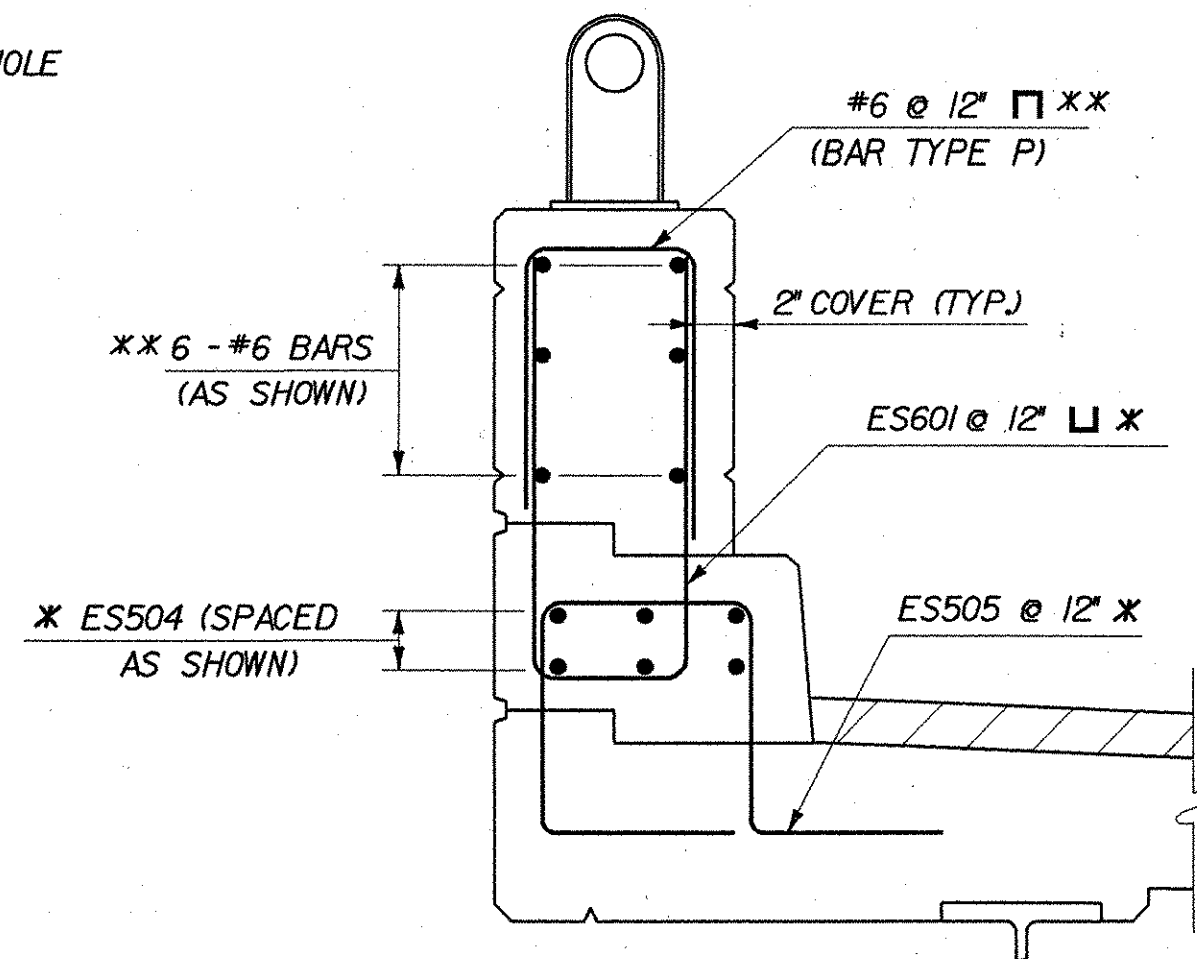


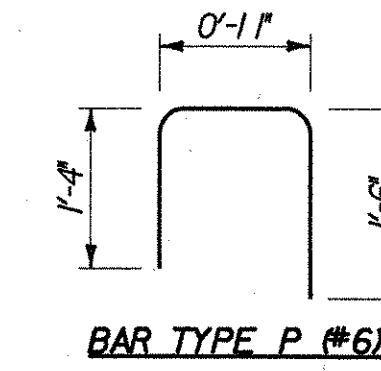
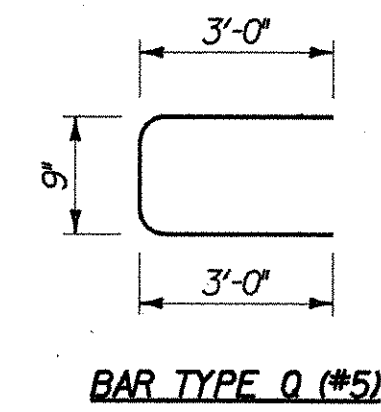
**TYPICAL SECTION**  
SCALE: 1" = 1'-0"



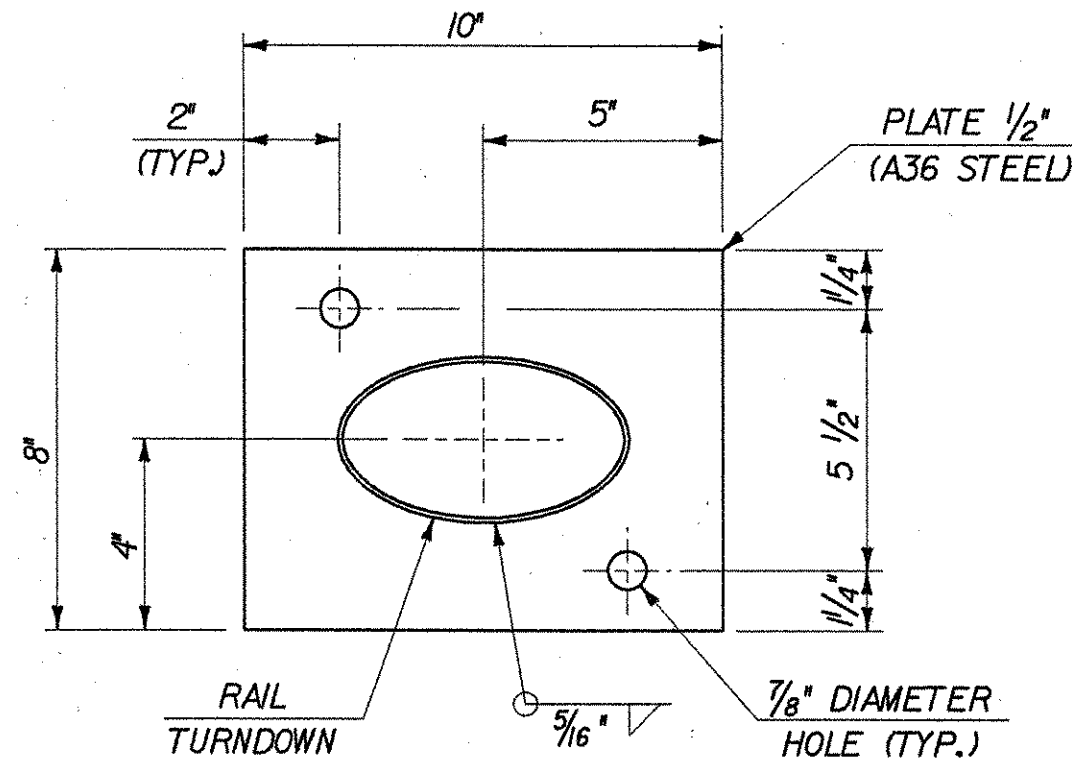
**TYPICAL SECTION - REINFORCEMENT**  
SCALE: 1" = 1'-0"

\* (COST INCLUDED IN ITEM 507.17, EPOXY COATED REINFORCING STEEL) (FOR DETAILS, SEE REINFORCING PLAN & DETAILS, SHEET 18.)

