

FIBER OPTIC LIGHTING SYSTEM

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

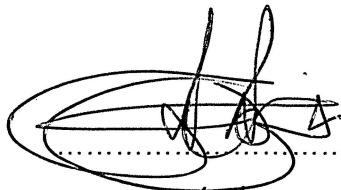
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MAY 2010

"I declared that this thesis is the result of my own work except the ideas and summaries which I clarified their recourse. This thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree."

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ACKNOWLEDGEMENT

Thank you to Allah the one who give me strength, motivation and help in this research. Thank you to Mr. Baljit Singh A/L Bhathal Singh for the support and guidance in writing and understanding the project. Thank you to the Malaysia Meteorological Department for the data obtained from the M.M.D and Faculty of Mechanical Engineering and also Faculty of Applied Science in providing material and equipment for me to accomplish this experiment. Thank you to my family in supporting me and my dear friends who have helped me. And I hope my research can help other who needs to continue my effort.

ABSTRACT

Solar lighting can be considered as a very promising technology to be used for an energy efficient green building in order to reduce the energy consumption and also help to maintain the environment. The aim of this study is to determine whether the solar fiber optic using PMMA cable can be built as an energy efficient using a low cost parabolic reflector. This research is to measure the capabilities of using the fiber optic lighting system in Malaysia within the condition of weather changes and cloudy environment. Using the 1-axis sun tracking device and using the parabolic reflection to concentrated the sunlight into the single fiber optic with radius of 10mm as a lighting system. The system is installed and put at the top floor of the Science and Technology building and the luminance is recorded for each hour for 6 days. The system is used to light a covered space where the measurement device is put under the tip of the fiber optic with a ratio of high to width 1:1. The dispersion effect of the light is not measured. The study is only to determine the availability of the light in 11 hours from 8.30am to 6.30pm. From the analysis, the system can be used for constant illumination for 8 hours start from 10.30am to 5.30pm if the sky is clear. And the condition of the weather changes may affect the value of luminance from the fiber optic. Parameter affecting the performance was discussed, and suggestion to improve the system to increase the efficiency of the system is stated. It is believed that this system can be one of a way to reduce electric consumption for building application.

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