Shinseiko-landslide induced by the great Kanto Earthquake had a sliding surface in the Tokyo Pumice, which is widely distributed in Kanagawa and Tokyo areas

*Masahiro Chigira[1], Hirokazu Furuki[2], Tomohiro Kasama[3], Takehiko Suzuki[4]

1.Disaster Prevention Research Institute, Kyoto University, 2.Nippon Koei Co. Ltd., 3.Kanagawa Prefectural Museum of Natural History, 4.Tokyo Metropolitan University

Numerous numbers of slope movements were induced by the great Kanto Earthquake in the west of Kanagawa prefecture. One of them made a landslide dam and a lake, Shinseiko, which means a lake made by an earthquake. That lake still remains as a part of a park. That landslide was surveyed by Terada and Miyabe (1932) but its internal structure has never been known. We confirmed that the shape of head and frank scarps keeps their original shape and made two ca 30-m long drill holes aligned on a slope line 20 m away from the right frank scarp. The drilling results and the field survey around the landslide strongly suggest that the sliding surface of this landslide is in the Tokyo Pumice (Hk-TP, hereafter TP) about 17 m below the ground surface.
The top of the two drill holes had an 8 m of difference in elevation. The higher one penetrated 17 m of brown volcanic soil from the ground, TP with 1.3 m thickness, then Miura Pumice (Hk-MP, hereafter MP) 1.4 m below it. The lower drill hole penetrated 10 m of black and brown volcanic soil, 7 m of pumice flow (Hk-T(pfl), hereafter TPfl), 1.9 m of TP, then MP. These occurrences draw a geologic profile, in which TP is subparallel to the slope surface and approaches the foot of the head scarp. TP was observed to be involved in the landslide mass in the base of the mass at the downstream face of the deposits on the Ichiki River. Pumice grains of TP and TPfl in the drill cores and in the landslide mass were weathered and weak, while those on the river bed of the Ichiki River were fresh and hard.
High-resolution DEMs obtained by the airborne LiDAR suggest that there are many other remnants of landslide with a planar base, where the materials are all went out. Their sliding surfaces could be along TP, which could have been undercut, judging from the distribution of the TP outcrops.
TP erupted from the Hakone volcano 60 to 65 ka (Machida and Arai, 2003; Kasama and Yamashita, 2008; Machida and Moriyama, 1968) and widely covers Kanagawa and the west of Tokyo areas, forming slope-parallel bedding and being covered by thick Younger loam. When those beds are undercut, they could slide catastrophically during a future big earthquake.
Kasama, T., Yamashita, H., 2008. Tokyo Pumice from Hakone volcano, central Japan. Res. Rep. Kanagawa prefect. Mus. Nat. Hist. 13, 91-110.
Machida, H., Arai, F., 2003. Atlas of tephra in and around Japan. Tokyo University Press, Tokyo.
Machida, H., Moriyama, A., 1968. The development of Mt. Fuji and Mt. Hakone volcanoes analysed from the tephrochronological study in the Ooiso Hills. Geographical Review of Japan 41, 241-257.
Terada, T., Miyabe, N., 1932. Landslide in Hatano. Bull. Earthq. Res. Inst. Univ. Tokyo 10, 192-199.

Keywords: Pyroclastic fall deposits, Earthquake, Landslide, Tokyo Pumice

©2016. Japan Geoscience Union. All Right Reserved.