Mr. John Pasakarnis  
Dicke Safety Products  
1201 Waren Ave.  
Downers Grove, IL 60515

Dear Mr. Pasakarnis:

This letter is in response to your February 11, 2020 request for the Federal Highway Administration (FHWA) to review a roadside safety device, hardware, or system for eligibility for reimbursement under the Federal-aid highway program. This FHWA letter of eligibility is assigned FHWA control number WZ-403 and is valid until a subsequent letter is issued by FHWA that expressly references this device.

**Decision**

The following device is eligible within the length-of-need, with details provided in the form which is attached as an integral part of this letter:

- Dicke Safety Products DF3000P Sign Stand with 48”x48” Vinyl Roll-up Sign

**Scope of this Letter**

To be found eligible for Federal-aid funding, new roadside safety devices should meet the crash test and evaluation criteria contained in the American Association of State Highway and Transportation Officials’ (AASHTO) Manual for Assessing Safety Hardware (MASH). However, the FHWA, the Department of Transportation, and the United States Government do not regulate the manufacture of roadside safety devices. Eligibility for reimbursement under the Federal-aid highway program does not establish approval, certification or endorsement of the device for any particular purpose or use.

This letter is not a determination by the FHWA, the Department of Transportation, or the United States Government that a vehicle crash involving the device will result in any particular outcome, nor is it a guarantee of the in-service performance of this device. Proper manufacturing, installation, and maintenance are required in order for this device to function as tested.

This finding of eligibility is limited to the crashworthiness of the system and does not cover other structural features, nor conformity with the Manual on Uniform Traffic Control Devices.
**Eligibility for Reimbursement**

Based solely on a review of crash test results and certifications submitted by the manufacturer, and the crash test laboratory, FHWA agrees that the device described herein meets the crash test and evaluation criteria of the AASHTO’s MASH. Therefore, the device is eligible for reimbursement under the Federal-aid highway program if installed under the range of tested conditions.

Name of system: Dicke Safety Products D3000P Sign Stand with 48”x48” Vinyl Roll-up Sign  
Type of system: Work Zone  
Test Level: MASH Test Level 3 (TL3)  
Testing conducted by: Applus IDIADA KARCO Engineering, LLC.  
Date of request: February 11, 2020

FHWA concurs with the recommendation of the accredited crash testing laboratory on the attached form.

**Full Description of the Eligible Device**

The device and supporting documentation, including reports of the crash tests or other testing done, videos of any crash testing, and/or drawings of the device, are described in the attached form.

**Notice**

This eligibility letter is issued for the subject device as tested. Modifications made to the device are not covered by this letter. Any modifications to this device should be submitted to the user (i.e., state DOT) as per their requirements.

You are expected to supply potential users with sufficient information on design, installation and maintenance requirements to ensure proper performance.

You are expected to certify to potential users that the hardware furnished has the same chemistry, mechanical properties, and geometry as that submitted for review, and that it will meet the test and evaluation criteria of AASHTO’s MASH.

Issuance of this letter does not convey property rights of any sort or any exclusive privilege. This letter is based on the premise that information and reports submitted by you are accurate and correct. We reserve the right to modify or revoke this letter if: (1) there are any inaccuracies in the information submitted in support of your request for this letter, (2) the qualification testing was flawed, (3) in-service performance or other information reveals safety problems, (4) the system is significantly different from the version that was crash tested, or (5) any other information indicates that the letter was issued in error or otherwise does not reflect full and complete information about the crashworthiness of the system.
Standard Provisions

• To prevent misunderstanding by others, this letter of eligibility designated as FHWA control number WZ-403 shall not be reproduced except in full. This letter and the test documentation upon which it is based are public information. All such letters and documentation may be reviewed upon request.

• This letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented system for which the applicant is not the patent holder.

• This FHWA eligibility letter is not an expression of any Agency view, position, or determination of validity, scope, or ownership of any intellectual property rights to a specific device or design. Further, this letter does not impute any distribution or licensing rights to the requester. This FHWA eligibility letter determination is made based solely on the crash-testing information submitted by the requester. The FHWA reserves the right to review and revoke an earlier eligibility determination after receipt of subsequent information related to crash testing.

Sincerely,

Michael S. Griffith
Director, Office of Safety Technologies
Office of Safety

Enclosures
Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

Date of Request: February 11, 2020

Name: DickeSafetyProducts, c/o John M. Pasakarnis

Company: DickeSafety products

Address: 1201 Warren Ave, Downers Grove, IL 60515

Country: United States of America

To: Michael S. Griffith, Director
FHWA, Office of Safety Technologies

I request the following devices be considered eligible for reimbursement under the Federal-aid highway program.

