

Slope Stability Analysis

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Abstract

The analysis of stability of slopes is one of the utmost significance as its failure may lead to loss of lives and great economic losses. Slope stability analysis is to determine the endangered area and safe design of human-made or natural slope. Nowadays, spreadsheet has been used in design and analysis of geotechnical structures. Spreadsheet has the capability of solving problems in short time which make design calculation easier especially when involving trial and error method. Today, there is a lot of software on the market that can be used for slope stability analysis. Some are quite rigorous, while some are expensive.

Key-word: - Slope Stability Analysis, Factor of Safety

1. Introduction

The boundary surface of a soil mass inclined to horizontal and exposed to atmosphere or in contact with free water is called a slope (Alam Singh, 2008). When a slope fails, it is often called a landslide or a slope failure. Several classification methods and systems have been proposed for landslides. Landslides are the downward and outward movement of slope material because of exhaustion of shear strength (Raj, 2008).....

Hill slope in Malaysia are vulnerable to soil erosion and shallow slope failure due to intense and frequent rainfall events. Malaysia's annual rainfall is about 1500mm to 3000 mm per annum with an average 2400mm (Latif and Chan ,1995; Suhaila & Abdul Aziz, 2007).

On the today's market, there are many programming tools are introduced and each of them has advantages and disadvantages in terms of cost, speed and flexibility (Wolff, 1995).

1.1 Aims and Objectives

This study emphasizes on the slope stability analysis using the Microsoft Excel. This study will provide facilities to students and designers to compute the slope analysis quickly and easily in the future. Therefore, this study is expected to save cost and time in the analysis of the slope compared to manual calculations. To achieve this aim, several objectives are outlined as below:

- 1) To develop a spreadsheet for slope stability analysis.
- 2)

1.2 Scope of Works

The scope of this study is to

2. Methodology

Microsoft excels sheets were used in the building of slope stability analysis. This process involved the inclusion of the relevant formula in the analysis. In this study, two methods of analysis of the calculation sheet were developed,....

3. Results and Discussion

3.1 Development Of Simulation In Excel Program

Basic slope stability as written by Roy Whitlow (2001) is selected for developing the spreadsheet. The geometry, properties of soil and critical slip surface (ordinary method) are shown in figure 1.

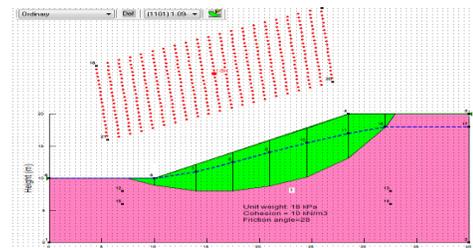


Figure 1 : Critical Slip surface for Ordinary Method

Table 1 : Factor of safety

Example data	Factor of Safety		Percentage of different
	Excel	Slope/W	
Ordinary Method	1.080	1.094	1.4%
Bishop Method	1.316	1.315	0.1%

The value of FOS is 1.080 for simulation in excel program (ordinary method) and 1.316 for Bishop Method as shows in and the difference value FOS for excel program and slope/w for both method shown in table 1. ..

4. Conclusion

On the whole, objectives of this study are achieved. An excel program for analysis soil slope stability has been successfully developed. The conclusions that can be drawn from this study are as follows:...

5. Limitation and recommendation

The use of spread sheets in analysing the data can be more time saving than manual calculations....

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**Note:

- 1) Paper can be submitted in English and Bahasa Malaysia
- 2) This paper should be typed with single spacing using Times New Roman Size : Topic (12), Author information (11), Content (10), and stored using Microsoft WORD format.
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- 4) Use the APA style format for the list of references and the minimum number of references is 5