

NOTES

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.

ANODIZING
ALUMINUM FOR POSTS, BASES, RAILS, EXPANSION BARS, CLAMP BARS, RIVETS, CAPS, SHIMS, ATTACHMENT BRACKETS AND HOLD-DOWN PLATES SHALL BE ANODIZED. THE CONTRACTOR SHALL SUBMIT THREE (3) SETS OF ASTM B-221 6061-T6 ALUMINUM SAMPLES ANODIZED MEDIUM BRONZE, DARK BRONZE, AND EXTRA DARK BRONZE TO THE ENGINEER. THE ENGINEER SHALL SELECT FROM THE SAMPLES FURNISHED BY THE CONTRACTOR THE COLOR WHICH MOST CLOSELY MATCHES THE ATTACHED GURARDRAIL.
ANY DAMAGE TO THE ANODIZED SURFACE OF THE RAIL OR COMPONENTS DURING CONSTRUCTION SHALL BE REPAIRED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS AT THE DIRECTION OF THE ENGINEER AND AT THE CONTRACTOR'S EXPENSE.
AFTER A SHADE OF BRONZE HAS BEEN SELECTED FOR THE RAILING, THE CONTRACTOR SHALL SUBMIT A SAMPLE OF COMPATIBLE EXTERIOR ACRYLIC HOUSE PAINT TO THE ENGINEER. THIS PAINT SHALL MATCH THE ANODIZED RAIL COLOR AS CLOSELY AS POSSIBLE. AFTER ERECTION OF THE ANODIZED ALUMINUM RAILING, ALL EXPOSED ANCHOR BOLTS, NUTS, WASHERS, MACHINE SCREWS, CAP SCREWS, BOLTS, AND BUILT UP ANGLES SHALL BE COATED WITH TWO COATS OF THIS PAINT.

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.
FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

MATERIAL FOR ANCHOR STUDS SHALL BE ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. STUDS TO BE EMBEDDED 7" IN CONCRETE. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK, CLASS 2B THREAD, AND MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ANCHOR SHALL BE AASHTO M270 GRADE 36.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 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.

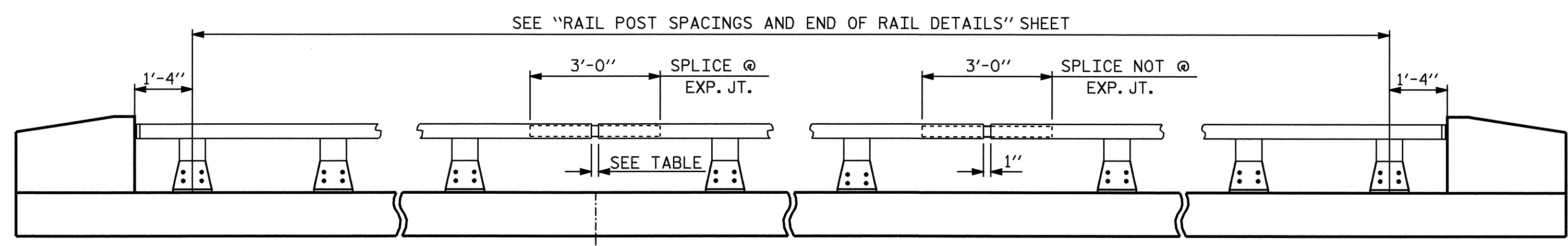
SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.
ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

