Florida Department of Transportation

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ROADWAY DESIGN BULLETIN 15-16

DATE: December 23, 2015

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

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

COPIES: Brian Blanchard, Tom Byron, Tim Lattner, David Sadler, Rudy Powell, Amy Tootle, Timothy Ruelke, Robert Robertson, Bob Crim, Mark Wilson, Bruce Dana, Gregory Schiess, Trey Tillander, Lora Hollingsworth, Nick Finch (FHWA), Chad Thompson (FHWA), and Phillip Bello (FHWA)

SUBJECT: 2016 Plans Preparation Manual (PPM)

This bulletin announces the release of the 2016 Plans Preparation Manual (PPM), which is available on the Office of Design website at the following link:

http://www.dot.state.fl.us/rddesign/PPMManual/PPM.shtm

REQUIREMENTS:

The major changes in design requirements are to be implemented as follows:

Volume 1, Chapter 2, Table 2.1.2: Lane Widths – Special

The note regarding bicycle lanes in and within 1 mile of an urban boundary was revised to refer to Chapter 8.

IMPLEMENTATION:

This change is clarification of existing requirements and is already in effect.

Volume 1, Chapter 2, Table 2.3.2: Shoulder Widths and Cross Slopes – Arterials Divided, and Table 2.3.4: Shoulder Widths and Cross Slopes – Collectors Divided and Undivided

Footnote 7 was revised, and footnote 8 was added to provide clarification on the required shoulder widths in or within 1 mile of an urban boundary.

IMPLEMENTATION:

These changes are clarification of existing requirements which are already in effect.

Volume 1, Chapter 2, Section 2.13.1 Roundabouts

This section incorporates Roadway Design Bulletin 15-07, which established a process to satisfy the roundabout evaluation requirement. Corresponding changes to roundabout evaluation were made to Section 25.4.17 in Volume 1 and Section 2.3.3 in Volume 2.

IMPLEMENTATION:

The requirements provided in Roadway Design Bulletin 15-07 are now included in the PPM. Roundabout evaluation requirements may be waived for projects that began the design phase prior to April 2015 and implementation will adversely impact the project's schedule.

Volume 1, Chapter 2, Figure 2.16.1 Four-Lane High-Speed Urban and Suburban Section, and Figure 2.16.2 Six-Lane High-Speed Urban and Suburban Section

These two figures were removed since the information is presented in a more appropriate location in the Typical Section Exhibits in Chapter 6 of Volume 2.

IMPLEMENTATION:

These changes are clarification of existing requirements which are already in effect.

Volume 1, Chapter 2, Section 2.16.5 Shoulders

To remove duplication of criteria, the language regarding bicycle lane markings and widths was removed from this section and replaced with a reference to Section 2.3 (Shoulders).

IMPLEMENTATION:

These changes are clarification of existing requirements which are already in effect.

Volume 1, Chapters 2, 4, 7, 10, 21, 25

Chapter 4 was substantially revised. All roadside safety criteria (New Construction, Temporary Traffic Control, TDLC, RRR) has been moved from Chapters 2, 7, 10, 21, and 25, and is now located in Chapter 4. New sections were added to Chapter 4 to provide clarification and to reference requirements found in other documents and Design Standards. There were also policy changes within this chapter, as described below:

