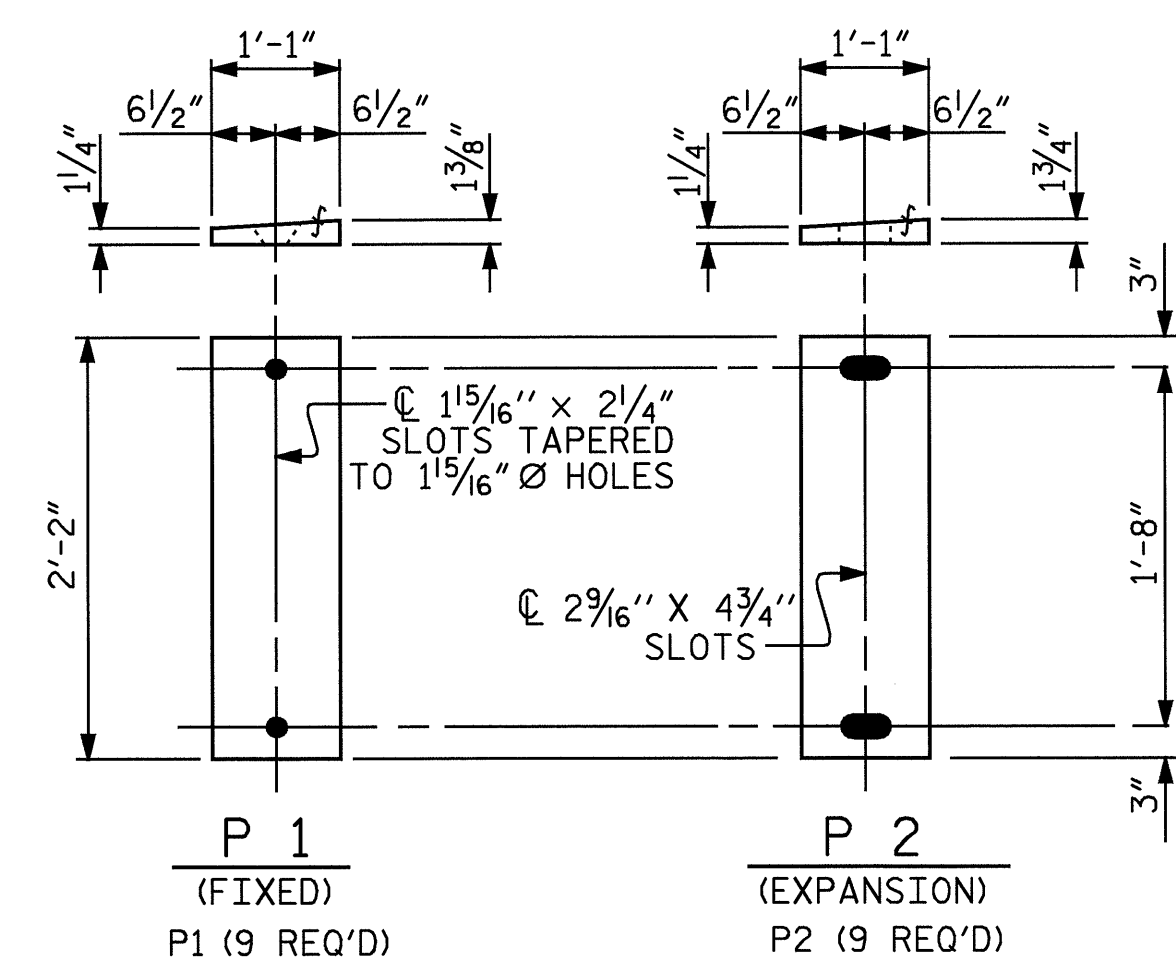
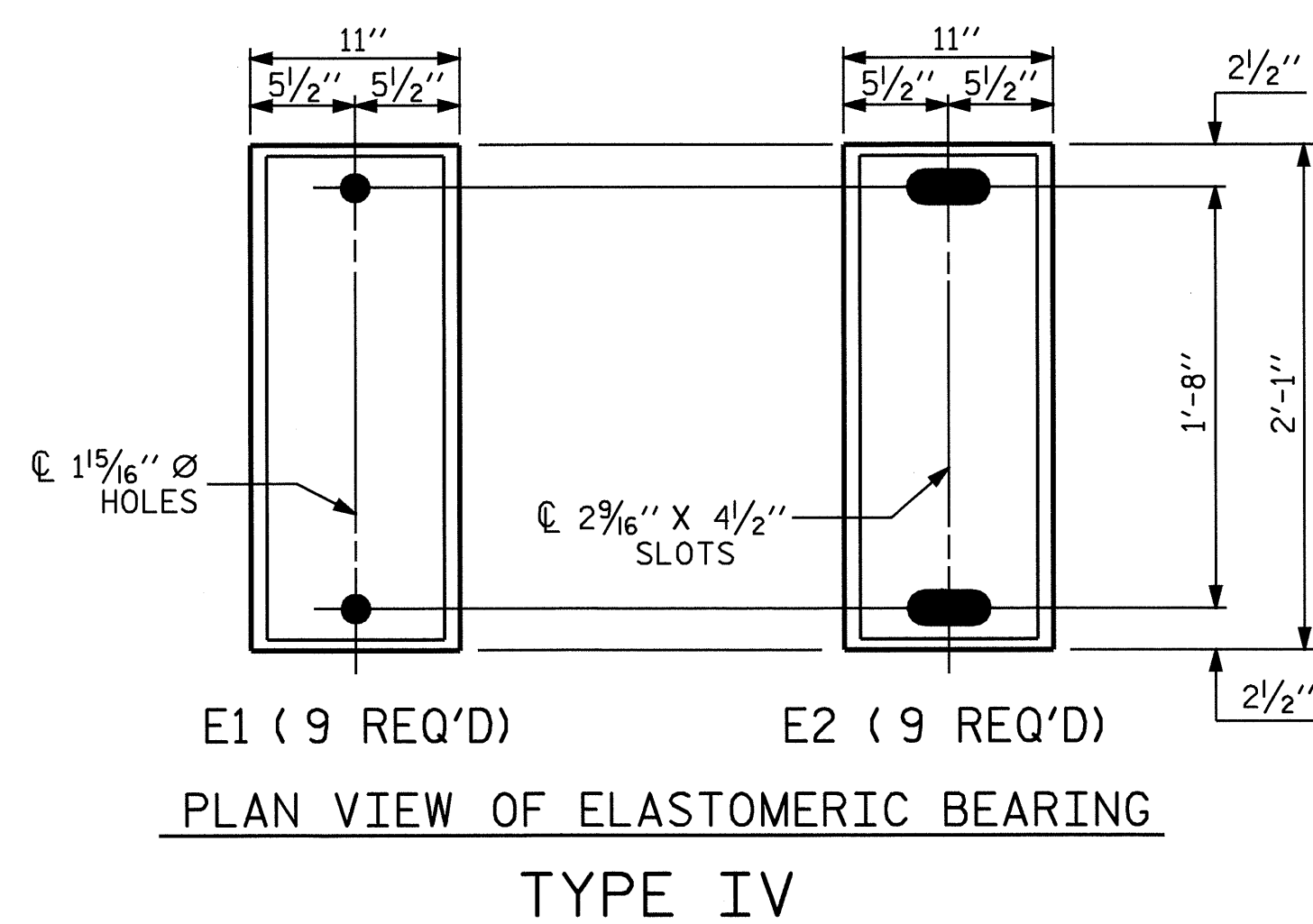
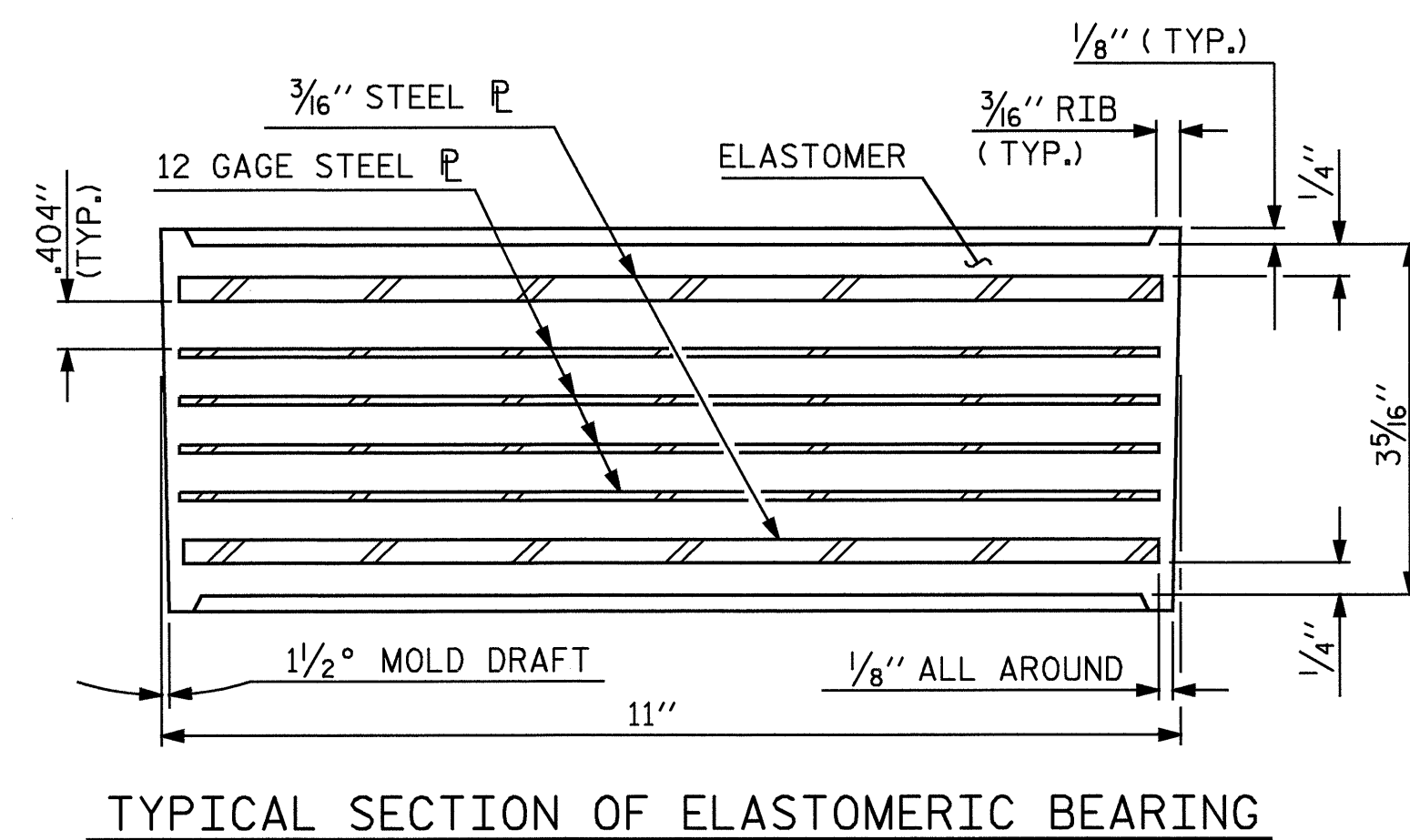
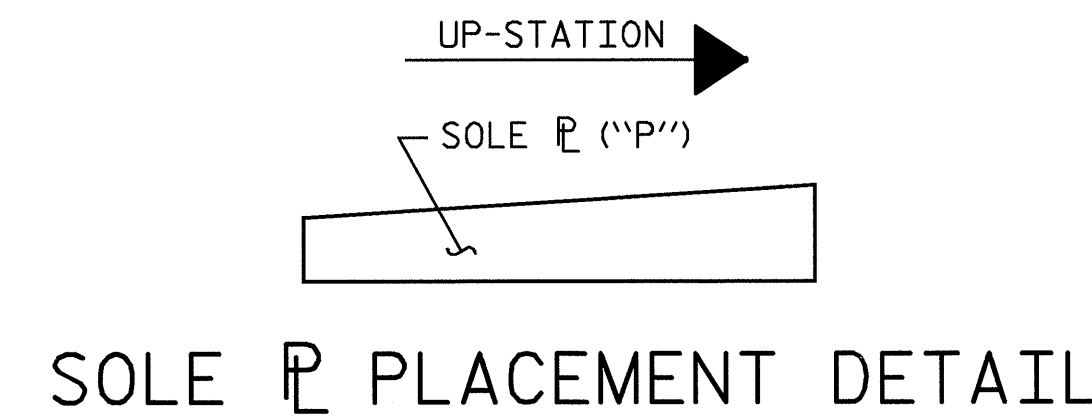
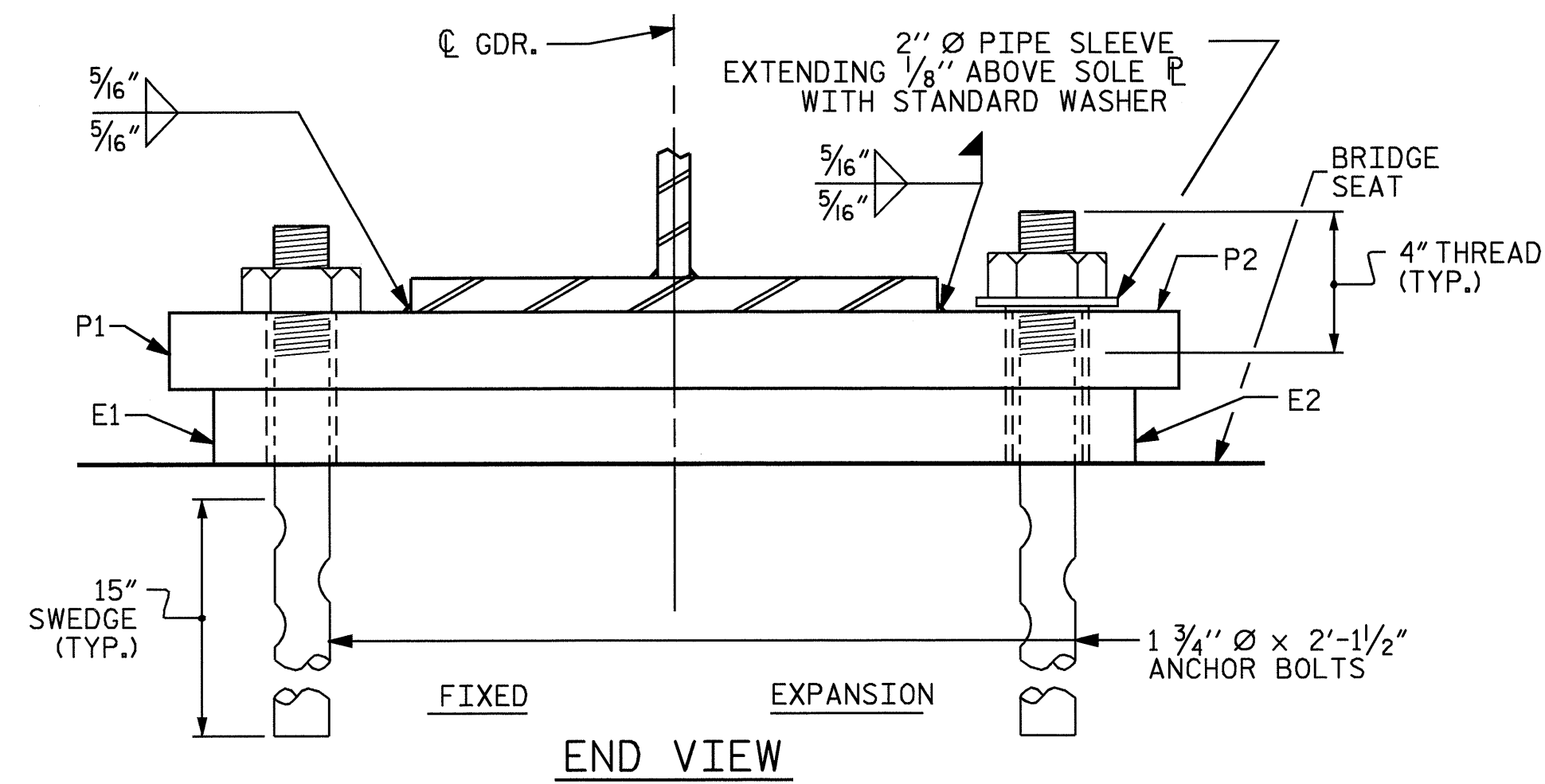
THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

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.

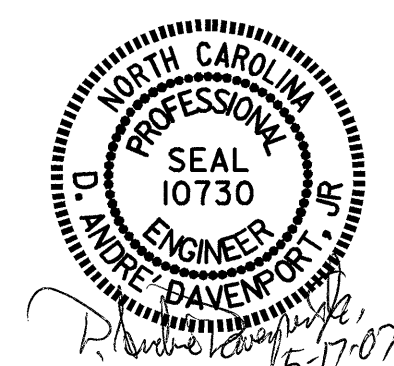
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.



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

PROJECT NO. B-4128  
GUILFORD COUNTY  
 STATION: 24+02.00 -L-

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



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

TOTAL SHEETS: 25

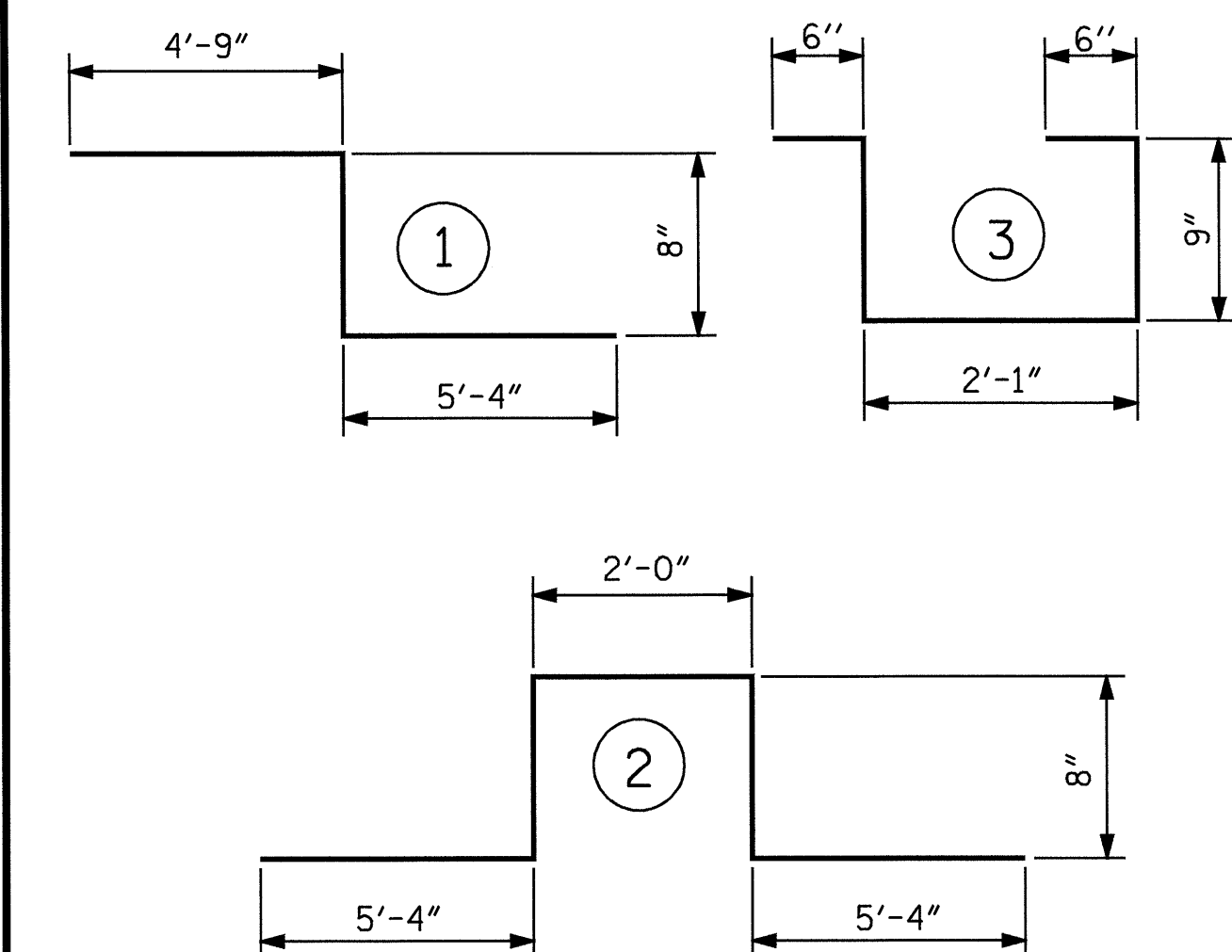
DRAWN BY: A. A. COLE/A.S DATE: 12/05  
 CHECKED BY: H. T. BARBOUR DATE: 1/06



