A Study on the Seismic Failure Probability Evaluation for the Underground Structure

Kazuhiko URANO, Tsuyoshi NISHIMURA and Ikumasa YOSHIDA

Seismic reinforcement is also performed for underground structures by ground improvement assuming a large-scale earthquake, but it is important to understand the effects of quality variations on the reinforcement effect. However, earthquake damage probability assessment for underground structures requires a two-dimensional FEM of ground-structure interaction, which may require enormous numbers of calculation cases and calculation time and is difficult to apply. In this paper, a simple damage probability evaluation method using the minimum Monte Carlo simulation is proposed, and damage probability evaluation during an earthquake was conducted for box culverts. Based on the evaluation results, we compared the simplified method with the conventional method, and confirmed the applicability of the simplified method.