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

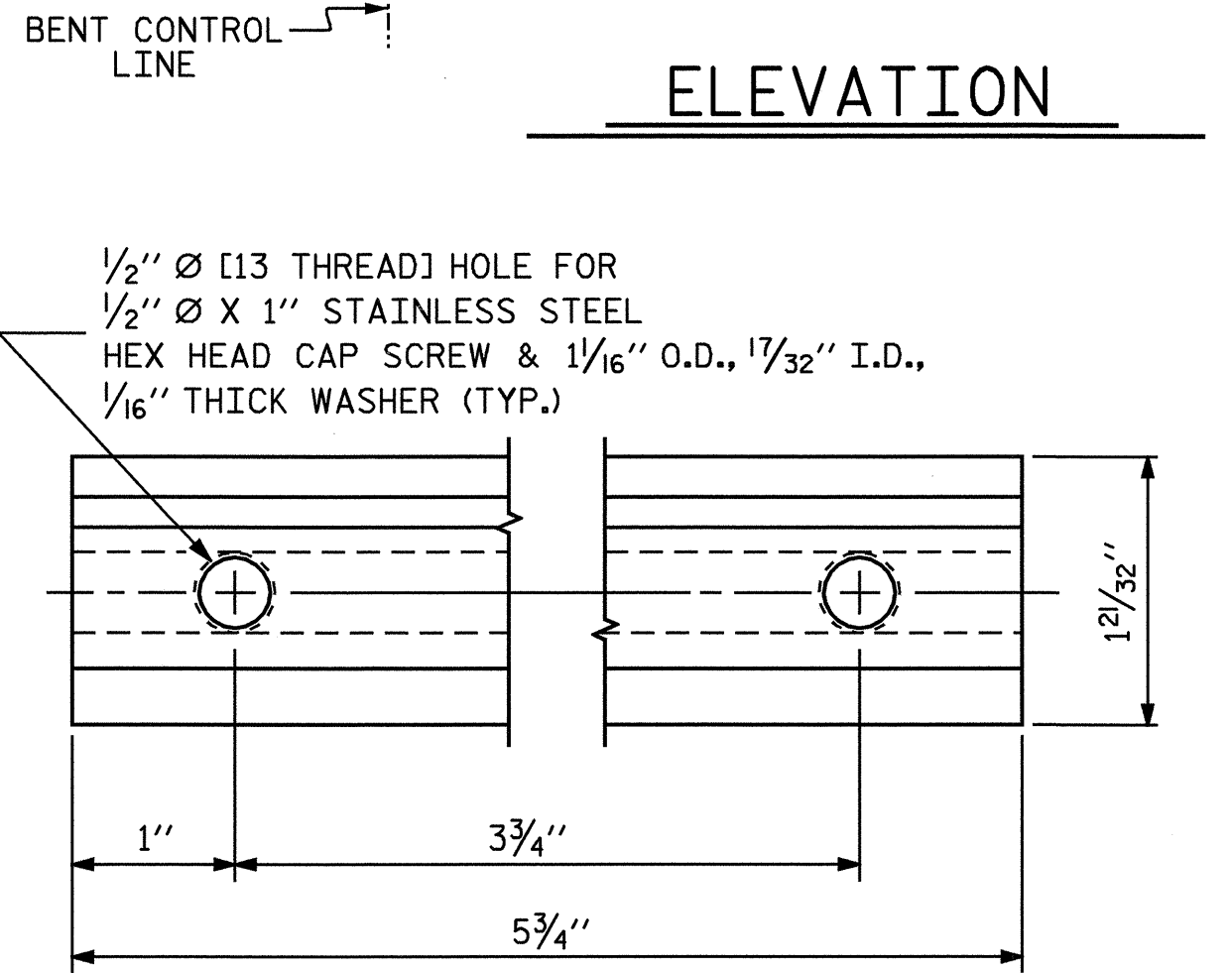
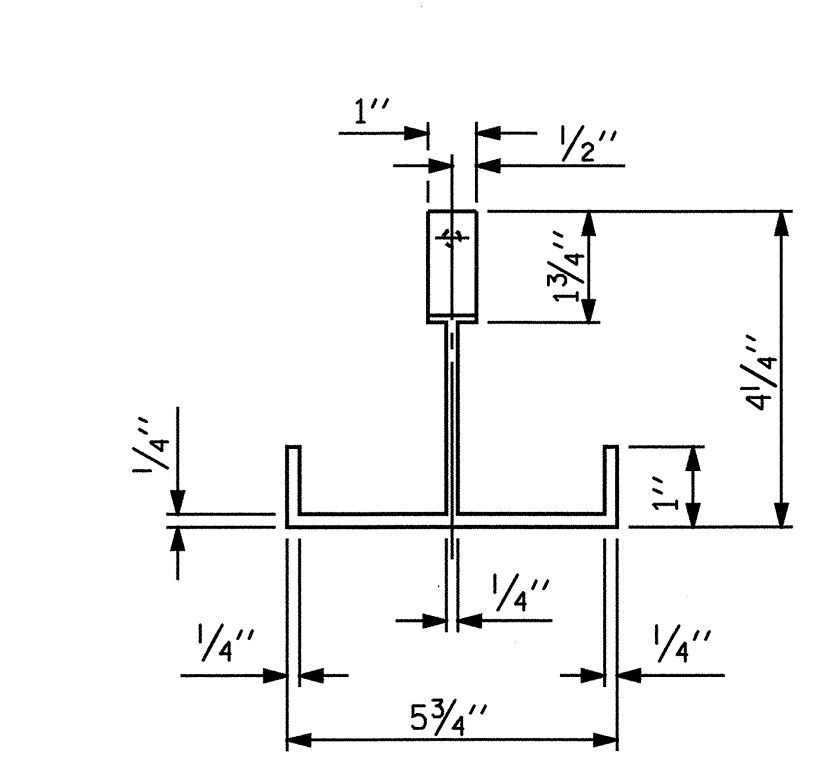
THE CONTRACTOR, AT HIS OPTION, MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN LIEU OF THE ANCHOR ASSEMBLY. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS REQUIRED. SEE SPECIAL PROVISIONS FOR "ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS".

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS, NUTS AND WASHERS SHALL MEET THE SAME REQUIREMENTS AS THE ANCHOR STUDS, NUTS AND WASHERS FOR USE WITH THE ANCHOR ASSEMBLY.

