

Approval & Reception Procedure

DG – Geotechnical Department	
Pre-drilling Prospecting-Pile Foundation	Document no. ARP/DG/19
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1. Reference standard

《Regulamento de Fundações》、《Guia de Dimensionamento Fundações》、《Code for investigation of geotechnical engineering GB 50021 - 2001》、《Specification for geotechnical investigation of tall buildings JGJ 72 - 2004》、《Specification for geotechnical investigation in soft clay area JGJ 83 - 2011》、《Technical specification for engineering geological prospecting and sampling of constructions JGJ/T 87 - 2012》、《Standard for engineering classification of rock mass GB 50218 - 94》、《Standard for engineering classification of soil GB/T 50145 - 2007》、《Geoguide2 – Guide to Site Investigation, Geotechnical Engineering Office HK》、《Geoguide 3 – Guide to Rock and Soil Descriptions, Geotechnical Engineering Office HK》、《Code of Practice for Foundations – Buildings Dept. of the Government of the Hong Kong SAR, Geo Publication No. 1/2006》、《Foundation Design and Construction, Civil Engineering and Development Dept. of the Government of the Hong Kong SAR》、《Code of practice for site Investigations, BS 5930:1999》

2. Approval procedure

2.1. Information to be submitted

- A Resume documents of entities performing pre-drilling works(included but not limited: registration document, job reference in geotechnical engineering prospecting and relevant professional document of the entities, name list and resume of key person, name list and resume of operators, personnel training document and relevant professional qualification document)
- B Equipment documents for performing pre-drilling works (included but not limited : list for quantity of equipment, catalogue and specification of equipment, relevant calibration document)
- C Method statement for performing pre-drilling works (included but not limited : construction plan, logistic plan, statement for drilling process, quantity of personnel and equipment)

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2.2. Technical specifications of project or designer

- A Technical specification and design document of project
- B Construction proposal of pile foundation

Beside of the information above, all the document required in clause 42, 43, 48 of 《Regulamento de Fundações》 may be requested to submit.

3. Principles of quantity and layout of pre-drilling holes

- A According to the specification and the requirement on the quantity of pre-drilling holes from the design document and from the technical specification of the project
- B For large diameter pile(pile diameter $\geq 2.5\text{m}$), 2 pre-drilling holes are required on each pile
- C For large diameter pile($750\text{mm} \leq \text{pile diameter} < 2.5\text{m}$), 1 pre-drilling hole is required on each pile
- D For small diameter pile(pile diameter $< 750\text{mm}$) , pre-drilling should be carried out such that the tip of every pile should be within 5 m distance from a pre-drilling hole
- E When significant difference of soil properties on horizontal and vertical direction was found by adjacent pre-drilling holes, which may affect the pile construction proposal, additional pre-drilling holes should be performed

When the principles of quantity and layout of pre-drilling holes from the design document and from the technical specification of the project conflict with the above principles B to E, the principles that are more stringent or have a more favourable understanding of the geological conditions of the project should be followed.

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4. Principles of drilling depth of pre-drilling holes

- A According to the specification and the requirement on the quantity of pre-drilling holes from the design document and from the technical specification of the project
- B For the piles founded on rock or rock socket without specified requirement, such pre-drilling should be sunk at least 5m below the proposed founding level of the pile, or sunk into the founding layer with a depth of 2 times of pile diameter below the proposed founding level of the pile, whichever is the greater. The founding layer should comply with the Total Core Recovery(TCR) $\geq 85\%$ with the weathering grade of III of rock or better, and the Unconfined Compressive Strength(UCS) of rock should be greater than 25 MPa (Equivalent Point Load Strength Index PLI50 greater than 1 MPa). The diameter of rock core should be not less than TNW (61mm).
- C For friction pile, such pre-drilling should be sunk at least 5m~10m or 6d~10d(d is the pile diameter or transformed diameter of square pile, small value is required for large diameter pile, and large value is required for small diameter pile), and satisfy the verification of soft layer. For the pile foundation which is necessary to verify the settlement, drilling depth should be deeper than the calculated depth of the deformation of foundation (1~2 times of the width of the supposed foundation can be considered)

When the principles of quantity and layout of pre-drilling holes from the design document and from the technical specification of the project conflict with the above principles B to C, the principles that are more stringent or have a more favourable understanding of the geological conditions of the project should be followed.

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5. Reception and reporting of pre-drilling holes

- A The reception and reporting work for pre-drilling shall be performed by independent 3rd party which is qualified in the field of geotechnical prospecting, and is approved by the client/representative of client, the designer, the consultant and the quality control entity
- B The following information(included but not limited) of the independent 3rd party to perform the reception and reporting work of pre-drilling shall be submitted and be approved by the client/representative of client, the designer, the consultant and the quality control entity :
- (a). The entities shall be well experienced and recognized in the field of geotechnical prospecting in Macau
 - (b). Document of the independent 3rd entities
 - ◆ Registration document in Macau
 - ◆ Name list and resume of key personnel of entities(included but not limited the academic qualifications and qualification certificate)
 - ◆ Job reference and resume in the field of geotechnical prospecting of the entities(included but not limited the relevant professional qualification certificate)
 - (c). Reception record and report shall be signed by the qualified civil engineer/geotechnical engineer from the entities