

VISCOELASTIC CONTINUUM DAMAGE ANALYSIS OF POLYMER MODIFIED ASPHALT IN THE CYCLIC SEMI- CIRCULAR BENDING TEST

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ABSTRACT

Notched semi-circular asphalt specimens were tested under cyclic loading at a range of applied loading levels and the damage growth modelled using the viscoelastic continuum damage theory (VECD). It was found that, as predicted by the theory, for each asphalt mixture, the pseudo-stiffness (C) versus damage (S) curves could be superimposed to form one unique curve. Both polymer modified and penetration grade bitumens were analysed in this study, and the effect of the level of polymer modification on the C versus S curves investigated. From these curves, the number of cycles to failure was predicted, and the improved damage resistance of the mixture due to increasing level of polymer in the binders demonstrated.