

ABSTRACT

Wind pressure is directly correlated with topography. Current literature and engineering codes and standards often simplify complex topographies as uniform to provide a general understanding of their contribution to wind loading. This limitation has hindered the ability to observe how true landscape composition interacts with the built environment.

This study discusses the effects of heterogeneous terrain-derived wind loading on mid-rise steel frame structures based on the Finite Element Method (FEM). A previous study conducted by Allijenad et al. conducted wind tunnel testing by observing heterogeneous terrain upwind and gathering wind-loading data on mid-rise buildings. This data was utilized to perform explicit dynamic analysis on a real-scale steel-framed building using FEM for serviceability and strength level checks. The analysis includes a comparative study on the effects of homogeneous and heterogeneous terrain wind loading.