

Behavior on the mechanical performance and scanning electron microscopy of coal waste brick

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ABSTRACT

Waste is a common ingredient in Malaysia that has to do with man-made waste. Waste materials can be abundant in landfills without any profit. Waste materials can be harmful to the environment as well as to human health. One of the most abundant wastes is coal combustion ash from coal-fired power plants. In addition, the most common material used in the construction industry is brick. Bricks have been used for non-polluting structures and must be made of durable materials. The common material used for bricks is clay, sand and cement. All these ingredients are derived from natural resources. The depletion of natural resources has been a cause of concern for many. Therefore, this paper focuses on the development of bricks from coal terms of mechanical properties. The density, compressive strength and water absorption capacity of bricks made from coal ash were investigated after curing for 7, 14 and 28 days. The results show that the density of bricks made from coal ash is low, while the compressive strength meets the requirements and is 10.25 MPa and 8.67 MPa higher than control concrete, respectively. For the crushing value, the coal ash was compared with the coarse aggregate to meet the requirements of the test. The result shows that the coal is 34.6% higher than the natural aggregate. In conclusion, the use of coal ash in the production of bricks is a promising long-term option for the production of bricks.

KEYWORDS

Coal bottom ash; Lightweight; Mechanical performance; Scanning electron microscopy

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