



Causes and mechanisms of landslides triggered on foundation soil areas

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Landslide research has a big practical meaning, since the disturbance of slopes and landslide triggering cause significant risks in the building development. A large number of inhabited areas are prone to landslide phenomena, due to the accumulation of a series of negative factors. Landslide processes cause direct and indirect damage to the cities, buildings, transport facilities, main pipelines, cause accidents and destruction often accompanied by human casualties. The determination of appropriate places for safe urban development within the community boundaries can be achieved through analysis of the parameters that affect the manifestation and evolution of such phenomena. Systematization of landslide-affected territories is made on the basis of the main criterion – geological structure – and the important characteristics, such as factors of landslide formation and the mechanism of landslide displacement. Geological structure determines types of landslides and the intensity of the landslide process. In spite of the fact that for each slope exist individual peculiarities in the structure, the general features of big groups of slopes must be considered, in order to determine the characteristics of the landslide process. Some peculiarities of geological structure of slopes are the most important for landslide development: form and size of the bodies and conditions of their location with regard to the slope; physical and mechanical characteristics of all rocks comprising the slope; form of contact between the rocks, contact orientation with regard to the slope, presence of fissures and other surfaces of weakening.

When a landslide occur all geo-mechanical indexes are degraded because of the presence of groundwater that increases land instability and accelerates the landslide phenomena. Natural surface water and pore water in the soil is not an ideal, incompressible fluid. The fluid shows compressibility due to the microscopic air bubbles dispersed in the water. Compressible pore water causes a delayed reaction of the pore water pressure on any pressure change at the boundaries if the soil has the permeability less than the velocity of the lowering of the surface water level. Due to this phenomenon, the stability is affected by the interaction of surface water and pore water. The effect of retarded pore water pressure release on slope stability is primarily dependent on the permeability of the soil, the compressibility of the pore water, and the velocity of the pressure change.

Many of the slopes represent geosystems that are functioning under conditions of unstable equilibrium. One of the consequences of its disturbance is the appearance or intensification of geological processes. This acts to alter drastically and sometimes irreversibly the engineering-geological and environmental setting.

The paper presents the causes and the mechanisms of the disturbance of stability under natural and artificial effects affecting foundation soils.