

STAIR Designer



DesignSoft

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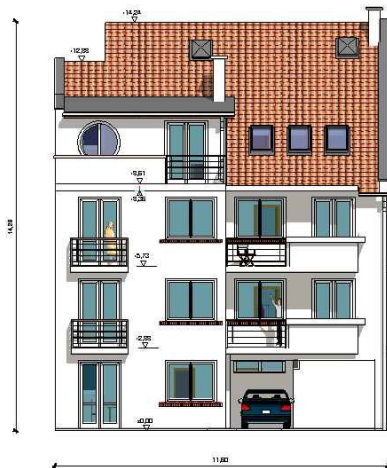
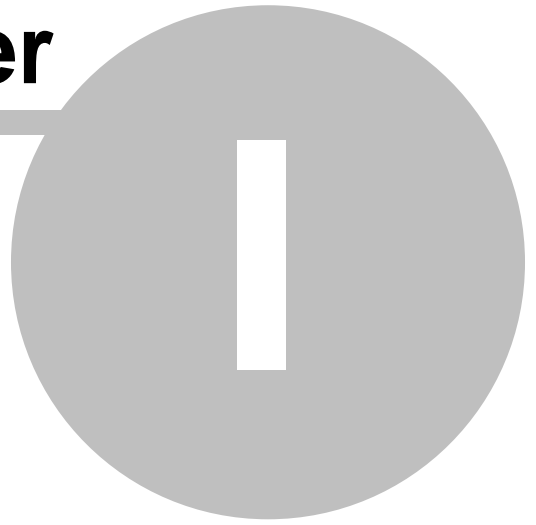
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Chapter



1 The upper iconline



By clicking on the icon a new top view window appears.



Open four new windows



Creating, selecting and moving dots



Selecting polygons



Creating dots continuously



Moving the view



Rotating the 3D view





Changing Views



Zooming



Switch On/Off the crosshairs when the  or  buttons are down.



Snap modes



You may select the unit of measure that you wish to use. See **Designing in different measure units**.




Activates the **Automatic stair designer** dialog.



Return to the floorplan editor

1.1 Opening four new windows

You can display four windows by clicking on the  icon. The editor windows are as follows:

Top view X-Y,


Front view X-Z,

Right view Y-Z

and *3D-view, axonometric window.*

Each of the four windows is an editing window, so it doesn't matter which window you use to work out the different steps of your editing. To make a window active, click on it. See **Changing Views** for details about changing the view of the active window.

1.2 Creating, selecting and moving dots

If this icon  is selected, you can create new dots or select and modify existing dots.

Note that you cannot create new dots or modify existing dots in the 3D axonometric view window.

There are five ways of *creating* a new dot:

1. By clicking on the **Create dot here (Insert)** in the right mouse button click pop-up menu
2. By clicking on the **Create...** menu item
3. By **Creating an arc**
4. By **Continuously creating dots**, lines and polygons
5. **Automatic stair generation**

Selecting a dot

It is very simple to select dots. Click on the dot represented by a small circle on the screen which you wish to select. To indicate your selection, the color of the dot will change to red. If there are dots one above the other in the active view, then you can *alternate dot selection* by hitting the **Space** bar. In other views, you can easily follow the selection of the proper dot. You may select more dots one after another. To select both dots one above the other select the dot twice. The selected dot or dots are red-colored. To cancel the selection of a dot, you must reselect it.

You can select a dot or dots by framing an area. In this case, every dot, line and plane in the frame will be selected. This selection is also indicated by changing the color to red.

Pressing Ctrl-A will **Select All** dots.

Moving dots

To move the selected dots together on the screen, just pick one dot and move it to the desired position holding the left mouse button down and they will all move together. For moving the dots you may wish to switch to another window or view.

To improve the accuracy of your move, you have additional possibilities such as:

Change Move Direction (Tab)

Move with offset

Moving to Crosshairs

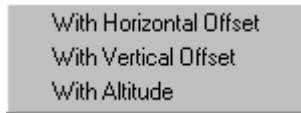
1.2.1 Create dot here...(Insert)

By choosing the **Create dot here** menu item, a new dot appears at your cross-hairs (or cursor) location.

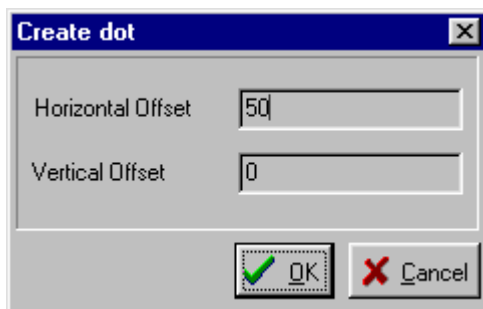
Pressing **Insert** is the fastest and most comfortable way of creating a dot.

1.2.2 Create dots...

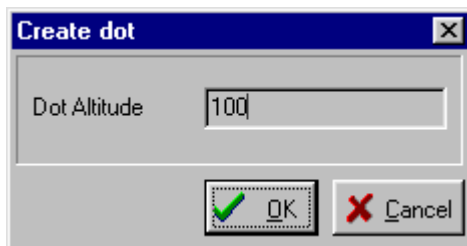
If you choose the **Create...** menu item, a new window pop-up appears where you can adjust the offset values of the new dot from your cross-hairs.



To specify the **Horizontal/Vertical offset values** a new menu window appears where you can enter the offset values. The new dot will then be created offset with those values from the cross-hairs' position.



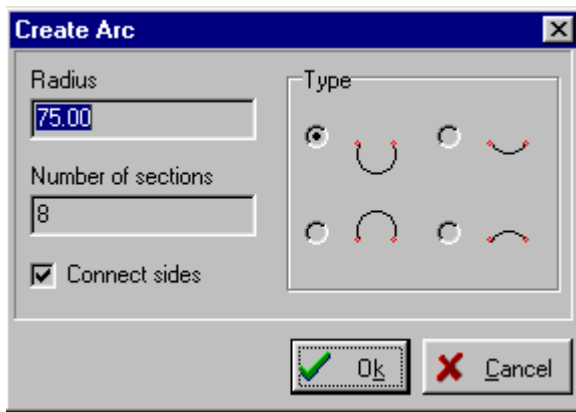
You can also enter altitude offset values of a dot, if you create the dot in the **X-Y view** window. Choose the **With Altitude** menu item.



Enter the value in the display window. The new dot created in the active window will be offset above the X-Y plane with the entered altitude value.

1.2.3 Create arc...

You can create dots by creating arc too. To create an arc, you must select two dots. Then click the right mouse button and choose the **Create Arc...** menu item in the pop-up menu. The following dialog box will appear.



You must enter the following values in the dialog box:

Radius: The radius of the arc (in your chosen measure unit) The default value is a semi-circle's radius

Number of sections: The number of straight lines that connect the arc.


Please pay attention to the number of sections in order to avoid both the creation of too many dots and un-smooth curves.



Connect Sides: Select to connect the dots immediately.

Type: To define the direction of the arc.

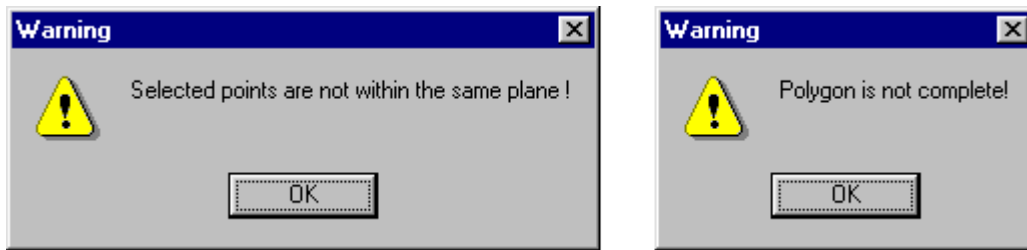
By selecting your dots in a consistent manner by relative position, this setting will help you get predictable results.

1.3 Working with polygons

Use the Select polygons mode (by clicking on the  icon) is an easy way to make polygons. In this mode, if you click at any location, the program will search for an enclosed plane figure nearby and change its color to red. If there are more than one plane figure overlapped, you may then alternately select plane by plane by hitting the **Space** bar. Using the **P** key, you can make polygons from this set of dots .

