U.S. Department of Transportation
Federal Highway Administration

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

April 24, 2026

In Reply Refer To:
HSST-1/B-393

Diego Santiago Gonzalez
Road Steel Engineering SL
Paseo De Belen, 11 Edificio UVainnova-Campus
1778 Valladolid. 47011
Spain

Dear Mr. Gonzalez:

We received your correspondence on April 4, 2024, requesting issuance of a Federal-aid reimbursement eligibility letter under the Federal-aid highway program for the roadside safety system, device, design, product, or hardware (collectively "device") described below. We write to inform you that the device Rent-a-Flash Type II Barricade is eligible for Federal-aid reimbursement. This letter is assigned Federal Highway Administration (FHWA) control number B-393.

ELIGIBILITY LETTERS

The FHWA issues Federal-aid reimbursement eligibility letters for new roadside safety devices that are crash tested in accordance with the industry standard of the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH).

FHWA, the Department of Transportation, and the United States (government) do not regulate roadside safety devices, crash test facilities, or the manufacturing industry. Issuance of eligibility letters is discretionary and provided only as a service to the states. FHWA may, at its discretion, decline to issue, revise, or rescind an eligibility letter. Eligibility letters are only issued by the FHWA Office of Safety.

Eligibility letters are issued only as notice to the states that a device is eligible for reimbursement under the Federal-aid highway program. They do not establish approval or certification for any other purpose. Issuance of an eligibility letter is not a prerequisite or requirement for state transportation agencies seeking to use Federal-aid funds for roadside safety devices. State agencies may use a device for which an eligibility letter has not been issued and seek Federal-aid reimbursement.

FEDERAL-AID REIMBURSEMENT

The request for issuance of this letter certified the device was crash tested in accordance with the industry standard of AASHTO's MASH. This eligibility letter is based on that certification and

the material offered in support of its issuance. The device described below is eligible for reimbursement under the Federal-aid highway program.

Name of system: Trionda S2-TL4 MASH Barrier
Type of system: Longitudinal Barrier
Test Level: Test Level 4
Testing conducted by: CIDUAT Road Infrastructure Laboratory
Date of request: April 4, 2024

The device and as-tested condition(s) is described as follows:

TRION DA S2-TL4 MASH is a high containment guardrail made entirely of galvanized steel, consisting of thrie beam rails supported by steel posts with steel spacers. The three-beam rails, posts, and spacers are made of hot-rolled steel sheet with quality S355JR according to EN ISO 10025 and are hot-dip galvanized according to EN ISO 1461. The thrie-beam has a nominal thickness of 2.5 mm. The posts have a C section of 125x80x25 mm, with a nominal thickness of 4.5 mm and a length of 1950 mm. The spacers have a C section of 100x60x25 mm, with a nominal thickness of 4.5 mm and a length of 290 mm. For installation, the top of the thrie-beam rail is located 1000 mm above the ground. The posts are placed every 1.905 m and are installed at a height of 940 mm from the ground. The fixing screws between the thrie-beam rail and the spacers are TBC M16x50 class 8.8 round head bolts, 100x40x5 mm rectangular plates of S235JR quality according to the EN ISO 10025 standard, M 16 washers, and M 16 nuts, following the UNE 135122 standard. Spacers are screwed to the posts using CRF-10.5 M 16x50 class 5.8 round head bolts, 100x40x5 mm, and 35x35x5 mm rectangular plates of S235JR quality according to EN ISO 10025 and Ml 6 nuts following the UNE 135122 standard. Thrie-beam rails use TBC M16x30 class 5.8 round head bolts, Ml 6 washers, and Ml 6 nuts, following the UNE 135122 standard. The CRF-10.5 M 16x50 bolts that join the spacer and the post are tightened with a torque between 30 Nm and 50 Nm. The bolts that join consecutive fences and those that join the spacers and rails are tightened with a torque between 80 Nm and 100 Nm.

Information about the device, including material such as the eligibility request, crash test reports, drawings, or images are included in one or more attachment(s) to this letter.

Eligibility letter B-393 is inapplicable to devices, optional equipment, alternate materials, or other features that were not crash tested in accordance with AASHTO's MASH.

