



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

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

Refer to: HSA-10/WZ-88

**MR. RICHARD COLE
GENERAL MANAGER
BARRICADE LIGHT AND RENTAL
3015 EAST ILLINI STREET
PHOENIX, AZ 85040**

Dear Mr. Cole:

Thank you for your letters of May 14 and July 16 requesting Federal Highway Administration (FHWA) acceptance of your company's Vertical Panel 2000, with attached warning light, and your Type II Barricades as a crashworthy traffic control device for use in work zones on the National Highway System (NHS). Accompanying your May 14 letter was a report of crash testing conducted by E-Tech Testing Services along with a video of the test. You requested that we find these vertical panels and barricades 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 devices for which you are requesting acceptance follows:

The Barricade and Light Rental Model NES VP 2000 Vertical Panel construction is detailed in the enclosed drawings "*Barricade and Light Rental - NES VP 2000 Vertical Panel.*" The design features two 203 mm (8 inch) wide by 9 mm (0.35 inch) thick high density polyethylene plastic panels. The front panel is 610 mm (24 inches) tall and the back panel is 686 mm (27 inches) tall. The panels are sheeted with engineering grade retroreflective striping and supported by a 38 mm (1.5 inch) nominal size furniture grade Schedule 40 PVC plastic pipe (tube). The panels are attached to the tube with two 8 mm (5/16 inch) diameter by 83 mm (3 1/4 inch) long ASTM

A307 cadmium plated hex bolts, nylon lock nuts, and flat washers. The base of the tube is attached to a 368 mm (14.5 inch) wide by 445 mm (17.5 inch) long by 44 mm (1 3/4 inch) thick

7.27 kg (16 pound) rubber base. The bottom end of the tube is flared and held to the base with a plastic retaining ring which is fastened with two 8 mm (5/16 inch) diameter by 38 mm (1 1/2 inch) long ASTM A307 cadmium plated hex bolts, nylon lock nuts, and flat washers that pass through the base. The Vertical Panel was equipped with the C&C Signals warning light shown in Illustration C-2 (1 sht) "*C&C Signals Warning Light Product Information Sheet.*" The warning light was attached to the back panel using a warning light bolt with cup washer.

The Type II Barricade also uses 203 mm (8 inch) wide by 610 mm (24 inch) long by 9 mm (0.35 inch) thick high density polyethylene panels. The frame consists of four 10 gage steel 31.75 mm (1 1/4 inch) angle iron. The panels are fastened to the frame with 6.35 mm x 15.875 mm (1/4 inch x 5/8 inch) plated rivets, and the frame is fastened together with 12.7 mm x 19 mm (1/2 inch x 3/4 inch) bolts.

Testing

Full-scale automobile testing was conducted on your company's vertical panel. 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 crash test is summarized in the table below:

Test Number	29-4252-001
Test Article	NES VP 2000 Vertical Panel
Height to Top of Panel	965.2 mm (38 inches)
Flags or lights	C & C Signals Warning Light
Test Article Mass (each)	13.5 kg (29.76 pounds) with base and light
Vehicle Inertial Mass	774 kg (1706 pounds)
Impact Speed, Head-on	103.9 km/hr (64.6 mph)
Impact Speed, 90 Deg.	99.7 km/hr (62.0 mph)
Velocity Change, Head-on**	1.17 m/s (3.83 fps)
Velocity Change, 90 deg.**	1.17 m/s (3.83 fps)
Vehicle crush	None
Occupant Compart. Intrusion	None
Windshield Damage	Glancing blow head on, no contact at 90 degrees

Findings

Damage was limited to the bumper and hood, with no damage to the windshield, nor any potential for occupant compartment intrusion. The results of the testing met the FHWA requirements and, therefore, the vertical panel described above and shown in the enclosed drawings for reference

using the C&C Signal warning light is acceptable for use as a Test Level 3 device on the NHS under the range of conditions tested, when proposed by a State.

