



Florida Department of Transportation

RICK SCOTT
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

ANANTH PRASAD
SECRETARY

ROADWAY DESIGN BULLETIN 13-01

DATE: January 8, 2013

TO: District Design Engineers and Plans Preparation Manual Holders

FROM: Frank T. Sullivan, P.E., Roadway Design Administrator *Frank T. Sullivan*

COPIES: Brian Blanchard, Tom Byron, David Sadler, Tim Lattner, Mark Wilson, Bruce Dana, John Krause, and Monica Gourdine (FHWA)

SUBJECT: Design Standards, Index 430 "Crash Cushion Details"

REQUIREMENTS

This bulletin introduces the requirement of a new design standard, Index 430 "Crash Cushion Details." This index aids in the selection of permanent crash cushions. Standard details of crash cushion systems for installations which shield concrete barrier wall ends and guardrail ends can be found on the Qualified Products List (QPL) product drawings.

Selection

Index 430 includes information for both concrete barrier wall and guardrail applications. Establish the location station for crash cushions and barrier ends as based on the design length of the shortest crash cushion for a given design speed. See the Plans Preparation Manual (PPM) Volume 1, Chapter 4.

Plan Content

For permanent crash cushion applications, the designer shall indicate in the plans the location (station and side), barrier system (concrete barrier wall or guardrail), design length, design speed, crash test level, hazard width and all length restriction requirements for each given location (refer to PPM Volume 2, Exhibit SQ-4). A summary box for the "Summary of Permanent Crash Cushions" is available in CADD cell format from the Engineering CADD Support Office (ECSO).

COMMENTARY

The technical application of this bulletin is supported by the response to an FHWA; Frequently Asked Question (FAQ) on crash cushion applicability when design speeds are greater than 60 mph. The FHWA

Office of Safety considers a 100 km/hr test (TL-3) to be representative of the worst case run off the road crash. The answer to this FAQ can be found in the FHWA memoranda entitled “Roadside Design: Steel Strong Post W-beam Guardrail” dated May 17, 2010.

BACKGROUND

This bulletin is based on guidance from the Federal Highway Administration (FHWA); the Department has required manufacturers to modify their product drawings for crash cushions to specify whether the crash cushions are TL-2 or TL-3. Based on that requirement, Index 430 was generated to facilitate the selection of crash cushions.

IMPLEMENTATION

Beginning with projects let on January 1, 2013 and later, the selection of permanent crash cushions will be based on immediate implementation of the requirements for the crash cushion details as shown and noted in Index 430.

