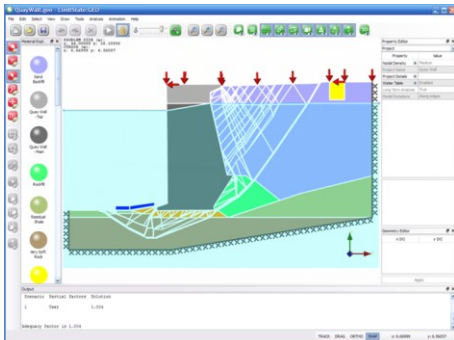
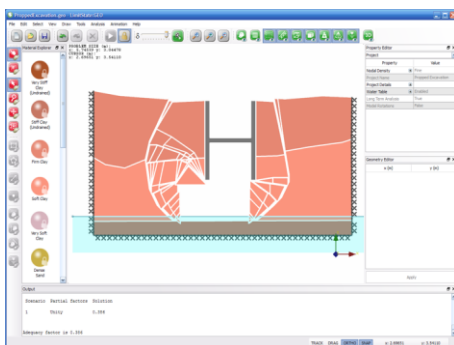


the complete stability analysis solution



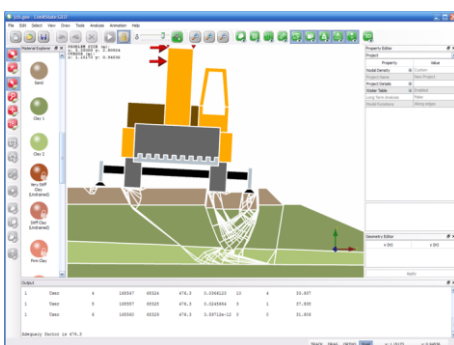
Combined rotational and translational failure of a quay wall with crane loading.

Courtesy of Mott MacDonald, UK



Propped excavation of a multi-layered clay soil with water ingress into base.

Courtesy of University of Sheffield, UK



Excavator on temporary road surface close to the crest of a shallow slope.

Powerful geotechnical analysis tool built on new technology and with numerous applications

LimitState:GEO uses new technology to identify the critical ultimate limit state failure mechanism for a wide range of geotechnical engineering problems.

One product, many applications

Today's desktop PCs would be regarded as supercomputers by 1990's standards, yet much of the geotechnical software we use today doesn't take advantage of this. However, LimitState:GEO makes use of modern computing power to identify in seconds failure mechanisms that cannot be identified using conventional ultimate limit state analysis software, and which might take a lifetime to identify manually. To achieve this, the powerful and efficient numerical analysis procedure 'Discontinuity Layout Optimization' (DLO) is used to provide an automatic means of identifying very accurate limit analysis solutions.

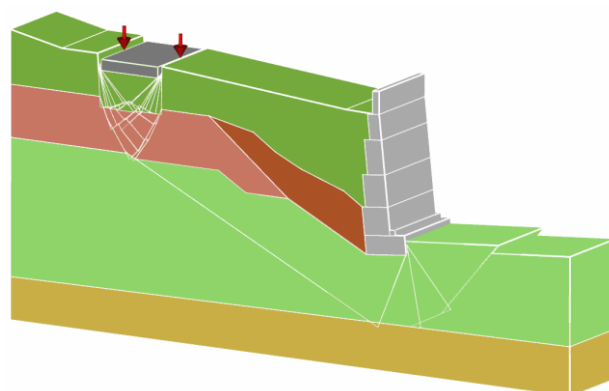
LimitState:GEO can handle problems with any geometry or loading conditions, which means that the engineer no longer needs to resort to application-specific 'hand-type' calculations, or the plethora of in-house spreadsheets and/or software applications that attempt to automate these. However, unlike other general analysis methods (e.g. non-linear finite element analysis), problems can be set up quickly and solutions can easily be checked by hand using the free-body diagrams output in the report.

Easy to use

The LimitState:GEO user-interface is designed to be intuitive, modern and fully interactive, allowing even novice users to build a model from scratch in a matter of minutes. Predefined wizards are also available to enable commonly encountered geotechnical problems to be setup and analysed even more rapidly. Once a model has been created it is easy to then change any aspect of the problem geometry, loading, materials or partial factors.

