

**GROUND IMPROVEMENT METHODS
: A CASE STUDY OF HEAVY TAMPING AND COMPACT
VACUUM CONSOLIDATION**

MASTER OF BUSINESS ADMINISTRATION

IN

PROJECT MANAGEMENT



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**GROUND IMPROVEMENT METHODS
: A CASE STUDY OF HEAVY TAMPING AND COMPACT
VACUUM CONSOLIDATION**

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The Dissertation was submitted to the Department of Civil Engineering of the University of Moratuwa in partial fulfillment of the requirement for the Degree of Master of Business Administration.

Department of Civil Engineering

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May 2012

DECLARATION

I confirm that, except where indicated through the proper use of citations and references, this is my own original work. I confirm that, subject to final approval by the Board of Examiners of University of Moratuwa, a copy of this Dissertation may be placed upon the shelves of the library of the University of Moratuwa and may be circulated as required.

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To best of my knowledge the above particulars are correct.



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ABSTRACT

The qualitative ground improvement against the cost efficiency is widely discussed topic in the construction industry. Since the inception of Southern Transport Development project (STDP) in Sri Lanka in 2003 many ground improvement applications have implemented along the highway trace from Colombo to Mathara. The core aspects of ground improvement are cost, quality and process duration of the application, which determined the success of the construction. Consequently, the ground improvement techniques need to be defined that the most appropriated application for a particular site conditions.

The first objective of this research was to evaluate complete cost analysis for Heavy Tamping (HT) method application in STDP. Then the second objective was carried out complete cost analysis for Compact Vacuum Consolidation (CVC) method as an alternative ground improvement technique to the HT. Finally compare the both methods financial aspects, process duration and quality as well as established recommendation for selecting alternative technique by analyzing the key performance indexes.



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Research does consider specific site conditions which both methods are applicable to improve the existing ground and the comparison limit where the sites have similar range of ground properties.

Research was carried out through data collection and normalization of a trial application in STDP and the cost estimation done according to the Bottoms-up technique. The methods comparison was done by considering five main out lines: time consumption, technology requirements, labor intensity, machine intensity and total cost. These factors are determined which method is most appropriate to the ground improvement.

Overall research findings evidenced that the CVC method has similar cost with respect to the HT method. When compare the other key factors, the HT method has less time, labor and technology requirement than the CVC but it is higher machinery intensive. It can be stated two major recommendations for selecting ground improvement technique; first is carried out feasibility study for listing out suitable techniques and the second is compare the key performance indexes of that.

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