

IMPERIAL ROAD DESIGN MANUAL
REVISIONS July 2010

CHAPTER 1C

- Page 1C-1 – Revised the first sentence under “DISTRICT AND RESIDENCIES” from; *“There are four or more residency offices in eight of the nine construction districts in Virginia.”* To; *“There are two or more residency offices in the nine construction districts in Virginia.”*

Deleted the following language under “DISTRICT AND RESIDENCIES”; *“The Northern Virginia District, which administers activities of the counties of Arlington, Fairfax, Loudoun and Prince William and the municipalities within their outer boundaries, has three residency offices and receives technical assistance in certain areas from the Culpeper District.”*

Replaced the following language in the second sentence under “DISTRICT AND RESIDENCIES”; *“Resident Engineers”* with *“Residency Administrators”*.

- Pages 1C-4 thru 1C-18 – These “Figures” were revised to reflect the closures of the VDOT Residencies.
- Pages 1C-18 thru 1C-28 – Added “Figures 1C-18 thru 1C-27 Residency Offices in the State.

CHAPTER 2A

- Page 2A-4 – Deleted the following language under SECTION 2A-3 REVIEWING WORK LOAD AND ASSEMBLING DATA;

SETTING UP CORRESPONDENCE FILES

The initiation and constant maintenance of correspondence files cannot be over-emphasized. A properly maintained file will provide a continuing history of the project and will permit documentation of the various stages of activities. When a project is received by the Engineer to whom it is assigned, every effort should be made to assemble all correspondence relative to this particular project. This will involve a search of the main file, a review of the files of other divisions, and possibly a review of the files of District personnel. All original correspondence is to go to the central files after copies are made. When all available correspondence is assembled, consideration is to be given to the number of files needed and their content. All pertinent information at major milestones and other information deemed important by the Project Manager will be downloaded into iPM. On large projects or those expected to continue for several years, this is very important, as a separation of certain items will provide optimum access.

SETTING UP ROUTE FILES

Route files will contain all rolls, mosaics, old plans, photographs, USGS quadrangle sheets and other available data. Consideration must be given to the size and expected time frame of the project and sufficient space provided for the anticipated accumulation. Items in the route file are to be identified by some method for easy access. As the project progresses, care must be taken to keep only essential items, as an accumulation of unneeded material will waste valuable space.

- Page 2A-6 – Added the following language in the last sentence in the second paragraph under “REQUEST FOR TRAFFIC DATA”; “The design year (“*Ad date plus*” 11 years or 22 years)...”
- Page 2A-11 – Revised the second sentence under “DESIGN WAIVERS” to include the following language; “When design criteria meets or exceeds AASHTO minimal design “*requirements*” but falls short of VDOT’s minimal design “*standards*”, a Design Waiver shall be required.”

CHAPTER 2C

- Page 2C-5 – Revised the second sentence under “DRAFTING” to delete the following language; “Care must be taken “*by the engineering technician*” to clearly distinguish items.”
- Page 2C-6 – Deleted the following sentence at the end of “SURVAY BASELINE”; “*The last digit of the intermediate station is to be shown close to the station marks. (Imperial only).*”

CHAPTER 2D

- Page 2D-4 – Replaced the following language at the beginning of the page; “RESPONSIBILITY OF THE PUBLIC INVOLVEMENT SECTION” with “*RESPONSIBILITIES OF THE PROJECT MANAGER AND THE DISTRICT PUBLIC AFFAIRS SECTION*”

Replaced the following language; “URBAN AND SECONDARY PROJECTS”

On applicable projects, the Local Assistance Division works closely with the Public Involvement Section in the processing of the aforementioned data.” with;

“*INTERSTATE, PRIMARY, URBAN AND SECONDARY PROJECTS*

The Project Manager and the District Public Affairs Manager is responsible for processing of the necessary data. For Locally Administered Projects, see the Locally Administered Project Manual, which can be accessed at http://www.virginiadot.org/business/locally_administered_projects_manual.asp”

Revised heading label from; “DATA REQUIRED FROM PROJECT MANAGER” to “PROJECT MANAGER RESPONSIBILITIES” and deleted the following language; “*In order to properly fulfill their responsibilities, the Public Involvement Section is to be provided certain data by the project manager. All necessary data is to be furnished at least sixty days prior to the scheduled hearing date.*”

Revised the first sentence in the “New” first paragraph under “PROJECT MANAGER RESPONSIBILITIES” from “The project manager should consult with *the moderator of the public hearing and determine...*to “The project manager should consult with the *project designer to and determine...*”

Revised the first sentence in the “New” second paragraph under “PROJECT MANAGER RESPONSIBILITIES” from “After the needs have been determined, prints of plans and other necessary data are to be provided to the Public Involvement Section for their use in preparing...”to “After the needs have been determined, prints of plans and other necessary data are to be *used* in preparing...and replaced “*Public Involvement Section*” with “*District Public Affairs Manager*” in the last sentence.”

Replaced the following language in the “New” third paragraph; “*Public Involvement Section*” with “*District Public Affairs Manager*” and deleted the following sentence; “*This is to be accomplished by the Local Assistance Division on applicable projects.*”

CHAPTER 2E

- Page 2E-16 – Revised the third sentence in the first paragraph; “When a flush median with median barrier is used on a six lane facility, the minimum median width is to be 22 feet (6.6 m). If truck DHV exceeds 250, then a median width of 26 feet (7.8 m) is desirable.” with; “When a flush median with median barrier is used on a six lane facility, the minimum median width is to be “26 feet (7.8 m) unless truck DHV is ≤ 250 , then a median width of 22 feet (6.6 m) is sufficient.”
- Page 2E-22 – Added the following language at the end of the page; “*Form LD-155 shall be completed to investigate the feasibility of alternate retaining wall designs, such as cantilever, reinforced earth, etc., and are to be considered and discussed with the Structure and Bridge Engineer for Geotechnical Design of Structures for possible use in lieu of standard designs (especially if wall height exceeds 10 feet (3 m).*”
- Page 2E-23 – Deleted the following language; “*Alternate retaining wall designs, such as cantilever, reinforced earth, etc., are to be considered and discussed with the Standards/Special Design Section for possible use in lieu of standard designs (especially if wall height exceeds 10 feet (3 m).*”
- Page 2E-29 – Replaced the following language in the second sentence under “SIGN ISLANDS”; “*District Traffic Engineer*” with “*Regional Traffic Engineer*”.

- Page 2E-33 – Revised language under “CURB / CURB AND GUTTER”;

“Curb and/or curb and gutter should be utilized in special situations ONLY on highways with design speeds of 50 mph or greater. These situations may include, but are not limited to, drainage considerations, access control and right of way restrictions. Whenever necessary to utilize curb and/or curb and gutter on a highway with a design speed of 50 mph or greater, mountable type curb (Standard CG-3 / CG-7) shall be used. Because Urban Principal Arterial highways are typically free-flowing with higher operating speeds, mountable type curb (Standard CG-3 / CG-7) shall be used with design speeds of 45 mph or greater. (See AASHTO Green Book, Chapter 4)

Barrier Type Curb

The use of barrier type curb (standard CG-2 / CG-6) is limited to low-speed highways (design speeds 45 mph or less) with the exception of urban principal arterials mentioned above. The same standard entrance gutter, street connection, median strip, etc. Is used for standard CG-3 / CG-7 and standard CG-2 / CG-6.” To;

Barrier Type Curb

Standard CG-2 curb or Standard CG-6 curb and gutter has a 6" vertical face and is referred to as "barrier curb". The use of barrier curb is limited to design speeds of 40 mph or less.

Mountable Type Curb

Standard CG-3 curb or Standard CG-7 curb and gutter has a 4" sloping face and is applicable to all design speeds (required for design speeds of 45 mph or greater). (See AASHTO Green Book, Chapter 4)

For curbed entrances, the same standard entrance gutter, street connection, median strip, etc. is used for either Standard CG-2 / CG-6 or Standard CG-3 / CG-7.

For highways with design speeds of 50 mph or greater, curb and/or curb and gutter should be utilized in special situations ONLY. These situations may include, but are not limited to, drainage considerations, access control and right of way restrictions.

- Page 2E-37 – Deleted the following language; “Right of Way breaks are to be shown as near as feasible to the applicable break, and lettered along a line parallel to the baseline. The distance from the baseline is to be shown above a solid line with the baseline plus below. When more than one baseline is used, the referenced line should be identified.”

Added the following language in the second sentence under “DETERMINING PROPOSED RIGHT OF WAY WITH SLOPE EASEMENTS”; “The proposed right of way line, in this case, is usually based on the computed back of sidewalk line “plus 1 foot” or on a line parallel to the back of sidewalk.”

Deleted the following language in the second paragraph under “DETERMINING SLOPE EASEMENTS”; “...with the pluses and distances for the breaks shown in parentheses for temporary easements, or brackets for permanent easements. If an easement break falls on a right of way break, a separate easement break will also be shown.”

Deleted the following language to the “Note” section under “DETERMINING SLOPE EASEMENTS”; "Note: “Figures in parentheses and” dot-dot-dashed lines denote temporary easements."

Or "Note: “Figures in brackets, and” dot-dashed lines denote permanent easements."

