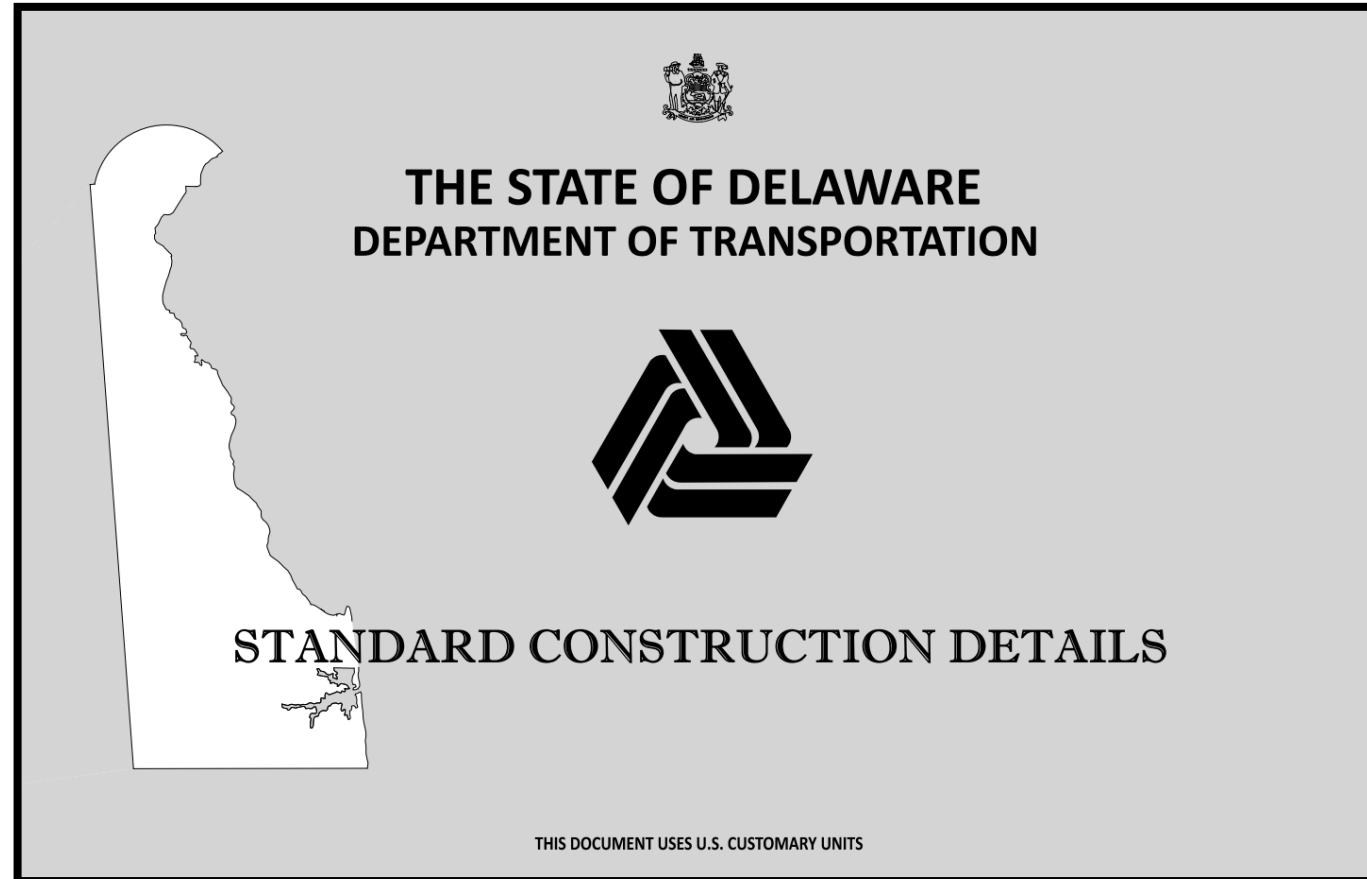


# MASH (APL) AND DETAIL UPDATE



# 2022 Standard Construction Details

- Old details updated: 39
- New details developed: 17
- Total new details: 56/235
  - ~ 25%









# Overall Updates

- Section I – Barrier: 7
- Section II – Curb & Gutter: 9
- Section III – Drainage: 3
- Section VI – Miscellaneous: 3
- Section VII – Pavement: 2
- Section VIII – Traffic: 32
  - 17 new details

## 2022 Standards

-  [DelDOT Standard Details](#) - edited: 12/21/2022
-  [DelDOT Standard Details Revision Sheets](#) - edited:12/21/2022
-  [Index Sheets](#)
-  [Memo to Current Holders - List of Changes for 2022](#)

