

**METRIC ROAD DESIGN MANUAL**  
**REVISIONS JANUARY 2010**

**APPENDIX “A” METRIC**

- Page A-7M (GS-1M) – Deleted the “Relationship of Maximum Grades to Design Speed” chart and replaced it with the following note; *“For maximum grades relative to terrain and design speed, see AASHTO Green Book, Chapter 7, Exhibit 7-2”*.

Added the following language to the end of “FOOTNOTE” No. 3; *“A hydraulic analysis is necessary to determine actual depth requirement.”*

Replaced “FOOTNOTE” No. 6 with the following; *“For additional information on sight distance requirements on grades of 3 percent or greater, see Exhibit 3-2 of the 2004 AASHTO Green Book”*.

- Page A-8M (GS-2M) – Deleted the “Relationship of Maximum Grades to Design Speed” chart and replaced it with the following note; *“For maximum grades relative to terrain and design speed, see AASHTO Green Book, Chapter 7, Exhibit 7-2”*.

Added the following language to the end of “FOOTNOTE” No. 3; *“A hydraulic analysis is necessary to determine actual depth requirement.”*

Added the following language to the end of “FOOTNOTE” No. 4; *“For additional guidance on shoulder widths, see the AASHTO Green Book, Chapter 7.”*

Replaced “FOOTNOTE” No. 8 with the following; *“For additional information on sight distance requirements on grades of 3 percent or greater, see Exhibit 3-2 of the 2004 AASHTO Green Book”*.

- Page A-9M (GS-3M) – Deleted the “Relationship of Maximum Grades to Design Speed” chart and the following note; *“Maximum grades of short length (less than 500'), on one-way down grades and on low-volume Rural Collectors may be 2 percent steeper”* and replaced it with the following note; *“For maximum grades relative to terrain and design speed, see AASHTO Green Book, Chapter 7, Exhibit 7-2”*.

Added the following language to the end of “FOOTNOTE” No. 3; *“For additional guidance on shoulder widths, see the AASHTO Green Book, Chapter 6.”*

Added the following language to the end of “FOOTNOTE” No. 5; *“A hydraulic analysis is necessary to determine actual depth requirement.”*

Replaced “FOOTNOTE” No. 9 with the following; *“For additional information on sight distance requirements on grades of 3 percent or greater, see Exhibit 3-2 of the 2004 AASHTO Green Book”*.

- Page A-10M (GS-4M) – Deleted the “Relationship of Maximum Grades to Design Speed” chart and replaced it with the following note; *“For maximum grades relative to terrain and design speed, see AASHTO Green Book, Chapter 5, Exhibit 5-4”*.

Added the following language to the end of “FOOTNOTE” No. 5; *“For additional guidance on shoulder widths, see the AASHTO Green Book, Chapter 5.”*

Added the following language to the end of “FOOTNOTE” No. 6; *“A hydraulic analysis is necessary to determine actual depth requirement.”*

Replaced “FOOTNOTE” No. 9 with the following; *“For additional information on sight distance requirements on grades of 3 percent or greater, see Exhibit 3-2 of the 2004 AASHTO Green Book”*.

- Page A-11M (GS-5M) – Revised “Minimum Radius” from 215m to 222m for 70km/h design speed on “Other Principal Arterial with Curb and Gutter”.

Deleted the “Relationship of Maximum Grades to Design Speed” chart and replaced it with the following note; *“For maximum grades relative to terrain and design speed, see AASHTO Green Book, Chapter 7, Exhibit 7-2”*.

Added the following language to the end of “FOOTNOTE” No. 3; *“A hydraulic analysis is necessary to determine actual depth requirement.”*

Replaced “FOOTNOTE” No. 13 with the following; *“For additional information on sight distance requirements on grades of 3 percent or greater, see Exhibit 3-2 of the 2004 AASHTO Green Book”*.

Revised language in “FOOTNOTE” No. 14 from “Appendix C, Table C-1-5” to “Appendix F, Table 2-7”.

