



## **Hydrological Effects on Failure Mechanism of the Shiaolin Landslide, Taiwan Induced by Typhoon Morakot**

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In 2009 Typhoon Morakot struck southern Taiwan and induced a catastrophic landslide in Shiaolin Village, Kaoshiung City, and more than 400 people were killed. This research focused on the hydrological condition and its effect on the failure mechanism of the catastrophic Shiaolin Landslide. The topographic analysis was conducted using the DEM before and LiDAR derived DEM after the landslide. Based on results of the topographic analysis, a wedge type failure mode was deduced. In order to determine the critical sliding condition and geometry of the failure wedge, the PIV analysis, slope & aspect analysis and attitude analysis were conducted, and comparisons of results were made to finalize the geometry and attitude of the critical sliding condition of the Shiaolin Landslide. The stability analysis was conducted accordingly using material properties from laboratory test and estimation from the similar formation. The effects of ground water variation, possible effect of fault gouge on seepage water table, and the strength reduction of rock mass material were considered in the detailed analysis. The results suggested that the Shiaolin Landslide has a wedge type failure mode, and the ground water variation played an important role of the landslide, and the existence of fault gouge affected the ground hydrology significantly, which could lead to the critical failure of the Shiaolin Landslide.