



REVIT PURE PRESENTS
PAMPHLETS



ISSUE #28 / SPRING 2023

FAMILY VISIBILITY



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by: Nicolas Catellier, Architect

PAMPHLETS COLLECTION



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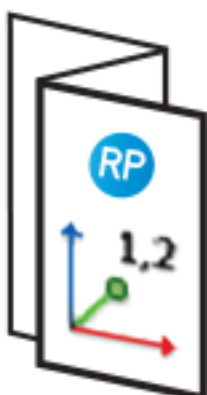
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WHAT IS THIS “PAMPHLET”?

Revit Pure Pamphlets are published 4 times a year by email. Each edition covers a particular Revit theme. We like to pick themes that are complex and confusing. Our job is to make these topics simple for you.

ABOUT FAMILY VISIBILITY

This is a new pamphlet in our series about Revit families.

You can read [pamphlet #24](#) if you are a family beginner.

For this edition, we go deep into visibility issues in Revit families. You will learn about cuttable families, nested cut plane, overhead visibility and more.

[Click here](#) to download a Revit sample file that explains the concepts in this pamphlet.


Good luck!

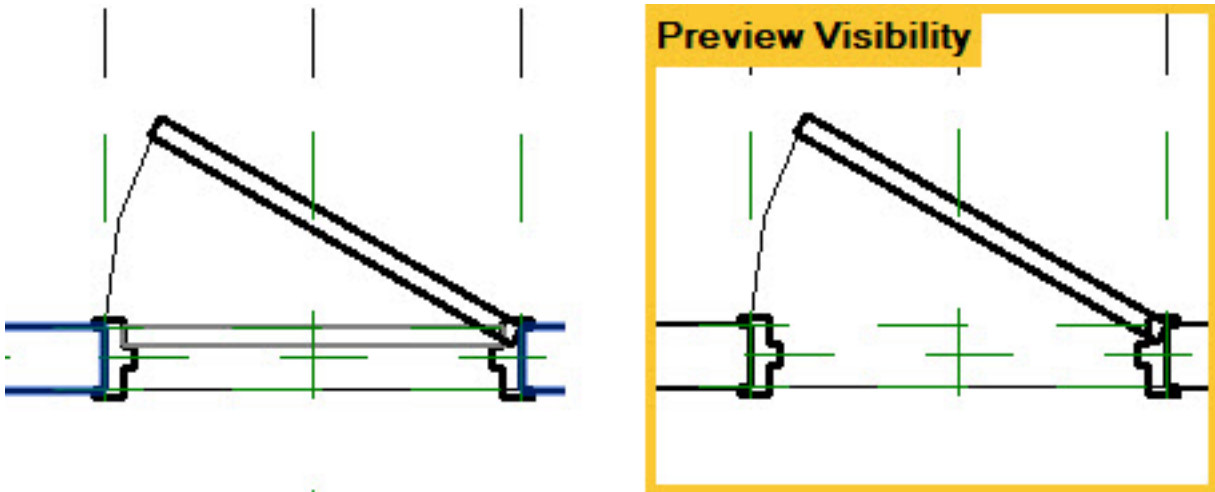


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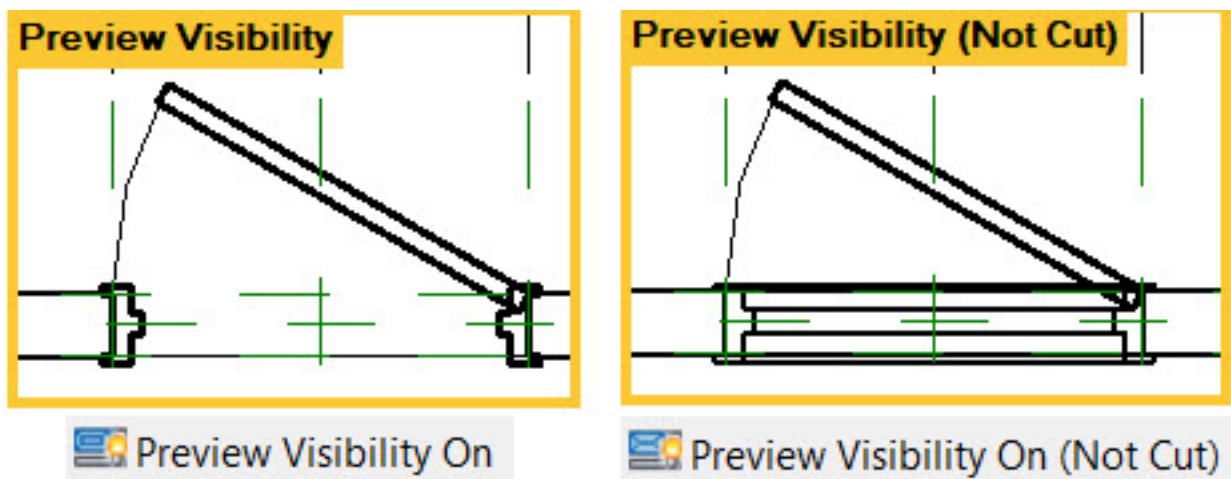
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#1: USE "PREVIEW FAMILY VISIBILITY"

Since we are talking about visibility, make sure to use the  **Preview family visibility** tool. It is located at the bottom of your screen, in the options bar. It allows you to see what the family will look like once loaded in the project. You can see that **elements** in grey disappear once this feature is active.



When using this option, you can pick between showing the **Cut** or **Not cut** preview.





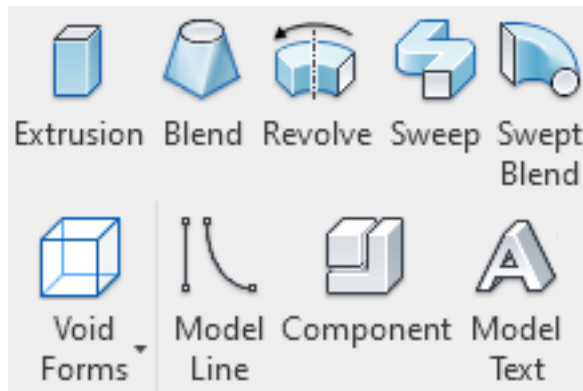
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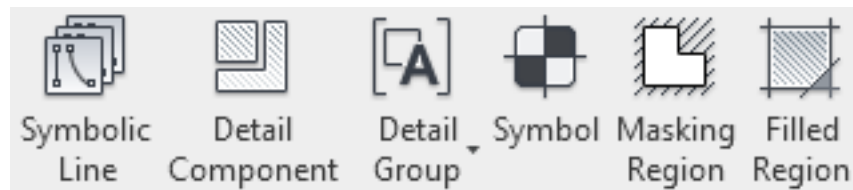
#2: 2D VS 3D ELEMENTS = DIFFERENT VISIBILITY SETTINGS

In 3D Revit families, you can use 2D elements and 3D elements. 3D elements are visible in all views by default, while 2D elements are visible only in one view type (elevation, section, plan view, ceiling view). 3D elements are generally found in the **Create** tab and 2D elements in the **Annotate** tab.

