



## Florida Department of Transportation

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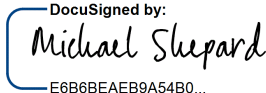
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KEVIN J. THIBAUT, P.E.  
SECRETARY

### ROADWAY DESIGN MEMORANDUM 19-02

DATE: **February 5, 2019**

TO: District Directors of Transportation Operations, District Directors of Transportation Development, District Design Engineers, District Construction Engineers, District Structures Design Engineers, District Maintenance Engineers, District Roadway Design Engineers, District Traffic Operations Engineers, District Program Management Engineers, District Consultant Project Management Engineers, District Materials Engineers, District Project Development Engineers

FROM: Michael Shepard, P.E., State Roadway Design Engineer 

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SUBJECT: **Permanent Crash Cushions**

This memorandum highlights changes made to Crash Cushion Details, as shown in the *[FY 2019-20 Standard Plans, Index 544-001](#)*, and the supporting *Standard Plans Instructions, Basis of Estimates Manual (BOE)*, and *July 2019 Standard Specifications*. These changes have been made to accommodate the implementation of the AASHTO Manual for Assessing Safety Hardware (MASH) compliant crash cushions, simplify design processes for designers, and clarify *Standard Plans* requirements for contractors. A summary of these changes is as follows:

- *Standard Plans, Index 544-001 (Crash Cushion Details)* –
  - Callout points were updated so that the Crash Cushion Station, the connecting Begin/End Barrier Station, and the Length of Need Departure Line are all at the same longitudinal location.
  - “Length of End Treatment” segment was defined, which includes all proprietary elements of Crash Cushion as shown in the Approved Products List drawings.
  - “Length Restriction” was redefined as a length limitation on contractor’s selection of Crash Cushion, only when called for in the project Plans.
  - “Standard Guardrail Transition” was redefined to include entire reduced post spacing segment required. Also, instructions were provided for connecting to Crash Cushions ending in both Thrie-Beam and W-Beam.

- ***Standard Plans Instructions (Index 544-001, Crash Cushion Details)*** – Redeveloped to include information for:
  - A. “Location” of Crash Cushion callout station
  - B. “Length of Need” design process
  - C. “Test Level” selection
  - D. “System Width” selection
    - NOTE:** “Wide” systems now discouraged (i.e., connected barrier widths >2’-0”)
  - E. “Length of End Treatment” (default value 27’-6”)
  - F. “Constrained Conditions” (methods for reducing space needed)
  - G. “Temporary Crash Cushions” (reference to different Standard)
  - H. “Alternative Crash Cushion Usage”
  
- ***Standard Specifications*** – Updates to the ***July 2019 Standard Specification eBook*** will introduce “Method of Measurement” and “Basis of Payment” subarticles. These updates also include a revised Pay Item structure to differentiate between Crash Test Level (TL) (i.e., TL-2 or TL-3) and system width (i.e., “Narrow” or “Wide”). See the BOE Pay Items below.
  
- ***Basis of Estimates (BOE)*** –
  - Pay Items were updated to include four options:
    - 544-2-1, Crash Cushion, TL-2 Narrow
    - 544-2-2, Crash Cushion, TL-2 Wide
    - 544-3-1, Crash Cushion, TL-3 Narrow
    - 544-3-2, Crash Cushion, TL-3 Wide
  - Summary Box (*Summary of Permanent Crash Cushions*) was updated to include:
    - Location (Station and Side)
    - Crash Cushion System Width (In “Pay Item Description”)
    - Crash Test Level (In “Pay Item Description”)
    - Barrier Width (Connecting barrier width in inches)
    - Length Restriction (Based on site-specific space constraints)

**NOTE:** New Summary Box and Crash Cushion Cell with default Length of End Treatment was released with FDOT SS4 MR9 CADD Software (v01.09.00, released January 4, 2019)

## **BACKGROUND**

In accordance with AASHTO/FHWA Joint Implementation Agreement for MASH and effective with the ***January 2019 Standard Specifications***, all new installations of permanent crash cushions are required to meet MASH crash testing criteria (see ***E&O Memorandum 16-01***). As a result of MASH implementation, there are fewer crash cushion options on the Department’s Approved Products List (APL). This affects the crash cushion length and width options available for design, construction, and maintenance. While the Department does expect crash cushion options to expand, it is unlikely that equivalent sizes for all previous options will be available in the future. As a result, the above policy changes were made to help mitigate the impacts of this transition to MASH compliant devices.

Roadway Design Memorandum 19-02  
Permanent Crash Cushions  
Page 3 of 3

## **COMMENTARY**

The policy changes of this memorandum are effective with the *FY2019-20 Standard Plans for Road and Bridge Construction*, for all projects beginning with July 2019 construction lettings.

Existing crash cushions may remain in place in accordance with the provision of *FDM 215.7.3*.

For new crash cushion usage, the Department recognizes the current limited product availability and will be addressing projects let for construction between January 1, 2019 and June 30, 2019 in accordance with *DCE Memorandum 18-18*.

The use of “Wide” crash cushion systems are now discouraged due to the currently limited product availability.

For more information, see the *Standard Plans Instructions (Index 544-001, Crash Cushion Details)* and the State Roadway Design Office’s online training, *Standard Plans Update Training for FY 2019-20*.

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