Device & Testing Criterion - Enter from right to left starting with Test Level

<table>
<thead>
<tr>
<th>System Type</th>
<th>Submission Type</th>
<th>Device Name / Variant</th>
<th>Testing Criterion</th>
<th>Test Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>'WZ': Crash Worthy Work Zone</td>
<td>Physical Crash Testing</td>
<td>DF3000PSignStand with 48” x 48” Vinyl Roll-Up Sign</td>
<td>AASHTO MASH</td>
<td>TL3</td>
</tr>
</tbody>
</table>

By submitting this request for review and evaluation by the Federal Highway Administration, I certify that the product(s) was (were) tested in conformity with the AASHTO Manual for Assessing Safety Hardware and that the evaluation results meet the appropriate evaluation criteria in the MASH.

Individual or Organization responsible for the product:

Contact Name: DickeSafetyProducts, c/o John M. Pasakarnis, Same as Submitter

Company Name: DickeSafety products, Same as Submitter

Address: 1201 Warren Ave, Downers Grove, IL 60515, Same as Submitter

Country: United States of America, Same as Submitter

Enter below all disclosures of financial interests as required by the FHWA 'Federal-Aid Reimbursement Eligibility Process for Safety Hardware Devices' document.

DICKE Safety Products is the manufacturer and marketer of device.

Applus IDIADA KARCO Engineering, LLC (IDIADA KARCO) is an independent research and testing laboratory having no affiliation with any other entity. IDIADA KARCO is actively involved in data acquisition and compliance/certification testing for a variety of government agencies and equipment manufacturers. The principals and staff of IDIADA KARCO have no past or present financial, contractual or organizational interest in any company or entity directly or indirectly related to the products that KARCO tests. If any financial interest should arise, other than receiving fees for testing, reporting, etc., with respect to any project, the company will provide, in writing, a full and immediate disclosure to the FHWA.
PRODUCT DESCRIPTION

The DICKESafety Products DF3000P sign stand is a work-zone traffic control device. The as-tested device consisted of one (1) 48.0 in. (1.2 m) square vinyl roll up sign, one (1) fiberglass cross brace assembly, one (1) steel tube upright, and one (1) base assembly. The as-tested device weighed approximately 25.0 lbs (11.3 kg). The device had a height of 85.5 in. (2.2 m) measured to the top of the sign. The DF3000P sign stand was tested with four (4) 25.0 lb. (11.3 kg) sand bags; one (1) for each of its legs.

The square vinyl roll-up sign was attached to a fiberglass cross brace and was set at a mounting height of 18.5 in. (470 mm) measured to the bottom corner. The 34.0 in. (864 mm) long by 1.0 in. (25 mm) square steel tube upright was fastened to the vertical cross brace and mounted the sign to the base assembly.

The base assembly consisted of one (1) post adapter tube, one (1) spring assembly, and four (4) telescoping legs. The post adapter tube held the steel tube upright and pivoted about the spring assembly. The spring was constructed of a steel double torsion system. The legs consisted of two (2) portions: one (1) 1.25 in. (32 mm) aluminum square tube piece and one (1) 1.0 in. (25 mm) aluminum square extension tube piece. In its deployed state, the base assembly had a footprint measuring 45.0 in. (1.1 m) by 71.0 in. (1.8 m).

CRASH TESTING

By signature below, the Engineer affiliated with the testing laboratory, agrees in support of this submission that all of the critical and relevant crash tests for this device listed above were conducted to meet the MASH test criteria. The Engineer has determined that no other crash tests are necessary to determine the device meets the MASH criteria.

Engineer Name: Bruno Haesbaert

Engineer Signature: Bruno Haesbaert

Address: 9270 Holly Rd, Adelanto, CA 92301

Country: United States of America

A brief description of each crash test and its result:

