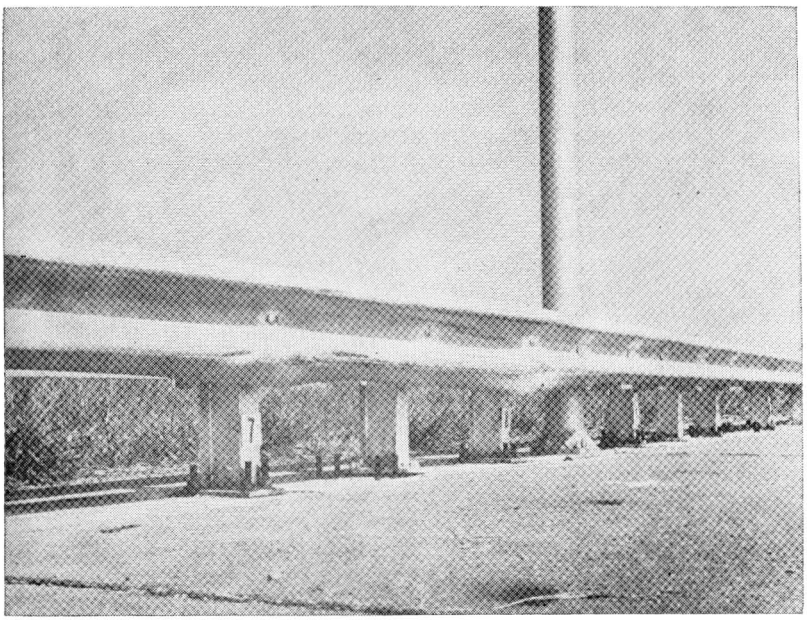
CRASH TEST AND EVALUATION OF A STIFFENED METAL BEAM GUARD FENCE MEDIAN BARRIER FOR USE AROUND LUMINAIRE SUPPORTS

SUMMARY REPORT
of
Research Report Number 146-13F
Study 2-10-68-146



Test MB 101 Barrier After Impact

Cooperative Research Program of the
Texas Transportation Institute
and the
State Department of Highways and Public Transportation
In Cooperation with the
U. S. Department of Transportation, Federal Highway Administration

November, 1975

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Crash Test and Evaluation of a Stiffened Metal Beam Guard Fence Median Barrier for Use Around Luminaire Supports

by

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The State Department of Highways and Public Transportation utilizes, in most cases, two basic median barrier designs to prevent median cross over accidents. These are the Concrete Median Barrier (CMB) and the Metal Beam Guard Fence (MBGF). The concrete median barrier is an unyielding or rigid barrier.

Previous crash tests have indicated that the flexible metal beam guard fence median barrier will deflect laterally up to 1.0 ft (0.30 m) during vehicle impacts. It was concluded that it would not be desirable to install median mounted luminaire supports in conjunction with this flexible barrier since the vehicle could potentially snag or knock down the luminaire pole during impact. Since it is frequently desirable to have luminaire supports in a median protected with the metal beam guard fence, a safe design for such an installation was desired.

Description of the Metal Beam Guard Fence Tested

The standard metal beam guard fence (SDHPT designation MBGF(B)-74) is designed using the "weak post" concept. On impact the 6B8.5 support post breaks away from its base, allowing the back-to-back guardrail to deflect laterally. The 3/8 in. (.95 cm) fillet welds connecting the two outer faces of the post flanges to the 5/8 in. (1.6 cm) base plate are designed to fracture at relatively low impact forces. Since the posts shear off at the base, there is a reduced tendency for the deflecting rail to rotate downward, thus minimizing the possibility of vehicle ramping.

The standard metal beam guard fence was modified by widening and strengthening a discrete length of the fence to allow a luminaire support to be placed between the side rails. The primary features of the modification were to increase the space between the 10 gage steel rails to 18 in. (46 cm) at the luminaire support by the addition of 18 in. (46 cm) spacers on each side of the luminaire support; the addition of one additional post in the spaces adjacent to each side of the support; and the gradual increase in strength of the shear connection between the post and base plate. The transition from a 6 in. (15 cm) to the 18 in. (46 cm) spacing between rails was over three post spaces or 18 ft. 9 in. (5.72 m).

During construction particular attention was given to the direction of lap of the rails for each of the 25 ft. (7.62 m) lengths. The lap was made so that the vehicle would not snag if it were intercepted. The rail sections in the vicinity of the test were

rolled from 10 gage galvanized steel stock. These modifications transformed the flexible metal beam guard fence to a "strong beam strong post" type in the vicinity of the luminaire support.

Results

The modified Metal Beam Guard Fence median barrier behaved as intended by smoothly redirecting a 4270 lb vehicle impacting at 15 degrees without snagging on the luminaire pole. Damage to the vehicle and barrier was moderate.

A copy of the full report of findings may be obtained by addressing your requests as follows:

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