The following commands are available in the right click popup menus of  dot selection mode and  polygon selection mode.

Make Polygon (P) You may construct planes onto the selected polygons. To make a polygon from the selected dots, use the **P** key or choose the first menu item. If the dots do not lay on one plane together, then you will receive a warning message. The two possible warning messages are shown below.



First you must fix the fault and after that you may make a polygon from the selected dots. *To verify the polygon's existence press down the **S** key. This time you will see the polygons red shaded.*

Delete polygon

Selecting this menu item, you can strip the polygon from the selected dots. To verify the polygon's existence, press down the **S** key. After deletion, the plane will no longer be shaded red.

Show polygons (S)


To verify a polygon's existence, press down the **S** key. Now you will see all the polygons shaded red. In the roof editor the roof contour polygon will be shaded green.

Create All - Auto generating polygons

You may ask to auto-generate polygons from your created set of dots and lines. After calling the function, the first found polygon will be drawn in red. Press Space to cycle through all the found polygons. You can create a polygon from the currently selected set of dots by pressing P or using the right-click popup menu.

To create holes on polygons, see **Cutting polygons**.

1.3.1 Selecting polygons

After pressing the  icon, you may select polygons in the active window by clicking between lines. *The tilt angle of the polygon appears on the selected polygon.* This function serves to provide you with information only. If there are polygons one above the other, you may alternate their selection plane by plane by hitting the **Space** bar and you will see the tilt angle of each plane. The tilt angle of a created polygon which is defined as a plane is shown in black, while for a polygon which is not defined as plane it is shown in red.

(See **Polygons...**)



1.3.2 Cutting polygons



You can create holes in a polygon, so that it will be visible in 3D rendering. The practical benefit of this feature is the possibility to make room for attic windows, chimneys and other objects.

There are 2 ways of cutting polygons:

1. Selecting one polygon and drawing a cutting contour


2. Drawing a cutting contour and cut one or more polygons

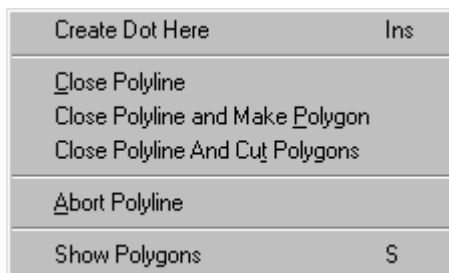
1. Press  to activate polygon selection mode. Click on the desired polygon, so that its contour turns to red and its sloping is written in black. Activate right-click popup menu and choose “**Cut selected polygon with polyline**”. You may note that the polyline mode  has been activated. Draw the contour of the hole using **Create here (Insert)**, or **Create with offset (X,Y)** functions. Finally, choose “**Close polyline and cut polygons**” from the right click popup menu. You see that the created hole is drawn blue.

2. Press  to activate polyline drawing mode. Draw the contour of the hole using **Create here (Insert)**, or **Create with offset (X,Y)** functions. Choose “**Close polyline and cut polygons**” from the right click popup menu. You may note that the polygon selection  mode has been activated. Click on a polygon, and if possible a hole is created in that polygon, it is shown in blue. You may select additional polygons to cut.

Note: the points of holes are movable, deletable as other points. However, if you move a hole point out of its plane, a dialog box appears. You may choose to delete the hole or cancel the movement. So, it is recommended to move the polygon and its hole points together.

1.4 Creating a continuous line...

After pressing the  icon you can create dots by pressing down **Ins** key when the cross-hairs and the small arrow are at the desired position. This is the fastest way of creating a dot and is comfortable to use. The created dots are connected with lines. You can stop the dot creation by clicking the right mouse button and you can close the polyline and make a polygon by choosing from the right mouse click pop-up menu :



Create dot here (Insert)

Close Polyline Finish the polyline

Close Polyline and Make Polygon Finish the polyline as well as create a polygon.


Close Polyline and Cut Polygons Finish the polyline as well as start to cut polygons. See **Cutting polygons** for details.


Abort Polyline (Esc) Leaves the polyline in its current form.

Show Polygons To verify a polygon's existence, press down the **S** key. Now you will see all the


polygons shaded red.

1.5 Moving the View

After selecting this  icon, you can move the whole plan in the active window. While holding the left mouse button down, you can dynamically position the whole roof together with its contour lines. This movement does not really move the plan, only the visible area changes.

You may also position the plan by using one of the  icons or **Ctrl+**, **Ctrl-** or **Ctrl E**, **Ctrl Shift E** hot keys. (See **Zooming**)


1.6 Rotating the 3D view

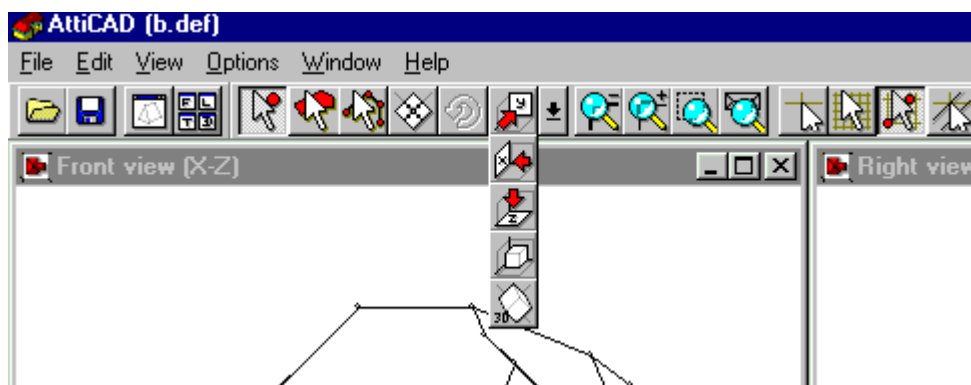
To rotate the roof, click on the  icon and *while pressing down the left or right mouse button* (depending on your desired rotation direction) simply move the mouse.

1.7 Changing Views


With the **View** menu, you can change the content of the view in the active window. For example, we can switch the content of Top view (X-Y) window to the Right view (X-Y) image.

We mention here that you can enlarge the active window to the full screen by clicking on (the second) icon in the upper-right corner of the window. As in other Windows programs, switching back to a divided windows mode is available by clicking on the replaced icon also the second small icon. The first corner icon is used to temporarily close the program window, while the third one (X) is used for final closing.


You can also set the view by clicking on the upper icon and choosing the right icon from the pull-down menu. 







There are two kinds of 3D-view windows.

1. The  axonometric view window shows you the front-view axonometrical illustration of the roof.

Its role in the editing is limited to selecting dots.

2. In the 3D  axonometric view window you can also **rotate** the roof shown in the window. Its role in the editing is limited to selecting dots.

1.8 Zooming

You can adjust the viewed size of your plan by using one of the     icons or the equivalent **Ctrl** and a character hot-key combination. Let's see the effects of the icons and the hot-keys.



Ctrl - Zoom in on the image in the active window. If the image becomes too small to zoom in again, then further execution of the function will be suspended.



Ctrl + Zoom out the image in the actual window. If the image becomes too large to zoom out again, then further execution of the function will be suspended.



Ctrl W Zoom out to an area defined by frame. You select an area with a frame which you want to zoom out to fit to window.



Ctrl E Zoom to plan size. You may zoom the whole plan extents to fit to the active window.

Ctrl Shift E Zoom all to plan size. You may zoom the whole plan to fit to window in every view.

1.9 Snap modes



For easier and more accurate editing, you can turn *on/off* snapping modes. To turn *on/off* snap modes, use the icons. If the icon is picked, the actual snap mode is toggled active or deactivated. Snapping means snap to already existing dots. You can choose from more snap modes by clicking on its icon in the upper iconline.



With this icon you turn *on/off*, the **Snap to grid** mode.



With this icon you turn *on/off*, the **Snap to existing dots** mode.




With this icon you turn *on/off*, the **Snap to lines** mode.





With this icon you turn *on/off*, the **Snap to planes** mode.

