

**IMPERIAL ROAD DESIGN MANUAL**  
**REVISIONS January, 2013**

**CHAPTER 1B**

- Page 1B-6 – Added the following definition; “**AUXILIARY LANE** – See “LANE”
- Page 1B-8 – Added the following definition; “*Engineer* – The Engineer representing the Virginia Department of Transportation.”
- Page 1B-12 – Deleted the following definitions; “**LINEAGE (PPMS-ID)** – Any other applicable PPMS-ID numbers.” and “**PPMS-ID LINEAGE** – Any other applicable PPMS-ID numbers.”
- Page 1B-13 – Added the following definition; “**RAMP LENGTH** – A Ramp connecting to an at-grade intersection, this would be measured from painted nose of gore to intersection curb line. In case of ramp connecting to another ramp or a freeway, this would be measured from painted nose of gore to painted nose of gore.”

**CHAPTER 1E**

- Page 1E-1 – Revised the second sentence in the second paragraph under “INTRODUCTION” from; “The appropriate Section Manager and Program Manager will complete the checklist...”  
To; The appropriate “Design” Section Manager will complete the checklist...
- Page 1E-2 – Revised the last sentence in the third paragraph under “CHECKLIST” from; “As the Project Manager approaches a particular targeted review, he/she should check off the items on the checklist as they are completed.”  
To; As the Project Manager approaches a particular targeted review he/she should “ensure the checklist has been completed by the reviewer.”

**CHAPTER 2B**

- Page 2B-11 – Deleted the following language at the end of the first sentence under PREPARATION OF PROJECT COST ESTIMATE AND REPORT; “(Form LD-297)”. This form no longer exists.

## CHAPTER 2C

- Page 2C-3 – Revised language in the first sentence under SETTING UP AN ELECTRONIC ROUTE FILE from; “All project plan files shall be tiff and placed in the archives at each major milestone.” To; “*All project plan files shall be archived at each major milestone.*”
- Page 2C-5 – Revised language under “INDENTIFICATION” from; “*The first items to be shown on plan sheets are the applicable project numbers in blocks in the upper and lower right corners of the plan and profile sheets. The names and phone numbers, including area code, and District, if applicable, of the following persons are to be shown in the upper left corner: Project Manager: (VDOT), Surveyed By: (L&D Survey Office Manager or Consultant Survey Project Manager), Design Supervised By: (Responsible Person) and Designed By:(Designer)*”  
To;  
The first items to be shown on plan sheets are the applicable project numbers in blocks in the upper and lower right corners of the plan and profile sheets. The names and phone numbers, including area code, and District, if applicable, of the following persons are to be shown in the upper left corner: Project Manager: (VDOT), Surveyed By and “*Date completed*”: (L&D Survey Office Manager or “*Firm and*” Consultant Survey Project Manager), Design By: (Responsible Person) and “*Subsurface Utility Provided By and Date (completed)*:”
- Page 2C-9 – Revised language under “INDENTIFICATION OF ITEMS ON PROFILE SHEETS” from; *The first items to be shown on the profile sheets are the applicable project numbers in the preprinted blocks. The names and phone numbers, including area code, and District, if applicable, of the following persons are to be shown in the upper left corner: Project Manager: (VDOT), Surveyed By: (L&D Survey Office Manager or Consultant Survey Project Manager), Design Supervised By: (Responsible Person) and Designed By:(Designer).*  
To;  
The first items to be shown on the profile sheets are the applicable project numbers in the preprinted blocks. The names and phone numbers, including area code, and District, if applicable, of the following persons are to be shown in the upper left corner: Project Manager: (VDOT), Surveyed By and “*Date completed*:” (L&D Survey Office Manager or “*Firm and*” Consultant Survey Project Manager), Design By: (Responsible Person) and “*Subsurface Utility Provided By and Date (completed)*:”

