

Floating Floors and False Ceilings

Pavimenti galleggianti e controsoffitti

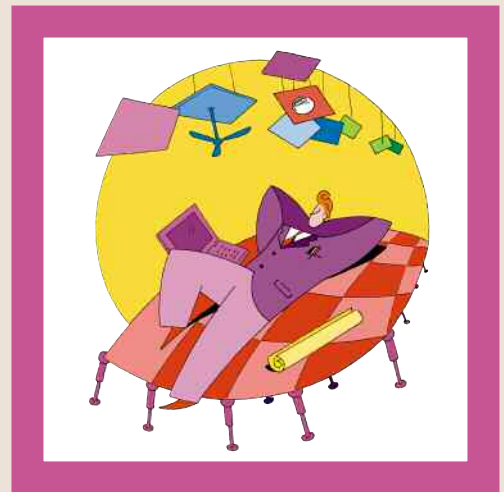
Eingezogene Fussböden und Zwischendecken

Sols flottants et faux-plafonds

Creación de pavimentos flotantes y falsos techos

ArchiPanel™

vers. 1.0



PLUG-IN FOR ARCHICAD®

ArchiPanel™

User Guide

ArchiPanel "User Guide"

Version 1.0 for Microsoft Windows and Apple Macintosh

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The ArchiPanel Plug-in

Floating Floors and False Ceilings for ArchiCAD

What are ArchiCAD Plug-ins?

ArchiCAD plug-ins are software components that add functionality to the standard features of ArchiCAD.

Extensions are currently available for import/export operations, for executing special GDL functions and for some of the display methods that come with the standard ArchiCAD package.

ArchiPanel is one of these extensions.

System Requirements

From a technical standpoint, ArchiCAD plug-ins are code fragments.

This means that they cannot be launched directly from the Finder (Macintosh platform) or from Windows Explorer (Windows platform). ArchiCAD opens and closes them automatically using the Code Fragment Manager's service routines.

Memory

As import libraries are not applications, they do not require special memory configurations.

Import libraries are loaded into the system heap when they are activated. If there is not enough memory available, a warning will be displayed.

If this occurs, make more memory available to the operating system by quitting other applications or reducing the memory allocated to ArchiCAD.

ArchiCAD Version

ArchiPanel is compatible with ArchiCAD 8.1 (release 8.1 - R2 is recommended) and later versions.

It will not run with earlier versions of ArchiCAD.

How are ArchiCAD Plug-ins Used?

Normally, you will not even realize you are using a plug-in.

When you select a particular command or action, ArchiCAD automatically executes the appropriate code. You will only notice that new functionality has been implemented within the program.

The only special attention required by the user involves the location of the ArchiCAD plug-ins on the computer's hard drive.

Where to Install Plug-Ins

Plug-ins must be copied into ArchiCAD's Add-Ons folder.

Different types of code can be placed in various levels of subfolders.

- **Mac OS:** The Add-Ons folder can be located either in the same folder as the ArchiCAD application or in the Graphisoft folder inside the System Folder.
- **Windows:** The Add-Ons folder must be in the same folder as ArchiCAD. If placed in any other location, ArchiCAD will not be able to access it.

ArchiCAD verifies the presence of the plug-ins at start-up. If they are not in the correct folder, you will have to exit the program, move them to the appropriate location and restart ArchiCAD.

If a plug-in is used on an infrequent basis, you can launch it using the **Load Add-On...** command from the Tools menu.

Package Installation

To ensure correct installation of the package, follow the procedure described below:

- Copy the ArchiPanel folder to the Add-Ons folder, which is located in the same folder as the ArchiCAD application.

If the installation is successful, a new menu will be added to the Menu Bar (typically in the Extra menu).

This new menu will allow you to show or hide the ArchiPanel Palette depending on your needs.

The ArchiPanel Palette



The Palette gives you access to all of ArchiPanel's commands and functions. From left to right and from top to bottom, these include:

- Create a new panel
- Create a panel module
- Distribute panels on floor/ceiling
- Distribute panel modules on floor/ceiling
- Modify default values for covering
- Define offset
- Change layout origin
- Cut/Drill paneling
- Modify paneling
- Modify covering / Create structure
- Update paneling
- Online help

Panels and Panel Modules

Before moving on to a detailed description of ArchiPanel's commands, let's discuss the difference between an individual panel and a panel module.

Individual panels are the constituent elements of your floor/ceiling, while panel modules define the layout of a repeated group of panels that can be distinguished for the materials they are made of and/or their geometry.

Individual panels are used to define “simple” layouts consisting of similar panels in terms of shape and size and where the paneling can be easily created by repeating two panels repeated over the surface.

Modules are used when the layout consists of elements of various shapes with more elaborate arrangements and possibly panels that have different materials/colors depending on their position.

Later, we will see how to define a module and how to maintain certain parameters during this process that will help us as we work.

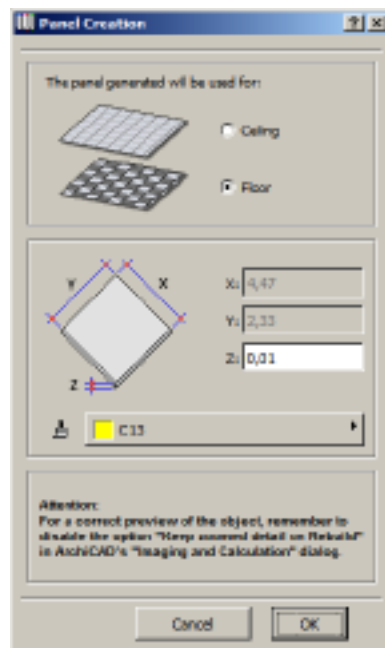
Create a New Panel

In theory, since the panels used by ArchiPanel are completely parametric, you should not have to generate new panels to manage your floors and false ceilings.

At any rate, it may be more convenient to generate new panels so that you can reuse their size and material attributes without having to reconfigure them every time or when you want to generate irregular or custom-shaped panels to use in modules.

Create a new, very simple panel:

1. With ArchiCAD'S Fill tool, define the shape of your panel, remembering that:
 - a) a panel cannot have holes (if your fill has holes, they will be ignored)
 - b) the dimensions of the fill determine the size of your panel; remember this while drawing your fill
2. Select the fill you just drew and click the icon of the Create New Panel tool on the ArchiPanel Palette.
3. In the dialog box that appears, you can configure the panel by defining:



1. whether the element will be used to panel Floors or Ceilings (the structure type and characteristics of the accessories are different depending on the element's intended use)
2. the panel's thickness (the bounding box naturally depends on the size of the original fill)
3. the default material (you can always modify the material later when using the panel, but you will be prompted with the material defined here)

As indicated in the note at the bottom of the dialog box, always remember to uncheck the option "Keep zoomed detail on Rebuild" in ArchiCAD's "Imaging and Calculation" dialog.

When this option is disabled, during the creation of the panel object, ArchiPanel calculates a preview of the panel and attaches it to the library part.

If this option is checked when the panel is saved, the preview will not match the panel itself; this will not affect the element's functionality, but it will make it more difficult to recognize during selection.

When you have finished defining the panel, click the OK button to save it.

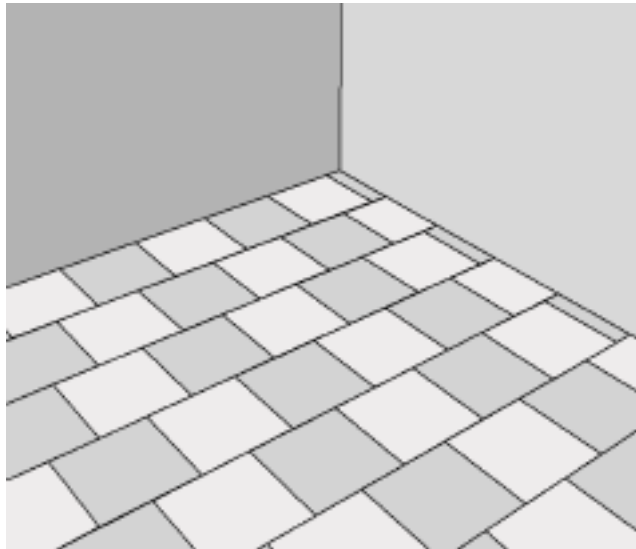
A standard dialog box will be displayed where you can enter the name of the new element and select its save location (remember to save new elements in an active library).

After a brief moment of processing, a message will confirm the successful creation of the library part.

Create a Panel Module

As mentioned previously, a panel module is a repeated group of panels that allows the definition of more complex layouts.

Let's look at a practical example to help us understand this concept.

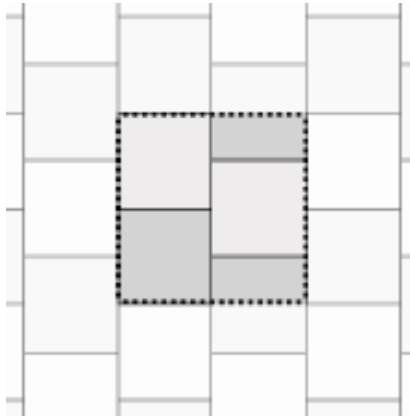


Assume that we want to recreate the flooring shown in the image above.

It consists of two alternating panels that are offset by half a panel on each row, making it impossible to use ArchiPanel's "standard" layout.

The solution is relatively simple: it involves finding the base module for this layout, i.e., the module that, when repeated infinitely, allows this result to be achieved.

The image below (the layout plan) shows the module in question:



Imagine repeating this group of panels horizontally and vertically, and you will see how it forms the base module for the layout.

To create it, then, we assemble 5 simple panels (previously created with the Create New Panel tool), while paying attention to their positioning and the material chosen.

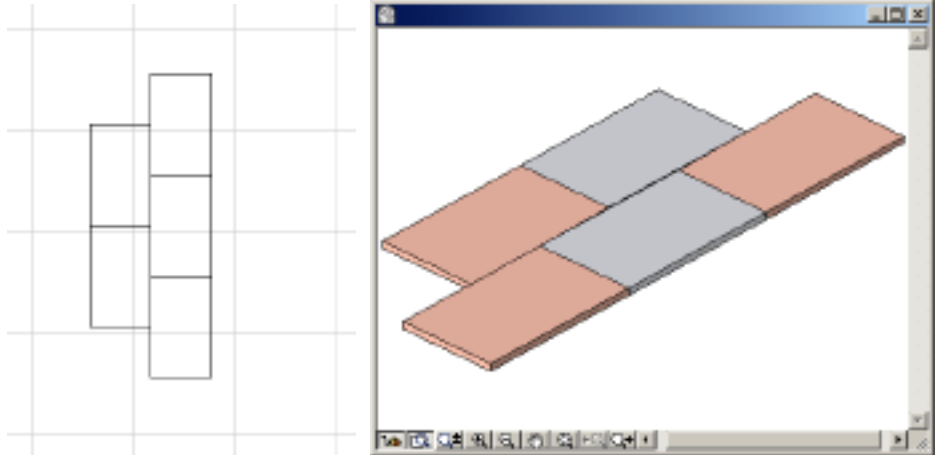
The settings defined will become this panel module's default values.

As you can see in the following figure, the panels were composed using "uncut" panels.

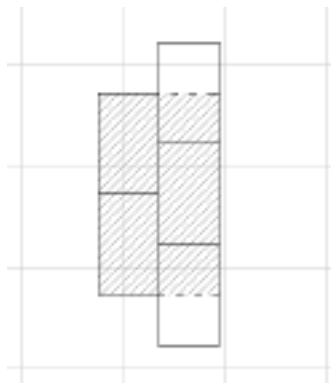
The module (which must always be a rectangle or a square) is defined using ArchiCAD's Fill tool, and the panels that are "intersected" (cut) by the edges of the Fill are handled specially in the library part you create: these edges will be invisible so that the panels to be joined correctly when they are repeated in all directions.

To summarize these last steps:

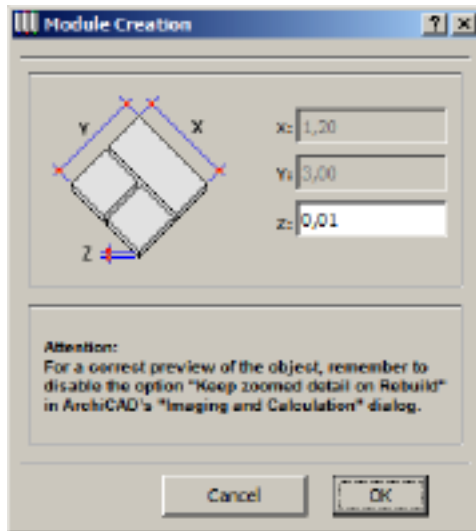
1. we define the base module by adding the desired panels to the Floor Plan (using ArchiCAD's Object tool, since ArchiPanel panels are library parts):



2. we use ArchiCAD's Marquee tool to define the perimeter of our module (in order to "cut" the parts of the panels that extend beyond the edges):



3. we select all elements (the panels and fills that define the shape of our module) and then click the Create Panel Module tool icon in the ArchiPanel Palette. The dialog window for creating the module is displayed:



Similar to the dialog described for creating single panels, you can define a thickness for the panels (the size of the bounding box is determined by the dimensions of the surfaces included in the fill), while the module's intended use (ceiling or floor) is automatically determined depending on the panels used and the module's composition.

As indicated in the note at the bottom of the dialog box, always remember to uncheck the option "Keep zoomed detail on Rebuild" in ArchiCAD's "Imaging and Calculation" dialog.

When this option is disabled, during the creation of the panel object, ArchiPanel calculates and uses a preview of the panel and attaches it to the library part.

