



U.S. Department
of Transportation

**Federal Highway
Administration**

400 Seventh St., S.W.
Washington, D.C. 20590

February 4, 1998

Refer to: HNG-14

Mr. Rich Peter
Chief, Roadside Safety Technology Unit
Office of Materials Engineering and
Testing Services - MS #5
P.O. Box 19128
Sacramento, California 95819-0128

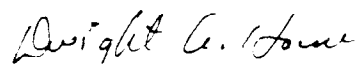
Dear Mr. Peter:

In your January 12 letter to Mr. Henry H. Rentz, you requested the Federal Highway Administration's formal acceptance of your Type 60G median barrier for use on the National Highway System (NHS). This is a slip-formed, reinforced concrete barrier having a constant slope face of 9.1 degrees, versus the 10.8-degree slope developed and first used by Texas for a similar barrier. The Type 60G barrier has a 610-mm base width, a 150-mm top width, and a total height of 1420 mm. The barrier itself is slip-formed on grade with no embedment, but each end has a 3050-mm long by 250-mm deep footing and contains additional reinforcing steel as shown in Enclosure 1. To support your request, you sent us a copy of the Caltrans report titled "Vehicular Crash Tests of a Slip-Formed, Single Slope, Concrete Median Barrier With Integral Concrete Glare Screen," dated December 1997, and video tapes of the full-scale tests that you conducted.

Two tests, test 3-10 and test 3-11, are recommended in the National Cooperative Highway Research Program (NCHRP) Report 350 to qualify a longitudinal barrier as crashworthy at test level 3 (TL-3). Test 3-10 requires an 820-kg car to impact the barrier at 100 km/h and 20 degrees. These impact conditions were attained in your Test 511, which met all appropriate evaluation criteria. We noted, however, that a shorter design (called the Type 60), also with a 610-mm base width and a 9.1 degree sloped face, but with an overall height of only 810 mm, was used for this test. Nevertheless, we concur with your assertion that the test results would have been the same with the taller Type 60G design. Test 3-11 requirements were satisfied by your Test 534, a 97.7 km/h impact at 25.2 degrees with a 2000-kg pickup truck into the Type 60G design. Again, we noted that all NCHRP Report 350 evaluation criteria were met. Enclosure 2 consists of summaries of both of these acceptance tests. It appears that this barrier is an improvement over both the standard New Jersey concrete barrier shape and the Texas constant slope barrier because of the reduced vehicular climb seen upon impact with this barrier's 9.1 degree sloped-face and on the less severe post-crash vehicular trajectories observed in the crash test videos.

Based on our review of the information you provided, we consider both the Type 60 and Type 60G barriers to be acceptable at TL-3 for use on the NHS. We will so advise our field offices via copies of this letter.

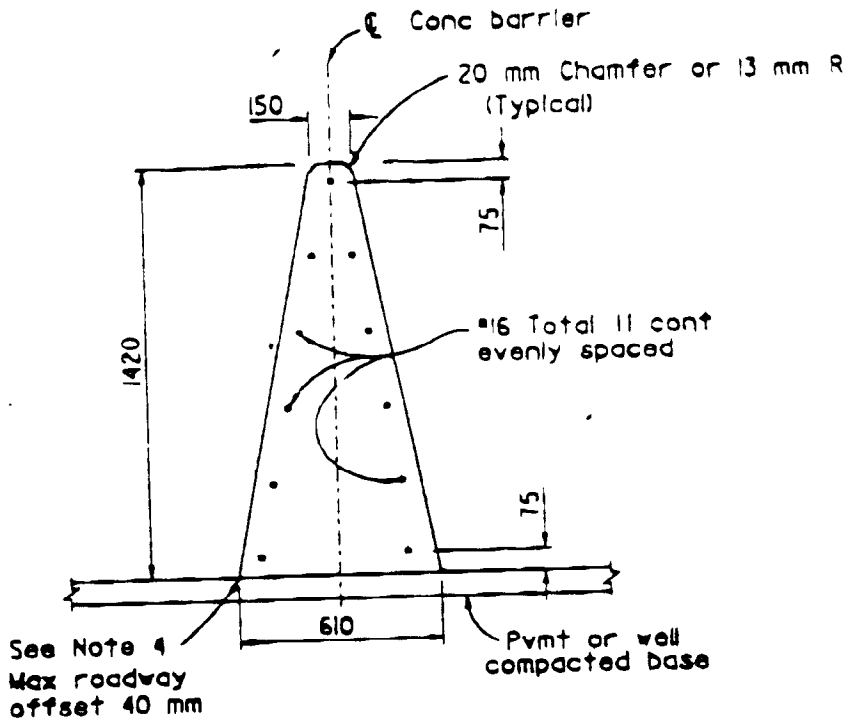
Sincerely yours,

A handwritten signature in cursive script that reads "Dwight A. Horne".

