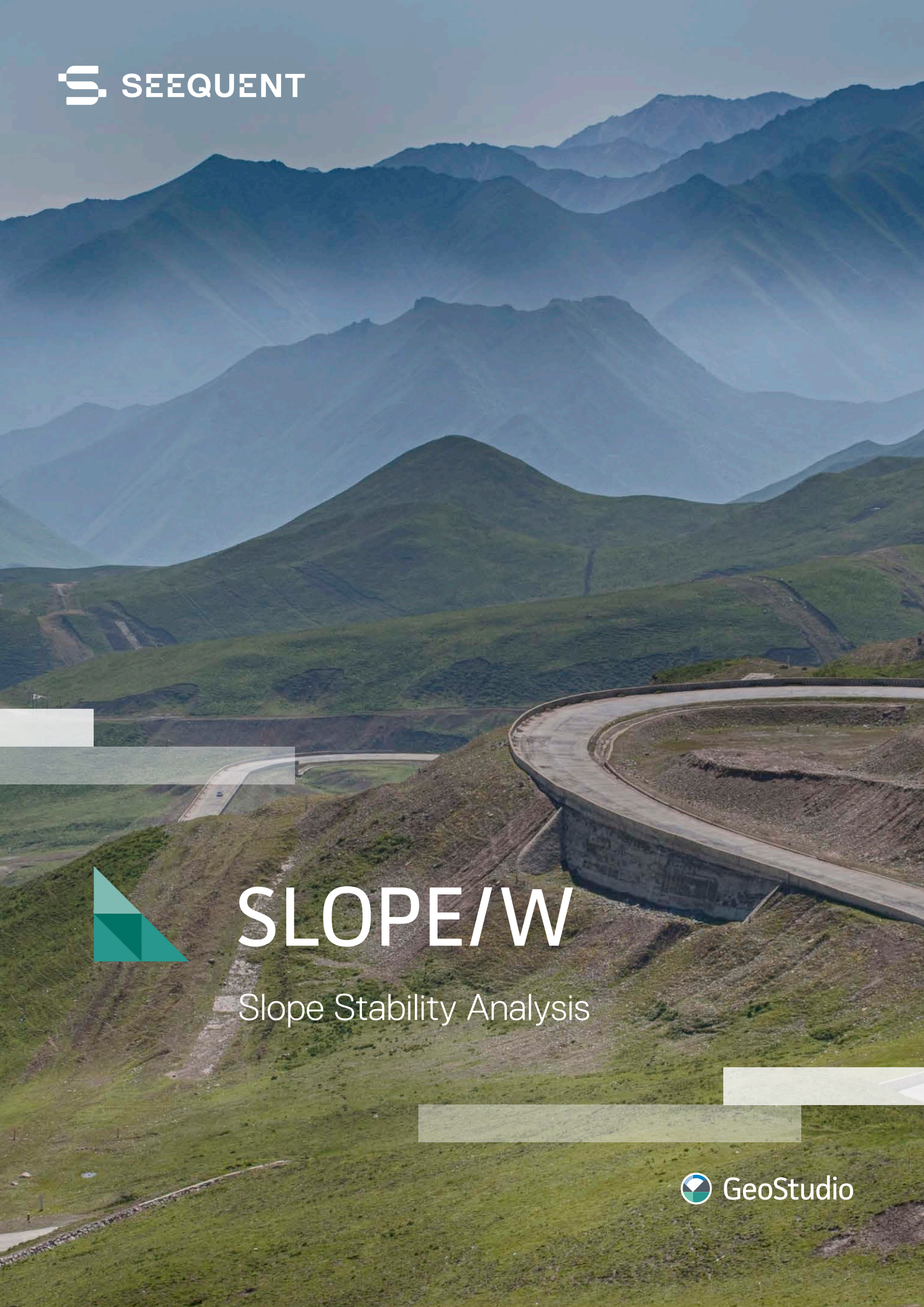
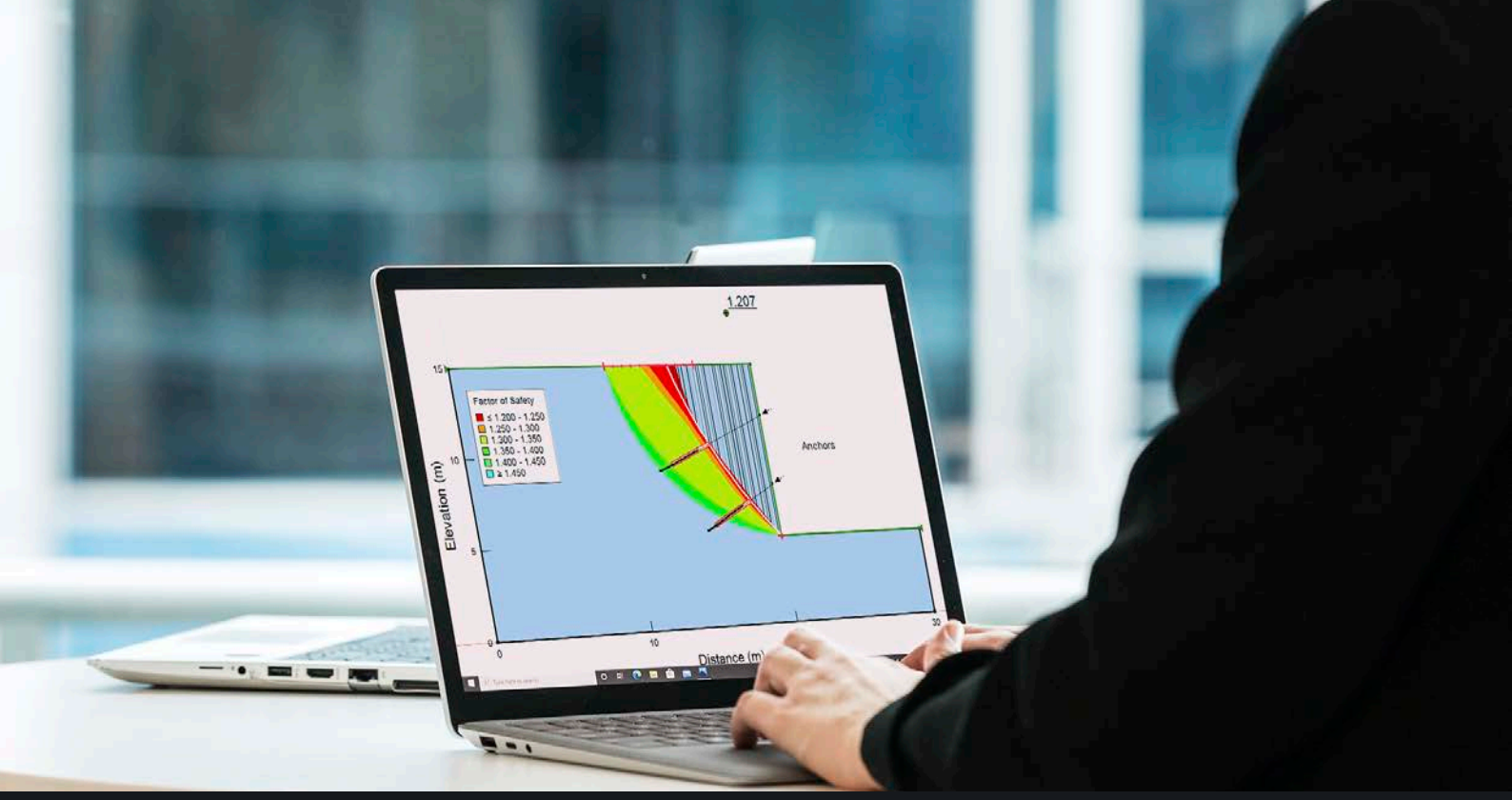