CONTACT

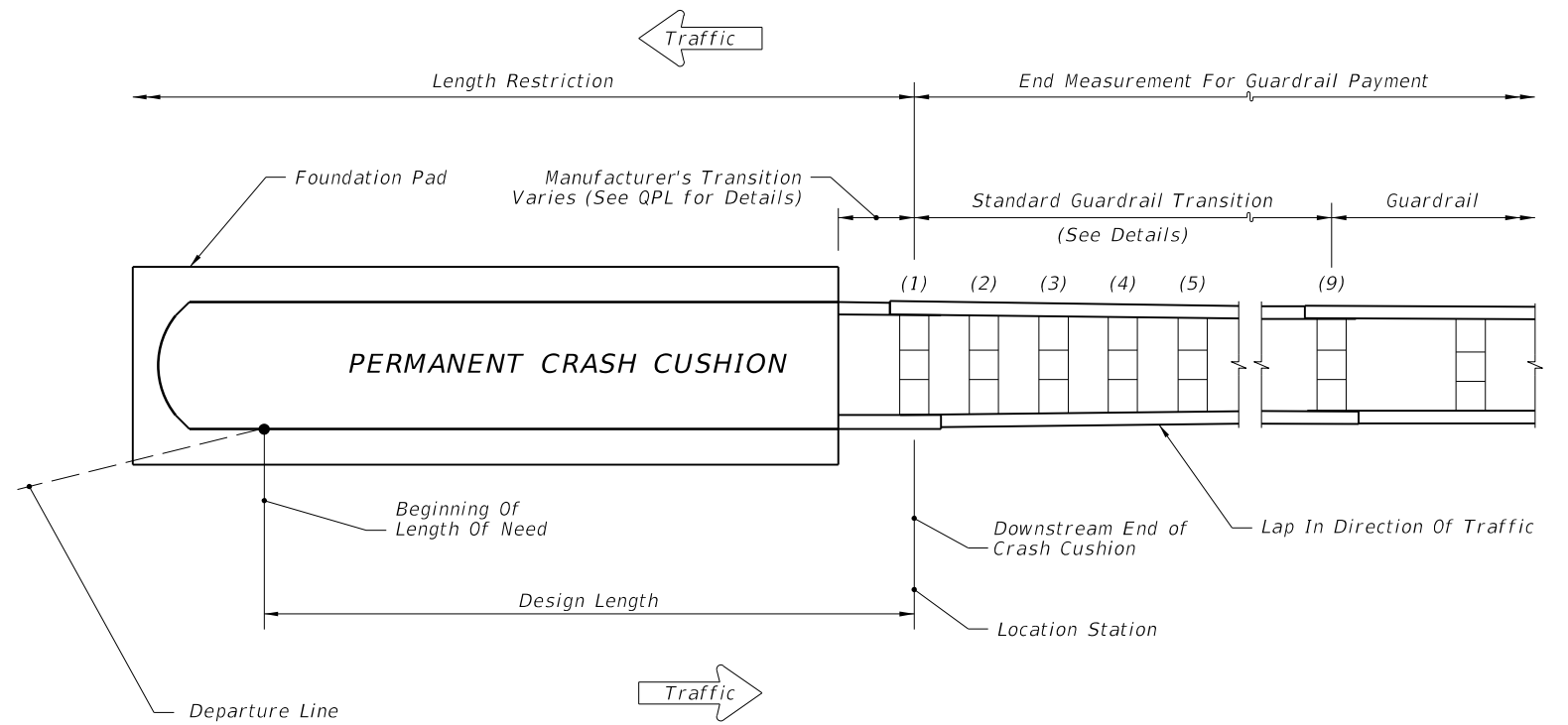
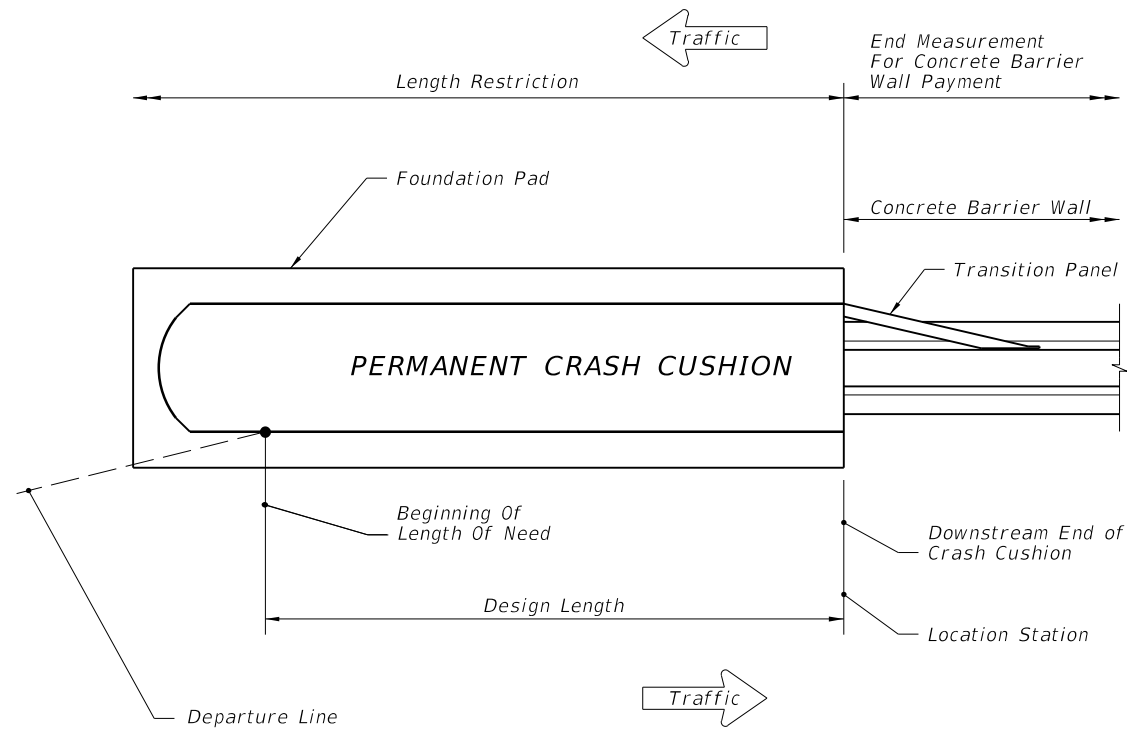
Frank T. Sullivan, PE
Roadway Design Administrator
605 Suwannee Street, MS 32
Tallahassee, FL 32399-0450
Phone (850) 414-4324
Frank.Sullivan@dot.state.fl.us

