CTC SOFTWARE

A SYMETRI COMPANY

CTC BIM Project Suite™ User Guide

Contents

Suite Overview

The products from CTC Software offer many utilities for enhancing the productivity of users of Revit® software from Autodesk®. Revit users typically launch these tools from within the Revit software.

Although written to function correctly with the international community in mind wherever possible, CTC Software products are currently only tested on English USA versions of Revit running on English USA versions of Windows.

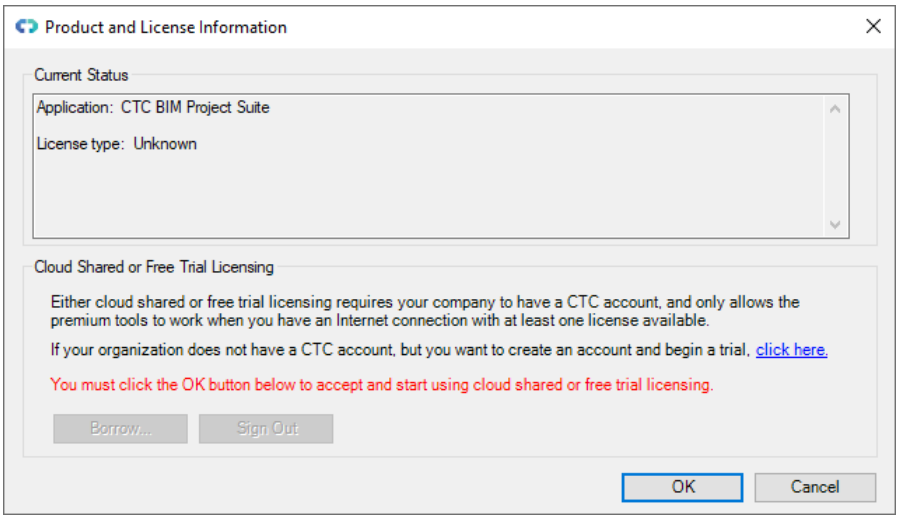
Installation and Configuration

The standard workstation installation requires little more than running the setup program. For more information regarding topics such as automating workstation installations and preconfiguring workstation settings, please refer to the *CTC BIM Suites Installation and Configuration Guide* document.

License Activation and Management

The productivity tools provided with light background colors are free tools that run without any special licensing. The productivity tools provided with dark background colors are premium tools which require licensing.

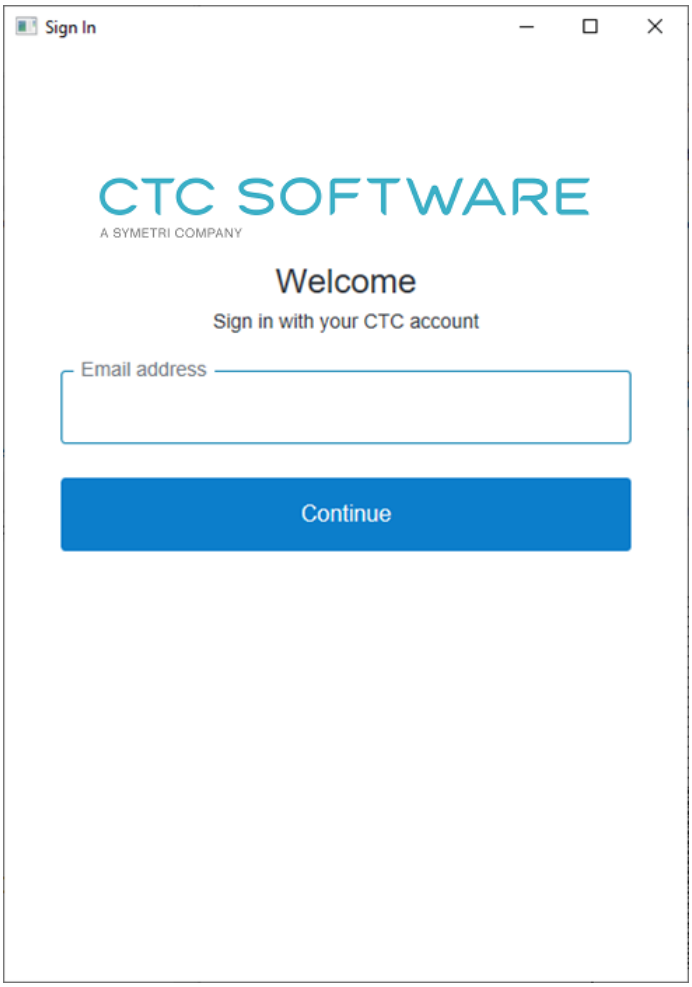
Unless initially preconfigured by the system administrator, the first time any of the licensed tools are launched from the Revit ribbon, the *Product and License Information* dialog will appear which requires acknowledging the licensing requirements by clicking the OK button at the bottom.



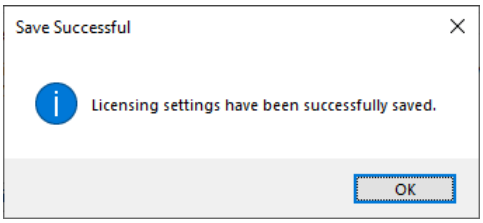
CTC Software products support only cloud-shared licensing, and also free trial licenses that use CTC's cloud licensing engine. You must click the OK button to activate the cloud licensing and acknowledge using a CTC cloud account.

The licensing will automatically apply to all of the tools that are included in the suite which require licensing. So once the first tool has configured the licensing, the other premium tools in the suite will automatically use the same configuration.

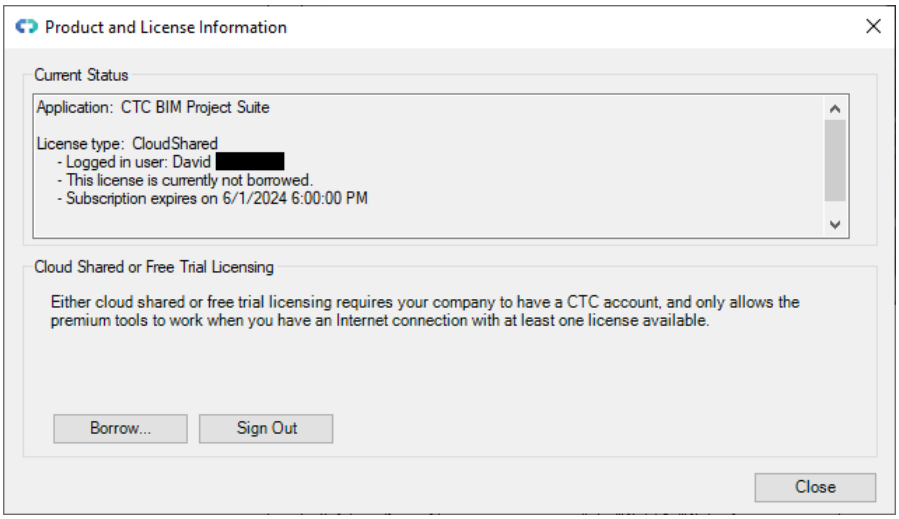
Once you click the OK button, you may be asked to login, if you aren't already logged in from using another CTC product:



Either way, once you have logged in, the product will be configured for cloud shared licensing:



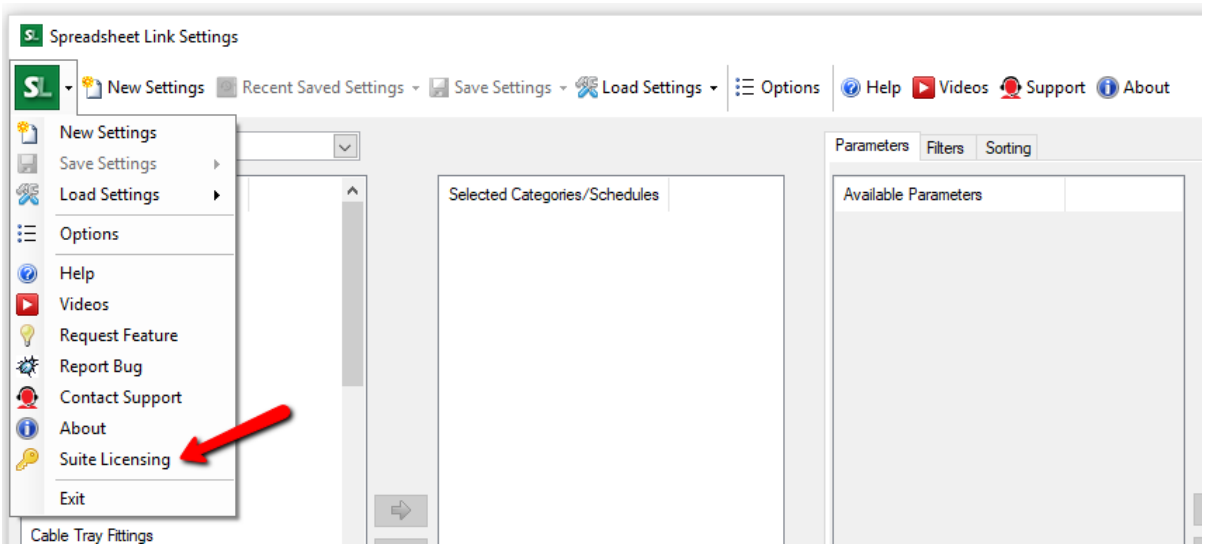
and the licensing screen will be updated to show that:



At this point, you may borrow a license for offline use (if permitted by the administrator). You may also Sign Out from the cloud licensing system in case a different user needs to sign in on this computer.

Changing Licensing at Any Time

Licensing can also be changed at any time using the "Suite Settings" tool, which is discussed below, or by using the "Suite Licensing" menu choice in the licensed add-in tools:



Borrowing a Cloud Shared License

If a license is needed in anticipation of being disconnected from the Internet, borrowing a license can ensure that the CTC tools are available for use when offline.

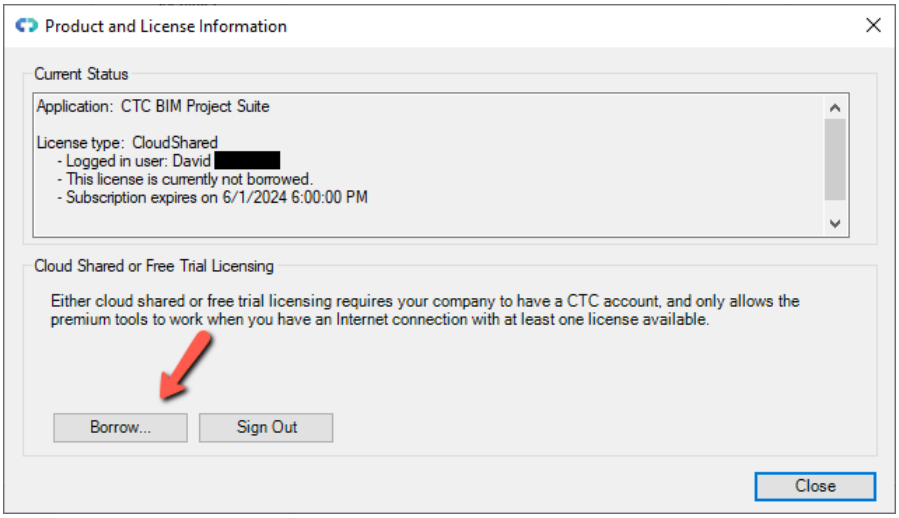
IMPORTANT: For normal use of the software, where you have a standard Internet connection, you DO NOT need to borrow a license. Borrowing a license is normally only needed when you know you will need to use the software at a

time when you won't have a reliable Internet connection. While you have a license borrowed, that is one less shared license available to all other users.

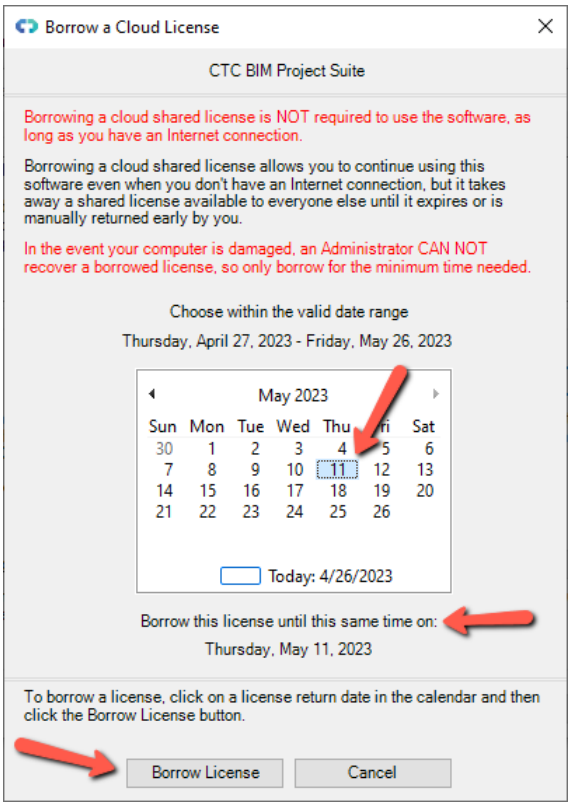
NOTE: Borrowing is only available for purchased cloud shared licenses. **Borrowing is not available for trial licenses.**

IMPORTANT: In the event your computer is lost, stolen or damaged (e.g. a hard drive crash) **an administrator CAN NOT recover a borrowed license.** In that case, the license will be unavailable to all users until the borrow period has naturally expired. *As such, you only want to borrow a license for the barest minimum amount of time needed.*

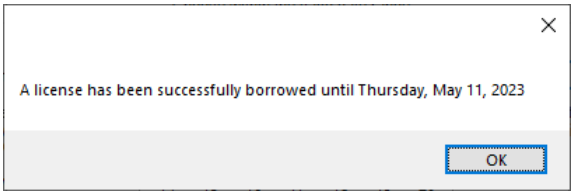
Begin by opening the *Product and License Information* screen from either the main pulldown menu of a premium tool, or from the Suite Settings add-in. From here, click the 'Borrow…' button to begin the process of choosing the length of time to borrow a Cloud Shared license.



The date selector should appear:

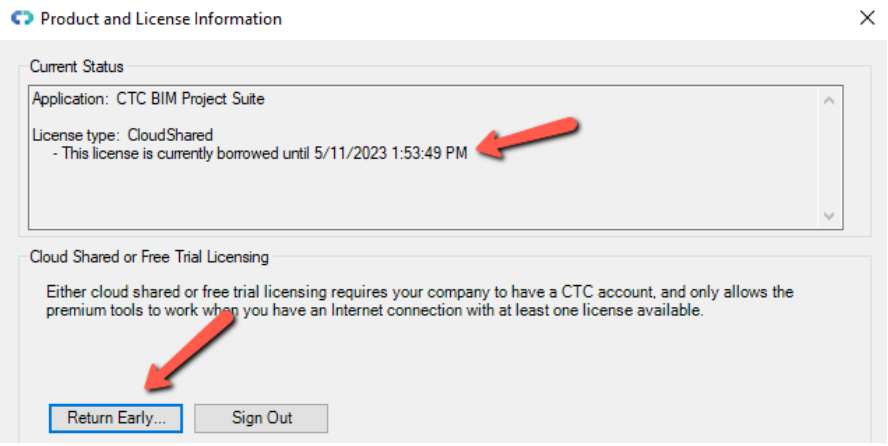


Confirm the date selection and click the *Borrow License* button. A success message should appear.

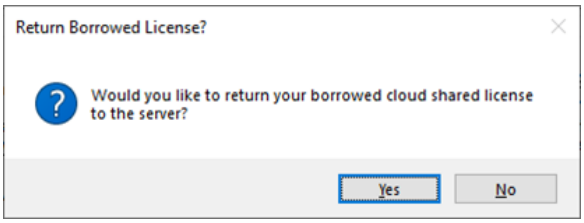


Returning a Borrowed Cloud Shared License Early

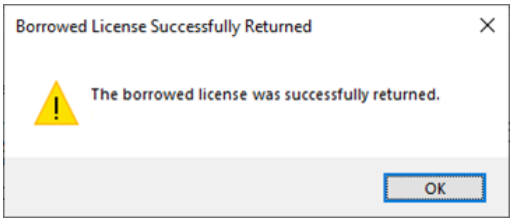
To return the license early, in the *Product and License Information* form, find the *Return Early…* button and click it.



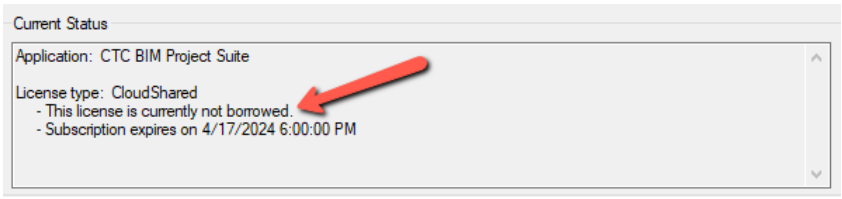
A prompt will appear confirming that the license should be returned.



Click the Yes button, then you should see:



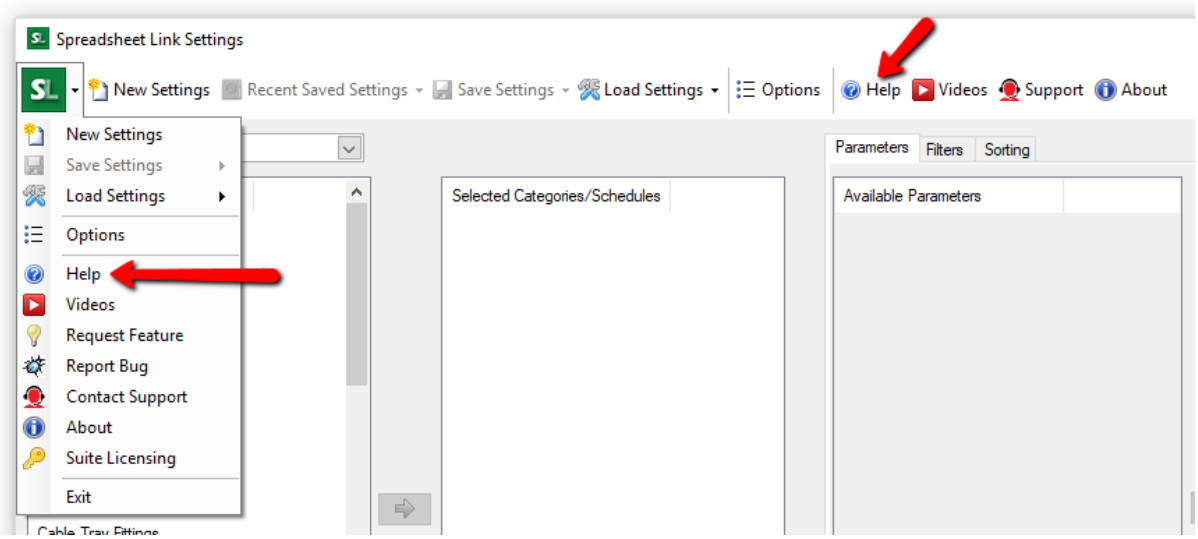
The license status should now show a 'not borrowed' message.



Common Toolbar and Menu Buttons

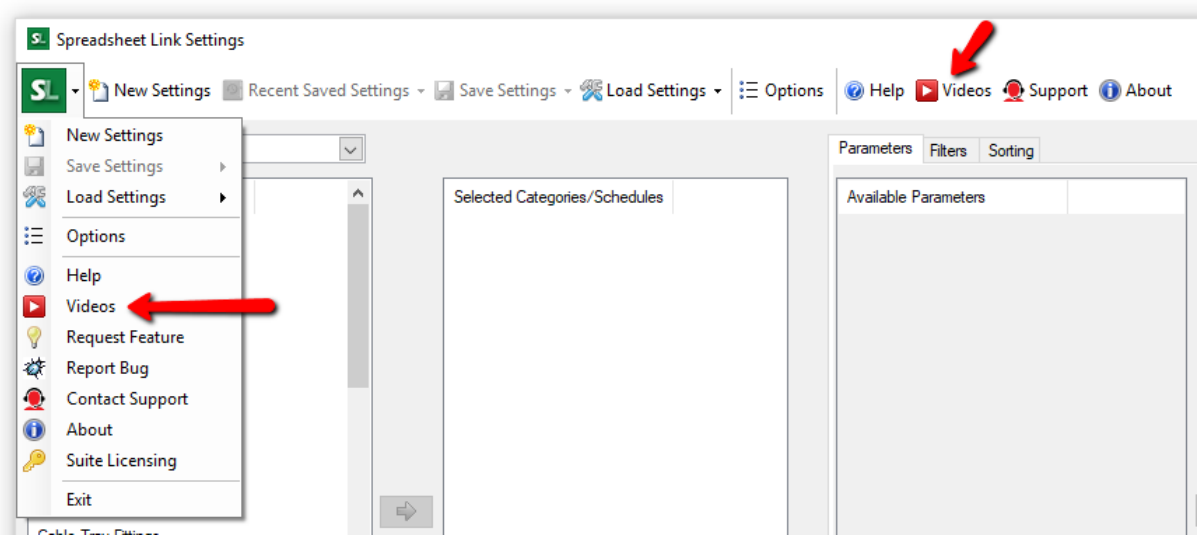
Getting Help

In the toolbar, clicking the “Help” button will display this user guide.



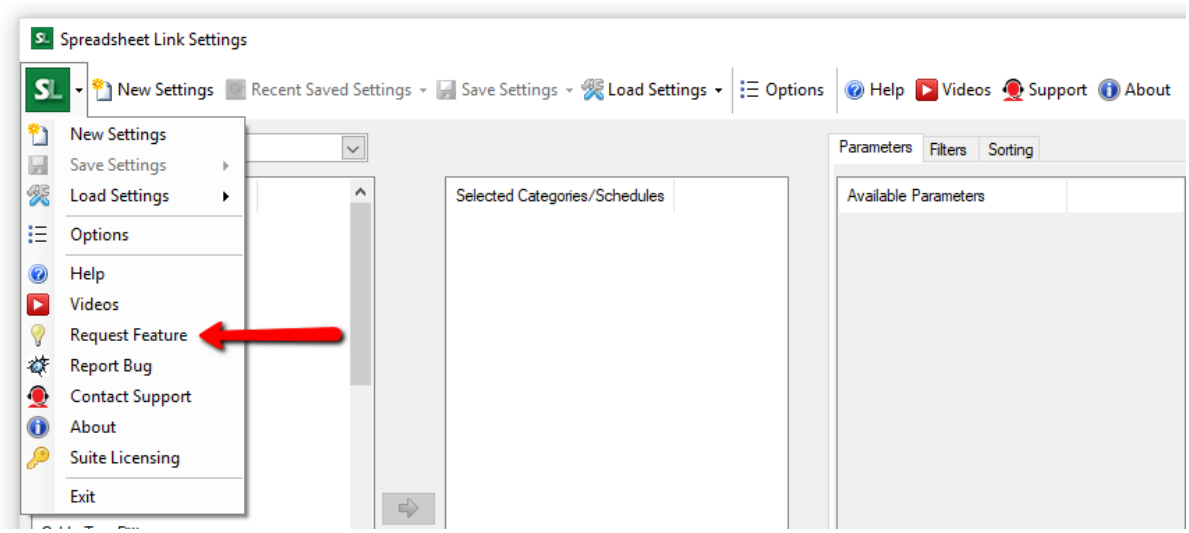
Getting More Help: Videos

An alternate source of help is to click on the Videos button, which will display a list of tool-specific videos in your web browser.



Submitting a Feature Request

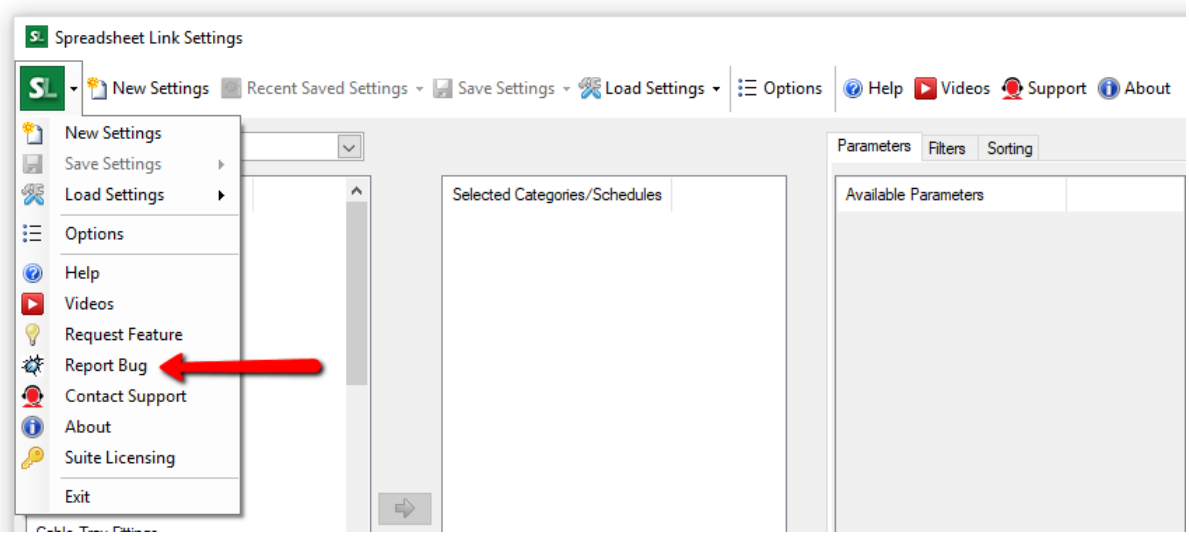
If you have an idea for enhancing a feature or would like to see a new feature added to the software, you can either use the “Request Feature” button on the About dialog (seen below) or can access that functionality using the “Request Feature” drop-down menu choice:



Selecting this option will open the Support page on the CTC web site, which allows you to add a request for a new feature by selecting the Wish List option.

Reporting a Bug

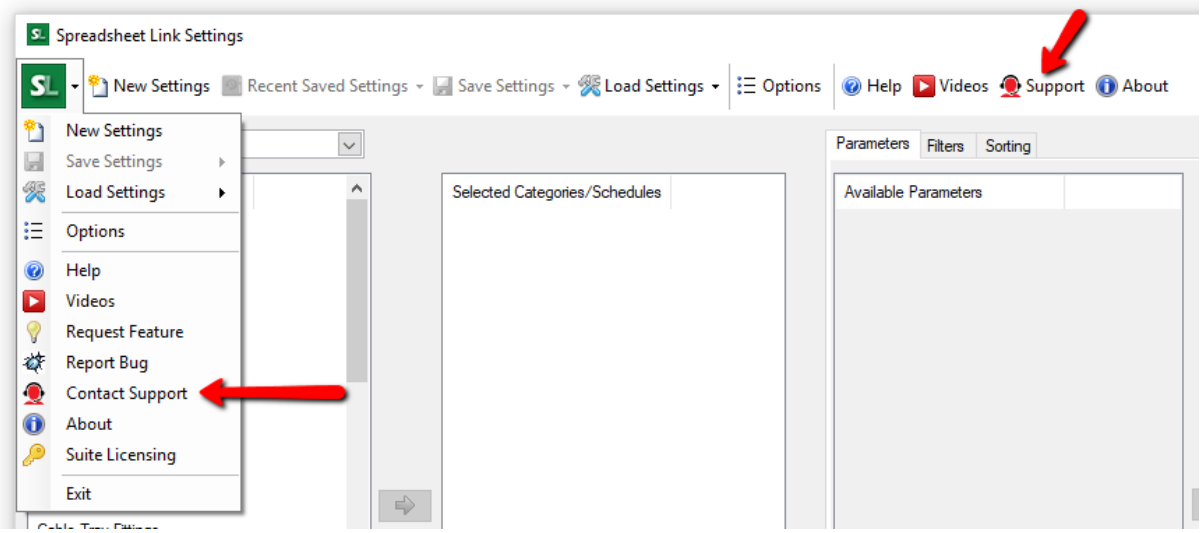
If you encounter what you feel is an issue or incorrect operation in the software, you can report this as a “bug” by either using the “Report Bug” button on the About dialog (seen below) or can access that functionality using the “Report Bug” drop-down menu choice:



Selecting this option will open the Support page on the CTC web site, which allows you to submit the information about the issue.

Contacting Technical Support

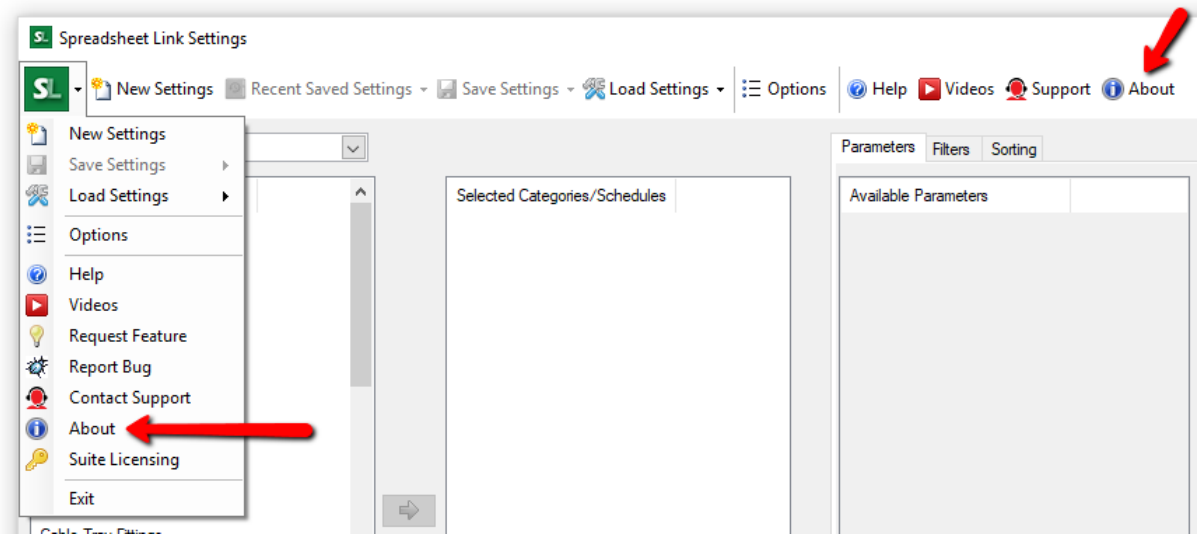
In the toolbar, clicking the “Support” button will open the Support page on the CTC web site. This button may be hidden by your system administrator.



Selecting this option will open the Support page on the CTC web site.

Getting Application Information

In the toolbar, clicking the “About” button will display a dialog which shows information about this tool.



This screen should look like this:


About Spreadsheet Link
CTC SOFTWARE
A SYMETRI COMPANY
Buy Now!
Request Feature
Report Bug
Spreadsheet Link
This tool exports and imports project data between Revit and a spreadsheet program.
Website: https://ctcsoftware.com
Contact Support: https://ctcsoftware.com/support
Installed suite version: 25.3
System Information
Download Latest Suite Installer
Copyright ©2024 CTC Software
OK

Revit Properties

Unlike the other tools in BIM Project Suite, Revit Properties does not actually run within Revit. Instead, it modifies the Windows Explorer / File Explorer interface to provide access to basic data about Revit project files, family files, project template files and family template files.

Most importantly, **without having to be in Revit** it will tell you what version of Revit last saved the file, but includes other information as well. Knowing what version of Revit last saved the file can help you know which version of Revit to use to open the file.

Further, Revit Properties can open Revit files in a user-selected version of Revit as well, but has the following limitations:

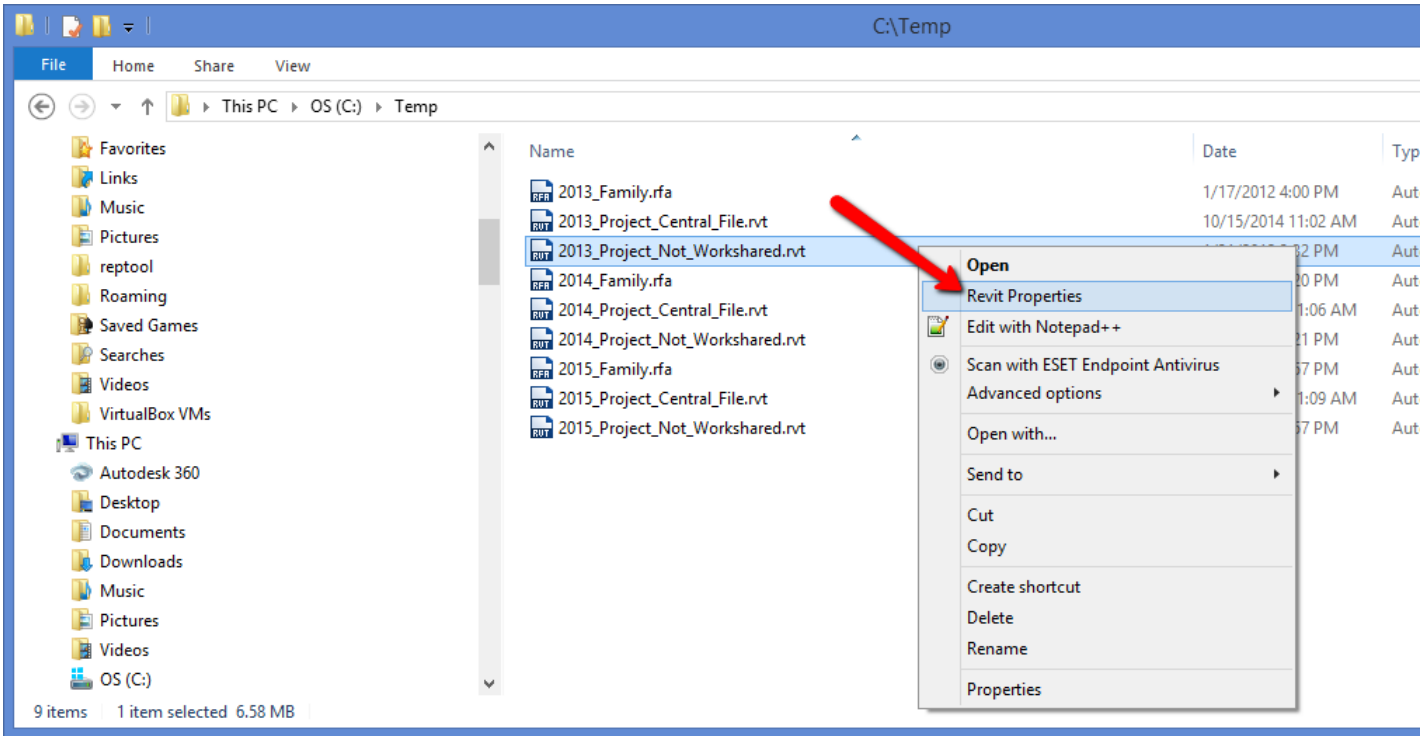
- It cannot open a project "Detached from central"
- It cannot open a project while allowing the user to choose which worksets to open
- It cannot open a workshared project AND overwrite the previous local copy – it can only append with date and time
- It cannot open a file with auditing turned on

However, this tool will let you "Create New Local" from a central file in the same manner Revit does.

This is a free tool that does not have licensing requirements.

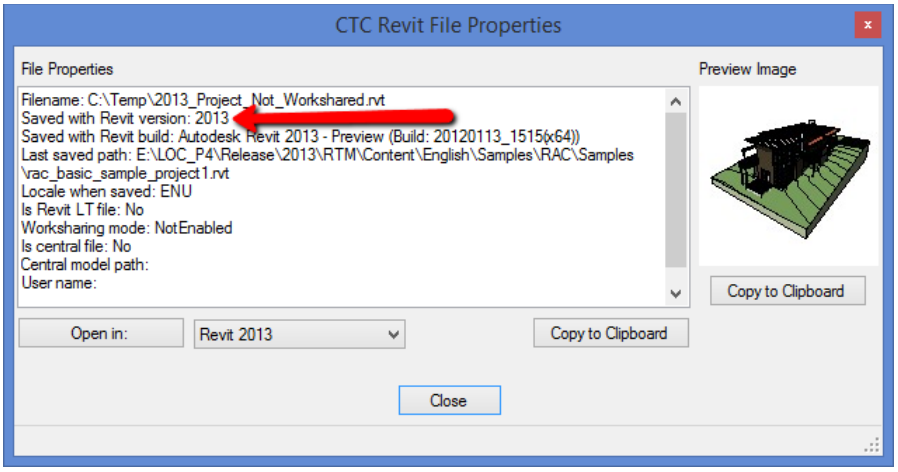
Starting Revit Properties

In Windows Explorer or File Explorer, navigate to the folder which has the Revit file of interest, right-click on the Revit file and select the "Revit Properties" pop-up menu choice:



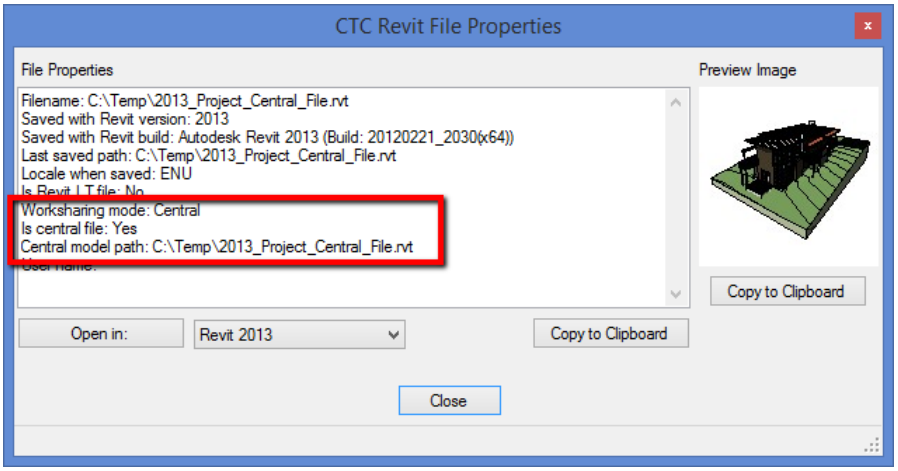
This menu choice will only appear for *.rvt, *.rfa, *.rte and *.rft files.

A resizable dialog like the following will appear:

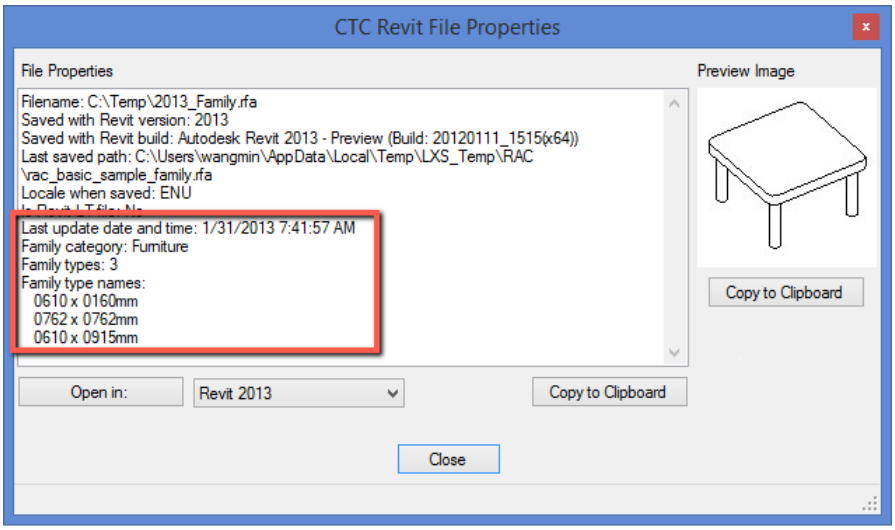


The Revit version that last saved the file is indicated in the image above.

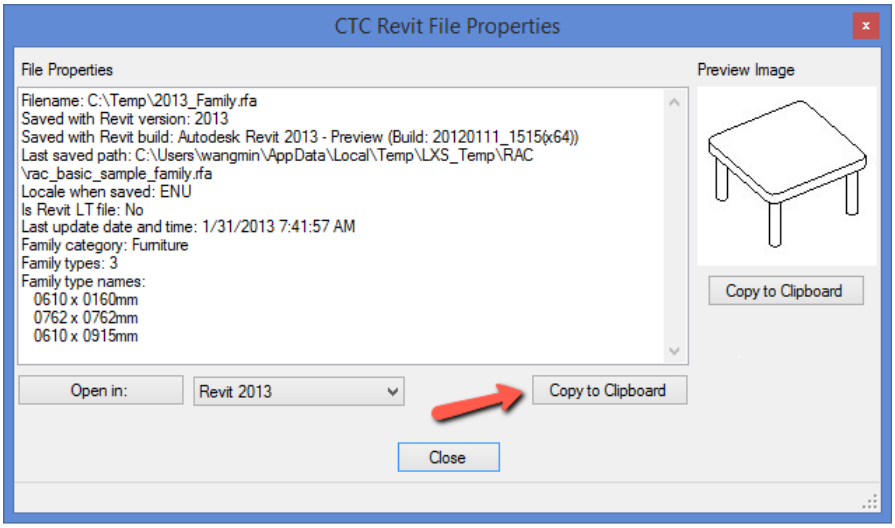
A central file shows different information:



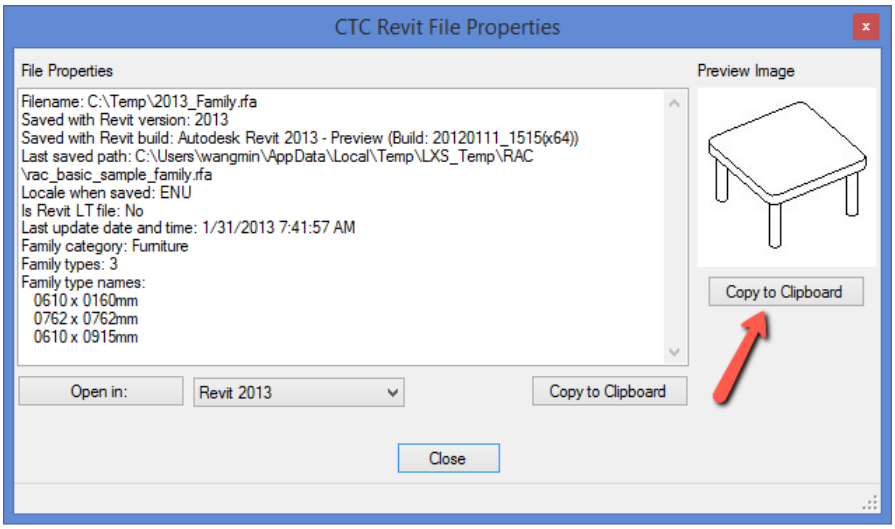
The list of data available for family files has some information about the last time the file was updated, the family category, and the number of types and the names of the types in the family:



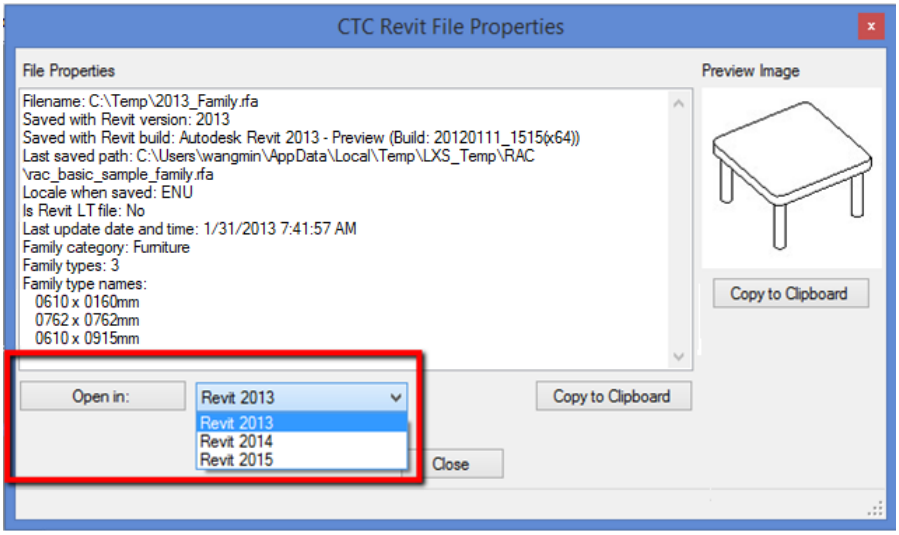
This button will copy the information from the list of file properties to the clipboard, as text:



This button will copy the preview image to the clipboard as a 128 x 128 pixel image:



These buttons provide the ability to open the document in a specific version of Revit:

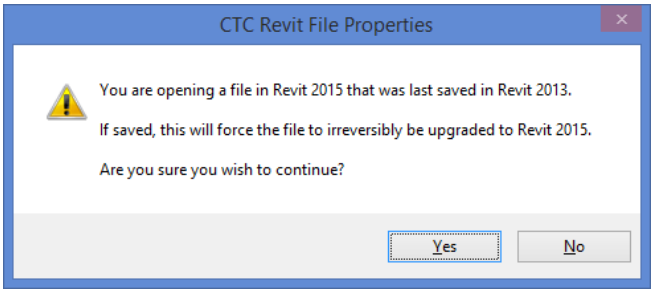


If the file was saved in a version of Revit that is later than any version installed (or if no versions of Revit are installed), these buttons will not be visible. Otherwise, the list of choices will show all the versions of Revit that have been detected on this computer.

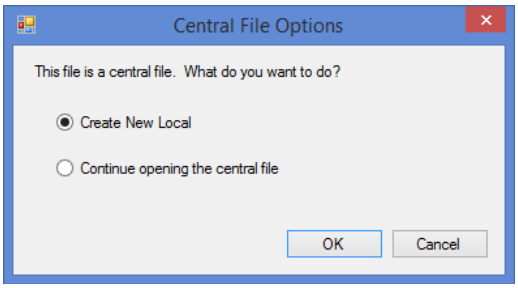
If only one version of Revit is installed, the list will not be visible and the button will change to say something like “Open in Revit 2019” (as appropriate).

If more than one version of Revit is installed, the list will be visible and the version that most closely matches the version in which the file was last saved will be selected automatically by default. This is true for older versions of Revit as well, which may have contained discipline-specific names such as “Revit Architecture 2018” or “Revit MEP 2019.”

For families and non-workshared project files, if a later version of Revit is selected and the “Open in:” button is clicked, a warning like this will appear:

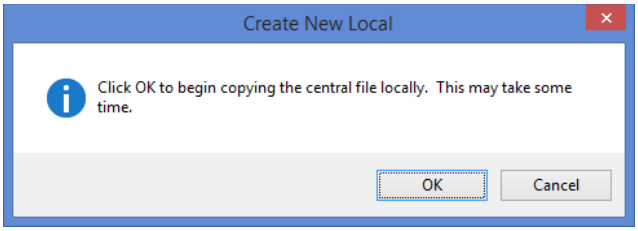


Opening a central file in the same version of Revit in which it was last saved presents some options:

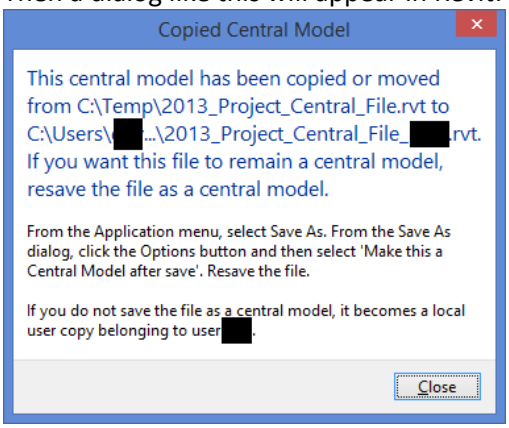


If “Create New Local” is selected, a new local file will be created in the same folder and with the same name that Revit natively does, based on the settings for that version of Revit.

Because project files can be large and take time to copy, the following message is presented:

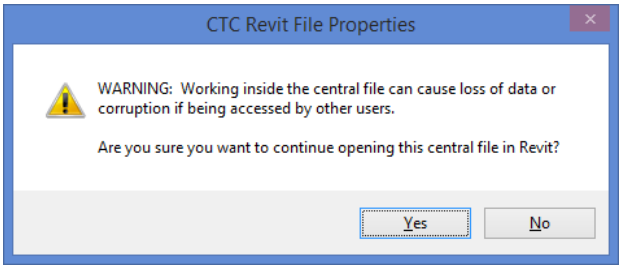


Then a dialog like this will appear in Revit:

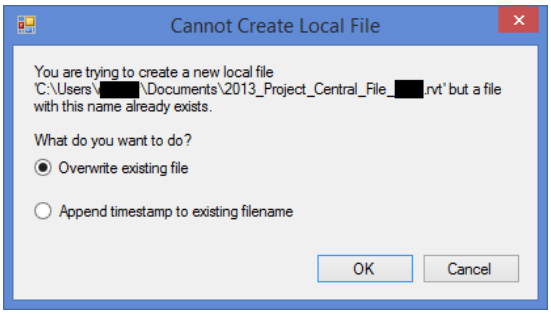


This is normal. Clicking the “Close” button will complete the process, and a new local file will be used.

If instead the “Continue opening the central file” choice is selected, before opening the file directly in Revit this warning is displayed:

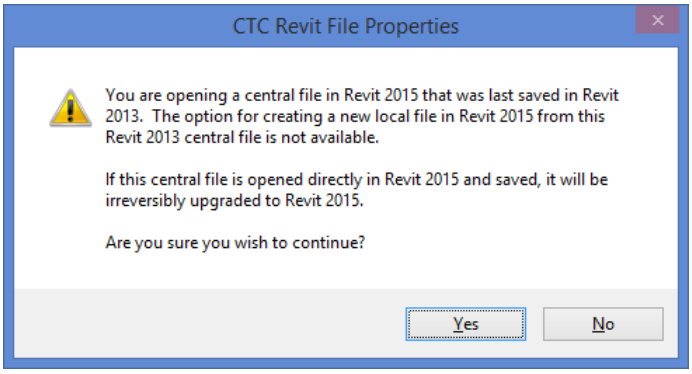


If creating a new local file is selected again later on the same central file by the same user, a dialog similar to the equivalent one in Revit will appear:



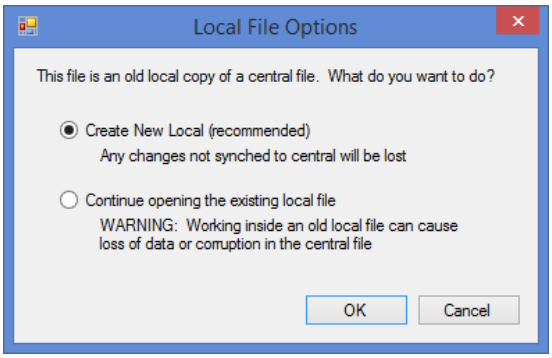
If the timestamp approach is chosen, the existing local file will be renamed with the same time stamp system that Revit uses, and a new local file is created from the central file.

Revit itself will not allow creating a new local file from a central file if the version of Revit that is running is newer than the version that was used to last save the central file. The same is true for this tool if you select to open a central file in a newer version of Revit. In that case you will not get the option to create a new local file, but instead will see this:

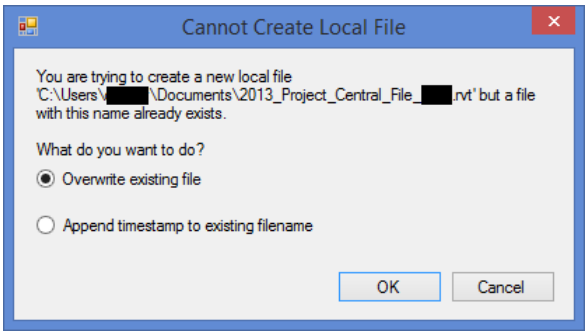


Choosing “Yes” will continue with opening the central file directly in the later version of Revit.

Using Revit Properties on an existing local file and having it be opened with this tool will show the following:



Selecting the default “Create New Local” choice will show the subsequent dialog (seen previously):


Cannot Create Local File
You are trying to create a new local file 'C:\Users\[redacted]\Documents\2013_Project_Central_File_[redacted].rvt' but a file with this name already exists.
What do you want to do?
Overwrite existing file
Append timestamp to existing filename
OK
Cancel

Suite Settings

The Suite Settings tool allows suite-level changes to be applied.

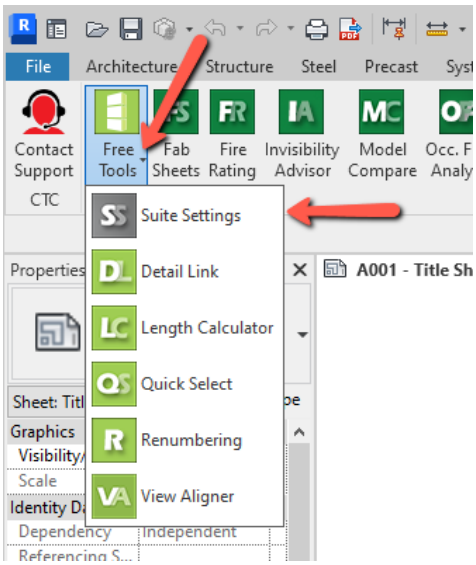
NOTE: You may need to restart Revit in order to see any changes made with this tool take effect.

NOTE: Your system administrator may disable some features of this application.

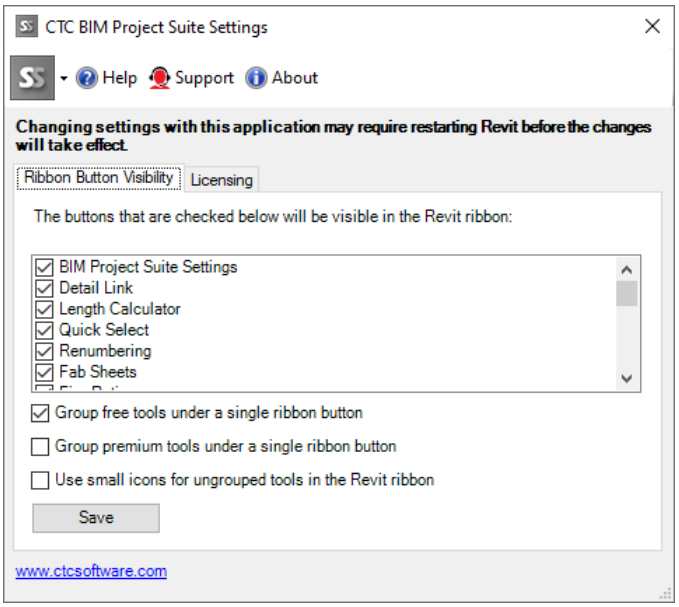
Starting Suite Settings

On the Revit ribbon, click on the “Suite Settings” button.

Depending on ribbon button configuration, the button may be labeled “BIM Project Suite Settings” and be located under the “Free Tools” dropdown button on the *CTC BIM Project Suite* panel.

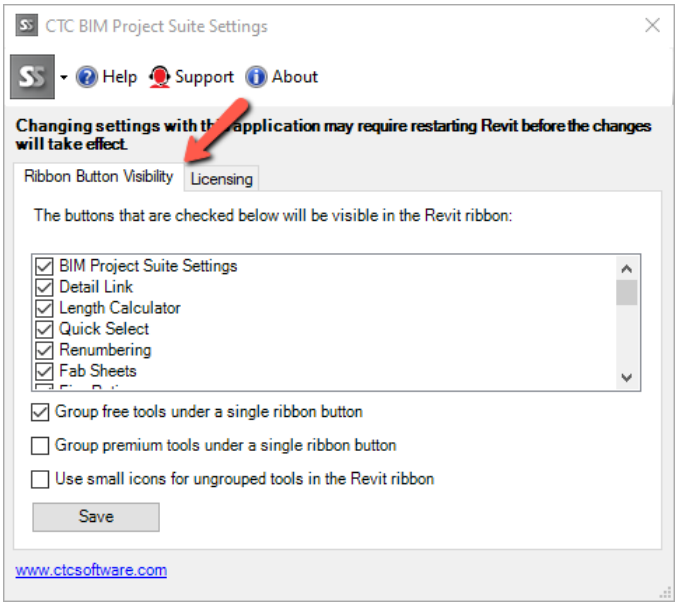


This will launch the application, which should look something like this:



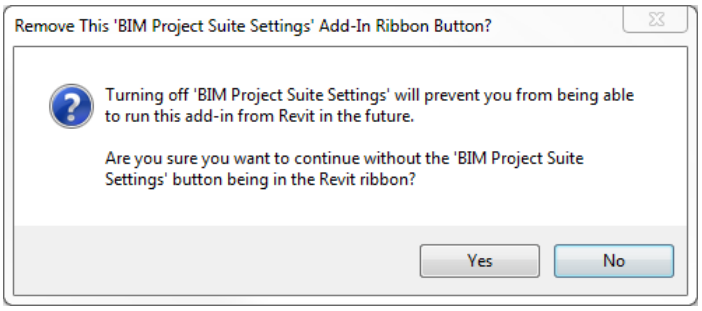
Changing Which Ribbon Buttons are Visible and how they Appear

The first tab in the Suite Settings tool allows changing which ribbon buttons are available, if this feature has not been disabled by the system administrator. The *CTC Suites Installation and Configuration* document explains how ribbon button availability can be controlled more automatically using either configuration files or Active Directory security group definitions.

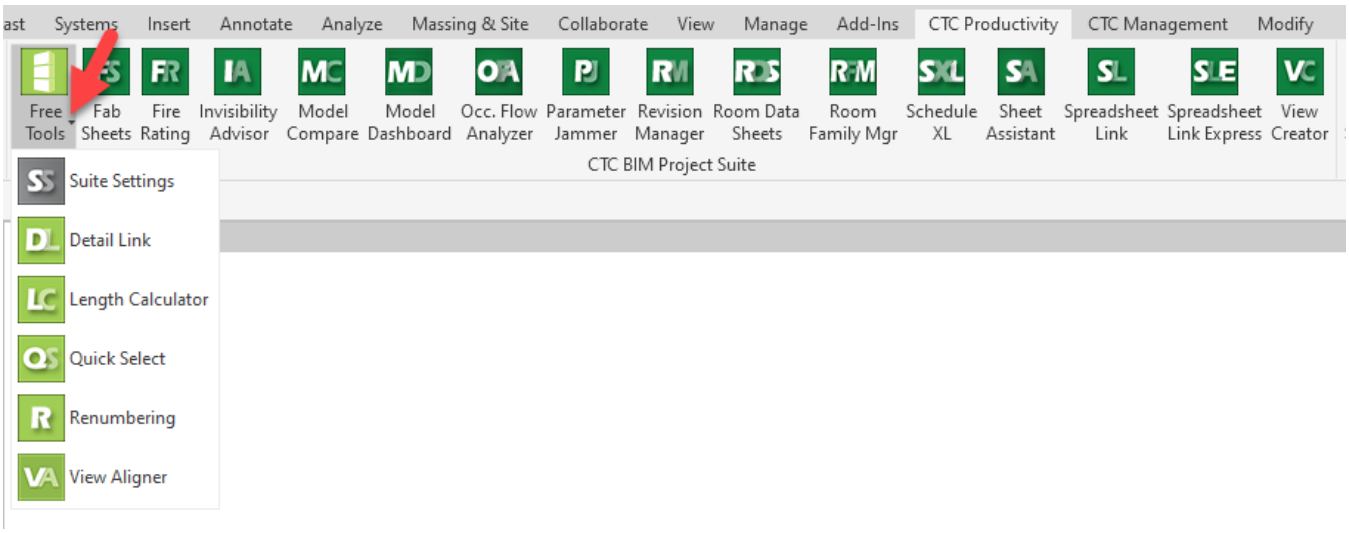


For any ribbon buttons that you don't want to have available, simply clear the checkmark by their name and then click the "Save" button at the bottom.

If you turn off the button for this application itself, the following dialog will appear when you try to save that change:

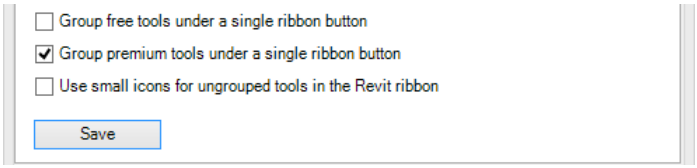


Selecting the grouping checkboxes near the bottom of the dialog will condense the tools into a dropdown button. This is the default behavior when the tools are installed on a new computer:

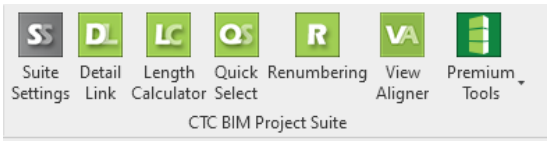


Note that if only one tool within a group is visible, the button for that tool will be placed directly on the panel. There will be no drop-down button if there would be only one tool to show underneath it.