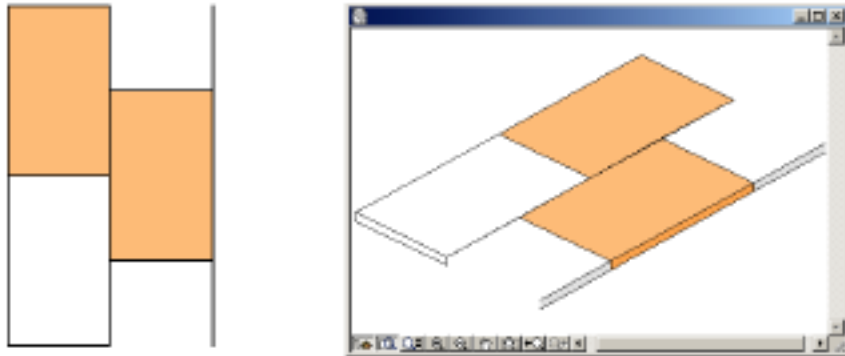
If this option is checked when the panel is saved, the preview will not match the panel itself; this will not affect the element's functionality, but it will make it more difficult to recognize during selection.

When you have finished defining the panel, click the OK button to save it.

A standard dialog box will be displayed where you can enter the name of the new element and select its save location (remember to save new elements in an active library).

After a brief moment of processing, a message confirms the successful creation of the library part.

If we view the new object in the Floor Plan or 3D Window, we can see that the module has been saved correctly and the panels have been cut (the cut edges are invisible, allowing the modules to be correctly joined with adjacent modules):



Managing the Materials of the Panels Used in the Module

One important factor to keep in mind when creating panels that will be cut is that ArchiPanel generates a parametric object in terms of the materials.

In compositions that will be saved as modules, you can use up to 21 different surface materials. When you use a module created in this manner, ArchiPanel will let you modify the materials assigned, thus allowing infinite variations of the original appearance of the module's components.

In the example we just saw, two different materials were used; therefore, the coverings that use this module will have the possibility of configuring two different materials as you desire.

Managing Joints in Panel Modules

As we will see moving forward, you can define joints or a space between the individual panels in your layouts.

Since modules are treated as a single element, you will have to define the joints from the beginning.

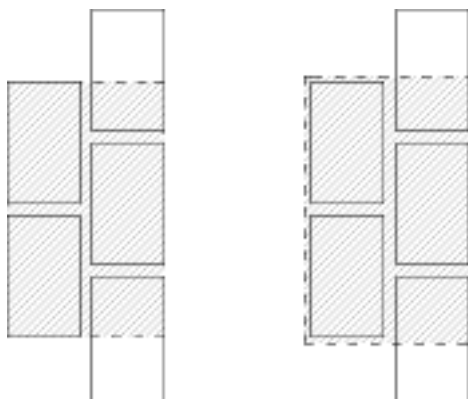
When you create your layout, ArchiPanel will consider the joint between each individual module; this will not have an effect on the distance between the panels that make up the modules.

The distance between the individual panels that make up the module must be defined in advance.

Let's compose the piece of paneling shown in the following figure, adding a joint between each panel (in the example, the size of the joints has been increased to make them easier to see).



As before, we use the ArchiCAD Fill tool to define our module, (figure on the left, below), but this time we trace an offset around its entire perimeter, extending it by a value equal to half the width of the joint (the two half joints of two adjacent modules will make a full joint):



Lastly, we select the panels and fill and save the module using the Create Panel Module tool in the ArchiPanel Palette.

One final thing to remember (we will see this again later) is that whenever this module is used to create a paneling, the joint size must be set to zero. This is because the joint has already been defined as part of the module.

Create Floors/Ceilings

This tool allows you to cover your slabs/ceilings with previously defined panels using semi-automatic procedures.

You can choose between two different methods for paneling these surfaces.

Defining a Covering Using a Fill

An ArchiCAD Fill can be used to define the surface to cover (floor and/or ceiling).

The covering generated will maintain a “link” with the fill used to define the zone (unless the link is cancelled from the Floor Plan).

If the original fill is modified, you can update the covering that is linked to it so that the changes will be reflected in the covering as well.

The fill used to define the surfaces to be covered can have holes (the holes will not be covered) and/or curved sides.

Defining a Covering Using a Zone

You can also use an ArchiCAD Zone to define an area to be covered.

Normally, an ArchiCAD Zone is a well-delineated space that is closely linked to the primitives that comprise it; therefore, any changes made to the model can be automatically applied to the zone by using the update command.

When the shape of a zone is modified, you can update the covering that is linked to it so that the changes made will be reflected in the covering as well.

This method of definition has both advantages and disadvantages with respect to defining a covering using a fill.

Since zones are closely linked to models, any design change made to a model causes an automatic update of the related zone; this makes it easy to update the coverings linked to zones.

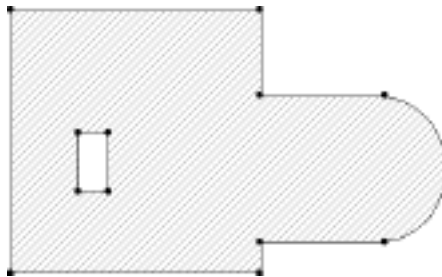
Another advantage of zones lies in the fact that they are three dimensional: in the case of creating false ceilings, ArchiPanel will automatically propose a height based on the height defined for the selected zone.

At the same time, zones “necessarily” follow the geometry of the areas they comprise and therefore impose more constraints than fills, which can have any shape and thus, for example, allow you to cover only certain parts of the space with any shape you desire.

Procedure for Creation Using a Fill

First, let's look at the procedure for creating a floor/false ceiling using an ArchiCAD Fill

We define the perimeter of the surface to be covered using an ArchiCAD Fill:



The fill we use can have curved sides and holes.

We select the fill and click the Create Floor/Ceiling icon.

ArchiPanel gathers information about the geometry of the fill and immediately displays the following dialog box:



In the top part, we must specify whether we are going to create a floor or a false ceiling; the options proposed and the editing possibilities will depend on this choice. For this example, let's assume that we want to create a false ceiling; therefore we choose the first radio button.

In the bottom part of the dialog box, we can define a value for the inset with respect to the edge.

If this value is not equal to zero, the false ceiling's paneling will be inset from the edge by the value entered.

If the inset is not equal to zero, the Apply to Holes checkbox will be enabled. If checked, the inset value will also be applied to the edges of the holes included in the selected fill.

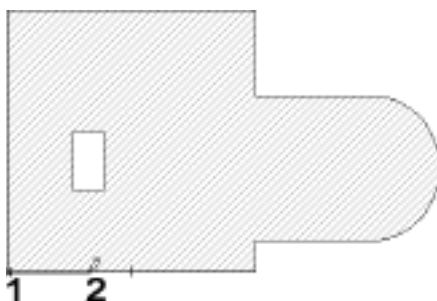
For our example, we set the inset value to 20 cm and activate the inset for the holes as well.

The last field, Minimum Area, defines the minimum surface area that a piece of panel can have in order to be considered by ArchiPanel: remember that ArchiPanel operates with maximum geometric precision; therefore the geometry of the fill could cause extremely small pieces of panel to be included. This value makes it possible to avoid the inclusion of superfluous pieces.

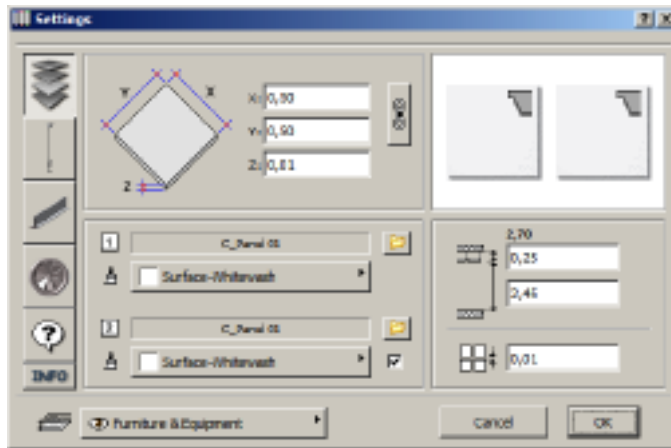
Once we have defined the desired configuration, we confirm the settings by clicking OK.

At this point, ArchiPanel waits for two clicks on the Floor Plan worksheet:

- the first click defines the layout's origin
- the second click defines the orientation vector



Once the vector has been defined, ArchiPanel displays a window for defining the covering's settings:



The settings dialog box allows us to configure all of the attributes for our false ceiling's paneling.

On the left side, a set of buttons lets us switch between the various sections of the dialog.

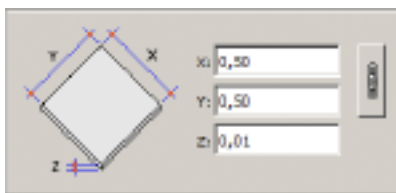
Let's see how these are used, from top to bottom:



1. Panel selection/configuration
2. Supporting elements selection/configuration
3. Structure selection/configuration
4. Available accessories selection/configuration
5. Online help
6. Information on ArchiPanel

The settings defined in this dialog will become the covering's default settings; we will see how each individual component of the covering can be configured in subsequent phases.

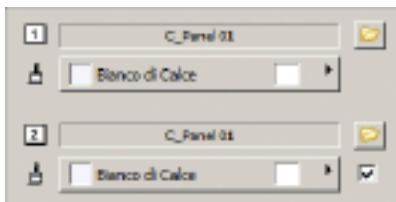
Panel Selection/Configuration



This section of the dialog lets us select and configure the panels that will be used in our false ceiling.

In the top left area, we can define the panel's dimensions: length, width and thickness.

Immediately underneath, we can select (from the libraries currently loaded) the two panels to use and define a material for them.



The name of the active panel is displayed in a non-editable field. Next to the name, a small button with a folder icon lets you browse the library to select the panel you desire.

Clicking the folder icon opens a standard ArchiCAD Object Settings dialog box that lists only the panels present in the active libraries; if we are creating a false ceiling, only the panels created for ceilings are shown and, if we are creating a floor, only those created for floors are shown.

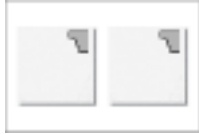
Under the name, a popup menu lets you choose a material for the panel selected.

Next to the popup menu for the second panel's material, a checkbox enables/disables the use of the second panel.

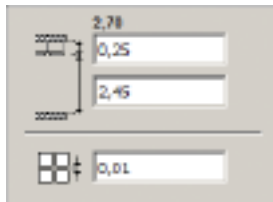
ArchiPanel allows the creation of either checkered paneling, in which two panels of different types and/or materials alternate, or simple paneling, in which a single panel is repeated over the entire surface to be covered.

This checkbox allows you to choose between the two styles of coverings. If it is unchecked, the controls for choosing/configuring the second panel will be disabled.

The top right area shows preview images of the selected panels (one or two depending on the covering type).



The area on the bottom right is used to position the covering. This area is present in all sections of the dialog.



In this area, you can define the position of the false ceiling by setting its distance from the floor or upper slab (a non-editable value at the top indicates the maximum height, i.e., the sum of these two values).

Lastly, immediately underneath, you can define the width of the joints between the panels; this value can also be zero.

Remember that this value has an effect on the structure's dimensions.

In the bottom left area of the dialog box (present in all sections), a popup menu lets you choose the layer on which you want to place the element.

Supporting Elements Selection/Configuration

Clicking the second button accesses the section for configuring the supporting elements.

The name of the active element is displayed in a non-editable field. Next to the name, a small button with a folder icon lets you browse the library to select the element you desire.



Clicking the folder icon opens a standard ArchiCAD Object Settings dialog box that lists only the supports present in the active libraries: if we are creating a false ceiling, only the ceiling supports are shown and, if we are creating a floor, only the floor supports are shown.

Immediately underneath, two popup menus allow you to choose the two main materials for the elements (see the Appendix for additional information).

Lastly, a checkbox allows you to activate the visibility of this type of element.

A paneling that covers a large, highly detailed area could require lengthy processing times; we suggest that you enable this checkbox only for views in which the visibility of these elements is necessary. In all others, disable it to shorten calculation times.

Structure Selection/Configuration



Clicking the third button accesses the section for configuring the structure's horizontal elements.

The name of the active element is displayed in a non-editable field. Next to the name, a small button with a folder icon lets you browse the library to select the element you desire.

Clicking the folder icon opens a standard ArchiCAD Object Settings dialog box that lists only the horizontal supporting elements present in the active libraries: if we are creating a false ceiling, only those for ceilings are shown and, if we are creating a floor, only those for floors are shown.

Immediately underneath, two popup menus allow you to choose the two main materials for the elements (see the Appendix for additional information).

Lastly, a checkbox allows you to activate the visibility of this type of element.

A paneling that covers a large, highly detailed area could require lengthy processing times; we suggest that you enable this checkbox only for views in which the visibility of these elements is necessary. In all others, disable it to shorten calculation times.



Available Accessories Selection/Configuration

Accessories are elements with specific functions (for example smoke detectors, light sources, grates, etc.) that are placed on the panels of our covering.

Given their “extraordinary” nature, they will not be present on every panel of the covering. As such, this button is not enabled in this phase (we are in the creation phase, which means we are defining the common features of all elements in the covering).

We will cover its use later.

Online Help



Clicking this button displays the user guide in PDF format.

Information on ArchiPanel

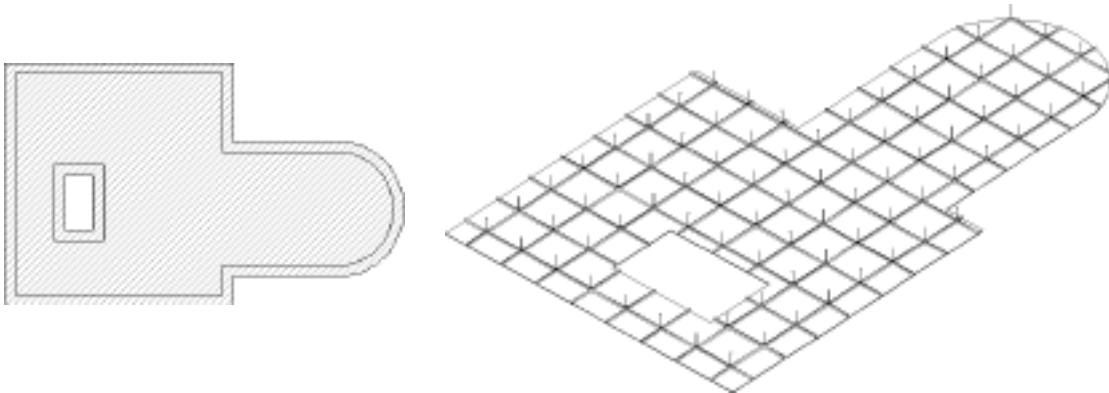


Clicking this button displays a dialog box with information on the program.

