

Abstract

Pavement system response is probabilistic in nature due to intrinsic variability of input parameters used in design. To deal with this, reliability based design approaches have been developed. This thesis aims to incorporate the concept of reliability for multiple rehabilitation cycles of asphalt pavement over the analysis period. The work done consists in the proposition of asphalt modulus deterioration model, in the incorporation of this model in calculation of reliability of pavement and in the prediction of optimum rehabilitation strategy using reliability as performance indicator. The asphalt modulus deterioration model is theorized on the basis of remaining life concept. This suggests that deterioration curves with respect to traffic are parabolic in nature. This model is generalized for pavements with varying thicknesses. Using the generalized model, reliability curves for various cycles of rehabilitation are obtained for the selected pavement. Finally, an optimum rehabilitation strategy is presented based on cost constraint and reliability threshold.

Keywords : Reliability, Rehabilitation, Asphalt modulus deterioration, Remaining life