U.S. Department of Transportation
Federal Highway Administration

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

December 18, 2015

In Reply Refer To:
HSST/B-243A

Ms. Karla Lechtenberg
Midwest Roadside Safety Facility
130 Whittier Research Center
2200 Vine Street
Lincoln, NE 68583-0853

Dear Ms. Lechtenberg:

This letter is in response to your March 6, 2015 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 B-243A and is valid until a subsequent letter is issued by FHWA that expressly references this device.

Decision

The following devices are eligible, with details provided in the form which is attached as an integral part of this letter:
• Non-Blocked Steel-Post MGS for Use on Wire-Faced, MSE Walls

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 American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (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: Non-Blocked Steel-Post MGS for Use on Wire-Faced, MSE Walls
Type of system: Longitudinal Barrier
Test Level: MASH Test Level 3
Testing conducted by: Midwest Roadside Safety Facility
Task Force 13 Designator: SGR39
Date of request: March 6, 2015
Date initially acknowledged: March 23, 2015
Date of completed package: August 21, 2015

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

If a manufacturer makes any modification to any of their roadside safety hardware that has an existing eligibility letter from FHWA, the manufacturer must notify FHWA of such modification with a request for continued eligibility for reimbursement. The notice of all modifications to a device must be accompanied by:

- Significant modifications – For these modifications, crash test results must be submitted with accompanying documentation and videos.
- Non-signification modifications – For these modifications, a statement from the crash test laboratory on the potential effect of the modification on the ability of the device to meet the relevant crash test criteria.

FHWA's determination of continued eligibility for the modified hardware will be based on whether the modified hardware will continue to meet the relevant crash test criteria.

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 the 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

- This letter provides a AASHTO/ARTBA/AGC Task Force 13 designator that should be used for the purpose of the creation of a new and/or the update of an existing Task Force 13 drawing for posting on the on-line 'Guide to Standardized Highway Barrier Hardware' currently referenced in AASHTO Roadside Design Guide.

- To prevent misunderstanding by others, this letter of eligibility designated as FHWA control number B-243A 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.

- If the subject device is a patented product it may be considered to be proprietary. If proprietary systems are specified by a highway agency for use on Federal-aid projects: (a) they must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with the 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.

Sincerely yours,

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:	February 19, 2015	◉ New ○ Resubmission
	Name:	Karla Lechtenberg	
	Company:	Midwest Roadside Safety Facility	
	Address:	130 Whittier Research Center, 2200 Vine Street, Lincoln, NE 68583-0853	
	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.

Help

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'B': Barriers (Roadside, Median, Bridge Railings)	◉ Physical Crash Testing ○ FEA & V&V Analysis ○ Engineering Analysis	Non-Blocked Steel-Post MGS for Use on Wire-Faced, MSE Walls	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.

Identification of the individual or organization responsible for the product:

Contact Name:	Karla Lechtenberg	Same as Submitter ☒
Company Name:	Midwest Roadside Safety Facility	Same as Submitter ☒
Address:	130 Whittier Research Center, 2200 Vine Street, Lincoln, NE 68583-	Same as Submitter ☒
Country:	USA	Same as Submitter ☒

