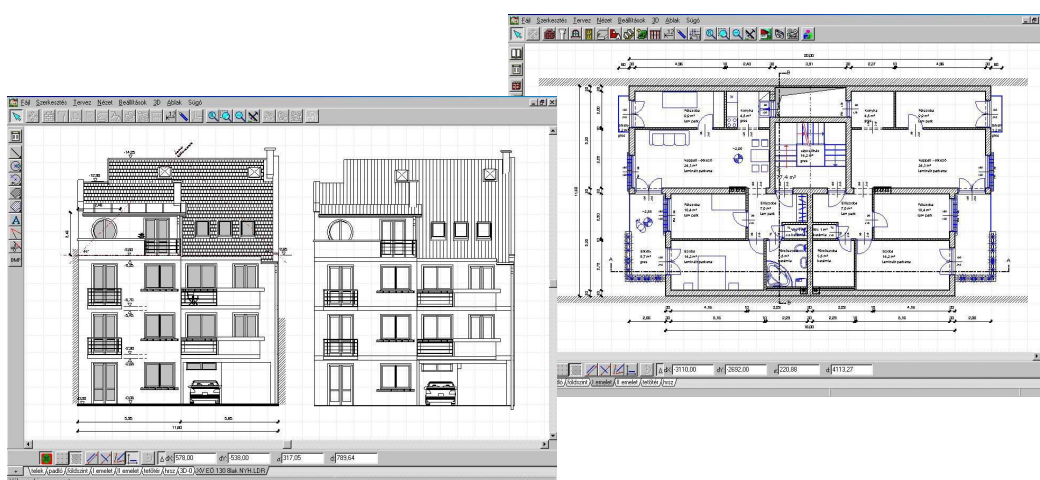


ARCAD

For do-it-yourself Architects



User's Guide

DesignSoft

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1 Introduction

What is ARCAD?

ARCAD is a powerful, yet affordable program for every aspect of your architectural project. You can draw and edit plans, create photorealistic 3D images and movies of your project.

You can also quickly and effectively design stairs, roofs, roof frames, landscaping, pieces of furniture and much more. With ARCAD it is also possible to calculate budget and materials estimates for your project.

Other features are: a straightforward menu layout, logical and transparent structure, simple work surface design. With ARCAD it is easy to develop your own work style. The hardware requirements of ARCAD are minimal, yet the software also supports top end hardware and the most up to date DirectX and OpenGL graphics systems.

With ARCAD's intuitive design and powerful functionality you can make your ideas a reality from day one!

The most important features of ARCAD include:

FLOOR PLAN DESIGNER

ARCAD makes designing your floor plan easy. The floorplan is generated quickly, dimensions and calculated values are automatically updated as you modify the plan. You can precisely and attractively design interiors as well as exteriors, using the extensive and expandable libraries. Planning multi-story buildings is made easy by the level manager and a flexible foil system.

Features of the floor plan designer:

- Design multi-layered walls, slabs
- Multiple snap functions
- Design custom windows and doors
- Automatic 3D generation
- Automatic area measurements and much more...

3D VIEW OPTIONS

View your design from all angles in 3D. From your floorplans the program automatically creates detailed facades, cross-sections and 3-dimensional photorealistic images. You may assign patterns or transparency values to

surfaces. Shadows can also be added to the project, making the images even more realistic. You can also import a photo of the building site and use it as a background. Film a *QuickTime-viewable*, *AVI* or *panorama* virtual tour of the completed structure.

Also available:

- 3D views in multiple windows - within the roof, stair and roof frame design modules as well
- Dynamic animations
- WRML, AVI, MOV, FLV, SWF, 3D DXF, JPG, BMP export and more....

ROOF DESIGNER

With ARCAD you can design even the most complicated roof designs quickly and easily. You only have to enter the data for the roof's pitch and contours and the program generates it automatically. Designing and adding eaves, ridge boards and rafters can be carried out by hand or automatically.

ROOF STRUCTURE DESIGNER

You can design roof frames with ARCAD's advanced frame designer. The designer contains the most frequently used roof frame types, which can be easily customized to meet your specifications. You can multiply, reflect and rotate elements to make a frame structure of your own design. Designing custom elements and joints is feasible as well.

3D MODELER

With ARCAD it is possible to design new symbols, entrances, facade decorations, and even custom furniture with the 3D modeler. By this powerful tool you can exponentially increase your design options! Extensive interior, openings and railing libraries complete your projects. A library of more than 3,000 elements is included in the program!

STAIR DESIGNER

You can use **ARCAD**'s stair designer module for professional results every time. Staircases can be designed either one section or according to the stair contour lines that you supply. Specify the landings, supports and banisters. By entering values for the height of the stairs the 3D generation is automatically carried out by the software.

Other features:

- Multiple window OpenGL 3D images in the roof-, stair- and roof frame

designers

- Design individual stairs by specifying their placement in the top view screen
- Select railings from the railing library and they automatically appear in 3D

GRAPHICS EDITOR

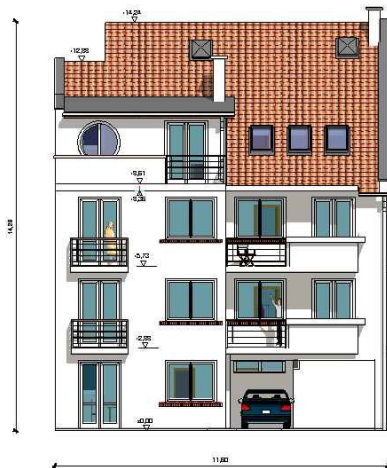
With ARCAD you can easily transfer levels, 3D drawings and cross section views to a drawing sheet in the desired proportions. Drawings may include captions and text boxes. You can prepare your own personalized template sheets using your contact information and logos. Exporting line drawings in DXF file format is also available.

BUDGET AND MATERIALS ESTIMATES: BILL of MATERIALS

ARCAD can also gather collect quantitative data, to be saved in an ASCII file useable in budget planning programs. You can collect data for individual rooms or the entire building, and export data in XML files.

Chapter

II

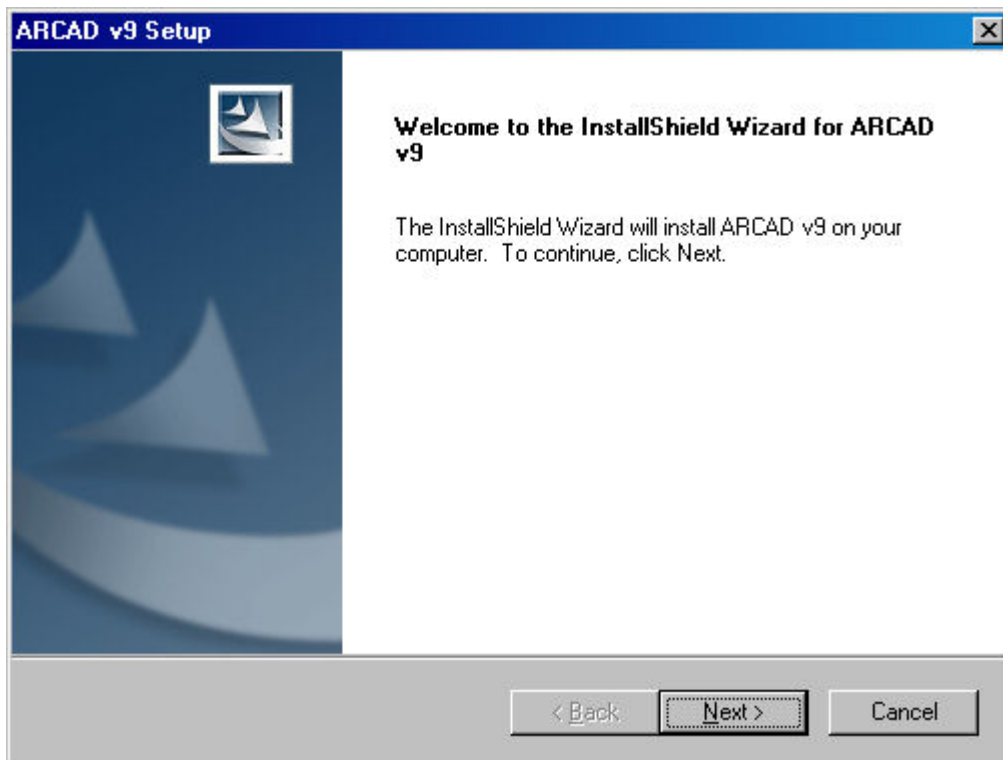


2 Installing the software

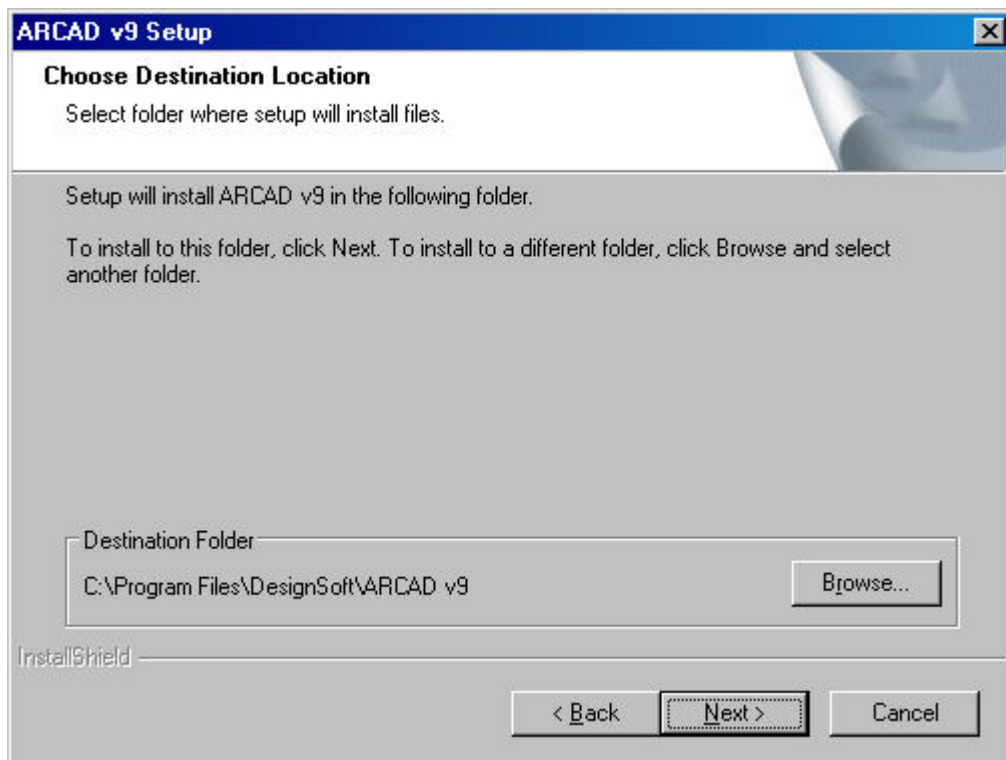
Check the list of requirements in the previous section before you install ARCAD.


To install ARCAD:

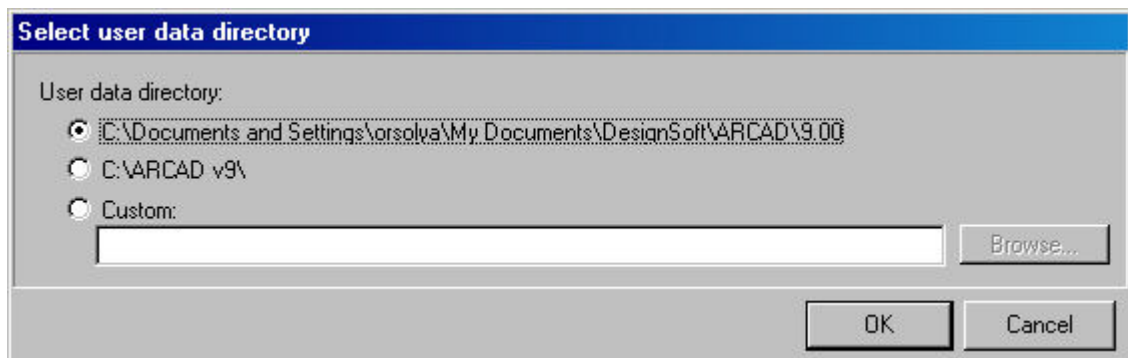
1. Insert the CD into the CD-ROM drive.
2. The CD should run automatically, if not: click the **Start** button then select **Run**. In the dialog box, type **e:\setup**
(If your CD-ROM drive is identified with another letter, type that letter instead.)
3. The setup screen shown below opens. Click on Next.
4. Check the target drive default setting (c:\program files\designsoft\ARCAD vn\). Highlight the setting and type a different location if desired.



5. Select a typical, compact, or custom installation. A description of each is provided. Most users should choose “typical.”
6. Select a program folder name. The default name is ARCAD vn.



7. Check the settings summarized by the installation program. If acceptable, click the Next button. Insert the remaining disks when prompted.
8. Once Setup is complete, click Finish.
9. To access the program, run ARCAD. Click on the  icon or go to *Start / Programs / ARCAD for Windows / ARCAD*.
10. Define the User DATA directory, the program copies the files into the selected user data folder.



11. Your ARCAD is now installed.

2.1 Software key authorization

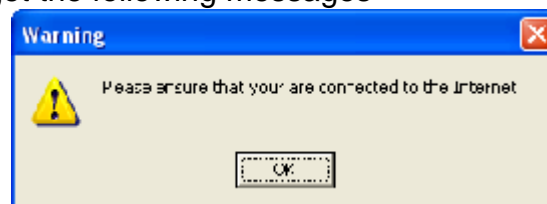
In order to run this program, you must receive authorization from DesignSoft. When you first run the program, a message box appears showing your initial authorization status. If you do not receive authorization, you are normally limited to 31 sessions to try the program.

At the end of the trial period – but preferably as soon as possible – do the following:
Run the **Help / Authorization / Authorize** menu. The **Authorize** message box appears:

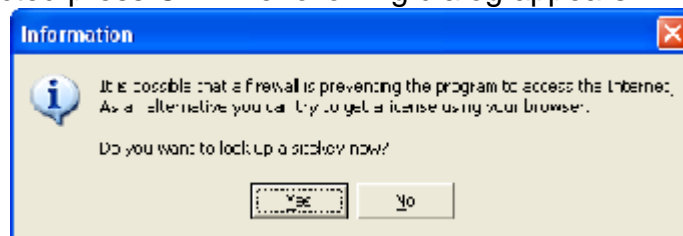


If you have received your program with a 16 digit **Order number** you can authorize your program in 3 simple steps described in the dialog box above.

It may be that your firewall does not allow your program to connect to the Internet. In this case you will get the following messages



If you are connected press OK. The following dialog appears:



Press **Yes**. Your **Site Key** will appear in a browser. Copy and Paste this into the **Authorization** dialog of your program.

If you do not have an **Order number**, or it does not work for any reasons or you do not have Internet connection, then click on the **Other** tab on the top of the dialog box. The **Other** page of the Authorize message box appears:



This dialog shows your personal **Site code**, which identifies your computer.

Record and send your **Site Code** and your **Order number** to DesignSoft by email or using the given web address. Always use Copy and Paste when you need to copy these information from one field into another.

If you have received the program on CD, the Order number is provided with the CD. If you receive the program as download it should be included in the email containing the download link.

Note, that if you click on the email address above, your default email program starts using an initial email template, that already includes both the **Order number** and the **Site key**.

If you prefer, you can click on the <http://www.designsoftware.com> .com address and select Registration on top of the screen, where you can enter the necessary information.

Whichever option you choose, make sure you give us your

- **Site Code**
- **Order Number and**
- **your email address**

so that we can send you your authorization code (site key).

If you contact us by email or via the web, you will shortly receive an acknowledgement of your transaction by email. If you haven't received this acknowledgement very soon, perhaps you mistyped your email address, so you should re-send the information. Within a few working days, we will send you your site key by email.

When you receive your **Site key**, run the **Authorize** menu again, enter the **Site key** into the **Site key** field, and press OK.

If you want to move your authorized program to another computer, use the commands “*Transfer using removable media*” or “*Transfer using Internet*” from the **Help / Authorization** menu. The default password of these commands is **ProgramProtection**. For more information see the **Help** of the **Authorization** dialog and check **Transfer License**.

2.2 Hardware keys (USB or parallel dongle)

Do not insert your USB device before installing the software.

Installing the USB device

When you install the software, the driver needed for your USB key is installed as well.

After installation you will need to restart your computer.

After installation, when your USB key is first plugged into the USB port, the system will ask you to identify it.

Choose:

- Look for software associated with the USB stick, then
- Install software automatically, then
- OK/Next.

Do not insert your USB device before installing the program!

Installing the parallel port

When you install the software, the driver needed for your parallel port is installed as well.

After installation you will need to restart your computer.

Plug your hardware key into the parallel port. If you have a printer, connect it through this key.

2.3 Deleting Registry Settings

Every dialog box has a Default settings button in it, whereby you may save your settings. These setting are then applied as default settings at the next start up of the software. Individual projects retain their own specifications, these may differ from the default settings. These settings are stored in the Windows registry and may be deleted by REGEDIT.

The entries can be found by the following path in Registry:

```
HKEY_CURRENT_USER
  + SOFTWARE
    + DESIGNSOFT
      + ARCAD for Windows
        + n.00
```

Use this function cautiously.

The + shows an additional level of the hierarchical structure of the registry. Click on it to open its contents. Choose the n.00 level and hit **Del** to remove its content.

ARCAD should NOT be open and running when performing the above steps.

2.4 System requirements

- IBM PC 586 or compatible (high speed processor, if possible)
- 1 GB of RAM
- A hard disk drive with at least 500 MB of free space
- Microsoft Windows 9X/NT/2000/ME/XP/Vista or later

Recommended configuration:

- IBM PC Pentium or compatible
- 2 GB of RAM
- A hard disk drive with at least 1 GB of free space
- Microsoft Windows 9X/NT/2000/ME/XP/Vista

OpenGL 3D accelerator (v1.0):

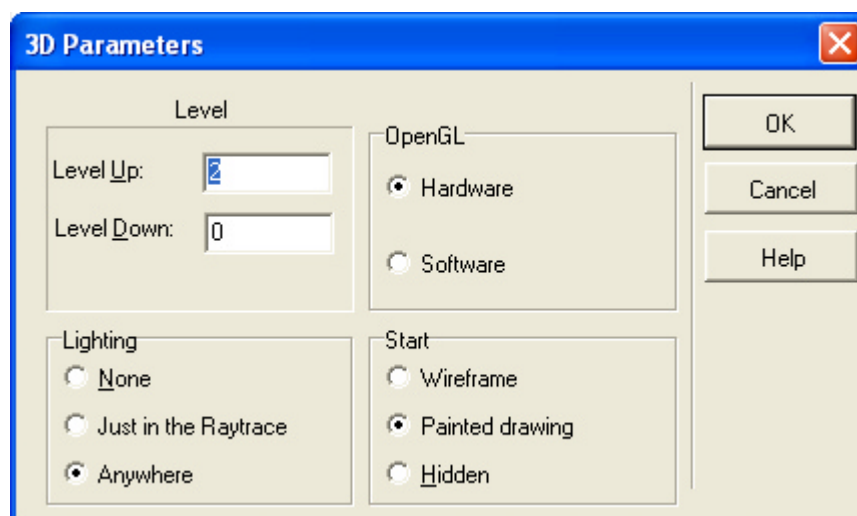
- ASUS TNT2 accelerator
- (800*600 or higher DPI resolution, 16 bit or higher Color resolution)

We advise you to use a graphical card that supports a fully functional OPEN GL.

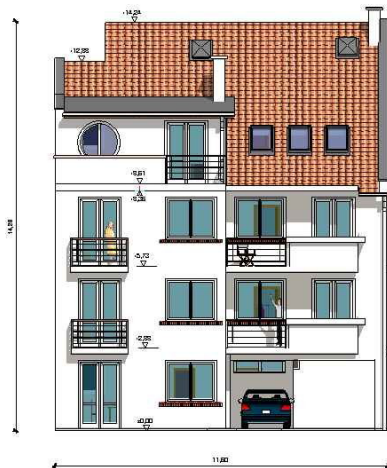
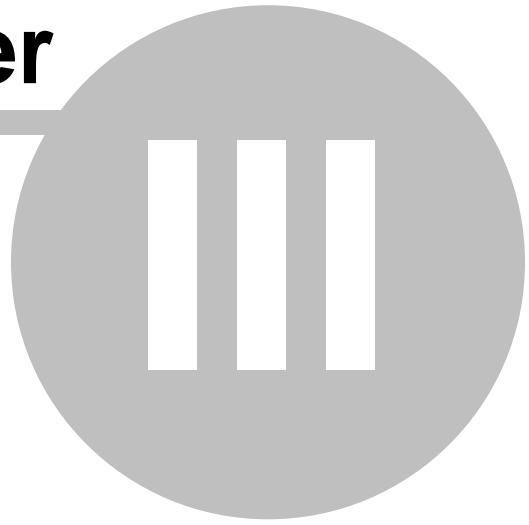
2.5 OpenGL video card when running 3D graphics.

The software uses the OpenGL video card when running 3D graphics. For running the software properly you should have the card's latest driver installed on your computer. This can be downloaded from the website of the card's manufacturer. When running 3D graphics it is possible that the software does not support your computer's OpenGL card. In this case you may inactivate the graphics card, in the following way:

In 2D mode: within the 3D menu click 3D parameters, then choose OpenGL/ Software.



Chapter



3 The Basics

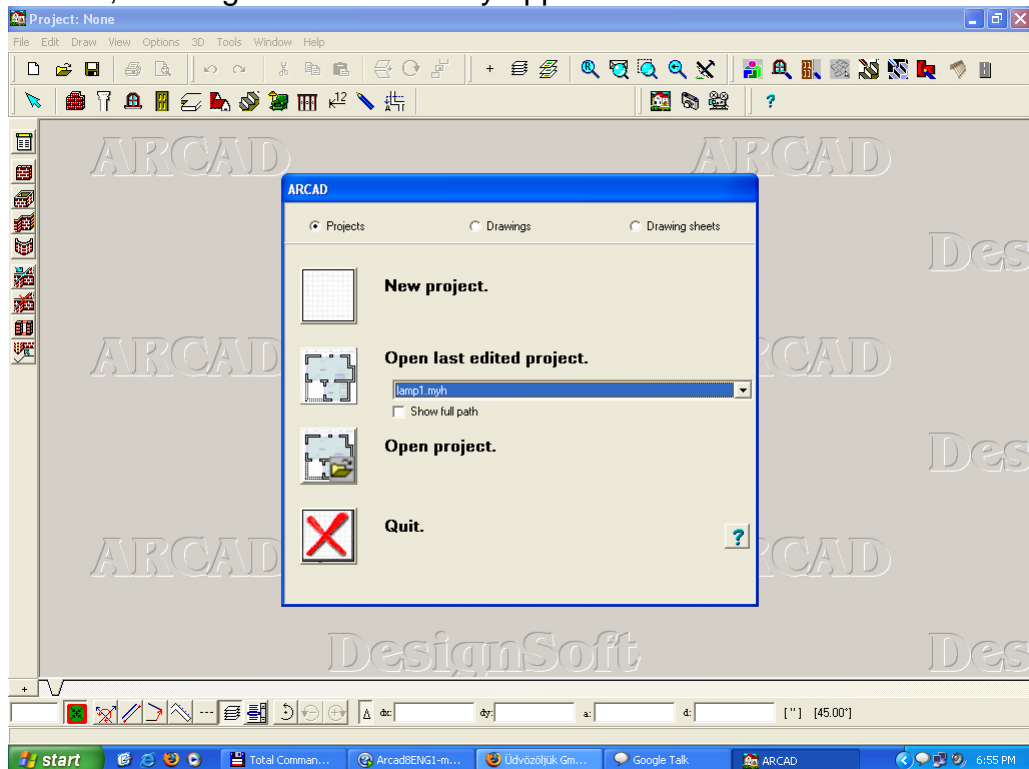
In order to help you learn to use the software quickly and easily we show you its basic functions through a simple example.


We only go through the options and steps necessary for this project, without giving a complete survey of the software.

The detailed descriptions of all options can be found in the Help files. In the following you will be guided through the basics of floor plan editing, 3D functions and the graphical editor module.

1. Level manager
2. Walls
3. Dimensioning
4. Door, Window
5. Slab
6. Symbol library
7. Stairs
8. Roof
9. Columns
10. Internal and external 3D visualizations
11. Sectional views
12. Graphical Editor
13. Creating Movies
14. Playing movies

After starting the software you can begin designing a new building. After starting the software, a dialog box automatically appears.




Choose the icon **NEW PROJECT** , then specify a name for it (here: TRAINING-cm). The software automatically opens an empty level, with the name Level-0.

