



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

May 29, 2009

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

In Reply Refer To:
HSSD/B-192

Mr. Robert Williams
President, BWW Enterprises, Inc.
5733 South Dale Mabry Highway
Tampa, FL 33611

Dear Mr. Williams:

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

Name of system: BWW Enterprises Diamond Block
Type of system: W-Beam Guardrail Offset Block, 8-inch
Test Level: NCHRP Report 350 TL-3
Testing conducted by: Midwest Roadside Safety Facility
Date of request: March 4, 2009

You requested that we find this product 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 systems 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 Diamond Block is comprised of approximately 97.65 percent recycled high density polyethylene plastic, 1.25 percent chemical blowing agent, 1 percent carbon black, and 0.1 percent UV stabilizer. It measures approximately 7.5 inches x 4.6 inches x 14.5 inches tall with a recess on the back to accommodate the face of the guardrail post. The voided design of the block is seen in the drawing which is enclosed for reference. The block's weight is in the range of 5.8 to 5.9 pounds.



Crash Testing

The Midwest Roadside Safety Facility conducted two bogie vehicle tests using standard steel guardrail posts held rigidly in a test foundation. One test evaluated the performance of a standard routed wood blockout, and the other evaluated the Diamond Block (named EXUL-1 during the testing phase). In both cases the bogie vehicle impacted a short length of w-beam rail mounted on the face of the blockout. In the wood blockout test the 2190-pound bogie impacted the test article at 20 mph. In the test of the Diamond block the 1817-pound bogie impacted the test article at 23.0 mph.

Based on the results of the crash tests, no significant differences were observed between the performance of the wood and plastic spacer blocks. Both blocks displayed similar levels of permanent damage after impact. Analysis of the high-speed video showed that the plastic block remained firmly attached to the post during the impact with the router gripping the front flange of the post until it was overridden by the bogie vehicle. No concerns were observed with regards to the dynamic performance nor the structural integrity of the plastic blockout when compared with the wood. In addition, the force vs. deflection curve for the Diamond Block test was cross plotted against component testing using results from two previously FHWA accepted plastic blockouts. The results of this comparison showed that the Diamond blockout displayed similar force vs. deflection behavior to previously accepted designs.

Findings

Therefore, the guardrail offset block described above and detailed in the enclosed drawing 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 Diamond Blocks furnished have essentially the same chemistry, mechanical properties, and geometry as the EXUL-1 that was crash tested for acceptance, and that w-beam guardrail using the Diamond Block 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-192 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.

- The Diamond Block is a patented product and considered proprietary. If proprietary systems are specified by a highway agency for use on Federal-aid projects, except exempt, non-NHS projects, (a) they must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with the existing highway facilities or that no equally suitable alternative exists; or (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411.
- 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,



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

Enclosures

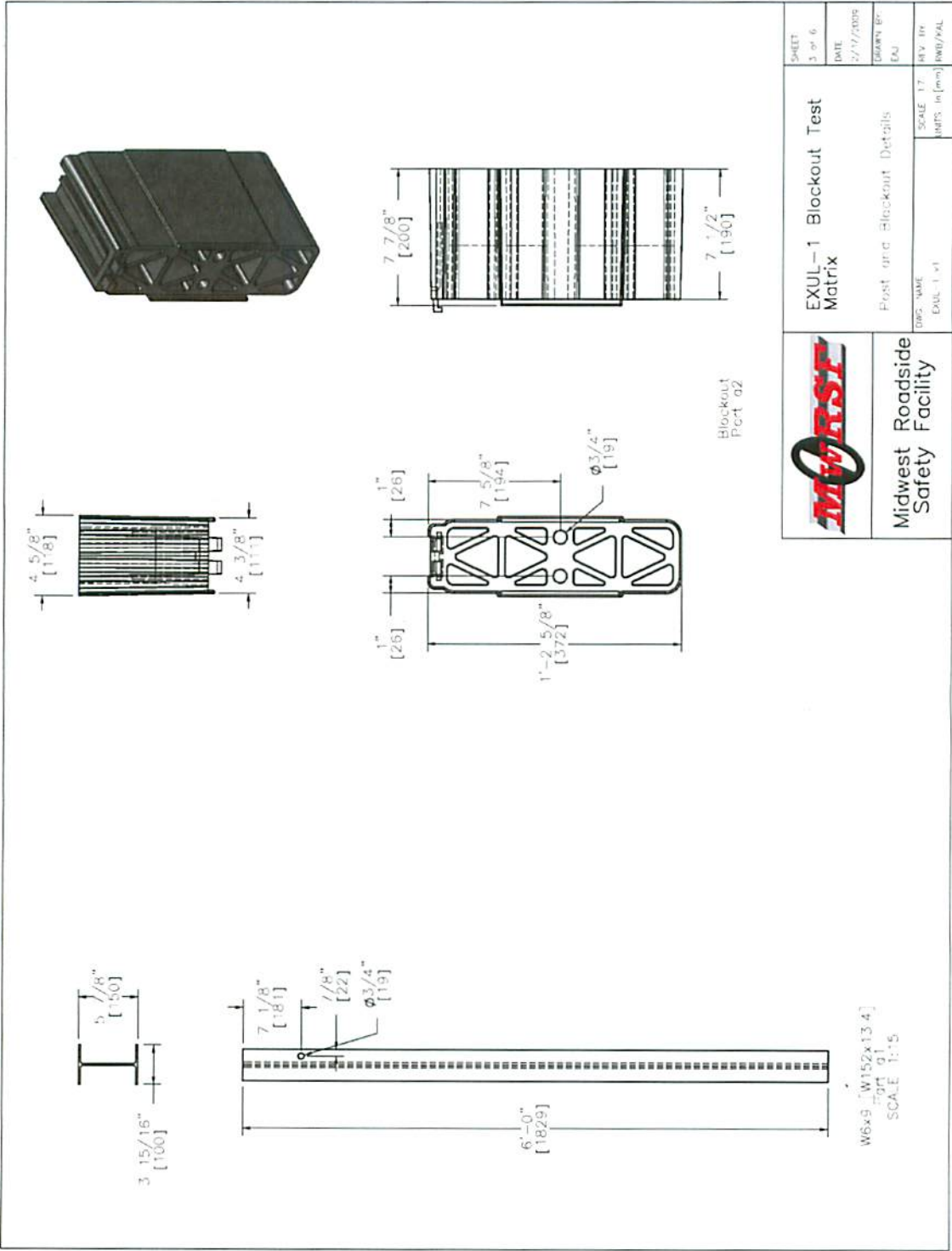


Figure 7. Plastic Spacer Block Details, Test EXUL-1