

September 4, 2001

Refer to: HSA-10/B47B

**Robert L. Wilson, P.E.**  
**Director, Design Division**  
**Texas Department of Transportation**  
**125 E. 11<sup>th</sup> Street**  
**Austin, Texas 78701-2483**

**Dear Mr. Wilson:**

**In a joint letter dated June 29, you and Ms. Mary Lou Ralls, Director of TxDOT's Bridge Division, requested Federal Highway Administration acceptance of a modified guardrail to bridge rail transition design. A copy of this response is being sent directly to Ms. Ralls.**

**Your proposed design is similar to a design developed at the Midwest Roadside Safety Facility in Lincoln, Nebraska, which was accepted as a TL-3 design in Mr. Dwight A. Horne's May 28, 1999 letter. A copy of that letter is enclosed for your reference. Based on subsequent testing, acceptance of the direct connection to a vertical concrete parapet is no longer considered conditional, but the curb remains an essential element of the design.**

**Since your proposed design was similar to the Nebraska design except for its use of round timber posts, Mr. Richard Powers of my staff requested information on its expected deflection characteristics. Mr. Roger Bligh with the Texas Transportation Institute conducted computer simulations of the two designs using the Barrier VII analysis program and concluded in his August 27 letter to Mr. Powers that the stiffness of your design was essentially the same as the previously accepted version. Consequently, the design described below may be considered an acceptable design at test level 3 (TL-3) under the National Cooperative Highway Research Program (NCHRP) Report 350 and may be installed on the National Highway System.**

**Your design substitutes 178-mm (7-in) diameter round posts for the 150 mm x 200 mm (6 in by 8 in) wood posts specified in the original design. The first 6 posts off the bridge are 2100-mm (7 feet) long, on 475-mm (18.75 in) centers. The next 3 posts are 1830-mm (6 feet) long on 950-mm (3 foot-1.5 in) centers. All other posts are standard line posts at the normal 1905-mm (6 foot-3 in) spacing. One 3.8 m (12.5 ft) section of nested 12-gauge Thrie-beam is attached to the concrete parapet at the bridge with a standard terminal connector and to the approach w-beam at the upstream end with a standard 10-gauge Thrie-beam to W-beam transition piece. A 100-mm (4-in) high asphalt curb extends a minimum of 3.8 m (12.5 feet) from the concrete parapet. As noted above, the curb is an essential element of the overall design because it reduces the likelihood of wheel snagging on the end of the parapet. A higher curb (either asphalt or concrete), up to 200 mm (8 in), would also be**

**acceptable and probably more effective. If used, the higher curb would need to be tapered to a height no greater than 100 mm (4 in) at the approach end.**

**Sincerely yours,**

**(original signed by Frederick G. Wright, Jr.)**

**Frederick G. Wright, Jr.  
Program Manager, Safety**

Refer to: HMHS

Dean L. Sicking, Ph.D., P.E.  
Director, Midwest Roadside Safety Facility  
Civil Engineering Department  
P.O. Box 880601  
Lincoln, NE 68588-0601

Dear Dr. Sicking:

In your March 12, 1999, letter to Mr. Richard Powers of my staff, you asked if a modification to two previously-accepted guardrail-to-bridge rail transition designs would be considered acceptable by the Federal Highway Administration (FHWA) without additional testing. Specifically, the modification consisted of attaching either one of the nested Thrie-beam designs accepted in my March 6, 1998, letter to Mr. Ron Faller of your staff directly to a vertical concrete parapet. The earlier designs incorporated a fabricated steel connector plate to allow a direct vertical-plane connection to a safety shaped parapet.

We have reviewed your proposal and noted that a Thrie-beam transition to a vertical concrete wall was the first priority of the State highway representatives participating in the FHWA-sponsored pooled fund study No. 2-134, "Testing of New Bridge Rail and Transition Designs." Since we believe your proposed modification will perform as well as the two accepted designs, and will be verified when testing is completed under the aforementioned pooled fund effort, we will consider your modification to be *conditionally* acceptable as a test level 3 transition pending successful completion of the anticipated pooled fund test(s). If any changes to your design are deemed necessary based on the outcome of our tests, we will notify you accordingly.