TABLE	
EXPANSION JOINT @	RAIL OPENING
BENT #1 CONTROL LINE	2"
BENT #2 CONTROL LINE	2"

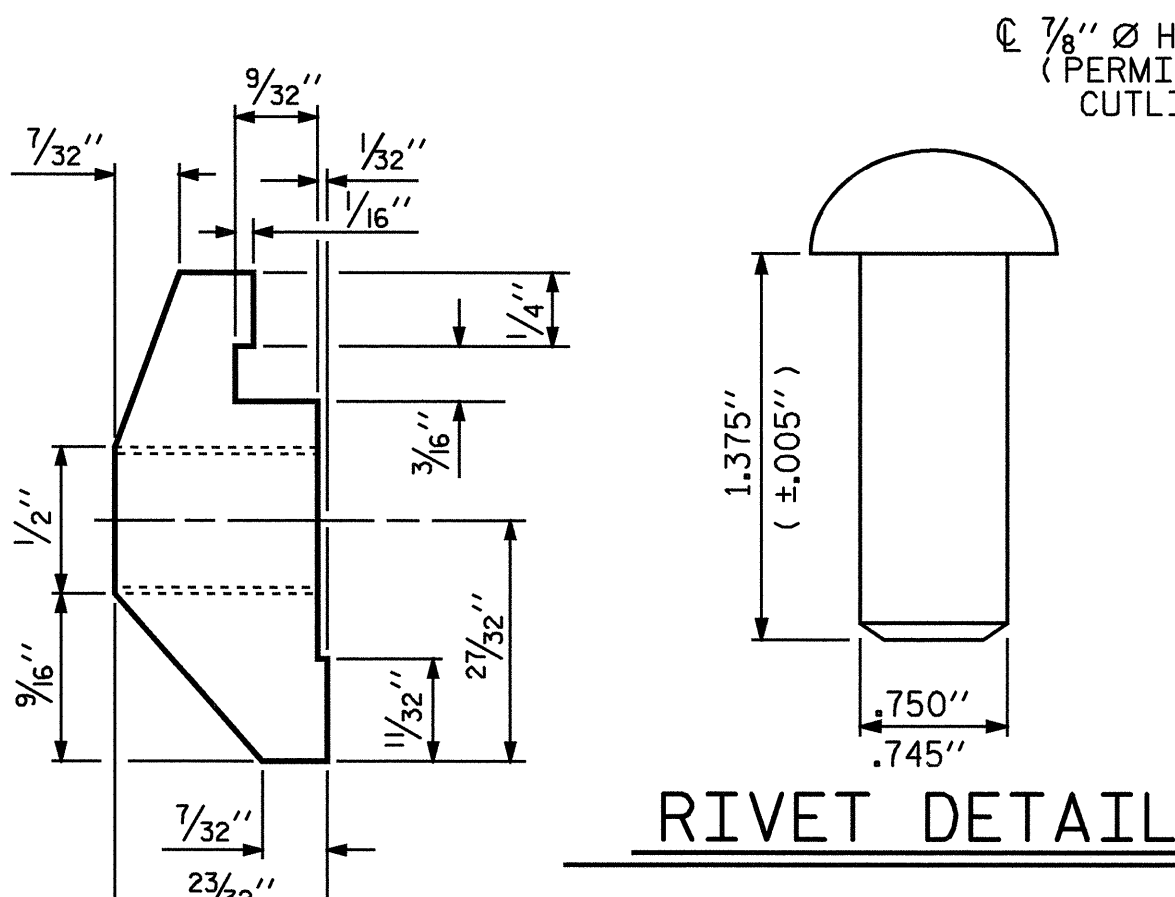


NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "RAIL POST SPACING AND END OF RAIL DETAILS" SHEET.

