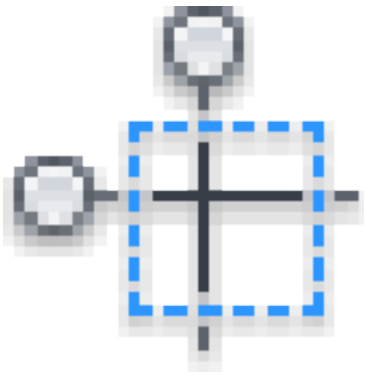
REVIT PURE PRESENTS

PAMPHLETS

ISSUE #10 / FALL 2018

SCOPE BOXES



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PAMPHLETS

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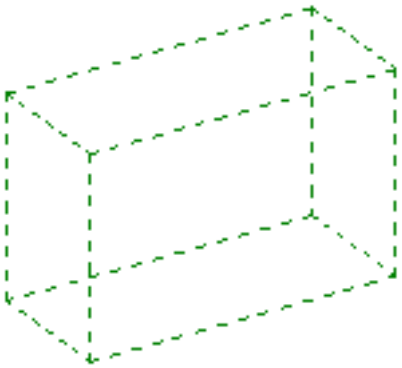
WHAT IS THIS “PAMPHLET” ?

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

WHY SCOPE BOXES?



For years, I didn’t like scope boxes. These dashed green boxes just looked silly and were kind of annoying. And in a sense, they are probably not necessary for most small projects.

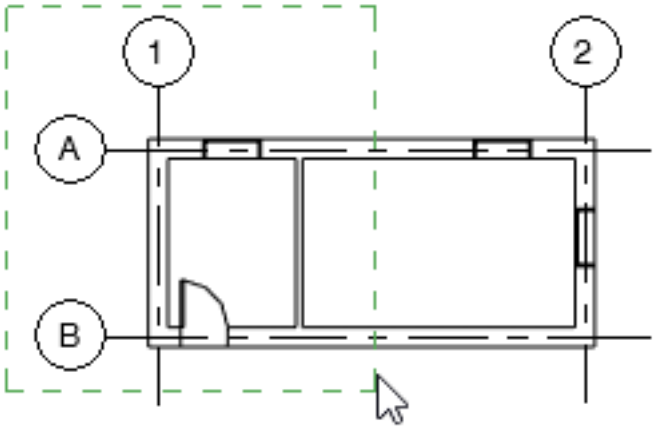
In the recent years, I’ve worked on several large projects with multiple wings. That’s when I started to truly grasp the power of scope boxes. When you have 50 views cropped to the exact same area, not using a scope box is an insane waste of time. With Revit 2019, scope boxes can now be used with 3D views, automatically creating a section box to match the extents.

If like me, you used to ignore scope boxes, it’s time to reconsider and start unleashing their power. This pamphlet is the right place to get started.

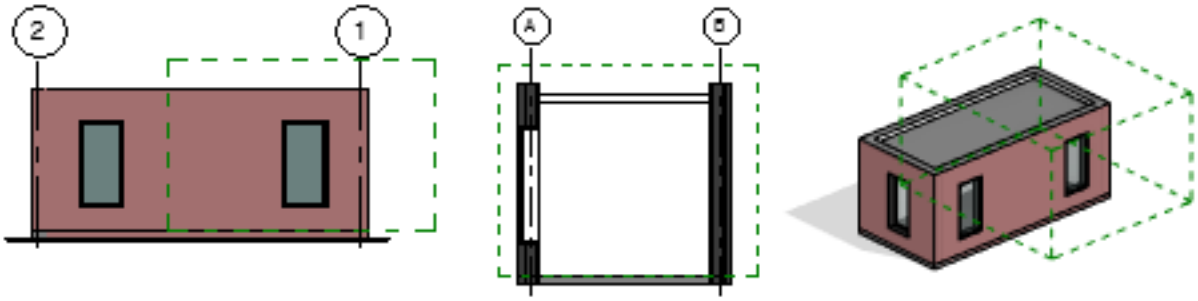
16 TIPS TO UNDERSTAND SCOPE BOXES

1- SCOPE BOXES ARE CREATED IN PLAN VIEWS BUT ARE VISIBLE IN OTHER VIEW CATEGORIES

To create a Scope Box, you have to be in either a **Plan View** or in a **Reflected Ceiling Plan**. However, once a scope box is created, it is going to be visible in the other view categories: sections, callouts, elevations and 3D views. In elevations and sections, the scope box is only going to be visible if it intersects the cut line. You can adjust the extents of the scope box in all view categories.

