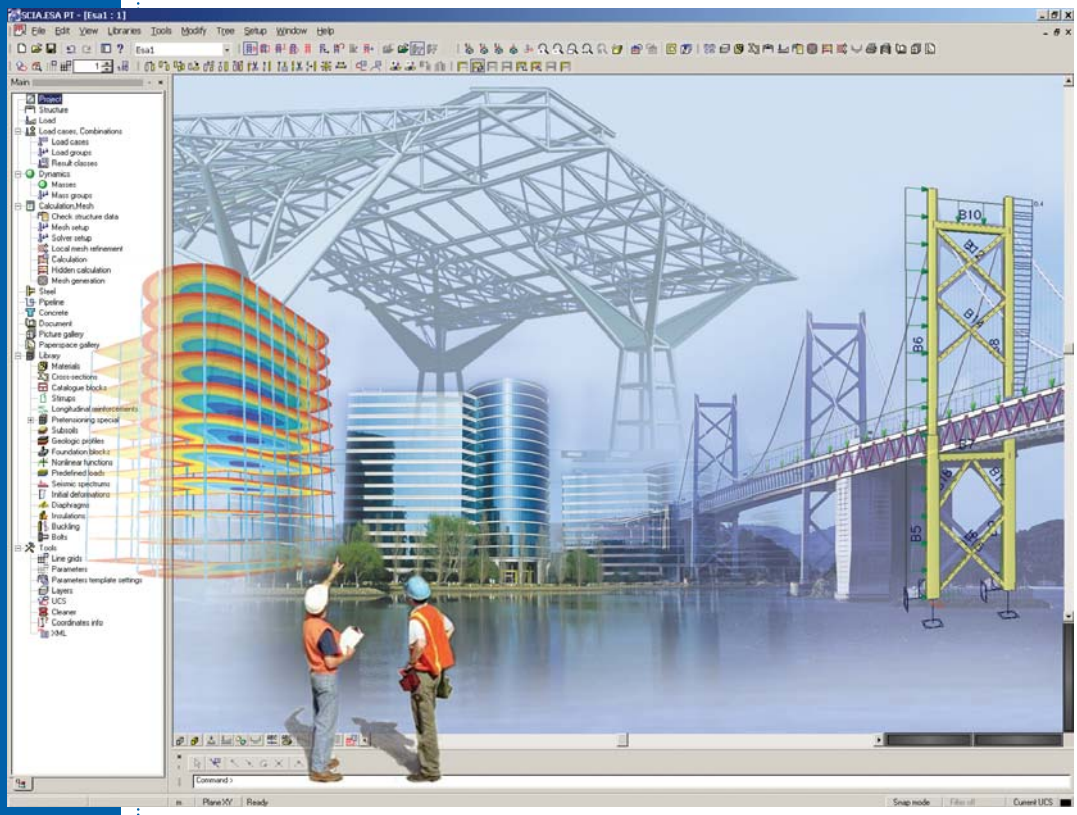
SCIA scientific software

Engineering Structural Applications Professional Technology

SCIA • ESA PT



The latest technology for modelling, analysing, designing and detailing steel and concrete structures in 1D, 2D and 3D

Design your projects quickly and accurately, and present them to your customers in a perfect way

Double speed, Double functionality, 4 times more profitable!

Fast, accurate and time-saving modelling and design of all your projects

Enabling Productive Construction through IT

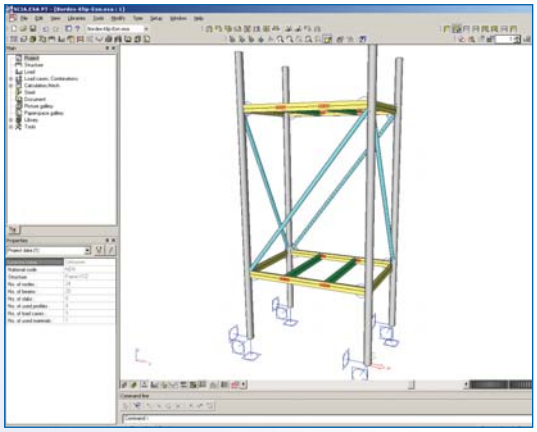
Certified ISO 9001 by BVQI
SCIA Group nv
SCIA W+B Software bv

