

+ FREE DOWNLOAD

Visit www.optumce.com to download your copy of the latest version of OptumG3.

TRY IT FREE FOR 30 DAYS

Opt⁺um^{G3}

GEOTECHNICAL ANALYSIS SOFTWARE

FULLY SUPPORTED

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

+ SOIL AND ROCK MODELS

+Mohr-Coulomb: the classic benchmark model including tension cut-off. Use associate flow rule in connection with Limit Analysis for determining bearing capacity, and more refined non-associated flow rule in connection with a more classic Elasto Plastic analysis. Both options are possible.

+Drucker-Prager: similar to but sometimes preferred over Mohr-Coulomb for rock and concrete.

+Tresca: Standard and Generalized versions, the latter being relevant for axisymmetric analysis

+AUS: Anisotropic Undrained Shear model for advanced analysis of soft soils displaying anisotropic strength and stiffness

+Elastic: Simple and usefull material model for representic strcutural elements and concrete

+Rigid: A very usefull material for modelling structural elements, such as slabs and walls, with infinite stiffness - without numerical problems

+ ANALYSIS TYPES

+Limit Analysis: Fast and rigorous evaluation of upper and lower bounds on bearing capacity, stability numbers, etc. With introduction of the new Mixed Element 3D simulations have never been faster, easier and more precise.

+Strength Reduction: Fast and rigorous evaluation of upper and lower bounds on factor of safety. Extremely fast and powerfull in connection with with automatic adaptive mesh refinement

+Elastoplastic: Fast and accurate analysis using a variety of basic and advanced constitutive models. Use eith associated or non-assciated flow rules.

+Initial Stress: Determination of initial stresses on the basis of a specified earth pressure coefficient (arbitrary geometries)

+Elastic Analysis: The simples analysis type but usefull for various verifications

+Staged Construction: convenient and intuitive sequencing of construction stages

+ STRUCTURAL ELEMENTS

+Plates: Elastoplastic plates, possibly with elastoplastic hinges, for modelling walls, tunnel linings, foundation skirts, etc

+Interface elements: For modelling discontinuities, faults, and similar features

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A COMPREHENSIVE 3D FE PROGRAM FOR GEOTECHNICAL STABILITY AND DEFORMATION ANALYSIS

- + Efficient and Robust Algorithms
- + Adaptive Mesh Refinement
- + Upper and Lower Bounds
- + Elasto Plastic and Limit Analysis
- + Accurate Soil and Rock Models
- + Eurocode 7 Compatibility
- + Command line version
- + CAD Import and Export

3D FE DESIGN TOOL FOR GEOTECHNICAL PRACTITIONERS - REINVENTED

OptumG3 is a unique Finite Element program allowing engineers to analyse and geotechnical problems in 3D with never before seen speed, accuracy, simplicity and fun!

THE USER INTERFACE

Its modern graphical user interface ensures an intuitive and efficient workflow. No hidden menus and hard to find buttons or fields. Models are easily created, materials and loads applied and results calculated and viewed.

MODELLING IN OPTUMG3

Never before has 3D modelling been so easy. We have taken the simplistic approach from OptumG2 and expanded it to 3D. The clear aim and goal has been to allow geotechnical practitioners without prior knowledge of 3D modelling to get started immediately. We strongly believe we have come a long way in achieving this goal.

You can either setup 3D geometry directly in OptumG3 applying the unique and very user-friendly modelling tools or choose to import geometry from a 3rd party CAD tool. The choice is yours.

WHAT MAKES OPTUMG3 DIFFERENT?

Well quite a number of things. At a first glance OptumG3 might, depending on the eye, either seem like something entirely unique or something like all the rest. This might seem paradoxical but is actually not so strange since OptumG3 embraces both the new and unique as well as the traditional approach.

The computational core, based on the classical and traditional Finite Element approach, has been built upon an entirely new and novel algorithmic platform based on state-of-the-art mathematical optimization algorithms. Benefits? Unprecedented robustness, speed and accuracy, resulting in unseen efficiency, flexibility in your workflow, and -yes- even fun and enjoyment solving complex and challenging 3D geotechnical problems.

OptumG3 being based on traditional Finite Elements, but solving the equations smarter and more efficiently, lets OptumG3 offer the same analysis types as traditional packages and some more completely unique to Optum.

+ Elasto Plastic analysis

This is the classical and most used analysis type in all conventional FE packages when either solving bearing capacity type problems (ULS) or settlement type jobs (SLS). OptumG3, of course offers this analysis type. Use in connection with either associated or non-associated materials models.

+ Limit Analysis

In many cases you might actually just be looking for the bearing capacity AND NOT interested in settlements. This is often the approach when calculating the Ultimate Limit State. You can now, using Optum's unique technology, calculate bearing capacities in a single step using the Limit Analysis option. The program even allows you to calculate upper and low bound values providing you with a valuable bracket of the exact solution to the posed problem. This helps provide you with confidence and transparency and helps you move faster and more efficiently ahead.

+ Robustness and efficiency

The computational core of OptumG3 builds on state-of-the-art numerical algorithms that mark a radical departure from traditional approaches. These algorithms lead to a level of robustness and efficiency unmatched by any existing programs for geotechnical finite element analysis. Failure to converge and similar "numerical problems" that continue to haunt conventional finite element programs are non-issues in OptumG3.

As such, tedious and time consuming tweaking of algorithmic parameters is unnecessary and all attention can be devoted to what it is all about, namely the physics of a given problem.

