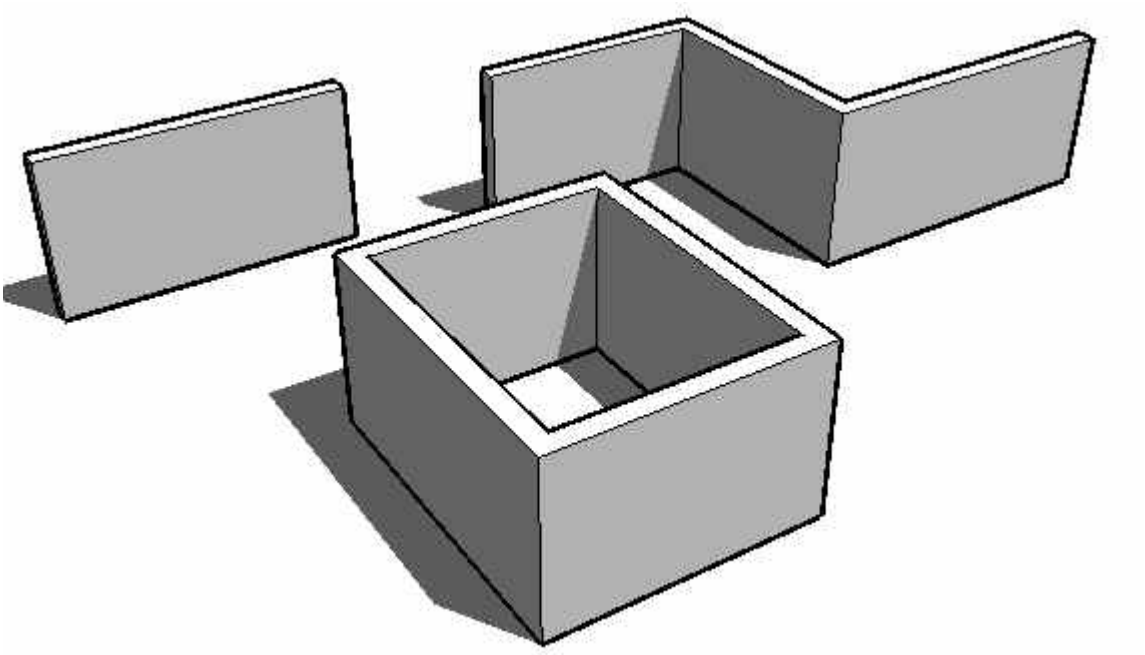
Wall Cutting Tool v1.0.
for SketchUp v5 and v6 (Free and Pro)

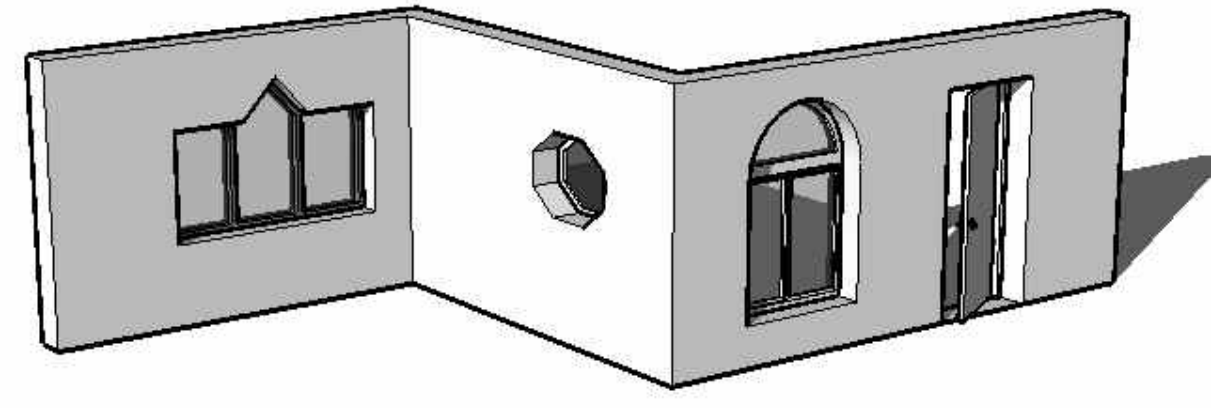
© D. Bur, 29.12.2007

This script contains two tools to quickly create special "cutting" windows/doors components, and one tool to create the opening for them and automatically place them wether on the inner side, outer side of wall, or at a specified distance from the inner side of wall. What I call a "wall" here is any double-sided volume such as these:



What is a "cutting component" ?

