



U.S. Department
of Transportation
**Federal Highway
Administration**

Memorandum

Subject: INFORMATION: Modified Oregon 2-Tube Bridge
Rail/Acceptance Letter B-121

Date: July 25, 2003

From: Original signed by Michael L. Halladay for
A. George Ostensen
Associate Administrator for Safety

In Reply Refer To:
HSA-10/B-121

To: Mr. David O. Cox
Division Administrator (HDA-OR)
Portland, Oregon

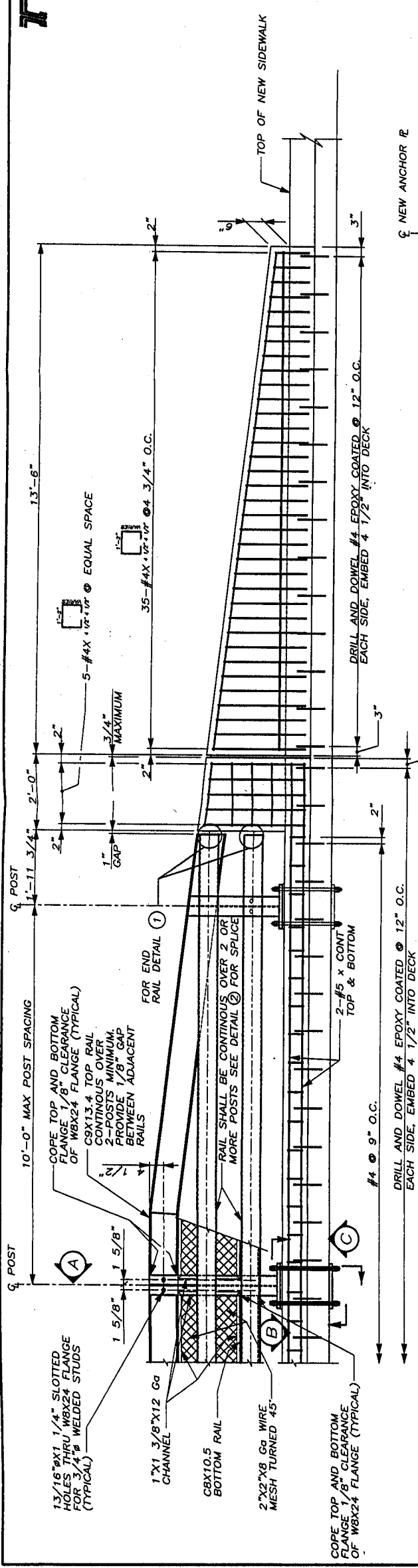
In your June 18 memorandum to Mr. Richard Powers of my staff, you requested formal acceptance of a modified bridge rail design proposed for use on the NHS by Multnomah County officials.

Based primarily on the previously accepted Alaska 2-tube bridge rail (which was subsequently adopted as an Oregon Department of Transportation standard), the modifications consisted of the substitution of TS 6 x 4 x 5/16 railings for the original TS 5 x 5 x 5/16 Alaska design, and the addition of a pedestrian railing on the field side of the original design with the use of longer W8 x 24 steel posts to support this backside railing. A drawing of the proposed design is attached. My staff has reviewed the testing that was done on the original 2-tube design and has concluded that the additional height, with its offset design, minimizes the likelihood of hood snagging if the rail is struck by a passenger-size vehicle, and would most likely also reduce the roll angle of a higher center of gravity vehicle such as the test level 4 TL-4 single unit truck. The shallower rail size with its 4-inch depth is similar to the New England Transportation Consortiums (NETC) curb-mounted 2-tube bridge rail, but uses a thicker tube and larger support posts, further reducing the likelihood of vehicular snagging in a crash. Consequently, I agree with staff conclusions that the modified design may be considered an NCHRP Report 350 TL-4 design and used on the NHS when it is selected by the appropriate transportation agency.

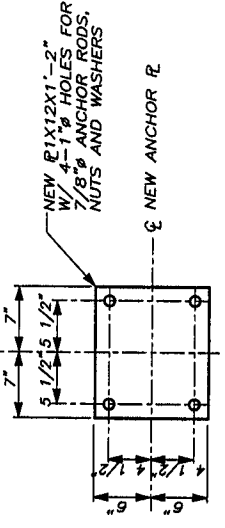
Two of the issues identified in your letter bear repeating. First, the calculations accompanying your request were based on a rail thickness of 5/16 inch, not 1/4 inch, and the drawing must be revised to show the greater thickness. Second, the sloped end terminal design is not crashworthy and its use is limited to locations where posted speed limits do not exceed 40 mph. An alternative treatment would be to terminate the sloped section when it reaches a height equal to that of an approach rail and use a crashworthy transition design to connect any approach rail to the concrete parapet.