This letter is issued only for the subject device as crash tested under AASHTO's MASH. Later modification(s) of the device are not eligible for Federal-aid reimbursement under this letter. Notice of later modification(s) should be given to transportation agencies, facility owners, and operators (collectively "agencies").

Agencies should be provided appropriate information about the device's design, installation, maintenance, materials, and mechanical properties.

Issuance of this letter is discretionary, and it may be revised or rescinded at FHWA's discretion. This letter is not a determination of compliance with the Build America Buy America Act, the

Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) or ownership of any intellectual property rights.

This eligibility letter is not a determination by the government that a crash involving the subject device will result in any particular outcome. It is limited to only the device's eligibility for Federal-aid reimbursement.

INTELLECTUAL PROPERTY

Issuance of this eligibility letter does not convey property rights of any sort nor any exclusive privilege. This letter is not authorization or consent by the government for the use, manufacture, or sale of any patented or proprietary system, device, design, product, or hardware for which the requester is not the patent owner. Eligibility letters are not an expression of any view, position, or determination by the government as to the validity, scope, or ownership of any intellectual property rights to a specific device. These letters do not grant, impute, suggest, or otherwise establish any ownership, distribution, or licensing rights to the requester. The government expresses no opinion about the intellectual property rights relating to any device for which this or any other eligibility letter is issued.

PUBLIC DISCLOSURE

To prevent any misunderstanding, and as discussed above, this Federal-aid eligibility letter is assigned FHWA control number B-393. It should only be reproduced in full with its attachment(s). This Federal-aid eligibility letter and the material offered by the requester supporting its issuance is public information. All eligibility letters and supporting material are subject to public disclosure under the Freedom of Information Act (FOIA). Eligibility letters are available to the public at https://safety.fhwa.dot.gov/roadway_dept/countermeasures/reduce_crash_severity/.

If you have any questions please contact Paul LaFleur at Paul.LaFleur@dot.gov.

Sincerely,

Jessie Yung
Director, Office of Safety Technologies
Office of Safety

Enclosures

Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

Submitter	Date of Request:	April 04, 2024	◉ New ○ Resubmission
	Name:	DIEGO SANTIAGO GONZALEZ	
	Company:	ROAD STEEL ENGINEERING SL AND GONVARRI MS COLOMBIA SAS	
	Address:	PASEO DE BELEN 11 EDIF UVAINNOVA 1778 VALLADOLID. 47011	
	Country:	SPAIN	
	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
'B': Rigid/Semi-Rigid Barriers (Roadside, Median, Bridge Railings)	◉ Physical Crash Testing ○ Engineering Analysis	TRIONDA S2-TL4 MASH	AASHTO MASH	TL4

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:	DIEGO SANTIAGO GONZALEZ	Same as Submitter ☒
Company Name:	ROAD STEEL ENGINEERING SL AND GONVARRI MS COLOMBIA SAS	Same as Submitter ☒
Address:	PASEO DE BELEN 11 EDIF UVAINNOVA 1778 VALLADOLID. 47011	Same as Submitter ☒
Country:	SPAIN	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.

CIDAUT completes testing activities for ROAD STEEL ENGINEERING, S.L. and GONVARRI MS COLOMBIA, S.A.S. for the completion of this servicing. CIDAUT receives payment in the form of professional fees. In no circumstances are fees received linked to the performance of the product nor the outcome of the test.
CIDAUT does not have, nor has it ever had, any financial interest in ROAD STEEL ENGINEERING, S.L. and GONVARRI MS COLOMBIA, S.A.S. or any of the products that they sell.

