

Working with a Revit file in AutoCAD/Cap

The process of pulling information from Revit to use in AutoCAD/Cap, sending the information back to Revit, and subsequent revisions



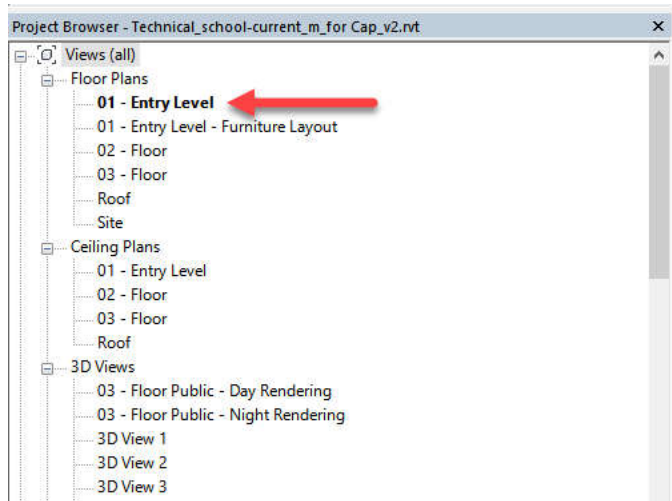
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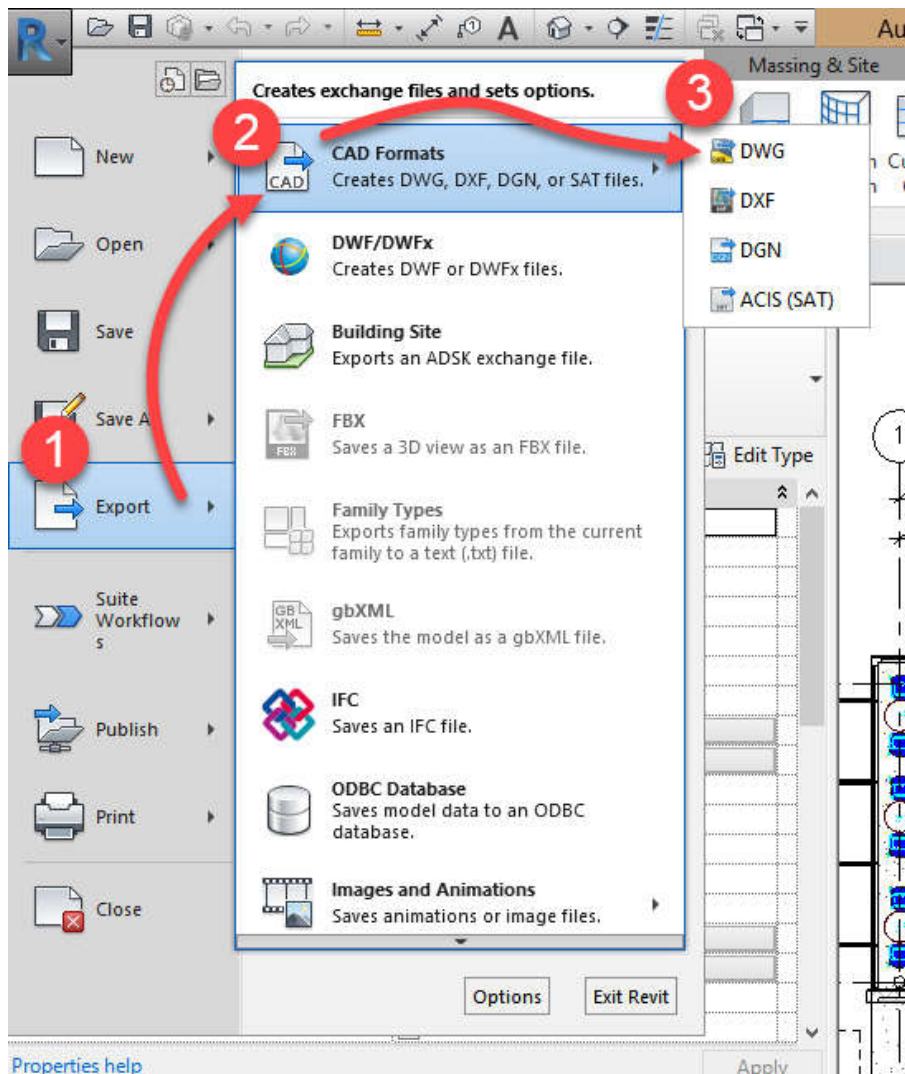
Getting drawing data out of Revit and into AutoCAD/Cap