Here are the possible elements for each:



3D elements



2D elements

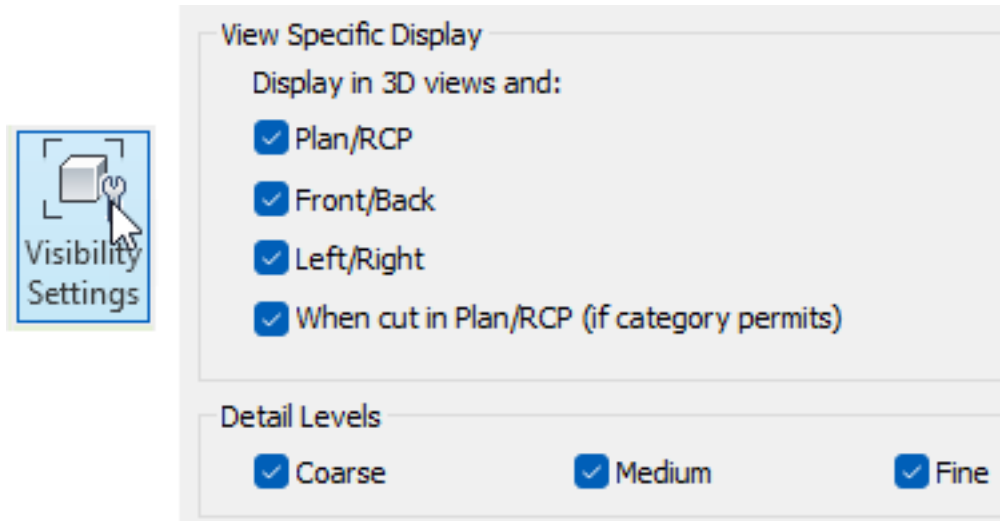


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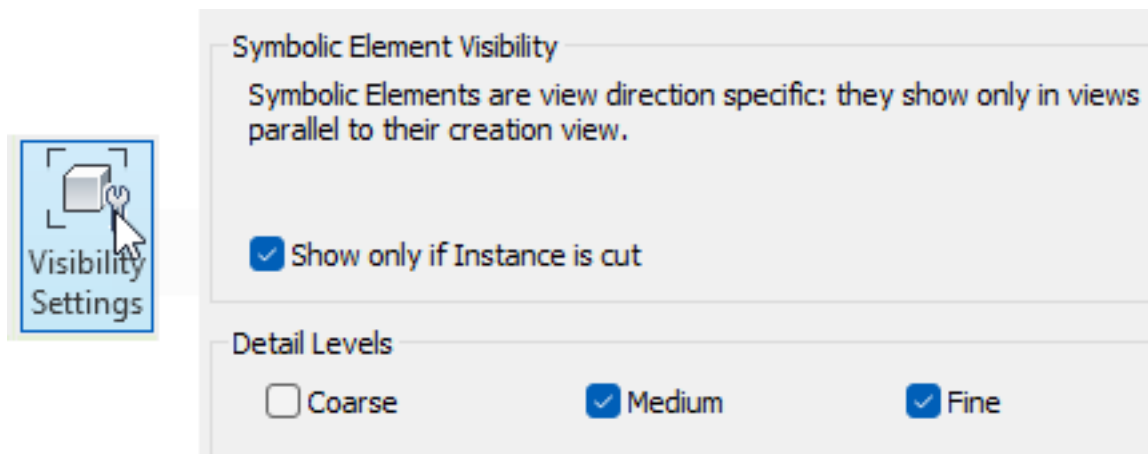
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Both 2D and 3D elements have access to the **Visibility Settings** menu.

Here is what you'll see for 3D elements:



Here is what you'll see for 2D elements:



As you can see, you can specify what views the 3D elements can be visible. For 2D elements, they are only visible in "views *parallel to their creation views*".



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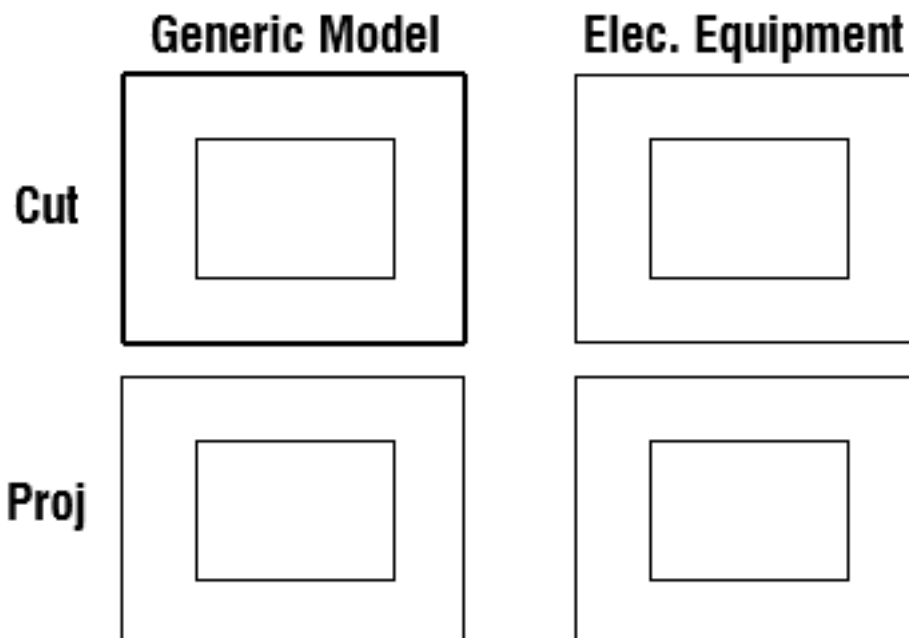
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#3: "CUTTABLE FAMILIES" CAN HAVE DIFFERENT THICKNESS AND LIFESTYLES WHEN CUT

Most family categories are "cuttable", which mean they can be displayed with additional thickness when they are cut in plan views or sections. It's easy to know which categories are cuttable and which aren't. Go to the Visibility/Graphics menu. The Cut columns are disabled for categories that are **not cuttable**.

| Visibility | Projection/Surface | | | Cut | |
|--|--------------------|----------|---------|-------|----------|
| | Lines | Patterns | Tran... | Lines | Patterns |
| <input checked="" type="checkbox"/> Doors | | | | | |
| <input checked="" type="checkbox"/> Electrical Equipment | | | | | |

Doors are cuttable and **Electrical Equipment** are not. In the example below, you can see the difference between a Generic Model that is in projection and another that is cut. Then, the same family but in the Electrical Equipment category.