<table>
<thead>
<tr>
<th>Required Test Number</th>
<th>Narrative Description</th>
<th>Evaluation Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-70 (1100C)</td>
<td>Designed to evaluate the ability of a small vehicle to activate any breakaway, fracture, or yielding mechanism. Is considered optional for work-zone traffic control devices weighing less than 220 lb (100 kg). The DF3000P sign stand weighed approximately 25.0 lbs (11.3 kg) and therefore the test was non-relevant and not conducted.</td>
<td>Non-Relevant Test, not conducted</td>
</tr>
<tr>
<td>Required Test Number</td>
<td>Narrative Description</td>
<td>Evaluation Results</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>3-71 (1100C)</td>
<td>Two (2) DF3000P sign stands were impacted on the same test run. The devices were spaced 60.0 ft. (18.3 m) apart and set at two (2) critical impact angles (CIA), 0° and 90°. The 1100C small car used for this test was a 2010 Kia Rio 4-door sedan with a test inertial weight of 2,428.4 lbs (1,101.5 kg). The test vehicle impacted the 0° test sign at a speed of 62.90 mph (101.22 km/h) and proceeded to impact the 90° test sign at a speed of 61.02 mph (98.20 km/h). Upon impact, both DF3000P's vinyl signs broke away from its upright assembly. The occupant compartment was not penetrated and the deformation limits were not exceeded. The DF3000P sign stand broke away in a predictable manner. Debris from the test articles did not cause a hazard to the driver's vision. The vehicle remained stable and upright throughout the test. The DF3000P sign stand met all the requirements for MASH Test 3-71.</td>
<td>PASS</td>
</tr>
<tr>
<td>3-72 (2270P)</td>
<td>Two (2) DF3000P sign stands were impacted on the same test run. The devices were spaced 60.0 ft. (18.3 m) apart and set at two (2) critical impact angles (CIA), 0° and 90°. The 2270P vehicle used for this test was a 2014 RAM 1500 4-door pick-up truck with a test inertial weight of 5,052.9 lbs (2,292.0 kg). The test vehicle impacted the 0° test sign at a speed of 63.45 mph (102.11 km/h) and proceeded to impact the 90° test sign at a speed of 62.57 mph (100.70 km/h). Upon impact, both DF3000P's vinyl signs broke away from its upright assembly. The occupant compartment was not penetrated and the deformation limits were not exceeded. The DF3000P sign stand broke away in a predictable manner. Debris from the test articles did not cause a hazard to the driver’s vision. The vehicle remained stable and upright throughout the test. The DF3000P sign stand met all the requirements for MASH Test 3-72.</td>
<td>PASS</td>
</tr>
</tbody>
</table>

Full Scale Crash Testing was done in compliance with MASH by the following accredited crash test laboratory (cite the laboratory's accreditation status as noted in the crash test reports):
Laboratory Name: Applus IDIADA KARCO Engineering, LLC.

Laboratory Signature: Bruno Haesbaert

Address: 9270 Holly Rd, Adelanto, CA 92301

Country: United States of America

Accreditation Certificate Number and Dates of current Accreditation period:

TL371: July 1, 2019 - July 1, 2022

Submitter Signature: John M. Pasakarnis

ATTACHMENTS

Attach to this form:

1) Additional disclosures of related financial interest as indicated above.
2) A copy of the full test report, video, and a Test Data Summary Sheet for each test conducted in support of this request.
3) A drawing or drawings of the device(s) that conform to the Task Force-13 Drawing Specifications [Hardware Guide Drawing Standards]. For proprietary products, a single isometric line drawing is usually acceptable to illustrate the product, with detailed specifications, intended use, and contact information provided on the reverse. Additional drawings (not in TF-13 format) showing details that are relevant to understanding the dimensions and performance of the device should also be submitted to facilitate our review.

FHWA Official Business Only:

<table>
<thead>
<tr>
<th>Eligibility Letter</th>
<th>number</th>
<th>Date</th>
<th>Key Words</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# MASH 2016 Test 3-71 Summary

## GENERAL INFORMATION
- **Test Agency**: Applus IDIADA KARCO
- **Test No.**: P39343-01
- **Test Designation**: 3-71
- **Test Date**: 12/16/19

## TEST ARTICLE
- **Name / Model**: DF3000P Sign Stand
- **Type**: Work-Zone Device
- **Device Height**: 85.5 ft. (26.1 m)
- **Key Elements**: Metal, fiberglass, vinyl
- **Road Surface**: Smooth, clean concrete

## TEST VEHICLE
- **Type / Designation**: 1100C
- **Year, Make, and Model**: 2010 Kia Rio
- **Curb Mass**: 2,436.1 lbs (1,105.0 kg)
- **Test Inertial Mass**: 2,428.4 lbs (1,101.5 kg)
- **Gross Static Mass**: 2,592.6 lbs (1,176.0 kg)

## Impact Conditions
- **Impact Velocity Device 1**: 62.90 mph (101.22 km/h)
- **Device 1 Angle**: 0.0°
- **Device 1 Kinetic Energy**: 321.1 kip-ft (435.4 kJ)
- **Impact Velocity Device 2**: 61.02 mph (98.20 km/h)
- **Device 2 Angle**: 90.0°
- **Device 2 Kinetic Energy**: 302.2 kip-ft (409.8 kJ)

