

# Design Standards Letter

**Letter Number: D-1999-15**

**Letter Date: 10/01/1999**

**Effective Date: 10/01/1999**

**Section/Plan No.: D1-03, D2-01, D2-02, D2-04, D3-03, D4-02, D4-03, D4-04, D4-07, D4-09, D6-04, D6-07, D8-01, D8-02, D8-03, D1-01.2, D2-01.1, D2-01.2, D2-01.4, D2-01.6, D2-02.1, D4-01.1, D4-03.6, D4-04.1, D4-09.10, D4-09.11, D4-09.12, D6-03.1, D6-03.2, D6-03.3, D6-03.4, D6-03.6, D6-03.7, D6-03.8, D6-03.10, D6-07.2**

**Subject: Sections 1-03, 2-01, 2-02, 2-04, 3-03, 4-02, 4-03, 4-04, 4-07, 4-09, 6-04, 6-07, 8-01, 8-02 and 8-03 Figures 1-01.2, 2-01.1, 2-01.2, 2-01.4, 2-01.6, 2-02.1, 4-01.1, 4-03.6, 4-04.1, 4-09.10, 4-09.11, 4-09.12, 6-03.1, 6-03.2, 6-03.3, 6-03.4, 6-03.6, 6-03.7, 6-03.8, 6-03.10 and 6-07.2**

## Body

-----  
The following is a summary of revisions to the *Project Development Manual*. All revisions or additions are effective October 1, 1999.

**Volume I** Revision date changed to 10-1-99 for the Contents sheet and Sections 1-03, 2-01, 2-02, 2-04, 3-03, 4-02, 4-03, 4-04, 4-07 and 4-09.

**Figure 1-01.2** Added standard forms D-13, D-15 and D-49. Deleted form D-52.

**Section 1-03** In Subsection 1-03.4, added fourth, fifth and sixth paragraphs providing details about payment bonds.

**Section 2-01** In Subsection 2-01.2, added sixth paragraph about including accident data in the conceptual study report and discussing safety enhancements and bicycle/pedestrian facilities. Accident data should now be gathered from the Transportation Management System (TMS). Revised Subsections 2-01.3 (5) and 2-01.4 (6) to state that accident data should come from TMS and that the need for bicycle/pedestrian facilities should be discussed in the 3R and 4R reports. In Subsection 2-01.5, modified the accident rate formulae such that the value used for the average ADT should be a weighted average.

**Figure 2-01.1** Under Accident Data and Safety Enhancements, added section for the discussion of bicycle/pedestrian facilities.

**Figure 2-01.2** Under Accident Data and Safety Enhancements, revised H. for the discussion of bicycle/pedestrian facilities.

**Figure 2-01.4** Under (8), revised fifth paragraph stating that all bridge ends shall have a standard bridge anchor section and a Type A crashworthy end terminal. Revised sixth paragraph stating that any bridges programmed for rehabilitation or replacement may remain in place, but must be shown as design exceptions.

**Figure 2-01.6** Under Accident Data and Safety Enhancements, revised I. for the discussion of bicycle/pedestrian facilities.

**Section 2-02** In Subsection 2-02.3 (2) (a), added last paragraph stating that bicycle/pedestrian facilities should be discussed in the location study report.

**Figure 2-02.1** Under Accident Data and Safety Enhancements, added section for the discussion of bicycle/pedestrian facilities.

**Section 2-04** In Subsection 2-04.3, revised fourth paragraph to reference Subsection 4-02.15 for requesting asbestos inspection and removal. In Subsection 2-04.4 (1) (b), revised first paragraph stating that federal funds are not available for Type II noise projects. State funds may be considered based on the bulleted items. In Subsection 2-04.9 (2) (a), revised second paragraph to reference Subsection 4-09.21 (1) for information required for applying for a Section 404 permit.

**Section 3-03** In Subsection 3-03.2, corrected typo for the English photo-scale (ratio) formula to 9 in. in the denominator.

**Chapter IV** Added and revised subsection and figure titles as needed.

**Figure 4-01.1** Changed accuracy of bearings and angles to 1 second and corrected typo for metric rate of grade to 0.001%.

**Section 4-02** In Subsection 4-02.2 (3), revised third paragraph to state that exceptions to the use of median crossovers to access private or commercial entrances must be justified and approved as design exceptions. Revised Subsection 4-02.13 to state that district Right of Way will make approval requests for all hardship and protective purchases to the Right of Way Division. Subsection 4-02.15 has been extensively revised. **PLEASE REVIEW THIS SUBSECTION CAREFULLY.**

**Section 4-03** Added Subsections 4-03.15 and 4-03.17 (1) (e) regarding the Equipment and Materials List (Form D-15). The D-15 is provided in the Design Forms category of the Design Forms on the computer. The D-15 is a generic list of possible lighting and signal items that can be used in projects. Designers should condense this list to only items which are applicable to their projects and submit the condensed list, with a cover letter (Figure 4-03.6), when submitting the final plans.

**Figure 4-03.6** This new figure is an example cover letter to be submitted with Form D-15. Words and phrases shown in bold should be adapted to fit the project specifics.

**Section 4-04** Added Subsection 4-04.1 (2) as a copy of Subsection 2-02.3 (1) (d), third paragraph. This paragraph instructs designers to design rural, divided roadways at the 70 mph (110 km/h) design speed. Should a rural, divided roadway contain elements of topography which would normally classify the roadway as "rolling" or "mountainous", those segments of the roadway which cannot satisfy the criteria for this design speed should be addressed through the design exception process as necessary. However, if a rural, divided roadway contains a considerable percentage of "rolling" or "mountainous" terrain, the designer should use the corresponding design criteria for such terrain.

