



U.S. Department  
of Transportation  
**Federal Highway**

**Administration**

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

Refer to: HSA-1\WZ-66

**MR. RON JONES**  
**UNITED RENTALS/STAR-LITE BARRICADE**  
**2401 SOUTH FIFTEENTH AVENUE**  
**PHOENIX, AZ 85007**

Dear Mr. Jones:

Thank you for your letter of November 10, 2000, and your E-mail message of June 18 requesting Federal Highway Administration (FHWA) acceptance of your company's Type II barricade as a crashworthy traffic control device for use in work zones on the National Highway System (NHS). We apologize for the delay in completing this action. Accompanying your letter was a report from E-Tech Testing Services and a video of the crash tests. You requested that we find your company's barricade 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 for which you are requesting acceptance follows:

The barricade is made up of 31 mm x 31 mm x 10 gage (1.25 in x 1.25 in x 10 ga) galvanized mild steel angle iron supports and rails and outfitted with 610 mm wide by 203 mm tall by 7.4 mm thick (24 in x 8 in x 0.3 in) polypropylene plastic top and bottom reflective panels. The panels are affixed to the rails using 6.35 mm x 15.875 mm (1/4 in x 5/8 in) ovalhead semi-tubular steel rivets. A WLI ToughLite 2000 warning light was attached to each test barricade using 12.7 mm diameter x 76.2 mm long (1/2 in diameter x 3 in long) bolt and cupped washer. Two blocks of wood resting on top of the top rails were used to suspend two 9 kg (20 pound) bags of dry sand ballast approximately 200 mm (8 in) above the pavement.

### 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 devices as tested are shown in the Enclosure 1.

The crash test is summarized in the table below:

Test Number	06-0506-001 NHCRP Test 3-71
Test Article	Type II Barricade
Height to Top of Top Panel	915 mm (36 in)
Flags or lights	ToughLite 2000 on each barricade
Test Article Mass (each)	12 kg (26 pounds)
Sand Ballast Added	18 kg (40 pounds)
Vehicle Inertial Mass	812 kg (1790 pounds)
Impact Speed, Head-on	101.8 km/hr (63.3 mph)
Impact Speed, 90 Deg.	97.7 km/hr (60.7 mph)
Velocity Change, Head-on**	1.14 m/s (3.74 fps)
Velocity Change, 90 deg.**	1.14 m/s (3.74 fps)
Vehicle crush	Minor dents to bumper, grille, & hood
Occupant Compartment Intrusion	None
Windshield Damage	No contact

### Findings

Damage was limited to minor dents and scrapes to the front of the vehicle, with no damage to the windshield. The velocity change was well within the acceptable limit. The results of test met the FHWA requirements and, therefore, the device described above and shown in the enclosed drawings for reference are acceptable for use as Test Level 3 devices on the NHS under the range of conditions tested, when proposed by a State. The sand ballast is optional but, when used, may be suspended no higher than that used in the test.

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-66 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.
- Your company's barricade may include patented components and if so 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 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

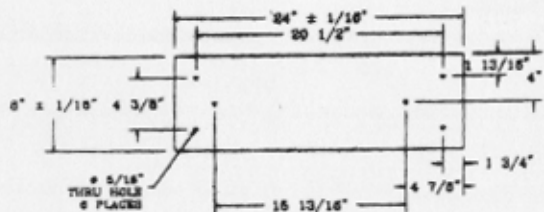
FHWA:HSA-10:NArtimovich:tm:x61331:07/03/01

File: StarLiteBarricadeFin-WZ66.wpd

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



# TYPE-II BARRICADE

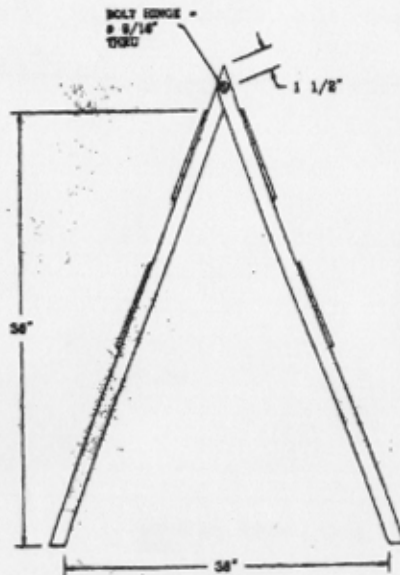
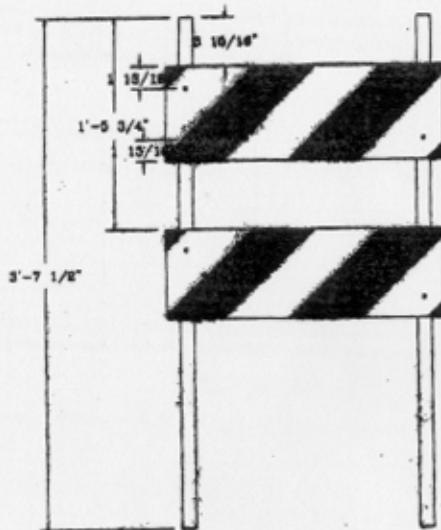


MATERIAL = .290" x 8" x 24"  
POLYPROPYLENE PLASTIC

REFLECTIVE STRIPED FACE  
PER MUTCD STANDARDS.

