

November 2, 2004

Refer to: HSA-10/WZ-193

Mr. Peter A. Speer
Vice President, Sales
Davidson Traffic Control Products
Bunzel-Tacoma
3110 70th Avenue, East
Tacoma, Washington 98424

Dear Mr. Speer:

Thank you for your letter of January 13, 2003, requesting Federal Highway Administration (FHWA) acceptance of your company's FG300 Curb System as a crashworthy traffic control device for use in work zones on National Highway System (NHS). Accompanying your letter was a detailed description of the product. In our initial response we requested that crash testing be conducted. On July 22, 2004, you submitted reports of crash testing conducted by the Texas Transportation Institute and video of the tests. You requested that we find these devices acceptable for use on the NHS under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

Introduction

The FHWA guidance on crash testing of work zone traffic control devices is contained in two memoranda. The first, dated July 25, 1997, titled "INFORMATION: Identifying Acceptable Highway Safety Features," established four categories of work zone devices: Category I devices are those lightweight devices which are to be self-certified by the vendor, Category II devices are other lightweight devices which need individual crash testing but with reduced instrumentation, Category III devices are barriers and other fixed or heavy devices also needing crash testing with normal instrumentation, and Category IV devices are trailer mounted lighted signs, arrow panels, etc. for which crash testing requirements have not yet been established. The second guidance memorandum was issued on August 28, 1998, and is titled "INFORMATION: Crash Tested Work Zone Traffic Control Devices." This later memorandum lists devices that are acceptable under Categories I, II, and III.

A brief description of the devices follows:

The Davidson Traffic Control Products FG300 Curb System consists of plastic curb sections alternating with circular delineator bases, all of which are attached to the pavement. The curb sections measure 7 ¾ inches wide at the base by 2 inches tall by approximately 30 ¾ inches long.

The curb sections are anchored with six steel bolts capable of holding 5,000 pounds in tension and are connected by round plastic base pieces to form a continuous longitudinal appearance. The “T” shaped plastic delineators are 3 inches by 2 inches by 36 ½ inches. The delineators are inserted into the 8 inch diameter base pieces which are anchored by four bolts, with the flat side of the delineator facing traffic. The delineators are held into the bases by two plastic pins.

<i>Component</i>	<i>Composition</i>	<i>Dimensions</i>	<i>Weight</i>
FG 300 HD Base	Thermoplastic	8 in dia. x 2 in tall	1.6 pounds
FG336 UR Post	Urethane Plastic	3 in dia. x 36 in tall	1.7 pounds
FG300 Curb Unit	Thermoplastics	8 in wide x 2 in tall x 32 in long	3.5 pounds
Bolts	Tempered Steel	Either 2.5 in or 4 in long	2 oz
Refl. Road Studs	Thermoplastic & Glass	2 in x 1 in x 0.5 in tall	0.1 oz

Testing

Full-scale automobile testing was conducted on your company’ devices. As longitudinal channelizing curbs are not intended to redirect vehicles, nor are the plastic delineator posts likely to damage the windshield of a test vehicle, no standard crash test found in the NCHRP Report 350 is appropriate. Therefore, a special test matrix was recommended by the FHWA. A fourth test, similar to one conducted by a competitor, was run in addition to the three recommended tests.

Test 1. Traversal of the curb at 20 degrees. An installation of the FG300 system measuring 55 ft, 6 inches long included 19 delineators at 36.5 inch spacing on centers. The live-driver test vehicle impacted the curb system near delineator #8 at an angle of 20 degrees and a speed of 64.8 mph. The final delineator contacted was #13. The vehicle sustained dimpling of the hood and a dislodged driver’s side mirror. The vehicle did not vault.

Test 2. Traversal of the curb at 0 degrees. Total length of the FG300 system was 101 ft, 1 inch. No delineators were installed in the curb system for this test. The vehicle impacted the curb at 61.4 mph, and rode up onto and along the curb. The left front and rear tires remained on the curb for the entire length of the installation . No damage to the vehicle occurred and there was no vaulting.

Test 3. Lane Change Maneuver. Total length of the system was 101 ft, 1 inch. No delineators were installed for this test. The test vehicle was traveling at 60.8 mph, with the first tire contact at the 54 foot mark. The final tire crossed over at 83 ft 6 inches. There was no damage to the vehicle and no vaulting occurred.

