

A VISCOELASTIC-VISCOPLASTIC DAMAGE MODEL FOR ASPHALT MIXES

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Asphalt mixes exhibit a viscoelastic-viscoplastic behavior and the contribution of the different constitutive components depends on the temperature and rate of loading. The presentation will discuss the development of an anisotropic damage viscoelastic-viscoplastic model for the characterization of asphalt mixes. The influence of the anisotropic aggregate distribution and damage are accounted for in both the viscoelastic and viscoplastic responses. Repeated triaxial tests were conducted in order to determine the model's parameters for three asphalt mixes that included aggregates with different characteristics. The presentation will discuss the experimental considerations in the repeated tests that are necessary to identify the viscoelastic and viscoplastic components. It also discusses the relationship between the model's parameters and mix response. The results show that the mix dilation or contraction behavior depends on aggregate properties. Also, the developed model and experimental program make it possible to distinguish between the nonlinear viscoelastic response of the intact material, damage viscoelastic behavior and viscoplastic response.