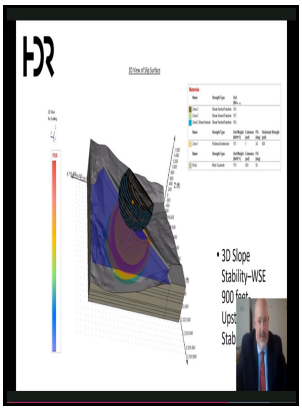
Slope stability analysis of earth embankments

University of Kentucky - Stability of Slopes Using Geo Slopes



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Once detached, a rock boulder will follow a certain trajectory which depends on its size and shape and the topography of the region.

Introduction to Slope Stability

The methodology uses conventional limit equilibrium slope stability analysis methods, in combination with the Newmark method for es- timating displacements. As the slope becomes more complicated, particularly if there are thin, low-strength bedding planes, then this screening criteria identified in Table 8-3 should not be used and a detailed slope stability analysis performed, in which the strength in each soil layer is modeled. The groundwater location for most of these slopes will be at some distance below the base of the fill.

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The crown is the area above the main scarp that has not moved downwards.

Introduction to Slope Stability

It works best when the slope is relatively homogeneous in consistency and there is no water table within the slope. The surface of rupture is the zone in which the ground material slides. There are certain landslide phenomena that take the form of slow or fast-moving flows.

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The potential failure mass is treated as either a rigid body or deformable body, depending on whether a simplified Newmark sliding block approach or more advanced numerical modeling is used. In these cases the de- termination of the strength of the foundation material under static and seismic loading becomes a key consideration dur- ing the analysis.

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The seismic coefficient used in the analysis is based on the site-adjusted PGA ad- justed for wave scattering effects using the Î± factor defined in

Chapters 6 or 7. In particular, it decreases the normal effective stress that acts between the grains and hence, the frictional resistance is reduced.

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