

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.

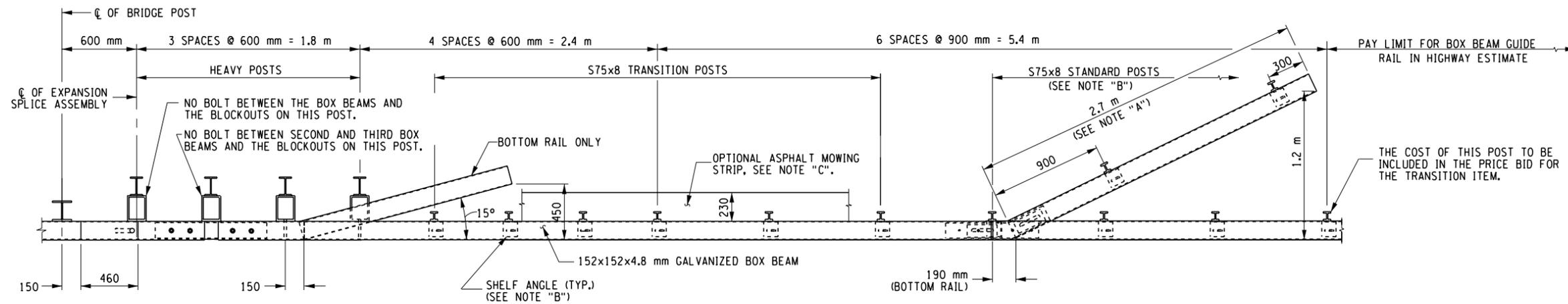
As noted in your letter, the single-unit truck test used to verify TL-4 performance is less demanding than the pickup truck test because the impact speed and angle are less and the large tires of the single-unit truck are much less likely to snag on any transition elements. Transition designs equal in 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/

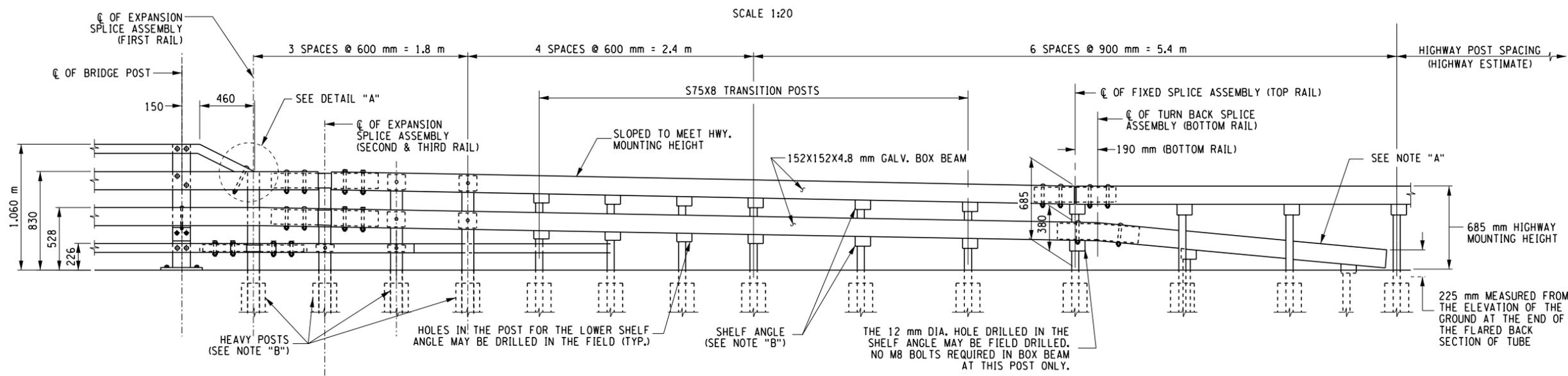
John R. Baxter, P.E.
Director, Office of Safety Design
Office of Safety

Enclosure



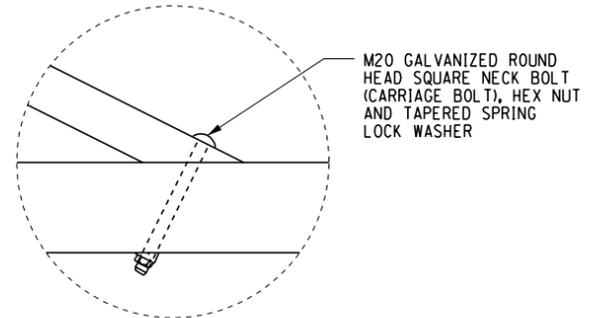
PLAN

SCALE 1:20



ELEVATION

SCALE 1:20



DETAIL "A"

NOT TO SCALE

ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED.

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)

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