**REINFORCING BAR SCHEDULE**

SPAN A																													
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT						
*A1	194	#5	STR	39'-11"	8077	*A120	4	#5	STR	40'-1"	167	A201	8	#5	STR	39'-0"	325	A223	4	#5	STR	34'-5"	144	*D1	112	#4	STR	0'-8"	50
A2	194	#5	STR	39'-9"	8043	*A121	4	#5	STR	38'-2"	159	A202	8	#5	STR	38'-1"	318	A224	4	#5	STR	32'-7"	136						
*A101	8	#5	STR	39'-2"	327	*A122	4	#5	STR	36'-4"	152	A203	8	#5	STR	37'-2"	310	A225	4	#5	STR	30'-8"	128	*G1	4	#5	STR	45'-11"	192
*A102	8	#5	STR	38'-3"	319	*A123	4	#5	STR	34'-5"	144	A204	8	#5	STR	36'-2"	302	A226	4	#5	STR	28'-10"	120	*G2	188	#4	STR	6'-3"	785
*A103	8	#5	STR	37'-4"	312	*A124	4	#5	STR	32'-7"	136	A205	8	#5	STR	35'-3"	294	A227	4	#5	STR	26'-11"	112						
*A104	8	#5	STR	36'-4"	303	*A125	4	#5	STR	30'-8"	128	A206	8	#5	STR	34'-4"	286	A228	4	#5	STR	25'-1"	105	*K1	12	#5	1	10'-9"	135
*A105	8	#5	STR	35'-5"	296	*A126	4	#5	STR	28'-10"	120	A207	8	#5	STR	33'-5"	279	A229	4	#5	STR	23'-2"	97	*K2	42	#5	2	14'-0"	613
*A106	8	#5	STR	34'-6"	288	*A127	4	#5	STR	26'-11"	112	A208	8	#5	STR	32'-5"	270	A230	4	#5	STR	21'-4"	89						
*A107	8	#5	STR	33'-7"	280	*A128	4	#5	STR	25'-1"	105	A209	8	#5	STR	31'-6"	263	A231	4	#5	STR	19'-5"	81	*S1	128	#4	3	4'-7"	392
*A108	8	#5	STR	32'-7"	272	*A129	4	#5	STR	23'-2"	97	A210	4	#5	STR	58'-10"	245	A232	4	#5	STR	17'-7"	73						
*A109	8	#5	STR	31'-8"	264	*A130	4	#5	STR	21'-4"	89	A211	4	#5	STR	57'-0"	238	A233	4	#5	STR	15'-8"	65						
*A110	4	#5	STR	58'-10"	245	*A131	4	#5	STR	19'-5"	81	A212	4	#5	STR	55'-1"	230	A234	4	#5	STR	13'-10"	58						
*A111	4	#5	STR	57'-0"	238	*A132	4	#5	STR	17'-7"	73	A213	4	#5	STR	53'-3"	222	A235	4	#5	STR	11'-11"	50						
*A112	4	#5	STR	55'-1"	230	*A133	4	#5	STR	15'-8"	65	A214	4	#5	STR	51'-4"	214	A236	4	#5	STR	10'-1"	42						
*A113	4	#5	STR	53'-3"	222	*A134	4	#5	STR	13'-10"	58	A215	4	#5	STR	49'-6"	207	A237	4	#5	STR	8'-2"	34						
*A114	4	#5	STR	51'-4"	214	*A135	4	#5	STR	11'-11"	50	A216	4	#5	STR	47'-7"	199	A238	4	#5	STR	6'-4"	26						
*A115	4	#5	STR	49'-6"	207	*A136	4	#5	STR	10'-1"	42	A217	4	#5	STR	45'-9"	191	A239	4	#5	STR	4'-5"	18						
*A116	4	#5	STR	47'-7"	199	*A137	4	#5	STR	8'-2"	34	A218	4	#5	STR	43'-10"	183	A240	4	#5	STR	2'-7"	11						
*A117	4	#5	STR	45'-9"	191	*A138	4	#5	STR	6'-4"	26	A219	4	#5	STR	41'-11"	175												
*A118	4	#5	STR	43'-10"	183	*A139	4	#5	STR	4'-5"	18	A220	4	#5	STR	40'-1"	167	*B1	256	#4	STR	25'-10	4418						
*A119	4	#5	STR	41'-11"	175	*A140	4	#5	STR	2'-7"	11	A221	4	#5	STR	38'-2"	159	B2	176	#5	STR	49'-8"	9117						
												A222	4	#5	STR	36'-4"	152												
																				REINFORCING STEEL = 23,778LBS									
																				*EPOXY COATED REINF. STEEL = 21,294 LBS									

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT

**DEAD LOAD DEFLECTION TABLE FOR GIRDERS**

TENTH POINTS	SPAN A GIRDERS 1 & 9											SPAN A GIRDERS 2,3, 7, 8											SPAN A GIRDERS 4, 5, 6											
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
	DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.025	0.046	0.063	0.073	0.077	0.073	0.063	0.046	0.025	0.000	0.000	0.025	0.046	0.063	0.073	0.077	0.073	0.063	0.046	0.025	0.000	0.000	0.025	0.046	0.063	0.073	0.077	0.073	0.063	0.046	0.025
DEFLECTION DUE TO WEIGHT OF SLAB	↓	0.000	0.092	0.183	0.254	0.298	0.314	0.298	0.254	0.183	0.092	0.000	0.000	0.088	0.176	0.244	0.286	0.302	0.286	0.244	0.176	0.088	0.000	0.000	0.084	0.168	0.233	0.275	0.289	0.275	0.233	0.168	0.084	0.000
DEFLECTION DUE TO WEIGHT OF SIDEWALK	↓	0.000	0.010	0.019	0.026	0.031	0.032	0.031	0.026	0.019	0.010	0.000	0.000	0.010	0.019	0.025	0.030	0.031	0.030	0.025	0.019	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.127	0.248	0.343	0.402	0.423	0.402	0.343	0.248	0.127	0.000	0.000	0.123	0.241	0.332	0.389	0.410	0.389	0.332	0.241	0.123	0.000	0.000	0.109	0.214	0.296	0.348	0.366	0.348	0.296	0.214	0.109	0.000
VERTICAL CURVE ORDINATE	↑	0.000	-0.097	-0.172	-0.226	-0.258	-0.269	-0.258	-0.226	-0.172	-0.097	0.000	0.000	-0.097	-0.172	-0.226	-0.258	-0.269	-0.258	-0.226	-0.172	-0.097	0.000	0.000	-0.097	-0.172	-0.226	-0.258	-0.269	-0.258	-0.226	-0.172	-0.097	0.000
REQUIRED CAMBER	0	3/8"	15/16"	13/8"	13/4"	17/8"	13/4"	13/8"	15/16"	3/8"	0	0	5/16"	13/16"	1/4"	19/16"	11/16"	19/16"	1/4"	13/16"	5/16"	0	0	1/8"	1/2"	7/8"	1/16"	13/16"	1/16"	7/8"	1/2"	1/8"	0	

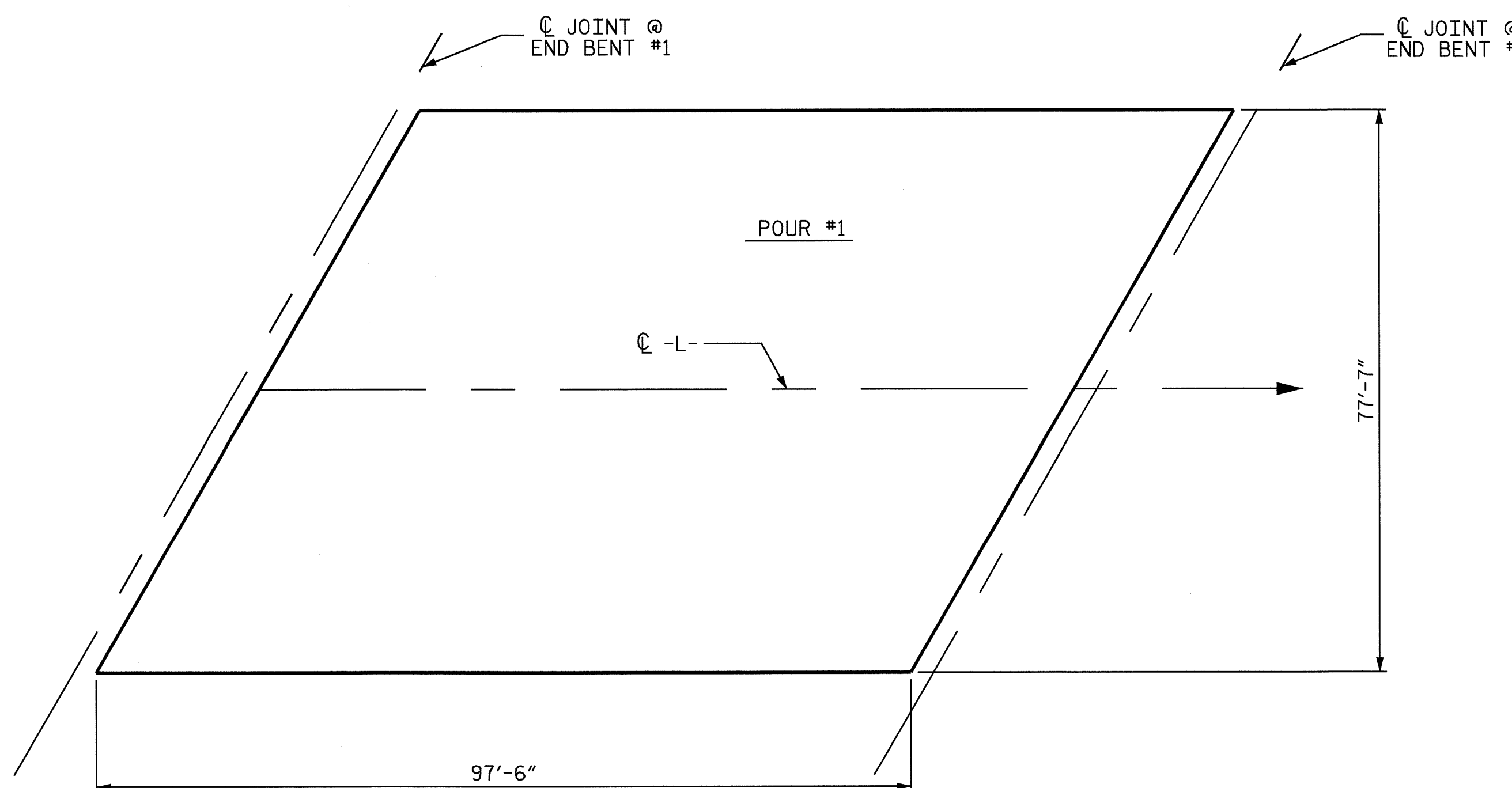
\* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER," WHICH IS GIVEN IN INCHES (FRACTION FORM).

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

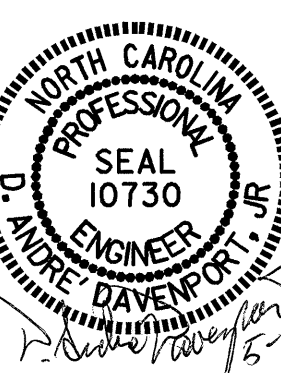
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-9"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

**GROOVING BRIDGE FLOORS**

APPROACH SLABS	2891 SQ.FT.
BRIDGE DECK	5859 SQ.FT.
TOTAL	8750 SQ.FT.



LAYOUT FOR COMPUTING AREA  
OF REINFORCED CONCRETE DECK SLAB  
(SQ. FT. = 7564)



**SUPERSTRUCTURE BILL OF MATERIAL**

	CLASS AA CONCRETE (CU.YDS.)	REINFORCING STEEL (LBS.)	*EPOXY COATED REINFORCING STEEL (LBS.)
SLAB	242.9		
SIDEWALK	33.5		
TOTALS**	276.4	23,778	21,294

\*\* QUANTITIES FOR END POSTS ARE NOT INCLUDED

PROJECT NO. B-4128  
GUILFORD COUNTY  
STATION: 24+02.00 -L-

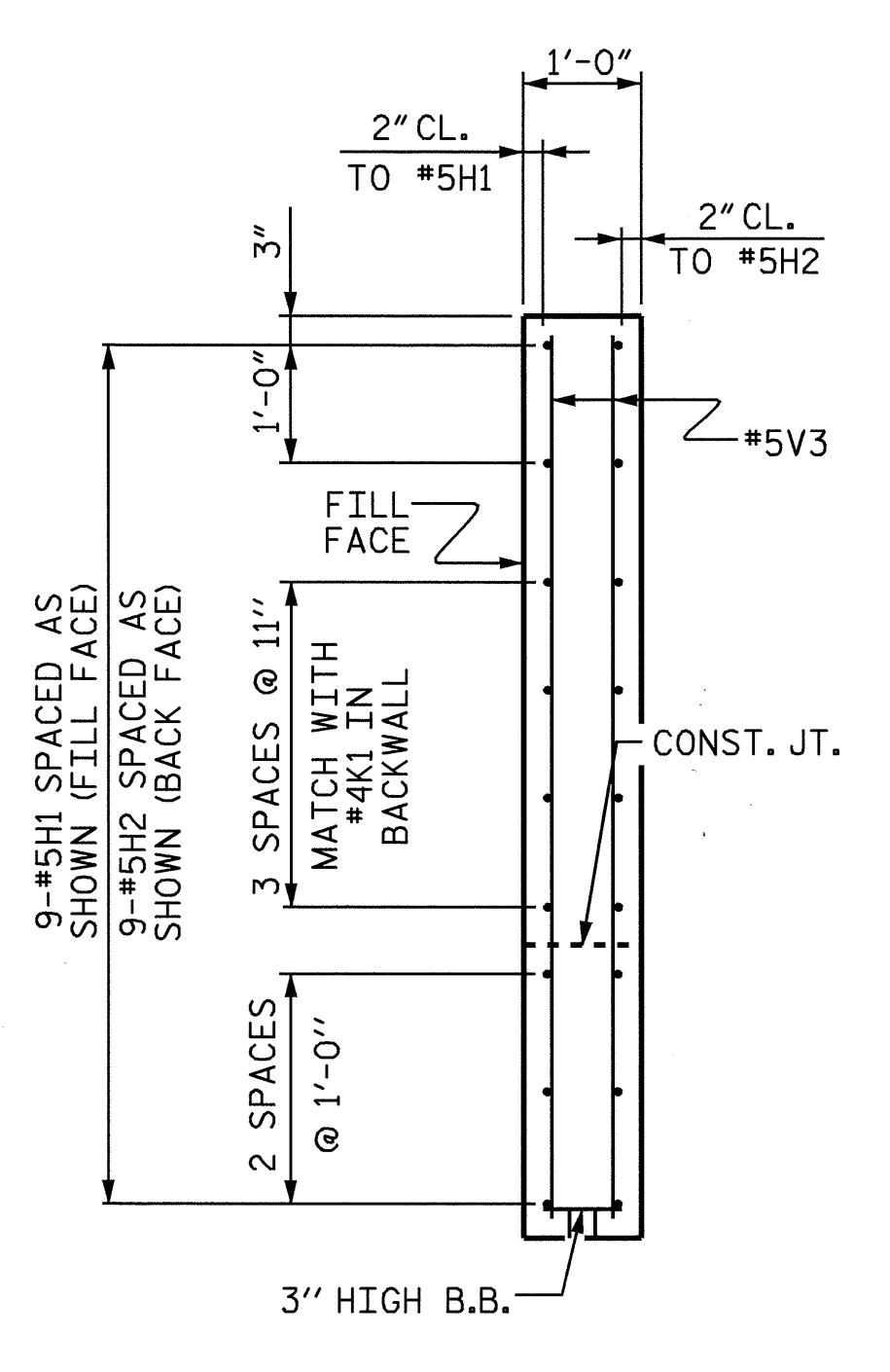
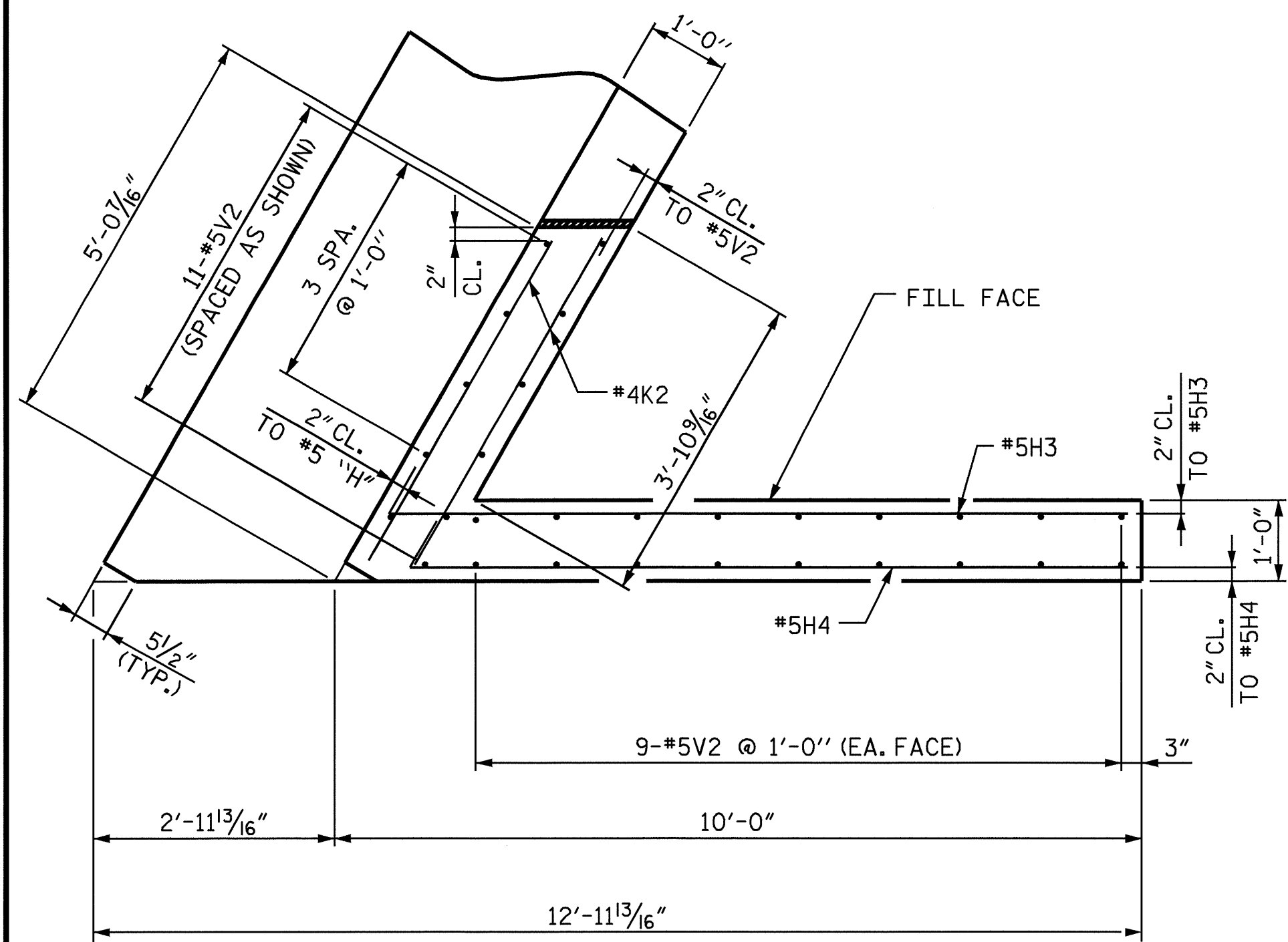
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUPERSTRUCTURE  
BILL OF MATERIAL &  
DEAD LOAD DEFLECTION**

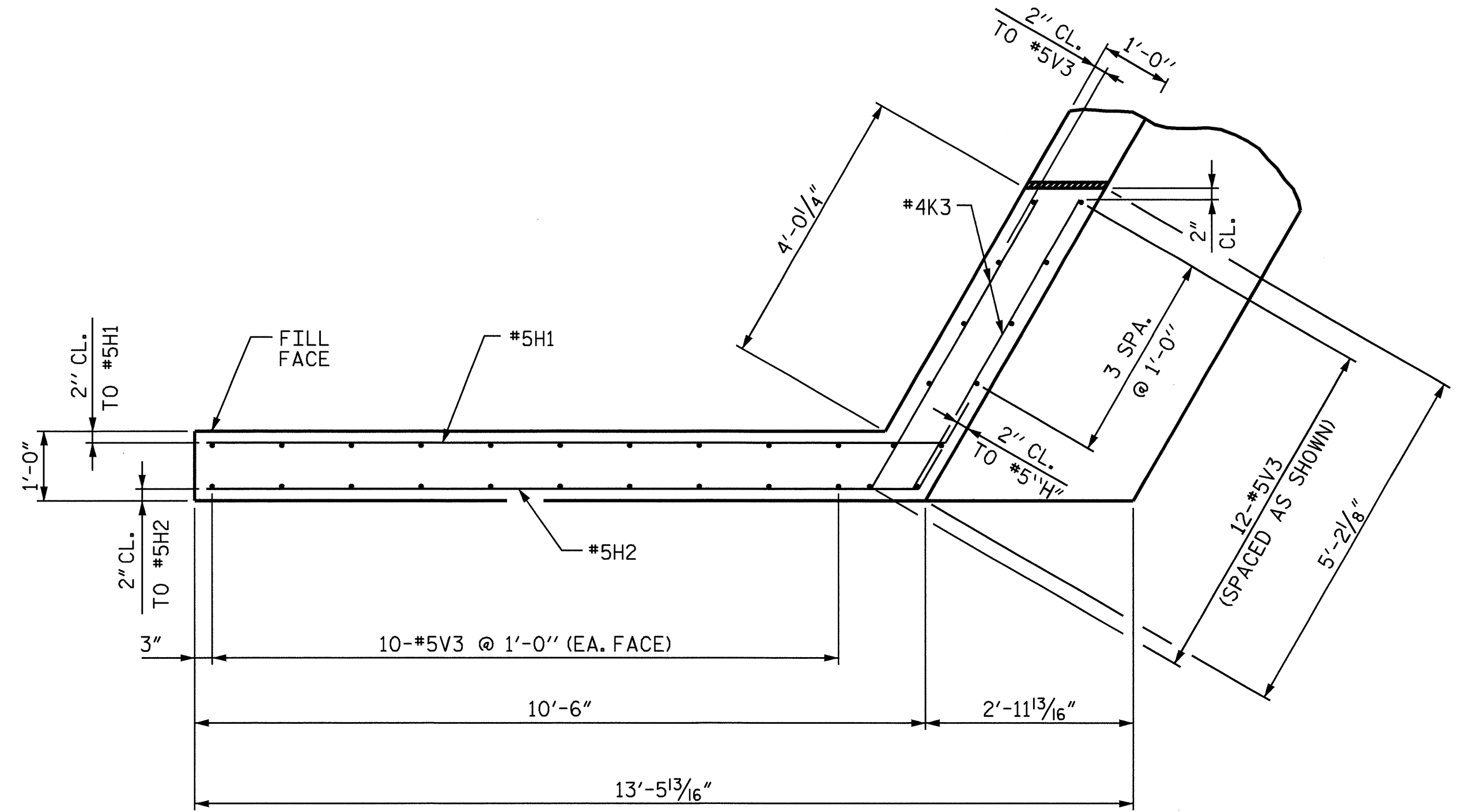
ASSEMBLED BY: A. A. COLE/A.S DATE: 12/05  
CHECKED BY: H. T. BARBOUR DATE: 1/06  
DRAWN BY: JMB 5/87 REV. 6/1/94 EEM/GRP  
CHECKED BY: SJD 9/87 REV. 8/16/99 RWW/LES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS S-25
2			4			



