

PRE-PRESSED AND BURNT SANDY CLAY TILES USED TO COVER EXPOSED CONCRETE ROOFS AS A SUSTAINABLE ALTERNATIVE

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Abstract

Traditional method of concrete ceiling used in Iraq is composed of covering the steel reinforced concrete roofs with a thin layer of asphalt covered by 7-15cm river sand, as a minimum, and then covered with concrete slabs 80x80x5 cm which are both, heavy materials and highly conductive causing severe problems of cost, cooling and heating tasks. In this research work a sustainable construction materials were studied to replace those conductive and unsustainable materials. A layer of putty clay with straw is used as a mortar on the asphalt coated concrete roof surface and then covered with tiles made of burned sandy clay. Pre-pressed Burnt Sandy Clay Tiles (PBSCT) were developed, produced and tested by the researchers. Used raw materials for slab manufacturing were withdrawn from Al-Anbar western desert. Chemical and physical analysis revealed that the best selected samples were from A'amj & Al-Husayniat quarries. Test results showed that higher silicon content, lower magnesium, potassium and sodium compounds leads to better slabs specifications. Higher compressive strength was obtained with higher burning temperatures as results showed 3.7 (M Pa) was the maximum reading for A'amj & Al-Husayniat clays with burning temperature of 1320 oC. Breakdown test shows that the max result was 1.43 (M Pa) at the same temperature.