

# Bentley PLAXIS<sup>®</sup> 3D Product Tiers

*Find the right product level for your needs*

Project teams and their requirements can change. To conquer common or complex geotechnical challenges with confidence, you need to use the appropriate capabilities that meet your current needs.

**PLAXIS** is a user-friendly, finite element package with trusted computation that is used by geotechnical engineers worldwide. We offer three flexible options, each tailored to the different geotechnical analysis needs of any firm.

**PLAXIS 3D** offers all the essential functionality to perform everyday deformation and safety analysis for soil and rock, which do not require the consideration of creep, steady state groundwater, consolidation analysis, or any time dependent effects.

**PLAXIS 3D Advanced** enhances your geotechnical design capabilities with more advanced features and material models to consider creep or flow-deformation coupling through consolidation analysis. It also solves your problems faster than PLAXIS 3D with the multicore solver.

**PLAXIS 3D Ultimate** augments the most comprehensive functionality to deal with the most challenging geotechnical projects. The offered options analyze the effects of vibrations in the soil, like earthquakes and moving traffic loads. They also help simulate complex hydrological conditions through time-dependent variations of water levels or flow functions on flow functions on model boundaries, as well as soil boundaries.

Features	PLAXIS 3D	PLAXIS 3D Advanced	PLAXIS 3D Ultimate	Available without GSE
<b>PROJECT AND MODEL PROPERTIES</b>				
Selection of imperial and SI units for length, force etc.	✓	✓	✓	✓
<b>GEOMETRY CREATION</b>				
Create Borehole Tool	✓	✓	✓	✓
Select, Move, Rotate and Array Tools	✓	✓	✓	✓
Create Point, Line, Nurbs Curve and Surface Tools	✓	✓	✓	✓
Polycurve Designer	✓	✓	✓	✓
Intersect, Combine, Extrude, Revolve Around Axis, Loft Polycurve and Blend Surfaces Tools	✓	✓	✓	✓
Create Point, Line and Surface Load Tools	✓	✓	✓	✓
Create Point, Line and Surface Prescribed Displacement Tools	✓	✓	✓	✓
Create Embedded Beam, Plate, Geogrid, Fixed-End Anchor, Node-To-Node Anchor, Interface Tools	✓	✓	✓	✓
Create Surface Contraction Tool	✓	✓	✓	✓
Create Well, Line Drain, Surface Drain and Surface Groundwater Flow Boundary Condition Tools		✓	✓	✓
Create Added Mass Tool			✓	✓
Create Moving Point and Line Load Tools			✓	✓
Tunnel Designer	✓	✓	✓	
Reinforcement (Rockbolts and Umbrella Arches) Definition in the Tunnel Designer	✓	✓	✓	
Girder/beam Definition in the Tunnel Designer	✓	✓	✓	
Tunnel Splitting Tool	✓	✓	✓	
Definition of Excavation Sequence in the Tunnel Designer	✓	✓	✓	
Automatic Generation of Staged Construction Phases for Tunnels	✓	✓	✓	

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<b>SOIL MATERIAL MODELS</b>				
Linear elastic	✓	✓	✓	✓
Mohr-Coulomb	✓	✓	✓	✓
Hardening Soil	✓	✓	✓	✓
Hardening Soil Small Strain Stiffness	✓	✓	✓	✓
Modified cam-clay	✓	✓	✓	✓
Jointed Rock model	✓	✓	✓	✓
NGI-ADP	✓	✓	✓	✓
Hoek-Brown, with Parameter guide	✓	✓	✓	✓
Soft soil		✓	✓	✓
Soft Soil creep		✓	✓	✓
Sekiguchi Ohta (Viscid)		✓	✓	✓
Sekiguchi Ohta (Inviscid)		✓	✓	✓
UDCAM-S and Cyclic Accumulation tool		✓	✓	✓
Concrete		✓	✓	✓
User Defined Soil Models		✓	✓	✓
UBC3D-PLM (liquefaction)			✓	✓
<b>SOIL MATERIAL DRAINAGE TYPES</b>				
Drained	✓	✓	✓	✓
Undrained A	✓	✓	✓	✓
Undrained B	✓	✓	✓	✓
Undrained C	✓	✓	✓	✓
Non-porous	✓	✓	✓	✓
<b>STRUCTURAL ELEMENT MATERIAL TYPES</b>				
Elastic & elastoplastic Plates	✓	✓	✓	✓
Elastic, elastoplastic, elastoplastic (N-Epsilon) & viscoelastic Geogrids	✓	✓	✓	✓
Elastic & elastoplastic Beam	✓	✓	✓	✓
Elastic & elastoplastic Embedded beam	✓	✓	✓	✓
Elastic, elastoplastic & elastoplastic with residual strength Fixed-end and Node-to-node Anchors	✓	✓	✓	✓
<b>DYNAMIC AND GROUNDWATER FLOW MATERIAL PROPERTIES</b>				
Groundwater properties, incl. soil classification systems (Hypres, USDA etc) and predefined data sets for (Approximate) Van Genuchten models for soil materials	✓	✓	✓	✓
Rayleigh damping for soil and structural elements			✓	✓
<b>INITIAL CALCULATION TYPES</b>				
K <sub>0</sub> procedure	✓	✓	✓	✓
Gravity loading	✓	✓	✓	✓
Field stress	✓	✓	✓	✓
Ground water flow only			✓	✓

