

Practical reinforcement on 1D members

CPE **esacdt.01**

This module allows the user to define practical reinforcement for frame structures (beams and columns).

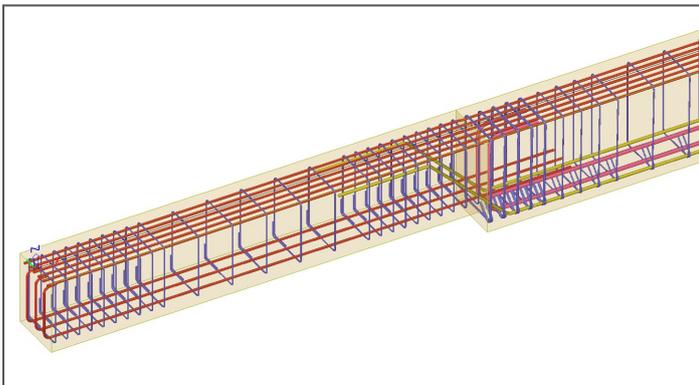
Highlights

Definition of various types of anchorages for stirrups and longitudinal reinforcement and check of the anchorage according to code specific requirements.

Automatic design of practical reinforcement according to the ultimate limit state for concrete beams and columns; the required number of stirrups and longitudinal bars and their spacing is designed automatically.

User input of a practical layout of reinforcement for concrete frames. This reinforcement can then be used for ULS, SLS and deflection checks (in combination with RC beams and columns module).

Reinforcement around openings and in variable profiles.



Anchorage

The module structural reinforcement for beams and columns esacdt.01 is extended by the possibility to define anchorage details for longitudinal and shear reinforcement through bends and hooks. As two “independent” models of a structure are defined in SCIA Engineer (analysis model for input and calculation, and structural model for drawings), also the longitudinal and shear reinforcement can be displayed in two models;

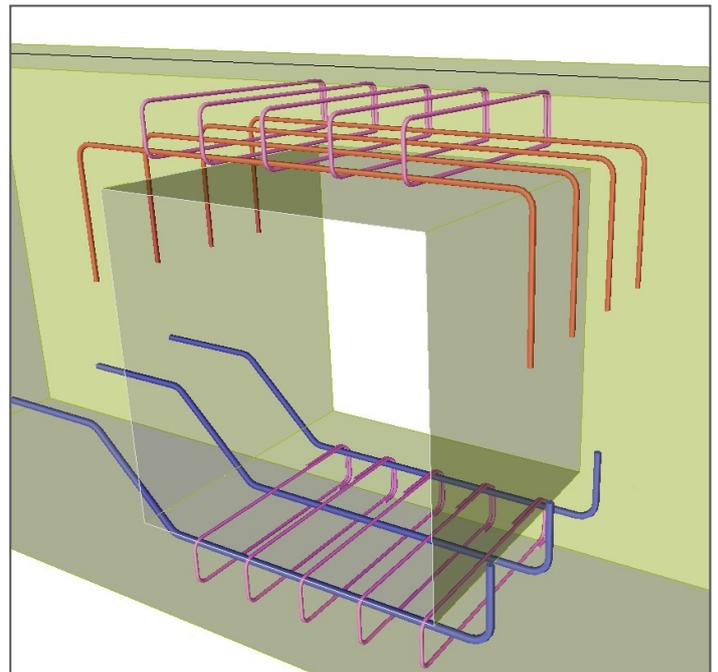
- Analysis model of the reinforcement applies in checks according to national standards and in non-linear calculation of deformations or redistribution of internal forces of concrete beams and columns;

- Structural model of reinforcement has been implemented for the needs of drawings and export and import of reinforcement into and from CAD systems. This reinforcement can be input manually by the user or it can be calculated and input automatically by SCIA Engineer.

The anchorage in the form of hooks and bends is defined always in the structural model and, therefore, is neglected in calculations and in checks. Its purpose is related exclusively to the display in the graphical window, document and drawings in SCIA Engineer and to the exchange of data with specialised programs for the preparation of drawings of reinforcement.

