



September 15, 2000

Mr. Don Freeman
Continental Safety Supply Company, Inc.
790 Bloomfield Avenue
Clifton, New Jersey 07012

Refer to: HSA-1

Dear Mr. Freeman:

Thank you for your letter of June 28 requesting Federal Highway Administration (FHWA) acceptance of your company's Soft Sandwich® as a crashworthy traffic control devices for use in work zones and elsewhere on the National Highway System (NHS). Accompanying your letter was a report from the U.S. Army Aberdeen Test Center, detailed descriptions and drawings of the device, and videos of the crash tests. You requested that we find the devices acceptable for use on the National Highway System under the provisions of NHS 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 were those lightweight devices which could be self-certified by the vendor, Category II devices were other lightweight devices which needed individual crash testing, Category III devices were barriers and other fixed or massive devices also needing crash testing, and Category IV devices were trailer mounted lighted signs, arrow panels, etc. 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.

The "Soft Sandwich® Crosswalk Safety System" consists of 890-mm (35-inch) high traffic cones which are placed over an 8 gage zinc plated wire construction, the "summer cone support." A rubber weight (7.25 kg (16 pounds)) is then placed on the base of each cone. A plastic "universal cone adapter" is placed on top of the cone that connects to two small horizontal pieces of PVC pipe with end caps. Mesh signs are draped over the PVC pipes and routed under the cone weights. Signs, flags, and other small traffic control devices can be mounted to the top of the "universal cone adapter" and are connected to the cone base with a security cable. For this series, the system was successfully tested in three modes: with no auxiliary devices, with plastic sign panels, and with flags. The plastic sign panels were 254 x 356 mm (10 x 14 inches). The orange flag was mounted on a 667 mm (26-inch) long wood staff. The fourth test with high intensity lights was not successful.

Testing

Full-scale automobile testing was conducted on your company's Soft Sandwich® Crosswalk Safety System. Two stand-alone examples of each device were tested in tandem, one head-on and the next placed 6 meters downstream turned at 90 degrees, as called for in our guidance memoranda. Both cones were fitted with the Soft Sandwich® system. In tests 2, 3, and 4, an auxiliary device as noted in the chart was used on each cone. The complete devices are shown in the enclosed product literature for reference.

The crash test is summarized in the table below:

Test Article	Test 1	Test 2	Test 3	Test 4
Cone with flag, sign or light	None	Plastic Sign	Flag	Strobe Light
Height to top of unit	1100mm	1327mm	1695mm	n/a
Test Article Mass (total)	12.7 kg	13 kg	13 kg	13.2 kg
Vehicle Inertial Mass	1190 kg*			
Impact Speed, Head-on	Approximately 101.9 km/hr			
Impact Speed, 90 Deg.	Approximately 100 km/hr			
Velocity Change	Not measured			
Vehicle crush	Minor dents	More dents	More dents	More dents
Occupant Compart. Intrusion	None	None	None	Penetration
Windshield Damage Head-on	No Contact	Cracking	Cracking	Hole through
Windshield Damage 90 Deg.	No Contact	Cracking	Cracking	Hole through

* The mass of the test vehicle exceeded the standard 820C vehicle mass, however because of the low mass of the test articles vehicle velocity change was not a concern.

Findings

Damage to the vehicle was limited to bumper and hood dents and cracks to the windshield until Test 4 where the strobe lights separated from the cone unit and impacted the windshield with such force that holes were made through the glass. In Tests 1, 2, and 3 the test articles did not show potential for penetrating the occupant compartment. Except for Test 4, the results of this testing met the FHWA requirements and, therefore, the Soft Sandwich® Crosswalk Safety System with or without the sign panel or flags, as noted in Tests 1, 2, and 3 above, are acceptable for use as Test Level 3 devices on the NHS under the range of conditions tested, when proposed by a State.

Please note the following standard provisions which apply to 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 (MUTCD).

- ! 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, designated as number WZ-53, shall not be reproduced except in full.
- ! Soft Sandwich® Crosswalk Safety Systems are patented products and 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 for use on Federal-aid projects, except exempt, non-NHS 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.

Sincerely yours,



Frederick G. Wright, Jr.
Program Manager, Safety

SOFT SANDWICH® CROSSWALK SAFETY SYSTEM

COMPLETE WITH ABC'S SECURITY SYSTEM

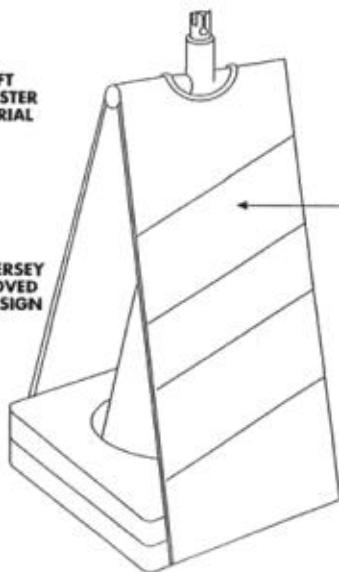


NEW YORK APPROVED PANEL SIGN



SOFT POLYESTER MATERIAL

NEW JERSEY APPROVED PANEL SIGN



REFLECTIVE STRIPES

NOTE: NCHRP Report 350 crash tested with one cone weight. Wire frame "summer cone support" in the test articles not shown in drawings.

