

National Exams November and December 2011

04-Geol-B3, Site Investigation

3 hours duration

NOTES:

1. If doubt exists as to the interpretation of any question, the candidate is urged to submit with the answer paper, a clear statement of any assumptions made.
2. This is an OPEN BOOK EXAM.
3. Candidates may use any non-communicating calculator.
4. Questions have equal value. The grade for each question is given. It is suggested that the candidate proportion time based on the allocated value.
5. All questions require an answer in essay format. Clarity and organization of the written answer and any figures or sketches are important.
6. The examination has an overall value of 100 Marks: 4 questions consisting of 25 Marks each.

Value

25 Marks **Question #1**

A group of experts have convened a meeting in order to discuss the construction of a school building within the limits of a city. As an Engineer that is sitting in at the meeting, your boss asks you what you believe a site investigation should entail. Describe in detail your response to how you would go about planning and designing a site investigation for this project.

- 10 Marks a. What would be the major topics that you would cover? i.e. What would be the major headings that would be summarized in the final geotechnical/site investigation report?
- 10 Marks b. Propose what resources you would require to conduct the site investigation
- 5 Marks c. What would the costs associated with such an investigation be? i.e. What percentage of the overall budget should the site investigation be?

25 Marks **Question #2**

As part of a site investigation, one must try and ascertain the geotechnical components of a particular site with respect to the soil, rock and groundwater types as well as other relevant influences. How does one go about determining what type of soil and rock is present during a site investigation? Once the type of rock and soil has been determined, what else is an Engineer required to investigate or quantify? As well, how can one determine the extent or influences of the groundwater table and aquifers? Are there any other factors that one must examine in order to determine the potential risks associated with a particular site? i.e. is it enough just to determine the rock type(s), soil type(s) and the influence of water? What else should the Engineer consider above and beyond these?

25 Marks **Question #3**

List and describe at least 5 industry accepted in-situ sampling techniques used for soil or rock. Describe each technique, its methodology, equipment used, effectiveness, and limitations.

25 Marks

Question #4

A Site Investigation is conducted in stages. For each stage, cite, describe and include all of the related tasks and activities associated with each of the stages listed below.

5 Marks

a. Preliminary Information Study;

5 Marks

b. Site Inspection;

5 Marks

c. Preliminary Ground Investigation & Assessment;

5 Marks

d. Main Ground Investigation;

5 Marks

e. Investigation During Construction and Operation;