PANEL FASTNERS = 1/4" X 5/8" DVALHEAD  
SEMI-TUBULAR STEEL RIVITS.

BARRICADE LIGHT ATTACHED USING  
1/2" X 3 1/2" BOLT.



DRAWING # UR-1 DATE : 08/22/00

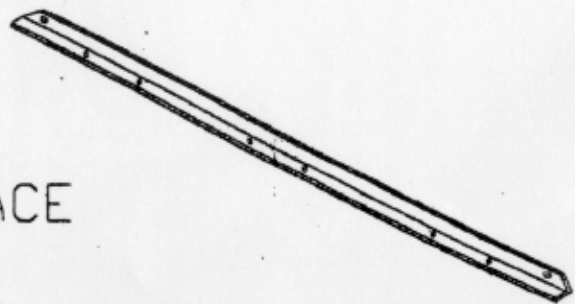
DRAWN BY : TOM WALSH REV: 08/29/00

DRAWING NOT TO SCALE

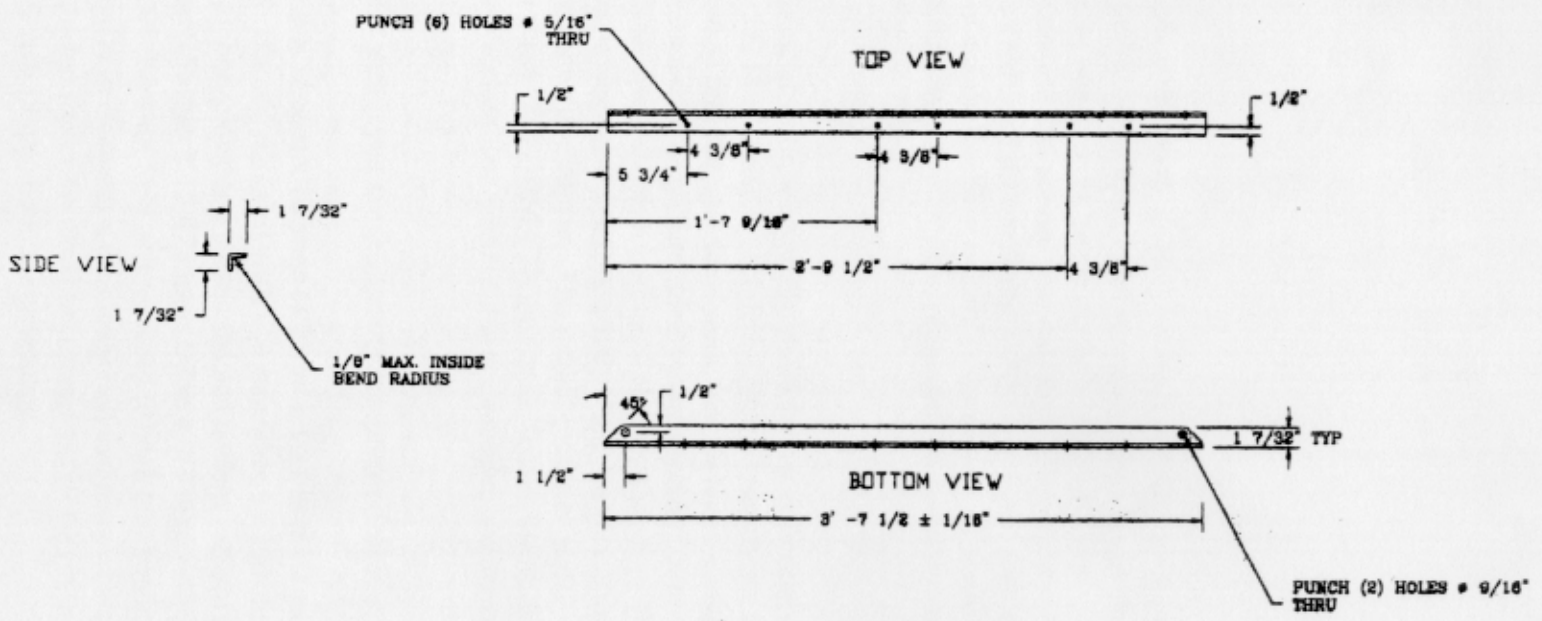


GENERAL NOTES :

- 1. USE 10 GA. (.138") GALVANIZED PER ASTM SPECS. A653
- 2. 1/32" TOLERANCE UNLESS OTHERWISE NOTED.



# ANGLE BRACE



DRAWING NOT TO SCALE

DRAWING # UR-2	DATE : 08/22/00
DRAWN BY : TOM WALSH	REV: 08/28/00

Illustration C-1. Type II Barricade - Drawings IR-1 and IR-2 (7 of 7)