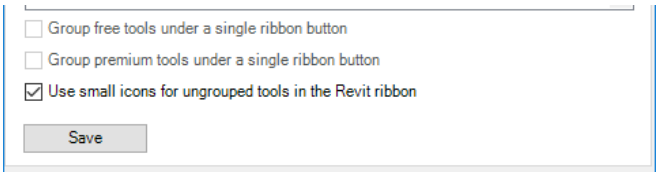
Either free or premium tools (or both) can be ungrouped. For example, these settings:



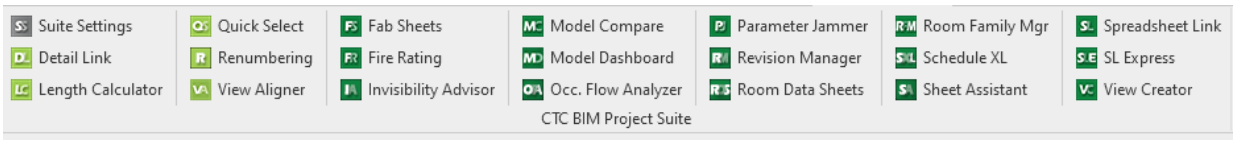
results in this:



Selecting the "Use small icons for ungrouped tools in the Revit ribbon" checkbox can save some ribbon space for ungrouped tools. For example, these settings:

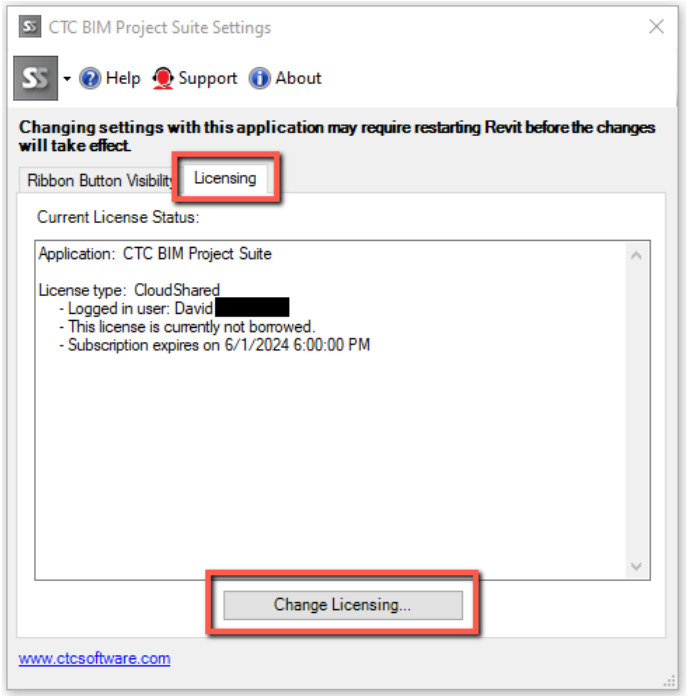


results in this:

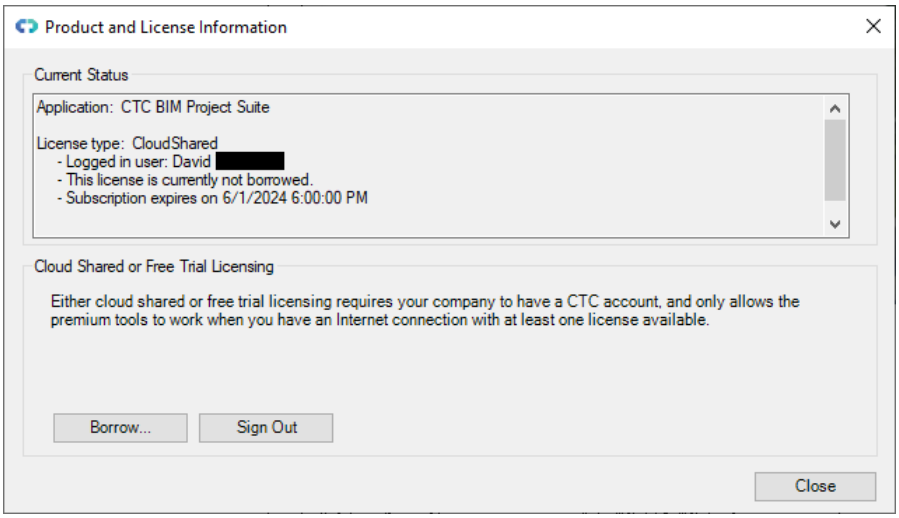


Seeing and Changing License Status

The second tab in the Suite Settings tool allows seeing the current license status and changing the licensing:



The top portion of this screen shows how the licensing is currently configured for this suite. Clicking the "Change Licensing…" button will show the *Product and License Information* dialog that allows changing how the suite is licensed, which is discussed above.



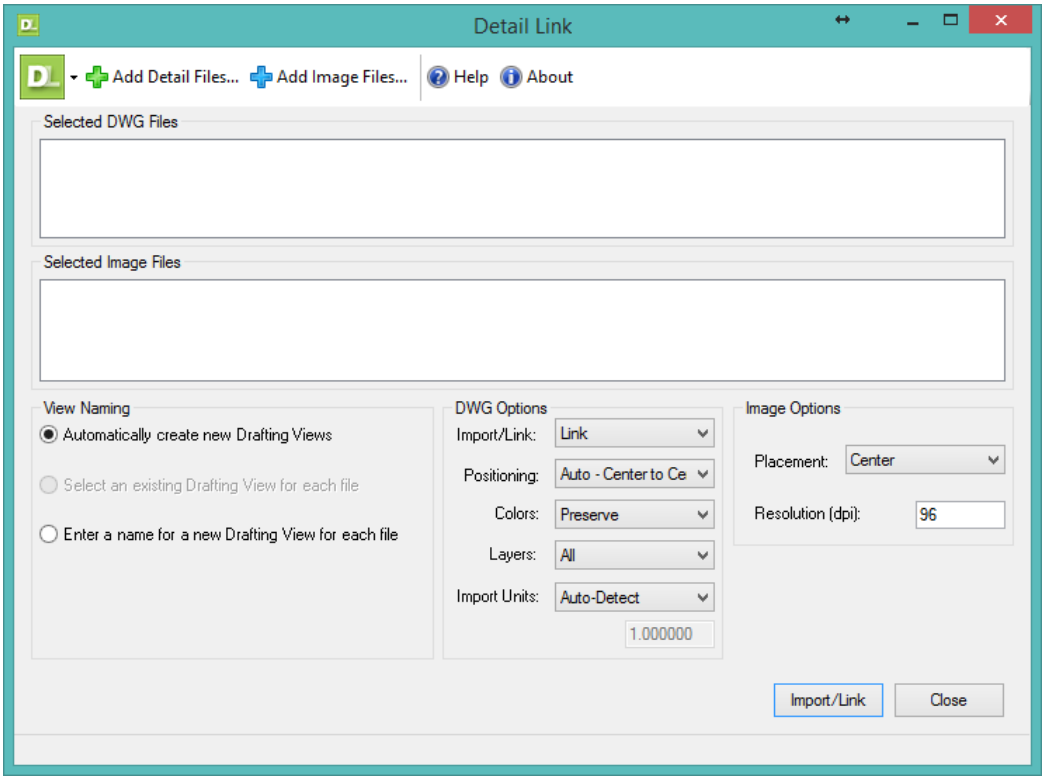
Detail Link

Introduction

Detail Link allows for the automation and mass linking or importing of multiple external AutoCAD DWG detail files. Detail Link can also be used for the automation and mass importing of image files. Each detail or image will be linked or imported and placed into a Drafting view based on options selected.

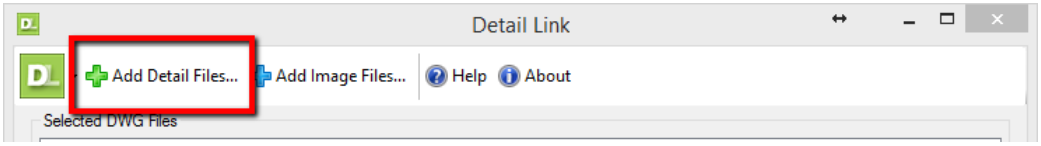
Starting Detail Link

On the Revit ribbon, click on the “Detail Link” button.

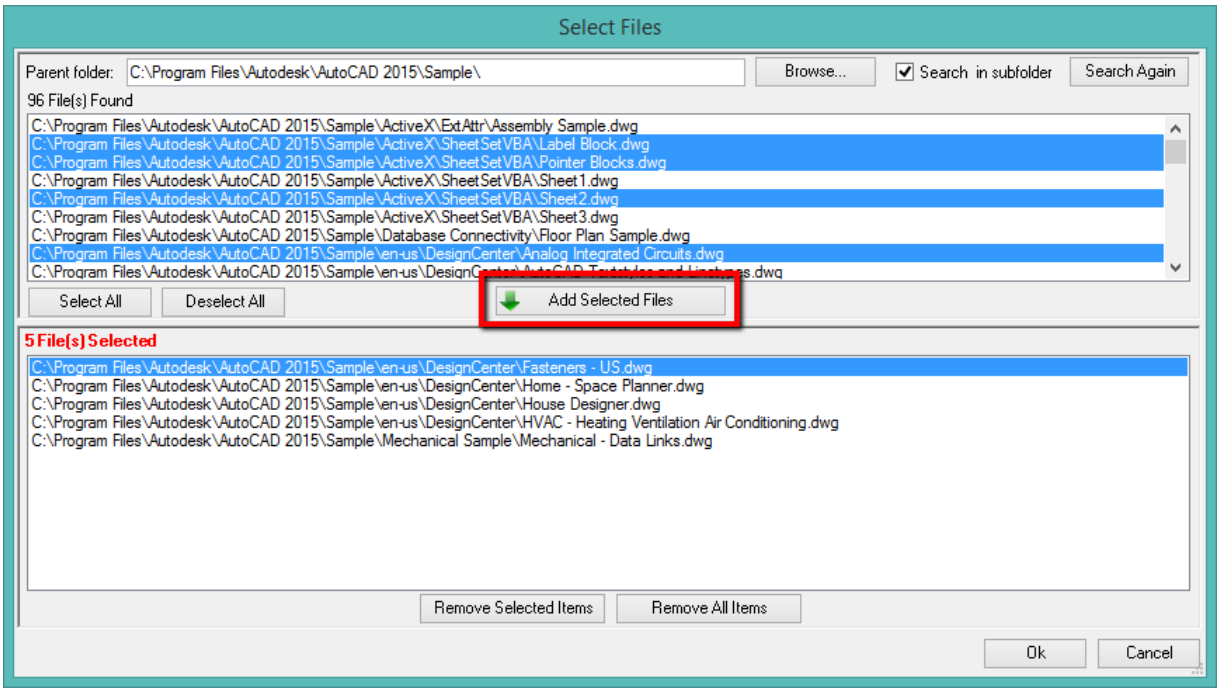


DWG File Selection

To select which DWG files should be linked or imported, click the “Add Detail Files…” button in the toolbar at the top.



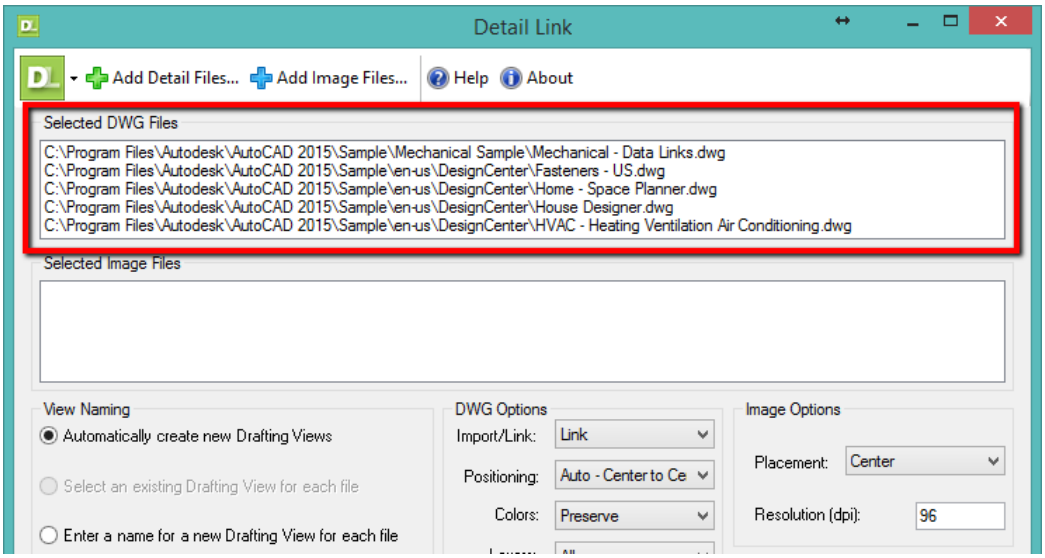
The following dialog will appear:



The controls at the top allow specifying in which folder to look for DWG detail files, and whether or not to include subfolders when searching. Clicking the "Search Again" button will search for the DWG files.

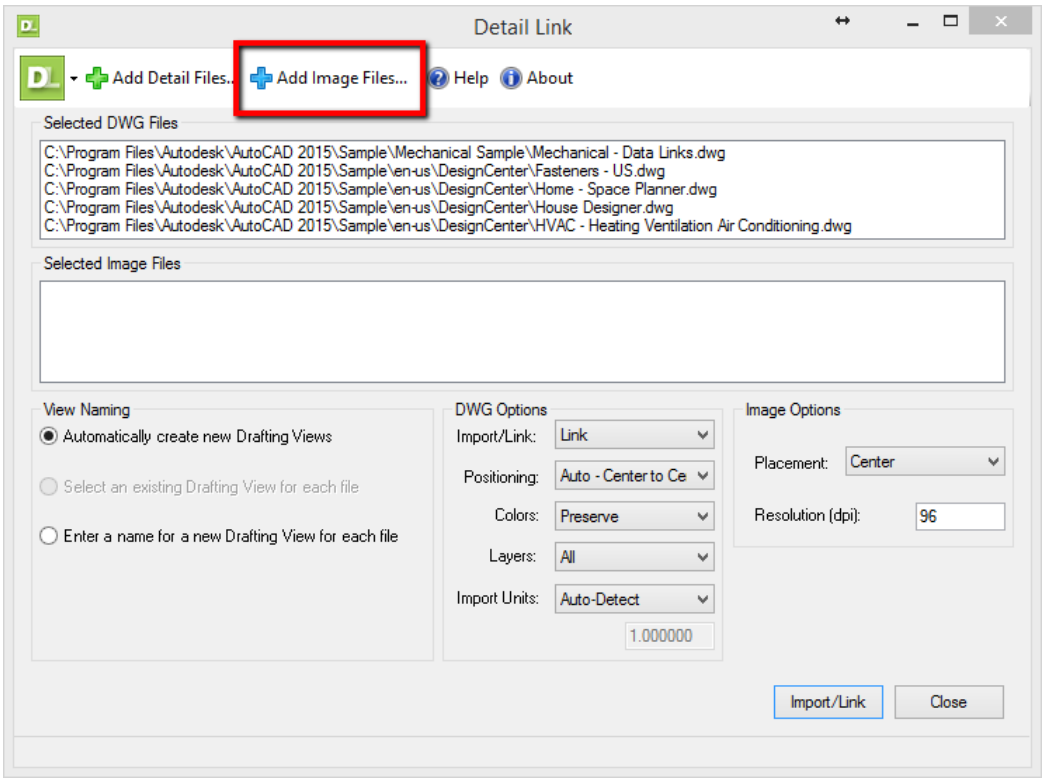
Once one or more DWG files have been found, they will appear in the "Files found" list. Click on one or more DWG files and then click the "Add Selected Files" button to add them to the list of DWG files to process in the lower half of the screen.

Clicking the OK button will return the list of files selected to the main dialog:

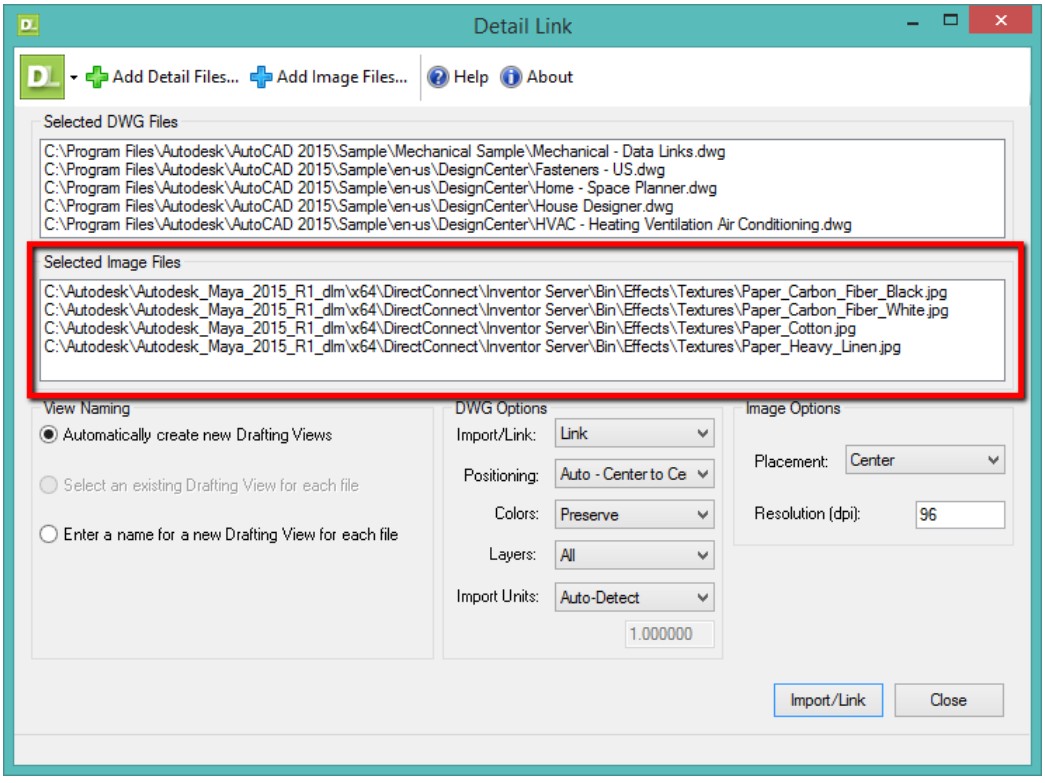


To remove items from the list, simply select one or more of them and press the Delete key on the keyboard.

Image files can be selected using a similar process to DWGs. Click the "Add Image Files…" button to launch the "Select Files" dialog.

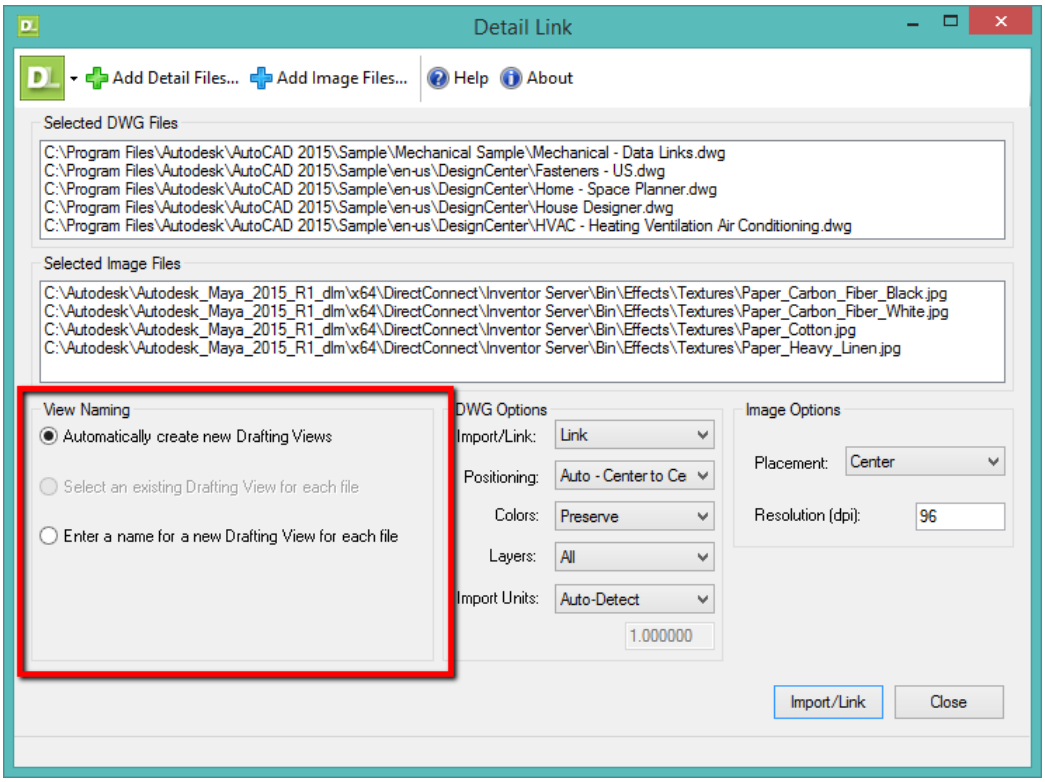


Once images have been selected they will appear in the “Selected Image Files” list.



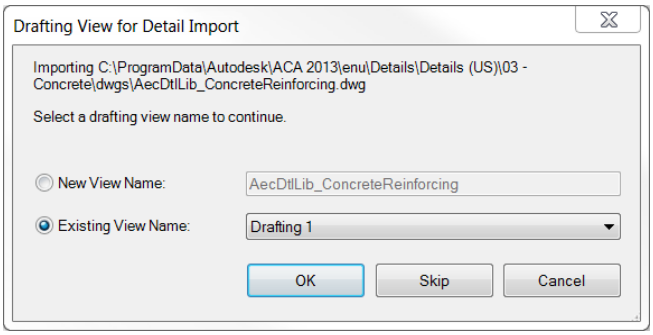
View Naming

View naming can be handled using one of three options.



The *"Automatically create new Drafting Views"* option will generate and name the drafting view the same as the DWG or image file name, without the file extension.

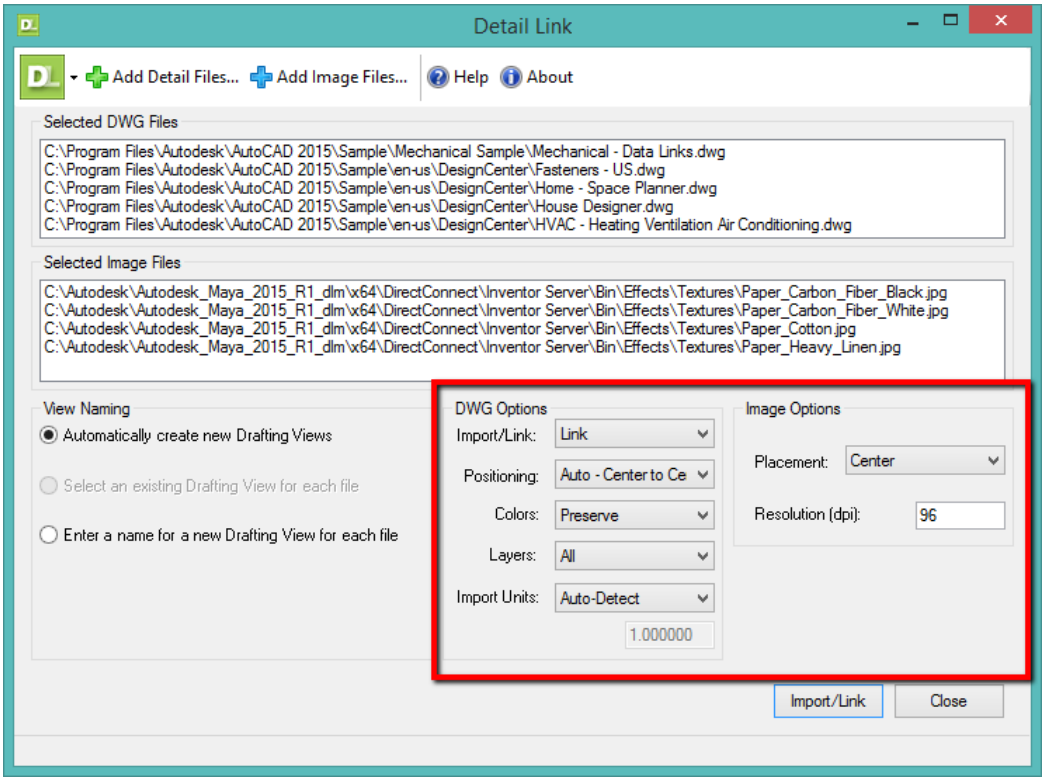
The "*Select an existing Drafting View for each file*" option allows selecting an existing drafting view for each DWG or image to be imported/linked into Revit. If an appropriate view does not exist the option to create a new view can be used instead.



The *"Enter a name for each new Drafting View for each DWG"* option requires manually entering a name for each new drafting view to be created. If an appropriate view already exists the option to select an existing view can be used instead.

Options

The options area are used to configure the settings to use when importing or linking each file.



DWGs can either be imported or linked into the project. The Import/Link option controls whether to link or import the CAD detail. CTC recommends as a best practice to **link** CAD files where possible.

The Positioning option controls whether the DWG file is placed “Auto - Center to Center” or “Auto - Origin to Origin” within the Revit environment.

The Colors option controls how to handle layer colors from AutoCAD. The options are to preserve, invert or convert to black and white.

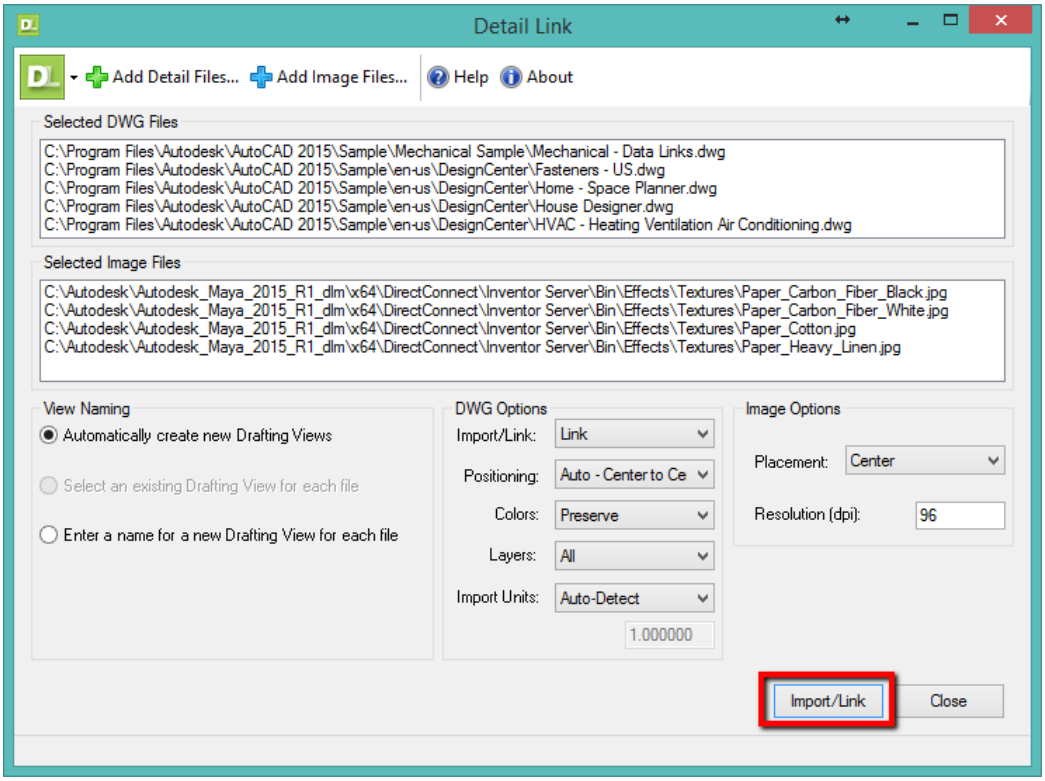
The Layers option controls whether to import or link all layers from the DWG file or only the visible layers.

Import units are typically set in the original DWG file but if the units are unknown, or alternative units are needed, they can be set using the Import Units option.

Image files can only be imported, the image options control how to position the image file and what the resolution of the image should be.

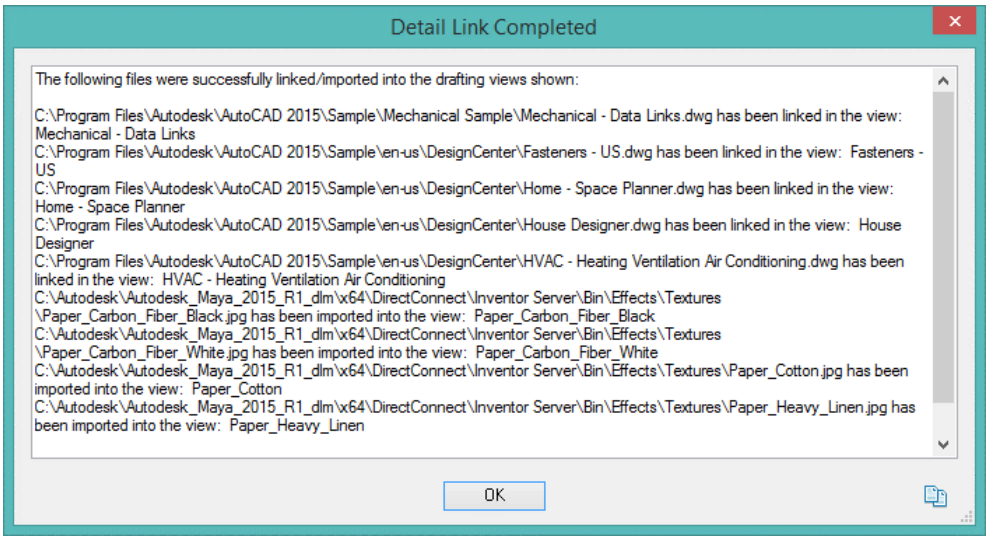
Starting the Import

After all options have been configured, click the “Import/Link” button to import or link the DWG files into Revit.



A progress bar will appear at the bottom of the screen while the drawings are being imported.

Once processing is complete, a report will show the results:



The icon in the lower right corner of the window will let you copy the contents of the window to the clipboard.

If any drawing files failed to link they will show up in a separate section at the bottom of the report.

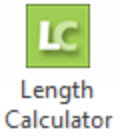
Length Calculator

Introduction

Length Calculator is a simple add-in designed to assist during the design phase of duct, pipe, conduit or cable tray layout by quickly calculating the length of a run.

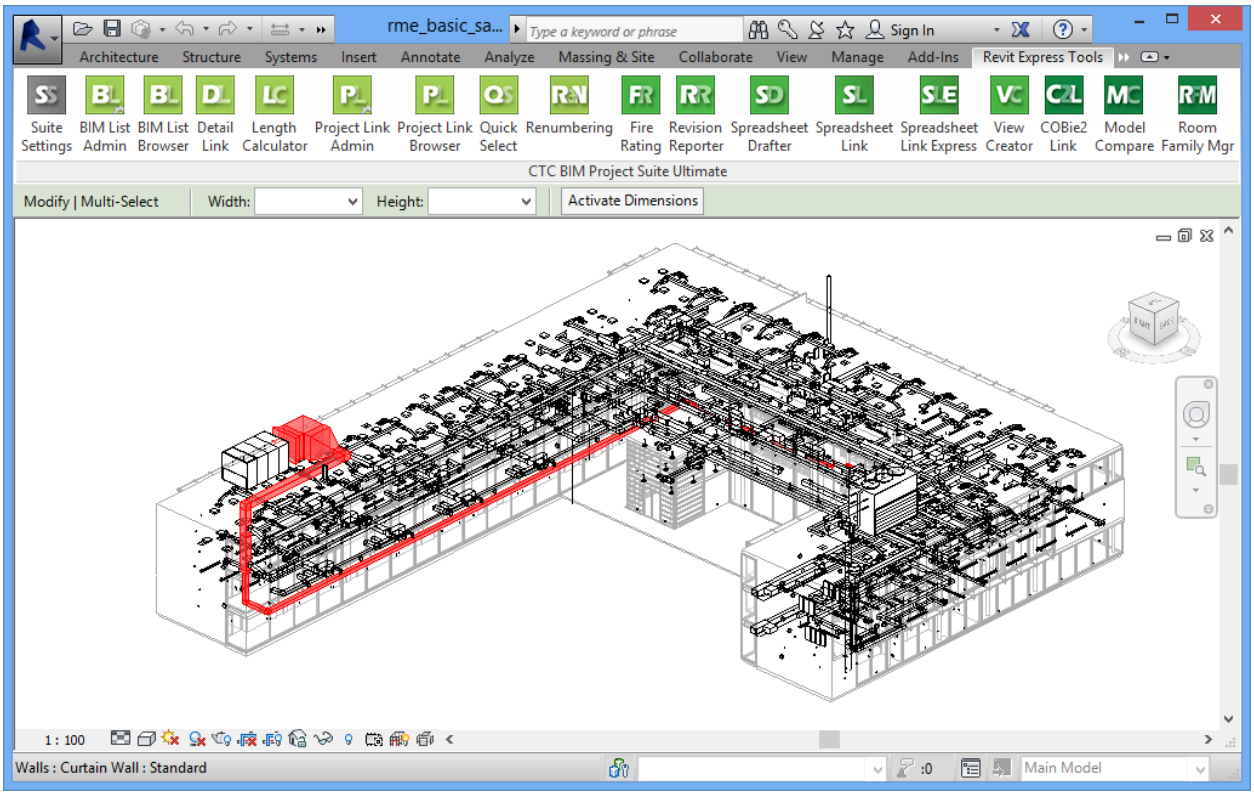
Starting Length Calculator

On the Revit ribbon, click on the “Length Calculator” button.

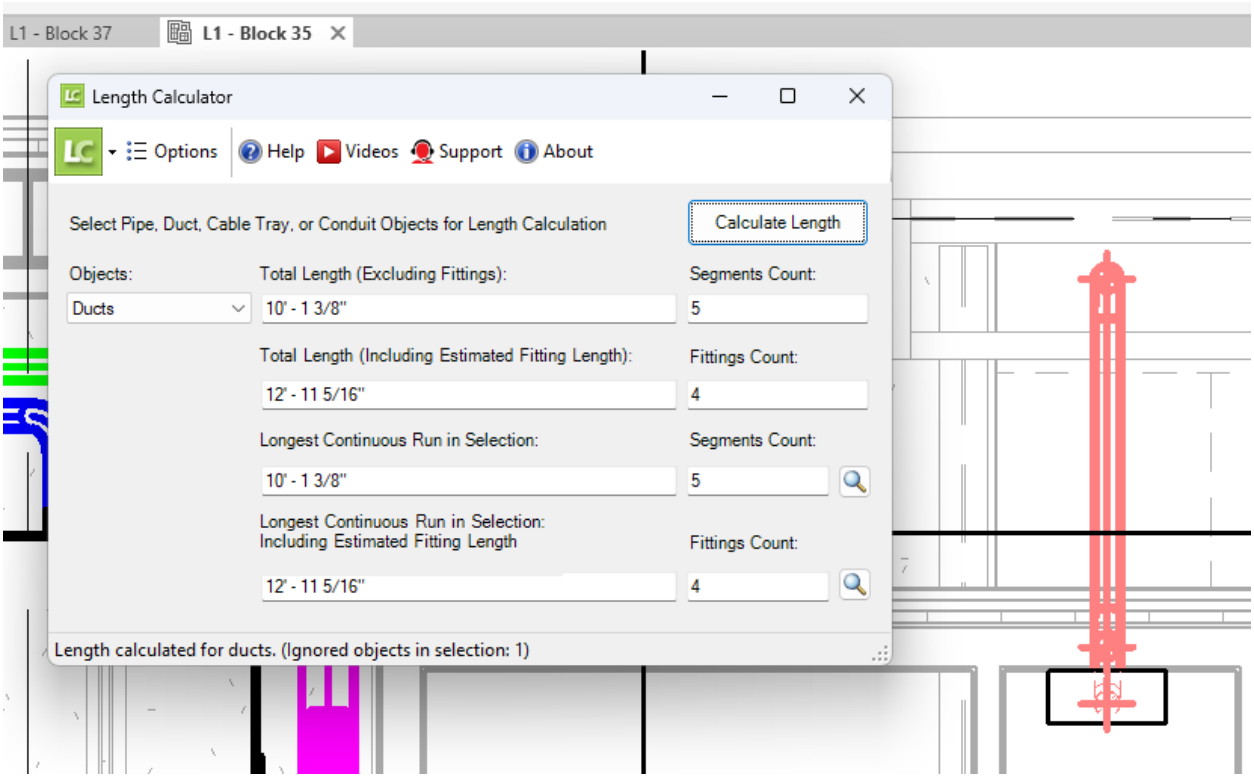


Calculate a Run Length

To calculate a run length, select the elements in the run.

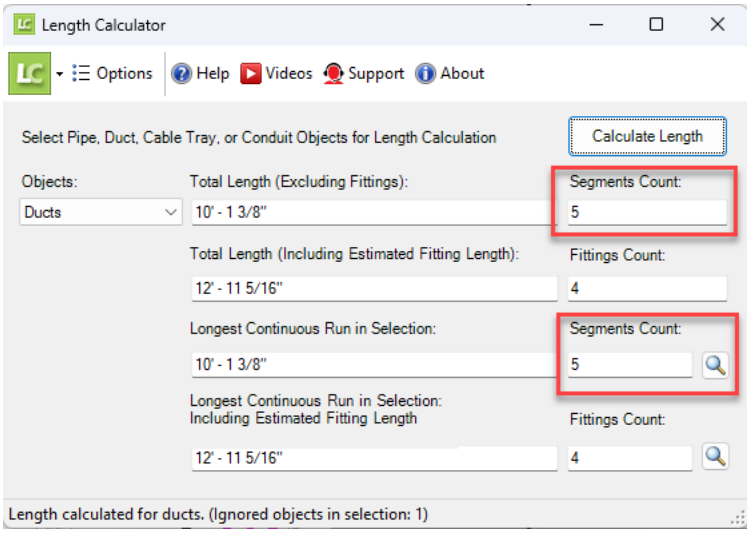


With the elements still selected, launch Length Calculator and click the “Calculate Length” button.



The length of any selected pipe, duct, cable tray or conduit will be calculated in the current project units and displayed in the “Total Length” field. Fittings will be shown calculated as part of the total length including their estimated length (due to their actual linear dimension not being available).

The number of segments of the selected run will also be shown in the “Segments Count” field.

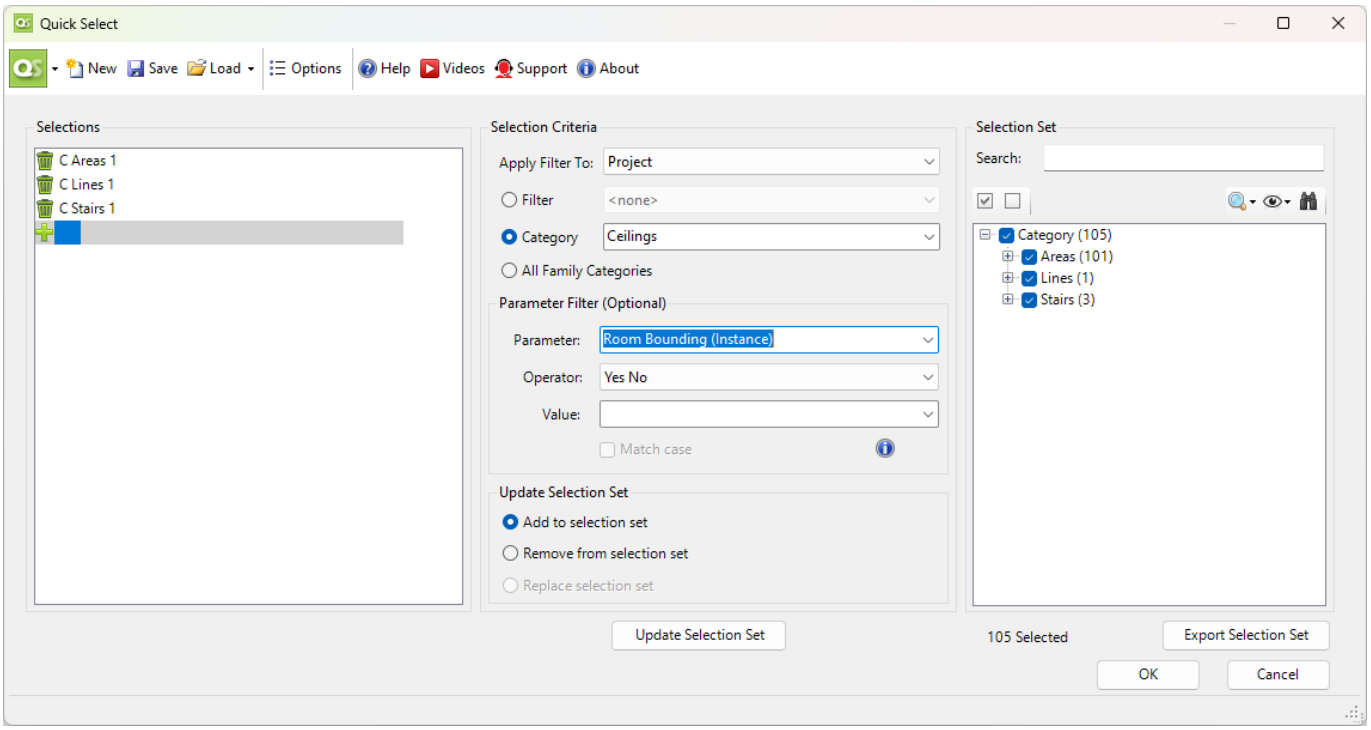


Quick Select

Quick Select facilitates the selection of specific elements by Revit filters or specific categories and parameter values. The elements that match the filter criteria can either be added to, removed from or replace the currently selected elements. In some cases it may be beneficial to run through the Quick Select interface more than once to refine selection results.

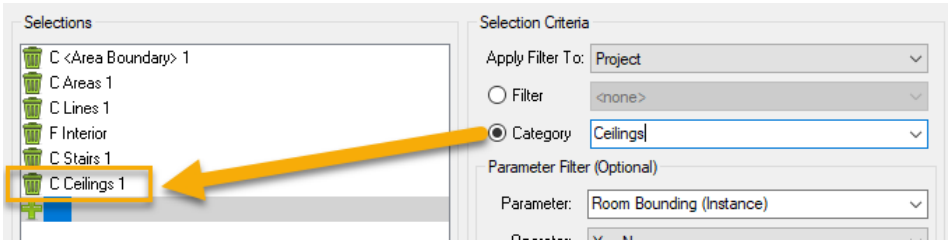
Starting Quick Select

On the Revit ribbon, click on the “Quick Select” button



Selections

Quick Select can build a new selection, add to an existing selection, remove items from an existing selection, or replace the current selection altogether. The Selections list shows the selection criteria that have been created. For instance, when choosing Category as the first criteria, an item will appear in the list with 'C' (category).



If choosing 'Filter', an 'F' will preced the filter name.

To create more than one criterion for the same category or filter:

1. Click on the plus in the list
2. Select the same filter or category
3. Choose additional or other Parameter Filter options

Selection criteria of the same category or filter will be numbered, like this:

```
C Areas 1

C Areas 2
```

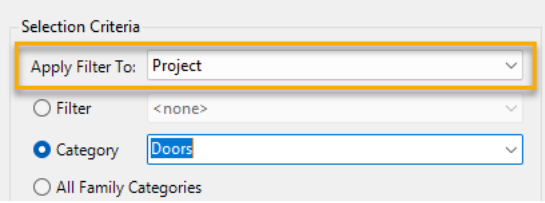
To modify the selection criteria of an item in the selections list, simply select the item and change it's properties.

Selection Criteria

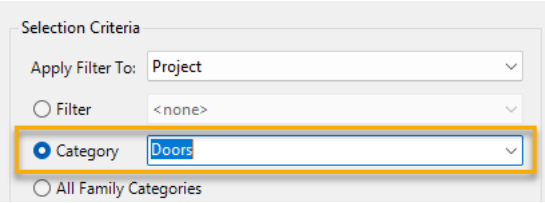
The three options in the “Apply Filter To” dropdown are listed below and determine which elements will be considered in the selection filter:

- Project – All elements in the current Revit project
- Active View – Only elements in the current Revit view
- Current Selection – Only elements in the current selection

In this example, a new selection will be built using the “Project” option.

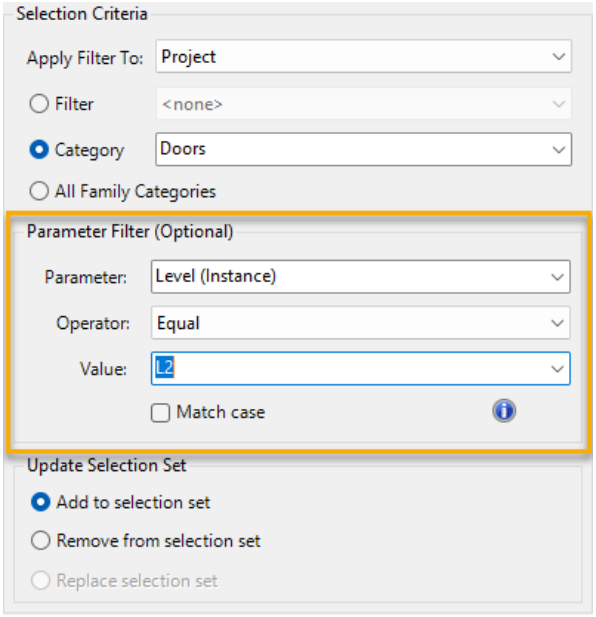


The next step is to decide how to build the filter. Quick Select can utilize an existing view filter or to build a filter by category. In this example the category option is used and the “Doors” category has been selected.

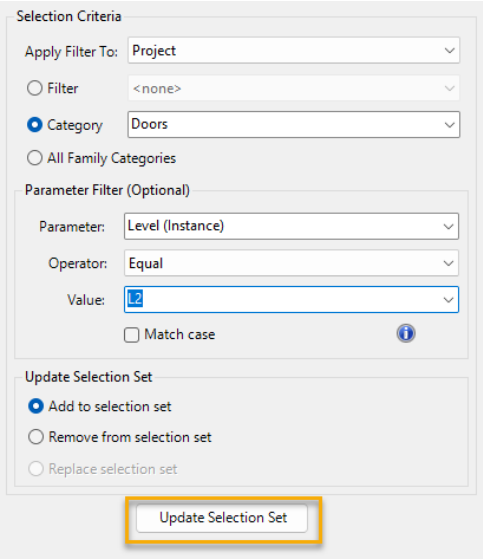


HINT: Type the name of the desired category to find it in the list more quickly.

At this point clicking “Select” would add all doors in the project to the selection set, however the filter can be further refined using the parameter filters. In this example the “Level” property will be used to only add doors on level 1 to the selection set.

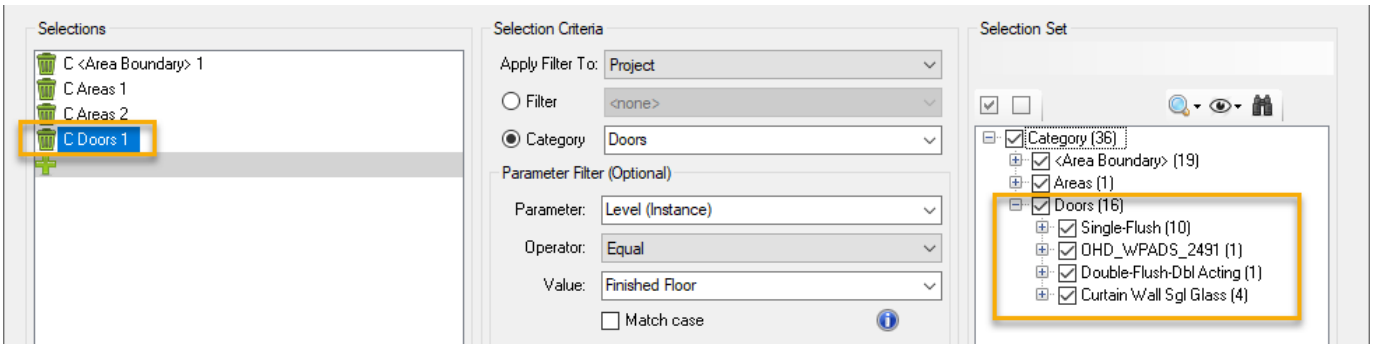


Once the filter is configured click the “Update selection set” button to add the elements that fall under the filter to the list.

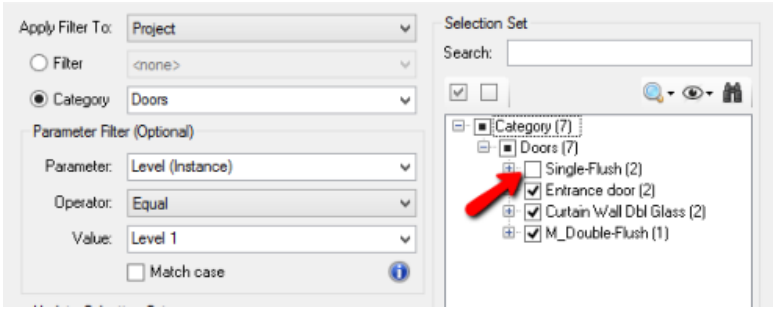


The “Selection Set” window will be updated to reflect the results of the filter and the "Selections" list will now include the new criteria.

In this case the doors in the project from Finished Floor are displayed. The doors category has been expanded to show the different families and how many instances of each exist.



The tree view of the selection set can be used to further refine the selection. In the example below, unchecking the "Single-Flush" family from the tree view will remove the two instances of that door from the selection set.



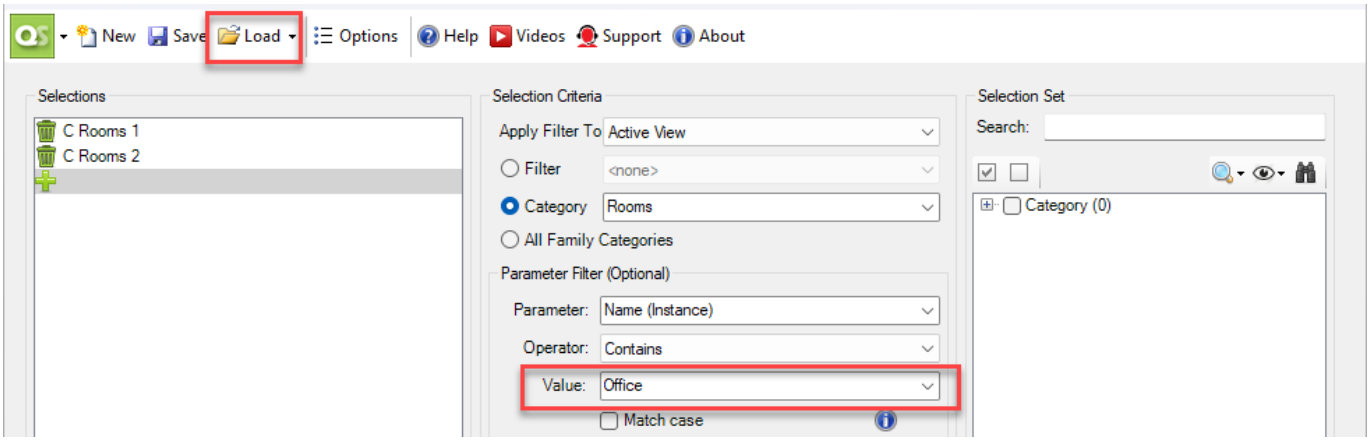
TIP: Refining Selections

It may be desirable to refine a selection with more granularity than can be achieved by a single filter. If additional filtering is desired, create duplicate selections as many times as needed, each time applying the changes to the selection set until the target elements are selected.

Saving and Loading Selection Settings

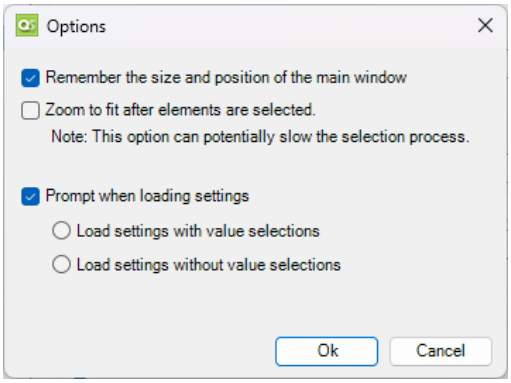
Quick Select criteria can be saved for later use. The filters and their values are stored in a file with a .qssh extension. After the criteria has be set, click the save button on the toolbar at the top and specify the name and location of the .qssh file.

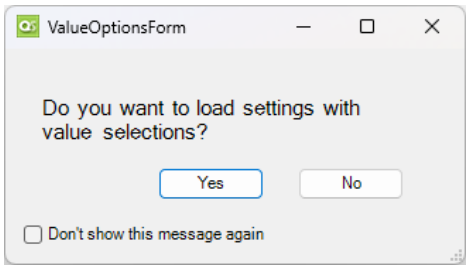
To load the settings, choose either 'Load with Values' or 'without'. When loading with values, the chosen value from the parameter filter will be set. When loading without values, the values are ignored and will require a selection to apply.



Settings Load Options

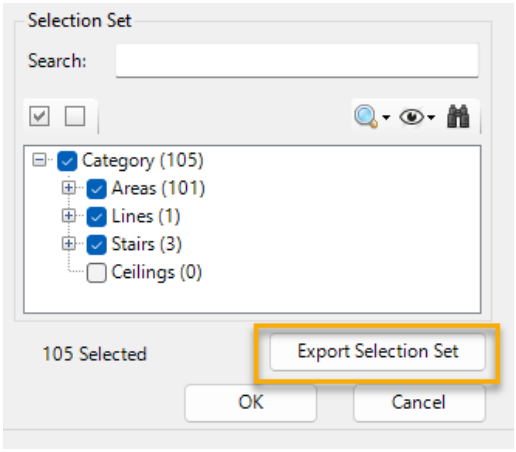
In options, the default is to prompt the user to choose each time settings are loaded whether to include values. The options can alternatively be set to default to one method and never prompt:





Exporting Selections

The list of selected elements can be exported as a spreadsheet if desired. To do this, make the selections and click the "Export Selection Set".

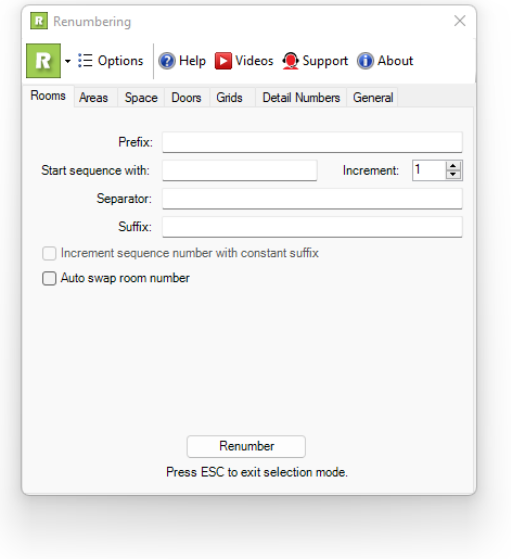


Renumbering

Starting Renumbering

On the Revit ribbon, cick on the “Renumbering” button.

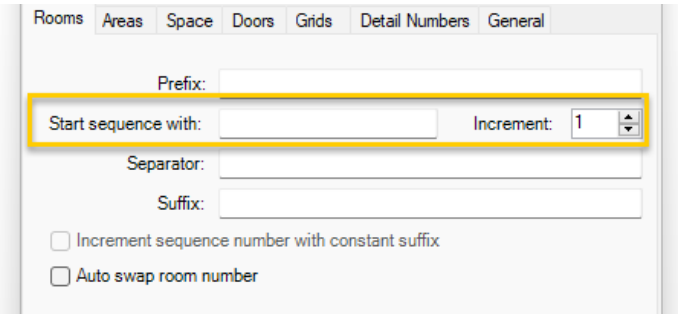
There are several tabs to allow renumbering elements, rooms, doors, grids and detail numbers.



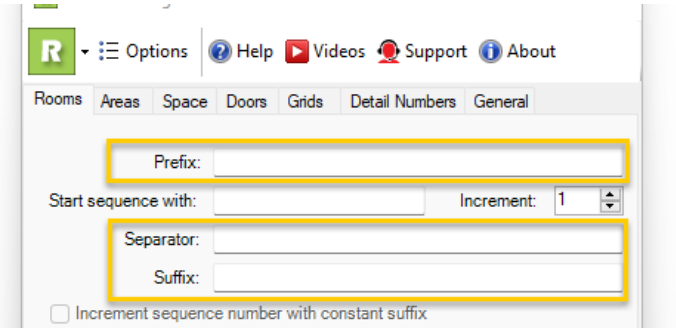
Sequences can be alphanumeric and in most cases, increments will follow some common patterns. For example, a “Start sequence with” value such as 001 will increment using that pattern up to 009 then subsequently shift to a single place zero (010, 011, etc.). This convention does not apply to a specified Prefix value.

Renumbering Rooms, Areas and Spaces

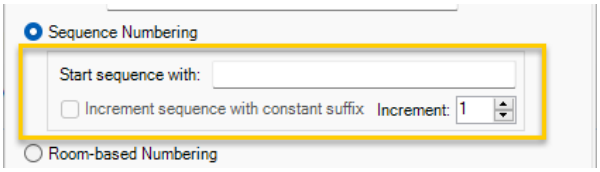
To renumber areas select the “Areas” tab. Enter a value in the *“Start sequence with”* textbox.



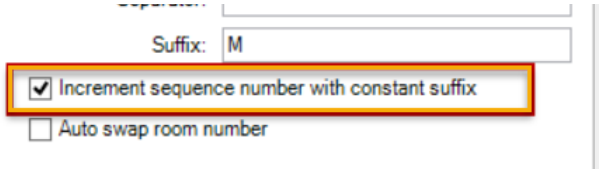
The “Prefix” and “Suffix” textbox is optional and can be used to pre/append values to the sequence number. The separator is also optional and defines additional characters to use as a separation between the sequence number and the suffix.



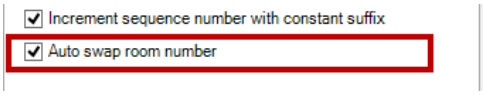
Specify the ‘Start sequence with:’ to begin numbering with that value. Choose the ‘Increment’ value to increase subsequent numbers by that increment.



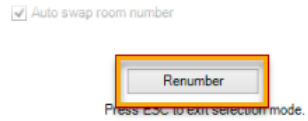
If the “Increment sequence number with constant suffix” checkbox is checked, all subsequently renumbered areas will receive the specified suffix value. With this option disabled, the suffix value will increment for each area with a constant number; for example, if the first area’s suffix is “1” the suffix shown next will be “2” . In the example below, deselecting this option would increment “M” to “N”.



If the “Auto swap area number” checkbox is checked, the number will be swapped automatically to avoid duplicates.



Once the number format is set, click on the “Renumber” button to start selecting areas from the active document.



The order in which the areas are numbered depends on the user selection. While selecting objects, the Renumbering tool will display the next area number in the sequence.

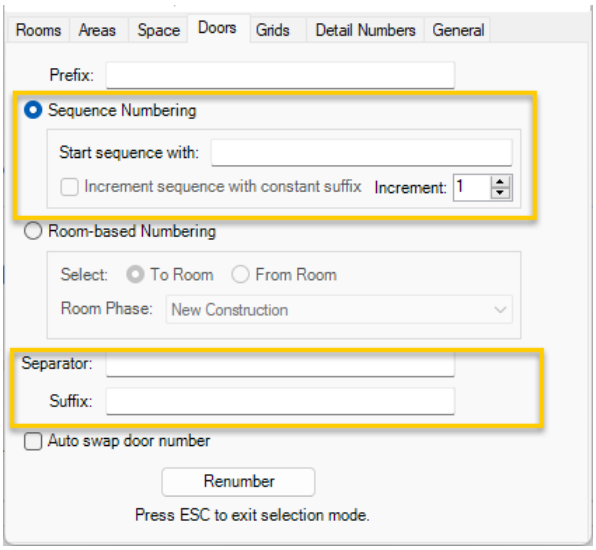
Press the **Escape (Esc)** key, located on the upper left corner of the keyboard, to discontinue the selection prompt.

Renumbering Doors

To renumber doors, select the “Door” tab.

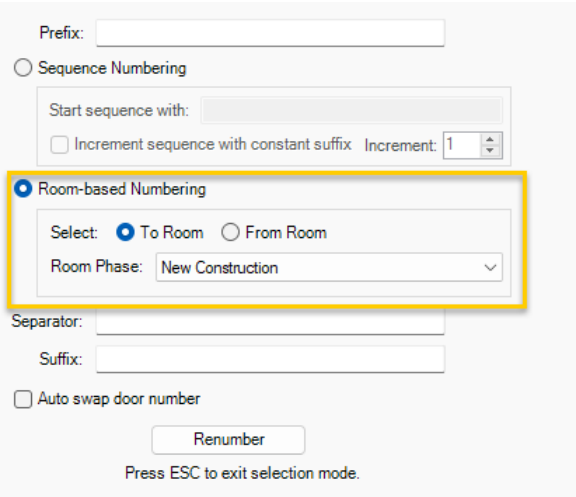
Two methods can be used to renumber doors: sequential numbering (similar to the room renumbering) or the To Room/From Room property.

The “Start sequence with” textbox is used to set the starting sequence value and can optionally be combined with the Separator and Suffix fields below.

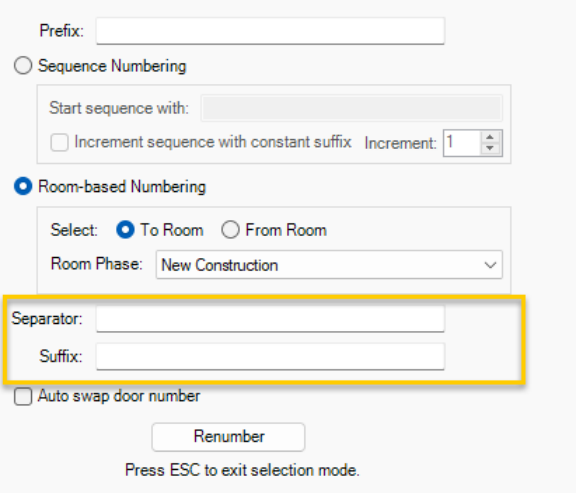


Once the values have been supplied, click the “Renumber” button to begin renumbering doors. Press the **Escape (Esc)** key, located on the upper left corner of the keyboard, to discontinue the selection prompt.

The other option is to renumber doors based on “To Room” and “From Room” property of a door. To use this method select the “Room-based Numbering” option.



This function works by pulling the “From Room” or “To Room” property from the door. Select the desired property and which phase the rooms exist in.



The “Separator” and “Suffix” options will be used a room contains more than one door, all the doors in that room will be marked with the room number followed with the separator, if entered, and the suffix. If a room has only one door it will be marked with the room number only.

Once the options have been selected click the “Renumber” button to begin renumbering doors. Once each door is numbered in the desired order, press the **Escape (Esc)** key, located on the upper left corner of the keyboard, to discontinue the selection prompt.

Important: The tool won’t number the door correctly if the door has been flipped. To resolve this issue, please change the “From Room” and “To Room” properties of the door.

Renumbering Grids and Detail Numbers

The grid and detail number renumbering functions the same as the Room renumbering. Supply the configuration options as desired and click the "Renumber" button. Once each element is numbered in the desired order, press the **Escape (Esc)** key, located on the upper left corner of the keyboard, to discontinue the selection prompt.

Renumbering General Elements

The "General" tab, unlike any of the previous tabs, has the ability to renumber elements from any category with the selected parameter (Mark by default). It is important to remember that it is possible to renumber elements from multiple categories, so be sure to click on only the elements intended to be renumbered.

Special Notes

While renumbering elements, the change to its number is instantaneous. If you need to undo an action, exit the object selection by pressing **Escape (Esc)** key, located at the upper left corner in the keyboard, and click the undo button in the Revit.

View Aligner

Using View Aligner

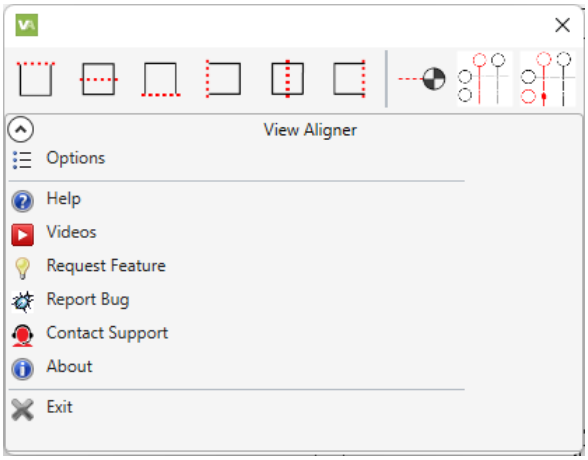
View Aligner helps users with the placement of views on sheets. Use this tool to align views with other views by common edges and levels.