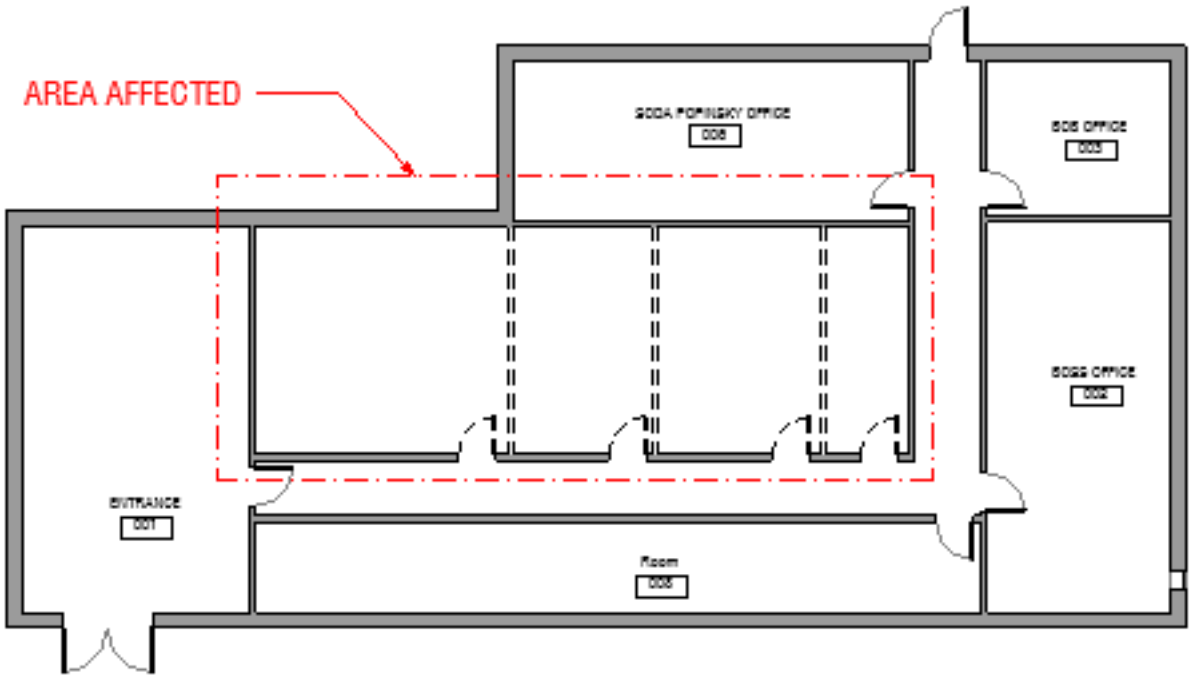


SCOPE BOX CREATED IN PLAN VIEW



SCOPE BOX VISIBLE IN ALL VIEWS

2- SCOPE BOXES ARE USED TO QUICKLY CROP VIEWS

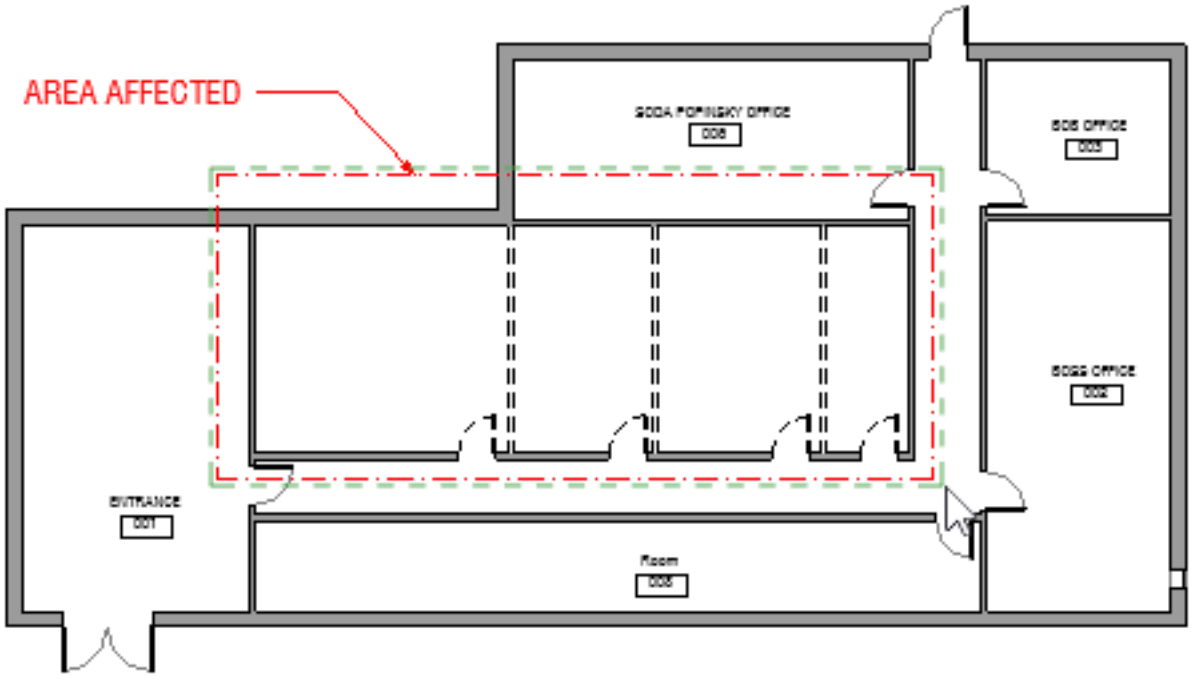


Consider this office building renovation project. The area affected is in the middle of the building. You want the views to be cropped to fit the red rectangle.

The thing is: you have a lot of views to create. Existing floor plan. Demolished floor plan. New floor plan. Ceilings. Finishes. Layout. All in all, you'll have about 10 views that need the exact same crop region.

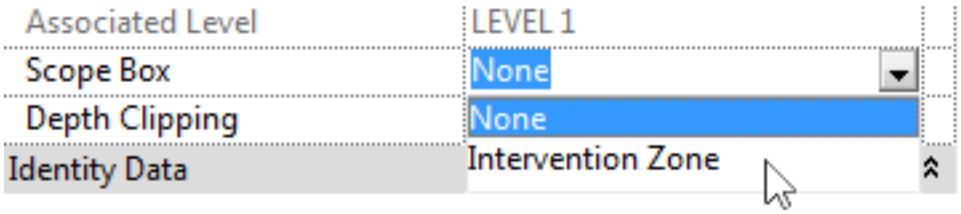
An archaic workflow would be to manually adjust the crop region of each view. That would probably work. But what if the project changes and the area affected gets bigger? You have to adjust all the crops again?

That's when the power of scope boxes come into play. Go to the View tab and create a **Scope Box**. Match it to your intervention area. Give it a name.

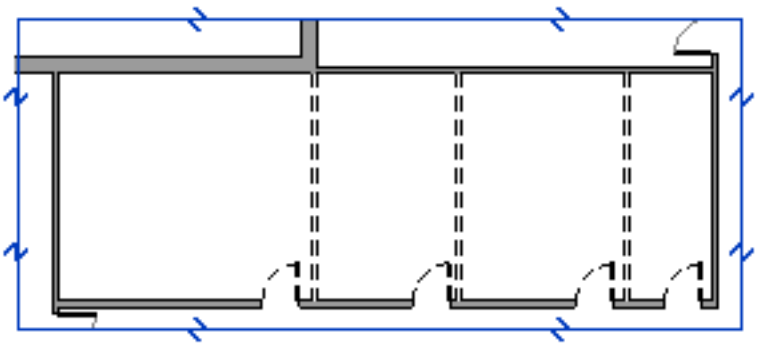


CREATE SCOPE BOX AROUND DESIRED CROP AREA

Have a look at the Instance Properties of your plan view. Under **Extents,** you will find the Scope Box parameter. Assign the scope box you've just created to the plan view.

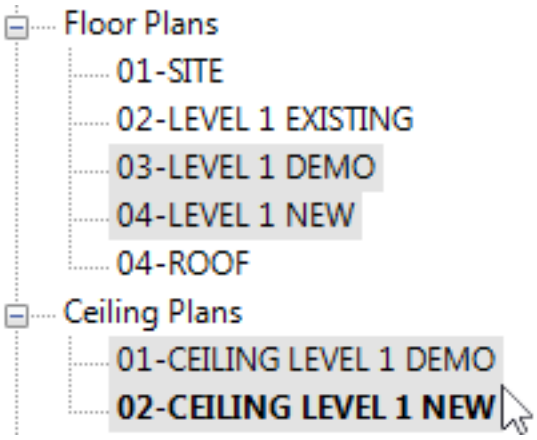


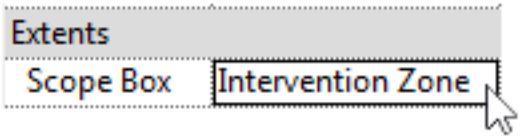
As you see, the Crop Region of the view now perfectly matches the scope box limits. The blue dots that can usually be used to modify the crop region are now invisible: that's because you can't modify it.



