



Howard County

Internal Memorandum

Subject: Resolution Adopting the 2017 Revisions to the Howard County Design Manual
Volume III- Roads and Bridges

To: Lonnie Robbins
Chief Administrative Officer

From: James M. Irvin, Director
Department of Public Works

Date: September 5, 2017

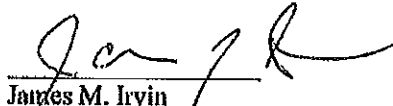
We are presenting to the County Council for consideration and adoption a revision to the Howard County Design Manual Volume III - Roads and Bridges. The significant changes include: approved County Council resolutions (i.e. downtown Columbia guidelines), AASHTO updates, MSE (mechanically stabilized earth) wall criteria and various recommendations of stakeholders. There is no fiscal impact with this change.

Input on the proposed revision was received from various Bureaus within the Department of Public Works, Department of Planning and Zoning, and private engineering consulting firms affiliated with the Howard County Chapter of the Maryland Building Industry Association.

Pursuant to the provisions of Section 18.210 of the Howard County Code, a public hearing was held before the Public Works Board on June 13, 2017, and all interested parties were given an opportunity to speak on the proposed revision. After consideration of the testimony presented at the public hearing, the Public Works Board recommended approval of the proposed revisions to the Howard County Design Manual Volume III - Roads and Bridges on August 8, 2017.

In accordance with Section 18.210 of the Howard County Code, we are presenting the proposed revisions to the Howard County Design Manual Volume III - Roads and Bridges to the County Council for adoption by resolution.

If you require any further information concerning this matter or have any additional questions, please do not hesitate to contact me at your convenience. Representatives from the Department of Public Works will be present at the public hearing to answer your questions.



James M. Irvin
Director

Cc: Thomas Butler
Brandon Love



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September 5, 2017

To: County Council

Subject: Proposed Revisions to the Howard County Volume III Design Manual - Roads and Bridges

Below is a list of changes of the Howard County Design Manual Volume III, Roads and Bridges, dated August 2017. Please note that the Office of Transportation is currently working on proposed design criteria for complete streets and those revisions are not part of this draft version.

The proposed Design Manual Volume III changes include approved County Council resolutions (i.e. downtown Columbia guidelines), MSE (mechanically stabilized earth) wall criteria, AASHTO updates and various consultations with stakeholders. The changes have been distinguished into two categories below: "Volume III Significant Changes" and less significant "Volume III Improvements, Updates and Clarifications."

Volume III Significant Changes:

CHAPTER 1:

- Page 1-12 (PDF 017) 1.8 B 2. j. Under "Items to Include in Topographic Surveys" added "Stormwater Management Facilities" to be included in the topographic surveys to include all structures, pipes, inverts and pipe sizes, cleanouts, observation wells and contours.

CHAPTER 2:

- Page 2-6 (PDF 039) Table 2.02 Minimum Passing Sight Distance. Revised values based on 2011 edition of *A Policy on Geometric Design of Highways and Streets*.
- Page 2-10 (PDF 043) 2.3 A. 3. e. "Permanent Non-Through Streets" has been revised to: clarify the definition of a "Permanent Non-Through Street", clarify that the 1200' maximum length of a non through street will start over after any intersection with a public road, clarified that all non-residential roads shall be terminated with a cul-de-sac and added that the head of a tee or y-turnaround will have a 60' width.
- Page 2-17 (PDF 050) Table 2.05 Design Controls for Crest Vertical Curves Based on Passing Sight Distance. Revised values based on 2011 edition of *A Policy on Geometric Design of Highways and Streets*.
- Page 2-20 (PDF 053) B. Pavement and Right-of-Way Width 2. Pavement Widths and Cross Slope: Delete the specification of requiring a 3' unpaved shoulder where sidewalks are not present
- Page 2-21 (PDF 054) C. Paving Section second paragraph: Removed the suggestion that the Soils Evaluation and Pavement Design Report be prepared using the DPW "Geotechnical Data required for Water, Sewer, Storm Drain and Road Design and Construction Guideline."

