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The run-out and recessional distances of granular slope based on shaking table model tests

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The sliding distance is one of the most important indicator for slope behavior and landslide hazard mitigation. The focus of this study is to simulate the run-out distance of model slope when subjected to seismic loads acting on the model box. To study the run-out and recessional distances of slope under seismic loads, 5 granular model slope shaking table specimens were prepared. The specimens were prepared using dry pulluviation and boundary conditions were simulated before experiment to avoid end effects. The weight of each specimen ranges from 55.5 to 56.8 kN and the unit weight of each specimen ranges from 15.3 to 15.8 kN/m^3. The height of slope is 50cm and the slope angle is 30 degree. The sinusoidal type acceleration histories were applied with various peak amplitude. In order to compare the effects of horizontal and vertical accelerations to the progressing of landslide, specimens were subjected to different input acceleration conditions. Two specimens were subjected to horizontal accelerations only with the peak amplitude of 0.28g and 0.35g, respectively. Horizontal acceleration amplitudes with 0.22g, 0.34g, 0.38g and vertical acceleration amplitude with 0.1g, 0.08g, 0.12g in pairs were applied to the other three specimens. The toe run-out and crest recession started when the acceleration just exceeding the critical acceleration derived from pseudo-static analysis. The landslide propagates after the landslide initiates. In the specimens with horizontal acceleration only, the run-out and recessional distances increased with increasing acceleration amplitude. Moreover, the distances increased even more when the vertical acceleration was applied to the specimen. The maximum run-out distances range from 15.8 to 45.6cm at the toe and the maximum crest recessional distances range from 11.4 to 43.5cm. However, no significant effects were observed in run-out and recessional distances of increasing horizontal accelera-

tion amplitudes when the vertical acceleration remained constant. The study illustrates the distance of run-out and recession, and the potential area of landslide hazard can be suggested accordingly.

Key words: model slope shaking table test; run-out distance; recessional distance