

Ground water in urban landslides

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The urban developments changed original landforms completely during this several decades. The crests of the hills have been removed and the valleys filled by cutting soil and industrial waste, with many artificial slopes and valley fills have been formed in the hillside. During heavy rainfall, most of water runs out immediately through the artificially covered ground surface, however, unusual infiltration flow into aging cracks of urban structures occurs slope disaster by increasing of confining water pressure in the slope structure.

Shallow ground water level in valley fill materials has been observed frequently even though the artificial drainage system that was made completed officially. Recharge of ground water from aged water supply and drainage system, and natural ground water system has been estimated to exceed the discharge by the poor drainage system in valley fill. The liquefaction of the fill during strong shaking occurs valley fill type landslides frequently in the past earthquake disasters. Increase of pore water pressure has proportionally relation to the ground velocity by earthquake, and effective stress will be 0 (zero) in the case of the ground velocity over 25 cm/s.

These landslides also revealed the weaknesses of urban development in Japan over the past half century. Precise observation and the assessment model for urban ground water system are required.