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Flexible Pavement Analysis Considering Temperature Profile and Anisotropy Behavior in Hot Mix Asphalt Layer

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ABSTRACT

A three Dimensional finite element model (FEM) incorporating the anisotropic properties and temperature profile of hot mix asphalt (HMA) pavement was developed to predict the structural responses of HMA pavement subject to heavy loads typically encountered in the field. In this study, ABAQUS was adopted to model the stress and strain relationships within the pavement structure. The results of the model were verified using data collected from the Korean Highway Corporation Test Road (KHCTR). The results demonstrated that both the base course and surface course layers follow the anisotropic behavior and the incorporation of the temperature profile throughout the pavement has a substantial effect on the pavement response predictions that impact pavement design. The results also showed that the anisotropy level of HMA and base material can be reduced to as low as 80% and 15% as a result of repeated loading, respectively.

KEYWORDS

Anisotropic Behavior, Finite Element Method, Aggregate Base, HMA

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