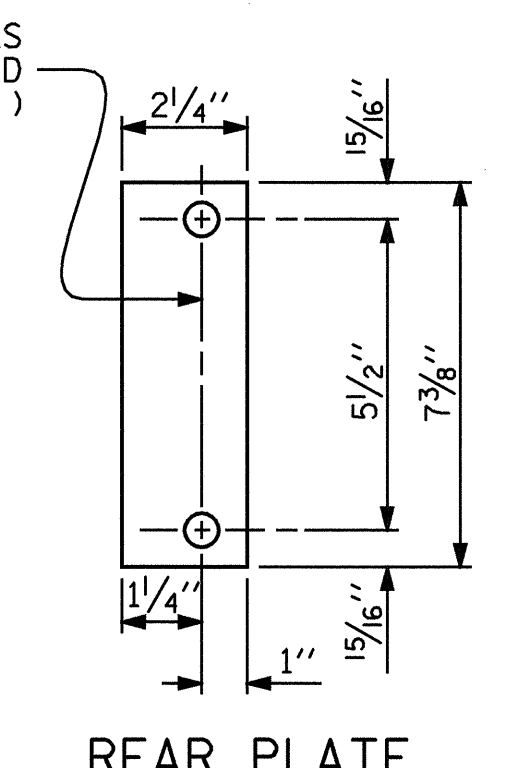


ELEVATION

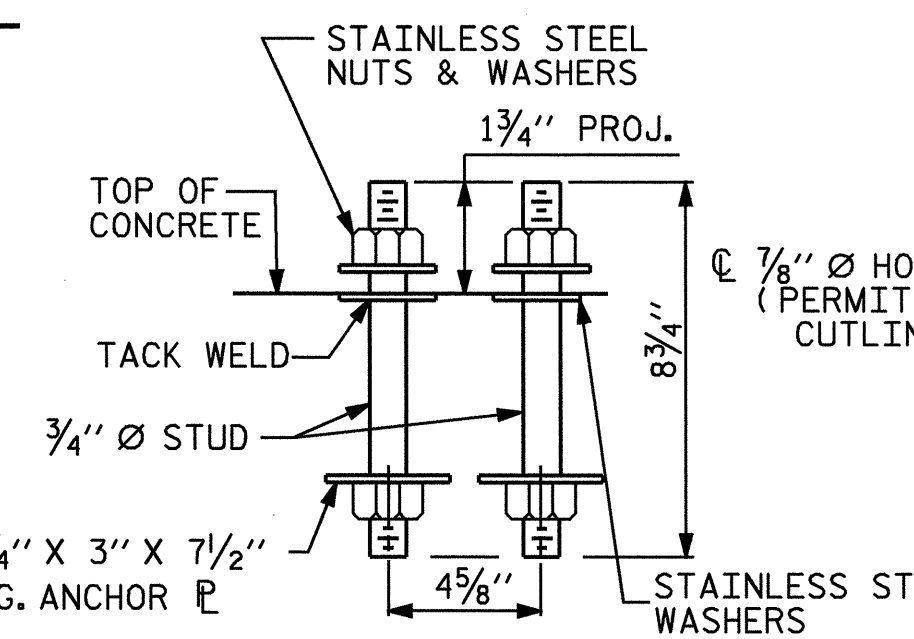
**CLAMP BAR DETAIL
(2 REQUIRED PER POST)**