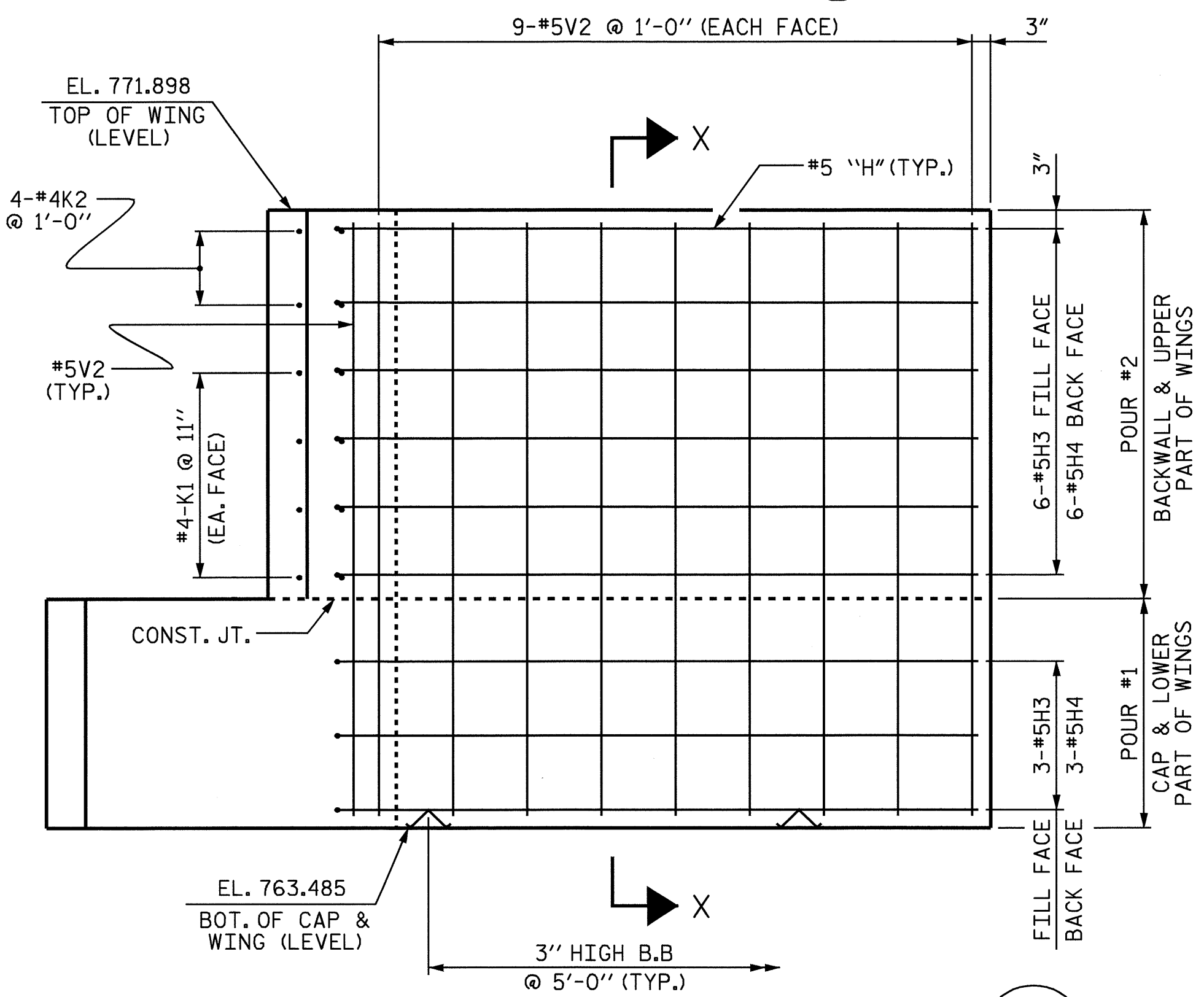


SECTION Y-Y

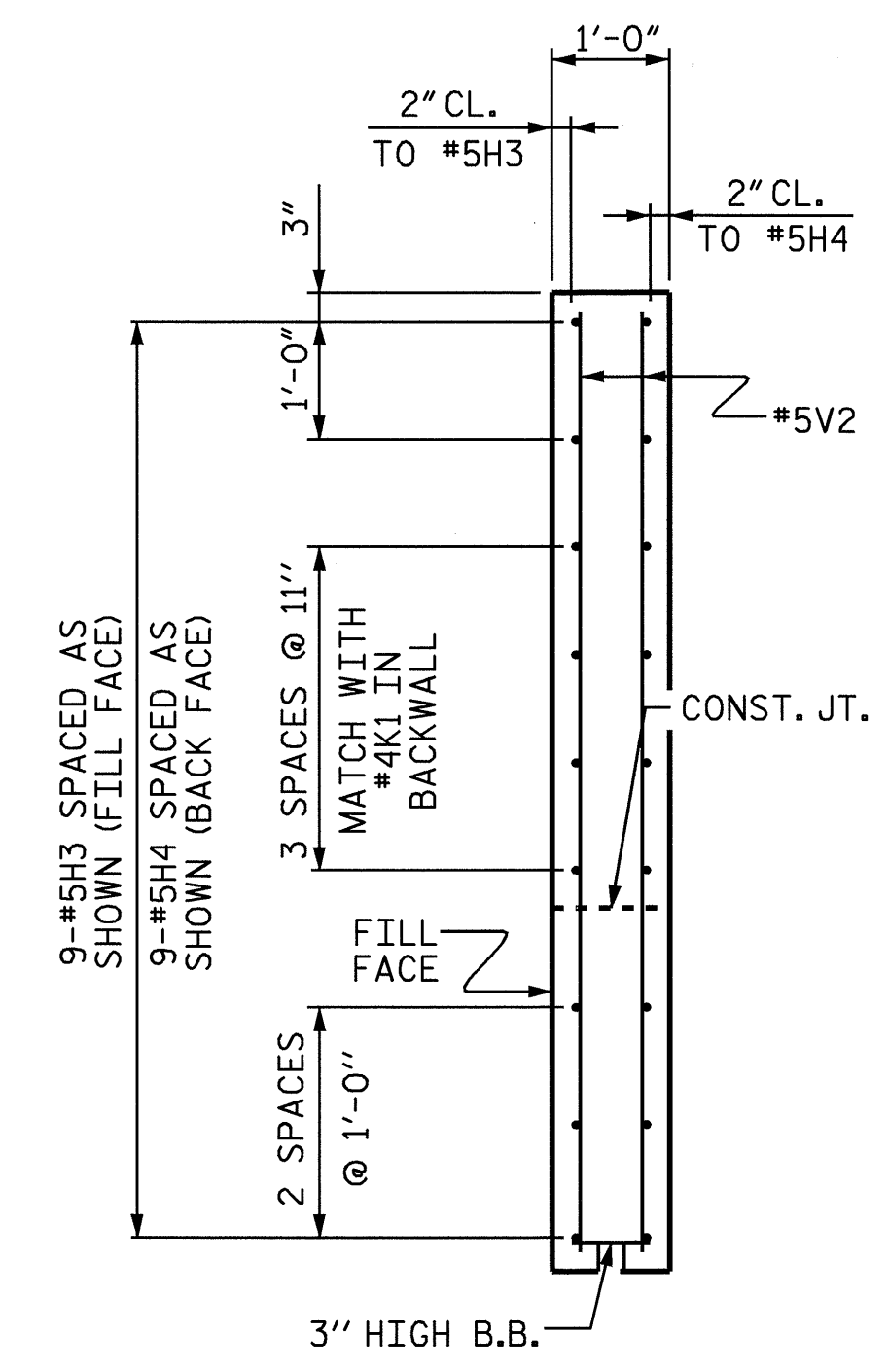


PLAN OF RIGHT WING - W2

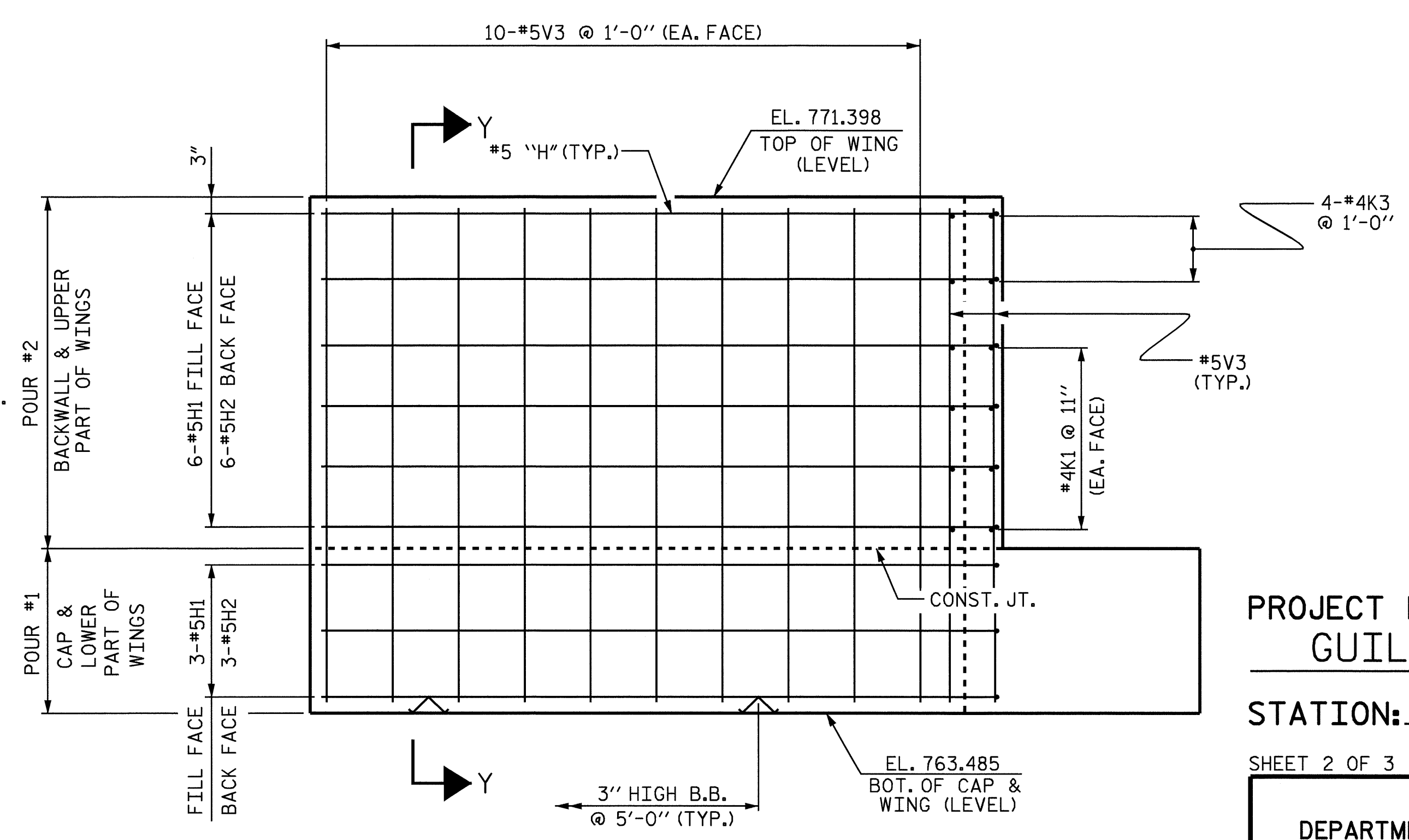
PLAN OF LEFT WING - W1



ELEVATION OF LEFT WING - W1



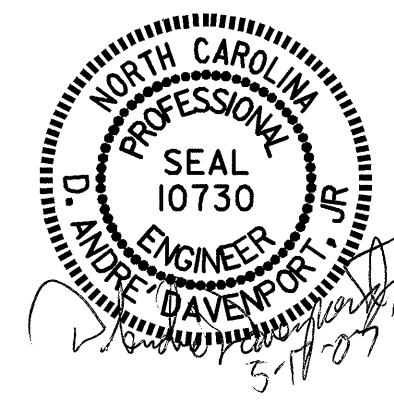
SECTION X-X



ELEVATION OF RIGHT WING - W2

PROJECT NO. B-4128  
 GUILFORD COUNTY  
 STATION: 24+02.00 -L-

SHEET 2 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT #1  
 WING DETAILS



DRAWN BY: B. L. GREEN/M.G.S. DATE: 1/06  
 CHECKED BY: H. T. BARBOUR DATE: 2/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			25
2			4			



**NOTES**

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

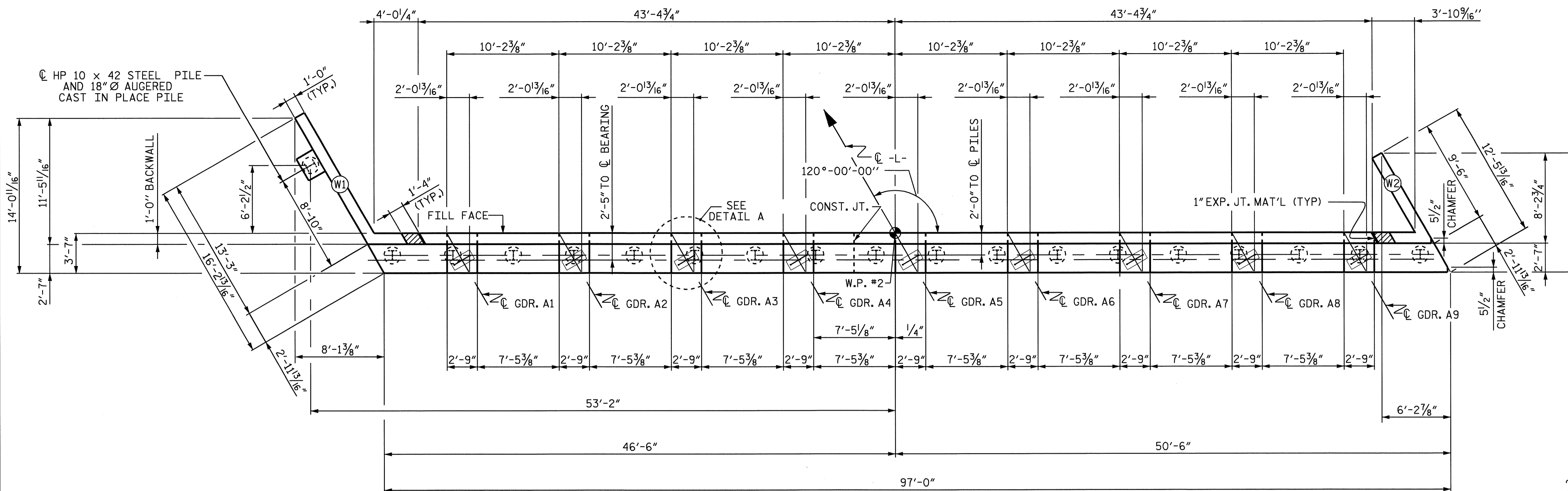
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

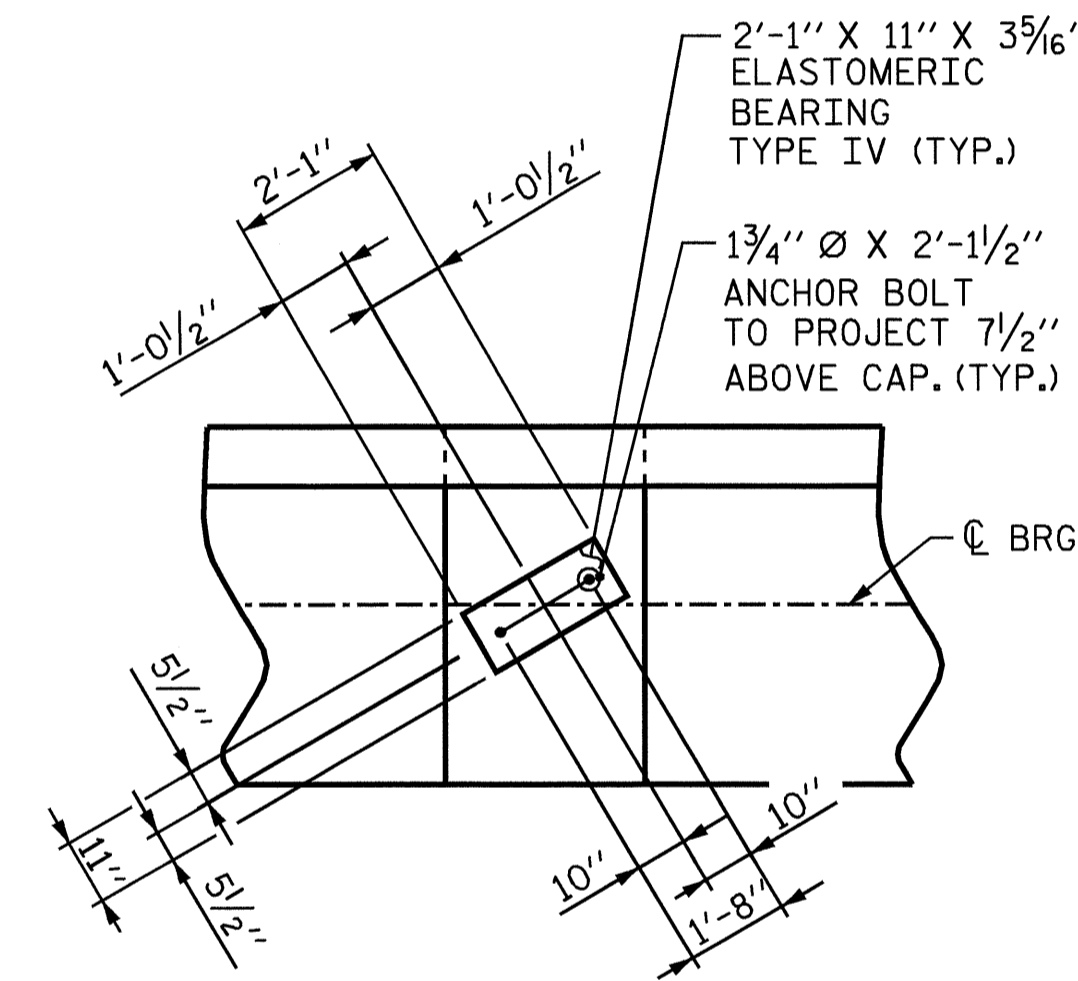
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT IN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.