Test 4. Traversal of “Vee” at zero degrees. In this test, a “vee” of curb channelizers were installed as if they were shielding a crash cushion or gore hazard. On one side the 101 foot, 1 inch installation was re-used, and an additional 31 ft, 1 ¾ inch section was placed on the left

side of the “vee.” No delineators were used in this test. The test vehicle contacted the apex of the channelizers head-on and maintained the straight-ahead position with minimal steering input. As in the other three tests, the vehicle’s tires rode over the curb units and became momentarily airborne. The vehicle did not rise up on its suspension, rather it maintained a level trajectory.

Findings

Damage was limited to the hood dimpling and mirror damage noted in the first test. None of the curb segments became dislodged during any of the tests, and there was no potential for windshield damage or passenger compartment intrusion. In each test the vehicle’s tires left the pavement as they traversed the 2 inch high curb, but returned to the ground approximately one foot later.

The results of the testing met the FHWA requirements and, therefore, the devices described in the various requests above and detailed in the enclosed drawings are acceptable for use on the NHS under the range of conditions tested, when proposed by a State.

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

- Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, nor conformity with 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, it reserves the right to modify or revoke its 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 they will meet the crashworthiness requirements of the FHWA and the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number WZ-193 shall not be reproduced except in full. This letter, and the test documentation upon which this letter is based, is public information. All such letters and documentation may be reviewed at our office upon request.
- The Davidson Plastics FG300 Curb System is a patented device and is considered "proprietary." The use of proprietary work zone traffic control devices in Federal-aid projects is generally of a temporary nature. They are *selected by the contractor* for use as needed and removed upon completion of the project. Under such conditions they can be

presumed to meet requirement "a" given below for the use of proprietary products on Federal-aid projects. On the other hand, if proprietary devices are *specified by a highway agency* for use on Federal-aid projects they: (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with 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. These provisions do not apply to exempt non-NHS projects. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.

- 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,

/Original Signed by/

John R. Baxter, P.E.
Director, Office of Safety Design
Office of Safety

Enclosures

FHWA:HSA-10:NArtimovich:tb:x61331:10/26/04
File: h://directory folder/nartimovich/WZ193-BunzlFIN
cc: HSA-10 (Reader, HSA-1; Chron File, HSA-10;
N. Artimovich, HSA-10)

APPENDIX A. DETAILS OF THE FG300 CURB SYSTEM

NOTES:

AS INSTALLED
WITH FG300 POSTS

EXTRUSION	7194 8007194CURB
300 W. Ave. 6th North Vancouver, BC V7E 2W4-806	DATE: 03/22/04 REV: 08-

The drawings and other Davidson products are available in AutoCAD format. Also single drawings and shop drawings to facilitate product identification directly into design drawings. Davidson product CD users able to utilize product information on the CD. Every effort is made to provide the most accurate information. It is possible to purchase these products from our website. See Davidson.com for more information.

AutoCAD CD Available

FLEX-GUIDE 300 CURB SYSTEM	DATE
PART NAME	ENGINEERING NUMBER

Davidson Traffic Control Products

"Creating Products to Save Lives"

www.davidson.com

trp@ds.com

Sec. 635.411 Material or product selection

(a) Federal funds shall not participate, directly or indirectly, in payment for any premium or royalty in any patented or proprietary material, specification, or process specifically set forth in the plans and specifications for a project unless:

(1) Such patented or proprietary item is purchased or obtained through competitive bidding with equally suitable unpatented items; or

(2) The State highway agency certifies either that such patented or proprietary item is essential for synchronization with existing highway facilities, or that no equally suitable alternate exists; or

(3) Such patented or proprietary item is used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes.

(b) When there is available for purchase more than one nonpatented, nonproprietary material, semifinished or finished article or product that will fulfill the requirements for an item of work of a project and these available materials or products are judged to be of satisfactory quality and equally acceptable on the basis of engineering analysis and the anticipated prices for the related item(s) of work are estimated to be approximately the same, the PS&E for the project shall either contain or include by reference the specifications for each such material or product that is considered acceptable for incorporation in the work. If the State highway agency wishes to substitute some other acceptable material or product for the material or product designated by the successful bidder or bid as the lowest alternate, and such substitution results in an increase in costs, there will not be Federal-aid participation in any increase in costs.

(c) A State highway agency may require a specific material or product when there are other acceptable materials and products, when such specific choice is approved by the Division Administrator as being in the public interest. When the Division Administrator's approval is not obtained, the item will be nonparticipating unless bidding procedures are used that establish the unit price of each acceptable alternative. In this case Federal-aid participation will be based on the lowest price so established.

(d) Appendix A sets forth the FHWA requirements regarding (1) the specification of alternative types of culvert pipes, and (2) the number and types of such alternatives which must be set forth in the specifications for various types of drainage installations.

(e) Reference in specifications and on plans to single trade name materials will not be approved on Federal-aid contracts.