

A SIMPLE APPROACH TO THE DESIGN OF PAVEMENTS INCORPORATING GROUTED MACADAMS

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ABSTRACT

Grouted macadams form a semi-flexible class of composites whose behaviour lies somewhere between concrete and conventional asphalt materials, having both excellent rut resistance and a degree of flexibility. This paper presents a series of pavement design computer simulations, based on results obtained from laboratory fatigue and stiffness tests on grouted macadam and conventional asphalt mixtures. The design variables explored include the application of grouted macadams both as surface and binder/base course layers. Comparisons were made with conventional asphalt surface and base course constructions. The resultant stresses, strains and fatigue lives were determined based on four classes of pavement foundations with increasing bearing capacity. In order to simulate traffic loading more realistically, the fatigue characterisation tests carried out on the grouted macadam mixtures incorporated and examined the effect of rest periods on fatigue performance. This paper discusses key findings and includes results in the form of design charts for both composite types. The main conclusion drawn from this project was that the incorporation of grouted macadams is likely to provide an economical solution in many pavement design circumstances owing to their superior stiffness and fatigue characteristics.

KEY WORDS: Pavements, grouted macadam, design, fatigue, shift factors