If you turn on a snap mode by clicking on its icon, then creating a new dot or moving an existing dot will take the snapping mode into consideration. With the help of snap modes, you can, for example, *place a dot in line with other dots* without paying particular attention to the coordinates. Using snap modes, you can edit quickly and more accurately. But of course in certain cases, there is no need to use snap modes. Most of the snapping icons also activate the cross-hairs.

1.9.1 Snap to existing dots


Clicking on the  icon you turn *on/off* the snap to existing dots mode. You can also specify a "sense range" to the snap dots. You may adjust the sensitivity of snapping in the **Options|Editor** main menu's **View/Dot snap sense range** field, but note that the range is defined in pixels here. This snap mode also activates the cross-hairs.

1.9.2 Snap to lines

Clicking on the  icon, you turn *on/off* the **snap to lines** mode. You may adjust the sensitivity of snapping in the **Options|Editor** main menu's **View/Line snap sense range** field, but note that the range is defined in pixels here. With the help of the **line snap**  icon, you can move or create dots on an existing line. The line snap mode in the active view always refers to the view of the line projected to the plane and not to the three-dimensional view. So if you wish the dot to definitely be on a 3D line, you need to snap to the line in two views. This snap mode also activates the cross-hairs.

1.9.3 Snap to planes






This icon switches *on/off* fitting to planes. Before using this feature, you have to select at least three dots which lie in the common plane. Using automatic polygon search (press  and click on a roof plane) is an easy way to select the plane which you want to work on. After switching on the plane fitting, every dot creation will produce dots lying in the chosen plane. For example, if you create a dot using the Insert key, the third coordinate which is perpendicular to the view of the active edit window, will be calculated. Plane fitting is also working when moving selected dots.

Important: don't forget to switch off the function when it's not necessary anymore.

Deleting the dots which specified the fitting plane will have no effect on the plane fitting feature.

1.9.4 Using the grid

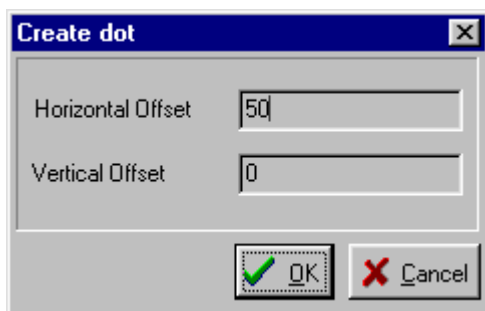
To turn *on/off* the **Grid snap** mode, click on the  icon. You can display grid dots on the screen. You may set the distance between grid dots in a given unit of measure unit in the **Options|Editor** main menu's **View/Grid dot spacing** field. To make the grid dots visible, click on the  icon in the upper iconline. If you would like to use the grid snap mode, you have to click on the  icon in the upper iconline. The grid snap mode works with the process of dot creation. If you activate this snap mode by clicking on its icon, then you can create dots only on the snap grid dots. The cross-hairs appear when activating the grid snap mode. You may shift the grid using the **F5** function key. To shift the grid to a desired dot location, follow these steps: move the cross-hairs to the dot or position where you would like to place a grid dot and push the **F5** function key or select the **Place Grid Here** function from the menu which appears by pressing the right mouse button. The program will then redraw the whole grid up/down left/right from this new origin using the grid space setting.

1.10 Designing in different measure units

Designing in centimeters



The mouse moves "independently" on the screen if no snapping mode is activated. You may follow the relative coordinate position values of the mouse in the lower data field. If you use arrow keys for moving, you may reset its increment steps using the **F3** function key. By using **F3**, you can toggle switch the value of displacement from 1 cm to 0.1 cm and vice versa. The default value is 1 cm until you switch to 0.1 cm by using the **F3** function key. To switch back to 1 cm, use the **F3** function key again. If you want to add to the increment step (to 100 times larger, e.g. to 10 or 100 cm) use the **Shift** together with **arrow keys**. The direction of the arrow key defines the direction of the displacement from the actual position and in accordance with it, the X-Y coordinates change. The coordinate of the actual position is shown in the lower data field. You may reset the lower data field by using the **F4** function key. With this function, you locate a new origin at the cross-hairs' and small arrow's position. You may displace the origin from the actual cursor position with a value entered with the **X and Y** keys in the dialog box which appears on the screen. For entering the horizontal/vertical offset values, a dialog box appears.



The new dot will be created offset from the actual cursor position with the entered parameters.

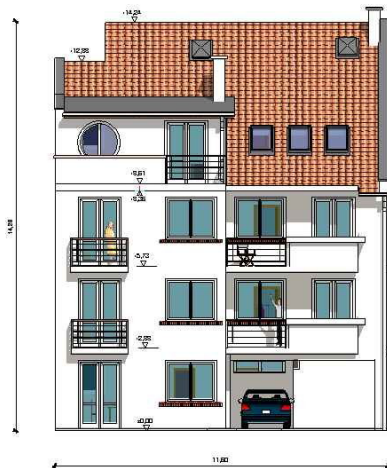
Designing in inches



Using inch-based designing coordinates are shown in feet and inches. Cursor keys move the cross-hairs by one inch or 1/16 inch depending on the state altered by pressing F3. Shift+Cursor keys cause one foot or 3/4inch movement. In every other feature, designing in inches is the same as designing in **cm**'s.

Chapter

II



2 File menu

File menu commands:

New Start editing a new stair

Open Loading a saved stair

Save and Exit Suspending the editing and closing the stair

Save Saving an edited stair

Save As... Saving the edited stair into new file

Import stair Loading a stair saved in an M3D file format

Export Stair Saving the edited file in an M3D file format

Exit End of stair-editing

2.1 Opening saved stairs

You can load an edited stair saved in **name.SDF** file format with the *Open* command.

In the *Open* window, you can choose the required file from the desired directory and then, you can load it to the *stair-editor*. When you save an edited stair, all data about the stair is saved in a **name.SDF** file format. You can simply load these saved files by choosing this command. The file contains the stair and its additional datas.

2.2 Save and Exit



If you wish to stop the editing on the stair shown on the screen, just click on the **Save and Exit** command.

When you return to the program, your designed stair will be available to apply to your floorplan. In the program, if you select a stair, and call the *stair-designer* program, the selected stair will be transmitted to the *stair-designer* program, so you can modify its elements and when you finish the modifications, the stair will be re-transmitted by returning to the program. Thus, there is a two-way data communication between the two modules.

2.3 Saving the stair

With this command, your stair plan will be saved in the file whose plan name is shown on the top line of the program-window. During the save, the edited stairs will be saved in a **name.SDF** file format. The saved file will contain the stair and also its adherent contours.

2.4 Save as...

By typing the name of the stair-file into the File name field, the edited stair may be saved into a new **name.SDF** file format. The saved file will contain the stair and also its additional datas.

2.5 Importing Stairs

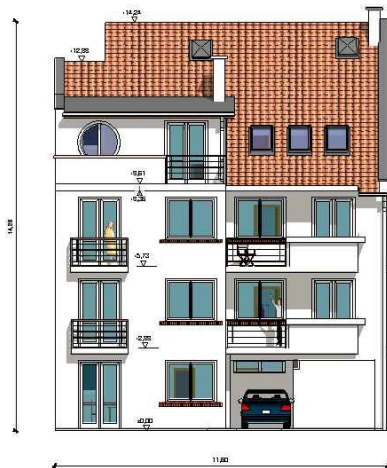
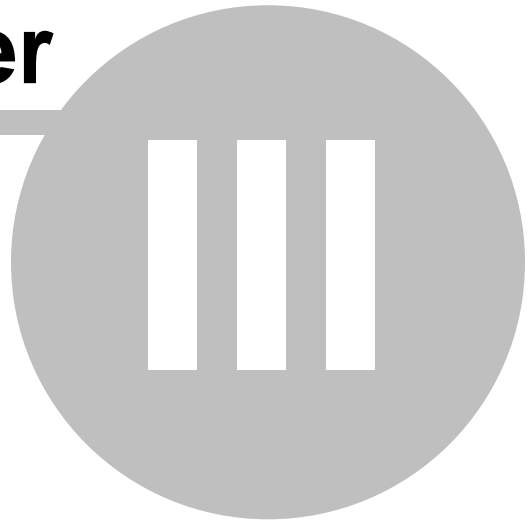
You can reload back a stair previously saved in **M3D** file format to the stair-planning-module. During the import, all the wall layers will be cleared from the screen and only the stair will be loaded from the **M3D** file. Automatic generation is not available for imported stairs. The **Modeler** 3D program can also open the **M3D** file format and with its help, you can link the models made by the stair editor to a library.