Or "Note: “Figures in double brackets, and” dot-dashed lines denote utility easements."

- Page 2E-38 – Revised the language in the first sentence of third paragraph under “DETERMINING PERMANENT EASEMENTS” from; “*The permanent easement lines are to be dot-dashed and pluses and distances are shown in brackets.*” to “*The permanent easement lines are to be dot-dashed lines.*”

Deleted the following language to the “Note” under “DETERMINING PERMANENT EASEMENTS”; “*Figures in brackets and*” dot-dashed lines denote permanent easements.

Revised the following language in the last paragraph under “DETERMINING PERMANENT EASEMENTS” from; “*The exact usage of the easement needs to be specified at each location, such as "Prop. Permanent Easement for Installation and Maintenance of Prop. Drainage Structure" or "Prop. Permanent Easement for Construction and Maintenance of Prop. Drain Ditch." If space is not available in the area of the easement, label the easement "Proposed Permanent Easement" with an asterisk (or similar notation) and show a note detailing the exact usage of the easement at another location on the sheet. Highway aerial easements are to be shown similar to the drainage easements and labeled "Proposed Aerial Easement for Bridge" and, if necessary, asterisks (or similar notations) are to be shown on all applicable easement breaks to distinguish the easement from other easements in the area.*” to; “*The usage of the easement needs to be specified at each location, such as "Prop. Permanent Drainage Easement."* However, if space is available in the area of the easement, label the easement "Prop. Permanent Easement for Installation and Maintenance of Prop. Drainage Structure" or "Prop. Permanent Easement for Construction and Maintenance of Prop. Drainage Ditch”. Highway aerial easements are to be shown similar to the drainage easements and labeled "Proposed Aerial Easement for Bridge" and, if necessary, asterisks (or similar notations) are to be shown on all applicable easement breaks to distinguish the easement from other easements in the area.”

- Page 2E-39 – Deleted the following language; “*Easements that run away from the roadway (generally perpendicular) are to be dimensioned by pluses and distances to each corner.*”
- Page 2E-41 – Deleted the following language at the end of the first sentence in the last paragraph; “*with pluses and distances shown in double brackets [[-]].*”

- Page 2E-43 – Deleted the following language; “*SEPARATE RIGHT OF WAY PLANS*
If plan sheets are extremely congested with topography, etc., separate right of way plans may be justified. This determination is to be made by the Engineer in charge of the project design. PROPERTY REQUIRING METES AND BOUNDS DESCRIPTION
Complete metes and bounds information is to be included in the approved right of way plan assembly for projects requiring procurement of property from unique clients (e.g. Federal and State governmental agencies, railways and Power companies). This requirement shall apply to all land and permanent easement acquisitions. It is not necessary to provide metes and bounds descriptions for temporary construction easements. Temporary construction easements shall be designated with conventional plus and distance on the breaks and acreage of take.”
- Page 2E-44 – Deleted the following language; “*This information is to be shown on a "METES AND BOUNDS" sheet included in the approved right of way plan assemblies for applicable projects as a "1 series" sheet. Information shown shall include property owner names (including adjacent parcels), utility company names (e.g. Bell Atlantic, Virginia Power, Hampton Roads Sanitation District, etc.) types of easement (permanent drainage, permanent utility, temporary construction, etc.) property lines, right of way and easement lines (proposed and existing), centerline/baseline identification with stationing, bearings, lengths, curve data, and acreage of take. Right of way and permanent easement takes on radius are to show chord length, chord bearing, arc length, and radius.*

The Metes and Bounds closure is to be calculated in a clockwise direction, with all break points labeled and information (bearings, lengths, curve data) shown in tabular form on the Metes and Bounds sheet. The point of beginning for each parcel will be a readily identifiable point, such as an iron pin, Right of Way monument or reference to the Construction Baseline. Deed records for railroad properties are to be referenced from a railroad mile post and tied specifically to railroad track stationing. The Metes and Bounds sheet should have sufficient descriptive detail to be used independent of the construction plan sheets; however, construction plans and Metes and Bounds sheets should reference each other for supplemental information.

A separate metes and bounds sheet may not be needed on non-complex projects, provided data can be shown legibly on the roadway plan sheet.

The District Survey Sections (or Central Office Survey Section) shall confirm that the metes and bounds are shown correctly. The road designer shall furnish any available original property line back up information to the Survey Section for this review. At the completion of the review, the road designer shall furnish the sheet to the Right of Way Division, normally, as part of the approved right of way plan assembly for their use in preparing the deed description. (See Sample Metes and Bounds Sheet, Figure 2E-9).

Some Federal agencies prefer that only a single roadway easement be shown, rather than separate easements for roadway, drainage, stormwater management or other types of permanent easement. It would be advantageous to the designer to contact the Central Office Right of Way Division's Special Negotiations Section for directions prior to determining right of way requirements."

- Page 2E-45 – Deleted “*FIGURE 2E-9 SAMPLE METES AND BOUNDS SHEET*” and renamed “*FIGURE 2E-10 DEPICTING LIMITED ACCESS RIGHT-OF-WAY*” to “*FIGURE 2E-9 DEPICTING LIMITED ACCESS RIGHT-OF-WAY*”.
- Page 2E-46 – Renamed “*FIGURE 2E-10.1 DEPICTING LIMITED ACCESS RIGHT-OF-WAY*” to “*FIGURE 2E-10 DEPICTING LIMITED ACCESS RIGHT-OF-WAY*”.
- Page 2E-52 – Replaced the following language in the second sentence; “*See IIM LD-110*” with “*See IIM LD-204*”.
- Page 2E-57 – Replaced the following language in the second sentence under “FUNCTIONAL CLASSIFICATION – TRAFFIC DATA”; See IIM LD-110 with IIM LD-204.

Revised the following language in the third sentence under “FUNCTIONAL CLASSIFICATION – TRAFFIC DATA”; Traffic data is listed below this information, in the same block, as furnished to this Division by the Traffic Engineering Division on Form No. TS-25, or from the Transportation Planning Division on Form No. TPD-1A. To read “*Traffic data is listed below this information, in the same block, as furnished to this Division by the Traffic Engineering Division or from the Transportation and Mobility Planning Division.*”

Deleted the following language under “PROJECT SECTION NUMBERS”; “Right of Way numbers (RW-) are to be shown in the upper right hand corner on all plans, profiles, detail sheets (pertaining to R/W only) and cross sections.”

Added the following language in the last sentence under “PROJECT SECTION NUMBERS”; “*Right of Way (RW-), Construction or Minimum Plan numbers (C- or M-) are to be shown in the upper right hand corner on all sheets including plans, profiles, detail sheets and cross sections.*”

- Page 2E-60 – Deleted the following language at the beginning of the page; *Sheets which only pertain to Right of Way (i.e. R/W Data Sheet, Revision Data Sheet) are to be denoted with an asterisk as shown below:*

<i>SHEET NO. 1</i>	<i>TITLE SHEET</i>
<i>SHEET NO. 1A</i>	<i>PROJECT LOCATION MAP</i>
<i>SHEET NO. 1B</i>	<i>INDEX OF SHEETS</i>
<i>*SHEET NO. 1C</i>	<i>RIGHT OF WAY DATA SHEET</i>
<i>*SHEET NO. 1D</i>	<i>REVISION DATA SHEET</i>
<i>*SHEET NO. 1M</i>	<i>METES & BOUNDS</i>

**Denotes sheets which are not to be printed for construction, but sheets shall be included in final set of construction plans stored in Falcon/Web Suite.*

- Page 2E-62 – Replaced “*Figure 2E-15 SAMPLE INDEX SHEET.*”

CHAPTER 2F

- Page 2F-1 – Replaced the following language in the third sentence under “RIGHT OF WAY DATA SHEET”; “This information is furnished by the Right of Way Division and is recorded on a Preliminary Right of Way Data Sheet (See Figure 2E-17).” To; “This information is furnished by the *Survey Section in Location and Design* Division and is recorded on a Preliminary Right of Way Data Sheet (See Figure 2E-17)”.
- Page 2F-3 – Replaced the following language in the forth paragraph; “*The estimates in PCES, RUMS and PCES must be verified to agree.*” with “*The estimates in PCES and RUMS must be verified to agree.*”

CHAPTER 2G

- Page 2G-6 – Added the following language; “*Summarization of work to be performed by State Forces and Railroad Forces are typically included in the Incidental Summary. For instructions on showing State Force work for providing construction signs, see IIM-LD-93. IIM-LD-93 should also serve as a guide for the method of showing State Force work for Construction Surveying when approved by the State Location and Design Engineer (see IIM-LD-152). For instructions on the summarization of Railroad Force work, see IIM-LD-143.*”

APPENDIX “A”

- Page A-8(GS-1) – 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-12(GS-5) – Revised right shoulder width on Freeways from 12’ to 14’.