- ***Section 4.2.3*** – Added "Basic" Clear Zone Concept.
- ***Section 4.2.7*** – Added New "Drainage Features" Section.
- ***Section 4.2.8*** – Added New "Traffic Separator" Section.
- ***Section 4.3.2*** – Revised Barrier Placement requirements (i.e. outside of the clear zone and no closer to canal top slope than distances provided).
- ***Section 4.4*** – Added New "Roadside Barriers" Section to provide list and limitations of various Standard Barriers, End Treatments, Crash Cushions, and Barrier Transitions.
- ***Section 4.4.1.2*** – Thrie-Beam Guardrail, as a standard barrier type, has been removed from the PPM. With the introduction of 31" W-Beam Guardrail (MGS) as the standard guardrail barrier option on the State Highway System Thrie-Beam Guardrail, as it is currently configured, is considered obsolete. Thrie-Beam panels will still be used in barrier transitions and with Modified Thrie-Beam installations.
- ***Section 4.4.1.3*** – Added statement that modifications to Rigid Barriers must be approved by the State Roadway Design Office or State Structures Design Office.
- ***Section 4.4.5*** – Expanded Barrier Type Selection to include all barrier types, not just guardrail.
- ***Section 4.4.5.1*** – Added barrier "Order of Bias" table.
- ***Section 4.4.5.4*** – Added Flowchart for Pier Protection Selection.
- ***Section 4.4.6.1*** – Revised guardrail offset from curb face criteria. Modified ***Table 4.4.2*** to remove Thrie-Beam and to include setback distances for all standard barrier types, not just guardrail.
- ***Section 4.4.5.2*** – Added New "Grading Requirements" Section. Included maximum algebraic difference of 7% in advance of barrier.
- ***Section 4.4.6.2*** – The Department has changed the method of calculating "Length of Need" and has added this new Section to explain this topic.
- ***Section 4.4.6.4*** – Added new criteria for Median Barriers on high-volume, high-speed, non-limited access facilities.

- ***Section 4.4.6.5*** – Added requirement for a "Refuge Area" on roadways with Temporary Barrier installations along both edge lines. Added requirement that existing permanent barriers must be maintained in accordance with the permanent system requirements (i.e. deflection space, grading, setbacks, etc.). Added limitation for placement of temporary barrier beyond the slope breakpoint in superelevated section.
- ***Section 4.5.2*** – Removed design criteria for sign attachments to traffic railings.
- ***Section 4.7.2*** – Updated language to clarify difference between ***2013 Design Standards***, Index 400 and current (i.e. 27" vs. 31" Guardrail). Also, updated criteria for allowance of existing steel offset blocks to roadways with design speeds ≤ 45 mph only.
- ***Section 4.7.5*** – Removed reference to "Guardrail Continuous Across Bridge" to match removal of ***Design Standards***, Index 403.

The following is a summary of the changes to the chapters impacted by the Chapter 4 reorganization:

PPM Sections		
Topic	**Moved From 2015 PPM Volume 1 Section(s)**	**Moved To 2016 PPM Volume 1 Chapter 4 Section**
Lateral Offset	2.11 Lateral Offset 21.5.6 Lateral Offset 25.4.14 Lateral Offset	4.2.4 Lateral Offsets
Roadside Slope Criteria	2.4 Roadside Slopes 25.4.9 Side Slopes	4.2.6 Roadside Slope Criteria
Curbs	2.3.3 Use of Curb on High Speed Roadways 25.4.14.3 Use of Curb on RRR Projects	4.2.7.2 Curbs
Signing, Lighting, Traffic Signals, and Other Similar Roadside Features	4.6 Roadside Appurtenances	4.2.9 Signing, Lighting, Traffic Signals, and Other Similar Roadside Features
Roadside Hazards	4.2 Hazard Standards 10.12.10 Above Ground Hazards 10.12.11 Drop-offs in Work Zones	4.3 Roadside Hazards
Roadside Barriers	10.11.2 Barrier Walls (Temporary)	4.4.1.4 Temporary Barriers
Crash Cushions	4.5 Permanent Crash Cushions 10.11.5 Temporary Crash Cushions	4.4.3 Crash Cushions

