



* SEE STD. CONSTR. DWG. GR-1.2M FOR ADDITIONAL POST EMBEDMENT DETAILS.

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 GUARDRAIL 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:
REINFORCING STEEL - MINIMUM YIELD STRENGTH = 60,000 PSI
STEEL TUBING - MINIMUM YIELD STRENGTH = 46,000 PSI
ALL OTHER STEEL - MINIMUM YIELD STRENGTH = 50,000 PSI

MATERIALS: FURNISH SHAPED STRUCTURAL TUBING ACCORDING TO 707.10 (ASTM A500, GRADE B). IN LIEU OF THE "DROP WEIGHT TEAR TEST" (ASTM E436), THE MANUFACTURER MAY CHOOSE TO SUPPLY TUBING THAT MEETS IMPACT TOUGHNESS ACCORDING TO AASHTO T266, "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.

FURNISH STRUCTURAL STEEL SHAPES, PLATES AND PLATE WASHERS ACCORDING TO 711.01.

GALVANIZING: GALVANIZE ALL SHAPED STRUCTURAL TUBES, POSTS, PLATES, HARDWARE AND ACCESSORIES IN ACCORDANCE WITH 711.02. PRIOR TO GALVANIZING, ROUND ALL STRUCTURAL TUBING ENDS AND REMOVE BURRS 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, HEAT CURVE THE HORIZONTAL RAIL ELEMENTS ACCORDING TO THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.

TUBE SPLICES: LOCATE SPLICES SO THAT EACH TUBE SEGMENT IS CONNECTED TO NOT LESS THAN TWO POSTS. STAGGER SPLICES IN THE TOP AND BOTTOM TUBES TO AVOID OCCURRENCES 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). THE THREAD LENGTH REQUIREMENT OF A325 MAY BE WAIVED.

END WELDED STUDS SHALL CONFORM TO ASTM A 108.

THE TUBE STEEL RAIL TO POST CONNECTION BOLTS AND HEX NUTS SHALL CONFORM TO 711.10 (ASTM A307). THE THRIE BEAM RAIL TO POST CONNECTION BOLTS AND NUTS SHALL CONFORM TO 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 ACCORDING TO 710.14 AND FABRICATED WITH SQUARE ENDS. BORE BOLT HOLES AND TRIM TOPS OF POSTS, IF REQUIRED, AFTER THE POSTS ARE SET.

THE CONTRACTOR MAY FURNISH, AT NO ADDITIONAL COST, STEEL POSTS AND STEEL BLOCKOUTS ACCORDING TO THE CHART GIVEN ABOVE. PLASTIC BLOCKOUTS WILL NOT BE PERMITTED.

METHOD OF MEASUREMENT: THE DEPARTMENT WILL MEASURE THE TWIN STEEL TUBE RAILING ACCORDING TO 517.06. THE DEPARTMENT WILL MEASURE THE BRIDGE TERMINAL ASSEMBLY TO THE SECOND POST OFF THE BRIDGE BY THE NUMBER FURNISHED AND ERECTED COMPLETE

BASIS OF PAYMENT: THE COSTS ASSOCIATED WITH FURNISHING AND INSTALLING ALL STEEL TUBING, STEEL POSTS, POST ANCHOR DEVICES, ANCHOR PLATES, TUBE SPLICE PLATES, STEEL SHIM PLATES, BRIDGE TERMINAL CONNECTOR ASSEMBLIES, ANCHOR BOLTS, 3/4" ROUND HEAD BOLTS, SLEEVE NUTS, NUTS, CAP SCREWS, WASHERS AND OTHER HARDWARE WILL BE INCLUDED WITH THE TWIN STEEL TUBE RAILING. THE DEPARTMENT WILL PAY FOR ACCEPTED QUANTITIES AT THE CONTRACT PRICE FOR ITEM 517, RAILING (TWIN STEEL TUBE).

THE DEPARTMENT WILL PAY FOR ACCEPTED TERMINAL ASSEMBLIES AT THE CONTRACT PRICE FOR ITEM 606, BRIDGE TERMINAL ASSEMBLY, TYPE 3 (MODIFIED).