This memorandum is in response to your request for FHWA’s acceptance of a roadside safety system for use on the NHS.

Name of system: Random Rubble Cavity Wall
Type of system: Aesthetic Stone Faced Concrete Barrier Guardwall
Test Level: NCHRP Report 350 TL-1
Testing conducted by: SwRI
Date of request: March 10, 2008

You requested that we find this system acceptable for use on the NHS under the provisions of the NCHRP Report 350 “Recommended Procedures for the Safety Performance Evaluation of Highway Features.”

Requirements

Description
The Random Rubble Cavity Wall is 460 mm wide and composed of two different height sections. One section is 460 mm tall by 3.66 m long, and the other section is 610 mm tall by 1.68 m long as shown in the attached drawings for reference. The sections are staggered such that there is a 610 mm tall section then a 460 mm tall section and then another 610 mm...
tall section. This alternating height pattern continues for the length of the installation. The
guardwall consists of a reinforced concrete footing and a reinforced concrete core.
Indigenous rock is placed on the sides and top of the concrete core. The majority of the rock
is 300 mm to 460 mm in size with smaller rocks and masonry mortar used to complete the
assembly of the guardwall.

Crash Testing
Full-scale crash testing was conducted on this barrier. The TL-2 testing at 70 km/hr
(43.5 mph) resulted in failure when the 2000P test vehicle drove over the barrier. Two TL-1
tests were conducted at 50 km/hr (31 mph), NCHRP Report 350 Test 1-10 (RW-2) and Test
1-11 (RW-1). Copies of the test data summary sheets for these tests are enclosed for
reference. In both tests the vehicles were smoothly redirected and the occupant impact
values were within the required limits. There was no deflection of the barrier in either test,
nor was there any deformation of the occupant compartment.

Findings
Therefore, Random Rubble Cavity Wall described 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 the 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-181 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.

3 Attachments
Figure 1. Variable Height Guardwall Construction Details
### General Information
- **Test Agency**: Southwest Research Institute
- **Test Number**: RW-1
- **Test Date**: 9/11/94
- **Test Article**: Longitudinal
- **Installation Length (m)**: 30.5
- **Barrier**: Variable Height Stone Masonry Guardrail
- **Soil Type and Condition**: Standard Soil, Dry Compacted
- **Vehicle**: 2000 Ford P50 Model

### Impact Conditions
- **Speed (km/h)**: 40.2
- **Angle (deg)**: 25

### Exit Conditions
- **Speed (km/h)**: 9
- **Angle (deg)**: 9

### Occupant Risk Values
- **In-Pad Velocity (m/s)**: 2.039
- **Ride-Down Acceleration (g's)**: 15 Estimated

### Vehicle Damage
- **Exterior**: Q4DI
- **Interior**: LF9112000

### Figure 8. Summary of Test Conditions and Results - Test RW-1
4. General Information

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<tr>
<th>Type</th>
<th>Installation Length (m)</th>
<th>Barrier</th>
<th>7. Test Article (Continued)</th>
<th>8. Impact Conditions</th>
<th>9. Exit Conditions</th>
<th>10. Ride-Down Acceleration (g's)</th>
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Figure 14. Summary of Test Conditions and Results - Test RW-2