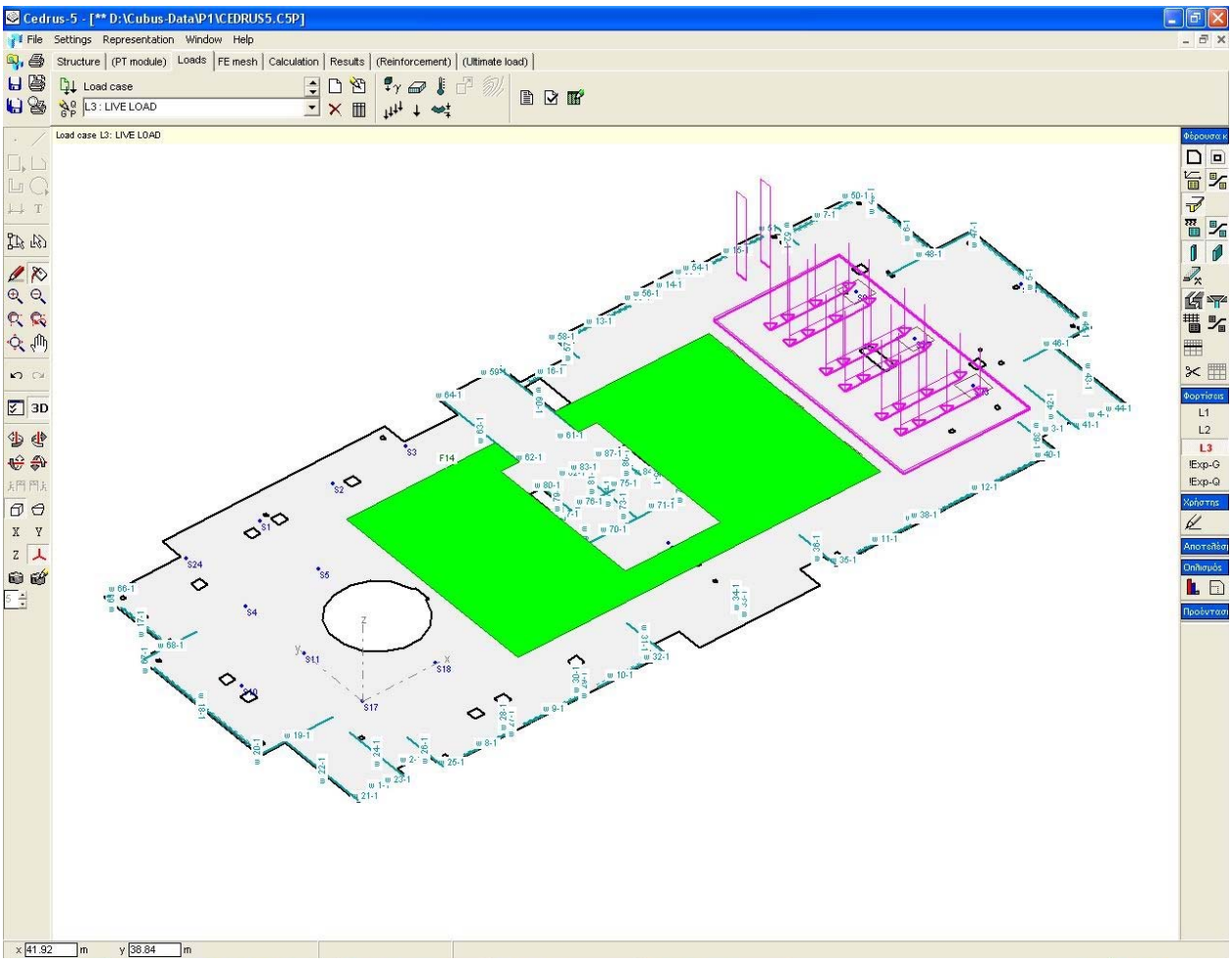
CEDRUS-5

Slabs and Discs

Design and Analysis
Optimization of Reinforcement
Ultimate Load

Prestressing
Dynamic



With CEDRUS-5 you can calculate Reinforced Concrete Slabs and Discs as fast and comfortable as never before. It includes all elements of a modern FE-calculation program, like windows surface with object oriented graphic editor, extreme fast 32-Bit solution method, automatic generation of load envelopes and design according to the codes, punching check, supports with tension cut-off, graphic and text output with user defined page-layout and preview

