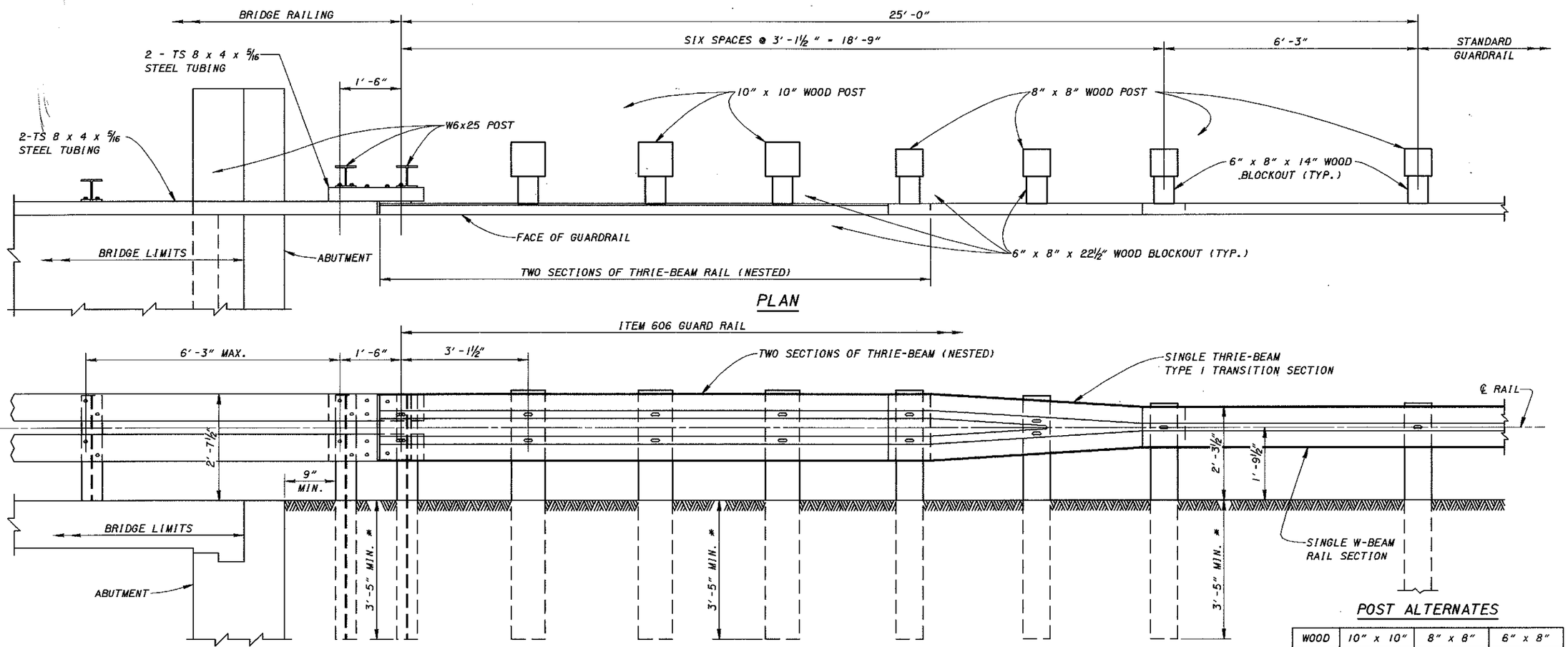

TYPE 3 BRIDGE TERMINAL ASSEMBLY (MODIFIED)

POST ALTERNATES

WOOD	10" x 10"	8" x 8"	6" x 8"
STEEL	W8x24	W6x25	W6x9

TST-1-99 GENERAL NOTES:

GENERAL: THIS DRAWING PROVIDES DESIGN AND CONSTRUCTION DETAILS. THE PROJECT PLANS FOR EACH STRUCTURE SHALL PROVIDE NECESSARY ADDITIONAL RAILING DIMENSIONS INCLUDING RAILING LENGTHS, POST SPACINGS, POST LENGTHS AND ANY OTHER PERTINENT INFORMATION INCLUDING SPECIAL NOTES AND DETAILS. FOR ADDITIONAL GUARDRAIL DETAILS, SEE STD. CONSTR. DWGS. GR-1.1, GR-1.2 AND OTHER DRAWINGS PERTAINING TO DESIGN OF SPECIFIC GRARDRAIL TYPES.