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#4: ARE THESE CATEGORIES CUTTABLE?

| CATEGORY | <div style="display: flex; justify-content: space-between; border-bottom: 1px solid black;"> Projection Cut </div> <div style="display: flex; justify-content: space-between;"> 1 </div> | <input type="checkbox"/> When cut in Plan/RCP | OVERHEAD VISIBILITY |
|--|---|---|---------------------|
| | CUTTABLE? | CUT VISIBILITY OPTION? | |
|  DOORS | ✓ | ✓ | ✗ |
|  WINDOWS | ✓ | ✓ | ✓ |
|  GENERIC MODELS | ✓ | ✗ | ✓ |
|  STRUCTURAL COLUMNS | ✓ | ✓ | ✗ |
|  ELECTRICAL FIXTURES | ✗ | ✗ | ✗ |
|  CASEWORK | ✓ | ✓ | ✓ |
|  FURNITURE | ✓ * | ✗ | ✗ |
|  SPECIALTY EQUIPMENT | ✓ * | ✗ | ✗ |
|  PLUMBING FIXTURES | ✓ * | ✗ | ✗ |

* ONLY SINCE REVIT 2023



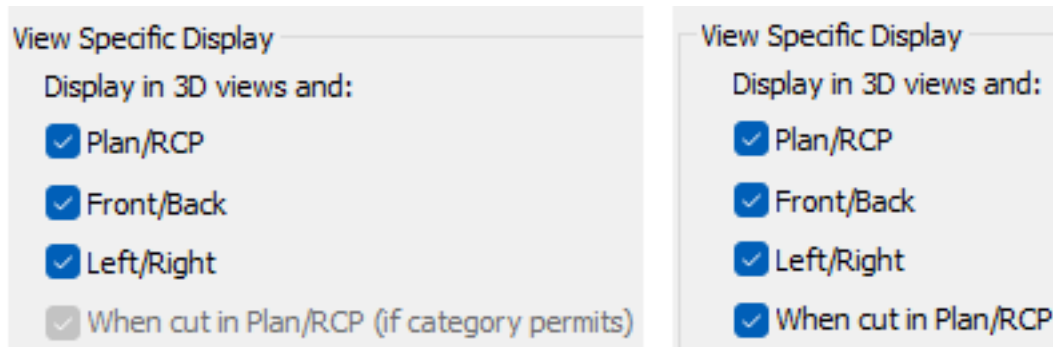
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#5: CUT VISIBILITY OPTION IN PLAN VIEW

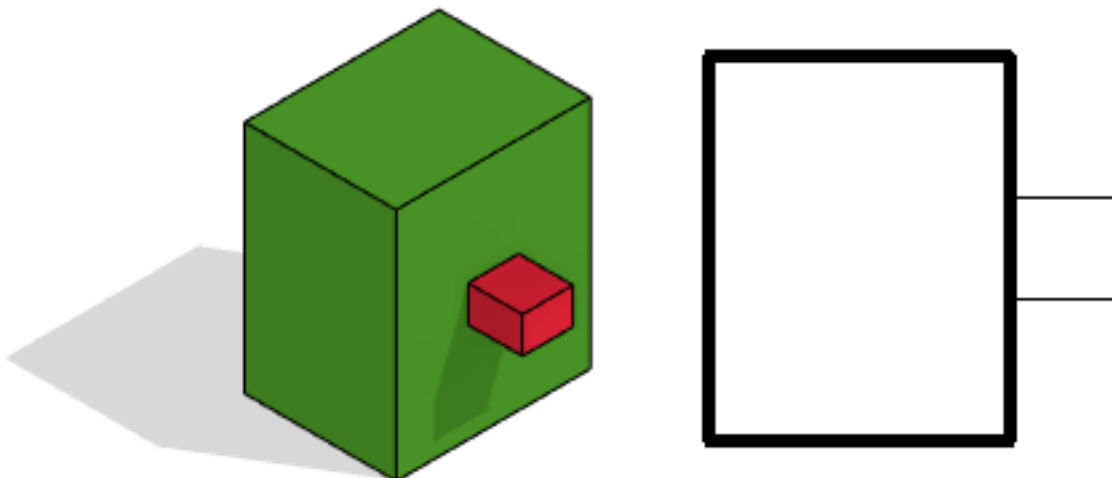
Certain family categories have a visibility option that allows you to hide an element when it is **cut** in plan view. This is different from a family being **cuttable** or not.

In the image below, you can see a family category that doesn't have this option available and one that does.



CUT VISIBILITY OPTION

Let's explore this feature with a random generic model element. Here is the 3D shape. You can see this is a cuttable family, as the main box displays in thick lines and the appendix with thin lines.



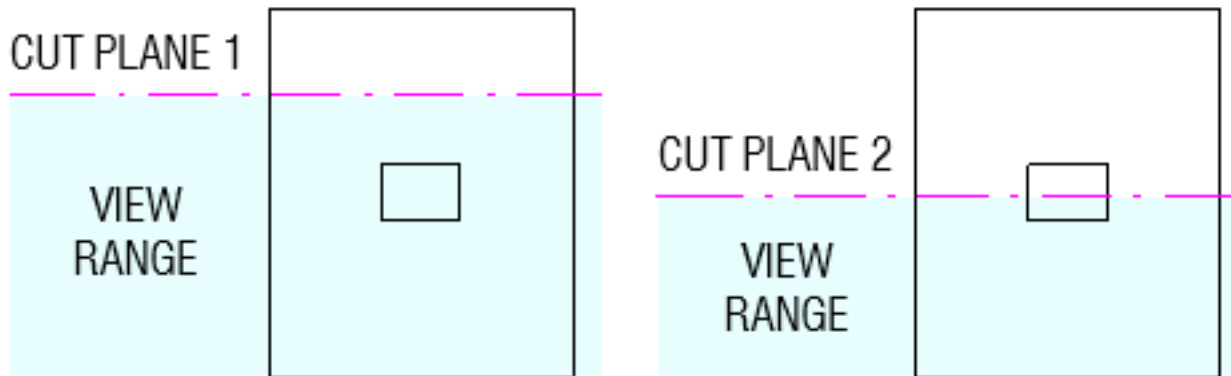


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If you play with the view range, you can cut through the appendix element. In the image on the right, you can see it becomes thick because the cut plan of the view goes through it.

