

ABSTRACT

The uncertainties associated with geotechnical system in the form of material variability and seismic ground motion, pose great challenges to engineers. To account for these uncertainties in the planning of geotechnical infrastructure in mountainous regions, this study aims to highlight the applicability of reliability analysis and seismic fragility curves in assessment of slope performance.

In this study the First Order reliability Method (FORM) of slope under Pseudostatic condition is presented along with the development of fragility curves. Reliability analysis is done using Response surface Method (RSM) and FORM. Response surface method is used to generate the performance function *i.e.* the relation between the input variables and output response. Subsequently, fragility curves are generated using numerical analysis under dynamic condition.

Reliability analysis aims to quantify the system performance in terms of probability of failure. In addition, fragility curve defines the relation between the damage states corresponding to increasing intensity of ground motion. The study also presents significant computational advantage of reliability analysis over conventional methods.