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

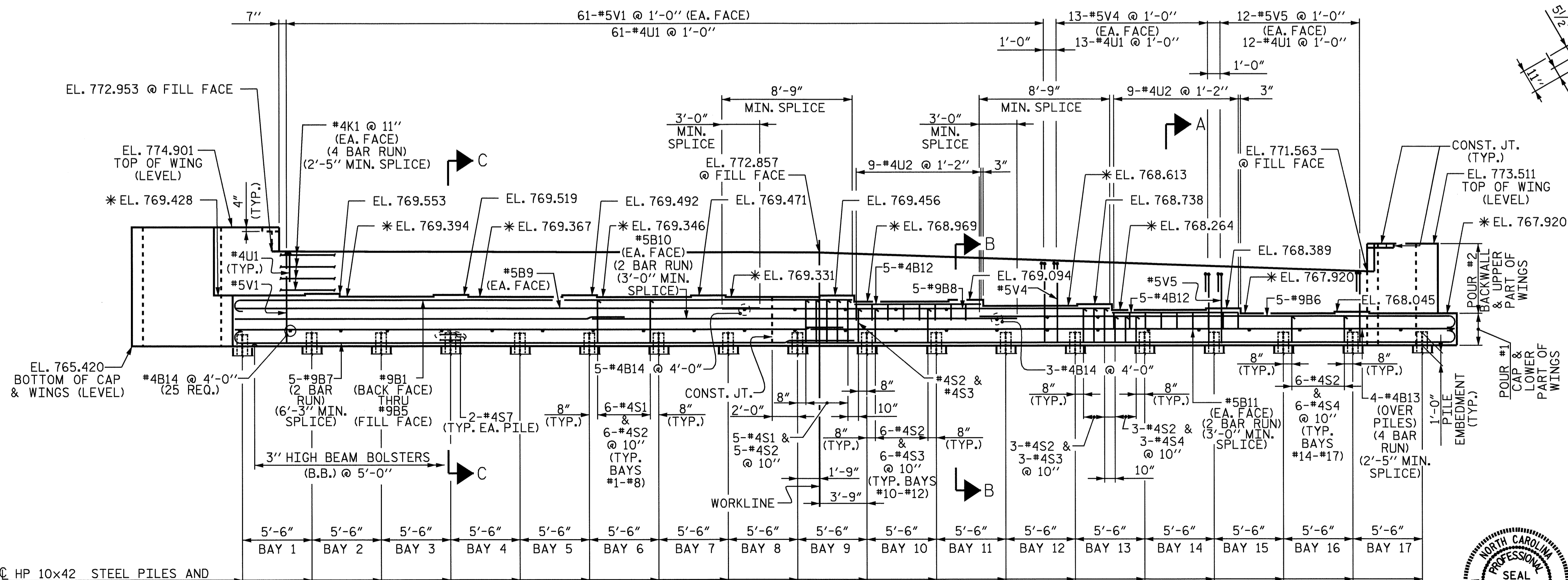
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" Ø DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



**PLAN**



**DETAIL A**



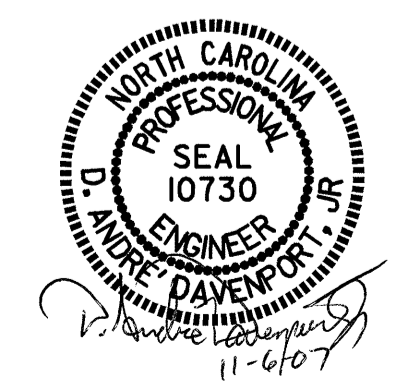
**ELEVATION**

PROJECT NO. B-4128  
 GUILFORD COUNTY  
 STATION: 24+02.00-L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

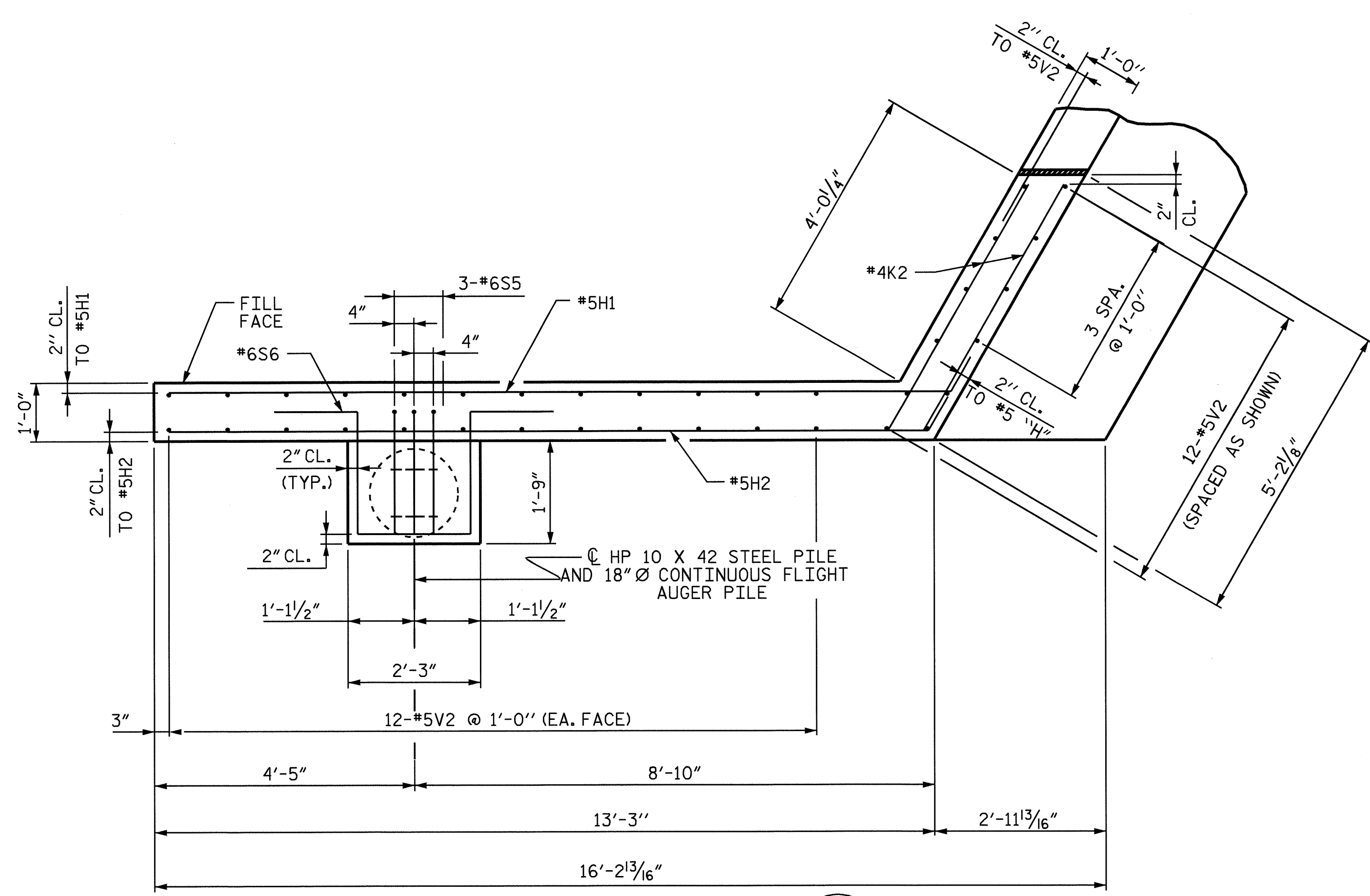
**SUBSTRUCTURE  
 END BENT #2**



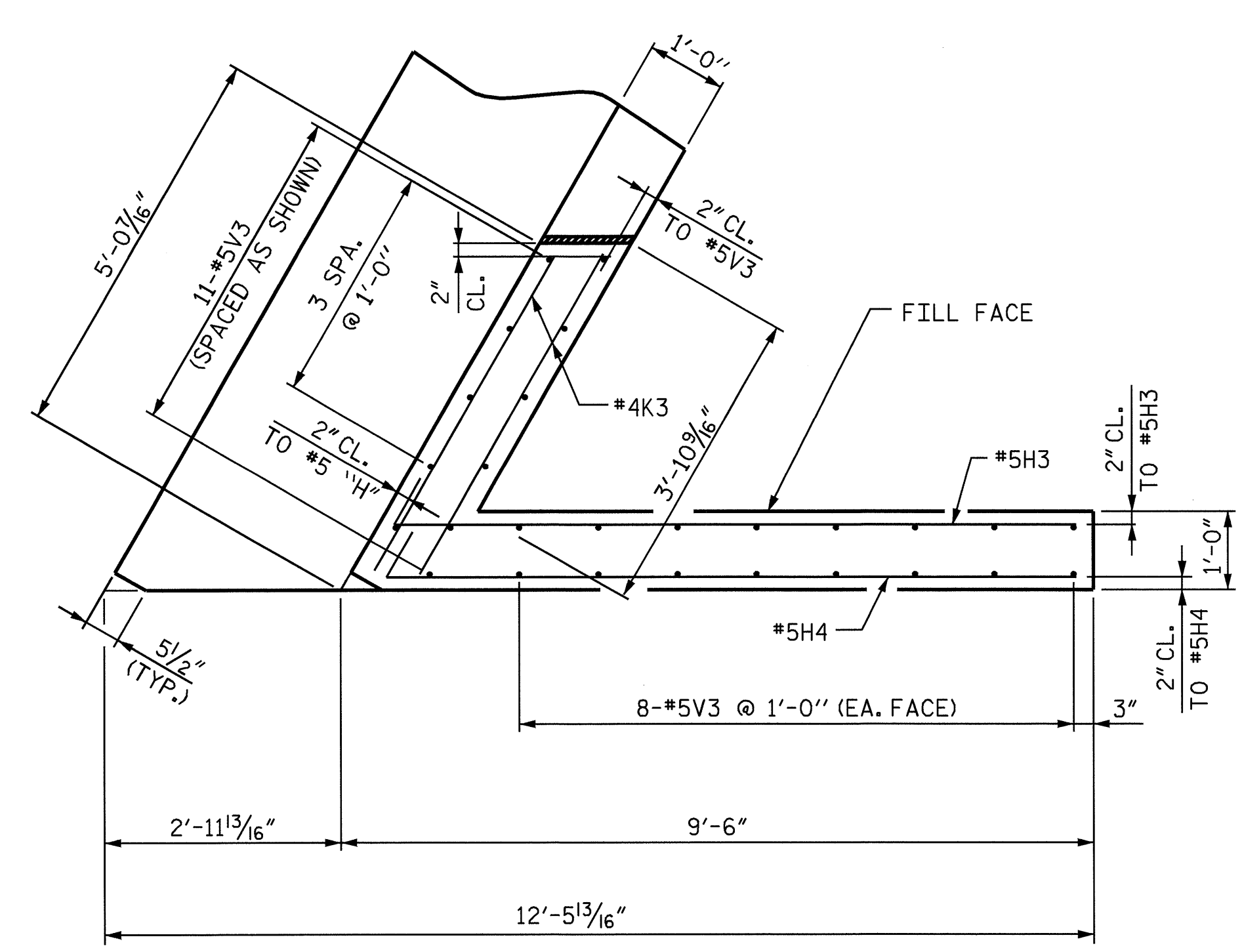
DRAWN BY : B. L. GREEN/M.G.S. DATE : 1/06  
 CHECKED BY : H. T. BARBOUR DATE : 2/06

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20	
1			3			TOTAL SHEETS	
2			4			25	

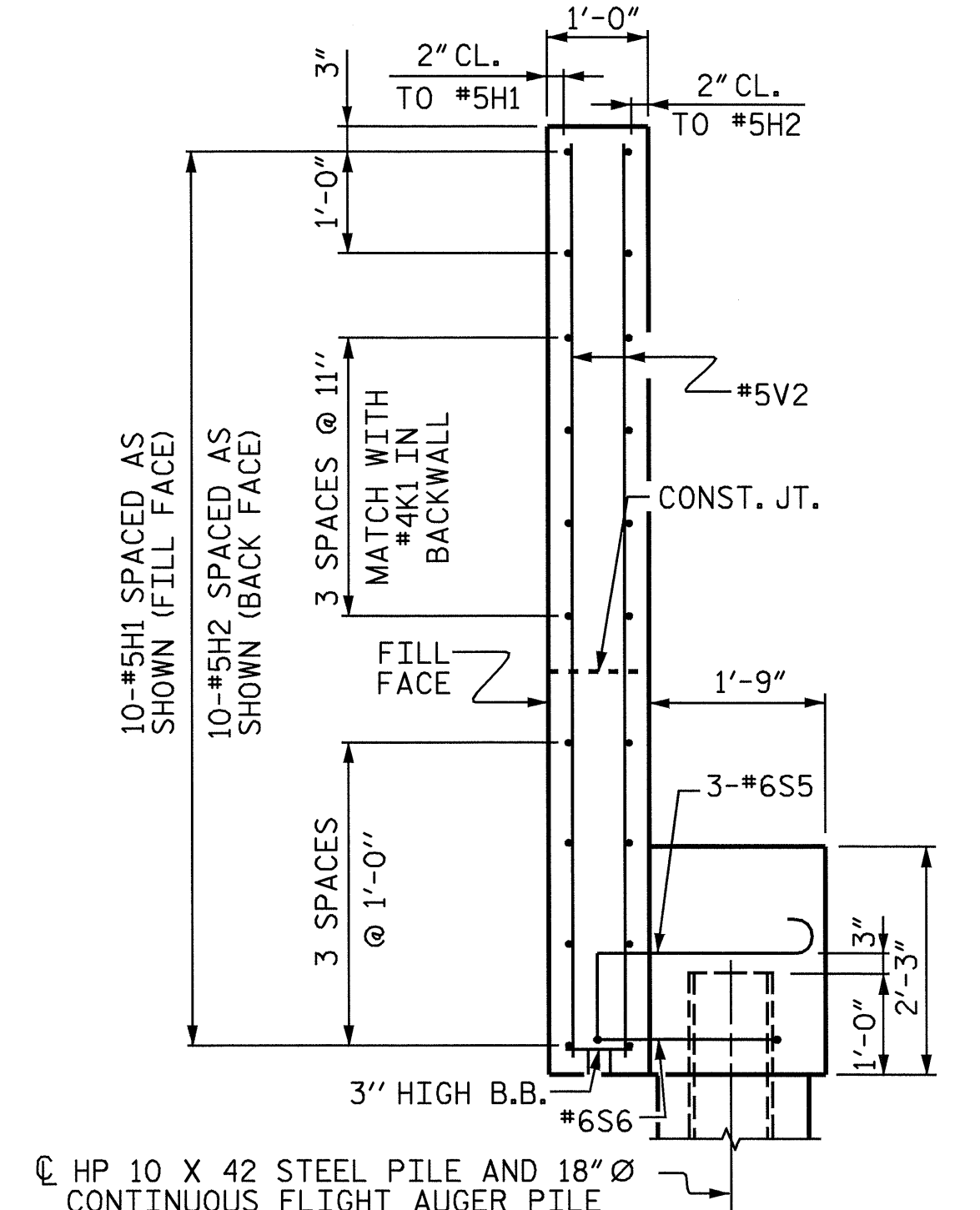
06-NOV-2007 12:21  
 I:\Structures\shalkh\Microstation\B-4128.sd.E\*.dgn  
 adavenport