2.6 Exporting Stairs

You can save the stair without its contour lines and with the help of the **MODELER** program, you can also place and save it into a library. The *floorplan designer* system supports this library format, and so the stair is directly loadable as a ready library unit. That's why you need to save the stair into a file type supported by the **MODELER** program; i.e. the **M3D** file format which only contains the depictions of dots, lines, planes and cuts.

The **Modeler** 3D program can also open the **M3D** file format.

Chapter



3 Edit menu

Edit menu commands:

Undo Alt-Backspace

Redo Shift-Alt-BackSpace

Cut Ctrl X

Copy Ctrl C

Paste Ctrl V

Delete Del

Select All Ctrl A

3.1 Undo and Redo

The **Undo** and **Redo** functions serve to cancel a previously executed command or execute a previously canceled command. The command which this function "undo's" or "redo's" is shown in the menu line, so you can check the effects of the function in advance, with the safety of simply undo-ing the effects of an undesired command. Often times, instead of using the Delete function, it is more efficient to remove the edited results in the plan with other program commands. In such a case, we recommend using the **Undo** function.

Example: a roof is shown on the screen. You wish to move a few dots of it some centimeters away. You select the dots and move them. After the move, you realize that the dots you have moved are not the right dots. Using the *Undo* function, you can restore the previous location of the dots. The command relocates all the moved dots together. These are multilevel functions, which means there is a possibility to execute the **Undo** and **Redo** functions repeatedly. How many times depends on memory size and the task you are working on. If the program cannot step back, it tells you by changing the color of menu item to gray.

All the above applies similarly to the **Redo** function, but it performs the command that you have previously cancelled via the **Undo** function. You can simply call these functions by pressing **Alt-BackSpace / Shift-Alt-BackSpace** or **Ctrl Z / Ctrl Y**.

3.2 Cut,Copy and Paste

The **Cut** function /as in other programs/ places the selected elements on the clipboard in such a way that it removes the selections from the plan. You can also use **Ctrl X** hot-key to call this function.

The **Copy** function /as in other programs/ places the selected elements on the Clipboard in such a way that it leaves the selections in the plan. You can also use **Ctrl C** hot-key to call this function.

The **Paste** function /as in other programs / places the elements from the Clipboard into the plan. You can also use **Ctrl V** hot-key to call this function.

3.3 Deleting dots

The **Delete** function (**Del**) /as in other programs/ removes the selected elements. The selected elements can only be dots here. This function removes the lines and planes created by the dots. You can also use **Del** hot-key to call this function.

3.4 Select All (Ctrl A)

Using this function all the dots will be selected. Pressing **Ctrl-A** also switches to dot selection and creation mode.

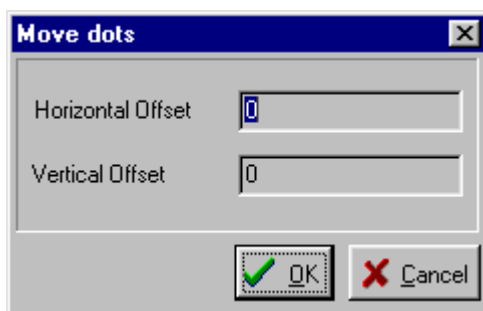
3.5 Change move direction

If you want to move the dots only horizontally or vertically, you may set a move direction. You have two ways to do this. While pressing the left mouse button, hit the **Tab** key and move the dots to the desired direction indicated on the screen, or simply click the right mouse button and choose the **Change move direction** menu item in the pop-up menu. When moving dots, a two-directional arrow appears on the screen to show the selected move direction.

3.6 Move with offset...

You may move the dots with a measured offset from their existing position.

Enter the offset values in the dialog box.

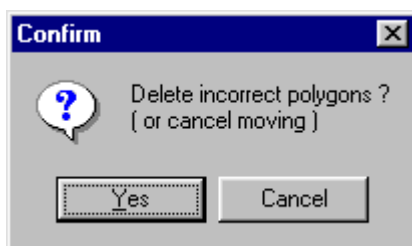


3.7 Move to crosshairs

You can also move a dot or dots to your cross-hairs.

Choose the **Move.../To cursor** popup menu item or then press the **O** (letter O) key.

In this process, the connecting lines and the planes will be shifted as well. If the planes would deflect due to this move, the program will suspend the move with an error indication, and you can decide whether you want to continue or not.



If you answer **Yes**, the dots will be moved to their new position in such a way that the deformed roof planes will be deleted from the roof. You may verify this by visualizing the planes (**S key**).

3.8 Connecting dots

You may connect the selected dots with a line. You may select three dots at the same time and make a triangle by connecting them. These created lines become a part of the roof and thus are visible lines in the 3D view.

3.9 Connect as help lines

These created lines are light-colored. Their aim is to help editing (they are useful when fitting to lines is turned on), or to create edges to close polygons, so that these polygon edges won't be visible in 3D rendering.

3.10 Disconnect dots

Choosing the **Disconnect** menu item, you erase the lines that connect the selected dots. The dots will now be independent from each other.

Chapter

IV



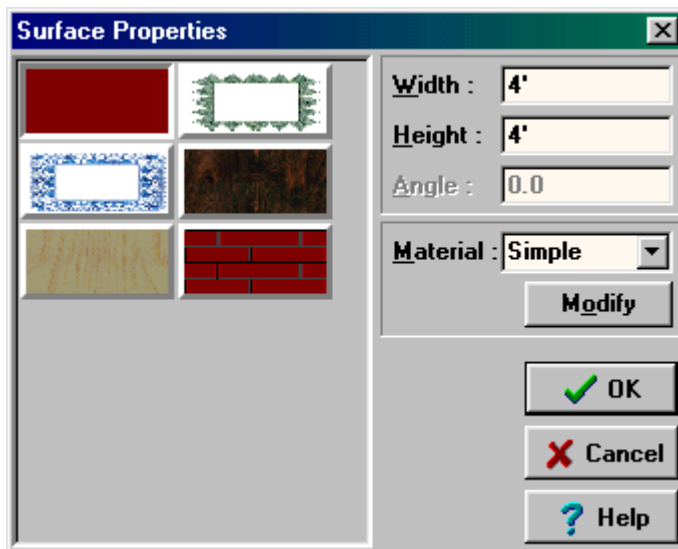
4 Options menu

Options menu commands: EditorSurface Properties

Using these commands, you can set the editor properties and the definition of surface's texture. The editor properties will be saved, and when restarting the program, will load its last settings.

4.1 Surface Properties

Using **Surface properties**, you can assign a characteristic texture to the elements of your stair. When visualizing the 3D rendering, your stair would be covered with the patterns of these surface properties. To define a texture, adjust the settings per below in the dialog box which will appear.



The settings of the dialog box are as follows:

Color button : press this to assign a homogenous color to the stair surface.

Textures: Textures are stored in **BMP** format files that may augment with additional textures. To do so, place the new **BMP** file in the **LIB** directory and then note the new file name in the **Stair** information section of the **Texture.ini** text file;

Width/Length: These parameters set the size to which you wish to stretch the pattern shown on the display swatch before it repeats;

Rotation: adjusts the rotational angle of the pattern displayed on your stair plane;

Material : You can change the material used for photorealistic rendering (ray-tracing).