The Barricade Light and Rentals Type II barricade was not crash tested, but it is very similar to other tested barricades, notably the Generic Type II barricade which was the subject of our November 15 acceptance letter WZ-85. The only significant difference is that your steel barricade legs are 10 gage material which is somewhat thicker than the tested 12 gage barricade legs. However, as the tested barricade used plywood panels and your barricade uses plastic panel the overall weight of the barricade should not be very much different from the tested version. We expect that the performance would be similar as well. Therefore your company's Type II barricade will be acceptable for use on the NHS if requested 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.
- 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-88 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.
- Barricade Light and Rental devices 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,

Michael L. Halladay
Acting Program Manager, Safety

Enclosure

FHWA:HSA-10:NArtimovich:tm:x61331:12/19/01

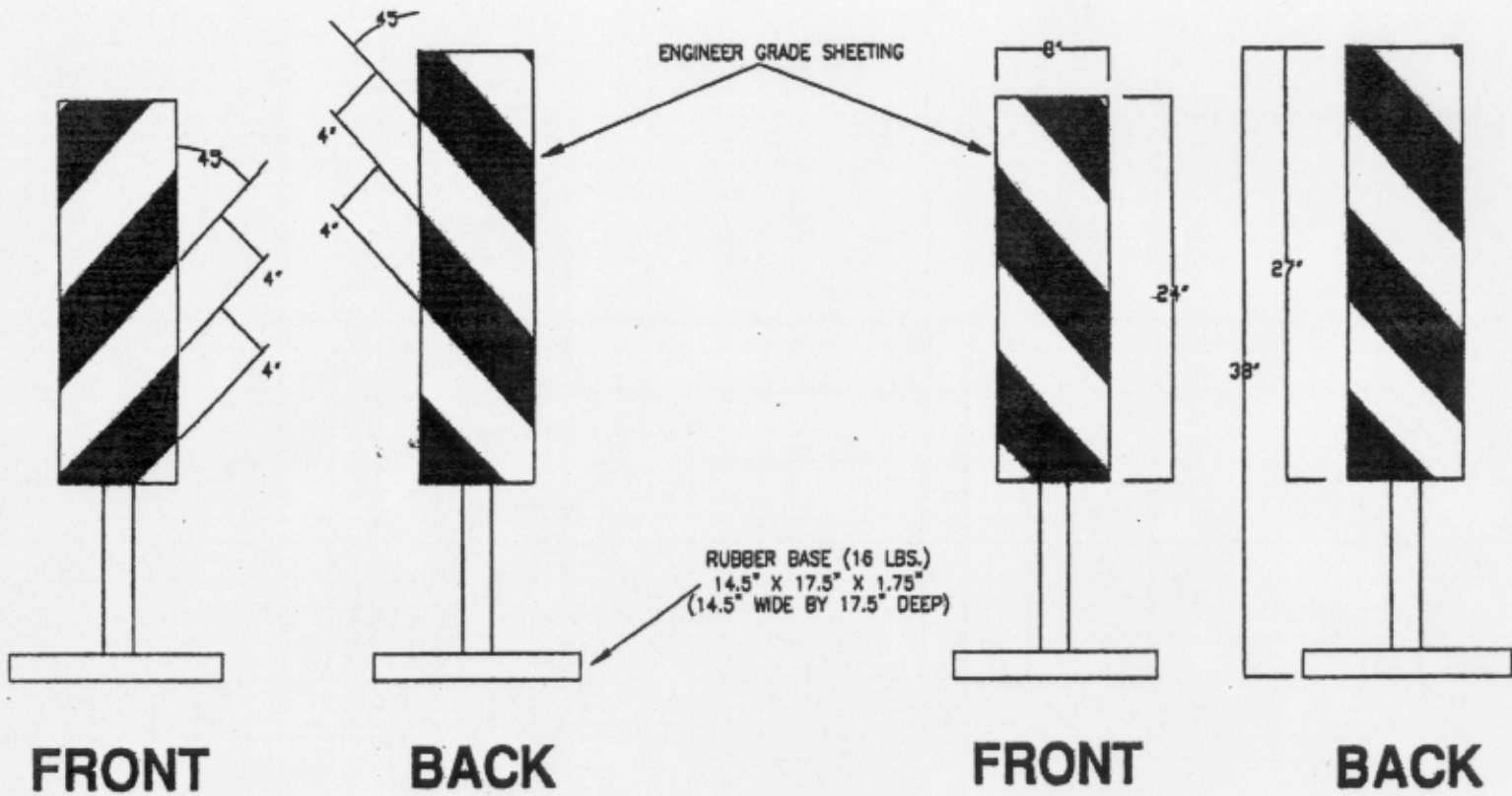
File: WZ88-ColeSept.wpd

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



SIDE VERTICAL

CENTER VERTICAL



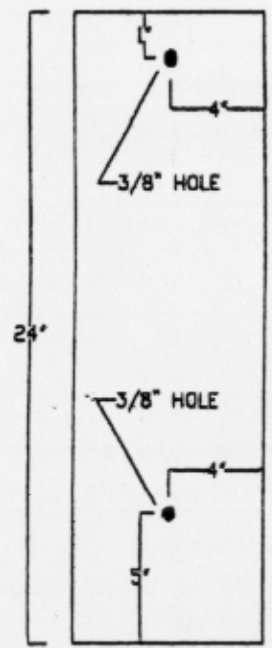
	DESIGNED BY PATRICK LYNCH	
	DATE: 01-20-07	VERSION: 11-07-06
	NES VERTICAL PANEL 2000	
	SCALE: AS SHOWN	REVISED:

Illustration C-1. Barricade and Light Rental - NES VP 2000 Vertical Panel (2 of 4)

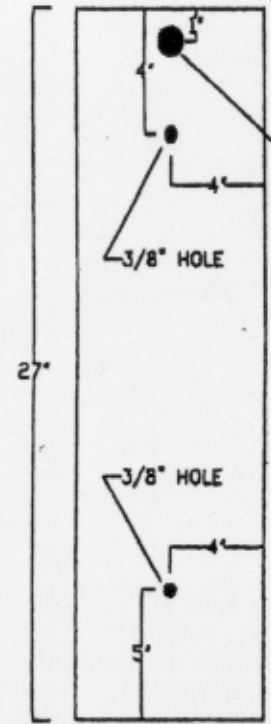


E-TECH Testing Services, Inc.

PLASTIC PANEL



FRONT



BACK

.350 HI DENSITY POLYETHYIENE



DRAWN BY PERWICK LYNCH	
DATE 08 08 07	ISSUED 08 07 08
NES VERTICAL PANEL 2000	
DETAIL - PANEL	
SCALE AS SHOWN	SEE 1471

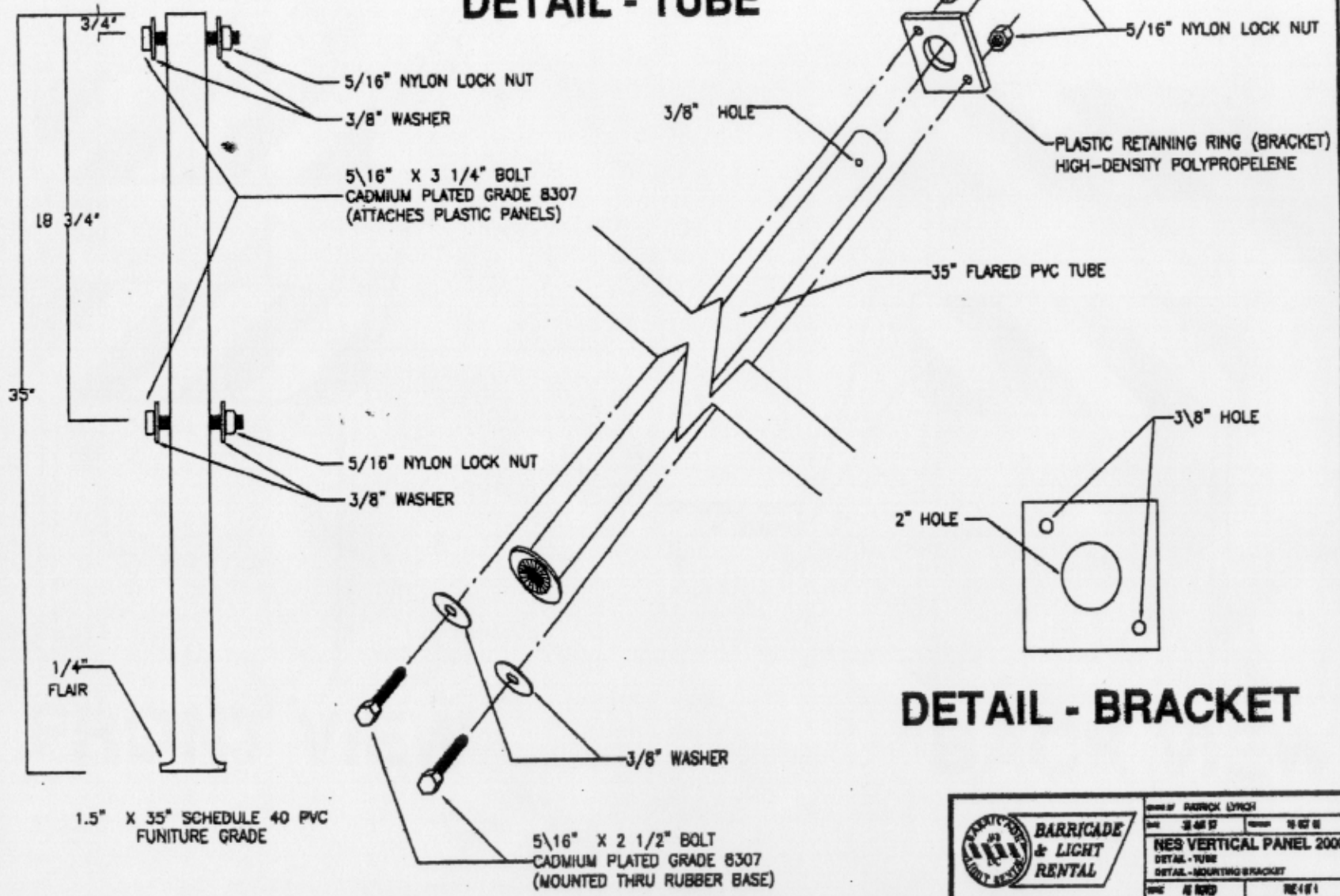
Illustration C-1. Barricade and Light Rental - NES VP 2000 Vertical Panel (3 of 4)

