



Newsletter 10

CivilCAD 2006 V1

Empowered by 3D ACT

It has been a year since we have published our last *Newsletter*, a year of hard work, innovation and enhancement. We are proud to present the outcome of our efforts: one of the leading civil engineering tools in the world, **CivilCAD 2006**. A number of sub and major versions bridged between CivilCAD 2004 version and **CivilCAD 2006**, but we are certain that the awaiting was worthwhile.

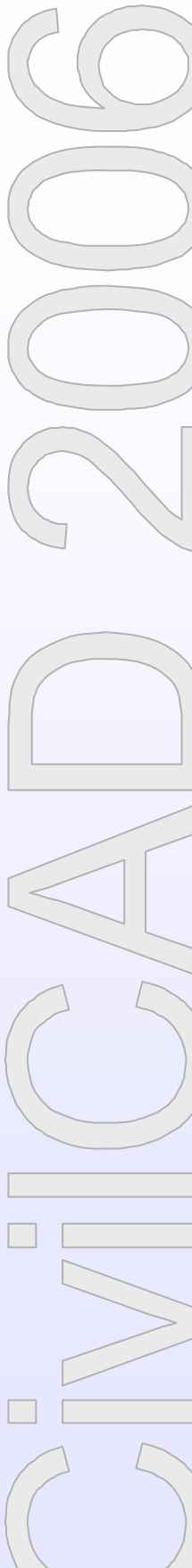
This document is not a marketing publication – it contains useful information and an overall overview of the entire changes which has been accomplished, since the release of the former *Newsletter* along with CivilCAD 2004 V3. It is strongly recommended to read the entire content, whereas you will find important changes that will ease accelerate and improve the quality of product you will produce by the software.

Additional area that continuously improves is the new **CivilCAD 2006 3D ACT** product, the world-wide leading simulation software for civil engineering, mapping and surveying. With the presentation of **CivilCAD 2006**, we also release the new simulation element, **3D ACT (Simulator & Viewer)** that includes better performance (speed and stability), a larger and new library of elements (traffic signs, new type of trees, manholes etc.), positioning of houses and more. **Contact us today to learn more and watch by yourself how in a few single steps, your design become a real life 3D simulation, in a quality you have never met.**

I want to utilize this opportunity to thank our customers that supported and believed in us from the beginning, and reassure you that we will continue to lead, innovate and improve the product according to your needs, as users of our software.

Faithfully yours,

Shlomi Sivan, CEO
Sivan Design D.S Ltd



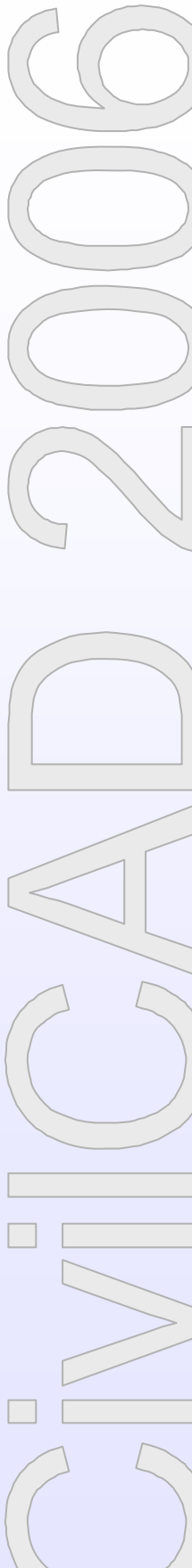


CivilCAD 2006 software can not be downloaded from the web-site; A CD must be supplied for a full installation. In case you have not received a CD, please contact our office. Upgrades for the software can be downloaded from our web-site at www.sivandesign.com/Downloads.html. In the process of the installation it is strongly advised to follow the installation instructions and go through the entire 'Setup completion wizard' steps to fit the software to your own working method. The new manual (PDF format) and upgrade for the 3D ACT are included in the CD and can also be found at our web-site.