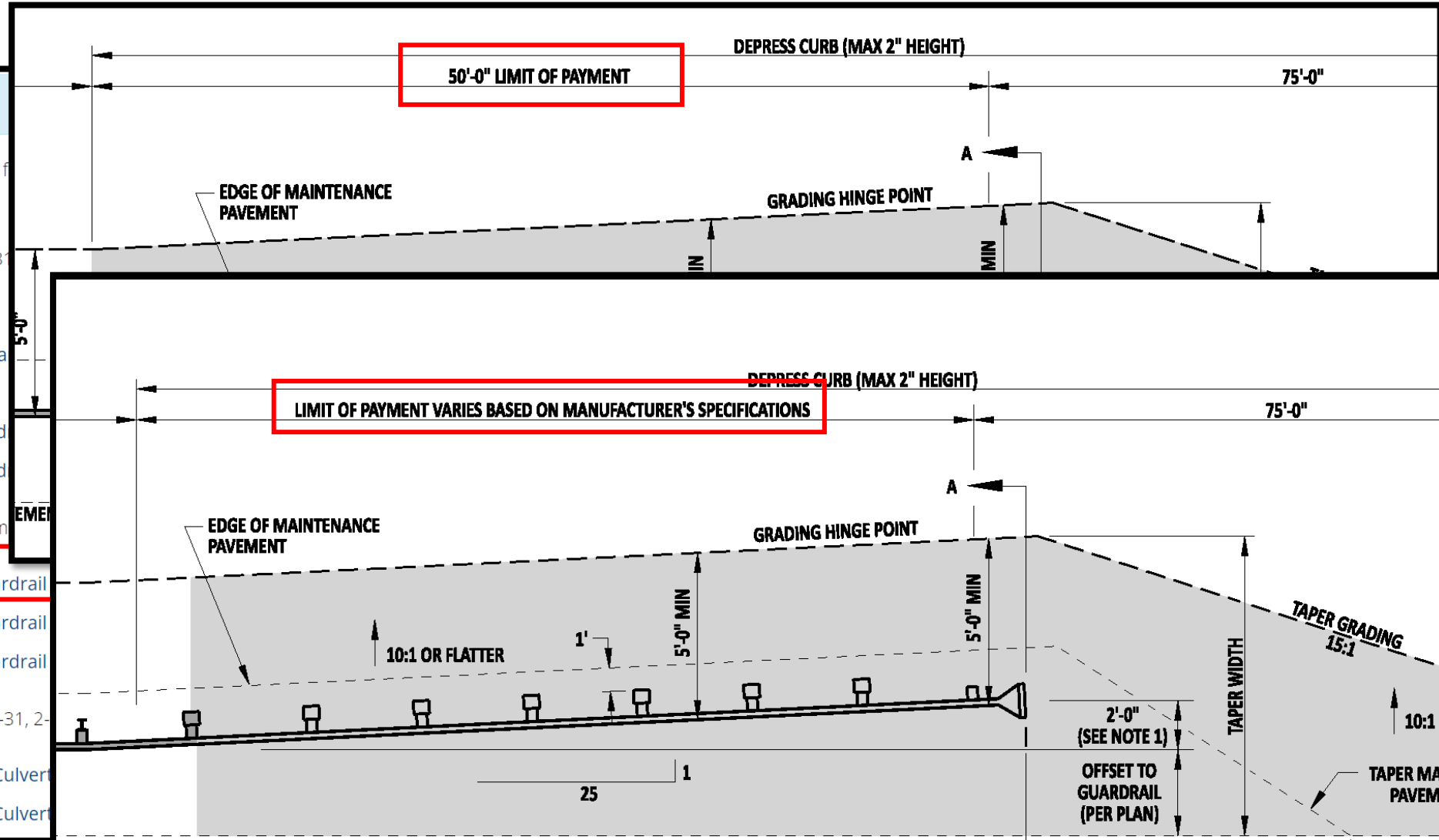


# Barrier Limit of Payment

- Significant updates to Section I - Barrier

Note: Click icon for MicroStation DGN file

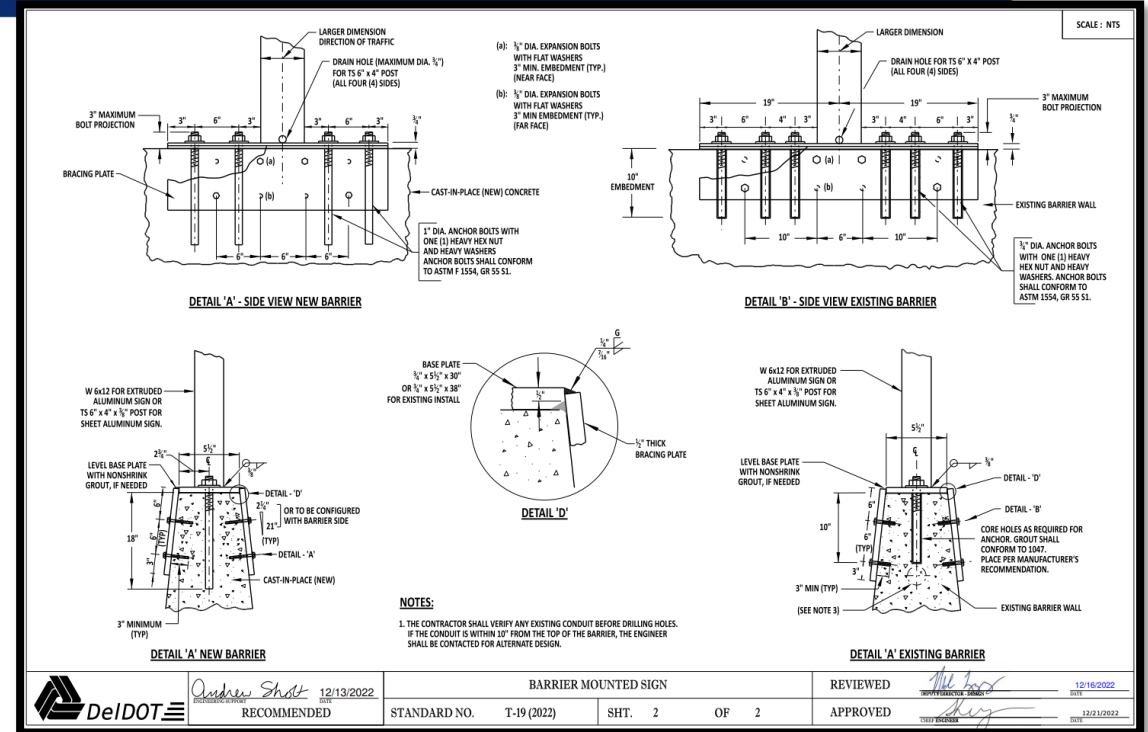
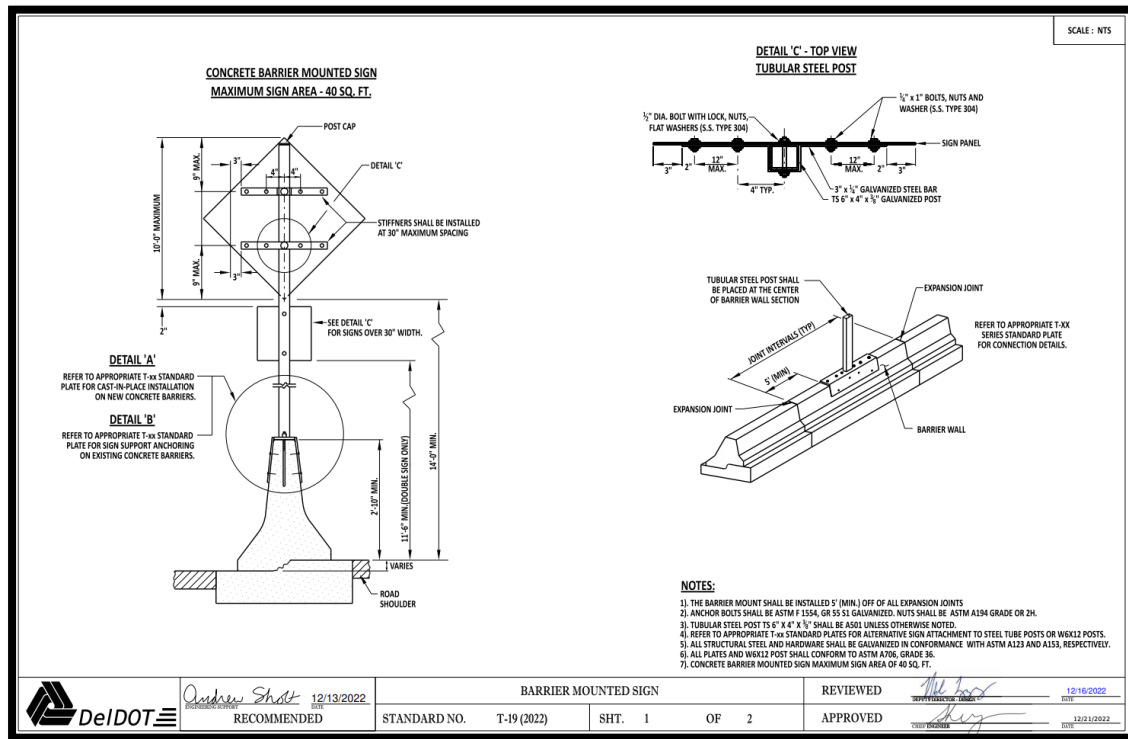
- B-L (2022) - Barrier Legend
- B-1 - Guardrail Applications (Types 1-31)
  - B-1 (2020) - 1 - Plan Views
  - B-1 (2020) - 2 - Elevation Views
  - B-1 (2021) - 3 - Section Views
  - B-1 (2022) - 4 - Type 1-31, Guardrail
  - B-1 (2020) - 5 - Type 1-31, Guardrail
- B-2 - Grading for Guardrail End Treatment
  - B-2 (2022) - 1 - Grading For Guardrail**
  - B-2 (2022) - 2 - Grading For Guardrail
  - B-2 (2022) - 3 - Grading For Guardrail
- B-3 - Guardrail Over Culverts (Types 1-31, 2-31)
  - B-3 (2022) - 1 - Guardrail Over Culvert
  - B-3 (2022) - 2 - Guardrail Over Culvert





