CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

Nowadays, mortar is the important component in construction industry and it is composed of cement, fine aggregate and water. Mortar is used as a binder that help to increase the strength to hold brick with different size. The mortar also used to patch holes in wall buildings. Mortar will become hard when it exposed to water and cause in a firm aggregate structure. The ingredients in cement mortar differ somewhat, depending on the manufacturer specifications. A typical mortar will include both sand and cement, with lime added to the mix. Other types of aggregates may be added, depending on the texture that is desired for the mortar. Cement as main component in construction material is used to fasten coarse and fine aggregate. The demand of cement for construction is very high and cause maximum production of the material in Malaysia. Cement is material with adhesive and cohesive properties and its function is to bind fine and coarse aggregate together. Cement also act as filler to any void in between the aggregates and also form a compact mass.

Development in construction material is being increased by time. There are many researches about utilization of agriculture waste to substitute the material in construction. The waste product such sugarcane, eggshell and others waste product can be used as replacement for construction material. These waste products are high probability to replace the cement, fine aggregate and coarse aggregate.

Banana fibre ash is one of example of agriculture waste. Banana leaves ash (BLA) can be used as pozzolanic material in civil structures with advantages such as lower costs and the equivalent reduction of environmental impacts resulting from the accumulations of this type of residue in the field. The concrete dosage with 10% BLA
materials were satisfactory casted as cross arms for electrical distribution network factory production. (R.C. Kanning et al.2014).

In this research, banana trunks ash is use as replacement for cement. It is use as cementitious material to produce high strength of mortar. The composition of the banana trunks have good characteristic to be use as binder in the mortar.

1.1 PROBLEM STATEMENT

Cement industry is a developing industry and important to the process of modern world but the industry generates dust during its production. The dust causes many respiratory diseases like obstructive lung diseases and other respiratory diseases. The Cement industry is known as industry that emitting Carbon Dioxide (CO₂). The amount of CO₂ emitted by cement industry is nearly 900 kg for every 1000 kg cements produced. The produce of excessive CO₂ will cause the increase temperature of atmosphere and it will affect the climate and also all living being. According to the World Business Council for Sustainable Development (WBCSD), emissions from Portland cement manufacturing vary in different regions of the world from 0.73 to 0.99 kg of CO2 per kg of cement produced.

Agriculture waste is a raw material for industry nowadays. It does not only economical but also can lead to air pollution such as global warming (R.Srinivasan , 2010). Agriculture waste material usually disposed into landfill or dispose by open burning that may lead to air pollution. The agriculture waste can be use as replacement or additive for construction material. For example, Coconut fibre can be use as additive to concrete, palm oil kernel can be use as coarse aggregates in concrete and agriculture waste as replacement of cement in mortar.

To overcome this problem, this research is carried out to determine the waste product such as banana trunks ash can be use to replace cement in the making of mortar and able to solve the environment problem.
1.2 OBJECTIVE OF STUDY

i. To determine the best portion of banana trunks ash can be replace the cement in the making of mortar.

ii. To determine the strength of mortar that can be achieve by using banana trunks ash.

1.3 SCOPE OF WORK

Based on the objective, this research focused on how to overcome the problem that occurred in construction industry regarding the strength of banana trunks ash as cement replacement in mortar.

i. Banana trunks are collected around Gambang.

ii. The banana trunks are cut into small pieces and burn in the furnace machine at 500 C for 2 hours to produce banana trunks ash.

iii. The design specimens are 50 mm × 50mm × 50 mm.

iv. The ratio of the mortar is 1:3 with water cement ratio is 0.5.

v. The materials for this research are cement, water, fine aggregate and banana trunks ash.

vi. 27 cubes of mortar are made with 3 different percentage weight of banana trunks ash.

vii. 1%, 2% and 3% of banana trunks ash are used to replace cement by weight.

viii. This test will be conducted at 7 day, 14 day and 28 days of water curing to get the strength and the results will be recorded.

ix. The compression test is to test compressive strength of the specimens.