

Connection grid pinned

esasd.08

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Design and verification of grid connections in steel structures according to EC3, DIN 18800 and BS 5950-1:2000. As fasteners, welded or bolted plates, angles or a short cap plate can be selected. The nodal elements are entered in clear dialogues: angles, cap plate, bolts (default or high strength bolts), trimmings... The connection is immediately visualised in the CAD-model. For each operation, the normative prescriptions (e.g. for the clearances between the bolts) and the practical feasibility are checked. The node capacity is checked with regard to the prevailing internal forces and if required, the node can be further optimised in an interactive manner.



Datasheet Scia Engineer

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Scia
Engineer



The Scia Engineer connections grid module is a powerful program for designing steel connections known as grid pinned connections.

Years of experience and customer-led developments combined with the graphical Windows environment resulted in the Connections module.

The structural engineer now has an interactive, graphical tool to design of bolted and welded connections according to Eurocode 3 regulations.

Working with connections grid

The Scia Engineer graphical environment hosts the structural model for designing connections. The user can mouse-click on the nodes to be checked, and enters connection elements - such as cleats, endplates, stiffeners, bolts and notches - into a clear dialogue window. An open bolt library facilitates bolt and anchor choice, with all elements visible on the screen.

The user-editable program offers all significant factors and coefficients for checking the following:

- Safety factors;
- Geometrical defaults;
- Bolt positions limits, bolt intermediary distance limits, minimum weld sizes;
- Slip and moment factors for preloaded bolts.

Following the calculation process the program displays the allowable and actual connection forces within the critical load case/combination, as also the limiting part of the connection.

The program sends the detailed calculation to printer or document.

The "detailed connection drawing" (esad2.02) wizard module automatically generates detailed dimensioned drawings for all parts.

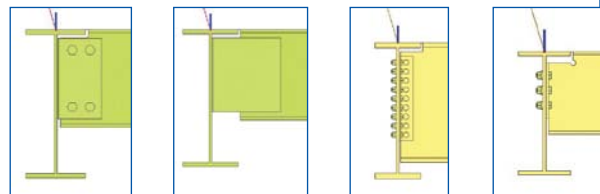
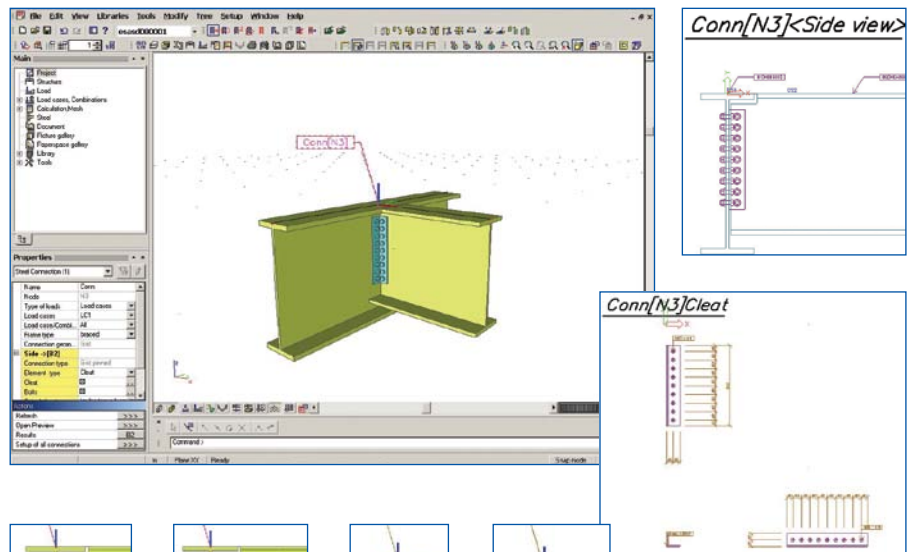
Pinned connections

Grid pinned connections are connections which do not transfer any moment. This is because there is a gap between the supported and supporting beam.

The program supports the following connection elements:

- Plate welded to supported beam web and welded to supporting beam web;
- Plate bolted to supported beam web and welded to supporting beam web;
- Cleat section bolted to supported beam web and bolted to supporting beam web;
- Short endplate: welded to supported beam web and bolted to supporting beam web.

The program also supports symmetric I-sections for major-axis bending configurations.



Checks

Calculations to:

- Eurocode 3: Design of steel structures
Part 1-1: General rules and rules for buildings
EN 1993-1-1: 2005

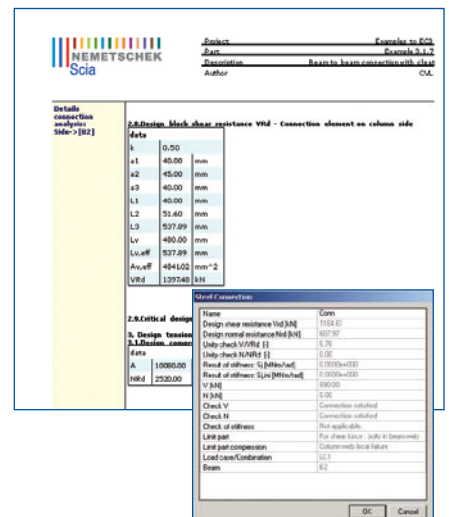
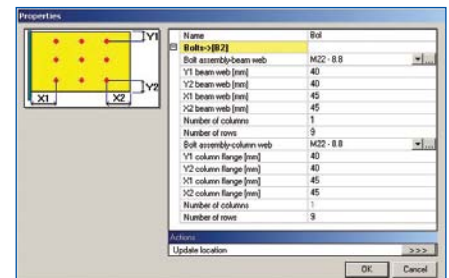
The referenced algorithms and methods calculate the limit states of the connection. The respective national codes (EC3, DIN 18800 T1 or BS 5950-1:2000), depending on the national code setup provide the formulae for calculating the capacities of the underlying steel parts. Other codes - such as NEN, CM, ÖNORM, and CSN - use the default EC3 capacities.

For pinned connections the program can check the following critical conditions concerning shear and normal forces:

- Supported beam web in shear;
- Supported beam web in tension;
- Supporting beam web in shear;
- Supporting beam web in tension;
- Plate, angle section, endplate in shear;
- Plate, angle section, endplate in tension;
- Bolts in tension;
- Bolts in shear;
- Bolts in bearing.

Seamless integration with structural analysis

Researchers can directly take the results from the Scia Engineer modules for structural analysis, or from third party programs using an ASCII file. The results of the connection design and part drawings are available in the project document.



Highlights

- ▶ Full integration into the main graphical user interface.
- ▶ Simple design, fast assessment, detailed output, clear drawings within several clicks.