

**ATTIC VENTILATION AND THERMAL PERFORMANCE OF METAL
DECK ROOF**

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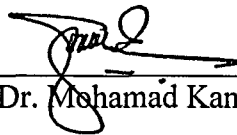
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ABSTRACT

Building material generally refers to those building components that enclose conditioned spaces and through which thermal energy is transferred to or from the outdoor environment. Moreover, the ventilation of residential attics with outdoor air is the accepted method for controlling excessive temperatures during summer and moisture accumulation during winter. Most building codes specify some form of ventilation requirement for attics either as a required air flow rate or a certain vent area that must be incorporated into the exterior envelope of the attic. Building envelope is the main and most important factor for energy efficiency in buildings, which is everything that separates the interior of the building from the outdoor environment like the doors, windows, walls, foundations, and roofing structures. All the components of the building envelope need to work together to keep a building warm in the cool weather, cool in the hot weather and also comfortable. Improvement can be made on the heat transfer characteristics through roofing materials if experiments are conducted on its thermal characteristics. In this study, the research was done on heat flow characteristics through roofing materials of low slope roofs for the cases in unventilated and ventilated attic, which are commonly found in many non-residential buildings in Klang Valley, Selangor. The comparison between with and without ventilation were then investigated by measuring the thermal characteristics, particularly the heat flow through roof structure. Heat flux through the roofing materials were measured using huksefluks HFP01SC sensors. At the same time, temperatures of the surfaces were recorded simultaneously on the interior and exterior of the roofing materials by using thermocouples Kx. The temperature differences were used in estimating the thermal resistance of the roofs. From this study, it was found that the insulation and the attic environments do provide a significant impact on the temperature where the insulations reduced the heat transfer and the attic ventilation reduced the temperature in the roofing structure. This is a good indication that the building components or structure is good in reducing heat trapped in insulators.

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