HEAT FLOW CHARACTERISTICS THROUGH LOW-SLOPE METAL DECK ROOFS

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A thesis submitted in partial fulfillment of the requirements for the award of Bachelor Engineering (Hons) (Mechanical)

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APRIL 2005

ACKNOWLEDGEMENT

Firstly, in the name of the Almighty I would like to express my thankful for His guidance and generosity in giving me strength and courage to complete this thesis successfully from its planning until its finish touch in order to fulfill the requirement for Bachelor of Engineering (Hons.) in Mechanical Engineering.

To my project advisor, Prof. Dr. Azni Zain Ahmed, I would like to express my appreciation for her sincerely and positive advices, help, patience and encouragement in the duration of the report preparation from the beginning until it fully completion. Her knowledge and enthusiasms was an essential ingredient in this thesis. I am particularly grateful that they were willing to take me as their student, despite her numerous other responsibilities.

In expressing my appreciation and thanks I will not forget En Badrul Hisham Mohd Noor for his continuously help in preparing the equipment, and warm encouragement for the duration of this project.

In addition, I wish to express my sincere gratitude to my partner Hafizul Kamarulzaman Bin Azmi for his invaluable contributions. I would also like to thank my lecturers at the Universiti Teknologi Mara (UiTM) for the valuable knowledge that I obtained during my studies. There are many kind-hearted people at UiTM whose time, energy and effort are greatly appreciated.

Finally, I would like to extend our heartiest thanks to my parents, family, friends and every participant that involved directly or indirectly to complete that given the assistance especially for their effort, support, and ideas in completing my project.

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. In buildings, energy efficiency means using less energy for heating, cooling, and lighting. It also means buying energy-saving appliances and equipment for use in a building. 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, foundation, roof, and insulation. 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 comfortable. Roofing material is known as an important part of residential, non-residential and industrial buildings. Improvements can be made on the heat transfer characteristics through roofing materials if experiments are conducted on its thermal characteristics. In this project, the research was done on heat flow characteristics through roofing materials of low slope roofs, commonly found in many non-residential buildings in Klang Valley, Selangor. The thermal characteristics, particularly the heat flow and the characteristics of the roofing structure are investigated to determine its appropriateness as a roofing material. Heat flux through the roofing materials are measured using hukseflux sensors. At the same time, temperature measurements were recorded simultaneously on the interior and exterior of the roofing materials by using thermocouples. The temperature differences were used in estimating the thermal resistance of the roofs. Generally, the study found that the insulation does give a significant impact on the temperature where the insulations reduce the inside temperature of the buildings. This is a good indication that the building materials for roofing are good insulators.

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