

SUBCOMMITTEE #1

PUBLICATIONS MAINTENANCE



October 19, 2023

Fall Meeting

HARDWARE GUIDE

A Standardized Reference Guide to Roadside Hardware

ERIC LOHREY, P.E.

ECL ENGINEERING, PLLC

TF13 GUIDE MANAGER

TF13 WEBSITE & ROADSIDE HARDWARE GUIDE

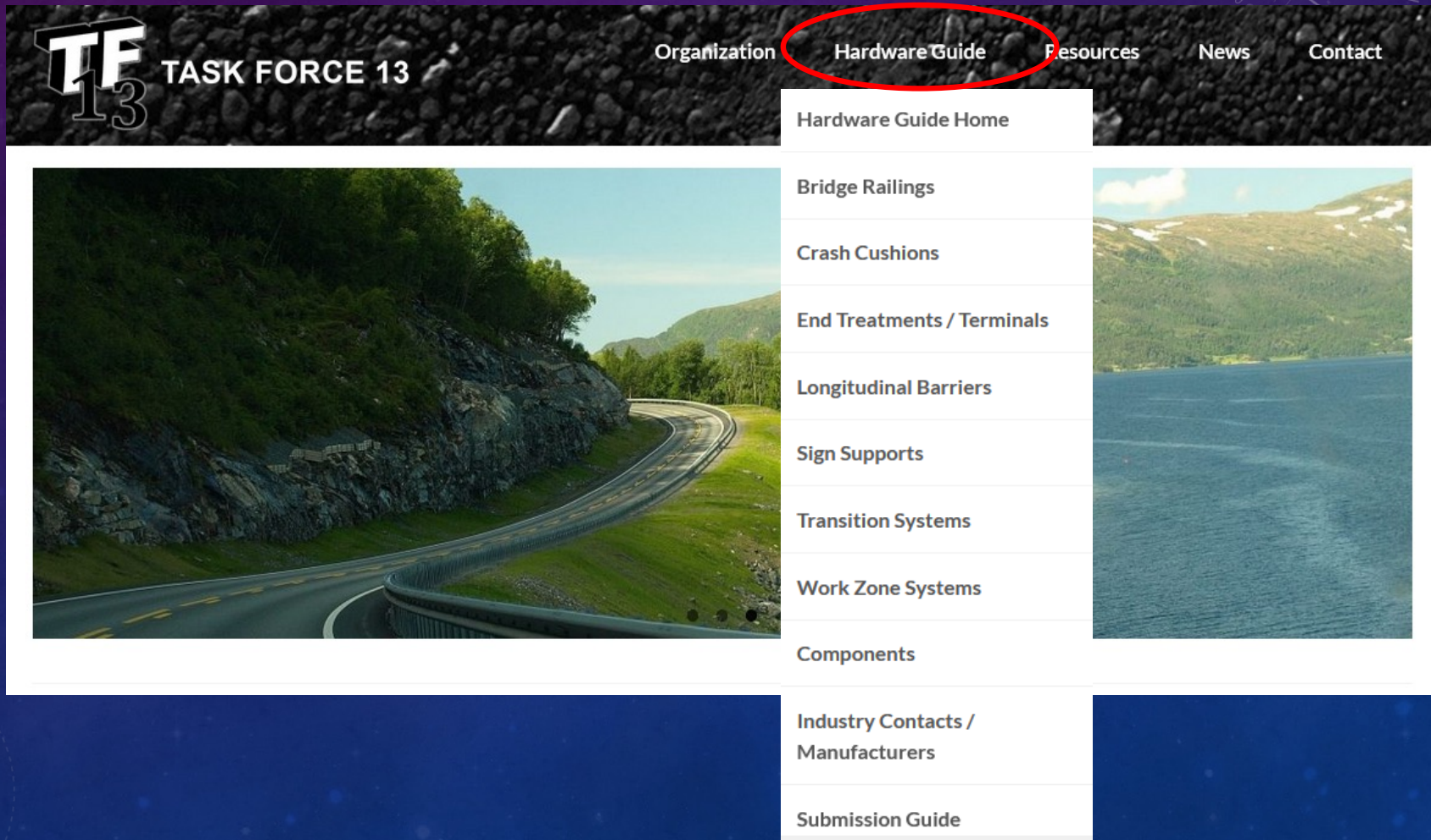
- Website & Guide **TF13.org**

- Roadside Hardware Guide

- Searchable Database of Roadside Hardware

- [Crashworthy Systems](#)
- [Components](#)

TF13 WEBSITE & ROADSIDE HARDWARE GUIDE

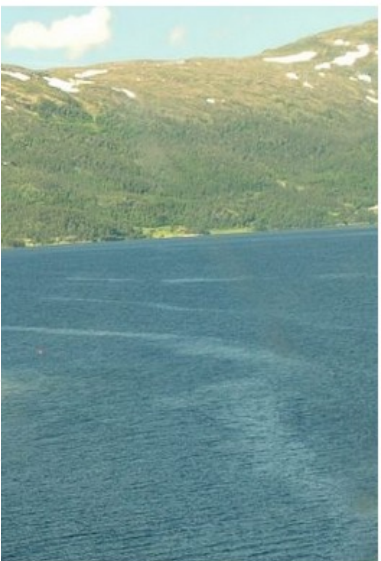



The image shows a screenshot of the TF13 Task Force 13 website. The top navigation bar includes links for Organization, Hardware Guide (circled in red), Resources, News, and Contact. The Hardware Guide dropdown menu is open, listing various roadside hardware categories. On the left, there is a large image of a winding road with a guardrail. On the right, there is a smaller image of a lake and mountains.

TF13 TASK FORCE 13

Organization **Hardware Guide** Resources News Contact

- Hardware Guide Home
- Bridge Railings
- Crash Cushions
- End Treatments / Terminals
- Longitudinal Barriers
- Sign Supports
- Transition Systems
- Work Zone Systems
- Components
- Industry Contacts / Manufacturers
- Submission Guide



TF13 ROADSIDE HARDWARE GUIDE

Bridge Railing Search

Browse and Search

Nomenclature

Show All entries

Search:

Designator and Name	Image	Material	Test Specification	Test Level	Perm/Temp	Mounting Type	Deck Type	Aesthetic	See-Thru	Retrofit	Combo	Contact
<input type="text" value="Search"/>		<input type="text" value="Any"/>	<input type="text" value="Any"/>	<input type="text" value="Any"/>	<input type="text" value="Any"/>	<input type="text" value="Any"/>	<input type="text" value="Any"/>	<input type="text" value="Any"/>	<input type="text" value="Any"/>	<input type="text" value="Any"/>	<input type="text" value="Any"/>	<input type="text" value="Search"/>

SBA02b

Foothills Parkway Bridge Railing



Aluminum (A)	AASHTO Guide Spec for Bridge Railings	TL-2	Permanent	Parapet	Conventional Reinforced Concrete	Yes	Yes	No	No	Valentine & Company
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SBA03b

North Carolina Standard 1-Bar



Aluminum (A)	AASHTO Guide Spec for Bridge Railings	TL-2	Permanent	Parapet	Other	Yes	Yes	No	No	North Carolina DOT
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PennDOT PA Type 10M Bridge Barrier



Designator

SBB48d

Designator	SBB48d
Material	Steel Tube/Box (B)
Test Specification	AASHTO MASH 2016
Test Level	TL-4
Perm/Temp	Permanent
Mounting Type	Parapet
Deck Type	Conventional Reinforced Concrete
Aesthetic	No
See-Through	Yes
Retrofit	No
Combo Traffic/Pedestrian	No
Contact	Pennsylvania Department of Transportation
Drawing Status	Review Complete
Manufacturer	Non-Proprietary
FHWA Eligibility Letter	B-333.pdf
Components	
Drawings	SBB48d_PennDOT-BD617M.pdf SBB48d_PennDOT-BC709M.pdf
Other Docs	
Archive	
External Links	



Industry Contacts / Manufacturers

Show All entries

Search:

