

A STUDY ON

SLOPE STABILITY PROBLEMS IN CYPRUS

by :

Mitrou Georgia

Project Report
submitted to
the Department of Civil Engineering
of the Higher Technical Institute
Nicosia - Cyprus

in partial fulfillment of the requirements
for the diploma of
TECHNICIAN ENGINEER

in

CIVIL ENGINEERING

JUNE 1990

INTRODUCTION

The failure of a mass of soil in a downward and outward movement of a slope is called a slide or slope failure.

Stability analysis determines whether the given or proposed slope meets the safety requirements. Soil mass under given loads should have an adequate safety factor with respect to shear failure and the deformation of the soil mass under the given loads should not exceed certain tolerable limits. The analysis must be made for the worst conditions.

This project deals with the slope stability problems and three specific cases of such problems in Cyprus, are examined. At the end, drawings and pictures of some of the cases are included.

Also, various methods used nowadays for the analysis of stability, problems are given and explained as well as the effect of some parameters on such cases.

Finally, the purpose of this study is to help and give an explanation to Engineers in Slope Stability problems which is a very important element in the Construction Business.

CONTENTS

Page

INTRODUCTION

PART 1

1.0.	THEORY ON SLOPE STABILITY	1
1.1.	Failure mechanisms and methods of analysis	1
1.2.	Factor of safety	2

PART 2

2.0.	METHODS OF MEASURING THE FACTOR OF SAFETY	3
2.1.	Cohesionless soils	3
2.1.1.	Slopes in dry Cohesionless Soils	3
2.1.2.	Effect of seepage on slopes in cohesionless soils	5
2.2.	Cohesive soils	6
2.2.1.	Method of slices (long term stability)	7
2.2.2.	Method of pore pressure ratio	8
2.2.3.	Bishop's method	12
2.2.4.	Method of slices (short term stability)	12
2.2.5.	Taylor's stability curves	13
2.2.6.	The Swedish method of slices analysis	17
2.3.	Partially submerged slope	18
2.4.	Location of the most critical circle	19
2.5.	Effect of crack in the stability of slope	21

PART 3

3.0.	FACTORS AFFECTING THE STABILITY OF SLOPES	24
3.1.	Height of the slope and angle on inclination	24
3.2.	Materials constituting the slope	24
3.3.	Effect of water	24

PART 4

4.0.	SLOPE FAILURE IN CYPRUS	26
4.1.	Slope failutre at Ora-Khirokitia road	26
4.1.1.	The problem	26
4.1.2.	Suggestions-recommendations	26
4.2.	Slope failure at Stavrovouni Monastery	28
4.2.1.	Introduction	28
4.2.2.	Location	29
4.2.3.	Topography	31
4.2.4.	Investigated areas and background history	31
4.2.5.	Geological setting	31
4.2.6.	Geotechnical considerations	34
4.2.7.	Conclusions	36
4.2.8.	Recommendations	37
4.3.	Slope failure at kakoratsia cut	43
4.3.1.	The problem	43
4.3.2.	Background	43
4.3.3.	Work done	44
4.3.4.	Geological setting	44
4.3.5.	Structure	45
4.3.6.	Geotechnical considerations	46
4.3.7.	Conclusions and recommendations	48

PART 5

5.0.	CONCLUSIONS	52
------	-------------	----

PART 6

6.0.	DRAWINGS	
------	----------	--