



Siberian State Academy of Geodesy

USING LASER SCANNING FOR ESTIMATING MINES OUTPUT VOLUMES AND 3D MODELING OF GEOLOGICAL SITUATION

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Lake Baikal, Listvyanka, Russian Federation*

REGIONAL CENTRE FOR LASER SCANNING (RCLS)

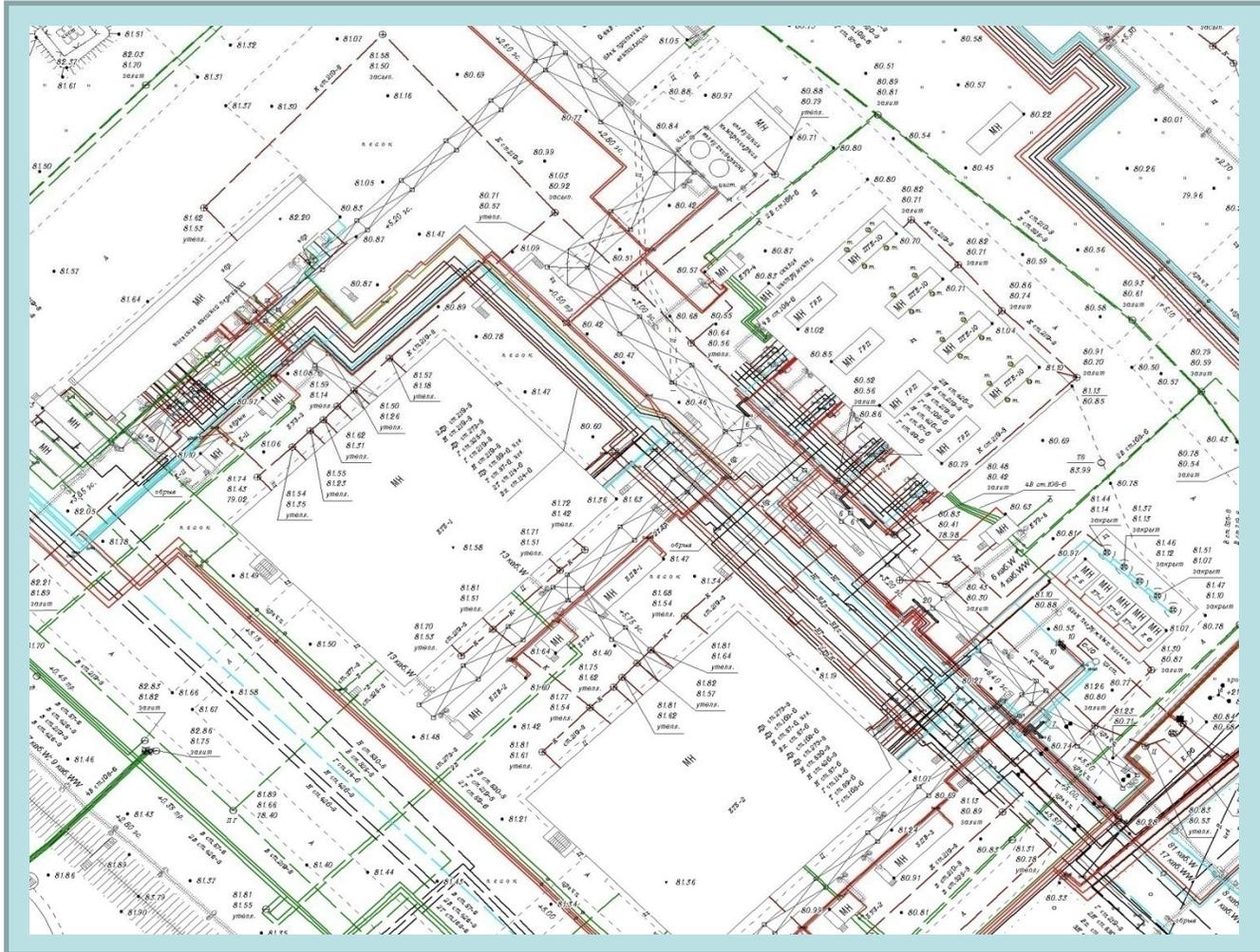
- ◆ Year of foundation - 2003
- ◆ The number of terrestrial laser scanners – 5 sets
- ◆ The number of total stations – 3 sets
- ◆ Software – Cyclone, RealWorks Survey, AutoCAD, RapidForm, Microstation
- ◆ Regular staff members – 5 persons
- ◆ The number of educational programs – 3
- ◆ Candidates' degrees – 3
- ◆ Postgraduate students number – 3

Topographic surveys of 1:500 – 1:1000 scales using terrestrial laser scanning

Experience of carrying out operations at the sites like the following:

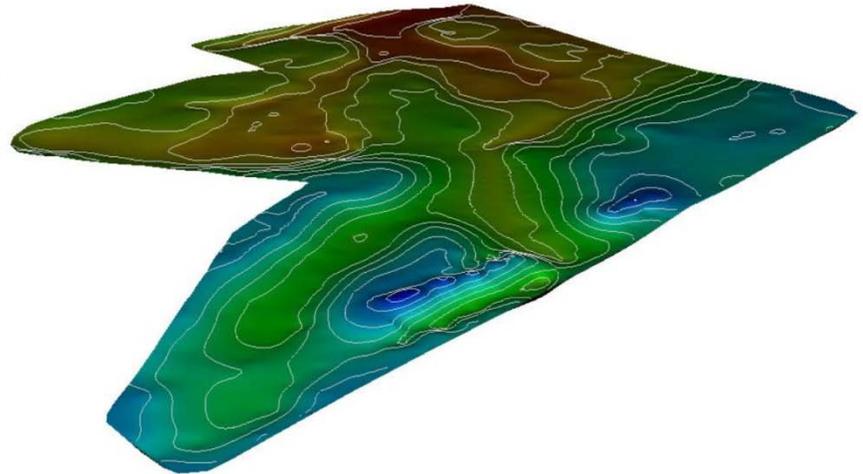
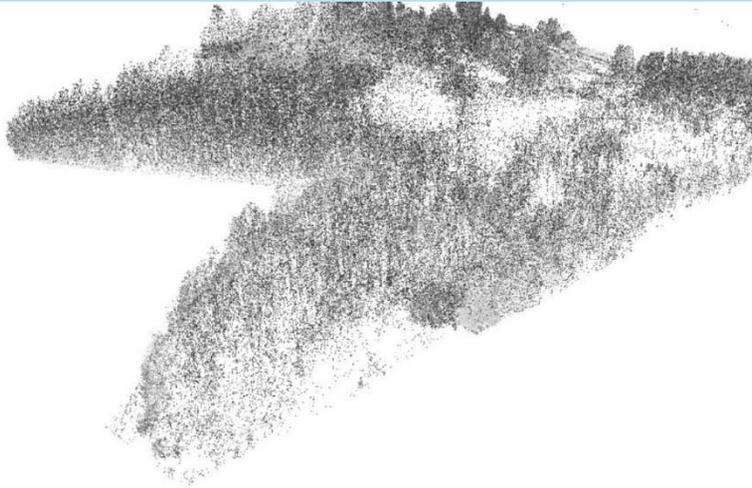
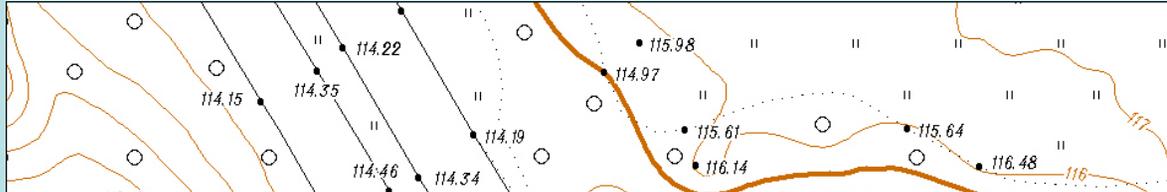
- Industrial enterprise
- Oil-and-gas production enterprise
- Long-term construction
- Urban territories
- Total area of the conducted large-scale topographic surveys – 1,200 hectares

Topographic surveys of 1:500 – 1:1000 scales using terrestrial laser scanning

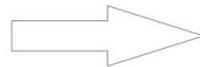


Oil processing and pumping shop

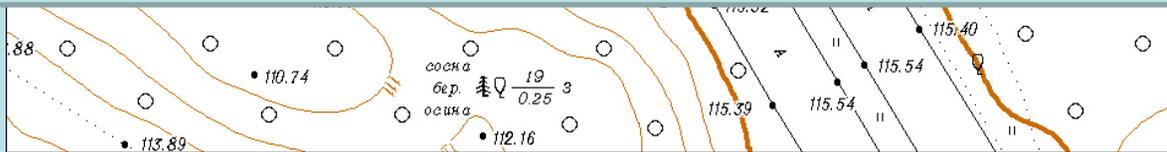
Topographic surveys of 1:500 – 1:1000 scales using terrestrial laser scanning



“Облако” точек



ЦМР



Long-term construction site

Topographic surveys of 1:500 – 1:1000 scales using terrestrial laser scanning



Big-City

Topographic surveys of 1:500 – 1:1000 scales using terrestrial laser scanning

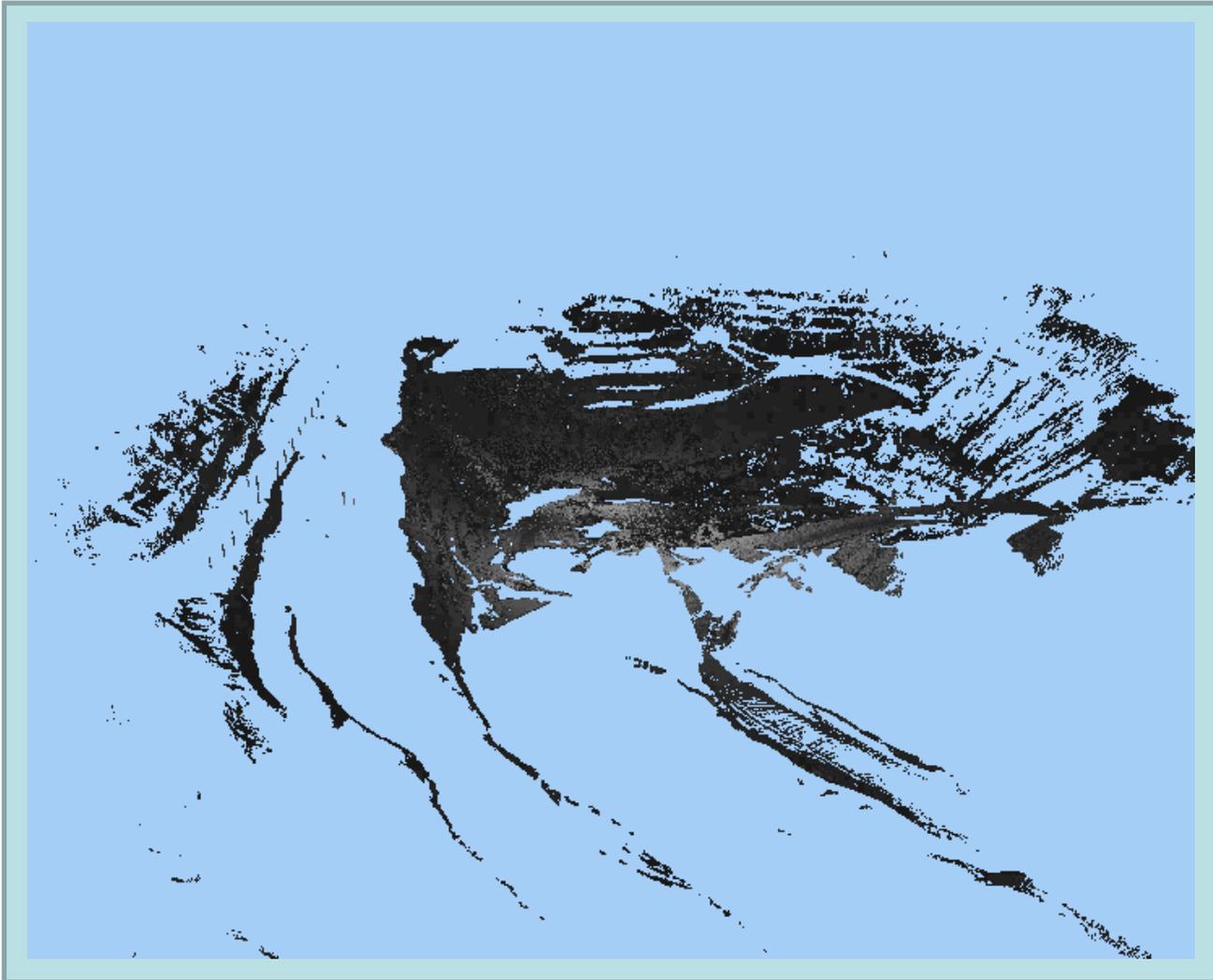
Basic advantages of laser scanning

- **3 times increased rate of surveys**
- **Better accuracy of topographic surveys**
- **Cost of works – traditional (like that of usual methods)**

