Landslide Movement at Lokanthali during the M_w = 7.8 Gorkha (Nepal) Earthquake of April 25 2015

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ABSTRACT

The Gorkha earthquake (M_w = 7.8) of April 25, 2015 caused widespread damage in the Kathmandu Valley. At a site, known as Lokanthali, large fissures and tension cracks with vertical offsets in excess of 1 m, were observed along a ridge for a distance of about 1 km. The authors conducted post-earthquake engineering field reconnaissance of the affected areas, performed subsurface explorations, conducted in-situ soil strength tests, and surveyed the topography of the site. Additionally, numerical analyses were performed to understand the seismic vulnerability of the site. The authors discovered that the undrained shear strength of the site's soft and highly plastic lacustrine clays was very low. In addition, vane shear tests revealed the high sensitivity of these clays. As a result, Lokanthali was affected by seismically induced landslide movements, although the site has gentle slopes and the Gorkha earthquake produced relatively moderate ground accelerations. The site provides a case history of moderate seismic landslide movement which may be used to calibrate simplified Newmark Sliding Block models.

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