

**THE EFFECT OF INSULATION ON DAYTIME COOLING FOR
INSULATED AND NON-INSULATED BUILDING**

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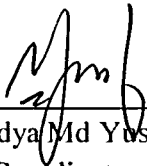
This Final Year Project entitled “**The Effect of Insulation on Daytime Cooling for Insulated and Non-Insulated Building**” was submitted by Mohamad Amerul Akmal Kamarulzaman, in partial fulfillment of the requirement for the Degree of Bachelor of Science (Hons.) Physics, in the Faculty of Applied Sciences and was approved by



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ABSTRACT

In a tropical country like Malaysia, there is a dire need of installing air-conditioning in order to have a more comfortable ambience temperature. However, there are growing concerns about the increasing energy consumption in the world and Malaysia particularly. In order to achieve both comfortable lifestyle and energy conservation at the same time, mostly believed and held upon through studies and research done, the installation of insulation above the ceiling is one of the solution. Therefore this study is aiming to further complement the studies and research done, by evaluating the energy consumptions on non-insulated and insulated building during daytime cooling using field data, and is compared and backed with computer simulation data using Integrated Environmental Solution software (IES) and also to determine the relationship between energy consumption and outdoor temperature. The field study was carried out at energy efficiency test cell with dimensions are 4m width, 4m length and 3m height located in Universiti Teknologi MARA, Shah Alam, measuring the energy consumption on cooling load in daytime cooling for non-insulated and insulated building in 7 days with 10 minutes interval. One of the test cells was equipped with insulation at ceiling and mineral wool insulation with the thickness of and 100mm for fiberglass insulation and was installed with a 950W split unit air conditioning system that setup the temperature at dry bulb temperature, 24°C. The results for both field and computer simulation data gave a similar pattern showed in this study, which is that insulation building will consume less energy, despite the difference in value in terms of the energy consumption between field and computer simulation. From the result, total daily energy consumption recorded was influenced by the outdoor temperature as the outdoor temperature increase, the energy consume by cooling load also increase. From this relationship, the best equation with higher correlation coefficient was generated and the value of correlation coefficient is showing the effectiveness of outdoor temperature on energy consumption.