



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

February 8, 2007

400 Seventh St., S.W.  
Washington, DC 20590

In Reply Refer To:  
HSSD/WZ-243

Mr. Greg Hannah  
President  
Impact Recovery Systems, Inc.  
246 W. Josephine Street  
P.O. Box 12637  
San Antonio, TX 78212

Dear Mr. Hannah:

Thank you for your November 6, 2006, letter requesting the Federal Highway Administration's (FHWA) acceptance of your company's Tuff Curb, a longitudinal channelizing curb, as a crashworthy traffic control device for use in work zones on the National Highway System (NHS). Accompanying your letter was the FHWA Office of Safety Design form and test report documentation of relevant crash tests conducted by Texas Transportation Institute. You requested that we find this longitudinal channelizing curb acceptable for use on the NHS under the provisions of National Cooperative Highway Research Program Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

This letter is the acknowledgement of the FHWA's acceptance of your request. The original completed form has been modified by the addition of the FHWA acceptance letter number and the date of our review. The form, of which a copy is enclosed for reference, will be posted on our Web site in the near future.

Thank you for working with us as we institute this new review and acceptance process.

Sincerely yours,

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

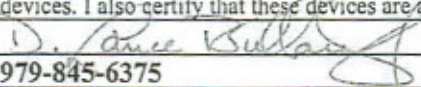
Enclosures

FHWA:HSSD:MLupes:tb:x66994:2/7/07

File: s://directory folder/mlupes/WZ243-Tuff Curb.doc

cc: HSSD (Reader, HSA; Chron File, HSSD; M.Lupes, HSSD;  
MMcDonough, HSSD; J.Baxter, HSSD)



Page 1	<b>FEDERAL HIGHWAY ADMINISTRATION OFFICE OF SAFETY DESIGN Category 2 Work Zone Device Acceptance Letter</b>	Letter Number <b>WZ-243</b> Date: 11/6/06
Contact Info	Petitioner / Developer Name and Address: <b>Greg Hannah, President Impact Recovery Systems, Inc. 246 W. Josephine St., PO Box 12637 San Antonio, TX 78212</b>	
	I hereby certify that the device(s) covered by this Acceptance Letter meet(s) the crash - worthiness test and evaluation requirements of the FHWA and NCHRP Report 350.	
Signature		
Telephone #	<b>800-736-5256</b>	
Email Address	<b>ghannah@impactrecovery.com</b>	
	Laboratory / Engineer Name and Address <b>D. Lance Bullard, Jr., P.E. Texas Transportation Institute The Texas A&amp;M University System 3135 TAMU College Station, TX 77843-3135</b>	
Check One:		
<input checked="" type="checkbox"/>	I hereby certify that the testing that supports this Acceptance Letter was conducted in accordance with NCHRP Report 350 guidelines, that the device(s) tested is/are accurately described on this form, and that the test results indicate that the device meets all applicable NCHRP Report 350 evaluation criteria.	
<input type="checkbox"/>	I have evaluated the requested modifications to these devices previously found acceptable by the FHWA in Acceptance Letter WZ-___, and hereby certify that, in my opinion, the modifications do not adversely affect the crash performance of the devices. I also certify that these devices are accurately described on this form.	
Signature		
Telephone #	<b>979-845-6375</b>	
Email Address	<b>l-bullard@tamu.edu</b>	
Keywords:		
	Type of Device (See page 3) <b>Longitudinal Channelizing Barricade Curb</b>	
	Composition of Sign or Rail substrate (See Page 3)	<b>NONE</b>
	Thickness of substrate (inches):	<b>N/A</b>
	Height of sign from the ground (inches), if applicable: (See Page 3)	<b>N/A</b>
	Flags and or lights present during test? Indicate number of each:	
	# of flags: 0 # of lights: 0 Weight of lights: ea.	
Device Name	<b>Tuff Curb</b>	



