FOUNDTEST

METHOD STATEMENT
FOR
COMPACTION GROUT
CAVITY TREATMENT

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1.0 INTRODUCTION

Presence of cavities in limestone area could cause instabilities to the foundation of a building structure. Therefore, it is important that all cavities shall be properly treated during the foundation construction stage. As a foundation specialist, Foundtest Drilling Sdn Bhd do provides cavity probing and grout treatment service to the construction industry. This method statement presents our scope of works in cavity grout treatment.

2.0 OBJECTIVE

The objective of the cavity grout treatment is to enhance the ground foundation stability by filling up the cavities underground with cement grout before proceeding with any deep foundation works.

3.0 SCOPE OF WORKS

The scope of works involved in this cavity probing and treatment includes the followings:-

1. To carry out rotary wash boring on the surface of the ground to the Rock level.
2. To carry out deep Rock Probing and record bore log.
3. To obtain Rock core samples from the Ground.
4. To determine the presence of cavities in the rock.
5. To carry out Cavity treatment if there is any cavity in the rock.

4.0 DESCRIPTION OF FIELD EXPLORATION WORKS

4.1 Deep Boring Plant

The Boring Plant used was 'YWE D90R' which is capable of boring and drilling to the depth indicated in the Bill of Quantities and Drawings.

The Boring Plant is capable of boring and drilling to the depth requested by the client.

These boring rigs are also suitable for advancing the borehole, sampling, in-situ testing and rock drilling in accordance with the relevant specifications of each of these operations.

4.2 Method of Advancing Boreholes

The methods for advancing the boreholes were rotary wash boring, continuous sampling rotary drilling or a combination of these methods. Water is used as flushing agent.

4.3 Rock Drilling

When rock is encountered, NMLC diamond core drilling was carried out into the rock in accordance with ASTM D2113-99: "Standard Practice for Rock Drilling of Rock for Site Investigation". The Core Recovery Ration (CRR) and the Rock Quality Designation (RQD) as described below will be reported for each core run. The diameter of the core barrels used were such as to produce a rock core of 54.0mm diameter size i.e. NMLC core barrels.

Good quality core is defined as intact core having a fully circular circumference or in the case of broken rock fragments assembled to form cores with a fully circular circumference. The CRR shall mean the ratio of the total length of the good quality cores over the drilling, expressed to the nearest 5%. The RQD is the ratio of the total length of good quality cores each exceeding 100mm in length, over the drilling run, correct to the nearest 5%.

Drilling runs shall not exceed 1.5m length and the core barrel shall be withdrawn and core removed as often as may be necessary to secure the maximum possible amount of core recovery.

Rock core log would be recorded and if any cavities are encountered, cavity treatment procedure would be carried out accordingly.

4.5 Sampling in Boreholes

Rock core samples obtained during the fieldworks were labeled, properly kept in core storage box and handed over to the client for further investigation according to their requirements. All samples were stored orderly at the site in protective boxes in a dry place under cover until they are dispatched to the laboratory. .

5.0 DESCRIPTION OF CAVITY TREATMENT WORKS (COMPACTION GROUTING)

When there is any cavity encountered, compaction grouting could be carried out for the cavity treatment works. The method and work scopes proposed in this submission are subject to the approval of the geotechnical engineer of the project. The engineer may issues alternative methods for the cavity treatment if deemed necessary.

Drilled casing would be remained in the appropriate level where the cavity is detected. Grouting method to be followed as:

i. Cement mortar of grade 5 shall be used where substantial cavity is encountered.

ii. The drilling casing with 89mm diameter would be used as temporary casing to pump the grout into the cavity area.

iii. Connect directly from mortar pump or equivalent static pump to the grout pipe.

iv. Pump mortar and observe the working pressure reading registered at the pump set. Subject to a maximum registered pressure of 100 bar, the grout pipe shall be gradually withdrawn at about 0.5m interval within rock region and continue pumping of mortar.

v. The cycle of grout pipe withdrawal and mortar pumping shall repeat until the pipe toe reaches rock surface level. Thereafter, the drilled hole shall be mortar grouted to overflow.

Pressure release hole: Nearby bored holes before grouted shall form as a pressure release holes.

In case of multiple cavities encountered in any drilled hole, the grouting shall proceed from the lowest cavity and completed before proceeding to the next higher cavity.