Logo	Organization	Name	Web Page
	Akron Foundry Company	Robert A. Sik	https://www.akronfoundry.com/
	Alaska Department of Transportation	Alaska Department of Transportation	http://dot.alaska.gov/
	Allied Tube & Conduit	Allied Tube & Conduit	https://www.atc-mechanical.com/telespar/
	ArcelorMittal USA, LLC	Richard Clausius	https://corporate.arcelormittal.com/
	Asset Integrity Management Solutions, LLC	AIMS Composites	https://aimscomposites.com/
	Bexar Concrete Works I, Ltd.	Bexar Concrete Works I, Ltd.	
	Brifen USA, Inc.	Richard Butler	http://brifenusa.com/
	California Department of Transportation	Roadside Safety Research Group	https://dot.ca.gov/

California Department of Transportation

Contact Name Roadside Safety Research Group

Email

Address

1801 30th Street, MS 9-2/9i, Sacramento, CA 95816

Phone

916-227-8676

Url

<https://dot.ca.gov/>

Logo



Bridge Railings

- CA Type ST-30
- CA Type ST-40 (NETC 4-Bar)
- CA Type 732
- CA Type 80
- California Type 90 Concrete/Steel Bridge Railing
- CA Type ST-10
- CA Type 80 SW
- CA Type ST-20
- California Type 732SW Bridge Railing

Longitudinal Barriers

- Low-Profile Reinforced Concrete Barrier, TL-2

TF13 GUIDE – NEW SYSTEMS

SBB54c – PA 3-Rail Bridge Barrier, TL-3

[FHWA Letter B-367]



TF13 GUIDE – NEW SYSTEMS

SBB56d – TxDOT C2P Bridge Rail, TL-4

[FHWA Letter B-369]



TF13 GUIDE – NEW SYSTEMS

SGM48a – PennDOT 50" Tall Precast F-shape Concrete Barrier Keyed in 4" of Asphalt [FHWA Letter B-369]



TF13 GUIDE – NEW SYSTEMS

SGM47a – SAFENCE 4RC-19CC3.0, TL-4

[FHWA Letter B-368]



TF13 GUIDE – NEW SYSTEMS

SSF43a – SQR-LOC Yielding Sign Support System-Single Post

[FHWA Letter SS-187]

Technical drawing showing three views of the SQR-LOC Yielding Sign Support System-Single Post:

- FRONT:** Shows a signpost with a sign. Dimensions include a signpost diameter of 36 [91.4], a signpost offset of 1 1/2 [38], and a minimum signpost height of 84 [213.4].
- SIDE:** Shows the signpost with a dimension labeled "LENGTH AS REQUIRED".
- BACK:** Shows the signpost with a sign.

2023

SQR-LOC® YIELDING SIGN SUPPORT SYSTEM- SINGLE POST

		SSFXXa	
SHEET NO.	DATE		
1 of 4	2/14/2023		

SSP-1021 Rev 1 02/23

INTENDED USE

The SQR-LOC® perforated steel tubular sign support system is a single post sign support system. The system utilizes a drivable anchor sleeve in standard soil. The sign support system was successfully crash tested to TL-3 in accordance with MASH 2016 guidelines. This system meets the requirements of the AASHTO *LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 1st Edition, 2015*.

FEATURES

The SQR-LOC® perforated steel tubular sign support system consists of a 2.50 inch 10 GA perforated square steel tube signpost and a square steel anchor sleeve (sheet 3 of 4). The signpost slides into the anchor sleeve and is secured in place by a 5/16" corner bolt and nut. The drivable anchor sleeve is manufactured from 3 inch square 7 GA steel tubing per ASTM A500 and galvanized per ASTM A123. The material for the pre-coated steel signpost tubing conforms to ASTM A653. The exterior surface is coated with minimum 0.5 mils clear acrylic polymer.

ELIGIBILITY

The SQR-LOC® single post, perforated steel tubular sign support system has been tested to MASH 2016 Test Level 3 and is eligible for Federal reimbursement by FHWA.

FHWA Eligibility Letter(s): XX-XXX dated _____ for MASH 2016 Test Level 3.

REFERENCES

Manual for Assessing Safety Hardware (MASH), American Association of State Highway and Transportation Officials (AASHTO), 2016.

CONTACT INFORMATION

15601 Dallas Parkway, Suite 525 Addison, TX 75001
 Telephone: (888) 323-6374
 www.valtir.com

SQR-LOC® YIELDING SIGN SUPPORT SYSTEM- SINGLE POST

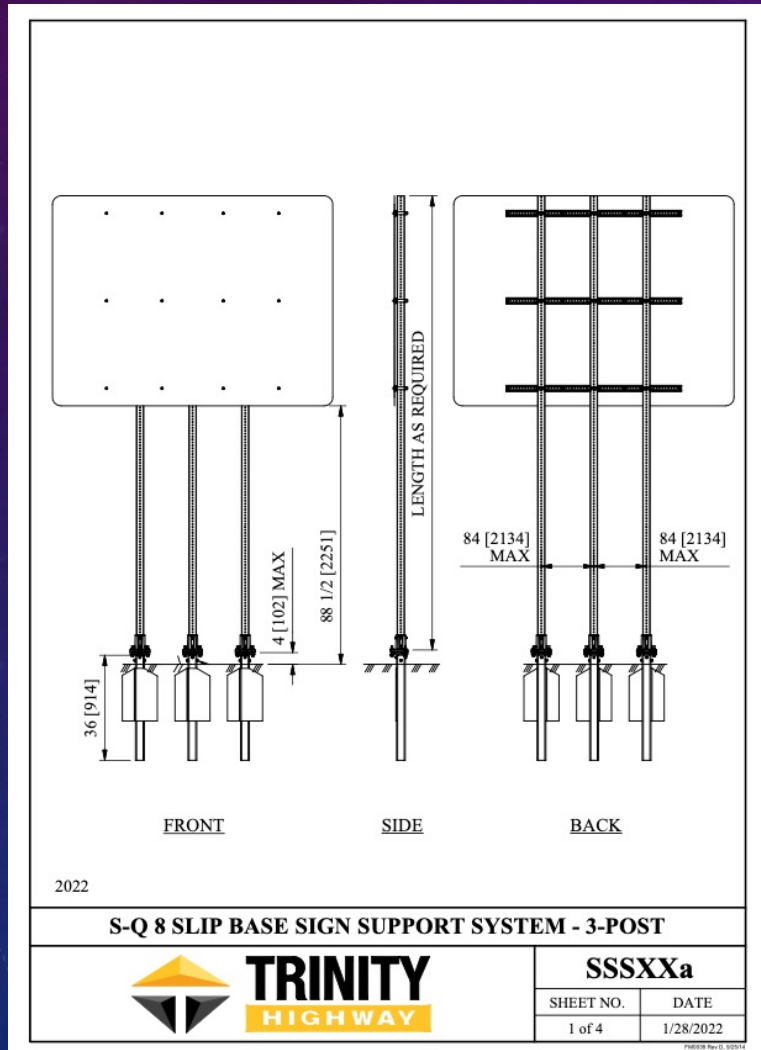
SSFXXa			
SHEET NO.	DATE		
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SSP-1021 Rev 1 02/23

TF13 GUIDE – NEW SYSTEMS

SSS23a – S-Q 8 Slip Base Sign Support System 3-Post

[FHWA Letter SS-189]



INTENDED USE

The S-Q 8 perforated steel tubular sign support system is a three (3) post sign support slip base system. The system utilizes drivable anchor sleeves with a soil bearing plate in standard soil. The sign support system was successfully crash tested to TL-3 in accordance with MASH 2016 guidelines. This system meets the requirements of the AASHTO *LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 1st Edition*.

FEATURES

The S-Q 8 perforated steel tubular sign support system consists of three (3) 2.50 inch 12 GA square perforated steel signposts and three (3) 3.00 inch 7 GA square steel anchor sleeves with soil bearing plate (sheet 3 of 4). The slip base system consists of a slip base stub, bolt keeper plate and slip base casting. The slip base stub is secured to the anchor sleeve with two (2) Ø3/8" shoulder bolts and the slip base casting is secured to the slip base stub with three (3) Ø1/2" bolts and nuts. The signposts slide into the slip base castings and are secured in place by two (2) Ø3/8" shoulder bolts and nuts. The material for the anchor sleeves conforms to ASTM A500 and the soil plate steel conforms to ASTM A36. The pre-coated steel material for the perforated signposts conforms to ASTM A653. The exterior surface of the signposts is coated with minimum 0.5 mils clear acrylic polymer.

