

**IMPERIAL ROAD DESIGN MANUAL**  
**REVISIONS JULY 2007**

**CHAPTER 1E**

- Page 1E-2 – Replaced “Advertisement” with “Final Submission” at the end of the first paragraph.

**CHAPTER 2A**

- Page 2A-3 - Revised the following language to “PROJECT NUMBERS”; Project Managers (PM) or Project Coordinators (PC) will use “Project Pool” and it’s features (“Job Number Tab”) to set up new projects, delete project numbers, or request additional project numbers (PE, R/W, C, B, or D numbers) and revisions of existing project numbers and descriptions.
- Page 2A-3 - Added the following information for “REQUESTING ADDITIONAL PROJECT NUMBERS”; The Project Manager (PM) must consider the different potential phases of a project that might result in separate contracts associated with the project. This could include advance demolition work, phased construction under different contracts, etc. In requesting the assignment of UPC’s for the project, at a minimum, a different UPC must be requested for each anticipated contract. These UPC’s should be associated in the Project Pool, on the Miscellaneous Tab, under the section Linked UPC’s (Ancestor/Lineage). While a contract can include more than one UPC, no individual UPC can be included in more than one contract. Including a UPC in more than one contract creates adverse impacts throughout VDOT, including invalid information in VDOT applications and processes such as the Dashboard and the cash forecast. Should the situation exist where a UPC was used in more than one contract, the PM must coordinate a request for a new UPC for one of the contracts, transfer the expenditures and the appropriate allocations to cover the expenditures associated with that project. This decision needs to be communicated with the appropriate District Team members in Programming Division prior to initiating the new project. The UPC must also be changed in all corresponding Transport Systems.
- Page 2A-3 and 2A-4 - On call (District-wide, Region-wide) construction demo contracts should be set up with an administrative construction UPC (that will not have funding associated with it-similar to the Administrative Maintenance UPCs used for schedules). This will allow the estimate to successfully go over to FMSII where the charges must be redistributed before the voucher is approved to the original UPC where the construction will occur and where the funding resides.
- Page 2A-4 - Revised language from “REQUESTING A REVISION TO A PROJECT DESCRIPTION” to “REQUESTING A REVISION TO THE PROJECT SCOPE”.

- Page 2A-10 and 2A-11 – Added “Design Year” to the beginning sentence of “REQUEST FOR TRAFFIC DATA”. Added the following language to the end of the first paragraph under “REQUEST FOR TRAFFIC DATA”; “Design Year Traffic Data is required on Local Roads and Rural Collectors requiring a detailed traffic analysis, such as roads experiencing a higher than normal growth rate of for other reasons that would require some type of traffic forecast”.

Added the following language to the end of the second paragraph under “REQUEST FOR TRAFFIC DATA”; The design year (11 years or 22years) is dependant upon the functional classification of the roadway and the extent of the roadway improvement.

New construction, major improvements or expansion of the facility includes, but is not limited to the following:

- Construction of additional through lanes
- Addition of free-flow ramps to an existing at-grade intersection
- Conversion of an at-grade intersection to a grade separation
- Construction on new location
- Modification of an existing facility that results in some or all of the facility on new location

Reconstruction in kind or minor improvements includes, but is not limited to the following:

- Addition of turn lanes to an existing facility
- Shoulder modifications
- Restoration/maintenance of a roadway that results in a new facility that duplicates the original roadway on the same location
- Minor widening of an existing lane to achieve a standard lane width

Also see the AASHTO “Green Book”, Chapter 6 and AASHTO’s “A Guide for Achieving Flexibility in highway Design”, Chapter 1.

- Page 2A-15 – Replaced “District Location and Design Engineer” with “Project Manager” under “SCOPING PROCESS”.

