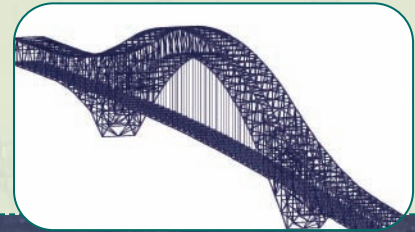


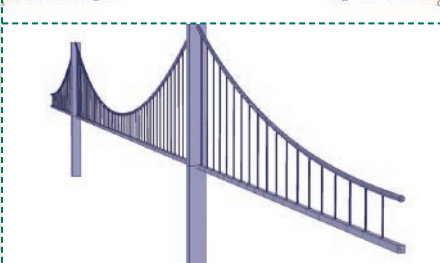
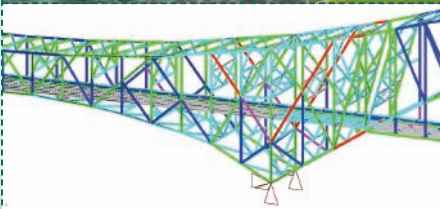
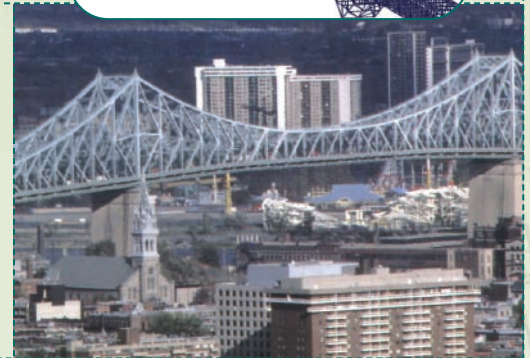


SAFI™ Bridge



The SAFI™ Bridge program allows to analyze, verify, evaluate and design 2D and 3D bridge models of any type and size subjected to standard or non-standard moving loads. The program allows to evaluate and design steel, composite, reinforced concrete, bridges as well as pre-stressed bridge girders.

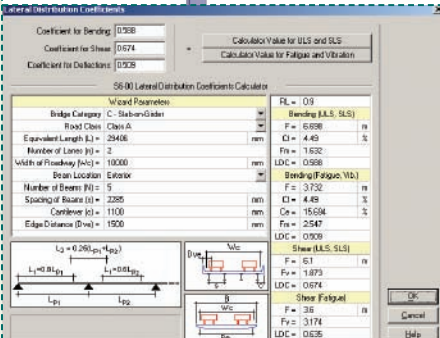
The SAFI™ bridge analysis component of the program is code independent and universal. The unmatched graphical user interface of SAFI™ allows to create, analyze and design large and complex models quickly and easily.



Technical Specifications



- The program performs multiple simultaneous or non simultaneous standard and non standard moving loads analysis on simple and complex trajectories.
- The program includes a comprehensive library of over 25 standard trucks and a moving load editor for user defined trucks and trains.
- The moving loads are transferred to selected elements of the model.
- Impact factors can be specified for an entire truck load or on a per axle basis as well as for lane loads. Axles can be raised as required by some bridge design codes such as the CAN/CSA S6-00 code.
- Lateral distribution factors for moment, shear and deflection are supported.
- Envelopes of response are obtained for any combination of moving loads, lane loads and non moving loads.
- Incremental analysis can be carried out to account for staged constructions.
- Load factors can be determined automatically by the program when evaluating an existing bridge.
- Associated forces and maximum values can be obtained at any point of the structure using the advanced query engine.
- SAFI™ Bridge permit to query analysis results and associated results at any point of the structure.
- SAFI™ Bridge can be seamlessly linked to SAFI™ Steel, SAFI™ Concrete and SAFI™ Pre-Tension, this allows to evaluate and design steel, composite, reinforced concrete, bridges as well as pre-stressed bridge girders.