This document presents the major changes been done in the software. The document does not include list of bugs been fixed or minor improvements. The changes are serially listed, and divided into the following subjects:

- **ROADS/ DITCHES.**
- **3D ACT MODULE 1.4.**
- **PIPELINES.**
- **EARTHWORKS.**
- **GENERAL.**
- **RESERVOIRS DESIGN.**
- **SURVEYING.**

Note: Some of the paragraphs that have been included under a certain subject ("ROADS" for example) can be useful for other users of the software (Surveyors for example). It is advised to go through the entire paragraphs included in the document, either if they are not directly linked to the type of job you are doing.





Roads/ Ditches

1. Multi layers in cross section

Following many requests and a long design and development process, the new version includes a release of a new development – multi layers in cross sections. The elements of the multi layers option includes:

- Each major layer in the software – 'Existing G.L', 'Design G.L' (Earthworks) and 'Structure', can be divided into 10 sub-layers to a total of 30 sub-layers for each section!
- Each layer can be presented with its Cut & Fill area in the section, and also can be accumulated in a volumes table.
- Topography data as well as external TXT and Cs.out/SEC files can be read into each layer, without canceling the typing data manually option.
- Crossing/Parallel roads data will be automatically read as a new layer (see more details later on).
- Crossing/Parallel ponds data will be automatically read as a new layer (see more details later on).

2. Import/Export of cross sections' layers TXT files (can be created using Excel)

As part of expanding the capabilities of transferring layers between projects and within projects, an option of reading and writing a single or multi layers into/from TXT file (been used by Excel) has been added. Reading and writing layers is possible for all layers, including Existing G.L (up to 10 sub layers of the existing G.L), Design G.L and the Structure layers.

3. Automatic updates of elevations between the side ditches in the cross section and the ditches' I.L in the profile

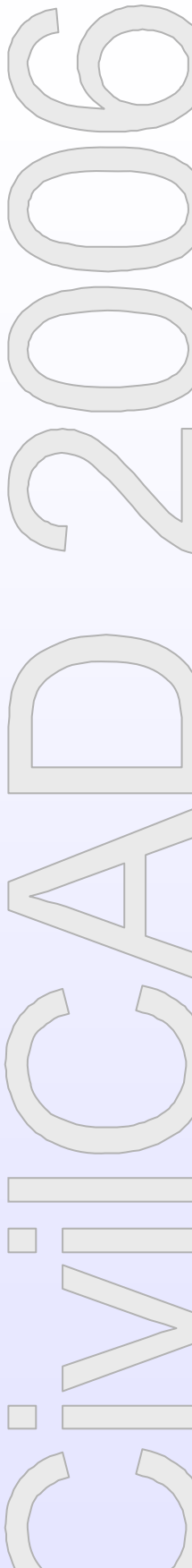
In the new software, updates of the ditches' profile (Ditch R/L in the V. Alignment) will be automatically updated in the 'Depth in Cut/Fill' fields in the Left/Right ditches of the cross section. The update will be mutual – changes in the ditches' depth in the cross sections will affect on the ditches' I.L in the profile.

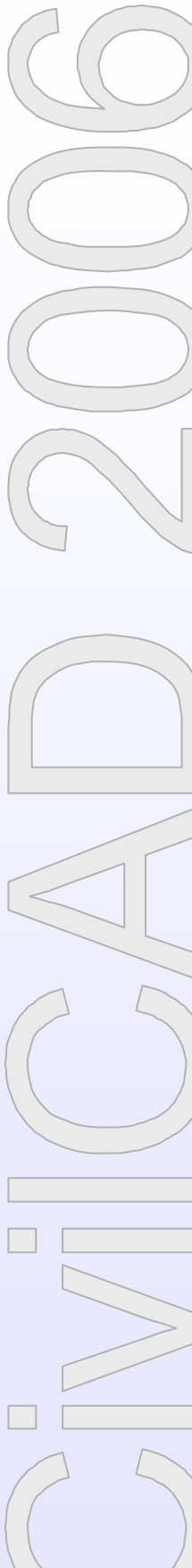
4. Definitions for Transition curves

As part of the definitions of the H. Alignment, the following two options have been added:

- Defining the curve as a Cubic Parabola in addition to the existing option of Clothoid. The transition curve can be defined by either its true or projection length.
- Defining the distance between the curve's segments (default is set to 1M) – the data will affect the curve's accuracy.

