SEEP3D

3D Groundwater Flow Analysis

Add SEEP3D to SEEP/W to unlock the power of 3D groundwater flow analysis in porous media. SEEP3D provides the tools to quickly create 3D geometry, apply materials and boundary conditions to 3D objects, generate finite element mesh, and solve and interpret 3D results.

SEAMLESS 2D-3D INTEROPERABILITY

Project files may contain both 2D and 3D analyses, allowing for easy generation of 3D geometries from 2D analyses. Material and boundary condition assignments from the 2D analysis are automatically applied in 3D.

MATERIALS AND BOUNDARIES

SEEP3D supports the same comprehensive set of boundary conditions and material properties as SEEP/W. Moreover, materials and boundary conditions are applied directly to geometric objects, making 3D numerical analysis fast and intuitive.

SLOPE/W INTEGRATION

Integration of SEEP3D with SLOPE/W makes it possible to analyze the stability on multiple 2D cross-sections generated from the 3D groundwater flow model in a single GeoStudio file.

INTERPRETING RESULTS

SEEP3D builds on the traditions of SEEP/W, with a powerful graphing engine at the heart of interpretation. Easily create graphs at any location using geometric objects or polylines. Seamlessly extract data from GeoStudio with a click of the mouse.

SEEP3D extends the functionality of SEEP/W to model a greater range of groundwater problems

GROUNDWATER FLOW SYSTEMS

Understanding the flow dynamics of a hydrogeological system is often the cornerstone of geo-engineering and earth science projects. SEEP3D can be used to analyze small-scale and large-scale 3-dimensional groundwater flow systems. Integration with BUILD3D allows for the analysis of systems with complex stratigraphy and topography.

DAMS AND LEVEES

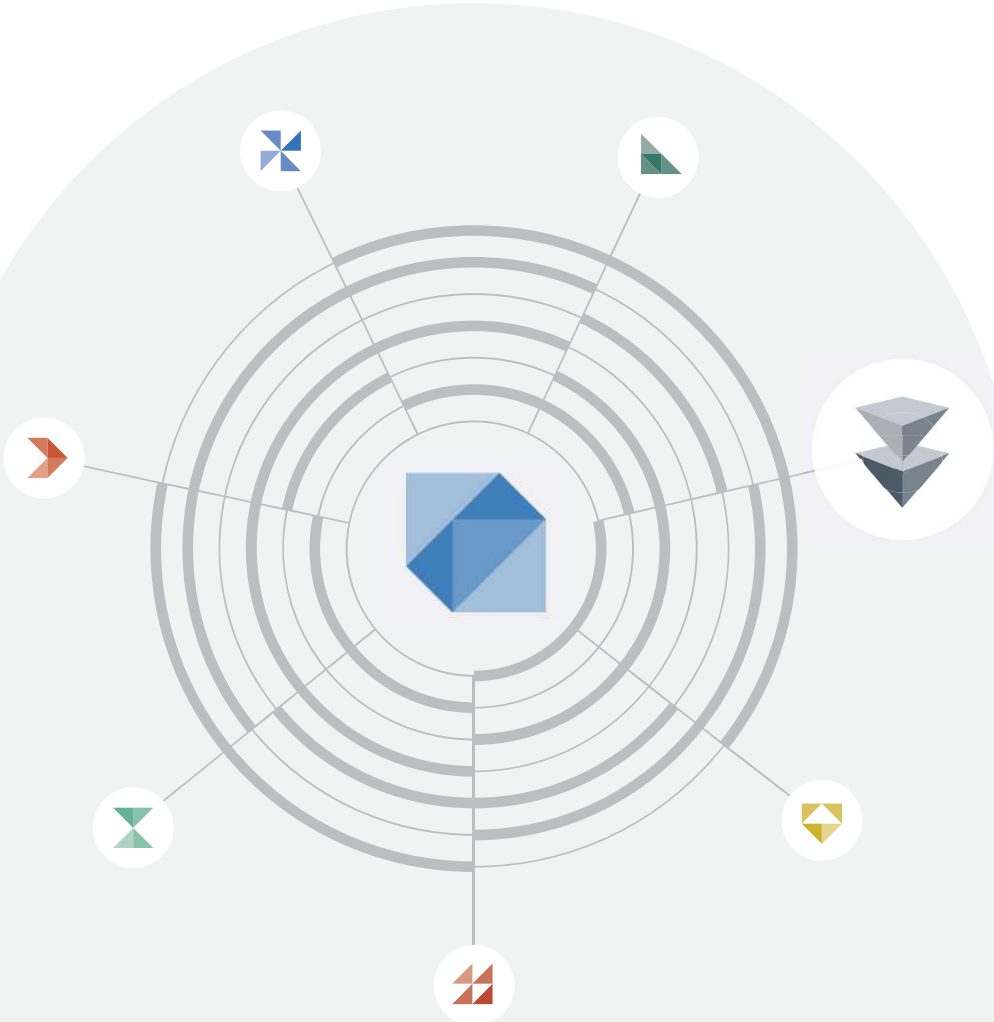
Use SEEP3D to analyze and design a range of hydraulic structures such as homogenous levees or large-scale tailings dams with complex internal drainage systems, the transient formulation and sophisticated boundary condition options allow SEEP3D to analyze reservoir drawdown and the effect of severe climate events on dam and levee performance. Use SEEP3D results in SLOPE/W to assess stability across a 2D dam section, or couple with BUILD3D to assess flooding impacts on a levee following a sweeping natural river path.