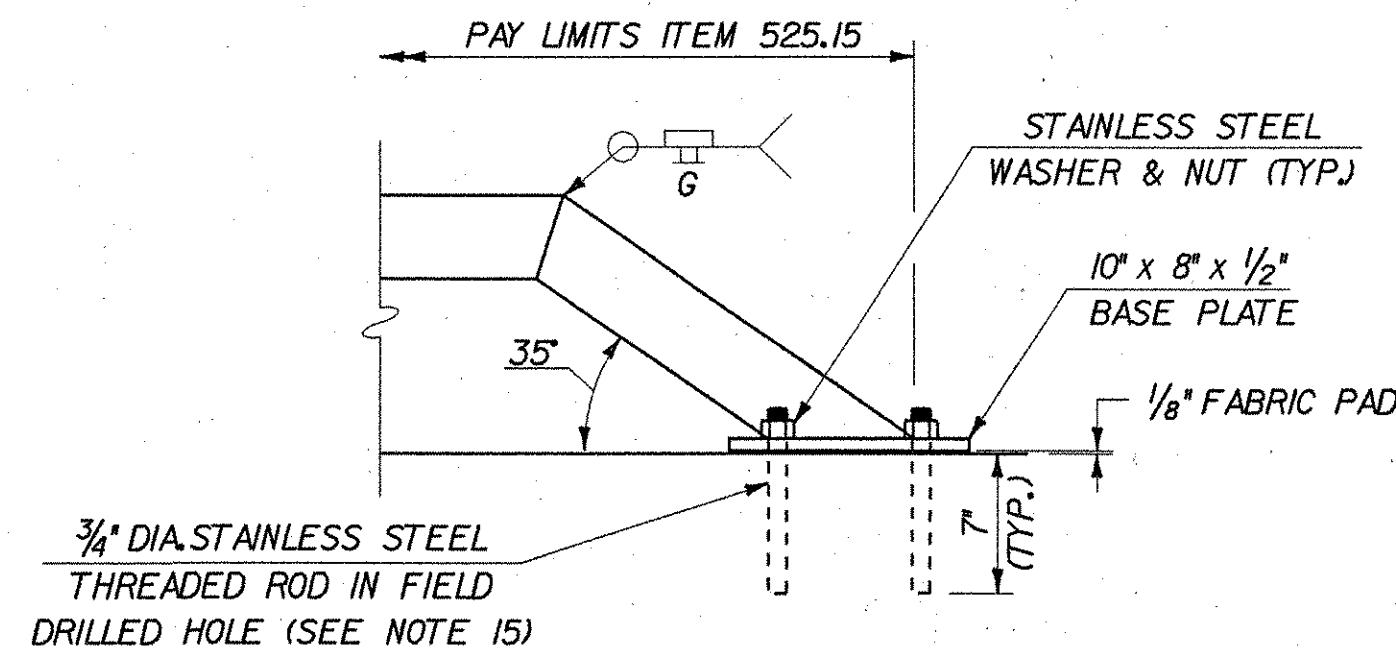
\*\* THE REINFORCING STEEL PLACED WITHIN THE CONCRETE RAIL SHALL BE INCIDENTAL TO ITEM 525.50, CAST-IN-PLACE CONCRETE BRIDGE RAIL AND ARE NOT DETAILED ON THE REINFORCING STEEL SCHEDULE