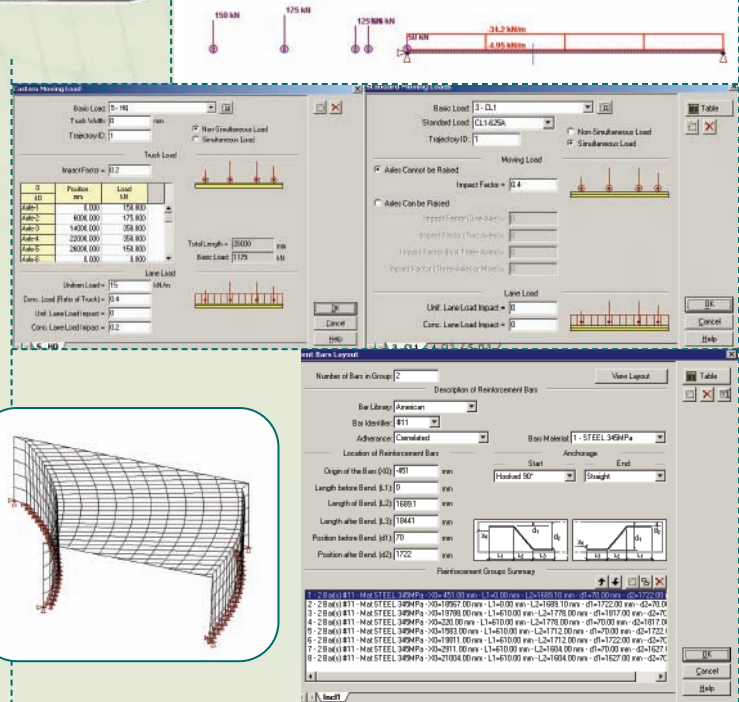
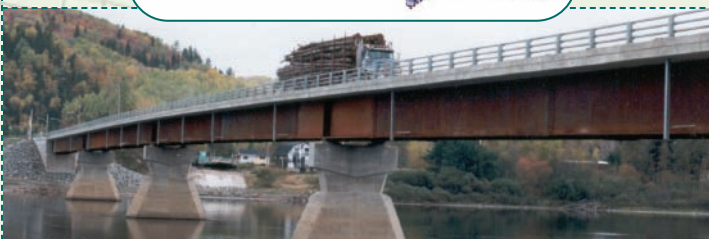
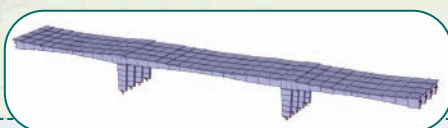
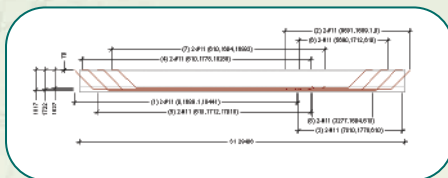
Potential users : • Engineers • Architects • Bridge Fabricators • Ministries of Transportation
Public works and municipalities • Governmental institutions



Design Features



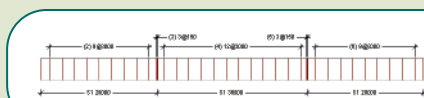
- Design of steel bridges and composite bridges with SAFI™ Steel according to the CAN/CSA S6-00 code.
- Full support for transverse, bearing and longitudinal stiffeners.
- Total and partial composite action and automatic determination of the required studs.
- User defined studs.
- Plain concrete slab or concrete slab cast on steel deck.
- User defined and standard steel decks.
- Long term deflections can be considered.
- Slab reinforcement can be considered in analysis.
- Effective or full composite inertia can be used.
- Includes all features of SAFITM Steel.
- Design of reinforced concrete bridges with SAFI™ Concrete according to the CAN/CSA S6-00 code.
- Automatic determination of longitudinal and transverse beam reinforcement.
- Automatic determination of pile reinforcement.
- Edition of all reinforcement bars.
- Multi-cycle design and verification.
- Design of partial structures.
- Includes all features of SAFITM Concrete.
- Design of pre-stressed bridge girders can be done with SAFI™ Pre-Tension.



