

AN EXPERIMENTAL STUDY ON CONCRETE PARTIALLY
REPLACEMENT OF CEMENT BY ZEOLITE

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ABSTRACT:

The main aim of this study is the use of admixtures that can be incorporated into concrete for new added benefits in order to gain understanding into the characterization of their influence and specific behavior in linear structures. With the use of special admixtures the number of benefits of concrete during its useful life increases, both in terms mechanical properties and durability. Zeolite is a popular type of natural pozzolanic material which has been widely utilized in constructions since ancient times and zeolite is the largest group of silica minerals. It is widely used in producing blended. The use of Zeolites in mixture designs, both mortar and concrete. The present study is carried out in mix of M30 grade concrete with partial replacement of cement by 0%, 5%, 10%, and 15% Zeolite is carried out to determine the optimum percentage of replacement and hardened concrete properties such as compressive strength, flexure strength, split tensile strength test of the concrete on 7, 14 & 28 days is achieved. The presence of silicon dioxide in natural zeolite will expected to increase the concrete strength through reaction with the calcium hydroxide from the hydration of OPC (Ordinary Portland Cement). Test results indicate the use of combination of Zeolite in partial replacement of cement in the concrete has improved the mechanical properties

Keywords: Zeolite, mechanical properties, M30, optimum percentage, test on concrete.

1. INTRODUCTION

Today concrete is the most used man-made material in the world due to its competitive price and desirable properties. However cement production is estimated to produce about 5% to 7% of total greenhouse gas emission each year. This has a significant impact on the environment and construction industries. The high carbon footprint of cement production urges the industry to look for more sustainable, durable and low energy product.

Nowadays, supplementary cementing materials (SCM) have been widely used to reduce the consumption of Portland cement in order to improve the sustainability of our environment. Materials are usually added to concrete to reduce permeability, increase strength or to provide a sustainable solution where a large amount of binder required.

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