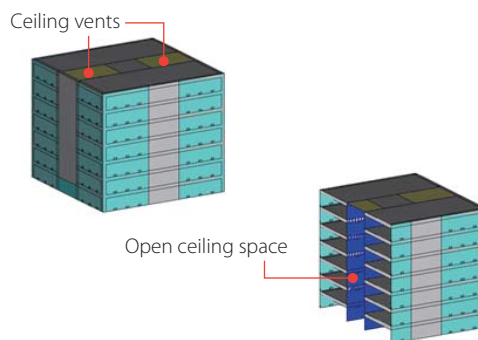
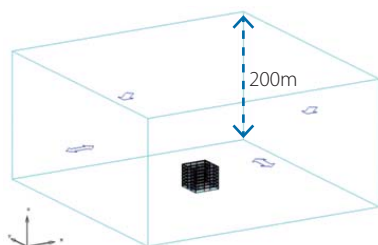
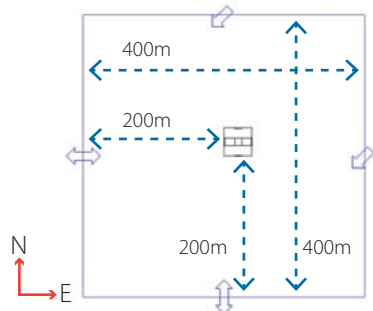


# Passive Ventilation of an Office Building

scSTREAM is used to simulate a passive ventilation system of an office building where the external air is taken from the vents below the windows and exhausted through open ceiling spaces of the building. The building is set up in an urban environment model with a constant wind.

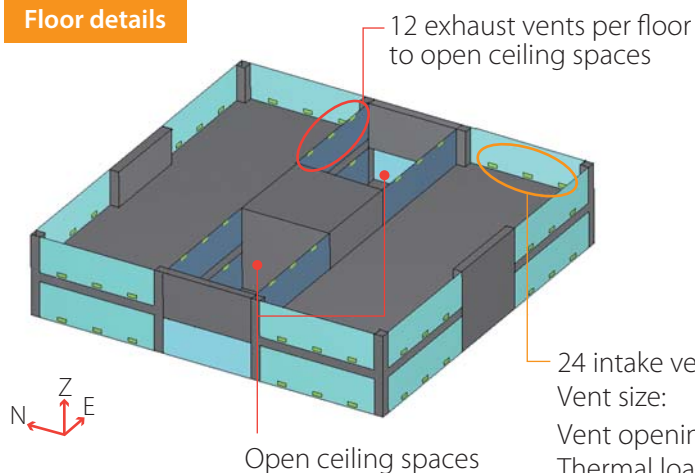
## Simulation Model

40m x 40m x 35m, 7-story office building

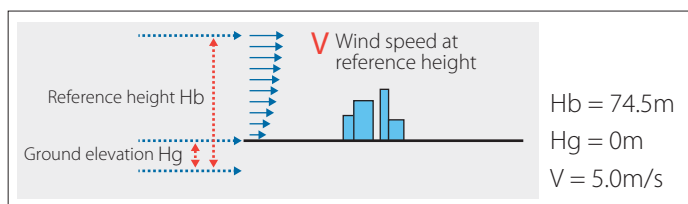


## Conditions and Results

### Floor details

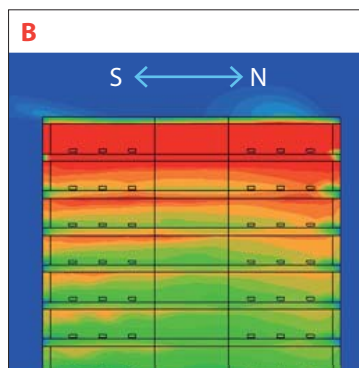
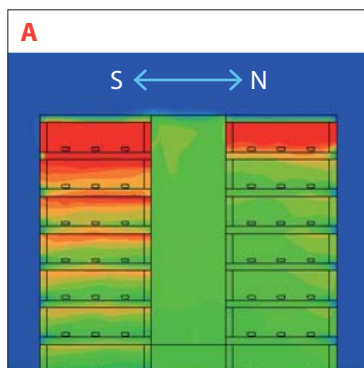
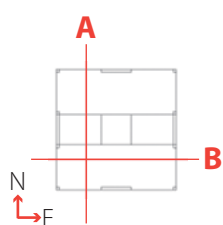


### Wind conditions: Northeast wind at 20°

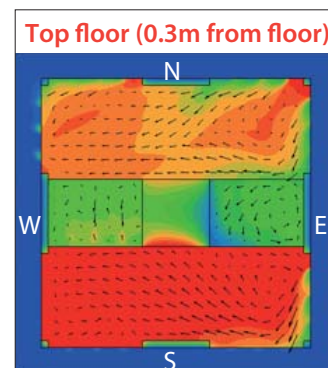


24 intake vents per floor below the window  
Vent size: 1.0m x 0.4m  
Vent opening ratio: 75% (including the ceiling vents)  
Thermal load: 30W/m<sup>3</sup> inside offices

### Temperature contour plots



20.0 25.0 30.0 35.0  
Temperature [deg C]



Arrows show flow direction

## Notes

Using scSTREAM, it is shown that the north side of the offices is cooled down well under a northeast wind condition, exhausting heat through the open ceiling spaces. The south side of the offices, especially in the upper floors, cannot be ventilated passively under this condition and requires active air-conditioning.