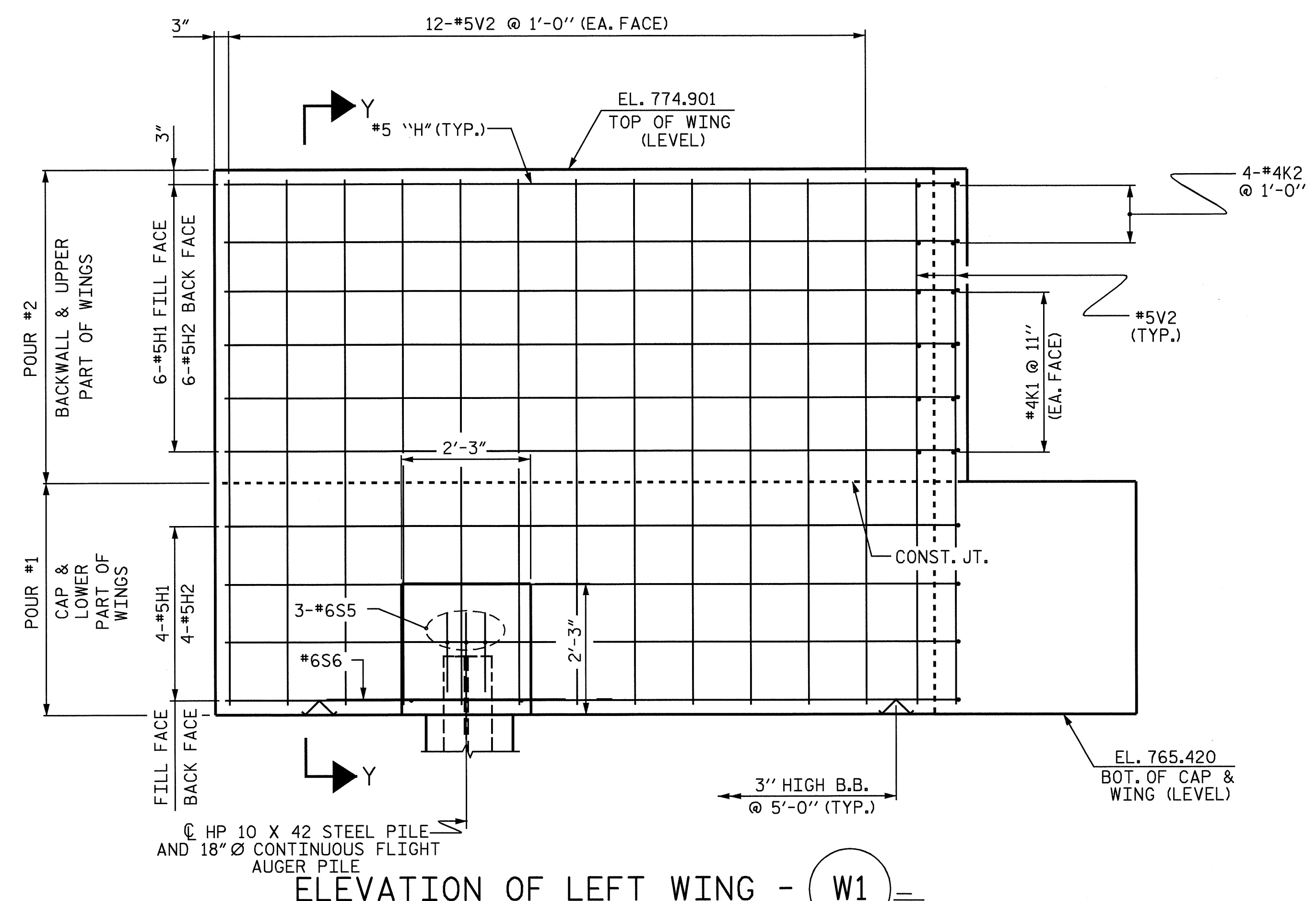
PLAN OF LEFT WING - W1



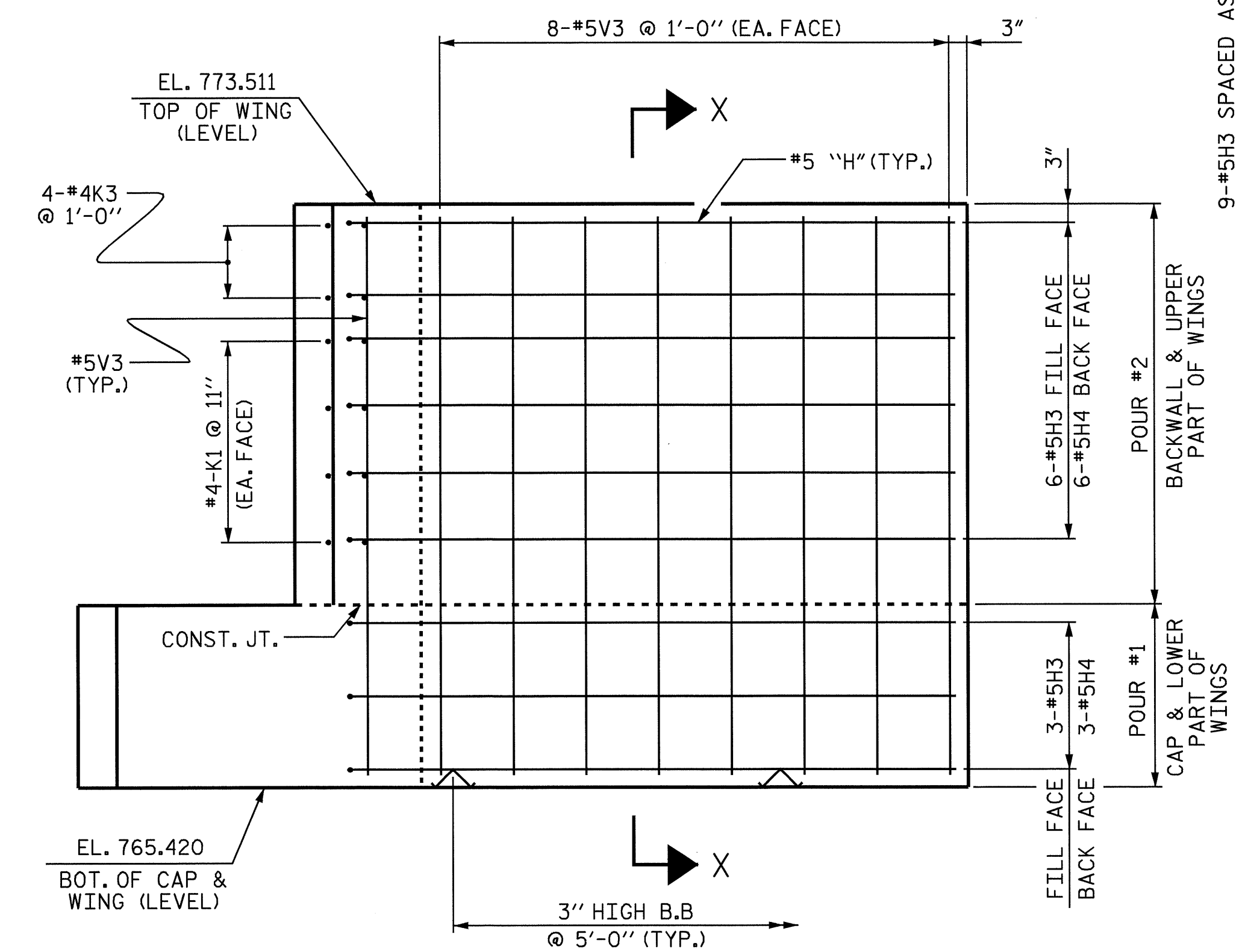
PLAN OF RIGHT WING - W2



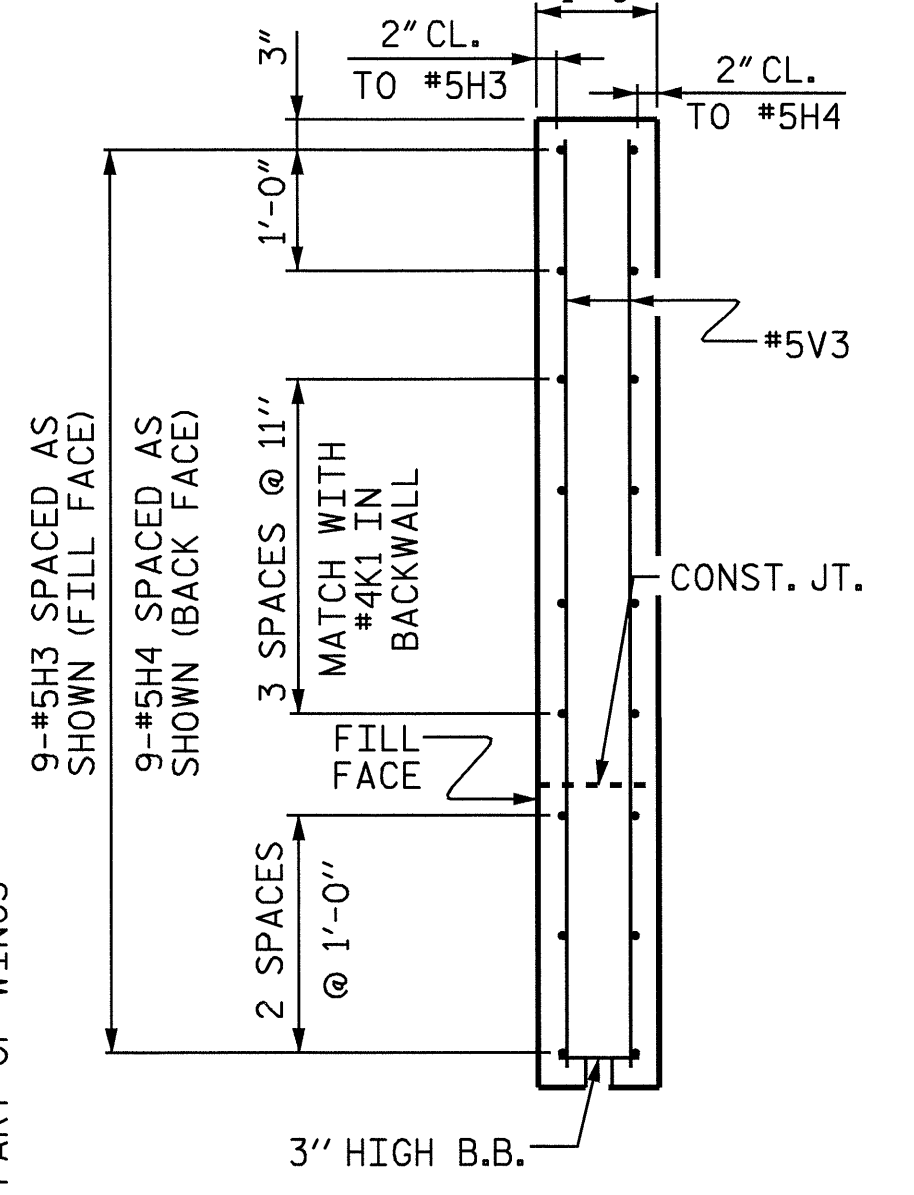
SECTION Y-Y



ELEVATION OF LEFT WING - W1



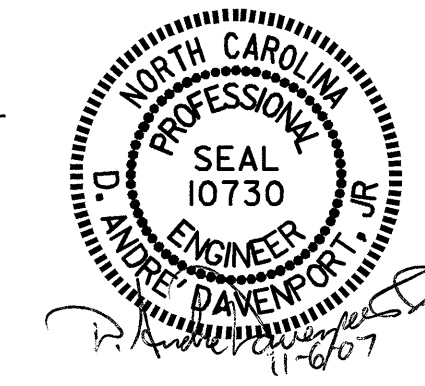
ELEVATION OF RIGHT WING - W2



SECTION X-X

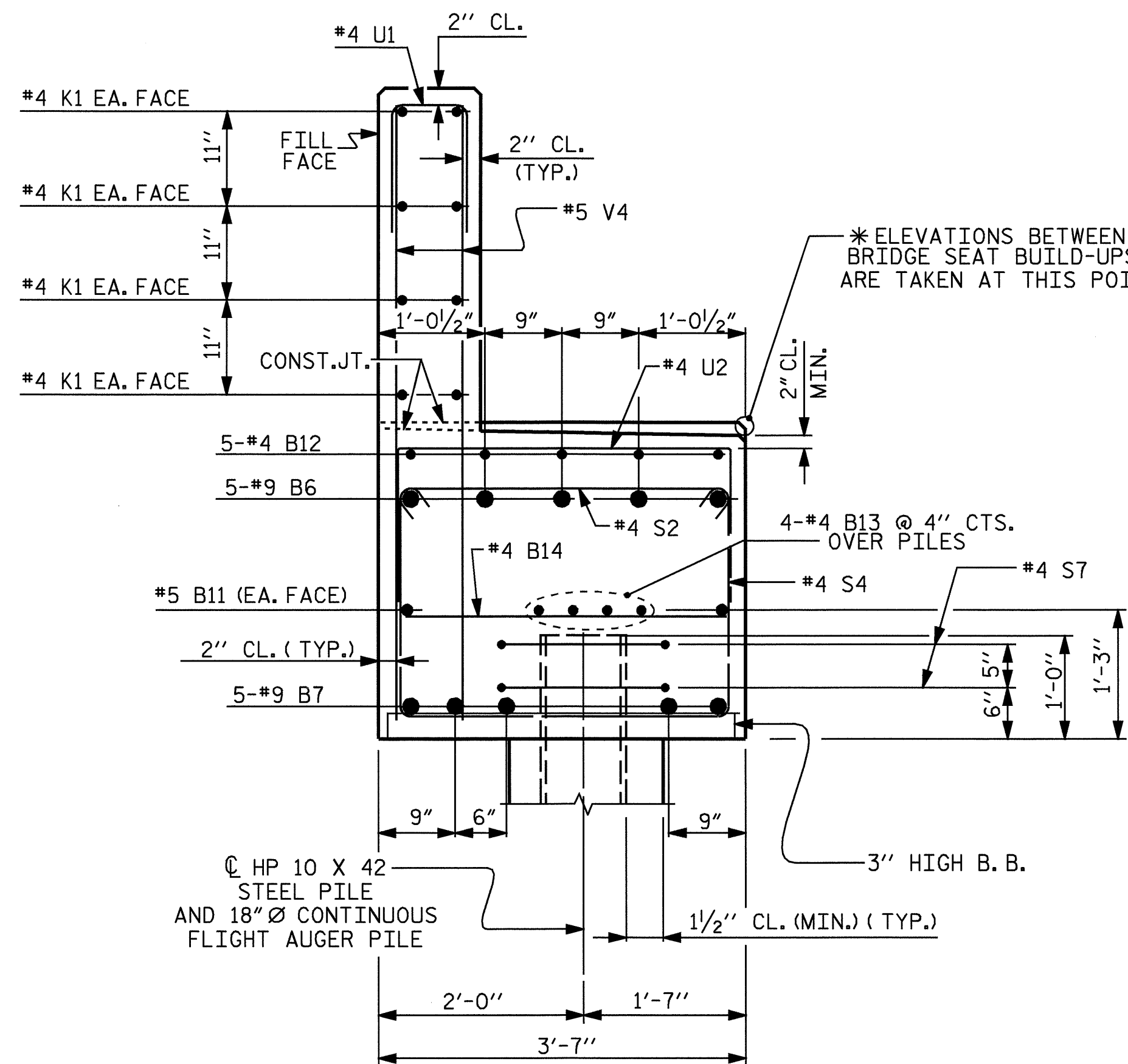
PROJECT NO. B-4128  
 GUILFORD COUNTY  
 STATION: 24+02.00 -L-  
 SHEET 2 OF 3

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

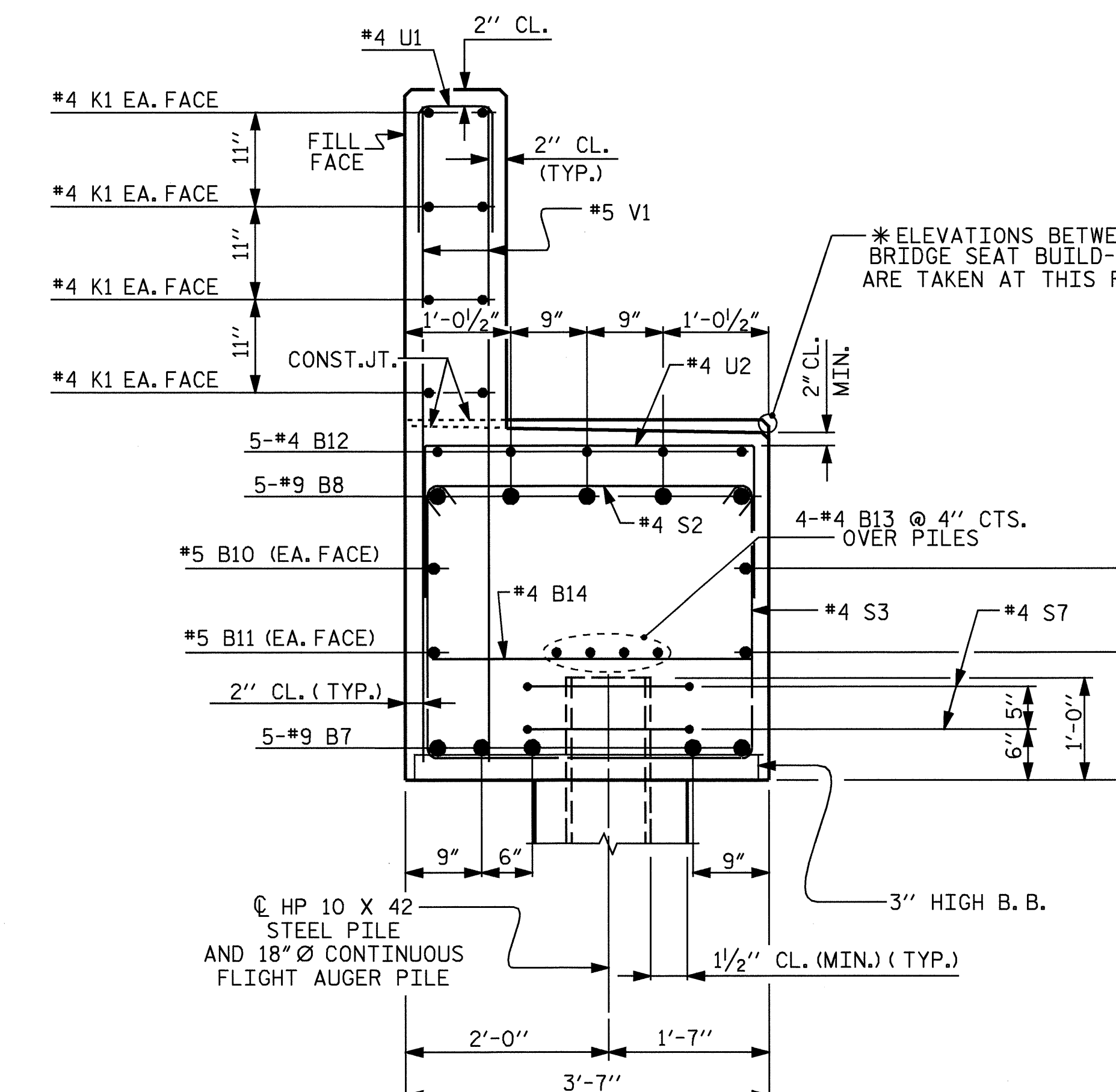


DRAWN BY: B. L. GREEN/M.G.S. DATE: 1/06  
 CHECKED BY: H. T. BARBOUR DATE: 2/06

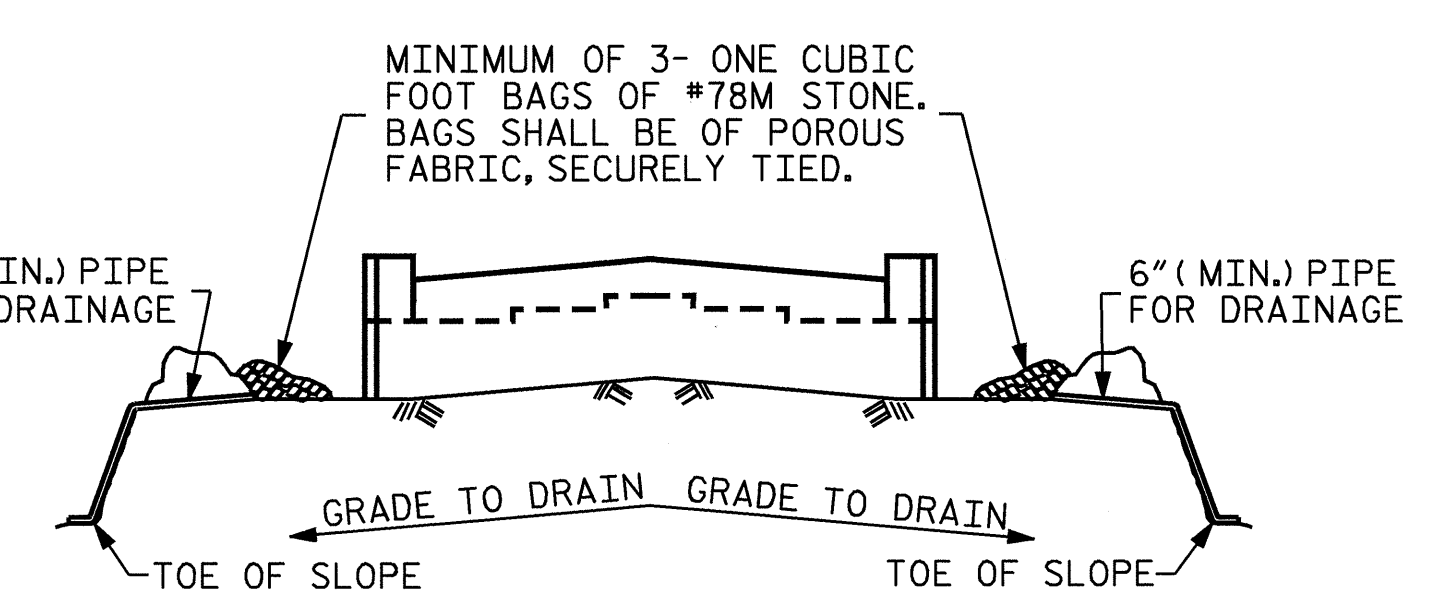
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					25



SECTION A-A



SECTION B-B

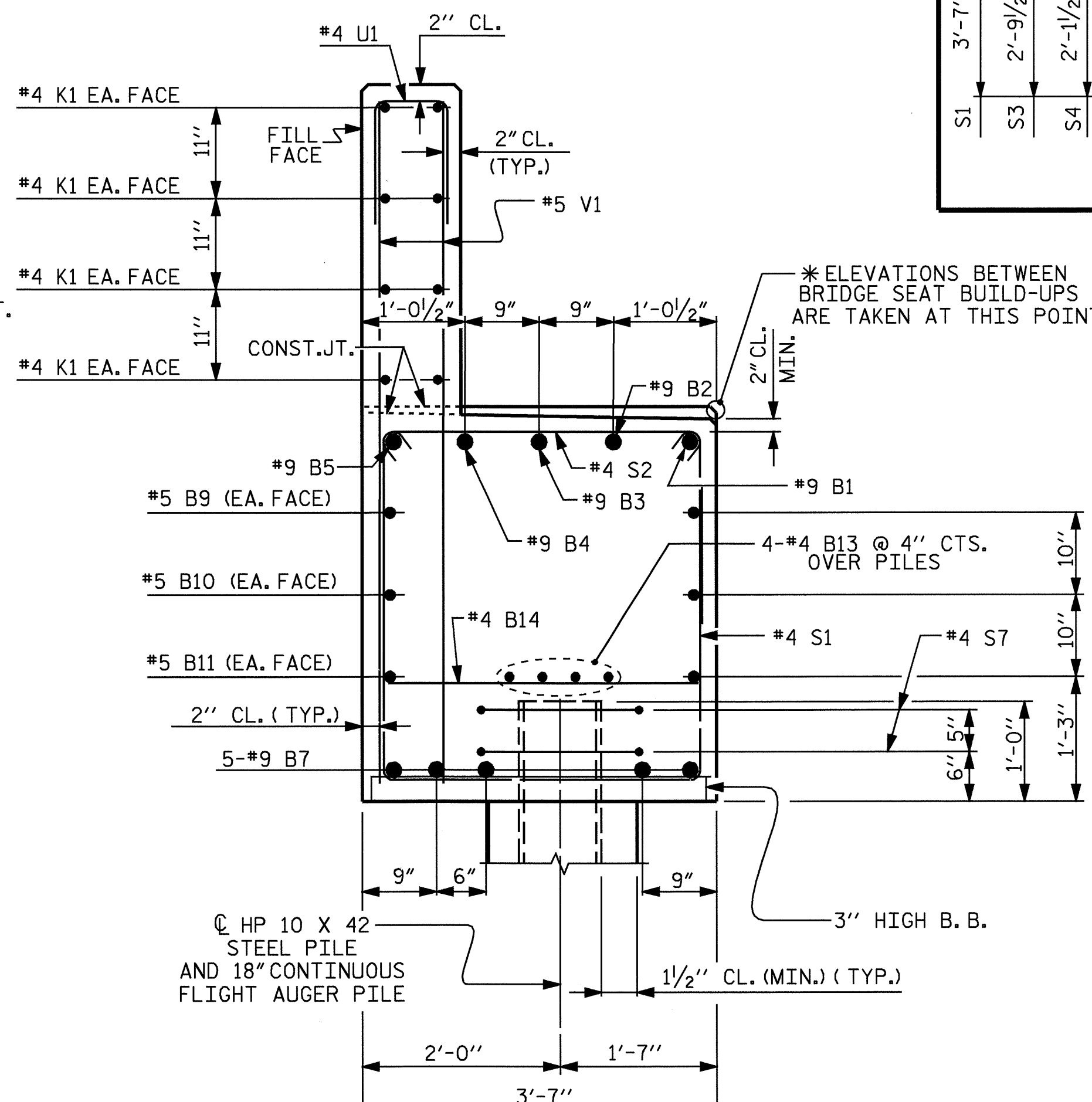


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

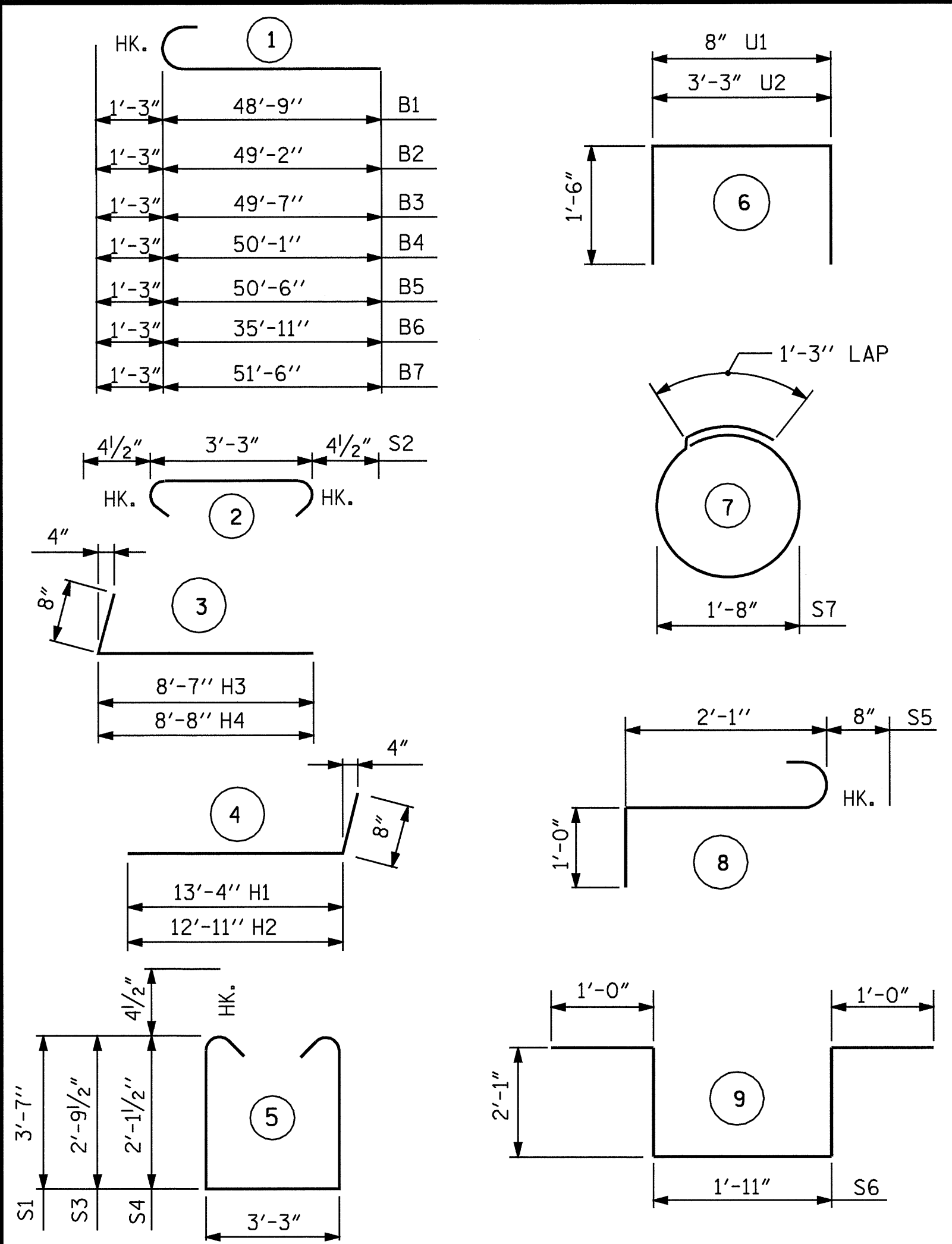
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