Starting View Aligner

View Aligner is a floating toolbar which can be present even while using other tools and Revit commands.

On the Revit ribbon, click on the “View Aligner” button.

The View Aligner toolbar will open. The toolbar is shown below with the common menu expanded.



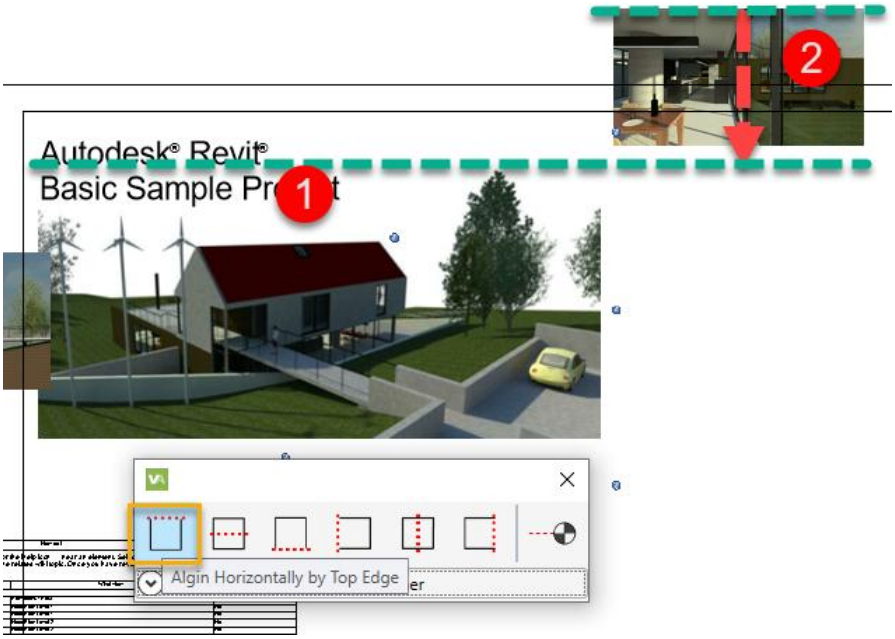
Alignment Methods

Each method described below begins by clicking the toolbutton, selecting the view to align by, then selecting subsequent views to align.

The alignment method ends by pressing the escape (ESC) key.

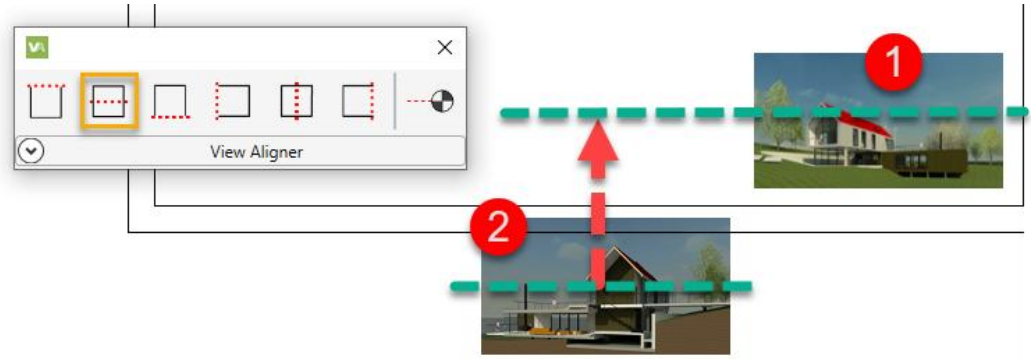
NOTE: Edges of views are defined by their crop boundary.

Align Horizontally by Top Edge



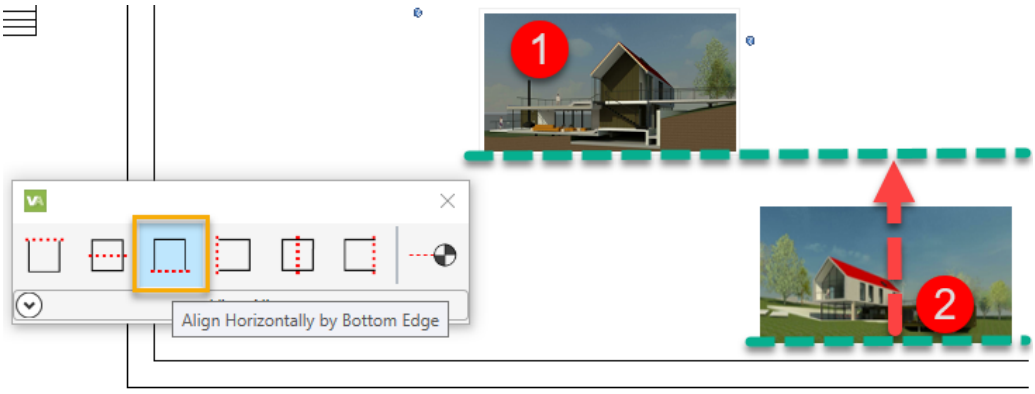
Pick the view to align to (1) then the views to align (2). Press escape when all of the views have been aligned.

Align Horizontally by Center Line



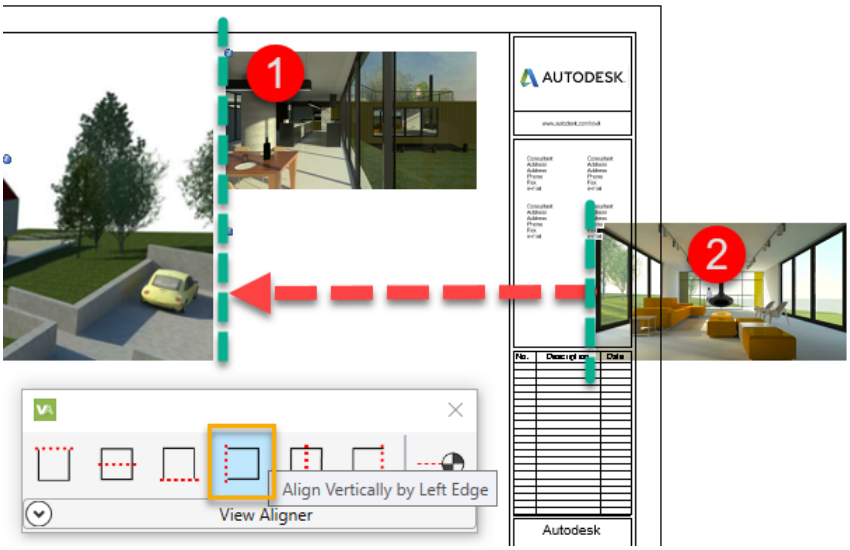
Pick the view to align to (1) then the views to align (2). Press escape when all of the views have been aligned.

Align Horizontally by Bottom Edge



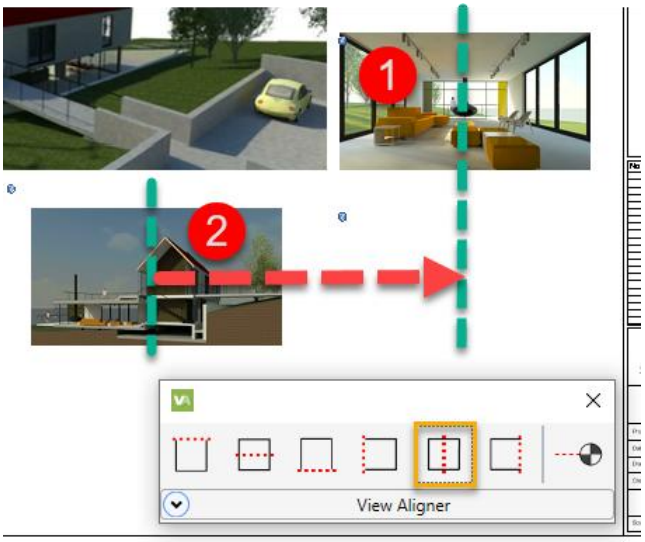
Pick the view to align to (1) then the views to align (2). Press escape when all of the views have been aligned.

Align Vertically by Left Edge



Pick the view to align to (1) then the views to align (2). Press escape when all of the views have been aligned.

Align Vertically by Center Line



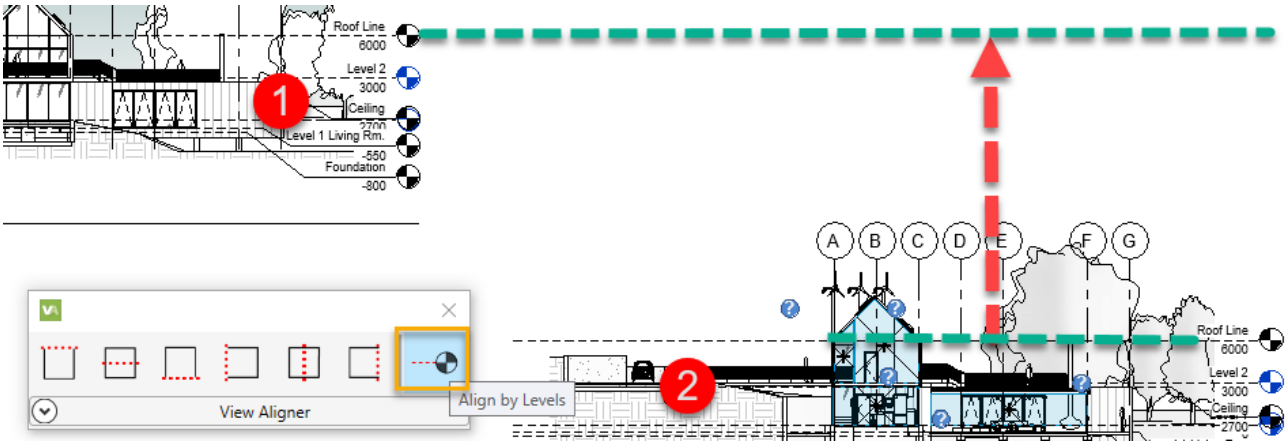
Pick the view to align to (1) then the views to align (2). Press escape when all of the views have been aligned.

Align Vertically by Right Edge

Pick the view to align to (1) then the views to align (2). Press escape when all of the views have been aligned.

Align by Levels

NOTE: Views must be of the same scale.



Pick the view to align to (1) then the views to align (2). Press escape when all of the views have been aligned.

Align by Grid

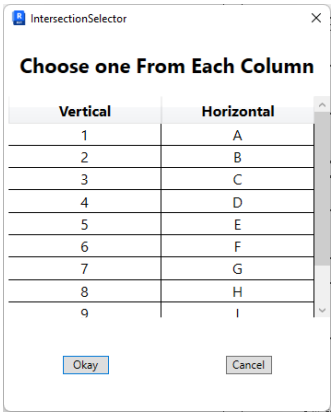
Aligns views by the same grid. Vertical aligns to vertical, horizontal to horizontal. Views must be oriented in the same direction.

Choose a grid from the list that is presented.

Align by Intersection

Aligns views by the same grids that intersect. Views must be oriented in the same direction.

Choose a horizontal and vertical grid in the list that is presented.



Fab Sheets

Introduction

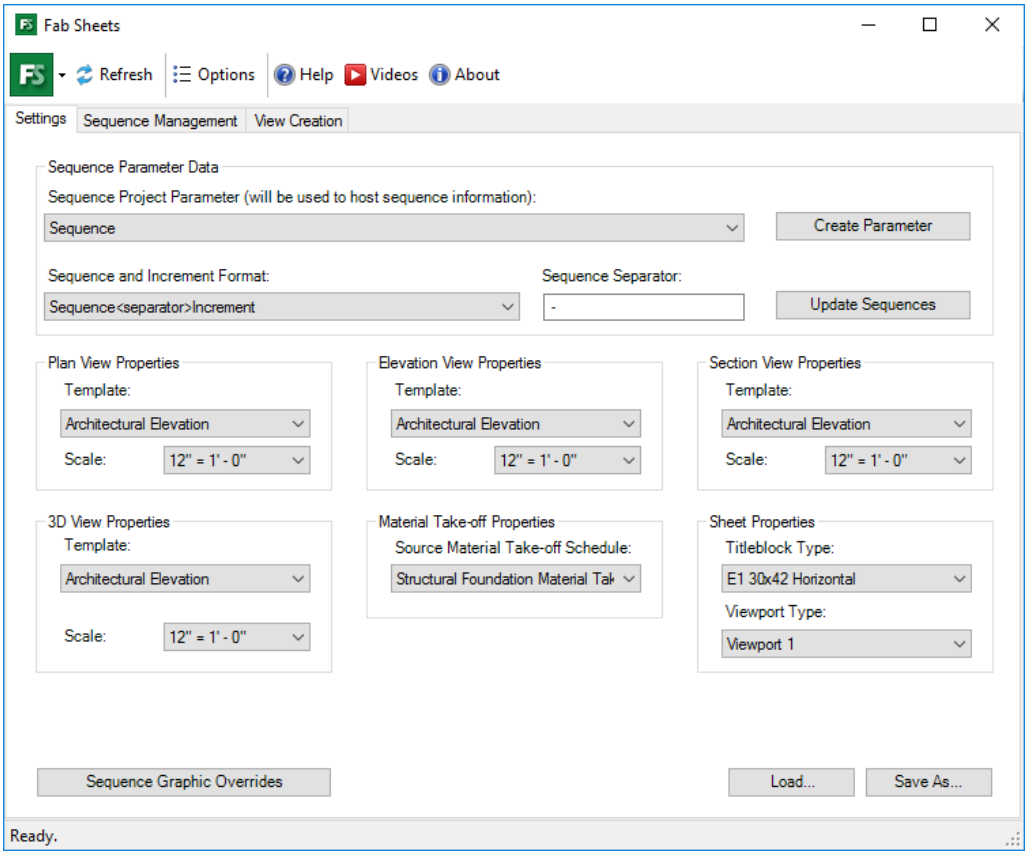
Fab Sheets provides tools to group elements by parameter values, create scope boxes for each group of elements, then produce views & sheets based on the scope boxes. While this tool is geared towards a fabrication workflow it may be applied anywhere multiple views are required for a group of elements.

Starting Fab Sheets

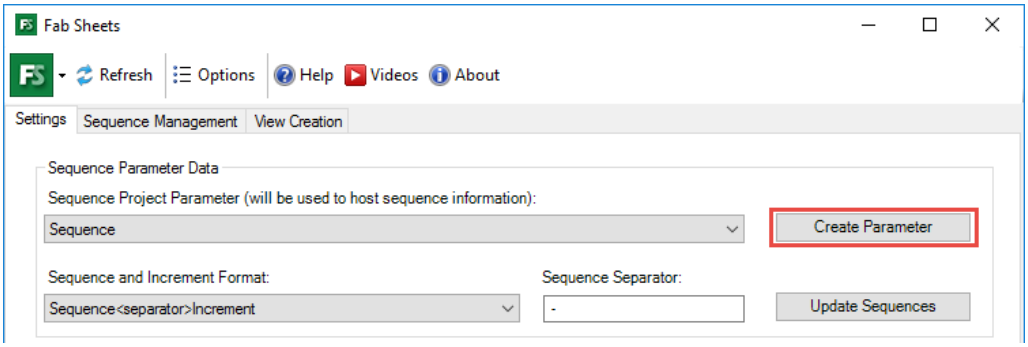
On the Revit ribbon, click on the “Fab Sheets” button.

Settings

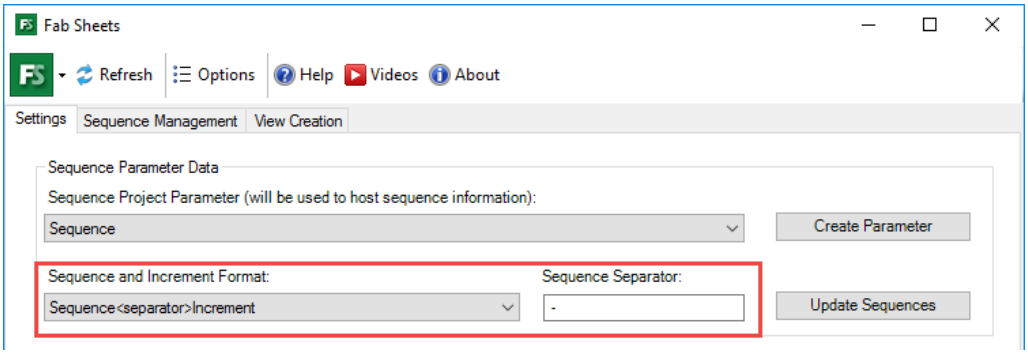
The first tab in Fab Sheets is used to set up all the graphics settings that will be used for view and sheet creation.



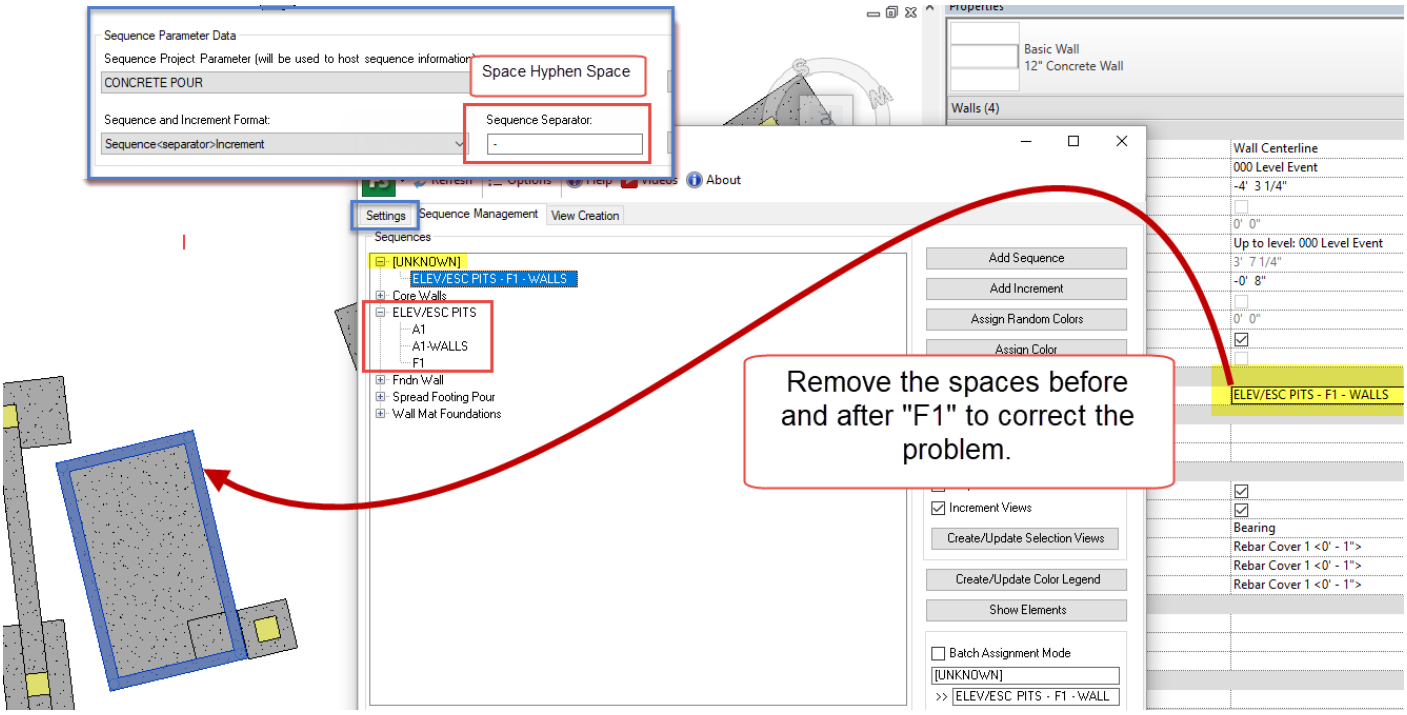
In the “Sequence Parameter Data” area, a project parameter must be specified to host the grouping values for elements. An existing parameter can be selected, or a new parameter can be created using the “Create Parameter” button. While any name can be provided, the default name for this parameter is “Sequence.”



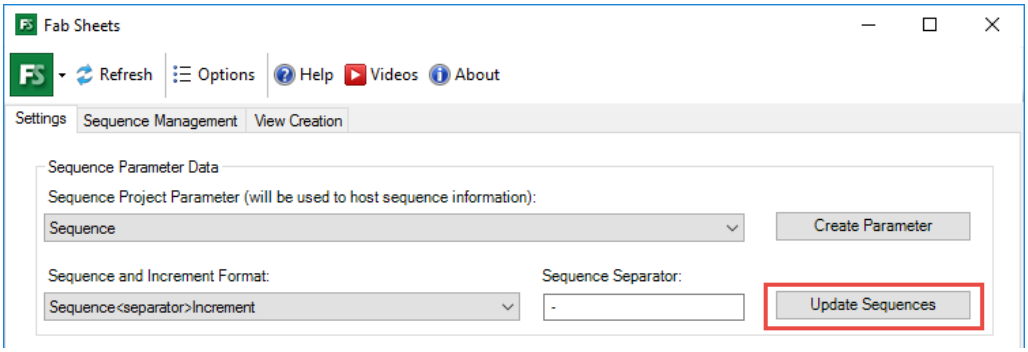
The “Sequence and Increment Format” is used to adjust how the sequence and increment values are assigned to each element when grouping them together. The default setting is “Sequence<separator>Increment” but can be reversed if desired. The “Sequence Separator” field can be modified to adjust how the sequence and increment values will be separated.



NOTE: It is important to choose a separator that will not conflict with the names and values of element parameters. In addition, it is best practice to edit the element parameter values using the Fab Sheets tools to ensure they match the names of the Sequences and Increment. If the values don’t match, Fab Sheets will not be able to determine the sequence group of the elements. In the following example, the walls have a value with too many separators.

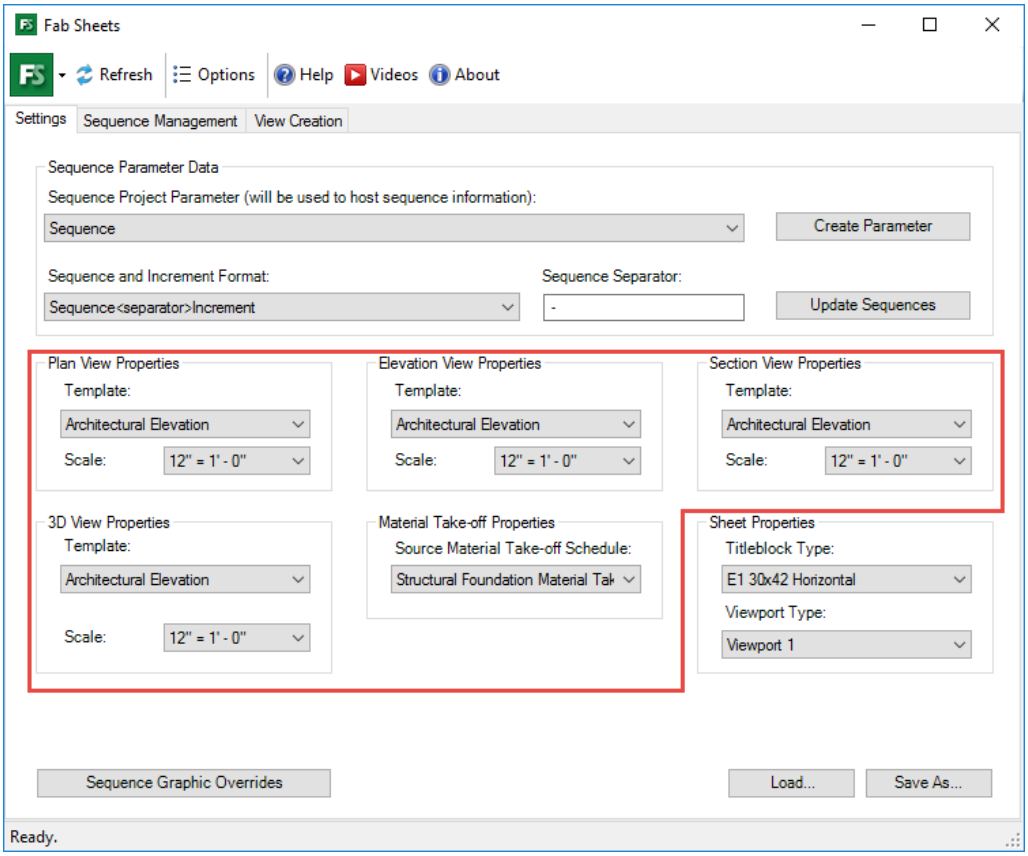


If any of these options are changed after initial setup, the “Update Sequences” button will parse through the project to update any affected elements.

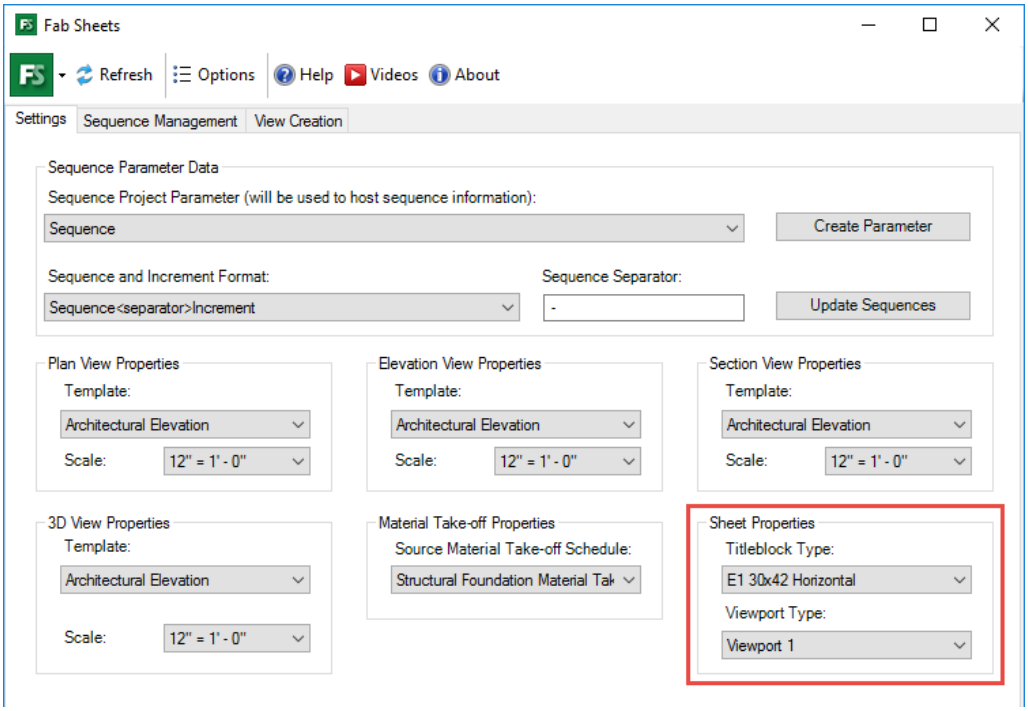


Helpful hint: When creating new sequence parameters, ensure that appropriate categories are associated. This can be managed using Revit’s project parameters tool in the Manage tab.

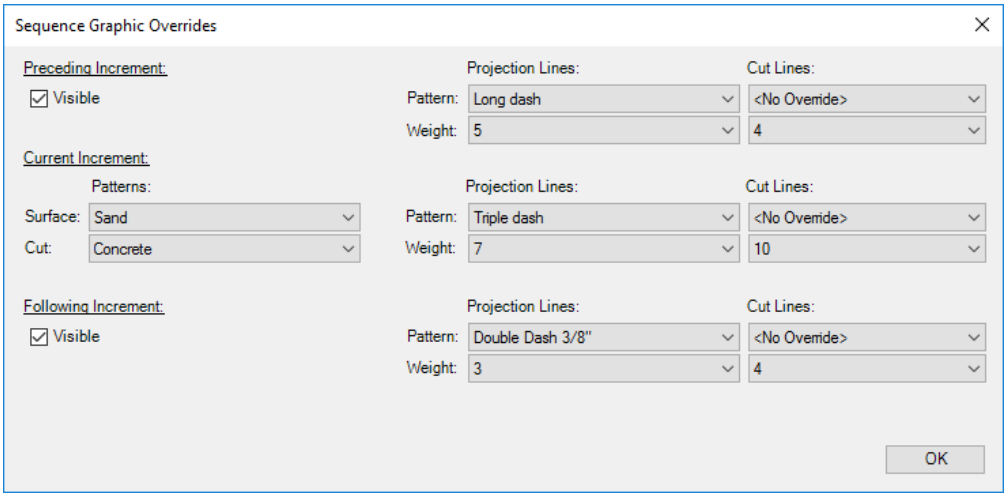
Default view template dropdowns control the view templates that will be applied to views created by the tool. The scale option only takes effect if scale is not included in the view template.



The “Sheet Properties” are used to set the titleblock and viewport to be used when creating sheets and placing views.

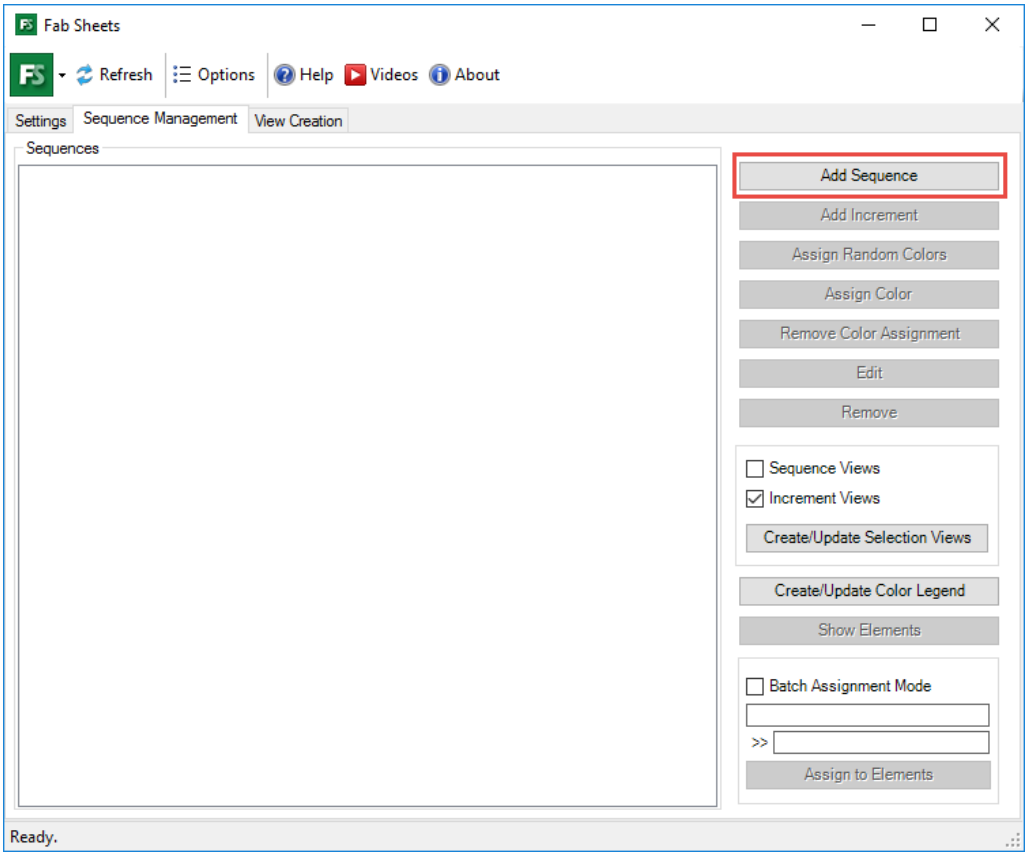


In some Fab Sheets workflows, such as concrete pour sequencing, it is desireable to be able to adjust graphic display options for elements depending on their sequence values. Click the “Sequence Graphic Overrides” button to access the “Sequence Graphic Overrides” dialog. Once any desired changes have been made click the “OK” button to save the configuration and continue.

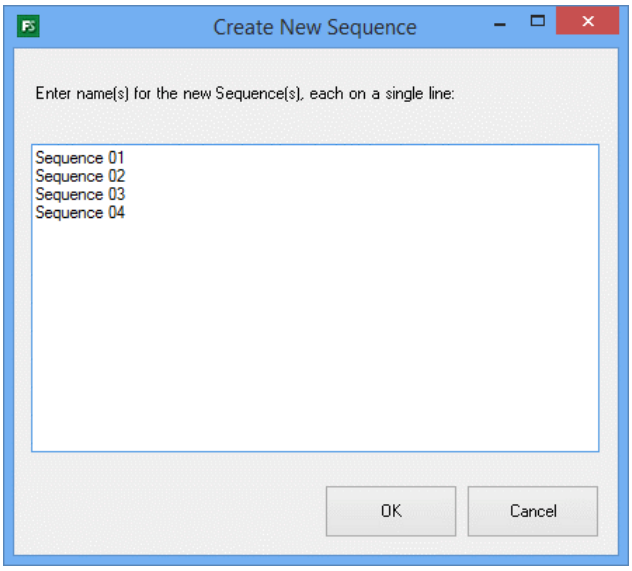


Sequence Management

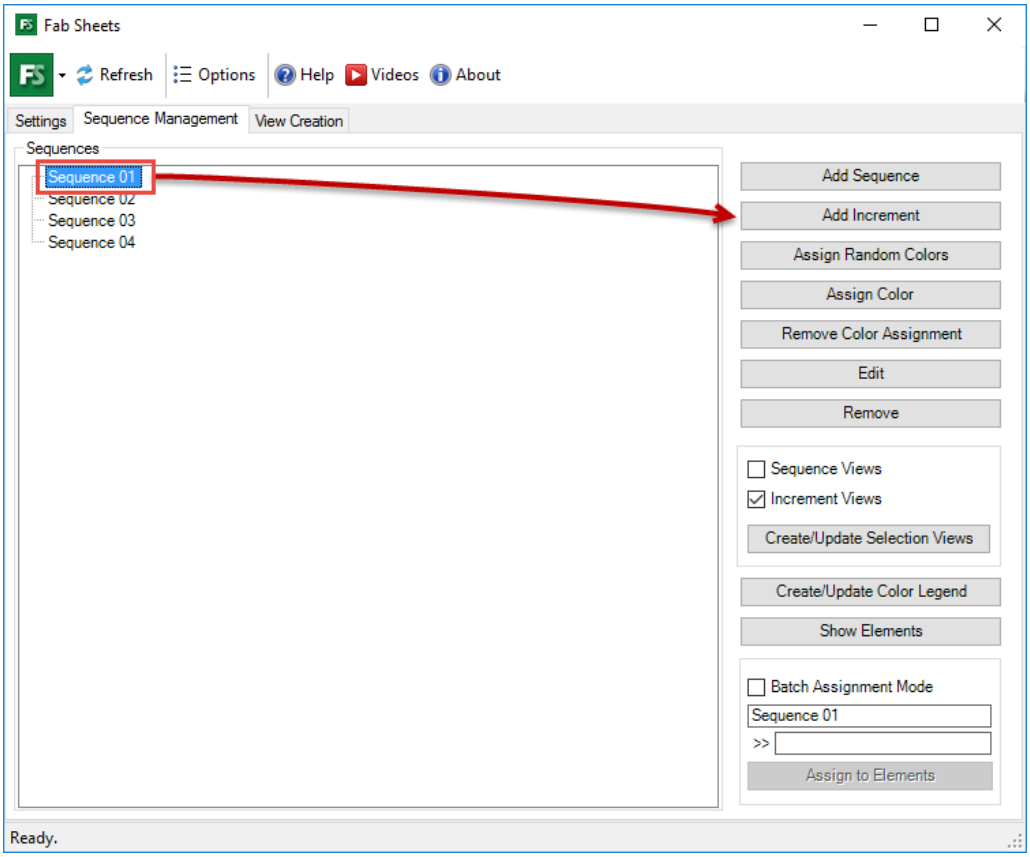
The “Sequence Management” tab is used to build the sequence/increment structure, create selection views and assign elements to increments. Sequences are used to organize increments, and increments are assigned to elements to build groupings. To create a new sequence, click the “Add Sequence” Button.



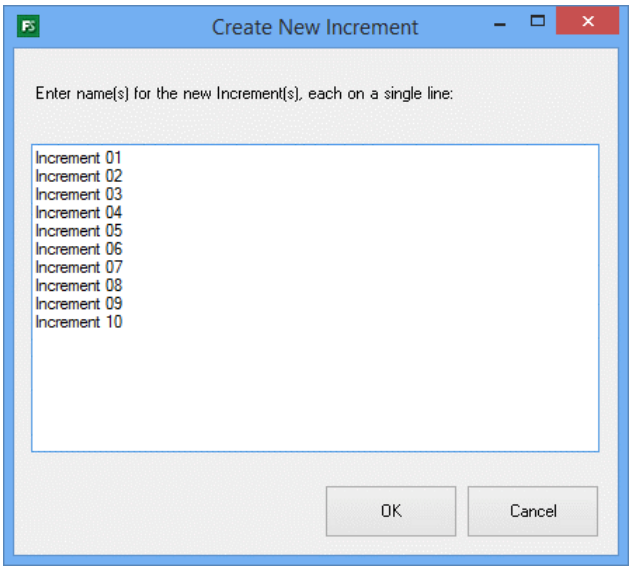
In the “Create New Sequence” dialog type are the name(s) of the sequence(s) to be created. Multiple sequences can be entered at the same time, separated by pressing the “Enter” key. Sequence names can also be generated in a Microsoft® Excel® table, then copy/pasted into this dialog. Click “OK” to create the sequences.



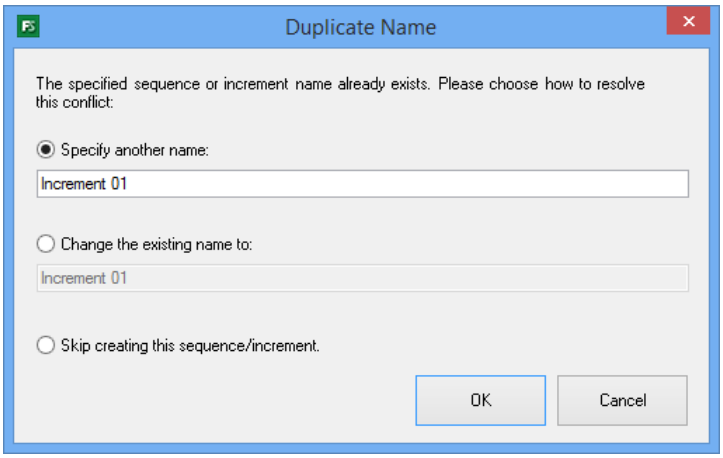
To add increments, select the desired sequence from the list and click the “Add Increment…” button.



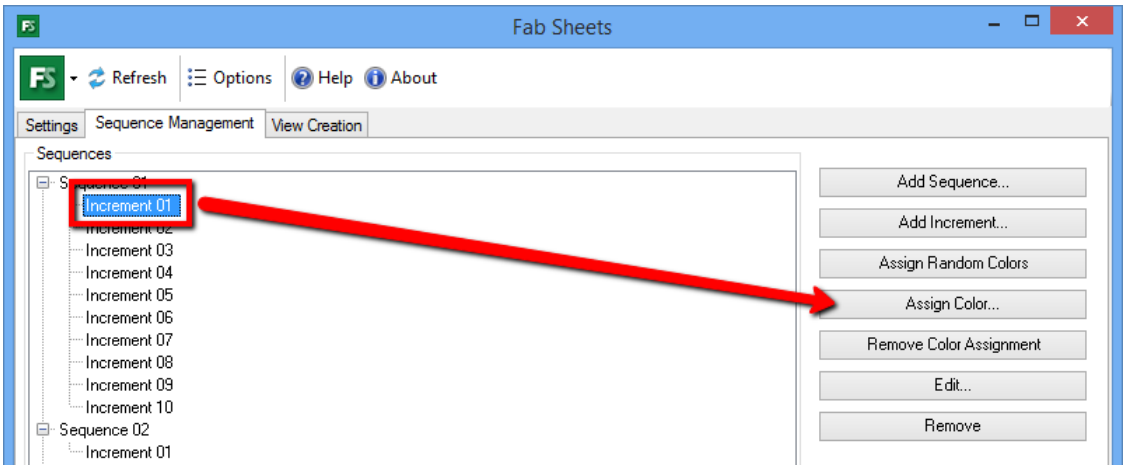
In the “Create New Increments” dialog, type in the name(s) of the increment(s) to be created. Multiple increments can be entered at the same time, separated by pressing the “Enter” key. Increment names can also be generated in an Excel table, then copy/pasted into this dialog. Click “OK” to create the increment(s).



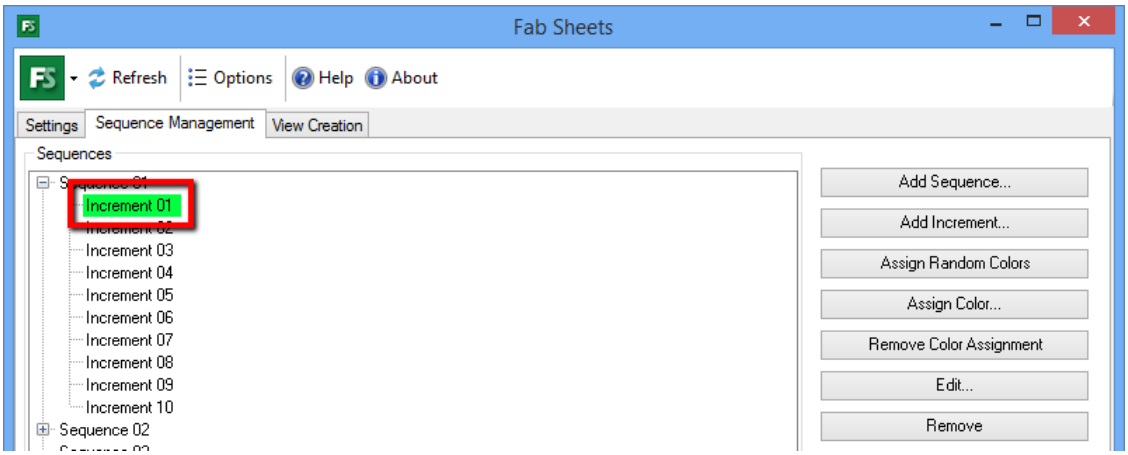
If a sequence name or sequence/increment name combination that already exists is specified, a duplicate name resolution dialog will appear. Select the desired action to handle the duplicate and click the “OK” button.



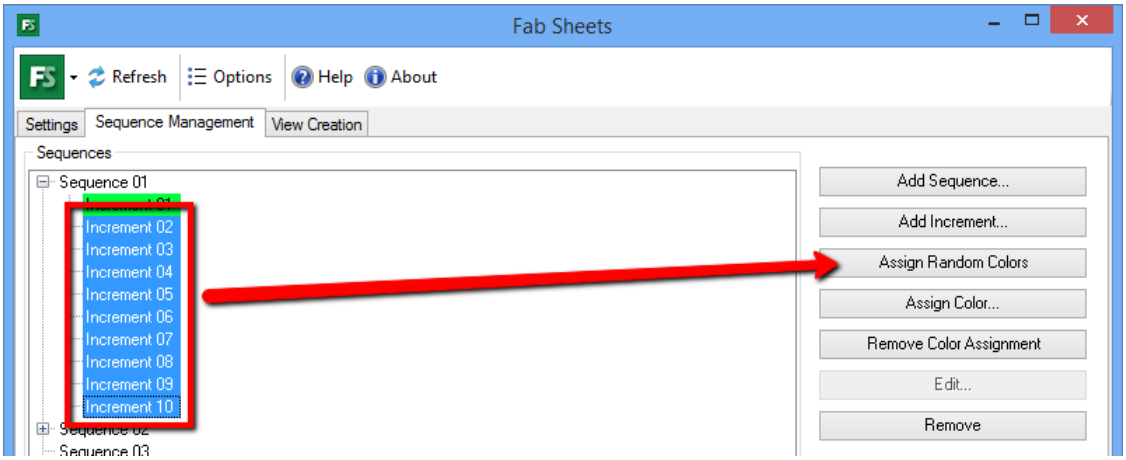
It may be helpful to assign colors to the increments to help identify elements belonging to that increment. Select an increment and click the “Assign Color” button.



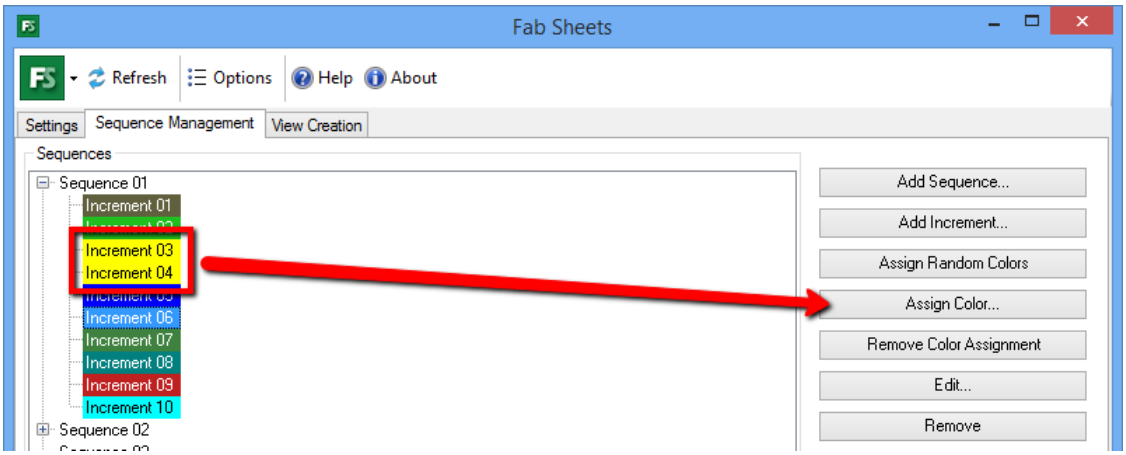
A color selection dialog will appear, select a color and click the “Ok” button. The selected color will be associated with the increment.



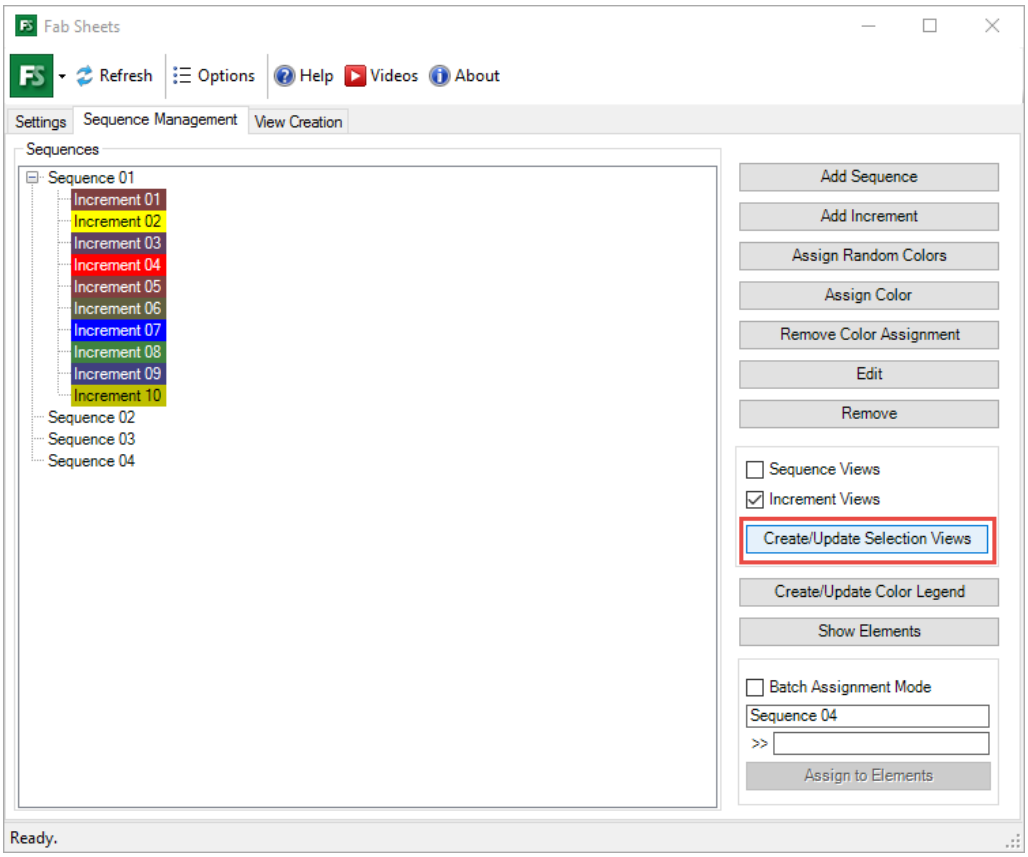
The “Assign Random Colors” button can be used to apply colors to multiple increments at the same time using Shift or Ctrl keys.



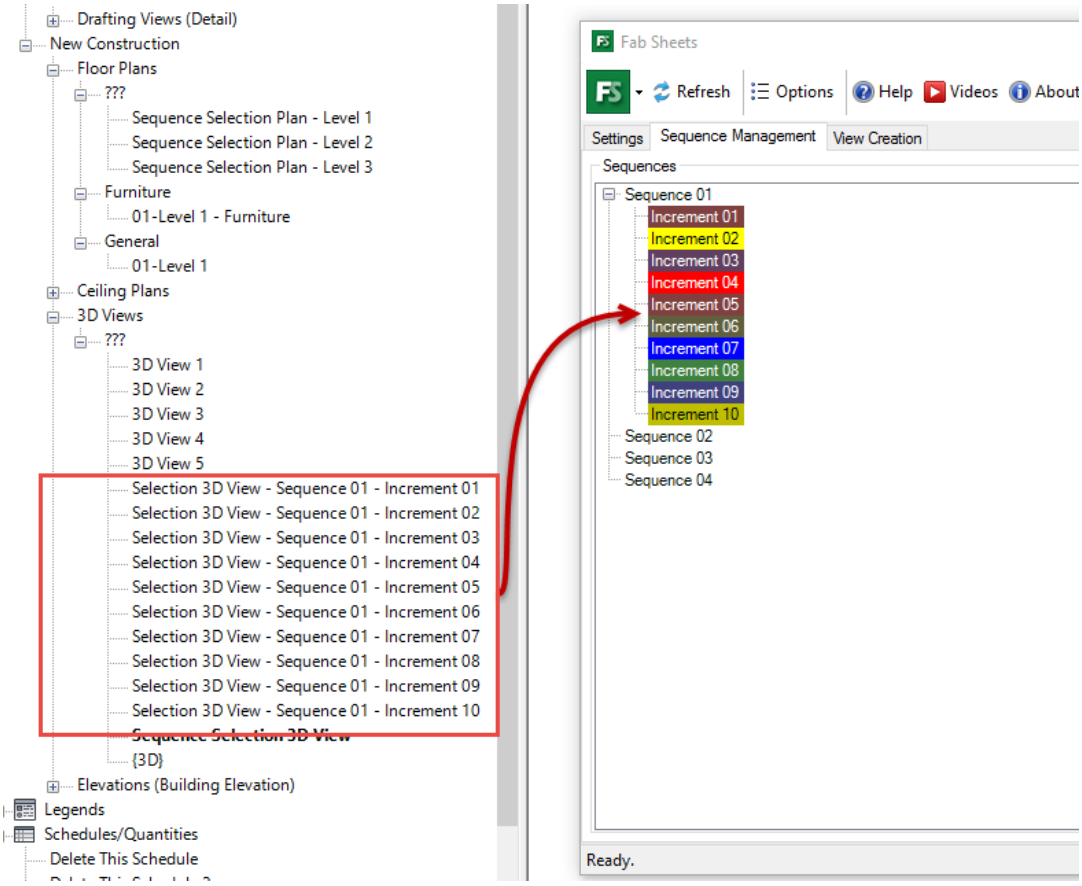
If some of the randomly assigned colors are not desirable, or are too close to their neighboring colors in appearance, select the increment and use the “Assign Color” function to specify a different color.



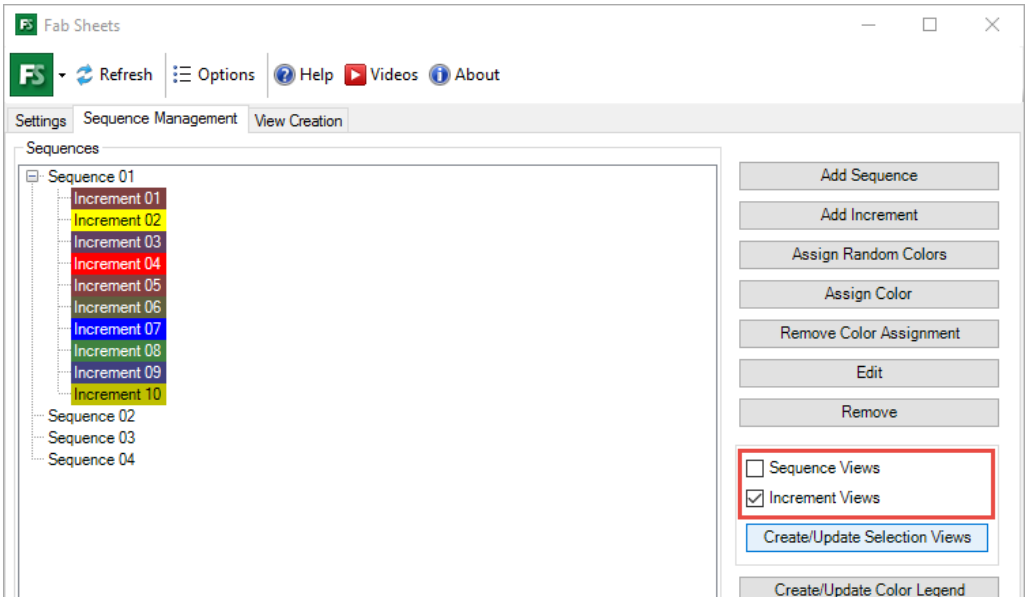
To assist with assigning elements an increment/sequence combination, Fab Sheets can create “Selection Views” which are created with color filters that match the color assignment. To create or update the selection views, such as after changing a color assignment or name, click the “Create/Update Selection Views” button.



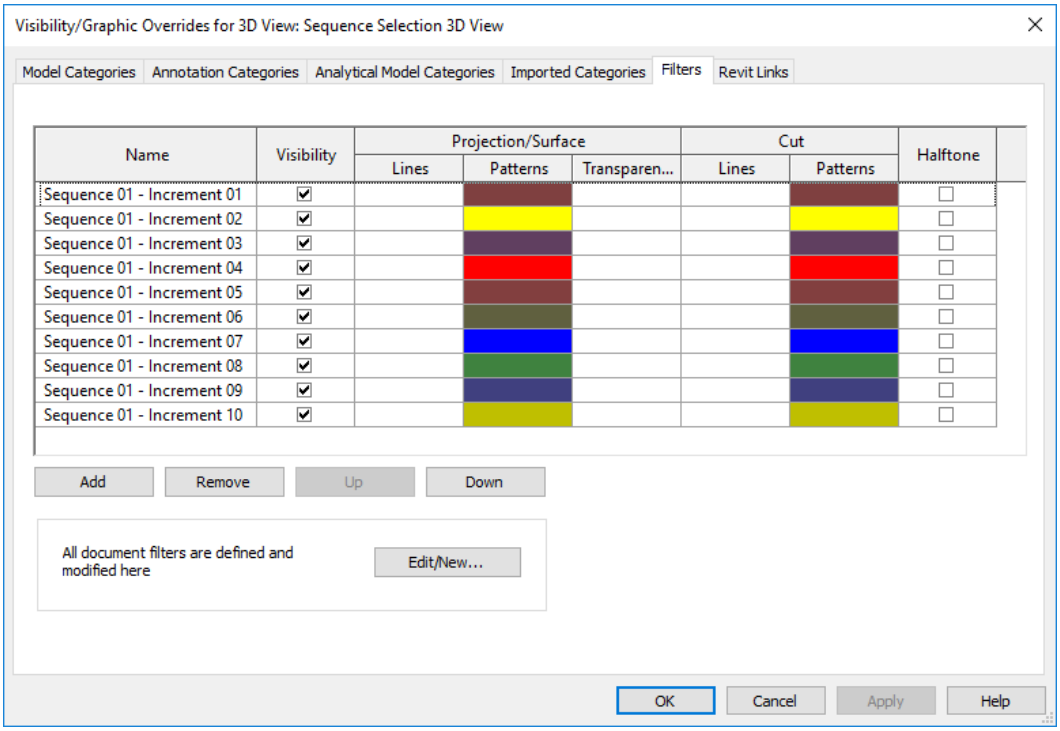
Floor plan views named “Sequence Selection Plan – Level #” will be added for each level of the building. 3D views named “Selection 3D View – <*sequence*>” will be added for each sequence, as well as an overall “Sequence Selection 3D View” view.



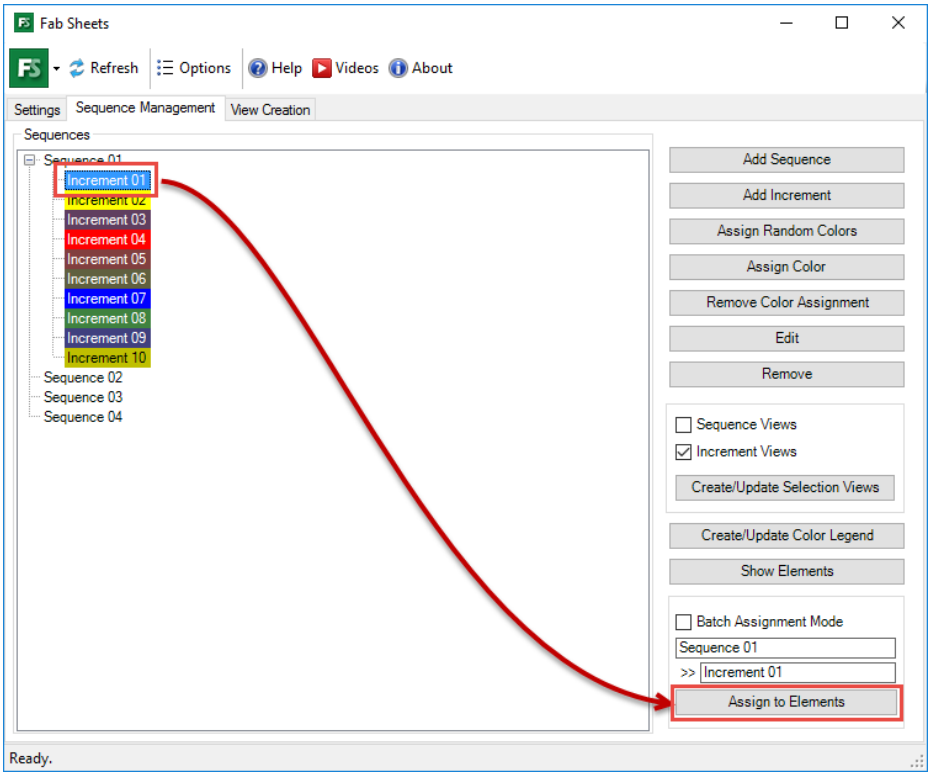
Fab Sheets can create views for both Sequences (shows all increments of the sequence) and Increments (just the elements associated to an increment) by checking the boxes above the Create/Update Selection Views button.



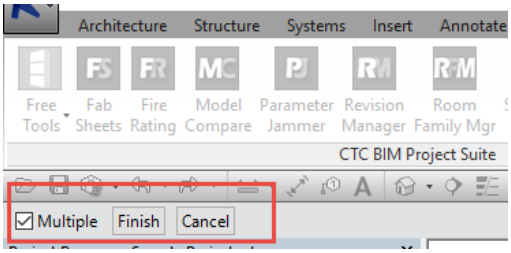
These views are generated with filters to help identify elements that have been assigned to a sequence/increment combo. If changes are made to the sequence/increment structure or names, or if a color is modified, the views can be updated by clicking the “Create/Update Selection Views” button again.



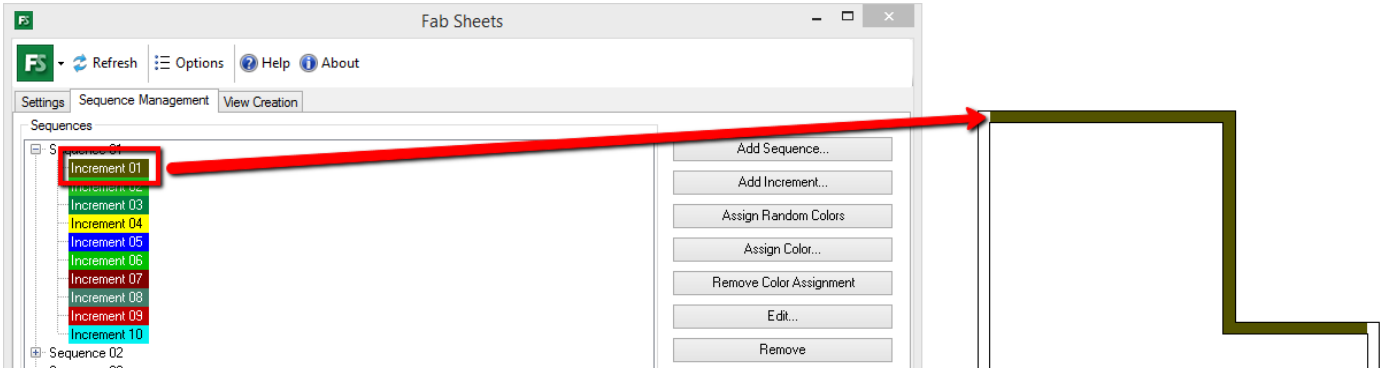
To assign an element to a sequence/increment, select the desired increment and click the “Assign to Elements” button.



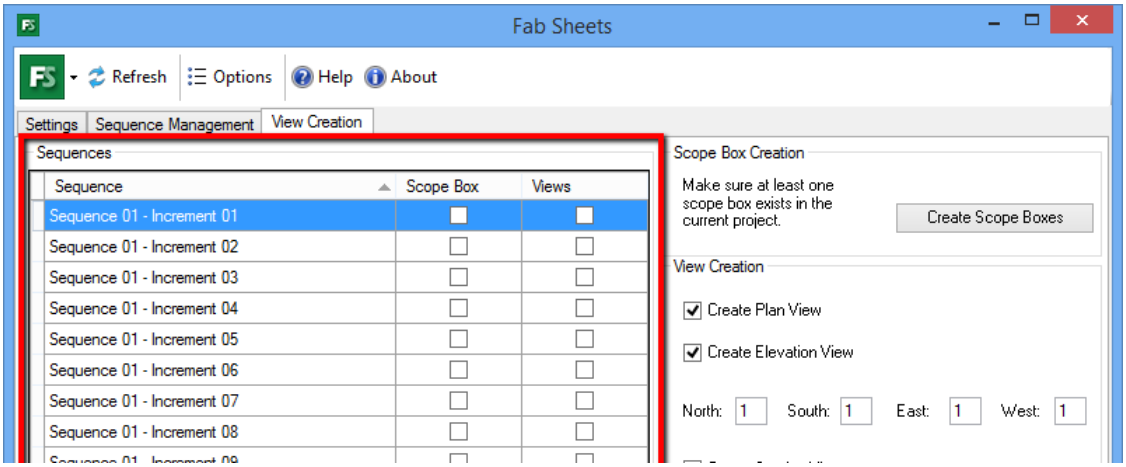
Revit will go into a “selection mode” allowing the selection of multiple elements by clicking on them. Window and crossing selections can also be used in the selection mode. Once all desired elements have been selected, click the “Finish” button from the options bar to assign the elements to that increment/sequence.