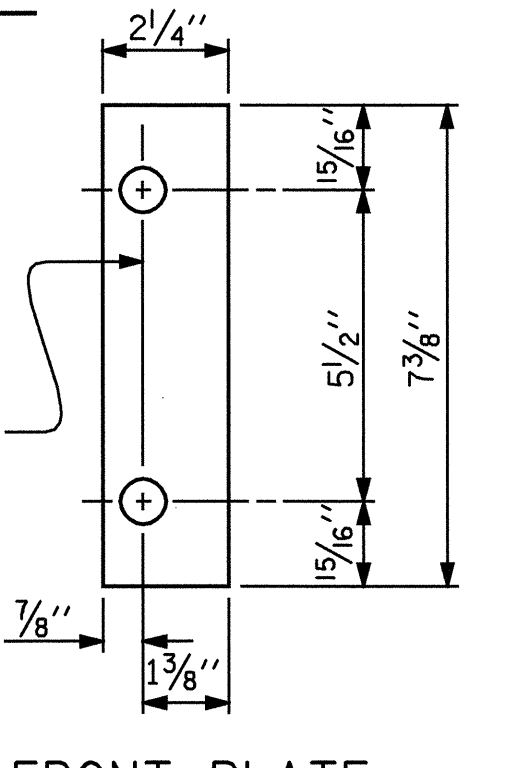
RIVET DETAIL



REAR PLATE



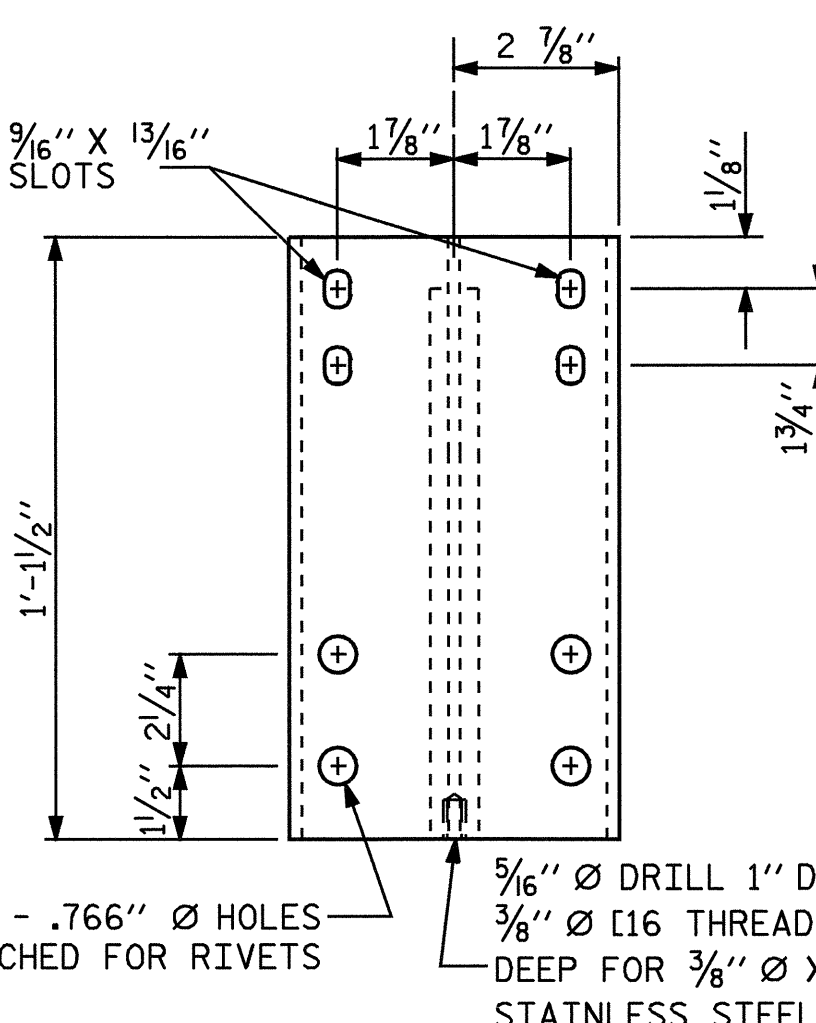
ANCHOR ASSEMBLY



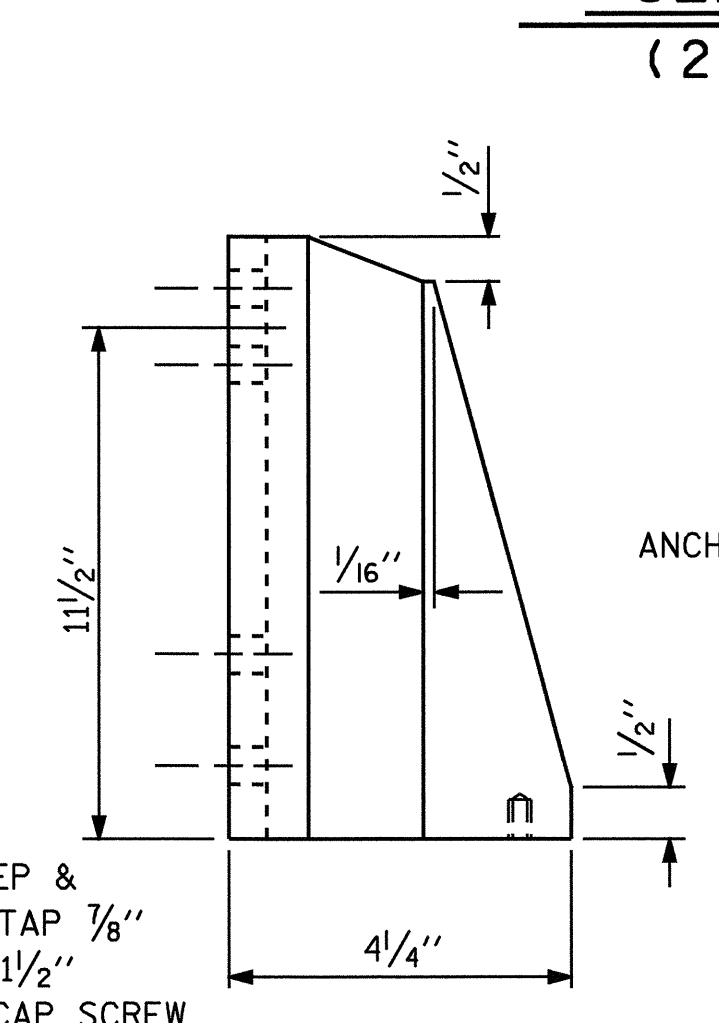
FRONT PLATE

SHIM DETAILS

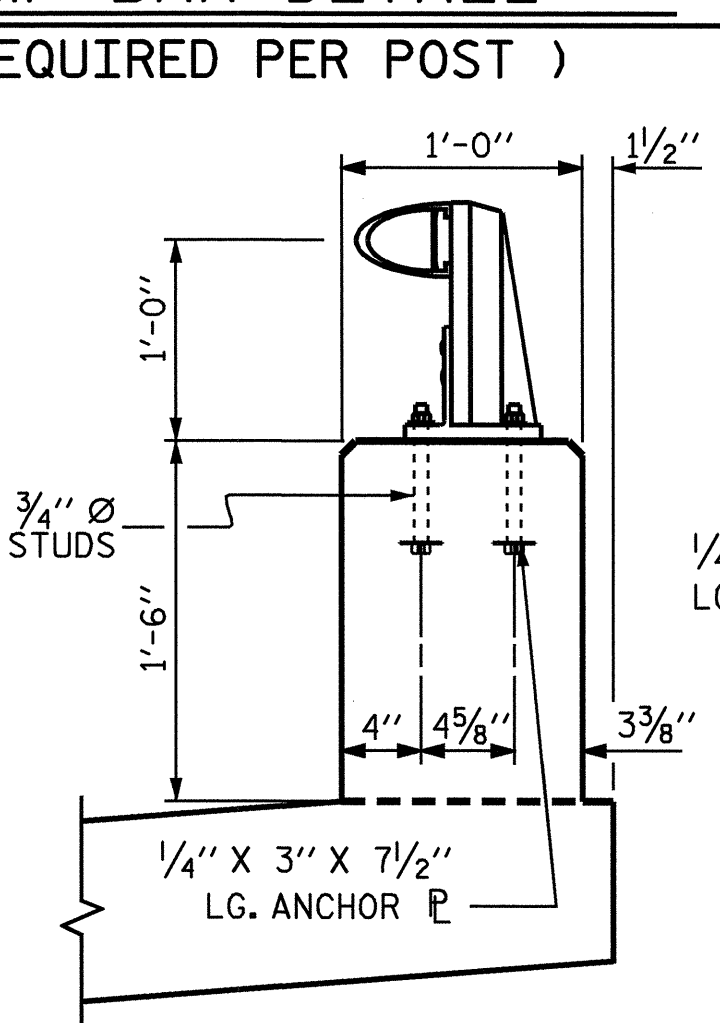
NOTE: SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