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Software · Consulting Services

Slabs

Model

- Slab (plane system with 3 degrees of freedom per node according to the theory of bending of thin slabs)
- Arbitrary form of slab perimeters and holes
- Zones with different thikness, material models (isotrop, orthotrop, torsion flexible) and material parameters
- Beams as independent objects
- Columns with rectangular or circular cross section with area or point support; automatic calculation of the column stiffness
- Point, line and area supports (slabs on soil) with arbitrary elastic properties
- Lines of symmetry
- Tension cut-off for all types of supports
- Hinge lines without moment transfer

Loading

- Area load with arbitrary polygonal boundary for dead and live load and differential temperature action
- Uniform or trapezoidal distributed line loads and moments in arbitrary position
- Point loads and moments
- Prescribed displacements or rotations of point supports
- Influence fields for moments, displacements and reactions
- Automatic generation of load cases for unfavourable load positions
- Assign of load cases to actions according to the new codes (Swisscode/SIA, EC2,E-DIN, OeNorm, GReek Norm etc.)
- Transport of reactions of another slab as loading under consideration of the dead load of walls and columns

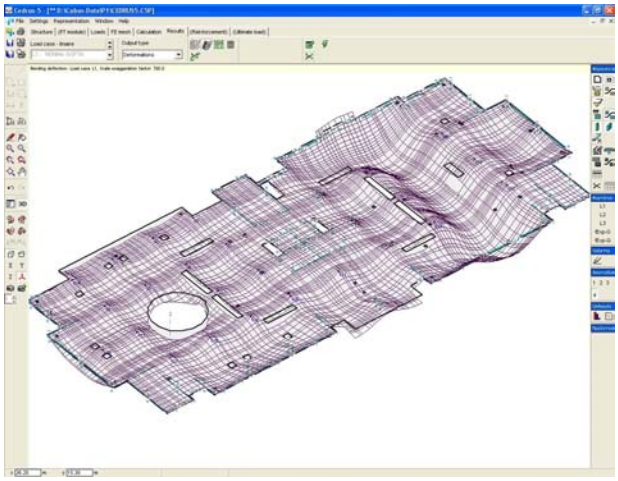
Finite Elements

- Arbitrary shaped triangular and quadrilateral hybrid elements
- Fully automatic generation of FE-Mesh according to predefined values (also zonewise) for density and main directions
- Extremely fast solution procedure
- Unlimited number of elements

Results

For Loadings and Load Combinations

- Section forces (moments and shear forces) zonewise in arbitrary directions
- Principal moments, maximum shear forces
- Displacements
- Reactions at line supports through subdivision in equal lengths, in bar forms
- Automatic export of reactions in order to load other slabs



For Envelopes :

- Automatic generation of envelopes according to the codes (Actions, Hazard Combinations/Design Situations)
- Reinforcement area zonewise in arbitrary orthogonal directions, calculated after ultimate state analysis or permissible steel stress
- Reinforcement moments zonewise in arbitrary direction, shear forces
- Displacements
- Reactions at line supports piecewise in bar form
- Punching shear calculations

Output Formats :

- Results can be obtained in graphical form (isolines, 3D-presentation, sections, principal direction graphic, reaction graphic) or in table form
- Special calculation of section forces and reinforcement in beam sections (integration of values over width of section)

Supported Codes :

- Swisscode/SIA, EC2,E-DIN, DIN, GReek Norm etc.