## CHAPTER 2D

- Page 2D-2 – Revised the following language in the first sentence under PURPOSE OF BROCHURE from; “Public Involvement Policy Manual” To; “Policy Manual for Public Participation in Transportation Project.”
- Page 2D-4 – Revised the following language under RESPONSIBILITIES OF THE PROJECT MANAGER AND THE DISTRICT PUBLIC AFFAIRS SECTION from; “Please refer to the Public Involvement Policy Manual” To; “Please refer to the “Policy Manual for Public Participation in Transportation Project.”
- Page 2D-5 – Revised the following language under SECTION 2D-4 PRE-PUBLIC HEARING MEETING from; “Refer to Section 3.0 of the Public Involvement Policy Manual” To; “Refer to Section 3.0 of the “Policy Manual for Public Participation in Transportation Project.”
- Page 2D-6 – Revised the following language under SECTION 2D-5 NOTICE OF WILLINGNESS TO HOLD A PUBLIC HEARING from; “Refer to Section 3.0 of the Public Involvement Policy Manual” To; “Refer to Section 3.0 of the “Policy Manual for Public Participation in Transportation Project.”
- Page 2D-7 – Revised the following language under ESTABLISHING TIME AND LOCATION from; “Refer to Appendix C of the Public Involvement Policy Manual” To; “Refer to Appendix C of the “Policy Manual for Public Participation in Transportation Project.”
- Page 2D-9 – Revised the following language at the beginning of the first paragraph from; “*The Project Manager: (VDOT), Surveyed By: (L&D Survey Office Manager or Consultant Survey Project Manager), Design Supervised By: (Responsible Person) and Designed By: (Designer) names...*” To; Project Manager: (VDOT), Surveyed By and “*Date completed:*” (L&D Survey Office Manager or “*Firm and*” Consultant Survey Project Manager), Design By: (Responsible Person) and “*Subsurface Utility Provided By and Date (completed)*” names...
- Page 2D-12 – Added “FIGURE 2D-1.1 SAMPLE RIGHT OF WAY PLAN SHEET.
- Page 2D-19 – Revised the following language in the last sentence of the first paragraph from; “*The Project Manager: (VDOT), Surveyed By: (L&D Survey Office Manager or Consultant Survey Project Manager), Design Supervised By: (Responsible Person) and Designed By: (Designer) names...*” To; Project Manager: (VDOT), Surveyed By and “*Date completed:*” (L&D Survey Office Manager or “*Firm and*” Consultant Survey Project Manager), Design By: (Responsible Person) and “*Subsurface Utility Provided By and Date (completed)*” names...

- Page 2D-24 – Replaced the following language “APPLICATION OF STIPPLING” from;  
 “*Stippling is to be applied, as deemed necessary by the designer, to depict proposed pavement areas by applying dots to the pavement area in accordance with the CADD Manual. Stippling is not necessary for showing proposed pavement on a new location; however, to depict widening of an existing roadway, stippling should be used.*”  
To; Stippling is to be applied “*in accordance with the CADD Manual, Appendix D.3 “Stippling and Cross-Hatching.”*”
- Page 2D-30 – Revised the following language in the second sentence in the first paragraph from;  
 “See Approval Process Flow Chart in the Public Involvement Policy Manual”  
To; “See Approval Process Flow Chart in the “*Policy Manual For Public Participation In Transportation Project.*”
- Page 2D-31 – Revised the following language under REVIEW OF PUBLIC HEARING TRANSCRIPT AND POST- HEARING CORRESPONDENCE from;  
 “See Approval Process Flow Chart in the Public Involvement Policy Manual” To; See Approval Process Flow Charts in the *Policy Manual For Public Participation In Transportation Project* “for guidance on both Tier 1 and Tier 2 projects.”

## CHAPTER 2E

- Page 2E-25 – Revised the following language from; CONSTRUCTION OF CONCRETE BARRIER & RETAINING WALLS ON SUPERS POLICY To;  
 “*POLICY FOR CONSTRUCTION OF CONCRETE BARRIER & RETAINING WALLS ON SUPERELEVATIONS*”.
- Page 2E-37 – Deleted the following language under “DETERMINING SLOPE EASEMENTS”;  
 A note is to be shown on each applicable plan sheet in a conspicuous location as follows:  

"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 – Deleted the following language to the “Note” under “DETERMINING PERMANENT EASEMENTS”; Dot-dashed lines denote permanent easements.

Revised the following language in the fourth paragraph under “DETERMINING PERMANENT EASEMENTS” from; *“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.”*

To; *“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.”*

Revised language in the last sentence in the fifth paragraph under DETERMINING PERMANENT EASEMENTS from; *“Where this is necessary, the temporary construction easement is to be shown, in its entirety, as the previously mentioned temporary slope easements and labeled “Prop. Temporary Construction Easement.”* To; *Where this is necessary, the temporary construction easement shall be shown, in its entirety, as the previously mentioned temporary slope easements and labeled “Prop. Temporary Slope Easement”.*

- Page 2E-43 – Revised language in the first sentence in the second paragraph from; *“Detailed utility easements requirements are determined by the District Utility Engineer...”*

To; *Detailed utility easements requirements are determined by the “Regional Utility Coordinator...”*

Revised language in the second sentence in the second paragraph from; *“The District Utility Engineer will furnish...”* To; *The “Regional Utility Coordinator” will furnish...*

Deleted the following language in the first sentence in the third paragraph; *Electronic reference file furnished, showing the necessary easements, shall contain the appropriate note indicating type (standard or trim and overhang)...*

Revised language in the fourth sentence in the last paragraph from; *“Normally these lines should be combined into a joint easement at the wider width; however, the District Utility Engineer should be consulted before making that change.”*

To; *Normally these lines should be combined into a joint easement at the wider width; however, the “Regional Utility Coordinator” should be consulted before making that change.*