# Barrier Mounted Sign T-19

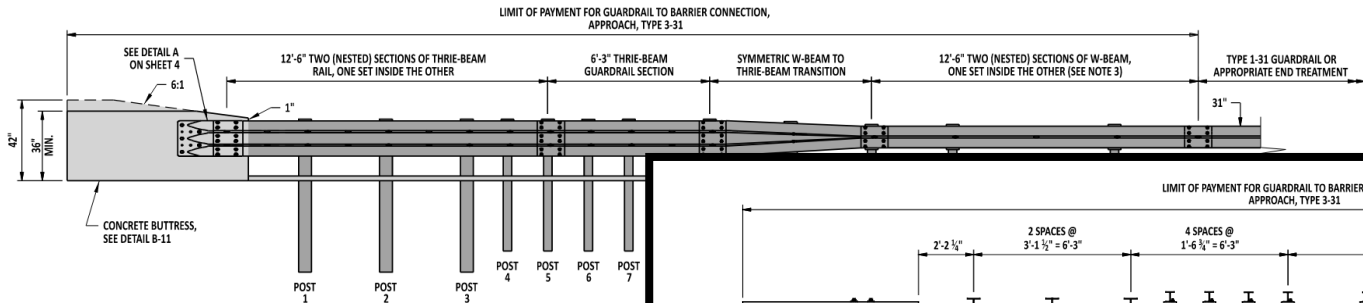
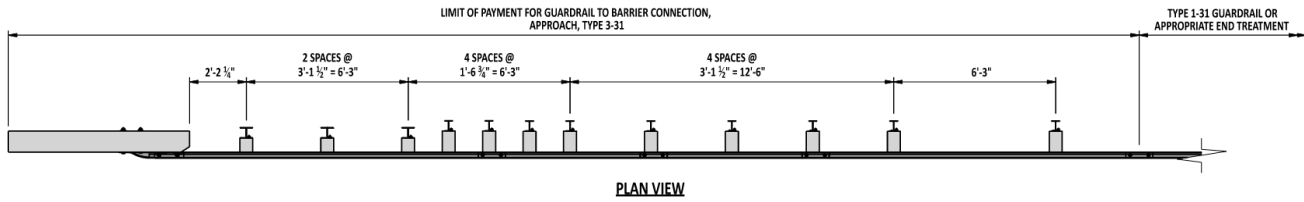
- New to our Standard Construction Details
- Consistently implemented as a plan detail



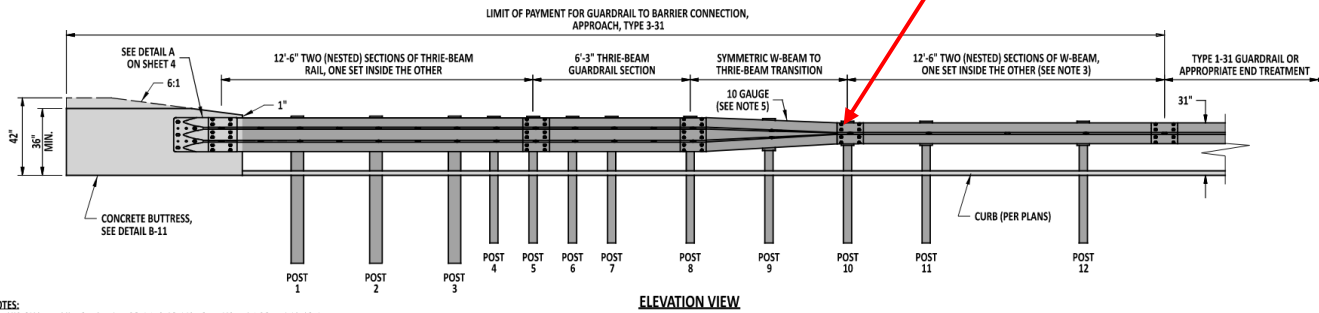
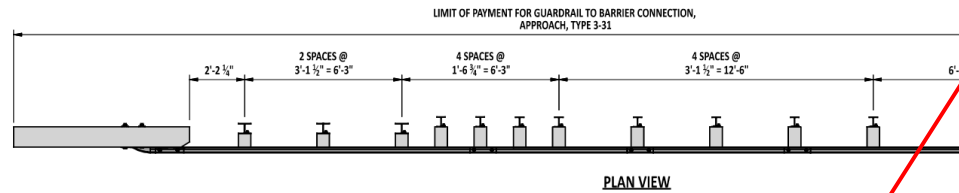
- Crash testing was performed by TTI
- No FHWA eligibility letter was issued
- Reviewed by the MASH Committee
- DeIDOT self-certified the product for use on Delaware roads



