



September 8, 2000

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Refer to: HSA-1

Mr. Larry Leahy  
Xcessories Squared  
P.O. Box 135  
Auburn, Illinois 62615

Dear Mr. Leahy:

Thank you for your May 5, 2000 letter requesting Federal Highway Administration (FHWA) acceptance of your company's perforated square steel tubes (PSST) as components of crashworthy Type III barricades for use in work zones on the National Highway System (NHS). Type III barricades framed with PSST have been successfully tested using a number of different base connections. Your letter, plus an earlier letter dated March 27, 2000 requested acceptance of your company's base design which use PSST skids and a shear bolt connector to support the upright elements. You requested that we find that base connection 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.

### **Testing**

Type III barricades with frames of PSST have been tested in a number of studies. The table below lists the FHWA letters of acceptance which include these barricades:

FHWA WZ-3 8-28-98	TTI for Texas D.O.T.	TTI tested numerous work zone traffic control devices. All the devices listed here were successfully tested in these two crash test programs and met <b>TL-3</b> criteria. The crash testing is fully documented in the two reports <sup>1,2</sup> which should be consulted for additional details of the hardware.
		Perforated Steel Tube Type III Barricade with Plastic Panels. Base connection uses splice plates. (see Figure 11.5 "Figure 41" & "Figure 45")
		Perforated Steel Tube Type III Barricade with 1x8 Wood Panels. Base connection uses splice plates. (see Figure 11.6 "Figure 42")
		Type III Perforated Tubing Barricade (3.7 m) Similar to barricades above except for welded base connection. (see Figure II.10 "Figure 2.") (Vertical braces added Acceptable with 1x8 wood or hollow core plastic rails.)
		Type III perforated Tubing Barricade (1.2 m) Welded Base Connection. (see Figure II.11 "Figure 3.") Acceptable with 1x8 wood or hollow core plastic rails.
WZ-40 6-6-2000	FHWA / TTI	Pooled-Fund Study Devices: Perf.Square Tube Type III with sign,
WZ-44 7-25-2000	Penn Dot	Type III Barricade / Sign Support. Perforated square tube frame, 4 ft. plastic rails, plywood sign, warning light.

Your requests were that the PSST Type III barricade could be fabricated using any of the following base connection details:

- ! PSST stub welded to the horizontal rails (or "skids"), also of PSST
- ! Using the rectangular splice plate and shear bolt arrangement used in the TTI tests described in WZ-3,
- ! Using the Xcessories Squared TBB-3 Trapezoidal Connector, shown in the enclosed drawings (overall height of the TBB-3 is 5 ½ inches). An important feature of this connector is the use of two locking bubbles that fit in the holes of the PSST. This connection releases when the barricade is struck allowing the barricade to fall flat. It also permits easy moving and storage of the barricade when the bolts are loosened in the TBB-3 and the barricade can lay flat.

### **Findings**

The results of the crash testing of the various PSST Type III barricades met the FHWA requirements. We concur that the base connections listed above will result in acceptable performance when used on any of the crash-tested PSST Type III barricades, therefore, they 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-51, shall not be reproduced except in full.
- ! Some of the barricade components may be 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.

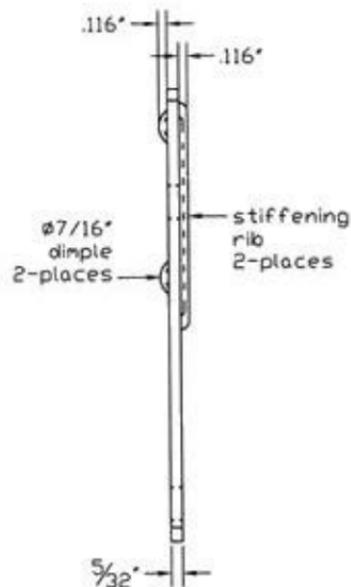
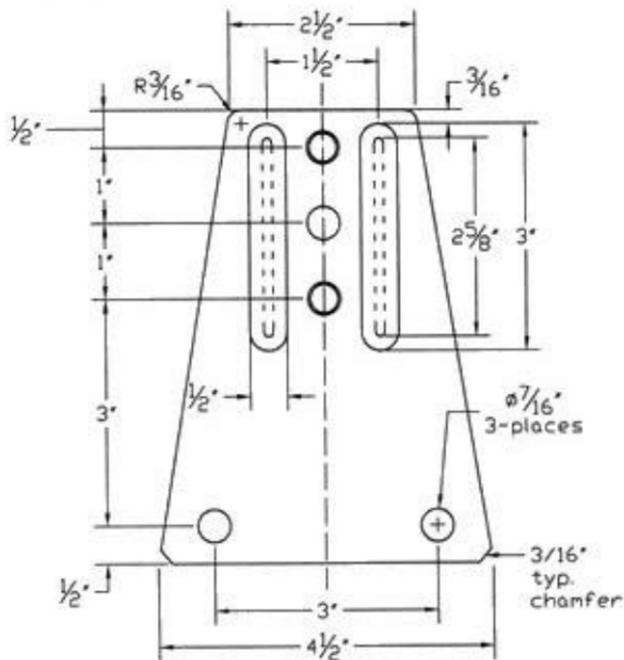
Sincerely yours,



