Prince of Songkla University

Faculty of Engineering

Final Examination: Semester II
Date: Monday 19th, 2007
Subject: 235–402 Geotechniques

Academic Year: 2006
Time: 13.30-16.30 a.m.
Room: A 203

Instructions

1. Attempts all questions (5 major problems) in 7 pages.
2. Answer all questions in this given papers and do rear papers allowed
3. All books and materials (Handheld non-programmable electronic calculators) are not allowed
4. Write your name in each page and returned all papers to controllers
5. Total marks are 124 points or 30 % of subject.

Question Part	Question Number	Full Scores	Assigned Scores
Part 1		**14**	
Part 2	**1**	**25**	
	2	**30**	
	3	**25**	
	4	**30**	
Total scores	**124**		

"ทุจริตในการสอบ โทษขั้นต่ำปรับตกในรายวิชานั้น และพักการเรียน 1 ภาคการศึกษา สูงสุด ให้ออก"

Name ..... **Surname** ..... **ID** .....

Bonne Chance et bon courage

Danupon Tonnayopas
Instructor
14 February 2007

Part 1. Answer the following questions:

1.1 In rockbolt applications, grouting serves purpose of (3 points)

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1.2 Water cement ratio of grouting (2 points)

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1.3 The ultimate bearing capacity of foundation depends on; (5 points)

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1.4 It is difficult to state the limiting condition for which a local or general shear failure takes place for a given soil.

a) However, which of the following parameters can be used as a rough guide to determine the type of failure? (2 points)

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b) The bearing capacity factors for local shear failure are determined with respect to (2 points)

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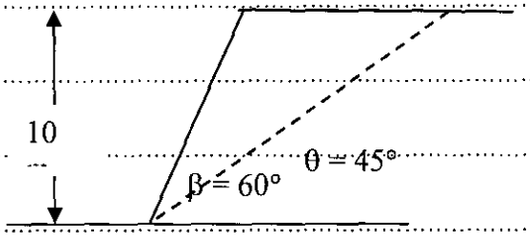
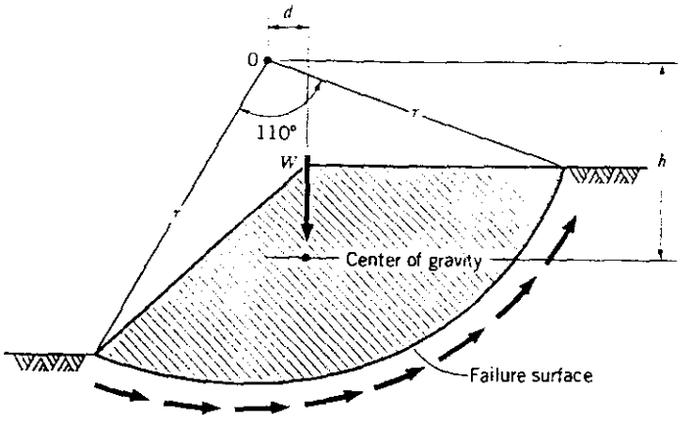
Part 2. Calculation questions

2.1 What will be the gross and net safe bearing pressure of sand having $\phi = 36°$ and effective weight 1.8 t/m^3 under (a) a 1 m wide strip-footing, (b) a 1 m square footing? Assume the footings are placed at a depth of 1 m below ground surface and that the water table is at grat depth. Also assume a factor of safety of 3.0. Use Terzaghi's theory. Given are $\phi = 36°$, $N_q = 47$ and $N_\gamma = 43$ (25 points)

