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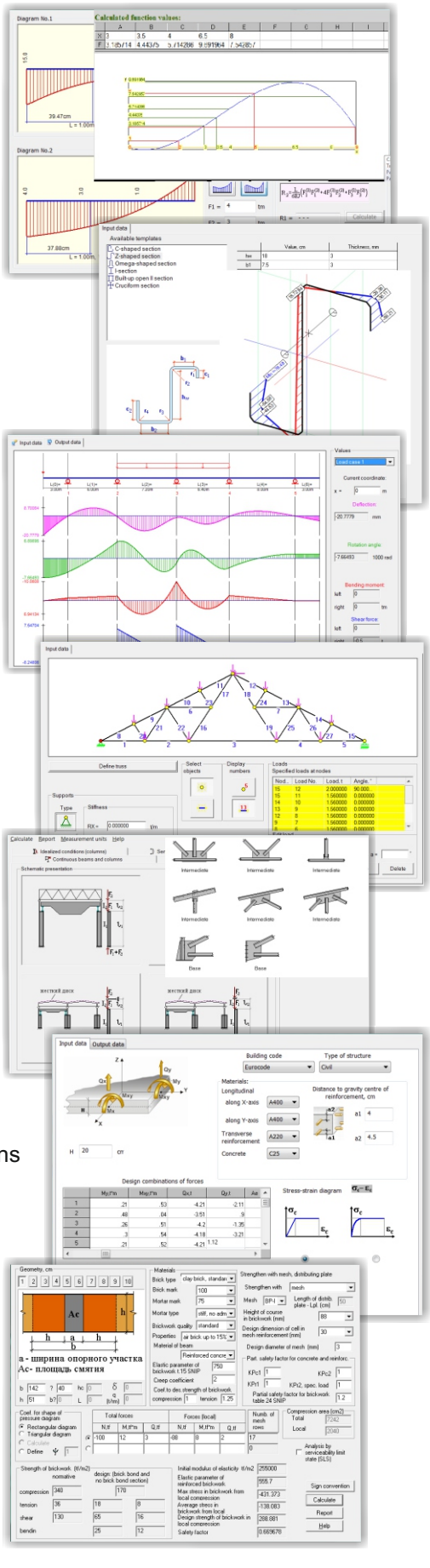
ESPRI

Engineering Assistance Package

Modern concepts of computer-aided analysis and design in Windows Vista/7/8

ESPRI software package is a set of reference and calculation programs for the day-to-day needs of civil and structural engineers.

ESPRI program enables you
- **to obtain adequate design model of the structure;**
- **to evaluate different types of analysis results for the model;**
- **to give an expert judgement of projects.**



1.Mathematics

- Areas and Volumes
- Diagram Multiplication
- Linear Algebra
- Polynomial Roots
- Function Interpolation
- Advanced Calculator ESPRI

The chapter contains modules for the most commonly used mathematical operations. Advamced Calculator for different types of engineering issues.

2. Sections

- Parametric Sections
- Parametric Thin-walled Sections
- Separate Sections as Single Unit
- Moment of Inertia in Torsion

The chapter contains modules that enable you to calculate geometric properties of solid, thin-walled and built-up sections.

3. Static & Dynamic Analyses, Stability (Statics-Dynamics-Stability)

- Continuous Beam
- Influence Lines in Continuous Beam
- Truss
- Parametric Plane Frame
- Arbitrary Plane Frame
- Rectangular Slab on Elastic Foundation
- Rectangular Slab
- Wall-beam
- Shell on Rectangular Plan
- Shell on Circular Plan
- Mode Shapes and Frequencies of Natural Vibrations in Cantilever
- Stability Factors and Buckling Modes in Cantilever
- Mode Shapes and Frequencies of Natural Vibrations in Continuous Beam
- Cable and String

The chapter contains modules for static analysis of continuos beams, trusses and frames of different shapes, slabs, diaphragms and shells, cables and strings. There are also modules for stability analysis as well as calculation of natural vibrations in cantilevers and continuous beams.

4. Steel structures

- Steel Table
- Analysis of Steel Elements
- Principal and Equivalent Stresses in Steel Structures
- Effective Lengths of Steel Structure Elements
- Parametric Joints of Steel Structures
- Analysis of Welds*
- Bolted Connections*
- Cold-formed Shapes

The chapter contains modules that enable you to select and check sections of elements and joints of steel structures, to calculate effective lengths of elements, welds and bolted connections. Wide set of reference tables for steel shapes with option to edit such tables.

5. Reinforced concrete (RC) structures

- Properties of Concrete
- Table of Reinforcement
- Anchorage of Reinforcement by DSTU 3760-98
- Sections of RC Elements
- RC Shell
- RC Wall-beam
- RC Slab
- Principal and Equivalent Stresses
- Strengthening with Composite Materials
- Concrete Pipe Sections
- Strength of RC Connection in Shear
- Composite Steel and Concrete Columns
- Concrete Sections with Fibre-Reinforced Polymer (FRP) Bars

The chapter contains modules that enable you to determine reinforcement in sections of bars, slabs, diaphragms and shells. Length of anchorage for rebars may be also calculated. Reference materials with design and normative properties for concrete and reinforcement.