John Mauthner, PE
Design Standards Manager
605 Suwannee Street, MS 32
Tallahassee, FL 32399-0450
Phone (850) 414-4334
John.Mauthner@dot.state.fl.us

FS/JM/jm

Attachments:
Index 430, “Crash Cushion Details”
Exhibit SQ-4

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GENERAL NOTES

1. Index 430 is applicable for permanent crash cushion installations that shield the ends of Concrete Barrier Wall or Guardrail, only.
2. Design Length is based on a given design speed and the shortest Crash Cushion available on the Qualified Products List (QPL).
3. For High Speed Facilities with a Design Speed greater than 60 mph, use a TL-3 Crash Cushion.
4. Assemble and install Crash Cushions according to the limitations noted on the Qualified Products List (QPL) webpage, the manufacturer's specifications, and the applicable crash cushion drawings posted on the QPL.
5. When subjected to reverse direction hits, construct Transition Panels from Concrete Barrier Walls to Crash Cushions; for additional details refer to the applicable crash cushion drawings on the QPL.
6. Galvanize metallic components to meet the requirements for Steel Guardrail, Section 967 of the Standard Specifications for Road and Bridge Construction.
7. For Guardrail Applications, construct the Manufacturer's Transition between the Permanent Crash Cushion and the Standard Guardrail Transition; refer to all Standard Guardrail Transition details of this index.
8. For additional information on the End Measurement for Guardrail Payment, refer to the Standard Specifications for Road and Bridge Construction, Section 536.
9. A yellow Type I Object Marker shall be centered 3' in front of the crash cushion nose. Mounting hardware shall be in conformance with Section 993 of the Standard Specifications for Road and Bridge Construction.

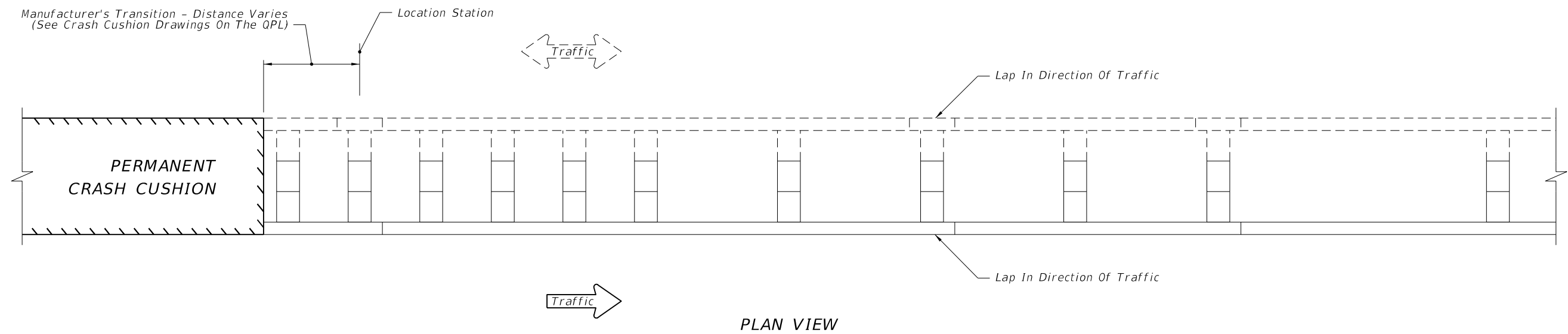
As an option, the contractor may install reflective sheeting on the nose of the crash cushion. The sheeting to be used must be solid yellow, Type III or better and must be a product listed on the Department's Qualified Products List (QPL). The sheeting to be applied to the nose of the crash cushion shall be a minimum of 360 square inches with a minimum height of 15 inches.