Speed

Speed

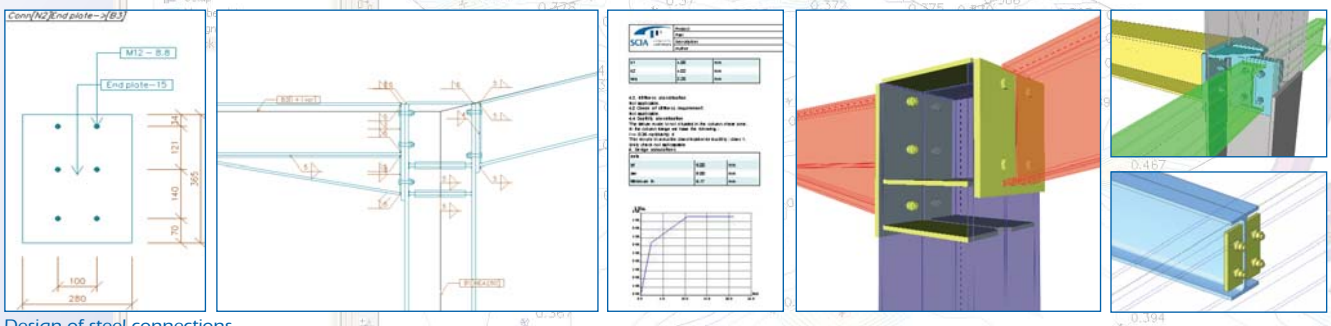
Analysis and design of all your steel and concrete structures is possible thanks to a super fast finite element computing engine. Proven speed thanks to:

- Working graphically with intelligent structural objects (beams, columns, walls, floors, ...)
- Intuitive and easy to learn user interface
- An open library of parametric models for the fast generation of new structures
- Load generators (snow, wind, water accumulation, ...)
- Generation of a customized calculation note with automatic paragraph numbering
- Automatic new generation of the calculation results after modification of the structure (active document)
- Extended picture gallery: overview drawings, details



Parametric model of a part of a scaffold.

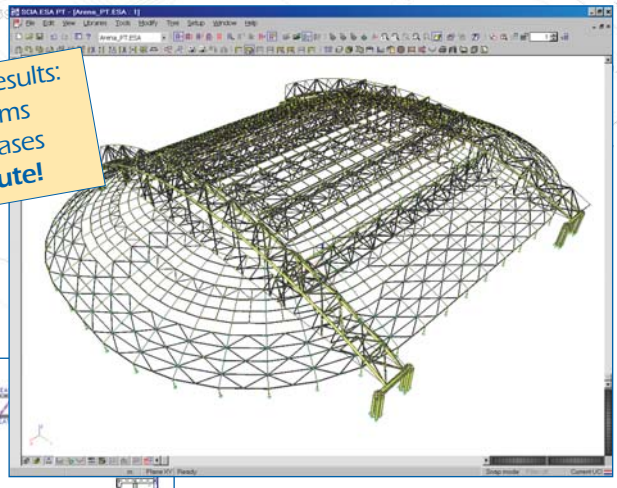
The program offers significant added value thanks to its comprehensive and professional calculation reports



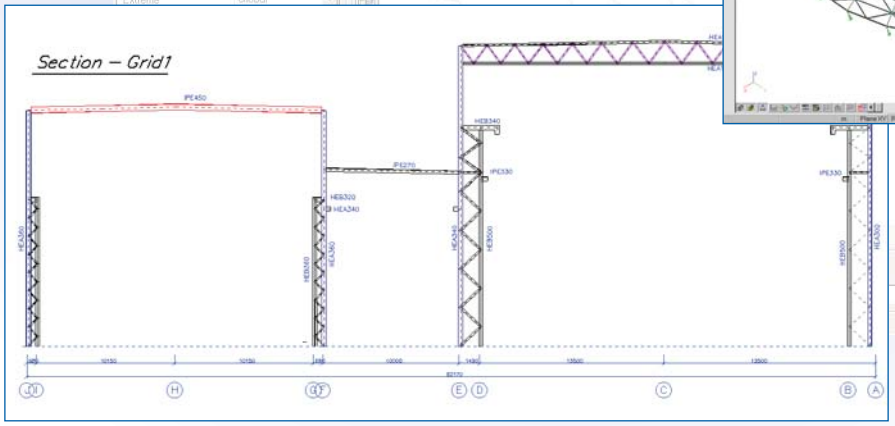
Design of steel connections
Drawings are generated automatically.