Almost any component can be edited to have the ability to create an opening in a wall. Such a component much be edited so it "knows" how to cut a wall. This can be done by clicking points to define the shape of the opening, or by selecting a face in a component and making the outer loop of the face cut walls.



Installation:

Unpack the archive in the SketchUp Plugins folder. Restart SketcUp.

You should have:
"cutting_windows.rb" in your Plugins folder
" Cutting_windows User Guide.pdf" in your Plugins folder. You can move this file where you want.

Menu:

There is no option or sub-menu in the standard menus of SketchUp.
The tools options will only appear in the context menu (right-click), and only when their actions will be possible.

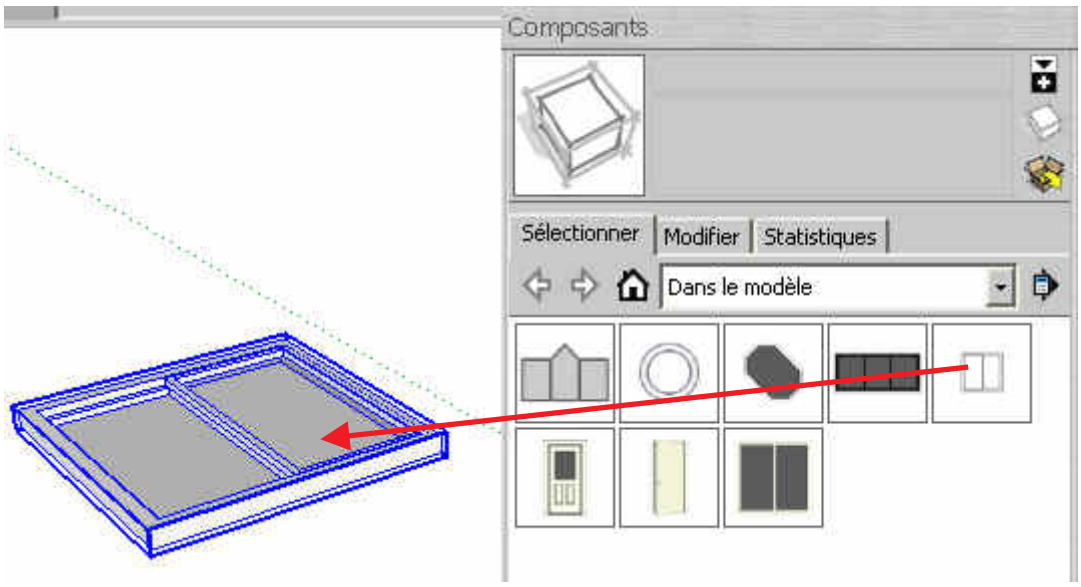
1. Making a component cut walls:

Usable components: every component that glues to any, horizontal, vertical, or sloped face. Thus you can create openings in walls as well as slabs or roofs.
There are two ways for defining the shape and dimensions of the opening: by points or by face.

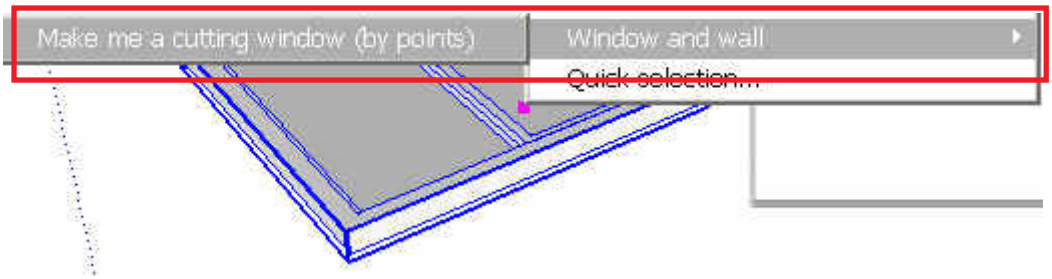
First method is for simple shapes (square, rectangles...) and the second is for complex shapes (arched windows, circles, n-gons shaped windows...), that's-to-say when there would be a lot of points to click to define the shape of the opening.

