U.S. Department
of Transportation
Federal Highway Administration

400 Seventh St., S.W.
Washington, D.C. 20590

March 24, 2006

In Reply Refer To:
HSA-10/WZ-225

Mr. John T. Dvorak
President, John Thomas, Inc.
1560 Lovett Drive
Dixon, Illinois 61021

Dear Mr. Dvorak:

Thank you for your letter of January 25, 2005, requesting the Federal Highway Administration (FHWA) acceptance of your company's Dura-Curb channelizing system as a crashworthy traffic control device for use in work zones and permanent installations on the National Highway System (NHS). Accompanying your letter were reports of live driver crash testing you conducted 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. Our new acceptance process was outlined in our memorandum "FHWA Hardware Acceptance Procedures – Category 2 Work Zone Devices" dated November 11, 2005.

A brief description of the devices follows:

Individual Dura Curb units are 40 inches long by 12 inches wide and 3.25 inches high in relief. Each high molecular weight high-density polyethylene unit can be bolted to the pavement using two 5/8" x 6 hex lag bolts. The units are not designed to be interconnected. In use, a plate for mounting road tubes is bolted to the top of the unit.

Testing

Full-scale, live driver automobile testing was conducted on your company's devices. In each of the six scenarios below the driver traversed the system 3 or 4 times, each traversal being recorded on video. Each curb unit was bolted to the pavement using the recommended hardware as noted above.

Test 1. Approximately 130 feet of Dura-Curb
- Goal was to cross the curb at a shallow angle and return across to the proper lane.
- Speed was in excess of 62.5 and the impact angle was approximately 5 degrees.
- Vehicle was a 2220-pound Mitsubishi Mirage.

Test 2. Approximately 250 feet of Dura-Curb
- Goal was to cross the curb at a steeper angle and return across to the proper lane.
- Speed was in excess of 62.5 and the impact angle was approximately 20 degrees.
- Vehicle was a 2220-pound Mitsubishi Mirage.

Test 3. Approximately 130 feet of Dura-Curb with Gore
- Goal was to enter the "gore" area head on to determine effect on vehicle's bumper with respect to impact attenuators in the gore area.
- Speed was in excess of 62.5 and the impact angle was approximately 140 degrees at the gore delta.
- Vehicle was a 2220-pound Mitsubishi Mirage.

Test 4. Approximately 130 feet of Dura-Curb with Gore
- Goal was to traverse the "gore" area at an angle to determine the effect on driver's ability to cross the gore to correct an error in navigation.
- Speed was in excess of 62.5 and the impact angle was approximately 20 degrees at the gore delta.
- Vehicle was a 2220-pound Mitsubishi Mirage.

Test 5. Approximately 130 feet of Dura-Curb with Gore
- Goal was to enter the "gore" area at a slight angle to determine the effect on vehicle's bumper with respect to impact attenuators in the gore area.
- Speed was in excess of 62.5 and the impact angle was approximately 160 degrees at the gore delta.
- Vehicle was a 2220-pound Mitsubishi Mirage.

Test 6. Same conditions as Test 5 but using 4100 pound SUV to further stress Dura Curb units with a heavier vehicle.

Findings
There was no evidence that a driver traversing the Dura-Curb installation would have lost control of the vehicle due to contact with the curb. The gore traversals showed that the curb units would not have affected the vehicle bumper height and subsequent contact with a crash cushion or longitudinal barrier would not have been adversely affected.

No units were dislodged during any of the traversals.

As has been the case with all previous tests of modular curb channelizing units, no road tubes or other vertical components were in place.

The results of the testing met the FHWA requirements and, therefore, the device described above and detailed in the enclosed drawings is 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 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 the FHWA and the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number WZ-225, 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 Dura-Curb 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 (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 existing highway facilities or that no equally suitable alternative exists; (c) or 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 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

FHWA:HSA-10:NArtimovich:tb:x61331:3/21/06
File: h://directory folder/artimovich/WZ225-DuraCurb.doc
cc: HSA-10 (Reader, HSA-1; Chron File, HSA-10;
N.Artimovich, HSA-10)

40" Curb Section

PARTS LIST

Item	Part No.	Description	Req'd
1	See Table A	40"x12" +/-.5" Arched DURA-CURB with Vision Strip	1
2	357	40"x12" +/-.5" Universal Arched Curb Section, HMW/HDPE	1
3	365	5/8" x 6 Hex Lag Bolt,Coated	2
4	368	5/8" Flat Washer, Coated	2
5	369	3/4" x 3-9/16" Molly Plug	2
6	370	Universal Quick Release Base Plate, Coated *	1
7	372	3/8" x 1-1/2" Shouldered Allen Lag Screw, Coated	4