Revised the language in the tenth paragraph under “General Notes” from; “*A minimum 30’ width of surfacing or a minimum 30’ 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-13(GS-6) – Revised the language in the seventh paragraph under “General Notes” from; “*A minimum 30’ width of surfacing or a minimum 30’ 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-14(GS-7) – Revised the language in the fifth paragraph under “General Notes” from; “*A minimum 30’ width of surfacing or a minimum 30’ 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 4’ wide paved shoulders when the graded shoulder is 5’ wide or greater or provide 3’ wide paved shoulders when the graded shoulder is 4’ 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-15(GS-8) – Revised the language in the sixth paragraph under “General Notes” from; “*A minimum 30’ width of surfacing or a minimum 30’ 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 4’ wide paved shoulders when the graded shoulder is 5’ wide or greater or provide 3’ wide paved shoulders when the graded shoulder is 4’ wide.*”

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

- Page A-18 – 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-19 – 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 50 mph 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 8' 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 50 mph for one of the situations listed above, the minimum lateral offset distance is 1.5 feet 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 45 mph, the greatest practical lateral offset is to be provided, and shall extend a minimum of 8' 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 1.5' 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 45 mph, the minimum lateral offset distance is 1.5 feet measured from the face of curb. See Figure A-2-1, Case 3."

- Page A-21 – Replaced "CASE 3" in "FIGURE A-2-1".
- Page A-23 – Added the following language; "Another cost effectiveness selection procedure is to utilize the Roadside Safety Analysis Program (RSAP) mentioned in Appendix A of the Roadside Design Guide (CD included with guide)."
- Page A-26 – Replace the following language in "NOTE" #3; "if GR-3 or GR-8" with "when" to read "Recoverable area width to be increased 3' when Guardrail is required."
- Page A-32 – 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 \leq 45 m.p.h."

- Page A-34 – Replaced the following language under “GUARDRAIL INSTALLATION IN URBAN SETTINGS”; *“In Urban settings with design speeds of 45 MPH or less that includes curb or curb and gutter, the use of guardrail is not recommended. Standard CG-2 or CG-6 (6" high curb) is usually used for design speeds of 45 MPH or less in urban and suburban areas and is referred to as "barrier curb" because it has a 6" vertical face and is intended to discourage motorists from deliberately leaving the roadway. 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 blockout) 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. When the guardrail is to be aligned with the face of the curb, only GR-2 (Strong Post) and CG-3 or CG-7 (4" high curb) is to be used regardless of the design speed. If the guardrail is not to be aligned with the face of the curb or if CG-2 or CG-6 (6" high curb) is being used, then provide maximum offset where possible by placing the guardrail 11' or more behind the face of curb for high speed (50mph or more) roadways and 6' or more behind the face of curb for low speed (45mph 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 any 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 (4" 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 (45 mph or less) the guardrail shall be offset a minimum of 6' behind the face of curb. For high-speed roadways (50 mph or greater) the guardrail shall be offset a minimum of 11' 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 1' 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-38 – 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 2 feet in depth “*when it is within the design clear zone.*”

- Page A-49 – 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-91 – Revised the following language under “Bike Lane Widths” from; “*The recommended width of a bike lane is 5 feet from the face of a curb to the bike lane stripe on roadways without a gutter pan. The recommended width of a bike lane is 4 feet from the edge of pavement to the bike lane stripe on curb and gutter roadways.*” to; “The width of a bike lane is 5 feet “*minimum*” from the face of a curb to the bike lane stripe on roadways without a gutter pan. The width of a bike lane is 4 feet “*minimum*” from the edge of pavement “*(face of gutter pan)*” to the bike lane stripe on curb and gutter roadways.”

Replaced “should” with “shall” in the first sentence of the third paragraph under “Bike Lane Widths”.

- Page A-93 – Replaced “*paved shoulder*” with “*graded shoulder*” in the third sentence under “Shoulder and Ditch Typical Section”.

- Page A-95 – Added the following language under “SHARED USE PATH”;
 - *Slopes 1:1 or steeper, with a drop of 1 foot or greater*
 - *Slopes 2:1 or steeper, with a drop of 4 feet or greater*
 - *Slopes 3:1 or steeper, with a drop of 6 feet or greater*
 - *Slopes 3:1 or steeper, adjacent to a parallel water hazard or other obvious hazard*

Added the following language; “*Note*” to the beginning of the third paragraph.

Added the following language in the last sentence of the page; When a shared use path is “*constructed adjacent to*” a retaining wall or any vertical drop-off “*1' or more*” a railing or chain link fence 54 inches high is required.

- Page A-96 – Added the following language at the beginning of the page; “*When railing or chain link fence are required, contact the Location and Design Standards and Special Design Section for details*”.
- Pages A-107 thru A-120 – Added the following language;

PEDESTRIAN ACCESS ROUTES

DEFINITIONS

ACCESSIBLE ROUTE

A continuous unobstructed path connecting all accessible elements and spaces of a building or facility. This term applies only to individual sites (see “Pedestrian Access Route” for routes in the public right-of-way). Accessible route surfaces shall be firm, stable, and slip-resistant.

ALTERATIONS

A change to a building or facility that affects or could affect the usability of the building or facility, or portion thereof, that is in the scope of the project and is technically feasible, without regard to cost. Alterations include, but are not limited to, remodeling, renovation, rehabilitation, reconstruction, historic restoration, and resurfacing of circulation paths or vehicular ways.

Alterations shall incorporate accessibility improvements to existing pedestrian facilities to the extent that those improvements are in the scope of the project and are technically feasible, without regard to cost. Projects altering the usability of the roadway must incorporate accessible pedestrian improvements concurrent with the alterations to the roadway.

The FHWA has determined that alterations are projects that could affect the structure, grade, function, and use of the roadway. Alteration projects include reconstruction, major rehabilitation, structural resurfacing, widening, signal installation, pedestrian signal installation, and projects of similar scale and effect.

(Source: FHWA Office of Civil Rights Memorandum dated September 12, 2006, which can be accessed at:

www.fhwa.dot.gov/civilrights/ada_memo_clarificationa.htm).

For additional information, also see [Special Report: Accessible Public Right-of-Way Planning and Designing for Alterations](#) dated August 31, 2007, which can be accessed at:

<http://www.access-board.gov/news/rowalterations-guide.htm>.

BUFFER STRIP

The space provided between the back of curb and the sidewalk to place all lateral obstructions (landscaping, fire hydrants, street lights, parking meters, signal control boxes, signal, sign and utility poles, etc.) to ensure that the pedestrian access route is free of obstacles. When possible, signal poles and signal control boxes should be located behind the sidewalk to minimize conflict with intersection sight distance.

COMBINED (PARALLEL & PERPENDICULAR) CURB RAMP (CG-12, TYPE C)

*This alternative is typically used when public pedestrian right of way width established by local or state regulation, guideline, or practice will not accommodate a perpendicular curb ramp. A segment of the sidewalk is ramped or depressed to a relatively level landing to accomplish part of the level change and the balance is achieved by a short perpendicular curb ramp. They may be installed for new construction in the center of a curved section of curb when the radius is less than 25 feet and for alterations when the distance between two CG-12, Type B's is insufficient to install a separate landing for each. **One curb ramp is to be provided for each direction of crossing, where feasible.** (See Standard CG-12, Type C in the Road and Bridge Standards.)*

CURB RAMP

A ramp cutting through a curb or built up to it. A curb ramp consists of a ramp, with a maximum running slope of 12:1 and its accompanying landing(s), with flares where appropriate.

DIAGONAL CURB RAMP

Diagonal or corner type curb ramps with returned curbs or other well-defined edges shall have the edges parallel to the direction of pedestrian flow. The bottom of diagonal curb ramps shall have a clear space 48" (1220 mm) minimum outside active traffic lanes of the roadway.

Diagonal curb ramps provided at marked crosswalks shall provide the 48" (1220 mm) minimum clear space within the markings. Diagonal curb ramps with flared sides shall have a segment of curb 24" (610 mm) long minimum located on each side of the curb ramp and within the marked crossing. See Road and Bridge Standards.

CG-12's Type A, B and C can be constructed as Diagonal Curb Ramps.

LANDING

A level area of a curb ramp with a cross slope of less than 48:1. For perpendicular curb ramps, the landing allows pedestrians to bypass the flares and ramp and provides a level maneuvering space for persons using wheelchairs entering or exiting the ramp. For parallel curb ramps, the landing is between the ramps. See Road and Bridge Standards.

NEW CONSTRUCTION

All Areas Of Newly Designed And Newly Constructed Facilities In Public Rights Of Way Are Subject To These Guidelines. This Applies To Work Such As The Extension Of Roadways And Sidewalks Into Undeveloped Areas, New Subdivisions, And Similar Types Of Projects. Full Compliance Is Generally Easier In These Types Of Projects Because The Scope Of Work Is Usually Extensive Enough To Allow Necessary Grading And Acquisition Of Sufficient Right Of Way.

