

SUMMARY REPORT 223—1(S)

**CRASH TEST AND EVALUATION OF A PRECAST
CONCRETE MEDIAN BARRIER**

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Crash Test and Evaluation of a Precast Concrete Median Barrier

by

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Median barriers are used on high-volume, high-speed traffic facilities to prevent errant vehicles from crossing a median and conflicting with the opposing traffic stream. A secondary function for some designs of median barriers is to minimize the glare of opposing headlights.

The cast-in-place Concrete Median Barrier (CMB) has proven to be an effective and economical barrier in Texas and other states. Investigation into the use of a precast concrete median barrier stemmed from the interest involved in utilizing a barrier to be prefabricated concurrently with roadway construction. This more effective utilization of work force as well as early project completion and acceptance could provide measurable potential savings to both contractor and the State. In addition, when this barrier is installed on existing facilities the traffic may be disrupted for a considerable period of time if it is cast-in-place. Consequently, there is a need for a Precast Concrete Median Barrier (PCMB) which can be quickly installed on active facilities with a minimum period of traffic disruption.

In order for a precast concrete median barrier to function properly in redirecting vehicles, the relatively short precast sections must be adequately connected together after they are placed in the highway median.

Engineers of the Texas State Department of Highways and Public Transportation and the Texas Transportation Institute developed working drawings for precast sections of a PCMB and two connection details. Full-scale crash tests were conducted on the PCMB and connections in order to verify the stability and strength of the installation.

The 30 ft (9.1 m) long sections with grouted dowel connections and the 1 in. asphalt concrete paving (ACP) fill material behind the barrier proved to be an effective barrier in redirecting 4500 lbm (2040 kg) vehicles impacting at 60 mph (96.5 km/hr) and 25 degrees.

If the 1 in. ACP or some other backup device is not used to prevent lateral sliding, the doweled connections tested here appear to be adequate, however considerable maintenance can be anticipated after high speed, high angle impacts. This type installation (without backup device) should only be used as a temporary barrier.

Four #4 longitudinal reinforcing bars are adequate for handling and lifting requirements provided that the sections are cast right side up. Where the units will be cast bottom side up (for simpler form design and removal) four #5 longitudinal bars are recommended provided two pickup points located approximately 6 ft 2½ in. (1.9 m) from each end are used.

The recommendations for reinforcing steel are intended to produce added safety during installation and reduced maintenance when in service. These concrete sections could have been designed as plain unreinforced concrete members.

The PCMB developed is now being used on IH 35 in Austin, Texas. Design details of the PCMB can be obtained from the Texas State Department of Highways and Public Transportation in Austin, Texas:

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

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