

**Foundation Works
(Driven Precast Prestressed Spun Concrete Piles)**

In giving this approval of plans, I hereby impose the following conditions under item 6 in section 17(1) of the Buildings Ordinance:

- (a) Trial pile test on pile no.(s) [please refer to approval letter for details] (which should be driven without the use of follower) and pile no.(s) [please refer to approval letter for details] (which should be driven with follower in obtaining the final set) should be carried out before driving other working piles for verification of design assumptions, pile performance and the proposed dynamic formula for pile driving. PDA testing with the Case Pile Wave Analysis Program (CAPWAP) analysis should be carried out to verify the maximum driving stresses and the integrity/capacity of the piles during final set measurement of all trial piles. A consent to the commencement of the trial piles will be required. After installation, Form BA14 certifying completion of the trial piles should be submitted and the trial piles should be tested by the imposition of a test load in accordance with the Code of Practice for Foundations 2017. The PDA testing and proof load testing shall be carried out by a laboratory* accredited under the Hong Kong Laboratory Accreditation Scheme (HOKLAS)^. The Buildings Department (BD) should be notified of the time and date of the tests so that the test driving and the corresponding loading test may be witnessed by a representative from the Department.
- (b) Further test driving on pile no.(s) [please refer to approval letter for details] should be carried out under witness by BD staff to assess on the effects due to variation on ground geology. Driving of the other working piles should not be commenced until satisfactory completion of the required driving tests.
- (c) Core test – At least 2% of the piles with a minimum of one pile per batch per delivery to the site should be core tested to check the estimated in-situ cube strength for verification of concrete strength in accordance with construction standard CS1:2010. Three sets of three cores (total nine numbers) of 76 mm diameter shall be taken, normal to the length of the pile, from three transverse sections of a sample pile selected. All testing shall be carried out by a laboratory* accredited under HOKLAS^. Test results@ should be reported on a HOKLAS Endorsed Certificate and submitted within 60 days of the delivery of the piles to site. The test reports should be appended with a statement signed by the Registered Structural Engineer to confirm the following:
 - (i) The required concrete strength of the sampled piles has been complied with.
 - (ii) All core tests have been carried out by a laboratory* accredited under HOKLAS^.

All cored segments cannot be re-used in the permanent works.

- (d) Visual inspection – Every pile section delivered to site shall be visually inspected to ensure defect free condition. The inspection reports shall be submitted within 21 days after inspection;
- (e) Stress wave dynamic tests – At least 5% of the total number of piles should be checked with PDA measurement with CAPWAP analysis by a laboratory* accredited under the HOKLAS[^] to verify the maximum driving stresses and the integrity of the piles during driving. The test results[@] shall be submitted upon completion of piling works; and
- (f) Tests on welded joints – Welding procedures and welders should be assessed/tested in accordance with the appropriate provisions of the Annex A to the Code of Practice for the Structural Use of Steel 2011 (the Code). Before driving in spliced sections of the piles, non-destructive tests on a representative number of welded joints should be carried out with a sampling rate of not less than that specified in Table 14.3a of the Code by a laboratory* accredited under the HOKLAS[^]. The test results[@], with the joint locations clearly specified, should be submitted within 21 days after testing.

2. You are reminded that site supervision of the foundation works by a team of supervisors shall be provided each by the Authorized Person, the Registered Structural Engineer and the Registered Specialist Contractor in accordance with the Technical Memorandum for Supervision Plans 2009 and the Code of Practice for Site Supervision 2009 (2021 Edition) to ensure that the quality of the foundation works is up to standard and that the works are carried out in accordance with the plans approved and in such a manner as not to render inadequate the margin of safety of, or impair the stability of, or cause danger to any building, structure, land, street or services. Details of site supervision for the foundation works shall be included in the supervision plan and submitted prior to or at the time of application for consent to the commencement of the foundation works.

3. Under Building (Administration) Regulation 10, the following documents are required to be submitted:

- (a) One set of foundation record plans and report together with the Form BA14 required under Building (Administration) Regulation 25 to certify the completion of the foundation works are required to be submitted. The record plans should include details of the characteristic features of the site and the identification, location, size, depth and level of each pile as constructed and the report should include for each pile the date of installation, the quality and quantity of materials used and the driving performance. In order to detect any dislocation of the pile shoe, the depth of the inner core of each pile should also be measured and recorded in the report.
- (b) Concrete cube test reports and mill certificate of the prestressing bars, spiral wires and steel plates for each batch of piles used are required to be submitted within 60 days of the delivery of the piles to the site.
- (c) The manufacturer's certificates of the piles delivered to the site are required to be submitted within 60 days of the delivery of the piles to the site. The certificate shall include the following information:

- (i) The piles have been manufactured in accordance with the approved complying standards.
- (ii) The pile serial number, sizes and date of manufacturing.
- (iii) The sources of raw materials and their complying standards and concrete mix information.

4. With regard to paragraph 1(a), consent to the commencement and carrying out of the working pile works will not be given until the report of PDA testing with CAPWAP analysis of all trial piles has been submitted and found satisfactory. The proof load testing report of trial piles should be submitted within one month after submission of the corresponding Form BA14. With regard to paragraph 3(a) for submission of the Form BA14 to certify the completion of the foundation works, the pile(s) for proof load testing of working piles will not be selected until the proof load testing report of trial piles has been found satisfactory.

5. Consent to the commencement and carrying out of the pile cap and superstructure works will not be given until the reports for the tests specified in paragraphs 1(c) to 1(f) above, and the foundation record plans, reports, Form BA14 and other documents specified in paragraph 3 above have been submitted and found satisfactory, and that the required proof tests have also been satisfactorily carried out by a laboratory* accredited under the HOKLAS^.

6. All significant signs of distress during the construction works should be reported promptly to the Buildings Department. Where the ground settlement reaches or exceeds the trigger value of the "Alarm Level" defined in the monitoring scheme, the Chief Highway Engineer/Research and Development, Highways Department (Attention: Land Surveyor/Geographic Information System, telephone number: 2762 3498, fax number: 2714 5290, email: lsgis.rnd@hyd.gov.hk) should be notified promptly together with the relevant details of the monitoring.

* A Directory of Accredited Laboratories in Hong Kong is obtainable from the Hong Kong Accreditation Service (HKAS) Executive, Innovation and Technology Commission.

A laboratory's accreditation for an individual test or calibration may be granted, modified or withdrawn at any time. Up-to-date information on accredited laboratories and their scopes of accreditation are available on the internet at the HKAS website at <http://www.itc.gov.hk/hkas/>.

@ The test carried out by an accredited laboratory should be within its scope of accreditation. To ensure this, test results should be reported on a HOKLAS Endorsed Certificate or equivalent Certificate/Report issued from other laboratory accreditation bodies which have reached mutual recognition agreements/arrangements with the HOKLAS.

^ Test to be carried out by a laboratory* accredited under the HOKLAS or by other laboratory accreditation bodies which have reached mutual recognition agreements/arrangements with the HOKLAS for the particular test concerned.