

The Effect of Phase Development on Micro-Climate Change of Urban Area

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Abstract : This paper presented the changes in temperature and air ventilation of an inner urban area at different development stages during 2002 to 2012 and the high-rise buildings to be built in 2018. 3D simulation models ENVI-met and Autodesk Falcon were used. The results indicated that replacement of old residence buildings or open space with high-rise buildings will increase the air temperature of inner urban area; the air temperature at the pedestrian level will increase more than that at the upper levels. The temperature of the inner street in future will get higher than that in 2002, 2008 and 2012. It is attributed that heat is trapped in the street canyons as the air permeability at the pedestrian levels is lower. High-rise buildings with massive podium will further reduce the air ventilation in that area. In addition, sufficient separations among buildings is essential in design. High-rise buildings aligned along the waterfront will obstruct the wind flowing into the inner urban area and accelerate the temperature increase both in daytime and night time.

Keywords : micro-climate change, urban design, ENVI-met, construction engineering

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