Added the following language: “DESIGN WAIVERS” This Design Waiver Policy is for roadway projects only. Design Waivers are required when deviations from VDOT’s design criteria occur. When design criteria meet or exceed AASHTO minimal design but fall short of VDOT’s minimal design, a Design Waiver will be required. Design Waivers will be applicable to all projects regardless of functional classification and funding and shall be documented and approved in accordance with the Design Waiver Request Form LD-448. Please refer to IIM-LD-227 for specific guideline on obtaining design waiver.

## CHAPTER 2B

- Page 2B-1 – Added “Above and” to “Underground utilities are to be designated as instructed in IIM LD-140”.
- Page 2B-8 – Added note stating “Project cost estimates at Field Inspection Stage should be based on quantities and run through Trns.port then uploaded to PCES.”

Replaced IPM with PCES in the first paragraph and deleted “IPM and” in the second paragraph under “COST ESTIMATES”.

- Page 2B-9 – Added “Scoping” to the third paragraph, also replaced the forth paragraph with the following: “For Concurrent Engineering Constructability Review Guidelines See Appendix “E” in the Road Design Manual”.

## CHAPTER 2C

- Page 2C-2 – Replaced the wording “is to” with “shall” and “on the report from the” with “in”, in the second paragraph under “REVIEW OF WORK LOAD”.

Replaced “Location and Design Transportation Engineer Senior” with “District Preliminary Engineer Manager” and “Location and Design Transportation Engineer” with the “District Location and Design Engineer” under “ESTABLISHING PRIORITIES”.

- Page 2C-3 – Included “ELECTRONIC” to “SETTING UP A CORRESPONDENCE FILE” and “SETTING UP A ROUTE FILE”.

Replaced “is to” with “shall” and “a general file which is conveniently segregated” with “in IPM Project Documents Section”.

Deleted “These files are assigned a permanent location for the life of the project.” and replaced with “Copies of the correspondence can also be kept in a general file which is conveniently segregated.” under “SETTING UP A ELECTRONIC CORRESPONDENCE FILE”.

Revised language under SETTING UP A ELECTRONIC ROUTE FILE to the following: “All correspondence shall be kept in IPM Project Documents Section. Copies of the correspondence can also be kept in a general file which is conveniently segregated.”

Deleted “SETTING UP PLAN FILE”.

- Page 2C-4 – Reworded the entire paragraph under “PROJECT ASSIGNMENT” to the following: “Upon receipt of the survey data, the District Location and

Design Engineer and the District Preliminary Engineering Manager will request that the design unit prepare the preliminary design. Assignment will be determined based upon the projected availability of manpower either in the district or the Central Office design unit”.

## **CHAPTER 2D**

- Page 2D-1 – Deleted the following language from “PROJECT REVIEW”:  
“project funding and a reassessment as to the actual need and scope of the project”.
- Page 2D-16 – Replaced example of the Profile Sheet.
- Page 2D-17 – Added the following language: “DESIGN WAIVERS” This Design Waiver Policy is for roadway projects only. Design Waivers are required when deviations from VDOT’s design criteria occur. When design criteria meet or exceed AASHTO minimal design but fall short of VDOT’s minimal design, a Design Waiver will be required. Design Waivers will be applicable to all projects regardless of functional classification and funding and shall be documented and approved in accordance with the Design Waiver Request Form LD-448. Please refer to IIM-LD-227 for specific guideline on obtaining design waiver..
- Page 2D-19 – Added the following note regarding unsuitable material; “Unsuitable Material or Undercut Excavation limits are to be shown on the cross sections when provided by the Materials Division. GEOPAK has the capabilities to show the outline of the limits on the cross sections; however the designer will have to manually place hatching to depict the difference between regular excavation and the unsuitable material See Figure 2D-4A.” (Figure 2D-4A was also added).
- Page 2D-23 – Added “State” to “Assistant Location and Design Engineer” in the second paragraph.
- Page 2D-32 – Deleted the “L&D” reference to the Project Manager in the first and fourth sentence, and replaced “L&D Project Manager” with “Project Designer” in the fifth sentence under ”DESIGN APPROVAL”.

