



EVALUATION OF FEASIBILITY OF COMPOSITE PAVEMENTS FOR RESURFACING INTERSECTIONS IN PEDESTRIAN CROSSINGS IN SRI LANKA

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Moratuwa in partial fulfilment of the requirement for the Degree of Master of
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Abstract

Intersections, pedestrian crossings and their approaches are more susceptible to cause distresses due to often decelerating and accelerating effects of vehicles. Frequent maintenance of asphalt concrete pavements at intersections and pedestrian crossings create severe traffic delays in metropolitan regions. Therefore in essence a long lasting pavement rehabilitating method has to be adopted for intersections and pedestrian crossings. This study attempts to reveal the feasibility of whitetopping for resurfacing of such vulnerable places.

A three-dimensional (3-D) finite element model was developed for stress analysis of whitetopping pavements with SAP2000 structural analysis software in order to simulate field conditions of a whitetopping pavement constructed in the pavement testing facility, at Florida Department of Transportation and it was verified with field strain data. The verified software model was used to perform a parametric study in with the ultimate goal of revealing applicability of whitetopping concept to resurfacing intersections and pedestrian crossings. A software model for a ramp was also developed and parametric study was conducted in order to develop a ramp for raised pedestrian crossings. Through the study, it could be revealed that the software models developed can be used to estimate the maximum anticipated stresses. In whitetopping pavements while emphasizing the significance of using accurate design parameters and material properties.

High performance concrete mix design was performed to reveal a proper concrete mix and a suitable admixture with available materials in Sri Lanka. Applicable curing method was also revealed to reduce early age cracking. Maturity test was performed to verify the field strength gain.

A life cycle cost analysis was performed to compare the cost of whitetopping and asphalt concrete. The cost comparison shows that whitetopping overlaying saves significant amount of maintenance cost.

DECLARATION

The work included in this thesis in part or whole has not been submitted for any other academic qualification at any institution.

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