PRODUCT DESCRIPTION

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

TRIONDA S2-TL4 MASH is a high containment guardrail made entirely of galvanized steel, consisting of thrie-beam rails supported by steel posts with steel spacers. The three-beam rails, posts, and spacers are made of hot-rolled steel sheet with quality S355JR according to EN ISO 10025 and are hot-dip galvanized according to EN ISO 1461. The thrie-beam has a nominal thickness of 2.5 mm. The posts have a C section of 125x80x25 mm, with a nominal thickness of 4.5 mm and a length of 1950 mm. The spacers have a C section of 100x60x25 mm, with a nominal thickness of 4.5 mm and a length of 290 mm. For installation, the top of the thrie-beam rail is located 1000 mm above the ground. The posts are placed every 1.905 m and are installed at a height of 940 mm from the ground. The fixing screws between the thrie-beam rail and the spacers are TBC M16x50 class 8.8 round head bolts, 100x40x5 mm rectangular plates of S235JR quality according to the EN ISO 10025 standard, M16 washers, and M16 nuts, following the UNE 135122 standard. Spacers are screwed to the posts using CRF-10.5 M16x50 class 5.8 round head bolts, 100x40x5 mm, and 35x35x5 mm rectangular plates of S235JR quality according to EN ISO 10025 and M16 nuts following the UNE 135122 standard. Thrie-beam rails use TBC M16x30 class 5.8 round head bolts, M16 washers, and M16 nuts, following the UNE 135122 standard. The CRF-10.5 M16x50 bolts that join the spacer and the post are tightened with a torque between 30 Nm and 50 Nm. The bolts that join consecutive fences and those that join the spacers and rails are tightened with a torque between 80 Nm and 100 Nm.

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:	J. ALBERTO DE PRADO RODRIGUEZ	
Engineer Signature:		
Address:	PARQUE TECN BOECILLO P-209, VALLADOLID. 47151	Same as Submitter ☐
Country:	SPAIN	Same as Submitter ☒

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
4-10 (1100C)	MASH 4-10 Test No. E23-0800 Test Date - June 22nd, 2023 Test Report No. 1740-230509/ 03_ENG The "TRIONDA S2-TL4 MASH" High containment guardrail contained and redirected the 1100C vehicle. The vehicle did not penetrate, underride, or override the installation. Maximum dynamic deflection during the test was 2.32 ft. No detached elements, fragments, or other debris from the system tested were present to penetrate or to show potential for penetrating the 1100C vehicle, or to present hazard to others in the area. Maximum occupant compartment deformation was 4.3 inches in the front-left lateral pannel area. The 1100C vehicle remained upright during and after the collision event. Maximum roll and pitch angles were 15 degrees and 13 degrees, respectively. Longitudinal occupant impact velocity was 26.5 ft/s, and lateral occupant impact velocity was 17.1 ft/s. Maximum longitudinal occupant ridedown acceleration was 14.8 G, and maximum lateral occupant ridedown acceleration was 8.1 G. The 1100C vehicle exited within the exit box specifications.	PASS

Required Test Number	Narrative Description	Evaluation Results
4-11 (2270P)	MASH 4-11 Test No. E23-0645 Test Date - May 22nd, 2023 Test Report No. 1740-230509/ 03_ENG The "TRIONDA S2-TL4 MASH" High containment guardrail contained and redirected the 2270P vehicle. The vehicle did not penetrate, underride, or override the installation. Maximum dynamic deflection during the test was 2.82 ft. No detached elements, fragments, or other debris from the system tested were present to penetrate or to show potential for penetrating the 2270P vehicle, or to present hazard to others in the area. Maximum occupant compartment deformation was 1.0 inches in the driver door area. The 2270P vehicle remained upright during and after the collision event. Maximum roll and pitch angles were 4 degrees and -5 degrees, respectively. Longitudinal occupant impact velocity was 24.3 ft/s, and lateral occupant impact velocity was 14.8 ft/s. Maximum longitudinal occupant ridedown acceleration was 5.1 G, and maximum lateral occupant ridedown acceleration was 8.2 G. The 2270P vehicle exited within the exit box specifications, crossing the line 57.9 ft downstream of the final intersection of wheel track with initial traffic face of barrier.	PASS
4-12 (10000S)	MASH 4-12 Test No. E23-0617 Test Date - May 16th, 2023 Test Report No. 1740-230509/ 03_ENG The "TRIONDA S2-TL4 MASH" High containment guardrail contained and redirected the 10000S vehicle. The vehicle did not penetrate, underride, or override the installation. Maximum dynamic deflection during the test was 4.08 ft. No detached elements, fragments, or other debris from the system tested were present to penetrate or to show potential for penetrating the 10000S vehicle, or to present hazard to others in the area. Maximum occupant compartment deformation was 3.5 inches at the left cockpit area. The 10000S vehicle exited within the exit box specifications.	PASS
4-20 (1100C)	Transition test is not applicable for the TRIONDA S2-TL4 MASH barrier	Non-Relevant Test, not conducted
4-21 (2270P)	Transition test is not applicable for the TRIONDA S2-TL4 MASH barrier	Non-Relevant Test, not conducted

