

Chapter 30

The Potential of Blended Cement Mortar Brick Using Sewage Sludge and Eggshell Waste



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Abstract Sewage sludge is one of the largest contributors toward solid waste in Malaysia. The amount of sewage generated is expected to increase every year, which is in line with the population growth in Malaysia. Landfilling has been identified to be the most widely used method to dispose of sewage sludge in Malaysia. This high amount of solid waste resulted in shortage of landfilling area, which has indirectly increased the cost of waste management in Malaysia. Hence, the aim of this chapter is to identify the potential use of solid wastes; namely sewage sludge and eggshell as partial cement replacement in mortar bricks. The sewage sludge and eggshell wastes were obtained from Indah Water Konsortium (IWK) and Eggtech Manufacturing, respectively. Both sewage sludge and eggshell powder were treated prior to mixing. The organic materials in the sewage sludge were removed through incineration process at a temperature of 800 °C for 3 h in which Incinerated Sewage Sludge Ash (ISSA) was produced. Meanwhile, the eggshell waste was dried under the sun before being ground into powder form. The treated ISSA and eggshell powder were then mixed with Ordinary Portland Cement, fine aggregates, and water to produce mortar bricks. Tests including compressive strength, flexural strength, and water absorption were conducted on bricks formed from four different percentages of eggshell powder (5–20%) with 10% ISSA. Findings showed that 10% ISSA as partial cement replacement with 5% eggshell as additive has increased the strength of the mortar bricks tested to 72% higher than the strength of the control bricks.

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© Springer Nature Singapore Pte Ltd. 2018
N. A. Jacob et al. (eds.), *Regional Conference on Science,
Technology and Social Sciences (RCSTSS 2016)*,
https://doi.org/10.1007/978-981-13-0074-5_30

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