Surveying of mines quarries and storages yards

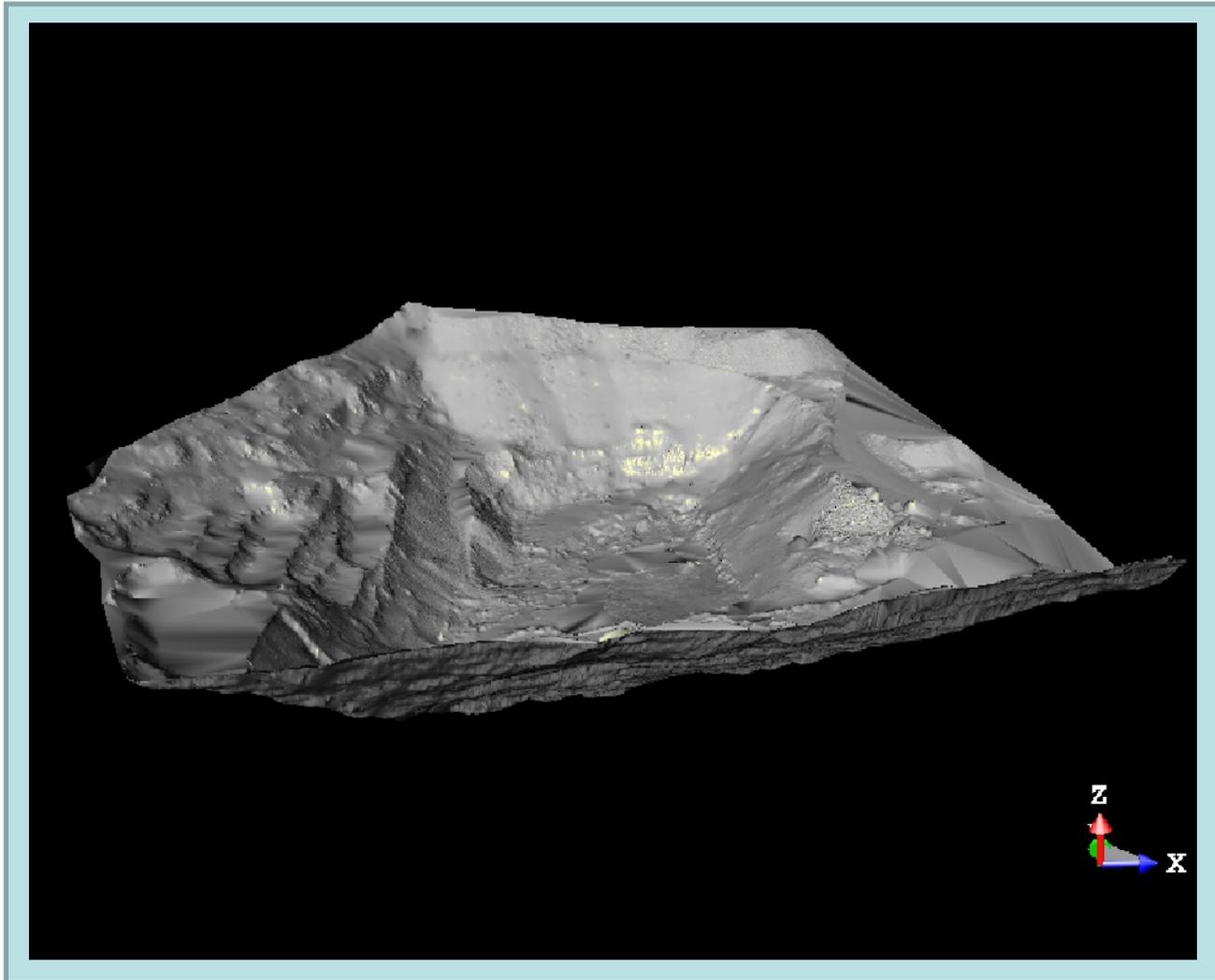


Topographic surveys of 1:500 – 1:1000 scales using terrestrial laser scanning



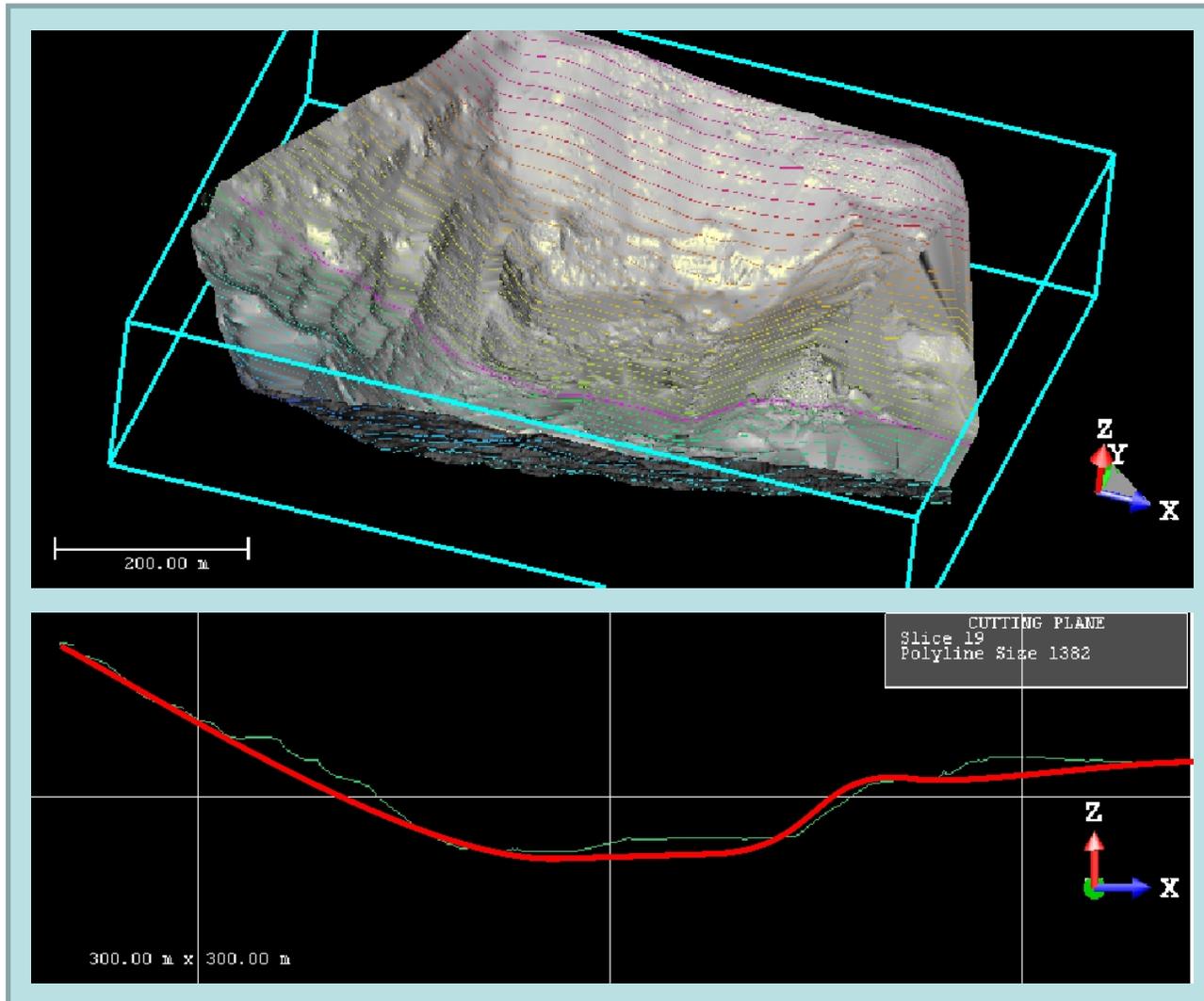
3D modeling of coal open-casts

LASER SCANNING SURVEY OF QUARRIES AND STORAGE YARDS



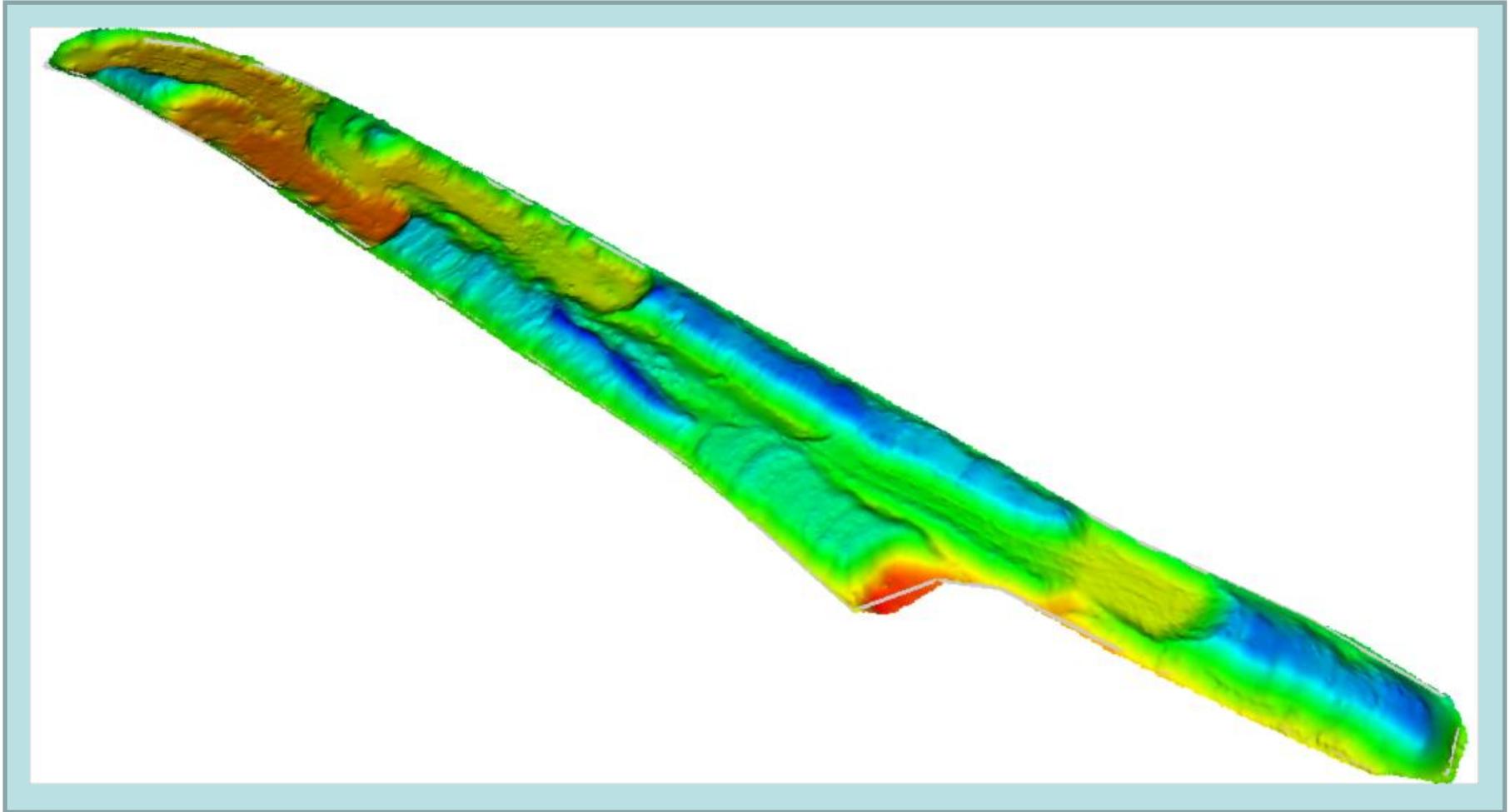
3D modeling of coal open-casts

LASER SCANNING SURVEY OF QUARRIES AND STORAGE YARDS



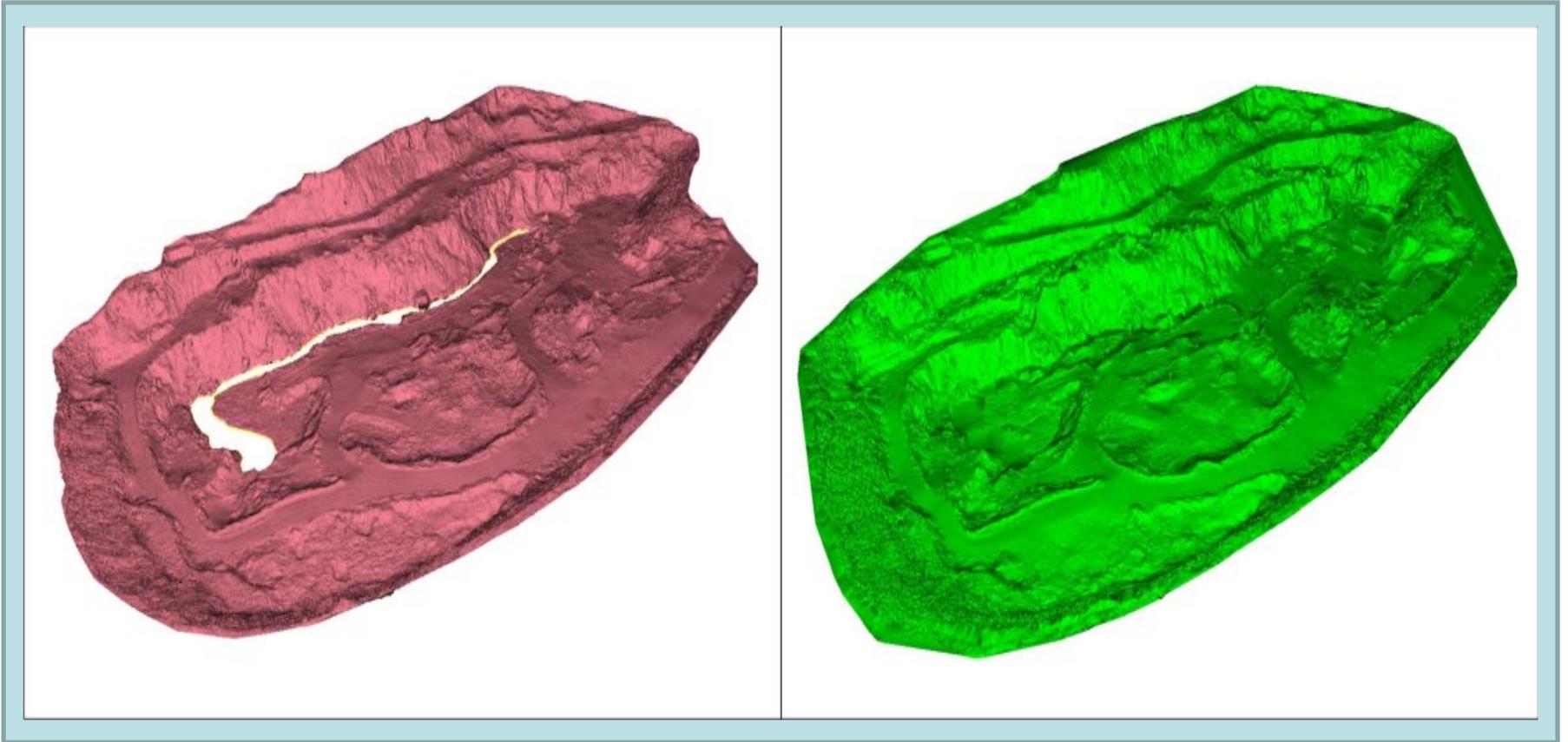
Monitoring of pit edges

LASER SCANNING SURVEY OF QUARRIES AND STORAGE YARDS



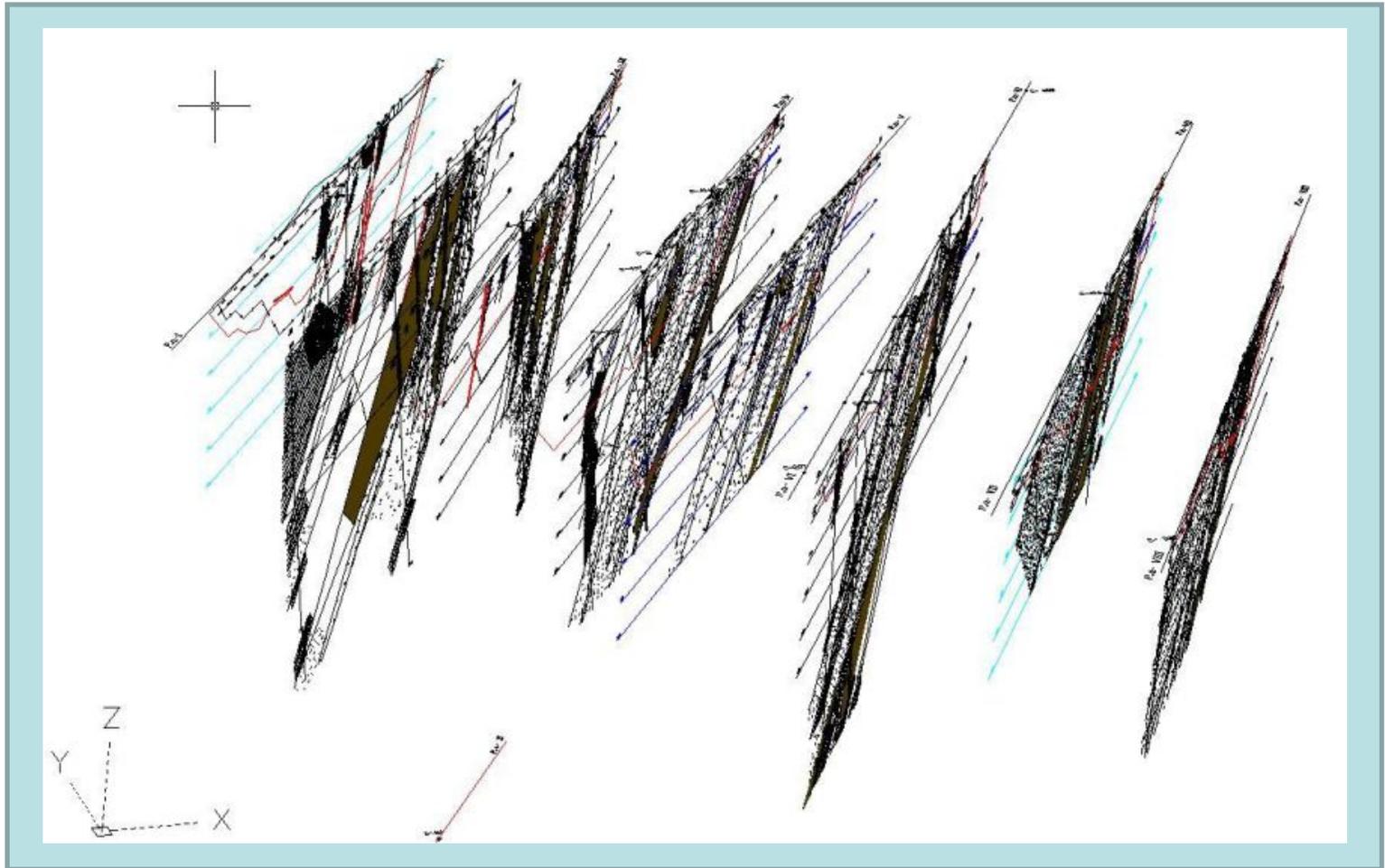
Determination of current volumes of products at store yards

