

METHODS FOR IMPROVEMENT OF
ENGINEERING PROPERTIES OF PEAT
-A COMPARATIVE STUDY

Project Report Submitted in partial fulfillment of the



M. Eng. Degree Course
University of Moratuwa, Sri Lanka.
in Geotechnical Engineering

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Ms. W.G.S. Munasinghe



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Supervised By : Dr. S.A.S. Kulathilaka

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Department of Civil Engineering
University of Moratuwa
Sri Lanka

April 2001

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ABSTRACT

Development of cost effective methods for improvement of engineering properties of peat is a need of the hour in Sri Lanka in view of the number of major infrastructure development projects that are proposed over the lands underlain by peat. In this research several different methods of improvements were tried out in Sri Lankan peat, which have a rather low organic content around 20%-40%. The improvement methods tried out were namely; pre-consolidation through preloading, mixing with cement at percentages of 5%, 10% and 15% and mixing 15% of lime. Peats at different levels of humification were used in the study.

It was shown that the preconsolidation causes a significant improvement in both the primary and secondary consolidation characteristics irrespective of the degree of humification. Improvements were achieved in both the fibrous and amorphous peat.

Even after the mixing of 15% of cement or 15% of lime significant improvements of consolidation characteristics could not be achieved in fibrous peat. But, even the mixing of 5% cement caused significant improvements in both the primary and secondary consolidation characteristics in amorphous peats. The organic contents of the two types of peat considered were similar.

Improvements of shear strength were achieved in all types of peat due to preconsolidation. Mixing with cement also caused some improvements in undrained shear strength of Peat. However, these improvements were not as high as those reported for inorganic soils.

Consolidation tests were conducted with simultaneous measurement of settlement and pore water pressure, in a new experimental setup developed. The data obtained were used to check the validity of the Terzaghi theory to model the consolidation behaviour of peat. Some experiments were conducted to derive Bjerrum curves for Peat.

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