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Modulus Prediction of Asphalt Mixtures using Dynamic Semicircular Bending Test: Estimation Algorithm and Nomograph Development

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Abstract

The study estimated the damage of asphalt materials properties measured by modulus based on the fatigue damage as captured through fracture characteristics. Dynamic semi-circular bending (SCB) test was conducted on eighteen asphalt mixtures at three temperatures and a series of parameters were evaluated and further utilized to estimate the reduction coefficient (δ SCB) related to the initial modulus. Finally, this study developed a nomograph to estimate δ SCB with increasing crack length. Overall, this study established the correlation between reduction in the modulus and fracture properties of asphalt mixtures, and thus developed the conceptual outline to formulate a nomograph.

Keywords: Asphalt mixture; dynamic SCB test; cracking mechanism; fatigue life prediction; CMOD.

1. Introduction

Fatigue cracking is one of the major distresses in flexible pavement systems. Fatigue life design and maintenance strategies employ a challenging task due to the inherent nonlinear viscoelastic properties of asphalt mixtures and complex cracking behavior observed in the field. Thus, a Download English Version:

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