LASER SCANNING SURVEY OF QUARRIES AND STORAGE YARDS



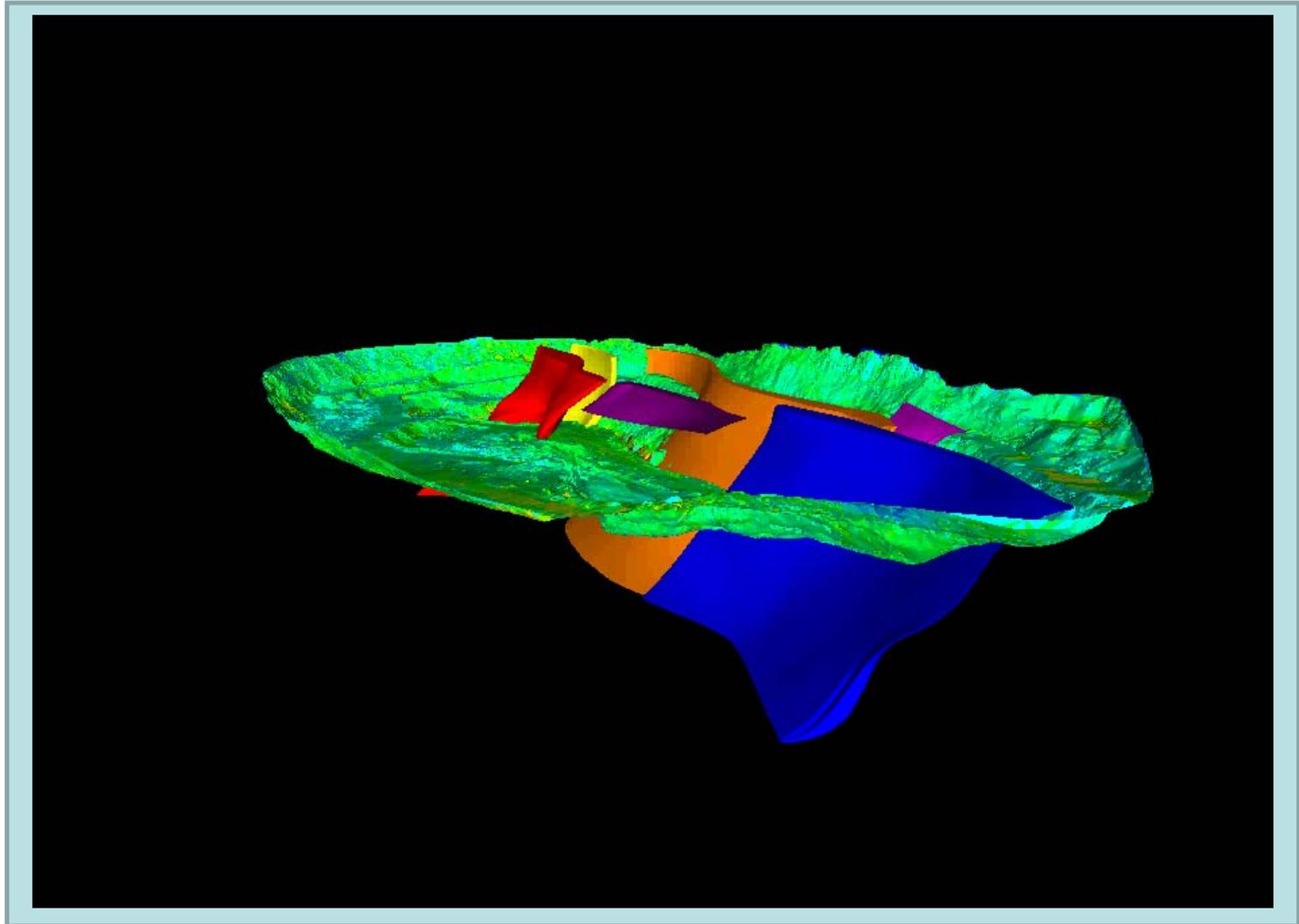
Determination of outputs

LASER SCANNING SURVEY OF QUARRIES AND STORAGE YARDS



3D modeling of subsurface geology

LASER SCANNING SURVEY OF QUARRIES AND STORAGE YARDS

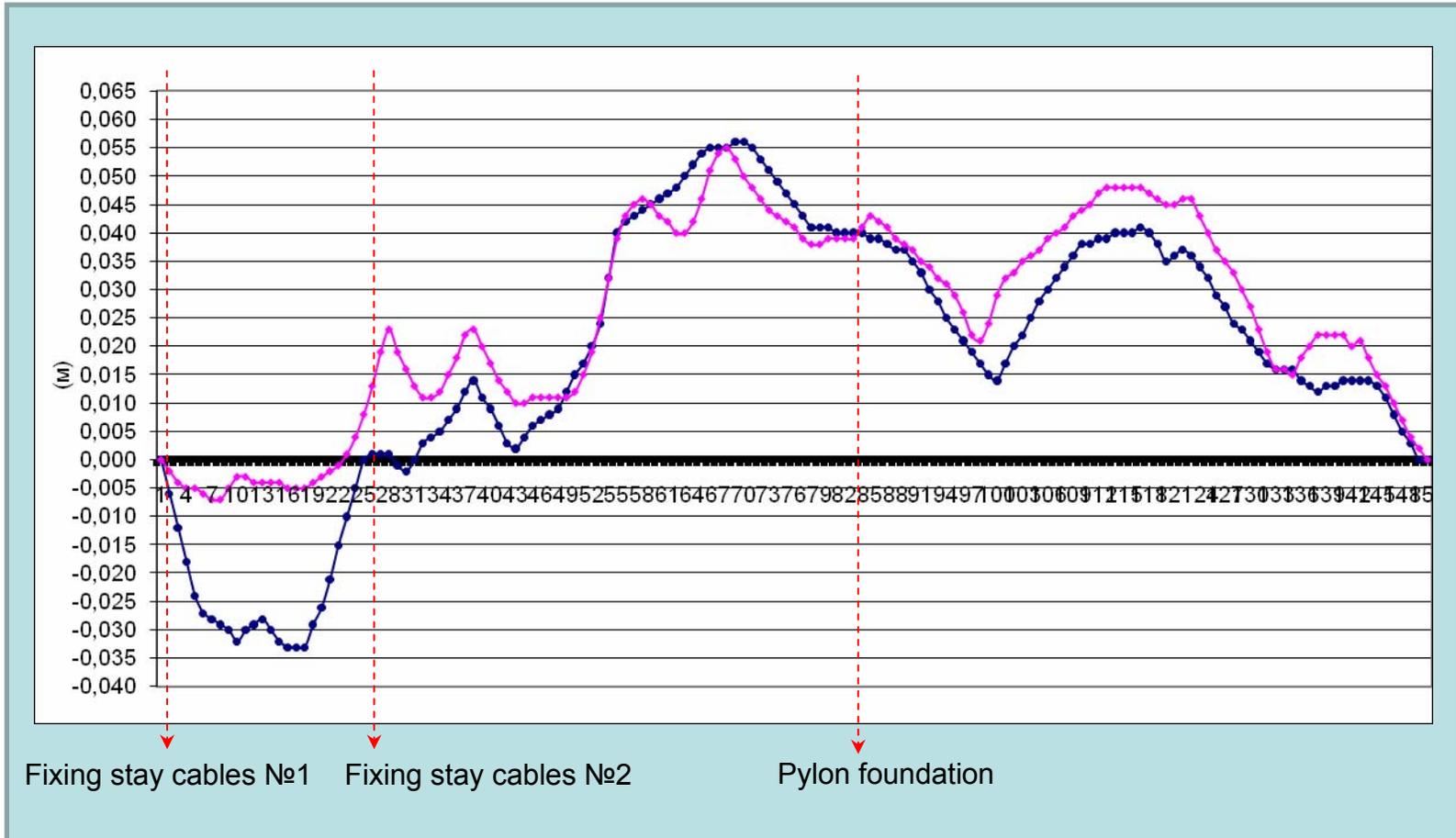


3D modeling of subsurface geology

Surveying and monitoring of bridges

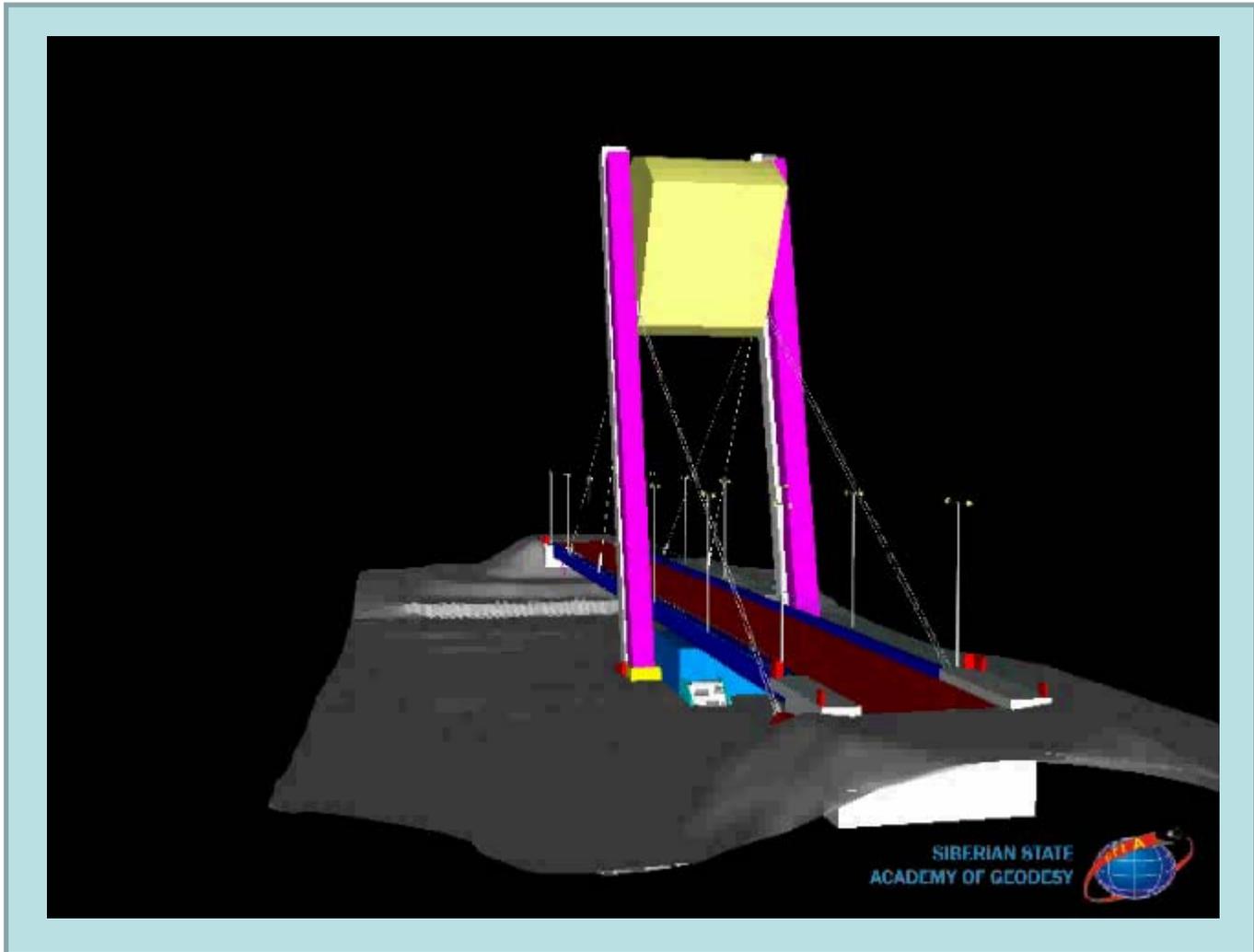


Surveying and monitoring of bridges



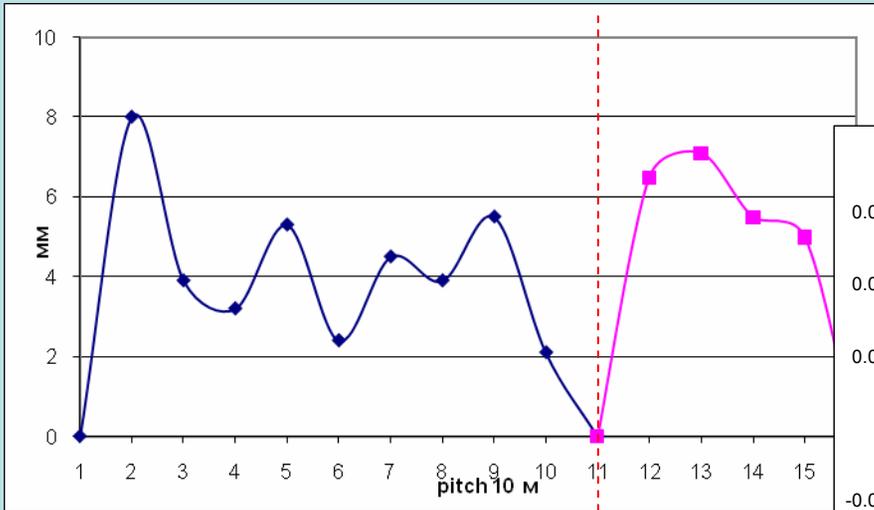
Determination of bearing structures deformations