1.1 Export out of Revit

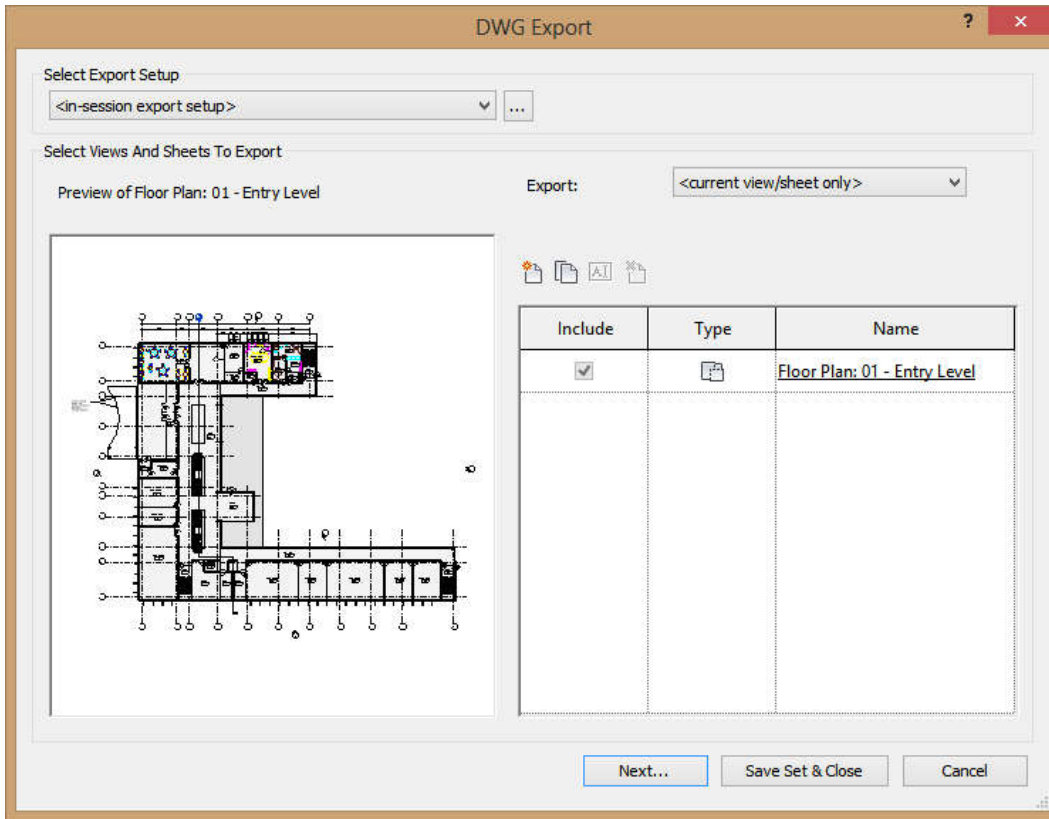
- 1) Open the Revit drawing
- 2) Navigate to the view that includes the floorplan that you wish to bring into AutoCAD/Cap



- 3) Go to the main application menu (the Revit "R" in the upper left corner), and select "Export"
 - a) In the "Export" menu, choose "CAD Formats", then "DWG"

