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**STUDY ON UTILIZATION OF BUILDING DEBRIS IN  
ROAD CONSTRUCTION IN NORTHERN PROVINCE  
OF SRI LANKA**

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(118818M)**

**Degree of Master of Engineering**

**Department of Civil Engineering**

**University of Moratuwa  
Sri Lanka**

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OF SRI LANKA**

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**Thesis submitted to University of Moratuwa in partial fulfillment of the  
requirements for the Degree of Master of Engineering in Foundation  
Engineering and Earth Retaining Systems**

**Department of Civil Engineering**

**University of Moratuwa**

**Sri Lanka**

**March 2016**

## DECLARATION

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any University or other institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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The above candidate has carried out research for the Master Dissertation under my supervision.

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## **ABSTRACT**

Due to rapid development and population growth, construction industry has emerged with few new problems. The major problem faced by the industry is the scarcity of construction material and disposal of construction waste because of high disposal cost and inadequate land fill area.

Northern region of Sri Lanka is undergoing a massive infrastructure development within a shorter period especially in the road sector development. Roads are major consumers of aggregate and soil and the influence of aggregate cost is more in total construction cost of the roads.

The aggregates for these road construction projects are transported from Medawachchiya due to scarcity of local material and the approximated transport distance from Medawachchiya is more than 150 km. Hence, transport cost is approximately 70% of the project cost. In order to curtail the cost of construction of roads and reduce the industrial waste disposal, the possibility of using building waste as road construction material has been studied.

Building debris such as concrete, random rubble masonry, concrete block and plaster were selected for this research. Experimental studies were carried out to determine the engineering properties of the recycled construction material and compared with conventional road construction material. Aggregate Impact Value Test, Aggregate Crushing Value Test, Los Angeles Abrasion Test and California Bearing Ratio Test were carried on selected building debris to find out the suitability for road base construction. Crushed samples of selected debris were tested to determine the suitability for replacement of soil in road construction. It has been observed that the Random Rubble Masonry debris can be directly used for road base construction however, crushed debris of block masonry, plaster and concrete can replace the soil for construction of sub base, shoulder, embankment and for surface of 'D' & 'E' class roads after adding suitable percentage of plastic clay.

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Pirashanthi Shankar,

Road Development Authority

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## **LIST OF ABBREVIATIONS**

AIV	-	Aggregate Impact Value
ACV	-	Aggregate Crushing Value
LAHV	-	Los Angeles Abrasive Value
CBR	-	California Bearing Ratio
LL	-	Liquid Limit
PL	-	Plastic Limit
PI	-	Plastic Index
MDD	-	Maximum Dry Density
OMC	-	Optimum Moisture Content
SSCM	-	Standard Specification of Construction & Maintenance of Roads & Bridges
BS	-	British Standards
ASTM	-	American Standards for Testing and Materials