Both options appear in the Options window of the H. Alignment.





5. Display of crossing utilities in the V. Alignment

The new version includes an option to trace and display utilities (sewage, drainage, cables etc) that are crossing the road. The option is accessible through the V. Alignment window.

6. Display of the Cut/Fill Depth/Height in the V. Alignment

The Cut & Fill depths/heights can be shown in the V. Alignment. The depths/heights will be shown for each section in the data table at the bottom of the section's drawing. The option is accessible through the V. Alignment's options window.

7. Defining the display's accuracy of slopes' percentage in the V. Alignment

The accuracy of the slopes' percentages in the V. Alignment can be defined – accuracy of one or two digits after the decimal points (For example: 1.0% or 1.00%). The option is accessible through the V. Alignment's option window.

8. Displaying the K factor in the V. Alignment

In addition to the existing data been shown in the vertical curve (Length, Radius...), the K factor can be also shown. The K factor represents the difference (change) between the slopes at the entrance and exit of the curve. The data will be shown in the V. curve row at the data table at the bottom the section. The option is accessible through the V. Alignment options window.

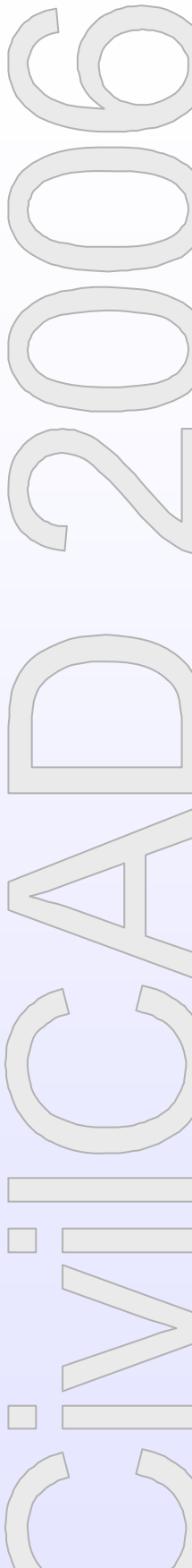
9. Defining the horizontal distance between cross sections when creating a single sheet of paper ('No division' option)

When arranging the cross sections on a single sheet using 'No division' option on the 'Frames division' window, you can now define the horizontal distance (dX) between the cross sections. The option exists when using 'Model space' only.

10. Logo and Frame in cross sections frames division option when dividing into Model space

Arranging the cross sections into Model space sheets (separate files) has been changed and includes the capability of adding Logo and frame to each sheet. The logo that will be attached to the sheets will be a regular AutoCAD file (Default file – Logo_Section.dwg). The file should be created (physical size – the drawing scale) at the same size (more or less) of the default file. In addition, it is possible to add two special Attributes to the file that will be recognized and updated automatically by the software as follows:

- Sections_range – will display the range of sections that appears on the sheet.
- Sections_scale – will display the scale of the sheet.



11. Reading Horizontal alignment

In the H. Alignment window, an option has been added enabling to read C.L files that has been created either by Civil 3D or Idan (RDS) software. To use this option, change the "Files of type" in the files browser window been accessed through the 'Read from file' button in the H. Alignment window.

12. Automatic SuperElevations

Automatic creation of SuperElevations is now available in the SuperElevations window, using the following 3 parameters:

- Lane width (Default is 3.6M).
- Normal side slope (Default is 2%).
- Speed limit.