Attachment

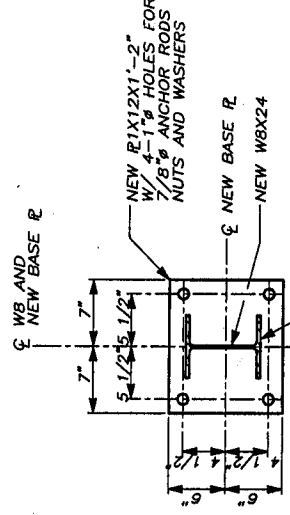




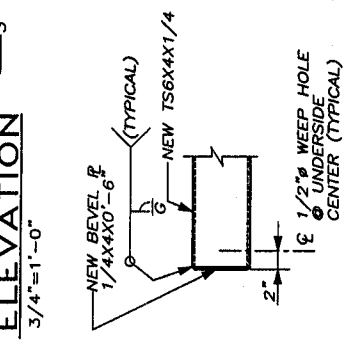
ELEVATION
3/4"=1'-0"



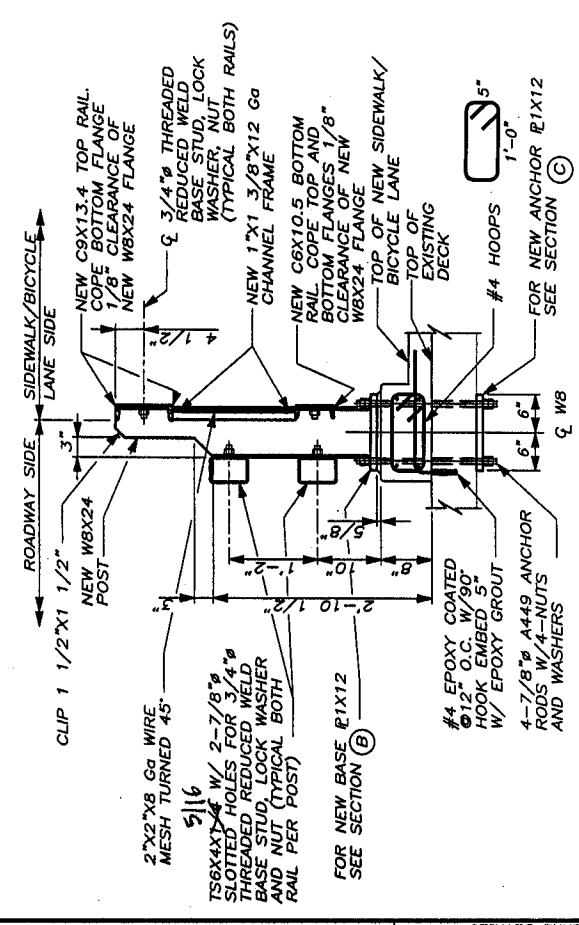
SECTION C
1 1/2"=1'-0"



SECTION B
1 1/2"=1'-0"



END RAIL DETAIL 1
1 1/2"=1'-0"



SECTION A
1"=1'-0"

RAIL SLEEVE DETAIL 2
1 1/2"=1'-0"

DO NOT SCALE THIS DRAWING
FOLLOW DIMENSIONS INDICATED
SCALES CORRECT ONLY FOR
FULL SIZE SHEET (22"X34")

REVISION DATE BY	DESIGNED CHERYL STRUBB 18535 JULY 10, 2003 KENNETH R.	TRANSPORTATION DIVISION OREGON DEPARTMENT OF TRANSPORTATION BRIDGE ENGINEERING SECTION	BRIDGE NO. 02758 DATE CALC. BOOK	SHEET 1 OF 1 DRAWING NO.
TRANSPORTATION DIVISION OREGON DEPARTMENT OF TRANSPORTATION BRIDGE ENGINEERING SECTION			MULTIUSE PATH (PORTLAND) SECS. S.W. MORRISON	
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