PARALLEL CURB RAMP (CG-12, TYPE B)

*Parallel ramps are especially suited to narrow rights-of-way where there is insufficient space for the top landing of a perpendicular curb ramp. In this case, the bottom landing usually serves as the direct connection to the street crossing and shall be located within the crosswalk. Criteria for parallel curb ramps address the running slope (grade) (12:1 maximum and 48:1 minimum), cross slope (48:1 maximum), level landings at the bottom at least 60" by 60" (1525 mm X 1525 mm), and barriers at drop-offs. The running slope (grade) of parallel curb ramps will be affected by the slope of the sidewalk, which is permitted to be as steep as the adjacent roadway. Thus, a maximum slope of 12:1 may not be achievable due to the road grade. In recognition of this, an exception limits the required length of a parallel ramp to 15' (4.6 m), regardless of the slope. The landing required at the bottom of the ramp is not permitted to slope more than 48:1 in any direction. They may be installed for new construction in the center of a curved section of curb when the radius is less than 25 feet and for alterations when the distance between two CG-12, Type B's is insufficient to install a separate landing for each. **One curb ramp is to be provided for each direction of crossing, where feasible.** (See Standard CG-12, Type B in the Road and Bridge Standards.)*

PEDESTRIAN ACCESS ROUTE

A key term that refers to the portion of the public right of way that serves as an accessible route. Since the technical requirements for this route are unique to public rights of way, the Access Board's advisory committee wanted to use a term distinct from "accessible route," which is used by Americans with Disabilities Act Accessibility Guidelines (ADAAG) in referring to routes on sites. The pedestrian access route provides a continuous accessible means of passage. The minimum clear width for a pedestrian access route is 48" (1220 mm), excluding the width of curbs. The grade of the pedestrian access route within a sidewalk shall be no more than 20:1; however, it is permitted to be as steep as the grade of the adjoining roadway.

The pedestrian access route surfaces shall be firm, stable, and slip resistant and openings that are more than 1/2" (13 mm) in one dimension are prohibited. The pedestrian access route is permitted level changes up to 1/4" (6 mm) without treatment and level changes between 1/4" (6 mm) and 1/2" (13 mm) that are beveled with a slope no greater than 2:1.

PERPENDICULAR CURB RAMP (CG-12, TYPE A)

*A curb ramp, normally perpendicular to the curb at the street crossing, with a maximum running slope of 12:1 and a 48:1 maximum level landing (48" x 48" minimum) (1220 mm x 1220 mm minimum) at the top. The bottom of the ramp run, exclusive of flared sides (10:1 maximum slope), shall be located within the crosswalk. The cross slope shall be 48:1 maximum. Sidewalks are permitted to follow the running slope of the adjacent roadway, which determines the cross slope of perpendicular ramps and landings at mid-block crossings. They may be installed for new construction in the center of a curved section of curb when the radius is less than 25 feet and for alterations when the distance between two CG-12, Type A's is insufficient to install a separate landing for each. **One curb ramp is to be provided for each direction of crossing, where feasible.** The perpendicular curb ramp (CG-12, Type A) is the preferred design for new construction. However, sidewalk width or right of way limitations may warrant a CG-12, Type B or CG-12, Type C. (See Standard CG-12, Type A in the Road and Bridge Standards.)*

PUBLIC RIGHT OF WAY

Land or property, usually in a corridor, that is acquired for or devoted to transportation purposes.

SIDEWALK

That portion of a public right of way between the curb line or lateral line of a roadway and the adjacent property line that is improved for use by pedestrians.

TECHNICALLY INFEASIBLE

Existing physical or site development conditions that prohibit the modification or incorporation of elements, spaces, or features which are in full and strict compliance with the minimum requirements for new construction in the public right of way and which are necessary for pedestrian access, circulation, and use (the basis used for exceptions and special technical provisions allowed in alterations). (Source: FHWA Office of Civil Rights Memorandum dated September 12, 2006).

When an alteration meets accessibility requirements but is technically infeasible, the public agency must ensure that the alteration provides accessibility to the "maximum extent feasible".

POLICY

VDOT's policy is to provide facilities for persons with disabilities in accordance with the Code of Virginia, Section 15.2 –2021:

<http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+15.2-2021> .

Curb ramps shall be provided wherever a pedestrian access route crosses a curb regardless of whether sidewalk is existing, proposed, or non-existent.

The width of curb ramps (excluding the flares) for shared use paths shall be the same width as the width of the shared use path and include detectable warning surfaces the entire width of the path.

Each location under consideration for requiring curb ramps should be reviewed to determine if a pedestrian access route exists. Curb ramps are required only when a pedestrian access route is to be provided connecting pedestrian areas, elements and facilities. Do not install a curb ramp just because there is an intersection along a curb and gutter section of roadway. Use engineering judgment in evaluating the location. Do not install a curb ramp if it would direct the pedestrian into a wall, fence or drainage structure instead of along a pedestrian access route.

Curb ramps shall conform to the Road and Bridge Standard CG-12, Type A, B or C and Sections 502 and 504 of the Road and Bridge Specifications. Each curb ramp location shall be evaluated. The designer shall ensure curb ramps are graphically depicted accurately on plans, drawn to scale, and annotated to denote the Type of Curb Ramp (CG-12, Type A, B or C). Curb ramps shall be stable, firm, slip-resistant and constructed of hydraulic cement concrete with a detectable warning surface in accordance with the Special Provision “CG-12 Detectable Warning Surface.”

One curb ramp is to be provided for each direction of crossing, where feasible.

Construction of the entire Standard CG-12, Type A, B or C is required. Construction of the wiped down section of curb only, with intentions of installing the curb ramp when/if a sidewalk is installed along the continuous passage, is not acceptable.

The Project Manager is to coordinate, early in the design process, with the State Bicycle and Pedestrian Coordinator concerning a pedestrian movement plan and the project traffic engineer concerning crosswalk locations to determine the most desirable road crossing locations. Proposed curb ramp locations, the pedestrian access route, and sidewalks are to be reviewed with the Location & Design Traffic Engineering Design Section early in the design process and throughout the plan development process to determine any possible conflicts with traffic control devices, signs, signals, signal boxes, lighting, crosswalks, and stop bars and other pavement markings. Proposed curb ramp locations also are to be reviewed also by the Hydraulics Section and any other affected disciplines (such as utilities) to avoid potential drainage problems or other conflicts.

GOALS AND OBJECTIVES

A curb ramp is required to provide access to and from sidewalks or pedestrian access routes for all users. This access is beneficial to pedestrians, users of wheelchairs, canes, crutches, walkers, braces, lower-limb prostheses, persons with gait balance and stamina disabilities, the elderly, and persons with visual disabilities (such as depth perception difficulties).

There are four objectives related to this goal:

- 1. Provide a curb ramp design and placement that is usable by persons with disabilities.*
- 2. Provide design and placement alternatives for a range of sidewalk and street conditions.*
- 3. Provide minimal negative impact to all pedestrians.*
- 4. Place curb ramps in uniform and consistent locations.*

Pedestrians with disabilities will benefit most from design approaches that minimize physical barriers to travel and maneuverability. Pedestrians who use crutches are particularly susceptible to cross slope when they are traveling downhill. Pedestrians with cognitive and sensory disabilities, particularly those who have limited vision and those who are blind, should have access to information on the pedestrian environment that is necessary for independent travel. Children, including those with disabilities and those using bicycles and other wheeled toys, are significant users of sidewalks and are significantly less able to compensate for cross slope than adults.

BUFFER STRIP

The space provided between the back of curb and the sidewalk to place all lateral obstructions (landscaping, fire hydrants, street lights, parking meters, signal control boxes, signal, sign and utility poles, etc.) to ensure that the pedestrian access route is free of obstacles. When possible, signal poles and signal control boxes should be located behind the sidewalk to minimize conflict with intersection sight distance.

Width

Buffer strip shall be 48" (1220 mm) wide to provide the minimum lateral offset for the placement of conventional signs in accordance with the MUTCD, Part 2. Buffer strip less than 48" (1220 mm) wide may be utilized; however, additional right of way shall be acquired behind the sidewalk for the placement of lateral obstructions (landscaping, fire hydrants, street lights, parking meters, signal control boxes, signal, sign and utility poles, etc.) as well as proposed drainage structures. The Roadway Design should coordinate with the Traffic Engineering Designer to determine the amount of right of way necessary.

*In unique situations where **no** buffer strip is provided and a 60" (1525 mm) sidewalk (or sidewalk space) is placed adjacent to the curb, a Design Waiver will be considered when appropriately documented and submitted (See IIM-LD-227). All lateral obstructions (landscaping, fire hydrants, street lights, parking meters, signal control boxes, signal, sign and utility poles, etc.) shall be placed behind the sidewalk so as not to encroach on the pedestrian access route.*

Therefore, additional right of way shall be acquired behind the sidewalk to place all lateral obstructions as mentioned above. The Roadway Designer should coordinate with the Traffic Engineering Designer to determine the amount of right of way necessary.

If trees are to be planted in the buffer strip it shall be a minimum 72” (1830 mm) wide and the trees should be planted so that the center of the trees are 36” (914 mm) minimum behind the back of curb.

SIDEWALKS

Sidewalks are that portion of a public right of way between the curb line or lateral line of a roadway and the adjacent property line that is improved for use by pedestrians. Sidewalks shall have the following elements:

Height Restrictions

The vertical clearance from the top of the sidewalk to the bottom of any sign shall be 84” (2134 mm) minimum in accordance with the MUTCD, Part 2. Guy wires and utility tie-downs should not be located in or across sidewalks at heights below 96” (2440 mm).

The passage along or within a sidewalk should be clear of obstructions underfoot, overhead, or between. Objects with leading edges above the standard sweep of canes (27” (685 mm)) from the ground and below the standard head clearance (80” (2030 mm)) from the ground shall protrude no more than 4” (100mm) maximum horizontally into the accessible route.