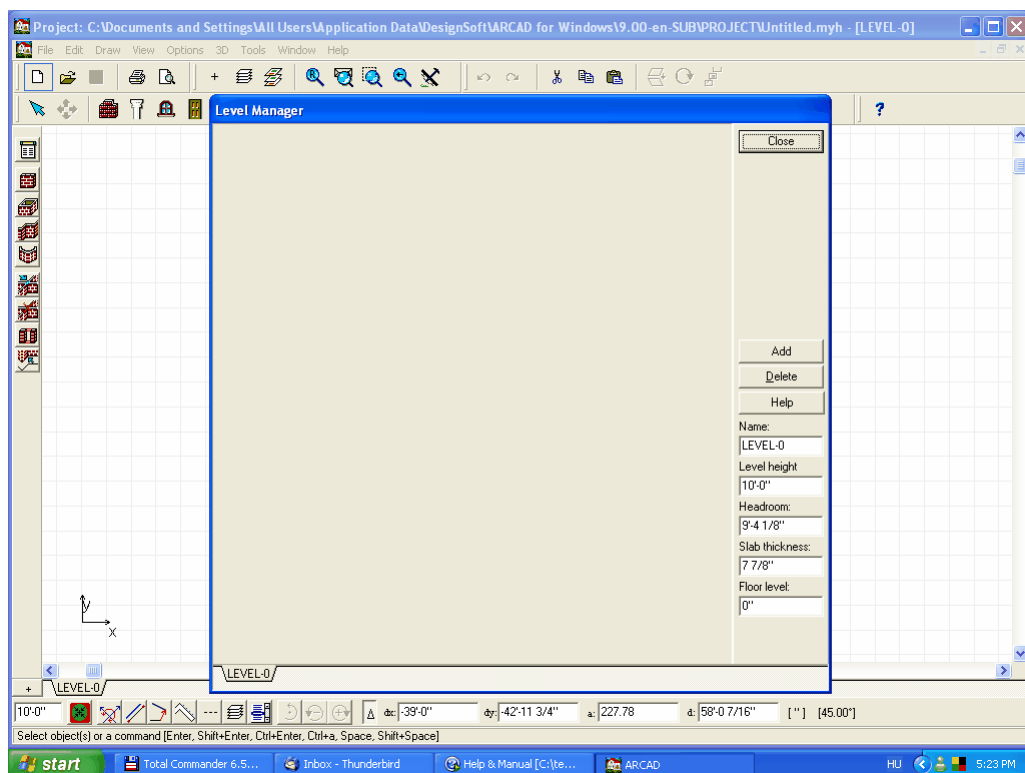
The project can be identified later on by its file name, displayed in the upper row. The name of the window (LEVEL-0) may be modified by the Level Manager, whereas the file name can be specified when saving the project.

Note: Pressing Ctrl+F2 during editing entails an automatic saving of the project, with its momentary name. Therefore, it is practical to specify a file name immediately after starting the project. Thus, pressing Ctrl+F2 saves the project by the defined name, and to the desired folder. Furthermore, following default settings, an automatic saving is done every ten minutes, by the name Autosave-name-date-time.

In the provided sample project, the project TRAINING is used, found on the CD.

3.1 Level manager

Before starting the designing itself you should first specify the level parameters by the Level Manager. The Level Manager can be opened by the  icon, found in the lower left corner of the window. Here you may adjust the characteristics of existing levels, such as level height, interior height, slab thickness, floor level. Level height, interior height and slab thickness are interdependent parameters, they are calculated (and adjusted) from each other automatically by the program.



Level Manager dialog box

In Level Manager you rename the level as GF (ground floor). After typing in the name hit Enter and the window is renamed (the GF sign is displayed on the slot). You may modify the floor level too (5 centimeters), which changes the position of apertures in 3D.




Note: The apertures are raised in 3D by the value of the Floor level, though

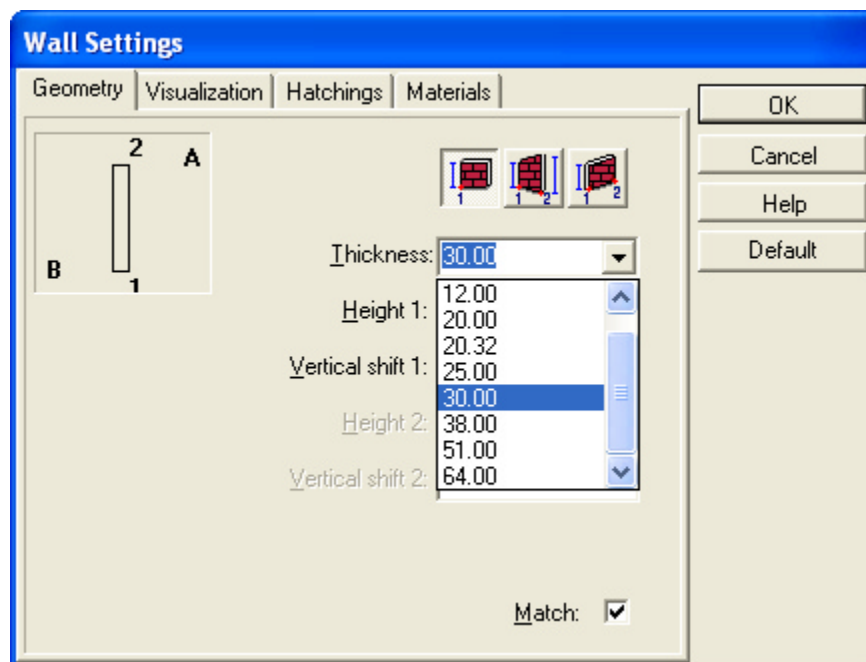
parapets remain at their original level in 2D. If you use multiple insulating layers within the layer, you should leave the Floor level at 0, and rather modify Floor level settings later on, from the right click menu (opened by right clicking on walls). This way, it is the actual slab thickness that determines the floor level in 3D.

The adjusted Floor level determines the 3D view in other ways as well. If you design a multi-level building, the software automatically sets the level heights and the different objects on the individual levels are arranged accordingly. Objects may extend to another level, but their positional parameters are always to be understood from the 0 level of their own level. The adjusted value for the Headroom affects the height of columns and walls. In the dialog boxes of these elements the adjusted value of the headroom is automatically displayed as their height.

3.2 Wall

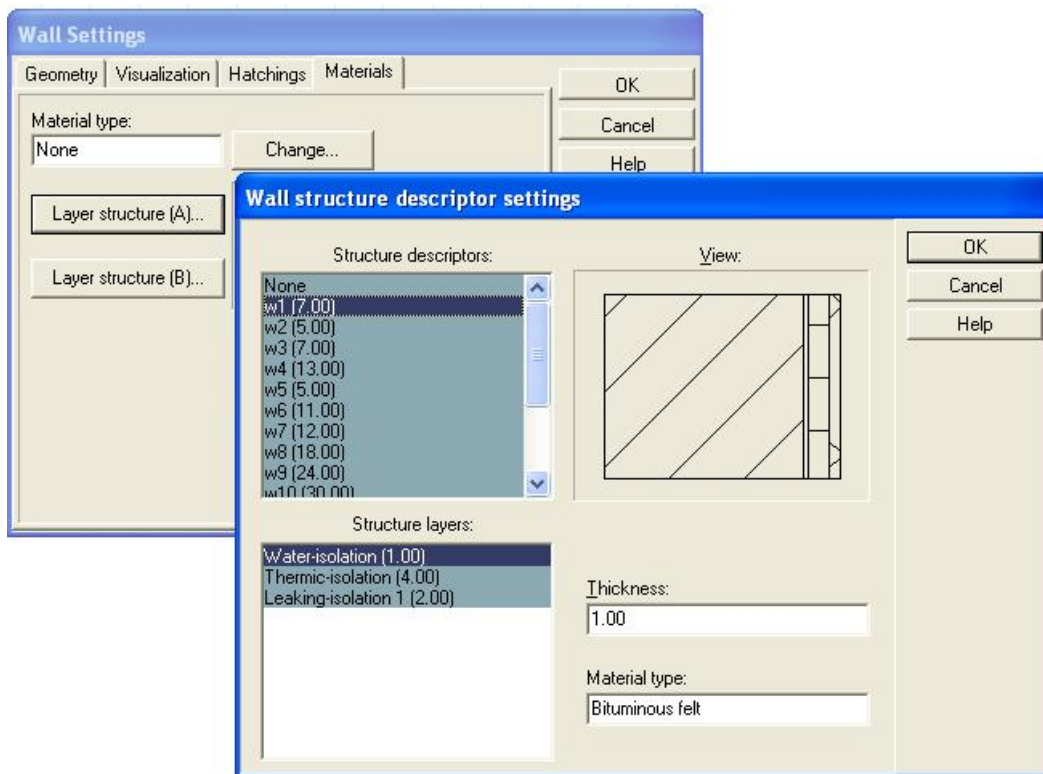


To draw a wall, click on the  wall icon, then select Draw continuous wall sections  from the row icons appearing on the left. This icon is for drawing continuous stretches of walls. Before starting to draw the wall, you may see its parameters in its dialog box. The dialog box is opened by clicking on the  icon. Go to the **Geometry** sub-window and set wall thickness to 30 cm. In order to do this click on the arrow at **Wall Thickness** that opens the slide down menu and select the desired value, or enter it manually.



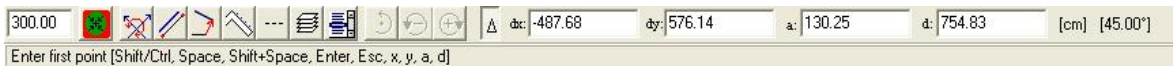
The Geometry sub-menu within the dialog box

Additional layers and materials may be added to both sides of walls, these can be selected from **Material types**. Here you should click on the button **Layer structure (A)** and select W1 from the list of materials. Then, you should do this for the B side of the wall as well.




The Material types sub-menu

After closing the dialog box, the drawing pen appears in the editing window. During editing you may follow the drawing pen's **X** and **Y** position at the bottom of the screen, in the fields **dX** and **dY**.



These two fields help you in positioning new elements precisely. In the line below, you can see text messages concerning editing. For example, the software would

prompt you to put down the first point of the wall, after selecting the  **Polygon** wall icon.

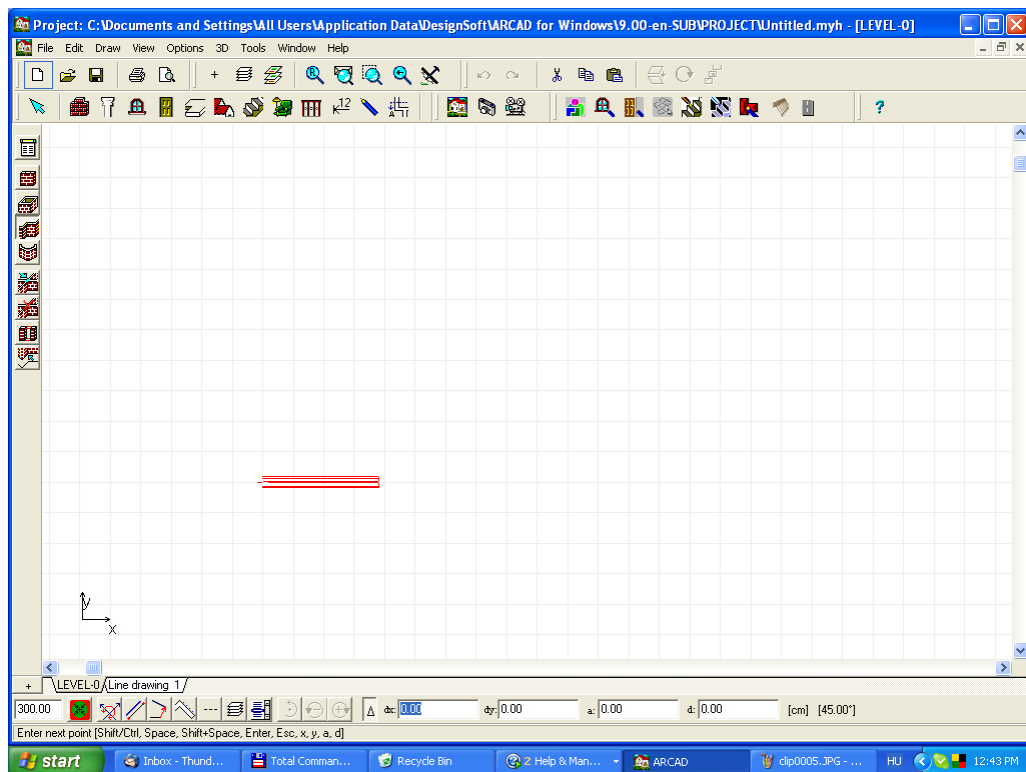
The **X** and **Y** values displayed are to be understood from the defined point of reference. This point is indicated by a small red cross in the editing window. Put down the first point of the wall.

You should choose a position that makes it easy to put down the second point as well. After putting down the first point the fields **dX, dY, a, d** are readjusted to **(0,0,0,0)**, and it is defined as the new reference point. The values displayed in the fields **dX, dY, a, d** enable you to determine the exact coordinates, orientation and length of the wall sections that are being created. By moving the mouse around and following the changing of the X,Y coordinates, of the orientation in the field **a** and the length of the wall in **d**, you may easily select the second point.

After putting down its first point, the designing is helped by a rubber line showing the would-be shape of the wall. Within the rubber line an axis can be seen, relative to which wall thickness is defined. Pressing Space will modify the wall's structure, as the wall is toggled to the right/left of the axis. The total thickness of the wall is not modified by toggling. Overall, walls have 5 defining parameters: 2 edges, 2 layer edges and the axis. You can transpose the layers on the two sides of a wall by using **Shift + Space**.

In the present example the layers on the two sides are identical, so no change can

be perceived this way. After adjusting the wall's thickness enter *Data entry* mode by pressing X. Here you may enter the wall's length by numerically specifying its value in **dX,dY,a,d**.



Creating a wall by defining its parameters


Let the first wall be 2,90 meters long and have a horizontal orientation. The software uses centimeters as its default unit of measurement, therefore you should enter 290 for x and then hit Enter. Repeat this to define the other walls of the building. Before pressing down X or Y you should check the wall's thickness, and readjust it, if needed. The rubber line may be moved by the mouse too.

The entered data is always applied relative to the reference point.

Let us use the following set of data here:

Y=-290, X=360; Y=290, X=80; Y=190, X=-80; Y=160, X=-650 cm

For the last wall section you do not need to enter its data, as the software automatically matches it with the first point, if you drag it in its proximity by the mouse.

To create an inner wall, choose the icon  **Single** walls. By this feature you can design single walls by putting down their two end points. After putting down the first point a rubber line shows the length of the prospective wall section. The width of the wall may be shifted by **Space**. The matching of new walls with the existing ones is carried out automatically, if the **Snapping** options are not switched off.



The orientation of the wall may be adjusted with the **Ortho** icon, with the key combination **Ctrl O**, or with holding down **Shift** or **Ctrl** and rotating the wall manually. With the **Ortho** option on walls may only be adjusted in an orientation of **0,45,90...** degrees.

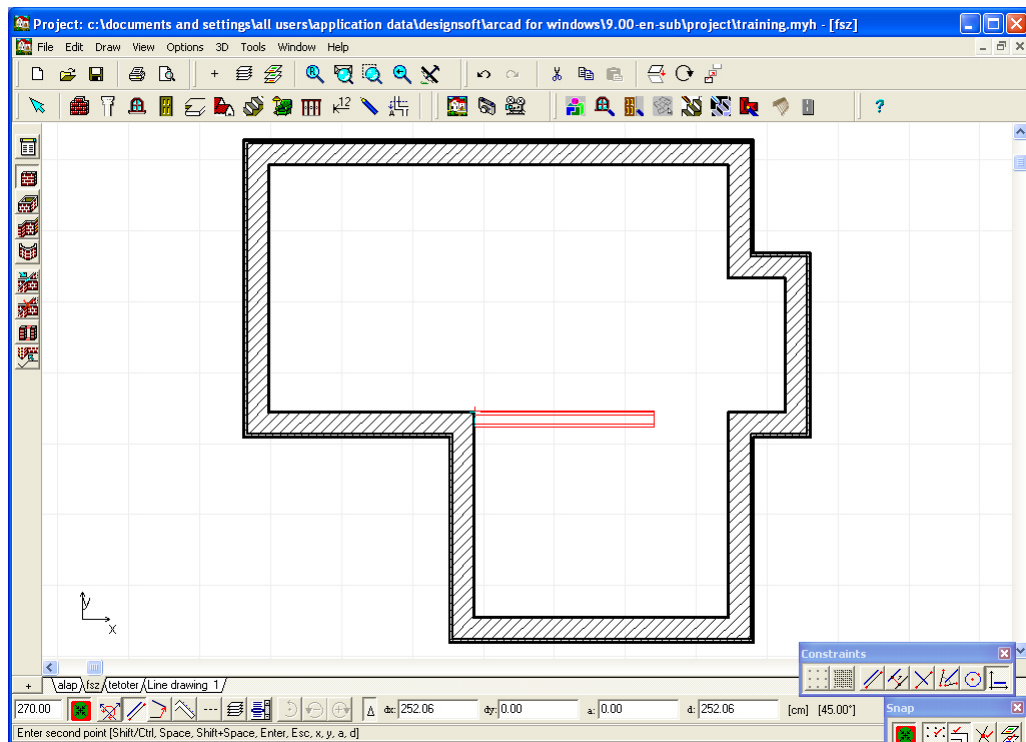
The automatic matching of walls with the grid can be switched on by **Options/Snap/Catch gridpoints**.

Create an inner wall and try out the other icons for drawing walls as well.

Note: After hitting the buttons **X,Y,a,d** you may enter the length of the wall by entering its values numerically.

You can change between the fields by **Tab**, **Shift+Tab**. After entering two of the four values hit **Tab** and the remaining two are automatically calculated by the software. The wall is visualized after pressing Enter.


Do not move the mouse when doing this.



Creating an orthogonal wall section with matching options on.

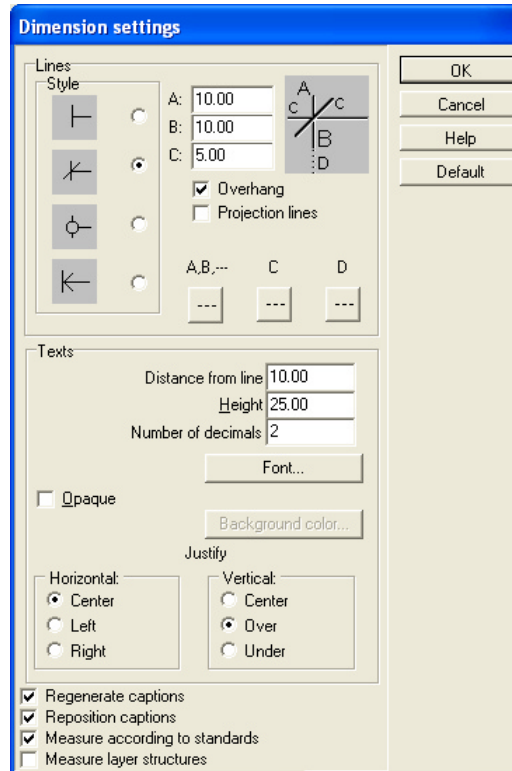
3.3 Dimensioning

It is practical to introduce dimensioning structures after the first walls are set up, which will guarantee that the drawing is correct. You may also use dimensioning lines that are automatically readjusted when modifications within the plan take place.

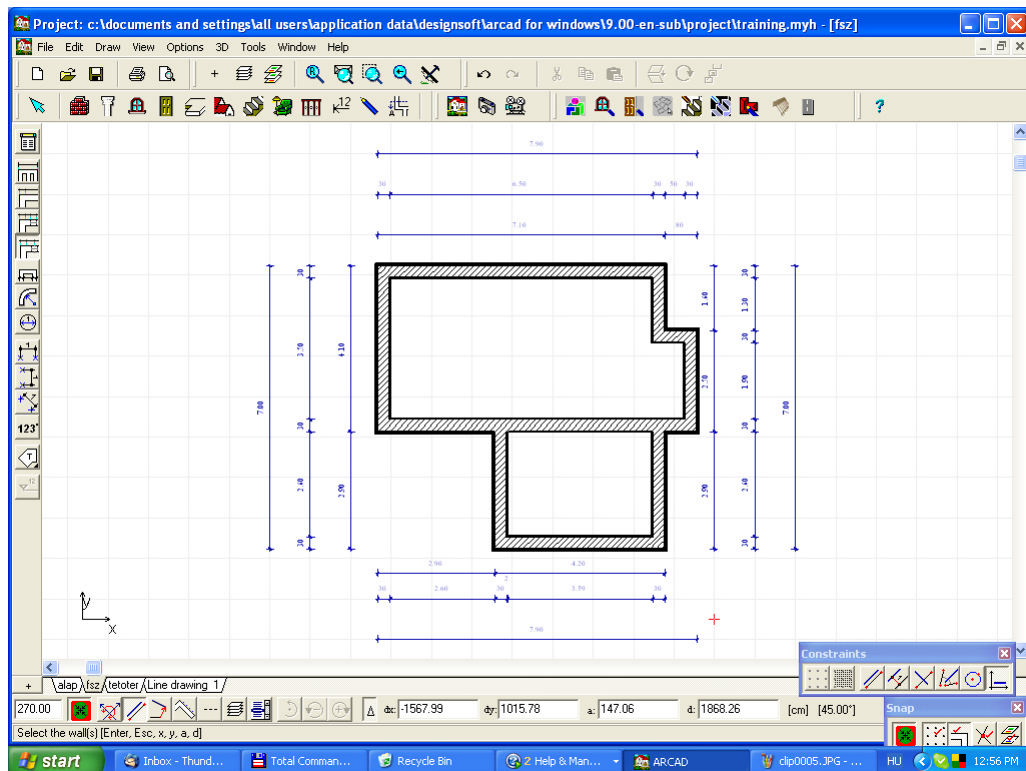
Press down the  button and the different dimensioning icons appear. The fourth icon from the top is Dimensioning axis for apertures. Click on it and select the walls to which you want to assign dimensioning lines, then define the dimensioning line by putting down its 2 end points. See to it that the wall section is within the 2 end points of the dimensioning line.

The data of the walls and apertures are projected onto the dimensioning line. Introducing new apertures automatically makes their parameters appear on the dimensioning lines. This kind of dimensioning is called associative. When using associative dimensioning new elements and modifications are always automatically displayed on the dimensioning lines. Eg. removing/repositioning a wall removes/repositions its dimensioning structures too. The same applies to apertures (windows, doors). Dimensioning settings (line style, font etc.) may be

adjusted by clicking on the small notebook icon at the top of the row.



The dialog box for dimensioning settings



Introducing dimensioning lines

After putting down the 4 internal dimensioning lines, click on the **Overall**



icon to set up dimensioning lines for the whole building, then go on to **Detailed**

and **Aperture Axis** icons. In all of these operations you should put down dimensioning lines that are longer than the measured wall sections. You can also select walls (or other building structures) by encircling them. You may reposition dimensioning lines by clicking on their axis and moving them to an other position. This way you may only move dimensioning lines parallel to their original axis.

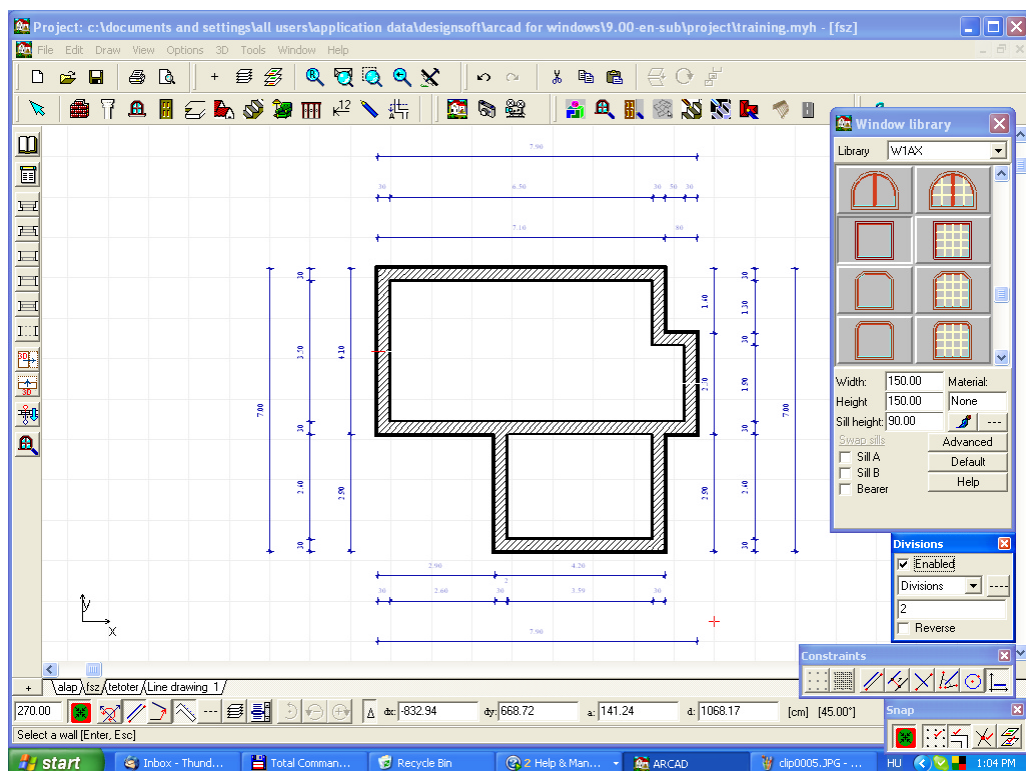
3.4 Door, window

You can insert windows and doors into the new walls. After clicking on the

Window/Door button the relevant icons appear on the left. The different kinds of doors/windows are stored in graphical libraries. After clicking on the door/window icon the graphical library opens automatically. Doors (windows) are sorted to groups (**BTN** files). All doors/windows are modifiable, they may be introduced to the floor plan in different sizes/colors. Besides, you may create new doors/windows and organize them into new libraries. You may change between libraries by clicking on the field showing the name of the given type of window/door and choosing the name of the desired folder.

