



SLOPE/W SLOPE3D

Slope Stability Analysis



SLOPE/W and SLOPE3D is the leading slope stability software for soil and rock slopes. Effectively analyze both simple and complex problems in 2D and 3D for a variety of slip surface shapes, pore-water pressure conditions, soil properties, and loading conditions.



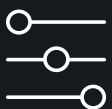
Pore-Water Pressure

Pore-water pressures can be defined using piezometric lines, spatial functions, or the results from other GeoStudio finite element analyses. Values can be displayed as contours on the geometry to reveal PWP values used in the analysis.



Rapid Drawdown

Rapid drawdown analysis can be conducted using the pore-water pressures defined using piezometric lines, transient finite element GeoStudio analyses, or the multi-stage rapid drawdown technique.



Material Models

SLOPE/W and SLOPE3D support a comprehensive list of material models including Mohr-Coulomb, undrained, high strength, impenetrable, bilinear, anisotropic strength, SHANSEP, spatial Mohr-Coulomb and more.



Limit State Design

Limit state design or load resistance factor design is handled by specifying partial factors on permanent/variable loads, seismic coefficients, material properties, reinforcement inputs and more.



SLOPE/W and SLOPE3D offer simple but powerful analytical capabilities when used in combination with other GeoStudio products.



Integrate Pore Water Pressures

Using finite element pore-water pressures allows SLOPE/W and SLOPE3D to consider complex saturated/unsaturated pore water pressures. Transient pore-water pressures can be used to investigate stability changes over time.



Integrate Stresses and Pore Water Pressures

Many geotechnical problems require both deformation and stability analyses. For others, a limit equilibrium analysis alone is inadequate. For these cases, SIGMA/W stresses may be used in SLOPE/W to compute the safety factors.



Integrate Dynamic Analysis Results

Earthquakes may generate inertial forces and excess pore-water pressures affecting the stability of ground structures. SLOPE/W can use both dynamic stresses and pore-water pressures from QUAKE/W to assess stability and deformation following an earthquake.

Model a full range of stability problems

Natural soil and rock slopes

Full-featured capability allows for the stability analysis of natural soil and rock slopes under a variety of conditions including surcharge and seismic loading, pore-water pressure fluctuations in the saturated and unsaturated zone, and more. An extensive material model library and flexible search techniques provide the capacity to handle the most complicated failure mechanisms possible in the field of geotechnical engineering.

Dams and levees

SLOPE/W and SLOPE3D are used worldwide for the design and analysis of hydraulic structures subjected to a variety of natural and anthropogenic forces including flood events, rapid drawdown, earthquake loading, and evolving hydrogeological systems. Comprehensive probabilistic and sensitivity analysis in 2D facilitates risk-assessment while integration with SIGMA/W or QUAKE/W allows for sophisticated finite element stability and Newmark deformation analyses.

Roads, bridges and embankments

SLOPE/W and SLOPE3D are commonly used to assess stability of roadways, rail beds, bridge abutments,

and MSE walls both during and after construction. SLOPE/W and SLOPE3D can analyze stability at each construction stage, including the effects of pore-water pressure changes and interaction with reinforcement.

Slope stabilization

SLOPE/W and SLOPE3D include a broad range of stabilization options for civil, geotechnical, and mining applications, from simple earthen toe berms to complex subsurface drainage and soil-structure techniques. The reinforcement functionality, material model library, and diverse pore water pressure definition can be used together to design even the most sophisticated slope stabilization options.

Construction excavations and mine slopes

Modelling construction excavations and mine slopes is seamless with the use of SLOPE/W and SLOPE3D and the powerful workflow of GeoStudio. From vertical excavation cuts to benched mine slopes, the powerful geometry tools and unique GeoStudio analysis tree facilitate both reinforcement design and optimizing slope configurations.

SLOPE/W and SLOPE3D offer a comprehensive list of features

- Rigorous limit equilibrium formulation
- Comprehensive list of analysis methods including Morgenstern-Price
- A variety of slip surface search techniques including Entry-Exit and Cuckoo
- Rigorous root-finding algorithm for computing the factor of safety
- Comprehensive pore-water pressure definition
- Finite element integration with SEEP/W, SEEP3D, and SIGMA/W
- Probabilistic & sensitivity analysis capabilities in 2D
- Staged pseudostatic, and staged rapid drawdown formulations in 2D
- Comprehensive material model library for soil and rock
- Reinforcement, surcharge, and seismic load functionality
- Vendor reinforcement library with products from Huesker, Maccaferri, TenCate, and Tensar in 2D
- Limit state design support for Eurocode or Load Resistance Factor Design

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