Appendix



E-TECH Testing Services, Inc

DETAIL - TUBE



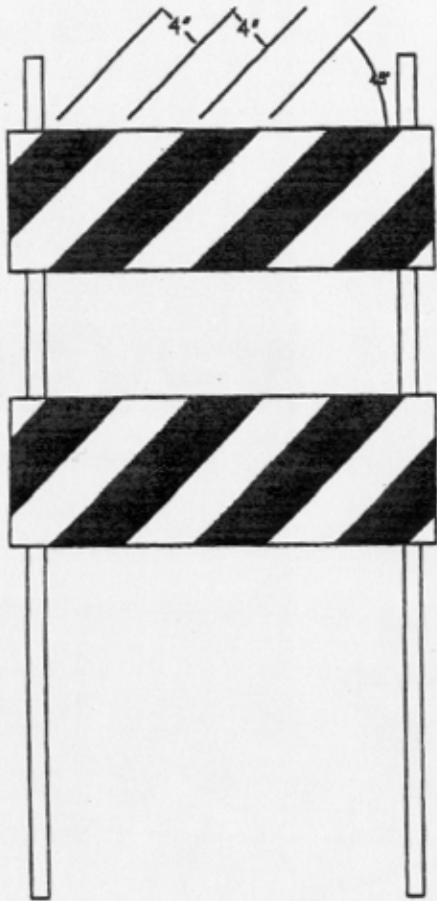
DETAIL - BRACKET



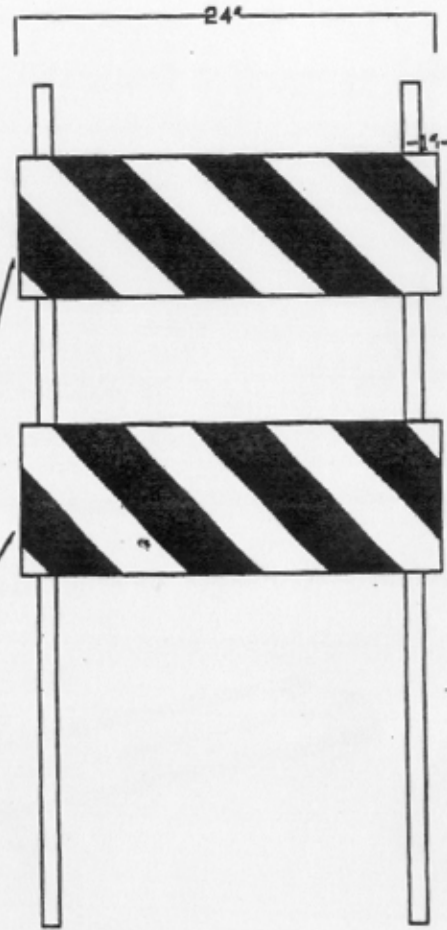
DRAWN BY: DARRICK LYNN	
DATE: 08-08-07	REVISION: 08-02-08
NES VERTICAL PANEL 2000	
DETAIL - TUBE	
DETAIL - MOUNTING BRACKET	
DWG NO: 48-000	REV: 1