PRODUCT DESCRIPTION

(•) New Hardware	( ) Modification to Existing Hardware	

The non-blocked Midwest Guardrail System (MGS) for use on wire-faced, MSE walls (SGR39) consists of standard 12-gauge W-beam sections (RWM04a) installed with the top of the rail set at a nominal height of 31 inches. The rail is mounted on standard W6x8.5 (or W6x9) ASTM A992 or A36 steel posts that are 6-ft long (PWE06) and set at 75-in. centers. The posts are embedded 40 inches in the wire-faced, MSE wall. The posts are placed at the slope break point of the 3H:1V fill slope located on the wire-faced, MSE wall. A 12-in. long, 12-gauge backup plate (RWB01a) is used to block the rail away from the front face of the steel post. The rail splices are located at mid-spans between adjacent posts. Standard splice bolts or ASTM A307 5/8-in. diameter x 1½-in. long guardrail bolts and nuts (FBB01) are used to attach the rail to the posts. The wire-faced, MSE wall system consisted of three 2-ft thick layers of roller-compacted, course, crushed limestone material with a 3H:1V fill slope at the outer edge for the as-built test installation. Other wire-faced, MSE wall configurations may be used, however, three layers is the minimum and the soil-aggregate material shall be the same. The soil-aggregate material shall meet the select wall backfill materials denoted in Sections 255 and 704 of the 2003 FHWA Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, which also closely conforms to the Grading B specifications of AASHTO M147-65 denoted in MASH and NCHRP Report No. 350. The outer region of the bottom two layers shall contain a wall facing fill material that consists of 4 to 6-in. diameter rocks that shall be placed by hand. Steel-wire reinforcement mats are used to construct and stabilize the MSE wall system.

For non-blocked steel-post MGS systems, the back side of steel posts are recommended to be placed a minimum of 1 ft away from the inside edge of the wall facing fill or 4 ft away from the outer edge of the MSE wall which utilize a 3H:1V fill slope, whichever results in the largest lateral offset between the post and exterior wall face. For this recommendation, the minimum lateral offset between the rail face and outer edge of the MSE wall would be 4 ft – 9¼ in. The recommended guidance regarding the minimum lateral offset for the steel posts for varying thickness of select wall backfill and different widths for the 3H:1V fill slope are shown in Figures ES-1 through ES-3.

CRASH TESTING

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-10 (1100C)	The results of test no. MGSGW-1 conducted on October 20, 2009 are found in MwRSF report no. TRP-03-235-11. A 2,596-lb small car with a simulated occupant in the right-front seat, impacted the non-blocked steel-post MGS system placed at the slope break point of a 3H:1V fill slope on top of a wire-faced, MSE wall at a speed of 61.0 mph and at an angle of 25.3 degrees. At 0.726 sec, the vehicle exited the system at a speed of 10.2 mph and at an angle of 58.3 degrees as it spun-out. Exterior vehicle damage was moderate, and the interior occupant compartment deformations were minimal with a maximum of 1¼ in., consequently not violating the limits established in MASH. Damage to the barrier was also moderate, consisting of contact marks on and deformation to the W-beam rail and the guardrail posts. The maximum lateral dynamic rail and post deflections were 27.4 in. and 26.2 in., respectively. The working width of the system was 35.7 in. All occupant risk measures were within the recommended limits, and the test vehicle showed no tendency for rollover.	PASS

Required Test Number	Narrative Description	Evaluation Results
3-11 (2270P)	The results of test no. MGSGW-2 conducted on November 20, 2009 are found in MwRSF report no. TRP-03-235-11. A 5,169-lb pickup truck with a simulated occupant seated in the right-front seat, impacted the non-blocked steel-post MGS system placed at the slope break point of a 3H:1V fill slope on top of a wire-faced, MSE wall at a speed of 65.3 mph and at an angle of 25.1 degrees. At 0.230 sec after impact, the vehicle became parallel with the system at a speed of 46.7 mph. At 0.452 sec, the vehicle exited the system at a speed of 43.8 mph and at an angle of 20.4 degrees. Exterior vehicle damage was moderate, and the interior occupant compartment deformations were minimal with a maximum of 1 1/2 in., consequently not violating the limits established in MASH. Damage to the barrier was also moderate, consisting of contact marks on and deformation to the W-beam rail and the guardrail posts. The maximum lateral dynamic rail and post deflections were both 35.7 in. The working width of the system was 45.2 in. All occupant risk measures were within recommended limits, and the test vehicle showed no tendency for rollover.	PASS
3-20 (1100C)	Not Applicable	WAIVER REQUESTED
3-21 (2270P)	Not Applicable	WAIVER REQUESTED

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:	Midwest Roadside Safety Facility	
Laboratory Contact:	Karla Lechtenberg	Same as Submitter ☒
Address:	130 Whittier Research Center, 2200 Vine Street, Lincoln, NE 68583-0853	Same as Submitter ☒
Country:	USA	Same as Submitter ☒
Accreditation Certificate Number and Date:	A2LA Certificate Number: 2937.01, Valid to November 30, 2015	

