

Refer to: HSA-10/WZ-167

Mr. Bill Fisher  
Ply-Glo Safety Devices  
RR # 2  
Crossfield AB T0M 0S0 CANADA

Dear Mr. Fisher:

Thank you for your letter, received on December 17, 2003, requesting Federal Highway Administration (FHWA) acceptance of your company's illuminated road tubes as crashworthy traffic control devices for use in work zones on the National Highway System (NHS). Accompanying your letter were reports of informal crash testing you had conducted, dimensioned drawings of the devices, and a DVD containing 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 Ply-Glo Illuminated Safety Device is a low-density polyethylene road tube delineator mounted on a detachable rubber base. A light source is mounted in the base such that the light shining up through the tube illuminates it from within increasing nighttime visibility.

## **Testing**

Roadtubes are nominally considered Category 1 devices by the FHWA, meaning they do not have to be individually tested. The addition of the lighting device to this product had the potential to significantly affect the crash performance, and resulted in the device requiring at least informal crash testing as a Category 2 device. Because the trajectory of the tube with its lighting device installed was our principal concern, informal vehicle testing was conducted on your company's device. Stand-alone examples of the devices were tested in numerous impacts, at various speeds, and with and without the lighting hardware. In every case the tube separated from the base. In those tests with the lighting device, no part of the device appeared to approach the windshield.

This crash-testing program used a van of a mass larger than the standard 820C test vehicle. There are significant constraints involved in using such a non-standard test vehicle, some of which are:

1. The potential vehicle velocity change must be considered insignificant.
2. The crush characteristics of an automobile bumper must not be expected to have a significant affect on the trajectory of the test article.
3. No part of the test article may have a trajectory that could propel it over the hood and into the windshield area of an 820C vehicle after impact.

In this case, testing of the Ply-Glo traffic safety marker device with the van was done within these constraints.

## **Findings**

No part of the delineator or lighting device was projected up into the air or otherwise jeopardize the occupant compartment of the test vehicle. The results of the informal testing met FHWA requirements and, therefore, the devices described 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 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.
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- 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-167 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 Ply-Glo Illuminated Safety Device 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. Patent issues are to be resolved by the applicant and the patent owner.

