

The SOFISTiK feature library is perfectly suited for bridge analysis and design. There are various tools for all relevant bridge engineering tasks. SOFISTiK allows the analysis and design of typical every-day structures as well as the detailed analysis of high-end problems as they appear in long-span bridges. The analysis workflow is performed by using a combination of AutoCAD-based graphic input, alphanumeric/parametric input using CADINP and different wizards – all controlled within the SOFISTiK Structural Desktop. In addition to the evidently implemented DIN Code many international codes are supported regarding material data, loading, load combinations and design code checks.

### Bridge Types / Construction Methods

- Span-by-Span, Grillages
- Free and Balanced Cantilever (FCM/BCM)
- Incremental Launching (ILM)
- Cable Stayed / Suspension
- Slab/Frame/Integral
- Extradosed
- Composite
- AutoCADbased system modelling, parametric definitions, alpha-numeric handling of data

### Pre- / Post-Tensioning

- Cubic 3D spline
- Full 3D Geometry Definition, Plan/Cross-Section/Elevation-View
- With/ without composite
- Internal/External PT
- Casting yard pre-tensioning.
- Stressing Procedure Library (SUSPA, Hochtief, Bilfinger)
- Stressing diagram
- Stressing protocol (numerical and graphical)

### Analysis

- 1st, 2nd, 3rd order theory
- Non-linear material
- Non-linear spring elements (Slip, Yielding, Failure)
- Primary states for deformation and stress („construction memory“)
- Hydration
- Imperfections
- Buckling
- Construction stages

### Dynamic Analysis

- Eigenvalues and Eigenmode shapes
- Response spectra
- Time history
- Wind
- Moving loads and masses
- Train-Structure Interaction

### Cross-sections

- Open/closed
- Any polygonal
- Thick / thin walled
- Effective Widths (shear lag)
- Composite cross-sections
- Stress points (automatic and user defined)
- Stage-wise change of materials (-values)

### Loads

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

### Design Code Checks

- SLS and ULS in general with reinforcement design
- Steel design according to DIN 18800 and EC3
- Decompression, crack widths, robustness, fatigue
- DIN Fachberichte (101, 102-104)
- Eurocode 2,3,4,8
- BS5400
- AASHTO, LRFD
- ACI
- EHE (Spain)
- IRC (India)
- SNIP (Russia)
- SIA (Switzerland)
- Ö-Norm (Austria)
- AS 5100 (Australia)
- Hong Kong concrete model

### Additional features

- Pre-camber and shop forms
- Push over analysis
- Optimization of structural parts (cable forces, max. moment, min. displacement, etc.)
- Geometry finding for cable structures.
- Geometry and erection control
- Geometry adaptation during construction to match fields measurements

