Summary of Decisions of the Structural Engineering Committee
SEC 10/2011 held on 01.09.2011

(a) Case 10/2011

Issues: Large diameter bored piles (LDBPs) using shaft grouted friction and end bearing.

Recommendations:

1. To accept the rational design method for the design of LDBP using shaft friction and end bearing on soil:

   (a) The ultimate shaft friction resistance in Colluvium/Completely Decomposed Granite (CDG) to be 1.4 SPT-'N' but limited to 140kPa with a factor of safety of 2.

   (b) The allowable end bearing capacity for highly to completely decomposed granite layer to be 1000kPa with SPT-'N' larger than or equal to 200.

   (c) The allowable pile capacity for combined shaft friction and end bearing of large diameter bored piles, shall be the summation of the maximum ultimate values as given in item 1(a) divided by a factor of safety of 2 and the allowable end bearing given in 1(b). The ultimate shaft friction capacity is subject to the satisfactory results of proof loading test on two proposed trial piles (TP03 & TP04).

2. To grant the modification to Building (Construction) Regulations 26(5)(a) to permit the spacing between centres of the proposed large diameter bored piles to be less than the minimum requirement of one pile perimeter but subject to a clear pile spacing of not less than 2m.

3. To allow adopting acceptance criteria for loading test on trial piles which do not follow Code of Practice for Foundation as below:

   (a) Maximum settlement at head of pile does not exceed the value

$$\frac{PL}{AE} + \frac{D}{50}$$

   where

   P= 2 x allowable pile capacity
   (For trial pile TP03 with soft toe the allowable pile capacity is based on capacity derived from shaft friction)
   L = pile length
   A= cross sectional area of pile

E= equivalent young's modulus of pile
D=diameter of trial pile

(b) Residual settlement at the head of the pile does not exceed the value

$$\frac{D}{50}$$

The residual settlement criteria is only required for trial pileTP04 (without soft toe) and not required for trial pile T03 with soft toe

Decision: Noting the background information and after making reference to past projects adopting similar construction, members endorsed the recommendation.