U.S. Department
of Transportation
Federal Highway
Administration

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

February 8, 2005

In Reply Refer To: HSA-10/WZ-189

Mr. Felipe Almanza
TrafFix Devices
220 Calle Pintoresco
San Clemente, California 92672

Dear Mr. Almanza:

Thank you for your letter of May 20, 2004, requesting Federal Highway Administration (FHWA) acceptance of four of your company's products as crashworthy traffic control devices for use in work zones on the National Highway System (NHS):

- Looper Cone with 30 pound base and standard barricade light
- Metro A Cade with Phoenix Extruded Rail and standard barricade light
- Big Buster Sign Stand with dual springs, Aluminum inner mast and .080 Aluminum sign
- Phoenix Sign Stand with 12 gage, 1.75" PSST upright, .080 Aluminum sign and standard light

Accompanying your letter were reports of crash testing conducted by Karco Engineering and video of the tests. You requested that we find these devices 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." We initially responded on August 4, 2004, and additional information was provided by Karco on November 29, 2004.

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

BUCKLE UP AMERICA

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:

Looper Cone with 30 pound base and standard barricade light

This 42 inch tall cone tapers from a bottom diameter of 7 3/4 inches to 4 inches at the top. It is made of low density polyethylene with a nominal wall thickness of 3/16 inches, and is ballasted with a 30 pound (recycled crumb rubber) base. A conventional Type A or C warning light, weighing 3 pounds, including batteries, was attached to the top using a 4 1/8 inch long, 1/2 inch diameter bolt and nut, (along with a vandal resistant washer.)

Metro A Cade with Phoenix Extruded Rail and standard barricade light

This Type II barricade consists of two A-Frame legs, which support, and are perpendicular to, the two 8.25 inch wide Itasca Plastics striped rails. The 96-inch long rails weigh 5.9 pounds each, and the 39.36 inch tall A-Frame legs weigh 6.2 pounds apiece. The rails are extruded high density polyethylene plastic (HDPE) and the legs are injection molded HDPE. A conventional Type A or C warning light, weighing 3 pounds, including batteries, was attached to the top using a 4 1/8 inch long, 1/2 inch diameter bolt and nut, (along with a vandal resistant washer.)

Big Buster Sign Stand with dual springs, Aluminum inner mast and .080 Aluminum sign

This "X-footprint" portable sign stand has an aluminum upright mast measuring 1 1/2 inches square, out of which telescopes the 1 1/4 inch square aluminum inner mast. The total height of the extended mast is 131 inches, which supports a 48x48 inch diamond sign approximately 60 inches above the pavement. The mast is supported on dual springs mounted on 1 1/4 inch square folding legs which measure 125 inches each when extended. The signs are held in place with a set of TrafFix Devices rigid sign brackets.

Phoenix Sign Stand with 12 gage, 1.75"PSST upright, .080 Aluminum sign and standard light

The 102 inch tall mast of this stand is 12 gage, 1.75 inch square perforated square steel tubing simply supported by a recycled rubber and steel base. The bottom of the sign is mounted 13 inches above the pavement. A 48x48 inch diamond, 0.080 inch thick aluminum sign was bolted to the mast. A conventional Type A or C warning light, weighing 3 pounds, including batteries, was attached to the top using a 4 1/8 inch long, 1/2 inch diameter bolt and nut, (along with a vandal resistant washer.)

Testing

Full-scale automobile testing was conducted on your company's devices. Two stand-alone examples of the device were tested in tandem, one head-on and the next placed six meters downstream turned at 90 degrees, as called for in our guidance memoranda.