PPM Sections		
Topic	**Moved From 2015 PPM Volume 1 Section(s)**	**Moved To 2016 PPM Volume 1 Chapter 4 Section**
Barrier Type Selection	4.5.2 Selection	4.4.5 Barrier Type Selection
Barrier Placement	4.3.5 Placement	4.4.6.1 Barrier Offset
Warrants for Roadside Barriers	4.3.1 Recommendations 4.1.1 Clear Zone Concept 10.11.1 Traffic Barriers	4.4.7.1 Evaluation of Roadside Hazards 4.4.7.2 Shielding Requirements 4.4.7.3 Positive Protection in Work Zones
Attachments to Barriers	7.1.2 Attachments to Traffic Railings	4.5 Attachments to Barriers
Surface Finishes	4.3.7 Surface Finishes	4.6 Surface Finishes
Upgrading Existing Barrier	4.3.6 Upgrading Existing Barrier System 4.3.6.1 Resetting Guardrail 25.4.25.1 Longitudinal Barriers, Guardrails, Median Barriers 25.4.25.3 Guardrail Terminals 25.4.24.3 Bridge Railing 25.4.25.2 Guardrail to Bridge Rail Transitions	4.7 Upgrading Existing Barrier System 4.7.1 Resetting Guardrail 4.7.2 Existing Longitudinal Roadway Barriers on RRR Projects 4.7.3 Existing End Treatments & Crash Cushions on RRR Projects 4.7.4 Bridge Traffic Railing on RRR Projects 4.7.5 Guardrail to Bridge Railing Transition on RRR Projects
Non-Standard Roadside Safety	4.7 Non-Standard Roadside Safety Devices	4.8 Non-Standard Roadside Safety Hardware
PPM Tables and Exhibits		
Topic	**Moved From PPM Volume 1 Section(s)**	**Moved To PPM Volume 1 Chapter 4 Section**
Clear Zone Criteria	Table 2.11.11 Recoverable Terrain Table 21.6 TDLC Recoverable Terrain Table 25.4.14.1 Recoverable Terrain	Table 4.2.1 Clear Zone Width Requirements
	Design Standard, Index 600	Table 4.2.2 Clear Zone Width Requirements for Work Zones

PPM Tables and Exhibits		
Topic	**Moved From PPM Volume 1 Section(s)**	**Moved To PPM Volume 1 Chapter 4 Section**
Lateral Offset	Tables 2.11.1 thru 2.11.5 Tables 21.2 thru 21.5 Tables 25.4.14.2 thru 25.4.14.10	Table 4.2.3 Lateral Offset Criteria
Roadside Slope Criteria	Table 2.4.1 Roadside Slopes	Table 4.2.4 Roadside Slopes
Control Zones	Exhibit 25-A	4.2.5 Control Zones *(Figures 4.2.4 thru 4.2.13)*
Drainage Features	Figure 4.1.2.1 Clear Zone Plan View Figure 4.1.2.2 Clear Zone Cross Section Figure 4.1.3.1 Roadside Ditch "V" Shape Figure 4.1.3.2 Roadside Ditch "Trapezoidal" Shape	Figure 4.2.1 Clear Zone Plan View Figure 4.2.3 Adjusted Clear Zone Concept Figure 4.2.14 Roadside Ditches – Bottom Width 0 to 4 feet Figure 4.2.15 Roadside Ditches – Bottom Width ≥ 4 feet
Roadside Hazards	Exhibits 4-A & 4-B (Minimum Standards for Canal Hazards) Figure 4.2.2 Drop-off Hazards in Urban Sections	Figures 4.3.1 & 4.3.2 (Minimum Offsets for Canal Hazards) Figure 4.3.3 Drop-off Hazards in Urban Sections
Bridge Railings	Figures 2.12.1 thru 2.12.12	Figures 4.4.1 thru 4.4.10
Barrier Placement	Table 4.3.1 Minimum Offset to Barriers	Table 4.4.2 Minimum Barrier Setback
	Figure 2.11.1 Lateral Offset to Guardrail	Figure 4.4.12 Lateral Offset to Guardrail
	Figure 7.1.2.1 Setback Distances for Discontinuous Attachments to Standard FDOT Traffic Railings	Figure 4.4.13 Setback Distances for Discontinuous Elements

IMPLEMENTATION:

These changes are effective on projects beginning design on or after January 1, 2016 and on projects currently in the design phase where implementation will not adversely impact production schedules.

