

## WIND EFFECTS ON LOW-RISE BUILDINGS DUE TO SURROUNDING TREES

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This study is aimed to understand the wind effects on low-rise buildings due to the surrounding trees. Windstorms are responsible for most of the damage to low rise buildings from natural hazards, in many parts of the world. People in tropical climates always use trees in their gardens/fences for shading and aesthetic benefits. Low rise buildings immersed in the aerodynamic boundary layer have complicated wind characteristics. As a result, a precise modelling sequence is required to produce accurate results. Wind tunnel and full-scale studies have been carried out to understand the pressure distribution on low-rise buildings. Most of the recent wind tunnel studies have been carried out in uniform terrain conditions neglecting complications due to surrounding obstructions such as surrounding trees and boundary walls. This study presents a comprehensive analysis of the effect of surrounding trees on external pressure variation of low-rise buildings. A 1/50 length scale open circuit boundary layer wind tunnel model study was performed on a gable roof house to record spatial and temporal pressure variations on the roof and wall surfaces. The results showed that the efficiency of windbreaks depends on the number of trees (windbreak density), their configurations, separation distance to the building and the direction of dominant winds. Furthermore, the results indicate that, except for sidewall sections and certain roof areas, external pressure coefficients are generally lower than those specified by international wind standards.

**Keywords:** low-rise gable-roofed building; tree configurations; wind tunnel test; external pressure coefficient

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