STRAP Version 12.5

List of Enhancements

January 2007

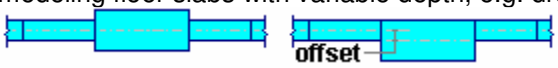
Highlights:

Concrete slab deflections

New The program now calculates short-term and long-term deflections based on the cracked section properties.

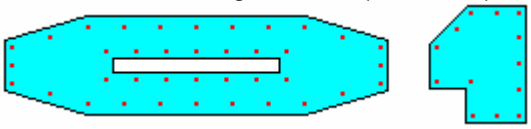
Element offsets

New An offset perpendicular to the element may now be defined. The option is useful when modeling floor slabs with variable depth, e.g. drop panels.



Concrete design

New The user can now design any column defined as a 'solid section' (including openings) in the *STRAP* section generator (*CROSEC*). For example:



Section generator (CROSEC)

New A closed perimeter from a DXF file may now be imported into the program.

New Standard sections may now be defined according to parameters, e.g. standard pre-stressed bridge sections.

Detailed List of Enhancements:

General

- Output to Word (RTF) file: the company logo (bitmap) may now be printed in the Word format file.
- Display a plane: an new option has been added to rotate the plane to the screen plane.
- Print/edit a saved drawing:
  - New options have been added to revise drawing names, delete drawings and to revise the order of the drawing list.
  - Several drawings may now be printed simultaneously on a single page; the program automatically arranges the drawings.
  - Multyline text may now be edited.
  - the mouse wheel can now be used to Zoom and Pan.

Main menu

- A 'note' may be typed for each model. The note is defined/displayed adjacent to the small model drawing at the base of the screen. The option allows the user to maintain a log of all information relevant to the model.
- Setup: the following options have been added:

- Dimension line options
- cover for reinforcement calculations
- Code related factors, e.g. EC2 National Supplement factors for individual countries

- Print: the following may now be printed from the main screen: load case and combination lists, wall results, spring stress results.
- Toolbar:
  - toolbars may now be arranged for the results, steel and concrete modules
  - new options are now available in all toolbars.

Geometry

- Element offset: an offset perpendicular to the element may now be defined:
  This option allows a concrete slab with variable depth (e.g. drop panels) to be defined so that the top surface of the slab is at a uniform level:
- Stages:
  Different releases and offsets may now be defined in each stage.
- 'Paste' sections (from CROSEC): the maximum number of lines in the section has been increased to 100 (from 20).
- Walls: 'right-click' options have been added, e.g. revise section, rotate section, display data, etc.
- Rigid links:
  A new option is available to rigidly connect nodes that have two identical coordinates. For example, two parallel planes may now be rigidly linked with one command.
- Nodes:
  - Perpendicular from a node to a line: multiple nodes may now be selected
  - Intersection of a plane and a line: Additional nodes may now be selected; the program creates lines parallel to the defined one passing through the additional nodes and generates nodes at their intersections with the plane.
  - Intersection of a cylinder and a line: Additional nodes may now be selected; the program creates lines parallel to the defined one passing through the additional nodes and generates nodes at their intersections with the cylinder.
  - nodes may now be defined at the intersection of grid lines.
  - Move nodes: a single coordinate for a group of nodes may now be moved.
- Unify: a 'tolerance' value may now be defined; two nodes will be unified if the distance between them is less than this value.
- Releases: a release at one end only may now be defined for a multiple beams.
- Beams:
  - the property may now be selected from a 'list' when defining new beams.
  - properties - dimensions: the property number is now displayed in the dialog box header and the schematic section sketch has been improved.
- Springs:
  - Spring constants may now be deleted in one direction without affecting existing values in other directions.
  - Radial springs may now be defined along an arc.
- Copy:
  - the program displays the distance from the original location when defining the new location of the reference node.
  - springs may now be copied.
- Walls
  - Section definition: a segment perpendicular to another segment may now be defined.
    the mouse wheel can now be used to Zoom and Pan.
  - Print section list: the size of the section drawing, the line thickness and text sizes may now be specified by the user.
- Display data: data for walls may now be displayed

- DXF drawing: the drawing may be displayed with the original DXF file colors and with all text.

Loads

- Prestress: variable cable force and eccentricity may now be defined along a line of beams (or arc)
- Global loads:
  - several global loads may be deleted simultaneously
  - display global loads applied to beams: the load case number is now displayed in the table header
- Lack-of-fit: up to 5 digits after the decimal place may now be defined.
- Display loads:
  - joint loads: angle has been changed from 45 so that the line does not coincide with element boundaries.
  - beam loads: distance between vertical lines may now be specified in STRAP.INI.

Output

- Slab deflections:
  The program now calculates short-term and long-term deflections based on the cracked section properties and the reinforcement in both directions:
  - the user may define actual reinforcement area (default = area calculated by the program)
  - the user identifies combinations that contain the loads for short-term and long-term deflections.
  - the program calculates the cracked section properties in both directions and solves the model again with the new orthotropic properties.
  - the program calculates a deflection envelope for short-term and long-term deflections (increased by the creep factor).
- Slab reinforcement: new option to calculate minimum reinforcement areas according to the Code
- Wall results: new option to display results for the entire wall (M,P,V) and not only for the component segments.
- Deflections - graphic: the deflection for a selected global direction may now be drawn.
- Reinforcement:
  - Eurocode 2: load combinations may be specified as 'Accidental'.
    γ_c and γ_s may be specified for accidental and regular combinations.
  - BS8110: if γ_s is not equal to 0.95, the value is now displayed in the reinforcement table.
- Tool bar: new icons have been added.
- Beam end results (tables): maximum results for each beam end may now be displayed.

Concrete

- Columns - general sections:
  - the user can now design any column defined as a 'solid section' (including openings) in the *STRAP* section generator (CROSEC).
  - options are available for defining 'corner bars' and reinforcement 'lines' and 'groups' for these sections.
  - these reinforcement patterns may be saved in a library and recalled later for similar sections with different dimensions.
- Display:
  - all 'Parameters' and 'Results' options have been removed from the 'Display' menu to a new 'Data display' menu.
  - Parameter and Result options are now available for walls.
  - beam and column names may now be displayed graphically.
- Walls:
  Different effective length factors and moment magnifier values may now be defined for each

segment in a wall.

- Beam detailing (*BEAMD*):
  - All beams may now be detailed at the same time; the program display a parameters menu and the specified values are used for detailing all of the beams
  - Concrete volumes and reinforcement weights may be displayed for projects and/or beams.
- Eurocode 2: factors may be revised according to National Annex.

Steel

- AISC: the program has been updated according to the revised 2006 version of the Code.
- Eurocode 3: factors may be revised according to National Annex.
- Section tables: the section lists may be rearranged.

Section generator - CROSEC

- DXF Import:
  A closed perimeter from selected layers in a DXF file may now be imported into the program. Additional interior perimeters are treated as openings.
- Sections defined by parameters:
  - standard sections may now be defined according to parameters, e.g. standard pre-stressed bridge sections, I sections with holes, etc.
  - additional sections may be added to the library upon request; please contact your *STRAP* dealer.