U.S. Department of Transportation
Federal Highway Administration

May 13, 2020

1200 New Jersey Ave., SE
Washington, D.C. 20590

In Reply Refer To:
HSST-1/WZ-390

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

Dear Mr. Pasakarnis:

This letter is in response to your August 2, 2019 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-390 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 TF18-RUB Traffic Control 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 TF18-RUB Traffic Control Sign
Type of system: Work Zone
Test Level: MASH Test Level 3 (TL3)
Testing conducted by: Texas A&M Transportation Institute
Date of request: August 2, 2019

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-390 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

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

Enclosures

Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

Submitter	Date of Request:	08/02/2019	◉ New ○ Resubmission
	Name:	Dicke Safety Products, c/o John M. Pasakarnis	
	Company:	Dicke Safety Products	
	Address:	1201 Warren Avenue, Downers Grove, IL 60515	
	Country:	USA	
	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 ! - ! - !

! - ! - !

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'WZ': Crash Worthy Work Zon Zone Traffic Control Devices	◉ Physical Crash Testing ○ Engineering Analysis	TF18-RUB Traffic Control Sign Stand	AASHTO MASH	TL3

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:	Dicke Safety Products, c/o John M. Pasakarnis	Same as Submitter ☒
Company Name:	Dicke Safety Products	Same as Submitter ☒
Address:	1201 Warren Avenue, Downers Grove, IL 60515	Same as Submitter ☒
Country:	USA	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.

Texas A&M Transportation Institute (TTI) was contracted by Dicke Safety Products to perform full-scale crash testing of the TF18-RUB Traffic Control Sign Stand. There are no shared financial interests in the TF18-RUB Traffic Control Sign Stand by TTI, or between Dicke Safety Products and TTI, other than costs involved in the actual crash tests and reports for this submission to FHWA.

PRODUCT DESCRIPTION

(●) New Hardware or Significant Modification ( ) Modification to Existing Hardware

The tested traffic control device wasa proprietary traffic control sign stand manufactured by Dicke Safety Products of DownersGrove, Illinois. Each test assembly consisted of a base, telescoping aluminum uprights, a sign assembly, and three flags. The base was comprised of four tubular legs, springs, and brackets. The sign assembly (Model Name: RUNR48-200) consisted of a nonreflective vinyl banner with reinforced corners and fiberglass stiffeners. The bottom corner of the sign was positioned 22 inches above grade.

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:	Roger Bligh	
Engineer Signature:	Roger Bligh — Digitally signed by Roger Bligh Date: 2019.11.11 12:49:36 -06'00'	
Address:	3100 SH 47, Building 7091, Bryan, Texas 77807	Same as Submitter ☐
Country:	USA	Same as Submitter ☐

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-70 (1100C)	MASH states that Test 3-70 for small vehicles is considered optional for work-zone traffic control devices weighing less than 220 lb, because velocity changes during low-speed impacts with free-standing, lightweight features will be within acceptable limits. The traffic control device weighed approximately 43 pounds. Therefore, MASH Test 3-70 was not performed on this traffic control device.	Non-Critical, not conducted

Required Test Number	Narrative Description	Evaluation Results
3-71 (1100C)	MASH Test 3-71 involves an 1100C vehicle weighing 2420 lb ±55 lb impacting the traffic control device at an impact speed of 62 mi/h ±2.5 mi/h. Per MASH recommendations, the device was tested at critical impact angles (CIAs) of 90° ±1.5° and 0° ±1.5°. The results of test 690900-DSP3 conducted on November 20, 2018 are found in TTI Test Report number 690900-DSP3-4-4a. The test vehicle was traveling at 62.6 mi/h when it contacted the first traffic control device at an impact angle of 90°, and was traveling at 61.5 mi/h when it contacted the second device at an impact angle of 0°. The vehicle came to rest 320 ft downstream of the impact and 8 ft to the right of centerline of the vehicle path. Both assemblies fractured into several pieces with the debris field measuring 15 ft left and 16 ft downstream of the first impact. There were scuff marks on the front bumper, hood, and windshield. The windshield was cracked, but there was no tear or hole. No measurable exterior crush to the vehicle was noted, and no occupant compartment deformation or intrusion was noted. MASH does not require instrumentation of the vehicle for tests of traffic control devices weighing less than 220 lb, thus, the occupant risk factors were not calculated for this test. The evaluation of the second impact was not hindered by the first impact. The device performed acceptably for MASH test 3-71.	PASS

