

MIDAS Release Notes

Civil 2006 *Release No. 1*

Enhancements

- 1. GUI**
- 2. Pre-processing**
- 3. Eigenvalue Analysis**
- 4. Response Spectrum Analysis**
- 5. PSC Bridge**
- 6. Cable-Stayed / Suspension Bridge**
- 7. Pushover Analysis**
- 8. Linear/Nonlinear Time-history Analysis**
- 9. Material Nonlinear Analysis**
- 10. Post-processing**
- 11. Design**
- 12. Others**



1. GUI

- New GUI of Civil 2006.
 - Task Pane.
 - Command line input using one key (similar to AutoCAD).
 - Tabbed Toolbar.
 - Addition of story name display icon.
- Improved Open GL Graphics.
 - High Speed Graphics (Rendering) due to Open GL.
 - Walk-through Effect.
 - Removal of Hidden Labels and improved quality of printing.
- Provide hidden display of values, symbols and labels in the post-processing mode.

2. Pre-Processing

- Support user-defined section (input through SPC) in Pre/Post-Processing.
- Connect frame elements automatically with a rigid element during copy or move.
- Create a nonlinear load case automatically using Create Load Cases Using Load Combinations function.
- Improvement of defining and modifying a construction stage.
- Addition of Italian Material DB (Steel, Concrete, Rebar).
- Addition of Italian Steel Section DB.
- Addition of Weight column in Query Elements and addition of Element Weight Table.
- Improvement in the Input / Display of Floor Load.
 - Two way load distribution is applicable even for a polygonal (pentagon, hexagon, etc.) loaded area.
 - Option not to load the elements within the area of an assigned floor load.
 - Display of load distribution direction (one-way) and tributary (two-way) area.
- Addition of importing files from Nastran.
- Addition of Graphic File formats (*.dxf, *.dwg) for saving.
- Addition of Heat and Temperature unit selection option.

3. Eigenvalue Analysis

- Addition of Consistent Mass option.
- Provide Modal Participation Factors, Modal Direction Factors, Modal Effective Mass and Participation Vectors.
- Addition of Eigenvector normalization option (normalize mode shape to 1).

Note: As Eigenvalue analysis results table is revised from Civil 2006, analysis results including Eigenvalue data, which have been generated in V6.7.1 or an older version, cannot be read.

4. Response Spectrum Analysis

- Addition of response spectrum function as per Eurocode8 (2004).

5. PSC Bridge

- Addition of a wizard of PSC Bridge.
 - Auto generation of tapered sections based on bridge spans and schedule-based input of rebars.
 - Automatic calculation of effective width
- Auto generation of transverse analysis models through global analysis model
- Lumped representative tendon
- Addition of assigning geometrical properties of a section as a spread sheet.
- Addition of copying the Reinforcement to another section.
- Addition of assigning Beam Section Temperature for PSC section.
- Display multiple PSC Beam Stress Diagrams in multiple locations.

6. Cable-stayed / Suspension Bridge

- Unknown Load Factor Analysis
 - Improvement of convergence solving the equations by system of linear equations which is a method improved from optimization method.
 - Addition of a function to iterate the calculation to solve the unknown factor automatically.
- Addition of the methods to apply pretension to a cable element:
 - Change in unstrained length input method, $L_u/L \Rightarrow L_u$.
 - Addition of Horizontal cable force input option.

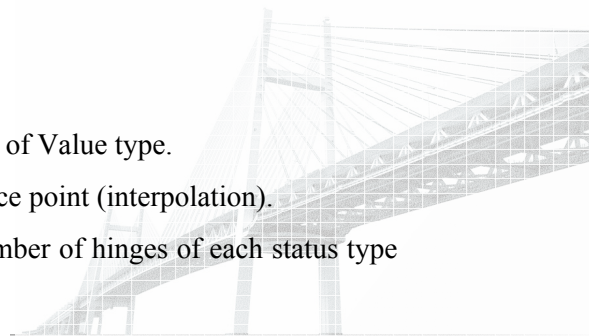
- Addition of a function of assigning the horizontal force to main cables, to perform an equilibrium status analysis of a suspension bridge.

7. Pushover Analysis

- Allow assigning hinge properties to the steel section of Value type.
- Auto step generation and result output of performance point (interpolation).
- Display the hinge status type rate relative to the number of hinges of each status type in model view legend.
- Addition of Pushover Vertical P-delta curve.

8. Linear/Nonlinear Time-history Analysis

- Addition of nonlinear truss element.
- Effective Damping of General Link is reflected when Mass & Stiffness proportional damping method (Rayleigh Damping) is selected.
- Graphic display of yielding status (elastic/crack/yielding).
- Consider geometric stiffness of member due to initial axial force.
- Method of determining initial stiffness is improved for the case when unsymmetrical initial stiffness is entered for inelastic hinge hysteretic models.
 - V6.7.1: For both (+) side and (-) side, the initial stiffness of (+) side was used.
 - Civil 2006: Considers hysteretic unsymmetrical initial stiffness for the nonlinear elastic type and origin oriented type, and for the rest, uses the largest of initial stiffness values on (+) and (-) sides.
- Even when time history analysis diverges, generate results up to the step before divergence.
- Improvement in Viscoelastic Damper Type Nonlinear Spring dialog box of General Link Prop.
- Addition of slip hysteresis for brace.
- Fiber
 - Improved convergence.
 - Renumbering cell number.
 - Extend the number of Fiber material properties that can be defined, from 3 to 6.



9. Material Nonlinear Analysis

- Material nonlinear analysis for plate elements (including both membrane and bending behavior).
- Real nonlinear analysis of plate elements (considering both geometric and material nonlinearity).

10. Post-processing

- Maximum & Minimum value of the Contour Range can be modified by user.
- Display truss and beam member forces together.
- The displacement values in the legend can be displayed as a fixed format.
- Provide special window to display diagram for selected members (Simplified beam detail analysis).
- User defined Diagram (Display diagram only for selected members.).
- Beam Diagram option to generate truss member forces only.
- Change max./min. value of legend by dragging the mouse or by manual input.
- Display Results table that describes the average force/stress of Plate, Plane Strain, Plane Stress, and Solid elements.

11. Design

- Display number of tie legs for shear reinforcement design in major and minor directions.
- Distinguish NG members by colors when displaying Concrete / Steel / SRC Design Results.
- Save graphic reports of design as a batch file.

12. Others

- Change in the method of saving temporary files reduces construction stage analysis time.

Test example:

- Number of elements: 2,523; Construction stage: 353 steps.
- System configuration: Intel CPU 3.06GHz, Memory 1GB.
- Effect of Improvement.

	V6.7.1	Civil 2006	Analysis Time
Run time	19,900 sec	11,700 sec	Reduced to about 60%

- Applicable for 64bit operation system.