Surveying and monitoring of bridges

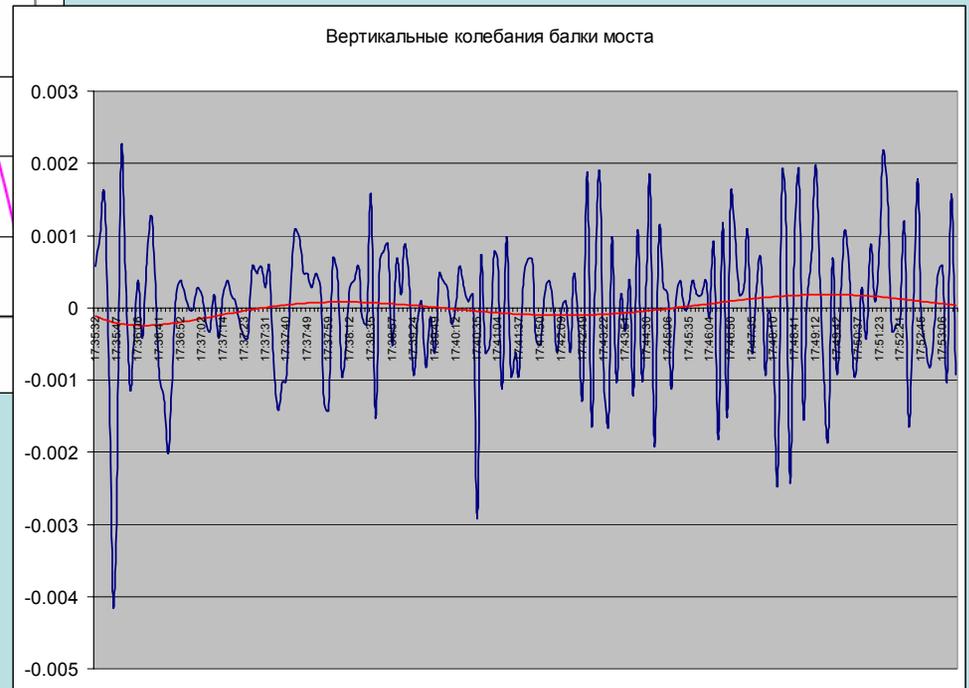


3D modeling of bridges

Surveying and monitoring of bridges

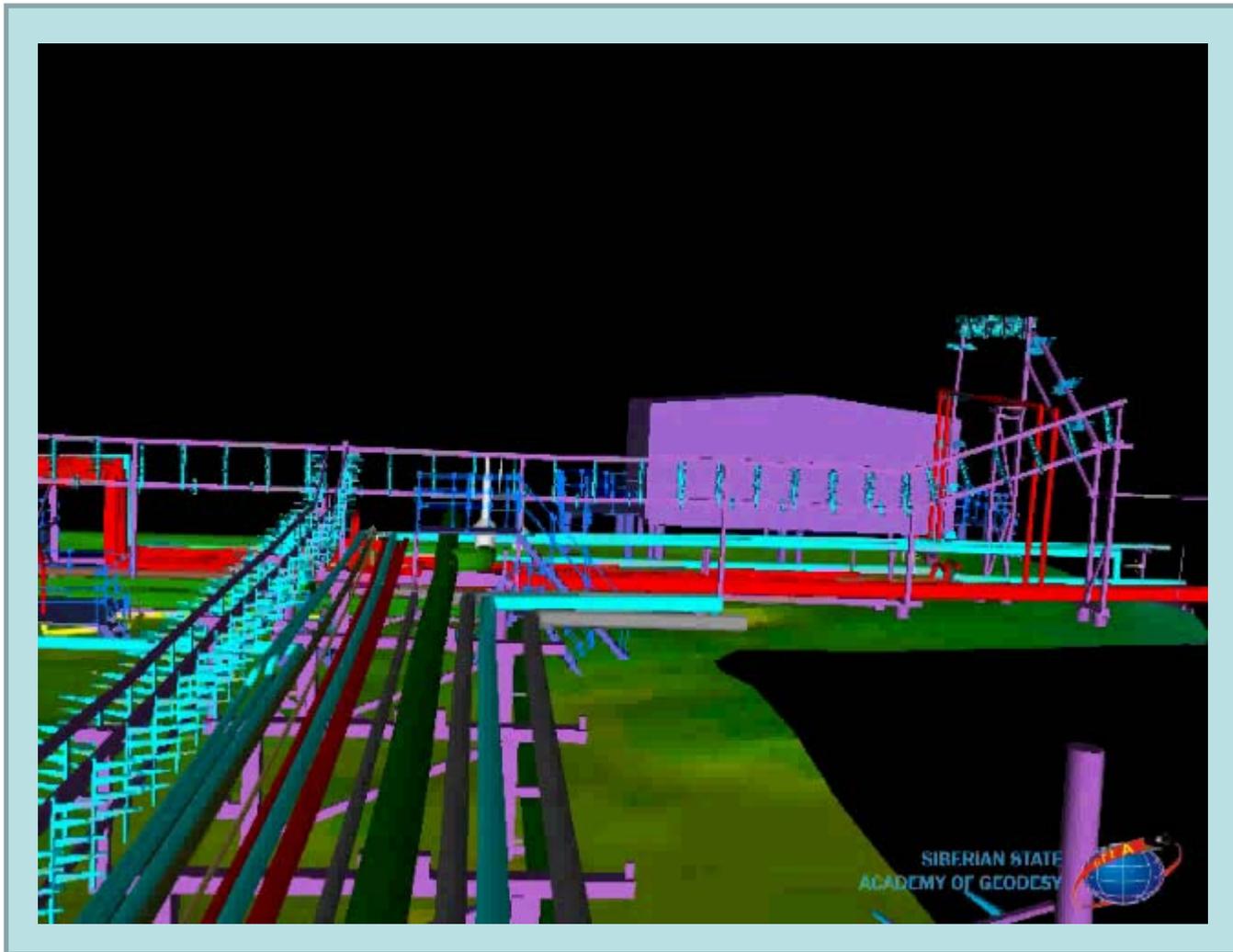


Pylon foundation



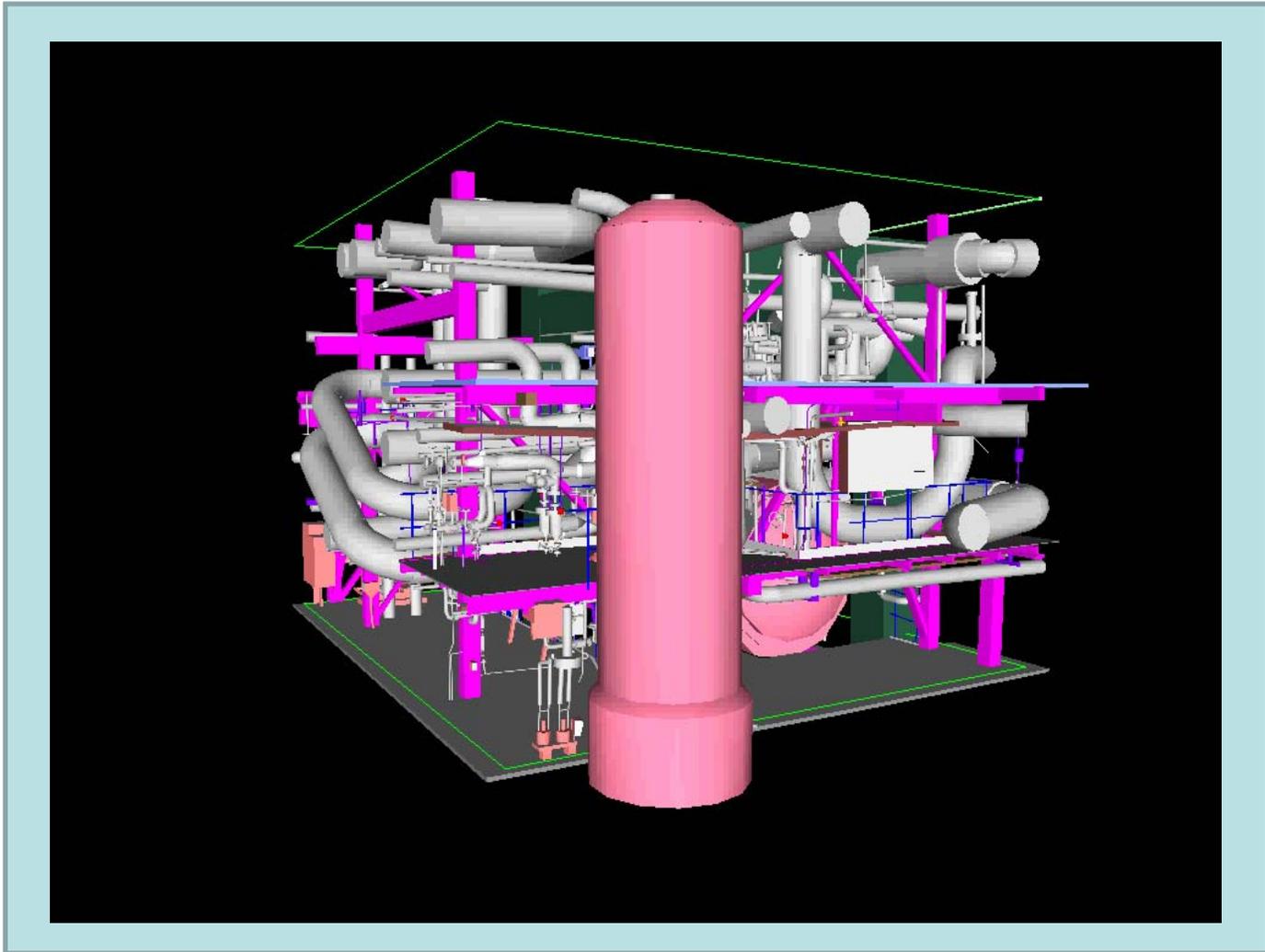
Determination of bearing structures vibrations frequency and amplitude

3D modeling of objects



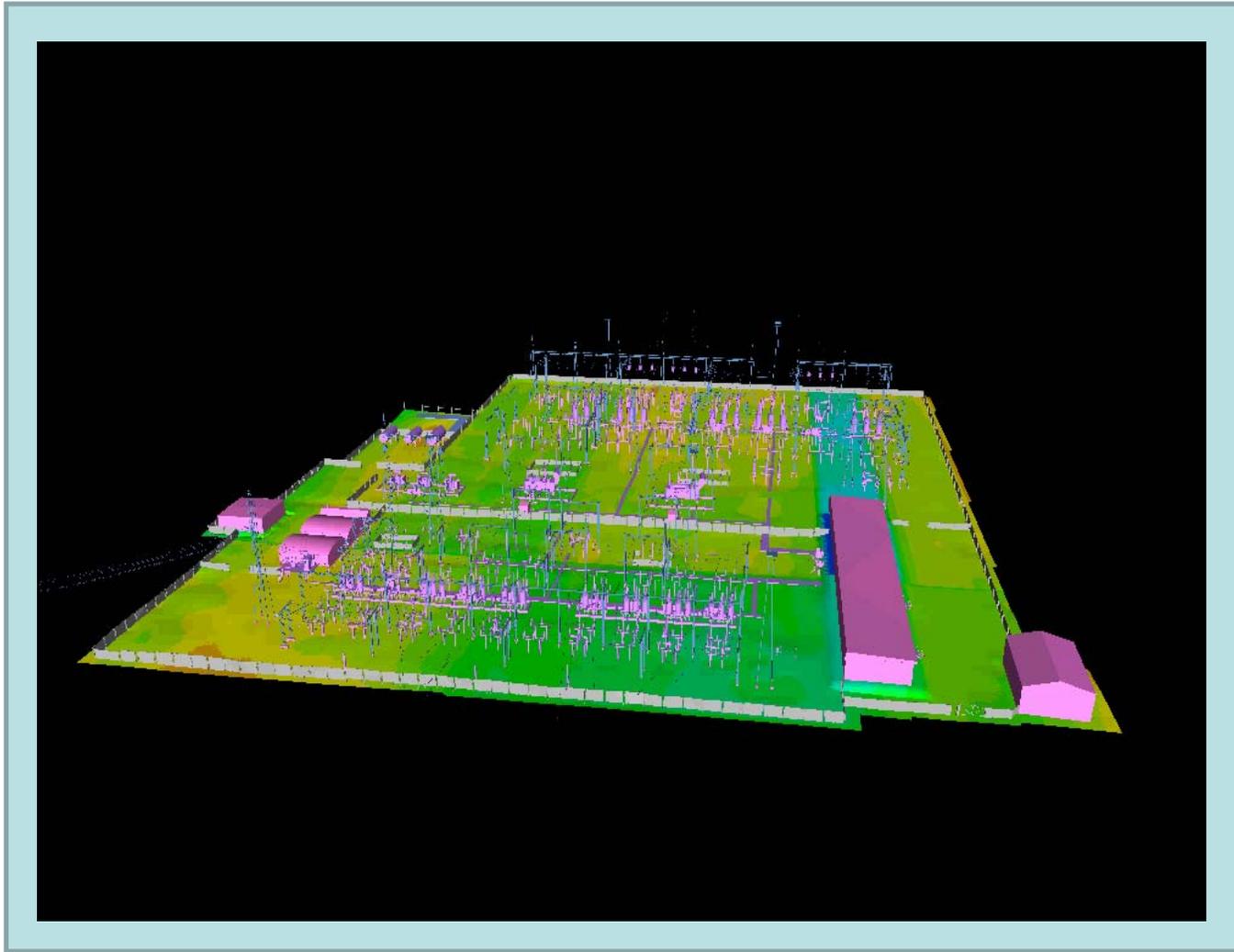
