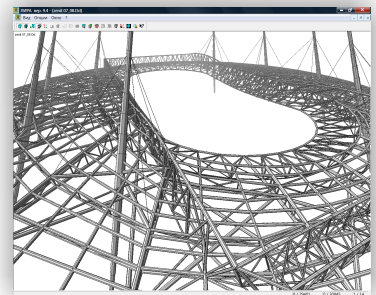
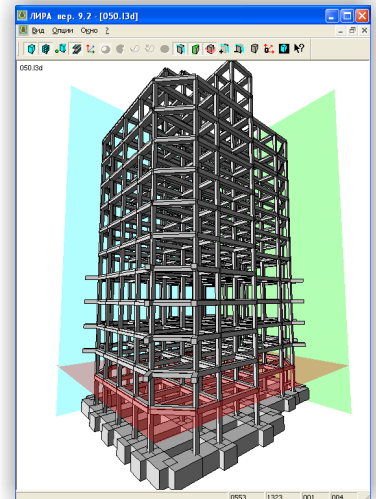


Modern concepts of computer-aided analysis and design in Windows 98/ME/2000/XP/Vista

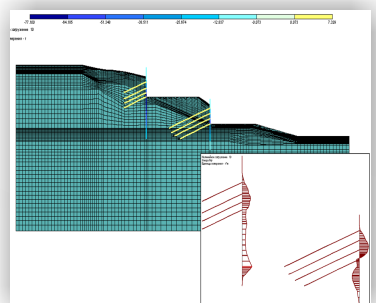
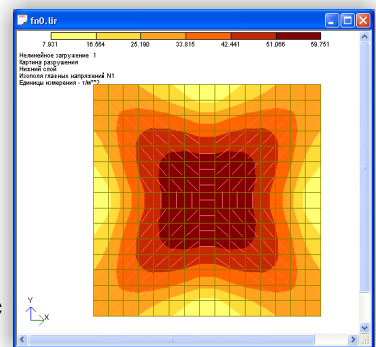
## Main features

- user-friendly graphical interface (LIR-VISOR module) where it is possible to visualize design model in 3D graphics at all stages of analysis;
- powerful multifunctional solver that realizes advanced algorithms of setting up and solving the set of equations up to several millions of unknowns;
- extensive library of finite elements that enables you to create computer models of almost any structures;
- dynamic analysis of the structure (earthquake, wind with pulsation, vibration, impulse, impact, response spectrum, earthquake by accelerograms). For earthquake analysis, building codes of different foreign countries are supported;
- modules for design of reinforced concrete (RC) and steel elements in accordance with building codes of CIS, Europe and the USA;
- special Document Maker that enables you to generate report that contains data in text, tabular and graphical form and generate files for MS Office;
- interface with other graphic and documentary systems (Revit Structure 2008, Revit Architecture, AutoCAD, ArchiCAD, Advance Steel, BoCAD, Allplan, STARK ES, MS Word, MS Excel, GLAZER, etc.) through a \*.DXF, \*.MDB and other files;
- Russian/English languages for interface and/or documents. The languages may be changed at any stage of analysis;
- various systems of measurement units.



## Specific features

- super-element simulation with visualization at every stage of analysis. This simulation allows you to lift any restrictions on the size of the problem;
- modules of physical nonlinearity on the basis of different nonlinear relations  $\sigma$ - $\epsilon$ . These modules enable you to simulate the loading process for both mono- and bi-material RC structures and to trace crack propagation, creep strain and yield until the complete damage of the structure;
- modules of geometrical nonlinearity that enable you to analyse both geometrically stable structures (flexible plate, shells, trusses, etc.) and geometrically unstable structures that take load due to considerable change in its initial shape (separate ropes, guy trusses, guy shells, tent structures, membranes);
- a wide range of special finite elements that allows you to create adequate computer models of complicated and non-standard structures. For example, FE turnbuckle (tensioning device) enables you to simulate pretension and then trace changes in shape of the structure and in forces; 'rigid body' option enables you to simulate the nodes where column is joined the non-beam floor slab, etc.



**Constant development, comprehensive support.**

## Main modules

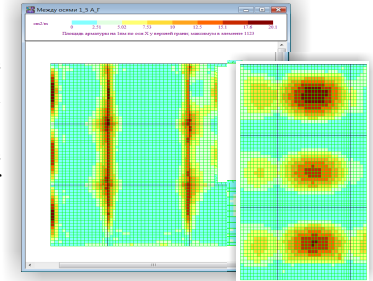
### ■ LIR-ARM module. Reinforced Concrete (RC) Structures

LIR-ARM - module for analysis and design of reinforced concrete structures. LIR-ARM determines areas of reinforcement for columns, beams, slabs and shells according to ultimate and serviceability limit states. Design model and forces are imported from LIR-VISOR module. It is possible to assign arbitrary properties of concrete and reinforcement. Drawings of beams and columns are presented after analysis and they can be saved as DXF files. The following building codes are supported: SP 52-101-2003, SNIP 2.03.01-84, Eurocode, TSN 102-00, DSTU 3760-98.