Width

New sidewalks should be a minimum of 60” (1525 mm) wide. However, in unique situations where this is not feasible, a minimum clear width of 48” (1220 mm) shall be provided excluding the width of curb and will be considered when appropriately documented and submitted as a Design Waiver (See IIM-LD-227).

New sidewalks less than 60” (1525 mm) in continuous width shall provide a pedestrian passing area a minimum of 60”x 60” (1525 mm x 1525 mm) at reasonable intervals not to exceed 200’ (61 m). These passing areas can be provided at driveways with cross slopes no greater than 48:1 (2%), entrances, or street intersections.

For “NO” on-street parking situations where sidewalk is placed adjacent to the curb, the width should be 24” (600 mm) wider than normal (minimum) width of 48” (1219 mm) [48”+24”=72” (1829 mm)], but shall not be less than 60” (1525 mm) wide and requires the submission of a Design Waiver (See IIM-LD-227). All lateral obstructions (landscaping, fire hydrants, street lights, parking meters, signal control boxes, signal, sign and utility poles, etc.) shall be placed behind the sidewalk so as not to encroach on the pedestrian access route. Therefore, right of way shall be acquired behind the sidewalk for placement of all lateral obstructions.

For on-street parking situations, where sidewalk is placed adjacent to the curb, the width shall be 96” (2438 mm) minimum to allow vehicle doors to open and people to exit from the vehicle without blocking the pedestrian access route.

Slope

Sidewalk running slope (grade) shall not exceed the general slope (grade) established for the adjacent street or highway.

Cross slope shall not exceed 48:1. A level area with minimal cross slope is necessary for accessible passage across a driveway. Driveway aprons constructed like a ramp with steep short side flares can render a section of sidewalk impassible, especially when encountered in series as in residential neighborhoods.

Surfaces

*Sidewalk surfaces shall be **stable, firm and slip resistant** and shall be generally in a continuous plane with a minimum of surface warping. “Materials such as gravel, wood chips, or sand, often used for outdoor walkways, are neither firm nor stable, nor can they generally be considered slip-resistant. Thus, these materials do not constitute an accessible route. However, some natural surfaces, such as compacted earth, soil treated with consolidants, or materials stabilized and retained by permanent or temporary geotextiles, gridforms, or similar construction may perform satisfactorily for persons using wheelchairs and walking aids.”*

Changes in level up to 1/4” (6 mm) may be vertical and without edge treatment. Changes in level between 1/4” (6 mm) and 1/2” (13 mm) shall be beveled with a slope no greater than 2:1. Changes in level greater than 1/2” (13 mm) shall be accomplished by means of a ramp.

Grates in sidewalks shall have spaces no greater than 1/2” (13 mm) wide in the direction of traffic flow.

Where sidewalks cross rail systems at grade, the surface of the pedestrian access route shall be level and flush with the rail top at the outer edge and between the rails.

Sidewalks Along Curb and Gutter Streets

- (1) Sidewalks along curb and gutter streets shall be constructed with hydraulic cement concrete sidewalk or solid paving units.*
- (2) Concrete sidewalks shall be constructed in accordance with the Department’s specifications for hydraulic cement concrete sidewalk, on a compacted subgrade, and include underdrains in accordance with the Department’s Standard UD-3.*
- (3) Solid paver unit sidewalks shall be constructed in accordance with VDOT’s Location and Design Instructional & Information Memoranda IIM-LD-218, Paver Units (Sidewalk and crosswalk), located at <http://www.virginiadot.org/business/locdes/rd-ii-memoranda-index.asp>*

Sidewalks Along Shoulder and Ditch Streets

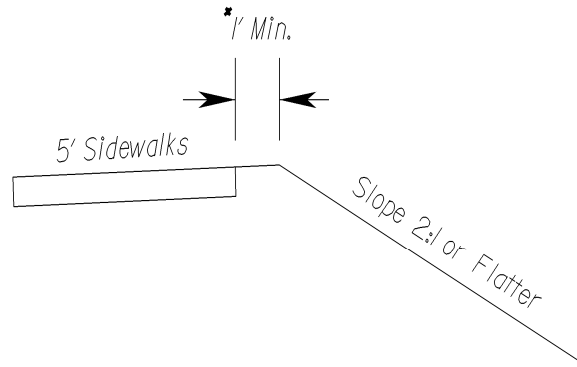
(1) Sidewalks along shoulder and ditch streets shall be constructed in accordance with VDOT's Road and Bridge Specifications for asphalt concrete sidewalk or hydraulic cement concrete sidewalk, on a compacted subgrade, and include underdrains in accordance with VDOT's Standard UD-3, located at <http://www.virginiadot.org/business/locdes/road-and-bridge-standards.asp>.

Separation - Curb and Gutter Street

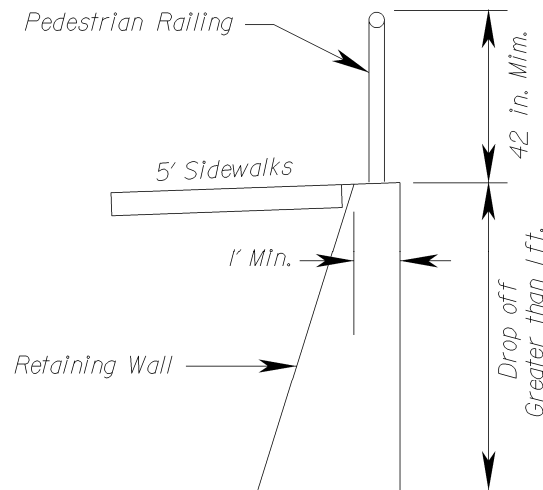
Designers shall consider providing sidewalks with both a vertical and horizontal separation from the adjacent roadway. Vertical separation shall be created through the installation of curbs. Horizontal separation can be achieved through the installation of a buffer strip, landscaping or furniture zones for benches, planters, literature display boxes, or similar clearly defined features or surfaces that will help guide persons who may otherwise unintentionally enter the vehicular way.

Separation - Shoulder and Ditch Street

Sidewalks constructed along a shoulder and ditch section shall be placed behind the ditch in a manner that will be compatible with the roadway if the roadway is converted to a curb and gutter section. (Note: Placement of sidewalk within the shoulder area is not permitted.)



** No railing is required if a 1' min. graded area is provided at the back of sidewalk when the slope is 2:1 or flatter, unless adjacent to a parallel water hazard 2' deep or other obvious hazard. If a railing is required the graded area behind the sidewalk shall be increased by 1' to accommodate the railing. Contact the Location and Design Standards and Special Design Section for details.*



Railing is required when sidewalk is constructed adjacent to a vertical drop-off greater than 1'. However, gripping rail is required only when the slope of the sidewalk is 5% or greater. Contact the Location and Design Standards and Special Design Section for details.

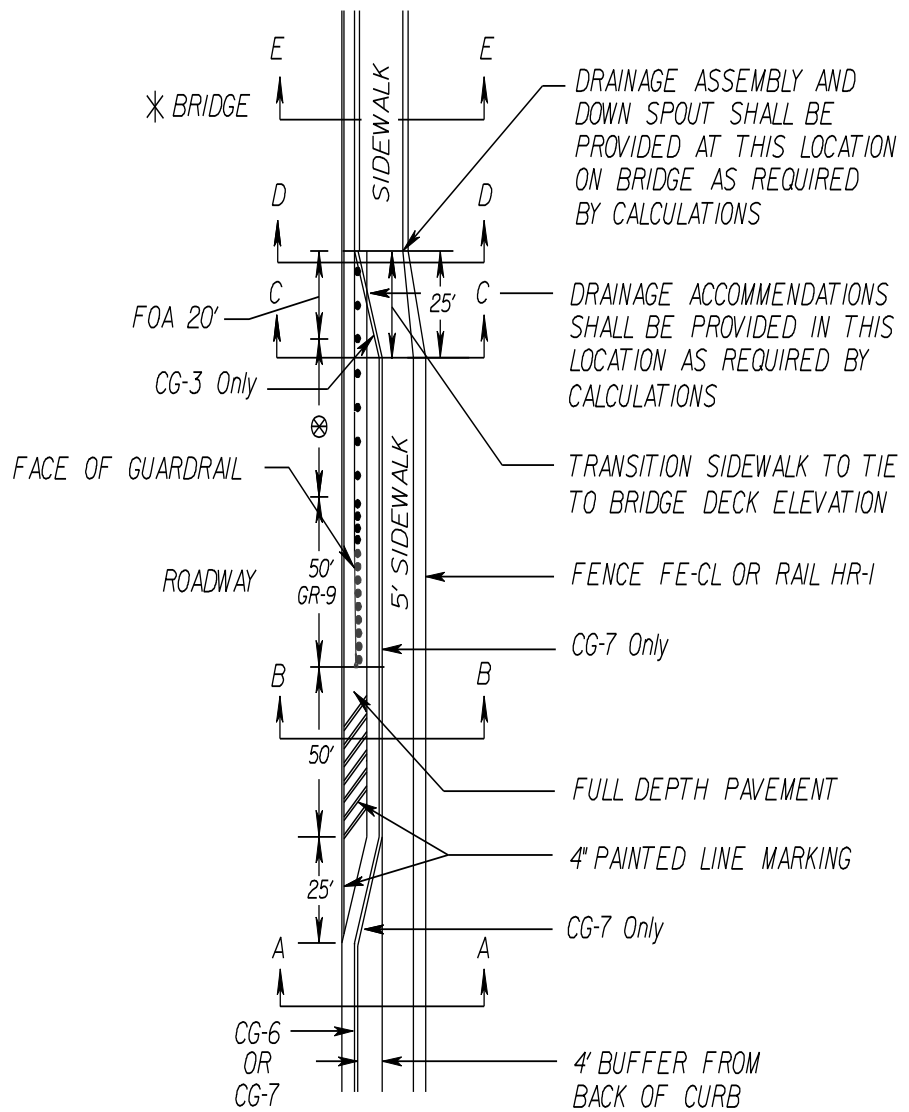
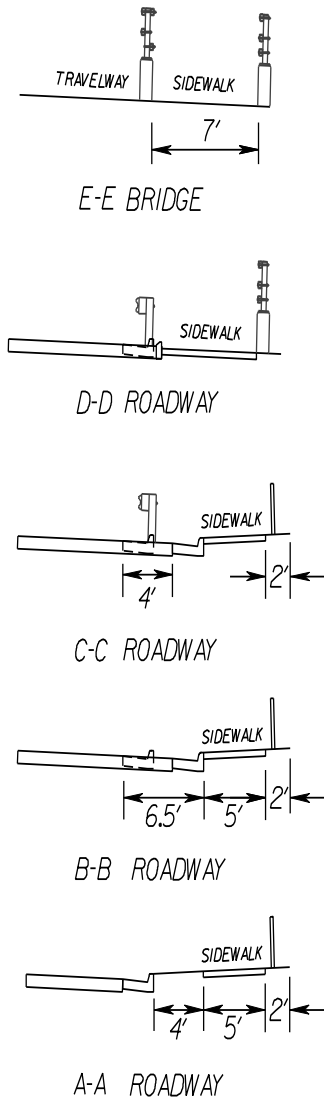
SIDEWALK TRANSITION FROM ROADWAY ONTO BRIDGE

