
Study on Seismic Deformation Prediction and Dynamic Stability Evaluation of Castle Masonry Wall

Yasutaka NOMA, Hiroyuki YAMAMOTO, Tsuyoshi NISHIMURA,
Hiroyoshi KASA, Tatsuaki NISHIGATA, Kazuhiko NISHIDA

It is a crucial problem for maintenance of castle masonry walls to establish a stability evaluation method under seismic loads. Hence, in the present study, techniques to predict the seismic deformation and evaluate the dynamic stability of castle masonry walls were examined. Simulations of the deformation characteristics of castle masonry walls during shaking table tests to investigate the applicability of the distinct element method to seismic deformation predictions were conducted after deciding appropriate input parameters for each component (stone, cobble, and ground). As a result, it is confirmed that displacements and deformation modes of the castle masonry wall in the tests were well reproduced by analyses. Finally, proposals to evaluate analytical results by using a bulging index (ratio of bulging amount to masonry height) were shown for the inspection of the dynamic stability of castle masonry walls should be inspected.