3-72 (2270P)	MASH Test 3-72 involves a 2270P vehicle weighing 5000 lb ±110 lb impacting the traffic control device at an impact speed of 62 mi/h ±2.5 mi/h. Per MASH recommendations, the device was tested at critical impact angles (CIAs) of 90° ±1.5° and 0° ±1.5°. The results of test 690900-DSP4 conducted on November 20, 2018 are found in TTI Test Report number 690900-DSP3-4-4a. The test vehicle was traveling at an impact speed of 62.7 mi/h when it contacted the first traffic control device at an impact angle of 90°. After impacting the first device, the pickup truck's trajectory slightly shifted, which caused the impact with the second device to be of a glancing nature, instead of fully engaging the device. This hindered evaluation of impact performance of the second device. Therefore, a separate test (Test No. 690900-DSP4A) was conducted to evaluate the impact performance of the device at 0°. Test 690900-DSP4A is described below. In test 690900-DSP4, the vehicle came to rest 355 ft downstream of the impact and in the centerline of the vehicle path. The test assemblies fractured into several pieces with the debris field measuring 18 ft right and 260 ft downstream of the first impact. The front bumper and hood sustained scuff marks and two small dents. There was a 2-inch long × 0.75 inch wide tear on the right front edge of the hood, and another 2.25-inch long × 1.25-inch wide tear in the right rear of the hood. The windshield was cracked, but there was no tear or hole. No measurable exterior crush to the vehicle was noted (other than the above mentioned hood damage), and no occupant compartment deformation or intrusion was noted. MASH does not require instrumentation of the vehicle for tests of traffic control devices weighing less than 220 lb, thus, the occupant risk factors were not calculated for this test. The device performed acceptably for MASH test 3-72 with an impact angle of 90°. The results of test 690900-DSP4A conducted on November 21, 2018 are found in TTI Test Report number 690900-DSP3-4-4a. The test vehicle was traveling at an impact speed of 63.5 mi/h when it contacted the traffic control device at an impact angle of 0°. The vehicle came to rest 327 ft downstream of the impact and 10 ft to the left of the centerline of the vehicle path. The assembly fractured into several pieces with the debris field measuring 17 ft left and 155 ft downstream of the impact point. The front bumper and hood sustained scuff marks and two small dents. Th[illegible]	PASS

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:	Texas A&M Transportation Institute	
Laboratory Signature:	Digitally signed by Darrell L. Kuhn 'Date: 2019.11.11 10:35:57 -06'00	
Address:	3100 SH 47, Building 7091, Bryan, Texas 77807	Same as Submitter ☐
Country:	USA	Same as Submitter ☐
Accreditation Certificate Number and Dates of current Accreditation period :	ISO 17025-2017 Laboratory A2LA Certificate Number: 2821.01 Valid To: April 30, 2021	

Submitter Signature*: John M_ Pasakarnis

Digitally signed by John M_ Pasakarnis
DN: C=US, O=Dicke Safety Products, CN=John M_ Pasakarnis, E=john@dicketool.com
Reason: I have reviewed this document
Location: your signing location here
Date: 2019-12-17 11:40:31
Foxit Reader Version: 9.5.0

Submit Form

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:

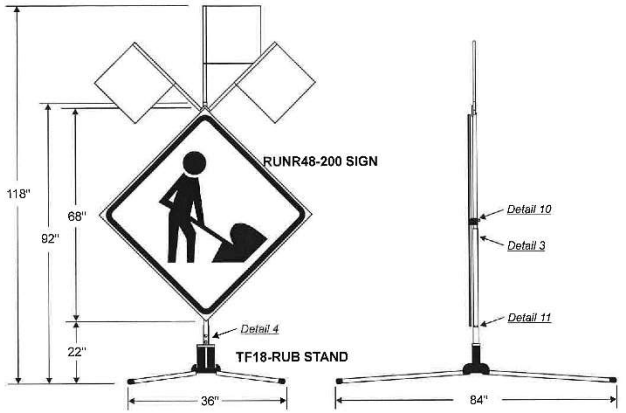
Eligibility Letter		
Number	Date	Key Words

0.000 s

0.150 s

0.300 s

0.450 s



General Information
- Test Agency ..... Texas A&M Transportation Institute (TTI)
- Test Standard Test No. ..... MASH Test 3-71
- TTI Test No. 690900-DSP3
- Test Date 2018-11-20