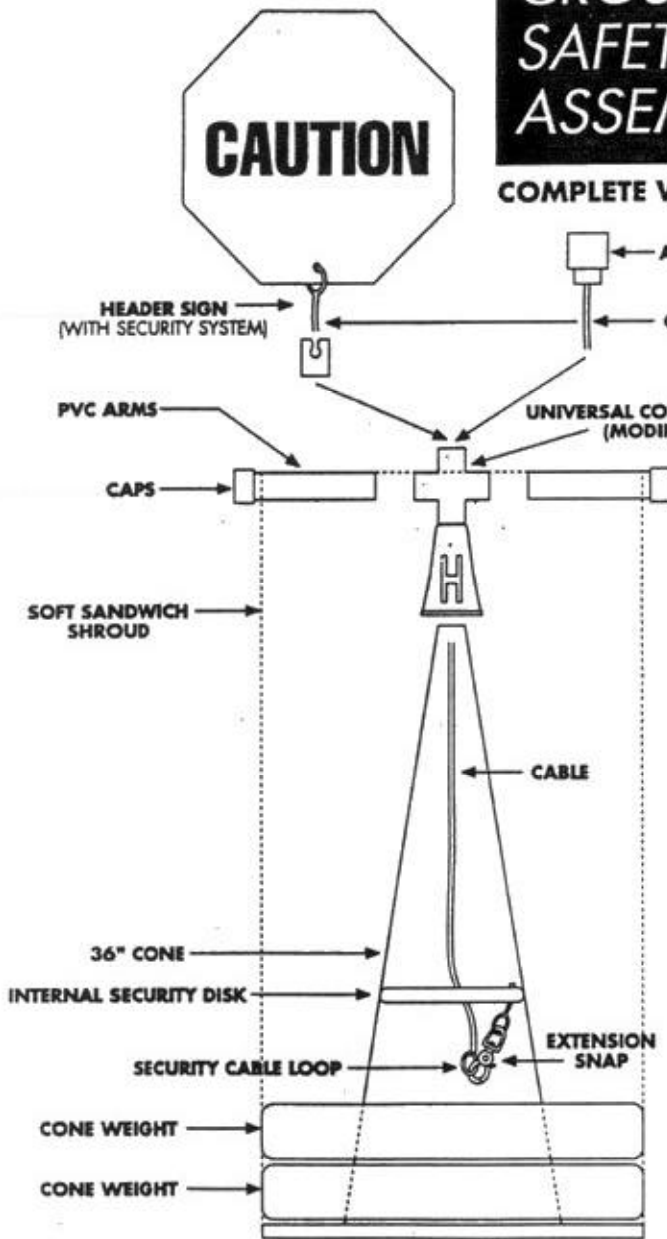
CONTINENTAL SAFETY SUPPLY CO., INC. • 790 BLOOMFIELD AVENUE, CLIFTON, NJ 07012

US Patents 5,109,271; 5,755,174 and other patents pending.

PHONE 973.778.9605

SOFT SANDWICH[®] CROSSWALK SAFETY SYSTEM ASSEMBLY

COMPLETE WITH ABC'S SECURITY SYSTEM



**PLEASE READ DIRECTIONS CAREFULLY
BEFORE ASSEMBLY**

- 1) INSTALL MODIFIED UNIVERSAL CONE ADAPTER INSIDE SHROUD.
- 2) INSERT PVC ARMS THROUGH SHROUD SLEEVES INTO ADAPTER, INSTALL CAPS ON ENDS (IF NOT ALREADY INSTALLED).

SECURITY SYSTEM WITH OR WITHOUT ACCESSORIES (SIGNS, LIGHTS, FLAGS ETC.) SHOULD BE INSTALLED AT THIS TIME.

- 3) INSTALL CABLE FROM ACCESSORIES THROUGH TOP OF ADAPTER.
- 4) PLACE WEIGHTS INTO BOTTOM OF SHROUD.
- 5) HOIST ASSEMBLY ABOVE CONE, INSERTING SECURITY CABLE INTO CONE AND SET INTO PLACE.
- 6) LOWER ENTIRE ASSEMBLY ONTO CONE.
- 7) TURN ASSEMBLY ON SIDE AND PULL CABLE THROUGH INTERNAL SECURITY DISK, CONNECT EXTENSION SNAP INTO SECURITY CABLE LOOP.

- 8) TURN RIGHT SIDE UP AND IT IS READY FOR USE

NOTE: NCHRP Report 350 crash tested with one cone weight. Wire frame "summer cone support" in the test articles not shown in drawings.

[Code of Federal Regulations]
[Title 23, Volume 1]
[Revised as of April 1, 1998]
From the U.S. Government Printing Office via GPO Access
[CITE: 23CFR635.411]

[Page 198-199]

TITLE 23--HIGHWAYS

CHAPTER I--FEDERAL HIGHWAY ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

PART 635--CONSTRUCTION AND MAINTENANCE--Table of Contents

Subpart D--General Material Requirements

Sec. 635.411 Material or product selection.

(a) Federal funds shall not participate, directly or indirectly, in payment for any premium or royalty on 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.