Dwight A. Horne
Chief, Federal-Aid and Design Division

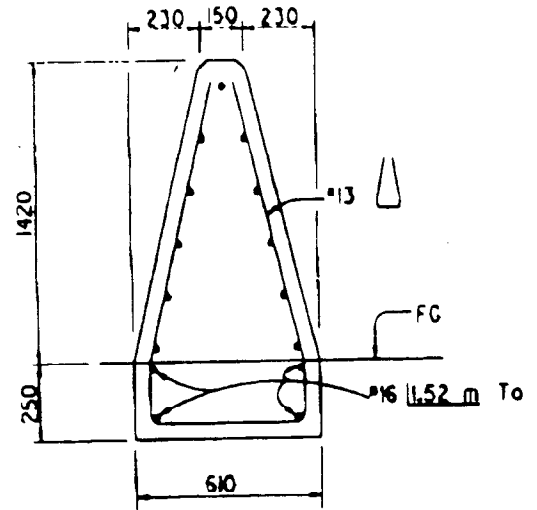
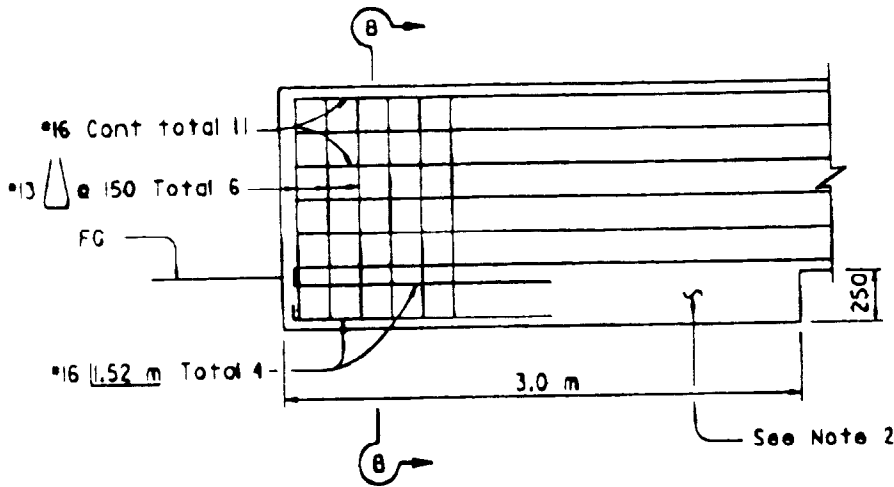
2 Enclosures