Our conditional acceptance is based on all other design aspects of the transitions remaining the same as noted in our March 6, 1998, acceptance letter, including the 100-mm high curb which we believe is needed to minimize the likelihood of wheel snagging on the end of the concrete wall. The enclosure shows the dimensions and reinforcing details of your modified design.

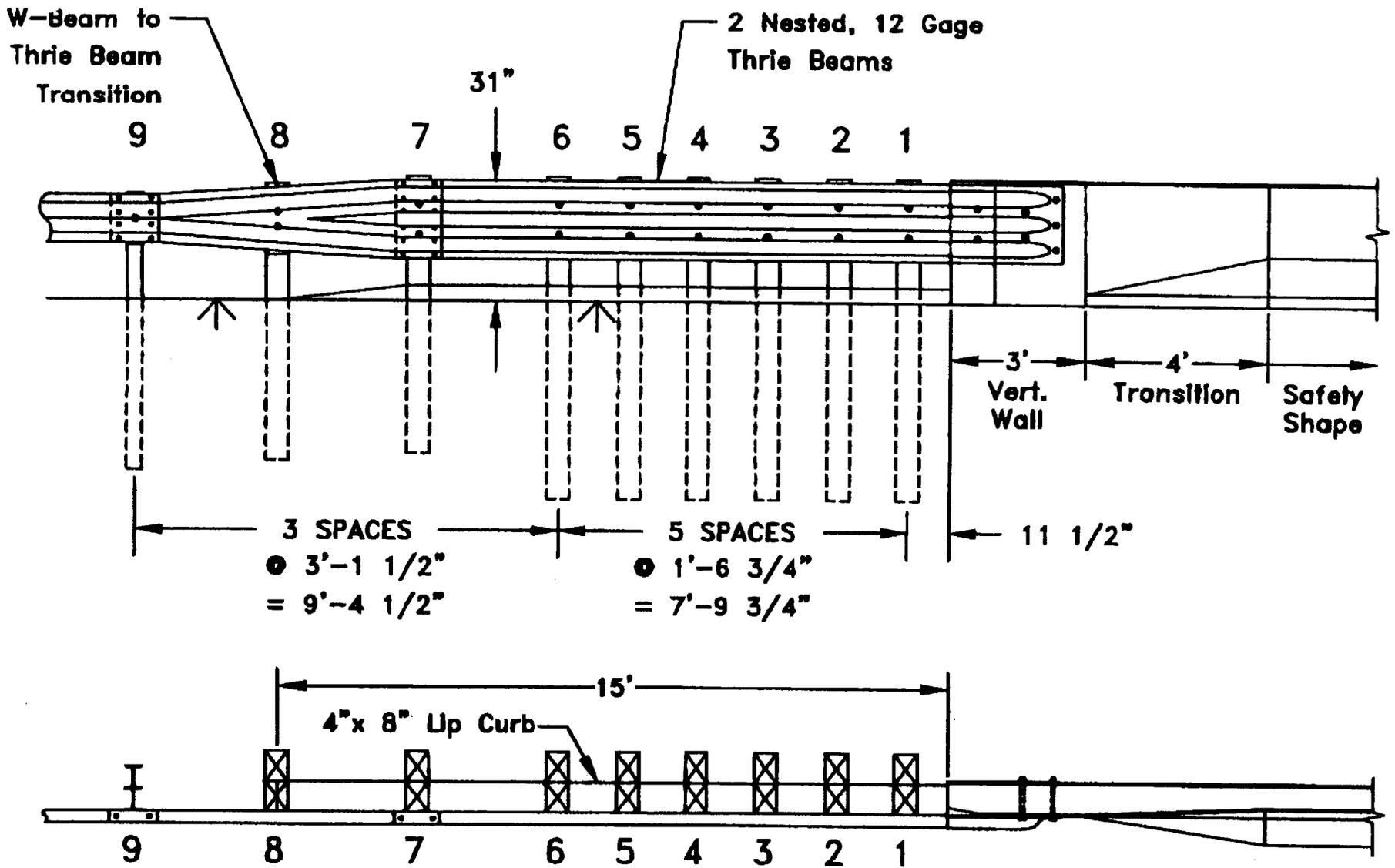
Dwight A. Horne  
Director, Office of Highway Safety Infrastructure