Choose the window 212 from the folder W1A and put one in the middle of the wall. In order to do this, first select the window from the library, then click on the wall it is to be inserted to and position the window to its desired location.

In order to position the window to the middle switch on the function **Division mode determination**, and set it to Divisions=2. This function automatically displays the middle point of walls. Insert the windows. The middle point is always calculated from the corner points.



Putting a window to the center point of the wall

Note: In the graphical menu the parameters of apertures may be modified by overwriting the original values and hitting Enter.

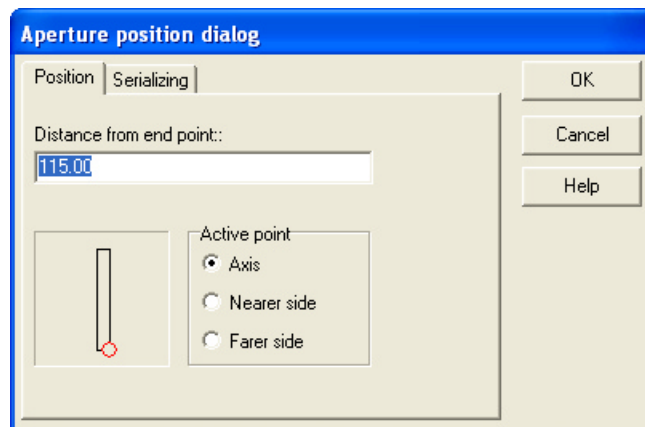
Positioning the aperture at a given distance from the wall's end point is possible in the following way: hit X or Y while moving the window along the wall. A dialog appears. Here you may select the given corner point and specify the distance. You may also set here whether you want the aperture's end point or its center point to be at the defined distance from the wall's end.

At this point set the window's axis to be 180 centimeters away from the right hand end of the wall (see below on the picture).

After putting down the windows let us insert a door into the wall. Choose the door 272 from the library D1A and insert it at the middle of the wall as shown on the picture.

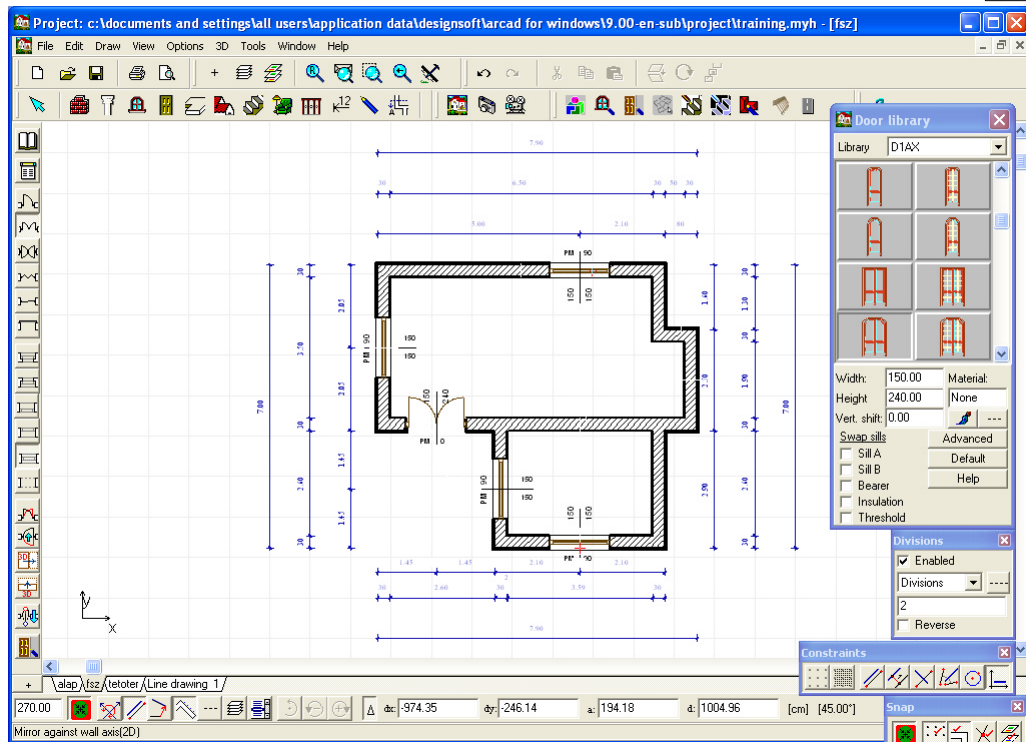
Note: You may also add sills or bearers to the windows. To doors it is possible to add insulators, bearers or door-sills. These structures are visible in sectional views as well.

The end point of the wall (from which you want the distance to be calculated) can be selected by simply clicking on it in the dialog box.




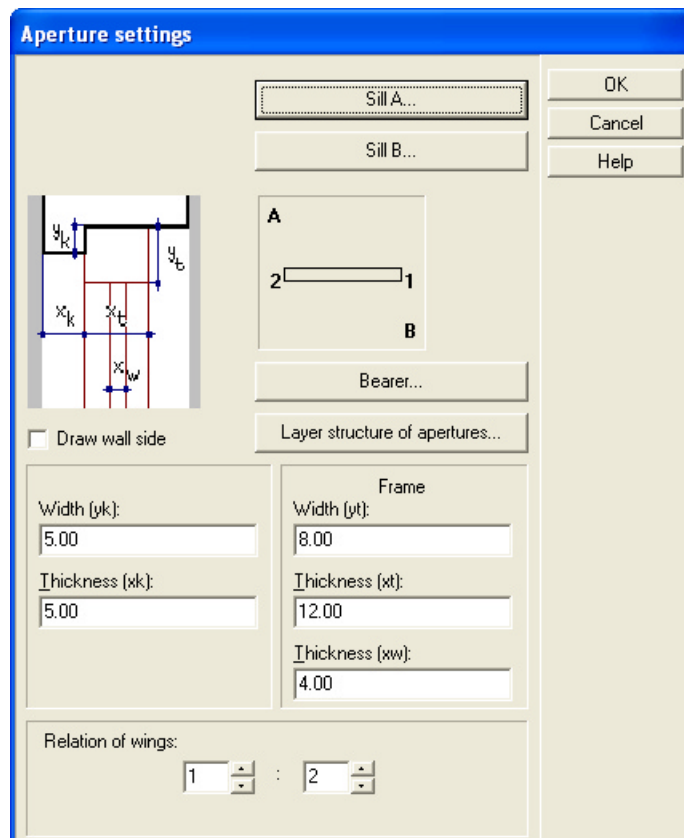
Positioning the window at a specified distance from the wall end

From the different door icons on the left select the icon **Double door with unidirectional swing**.

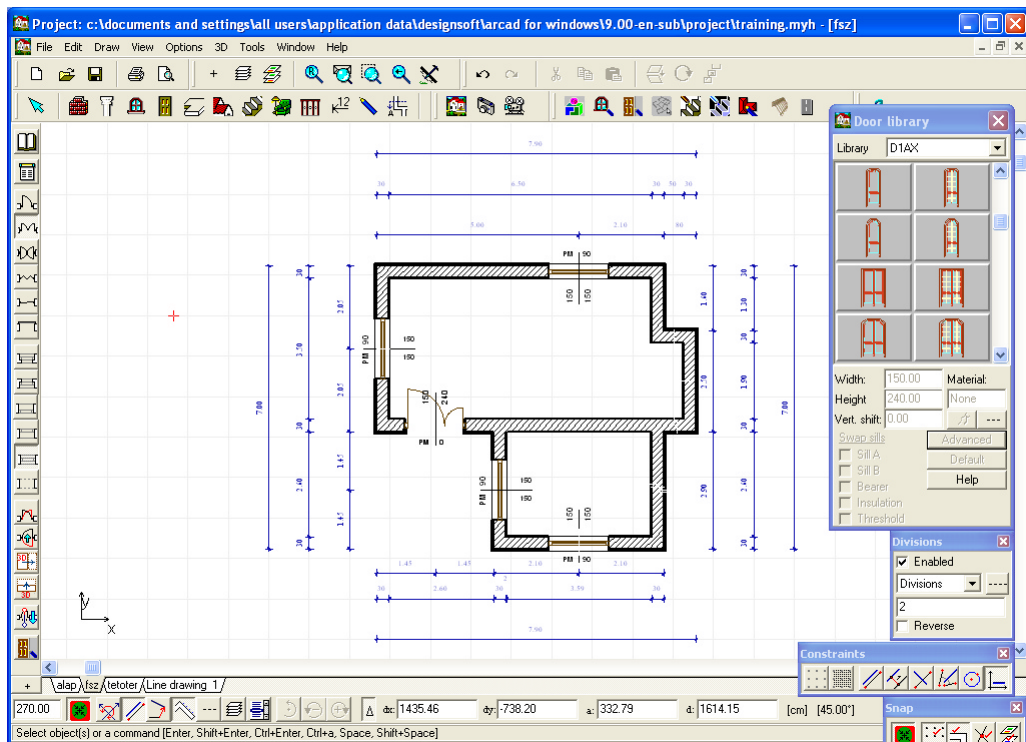


Positioning the door in the middle of the wall

You may change the door's swing direction , its sill or its dimensioning lines as well in the graphical library window. You may also change the size of the door wings. The inserted door may be selected and modified as well. Its dimensioning lines may be selected along their axis. Elements that are superimposed on each other may be selected by right clicking on them and choosing the element to be selected from the list **Selectable items**. Select the door. Now you may also modify the wings' proportion to each other, the bearers etc in the dialog box opened by **Properties** in the right click menu (this reopens the graphical library menu).



The Properties/Advanced dialog of a double door



The floor plan after the insertion of the apertures


Note: Note that after the insertion of the apertures the size parameters appear on the dimensioning lines.

Note: In the dialog box opened by Properties/Advanced/Bearer you may also specify the parameters of bearers. These changes are automatically displayed on

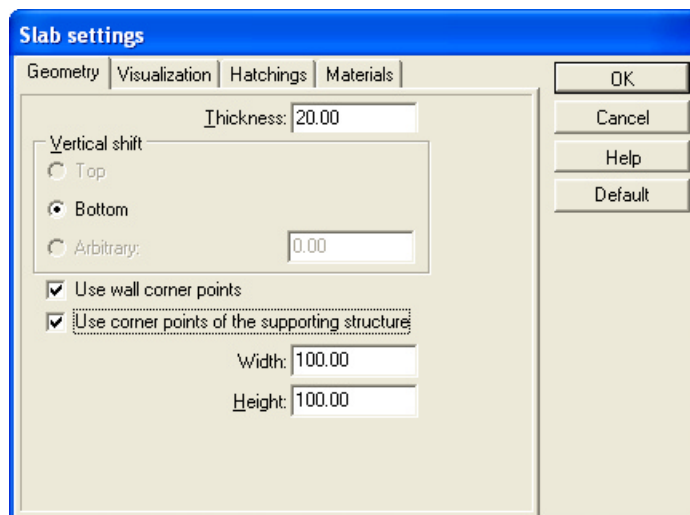
the floor plan and sectional views. You may also assign colors to the bearers for sectional views.

3.5 Slab

Slabs consist of a supporting structure and additional layers added to their lower/upper/lateral sides. With the addition of these layers you ensure that the slab layers are visible on sectional views. You may assign different kinds of patterns, which are displayed on sectional views.

To create a slab select the  **Slab** icon from the upper row of icons. The different slab-related icons appear on the left. Separate icons serve for creating the slab itself, for adding extra layers etc.


In our example let us introduce a 20 cm thick slab under the building, complemented with an arched terrace. To design such a structure you need to select the **Polygonal shaped** slabs icon from the icon row (see picture to the right). The parameters of slabs may be adjusted in the dialog box opened by selecting the slab and choosing **Properties** in the right-click menu. Within the dialog box, the **Geometry** sub-dialog enables you to adjust the thickness and the scope of **Vertical shift** assigned to the slab, (which means shifting of the slab from the standard floor level).



The dialog box of slabs

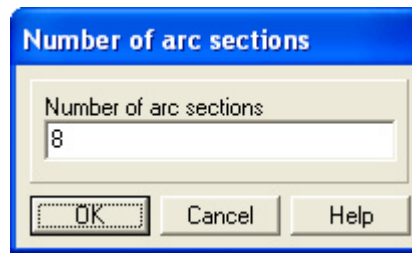
In the **Materials** submenu you may adjust a material for the slab, and you may also add additional layers to the edges of the slab. There are two subtypes of additional layers: **Layers on the sides** and **Wall layers on the sides**. You may add layers that are made of the same material as the walls. These may be added by right-clicking on the slab's edge and choosing **Set wall layer structure of edges** from the menu, here you may assign the wall's layers to the edge.

In our example let us assign the W5 layer to the edge. You may also add extra layers to the edges. These may be added through the option **Set wall layer structure of edges** (found in the right-click menu). Choose the layer **Insulation1**. To design the polygonal shape of the slab, you have to put down its corner points. The Snapping option automatically matches the slab with the walls.

After putting down the first point of the polygon the **Creating arcs** icon  is turned on (found in the icon row at the bottom of the screen).


Click on the icon and then proceed to adjust the arc by putting down its third point.

After clicking on the **Creating arcs** icon press down the right button of the mouse and in the upcoming dialog box you can adjust the **number of arc sections**.



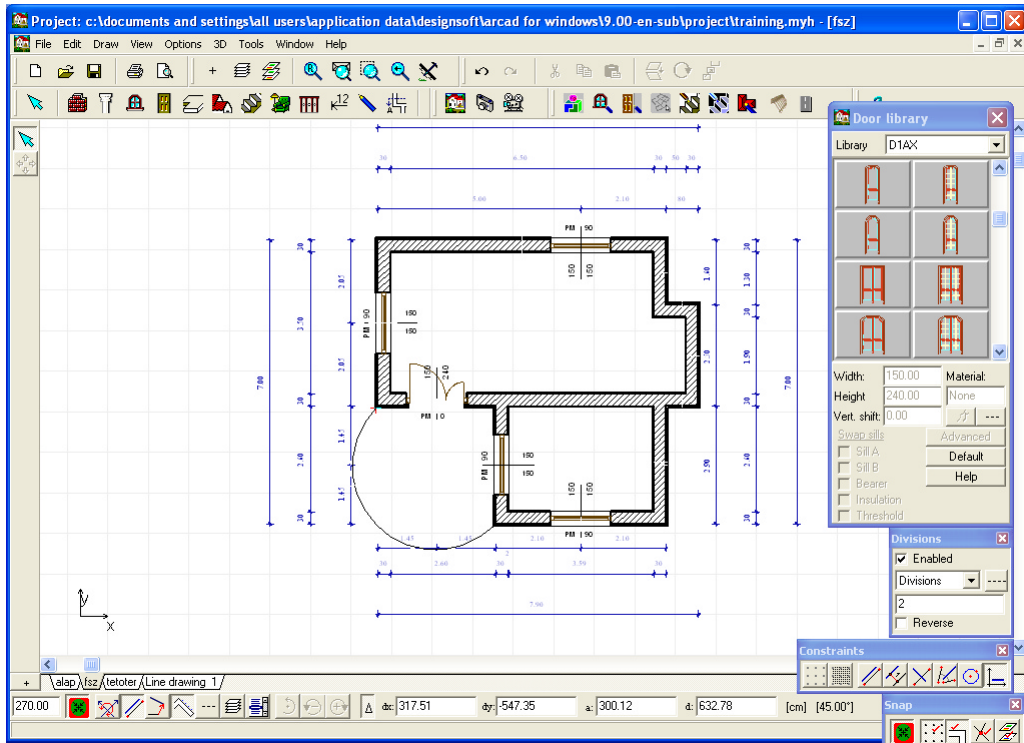
Defining the number of arc sections

When drawing the polygon it is not necessary to return to the starting point, you may also complete the polygon by double clicking at the last corner point. It is advised to close the polygon this way, as you avoid the possibility to create “loops” around the starting point by misplacing the end point.

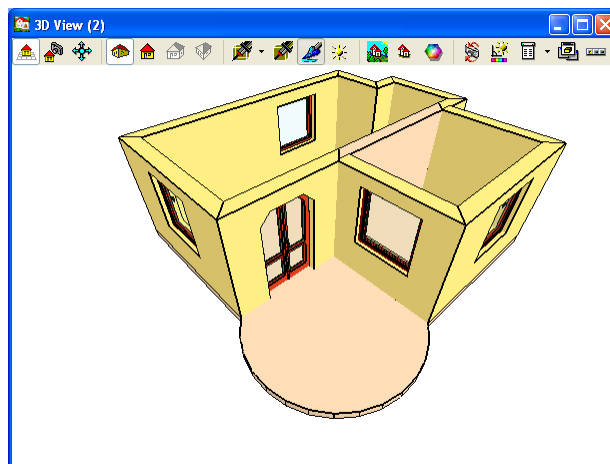
Note: If the slab overlaps entirely with the building it is practical to use the function **Room shaped slab**. Click on the  icon, move the cursor next to a wall (from the outside) and left click once. Then the software automatically determines the shape of the building and generates a slab that matches it exactly. In this way you may also calculate the surface of an area, or generate a roof contour.

You may modify the slab's parameters by selecting it and then double clicking on it, opening its dialog box. If you only want to modify a certain edge of the slab, then right-click on the given edge and choose the relevant command in the right click menu (Set layer structure of the edge etc.).

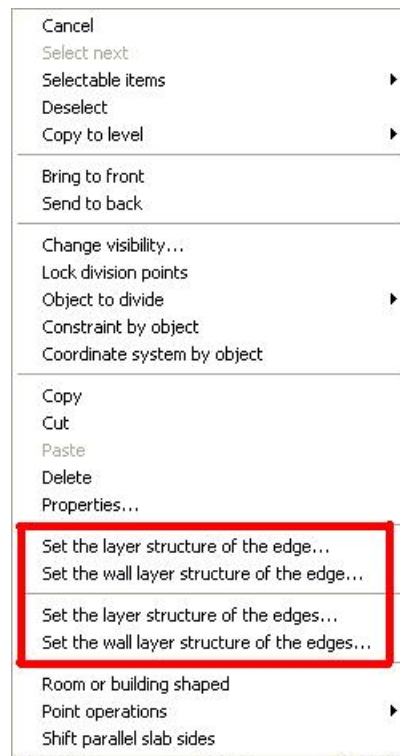
Note: New edges may also be introduced into the slab by right clicking on it and choosing Point operations/Point insertion. The corner points of slabs which were not automatically generated may be freely repositioned. In the right click menu you may also switch on/off the modifiability of slabs.







The slab on the floorplan

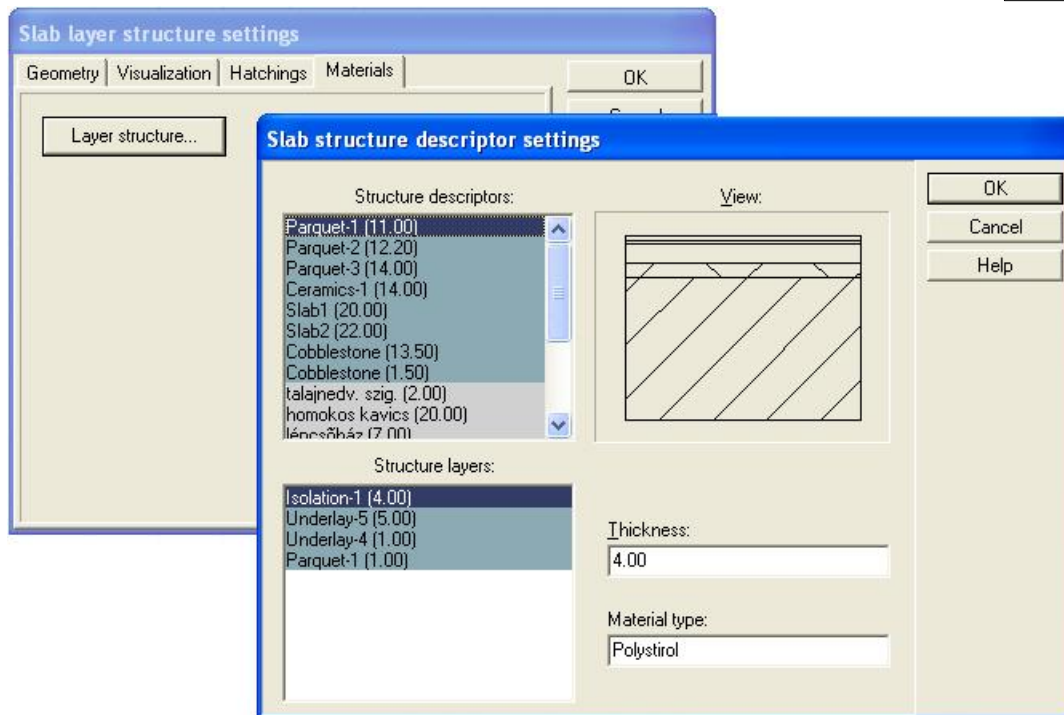


The 3D view of the building without the upper slab




The right click menu with the slab layer commands

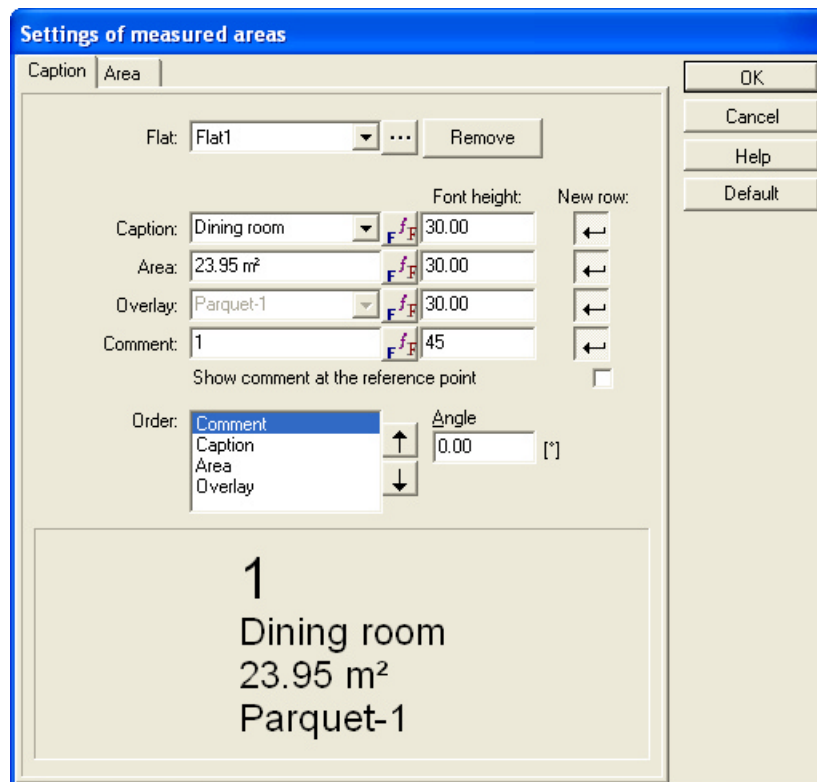
Additional layers may also be added to the upper or lower surface of slabs. The surface may be divided into several subparts and insulated by different materials, according to the internal division of the building, or as defined by yourself. This may be done in the following way: click on the icon **Draw lower slab layer structure**  or **Draw upper slab layer structure**  and then select the icon **Room-shaped**  from the slide-down list. In the dialog box opened by clicking on the  icon go to **Materials/Layer structure** and choose a layer from the list.



Slab layer structure dialog box

Choose *Parquet* for one room, and *ceramic flooring tile* for the other. In the **Geometry** sub-menu switch on **Create area label**, which makes the area of each room displayed automatically, with the designation of the assigned extra layers as well. In the **Visualization** sub-menu you may assign different patterns and line styles for sectional contours and layer boundaries, and a surface pattern for 3D visualizations.

After clicking on the  icon, select the slab by a single left click. The contour line of the slab is highlighted. Then proceed by clicking on the surface to which you want to insert the layers. The dialog box **Settings of measured areas** appear (here: living room).



The dialog box Settings of measured areas

The text to be displayed on the given surface can be entered in the **Captions** field. A list of premises is already provided.

