



U.S. Department
of Transportation
**Federal Highway
Administration**

Memorandum

SENT VIA ELECTRONIC MAIL

Subject: INFORMATION: Guidelines for the Selection of W-Beam Barrier
Terminals

Date: October 26, 2004

/Original Signed by/
From: John R. Baxter, P.E.
Director, Office of Safety Design

In Reply Refer To: HSA-10

To: Resource Center Directors
Division Administrators
Federal Land Highway Division Engineers

Since late 1998, W-beam terminals installed on the NHS have been required to be crashworthy. The NCHRP Report 350 was adopted in 1993 as the standard by which the “crashworthiness” of roadside hardware is judged and its adoption has resulted in many new or re-designed terminals for W-Beam guardrail. However, all crashworthy terminals do not have the same performance characteristics and thus should not be used interchangeably without regard to site-specific conditions. The purpose of this memorandum is to provide specific information on the characteristics of most W-beam guardrail terminals that have been accepted for use on the NHS under the test evaluation criteria contained in NCHRP Report 350, and to provide guidelines for their selection. In addition, it provides specific information on the proper design and use of the generic buried-in-backslope design, an issue that was raised by the NTSB in conjunction with its recent report on a multiple fatality crash.

Designers must assure that all W-beam terminals, especially those that do not dissipate significant impact energy in end-on hits, are situated to provide an adequate recovery area behind the terminal. Adequate advance grading, adjacent grading and runout distance grading are critical for achieving optimal crash performance for all W-beam terminal designs. For a buried-in-backslope terminal, care should be given to assuring a proper length of need is established and that an appropriate recovery area is provided beyond and behind the rail if the backslope is flatter than approximately 1:1. In addition, the guardrail height for a buried-in-backslope terminal design should be measured from the roadway grade and not from the ground directly below the rail on high-speed NHS routes.



The attached guidelines provide general information on a number of W-beam barrier end treatments as well as an expanded discussion of the design criteria noted above. Detailed information on specific terminals is at <http://safety.fhwa.dot.gov/report350hardware> under Terminals and Crash Cushions, using the keyword “W-beam Terminals” from the [dropdown list](#). If you have further questions, please contact Mr. Richard Powers at (202) 366-1320 or at richard.powers@fhwa.dot.gov.

Attachment