3D Frame Library Features

	BASIC	PROFESSIONAL	ADVANCED
Model creation features			
Object based entities of Nodes, Elements, Diaphragms, Materials, Cross sections, Analysis options, Loads and all given parameters	✓	✓	✓
Definition of local nodal system that can be different from the global one	✓	✓	✓
Skew supports at user defined coordinate system	✓	✓	✓
Spring supports	✓	✓	✓
Additional nodal and element masses consideration		✓	✓
Model mass can be defined using a load combination, e.g. “DEAD+0.5LIVE”		✓	✓
Automatic creation of optimized Analysis model based on the given geometry	✓	✓	✓
Automatic subdivision of given elements at points determined by the library to ensure maximum accuracy and optimized solution time	✓	✓	✓
Support of any cross section by providing its inertia features	✓	✓	✓
Floor diaphragm support		✓	✓
Floor diaphragm can be defined by specifying their edges in plan view and their elevation level. The library automatically applies the proper constraints to the corresponding elements/nodes.		✓	✓
Unlimited count of load cases and combinations	✓	✓	✓
Load cases can be of the following types DEAD, LIVE, SUPERDEAD, SNOW, WIND, QUAKE, CRANE, OTHER for more inspectional data handling	✓	✓	✓
Concentrated nodal loads (forces, moments)	✓	✓	✓
Displacements/Rotations loads on nodes	✓	✓	✓
Unlimited number of point loads on elements	✓	✓	✓
Unlimited number of constant, linear, triangular, trapezoidal loads on any part of frame elements	✓	✓	✓
Element loads can be defined with respect to their absolute or relative distance from the starting node of the element	✓	✓	✓
Element loads can be applied in global, global projective or their local coordinate system	✓	✓	✓
Temperature loads (uniform temperature change and gradient temperature loads)	✓	✓	✓
Diaphragm loads		✓	✓
Load cases can be combined by many combination types (Additive, Envelope, ABS, SRSS)	✓	✓	✓
Use of full or partial rigid dof releases	✓	✓	✓
User definition of modes number to find		✓	✓
Response spectrum definition by providing Periods vs. Accelerations points		✓	✓
Time History definition by providing Seconds vs. Accelerations accelogram points		✓	✓
Specification of user defined ground motion direction for Response spectrum and time history analysis		✓	✓

Element features			
6 dof node element	✓	✓	✓
Optimized 12 dof frame element	✓	✓	✓
Optimized non-linear 12 dof cable element			✓
Optimized 20 dof shell element			✓
Rigid offset consideration	✓	✓	✓
Rigid horizontal diaphragm support		✓	✓
Timoshenko's beam theory supported		✓	✓
Lumped or distributed mass model		✓	✓
Handling of any kind of dof releases	✓	✓	✓
Analysis features			
Effective memory handling	✓	✓	✓
Optimized techniques to solve large-scale problems in minimum solution time	✓	✓	✓
Use of optimized sparse matrices	✓	✓	✓
Automatic creation of stiffness and mass matrices so that minimum solution time is ensured		✓	✓
Support of Cholesky method to efficiently solve large scale models	✓	✓	✓
Linear static analysis	✓	✓	✓
Shear deformation effects		✓	✓
Elements on winkler springs considering shear deformation effects		✓	✓
Modal analysis using accelerated Jacobi algorithm		✓	✓
User defined modal damping ratio		✓	✓
Modal superposition according to SRSS or CQC rules		✓	✓
Consideration of diagonal or compact mass matrix		✓	✓
Linear Response Spectrum Analysis		✓	✓
Linear Time History Analysis		✓	✓
Optimized non-linear solver for geometric non linearities			✓
Different update modes for non-linear analysis (after each iteration, after each load step or constant stiffness method)			✓
User defined of load steps/iterations number and convergence tolerance			✓
Results reporting features			
All results are reported per load case or load combination	✓	✓	✓
Deformed configuration reporting	✓	✓	✓
Nodal reactions reporting	✓	✓	✓
Internal element stresses, forces and displacements (deflections and rotations) reporting taking into account possible shear deformation effects (if so specified)	✓	✓	✓
Reporting of soil spring reactions		✓	✓
Reporting of calculated dynamic modes		✓	✓
Reporting of Periods, Eigenvalues, directional effective masses per each dynamic mode		✓	✓
Calculation of Total effective mass per direction		✓	✓
Time history analysis results are reported per time step		✓	✓
Geometric non-linear analysis results can be reported per time step or at the final stage for lower memory usage			✓
Reporting of floor diaphragm displacements		✓	✓