4.2 Options / Editor

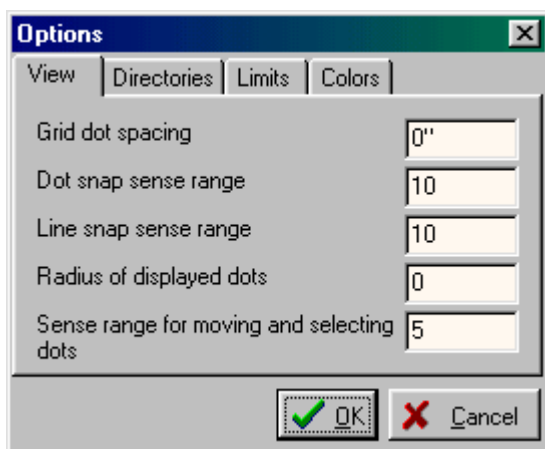
There are four property sets you can set. These are as follows:

View Setting editor properties


Directories Setting the directories in which the files are stored by default.


Limits Setting the maximum number of dots, lines etc. in the editor. Changing these values take place when you restart the program.


Colors Customizing editor colors




4.3 Options / Editor / View

Grid dot spacing. You can display grid dots on the screen. In this field, you may give the distance between grid dots in a chosen measuring unit. You may have grid dots display or not display by turning on/off the  icon in the upper iconline. During the editing, you may also ask the program

to snap to grid dots by also clicking on the  icon in the upper iconline. You may shift the grid using the **F5** function key. To shift the grid to a desired dot location, follow these steps: move the cross-hairs to the dot or position where you would like to place a grid dot and press the **F5** function key or select the **Place Grid Here** function from the menu which appears by pressing the right mouse button. The program will then redraw the whole grid up/down left/right from this new origin using the grid space setting.

Dot Snap Sense Range: You can also set the sense range from your cursor to snapping dots.  By changing the **Dot Snap Sense Range** (the maximum distance from cursor to dot to snap to), the measurement must be given in screen pixels, and actual measured distance will be dependent on your zoomed view. This setting affects the dot snap mode.

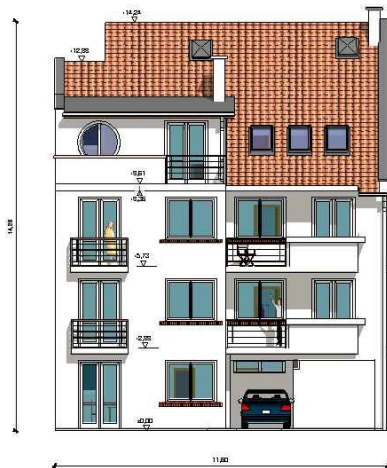
Line Snap Sense Range: This setting affects the sensing range from cursor to your snapping line. The measure must be given in pixels, so again, the actual measured distance in cms or inches depends on your zooming plane. By clicking on the  icon, you can turn *on/off* the line snap mode. With the help of the feature, you can move or create dots on an existing line. The line snap mode in the active view always refers to the view of the line projected to the plane and not to the three-dimensional view. So if you wish the dot to definitely be on a 3D line, you need to snap to the line in two views.

Radius of displayed dots: The dots created on the screen are represented by small circles. You may enter here the radius of those circles. Be careful that your radius is not too large as it can complicate your editing.

Range for selecting and moving dots: You can select a dot or dots by framing an area, while holding down the left mouse button. With this "plus range" setting, the dot selection may also contain dots outside of that frame within the range of the given pixel number. You can move selected dots by dragging them with the mouse, holding down the left mouse button. This value also represents the distance (in pixels) in which you can catch the dots to select them for moving.

Chapter

V



5 View menu

View menu commands: TopLeftFrontAxonometric3D
editor window.

These set the view of the active

Show/Hide Crosshairs

Show/Hide Grid see also **Snapping to Grid**

Chapter

VI



6 Window menu


Window menu commands:


Cascade arrangement In the **Cascade** arrangement, the program displays windows stacked and cascading from the top left to the bottom right of the screen.

Tile arrangement In the **Tile** arrangement, the program displays windows edge to edge, filling the whole workplace.

Arrange Icons This function arranges the minimized windows within the main window. You may minimize a window by clicking on the first icon at its the upper right corner.

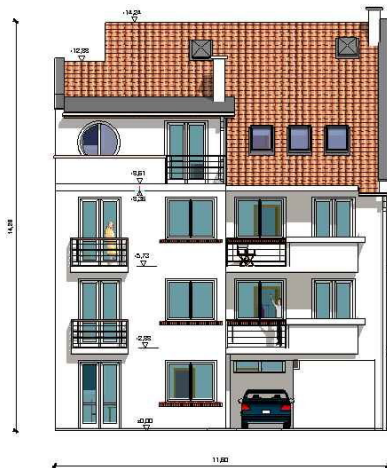
Close All The selection closes every opened window.

Show New With this command you can open a new window. The new window will appear in top view mode. You may also press the  icon to reach the function.

Show All Views Use this command to display four new windows with four different views. You may also press the  icon to reach the function.

Chapter

VII



7 Right click popup menus

You find main functions in the right mouse button click pop-up menu. These menus pop up when you right-click in the workspace of the non 3D editor windows. You will often execute these useful functions and the same commands can be found in other menus as well.



Popupmenu for creating, selecting and moving dots

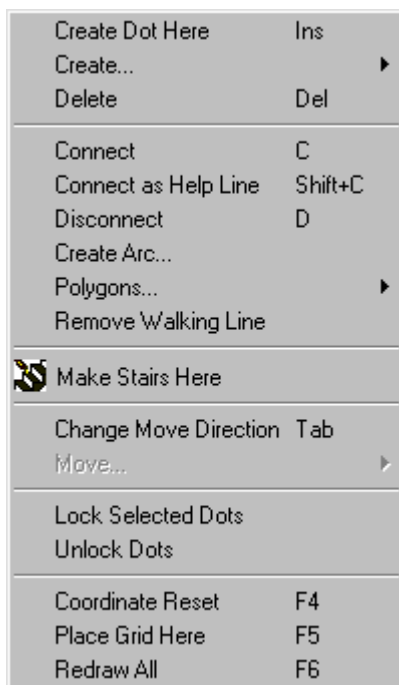


Popupmenu for selecting polygons



Popupmenu for creating dots continuously

7.1 Popup menu for dot creation, selection and movement



Create dot here (Insert)

Create...

Delete (Del)

Connect

Connect as helpline

Disconnect

Creating an arc

Polygons... Remove walking line The stair's walking line will be deleted.



Make stairs here The automatic stair designer dialog appears and the the stair will be placed at the crosshairs position.

Change Move Direction (Tab)

Move...

Lock selected dots You may assign a special attribute to the dots so that later you may select the dots but cannot move them. Clicking on this menu item, you lock the selected dots. The dots will stay at their position and you cannot displace them unless you unlock them first. Of course you may use these dots for other functions (like connecting them with lines, defining planes, etc.).


Unlock dots To release the locked dots, use this menu item to allow you to subsequently move them.



Coordinate reset (F4) You may reset the coordinate-system origin to the cross-hairs' current position so thereafter the X,Y values will appear relative to this new position in the lower right information field.

Place grid here (F5) You use this command to shift the grid to a dot of your choosing. The program will then redraw the whole grid up/down left/right from this new origin.

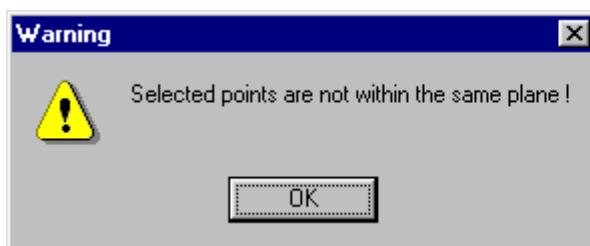
Redraw all (F6) Sometimes you may find "ghost marks" on the screen that you may clear in refreshing the screen by choosing this menu item or by using the **F6** function key.

7.2 Working with polygons

Use the Select polygons mode (by clicking on the  icon) is an easy way to make polygons. In this mode, if you click at any location, the program will search for an enclosed plane figure nearby and change its color to red. If there are more than one plane figure overlapped, you may then alternately select plane by plane by hitting the **Space** bar. Using the **P** key, you can make polygons from this set of dots.

The following commands are available in the right click popup menus of  dot selection mode and  polygon selection mode.