- Page A-12M (GS-6M) – Revised “Minimum Radius” from 215m to 222m for 70km/h design speed on “Other Principal Arterial with Curb and Gutter”.

Revised “Minimum Width Graded Shoulder” and “Paved Shoulder Width” for “Streets with Shoulder Design”.

Deleted the “Relationship of Maximum Grades to Design Speed” chart and replaced it with the following note; *“For maximum grades relative to terrain and design speed, see AASHTO Green Book, Chapter 7, Exhibit 7-2”*.

Added the following language to the end of “FOOTNOTE” No. 9; *“A hydraulic analysis is necessary to determine actual depth requirement.”*

Replaced “FOOTNOTE” No. 12 with the following; *“For additional information on sight distance requirements on grades of 3 percent or greater, see Exhibit 3-2 of the 2004 AASHTO Green Book”*.

Added the following “FOOTNOTE”; No. 13 “For information on reduced shoulder widths, See Exhibit 7-3 of the 2004 AASHTO Green Book.

- Page A-13M (GS-7M) – Revised “Minimum Radius” from 215m to 222m for 70km/h design speed on “Other Principal Arterial with Curb and Gutter”.

Revised “Minimum Width Graded Shoulder” and “Paved Shoulder Width” for “Streets with Shoulder Design”.

Deleted the “Relationship of Maximum Grades to Design Speed” chart and the following note; *“Maximum grades of short length (less than 500’), on one-way down grades may be 2 percent steeper”* and replaced it with the following note; *“For maximum grades relative to terrain and design speed, see AASHTO Green Book, Chapter 6, Exhibit 6-4”*.

Added the following language to the end of “FOOTNOTE” No. 6; *“A hydraulic analysis is necessary to determine actual depth requirement.”*

Replaced “FOOTNOTE” No. 11 with the following; *“For additional information on sight distance requirements on grades of 3 percent or greater, see Exhibit 3-2 of the 2004 AASHTO Green Book”*.

Added the following “FOOTNOTE”; No. 12 “For information on reduced shoulder widths, See Exhibit 6-5 of the 2004 AASHTO Green Book.

- Page A-14M (GS-8M) – Revised “Minimum Width Graded Shoulder” and “Minimum Bridge Width” for “Streets with Shoulder Design”.

Added the following language at the end of “FOOTNOTE” No. 1; *“For maximum grades relative to terrain and design speed, see AASHTO Green Book, Chapter 5, Exhibit 5-4”*.

Replaced “FOOTNOTE” No. 4; *“The minimum buffer strip width with no sidewalk or sidewalk space is to be 2.4m* With “FOOTNOTE” No. 10; *“For buffer strip widths see IIM-LD-55”*.

Added the following language to the end of “FOOTNOTE” No. 8; *“A hydraulic analysis is necessary to determine actual depth requirement.”*

Replaced “FOOTNOTE” No. 11 with the following; *“For additional information on sight distance requirements on grades of 3 percent or greater, see Exhibit 3-2 of the 2004 AASHTO Green Book”* and renamed “FOOTNOTE” No. 10.

Added the following “FOOTNOTE”; No. 12 “For information on reduced shoulder widths, See Exhibit 5-5 of the 2004 AASHTO Green Book and renamed “FOOTNOTE” No. 11.

- Page A-15M(GS-9M) – Added additional information to the table for “Service Roads”.

Added the following language to “FOOTNOTE” No. 1; “Also” to Standard CG-12.

Added the following language to the end of “FOOTNOTE” No. 3; “*A hydraulic analysis is necessary to determine actual depth requirement.*”

- Page A-16M (GS-RM) – Revised “Minimum Radius” from 51m to 52m for 40km/h design speed on “Interchange Ramps”.

Added the following language at the end of the fourth paragraph under “GENERAL NOTES”; “*However, down grades with sharp horizontal curvature and significant heavy truck or bus traffic should be limited to 4 percent. See page 829 of the 2004 AASHTO Green Book*”.

Added the following language at the end of the “GENERAL NOTES”; “*See Chapter 10 of the 2004 AASHTO Green Book for further guidance on ramp design*”.