ELEVATION



PLAN VIEW



What if you want the appendix element to only be visible when it is **cut**? The result would look like this:

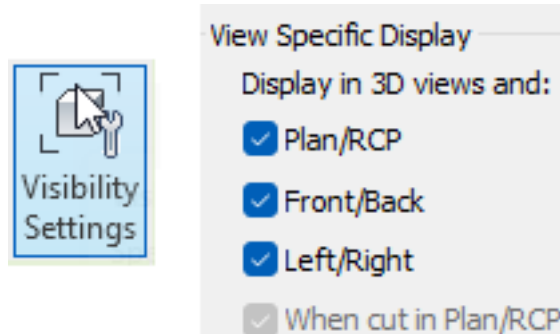




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Currently, the family is in the Generic Model category. When you select the appendix geometry and click on **Visibility Settings**, the "When cut in Plan/RCP" option is not available.

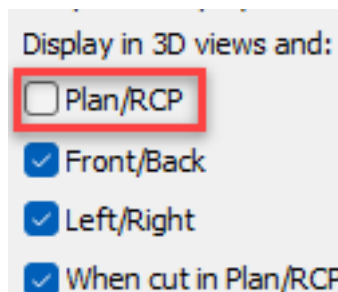


That means that it is impossible to have the element visible when cut, but invisible when not cut.

Let's play a little trick. Click on the **yellow folder** icon and switch the family category to **Doors**.



Select the appendix geometry again and go back to the Visibility Settings menu. The option for cut in Plan/RCP is available! Leave the box checked, but uncheck Plan/RCP.



This way, the appendix is only visible when cut. However, there is a twist. Read on.



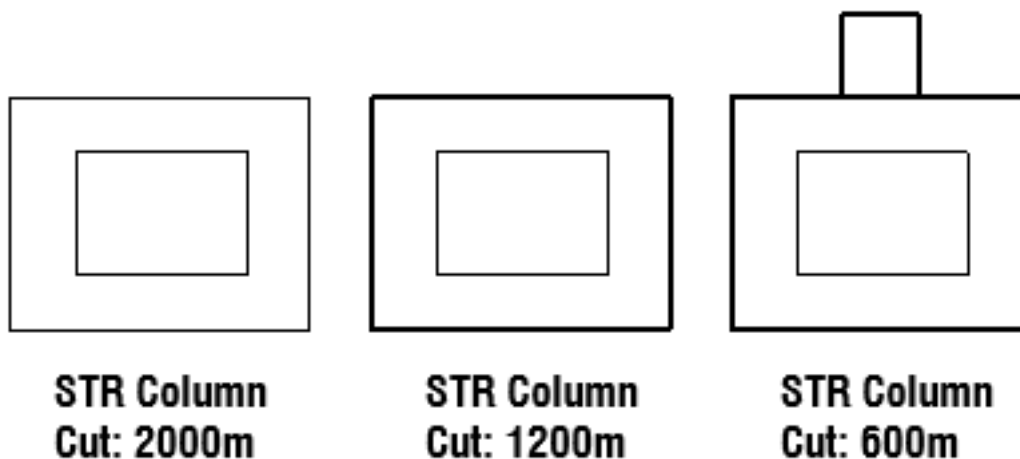
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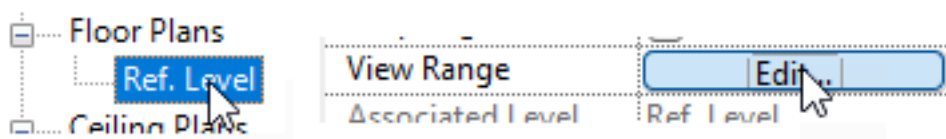
#6: ADJUST VIEW RANGE INSIDE THE REVIT FAMILY

Did you know the **cut plane** inside the plan view of Doors, Windows, Structural Columns, Casework and a couple of other categories has a huge impact on the visibility inside a project?

If any of the 3D geometry is cut, the **View Range** settings inside the family floor plan will be used. In the image below, these 3 families are identical, except they have different cut plane **inside** the families.



Let's modify the cut plane. Accessing the View Range of the family is a bit different from doing so inside a project. First, you have to **select** the floor plan in the project browser. Then, click on **Edit...** next to View Range.




Go to View Range *inside* the family

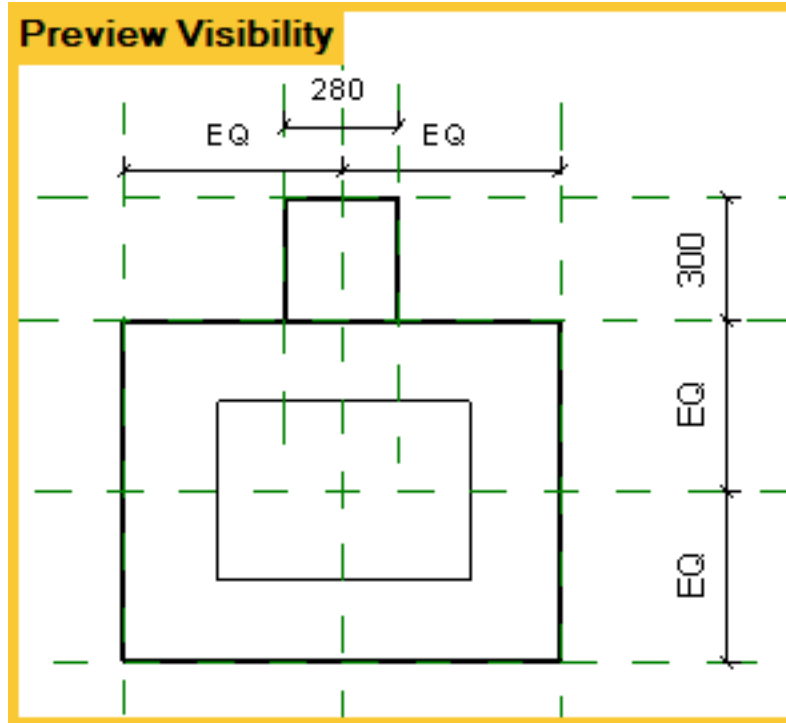
Adjust the **cut plane** of the view. For example, you could set it to ensure the appendix is cut, so at 600mm.