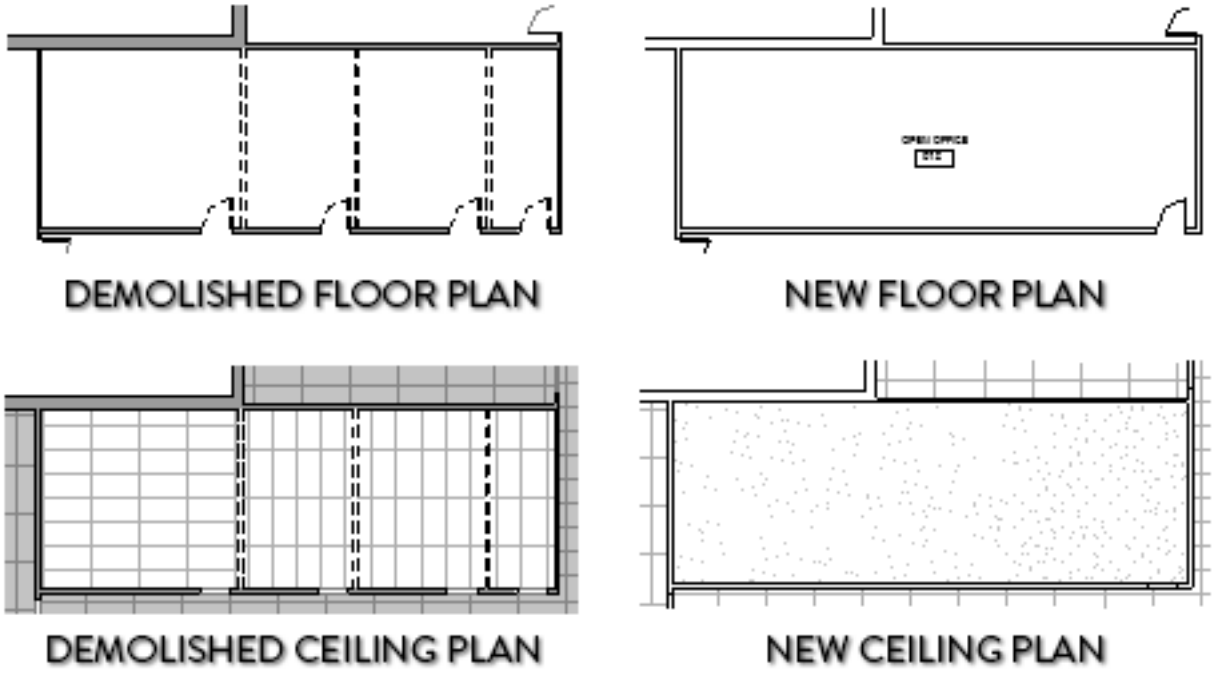
THE VIEW CROP MATCHES THE SCOPE BOX

Now, apply the scope box to all the views that will be using this crop. To save time, select all the views in the project browser by holding the CTRL key.





Look at all these views, sharing the exact same perfect crop. Isn't it beautiful? Adjusting the new **Scope Box** will affect all these views.

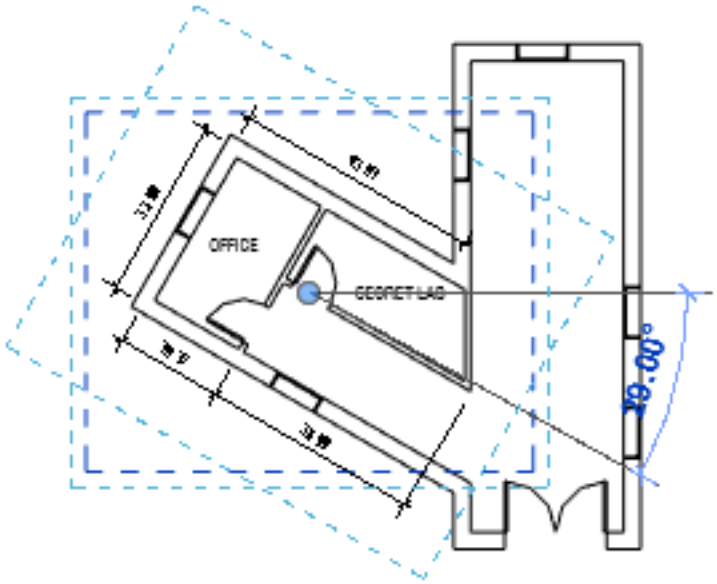


3- VIEWS WITH A SCOPE BOX CAN'T BE UNCROPPED

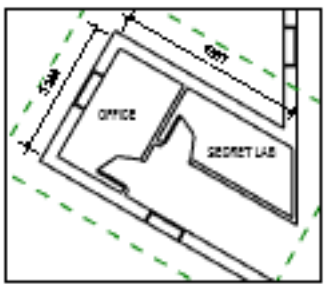
The moment a scope box is assigned to a view, the **Crop Region** is locked and can't be modified. Also, you can't use the **Do Not Crop View** tool. To see the whole project in a view, you'll have to create a different plan or remove the scope box temporarily.

4- ROTATING SCOPE BOX ALSO ROTATE CROP REGION

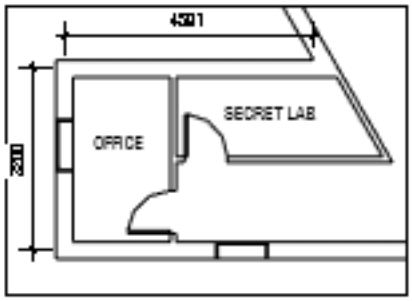
In addition to controlling the extents of a crop region, a scope box can also be used to control the angle of a view. In the project below, a scope box is created and rotated to fit the angled shape of the building. Then, the view is duplicated and the extents are assigned to the new scope box. The crop region is automatically adjusted to fit the angle. Removing the scope box from a view will revert the crop angle back to default.



ROTATE SCOPE BOX TO FIT BUILDING SHAPE



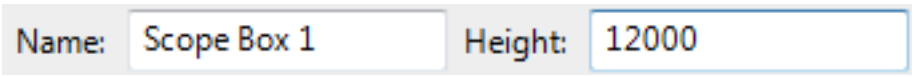
Scope Box	None



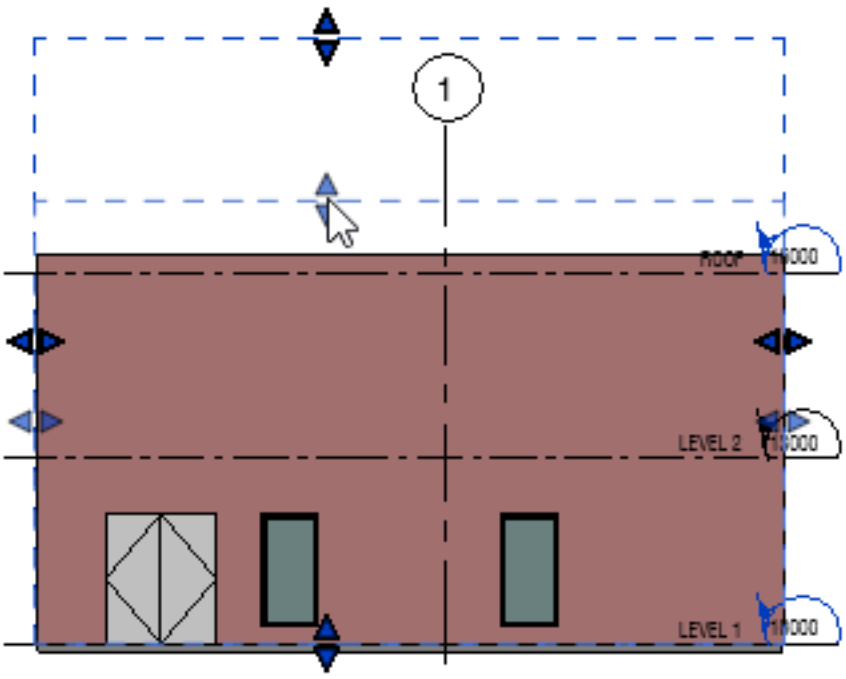
Scope Box	Angled Wing

5- ADJUST SCOPE BOX HEIGHT IN THE OPTIONS BAR

Have a look at the option bar when creating a scope box: you can give a specific name and enter a height value. This is your only chance to give a specific value number to the height.