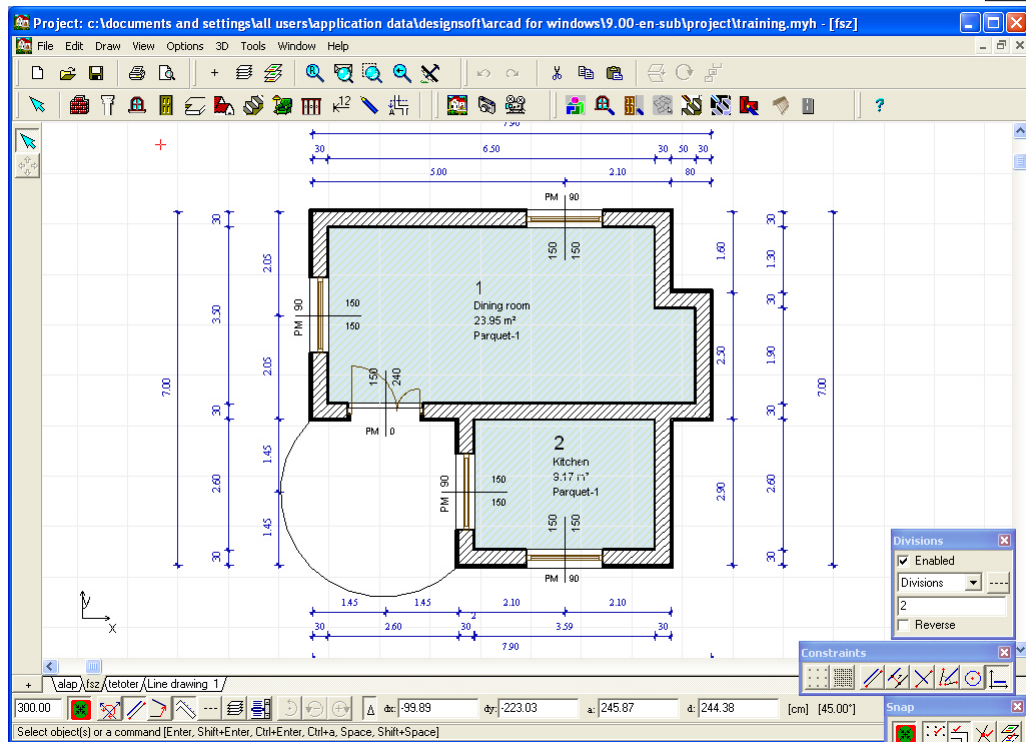
You can easily choose between the different items by entering the first letter of the desired item. (The list is stored in the LIB library, in the form of the ROOMS.DAT TXT file, and may be expanded by WordPad) The sequence of items may be changed by selecting a given element and moving it by the arrows found to the right of the field. The final layout can be seen in the bottom window.

Apartments may also be assigned to the house in the field at the top.

It is practical to use this feature, as the program carries out the **Listing of materials** by apartments, and disregards premises not classified as apartments.

Put on the coating layers of the two rooms and have a look at the plan in 3D view. To modify slabs, first select the edge and then right click on it.


Depending whether you want to impose extra layers to only one or to all edges choose **Set the layer structure of edges** or **Set the wall layer structure of edges**. By clicking on one of these features an extra lateral layer and the wall layer is assigned, these being visible only in sectional views.



2D view of the building with slabs, measured areas

3.6 Symbols

Pieces of furniture, decorative elements for façades and other objects may also be inserted into the plan. These objects (symbols) are grouped into different categories according to their function and usual locations.

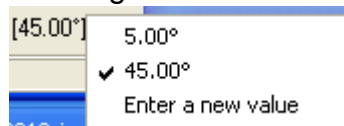
You may change between the libraries (after clicking on the  icon) by clicking on the arrow in the upcoming **Symbols** window opening the slide-down menu, and choosing the desired category.

You may also change between the categories by clicking on one of the icons that appear on the left (after clicking on the  icon).

Choose the S25 item from the SABLON (Template) list.

The floor plan representation of the symbol appears, which you may move to any location. It may also be rotated with the +/- buttons.

The magnitude of rotational steps may be changed by pressing **Shift+F3** or on the



field at the bottom of the screen.

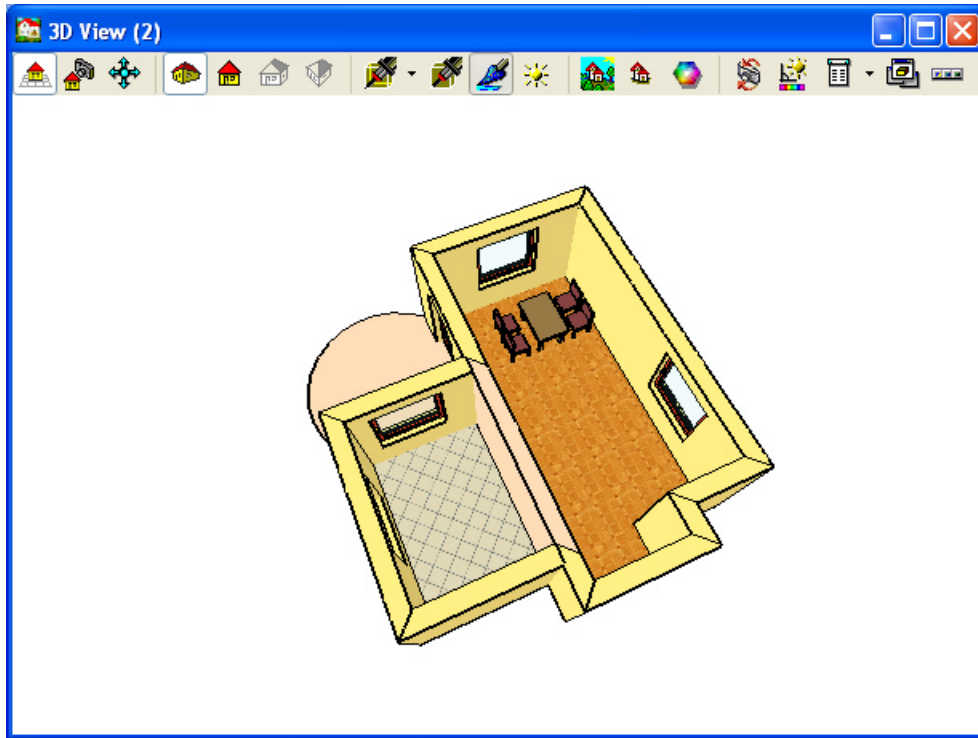
The numerical value may be specified through **Options/Rotation settings**.

In the FRAME library you may find decorative moulding for façades which can be installed around windows.

Choose the item K1515S, which is a corner framing fitting 150*150 cm windows. Set the Vertical shift parameter to equal the parapet height.


Note: that the automatic foil assignment would locate the symbol onto the FURNITURE foil. In order to avoid this choose the Façade accessories foil and then go on to insert the element at its adequate position.

Check out the both 2D and 3D visualization of the resulting changes.



3D visualization of the building with furniture and window frames.

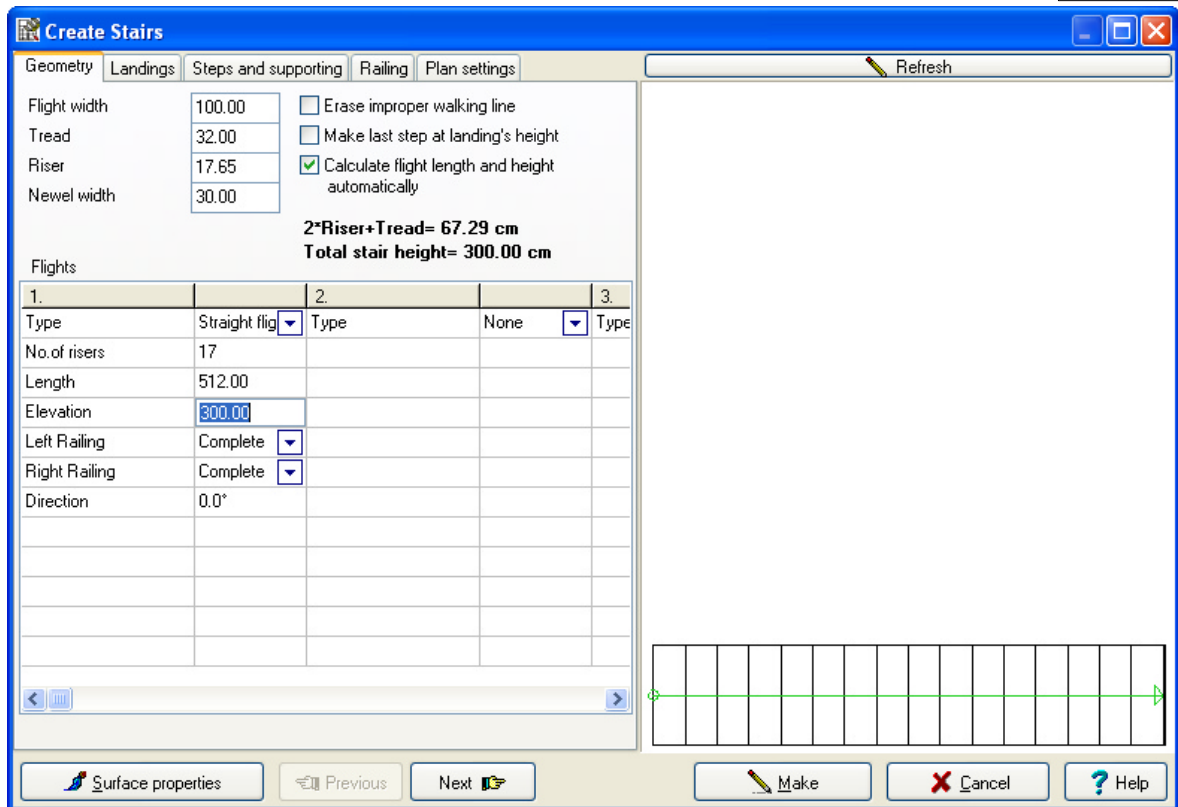
3.7 Stairs

Open the **Stair designer** by the  icon. In this project we want to design the stairs so that it will fit into the 190cm wide protruding part of the building.

Within the Stair designer you should first specify the Stairs riser, stairs tread and the width by creating a temporary straight winder.

You can do this by choosing **Straight winder** in the **Elevation** field. For Elevation enter 300 cm, and set the number of steps (**No. of risers**) to 17. Then go on to erase the pre-provided value for risers and hit **Enter**. The software then calculates the new value for the riser, 17,65 centimeters. It is always practical to have the software calculate these parameters. This is done by entering the values into the respective fields, erasing the default values pre-provided for the unknown parameters and the hitting **Enter**.

After these initial steps you may start to create the final structure of the steps. In this project let's design a **Winding flight** stairs, with a slue (turning) of 180 degrees. This may be done after selecting winding flight and then specifying Starting orientation=0, and Final orientation=180, 1st edge length=200 cm, 2nd edge length=300 cm. After setting these parameters you may adjust any value for Straight steps 1 and Straight steps 2, and the software calculates the number of steps (Straight steps).



Calculating the stairs parameters

In the Left/Right railings field you may set whether you want to have rails on only one or on both sides of the stairs and in the **Rail** window you may choose the type of railing you want. You may also draw a rail in floor plan mode, the software automatically positions rails from the symbol library at the appropriate height.

In the **Steps and supporting** window you may adjust the support structure of the stairs. In the **Plan settings** sub-window you may set how the stairs should be visualized in floor plan mode. You may resume to 2D floor plan mode by clicking

on the  icon.

Create Stairs Refresh

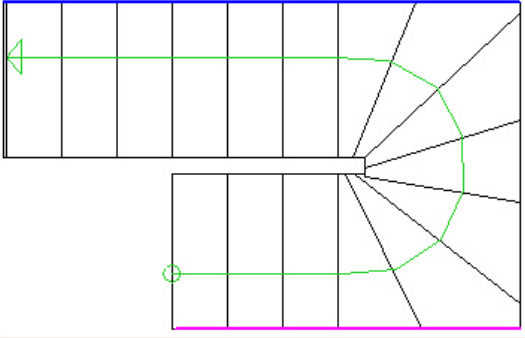
Geometry Landings Steps and supporting Railing Plan settings

Flight width: 90.00 Erase improper walking line
 Tread: 32.00 Make last step at landing's height
 Riser: 17.65 Calculate flight length and height automatically
 Newel width: 10.00

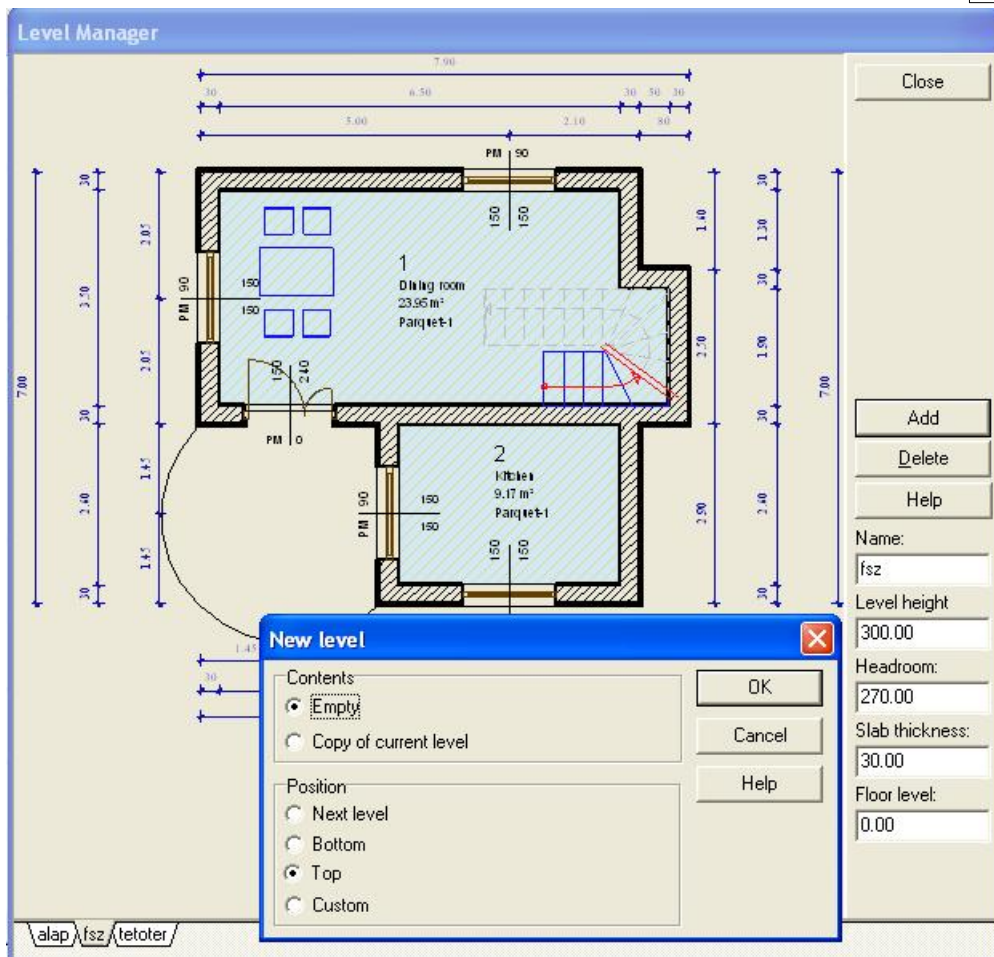
2*Riser+Tread= 67.30 cm
Total stair height= 300.00 cm

Flights

| 1. | 2. | 3. | | |
|--------------------|---|------|---------------------------------------|------|
| Type | Winding flig <input type="button" value="v"/> | Type | None <input type="button" value="v"/> | Type |
| No. of risers | 17 | | | |
| Length | 512.00 | | | |
| Elevation | 300.00 | | | |
| Left Railing | Complete <input type="button" value="v"/> | | | |
| Right Railing | Complete <input type="button" value="v"/> | | | |
| Starting direction | 0.0° | | | |
| End direction | 180.0° | | | |
| Side 1 length | 200.00 | | | |
| Side 2 length | 300.00 | | | |
| Straight steps 1 | 3 | | | |
| Straight steps 2 | 6 | | | |




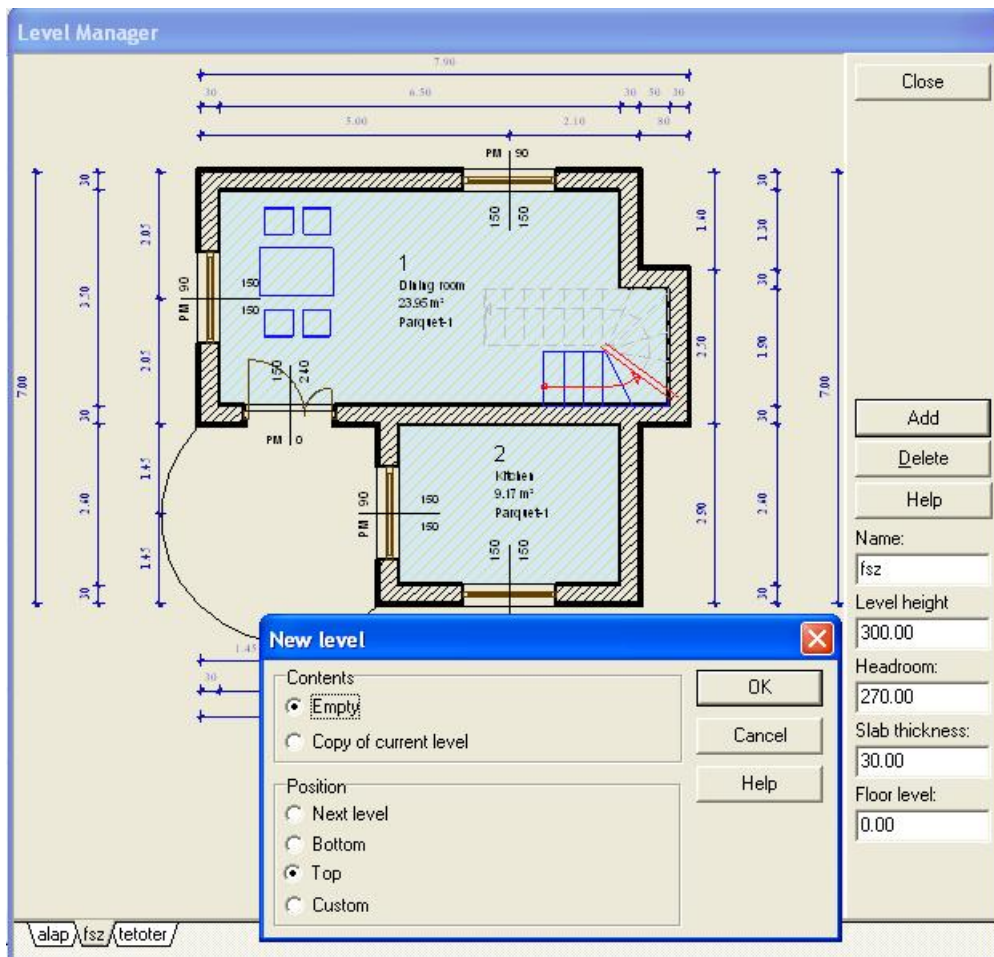
Stair designer



Level manager



3.8 New level

Let's create a further level to continue with our project. The level manager can be opened by clicking on the  icon in the lower left corner of the screen.



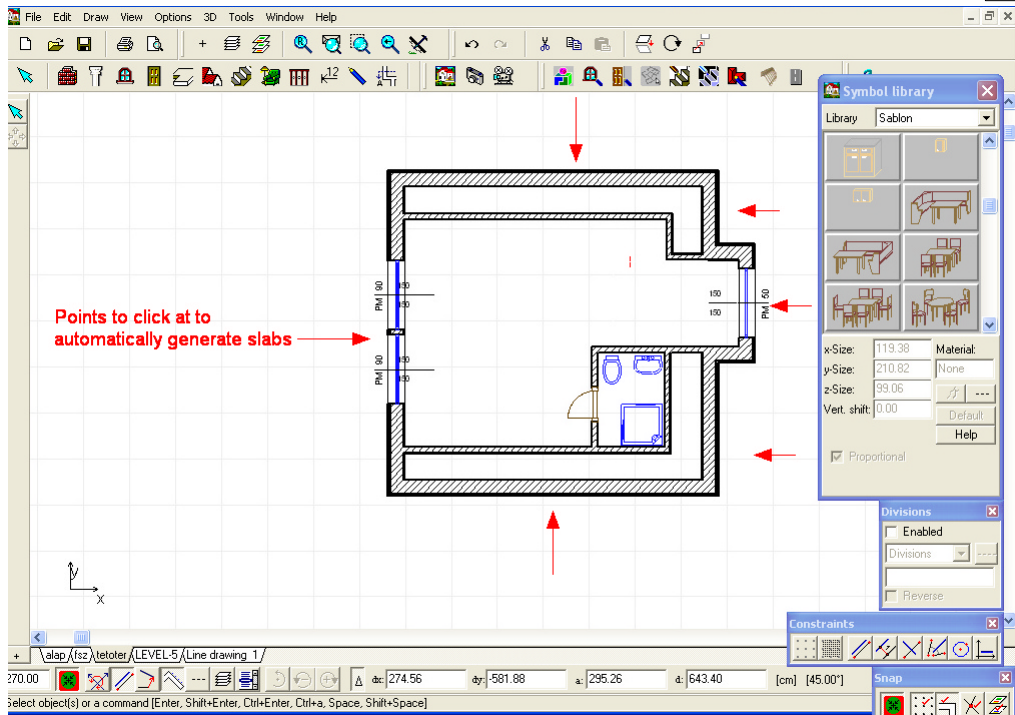
Level manager

Within the level manager you may have existing level copied onto the new one. You can also have the ground floor displayed as a foil, which guides you in drawing the walls.

Other levels can be made visible by **View/Level Foils (Shift+R)** or by the  icon of the **Foils dialog**. It is also possible to make the snapping points of the displayed levels visible by going to **Options/Snap** and switching on **Catch objects on level foils** or by clicking on the **Snap** icon (lower right corner) and then clicking on the  icon. With this option on, it is very easy to design the new walls. Go on to draw these and create the pertaining apertures and frames.

You may create a slab for the new level by left clicking along the outer side of one of the walls.

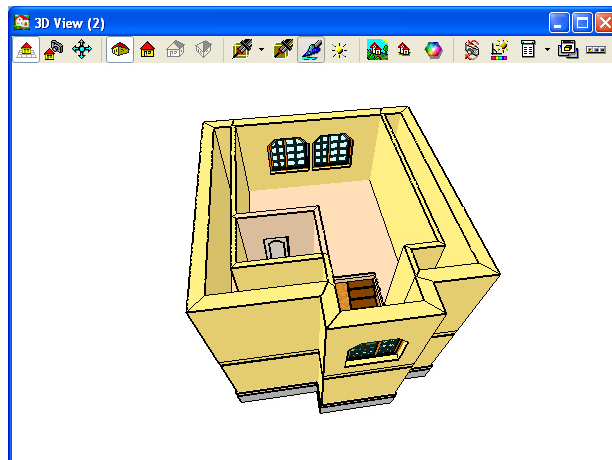
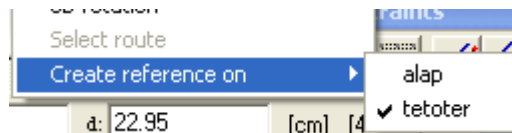
Note: Do not click at the corners of the walls.



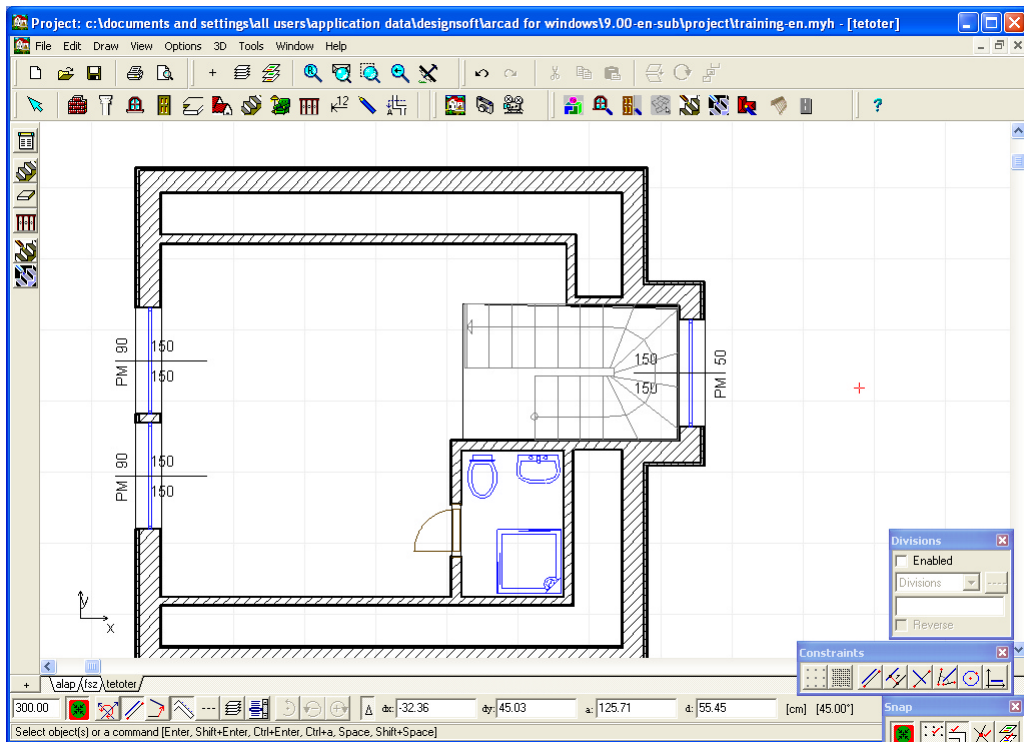
New level with automatic slab generation


You have to remove a part of the slab to make way for the stairs. In order to do this, you must have the **Level foils** feature on which ensures the visibility of the ground floor.