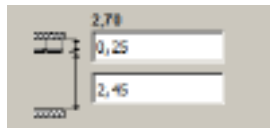
After all sections of this dialog box have been configured, we click the OK button to confirm the settings defined.

For technical reasons beyond our control that may be resolved in the future, a dialog box appears at this point: click the OK button to confirm, and the covering object is placed on the Floor Plan.

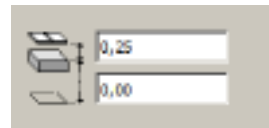
This is how it appears on the Floor Plan and in 3D:



Had we chosen to create a covering for a floor (instead of for a ceiling), the procedure would have been similar for everything except the definition of the paneling's position; in this case, the position would have been defined in relation to the underlying slab.

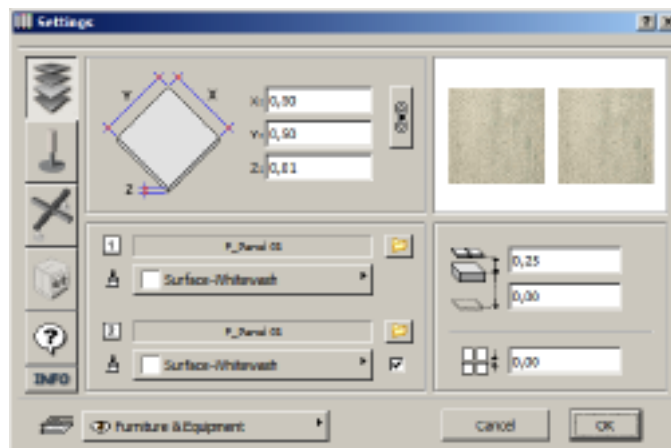


*Height definition
for a ceiling*

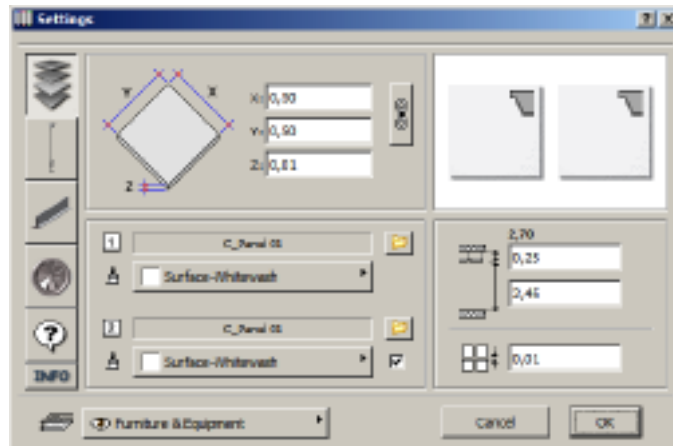


*Height definition
for a floor*

The only important difference, which is structural, would have been automatically handled by ArchiPanel: the elements pertaining to a floating floor structure would have been displayed instead of those for a false ceiling (the icons associated with the two buttons also change to show the different characteristics).



Floor paneling settings dialog box



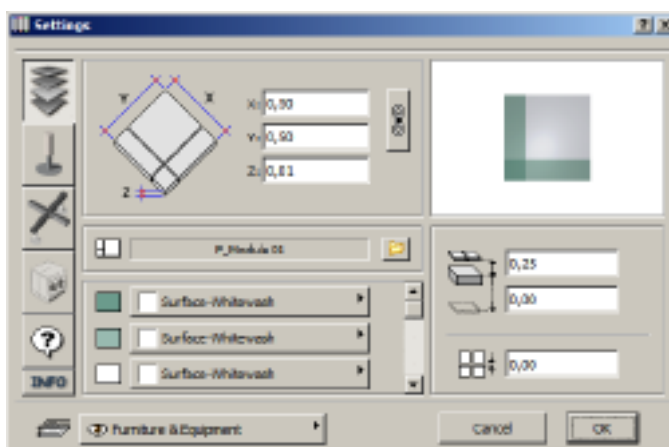
Ceiling paneling settings dialog box

Creating Floors/Ceilings Using Panel Modules

This tool allows you to cover your slabs/ceilings with previously defined panel modules using semi-automatic procedures.

This procedure is the similar to the one described in the last paragraph: the only difference lies in the fact that, in this case, instead of using simple panels as the components of our paneling, we will use panel modules.

We suggest rereading the description of panel modules in the paragraphs above before continuing with this chapter.



As you can see in the image above, the settings dialog box for creating floors/ceilings using panel modules differs from the dialog box associated with using single panels only as concerns the configuration of the base element: in this case, instead of defining either one or two panels, a single module is defined (which is composed of multiple panels, as seen above).

In addition to defining the module's dimensions (width, length, thickness - be careful, as the improper definition of these values will change the shape of the original module), we can select the module to use (by clicking the folder icon next to the name of the module selected) and choose the materials to be used for the module's components.

In the bottom area, a scrolling list displays all of the materials that can be used for the panel module selected.

All other sections of the dialog box are exactly the same as for the creation of simple panel coverings; please refer to the previous explanations for a thorough description of these sections.

Note: *Note: in the case of modules, the structure is defined based on the module's bounding box; beams and supports will be positioned along the outer edge of the module's bounding box.*

Modify Default Values for Covering

Using this tool, we can change the default settings for a covering object that has already been placed on the Floor Plan.

We select the covering object we want to modify and click the appropriate button in the ArchiPanel Palette.

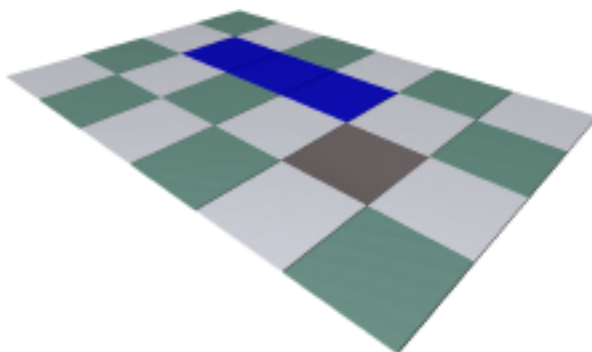
ArchiPanel immediately displays the element's settings dialog box (the same one used during creation of the element), which gives us access to all of the element's parameters.

Keep in mind that you are changing the element's default values: this means that all panels that were modified separately (changes to the material or the addition of accessories) will not be changed.

Only those components that use default values will be affected by these changes.

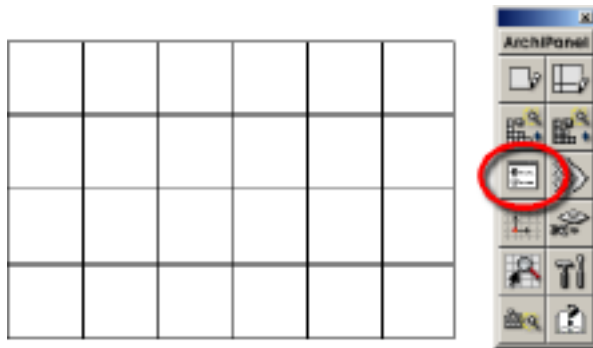
To clarify this concept, let's look at a simple example.

In the example below, we see a section of a floor with a checkered covering (two colors) that includes panels that have been modified: some panels have a different color (much darker), and one has a grating:

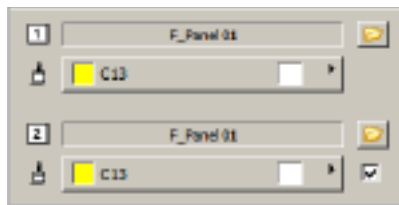


As you can see, these “different” elements were created by assigning specific attributes to the panels in the beginning.

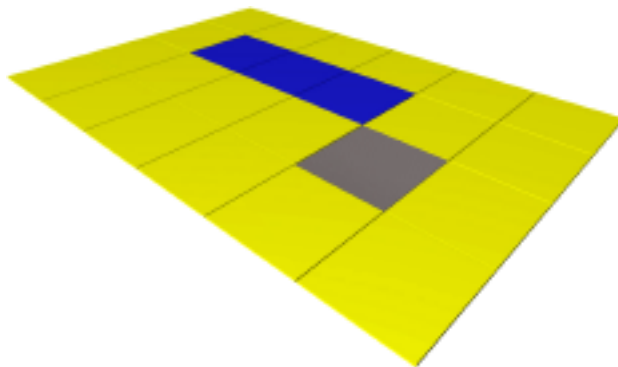
Now we select the covering object and click the Change Default Values for Covering tool on the ArchiPanel Palette:



We change the material of the two panels used in the covering by choosing the same material for both and then confirm the change with the OK button.



Let's see how the element has changed in 3D:



As we can see from the image above, changing the default values affects all of the panels that use those settings; the panels that were configured separately maintain the characteristics defined for them.

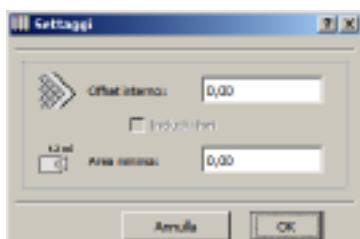
Define Offset

This tool allows you to change/set, at any time, an “inset” value for the paneling with respect to the outer edge of the area to be covered.

This process is similar to the one described in the paragraph on creating a covering element.

Select the covering object for which you want to change the offset, then click the icon of the Define Offset tool in the ArchiPanel Palette.

ArchiPanel immediately displays the following dialog box:



As seen before, using this dialog allows us to define an inset value with respect to the border of the paneling.

If this value is not equal to zero, the paneling will be inset from the edge by the value entered.

If the inset is not equal to zero, the Apply to Holes checkbox will be enabled. If checked, the inset value will also be applied to the edges of the holes included in the selected fill.

The last field, Minimum Area, defines the minimum surface area that a piece of panel can have in order to be considered by ArchiPanel: remember that ArchiPanel operates with maximum geometric precision; therefore the geometry of the fill could cause extremely small pieces of panel to be included. This value makes it possible to avoid the inclusion of superfluous pieces.

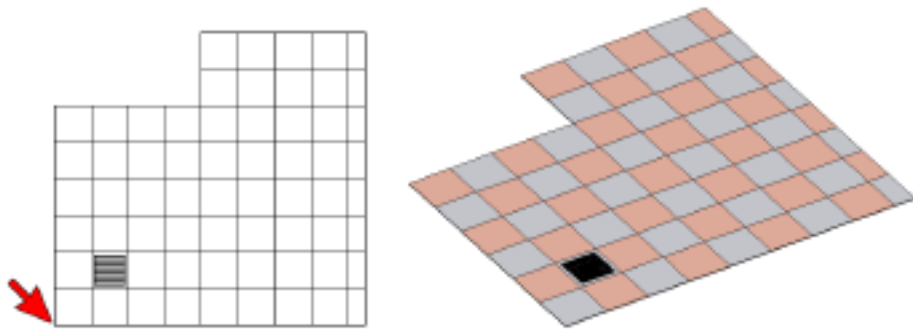
Change Layout Origin

Selecting this tool from the ArchiPanel Palette allows you to change the origin and orientation of the panel layout for a covering that has already been placed on the Floor Plan.

One of the most interesting aspects of this function is that, when the origin is changed, any modifications made to the individual components of your paneling will be maintained.

Let's use a simple example to see how this procedure works and the logic it uses to update components.

The image below shows a floor covering that was created using a checkered paneling in which two different-colored panels alternate:



The origin that was defined when the covering was created was in the bottom left corner, and the orientation angle was set to 0° (from left to right).

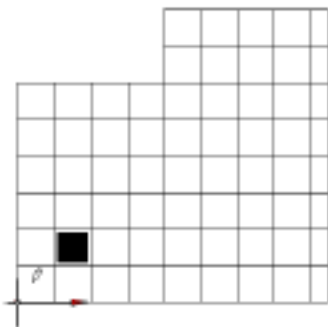
Later, a panel was customized (second row, second column) with the addition of a grate.

To change the layout origin and orientation, we select the covering object and click the icon of the Change Positioning Origin tool in the ArchiPanel Palette.

ArchiPanel immediately transforms the element's appearance, indicating with two axes and an arrow the position of the origin and its orientation.

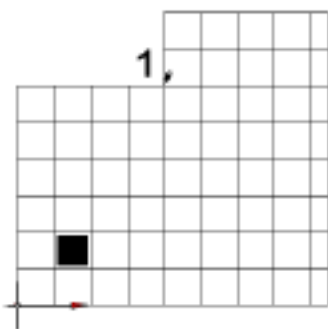
The cursor's form also changes (pencil), prompting the user to identify the new origin and orientation with two clicks (the first click defines the

position and the second the orientation angle, which is defined by the vector from the first to the second point):



Let's assume that we want to move the origin from the bottom corner to the center and we want to position the joint at a 315° angle.

First of all, we click the corner desired (you can click anywhere you like):

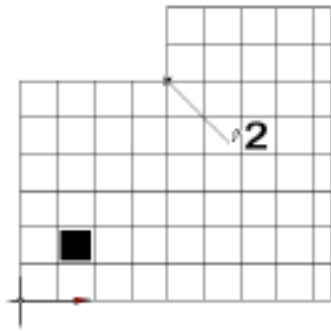


Then we click a second time to define the direction of the layout.

