

USE OF AXISYMMETRIC FINITE ELEMENT MODEL FOR FLEXIBLE PAVEMENT PERFORMANCE-RELATED SPECIFICATIONS

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ABSTRACT

Many agencies use End-result specifications to calculate pay factor. This specification considers the variability of materials and construction (M&C) factors, but does not recognize the long-term performance. For this reason, the highway agencies have developed the performance-related specification (PRS), which depends mainly on the anticipated long-term pavement performance. In this specifications, the life cycle cost (LCC) of the as-constructed pavement is calculated and compared with the LCC of the as-designed pavement to determine the pay factor. The previous studies of the PRS have used limited models when calculating the pavement response. These models are based on linear elastic theory or linear viscoelastic theory and are not representative to the exact behavior of the pavement materials. Finite element method can deal with the nonlinearity and orthotropy of the materials. The aim of this study is to develop a framework for flexible pavement PRS using a suitable finite element model comprises material properties models more representative to the actual behavior of pavement layers to determine the pavement response. To demonstrate this framework, a computer program is developed to relate the M&C factors to the expected pavement performance and in turn to calculate the contractor pay factor using the finite element procedure.