- Page 2-21 (PDF 054) C. Paving Section Third paragraph: Removed requirements of Soils Evaluations and Pavement Report from this section and referenced requirements for the Soils Evaluation and Pavement Report are in Section 504.03 Design Manual Volume IV.
- Page 2-21 (PDF 054) D. Curb and Gutter: Revised permitted use of Modified Curb and Gutter from cul-de-sac bulb, local streets and minor collectors Street in residential areas to Access Place, Access Street and minor collector in residential areas.
- Page 2-24 (PDF 057) J. Pathways and Bikeways: Added the Office of Transportation in the 5th and 6th paragraphs as offices to be consulted when planning a bikeway.
- Page 2-31 (PDF 064) 7. Median Lanes and Openings: Eliminated the third paragraph saying “Barriers shall not be used to separate the through and left turn lanes.”
- Page 2-33 (PDF 066) 9. Intersection Sight Distance: Revised intersection sight distance to be measured in accordance to AASHTO procedures. In residential areas, stopping sight distance may be used on the Major Street when the Major Street classification is a Minor Collector or below.
- Page 2- 39 (PDF 072) G. Auxiliary Lanes: Added minor arterials as locations where auxiliary lanes may be required and removed the restriction width of 40’ maximum.
- Page 2-40 (PDF 073) 2.7 Alleys: Revised the paragraph to better define Alleys. Raised the minimum width of alleys from 16’ to 20’. Added a restriction for alleys greater than 200’ in length to add a cul-de-sac or tee-turnaround.
- Page 2-40 to 2-41 (PDF 073 to PDF 074) B. Residential Parking: Clarified that On Street Parking shall be treated according to Table 2.11. Removed the second paragraph clarifying information on how zoning requirements for off-street parking can be met. Revised the heading of Table 2.11 from OVERFLOW / GUEST PARKING to ON STREET PARKING. Removed the column in Table 2.11 for Overflow/Unit.
- Page 2-44 to 2-46 (PDF 077 to 079) 2.13 Roadway Lighting: Section revised from relocating Street Lighting from Chapter 5 Traffic Studies and moving to Chapter 2 Design of Roads and has been revised in its entirety.
- Page 2-49 (PDF 082) C. Design Characteristics, 6. Speed Humps: Added new section.
- Page 2-49 to 2-50 (PDF 082 to PDF 083): Added specification Section 2.15 Standard for Maintenance of Scenic Roads.
- Appendix A (PDF 084) Public Roadway Design Criteria: The *Max. Dist. Between Speed Control Devices* column has been noted to apply to “Capital Improvement Project Only”.
- Appendix A (PDF 084) Public Roadway Design Criteria: Under Notes: Added to Note 1.a. Flush curb on inside of all curves with radius of 1000 feet or less.
- Appendix G (PDF 091) Parking Stall Layout Elements- Removed curb notation, line representing curb on plan, and offset to curb from plan and table.
- Appendix H (PDF 092) Intersection Sight Distance in Residential Areas when Major Street Classification is Equal to or Less Than a Minor Collector – New Figure
- TYPICAL SECTIONS: All Typical Sections removed from Chapter 2 Appendix

CHAPTER 3:

- Page 3-17 to 3-18 (PDF 112 to 113) 3.4 A.: Added a paragraph making a distinction between “Fill” Retaining Walls and “Cut” Retaining Walls. Added a Table providing guidelines for fill retaining walls selection.
- Page 3-21 (PDF 116) f. MSE: Revised the MSE wall specification adding detail concerning Overall Stability, Reinforced Soil Mass and Facing Elements.
- Page 3-21 to 3-22 (PDF 116 to PDF 117) f. MSE: Added General design guidelines at end of section.
- Page 3-24 to 3-26 (PDF 119 to PDF 121) Added 3 pages for: 2. Cut Type Retaining Walls specification.
- Page 3-30 (PDF 125) f. Design Calculations / Failure Analysis: Removed the word three in order to not limit the possible modes of failure. Removed the resistance factors and added that the resistance factors meet AASHTO.

