

BI 08 A comparison of the long term and short term performances of masonry blocks manufactured with waste materials

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Construction and demolition Waste (C&DW), rice husk ash (RHA) and coconut shells (CS) are often considered as waste, though it consists of appreciable structural properties such as high strength and bond capacity. In order to utilize these wastes, several researches have been carried out. Developed blocks using C&DW, RHA and CCS have exhibited acceptable performances in short term condition. However, it is important to study about long term performances to investigate the durability of the product. In this study, long term performances of the blocks, such as compressive strength and water absorption, were investigated and compared with short term performances. In addition, long term thermal performance of the CCS based block was also investigated. Two sets of blocks with the age of 28 days and 1-3 years were used to investigate short term performance and long term performance, respectively. Long term average compressive strength of C&DW based block, RHA based block and CCS based block was 2.886N/mm², 2.694 N/mm² and 4.947 N/mm² respectively. Long term average water absorption of the C&DW, RHA and CCS based blocks was 9.268%, 14.55% and 13.513%, respectively. Most of the average compressive strengths and water absorptions were greater than that of the corresponding conventional blocks of the same age. In addition, these values satisfied the acceptable limit. The long term thermal performance of CCS based blocks was better than the short term thermal performance. Temperature difference between long term and short term performances at the peak time was 2^oC. It was found that the blocks manufactured with waste have acceptable structural and thermal properties after long time.

Keywords: crushed coconut shells, rice husk ash, construction and demolition waste, compressive strength, water absorption