

Enhancing Performance of Semi-Flexible Pavements through Self-Compacting Cement Mortar as Cementitious Grout

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Abstract : This research investigates the performance enhancement of semi-flexible pavements by incorporating self-compacting cement mortar as a cementitious grout. The study is divided into three phases for comprehensive evaluation. In the initial phase, a porous asphalt mixture is formulated with a target voids content of 25-30%. The goal is to achieve optimal interconnected voids that facilitate effective penetration of self-compacting cement mortar. The mixture's compliance with porous asphalt performance standards is ensured through tests such as marshal stability, indirect tensile strength, contabro test, and draindown test. The second phase focuses on creating a self-compacting cement mortar with high workability and superior penetration capabilities. This mortar is designed to fill the interconnected voids within the porous asphalt mixture. The formulated mortar's characteristics are assessed through tests like mini V funnel flow time, slump flow mini cone, as well as mechanical properties such as compressive strength, bending strength, and shrinkage strength. In the final phase, the performance of the semi-flexible pavement is thoroughly studied. Various tests, including marshal stability, indirect tensile strength, high-temperature bending, low-temperature bending, resistance to rutting, and fatigue life, are conducted to assess the effectiveness of the self-compacting cement mortar-enhanced pavement.

Keywords : semi-flexible pavements, cementitious grout, self-compacting cement mortar, porous asphalt mixture, interconnected voids, rutting resistance

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