

Numerical Study of Flow Pattern in Buildings with Different Heights

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Abstract

Understanding the flow pattern around the building, results in an accurate analysis of structure performance. Furthermore, having a proper configuration of the buildings next to each other we can provide a situation in which the buildings use the wind to make the air movement and natural ventilation. In this paper we use the FLUENT software to verify numerical flow pattern in buildings with different heights, and the results are provided in the form of distribution of velocities, velocity in Y direction, flow patterns and counters of turbulent.

Keywords: Numerical Method; Configuration of Buildings; Flow Pattern; Computational Fluid Dynamics.

1. Introduction

Comfort has been one of the most important needs of man in all his life. This comfort has been made or forbidden from various ways for man. But having comfort in structures is the most important issue in this relation. One of the major factors considered for this, is an atmosphere of comfort that is available by creating a suitable environment in terms of temperature and ventilation. Creating air flow in the living area will have an important role in providing comfort. On the other hand wind flow can be named as one of the main factors on the dispersal of pollutants in urban environments and among the buildings. However it is an obvious issue that pollutants have some effect on the wind flow. In fact, urban areas have row buildings with different heights which streets have separated them from each other and cars on the street are the main generators of pollutants in these areas. Various parameters like buildings and local users influence on the amount of their distribution and wind flow [1, 2].

For the first time Lipman, published an article in 1952 about the turbulent flow of wind, he mentioned near the earth's surface. These models Later in 1961, by Vlasy and Cohen was diagnosed with a complete and correct method of Davenport that the fluctuations pressure on the surface of the wind in some way depends on the structure function the way back to the wind (Figure 1).

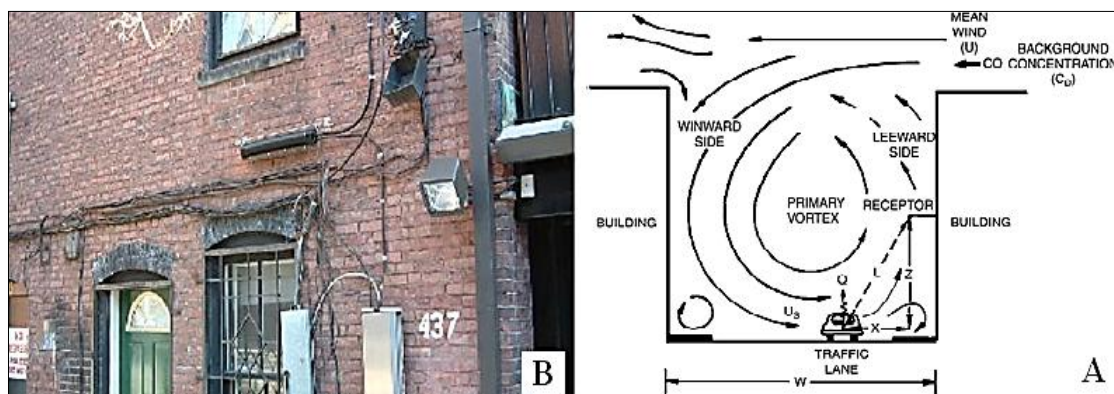


Figure 1. A) Pollution incidence in street regular canyon B) Smoke and pollution accumulation of wall of houses

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