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In this case, we set at at 600mm, ensuring the appendix is cut. Use the  **Preview Visibility** tool to verify if you see everything you should. This is exactly what you will see when the family is cut in a view:



The cut plane of the plan view only has an impact on these specific family categories:

- Baluster
- Casework
- Doors
- Site
- Structural Columns
- Structural Framing
- Structural Foundation
- Windows



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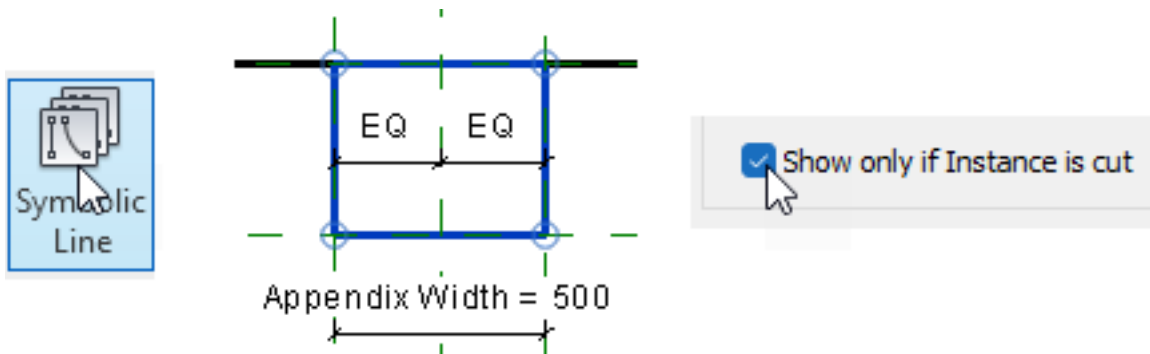
#7: DRAW SYMBOLIC LINES TO AVOID HAVING PLAYING WITH THE VIEW RANG

This whole workflow is a bit tedious isn't? Being forced to modify the view range inside the family... yuck.

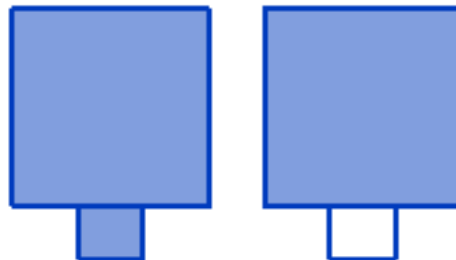
An alternative is to draw Symbolic Lines on top of the geometry.

This is for family categories that have the "Cut Visibility Option", so Windows, Doors, Structural Columns and a couple more.

Draw the symbolic lines on top of the geometry. In the Visibility Options, check the box that says "Show only if Instance is cut".



This way, these symbolic lines will display whenever the family is cut, regardless of the view range inside the family. You can spot a family using symbolic lines because the inside isn't filled with blue. You could also use a masking region.



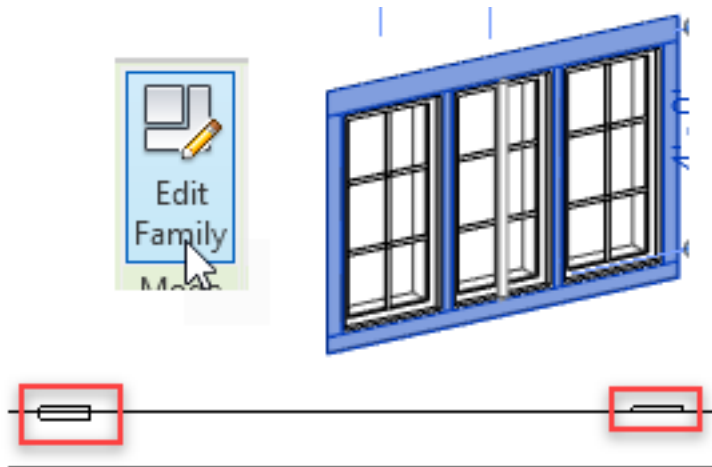


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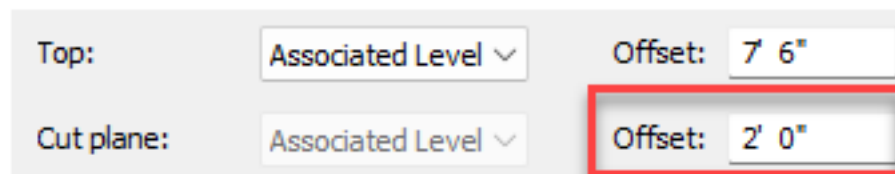
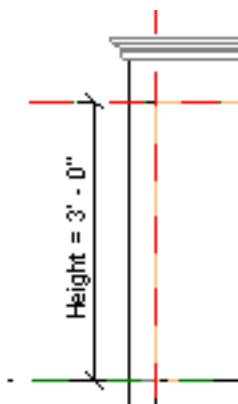
#8: ADJUST THE CUT PLANE OF THE NESTED FAMILIES

Do you have visibility issues with your nested families? It might be because of the cut plane inside of them. In this window family, the trim are in a nested family. As you can see, they are visible even if the window isn't cut. You might other weird visibility behavior.



Nested Trim visible when window not cut

The only way to solve this issue is to enter the nested family. It turns out that the cut plane inside the nested trim is too high and doesn't cut the trim. Adjust it to ensure it cuts the vertical trim. In this case, the cut plane is set to 2'-0".



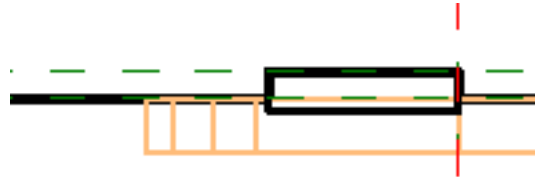
Adjust to below 3'-0"



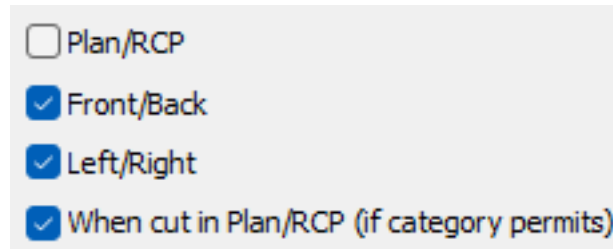
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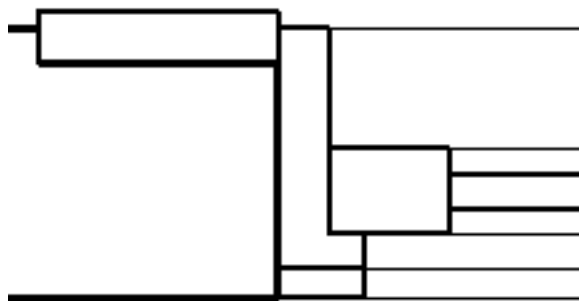
Remember, you need to select the plan view in the project browser to be able to modify the View Range. Inside the plan view, you should see the trim cut:



The visibility of the trim should be set this way:



Load the family back into the host family, then into the project. The visibility of the trim should behave properly. It is visible when the window is cut, and not visible when it isn't.



Window cut



Cut plane above window

Remember: the cut plane inside the families is only relevant for specific categories such as Windows, Doors, Casework and Structural Columns. It has no impact on other categories such as Generic Model.