Method 1 by points:

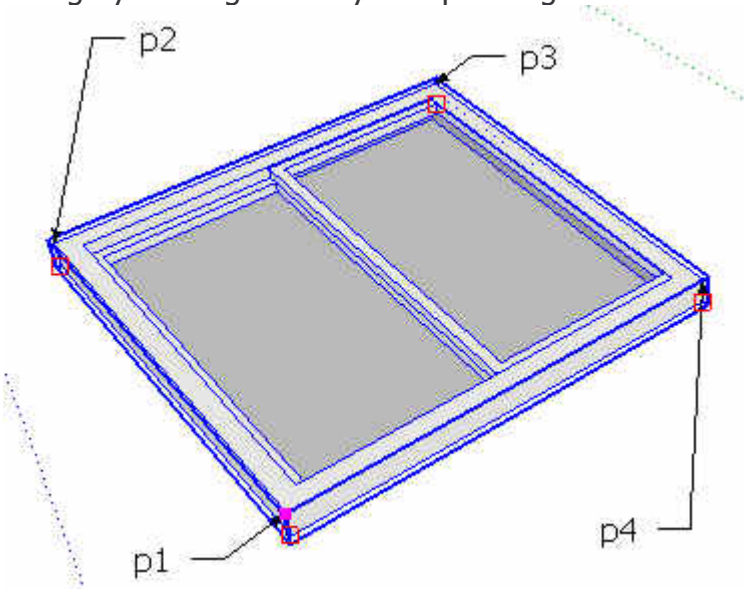
Drag a component from the component browser to an empty area of your model:



Right-click on the selected component and select this option:

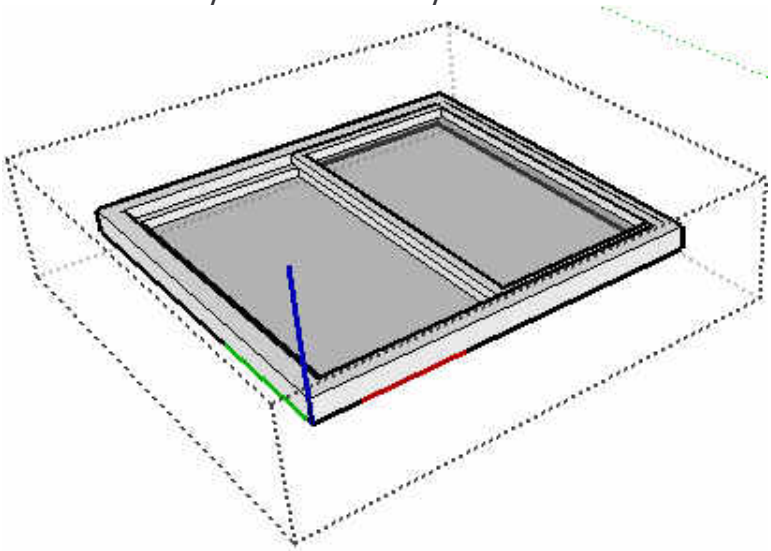


Now click clockwise on the points that define the outline of the window, starting anywhere, and ending by clicking the very first point again:



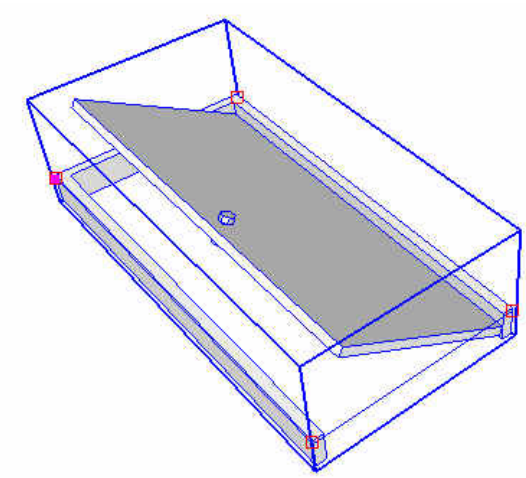
On the above image, I have started with p1, then p2, p3, p4, and finally I will click on p1 again.
The command ends and the component is now ready to use.

