



U.S. Department
of Transportation
Federal Highway

Administration

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

Refer to: HSA-10/WZ-98

MR. MOON K. HONG
MANAGING DIRECTOR
KONG YOUNG LAMPS & SAFETY COMPANY, LTD.
C-3504 DONG II TECHNOTOWN
889-1 KWAN YANG DONG
DONG AN KU, AN YANG SI, KYUNG GI DO
431-060 KOREA

Dear Mr. Hong:

Thank you for your letter of August 17 requesting Federal Highway Administration (FHWA) acceptance of your company's Auto L.E.D. Warning Beacon for Barricade Use as a crashworthy traffic control device for use in work zones on the National Highway System (NHS). Accompanying your letter was a report of crash testing conducted by E-Tech Testing Services and a video of the tests. You requested that we find this device 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 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.

A brief description of the device follows:

The Auto L.E.D. is a 360 degree warning light beacon powered by two 1.5-volt D-cell (3V total) batteries. It weighs approximately 1 kg complete with batteries. Product specifications are enclosed for reference. For purposes of testing the Auto L.E.D. was mounted to the Bent Type II Plywood Panel Barricade also illustrated in the enclosures. The "worst case" 914 mm wide barricade test article assembly was specified for testing. This barricade had previously been successfully tested to NCHRP Report 350 and found acceptable by the FHWA (Acceptance Letter

WZ-6 dated November 23, 1998). The design of this barricade was also released as a generic design by FHWA in our Acceptance Letter WZ-54 on September 15, 2000. The test article mass, including the warning light, is 11.8 kg.

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. The complete device as tested is shown in Enclosure 1. The crash test is summarized in the table below:

Test Number	36-0620-1
Test Article	Auto LED Warning Beacon on Bent Type II Plywood Panel Barricade
Height to Top of Top Panel	930 mm
Height to Top of Leg	1035 mm
Height to Top of Light	1150 mm
Flags or lights	One light on each barricade
Test Article Mass (each)	11.8 kg (no ballast used)
Vehicle Inertial Mass	813 kg
Impact Speed, Head-on	102.5 kmh
Impact Speed, 90 degree	100.4 kmh
Velocity Change, Head-on	0.58 m/s
Velocity Change, 90 degree	0.58 m/s
Vehicle crush	Slight damage to bumper, hood, and grill.
Occupant Compart. Intrusion	None. No windshield contact by barricade or light
Windshield Damage	None. No contact

Findings

In the head-on impact the light remained intact and connected to the barricade. In the 90 degree impact the light was hit by the first barricade and came apart. No part of the light or batteries impacted the windshield. Damage was limited to dents in the bumper, hood, and grille. No part of either barricade or light impacted the windshield.

The results of the testing met the FHWA requirements and, therefore, the devices described above and shown in the enclosed drawings for reference are acceptable for use on the NHS under the range of conditions tested, when proposed by a state. All warning lights, including the Auto L.E.D. Warning Beacon for Barricade Use, must be securely attached to the barricade with standard fasteners including the vandal-resistant cupped washer or equivalent.

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.
- 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-98 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 Auto L.E.D. warning light is patented it would be 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