SECTION C-C

BAR TYPES



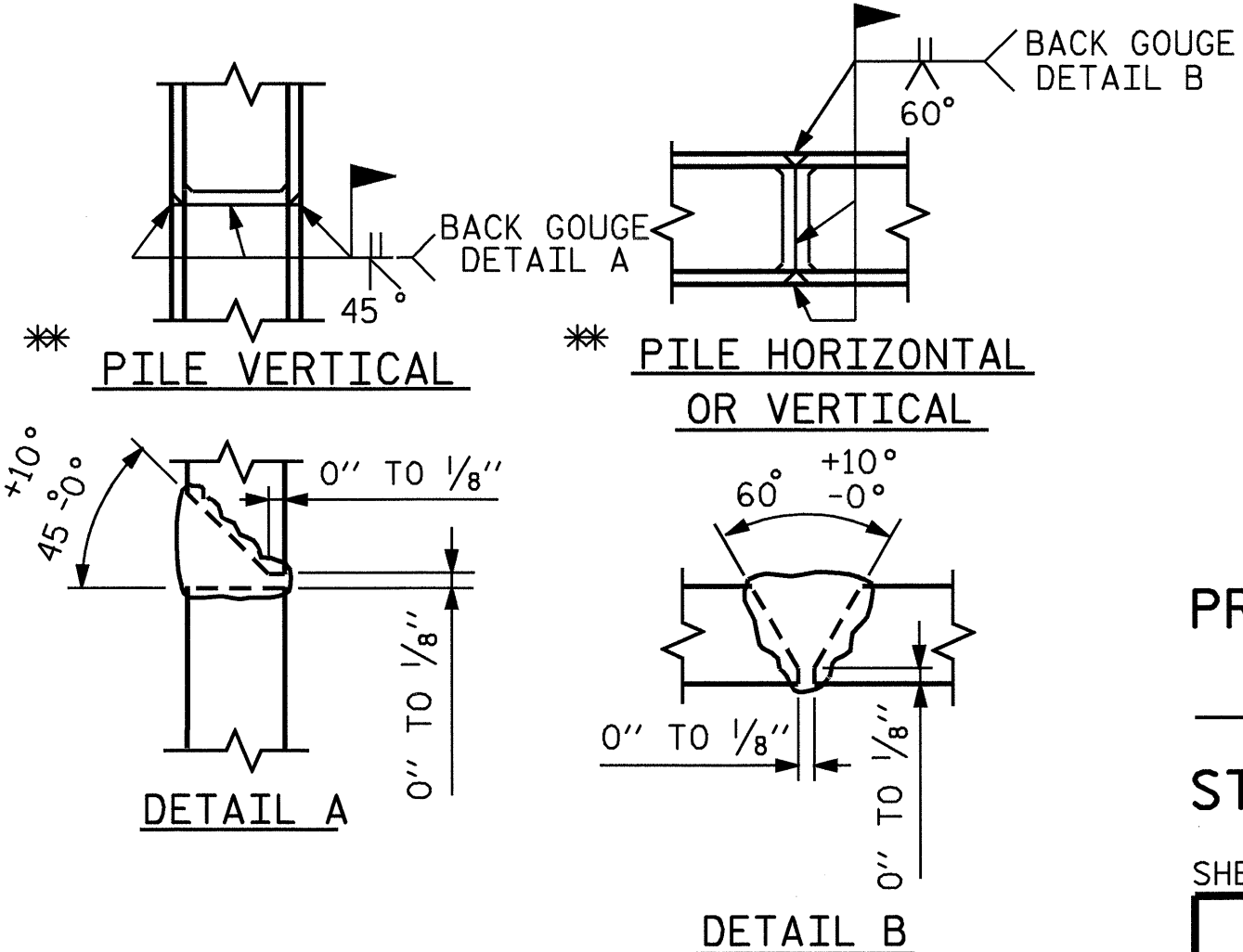
BILL OF MATERIAL

END BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	1	#9	1	50'-0"	170
B2	1	#9	1	50'-5"	171
B3	1	#9	1	50'-10"	173
B4	1	#9	1	51'-4"	175
B5	1	#9	1	51'-9"	176
B6	5	#9	1	37'-2"	632
B7	10	#9	1	52'-9"	1794
B8	5	#9	STR	29'-2"	496
B9	2	#5	STR	42'-6"	89
B10	4	#5	STR	33'-5"	139
B11	4	#5	STR	49'-10"	208
B12	10	#4	STR	10'-0"	67
B13	16	#4	STR	26'-0"	278
B14	33	#4	STR	3'-3"	72
H1	10	#5	4	14'-0"	146
H2	10	#5	4	13'-7"	142
H3	9	#5	3	9'-3"	87
H4	9	#5	3	9'-4"	88
K1	32	#4	STR	26'-0"	556
K2	4	#4	STR	4'-9"	13
K3	4	#4	STR	4'-7"	12
S1	53	#4	5	11'-2"	395
S2	102	#4	2	4'-0"	273
S3	22	#4	5	9'-7"	141
S4	27	#4	5	8'-3"	149
S5	3	#6	8	3'-9"	17
S6	1	#6	9	8'-1"	12
S7	36	#4	7	6'-6"	156
U1	86	#4	6	3'-8"	211
U2	18	#4	6	6'-3"	75
V1	122	#5	STR	6'-4"	806
V2	36	#5	STR	9'-1"	341
V3	27	#5	STR	7'-9"	218
V4	26	#5	STR	5'-9"	156
V5	24	#5	STR	5'-6"	138

REINFORCING STEEL = 8772 LBS

CLASS A CONCRETE	
POUR #1	48.0 CU. YDS.
POUR #2	18.1 CU. YDS.
TOTAL	66.1 CU. YDS.
HP 10 x 42 STEEL PILES	304 FEET
NO. 19	
18" Ø CONTINUOUS FLIGHT AUGER PILES	285 FEET



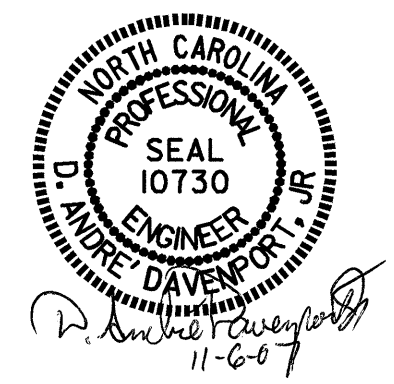
PILE SPLICE DETAILS

PROJECT NO. B-4128  
 GUILFORD COUNTY  
 STATION: 24+02.00 -L-

SHEET 3 OF 3

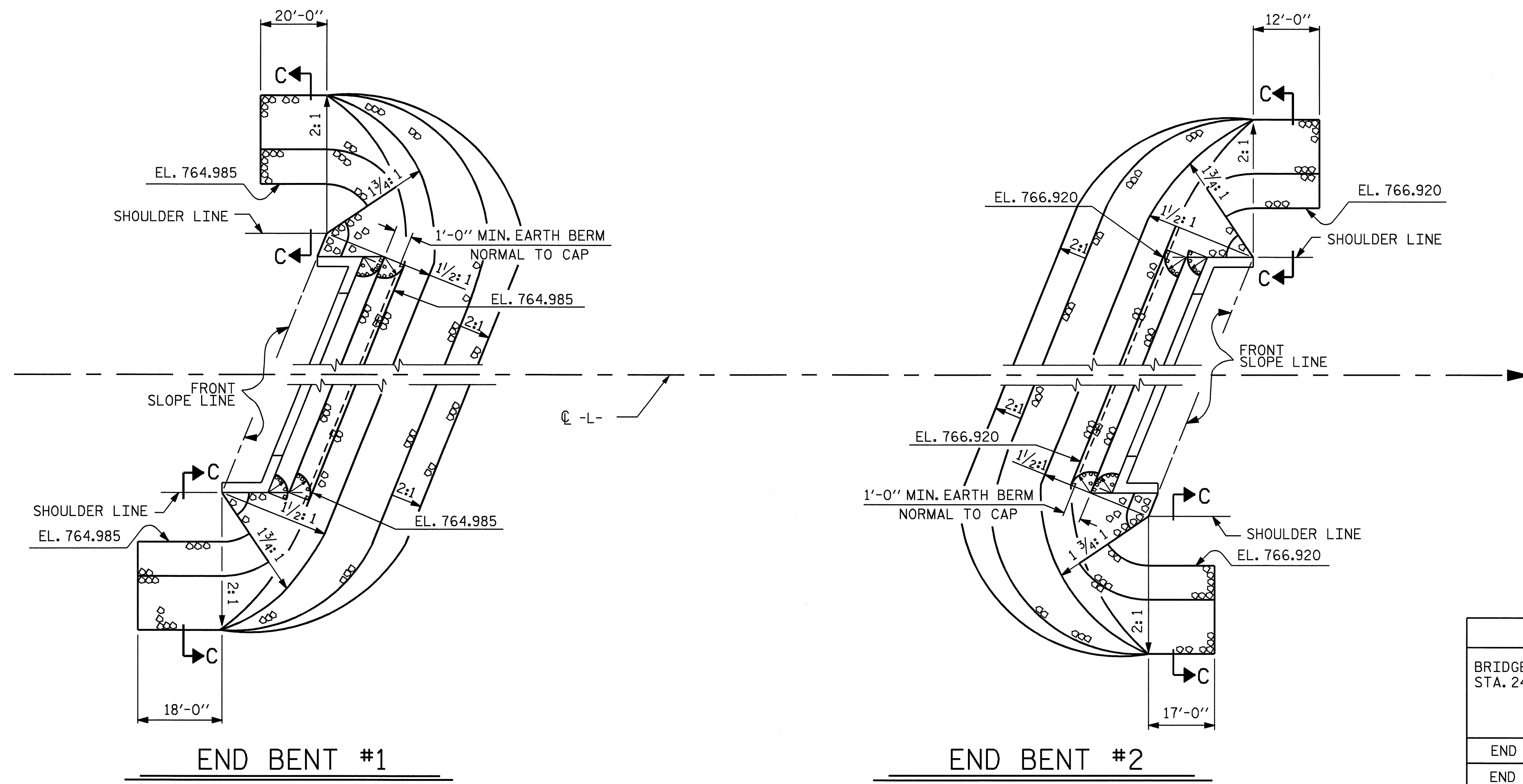
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT #2  
 DETAILS



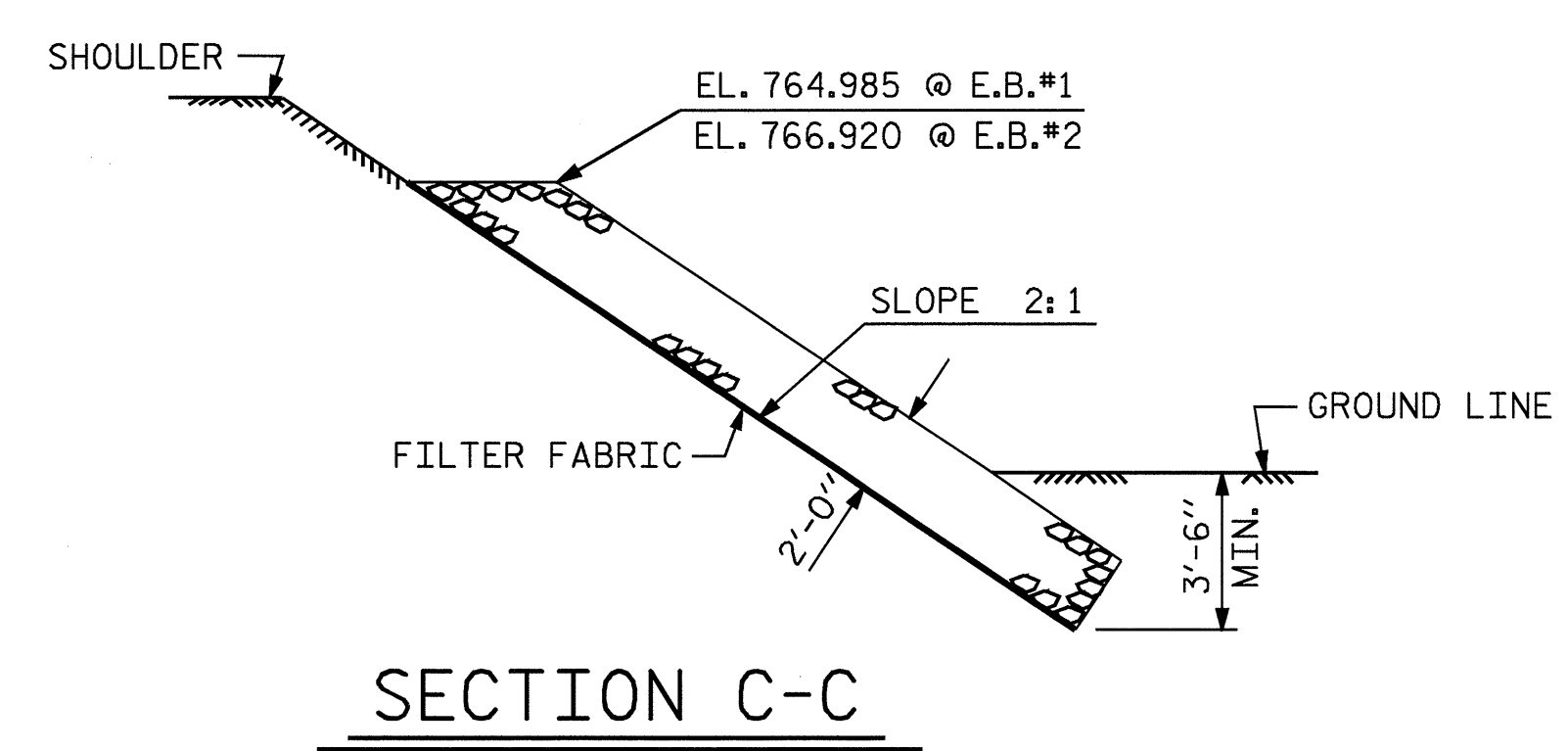
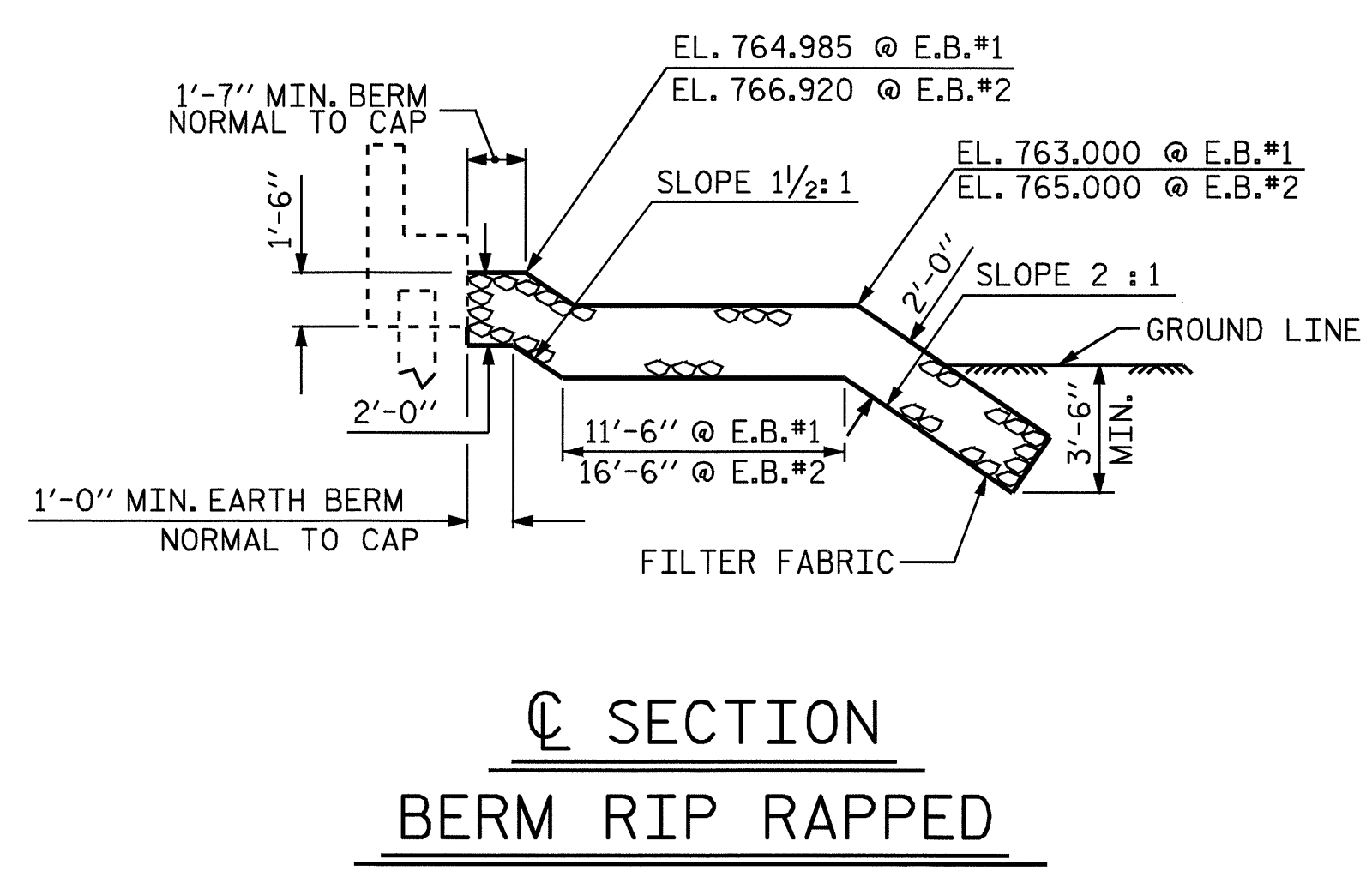
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : B. L. GREEN/M.G.S. DATE : 1/06  
 CHECKED BY : H. T. BARBOUR DATE : 2/06



ESTIMATED QUANTITIES		
BRIDGE @ STA. 24+02.00 -L-	RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	526	585
END BENT 2	536	595
TOTAL	1062	1180

PLAN



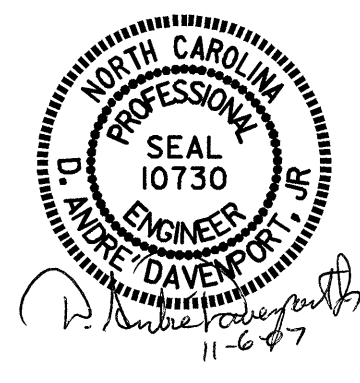
SECTION C-C  
BERM RIP RAPPED

SECTION C-C

PROJECT NO. B-4128  
GUILFORD COUNTY  
 STATION: 24+02.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