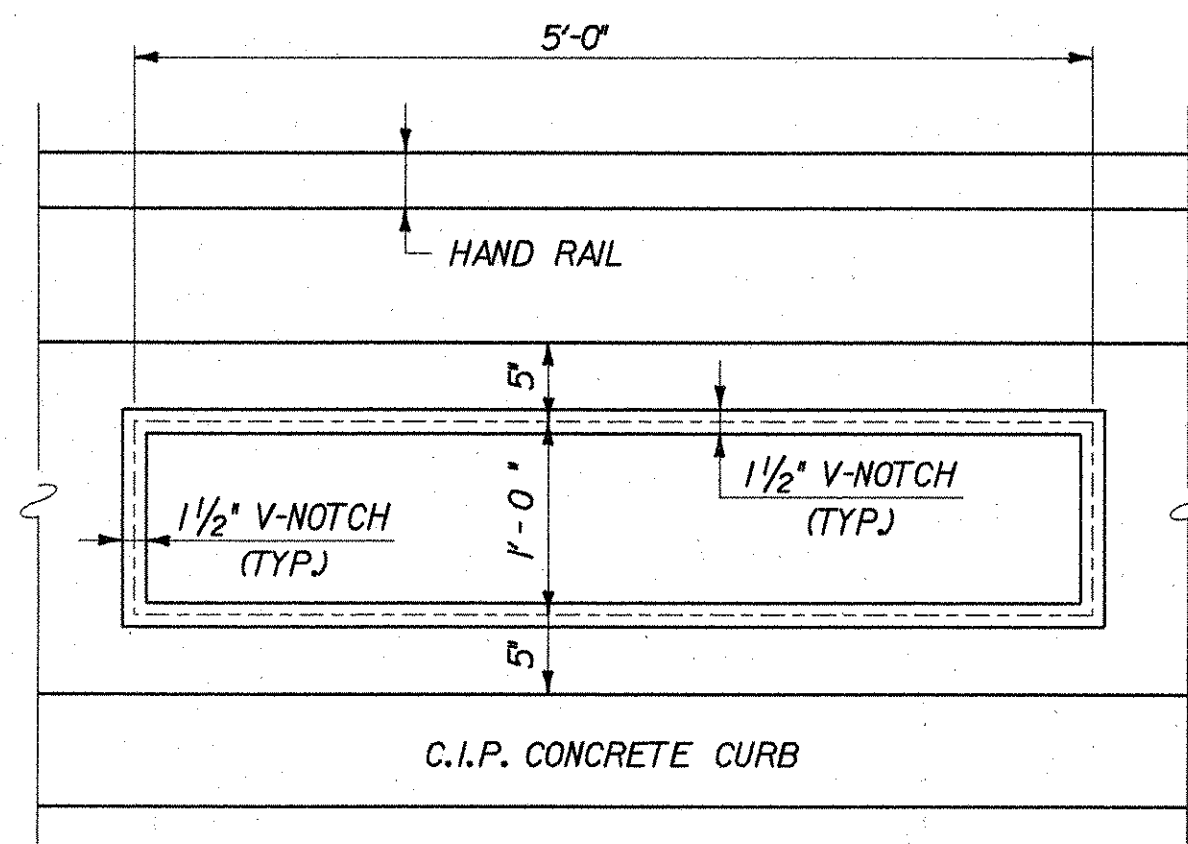
**BAR DETAILS** \*\*  
NOT TO SCALE



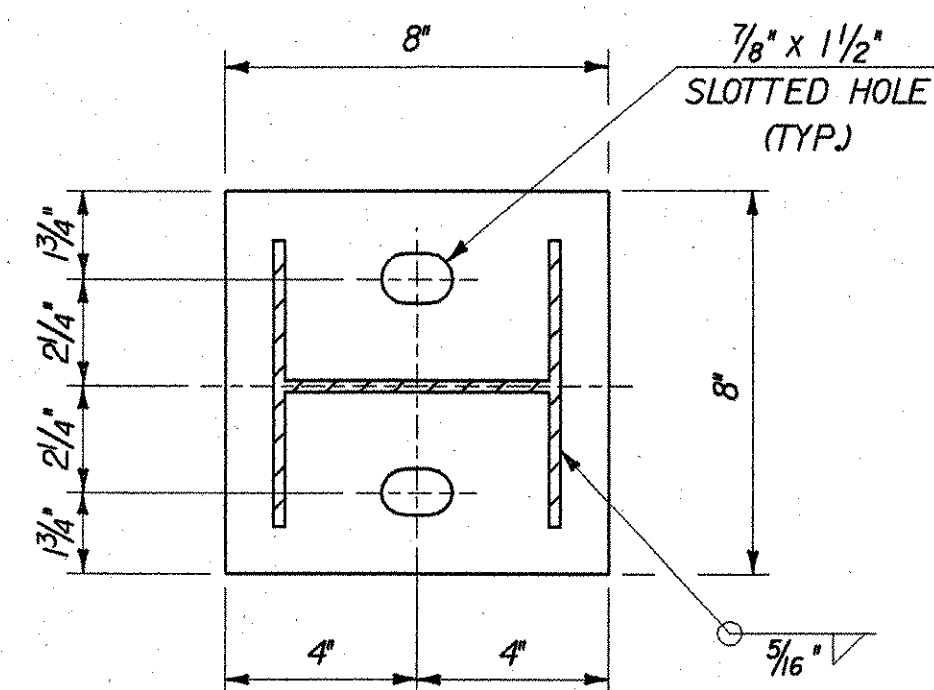