	Test Numbers TR-P23163-			
Test Number	-01-NC	-02-NC	-03-A	-04-NC
Device Tested	Looper Cone	Metro A Cade	Big Buster	Phoenix
Weight of Device	35.3 pounds	24.2 pounds	65 pounds	72 pounds
Mounting heights	N/A	N/A	60 in	12 in
Flags? Lights?	1 Light	None	None	1 Light
Mass of Vehicle	1819 #	1819#	1819 #	1819 #
Impact Speed	101.4 km/hr	101.1 km/hr	100.4 km/hr	102.0 km/hr
Velocity Change	0.8 m/s	0.4 m/s	0.6 m/s	1.6 m/s
Extent of contact	Light hit windshield	Rail hit wind.	Dents in hood	Dents in hood
Windshield Damage	Minor cracking	None	Glass shattered	Glass shattered
Other notes	None	No damage	No holes	No holes

The tests are summarized in the table below.

Findings

Damage was limited to the bumper, sheet metal damage to the hood and roof, and minor to modest cracking to the windshield. 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 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-189 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 TrafFix devices are patented products and are 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,

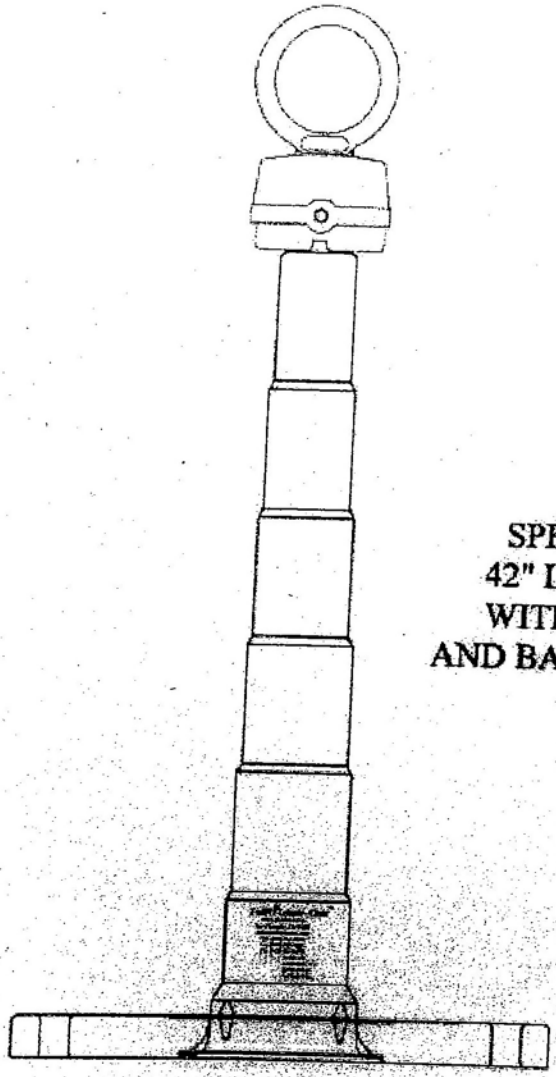
/Original Signed by Harry W. Taylor/

~for~

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

Enclosures

Manufacturer's Drawing of Test Article



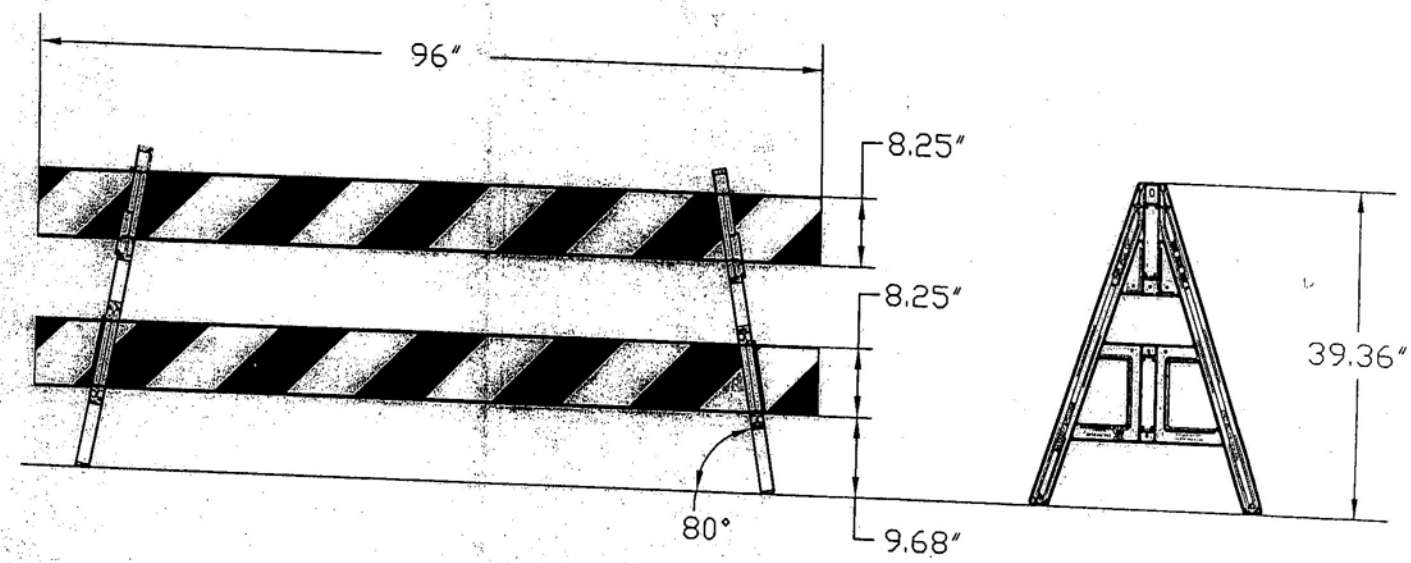
SPECIFICATION
42" LOOPER CONE
WITH 30 LB. BASE
AND BARRICADE LIGHT

UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES.	TrafFix Devices Inc.	220 Calle Pintoresco San Clemente, CA 92672 (949) 361-5663 FAX (949) 361-9205 www.traffixdevices.com	
	LOOPER CONE WITH 30 LB BASE AND BARRICADE LIGHT		
DRAWN BY: / DATE:			
CHECKED BY: / DATE:	SIZE A	DWG NO. 46000 SERIES	REV —
APPROVED BY: / DATE:	SCALE 1/1	SHEET 1 OF 1	

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

METRO A CADE WITH ITASCA RAILS

METRO A-CADE 2 X 6.20 LB
ITASCA RAILS 2 X 5.90 LB



UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE IN INCHES.

DRAWN BY:	DATE: 01-06-04	
CHECKED BY:	DATE:	
APPROVED BY:	DATE:	

TrafFix Devices Inc.
220 Calle Pintoresco
San Clemente, CA 92672
(949) 361-5663
FAX (949) 361-9205
www.traffixdevices.com