Volume 1, Chapter 6, Section 6.2.3 Quiet Zones

Quiet Zones are segments of rail lines that include public highway-railroad crossings at which locomotive horns are not routinely sounded. With an increasing demand for rail corridors to be classified as Quiet Zones, design criteria for crossings within Quiet Zones is needed. This new section provides FDOT-specific design criteria that is based on the Code of Federal Regulations (CFR) that relates to Quiet Zones (49 CFR Part 222).

IMPLEMENTATION:

These changes are effective on projects beginning design on or after January 1, 2016 and on projects currently in the design phase where implementation will not adversely impact production schedules.

Volume 1, Chapter 7, Section 7.2 Signing, 7.4 Traffic Signals, and 7.7 Foundation Design

Information regarding sign and signal support structures and foundations has been moved to Chapter 29 (Structural Supports for Signs, Luminaires, and Traffic Signals), which is a more appropriate place for this criteria.

IMPLEMENTATION:

These changes are clarification of existing requirements which are already in effect.

Volume 1, Chapter 7, Section 7.2.11 Exit Ramp Intersections

This section incorporates Roadway Design Bulletin 15-08, which established new minimum signing and pavement marking standards for interstate exit ramp intersections to complement the Manual on Uniform Traffic Control Devices (MUTCD).

IMPLEMENTATION:

The requirements provided in Roadway Design Bulletin 15-08 are now included in the PPM. These requirements were effective upon the release date of the bulletin (April 2015).

Volume 1, Chapter 7, Section 7.3 Lighting

This section was rewritten to include new methodologies for lighting calculations. The revisions also include new criteria for signalized intersections.

IMPLEMENTATION:

These changes are effective on projects beginning design on or after January 1, 2016 and on projects currently in the design phase where implementation will not adversely impact production schedules.

Volume 1, Chapter 7, Section 7.4.5 Left Turn Treatments

Option #3 was added for Three Approach lanes on Stem of "T" intersections.

IMPLEMENTATION:

These changes are effective on projects beginning design on or after January 1, 2016 and on projects currently in the design phase where implementation will not adversely impact production schedules.

Volume 1, Chapter 7, Section 7.4.10 Mast Arm Supports

This section was modified to incorporate Roadway Design Bulletin 15-14, which prohibits the use of pivotal adjustable hangers for traffic signals. The references to this have been updated to "adjustable hangers." This is based on recent Department-funded research.

IMPLEMENTATION:

The requirements provided in Roadway Design Bulletin 15-14 are now included in the PPM. These requirements were effective upon the release date of the bulletin (December 2015).

Volume 1, Chapter 7, Section 7.6 Pavement Markings

This section incorporates Roadway Design Bulletin 15-02, which established a new pavement marking selection criteria for both asphalt and concrete surfaces.

IMPLEMENTATION:

The requirements provided in Roadway Design Bulletin 15-02 are now included in the PPM. These requirements were effective upon the implementation date identified in the bulletin (July 2015).

Volume 1, Chapter 8, Section 8.3.3.1 Crosswalks at Intersections

Language was added in this section to require Special Emphasis crosswalk markings at all signalized intersections, mid-block crossings, and school crossings. Standard crosswalk markings will still be used for stop or yield controlled intersections where pedestrian facilities are present.

IMPLEMENTATION:

These changes are effective on projects beginning design on or after January 1, 2016 and on projects currently in the design phase where implementation will not adversely impact production schedules.

