

## **Utilization Of Ultrafine Palm Oil Fuel Ash in Interlocking Compressed Earth Brick**

### **ABSTRACT**

In this paper, the effect on utilization of ultrafine palm oil fuel ash (UfPOFA) on the properties of interlocking compressed earth bricks (ICEB) were investigated. The materials used to produce Interlocking Compressed Earth Brick (ICEB) includes clay soil, sand, Ordinary Portland cement (OPC), and water. OPC were replaced at 0%, 10%, 20%, 30% and 40% by mass percentage with UfPOFA. The ICEB specimens were cured at 7 and 28 days to study the bulk density, compressive strength and water absorption of the ICEB. The experimental results found that the incorporation of UfPOFA reduced the bulk density and compressive strength at both ages of the specimens as compared to the control mix. However, it was observed that their compressive strength improved with age. The compressive strength of ICEB specimen with 10% of UfPOFA showed the highest strength at 28 days amongst all mixtures containing UfPOFA with 6.53MPa, which was higher than the strength value required for loadbearing earth bricks in Malaysian Standard (MS) 76:1972. In addition, the lowest rate of water absorption was found to be 15.44% for 28-day old ICEB specimen with 10% UfPOFA, which was just slightly higher than 15% in compliance with MS 76:1972 on the rate of water absorption for earth bricks. The results thus showed UfPOFA as a potential material to be used as an OPC replacement to produce a sustainable ICEB.