According to these parameters, the software will automatically create the SuperElevations segments, filling the data in the SuperElevations table enabling manually editing if needed.

13. Definitions for automatic SuperElevations creation

By default, running the new automatic SuperElevations option will create the lanes side slopes according to highways SuperElevations standards. The user can edit and change the standards filling the "SuperElevations' rates" table (access through the Options button in the SuperElevations window) that includes the following parameters:

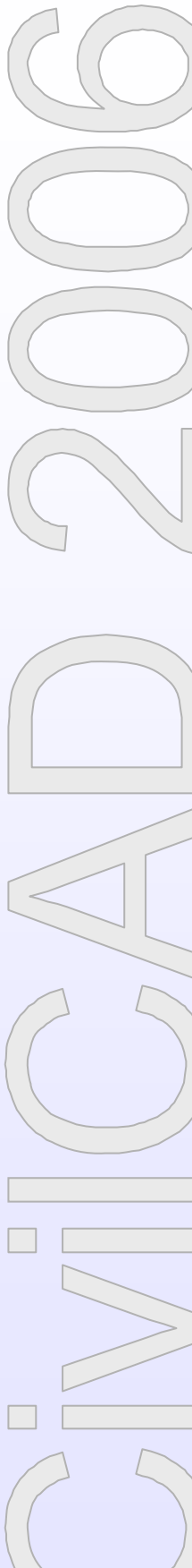
- Design speed.
- Minimum radius.
- Maximum cross slope (%).
- Minimum radius without SuperElevation).

In addition, the user will define the following parameters (separate parameters that are not in the table):

- Default for lane width.
- Default for normal side slope.
- Minimum SuperElevation's runoff ratio – the ratio will be multiplied by the height differences between the runoff's beginning and end (SuperElevation's height difference) to define the runoff length.

14. Changes in the SuperElevation calculations procedure

The SuperElevation calculation procedure has been changed – the change in the slope of the lane that less Super-elevate starts at the consolidation of the two slopes. For example: SuperElevation from -2%/-2% to 4%/-4% will be in two phases – the left lane will change to 2%/-2% and then the two slopes will continue together to the maximum change – 4%/-4%.



15. 3D Road's model creation at the layout stage

A new "Triangle" option has been added to the layout creation window (Layout & contours window). The option creates an unseen 3D model of the road (saved in the memory) that can later be used by different modules of the software such as getting the data of intersecting or parallel roads and reservoirs, getting the road's design level when designing an underground sewage or drainage system and more. To operate the option mark the "Triangles" option ("V" mark) at the Layout & contours window, when creating the roads' layout.

16. Setting the minimum distance for data sampling in the cross sections

As part of improving the flexibility of the software, a new option has been added enabling the user to define the minimum offset distance for topography data sampling. To set the parameter, change the "Minimum offset difference" value in the cross section's Option window. Note that the option will reduce the accuracy of data sampling with bigger parameter, yet for projects with high surveying density it will reduce the number of unwanted digitized segments in the cross sections.

17. Adding a Block to crossing utilities in cross sections

The Utilities option in the cross sections window enables displaying crossing systems (fences, marking the right of way, cables, phone-lines etc.).

A new feature in the utilities option is the capability to add AutoCAD block (DWG file) to be presented in the cross section. Activating process: after scanning the utilities layer, open the Utilities table and choose the block type by double clicking the combo box in the relevant crossing utility.

18. Settle between crossing/parallel roads

In the new version, we have developed a useful feature for settlement of several crossings/parallel roads including settling ramps etc.

