

METRIC ROAD DESIGN MANUAL
REVISIONS JULY 2010

APPENDIX “A” METRIC

- Page A-7M (GS-1M) – Revised the language in the seventh paragraph under “General Notes” to the following; “For *additional information on roadway widths and maximum grades* relative to terrain and design speed, see AASHTO Green Book, Chapter 7, Exhibit 7-2 “*and 7-3;*” for Freeways, see Chapter 8, Exhibit 8-1.”
- Page A-11M (GS-5M) – Revised “Minimum Width Total Shoulder” “Cut & Fill” from 3.6m to 4.3m.

Revised “Paved Shoulder Width” “Right” from 3.0m to 3.6m.

Revised right shoulder width on Freeways from 3.6m to 4.2m.

Revised the language in the tenth paragraph under “General Notes” from; “*A minimum 9.2m width of surfacing or a minimum 9.2m face to face of curb is to be used within incorporated cities or towns to qualify for maintenance payments.*” To “*For minimum widths for roadway and right of way used within incorporated cities or towns to qualify for maintenance funds see Code of Virginia Section 33.1-41.1.*”

Revised language in “FOOTNOTE” No. 10 from “3:1 and flatter slopes *may* be used...” to “3:1 and flatter slopes *shall* be used...”

Revised language in “FOOTNOTE” No. 11 from “see IIM-LD-55” to “see *Appendix A, Section A-5 Bicycle & Pedestrian Facility Guidelines.*”

- Page A-12M (GS-6M) – Revised the language in the seventh paragraph under “General Notes” from; “*A minimum 9.2m width of surfacing or a minimum 9.2m face to face of curb is to be used within incorporated cities or towns to qualify for maintenance payments.*” To “*For minimum widths for roadway and right of way used within incorporated cities or towns to qualify for maintenance funds see Code of Virginia Section 33.1-41.1.*”

Revised language in “FOOTNOTE” No. 5 from “3:1 and flatter slopes *may* be used...” to “3:1 and flatter slopes *shall* be used...”

Revised language in “FOOTNOTE” No. 10 from “see IIM-LD-55” to “see *Appendix A, Section A-5 Bicycle & Pedestrian Facility Guidelines.*”

Added “FOOTNOTE” reference (13) to “Minimum Width Graded Shoulder”.

- Page A-13M (GS-7M) – Revised the language in the fifth paragraph under “General Notes” from; “*A minimum 9.2m width of surfacing or a minimum 9.2m face to face of curb is to be used within incorporated cities or towns to qualify for maintenance payments.*” To “*For minimum widths for roadway and right of way used within incorporated cities or towns to qualify for maintenance funds see Code of Virginia Section 33.1-41.1.*”

Revised language in “FOOTNOTE” No. 5 from “3:1 and flatter slopes *may* be used...” to “3:1 and flatter slopes *shall* be used...”

Revised language in “FOOTNOTE” No. 7 to delete the following language; “*Provide 1.2 m wide paved shoulders when the graded shoulder is 1.5 m wide or greater or provide 1 m wide paved shoulders when the graded shoulder is 1.2 m wide.*”

Revised language in “FOOTNOTE” No. 10 from “see IIM-LD-55” to “see *Appendix A, Section A-5 Bicycle & Pedestrian Facility Guidelines.*”

Added “FOOTNOTE” reference (12) to “Minimum Width Graded Shoulder”.

- Page A-14M (GS-8M) – Revised the language in the sixth paragraph under “General Notes” from; “*A minimum 9.2m width of surfacing or a minimum 9.2m face to face of curb is to be used within incorporated cities or towns to qualify for maintenance payments.*” To “*For minimum widths for roadway and right of way used within incorporated cities or towns to qualify for maintenance funds see Code of Virginia Section 33.1-41.1.*”

Revised language in “FOOTNOTE” No. 4 from “see IIM-LD-55” to “see *Appendix A, Section A-5 Bicycle & Pedestrian Facility Guidelines.*”

Revised language in “FOOTNOTE” No. 6 from “3:1 and flatter slopes *may* be used...” to “3:1 and flatter slopes *shall* be used...”