Preparation of 3D foundation for projects designing and reconstruction

3D modeling of objects



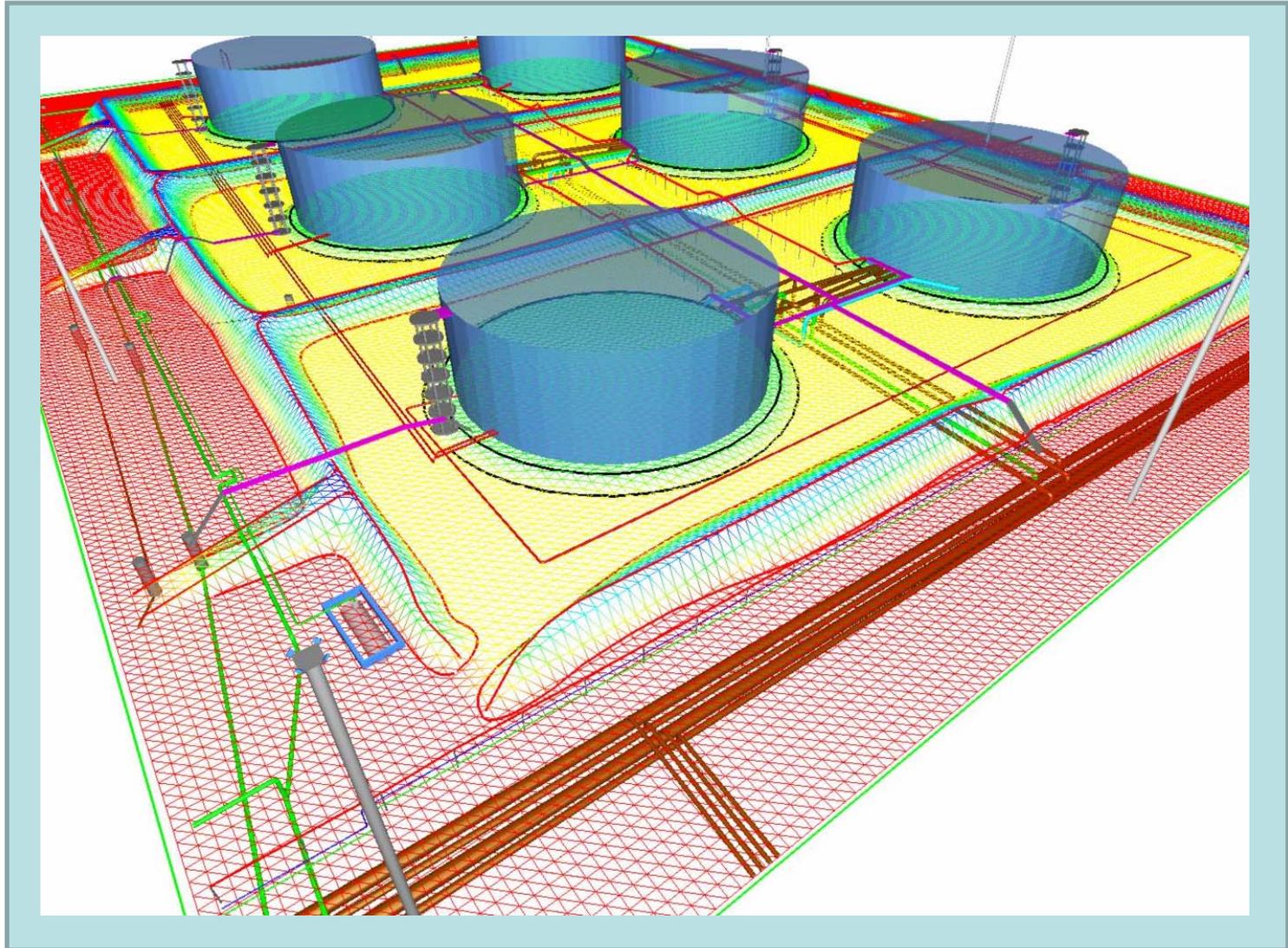
Preparation of 3D foundation for projects designing and reconstruction

3D modeling of objects



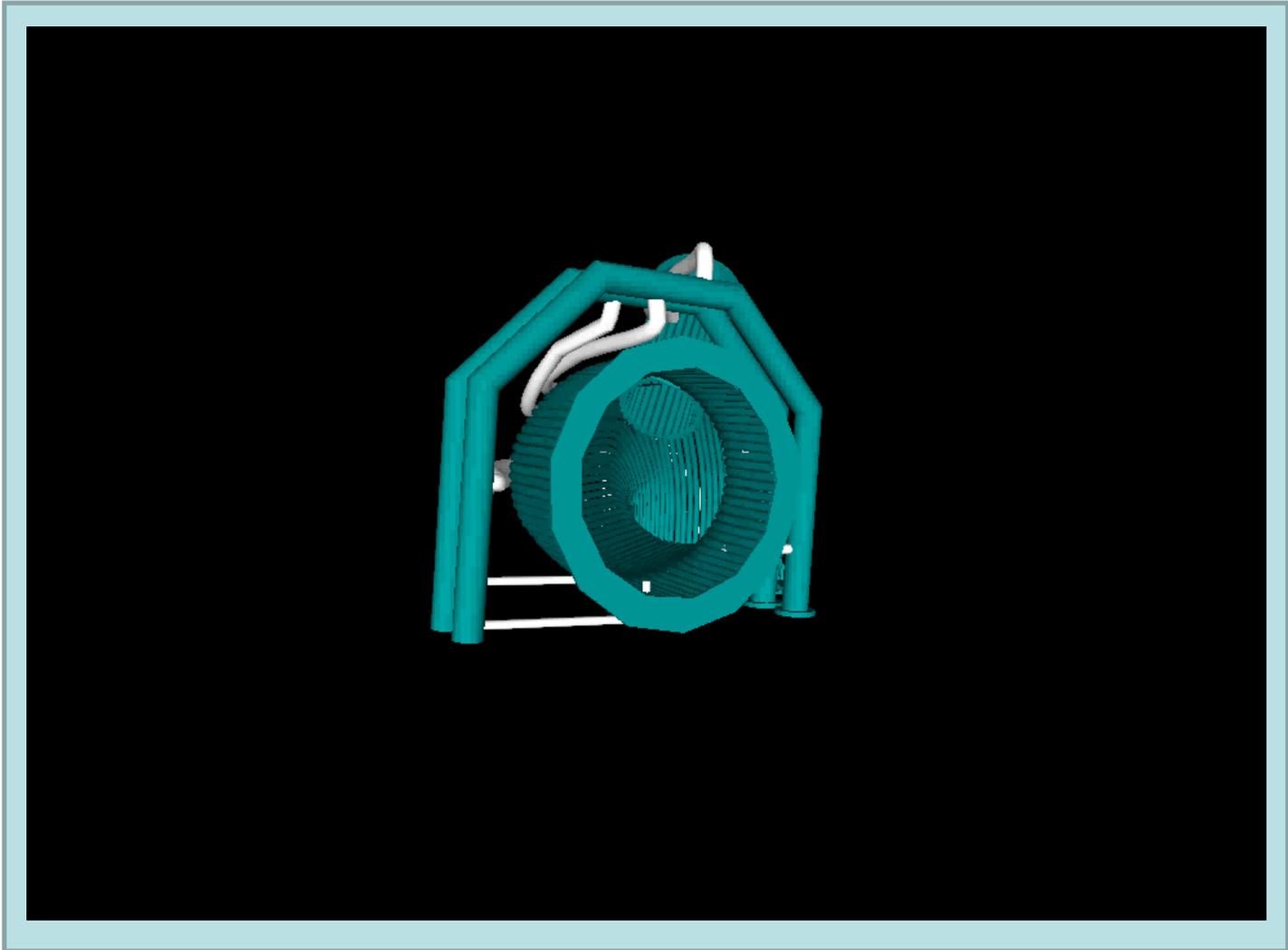
Preparation of 3D foundation for projects designing and reconstruction