SIDEWALK TRANSITION FROM ROADWAY ONTO BRIDGE

Not to Scale

⊗ LENGTH OF NEED SHALL DETERMINE ANY ADDITIONAL GUARDRAIL REQUIRED

* SEE STRUCTURE AND BRIDGE MANUAL, VOLUME V, PART 2, CHAPTER 6, NO. 06.04-6



GUIDELINES FOR CURB RAMP LOCATIONS

The placement of curb ramps is as critical to their effectiveness as the design. Placement should be determined by design constraints of the sidewalk, roadway, and intersection with respect to obstructions, crosswalks, and intersection types. Placement relative to obstructions should maintain consistency and effectiveness.

Curb ramps shall be located within the crosswalks (marked or unmarked). The ramps may be centered or located to one side of the crosswalk with the flare outside of the crosswalk. Curb ramps shall be located in front of the vehicle stop bar, if one exists. The Project Manager should discuss the relationship between crosswalks, stop bars and curb ramps with the Traffic Engineering Designer throughout the design of a project.

Pedestrian access routes that cross medians and refuge islands shall include a break or cut through a minimum of 60" (1525 mm) wide and shall include ramps and delectable warning surfaces. See Road and Bridge Standards.

Typical situations depicting the placement of curb ramps in new construction and in alterations have been incorporated into VDOT's Road and Bridge Standard details. Designers are urged to use sound engineering judgment in determining placement.

Curb ramps should be provided for each direction of crossing at intersections that incorporate pedestrian access routes, or on both sides of a mid-block location to establish a pedestrian access route for ramp users. If curb ramps are not placed at all corners of an intersection the ramp user's accessibility is restricted to the paths that provide curb ramps. Access to all pedestrian paths should be provided.

On new construction projects, utility poles, traffic control devices (such as sign, signal and lighting structures), fire hydrants, and drop inlets should be located so as to provide an unobstructed pedestrian access route to the curb ramp. Because the location of curb ramps may be adversely affected by obstructions, the curb ramp location should have priority over the location of potential obstructions.

GUIDELINES FOR ALTERATIONS

When existing areas, elements, or facilities intended for pedestrian access, circulation, and use in an existing developed public facility are altered, that is considered an alteration.

An alteration of an existing element, space, or area of a building or facility shall not impose a requirement for accessibility greater than required for new construction.

In alterations, where compliance with applicable requirements for new construction is technically infeasible, the alteration shall comply with the requirements to the "maximum extent feasible".

An alteration that decreases or has the effect of decreasing the accessibility of a public building or facility below the requirements for new construction at the time of the alteration, is prohibited.

If alterations to existing sidewalks, curb ramps, or pedestrian street crossings, when considered together amount to reconstruction of a block, intersection, or other substantial segment of the pedestrian circulation network in the public right of way, the entire segment, to the “maximum extent feasible”, shall comply with provisions for new construction.

Alterations to a sidewalk, curb ramp, or pedestrian street crossing in the public right of way shall be made so that adjacent segments on the pedestrian access route are readily accessible to and usable by individuals with disabilities.

Ramps, curb ramps and exterior ramps to be constructed on sites or in existing facilities where space limitations prohibit the use of a 12:1 slope or less may have slopes and rises as follows:

- *A slope between 10:1 and 12:1 is allowed for a maximum rise of 6” (150 mm).*
- *A slope between 8:1 and 10:1 is allowed for a maximum rise of 3” (75 mm). A slope steeper than 8:1 is not allowed.*

In alterations, full extension of handrails shall not be required where such extensions would be hazardous due to the ramp configuration.

The guidelines apply technical requirements according to the scope of work for a planned alteration or addition. The more extensive the work is, the greater are the opportunities to achieve access. Compliance is "prorated" based on the extent of the work planned.

MISCELLANEOUS NOTES

Maintenance of curb ramps may be necessary where there is a low velocity of storm water runoff. Debris may accumulate in the relatively flat areas at the base of the ramps, particularly in CG-12, Type B. Very little can be done cost-effectively to overcome this from a design and placement perspective.

The design guidelines are based on a standard barrier curb height of 6” (150 mm). Should increased heights be used, it will be necessary to add to the length of the curb ramp.

Special attention should be given to ensure that the bottoms of curb ramps and gutter pan lips are not adversely affected during street re-paving.

New construction should not contain grates within the pedestrian access route. Should grates be located in walking surfaces, they shall have spaces no greater than 1/2” (13 mm) wide in the direction of traffic flow. If grates have elongated openings, they shall be placed so that the long dimension of the opening is perpendicular to the dominant direction of travel.

Detectable warnings surface shall be provided only at the following locations:

- *Where a sidewalk or shared use path crosses a vehicular way, excluding un-signalized driveway crossings (private entrances).*
- *Where a rail system crosses pedestrian facilities that are not shared with vehicular ways. (See 1108.2 of the Access Board Draft Guidelines for Accessible Public Rights-of-Way for information)*
Guidelines concerning detectible warning locations at rail systems are contained in Section 1108.2.2 of the Access Board Draft Guidelines for Accessible Public Rights-of-Way (See References).
- *At reflecting pools within the public right-of-way, which have no curb or rim protruding above the walking surface.*
- *Pedestrian access routes that cross medians and refuge islands. See Roads and Bridge Standards.*

PROCEDURE FOR DETERMINING THE LOCATION AND DESIGN OF CURB RAMPS

Where do we want and plan for all pedestrians to walk or move? What is their destination and what is their current path? Is there an established network? The path may be along a sidewalk (or a relatively flat, unobstructed grass area behind a curb even though it is not surfaced) and through intersections.

1. *Determine if the subject project is a new project or an alteration project.*
2. *Coordinate, early in the design process, with the State Bicycle and Pedestrian Coordinator concerning a pedestrian movement plan (pedestrian access route) Policy and Procedure Section and the Traffic Engineering Designer concerning crosswalk locations. Determine the most desirable crossing locations.*
3. *Determine the best type of curb ramp (CG-12, Type A, B or C) for each location. Specify a CG-12, Type A if there is sufficient space for the landing at the top of the ramp.*
4. *Evaluate conflicts with curb ramps (light poles, fire hydrants, traffic control devices, utilities, drainage structures, etc.) and coordinate revised crossing locations or fixed object locations as necessary to install curb ramps.*
5. *The above procedure should continue as necessary throughout the plan development process.*

ALTERATION (RETROFIT) CG-12 INTO EXISTING CURB AND GUTTER AND/OR SIDEWALK LOCATIONS

When retrofitting a CG-12 into an existing curb and gutter location and/or sidewalk location, evaluation must be made for the most appropriate type of CG-12 configuration to match existing conditions with consideration of grade, type of curb and gutter, pedestrian path, available crosswalks, R/W, location of utilities, location of drainage structures, and any other features that may prohibit or affect the placement and design of the curb ramp.