## **CHAPTER 2E**

- Page 2E-23 – Revised language from “Engineering Services Section” to “Standards/Special Design Section” in the second paragraph.
- Page 2E-25 – Revised language from “Engineering Services Section” to “Standards/Special Design Section” in the first sentence. Replaced Form UD-9 with

Form PD-3. Added reference “For details on the design of Sign Islands see AASHTO “Green Book” Chapter 9”.

- Page 2E-56 – Added “Insertable Sheets and Special Design Sheets” to the “2” series of the Index of Sheets.
- Page 2E-59 – Replaced existing SAMPLE INDEX SHEET with new sheet format.
- Page 2E-62 & 63 – Replaced “Sample Project Location Map Sheet” and “Sample Right-of-Way Data Sheet”.
- Page 2E-74 – Replaced “State Scheduling and Contract Engineer” with “State Construction Engineer”.

## **CHAPTER 2F**

- Page 2F-7 – Revised “Certification from District L&D Engineer” to “Form LD-406 Certification for Plan Correctness”.  
Replaced “L&D” with “the project manager” in the first paragraph and replaced both “District personnel and Central Office designer” with “Project Manager” in the fourth paragraph under “REQUEST FOR RIGHT OF WAY AUTHORIZATION FROM FHWA”.
- Page 2F-9 - Deleted reference to form LD-113 under “DISTRIBUTION OF PRINTS OF PLANS”.

## **CHAPTER 2G**

- Page 2G-1- Replaced “PROGRAM/PROJECT MANAGEMENT SYSTEM” with “INTEGRATED PROJECT MANAGEMENT”.
- Page 2G-2 – Replaced “Engineering Services Section” with “Standards/Special Design Section” in both the second and third paragraph.
- Page 2G-5 – Added the following note: “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: (Design Engineer in Responsible Charge) and Designed By:(Designer)”.
- Page 2G-6, 2G-14 & 2G-17 – Replaced “Scheduling and Contract Division Engineer” with “State Construction Engineer”.

- Page 2G-16 - Replaced “submission to the Scheduling and Contract Division” with “Pre-Advertisement Conference” in the first paragraph.
- Page 2G-17 – Replaced “approximately 90 days prior to submission to the Scheduling and Contract Division” with “in accordance with the cutoff dates schedule” in the first paragraph.
- Page 2G-18 – Added the following language: “and the Pre-advertisement Conference has been held” in the first paragraph. Replaced “DATA REQUIRED FOR PRE-ADVERTISEMENT CONFERENCE” with “DATA REQUIRED FOR PLAN COORDINATION REVIEW”. Revised items to be submitted to the Plan Coordination Section.
- Page 2G-19 – Replaced “final submission” with “advertisement submission” in the fourth paragraph.
- Page 2G-20 – Replaced “PRE-ADVERTISEMENT CONFERENCE PLAN CHANGES” with “POST-CERTIFICATION PLAN CHANGES”. Added the following language to this paragraph: “after the Project Manager has certified the plans” and prior to “Advertisement” Submission. Added “and the State Location and Design Engineer” and “Advertisement” Submission.
- Page 2G-22 – Replaced “at the Pre-Advertisement stage of the project development” with “after the draft contract documents have been completed.” And replaced “special provisions” with “contract documents”.
- Page 2G-23 – Replaced “Final Submission” with “Advertisement Submission” in three locations. Deleted the following note: Project Manager approves changes to the plans as a result of the PAC Review.
- Page 2G-24 – Replaced “designer” with “Project Designer” in the first sentence.
- Page 2G-25 - Replaced “Final Submission” with “Advertisement Submission” in the first and third paragraph.

Revised paragraph two to replace the following: “prepare the proper input forms to revise the computerized Engineering Estimate by coordinating” with “coordinate”.

Deleted the following note: “The designer or district/consultant coordinator must check all original plans to verify that the latest changes coordinated with the Scheduling and Contract Division have been made correctly prior to submitting the plan assembly to the Plan Coordination Section.”

