First Semester Examination
2020/2021 Academic Session

February 2021

EAG444 – Soil Stabilisation and Ground Improvement

Duration : 1 hour

Please check that this examination paper consists of **THREE (3)** pages of printed material before you begin the examination.

Instructions : This paper contains **TWO (2)** questions. Answer **ALL** questions.

All questions **MUST BE** answered on a new page.

1. (a). A development project of building a township at the hill slope which has a problem of erosion and land sliding.

(i). Make assessment and explain the condition of this failure with the aid of sketches to show the causes of failure.

[10 Marks]

(ii). Relate this to the requirement by the Hillside Development Guideline in order to be able getting an approval for the improvement for the development.

[15 marks]

(b). Case Study: A project of construction of an Embankment require to be improved by using Geosynthetics as the ground condition were very poor and the ground is made of soft soil. So in this condition what would you suggest to be used and what are the functions related to the project condition.

[10 marks]

(c). By relating with one of the functions that will show the applications of Geosynthetics, design this application. Make necessary assumptions for all the parameter that is required in the design. Show a conceptual practice in designing using geosynthetics

[15 marks]

2. The application of mechanically stabilized earth is proposed for a housing project near hillside. The design of an 18 meter high mechanically stabilized earth is shown in **Figure 1**. Sand backfill with a unit weight of 17 kN/m^3 and friction angle of 33° will be used for the backfilling. The 5 mm thick and 75 mm wide of ties-back strip will be used for the reinforcement. The allowable tension and interfacial angle of the strip are 2.4 x10^5 kN/m^2 and 10° respectively.

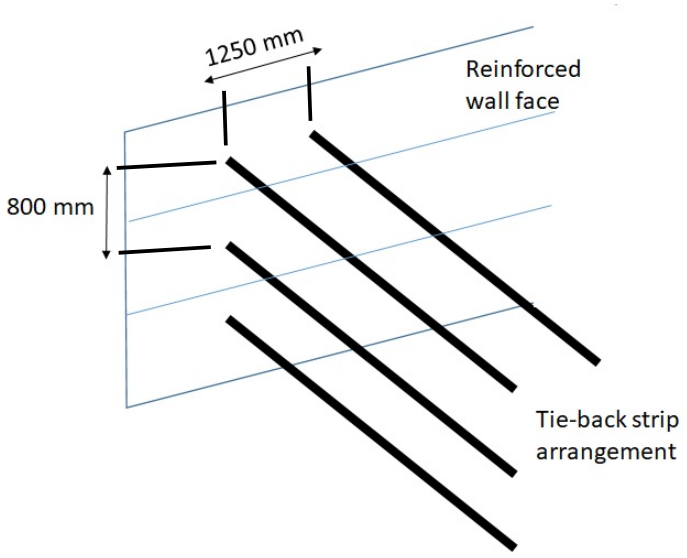

Figure 1

(a). If the required factor of safety against tie breaking for the mechanically stabilized earth is 1.5, check if this tie-back strip is adequate.

[16 marks]

(b). Calculate the maximum mechanically stabilized earth height if the factor of safety against tie-breaking is increased to 2.0.

[20 marks]

(c). With the help of a sketch, explain why if sand backfill friction angle reduces, the factor of safety against tie-breaking would also decrease.

[14 marks]

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