ELIGIBILITY

The S-Q 8 3-Post perforated steel slip base sign support system has been tested to MASH 2016 Test Level 3 and is eligible for Federal reimbursement by FHWA.

FHWA Eligibility Letter(s): SS-XXX dated _____ for MASH 2016 Test Level 3.

REFERENCES

Manual for Assessing Safety Hardware (MASH), American Association of State Highway and Transportation Officials (AASHTO), 2016.

CONTACT INFORMATION

15601 Dallas Parkway, Suite 525
Addison, TX 75001
Telephone: (888) 323-6374
<https://trinityhighway.com>

S-Q 8 SLIP BASE SIGN SUPPORT SYSTEM - 3-POST

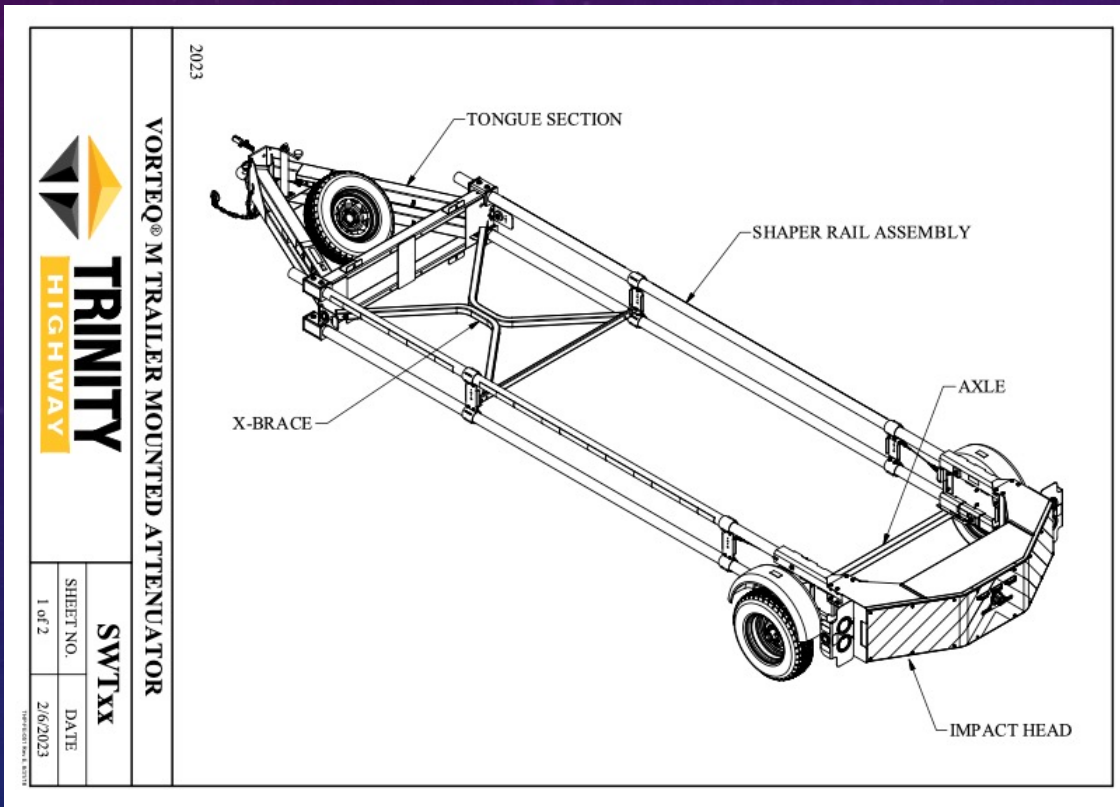
SSSXXa		
SHEET NO.	DATE	
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FHWA Rev. 6, 2021

TF13 GUIDE – NEW SYSTEMS

SWT06a – VORTEQ M Trailer-Mounted Attenuator, TL-3

[FHWA Letter CC-172]



INTENDED USE

The VORTEQ®M is a mobile crash cushion attached to the rear of a support vehicle. It is a towable system designed to be used on shadow or advanced warning vehicles upstream of moving operations or as a barrier vehicle for stationary work zones. The VORTEQ®M is designed to be used on support vehicles with a minimum weight of 12,200 lb. and an infinite maximum weight.

FEATURES

The VORTEQ®M consists of a tongue section, energy absorbing shaper rails, an axle, lighting, and an impact head with face plate, optional spare tire, and optional arrow board/message board. All major components are manufactured from steel and have a galvanized coating. There is also a flanged pintle lunette ring that bolts into location on the front of the system.

SPECIFICATIONS

- The VORTEQ®M is 294" long.
- Width is 91" wide.
- Height is 33" high.
- A system without options weighs approximately 1700 lbs.

ELIGIBILITY

The VORTEQ®M TMA has been tested in conformance to MASH 2nd Edition (2016) with 2020 Errata Test Level 3 and is eligible for Federal-aid reimbursement by FHWA. FHWA Eligibility Letter(s): CC-#### dated _____ for MASH 2016 Test Level 3

REFERENCES

American Association of State Highway and Transportation Officials (AASHTO), Manual for Assessing Safety Hardware (MASH), 2nd Edition (2016) with 2020 Errata.

CONTACT INFORMATION

15601 Dallas Parkway, Suite 525 Addison, TX 75001
 Telephone: (888) 356-2363 Fax: (800) 770-6755
<http://www.trinityhighway.com>

VORTEQ® M TRAILER MOUNTED ATTENUATOR

SWTxx

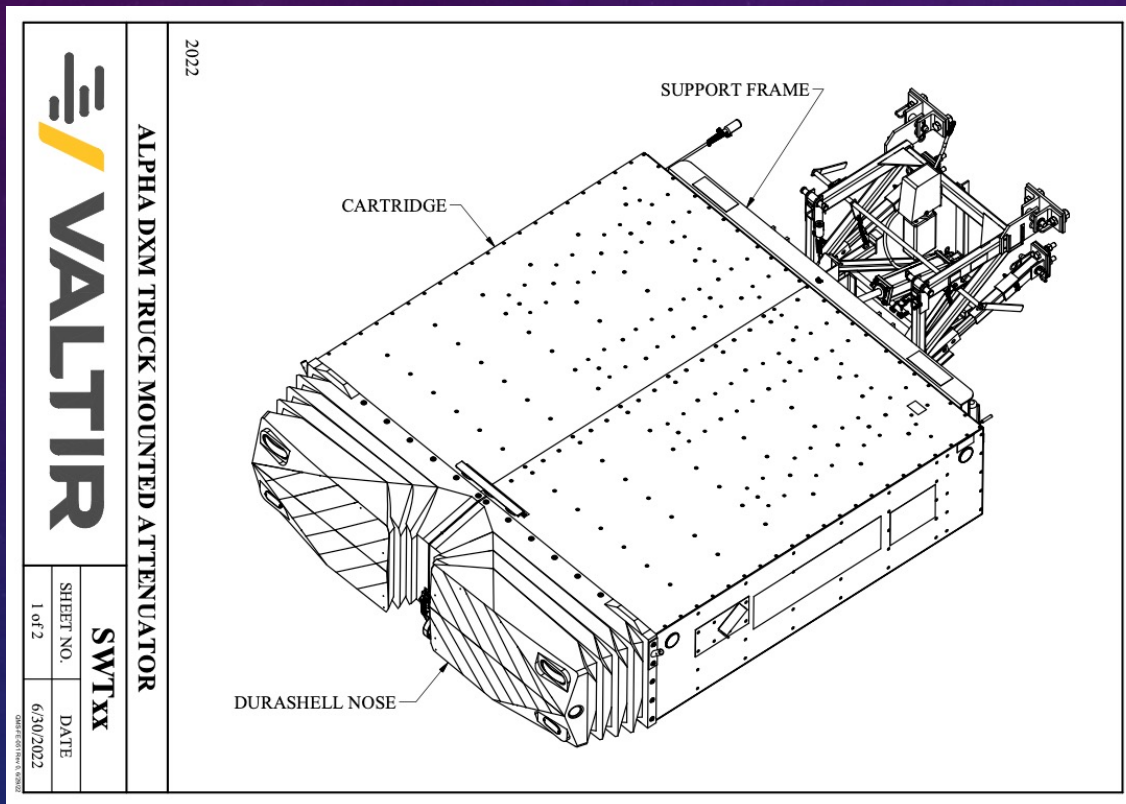
SHEET NO.	DATE
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TF13 GUIDE – NEW SYSTEMS

SWT07a – ALPHA DXM Truck-Mounted Attenuator, TL-2

[FHWA Letter CC-173]



INTENDED USE

The ALPHA™ DXM is a Truck-Mounted Attenuator (TMA) for use on stationary or moving shadow support vehicles. The ALPHA™ DXM TMA is comprised of an aluminum cartridge attached to a steel support frame. The ALPHA™ DXM is designed to be used on support vehicles with a minimum weight of 12,200 lbs [5,534 kg] and a maximum weight of 26,500 lbs [12,020 kg].