Note: It is also possible to import the linear representation of the stairs to another level. Select the stairs, then choose **Create reference on...** from the right click menu, and adjust which level you want it to be exported to.



2D, 3D view of the building






Removing part of a slab: Click on the  icon and define the area you want to have removed by putting down its corner points. Extra layers may be assigned to the edges of the aperture. Select an edge and choose the appropriate command from the menu.

Note: The removed part of the slab is not taken into account by the automatic measurement of areas. On the other hand, the changes are displayed in 3D mode.

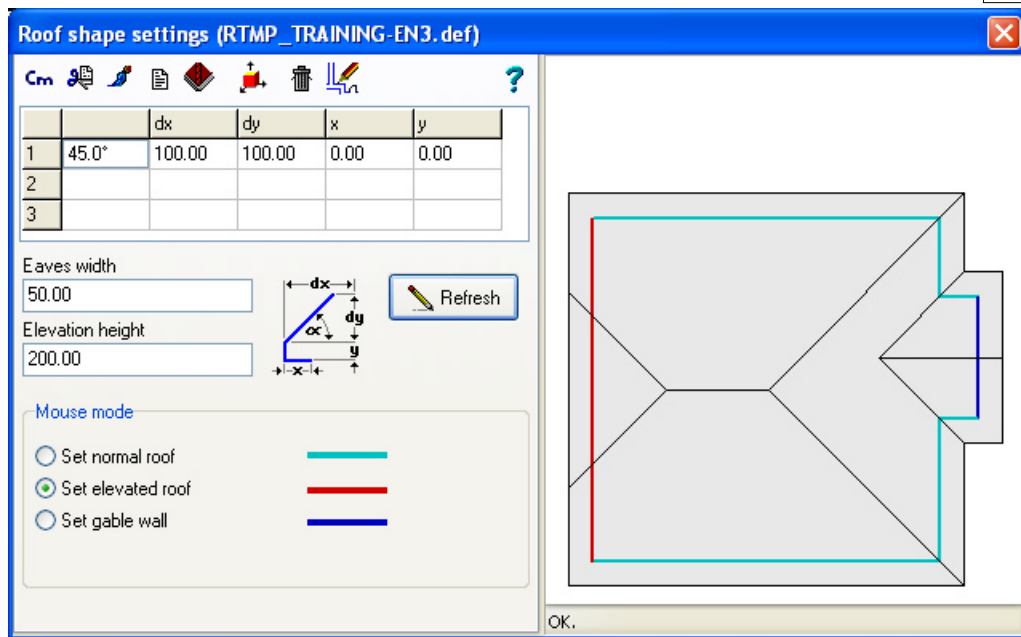
3.9 Roofs

Designing individual roofs

Let's design a simple roof. Use the **Automatic roof designer**  feature for this. After clicking on this icon draw the shape of the roof – by closing the polygon the roof designer automatically comes up. If you want to design a roof having an identical shape with the building itself, it is practical to make the software automatically generate it. You can initiate this by clicking the  icon and then left clicking at one of the (outer) walls of the building.

Note: If you do not want to use the automatic generation feature, use the  icon whereby you can define the polygon for yourself.

The Roof designer module appears, with the top view representation of the roof.



Automatic Roof Designer

In this dialog box you may adjust the slope of the roof plane (set it to 45 degrees), the width of eaves (60 cm), the height of the lower plane in the case of hip-roofs (200 cm) etc.

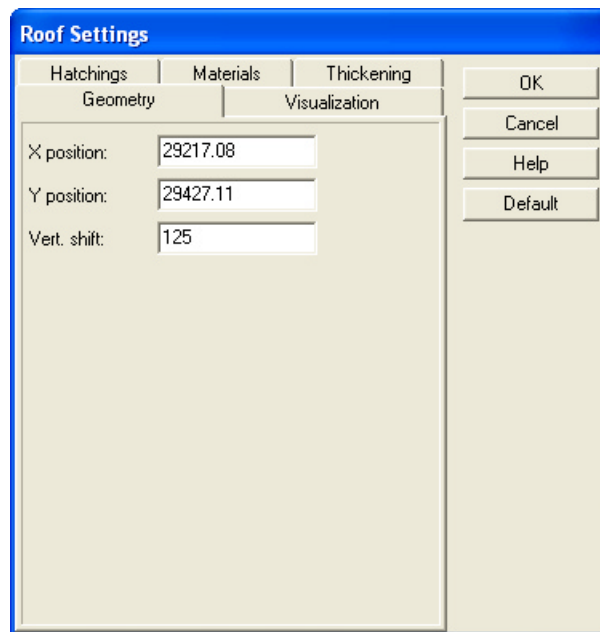
The automatically generation process creates 45 degree steep, normal roof planes. You may modify these settings by choosing, for example, Hip-roof settings and then select the edge you want to have changed and enter the new data.

You may change the settings of gables the same way. The changes are immediately applied and displayed in the graphical window of the dialog box.

The colors of the edges also indicate their type and adjustments (normal, hipped, gable). The final arrangement can be sent back (and applied) to the floor plan editor by clicking on the





icon. Here, you may open the dialogs where further changes to the roof can be carried out. For instance, you can set the height of the lowest point of the roof relative to the level height (set it to 125cm), the linear or tile pattern of the roof etc. You may also insert eaves, pans, ridge-tiles into the roof.



Roof settings dialog



Note: If you want the roof planes to have a different degree of steepness you can design it with the normal **Roof designer** .

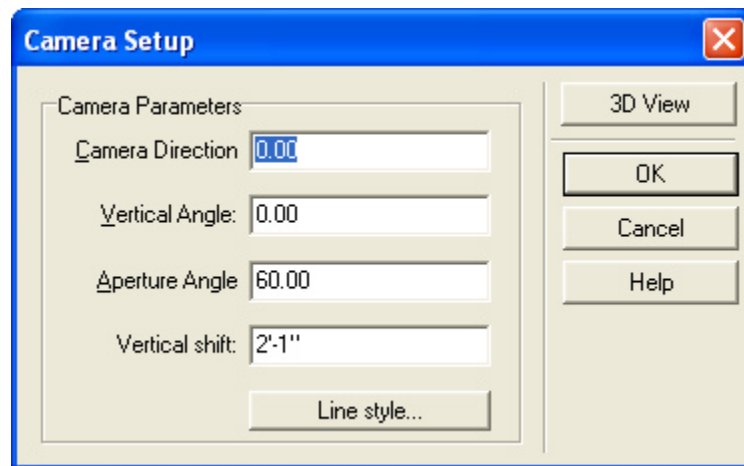
3.10 Columns




To create columns click on the  icon. From the icons appearing on the left, you may choose between different kinds of columns: rectangular, circular, polygonal. Click on the  icon, and put a circular column to the edge of the ground floor terrace. In its dialog specify the radius of the circle. You may also create a pedestal by putting several columns on each other by specifying different heights for them etc.

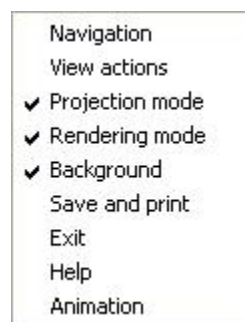
3.11 3D visualization

3D visualization of the project: from the outside and inside.



The project can be visualized in 3 dimensions at any point. The most basic 3D view is the 3D image of the entire building from the outside. This is shown by simply clicking on the  icon. The inside view is created by first clicking on the  icon, putting down a camera, double clicking on the camera and selecting the 3D view.



The 3D window has a different set of (upper row) icons. The wireframe or painted image of the project can be seen below the icons. You may change between the wireframe and colored representations in the **3D/3D parameters** menu of the 2D editing window or by the   icons of the 3D window. The icons of the 3D window may be removed (and put back) by right clicking on the icon bar and choosing between the icons or by the menu which opens by clicking on the  icon. The items marked with a small pipe are the ones displayed in the icon row.




The right click menu of the icon bar in the 3D window

The   icons (**Alt 1** or **Alt 2**) enable you to choose between the external: **Examine Alt+1** and the camera **Handycam Alt+2** views, while also determining which set of icons are displayed, by switching on the **Navigation** menu:

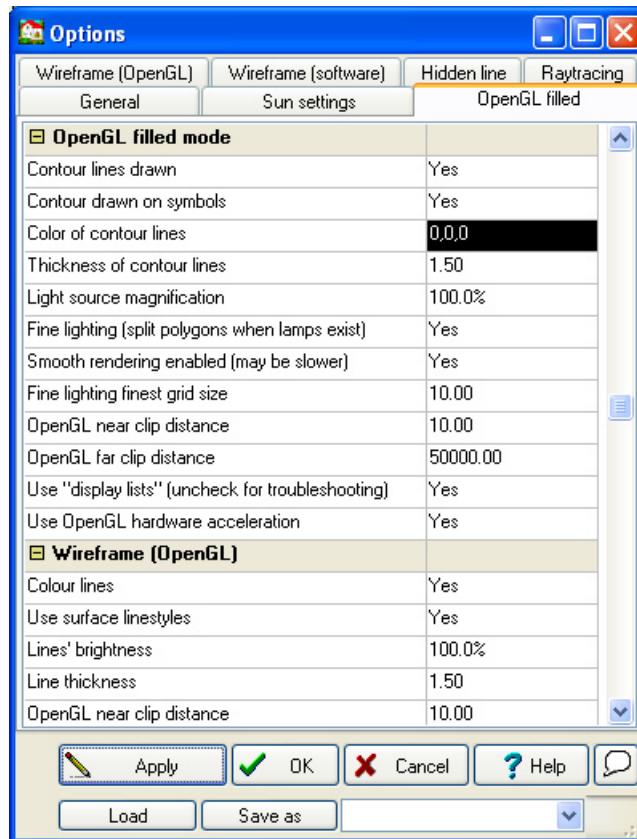
the rotating-moving arrow icons  or

the camera adjustment icons .



The 3D picture can be rotated or moved around by these icons, or **by the mouse**, including its scroll-wheel. The adjustment of 3D parameters can be done (partly) in the **3D/3D parameters** menu of the 2D editing window. Other parameters can be

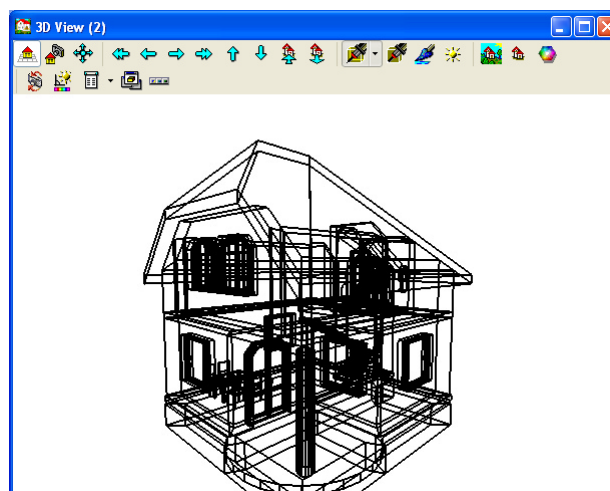
adjusted by clicking on the  icon of the 3D window. For example, you may set the optical parameters of painted images, the line colors for wireframe pictures here. The dialog has multiple sub-windows. Changing between the colored and

hidden line views is possible in Rendering mode or by the  icons.

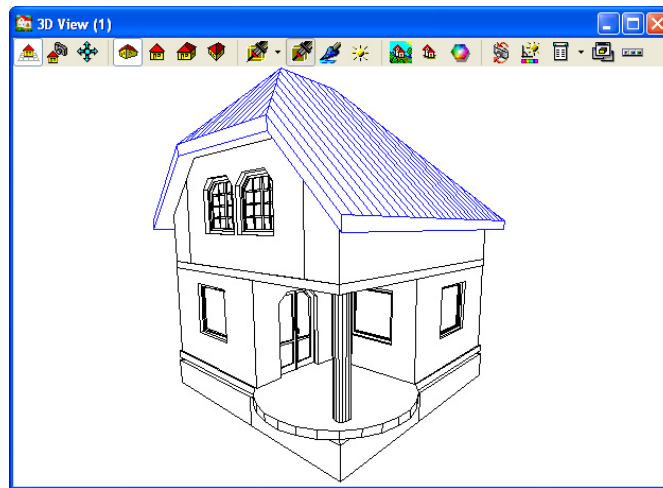


3D Parameters dialog box

By the  icons you can change between the perspective and frontal views, these icons are switched on by clicking on **Projection modes** in the right click menu. You may resume to 2D editing by clicking on the  icon.




Wireframe line view of the building

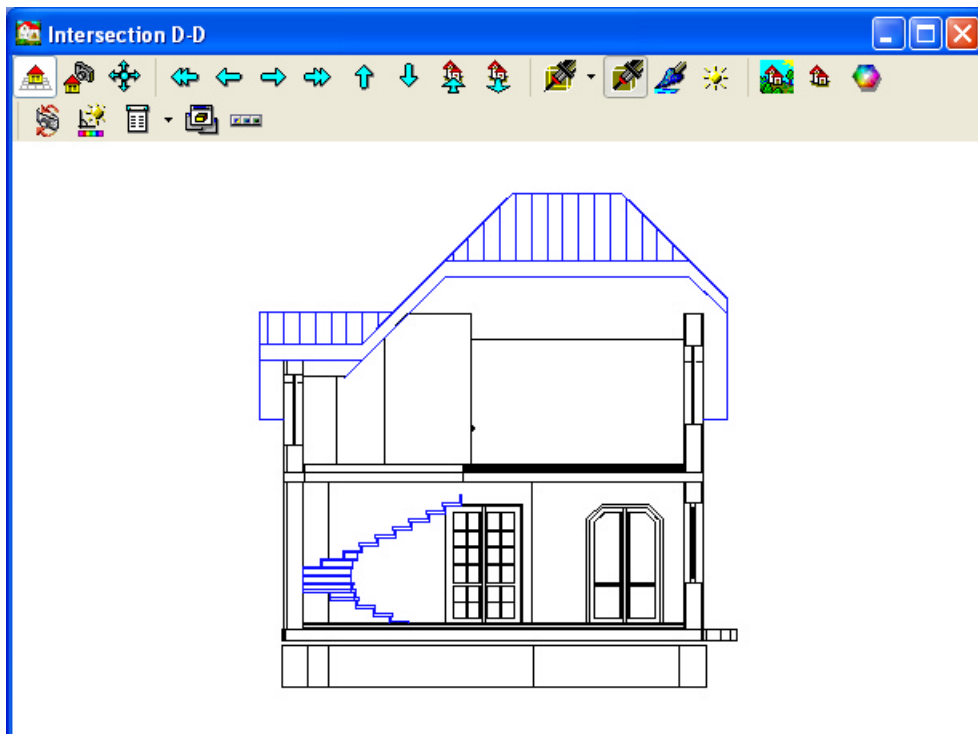


Hidden line view of the building

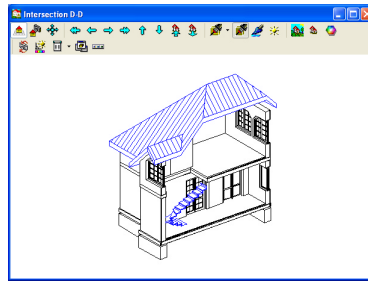
3.12 Sectional views

A sectional view can be created by defining a sectional plane on the floor plan. This is done in the following way:

Click on the  icon, and then define the sectional plane by putting down its two end points. By the third point you decide which side of the plane you want to see. The 3D sectional mode is automatically started by the software. The sectional mode has a 3D window in it (only representation), and a 2D editing window containing the sectional lines and hatched areas.




Windows in Sectional mode




The 2D and 3D window have the same tag, which is the identifier entered for the sectional plane (eg. Section A-A). In the 2D window (of the sectional mode) you may carry out further modifications on the sectional drawing. In the 3D window you may create wireframe/colored pictures of the sectioned building, rotate it etc.

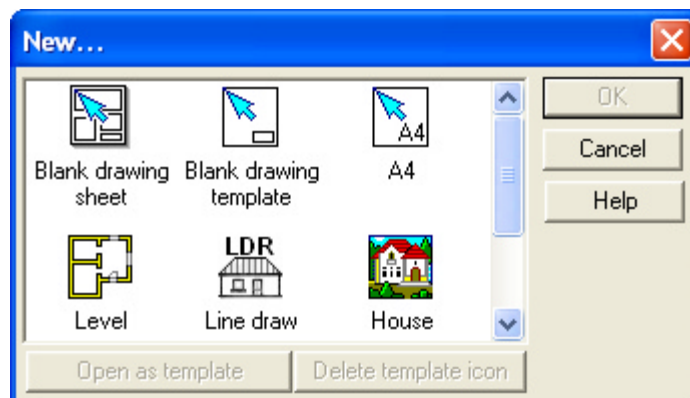
3.13 Graphical editor

Wireframe models may be transferred from the 3D window to a separate 2D

window by the  icon. In these windows you may freely remove, rescale, and redraw the original picture with the help of the different icons.

With the help of this graphical editor you may finalize and perfect frontal (or perspective) views of your building. Dimensioning lines for height may also be

inserted here by the  icon. After finishing the drawing, you may ask for a separate drawing sheet where you can transfer the 2D floor plan and the 3D images as well (in any scale). Different drawings may all be put on one drawing sheet. You may use a blank sheet or a drawing sheet with your own pre-set templates. Blank drawing sheets can be opened by File/New and clicking on the pertinent symbol in the upcoming dialog.



The New... dialog opened from File



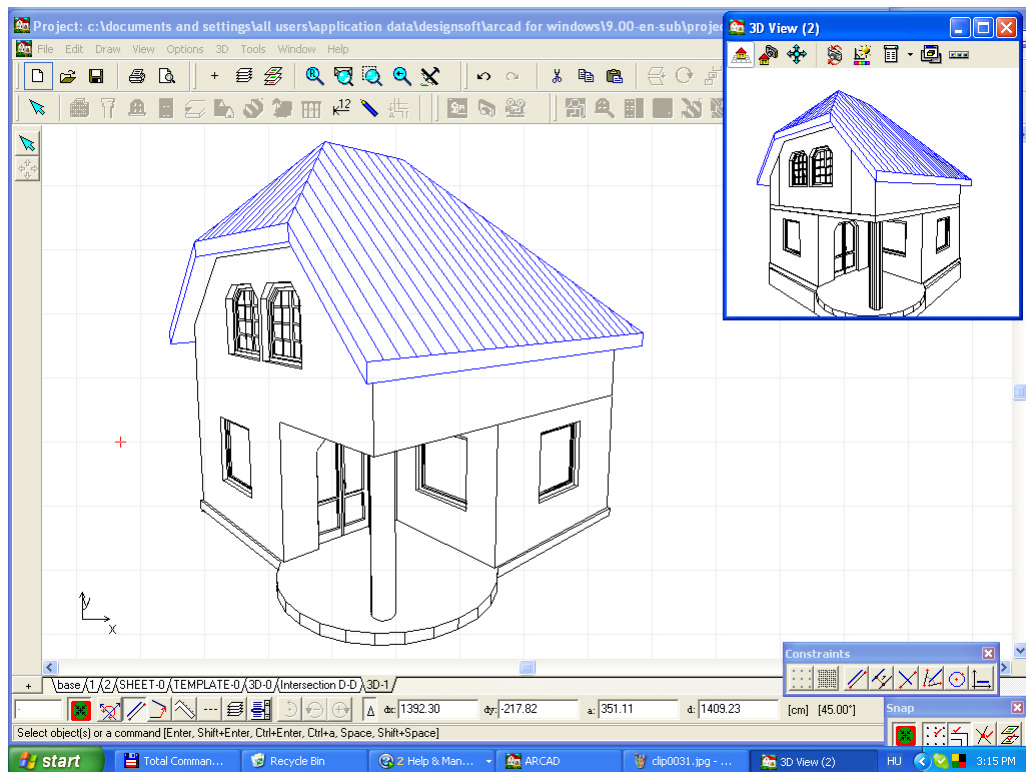
Blank drawing sheet: open this to piece together different drawings to one sheet.

The drawings may be:

- 2D floor plans of projects,
- 3D frontal or perspective views or
- sectional views.

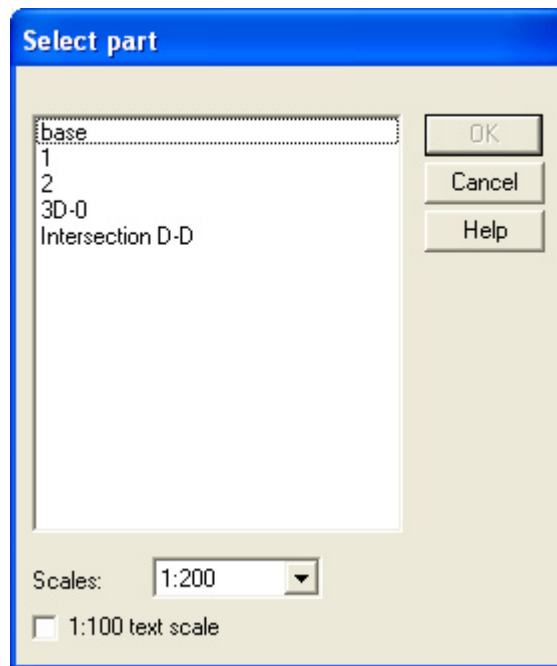
Create a 3D hidden line perspective view of the project and send it over to the graphical editor.

Note: You may assign hatching patterns for the roof in the Roof dialog, in Hatchings/Hatching pattern types. (Set it to Horizontal.)



3D wireframe model in the 3D window and the perspective view transferred into the window

Open a blank drawing sheet. Drawings may be imported by choosing Insert Drawing... from the right click menu. This command opens a list displaying the set of drawings (the name of the windows) that can be imported. After selecting a particular item from the list, the drawing may be moved around on the drawing sheet as an object. The inserted drawing functions as a closed item on the drawing sheet, and can be modified only as a graphical image, not as a (modular) plan. If you want to carry out changes on the original drawing, do this in its editing window – the changes are automatically applied on the drawing sheet as well. Floor plans imported to the drawing sheet function in the same way.





Insert drawing dialog




The drawing sheet may be printed out on one or multiple pages, depending on your printer etc. In the Print settings dialog you can set the number of pages to be used, the margin's width etc. A preliminary print view may also be visualized.

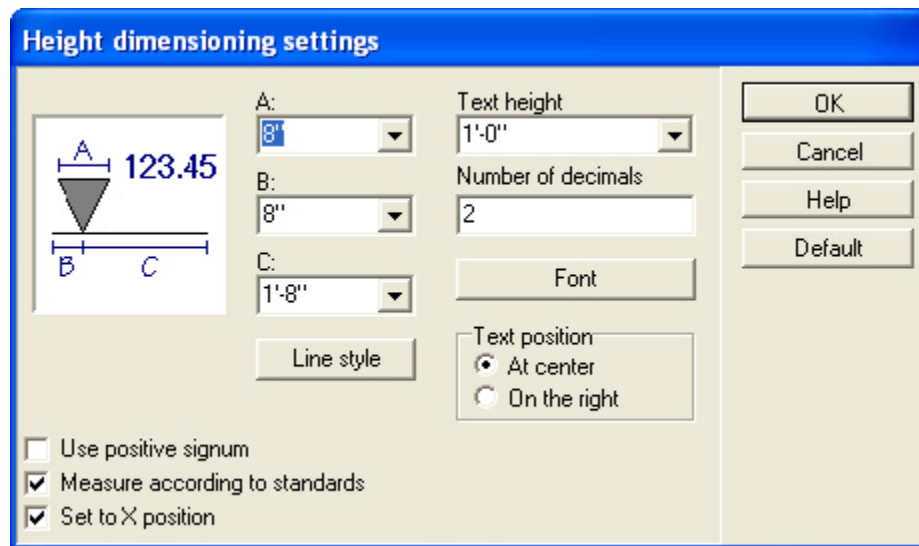
Note: Before printing, have a look at the drawing sheet in File/Print view.

3.14 Height dimensioning

The graphical editor window differs from the floor plan editor window in certain respects. Some icons of floor plan editing are not available. In the drawing window of LDR files you may only create 2-dimensional drawings. However, there are certain extra functions, only available here.

Height dimensioning lines may be introduced to the plan on sectional and frontal views. Wireframe models can be created from sectional and 3D views by using the  and  icons. The drawings may be modified in their own window, lines may be removed, dimensioning lines or hatchings may be introduced. Once the drawing is transferred to the sheet, it functions as a closed item, meaning that no internal modifications, like removing lines, may be done to it.