Revised language in “FOOTNOTE” No. 7 to delete the following language; “*Provide 1.2 m wide paved shoulders when the graded shoulder is 1.5 m wide or greater or provide 1 m wide paved shoulders when the graded shoulder is 1.2 m wide.*”

Added “FOOTNOTE” reference (11) to “Minimum Width Graded Shoulder”.

- Page A-17M – Added the following language under “INTRODUCTION”; “*When establishing a full-width clear zone in an urban area is not practical due to right of way constraints, consideration should be given to establishing a reduced clear zone or incorporating as many clear zone concepts as practical such as removing roadside objects or making them crashworthy.*”

- Page A-18M – Added the following language at the top of the page; *“In an urban environment, right of way is often extremely limited and in many cases it is not practical to establish a full width clear zone using the guideline in the Roadside Design Guide.”*

Revised the following language in the second and third paragraphs under “ROADWAYS WITH CURB” from;

“When necessary to utilize curb on a roadway with a design speed \geq 80 km/h for one of the situations listed above, a clear zone distance commensurate with prevailing traffic volumes and vehicle speeds is to be provided. (See AASHTO’s Roadside Design Guide, Chapter 3).

In situations where these clear zone widths are not practical, the greatest practical values should always be utilized. The lateral offset shall extend a minimum of 2.4m from the face of curb, or beyond the back of the sidewalk, whichever is greater (See Figure A-2-1, Case 3).” to;

“When necessary to utilize curb on a roadway with a design speed \geq 80 km/h for one of the situations listed above, the minimum lateral offset distance is 2.4m measured from the face of curb. However, consideration should be given to providing more than the minimum lateral offset to obstructions (signs, utility poles, luminaire supports, fire hydrants, etc. including breakaway devices), where practical, by placing fixed objects behind the sidewalk. See Figure A-2-1, Case 3.”

Replaced the following language under “Low-Speed Roadways with curb” from;

“When curb is utilized on urban roadways with design speeds of \leq 70 km/h, the greatest practical lateral offset is to be provided, and shall extend a minimum of 2.4m from the face of curb, or beyond the back of the sidewalk, whichever is greater. See Figure A-2-1, Case 3.

In situations where space is restricted, the lateral offset distance may be reduced to an absolute minimum of 0.5m beyond the face of the curb, with wider distances provided where practical. See Figure A-2-1, Case 4. (Source: AASHTO Roadside Design Guide, Chapter 3 and 2004 AASHTO “Green Book”, Chapters 4 and 5) The justification for not providing a minimum 8’ lateral offset beyond the face of curb (or to the back of sidewalk) is to be documented in the project file with an approved Design Waiver.” to;

“When curb is utilized on urban roadways with design speeds of \leq 70 km/h, the minimum lateral offset distance is 0.5m measured from the face of curb. See Figure A-2-1, Case 3.”

- Page A-20M – Replaced “CASE 2” and “CASE 3” in “FIGURE A-2-1”.
- Page A-21 – Replaced “CASE 4” in “FIGURE A-2-1”.
- Page A-26M – Replace the following language in “NOTE” #3; *“if GR-3 or GR-8”* with “when” to read *“Recoverable area width to be increased 1m when Guardrail is required.”*

- Page A-34M – Deleted the following language at the end of the first paragraph; “*The Standard GR-8 Weak Post System is to be used only when speeds are ≤ 70 km/h.*”
- Page A-36M – Replaced the following language under “GUARDRAIL INSTALLATION IN URBAN SETTINGS”; “*In Urban settings with design speeds of 70 km/h or less that includes curb or curb and gutter, the use of guardrail is not recommended. Standard CG-2 or CG-6 (150 mm high curb) is usually used for design speeds of 70 km/h or less in urban and suburban areas and is referred to as "barrier curb" because it has a 150 mm vertical face and is intended to discourage motorists from deliberately leaving the roadway. Even when CG-3 or CG-7 (100 mm high mountable curb) is used in Urban settings, it is impractical to install guardrail in an attempt to protect pedestrians walking along sidewalks due to the lack of accessibility caused when placing guardrail and terminals adjacent to accessible routes.*