**HAND RAIL TURNDOWN BASE PLATE**  
SCALE: 3" = 1'-0"



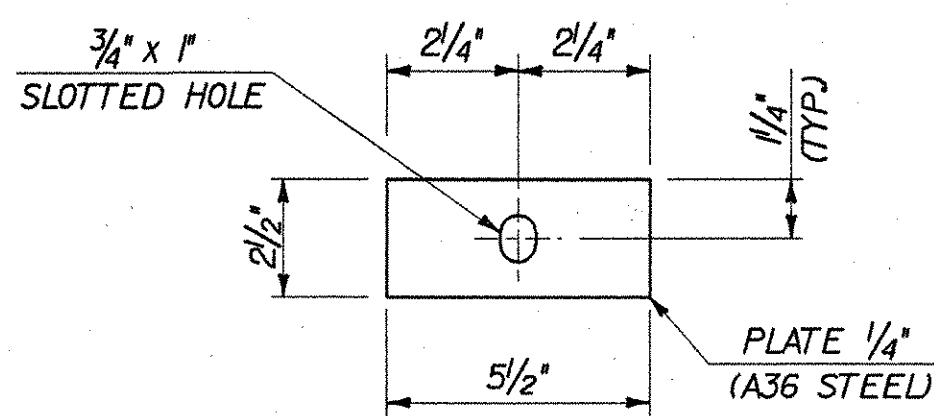
**HAND RAIL TERMINAL DETAIL**  
SCALE: 1/2" = 1'-0"



