

## **ABSTRACT**

### **OPTIMIZATION OF COMPRESSIVE AND WATER ABSORPTION STRENGTH OF THE CONCRETE BRICK WITH THE UTILIZATION OF BOTTOM ASH**

**BY**

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The use of coal as an energy source in power plants or other industries might result emerge of solid waste, in the form of fly ash and bottom ash. One way to utilize the use of coal waste is by using it as building material. In this study, coal waste (bottom ash) is used as a partial replacement of sand in construction materials such as hollow bricks.

This study aimed to determine the effect of the utilization of bottom ash in hollow brick toward the compressive and water absorption strength of hollow brick, as well as to determine the optimum percentage of bottom ash in the mixing of hollow brick. The comparison of the mixture composition of cement and sand used is 1: 5, whereas variations in the usage of bottom ash used in the mixture is at 0%, 5%, 10%, 15%, 20%, 25% and 30% of the weight of the sand.

The results showed that the hollow brick in a mixture with 25% bottom ash composition of the weight of the sand, produce the optimum compressive strength, 45.46 kg / cm<sup>2</sup> for 28 days old and 48.58 kg / cm<sup>2</sup> for 56 days old. Both of the hollow brick can be classified into the class II of SNI 03-0349-1989. For the water absorption test results, showed that the water absorption strength of Hollow brick can be classified into the class II of SNI 03-0349-1989, the amount of the water absorption strength is affected by the compressive strength of hollow brick.

Key words: hollow brick, *bottom ash*, compressive strength, water absorption strength.