CHAPTER 4:

- Page 4-1, 4-2 (PDF 160, PDF 161) Reference is made to the point that Downtown Columbia will have its own separate set of standards and evaluation requirements as set forth in section 4.9.
- Page 4-2 (PDF 161) 4.3 Traffic Volumes: Reference were added to include the ITE Trip Generation Handbook, ITE Transportation Impact Analysis for Site Development, and ITE Trip Generation.
- Page 4-2 to 4-3 (PDF 161 to PDF 162) B. Project Site-Generated Traffic Volumes: References were added to include ITE and trip generation studies approved by Howard County.
- Page 4-4 (PDF 163) 4.5 Mitigation Requirements: The words "General County" were added to the heading. Reworded the first paragraph from "that the level of service will be below the adopted level of service standard" to "operations will be below the adopted standards of Section 4.2".
- Page 4-6 (PDF 165) 4.6 Traditional Requirements Added a 4th paragraph exception allowing Downtown Columbia to modify certain FDP traffic studies.
- Page 4-7 (PDF 166) A. Subdivision Approval: Added under 4. This provision does not apply to Downtown Columbia
- Page 4-8 (PDF 167) 4.8 Approval Requirements: Added paragraph "Exception" allowing Downtown Columbia to modify certain FDP traffic studies
- Page 4-8 (PDF 167) B. Site Development Plan: Added "or as stipulated in the exception above" at the end of the paragraph.
- Page 4-8 to 4-26 (PDF 167 to PDF 185) Added Specification Section 4.9 Requirements – Downtown Columbia.

CHAPTER 5:

- Page 5-9 (PDF 196) C. Safety Studies: Added information to clarify how to obtain crash data from SHA and Howard County.
- Page 5-15 (PDF 202) B. Roundabouts: Revised the last paragraph to update the reference from June 2004 to October 2012 for Maryland's SHA "Roundabout Design Guidelines". Removed the references to FHA and added a reference to NCHRP Report 672 or latest edition.
- Page 5-17 (PDF 204) 5.5 Street Lighting: Removed the entire section from Chapter 5.

Volume III Improvements, Updates and Clarifications**CHAPTER 1:**

- Page i thru ii (PDF 004, PDF 005) Revised Table of Contents
- Page 1-4 (PDF 009) 1.3 Definitions, Standard Specifications: Revised the capitalized letter F in the word For to non-capital, removed a comma.
- Page 1-6 (PDF 011) 1.5 Minor Collector: Changed a semi colon to a comma.
- Page 1- 11 (PDF 016) 1.8 B 2. e. Under "Items to Include in Topographic Surveys" clarified hydrants are "fire" hydrants and added "Sanitary sewer mains" as an item to be included in the topographic surveys.
- Page 1-12 (PDF 017) 1.8 B 2. k. Under "Items to Include in Topographic Surveys" added "Wetland Buffers" to be included in the topographic surveys.
- Page 1-17 (PDF 022) 1.9.C 7.c. Revision Box. Added "and the plan has been signed by the approving authority" to after the designers seal and signature has been affixed to the plan.
- Page 1-19 (PDF 024) 1.9 E, Clarified that the coordinate system is based on Maryland State "Plane Coordinate" System by adding the words "Plane Coordinate".

CHAPTER 2:

