CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Good road network system provide accessibility to people to travel. In the earlier days, roads is used for transportation of earth resources such as iron ore from site to the port. From the point of view, road are the main pulse for a nation economic survival.

In Malaysia, it can be clearly seen that the modernization of the country started by construction of road network system that connecting the whole country. The variety function of road such as transporting people, deliver goods helps to provide a better economic for the country.

Unfortunately, not all area is covered with a proper conventional road by means paved roads. It is because due to high cost of proper paved roads to built in plantation and rural area. Moreover, there will be problem if paved road is constructed in the area as the roads tends to be damaged as heavy vehicles with fully loaded will pass through each day.

Unpaved roads is recently connecting the main road to access plantation or rural area. Unpaved roads is exposed to the cause of it to be damaged such as water. The roads tends to deform when loading is apply as the soil contain too much water.
1.2 PROBLEM STATEMENT

The access to the plantation area usually constructed using earth roads. Heavy vehicles will pass through the road in order to transport the goods. The common behavior of unpaved road is pore water pressure, lateral movement, settlement and total stress. Meanwhile, the poor unpaved roads cause the road to be damaged because the soil cannot cater the load of the vehicle. Besides, the road is exposed to water as the road is not covered. The soil will absorb water thus decrease the strength of the unpaved road. The main key to solve this problem is the cost of construction and something that will not disturbed the soil of the plantation area. Soil stabilization is most likely to be suitable to overcome this problem.

Soil stabilization often involving using material that is cement, lime, fly ash. This type of material is easy to apply and low in cost besides it is suitable to change the physical many type of soil. To treat sandy soil, it often required material that has glue properties to bind the soil together, for example cement and asphalt emulsion. For fine grained soil, the required material has the properties to decrease the plasticity index in order to increase the strength of soil.

1.3 OBJECTIVE

The main concern of this study is to provide eco-friendly earth road besides uses less cost compared to conventional road construction in Malaysia. The objectives of the study are:

1. To determine the soil characteristic of untreated soil used in this study.
2. To evaluate the existing strength of treated soil with bi-sulphate at site.
3. To determine the strength of soil when freshly treated with bi-sulphate.
1.4 SCOPE OF STUDY

The main point of this study is to investigate the effect of bi-sulphates on subgrade soil that has problem with its poor condition and performance. Bi-sulphates (liquid) is chosen to be stabilizer for the subgrade soil. The sample of subgrade soil is taken at Kompleks Sawit Seri Meranti, Lepar, Kuantan with coordinate of 3°37'19.1”N 103°08'14.1”E. The scope of this study cover the study previous research to get standardization of the laboratory procedure for preparing mixtures using bi-sulphates besides reviewing procedure for mixture of non-traditional stabilizer. In addition, to identify the engineering properties of soil by conducting following test: specific gravity, Atterberg limit, moisture-density relationship by standard Proctor test. Last but not least to determine the changes in soil strength using Unconfined Compression Test (UCT) and California Bearing Ratio (CBR) when different amount of bi-sulphates is used.

At first, the soil is oven dried before the required test to determine the properties of soil started. Then, the soil sample is prepared at the optimum water content in order to standardize the water content in soil so that the changes in strength of soil when different content of the bi-sulphates used can be easily identify.