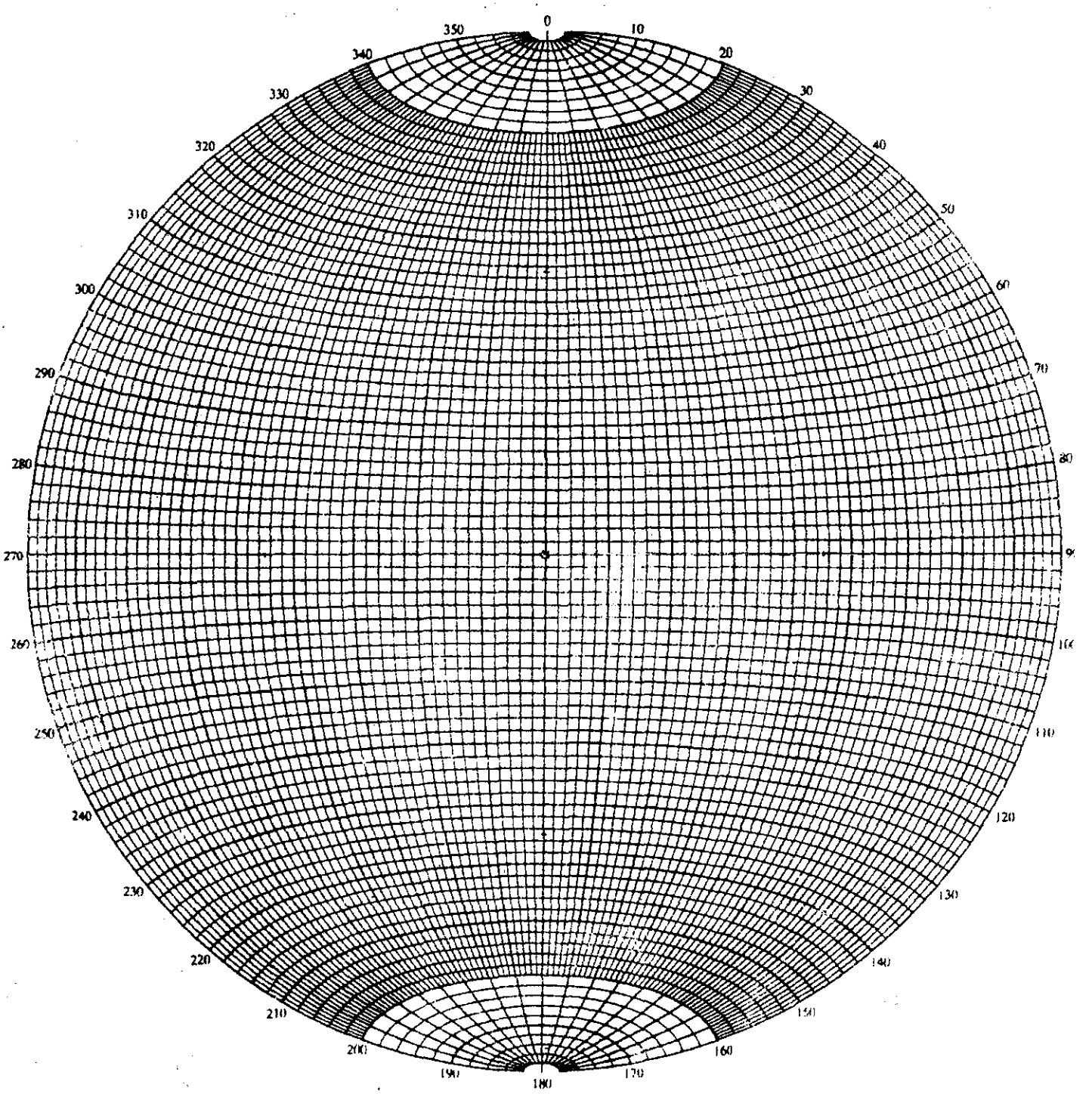
2.2. A cut slope is to be excavated to a depth of 10 m in sandstone with dip of bedding plane toward the excavation at a slope of approximately 45°. Determine the safety factor of the 60° slope, as shown. Direct shear test were run on samples to evaluate $\phi = 30°$, $c = 15$ kN/m^2 and its unit weight $\gamma = 25$ kN/m^3 (30 points)



2.3 For the slope shown below, assume the following data; W = 4500 kN, r = 15 m, d = 3.3 m, c = 30 kN/m^2, and ϕ = 0. Determine the safety factor against sliding on the circular surface shown? (25 points)



2.4 From data below evaluate slope stability by using stereo net projection.
Joint # 1 = 330°/60°; Joint # 2 = 230°/55°; cut slope 270°/60°; friction angle 45°. (30 points)



ตะข่ายแบบเส้นศูนย์สูตรชนิดพื้นที่เท่ากัน

(Equatorial equal-area net)