The elements will be color coded based on their sequence/increment color:

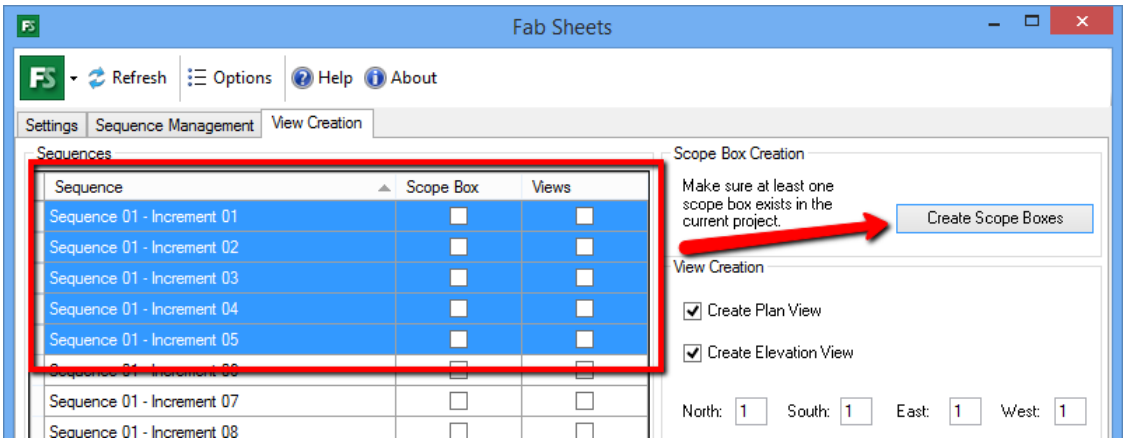


Once elements have been assigned to sequence/increments, views can be created. On the “View Creation” tab each sequence/increment that has elements assigned to it will appear in the list

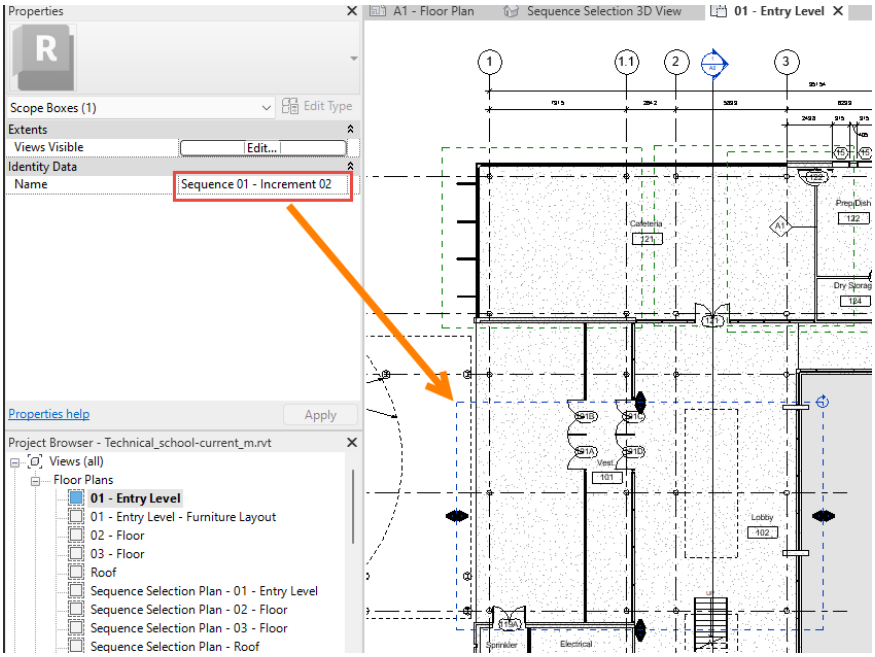


Select sequence/increment(s) from the list and click “Create Scope Boxes” to generate a scope box for each sequence/increment. In this example, scope boxes will be created for Increment 01 – Increment 05

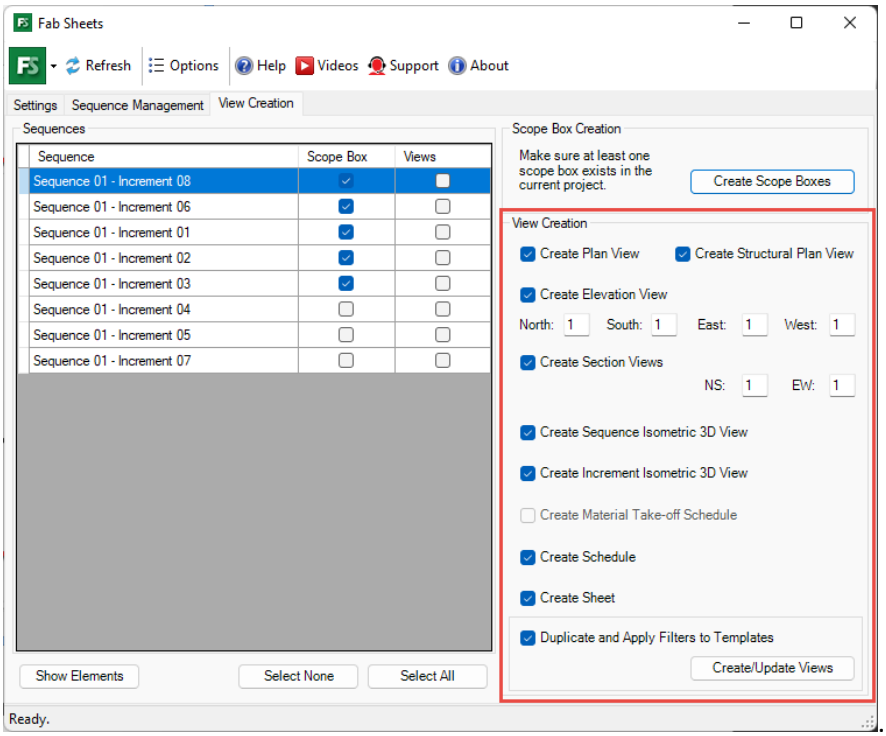
To generate views without scope boxes, skip this step. Fab Sheets will attempt to define the view crop area based on the extents of the geometry to be displayed.



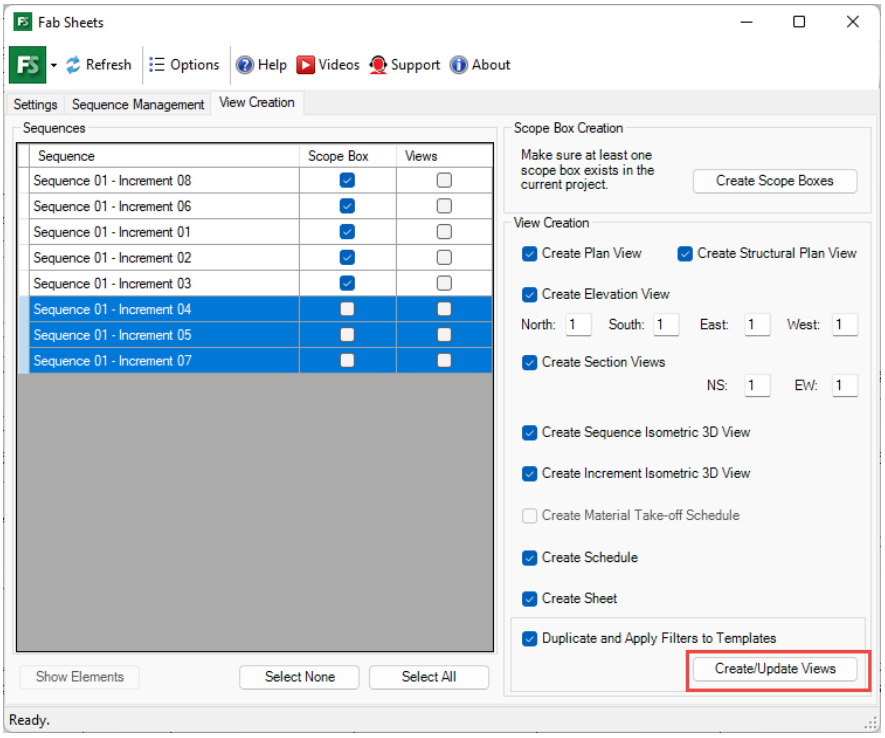
The new scope boxes will be centered around the centroid of the elements for each sequence/increment. At this point it may be desirable to resize the scope box to achieve a better fit around the elements.



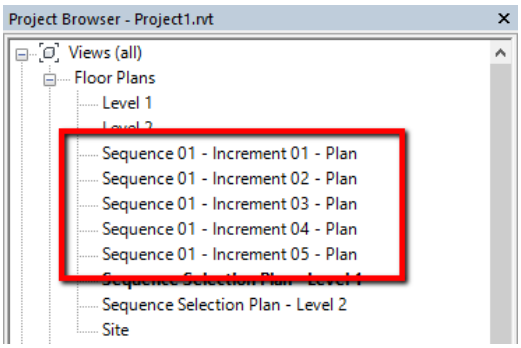
Once the scope boxes have been resized as needed, the last step is to create views. Select sequence(s)/increment(s) from the list and then check the boxes next to each view type to be created in the “View Creation” area



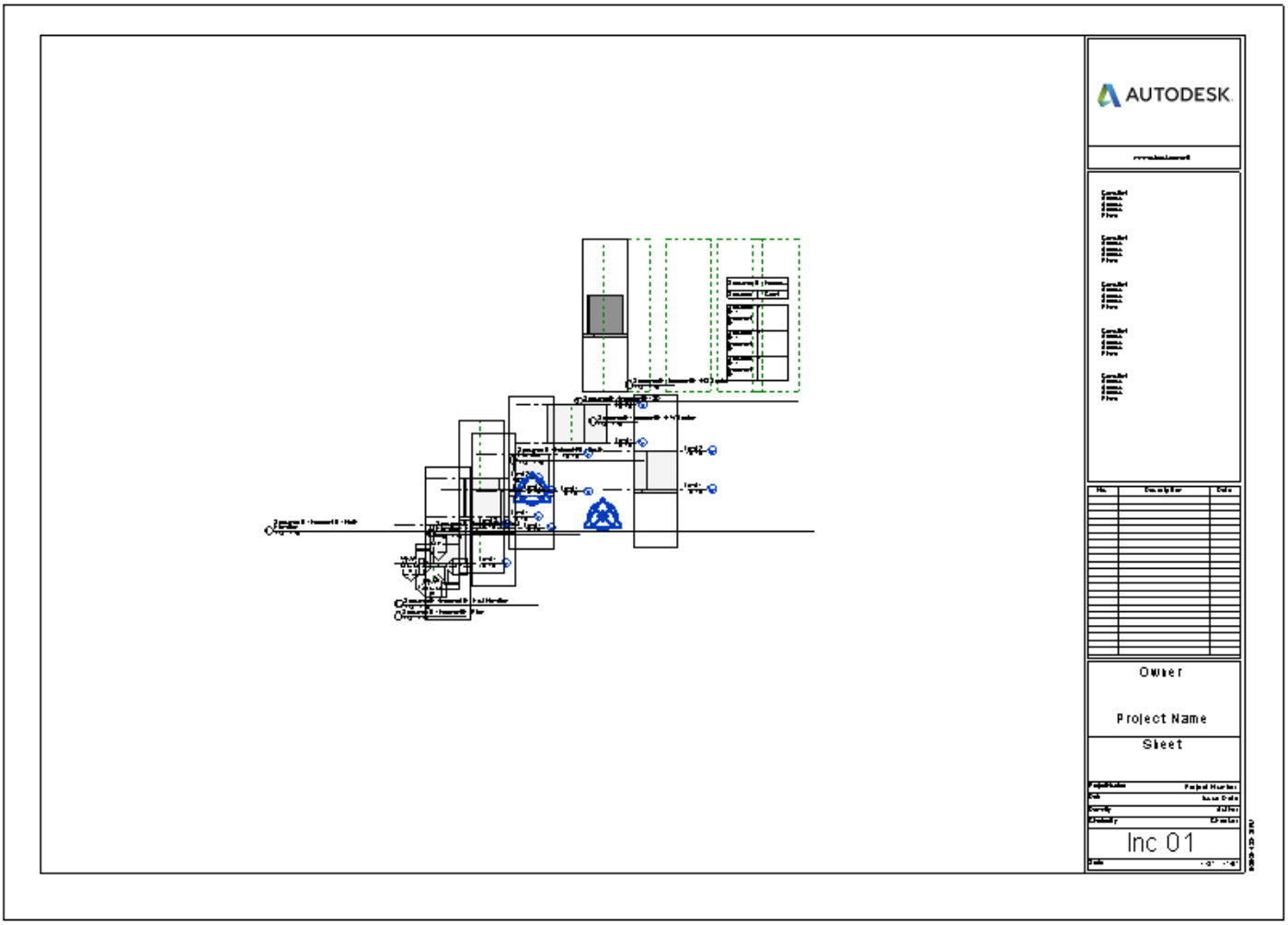
The view type selections will be applied to all sequence/increment(s) selected. Click the “Create/Update Views” button to generate the views.



A view will be created and named for each sequence/increment and each view option selected. The default naming convention of “Sequence – Increment – View Type” can be adjusted on the settings tab by changing the “Sequence and Increment Format” order. In this example some of the plan views generated are shown:



If the “Create Sheet” option was selected, a sheet will be created for the sequence/increment and all of the views for that sequence/increment will be added to the sheet automatically.



Fire Rating

Introduction

Fire Rating is designed to assist in the creation of life safety plans. The add-in has tools to assign values to the fire rating property, map line types to each fire rating value and generate graphics for plan views.

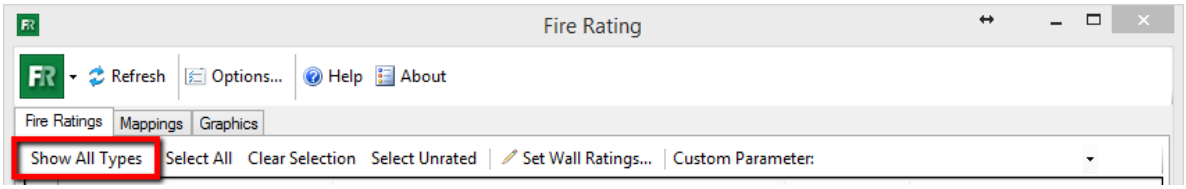
Starting Fire Rating

On the Revit ribbon, click on the “Fire Rating” button.

Setting Fire Ratings

The “Fire Ratings” tab can be used to set the native Revit f*ire rating* property of walls. The f*ire rating* property can also be configured manually by editing the type properties of walls. Manually configured ratings can still be used with the rest of the Fire Rating utility’s functions. Fire Rating also supports generating graphics based on fire rating values hosted in a custom text based project parameter assigned to the walls category. Configuring the custom parameter will be covered below.

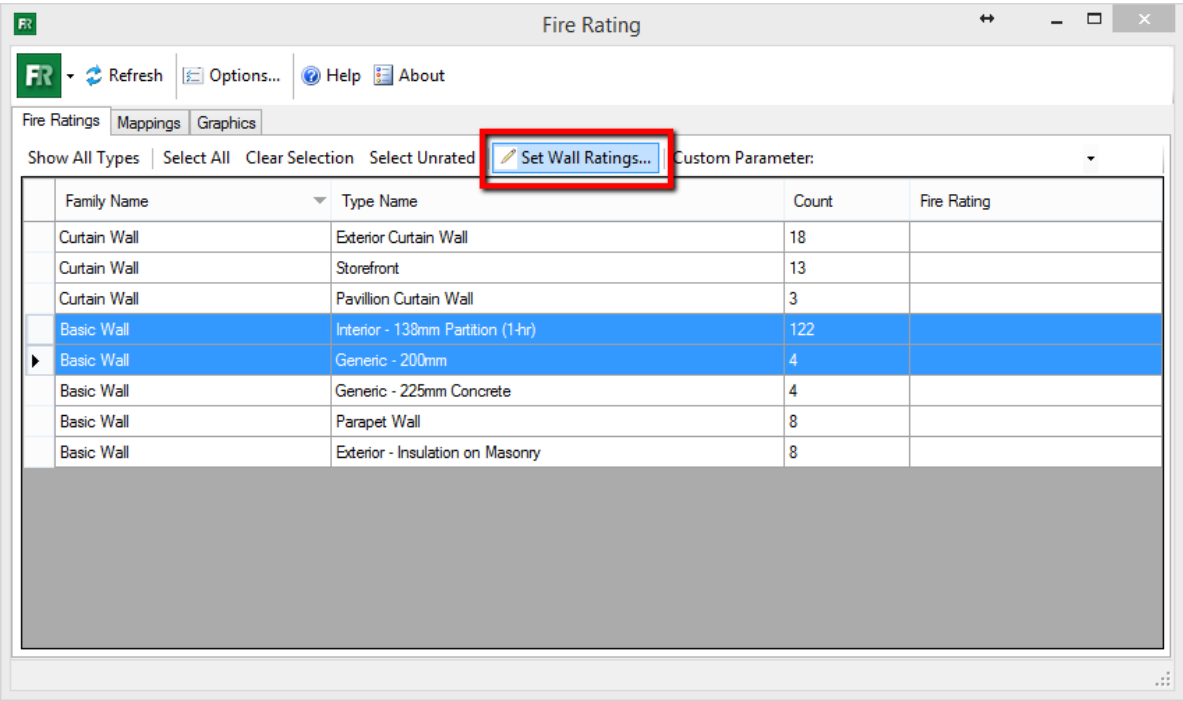
The Fire Ratings tab will display a list of wall types in the project. By default the list is filtered to show only the wall types that have instances placed in the project. To display all wall types in the project toggle the “Show All Types” button.



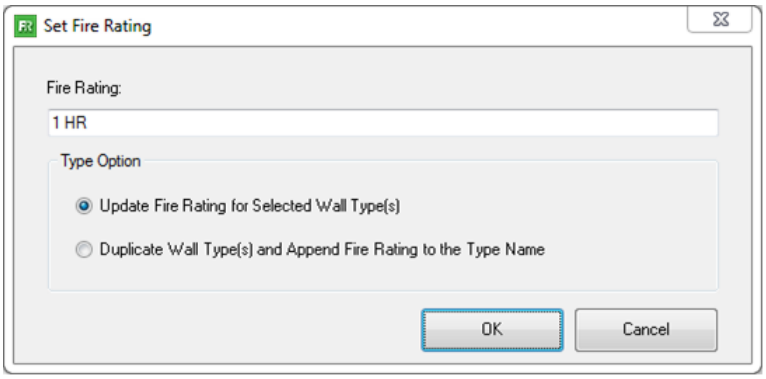
To configure the out of box fire rating property for a wall using this tool, find the desired wall type from the list and click on it to select it. Selected items will have a blue background.

Multiple wall types can be selected by holding down the CTRL key. Additionally the “Select All” or “Select Unrated” buttons can be used to make selections.

Once the selection set has been made, click the “Set Wall Ratings…” button.



In the new “Set Fire Rating” dialog that will appear, enter the desired fire rating value to apply to the wall(s). The options control whether the value should be applied to the current type or if a new type should be generated.

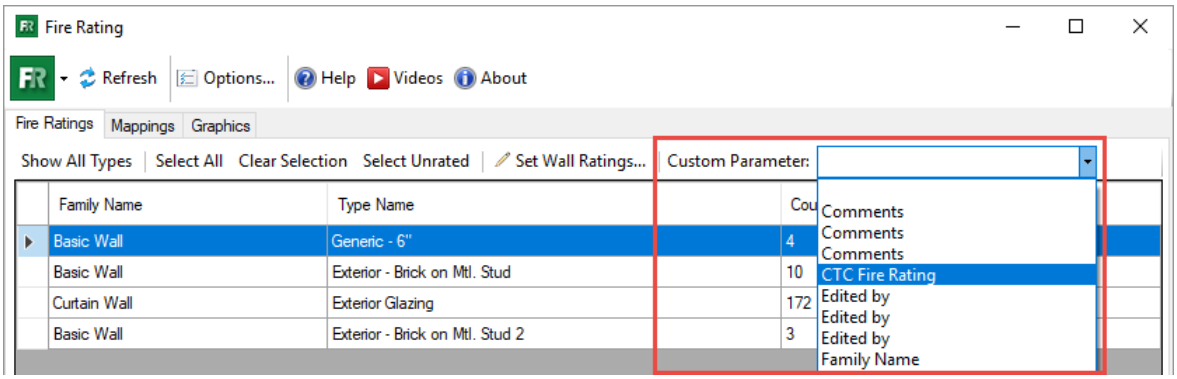


Custom Fire Rating Parameter

Fire rating also supports fire rating values hosted in a custom text based parameter assigned to the walls category. Many companies leverage a custom parameter to have an instance based option for assigning the fire rating values.

The “Custom Parameter” dropdown menu facilitates selecting a text based project parameter assigned to the walls category. The custom parameter can be either an instance or type parameter and may be assigned to additional categories beyond walls.

NOTE: if instance parameters are used, the values will NOT show in the Fire Ratings list. They will appear in the Mappings tab.

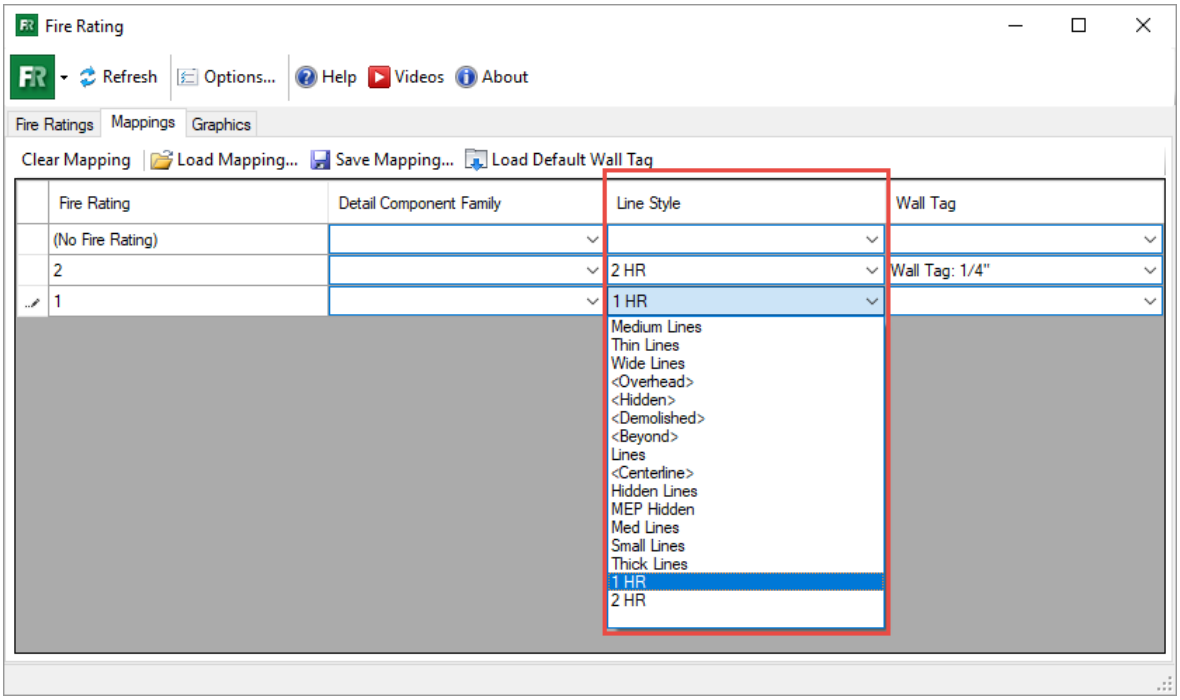


The custom mapping values can be used in conjunction with the out of box fire rating values. When generating fire rating graphics the application will first check if there is a value in the custom rating parameter, if there is that value will be used and the graphic will be generated. If there is not a value in the custom parameter the out of box parameter will be checked. Again, if a value is found it will be respected and the graphic will be generated. If neither parameter has a mapped value no graphics will be generated for that wall.

Note that custom rating values will not appear on the wall elements shown on the “Fire Ratings” tab.

Mappings

The “Mappings” tab is used to tie existing Revit line styles and/or wall tags to fire rating property values that exist within each project. For each fire rating property there will be a dropdown box to select an existing line style and another dropdown box to select an existing wall tag. These mappings will be used to generate the graphics as described on the next tab.

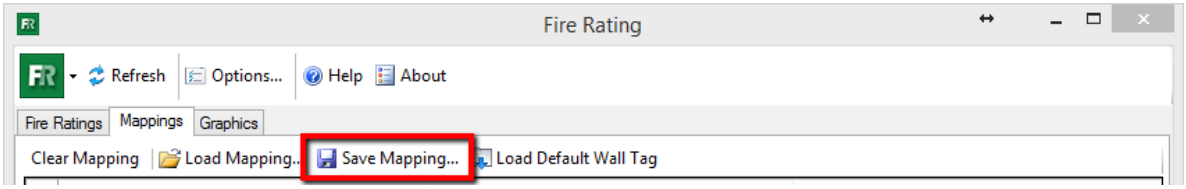


Detail components can be used as well. If the component is available in the project, select it from the list.

Mappings configured on this tab can be saved for re-use later or on other projects.

NOTE: While the mapping itself can be saved, this add-in does not facilitate transferring the actual Revit line type(s) or wall tag(s).

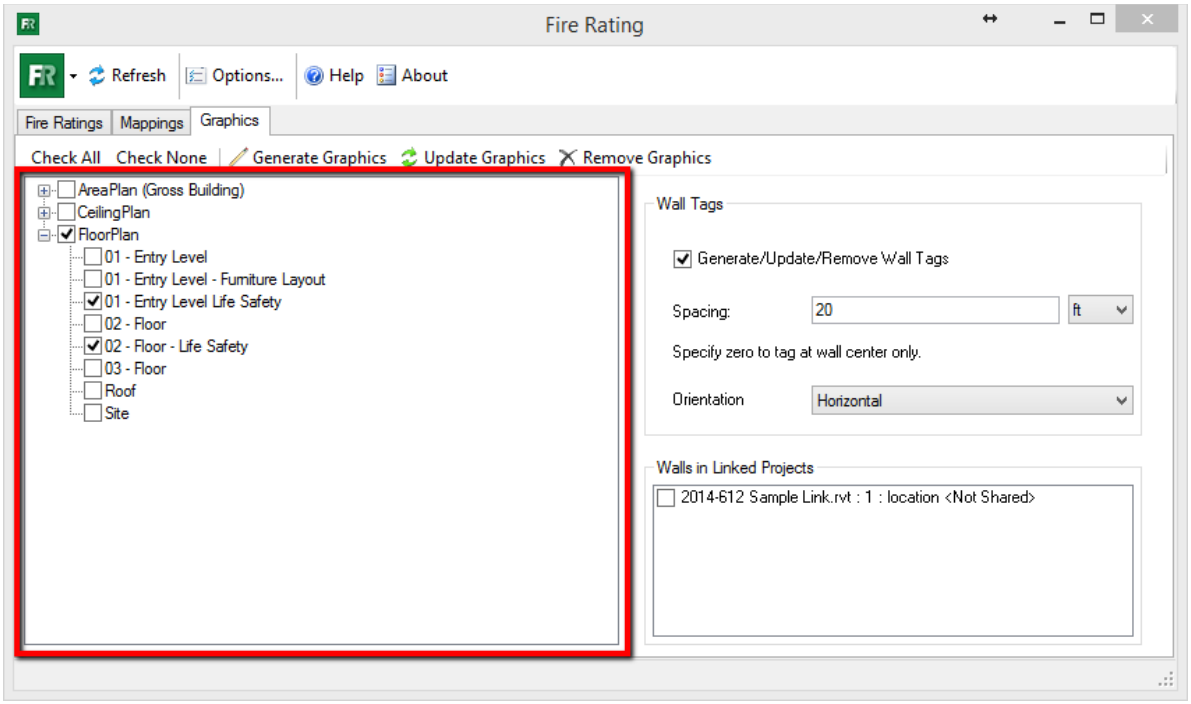
To save a mapping, click the "Save Mapping…" button. Mappings can be saved in a project (must open the project model to use them) or to a discreet file that can be loaded in by users.



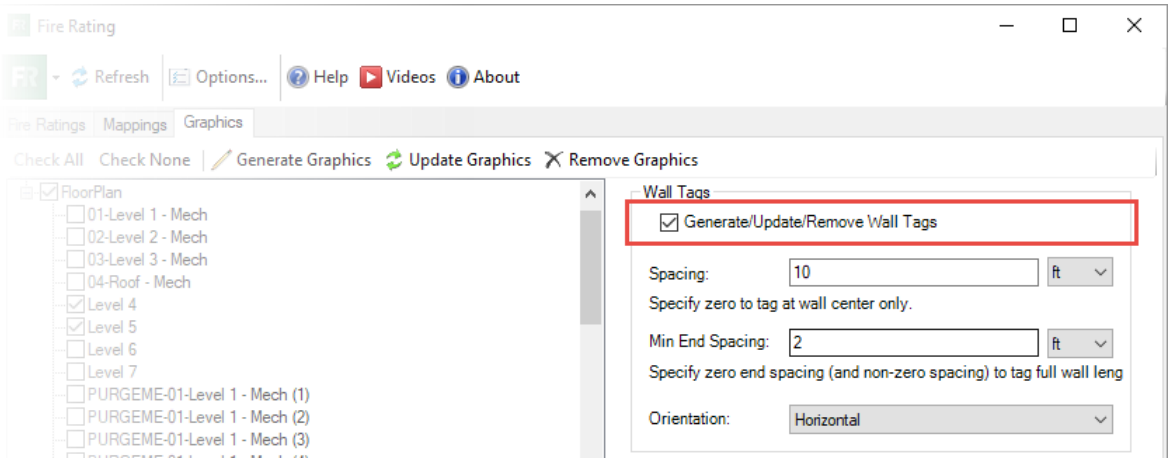
CTC provides a simple, default wall tag family which is configured to show the "Fire Rating" property for walls. This default family can be loaded into the project by clicking the "Load Default Wall Tag" button. Modifying the supplied room tag or using a different tag family is fully supported.

Generating Graphics

Once fire ratings and mappings have been defined, graphics can be generated using the "Graphics" tab. On the left side of the "Graphics" tab a tree view displays plan views from the active Revit project. Select the views from the tree for which graphics should be generated.

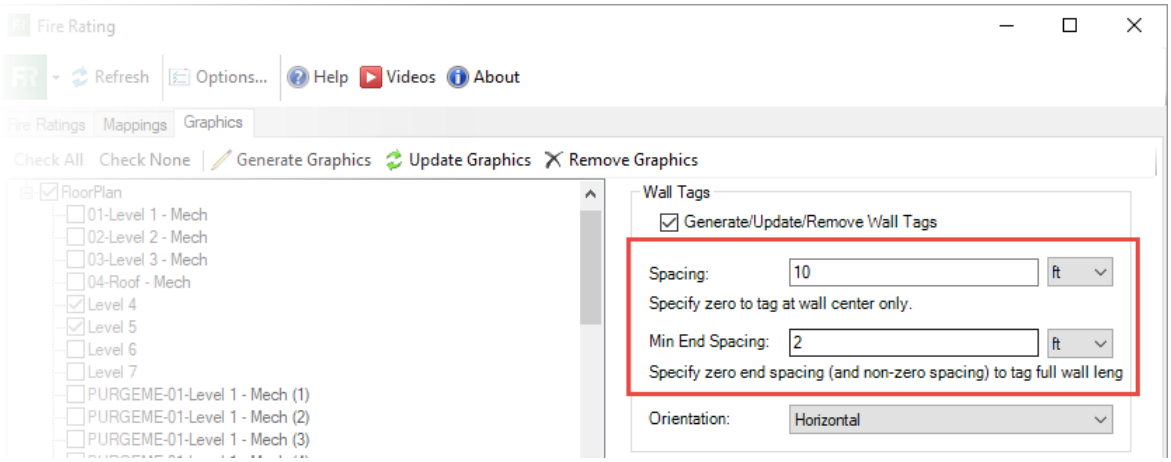


The “Generate/Update/Remove Wall Tags” checkbox will toggle whether or not mapped wall tags will also be processed when generating graphics.

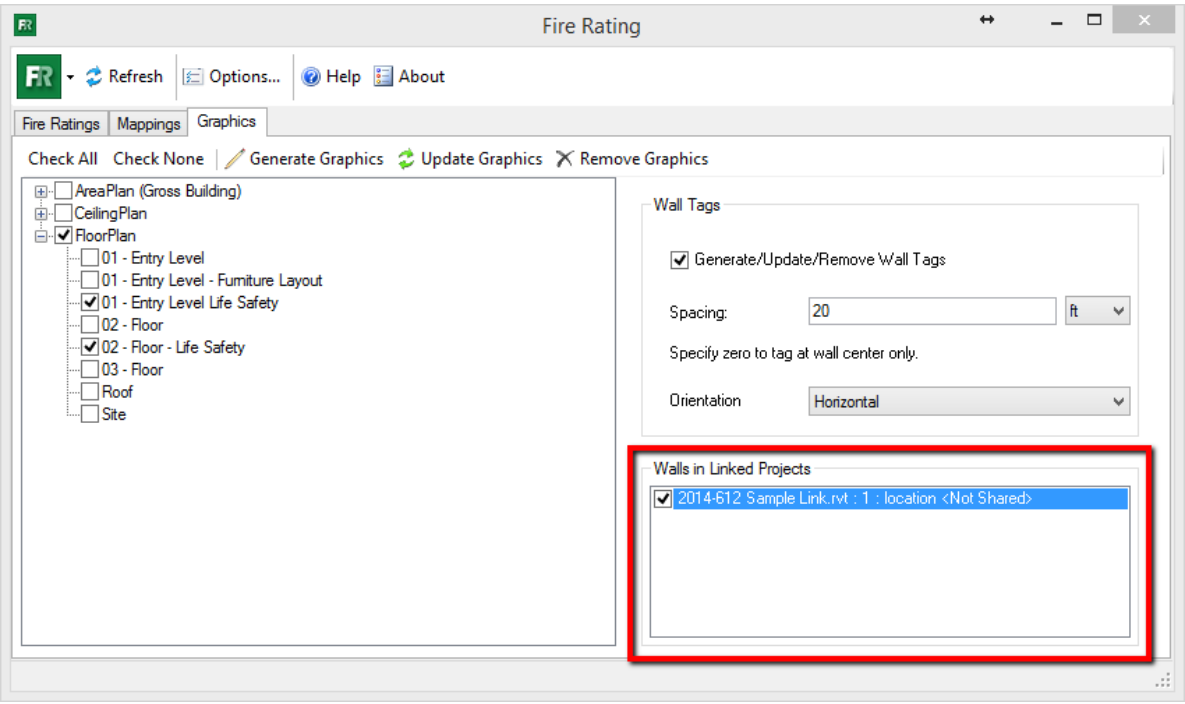


The “Spacing” field controls the distance between tags along the length of a wall. If a single tag at the midpoint of the wall is desired enter 0 for the spacing value. Curved walls will only be tagged at the midpoint. The “Orientation” dropdown controls the orientation with which the tags should be placed; Horizontal, Vertical or Using Wall Orientation.

To control how far from the apparent end of wall a tag should be placed, specify a distance value the Min. End Spacing text box. Select the distance unit from the dropdown.

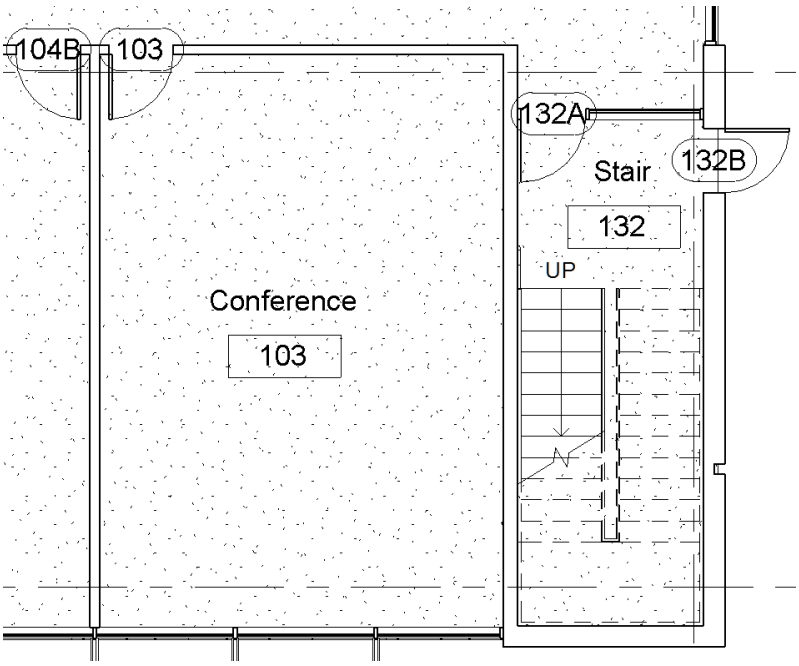


Fire Rating also supports generating line graphics based on walls in linked projects. To include linked walls in the graphics creation process, select the desired link(s) from the “Walls in Linked Projects” dialog.

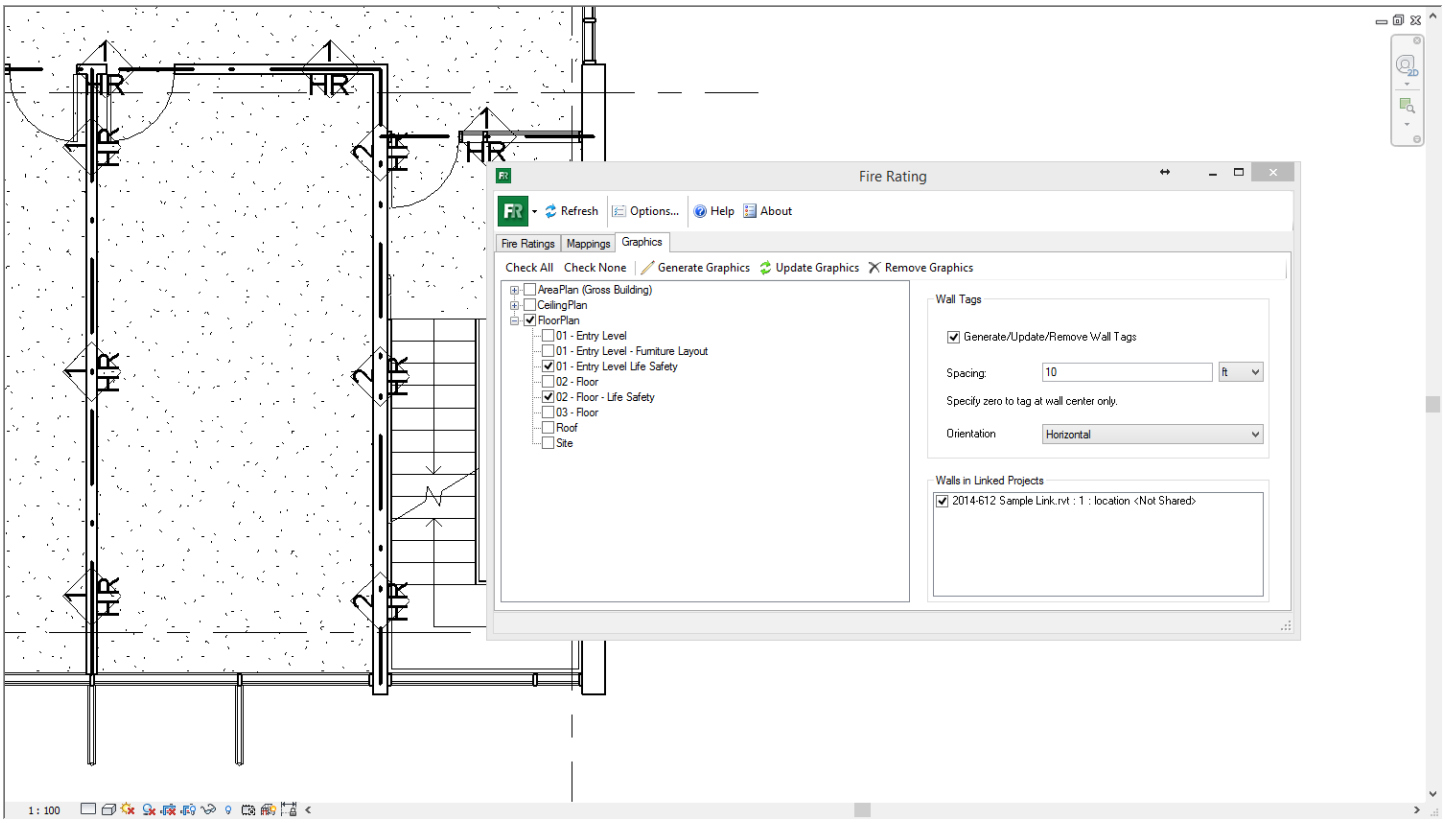


Once the desired views, tag options and links have been configured the “Generate Graphics” button can be used to generate lines and tags in the plan views selected.

Before:



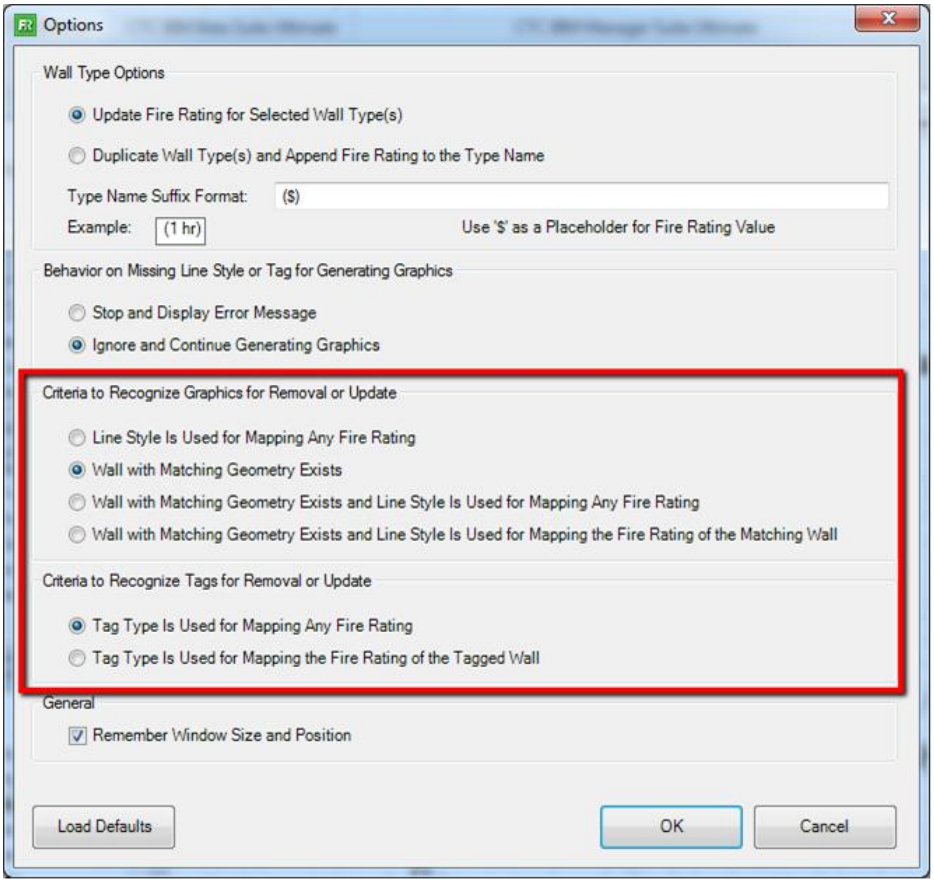
After (using the default CTC wall fire rating tag):



Note: *Due to limitations in the Revit API, tags cannot be applied automatically to linked elements. Fire Rating can generate and manage line graphics on linked elements, however.*

Graphics Maintenance

Generated graphics are static and will not automatically update if the model changes. To keep graphics in sync with current model geometry the “Update Graphics” or “Remove Graphics” buttons can be used. Graphics updates or removal are based on a set of rules in the “Options” dialog:



Invisibility Advisor

Introduction

Invisibility Advisor assists Revit users in finding elements that are not displaying properly. In addition, it can identify the causes of invisibility as well as offer useful information and links to relevant knowledgebase articles for each issue. In many cases, Invisibility Advisor can automatically 'fix' the display of the elements in question.

Starting Invisibility Advisor

On the Revit ribbon, click on the "Invisibility Advisor" button.

Fixing Common Visibility Issues of Elements in Views

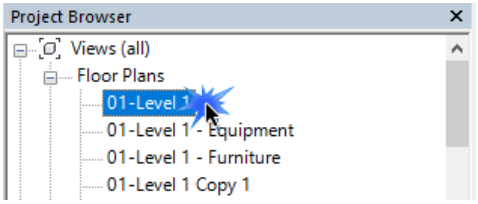
There are two ways to begin: Pick an element from a list or select one or more in a Revit view. Depending upon what is known about the element, either is fairly straightforward.

Invisibility Advisor is "modeless" which means it can be used simultaneously with most Revit operations such as navigating views, selecting, creating and editing elements.

Choosing an Element to be Found in a Target View

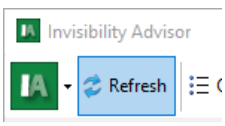
If there is no view where the element is visible or only the name and category of the element is known, this is the most effective starting point.

Open the view in which should display the element using Revit's Project Browser pane. All views which can contain elements can be analyzed but they must be "open" in the current Revit project.

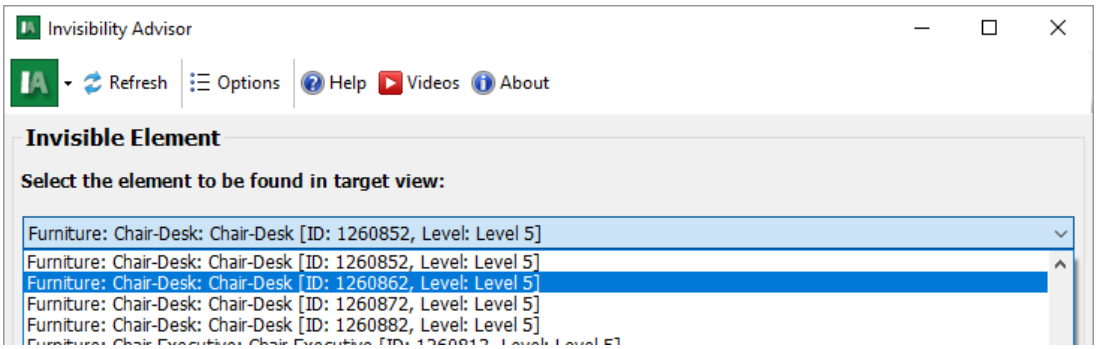


Using this method, it is most helpful to open any views that could have visibility issues before proceeding.

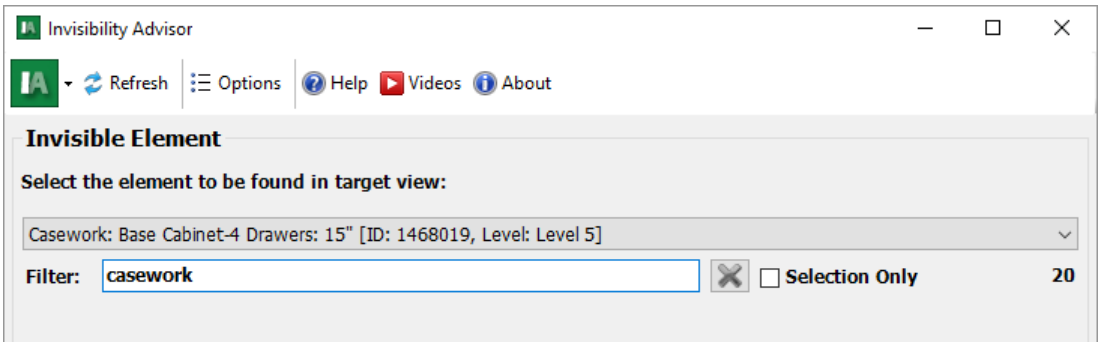
If additional views are needed, open them and be sure to click the "Refresh" button so that the tool can gather an inventory of the elements once again.



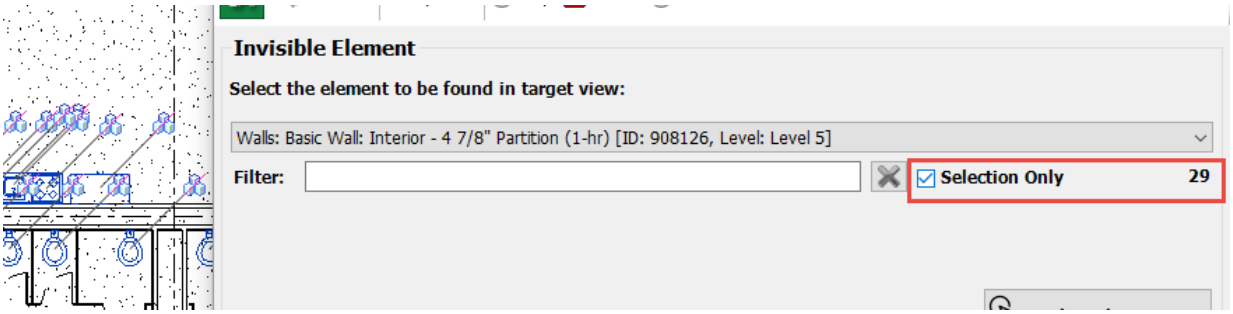
From the element selection dropdown, locate the element to be found in the list and select it.



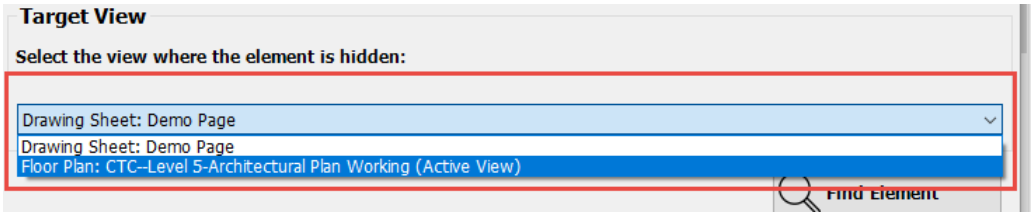
To refine the list, type a term that matches the category, name or ID.



To display a list of only pre-selected elements, check “Selection Only”



Choose the view to search in the Target View dropdown list and click the Find Element button.

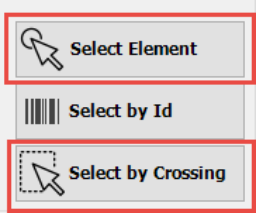


Pre-Selecting One or More Elements that are Visible in Other Views

There may be cases when the easiest method of uncovering hidden elements is to find a view where they are visible and selecting them. This is most effective from views which display the objects from other perspectives or sub-views such as elevations, sections or enlarged views.

Open the target view if is not already. Next open a view which displays the object or objects to be analyzed.

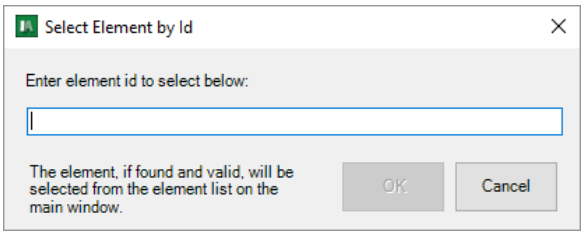
Click either the “Select Element” or “Select by Crossing” buttons.



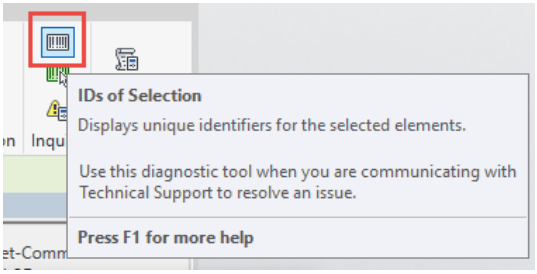
This will allow a single element to be selected at a time.

Select multiple objects by drawing a rectangular selection window from corner to corner

If an element’s ID is known, use the “Select by Id” button and enter it.



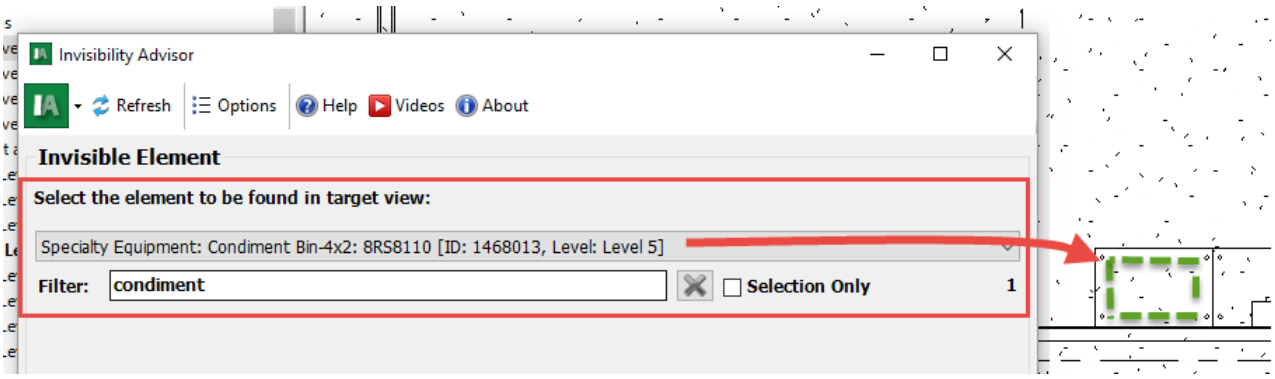
TIP: to find an element’s ID, select it and use Revit’s ID inquiry tool located on the Manage tab.



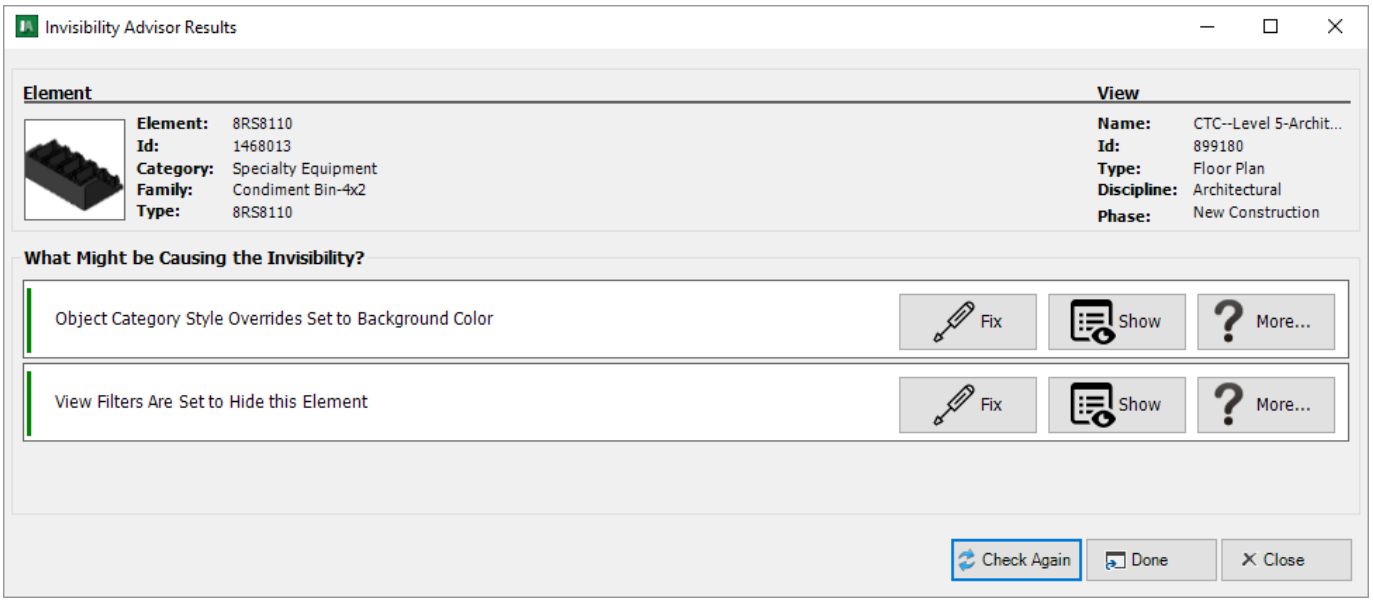
Once all elements to be found have been selected, choose the target view to search and click “Find Element”.

Invisibility Advisor Results

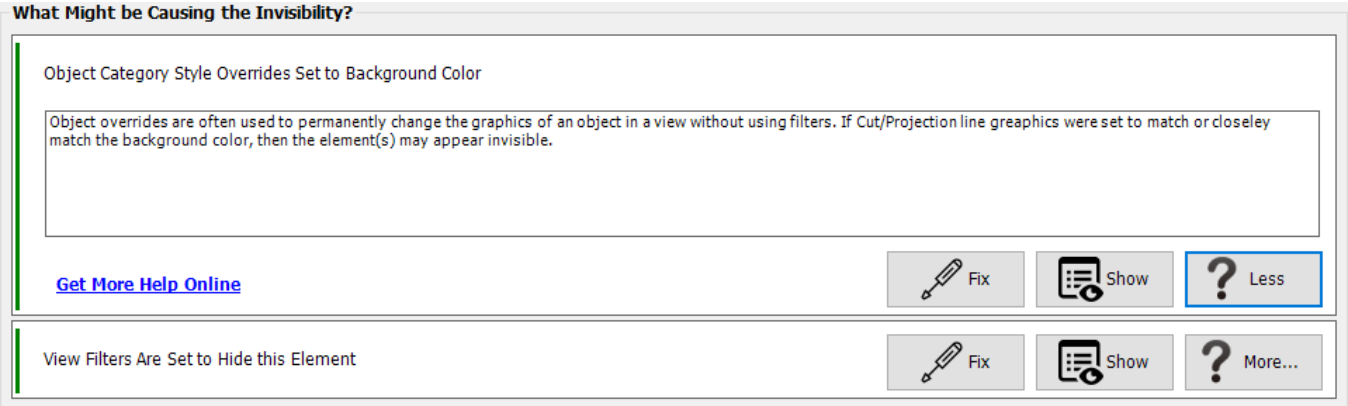
In the following example, we are trying to find out why this element (represented as green dashes) is not visible in the view.



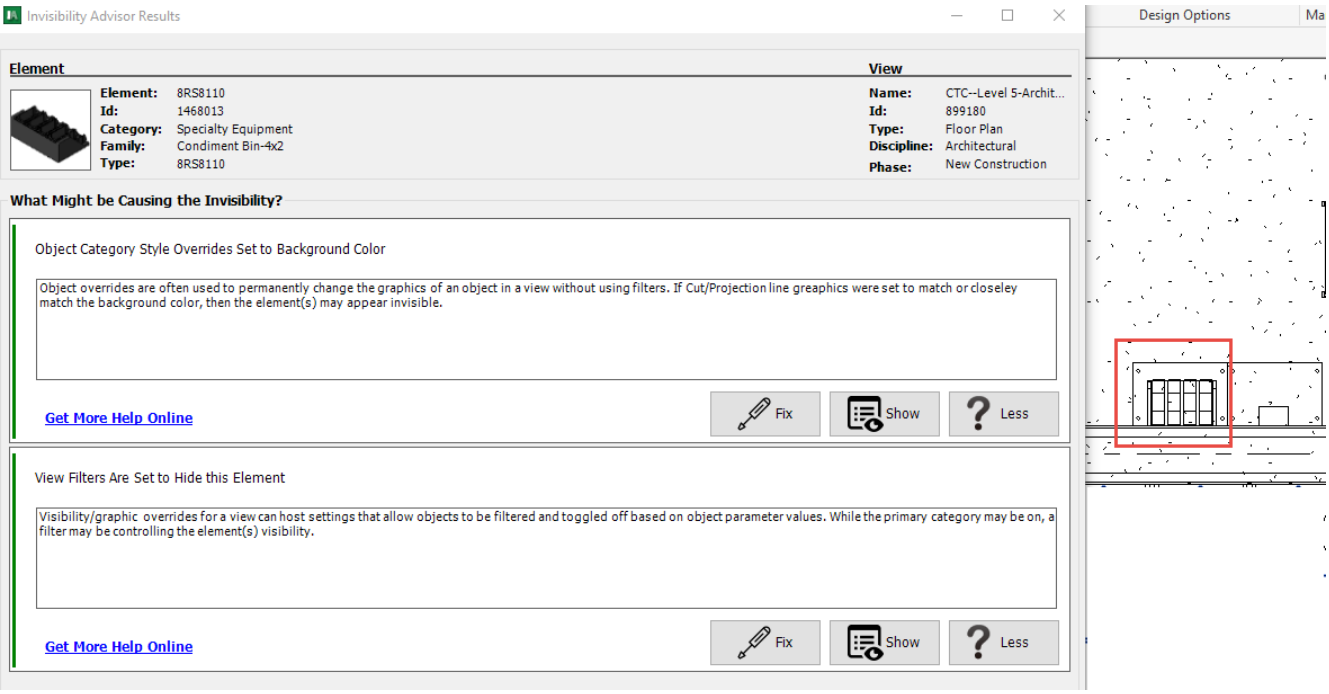
After clicking the “Find Element” button, the Invisibility Advisor results window is shown.



The element has two issues preventing it from being displayed properly in the view. To see more details about each issue, click the “More” button. This will expand showing additional information about the specific problem found.



According to the results, this object has object style overrides and view filter properties applied that contribute to it’s invisibility. Luckily, these two conditions are easily fixed automatically. Simply click the “Fix” buttons for each issue until the object becomes visible again.