## Exit Conditions
- **Device 1 Exit Velocity**: 61.8 mph (99.4 km/h)
- **Device 2 Exit Velocity**: 60.4 mph (97.2 km/h)
- **Vehicle Resting Position**: 333.5 ft. (101.6 m) Downstream 6.9 ft. (2.1 m) Left
- **Vehicle Stability**: Satisfactory
- **Maximum Roll Angle**: N/A*
- **Maximum Pitch Angle**: N/A*
- **Maximum Yaw Angle**: N/A*

## Occupant Risk
- **Longitudinal OIV**: N/A*
- **Lateral OIV**: N/A*
- **Longitudinal RA**: N/A*
- **Lateral RA**: N/A*
- **THIV**: N/A*
- **PHD**: N/A*
- **ASI**: N/A*

## Test Article Deflections
- **0° Sign Debris Field (longitudinal)**: 19.7 ft. (6.0 m)
- **0° Sign Debris Field (lateral)**: 6.9 ft. (2.1 m)
- **90° Sign Debris Field (longitudinal)**: 179.3 ft. (54.7 m)
- **90° Sign Debris Field (lateral)**: 4.8 ft. (1.4 m)

## Vehicle Damage
- **Vehicle Damage Scale**: 12-FD-1
- **Maximum Deformation**: 0.3 in. (8 mm) at windshield

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* Not Applicable, device weighs less than 220 lbs (100 kg)
### MASH 2016 Test 3-72 Summary

**0° CIA**

![Image 0° CIA]

**90° CIA**

![Image 90° CIA]

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#### General Information

**Test Agency**
Applus IDIADA KARCO

**Test No.**
P39344-01

**Test Designation**
3-72

**Test Date**
12/16/19

#### Test Article

**Name / Model**
DF3000P Sign Stand

**Type**
Work-Zone Device

**Device Height**
85.5 ft. (26.1 m)

**Key Elements**
Metal, fiberglass, vinyl

**Road Surface**
Smooth, clean concrete

#### Test Vehicle

**Type / Designation**
2270P

**Year, Make, and Model**
2014 RAM 1500

**Curb Mass**
5,029.8 lbs (2,281.5 kg)

**Test Inertial Mass**
5,052.9 lbs (2,292.0 kg)

**Gross Static Mass**
5,052.9 lbs (2,292.0 kg)

#### Impact Conditions

- **Impact Velocity Device 1**
  - 63.45 mph (102.11 km/h)

- **Impact Velocity Device 2**
  - 62.57 mph (100.70 km/h)

- **Device 1 Angle**
  - 0.0°

- **Device 2 Angle**
  - 90.0°

- **Device 1 Kinetic Energy**
  - 680.0 kip-ft (922.0 kJ)

- **Device 2 Kinetic Energy**
  - 661.3 kip-ft (896.7 kJ)

#### Exit Conditions

- **Device 1 Exit Velocity**
  - 62.9 mph (101.2 km/h)

- **Device 2 Exit Velocity**
  - 62.0 mph (99.8 km/h)

- **Vehicle Resting Position**
  - 431.5 ft. (131.5 m) Downstream

- **Vehicle Stability**
  - Satisfactory

- **Maximum Roll Angle**
  - N/A*

- **Maximum Pitch Angle**
  - N/A*

- **Maximum Yaw Angle**
  - N/A*

- **0° Sign Debris Field (longitudinal)**
  - 123.0 ft. (37.5 m)

- **0° Sign Debris Field (lateral)**
  - 6.6 ft. (2 m) Left

- **90° Sign Debris Field (longitudinal)**
  - 154.8 ft. (47.2 m)

- **90° Sign Debris Field (lateral)**
  - 7.0 ft. (2.1 m)

- **Vehicle Damage**
  - Due to secondary impact with dirt mound

#### Occupant Risk

- **Longitudinal OIV**
  - N/A*

- **Lateral OIV**
  - N/A*

- **Longitudinal RA**
  - N/A*

- **Lateral RA**
  - N/A*

- **THIV**
  - N/A*

- **PHD**
  - N/A*

- **ASI**
  - N/A*

**Test Article Deflections**

- **0° Sign Debris Field (longitudinal)**
  - 123.0 ft. (37.5 m)

- **0° Sign Debris Field (lateral)**
  - 17.3 ft. (5.3 m)

- **90° Sign Debris Field (longitudinal)**
  - 154.8 ft. (47.2 m)

- **90° Sign Debris Field (lateral)**
  - 7.0 ft. (2.1 m)

**Vehicle Damage Scale**

- **12-FD-3**

**CDC**
12FDEW1

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*Not Applicable, device weighs less than 220 lbs (100 kg)*