- Page 2G-30 thru 2G-33– Revised Section 2G-16 “Post Construction Review” to agree with the Construction Division Memoranda CD-97-17/ IIM-LD-219.

## APPENDIX “A”

- Page A-3 - Added the following language: “DESIGN WAIVERS” This Design Waiver Policy is for roadway project only. Design Waivers are required when deviations from VDOT’s design criteria occur. When design criteria meet or exceed AASHTO minimal design but fall short of VDOT’s minimal design, a Design Waiver will be required. However, when AASHTO design criteria for any of the 14 FHWA Controlling Criteria are not met, than a Design Exception will be required. Design Waivers will be applicable to all projects regardless of functional classification and funding and shall be documented and approved in accordance with the Design Waiver Request Form LD-448. Please refer to IIM-LD-227 for specific guideline on obtaining design waiver.

- Page A-4 - Revised table to include reference to AASHTO “Green Book” to include chapters.

Added the following note; (1) Use Design Year ADT for new construction and reconstruction projects (not applicable to R.R.R. projects or roads with ADT < 400). In accordance with Road Design Manual, Chapter 2A, “REQUEST FOR TRAFFIC DATA” and Form LD-104.

- Page A-5 thru A-8 – Added the following note to describe built-up. “Built-up” is where there is sufficient development along the roadway that justifies a need to channelize traffic into and out of properties utilizing curb and gutter.

Added the following language in the first sentence in FOOTNOTES (1) on page A-5; “with no additional width necessary for guardrail situation.”

Added the following language to FOOTNOTES (1) on pages A-6 thru A-8; “Use Design Year ADT for new construction and reconstruction projects (not applicable to R.R.R. projects or roads with ADT < 400). In accordance with Road Design Manual, Chapter 2A, “REQUEST FOR TRAFFIC DATA” and Form LD-104.

- Page A-9– Added the following note regarding paved shoulders; “The width of all outside (right) paved shoulders shall be at least 10’. However, where economic or practical constraints exist it is permissible to reduce the outside (right) paved shoulder width to 4’. When the mainline is 6 or more lanes (both directions) both the outside (right) and median paved shoulders should be at least 6’. Facilities with traffic volumes > 2000 ADT or volume of trucks > 250 DDHV should have

outside (right) shoulders at least 8'. When the mainline is 6 or more lanes (both directions) both shoulders should be at least 8'. The designer shall provide applicable documentation to support the use of reduced design criteria”.

- Page A-11 – Added the following note regarding paved shoulders; “The width of all outside (right) paved shoulders shall be at least 8'. However, where economic or practical constraints exist it is permissible to reduce the outside (right) paved shoulder width to 4'. When the mainline is 6 or more lanes (both directions) both the outside (right) and median paved shoulders should be at least 6'. Facilities with traffic volumes > 2000 ADT or volume of trucks > 250 DDHV should have outside (right) shoulders at least 8'. When the mainline is 6 or more lanes (both directions) both shoulders should be at least 8'. The designer shall provide applicable documentation to support the use of reduced design criteria”.

Added the following to FOOTNOTE (1) on page A-11 “Design year” and “based upon design speed and traffic volumes. (See AASHTO Green Bk., Exhibit 6-5)”.

