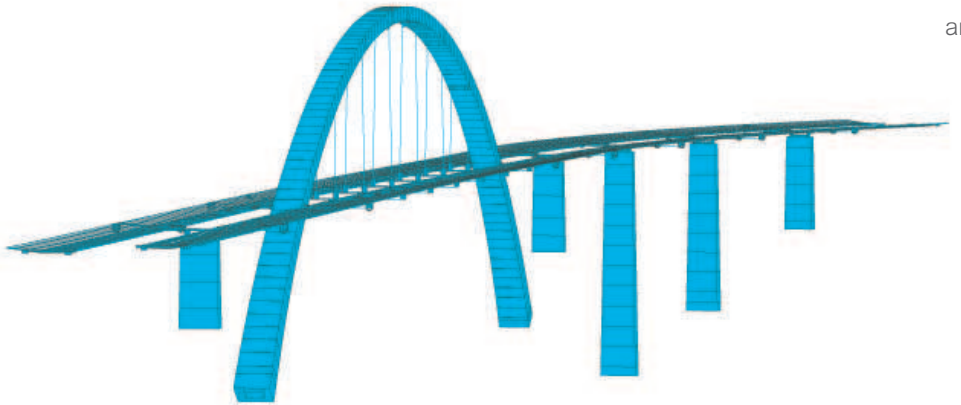
Bridge Design

The SOFiSTiK module portfolio is especially powerful and versatile for advanced analysis and design in all fields of bridge engineering. Seamless integration of construction stage analysis, precambering and force optimization for large bridges is available. Analysis with nonlinear effects as well as economical influence line evaluation is possible. From a library of standard load models (roads and railway) to special design and serviceability assessments a large amount of design code information is implemented.

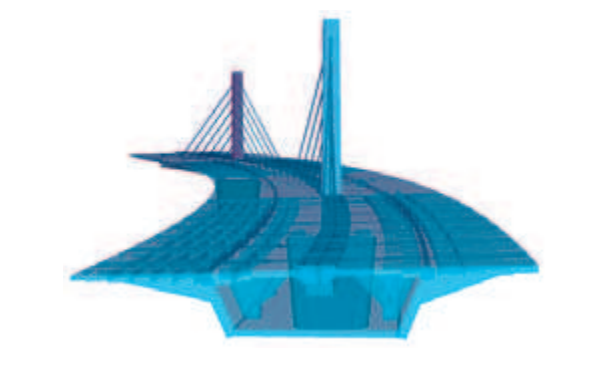


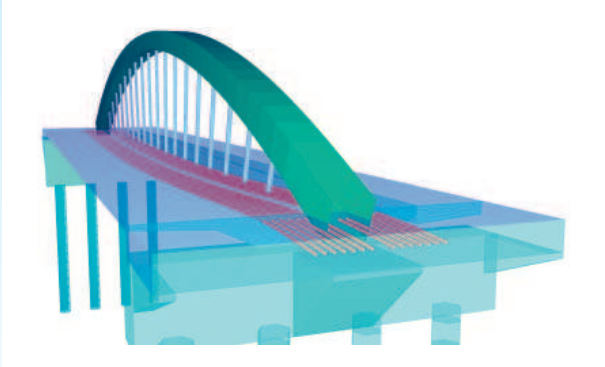
Pre- / Post-Tensioning

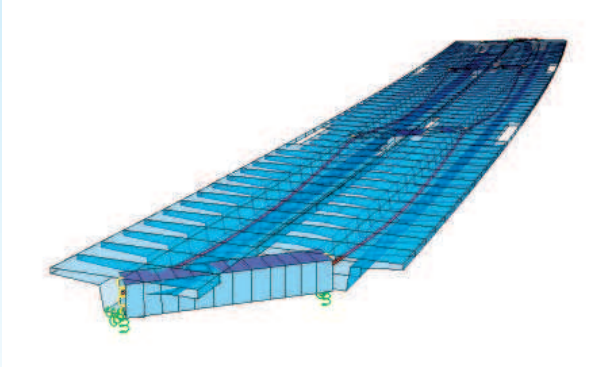
- Cubic 3D spline tendon geometry
- Full 3D geometry definition in plan-, elevation and cross-sectional views
- Jacking and construction sequences
- Prestress for beam and shell structures
- Immediate bond
- Unbonded tendons
- Internal and external tendons
- Library of prestressing systems
- Tendon stress diagram
- Jacking protocol (numerical and graphical)

Bridge Types / Construction Methods

- Single or multi-web beam systems
- Cable stayed bridges
- Suspension bridges
- Slab/Frame/Integral systems
- Moving and foldable systems
- Hybrid systems (beam and orthotropic shell deck)
- Grillages
- Span-by-span erection with precamber
- Free and balanced cantilever method (FCM/BCM)
- Incremental launching with special contact bearing elements (ILM)
- Extradosed bridges
- Composite systems







Analysis

- 1st, 2nd, 3rd order theory
- Nonlinear material
- Nonlinear spring and damper elements
- Contact elements for ILM
- Primary states for deformation and stress (“construction memory”)
- Time-step integration
- Influence lines
- Hydratation
- Buckling analysis
- Construction stages
- Dynamic wind analysis
- Earthquake and response spectra analysis
- Eigenvalues
- Moving loads (rolling stock)
- Vehicle-Structure Interaction

Loads

- Library for traffic loads (road and railway)
- Influence lines and influence surfaces
- Free or element/node related load definition
- Settlement, temperature, wind, collision, support jacking
- Load combinations according to selected standard

Cross-sections

- Open and closed sections
- Thick- and thin-walled
- Effective widths (shear lag)
- Composite cross-sections
- Stress points (automatic and user defined)
- Cross sectional construction stages

Design Code Checks

- SLS and ULS in general with reinforcement design, stress checks, decompression, crack widths, robustness, fatigue
- DIN-FB 101, 102-104
- Eurocode 2/3/4/9
- ÖNorm B 4750
- SIA
- AASHTO 2002/2004, LRFD
- ACI 318-02
- BS 5400
- AS 5100 (Australia)
- EHE (Spain)
- IRC (India)
- S-BRO 2004 (Sweden)
- NS (Norway)
- SNIP (Russia)
- Hong Kong concrete model

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