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ROADWAY DESIGN BULLETIN 21-XX

DATE: March XX, 2021

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 Consultant Project Management Engineers, District Roadway Design Engineers, District Traffic Operations Engineers, Program Management Engineers, District Materials Engineers, District Specifications Engineers, District Estimates Engineers, District Drainage Design Engineers

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

COPIES: Courtney Drummond, Will Watts, Dan Hurtado, Rudy Powell, Michael Shepard, Stefanie Maxwell, Scott Arnold, Paul Hiers, Vern Danforth, Daniel Strickland, Robert Robertson, Lora Hollingsworth, Gevin McDaniel, Kevin Burgess (FHWA), Chad Thompson (FHWA), Bren George (FHWA)

SUBJECT: **Project Design Variation Memorandum**

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This Bulletin introduces revisions to the ***FDOT Design Manual (FDM)*** to streamline the Design Documentation process for Design Variations within the District and Turnpike Offices. Additional updates are included to clarify Chief Engineer signature requirements for Non-Traditional Use of Shoulders.

Background

Design Variations are required to be approved when FDOT Department Criteria are not met on a project. To streamline the documentation and review process, a Project Design Variation Memorandum (***FDM Form 122-B***) has been created to document all Non-Controlling Design elements for a project that do not meet Department criteria within one signed and sealed report. Those elements requiring a more detailed analysis (through a Formal Design Variation) can also be identified on the form by the District Design Engineer.

Due to the multi-purpose nature of shoulders and their impacts on safety and mobility, projects proposing non-traditional use of shoulders (e.g., Bus on Shoulder projects) require approval by the Chief Engineer. This has been added to the approval sections of ***FDM Chapter 122***.

REQUIREMENTS

1. Delete ***FDM 122.2.2, FDM 122.4,*** and replace with each associated Sub-section in Attachment 'A'.
2. Delete ***FDM 122.7.4 Paragraphs 1 and 2*** and replace with Attachment 'B'
3. Delete ***FDM Table 122.7.1*** and replace with Attachment 'C'
4. Add ***FDM Form 122-B to FDM Chapter 103,*** Attachment 'D'
5. Delete PSEE Folder category "APPROVALS" from ***FDM, Table 111.7.1,*** and replace with Attachment 'E'

IMPLEMENTATION

These requirements are effective immediately at the discretion of the District for all projects which have not yet begun design and for any project where it can be implemented during design.

CONTACT

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Attachment 'A'

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122.2.2 Design Variations

Design Variations are required when existing or proposed design elements do not meet the Department's criteria.

There are 2 methods to document Design Variations:

- Formal Design Variation
- Project Design Variation Memorandum

A **Formal Design Variation** is used for Controlling Design Elements and any of the following design elements:

(1) American with Disabilities Act (ADA)

Design elements requiring signature by individual or office noted in ***FDM 122.7.4***.

A **Project Design Variation Memorandum (*Form 122-B*)** is used to document all Non-Controlling Design elements for a project that do not meet Department criteria and for design elements that are not included in the above list for Formal Design Variations. This document is prepared by the Engineer of Record and approved by the District Design Engineer and the District Traffic Operations Engineer (as needed). This form should be submitted early in the review process, as certain items may require more extensive review. A Formal Design Variation may be required by the District Design Engineer for any elements requiring a more extensive analysis.

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122.4 Documentation for Approval

Supporting documentation that is generated during the approval process is to accompany each submittal. The level of detail for Design Exceptions and Design Variations should be commensurate with the complexity of the design element and the relevance of information to engineering decisions.

Design Exceptions and **Formal Design Variations** should include the following documentation:

(1) Submittal/Approval Letter (***Form 122-A***, see ***FDM 103)***

Project Description: general project information, location map, context classification, existing roadway characteristics, project limits (mileposts), county section number, work mix, objectives, and obstacles. Include any associated or future limitations that exist as a result of public or legal commitments.