Submitter Signature*: Karla Lechtenberg

Digitally signed by Karla Lechtenberg
DN: cn=Karla Lechtenberg, o=Midwest Roadside Safety Facility (MwRSF), ou, email=kpolivka2@unl.edu, c=US
Date: 2015.03.06 16:27:05 -06'00'

Submit Form

ATTACHMENTS

Attach to this form:

1) A copy of the full test report, video, and a Test Data Summary Sheet for each test conducted in support of this request.
2) 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 key to understanding the performance of the device should also be submitted to facilitate our review.

FHWA Official Business Only:

Eligibility Letter		AASHTO TF13	
Number	Date	Designator	Key Words

University of Nebraska

MIDWEST ROADSIDE SAFETY FACILITY

December 11, 2015

Subject: Not Applicable Tests

Dear Will:

This letter is intended to further clarify the Not Applicable statement in the Narrative Description for Required Test Number 3-20 and 3-21 in the Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware form submitted for **Non-Blocked Steel-Post MGS for Use on Wire-Faced, MSE Walls** for which we are requesting a letter of eligibility on behalf of the state departments of transportation participating in the Midwest States Regional Pooled Fund Program, specifically Wisconsin Department of Transportation.

Test numbers 3-20 and 3-21 are not applicable for this type of system.

If you need any further information or clarification, please feel free to contact Dr. Ron Faller or myself.

Sincerely,

Karla A. Lechtenberg
Research Associate Engineer

cc: Ronald K. Faller, Ph.D., Director and Research Associate Professor

University of Nebraska
MIDWEST ROADSIDE SAFETY FACILITY

August 27, 2015

Subject: Financial Interest Statement

Dear Will:

This letter is intended to be a disclosure of any financial interest that the Midwest Roadside Safety Facility (MwRSF) and its employees have in the **Non-Blocked Steel-Post MGS for Use on Wire-Faced, MSE Walls** for which we are requesting a letter of eligibility on behalf of the Federal Highway Administration, Central Federal Lands Highway Division.

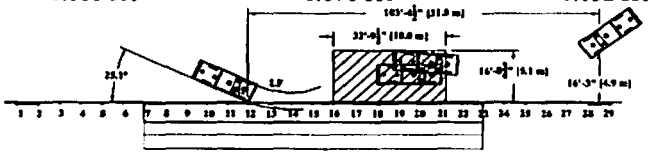
MwRSF's financial interests are as follows:
(i) No compensation, including wages, salaries, commissions, professional fees, or fees for business referrals;
(ii) Consulting relationships consist of answering design and implementation questions;
(iii) Research funding or other forms of research support include funding individual research with MwRSF;
(iv) No patents, copyrights, or other intellectual property interests for this system;
(v) No licenses or contractual relationships for this system; and
(vi) No business ownership and investment interests for this system.

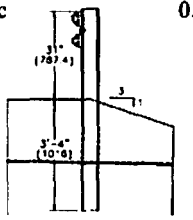
If you need any further information or clarification, please feel free to contact Dr. Ron Faller or myself.