- Page 2E-52 – Revised the language in the “Project Length Tabulation Block” to replace the “Bridge Project No.” with “*Bridge Plan No.*”.
- Page 2E-53 – Revised the language in the “Project Length Tabulation Block” to replace the “Bridge Project No.” with “*Bridge Plan No.*”.
- Page 2E-54 – Revised the language in the “Project Length Tabulation Block” to replace the “Bridge Project No.” with “*Bridge Plan No.*”.
- Page 2E-55 – Revised the language in the “Project Length Tabulation Block” to replace the “Bridge Project No.” with “*Bridge Plan No.*”.
- Page 2E-56 – Revised the language in the “Project Length Tabulation Block” to replace the “Bridge Project No.” with “*Bridge Plan No.*”.
- Page 2E-57 – Revised the language in the “Project Length Tabulation Block” to replace the “Bridge Project No.” with “*Bridge Plan No.*”.
- Page 2E-59 Revised the following language in the last paragraph from; “*The names and phone numbers, including area code, and District, if applicable, of the following persons are to be shown in the upper left corner: Project Manager: (VDOT), Surveyed By: (L&D Survey Office Manager or Consultant Survey Project Manager), Design Supervised By: (Responsible Person) and Designed By: (Designer)*”.  
To;  
The names, phone numbers, including area code, and District, if applicable, of the following persons are to be shown in the upper left corner: Project Manager: (VDOT), Surveyed By and “*Date completed:*” (L&D Survey Office Manager or “*Firm and*” Consultant Survey Project Manager), Design By: (Responsible Person) and “*Subsurface Utility Provided By and Date (completed):*”
- Page 2E-60 – Revised the language in the third paragraph to add the following;  
The appropriate TC-5 designation (*TC-5.11U, TC-5.11ULS, TC-5.11R, TC-5.04 ULS, TC-5.01U, or TC-5.01R*) must be shown on the title sheet.
- Page 2E-62 – Added the following language after the first paragraph; “*Bridge Plan Number – This number can be found on the lower right hand corner of the bridge title sheet, example 345-10*”.
- Page 2E-67 – Added the following to the “INDEX OF SHEETS”; “*Sheet No. 3RW, 4RW, etc., are assigned to Right of Way Plans (See FIGURE 2E-15 SAMPLE INDEX SHEET).*”

- Page 2E-68 – Added the following language after the second paragraph;  
*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 &amp; 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-70 – Revised FIGURE 2E-15 SAMPLE INDEX SHEET to include “Phased Erosion and Sediment Control Plans” and “Right of Way Sheets”.
- Page 2E-71 – Revised language in the second paragraph under RIGHT OF WAY DATA SHEET from: *“The "RW" project number is to be shown in the appropriate blocks (construction project numbers are not applicable to this sheet), and the names and phone numbers, including area code, and District, if applicable, of the following persons are to be shown in the upper left corner: Project Manager: (VDOT), Surveyed By: (L&D Survey Office Manager or Consultant Survey Project Manager), Design Supervised By: (Responsible Person) and Designed By:(Designer) No other information is necessary on the sheet at this time.”* To: *The "RW" project number is to be shown in the appropriate blocks (construction project numbers are not applicable to this sheet), and the names and phone numbers, including area code, and District, if applicable, of the following persons are to be shown in the upper left corner: Project Manager: (VDOT), Surveyed By and “Date completed:” (L&D Survey Office Manager or “Firm and” Consultant Survey Project Manager), Design By: (Responsible Person) and “Subsurface Utility Provided By and Date (completed):”*

## **CHAPTER 2F**

- Page 2F-1 – Added the following language after PRELIMINARY RIGHT OF WAY DATA SHEET;

### ***FINAL RIGHT OF WAY DATA SHEET***

*The Final Right of Way Data Sheet will be included with all projects requiring right of way for construction. The Survey Section in Location and Design Division will check all data indicating the total area, fee taking, fee remainder, and the area of permanent and temporary easements.*

## CHAPTER 2G

- Page G-26 – Added the following language after the second paragraph;  
**AS BUILT PLANS**

*Forward all “As-Built” plan information not captured through the formal plan revision process developed during construction to the District Location and Design Engineer. It is assumed that significant right of way design changes made during construction would be captured through the formal revision process.*

## APPENDIX “A”

- Page A-3 – Deleted the following language at the bottom of the page; *Table A-1-1 indicates the various speed ranges applicable to each functional classification.*
- Page A-29 – Revised “TYPICAL RURAL SECTION” detail to clarify clear zone area and the additional width needed when guardrail is required.
- Page A-33 – Added the following language at the bottom of the page; *“In some limited situations in which the embankment slopes significantly downward, a vehicle could encroach farther from the through traveled way and 30 feet clear zone might not be adequate. In these cases, guardrail should be considered.”*
- Page A-37 – Revised the following language in the fifth sentence in the first paragraph under GUARDRAIL INSTALLATION IN URBAN SETTING from; *“This decreases the possibility of an errant vehicle striking the curb before impacting the guardrail or snagging the guardrail posts.”* To; *This decreases the possibility of an errant vehicle striking the curb “and vaulting the guardrail”.*