Note that the points that you click are always displayed as pink open squares on the red-green plane of the component. This is this plane which will be used as the reference plane when the component will be "pushed" inside a wall:

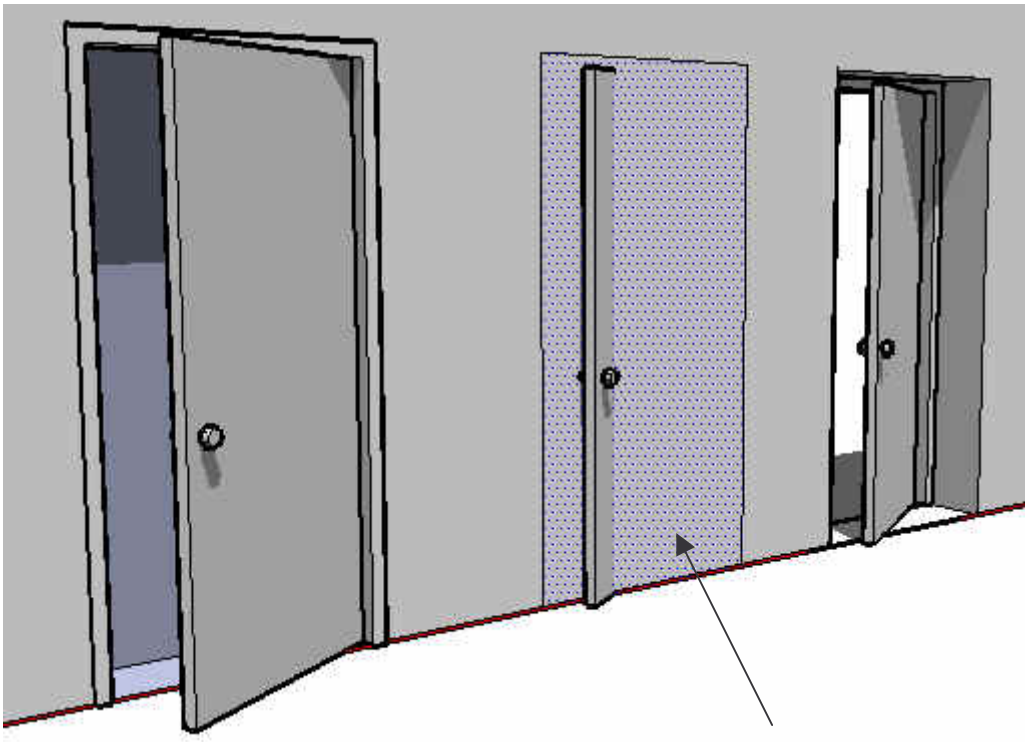


Note: to see where the reference plane of your component is, just double-click on it (as if you were to edit it) and check where the local RGB axis are. Green and red axis define the gluing face. I prefer the term "reference plane".

Example of a cutting door:



Known (and unresolved) issue:
When using cutting doors you may obtain the following result (see image below). For some unknown reason, when done "manually", the process of creating the hole in the wall works (pushpull a face from side to side), and unfortunately doing this with a ruby script leaves a remaining face. This only happens when the opening touches the wall basis line.