4-22 (10000S)	Transition test is not applicable for the TRIONDA S2-TL4 MASH barrier	Non-Relevant Test, not conducted

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:	CIDAUT ROAD INFRASTRUCTURE SAFETY LABORATORY	
Laboratory Signature:		
Address:	PARQUE TECN BOECILLO P-209, VALLADOLID. 47151	Same as Submitter ☐
Country:	SPAIN	Same as Submitter ☒
Accreditation Certificate Number and Dates of current Accreditation period :	ENAC No. 412/LE858, IN FORCE SINCE APRIL 2nd, 2004	

Submitter Signature*:

Submit Form

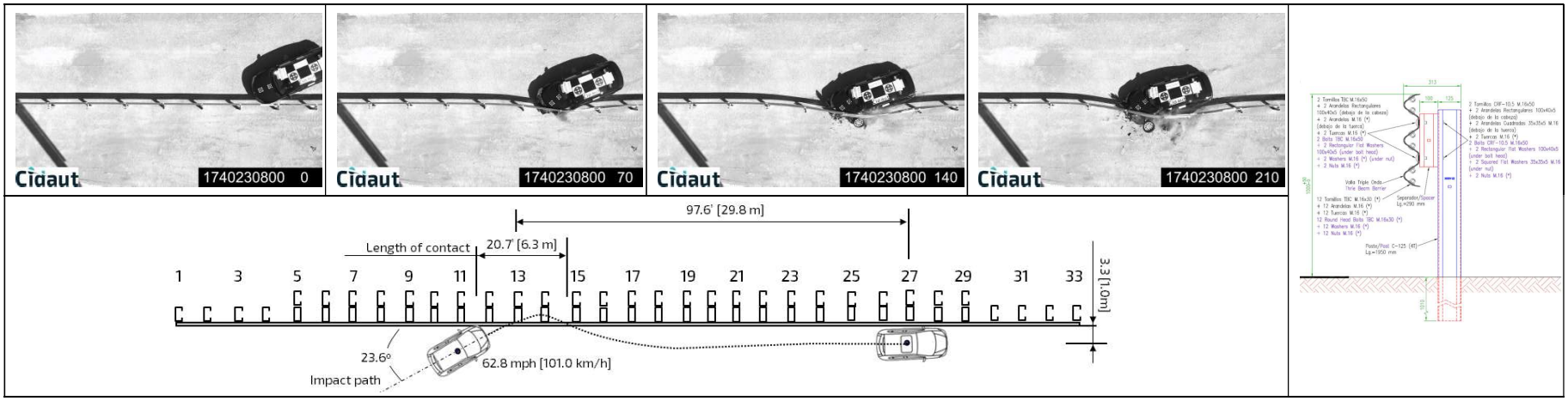
ATTACHMENTS

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



General information

Test Agency	CIDAUT Road Infrastructure Laboratory
Test Standard Test No.	MASH Test 4-10
Test No.	E23-0800
Test Date (yyyy-mm-dd)	2023-06-22

Test Article

Type	Longitudinal barrier
Name	"TRIONDA S2-TL4 MASH"
Installation Length	150,0 ft (without terminals)
Material or Key Elements	Thrie-beam, C125x80 post, spacer C100

Soil

Soil type and condition	Standard soil, dry
Type of soil	Grading B – AASHTO M 147-65 (2004)
Description of placement	6-inch lifts tamped with compactor

Test Vehicle

Type/Designation	1100C
Make and Model	2017 Seat Toledo Sedan
Curb mass	2418 lb
Test Inertial mass	2451 lb
Dummy	165 lb
Gross Static mass	2616 lb

Impact conditions

Speed	62.8 mi/h
Angle	23.6°
Location/Orientation	10.1 ft upstream of post 13

Exit Conditions

Speed	24.3 mi/h
Angle	10.3°
Exit Box criterion	Pass

Occupant Risk Values

Impact Velocity	
Longitudinal	26.5 ft/s
Lateral	-17.1 ft/s
Ridedown Accelerations	
Longitudinal	-14.8 g
Lateral	8.1 g
THIV	9.3 m/s
PHD	14.8 g
ASI	1.0
Max. 0.050-s Average	
Longitudinal	-9.7 g
Lateral	6.3 g
Vertical	4.1 g