Height dimensioning lines can be introduced by clicking on the  icon, and then choose the  icon from the icon row appearing on the left hand. The line style for the dimensioning lines may be specified in **Options/Default Values/Dimensioning/Height dimensions...** or select the  icon.



Height dimensioning settings dialog

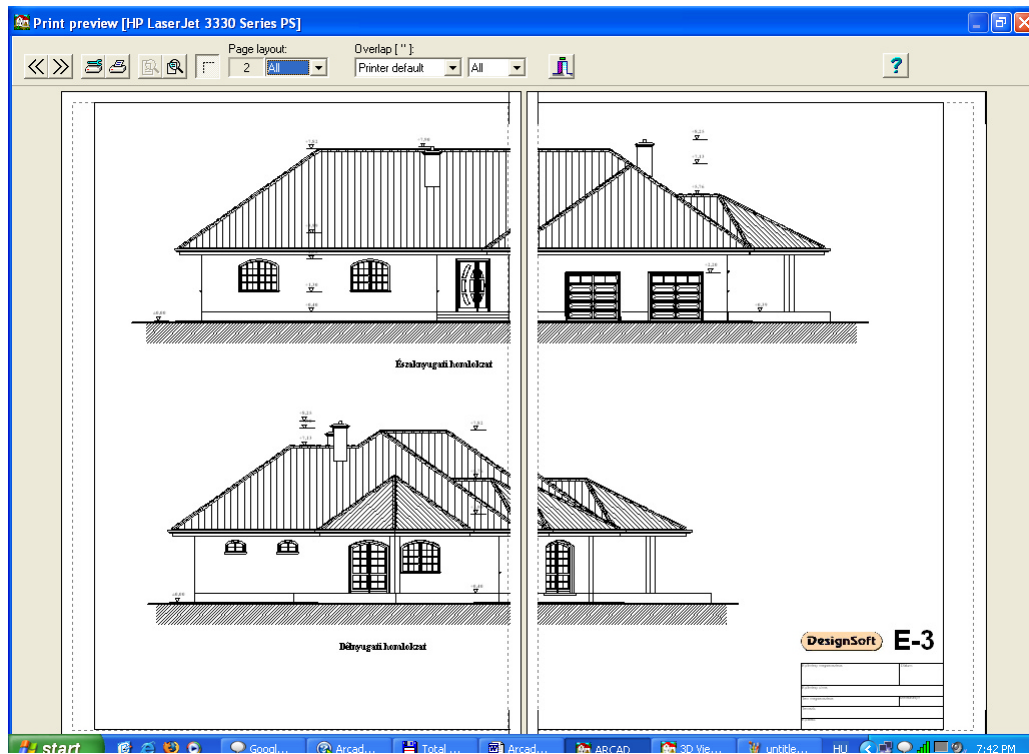
Height dimensioning lines may be arranged with having the same **x** position or scattered around arbitrarily.

Same X position: if you switch on this **Set to X position** option, you have to first set the X position.

After setting these options carry on to define a reference point and then the spots you want to have measured. Repositioning of reference points entails the shifting of all dimensioning lines.

3.15 Printing drawing sheets

Drawing sheets may be printed out to one (or several) page(s), depending on the type of printer you have, the paper you use etc. Before printing you may set the number of pages to be used, the width of margins, whether you want the page number to be printed on the paper, the scale etc. You may also have a print preview of your drawing to see its layout on the paper.



Print preview

Note: The program automatically divides the drawings according to fit the the paper size. Thus you may print out projects of any dimension and join the sheets together after printing to obtain the full view.

You may save your project as a file and print it from another computer. For example, if the drawing is too big and you wish to print it on an A0 printer, first acquire the driver of the printer (from the Internet, or directly with the installation software of the printer). Install the driver and set Print to file for this printer. A PNR file is created, which you send to the computer that is connected to the printer and print. In the printing options make sure that you do NOT use the printer's fonts, but instead print TrueType fonts as BIT images.

You can print into PDF file too, using a PDF driver.

Note: When printing a drawing sheet it is not possible to define margins. This does not present a problem, as one may position the project freely on the drawing sheet when importing it. If you wish to print out a level with its given scaling* without transferring it to a drawing sheet, then you should adjust the margins for it.

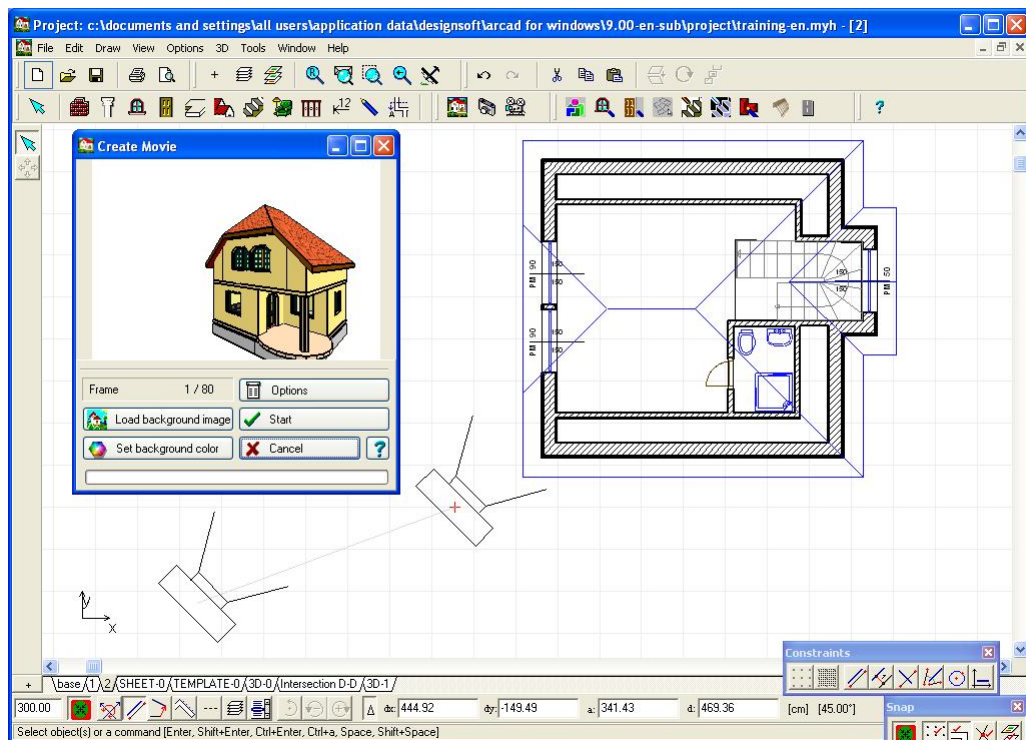
Note: The area between the dashed lines indicates the printable area.

3.16 Creating Movies


Movies may be created with the **Create movie...** command of the **3D** menu. Movies can be created from colored, wireframe or hidden line models of a project. First, you have to put down cameras. This is done by 3D/Positioning of cameras or QT camera positioning. By the first feature you may create AVI films, while the second is for creating movies from QuickTime MOV panoramic images.

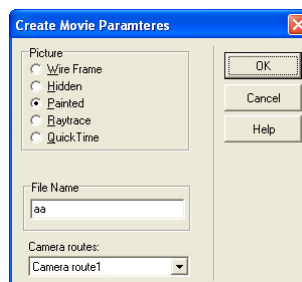
The difference between the two movie types is that the AVI files are only for viewing, while QT MOV movies are interactive, which means that you can create Quick time gates at apertures, from which the movie goes from one panoramic image to the other.

Put down a few cameras on the floor plan to create your AVI movie file. The cameras define the trail of the movie.



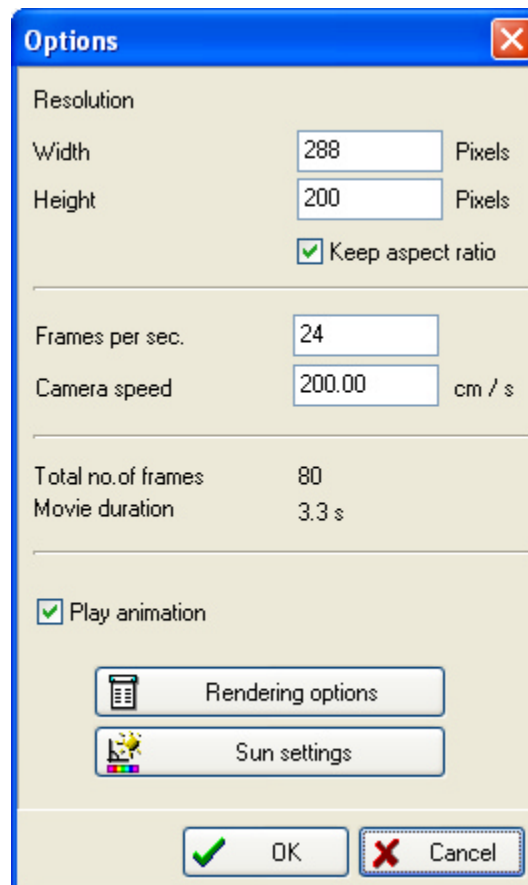
Cameras for an AVI film. 3D frames with and without a background

After putting down the cameras, you may select them by clicking  and then on one of the cameras. By double clicking on them their height (and other parameters) can be rearranged. After clicking on a camera you can open its dialog box by double clicking on it. The 3D position and orientation of cameras may be checked by the 3D view button. After the positioning of cameras go to 3D/Create movies....

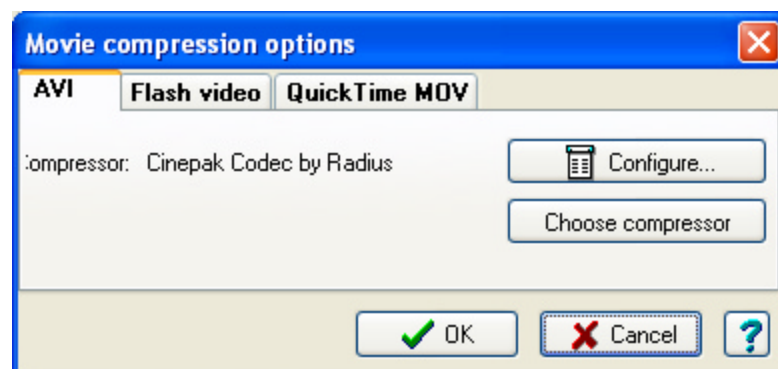


A dialog box comes up, in which you may decide whether you want your movie to be created from Wireframe, Hidden Line, Colored, Ray traced pictures or to make a Quick Time movie. You also need to provide a name for the movie file.

Note: The **Create Movie...** dialog box may also be opened by double clicking on the line connecting the cameras, or by right clicking on the line and choosing it from the right click menu. By double clicking on the camera trail you may also specify a name for it.



Create movies Options dialog



Before the generation of the movie you may also set a background to it.

The time requirement of the process depends on

- the complexity of the project the movie depicts,
- the number of frames.


During the manufacturing of the movie you can follow the phases of the process, and also the frames as they are being inserted into the film.

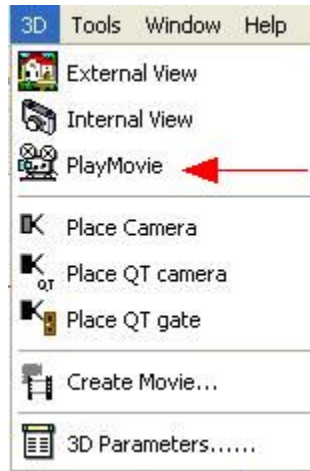
Movies containing colored pictures are made much quicker on computers running with an Open GL card, than on computers with basic graphical cards.

QT movies of a MOV extension are created in a similar way, except that for these you also have to define the QT gates, spots which serve as shifting point from one frame to the other (by clicking on them while watching the movie).

In these movies you may move or spin around etc within one frame.

3.17 Playing the movies

You may watch the movie by clicking the  **Play movie** icon or by going to **3D/Play movie**.



Windows Media Player AVI opens. MOV files may be watched by the Mov viewer of QuickTime.

Chapter

IV



4 Editing tips

This appendix contains practical tips for users who are already familiar with the software to a certain degree. In the coming few pages we shall go through a few editing “tricks” and shortcuts that make the process of designing much easier and more efficient.

By choosing the right scale, it is easier to create sectional, frontal and perspective representations.

Incorporating more and more details into your plan means an ever closer approximation of the prospective architectural site.

Different kinds of building elements are found in the different libraries, functionally organized. However you may also create elements of your own, if there is no appropriate item in the libraries for a certain task. Furthermore, keep in mind that certain building elements may also be used in ways that go beyond their standard use. Using a wide variety of different elements is always to the advantage of the general quality and the realistic nature of the project.

Note: From this point menu items and buttons are highlighted in bold fonts.

For a quicker, more efficient editing it is practical to use both hands all through the designing process. While you handle the mouse with the more skillful hand, you may use the other for keyboard shortcuts etc. Keyboard shortcuts that can be used very frequently and can save you a lot of time:

orthogonal rotation:**Shift**,

+45 degree rotation:**Ctrl**,

Cut: **Ctrl+x**, copy: **Ctrl+c**, paste: **Ctrl+v**, from the **Edit** menu:

serialization: **Shift+Ctrl+s**, reflection: **Shift+Ctrl+m**, rotation: **Shift+Ctrl+r**.

Advised system requirements: mouse with 1-2 scroll wheel (can be an optical mouse, though not necessarily). For scrolling along the x-y axis it is practical to use the F6: refresh screen function.

Monitor: 17” or larger, 85 Hz or higher frequency.

Printer: A3 or larger, multi-color, refillable.

It is advised to use at least a P-III system. In general, it is expedient to run your computer with all its best equipment (fast hard drive, large RAM, strong video card (OpenGL), CD writer, modem), but the software also functions on computers with a less powerful configuration. It may also be useful to keep a calculator at hand.

Before you start editing it is best to go to **Options/Default** values and set the default adjustments for patterns, graphical style, font, line style (for dimensioning lines), units of measurement etc. and save these settings.

Through the course of your work it is highly advised to save the project after each new step, the easiest way to do this is by pushing **Ctrl+F2**. The software automatically saves the ongoing project to the **Project** folder, but as this folder is quickly overloaded with partial files, it is always better to create your projects into separate folders and subfolders.

You may also put the transitional project versions into separate subfolders. The most convenient way to do it is to put these files into C:\..... arcad vn\project\plans\
(name of the building) + \ construction etc


4.1 General plan and layout of the site (name.MYH)

New level: General plan

Create a new level to load the general plan to.

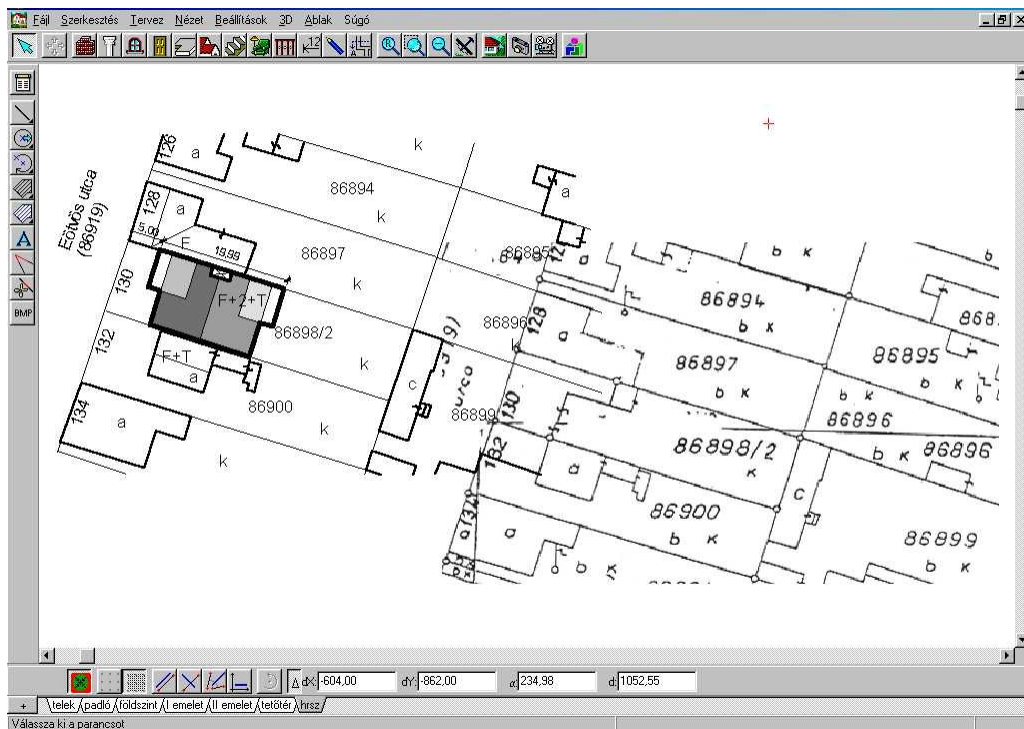
Drawing tools, BMP submenu

Insert the scanned BMP image to the editing window, while taking into account its size and resolution (for more details: FAQ 21th). It is practical to redraw the


general plan by the drawing tool opened by the  icon, as much as it is necessary, by using different line widths. Later on you may also include the text boxes. You may have the software calculate the area of the site, but for exact values you need a geodesic measurement.


Contour lines

In the case of uneven (sloping) sites, you may add contour lines to the project. After finalizing the general plan you may as well remove the original BMP image, making the site easier to use. You can insert the floor plan of the floor level onto this surface (or its contour drawing), rotate it to the appropriate orientation. After that, you should draw the roof structure above it, then go on to put on dimensioning lines for the whole plan and the general plan is ready for approval.




Parallel (shifted) representation of the drawn and BMP view of a general plan

Click on the  Terrain designer icon of the Symbols menu, define the territory by drawing a closed shape on the floor plan and the **Terrain designer** opens. You create the topography of the terrain by putting down the corner points and the other defining points (put down by pushing Insert) and defining their relative height to each other. This way you create a terrain for 3D view.

Note: The coordinate system may be rotated by the  icon. After the alignment you may use the orthogonal editing feature, making designing easier and quicker.

4.2 NEW LEVEL: ground floor




Before setting up walls go to the  icon, found in the lower left corner of the screen, to open a new level, to be named a ground floor. (enter "ground floor" to the Name field and press Enter). For the level height you should enter the height value that is the sum of the internal height and the thickness of the slab. It is practical to define the thickness of the slab at this point. The height of the walls is automatically identified with the internal height. The values for level height, internal height and slab thickness are interrelated, changing one of them entails the readjustment of the others.

You may also modify all wall heights at the same time by the following measures: **Ctrl+A** – select all, double click on the highlighted drawing, and then on **Walls** from the upcoming list – then, overwrite the wall **height** in the upcoming **Walls** menu. **Close**, **Ctrl+S** or click on a free spot, switching off the highlighting.


4.3 Inserting building elements

Enter topic text here.

4.3.1 Wall


Single line , polyline , or curved  walls may be created anywhere on the floor plan, their position may be fine-adjusted by pressing the **Space** button. You may control the length of the given wall section by looking at the **dx**, **dy** values at the bottom of the screen, or by manually defining the length (and orientation) by going to the **X**, **Y**, **a** (degree), **d** (length) and filling them in numerically. Take care not to move the mouse during this as that would entail the overwriting of the values. Changing between the fields is possible by **Tab**, **Shift Tab**. Normally walls are automatically merged at intersection points, failing that


however, you may do this also by the **Merge walls** button .



Intersection points may also be **unmerged** by . In the case of split-level buildings the **z** coordinates of the shifting should be separately calculated and the values for shifting the level (**Shift 1**, **Shift2**, **Height1**, **Height2**) accordingly set. This is necessary because doors are always aligned with the bottom line of the wall (**+Level Manager / Floor level value**).

4.3.1.1 Modifying walls

You may reposition walls individually, or you may select several walls by using **Ctrl** or **Shift** and move them together. You may also select multiple elements by encircling an area with your mouse (while pushing down the left hand button).




Sometimes you may need to switch off Snapping  or Alignment by cms (by **F3**), or orthogonal editing (**Ctrl+O**) in order to be able to fine-adjust the position of the elements, undisturbed by the automatic matching options. Building elements may be repositioned manually by the mouse or by specifying its prospective **x**, **y**

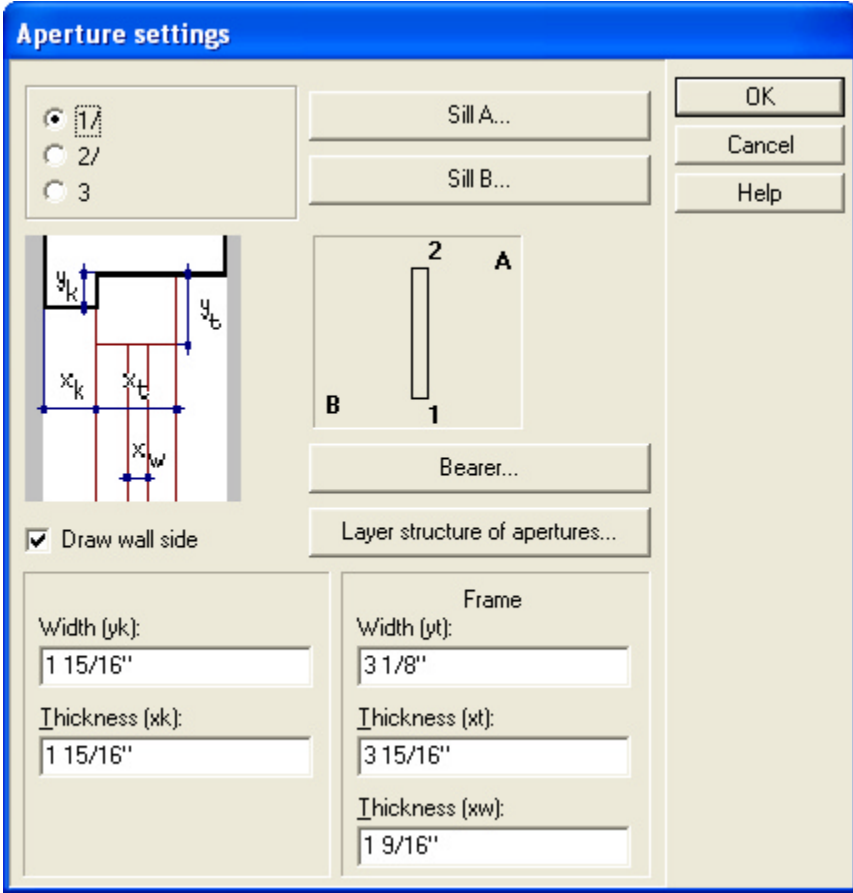
values, or by clicking on the  icon and positioning the item by the cursor arrows.

You may also need to unmerge walls by the  icon, or remove parts of them by .

If you have a row house at hand, it suffices to design only one unit and then serialize it by serialization: **Shift+Ctrl+s**, also found in **Edit/Transformation/Serialization**. Symmetrical or twin houses may be created in a similar way by using **Mirroring (Shift+Ctrl+M)** (or through **Edit / Transformation / Mirroring**).

4.3.2 Windows, doors

After clicking on the **Window** (or **Door**)  icon the window/door graphical library appears. Under the graphical symbols go to **Advanced**, opening a dialog where you may set the type, relative position (within the wall), reveal size and frame thickness (**xk**, **yk**, **xt**, **yt**, **xw**) of the door/window. You may define the **sill**, **bearer** and **layer structures of apertures** as well. You may also insert only apertures into walls by the  icon, in floor plan mode. If you have a very specific window/door in mind it may be worthwhile to create it for yourself by **MODELER** . These individually created items cannot be saved to libraries containing the default library objects. Therefore you need to specify a new folder for them with new own names etc.



Aperture settings

1
 2
 3

Sill A...
 Sill B...

Bearer...
 Layer structure of apertures...