Complete and detailed control of the calculations and all results

Benchmark results:
3800 Beams
15 Load cases
in 1 minute!



This project is used for testing the calculation speed.
Thanks to Arcadis Bouw & Vastgoed for his input.



Automatic generation of professional overview drawings. Thanks to our customer Edibo for his input.

Increase your profit margin by reacting quickly 'in real time' on each modification to the structure

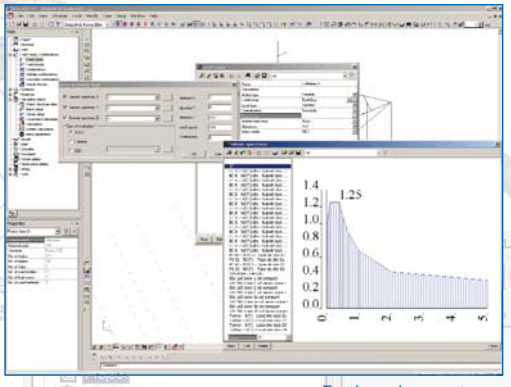
Quality

Quality

The quality is guaranteed thanks to a user-friendly, precise and complete interface, as well as through clear visualisation, calculation functionalities and output.

Quality:

- Calculation and execution models are integrated: possible mistakes are eliminated
- Visual control
- 2D drawings are automatically generated from the 3D model
- Professional calculation notes
- Development and support by an ISO 9001 / 2001 company

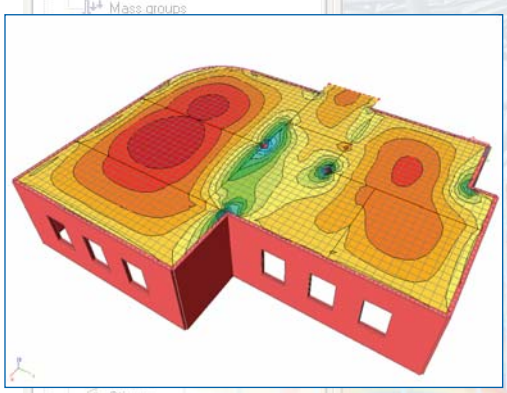


Earthquake spectrum.

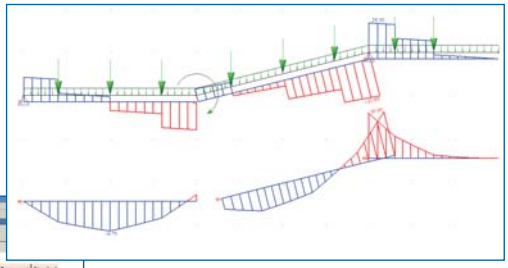
A guaranteed quality and contribution to safety control

Safety:
Reliable calculation results guarantee an indispensable tool for everyday use

- Control of fire resistance
- Simulation of various loads (snow, wind, rain, earthquakes)
- Dynamic behaviour
- Large deformations
- Totally in accordance with international design codes

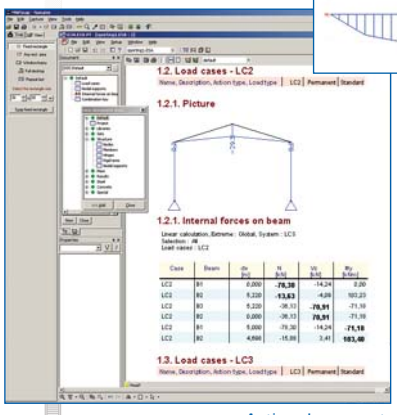


Bending moments in a reinforced concrete floor.

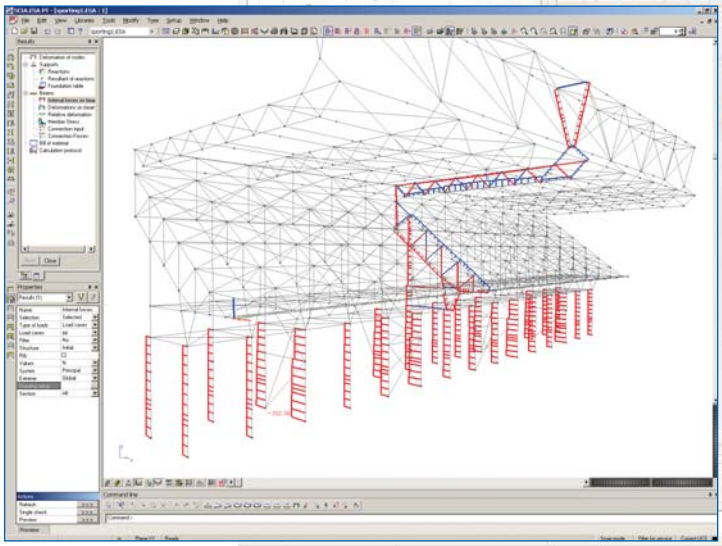


Internal bar forces.