- Page i thru iii (PDF 31 thru 33) Revised Table of Contents
- Page 2-5 (PDF 038) D Sight Distance: Updated the references for Table 2.01 “Stopping Sight Distances” from 2004 to 2011.
- Page 2-6 (PDF 039) D Sight Distance: Updated the references for Table 2.02 “Minimum Passing Sight Distance” from 2004 to 2011
- Page 2-6 (PDF 039) Reference stating that “ E. Permanent Non-Through Streets/Temporary Non-Through Streets” and “ F. Alleys” are discussed in different sections were removed from this heading of “Roadway Design”.
- Page 2-8 (PDF 041) 2.3 A. 1. f. Horizontal Sight Distance: Updated the references from 2004 to 2011.
- Page 2-10 (PDF 043) 2.3 A. 3. d. Updated the references in paragraph 2 from 2004 to 2011.
- Page 2-11 (PDF 044) 2.3 A. 3. F. Temporary Non-Through Streets: Revised the un-capitalized letter n in the word non to Non-capital.
- Page 2-12 (PDF 045) Table 2.03: Revised the reference from Exhibit 3-15 to Table 3-7 and updated from 2004 to 2011.
- Page 2-12 (PDF 045) Second paragraph after Table 2.03 references: Revised the reference from Exhibit 3-32 to Table 3-17 and updated from 2004 to 2011.
- Page 2-13 (PDF 046) B. Vertical Alignment, Grades: Revised numerical heading for “Grades” from 5. To 1.
- Page 2-15 (PDF 048) Crest Vertical Curves, first paragraph after formula definitions: Revised the reference from Exhibit 3-71 to Figure 3-43 and updated from 2004 to 2011.
- Page 2-16 (PDF 049) Table 2.04: Revised the reference title from “Stopping Sight Distance and for Crest Vertical Curves” to “Crest Vertical Curves Based on Stopping Sight Distance”, From Exhibit 3-72 to Table 3-34 and from 2004 to 2011.
- Page 2-17 (PDF 050) Table 2.05 References: Revised the reference from Exhibit 3-73 to Table 3-35 and updated from 2004 to 2011.
- Page 2-18 (PDF 051) Table 2.06 References: Revised the reference from Exhibit 3-75 to Table 3-36 and updated from 2004 to 2011. Next paragraph revised the reference from Exhibit 3-74 to Figure 3-44 and updated from 2004 to 2011.
- Page 2-19 (PDF 052) 3. Critical Length of Grade, third and fourth paragraph: revised references from exhibit 3-59 to Figure 3-28 and updated the reference from 2004 to 2011.
- Page 2-22 (PDF 057) I. Traffic Barrier: Replaced the word needed with required.
- Page 2-26 (PDF 059) 2.5 Intersection Design A.: Revised the heading from “Staged Construction” to “General”.
- Page 2-28 (PDF 061) B. Geometric Design 3.: Updated reference from 2004 to 2011.
- Page 2-28 (PDF 061) B. Geometric Design 4.: Updated two references from 2004 to 2011. Revised the reference from Exhibit 9-19 to Table 9-15 and from Table 9-20 to Table 9-16. Added the words “Simple Curve Radius with Taper” to the “Edge-of-Traveled-Way Design for Turns at Intersections” reference. Added the words “Designs” and “Three-Centered Curves” to the “Edge-of-Traveled-Way for Turns at Intersections” of AASHTO reference.
- Page 2-28 (PDF 061) TABLE 2.08: Corrected the spelling of MIMIMUM to MINIMUM in the title.
- Page 2-29 (PDF 062) Updated the reference from 2004 to 2011. Revised the reference from Exhibit 9-19 to Table 9-15 and revised the reference from Table 9-20 to 9-16.
- Page 2-30 (PDF 063) 5. Auxiliary Lanes, 3rd paragraph after d.: Updated the reference from 2004 to 2011. Revised the reference from Exhibit 10-70 to Table 10-3. Revised the reference from Table 10-73 to Table 10-5.
- Page 2-31 (PDF 064) 6. Turning Roadways: First paragraph revised the reference from Exhibit 3-51 to Table 3-59 and updated the reference from 2004 to 2011. Second paragraph revised the reference from Exhibit 3-51 to Table 3-29 and updated the reference from 2004 to 2011.

