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IMPROVEMENT OF PEATY CLAYS BY DEEP MIXING AND PRELOADING

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Dissertation Submitted in partial fulfillment of the requirement for the degree of

Master of Engineering

Department of Civil Engineering

University of Moratuwa

Sri Lanka

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December 2011

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ACKNOWLEDGEMENT

I am extremely grateful to my supervisor, Professor Athula Kulathilake, Head of the Division of Geotechnical Engineering, University of Moratuwa for his enthusiastic guidance, invaluable help, and encouragement in all aspects of this Master Project. His numerous comments, criticisms and suggestions during the preparation of this project are gratefully acknowledged. Also his patience and availability for any help whenever needed with his heavy workload is highly appreciated.

I would like to thank fellow postgraduate students of Foundation Engineering and Earth Retaining Structures program in Geotechnical Engineering for their discussions, support, and social interaction during my study. My appreciation is also extended to all academic and non-academic member of Department of Civil Engineering at University of Moratuwa, for their warm hearted co-operation during my study.

Acknowledgement is not complete without thanking to the assistance given to me by the laboratory staff, Mr. K.R. Pitipanarachchi, Mr. D. Bandulasena, Mr. D.G.S. Vithanage and Mrs. Pradeepa Peiris. Their assistance enabled me to complete this project report successfully.

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I would also thanks to all the staff members of the Computer Division of Civil Engineering for their support given to me in this report documentation work.

My special thanks go to Dr. Lilantha Samaranayake of NANO Technological Institute of Free Trade Zone, Biyagama, who helped me to get micro-structural and mineralogical changes by scanning electron microscope (SEM) of natural and treated peaty clay specimens,

I also thank the Director Principal, Deputy Principals and entire Academic and Non Academic staff members of Civil Engineering Department of Institute of Engineering Technology Katunayake for their support given to me in this report documentation work.

Finally my heartfelt and sincere acknowledgements are extended to my wife, my baby girl vinuji, our parents, for their sacrifices, support and encouragement given to me during the difficult times of my study.

ABSTRACT

One major problem related to construction on peaty clay deposit is the low shear strength of the soil. However previous researches have shown that the shear strength could increase significantly by mixing with cement and various stabilizers. Hence some improvement methods have been developed to increase the bearing capacity of the peaty clay deposit by mixing with stabilizers and cement.

The aim of this project is to evaluate the increase of shear strength of peaty clays due to mixing with cement and the application of preloading pressure during the curing period. The initial undrained shear strength was obtained from untreated remoulded peaty clay subject to preloading pressures.

For this study, samples were prepared for untreated peaty clay samples and treated peaty clay by mixing with 15% and 20% cement by wet weight and keeping under two preloading pressures of; 20kN/m^2 and 40kN/m^2. The shear strength of the samples was obtained by triaxial compression test under unconsolidated undrained condition. The results proved that there is an increase in the range of 150% to 240% in shear strength due to mixing with cement and application of preloading pressure during the curing process.

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The other major problem related to construction on peaty clay deposit is the high settlement of the soil. The previous researches have proven that the settlement of soft soil has decreases significantly with the addition of stabilizers and cement.

For the analysis of compressibility characteristics, peaty clay samples were mixed with 0%, 15% and 20% cement by wet weight and keeping under two preloading pressures of; 20kN/m^2 and 40kN/m^2. Consolidation characteristics of the untreated and treated peaty clay are determined through the series of laboratory consolidation testing.

From the consolidation test results, coefficient of volume compressibility (m_v) and the coefficient of secondary consolidation (C_α) were evaluated in all the loading and reloading increments. The values of compression index (C_c) and recompression index (C_r) were also evaluated using the e Vs log σ plot. The improvement of the stiffness is assessed and compared by the measurement of compressibility characteristics of the treated peaty clay with untreated peaty clay.

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