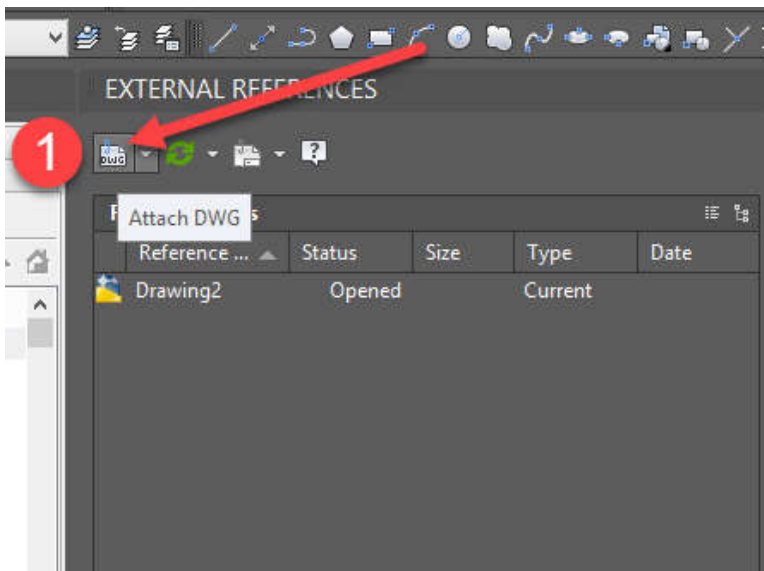


b) Leave all the settings in the Export dialog as-is

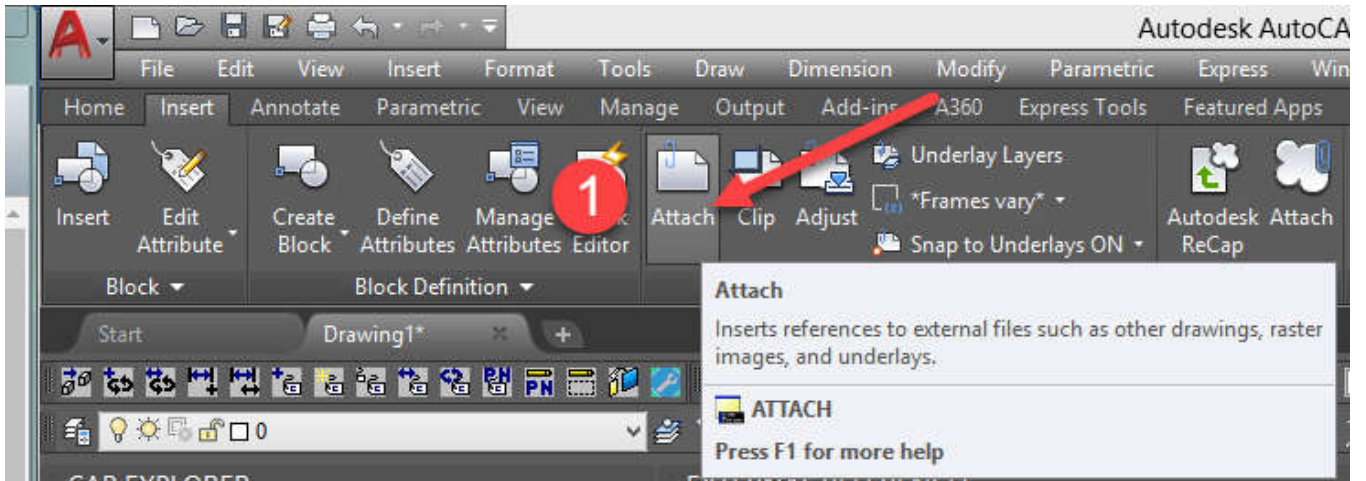


1.2 Import into AutoCAD

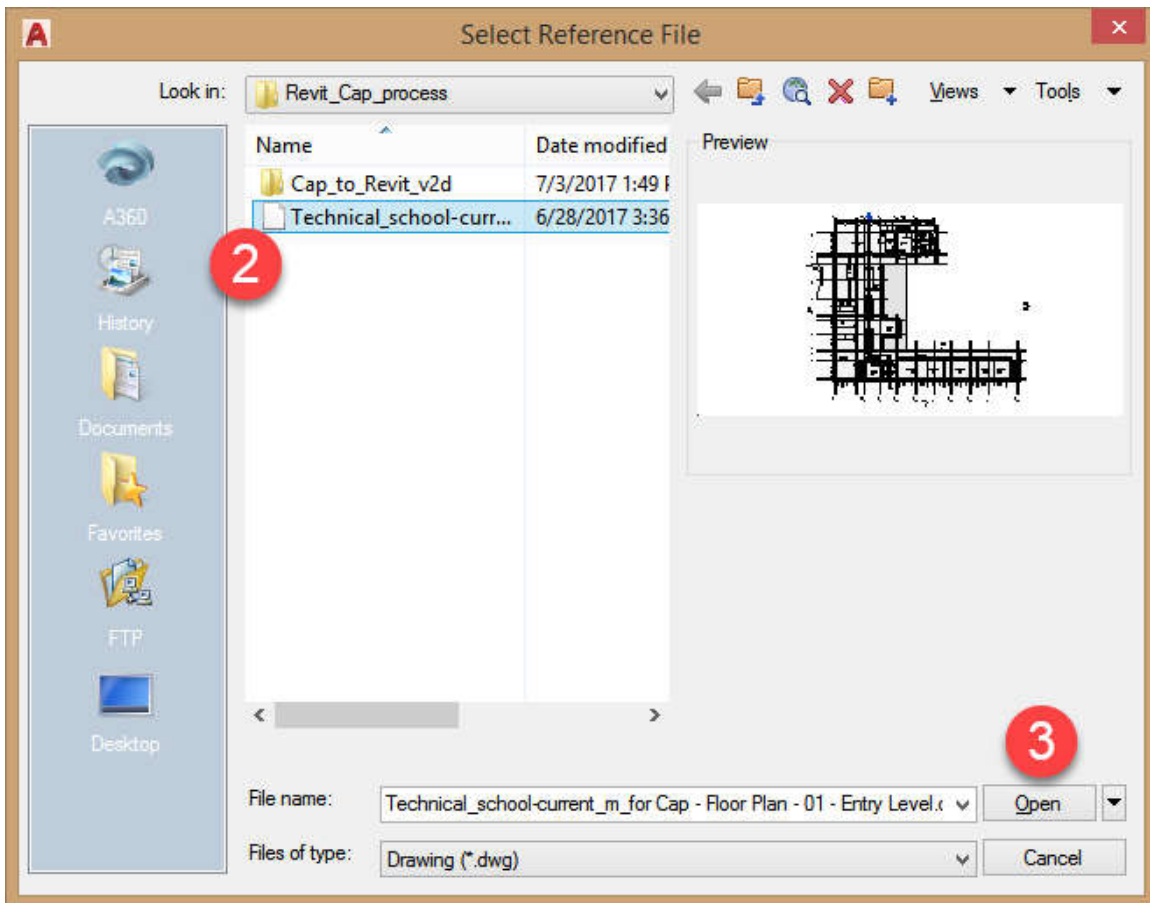
- 1) Start a new, empty drawing in AutoCAD
- 2) Load Cap
- 3) Attach the DWG created out of Revit as an external reference within AutoCAD
 - a) Typing “XREF” at the AutoCAD command line and using the “External Reference” palette is the most common method, but it also possible via the “Insert” ribbon, in the “Reference” section.
 1. “XREF” method:



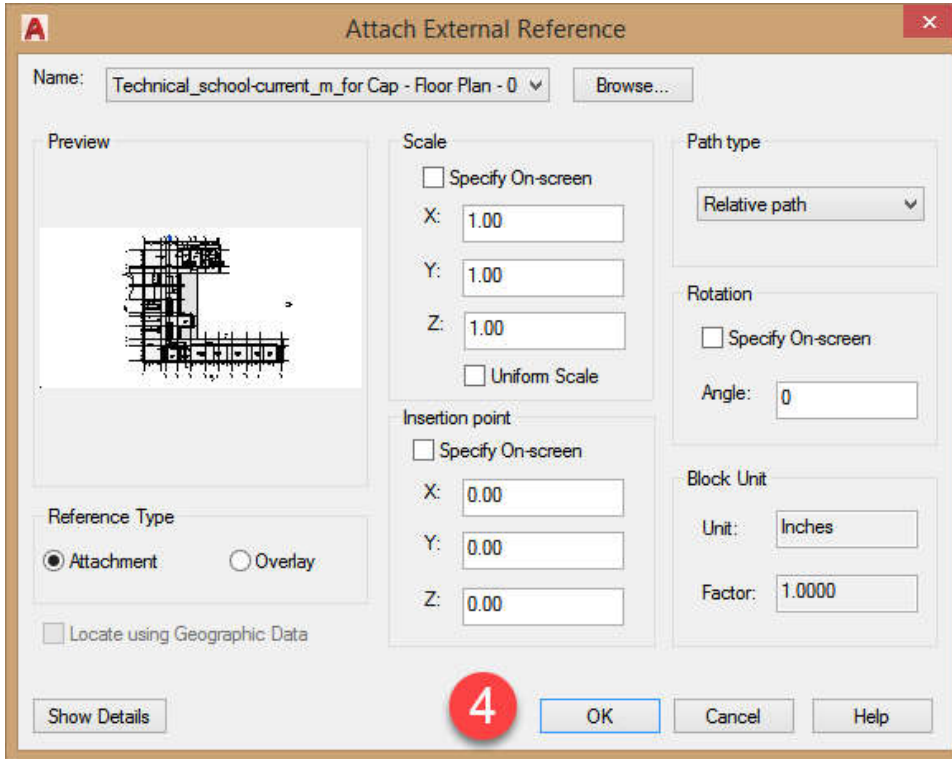
1) "Insert" ribbon method:



2) Choose the file to attach and click "Open":