Enclosure

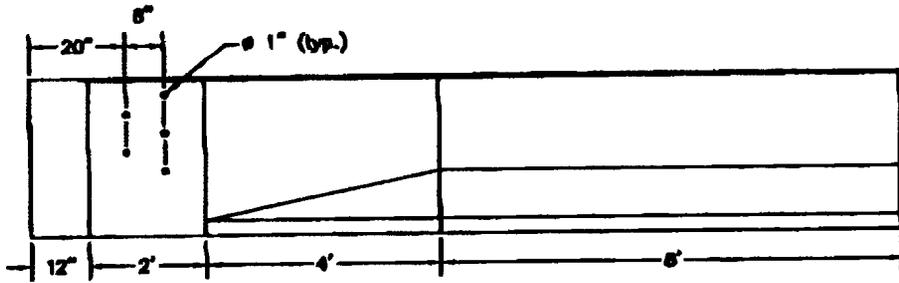
FHWA:HMHS:DPowers:db:x61320:5./25/99

cc: Reader - HMHS, Chron - HMHS  
D. Powers - HMHS

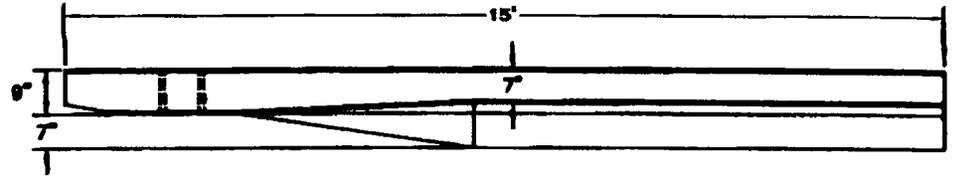
File: B-47 (MOD-ITRAN)



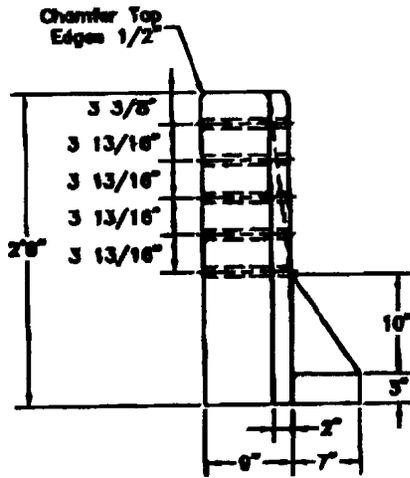
<b>MWRSF</b> University of Nebraska C.E. Department	
ITRANS	
DATE: 5/28/99	
SCALE: none	
DRN: EAK	vw01103



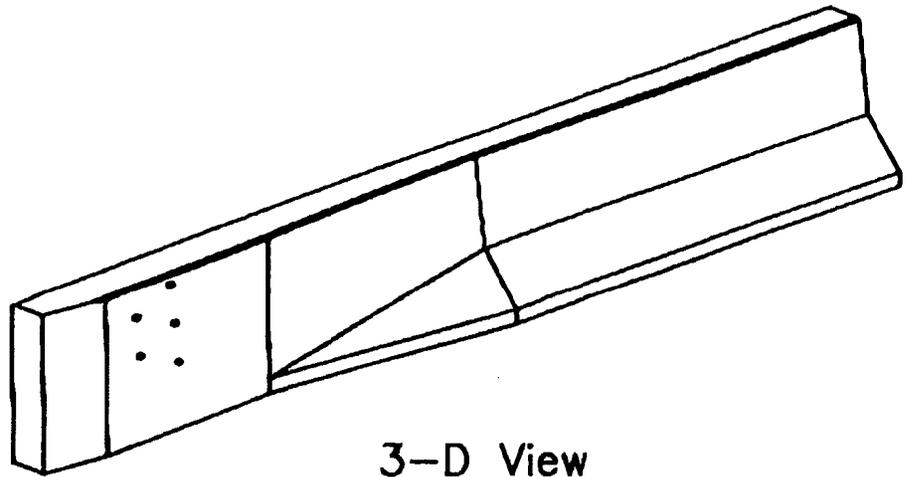
Front View



Top View



End View



3-D View

<b>MWRSF</b> University of Nebraska C.E. Department	
<b>ITRANS (Vertical Wall)</b>	
DATE: 5/27/99	
SCALE: none	
DRN: EAK	vwall04