Sincerely yours,

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

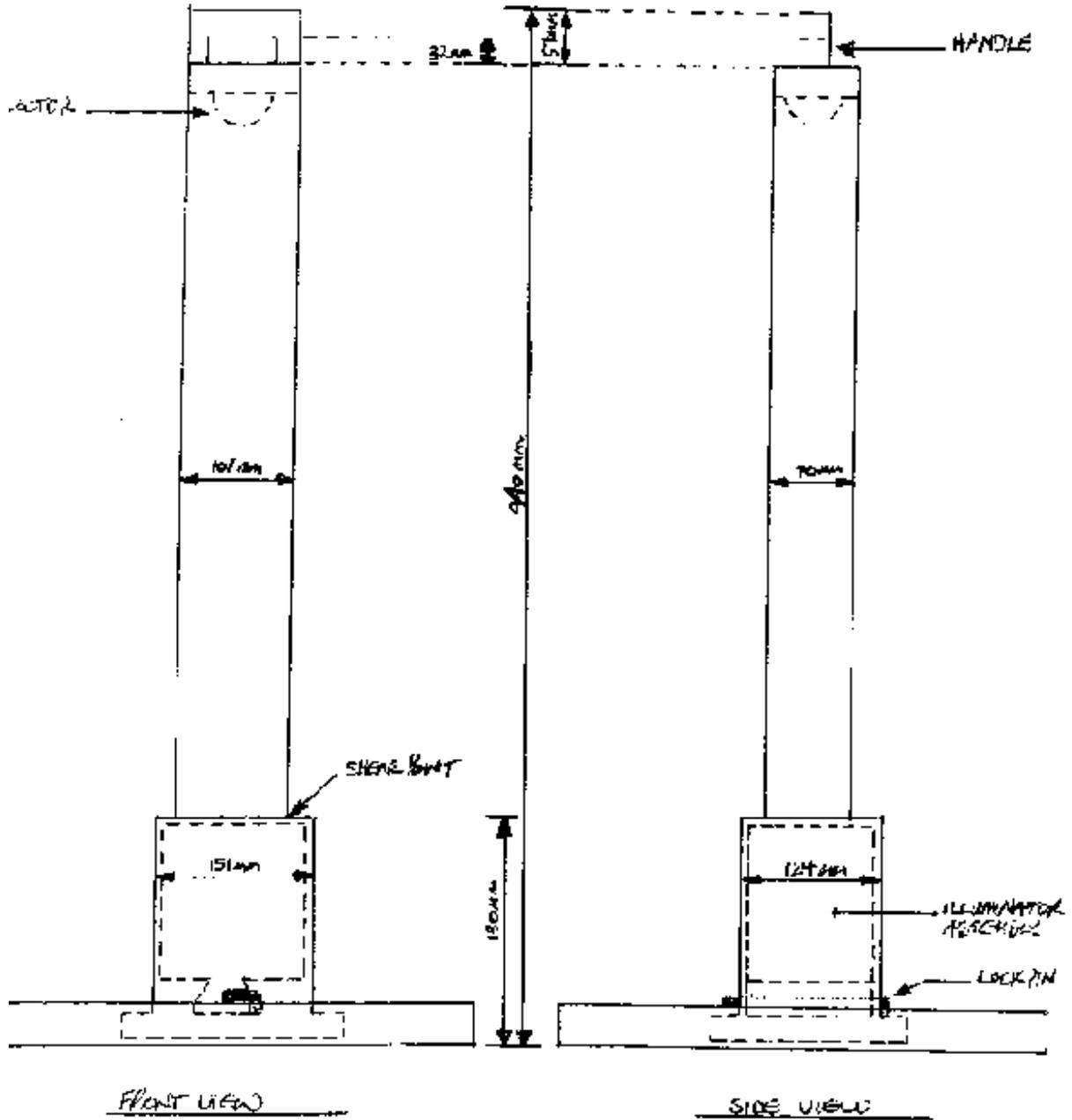
Enclosures

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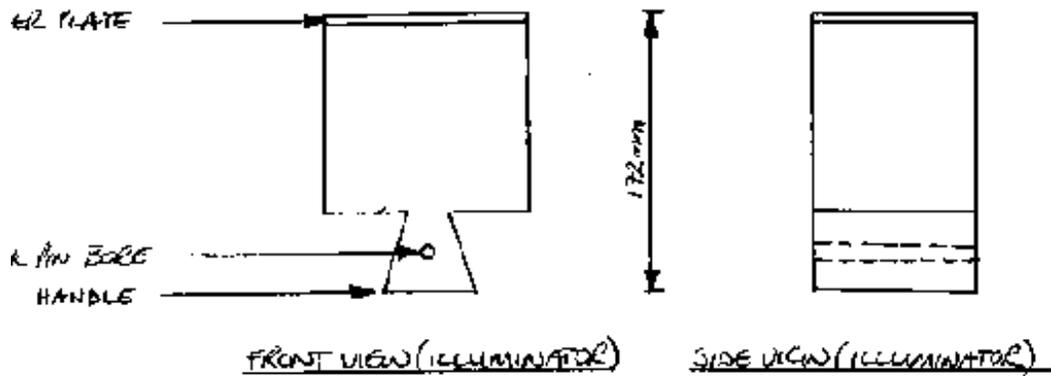
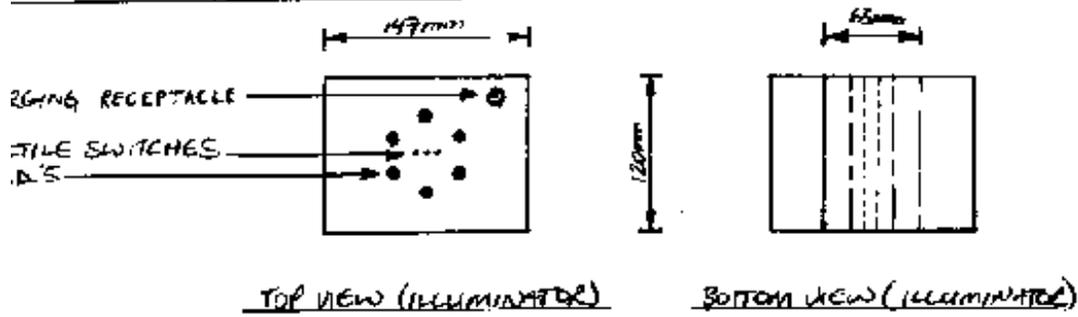
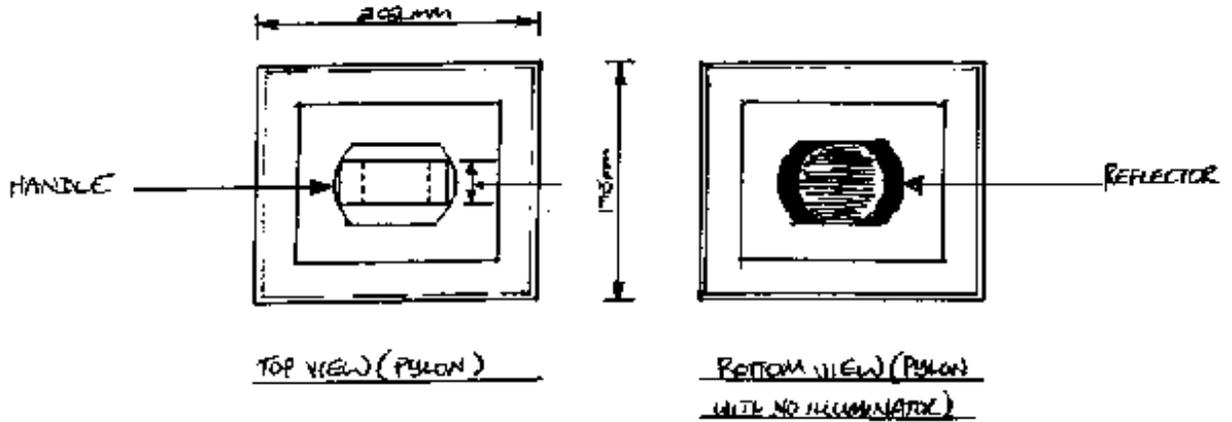
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cc: HSA-10 (Reader, HSA-1; Chron File, HSA-10;  
 N. Artimovich, HSA-10)