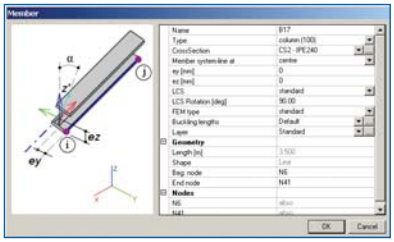
Cooperation with other industrial partners: SCIA programs are used world-wide by over 4.000 companies



Active document.



Normal forces in the columns
Thanks to our customer Ingénieurs Associés for his input.



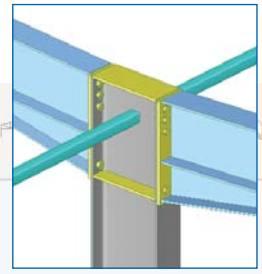
Properties of the objects are always accessible.

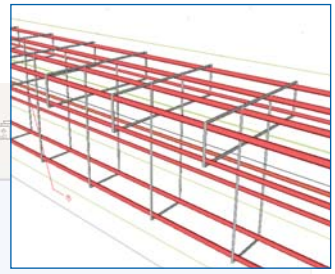
Innovation

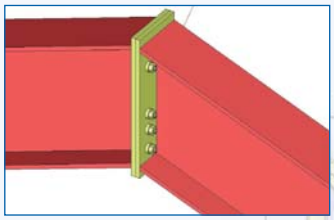
Innovation

SCIA • ESA PT is a new software platform for structural engineering. Analyses, designs and details any type of structure. From the most simple to the most complex construction in concrete, steel or mixed, with integration of the local and international codes and with a bi-directional link between the analysis and drawing components.

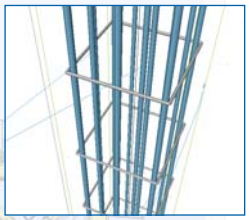
- Object oriented technology (each element of the structure is an intelligent structural object)
- Excellent integration and communication (XML, various industry interfaces)
- Bi-directional coherent link between the calculation and drawing models (CAD)
- Extensive calculation possibilities (linear, second order, dynamic, ...)
- International program (with a comprehensive range of codes for various countries)
- Parametric modelling and optimisation of the design
- Structures from simple to complex geometry: straight bars, curved bars, with reinforcements and variable changing inertia
- Detailing: design of steel connections, design of concrete reinforcement
- The newest design techniques, e.g. fire safety control of steel structures
- Open program interface for customisation by professional users
- Continuous development by an experienced international development team





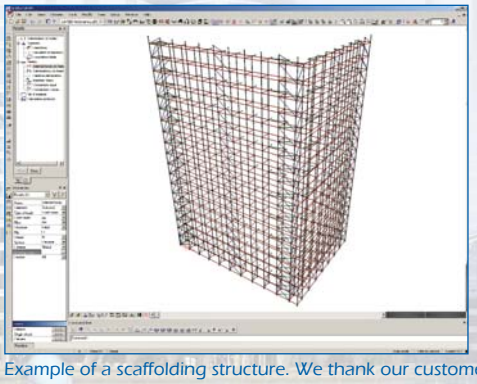


Steel connections.

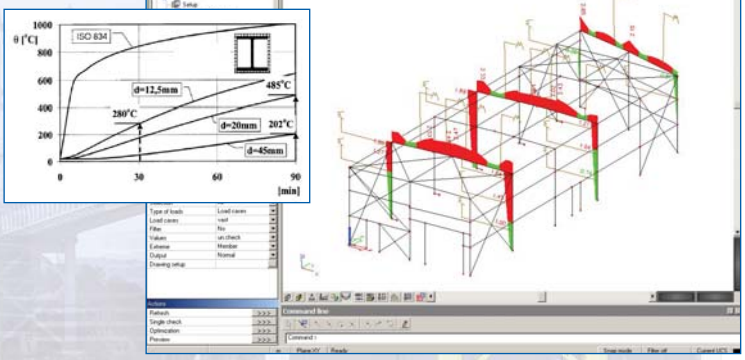


Concrete reinforcement.