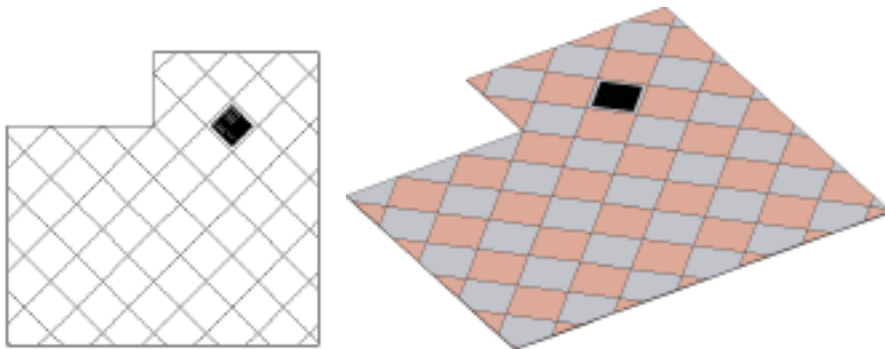
In this phase, it is as if we were drawing a line using normal ArchiCAD procedures. Therefore we can use any of ArchiCAD's standard techniques to define the angle.

We can either press the Shift key to constrain the vector to the fixed/custom angles, or we can use the Coordinate Bar to enter the absolute or relative values for the X, Y coordinate, the ray R or the angle A.

The image below shows the second click:



As soon as we click a second time, ArchiPanel changes and updates the object:



As you can see in the Floor Plan and 3D views of the covering shown above, the position of the panel with the grate (or any other customized element) in relation to the paneling's origin has not changed.

Cut/Drill Paneling

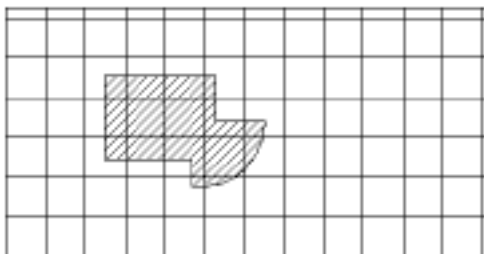
As we saw earlier, if there are holes in the zone or fill used to create our covering, the covering we generate will contain holes that correspond exactly to the original element.

At any rate, you may want to make other holes in the paneling once it has already been positioned without having to recreate the original element or make holes in it.

In this case, the Cut/Drill Paneling tool can assist you.

Using this function is extremely easy; let's see how it works using a simple example.

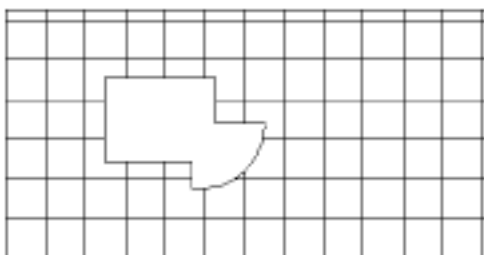
The figure below shows a covering over which we have drawn, using an ArchiCAD fill, the shape of the hole we want to create:

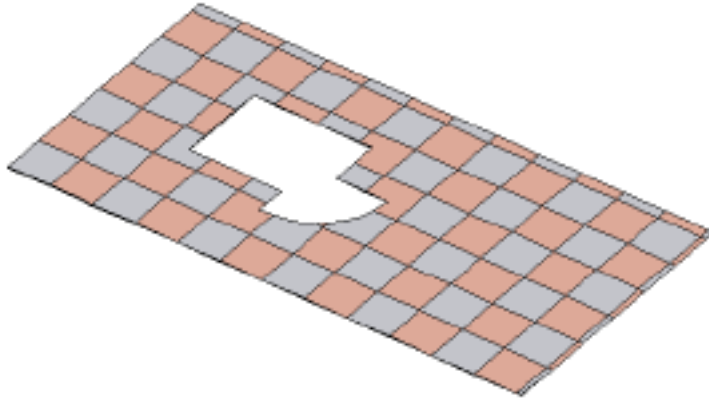


This is all we need: a covering object to cut and a fill that outlines the shape of the hole.

We select both the library part and the fill, then we click the icon of the Cut/Drill Paneling tool on the ArchiPanel Palette.

ArchiPanel immediately creates the hole:





As we can see from this example, the fill that defines the hole can have curved sides.

The only limitation (this may seem obvious since the fill defines a hole) is that the fill itself cannot have holes; if ArchiPanel finds a fill with holes in the selection, it will use the outer edge of the fill to generate the hole in the covering and ignore any holes in the fill.

ArchiPanel will not automatically cancel the fill used to create the hole.

Modify Paneling

This will surely be the tool you will use the most; it allows you to customize the individual components of the panelings created with ArchiPanel.

As we have already seen, when generating a covering, we set default values that determine the general appearance of our paneling.

This tool can be used to control certain aspects of the individual components, including changing the materials used or adding accessories.

Its use can be divided into two distinct phases:

1. first, select the components to be modified
2. then make the changes to the elements selected

Selecting the individual components can be done either manually by clicking them (clicking an unselected element will select it; clicking a selected element will deselect it), or by defining the selection criteria in a search dialog box.

The components selected will be highlighted in the plan symbol with a colored fill to make it easier to identify them and to keep track of your selections as you go.

Only one selection method can be used at a time (either manual or via search criteria), but the command can be repeated as many times as you like on the same element.

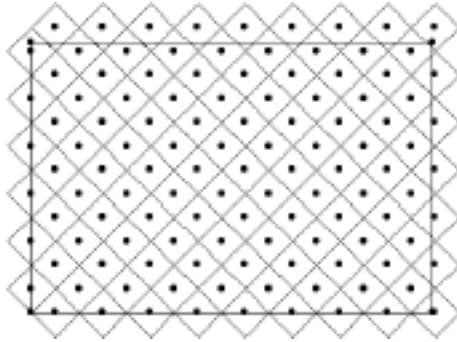
The procedure is extremely simple: select a covering element you want to change, then click the Modify Paneling icon in the ArchiPanel Palette.



The appearance of the covering changes on the Floor Plan (to allow the discrete selection of each individual component; furthermore, all panels appear in their entirety, even if they have been cut in the covering) and a new palette opens. This palette, which has three buttons, lets you:

- make a selection using customizable search criteria (the first icon on the left with the small magnifying glass)
- confirm the selection made by clicking the object (the icon in the middle with the checkmark)

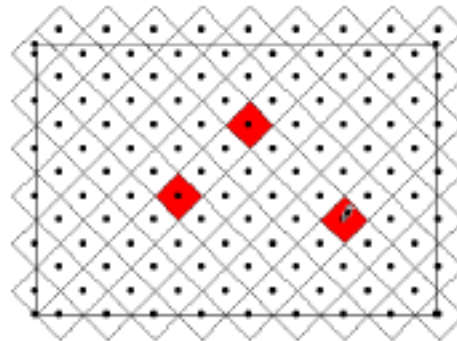
cancel the command without changing the element selected (the last icon on the right with a red X)



Manual Selection

Let's start with the most simple type of selection: manual.

To select a panel, click the hotspot in the center. ArchiPanel highlights the panel with a colored fill:



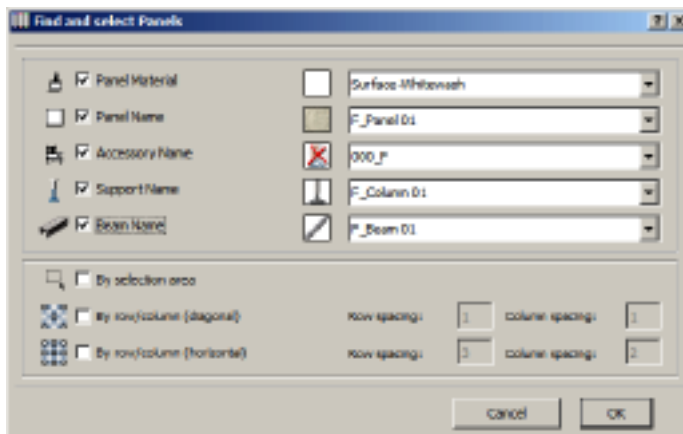
Clicking a selected panel's hotspot a second time will deselect the panel.

Lastly, clicking the checkmark button confirms the selection of the highlighted panels (conversely, clicking the red X button cancels the procedure without selecting any panels).

When the selection is confirmed, the dialog box appears for defining the covering's settings. Here, we can change the parameters of the panels selected.

Selection Using Criteria

Clicking the button with the magnifying lens icon accesses the dialog box for specifying our selection criteria:



The dialog box is divided into two parts (you can only use one of these during the same search session).

In the upper section, search criteria can be specified based on:

1. panel surface material
2. panel name
3. name of the accessory associated with the panel
4. support name
5. beam name

Use the checkbox on the left to enable or disable each criterion.

When you check one of the criteria, a popup menu is activated on the right listing all of the attributes currently associated with the selected covering element.

This means, for example, that the popup menu for material selection will not include all of the material attributes configured for the ArchiCAD project that is currently open; instead, it will list only the surface materials assigned to the panels used in the covering element.

This is because we would clearly not want to search for a panel that is associated with a material that is not used (the result would be null).

Immediately to the left of the popup menus, a small preview image helps us recognize the attribute chosen.

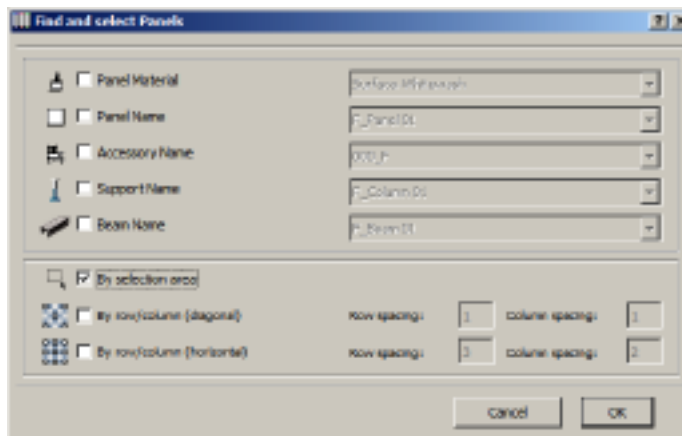
This dialog allows you to combine different types of criteria, however, you cannot use multiple criteria of the same type. This means, for example, that we could search for all panels that are made with a certain material and use a certain accessory, but we could not search for all panels that use two different materials (for this, we would have to perform additional searches).

The lower section allows selections to be made manually or based on geometric rules instead of using search criteria.

In this case, the aim is to select groups of contiguous panels or patterns of panels.

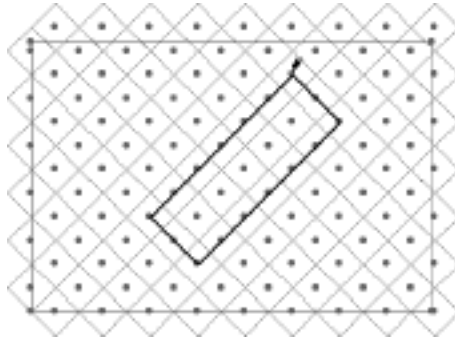
Selection Using a Rectangular Area

We click the By Selection Area checkbox and confirm our choice by clicking the OK button.



The dialog box closes and the cursor becomes a hammer while waiting for us to define, with two clicks on the panels' hotspots, the diagonal of the rectangular selection area.

As you can see in the example below, ArchiPanel automatically orients itself in relation to the angle of the panels:

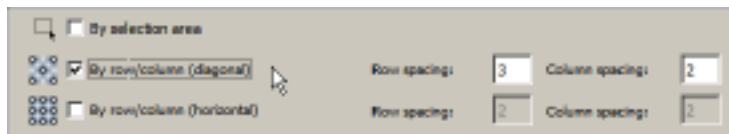


A rubberband line (shown using a thicker line in the image above to make it easier to distinguish) indicates the panels we are selecting: all of the panels intersected by or included in this rectangle will be selected.

When the selection is confirmed, the dialog box appears for defining the covering's settings. Here, we can change the parameters of the panels selected.

Selection by Row/Column (Diagonal)

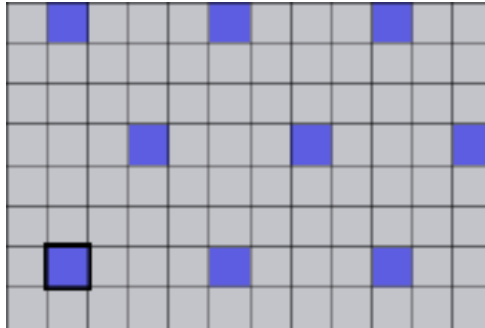
This type of selection lets you choose - after defining the panel to start from with a click - a set of panels with a specific number of rows and columns between them.



In the image below, we see the result of the selection made. The panel with the black border is the starting panel (the one that was clicked to begin the process).

When the selection is confirmed, the dialog box appears for defining the covering's settings. Here, we can change the parameters of the panels selected.

In this example, the surface material was changed to highlight the panels found/selected.



Selection by Row/Column (Horizontal)

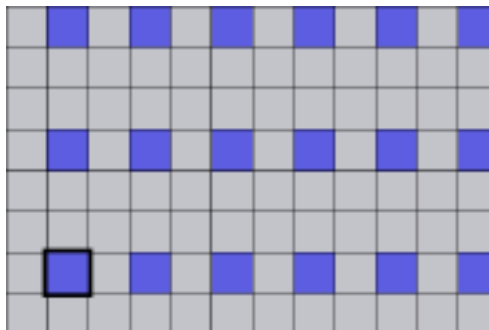
This type of selection lets you choose all panels positioned at a certain number of rows and columns from the origin (which is defined with a click). The selection will include a grid of panels with a regular row and column structure.



In the image below, we see the result of the selection made. The panel with the black border is the starting panel (the one that was clicked to begin the process).

When we confirm the selection, the dialog box appears for defining the covering's settings. Here, we can change the parameters of the panels selected.

In this example, the surface material has been changed to highlight the panels found/selected.



Changing the Parameters of the Panels Found/Selected

Clearly, the purpose of these searches and panel selections is to give us an easy way to modify the characteristics of the panels in question.

Once the selection has been made (manual or using criteria), ArchiPanel displays the settings dialog for the covering element.

This dialog box is the same as the one described during the phase of creating the covering; however, in this case, the changes we make will only be applied to the panels selected instead of affecting the entire covering (default settings).

The main difference lies in the fact that, in this mode, we can assign accessories to our panels.

