

Feasibility Study of Manufacturing Eco- Blocks Concrete Using Marble Sludge powder as Raw Materials

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Abstract

Marble wastes in the form of sludge obtained from marble cutting industry were incorporated in the batch formulations of block concrete. The possible substitution of Marble sludge powders produced from marble processing for limestone was investigated through three years. Samples of different formulations, in form of concrete blocks, were produced at pilot – plant scale and characterized throughout all the stages of production process. The experimental results and their interpretation shows that suitable incorporation of Marble sludge powders can result in blocks manufacturing with accepted and favorable characteristics, in terms of compression strength at 28 days (9 N/mm²), and water absorption (7%). Incorporation of Marble sludge had positive effect on block properties and density during manufacturing process, anticipating a complimentary usage of sludge as a by- product instead of being waste.

Keywords: *Eco-construction blocks, marble sludge powder, cement, sustainability, environment, waste re-use.*

1. Introduction

Nowadays, the growing consumption among available natural resources as raw materials in industry to increase production to satisfy the market needs, leads to decreasing their quantity as well as