APPLICATION: THE TWIN STEEL TUBE RAILING SHALL BE USED ON STRUCTURES DESIGNED TO DRAIN SURFACE WATER OVER THE SIDES OF THE STRUCTURE. THIS RAILING IS NOT APPLICABLE TO COMPOSITE BOX BEAM BRIDGES WITH DESIGN OVERHANGS GREATER THAN 2" OR TOP FLANGE THICKNESSES LESS THAN 5".

THE TYPE 3 BRIDGE TERMINAL ASSEMBLY (MODIFIED) SHALL BE USED TO CONNECT GUARDRAIL RUNS TO BOTH THE APPROACH AND TRAILING ENDS OF TWIN STEEL TUBE BRIDGE RAILINGS.

DESIGN SPECIFICATIONS: THIS DESIGN CONFORMS TO THE "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 1996, INCLUDING THE 1997 INTERIM SPECIFICATIONS, AND THE ODOT BRIDGE DESIGN MANUAL.

DESIGN DATA:
SHAPED STRUCTURAL TUBING: ASTM A 500 GRADE B Fy=46 KSI
STRUCTURAL STEEL SHAPES AND PLATES: ASTM A 572 Fy=50 KSI

MATERIALS: SHAPED STRUCTURAL TUBING SHALL BE AS PER ODOT CONSTRUCTION AND MATERIALS SPECIFICATIONS (CMS) ITEM 707.10. IN LIEU OF THE "DROP WEIGHT TEAR TEST" AS PER ASTM E 436, THE MANUFACTURER MAY CHOOSE TO SUPPLY TUBING THAT MEETS IMPACT TOUGHNESS ACCORDING TO AASHTO T 266, "NOTCHED BAR IMPACT TESTING OF METALLIC MATERIALS (CVN)". THE CVN IMPACT REQUIREMENTS SHALL BE 15 FT-LBS AT 0°F. FOR EACH HEAT SUPPLIED, THE MANUFACTURER SHALL FURNISH ONE 2" x 18" SPECIMEN, MARKED WITH ITS HEAT NUMBER, FOR IMPACT TESTING.

STRUCTURAL STEEL SHAPES AND PLATES SHALL BE AS PER CMS ITEM 711.01

GALVANIZING: ALL SHAPED STRUCTURAL TUBES, POSTS, PLATES HARDWARE AND ACCESSORIES SHALL BE GALVANIZED IN ACCORDANCE WITH CMS 711.02. PRIOR TO GALVANIZING, ALL EXPOSED STRUCTURAL TUBING ENDS SHALL BE ROUNDED, AND BURRS SHALL BE REMOVED FROM ALL STEEL TUBING, SHAPES AND PLATES.

HORIZONTAL CURVATURE: THIS STANDARD IS APPLICABLE TO STRUCTURES HAVING A RAILING CURVATURE RADIUS OF 20 FEET OR MORE. FOR A RADIUS OF LESS THAN 20 FEET, THE DESIGN SHALL BE SPECIAL. FOR ALL CURVED STRUCTURES, THE HORIZONTAL RAIL ELEMENTS, SHALL BE HEAT CURVED AS SPECIFIED BY AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.

TUBE SPLICES ARE TO BE LOCATED SO THAT EACH TUBE SEGMENT SHALL BE CONNECTED TO NOT LESS THANT TWO POSTS. SPLICES IN THE TOP AND BOTTOM TUBES SHALL BE STAGGERED AND SHOULD NOT OCCUR IN THE SAME PANEL.