The anchorage can be defined for:

- Stirrups (shear and torsion);
- Longitudinal reinforcement (bending).



Anchorage properties:

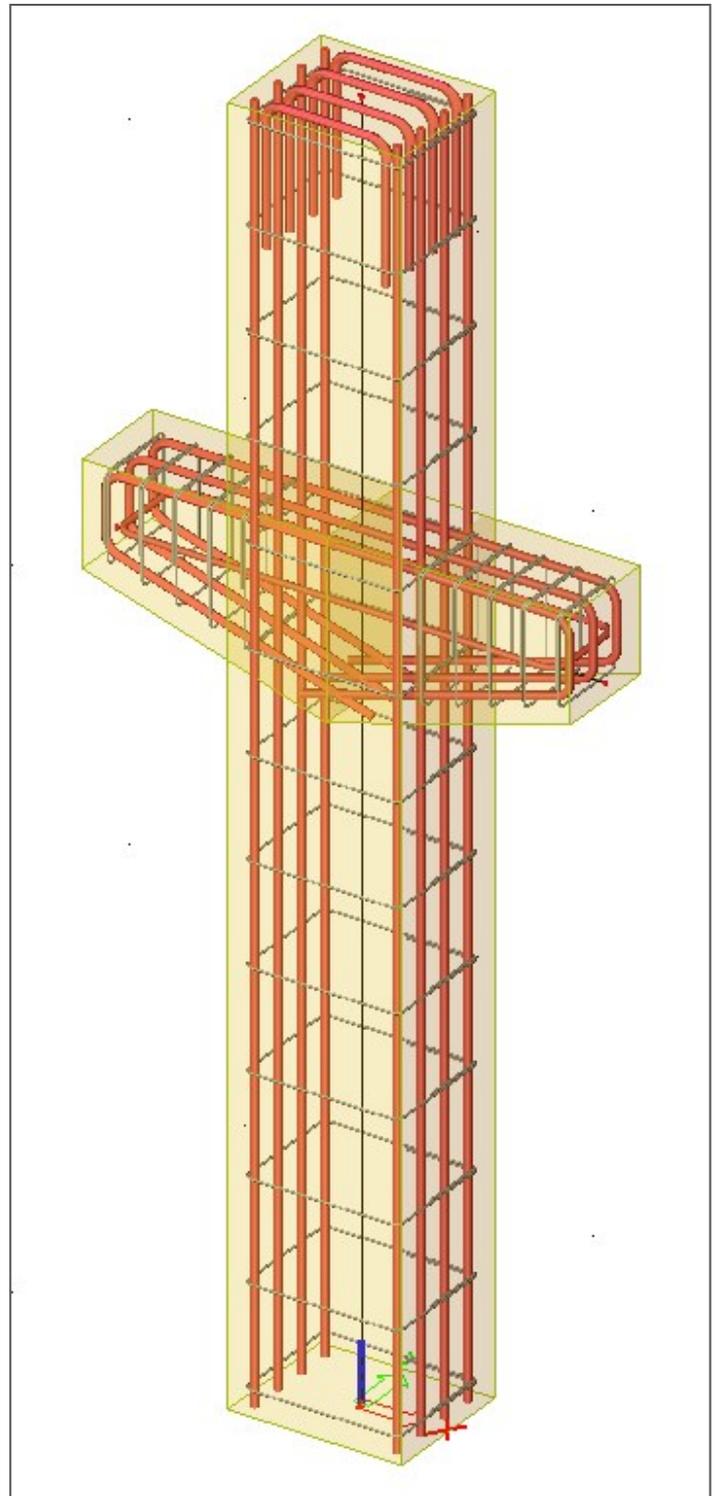
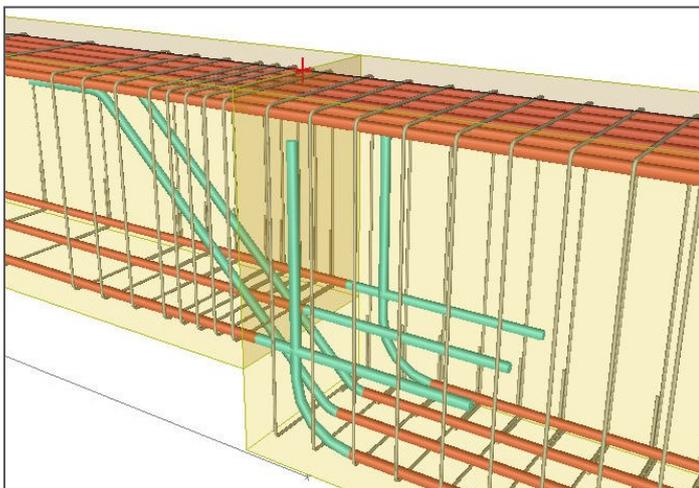
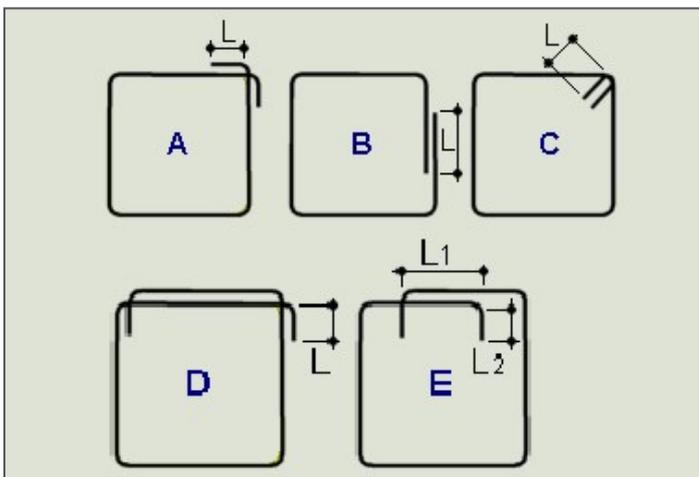
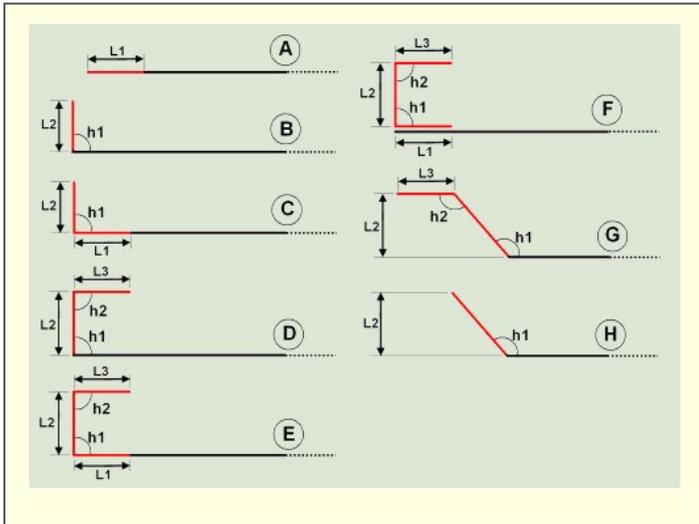
- The default properties of anchorage details can be adjusted separately for individual projects or globally for all projects;
- The anchorage can be displayed in a different colour than the reinforcement that is taken into account in calculations;
- The program is able to check the minimal anchorage length for stirrups in accordance with the specified national standard. If the anchorage

length does not meet the stipulated conditions, the program modifies it accordingly;

- Individual anchorage properties can be parametrised. This feature makes it possible to prepare user templates;
- The anchorage length can be applied to both open and closed stirrups;
- The anchorage details are available for all types of cross-sections;
- The user himself can choose the position of the anchorage on a stirrup;
- The user can also automatically input reinforcement around openings.

Display modes for anchorage in the graphical window, document and drawings:

- 3D display style including the anchorage details;
- Drawing of individual reinforcement bars in a beam.



Required modules

esa.00