- Page 2-32 (PDF 065) 7. Median Lanes and Openings: 5th Paragraph; Revised the reference from Exhibit 9-79 to Table 9-26 and Figure 9-81 to Figure 9-56. Added "(SU-30) Design Vehicle, Control Radius of 50 ft. to the reference. 7th Paragraph; Revised the reference from Exhibit 9-87 to Figure 9-59 and updated the reference from 2004 to 2011.
- Page 2-32 (PDF 065) 8. Traffic Islands: First paragraph changed the word "marked" to "demarcated" and the word "paint" to "pavement markings".
- Page 2-32 (PDF 065) 8. Traffic Islands: Sixth paragraph changed the word "evergreens" to "materials".
- Page 2-43 (PDF 076) E. Design Unit Size and Location: First paragraph removed the reference to a "Private Access Place" requirement for screening a collection area from adjacent properties.
- Page 2-47 (PDF 080) 2.14 Speed Control Devices B. Definitions: Added the term Vertical deflection as a device including speed humps and clarifying what horizontal deflections cover.
- Appendix G (PDF 091) Parking Stall Layout Elements: Under Notes: Revise Note 2 reference from See Section 2.8... to See Section 2.9...

CHAPTER 3:

- Page 3-12 (PDF 107) M. Foundation Reports: Added in the first paragraph that the depth and number of borings should be per AASHTO requirements.
- Page 3-13 (PDF 108) M. Foundation Reports: Added in the second paragraph the words "impact of" prior to settlement. Added construction control considerations as an item to be addressed in the foundation report. Revised the word "accompanies" to "accompanied".
- Page 3-20 (PDF 115) f. MSE: Added a description of what an MSE wall is.
- Page 3-27 (PDF 122) Revised the heading number from 2. to 3. For Retaining Wall Design Guidelines.
- Page 3-30 (PDF 125) e. Construction Details- Fences/Guardrails: 8th paragraph – grammatical correction: shortened space between words.
- Page 3-31 (PDF 126) g. Construction Drawings – Required Notes: Changed the "pressure" to "resistance" in the second paragraph.

CHAPTER 4:

- Page i thru ii (PDF 158 to PDF 159) Revised Table of Contents
- Page 4-1 (PDF 160) B. Level of Service: Description has been slightly reworded.
- Page 4-2 (PDF 161) C. Study Area: The words "as follows" were changed to "defined below".
- Page 4-7 (PDF 166) B. Exempt Residential Projects: Added to item 6 "previously tested in the subdivision process".

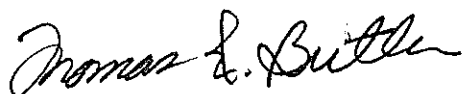
CHAPTER 5:

- Page i (PDF 187) Revised Table of Contents
- Page 5-2 (PDF 189) 2 Traffic Studies A. 1.: Changed the word from "accident" to "safety".
- Page 5-8 (PDF 195) b. At-Grade Intersection (Interrupted Flow): Changed the word from "assures" to "assumes".
- Page 5-13 (PDF 200) 4. Revised date to MONTH YEAR
- Page 5-15 (PDF 202) 5.3 A. Traffic Signals: Added the acronym (SHA).
- Page 5-16 (PDF 203) A. General: Added the words "latest edition of" for the MUTCD and removed the 2003 date.
- Page 5-16 (PDF 203) B.: Capitalized the word "The".

- Page 5-17 (PDF 204) Revised the heading number from 5.6 to 5.5 for Maintenance of Traffic During Construction.
- Page 5-18 (PDF 205) Maintenance of Traffic During Construction: Added the words "latest edition of" for the MUTCD and removed the 2003 date in the ninth paragraph.
- Page 5-18 (PDF 205) Revised the heading number from 5.7 to 5.6 for At-Grade Railroad Crossings.
- Page 5-18 (PDF 205) At-Grade Railroad Crossings: Added the words "latest edition of" for the MUTCD and removed the 2003 date in the ninth paragraph.

If you have any question, please contact Thomas Auyeung of the Transportation and Special Projects Division at 410-313-6142.

Very truly yours,

A handwritten signature in black ink that reads "Thomas E. Butler". The signature is written in a cursive, flowing style.

Thomas E. Butler, Deputy Director
Department of Public Works
Engineering, Development and Construction