Illustration C-1. Barricade and Light Rental - NES VP 2000 Vertical Panel (4 of 4)

ENCAPSULATED LENS REFLECTIVE SHEETING




FRONT VIEW

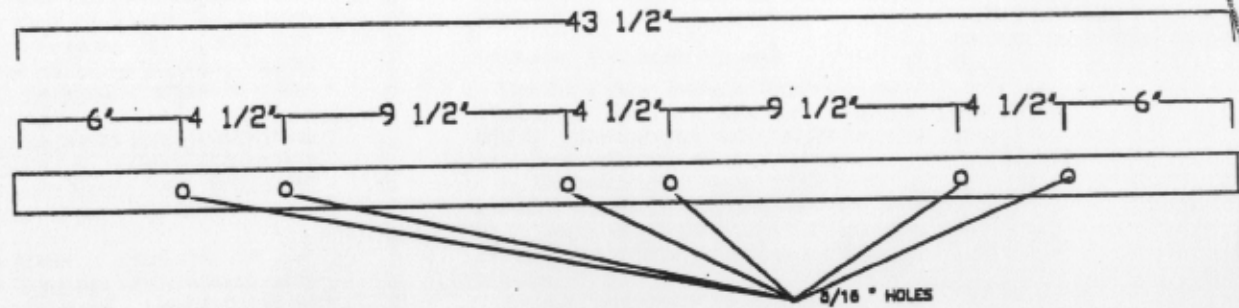


BACK VIEW

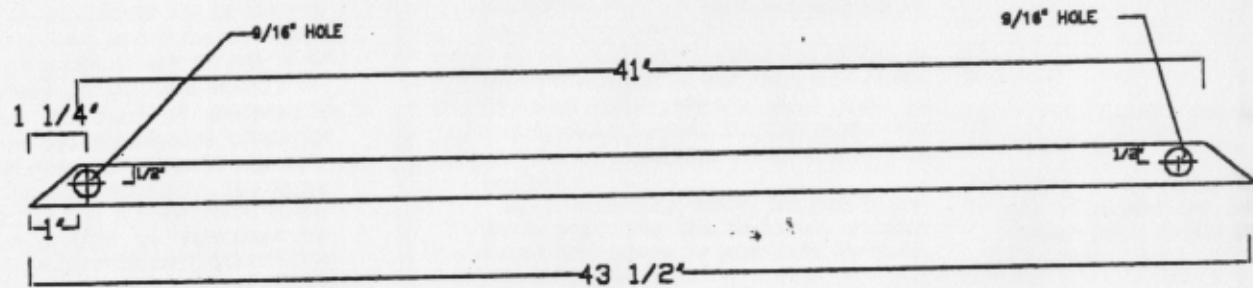
ORANGE/ WHITE
4" STRIPES

	DRAWN BY PATRICK LYNCH	
	DATE 26 APR 07	ISSUED 17 MAY 07
TYPE II BARRICADE		
SCALE AS NOTED	PAGE 1 OF 1	

FRONT VIEW



SIDE VIEW



10 GAUGE GALVANIZED

1/2" X 3/4" BOLT
1/2" NUT

1/4" X 5/8" PLATED RIVET



**BARRICADE
& LIGHT
RENTAL**

DRAWN BY PATRICK SYNCH	
DATE 8-28-71	SCALE 1/2" = 1'
TYPE II BARRICADE	
DETAIL - LEG	
DATE REVISION	BY

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