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<b>DEFORMATION CALCULATION TYPES</b>				
Plastic	✓	✓	✓	✓
Safety	✓	✓	✓	✓
Consolidation		✓	✓	✓
Dynamic			✓	✓
Dynamic with consolidation			✓	✓
Fully coupled flow-deformation			✓	✓
<b>PORE PRESSURE CALCULATION TYPES</b>				
Phreatic level	✓	✓	✓	✓
Use pore pressures from previous phase	✓	✓	✓	✓
Steady state groundwater flow		✓	✓	✓
Transient groundwater flow			✓	✓
<b>MISCELLANEOUS FEATURES, TOOLS AND INTEROPABILITY</b>				
Create cluster field stress	✓	✓	✓	✓
Staged construction & automatic regeneration of construction stages	✓	✓	✓	✓
Multicore and parallel calculation		✓	✓	✓
Pseudostatic analysis		✓	✓	✓
Generate Stratigraphy from imported CPT Logs	✓	✓	✓	
SoilTest and parameter optimization tool	✓	✓	✓	
Calculation Manager	✓	✓	✓	
CAD Import (incl. IFC, point clouds, water levels, borehole top and bottom) and Export	✓	✓	✓	
Command line input (Input, Output & SoilTest)	✓	✓	✓	✓
Command line autocomplete (Input, Output & SoilTest)	✓	✓	✓	
Commands runner (Input, Output & SoilTest)	✓	✓	✓	
Macro library and running macros (Input, Output & SoilTest)	✓	✓	✓	
Remote scripting for Input, Output and SoilTest	✓	✓	✓	
Scripting reference	✓	✓	✓	
Projectwise integration, loading from and saving to ProjectWise server	✓	✓	✓	
Bentley Cloud Services: personal & project portal, project association	✓	✓	✓	
Import of and export to ISM	✓	✓	✓	
PLAXIS 3D Coupling tool for STAAD.Pro	✓	✓	✓	
<b>TIME DEPENDENT FUNCTIONS</b>				
Time dependent groundwater flow components for water levels, groundwater flow boundary conditions and soil clusters			✓	✓
Definition of groundwater flow functions to specify time dependent changes in head or prescribed discharge etc.			✓	✓
Dynamic components in x and y direction for point and line loads or displacements			✓	✓
Definition of Dynamic multipliers to create vibration and earthquake signals			✓	✓
Scaling tools, Fourier, response spectra & Arias intensity plots and drift correction for input earthquake signals			✓	✓
Definition of Movement functions to specify time dependent changes in velocity			✓	✓

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<b>DYNAMIC BOUNDARY CONDITIONS</b>				
Viscous			✓	✓
Compliant base and free field boundaries			✓	✓
All nodes fixity			✓	✓
<b>POSTPROCESSING &amp; RESULTS</b>				
Various ways to display forces, displacements, stresses and strains in contour, vector, and iso-surface plots	✓	✓	✓	✓
Tables of results with copy, sorting and filter options	✓	✓	✓	✓
Curve manager to plot graphs of various results across a selection of calculation phases	✓	✓	✓	✓
Load-Displacement curves	✓	✓	✓	✓
Cross-section tools and cross-section curves	✓	✓	✓	✓
Automatic and manual centerline extraction for structural forces plots of volumes piles	✓	✓	✓	✓
Resulting forces view	✓	✓	✓	✓
Plot annotations	✓	✓	✓	✓
Animations	✓	✓	✓	✓
Report generator	✓	✓	✓	✓
Printing and saving plots & curves	✓	✓	✓	✓
Plots & Curves of accelerations, velocities, structural forces envelopes for Dynamic phases			✓	✓
Curve plots of Pseudo Spectral Acceleration, relative displacements and switching between time & frequency representations			✓	✓
Plots and curves of pore pressures for phreatic level calculations	✓	✓	✓	✓
Plots and curves of pore pressures, saturation, suction, and Darcy flux for steady state groundwater flow calculations		✓	✓	✓
Plots and curves of pore pressures, saturation, suction, and Darcy flux for transient groundwater flow or fully coupled flow deformation calculations			✓	✓
Export of results to Paraview	✓	✓	✓	