

Applicability of variability response function for geotechnical risk assessment

M. K. Lo

Ph.D. Student, Dept. of Civil and Environmental Engineering, The Hong Kong Polytechnic University, Hong Kong

Y. F. Leung

Assistant Professor, Dept. of Civil and Environmental Engineering, The Hong Kong Polytechnic University, Hong Kong

ABSTRACT: This paper explores the use of variability response function (VRF) for risk assessment of geotechnical system under spatially variable soil properties, where the properties exhibit a range of possible autocorrelation characteristics. VRF only requires a single set of analysis, but traditional Monte Carlo simulation (MCS) requires separate sets of analyses. VRF can be estimated through a simple regression procedure, which does not require random field simulation. In a footing displacement analysis, the reliability assessments by VRF match well with those of MCS, when the soil property has relatively low variance.