

Investigating an optimum mixing method to produce foam concrete fulfilling the workability, density, shrinkage, strength and total volume criteria

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Abstract. Production of foamed concrete have the risk of encountering segregation, high shrinkage and low strength. One of the reasons for these problems is the difficulty in mixing method. Two mixing techniques, wet and dry mixing methods, were investigated and resulting properties recorded. Five main properties characterized a foamed concrete mix and these are density, workability, shrinkage, strength and total volume. The first mixing method, wet mixing method, tend to have segregation and shrinkage problems. The target density was difficult to achieve. The second mixing method, dry mixing method, proved to achieve target density easily and lesser shrinkage problem. The dry mixing method proved to produce foamed concrete with specific target density and workability.

Keywords: foamed concrete, production, shrinkage, segregation, dry mixing method

1 Introduction

Today's construction industry is constantly in need of new materials for use. One of the most common materials is concrete. In the advent of chemical innovations the technology to produce property-specific concrete has developed various types of high performance concrete (HPC). One special concrete that falls under HPC is a lightweight concrete. Lightweight concrete is used to minimize the self-weight structure. There are three main types of lightweight concrete which are autoclaved aerated concrete, lightweight aggregate concrete and foamed concrete. In this study the lightweight concrete is foamed concrete by introducing foam into a mortar slurry.

Foam concrete is produced from four basic materials, viz cement, water, sand and foam (Fig.1). The foam used in this process is a category of stable white bubbles flowing from a compressed tank. Foam concrete is known as a cementitious concrete with mechanically entrained foam in the mortar slurry in which air-pores



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