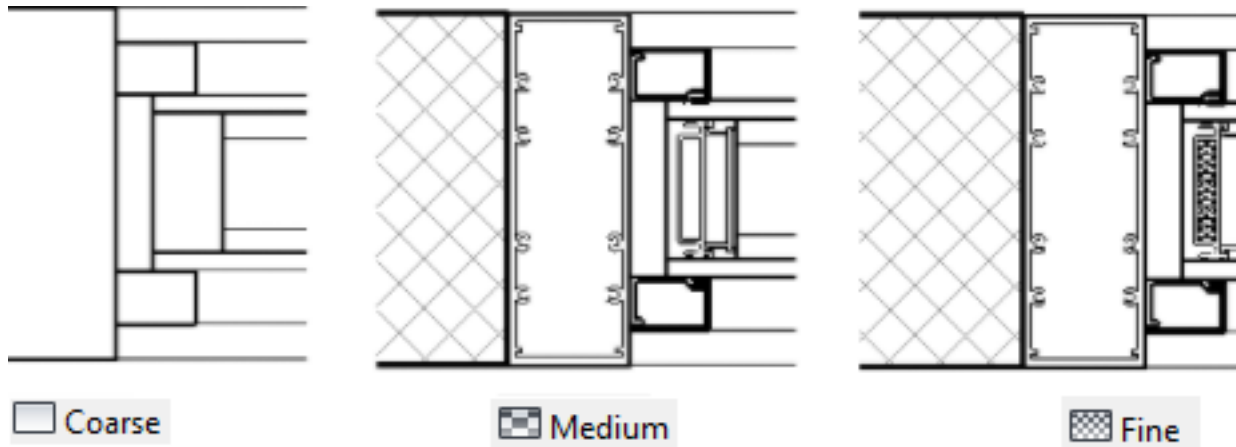


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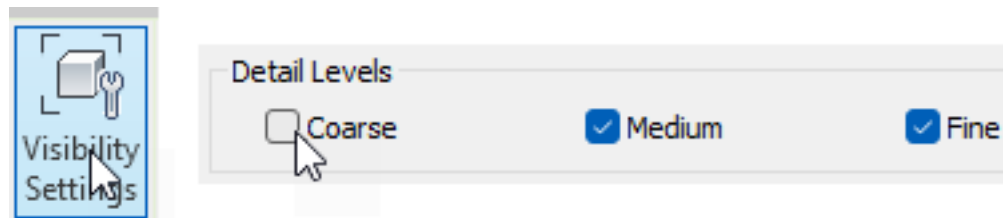
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#9: SET LEVEL OF DETAIL VISIBILITY

It is possible to set different level of detail to the geometry. In the example below, the detail items aren't visible at Coarse. With the Medium setting they appear and at Fine they get even more detailed.



With any element, regardless of 2D or 3D, you can pick the level of detail in which they will be visible. Select an element and click on **Visibility Settings**. Uncheck all the required boxes:





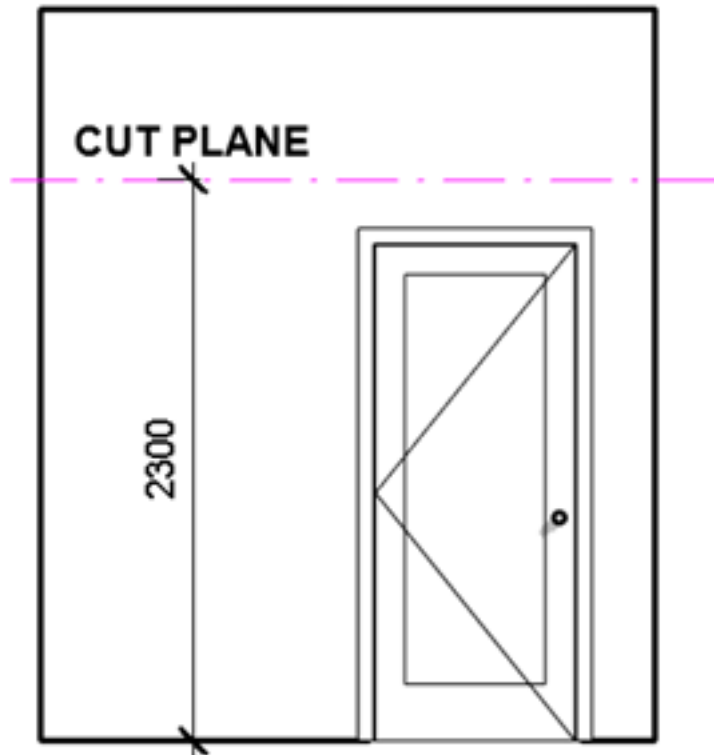
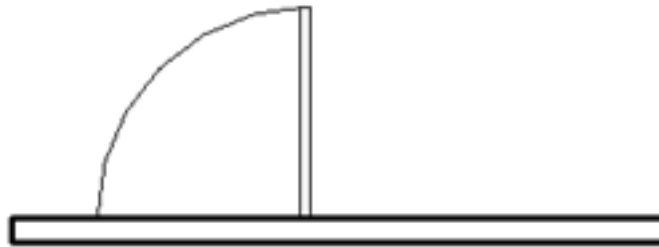
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#10: SOLVING THE DOOR SWING VISIBILITY PROBLEM

Doors have a symbolic plan swing element that is only visible in plan view. If you are using Revit's default door library, the door swing is a nested family. [Here is a tutorial](#) about this technique.

The problem with this strategy is that when the door is not cut, the swing still displays.

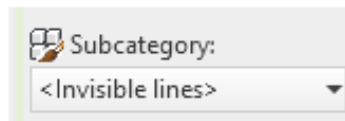
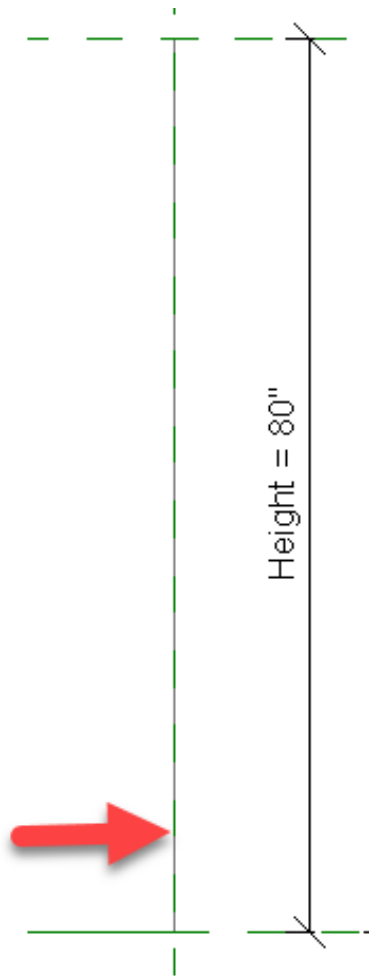




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The trick to solve this issue is to enter the nested plan swing family. At the moment, there is nothing to be cut inside this family. That's why you need to add an **invisible model line**. Match the height of this line to the door height. Model lines are considered as 3D elements. If the cut plane goes through it, Revit considers the family is cut.