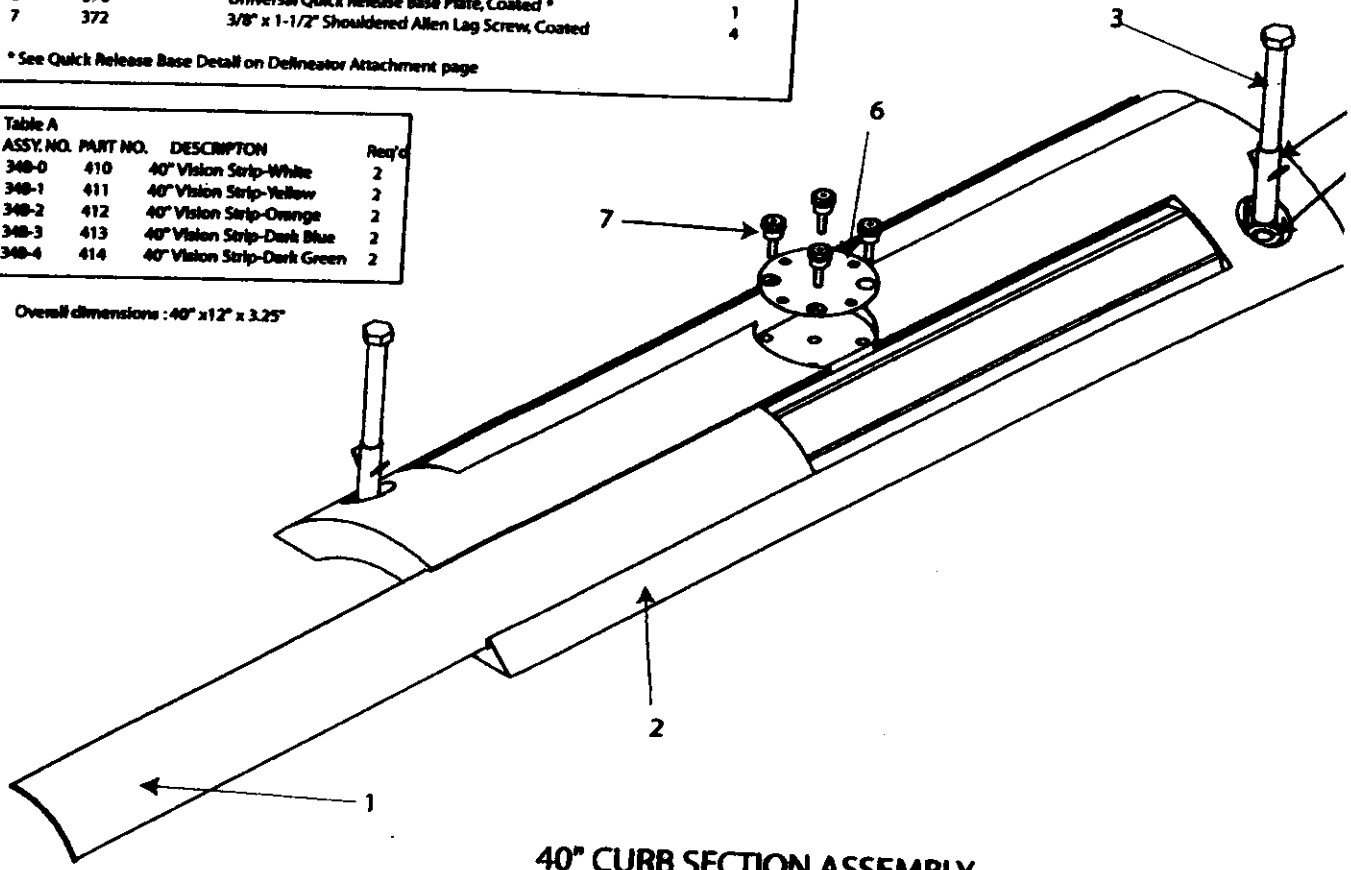
* See Quick Release Base Detail on Delineator Attachment page

DRAWING NO. 2001-4736.DWG

Table A

ASSY. NO.	PART NO.	DESCRIPTON	Req'd
348-0	410	40" Vision Strip-White	2
348-1	411	40" Vision Strip-Yellow	2
348-2	412	40" Vision Strip-Orange	2
348-3	413	40" Vision Strip-Dark Blue	2
348-4	414	40" Vision Strip-Dark Green	2

Overall dimensions : 40" x12" x 3.25"



