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# DISCUSSION

VICTOR DE MELLO, Professor, Dr., Sao Paulo, Brazil.

May I put in just a brief comment with respect to your problem. We have very much the same problem in slope stability in that transition material between mature residual soil and bedrock, that is, the saprolite and weathered rock. The only technique that we have found to be more or less satisfactory, and it is a remedy I would suggest, is the following:

If you try to compute the actual Factor of Safety of the stability of any slope it is very difficult because of the heterogeneity and errors and so on. But no matter what parameters you use, if they are within reasonable range you can use a set of parameters to check on how much of a Change of Factor of Safety your work introduces. Now, let us respect the fact that Nature is usually at a Factor of Safety of close to 1. Nature doesn't have a reputation to perserve such as Prof. Sowers pointed out we engineers have to. Nature really and usually is at a factor of safety 1 under critical conditions.

So if your engineering project causes changes, with respect to which your computations of $\Delta FS$ can in closed-cycle comparisons prove surprisingly satisfactory irrespective of errors in parameters, then the best engineering Decision of Design is to attempt to introduce compensatory measures so that $\Delta FS \longrightarrow 0$ or $\Delta FS < X$ (the limit you decide to allow).

In the rush program of highway and railroad development that is being pushed presently in Brazil, that is the design and computational routine that we have been using, with considerable success.

Statistically I have had very few cases where one has had to repent of measures taken within the phylosophy of not letting $\Delta FS$ become unduly unfavourable or adverse, starting from initial critical Hypotheses and set of strength parameters that lead to $FS \simeq 1.0$.