

# CANYON

## Digital Ground Model

### Digital Ground Model

CANYON is a general digital ground data modeling package.

### Data

CANYON can read data (points, structure and break lines) in all common formats (including DXF). It is also possible to specify new data formats.

### Aerial survey data

Data produced from the numerical restitution of photogrammetrical flights can be read directly into CANYON (Points and lines).

Certain layers (buildings, lakes) can be defined as dead zones which are excluded from the ground model. Others, which represent the inflexion points of rooves can be used to recreate the shape of buildings automatically for representation in cross-sections and perspective views.

### Modelling

CANYON uses the Delaunay triangulation method, giving the best possible interpolation quality. Break lines, structure lines and edges can be defined to guarantee the best possible conformity between the model and reality. Each model may be made up of one or more layers.

- The interpolated altitude of a point is always exact.
- Zones with very different point densities can coexist within the same model.
- Smoothed surfaces can co-exist with sharp breaks in continuity (road edges, walls, buildings).

### Construction

Models can be combined, added or subtracted. Part of a global model can be replaced by another model. Surfaces generated by other modules like Road Design can be integrated into existing models.

Cut and fill volumes can be calculated by comparison.

### Editing functions

Whatever their origin (points, photogrammetry, road design, etc), ground models can be modified or completed manually at any time. Functions include:

- Adding new points, lines or triangles.
- Deleting points, lines or triangles.
- Modification of the coordinates of points or of the levels of points or groups of points.
- More sophisticated functions, such as cutting or fitting of lines, intersections, merges, etc.
- Information on the data, altitudes or the slope at any given point can be displayed.

Modifications can be made definitive or abandoned at any given time.

### Drawings and Printouts

All data and results contained in a CANYON database can be printed or exported in a simple ASCII format.

The graphic representation of the model's data can be completed by the point numbers and/or levels.

Contour lines can be smoothed by finite element interpolation of the surface (very high precision and correct rendering of break lines), by the use of splines (very fast but less precise) or by a combination of the two for optimal rendering quality.

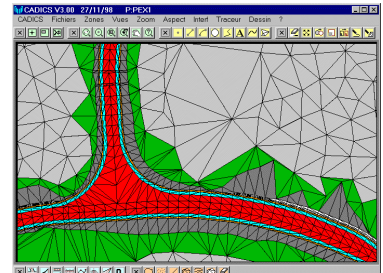
Isopachytes represent the difference between two layers or the thickness of one layer in the form of contour lines.

Cross-sections can be generated at any point of the model and can represent one or more layers of one or more models.

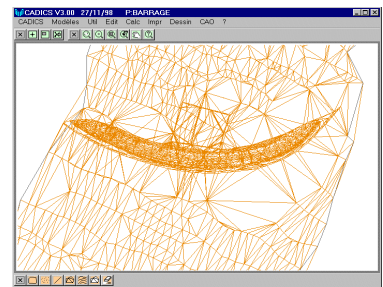
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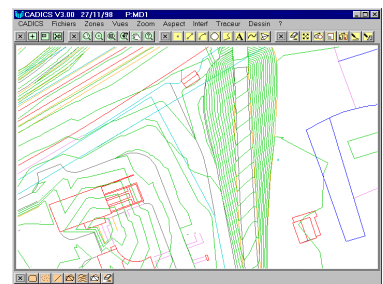
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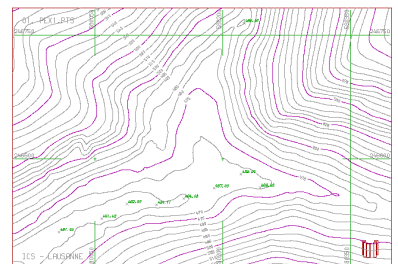
*A road design can replace part of a model. Links between the models are created automatically (green triangles).*



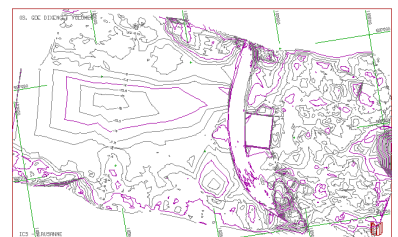
*Model of the Grande Dixence dam showing the old and new states recorded by sonar.*



*A digital ground model is automatically extracted from the layers representing the ground, rooves and dead zones.*



*Contour lines can be smoothed by subdivision and/or by splines. They can be labeled automatically.*



*Isopachyte curves show the quantity of aluvial deposits in the basin of the Grande-Dixence dam in Switzerland.*