CASE STUDY ON SLOPE STABILITY ALONG FINCHA-LEMLEM-BEREHA ROAD PROJECT

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Abstract

The aim of this project was to assess a land slide problem that occurred during construction of the Fincha-Lemlem Bereha road in Ethiopia. The road begins at Fincha town and crosses a moderately sloped ground, then a very steep down hill until it reaches a Sugar factory, 900 km below the elevation of the town. The soil parameters determined by the already performed investigation were used for analysis of this problem using the SLIDE software.

The analyses included factor of safety determination depending on different conditions in relation to:

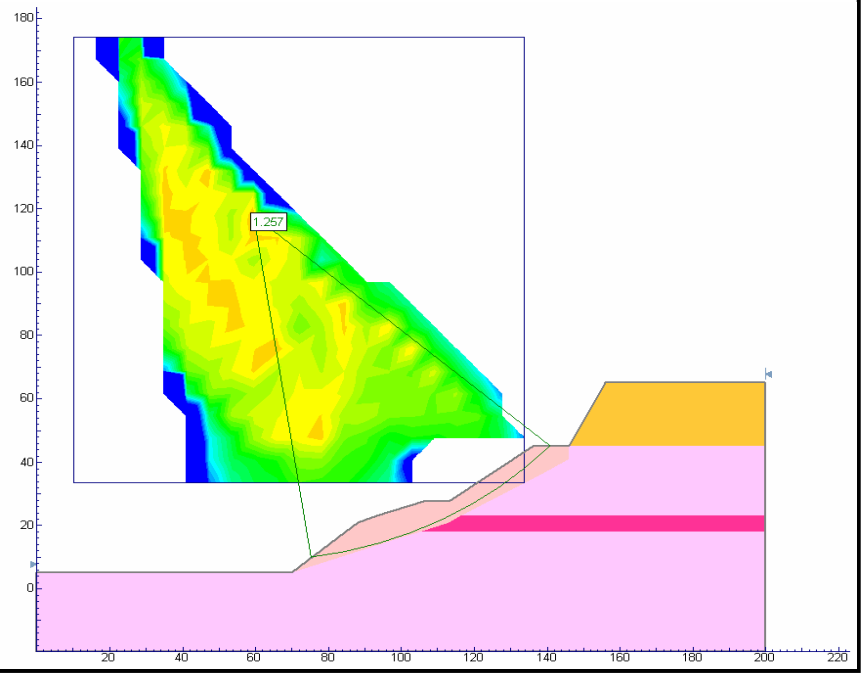
- Assigning strength parameters and assigning Ground Water Level
- The condition of the slope sections before and after construction

Further, the results from these analyses were scrutinized and indicated that the strength parameters taken for the bottom layer of the slope sections were not representative of the layer. Therefore, back-analyses were done to investigate the stability of the slope with variable strength parameters for the specific layer. To perform the back-analysis, sensitivity analyses by SLIDE were made; first to determine which strength parameter influences the strength property the most and then the minimum values of this influencing strength parameter were computed for the available slope sections. These back analyses yielded minimum values of the strength parameters at each slope sections for factor of safety values above unity and hence, probable stability.

Also analysis results from this project were compared with the already existing remedial proposal to supplement subsurface drainage to lower the water table below the fill. The remedial solution was thereby proved to improve the stability of the problematic road section.

Road section after the slide takes place on June, 2005, photo taken from the end of the slide mass.

Section at BH8
- ground before construction of embankment
-with no pore pressure
-Undrained Analysis



Section at BH8
- ground after embankment construction
-with pore pressure
-drained analysis