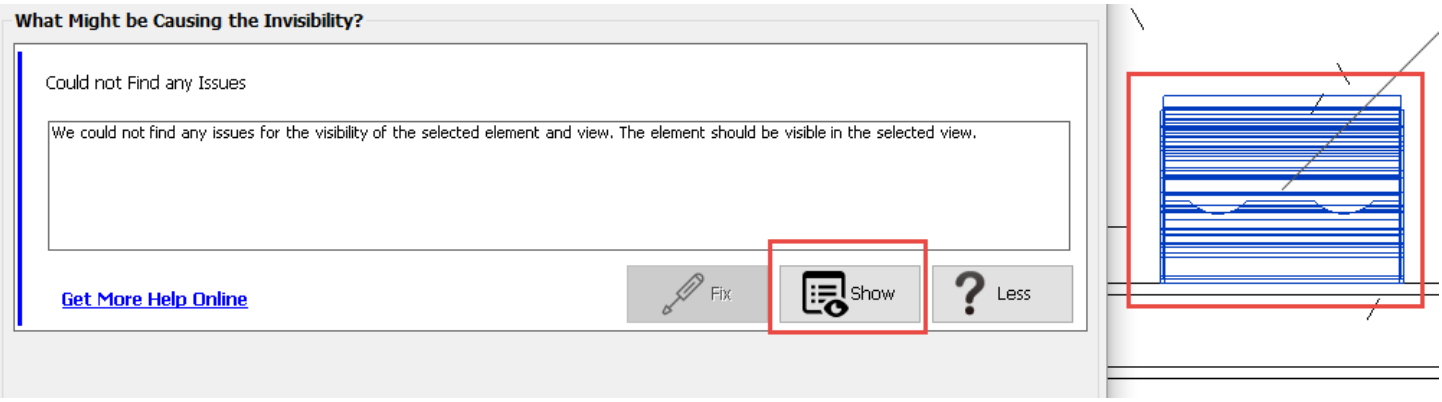
We found it!

To go back to the main window and find more elements, click the “Done” button at the bottom of this window.

To force the application re-to analyze the element and target view another time (if the attempts to manually fix were not fully successful), click “Check Again”.

Clicking “Close” will exit the tool. The applied fixes will be retained.

It may be helpful to use the “Show” button to invoke the command or tools that can be used to manually fix the cause of invisibility.



Online Help

In the lower left of each issue card is a hyperlink to Autodesk’s current knowledge article database. The link includes parameters that indicate Revit version and keywords related to the issue.

An internet connection is required to use this feature and public access to the website may be dependent upon company firewall rules or limitations.

Click this link to test whether the main site is accessible from your location: http://help.autodesk.com

If no result is shown for an item, it may be that a related article exists.

The terms used to search the site can be managed in the Help Links File (see the Options section below).

Options

The table below lists the options available in Invisibility Advisor and their functions .

Default	Label	Description
Checked	Remember the size and position of the main and results window	Interface, user changes will be remembered
Checked	Warn when fixing visibility issues may affect other elements	If checked, user receives a warning that multiple objects will be affected visibly but the proposed fix
Unchecked	Always search for elements within links	If checked, the amount of time the application runs a search is greatly increased
Checked	Include results with occasional unknown visibility status	Also show a result row even if the cause of an element’s invisibility cannot be determined
Checked	Include cases where visibility cannot be ever evaluated by this app	In some situations or due to API limitations, visibility status cannot analyzed
C:\Program Data \ CTC	Help Links File:	XML file that specifies search terms to be used when linking to an online Knowledge Base system.

Model Compare

Introduction

Model Compare is used to compare the same Revit file at 2 different points in time, to identify differences. Model Compare works by taking data "snapshots" of Revit files, which are then used to generate comparison results. By utilizing snapshots there is no need to retain full copies of Revit project files as a project progresses.

Snapshot files are self-contained and small by comparison to a Revit model. Snapshots can also be configured to be taken on a schedule, for example after hours and perhaps once a week for a specific project.

Starting Model Compare

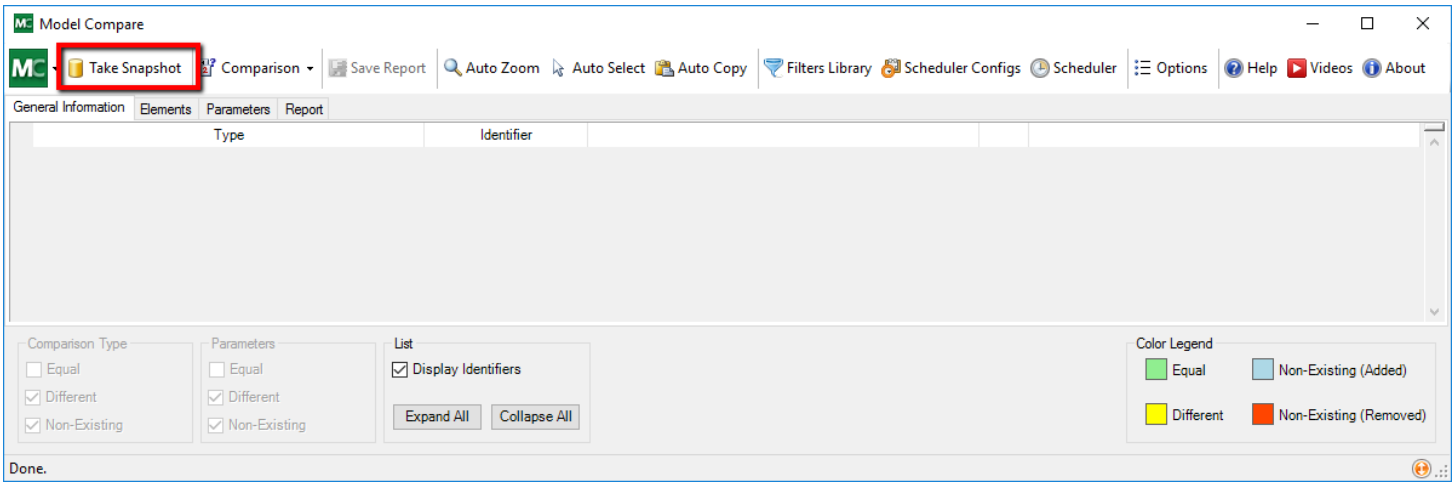
On the Revit ribbon, click on the "Model Compare" button.

Effective Use of Model Compare

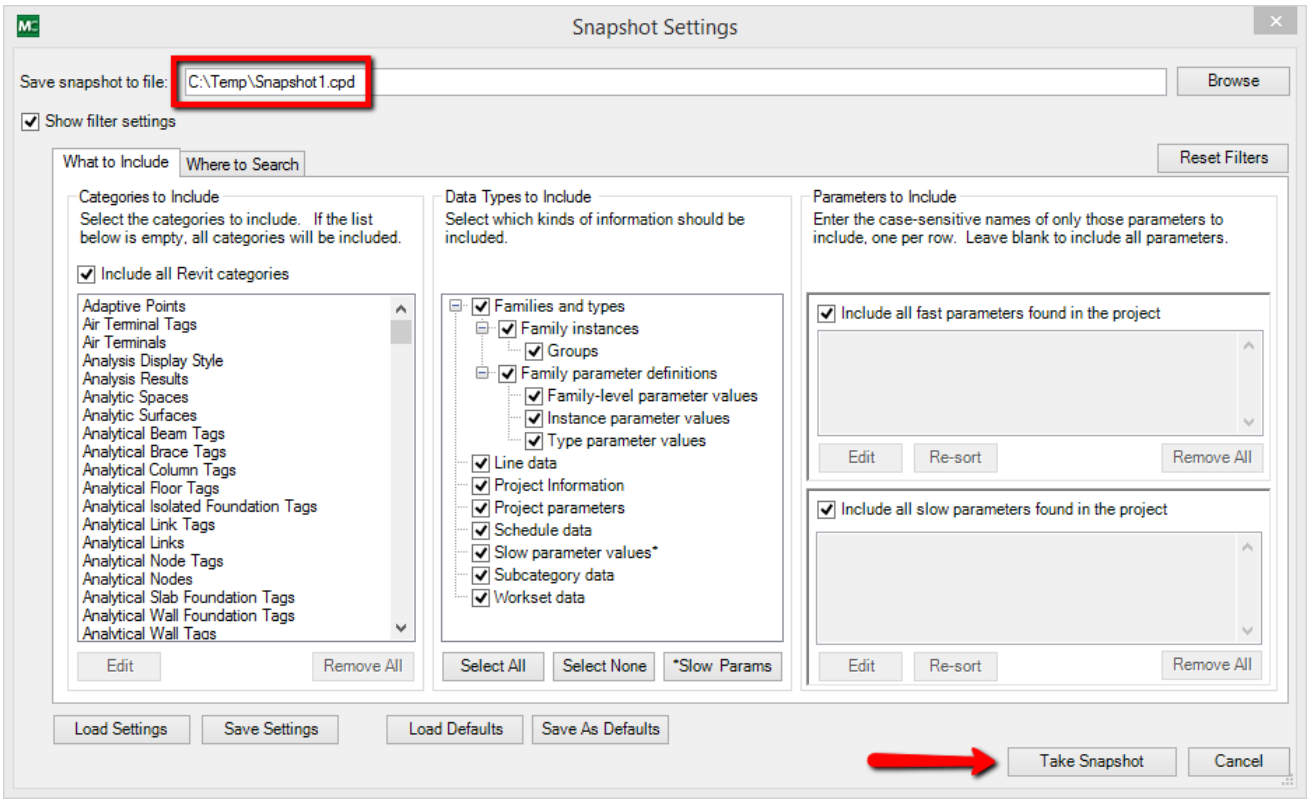
The most effective use of Model Compare is to take periodic snapshots of the desired Revit files. The comparison between two snapshot files is based heavily on Revit element IDs, which would vary from project to project. Periodic snapshots can be used, for example, to identify what changes are being made within a project over the life of the project, or to identify changes made by consultants

Taking Snapshots

To take a snapshot, first open the desired Revit model. For performance reasons it is advisable to have only the single model whose snapshot is desired be open in the Revit session. The file must not have any unsaved changes at the time the snapshot is taken. Click on the "Take Snapshot…" button.



The following dialog will appear:



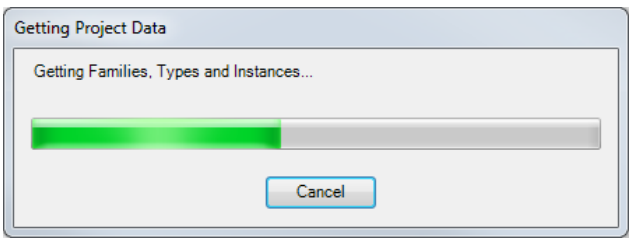
The first step is to select to where the snapshot file should be created. The "Browse" button can be used to select the location and enter the file name to use.

The next step is to determine what data to include in the snapshot. This is done using the large filtering section in the middle of the screen. The more information that is included in the snapshot, the longer it will take to create the snapshot.

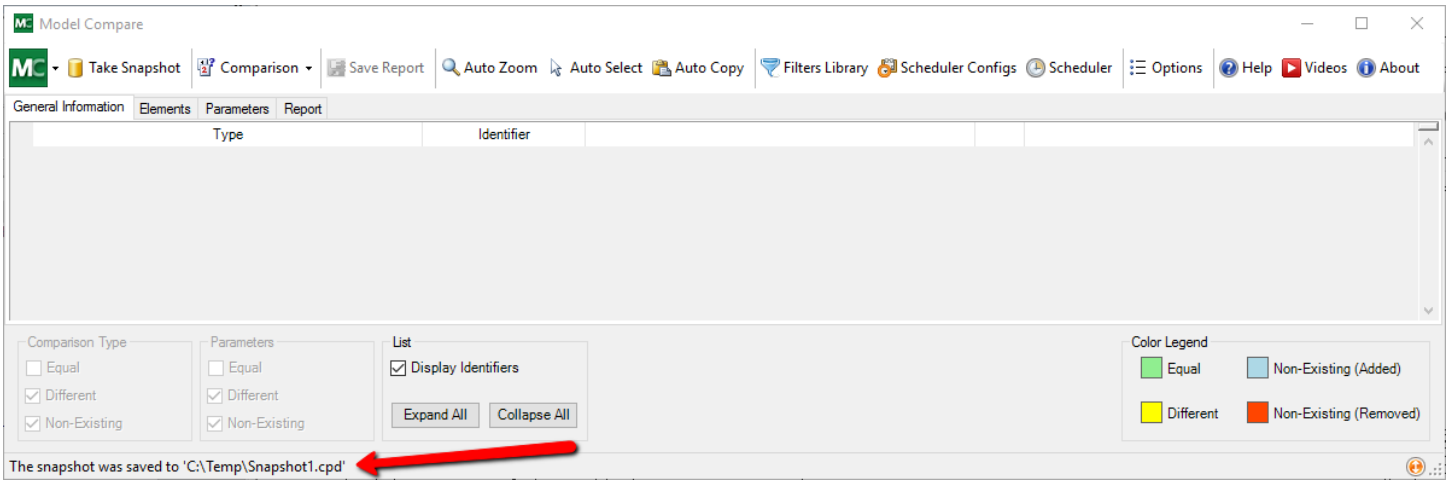
Filtering can be used to not only reduce the time it takes to create a snapshot, but reduce the amount of information that needs to be analyzed in the resulting comparison report.

Please refer to Appendix A for an explanation of how to configure the settings on the "What to Include" and "Where to Search" tabs.

Once the "Take Snapshot" button is clicked, Model Compare will begin extracting project information into a Snapshot. Depending on the size/density of the Revit model, as well as the filter settings, this can take several minutes. The following progress dialog will be displayed during the snapshot:



When the snapshot completes, a message will be shown at the bottom of the main Model Compare window indicating the results of the snapshot.

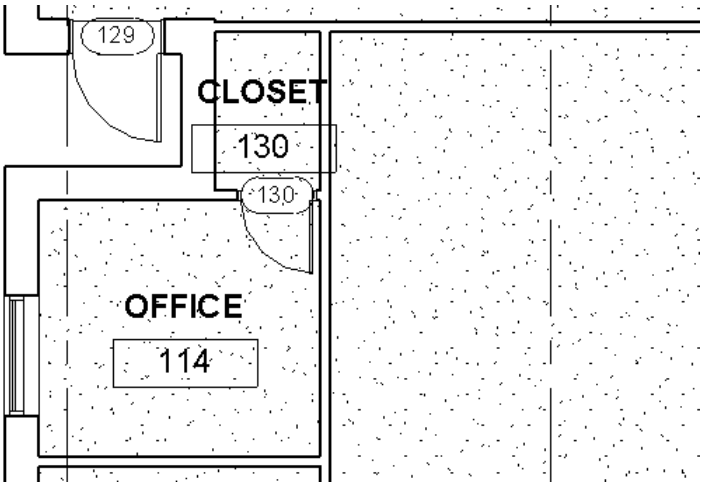


Example Changes

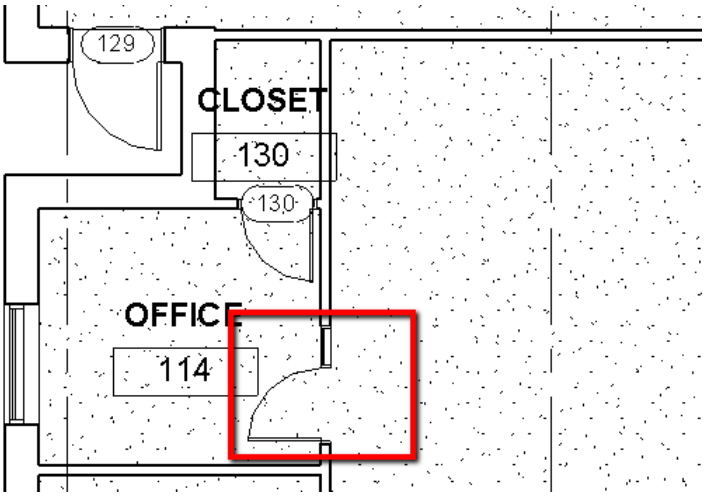
This section will help tie the comparison results (shown in the next section) to actual changes made in Revit. These changes will be specific examples made on a sample project, in an actual production environment.

Office 114 – New Element

In the first snapshot, there was no door leading into office 114:

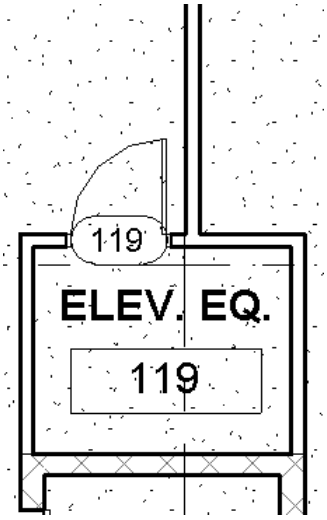


In the second snapshot, a door has been added:

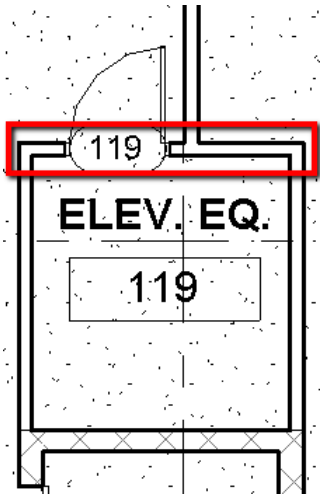


Elevator Equipment Room – Model Change

In the first snapshot, the ELEV EQ. Room 119 had an area of 52.76 square feet:

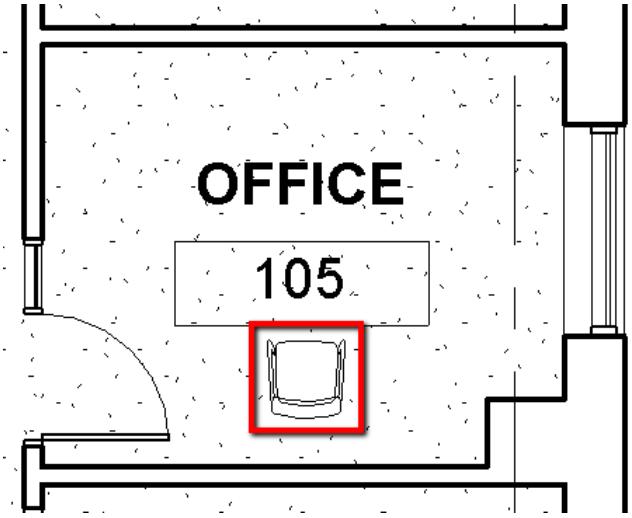


In the second snapshot, the north wall has been moved to increase the size of the room. The area has changed to 69.90 square feet. Note the position of the north wall in relation to the horizontal grid line.

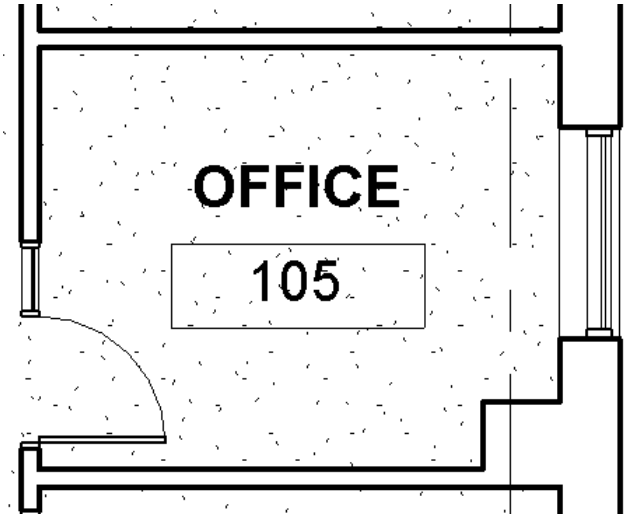


Office 105 – Element Deletion

In the first snapshot, room 105 contained a chair family:

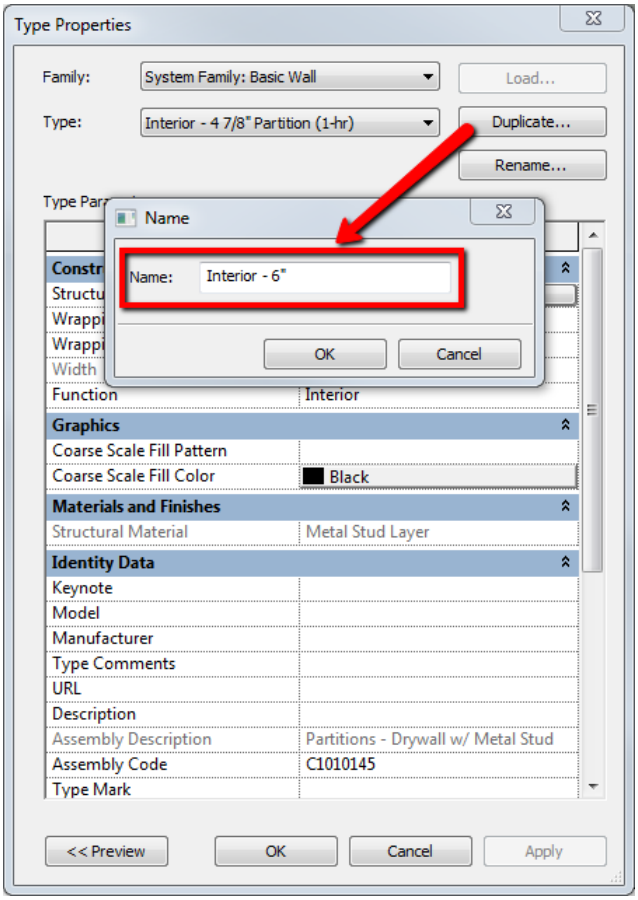


In the second snapshot the chair has been deleted:



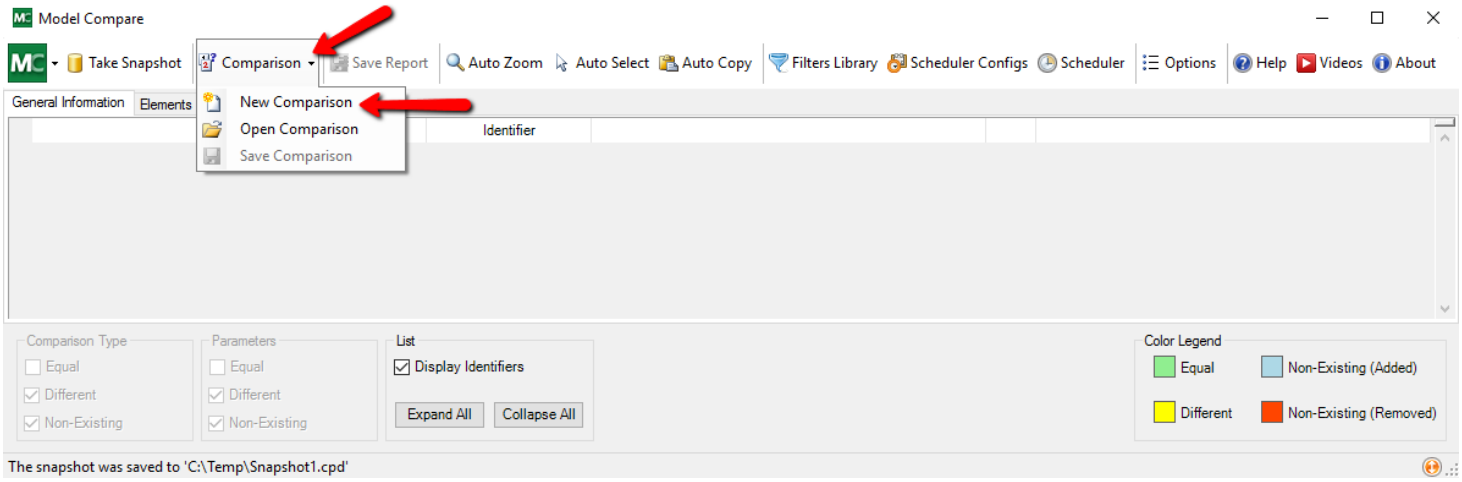
Family Definition change - New Wall Type

A new wall type has been added after the first snapshot and before the second. The new wall type name is Interior – 6”

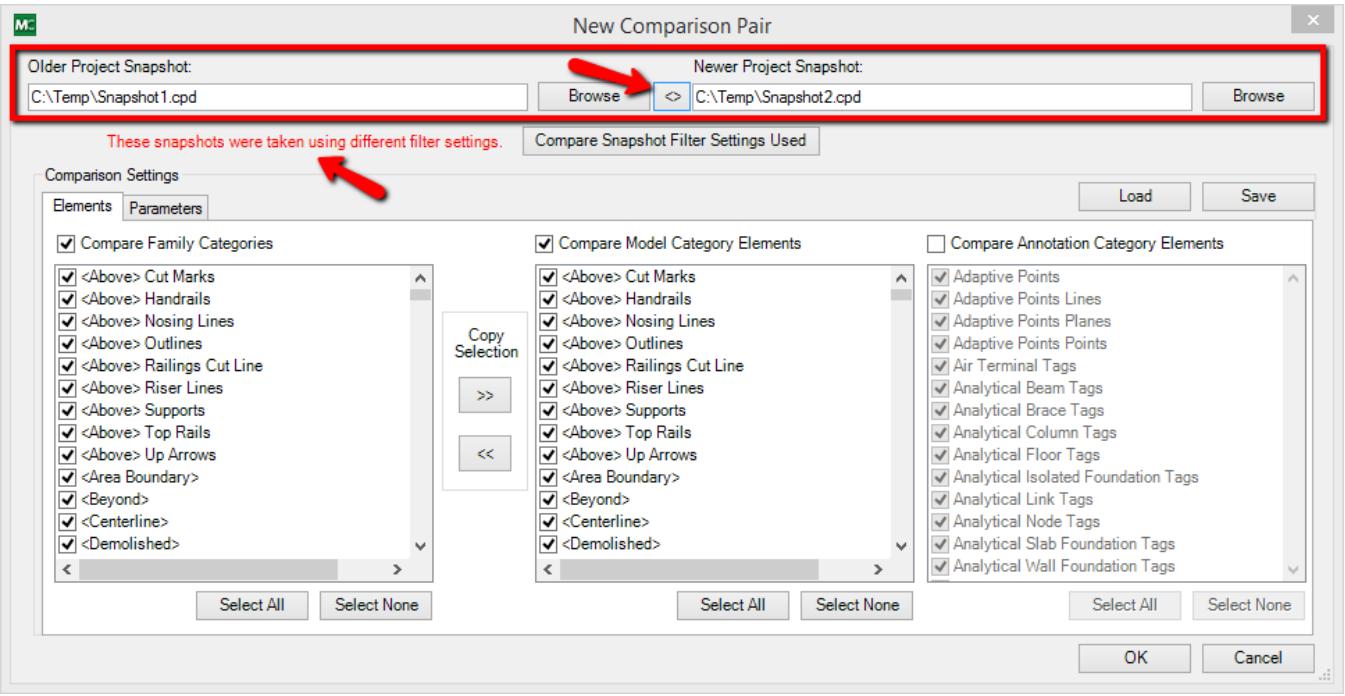


Comparing Snapshots

To run a comparison, click the “Comparison” drop-down button, then the “New Comparison” button.



In the “New Comparison Pair” dialog, browse to two previously taken snapshot files. The older snapshot should be selected on the left side, while the newer snapshot should be selected on the right side. Note the “<>” button can be used to swap the locations of the selected snapshot files between the left and right sides.



If the filter settings that were used to create each snapshot were different, the red text seen in the image above will appear.

IMPORTANT: If the filter settings were too different (generated mutually exclusive data) Model Compare will not let you proceed to generate the comparison data from those snapshots, because there wouldn’t be any meaningful results.

A comparison won’t be allowed if any of the following are true:

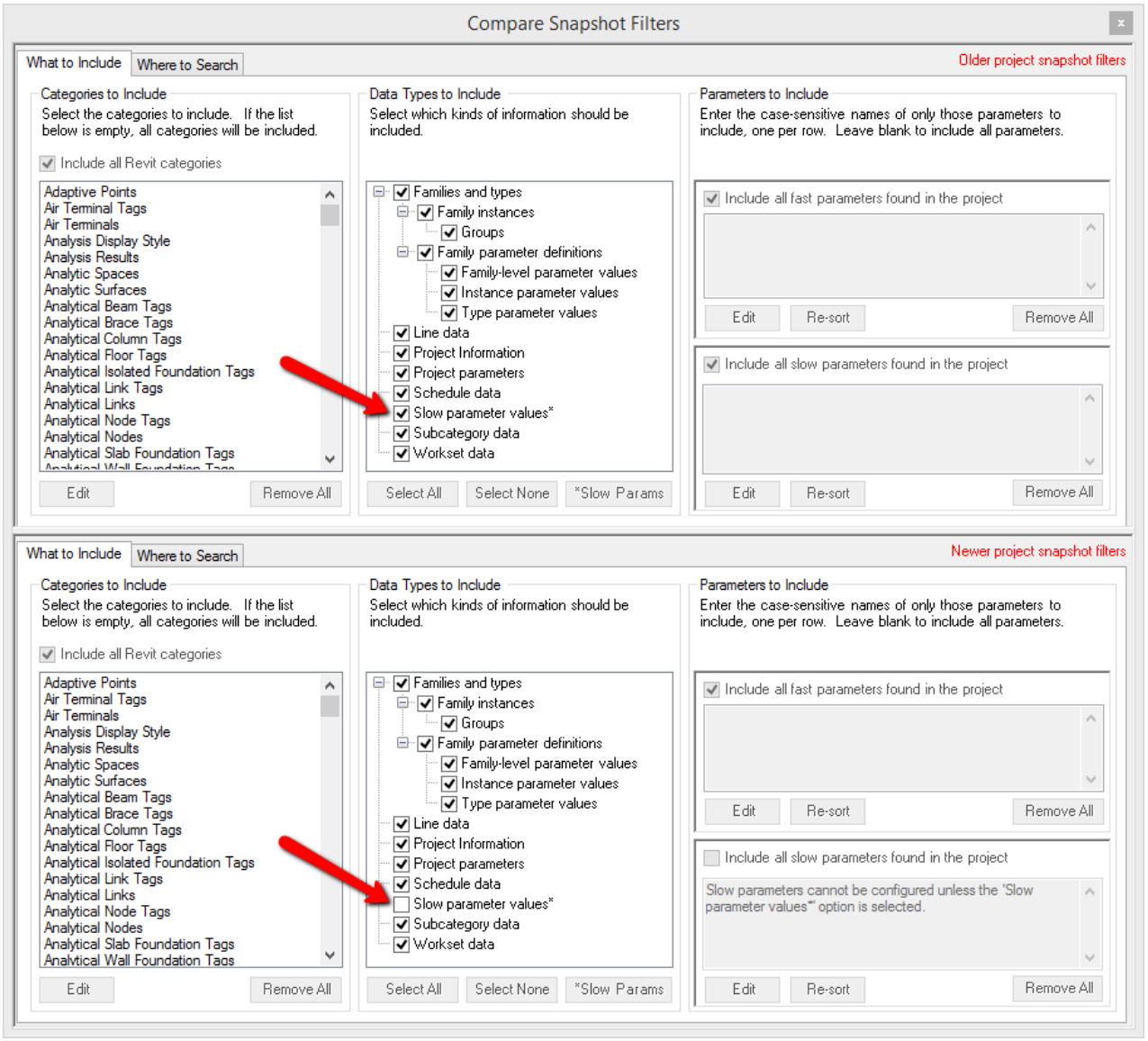
- The selected snapshots were filtered to include completely different sets of categories
- The selected snapshots were filtered by completely different levels
- The selected snapshots were filtered by completely different views
- The selected snapshots were filtered by different “Phase Created” names
- The selected snapshots were filtered by different “Phase Demolished” names

IMPORTANT: If the filter settings between the snapshots only contained some common overlapping data gathered, Model Compare will allow the comparison to be generated, but with a warning stating that some results may be misleading.

For example, extra Revit objects that were collected in the later snapshot may appear as “Added” in the resulting comparison, when in reality they did exist in the older snapshot, but were filtered out.

The best practice is to use identical filtering settings on the snapshots to be compared. Filter settings can easily be saved and reloaded for later use, which should help make keeping track of filter settings manageable.

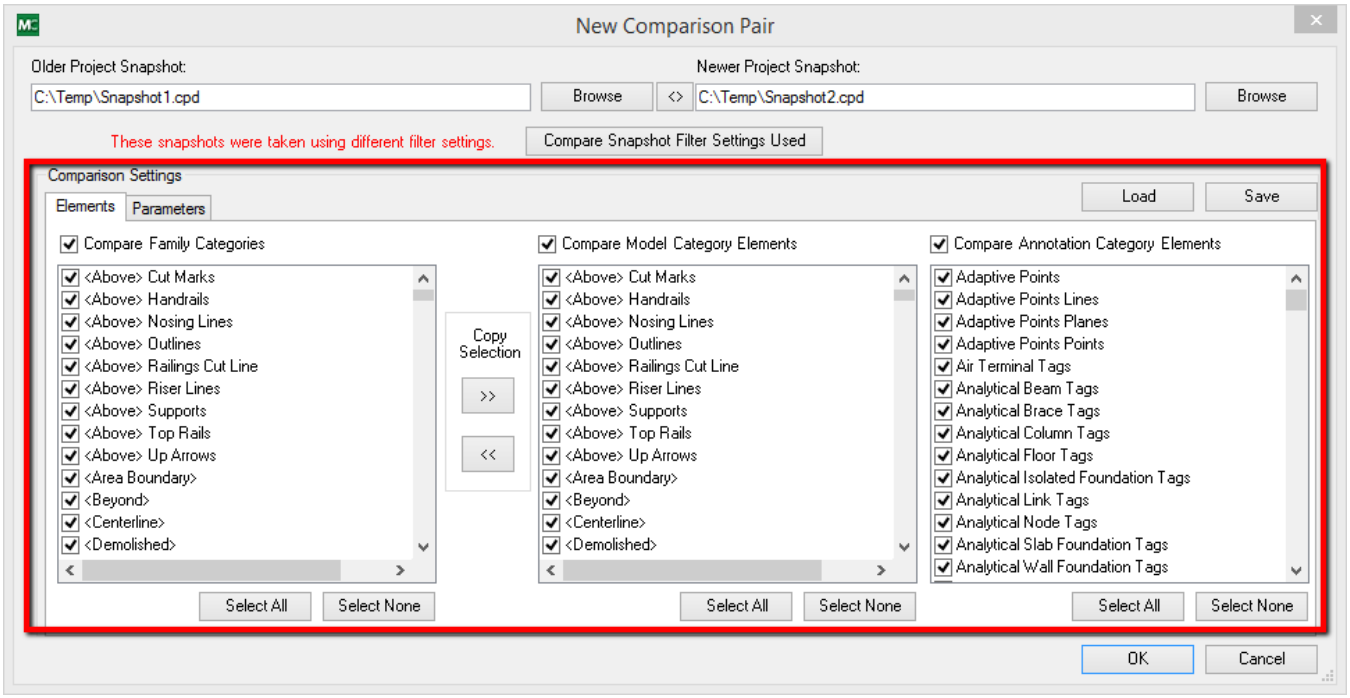
Clicking the “Compare Snapshot Filter Settings Used” button will allow viewing the filter settings used by each snapshot at the same time:



Switching between tabs for either the settings used by the old snapshot or new snapshot will automatically switch tabs for the other settings as well.

In the above example, the filter settings for the newer snapshot show that Slow Parameters were not gathered when the later snapshot was taken.

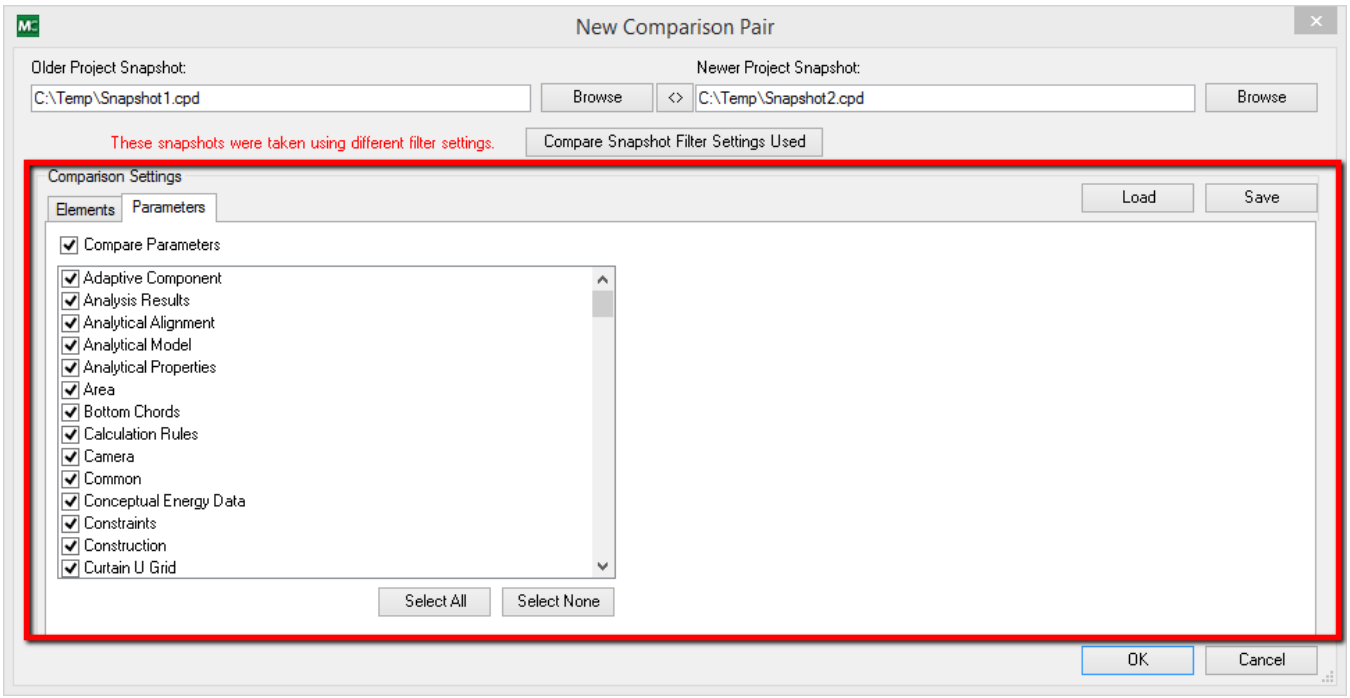
Once the snapshots have been defined, Comparison Filters are available to control which information to compare between the snapshots.



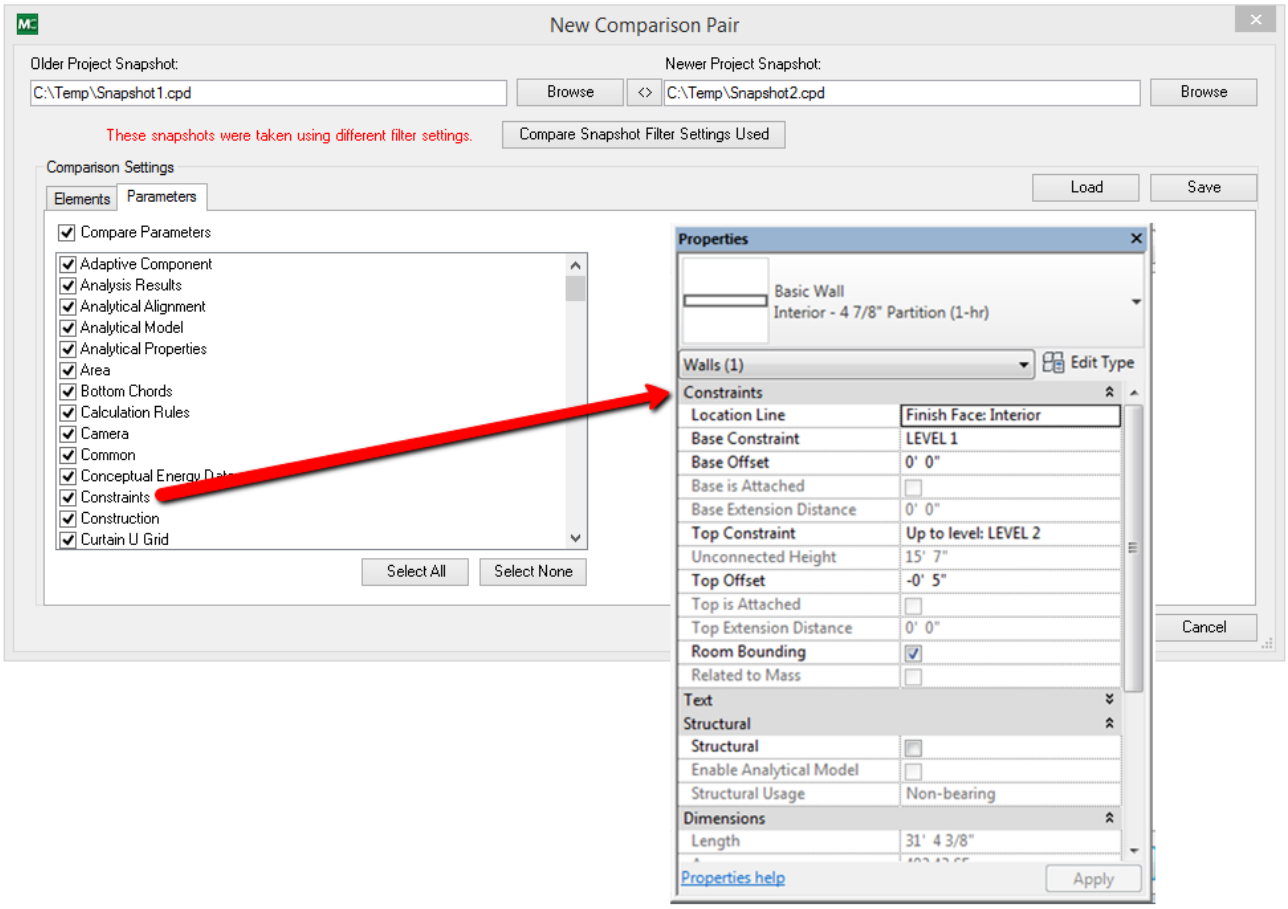
The three comparison filters on the first tab (for elements) are:

- Family Categories – This column is for the family definitions themselves. For example, if a new wall type was created on the walls category, checking “Walls” in this list would cause that change to be shown in the comparison results.
- Model Category Elements – This column is for model elements that exist in the project. For example, if a new wall is drawn in the project, checking “Walls” in this list would cause that change to be shown in the comparison results.
- Annotation Category Elements – This column is for annotation elements that exist in the project. For example, if a wall tag is deleted, checking “Wall Tags” in this column would cause that change to be shown in the comparison results.

Comparison filters can also be configured on the “Parameters” tab:

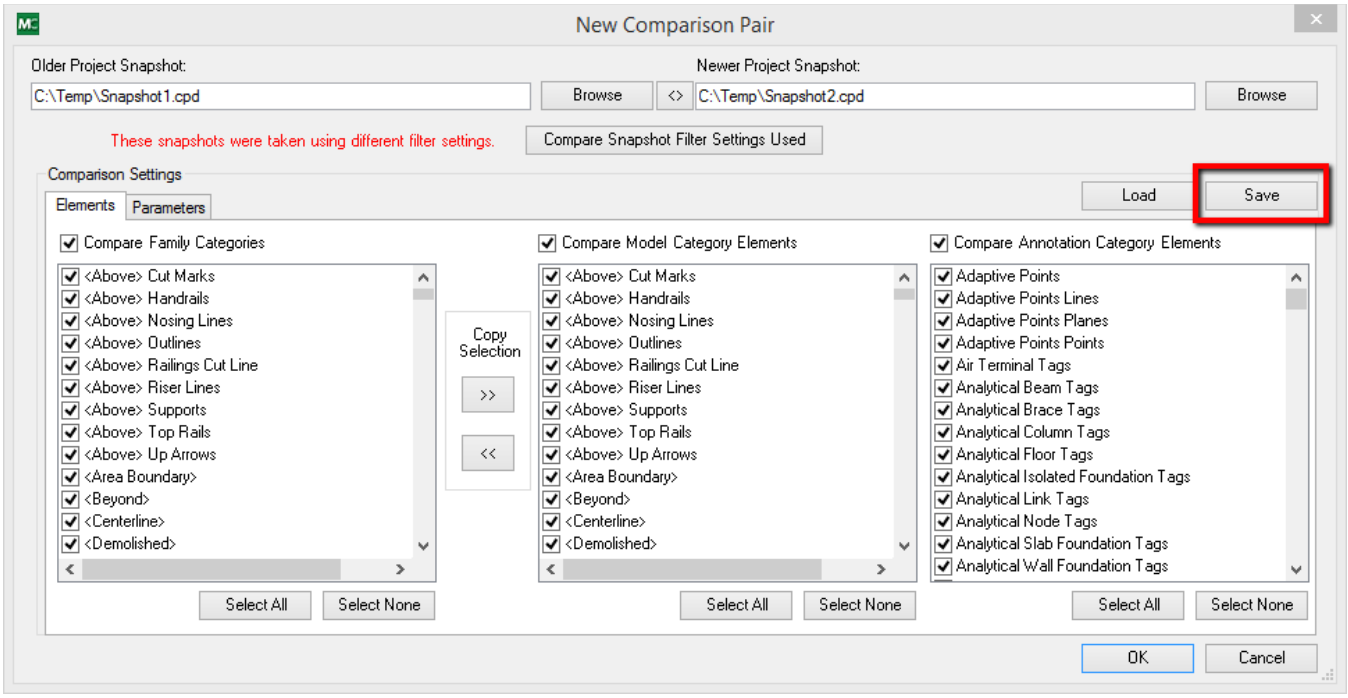


The options available determine which groups within the parameter window should be included in the comparison. For example, checking “Constraints” would include all the parameters listed under “Constraints” in the properties window to be compared (“Location Line” through “Related to Mass”)

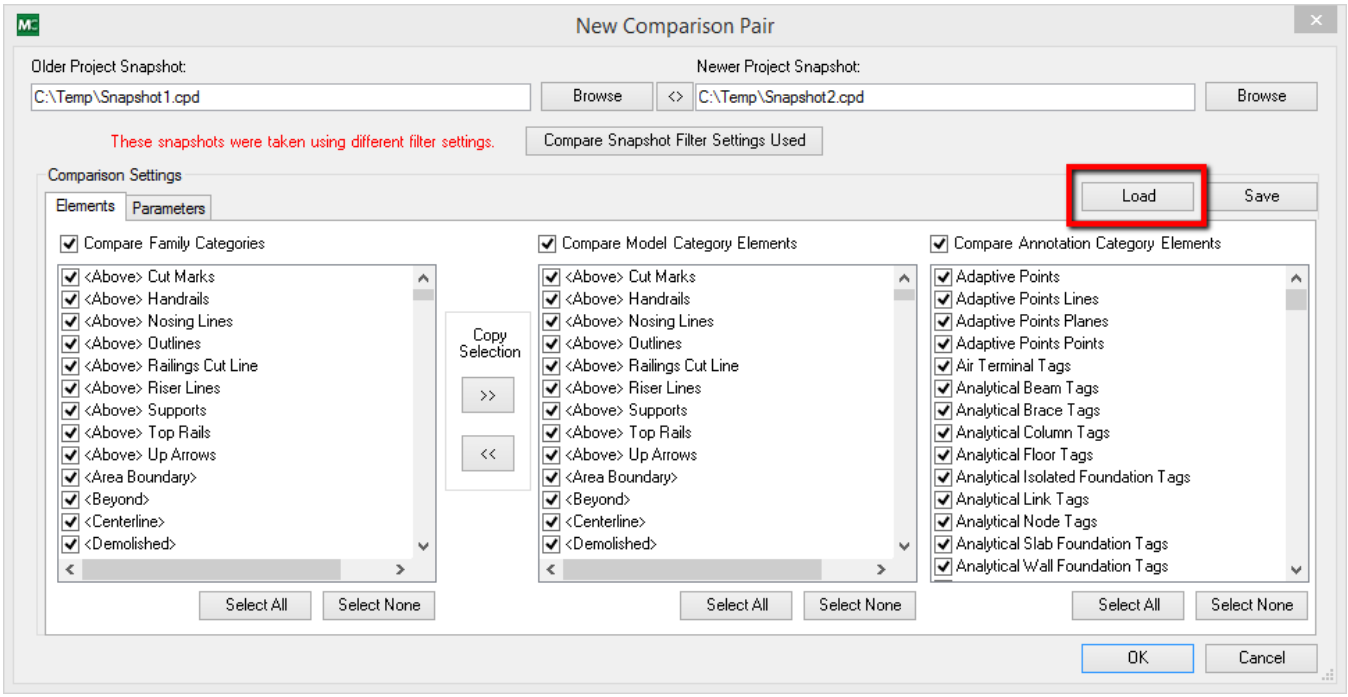


Select the desired options for the comparison. For this example all items have been checked.

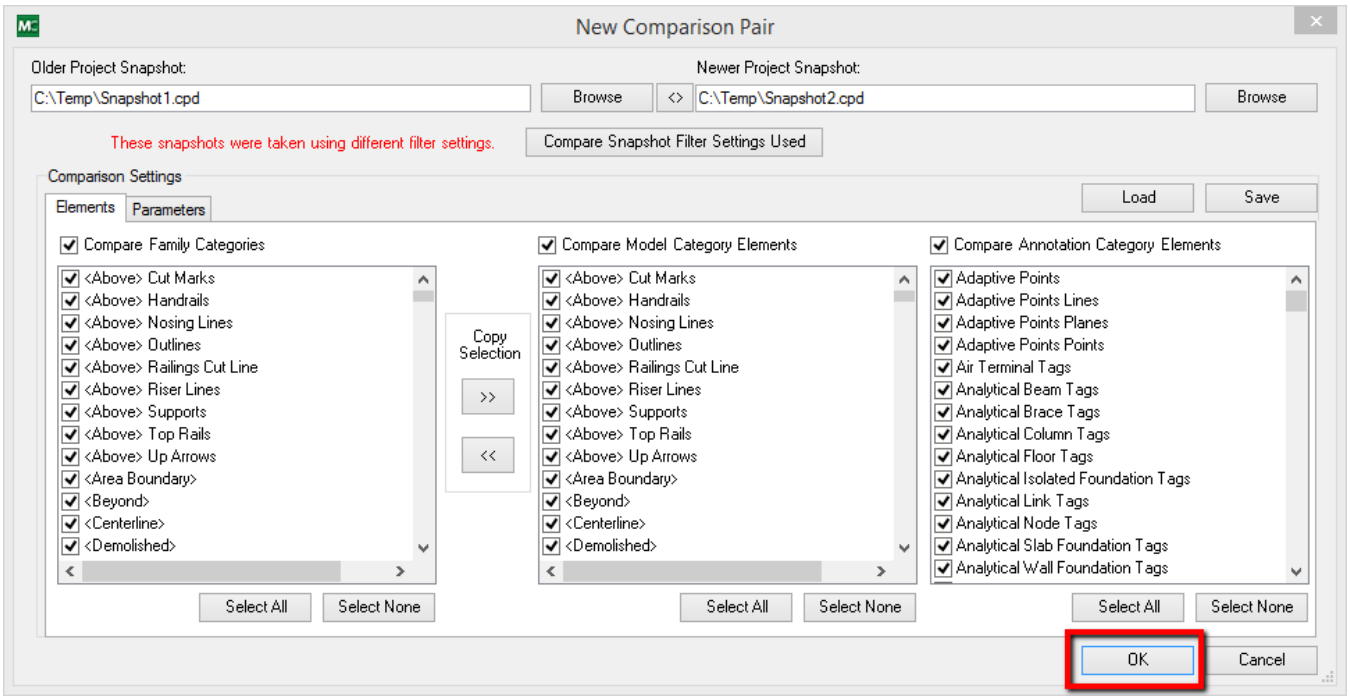
The “Comparison Settings” can be saved to a .cps settings file for later re-use or to share with other Model Compare users. To save the settings file, click “Save…” and specify the desired location.



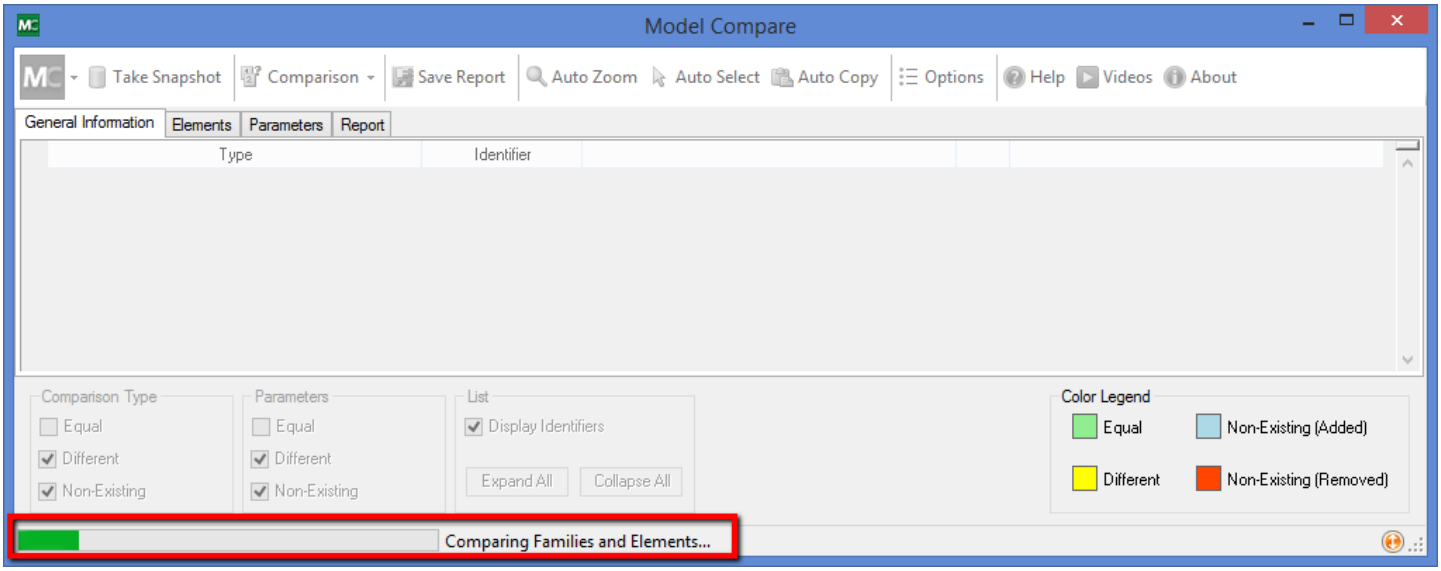
To load previously save settings, click the “Load…” button and browse to the desired settings file.



For this example we have selected all possible comparison options. Click OK to run the comparison.

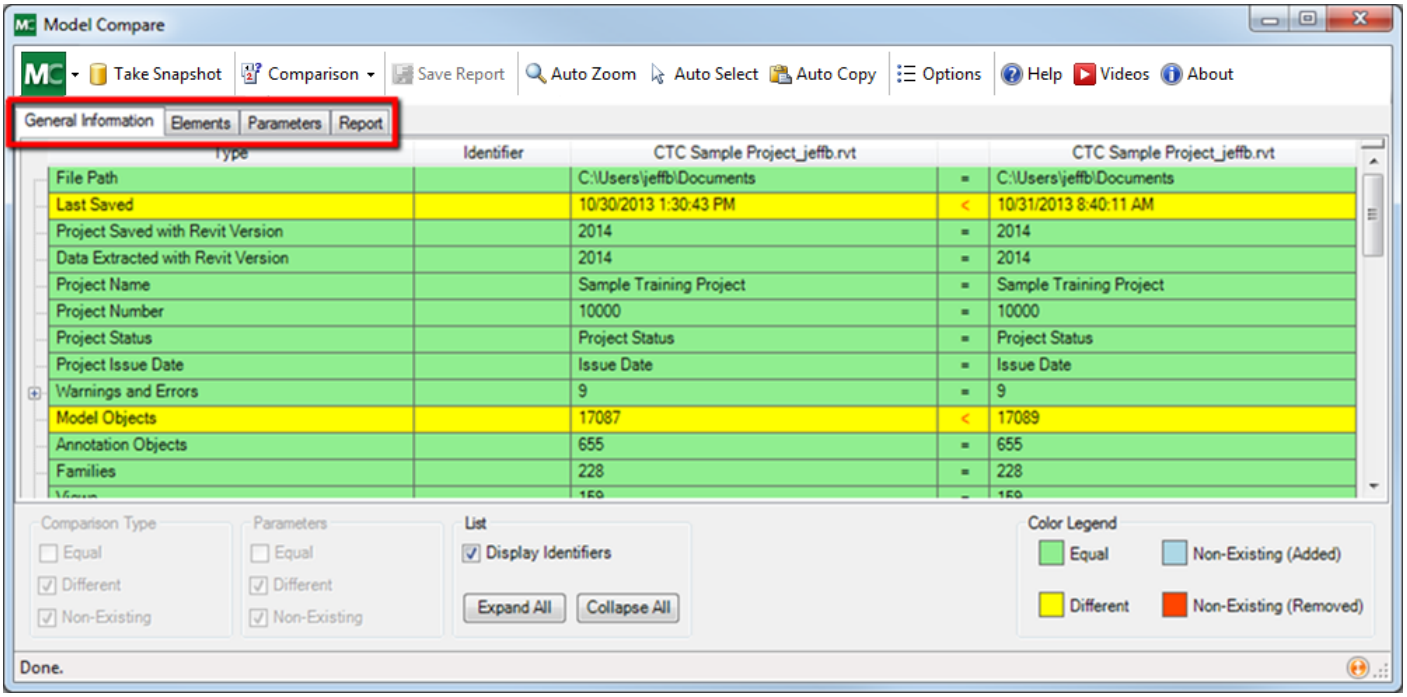


Depending on the size of the snapshot files the comparison may take several minutes to complete. A progress bar will display the current activity at the bottom of the "Model Compare" dialog.



Comparison Results

Once a comparison has completed the results will be displayed in the main “Model Compare” window. Tabs are used to display different parts of the comparison results.

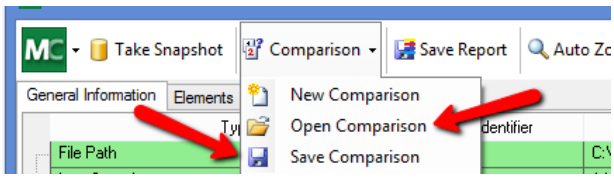


The tabs are:

- General Information – Contains overview information about the Revit project such as the number of model objects, warning counts, view counts, etc.
- Elements – Contains information about Family definitions and Modeled elements. If the model or family definitions are changed that information will be reflected here.
- Parameters – Contains parameter values organized by group. The “Position X” value could be used to identify all elements across all categories that moved in the X axis for example.
- Report – Rolls up all the information from the previous 3 tabs and puts it in a spreadsheet that can be saved to a spreadsheet file (for example a .xlsx file), searched, sorted or shared.

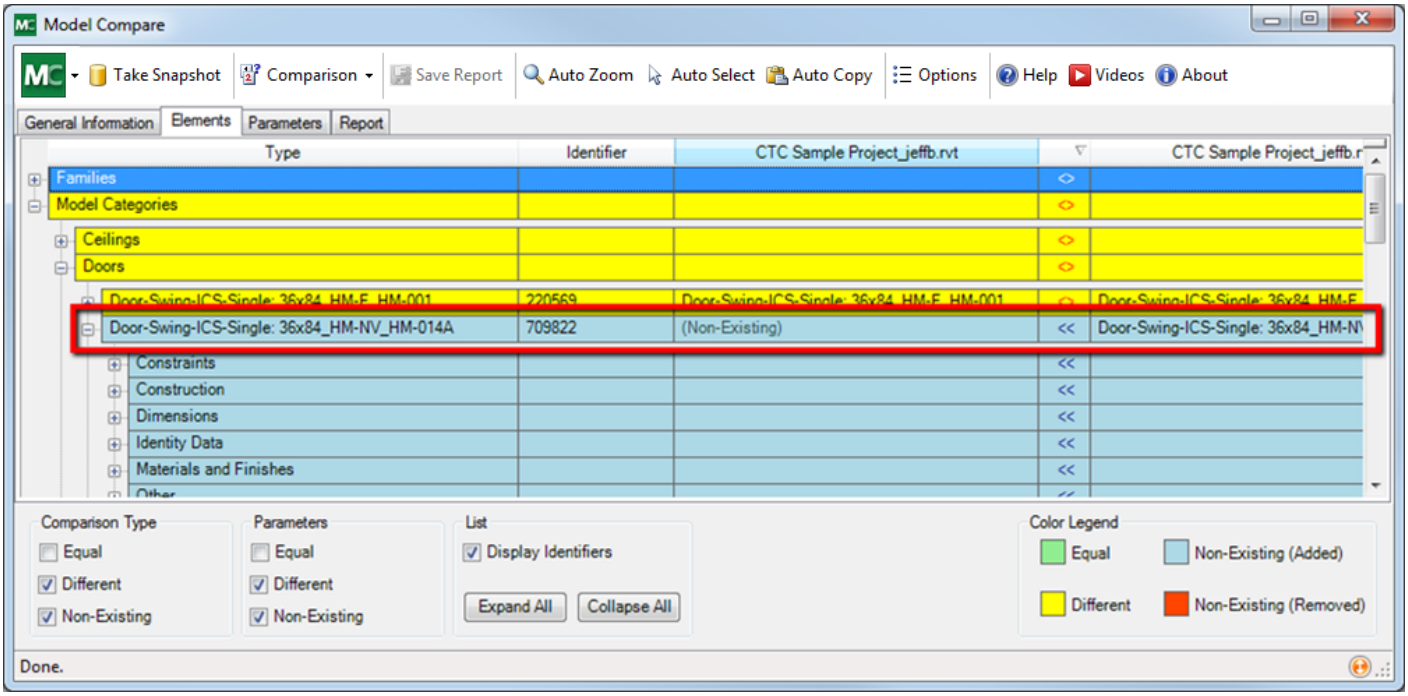
Here are the how the changes made earlier are reflected in the comparison results.

NOTE: Once a comparison has been made, the comparison results themselves can be saved to a .mcr file, which can then be reloaded at a later time, even by a different Model Compare user who is using a different computer.



