Summary of Decisions of the Structural Engineering Committee
SEC HD-02/2011 held on 13.07.2011

(a) Case HD-02/2011

Issue: Barette piles using shaft grouted friction

Recommendation:

1) That the proposed rational design method in conjunction with the in-situ testing method for the design of 2.8m x 0.8m barrette piles using shaft grouted friction on soil only be accepted.

2) That the following maximum values be accepted for the design parameters:

   (a) The ultimate shaft grouted friction in alluvium shall not exceed 4.5 x SPT "N" value, with a limit of 180 kPa.

   (b) The ultimate shaft grouted friction in Completely Decomposed Metamorphosed Siltstone (CDMS) shall not exceed 2.0 x SPT "N" value, with a limit of 140 kPa.

   (c) The allowable load due to the shaft grouted friction of barrette piles shall be defined as not exceeding the summation of the maximum ultimate values as given in item 2(a) and 2(b) above divided by a factor not less than 2.0.

3) That the modification to Building (Construction) Regulation 26(5)(a) to permit the spacing between centers of the barrette piles to be less than the minimum requirement of one pile perimeter (i.e. 7.2m) but subject to a clear spacing between barrettes of not less than 2 m be granted.

4) That the modification to Building (Construction) Regulation 26(5)(b) to permit the spacing between centers of the barrette piles and site boundary to be less than the minimum requirement of half the length of the pile perimeter (i.e. 3.6m) but subject to a clear spacing to the site boundary of not less than 2.14m be granted except for barrettes 2BR23, 2BR27, 2BR34 and 2BR40 in which a clear spacing to the site boundary along Wang Chau Road of not less than 1.50m be granted.

5) That the following proposed acceptance criteria for loading tests of the barrette piles be accepted:

   (a) Maximum settlement *(at head of pile)* < PL/AE + D/50
   (Where P = 2 x design working load, L = pile length, A = cross sectional area of pile, E = Young's Modulus of pile, D = diameter of pile or diameter of equivalent circle with same area as the non-circular barrette pile)

(b) Residual settlement < D/50 (mm)

(c) Under working load condition, maximum settlement should not exceed 20mm.

Decision: Noting the background information, the combined rational and in-situ testing approach used and RSE's clarification, members endorsed the recommendations (1), (3), (4) and (5) subject to the following :

(a) Quality supervision of the foundation works including the shaft grouting operation should be provided by the Registered Structural Engineer and the Registered Specialist Contractor.

(b) A comprehensive settlement assessment report on the possible total and differential movement of the building structures and their effects on the durability and serviceability of all structural and non-structural building elements, taking into account of the group effects and soil-structure interaction etc shall be submitted upon completion of piling works. The limitation of the angular distortion and deflection of the building structures shall not be greater than that can be tolerated by the building, building works, structure or street supported by the foundation.

(c) An assessment report on the variation of founding strata between the locations of the testing piles and all the working piles shall be submitted upon the completion of piling works.

(d) A proposal for monitoring the settlement of the foundation during construction of the sub-structure and superstructure works is to be submitted for agreement prior to application for consent for the commencement of the works.

(e) A performance review report on the settlement behaviour of the building structure shall be submitted for consideration prior to the application of Occupation Permit.

(f) A test proposal to verify the effectiveness of the grout around the barrette piles shall be submitted for agreement prior to application for consent for the commencement of the works.

(g) Proof loading test to minimum 3 nos. of working piles and core-drilling test to minimum 3 nos. of working piles are required to ascertain the performance of the constructed working piles.