Make Polygon (P) You may construct planes onto the selected polygons. To make a polygon from the selected dots, use the **P** key or choose the first menu item. If the dots do not lay on one plane together, then you will receive a warning message. The two possible warning messages are shown below.



First you must fix the fault and after that you may make a polygon from the selected dots. *To verify the polygon's existence press down the **S** key. This time you will see the polygons red shaded.*

Delete polygon

Selecting this menu item, you can strip the polygon from the selected dots. To verify the polygon's existence, press down the **S** key. After deletion, the plane will no longer be shaded red.

Show polygons (S)


To verify a polygon's existence, press down the **S** key. Now you will see all the polygons shaded red. In the roof editor the roof contour polygon will be shaded green.

Create All - Auto generating polygons

You may ask to auto-generate polygons from your created set of dots and lines. After calling the function, the first found polygon will be drawn in red. Press Space to cycle through all the found polygons. You can create a polygon from the currently selected set of dots by pressing P or using the right-click popup menu.

To create holes on polygons, see **Cutting polygons** .

7.2.1 Selecting polygons

After pressing the  icon, you may select polygons in the active window by clicking between lines. *The tilt angle of the polygon appears on the selected polygon.* This function serves to provide you with information only. If there are polygons one above the other, you may alternate their selection plane by plane by hitting the **Space** bar and you will see the tilt angle of each plane. The tilt angle of a created polygon which is defined as a plane is shown in black, while for a polygon which is not defined as plane it is shown in red.



(See **Polygons...**)



7.2.2 Cutting polygons

You can create holes in a polygon, so that it will be visible in 3D rendering. The practical benefit of this feature is the possibility to make room for attic windows, chimneys and other objects.

There are 2 ways of cutting polygons:

1. **Selecting one polygon and drawing a cutting contour**
2. **Drawing a cutting contour and cut one or more polygons**


1. Press  to activate polygon selection mode. Click on the desired polygon, so that its contour turns to red and its sloping is written in black. Activate right-click popup menu and choose "**Cut selected polygon with polyline**". You may note that the polyline mode  has been activated. Draw the contour of the hole using **Create here (Insert)**, or **Create with offset (X,Y)** functions. Finally, choose "**Close polyline and cut polygons**" from the right click popup menu. You see that the created hole is drawn blue.

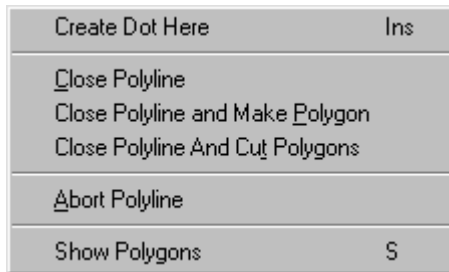
2. Press  to activate polyline drawing mode. Draw the contour of the hole using **Create here (Insert)**, or **Create with offset (X,Y)** functions. Choose "**Close polyline and cut polygons**" from the right click popup menu. You may note that the polygon selection  mode has been activated.

Click on a polygon, and if possible a hole is created in that polygon, it is shown in blue. You may select additional polygons to cut.

Note: the points of holes are movable, deletable as other points. However, if you move a hole point out of its plane, a dialog box appears. You may choose to delete the hole or cancel the movement. So, it is recommended to move the polygon and its hole points together.

7.3 Creating a continuous line...

After pressing the  icon you can create dots by pressing down **Ins** key when the cross-hairs and the small arrow are at the desired position. This is the fastest way of creating a dot and is comfortable to use. The created dots are connected with lines. You can stop the dot creation by clicking the right mouse button and you can close the polyline and make a polygon by choosing from the right mouse click pop-up menu :



Create dot here (Insert)

Close Polyline Finish the polyline

Close Polyline and Make Polygon Finish the polyline as well as create a polygon.

Close Polyline and Cut Polygons Finish the polyline as well as start to cut polygons. See **Cutting polygons** for details.

Abort Polyline (Esc) Leaves the polyline in its current form.

Show Polygons To verify a polygon's existence, press down the **S** key. Now you will see all the polygons shaded red.

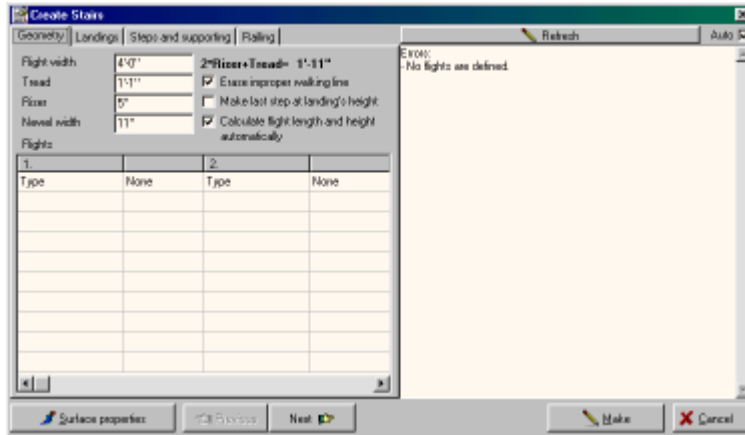
Chapter

VIII



8 Automatic stair designing

In the automatic stair-generating window, you may enter all the stair data such as: flight width, flight type (straight, winding or arched), etc. the dimensions for each step. The stairs may consist of several flights, which can be connected with landings. You may make a landing when the directions of two sequential flights vary. In this case, the program makes a landing between the two flights. The type of the landing is also selectable.



There is a multi-window dialog box for every flight where you can define the stair balusters, the individual stair data, the stair landing, the dimensions of stair rails. You may enter several data in the different windows. To switch to different windows, click on the small tabs where their names are shown.

When entering the data you can see the schematic top view shape of the developing stairs in the preview window. In this way, you can verify the prospective shape of the stairs. If you enter incorrect data, you will get error indications and may will be allowed to correct the data.

Every dialog page has a common data section referring to the whole stairs. An element can be applied in the stairs several times, so this data can cover repetitive conditions: for example, in case of multiflight stairs, the length of steps refers to every flight, etc.

There are four dialog pages such as:

Geometry Contains the geometric data of flights

Landings Contains the data for landings that connect the flights

Steps and supporting Contains the data of the individual steps of flights and the flight balusters.

Railing Contains the data of rails ascending on flights and rails that enclose the landings

See an **example** example for designing a stair.

8.1 Geometry dialog page

The data in the common data field:

Flight width: You enter the width of the flight that you will to define.

Step width: You may enter here the tread width of steps.

Riser: You may enter the riser (step height) here.

After entering the value of tread or riser, you can press Enter and these values will be assigned to all the flights. Vica versa: if you clear on of these fields and press Enter, the value of it will be calculated according to the entered flight datas. This calculation is not available when the entered flight datas result different values for the tread or riser values.

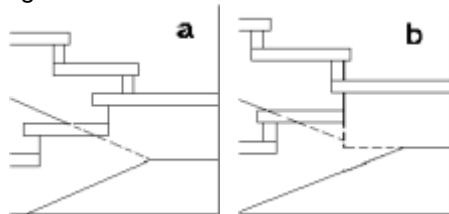
Newel width: In case of several flights, you enter the newel width two flights. This value is used in two cases. When automatic type landings are generated or when winding flights are generated and their turning is larger than 90 degrees.

2*Riser + Tread =... This formula is only informational and changes as you change the value of tread or riser.

Erasing improper "walking lines": In case of arched and winding flights, the constructed stair may step out of the permitted range. This will be red-colored on the screen and you can clear it off from the flights. You may remove all walking lines from the plan by choosing the **Edit/Remove walking line** menu item.

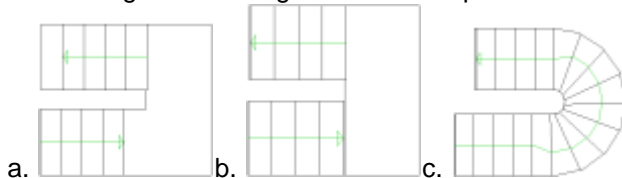
Make last step at landing's height:

If this option is set the last step of the stair flight will be at the same level as the following landing, so the flight length will be one tread longer. Also in this case the program will create the stair in a way that the supporting's and the landing's bottom is always at the same height. See this on the next figure:



180 degree turning landings, the supporting's and the landing's bottom is at the same height at the end of the flight (a), or not (b)

If the option is disabled, the flight width equals to $(\text{risers}-1) \times \text{tread}$ and the last step is one riser below the landing. The next figure shows the possible cases regarding to this option.



a. last step is at the same level as the landing

b. last step is below the landing the flight length is one tread shorter

c. the option is disabled. The first straight flight has the same elevation as the third straight flight, however the first flight is longer than the third. This is because there is no landing between the first and the second flight, so the first flight's last step must be created completely.

