

Memorandum

Subject: INFORMATION: Acceptance of Oregon 3-Tube Bridge Rail

Date: April 22, 2003

From: Michael S. Griffith/original signed by Charles A. Aiken/*for*
Acting Director, Office of Safety Design

In Reply Refer To: HSA-10/B-118

To: Mr. Bruce Johnson
FHWA Division Bridge Engineer
Salem, OR

In your April 18 memorandum to Mr. Richard Powers of my staff, you requested formal acceptance of the Oregon Department of Transportation 3-Tube Bridge Rail for use on the National Highway System (NHS). This design was tested by the Texas Transportation Institute to the National Cooperative Highway Research Program (NCHRP) Report 350 test level 4 (TL-4) and documented in three separate reports, all dated May 2000, entitled "NCHRP Report 350 Test 4-10 of the Oregon 3-Tube Bridge Rail", "NCHRP Report 350 Test 4-11 of the Oregon 3-Tube Bridge Rail", and "NCHRP Report 350 Test 4-12 of the Oregon 3-Tube Bridge Rail", respectively.

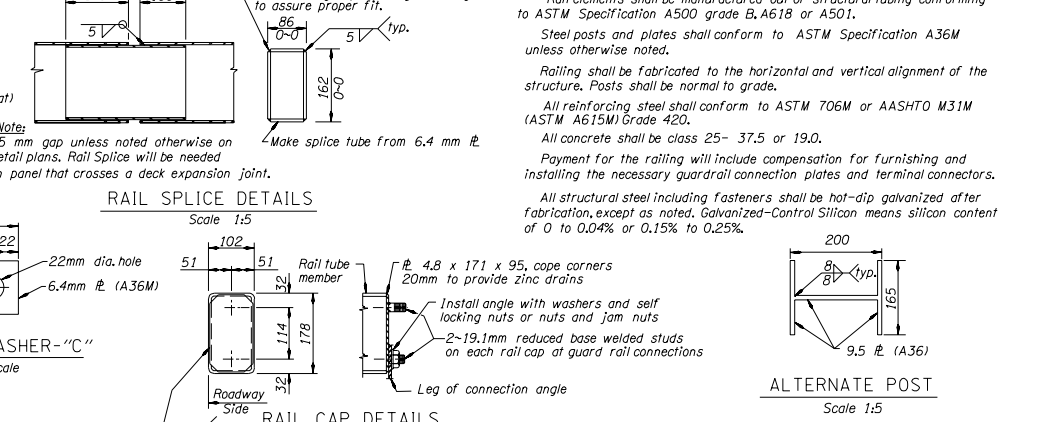
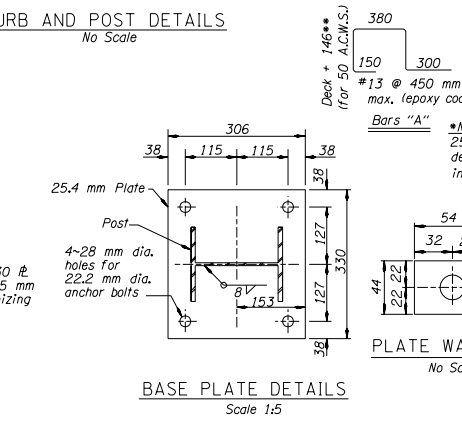
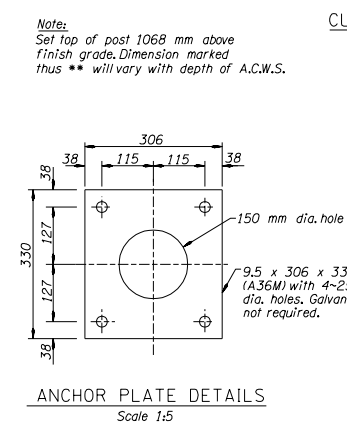
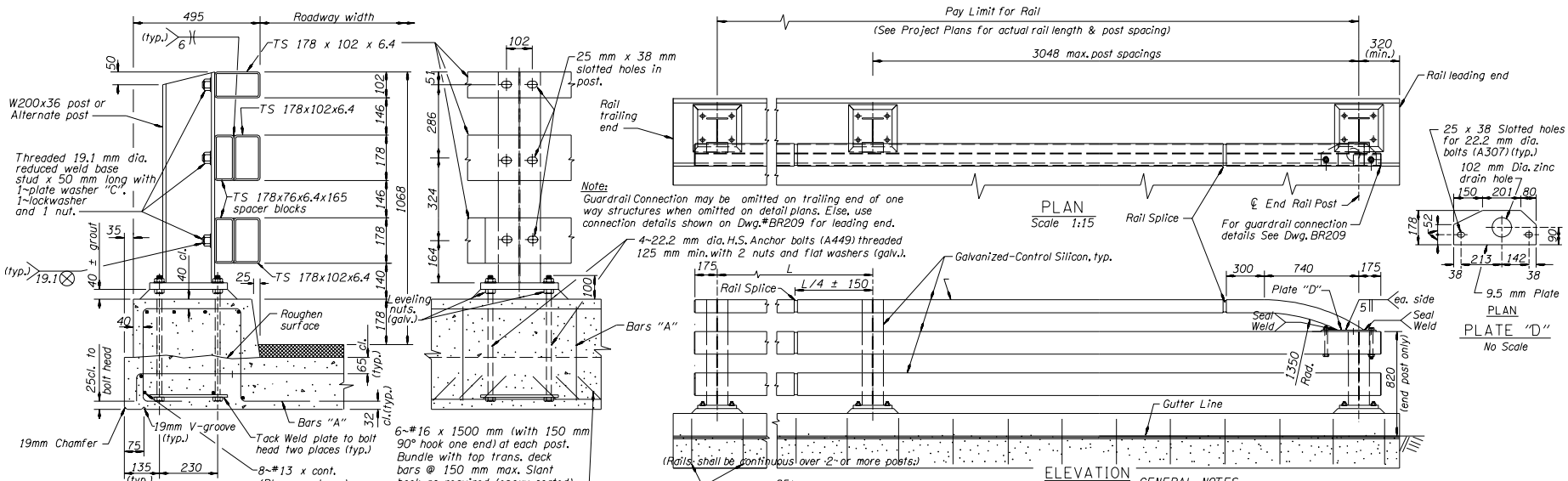
The Oregon 3-Tube Bridge Rail consists of three TS 178 x 102 x 6.4 tubes supported by W200 x 36 steel posts on 3-meter centers. The top rail is 1068 mm above the deck surface, the middle rail is 820 mm above the deck and the lower rail is 496-mm high. The lower two rails are blocked out from the support posts with TS 