Revised the following language in the second paragraph under GUARDRAIL INSTALLATION IN URBAN SETTING from; *“If the guardrail cannot be aligned with the face of the CG-3 or CG-7 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 8’ behind the face of curb. For high-speed roadways (50 mph or greater) the guardrail shall be offset a minimum of 13’ behind the face of curb. When using CG-2 or CG-6 (6” barrier curb) guardrail shall be offset a minimum of 8’ behind the face to curb for low-speed roadways.”*

To; *If the guardrail cannot be aligned with the face of the CG-3 or CG-7 curb, then the maximum practical offset behind the guardrail should be provided. For low-speed roadways “with design speeds less than 45 mph” the guardrail shall be offset a minimum of 8’ behind the face of curb. For high-speed roadways “with design speeds 45 to 50 mph,” the guardrail shall be offset a minimum of 13’ behind the face of curb. “For high-speed roadways with design speeds over 50 mph, guardrail is to be allowed with the face of curb and stiffened as noted previously.” When using CG-2 or CG-6 (6” barrier curb) guardrail shall be offset a minimum of 8’ behind the face to curb for low-speed roadways.*



- Page A-75 – Revised the following language in the last sentence in the last paragraph from;  
*“One set of pertinent plans, profiles and typical sections on appropriate projects are to be provided to the Location and Design Bicycle Facilities Coordinator...”*  
To; One set of pertinent plans, profiles and typical sections on appropriate projects are to be provided to the Location and Design Bicycle”/Pedestrian” Facilities Coordinator...

- Page A- 93 – Revised the following language in the first sentence under SHARED USE PATHS from;  
*“Shared use paths are facilities on exclusive right-of-way and with minimal cross flow by motor vehicles.”*  
To; Shared use paths are facilities  
*“physically separated from motorized vehicular traffic by an open space (buffer) or barrier and either within the highway right of way or within an independent right of way.”*

Added the following language after the first paragraph under SHARED USE PATHS; *“Care should be taken not to use shared use path and trail interchangeably because they have distinctly different design guidelines.”*

- Page A-94 – Added the following language to the first bullet; Width and “Horizontal” Clearance.

Revised language in the second sentence in the first paragraph from;  
*“Under most conditions, the recommended paved width for a two-directional shared use path is 10 feet.”*  
To; The “*minimum*” paved width for a two-directional shared use path is 10 feet.

Revised language in the third sentence in the first paragraph from;  
*“See Figure A-5-5. However in rare instances, a reduced width of 8 feet can be adequate.”*  
To; However in rare instances, a reduced width of 8 feet “*may be used*”.

Revised language in the forth sentence in the first paragraph from;  
“*This reduced width should be used only where the following conditions prevail.*”  
To; This reduced width “*may*” be used only where the following conditions prevail;

- Page A-95 – Revised the following language in FIGURE a-5-5 CROSS SECTION OF TWO-WAY SHARED USE PATH ON SEPARATED RIGHT OF WAY from;  
*“Width of Shared Use Path 10’ Recommended”*  
To; Width of Shared Use Path 10’ “*Minimum*”

- Page A-97 – Added the following language to the beginning of the page;  
*The physical barrier, railing HR-1 Type III or chain link fence shall begin prior to, and extend beyond the area of need. The lateral offset of the physical barrier shall be 3 feet from the edge of the shared use path. The ends of the physical barrier shall be flared away from the edge of the shared use path.*

*When railing or fence is used to discourage shared use path users from venturing off the path or onto adjacent property the design can include two or four horizontal members with vertical members spaced frequently enough to provide the needed structural support and in accordance with applicable building codes. Berms and/or vegetation can also be used to serve this function. The location of the railing or fence in relationship to the shared use path shall be the same as the location of physical barrier mentioned above.*

- *Vertical Clearance*

Revised the following language in the first sentence under “Vertical Clearance” from; The vertical clearance to obstructions should be a minimum of 8 feet.

To; The vertical clearance to obstructions “shall” be a minimum of 8 feet.

Revised the following language under “Design Speed” from; “Shared use paths should be designed for a selected speed that is at least as high as the preferred speed of the faster bicyclists. In general, a minimum design speed 20 mph should be used. When a downgrade exceeds 4 percent, or where strong prevailing tailwinds exist, a design speed of 30 mph or more is advisable.”

To; Shared use paths should be designed for a selected speed that is at least as high as the preferred speed of the faster bicyclists. In general, a minimum design speed “18” mph should be used. When a downgrade “of 6% or greater exist,” or where strong prevailing tailwinds exist, a “maximum” design speed of 30 mph “shall be used.”

Revised the following language under “Horizontal Alignment” from; “Most shared use paths built in the United States must also meet the requirements of the Americans with Disabilities Act, ADA guidelines require that cross slopes not exceed 2% to 3% to avoid the severe difficulties that greater cross slopes can create for people using wheelchairs. Thus, for most shared use paths, the maximum superelevation rate will be 3%. When transitioning a 3% superelevation, a minimum 25 foot transition...”