Enclosure

FHWA:HSA-10:NArtimovich:tm:x61331:11/14/01

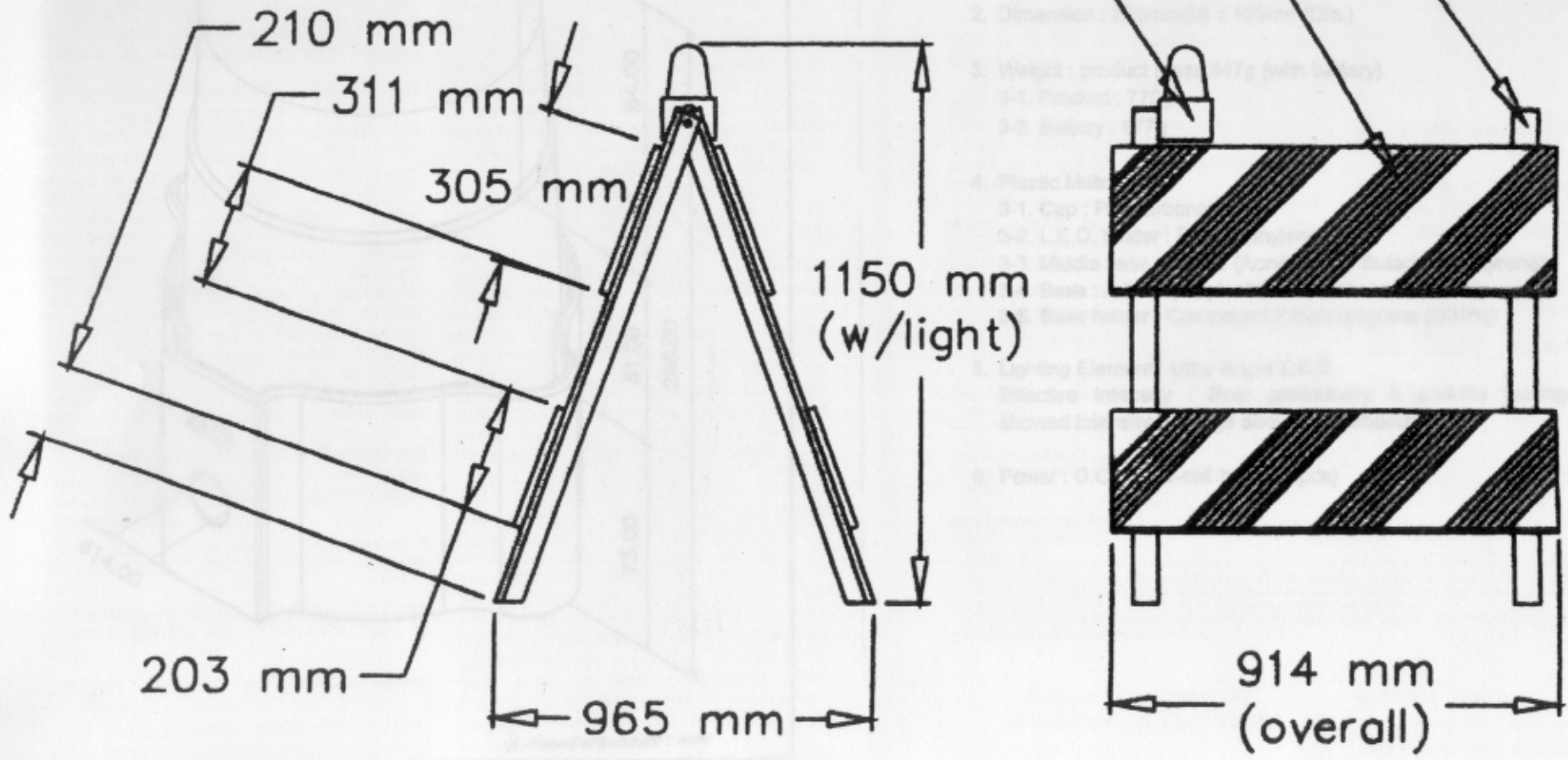
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cc: HSA-10 (Reader, HSA-1; Chron File, HSA-10;
N. Artimovich, HSA-10)

12 gauge galv. steel leg (typ)

13 mm thick plywood panel (typ)

Kong Young Lamps
Auto L.E.D.
Warning Beacon



210 mm

311 mm

305 mm

1150 mm
(w/light)

203 mm

965 mm

914 mm
(overall)



Kong Young Lamps & Safety Co., Ltd.