METRO A CADE WITH ITASCA RAIL

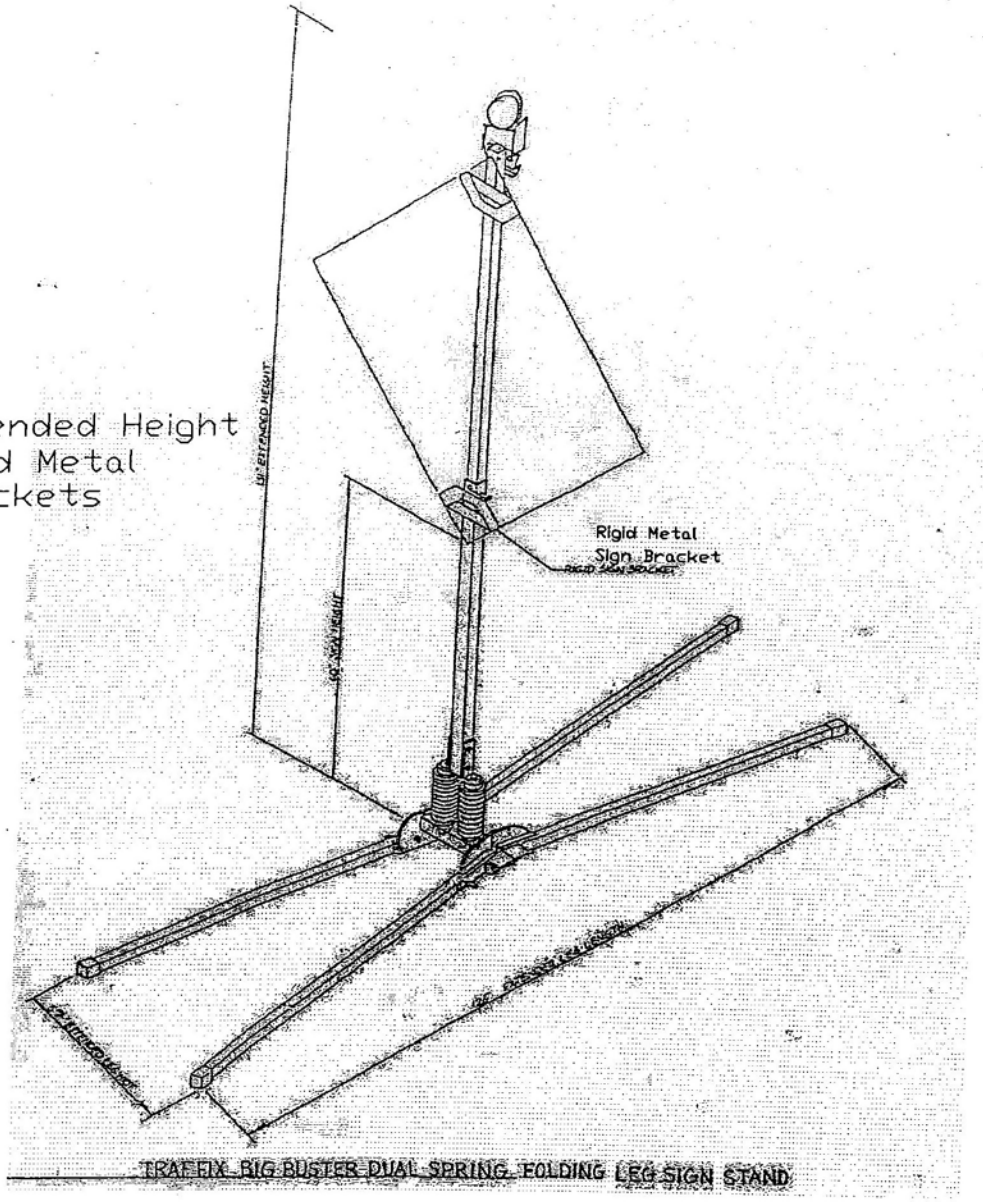
SIZE	DWG NO.	REV
A	44000 SERIES	—

SCALE 1/1

SHEET 1 OF 1

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

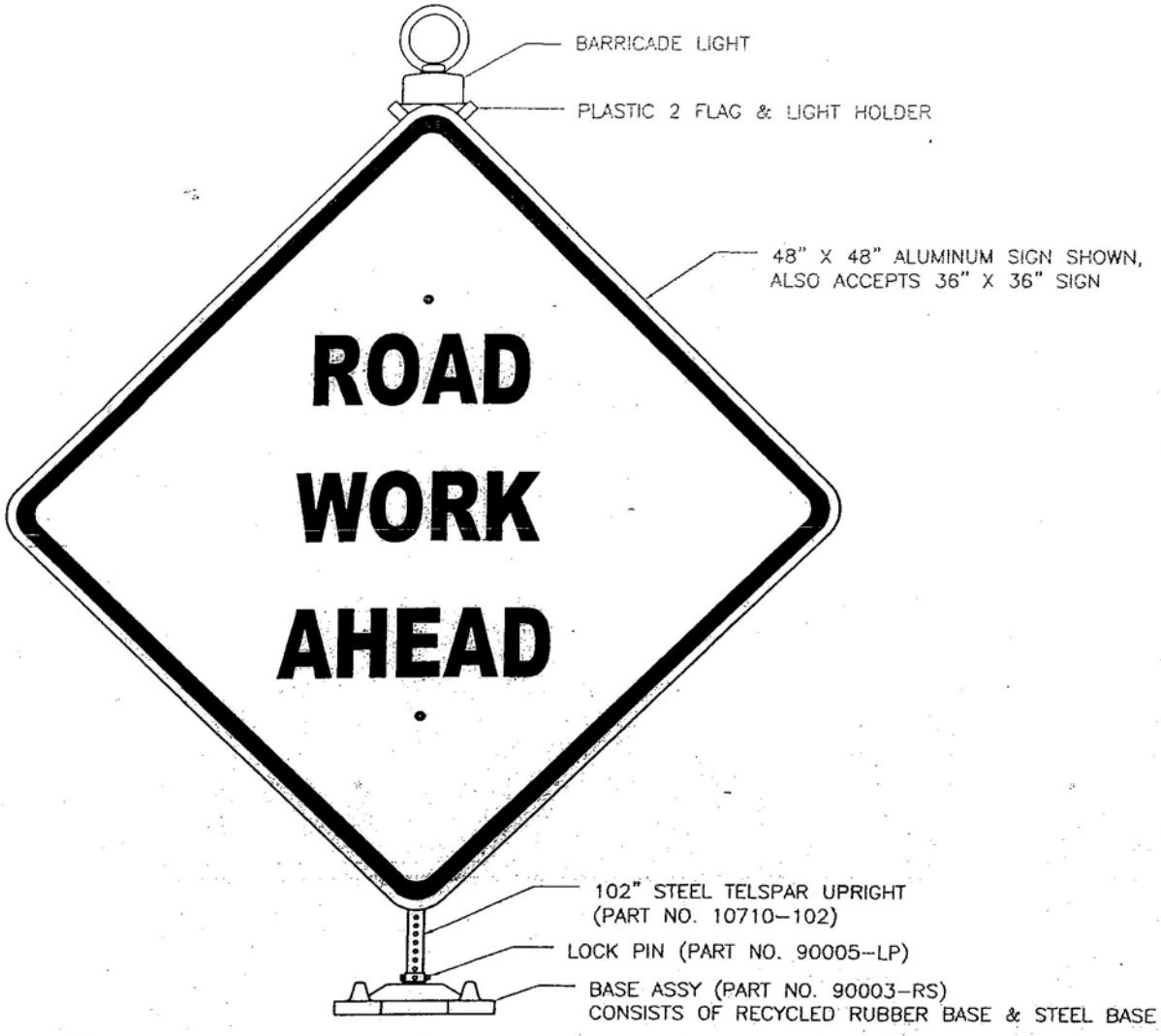
131" Extended Height
With Rigid Metal
Sign Brackets



TRAFFIX BIG BUSTER DUAL SPRING FOLDING LEG SIGN STAND WITH RIGID METAL SIGN BRACKETS

UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES.	TrafFix Devices Inc.	220 Calle Pintoresco San Clemente, CA 92672 (949) 361-5663 FAX (949) 361-9205 www.traffixdevices.com	
	TRAFFIX BIG BUSTER WITH DUAL SPRINGS AND FOLDING LEG STAND		
DRAWN BY: / DATE:	SIZE A	DWG NO. 60000 SERIES	REV —
CHECKED BY: / DATE:			
APPROVED BY: / DATE:	SCALE 1/1		SHEET 1 OF 1

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED



UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE IN INCHES.

TrafFix Devices Inc.
220 Calle Pintoresco
San Clemente, CA 92672
(949) 361-5663
FAX (949) 361-9205
www.traffixdevices.com

PHOENIX SIGN STAND ASSEMBLY WITH TELSPAR LIGHT AND SIGN

DRAWN BY:	DATE: 01-06-04	SIZE A		DWG NO. 90000 SERIES	REV -
CHECKED BY:	DATE:				