Scope boxes can only be created in plan views, but they can be adjusted in elevation, sections and 3D views. If you didn't set the correct height value when initially created, drag the blue arrows to adjust.



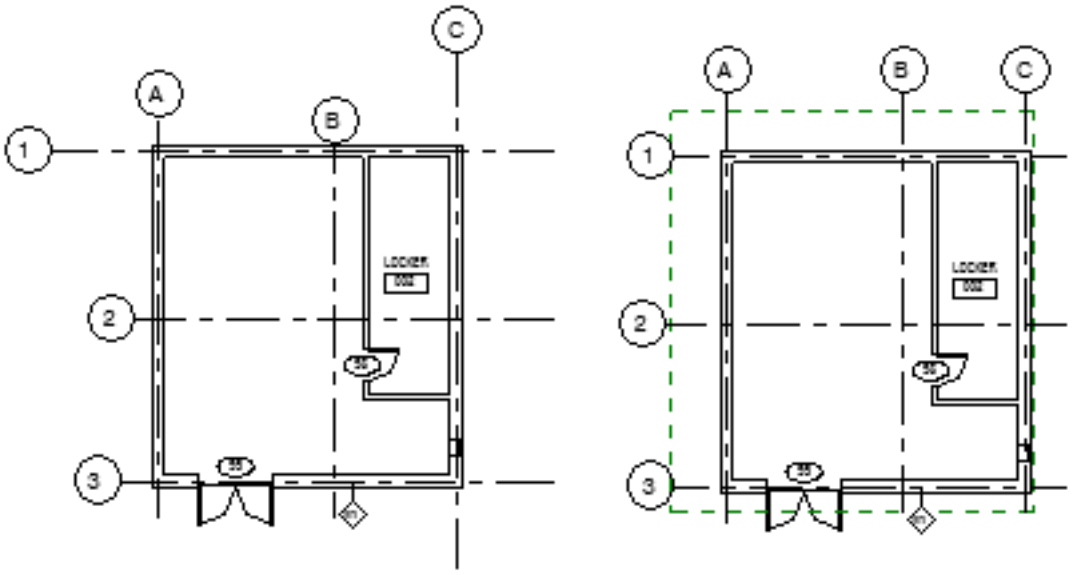
DRAG BLUE ARROWS TO ADJUST SCOPE BOX HEIGHT

6- SCOPE BOXES ARE USED TO AVOID A MESS WITH LEVELS AND GRIDS

Managing the visibility and extends of levels and grids can be a nightmare. On projects with many levels, getting the grids to share the same extends is complicated.

That's where scope boxes come into play. Scope boxes are used to control the extents of elements like grids, levels and reference planes. Each of these elements can be assigned to a specific scope box, limiting the 3D extents to the dashed green line limit.

In the example below we assign all the grids to a scope box. The 3D extents of all grids are now the exact same. That also includes the bottom and top elevation value of the grid.

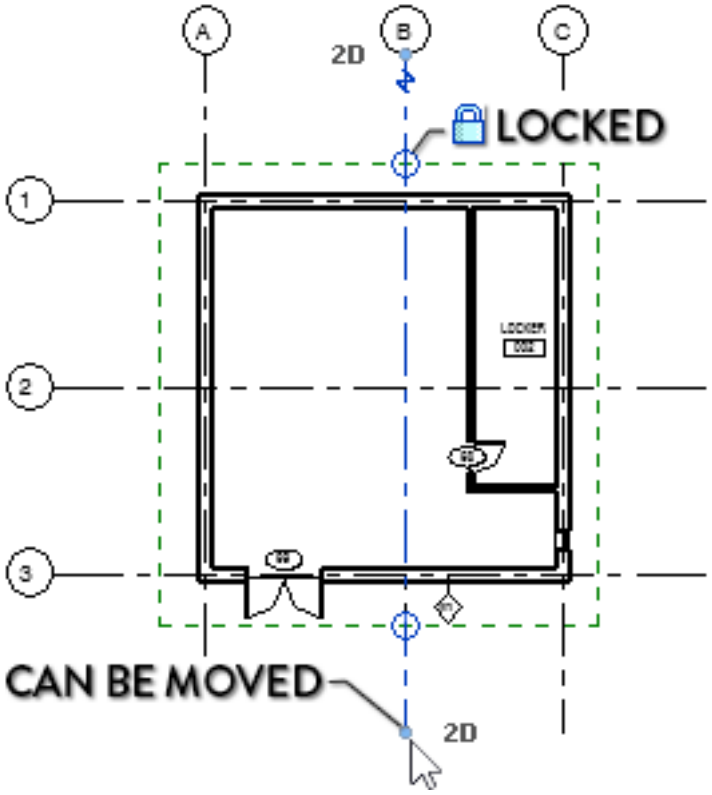


7- SCOPE BOXES AFFECT 3D EXTENTS BUT NOT 2D

3D extents affect all views in the model and are represented by an open blue circle.

2D extents affect a single view and are represented by a blue dot.

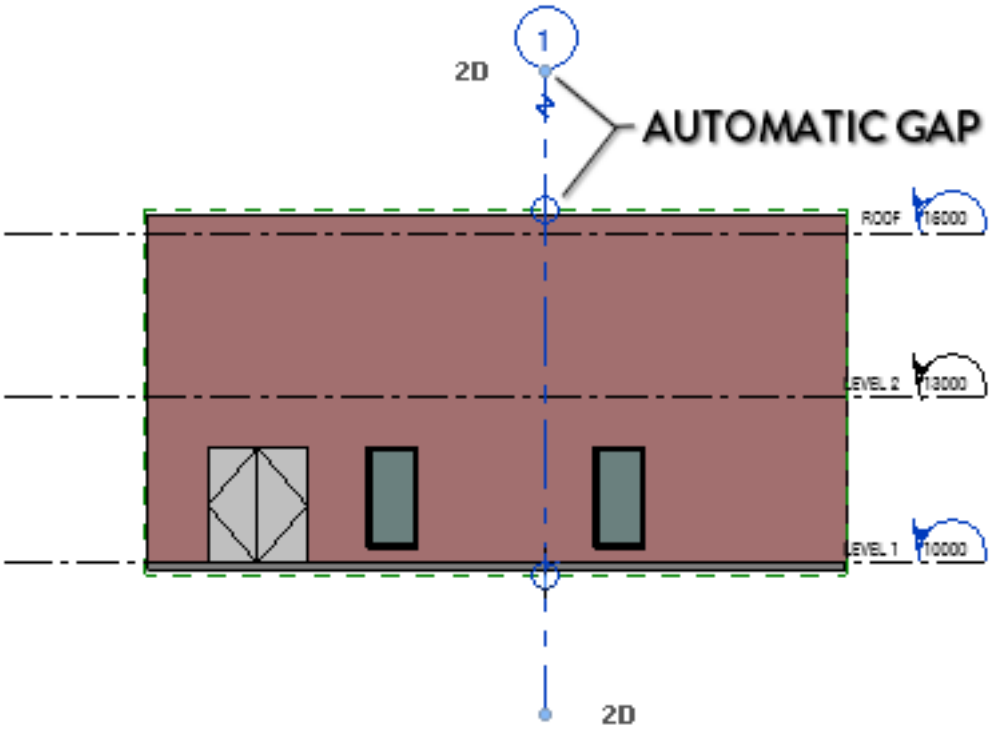
When you assign a scope box to datum elements, the 3D extents will become locked to the limits of the scope box. Dragging the ○ open blue circle won't work. However, you can adjust the • blue dots to modify the 2D extents of the grid.



