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COMPARATIVE STUDY ON THE BEHAVIOUR OF
NORMALWEIGHT CONCRETE AND LIGHTWEIGHT CONCRETE
USING 0.50 AND 0.70 WATER/CEMENT RATIO

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ABSTRACT

For structural applications of Lightweight Concrete (LWC), the density of concrete is often more important than the strength. A decreased density for the same strength level permits a saving in dead load for structural design and foundation.

The aim is to study the comparison on the behaviour of NWC (normalweight concrete) and LWC (light weight concrete). The concrete is of grade 35 and the water/cement ratio are at 0.50 and 0.70.

The strength development at test will be carried out on 150 mm x 150 mm x 150 mm cube at 3, 7, 14 and 28 days.

It is meant to study which portion of water/cement ratio gives the best output for lightweight aggregate concrete. Conclusively, the 0.5 w/c ratio of 60% LECA replacement gives better overall output as compared to 0.70 w/c ratio. Unfortunately, no conclusion can be outlined to evaluate which is better between LWC and NWC of the same water/cement ratio.

CHAPTER ONE

1.0 INTRODUCTION

The usage of concrete as construction materials whether in industrial, commercial, recreational and infrastructure is very widely used in developing country like Malaysia. Because of the varying in usage, it becomes more important and is preferred compared to timber or steel.

Mathematically,

$$\text{Concrete} = \text{cement} + \text{coarse aggregates} + \text{fine aggregates} + \text{water} \dots\dots\dots(\text{EQN. 1})$$

However, the dense nature of concrete reflects the dark side of its service. This dense properties contribute to the load of structure i.e. self weight. Furthermore, this characteristic constraints the handling, transporting, stacking and also installation of concrete. To overcome such problems, the idea of making a concrete lighter was introduced. As indicated in *EQN. 1* above, if we could reduce the weight of aggregates consumed, we might eventually reduce the weight of the hardened concrete. Nevertheless, the salient properties of strength and durability must not be compromised.