

June 18, 2004

Refer to: HSA-10/B-127

George A. Christian, P.E.  
Deputy Chief Engineer (Structures)  
State of New York  
Department of Transportation  
Albany, New York 12232

Dear Mr. Christian:

In your May 22 letter, you requested the Federal Highway Administration's acceptance of a box-beam guiderail to bridge rail transition design as a test level 4 (TL-4) design for use with several standard bridge railing designs currently used in New York. The design was successfully crash tested to TL-3 at the Texas Transportation Institute (TTI) and documented in that agency's April 2004 report entitled "NCHRP Report 350 Test 3-21 on the New York State DOT (NYSDOT) Modified Box Beam Transition to 4-Rail Steel Bridge Rail." This design is shown in the enclosure to this letter.

Based on the successful test of the transition to a 4-rail, deck-mounted bridge railing, you also requested acceptance of this transition design when connected to a two-rail bridge rail with a brush curb, a three-rail design flush-mounted, a four rail design mounted behind a sidewalk, and a five rail combination rail design. Each of these applications may be considered acceptable with the following caveats:

- With the two-rail curb-mounted bridge rail, the lower rubrail is not used, so the curb must be flared away from the roadway and extended under the transition to reduce the likelihood of a vehicle's wheel snagging on the leading edge of the curb.
- With the three-rail bridge rail, the design remains as tested, but the fourth rail is eliminated.
- With the five-rail design, the added upper rail may be terminated in a manner similar to the fourth rail in the tested design or flared behind the fourth rail.

Although not physically tested when connected to a concrete safety shape bridge railing, TTI completed a finite element analysis of this configuration and predicted that this transition when used in conjunction with a curb that blocks out the lower leading edge of the concrete safety shape would likely meet NCHRP Report 350 evaluation criteria at TL-3. Based on this analysis, I will consider the NYSDOT designs BD-RC 3, BD-RC13-R1, and BD-RC16-R1 at <http://www.dot.state.ny.us/caddinfo/structures/bd.html> to be acceptable also.

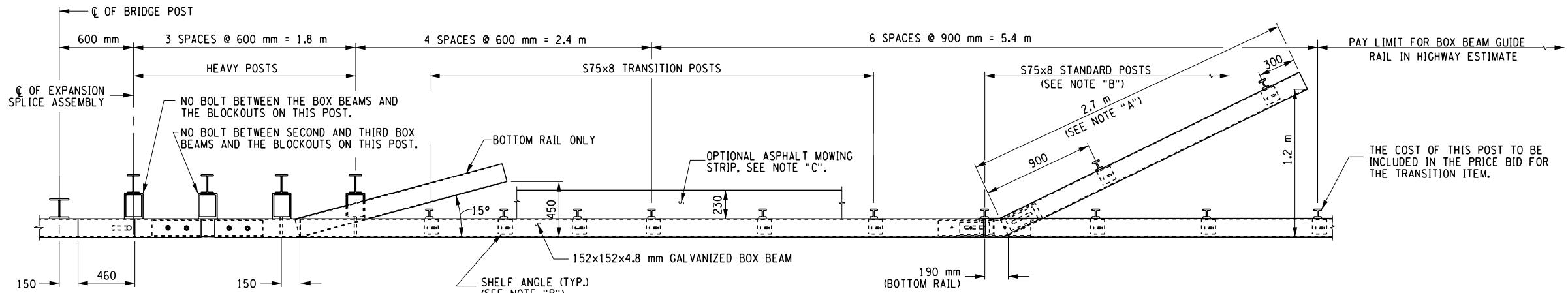
As noted in your letter, the single-unit truck test used to verify TL-4 performance is less demanding than the pickup truck test because the impact speed and angle are less and the large tires of the single-unit truck are much less likely to snag on any transition elements. Transition designs equal in height to your tested design have been successfully crash tested with the single-unit truck. Therefore, each of the transitions listed above may be considered TL-4 designs as requested. However, as with all roadside safety designs, field performance should be monitored to verify their assumed crashworthiness.

Sincerely yours,

*/Original Signed by/*

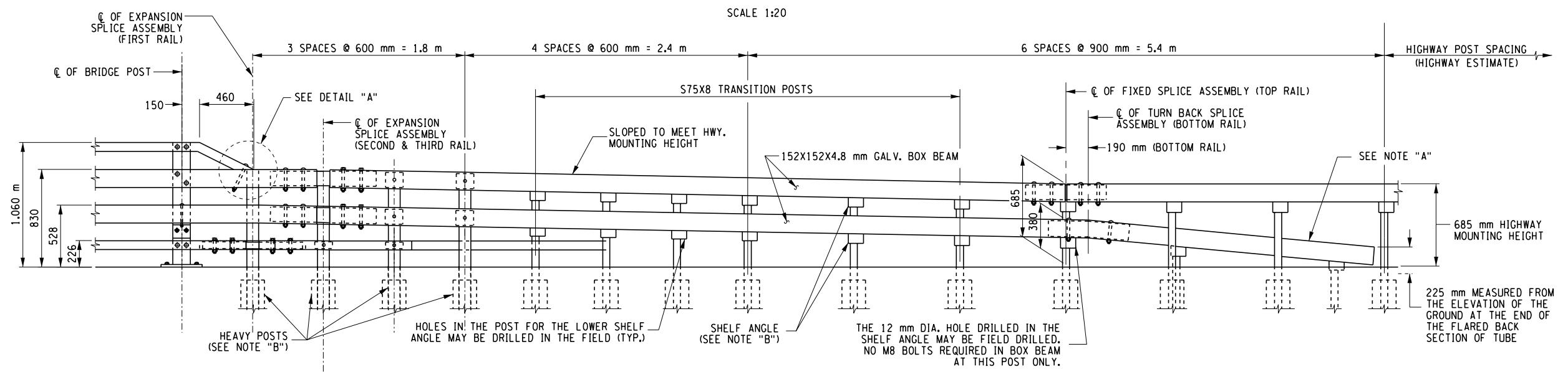
John R. Baxter, P.E.  
Director, Office of Safety Design  
Office of Safety

Enclosure



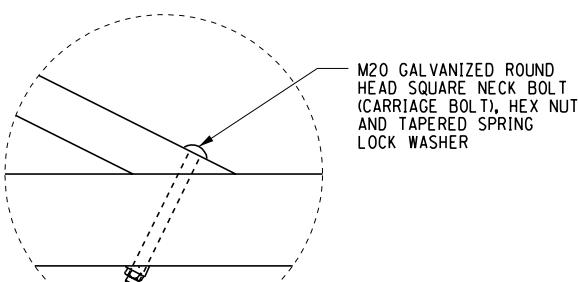
PLAN

SCALE 1:20



## ELEVATION

SCALE 1:20



DETAIL "A"

NOT TO SCALE

ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED

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ISSUED		STATE OF NEW YORK DEPARTMENT OF TRANSPORTATION STRUCTURES DESIGN AND CONSTRUCTION DIVISION
REVISED	STEEL BRIDGE RAILING TO BOX BEAM GUIDE RAIL TRANSITION	
	APPROVED:	
	DEPUTY CHIEF ENGINEER (STRUCTURES)	