Geometric and Safety Design Group Acceptance Letter BB-45



CONCRETE BARRIER TYPE 60G

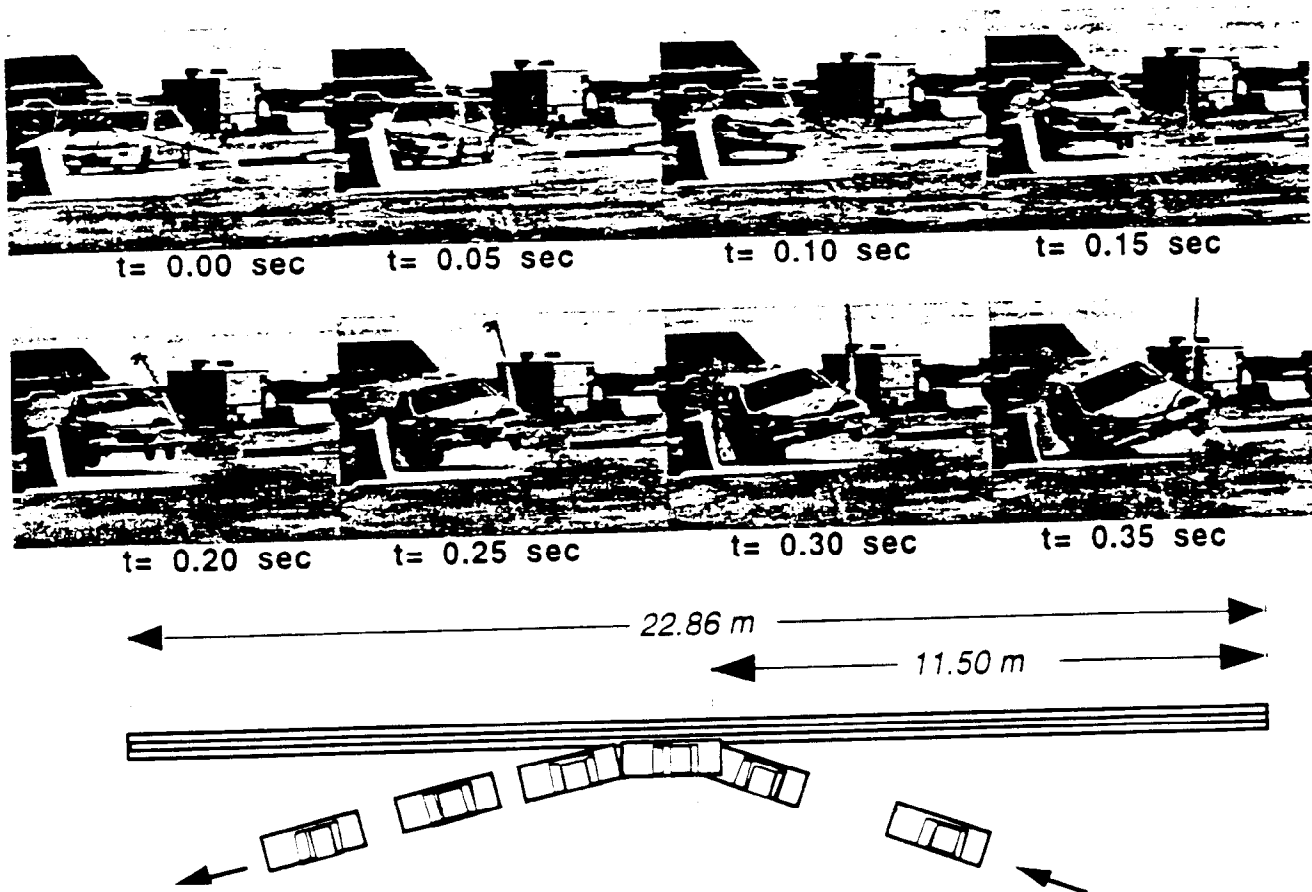
(Monolithic concrete glare screen/barrier)



