PREFACE

Due to the scarcity of land at coastal regions around the world, land reclamation is commonly carried out for the future expansion of various infrastructure facilities. Soft soil is present at most of the coastal regions of Southeast Asia and thus land reclamation on this highly compressible soil foundation often requires the use of soil improvement works to eliminate significant future settlements from occurring. The combination of prefabricated vertical drains with preloading is one of the most widely used ground improvement methods in land reclamation projects.

Due to the rapid expansion of major coastal cities like Singapore, the requirement for land reclamation is critical in such city states due to the scarcity of land. Often, areas that have been used as dumping location for dredged spoils, mine tailing activities or waste ponds require land reclamation to cater for the rapid expansion of the population as well as for major industries. Material in such type of ponds are extremely soft.

The deformation behaviour of ultra-soft soil due to additional load is different to that of the normally or overconsolidated soft soils. The prediction of magnitude and time rate of deformation by use of conventional soil mechanics theory is not applicable for such ultra-soft soils. The deformation behaviour of such ultra-soft soil deposits was previously not well understood nor the behaviour of such deposits when subject to land reclamation fills or as a result of ground improvement. The formation of such soil has to be studied from the sedimentation process right to the completion of self-weight consolidation by means of field tests and specialized laboratory tests.

This book is a result of extensive years of research and practical experience gained by the author who was actively involved in the land reclamation and ground improvement works at Changi East in the Republic of Singapore. The project involved works where such ultra-soft soil was

encountered in the project and had to be treated with prefabricated vertical drains to enable the reclaimed land to be used for major airport facilities.

The author spent many years working on the design and implementation at the project and embarked on an illustrious research career researching in topics such as land reclamation, soft soil engineering, in-situ testing, laboratory testing, field instrumentation, ground improvement and sand compactions works. Extensive specialized laboratory tests were carried out by the author and this was validated by soil models and field instrumentation results. A theory for settlement prediction for such ultra-soft soils was also developed by the author during the course of this research as was a finite-difference model for ultra-soft soils. This book should prove useful to the practicing engineers, project managers and researchers who are involved in land reclamation and ground improvement projects as well as students and contractors alike. The works by the author are land mark works in a new field of study which has never before been studied and thus this book now provides extensive inroads on the field of ultra-soft soil.

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