Draw wall side

Width (yk): 1 15/16"
 Thickness (xk): 1 15/16"

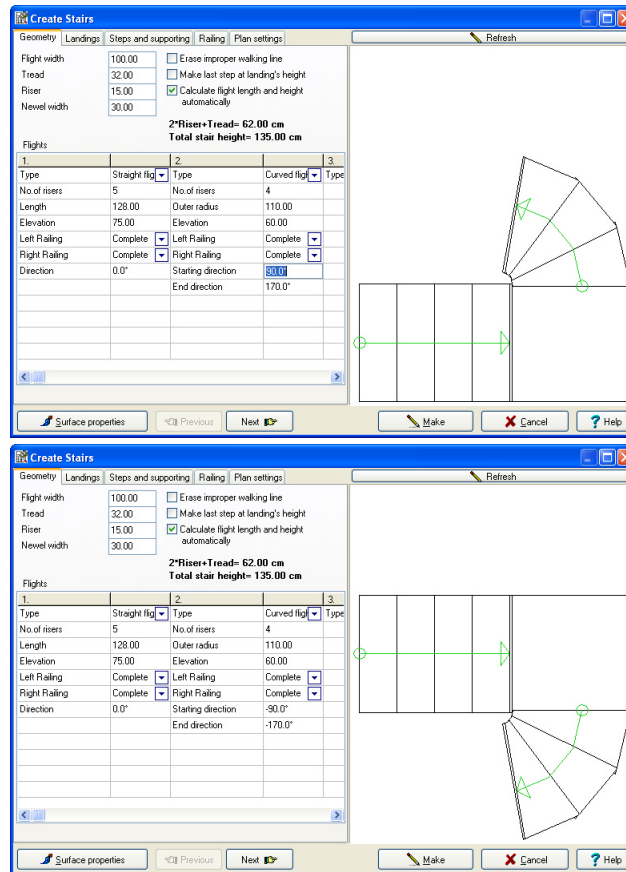
Frame
 Width (yt): 3 1/8"
 Thickness (xt): 3 15/16"
 Thickness (xw): 1 9/16"

OK
 Cancel
 Help

4.3.3 Stairs, Stair designer



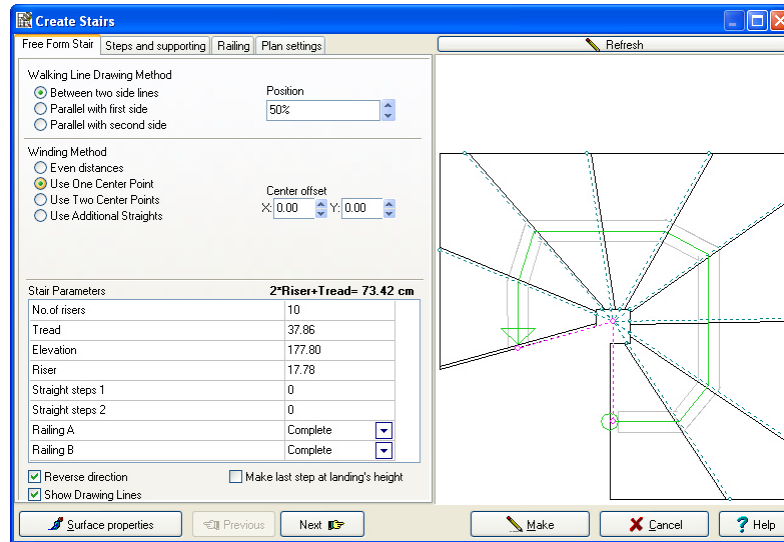
If you want to create multi-winder stairs with one winder having an opposite orientation than the previous one, you should set a negative value for it. The difference of orientation between two adjacent winders cannot exceed 180 degrees.




You may also use the stair designer to create crow-stepped gables. (For more information see the Stair designer appendix.)




Besides designing stairs winder by winder, you may also define the shape by simply drawing the inner and outer line of it and letting the program generate the stairs. You may not insert landings into the stairs when using the latter option.




4.3.4 Dimensioning lines toolbar

These  icons can be used for creating so-called associative dimensioning structures. This means, that dimensioning lines are automatically modified when the relevant building structures themselves are changed. When using the first 5 icons you first have to select walls, than draw the dimensioning lines, while the 6th icon works simply by putting down only one line transecting the building, through all its walls and columns, making this line the only dimensioning line, with all the parameters of the (transected) walls and columns projected onto it.

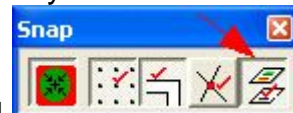
 You may use this icon for measuring the surface of closed areas (can also be used when inward protruding or curved wall sections are present). The measurement is started by clicking next to one of the walls (on the outer side). You may also use the other icons below this one, by these you have to first define the area to be measured by selecting its corner points.

4.3.5 NEW LEVEL: 1st level

By the  button you may create and name the first level. If you find it practical you may have the ground floor copied onto the new level by **Copy current level**. After deleting the unnecessary elements you should embark on creating a slab structure for the new level. By using foils (handling level foils: **Shift+F** or






) you may visualize the elements of the



other levels and may also switch on **Snapping** to position the elements.

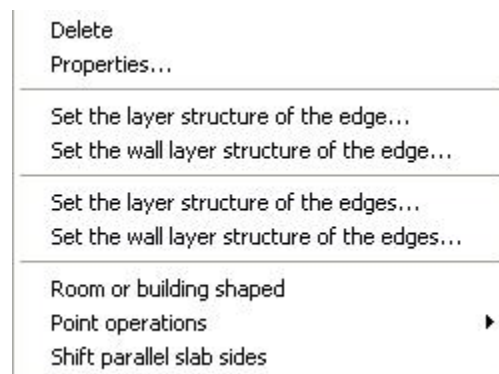
4.3.6 Slab

When specifying the z value of the slab, keep in mind that it is the position of the slab's upper plane that you determine. The thickness of the slab should be calculated and taken into account when setting the level height. Because of that the doors are always aligned with the lower plane of the level and the lower slab protrudes into the level below.

If the slab's design is finalized, you should create an appropriate aperture  at the site of the stairs' entering and adjust the layer structure  . (The aperture may be curved.) (Further details: FAQ 12th, 17th question)
The slab for the balcony may be thinner, may have a different z position etc. from the internal slab.




The layer structure should be harmonized with that of the walls. In the case of split-level houses the shifting of the level should be calculated and built into the plan. You may create beams, pergolas, walls, sills etc. by modifying the slab in different ways. (Further details: FAQ 30th question)

Slabs may have several apertures and/or additional layers in them. The apertures cannot be connected and they may not protrude into walls which are not part of the slab. Extra layers may be superimposed on each other. You may also assign extra layers to the lateral sides of the slab. You may decide whether you want to have extra layers on the sides of the slab in the slab dialog. You may also assign them by right-clicking on the slab and choosing **Set layer structure of the edge**.




4.3.7 Symbols

These items are usually used as pieces of furniture. Using a wide variety of symbols make your project look more realistic on 3D images.

Photo symbols are accessible with the , surface patterns with  and terrains with .


Important elements are eg. eaves (can be automatically installed), valleys, ridge tiles, window sills, thresholds, facade decorations.


4.3.8 NEW LEVEL: Attic

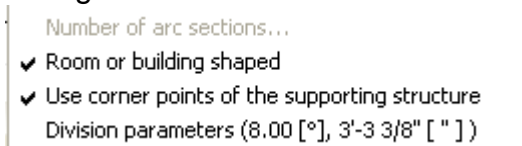
By the  button you may create and name the attic. If you find it practical you may have the first floor copied onto the new level by **Copy current level**. Keep in mind that the roof planes cut off the walls of the previous level.

Roof Designer

To make roof designing easier it is practical to use the **Automatic Roof Designer**

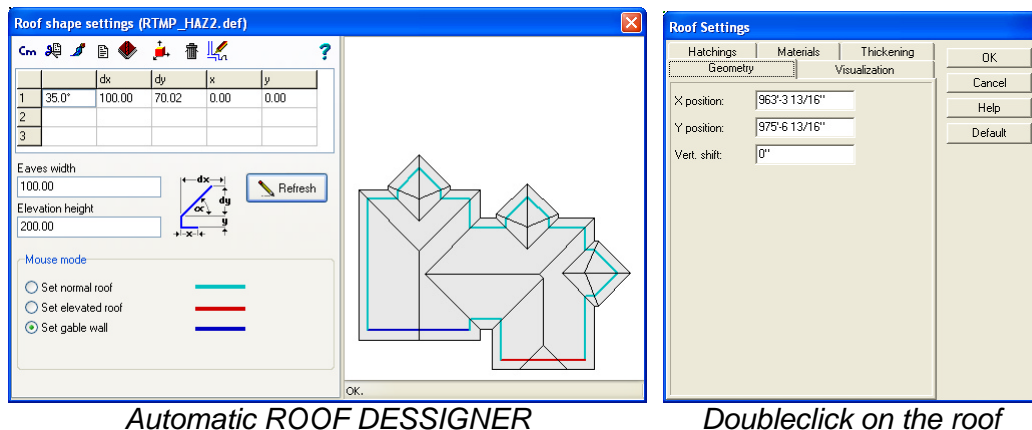
. Similar to slab generation you have to click once on the outer side of one of the walls, and the software automatically detects the outer lines of the building and prompts you to use them as roof edges.

If you want to determine the roof's outer lines for yourself, select the  icon, or right-click and switch off **Room or building shape** from the right-click menu, and then go on to draw the roof.












Even in this case it is practical to use the corner points of the building and define the eaves-width.

Fill in the tables of the roof designer.



If you shift the roof, the value you define for **Vertical shift** is taken as the lowest point of the roof structure.

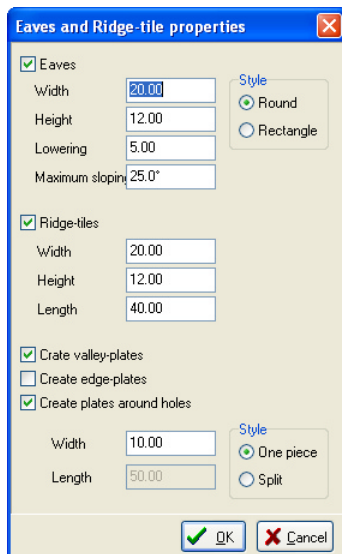
To carry out finer modifications and adjustments of the roof you need to use the complete **Roof designer** . Within the **Roof Designer** if you want to modify the roof plane, you may select it by . Select a polygon and clicking on the plane or by going to **Select points**  and then selecting three points of the plane and then switch on **Fit to plane** . It is also practical to remove the original polygon with , after modifications, and to put a new polygonal plane  on.

Another useful feature  serves for calculating the points of intersection of two planes. Skylights, attic windows may be created by clicking on **Select Polygon**  menu and then **Cut Polygon with polyline** , cutting a hole in the roof plane.

The easiest way to create large, complex roof systems is to design multiple simpler roofs, automatically generated, and then assemble them. You may also

use separate roofs for inserting metal-covered gables, oblique supporting walls with artificial stone and ramps.



Structures created in the **Roof Designer** may be exported to the **3D MODELLER**, assembled into libraries. In the LDR libraries (which may be downloaded from the Internet) you may find linear models for roofs.



Parameters of the automatic generated Eaves and Ridge-tiles

Note: After using the complete **Roof Designer** you cannot edit it with the basic **Automatic Roof Designer** as the modifications realized with the former cannot be visualized with it.

4.3.8.1 Additional structural elements for roofs

Chimneys, skylights or dormer windows and other symbols may be added to the roof. The plane of a skylight  is identical with that of the roof, and is thus suitable for creating solar collectors as well. The chimney icon  aligns vertically oriented objects with the roof's plane. It is practical to set a chimney height that makes it accessible to sweeping.

An alternative method to introducing dormers (from libraries) is removing an area of the roof slope and set the underlying walls to an appropriate height level to form the dormer.

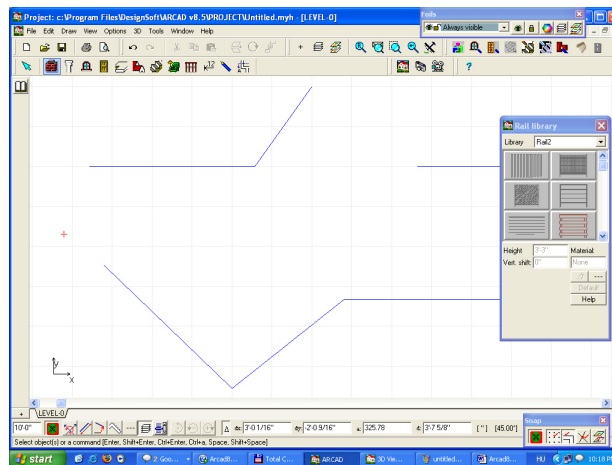
To build a dormer you first have to remove a sufficient surface, then set the walls to the desired height, to form the lateral walls, and then, finally, put on the other necessary walls to create a closed structure.

4.3.9 Rails

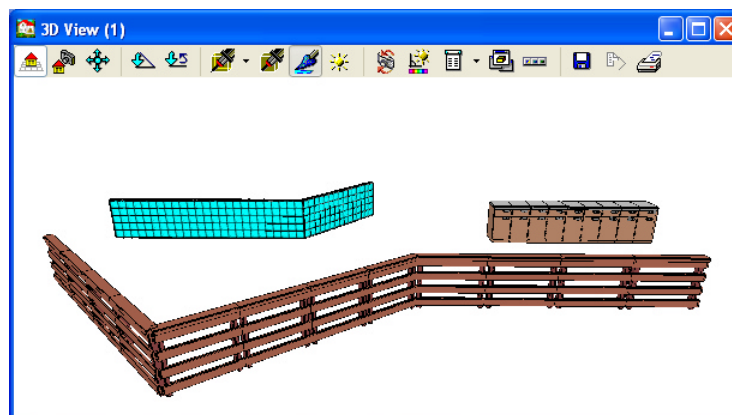
This feature can be used to serialize certain symbols. This means that it is enough to insert a single rail element and then serialize it with the software. The feature may also be used to design fences, gutters, glass walls, kitchen units, curtains, small bridges etc, any structure having serialized element in it.

The thickness of railings is not displayed on the floor plan. The line of the railing seen on the floor plan constitutes the central axis of the railing in 3D view.

Note: If you put the railings above a staircase, they are automatically adjusted to the steps. The best way to create the handrails is through the stair designer module.



2D editing and 3D visualizing of elements





2D editing and 3D visualizing of elements

4.3.10 NEW LEVEL: foundations


Open a new level by **+** and clicking on Add, then choose Bottom and name the new level (eg. base level or alike). This level is located beneath the floor level. The height you define is to be understood as the height of the foundation itself. By switching on foils (**Ctrl+F**, or by **View/Foils**) you may visualize the items of the the next (floor) level. By taking into account the structure of the floor level you can design the walls of the foundation.

4.3.11 Captions, measured areas...

The building is now complete. You may now want to introduce captions   containing legend/names/inscriptions or numbers referring to to size, area etc. It is also possible to insert added lines or to remove foils.

4.3.12 Sectional, frontal drawings (*.LDR)

Sectional views

Sections are the most complex drawings to be found in the software. They are generated by defining a sectional plane on the floor plan. They may be **simple** or graded  **Complex**. After defining the plane the program creates a linear drawing, with line types and hatchings as defined previously in the floor plan editor, and opens the sectional drawing in a separate window. If you find the line styles to be inappropriate, press Ctrl+A (selecting all lines), then double click on the area and readjust the line styles in the upcoming dialog box.

4.3.12.1 Sectional drawings

On sectional drawings you may modify, complement, simplify etc the original sectional picture. For example you may modify several lines at the same time by selecting the ends of multiple lines (by highlighting the area containing them) and dragging them together. To elongate lines or reposition corner points you should first switch on Snapping.

However, for the fine-grained repositioning of a (eg) corner point **Snapping** may have an interfering effect. For this reason the best solution may be to select the corner point with **Snapping**, but then switch it off to prevent it from perturbing the



repositioning.

You may also want to inactivate **Snapping by centimeters** by **F3** to have a perfectly free hand in positioning.

There are multiple ways to depict and highlight supporting structures on sectional images:

- Define line styles for each category of structures in the floor plan editor. This is the easiest and fastest way.
- Within the sectional drawing window redraw certain lines individually with a thicker line style, hatch the steel concrete structures. This is a much more time consuming way to highlight the supporting structure.
- Fill in, and reframe the supporting structures with different colors, fill in the iron concrete elements with hatchings.




When redrawing a staircase you should inactivate Snapping (by centimeters) by **F3**.


On these drawings you can only use manual dimensioning. Height dimensioning lines are automatically arranged after defining a default height level. However, you may always modify them individually afterwards. Readjusting the 0 level rearranges all of them automatically. With the **Space** button the dimensioning lines may be slightly wobbled when inserting them. Hatching patterns can be assigned to brick surfaces, terrains, tiled roofs (or other tiled surfaces), insulating surfaces.


Note: Foil captions regularly used should be saved and stored separately. It is also practical to save them into *.LDR files. This saves time and you do not have to type in the names each time you need them.

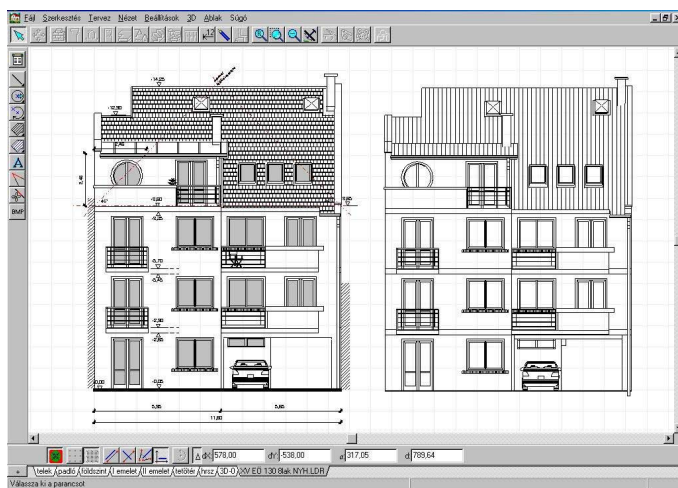
4.3.12.2 Frontal views

Before generating a frontal view of your project go to **3D menu/3D parameters** and switch on the number of levels you want to have visualized. Then press the 3D icon to generate the image.

In the 3D window click on the  icon, and then on **Hidden line** . Here it is advised to turn on Line filtering found in the dialog box opened by  icon / **General / Filter contour lines**.

The drawing should then be transferred to a drawing sheet with the help of the  icon. The drawing should then be finalized on the sheet, as described.

Another alternative is to transfer the frontal image to **RayTracing** , and then use this **BMP, JPG** image (with its own DPI resolution) as a background foil behind the linear drawing. This way you acquire a photorealistic, detailed image of the facade.



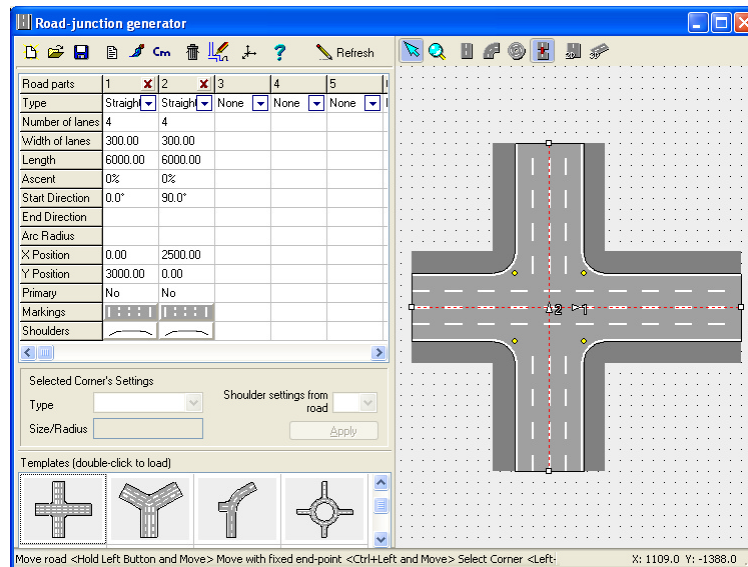
Two images of a facade: after and before modifications on the drawing sheet



Painted, final image of the facade with shadows

4.3.13 NEW LEVEL: street

If you are designing a building with a certain built environment, you may include some elements of the building's settings to the project. The **ROAD Designer** module of the program serves this purpose. With this option you may design alleys, sidewalks, ditches, slopes etc. Including the immediate surroundings of a building makes the project look more realistic. You may also use photographs (**JPG** files) of the environment as a background.




Road Designer

4.3.14 Creating photorealistic images (*.BMP, JPG)

Painting different surfaces of the building


If you insert a background image , you need to position the house on it ,

which can be done by selecting one of the icons , pressing down both buttons of the mouse and pulling the image. The background image may be any kind of loaded photograph (JPG, etc.). You may also create perspective images



by cameras placed outside of the building. Here you may adjust a set of different parameters eg. The scope of cameras etc, making the pictures even more manifold. After finding the final spot and orientation you should also set the direction and strength of lighting. In general, you need to have a contrast stronger than the default setting.

Ray Tracing

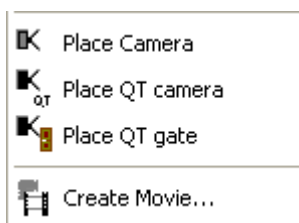
You may transfer the 3D image to the ray tracing module . First, it is recommended to check the lighting/shadow adjustments on a small preview picture. If you do not find them satisfying, go back to the painted 3D image and readjust the settings. If the preview seems to be OK, you should create a picture of a resolution of at least 1000x700, with smoothing and reflections. The ray-traced image is created in 2 steps (the second being the smoothing of the image). Besides the default BMP format you may also save the image as a compressed JPG file.



The final 3D image of a project

4.3.15 Movies

Movies can be composed of painted 3D images or of smoothed/shaded pictures. The maximum resolution that can be used for movies is limited. The number of steps between two adjacent cameras is calculated by the software, ensuring the continuity of the movie.



4.3.16 Drawing sheets (*.DRS)

Customized drawing sheets

It is practical to create personalized, customized drawing sheets, with framing, captions, company logo etc in A4 or A3 format. These customized, blank sheets are saved as *.TPL files, if they have contents on, then as *.DRS files. By using customized sheets you only have to fill in the fields of the client's name, the title and the type of the project for different plans.

Positioning

Projects may be transferred to the drawing sheet in any size. When putting a project on the drawing sheet the feature **Snapping by centimeters** (which can be turned on by **F3**) should be switched off as it interferes with the precise positioning of the image. You may not move the project outside of the printing area. However, if the project's size makes it impossible to fit it on a single page, it may be put on two (or more) pages, and you should use the margins and fitting crosses generated by the program to match the two (or more) pages.

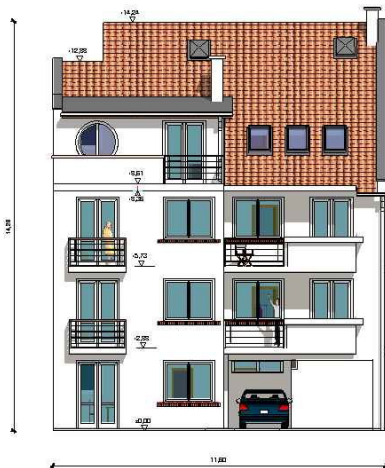
Before printing you should always use the **Print preview** option to see the layout of the page.

Printing while editing

You may also print any element of the building, magnified in the editing window. This can be done by **File/Print** and switching on **Current window**.

Chapter

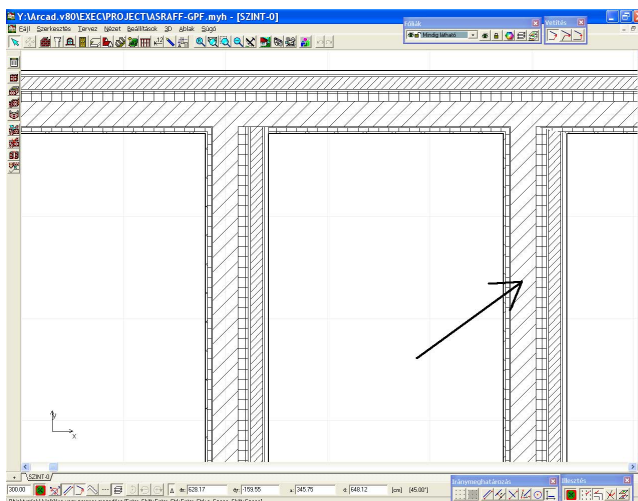
V



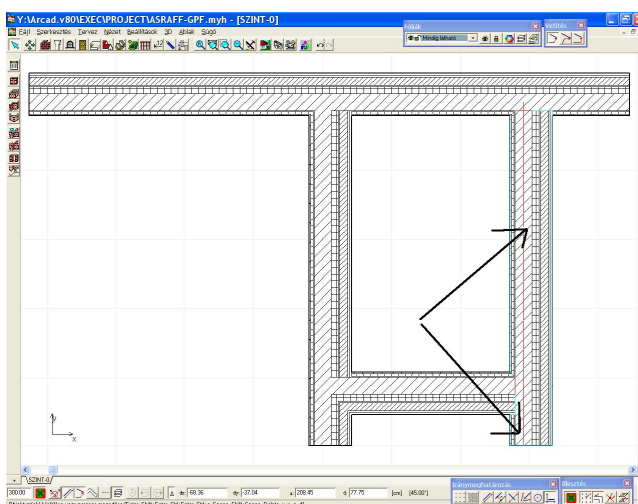
5 Frequently Asked Questions

1./ How do I move, unmerge or modify walls without interfering with the rest of the wall structure, with the other mergings, junctions etc?

When you create new walls, they are automatically inserted and merged into the existing network of walls. Moving walls already merged into others happens in the following way.



You may select the wall marked by the arrow, and move it to the other side of the other vertical wall. What you see is that the software automatically unhinges the wall from its original position, and then remerges it into the the same wall at its new location.





However, if you would want to reposition multiple walls (at the same time) in the same way (ie. moving them to the other side of a wall), the software would not allow you to do so. The error message Unauthorized step appears. The reason for this is that in this latter case the software would not unmerge the walls from their horizontal counterparts, but would try to drag those along. In this example the wall marked with the X would be dragged on the wall marked with a Y. In order to avoid this the program prevents you to move several walls at the same time.

