

ABSTRACT

This study aims to investigate the usage of grapevine Shoots (GV) and Waste Glass (WG) which could enhance the thermal insulation and strength of fired clay bricks. The raw clay used in this experiment was blended with WG sourced from tempered and household waste glasses at a constant addition of 2% weight. Grapevine shoots (Thomson seedless variety) were incorporated at varying proportions of 2.5%, 5%, 7.5% and 10% of weight. The brick specimens were fired at a fixed temperature. The fired clay bricks were then tested for their physical, mechanical and thermal properties. The results showed that the addition of GV and WG contributed to reduce the density and thermal conductivity of the bricks, while moderately improving the mechanical strength compared to conventional bricks. Grapevine shoots created additional porosity, enhancing insulation, while waste glass acted as a fluxing agent, assisting in partial vitrification during firing. The specimen with 2% of WG and 10% of GV achieved a very low thermal conductivity of 0.015 W/m.K, while its compressive strength was above third-class but slightly below second-class brick standards. The results suggest that the developed bricks are suitable for non-load-bearing applications with excellent thermal performance.