

Refer to: HSA-10/WZ-125

Mr. Grant Dicke  
Dicke Tool Company  
1201 Warren Avenue  
P.O. Box 518  
Downers Grove, Illinois 60515

Dear Mr. Dicke:

Thank you for your letter of March 29, 2002, and facsimile message of November 21, 2002, requesting Federal Highway Administration (FHWA) acceptance of your company's portable sign stands as crashworthy traffic control devices for use in work zones on the National Highway System (NHS). Accompanying your letter was a report of crash testing conducted by the Midwest Roadside Safety Facility. 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." Most of the sign support systems that were tested in this phase were reviewed previously and are the subject of our November 21, 2001, letter to you, designated WZ-99. This present letter of acceptance, WZ-125, will only deal with the one remaining sign stand that was tested with successful results.

### **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 follows:

Systems 58 and 59, Test No. D-30 DF-4000 Stand - A heavy duty, double torsion spring mounted portable sign support with a 1219 x 1219 mm vinyl sign mounted at a height of 305 mm from the ground and with three wood-staffed flags at a height of 2299 mm. This stand supported a RUNR48 reflective vinyl roll up sign. Tested at both 90 degrees and head-on.

### **Testing**

Full-scale automobile testing was conducted on your company's devices. Two stand-alone examples of the device were tested in tandem, one oriented at 90-degrees (i.e., turned away from oncoming traffic) and the next placed six meters downstream head-on, 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	D-30
Test Article	DF-4000 sign stand with RUNR48 vinyl roll up sign
Height to Bottom of Sign	305 mm
Height to Top of Sign	2013 mm
Flags or lights	3 flags on wood dowels, 2927 mm to top of flags
Test Article Mass (each)	19.05 kg
Vehicle Inertial Mass	812 kg
Impact Speed, Head-on	103.6 km/hr
Impact Speed, 90 Deg.	100.7 km/hr
Velocity Change, Head-on	0.81 m/s
Velocity Change, 90 deg.	Not recorded
Vehicle crush	Dents on hood and rear of roof
Occupant Compart. Intrusion	None
Windshield Damage	Minor "spider web" cracking plus single crack from top to bottom near center of windshield.

### Findings

Damage was limited to dents, and minor windshield cracking. 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.

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.
- 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-125 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 Dicke Tool Company signs 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,

Carol H. Jacoby, P.E.  
Director, Office of Safety Design

Enclosure

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.

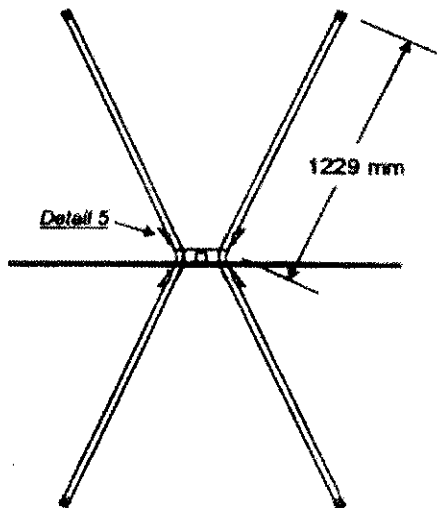
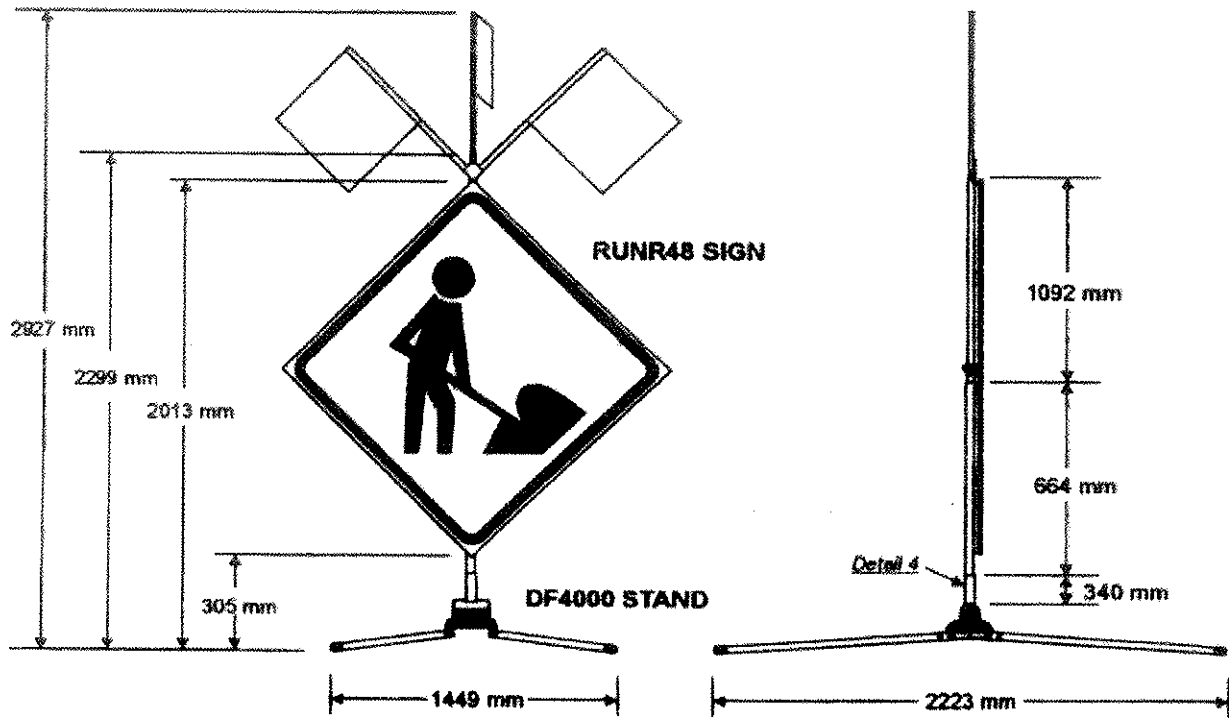
(b) When there is available for purchase more than one nonpatented, nonproprietary material, semifinished or finished article or product that will fulfill the requirements for an item of work of a project and these available materials or products are judged to be of satisfactory quality and equally acceptable 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



**DF4000 STAND**

- Base- Steel with heavy duty dual torsion spring system
- Mast- 2 stage telescoping, 38.27 and 31.76 mm sq. aluminum tubing with 2.82 mm and 2.80 mm wall thickness, respectively
- Legs- 31.93 mm sq. x 2.87 mm wall x 1229 mm long aluminum legs

**RUNR48 SIGN**

- Panel- Non-reflective vinyl, 1219 mm x 1219 mm
- Crossbrace- Vertical member is 8.05 mm th. x 31.12 mm wide x 1857 mm long fiberglass
- Crossbrace- Horizontal member is 5.07 mm th. x 29.77 mm wide x 1857 mm long fiberglass
- 3 Flage- 451 mm x 470 mm vinyl with 610 mm long (19.25 mm dia.) wood staff

Figure 4. System Nos. 58 and 59 Sign Support Details, Test D-30