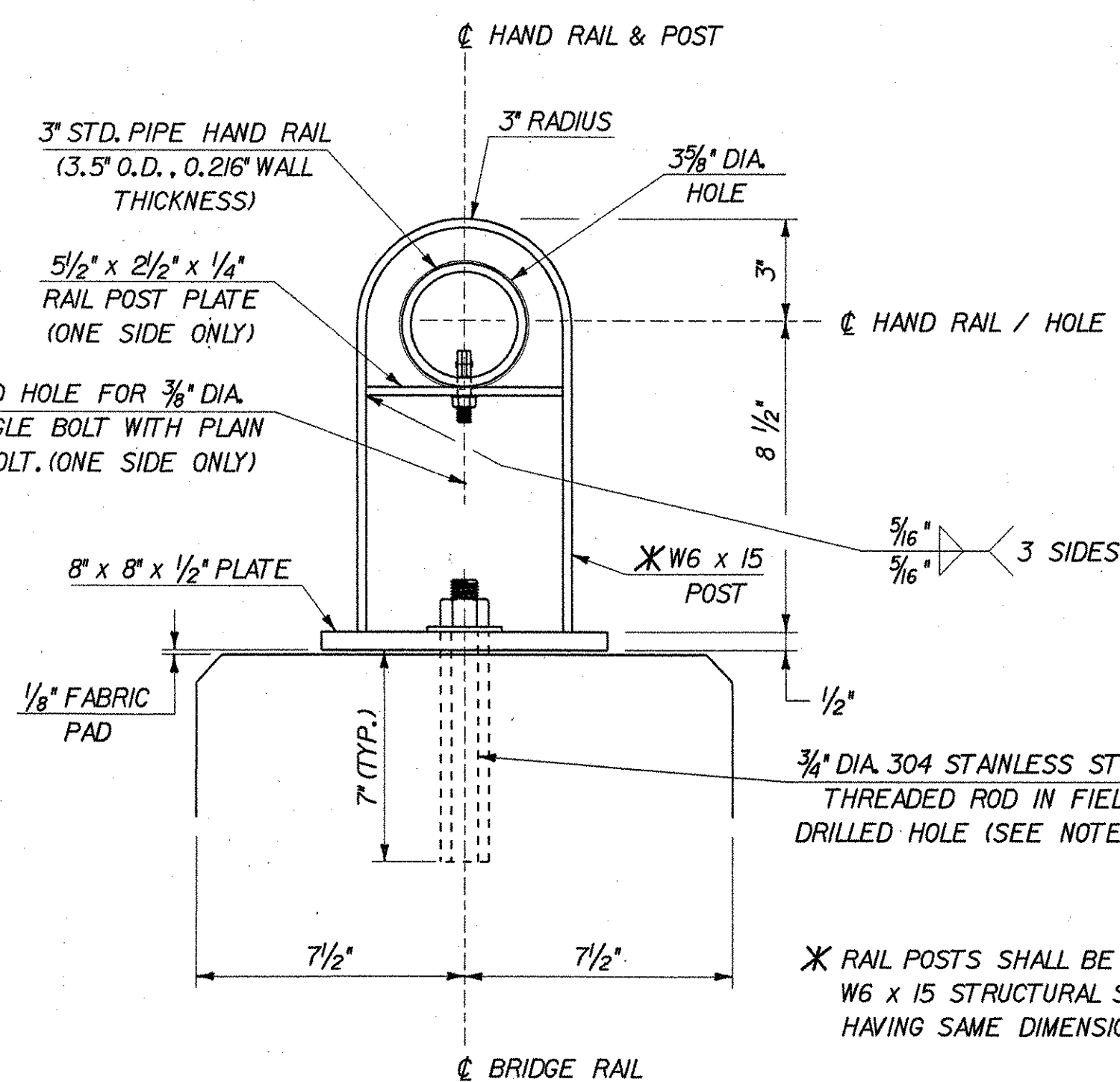
**ARCHITECTURAL PANEL**  
SCALE: 1" = 1'-0"