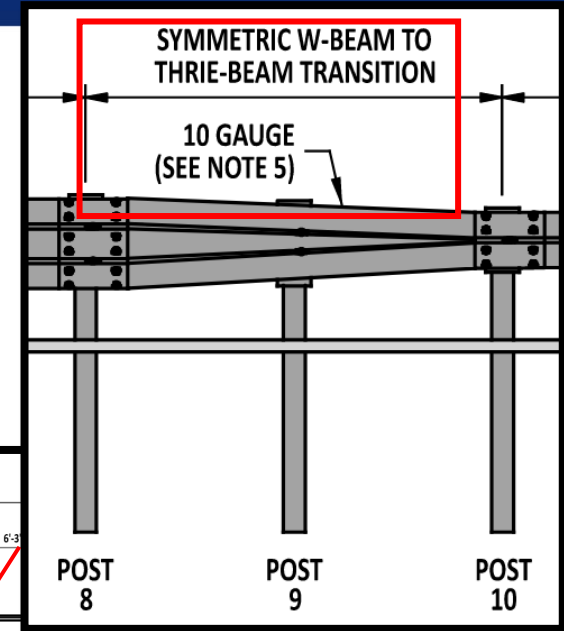
# I thought we were done... Another update! - B10-1



- NOTES:
- 1). THIS GUARDRAIL-TO-BARRIER CONNECTION IS TO BE USED IN COMBINATION WITH DETAIL B-11, ON NEW CONSTRUCTION ONLY.
  - 2). SEE SHEETS 2-4 FOR ADDITIONAL DETAILS.
  - 3). ONLY USE A SINGLE PIECE OF W-BEAM IN THIS SECTION WHEN CURB IS NOT USED.
  - 4). POSTS NOT DETAILED ON SHEETS 2 AND 3 ARE TO USE STANDARD POSTS AND BLOCKS.
  - 5). MASH COMPLIANT SYSTEM - DESIGN BASED ON MWRSF TEST REPORT TRP 03-367-19.

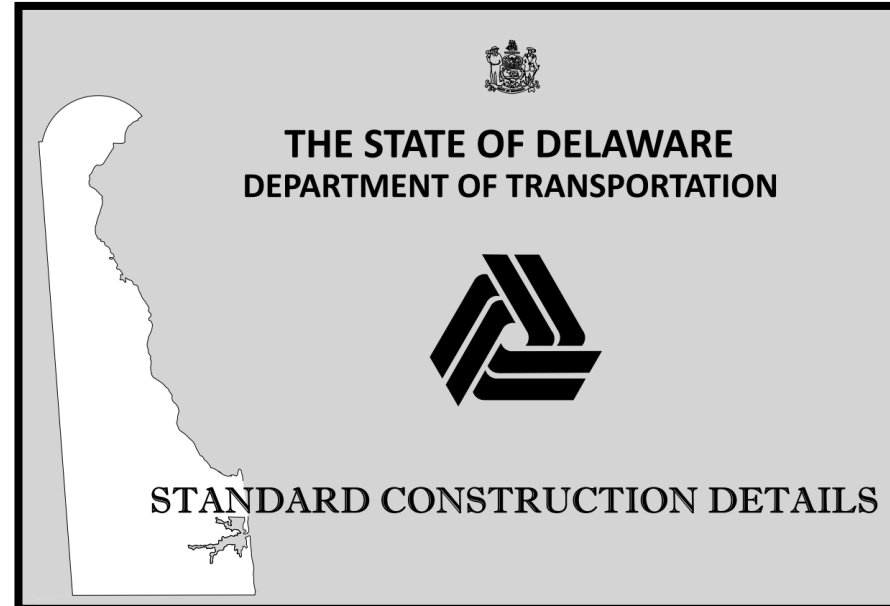


- NOTES:
- 1). THIS GUARDRAIL-TO-BARRIER CONNECTION IS TO BE USED IN COMBINATION WITH DETAIL B-11, ON NEW CONSTRUCTION ONLY.
  - 2). SEE SHEETS 2-4 FOR ADDITIONAL DETAILS.
  - 3). ONLY USE A SINGLE PIECE OF W-BEAM IN THIS SECTION WHEN CURB IS NOT USED.
  - 4). POSTS NOT DETAILED ON SHEETS 2 AND 3 ARE TO USE STANDARD POSTS AND BLOCKS.
  - 5). AASHTO M180, CLASS B, TYPE I OR TYPE II.
  - 6). MASH COMPLIANT SYSTEM - DESIGN BASED ON MWRSF TEST REPORT TRP 03-367-19.



# Lessons Learned?

- Start coordinating earlier
  - Consultants
  - MASH Committee
  - Traffic Design
  - Traffic Safety
- Know the Contract Document hierarchy - Section 105.6
- If there's a problem with a specification or detail please let me know!