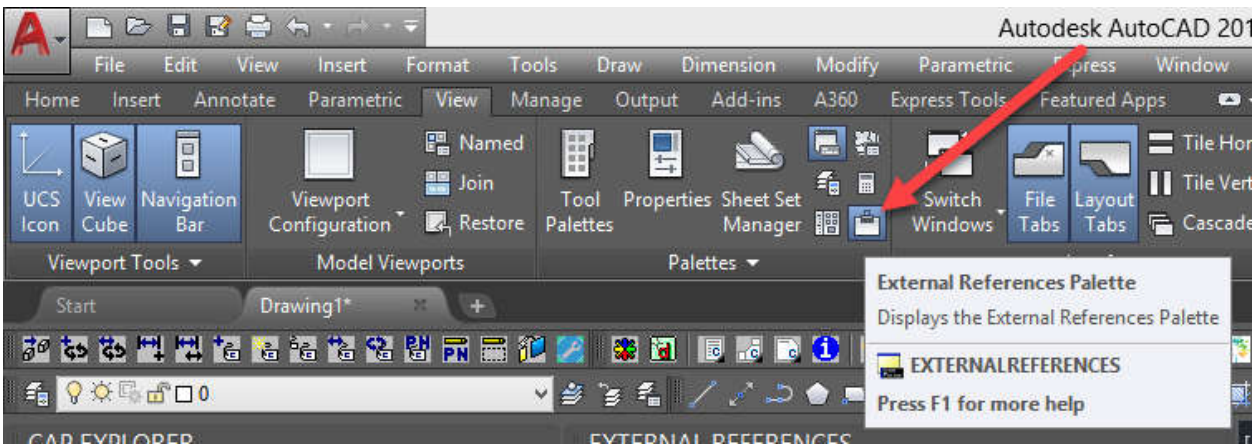


3) Verify the attachment values (leave these as-is):



- i) Make no changes to the scale or insertion point when attaching the drawing file.
 - ii) Be sure to make sure the "Reference Type" is set to "Attachment".
- b) Zoom out. A "Zoom – Extents" ("Z" > Enter > "E" > Enter) will work best.
 - c) Save the drawing to preserve the work that has been done so far.
 - d) Place an item in the drawing, place a dimension, or use the "Distance" command to ensure that the external reference attachment is scaled properly. (Measuring a known item, such as a door is usually how this is done.)
 - i) If the attached drawing is not scaled properly, it will need to be scaled to match the default units and scale of the Cap graphics.
 - e) At this point, the drawing needs to be evaluated for things like layers, dimensions, etc. that may disturb processes that are to be done within AutoCAD/Cap. This may mean that layers need to be locked, turned off, or frozen. It may mean that some things need to be removed altogether from the DWG that was attached as an XREF.
 - i) Anything that needs to be done in regard to editing the DWG that was exported out of Revit won't matter to what will be sent back to Revit. As will be explained in later steps, the building shell won't be part of the information sent back into Revit. Keep changes as minimal as possible though, since the whole idea of bringing the building shell out of Revit is to have all of that information available to reference when doing the space plan.

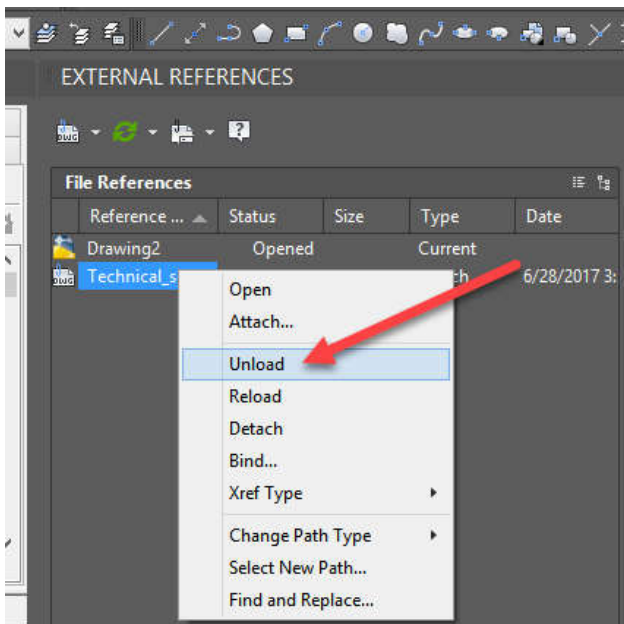
NOTE: If the ribbon was used to attach the DWG file, the "External References" palette will need to be turned on using the XREF command or from the "View" ribbon, selecting the External References" button:



- 4) Now that the DWG is visible within AutoCAD/Cap, has been checked to be properly scaled, and has any edits done to make space planning easier, place Cap graphics in the space.
- 5) Convert ALL graphics to 3D (**this is an important step!**)
 - a) Only items that have been converted to 3D will be useful for the camera views of the space. There is no way to convert items once they're in Revit.
- 6) Once the space plan is complete, it's time to get the drawing ready to go back into Revit.

