

**MUD CONCRETE PAVING BLOCK FOR PEDESTRIAN  
PAVEMENTS IN TROPICAL CLIMATIC CONDITIONS**

**MASTER OF SCIENCE**

IN

 University of Moratuwa, Sri Lanka.  
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**CONSTRUCTION PROJECT MANAGEMENT**

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# MUD CONCRETE PAVING BLOCK FOR PEDESTRIAN PAVEMENTS IN TROPICAL CLIMATIC CONDITIONS

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The dissertation was submitted to the Department of Civil Engineering of the University of Moratuwa in partial fulfilment of the requirement of the Degree of Master of Science.

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Sri Lanka

April 2016

## Declaration

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## Abstract

The road network of Sri Lanka has been developing rapidly in recent years. Parallel to the expansion of the road network, most of the urban areas are also being upgraded with township development. Some of these developments follow a proper master plan, while there are others which do not pay attention to proper strategies. The attention paid for sustainable, low cost materials has been minimal. Hence, these unplanned developments are causing severe environmental issues such as global warming, heat island effect, lowering the ground water table, losing the natural appearance etc. Therefore, it is essential to invent new sustainable and low cost materials to counter balance the stated issues.

This research is focused on developing a paving block using mud concrete as a replacement for existing artificial paving materials used in urban walkways along the road network and within recreation areas. The main aim of this research is to produce a mud concrete paving block that can withstand the required strength according to the SLS standard, and which has a wet compressive strength of 15 N/mm<sup>2</sup>. The suitability of the developed block is then evaluated for their thermal performance and skid resistance. The current research status is identified through a literature survey. An online questionnaire survey is carried out to identify public perceptions on pedestrian pavements and paving materials used in them. A field survey was carried out among the paving block manufacturers to identify the cement percentage used by them. This was then used to develop the mix-designs for the laboratory experimental work.

In the laboratory, blocks are cast in three stages and are tested for four variables, viz: cement content, soil composition, moisture content and vibration time. Temperature measurements are taken of different pavement systems to evaluate their performance. The skid resistance of the block surfaces is measured using the Pendulum Skid Resistance Tester. Results have proven that the mud concrete paving block is a good alternative to pedestrian walkways while reducing thermal impact on the surrounding environment.

Key words: *pedestrian pavements, paving materials, user comfort, heat island effect, sustainability*

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