FEATURES

The ALPHA™ DXM consists of a support frame and an energy absorbing cartridge fitted with a Durashell nose for additional protection from nuisance impacts. The support frame secures the cartridge to the support vehicle and utilizes a 90° tilt feature to move the system upright, so the cartridge is vertical enabling support vehicle transportation.

SPECIFICATIONS

In its deployed state, the ALPHA™ DXM TMA measures 11.0 ft [3.4 m] long by 7.8 ft [2.4 m] wide and has a ground clearance of 12.0 in ± 1.0 in [305 mm ± 25 mm]. The total system length is 11.0 ft [3.4 m] long from the hitches of the support vehicle to the end of the cartridge and when the cartridge is stored in the upright position, it stands 11.3 ft [3.4 m] from the ground.

Cartridge Dimensions:
 Length: 8.3 ft [2.5 m]
 Width: 7.8 ft [2.4 m]
 Height: 22.5 in [572 mm]

ELIGIBILITY

The ALPHA™ DXM has been tested in conformance to MASH 2nd Edition (2016) and is eligible for Federal-aid reimbursement by FHWA.

FHWA Eligibility Letter(s): CC-_____ dated _____ for MASH 2016 Test Level 2

REFERENCES

American Association of State Highway and Transportation Officials (AASHTO), Manual for Assessing Safety Hardware (MASH), 2nd Edition (2016) with 2022 Errata.

CONTACT INFORMATION

15601 Dallas Parkway, Suite 525 Addison, TX 75001
 Telephone: (888) 323-6374
www.valtir.com

ALPHA DXM TRUCK MOUNTED ATTENUATOR

SWTxx

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VALTIR

TF13 GUIDE – NEW SYSTEMS

SBB55e – New York MTA RK-19 Bridge Rail, TL-5

[FHWA Letter B-366]

- Incorrect Drawings & Test Data Sheets in FHWA Letter – To be fixed

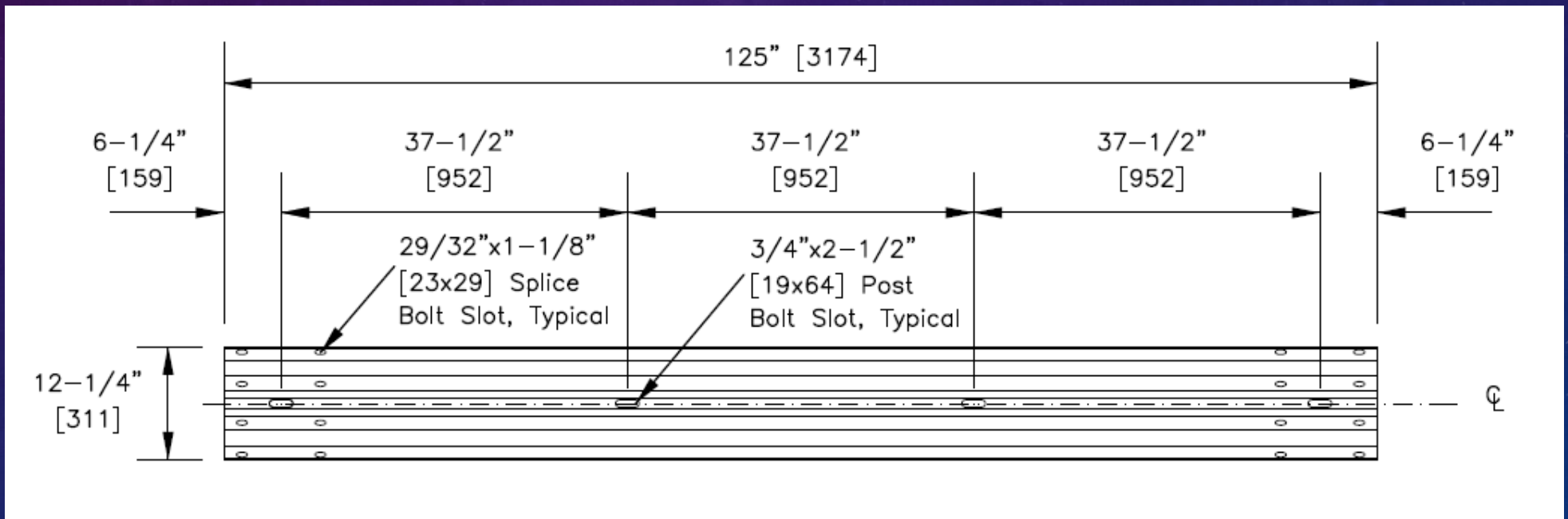
TF13 GUIDE – EXISTING SYSTEMS

- New & Updated Drawings, Photos, Test Reports, etc.
- Comments & Corrections for Existing Content
 - Accepted at Any Time

