Elastic strains, modulus and permanent deformation of foamed bitumen pavements in accelerated testing facility

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Resumen

An accelerated full-scale experiment on foamed bitumen (FB) pavements was conducted at the Canterbury Accelerated Pavement Testing Indoor Facility (CAPTIF) in New Zealand.

The results of the CAPTIF experiment showed that the section with 2.8% bitumen content and 1% cement content (section B28C10) had the best performance. These results were published in a previous research paper. The current paper is the continuation of the previous work and aims to provide design and performance parameters that could be used by practitioners and researchers.

The pavement strains were measured at different depths and transverse locations using pavement instrumentation. The measurements showed that subgrade strains are lower in section B28C10 and that the strain distribution in the subgrade is relatively uniform, reducing the strain concentrations in this layer. Falling Weight Deflectometer (FWD) measurements were used to determine an AASHTO 93 structural coefficient of 0.20 for the FB layer of section B28C10. FWD and pavement strain measurements were used to back-calculate the average elastic modulus of 1100 MPa for the FB layer. Finally, a permanent or plastic strain model was developed for the FB layer using the pavement vertical surface deformation measurements and post-mortem data.

Palabras clave

KeyWords Plus: ASPHALT