3D modeling of objects



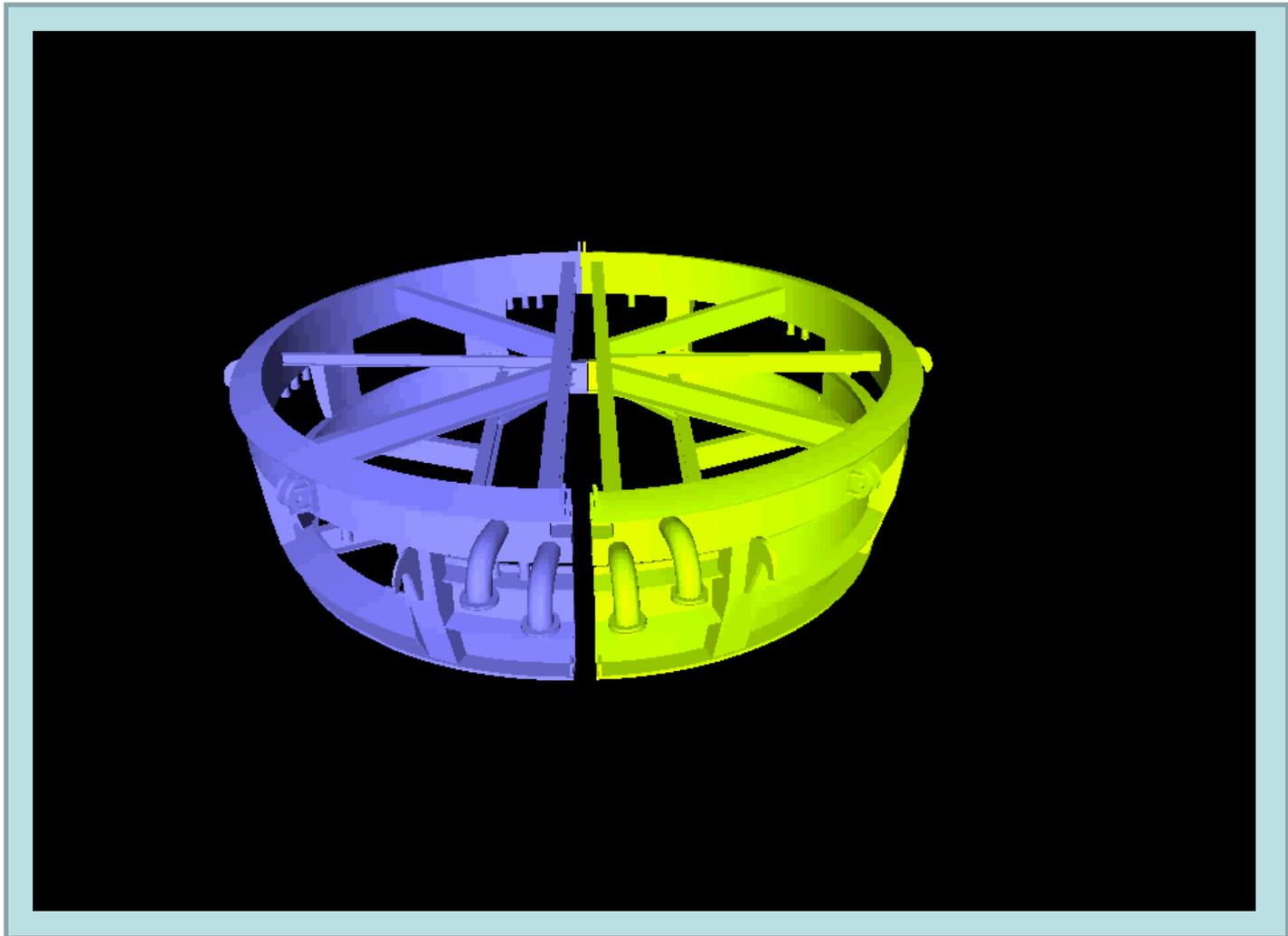
Development of 3D general plans of industrial enterprises

