

GSSL-2019-T2-S2/01

SLIP SURFACE SOIL MINERALOGY; WITH REFERENCE TO THE LANDSLIDES AT HAGGALA, NUWARELIYA AND KETAWALA, BADULLA, SRI LANKA

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In most landslides, soil consists of three layers; bottom stable soil layer, top most moving soil layer and the thin layer in between these two soil masses, which is known as the “slip surface” of a landslide. This study was carried out to understand the slip surface mineralogy. Eleven soil samples of five boreholes from two major landslides; Ketawala, Badulla and Haggala, Nuwaraeliya were investigated. The collected soil samples were subjected to sieves analysis and Atterberg Limit tests. Clay samples were extracted from soil samples of all three layers and the mineralogy of each clay sample were studied using differential thermal analysis (DTA) and X-Ray diffraction analysis (XRD).

The slip surfaces of those landslides were determined from the bore holes of no 1 and no 3 of Haggala site at depths of 13.00-13.45 m and 7-7.45 m and from the bore holes of no 5, 7 and 11 of Ketawala site at depths of 9-9.45 m, 8-8.45 m and 6.00-6.45 m, respectively.

According to sieve analysis most slip surface soil contained higher percentages of less than 20 µm of size particles. Atterberg limit test revealed that the plasticity index of samples collected from each slip surface was below 20 indicating the presence of clay particles. The clay from the soils above and below the slip surface were non-plastic. The XRD and DTA tests revealed the presence of high amount of montmorillonite and kaolinite in the soils from the slip surfaces. In addition, illite and mica were observed in nearby soil samples.

Keywords: Slip surface, Clay, Kaolinite, Montmorillonite, Illite