*Due to secondary impact with dirt mound*
DF3000P

**DF3000P STAND**
- Base - Steel with double torsion spring system
- Legs - Telescopic 1-1/4" and 1" sq. alum. tubing.

**VINYL ROLL-UP SIGN**
- Panel - vinyl, 48" x 48"
- Crossbrace - Vertical member: 1-1/4" wide x 66" long fiberglass bar with 1" sq. x 34" long steel tube
- Crossbrace - Horizontal member: 1-1/4" wide x 66" long fiberglass bar

**Weight: DF3000P**

<table>
<thead>
<tr>
<th>Item</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sign (w/Crossbrace)</td>
<td>8 lbs.</td>
</tr>
<tr>
<td>Sign Stand</td>
<td>17 lbs.</td>
</tr>
<tr>
<td>Total</td>
<td>25 lbs.</td>
</tr>
</tbody>
</table>
ATTACHMENT METHODS

REF: DETAIL 3 (TELESCOPING TUBES)

SIDE VIEW A

SIDE VIEW B

FRONT VIEW

.100 WALL, SQUARE ALUMUNUM TUBE

SQUARE STEEL OR ALUMUNUM TUBE

BUTTON HOLE

STEEL, SPRING-LOADED ROUND HD. BUTTON

BUTTON, LOCKED POSITION
ATTACHMENT METHODS
REF: DETAIL 5 (KICK RELEASE)

KICK RELEASE LEVER
.100 ALUMINUM

FLAT SPRING
.015 STAINLESS STEEL

LEG-.100 X 1.250 SQ.
ALUMINUM TUBE

LOCKING PIN
.360 RND. STEEL

LEG BRACE
.125 STEEL

3/8-16 BOLT AND NUT

LEG FLANGE
.188-.250 STEEL

LEG BRACKET
.090 STEEL

TOP VIEW  (Locked Position)

TOP VIEW  (Un-Locked Position)

SIDE VIEW
ATTACHMENT METHODS

REF: DETAIL 14 (STEEL TUBE TO ALUMINUM TUBE)

VERTICAL FIBERGLASS PANEL CROSS BRACE

PLASTIC SPACER

1/4-20 NUT AND BOLT

BUTTON LOCKED IN BUTTON HOLE

1.000 SQ. X .065 WALL STEEL TUBE

STEEL, SPRING-LOADED ROUND HEAD BUTTON

1.250 SQ. X .100 WALL ALUMINUM TUBE

BUTTON HOLE
# DF3000P Sign Stand

## Parts List

<table>
<thead>
<tr>
<th>Description (Quantity per Stand.)</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Post Adapter Tube (1)</td>
<td>31-089-02</td>
</tr>
<tr>
<td>2 Base Complete (No Sign Holder) (1)</td>
<td>DF3000R-BAS</td>
</tr>
<tr>
<td>3 Bolt (2)</td>
<td>91-007</td>
</tr>
<tr>
<td>4 Nut (2)</td>
<td>92-021</td>
</tr>
<tr>
<td>5 Leg Brace (2)</td>
<td>20-003-03</td>
</tr>
<tr>
<td>6 Leg Bolt (4)</td>
<td>91-012</td>
</tr>
<tr>
<td>7 Lock Nut (4)</td>
<td>92-006</td>
</tr>
<tr>
<td>8 Flat Washer (4)</td>
<td>92-041</td>
</tr>
<tr>
<td>9 Split Washer (4)</td>
<td>92-036</td>
</tr>
<tr>
<td>10 Left Kick Release (2)</td>
<td>34-001-02</td>
</tr>
<tr>
<td>11 Kick Release Pin (4)</td>
<td>12-004-01</td>
</tr>
<tr>
<td>12 Kick Release Rivet (4)</td>
<td>95-007</td>
</tr>
<tr>
<td>13 Kick Release Spring (4)</td>
<td>18-001-01</td>
</tr>
<tr>
<td>14 Right Kick Release (2)</td>
<td>34-001-01</td>
</tr>
<tr>
<td>15 Left Leg w/Kick Release Assembly (2)</td>
<td>ULL-22</td>
</tr>
<tr>
<td>16 Right Leg w/Kick Release Assembly (2)</td>
<td>ULR-22</td>
</tr>
<tr>
<td>17 Leg Bracket (4)</td>
<td>20-001-01</td>
</tr>
<tr>
<td>18 Extension Leg w/Button and Leg Tip (4)</td>
<td>UEL-19</td>
</tr>
<tr>
<td>19 Leg Tip Only (4)</td>
<td>43-019</td>
</tr>
</tbody>
</table>