Calculate flight length and elevation automatically:

When switched on, the program automatically calculates these values according to the number of risers entered in the table.

Under the common data section, you find a multi-column and multi-row **data entry field**. The fields are separated into two-column units. In every each two-column unit, you may enter the data of a stair-flight. In the first column, you see the type of data you have to enter, which can be different when choosing other flight-types. First, you have to choose the type of the flight. In the field marked

None, by clicking on the right corner, a scroll-down window appears where you see the possible flight-types. The types can be:

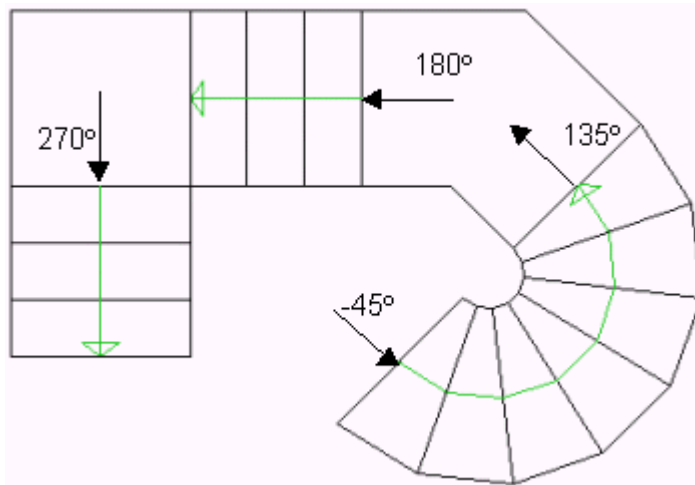
Straight Flight

After choosing the flight-type, the fields will be named in the first column and the required data you have to enter in the second column. Some are fields that the program can fill in by taking the data in the common fields into consideration. To execute this, clear the field and hit the **Enter** key. The common data fields are in relation with some flight data fields, so if you change any data of the common fields after hitting the **Enter** key, the program recalculates the related data fields. If you change data in other fields, then to get the values recalculated, you must first delete the values in the fields, and then hit the **Enter** key in every field. In case of incorrect data fields, you will get an error-indication. With the help of the above mentioned process, you may correct these problems.

The interpretation of top view directions of stair flights:

You may enter the top view direction of the flight in degrees.

0 degrees stands for horizontal and 90 is for vertical direction pointing to the right and up respectively. When entering these values you have to keep in mind the following: When you enter a direction after another direction as we move forward on the stairs, if the following direction has a larger value then the stair will turn left, if it's smaller one the stair turns right. The following figure demonstrates this.



8.2 Parameters of straight stair flight

This is the most common stair type. After choosing this type you can enter the following parameters.

Number of risers: Number of stair steps. The value is interactive with a common field, so the program can calculate it after entering the other values.

Flight length: Taking the tread width and the number of risers into consideration the program calculates the length of the flight. The value is interactive with a common field, so the program can calculate it after entering the other values.

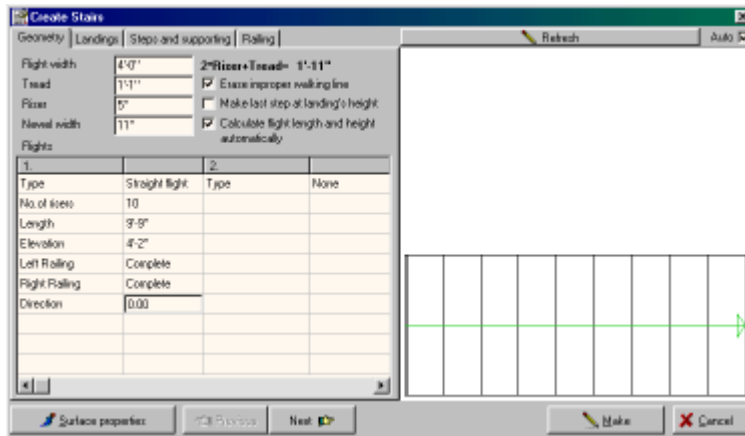
Flight elevation: The height value of the flight. The value is interactive with a common fields, so

the program can calculate it after entering the other values.

Left railing,

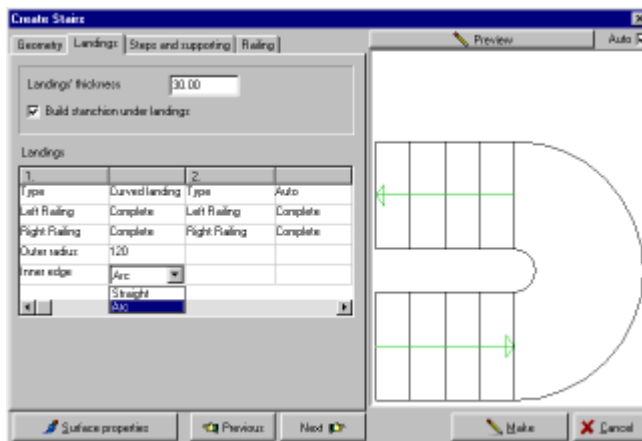
Right railing: You can ask the program to create railings to both sides along the flights. You can enter the definition of the left and righthand side separately. The railings can be omitted <None> or its columns (balusters) can be omitted <No column> or using the parameters of the railing entered in the dialog box, the program creates <Complete> a stair railing accordingly to the definition.

Direction: You may enter the direction of the flight in degrees.



8.3 Landings dialog page

Landings connect different directional flights. Taking the entered width of the newel into consideration, the program automatically builds in a landing between them.



Data fields:

Landing's thickness : the structural thickness of every landing.

Build supporting under landings: you tell that whether you wish a support under landings or not.

You may choose landing type by choosing it from the type field.

Type:

Auto

Simple You may enter the width of A and B, these sizes are shown on the top view sketch in different colours.

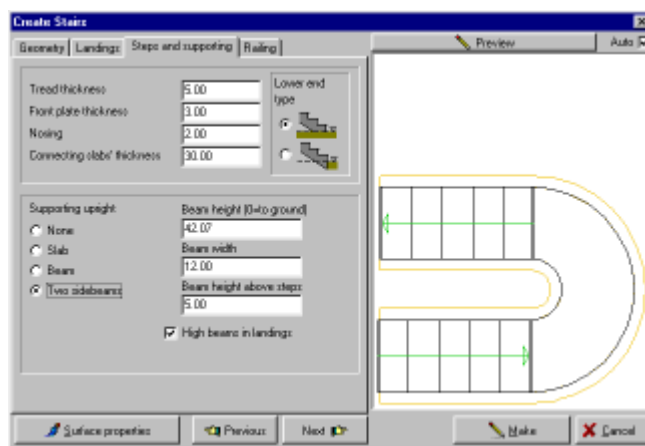
Curved landing You may enter the outer radius and the type of the inner edge

Left railing,

Right railing: You can ask the program to create railings to both sides along the flights. You can enter the definition of the left and right hand side separately. The railings are omissible **/None/** or its columns are omissible **/No column/** or considering the parameters of the railing entered in the dialog box the program creates **/Complete/** a stair railing accordingly to the definition.

8.4 Steps and supporting dialog page

You may enter the parameters of the supports under the flights and landings or instead you may enter the parameters of the steps in this dialog box.



Let's see the fields:

Width of tread: You may enter the width of the tread in this field for the three-dimensional image.

Width of front plane: You may enter the width of the front plane in this field for the three-dimensional image.

Nosing: You may enter the value of the overhang nosing in this field for the three-dimensional image.