Send to: GuideManager@TF13.org

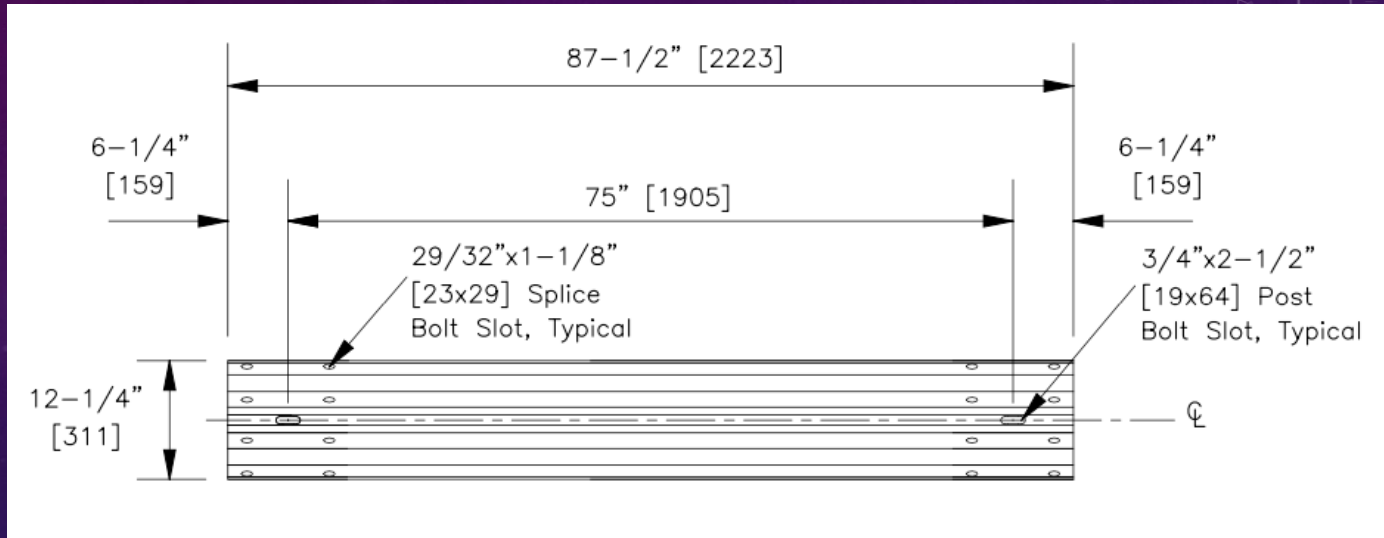
TF13 GUIDE – REVISED DRAWINGS

RWM05a-b, 3-Space W-Beam Guardrail for Splice Transition

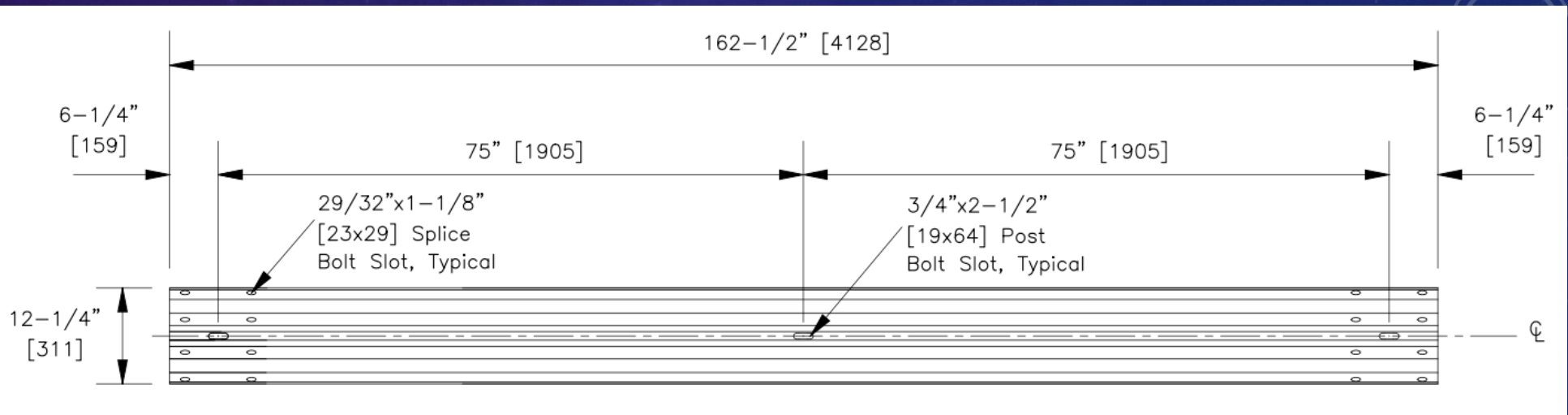


TF13 GUIDE – REVISED DRAWINGS

RWM01a-b, 1-Space W-Beam Guardrail, Short (6'-3")

