Summary of Decisions of the Structural Engineer
SEC 08/2013 held on 08.10.2013

(a) Case 08/2013

Issue:

1. Two Trial Piles (TP1 and TP2) of mini-piles grouted in pre-bored holes with post-pressurized grout to take vertical load

2. Use of 63.5mm dia. DYWIDAG threadbar in trial pile

3. Group reduction factor of 1.0 is adopted

Recommendation:

1. To accept the design principle of mini-piles (4 Nos. of Y50 Grade 460) grouted in pre-bored holes (323mm diameter) with post pressurized grout in Completely Decomposed Granite (CDG) to enhance shaft friction for resisting vertical load subject to the satisfactory verification by static loading tests on the two trial piles (TP1 and TP2) for vertical load complying with the acceptance criteria and the following criteria/ conditions:

    1.1 The ultimate shaft grout friction in CDG shall not exceed 4.8 x N with a maximum limit of SPT "N" value of 40 (i.e. 192kPa); and the frictional resistance should only be considered where the minimum SPT "N" is greater than 10.

    1.2 A factor of safety (FOS) of 3 will be adopted for calculating the allowable shaft friction;

    1.3 A detailed quality assurance proposal on grouting works shall be submitted. It shall specify the quality assurance measures adopted in controlling grout pressure, volume and time;

    1.4 For each grout mix one sample of grout shall be provided from each 10 batches of grout, or every $10m^3$ from the amount of grout produce in a day, whichever is the smaller, to determine the crushing strength of the grout. Sample shall be provided not more than 1 hour after the grout has been mixed;

    1.5 One trial pile TP2 will be load-tested to 3 times of the working pile vertical capacity; and the other trial pile TP1 will be load-tested to 2 times of the working pile vertical capacity.

    1.6 A performance review report of trial pile tests shall be submitted to the satisfaction of the Building Authority upon completion of the static loading tests.

    1.7 The minimum cover of the shaft grout mini-pile should be not less than 50mm (Y50) and the minimum pile spacing

between the shaft grout mini-piles and should not be less than the length of its perimeter. (3.14 x 323 = 1014mm i.e. 1100mm is adopted)

1.8 Site supervision level should be enhanced by increasing the RSE's T5 and RSC's T4 supervision to Full Time supervision during the post pressurized grouting works.

2. To accept the use of 63.5mm diameter DYWIDAG threadbars as rebar in trial pile TP2 only. TP2 will not be used as a working pile.

3. To adopt a group reduction factor of 1.00 instead of a group reduction factor of 0.85.

Decision: Noting RSE's justification, members endorsed the recommendation.