

UNIVERSITI TEKNOLOGI MARA

**THE EFFECT OF BUILDING
ENVELOPE PERFORMANCE
DESIGN USING THE OVERALL
THERMAL TRANSFER VALUE
(OTTV) FOR NON-RESIDENTIAL
BUILDING: A COMPARATIVE
STUDY**

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MSc

July 2020

AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulation of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research

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ABSTRACT

The heat gain of a building correlates to the building energy efficiency thus designing a building that does not gain a lot of heat gain is crucial in building an energy efficient design. The building envelope is the barrier between the indoor and outdoor environment thus the façade of a building would influence the performance of a building. This study identify which characteristic of a building envelope from the parameter of Overall Thermal Transfer Value (OTTV) that would enable the most heat loss thus would provide a more energy efficient building. In order to identify which parameter of a building envelope would influence the heat loss the most, comparison of the parameters of OTTV and the result of the heat gain building were compared. The comparison was done using two case studies that are chosen whereby a GBI index building is a good case study for an energy efficient façade while a conventional building without consideration of a sustainable design could be compared thus the parameter would be identified. Through building measurement and interview and lastly OTTV application, the data were collected and analysed. From this study, it was found that there are four OTTV parameters that would influence the heat gain which are (1) Window to Wall Ratio, (2) Solar Coefficiency Factor, (3) U-Value Fenestration and (4) U-Value Wall. The research discusses all of the four parameters and which influences the least heat gain in the building. It was found that the Solar Coefficiency Factor of the glass contributes most to the heat gain. This finding would contribute in designing a building envelope that would gain less heat.

Keywords: building envelope, façade, OTTV, heat gain, energy efficiency, GBI Index building,

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