**Standard Specifications**  
for  
**Road and Bridge Construction**

REVISION #2 - JUNE 2022





# MASH APL Update

- APL Location:
  - <https://deldot.gov/Business/prodlists/i>



The screenshot shows the Delaware Department of Transportation website. At the top, there is a navigation menu with links for ABOUT, CITIZEN, BUSINESS, SERVICES, and EMPLOYMENT. Below the menu is the department's logo and name. The main heading is "Approved Product Lists". On the left side, there is a sidebar with a "Section Home" link (with a house icon) and an "Information" link (with a right-pointing triangle icon). Below these are three bullet points, each representing a category of approved products: "Approved Products List - Guardrail End Terminals", "Approved Products List - Permanent Impact Attenuators", and "Approved Products List - Temporary Traffic Control Devices". On the right side, there is a paragraph of text explaining the purpose of the lists and a link to "Standard Specifications". Below this is a light blue box containing a link to the "Source of Supply Database" and another link to "Buy America Guidance and Requirements".







# MASH APL – What's Changed?

New APL categories will  
Approved Products Lists  
application (see below) for  
Products Lists. Please use

**MASH Approved Products**

MASH Approved Products

Several roadside hardware  
Device Waiver link below  
change. DeIDOT has also  
criteria. Please see the li

 [MASH Device Waiver](#)

 [NCHRP-350 Sunscreen](#)

Please submit any quest

## Delaware Department of Transportation

### MASH Committee

#### Procedures for Approval of Guardrail and Temporary Traffic Control Device Products

The Delaware Department of Transportation (DeIDOT) maintains Approved Products Lists (APL) which include Guardrail Hardware, Guardrail End Treatments, Permanent Impact Attenuators, and Temporary Traffic Control (TTC) Devices. The following procedures shall be followed for submitting products to DeIDOT for inclusion on these APLs.

1. Devices must be crashworthy in accordance with the latest edition of the *Manual for Assessing Safety Hardware (MASH)* published by the American Association of State Highway Transportation Officials (AASHTO). *Exception is trailer mounted temporary traffic control devices (Portable Changeable Message Signs, Arrow Board trailers, Temporary Traffic Signal Trailers, Portable Camera Trailers, Portable Detection Trailers, Portable Speed Display Trailers, etc.).*
2. Devices must meet DeIDOT's Standards Specifications, the latest edition of which can be found at [https://deldot.gov/Publications/manuals/standard\\_specifications/index.shtml](https://deldot.gov/Publications/manuals/standard_specifications/index.shtml)
3. To have a product qualified for the APL, fill out the MASH Approved Products List application and submit the application and necessary attachments as instructed within the application.



# MASH APL – What's Changed?

New APL of  
Approved  
application  
Products L

MASH App

MASH App

Several ro  
Device Wa  
change. D  
criteria. Pl

MAS

NCH

Please sub



## Delaware Department of Transportation MASH Committee Approved Products List Application

SUBMIT VIA EMAIL

Product Information	
Product Name:	<input type="text"/>
Product Type:	<input type="text"/>
Manufacturer:	<input type="text"/>
Model Number:	<input type="text"/>
Name of Submitter Point of Contact	<input type="text"/>
If Impact Attenuator, indicate Maintenance Type:	<input type="text"/>
Address:	<input type="text"/>
Phone:	<input type="text"/>
City:	<input type="text"/>
Email:	<input type="text"/>
State:	<input type="text"/>
Zip:	<input type="text"/>

### Product Documentation

Product Catalog Cut Sheet / Material Specification (provide website link or attach document)



# A Note on Certifications

- DelDOT is able to self-certify devices
    - Per FHWA April 9, 2017 Memo
  - Certification is handled by the MASH Committee
    - Craig Blowers – Chair, Construction
    - Andrew Short – Secretary, Engineering Support
    - James Osborn – Traffic Safety
    - Jennifer Pinkerton – Materials & Research
    - Brian Schilling – Maintenance & Operations
    - Jon Tice – Bridge
    - Abe Berihun – Planning
    - Thad McIlvaine – Project Development
  - Requires substantial backup documentation.
-



# MASH APL – What's Changed?

New APL categories will be added in the future depending upon device availability. Only devices that are on the Approved Product List (APL) are eligible for use on DelDOT projects. For more information, please see the APL application (see [APL Application](#)) and the current APL Products Lists.

[MASH Approved Products List](#)

[MASH Approved Products List](#)

Several roadsideside devices are being removed from the APL. A Device Waiver is required for these devices. Please see the change. DelDOT will be updating the APL criteria. Please see the [MASH Approved Products List](#).

[MASH Approved Products List](#)

[NCHRP-380](#)

Please submit a [MASH Approved Products List](#).

## B. Exempt Devices

DelDOT's MASH Committee has reviewed devices that were tested under MASH 2016 and has determined that the devices noted below either do not have a MASH 2016 compliant equivalent or the equivalent does not meet DelDOT's operational needs. The Committee recommends that the following devices continue to be permitted for use on DelDOT projects until such time that an acceptable MASH 2016 device is successfully crash tested.