Volume 1, Chapter 8, Section 8.4.2.2 Green Color Bicycle Lanes

The eligibility requirements for installing Green Bicycle Lanes have been revised. The requirement of having a crash history of 3 or more crashes has been removed. The language has been updated to specify that green bike lanes are permitted in areas where the speed limit is 35 mph or greater and a qualifying conflict area exists. Bike lane transitions across free-flow merge lanes or lane additions was added to the list of qualifying conflict areas.

IMPLEMENTATION:

This change is effective as of January 1, 2016.

Volume 1, Chapter 10, Section 10.5 Temporary Traffic Control Training

The outdated language in this section was removed and a reference to the new Temporary Traffic Control (Maintenance of Traffic) Training Handbook was added.

IMPLEMENTATION:

These changes are clarification of existing requirements which are already in effect.

Volume 1, Chapter 10, Section 10.8.1 Warning Lights

This section has been removed, per Roadway Design Bulletin 15-10, which prohibits the use of warning lights on temporary traffic control devices.

IMPLEMENTATION:

The requirements provided in Roadway Design Bulletin 15-10 are now included in the PPM. These requirements were effective upon the implementation date identified in the bulletin (July 2015).

Volume 1, Chapter 10, Section 10.8.3 Temporary Traffic Signals

For consistency and clarification purposes, design criteria for temporary signals was added to this section.

IMPLEMENTATION:

These changes are effective on projects beginning design on or after January 1, 2016 and on projects currently in the design phase where implementation will not adversely impact production schedules.

Volume 1, Chapter 13, Section 13.5.7 Fire Suppression Systems

This new section incorporates policy regarding the use of fire suppression systems on Department owned limited access facilities, bridges and retaining walls established in Roadway Design Bulletin 15-13.

IMPLEMENTATION:

The requirements provided in Roadway Design Bulletin 15-13 are now included in the PPM. These requirements were effective upon the implementation date identified in the bulletin (September 2015).

Volume 1, Chapter 19, Section 19.2.2 Digital Sealing

These sections have been updated to accommodate the recent changes to the Florida Administrative Code related to signing and sealing engineering documents. Also, outdated references to electronic delivery have been removed. Corresponding changes have also been made to Volume 2, Chapter 3 (Key Sheet and Signature Sheet).

IMPLEMENTATION:

These changes are effective on projects beginning design on or after January 1, 2016 and on projects currently in the design phase that have a letting date in March 2016 or later.

Volume 1, Chapter 23, Section 23.5 Documentation for Central Office Approval

Tables 23.5.1, 23.5.2, & 23.5.4: These tables have been updated with the most recent crash cost and crash distribution data (2010 – 2014).

Table 23.5.3: This is a new table that includes calibration factors for Florida to be used in Highway Safety Manual computations.

IMPLEMENTATION:

This change is effective as of January 1, 2016.

Volume 1, Chapter 25, Section 25.4.10.1 Vertical Curvature

Table 25.4.10.1 has been replaced. The new table is based on an object height of 2.0 feet, which matches AASHTO criteria. A Design Variation is not required for K values on existing facilities that meet the values shown in the new table. It should be noted that an object height of 6-inches must be used for new construction.

IMPLEMENTATION:

This change is effective as of January 1, 2016.

Volume 1, Chapter 33, Section 33.10 Traffic Railings

Thrie-Beam Guardrail, as a standard barrier type, has been removed from the PPM. With the introduction of 31" W-Beam Guardrail (MGS) as the standard guardrail barrier option on the State Highway System Thrie-Beam Guardrail, as it is currently configured, is considered obsolete. Thrie-Beam panels will still be used in barrier transitions and with Modified Thrie-Beam installations.

IMPLEMENTATION:

This change is effective as of January 1, 2016.

Volume 1, Chapter 34 Monitor Existing Structures

This new chapter provides the requirements for identifying structures that may need to be monitored during construction.

IMPLEMENTATION:

The requirements provided in Roadway Design Bulletin 15-11 are now included in the PPM. These requirements were effective upon the implementation date identified in the bulletin (July 2015).

