

MIDAS/Gen Ver. 7.0.2 Enhancements

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



1. GUI

- New GUI of MIDAS/Gen V702.
 - 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

- 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.
- Support user-defined section (input through SPC) in Pre/Post-Processing.
- Improved cable element input method:
 - Change in unstrained length input method, $L_u/L \Rightarrow L_u$.
 - Addition of Horizontal pretension load input option.

3. Eigenvalue Analysis

- 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 V702, analysis results including Eigenvalue data, which have been generated in V671 or an older version, cannot be read.

4. Response Spectrum Analysis

- Addition of response spectrum function as per Eurocode8 (2004).
- Addition of nodal acceleration and inertial force.
- Addition of linear modal combination method.

5. Pushover Analysis

- Allow assigning hinge properties to the steel section of Value type.
- Graphical output of story results (story shear force, story displacement, drift ratio).
- Auto step generation and result output of performance point (interpolation).
- Reflect Section/Wall Stiffness Scale Factor.
- 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.

6. Linear/Nonlinear Time-history Analysis

- Provide graph for story displacement/velocity/acceleration and story shear factor/overtopping moment.
- 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.

V7.0.2: 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 hysteretic characteristics of soil spring (RO, HD).
- Addition of slip hysteresis for brace.
- Table output of max. story displacement/velocity/acceleration, story shear force and bending moment, etc.
- Fiber
 - Improved convergence.
 - Renumbering cell number.
 - Extend the number of Fiber material properties that can be defined, from 3 to 6.

7. 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).

8. 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.
- Output of story displacement and story shear forces for Multi-Diaphragm Structure.
- Irregularity evaluation based-on IBC 2003.

9. 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.
- Design of Tapered Section RC Beam (Haunch Beam).
- Save graphic reports of design as a batch file.

10. 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 | V7.0.2 | Analysis Time |
|----------|------------|------------|----------------------|
| Run time | 19,900 sec | 11,700 sec | Reduced to about 60% |