

Stiffer binders and good stone-to-stone contact may provide improved rut resistance, but they may also reduce the mix flexibility and, thus, crack resistance. Today, this cracking phenomenon is getting more attention from pavement engineers. Cracks appear in flexible pavements primarily through fatigue, low temperature, or reflective cracking mechanisms. This paper investigates the feasibility of using the Overlay Tester (OT) as a simple test for characterizing crack resistance of asphalt mixes. The OT can be run on standard size samples, typically 150 mm long by 75 mm wide by 38 mm high, which can be prepared from either field cores or from lab molded specimens. Sensitivity studies indicated that the OT provides reasonable results in that raising the asphalt performance grade and decreasing the testing temperature will lead to shorter cracking life. Furthermore, in a series of controlled tests, it was found that asphalt absorption by aggregate appears to have a major impact on crack resistance of asphalt mixes. The effectiveness of the OT as a crack resistance test was validated by five reflective cracking case studies in Texas and testing conducted on cores from MnROAD low-temperature cracking sections. The OT results correlated well with field performance. A laboratory study was also conducted to compare the OT results with those from the bending beam fatigue tests. A good correlation was also obtained. In summary, the OT device appears to be a practical tool to characterize cracking resistance of asphalt mixes and to let the mix designer balance the competing requirements of both rut and crack resistance.

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FRACTURE AND FATIGUE STRENGTH OF GROUDED MACADAMS

Joel Oliveira (1), Nick Thom (2), Salah Zoorob (2);

(1) University of Minho (Guimaraes, Portugal); (2) University of Nottingham (Nottingham, United Kingdom)

Grouted macadams form a class of material that provides significant advantages in comparison to both concrete and conventional asphalt, having both rut resistance and a degree of flexibility. This paper presents a series of laboratory tests on several grouted macadam mixtures for stiffness, fatigue and low temperature fracture. The variables explored include binder grade and content, aggregate size and gradation, and grout strength. Although the material is found to perform fundamentally as an asphalt, there are several significant differences in the form of fatigue behavior found compared to that usually expected from an asphalt. In particular, the effect of varying binder content is found to be markedly different. The results are discussed in terms of optimizing mixture design in order to obtain the most desirable combination of properties (stiffness, fatigue strength, low temperature fracture resistance). Discussion is also presented regarding the possible role of grouted macadams as base or binder courses within highway pavements, and the conclusion is drawn that they are likely to provide an economical solution in many circumstances owing to their superior mechanical properties.

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INNOVATIVE SURFACINGS: WHAT'S NEW IN NEW ZEALAND?

Bryan Pidwerbesky, David Faulkner;

Fulton Hogan (Christchurch, New Zealand)

This paper discusses recent innovations, new technology and current projects that are specifically targeted at the next generation of pavements, for a wide range of areas covering environmental (e.g. low-noise surfacings, asphalt recycling and utilization of processed materials and by-products), developments in surfacing materials, maintenance and construction practices, data collection (e.g. seal texture measurement using digital imaging), and other related topic areas. Modern computer-controlled sprayers have been developed to apply bitumen at rates that vary transversely across the