Defining Accessories

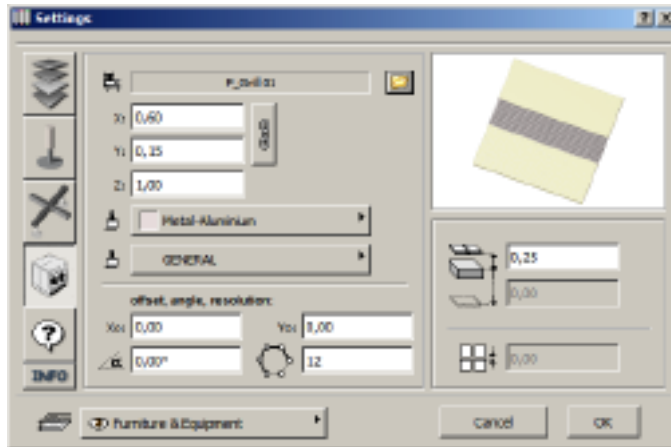
The fourth button in the settings window lets you assign an optional accessory to the panels selected.

ArchiPanel's library includes a number of these accessories (both for floors and false ceilings); however, expert users (those with GDL programming experience) can create additional accessories by following the specifications in the Appendix of this guide.

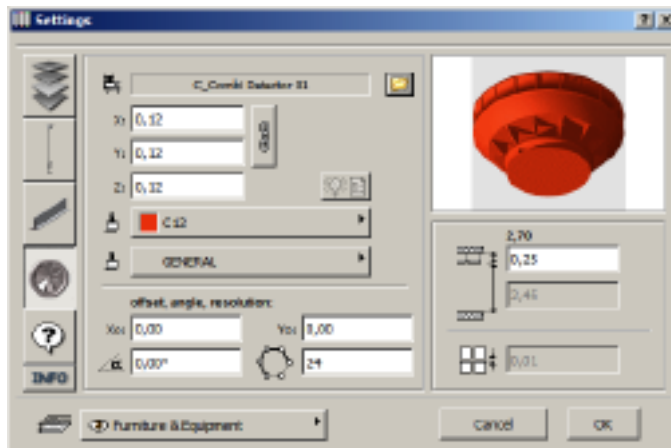
When you install ArchiPanel within ArchiCAD, two new element subtypes are added (in addition to others used by the add-on) to assist you in creating new accessories:

1. **APanel_ceiling_accessory**. This subtype defines an accessory element for use in ceilings. When you access the settings dialog box for a ceiling covering, ArchiPanel displays only this subtype of accessory element. This simplifies navigation in the libraries and the selection of these elements. Ceiling accessories also include special lamp accessories that let you illuminate your environments and define the specific details of the light source. Lamps, fans, aeration systems, ceiling signage, etc. are all included in this category of elements.
2. **APanel_floor_accessory**. This subtype defines an accessory element for use in floors. When you access the settings dialog box for a floor covering, ArchiPanel displays only this subtype of accessory element.

This simplifies navigation in the libraries and the selection of these elements. Grates, towers, etc. are all included in this category of elements.



Slab accessories section



Ceiling accessories section

As you can see from the two images above, the attributes of the two types of accessories (floor or ceiling) are similar.

Only in the case of ceiling accessories do we see an additional button that allows the settings for a light source to be defined.

Let's look at the options available in this dialog box.

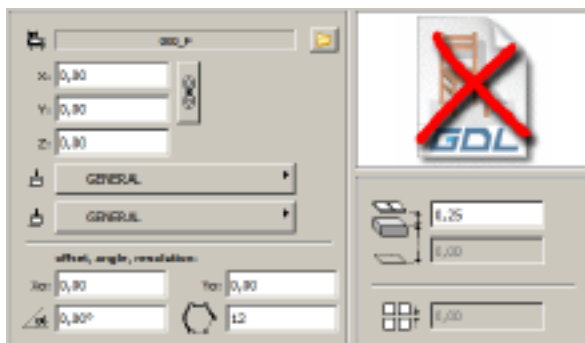
The name of the active accessory is displayed in a non-editable field. Next to the name, a small button with a folder icon lets you browse the library to select the accessory desired.

Clicking the folder icon opens a standard ArchiCAD Object Settings dialog box that lists only the accessories present in the active libraries: if we are creating a false ceiling, only the accessories created for ceilings are shown, and, if we are creating a floor, only the accessories created for floors are shown.

One particular accessory element (found in the library) is the “empty” accessory (“000_F” for floors and “000_C” for ceilings).

By default, all panels have an “empty” accessory (i.e. no accessory).

After assigning an accessory to a panel, it can be removed at any time by reassigning the “empty” accessory to the panel.



Under the element name, three editable numeric fields allow the measurements of the accessory's bounding box to be defined.

The next two popup menus allow two surface materials to be chosen for the element: a primary material and a secondary material (see the Appendix for a detailed description of this attribute).

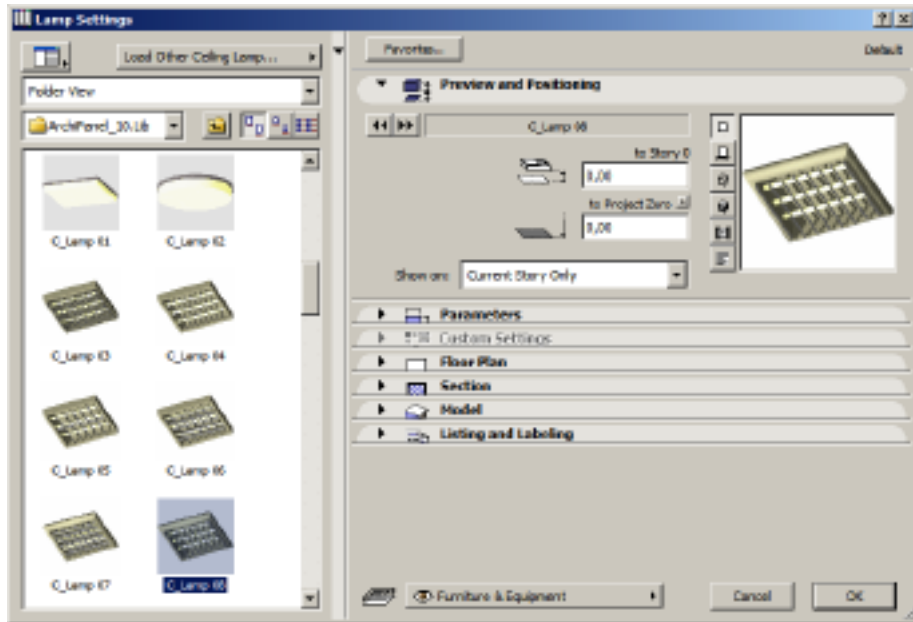
The last four fields in the lower part are for defining the following:

- Xo: the accessory's offset along the X axis in relation to the center of the panel
- Yo: : the accessory's offset along the Y axis in relation to the center of the panel
- α : the accessory's angle of rotation in relation to the panel
- Resolution of the accessory's curved parts

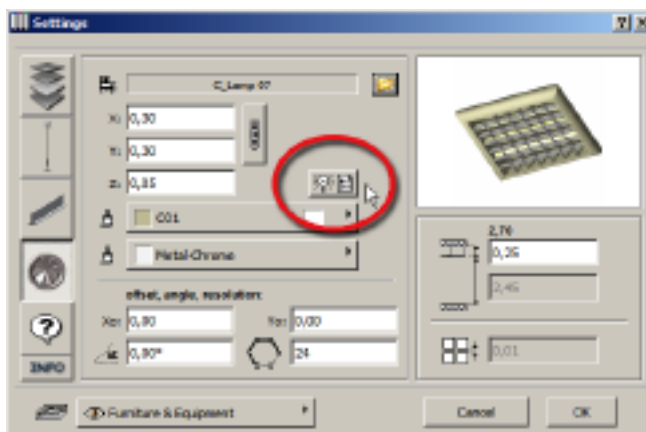
- Notes:** -
- each panel can have only one accessory.
 - the panel's offset values and angle of rotation can also be defined interactively using editable graphical hotspots (see the related section later on).

Lamp Accessories for Ceilings

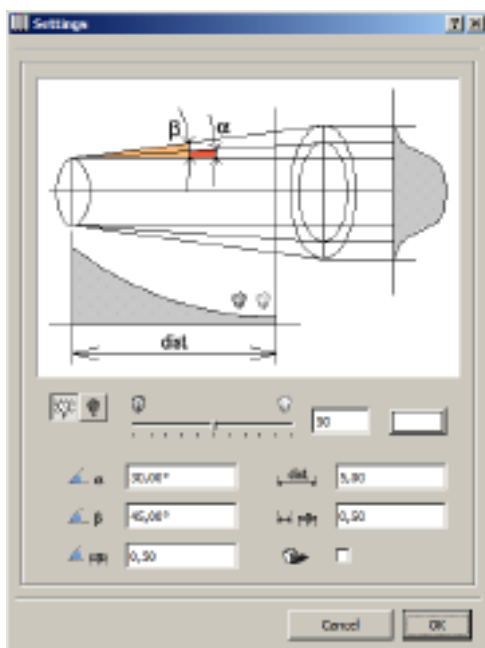
If we are configuring accessories for the panels of a ceiling, one of the accessories we can choose (and therefore configure) from the accessories library is a lamp:



If we choose a lamp accessory and confirm our selection with the OK key, when we return to the ArchiPanel settings dialog, we will see that the button for the lamp's settings has been activated:



Clicking this button accesses the dialog box for configuring the light source (as with other accessories, all other settings are defined in the dialog's main window):



The two buttons on the top left (with the lit and unlit light bulbs) turn the light source on or off.

Clearly, even if the light source is turned off, a 3D model of the lamp will still be visible in the covering's 3D view.

Immediately to the right, a slider and editable field let you define the light's intensity, while the button to next to the editable field lets you customize the color of the light emitted.

Click this button to choose a color from the system color palette.

The next elements are thoroughly described in the ArchiCAD GDL Reference Guide; at any rate, they include (from top to bottom and left to right):



the alpha angle determines the frustrum of cone where the light becomes most intense.



the beta angle controls the frustrum of cone where the light is dimmed. Inside this cone, the light reaches its maximum intensity at the center, then falls to zero at the beta angle.



the falloff of the light's intensity, which is associated with the beta angle, is handled by the angle_falloff parameter (zero gives the light a sharp definition; higher values produce a smoother transition between light and dark).



maximum distance reached by the light. In our case, being that the light source is positioned on the false ceiling, this value should always be greater than or equal to the distance between the floor and the false ceiling.



the distance_falloff parameter controls the decrease in intensity depending on the distance (zero produces a constant intensity; larger values are used for stronger falloffs).



the shadow casting checkbox allows calculation of the shadows that will be cast by the selected light source.

After configuring these parameters, we confirm the settings and close the dialog box by clicking OK.

When we return to the settings dialog box for the lamp accessory, we confirm our selections by clicking OK. ArchiPanel immediately modifies the currently selected panels by adding the lamp accessories we configured.

Modify Covering / Create Structure

This ArchiPanel tool has two different functions depending on whether the selection made includes a covering element.

If it is used when no selection has been made, it lets you generate a structure (for a floor or false ceiling), i.e., a set of columns on which to lay a beam (for floors) or a set of support elements that hold up a beam (for false ceilings).

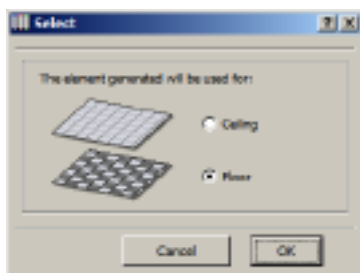
If a covering element is selected, the tool lets you control how it is displayed and change the position of the supports and accessories associated with it.

Let's have a look at these two methods.

Creating a Structure

Clicking the Modify Covering/Create Structure tool icon in the ArchiPanel Palette with no covering element selected starts the procedure for creating a structure

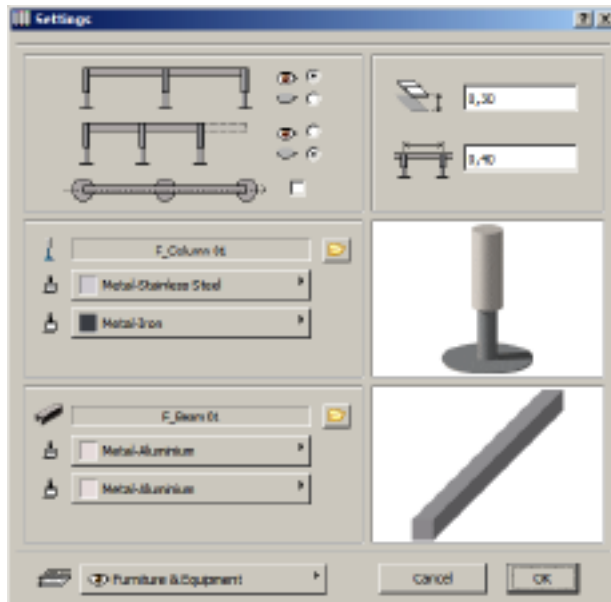
When the tool is clicked, ArchiPanel displays a dialog box for specifying whether the structure to be created is for a floor or for a false ceiling:



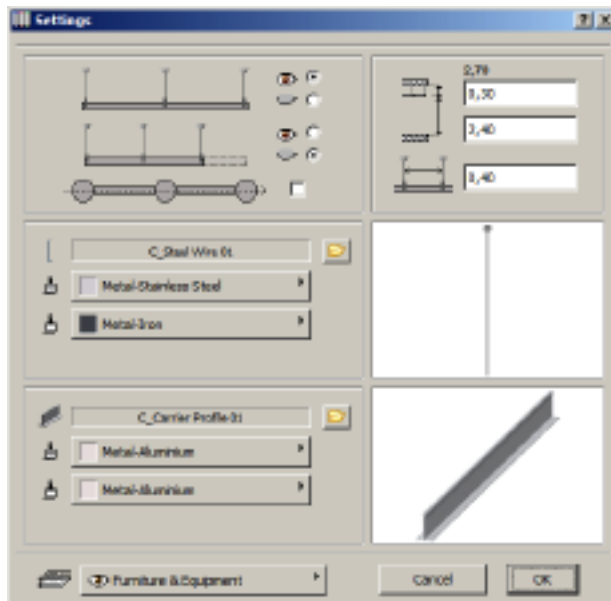
When the selection is confirmed with the OK button, a window appears for defining the structure's settings.