Adaptable to meet your needs thanks to its modular structure

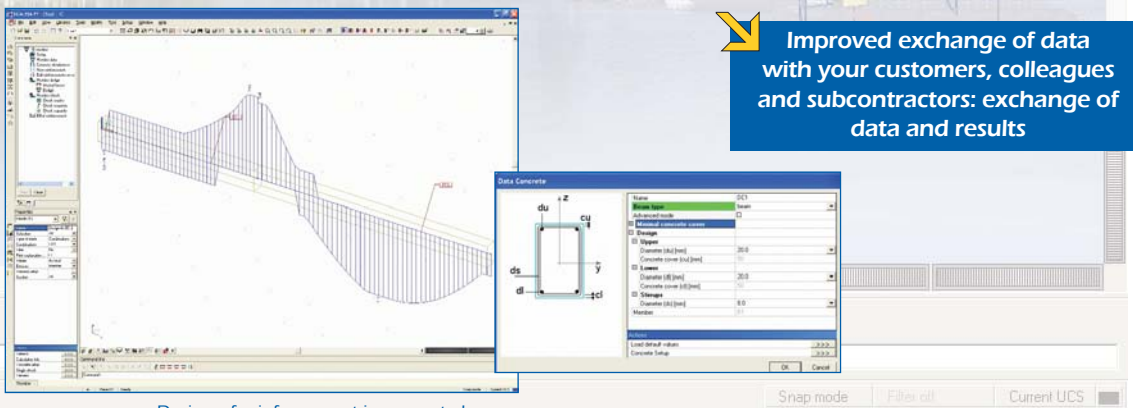


Example of a scaffolding structure. We thank our customer Travhydro for his input.

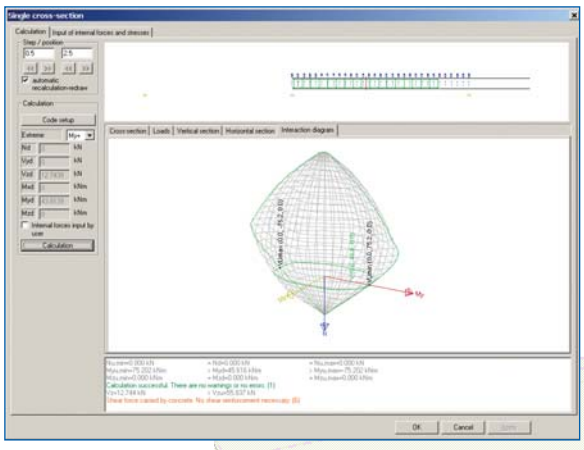


Assessment of the fire resistance of a steel structure.

Improved exchange of data with your customers, colleagues and subcontractors: exchange of data and results

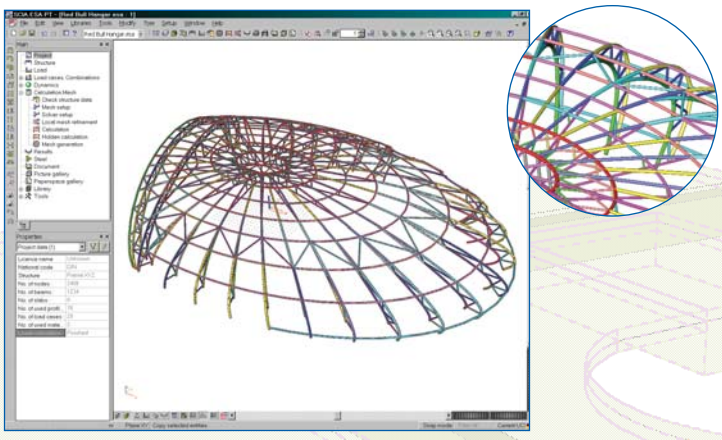


Design of reinforcement in concrete beams.



Detail control over the capacity of a reinforced concrete section.

Obtain a better and more complete perception of the behaviour of the structure

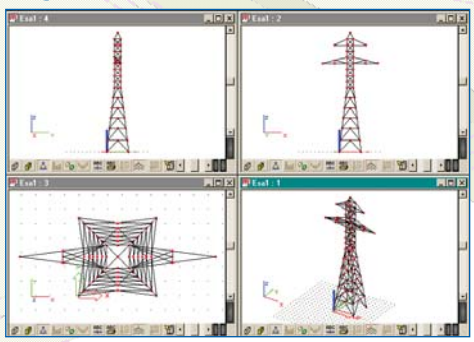


Airport shed of Salzburg. We thank our client Waagner Biro Austria for his input.