Design Length (ft.)	Design Speed (mph)	Crash Test Level
6.00	35	TL-2
6.00	40	
6.00	45	
9.00	50	TL-3
12.00	55	
15.00	≥ 60	

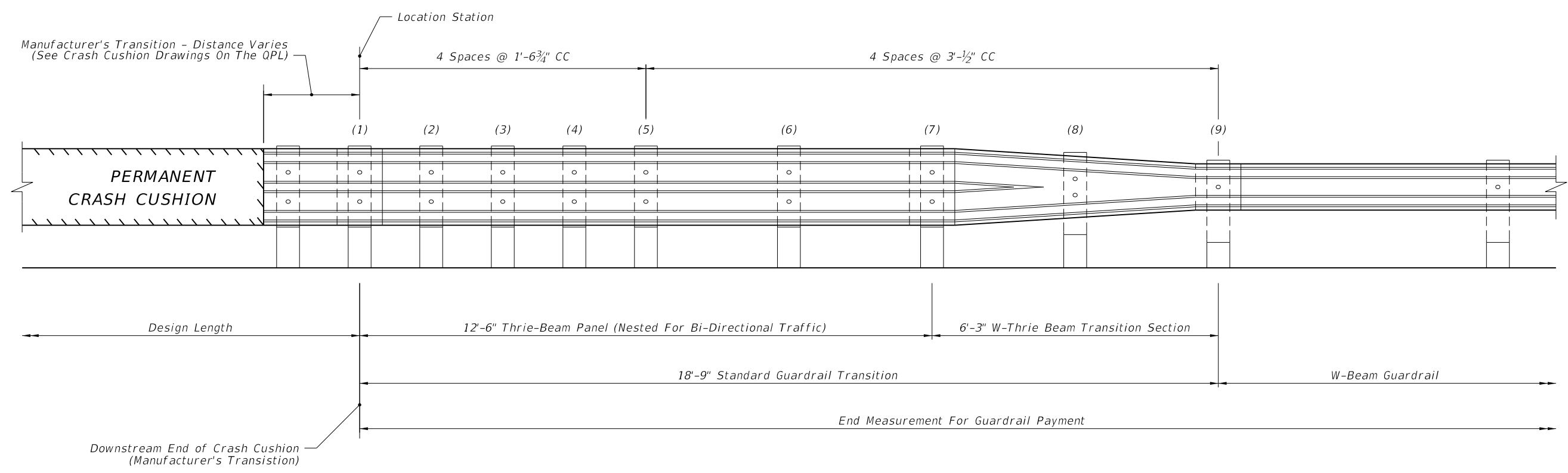
Design Length (ft.)	Design Speed (mph)	Crash Test Level
12.50	35	TL-2
12.50	40	
12.50	45	
15.63	50	TL-3
18.75	55	
18.75	≥ 60	

PERMANENT CRASH CUSHION APPLICATIONS

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PLAN VIEW



ELEVATION VIEW

STANDARD GUARDRAIL TRANSITION

LAST REVISION	REVISION	DESCRIPTION:	 FDOT DESIGN STANDARDS 2013	CRASH CUSHION DETAILS	INDEX NO. 430	SHEET NO. 2
01/01/13						

SUMMARY OF PERMANENT CRASH CUSHIONS											
LOCATION		BARRIER SYSTEM		DESIGN LENGTH (ft.)	DESIGN SPEED (mph)	CRASH TEST LEVEL (TL-2 / TL-3)	HAZARD WIDTH (in.)	LENGTH RESTRICTION (ft.)	QUANTITY		REMARKS
STATION	SIDE	CONCRETE BARRIER WALL	GUARDRAIL						P	F	
100+64.50	LT/RT		SGL FACE	18.75	60	TL-3	15.25	N/A	2		STANDARD GUARDRAIL TRANSITION
103+77.00	MED		DBL FACE	18.75	60	TL-3	24.50	N/A	1		STANDARD GUARDRAIL TRANSITION
110+45.00	MED	FULL WALL		15.00	60	TL-3	24.0	23.75	1		BIDIRECTIONAL TRAFFIC
125+25.00	RT	HALF WALL		15.00	70	TL-3	15.0	N/A	1		UNIDIRECTIONAL TRAFFIC
775+19.25	RT	BRIDGE WALL		12.50	35	TL-2	15.0	15.50	1		DRIVE ENTRANCE RESTRICTION
995+40.75	RT		SPECIAL	15.63	50	TL-3	69.0	39.25	1		GORE AREA (EXIT RAMP)
TOTAL LOCATIONS:									7		

Notes:

1. For Length Restrictions, refer to the Crash Cushion Drawings on the Qualified Product List (QPL).
2. For Additional Information on the Design Length of Permanent Crash Cushions, see Design Standards, Index 430 and IDS-430.

EXHIBIT SQ-4
Date: 1/1/12

REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SUMMARY OF QUANTITIES	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
				10	LEON	123456-1-52-01		