Abstract

18th October 2003

In this thesis analysis of flexible pavement has been studied using Finite Element Method. The three layer pavement structure has been idealized as 2-D plain strain problem with rectangular bilinear isoparametric element. Bituminous layer has been assumed as linearly elastic and nonlinearity in unbound materials in base and sub-base have been modeled by stress dependent resilient modulus. The variation of Poisson ratio with stress has been neglected. A generalized Fortran language code (Spave) has been developed for the nonlinear analysis. Correctness of Spave has been checked with a simple plate problem. For validation, the results have been compared with results of a standard nonlinear pavement analysis software, Michpave. It is observed that the prediction of pavement response by Spave deviate largely from Michpave results. The reason of this deviation lies in the difference in the modeling of unbound materials and idealization of pavement and loading. In the present approach more accurate pavement boundary conditions and material modeling have been considered. Thereafter, a study was made to predict the distribution of both stresses, strains and deformation inside the physical domain of pavement due traffic induced loading.