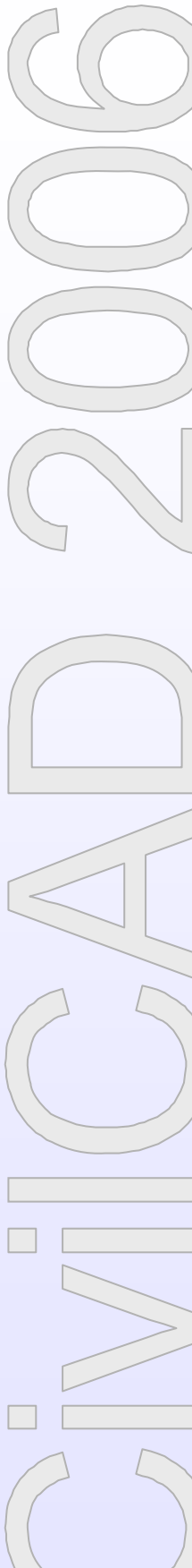
The feature enables sampling the side roads data inside the cross section view of the designed road. There is no limit to the quantity of roads you can scan and present.

The feature is enabled by clicking the 'get side roads' button. The side roads elevations will be read into new layers, which will get the same road's name. These layers will be presented as existing ground level layers so that the new design will use them as reference (for getting edges, ditches, earthworks etc.)

The side roads elevations will appear in the tables of the cross section.

Remarks:

- In order to get side roads data, the side roads should be first created as 3D model (see option of creating a road as 3D model in this document).
- The software will sample only the roads which are in the section width as defined in the 'options' screen in the cross sections window.



19. Lock Datum in V. Alignment

The 'lock datum' option in the V. alignment enables setting and locking the datum of the profile that appears in the left low corner of the section. As default the datum will be set and locked according to the first existing ground level data extraction. The user can change the datum manually by typing a value in the 'lock datum' field or unlocking the datum, enabling the software to change it according to changes in the section data.

3D ACT module 1.4

20. Presenting structures in the 3D simulation

The new 3D ACT version enables adding structures in the 3D simulation. The structures will appear as closed Polyline in a different layer/ layers. The user would scan the layers (or choose them manually) from the 3D ACT builder window (activate by clicking the 'structure' button). The structures heights will be set as follows:

- 2D Polyline in zero elevation – the structure will be set in a default value of 10M above ground level.
- 2D Polyline with elevation – the structure will get the line elevation (above ground level). For example a Polyline with 15m elevation will create a structure at the height 15m.
- 3D Polyline with changing elevation – the structure will get the elevation of each corner (above ground). That way it's possible to create inclined roof structure.

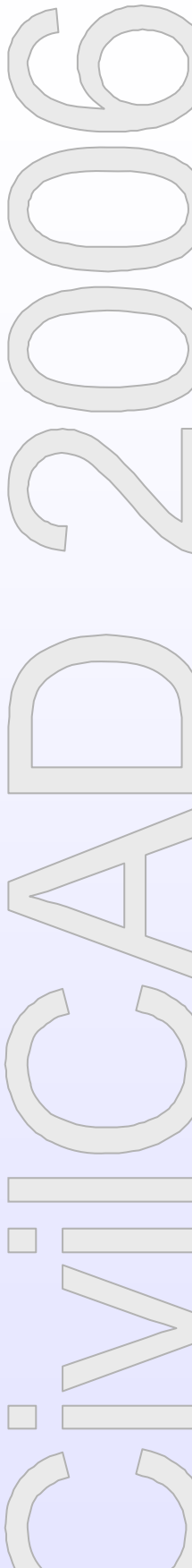
21. Adding new blocks (objects) in the 3D simulation

As part of the continuous improvement in the 3D simulation, we have added a complete series of blocks (objects) including: additional trees, sewage manholes, drain collector, sprinklers, traffic signs, light poles etc. The blocks make the 3D environment a real life-like simulation. The complete blocks list appear in the following Excel file '3D ACT codes.XLS' which is located in the software installation folder (usually in C:\CivilCAD 2006).

Pipelines

22. Real sized manhole and displaying the size in the layout

The sewage and drainage manholes will appear in their real size in the layout. The size will be according to the defined one in the section window under 'size' column. For rectangle manholes – it's necessary to type both dimensions (for example 100/100). For round manholes – it's necessary to type "*" before the diameter. In addition, the manholes dimensions will appear in the pipeline layout next to the manholes.