8- AN AUTOMATIC GAP BETWEEN 2D AND 3D EXTENTS IS CREATED AFTER SECTION BOX IS ASSIGNED

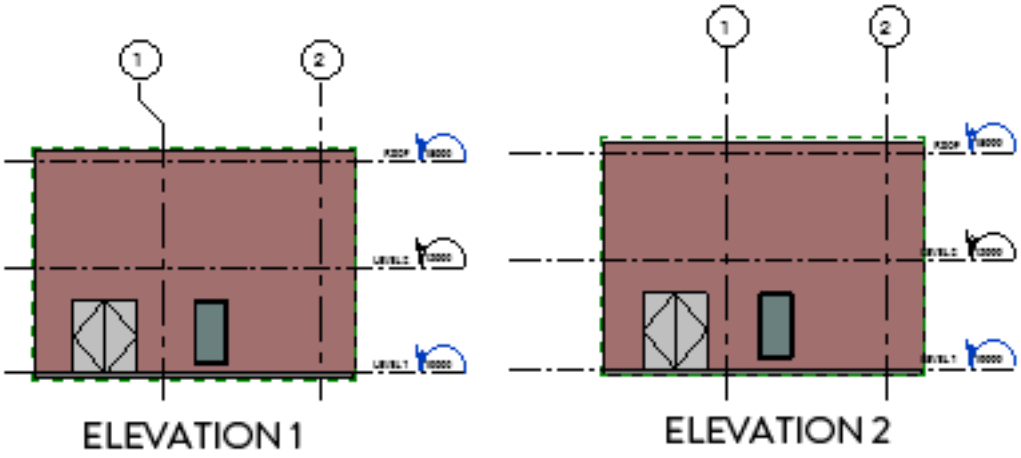
You learned that 2D extents are not affected by scope boxes. However, when you assign a scope box to datum elements, Revit will automatically create a small gap between the 2D and 3D extents. This is to provide better default visibility to the levels and grids values.

In the example below, the grid default 2D extension seems overextended. At the same time, the levels are too close to the building for proper clarity. Drag the blue dots to resolve the issue.

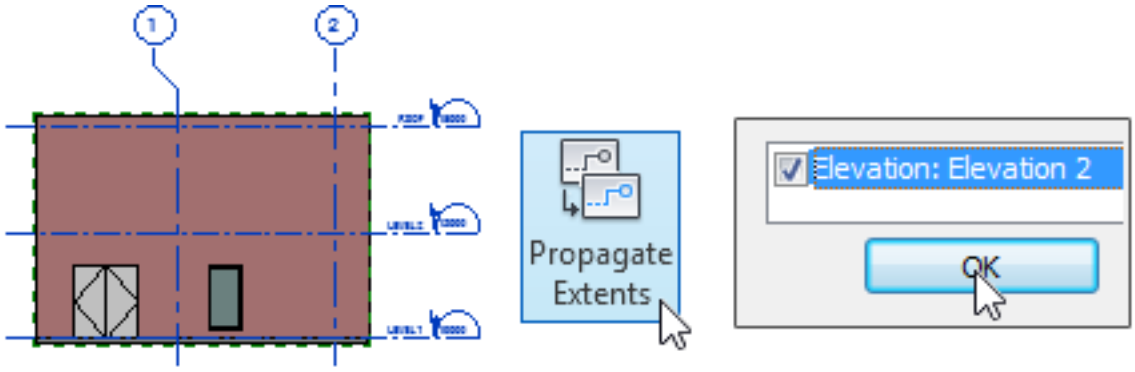


9- USE "PROPAGATE EXTENTS" TO SHARE 2D EXTENTS

Using Scope Boxes resolves the issue of inconsistent 3D extents among multiple levels and grids. However, it doesn't solve the issue of 2D extents disparity among multiple views. In the example below, the datum elements are adjusted in Elevation 1 but remain problematic in Elevation 2.

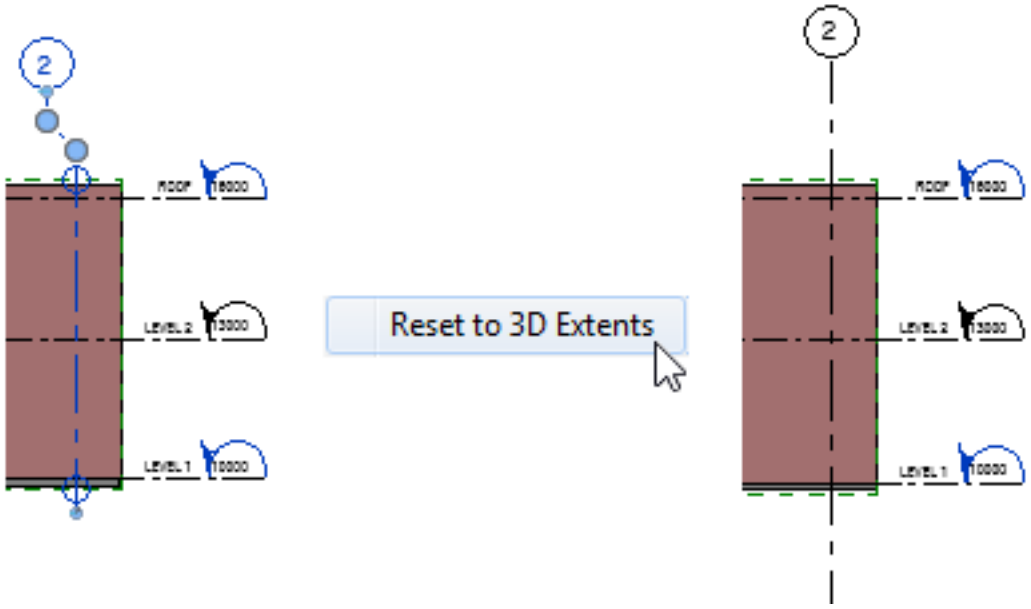


To solve the issue, select all datum elements in Elevation 1 and click on **Propagate Extents**. Check Elevation 2 in the list. The 2D extents will become identical among both views.

