



Slide in weathered banded gneiss due to gully action in southern Brazil

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Gully erosion is a common occurrence in Southern and Central Brazil. Usually they progress along buried channels, along sometimes hundreds of meters. Oftentimes they trigger slides if they undercut the toe of a slope of residual soil. An example of this kind of action, involving two simultaneous slides along weathered banded gneiss in the district of Bananal, Sao Paulo, Brazil, is presented. Geotechnical characterization was made through exploratory percussion borings with SPT and rotary drilling, plus block “intact” samples of representative layers of the slide mass, including the weathered layer along which the planar movement occurred. Field monitoring through Casagrande type piezometers and inclinometers confirmed the depth and shape of the sliding surface. One is the planar slide along the banded gneiss weathered layer; the other is conchoidal, with a curved failure surface, In the saprolitic soil mass at the opposite side of the first slide. In the planar slide, the weathering of the gneiss took place along a layer rich in biotite, and a series of tests involving the determination of the peak and residual strength of the weathered layer soil was undertaken. The results clearly demonstrated that the residual strength of saprolitic and lateritic soils is not dependent upon the plasticity index or liquidity index determined in de-structured soil. Also, the distinction of saprolitic and lateritic soils can be easily made through immersion tests of intact cubic samples in water. The saprolitic soil crumbles, and forms a softened mass underwater with a conic shape. The lateritic samples remain intact even after 24 hours of immersion, revealing the existence of true cohesion due to the iron and aluminium oxide’s cementation. The slide proceeds in small steps, annually, depending on rain precipitation, which increases the rate of soil removal at the foot

of the slides. The increase of the residual strength due to cicatrisation after a rest period was also investigated. It was small, but significant. The paper also dwells on the mechanics of the two types of slides provoked by the water exfiltration at this location.