

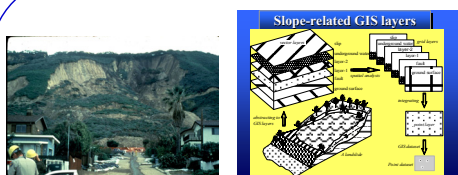
DEVELOPMENT OF GIS-BASED SPATIAL THREE-DIMENSIONAL SLOPE SPATIAL STABILITY ANALYSIS SYSTEM: 3DSlopeGIS SYSTEM

Abstract

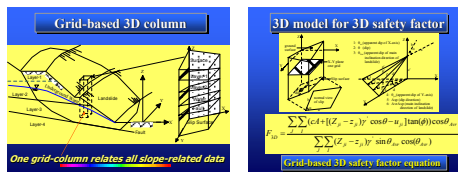
Based on a new IT technology-Geographic Information System (GIS), this study presents a new slope analysis approach which can be used to identify the possible slope failure bodies from complicated topography. In a system, all slope-related spatial information (vector or raster dataset) are integrated; the study area is divided into Slope Unit which possesses approximate inclination; assuming the initial slip to be the lower part of an ellipsoid, the 3-D critical slip surface in the 3-D slope stability analysis is located by minimizing the 3-D safety factor using the Monte Carlo random simulation.

Contents

GIS-grid based 3D models

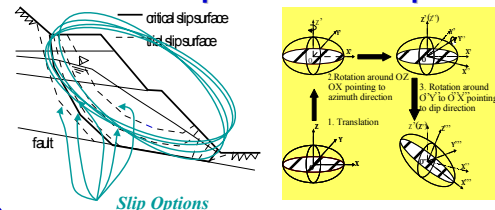


Abstracting the GIS Layers for a landslide



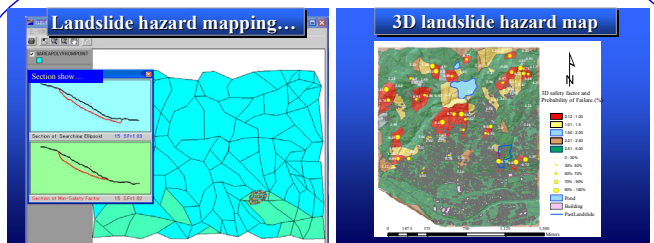
Deriving the Models for Calculating the 3D safety factor

Monte Carlo Simulation for Critical slip surface of slope

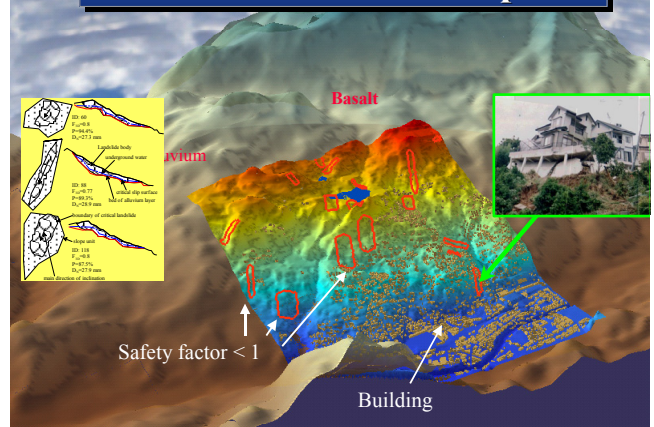


Slip Options

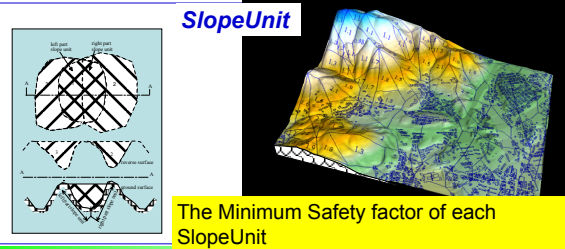
3D Landslide hazard mapping



3D landslide hazard map-3D

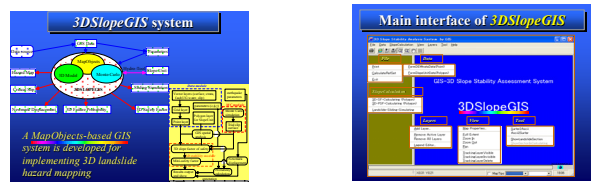


SlopeUnit



The Minimum Safety factor of each SlopeUnit

A GIS-based system-3DSlopeGIS



Conclusions

A GIS-based system of 3DSlopeGIS has been developed for evaluate the possible slope failure of a hilly area. A new Geographic Information Systems (GIS) grid-based 3-D deterministic model has been used to zone possible slope failure using the index of the 3-D safety factor of slope.