Added the following language to the end of “FOOTNOTE” No. 5; “*A hydraulic analysis is necessary to determine actual depth requirement.*”

Replaced “FOOTNOTE” No. 6 with the following; “*For additional information on sight distance requirements on grades of 3 percent or greater, see Exhibit 3-2 of the 2004 AASHTO Green Book*”.

- Page A-18M – Replaced the following language in the last paragraph; “(e.g. *Preliminary Field Inspection Report, recommendation from Right of Way Division, etc.*)” with “*with an approved Design Waiver*”.
- Page A-36M – Added the following language to the second sentence in the fourth paragraph; In situations like this, guardrail can be placed behind the sidewalk”/sidewalk space” and in front of the hazard.

Added the following language after the fourth paragraph; “*When a sidewalk or shared-use path transitions from the roadway onto a bridge, guardrail is required if the travelway and the sidewalk or shared-use path are separated by a barrier on the bridge. See detail in RDM, Appendix A, Section A-5 for shared-use paths and IIM-LD-55 for sidewalks.*”

- Page A-38M – Replaced the year 2003 with 2006 for the latest version of the “ROADSIDE DESIGN GUIDE” source for the “DESIGN PARAMETERS FOR ROADSIDE BARRIER LAYOUT” table.

- Page A-43M – Replaced the following language in the first paragraph; “*Standard GR-3P*” with “*GR-7*” and “*Special Design Drawing No. 2154-A, Asphalt Paving Under Guardrail*” with “*Standard MC-4*”.

## **APPENDIX “C” METRIC**

- Page C-2M – Added the language in the first paragraph under “Perpendicular or Angled Parking Spaces”; *and shall be provided at street level the full length of the parking space and shall connect to a pedestrian access route serving the space. Access aisles shall be marked so as to discourage parking in them.*”

Revised the following language at the end of the last a paragraph; from “*The Traffic Engineering Division and Environmental Division should be contacted to coordinate the signing and placement of curb cuts. Figure C-1-3M is to be used to provide ample space for the accessible loading area.*” to *The Location and Design Traffic Engineering Section should be contacted to coordinate the signing and placement of curb cuts. Figure C-1-3M is to be used to provide ample space for the Accessible Parking And Passenger Loading Zones.*

- Page C-3M – Added the following language to “*Parallel Parking Spaces*” title with “*in Central Business Districts (CBD) and Traditional Neighborhood Development (TND) Where Parking Spaces are Stripped and Signed*”.

Added the following language and 2 new figures under “PARALLEL PARKING SPACE IN CENTRAL BUSINESS DISTRICTS (CBD) AND TRADITIONAL NEIGHBORHOOD DEVELOPMENT (TND) WHERE PARKING SPACES ARE STRIPPED AND SIGNED”.; “*Where the width of the adjacent walkway is 4.3 m or greater an access aisle at least 1.5m wide shall be provided at street level the full length of the parking space. The access aisle shall connect to a pedestrian access route serving the space. The access aisle shall not encroach on the vehicular travel lane. See Figure C-1-1M.* and

EXCEPTION: An access aisle is not required where the width of the sidewalk between the extension of the normal curb and boundary of the public right-of-way is less than 14 feet. When an access aisle is not provided, the *accessible (handicapped)* parking space shall be located at *either* the end of the block *closest to the CG-12 curb ramp at the street crossing. See Figure C-1-2M.*

- Page C-4M – Revised “ACCESSIBLE PARKING AND PASSENGER LOADING ZONES” figure.

Replaced the following language under “PASSENGER LOADING ZONES”; “*If there are curbs between the access aisle and the vehicle pull-up space, then a Standard CG-12 Curb Ramp shall be provided.*” With “*Passenger loading zones shall provide a vehicular pull-up space 2.4 m wide minimum and 6 m long minimum. The access aisle serving the vehicle pull-up space shall be 1.5 m wide minimum and adjoin a pedestrian route and shall not overlap the vehicular way. Access aisles shall be marked so as to discourage parking in them.*”