SECTION B-B

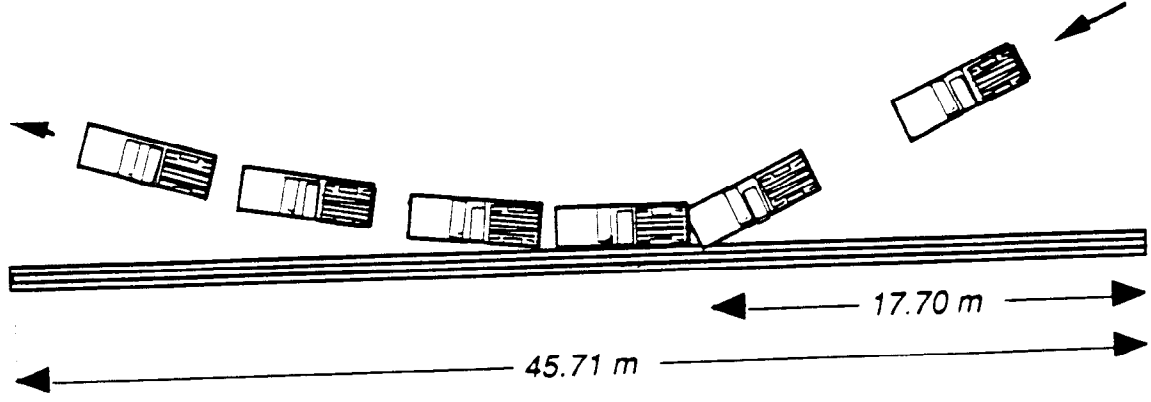
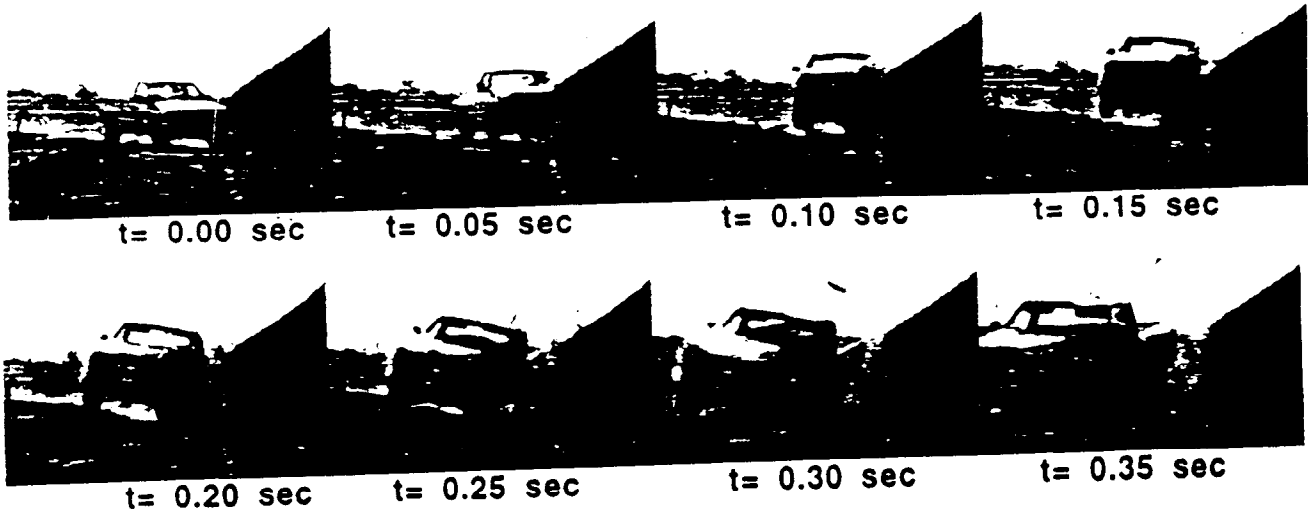
CONCRETE BARRIER TYPE 60G
CONCRETE BARRIER END ANCHORAGE

Figure 2.43 - Test 511 Data Summary Sheet



Test Barrier	Type: Type 70 Bridge Rail
	Length: 22.86 meters
Test Date:	April 6, 1997
Test Vehicle:	1992 Geo Metro
	Model: 843 kg
	Inertial Mass: 843 kg
	Impact / Exit Velocity: 104.1 km/h / 92 km/h
	Impact / Exit Angle: 20.0 / 12.1°
Test Dummy:	Hybrid III
	Type: Hybrid III
	Weight / Restraint: 74.8 kg / lap and shoulder
	Position: Front Right
Test Data:	
	Occ. Impact Velocity (Long / Lat): 4.51 m/s / 7.22 m/s
	Ridedown Acceleration (Long / Lat): -2.9g / -16.0g
	Max. 50 ms Avg. Accel (Long / Lat): -7.0g / -13.4g
	Exterior: VDS/CDC ² FR-5, RD-4 / 12RFEW3
	Interior: OCDI ²² RF0000110
Barrier Damage:	Only superficial scuffing

Figure 2.34 - Test 534 Data Summary Sheet



Test Barrier	Type:	Type 60G
	Length:	50 meters
Test Date:		November 28, 1995
Test Vehicle:	Model:	1991 Chevy pickup
	Inertial Mass:	2000 kg
	Impact / Exit Velocity:	97.7 km/h / 83.1 km/h
	Impact / Exit Angle:	25.2° / 6.5°
Test Dummy:	Type:	None
	Weight / Restraint:	NA
	Position:	NA
Test Data:	Occ. Impact Velocity (Long / Lat):	6.8 m/s / -9.51 m/s
	Ridedown Acceleration (Long / Lat):	-6.7g / 2.3g
	Max. 50 ms Avg. Accel (Long / Lat):	-8.9g / 15.7g
	Exterior: VDS/CDC ^a	FL-3, LD-4 / 12LFEK3
	Interior: OCCD ^b	LF1111131
Barrier Damage:		Only superficial scuffing