—RIP RAP DETAILS—

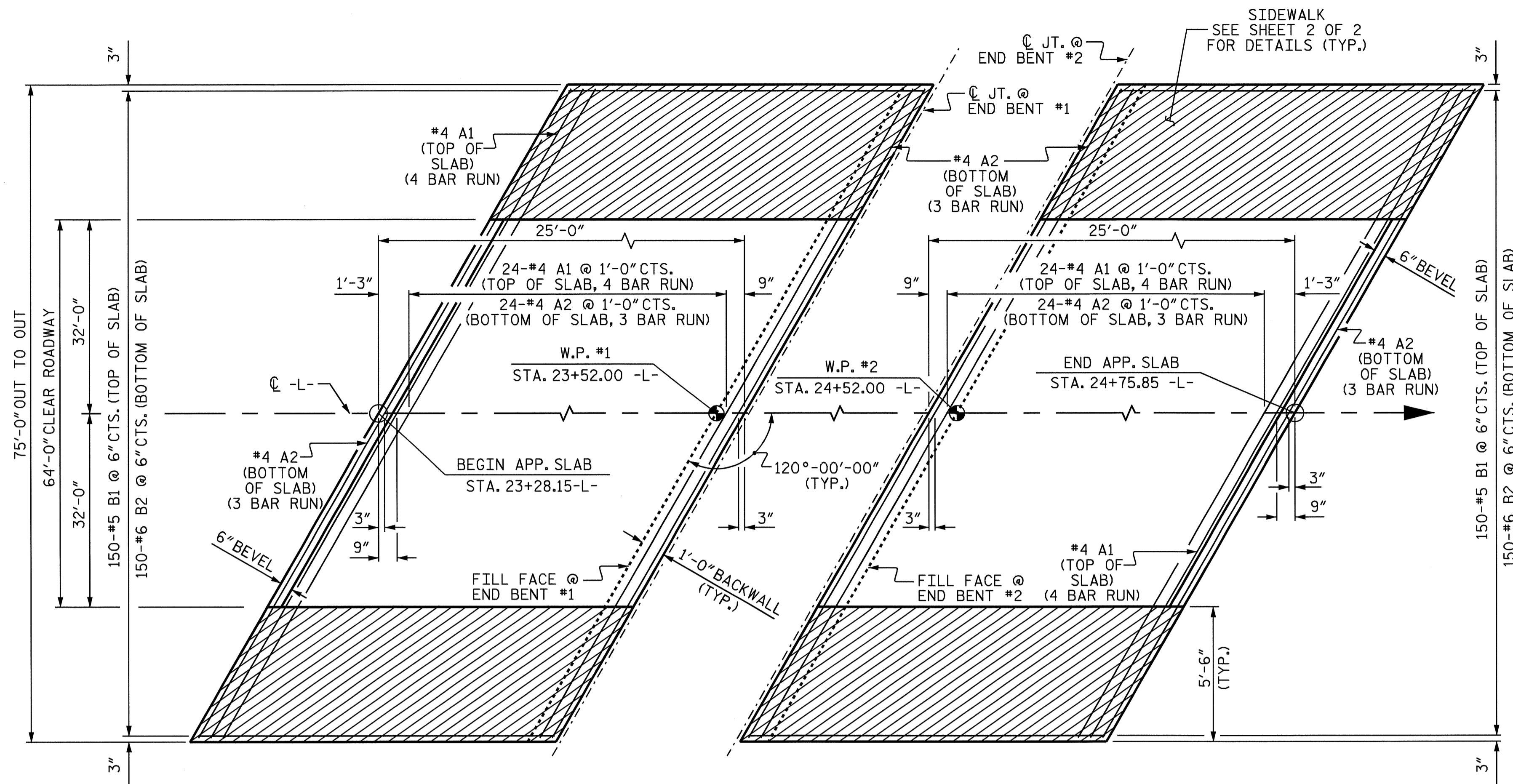


ASSEMBLED BY : B. L. GREEN/M.G.S. DATE : 2/06  
 CHECKED BY : S. P. LAM DATE : 3/06  
 DRAWN BY : REK 1/84  
 CHECKED BY : RDU 1/84

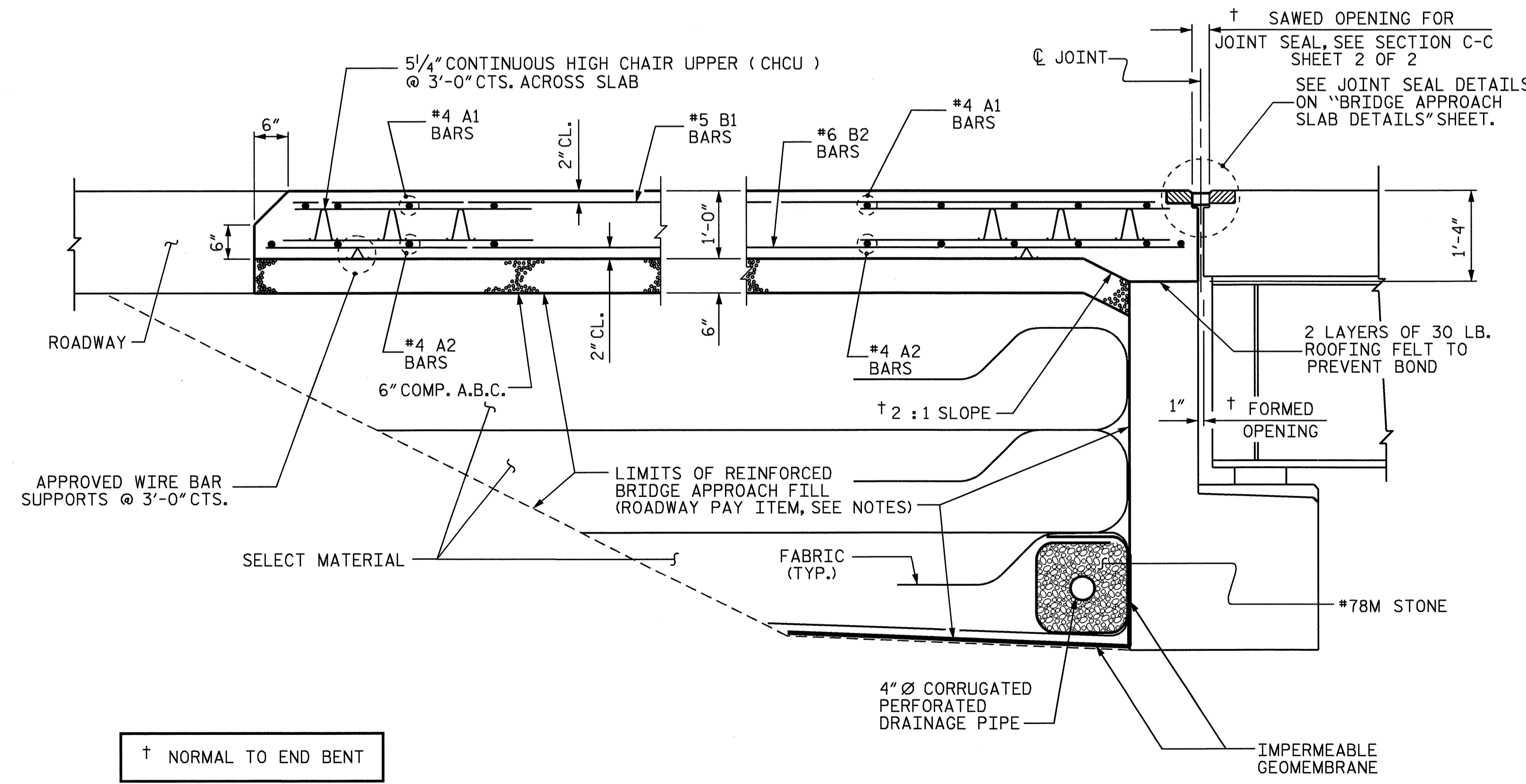
REV. 8/16/99 RWW/LES  
 REV. 10/17/00 RWW/LES  
 REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO. S-23
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 25
2			4			





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



SECTION THRU SLAB

ASSEMBLED BY : H. T. BARBOUR    DATE : 12-29-06  
 CHECKED BY : D. A. DAVENPORT    DATE : 3-07  
 DRAWN BY : EEM 3/95    LES/RDR  
 CHECKED BY : VAP 3/95    REV. 5/1/03R    RWW/JTE  
                                   REV. 5/1/06    TLA/GM

**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.

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

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

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

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

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

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

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	100	#4	STR	23'-1"	1542
A2	78	#4	STR	22'-11"	1194
*B1	150	#5	STR	23'-7"	3690
B2	150	#6	STR	24'-7"	5538
*B3	8	#4	STR	24'-7"	131
*G1	50	#4	STR	5'-0"	167
*D1	32	#4	STR	0'-8"	14
REINFORCING STEEL				6732	LBS.
*EPOXY COATED REINFORCING STEEL				5544	LBS.
CLASS AA CONCRETE				76.6	C. Y.
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	100	#4	STR	23'-1"	1542
A2	78	#4	STR	22'-11"	1194
*B1	150	#5	STR	23'-7"	3690
B2	150	#6	STR	24'-7"	5538
*B3	8	#4	STR	24'-7"	131
*G1	50	#4	STR	5'-0"	167
*D1	32	#4	STR	0'-8"	14
REINFORCING STEEL				6732	LBS.
*EPOXY COATED REINFORCING STEEL				5544	LBS.
CLASS AA CONCRETE				76.6	C. Y.

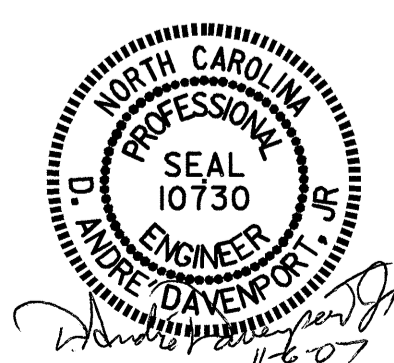
PROJECT NO. B-4128  
GUILFORD COUNTY  
 STATION: 24+02.00 -L-

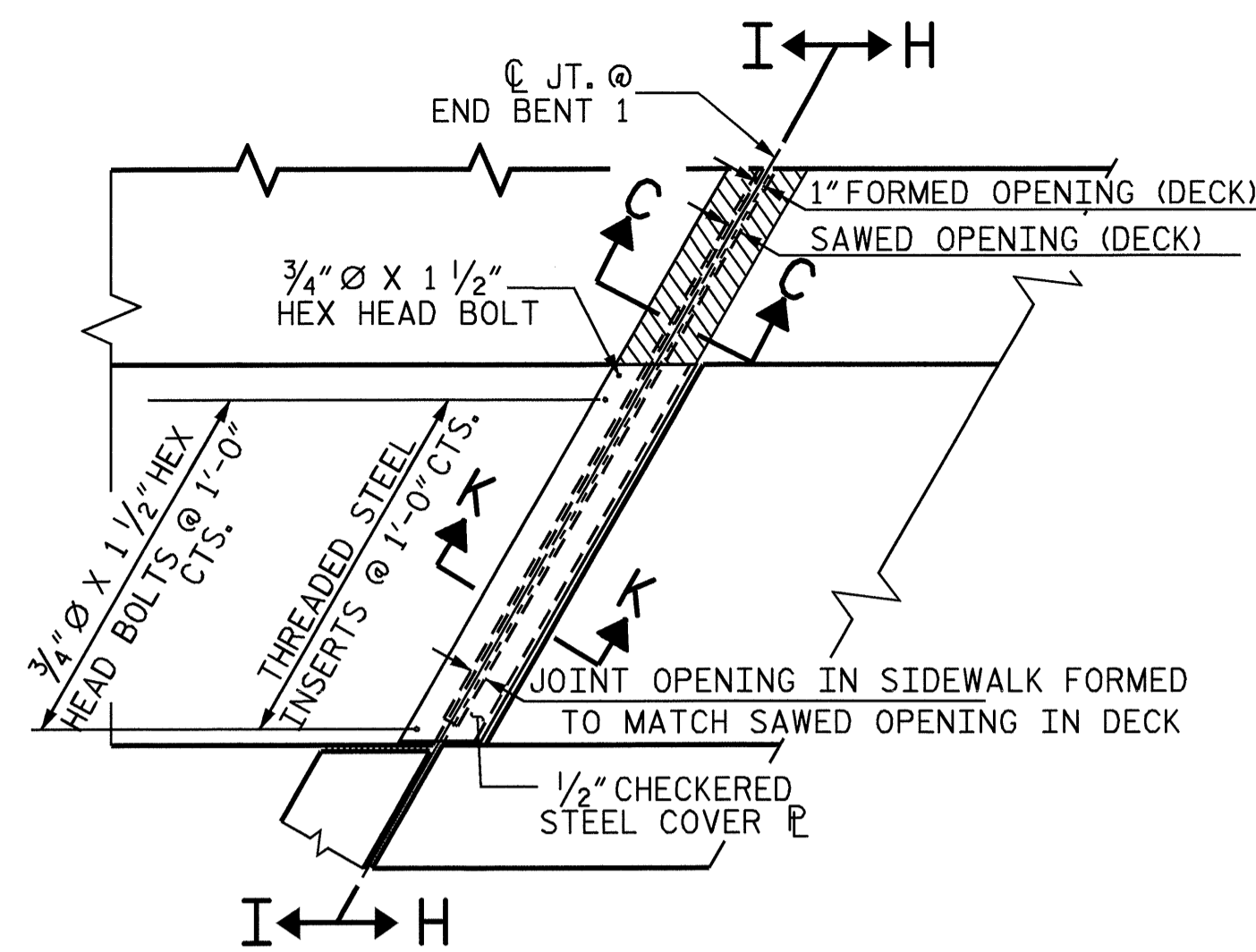
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

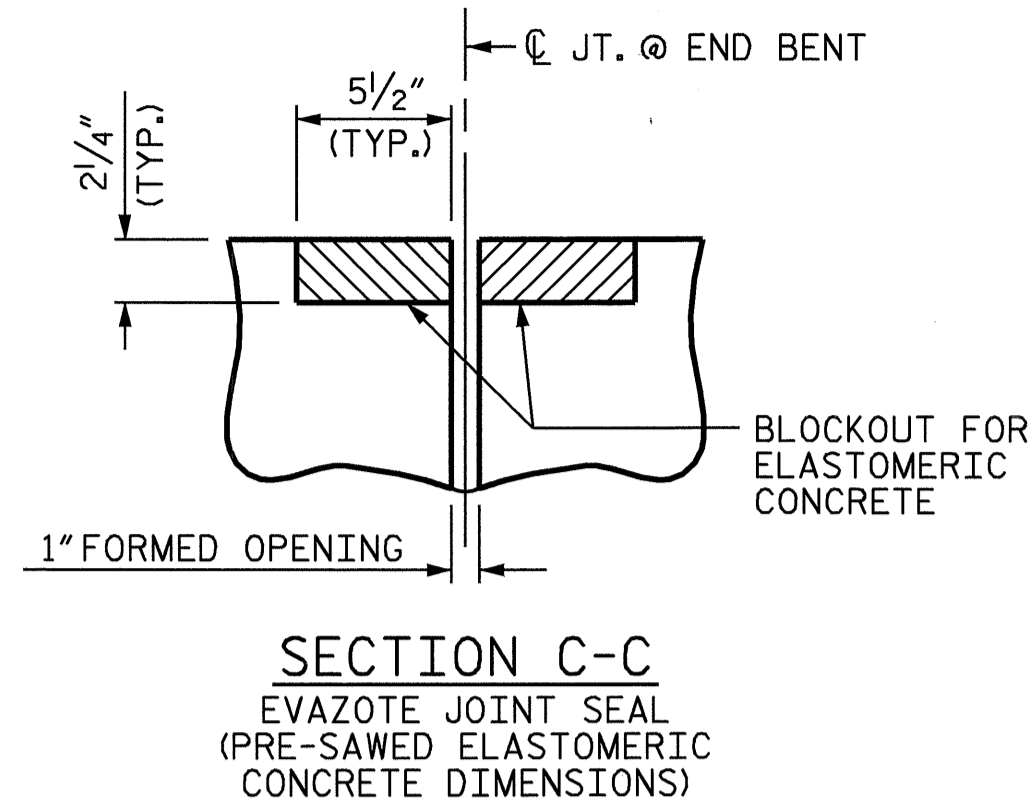
BRIDGE APPROACH SLAB  
 FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24	
1			3			TOTAL SHEETS	
2			4			25	

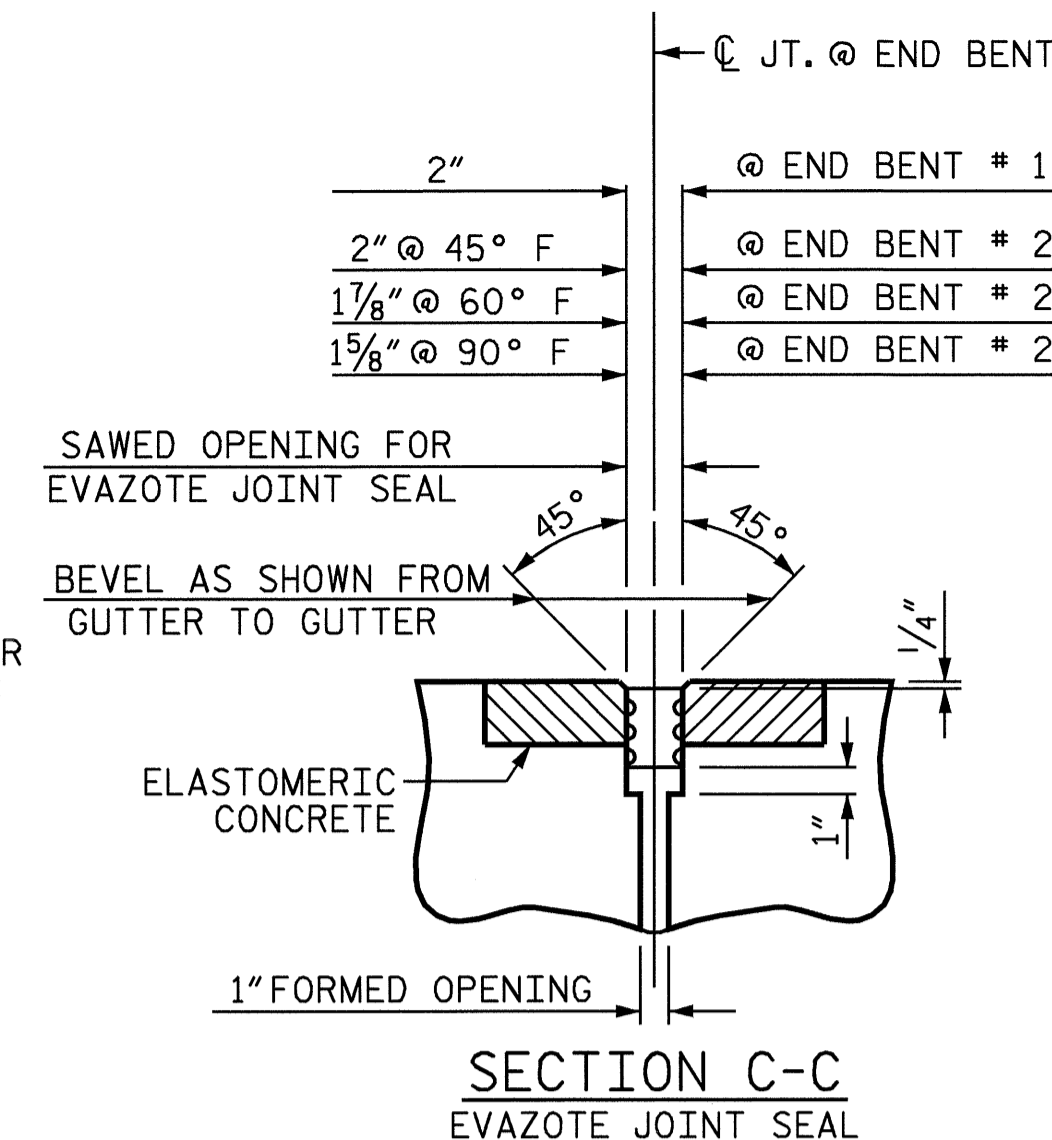




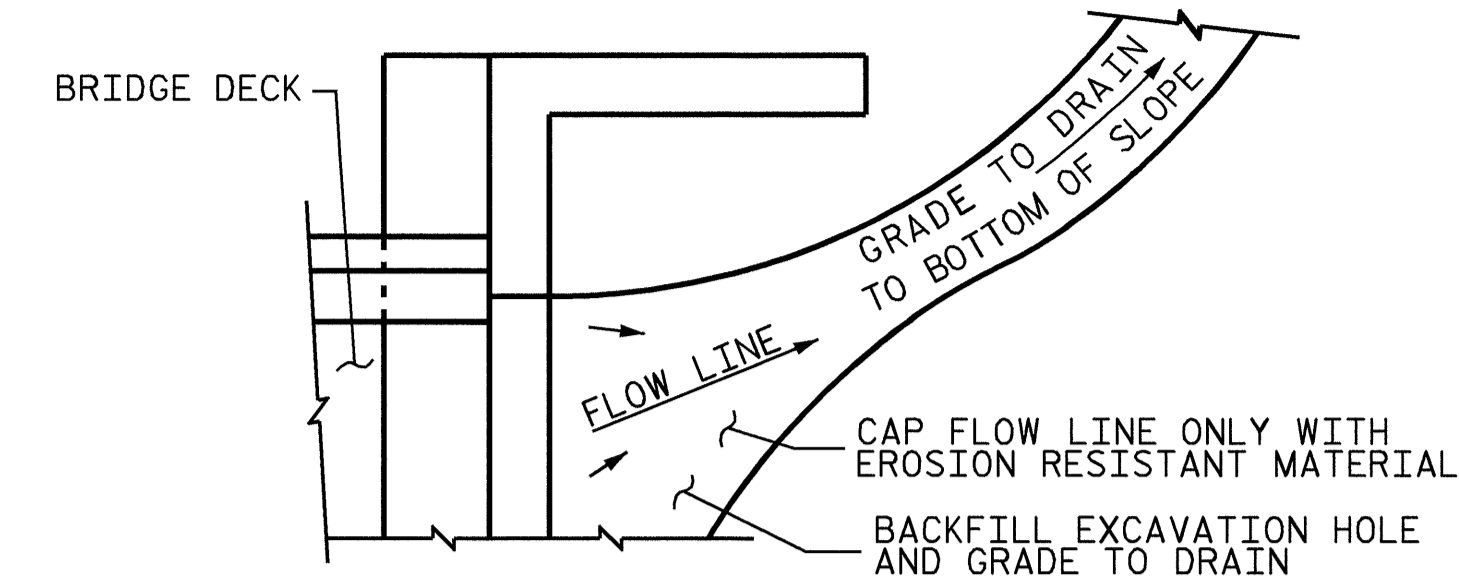
PLAN VIEW OF EVAZOTE JOINT SEAL @ END BENT FOR SIDEWALK



