

**IMPROVEMENT OF COASTAL SANDY SOIL BY  
BLENDING LOCAL UOORI CLAY FOR SUBGRADE/  
EMBANKMENT AND SUB BASE CONSTRUCTION**

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Degree of Master of Science

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Sri Lanka

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## **DECLARATION OF THE CANDIDATE AND SUPERVISOR**

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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 other University or institute of higher learning and to the best of my knowledge and believe 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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### **Improvement of Coastal Sandy Soil by Blending Local Uoori Clay for Subgrade/ Embankment and Sub Base Construction: An Experimental Study**

Use of locally available material for road construction is emphasized in the present context of potential environmental issues and the restriction on transport imposed by the state. Budgetary constraint for coastal road construction is yet another aspect meriting the use of local materials. The situation in the Northern Province of Sri Lanka is particularly severe compared to other provinces because of the scarcity of materials, which instigate long distance transport from adjacent provinces.

The research aims to carry out studies on the engineering properties of the locally available materials in the Northern Province and to adopt an appropriate technique to stabilize and use for low cost coastal roads construction. The material; Uoori clay (CH, Clay of high plasticity) and coastal sand are commonly available in the Northern coastal belts. It is proposed to blend the local Uoori clay material with the coastal sand and explore the use of the blended material for sub grade/embankment and sub base construction. Sieve Analysis, Atterberg Limits, Modified Proctor Compaction, and California Bearing Ratio (CBR) have been performed for the parent material (control sample) and the blended material with various compositions of local Uoori clay and coastal sand.

The blended materials were analyzed with the specified requirement under "Standard Specifications for Construction and Maintenance of Roads and Bridges (SSCM) (iCTAD, 2009)" in Sri Lanka. Accordingly it was found that the composite materials 50:50, 60:40, 70:30 and 80:20 shall be used as embankment materials in road construction works while composite material 60:40 shall only be used for sub base construction.

Key Words: Uoori clay, coastal sand and composite/blended material.

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## LIST OF ABBREVIATIONS

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Abbreviation	Description
AASHTO	American Association of State Highway and Transportation Officials
BS	British Standards
CBR	California Bearing Ratio
CC	Cement Content
CEA	Central Environmental Authority
CSB	Cement Stabilized Soil Base
GSMB	Geological Survey and Mines Bureau
ICTAD	Institute for Construction Training and Development
LL	Liquid Limit
MDD	Maximum Dry Density
OMC	Optimum Moisture Content
PI	Plastic Index
PL	Plastic Limit
SFRB	Steel Fibre Reinforced Bases
SSCM	Standard Specifications for Construction and Maintenance of Roads and Bridges
UCS	Unconfined Compressive Strength
UK	United Kingdom
USA	United States of America

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