CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

The construction industry is one of the most active sectors in Malaysia and it is contributing a major sector of employment in the countries. Unfortunately, this construction industry can cause global pollution to the environment because this industry produces a large amount of nonrenewable resources and release almost 30% of carbon dioxide to the environment. This situation is a serious issue in this century because it will give effects of the climate change such as increasing of the sea water level, increasing temperature, increase the risks of floods and others. The estimate of global pollution that can be attributed to the building is air pollution 23%, climate change gases 50%, drinking water pollution 40%, landfill waste 50% and ozone depletion 50%.

In order to overcome the more sustainable construction industry, the production of waste and the raw material consumption of construction industry must be reduced. There are some ways to reduce the use of nonrenewable resources and to achieve more sustainable construction industry such as by using natural fiber. Example of natural fiber that can be used as the alternative such as coconut, palm, bamboo, jute and sisal are readily available in the most of the countries. This natural fiber only required a low degree of industrialization, easy to get and it can reduce the cost of construction. According to Alida (2013) the use of natural fiber as element in construction material is one of the alternatives to reduce the use of nonrenewable resources. Besides, the use of natural fiber to reinforced
cement composite is also low cost and this constitutes a very interesting option for the building industry.

In order to reduce nonrenewable material consumption as well as to maintaining natural resources, the concept of recycling and sustainability were introduced. The concept of recycling also may solve the agro-waste problem. Normally, most of the agricultural waste will end up to the landfill. Therefore, this research will investigate alternative environmentally sustainable application of these waste materials. To build environmentally sustainable structures, the possibility of using some agricultural wastes and industrial byproduct from different industries as construction materials will be highly desirable and economic advantages (Shafigh, 2010).

Malaysia is well known as the largest palm oil producers in the world. However, as the largest palm oil producers, one significant problem during make processing the palm oil in large amounts. The agricultural wastes of palm oil such as Empty Fruit Bunches (EFB), Oil Palm Shells (OPS), Palm Oil Mill Effluent (POME), Palm Oil Fronds (OPF), Palm Oil Trunks (OPT) and others will become arising and this is one of the main contributors to the nation’s pollution problem. All these wastes needs to be disposed properly for the purpose of environmental sustainability.

1.2 PROBLEM STATEMENT

Malaysia is one of the world leaders in the production and export of the palm oil and contributes about 57.6% of the total supply of the palm oil in the world. As the largest palm oil producers, it will cause the increasing level of agricultural waste from the palm oil industry. In order to overcome this problem, one of the palm oil agricultural wastes has been used in this research which is OPF wasted.

As the alternative of this study, this research investigated the ability of the OPF as the additional raw material in the manufacturing of the cement sand bricks. In additional, this study also wants to minimize the OPF to be thrown away in landfills by recycling the
OPF waste. The OPF have the high potential used in the construction industries due to its capability. Due to limited usage and commercialization, lack of research work attempted on the OPF as compared with other oil palm wastes.

Furthermore, in the manufacturing of the brick, sand is one of the important raw materials especially for cement sand brick. Unfortunately, due to high demand of the sand in the construction industry has resulted to rapidly decreasing resources of the materials. This situation seems to be a global trend except to some locations which is near to the natural sand resources. There is some factor are contributing to the natural sand become decreasing such as rapid urbanization, high demand but have limited resources, expensive and cost to process.

All these problems will cause a rising cost for the construction industry because prices of sand become increasingly in every year. The high cost of the sand gives some effects to the construction industry. This alternative study also wants to compare the compressive strength, density and water adsorption of OPF cement sand brick with the standard cement sand brick.

1.3 OBJECTIVE OF STUDY

The objectives of this study are:

i. To determine the optimum ratio of OPF in the production of cement sand brick.

ii. To determine the characteristic of the cement sand brick with OPF in term of compressive strength, water absorption and density.

1.4 SCOPE OF STUDY

The OPF that has been used in this research was taken from Bandar Tasik Puteri, Rawang, Selangor. This raw material was added into the other four raw materials in the