23. Getting the road's level from the road's model

The option of displaying the road's level in the section has been improved and it enables reading the road's data automatically and in high precision.

Activating the feature stayed the same: in pipelines→section, change to 'Design' in the lower left 'Ground level' combo box and press the 'Get design data' button. In order to read the design data, it's necessary to create a 3D model of the relevant road (see option of creating a road as 3D model in this document).

24. Discharge calculations

A discharge report has been added to the existing pipelines reports. The report displays the maximum discharge capacity within the pipeline segments. The user can enter the desired discharge by clicking the 'Discharge input' button and receive the flow speed and average water level in each pipeline segment.

Earthworks

25. Division of the earthworks data into layers

The earthworks data in CivilCAD 2006 can be calculated in the following methods:

- Designed planes data.
- Triangles network data.
- Squares network data.
- Crosses grid network data.

The data in each method is now divided into 6 layers as follows: lines layer (planes lines, network lines), general information layer (planes names, triangles names), existing topography elevation layer, designed elevation layer, positive difference between existing and designed layer (Fill) and negative difference between existing and designed layer (Cut).

26. Displaying the planes corners text parallel to the plane

Now it's possible to display the planes corners text (heights, points names, heights difference) parallel to the plane. This feature enables automatic spacing of the corners text in several intersecting planes. Activate this option from the planes 'options' screen by selecting 'parallel' in the 'Location' combo box.

27. Triangles earthworks report

The triangles earthworks report has changed and it is now including the following data:

- Cut area and volume
- Fill area and volume
- Total area in horizontal projection and surface area (real area)



The data will be displayed for each triangle. A summary of each 10 triangles will be presented and a total summary would be displayed at the end of the report.

General

28. Narrowing the work area including breaklines

Usually the designer or surveyor is working on a smaller area than the measured one. Working on a large area creates unnecessary calculations, slows the working pace and makes it harder for the user to orient around.

In the new version we have improved the Erase→polygon in/out option (activation from the Topography/Design coordinates window from the right list 'Unused, Pick, Locate..'). Now you can erase also the breaklines in addition to erasing the points. The software will prompt the user whether to erase also the breaklines and if the user approves, the breaklines inside/outside the polygon will be erased accordingly. Breaklines which cross the polygon border will be adjusted to end at the polygon border.

29. Definition of text height/size relatively to the scale

In the main configurations window of the software (File→Configuration) we have added an option to control the text size relatively to the chosen scale. Activating this option is by pressing the 'system scale' button which is in the 'Drawing environment' tab. For each scale it is possible to define a specific text size as will be written on the plan. To make these definitions as default, it's necessary to define it in the 'prototype' project.

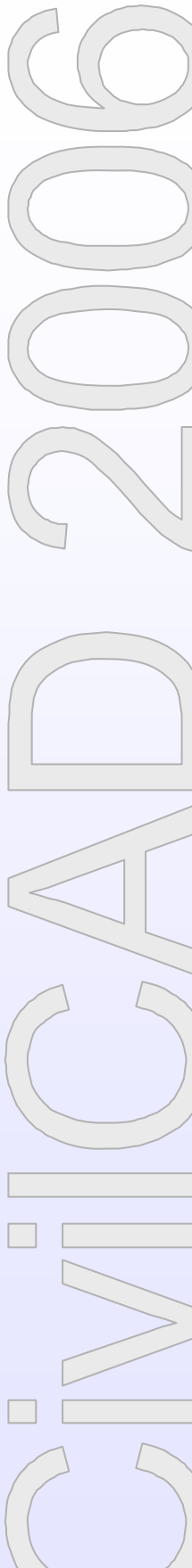
30. Definition of layers names

An option to define new names to the layers been created by the software, has been added in the 'Layers control' window. After pressing 'Layer settings' button, a table which contains all the layers CivilCAD 2006 created will appear. The user can change the layers names according to his requirements. To make these definitions as default it's necessary to define it in the 'prototype' project.