Evaluation Features



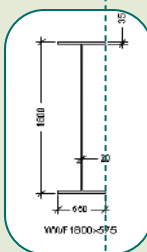
- Automatic determination of load factors according to chapter 14 of the CAN/CSA S6-00 code.
- Automatic determination of resistance factors (U) according to chapter 14 of the CAN/CSA S6-00 code.
- Supports standard traffic loads and special permits.
- Classes of dead loads can be set for each basic load (D1, D2 and D3).
- Classes of moving loads can be set for each basic load (Normal traffic, alternate normal traffic, PA, PB, PC and PS).
- Member properties such as system behavior, inspection level and reliability index are specified for each element.
- Element behavior is determined automatically for each element of the bridge.
- Provides forces, resistances, limit states and live load capacity factors for all elements of the model.
- Models can be edited either graphically or by means of tables.



Graphical User Interface



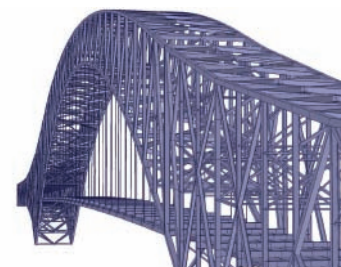
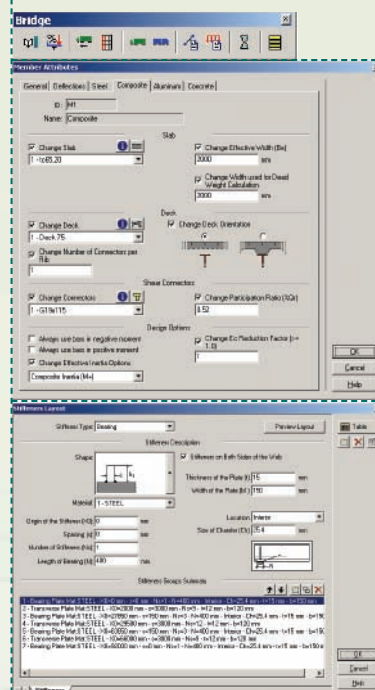
- Element can be created in batch or one by one.
- Elements of the models can be selected either graphically or according a set of criterions.
- Persistent groups of selected objects can be created and edited graphically or by means of tables.
- Multiple edition grids with user defined spacing, angles and labels.
- Powerful edition and automatic generation tools.
- Elements can be subdivided in any number of equal segments or at specific positions.
- Similar connected elements can be merged together.
- Elements of the structure can be renumbered according to several criterions.
- Element attributes can be set graphically or by means of tables (sections, analysis parameters, rotation angles, etc.).
- Element attributes can be edited in batch or element by element.
- Loads can be edited graphically or by means of tables.
- 3D solid display of all section shapes
- Ultra fast 3D visualization.
- Customized display of all graphical objects.
- Partial model visualization.
- Results can be displayed on screen for the whole or a part of the structure.
- Results can be displayed for each element separately by means of graphics and numerical results tables.
- Results can be displayed for a set of elements by means of numerical results tables.
- Graphical display of trajectories.
- Graphical display of transfer members.
- Diagram of deformations, forces, and stresses for the combined results.
- Diagram of forces and associated forces for the truck loads, lane loads and combined truck and lane loads.
- Diagram of forces for unfactored static loads.
- Diagram of forces for combined envelopes.
- Contour lines for finite element plates with customized range of values.



Fonctionnalités d'évaluation



- Evaluation of steel bridges and composite bridges with SAFI™ Steel according to the CAN/CSA S6-00 code.
- Full support for transverse, bearing and longitudinal stiffeners.
- Total and partial composite action.
- User defined studs.
- Plain concrete slab or concrete slab cast on steel deck.
- User defined and standard steel decks.
- Long term deflections can be considered.
- Slab reinforcement can be considered in analysis.
- Effective or full composite inertia can be used.
- Includes all features of SAFI™ Steel.
- Evaluation of reinforced concrete bridges with SAFI™ Concrete according to the CAN/CSA S6-00 code.
- Supports longitudinal and bent bars in bending.
- Supports inclined stirrups and bent bars in shear.
- Supports pile reinforcement.
- Includes all features of SAFI™ Concrete.

