A STUDY ON COMPRESSIVE STRENGTH OF CONCRETE WITH GLASS AGGREGATE

BY

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ABSTRACT

A study on compressive strength of concrete with glass aggregate will be carried out. In this study, the potential of glass waste aggregate as a replacement to the normal aggregate will be investigated. The waste glass, which is broken or rejected during the process of recycling, has a potential to be used as a glass aggregate. By using glass aggregate, the environmental problem can be reduced and provide an alternative for usage of normal aggregate. Generally, glass aggregate is clean, safe, economic, durable, strong and more workable. It can be used as a road beds, pavement and parking lots, as well as for drainage medium, backfill or landscaping purposes. The compressive strength depends on types of glass, where the strength at 28 days for pub and club bottle achieves 91.6 % and for bottle-bank achieves 81.8 % of relative strength. The size of the glass aggregate used in this study is 10.0mm. The type of glass is pub and club waste bottle. The grade of concrete is 30 and the replacements of the glass aggregate are 0%, 10%, 20%, 30% and 100%. The compressive strength of concrete cube will be tested on day 3, day 7, day 14 and day 28. For the preliminary study, a compressive strength test for concrete grade 30 has been carried out by using 100% glass aggregate to replace a normal aggregate. It is shown that, the compressive strength of concrete with glass aggregate is less compared to concrete with normal aggregate.

CHAPTER 1
INTRODUCTION

1.1 Background

Recycling will reduce pollution and saves energy, while by making products from virgin or raw materials will results in pollution and use more energy. Therefore, recycling waste is very beneficially in order to reduce pollution and saves the natural source of materials. Although, Malaysian municipal solid waste is not as critical compared to other developed countries, but it is better if the country have a prevention measures before it is too late.

The amount of the solid waste in Malaysia is approximately over 15,000 tons of rubbish everyday. It can be divided by category namely where 5,475 ton is from household waste, 4,050 ton is from a paper waste, 2,460 tons is from a plastic waste, 585 tons is from steel, 555 tons is from glass waste and 1,875 tons is from others. The highest content of the glass waste contributed from alcoholic and soft drinks bottle, which is 50%, 30% from other jar and bottle and 20% from durable goods (Kitar semula, 2000).

Although the amount of waste glass is small but it has a potential of releasing greenhouse gases into the atmosphere that might trap and retain heat from the sun. Therefore unmanageable glass waste will cause pollution and might create a warming effect on Earth.