Thus, moving walls merged into a complex wall structure should be done individually, if you do not want the whole structure distorted.

2./ I get wrong junctions, when merging walls. Why?

Sometimes when you are merging walls which are almost unidirectional, but have a different thickness, the generated merging points become imperfect and muddled.

To avoid this you should get the walls into exactly the same orientation, which can be done by (in the case of vertical walls) using Ortho (see the manual there), or by using the  Parallel editing icon.


On this picture we used  Orthogonal editing in the case of the upper 2 walls, whilst in the 2 walls above, we tried to draw a horizontal wall manually. The faulty merging point is the result of the latter.

You may also modify the wall junctions by selecting them, then right click on them and going to **Wall end cover type** and changing it. You should also switch on **Ortho (Shift or Ctrl)** when moving walls, to avoid distortions caused by involuntary movements.

3./ How do I ensure that the introduced elements are exactly the size I want them to be? How do I elongate, move etc existing walls, objects exactly to a certain size/position?

1. When inserting a new element hit x or y and you can enter the element's x and y size manually. In the case of selected elements this entails the shifting of the element with the provided values.

2. When inserting or moving an element you may use the cursor arrows to move around the element by centimeters (or by meters, by pressing down Shift). After pressing the functional key F3 you can do the same by millimeters. You need to

click on the  icon to go into „keyboard mode” and move elements by the cursor arrows.



3. End points, corner points may be moved by selecting them (left click), hitting x, y and specifying values for shifting.

4./ How do I design a two-level attic, so that the roof cuts off the walls on all levels?

You should place the roof on the highest level, and then position it „downwards” to its lowest point by assigning a negative shift to it. This way the roof goes through all the levels until the height level of its lowest point and cuts off the given wall sections.

The height level set for the lowest points of walls should always be below the roof plane's height. The roof's height and its position relative to the levels determine which walls it cuts through.

5./ How should I start designing a roof?


The software automatically generates a roof by clicking next to a wall (of a building), after selecting the  icon. You may also select the  Polygonal roof icon, and draw the shape of the roof manually. After closing the polygon by double clicking, the roof designer module automatically opens, containing a

representation of the new roof as well. Here you may set or modify the parameters of the roof, the steepness of the roof planes etc.

6./ How to select an element, when several of them are superimposed on each other?

If multiple elements are piled up on each other, you may change between them, by selecting one of them and then pressing Space. You may also open a list of available elements by right clicking on the given spot and choosing Selectable elements from the right click menu. The element that is momentarily selected is highlighted in color. You may also switch off the visibility of certain unwanted elements (like slabs) in the Foils dialog. The appearing white/black pipe also helps you to select elements

7./ How can I draw a curved wall with an exact size?

After putting down the two end points of the curve you have to specify the radius of the circle that defines the curve. This can be done by right clicking and selecting Radius determination from the right click menu. Here you may set the radius' length or the central angle. Thus, the curve can be precisely specified. The radius' dimensioning line can be visualized by the  icon.

8./ How do I position an aperture at precisely at a certain location within a wall? How do I move them along a wall in a precise, controlled way?

After selecting the door/window to be inserted and the wall to which it is to be inserted press X and you may numerically specify its prospective location. The red rubber line indicates the size (and shape) of the aperture. You may also serialize the door/window in the upcoming dialog. Positioning in the way described above is also feasible for curved walls.

9./ The 3D module does not seem to work, I cannot even visualize a single wall. What's wrong?

The most likely source of the problem is that the OpenGL system of your computer does not work. You should go to the 3D menu/3D parameters and turn on OpenGL/SOFTWARE.


10./ All of a sudden the floor plan on one of the levels shrinks to a very small size. What do I do?

1. Magnify the floor plan.
2. Select the magnified area by encircling it and copy it by **Ctrl C**.
3. Select all contents of the level by **Ctrl A**, and remove them by **Delete**.
4. Paste back this magnified version to the floor plan by **Ctrl V**.


After the pasting do not move the mouse, but press **Enter**, thus approving the position of the pasted-in elements.

Note: Before carrying out these steps it is highly advised to save your project in a temporary file.



11./ How do I draw a wall precisely perpendicular or parallel to another?

1. Put down the first point of the wall, click on the horizontal/perpendicular editing icon ,
 2. Select the other wall (to which you want the new wall to be perpendicular/parallel).
 3. An arrow indicating the desired direction appears, helping you to put down the second point of the wall.


12./ How do I draw a curved slab?

To create slabs having curved lines, you have to select the polygonal slab icon. Press the  icon to create the curved edge and then define the curve by putting down its end point and defining its radius.

I cannot modify the end point of walls, as the small black white does not appear. Why?

Snapping is not turned on. To turn it on go to the  icon, found at the bottom of the screen, and then click on the  icon in the upcoming small window.


13./ I created a new level, and it does not overlap with the level below. What should I do?

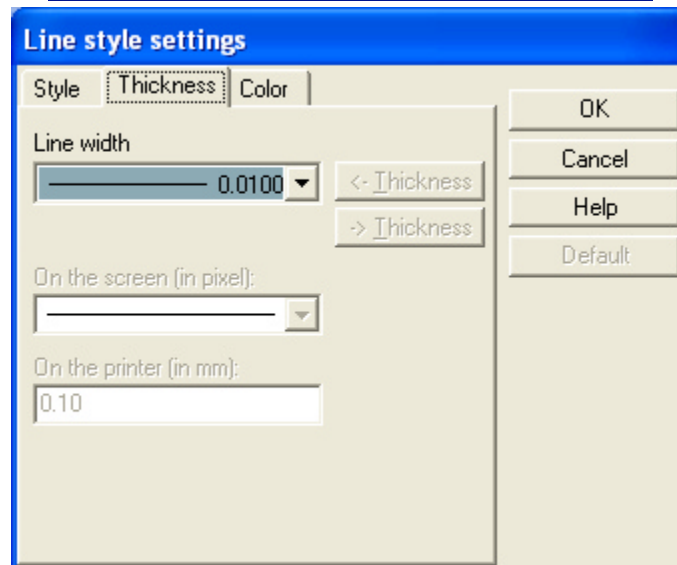
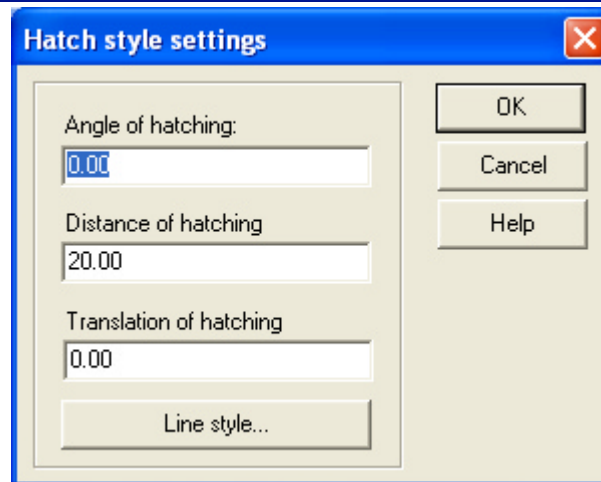
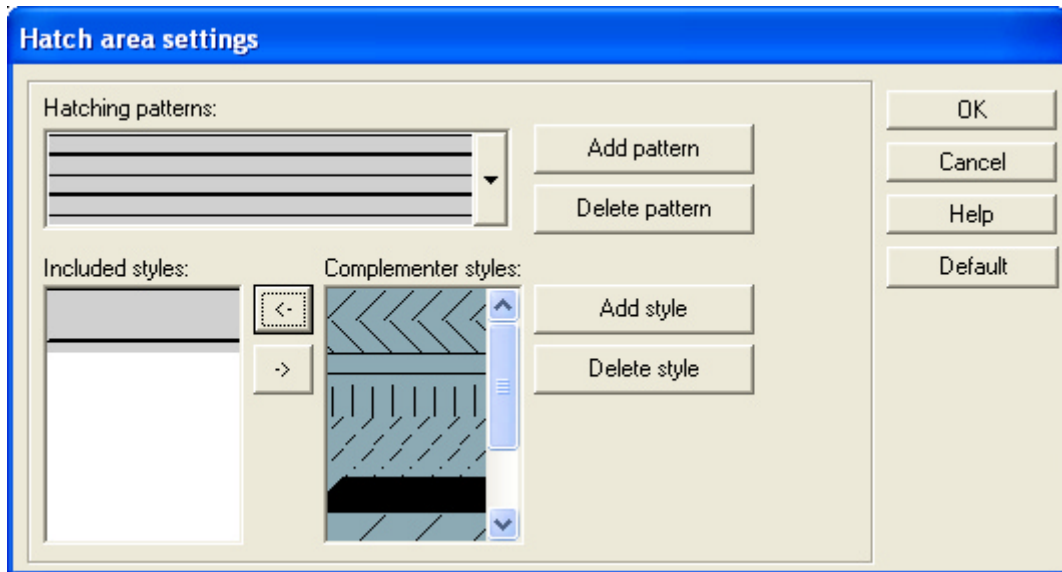
With the  Level Foils icon (appearing in the small window that comes up after clicking on the **Foil** icon at the bottom of the screen) you may make all other levels visible from a single level (Shift+R). When a new level is created you may turn on this feature and then arrange its position in a way that it is congruent with the one(s) below.

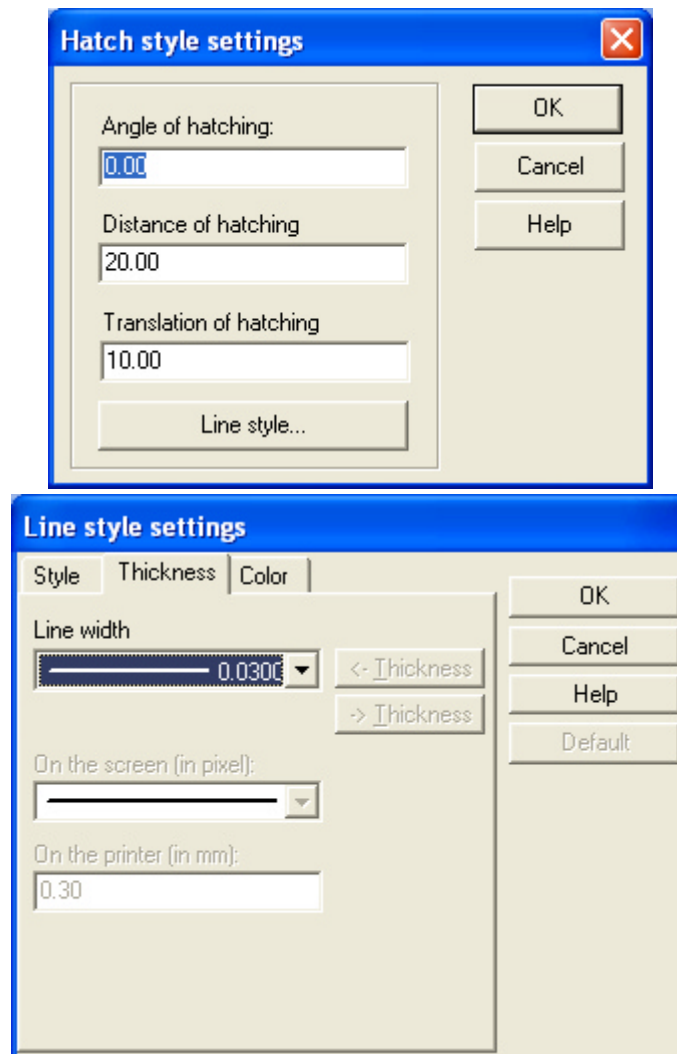
14./ How do I rotate a building element or a building?

Elements (walls, a whole level etc.) can be rotated, after selecting them, by clicking on **Edit/Transformations/Rotating** or hitting **Shift+Ctrl+R**. The small red circle indicating the radius of rotation appears. Move the mouse to a point where the axis of rotation will be, and press **Enter**. After that, press **a** and you may specify the magnitude of rotation numerically. Press **Enter** again and you'll see a preview of the rotated object, that you can approve by pressing **Enter** once again.

15./ I want to create a hatching of horizontal lines 10 cm apart, with lines alternately more and less wider. How do I do it?

New hatching patterns may be created in **Options/Hatch pattern editor**. The new patterns can then be stored and applied later on. To create a new hatching pattern press the **Add Pattern** button, which automatically assigns a pattern of 45-degree oblique lines to the Included styles field. If you want to transfer new patterns here from the Default styles field, select the given pattern and click on the  icon. Patterns may also be removed by clicking on the arrow looking in the opposite direction. To create a pattern described in the question above, consult the pictures below:





16./ If I open Options/Default values/Hatching patterns I cannot change anything about the patterns. Why?

In this dialog box you can only choose from existing patterns, but cannot modify them. New patterns may be created in the way described in the previous article.


17./ How to modify the shape of a polygonal slab/column etc?

Move the cursor to one of the corners of the polygon, and the small black pipe appears, enabling you to catch it, and then move it to a different location. In order to do this Snapping must be on.

Another way to change the geometry of the polygon is to select the edge of the polygon, right click on it and select Point operations/Insert point, inserting a new point at the selected position (or you may also remove one).

18./ In the 3D frontal view there are several lines superimposed on each other, I can remove them, but to no effect, they reemerge. What should I do?

When making 3D linear drawings you may switch on the option **Line Filtering** in


the **Options** dialog box opened by clicking on the  icon. This feature makes lines superimposed on each other disappear. However the feature slows down the process of generating the image.

19./ If I use a loaded picture as a background (in 3D mode), how do I position the building on it?

In 3D mode you may position the building by the keyboard arrows or by pressing down both mouse buttons and moving the mouse, you may rotate it by pressing down the left hand button of the mouse or, you may zoom in/out on it by the scroll wheel of the mouse. képet

20./ How do I position the building on a pre-arranged key plan?

The key plan should be scanned and stored in a BMP or JPG format. Mark down the DPI value of the image (eg. DPI 300). Open a blank drawing sheet in ARCAD.

Click on the  icon to import the BMP (JPG) file, while paying attention that the DPI number is the same as that of the image, and that the scale is 1:1. The building itself may be imported onto the drawing sheet in one of the following two ways:


1. Right click on the drawing sheet, and select the drawing you want to paste onto the sheet in **Insert part...** Pay attention to the scale of the project.
2. You may also use the 3D frontal or top view of the building. The (hidden-line) picture of the building should then be edited accordingly to the key plan, with the right scale etc.


21./ How to create a terrain by using contour lines?

The BMP/JPG image used in the floor plan window may also be used as a foil to help you to draw the contour lines of the site.

Draw the contour lines, and assign the height values to them. You may use the **Terrain designer** to introduce height points along the contour lines and then use these to generate a topographical terrain in 3D.


You may create a 3D model of the building site/terrain by using the **Terrain**

designer  module. First you should draw the outer lines of the terrain. These are usually identical to the property lines. After defining these, the terrain designer

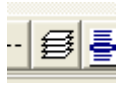
window opens. Here you may insert the height points (the relevant icon  is automatically turned on) and assign height values for them (after selecting them) in the **Point height** field.

In the **Terrain designer** you may also define the grid density (X,Y-grid density). By adjusting the grid's density you may ensure the smoothness of the surface. It is expedient to design the terrain on a separate level or foil. This level may contain elements you want to display in 3D mode, but are not needed on the 2D floor plan. You may set the the level height of this level to 0 cm. You may also hide these elements by the **Foils** function, which enables you to make certain elements invisible on the 2D floor plan but switch them on again in 3D.

22./ How can I make other levels visible whilst editing a certain level?

You may always turn on the visibility of other levels by the **Level foils**  feature (found in the View menu, or in the dialog opened



by the **Foils icon**  (in the lower icon row), or by pressing Shift+F).

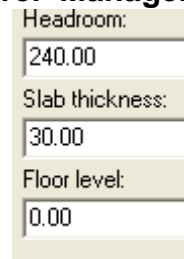
23./ What is the best way to design the foundation level?

Set a level height of 90 cm. Then draw the walls of the foundation, eg. with a thickness of 51 cm and with a fitting layer structure.

24./ How can I raise the height level of doors with a few centimeters, so that it is somewhat above the floor height?

You may assign a parapet height, that is, a certain shift in its height level to doors. This is the easiest way to modify the door's height.

Besides, you may define a **Floor level** in the **Level Manager** dialog, which



automatically raises all doors with the specified value.

25./ How do I save and store the default values adjusted by me, so that I do not have to reset them whenever I start a new project?

Every dialog has a button by which you may save the adjusted values as default values. If you push this button the **Save/Recall** window comes up, where you may save or revoke the modifications. The default values are then stored in the registration entries, and also individually within the file of each project.

26./ How can I elongate several lines at the same time?

Select the area (by encircling it with the mouse) containing the ends of the given lines. This way you may move the lines at the same time, either manually (by the mouse), or by pressing X/Y and setting the extent of the shift numerically.


27./ How do I tip up/down the small triangle seen on height dimensioning lines?

You may tip the triangle by the Space button.

28./ How do I transfer a painted image (eg BMP image) of a building on the linear drawing of the 3D frontal picture of a building?

You may impose ray-traced images on the outer surfaces of a building, while

retaining the visibility of the linear structure of the plan building.

If the Ray Tracing  module is opened while having the frontal view of a project in the 3D window, the upcoming Options dialog will have an automatically specified DPI value. This value is automatically readjusted if the Width/Height of the ray-trace picture is modified. Note this value (DPI), as you will have to enter it when you transfer the picture onto the linear drawing.

The scale of the ray-traced picture should be 1:100.

29./ How do I create a fence/enclosure on a sloping terrain, so that it follows the ascending slope?


You may use the stair designer for this purpose. For the width of the winder, set 30 centimeters (the width of the fence), 100 cm for the tread, 50 cm for the riser. The number of steps should be adjusted implicitly, eg. should be 11 in the case of a fence 10 meters long.

For **Foundation Laminar** should be set and it should have a thickness of 0.


Railing: You may create a railing within the Stair Designer module. Set 4 columns per step. Set the height of the rail to the height level of the fence, eg. to 150 cm, plus 50 cm for the footing.

You may also create a railing with the Rail option, by choosing one from the library of railings, and draw its line on the fence (in its middle), making the software automatically generate it (at the right height).

30./ How do I create pavements (side-walk) around a building?

You should do this by creating a slab with the  icon, by clicking next to an outer wall of the building, but before doing this you have to go to the Slab dialog and switch OFF Use wall corner points. After that, select the slab, right click on it and switch off Room or building shaped. Select the slab again and right click on it. Select Shift parallel slab sides from the menu, making the moveable rubber line image of the Slab appear, now you may adjust the size of the slab, so that it exceeds the building's boundaries, forming the pavements.


After that the slab within the building should be removed.

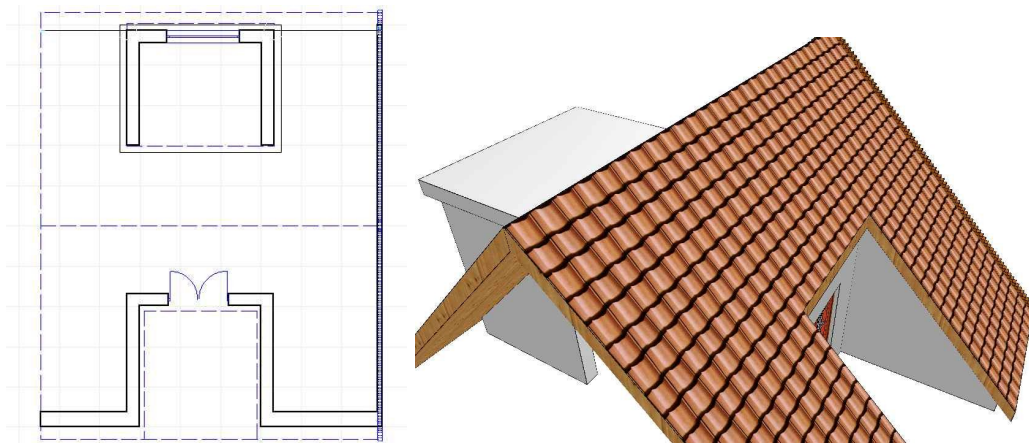
Press the  icon, select the slab by clicking on the pavement, and then click next to one of the walls, thus removing the slab within the walls of the building.

6 APPENDIX

A. Crow-stepped gables, roof incisions, roof projections

After creating the general layout of the building's roof, you may go on to add notches or protruding structures to it. This is done by setting the three walls, within the roof's plane, that define the projection/incision.

1. **Roof notches, incisions** If you are using the complete **Roof Designer**, you should first select the given roof plane, choose the **Polygon**  icon, and define the polygon that is to be removed, within the roofs. It is expedient to define the area to be removed that its limits are not the same as the wall lines, but being somewhat (eg. 1 cm) away from them. See pictures



2. **Roof projection** In this case too you need to define the three walls of the structure, but here these project are outside the roof. Here as well, you should pay attention that the roof does not come in contact with the walls, but this time the area (to be removed) should be (somewhat, eg 1 cm) away from the walls from the outside.

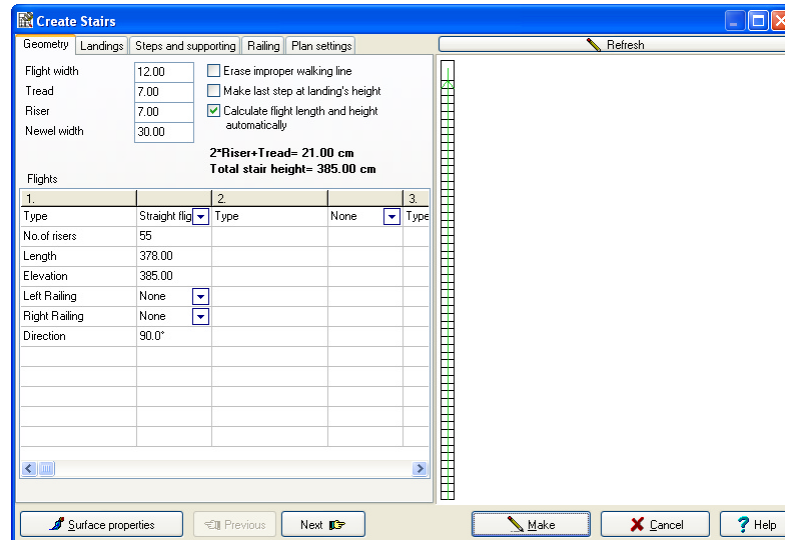
The projection can be covered with a slab, or by an additional roof. This additional roof should be created by the automatic roof designer (it is a very simple structure). A more elegant alternative is to complement the existing roof with an extra roof plane.

3. **Crow-stepped gables** can be created with the complete **Stair Designer**, setting the parameters in a way to create the gable.

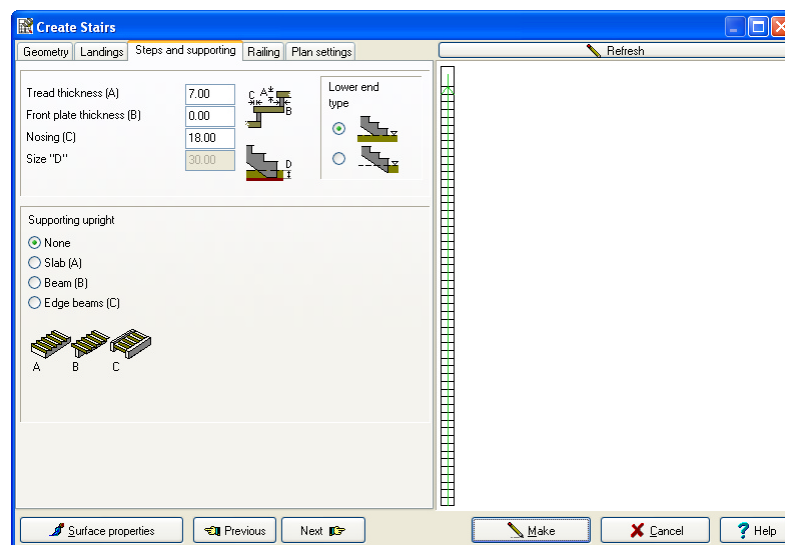
For example:

- Width: 12 cm.
- Step height: 7cm, or with 0,5 cm of mortar.
- Tread: should be calculated (you may calculate it by the roof designer as well, setting the angle and **dy** to 7 cm) In this example, let it be $45^\circ = 7\text{cm}$.
- In this example let the „stairs” (ie. the gable) be a linear staircase, whose number of steps equals the number of bricks used. The horizontal and vertical projection length beneath helps you along the designing process.
- No handrails.
- Direction: that of the gable.
- No landings.
- Tread: the thickness of the brick, 7cm, round off, or with 0,5 cm of mortar.

- No risers
- Nosing: from the length of bricks (25 cm) subtract the tread (7 cm). In this case: $25-7=18$ cm
- The other parameters need not to be specified.
- Height of sectioning: 0.
- After closing the Stairs designer, double click on the stairs and go to the Settings dialog. Here, it is advised that you set the section line's color to white, thus making the arrow showing the upward direction disappear.



Specifying stairs parameters/1



Specifying stairs parameters/2