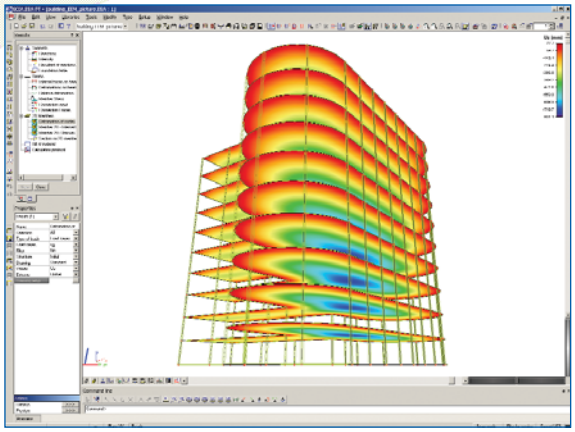
Intelligent help when searching for the best solution. But besides that it's also the ideal tool for preliminary design

Testimonies of customers:

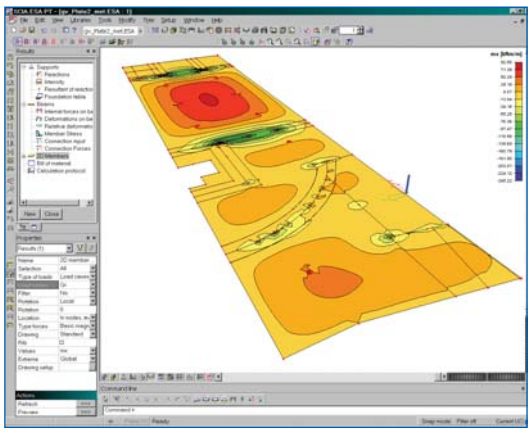
- M. Mersch of Ateliers Mersch (B):
  "The speed and the visualisation of the project in 3D within SCIA•ESA PT considerably accelerate the completion of the preliminary design. Besides that, I can present my customers with a complete overview of their project."
- L. Van Gorp of CSM (B):
  "The advantages of SCIA•ESA PT are the flexible "filter"-possibilities and the possibility to divide the structure into "layers". This last feature is very convenient in larger, more complex structures."
- F. CROZAT of Opéra National de Paris (FR):
  "SCIA•ESA PT is the software that approaches best our type of projects; it allows fast and intuitive construction of digital models and an effective analysis of results."
- B. Mont of Solvay (B):
  "Thanks to time saving and the optimization of complex structures by using the SCIA software, our company was able to realise substantial profits."



Pylons.

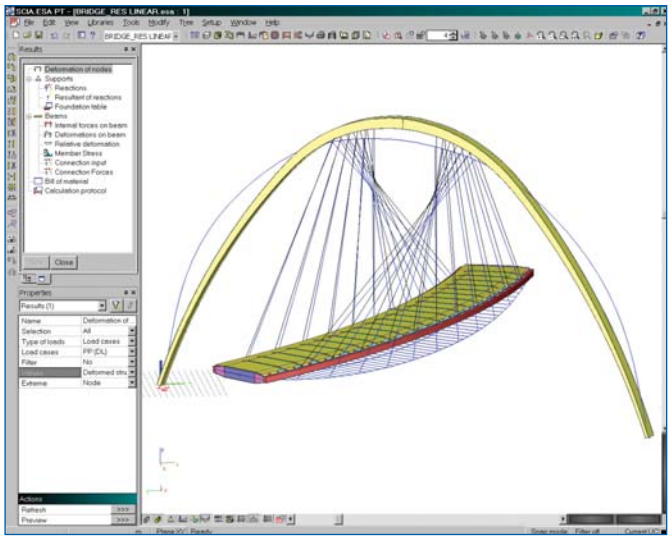


Deformations of a structure analysed with a finite element model.



Internal forces in a concrete Slab.

Present your results in a more professional way



Deformations of a stayed cable bridge.