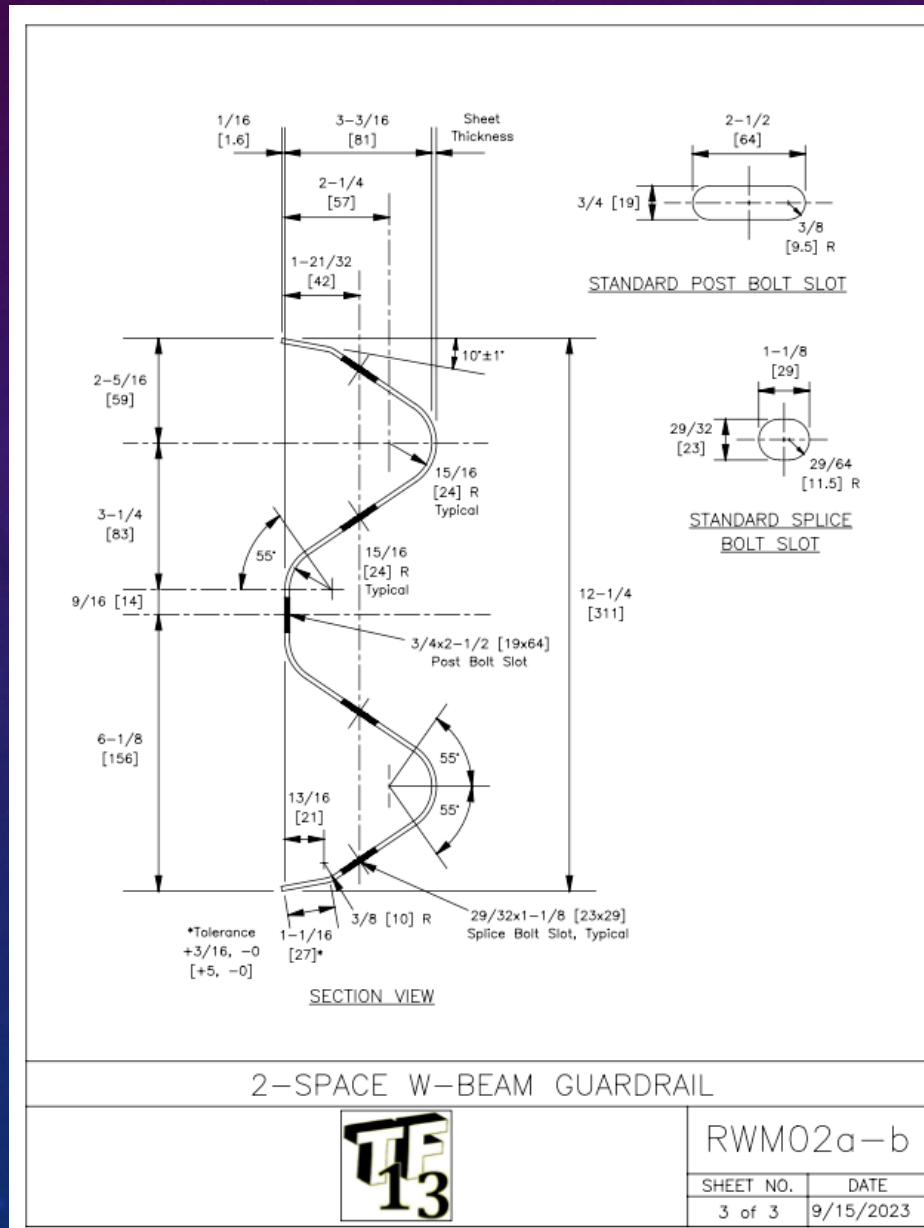


RWM02a-b, 2-Space W-Beam Guardrail



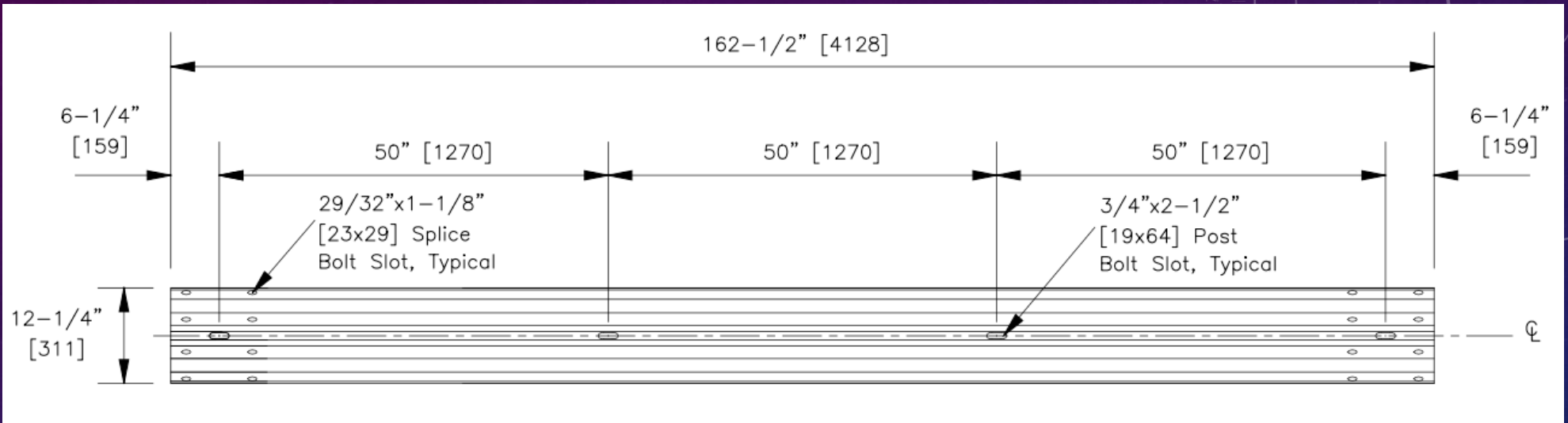
TF13 GUIDE – REVISED DRAWINGS

RWM02a-b, 2-Space W-Beam Guardrail

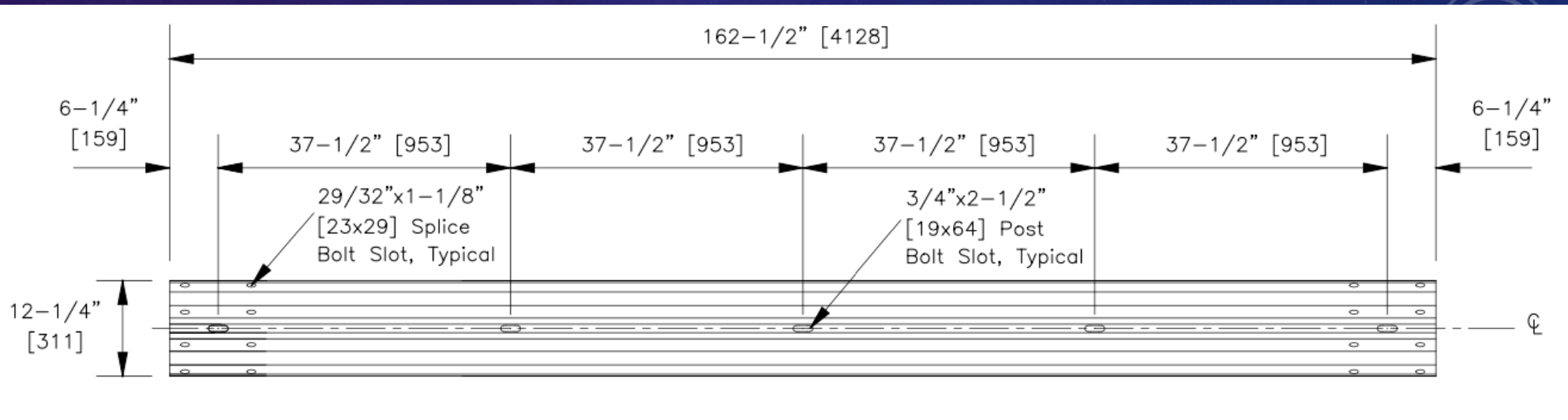


TF13 GUIDE – REVISED DRAWINGS

RWM03a-b, 3-Space W-Beam Guardrail

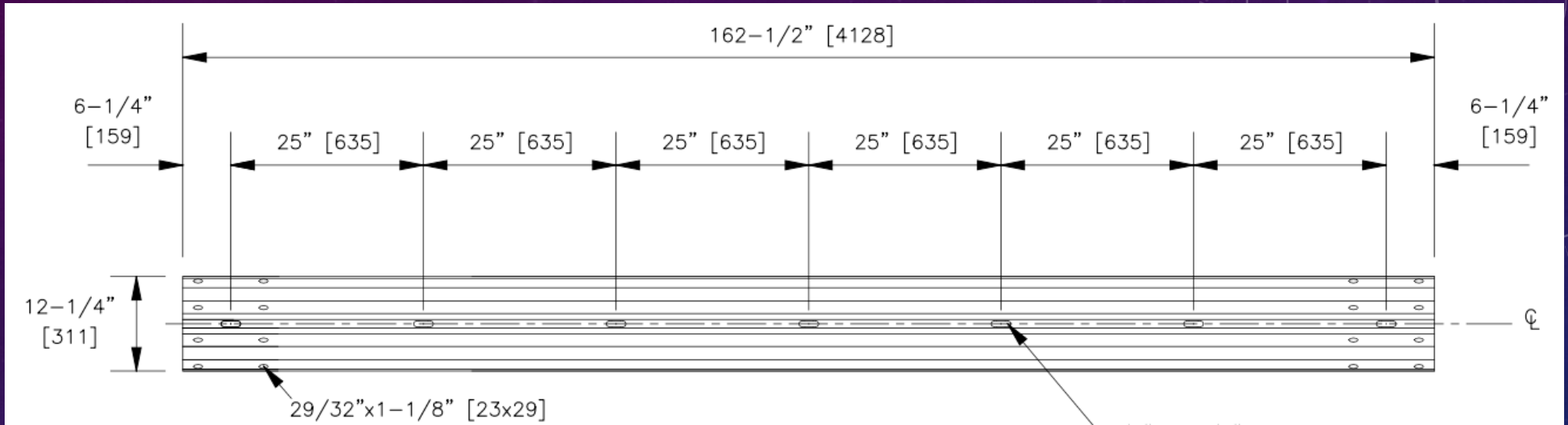


RWM04a-b, 4-Space W-Beam Guardrail

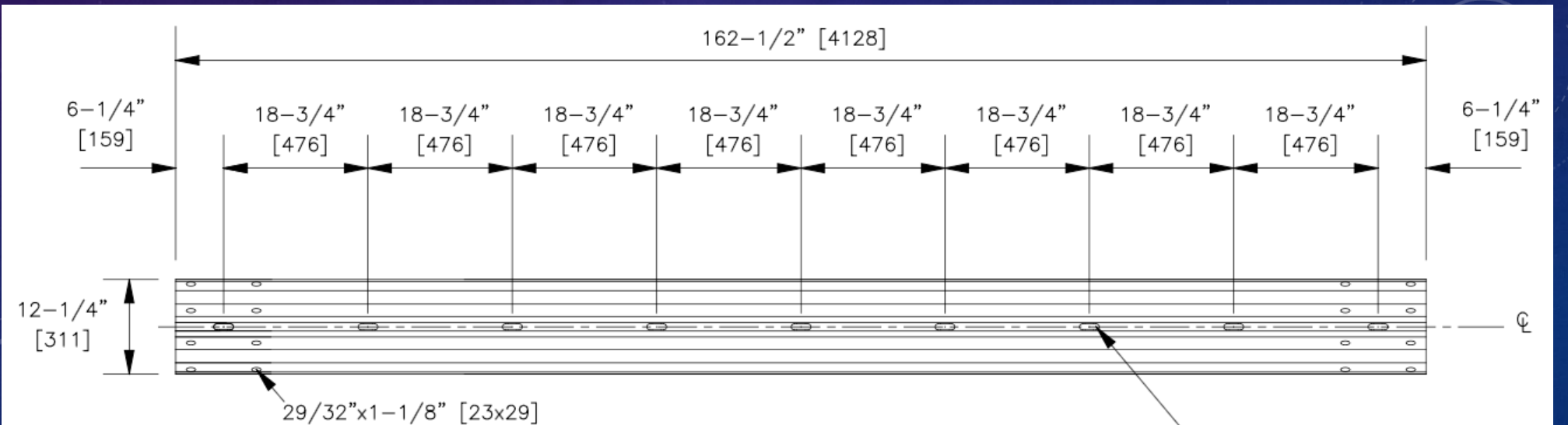


TF13 GUIDE – REVISED DRAWINGS

RWM06a-b, 6-Space W-Beam Guardrail

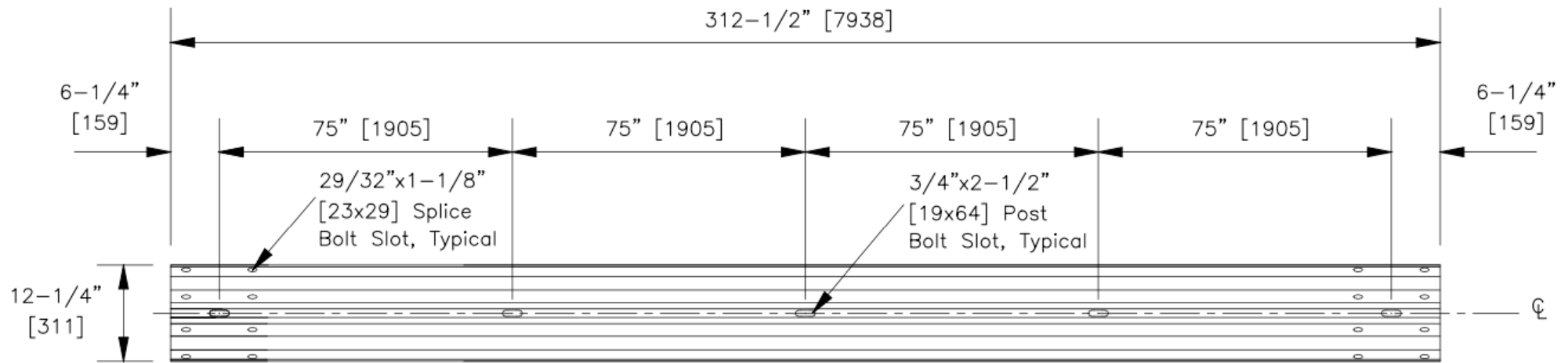


RWM08a-b, 8-Space W-Beam Guardrail



TF13 GUIDE – REVISED DRAWINGS



RWM22a-b, 4-Space W-Beam Guardrail, Long (25'-0")



TF13 GUIDE – REVISED AASHTO M180

Publication Detail

M 180, Standard Specification for Steel Components for Highway Guardrail, Single User PDF Download

 Materials, Testing, & Pavement 

This specification covers steel components used in non-proprietary highway guardrail, including corrugated sheet steel prepared for use as guardrail beams, transition beams, end sections, buffer sections, terminal connectors, and backup plates; fasteners including standard and high-strength bolt, nuts, and washers; steel guardrail posts; and anchorage wire rope and swage fittings.

