

Keynote Paper

The Role of Wind-Structure Interaction on Air Ventilation and Air Quality in Urban Environment

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ABSTRACT

The quality of Indoor and outdoor air have a significant impact on the health and well-being of the general population. The recent trend toward urban living and the dramatic increase in high-rise residential building construction to meet this growing demand heighten our awareness of the impact of high-density high-rise building development on air ventilation and dispersion of air-borne pollutants. Evidently high-rise buildings configured in close proximity, together with deep street canyons that these buildings create, adversely affect pedestrian level air circulation, air ventilation, and dispersion of air pollutants within the urban fabric. The SARS outbreak in 2003 in a Hong Kong high-rise residential housing estate brought into focus the potential role played by wind-structure interaction to facilitate the spread of air-borne contaminant. This paper presents the results of investigations on air ventilation and air pollutant dispersion around high-rise buildings using wind tunnel model studies and CFD simulations. The results show that air ventilation and air pollutant dispersion around buildings are dominated by wind-structure interaction, with building shape and features, building grouping and separation, and angle of wind incidence also playing a significant role.

REFERENCES

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