6. Masonry and Masonry Reinforcing **

- Design Compression Strength in Brickwork
- Brick Pier
- Brickwork in Local Compression
- Brick Pier in Tension
- Brick Pier by DBN V.2.6-162:2010

The chapter contains modules that enable you to analyse brick piers in eccentric compression, local compression and tension. Strengthening of brick pier (steel casing, RC casing, and reinforced plaster) is also considered. Reference data from SNIP II-22-81* is available.

7. Timber Structures *

- Elements of Solid / Glued / Built-up Timber

The chapter contains modules that enable you to analyse solid, glued and built-up sections in timber structures according to SNIP II-25-80.

8. Foundations and Beddings

- Moduli of Subgrade Reaction C1, C2
- Single Pile
- Pile under Combined Action of Loads
- Settlement of Equivalent Footing
- Principal and Equivalent Stresses in Soil
- Slope Stability
- Stability of Multi-layer Slope
- Bearing Capacity of Piles by Field Test Results

The chapter contains modules that enable you to calculate settlements and subgrade moduli for soil according to different building codes with account of different methods and soil models. There are also modules for calculation of single piles, settlement of equivalent footing and stability of slope.

9. Loads and Actions

- Load Factors
- Dead Weight of Multi-layer Coating
- Snow / Wind / Ice Loads
- Climatic Thermal Loads
- Hazardous Energy Combinations of Forces (EnergyCF)
- Resonance Check for Wind Turbulence

The chapter contains modules that enable you to calculate wind, snow, temperature and ice loads according to SNIP and DBN.

10. Deflections

Module that enables you to calculate inelastic deflections in multispan continuous beam (up to five spans) from arbitrary dead, live and short-term loads according to SNIP 2.03.01-84*, SNIP 52-01-2003, Eurocode 2, DSTU 3760-98, TSN-100.

11. Ellipsoid

Module that enables you to generate surface of bearing capacity for arbitrary RC section. The surface is similar to ellipsoid.

12. Sheet Piling

Module that enables you to analyse building envelope of a pit as 'wall in soil' or 'sheet piling'. 2D design model contains soil, elements of sheet piling and anchoring of walls. Calculation is made sequentially by stages; number of stages is determined automatically. The process of pit excavating is simulated. Stresses are accumulated (by stages) at elements of soil, forces are accumulated (by stages) in elements of walls and anchors.

13. Diaphragm

Module that enables you to determine ultimate strength of RC diaphragm in earthquake and cyclic loads. Calculation is made according to empirical methods (native and foreign) based on ultimate equilibrium. Seven empirical methods are realized.

14. Punching shear

- Punching Shear for Arbitrary Contour
- Punching Shear for Rectangular Contour

The chapter contains modules for punching shear analysis of floor slabs and foundation slabs from concentrated load and concentrated moments in two planes. Contour shape may be either rectangular or arbitrary one, with account of neighbouring openings and slab edge.

15. TOSTER

Thin-walled Bar Systems.

Module for static analysis of plane systems from thin-walled bars in combined bending and torsion. Output data contains nodal displacements (including deplanation) and forces in bars (including bimoment).

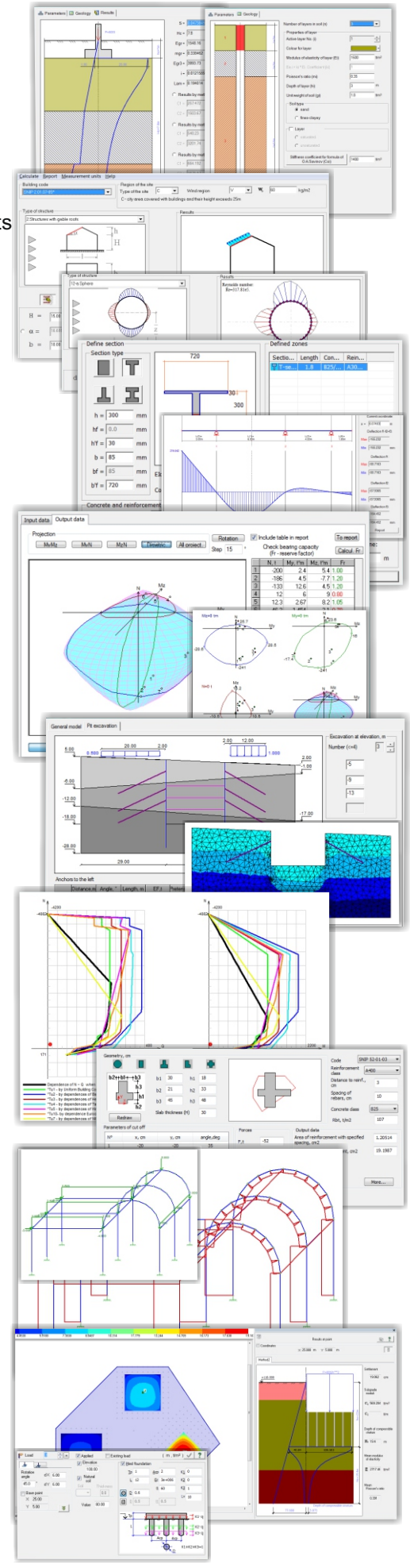
16. Prestressing

- Prestressing. Module for strength analysis of RC sections with prestressed reinforcement.
- Analysis of RC Support Sections (Posts)

17. SOIL

Moduli C1 and C2 according to Soil Model

Module that enables you to calculate moduli of subgrade reaction C1 and C2 according to 3D soil model.



* - only in Russian

** - now in Russian; English version in the next release

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