CHAPTER 1

INTRODUCTION

1.1. Background and problem statement

From the beginning of mankind, transportation, especially land transportation has been a main aspect in human lives. Communication and trade would not have been possible without it. For this purpose, thousands kilometers of road have been built over the world.

Started from the pavements built on Crete during the Minoian period (2600 – 1150 B.C.) mankind continuously develop the construction of road. The famous ancient road construction was built by the Romans. It should be noted that these pavements were remarkably well designed. From those early days of the Roman Empire to the interstate highway system in the United States, roadway networks as well as roadway construction have been developed. The materials used for roadway construction have progressed with time.

In its development, pavements can be broadly classified into two types, flexible and rigid pavement. Flexible pavement is the pavement where the surface or wearing course constructed using hotmix asphalt concrete, where rigid pavement the surface pavement constructed with the slab of cement concrete. From the two types of roadway pavement, flexible pavement is the most used in the world at the moment. Figure 1.1. and 1.2 show the flexible and rigid pavement respectively [1].

The field of pavement design is dynamic in that concepts are continually changing as new data become available. There are many methods of design avaiable, since opinions regarding suitability of designs vary from locale to locale. In particular, materials that are available for constructions of pavements have a major influence on design. There are, however, principles of design that are common to all problems irrespective of other extenuating circumstances [2].

The purpose of a pavement is to provide a smooth surface over which vehicles may pass under all climatic conditions. In turn, the performance of the pavement is affected by the characteristics of the subgrade. Desirable properties that the subgrade should posses include strength, drainage, ease of compaction, permanency of compaction, and permanency of strength. Therefore, design of the pavement is depend on the quality of the subgrade [3].

In this final assignment stabilized expansive clay soil with Buton Natural Rock Asphalt will be used for subgrade material of the road Semarang – Purwodadi, which located in North-East of Central Java Province.

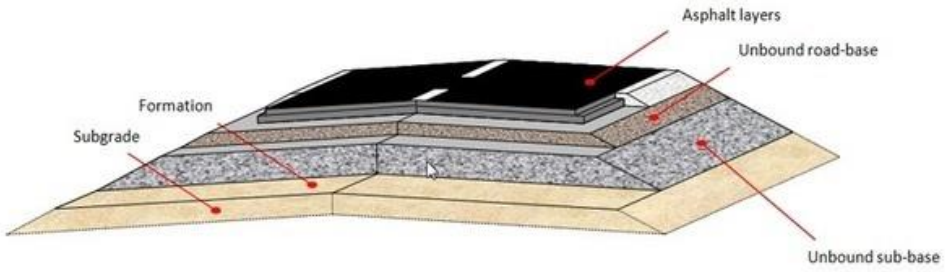

Figure 1.1. Basic flexible pavement structure (4)

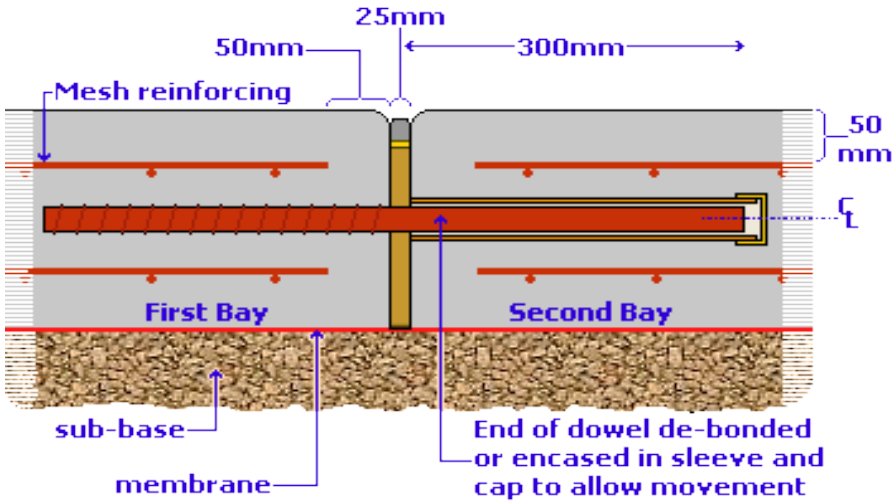

Figure 1.2. Basic rigid pavement structure (5)

1.2. The Objective of the research

From the above description, the objective of the research are as follows:

a. Make redesign of existing pavement a using unstabilized expansive clay soil as subgrade.
b. Make redesign the pavement Semarang – Purwodadi using BNRA Stabilized expansive clay soil as subgrade.
c. Comparing pavement design over existing subgrade and over stabilized subgrade

1.3. Scope of the Study

To accomplish those objectives, this study started with a literature review of the information pertaining to the relationship of pavement design.

Pavement design will be conducted pavement design method for flexible and rigid pavement. ASSHTO 1993 pavement design metod. Traffic data take from Bina Marga Services of Central Java, while for soil using de properties soil from Hasfarm Dian Engineering Consultan.