Sincerely,

Karla A. Lechtenberg
Research Associate Engineer

cc: Ronald K. Faller, Ph.D., Director and Research Associate Professor



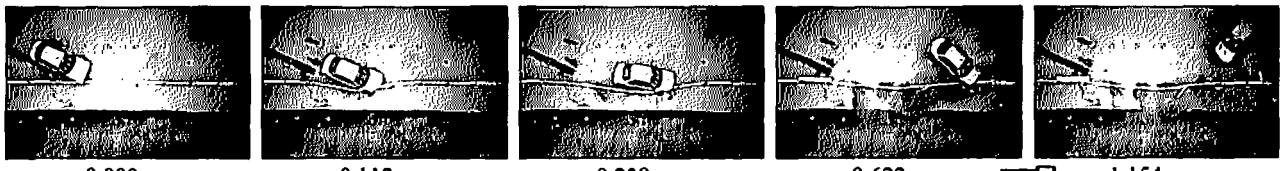


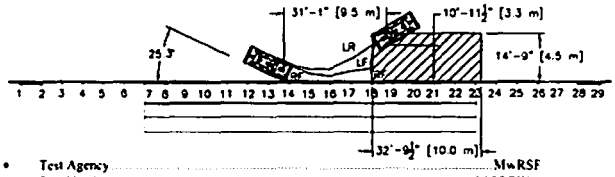
- Test Agency ..... MwRSF
- Test Number MGSGW-2
- Date 11/20/2009
- MASH Test Designation 3-11
- Test Article ..... MGS without blockouts on MSE wall with a 3:1 slope
- Total Length ..... 175 ft (53.4 m)
- Key Component - Steel W-Beam
  - Thickness ..... 12-gauge (2.66 mm)
  - Top Mounting Height ..... 31 in. (787 mm)
- Key Component - Steel Posts
  - Post nos. 3-27 ..... W6x8.5 (W152x12.6) by 6 ft (1.8 m) long
  - Post Location ..... Centerline of posts at slope break point
  - Spacing ..... 6 ft - 3 in. (1.9 m)
  - Blockouts ..... None
- Key Component - Wood Posts
  - Post nos. 1-2, 28-29 ..... 5½ by 7½ by 46 in. long (140x191x1,186 mm)
- Key Component - Foundation Tube ..... 6 ft (1.8 m) long
- Soil Type ..... NCHRP No. 350 Strong Soil
- Vehicle Model ..... 2003 Dodge Ram 1500 Quad Cab
  - Curb ..... 5,081 lb (2,305 kg)
  - Test Inertial ..... 4,999 lb (2,268 kg)
  - Gross Static ..... 5,169 lb (2,345 kg)
- Impact Conditions
  - Speed ..... 65.3 mph (105.0 km/h)
  - Angle ..... 25.1 deg
  - Impact Location ..... 16 ft (4.9 m) US of splice btwn posts 14 and 15
- Exit Conditions
  - Speed ..... 43.8 mph (70.5 km/h)
  - Angle ..... 20.4 deg
  - Exit Box Criteria ..... Fail (Not required)
- Vehicle Stability ..... Satisfactory
- Vehicle Stopping Distance ..... 103 ft - 4 ½ in. (31.5 m) downstream
  16 ft - 3 in. (4.9 m) laterally in front of traffic-side face

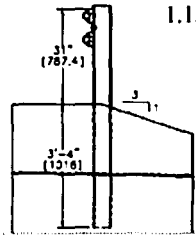
- Vehicle Damage ..... Moderate
  - VDS[29] 1-RFQ-3
  - CDC[30] 01-RDEW2
  - Maximum Interior Deformation ..... 1.1 in. (32 mm) right toe pan
- Test Article Damage ..... Moderate
- Test Article Deflections
  - Permanent Set ..... 26¼ in. (667 mm)
  - Dynamic ..... 35.7 in. (907 mm)
  - Working Width ..... 45.2 in. (1,148 mm)
- Maximum Angular Displacements (DTS)
  - Roll ..... 16.4 deg <75°
  - Pitch ..... -15.7 deg <75°
  - Yaw ..... 38.0 deg
- IS ..... 132.3 kip-ft (180 kJ)
- Transducer Data

Evaluation Criteria		Transducer			MASH Limit
		EDR-3	DTS set 1	DTS set 2	
OIV ft/s (m/s)	Longitudinal	-17.25 (-5.26)	-17.85 (-5.44)	-16.91 (-5.15)	≤ 40 (12.2)
	Lateral	-17.71 (-5.40)	-18.26 (-5.57)	-17.56 (-5.35)	≤ 40 (12.2)
ORA g's	Longitudinal	-11.15	-11.99	-10.98	≤ 20.49
	Lateral	-8.76	-8.91	-10.37	≤ 20.49
THIV - ft/s (m/s)		NA	24.1 (7.35)	NA	Not required
PHD g's		NA	12.73	NA	Not required
ASI		0.76	0.81	0.84	Not required

Figure 71. Schematic, Test Results and Sequential Photographs, Test No. MGSGW-2.