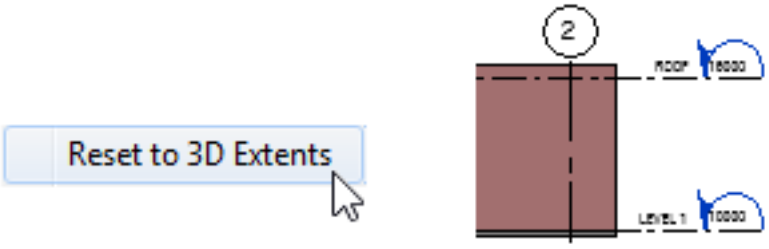


10- RESET 2D EXTENTS TO GO BACK TO DEFAULT

Maybe you messed up the 2D extents and you want to go back to default. Select the Datum element and use the right-click menu. Click on **Reset to 3D Extents**. The grid 2D extents will go back to the initial position after you first assigned the Scope Box. That means you will revert to the **automatic gap** that was described in tip #8.



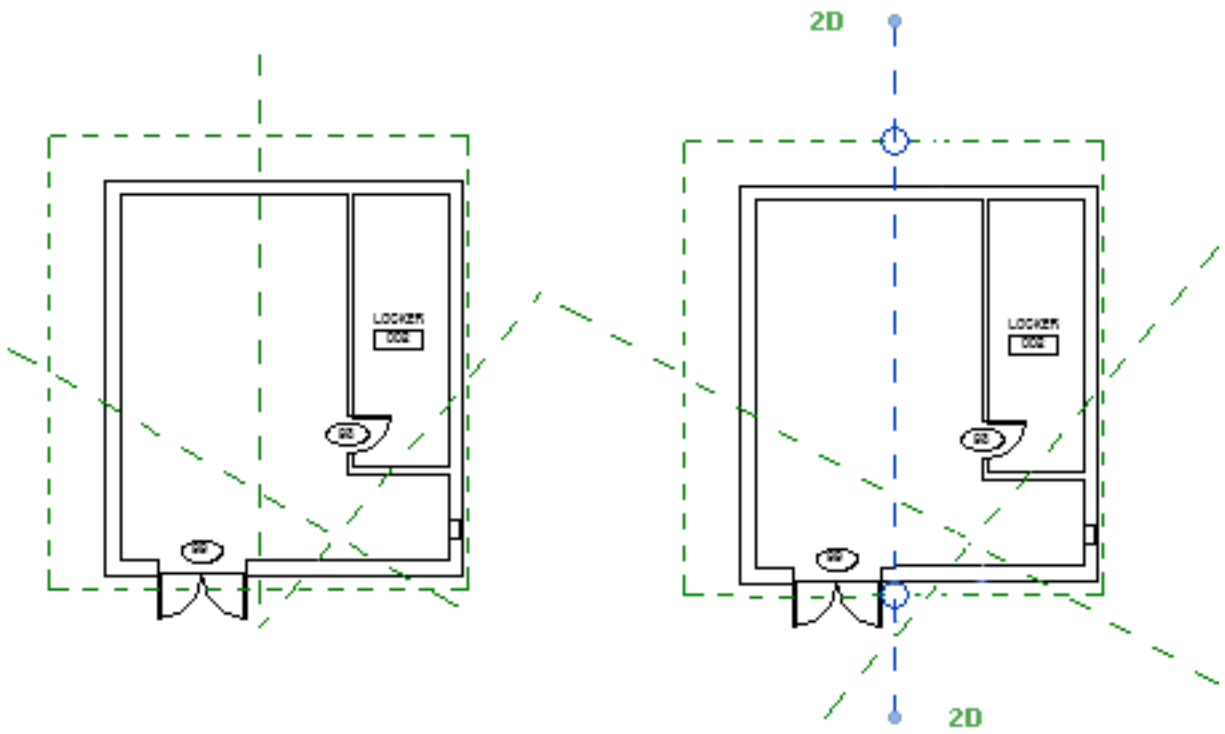
This behavior is specific to scope boxes: if you use the **Reset to 3D Extents** tool to an element without a Scope Box, the 2D extents will perfectly match the 3D extents.



GRID WITHOUT SCOPE BOX: 2D EXTENTS = 3D EXTENTS

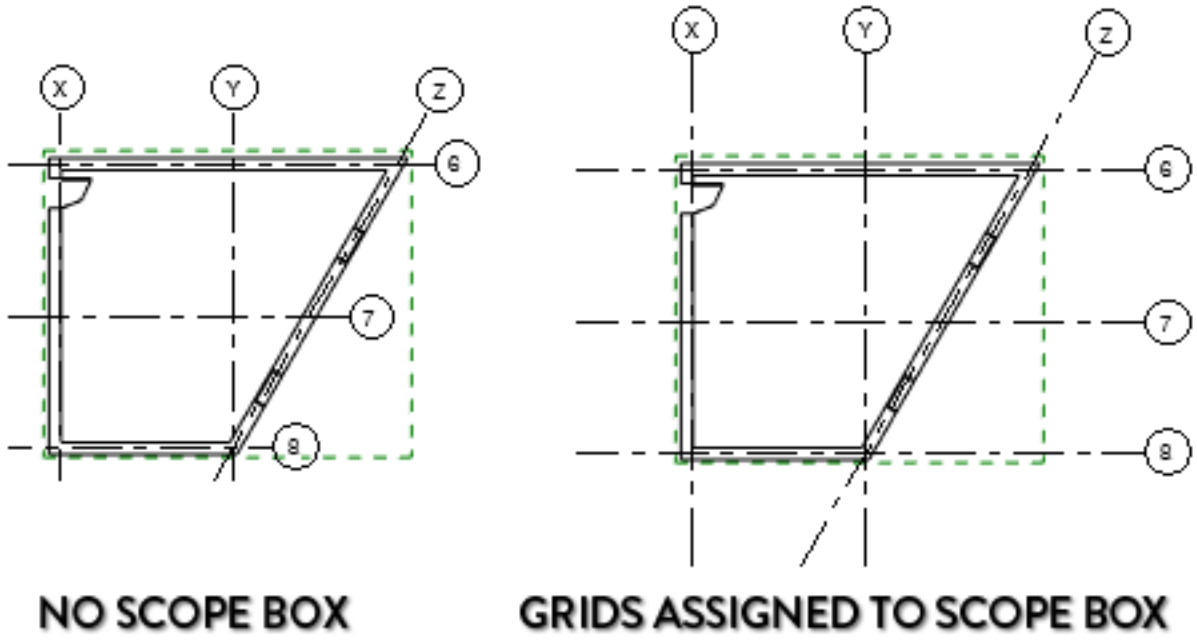
11- ASSIGN SCOPE BOX TO REFERENCE PLANES

The most common use of a scope box is with Levels and Grids, but Reference Planes can also be assigned to a scope box. Similar to levels and grids, reference planes can have both 2D and 3D extents. When first assigned to a scope box, an automatic gap will be created between the two extents values. The **Propagate Extents** tool can be used with Reference Planes if required. Reference planes are usually not printed so the visibility concerns are not as important.



12- SCOPE BOXES ARE ALWAYS SQUARE

Here is the annoying part about scope boxes: you can't have angles. That means that when working with a slanted wall, placing a scope box will be awkward. The purpose of a scope box is usually to match the exterior walls. That becomes a complicated task when the building has a lot of angles.