Post-Impact Trajectory

Stopping Distance	97.6 ft downstream
	3.3 ft twd traffic face

Vehicle Stability

Maximum Yaw Angle	12°
Maximum Pitch Angle	-13°
Maximum Roll Angle	-15°
Vehicle Snagging	No
Vehicle Pocketing	No

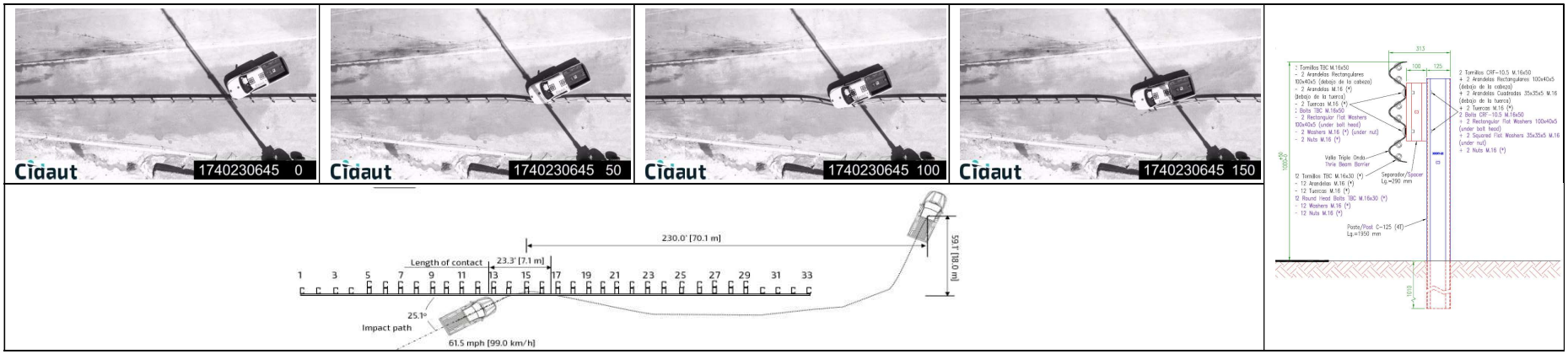
Test Article Deflections

Dynamic	2.32 ft
Permanent	1.04 ft
Working Width	2.67 ft

Vehicle damage

VDS	11FL4
CDC	11FDEW3
Max. Exterior Deformation	16.5 inches
OCDI	LF0000010
Max. Occupant Compartment Deformation	4.3 inches
Impact severity	51.7 kip-ft (-7.5%)
Internal Code	1740230800

Figure 7.9. Summary of Result for MASH Test 4-10 on "TRIONDA S2-TL4 MASH" High containment guardrail.



General information

Test Agency	CIDAUT Road Infrastructure Laboratory
Test Standard Test No.	MASH Test 4-11
Test No.	E23-0645
Test Date (yyyy-mm-dd)	2023-05-22

Test Article

Type	Longitudinal barrier
Name	"TRIONDA S2-TL4 MASH"
Installation Length	150,0 ft (without terminals)
Material or Key Elements	Thrie-beam, C125x80 post, spacer C100

Soil

Soil type and condition	Standard soil, dry
Type of soil	Grading B – AASHTO M 147-65 (2004)
Description of placement	6-inch lifts tamped with compactor

Test Vehicle

Type/Designation	2270P
Make and Model	2017 Dodge Ram 1500
Curb mass	4857 lb
Test Inertial mass	4974 lb
Dummy	No dummy
Gross Static mass	4974 lb

Impact conditions

Speed	61.5 mi/h
Angle	25.1°
Location/Orientation	13.7 ft upstream of post 15

Exit Conditions

Speed	41.4 mi/h
Angle	12.2°
Exit Box criterion	Pass

Occupant Risk Values

Impact Velocity	
Longitudinal	24.3 ft/s
Lateral	-14.8 ft/s
Ridedown Accelerations	
Longitudinal	-5.1 g
Lateral	8.2 g
THIV	8.6 m/s
PHD	8.5 g
ASI	0.8
Max. 0.050-s Average	
Longitudinal	-7.3 g
Lateral	6.3 g
Vertical	-2.3 g