To; Most shared use paths built in the United States must also meet the requirements of the Americans with Disabilities Act, ADA guidelines require that cross slopes not exceed 2% to avoid the severe difficulties that greater cross slopes can create for people using wheelchairs. Thus, for shared use paths, the maximum superelevation rate will be “2%.” When transitioning a “2%” superelevation, a minimum 25 foot transition...

Revised the following language in the last under “Horizontal Alignment” from; “Extrapolating from values used in highway design, design friction factors for paved shared use paths can be assumed to vary from 0.31 at 12 mph to 0.21 at 30 mph.”

To; Extrapolating from values used in highway design, design friction factors for paved shared use paths can be assumed to vary from “0.34 at 6 mph” to 0.21 at 30 mph.

- Page A-98 – Revised TABLE A-5-7 MINIMUM RADII FOR PAVED SHARED USE PATHS BASED ON 20% LEAN ANGLE to agree with AASHTO – Guide For The Development Of Bicycle Facilities.

Deleted the following language under “Grade”; *On some shared use paths, where terrain dictates, designers may need to exceed the 5% grade recommended for bicycles for some short sections. For a general guide maximum grade lengths where the grade must exceed 5% see Table A-5-8.*

5 to 6%	<b>For up to 800 feet</b>
7%	<i>For up to 400 feet</i>
8%	<i>For up to 300 feet</i>
9%	<i>For up to 200 feet</i>
10%	<i>For up to 100 feet</i>
11+%	<i>For up to 50 feet</i>

Source: AASHTO – Guide For The Development Of Bicycle Facilities.

Table A-5-8

*Maximum Grade Lengths*

Replaced the following language; *“The maximum grade of a shared use path adjacent to a roadway should be 5 percent, but the grade should generally match the grade of the adjacent roadway. Where a shared use path runs along a roadway with a grade exceeds 5 percent, the sidepath grade may exceed 5 percent but must be less than or equal to the roadway grade.”*

- Page A-99 – Revised the following language in the first sentence under “Sight Distance” to change the coefficient of friction from; 0.25 to; 0.16.

Revised language from; “TABLE A-5-9 MINIMUM STOPPING SIGHT DISTANCE (FT.) DESCENDING GRADE” To; “TABLE A-5-8 MINIMUM STOPPING SIGHT DISTANCE (FT.) DESCENDING GRADE”

Revised “TABLE A-5-8 MINIMUM STOPPING SIGHT DISTANCE (FT.) DESCENDING GRADE to match AASHTO – Guide for the Development of Bicycle Facilities.

Revised language from; “TABLE A-5-10 MINIMUM STOPPING SIGHT DISTANCE (FT.) ASCENDING GRADE” To; “TABLE A-5-9 MINIMUM STOPPING SIGHT DISTANCE (FT.) ASCENDING GRADE”

Revised “TABLE A-5-9 MINIMUM STOPPING SIGHT DISTANCE (FT.) ASCENDING GRADE” to match AASHTO – Guide for the Development of Bicycle Facilities.

- Page A-100 – Revised language from; “TABLE A-5-11 – MINIMUM LENGTH OF CREST VERTICAL CURVE (L) BASED ON STOPPING SIGHT DISTANCE”  
To; “TABLE A-5-10 – MINIMUM LENGTH OF CREST VERTICAL CURVE (L) BASED ON STOPPING SIGHT DISTANCE”

- Page A-101 – Revised the following language at the beginning of the page from; “Figure A-5-8 and Table A-5-12 indicate the minimum clearance that should be used to line of sight obstructions for horizontal curves.” To; Figure A-5-8 and Table A-5-11 indicate the minimum clearance that should be used to line of sight obstructions for horizontal curves.

Revised language from; “TABLE A-5-12 MINIMUM LATERAL CLEARANCE FOR HORIZONTAL CURVES” To; “TABLE A-5-11 MINIMUM LATERAL CLEARANCE FOR HORIZONTAL CURVES”

- Page A-103 – Added the following language under “Pavement Structure”; Hard, all weather pavement surfaces “(such as asphalt or concrete)” are preferred over...
- Page A-104 – Replaced FIGURE A-5-9 SHARED USE PATH TRANSITION FROM ROADWAY ONTO BRIDGE detail to help clarify the intent.
- Page A-106 – Added “**Trails**” subtitle label under TRAILS AND TRAILHEADS.

Revised the language in the first paragraph under TRAILS AND TRAILHEADS to add the following; Trails are defined in “October 19, 2009” Draft Final Accessibility Guidelines for Outdoor Developed Areas...

