EDITORIAL

Our country has been the epicenter of important phenomena of mass removal or landslides, which have brought great material losses and fatalities. For this reason, the study and prevention of these phenomena are a significant work area mainly for entities in charge of disaster prevention, and for the agencies of territorial planning and ordering.

The connection between deep rotational landslides and the groundwater system surrounding the affected area has been evidenced in mountain areas around the world (such as in Colombia) (Brönnimann, CS, 2011; Gattinoni P. and Scesi L., 2013; Take WA, Beddoe RA, Davoodi-Bilesavar R. and Phillips R., 2015).

The classical analysis for slope stability has been based on the calculation of safety factors from limit equilibrium methods or stress-strain analysis by numerical methods. Although these respond to internationally accepted methodologies, all geotechnical modeling is based on the understanding of dstabilizing forces, and these in turn respond to a correct understanding of the geological model that governs the slope or slope in question.

Different coupled hydrological and geotechnical models have been developed for the detailed study of mass movements triggered by rain (corresponding to surface events that respond to heavy rainfall). These models include SHALSTAB, TRIGRS, and SHIA_landslide, among others. These tools have allowed the modeling of vertical and lateral flow, as well as some analysis of stationary and transient conditions (Aristizábal E., Velez I. J. I., Martínez H. E., Jaboyedoff M., 2016). These models have also made it possible to evaluate the influence of subsurface flow on mass movements and not only deep flow and its respective changes in the water table. These changes respond to long- term antecedent rain conditions and trigger deep landslides, which require detailed studies for their destructive capacity.

Landslides are mostly associated with intense and prolonged rain conditions that favor saturation of the most superficial layers and localized accumulations with permeability differences. This saturation and accumulation generate hanging aquifers or other mechanisms of accumulation or underground circulation. Several authors have proposed the influence of groundwater flow systems through hydrogeological mechanisms (Hoyos, F., 1990;Bustamante,M.,1990;Rodríguez,C.,1977).

Groundwater flow systems operate through mechanisms conditioned by the permeability of the materials, which favor the appearance of a series of hydrogeological processes and represent unfavorable factors for landslides (i.e. infiltration, exfiltration, preferential paths of circulation of groundwater). Likewise, there have been important advances at territorial planning and local risk management scales in the modeling of susceptibility and threat zoning scenarios (Aristizábal E., Velez I. J. I., Martínez H. E., Jaboyedoff M., 2016). These have linked de information regarding the nature of subsoil materials, their disposition, and the behavior of water, which have contributed to the understanding of surface-type phenomena.

Mass movements involve a series of factors that together generate the phenomenon of instability due to loss of soil resistance or fatigue in a fractured rock mass. Flow lines along rock beds are discrete in nature, and ground approaches are not applicable in understanding circulation in fractured rock beds (National Academies of Sciences, Engineering, and Medicine, 2015). Rocks fracture when tensile, compressive, and / or shear stress exceeds the strength of the rock. Fractures can be modified as a result of stress-strain, as in seismic events; as well as by physical or chemical processes,such as weathering, erosion, dissolution, or precipitation of minerals.

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