3D modeling of objects



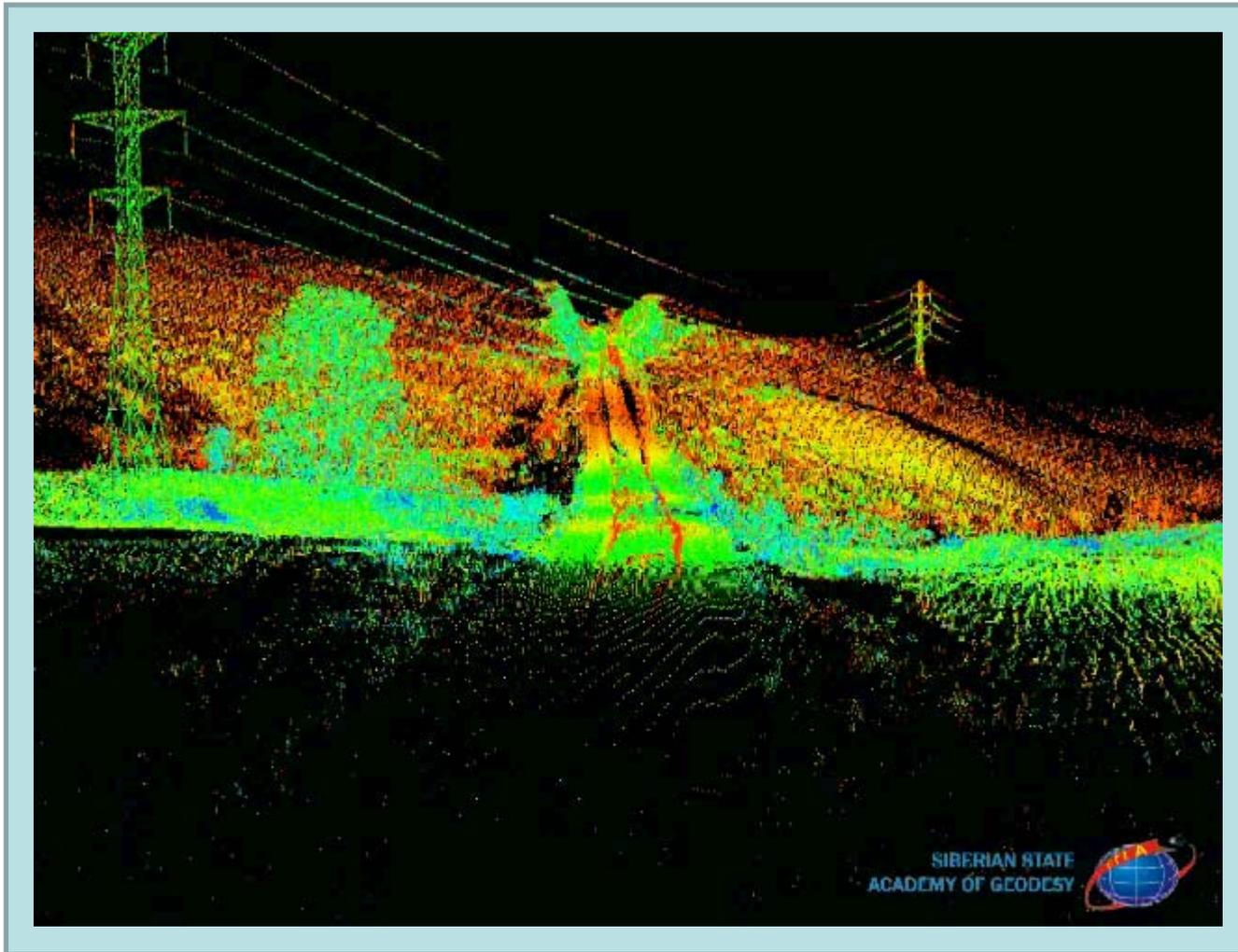
Control of industrial parts making

3D modeling of objects



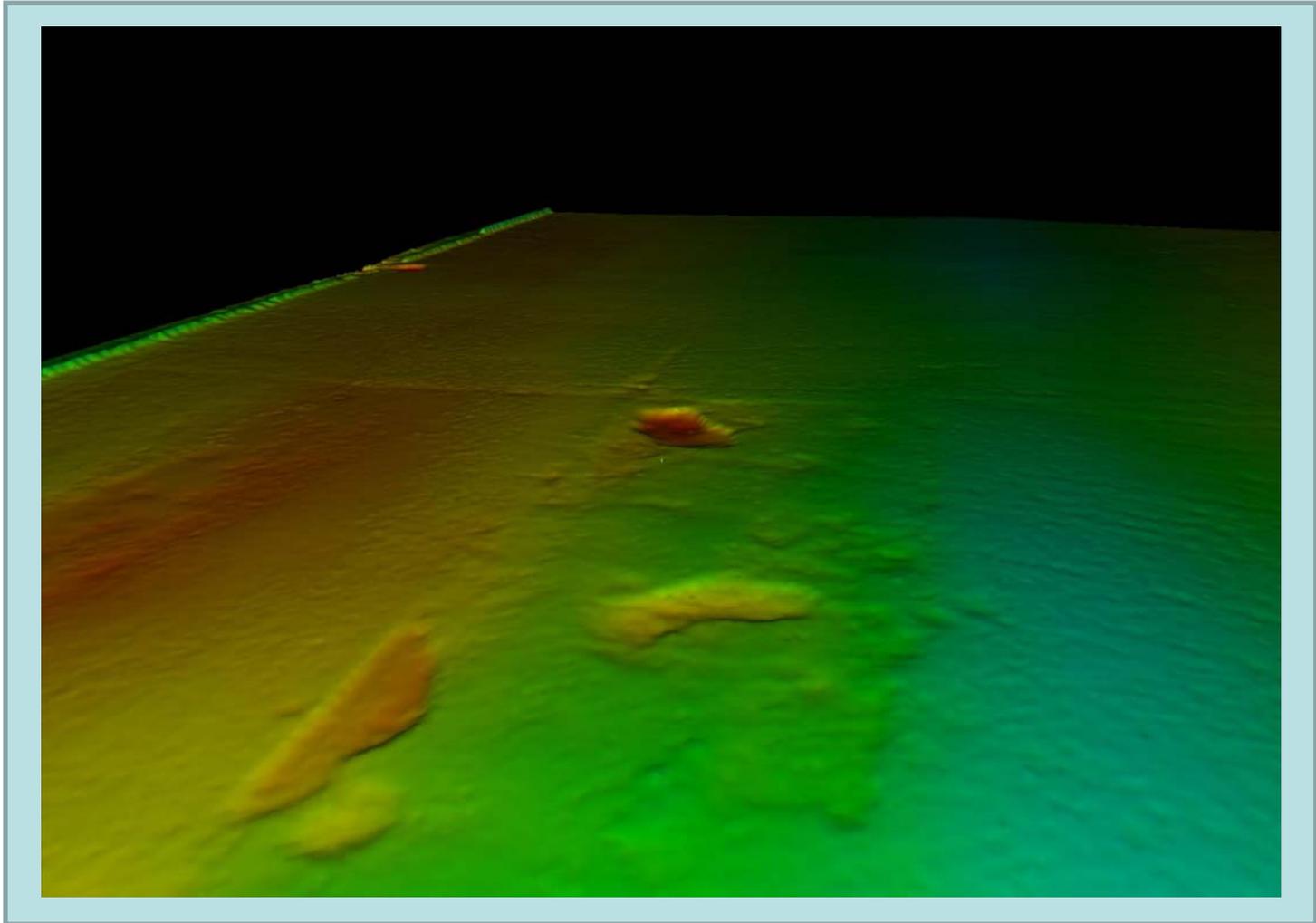
Control of industrial parts making

Surveying of highways and railways



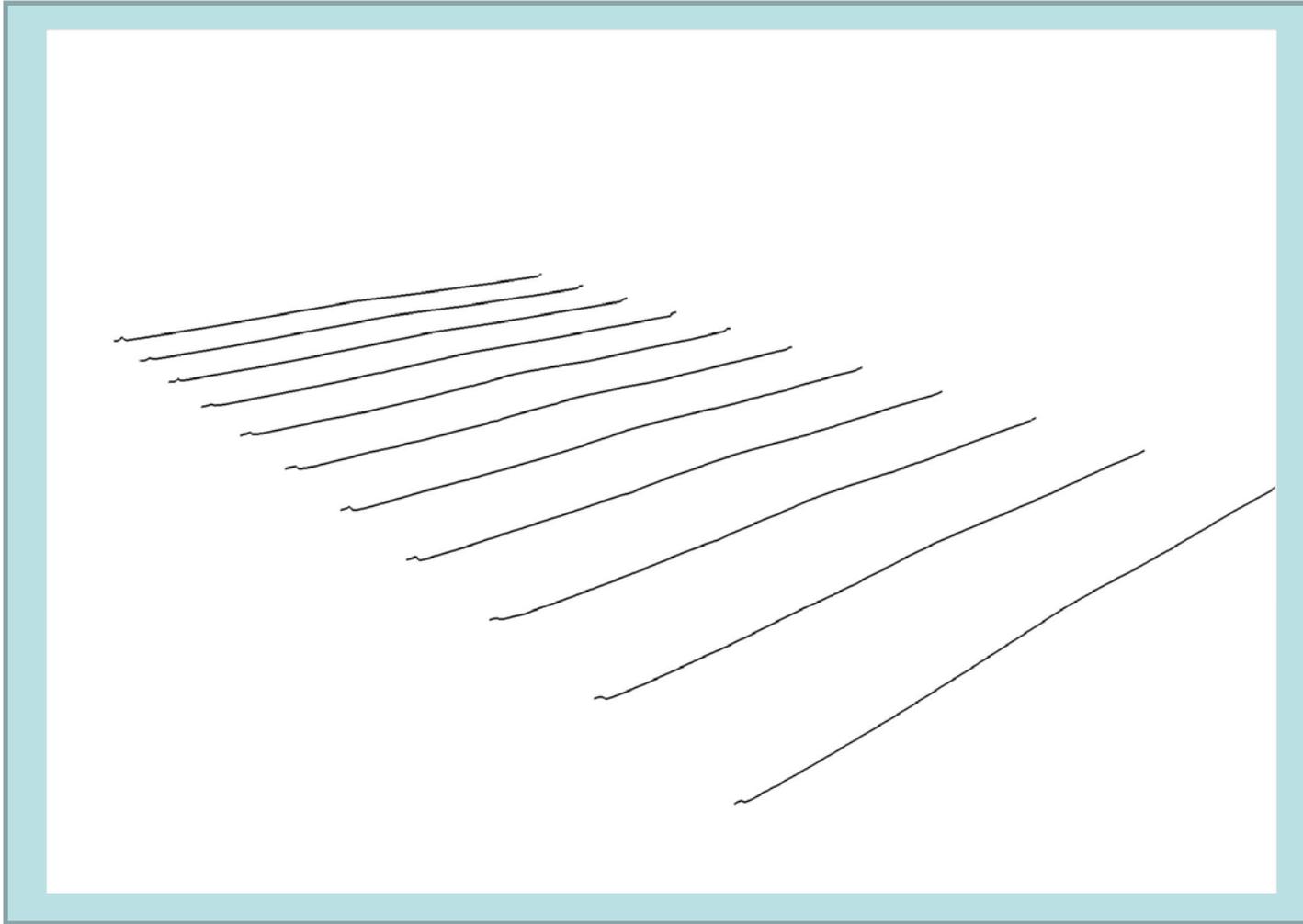
3D roads modeling

Surveying of highways and railways



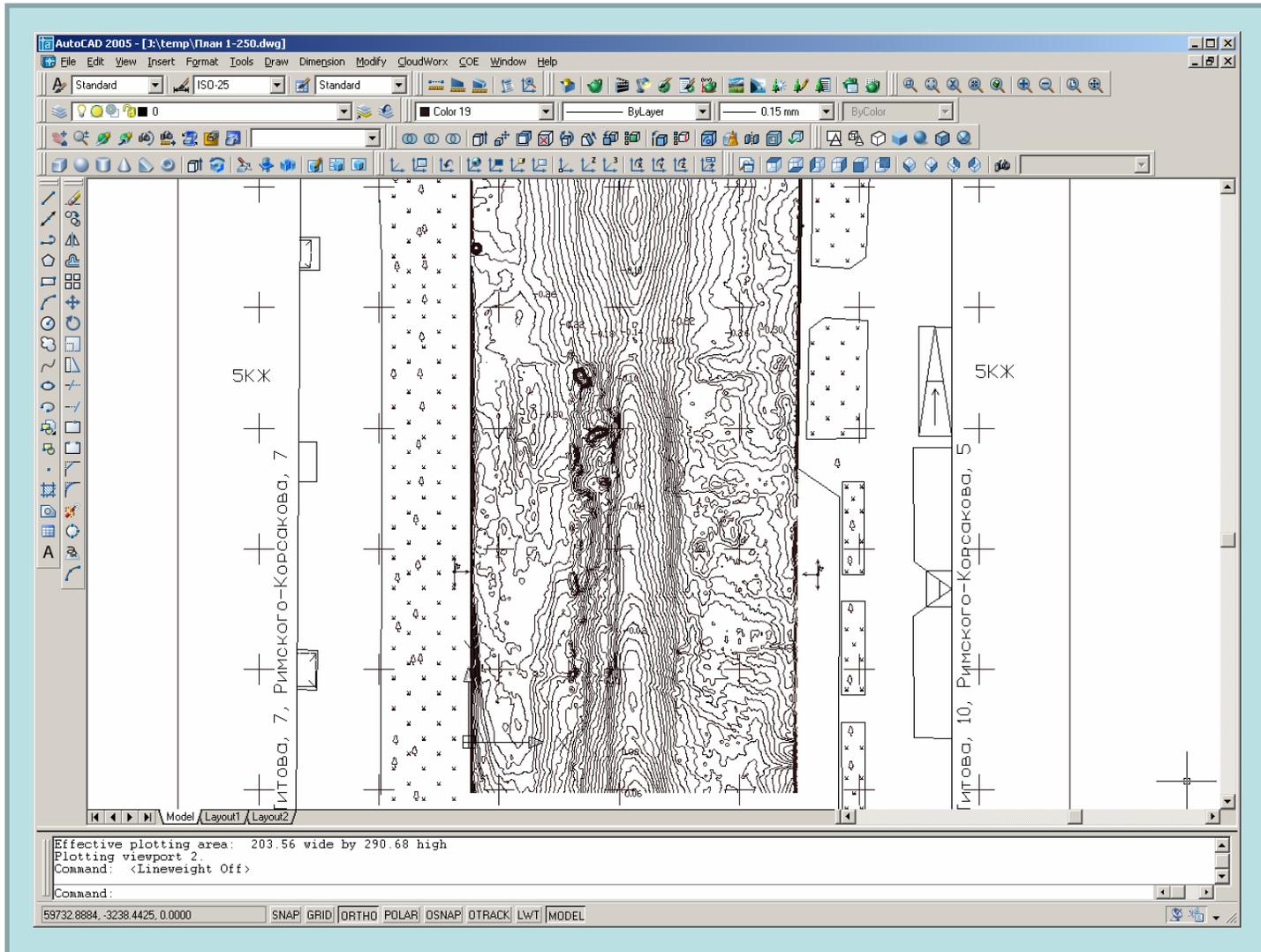
Determination of pavement faults characteristics and amounts