- Page A-15 – Added the following information about Clear Zones; “upper limit the clear zone widths for 45-50 mph should be utilized for 50 mph design speeds. Therefore, the greatest practical clear zone values based on design speed, traffic volumes and slope geometry should always be utilized. See Table A-2-1 Clear Zone Distances (In Feet from Edge of Driving Lane) on the following page.”
- Page A-32 – Replaced “Engineering Services” with “Standards/Special Design Section” in the third paragraph.
- Page A-33 – Replaced “Engineering Services Section” with “Standards/Special Design Section” in the first paragraph.
- Page A-36 – Replaced “Engineering Services” with “Standards/Special Design Section” in item No. 4, first paragraph.
- Page A-37 – Replaced “Special Design section” with “Standards/Special Design Section” in the first paragraph, and replaced “PPMS” with “UPC”.
- Page A-39 – Replaced “Engineering Services Section” with “Standards/Special Design Section” in the first and second paragraph.
- Page A-66 – Replaced “The Transportation Planning Division” with “The Transportation and Mobility Planning Division” at two locations in the first paragraph.
- Page A-69 – Revised title from “Transportation Planning Engineer” to State Transportation and Mobility Planning Administrator and under “EXISTING ROADS” and MAJOR DEVELOPMENTS AND SITE PLANS”. Replaced “Resident Engineer” with “Residency Administrator” and replaced “District Traffic Engineer” with “Regional Traffic Engineer”.



- Page A-71 – Added language “without gutter pan” to the description of the “Bike Lane”.
- Page A-80 and A-81 – Added parking area widths to the typicals. Added reference to Figure A-5-2, Sections 1 and 2 under BIKE LANES.
- Page A-82 – Added Figure A-5-2(2) indicating bike lanes use on roadways with graded shoulders.
- Page A-132 – Added “Regional” to “Traffic Engineer” in the second paragraph.

Replaced “prints of updated plans are provided to the Traffic Engineer” with “the electronic files are updated and will be provided to the Regional Traffic Engineer”.

Replaced “The Traffic Engineer prepares necessary plans for traffic control devices and provides plans to the road designer for inclusion in the construction plan assembly” with “The Regional Traffic Engineer will provide recommendations to the roadway designer to prepare the necessary traffic control devices for inclusion in the construction plan assembly”.

- Page A-139 – Replaced “Engineering Services” with “Standards/Special Design Section” in the last paragraph.
- Page A-142 – Replaced “Engineering Services” with “Standards/Special Design Section” in the first paragraph.

## **APPENDIX “B”**

- Page B-6 – Replaced “of” with “or” and added “(See Section B-4(G) CURB AND GUTTER DESIGNS)” under Section B LOCAL ROADWAY.
- Page B-9 – Revised “FOOTNOTES” indicators in the Table 3 – “ONE-LANE (ONE WAY) SUBDIVISION STREETS”.
- Page B-10 – Added Table 4 “GEOMETRIC DESIGN STANDARDS FOR SCHOOL BUS ACCESS ROAD”.
- Page B-19 – Added the word “designs” to “Curb and gutter” in the first paragraph.
- Page B-21 – Replaced “and” with “or” in the first sentence under “Private Entrances”

- Page B-25 – Deleted the following from Note (3); “and in accordance with VDOT’s Road and Bridge Standards, located at <http://www.virginiadot.org/business/locdes/road-and-bridge-standards.asp>.”

## **APPENDIX “C”**

- Page C-1 – Added note to describe how crossover spacing is measured.
- Page C-22 – Added reference to Chapter 9 in AASHTO’s “Green Book” for additional information on “Signalized and Unsignalized Intersections”.
- Page C-25 – Revised detail to depict crossover spacing.
- Page C-26 & 27 – Revised Figure C-1-4 & C-1-5 eliminating the 150’ Taper length and replacing it with a reference to Figure C-1-1 for instructions.
- Page C-110 – Added “Figure C-6-7 Simple Curve Computations”.
- Page C-111 – Added “Figure C-6-8 Compound Curve Computations”.
- Page C-112 – Added “Figure C-6-9 Parabolic Vertical Curve Computations”.
- Page C-113 - Added “Table C-6-1 Inches and Fractions of an Inch in Decimals of a Foot”.
- Page C-114 – Added “Figure C-6-10 Reference Formulas – 90 Degrees Triangle”.
- Page C-115 – Added “Figure C-6-11 Reference Formulas Oblique Triangle”.

## **APPENDIX “E”**

- Added Appendix E “Concurrent Engineering Constructability Review Guidelines”.