



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

1200 New Jersey Avenue, SE  
Washington, D.C. 20590

In Reply Refer To:  
HSSD/B-204

Bob Bielenberg, MSME, EIT  
Research Associate Engineer  
Midwest Roadside Safety Facility  
527 Nebraska Hall  
Lincoln, NE 68588-0529

Dear Mr. Bielenberg:

This letter is in response to your request for the Federal Highway Administration (FHWA) acceptance of a roadside safety system for use on the National Highway System (NHS).

Name of system:	Midwest Guardrail System MGS Median Barrier
Type of system:	W-beam median barrier
Test Level:	NCHRP Report 350 Test Level 3
Testing conducted by:	N/A
Task Force 13 Designator:	SGM29
Date of request:	September 3, 2009
Date initially acknowledged:	September 15, 2009
Date of completed package:	March 22, 2010

You requested that we find this system acceptable for use on the NHS under the provisions of the National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

### Requirements

Roadside safety devices should meet the guidelines contained in the NCHRP Report 350. The FHWA Memorandum "Identifying Acceptable Highway Safety Features" of July 25, 1997, provides further guidance on crash testing requirements of longitudinal barriers.

### Description

The 31-inch high Midwest Guardrail System (roadside version) was initially found acceptable under NCHRP Report 350 in FHWA Acceptance Letter B-133, dated March 1, 2005. Your present request is for a median version which consists of the basic MGS guardrail system with a second W-beam rail element spaced off of the back side of W6x8.5 or W6x9 steel posts with 12-inch deep blockouts.



Several existing 31-inch high, guardrail designs have been successfully crash tested in median configurations (FHWA Acceptance Letters B-150B and B-162) including systems that did not use blockouts in their median barrier configurations. The proposed MGS median barrier system is specified with splices at the midspan locations between the posts and uses 12-inch deep blockouts, as used on the standard roadside MGS design. Previous testing and analysis of guardrail systems has shown that the use of blockouts and placement of the guardrail splices away from the posts tends to increase the capacity of guardrail systems and reduce the potential for vehicle snag. Therefore, the proposed MGS median barrier system can be expected to have improved safety performance as compared to the existing 31-inch high, median W-beam guardrail systems.

While the stiffness of the MGS guardrail system would increase due to the use of front and back-side W-beam rails, this is not necessarily cause for concern. The MGS was successfully tested with a 1/4-post spacing which would be much stiffer and have much lower deflections than an MGS median system with the additional W-beam rail. Moreover, the length of the MGS post is the same as in conventional w-beam roadside and median barrier reducing post embedment. Therefore, the additional stiffness of the system is not a concern.

You recommended placement of the MGS median barrier on either the edge of shoulder or on 10:1 or flatter median slopes. We concur with these conservative guidelines to ensure acceptable safety performance.

### **Findings**

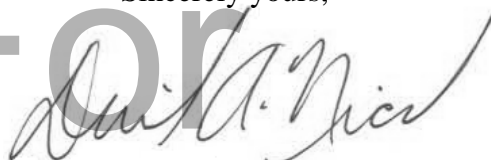
Therefore, the system described in the requests above and detailed in the enclosed drawings is acceptable for use on the NHS under the range of conditions tested, when such use is acceptable to a highway agency.

Please note the following standard provisions that apply to FHWA letters of acceptance:

- This acceptance is limited to the crashworthiness characteristics of the systems and does not cover their structural features, nor conformity with the Manual on Uniform Traffic Control Devices.
- Any changes that may adversely influence the crashworthiness of the system will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the system being marketed is significantly different from the version that was crash tested, we reserve the right to modify or revoke our acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that it will meet the crashworthiness requirements of the FHWA and the NCHRP Report 350.

- To prevent misunderstanding by others, this letter of acceptance is designated as number B-204 and shall not be reproduced except in full. This letter and the test documentation upon which it is based are public information. All such letters and documentation may be reviewed at our office upon request.
- This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented system for which the applicant is not the patent holder. The acceptance letter is limited to the crashworthiness characteristics of the candidate system, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

Sincerely yours,



David A. Nicol, P.E.  
Director, Office of Safety Design  
Office of Safety

Research  
and  
Historical  
Purposes  
Only