*The existing curb and gutter (or curb only) will need to be removed in the area of the ramp. If there is existing sidewalk it may need to be removed back to the point where the proposed curb ramp will meet existing sidewalk grade. A new curb and gutter will need to be placed to match the existing edge of pavement and to tie to the proposed CG-12 as called for on the plans by type. (This may result in a warped surface area of 20:1 rather than normal gutter slope in the area approaching the ramp.) The sidewalk will be placed to meet the selected type of CG-12 shown on the plans and the detectable warning surface will be placed by the acceptable method selected by the contractor as shown in the Standard for CG-12. **If the landing area is placed at the top of the ramp (i.e.: CG-12, Type A) it may be constructed of the same surface as the traversable path (including grass) although it still must meet the minimal requirements of a landing (i.e.: within R/W, flat surface, correct size, etc.).***

- Page A-128 – Added the following language after the first sentence in the second paragraph; *“Bridge/Structure improvements will consist of drainage structures, “bridge only” rehabilitation and replacement projects with minimal roadway approach work, bridge repair/maintenance and other engineered non-complex structures in nature. These types of projects are to be accomplished by the “Accelerated Bridge Plan” concept as defined in IIM-S&B-84.”* Also added the following language to the third sentence in the same paragraph; *““No Plan” and “Minimum Plan” concepts are to be used only for projects where significant reductions in the cost/time of engineering, contract development and construction...”*

Added the following language at the end of the page; ““No Plan” road projects and “Accelerated Bridge Plan” projects may be put together in a common contract in the same manner that a minimum plan (M) or construction plan (C) road project is contracted together with a bridge (B) project. When this is done, finished grade control must be provided through the limits of the 500 year flood plain at each bridge or major drainage structure located within the “No Plan” road project that requires a hydraulic analysis. When the contract contains an “Accelerated Bridge Plan” project the structure plans may consist of 8 ½” X 11” sketches inserted into the assembly or separate full scale bridge plans.”

- Page A-129 – Added the following language after the first paragraph; *“The “Accelerated Bridge Plan” process may be used with structures requiring “B” or “D” designation numbers and other structures requiring major hydraulic analysis or river mechanics studies, and may also be used for bridge repair/maintenance and other engineered structures when pertinent survey, exploration and engineering are needed. For “Accelerated Bridge Plan” projects, the plan submittal may consist of 8 ½” X 11” sketches inserted into the assembly or separate full scale bridge plans.”*

- Page A-130 – Added the following language; *Right of Way – Certification*
Type I certificates are required on all No Plan and Minimum Plan projects with the exception that a Type II certificate may be used if approved by the District Administrator or his designee.

Revised the following language in the first paragraph under “SPECIAL DESIGN STRUCTURES, SOIL SURVEY AND PAVEMENT DESIGN”; “No Plan” projects may include “standard” drainage structures “or channel modifications that do not require a” “hydraulic study.” Major structures with “B” or “D” designation numbers, major channel modifications “or other structures” that require a hydraulic study may be constructed under the “Accelerated Bridge Plan” concept. Separate bid items are to be set up “when needed.”

- Page A-131 – Deleted the following language in the third paragraph under ‘DRAINAGE FACILITIES AND EROSION AND SEDIMENT CONTROL MEASURES’; “or shall be performed by State Forces, at the discretion of the District. When seeding operations and other items are to be performed by State Forces, a plan note must be included to denote such State Force work; and, in the event of Federal Funding, finding of cost effectiveness must be furnished in accordance with existing policy and procedures.”
- Page A-132 – Deleted the following language in the first sentence under “PROCEDURES”; “District Construction Engineer or the...”
- Page A-133 – Added the following language to “Note (a)” under “NO PLAN PROJECT”; Minimal “or no” survey is required to accomplish engineering, right of way and construction stakeout.

Added the following language to “Note (f)” under “NO PLAN PROJECT”; Construction “& Plan/Contract Development” activities must be handled in an expeditious manner

Added the following language; “No Plan” projects and “Accelerated Bridge Plan” projects may be combined into the same contract. When the “Accelerated Bridge Plan” project involves a stream/river crossing, finished grade control shall be provided through the 500 year flood plain at each bridge or drainage structure.”

Replaced the following language to the first sentence in the second paragraph; “The District Construction Engineer...” with “District “Administrator’s Staff” ...”

- Page A-134 – Added the following language to the last sentence in the first paragraph; “However, where it is impractical or not economical to obtain the minimum design and a design exception is required, permission shall be secured from the State Location and Design Engineer and, if applicable, from the “State Structure and Bridge Engineer and/or” Federal Highway Administration.”

Deleted the following language in the fourth paragraph “District Construction Engineer or the” ...

Replaced the following language to the first sentence in the fifth paragraph; “the Residency Administrator...” with “the *District Staff*” ...”

Replaced the following language to the second sentence in the fifth paragraph; “The Residency Administrator...” with “the *District Administrator’s Staff*” ...”

Replaced the following language to the first sentence in the sixth paragraph; “The Residency Administrator...” with “The *Project Manager or Responsible Charge* ...”

Replaced the following language in the last paragraph; The Central Office Location and Design, Utilities Section will obtain any necessary FHWA authorization for utility work and will furnish utility clearances and estimates to the Scheduling and Contract Division for contract projects with “*federal funding*.” If no known utilities and/or railroads are involved, the plans will contain a note so stating.

- Page A-135 – Replaced the following language in the first sentence of the first paragraph; “The District Administrator *or Designee*...” with “The District Administrator’s *Staff*...”

Added the following language after the first paragraph; “*The Project Manager or Responsible Change will submit stand alone “Accelerated Bridge Plan” assembly directly to the Scheduling and Contract Division for processing, construction advertisement and applicable federal authorization.*

If the proposal and final estimate are developed by the District, the complete contract proposal (including all pertinent Copied Notes and Special Provisions and final estimate) shall be submitted no later than the Advertisement Plan Submission date (column 6 of the “No Plan” advertisement cut-off date chart). Federal criteria sheet shall be included in the submission.

If the proposal and final estimate are to be developed by the Scheduling and Contract Division, the appropriate documentation shall be submitted no later than the Contract Development date (column 2 of the “No Plan” advertisement cut-off date chart).

Proposals shall be developed utilizing approved templates.”

Replaced the following language in the first sentence in the fifth paragraph; “*Electric*” with “*Electronic*”

Deleted the following “Note” under “MINIMUM PLAN PROJECTS”; *(d) Projects with "B" and "D" designation numbers.*

- Page A-136 – Revised the following language in the third sentence in the first paragraph from; “If any additional right of way or easements are necessary, the *usual* right of way certification *letter* and release for advertisement will be required.” to; “If any additional right of way or easements are necessary, the right of way “*certificate*” and release for advertisement will be required.”
- Page A-138 – Deleted the following language in the first sentence of the first paragraph; “...to the Plan Coordination Section in the Central Office.”

Deleted the following language after the second paragraph; “Aggregate Material No. 21, 21A, 25 or 26 should be set up as a contract item for roadway base or subbase, maintenance of traffic, private entrances, and mailbox turnouts. Normally, one contract item should cover all uses.”

Added the following language after the second paragraph; “When “Minimum Plan” roadway projects are combined with “Accelerated Bridge Plan” projects, the proposal and final estimate will be developed by the Scheduling and Contract Division.”

Deleted the following language under “SPECIFICATIONS”; “No Plan” and “Minimum Plan” projects will often consist of small quantities of materials; therefore, materials testing requirements for most items will fall within the limits of minimum testing as set forth in VDOT’s Materials Manual. Compactive effort must be provided by the Contractor in such a manner as to attain the required densities and random compaction tests will be performed to the extent required to assure proper compaction.”

- Page A-139 - Revised the following language in the third sentence in the first paragraph from; “The Project Engineer and the Project Inspector must also attend the project showing.” To; “The Area Construction Engineer or Construction Manager and the Project Inspector must also attend the project showing.”
- Page A-161 – Replaced the following language in the second sentence in the forth paragraph and in the last paragraph; “District Traffic Engineer” with “Regional Traffic Engineer”.
- Page A-167 – Replaced the following language in the last sentence in the third paragraph; “District Traffic Engineer” with “Regional Traffic Engineer”.
- Page A-171 – Replaced the following language in the last sentence in the first paragraph; “District Traffic Engineer” with “Regional Traffic Engineer”.
- Page A-175 – Replaced the following language in the first sentence; “District Traffic Engineer” with “Regional Traffic Engineer”.

APPENDIX “B”

- Page B-12 – Replaced “Sight Distance Triangles” detail to conform to current AASHTO guidelines.
- Page B-38 – Replaced the following language in the last sentence in the fifth paragraph; “*District Traffic Engineer*” with “*Regional Traffic Engineer*”.

APPENDIX “B(1)”

- Page B(1)-20 – Replaced “Sight Distance Triangles” detail to conform to current AASHTO guidelines.
- Page B(1)-47 – Replaced the following language in the last sentence in the fifth paragraph; “*District Traffic Engineer*” with “*Regional Traffic Engineer*”.
- Page B(1)-34 – Deleted the following language; *If the separation is less than 5 feet wide and the drop-off is 2 feet 6 inches or greater, a physical barrier, railing or chain link fence 42 inches high is required. When the separation from the edge of the shared-use path to the top of the slope is 5 feet or greater situations may dictate a physical barrier such as the height of embankment or conditions at the bottom (i.e. - water greater than 2 feet deep). See Appendix A, Figures A-5-6.*

When a shared-use path is along a retaining wall or any vertical drop-off greater than 6 inches a railing or chain link fence 54 inches high is required. See Appendix A, Figures A-5-7.