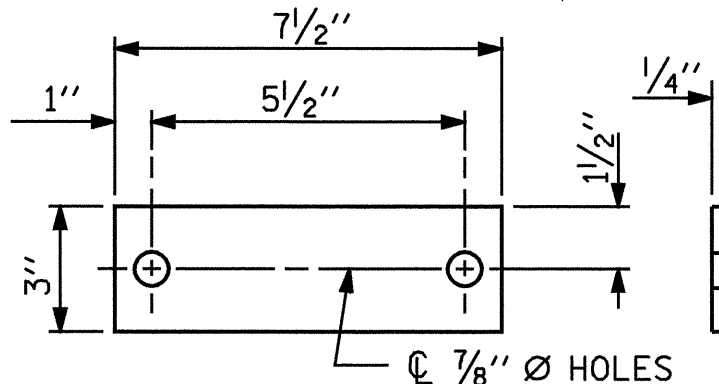
FRONT ELEVATION



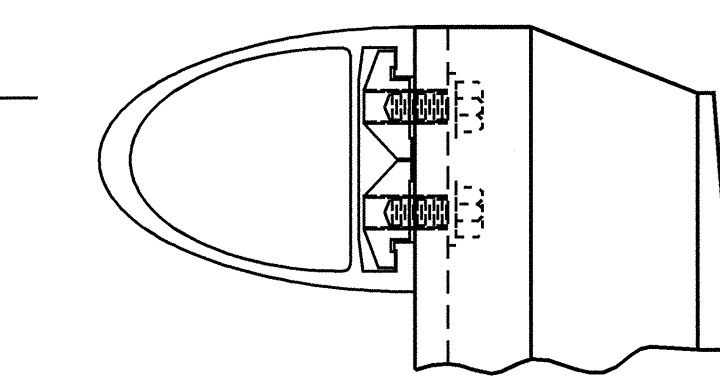
SIDE ELEVATION



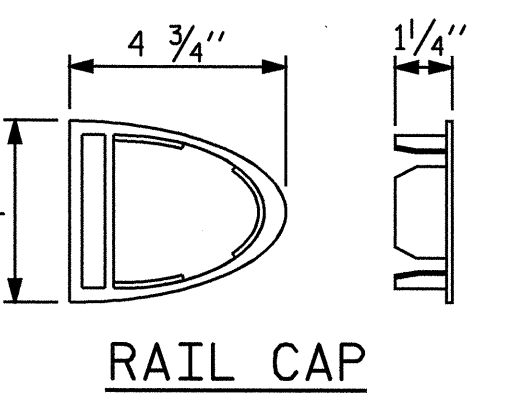
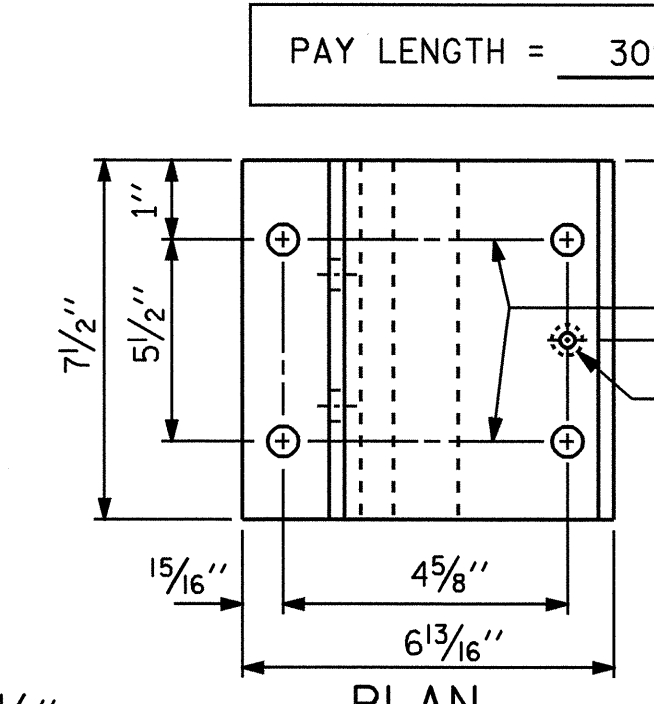
SECTION THRU PARAPET AND RAIL