Test Article
- Type ..... Work Zone Traffic Control Device
- Name ..... TF18-RUB Traffic Control Sign Stand 22-inch mounting height
- Installation Height ..... Vinyl sign substrate with carbon wrapped
- Material or Key Elements ..... fiberglass stays and metal base (Model Name RUNR48-200)

Soil Type and Condition ..... Placed on concrete surface, dry

Test Vehicle
- Type/Designation 1100C
- Make and Model ..... 2011 Kia Rio
- Curb ..... 2458 lb
- Test Inertial ..... 2448 lb
- Dummy ..... 165 lb
- Gross Static ..... 2613 lb

Impact Conditions
- Speed #1 ..... 62.6 mi/h
- Angle #1 ..... 90°
- Speed #2 ..... 61.5 mi/h
- Angle #2 ..... 0°

Kinetic Energy .....

Exit Conditions
- Speed #1 ..... 62.5 mi/h
- Speed #2 ..... 58.6 mi/h

Post-Impact Trajectory
- Stopping Distance ..... 320 ft downstream
  8 ft toward right

Test Article Deflections
- Fabric Sign & Upper Supports #1 ... 6 ft downstream
- Lower Support/Base #1 ..... 40 ft downstream
- Fabric Sign & Upper Supports #2 ... 16 ft downstream
- Lower Support/Base #2 ..... 15 ft downstream

Vehicle Damage
- VDS 12FC1
- CDC 12FCGN6
- Max. Exterior Deformation ..... None
- OCDI FS0000000
- Max. Occupant Compartment Deformation ..... None
- Windshield Damage ..... Cracked only

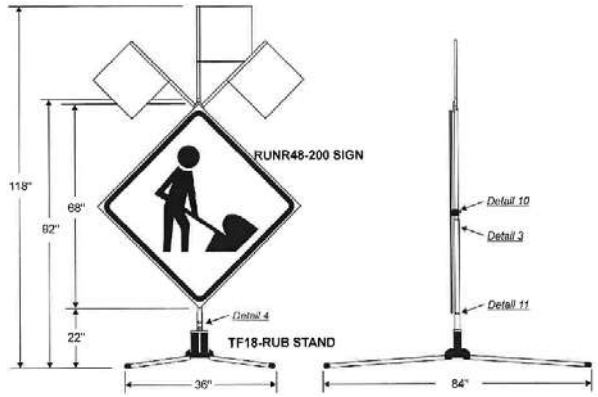
Figure 5.7. Summary of Results for *MASH* Test 3-71 on TF18-RUB Traffic Control Sign Stand.

0.000 s

0.075 s

0.150 s

0.300 s



General Information
- Test Agency: Texas A&M Transportation Institute (TTI)
- Test Standard Test No.: MASH Test 3-72
- TTI Test No.: 690900-DSP4
- Test Date: 2018-11-20

Test Article
- Type: Work Zone Traffic Control Device
- Name: TF18-RUB Traffic Control Sign Stand
- Installation Height: 22-inch mounting height
- Material or Key Elements: Vinyl sign substrate with carbon wrapped fiberglass stays and metal base (Model Name RUNR48-200)

Soil Type and Condition: Placed on concrete surface, dry

Test Vehicle
- Type/Designation: 2270P
- Make and Model: 2013 RAM 1500
- Curb: 5030 lb
- Test Inertial: 5060 lb
- Dummy: No dummy
- Gross Static: 5060 lb

Impact Conditions
- Speed: 62.7 mi/h
- Angle: 90°

Kinetic Energy: 665 kip-ft

Exit Conditions
- Speed: 62.4 mi/h

Post-Impact Trajectory
- Stopping Distance: 355 ft downstream On Centerline

Test Article Deflections
- Fabric Sign & Upper Supports #1: 0 ft downstream
- Lower Support/Base #1: 20 ft downstream

Vehicle Damage
- VDS: 12FC1
- CDC: 12FCGN6
- Max. Exterior Deformation: None
- OCDI: FS0000000
- Max. Occupant Compartment Deformation: None
- Windshield Damage: Cracked only