Post-Impact Trajectory

Stopping Distance	230.0 ft downstream
	59.1 ft twd field side

Vehicle Stability

Maximum Yaw Angle	37°
Maximum Pitch Angle	-5°
Maximum Roll Angle	-4°
Vehicle Snagging	No
Vehicle Pocketing	No

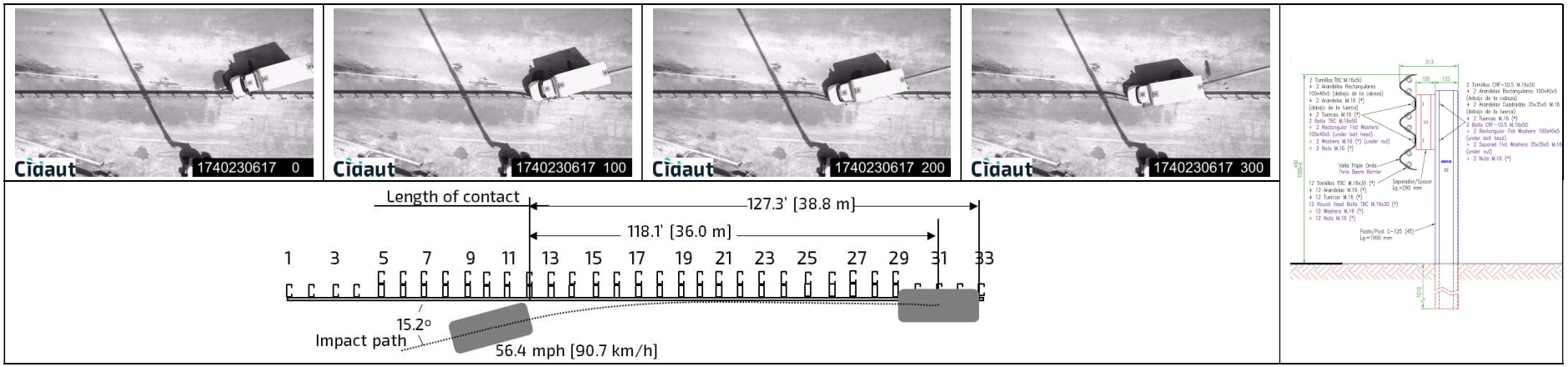
Test Article Deflections

Dynamic	2.82 ft
Permanent	2.19 ft
Working Width	3.57 ft

Vehicle damage

VDS	11FL2
CDC	11FYEW2
Max. Exterior Deformation	11.0 inches
OCDI	LF0000000
Max. Occupant Compartment Deformation	1.0 inches
Impact severity	113.2 kip-ft (-1.9%)
Internal Code	1740230645

Figure 6.9. Summary of Result for MASH Test 4-11 on "TRIONDA S2-TL4 MASH" High containment guardrail.



General information

Test Agency	CIDAUT Road Infrastructure Laboratory
Test Standard Test No.	MASH Test 4-12
Test No.	E23-0617
Test Date (yyyy-mm-dd)	2023-05-16

Test Article

Type	Longitudinal barrier
Name	"TRIONDA S2-TL4 MASH"
Installation Length	150,0 ft (without terminals)
Material or Key Elements	Thrie-beam, C125x80 post, spacer C100

Soil

Soil type and condition	Standard soil, dry
Type of soil	Grading B – AASHTO M 147-65 (2004)
Description of placement	6-inch lifts tamped with compactor

Test Vehicle

Type/Designation	10000S
Make and Model	2010 International Durastar 4300
Curb mass	14695 lb
Test Inertial mass	21644 lb
Dummy	No dummy
Gross Static mass	21644 lb

Impact conditions

Speed	56.4 mi/h
Angle	15.2°
Location/Orientation	5.6 ft upstream of post 13

Exit Conditions

Speed	Not applicable
Angle	Not applicable
Exit Box criterion	Pass

Occupant Risk Values

Impact Velocity	
Longitudinal	12.3 ft/s
Lateral	-8.3 ft/s
Ridedown Accelerations	
Longitudinal	-4.8 g
Lateral	7.4 g
THIV	4.2 m/s
PHD	7.8 g
ASI	0.4
Max. 0.050-s Average	
Longitudinal	-3.1 g
Lateral	3.6 g
Vertical	-2.5 g

