APPLICATION OF COMPUTATIONAL FLUID DYNAMICS (CFD) TO THE ASSESSMENT OF GREEN FEATURES IN BUILDINGS (WING WALLS)

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Background

The use of green features in building design not only improves the environmental quality, but also reduces the consumption of non-renewable energy used in active control of indoor environment. Larger window openings in the walls of a building may provide better natural ventilation. However, it also increases the penetration of direct solar radiation into indoor environment. The use of wing wall, one of the green features, is an alternative to create effective natural ventilation. CFD code can be used to study the ventilation performance of the wing wall. Its performances under different wind directions and speeds and wing sizes can be examined.

Fig. 1 Designation of the wind direction with an angle $\theta$

Fig. 2 CFD simulation (Filled contours of pressure) of rooms with and without wing walls of length 1.5m in 45° wind angle at wind speed (figures prepared by Mr. C. Cheng)