SEEQUENT
SLOPE/W
Slope Stability Analysis
GeoStudio



SLOPE/W is the leading slope stability software for soil and rock slopes. SLOPE/W can effectively analyze both simple and complex problems 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 supports 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 offers simple but powerful analytical capabilities when used in combination with other GeoStudio products.

SEEP/W/SEEP3D Results in SLOPE/W

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

SIGMA/W stresses in SLOPE/W

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.

QUAKE/W results in SLOPE/W

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.

SLOPE/W models a full range of stability problems

Natural soil and rock slopes

SLOPE/W's 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 is 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 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 is commonly used to assess stability of roadways, rail beds, bridge abutments, and MSE walls both during and after construction. SLOPE/W can analyze stability at each construction stage, including the effects of pore-water pressure changes and interaction with reinforcement.

Slope stabilization

SLOPE/W includes 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 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 offers a comprehensive list of features

- Comprehensive limit equilibrium formulation
- Thirteen analysis methods including Morgenstern-Price
- Several slip surface search techniques including Entry-Exit and Grid & Radius
- 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
- Partial factor, staged pseudostatic, and staged rapid drawdown formulations
- Sixteen soil strength models plus five advanced soil parameters
- Reinforcement, surcharge, and seismic load functionality
- Vendor reinforcement library with products from Huesker, Maccaferri, TenCate, and Tensar
- Limit state design support for Eurocode or Load Resistance Factor Design

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GeoStudio is the leading suite of geo-engineering software used in over 100 countries for the last 40 years. Join thousands of practising engineers, scientists, regulators, professors and students, and start using GeoStudio today.

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