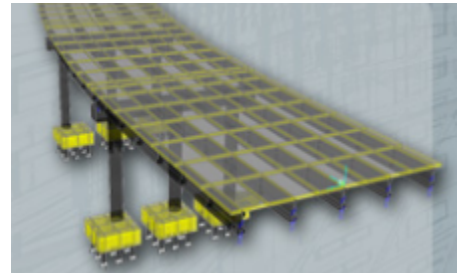


# Home



This space is devoted to **CSiBridge**. Please visit the [Technical Knowledge Base](#) for documentation on topics common to all **CSI** Software.

**CSiBridge** is specialized analysis and design software tailored for the engineering of bridge systems. Suspension, cable-stay, elevated-roadway, and other types of bridge systems may be modeled and designed to suit any one of a variety of purposes, including means for crossing water, linking points between shear terrain, or extending over highway infrastructure. Customized controls and features integrate across a powerful object-based modeling environment to offer an intuitive, practical, and productive computational tool for bridge engineering. Advanced modeling features and sophisticated analysis techniques account for dynamic effects, inelastic behavior, and geometric nonlinearity. Code-based templates streamline the engineering process from model definition through analysis, design optimization, and the generation of comprehensive output reports. CSiBridge is the premier software for bridge engineering.



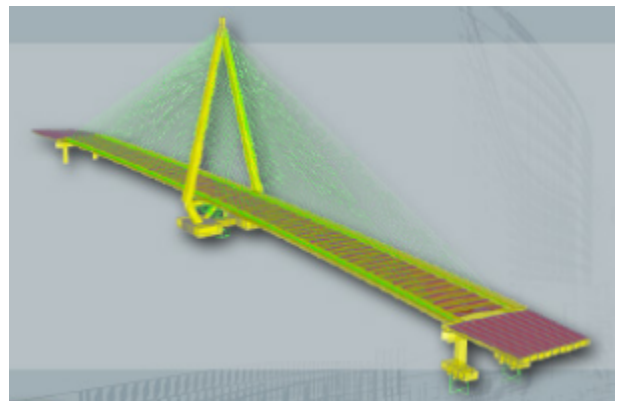
On this page:

- [Modeling of Bridge Systems](#)
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## Modeling of Bridge Systems

CSiBridge implements a parametric object-based modeling approach when developing analytical bridge systems. This enables designers to assign bridge composition as an assembly of objects (roadway superstructure, substructure, abutments, piers, foundation system, etc.) before the **SAPFire**® Analysis Engine, integral to **CSI** Software, automatically transfers the object-based model into a mathematical **finite-element** model by meshing the material domain and assigning material properties. This object-oriented approach simplifies and expedites the modeling process, saving engineers the need to directly define, link, constrain, and mesh all material volumes.

CSiBridge also allows engineers to import model data from Dwg/Dxf, IGES, CIS/2 STEP, and Land XML file formats, or export to **PERFORM-3D**, MS Access, and CIS /2 STEP, all following **IFC** standards.

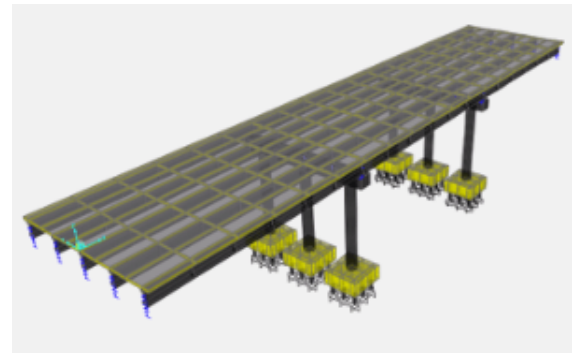


## Loading and Analysis

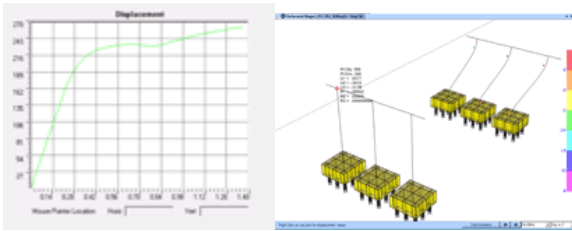
After modeling, CSiBridge provides options for the assignment of load cases and combinations. **Vehicle**, seismic, and wind loading are generated according to building code (AASHTO LRFD, Canadian, etc.) and assigned according to model geometry. A series of templates for assigning and enveloping load conditions make CSiBridge intuitive and practical.

After the original object-based model has been translated into a finite-element model and subjected to load cases and combinations, the analysis process follows directly.

Analysis capabilities go well beyond elastic performance into the assessment of **inelastic** behaviors. **Geometric** and **material nonlinearities** provide insight into strength, ductility, and other performance measures critical to response under extreme loading. Static-pushover and dynamic analyses (steady-state, **response-spectrum**, and **time-history**) provide further insight into earthquake resilience. Substructure **hinging** properties are customizable.



Additional analysis features may account for **creep** and **shrinkage** behavior, post-tensioning with optional automatic cable tensioning, **staged-construction** effects inherent to segmental construction, **buckling**, camber and shape finding.



## Design and Output

An automatic design process couples with analysis procedures to coordinate and optimize the resizing of bridge components. For reinforced-concrete systems, CSiBridge optimizes rebar sizing through a comparable procedure.

Customizable reports present analysis and design details in a variety of formats. Moment, shear, and axial response data and diagrams in 2D and 3D views, seismic-displacement capacity, demand-capacity ratio, load rating per classification, influence-surface plots for displacement, reaction, and [frame](#), [shell](#), [solid](#), or [link](#) response are all options for output generation.

## CSiBridge Tutorials

Refer to the [CSiBridge Tutorials page](#).

## CSiBridge Test Problems

Refer to the [CSiBridge Test Problems page](#).

## See Also

- [Bridge Modeler](#) – Technical Knowledge Base section

## References

- [Aviram, A., Mackie, K., Stojadinovic, B. \(2008\)](#). *Guidelines for Nonlinear Analysis of Bridge Structures in California*. Berkeley, CA: Pacific Earthquake Engineering Research (PEER) Center.

