

Probabilistic Analysis of Fiber-Reinforced Infinite Slopes

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Abstract : Fiber-reinforcement is an effective soil improvement technique for applications involving the prevention of shallow failures on the slope face and the repair of existing slope failures. A typical application is the stabilization of cohesionless infinite slopes. The objective of this paper is to present a probabilistic, reliability-based methodology (based on Monte Carlo simulations) for the design of a practical fiber-reinforced cohesionless infinite slope, taking into consideration the impact of various sources of uncertainty. Recommendations are made regarding the required factors of safety that need to be used to achieve a given target reliability level. These factors of safety could differ from the traditional deterministic factor of safety.

Keywords : factor of safety, fiber reinforcement, infinite slope, reliability-based design, uncertainty

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