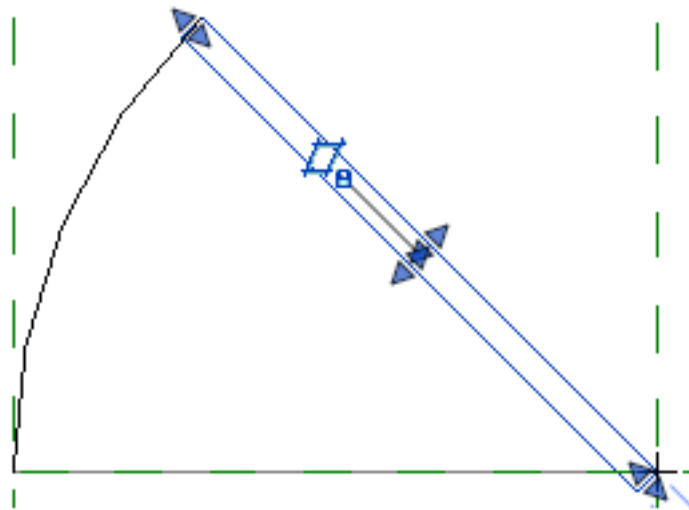
**DRAW VERTICAL
INVISIBLE MODEL LINE**



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Inside the nested plan swing, make sure that the 2D elements have this option enabled: "Show only if Instance is cut".



SELECT MASKING REGION



GO TO V/G OVERRIDES

Symbolic Element Visibility

Symbolic Elements are view direction specific: they show only in views parallel to their creation view.

Show only if Instance is cut

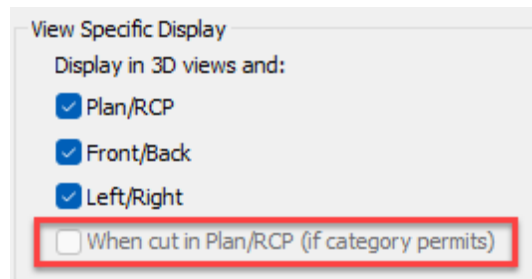
CHECK THIS OPTION



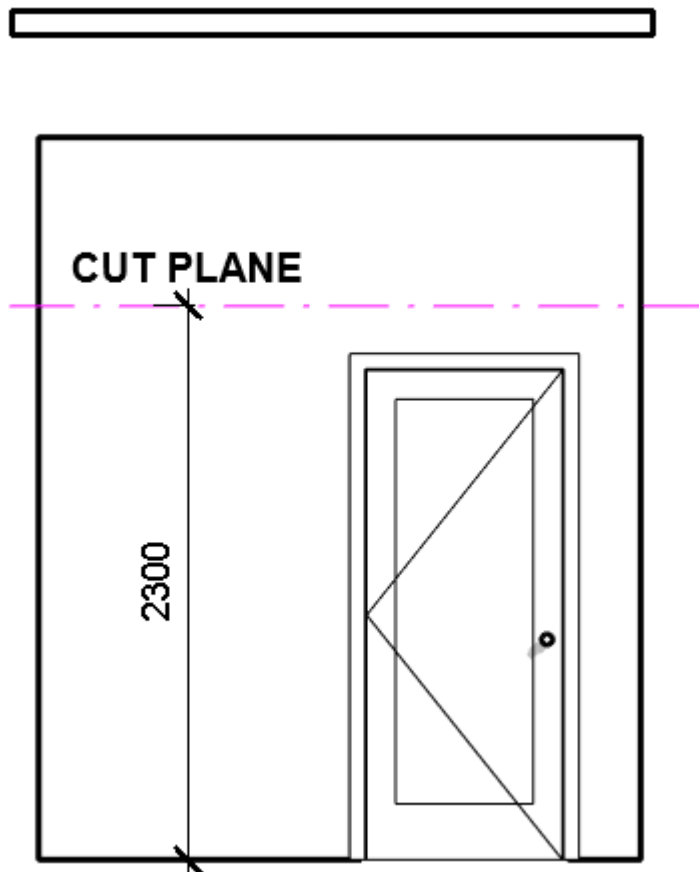
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Load the nested swing back to the main door family. You'll notice that you can modify the visibility option of the nested element, but you can't access the "When cut" option. That's because Revit will use the settings of the nested family itself.



Make sure to associate the height parameter from the nested family. Load the door family back into the project. As you can see, the swing doesn't display anymore if the door isn't cut!





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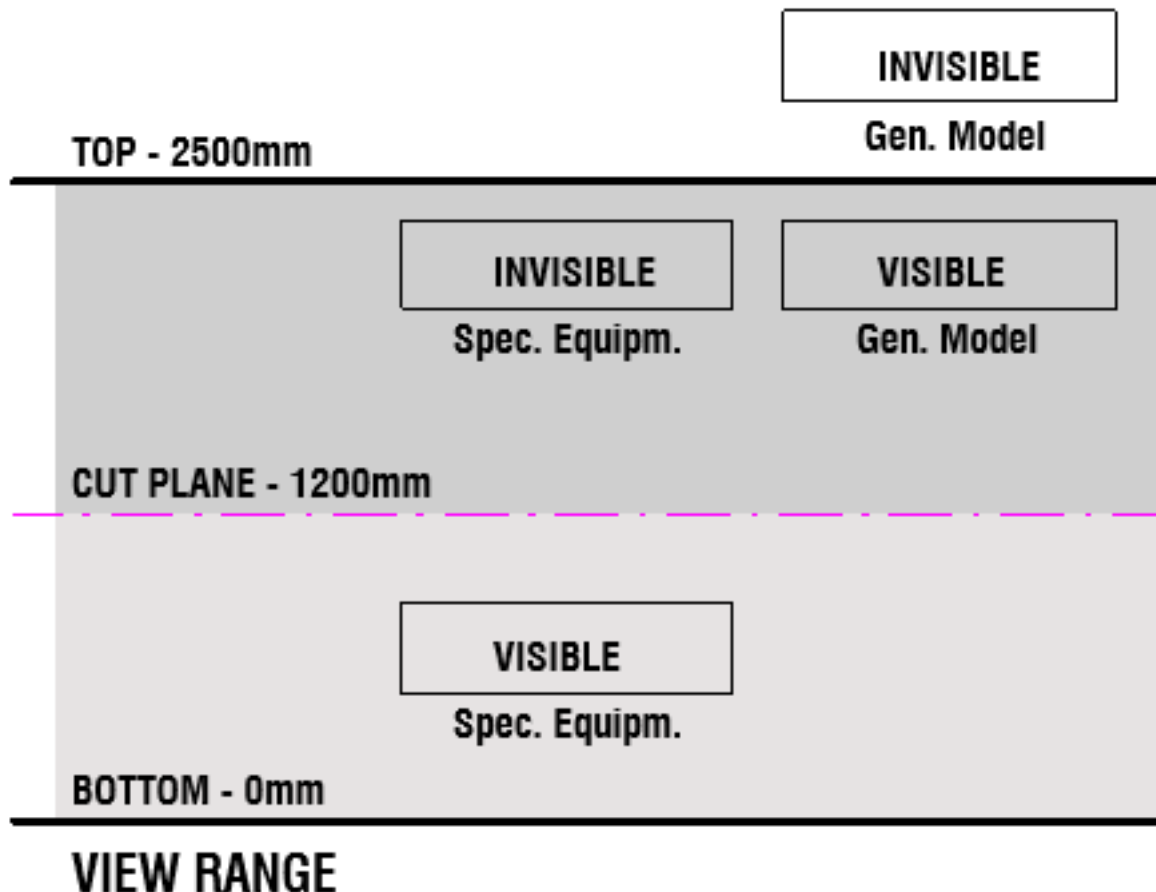
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#11: ONLY 3 FAMILY CATEGORIES ARE VISIBLE WHEN PLACED ABOVE THE CUT PLANE