- Pedestrian/Signal Poles
- Street Light Poles
- Detector Poles
- Pedestrian Fence
- Bridge Safety Fence
- Type 2 Guardrail
- Galvanized Telescoping Steel Sign Posts
- Community Signs
- Railroad Protective Barrier
- Category 4 Devices (PCMS Boards, Arrow Boards, Portable Speed Display Signs, etc.)



# MASH APL – What’s Changed?

## B. Sunset Dates

Contractors may continue to deploy TTC Devices that conform to NCHRP 350 standards and meet the American Traffic Safety Services Association’s Quality Guidelines for Work Zone Traffic Control Devices on projects that are advertised prior to these dates. TTC Devices on projects advertised after their respective Sunset Dates must conform to MASH 2016.

<u>Device</u>	<u>Date</u>
Temporary Barrier Wall	January 1, 2025
Temporary Sign Stands	January 1, 2025
Temporary Impact Attenuators	January 1, 2025
Truck Mounted Attenuators	January 1, 2030

DelDOT personnel may continue to deploy compliant NCHRP 350 devices for maintenance and emergency applications until the sunset dates listed above but shall only purchase new devices that conform to MASH 2016.

New A  
Appro  
applic  
Produ  
MASH  
MASH  
Severa  
Device  
chang  
criteri



Please

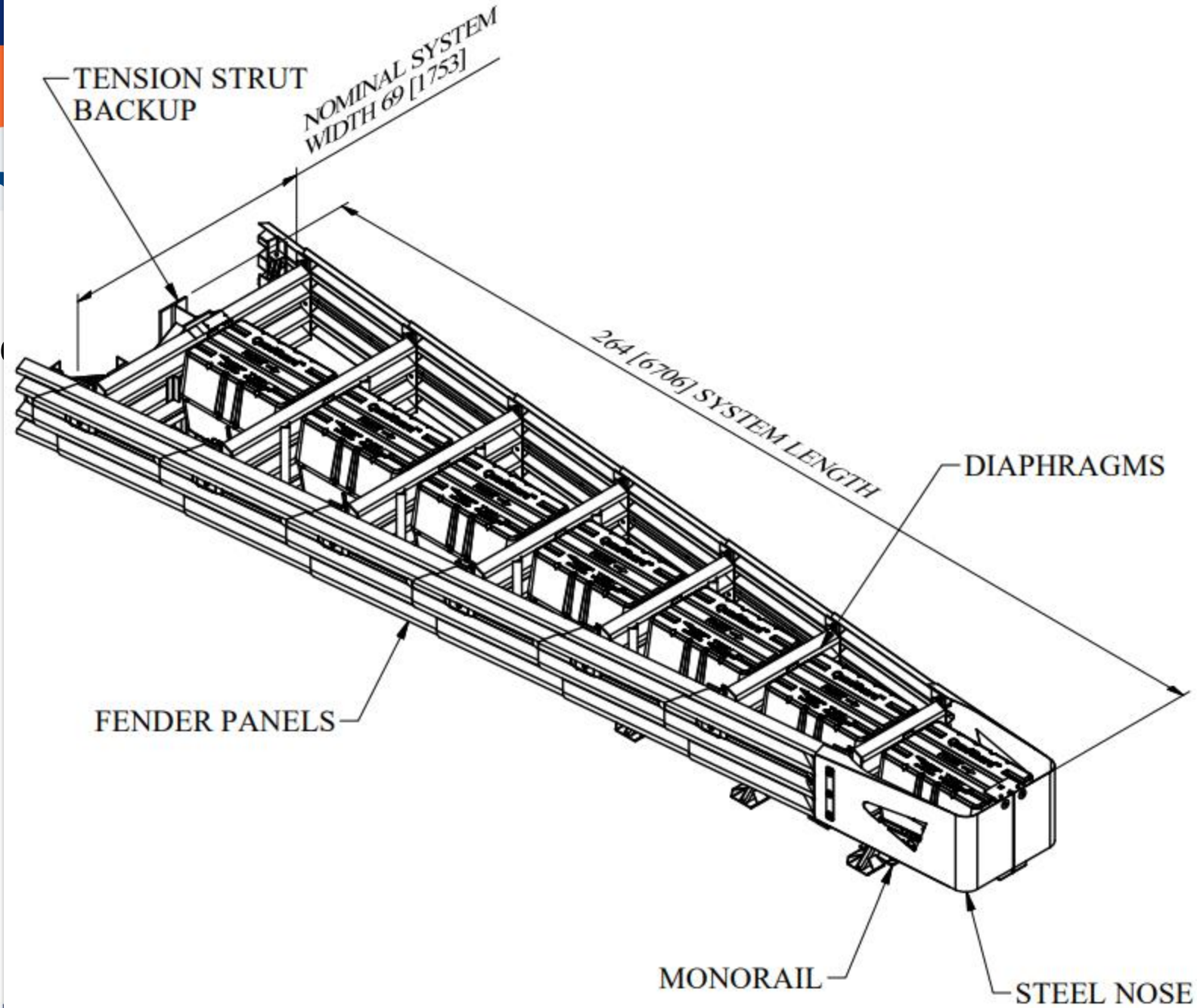
# Guardrail End Terminals

- No devices added.