When curbed sections do not include sidewalk or sidewalk space and hazards exist that warrant guardrail, St'd. GR-2 (Strong Post) guardrail (which includes a blackout) should be installed with the face of the rail aligned with the face of the curb. This decreases the possibility of an errant vehicle striking the curb before impacting the guardrail or from snagging the guardrail posts. If possible, to provide maximum offset, the guardrail should be placed 3.3m or more behind the curb for high speed (80 km/h or more) roadways and 1.8m or more behind the curb for low speed (72 km/h or less) roadways. The guardrail height when placed at the curb is measured from the roadway surface. When offset from the curb, it is measured from the ground beneath the rail. St'd. GR-8 (Weak Post) guardrail should not be used adjacent to asphalt or concrete curb.

Sometimes hazards that need to be shielded exist on urban projects with sidewalk/sidewalk space. In situations like this, guardrail can be placed behind the sidewalk/sidewalk space and in front of the hazard. Examples of such hazards are ponds, steep embankments, etc. When these situations arise, sound engineering judgment should be used in deciding whether/where to place the guardrail. If the hazard is within the clear zone, a barrier would be warranted. The hazards that are outside the clear zone are the items that require an engineering decision based on evaluation of all the elements within the design site.” with ;

Guardrail is not recommended where curb, or curb and gutter is used. Whenever it is necessary to provide guardrail along a curbed section (no sidewalk or sidewalk space) Standard GR-2 Strong Post Guardrail shall be used in conjunction with Standard CG-3 or CG-7 (0.1m mountable curb) and the face of the rail should be aligned with the face of curb. This decreases the possibility of an errant vehicle striking the curb before impacting the guardrail or snagging the guardrail posts and is applicable to all design speeds. Standard GR-8 Weak Post Guardrail shall not be used adjacent to any curb.

If the guardrail cannot be aligned with the face of the curb, then the maximum practical offset behind the guardrail should be provided. For low-speed roadways (70 km/h or less) the guardrail shall be offset a minimum of 1.8m behind the face of curb. For high-speed roadways (80 km/h or greater) the guardrail shall be offset a minimum of 3.3m behind the face of curb.

It is usually impractical to install guardrail between the roadway and a pedestrian route. When necessary to provide guardrail along a pedestrian route (at ponds, steep embankments, etc.) the guardrail should be placed 0.3m behind the sidewalk (or sidewalk space). In these situations, sound engineering judgment should be used in determining guardrail locations and evaluating needs when hazards exist outside the clear zone.

- Page A-40M – Added “*nested*” after “*rail double*” in three locations in the second paragraph under “GUARDRAIL OVER CULVERT IN FILLS”;

Added the following language at the end of “PONDS OR OTHER BODIES OF WATER”; Barrier is to be constructed on all functional classifications at ponds or other bodies of water over 0.6m in depth “*when it is within the design clear zone.*”

- Page A-52M – Revised the following language under “Ineligible Items of Work”; “*National Highway System (NHS). However some projects may be eligible, see “PREVENTIVE MAINTENANCE (PM) PROJECTS / RRR PROJECTS UTILIZING FEDERAL FUNDING ON NATIONAL HIGHWAY SYSTEM (NHS) ROADWAYS” at the end of Section 4-A for guidelines.*”
- Page A-82M – Replaced the following language in the second sentence in the fourth paragraph and in the last paragraph; “*District Traffic Engineer*” with “*Regional Traffic Engineer*”.
- Page A-88M – Replaced the following language in the last sentence in the third paragraph; “*District Traffic Engineer*” with “*Regional Traffic Engineer*”.
- Page A-92M – Replaced the following language in the last sentence in the first paragraph; “*District Traffic Engineer*” with “*Regional Traffic Engineer*”.
- Page A-96M – Replaced the following language in the first sentence; “*District Traffic Engineer*” with “*Regional Traffic Engineer*”.

APPENDIX “C” METRIC

Page C-2M – Added the following language to the first paragraph under “Perpendicular or Angled Parking Spaces”; “*Perpendicular or angled parking spaces that require backing maneuvers within state highway right-of-way shall not be permitted. All off-street parking areas must include on-site maneuvering areas and aisles to permit vehicles to enter and exit the site in forward drive without hesitation.*”