1.3 Preparing the drawing to go back into Revit

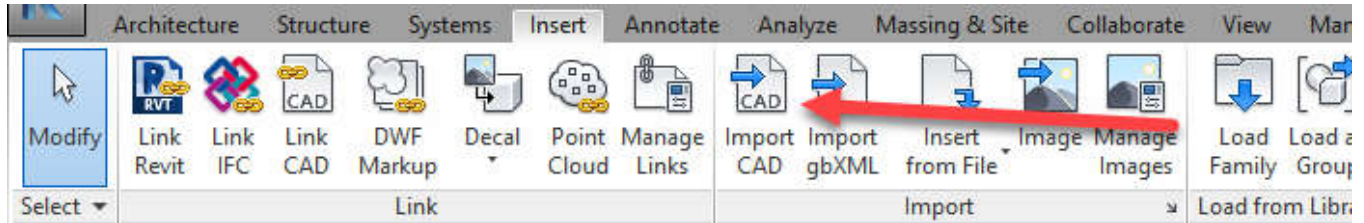
- 1) The drawing file, with the Cap furniture items, needs to be cleaned up as much as possible. Remove any extra items, notes, schedules, and tables so that the information goes into Revit as cleanly as possible.
 - a) If revisions will be necessary and the space plan drawing file will be needed again, create a copy of the file for your own use later (we'll reference this file as "Your Copy of the Drawing" later in this tutorial). This copy can retain all of the notes, and other things that won't be needed in Revit. With this version of the file stored away for changes later, clean up the version of the file that will be brought back into Revit.
- 2) Since the building shell itself already exists within Revit, it is not needed in the information that will be brought back into Revit. Unload the external reference file that was attached to the drawing.
 - a) To load the "External References" palette type "XREF" at the command line or from the "View" palette.
 - b) Right-click on the attached drawing and "unload" it.



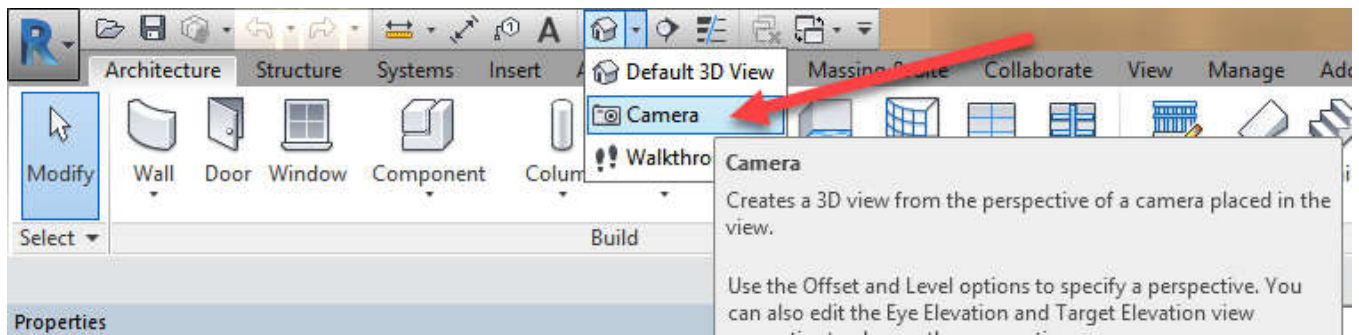
- c) Once the building shell drawing has been unloaded it no longer appears in the drawing.
- 3) Save the now-clean and XREF-free drawing. This is the file that will be brought into Revit.

1.4 Bringing the file into Revit

- 1) The cleaned up drawing that was saved in AutoCAD now will be brought into Revit
 - a) Within Revit, go to the “Insert” ribbon
 - b) On the “Insert” ribbon, click on “Import CAD”