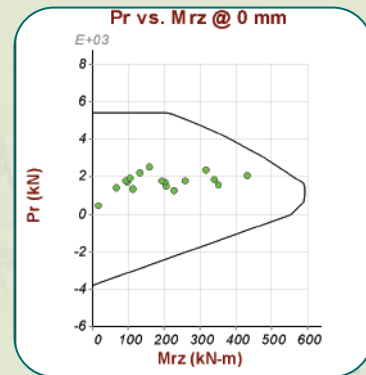




Bridge Evaluation Report

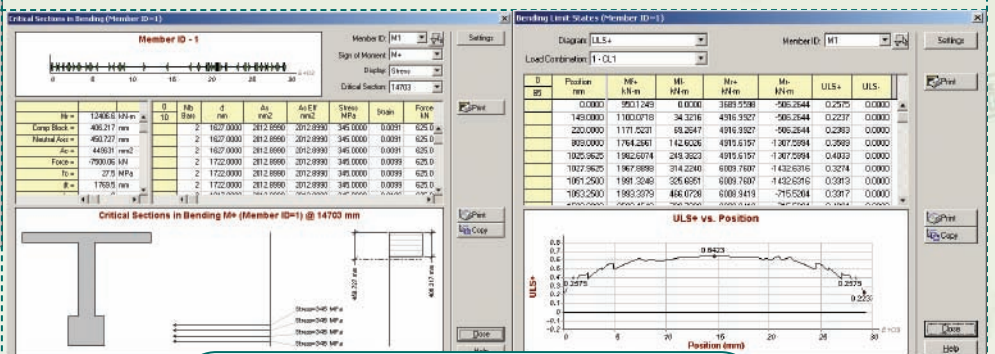
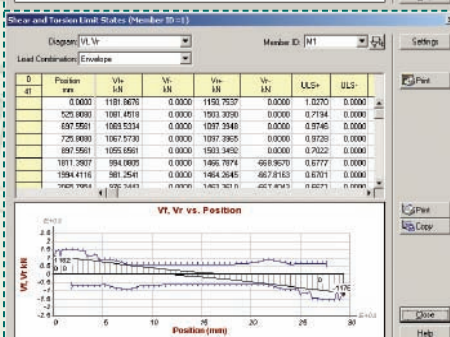
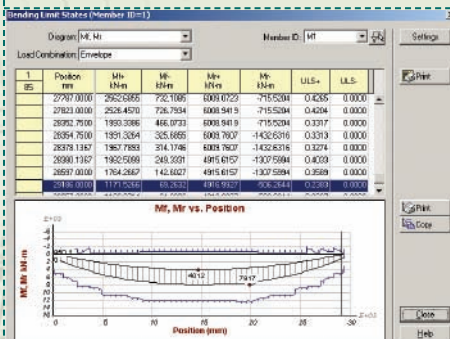


- Query any result of the bridge analysis at any point of the structure.
- The evaluation report may be printed for a point, a beam or the whole bridge.
- Results are available for the truck load, lane load, combined truck and lane load and for any load combination.
- Results for static loads can also be queried for a given set of criterions.
- Results for the truck load are given with the truck position and direction.
- Forces associated to queried results are also displayed.
- Reports are available in multiple file format including the SAFI™ format, Microsoft Excel worksheets and Microsoft Access databases.



Reports

- Results can be visualized either graphically or numerically.
- Input data and results may be printed for the whole structure or partial structures using a graphical selection or a range of elements.
- Customized list of input data and results to be printed.
- Reports are available in several formats including SAFITM reports, Microsoft Excel worksheets, Microsoft Access databases and ASCII text files.
- All graphics can be printed or copied to the clipboard for use in external programs.



SAFI, simply reliable

since 1986