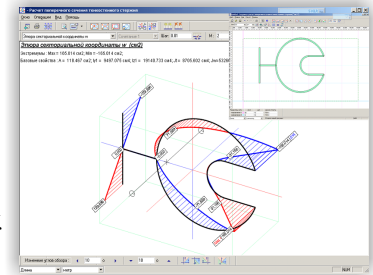
### ■ LIR-LARM module. Separate RC Bar or Plate Elements

LIR-LARM (LIR-ARM in local mode) - module for analysis and design of the separate reinforced concrete bar or plate element according to appropriate building codes. Design model of the element and loads applied to this element can be either imported from LIR-ARM module or defined in stand-alone mode. Areas of reinforcement are determined and then the specified reinforcement is checked for selected element. The program contains databases of material properties, forces and their unfavourable combinations. The following building codes are supported: SP 52-101-2003, SNIP 2.03.01-84, Eurocode, TSN 102-00, DSTU 3760-98.



### ■ LIR-STC module. Steel Structures

LIR-STC - module for analysis and design of elements of steel structures. It also allows you to determine and check sections, consider joints of steel structures. LIR-STC can work in stand-alone mode and check several variants of design. The following building codes are supported: SNIP II-23-82, Eurocode.

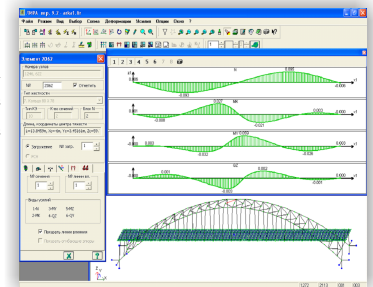


### ■ LIR-SRS module. Steel Tables (Steel Rolled Shapes)

LIR-SRS - module for editing of steel tables. LIR-SRS creates new and edits existing steel tables of rolled and welded sections. Properties of every shape may be specified as stiffness of bar. Extensive database of steel tables and shapes of CIS, Europe and the USA.

### ■ LIR-SB module. Section of Bar

LIR-SB (Section of Bar) module enables you to create custom shapes and compute their axial, flexural, torsion, shear and plastic section properties. It is also possible to compute sectorial properties, coordinates of shear centre and centre of torsion, section modulus, and determine shape of the section core. Distribution of stresses is presented. In this program you could create libraries of sections and export them to other modules of LIRA software.

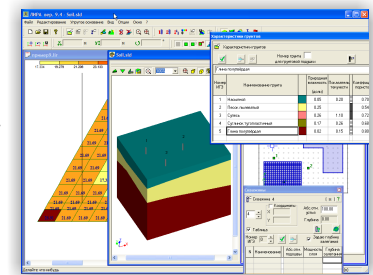


## Additional special solvers and graphic modules

■ Special solver **ASSEMBLAGE plus** that allows you to simulate erection (assemblage) of the multi-storey buildings with account of frequent changes in design model. For monolithic reinforced concrete structures it is allowed to disassemble formwork, temporary supports, change stiffness and strength of concrete due to temporary freezing of concrete mix and other factors.

■ **SOIL** system enables you to generate 3D soil model according to data from geological survey (location and soil properties in the specified boreholes). It is also possible to compute moduli of subgrade reaction that vary across the area of foundation slab.

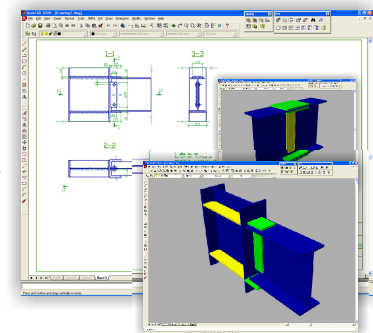
■ **LIR-KM** module, based on analysis of steel structures in LIRA software, enables you to obtain layouts with marks of elements and nodes, lists of elements, drawings of joints with 3D visualization and specifications. That is, you will get complete set of KM drawings (drawings of steel structures) in AutoCAD environment.



■ Special solver **Model variation** that enables you to specify different stiffness of elements and boundary conditions within the same problem (in this case topology of the model remains the same). This enables you to take into account: 1) change in stiffness of soil under dynamic loads (including earthquake), and 2) exclusion of separate elements from design model when analysing problems of progressive fracture.

■ Special solver **BRIDGE** that allows you to get influence lines and surfaces in elements of bridge structure from moving load. Superstructures of steel bridges may be specified as elements of box section.

■ Special solver **Dynamics plus** (time-history analysis) that enables you to analyse the structure on dynamic loads with account of nonlinearity (physical, geometric and constructive). Earthquake analysis by accelerograms is available.



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