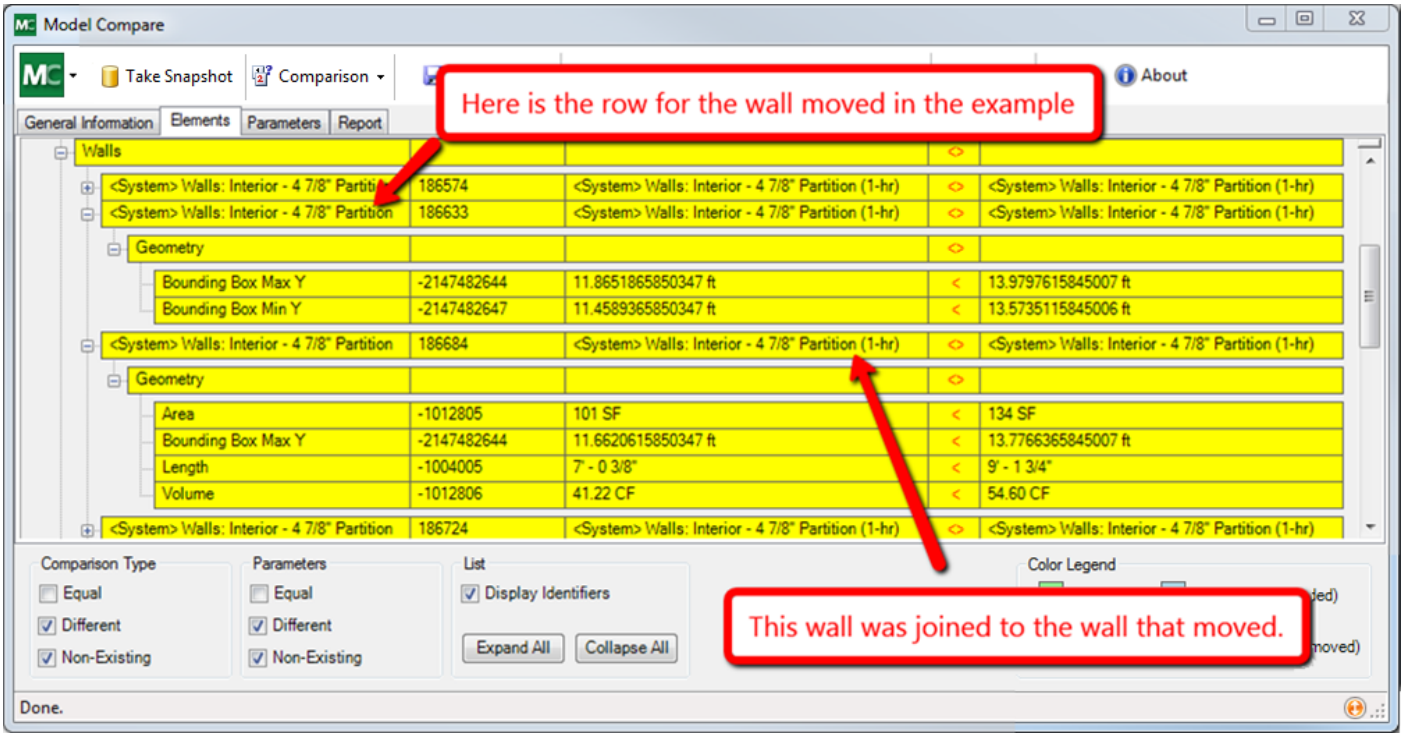
Office 114 – New Element Example

In the example above a new door was added. This change caused the “Doors” category to be highlighted in yellow indicating the change. Expanding the “Doors” category shows the new door exists in the second snapshot (on the right) that didn’t exist in the first snapshot (on the left). The line displaying the information for the new door is color coded in Blue to indicate a “non-existing (Added)” condition.



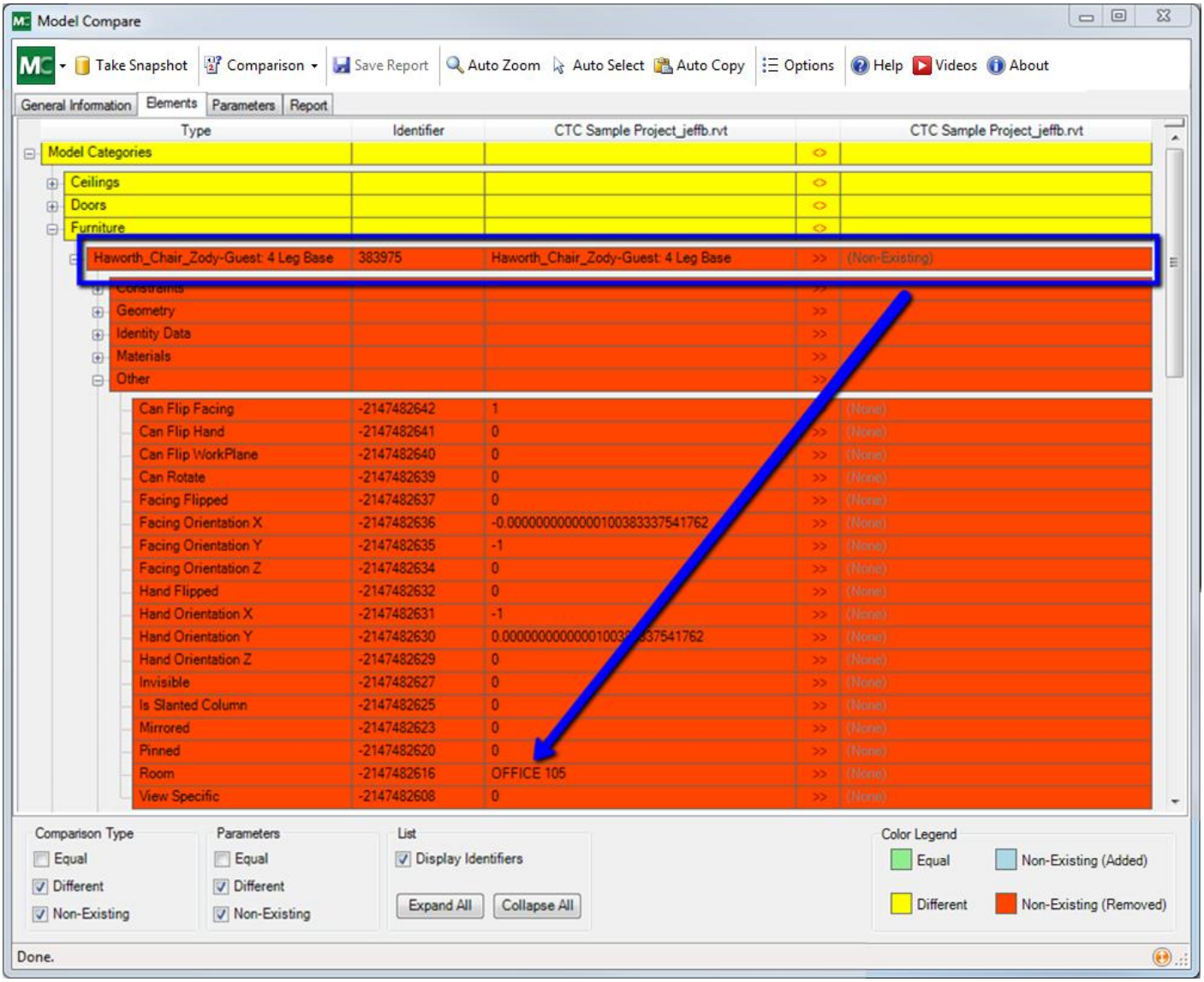
Elevator Equipment Room – Existing Element Change Example

In this example, the north wall of the Elevator Equipment room was moved north in the project by several feet. Moving this wall also extended the joined walls in the project. In the image below, two of the walls involved in the change are expanded to show their data. The top wall (element 186633) shows a change in its bounding box in the Y direction because that is the only axis in which it was moved. One of the joined walls (element 186684) shows a change in its Area, Bounding box, Length and Volume. The element existed in both snapshots, which Model Compare views as a change, and colors the cells yellow.



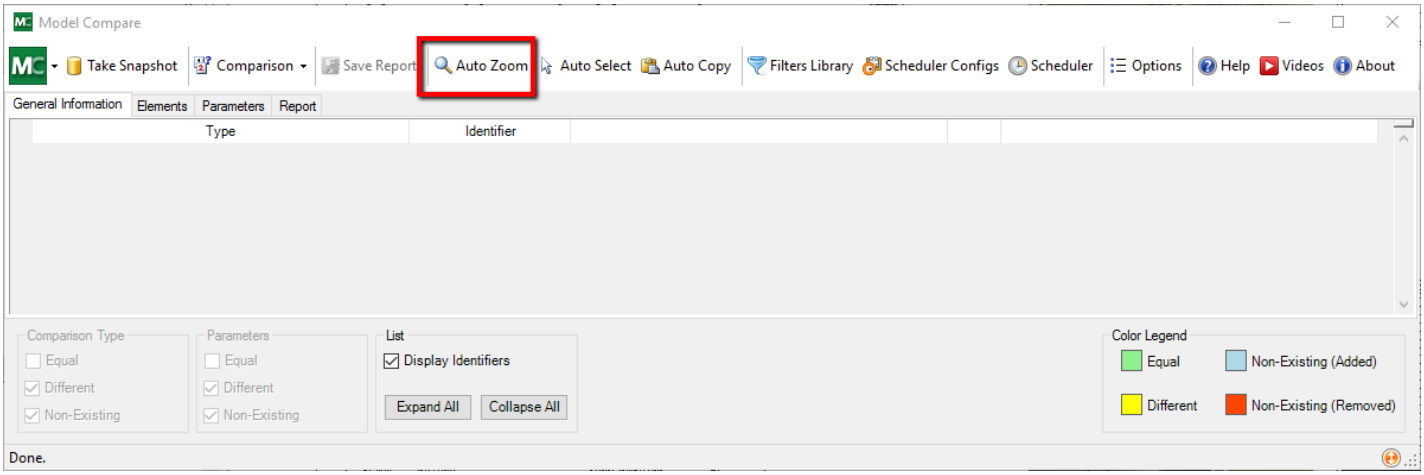
Office 105 – Element Deletion Example

In this example the chair in room 105 was deleted. The Furniture category is shown in yellow because of the change. Expanding the Furniture category reveals the chair itself (element 383975) shown in red. The image below shows the chair as well as the contents of the "Other" group of parameters; Note the value "OFFICE 105" of the "Room" parameter from the first snapshot.

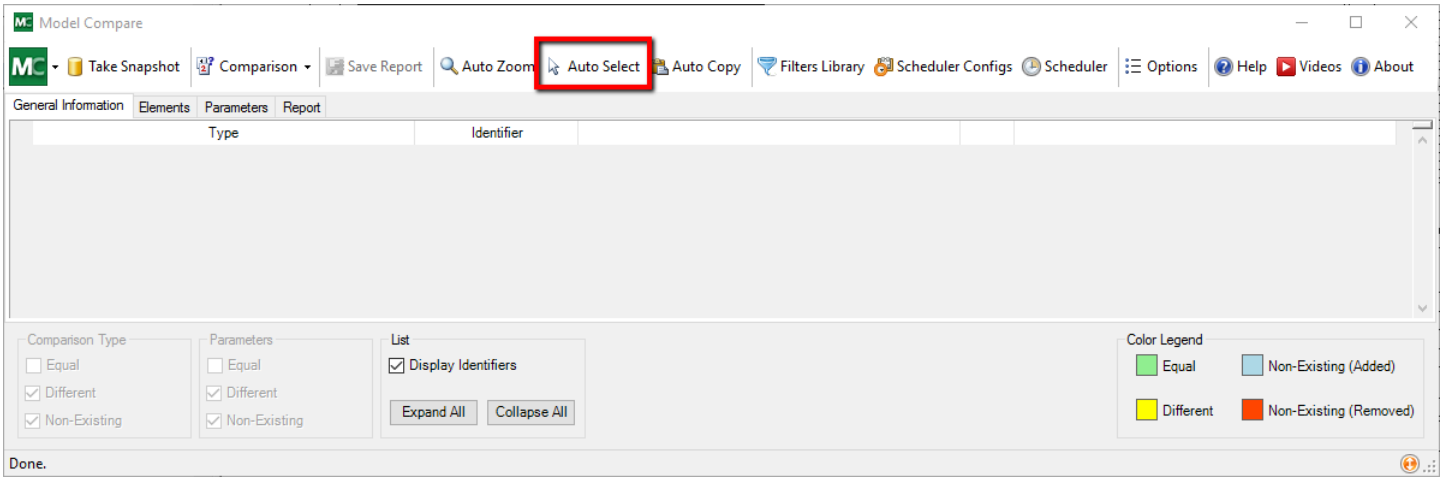


Auto Zoom, Select and Copy

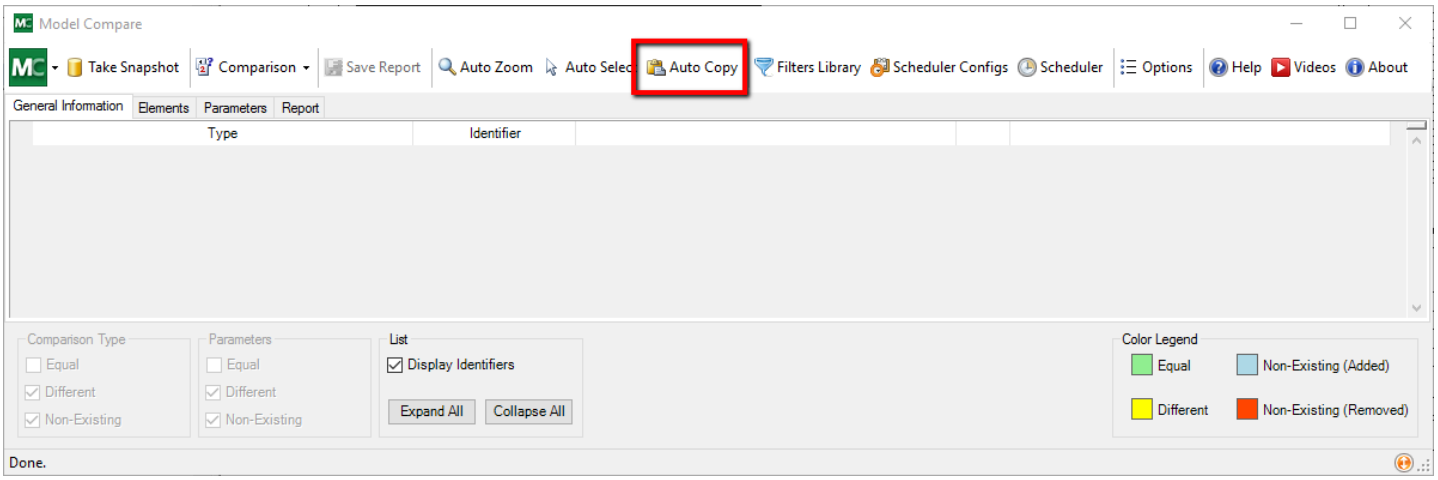
When the Auto Zoom button is enabled, Model Compare will automatically zoom in on the location of a model element within the Revit model when that element is selected from the comparison results. **This function assumes the model the snapshot was taken from is the model that is open in the current Revit session.**



When the Auto Select option is enabled, Model Compare will automatically select the element within the Revit model when that element is selected from the comparison results.



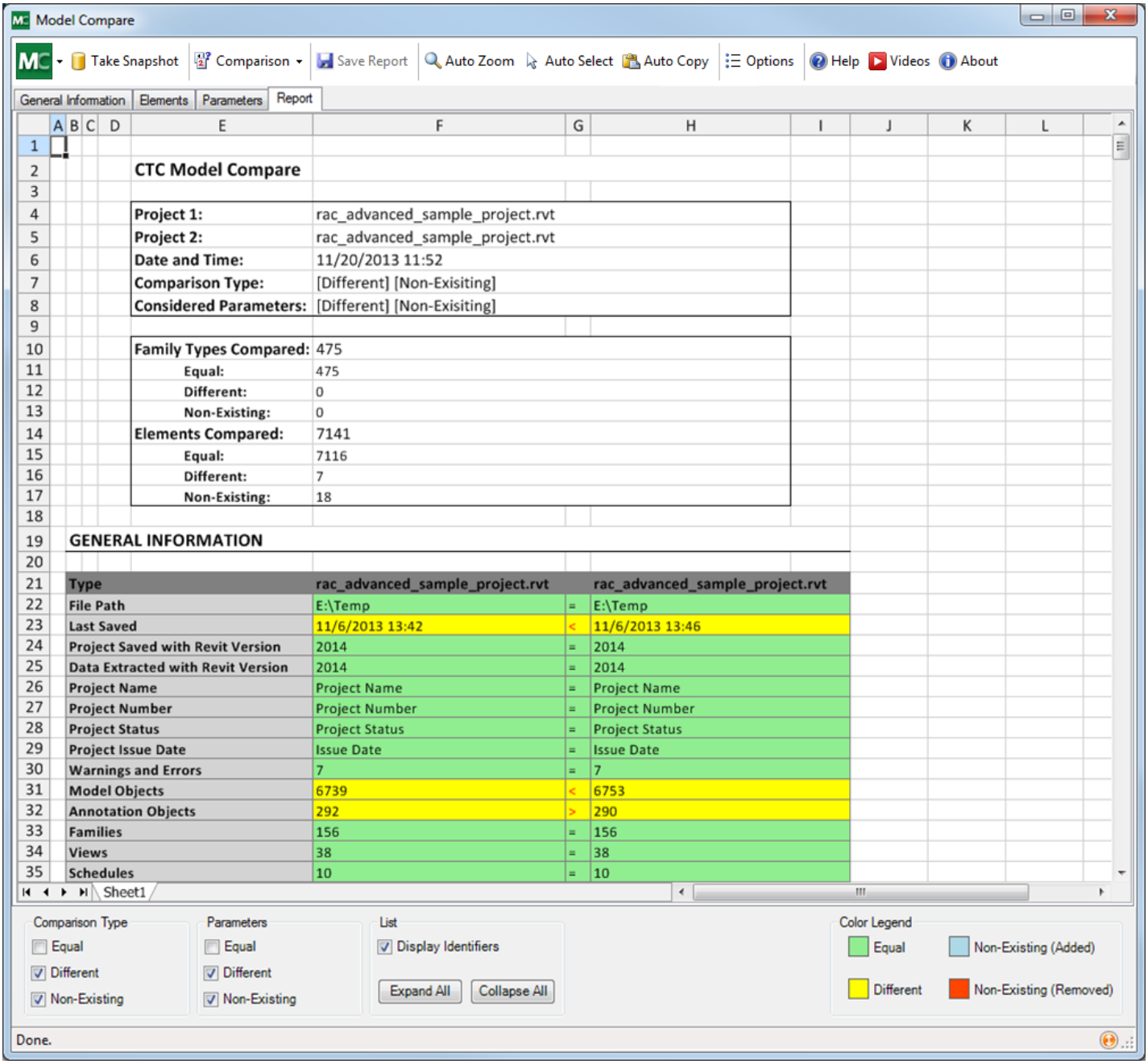
When the Auto Copy option is enabled, Model Compare will automatically copy the element ID of an element selected from the comparison results to the clipboard.



The next three tools (*Filters Library*, *Scheduler Configs* and *Scheduler*) will be discussed in the section below in the Scheduling Snapshots section.

Report Tab

The report function gathers all the information from the comparison results and puts it into a spreadsheet format. The report can then be saved externally in several popular spreadsheet formats, including .xlsx and .xls.



Scheduling Snapshots

Because querying a Revit project for data can be time-consuming, Model Compare allows you to schedule a snapshot such that the snapshotting process can happen any time, for example after hours or on a weekend.

As it can also be useful to track a project's changes over time, a snapshot of a project can be scheduled to occur periodically, for example every week.

IMPORTANT: **A BIM Project Suite license must be available during the entire time a scheduled task runs.** Snapshots will not be generated if a license is not available.

When snapshots are scheduled to occur, at the time they are to happen new Revit sessions will be used for the processing. The Revit splash screen will appear briefly as new Revit sessions begin the processing, but the rest of the snapshot process will not be visible.

IMPORTANT: Scheduled snapshots are not supported if Revit itself is using a borrowed floating license.

IMPORTANT: **A user account MUST BE logged in on the computer at the time the task is scheduled to run (e.g. 10:00 PM)**. This is required for Revit to be able to be launched. The logged in user DOES NOT need to be in Revit at the time. So if a task is scheduled to run on this computer later tonight, **you must NOT Log Off (or "Sign Out") at the end of the day**, but you can Ctrl+Alt+Del and "Lock" the workstation, which keeps you logged in but prevents anyone else from using the computer.

IMPORTANT: The user account logged in at the time the task runs must have drive letter mappings, permissions, etc. that are compatible with the settings and work to be done. For example, if you've specified to take a snapshot from a project on the "P:" drive, the user account that is logged in at the time the task is to run must have a "P:" drive mapped correctly and have permissions to at least read from that drive.

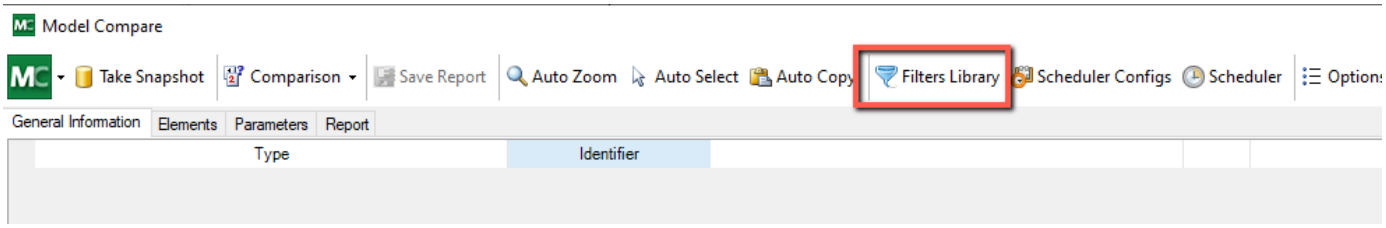
IMPORTANT: Any time a task is created or edited with this tool, when done being created or edited **it will be set to run as the user who just created or last edited the task**. In the above example, that means the person who last edited this task must have the proper permissions to files on the "P:" drive for the work to be done. Changing which account the task runs-as can be done using the Windows Task Scheduler, but if it's edited again with this tool, then who it runs-as will again get reset to being whoever last edited the task on this computer.

IMPORTANT: Central files are processed by creating a new local file in the current user's personal temporary directory and then opening the new local file for processing. This prevents conflicts or other issues that can be caused by opening a central file directly. The new local file is created opening all worksets. When the export is complete, the new local file is closed and deleted. This workflow is needed to ensure all links (including relative links) are maintained. Single user project files can only be opened from their original locations directly, in order to ensure all links are maintained. An error will occur if the single user project file is already opened in another Revit session, either on this computer or another computer.

The Windows Task Scheduler can be used to manually edit the task, provided none of the "Actions" are changed.

Configuring snapshot schedules is done using the *Filters Library*, *Scheduler Configs* and *Scheduler* buttons on the toolbar.

Filters Library

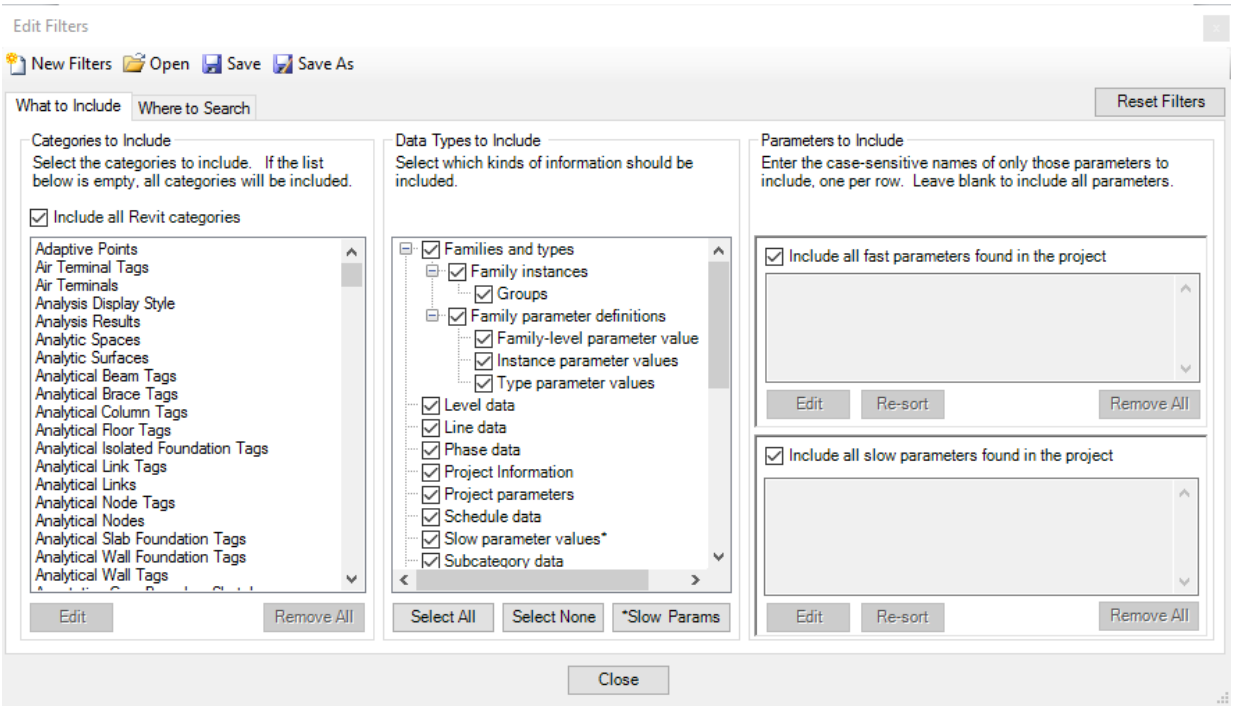


The Filters Library button allows you to load and save filter settings to *.psf (Project Snapshot Filters) files to any folder. The selection of a filters file is necessary for the scheduled snapshot to know what data to pull from each Revit project file it processes.

A default folder is provided, typically: **C:\Users\Public\CTC Software\Model Compare\Snapshot Filters**

The location of the default filters library folder can be controlled in the Options, which are discussed below.

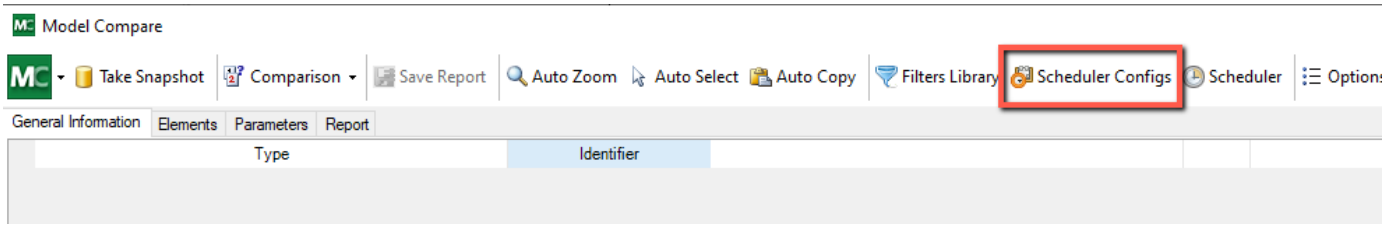
The Filters Library dialog is pretty self-explanatory:



The toolbar across the top controls loading and saving filter settings. The filter settings themselves complete the rest of the dialog.

Please refer to Appendix A for an explanation of how to configure the settings on the "What to Include" and "Where to Search" tabs.

Scheduler Configs

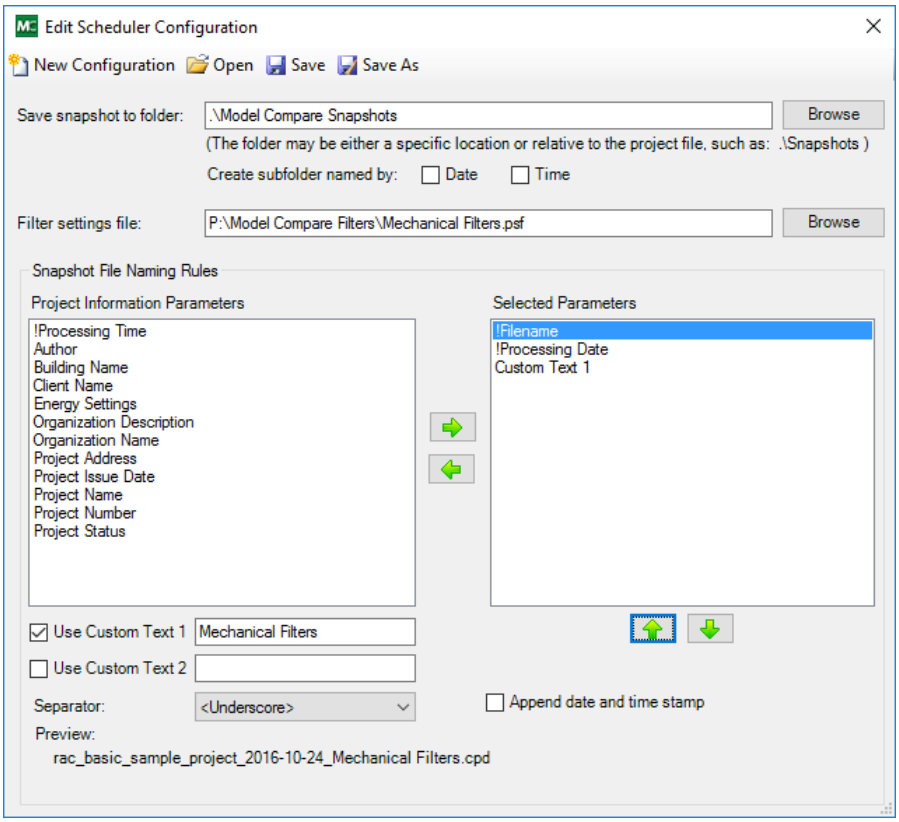


A scheduler configuration contains all the settings that are to be applied to a project when creating a snapshot. These settings are stored in *.mcconf (Model Compare Configuration) files.

These settings include:

1) In which folder to store the created snapshot file (*.cpd file)
2) Which filter settings file (*.psf) to use when taking the snapshot
3) Settings that control how to name the snapshot file to be generated

The dialog looks like this, with some sample values provided:



The value for “Save snapshot to folder” determines where the snapshot file will be stored. This can be a specific folder (e.g. “C:\Snapshots”) or it can be a folder that is located relative to where the project file being processed is located.

If either the “Date” or “Time” checkboxes are checked, one more subfolder will be created that will be named by a date- and/or tme-stamp of when the snapshot was taken.

Relative path example 1: Use a subfolder within the project's folder

Project file location: P:\Projects\Hospitals\Hospital1\Hospital1.rvt
"Save snapshot to folder" value: .\Snapshots
Resulting folder for exports (folder created if needed): P:\Projects\Hospitals\Hospital1\Snapshots

Relative path example 2: Use a folder at the same level as the project's folder

Project file location: P:\Projects\Hospitals\Hospital1\Hospital1.rvt
"Save snapshot to folder" value: ..\Snapshots
Resulting folder for exports (folder created if needed): P:\Projects\Hospitals\Snapshots

Relative path example 3: Use a folder at a higher level than the project's folder

Project file location: P:\Projects\Hospitals\Hospital1\Hospital1.rvt
"Save snapshot to folder" value: ..\..\Snapshots
Resulting folder for exports (folder created if needed): P:\Projects\Snapshots

In the example above, the snapshot will be stored in a folder called "Model Compare Snapshots" which will be created in the same folder as the project file itself. The folder will be created if needed. No date- or time-stamped subfolder will be created.

Also in the example above, the filter settings file used will be **P:\Model Compare Filters\Mechanical Filters.psf**, which perhaps only selects data from mechanically-based categories within the Revit model.

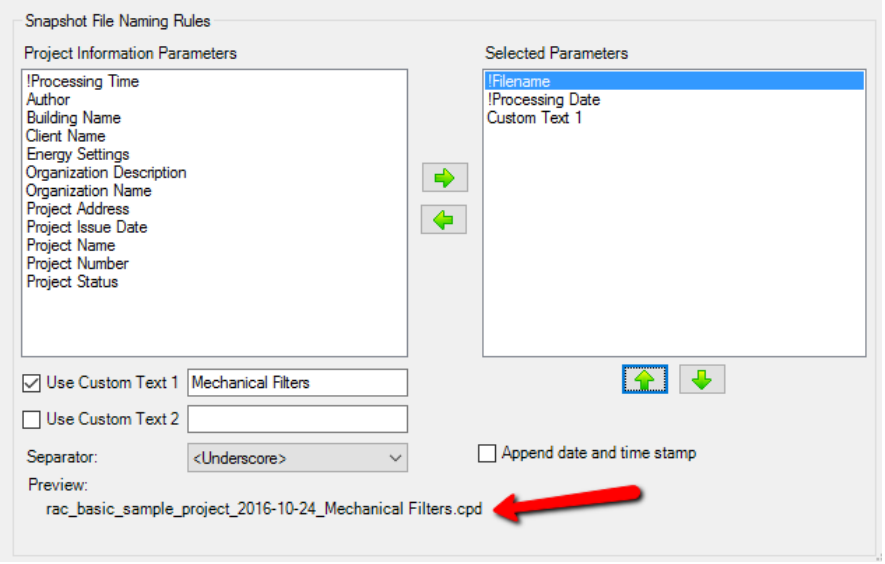
"Snapshot File Naming Rules" determine how the snapshot files to create will be named. Specifically, they'll be named based on the list of parameter values, in the order of the parameter values defined.

The list of parameter choices come from the project parameter values, as well as some fixed parameters (the project file name, the processing date, and the processing time). Up to 2 custom text values can be placed anywhere in the list as well.

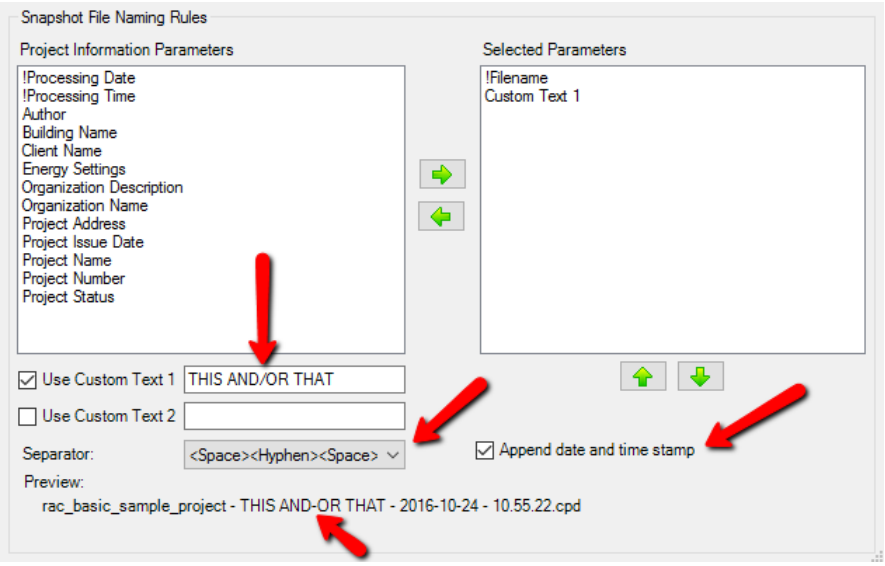
In the above example, the name to be generated will be the file name of the project followed by the date the snapshot was taken, followed by the words "Mechanical Filters" which describe which filters were applied.

The order in which the selected parameters are used can be controlled using the up- and down- arrows below the list, which will move the selected parameter(s) up or down.

A preview of what the final file name will look like (based on the current project's file name and project parameter values) can be seen in the lower left corner, and will update in realtime as the settings change:



Here's another example which uses some different settings:



In this example, the custom text has an illegal filename character (the "/") and the preview shows that a hyphen will be used wherever an illegal character appears in a parameter's value. The character to be used (or none) is controlled in the Options settings, discussed below.

The date and time of the snapshot are appended to the end of the file name by simply checking the "Append date and time stamp" checkbox.

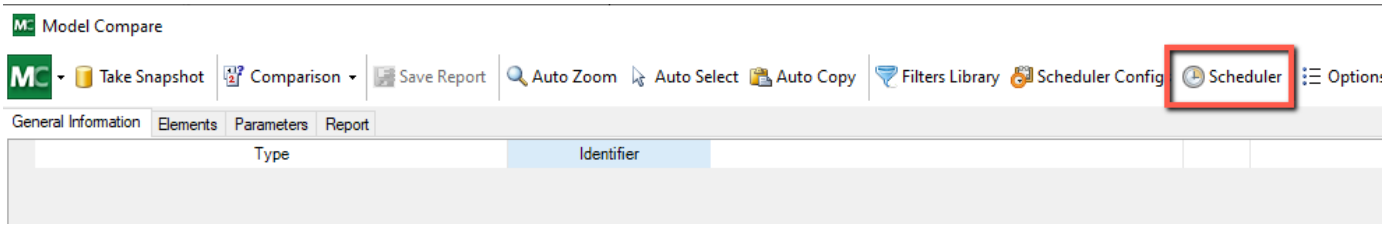
Also, the "<Space><Hyphen><Space>" separator was chosen, which can be seen in the preview between the project file name and custom parameter value, and again between the custom parameter value and the date, and again between the date and time.

The toolbar across the top of this window allows saving or loading scheduler configuration files. The default folder is usually: **C:\Users\Public\CTC Software\Model Compare\Scheduler Configurations**

The location of the default scheduler configurations folder can be controlled in the Options, which are discussed below.

We can save these filters to a file called “Mechanical Filters.mcconf” in that folder.

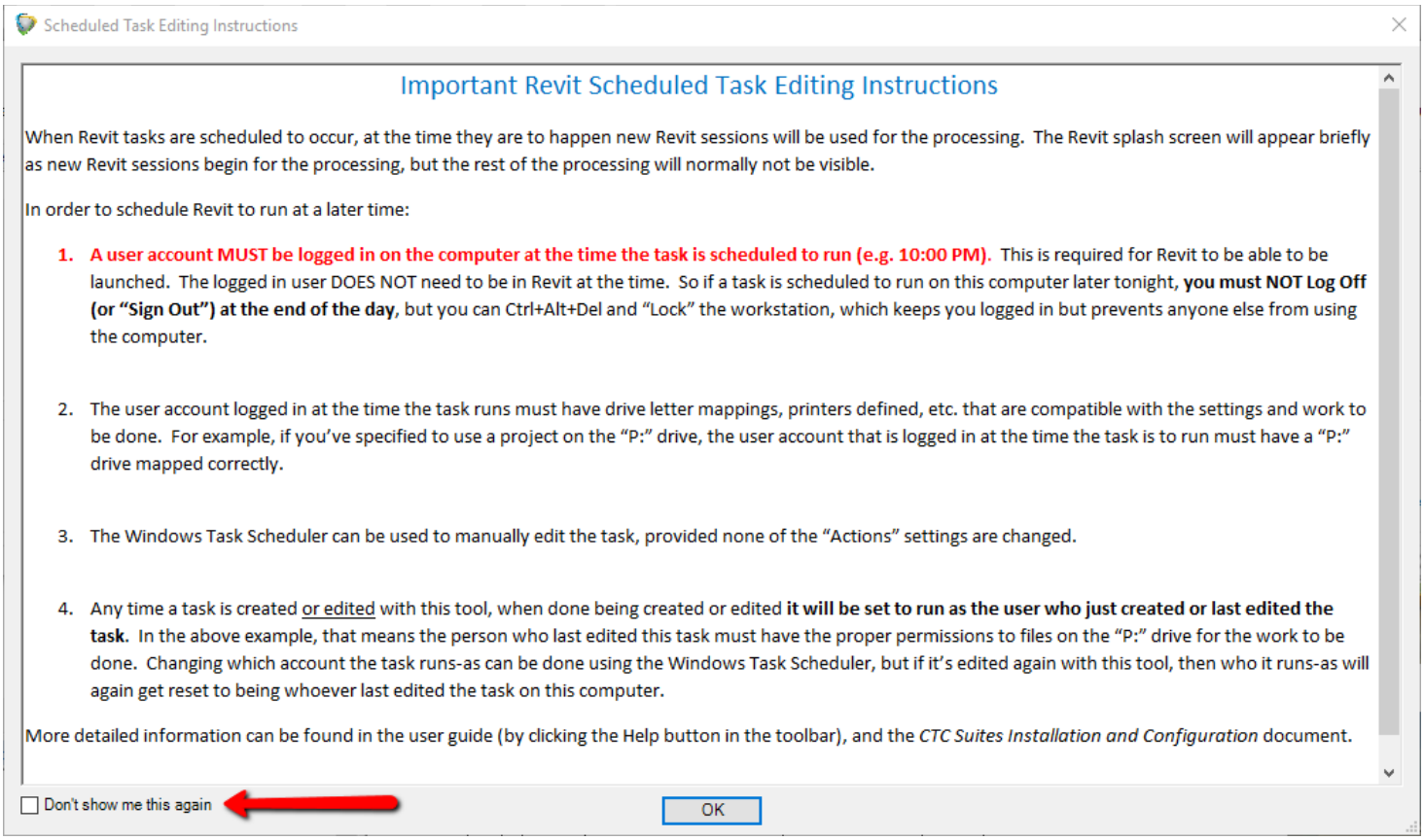
Scheduler



The Scheduler toolbar button allows defining the day(s) and time(s) at which a scheduler configuration file should be run, and on which project(s) it should be run.

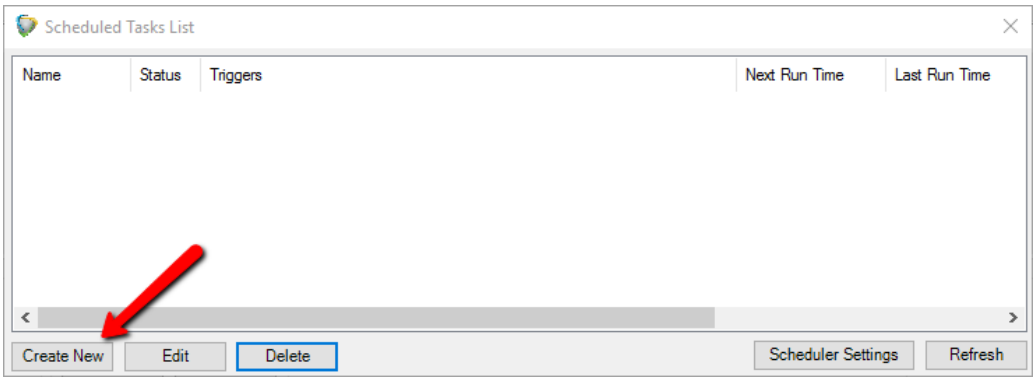
For example, you may want to schedule the same snapshot be taken every evening of a project so you can review the changes made to the project each day by generating a comparison between the snapshots.

Each time you click the Scheduler button, the following basic instructions will appear:

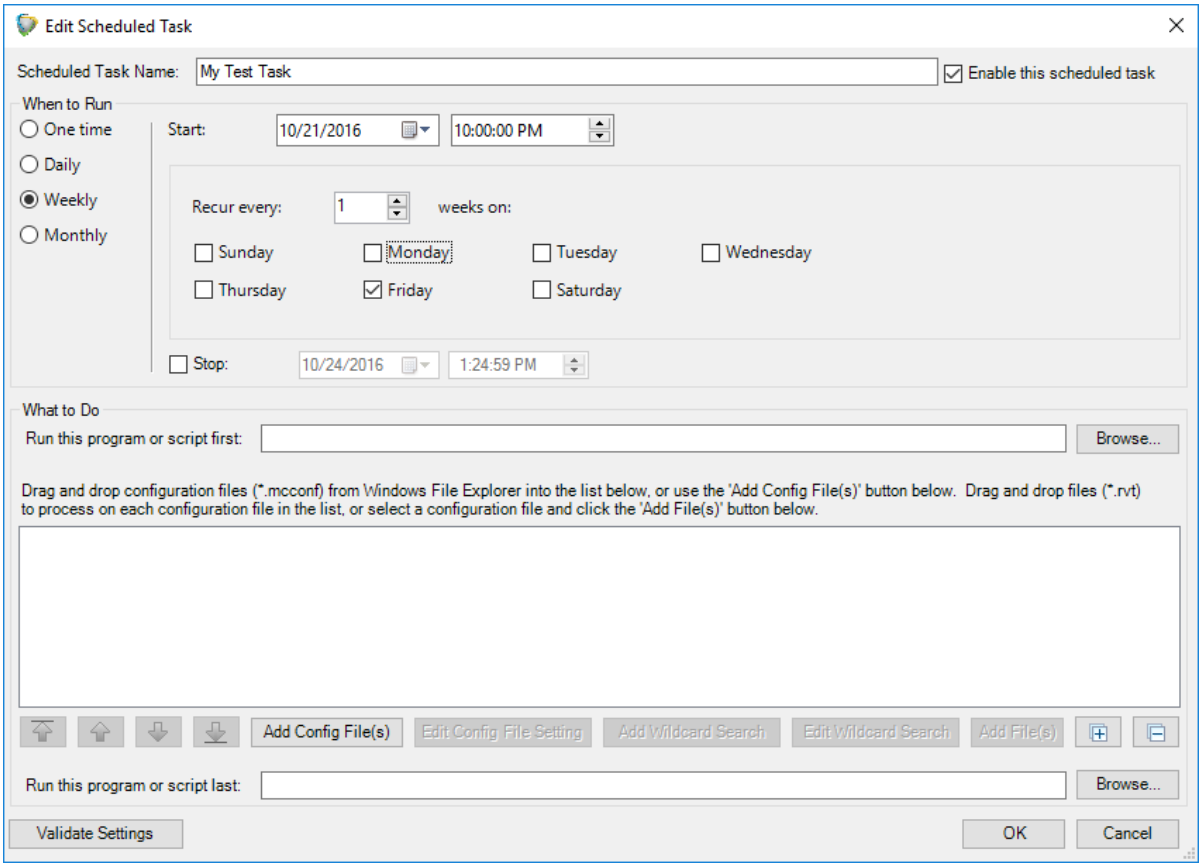


However, this can be turned off by checking the “Don’t show me this again” checkbox in the lower left corner.

Once the Scheduler toolbar button is clicked, the list of scheduled tasks will appear:



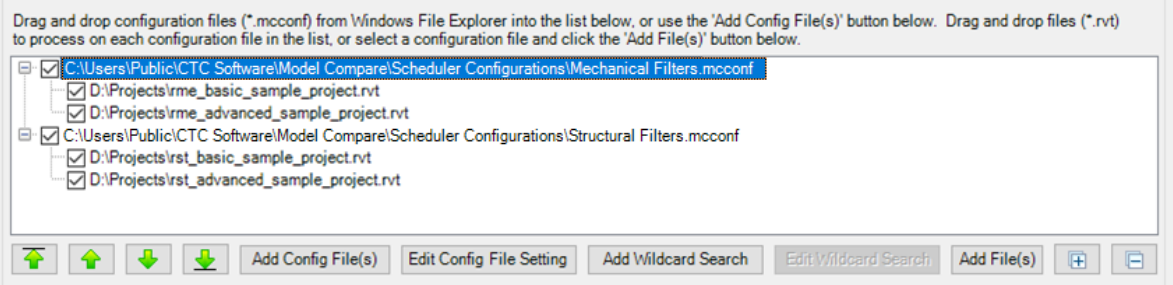
To create a new task, click the “Create New” button on the dialog seen above, which will bring up the task editor:



Every scheduled task needs a name and the settings to specify when it should run. These are set in the top portion of the screen, as can be seen in the image above.

Every scheduled task also needs to have defined what to do whenever the task runs. The heart of “what to do” is a list that you define of saved Model Compare configuration files, and the Revit project files on which to run each configuration file.

For example:



This approach allows you to specify the order in which configurations will be applied, and the order in which the projects they will be applied to are processed.

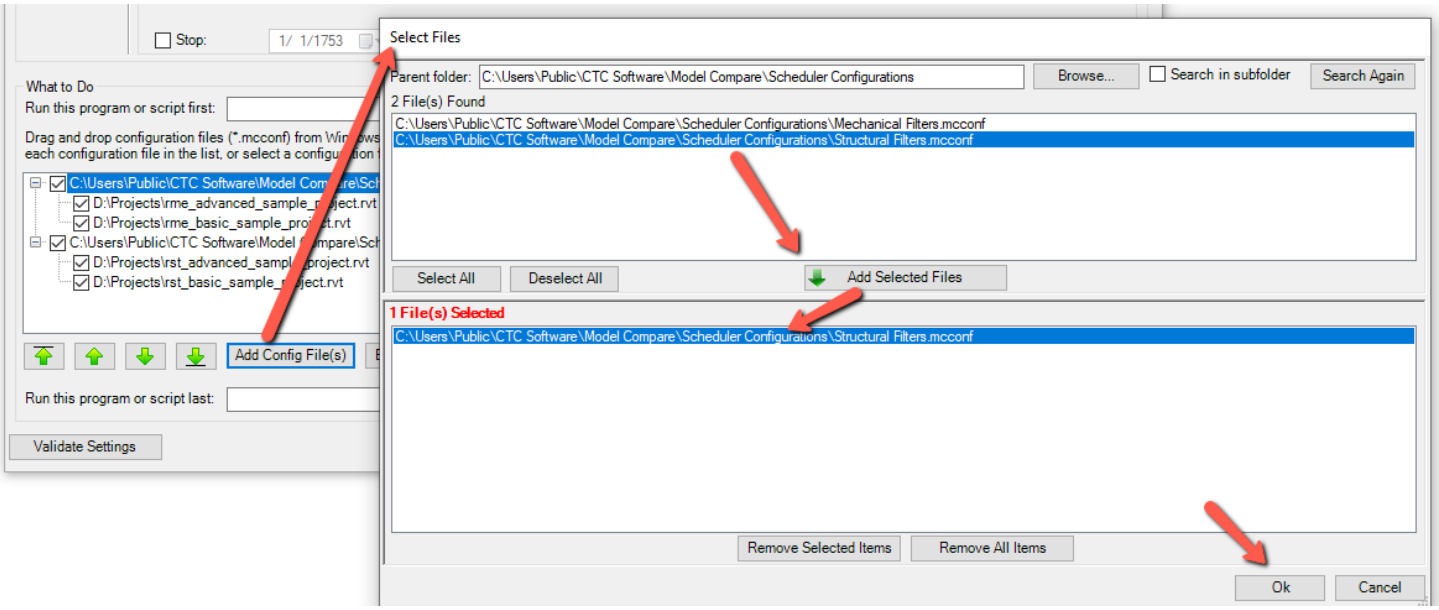
Further, **this approach also lets you configure an entire evening's processing in ONE scheduled task**.

IMPORTANT: It is recommended to avoid having two scheduled tasks run at the same time on the same computer. This is mostly for performance and stability reasons. Because Revit consumes a LOT of system resources, if two or more Revit sessions are opening projects at the same time on the same computer they will compete for resources, possibly running out of memory and almost certainly running significantly more slowly than if each had all the resources available and the tasks were run consecutively.

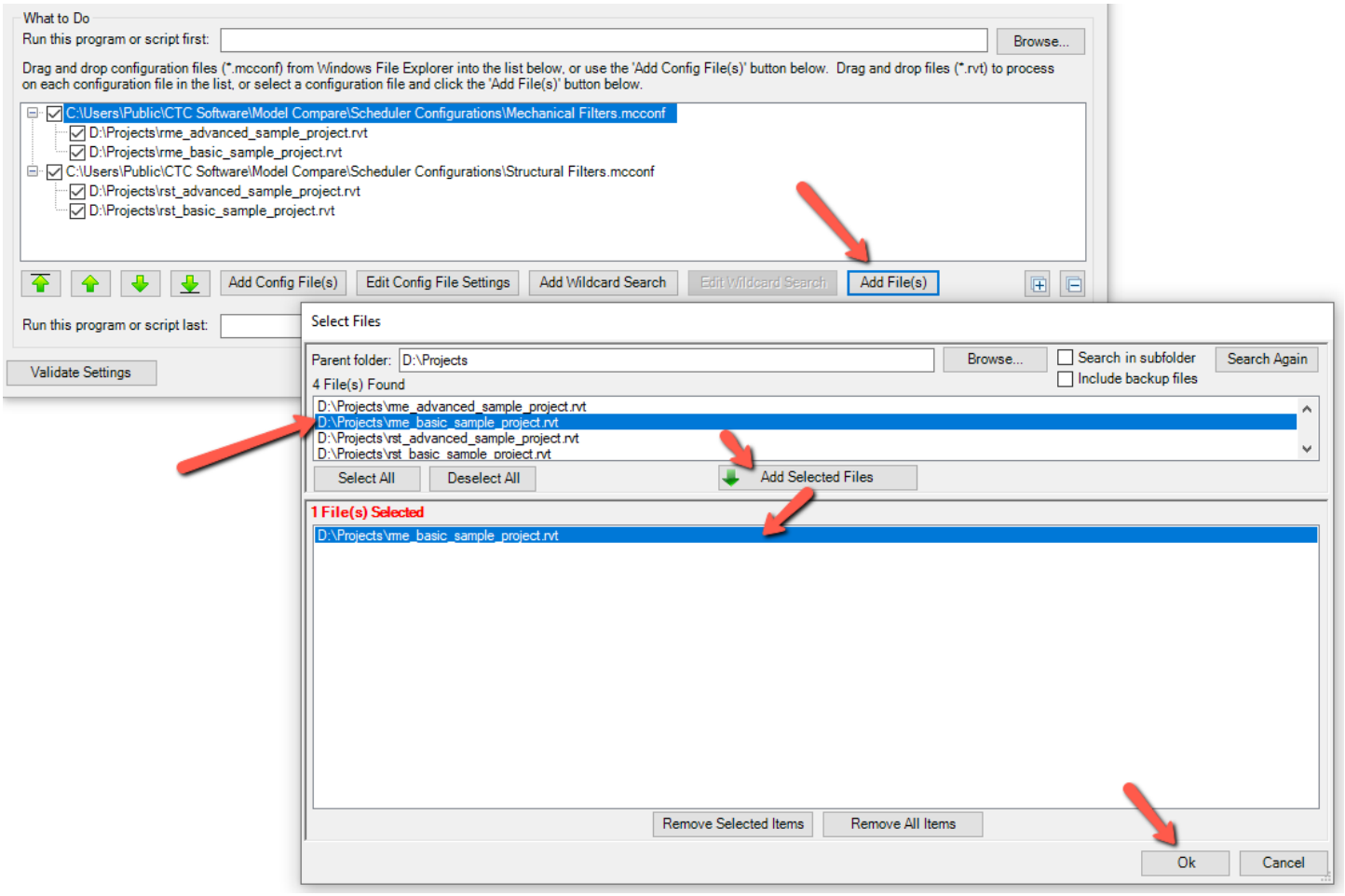
This feature of defining all of the configuration files to be run against all of the project files in a specified order can therefore improve performance and reliability of scheduled snapshots.

In the above example, we used Windows File Explorer to drag and drop configuration files (*.mcconf) into the list, and Revit project files (*.rvt) onto each configuration file. The new item(s) are added immediately after the item on which they were dropped.

We can also use the "Add Config File(s)" button below the list to browse for one or more configuration files from one or more folders to add to the list:

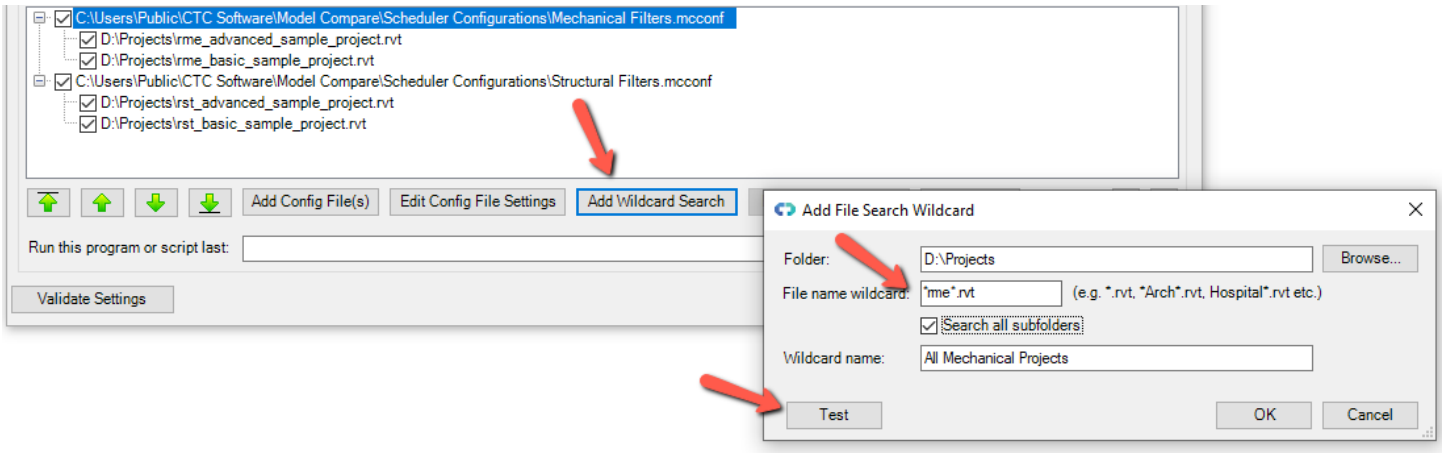


Once a configuration file is in the list, Revit project files can be dragged and dropped on top of it, or the “Add File(s)” button can be clicked to use the same Select Files browser to select one or more Revit project files from one or more folders to be processed using the added configuration file settings:

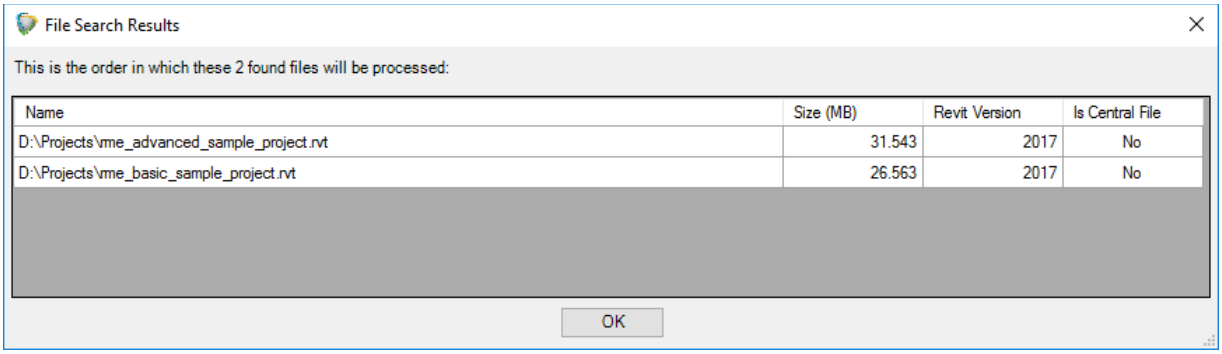


When selecting Revit project files, the search results in this dialog will not include Revit backup files by default.

Another important tool is the ability to add a “wildcard search” for Revit project files, which will search for all Revit project files whose names match a specified criteria within a given folder, and optionally all subfolders. This can be done using the “Add Wildcard Search” button below the list when a configuration file is selected. For example:

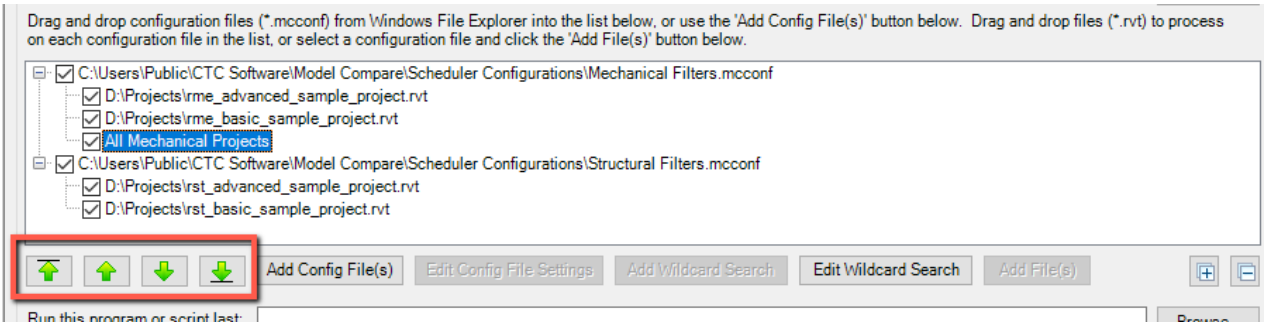


Clicking the “Test” button shows:



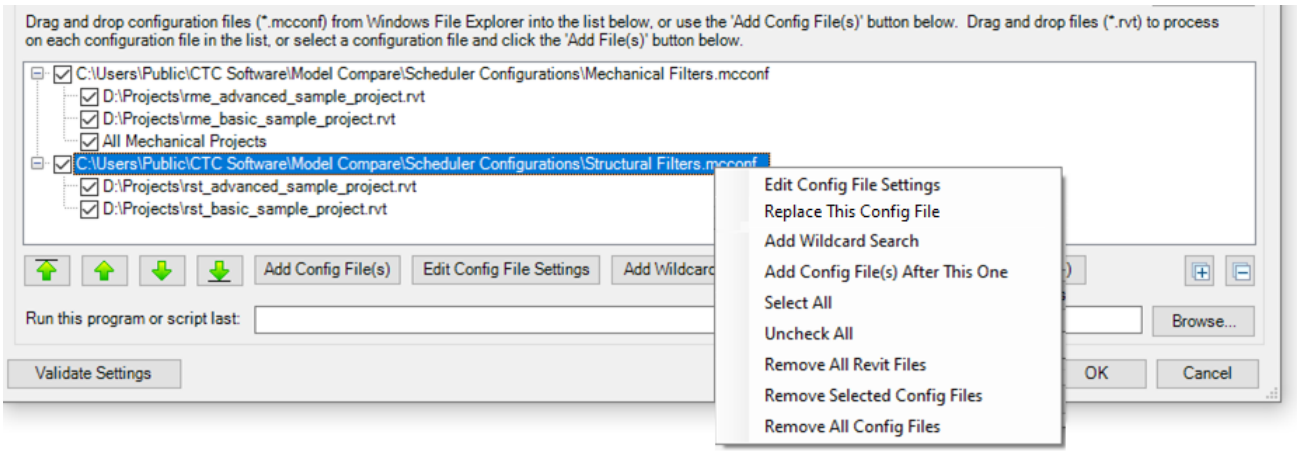
Editing a wildcard search that is in the list can be done by either double-clicking on the item, or selecting the item and clicking on the “Edit Wildcard Search” button or by right-clicking on the wildcard in the list and selecting “Edit Wildcard Search” from the pop-up menu.

The order in which exports will be processed can be changed by using the green Move buttons below the list. This works on multiple items selected:

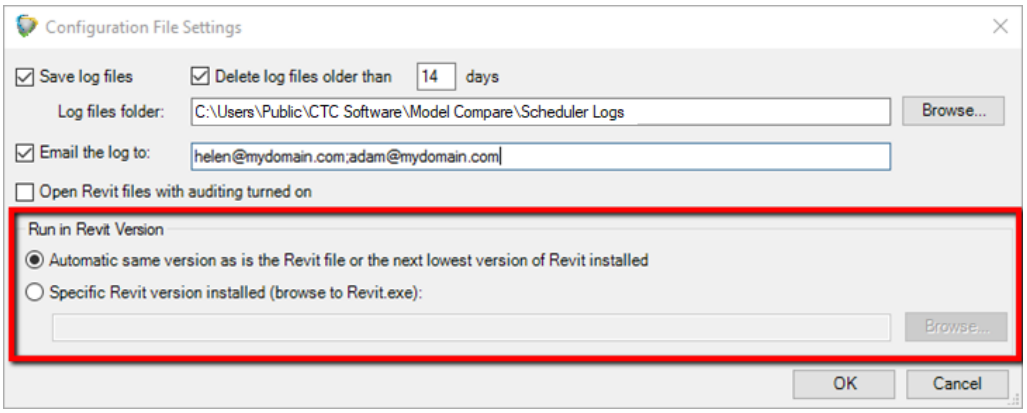


Items can be removed (deleted) from the list by selecting one or more items and pressing the “Del” key on the keyboard. As is also standard for working with list items, the “Ctrl+A” key combination will select all items in the list.