SUBSURFACE DEWATERING APPLICATIONS

SEEP3D can be used to analyze and design subsurface dewatering systems for civil infrastructure and construction projects. The rigorous 3D formulation provides an expedient approach for the design of well-spacing patterns and for analyzing dewatering systems in mine slopes, infrastructure embankments such as bridge abutments, and construction excavations. When integrated with BUILD3D, SEEP3D offers greater functionality including dewatering of complex mine pits.

NATURAL HILLSLOPES

The rigorous saturated-unsaturated formulation and range of available boundary conditions can be used to model seepage through natural slopes. Integration with SLOPE/W allows for stability analysis of 2D cross-sections using 3D pore water pressures.

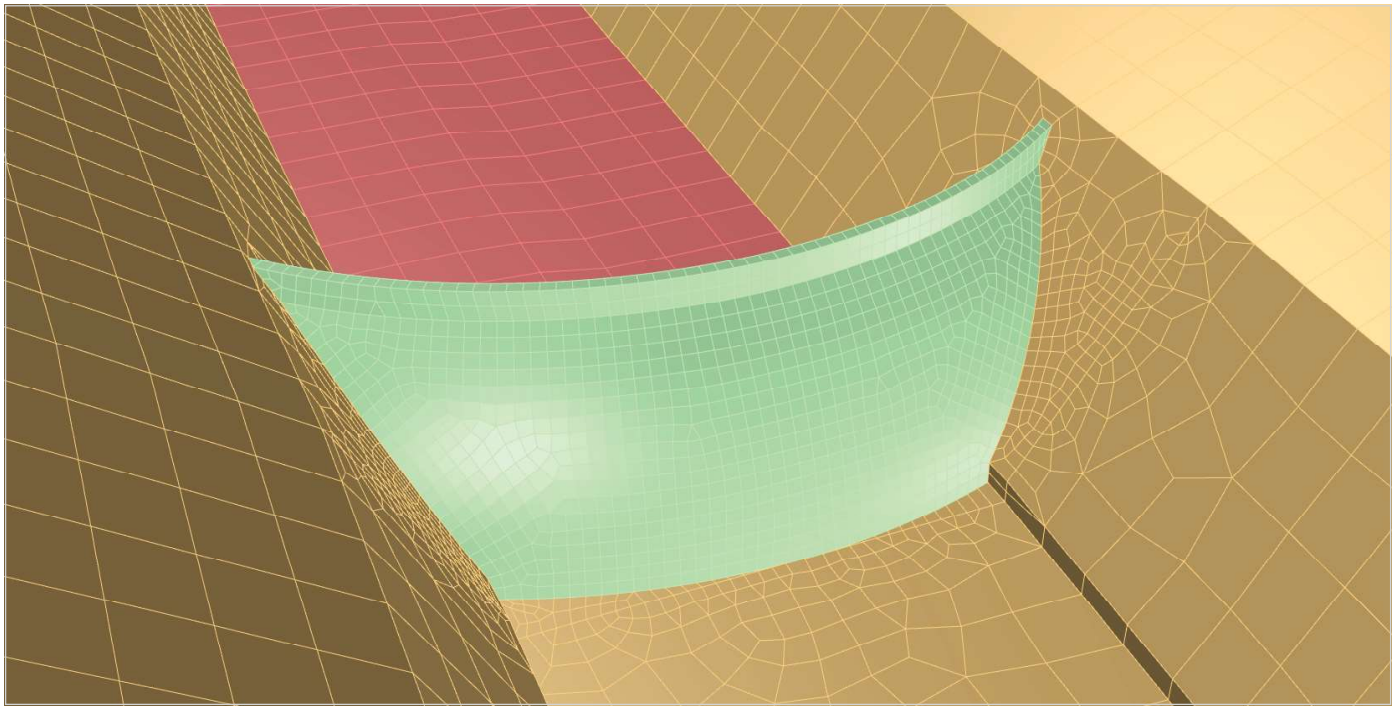


The power of integration

SEEP3D offers powerful analytical capabilities when used in combination with other GeoStudio products.

SEEP3D + SEEP/W comprehensive feature set

- ✓ Comprehensive saturated-unsaturated formulation
- ✓ Rigorous under-relaxation and convergence strategies
- ✓ Estimation routines for hydraulic functions
- ✓ Complete range of boundary conditions for all analysis types
- ✓ Steady-state or transient flow formulation
- ✓ Convenient initial condition definition
- ✓ 1D, 2D, 3D, axisymmetric and plan view analysis options
- ✓ Feature-based geometry creation offers significant time-savings
- ✓ Clean mesh generation with single click of the mouse
- ✓ Parallel solvers easily solve simple 1D to complex 3D analyses
- ✓ Integrate with BUILD3D for complex 3D geometries
- ✓ Powerful results graphing



PWP INTEGRATION WITH SLOPE/W

Three-dimensional pore-water pressure results generated by SEEP3D can be easily used by SLOPE/W to analyze stability. The Section feature in the 3D editor allows for the creation of 2D cross-sections through the 3D domain. These sections are used to generate new 2D geometries in the GeoStudio project. Thus a SLOPE/W analysis may be added to this geometry, using the 3D pore water pressures to evaluate stability of the 2D section.

ADD BUILD3D FOR COMPLEX GEOMETRY CREATION

BUILD3D is a revolutionary tool for constructing 3-dimensional, analysis-ready geometries. SEEP3D includes a free, feature-limited version of BUILD3D; however, adding the full-featured BUILD3D unlocks several additional tools allowing for unlimited geometry creation. BUILD3D's feature-based design can create models with: complex topography and soil layers; tunnels, rivers, dams and levees swept along arbitrary paths; and 3D geometry features imported from CAD files.

GEOSLOPE develops GeoStudio, 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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