## **ABSTRACT**

## Evaluation on Slope-Stabilizing Effect of Piles by use of the Bishop Simplified Method

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A new computer program SLOPILE with Windows version is presented in this study to analyze the stability of slopes containing piles. SLOPILE can be used to analyze and design piles installed in not only fill slopes but also cut slopes.

The analysis for both the slope-stability and the pile-stability are reviewed as followings.

1. Computer program, SPILE and CHAMP, being made to analyze and design the slope containing piles, were improved to SLOPILE program which can be used to analyze and design piles installed in not only fill slopes but also cut slopes.

SLOPILE can calculate the slope stability for both planar failure surfaces in infinite slopes and failure surfaces based on Fellenius and Bishop simplified methods. OS system combined Dos and CAD, which is applied in SPILE and CHAMP, is improved to windows version.

2. The safety factor in the limit equilibrium method based on Fellenius and Bishop simplified methods is calculated by SLOPILE for both not only fill slopes but also cut slopes. Comparing with two methods, the results show that the safety factor obtained from Bishop simplified methods for fill slopes and cut slopes have 0.15, 0.05 more than that from Fellenius methods, respectively.

From this fact, Fellenius methods is proved to be more acceptable safety

methods. Also the reason that the difference of safety factor having much at the fill slope is due to the depth of the circle failure surface.

3. The stability of ground installed piles is satisfied with depending on both the stability of the pile and the stability of slope. And the resistance force of stabilizing pile composed of the resistance of pile and of the ultimate reacting force of ground is used with the temporary criteria proposed by the engineer's judgement as mentioned 2 Chapter. But, through the application of critical value from the ultimate lateral resistance which represent the acting of the ground resistance according as soil modulus and displacement, the analysis could be conducted more reality. In case that the ultimate lateral resistance is considered, the safety factor of slope shows 0.8% 1.2% less than that of the ultimate lateral resistance being not considered and the occurred displacement of the pile is same.

4. The stability analysis of the slope containing stabilizing piles and the stability analysis of the foundation piles for abutment are summarized and SLOPILE program depending on their analyses is developed. It is known that the effect of the slope-stability containing piles is increased by increasing the size of soil modulus for the upper part of sliding surface and the number of piles in a row. And fixity condition of pile head, stiffness of piles, and soil modulus have much effect on the behavior of piles.