Replaced the language in the second paragraph under TRAILS AND TRAILHEADS from; “*The NPRM discussed shared-use paths that are developed for use by pedestrians and other groups such as bicyclists. Shared use paths are also called “hiker-biker trails.” The NPRM indicated that the scoping and technical provisions for trails apply to shared-use paths. The Access Board has further considered this issue and plans to conduct a separate rulemaking in the future to address shared use paths because they are also used for transportation purposes and may be subject to higher design standards.*” To; *This term “Trail” means an unimproved or sometimes improved recreational facility intended for recreational use such as hiking, mountain biking or equestrians. Care should be taken not to use Share-use path and Trail interchangeably because they have distinctly different design guidelines. However, when any portion of a Trail can be constructed using Share-use path design criteria it should be and an over-look or passing area 5 feet by 5 feet shall be constructed to allow users to experience the Trail without blocking the Trail for other users.*

*For guidance on the design of Outdoor Recreation Access Routes, see Section 1017 of the **Draft Final Accessibility Guidelines for Outdoor Developed Areas**, dated October 19, 2009, which can be accessed at <http://www.access-board.gov/outdoor/draft-final.htm> and the **DCR Greenways and Trails Toolbox**, which can be accessed at [http://www.dcr.virginia.gov/recreational\\_planning/greentrailtools.shtml](http://www.dcr.virginia.gov/recreational_planning/greentrailtools.shtml)*

- Page A-110 – Revised language from; “TABLE A-5-13 SEPARATION BETWEEN ACTIVE RAIL LINES AND PATHS(RWT)” To; “TABLE A-5-12 SEPARATION BETWEEN ACTIVE RAIL LINES AND PATHS(RWT)”
- Page A-119 – Revised language in the first sentence in the first paragraph under “SIDEWALK Width” from; “New sidewalks should be a minimum of 60” (1525 mm) wide.”  
To; New sidewalks “shall” be a minimum of 60” (1525 mm) wide.

Added the following language in the second paragraph under “SIDEWALK - Width”;  
*“When sidewalk is constructed adjacent to a retaining wall in a “cut” section situation the minimum width shall be 5.5 feet measured from the face of the retaining wall. However, the recommended minimum width is 6 feet. The 6 foot width allows for a 1 foot shy line, rather than a 6 inch shy line from the retaining wall.”*

- Page A-123 – Replaced FIGURE A-5-12 SIDEWALK TRANSITION FROM ROADWAY ONTO BRIDGE detail to help clarify the intent.

## APPENDIX “B”

- Page B-12 – Revised “FIGURE 2 – SIGHT DISTANCE TRIANGLES” to add “Decision Points A, B and C” and also added language at the end of the following note; Distance to middle of nearest through travel lane varies by roadway width. “(4 feet min. from the centerline or left edge of pavement).”
- Page B-40 – Revise the following language in the second paragraph under ROUNDABOUTS from; “Roundabout designs shall be based on Federal Highway Administration Publication Number FHWA-RD-00-067, Roundabouts: An Informational Guide at <http://www.tfsrc.gov/safety/00068.htm> and <http://www.tfsrc.gov/safety/00068.pdf>. Additional information can also be found in VDOT’s Roundabout Brochure at <http://www.virginiadot.org/infoservice/faq-roundabouts.asp>. See Figure 13 Roundabout Details. When roundabout design is proposed, the Residency Administrator should consult the District Location and Design Engineer.”  
To;  
*Roundabout designs shall be based on NCHRP Report 672, Roundabouts: An Informational Guide, Second Edition. See the following link:  
[http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp\\_rpt\\_672.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_672.pdf).  
Additional information can also be found in VDOT’s Roundabout Brochure at <http://www.virginiadot.org/info/resources/Roundabouts.pdf> and on VDOT’s roundabout web site at Roundabouts in Virginia.  
See Figure 13 – Roundabout Details. When a roundabout design is proposed, the District Administrator’s Designee should consult the District Location and Design Engineer.*

*For Truck Apron Curb use cell Mod. CG3 found in the cell library.*

## APPENDIX “B(1)”

- Page B(1)-21 – Added language to Element “C” heading to read “*PARALLEL*” PARKING LANE WIDTHS.

Added the following language; “*D. PERPENDICULAR AND ANGLE PARKING Perpendicular and angle parking along streets is normally prohibited. See Appendix C PARKING SPACES.*”

Revised language to old Element “D” heading to read “*E.*” INTERSECTIONS.

- Page B(1)-50 – Revise the following language in the last paragraph under ROUNDABOUTS from; “*Roundabout designs shall be based on Federal Highway Administration Publication Number FHWA-RD-00-067, Roundabouts: An Informational Guide at <http://www.tfhr.gov/safety/00068.htm> and <http://www.tfhr.gov/safety/00068.pdf>. Additional information can also be found in VDOT’s Roundabout Brochure at <http://www.virginiadot.org/infoservice/faq-roundabouts.asp>. See Figure 13 Roundabout Details. When roundabout design is proposed, the Residency Administrator should consult the District Location and Design Engineer.*”  
To;  
*Roundabout designs shall be based on NCHRP Report 672, Roundabouts: An Informational Guide, Second Edition. See the following link: [http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp\\_rpt\\_672.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_672.pdf). Additional information can also be found in VDOT’s Roundabout Brochure at <http://www.virginiadot.org/info/resources/Roundabouts.pdf> and on VDOT’s roundabout web site at Roundabouts in Virginia. See Figure 13 – Roundabout Details. When a roundabout design is proposed, the District Administrator’s Designee should consult the District Location and Design Engineer.*
- Page B(1)-51 Added the following language after the first paragraph; “*For Truck Apron Curb use cell Mod. CG3 found in the cell library.*”