Reservoirs design

31. Settle between crossing/ parallel reservoirs/ ponds

One of the major challenges the reservoir designer encounters is the planning of the correlation between several tangent ponds in the same project. A new feature to handle such cases was added. The feature enables sampling the parallel ponds data into the cross section view. The feature is enabled by clicking the 'get side roads' button. The side roads heights will be read into new layers, which will get the same pond's name. These layers will be presented as existing ground level layers so that the new design will



use them as reference (for getting edges). The side ponds heights will appear in the tables of the cross section.

Remarks:

- In order to get side ponds data, the side ponds should be first created as 3D model (see option of creating a road as 3D model in this document)
- The software will sample only the ponds, which are in the section width as defined in the 'Options' window of the cross sections.

32. Create the reservoir bottom as a separate plane

As part of developing new working methods, the new version includes a new method which enables creating the reservoir bottom separately, and then connecting the reservoir embankment to the new bottom. The work is done according to these steps:

- Design the reservoir as before (contours of existing, horizontal alignment of the embankment, cross sections and get the reservoir layout).
- Create the reservoir bottom as designed points (as points in Design Coordinates table) including elevations (It's necessary to make sure there are no other points with elevation in the 'Design Coordinates' table. Points without elevation like IP points do not affect the 3D model).
- Create designed contour lines.
- Open the cross sections window. Create a new layer under 'Existing G.L' and read the design contours data into this layer.
- Change the cross sections data – delete the inside segment (the last segment on the right side of the section) and define it as a closing slope to existing (like for the outside segment). The slope will close to the new layer of the bottom.
- Create the layout.
- In General→Reservoir window, choose the new option 'Use last segments' and press apply to create the reservoir. This option will use the inner edges points in addition to the designed points to create the reservoir bottom.

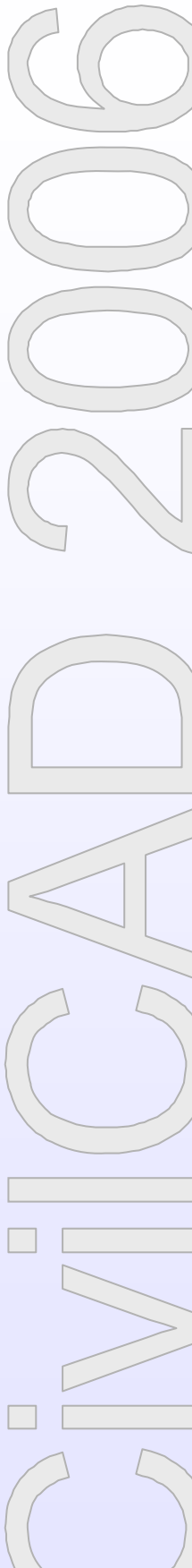
Surveying

33. Traverse adjustment, poly network and free network

After many requests from clients and massive investment in research and development, the new version includes a sophisticated yet simple to operate module for calculating bearings including traverse adjustment, poly network adjustment (network of traverses) and free network. Activation of the module is done from the Geometry→Distomat data window.

The new module includes the following components:

- Calculation of the topography points and the traverse adjustment in a single process.
- Identification of the traverse or the traverses network and adjust them automatically.



- Errors checking for legal angles, distance checks (measured Vs. computed), heights interval checks and orientation checks both for the traverses and every single station (if no traverse correction applies).
- Option to set the calculating parameters: orientation accuracy, distance accuracy and more.
- Display of the traverse or traverses network diagram and the surveying process.
- Production of a computations report including corrections to each bearing (stations and topography coordinates).

34. Reading a file which combines bearings and control points

As part of improving the working methods, the new software version enables reading bearing files which contains control points directly from the distomat data window, without a need to read the file again from the Topography coordinates window. When reading the measurements file, the software will locate the control points (if they exist in the file) and will automatically add them to the topography coordinates list as control points (with 'CP' as their code).

CivilCAD 2006