Post-Impact Trajectory

Stopping Distance	118.1 ft downstream 0.0 ft twd traffic face

Vehicle Stability

Maximum Yaw Angle	20°
Maximum Pitch Angle	-16°
Maximum Roll Angle	-73°
Vehicle Snagging	No
Vehicle Pocketing	No

Test Article Deflections

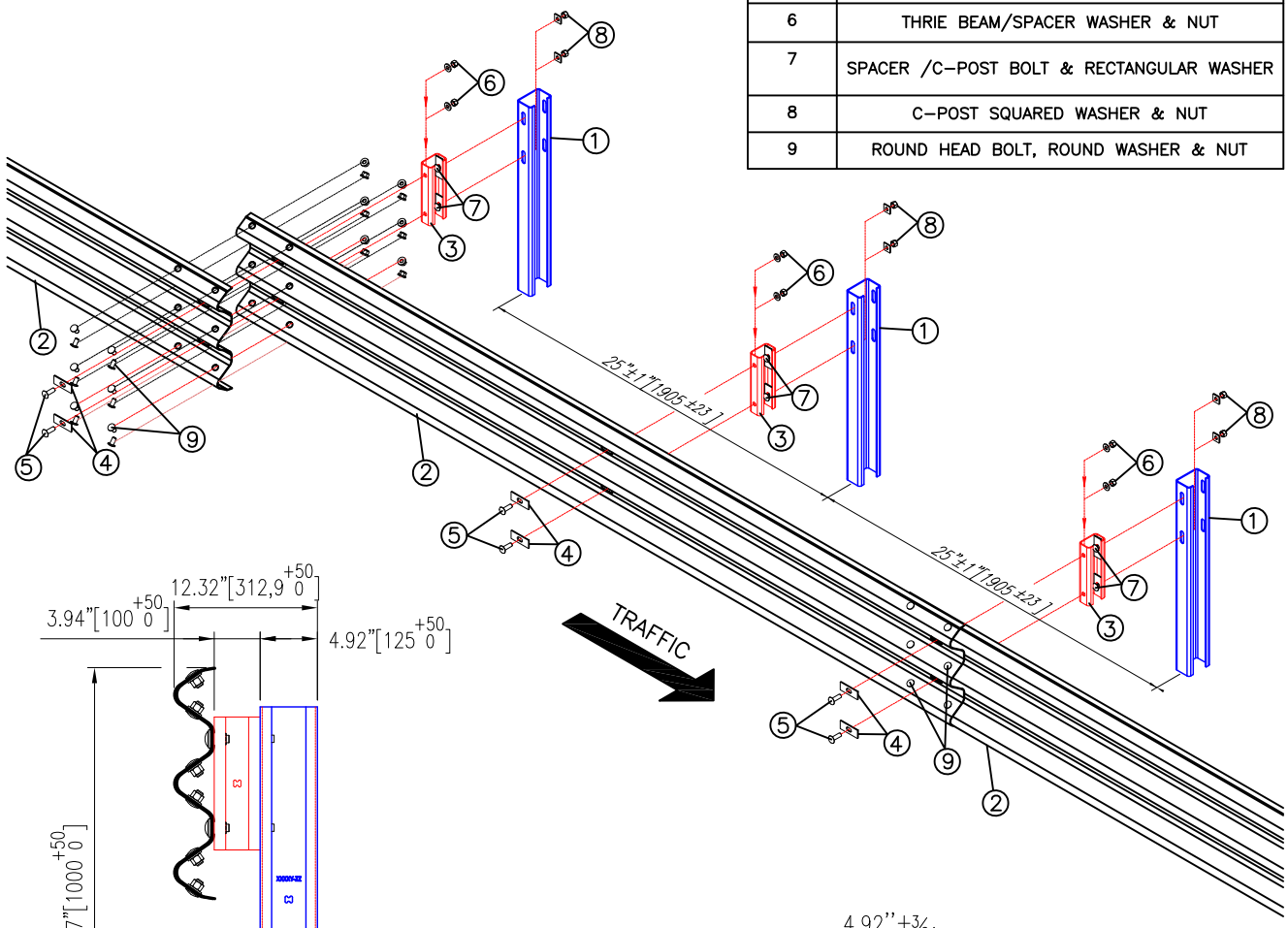
Dynamic	4.08 ft
Permanent	2.64 ft
Working Width	8.84 ft