- Test Agency ..... MwRSF
- Test Number MGSGW-1
- Date 10/20/2009
- MASH Test Designation 3-10
- Test Article ..... MGS without blockouts on MSE wall with a 3:1 slope
- Total Length ..... 175 ft (53.4 m)
- Key Component Steel W-Beam
  - Thickness ..... 12 gauge (2.66 mm)
  - Top Mounting Height ..... 31 in. (787 mm)
- Key Component Steel Posts
  - Post nos. 3-27 ..... W6x8.5 (W152x12.6) by 6 ft (1.8 m) long
  - Post Location ..... Centerline of posts at slope break point
  - Spacing ..... 6 ft-3 in. (1.9-m)
  - Blockout ..... None
- Key Component Wood Posts
  - Post nos. 1-2, 28-29 ..... 5½ by 7½ by 46 in. (140x191x1,168 mm)
- Key Component Foundation Tube ..... 6 ft (1.8 m) long
- Soil Type ..... NCHRP No. 350 Strong Soil
- Vehicle Model ..... 2003 Kia Rio Sedan
  - Curb ..... 2,302 lb (1,044 kg)
  - Test Inertial ..... 2,427 lb (1,101 kg)
  - Gross Static ..... 2,596 lb (1,178 kg)
- Impact Conditions
  - Speed ..... 61.0 mph (98.2 km/h)
  - Angle ..... 25.3 deg
  - Impact Location ..... 4 ft - 5 in. (1.3 m) US of splice btwn posts 14 and 15
- Exit Conditions
  - Speed ..... 10.2 mph (16.3 km/h)
  - Angle ..... 58.3 deg
- Exit Box ..... Fail (Not required)
- Vehicle Stability ..... Satisfactory
- Vehicle Stopping Distance ..... 31 ft - 1 in. downstream
  ..... 11 ft - 3 in. (3.4 m) laterally from traffic-side face
- Vehicle Damage ..... Moderate
  - VDS[25] 1-FR-5
  - CDC[26] 01-FZEW4
  - Maximum Interior Deformation ..... 1¼ in. (32 mm) Right Toe Pan
- Test Article Damage ..... Moderate
- Test Article Deflections
  - Permanent Set ..... 20¼ in. (511 mm)
  - Dynamic ..... 27.4 in. (696 mm)
  - Working Width ..... 35.7 in. (906 mm)
- Maximum Angular Displacements (DTS)
  - Roll ..... -11.2° < 75°
  - Pitch ..... -5.4° < 75°
  - Yaw ..... 126.0°
- IS ..... 58.97 kip-ft (80 kJ)
- Transducer Data

Evaluation Criteria		Transducer			MASH Limit
		EDR-3	DTS set 1	DTS set 2	
OIV ft/s (m/s)	Longitudinal	-22.62 (-6.89)	-25.87 (-7.89)	-22.45 (-6.84)	≤ 40 (12.2)
	Lateral	-16.51 (-5.03)	-17.07 (-5.20)	-16.53 (-5.04)	≤ 40 (12.2)
ORA g's	Longitudinal	-9.94	-13.78	-10.25	≤ 20.49
	Lateral	-6.54	-7.81	-7.40	≤ 20.49
THIV ft/s (m/s)		NA	30.10 (9.17)	NA	not required
PHD g's		NA	14.55	NA	not required
ASI		0.74	0.92	0.78	not required

Figure 54. Schematic. Test Results and Sequential Photographs, Test No. MGSGW-1.

