

Accelerated Pavement Testing of Low-Volume Paved Roads with Geocell Reinforcement

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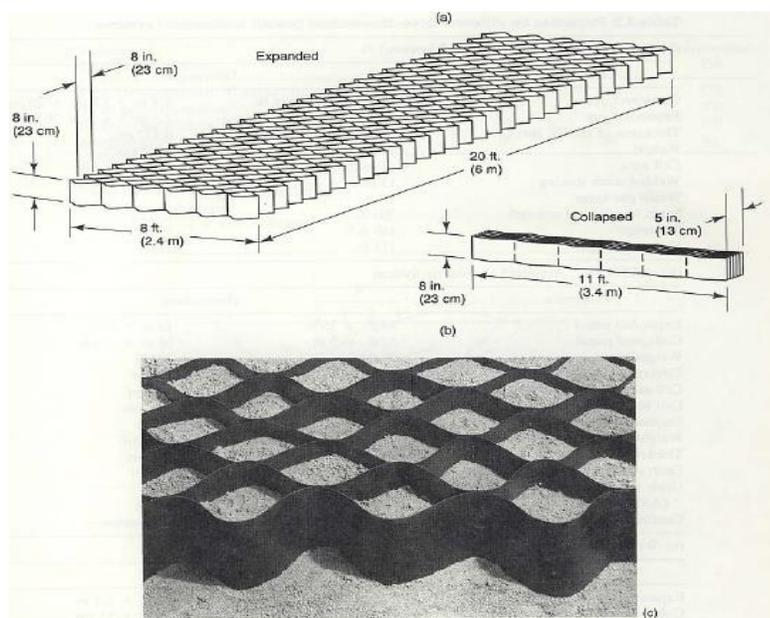
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A Transportation Pooled Fund Study - TPF-5(048)

Introduction

The Midwest States Accelerated Pavement Testing Pooled-Fund Program, financed by the highway departments of Kansas, Iowa, Missouri, and New York, has supported an accelerated pavement testing (APT) project to study the rehabilitation of low-volume paved roads with geocells and different infill materials under real-world traffic on a marginal subgrade, and to simulate this type of rehabilitation numerically so that a design method can be developed.



Geocell materials

Project Description

To achieve the study objective, four pavement test sections were constructed at the Civil Infrastructure System Laboratory of Kansas State University. Three out of these four lanes had geocell-reinforced bases with three different infill materials: crushed limestone, quarry by-products, and Recycled Asphalt Pavement. The fourth test lane was the control section consisting of crushed stone base. All sections were heavily instrumented. Repeated loads (80-kN single axle) were applied using an accelerated pavement testing machine. The sections with 50-mm HMA layer reached the failure criteria of 12.5-mm rut depth after 10,000 passes due to excessive stress in the subgrade. The redesigned sections with 100-mm HMA layer carried 1.2 million passes without reaching 12.5-mm failure rut depth.

Project Results

The geocells with marginal materials as infills appear to be viable in low-volume paved road applications.

Project Information

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