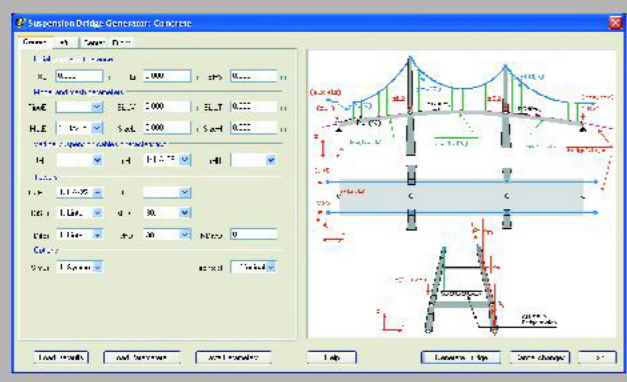
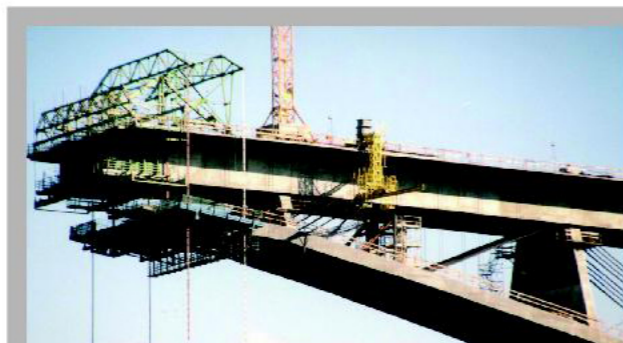
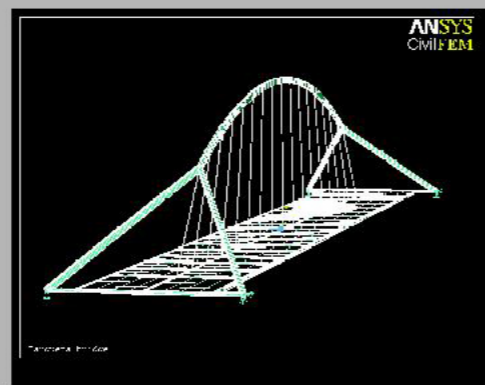


# Innovating at all levels



The bridges and civil nonlinearities module provides a complete solution that enables the bridge designers to solve complex problems with tools that demonstrate the latest advances in technology. It allows to intuitively generate mesh and load and analyze and design according to codes any complex bridge by using powerful wizards. Furthermore, its complete integration with ANSYS/CivilFEM ensures that any kind of static, dynamic, linear and nonlinear analysis can be easily performed.



BRIDGES AND CIVIL NONLINEARITIES MODULE

→Library of Common Bridge Cross Sections

- Definition of common bridge sections by specifying basic dimensions.
- Automatic "mesh" generation for the defined sections to calculate section properties. Any generic bridge section can be easily defined through the GUI.

→Bridge Layout Design (Plan and Elevation View)

- Allows generating the bridge layout from common engineering blueprints and parameters (mileage points, curvature radius, inclination, etc). It works like a complete "layout program" intuitively defining any complex layout.
- Automatically creates the 3D alignment from the definition of plan and elevation views.

→Automatic Generation of the Finite Element Model (Beam and Solid elements)

- Beam element model: Allows for a trial and error procedure using beam elements.
- Automatic discretization of the beam element cross sections (allows to analyse the section's internal behaviour using beam elements).
- Automatic solid element model: More accurate design can be performed using SOLID elements just by changing the element type and running the analysis again.

→Suspension/Cable Stayed Bridge Model Wizards

- Just enter the number of segments and the corresponding data to generate the entire bridge model for both 3D beam and solid elements.
- Optimization of the geometry and initial tension of cables for Suspension and Cable Stayed bridges.

→Moving Load Generator (Vehicle library)

- Automatically generates the required loadsteps for one or more vehicles moving throughout the bridge deck. These loads are automatically combined during postprocessing using the smart combination tool of CivilFEM.
- Database of standard design code vehicle loads (Caltrans, AASHTO, High-speed trains, etc.) and possibility of defining any generic vehicle with its corresponding load pattern.
- Definition of vehicle type: rigid or flexible (adaptable to trajectory).

→Automatic Surface Load Generator.

→Prestressed Concrete Utilities (please refer to the Prestressed Concrete Module for more advanced features)

- Introduction of prestressing cables along the structure. The program calculates an equivalent system of forces at each node of the element crossed by the tendon.

→Construction Sequence Analysis

- Simulation of real non-linear construction process taking advantage of CivilFEM is time-dependent material properties and the possibility of activating and deactivating elements and materials during the analysis.

→Civil NonLinearities

- Changes in the cross section geometry and time-dependent properties due to construction processes.
- Large Deflection Buckling of Concrete Beam Elements, Non-linear redistribution analysis and Cracking and Yielding Phenomena.
- Concrete Creep and Shrinkage, material behaviour (according to codes or user-defined).

→Detailed analysis of piers, cross bracings, diaphragms, etc.

→Moment-Curvature Diagrams

- CivilFEM allows the calculation of the real moment-curvature diagram for a given section.

(\*) For further information, please contact with your distributor.