

Abstract

This study investigates the fluid dynamics impact of tsunamis on small-scale residential buildings. Flow around a range of building structures and envelopes are explored using a computational fluid dynamics (CFD) programme. Theoretical analysis shows that lateral pressure resulting from waves acting upon buildings can be reduced significantly by streamlining the buildings' structures and envelopes, i.e. columns, roofs and walls. To minimise the structural impact while maintaining constructional practicality and interior space usability, a building should have a frontal width to depth ratio of about 1 : 3, with its floor being raised approximately 3 meter above the ground. Its columns should have a frontal width to depth ratio within the range of 1 : 2 – 1 : 3, and its roof should be of a hip shape. These results are then applied to help develop a prototype for houses in a Tsunami-prone area in Thailand.