Study on the factors of seepage erosion

*Szu-Wei Fu[1], Kuang-Tsung Chang[1]

1. National Chung Hsing University

The causes of many slope disasters are often related to the seepage behaviors of soil. For instance, groundwater seepage may cause internal erosion of the soil. The soil particles are taken away by seepage water to form void or pipe. In addition , the earth pressure leads to the collapse of the overlying soil.

In this study, we designed a set of apparatus that can add confining pressure to the outside of the specimen. In order to simulate the situation of sand in slopes, we investigated the critical seepage velocity of sands caused by seepage erosion failure under different confining pressure, with different particle size distributions, sizes of outflow, etc. Then a failure criterion for seepage erosion is developed based on the drag equation in fluid dynamics and confirm with experimental data.

The results show that the critical seepage velocity at failure is affected by the particle size distributions, sizes of outflow and the confining pressure. The theoretical results are compared well to the experimental data.

Keywords: seepage erosion, Drag equation