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

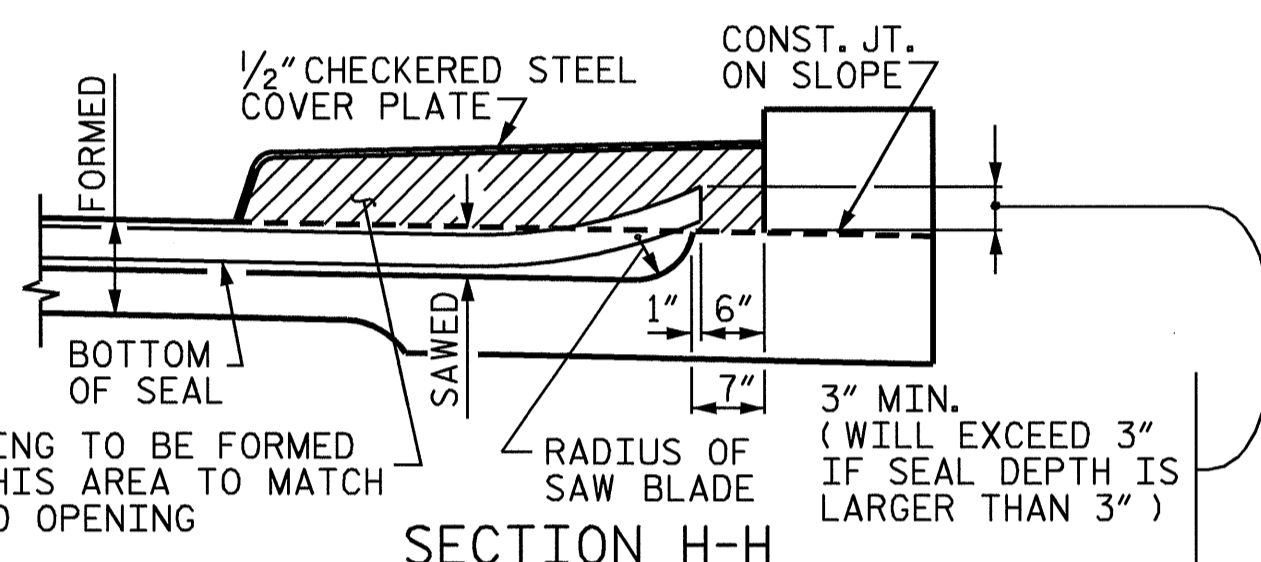


SECTION C-C EVAZOTE JOINT SEAL

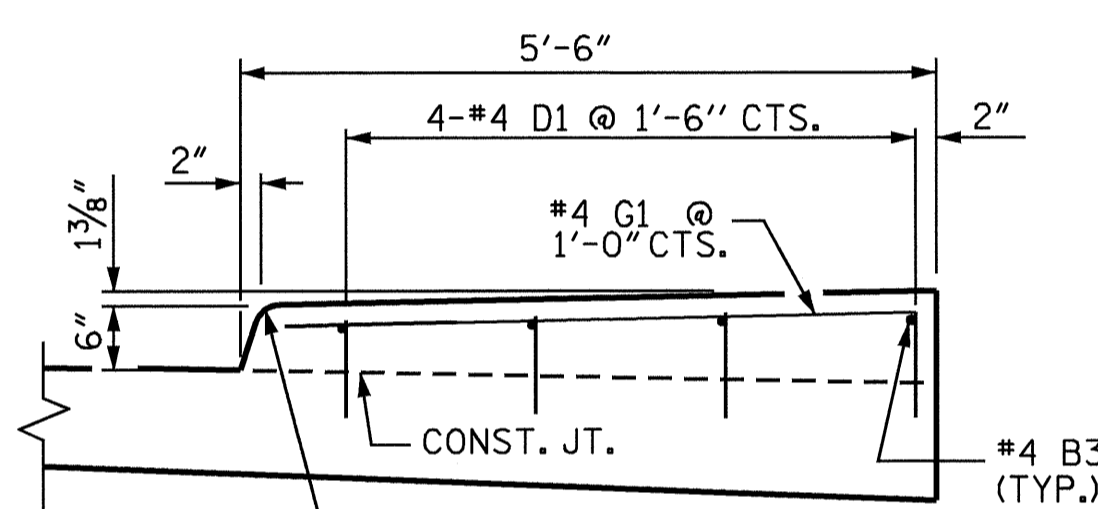


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

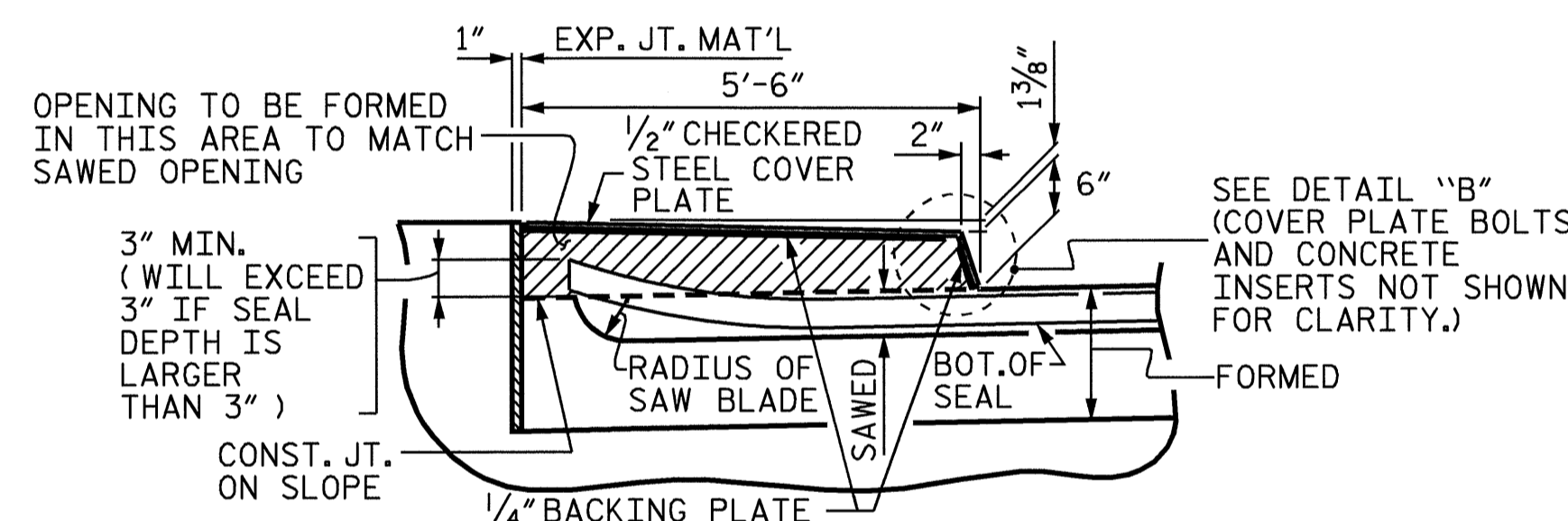
TEMPORARY DRAINAGE DETAIL



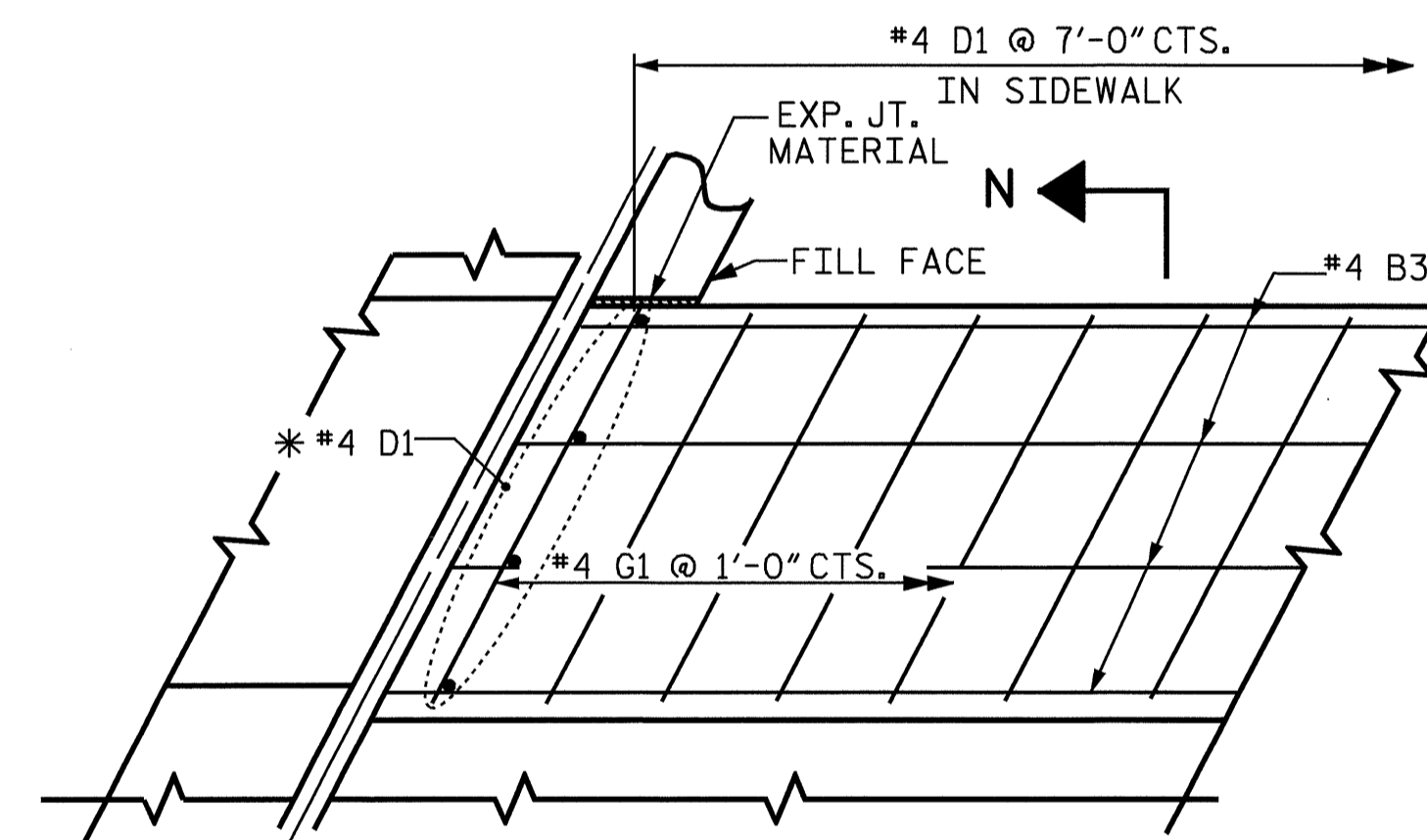
SECTION H-H



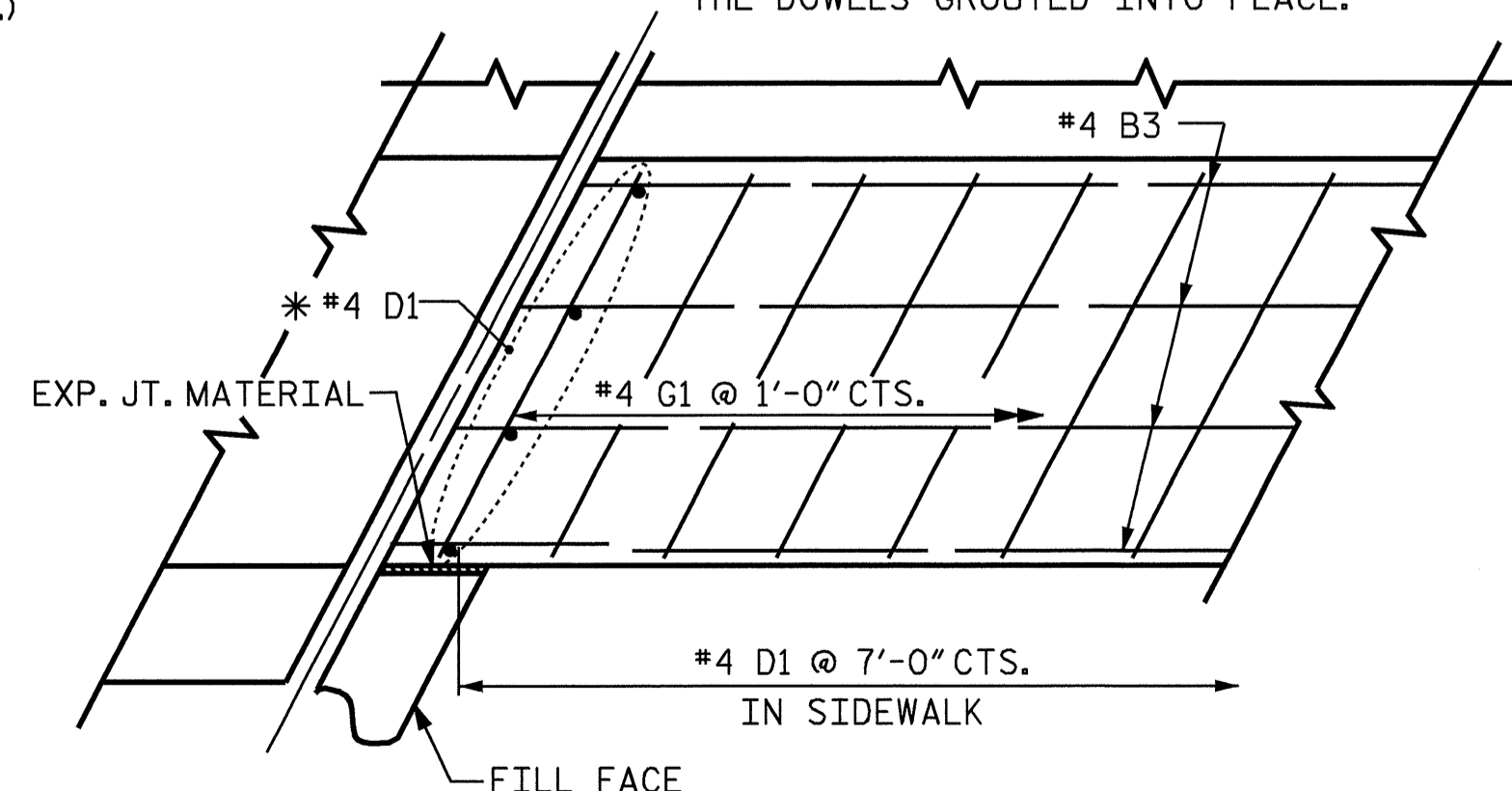
SECTION N-N SIDEWALK DETAILS



SECTION I-I



\* THESE DOWELS ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE DOWELS GROUTED INTO PLACE.

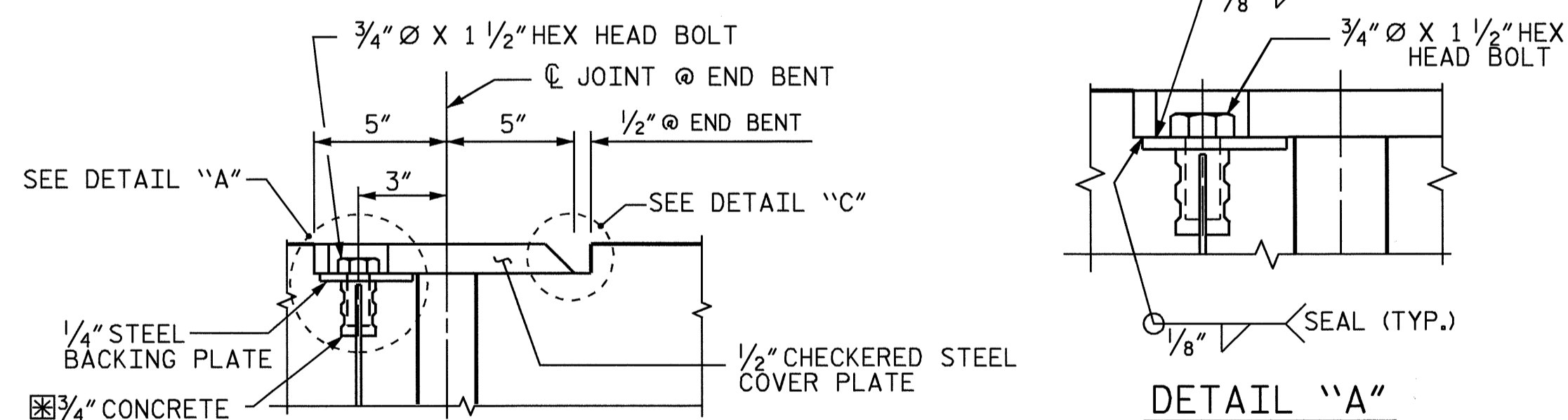


PLAN

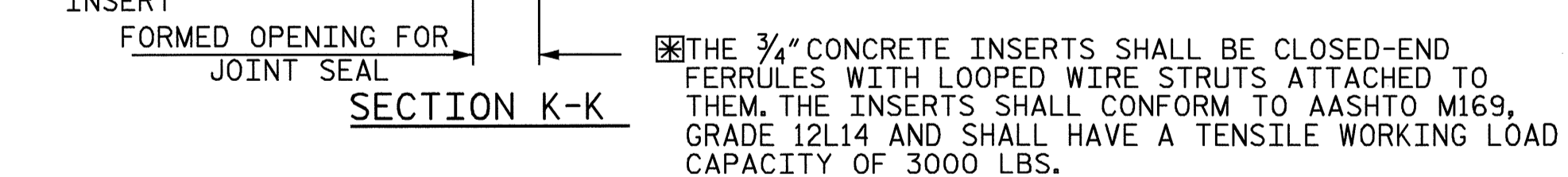
DETAILS OF SIDEWALK ON APPROACH SLAB

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE ** (CU. FT.)
1	12.7
2	12.7
TOTAL	25.4

\*\* BASED ON THE MINIMUM BLOCKOUT SHOWN.

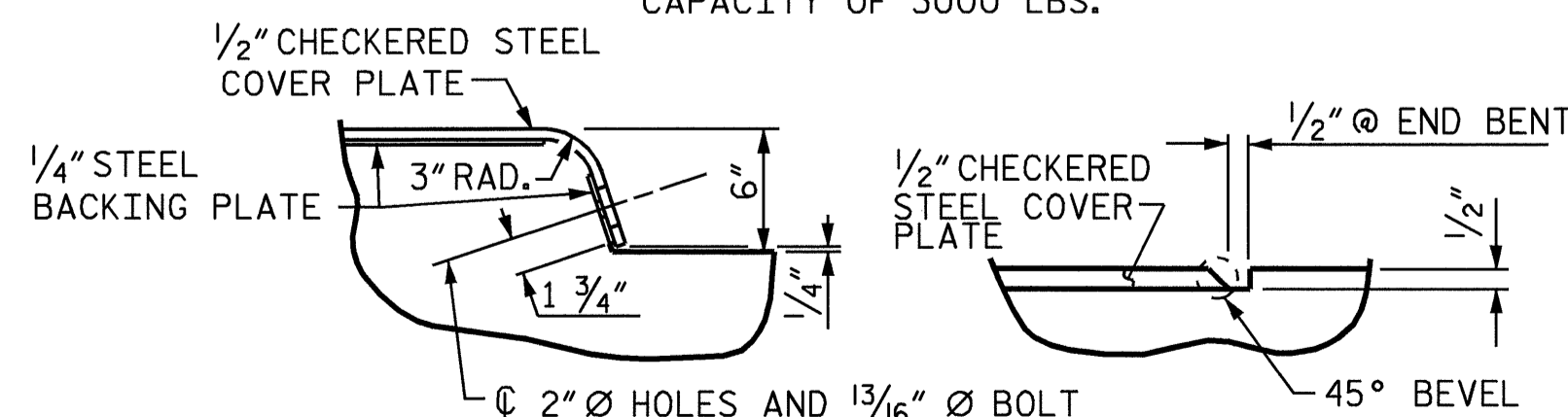


DETAIL "A"



SECTION K-K

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



DETAIL "B"

DETAIL "C"

JOINT SEAL DETAILS @ END BENT

ASSEMBLED BY : H. T. BARBOUR DATE : 12-29-06  
 CHECKED BY : D. A. DAVENPORT DATE : 3-07  
 DRAWN BY : FCJ 11/88 REV. 10/17/00 RWW/LES  
 CHECKED BY : ARB 11/88 REV. 5/7/03 RWW/JTE  
 REV. 5/1/06 TLA/GM

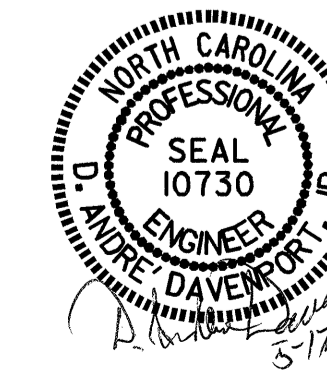
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PROJECT NO. B-4128  
 GUILFORD COUNTY  
 STATION: 24+02.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

BRIDGE APPROACH  
 SLAB DETAILS



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

STD. NO. BAS10 (SHT 12)

## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2002 STANDARD SPECIFICATIONS "FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

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

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

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

### REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED WITH THE EXCEPTION OF #2 BARS WHICH MAY BE FABRICATED FROM COLD DRAWN STEEL WIRE. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

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

### STRUCTURAL STEEL:

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

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

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

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

### HANDRAILS AND POSTS:

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

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

### SPECIAL NOTES:

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

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