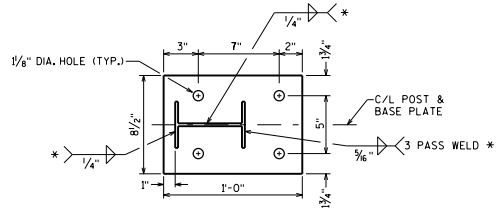
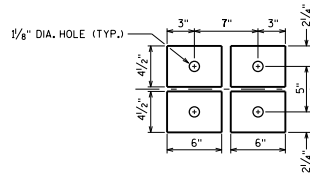


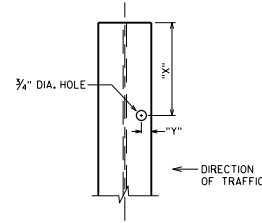
\* WELDING IS TO BE COMPLETED USING THE GAS-METAL ARC WELDING (GMAW) PROCESS WITH ERTOS-3 WELDING WIRE AND ARGON-OXYGEN OR CO<sub>2</sub> COVER GAS.



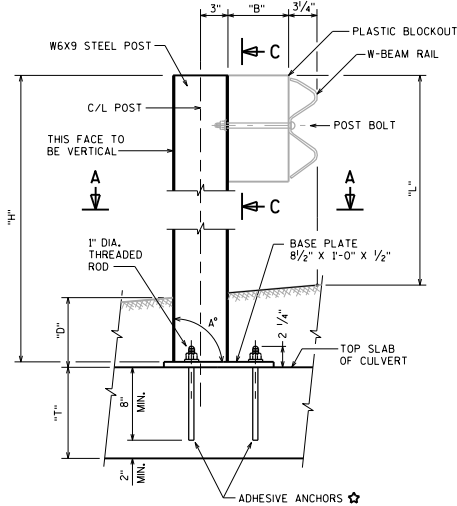
**SECTION A-A**  
POST & BASE PLATE



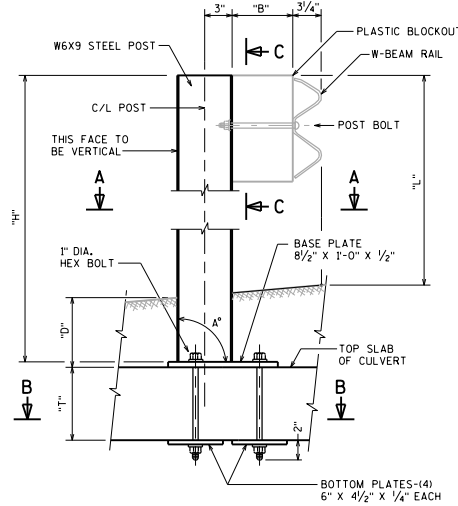
**SECTION B-B**  
(4)-BOTTOM PLATES



**SECTION C-C**  
HOLE IN POST FLANGE ON APPROACHING TRAFFIC SIDE



**ELEVATION**  
**GUARDRAIL POST ANCHORS TYPE 1**  
USE FOR THICKNESS "D" OF 10 INCHES OR MORE AND MINIMUM CONCRETE STRENGTH (f'<sub>c</sub>) OF 4,000 PSI



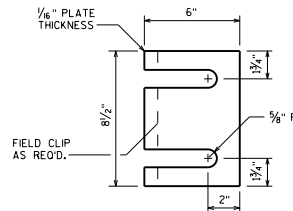
**ELEVATION**  
**GUARDRAIL POST ANCHORS TYPE 2**  
USE FOR THICKNESS "D" OF 8 INCHES OR MORE AND MINIMUM CONCRETE STRENGTH (f'<sub>c</sub>) OF 3,500 PSI

**GUARDRAIL POST ANCHORAGE SYSTEM**

**CRITERIA:**

USE FOR POSTS WITH "D" EMBEDMENT LESS THAN OR EQUAL TO 4'-0" AND GREATER THAN OR EQUAL TO 9". NOT REQ'D FOR POSTS WITH "D" EMBEDMENT MORE THAN 4'-0". NOT ALLOWED FOR POSTS WITH "D" EMBEDMENT LESS THAN 9".