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

MIDWEST ROADSIDE SAFETY FACILITY (MwRSF)[1]
University of Nebraska-Lincoln
4800 NW 35th Street
Lincoln, NE 68524
Ms. Karla Lechtenberg Phone: 402 472 9070

MECHANICAL

Valid To: December 31, 2015 Certificate Number: 2937.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests:

Tests	Test Methods[2]
Full-Scale Vehicle Crash Tests of Highway Safety Features	NCHRP Report 350; MASH; EN 1317
Full-Scale Vehicle Crash Tests of Perimeter Protection Systems and Access Control Devices	ASTM F2656; SD-STD-02.01 Revision A
Bogie and Pendulum Dynamic Tests of Highway Safety Features	Non-Standard Test Method: Dynamic Testing of Steel Post and Rigid Foundation; Non-Standard Test Method: Dynamic Testing of Post in Soil; Non-Standard Test Method: Dynamic Testing of Spacer Blocks
Crushable Nose Pendulum/Bogie Testing for Breakaway Supports	Non-Standard Test Method: Dynamic Testing of Breakaway Supports; AASHTO Breakaway Poles and Supports; NCHRP Report 350

On the following types of products, materials, and/or structures: Metal, Wood, Concrete and Plastic Structures, Components of Structures, Fasteners, and Roadway Pavements.

[1] Administrative office located at: 2200 Vine Street, 130 Whittier Building, Lincoln, NE 68583-0853.

[2] This laboratory meets A2LA R104 – *General Requirements: Accreditation of Field Testing and Field Calibration Laboratories* for these tests.

5202 Presidents Court, Suite 220 | Frederick, MD 21703-8398 | Phone: 301 644 3248 | Fax: 240 454 9449 | www.A2LA.org

Accredited Laboratory

A2LA has accredited

MIDWEST ROADSIDE SAFETY FACILITY (MWRSF)