Thickness of connecting slab: You may enter the thickness of the slabs that virtually connect to the start and the end of the stairs.

Lower end type: You may choose the type from the figure.

High beams in landings: you may turn *on/off* the edge-beam elevation along the landings.

For entering the parameters of the supporting, you need to select the type of the supporting first.

The following types are available:

Slab

Beam

Edgebeams

Parameters of slab supporting:

Thickness of Slab: You may enter the thickness of the supporting in this field. If you enter 0 then the flights and the landings will be supported down to the floor.

Tread side-hangout: You may enter the side-hangout (overhang) of the tread. You can see the effect of this function in the 3D view.

Parameters of beam supporting:

Beam height: You may enter the thickness of the supporting beam(s) in this field. If you enter 0 then the flights and the landings will be supported down to the floor.

Beam width: the other cross-sectional size of the beam.

Number of beams: You may enter the number of the beams for supporting upright in this field.

Distance between beams: When you use multibeam supporting you can enter the value of the distance between them. In case of one beam, it is positioned in the middle.

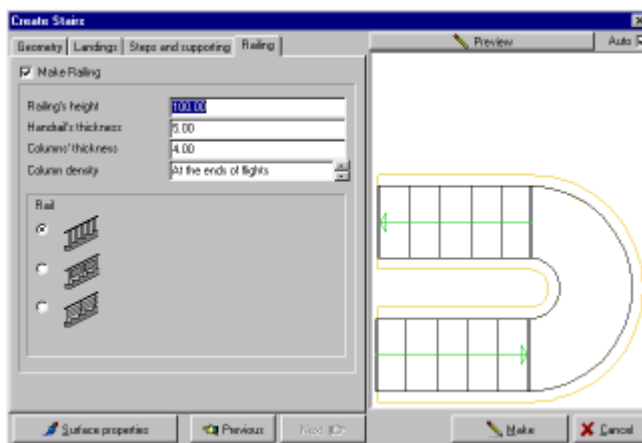
Parameters of edgebeam supporting:

Beam height: You may enter the total thickness of the supporting beams in this field. If you enter 0 then the flights and the landings will be supported down to the floor.

Beam width: the other cross-sectional size of the beam.

Beam height above steps: by increasing this value, you can make a stair with the edgebeams raising high.

8.5 Railing dialog page



The railing goes up on the flight and the program can generate it in three types.

Railings' height

Handrails' thickness

Columns' thickness

Column density: Using the small arrow you can change the density (spacing) of the columns.

Type of rail: You may choose it graphically. For the second type, you need to enter the measure of the spacing between the plates and the columns. And for the third type you need to enter the number, the thickness of the slats and the distance between the slats.

Chapter

IX



9 Example

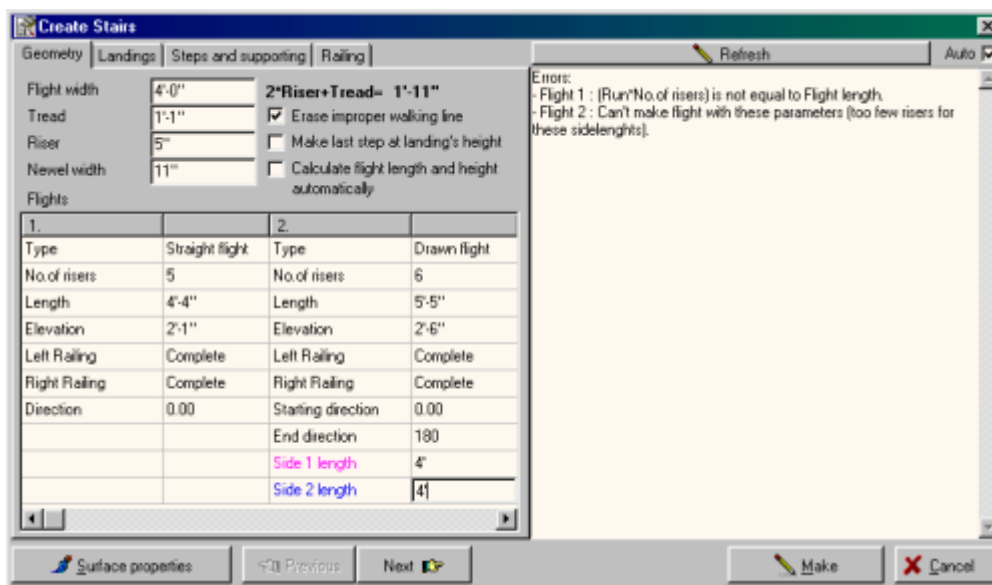
Let's review an example for several styles of three-flight staircases. Let's enter the parameters of several types of flights and follow through the process of entering the data.

The edited staircase is made up of two straight flights which are connected with a winding flight.

Switch off the creating of the *Last step in landings height*, as well as *Automatic flight length and elevation calculation*.

Choose straight flight type for the first flight. Enter **5** in the field of number of risers for the first flight. You may have the remaining parameters calculated by hitting the **Enter** key, field by field.

Choose winding flight type for the first flight. After entering **6** in the field of number of risers for the second flight, and you may have the flight length and the flight elevation calculated by the program again. You enter the degree of rotation and both of the sidelengths. After entering the parameters of the second flight in the example, the preview of the stair has not appeared but you have received two error messages.



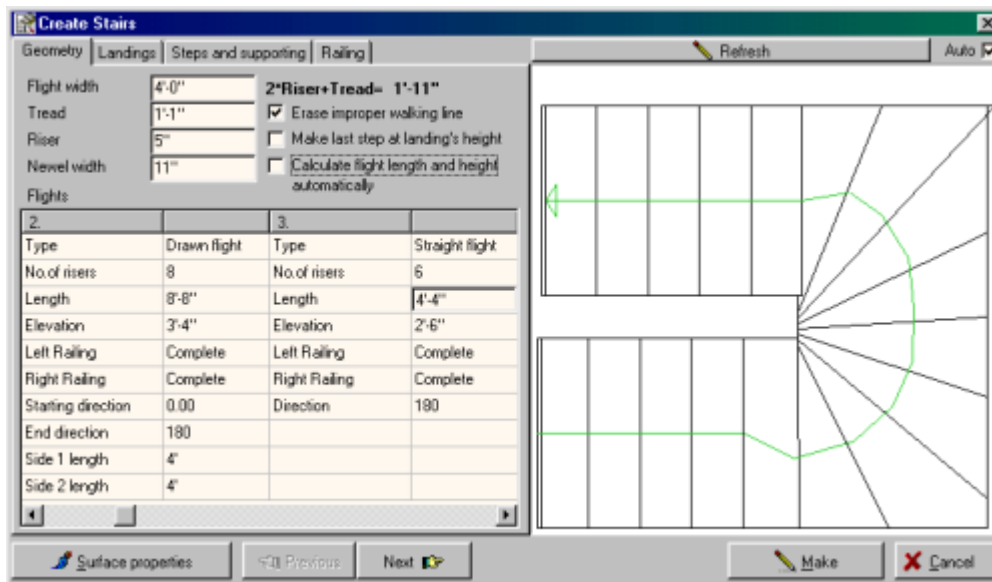
You need to have the flight length of the first flight recalculated because the length of the flight changes by attaching the subsequent flight. Clear the field of the flight length and have it recalculated by hitting the **Enter** key.

"(Tread x number of risers) is not equal to flight length" error message is fixed.

"Can't make a winding flight with these parameters (too few risers for these sidelengths)": this error message means that keeping the entered stair step on the walking line, the program cannot construct the turning flight with the specified amount of stairs. Fix the number of stair steps. Increase its number by two and calculate flight length and elevation. The program will now draw the preview of the first two flights after the modification.

You may enter the parameters of the third flight and fix the flight length of the second flight by recalculating it. <clear and Enter>. The edited flight appears.

Press **Make** to generate the stair.



During the editing, you can fix errors by clearing the entered values in that field which is marked as defective and hitting the **Enter** key to recalculate it. Most of these error messages don't appear if the **"Calculate flight length and elevation automatically"** option is enabled.

After this you may change the landings (there is none in this example), the type of supporting upright, the steps and the railing.

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