

Case 42/2016

Issue: Methodology Report for Wind Tunnel Test

Recommendation: To accept the following methodology and parameters for wind tunnel test at the proposed development:

(1) Topographic Model

Model scale: 1: 4,000

(2) Proximity Model

(i) Model scale: 1: 400

(ii) Extent of model: all known existing and proposed surrounding buildings and structures within a radius of 500m from the subject site will be modeled.

(3) Wind Climate Study Results

Directional characteristics of typhoons affecting HK based on a Monte Carlo simulation of storms passing within 250km of HK, conducted by Applied Research Associates, Inc. (ARA).

(4) Removal of adjacent buildings that could provide significant shelter

4 building groups were proposed to be removed in the Proximity Model.

(5) Design Wind Loads Adopted in Superstructure Design

The following in the superstructure design were proposed:

(i) The finally adopted peak design combined wind moment will not be less than 70% of the peak design wind moment based on code calculation as derived from the design values given in the Code of Practice on Wind Effects in Hong Kong 2004 (the Wind Code);

(ii) If the peak design combined wind moment determined in the wind tunnel test is found greater than the peak design wind moment based on code calculation as derived from the design values given in the Wind Code, the peak design combined wind moment determined in the wind tunnel test will be adopted for design;

(iii) The storey wind shears adopted for design shall be determined from the peak design combined wind

moment established in accordance with sub-paragraphs (i) and (ii) above; and

- (iv) The peak building acceleration assessment on human comfort under wind loads determined in the wind tunnel test shall be in accordance with the Code of Practice for Structural Use of Concrete 2013 clause 7.3.2. Limiting maximum peak acceleration at the top occupied floor of a residential building to 0.15m/s^2 should be adopted.
- (v) The AP/RSE would apply Occupation Permit (OP) for the proposed development after completion of the construction of all the two high-rise towers (i.e. Block 1 and Block 2) and the low-rise tower (i.e. Block 3). If the actual number of towers to be constructed was lesser, the RSE would conduct another wind tunnel test to verify whether the original wind tunnel test results used in the structural design of the high-rise towers were still applicable prior to the Temporary Occupation Permit (TOP) application.

Decision:

Having noted the background information and arguments together with RSE's supervision arrangement, members endorsed the recommendation subject to the following condition.

- (i) RSE's confirmation that two nos. of wind tunnel tests would be carried for the two towers respectively.
- (ii) RSE's demonstration in the superstructure submission that the rigidity of the floor diaphragm for the proposed towers would be consistent with the assumption of the wind tunnel test of which the entire parts of the tower block were rigidly linked with sufficient floor diaphragm at each storey.