Project Schedule and Lifespan: Provide (1) the Plans Production date, and (2) the Letting date for the project. Explain why the proposed Design Exception/Variation is either a temporary or permanent condition. Include any future work planned or programmed to address the condition.

Exception/Variation Description:

(a) Specific design criteria that will not be met (provide criteria values from both AASHTO and FDOT). Detailed explanation of why the criteria or standard cannot be complied with or is not applicable. Description of the proposed value and why it is appropriate.

(b) A plan view, plan sheet, or aerial photo of the location, showing the design speed, posted speed, right of way lines, and property lines of adjacent property. A photo of the area of the deficiency.

(c) Typical section or cross-section of the location.

(d) The milepost and station location (including left/right side).

Alternative Designs Considered: meeting Department criteria, meeting AASHTO criteria, partial correction, and the no-build (existing) condition.

Impacts of the Exception/Variation to:

(e) Safety Performance:

1. Review and evaluation of the most recent 5 years of crash data from the current date of analysis.

2. Description of the anticipated impact on safety, long and short-term effects. Description of any anticipated cumulative effects.

3. For non-existing or proposed conditions, a comparison of the predicted or expected crash frequency should be included along with a discussion of the 5-year crash history. Some resources that are available for this comparison include:

1. Highway Safety Manual (HSM)
2. Interactive Highway Safety Design Model (IHSDM)
3. Enhanced Interchange Safety Analysis Tool (iSATe)
4. Roadside Safety Analysis Program (RSAP)

(f) Operational Performance:

1. Description of the anticipated impact on operations, long and short-term effects. Description of any anticipated cumulative effects.

2. Traffic information: Design Year AADT and 24-hour truck volume.

3. Compatibility of the design with adjacent sections of roadway.

4. Effects on capacity (proposed criteria vs. AASHTO) using an acceptable capacity analysis procedure and calculate reduction for design year, level of service.

(g) Right of Way

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(h) Community

(i) Environment

(j) Usability by all modes of transportation

Costs: Description of the anticipated costs associated with the Design Exception or Variation. Provide a Benefit-Cost (B/C) ratio, where applicable.

Mitigation Measures: Description and explanation of practical mitigation measures or alternatives that were considered and selected treatments implemented on the project.

Summary and Conclusions

A **Project Design Variation Memorandum** should include the following documentation, which may be presented in the format of succinct bullets:

(1) Submittal/Approval Memo (***Form 122-B***, see ***FDM 103***).

(2) Design criteria versus proposed criteria.

(3) Review of crash history on the project related to the design element.

(4) Abbreviated justification for the proposed criteria.

For Lateral Offset Design Variations, provide a tabulation of stations (or mileposts) and lateral offsets for aboveground fixed objects.

Additional information can be found on the ***Crash Location Verification Status Dashboard***.

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Attachment ‘B’

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122.7.4 Signature Requirements

Obtain all required approvals as described in this section. Approvals from multiple individuals may be required for certain issues. The Director of Design must resolve any approval authority issues if conflicting objectives arise. Approval signatures are required by the following Department and FHWA personnel as specified:

Chief Engineer:

(1) Design Exceptions for Design Speed on SIS facilities, following review by the Chief Planner.

(2) Design Variations for Design Speed on SIS facilities, following review by the Chief Planner.

(3) Design Variations for omission of Emergency Shoulder Use (ESU) evacuation requirements for any phase of construction.

(4) Design Variation for Shared Use Paths in LA R/W not meeting the criteria in FDM 224.1.1, following review by the Chief Planner.

(5) Design Exceptions or Variations involving lateral offsets or vertical clearances for railroads not meeting the requirements of Rule 14-57 F.A.C. or the clearance criteria for the South Florida Rail Corridor (Topic No. 000-725-003 - South Florida Rail Corridor Clearance Policy for 25 KV service).