	"L"	"B"	"X"	"Y"
CLASS "A" GUARDRAIL	2'-4 5/8"	8"	7"	13 1/8"
MGS GUARDRAIL	2'-7 7/8"	12"	7 7/8"	7 1/4"



**STEEL SHIM DETAIL**  
4 PER POST

**NOTES**

DETAILS SHOWN FOR POSTS, PLATES, ANCHORAGE SYSTEM AND INSTALLATION, BLOCKS, AND GUARD RAIL ARE NOT PART OF THE STRUCTURE CONTRACT, BUT ARE BID PER THE ROADWAY DESIGN PLANS.

POST BASE PLATES (AND BOTTOM PLATES IF USED) SHALL BE FLAT WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL. ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS.

CUT BOTTOM OF POST SO THAT POST WILL BE VERTICAL WHEN POST ASSEMBLY IS PLACED ON TOP OF THE CULVERT. ALONG THE ROADWAY THE POST WILL BE NORMAL TO GRADE LINE. HEX BOLTS AND THREADED RODS ARE TO BE PLACED PERPENDICULAR TO THE BASE PLATE.

POST, BASE PLATE (AND BOTTOM PLATE IF USED), AND SHIMS SHALL BE GALVANIZED AFTER FABRICATION.

PRIOR TO GALVANIZING, ALL STEEL POSTS AND PLATES SHALL BE GIVEN A NO. 6 COMMERCIAL BLAST CLEANING BY SSPC SPECS.

ALL MATERIAL USED IN POSTS AND PLATES SHALL BE MADE FROM MATERIAL CONFORMING TO ASTM DESIGNATION A709 GRADE 50 OR 50S.

HEX BOLTS, THREADED RODS, HEX NUTS AND WASHERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F1554 GRADE 36, AND SHALL BE GALVANIZED. RODS ARE TO BE FULLY THREADED AND BOLTS TO BE THREADED 3", CHAMFER TOP OF BOLTS AND RODS BEFORE THREADING.

ADHESIVE ANCHORS 1-INCH EMBED IN CONCRETE AS DETAILED. CHARACTERISTIC BOND STRENGTH SHALL MEET OR EXCEED 1305 PSI FOR UNCRACKED CONCRETE.

STEEL SHIMS MAY BE USED BETWEEN PLATES AND SLAB WHERE REQUIRED FOR ALIGNMENT.

**DESIGNER NOTES**

CHECK CRITERIA TO SEE IF POST ANCHORAGE SYSTEM IS REQUIRED BASED ON FILL HEIGHT "D" AT POSTS. IF REQUIRED, THEN SELECT WHICH TYPE OF ANCHORAGE (TYPE 1 OR TYPE 2) SHOULD BE USED.

CONTACT THE ROADWAY DESIGN SECTION TO VERIFY IF CLASS "A" OR "MGS" GUARDRAIL SYSTEM WILL BE USED.

POST SPACING IS 3'-1 1/2" PER FDM SDD 14 B 51-1 SEE FDM SDD 14 B 51-1 FOR MINIMUM CLEARANCES FROM EDGES OR OBSTRUCTIONS TO ANCHORAGE SYSTEM. FOR TYPE 2 ANCHORAGE, MAKE SURE BOTTOM PLATE IS NOT PLACED AT THE SLOPED HAUNCH BETWEEN THE WALL AND TOP SLAB. SHIFT LOCATION OF POSTS (LONGITUDINALLY ALONG C/L OF POSTS) IF REQUIRED TO MEET SPACING AND CLEARANCE REQUIREMENTS.

SHOW DETAILS AND PERTINENT NOTES FOUND ON THIS STANDARD ON THE STRUCTURE PLANS FOR THE CHOSEN ANCHOR TYPE.

SHOW LOCATION OF POSTS AND SPACING ALONG C/L OF POST IN PLAN VIEW OF STRUCTURE PLANS. LABEL EACH POST (P1, P2, ETC.). SHOW A TABLE PROVIDING THE ESTIMATED LENGTH "H" OF EACH POST, AND THE ANGLE A° BETWEEN BASE PLATE AND POST.

IN THE TOP SLAB PROVIDE A MINIMUM OF #4 BARS AT 1'-0" IN EACH DIRECTION WHEN TYPE 1 OR TYPE 2 DETAILS ARE USED.

THIS RAILING AND ANCHORAGE SYSTEM MEET NCHRP 350 EVALUATION CRITERIA FOR TEST LEVEL 3 (TL-3).

<b>GUARDRAIL POST ANCHORAGE SYSTEM</b>	
	<b>BUREAU OF STRUCTURES</b>
APPROVED: <u>Bill Oliva</u>	DATE: 7-16