

Title: Thermal Comfort Assessment At Plazas Adjacent To Tall Buildings

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Abstract:

The thesis presents scientific evidence on the thermal performance of plazas built adjacent to tall buildings in Kuala Lumpur. Plaza is type of open space commonly built adjacent to tall buildings in the city. However, no work has been carried out to evaluate the thermal performance of these plazas adjacent to tall buildings (PATBs), particularly in the hot humid tropics. This thesis consists of three major areas: First is the development of P A TB types in Kuala Lumpur. The existing plazas adjacent to tall buildings (P A TBs) were identified through an environmental observation in central business district. The plazas adjacent to tall buildings (P A TBs) may be categorised into four types according to orientation and three types according to geometry. Second, is the development of the thermal comfort criteria for local application at the outdoors. The Predicted Mean Vote (PMV) was originally designed for indoor application and developed based on subjects from the temperate climate. At the outdoors, the Predicted Mean Vote (PMV) has been found to over-predict the Thermal Sensation Vote (TSV) of local human subjects. A modification scale, the Modified Predicted Mean Vote (PMVm) is proposed for the thermal sensation field experiment at the outdoors in the hot humid climate. Third, is the assessment of the representative plazas adjacent to tall buildings (PATBs), using the thermal comfort criteria. Generally, the plazas adjacent to tall buildings (PATBs) in Kuala Lumpur are thermally comfortable at the shaded areas for most part of the daytime. Shaded areas at the plazas adjacent to tall buildings (PATBs) can be achieved by providing appropriate orientation and geometry. It was found that the most favourable orientation is the combined orientation of Northwest-Southeast (NWSE) and Northeast-Southwest (NE-SW) while the most favourable geometry is the plaza underneath a tall building.