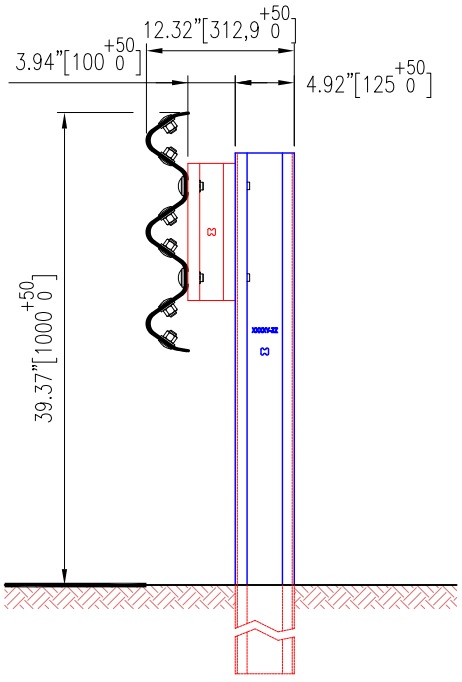
Vehicle damage

VDS	11L&T2
CDC	11LYEW3
Max. Exterior Deformation	13.4 inches
OCDI	LF1010100
Max. Occupant Compartment Deformation	3.5 inches
Impact severity	158.0 kip-ft (+2.3%)
Internal Code	1740230617

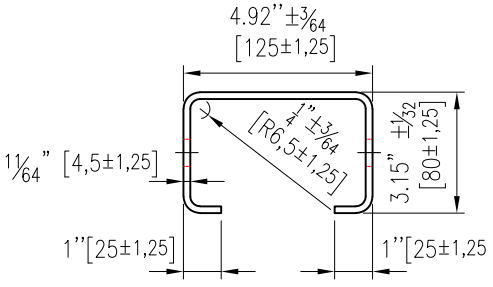
Figure 5.9. Summary of Result for MASH Test 4-12 on "TRIONDA S2-TL4 MASH" High containment guardrail.

BILL OF MATERIALS	
1	C–POST
2	THRIE BEAM GUARDRAIL
3	SPACER
4	THRIE BEAM WASHER
5	THRIE BEAM/SPACER BOLT
6	THRIE BEAM/SPACER WASHER & NUT
7	SPACER /C–POST BOLT & RECTANGULAR WASHER
8	C–POST SQUARED WASHER & NUT
9	ROUND HEAD BOLT, ROUND WASHER & NUT





C–POST ELEVATION



C–POST PLAN

"TRIONDA S2–TL4 MASH" HIGH CONTAINMENT GUARDRAIL

Road Steel Engineering

Gonvarri Colombia

S2–TL4MASH–271023–FHWA–001

SHEET NO.	DATE:
1 of 2	27/10/23

INTENDED USE

"TRIONDA S2–TL4 MASH" is a fully compliant TL4 MASH longitudinal guardrail barrier system and it can be used in TL4 design locations where maximum dynamic deflection of 4.07ft. or less is acceptable. "TRIONDA S2–TL4 MASH" system must be anchored with a suitable terminal system. The system post spacing is 75 inches [1905 mm].

COMPONENTS (unit lenght 150 in [3810]

Component	Quantity
Thrie–beam rail 4130 mm	1
Post C–125x80x4.5	2
Spacer Thickness 4.5 mm	2
Round Head Bolt TBC M.16x30 Class 5.8	12
Round Head Bolt TBC M.16x50 Class 8.8	4
Bolt CRF–10.5 M.16x50 Class 5.8	4
Rectangular Flat Washer 100x40x5 ø18 mm	8
Squared Flat Washer 35x35x5 ø18 mm	4
Circular Washer M.16 ø18 mm	16
Nut M.16 Class 5	20

CONTACT INFORMATION

Road Steel Engineering
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47011–Valladolid, España (Spain) Tel: (+34) 983 990 468
e–mail:info@roadsteel.com–http://www.roadsteel.com