## APPENDIX “C”

- Page C-2 – Revised the following language to the first sentence in the first paragraph under Perpendicular or Angled Parking Spaces from; *Perpendicular or angled parking spaces that require backing maneuvers within state highway right-of-way shall not be permitted.*  
To; “*Perpendicular or angled parking spaces along street are normally prohibited.*”
- Page C-3 – Replaced FIGURE C-1-2 DESIGNS FOR PARALLEL PARKING SPACES EXCEPTION to revise sidewalk width from 8 feet to 12 feet.
- Page C-4 – Replaced FIGURE C-1-3 ACCESSIBLE PARKING AND LOADING ZONES to revise sidewalk width from 5 feet to 12 feet to increase accessible route.

- Page C-12 – Revised the following language under ST'D RM-1 from; *“The St’d. Right of Way Monument, St’d. RM-I, is concrete and will be used at locations as recommended by the District Administrator at the Field Inspection.”*

To; The St’d. Right of Way Monument, St’d. RM-I, is concrete and will be used at locations as recommended by the “District Survey Manager or responsible charge” at the Field Inspection.

Revised the following language in the second sentence under ST'D RM-2 from; *“The St’d. RM-2 monument is not a replacement for the concrete monument (St’d. RM-I), but will be used at locations as recommended by the District Administrator at the Field Inspection.”*

To;

- Page C-13 – Revised the following language at the beginning of the page from; *(e) At 2500’ (750 meter) intervals between right of way breaks*

To; *(e) “At 500’ (Urban), 1000’ (Rural) and 2500’ (Interstates) maximum” intervals between right of way breaks*

Replaced the following language under CRITERIA FOR PLACEMENT OF RIGHT OF WAY MONUMENTS From; *“Where the right of way is variable around curves, use chords in lieu of arcs, limiting the number of chords to those actually needed to accurately delineate the right of way, but without obtaining excessive right of way. The foregoing is the general rule, but if it is necessary to use a curved non-concentric right of way line, then this line shall be described by arc length, radius and central angle. Where right of way around a curve is a constant distance from the baseline on which it is based, it is to be shown as a concentric curve.”*

To;

*If the Right of Way is variable in curves, the right of way should be developed with the following criteria:*

1. *Be concentric to the curve.*
2. *A combination of curves and chords that provide the best fit without obtaining excessive right of way.*
3. *Non-concentric curves should never be used.*

Revised the following language in the first sentence in the last paragraph from; *“The monuments along right of way lines, to meet inter-visibility requirements, shall be estimated by studying the grades or left up to the party setting the monuments to be placed at least every 2500’ (750 meters).”*

To;

The monuments along right of way lines, to meet inter-visibility requirements, shall be estimated by studying the grades or left up to the party setting the monuments to be placed at least every “500’ (Urban), 1000’ (Rural) and 2500’ (Interstates).”

- Page C-69 – Replaced the following language in the first paragraph under SPIRAL CURVES from; *“In order to approximate the path a vehicle makes when entering or leaving a circular horizontal curve, a spiral transition curve will be provided for horizontal curves with a radius less than or equal to 2865 feet, except for interchange ramps and loops.”*  
To; *“The use of spiral transitions for compound and reverse curves should be avoided. However, the engineer does have latitude in the use of spiral transitions if the geometrics are warranted.”*

## APPENDIX “F”

- Page F-2 – Added the following definition; *“Engineer: The Engineer representing the Virginia Department of Transportation.”*
- Page F-14 – Revised the following language in the first second in the fourth paragraph from; *“Sufficient offset dimensions, pavement widths, pluses, and radii shall be shown in the plans by the designer to insure...”* To; Sufficient offset dimensions, pavement widths, pluses, and radii shall be shown in the plans by the “Engineer” to insure...
- Page F-31 – Revised the following language in the first sentence in the fourth paragraph from; *“For shoulder applications, Figures 2-11 and 2-12 provides the designer with the basic...”* To; For shoulder applications, Figures 2-11 and 2-12 provides the “Engineer” with the basic...
- Page F-34 – Revised the following language to the reference source to “TABLE 2-5 STOPPING SIGHT DISTANCE” from; *“2004 AASHTO Green Book, Pages 112,113,272 and 272).* To; *“2011” AASHTO Green Book Page 3-4”*.  
  