This specification covers coating, storage, and handling requirements for zinc-coated, zinc-alloy coated, uncoated, and atmospheric corrosion-resistant components used in highway guardrail.

Although some of the components covered under this specification are used in proprietary guardrail systems, these specifications do not purport to address all components of proprietary guardrail systems.

AASHTO specifications and test methods are only sold on an individual basis as downloadable documents. The complete set of all AASHTO specifications and test methods can be ordered [here](#).

Single user downloadable PDF file. You must create an AASHTO Account to purchase this item. See the [PDF Download User Guide](#) for complete details.

System Requirements: Windows or Macintosh desktop or laptop computer. Adobe Reader or Bluebeam Revu PDF reader. PDF Features: Printable, create and save notes and highlight text, offline mode.

All sales are final. There are no refunds on digital publications.

Additional Information

Year Published: 2023

Item Pages: 18



Non-Member Price: **\$99.00**

Member Price: \$73.00 

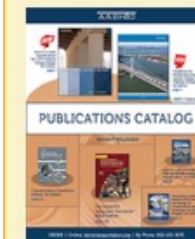
Item Code: M180-23-UL

Availability: In Stock

Item Format: PDF Download

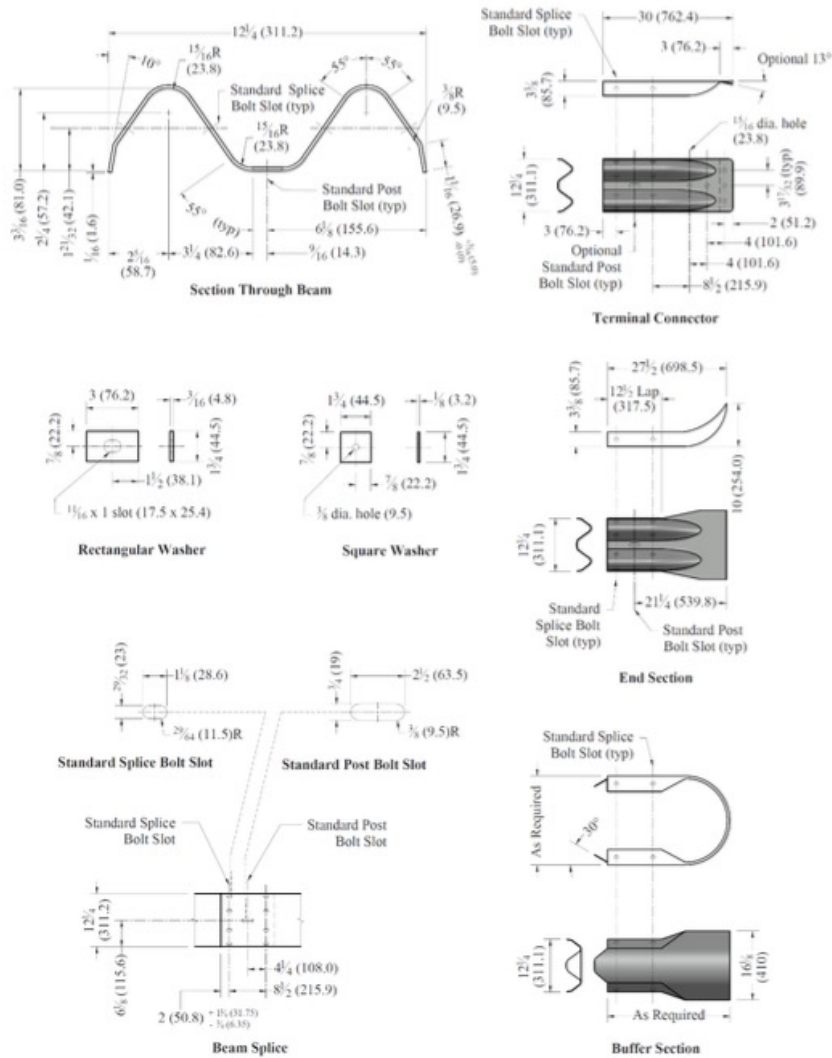
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 Add to Cart



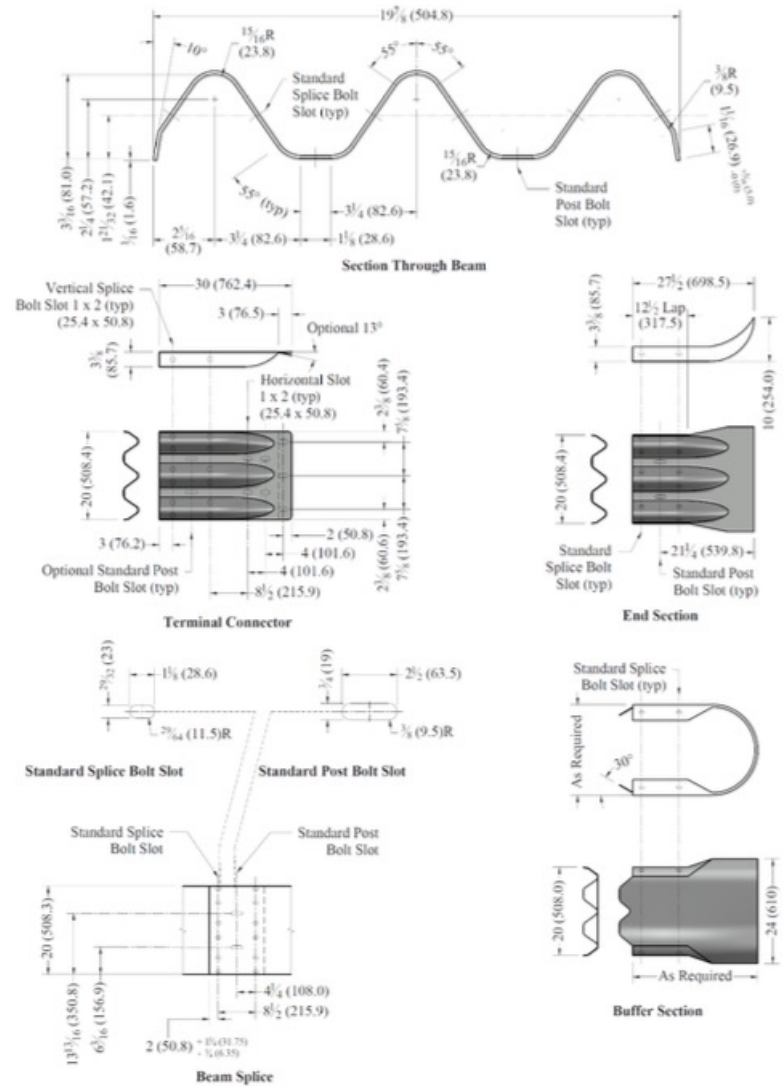
This free publication lists all available AASHTO publications with descriptions, prices for AASHTO members and non-members, ordering information and much, much more!