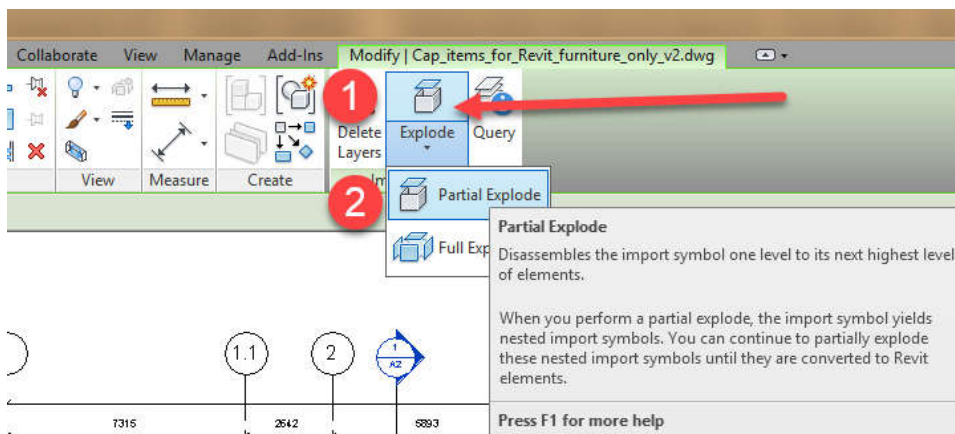


- c) In the dialog that appears, browse to the file that you saved at the end of the “clean up” part of the process.
- 2) The furniture will now appear within Revit as 3D graphics. Revit cannot convert these 3D graphics to Plan View graphics.
- 3) Create camera views to show the furniture within the space. Creating these views ensures that the graphics appear properly in



1.5 Revising the building shell within Revit (requires edits to the space plan)

- 1) Changes to a building shell are common. Some changes will require the furniture placement to change (changes to the space plan)
- 2) When inserted into Revit, the drawing file is a single entity. When selected, all of the items will be highlighted.
 - a) A “Partial Explode” can be done which will break apart the single entity into the individual furniture items.
 - i) Begin the Partial Explode process by selecting a piece of furniture, which selects all of the furniture.
 - ii) With the furniture selected, the interface should automatically change to the “Modify” ribbon of commands.
 - iii) On the “Modify” ribbon, click on the down arrow on the “Explode” and two explode types will appear: “Partial Explode” and “Full Explode”. Only choose “Partial Explode”.

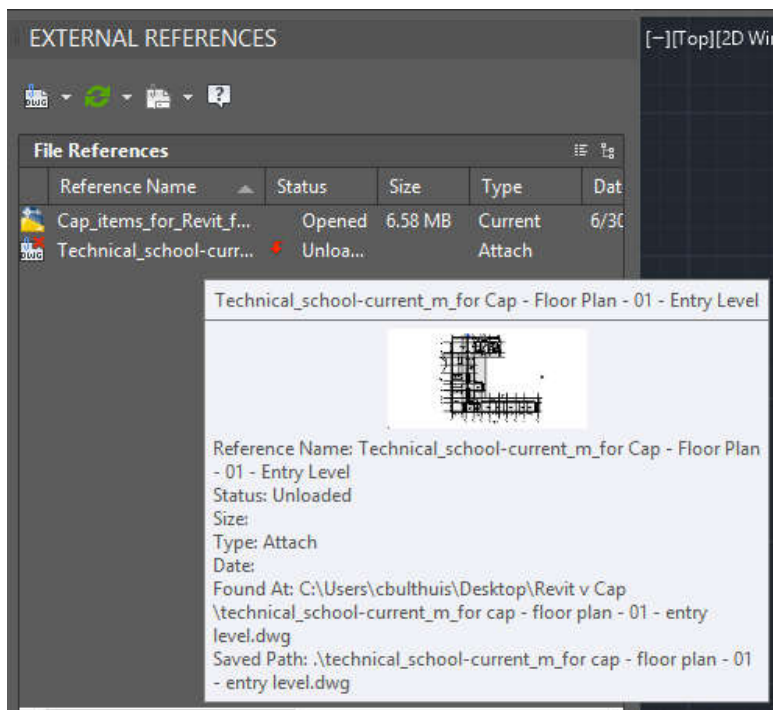


NOTE: If it's not necessary to do a "Partial Explode" of the space plan entity, don't do it. While partially exploding the space plan allows for the furniture items to be moved independently, having the parts separate makes it harder to remove them if the building shell needs to go back to AutoCAD/Cap for changes to the space plan.