# Perm

- Va  
wi



S  
the



Delaware Department of Transportation  
Approved Products List  
Temporary PCC Barriers

Product Name	Manufacturer	Test Level	Testing Criteria	Application	FHWA Eligibility Code
--------------	--------------	------------	------------------	-------------	-----------------------

DeIDOT Standard Item No. 807001

J-J Hook F-Shape Temporary PCC Barrier 20'	EASI-SET Industries	TL-3	MASH 2011		
--	---------------------	------	-----------	--	--

J-J Hook F-Shape Temporary PCC Barrier 12'	EASI-SET Industries	TL-3	MASH 2011		
--	---------------------	------	-----------	--	--

DeIDOT Standard Item No. 807005

J-J Hook F-Shape Temporary PCC Barrier Bolt Down in Bituminous Pavement	EASI-SET Industries	TL-3	MASH 2011		
---	---------------------	------	-----------	--	--

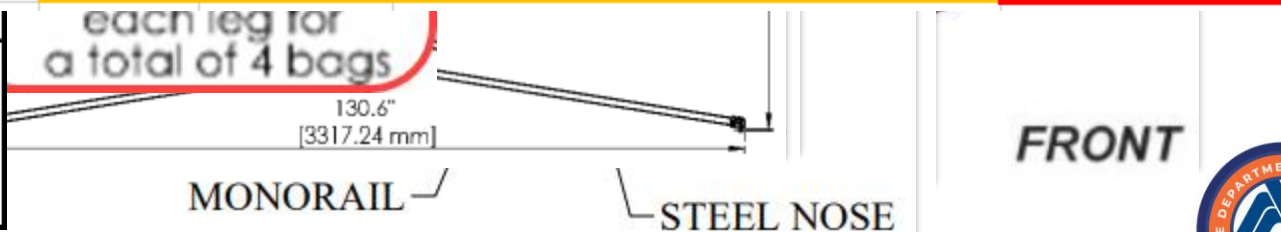
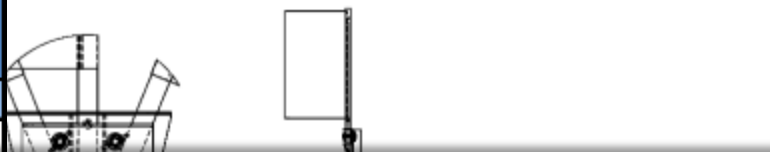
Strongstown B&K JJ Hook Retrofit V4 Bituminous Pavement	Strongstown B&K	TL-3	MASH 2011		
---	-----------------	------	-----------	--	--

DeIDOT Standard Item No. 807008

J-J Hook F-Shape Temporary PCC Barrier Bolt Down in PCC Pavement	EASI-SET Industries	TL-3	MASH 2011		
--	---------------------	------	-----------	--	--

Strongstown B&K JJ Hook Retrofit V3 Concrete Pavement	Strongstown B&K	TL-3	MASH 2016	Temporary	B-258
---	-----------------	------	-----------	-----------	-------

Proposed Item #	Item Desc.	Barrier Type	Foundation	Barrier Name	Calculated Working Width (Barrier width + dynamic deflection)
807005	Temporary Barrier, TL-3, 30" Max Working Width	Pinned	Bituminous	F-Shape X-Bolt PCC	25.52
		Pinned	PCC	J-J Hook F-Shape PCC Barrier	28.4
807006	Temporary Barrier, TL-3, 36" Max Working Width	Pinned	Bituminous	J-J Hook F-Shape PCC Barrier	31.26
		Pinned	Bituminous	Strongstown B&K J-J Hook Retrofit V4	34.2
807007	Temporary Barrier, TL-3, 48" Max Working Width	Unpinned	N/A	Single Slope X-Bolt PCC	40.8
		Pinned	PCC	Indiana Anchored Barrier	45.3
807008	Temporary Barrier, TL-3, 60" Max Working Width	Unpinned	N/A	F-Shape X-Bolt PCC	50.6
		Unpinned	N/A	Single Slope X-Bolt PCC	57
807011	Temporary Barrier, TL-3, 96" Max Working Width	Unpinned	N/A	J-J Hook F-Shape PCC Barrier	86.88
		Unpinned	N/A	J-J Hook F-Shape PCC Barrier	88.2





# A Note on Source of Supply

- For standard devices Materials & Research is verifying devices submitted are on the Approved Product List
  - No APL is available for Special Provisions
    - For these devices M&R is verifying it complies with the Special Provision
  - For project specific devices, the MASH Committee may render recommendations and can be used as a resource, but the EOR is ultimately responsible for approval.
-



# QUESTIONS/ COMMENTS



**THANK  
YOU!**