This window lets us define the settings for the individual elements that make up the structure.

When the configuration is complete, we click the ArchiCAD Floor Plan worksheet two times to define the insertion point, orientation and length of the structure to be generated.



Floor structure settings dialog box



Ceiling structure settings dialog box

The first section in the top left area is for configuring how the structure will be displayed.

The first two radio buttons allow the last column of the structure (or the last support for false ceilings) to be shown/hidden.

The next two radio buttons allow the last beam of the structure (or the last part of the beam) to be shown/hidden.

The checkbox on the bottom allows a half-structure to be drawn (this type of element is usually found at the edges of floating floors attached to the surrounding walls).

The two editable numeric fields in the top right area are for defining the distance from the floor (or ceiling) and between the centers of the supports.

Similar to above, the next section lets you choose an element to use (column/support or beam) by clicking the button with the folder icon and define two materials for the main surfaces.

When you confirm the settings with the OK button, the window closes and the cursor changes form (pencil icon), prompting you to click twice - the first time to define the element's insertion point and the second to define its length and orientation.



ArchiPanel places the structure and waits for you to click two more times to define another structure.

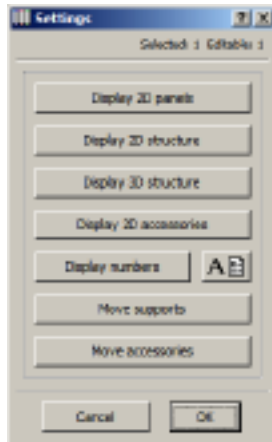
Thus, the command is cyclical; to interrupt it click the Cancel button on the ArchiCAD Control Box or the Esc key on your keyboard

The placement procedure described above is the same for both floor and ceiling structures.

Modify Covering

If a covering element is selected, this tool lets you control how it is displayed and change the position of the supports and accessories associated with it

When you click the icon (while only one covering element is selected), the dialog box below appears:



Display 2D panels

Shows/hides the panels in the Floor Plan view.

By default, the panels of the covering object are not displayed; only the outline of the covered area is visible.

Display 2D structure

Shows/hides the structure in the Floor Plan view.

By default, the structure of the covering object is not displayed; only the outline of the covered area is visible.

Notes: *remember that columns/supports and beams must be enabled, otherwise the display setting will have no effect. The structure's presence is enabled/disabled in the covering settings window; this dialog box is used to control its Floor Plan display.*

Display 3D structure

Shows/hides the structure in 3D views.

By default, a 3D model of the structure is not displayed; only the panels are visible.

Notes: *remember that columns/supports and beams must be enabled, otherwise the display setting will have no effect. The structure's is enabled/disabled in the covering settings window; this dialog box is used to control its 3D display.*

Display 2D accessories

Shows/hides the accessories in the Floor Plan view.

By default, the accessories of the covering object are not displayed; only the outline of the covered area is visible.

Display numbers

Shows/hides panel numbering in the 3D views. The panel at the origin is panel number 1.

55	56	57	58	59	60	61	62	63
46	47	48	49	50	51	52	53	54
37	38	39	40	41	42	43	44	45
28	29	30	31	32	33	34	35	36
19	20	21	22	23	24	25	26	27
10	11	12	13	14	15	16	17	18
1	2	3	4	5	6	7	8	9

The button next to the Display Numbering button is for configuring the settings of the text used for numbering.

You can specify the font, text style (normal, bold, cursive), size and pen:



Move supports

Shows/hides editable hotspots for defining an offset for the supports.

When this option is enabled, a dot and an editable hotspot appear at the center of every support.

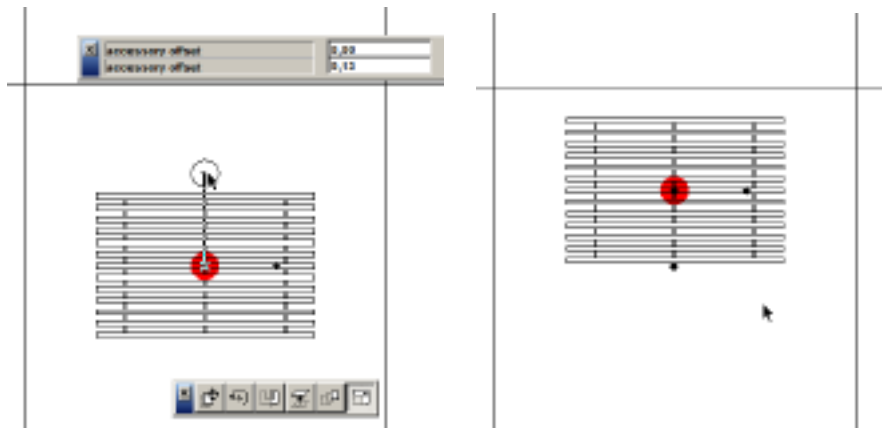
Clicking the hotspot and dragging moves the support to the desired position.

Move accessories

Shows/hides editable hotspots for defining the offsets and rotation angle of the accessories associated with the covering's panels.

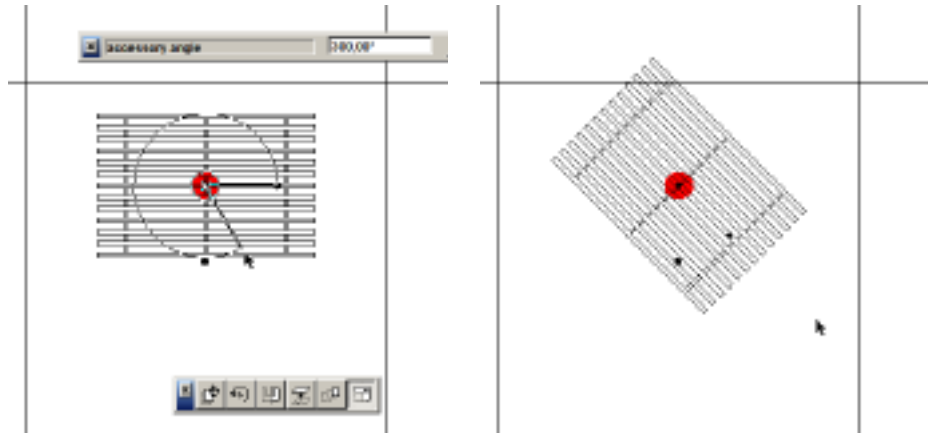
When this option is enabled, a dot and two editable hotspot appear for each accessory.

Clicking the hotspot in the center and dragging moves the accessory to the desired position:



The second hotspot is used to define the orientation of the accessory.

Clicking the hotspot and dragging rotates the accessory to the desired position:



Notes: *as we have seen, the accessory's offset and orientation can also be defined in the settings dialog box. The process described here, however, allows you to use graphic editing, which lets you take advantage of various alignments and snap points, to which ArchiCAD's intelligent cursor is sensitive.*

Update Paneling

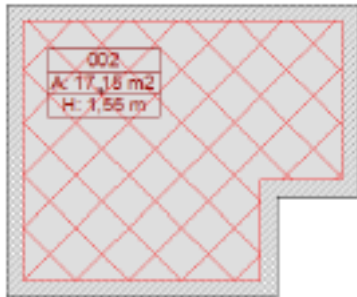
The covering elements created with ArchiPanel can be updated semi-automatically.

To keep from slowing down your work on your project, instead of allowing automatic updating, we preferred to let you choose when to update your coverings.

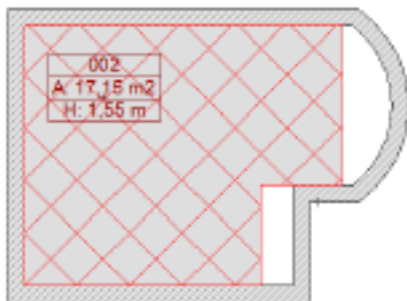
As covering elements can be generated from either ArchiCAD Zones or Fills, let's look at the two methods for updating these elements depending on how they were created.

Update Paneling Using Zones

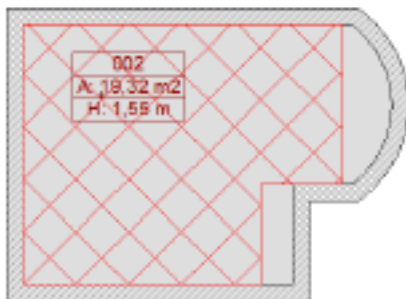
In the following image, we see a covering that was generated from a zone that delineates an area of an ArchiCAD project:



Lets suppose that, in a subsequent work phase, a change is made that includes offsetting the Zone slightly to the right and adding a curve to the right wall:

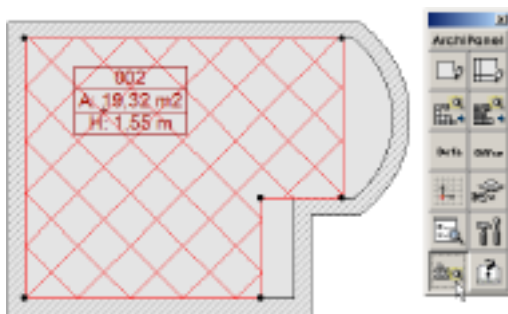


After making the change, the user updates the Zone using the Update Zones command from the ArchiCAD menus and achieves the following result:



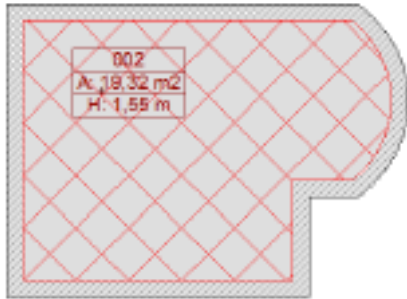
At this point, updating the covering is extremely easy since it is based on the ArchiCAD zone that was just updated.

We select the covering object on the Floor Plan and click the Update Paneling tool icon on the ArchiPanel Palette:



ArchiPanel reprocesses all of the data based on the changes made to the original zone that was used to create the covering element. The settings dialog box then reappears, where we confirm by clicking OK (as explained previously, the appearance of this window and confirmation with the OK button are technical limitations that we hope will be resolved in future versions of ArchiCAD).

When we confirm the settings, the covering reappears with the updates and settings we defined:

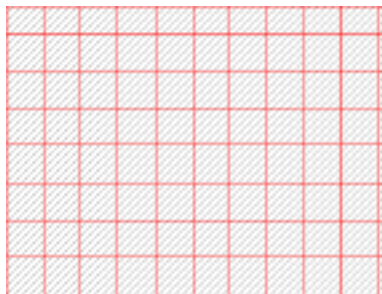


Update Paneling Using Fills

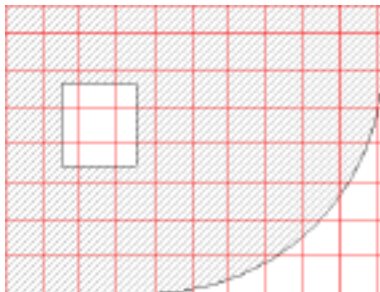
Coverings generated using fills are not as closely linked as with zones.

In this case, to update the paneling we must select a fill (be it the starting one or any other fill).

The image below shows a fill and the covering element that was generated from it:



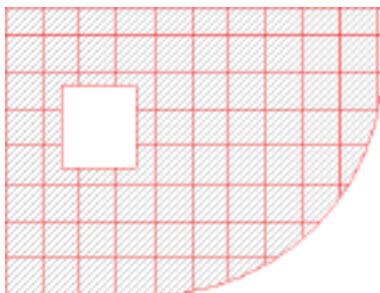
Now we edit the fill by rounding its lower left corner and adding a hole.



As with zones, to update the covering, we select both the fill and the element to be updated, then we click the Update Paneling tool on the ArchiPanel Palette.

ArchiPanel reprocesses all of the data based on the changes made to the fill selected. The settings dialog box then reappears, where we confirm by clicking OK (as explained previously, the appearance of this window and confirmation with the OK button are technical limitations that we hope will be resolved in future versions of ArchiCAD).

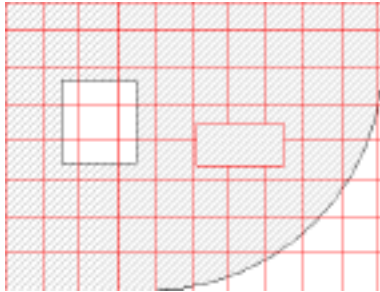
When we confirm the settings, the covering reappears with the updates and settings we defined:



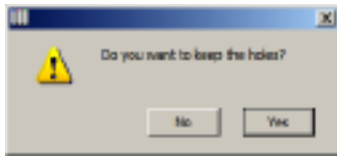
As seen before, using the Cut/Drill Paneling tool, we can create holes in the paneling that were not part of the geometry of the original element (be it a zone or a fill) from which the paneling was generated.

Since these “manually created” holes are not included in the geometry of the zone or fill used, they are of fundamental importance during updating.

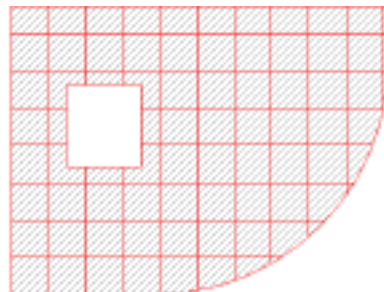
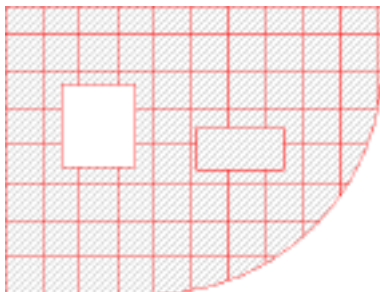
Let's suppose, as shown in the image below, that the covering to be updated includes a hole (in this example a fill is used, but it would be the same for a zone):



When we click the Update Paneling tool, ArchiPanel recognizes the holes and immediately displays a dialog window that asks if we want to process or ignore them:



If we choose to keep the holes, ArchiPanel updates the covering object maintaining the holes (image on the left), otherwise the object is updated but the manually created holes are ignored (image on the right):



Online Help

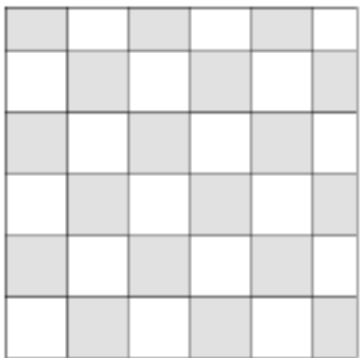
Clicking the Online Help icon in the ArchiPanel Palette opens the user guide in PDF format.