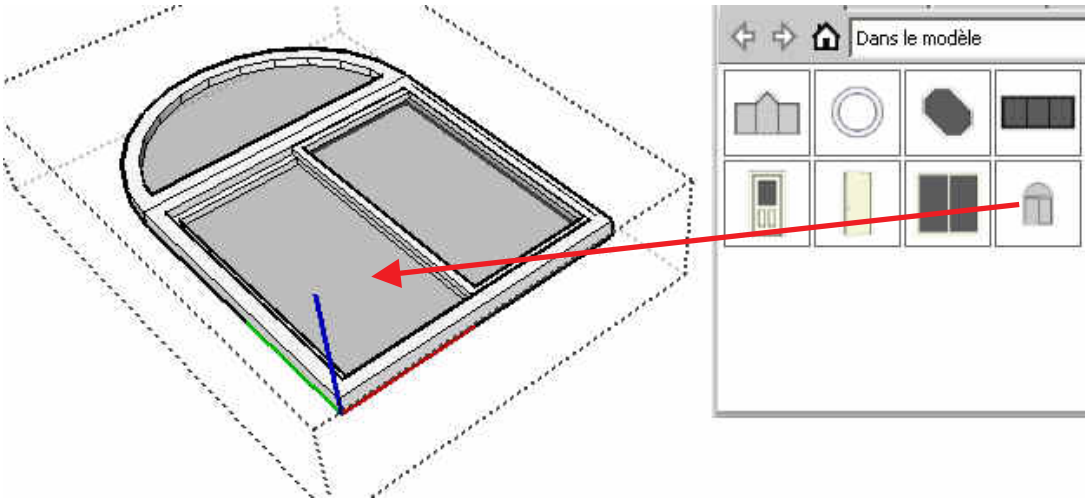


Before *After (just erase this remaining selected face)*

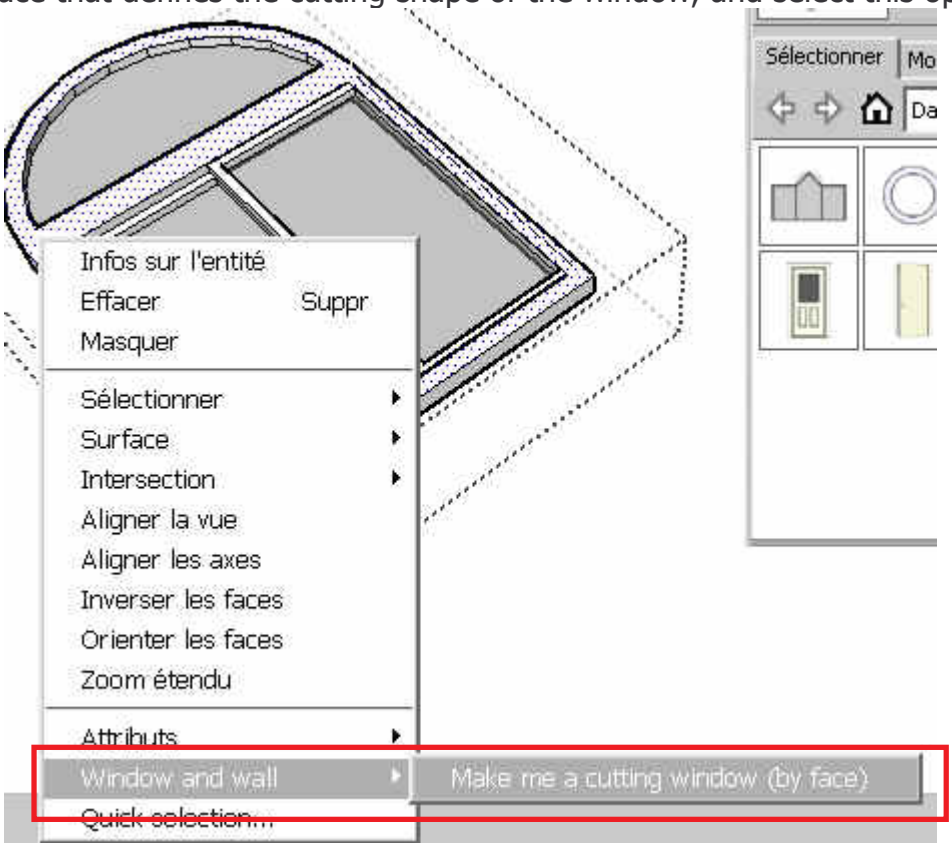
Method 2 by face:

Defining a complex cutting shape by points would be tedious say, if more than 8 or 10 points are needed. That's why a second method has been implemented: selecting a face, not matter its complexity, would be sufficient to get all the points of the cutting shape.
The process is slightly different:

Drag the component from the component browser to an empty area of your model, and double-click on it:



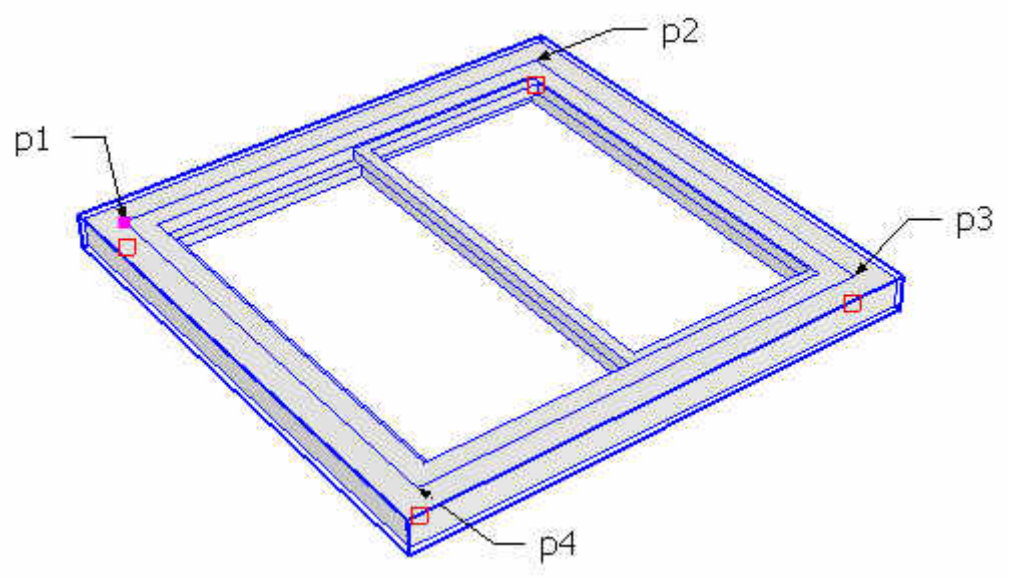
Select a face that defines the cutting shape of the window, and select this option:



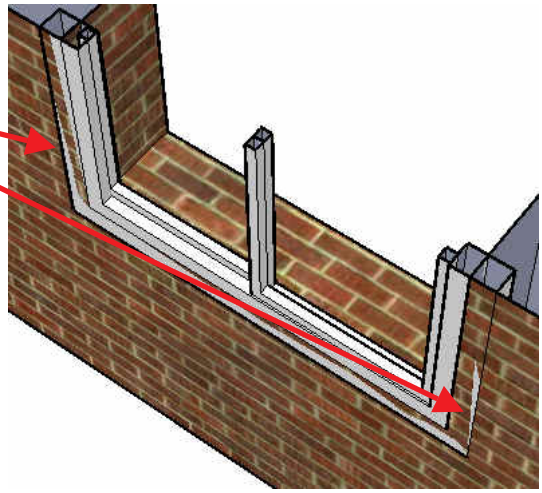
The selected face can be either on the reference plane (same Z) or not on it. Click somewhere outside the component to quit the edit mode, the component is now ready to use.

Note:
- You can define the cutting shape of a component first by points, and if you change your mind, later redefine the cutting shape by face, or by points again, as many times as you want.
- If you want to use cutting windows and doors in other models, save them in your components library, thus you wouldn't have to redefine the cutting shape in each new model !
Cutting information is persistent because it is saved one time for all in the component definition itself. But as you (may) know, components edited in a model cannot be used in other models without first saving them in the components library...

The cutting shape can be different than the component bounds, in case of rabbet for instance. Below is a component were the cutting shape has been defined with points p1,p2,p3,p4,p1.

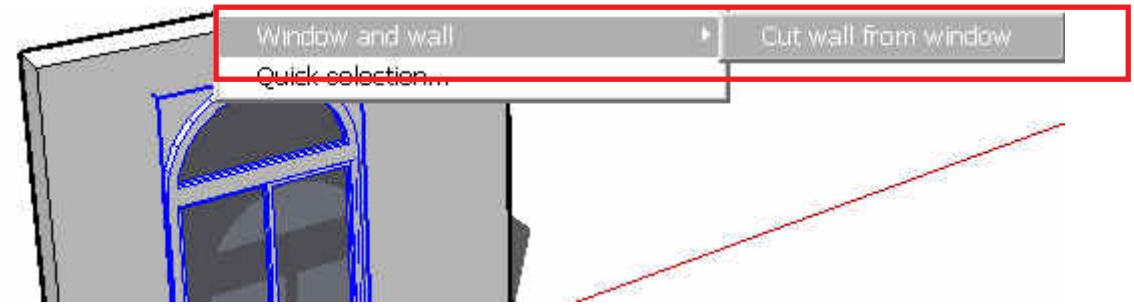


Once sticked on inner side of wall, it could cause some display problems, so it is a good idea to slighly offset this kind of component inwards, for instance 0.1cm: use "Distance from inner face of wall, and enter -0.1 for the distance.



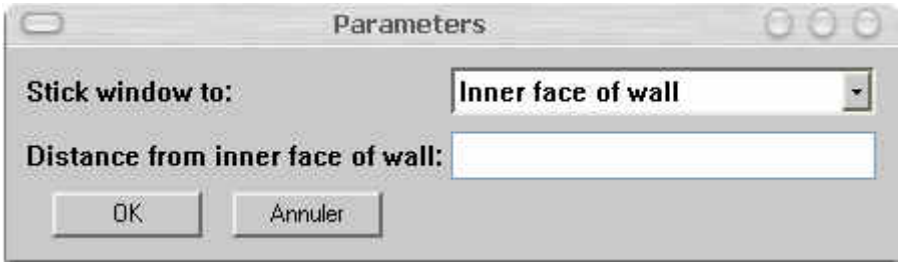
2. Using cutting components:

Drop a cutting component on the outer face of a wall. Right-click on the selected component and select this option in the context menu:



This option of the context menu will only appear if a component is selected, and if it is glued to a face, and if it has the cutting information available.

