

Investigation of Heat Impact Behavior on Exterior Wall Surface of Building Material at Urban City Area

Abstract

This paper represents a comparative study aiming to investigate the heat impact on the vertical surfaces of buildings temperature based on their thermal behaviors. This study was carried out based on four building materials commonly used in Malaysia namely brick, concrete, granite and white concrete tiles. In order to investigate the thermal performance on the building materials, surface temperature sensors, data logging system as well as infrared thermography procedures were used, respectively. As the thermal impact to the materials was measured using infrared thermometric and thermographic, a field work of thermal value can be simply observed as a “seeing heat” effect. The results indicate that bricks had the capability to absorb and store heat greater than other materials during peak daytime event. The normalized (total heat/solar radiation) of brick materials was 0.093, which was the highest value compared to others. A brick material shows the highest impact of heat in 51% than white granite material and it releases a substantial amount of heat into the atmosphere through radiation and convection factors. The types of material used at exterior wall buildings have significant impact to the surrounding environment. The use of suitable materials contributes to the reduction of the air temperature due to heat transfer phenomena.