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Deformation and Failure characteristics of Anaclinal Slope by Rainfall using Physical Modeling

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This study investigated the deformation characteristics of anaclinal slopes in Tai-an Township, Miaoli of Taiwan. There are several accidents cause by falling rocks at the study area in recent years, heaving rainfall and long duration were one of the causes. Field surveys and physical model tests were performed to explain the gravitational deformation characteristics of anaclinal slopes by rainfall under various conditions and to derive the deformation process and failure characteristics. The physical models have been considered material (the alternations of sandstone and shale), joint spacing, and dip angle. Observing the failure process of anaclinal slopes in the rainfall with physical models, and the physical models are compared the spacing of joint with the dip angle. The results of the study that the quantity of secondary weak plane is controlled by joint spacing, the more secondary weak planes have, the more deformation physical models will get. In addition, the gravitational is the key element to the changing dip angle of the physical model failure. The results of the study that compare the physical models of joint spacing with dip angle changing, the slope toe influence to the time of physical models failure.

Keyword: deformation characteristics, anaclinal slopes, rainfall, physical model