Added the following language at the end of the page; “*Railing Requirements See Appendix “A”, Figure A-5-6 Physical Barrier For Shared-Use Path.*”

APPENDIX “C”

- Page C-2 – 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.*”

- Page C-14 – Deleted the following language at the end of the first paragraph; *“Therefore, all pluses and distances can be calculated and shown to the nearest one-hundredth of a foot.”*

Deleted the following language; *“The practice of scaled pluses and distances for these right of way break points will not be acceptable.”*

- Page C-41 – Replaced the following language in item No. 4; *“District Traffic Engineer”* with *“Regional Traffic Engineer”*.
- Page C-62 – Replaced the following language in item No. 6; *“District Traffic Engineer”* with *“Regional Traffic Engineer”*.

APPENDIX “D”

- Page D-1 thru 15 – Added the following language at the bottom is each sheet; *“Quantities To Be Used Only For Computations of Dry Rip Rap For Outlet Protection.”*

APPENDIXES “F”

- Preface – Added the following language in the first sentence of the first paragraph; The 2007 General Assembly unanimously approved legislation *“(Chapter 863)”* proposed...

Deleted the following language in the first sentence in the second paragraph; *“including a policy advisory committee with representatives from local government, development, environmental, and transportation engineering organizations.”*

Added the following language in the first sentence of the third paragraph; Legislation *(Chapter 274)* was enacted during the 2008 General Assembly...

Deleted the following language in the first sentence in the third paragraph; *“according to highway functional classification.”* and the last sentence; *“The design standards are included as Appendix F in the Road Design Manual”*.

Added the following language at the end of the fifth paragraph; *“If a design standard can not be met a design exception or waiver is required. If a spacing standard can not be met, a spacing exception is required. For more information, see “Exceptions to the Spacing Standards” and “Exceptions/Waivers to the Design Standards” in Section 2.”*

Added the following language to “Note 1” at the bottom of the page; Maps of state highways by functional classification *“and information on the access management program”* are on the VDOT web site.

Added the following language to “Note 2” at the bottom of the page; The standards do not apply to proposed VDOT minor arterials, collectors and local streets if the construction design plans were presented at a VDOT public hearing prior to October 14, 2009 “*or principal arterials prior to July 1, 2008.*”

- Page F-1 – Added the following language at the end of the definition of “Corner Clearance”; “*The major roadway will have the higher functional classification (excluding local streets), will have the higher traffic volume.*”
- Page F-24 – Replaced the following language; “Footnote” No.8 with No. 9 to Table 2-2.
- Page F-26 – Revised the following language under “Footnote #9 from; “*The greater of the Table 2-2 spacing standards and the corner clearance standard will apply.*” To “The corner clearance distance will apply where it is greater than the Table 2-2 spacing standard. See the Corner Clearance in Section 4 for more information.”
- Page F-30 – Added the following language at the beginning of the second paragraph under “Exceptions to the Spacing Standards”; “*For new commercial entrances proposed for land development projects*”.

Added the following paragraph under “Exceptions to the Spacing Standards”; “*For highway construction or reconstruction projects on roadways maintained by VDOT, or on roadways maintained by localities which will be designed using VDOT standards, a request for a waiver to the spacing standards shall be submitted to the District Location and Design Engineer using Form AM-3. This form is available on the VDOT web site at <http://vdotforms.vdot.virginia.gov/>.*”

- Page F-31 – Added the following language at the beginning of both the first and second paragraphs under “Exceptions/Waivers to the Design Standards”; “*For both land development and highway construction projects,*”
- Page F-32 – Revised detail to add the following “Note”; “*The minimum angle of one-way and existing intersection that can not be realigned/reconstructed to 60° due to adverse impacts or geometrics is 45° and requires a design waiver be submitted for approval.*”
- Page F-33 – Revised detail to add the following “Note”; “*The minimum angle of one-way and existing intersection that can not be realigned/reconstructed to 60° due to adverse impacts or geometrics is 45° and requires a design waiver be submitted for approval.*”

- Page F-34 – Added the following language at the end of the second paragraph under “Stopping Sight Distance”; *“Crest vertical curves shall meet or exceed AASHTO design criteria for Stopping Sight Distance, not the “k” Values. Sag vertical curves shall meet or exceed the AASHTO design criteria for “k” Values.”*

Deleted the third paragraph under “Stopping Sight Distance”; *“For the minimum lengths of vertical curves for the recommended stopping sight distance for each design speed, and corresponding “K” values, see the AASHTO “Green Book”.*

- Page F-36 – Added the following language at the bottom of the page; *“The reference to 18’ median in Table 2-7 applies to medians up to 18’ in width (18’ or less). For medians up to this width there is not sufficient room to stop so more sight distance is needed. For wider medians, there would be room to stop in the middle of the highway so sight distance can be less.”*
- Page F-41 – Added the second sentence in the second paragraph; *“As a minimum, the roundabout alternative shall be reviewed to determine conceptual project impacts including safety, land impacts and construction. If the roundabout appears to be a feasible alternative, then a traffic analysis and preliminary layout should be created and analyzed in further detail.”*

Deleted the last sentence in the second paragraph; *“The documentation shall include, at a minimum, the criteria outlined in this section.”*

- Page F-48 – Added the following language in “FIGURE 3-1 LEFT AND RIGHT TURN LANE CRITERIA” under “Tapers”; *“Tapers are to be straight-line unless local policy requires reverse curves. In congested areas the taper length may be reduced to increase storage length. “However, a design waiver shall be required”.*”
- Page F-65 – Replaced the following language in detail; *“For Design Speeds \leq 35 MPH”* with *“For Design Speeds \leq 30 MPH”.*
- Page F-74 – Replaced the following language in the second sentence; *“Acceleration lanes should be designed so that a turning vehicle “will reach a speed between 75 and 80 percent of” the highway posted speed at the point where the full -width lane ends and transition taper begins.”* with *“Acceleration lanes should be designed so that a turning vehicle will “obtain” the highway posted speed at the point where the full -width lane ends and transition taper begins.”*

Replaced the following language under “Acceleration Lane”; *“A stop condition should be assumed when determining the length of an acceleration lane for an at-grade access. The length of an acceleration lane is the same for a right-turn acceleration lane or for a left-turn acceleration lane.”* with *“See AASHTO Green Book Exhibit 10-70 Minimum Acceleration Lengths for Entrance Terminals with Flat Grades of 2% or Less.”*

Replaced the following language under “Transition Taper”; “*Acceleration tapers should be straight line tapers with rounded beginning and ending points.*” with “*See Section 3 – Turning Lanes, Figure 3-1 Left and Right Turn Lanes Criteria in this chapter.*”

- Page F-80 – Replaced the second sentence under “Entrance Design Principles” from; “*The number of crashes is disproportionately higher at entrances than at other intersections; thus their design and location merit special considerations.*” to; “*Entrance design and location merit special considerations in order to reduce the number of crashes that occur at entrances.*”
- Page F-82 – Added the following language at the end of the second paragraph under “Commercial Entrances”; “*For Parking Space Guidelines See Appendix “C”.*”
- Page F-87 – Revised the following language in the second sentence under “COMMERCIAL ENTRANCE SIGHT DISTANCE”; “*Minimum intersection sight distance criteria are provided below.*” with “*Intersection sight distance criteria are illustrated below and the sight distance requirements are presented in Table 2-7.*”
- Page F-88 – Added the following language in the first sentence of the first paragraph under “Corner Clearance on a Minor Side Street”; “*It is important to think of the operational impacts of entrance placement on side streets where the side streets intersect with major roadways (the major roadway will have the higher functional classification or if the same classification “(excluding local streets)” will have the higher traffic volume).*”

Revised the third sentence in the last paragraph; “*The greater of the spacing standards and the corner clearance will apply to protect intersection operation.*” To “*The corner clearance distance will apply where it is greater than the Table 2-2 spacing standard to protect intersection operation.*”

- Page F-88 – Added the following sentence after the second sentence of the first paragraph under “ENTRANCE CONNECTIONS ON OPPOSITE SIDES OF A ROADWAY”; “*Entrances on opposite sides of a roadway shall be offset a sufficient distance to assure that entrance left turning movements do not conflict.*”
- Page F-95 – Added the following language in the first sentence under “ENTRANCES AFFECTED BY HIGHWAY CONSTRUCTION PROJECTS”; “*Title 33.1-89 of the Code of Virginia, as amended, requires that projects have the alignment, profile, and grade of “commercial and” private entrances shown on plans.*”

Added previous Note #4 “*A note is to be included on the general notes sheet as follows: “When no baseline alignment is shown for a proposed entrance, the entrance is to be constructed in the same location as the existing entrance.”*” to the end of Note #1, renumbering previous Note #5 to #4.

- Page F-96 – Replaced the following language in item No. 4; “*District Traffic Engineer*” with “*Regional Traffic Engineer*”.