CHAPTER 1

INTRODUCTION

1.1 Background

From the beginning of mankind, transport, especially road transport has become a major aspect of human life. Communication and commerce would not be possible without it. To this end, thousands of kilometers of roads have been built all over the world. Indonesia, a country with a land area of 1.922.570 square kilometers and a population of 258 million people (2016 estimate), based on the authority level, Indonesia has 523 974 km long road which consists of 47 017 km of State roads, provincial roads and 55 416 km 421 541 km of road district / city [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 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 the 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 kms length of road, 508,620 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 3.99% 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].

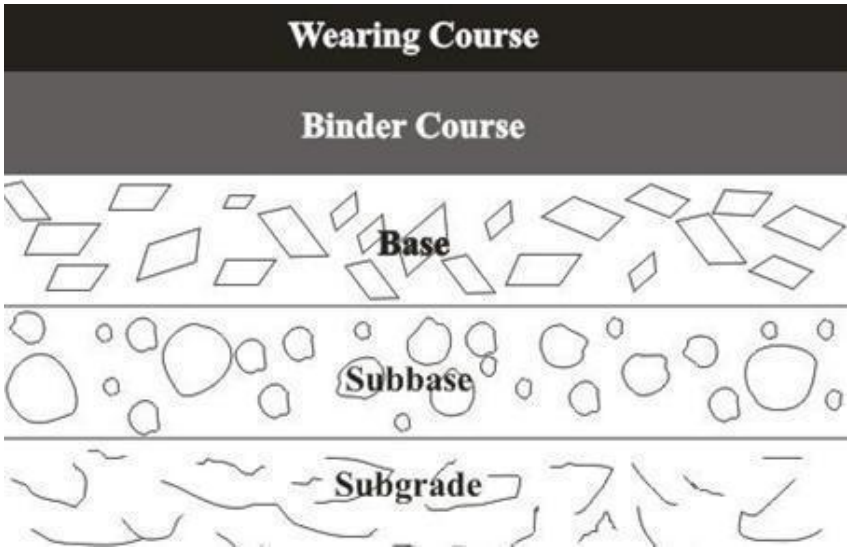

Figure 1.1: Basic flexible pavement structure

In most asphalt pavement, stiffness of each layer or lift is greater than in the lower layers and less than that in the upper layer. It can be understood from the distribution of the load (Figure 1.2) in which the stress in the surface layer is higher than the bottom layer.

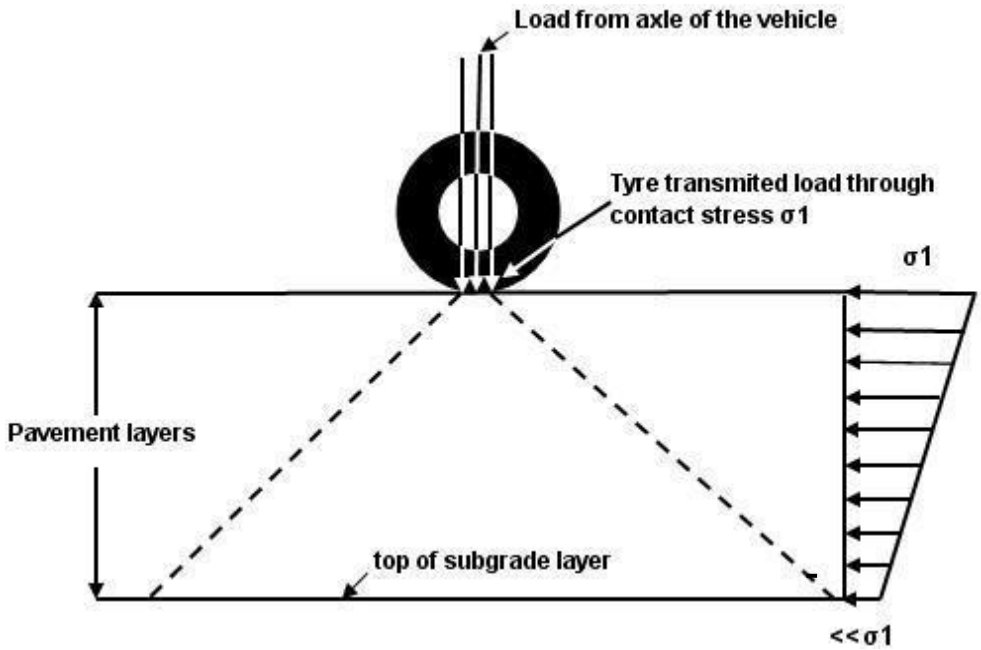

Figure 1.2: Load distribution on flexible pavements

Base course layer is the layer directly placed under the surface layer. Since the surface layer relatively thin, the tire load that have to be supported by base course layer stilll significantly high. Therefore, to be able support the traffic load and also the surface layer, base course layer have to have enough strength and also a high stiffness as well. To fulfill those strength and stiffness base course layer should be made from the good material.

1.2 Problem Statement

As for this study has the research problem:

a. The lower of the existing base course material.
b. The difficulties to find suitable base course materials.
c. Increasing the weight of heavy trucks, where a suitable and strenght of base course material are required.

1.3 The Objectives of the Research

From the description above it is clear that the material of base course layer should be treated to improve it strength and stiffness. Therefore, this study has the following objectives:

d. To investigate the feasibility of using Buton Natural Rock Asphalt (BNRA) to improve the strength of base course material.
e. To look for the strength parameter of base course after treating with BNRA.
f. To evaluate the levels of use BNRA on flexible pavement.

1.4 Scope of Study

To achieve these objectives, this study began with a review of the literature will be given in chapter 2, of information relating to the strength of Aggregate Base without asphalt, BNRA as a base strengther, and the characteristics of proportional BNRA required to achieve maximum power to test the content of asphalt different and also tests that will be carried out stabilization basic course.

Based on the results of his literary purposes, Researh design and methodology will be presented in chapter 3.

Developed involves preliminary research to find the right power, in this study are Natural Stone Buton Asphalt (BNRA) as a control, and materials testing laboratories and experiments. The data obtained from the test results were analyzed and the conclusions and recommendation made in chapter 4 and chapter5.