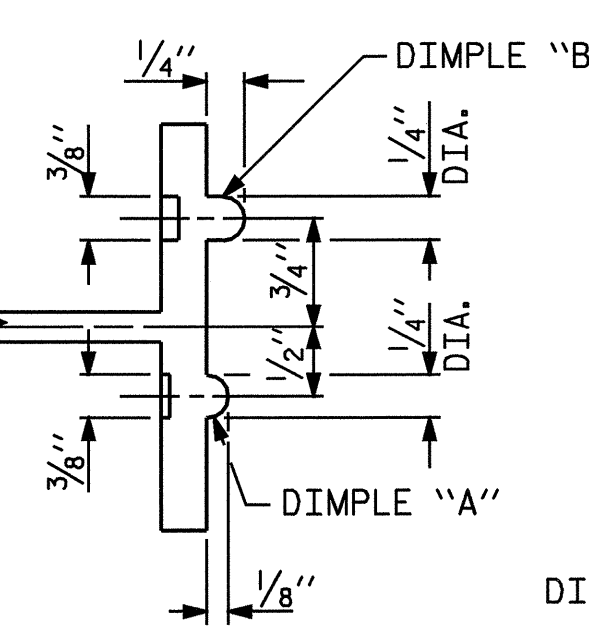
ANCHOR PLATE



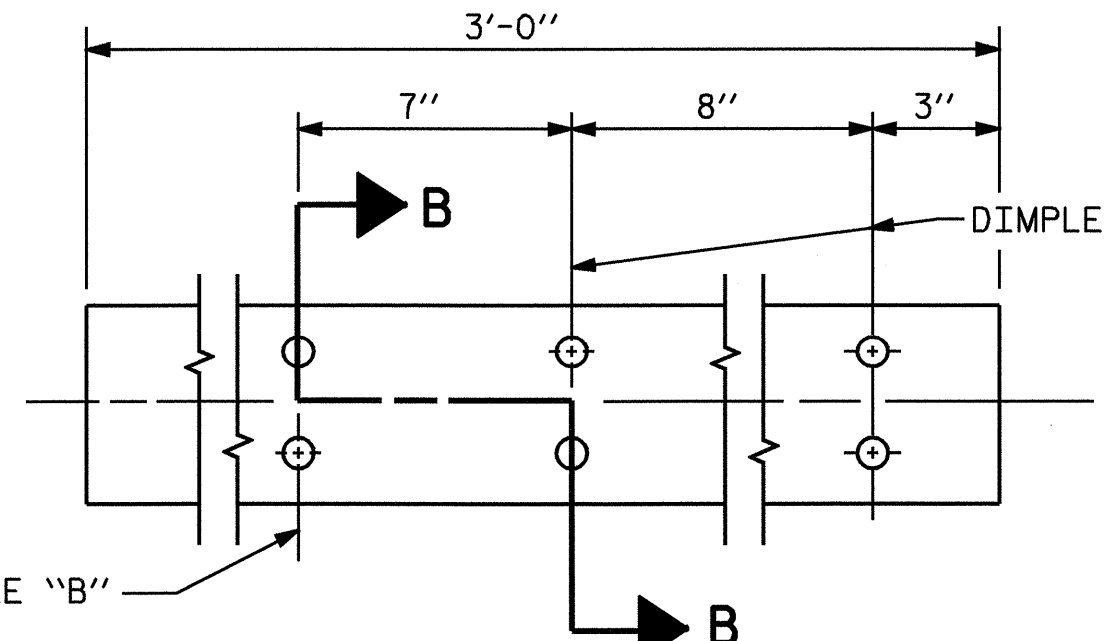
CLAMP & RAIL ASSEMBLY



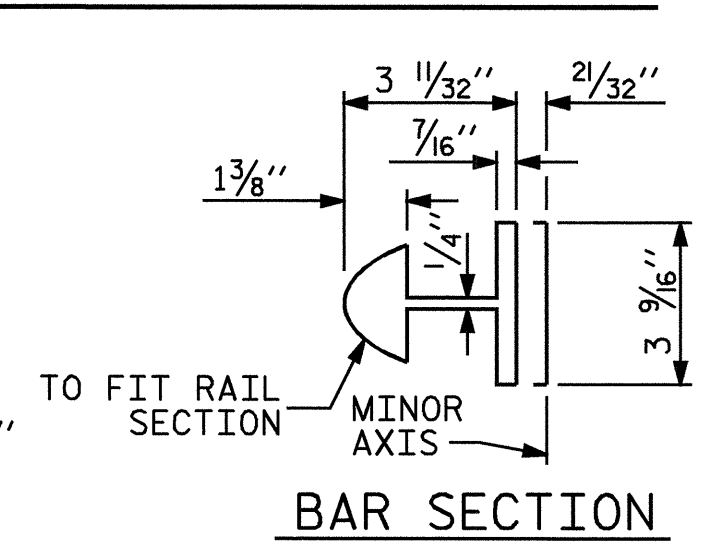
RAIL CAP



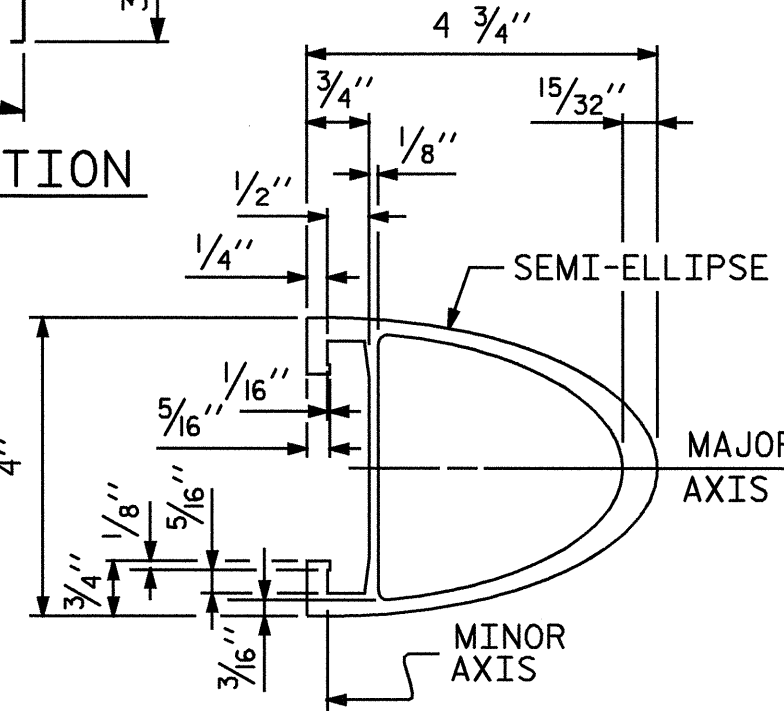
SECTION B-B



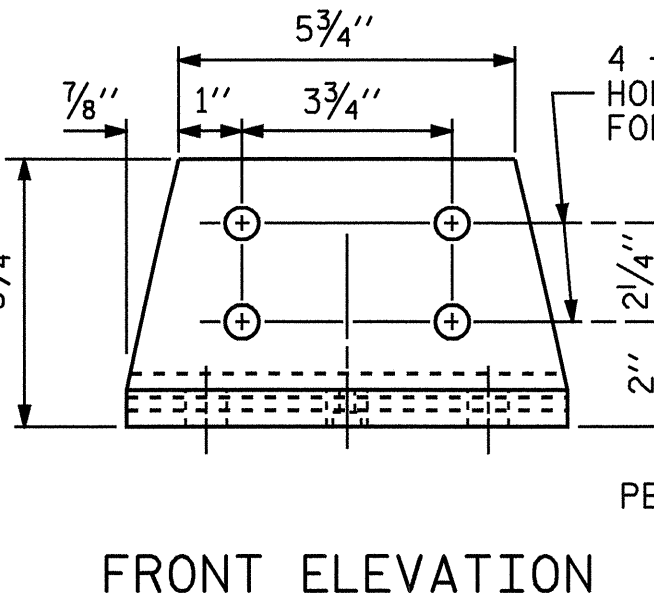
EXPANSION BAR DETAILS



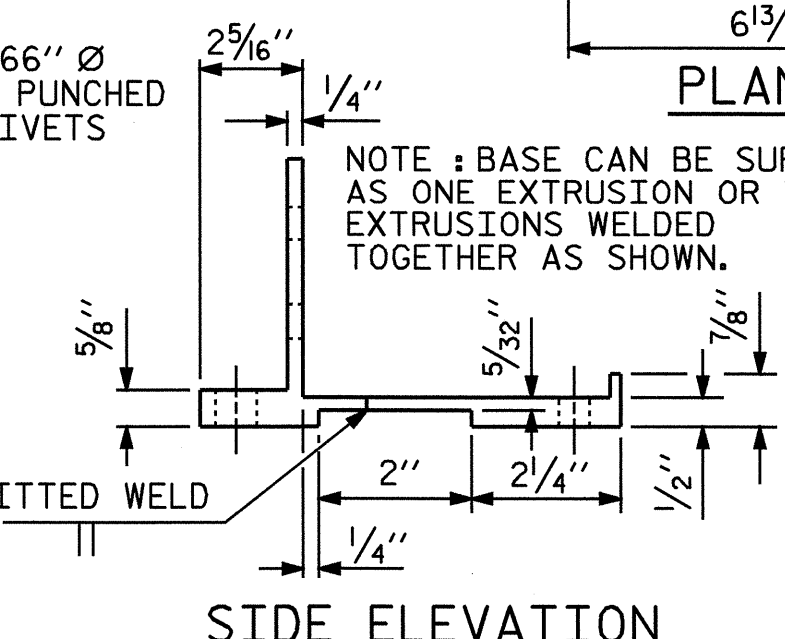
BAR SECTION



RAIL SECTION



FRONT ELEVATION



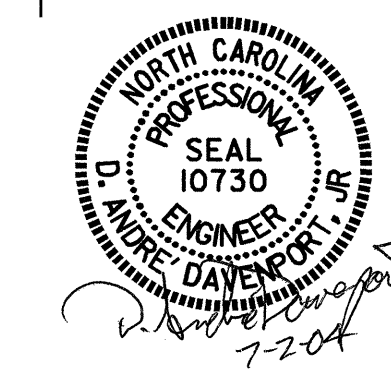
SIDE ELEVATION

POST BASE DETAILS

PAY LENGTH = 309.85 LIN. FT.

PROJECT NO. **B-3506**
RANDOLPH COUNTY
STATION: **17+97.50 -L-**

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
ONE BAR METAL RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



ASSEMBLED BY: H. T. BARBOUR DATE: 11-17-03
CHECKED BY: D. A. DAVENPORT DATE: 3-04
DRAWN BY: FCJ 1/88 RWW/LES
CHECKED BY: CRK 3/89 REV. 8/16/99 RWW/LES
REV. 10/17/00 LES/RDR

SHEET NO. 5-16
TOTAL SHEETS 35