Thesis Title	Quality Control of Construction Materials by Ultralight Dynamic Cone Penetrometer
Thesis Credits	12
Candidate	Mr. Akkasit Thumrongchai
Supervisors	Dr. Yongyuth Taesiri
	Assoc. Prof. Pinit Tungboonterm
Degree of Study	Master of Engineering
Department	Civil Engineering
Academic Year	1999

Abstract

This Thesis is to study the quality control of construction materials by Ultralight Dynamic Cone Penetrometer. The study concerns strength of selected materials by calculating cone resistance of pavement structure materials from Ultralight Dynamic Cone Penetrometer. The selected materials are compacted according to the standard test. The cone resistances from Ultralight Dynamic are used to study the relationship between Dry Density and California Bearing Ratio. The cone can also be used for quality control of construction materials. Its output is obtained in short time without testing sample in the laboratory.

The study is conducted by dividing the soil moisture into four conditions which are very dry, dry, normal and wet. According to the study results, the relationship equations for the compaction quality control of construction materials in the field can be written as :

$$\gamma d \quad = \quad 0.1753 \, \text{Ln} \, (qd) + 1.5058 \qquad \text{for lateritic soil compacted}$$

$$\gamma d \quad = \quad 0.1080 \, \text{Ln} \, (qd) + 1.5442 \qquad \text{for sand compacted}$$

$$\gamma d \quad = \quad 0.3006 \, \text{Ln} \, (qd) + 1.0813 \qquad \text{for clay compacted}$$

According to the field study, it is found that the relationship obtained from the field is lower than that from the laboratory. Therefore, the quality control of construction materials by

Ultralight Dynamic Cone Penetrometer requires a lot of samples testing in order to obtain the exact average.

Keywords : Ultralight Dynamic Cone Penetrometer / Dry Density / California Bearing Ratio / Compaction Energy / Selected Materials / Strength of Materials / Cone Resistance