Context-sensitive right-click pop-up menus are available. Here is just one example:



Each configuration file in the list can have custom processing settings defined. These can be edited using either the "Edit Config File Settings" pop-up menu choice, or by clicking on the "Edit Config File Settings" button located below the list, or by simply double-clicking on the configuration file in the list:



IMPORTANT: For emailing log files to work, working email configuration settings must be defined in the Options section of Model Compare (see below). Log files are always emailed in CSV format. A single email with multiple CSV attachments will be sent to each recipient specified (you can separate recipient addresses with semicolon characters). Each CSV attached will be the log for a separate project file that was processed.

IMPORTANT: By default, the lowest version of Revit will automatically be run on project files based on:

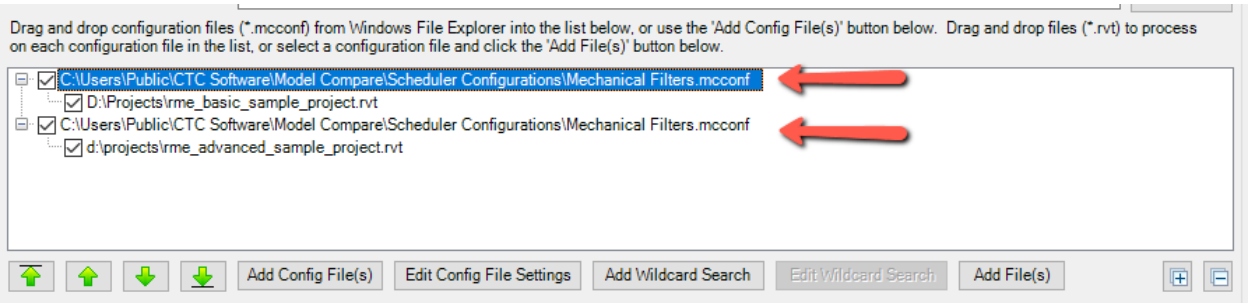
- First, the version of Revit in which the project file was last saved, then
- The lowest version of Revit installed for which Model Compare is supported

There may be times when you want to force the projects to be processed in a specific (same or later) version of Revit. To facilitate this, you can select "Specific Revit version installed (browse to Revit.exe)" and then select which Revit.exe to run.

The "Replace this Config File" menu choice will allow you to swap out the selected configuration file with a different configuration file to which you browse, without losing the list of the project files on which to run the configuration.

The default settings to apply to configuration files as they are added to the list can be controlled back on the main Scheduled Tasks List window using the "Scheduler Settings" button, which will be demonstrated further below.

A workflow where using different configuration file settings may be useful is if some project files should have their logs emailed to one person, while other project files should have their logs emailed to another person. For example:

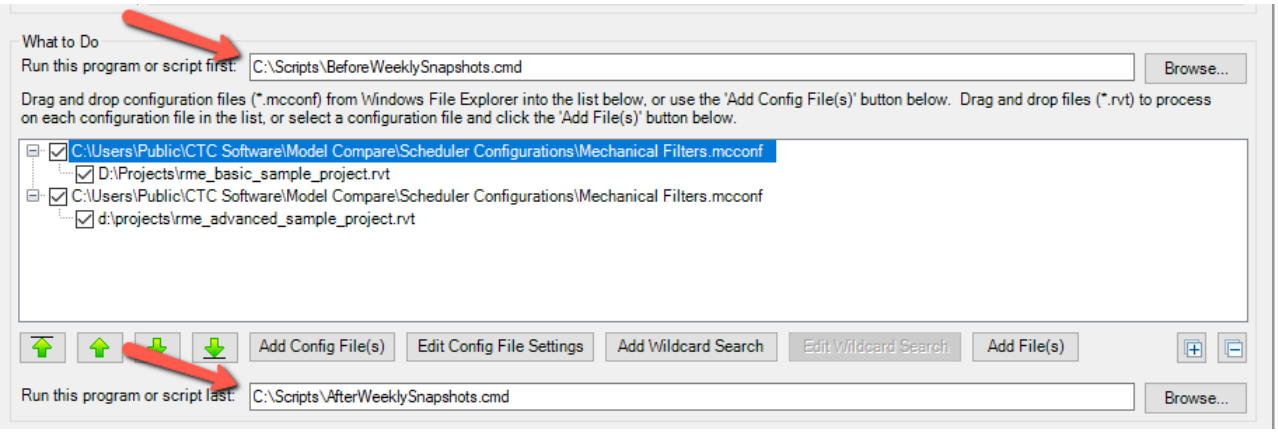


In this example, the same configuration file is listed twice, with different project files to be run for each one. The only difference in this case is to whom the emails are sent for each list of projects processed. Multiple email addresses can be listed if they are separated with a semicolon (;) character. For example:
helen@mydomain.com;adam@mydomain.com

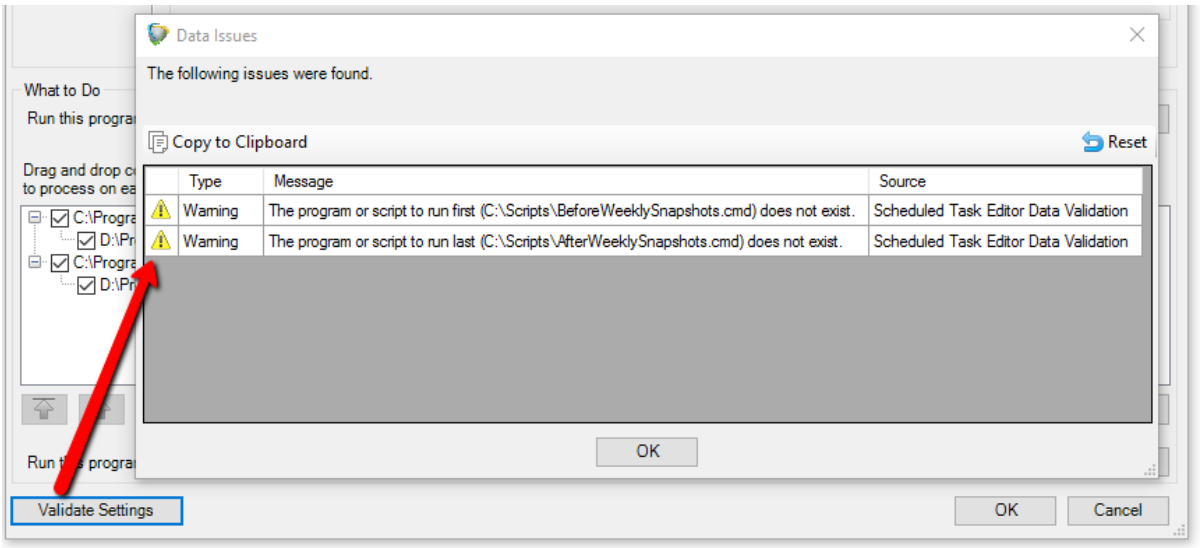
IMPORTANT: A separate Revit session is launched for each project file in the list, even if the same project is listed under different configurations. After each project is processed, its dedicated Revit session is closed. This is done because:

- A different version of Revit may need to be used for each project processed (e.g. if the default autodetection setting is used)
- A different, specific version of Revit may be set up for each configuration file
- To help ensure a clean Revit session is used for each project

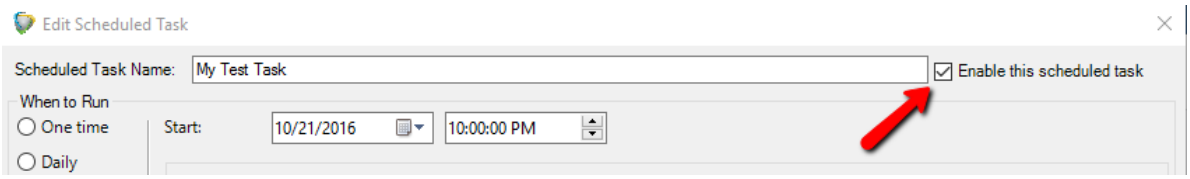
Scripts or other programs can be run before and/or after all processing is to happen:



In the lower left corner of the task editing window is the Validate Settings button. This button may bring up a dialog which warns you of any detectable issues with the scheduled task definition. For example:

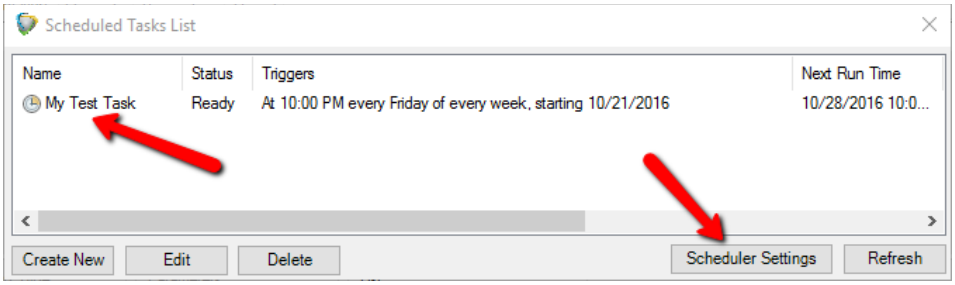


Finally, the last item to mention on the task editor screen is the task enable checkbox, which is checked by default:



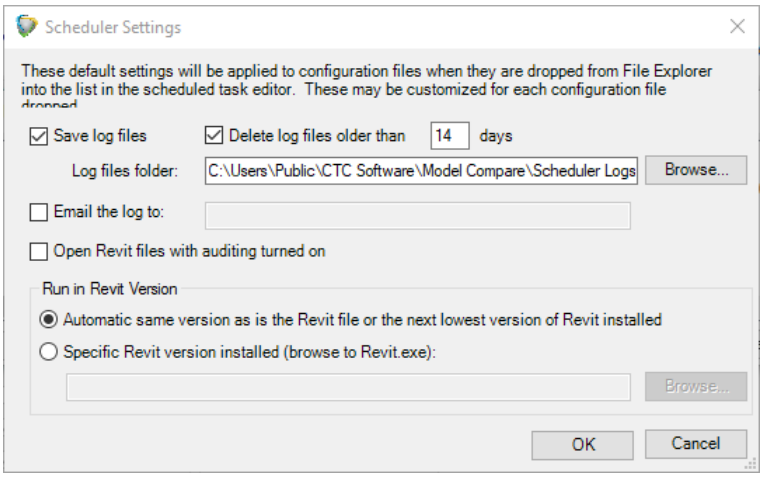
A scheduled task can be quickly and easily enabled or disabled by changing this checkbox. Disabling the task will prevent it from running at the scheduled time without having to delete its entire definition. So the task can be “turned on” or “turned off” easily.

Clicking the “OK” button at the bottom of the list saves the task definition in the task list:



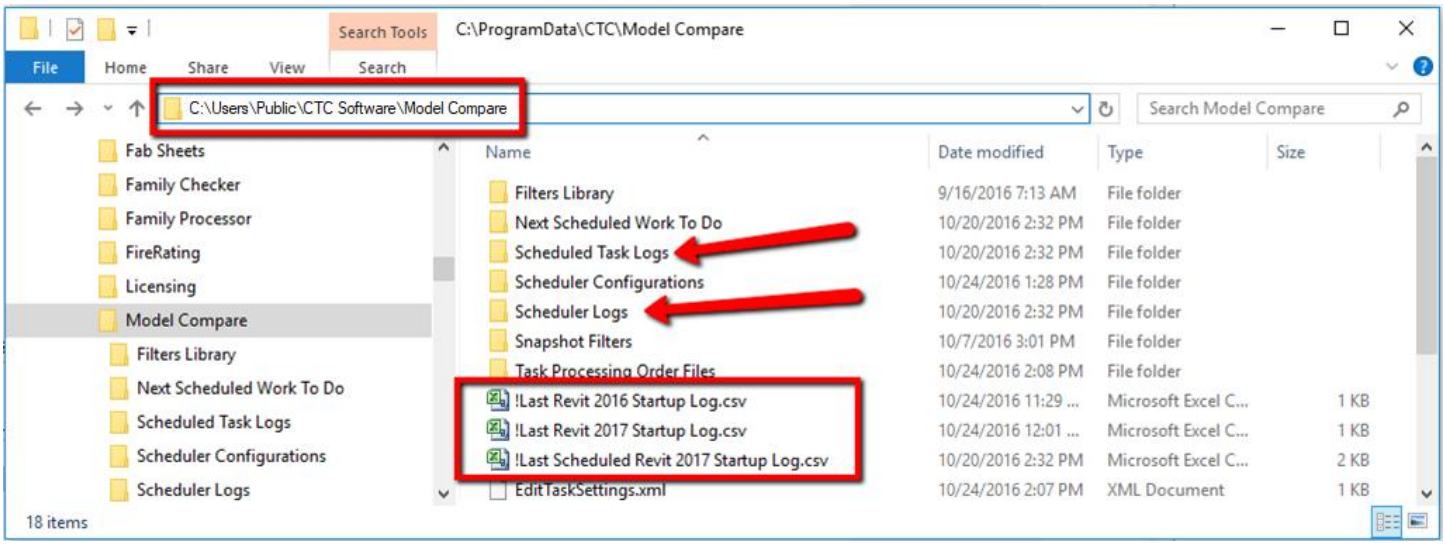
Editing a task can be accomplished by either double-clicking it or by selecting it and either clicking the “Edit” button below the list or right-clicking on it and selecting the “Edit” choice from the pop-up menu.

The “Scheduler Settings” button below the list can be used to change the default values that are applied to configuration files as they are added to the list for processing:



Scheduler Troubleshooting Tools

The primary tools for troubleshooting issues are the log files. These can be found in the following locations:



The “Scheduler Logs” folder contains the “mclog” XML files which have information about the actual snapshot creation process from a Revit project. These don’t usually list much information, but can include details about why a snapshot file couldn’t be created due to something like permissions issues.

The “Scheduled Task Logs” folder contains friendlier CSV files with similar information. These can readily be opened in spreadsheet software.

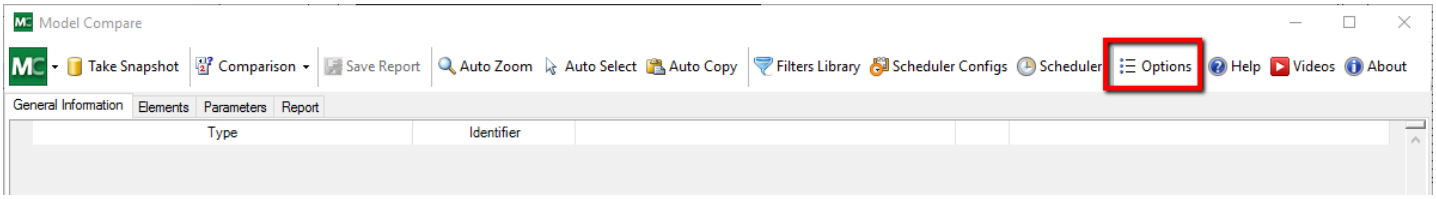
The “!Last Scheduled Revit 201x Startup Log.csv” files contain information generated when Revit starts up after the last time it was launched by the scheduler. These logs show what Revit did on startup, such as to where it copied a central file temporarily for opening as a new central file for processing, and other information about the processing that occurred within Revit as a result of the scheduler launching Revit.

The “!Last Revit 201x Startup Log.csv” files contain information generated the last time Revit started up, whether or not it was started by the scheduler. Most of the time these files report there’s no work for Model Compare to do, but the

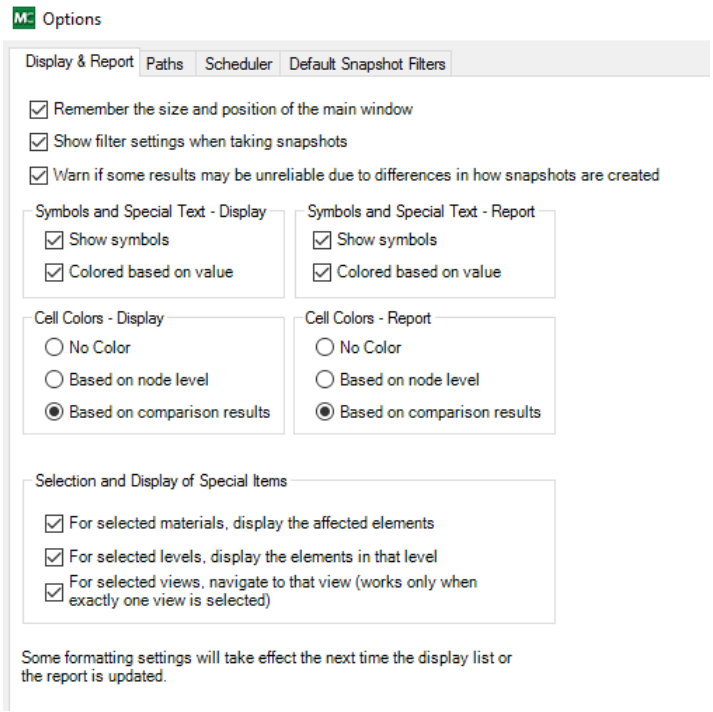
information will match the information found in the last **scheduled** startup log file if the scheduler was the last thing to launch Revit.

Options

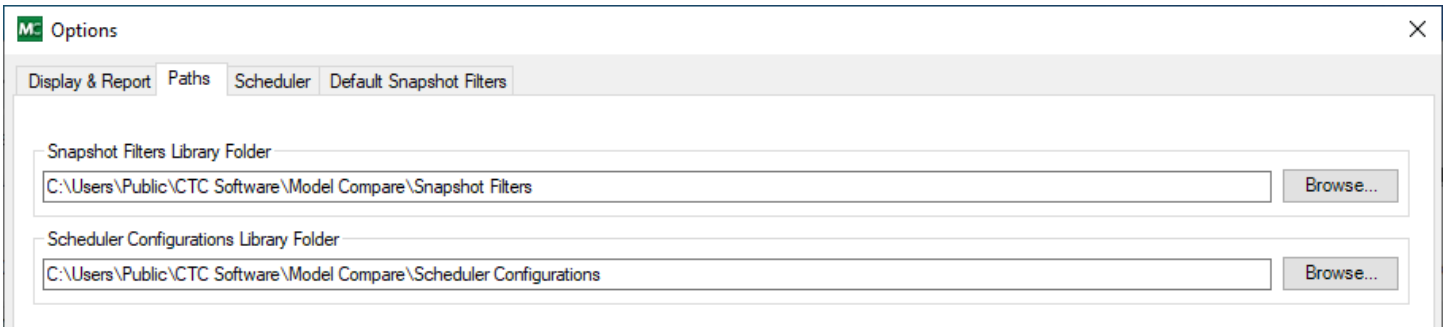
Selecting the Options button will display a new window which will allow controlling the default behavior for Model Compare.



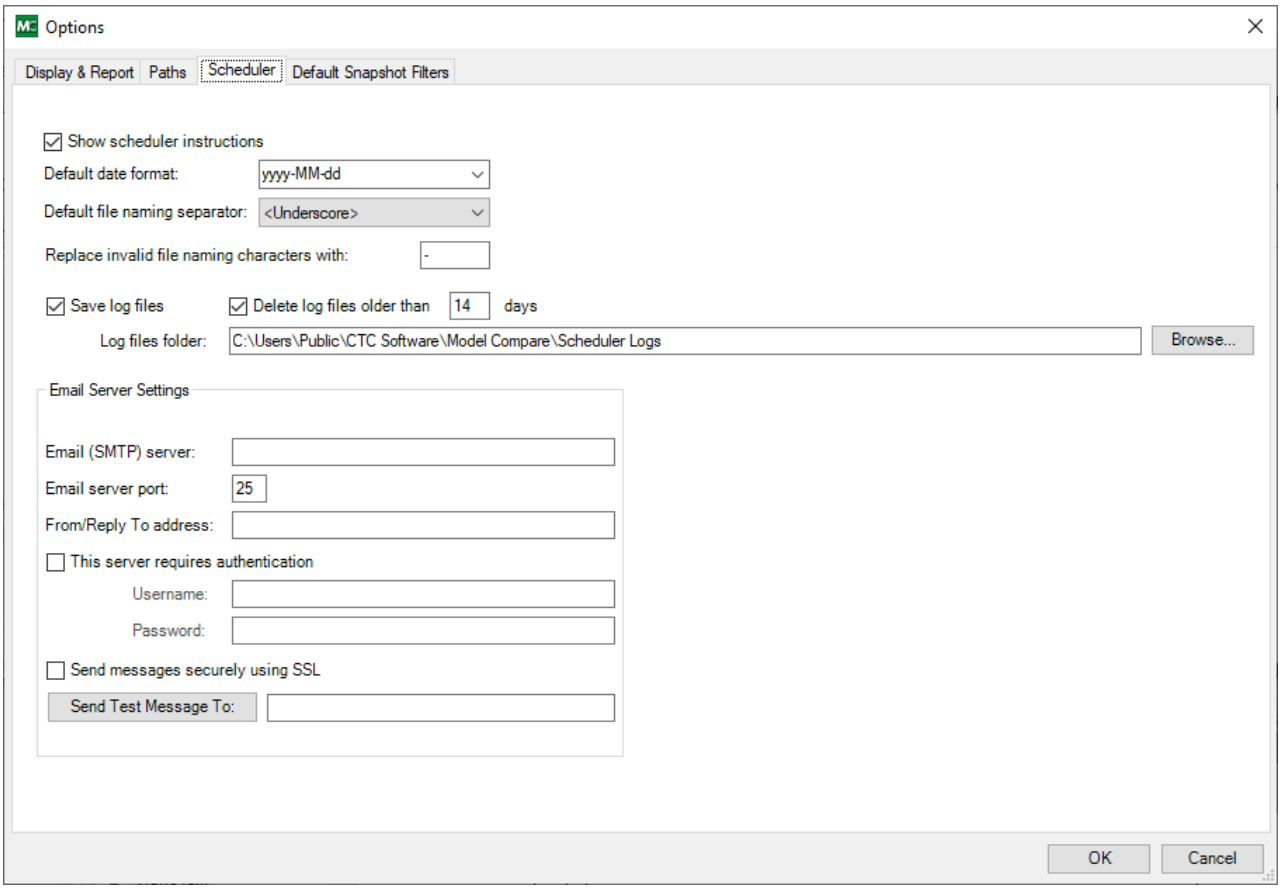
The "Display & Report" tab contains the settings which control how Model Compare runs and presents itself.



The "Paths" tab allows you to specify where the library of snapshot filter files is located, as well as the location for storing scheduler configuration files.

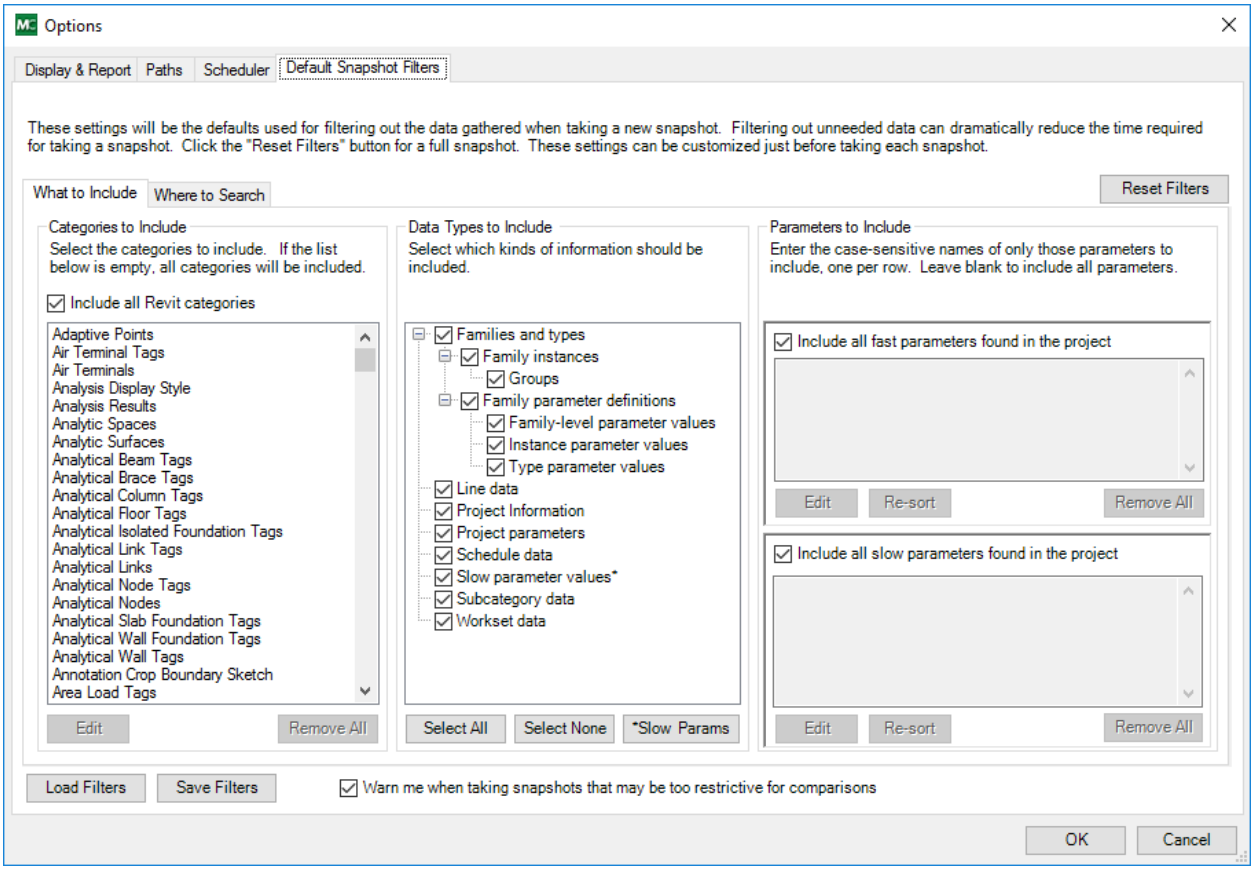


The “Scheduler” tab controls options that affect scheduled snapshots.



The “Date format” is used whenever a folder name or a file name is created which uses a date value. Although a list of choices is provided, you may also type in your own custom date format to use.

The “Default Snapshot Filters” tab contains the settings which will be used as the default filters whenever a new snapshot of a project is to be manually taken.



Filtering can be used to not only reduce the time it takes to create a snapshot, but reduce the amount of information that needs to be analyzed in the resulting comparison report.

Please refer to Appendix A for an explanation of how to configure the settings on the “What to Include” and “Where to Search” tabs.

The “Load Filters” button can be used to load previously-saved filters. Once loaded, clicking the “OK” button will save the changes on this dialog to be the new default settings.

Model Dashboard

Introduction

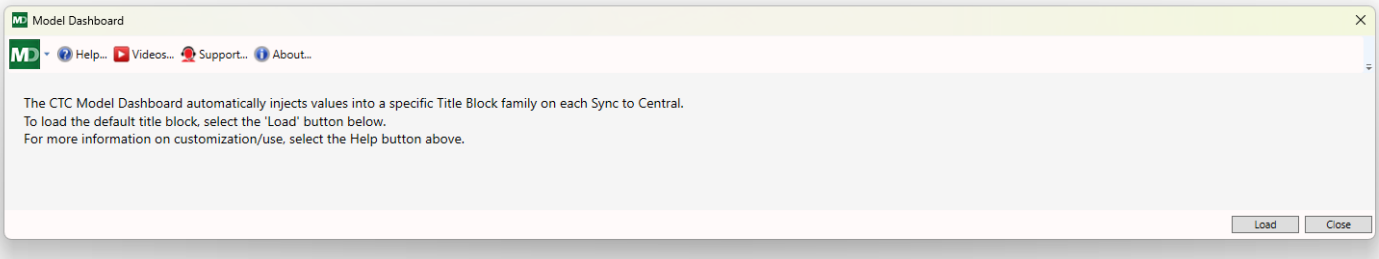
CTC Model Dashboard is an analytics gathering application that sets values in custom parameters of a Revit model. Also included (but not required) is a titleblock family which can read and display the values that are gathered. Simply run the import tool, place the titleblock on a sheet and save or sync to central the model. The data will be gathered and stored in the parameters to be displayed as helpful graphs of common indicators in Revit model health.

NOTE: *The application runs without user intervention and only collects data if the titleblock is present with the expected parameters.*

Starting Model Dashboard

On the Revit ribbon, click on the “Model Dashboard” button.

The import dialog will appear. Choose Load to bring the family into the project.

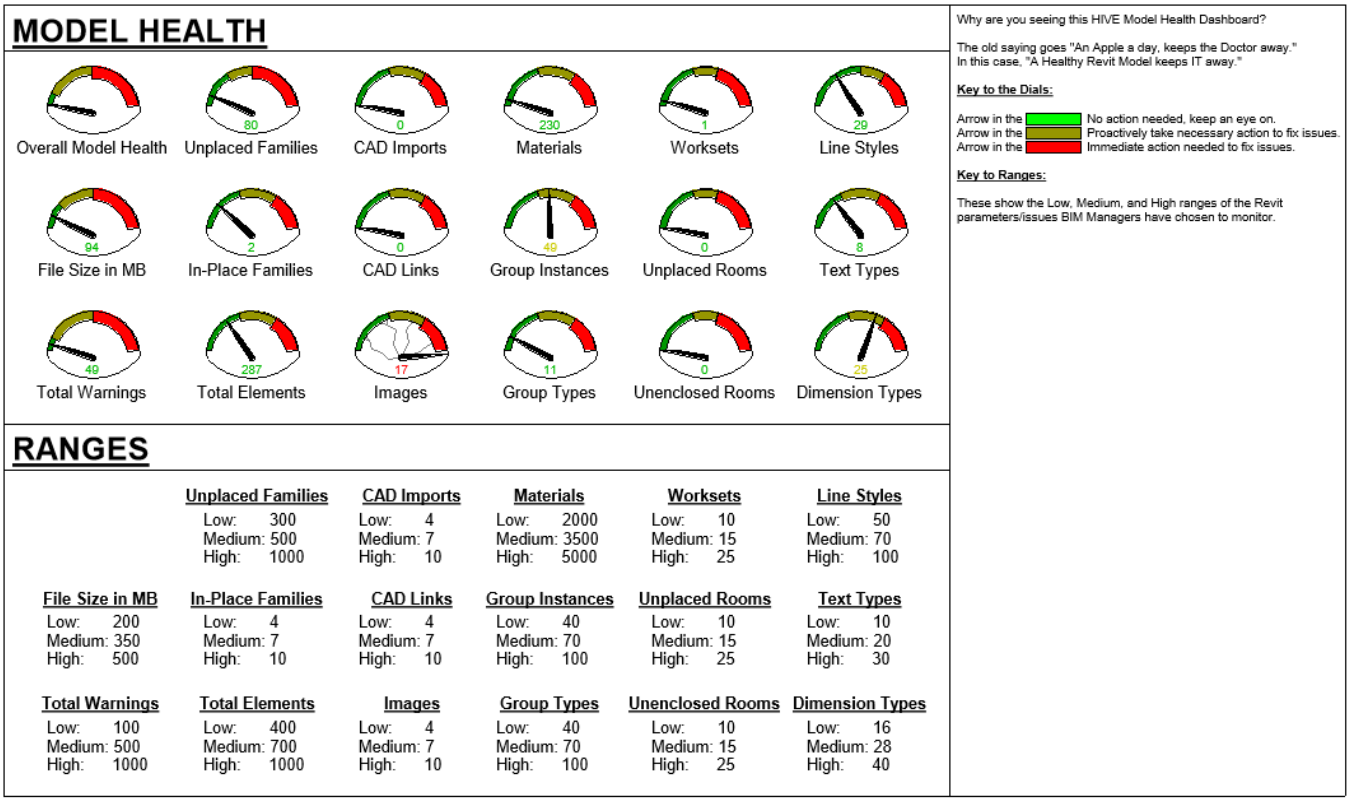


Once the family has been loaded, either place it on an existing sheet or create a new one.

Ideally, this will be displayed on the start view of the project so that users can see the stats when they open the model.

This Autodesk Knowledgebase article explains the process. It is applicable to most supported Revit versions.

https://help.autodesk.com/view/RVT/2024/ENU/?guid=GUID-622E667E-FB0B-47E1-8F66-E237A70771BD



The Model Health Dashboard

Parameters Model Data Metrics

CTC CAD Import Count: Number of imported CAD file definitions

CTC CAD Link Count: Count of Linked CAD file definitions

CTC Design Options Count: Number of design options (not design option sets)

CTC Detail Group Definition Count: Number of defined detail groups

CTC Detail Group Instance Count: Number of detail group instances in the model

CTC Dimension Type Count: Count of dimension types defined in the model

CTC Drafting View Count: Count of drafting views

CTC Drafting Views No VT Count: Count of drafting views that are not associated to a view template

CTC Duration Last Sync Sec: Number of seconds for the last Sync to Central (STC)

CTC Duration Open Sec: Number of seconds for the opening of the model

CTC Family Instance Count: Count of family instances in the model

CTC Fill Pattern Count: Count of defined fill patterns

CTC Filled Region Count: Count of defined filled regions

CTC IFC Link Count: Count of linked IFC models

CTC Image Import Count: Count of imported images in the model

CTC In-Place Families Count: Count of modeled-in-place families

CTC Level Count: Count of defined levels in the model (does not include linked models)

CTC Line Style Count: Count of defined line styles in the model

CTC Loaded Family Count: Count of loadable family definition (does not include system families such as walls, floors)

CTC Local File Size MB: Current file size of the active model in MegaBytes

CTC Material Count: Count of defined materials in the model

CTC Model Group Definition Count: Count of defined model groups in the model

CTC Model View Count: Count of model views

CTC Model View No VT Count: Count of model view that do not have an associated view template

CTC Phase Count: Count of model phases

CTC Placed Room Count: Count of all room instances

CTC Placed Space Count: Count of all space instances

CTC Project Parameter Count: Count of project parameters defined in the model.

CTC Redundant Room Count: Number of room instances indicating “redundant” in the area parameter value

CTC Redundant Space Count: Number of space instances indicating “redundant” in the area parameter value

CTC Revision Count: Count of revisions defined in the model

CTC Revit Link Count: count of linked RVT models

CTC Sheet Count: Number of sheets in the model that appear in the sheet list

CTC Sheet Placeholder Count: Number of placeholder sheets in the model

CTC Text Type Count: Number of defined text types in the model

CTC Unenclosed Room Count: Number of rooms that have an instance but no area value

CTC Unenclosed Space Count: Number of spaces that have an instance but no area value

CTC Unplaced Family Count: Number of family definitions that have no instances in the model

CTC Unplaced Room Count: Number of rooms that have no instances in the model

CTC Unplaced Space Count: Number of spaces that have no instances in the model

CTC Unplaced View Count: Number of views that have no instances in the model

CTC View Filter Count: Number of view filters in the model

CTC Warning Count: Number of warnings

CTC Warning Type Count: Number of warning types

CTC Workset Count: Number of worksets in the model

NOTES: When this addin runs, it does so silently. It will not produce errors if it is unable to gather data for various reasons. If the dashboard is not updating, it is most likely because the necessary parameters don't exist, it cannot write or display the data in the titleblock family or errors with the model are preventing it from processing.

Occupant Flow Analyzer

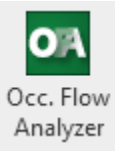
Introduction

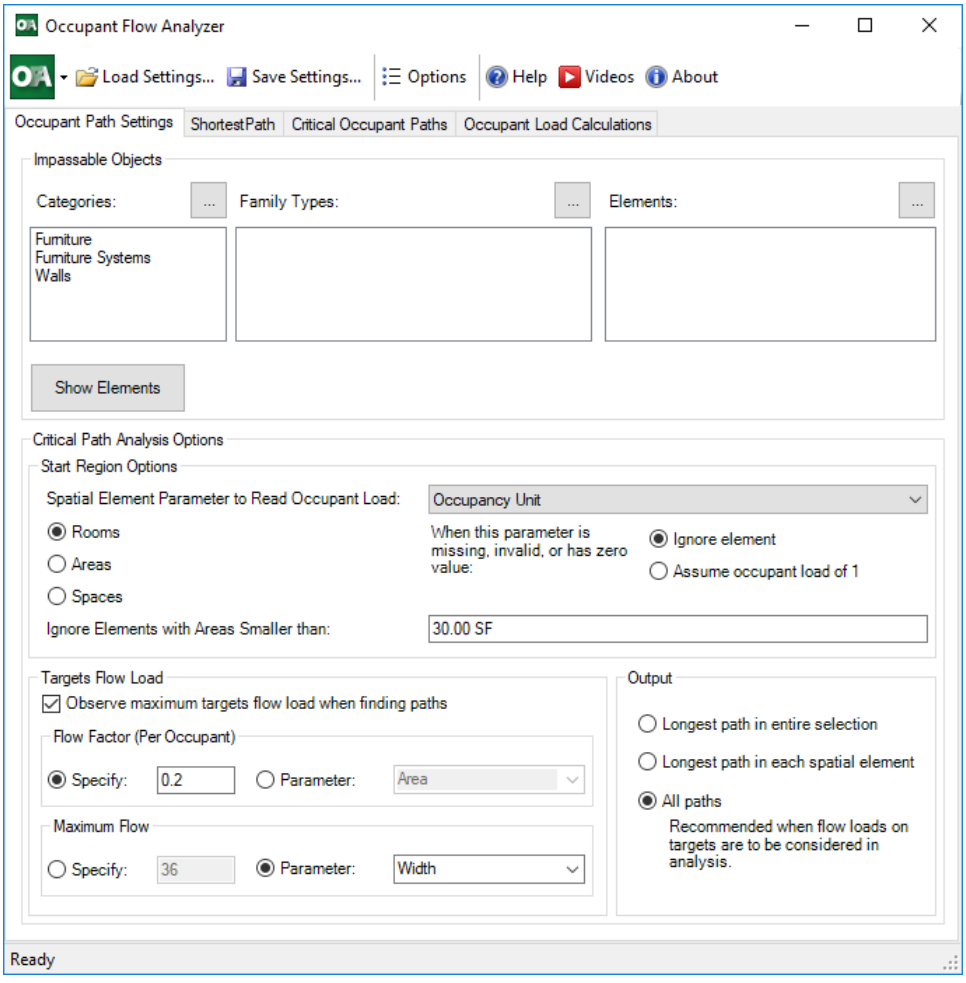
This tool can be used as a design aid for many common “flow” challenges. It can help determine possible paths between points, their distances, routes affected by impassible objects, overloads based on maximum egress values and perform occupancy related calculations.

NOTE: *The intended use of this tool is to provide potential solutions and model information that may be useful in the design process. It is not intended to be used for code compliance or life safety documentation without careful post analysis and validation by a qualified professional!*

Starting Occupant Flow Analyzer

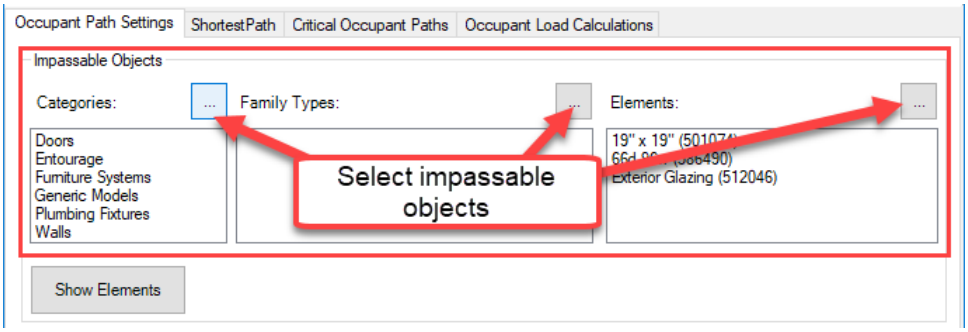
On the Revit ribbon, click on the “Occ. Flow Analyzer” button.





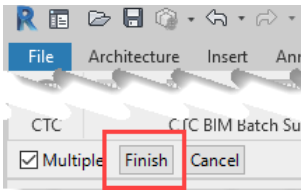
Working with Occupant Paths

First, begin in the first tab by defining which object categories or individual elements should be considered “impassable” (in other words, real-world objects that would obstruct the path of something which is moving). Paths will be routed around these objects. For an object to be considered an obstacle, it must have retrievable geometry within the height range of 0.7 to 7.0 (21.3 to 213 cm) feet above the level in question. That is, anything shorter than 0.7 or anything having a larger-than-7-ft clearance will be considered passable.
Select entire categories, specific family types and individual elements to build the impassable list.

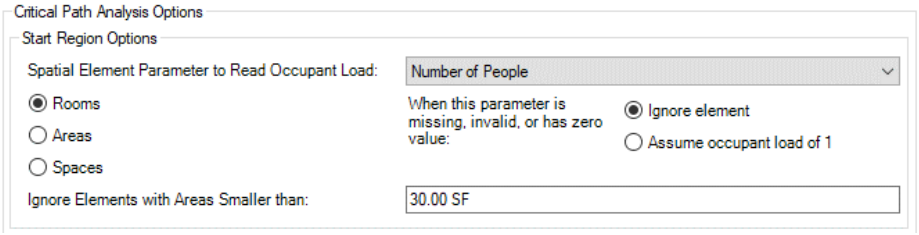


Once in the list, double check the selections using the Show Elements button, which will highlight all impassable elements. Alternativley, users can select specific items within the lists, and click Show in the right-click menu to see the highlighted items only.

After all of the desired objects have been selected, click the “Finish” button below the tool panels in the Revit interface.



In the Critical Path Analysis Options, select the spatial element parameter which will be used for to determine the number of people within each region (room, area or space). This parameter can have any name but must be a numeric data type (no alpha characters). If the parameter is missing or there is no value in this parameter, choose whether the spatial will be ignored (skipped) or if a load of 1 should be assumed for that.



Set the minimum area value to exclude extremely small or inconsequential rooms, areas or spaces, such as a closets, from calculation.

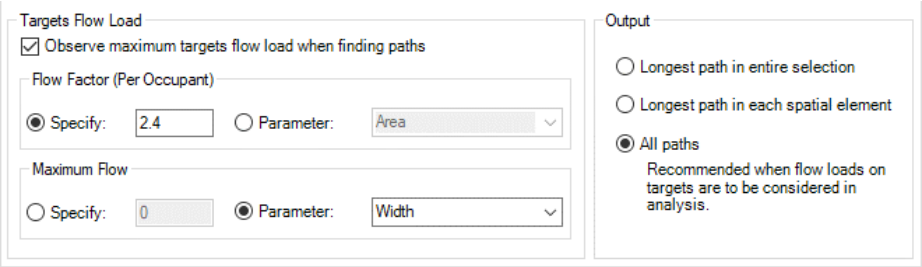
When finding paths to targets, their flow loads can be considered in directing the occupants to their best targets. If flow factors are not known or not important, uncheck the box for “Observe maximum targets flow load when finding paths”. Otherwise, a flow factor and maximum flow characteristics of the targets (more on targets in the next sections) will be

required to determine the target load capacity. If these values are defined in parametric data, choose the options to read that data from the objects. With this option, each target will only be loaded up to their capacity and excess load will be directed to the next available target.

Some sensible defaults for door targets are shown below. The factor is applied according to the projects measurement system. In the following example, the lengths are displayed in inches in Revit, so the capacity will be obtained by dividing the width **(eg 3 foot door for a project configured in feet units)** by the flow factor (2.4). If the targets have a capacity parameter, select it as the maximum flow parameter and specify 1 for flow factor.

NOTE: *In the above example, feet units are specified because the tool uses the units setting of the project. For metric, adjust the values accordingly.*

When considering flow loads on targets, it is best to find all paths for all occupants. This way, each occupant is able to independently reach the best target that is not overloaded. Otherwise, the entire capacity of each spatial object will be directed to the best target that has enough capacity for all occupants of that spatial element.

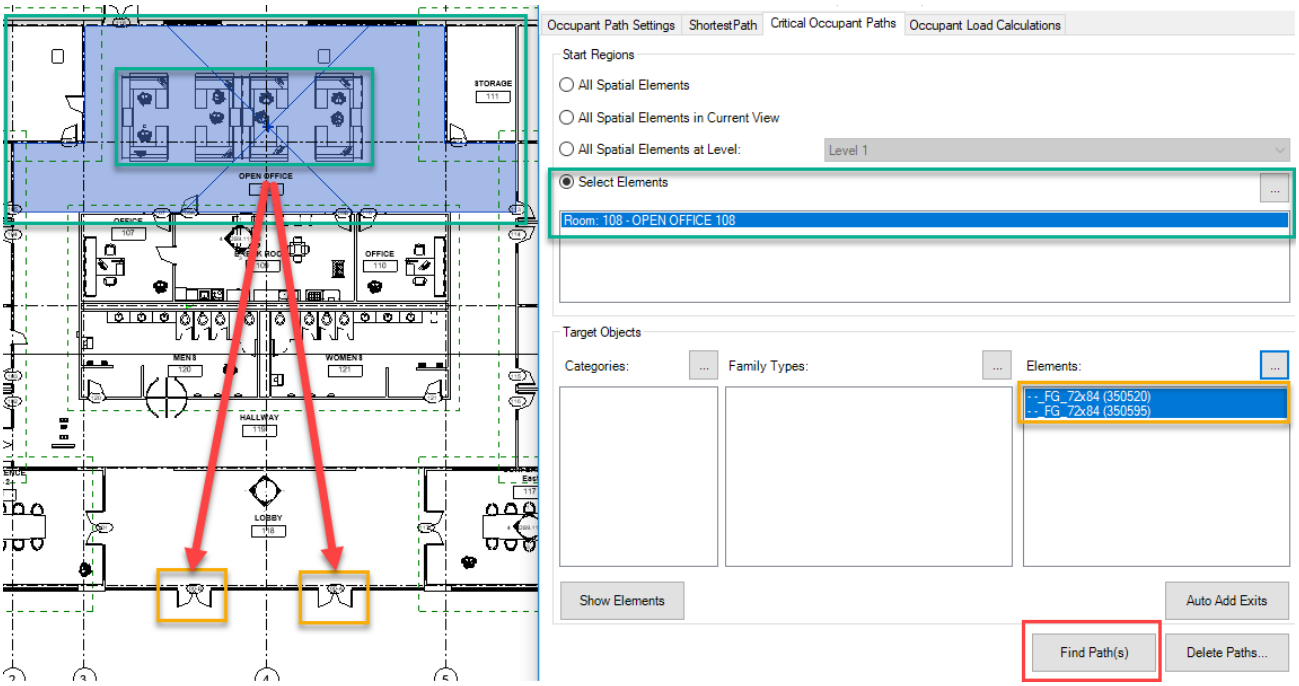


Creating Paths

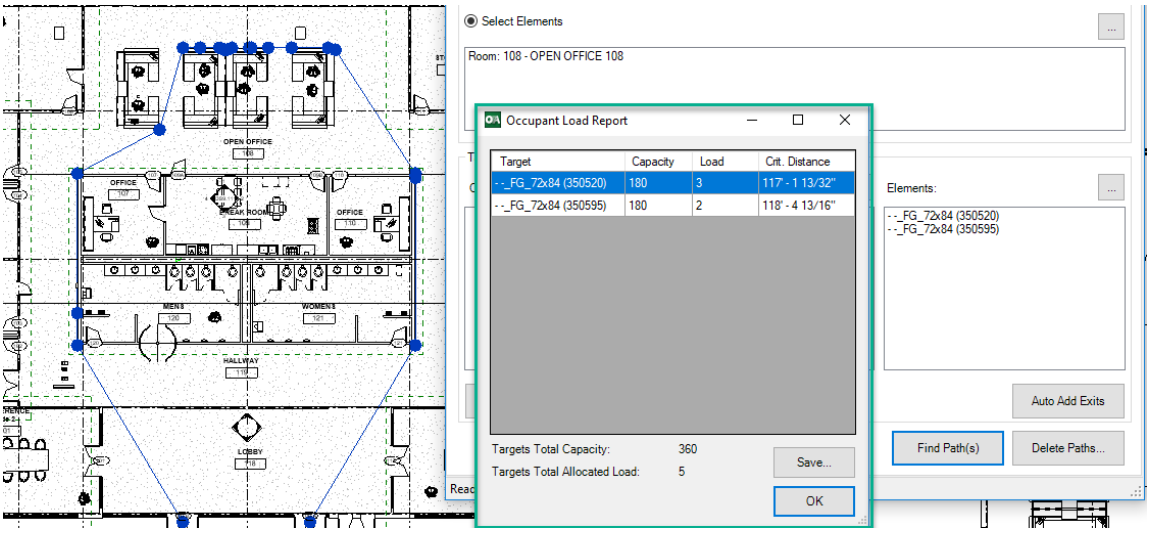
There are two ways to show analytical paths:

- Shortest Path will generate a path without obstruction between two selected points in the model that is the least distant, has the least number of segments, or a combination of both (more on this later). Simply go to the tab labeled “Shortest Path” and pick the start and end points in the model.
- Critical Occupant Paths can examine spatial elements to find the most critical path or paths to one or more targets. This can be done in the third tab (Critical Occupant Paths).

In the following example, it is desired to find the shortest paths from the “Open Office” room to the exit doors in the “Lobby”. Also taken into consideration will be any obstructions (such as the office furniture in the room). The path will begin at the point in the office furthest from the target(s).

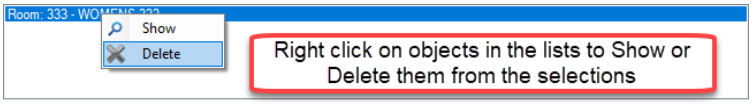


In this simple example, the application takes into account all of the factors and settings in the first tab and builds a graphical representation of the optimal path solutions.



More complex Revit models and greater selection sets will require more time to complete. It is recommended to consider this when running the "Find Path(s)" function.

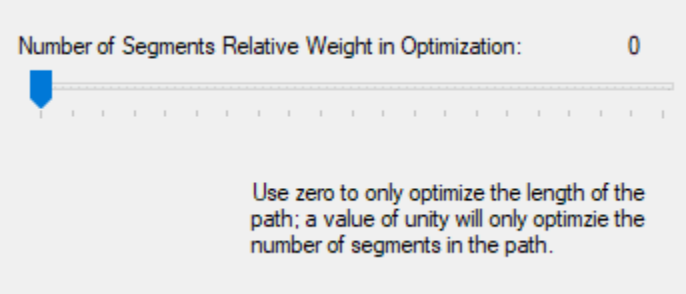
Similar to impassable objects, targets can be selected by category, type or element. The app also has some limited ability to identify exit doors. The targets selected using this method should be reviewed for accuracy. To remove object selections from the list, right-click on the name of the object in the list windows.



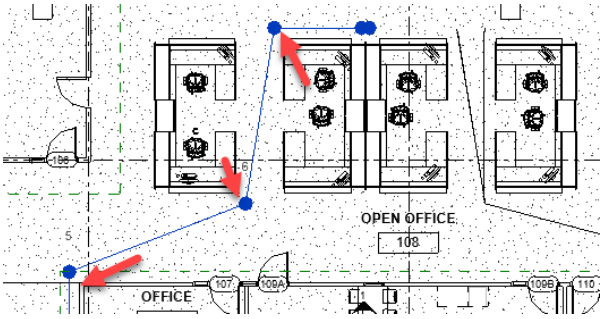
Fine Tuning Path Generation

There are a few more ways to fine tune the paths that are generated. Click the Options button to see the various graphical and performance options.

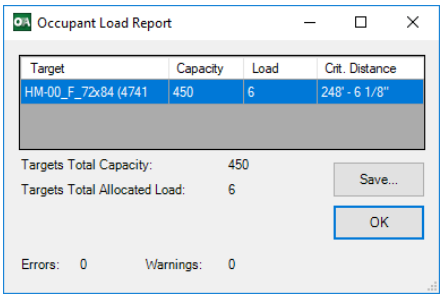
- To minimize the number of non-critical messages shown regarding inconsistent or empty values in the parameters used during calculation, uncheck “Warn if settings combination may lead to approximate results.” In any case, a list of warning or error messages will be available at the end of each process. *All warning messages should be reviewed carefully to ensure the integrity of the analysis. Furthermore, a number of warning messages provide a selection option that can highlight the problematic objects, so they can be helpful in resolving these issues.*
- To adjust the distance from objects a path will be drawn around, use the “Impassable Element Offset” slider.
- The element mesh size can be defined which will adjust how much space a path will be calculated around geometry. For example, an L-shaped desk will be regarded as more of a cube shape if the mesh size values are increased. Small mesh sizes will increase analysis time, but may lead to more accurate results.
- Curved wall meshes: larger values make paths follow a more tangential path – smaller causes paths to follow the curve more closely.
- Number of Segments Relative Weight in Optimization: by default, the shortest paths are considered to be the best. However, users may choose to alter that logic here by giving a larger-than-zero weight to the number of segments in the path.



A more realistic result based on changes in Options is shown below. This path has a 1-ft clearance from impassable objects.



For paths that span multiple floors, stairs and ramps are considered as a means of egress. The targets are usually doors or openings on the ground level, but this app is not limited to those object types. When the paths have been generated without error, a report is presented. The report can be saved as a spreadsheet for later review or further analysis.



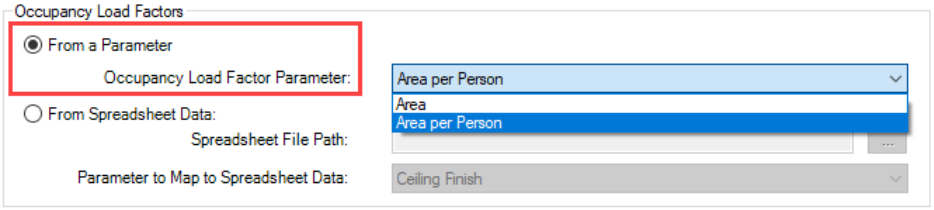
Occupant Load Calculations

OFA can perform calculations in the fourth tab, drawing the values from parameters or a spreadsheet, and write the results back to the model. This can be very helpful where models don't already contain the occupancy data as well as making adjustments later in the design process. Although this functionality is primarily directed at life safety analysis, it is not specific to that use.

Occupancy Load Factors

Using parameters

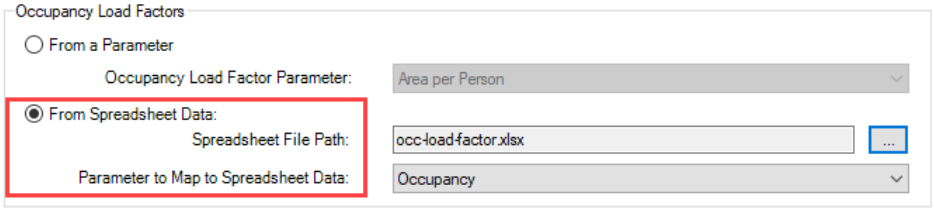
When the Revit model already contains the proper values, it may be most efficient to gather the load factors from the appropriate parameter. Usually, the value is a factor of area and the parameter must be a number. For example, if the rule is three occupants in a 10ft x 10ft space, the value would be 33.3 (100SF / 3).



These values will then be used to calculate the occupancy of every room, etc.

From spreadsheets

If the model does not contain load factors, a spreadsheet can be used. To begin, create or use a spreadsheet that contains a name or descriptor as the first column and the corresponding load factor values to be used. Browse and select the spreadsheet.



Next, choose the parameter whose values correspond to the descriptor column in the spreadsheet. Using this method, the application can search for matching values (like names or types) in the model and map the factors for calculation.

The spreadsheet's first and second columns should contain the values. All other columns will be ignored.

Occupancy	SF per Occupant
Prep/Dish	50
Dry Storage	10
Conference	50
Office	25
Admin	25

Column names are not required.

Load Results and Redistributions

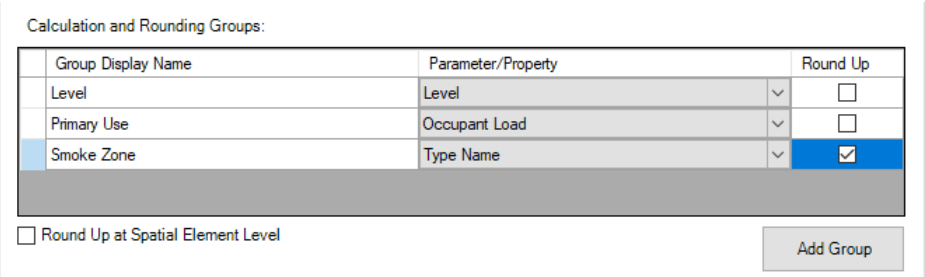
Redistribution changes the way totals are calculated and stored.

Redistribution Types:

1. don't redistribute – calculates totals only and stores them on the objects
2. redistribute uniformly – rounds up at the required group, then divides equally for objects
3. redistribute according to occupant load – rounds up at the required group, then proportionally applies values to objects based on their raw load values

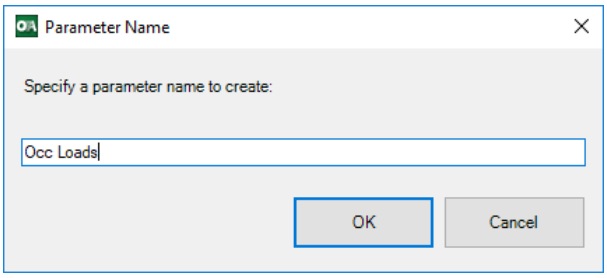
Defining Calculation and Rounding Groups:

By default, Revit rounds up individual object values which, when totaling many values, may result in some overestimation of the number of occupants. OFA can overcome this limitation by performing alternative order calculations. By defining groups, totals can be combined by common parameter values or other properties of the object, such as level, and then rounded up. Groups can have any name, and the default groups are merely suggestions. To change the name of an existing group, simply click on the text. Groups can be added or removed as desired.



Each group has the "Round Up" checkbox which forces rounding at that point rather than for each object value as Revit does. If rounding up is desired for each object, check the box "Round Up at Spatial Element Level". Only one of these check boxes can be checked at any time.

When the calculation is performed, the result values can be stored in a parameter associated with the selected spatial elements. The parameter can be chosen from an existing one, but must be a number. To create a new parameter, click "Add Parameter…"



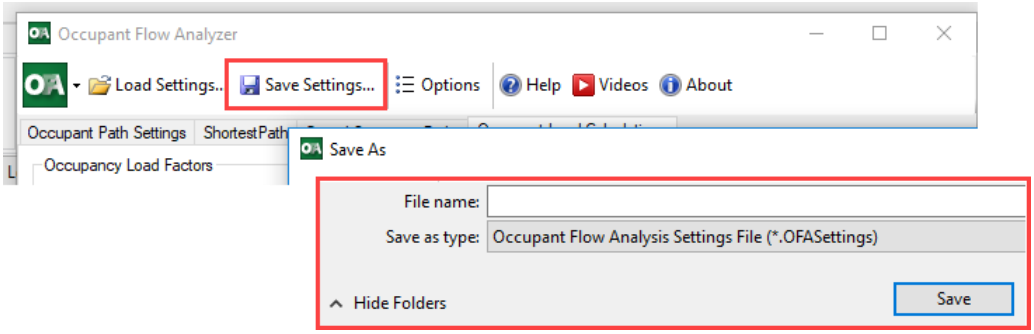
This will create a new parameter of the proper data type.

Choose which objects should be queried and calculated from the three spatial object type. If the primary target is rooms, for example, uncheck the others. Objects that do not have the applicable data values will be ignored as well. The warning/error messages will be displayed at the end of the process, if any.

Loading and Saving Settings

The loading and saving of settings is a convenient way to store many different configurations for various calculation scenarios. The settings files are stored in text files with an extension .OFASettings.

Create a settings file by clicking “Save Settings…” on the toolbar at the top. Browse to a location and choose a name for the file.



To load the a configuration, click “Load Settings…” and browse to a previously created .OFASettings file.

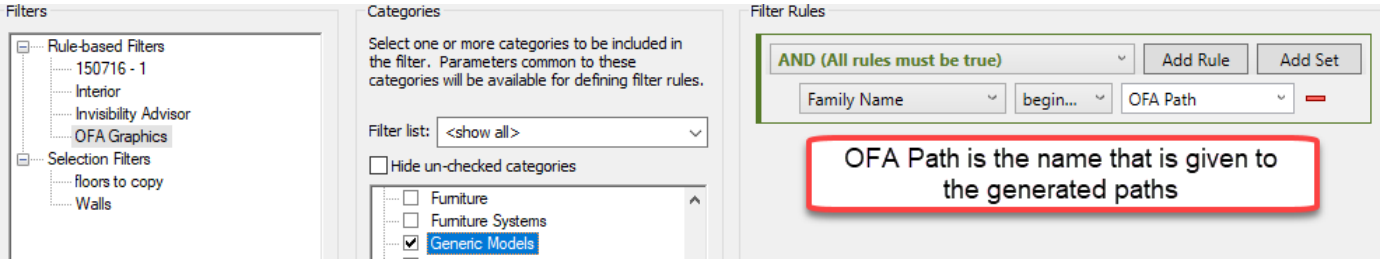
Note: Loading of settings from a file will replace the current settings in the application.

Path Graphic Representations

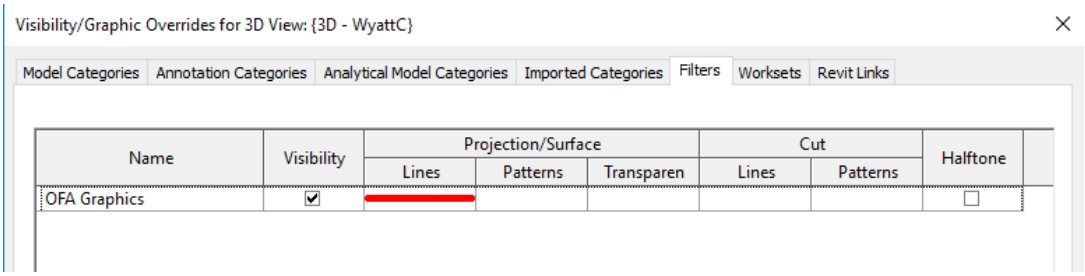
Occupant Flow Analyzer creates objects representing occupant paths. The object it a generic model with adaptive points at each vertex. The paths can traverse levels through stairs or ramps, and because it is a modeled object, is visible in plan, section, elevation and 3D views.

To make the paths more or less apparent, a view filter could be defined which overrides the default display of generic models.

