CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

In construction industry, cost is considered one of the important elements for constructing a project. Cost in construction includes the initial capital cost, and also the subsequent operation cost and maintenance cost. Generally, running a construction project will involve a lot of budget. Furthermore, the increasing rate of inflation by years, will affect the price of raw materials, transportation, fuel, machinery, man power and others. ot will be a bothers for the clients such as developer to invest money for a project. Hence, to overcome this problem, an alternative material or a new system will be the best option. Construction Industry Development Board Malaysia (CIDB) proposes cost saving methods which are the Industrialized building System (IBS) where the building component or the building systems are pre-fabricated and then install on site. Moreover, it is proven not only reducing the cost but also reduce the construction time.

Further information by CIDB, there is five types of IBS that were introduced for the construction industry to practice which are pre-cast concrete framing, panel and box system, steel formwork system, steel framing system, prefabricated timber framing system and finally the block work system. This report will focus on the block work system or in
detail for interlocking block made from cement laterized. The usage of interlocking blocks as the construction materials has been proven to provide a lot of benefits. By implementing the cement laterized interlocking block for buildings will greatly reduce the wastage, volume of building materials, reducing unskilled workers, provide better quality control, promote a safer and more organized site, and last but not least will greatly reduce the construction cost and time (Nasly et al., 2009).

Lateritic soil has been used as a construction material for a thousand years before and by enhancing this material, it can replace some material without dropping the required quality standard and of course reducing the cost. It can be recognized from it well-graded reddish brown state, with sandy-silt clay of medium plasticity and compressibility type of soil. It also has fines content ranging from 27 to 49.5% and contains extremely low gravel percentage of less than 10%. (Elarabi et al., 2013). Hence, this research is in view to recommend the production of blocks from cement laterized in supplementing the conventional sandcrete blocks.

1.2 PROBLEM STATEMENT

Research by Adepegba (1975) indicates that by comparing the properties of conventional concrete with concrete which sand replace by laterite, it shows that, concrete containing laterite could be used for structural member. Besides that, with addition of cement and sand as stabilizer, cement laterized block has a potential to be the alternatives building material which can achieved required strength of 2.8N/mm² for non-load bearing wall, 5.2N/mm² for load bearing wall and 7.0 N/mm² for load bearing wall specified for exterior wall based on the Public Work Department (PWD) standard. With a proper study, the laterite soil can be enhanced and use as one of the material in construction.

There are several factors that affect the mechanical properties of cement laterized block or cube especially in term of compressive strength. Some of the factors are the mix proportion for the block or cube, curing method, soil grains size, presence of additives, water content for the mixture, and many more. Basically, this research were carried out to
determine the effect of alkaline solution as additives, effect of grains size and effect of curing method in term of compressive strength of cement laterized cube, (CLC).

1.3 \textbf{RESEARCH OBJECTIVE}

The research will cover on the effect of additives concentration, sodium hydroxide (NaOH) on compressive strength of cement laterized cube (CLC) with different soil grains sizes which are 1.18mm, 600 micro and 150 micro. The objectives are as follow:

i. To identify the effect of concentration of alkaline solution (NaOH) on CLC in term of compressive strength.

ii. To determine the relationship between soil grains size and the concentration of alkaline solution in term of compressive strength.

iii. To compare the effect of curing method between air curing method and oven dry method in term of compressive strength.

1.4 \textbf{SCOPE OF STUDY}

i. Laterite soil will undergo mineralogy test, sieve analysis test and atterberg limit test to determine their properties. Then the soil will be sieved through a 1.18mm, 600 micro and 150 micro sieves for sample preparation.

ii. The mixed proportions that will be tested are 1:2:6 (cement: soil: sand).

iii. 8 sets of CLC samples will be produced based on the grains size, alkaline solution concentration and curing method.

iv. Concentrations of NaOH that will be tested are 1, 2 and 3 molarities.

v. The curing methods that the CLC samples will undergo are air curing method and oven dry method.