Lincoln, NE

for technical competence in the field of

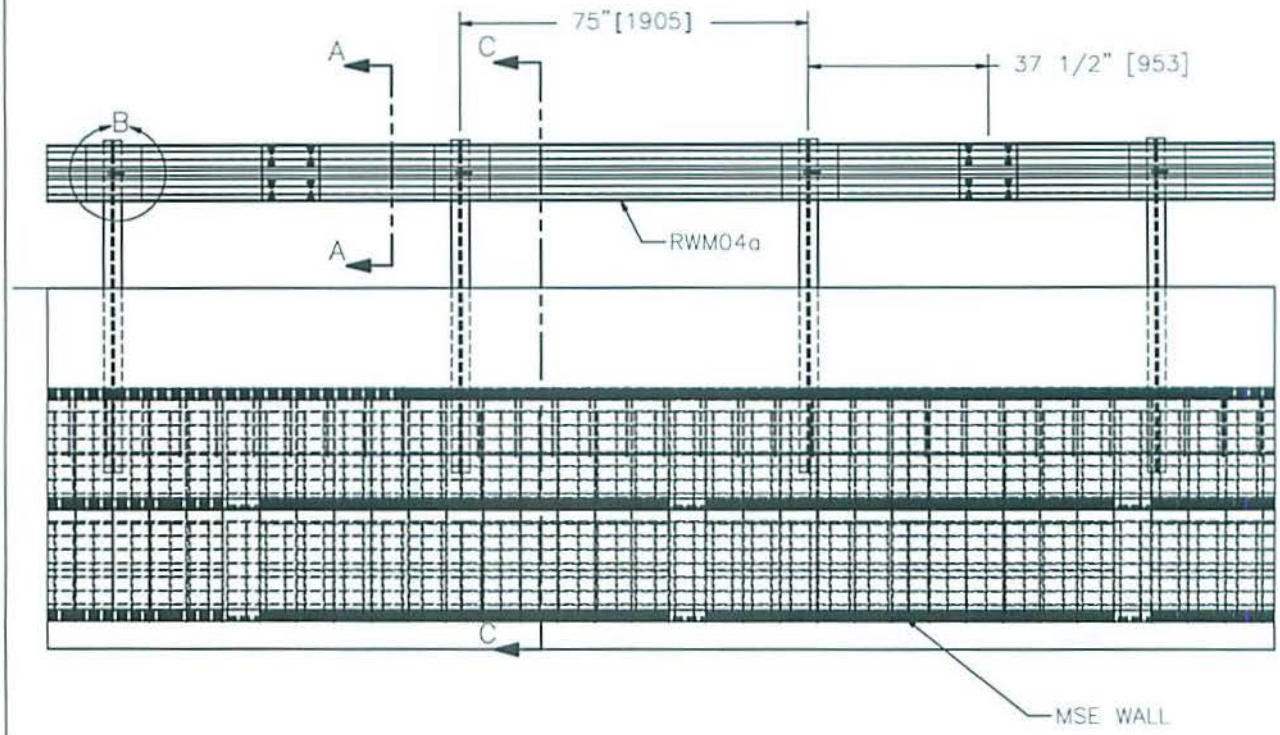
Mechanical Testing

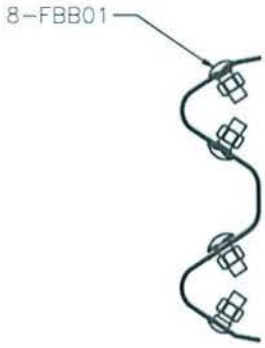
This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009*).

Presented this 31st day of December 2013.

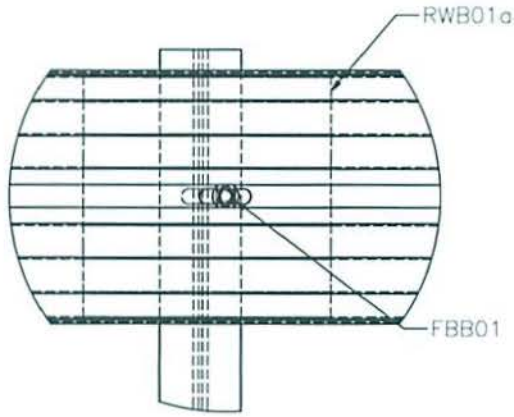
President & CEO
For the Accreditation Council
Certificate Number 2937.01
Valid to December 31, 2015

For the tests to which this accreditation applies, please refer to the laboratory's Mechanical Scope of Accreditation.





SECTION A-A



DETAIL B

MASH TL-3 NON-BLOCKED MGS ADJACENT TO A 3H:1V SLOPE ON TOP OF A WIRE-FACED, MSE WALL

MwRSF

SGR39

SHEET NO.	DATE:
1 of 4	9/7/2011

INTENDED USE

A non-blocked Midwest Guardrail System (MGS) with standard post spacing can be placed on top of and forward from a wire-faced, mechanically stabilized earth (MSE) wall system and used in locations where a maximum dynamic deflection of 27.4" [696] or less is acceptable and where a working width of 35.7" [907] is provided. The non-blocked MGS should be anchored and terminated using a suitable guardrail end treatment that is approved with a 31" [787] nominal top mounting height. The non-blocked MGS should be used with wide-flange steel posts (PWE06). The non-blocked MGS adjacent to a 3:1 fill slope on wire-faced, MSE wall system has been crash tested under TL-3 using test designations nos. 3-10 and 3-11 and was found acceptable according to the Manual for Assessing Safety Hardware (MASH) performance criteria.

COMPONENTS

Unit Length = 150" [3810]

DESIGNATOR	COMPONENT	NUMBER
FBB01	Guardrail splice bolts and nuts	10
RWB01a	W-beam back-up plate	2
PWE06	Wide-flange guardrail post	2
RWM04a	W-beam rail	1
-----	MSE Wall	1

ACCEPTANCE

FHWA Acceptance Letter will be pursued according to the TL-3 MASH performance criteria.

