



# Illinois Department of Transportation

2300 South Dirksen Parkway / Springfield, Illinois / 62764

## BDE PROCEDURE MEMORANDUM

**NUMBER:** 11-08

**SUBJECT:** BDE Manual Revision – Chapter 54

**DATE:** April 14, 2011

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Chapter 54 of the BDE Manual has been revised to update the Pavement Design/Selection procedures. See Chapter 54 of the BDE Manual on-line to view the revisions.

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### Background

Over the last several years the Department has worked with Industry and researchers at the University of Illinois at Urbana-Champaign (UIUC) to refine the mechanistic pavement design procedures and to incorporate the option of alternative bidding. The revisions described below fulfill that intent.

Section 54-1 – Section 54-1.04 was revised to add alternate bidding to the pavement selection process, and to reference legislation regarding pavement type selection.

Section 54-2 – Section 54-2.01(f)6. was revised to clarify use of the improved subgrade and Figure 54-2.D was added to provide details on each alternative.

Section 54-4.01 – The mechanistic design for jointed plain concrete pavement (JPCP) was updated to reflect an improved design based on research from the past 15 years. The following revisions were made in this section:

- clarified use of dowel bars;
- added option for 12-ft joint spacing on Class IV unmarked roads and streets;
- combined Traffic Factor (TF) equation for Class III and Class IV roads and streets into one equation;
- clarified requirements for improved subgrade and subbase by adding Figure 54-4.D;
- updated design charts in Figures 54-4.E through 54-4.G; and
- created a design catalog for Class IV unmarked roads and streets by adding Figures 54-4.H and 54-4.I.

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Section 54-4.02 – To address increased traffic volumes, the threshold TF allowing use of continuously reinforced concrete (CRC) pavement was updated to reflect the footprint used to set the original threshold value in the 1980s.

Section 54-5.01 – The mechanistic design for full-depth hot-mix asphalt (HMA) pavement was updated to reflect an improved design based on research findings from laboratory testing of current Illinois asphalt binder grades and HMA mixtures by the UIUC. The following revisions were made in this section:

- combined Traffic Factor (TF) equation for Class III and Class IV roads and streets into one equation;
- added Section 54-5.01(h) with requirements for improved subgrade;
- updated Figures 54-5.C through 54-5.H for standard design; and
- added Limiting Strain Criterion Design requirements, including maximum thickness determination based on location in the state using Figure 54-5.I, as well as mix characteristics and construction requirements that must be considered in the life-cycle cost analysis for pavement type selection.

Section 54-7 – Section 54-7.02 on new construction/reconstruction was updated to include revisions to the pavement type selection process related to the use of alternate bids that was added to Section 54-1. Maintenance and rehabilitation models used for life-cycle cost analysis in Section 54-7.03 were updated for JPCP (Figure 54-7.A) and Full-Depth HMA/HMA Overlay of Rubblized PCC Pavement (Figure 54-7.C), and a new model for CRC Pavement/Unbonded CRC Overlay (Figure 54-7.B) was added.

Engineer of Design and Environment