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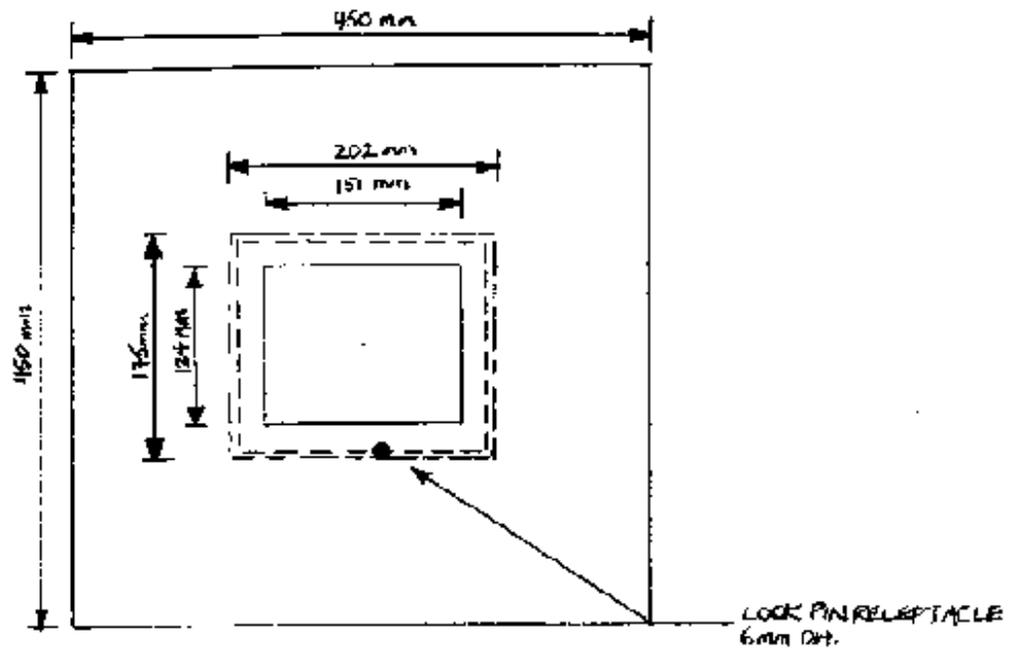


Py-Glo SAFETY DEVICES INC.  
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 TOP, BOTTOM AND SIDE VIEWS

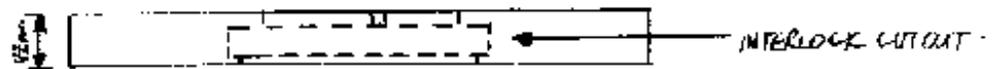


Py-GLO SAFETY DEVICES INC.  
RUBBER BALLAST MATT  
TOP AND FRONT VIEWS

TOP VIEW



FRONT VIEW



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.