Specifications

GENERAL - SCIA • ESA PT basic environment

- Object-oriented: with a simple right-click of the mouse button you can modify, delete, copy, ... everything everywhere
- Well-structured property dialogs are used for fast viewing and editing of all object-properties
- New Parametric Modelling: geometry and loads
- Templates and user defined models: individual generators
- Automatic design of steel profiles and concrete reinforcement according to different codes
- Several languages are supported: English, Dutch, German, French, Czech, Slovak, Spanish

INPUT OF YOUR STRUCTURE - Modeller

- Beams can be straight, curved, with haunches or completely arbitrary
- Flat slabs with constant or variable thickness can have holes, sub regions with a different thickness or ribs
- The calculation model can be 2D and 3D with a perfect integration of beams and slabs
- A wide range of cross-sections is available in the standard profile library. It includes standard steel cross-sections (HEA, IPE, L, RHS, CHS, C, T, ...), concrete cross-sections, welded sections, thin-walled sections, pairs of sections, sheet welded sections, mixed sections, ...
- Load generators: water and snow accumulation, wind, ...
- Import and export of the model with DXF, DWG, PSS, DSTV, XML. More intelligent and bidirectional links are available for AllPlan (Nemetschek) and ProSteel (Kiwi Software)

CALCULATION

- A wide variety of calculation types including linear, non-linear, dynamics and overall buckling analysis is available
- Linear analysis (1st order)
- Non-linear analysis (2nd order) with
  - Initial deformation and curvature of the structure
  - Beams with only-pressure, only-tension, limited pressure or limited tension
  - Gaps
  - Non-linear springs in hinges and supports (soil)
  - Cables
- Dynamic analysis
  - Natural modes and frequencies
  - Harmonic loads
  - Seismic loads (earthquake analysis)
- Stability analysis
  - Overall structure stability (structural buckling)

RESULTS

- A wide variety of results in beams and slabs can be viewed: deformations, internal forces, supports reactions, connections forces, internal stresses, contact stresses, foundation table
- Results can be viewed generally for the whole structure or detailed for a selection of elements
- The graphical representation of results is flexible and the user can choose between different possibilities

OUTPUT - The document

- The user defines the layout of the document:
  - Which tables should be printed
  - The contents and layout of each table
  - Which pictures, incl. size and location in the document
  - Customizable front page, headers and footers
  - The order: by load case, by element
- Picture gallery
- The document is intelligent: the tables with results are updated automatically when the input data is changed and the structure is recalculated
- Well-structured output can be obtained using the automatic paragraph numbering
- The user-defined layouts can be stored as a template so that they can be reused for other projects
- Active document: the user can change the project input data in the document. The project model will be adapted automatically, the structure can be recalculated and the document (results...) will be adapted accordingly
- The document can be exported into HTML, ASCII, RTF and PDF

STEEL DESIGNER

- Steel code checks according to a large number of codes: EC 3, NEN 6770/6771, DIN 18800, CSN, Önorm 4300, SIA 161, CM 66, BS 5950, AISC ASD/LFRD, CHIN, GBK 17-88, BSK 99 and KOR
- Steel code checks include buckling, lateral torsional buckling, section checks, optimisation of the profiles
- Buckling lengths are determined automatically and can also be changed by the user
- Fire resistance checks according to EC, NEN and SIA
- Connection design according to EC with bolted frame connections, welded frame connections, pinned frame connections, bolted diagonals and pinned grid connections
- Connection design with a large variety of shapes such as knee, plate to plate, tee, base plate, ... and with a large range of stiffeners such as top stiffener, bottom stiffener, diagonal stiffener, web doubler, haunches, ...
- Detailed drawings are generated automatically for each part of the connection

CONCRETE DESIGNER

- Concrete design of beams, columns and slabs according to a large number of codes: EC 2, DIN 1045, NEN 6720, Önorm B 4700, CSN, BS 8110, ...
- Buckling and double bending of columns
- Crack proof control
- Safe and economical design algorithm for bending and membrane forces in slabs, combined with an advanced algorithm for optimal steel reinforcement

DETAILER

- Automatic generation of professional steel overview drawings
- Generation of anchorage and implantation plan
- Different planes can be selected and a picture will be generated for each plane
- User-definable layout including all kinds of dimension lines
- Possibility to add texts, lines, circles, etc...
- Final drawing can be composed in the so called 'paper space' mode and can be exported to DXF, DWG, ...

SCIA scientific software

www.scia-online.com

your partner

SCIA Group NV Industrieweg 1007 B-3540 Herk-de-Stad (België)
Tel.: +32 13 55 17 75 Fax: +32 13 55 41 75 E-mail: info@scia.be

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