C-3504 Dong Il Technotown, 889-1 Kwan Yang Dong, Dong An Ku, An Yang Si

Kyung Gi Do, 431-060, Korea

Phone : +82-31-421-4121

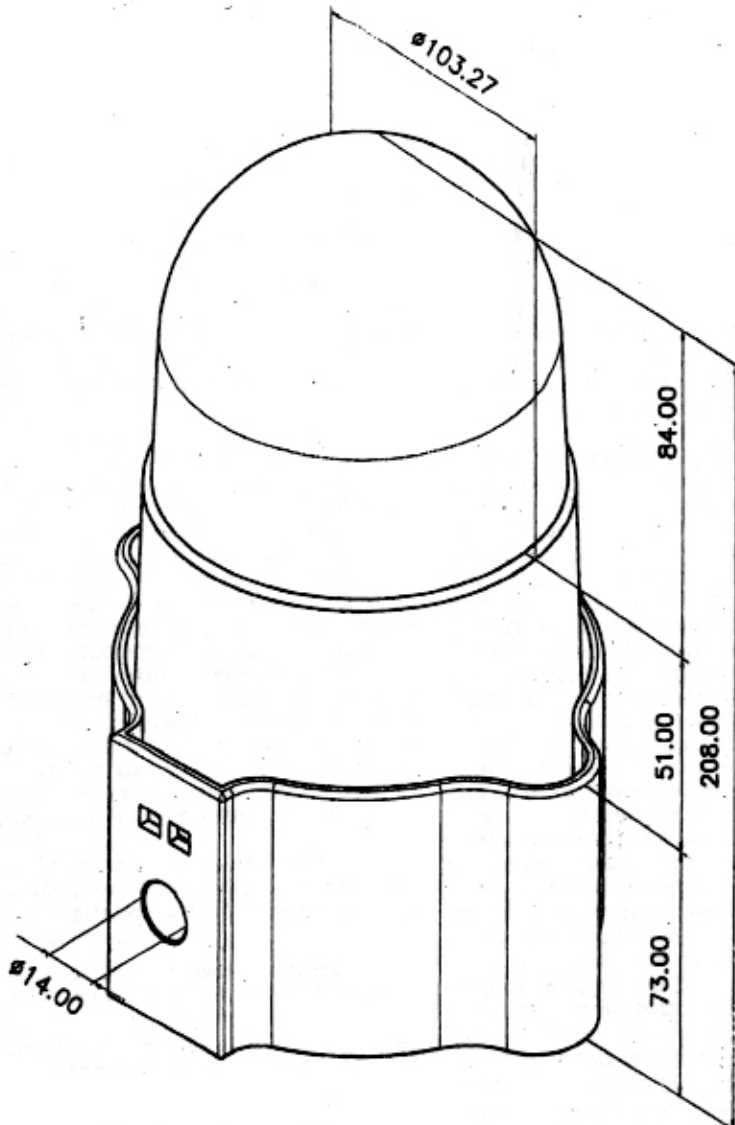
Fax : +82-31-421-4120

Web-page : <http://www.kongyoung.co.kr>

e-mail : kyt@kongyoung.co.kr

Specification

1. Item : Auto L.E.D. warning beacon for barricade
2. Dimension : 203mm(H) x 103mm(Dia.)
3. Weight : product mass 947g (with battery)
 - 3-1. Product : 770g
 - 3-2. Battery : 177g
4. Plastic Materials
 - 3-1. Cap : Polycarbonate
 - 3-2. L.E.D. holder : Polypropylene
 - 3-3. Middle base : A.B.S. (Acrylonitrile, Butadiene, Styrene)
 - 3-4. Base : A.B.S. (Acrylonitrile, Butadiene, Styrene)
 - 3-5. Base holder : Compound Polypropylene (G30%)
5. Lighting Element : Ultra Bright L.E.D.
Effective Intensity : Both preliminary & half-life testing(336hours) showed intensity readings above 4.0 candelas.
6. Power : D.C. 3V (D-cell battery 2pcs)



X measurement : mm

양	척	단	재	색	경	상	인	표	Auto L.E.D. warning beacon for barricade
3	/	mm							
기		재		KYN5-4KA		KYN5-002			

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.

ENCLOSURE 2