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# Experimental studies on cement stabilized masonry blocks prepared from brick powder, fine recycled concrete aggregate and pozzolanic materials

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## Abstract

This experimental work deals with the assessment of strength and water absorption characteristics of cement stabilized masonry block (CSMB) units made with brick powder (BP) and fine recycled concrete aggregate (FRCA) along with pozzolanic materials such as silica fume (SF), fly ash (FA) and ground granulated blast furnace slag (GGBS) as partial replacement for cement. The basic tests such as, dry density, 28 days wet compressive strength, water absorption and rate of moisture absorption are performed on CSMB units of size 190x90x90 mm. The correction factors that are available in the literature, with respect to fired clay bricks and compressed earth blocks, so as to account for the confinement of specimens by platen restraints at the ends are used to assess the uniaxial strength of CSMB units. The corrected average values of wet compressive strength of CSMB units at 28 days are found to meet the minimum requirement of 3.5 MPa. The percentage of water absorption is found to be higher, but, still within permissible limit of 18% by weight. The average dry density is also found to meet the minimum requirement of 1750 kg/m<sup>3</sup>. The rate of moisture absorption with time is found to follow an exponential trend.

**Key Words:** Brick powder; Fine recycled concrete aggregate; Silica fume; Fly ash; Cement stabilized masonry block.

## 1 Introduction and importance of this study

Construction and demolition waste predominantly comprises of concrete and brick masonry waste. Recycling of concrete waste is very well documented in the literature. Bricks are considered to be the second most widely used material after concrete. Bricks are mostly treated as waste, when broken or damaged during their production, or, from construction and demolition activities. It is observed that brick waste contributes significantly to the waste stream in India. The general practice of recycling brick waste is to crush and use them as

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