Frederick G. Wright, Jr.  
Program Manager, Safety

\*Do not scale drawing-work to dimensions  
 \*All tolerances +/- .0005" unless otherwise noted  
 \*Break all unmarked corners 1/32"

Xcessories Squared Dev. & Mfg.  
 Auburn, IL 62615  
 tel: 217-438-3535  
 fax: 217-438-3917



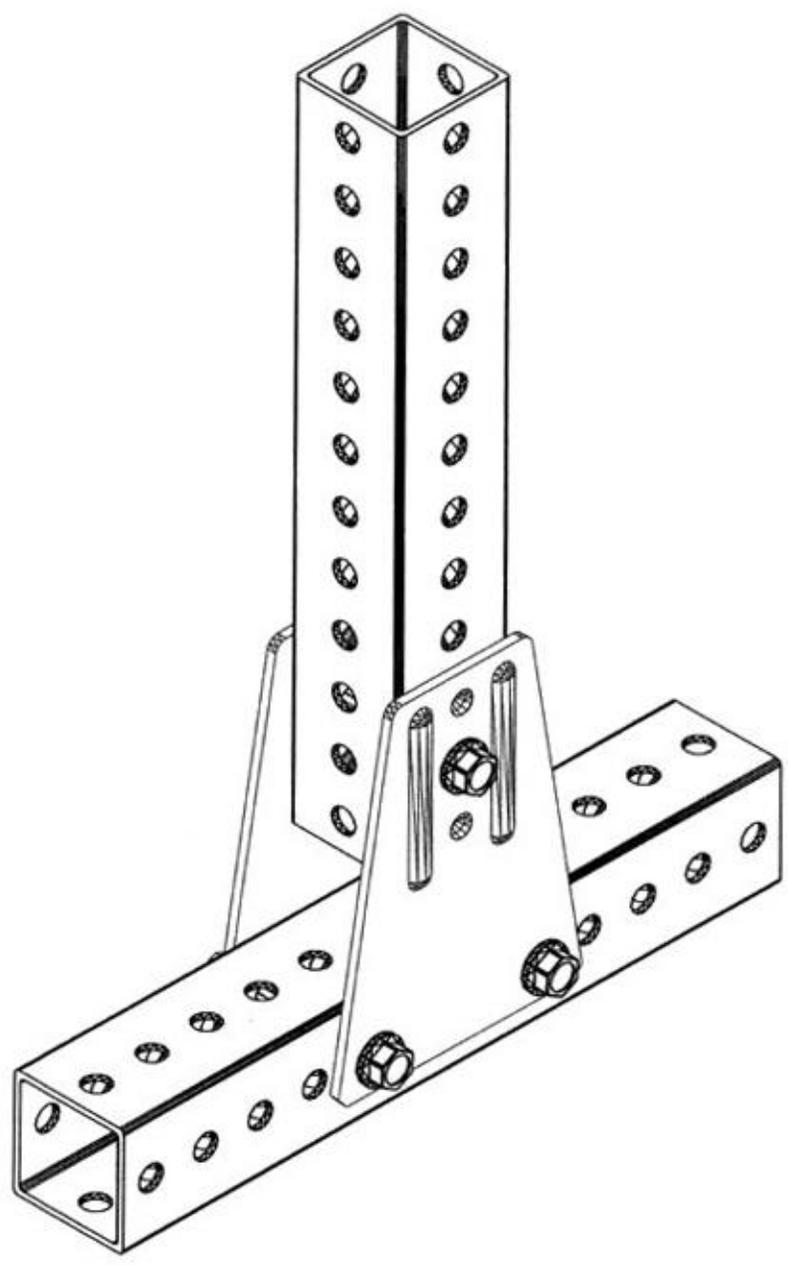
DRAWINGS	DATE
X26991	6-13-99

PART#	DRAWN BY	WEIGHT
TBB-3E	MEL	0.91 lbs.
MATERIALS	FINISH	
8 ga. (.168") H.R.P.&D.	Zinc Plate	

working-work to dimensions  
tolerances +/- 0.005" unless otherwise noted

### ASSEMBLY SHEET 2

MUDWORTH, IL. 62450  
tel: 217-438-3535  
fax: 217-438-3917



NAME TBB-3E	MATERIALS Triangular Barricade / Temporary Sign Support Bracket for Workzone Areas	DATE 9-29-99
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