

Summary of Decisions of the Structural Engineering Committee
SEC 02/2011 held on 20.01.2011

(a) Case 02/2011

Issue: Use of Jacking to install steel H-pile (Grade S450J0 305x305x180 kg/m) founded on soil

Recommendation: To accept the use of jacking to install steel H-pile (Grade S450J0 305x305x180kg/m with yield stress, f_y , taken as 430N/mm^2) for the proposed one storey podium structure (with a basement) of a residential development, subject to the results of the static loading tests on the trial piles complying with the acceptance criteria stipulated in the CoP for Foundations and the following criteria:

1. The design loading capacity is 3918 kN.
2. The tentative founding level of the pile is at the soil stratum with SPT N-value of around 120.
3. The pile settlement at termination of the jacking shall be monitored to confirm the termination criteria.

Decision: Members accepted in principle the recommendation subject to the following conditions in view of the empirical nature of the proposal:-

1. Pre-drilling with SPT shall be carried out under every column of the podium structure to ascertain the tentative founding levels of the jacked steel H-piles. Pre-drilling shall be carried out to firm soil of SPT not less than 200 or grade III rock or better.
2. The design capacity of the jacked piles under working load (WL) shall be limited to 2950 kN, (i.e. the steel stress = $0.3 f_y$)
3. The two trial piles shall be tested by the imposition of a test load of 3WL to verify the design assumptions and the performance of the jacked piles. One of them shall be instrumented with strain gauges to measure the mobilized soil skin friction and monitor the pile performance during installation.
4. The maximum jacking force during the pre-loading process prior to the termination stage of the jacking shall be maintained for not less than 30 seconds in every per-loading cycle.

5. The jacking force in preloading and at termination shall not be less than 9011 kN.
6. 10% of the installed piles shall be selected for re-jacking tests.
7. Upon completion, 5% of the working piles shall be selected for proof test by the imposition of a test load of 3WL.
8. RSE is required to submit a performance review report to substantiate that the installed steel H-piles are capable to sustain the intended design load without causing any adverse effects such as excessive settlement, sudden relief of lateral soil pressure, etc. The performance review report should verify the assumption that the influence zone is less than 3 pile perimeters if pile extraction is experience in case of encountering obstructions.