THE EFFECT OF NONYLPHENOLETHOXYLATE ON THE DENSITY, STRENGTH AND ABSORPTION CHARACTERISTIC OF LIGHTWEIGHT CONCRETE

by

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ABSTRACT

Concrete, so commonly accepted in our buildings, bridges, highways and an infinite variety of other structures, is taken for granted as massive and weighty. Not necessary so. A broad spectrum of light weight concrete has been used successfully in construction industry for many years. For structural applications of lightweight concrete, 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 of this project is to study on the effect of Nonylphenolethoxylate as partial raw material use in lightweight concrete on the performance of concrete strength development, density and durability. The experimental programs comprises of 18 different mix proportions; Cement aggregate ratio at 1 : 3. Air entraining agent is introduced with different dosage in the concrete mix.

The strength development test is carried out on 150mm cube at 3, 7, and 28 days and water curing is adopted. For the evaluation of absorption, the Initial Surface Absorption Test is adopted. Lastly, dry density of the sample is measured at the age of 28 days.

CHAPTER ONE

1.0 General

1.1 Introduction

Concrete is one of the most popular construction materials used since hundred years ago. Because of its flexibility in usage it becomes more important and is preferred compared to timber or steel. The combination of cement, coarse aggregate, fine aggregate and water makes up a concrete. It is an acceptable fact now that not only the strength of concrete which plays a main role, in deciding the quality of concrete but what matters most is the durability at services stage. This technological advancement form a challenge to mankind to look into various ways and means to improve concrete.

Aggregate is one of the important ingredients in term of strength and bonding in concrete. In general, aggregate in concrete can be defined as those having apparent specific gravity of 2.4 or above. Aggregate can be divided further according to their particle shape such as rounded irregular, angular and flaky and according to their surface texture, i.e. glassy, smooth, granular rough, crystalline and honey-combed and porous [*Short & Kinniburgh,1978*]. By virtue