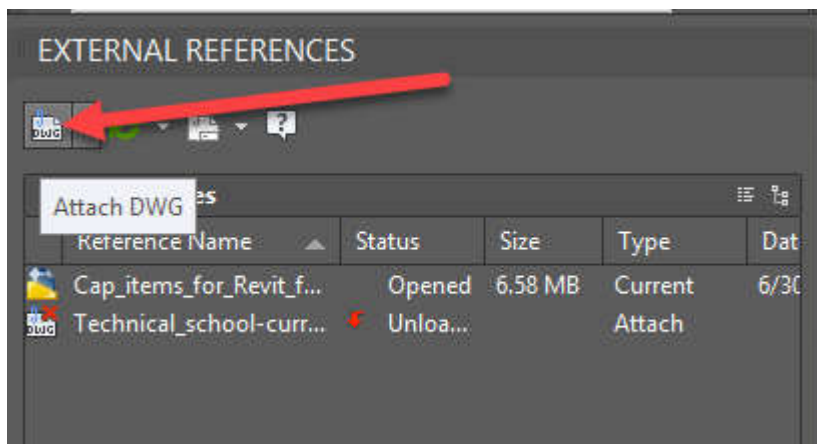
- 3) Make any changes within Revit that are necessary. If the changes require the space plan/furniture arrangement to change, it will have to go back to AutoCAD/Cap for those revisions.
- 4) The building shell will be exported out of Revit with the latest changes, to be brought back into the cleaned up space plan drawing that was saved earlier, or into "Your Copy of the Drawing".
- 5) Because the furniture is not needed, it needs to be removed from the Revit file. If the space plan is still intact, this will be easy: just select any item that was brought in from AutoCAD/Cap and all the items will be selected as one; delete them. If a partial explode was done, the furniture items need to be deleted one at a time. This may be made easier through layer controls within Revit, that is a more advanced Revit-specific process that won't be addressed in this document.
- 6) Once the Revit file has been modified and cleaned up, it will be exported as a DWG again, as shown earlier in this tutorial.

1.6 Revisions withing AutoCAD/Cap

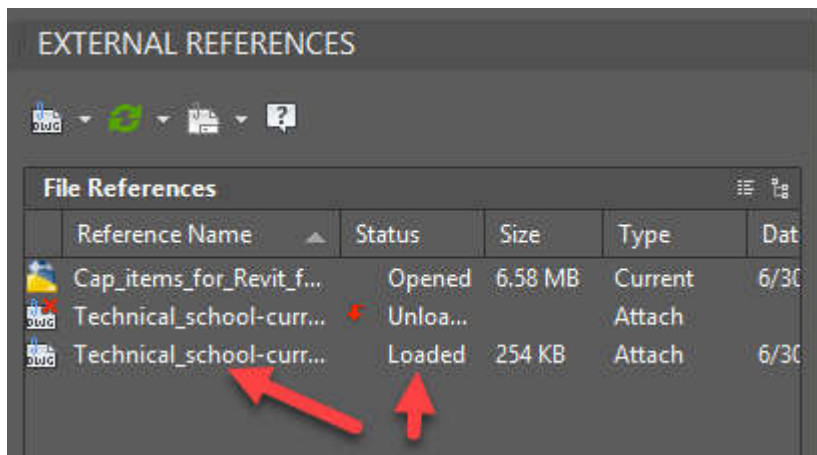
- 1) The process of bringing the modified building shell into AutoCAD/Cap follows most of the same steps as the first time the Revit-exported DWG was brought in, except rather than a new drawing, the DWG will be attached as an external reference to the space plan DWG file.
- 2) In AutoCAD, open the DWG file that was created to go into Revit (this might be the copy that was created that we've referred to as "Your Copy of the Drawing")
- 3) Attach the latest version of the floor plan to your drawing by typing XREF at the command line. This will bring up the External Reference palette.
 - a) Notice on the palette that the first version of the building shell still appears, but it is unloaded.



- b) Click on the Icon for the DWG attachment in the upper left corner of the External Reference palette



- c) When that button is clicked, a dialog will appear. Select the DWG of the building shell that was exported out of Revit.
 - i) Accept the values for insertion, as done earlier in the tutorial.
- d) Once the DWG has been attached, it'll appear in the drawing as it did the first time through and will appear in the External References palette as a "loaded" file, below the "unloaded" earlier version of the building shell.



- e) Make the necessary changes to the space plan to accommodate the changes made to the building shell.
- f) Save the space plan file with a name that clearly indicates this file is a different version than the one created earlier.

1.7 Preparing the revised space plan file to return to Revit

- 1) Similar to how the drawing required clean up in preparation to go back to Revit the first time around, the file again needs to be cleaned up.
- 2) Remove all that is not necessary for Revit, and save the file for use in Revit.
 - a) You may want to save a copy again, with all of the nonessential items in it for use if more revisions are possible.

1.8 Back into Revit to integrate with the building shell

- 1) Repeat the process as shown earlier in the tutorial when the space plan file was imported into Revit.
- 2) Work within Revit, making changes as necessary. These changes may require multiple iterations and cycles of back and forth between Revit and AutoCAD/Cap. Careful naming techniques will help avoid confusion of which file has which version of the project.

NOTE: When working with externally referenced files, the location needs to be consistent. Knowing where all of the associated files are on the computer or the network accessible to the computer is essential. Practicing good project management in terms of file location will help make the process described in this tutorial a easier and more enjoyable experience.