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Probabilistic and Stochastic Analysis of a Retaining Wall for C-Φ Soil Backfill

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Abstract : A methodology for the probabilistic analysis of active earth pressure on retaining wall for c-Φ soil backfill is described in this paper. The Rosenblueth point estimate method is used to measure the failure probability of a gravity retaining wall. The basic principle of this methodology is to use two point estimates, i.e., the standard deviation and the mean value, to examine a variable in the safety analysis. The simplicity of this framework assures to its wide application. For the calculation is required 2^n repetitions during the analysis, since the system is governed by n variables. In this study, a probabilistic model based on the Rosenblueth approach for the computation of the overturning probability of failure of a retaining wall is presented. The obtained results have shown the advantages of this kind of models in comparison with the deterministic solution. In a relatively easy way, the uncertainty on the wall and fill parameters are taken into account, and some practical results can be obtained for the retaining structure design.

Keywords : retaining wall, active earth pressure, backfill, probabilistic analysis
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