CHAPTER 1

INTRODUCTION

1.1 Background of Study

The provision of housing is a test confronted by all nations around the globe, particularly in developing nation like Malaysia. With the increment of development materials expenses as for example, cement, steel and timber; builders are not always have a desire to construct a house on a tight plan. Several possible solutions has been investigated to reach the goal as to fulfil client demand by using minimal effort building material and cost but still can produce affordable and good quality of housing.
Compressed Stabilised Earth Block (CSEB) is one of the new development materials utilizing pre-assembled parts that can interlock to each other and it’s improvise from ordinary steps that do not require mortar in bricklaying work. The quantity of cement that reacts as stabilised agent and the laterite soil are needed as to build quality of laterite CSEB. The common sense utilization of cubes method in development will minimise the total cost and time spend as there will be no mortar include in bricklaying work. Furthermore, it does not need talented and experienced worker (Nasly et al, 2009). The utilization of laterite CSEB is a perfect solution due to decreasing the materials usage and development cost (Adeyeye, 2012).

From the previous study that made by Ahmad Rashdan bin Mansor in 2014, two types of curing method were conducted which are left in sun for set 1 and left in shade for set 2. Three sets of block were prepared with the ratio used are different between each other, 1:2:6, 1:1:6, 1:0.5:6 (cement, laterite soil, sand) with the addition of alkaline solution of 1 molarity and 2 molarity of 1:2:6 mixture. Besides that, the laterite soils were obtained from nearby site location at University Malaysia Pahang, Kuantan.

At all stage of 7days, 14days and 28days of ages, curing set 1 which is left in sun was stronger than curing set 2. The maximum compressive strength that was recorded for ratio curing set 1 at 28 days was 3.96Mpa. Furthermore, the ratio of 1:1:6 was stronger than ratio 1:0.5:6 and 1:2:6 at all stage of ages ratio. The highest compressive strength was in ratio 1:1:6 at 28 days of age recorded was 5.63Mpa. Moreover, the highest compressive strength is in 2 molarity alkaline solutions on 28 days which is 5.4Mpa but slightly higher than 2 molarity alkaline solutions, 5.06MPa.
From the previous study that made by Habsullah Ali b Abd Rahim and Muhamad Zulkarnain b Zainal in 2014, the highest compressive strength of interlocking blocks were achieved 7.01MPa in 7 days of aged of curing when it was dried in sun.

This study will explore more on physical and mechanical properties of the cubes by using different ratio of aggregates with a constant amount of cement with the presence of an alkaline solution (NaOH).

1.2 Problem Statement

Cement and clay substances in cubes had a potential in determining the compressive strength, however the ideal ratio between cement-aggregates is not decided yet for minimum permissible average compressive strength for the cubes which is 5.2MPa according to an American Standard Testing Machine (ASTM) C-129 at the 28 days aged of curing. Optimum mixed proportions will give high quality with a maximum strength of a cube.

The standard compression strength that needs to achieve by the cubes is 5.2 N/mm2 for load bearing wall. Based on previous research, the optimum mix proportion had been obtained which is 1:2:6 and the strength of cubes will increase if the concentration of an alkaline solution increases. The expected result will be the cubes by using laterite soil with the present of alkaline can achieved the minimum permissible average compressive strength for the cubes is 5.2MPa at 28 days aged of curing.