Surveying of highways and railways



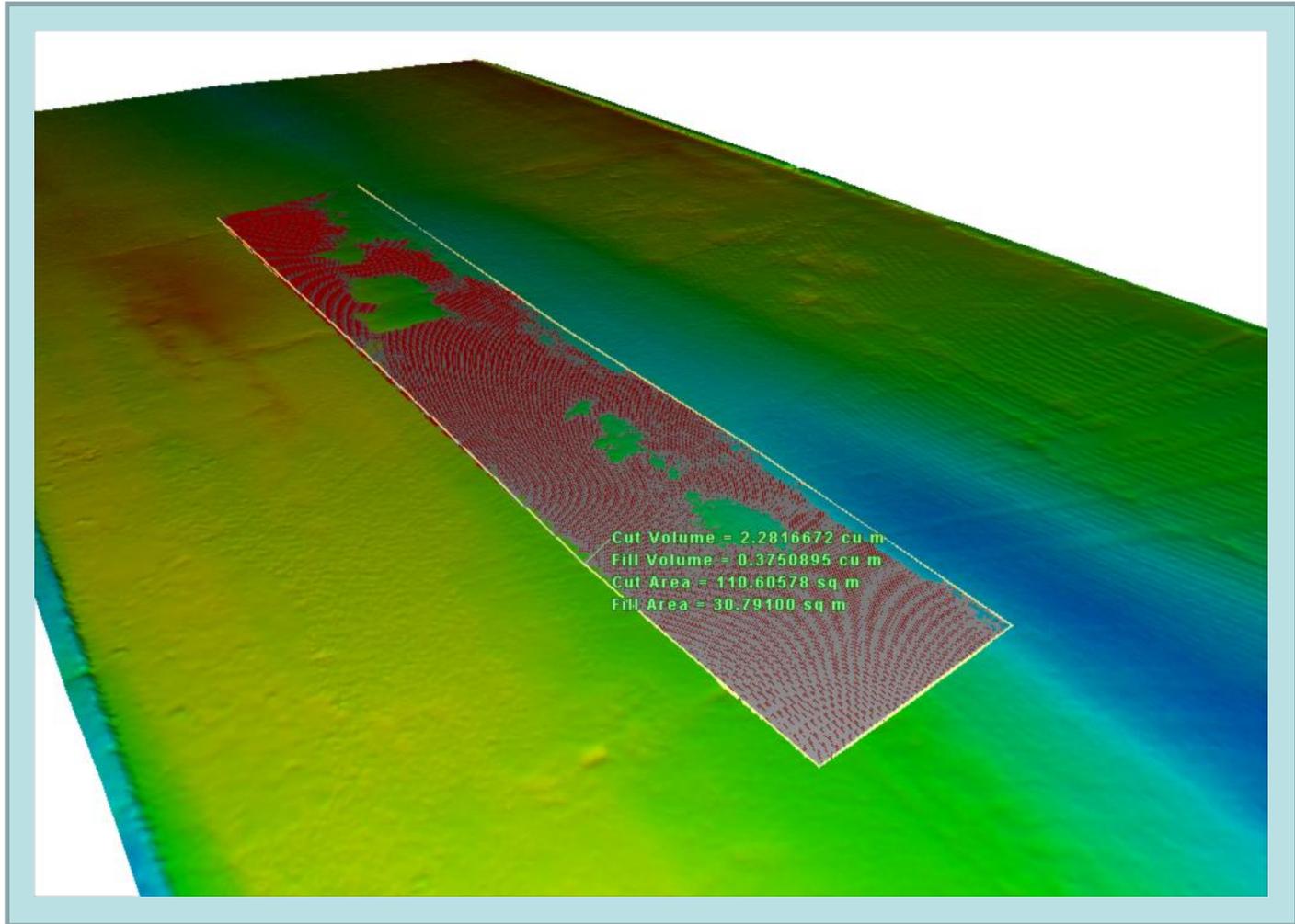
Road axis section construction

Surveying of highways and railways



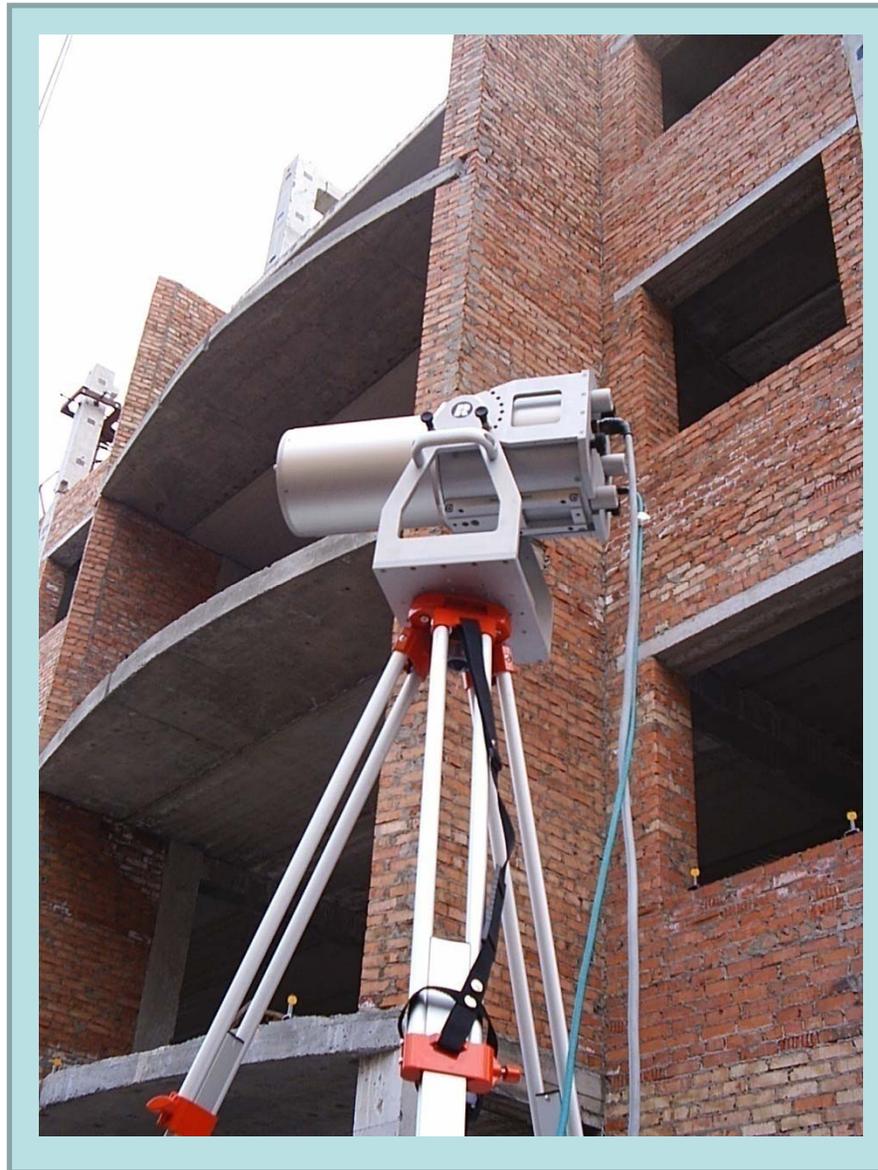
Roadway drawing

Surveying of highways and railways

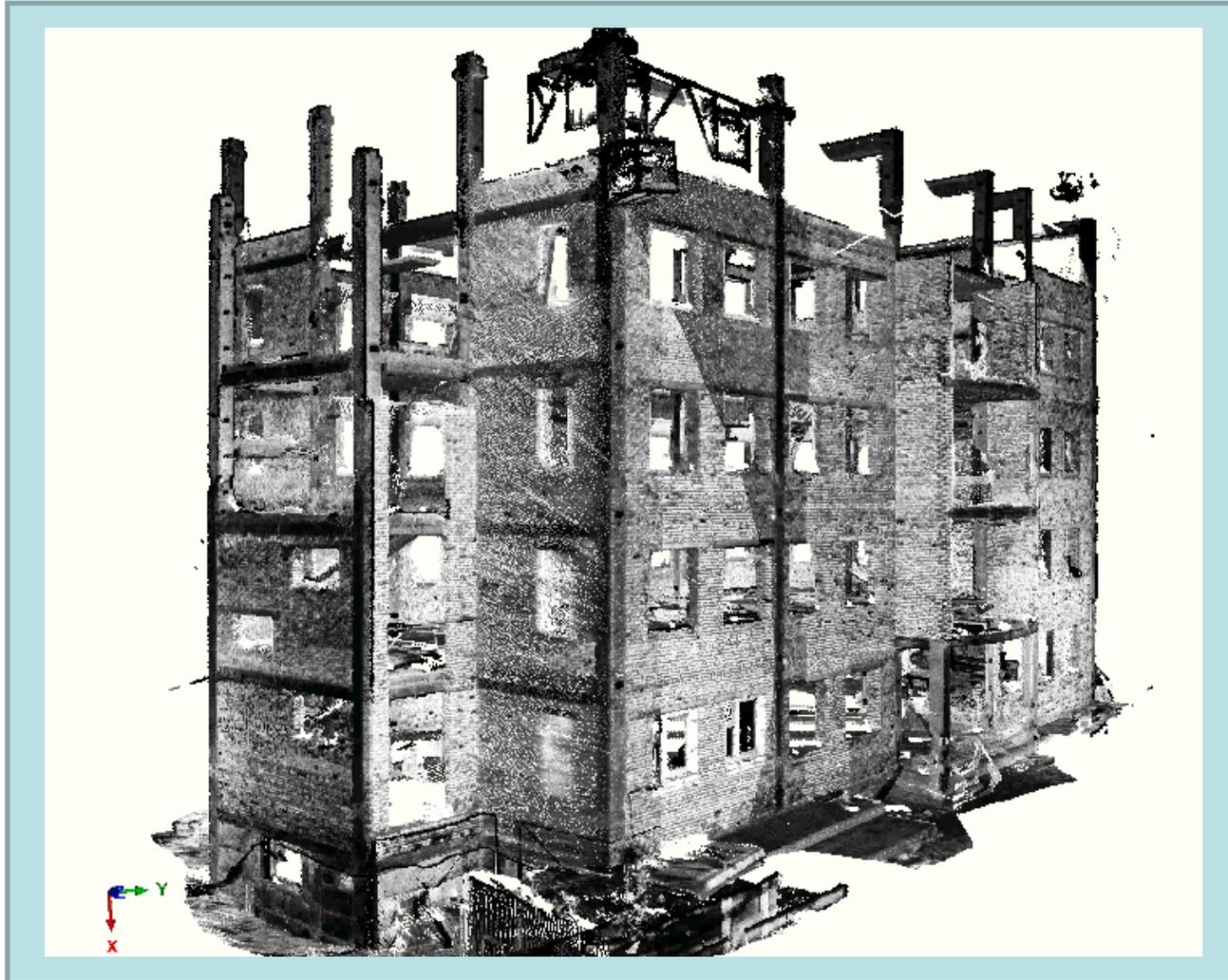


Engineering-and-repair works volume estimation

Surveying of facades

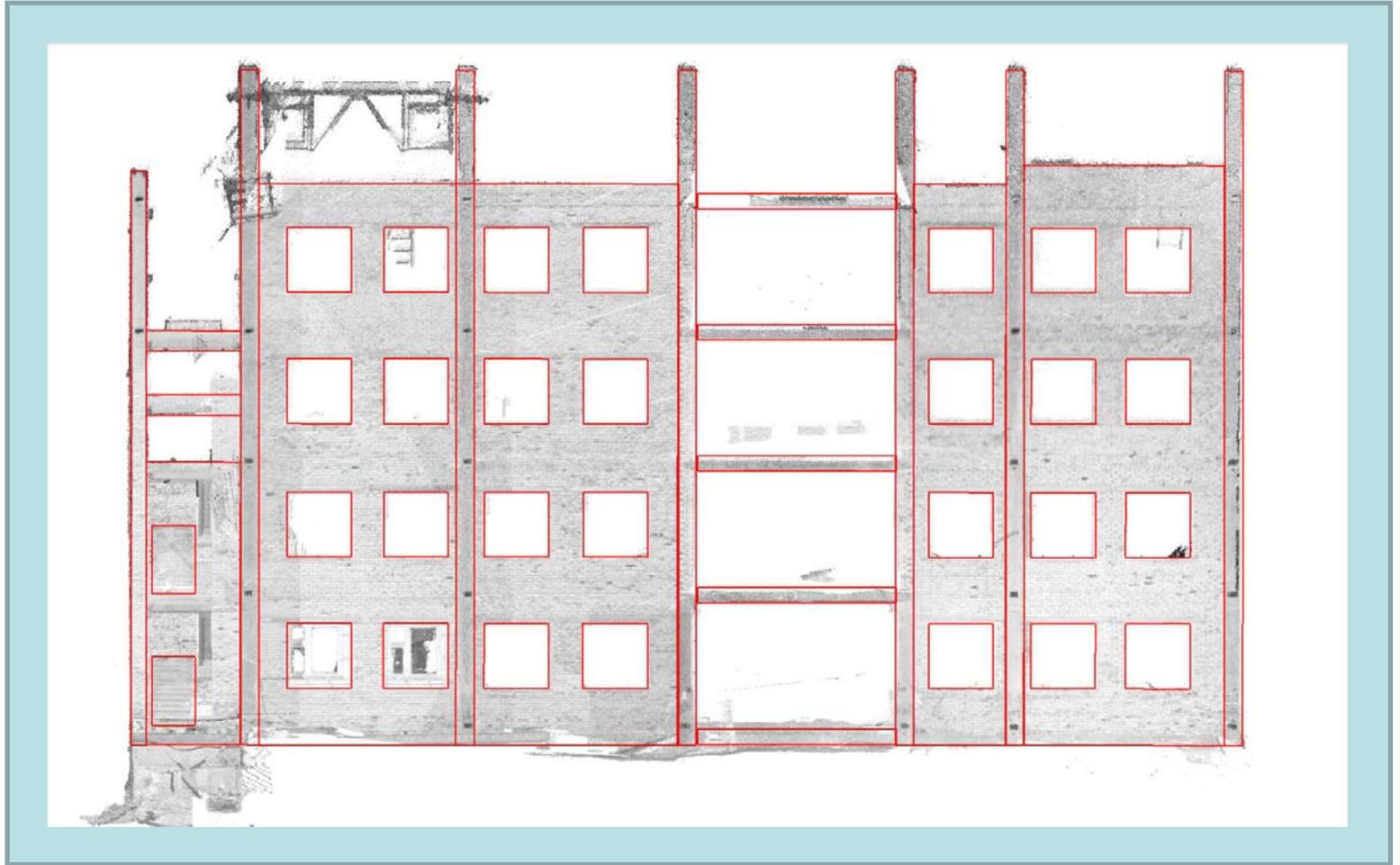


Surveying of facades



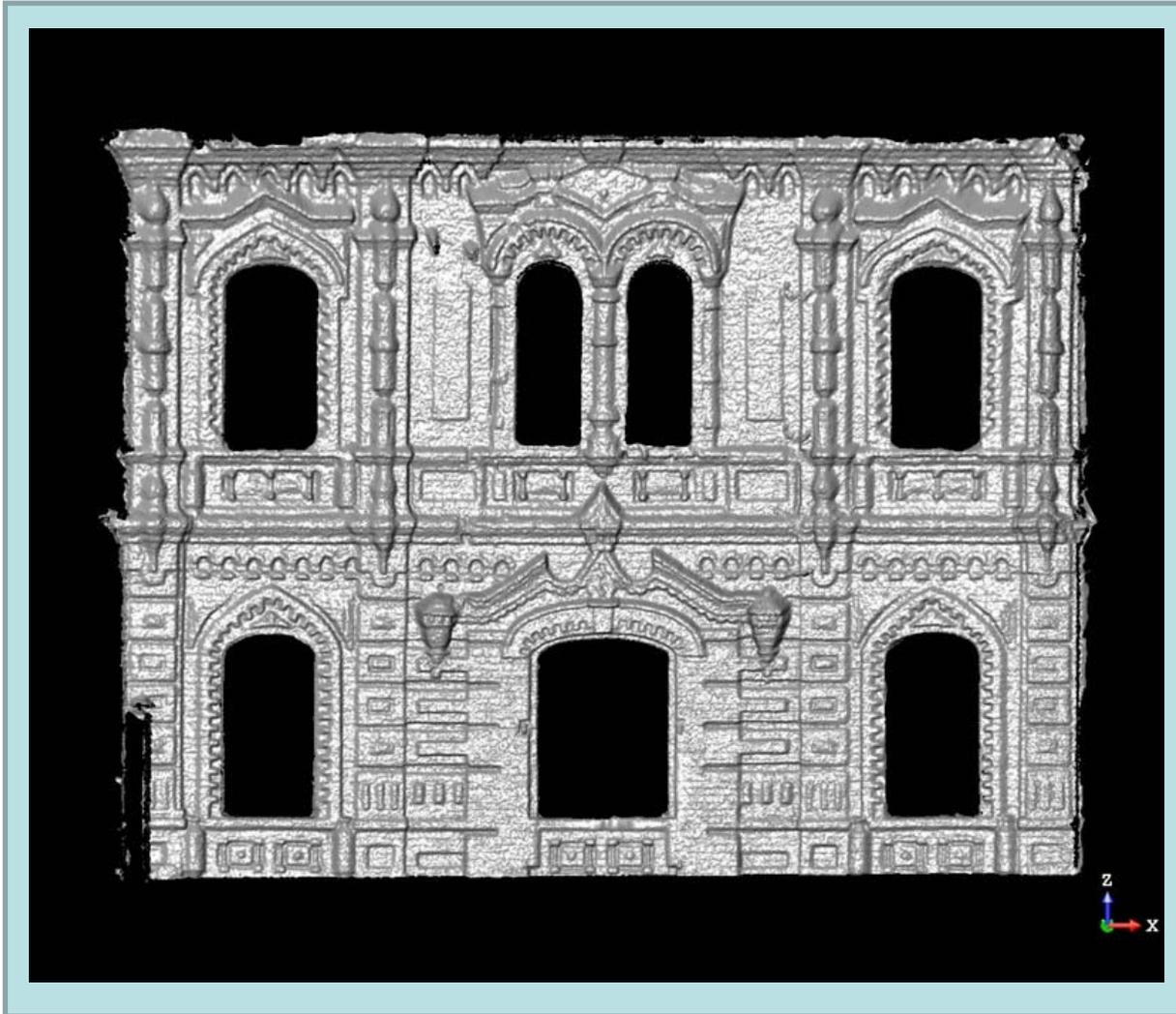
3D model generation of buildings

Surveying of facades



Making measurement drawings of any section

Surveying of facades



3D modeling and drawings of complicated architectural structures



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**Thank you very much
for your attention!**