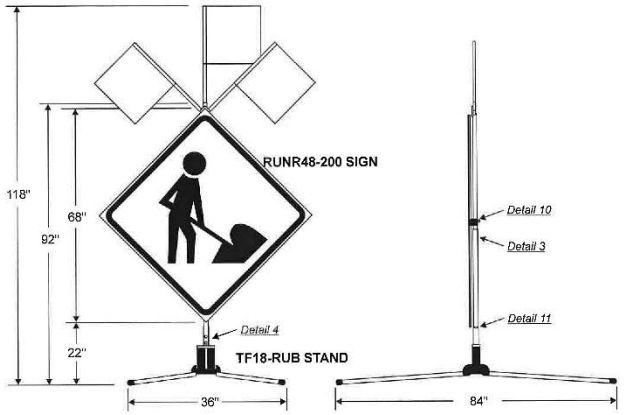
Figure 6.6. Summary of Results for *MASH* Test 3-72 at 90° on TF18-RUB Traffic Control Sign Stand.

0.000 s

0.075 s

0.150 s

0.300 s



General Information
- Test Agency ..... Texas A&M Transportation Institute (TTI)
- Test Standard Test No. ..... MASH Test 3-72
- TTI Test No. 690900-DSP4A
- Test Date 2018-11-21

Test Article
- Type ..... Work Zone Traffic Control Device
- Name ..... TF18-RUB Traffic Control Sign Stand
- Installation Height ..... 22-inch mounting height
- Material or Key Elements ..... Vinyl sign substrate with carbon wrapped fiberglass stays and metal base (Model Name RUNR48-200)

Soil Type and Condition ..... Placed on concrete surface, dry

Test Vehicle
- Type/Designation 2270P
- Make and Model ..... 2013 RAM 1500
- Curb ..... 5030 lb
- Test Inertial ..... 5060 lb
- Dummy ..... No dummy
- Gross Static ..... 5060 lb

