

Abstract

Proper characterisation of the mechanical properties of unbound granular materials (UGM) is an essential issue in the analysis and design of flexible pavements. In particular, the resilient modulus of aggregates is a key input parameter in UGM characterization and prediction of pavement structural performance. In the present work, three UGM constitutive models are implemented within an axisymmetric finite element code developed to simulate the nonlinear behaviour of pavement structures including two local aggregates of different mineralogical nature, typically used in Algerian pavements. The performance of these mechanical models is examined with regards to their capability of representing adequately, under various conditions, the granular material non-linearity in pavement analysis. In addition, deflection data collected by falling weight deflectometer (FWD) are incorporated into the analysis in order to assess the sensitivity of critical pavement design criteria and pavement design life to the three constitutive models. Finally, conclusions of engineering significance are formulated