By default, the family instances are only visible in a view if they are **below** the **cut plane**.

Only 3 categories are visible when located above the cut plane: **Windows**, **Casework** and **Generic Models**.

Family instances are always invisible if they are beyond the **top** plane. This view range elevation graphic might help you understand these concepts





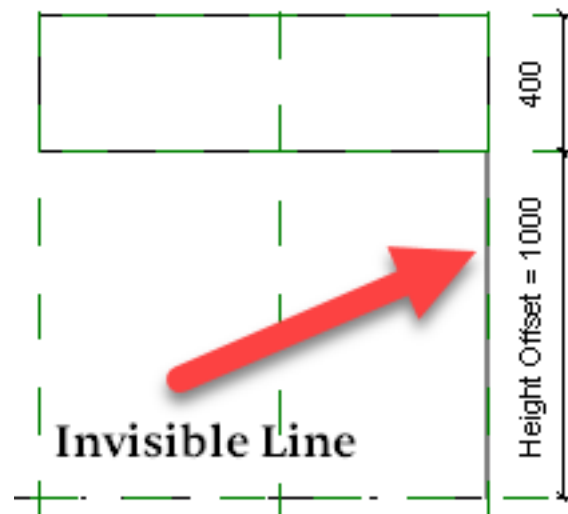
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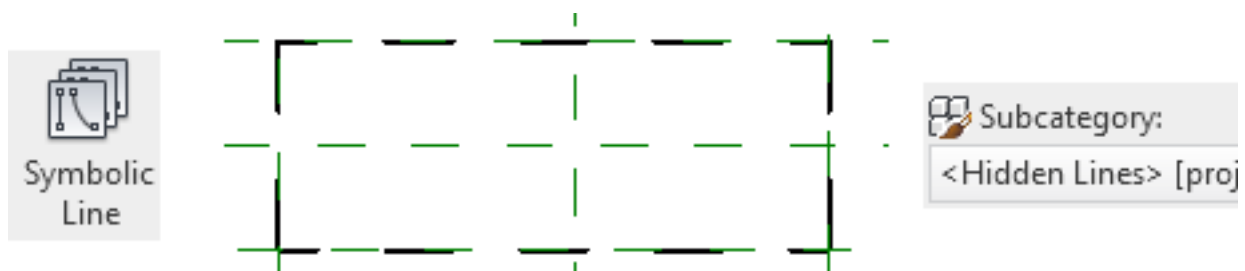
#12: PLACE AN INVISIBLE LINE TO DISPLAY A FAMILY ABOVE THE CUT PLANE

Only 3 categories are visible above the cut planes. What if you really want another category to be displayed? For example, a **Specialty Equipment**. Well, there is a workaround. Special thanks to Paul Aubin for this trick.

It is similar to tip #13: you have to create an invisible line. In this case, you'll have to model the "main" geometry higher and place the line between level 1 and the geometry. Here is an elevation view:



Some categories (Doors, Windows, etc) will be visible. For other categories, you need to draw 2D symbolic lines in the plan view. You can make them dashed.

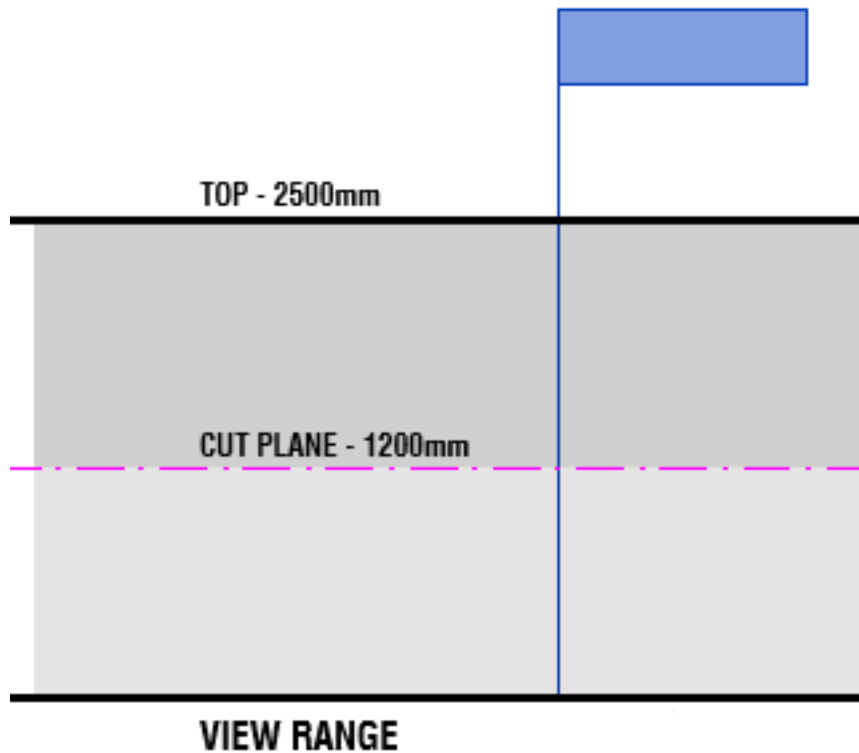




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Here is the new specialty equipment family in the project. You can see the preview of the invisible model line, even though it is invisible.



In plan view, you'll see the dash lines representing the family, as long as the invisible line goes through the cut plane.



Still... this is quite a workaround. You can simplify by using a Generic Model instead, if possible.



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THANKS FOR READING!

As always, send your thoughts to nick@revitpure.com. I read and answer all emails. Let me know what theme you want explored for the next edition.