**TYPICAL BASE PLATE**  
SCALE: 3" = 1'-0"



**RAIL POST PLATE**  
SCALE: 3" = 1'-0"



**HAND RAIL DETAIL**  
SCALE: 3" = 1'-0"

**HAND RAIL NOTES:**

- ALL WORK AND MATERIALS SHALL CONFORM TO THE PROVISIONS OF SECTION 525, "RAILINGS" OF THE STANDARD SPECIFICATION FOR CONSTRUCTION.
- RAIL PIPE AND POSTS SHALL MEET THE REQUIREMENTS OF SECTION 732, "RAILING MATERIALS" OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION EXCEPT THE DROP-WEIGHT TEAR TEST IN SECTION 732 SHALL NOT APPLY TO THE STRUCTURAL PIPE.
- ALL EXPOSED CUT OR SHEARED EDGES SHALL BE ROUNDED TO A 1/16" RADIUS AND BE FREE OF BURRS.
- RAIL POSTS SHALL BE SET NORMAL TO GRADE.
- PROVIDE A MINIMUM OF 1- 3/4" DIAMETER HOLE IN BOTTOM OF HAND RAIL BETWEEN POSTS TO ALLOW FOR DRAINAGE.
- SECTIONS OF RAIL TUBE SHALL BE ATTACHED TO A MINIMUM OF TWO (2) RAIL POSTS AND PREFERABLY TO AT LEAST FOUR (4) POSTS.
- ALL PARTS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111, EXCEPT THAT HARDWARE SHALL MEET THE REQUIREMENTS OF AASHTO M232.
- RAIL POSTS ANCHORING NUTS SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL ONE-EIGHTH TURN.
- HOLES IN RAIL FOR PIPE HAND RAIL ATTACHMENT SHALL BE FIELD-DRILLED.
- IF THERE IS A CONFLICT BETWEEN THESE STANDARD DETAILS AND THE DESIGN, THE REQUIREMENTS OF THE DESIGN DRAWINGS SHALL BE FOLLOWED.
- THE PIPE RAILING SHALL BE SHOP BENT TO THE CORRECT RADIUS.
- THE FABRICATOR SHALL SUBMIT SHOP DRAWINGS INCLUDING WELDING PROCEDURES TO THE STRUCTURES SECTION FOR APPROVAL IN ACCORDANCE WITH THE PROVISION OF 506.04, "SHOP DRAWINGS". ALL WELDING SHALL CONFORM WITH SECTION 506.10.
- HAND RAILING SHALL BE PAINTED BLACK.
- THE METAL POSTS SHALL BE ATTACHED TO THE CONCRETE BRIDGE RAIL VIA AN ADHESIVE ANCHORING SYSTEM CONSISTING OF STAINLESS STEEL THREADED RODS EMBEDDED AND ADHERED TO FIELD DRILLED HOLES. THE ADHESIVE ANCHORING SYSTEM SHALL INCLUDE 3/4-INCH HILTI RODS (304SS), NUTS, AND WASHERS, AS WELL AS THE HILTI HIT-RE500 ADHESIVE SYSTEM, OR ACCEPTED EQUAL. ALL COSTS SHALL BE INCLUDED IN ITEM 525.50, CAST-IN-PLACE CONCRETE BRIDGE RAIL.

**MATERIALS:**

- RAIL PIPE ———— ASTM A53
- RAIL POSTS AND BASE PLATES ———— ASTM A709/A709M, GRADE 36
- ALL OTHER SHAPES AND PLATES ———— ASTM A709/A709M, GRADE 36
- ANCHOR STUDS ———— ASTM A449
- ALL OTHER BOLTS (UNLESS NOTED) ———— AASHTO M164, TYPE 1

NUTS FOR AASHTO M164 BOLTS AND FOR ANCHOR STUDS SHALL COMPLY WITH AASHTO M291 (ASTM A563).

WASHERS SHALL COMPLY WITH AASHTO M293 (ASTM F436) SPECIFICATIONS.

1/8" PAD SHALL COMPLY WITH STANDARD SPECIFICATION SUBSECTION 731.01 OR 731.02.

**STATE OF VERMONT AGENCY OF TRANSPORTATION**

Town Of	WARREN	Bridge No.	7
Highway No.	TH 1	Log Sta.	
		Surv. Sta.	
<b>BROOK ROAD OVER FREEMAN BROOK</b>			
<b>RAILING DETAILS (2 OF 2)</b>			
Designed By	B. COLBURN / S. DELIA	Drawn By	P. DUSTIN / S. DELIA
Checked By	R. JOY	Date	02/07
		Bridge Design Supervisor	R. ROONEY
		Date	02/07
PROJECT	WARREN	PROJECT NO.	BHF 0188(7)
I.G.C. Info. m:\549107-Warren\BRIDGE\Final\2\276r12.dgn			
Bridge Sheet No.		Sheet	30 of 36



PLOTTED 09-FEB-2007