

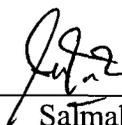
**INVESTIGATION OF DAYLIGHTING PERFORMANCE INSIDE
BUILDING DUE TO LIGHT PIPES OF DIFFERENT DESIGNS**

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**Final Year Project Report Submitted in
Partial Fulfilment of the Requirements for the
Degree of Bachelor of Science (Hons.) Physics
in the Faculty of Applied Sciences
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This Final Year Project Report entitle “**Investigation of Daylighting Performance Inside Building due to Light Pipes of Different Designs**” was submitted by Robaiah Bt Hj Mamat, in partial fulfillment of requirement for the Degree of Bachelor of Science (Hons.) Physics, in the Faculty of Applied Science, and was approved by



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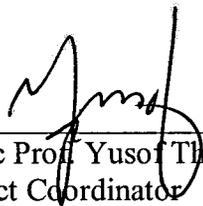
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ABSTRACT

INVESTIGATION OF DAYLIGHTING PERFORMANCE INSIDE BUILDING DUE TO LIGHT PIPES OF DIFFERENT DESIGNS

Malaysia is blessed with plenty of sunlight. Fully utilize of this great natural resource would significantly reduce the total electric energy consumption in buildings. Using light pipe for example, to introduce natural light in the occupied space is said to give a lot of advantages. Its small cross sectional area of opening allows less heat to enter the building. In addition, light pipe is also applicable for deep interior spaces, where having windows is an impossible option. This study was conducted to investigate the performance of five different designs of light pipes models. The models were built using a highly reflective material and were tested in a room model under a solar simulator. The whole experiment was divided to two parts. The first part covers the investigation on the intensity of the transmitted daylight when the light pipe models were placed at the center of the roof. The result indicates that cylindrical design performs the best in terms of the average illuminance of the transmitted daylight as well as the distribution of the light. In the second part, further investigation was carried out by placing the light pipes at one corner of the room. This involves only two designs which can be fixed nicely to the corner of the walls. It was found that having only one unit of light pipe of such design is not sufficient in bringing in daylight into the interior space. However, prediction based on the real measurement data shows that certain light pipe designs that can be fixed well to the corners have great potential to replace artificial light during daytime if more than one unit is used.