

EFFECT OF WIND DIRECTION AND DISPOSITION ON GUSTY WIND ENVIRONMENT AT HIGH-RISE BUILDING AREA

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Due to the urbanization, many high rise buildings (HRBs) have been built in a recent decade, which influences the urban microclimate in many respects. Among them, the increased wind speed around HRBs is one of the most important micrometeorological effects (Oke, 1987). Landsberg (1981) figured out the wind turbulence shows a distinct increase in the gusts with higher frequencies in the urban area compared to open areas.

Lawson and Penwarden (1975) reported that two old ladies died after being blown over by sudden wind gusts at the high-rise building corner in 1972(Wind Engineering Research Institute, 1995). And in Rotterdam, Netherland, it is mandated to investigate building wind; because there was an accident that a person was fell down from the hospital's stretcher due to the building wind. Many countries also established the guideline about the limitation of building construction to protect the building and human because people and facilities are concentrated in urban area.

In Korea, the glasses of seaside high-rise apartments' were broken by Typhoon 'Maemi' in Pusan, Korea. Also, the Typhoon 'Gonpasu' on September 2, 2010 resulted in serious wind damages. Hundreds of landscaping or street trees were blown down and glasses at apartment were broken near high-rise building, Gangnam in Seoul. According to the 'Typhoon White Book'(2011) published by Korean Meteorological Administration in 2011, there are total number of 327 typhoons affected Korea from 1904 to 2010, and there is a trend that maximum wind speed during the typhoon has increased since 2000s and typhoon induced wind damages are still increasing compared with the typhoon induced flooding. Wind is a highly complex phenomenon mainly depending on the local geometry such as size, shape, height,

density, separation, direction within the city structure. So, wind characteristics of urban high-rise building area under gusty wind condition needs to be investigated, to prevent and reduce the wind damages. The purpose of the study is to investigate the effect of wind direction and building disposition (building separation and building height) on the wind environment at HRB area under gusty wind conditions. The ultimate goal of this study is to provide a logical basis in building wind protection guideline for reducing the gusty wind damage for a comfortable environment.