Ref: BD _____

Address: _____

Appendix _____ to approval dated _____

Foundation Works
(Steel Bearing Piles Driven to Bedrock)

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

(a) For welding of structural steel works, 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. 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 10% of the total number of welded joints in accordance with the appropriate provisions of the Annex A to the Code of Practice for the Structural Use of Steel 2011 and by a laboratory* accredited under the Hong Kong Laboratory Accreditation Scheme (HOKLAS)^. The test reports[@], with the joint locations clearly specified, should be submitted within 21 days after testing.

[#](b) Test driving on pile no.(s) _____ should be carried out to verify the design assumptions before driving, other than pitching the first section, of any other piles. PDA testing with the Case Pile Wave Analysis Program (CAPWAP) analysis should be carried out by a laboratory* accredited under HOKLAS^ to verify the maximum driving stresses and the integrity/capacity of the piles during final set measurement of all tested piles. The Buildings Department should be notified of the time and date of the test so that the test driving may be witnessed by a representative from the Department.

[#](c) *Trial pile* – Test driving on pile no.(s) _____ 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 HOKLAS^. The Buildings Department should be notified of the time and date of the test so that the test driving and the corresponding loading test may be witnessed by a representative from the Department. A performance review report shall be submitted upon completion of the trial pile works. The report should include a full set of trial pile driving and loading test records, an assessment of these records and the necessity or otherwise of modifying the design.

(d) *Predrilling* – Predrilling at locations in close proximity of the piles should be carried out to better identify the quality of the founding material during construction of the piles and to confirm the appropriate founding levels. The number of predrill boreholes required should be such that the pile tip of every such pile should be within 5 m from a predrill borehole. The predrilling should be sunk to at least 5 m below the rock head of the specified category in accordance with the Code of Practice for Foundations 2017.

(e) *Post-construction proof drilling* – Upon completion of the piles, some additional proof drill holes should be sunk to at least 5 m below the as-built founding level of the nearest pile, to verify the rockhead profile and hence assess the adequacy of the piles. The number of such proof drill holes should be at least two for sites with 100 or less piles; or 1% of the number of piles for sites with more than 100 piles (any fraction of a proof drill hole so calculated should be construed as one additional proof drill hole).

(f) *Dynamic load tests* – (i) At least 10% of the total number of working piles should be carried out, half of which should be selected from the group of piles with greater depth. The peak driving stress at final set depth should also be measured which should not be less than 75% of the yield stress of the pile. (ii) At least #20% [***higher percentage should unfavourable soil condition be encountered***] of working piles, excluding the piles selected at (i) above, should be carried out to verify the integrity of the piles with a stress level not less than 30% of the yield stress of the pile, and should be carried out on a regularly basis along the course of the pile construction period as far as possible. The dynamic load tests should be carried out by a laboratory* accredited under the HOKLAS^.

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) For structural steel classified as Class 1 or 2 in accordance with the Code of Practice for the Structural Use of Steel 2011, a copy each of the mill certificates of the structural steel used, which should be submitted within 60 days of the delivery of the structural steel to the site and appended with a statement signed by the Registered Structural Engineer to confirm that the requirements of chemical composition and mechanical properties appropriate to the class and grade of steel have been complied with and that the structural steel used is produced from a manufacturer with an acceptable Quality Assurance system.

#(b) Two sets of trial pile performance review reports as required in paragraph 1(c) above.

(c) #One/Two set(s) 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. 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. The report should include for each pile the date of installation, the quality and quantity of materials used, the driving performance, the predrilling and post-construction proof drilling records and any necessary test on the bearing strata and should also be accompanied by an assessment report with a rockhead contour plan prepared based on the ground investigation, the predrilling and the post-construction proof drilling.

#4. Where structural steel of Class 2 is used, the following conditions are imposed under item 6 in section 17(1) of the Buildings Ordinance:

Sampling and testing of structural steel should be carried out in accordance with the Annex D to the Code of Practice for the Structural Use of Steel 2011. Testing should be carried out by a laboratory* accredited under HOKLAS or by other laboratory accreditation bodies which have reached mutual recognition agreements/arrangements with HOKLAS^. The test results@ should be appended with a statement signed by the Registered Structural Engineer who has prepared the plans and submitted within 60 days of the delivery of the structural steel to the site for confirmation of the followings:

(i) All structural steel used for the construction and the test specimens covered by the test reports are in accordance with the classes and grades of steel shown in the approved plans.

(ii) Sampling and testing of structural steel used have been carried out in accordance with the Code of Practice for the Structural Use of Steel 2011.

(iii) The acceptance criteria appropriate to each class and grade of steel used have been complied with.

(iv) Testing of steel has been carried out by a laboratory* accredited under HOKLAS^.

#5. If trial pile testing is required in paragraph 1(c) above, consent to the commencement and carrying out of the working piles 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 performance review report for the trial piles specified in paragraph 3(b) above should be submitted within one month after submission of the corresponding Form BA14. With regard to paragraph 3(c) 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 performance review report of trial piles has been submitted and found satisfactory.

6. Your attention is also drawn to Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers (PNAP) APP-18, the Technical Memorandum for Supervision Plans 2009 and the Code of Practice for Site Supervision 2009

regarding the requirements on predrilling and post-construction proof drilling works.

7. Consent to the commencement and carrying out of the pile cap and superstructure works will not be given until the test reports specified in paragraphs 1(a) and 4[#] above, the records of predrilling, post-construction proof drilling and stress wave dynamic tests specified in paragraphs 1(d), 1(e) and 1(f) above, and the mill certificates of the structural steel used, the foundation record plans, report and Form BA14 specified in paragraph 3(a) and (c) 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^.

8. 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.

[#] Delete wherever inapplicable.

* 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/.

^ 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.

@ 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.

Laboratory/Organisation/Testing Agency for carrying out the test(s) should be independent of the Registered General Building Contractor (RGBC)/Registered Specialist Contractor (RSC).