178 x 76 x 6.4 steel tubes, each 165-mm long. The top tube is installed with the narrow side against the post so the traffic sides of the rail elements lie in the same plane. The posts are mounted on a 178-mm high curb with four 22.2-mm diameter A325 steel bolts. These and additional details are shown in the attachment to this memorandum.

Based on staff review of the three tests that were conducted and their recommendations, I agree that the Oregon 3-Tube Bridge Rail meets all the evaluation criteria for an NCHRP Report 350 bridge rail at TL-4 and that it can be used on the NHS when such use is selected by the contracting authority. Although its crash performance was exceptionally good, I did note that in test 4-11, there was localized bridge deck damage when the two post bolts on the impact side of the rail sheared off. The use of larger or higher strength bolts would most likely minimize repair costs.

Attachment



y02 br208.dgn



DATE	REVISION	BY

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

<p>NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications.</p> <p>OREGON STANDARD DRAWINGS</p> <p>ACCOMPANIED BY DWGS. . . BR209</p>	<p>BRIDGE NO.</p> <p>STANDARD</p> <p>DATE</p> <p>CALC. BOOK</p> <p>4918</p>	<p>STANDARD</p> <p>3 TUBE CURB MOUNT RAIL</p> <p>GENERAL DETAILS</p>	<p>SHEET</p> <p>of</p> <p>2</p> <p>DRAWING NO.</p> <p>BR208</p>
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