For this procedure to function correctly, Acrobat Reader must be installed on your computer, and the ArchiPanel user guide must be present in PDF format in the same folder as the ArchiPanel add-on (the folder on the CD-ROM includes the guide).

Project Data Calculation

An interesting feature of ArchiPanel involves the calculation of the elements used to cover ceilings and floors.

Let's see how these calculations work using a simple example:



The image above shows a small floor covered with 80x80 panels in two different colors.

Using any Component list, we can easily obtain a calculation like the one below:

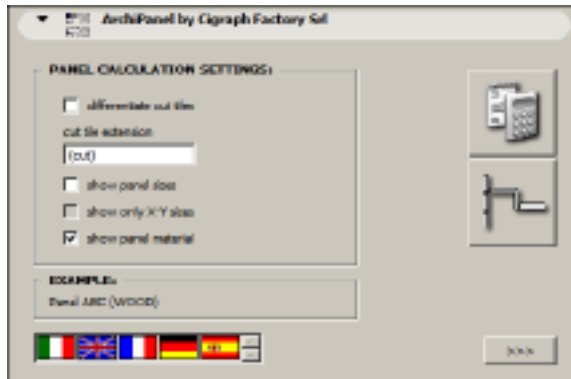
Component	Name	Component	Quantity
F_Beam	01		72
F_Column	01		36
F_Panel	01 (White)		18
F_Panel	01 (Grey)		18

The first column includes the name of the component (or the name given to the panel, beam or support selected to generate the covering). The second column lists the number of elements used in the structure.

Let's see how we can customize this data.

First, we select the covering object and double-click the Object tool (in the ArchiCAD Toolbox) to access its settings dialog box.

In the user interface section, we see the following dialog:



In the PANEL LIST SETTINGS parameter group, we can specify the data to display/compute in the calculation. In the EXAMPLE section, we see a preview of the results obtained.

If the “differentiate cut panels” checkbox is selected, the panels that have been cut to fit the area's shape are calculated separately (and labeled).

The next field is for entering the string to use for labeling the cut panels in the calculation.

If this checkbox is selected, the calculation above changes as follows:

Component Name	Component	Quantity
F_Beam	01	50
F_Beam	01 (cut)	22
F_Column	01	25
F_Column	01 (cut)	11
F_Panel	01 (White)	13
F_Panel	01 (White) (cut)	5
F_Panel	01 (Grey)	12
F_Panel	01 (Grey) (cut)	6

We now see that 18 panels were used for each of the two materials and that 5 white panels and 6 grey panels are cut and 13 white panels and 12 grey panels are whole panels.

Beams work in the same manner (22 are at the borders, i.e. half beams), as do supports (11 supports are situated along the border).

The “show panel sizes” checkbox is used to specify whether the dimensions should appear beside the component name, and the next checkbox - “only X-Y sizes” - enables/disables the appearance of the thickness next to the two measurements:

Component Name	Component	Quantity
F_Beam 01		72
F_Column 01		36
F_Panel 01 0,70x0,70 (White)		18
F_Panel 01 0,70x0,70 (Grey)		18

The last checkbox, “show panel material,” controls the display of the panel's material: be aware that using this option significantly affects the list results.

Below, we see how our calculation is affected if we decide to disable it:

Component Name	Component	Quantity
F_Beam 01		72
F_Column 01		36
F_Panel 01 0,70x0,70		36

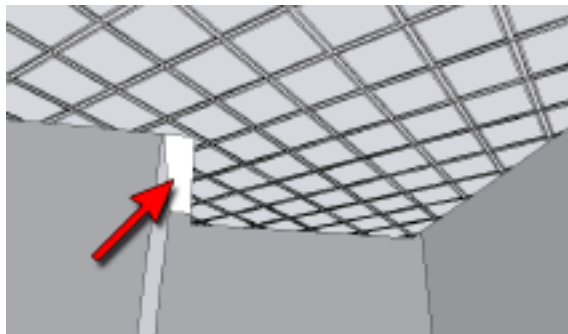
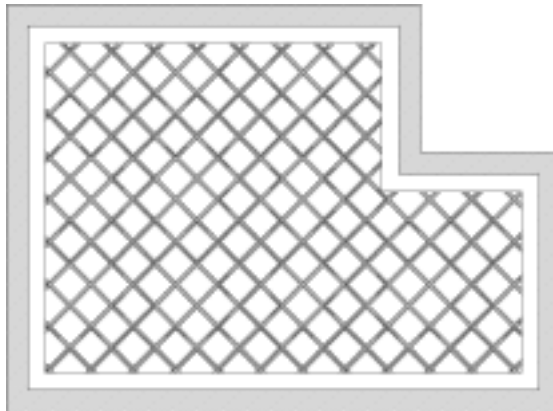
As the surface material is no longer displayed, all panels with the same name are grouped together, resulting in a general calculation of the panels used with no distinction by surface material/color.

Offsets and Edging for False Ceilings

As we have already discussed in this guide, an internal offset can be applied to both floor and ceiling coverings.

In the second case, i.e., when we generate false ceilings, the parametric characteristics of the covering element can be used to define its edging.

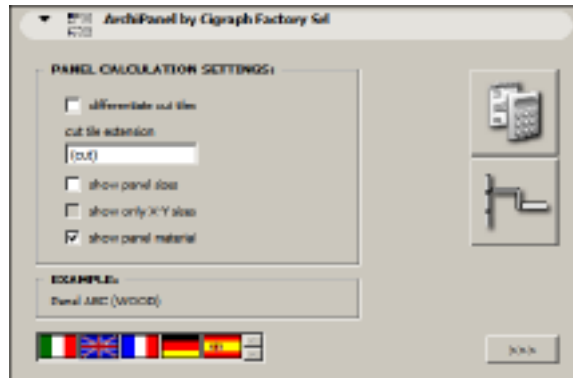
Let's look at the following example, which shows a false ceiling with an offset:



As shown in the two images, the false ceiling is inset by a specified distance from the edge of the surface, causing the border to appear empty.

We select the covering object and double-click the Object tool (in the ArchiCAD Toolbox) to access its settings dialog box

In the user interface section, we see the following dialog:



We click the button under the project data calculation button to access the dialog box that will be used to configure the border of our false ceiling:



In the top right area, four options offer four different possibilities for customizing the edging.

From left to right:



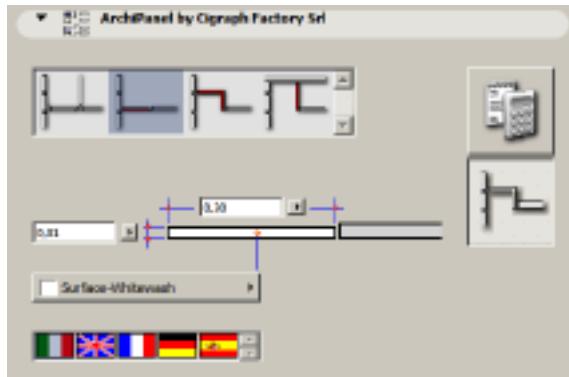
No edging. This is the standard default option: no edging is used; therefore, if an offset is defined, the border will be empty.



Simple edging. Activating this option results in the border being "filled" with horizontal edging at the same level as the false ceiling, starting at the panels and extending to the surrounding walls.

Clicking this icon will cause a series of parameters to be displayed allowing the element to be configured:

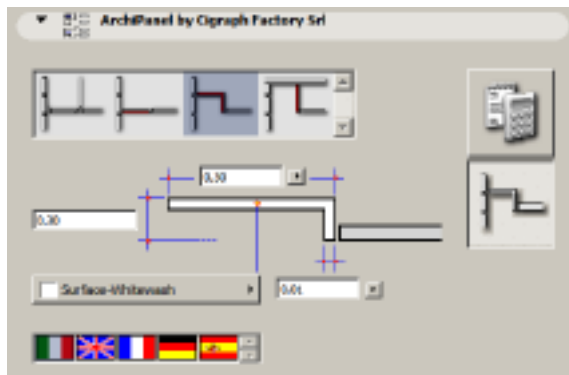
- thickness of the edging
 - width of the edging (could be different than the offset value)
- material used for the edging

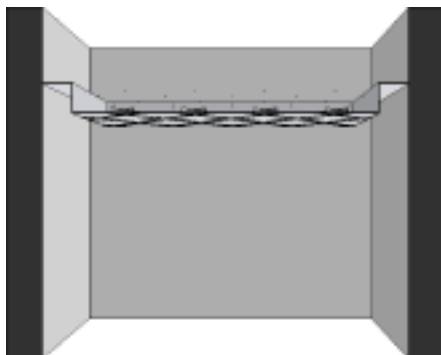


“Stair-step” edging. When this option is activated, the border is “filled” with horizontal edging that will be a specified distance from the false ceiling, with another vertical section joining the two elements.

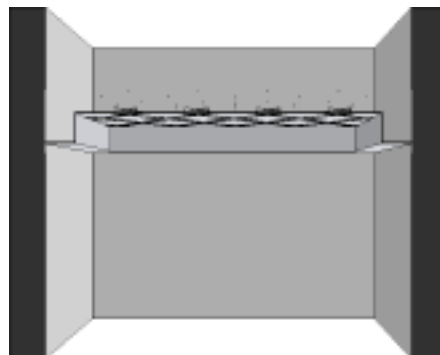
Clicking this icon will cause a series of parameters to be displayed to allow the element to be configured:

- thickness of the edging
- width of the edging (could be different than the offset value)
- vertical offset of the edging. The value can be either positive or negative, resulting in the border being either higher or lower than the false ceiling
- material used for the edging





*Example of a border
with a positive vertical offset*



*Example of a border
with a negative vertical offset*



Vertical edging. When this option is activated, a vertical block of a specified height will be generated.

Clicking this icon will cause a series of parameters to be displayed to allow the element to be configured:

- thickness of the edging
- width of the edging (could be different than the offset value)
- vertical offset of the edging. The value can be either positive or negative, resulting in the border being either higher or lower than the false ceiling
- material used for the edging

Appendix

The appendix covers the creation of new library parts using GDL programming.

Although expert users may benefit most from reading this section, less practiced users can refer to it to create customized elements as well.

The elements that can be created include:

- panels
- accessories
- lamp accessories
- beams
- supports

Panels

As seen previously in this guide, panels can be created automatically (both for floors and ceilings) using the Create a New Panel tool, which is found on the ArchiPanel Palette.

On the other hand, the surface materials and sizes of panels are parametric, therefore you could always use the same panel and change these parameters.

It could be the case, however, that, for a certain floor (or false ceiling), you want to create a panel with a 3D shape that cannot be generated using ArchiPanel's automatic functionality.

In this section, we will see how to create this type of panel using a GDL script.

Origin and Position

First of all, a panel that is to be used in ArchiPanel must follow certain rules in terms of its origin and position along the Z axis.

The panel must always be built so that its origin is located in the bottom left angle of its bounding box:



Likewise important is the position of the panel along the Z axis.

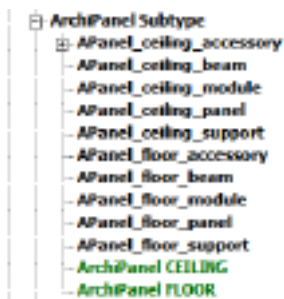
In the case of panels that will be used in floor coverings, the 0 level must be located under the panel, with the body of the panel extending upward:



In the case of panels that will be used in ceiling coverings, the 0 level must be located above the panel, with the body of the panel extending downward:



In order for the process to work correctly and for ArchiPanel to recognize the two panel types (for floors and for ceilings), you must select one of the two specific subtypes that are automatically generated by ArchiPanel in your ArchiCAD library when the software is installed:



Select the **APanel_ceiling_panel** subtype to create a panel for a ceiling or the **APanel_floor_panel** to create a panel for a floor.

When you choose one of these subtypes, ArchiCAD automatically adds a new variable, material_1, that controls the panel's surface material.

Remember, therefore, to use the MATERIAL material_1 command in your GDL script before defining the 3D elements that make up your panel so that the surface material will be parametric and can be configured using the ArchiPanel settings dialogs.

Any other material used in the 3D script will always remain the same; in other words, you will not be able to edit it using the ArchiPanel dialog boxes.

	A		X Dimension	1.00
	B		Y Dimension	1.00
	ZZYZX		Z Dimension	1.00
	AC_show2DHotspots...		Show 2D Hotspots in 3D	active
	material_1		material	0

When you save the object, you do not need to worry about its name: ArchiPanel manages its elements by their subtype.

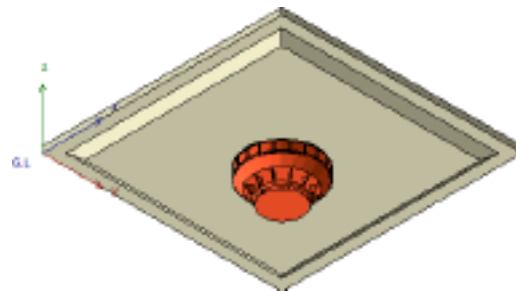
At any rate, we suggest that you use different naming standards for floor panels and ceiling panels; while this is not necessary, it is certainly helpful.

In the standard library provided with ArchiPanel, the function of the library parts can be recognized by the first letter of their name: F indicates an element that will be used for a floor covering; C indicates an element that will be used for a ceiling covering.

Accessories

The important thing to remember when creating an accessory for ArchiPanel is that the library part as well as the geometry of the accessory must be created based on the host panel.