<p>Detailed Desc. Of Device, Materials, sizes, Fasteners, Substrates Foundation, Aux. Features Ballast, etc.</p>	<p>Tuff Curb is an injection molded high-density polyethylene mountable curb made up of two halves, each measuring 12 in. wide by 3 ½ in. tall by 20 in. long. The curb halves interlock and are connected with two 7/16 in. x 1 ½ in. bolts. Each curb section measures 40 in. long and is anchored with two 5/8 in. by 5 in. lag bolts that are threaded into ¾ in. by 3 ½ in. plastic anchor sleeves placed into the roadway. The curb sections are spaced no less than ½ in. apart to form a continuous longitudinal appearance. The Tuff Curb installation begins and ends with a nose end section that measures 12 in. wide by 3 ½ in. tall by 18 in. long at the mating end and is 1 ¾ in. tall at the exposed end. Each end section is anchored with three 5/8 in. by 5 in. lag bolts that are threaded into ¾ in. by 3 ½ in. plastic anchor sleeves placed into the roadway. The tubular delineators are attached to the center of the curb section, at the joint of the two curb halves, by four bolts. The connection is a twist lock type.</p> <p>A single v-shaped test installation was constructed for the conduct of all the tests reported herein. The formation assembled for the tests allowed a lane separation configuration and gore type configuration to be tested with one test installation. The total length of longitudinal (parallel to traffic flow) Tuff Curb installed was 267 ft. The parallel leg was comprised of two segments; one 107 ft. long then a 100 ft. space followed by a 60 ft. long segment. The take-off leg of the vee was 30 ft. long and angled 30 degrees off of the longitudinal leg. The curb and end sections were anchored to the concrete apron. Delineators were not installed for tests one through four. Tests five and six were performed with vertical delineator panels installed. Photographs of the test installation are shown in Appendix B and photographs of the vehicle before and after testing are shown in Appendix C.</p>
--	---

Page 2	<b>FEDERAL HIGHWAY ADMINISTRATION OFFICE OF SAFETY DESIGN Category 2 Work Zone Device Acceptance Letter</b>		Letter Number <b>WZ-243</b>
			Date 11/6/06
	<b>Mandatory Attachments</b>		
	<b>Attachment # 1: Test data summary page(s)</b>		
	Attach. #1a	Test # Contract No. P006359, Project 400001-IRS1-6	
	Attach. #1b	Test #	
	Attach. #1c	Test #	
	Attach. #1d	Test #	
Alternative	<b>Attachment # 1: Description and discussion of modification(s) to crash tested and/or accepted device.</b>		
	Date:		
	<b>Attachment # 2: PDF drawing(s) of device(s)</b>		
	Attach. #2a	Drawing Title: <b>Details of the Tuff Curb</b>	
		Drawing #: <b>Appendix A</b>	
	Attach. #2b	Drawing Title: <b>Photographs of the Tuff Curb</b>	
		Drawing #: <b>Appendix B</b>	
	Attach. #2c	Drawing Title: <b>Photographs of the Test Vehicle</b>	
		Drawing #: <b>Appexdix C</b>	
	Attach. #2d	Drawing Title:	
		Drawing #:	
	Attach. #2e	Drawing Title:	
		Drawing #:	
	Attach. #2f	Drawing Title:	
		Drawing #:	
	Attach. #2g	Drawing Title:	
		Drawing #:	



Page 3	<b>FEDERAL HIGHWAY ADMINISTRATION OFFICE OF SAFETY DESIGN Category 2 Work Zone Device Acceptance Letter</b>	Letter Number
		WZ-243
		Date 11-6-06

**Please select from the following Keywords for “Type of Device”:**

Longitudinal Channelizing Barricade  
 Curb (Curb channelizer system with or without road tubes or other channelizers)  
 Drum  
 H-Footprint Sign Stand  
 X-Footprint Sign Stand  
 Trailer Mounted Signs (Does not include arrow boards or variable message signs or other Category 4 trailer mounted devices.)  
 Automated Flagger Device (not trailer mounted)  
 Tripod Sign Stand  
 Type I Barricade  
 Type II Barricade  
 Type III Barricade  
 Vertical Panel  
 Intrusion Detector  
 Ballast (Action relates to ballast on one or more devices)  
 Channelizer (Individual units unlike cones, road tubes, or drums)

**Please select from the following Keywords for “Sign Substrate”:**

Roll-up / Fabric (with fiberglass spreaders – aluminum or steel spreaders are not allowed.)  
 Plywood  
 Aluminum – Solid  
 Aluminum – Laminate  
 Corrugated Plastic  
 Extruded Plastic  
 Waffleboard Plastic  
 Wood / Lumber

**Please select from the following Keywords for “Height of Sign”:**

The distance to the lowest point on the sign is:

Low            12 to 18 inches above the pavement  
 Mid-A        20 to 24 inches above the pavement  
 Mid-B        25 to 36 inches above the pavement  
 Mid-C        37 to 59 inches above the pavement  
 Tall           60 to 71 inches above the pavement  
 Oversized    72 inches and taller

Page 4	<b>FEDERAL HIGHWAY ADMINISTRATION</b> <b>OFFICE OF SAFETY DESIGN</b> <b>Category 2 Work Zone Device Acceptance Letter</b>	Letter Number
		WZ-243
		Date 11-6-06

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

- Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, or 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, 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 FHWA and NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance 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.
- If the subject of this letter is a patented device it 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. 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 Federal Highway Administration 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.



# APPENDIX A. DETAILS OF THE TUFF CURB

