CHAPTER 1

INTRODUCTION

1.1 Background

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 aim, thousands kilometers of road have been built over the world. Indonesia, the country with total land area of 329,847 square kilometers and population of 27,200,000 peoples (2007 estimate), has 91,620 km length of road consisting of 17,765 Federal roads and 73,855 km State roads [1].

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 truly 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 developed with time.

In its development, pavements can be broadly classified into two types, flexible and rigid pavement. From the two types of roadway pavement, flexible pavement is the most used in the world at the moment. In Indonesia, for instance, from 91,620 km/s length of road, 87,626 km or 95.64% are flexible pavement roads, and roads constructed with rigid pavement are only 343 kms or 0.37%, while the rest of 3,651 km/'s or 3.99% are earth/gravel roads [1]. In the United States as of 2001 there were about 2.5 million miles of paved roads of which 94% were bituminous surfaced [2]. Figure 1.1 shows basic flexible pavement structure

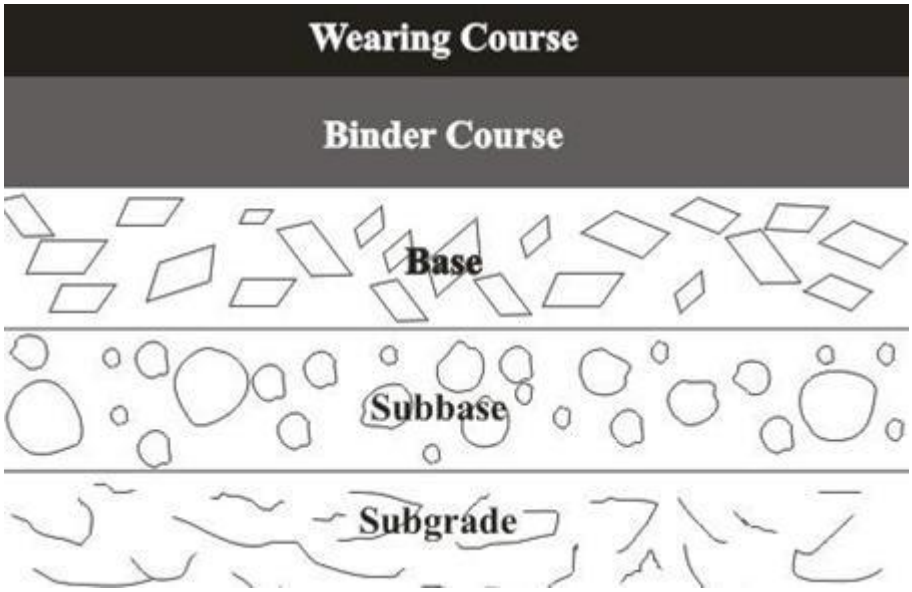

Figure 1.1: Basic flexible pavement structure

1.2 Problem Statement

Over the years different types of asphalt mixtures have been developed in different parts of the world for special applications. Some examples of such mixtures will be studied in this final assignment. Those asphalt mixtures are Dense Graded Asphalt Mixtures, Stone Mastic Asphalt, and Porous Asphalt. From those three types of asphalt mixtures we can draw the problem statement :

(1) How the characterization and quality of each hot mix asphalt mixtures ?

(2) How the application of each hot mix asphalt mixtures in surface course layer design of flexible pavement ?

1.3 The Objectives of the Research

From the above descriptions it is obvious that compare the three types of asphalt mixture is very important in order to selecting most suitable type for the

pavement where the road is build. For that purpose, this research has the following objective:

a. To investigate the mixture characteristic and compare the quality of Stone Mastic Asphalt, Dense Grade, and Porous Asphalt.
b. To know the strength of each asphalt mixtures if it used for surface course layer of the flexible pavement.

1.4 Scope of the Study

To accomplish those objectives, this study started with a literature review of the information pertaining the characteristics of each mixtures. Based on the results of the literature review, a research design was developed involving research the characteristics of each mixtures, as well as conducting laboratory experiments. Marshall Stability and Marshall flow will be performed to each type asphalt mixture. Design of flexible pavement using each type of those asphalt mixture for surface layer material then be conducted. Data obtained from the test were analyzed and conclusions and recommendations were made.