Readings in Contemporary Construction Technology and Management

Muhammad Abu Eusuf

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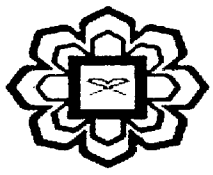

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ASSESSMENT OF LINKAGE BETWEEN NATURAL VENTILATION, THERMAL COMFORT AND URBAN MORPHOLOGY OF A SEMI-OPEN PLAZA IN THE HOT-HUMID CLIMATE

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ABSTRACT

Semi- open spaces microclimate conditions are affected by the surrounding structures and urban morphology. There is a trend in designing such spaces particularly around high-rise developments due to increased social and commercial activities within the suburban structure. The challenge within the hot, humid context is to not commit them to a lifetime of air-conditioning consumption. The impact on airflow magnitude and distribution are particularly significant in thermal comfort – hence overall aim of this study is to evaluate the relationship and effect of urban morphology, configuration of the plazas and their impact in terms of natural ventilation and thermal comfort. This study reports on analysis and field studies of a recently built mixed development complex in suburbs of Kuala Lumpur (by Ken Yeang). These two 21 story residential buildings are connected through a four-story plaza, designed as a commercial hub. The thermal comfort data logger 1221 set up via 7301 software and RS-232 interface was used to monitor bio-climatologically indices such as temperature, humidity and air-flow in addition to thermal sensation indices like PMV and ET. The study contributes to the validating prediction and simulation studies of selected features and design decisions in the plaza such as the canopy and openings. It also provides further understanding in linkage between thermal comfort, human activities and environmental conditions in a tropical climate.

Keywords: Natural ventilation, thermal comfort, semi-open plaza, hot and humid climate