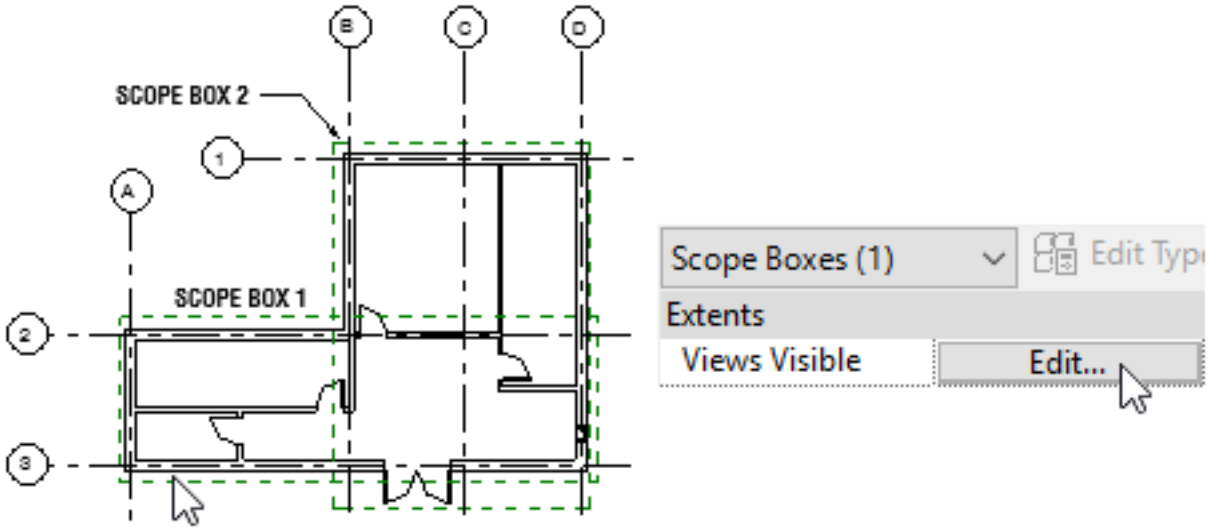
NO SCOPE BOX GRIDS ASSIGNED TO SCOPE BOX

A Datum element can only have a single Scope Box assigned. In a case like above, you'll have to select which wall the scope box will be parallel to. Some of the grids 3D extents will go way beyond the scope box.

Despite this serious and annoying limitation, the use of scope boxes in a angled building remains worth it.

13- ELEMENTS ASSIGNED TO A SCOPE BOX CAN BE MADE INVISIBLE IN A VIEW

The elements contained in a scope box can be turned invisible in a specific view. In the example below, you want to turn off Scope Box 1 and all the associated grids in the main floor plan view. Select Scope Box 1 and click on “Views Visible”.

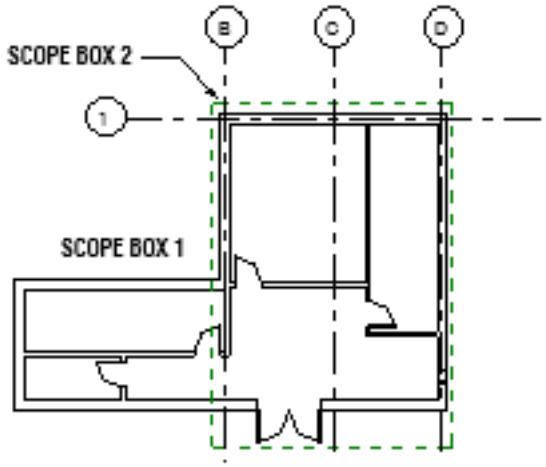


SELECT SCOPE BOX 1, CLICK ON VIEWS VISIBLE

View Type	View Name	Automatic visibility	Override
Floor Plan	PLAN WING 1	Visible	None
Floor Plan	PLAN WING 2	Visible	None
Floor Plan	PLAN OVERALL	Visible	Invisible

SET INVISIBLE OVERRIDE TO A SPECIFIC PLAN VIEW

As you can see in the image below, not only the scope box becomes invisible, but also grids A, 2 and 3.



SCOPE BOX 1 AND ASSOCIATED GRIDS BECOME INVISIBLE

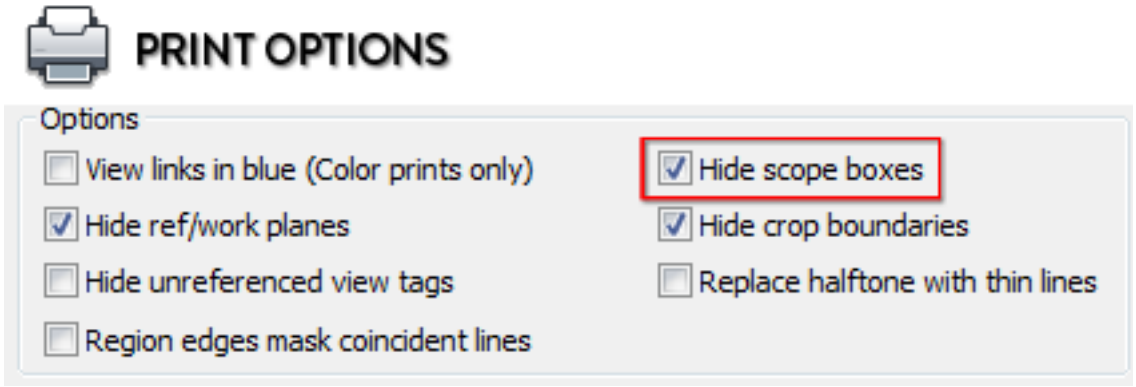
This feature is mostly helpful on large project with multiple wings, where views might slightly overlap with grids from neighboring areas. This feature allows you to use a systematic approach to hiding datum elements instead of individually using the **Hide Element** tool.

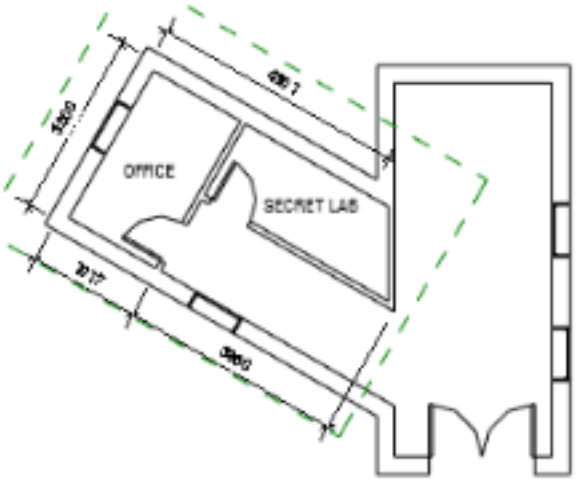
In a view where the scope box is already not visible, the Views Visible menu will display **Invisible** in the **Automatic Visibility** column.