40" CURB SECTION ASSEMBLY

18" Nose Section

PARTS LIST

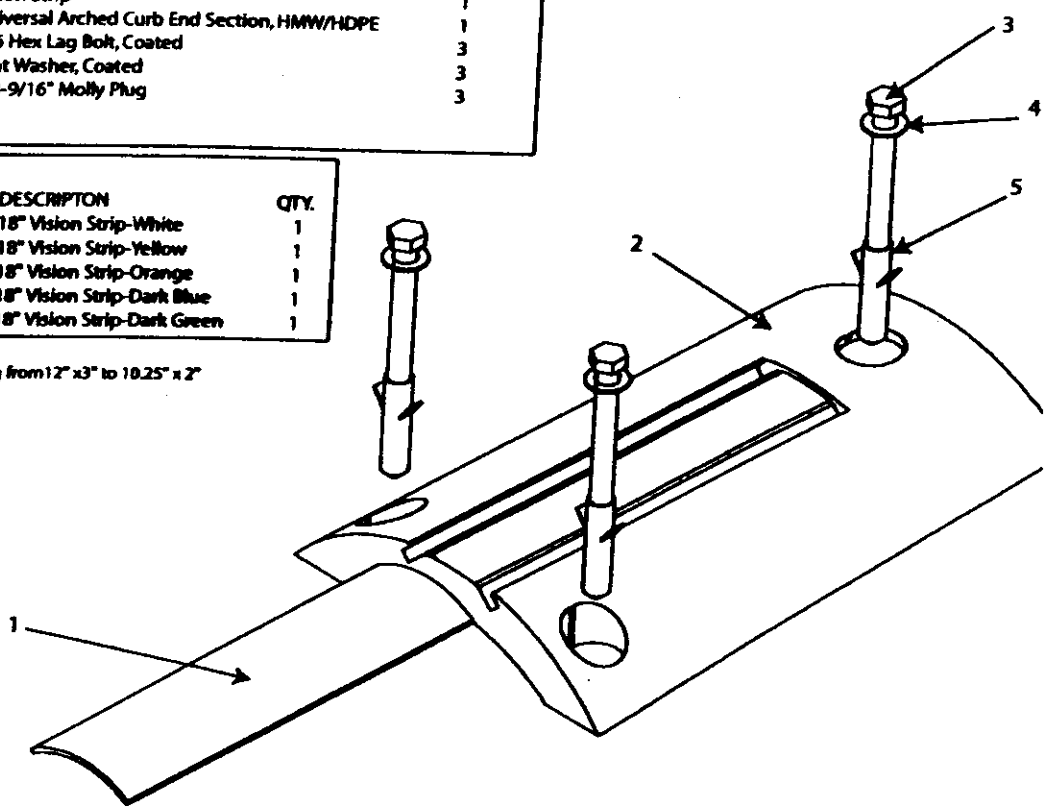
Item	Part No.	Description	Req'd
1	See Table A	18" Vision Strip	1
2	352	18" Universal Arched Curb End Section, HMW/HDPE	1
3	367	5/8" x 6 Hex Lag Bolt, Coated	3
4	368	5/8" Flat Washer, Coated	3
5	369	3/4" x 3-9/16" Molly Plug	3

DRAWING NO. 2001-4737.DWG

Table A

ASSY. NO.	PART NO.	DESCRIPTON	QTY.
355-0	400	18" Vision Strip-White	1
355-1	401	18" Vision Strip-Yellow	1
355-2	402	18" Vision Strip-Orange	1
355-3	403	18" Vision Strip-Dark Blue	1
355-4	404	18" Vision Strip-Dark Green	1

Overall dimensions: 18" long, tapering from 12" x 3" to 10.25" x 2"



40" Curb Section

PARTS LIST

Item	Part No.	Description	Req'd
1	See Table A	40"x12" +/-.5" Arched DURA-CURB with Vision Strip	1
2	35[illegible]	40"x12" +/-.5" Universal Arched Curb Section, HMW/HDPE	1
3	36[illegible]	5/8" x 6 Hex Lag Bolt,Coated	2
4	3[illegible]	5/8" Flat Washer, Coated	2
5	369	3/4" x 3-9/16" Molly Plug	2
6	370	Universal Quick Release Base Plate, Coated *	1
7	372	3/8" x 1-1/2" Shouldered Allen Lag Screw, Coated	4

