CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Construction industry has become a booming industries in the world nowadays. The development in the real estate industrial properties or the geographical expansion has a direct relationship to the rapid growth of the construction industry. This is due to the increasing in the population and the boost in the rate of urbanisation. The growth opportunities in the construction industry is expected to be increased in this coming five years especially in the infrastructure and residential segment.

It is undeniable that the growth in the construction activities have improved people lifestyle, stimulate the economics of a nation and create a lot of job opportunities globally. Have we ever think that the impact in this industrial growth such as environmental issue, climate change and etc. are dramatically increased recently? For example, the production of the cement which is a necessary material in the concrete had released massive amount of carbon dioxide to the environment every year. Ton of the carbon dioxide enters the atmosphere and cause the increment in the earth's temperature which is known as greenhouse effect. Gigantic amount of concrete is needed when the construction industry is developed. Common artificial materials that used in the construction of building or infrastructure are steel, plastic, concrete, aluminium, and glass. But concrete is the material that used the most and it is the second most widely used materials in this planet. There are a lot of people have do study on the replacement of cement by others raw materials which have the same or better properties compare to cement. Fly ash, silica fume and palm oil fuel ash are some of the raw materials that use to replace cement to

reduce the use of cement and lower the emission of carbon dioxide which may lead to the environmental negative impact.

People always focus on the replacement of cement due to it obvious negative impact to the environment. But, not to forget sand is also one of the materials used in concrete mix. Sand is a natural resources which is non-renewable because it is not continuously produced by the earth and has possibility to be depleted. It is smaller in size which is coarser than silt but finer than granular and it can be known as tiny particle of rock. The growth in the construction industry has increased the used of concrete. Thus, the demand on the sand resources is also increased and this actually is not a good symptom due to the largely reduce amount of natural resources which may bring bad impact to the environment. Sand mining activity for the purpose as a materials in construction industries has lower the riverbed level and caused severe deterioration to the river system in term of physical and biological environment (Padmalal. et al., 2008). The high demand on the natural sand lead to the collapse of river bank and also landscape destruction (Ako et al., 2014). An alternative to the sand is required to solve the problem above before the depletion of the sand and to control the negative impact to the environment.

Quarry dust is an alternative to the sand due to it similar physical and chemical properties to the natural sand. Quarry dust is tiny rock particle and also waste after the quarrying process. It is obtained when a huge rock is breaking into small rock and the tiny rock particle which is as small as dust is known as the quarry dust. The cost in getting the quarry dust is very low compared to the sand and this can greatly reduce the cost of the construction project due to it almost cost free material. In order to reduce the raw materials to the environment, the used of quarry dust waste in the concrete mix is a good solution to preserve the green environment and balance ecosystem.

1.2 PROBLEM STATEMENT

Sand is fine aggregates where generally can be found on the beach or desert. There is absence of desert in our country when refer to the geographical location of Malaysia. Therefore, most of the sand that used in the construction industries in Malaysia is originated from the beach which contain a lot of mineral and salts. Beach sand that composed of heavy salt minerals is not suitable to use in the concrete mix because the high concentration of salt is tend to corrode the steel reinforcement in the reinforcement concrete structure and affect the strength and durability of the concrete. Thus, the natural sand originate from the beach need to be treated to remove the salt minerals and organic material before apply in the concrete production. An additional action which is treatment to the sand is realized not effective due to the extra time and step is needed to clean the sand.

Labour, equipment and suitable place is required during the treatment of the sand and all the resources used in this process is charged in the materials cost which is part under the concrete cost. Large amount of concrete is needed in a construction work and the overall cost of the materials is directly affected by the amount and cost of the concrete. The increase in cost of the concrete significantly increase the cost of the project. In this case, an alternative to the sand which is cost effective and innovative is much more importance to overcome this problem. Client can save a lot of money in a project by lowering the concrete cost. An alternative material to the sand is recommended to prevent the unnecessary treatment process to clean the mineral salt of the sand so that the total cost of the materials can be lowered down.

Normal concrete with sand is easily attacked by the chemical solution and the durability of the concrete is weak. The used of other waste material to replace the material of current conventional concrete is encouraged to improve the durability on the concrete. Quarry dust is a type fine aggregate which has similar properties as the sand and it is cheaper compared to the sand. Besides, quarry dust has the potential to achieve better durability and the comparison with the normal concrete is required to prove on this matter.