

**Simple Method to Evaluate the Residual Uplift Displacement of Open Cut Tunnel
Caused by Liquefaction**

Kenji WATANABE Ryo SAWADA

Masaru TATEYAMA Junichi KOSEKI

In recent years, there has been serious uplift damage to underground structures which is caused by the liquefaction. In the current earthquake design procedure, the possibility of uplift of underground structures such as open cut tunnel is evaluated by the safety factor in which only the vertical force equilibrium of the structure is considered. It is difficult to estimate the residual uplift displacement of underground structures. In this study, therefore, a series of shaking table tests were conducted to investigate the uplift mechanism of open cut tunnel in liquefied ground. Based on these test results, a new method to evaluate the uplift displacement of the open cut tunnel is suggested.