CHAPTER I
INTRODUCTION

1.1 Background

The road is an infrastructure that is mostly used by Indonesian people to perform daily mobility so that the volume of vehicles that passes through a road section affects the capacity and supportability. The strength and durability of road is determined by the properties of sub grade bearing capacity (Sukirman, 1999).

The important factors for improvement and maintenance of roads among other things are data of sub grade strength, materials properties, existing composition and layer thickness. Sub grade strength in the field such as California Bearing Ratio (CBR) value depends on the condition during construction and operation services. The road deterioration is now being frequently happened, the fact of costly data collection, and the problem of late maintenance arise gives a contribution to be worst of road condition, where public economic movements are trafficked. To achieve these data, a Dynamic Cone Penetrometer has been introduced that is equipment for testing the strength of granular layers and sub grade or road pavement rapidly. These aims pavement layers are granular base, soil stabilization, including sub grade. The testing procedures is performed continuously until 80 cm depth, and if necessary to be deepen by extending the steel bar measurement to reach 120 cm depth. In the last ten years, DCP has been applied to achieve CBR data for road pavement design, so the time is coming for DCP testing method to be a standard testing in Indonesia (Dachlan, 2005).

Highway located in Selokan Mataram road (Maguwoharjo – Babarsari) works to mobilize the alternative route of traffic flow on Maguwoharjo to Babarsari. That road is located beside Selokan Mataram Canal, so it is not surprising that traffic movement through that road from year to year has increased rapidly. It should be high for accessibility which can be as comfortable as possible.

The use of Dynamic Cone Penetrometer resulted in an estimated ratio of soil strength, is cheap and can be done over and over - again. One of the advantages of the penetrometer is the force applied to add up, so that comparisons can be made between the type and model of the soil. Dynamic Cone Penetrometer is an inexpensive instrument, which can measure the shear strength and hit the ground. During the carrying capacity of soil is a function of soil moisture, dynamic cone penetrometer can also be used as an indicator of changes in soil moisture in situ testing in accordance through the soil profile (Gribb et.al. 1997).

I.2 Problem Statement

Based on the background, the problem in this research is:

1. What is the relationship of CBR and DCP from the test?
2. How is the result obtained from CBR and DCP test on Selokan Mataram Road (Maguwo - Babarsari)?

I.3 Problem Limitation

In order to research and to focus on primary objectives, it needs to be made a problem limitation.

The scope of research in this study is laboratory test at the Department of Civil Engineering, Faculty of Engineering, University of Atma Jaya Yogyakarta and DCP test field. DCP tests are conducted along the Selokan Mataram Road (Maguwo - Babarsari) to obtain a minimum of 15 samples (the data). The soil material is taken from the DCP test locations in the form of soil embankment. The laboratory tests use a modified proctor, CBR mold in accordance with ASTM. DCP test is conducted using the 60° conus. In this study the soil on the actual conditions is on the ground.

I.4 Research Objectives

- The purpose of this research is to find the correlation value of CBR (California Bearing Ratio) and DCP (Dynamic Cone Penetrometer) in soil embankment.
- In this study it is expected to find the laboratory CBR value and to compare its value by experimenting DCP.
- This research is expected to minimize the costs and to shorten the time required to obtain data on the strength or density of the soil on a project.

I.5 Research Originality

There is much research committed on California Bearing Capacity investigation, which is examined using various methods. However, the other researchers according to the writer's knowledge have not done the research about correlation between CBR laboratory and CBR test using DCP.