

Summary title: **Design and optimization of pavement mixtures incorporating bitumen foam**

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Project description:

Sustainable highway construction relies on maximum recycling and re-use of materials such as aggregates, bituminous binders and fillers. Currently foamed bitumen (FB), which is specially produced from reclaimed asphalt, is emerging as a resilient and highly recyclable material. An advantage of FB over other bitumen is that it can be mixed with secondary aggregates comprising a high content of fines to produce a more flexible and fatigue resistant surfacing and prevent precipitation even in wet climates by reducing mix instability. Current design guidelines are inappropriate for FB mix design and the proposed research aims to use systematic laboratory testing in order to develop a practical method of predicting the performance characteristics of FB stabilized materials comprising various additives. Based on extensive test data obtained, Artificial Intelligence (AI) methods and numerical models will be developed in MATLAB™, to simulate the behaviour of FB stabilized materials. Various parameters to be investigated are: depth of stabilization, relative density and moisture content at the time of laying, particle roughness, additive content, resilient modulus and air voids. The aim is to establish a practical methodology for designing pavement thicknesses and specifying FB based materials, to improve the current design codes.

(195 words)