

UNIVERSITI TEKNOLOGI MARA

**INVESTIGATING THE
PERFORMANCE OF TURFGRASS AS
PASSIVE COOLING ELEMENTS IN
BUILDING COURTYARD**

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MSc

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AUTHOR'S DECLARATION

I declare that the work in this dissertation was carried out in accordance with the regulation of Universiti Teknologi MARA. It is original and is the result of my own work unless otherwise indicated or acknowledged as reference work. This topic 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 current trend in constructing a building in Malaysia is having enough green space to meet the minimum standard of 'green building'. Typically, having vegetation in or around the building area will give cooling effects to the building especially building with courtyard. According to the previous studies, the presence of vegetation as passive cooling element will lead to the reducing of environment temperature which later contributes to the cooling environment and can adequately adjust the building microclimate. The passive cooling technique uses vegetation as a non-mechanical method to maintain a comfortable indoor and outdoor temperature. Vegetation such as turfgrass is widely used in the landscape design for buildings and design spaces. However, based on the previous research, there have been few studies regarding the impact of using turfgrass as an element in a passive cooling technique for building courtyard in Malaysia. This research aims to investigate turfgrass performance as one of the passive cooling technique element. To achieve this aim, three objectives have been formulated; (1) to measure temperature reduction on courtyard by using turfgrass; (2) to compare temperature differences between the turfgrass area and concrete area; (3) to investigate the significant of air temperature reduction of the turfgrass area compared to concrete area as passive cooling technique. The methodology adopted for this research is a field experiment and the investigation was implemented in one case study, a building courtyard with two different surfaces; the turfgrass area and concrete area. All data gathered in the finding implies that the turfgrass is capable of reducing air temperature provided that the turfgrass needs to meet the standard to be a passive cooling element. However, the significant differences between the performance of the turfgrass area and concrete area should be considered, given that the selected variables affect the result from both areas towards achieving passive cooling

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