



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

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

December 23, 2009

In Reply Refer To:
HSSD/CC-104A

Mr. Barry D. Stephens, P.E.
Senior Vice President Engineering
Energy Absorption Systems, Inc.
3617 Cincinnati Avenue
Rocklin, CA 95678

Dear Mr. Stephens:

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

Name of device:	Vorteq Trailer TMA <u>with integral Arrowboard</u>
Type of device:	Trailer Truck Mounted Attenuator (TMA)
Testing Level:	NCHRP Report 350 TL-3
Testing Conducted by:	E-Tech Testing Services, Inc.
Date of Request:	July 31, 2009
Date initially acknowledged:	September 18, 2009

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, as a minimum, meet the guidelines contained in the NCHRP Report 350 or the AASHTO Manual for Assessing Safety Hardware. In addition, the FHWA memorandum titled, "ACTION: Identifying Acceptable Highway Safety Features" of July 25, 1997, provides further guidance on crash testing requirements of longitudinal barriers.

Description

The Vorteq Trailer TMA was previously reviewed and accepted by FHWA in our Acceptance Letter CC-104, dated February 8, 2009. The Vorteq Trailer TMA was tested and accepted per the guidelines of NCHRP Report 350, TL-3 (100 km/h). A description of the Vorteq Trailer TMA is given in the referenced acceptance letter, CC-104. Your current request deals with the



mounting of a common 4 foot x 8 foot arrowboard on your TMA trailer. This was accomplished using two vertical stanchions and diagonal bracing attached to the front of the Vorteq Trailer's frame. This arrowboard attachment was designed to: 1) avoid interfering with the impact performance of the Vorteq Trailer TMA, 2) to properly support the sign during travel and 3) to resist stresses during impacts.

Crash Testing

As noted above, the Vorteq Trailer TMA was previously crash tested successfully to NCHRP 350, including both standard and optional tests. With this request you submitted a head-on crash test of a Vorteq Trailer TMA equipped with an arrowboard as described above. The test used a 1500 kg vehicle traveling at 111 km/h and was conducted per the United Kingdom's (UK's) TMA test guideline TD-49 "*Requirements for Lorry Mounted Crash Cushions*". From the supplied crash test data we noted that the impact vehicle was brought to a smooth, controlled stop, the shadow truck was pushed forward, and the arrowboard mount stayed fully intact. No significant loose debris was noted after the impact and the UK's pass/fail criteria were fully met.

We concur that the optional test shows that the addition of a flashing arrow panel or similar traffic control device does not affect the crashworthy performance of the Vorteq TMA.

Findings

Therefore the Vorteq Trailer TMA with attached arrowboard 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 devices 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 device 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 device 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 CC-104A, 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 Vorteq® Trailer Truck Mounted Attenuator is a patented product and considered proprietary. If proprietary devices are specified by 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 device for which the applicant is not the patent holder. The acceptance letter is limited to the crashworthiness characteristics of the candidate device, 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

Enclosures

FHWA:HSSD:NArtimovich:tb:x61331:12/11/09

File: s://directory folder/nartimovich/CC104A_Vortez_ArrowBoard.doc

cc: HSSD (Reader, HSA; Chron File, HSSD; N.Artimovich, HSSD; MMcDonough, HSSD;
DNicol, HSSD)



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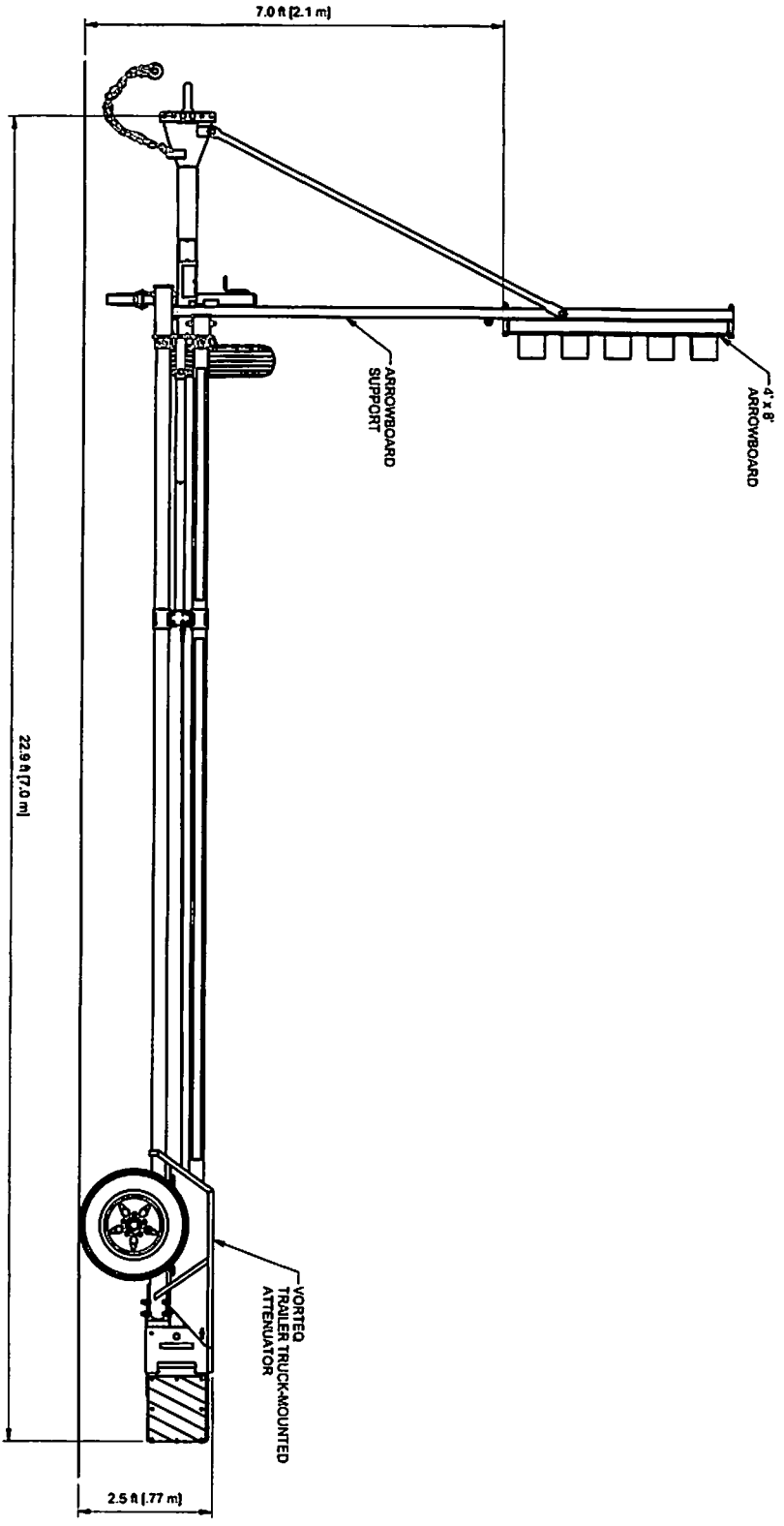
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Sincerely yours,

A handwritten signature in black ink, appearing to read "David A. Nicol". The signature is fluid and cursive, with a long, sweeping tail on the final letter.

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

Enclosures



REV	DATE	BY	APP
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ENERGY ABSORPTION SYSTEMS, INC.
 ENGINEERING AND RESEARCH DEPARTMENT

MOUNTING ASSY, ARROWBOARD, VORTEC