

June 26, 2001

HSA-10/B81

Michael M. Ryan, P.E.
Deputy Secretary for Highway Administration
Pennsylvania Department of Transportation
400 North Street, Seventh Floor
Harrisburg, PA 17103

Dear Mr. Ryan:

In your February 8 letter, you requested formal Federal Highway Administration acceptance at the National Cooperative Highway Research Program (NCHRP) Report 350 test level 3 (TL-3) of a Pennsylvania transition design from a w-beam guardrail to a flared concrete bridge parapet. This design was successfully tested by the Texas Transportation Institute (TTI) and the test results were included in that agency's July 2000 report entitled "NCHRP Report 350 Test 3-21 of the Pennsylvania Transition."

Based on staff review of the results of TTI test no. 404211-3, in which a 2000-kg pickup truck impacted the transition at 100.9 km/h and an angle of 24.3 degrees, I concur that the Pennsylvania transition design as described below, met all appropriate Report 350 evaluation criteria and may be used as a TL-3 transition on the National Highway System (NHS) when such use is proposed by the contracting authority.

The tested design consists of 3810 mm of nested 12-gauge w-beam and a C6 x 8.2 steel channel rubrail. The w-beam and the rubrail are bolted to single blockouts (routed wood or plastic) with nominal dimensions of 150 mm x 200 mm x 565 mm deep, thus putting both rails in the same vertical plane. All posts used in the design were W 150 x 13.5 steel posts, with the first four being 2135-mm long and the rest being 1830-mm long. The first post was approximately 263 mm from the concrete parapet. From post 1 to post 7, the spacing was 475 mm, increasing to 952 mm to post 11, and to the standard 1905-mm spacing beyond that point. The transition was attached to a concrete end wall that was flared horizontally at a 10 degree angle in its last 1800 mm and transitioned vertically from a 1070-mm tall safety shape to an 810-mm high vertical wall. This end wall was tied into a 330-mm thick concrete moment slab measuring 4.7 m by 6.6 m. A 150-mm diameter by 305-mm long steel spacer tube was attached between the nested w-beam and the concrete parapet approximately 475 mm from post 1 towards the terminal connector.

In addition to the above design, your Bridge Standard BC-739M includes a similar design for use where a 200-mm high curb with a drainage inlet is used. After initial discussions with Mr. William P. Longstreet in your Bridge Quality Assurance Division, the original design was modified to incorporate features in a similar transition that had been previously tested and accepted by my office. Specifically, these changes consisted of

using two W200 x 31.3 x 2438-mm long steel posts spaced 430 mm and 1245 mm from the concrete parapet, followed by three W150 x 13.5 x 2135-mm long posts on 475-mm centers and finally by four W150 x 13.5 x 1830-mm long posts on 952-mm centers. With these modifications, your design with the curb and inlet may also be considered acceptable for use on the NHS.

I understand that detailed drawings of both transition designs can be obtained directly from Mr. Longstreet at (717) 783-7476. Anyone interested in a CD version of a separate TTI report which includes test information and drawings of the Pennsylvania transition as well as several additional hardware designs, may contact Mr. Richard D. Powers of my staff by telephone at (202) 366-1320 or via e-mail at richard.powers@fhwa.dot.gov.

Sincerely yours,

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

Frederick G. Wright, Jr.
Program Manager, Safety