REFERENCES

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MASH TL-3 NON-BLOCKED MGS ADJACENT TO A 3H:1V SLOPE ON TOP OF A WIRE-FACED, MSE WALL

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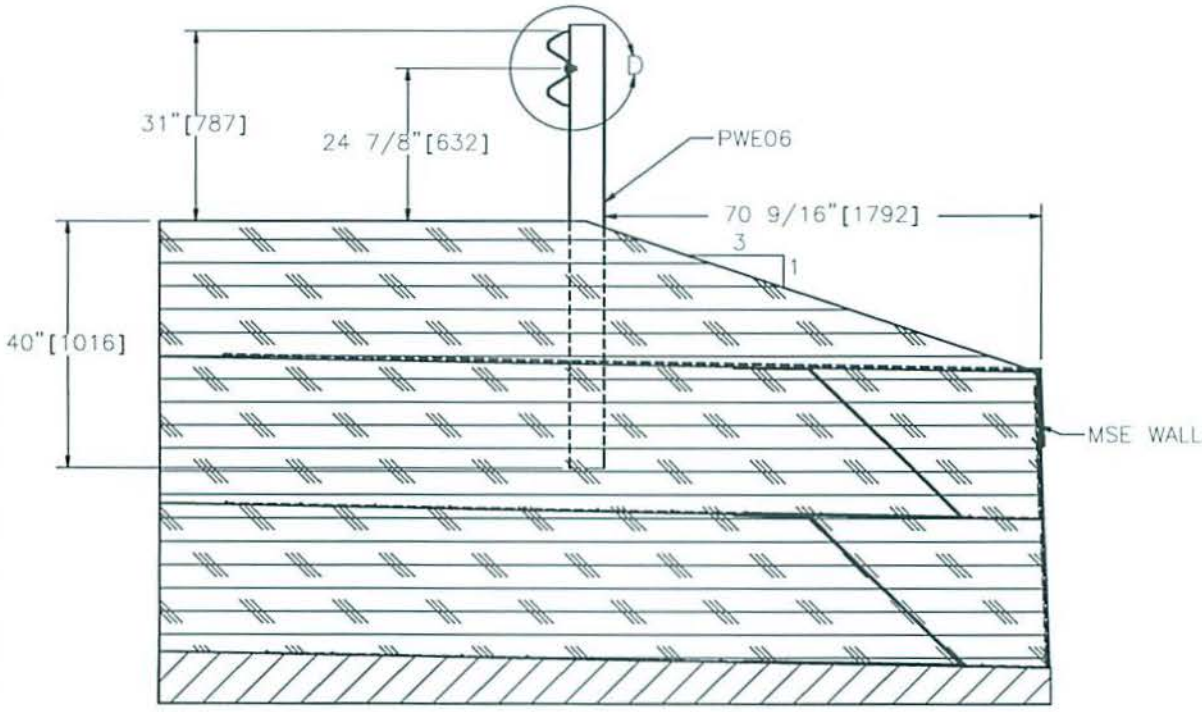
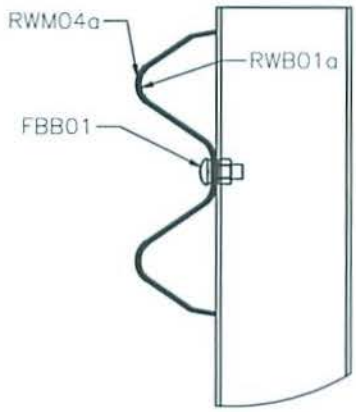


SECTION C-C



DETAIL D

MASH TL-3 NON-BLOCKED MGS ADJACENT TO A 3H:1V SLOPE ON TOP OF A WIRE-FACED, MSE WALL

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MSE SPECIFICATIONS

The wire-faced, MSE wall system is configured with three 2-ft (0.6-m) thick layers of roller-compacted, course, crushed limestone material and has a 3H:1V fill slope at the outer edge. The soil-aggregate material shall meet the select wall backfill materials denoted in Sections 255 and 704 of the 2003 FHWA *Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects*, which also closely conforms to the Grading B specifications of AASHTO M147-65 denoted in MASH and NCHRP Report No. 350. The outer region of the bottom two layers shall contain a wall facing fill material that consists of 4 to 6-in. (102 to 152-mm) diameter rocks that shall be placed by hand. Steel-wire reinforcement mats are used to construct and stabilize the MSE wall system.

MASH TL-3 NON-BLOCKED MGS ADJACENT TO A 3H:1V SLOPE ON TOP OF A WIRE-FACED, MSE WALL

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