Summary of Decisions of the Structural Engineering Committee
SEC HD-04/2011 held on 23.09.2011

(a) Case HD-04/2011

Issue: Large diameter bored piles (LDBPs) using shaft grouted friction

Recommendation:

1) That the proposed rational design method in conjunction with the in-situ testing method for the design of 2.0m diameter LDBPs using shaft grouted friction on soil only be accepted.

2) That the following design capacity be accepted for the pile design:

   (a) The design working capacity of shaft grouted LDBPs with 2.0m diameter is 15.5MN which is solely generated by shaft friction in alluvium and completely decomposed metamorphosed siltstone (CDMS).
   (b) The piles are proposed to be embedded in CDMS (i.e. terminated at -56mPD).
   (c) The capacity and performance of the piles will be verified by trial pile load tests.

3) That the modification to Building (Construction) Regulation 26(5)(a) to permit the spacing between centers of the LDBPs to be less than the minimum requirement of one pile perimeter (i.e. 6.28m) but subject to a clear spacing between LDBPs of not less than 2 m be granted.

4) That the following proposed acceptance criteria for loading tests of the LDBPs 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)
   (b) Residual settlement < D/50 (mm)
   (c) Under working load condition, maximum settlement should not exceed 20mm.

Decision: Members endorsed the Recommendations subject to the following conditions:

(a) Effect of substructure works at the adjoining site to the load carrying capacity of piles situated close to the site boundary should be duly considered in pile design.

(b) Full grouting records should be submitted by the RSE and found satisfactory prior to acknowledgement of completion of foundation works ;

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

(d) 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.

(e) 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.

(f) 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.

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

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

(i) 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.