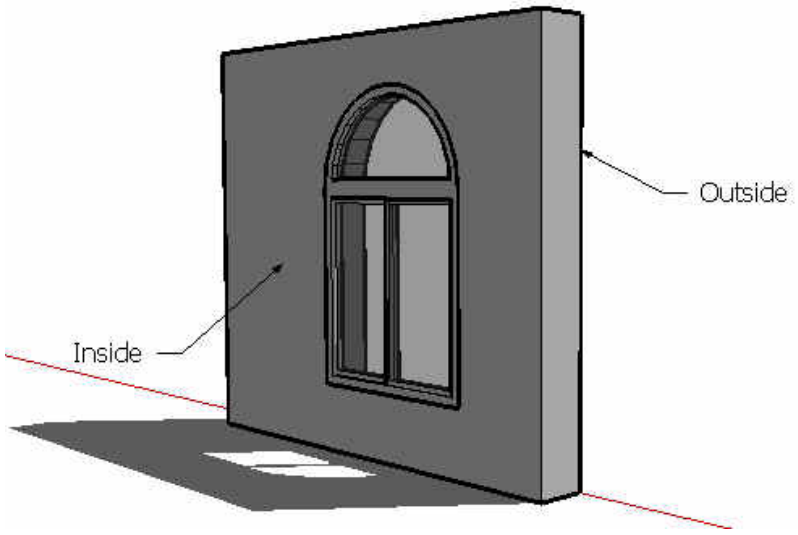
The following dialog box is displayed:



Choose an option from the dropdown list or enter a distance in the distance field (in this case, select "Distance from the inner face in the dropdown list).

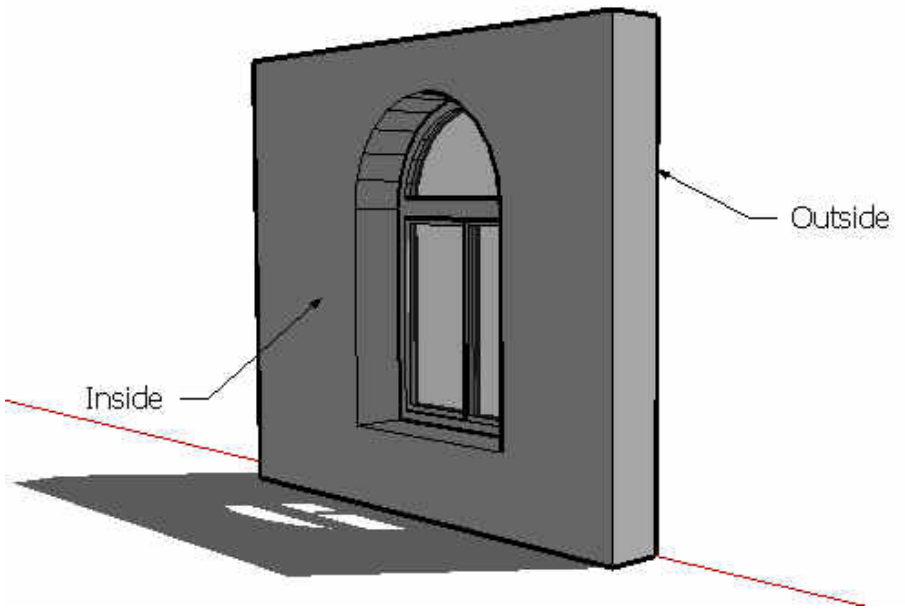
- Stick window to inner face of wall:

The reference plane of the window will be glued to the inner face of the wall.



