EVALUATION OF HEAT TRANSFER THROUGH WALL IN MALAYSIA- A CASE STUDY OF UiTM TEST CELL

ZAIDATUL SALWA BINTI MAHMUD

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ABSTRACT

EVALUATION OF HEAT TRANSFER THROUGH WALL IN MALAYSIA - A CASE STUDY OF UITM TEST CELL

This is a study to evaluate the heat transfer through walls of different building orientation in the local climate. A test cell located in the campus of UiTM Shah Alam is used as case study. Data of the internal and external surface temperature for walls at the for orientations of North, South, East and West were measured using thermocouple type T. there were recorded on automated data logging system at an interval of 10 minutes for a duration of 5 days. The heat transfer for each wall orientation were calculated and compared. The building OTTV was also calculated and checked for the MS compliance. And finally the thickness of the east and west wall to minimize heat gain were calculated and proposed. The results show that the maximum heat gain through North and South walls are 159.9 W at 2.30 pm on the 1st day, and 169.25 W at 12.40 pm on the 2nd day respectively. The MS for building OTTV is 50W m^{-2} and for this test cell the value is 0.97W m^{-2}. The calculated wall thicknesses of brick material are 0.228m for east wall and 0.345m for west wall.

CHAPTER 1

INTRODUCTION

1.1. Background

One of the main high internal heats for typical Malaysia buildings is the wall envelope. It is important that energy management is well conducted to ensure that maximum benefit would be derived from the insulation of the building envelope (M. Department of Standard, 2007). Heat transfer through building envelope is determined by the thermophysical properties of the envelope, and the internal and external environmental condition. This study focuses on the heat transfer through vertical wall for different orientation in tropical climate. Twin Energy Efficiency Test Cells are used. The walls are heavyweight walls. Type T thermocouples are connected to data logger, Data Taker DT80 and Graphtec. Data was taken with 10 minutes interval for 10 days in natural ventilated mode. The values for thermal transmittance, U-value is gained by calculation.