Revised the following language to the reference source to “TABLE 2-6 STOPPING SIGHT DISTANCE ON GRADES” from; *“2004 AASHTO Green Book, Pages 115.* To; *“2011” AASHTO Green Book Page 3-5”*.
- Page F-36 – Revised the following language in the first sentence in the fifth paragraph from; *“The designer must check each intersection to insure that adequate sight distance...”* To; The “Engineer” must check each intersection to insure that adequate sight distance...
- Page F-39 – Revised the following language in the first sentence in the first paragraph from; *“The designer is to study the requirements of each particular situation.”* To; The “Engineer” is to study the requirements of each particular situation.
- Page F-41 Added the following language after the first paragraph under “Design/Resources”; *“For Truck Apron Curb use cell Mod. CG3 found in the cell library.”*



- Page F-42 – Added the following language to the beginning of the page; *“See Figure 13 – Roundabout Details. When a roundabout design is proposed, the District Administrator’s Designee should consult the District Location and Design Engineer.”*

Deleted the following language in the last sentence in the last paragraph from; *“The approval and appeals will be the same as used above for these roadway systems with one exception: urban systems will require approval of the Local Assistance Division Administrator as well as the State Location and Design Engineer.”*

To; *“The approval and appeals will be the same as used above.”*

- Page F-48 – Revised the following language in the first sentence in the first paragraph under “Turn Lane Criteria for Single and Dual Lanes” from; *“As a general policy, left-turn lanes are to be provided for traffic in both directions in the design of all median crossovers on non-access controlled... To; As a general policy, left-turn lanes are to be provided for traffic in both directions in the design of median crossovers “and in one directional median opening (see Figure 3-25 illustration)” on non-access controlled...*

- Page F-50 – Added the following language under FIGURE 3-3 WARRARNTS FOR LEFT TURN STORAGE LANES ON FOUR-LANE HIGHWAYS; *“Opposing volume and left turning volume in vehicles per hour (VPH) are used for left turn storage lane warrants on four-lane highways.”*

Added the following language at the bottom of the page; *“The No. 211 study was undertaken to provide consistent volume warrants for left-turn storage lanes at unsignalized intersections.”*

Deleted the following language; *“When the Average Running Speed on an existing facility is available, the corresponding Design Speed may be obtained from IIM LD- 117.”*

- Page F-51 – Added the following language at the beginning of the page; *“Advancing volume and opposing volumes (VPH), speed and percent left turns are used to determine whether a left turn storage lane is warranted on two-lane highways.”*

Added the following language in the bottom right of the page; *“When the Average Running Speed on an existing facility is available, the corresponding Design Speed may be obtained from IIM LD- 117.”*

- Page F-52 – Revised the following language to the reference for FIGURE 3-4 PASSING/LEFT TURN LANE ON TWO-LANE HIGHWAY from; *“2003 MUTCD Chapter 6, Page 6C-8, Table 6C-4 (Formulas for Determining Channelizing Taper Lengths). Found at the following: <http://www.virginiadot.org/business/bu-mutcd-disclaim.asp>”*  
To; *“2011 Virginia Work Area Protection Manual, Chapter 6C, Page 6C-7”.*

- Page F-53 – Added the following language after the first paragraph; “*NOTE: There are circumstances where a turn lane may be needed even if the warrants are not met.*”

Revised the following language in the first sentence in the third paragraph from; “*Intersections with poor visibility and/or a bad accident record may require the designer to use engineering judgment...*” To; “*For example*” intersections with poor visibility and/or a bad accident record may require the “*Engineer*” to use engineering judgment...

- Page F-74 – Revised language in the first bullet under Acceleration Lanes from; “*Acceleration Lane: See AASHTO Green Book Exhibit 10-70 Minimum Acceleration Lengths...*” To; Acceleration Lane: See AASHTO Green Book, “*Table 10-3*” Minimum Acceleration Lengths...

- Page F-80 – Revised language in TABLE 4-1 DESIGN VEHICLE AND TURNING RADIUS BY LAND USE to add “*SU-30*” to “*Single Unit Truck*” design vehicle.

Revised language in TABLE 4-1 DESIGN VEHICLE AND TURNING RADIUS BY LAND USE to replace “*WB-50*” with “*WB-62*”.

- Page F-81 – Revised the last sentence in the first paragraph under “*Low Volume Commercial Entrance*” from; “*Low volume commercial entrances shall be placed at locations that provide adequate stopping sight distance as shown in Table 2-6.*”

To; Low volume commercial entrances shall be placed at locations that provide adequate stopping sight distance as shown in “*Table 2-5 and*” Table 2-6.

- Page F-82 – Revised FIGURE 4-1 PRIVATE ENTRANCE AND LOW VOLUME COMMERCIAL ENTRANCE DETAIL to delete the following language; “*Private Entrance serving a maximum of two residences*” and added the following language in one of the notes; Entrance details, “*including widths*” shown on this sheet, may be modified to meet specific site requirements as directed or approved by the Engineer when based on sound engineering principles.” And included a 24 ft. Maximum width surface.

- Page F-97 – Revised the following language in the third sentence in bullet number 2 from; “*The designer will then request the centerline and profile to be run by the survey party...*” To; The “*Engineer*” will then request the centerline and profile to be run by the survey party...