View Type	View Name	Automatic visibility
Floor Plan	PLAN WING 1	Visible
Floor Plan	PLAN WING 2	Invisible
Floor Plan	PLAN OVERALL	Visible

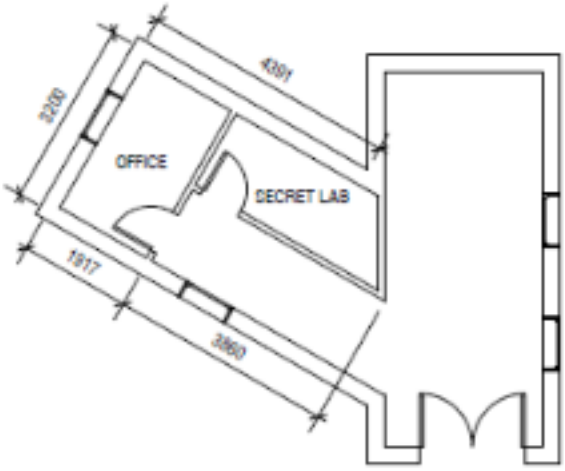
14- BY DEFAULT, SCOPE BOXES WON'T PRINT

There is almost no reason why you would want to see scope boxes once you print to PDF or to paper. In the Print settings, the option **Hide scope boxes** is activated by default.





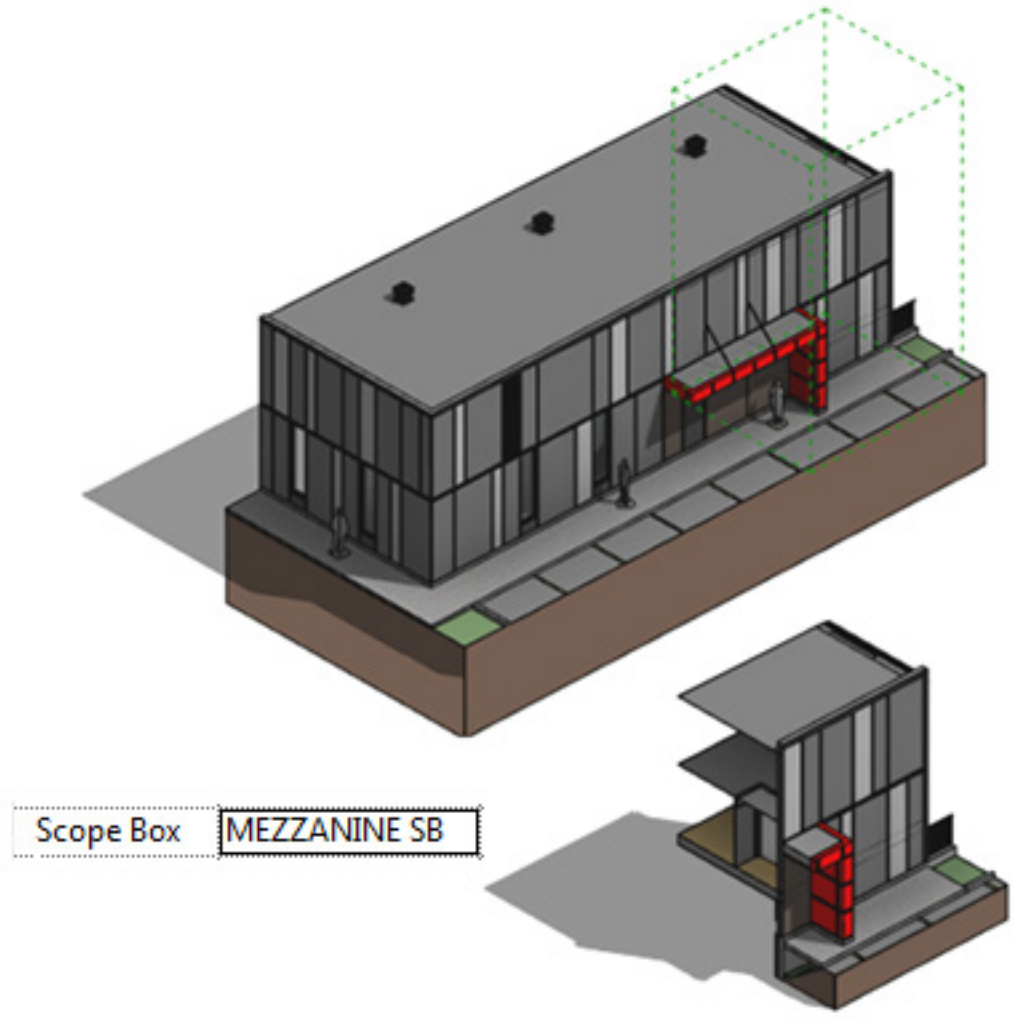
VIEW INSIDE REVIT



VIEW PRINTED TO PDF

15- IN REVIT 2019, ASSIGN A SCOPE BOX TO A 3D VIEW

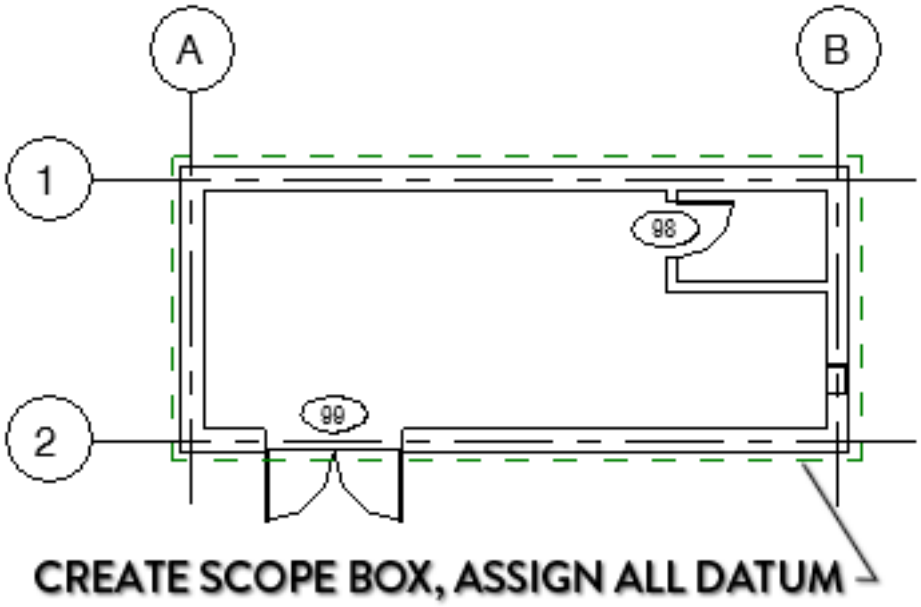
In Revit 2019, it is now possible to assign a Scope Box to a 3D view. This will perfectly match a Section Box to the scope box. This tool can be used to quickly create 3D view of multiple areas in a project.



ASSIGN SCOPE BOX TO 3D VIEW

16- INCLUDE A SCOPE BOX IN YOUR REVIT TEMPLATE

When creating a new project, you will have to move the default levels and grids. To avoid the pain of dealing with each datum element separately, include a scope box in your template and assign all levels and grids to it. The will make the process of creating a new project faster and less confusing. Just make sure everyone using the template understand how to use scope boxes.



THANKS FOR READING !

Thank you very much for reading and supporting the PAMPHLETS project. I hope you learned a lot.

DESIGN PACKAGE

The development of the DESIGN package took longer than expected, but it is still going forward. The eBook PDF is almost complete. The videos and bonus content production has been started. This new package is going to absolutely blow your mind and make your Revit drawings more beautiful.

Stay tuned.

As always, send your thoughts at nick@revitpure.com. I read and answer all emails. Let me know if you loved or hated this pamphlet.