Impact Conditions
- Speed ..... 63.5 mi/h
- Angle ..... 0°

Kinetic Energy ..... 683 Kip-ft

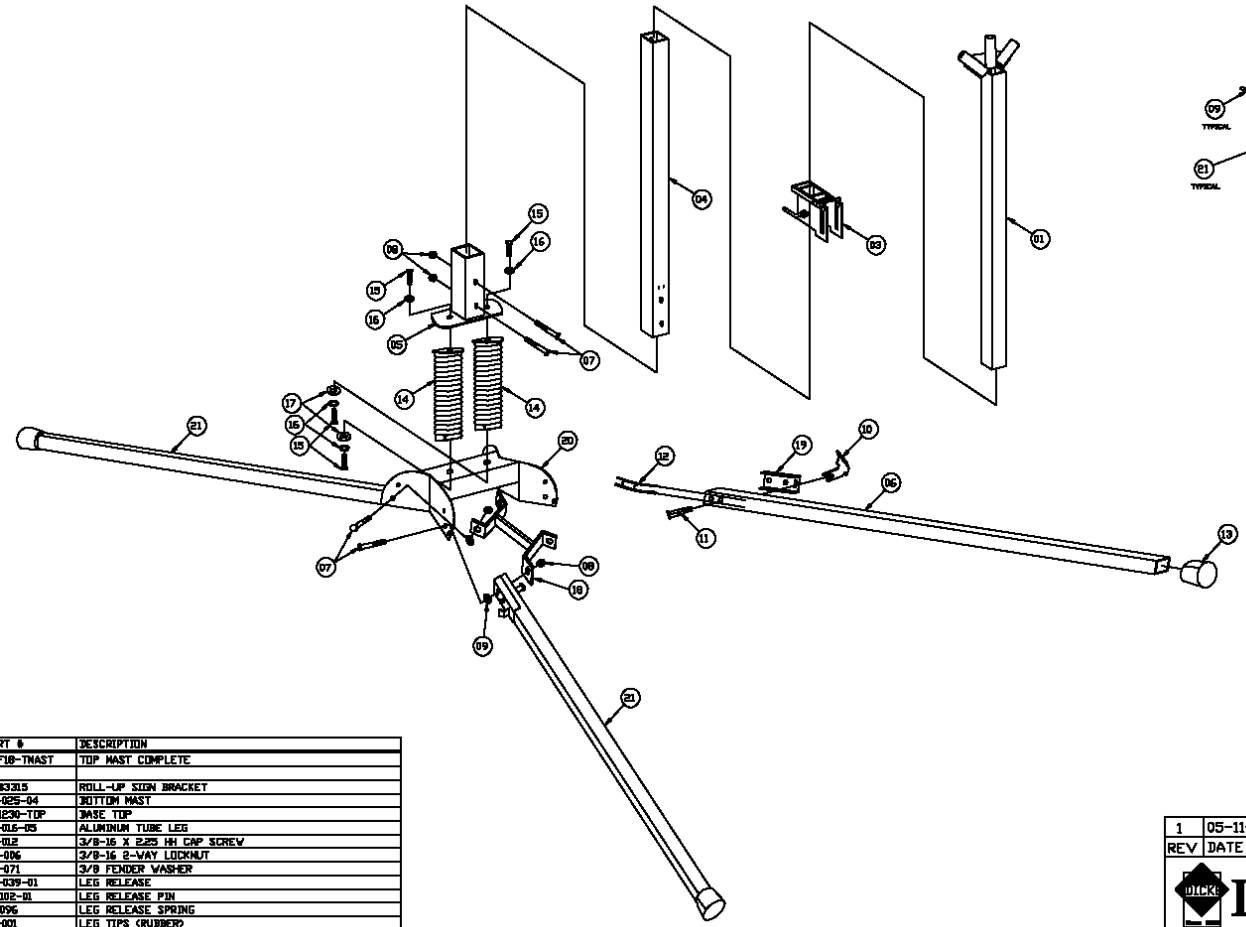
Exit Conditions
- Speed ..... 63.5 mi/h

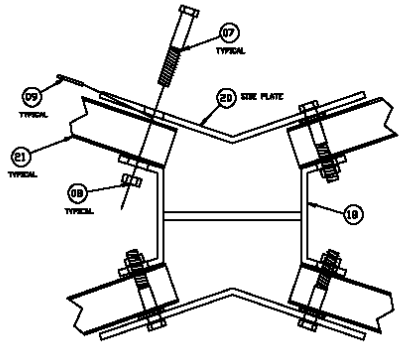
Post-Impact Trajectory
- Stopping Distance ..... 327 ft downstream
  10 ft toward left

Test Article Deflections
- Vinyl Sign & Upper Supports #1 ..... 64 ft downstream
- Lower Support/Base #1 ..... 64 ft downstream

Vehicle Damage
- VDS 12FC1
- CDC 12FCGN6
- Max. Exterior Deformation ..... None
- OCDI FS0000000
- Max. Occupant Compartment Deformation ..... None
- Windshield Damage ..... Cracked only

Figure 7.6. Summary of Results for *MASH* Test 3-72 at 0° on TF18-RUB Traffic Control Sign Stand.





ENLARGED BASE ASSEMBLY DETAIL

ITEM	QTY	PART #	DESCRIPTION
01	1	STF18-TMAST	TOP MAST COMPLETE
03	1	RU33315	ROLL-UP SIGN BRACKET
04	1	31-025-04	BOTTOM MAST
05	1	TF1230-TOP	BASE TOP
06	4	31-016-05	ALUMINUM TUBE LEG
07	6	91-012	3/8-16 X 2.25 HH CAP SCREW
08	6	92-006	3/8-16 2-WAY LOCKNUT
09	4	92-071	3/8 FENDER WASHER
10	4	20-039-01	LEG RELEASE
11	4	11-102-01	LEG RELEASE PIN
12	4	11-096	LEG RELEASE SPRING
13	4	14-001	LEG TIPS (RUBBER)
14	2	TF18-SPRING	SPRING ASSEMBLIES
15	4	91-068	1/2-13 X 1.25 HH CAP SCREW
16	4	92-039	1/2 MED SPLIT WASHER
17	2	92-062	1/2 FLAT WASHER
18	1	TF18-LEGBRACE	LEG BRACE
19	4	20-001-06	LEG SUPPORT
20	1	STF18-BOT	BOTTOM ASSEMBLY
21	4	SL-4E	LEG ASSEMBLY (AL)

REV	DATE	BY	DESCRIPTION
1	05-11-11	JMP	ADDED NEW LEG BRACKET

DICKE TOOL Co.

1201 WARREN AVE. DOWNERS GROVE, IL 60515

TITLE: TWIN-FLEX 18 SIGN STAND (AL)

CUSTOMER REF. NO.:

MATERIAL:

TOLERANCES

X	+/-	0.050
X.X	+/-	0.030
X.XX	+/-	0.010
X.XXX	+/-	0.005
ANGULAR	+/-	1.0°

DRAWN: JMP

CHECK:

DATE: 03-18-10

SCALE: NTS

SHT 1 OF 1

DRAWING/PART No.: TF18-RUB STAND

ISSUE: 1