Review paper: Strength performance of eggshell as a cement replacement in concrete

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ABSTRACT

The numbers of Malaysian construction industry had been increasing in several years with the large construction building and infrastructures projects had been constructed. Therefore, these developments led to an increase of cement production. The production of cement will cause wider environmental implication such are air pollution, water pollution and soil pollution which are very dangerous for human health. This is due to the manufacturing of cement that release dust, toxic and carbon dioxide emissions, which is a significant contributor of greenhouse gases. To overcome this problem, several researches had been conducted for the past few decade to find a new waste material that have same mechanical properties which can replace cement content in construction. One of the most promising materials that shows great potential is eggshell as a cement replacement. It is reported that the global egg production will increase to about 90 million tons by 2030, therefore the waste of eggshell will be increased too. This paper study the mechanical properties of eggshell as a cement replacement in concrete. Several papers had been reviewed and the results are presented in order to shows the performance of eggshell in concrete. The result shows that the concrete with less than 15% replacement of eggshell produced higher compressive and tensile strength compared to normal concrete. Moreover, the flexural strength of concrete containing eggshell up to 20% replacement shows comparable results with normal concrete. From the results, by replacing cement with eggshell up to 15% show a good performance as well as can reduce the use of cement and reduce the eggshell wasted in landfill.

KEYWORDS

Waste materials; Construction; Carbon dioxide; Emission; Cement

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