Volume 2, Chapters 1, 5 and 28 Aerial Photography

Chapter 1, Section 1.4: Plan sheets other than Drainage Maps may use photography (aerial or other) when approved by the District Design Engineer. Using photography for Drainage Maps or SWPPP supplemental site map does not require approval.

Chapter 5, Section 5.1: Drainage maps are required for all projects that add mainline capacity or include changes to the drainage hydraulics. Maps may be developed using a photograpic (aerial or other) base and included in the construction plans.

Chapter 28, Section 28.3: The supplemental site map may use photography (aerial or other). Include this supplemental map in the SWPPP sheets.

IMPLEMENTATION:

These changes are effective on projects beginning design on or after January 1, 2016 and on projects currently in the design phase where implementation will not adversely impact production schedules.

Volume 2, Chapter 3 Key Sheet and Signature Sheet

Volume 2, Chapters 3 and 30 (Signature Sheet) were combined and reorganized. The following is a synopsis of major additions or revisions to Chapter 3:

- The scale bar typically placed with north arrow on the key sheet is now optional.
- Signature Sheet requirements that were previously found in Volume 2, Chapter 30 are now included in Volume 2, Chapter 3, Section 3.3.
- A Signature Sheet is required for all contract plan sets, even when there is only one Professional of Record.
- The key sheet and signature sheet exhibits were updated to reflect the recent change to 61G15-23.004, F.A.C.
- New exhibits were added to show an example of a revised key sheet and a revised signature sheet.
- Section 3.2.7 shows the plan sheet for a Traffic Monitoring Site to be placed behind the roadway plan-profile sheets. Location in the plans set is also shown in Chapter 2, Figure 2.1 of Volume 2, and the Key Sheet exhibits.

IMPLEMENTATION:

These changes are effective on projects beginning design on or after January 1, 2016 and on projects currently in the design phase where implementation will not adversely impact production schedules.

Volume 2, Chapter 7, Summary of Quantities

The Summary of Quantities sheets are to be numbered SQ-1, SQ-2, SQ-3, etc. Include the electronic shape file (QTDSRD.dgn) and other documentation (i.e. calculations, sketches, or spreadsheets) that supports the quantities shown in the summary boxes with phase submittals, beginning with Phase III. Exhibit SQ-1 was redesigned to provide a generic example of a summary of quantities sheet and pay item notes. All other 2015 PPM SQ exhibits have been removed.

IMPLEMENTATION:

These changes are effective on projects beginning design on or after January 1, 2016 and on projects currently in the design phase where implementation will not adversely impact production schedules.

Volume 2, Chapter 9, Section 9.4 Project Notes

Project Notes are no longer to be placed on the Project Layout Sheet. The requirements of this section and exhibit PN-1 has been moved to Chapter 10 of Volume 2.

IMPLEMENTATION:

These changes are effective on projects beginning design on or after January 1, 2016 and on projects currently in the design phase where implementation will not adversely impact production schedules.

Volume 2, Chapter 10, Section 10.4 Project Notes

Project Notes are to be placed on the first Plan Sheet, or as an option, on a separate Project Notes Sheet. A bridge clearance project note is shown in the new Section 10.4.1.

IMPLEMENTATION:

These changes are effective on projects beginning design on or after January 1, 2016 and on projects currently in the design phase where implementation will not adversely impact production schedules.

Volume 2, Chapter 23, Section 23.1 General and 23.10 Plans for Thermoplastic Markings

The language related to separate thermoplastic contracts has been removed, as thermoplastic pavement markings will now be included in construction contracts. Section 23.10 was removed.

IMPLEMENTATION:

These changes are effective on projects beginning design on or after January 1, 2016 and on projects currently in the design phase where implementation will not adversely impact production schedules.

GENERAL

Other changes in the January 2016 Plans Preparation Manual consist of minor editing, updated references, and implementation of Federal Plain Language, and are effective as of January 1, 2016.

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