(6) Design Variations for Non-Standard Use of Shoulders. (e.g. Bus on Shoulder Projects)

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Attachment ‘C’

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Table 122.7.1 Central Office Approvals

Design Element	State Roadway Design Engineer	State Structures Design Engineer	Chief Planner	Chief Engineer
	Approval	Approval	Review	Approval
Design Speed Exception	X			
Design Speed Exception-SIS	X		X	X
Design Speed Variation-SIS			X	X
Design Variation: ESU Omission during Construction				X
Design Variation: Shared Use Path in LA R/W			X	X
Design Variation: Non-Standard Shoulder Use				X
Lane Width Exception	X			
Shoulder Width Exception	X			
Maximum Grade Exception	X			
Cross Slope Exception	X			
Superelevation Rate Exception	X			
Horizontal Curve Radius Exception	X			
Stopping Sight Distance Exception	X			
Design Variation: Traffic Railing (Category 1 and 2 Structures)		X		
Design Variation: Fencing on Traffic Railing between pedestrians and travel lanes on LA Facilities		X		
Design Variation: Crossovers on Limited Access Facilities	X			
Design Variation: Patterned Pavement Technical Special Provisions	X			
Design Variation: Use of fencing around stormwater management facilities	X			

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Table 122.7.1 Central Office Approvals (Cont.)

Design Element	State Roadway Design Engineer	State Structures Design Engineer	Chief Planner	Chief Engineer
	Approval	Approval	Review	Approval
Design Loading Structural Capacity				
-Design Exception		X		
-Design Variation: Category 2 Structures		X		
-Design Variation: Deficient Load Ratings (Category 1 and 2 Structures)		X		
Vertical Clearance Exception				
- Non-Bridge Items	X			
- Bridge Structures (Category 1 and 2)	X	X		
-RR-South Fla Rail Corridor	X	X		X
Vertical Clearance Variation				
-Category 2 Structures		X		
-RR-South Fla Rail Corridor	X	X		X
Lateral Offset Variation				
-Category 1 and 2 Structures	X			
-RR-South Fla Rail Corridor	X	X		X

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Attachment ‘D’

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Project Design Variation Memorandum (Sample-Draft)

To: _____ Date:_____
District or Turnpike Design Engineer

Financial Project ID: _____ New Const. RRR

Federal Aid Number: _____

Project Name: _____

State Road Number: _____ Co./Sec./Sub. _____

Begin Project MP: _____ End Project MP: _____

Request for: Design Variation

	Design Element	MP: Beg-End	Criteria: Existing	Proposed Required	Approved	Denied	Addl Docum.
1.	Turn Lane Length						
	Justification:						
2.	Sidewalk Width						
	Justification:						
3.	Bike Lane Width						
	Justification:						
4.	Median Width						
	Justification:						

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Design Element MP: Beg-End Criteria: Existing Proposed Required Approved Denied Addl Docum.

5. Barrier Offset _____ _____ _____ _____

Justification:

6. Border Width _____ _____ _____ _____

Justification:

Appendices: Yes No

Recommended by:

_____ Date _____
Name:
Responsible Professional Engineer or Landscape Architect (Landscape-Only Projects)

Approvals:

_____Date _____
Name:
District or Turnpike Traffic Operations Engineer

_____Date _____
Name:
District Design Engineer

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Attachment ‘E’

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Table 111.7.1 – Document Summary Table

PSEE Folder	Document Type	Document	File Name
APPROVALS	ICE Report	ICE Report	ICE Report
	Variations-Exceptions	Project Design Variation Memorandum	Project Design Variation Memo
		Design Variation Package	Design Variation
		Design Exception Package	Design Exception
		Design Memorandum	Design Memo
	Approval Docs	Project Correspondence	Correspondence
		Lane Elimination Approval	Lane Elimination Approval
		Federal Aviation Administration (FAA) Determination	FAA Determination
		Intersection Number Request Form	Intersection Number Request Form
		Contract Time Memorandum	Contract Time Memo
		Permit Exemption Letter	Permit Exemption Letter
		Structure Number Request Form	Structure Number Request Form
		Value Engineering Report	Value Engineering Report

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