Understand more

LimitState:GEO users can quickly explore a large number of 'what if' scenarios, each time viewing the corresponding failure mechanism and building up an increasingly clear understanding of both the likely mode of response and the key parameters influencing overall safety.



Combined bearing / retaining wall failure mechanism (image obtained using 3D view function in LimitState:GEO 2.0).

Eurocode 7 ready

The adoption of Eurocode 7, which becomes mandatory in Europe from 2010, will mark a significant change in the way geotechnical design is performed.

By utilizing partial factors that are independent of problem type, Eurocode 7 provides the engineer with a robust and flexible limit state design methodology.



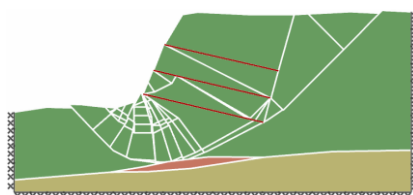
LimitState:GEO is fully compatible with the Eurocode 7 philosophy and has:

- Built in Eurocode 7 'problem-agnostic' partial factor sets
- Eurocode 7 compatible load descriptions (permanent, variable, accidental)
- Favourable and unfavourable load classifications
- The ability to check multiple Design Approaches / Combinations in one analysis, highlighting the critical case

Compatibility with the Eurocode 7 framework also enables LimitState:GEO to be readily used in conjunction with many other Limit State Design methodologies.

Key features

- Fully interactive modelling environment that allows models to be created and modified quickly on screen
- DXF import capability
- Work in Metric or Imperial units
- Built-in library of standard materials and the capability to define others, including those using Mohr-Coulomb, Rigid and Tension Cutoff models
- Soil-nail and sheet-pile wall modelling capability



Failure mechanism of a multi-layered slope containing soil nail reinforcing elements.

- Facility to define a flat or variably inclined water table with pressures hydrostatic or from r_u coefficients
- Facility to solve for multiple partial factor sets and drainage conditions in one analysis using the built-in 'Scenario Manager'
- Solver engine able to identify translational and/or rotational failure mechanisms
- Analyse problems involving seismic ground accelerations
- Context sensitive help system
- Ability to display animated and 3D rendered views of the failure mechanism
- Comprehensive report output facility

Fully supported

Whether you are in need of technical advice or assistance with your model, our support team are on hand to offer expert advice on all aspects of the software.

Try LimitState:GEO for yourself

Visit www.limitstate.com/download to obtain your copy of the latest version of LimitState:GEO and then try it free for 30 days.

Technology

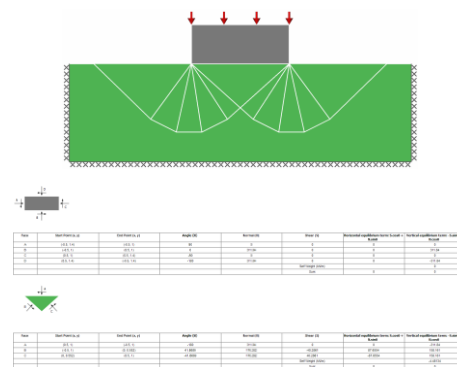
The powerful Discontinuity Layout Optimization (DLO) procedure uses rigorous upper-bound limit analysis theory to automatically identify the critical layout of slip-lines in a failing soil mass. So with DLO there is no need for the user to 'pre-judge' the types of failure mechanism expected to be most critical.

Easy to verify solutions

Unlike most other state-of-the-art analysis tools, output from LimitState:GEO is remarkably easy to check. The software can output a free-body diagram for each sliding block involved in the failure mechanism - complete with force equilibrium equations which are straightforward to check by hand, ensuring no error has been made when setting up the problem and providing a clear and easy means of checking solution validity.

LimitState:GEO has also been verified against a wide range of closed form solutions and other benchmarks, all of which can be viewed online. To find out more visit:

www.limitstate.com/geo/verification



Prandtl benchmark problem, also showing sample free body diagrams from the report.



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