**Figure 4-04.1** On Sheets 1 and 3, made revisions to the roadbed widths and applicable typical sections for Collectors and Locals with ADT's <400 and 400 - 1700. These changes were made to conform to AASHTO standards. On Sheets 2 and 4, deleted note (1) A., and added note (1) B. The new note advises designers to use design exceptions where design elements do not conform to the design speed. This note works hand-in-hand with the addition to Subsection 4-04.1 (2).

**Section 4-07** Added a new Subsection 4-07.3 (1) (e) and moved Subsections 4-07.3 (1) (e), (f), (g), (h) and 4-07.3 (2) (f) Subsection 4-09.26. Deleted Subsection 4-07.3 (2) (f).

**Section 4-09** In Subsection 4-09.18 (2), added sentence stating that an architect registered in the State of Missouri must review building plans which contain wiring, plumbing, heating, air conditioning and sewage. In Subsection 4-09.21 (1), seventh paragraph, added last three sentences to first bullet stating that submitting the necessary application data for a Section 404 permit should be done as early in the process as possible. A form for the use of submitting the application data is available in the Bridge category of the Design Forms. Added Subsection 4-09.26. This new subsection details the department's policy on the design, construction and maintenance of bicycle/pedestrian facilities. **PLEASE REVIEW THIS SUBSECTION CAREFULLY.**

**Figure 4-09.10** This new figure shows the data necessary for the application for a Section 404 permit. This form, with notes, is available in the Bridge category of the Design Forms.

**Figure 4-09.11** This new figure presents design criteria for bicycle paths. Typical section D-49 has been created for the use of creating bicycle path typical sections. The D-49 will be available on the district servers later next month. The file can be sent via email by request (SILVED or silved@mail.modot.state.mo.us) if needed.

**Figure 4-09.12** This new figure shows how to incorporate bicycle lanes into roadway typicals. For bicycle lanes adjacent to traveled ways, the bicycle lane pavement thickness should be the same as the traveled way thickness. In the case of a wide shared lane, the bicycle lane is incorporated into the traveled way.

**Volume II** Revision date changed to 10-1-99 for the Contents sheet and Sections 6-04, 6-07, 8-01, 8-02 and 8-03

**Chapter VI** Added figure title as needed.

**Figure 6-03.1** Changed traveled way width to variable to coincide with changes made to Figure 4-04.1. Changed width of Type 5 Base extension to 450 mm.

**Figure 6-03.2** Changed width of Type 5 Base extension to 450 mm.

**Figure 6-03.3** Changed width of Type 5 Base extension to 450 mm.

**Figure 6-03.4** Changed width of Type 5 Base extension to 450 mm.

**Figure 6-03.6** Removed specific details about pipe-aggregate pavement underdrain and added note referencing Standard Plan 605.10 for details.

**Figure 6-03.7** Removed specific details about pipe-aggregate pavement underdrain and added note referencing Standard Plan 605.10 for details. Changed width of Type 5 Base extension to 450 mm.

**Figure 6-03.8** Removed specific details about pipe-aggregate pavement underdrain and added note referencing Standard Plan 605.10 for details.

**Figure 6-03.10** Removed specific details about pipe-aggregate pavement underdrain and added note referencing Standard Plan 605.10 for details. Changed width of Type 5 Base extension to 550 mm.

**Section 6-04** In Subsection 6-04.6, revised minimum allowable final paving thickness to 3-<sup>3</sup>/<sub>4</sub> in. [95 mm] for application of rumble strips.

**Section 6-07** Revised Subsection 6-07.1 to comply with General Letter Nos. 4 and 11 of this year. Revised Table 6-07.2 to include Superpave Stone Mastic asphalt as an allowable surface mixture.

**Figure 6-07.2** This new figure provides an example calculation of how to break down a total pavement surface area into individual components (asphalt binder and mineral aggregate) for bid item use.

**Section 8-01** In Subsection 8-01.4 (5), clarified the location of lighting poles where clear zones exist.

**Section 8-02** In Subsection 8-02.12, fourth paragraph, changed the minimum distance from a pull box to an appurtenance to 2 ft. [0.6 m].

**Section 8-03** In Subsection 8-03.7 (3) (d), changed the number of Type IV object markers placed at the end of a road to three (coordinates with Standard Plan 903.03).

The following D-forms have been revised and have been placed, or will be placed later this month, on the district servers for use:

**D-2BS** Corrected description with item number 616-10.70 to Tubular Marker.

**D-29** Removed Total area for the Pipe Posts and Structural Steel Posts. The totals for these items should be shown in the 2B sheets.

**D-32** Moved the exit number panel to the right edge of the guide sign.

**D-49** This new typical section should be used for bicycle paths. This form will be available on the district servers later this month. The file can be sent via email by request (SILVED or silved@mail.modot.state.mo.us) if needed.

**D-50** Changed the slope on the tangent section to a single slope across roadbed.

**D-51** Changed the slope on the tangent section to a single slope across roadbed.

**D-52** Deleted.

**D-53** Changed the slope on the tangent section to a single slope across roadbed.

**D-64** Changed functional classification applicability.

**D-66** The traveled way and shoulder widths were revised to conform to AASHTO standards. Changed functional classification applicability.

**D-67** The shoulder widths were revised to conform to AASHTO standards. Changed the cross slope to match department standards. Changed functional classification applicability.

**D-69** Changed the cross slope to match department standards.

dts