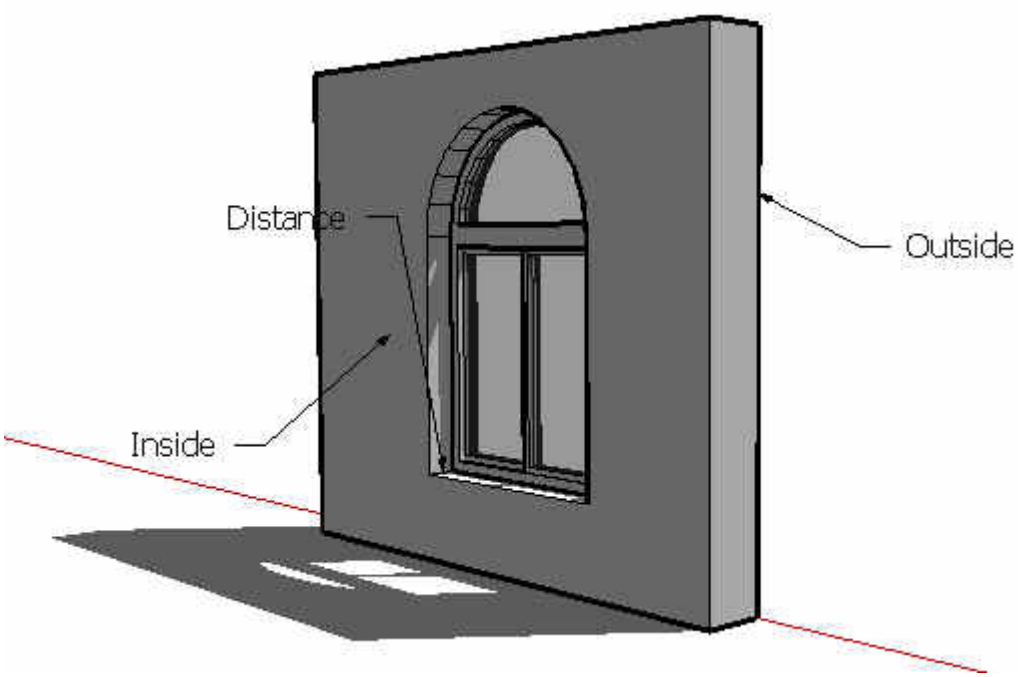
- Stick window to outer face of wall:

The reference plane of the window will be glued to the outer face of the wall.



- Distance from the inner face of wall:

Reference plane of the window will be offset from the inner side of the wall. Distance is the offset between the inner face of the wall and the reference plane of the window. Distance can be negative.



Note:

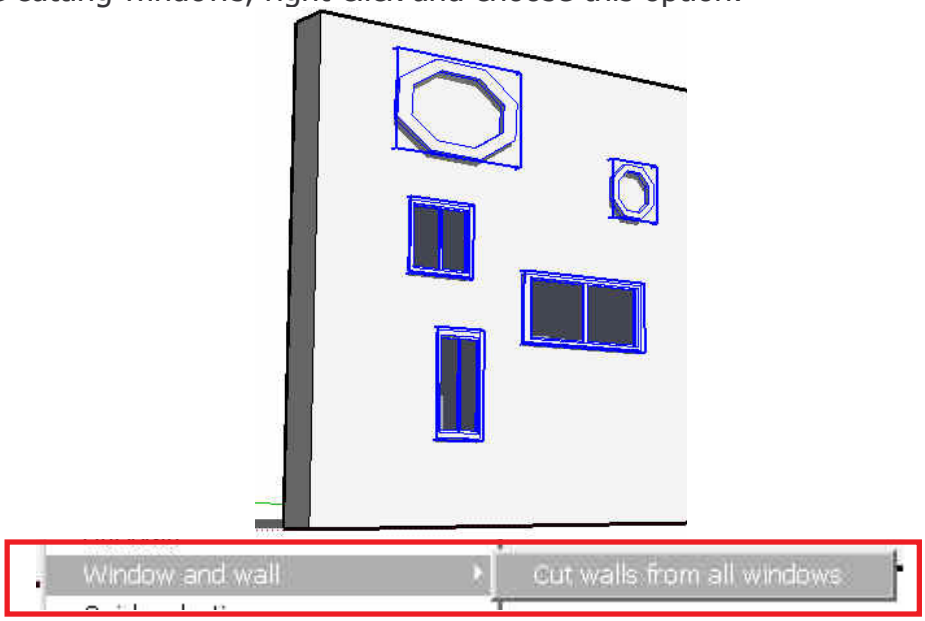
- when you make a window/door stick to the inner face of the wall, the component is glued to the inner face of the wall,

- when you make a window/door stick to the outer face of the wall, the component is glued to the outer face of the wall,
- when you select the option "Distance from inner face of wall", the component is not glued to any face.

2. Using a selection of cutting components:

When you have a lot of windows to "pushpull" through walls, you can select them and create all the openings at once:

Select the cutting windows, right-click and choose this option:



The same dialog box as usual is displayed and will be applied to all selected windows.

Note:
- if there is a "non-cutting" window in your selection, there will be no item appearing in the context menu.
- as you can see here, you can scale your components along X,Y,Z as needed without disturbing the process.