TF13 GUIDE – REVISED AASHTO M180



- Notes:
1. All dimensions are subject to manufacturer's tolerances except where allowable tolerances are shown.
 2. All dimensions shown in inches unless otherwise noted. (All parenthetical values are in millimeters unless otherwise noted.)
 3. Square washers are used in some weak-post guardrail designs; however, washers are not to be used under the bolt head in the main spans of strong-post guardrail, unless specified by the designer.
 4. The terminal connector shown has the typical standard splice bolt slots. Other splice slot orientations and dimensions for terminal connectors may be specified by the engineer.

Figure 2—W-Beam



- Notes:
1. All dimensions are subject to manufacturer's tolerances except where allowable tolerances are shown.
 2. All dimensions shown in inches unless otherwise noted. (All parenthetical values are in millimeters unless otherwise noted.)
 3. The terminal connector shown has vertical splice slots. Other splice slot orientations and dimensions for terminal connectors may be specified by the engineer.

Figure 3—Thrie Beam

TF13 GUIDE – DRAWINGS THAT NEED UPDATING

FWR03, Rectangular Guardrail Plate Washer

RTB01a-b, Thrie-Beam Back-up Plate

RTE02a, Thrie-Beam End Section (Rounded)

RTE03a-04b, Thrie-Beam End Section (Buffer)

RTM01a-02b, 1- & 2-Space Thrie-Beam Guardrail

RTM03a-b, 3-Space Thrie-Beam Guardrail

RTM04a-b, 4-Space Thrie-Beam Guardrail

RTM06a-b, 6-Space Thrie-Beam Guardrail

RTM09a, Thrie-Beam Guardrail, 6'-3" [1905], Quarter Post Spacing

RTM10a, Thrie-Beam Guardrail, 12'-6" [3810], Quarter Post Spacing

RWB01a-b, W-Beam Back-up Plate

RWE01a-b, W-Beam End Section (Flared)

RWE02a-b, W-Beam Terminal Connector

RWE03a, W-Beam End Section (Rounded)

RWE04a, MELT W-Beam End Section

RWE05a-07b, W-Beam End Section (Buffer)

RWM14a, BCT Terminal Rail Section

RWT01a-b, Symmetrical W-Thrie Beam Transition Section

TF13 GUIDE – REVISED AASHTO M180 – GUARDRAIL LABELING

NOTES:

1. Stamping shall be completed on any W6x8.5 or W6x9 Guardrail Post that is longer than the specifying agency's standard length for strong-post W-Beam Guardrail system.
2. Stamping options, such as character size and location will be per manufacturer's preference and in accordance with their processes & equipment. All options within the tolerances shown on this drawing shall be acceptable to the specifying agency.
3. Stamping shall be performed prior to galvanizing, legible after galvanizing, and permanent.
4. Stamping shall remain visible in the field after final assembly.

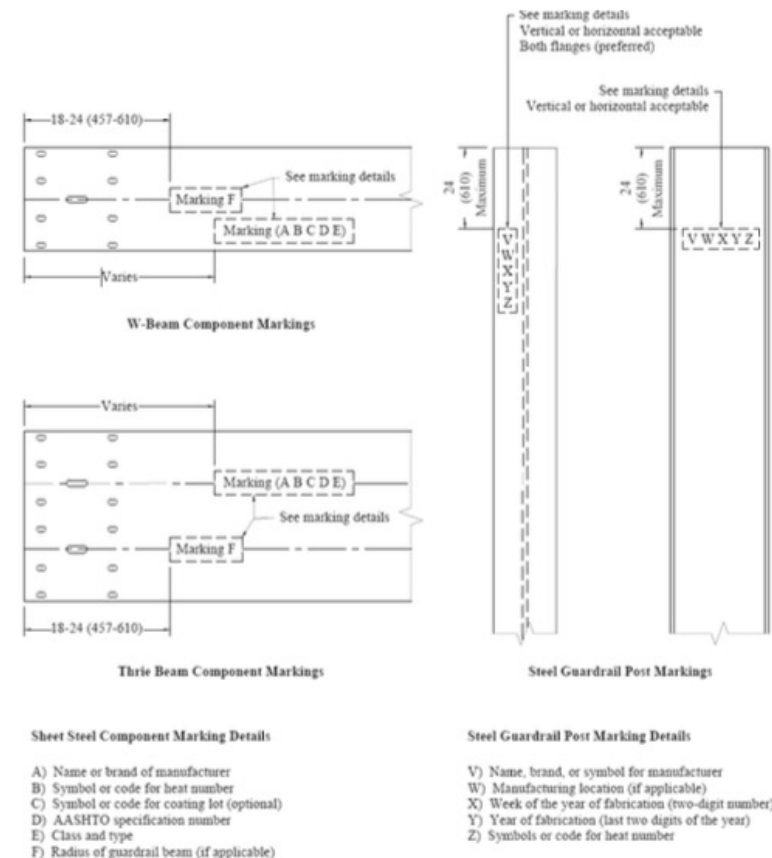
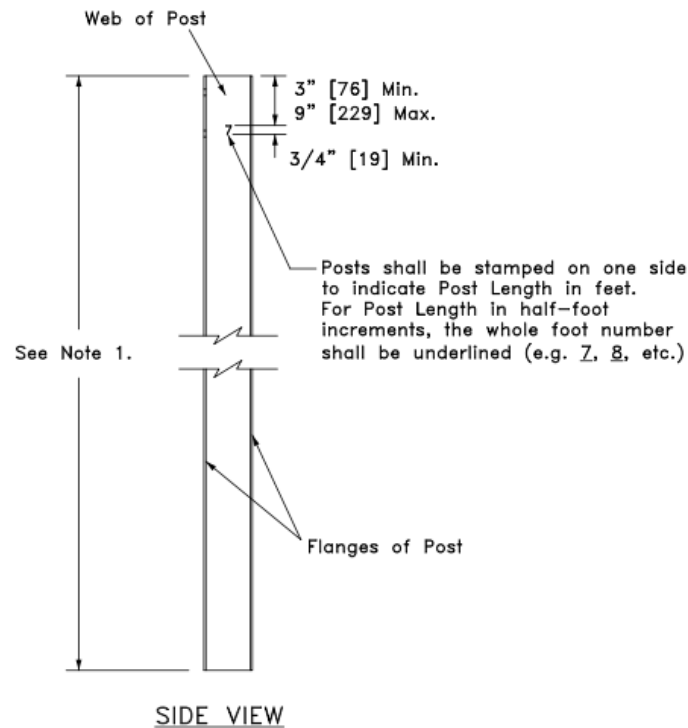


Figure 5—Suggested Marking for Sheet Steel Components and Steel Guardrail Posts

13. KEYWORDS

- 13.1. Alloy coated; aluminum; anchorage wire rope; guardrail transition section; buffer end; corrugated steel sheet; galvanized coatings, guardrail anchor cable; guardrail end section; guardrail fastener; guardrail posts; magnesium; swage fitting; terminal connector; terminal end shoe; thrie-beam; w-beam; zinc; zinc alloy coated, zinc coated.

EXTRA LONG WIDE-FLANGE GUARDRAIL POST LABELING



PWE14

SHEET NO.	DATE:
1 of 2	10/4/2019

SYSTEMS WITH NO FHWA LETTER

What Criteria for including these Systems into the TF13 Guide?

- Labs provide Pass/Fail for individual MASH tests
- Waived Tests – those determined to be easy pass
- Significant / Insignificant Modifications during course of testing
- Computational Mechanics to replace some (or all) physical tests
- Prefer an objective determination for consistency
- Initial consensus that Proprietary & Non-Proprietary Systems need to be treated differently

SYSTEMS WITH NO FHWA LETTER

Proprietary Systems

- Most still strive to obtain FHWA Letter? Becoming less so?
- Next Level: Rely on individual State DOT APL/QPL status
- Proposed to require APL/QPL approval from at least **17** US State DOTs (approximately 1/3 of the states)
- 1/3 deemed to sufficiently exclude unproven products

SYSTEMS WITH NO FHWA LETTER

Non-Proprietary Systems

- Some DOTs still obtain FHWA Letters → Automatically into Guide
- Most Pooled-Fund & NCHRP-tested systems do not pursue FHWA review
- In some cases, TF13 drawings are prepared as a project task
- No process in place to declare systems MASH crashworthy on a national level



- Send Guide Materials & Edits to:
 - **GuideManager@TF13.org**