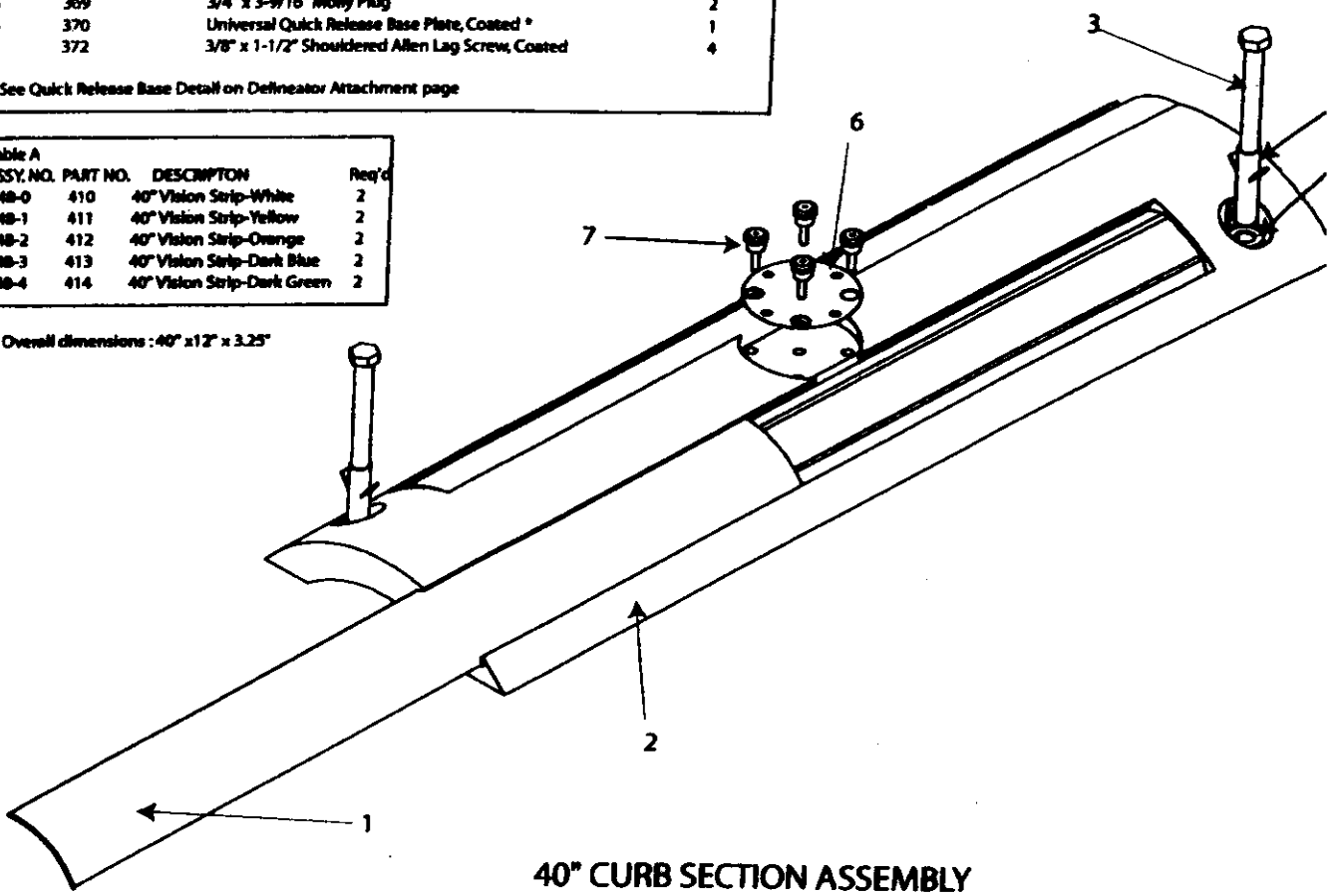
* See Quick Release Base Detail on Delineator Attachment page

DRAWING NO. 2001-4736.DWG

Table A

ASSY. NO.	PART NO.	DESCRIPTION	Req'd
348-0	410	40" Vision Strip-White	2
348-1	411	40" Vision Strip-Yellow	2
348-2	412	40" Vision Strip-Orange	2
348-3	413	40" Vision Strip-Dark Blue	2
348-4	414	40" Vision Strip-Dark Green	2

Overall dimensions : 40" x12" x 3.25"



40" CURB SECTION ASSEMBLY

18" Nose Section

DRAWING NO. 2001-4737.DWG

PARTS LIST

Item	Part No.	Description	Req'd
1	See Table A	18" Vision Strip	1
2	352	18" Universal Arched Curb End Section, HMW/HDPE	1
3	367	5/8" x 6 Hex Lag Bolt, Coated	3
4	368	5/8" Flat Washer, Coated	3
5	369	3/4" x 3-9/16" Molly Plug	3

Table A

ASSY. NO.	PART NO.	DESCRIPTON	QTY.
355-0	400	18" Vision Strip-White	1
355-1	401	18" Vision Strip-Yellow	1
355-2	402	18" Vision Strip-Orange	1
355-3	403	18" Vision Strip-Dark Blue	1
355-4	404	18" Vision Strip-Dark Green	1

Overall dimensions: 18" long, tapering from 12" x3" to 10.25" x 2"