Discs

The module Cedrus-5 Discs allows the linear elastic calculation and reinforcement design of discs or combined also with bending / by the finite element method

Model and Loading

- Disc (plane system with 3 degrees of freedom per node for the in plane action - membran action
- Material models: Isotrop (plain stress, plain strain) and orthotrop

- Point and line supports with elastic properties in support direction and perpendicular to it
- Area, line and point loads similar to the slab module, initial deformations, prescribed displacements of supports

Results

- Result output for loadings, load combinations and envelopes similar to the slabs

  Types of results: Deformations, disc stresses, disc forces, equivalent stresses (von Mises, Tresca) reinforcement forces, reinforcement areas, reactions

Dynamic

The Dynamic-module of Cedrus-5 calculates eigenvibration of slabs for predefined distribution of mass. The solution of the eigenvalue problem is efficient and fast due to modern calculation algorithms

Mass distribution

- Area masses (dead load masses, uniformly distributed masses with arbitrary polygonal boundary)
- Uniformly distributed linear masses in arbitrary position
- Point masses

Results

- Table-output of eigenfrequencies and modal participation factors
- Graphical and numerical output of eigenforms (vibration modes) in various presentation forms

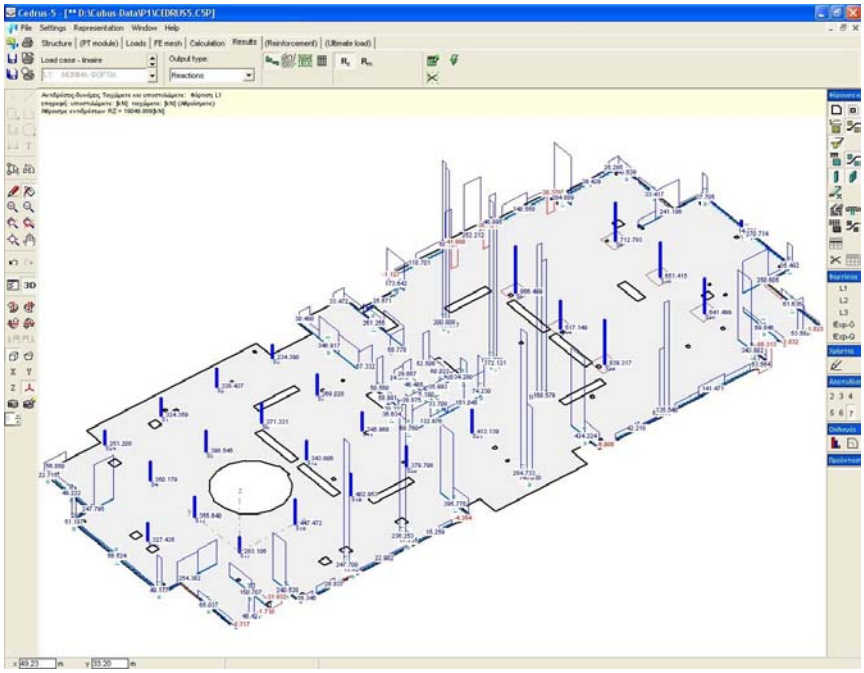
General

User surface

- Fast and efficient fully graphical input of all geometric and load data using the intuitive object-oriented graphic editor with CAD capabilities
- Multistep undo/redo function
- Optimized interface for data modification of single objects and groups of objects
- All graphical data managed in layers for easy visibility and selectability changes
- Highly interactive analysis: Actual results are recalculated on the fly after input modification (automatic checks and solution)
- Import of input object from another calculation through copy/paste
- Integrated CAD drawing functions for supplementing output with dimension lines, constructions, notes, scetches etc.
- Configurable user interface (colors, symbol sizes, fonts, units, output accuracy, predefined settings for dialog etc.)
- Extensive online documentation: Context sensitive, printable forms, text search
- Microsoft Windows application (NT4, 2000, XP)

Interfaces

- Import and Export of DXF-files
- Export of all numerical and graphical data into other Windows applications (clipboard,Word, Excel etc.)
- Text interface for import of structural and loading model
- Import of CEDRUS-3/4 projects



Print Manager (Cubus Viewer)

- Editable preview of all output data: Changing print order, scales, colors, visibility
- User-defined page layout (page format, company logo, texts, borders etc.)

Project Manager (Cubus Explorer)

- Project explorer with Windows-Explorer functionality
- Additional functions for project archieving, compression and decompression
- Graphical preview of projects

Further Options

- Prestressing
- Ultimate load calculation
- Reinforcement module and optimization of reinforcement
- CAD-, Bamtec-Interface

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