Summary of Decisions of the Structural Engineering Committee
SEC Meeting 6/2018 held on 19.9.2018

Case 30/2018

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 600m from the subject site will be modeled.

(3) Wind Climate Study Results

A typhoon simulation will be carried out to determine the design wind speeds for the typhoon wind climate based on a Monte Carlo statistical technique, performed by Applied Research Associates Inc (ARA).

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

119 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 maximum design wind moment based on code calculation in the most critical direction 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 maximum design wind moment based on code calculation in the most critical direction 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 hotel building to 0.25m/s^2 should be adopted.

(6) Design Wind Pressures Adopted in Cladding Design

The following in the cladding design were proposed:

(i) The finally adopted peak design combined wind pressures will not be less than 70% of the maximum design wind pressures based on code calculation in the most critical direction as derived from the design values given in the Wind Code;

(ii) If the peak design combined wind pressures determined in the wind tunnel test are found greater than the maximum design wind pressures based on code calculation in the most critical direction 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 highest peak net and differential design pressures and suctions, relevant to the design of the cladding elements and cladding systems of the proposed development will be provided based on the 50-year return period design wind speed i.e 59.5m/s at 500m;

(iv) The pressures on the cladding of the proposed development will be presented as peak net cladding pressures, which incorporate internal pressures for using pressure coefficients of -0.3 and +0.2 in accordance with the requirement of the Wind Code and the Explanatory Materials to the Wind Code (Explanatory Materials); and

(v) The wind pressures on architectural features of the proposed development where both sides of surfaces are exposed to the wind will be assessed as peak differential pressures, i.e resulting net wind force.

Decision: Having noted the background information and arguments together with RSE's supervision arrangement, members endorsed the recommendation.