+ Automatic adaptive mesh refinement

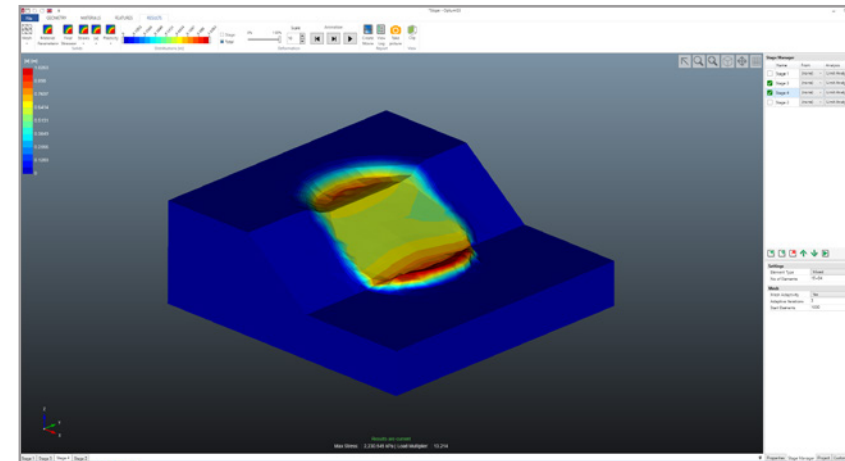
As a standard part of all analyses, it is possible to use automatic adaptive mesh refinement. Combined with ability to compute upper and lower bounds on quantities of interest, adaptive mesh refinement provides a powerful means of maximizing accuracy while keeping the computational cost at a minimum.

This feature is not available in any existing packages for geotechnical finite element analysis.

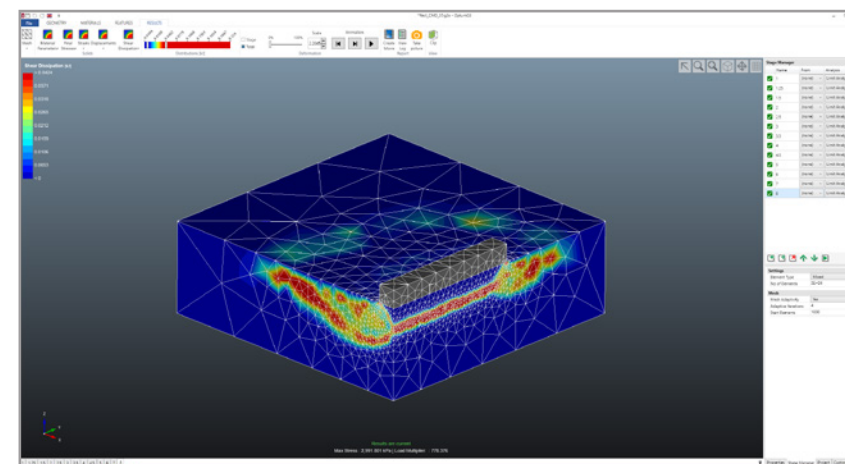
+ Upper, lower and now also mixed bounds

Conventional finite element programs provide approximate solutions are always on the unsafe side. I.e adding more finite elements reduces the bearing capacity or increased the displacements. The only problem is there is no way of knowing by how much. Consequently, the process of gradually refining the mesh is seen as a standard part of any finite element analysis.

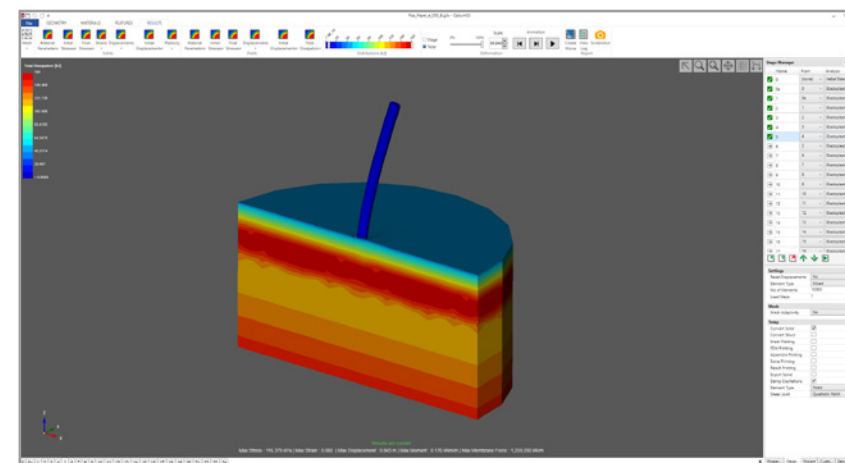
OptumG3 now introduces the unique Mixed element created to provide results between Upper and Lower bounds. Experience never before seen precision in 3D simulations. With Upper and Lower bounds available, an estimate of the exact solution and a measure of the worst-case error are immediately available, both of which may be improved by using more elements.



3D slope stability problem solved using OptumG3 unique Limit Analysis option



Automatic adaptive mesh refinement ensuring maximum accuracy at minimum computational cost



Soil and Rock Models including Mohr-Coulomb, Tresca (Standard and generalized) and AUS

FEATURES +

+ Efficient and Robust Algorithms
State-of-the-art algorithms ensure unmatched efficiency and robustness

+ Adaptive Mesh Refinement
For all analysis – maximizes accuracy while minimizing computational time

+ Upper and Lower Bounds
Rigorous bounds on quantities of interest including bearing capacities and displacements

+ Accurate Soil and Rock Models
Mohr-Coulomb, Tresca, AUS

+ Solid modelling
Unique and userfriendly solid modelling capabilities. No prior 3D modelling experience required

+ Material Parameter Distributions
Convenient import of user generated material parameter distributions

+ Fast, robust and accurate
Unprecedented speed, robustness and accuracy. Help increase your performance

+ Command line version
Bypass the graphical user interface and call the computational core via command prompt

+ CAD Import and Export
Functionality for importing and exporting geometry in DXF format