The position of the accessory must be the same as the position seen above for the panels:



The origin must be on the lower left side of the host panel's bounding box, and the accessory must be in the center of the panel.

To ensure that the element works correctly, it is extremely important that you use the variables provided. These variables will be automatically created when you select the correct subtype.

Choose the **APanel_ceiling_accessory** subtype to create an accessory for a ceiling, the **APanel_floor_accessory** to create an accessory for a floor or the **APanel_ceiling_lamp** to create a lamp accessory for the ceiling.

Selecting one of these three subtypes results in the automatic creation of the variables necessary for correctly managing the subtypes in ArchiPanel:

	A		X Dimension	1.00
	B		Y Dimension	1.00
	ZZYZX		Z Dimension	1.00
	AC_show3DHotpo...		Show 3D Hotspots in 3D	active
	material_1		accessory material 1	0
	material_2		accessory material 2	0
	elem_resolution		accessory resolution	12
	X_offset		accessory X offset	0.00
	Y_offset		accessory Y offset	0.00
	angle		accessory angle	0.00
	A_Panel		host panel A size	0.60
	B_Panel		host panel B size	0.60
	Z_Panel		host panel thickness	0.02
	Name_Panel		host panel A name	panel 01
	Mat_Panel		host panel material	66
	panel_off		hide panel	Off

The variables for the APanel_ceiling_accessory subtype

	A		X Dimension	1.00
	B		Y Dimension	1.00
	ZZYZX		Z Dimension	1.00
	AC_show3DHotpo...		Show 3D Hotspots in 3D	active
	material_1		accessory material 1	0
	material_2		accessory material 2	0
	elem_resolution		accessory resolution	12
	X_offset		accessory X offset	0.00
	Y_offset		accessory Y offset	0.00
	angle		accessory angle	0.00
	A_Panel		host panel A size	0.60
	B_Panel		host panel B size	0.60
	Z_Panel		host panel thickness	0.02
	Name_Panel		host panel A name	panel 01
	Mat_Panel		host panel material	66

The variables for the APanel_floor_accessory subtype

	A		X Dimension	1.00
	B		Y Dimension	1.00
	ZZYZX		Z Dimension	1.00
	AC_show2DHotspo...		Show 2D Hotspots in 3D	active
	material_1		accessory material 1	0
	material_2		accessory material 2	0
	elem_resolution		accessory resolution	12
	X_offset		accessory X offset	0.00
	Y_offset		accessory Y offset	0.00
	angle		accessory angle	0.00
	A_Panel		host panel A size	0.60
	B_Panel		host panel B size	0.60
	Z_Panel		host panel thickness	0.02
	Name_Panel		host panel A name	panel 01
	Mat_Panel		host panel material	66
	panel_off		hide panel	Off
	rosso		red component	1.00
	verde		green component	1.00
	blu		blu component	1.00
	ombra		shadow casting	Off
	angle1		angle 1	45.00
	angle2		angle 2	60.00
	angle_falloff		falloff angle	0.30
	distance2		light end at	3.00
	distance_falloff		falloff distance	1.00
	intensity		intensity	90
	ON_OFF		lamp is turn on	Off

The variables for the APanel_ceiling_lamp subtype

As you can see in the images above, the subtypes use some of the same variables.

The meaning of these variables is explained below using a lamp accessory, which includes all possible variables.

A	: accessory width (along the X axis)
B	: accessory length (along the Y axis)
ZZYZX	: accessory height
material_1	: main material
material_2	: secondary material
elem_resolution	: resolution of the curved parts
X_offset	: offset along the X axis in relation to the origin
Y_offset	: offset along the Y axis in relation to the origin

<code>angle</code>	: accessory's angle of rotation with respect to the Z-axis
<code>A_Panel</code>	: host panel size X
<code>B_Panel</code>	: host panel size Y
<code>Z_Panel</code>	: host panel thickness
<code>Name_Panel</code>	: host panel name (to be used as a macro)
<code>Mat_Panel</code>	: host panel material
<code>panel_off</code>	: hide (=1) or show (=0) host panel
<code>red</code>	: red component of light color (value between 0 and 1)
<code>green</code>	: green component of the color (value between 0 and 1)
<code>blue</code>	: blue component of light color (value between 0 and 1)
<code>shadows</code>	: activates (=1) or deactivates (=0) shadow casting calculation
<code>angle1</code>	: this angle determines the frustrum of cone where the light becomes most intense.
<code>angle2</code>	: this angle controls the frustrum of cone where the light is dimmed.
<code>angle_falloff</code>	: falloff angle (zero gives the light a sharp definition; higher values produce a smoother transition between light and dark).
<code>distance2</code>	: the effect of the light ends at this distance
<code>distance_falloff</code>	: controls the decrease in intensity depending on the distance (zero produces a constant intensity; greater values are used for stronger falloffs).
<code>intensity</code>	: intensity of the light source (value between 0 and 100)
<code>ON_OFF</code>	: turns light source on (=1) or off (=0)

All of these variables are "recognized" and managed by ArchiPanel through its dialog windows.

Other variables you may add will not be managed by ArchiPanel's dialogs.

Let's look at a practical example: how to create a lamp accessory for our ceiling using an existing ArchiCAD library part.

First of all, from ArchiCAD's File menu, we select the GDL Objects/New Object command.

When the dialog box of the library part editor opens, we click the Select Subtype button, then, from the tree structure that appears, we select the APanel_ceiling_lamp subtype (which should be located at the following path: General GDL Object / Model Element / ArchiPanelSubtype / APanel_ceiling_accessory / APanel_ceiling_lamp) and confirm with the Select button.

When we close this dialog box, we see how all of the variables needed to create an accessory element (in this case a ceiling lamp accessory) have been automatically generated and are ready for use.

ArchiCAD's standard library includes a Lamp object like the one below (the name depends on your particular ArchiCAD localization):



As you can tell from the image above, this object already corresponds to the requirements previously seen; i.e., it extends downward (ceiling accessory requirement).

Let's see how we can use it in our script.

First of all, we open the library part to see its variables and understand what they mean.

The table below shows how the variables of the Lamp object correspond to the variables of ArchiPanel's lamps.

ARCHIPANEL VARIABLE	LAMP VARIABLE
A	A
B	B
ZZYZX	zzyzx
material_1	base_mat
material_2	cand_mat
red	D
green	E
blue	F
shadows	light_shadow
angle_1	ail
angle_2	aol
angle_falloff	afo
distance_2	dist2
distance_falloff	dif
intensity	G
ON_OFF	C
elem_resolution	gs_resol

Thus, to program a call to this existing element part to use it in our accessory, we use a declaration similar to the following one:

```
CALL      "Chandelier" PARAMETERS
                                A = A, B = B, zzyzx = ZZYZX,
                                D = red, E = green, F = blue,
                                light_shadow = shadows,
                                ail = angle1, aol = angle2,
                                afo = angle_falloff,
                                dist2 = distance2,
                                dif = distance_falloff,
                                G = intensity,
                                C = ON_OFF,
                                base_mat = material_1,
                                cand_mat = material_2
```

The parameters of any other variables of this library part cannot be managed through ArchiPanel's dialog boxes, however, you could manage them in the call to the macro.

In our example above, after the PARAMETERS declaration, we included only the assignments of the variables used by ArchiPanel, but we could also assign values (in this case fixed, not parametric) to the other variables.

Let's see, then, what our final GDL script looks like:

```
IF panel_off<1 THEN
CALL Name_Panel PARAMETERS      A=A_Panel, B=B_Panel,
                                ZZYZX=Z_Panel,
                                material_1=mat_Panel

ENDIF

ADD A_Panel/2+X_offset,B_Panel/2+Y_offset,-Z_Panel+.01
CALL "Chandelier" PARAMETERS  A = A, B = B,
                                zzyzx = ZZYZX,
                                D = red, E = green, F = blue,
                                light_shadow = shadows,
                                ail = angle1, aol = angle2,
```

```

afo = angle_falloff,
dist2 = distance2,
dif = distance_falloff,
G = intensity,
C = ON_OFF,
base_mat = material_1,
cand_mat = material_2

```

```
DEL TOP
```

We explain it briefly below.

In the first step, which is the declaration:

```

IF panel_off<1 THEN
CALL Name_Panel PARAMETERS      A=A_Panel, B=B_Panel,
                                ZZYZX=Z_Panel,
material_1=mat_Panel
ENDIF

```

We create the panel.

The Name_Panel variable is the name of the panel, A, B and ZZYZX are its dimensions and material_1 is its surface material.

All of these variables are automatically handled by ArchiPanel (meaning that you do not have to make any assignments); therefore, these 3 lines should always be present in your 3D GDL scripts.

Now we go to the center of the panel and then move the distance of its thickness (along the Z axis):

```
ADD A_Panel/2+X_offset,B_Panel/2+Y_offset,-Z_Panel+.01
```

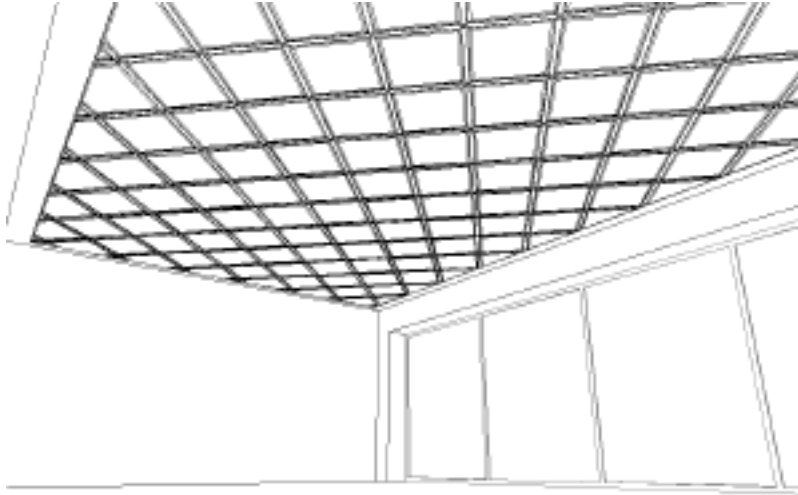
Infine viene eseguita la chiamata all'accessorio.

Lastly, we make the call to the accessory.

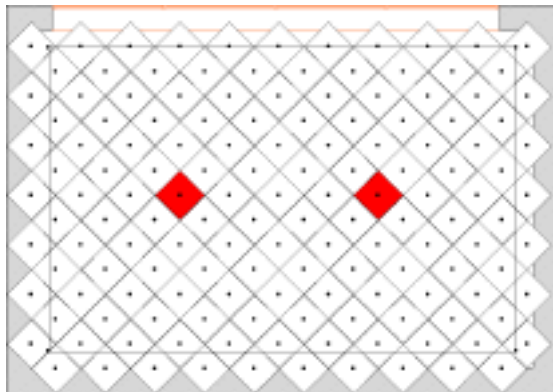
In this case, we used a library part as a macro, but we could have also included the GDL description of our accessory here.

We now save the library part in one of ArchiCAD's active libraries.

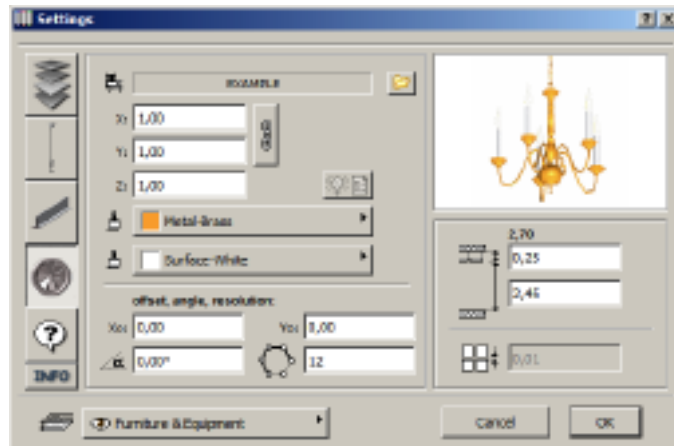
Now let's create a false ceiling (as we saw in this manual) for the room shown below:



Using the Modify Paneling tool, we select two of the panels in the false ceiling, as shown below:



We confirm the selection and assign the lamp accessory defined above to the two panels:



Here's how our accessory looks in 3D:



Vertical Supports

The structural supports handled by ArchiPanel include suspension systems for false ceilings and columns for raised floors.

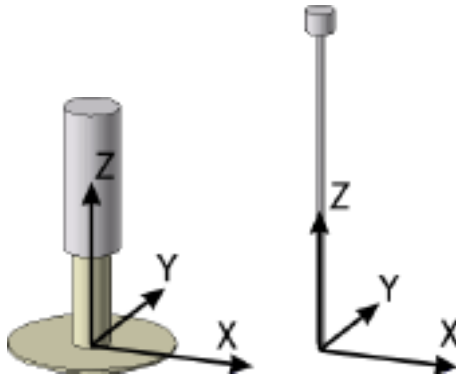
Both of these types of supports have a specific subtype.

- APanel_ceiling_support (for suspension systems)
- APanel_floor_support (for columns)

Selecting these subtypes while creating a library part will create two material variables (material_ and material_2) for use in your script. These variables will be handled automatically in ArchiPanel's dialogs.

The element's dimensions A and B will be fixed (not handled by ArchiPanel), as this type of element normally varies in height (depending on the position of the false ceiling or raised floor); thus, remember to use the ZYZX variable correctly, as ArchiPanel will use it for this purpose.

In the two images that follow, we see the correct positioning of the two elements along the Z axis (a column on the left and a piece of suspension equipment on the right):



Horizontal Structure

The horizontal structural framework of the false ceiling or raised floor is also handled by ArchiPanel using two specific subtypes:

- APanel_ceiling_beam (false ceiling)
- APanel_floor_beam (raised floor)

Selecting these subtypes while creating a library part will give you two material variables (material_ and material_2) for use in your script. These variables will be handled automatically in ArchiPanel's dialogs.

In the two images that follow, we see the correct positioning of the two elements along the Z axis (a structural element for a raised floor on the left and a structural element for a ceiling on the right):