FASTENERS SHALL CONFORM TO THE FOLLOWING:

THE ANCHOR BOLTS, SLEEVE NUTS, NUTS, AND WASHERS SHALL CONFORM TO CMS 711.09 (ASTM A 325).

END WELDED STUDS SHALL CONFORM TO ASTM A 108.

THE TUBE STEEL RAIL TO POST CONNECTION BOLTS AND HEX NUTS SHALL CONFORM TO CMS 711.10. THE THRIE BEAM RAIL TO POST CONNECTION BOLTS AND NUTS SHALL CONFORM TO CMS 711.10 AND TO AASHTO M180. THE RECTANGULAR BEAM WASHERS IN AASHTO M180 ARE NOT TO BE USED IN THE TUBULAR STEEL CONNECTIONS. TUBULAR STEEL CONNECTION WASHERS SHALL CONFORM TO ASTM F 436, TYPE 1.

THE HEX CAP SCREWS (BOLTS), HEX NUTS AND WASHERS SHALL CONFORM TO ASTM A 449.

BOX BEAMS: THE DISTANCE FROM THE CENTERLINE OF A GUARDRAIL POST TO THE ABUTMENT END OF THE BEAM OR TO THE CENTERLINE OF A TIE ROD SHALL NOT BE LESS THAN 1'-8". THE DISTANCE FROM THE CENTERLINE OF A GUARDRAIL POST TO THE PIER END OF THE BEAM SHALL NOT BE LESS THAN 2'-10". THE LOCATION OF THE HORIZONTAL TIE RODS MAY NEED TO BE ADJUSTED IN ORDER TO ACCOMMODATE EACH POST ANCHOR DEVICE.

POSTS MAY BE SET IN DRILLED HOLES OR DRIVEN TO GRADE.

WOOD POSTS SHALL BE SQUARE - SAWED PRESSURE TREATED WOOD AS PER CMS 710.14 AND FABRICATED WITH SQUARE ENDS. BOLT HOLES SHALL BE BORED AND TOPS OF POSTS TRIMMED, IF REQUIRED, AFTER POSTS ARE SET.

ALTERNATE STEEL POSTS AND STEEL BLOCKOUTS MAY BE FURNISHED ACCORDING TO THE CHART GIVEN ABOVE. PLASTIC BLOCKOUTS SHALL NOT BE PERMITTED.

PAYMENT FOR ITEM 517 - RAILING (TWIN STEEL TUBE) SHALL INCLUDE ALL STEEL TUBING, STEEL POSTS, POST ANCHOR DEVICES, ANCHOR PLATES, TUBE SPLICE PLATES, STEEL SHIM PLATES, BRIDGE TERMINAL CONNECTOR ASSEMBLY, ANCHOR BOLTS, ¾" ROUND HEAD BOLTS, SLEEVE NUTS, NUTS, CAP SCREWS, WASHERS AND OTHER HARDWARE.

PAYMENT FOR ITEM 606 - BRIDGE TERMINAL ASSEMBLY TYPE 3 (MODIFIED) SHALL INCLUDE THE EXTRA COST, IN EXCESS OF NORMAL GUARDRAIL COST, FOR ADDITIONAL AND DIFFERENT TYPE POSTS AND BLOCKOUTS, NESTED THRIE BEAM SECTIONS, THRIE BEAM TRANSITION SECTION, ⅝" ROUND HEAD BOLTS, HEX NUTS, WASHERS, AND OTHER HARDWARE.

DESIGN AGENCY
OFFICE OF STRUCTURAL ENGINEERING

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
Brad Fogel — ADMINISTRATOR
7-06-99 — DATE

REVISIONS

DESIGNED AJM/SAM
DRAWN SAM
CHECKED JS
REVIEWED WTL

STANDARD TWIN STEEL TUBE BRIDGE RAILING

TST-1-99