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Exemplification of Sustainable Materials through the Construction of Model Houses

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Abstract

The fast-growing civilization is contingent on the development of infrastructure. The population growth and economical competition induced many nations to run this development in fast-track that caused depletion of natural resources. This has affected our environment seriously that resulted in ecological imbalance. Hence, alternative materials are required to utilize to replace virgin materials. Development of appropriate technology is not the only step before implementation the technology in reality; ensuring the sustainability of substitutive material is the precedence step to materialize the concept. During the last three decades, Centre for Innovative Construction Technology (CICT), University Malaya (UM) has been involved in research and development of sustainable industrial by-products and wastes as alternative construction materials. Two single-story houses, namely Low-Cost Model House (LCMH) and Geopolymer Concrete House (GPCH) have been built using environmentally friendly materials within the university campus. UM is the first university in Malaysia to build a cement-free house on its campus. Locally available industrial by-products and waste materials, namely fly ash, ground granulated blast furnace slag, palm oil fuel ash, palm oil clinker powder, manufactured sand, steel slag aggregate, etc., have been used in the development and construction of these houses. Apart from the materials, environmentally friendly methods of construction were also adopted. The system of construction and the application of sustainable building materials used in the LCMH & GPCH along with its advantages in terms of environmental, economic and the social aspects would pave way for further meaningful application by the construction industry.



Low-Cost Model



Geopolymer Concrete House

Two model houses constructed using sustainable materials in University of Malaya, Kuala Lumpur, Malaysia as a showcase for public and construction companies.