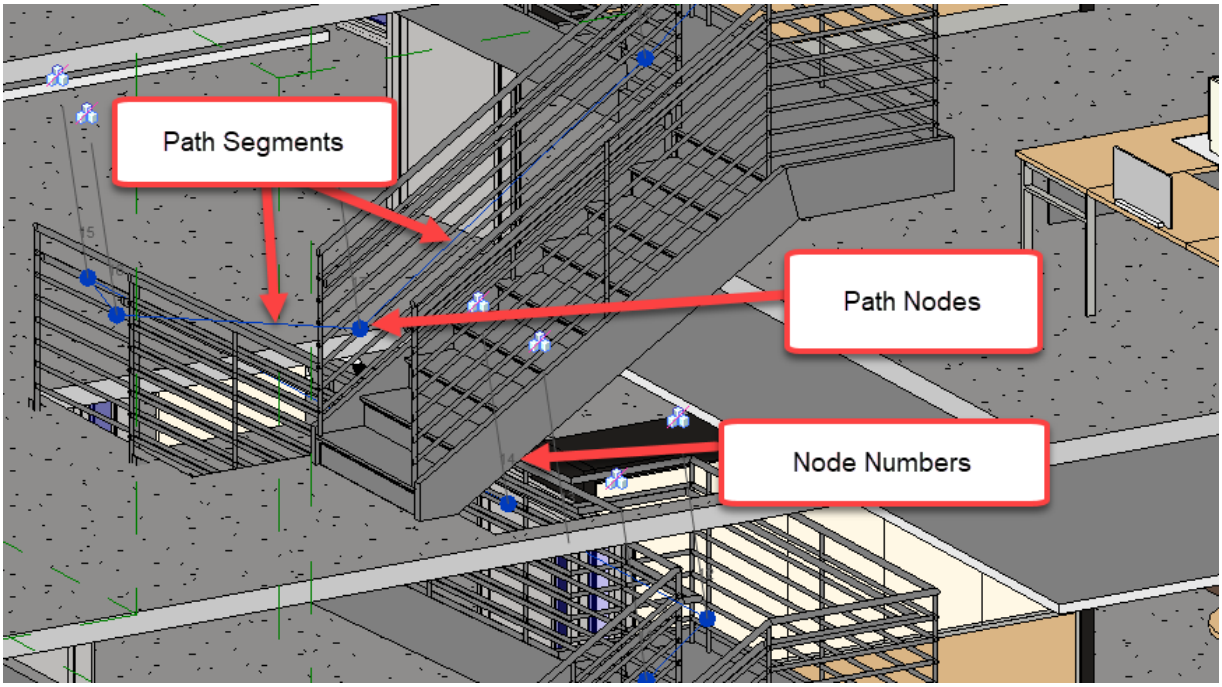
In Revit’s Visibility/Graphics Overrides window, create a new rule-based document filter. Check the “Generic Models” category and define a filter rule condition which selects by family name “begins with” OFA Path.



Back in the Filters tab, click add and select the custom defined document filter. Use the table to apply graphical representations as desired click OK when finished.



Path Object Components



The paths can be modified by selecting a node and moving it. *Note that if paths are modified, they no longer match the data that is shown in the Occupant Load Report.*

Selecting individual path nodes shows the number of occupants passing through that point through the Name parameter in adaptive point properties.

To remove paths, go to the Critical Occupant Paths tab and click “Delete Paths…”. This will aid in the selection and complete removal of the OFA Path objects from the model.

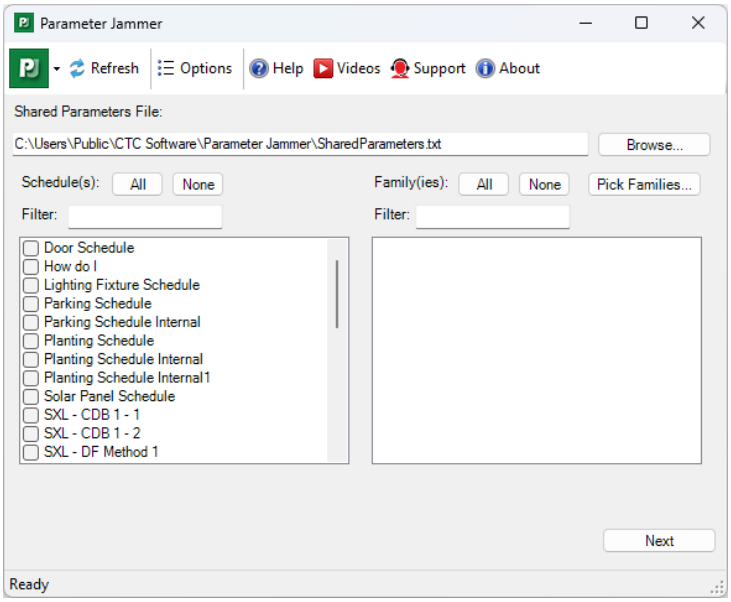
Parameter Jammer

Introduction

This tool will make changes to the families that are already in a project by modifying the parameter definitions in them to match what a given schedule requires.

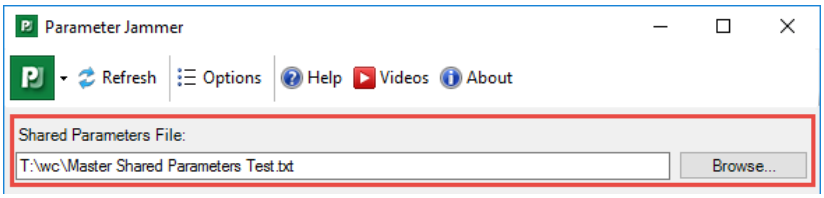
Starting Parameter Jammer

On the Revit ribbon, click on the “Parameter Jammer” button.



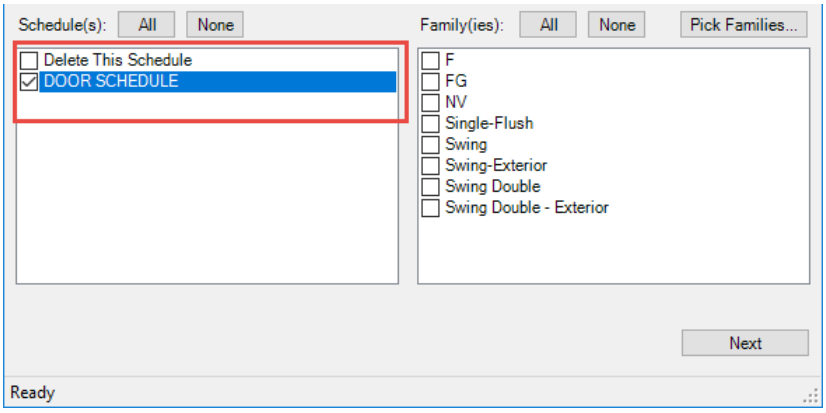
Choosing the Shared Parameters File

A shared parameter file must be specified. This will be used to source the shared parameter definitions. To select the shared parameter file click the “Browse…” button and navigate to the desired shared parameters file.



Selecting Schedules and Families

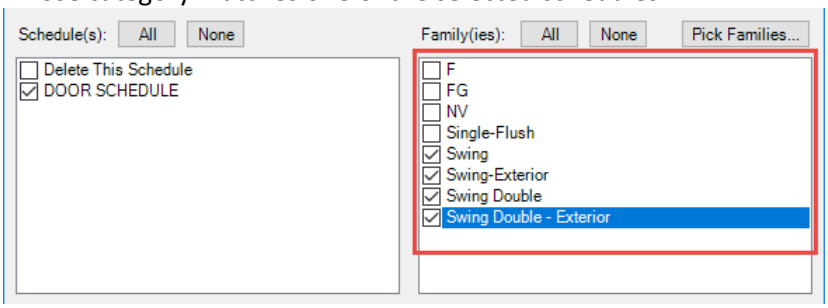
Select the desired schedule(s) from the list available in the project on the left.



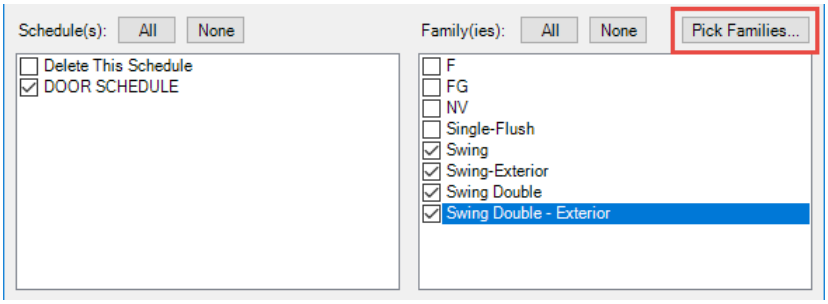
NOTE: **Selected schedule(s) must have at least one properly configured instance of a family placed in the project (ie. there must be at least one item in the schedule whose parameters are displayed correctly).**

One of two options can be used to select the family to change:

- Select the families by checking the box for each. The list will be filtered to display only those families whose category matches one of the selected schedules.



- Use the "Pick Families…" button to select an instances from a model view in the project.



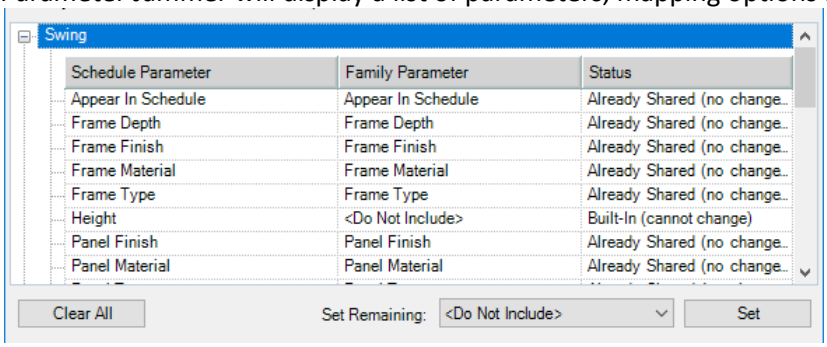
Once the shared parameter file, schedule and families have been specified, click the "Next" button.

Parameter Jammer will begin processing the selected families. During the first step, the parameter fields in the schedule will be matched by name to the parameters in the shared parameters file. Once the list of parameters on the schedule

has been built, Parameter Jammer will swap any parameters in the families with parameters from the shared parameters file that have the same name and data type, but an different GUID.

Mapping Parameters

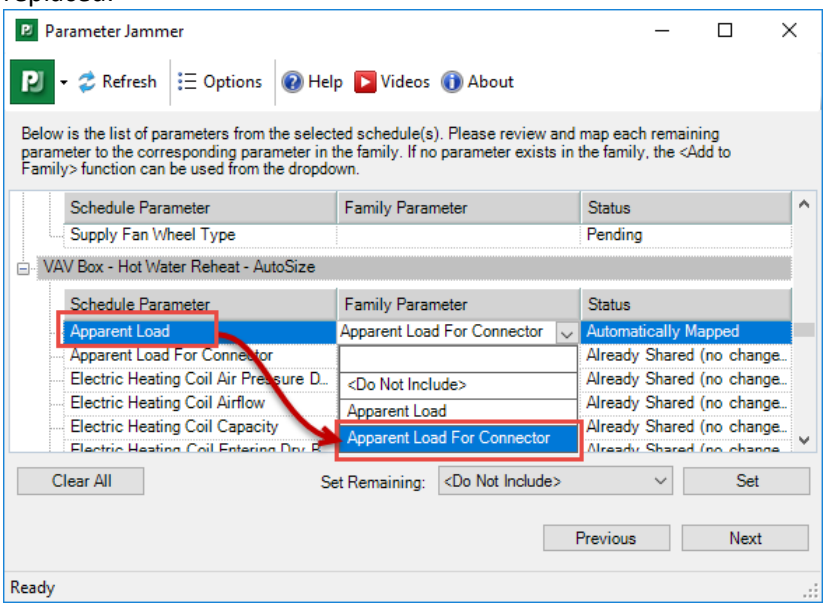
Parameter Jammer will display a list of parameters, mapping options and status for both automatic and unmapped.



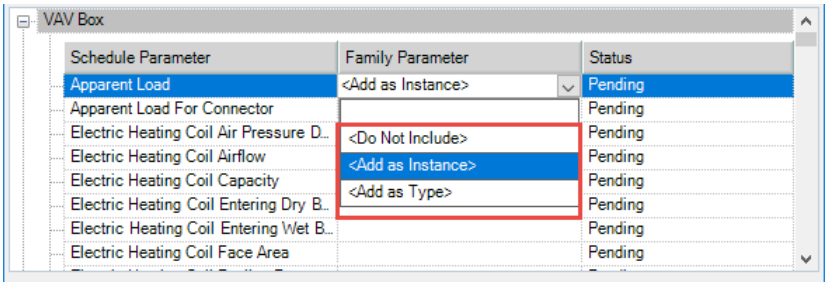
Select how to handle each parameter from the schedule. The dropdown menus contain options to:

- Add as Instance
- Add as Type
- Do Not Include

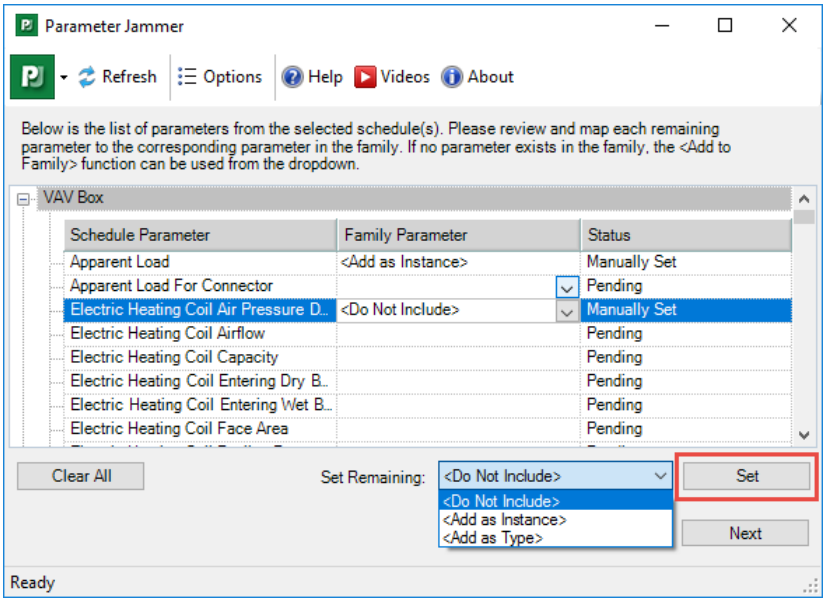
In this example the "Apparent Load" parameter from the schedule is being mapped to the "Apparent Load For Connector" parameter from the family. Parameter Jammer will swap out the parameter in the family to use the desired parameter from the schedule **while leaving any parameter values or formulas intact**. Note that when viewing the parameters in the family, the names from those in the schedule will now appear instead of the original names that were replaced.



In this example, there was no equivalent to the “Apparent Load” parameter so the <Add as Instance> option is being selected. When processing continues the “Apparent Load” parameter will be added to the family, but will have the default value for its data type (e.g. 0, empty string, etc.) in the family.



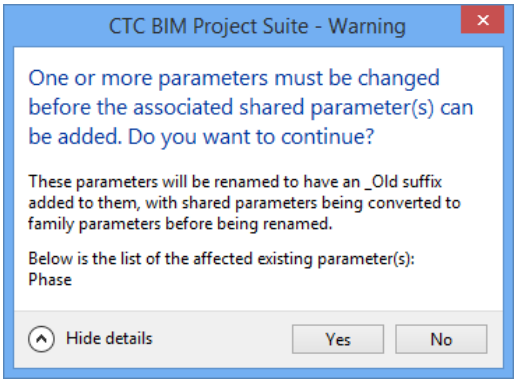
If the “<Do Not Include>” option is selected the parameter will not be added to the family.
This example shows a set of mappings for this sample family.



To automatically complete the empty mappings, choose an option from the Set Remaining drop-down and click Set. Once all parameters have been mapped, click “Next” to continue.

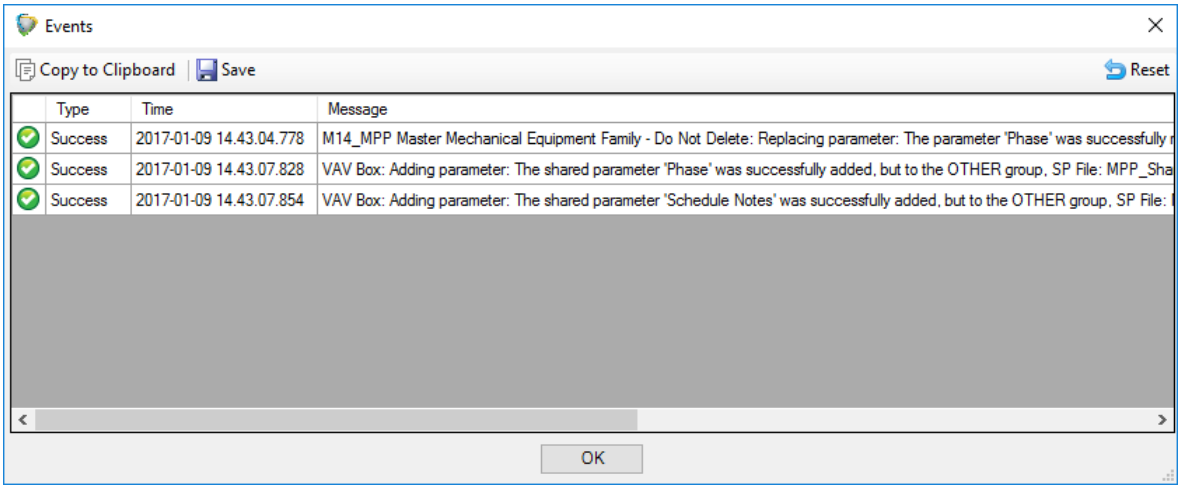
Processing the Changes

It is possible that one of the parameters from the schedule matches a parameter from the family by name, but has an alternate data type causing a parameter conflict. In this situation, if the action on the conflicting parameter is "<Add as Instance>" the following dialog will appear:



In this case the "Phase" parameter existed in the family as a Number parameter. The existing parameter in the family will be renamed with an "_Old" suffix to allow the new "Phase" parameter, which is of data type Number of Poles, to be added. Click "Yes" to continue.

Once processing has finished, a list of the shared parameter resolutions will be displayed. Click the "Finish" button to close Parameter Jammer. A log will be displayed with a detailed summary of the operation. The log can be copy/pasted in another document or exported to a spreadsheet file.



Revision Manager

Introduction

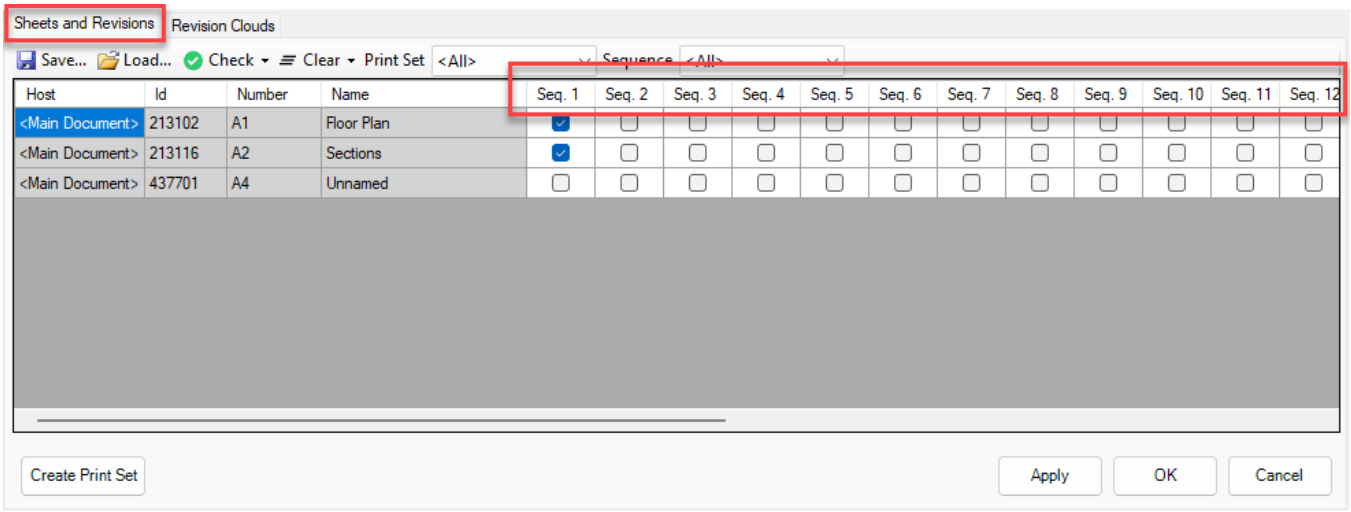
Revision Manger gathers all revisions in a Revit project, the views the revisions are on, and which sheets each view is assigned to. The information can then be sorted, filtered or saved to a spreadsheet format.

Starting Revision Manager

On the Revit ribbon, click on the “Revision Manager” button.

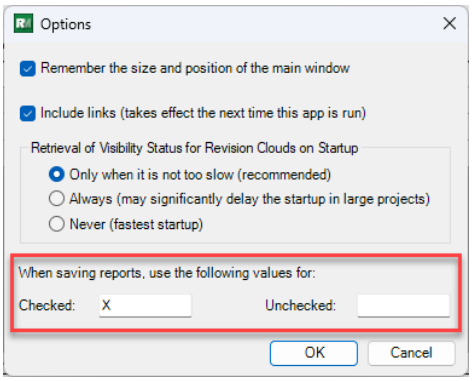
Revision Report

The first tab that is shown when RM is opened is a matrix style table of the sheets in the project. If a sheet contains revisions or a revision sequence has been associated to it, the corresponding ‘Seq. #’ will show a check in it’s box. Each revision sequence that has been created in the project will have its own column in this view.



Hint: Double-click any row to view the sheet in Revit.

The data shown in the matrix table can be exported to a spreadsheet by using the ‘Save’ button. This will produce a file that can be opened in nearly any spreadsheet application. The character used for the check box when exporting the table can be specified in options:



Other suggested values are: true/false, 0/1, or yes/no. Leave a text box empty for no value.

The result of the settings as shown above would appear like this in a spreadsheet editor:

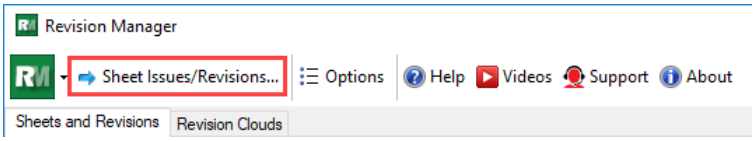
	A	B	C	D	E	F	G
1	**Id**	**Number**	**Name**	**Seq. 1**	**Seq. 2**	**Seq. 3**	**Seq. 4**
2	315204	I011	MATERIAL IDENTIFICATION CODES				
3	315210	I550	INTERIOR DETAILS	X	X	X	
4	324371	I501	INTERIOR ELEVATIONS	X	X		
5	324382	I030	STANDARD MOUNTING HEIGHT ELEVATIONS		X	X	

Importing Revisions

Changes made to the exported revisions worksheet can be applied to the model when imported using the “Load…” function. To add a sequence to a sheet, put an ‘X’ in the cell under the appropriate columns. In the grid, read-only values are identified with a gray background; Name, number and previously issued sequences cannot be changed.

Modifying Revision Information

For convenience, Revit’s revision management interface can be accessed by using the ‘Sheet Issues/Revisions..’ button.

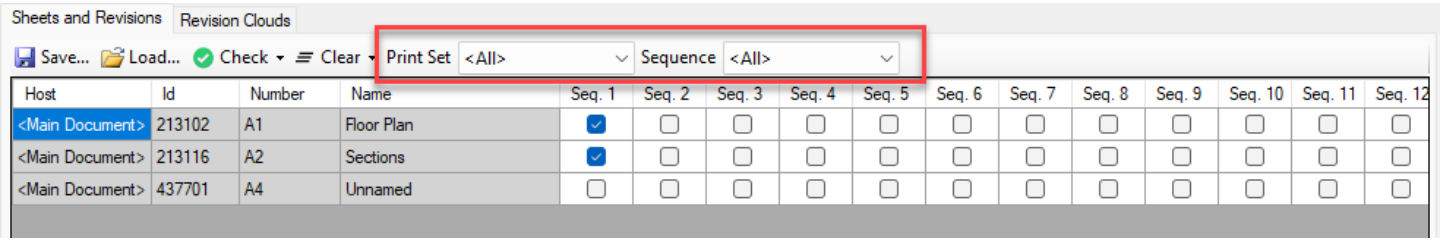


Creating and Using Print Sets

Print sets can be created directly from the selections of rows in Sheets and Revisions tab/grid. Double -click or Shift/CTRL double click to select rows, then use the Create Print Set button at the lower left of the window. This will prompt for a name and save it to the Revit project model.

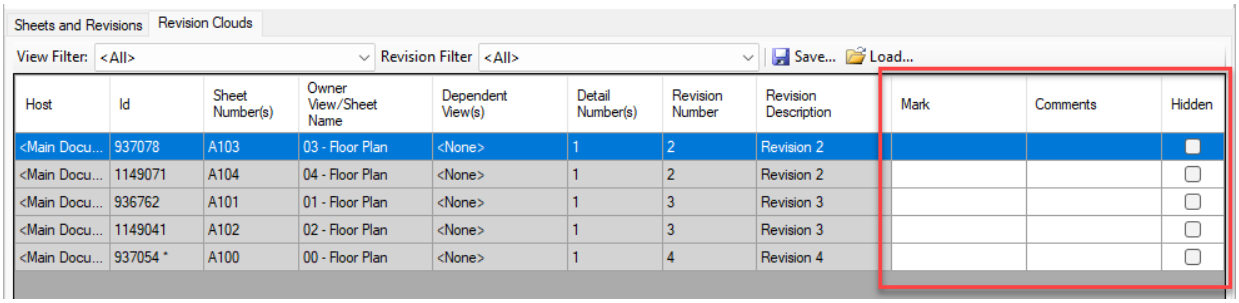
Any print sets that already exist in the model can be used to filter the list of sheets in the grid. Using the print set selector, choose the print set from the list.

Use the 'Sequence' selector to filter the list by the sequences found.



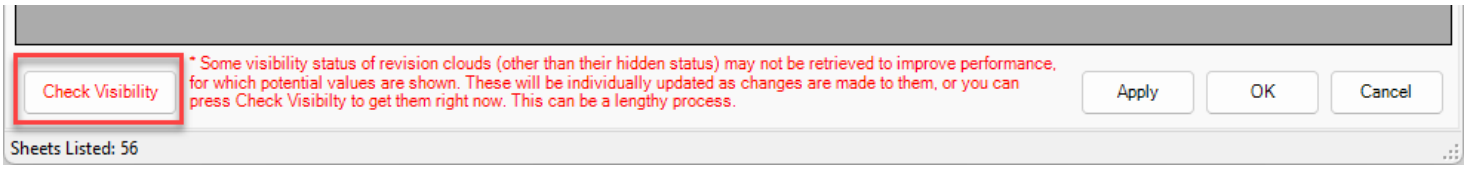
Managing Revision Clouds

On this tab, the white cells indicate the editable properties for the revision clouds found in the model.



ℹ *Hint:* Double-click any row to view the associated sheet in Revit.

For performance reasons, the visibility of clouds (such as when they have been turned off in a view or sheet) is not retrieved. If desired, click 'Check Visibility' to verify their display.



Mark, Comments and Hidden status can be modified in this list. When done editing, click 'Apply' to save changes to the model and keep the Revision Manager open or click 'Close' to apply the changes and exit the tool.

Other Options

Include Links: When checked, revision manager will query the linked Revit models for revision data inside them as well as the current model. This is turned off by default to improve the speed of the query.

Room Data Sheets

Introduction

The Room Data Sheets tool is a powerful and efficient View, Schedule and Sheet building utility for creating small and large format room (or spaces) data sheets. It is capable of building 3D, plans, elevations and schedule views for both rooms and spaces in a Revit project. The views are then automatically placed on new sheets which are parametrically named and numbered. The generated sheets require very little adjustment because views are placed according to their sizes, fit and order in which they are created.

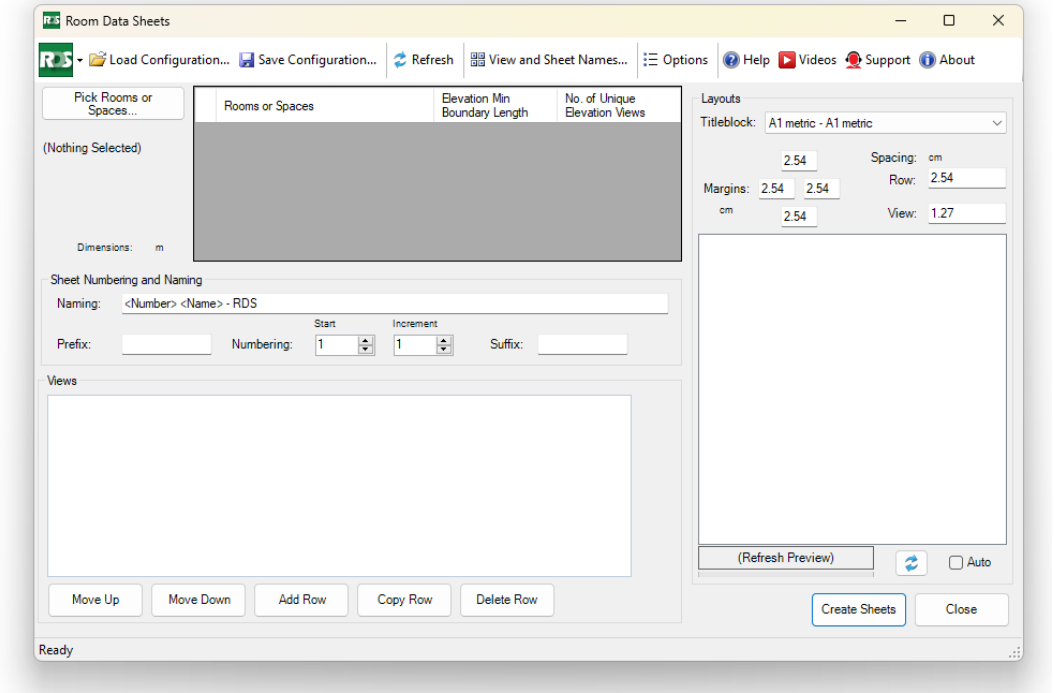
Starting Room Data Sheets

On the Revit ribbon, click on the “Room Data Sheets” button.

The Room Data Sheets Interface

The Room Data Sheets Interface is designed for an easy workflow:

1. Pick the room or space for which to create views and sheets
2. Use “Add Row” to specify the naming and numbering to be used for the views and sheets
3. Set up the types and order of views to create
4. Use the sheet layout previews to set the titleblock, order and spacing for view placement



Getting Started

Room Data Sheets does not require any special set up to use. It can leverage existing templates, legends and schedule views in a project. It also allows properties such as scale, browser organization and naming to be specified for each view created. Nearly any project that contains rooms and spaces can be used with but a little bit of preparation can greatly facilitate its use.

1. Ensure at least one title sheet family is loaded for use. Titleblock sizes are used to generate the layout previews
2. Configure any view templates specifically for use with RDS if desired
3. Configure schedules to be used with filtering by room. RDS can set the value needed from the selected room's number
4. Determine the numbers and names to be used. If corporate standards dictate a specific naming scheme, become familiar with it and how to use RDS naming and numbering to achieve it

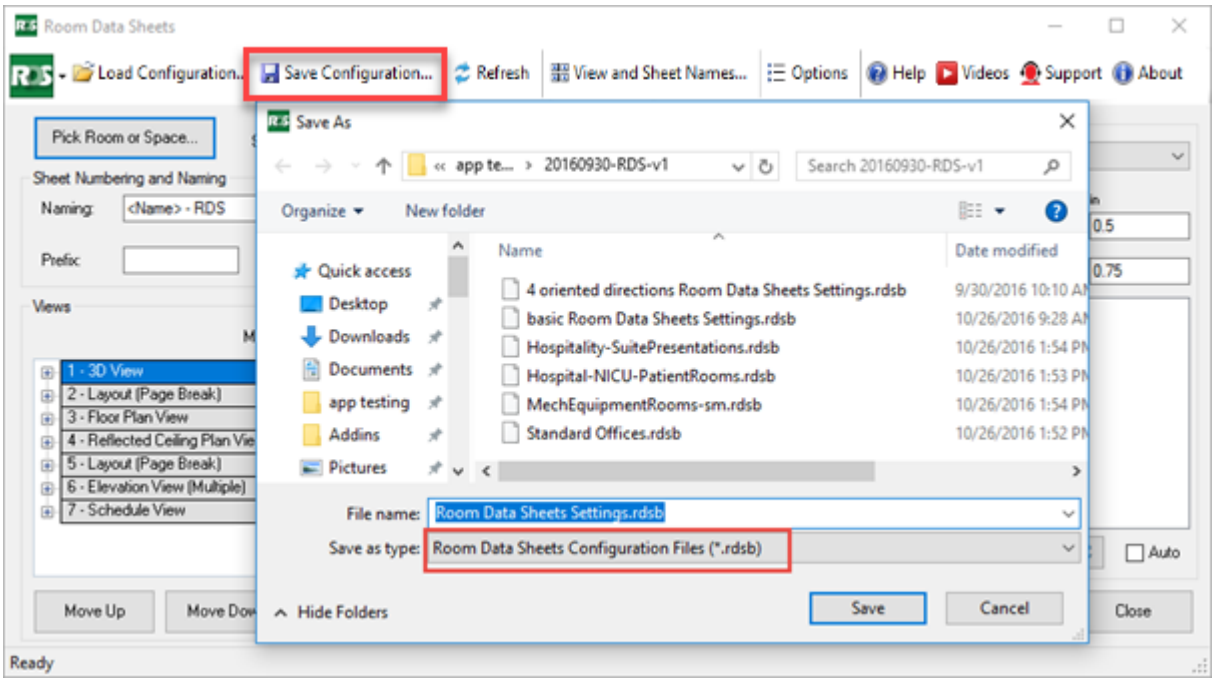
Saving and Loading Configurations

Use the saved settings feature to recall typical, complex or uncommon settings. The settings files can be stored and shared for distribution across projects and quick retrieval.

Configuration settings that are stored in the .rdsb files are:

- Sheet Numbering and Naming
- Minimum Boundary Length for Elevations setting
- Views and their properties such as type, names, scale, etc.
- View placement order
- Sheet settings such as titleblock, margins and spacing. If the titleblock does not exist in the project it will use the first one available.

Click 'Save Configuration…' from the toolbar to choose a name and location for a configuration (.rdsb) file



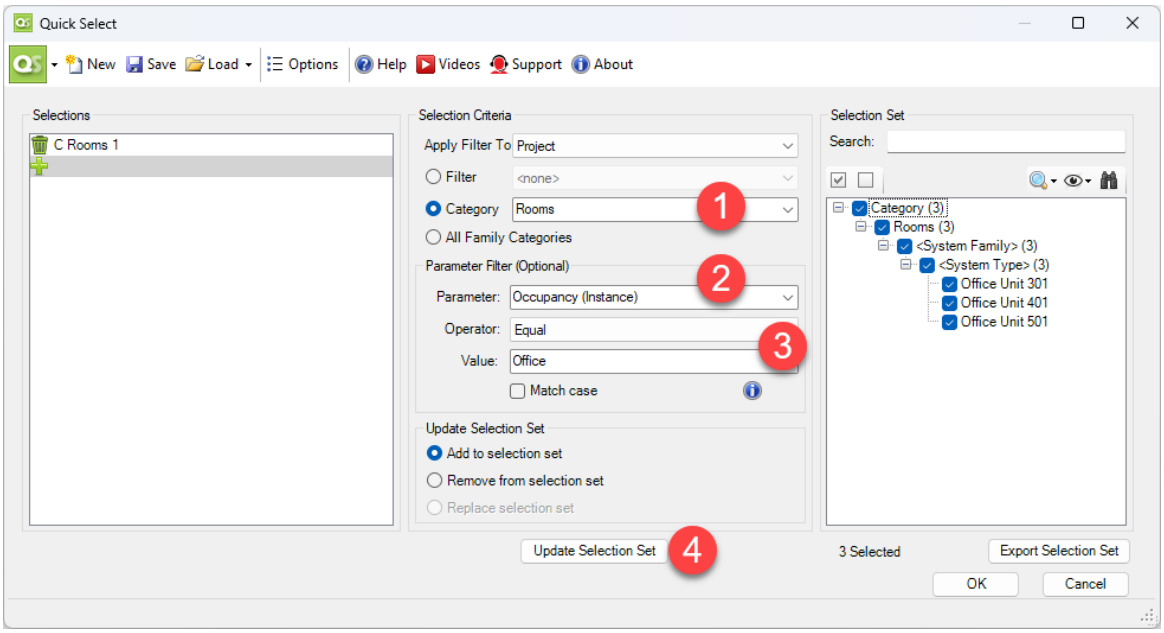
Click 'Load Configuration…' on the toolbar to import previously saved configurations. This will replace the current settings. Loading pre-configured settings reduces the amount of re-work that would otherwise be required for the various types and sizes of rooms or spaces.

Room and Space Selection

Two methods can be used to select rooms. First, clicking on 'Pick Room or Space…' can be used to select rooms or spaces manually by picking them in the Revit view. When done selecting, click the button to end selection from the upper left of the Revit interface.

The second and most powerful way to make selections is to use 'Quick Select'. This brings up the interface for the CTC tool which can select objects by category, parameter values and more. In the example below, Quick Select is used to find rooms which have an occupancy label of "Office".

1. Switch to category and choose either 'rooms' or 'spaces'
2. In the parameter selection, find the relevant parameter
3. Choose the operator (equal, greater than, etc) and then type or choose the value from the list of parameter values
4. Click 'Update Selection Set' to add the found objects to the collection on the right



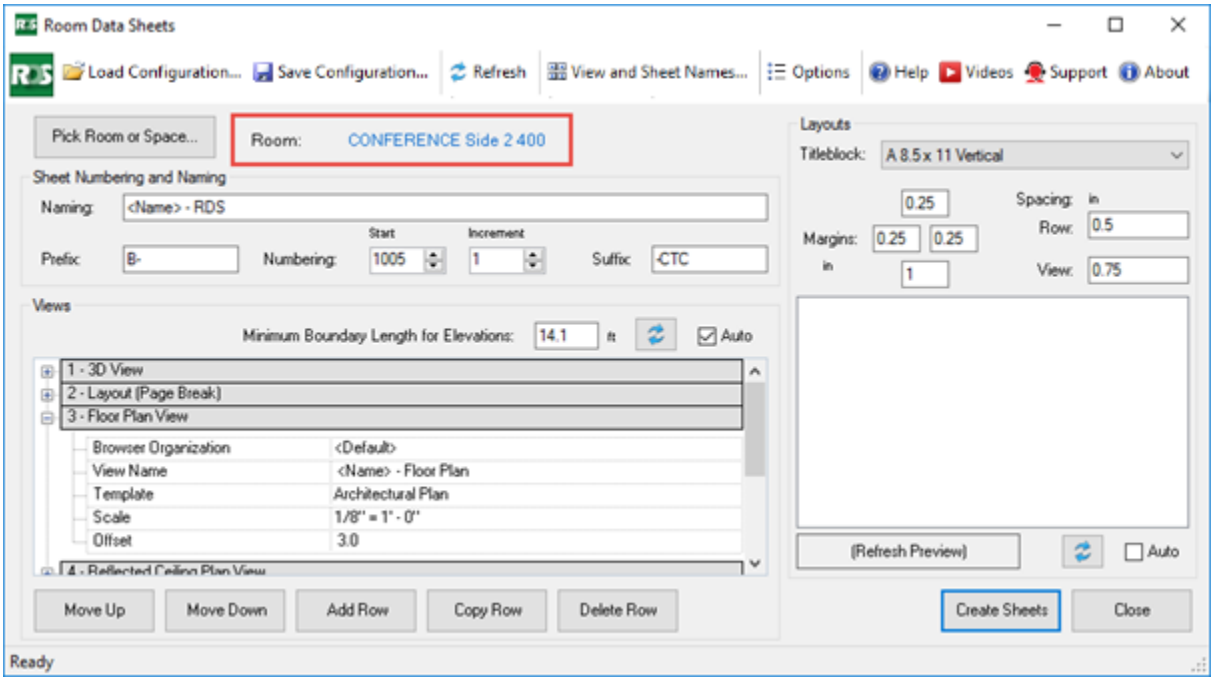
Sheet Naming and Numbering

In the text box labeled “Naming:” enter the characters to be included in the sheet names. RDS can automatically add the selected room/space name as part of the sheet name like this <Name>

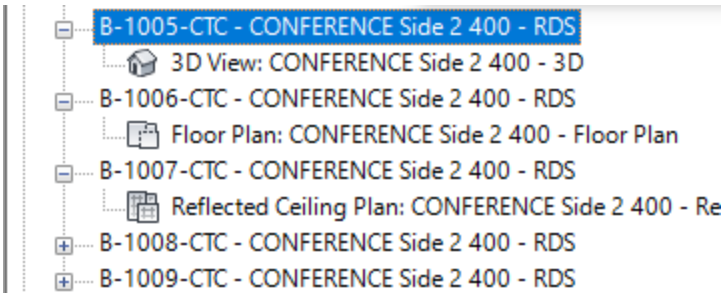
Supply a prefix and suffix if desired. This will be added to the number on the sheet.

Select the starting number and increment values. RDS will increment each sheet number value by 1 or more, depending upon this value.

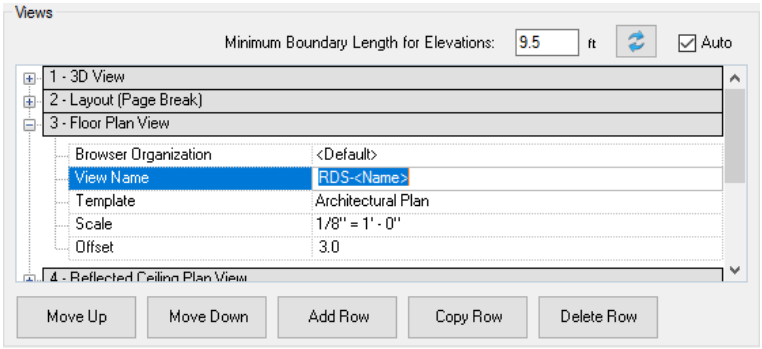
In the example below, the room named CONFERENCE Side 2 and numbered 400 has been selected:



The result of the example settings in Sheet Numbering and Naming will be:



The generated views are also automatically named using similar settings. If needed, change the names to be used for the views in the 'Views' list:

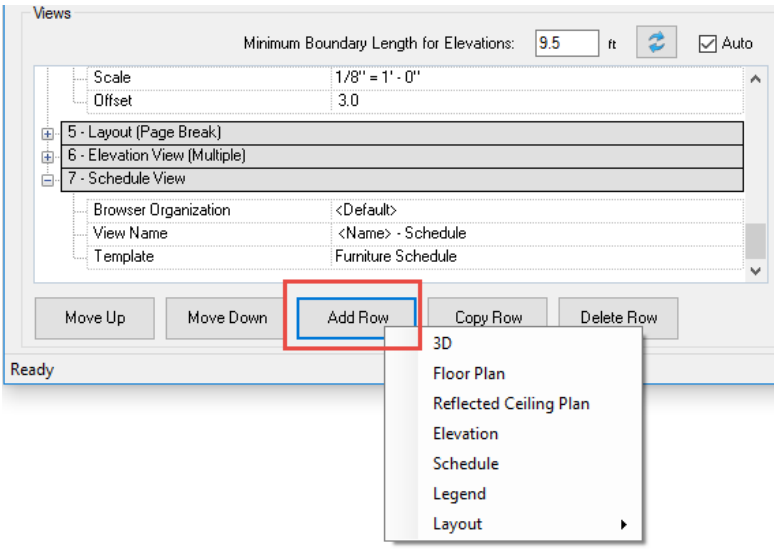


Views

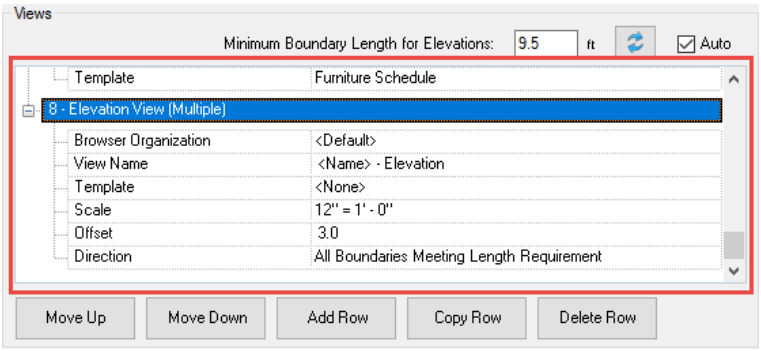
Room data sheets can generate multiple types of views based on the selected room or space. The available properties of the various view types may differ. All are described below:

- **Browser Organization**: where the view will be located in the Project Browser
- **View Name**: the name of the view on the sheet. This is also what will be shown as the view title
- **Template**: template to be used for the view. Choose <None> if no template should be associated
- **Scale**: choose the desired scale from the list. This is used to estimate the size and placement on the sheets and will override the scale setting from a template
- **Offset**: for plan views, this is the dimension beyond the room or space boundary to include. For elevations, this is the distance from a boundary to it's parallel cut plane inside the room or space
- **Viewer Location**: for axonometric 3D views, this is the direction the "camera" is pointed
- **View Direction**: for elevation view, this selects the facing direction of the cut plane
- **Type**: for layout helpers only, choose either Row or Page
  A *row* break forces the following view below the previous view
  A *page* break forces the following view to the next sheet

To add a view type to the list, click the 'Add Row' button below the views grid.

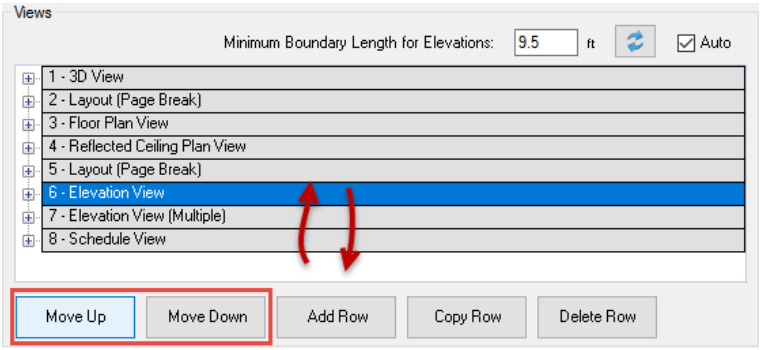


Choose the type of view to add by selecting it from the list. Once added, it's properties can be set by expanding the "+" next to it.



Change the properties by clicking their values in the right column.

The placement of the view can be changed by selecting its row, then clicking the 'Move Up' or 'Move Down' buttons.



The selected view or layout row can be duplicated by using the 'Copy Row' button and deleted by using the 'Delete Row'.

Note: These control the order and properties of the views to be generated. They have no effect on views that already exist in a project.

Elevation Views

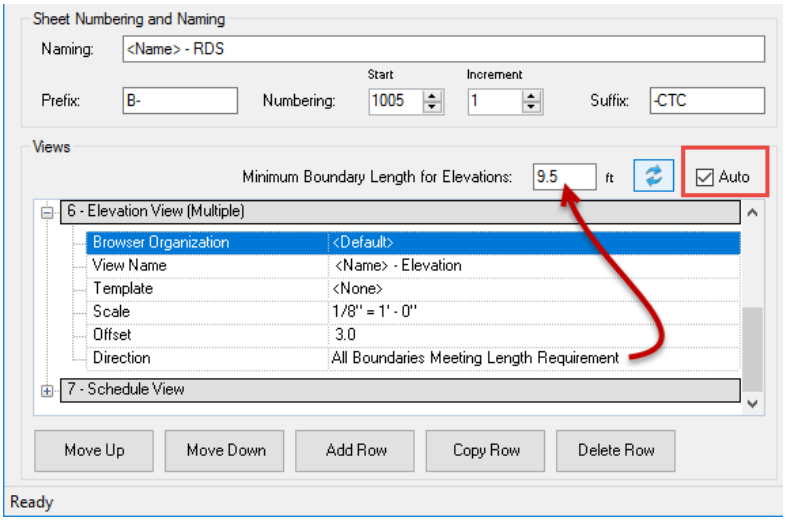
Elevation views can be created individually or in multiples. To create single views for specific directions, add an elevation view type to the list and expand it. In its 'View Direction' property, choose any of the True, Oriented or Wall selections.

True directions are 0, 90, 180 and 270 degrees based on the project true north setting
Oriented directions are relative to the projects oriented north setting
Wall directions are based on the room or space boundaries (use this for very unusual shapes)

To generate multiple elevations based on boundaries, select one of the first three options in 'View Direction'.

All True and All Oriented directions creates four elevations for the room or space and places a single view tag on the plan.

'All Boundaries Meeting Length Requirement' uses the setting from 'Minimum Boundary Length for Elevations'. This function uses some logic when determining how many elevations to create and what orientation they will have. To use this method, select a room with the 'Auto' box checked in the 'Views' pane:



RDS automatically calculates this value based on the smallest dimension of the four largest boundaries. The value can be overridden by unchecking the box and typing a value (decimal feet in an imperial project). This setting not only controls how long a boundary (a wall or divider in most cases) should be for an elevation view but also how many elevations should be created.

Schedule Views

Schedule views require a 'Template' selection which can either be a view or a template. RDS will create a new schedule view based on the template selection. For room/space based equipment, furniture, finishes, etc. types of schedules, the template must contain either a room/space number column or a room/space name column so that it can be filtered based on the room/space. These columns can be set to invisible if desired.

Sheet Settings

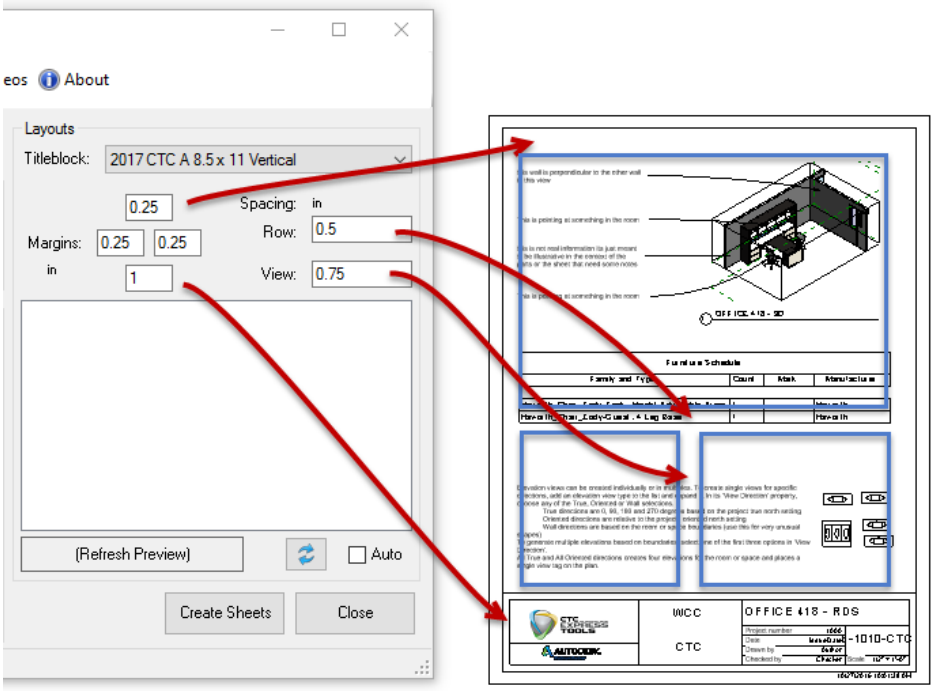
Select a titleblock from the list of the titleblock families which have been loaded into the project. As mentioned previously, the size of the titleblock is used to determine fitment of the views on the sheets.

The settings in the Layouts panel offer some opportunity for fine tuning of the placement areas on the sheet. For example, if the selected titleblock uses portrait orientation and most of the sheet information is located at the bottom, the margin values can be adjusted so that views will not be placed in areas that would overlap the borders and titles.

There are margin settings for top, bottom, left and right. The values should be entered in decimal units, depending upon the system of measurement setting for the project.

Adjustment is also available to control the spacing of views. The value in the 'Row:' text box controls the space from the bottom of a view (including title if present) and the top of the next. The value in the 'View:' text box defines the width of the space between the sides of views if more than one are in a row. Neither of these settings apply to edges of views that are adjacent to the margins of the sheet.

The text boxes for margins and view spacing are illustrated in the image below:



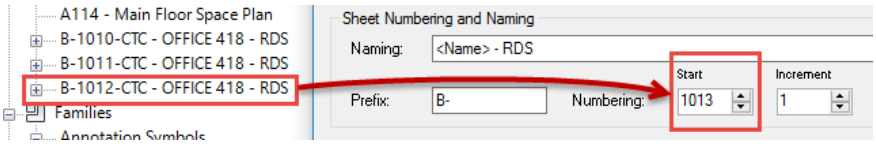
To preview the approximate placement result on all of the sheets, click the refresh button below the preview pane.

The preview displays the sheets with light blue filled boxes representing views. If a box is filled red, it is too large for the sheet but will not prevent it's creation. If adjustments are needed, click refresh again to see the new layout previews.

Creating Sheets

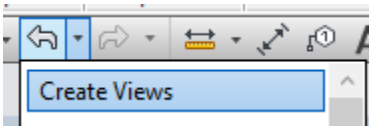
When the preview results are satisfactory, click the 'Create Sheets' button. Room Data Sheets will generate each required sheet and place the generated views on them. Depending upon the selected browser category, the sheets will appear in the Project Browser tree. RDS allows interaction with Revit while it is open which makes it possible to navigate through the sheets it has created to determine if the result is as desired or more adjustments need to be made.

Before repeating the sheet creation for another room or space, note the value in the 'Numbering:' field. Examine the numbers on the sheets created thus far and verify that the increment value has been set to the next unused number:



If the sheets are created with the same sheet numbering, Revit will append the characters (1),(2), etc.

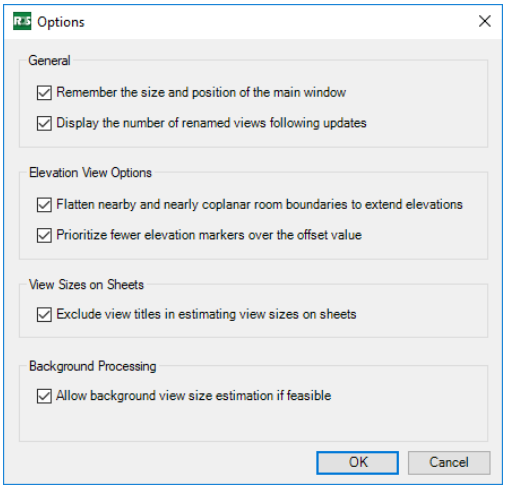
Delete vs. Undo – Room Data Sheets does not track the sheets and views it has created. The easiest way to "redo" the sheets for a room is to use the 'Undo' function in Revit. The entire operation is encapsulated in a single command. To undo the 'Create Sheets' command, find "Create Views" in the Undo history menu:



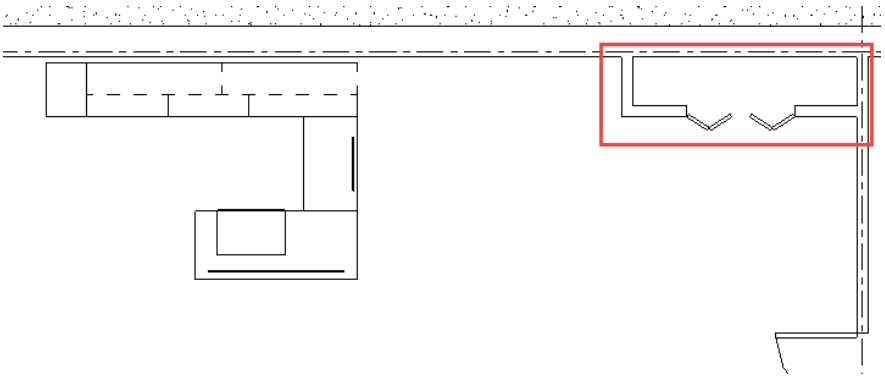
Each "Create Views" item represents a complete RDS operation. To undo more than one set of sheets for each room, go back more steps.

If the "Create Views" operation does not exist or is no longer available due to closing the project or being too far back, the only way to clean up the views and sheets is to manually delete them. If the views and sheets are clearly named, it is easier to find them in the Project Browser.

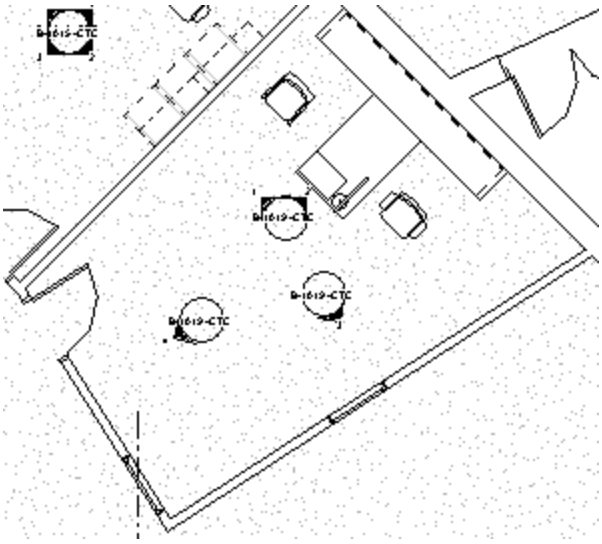
Options



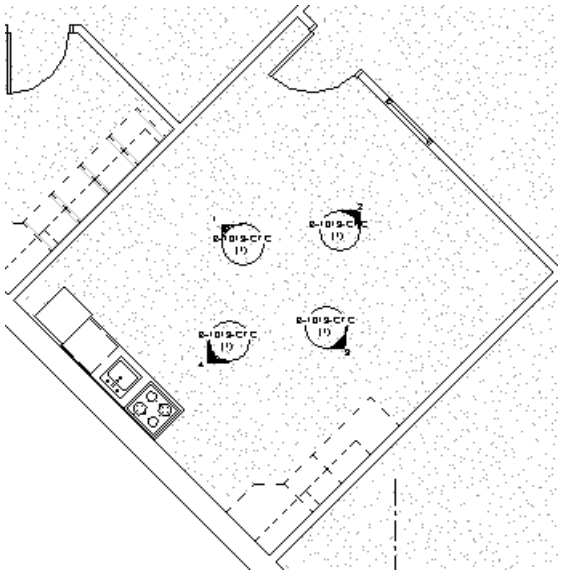
Flatten nearby and coplanar room boundaries to extend elevation – ignores small protrusions of an otherwise contiguous bounding element when qualifying elevation views.



Prioritize fewer elevation markers over the offset value – when checked, RDS will attempt to combine perpendicular elevation view references to a single tag:



Fewer marker priority combines perpendicular views



Marker placed for every view (unchecked)

Note: Depending upon the size of the selected room/space, offset value, size of the sheet and view scale, the elevation markers may overlap in some cases. This scenario requires adjustment of the locations of the elevation references on the plans after the sheets are created.

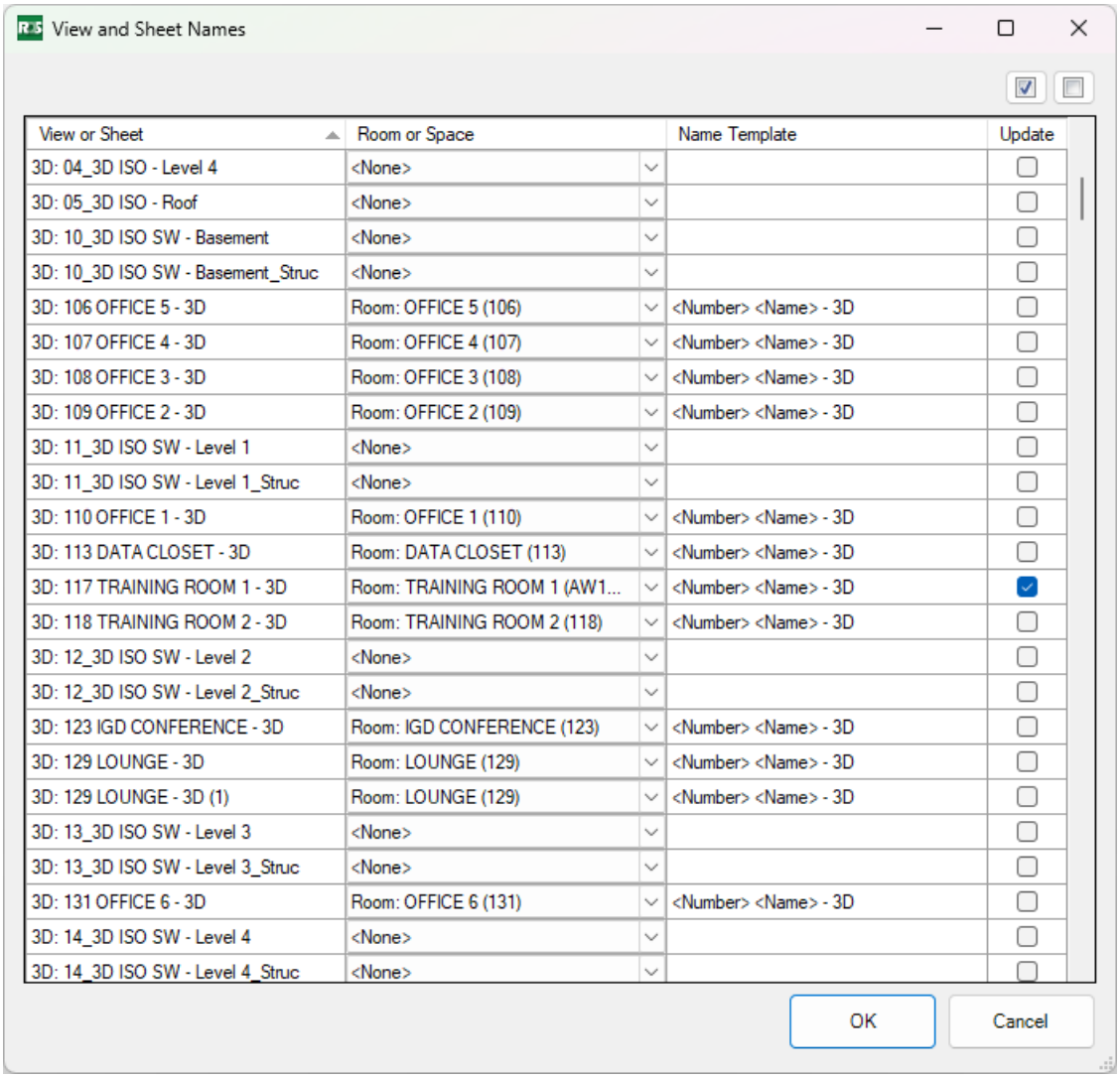
Exclude view titles in estimating view sizes on sheets – when checked, view titles will not be considered part of the overall view size. This may cause titles to overlap views but may also allow more views to be placed on a sheet.

Allow background view size estimation if feasible – This feature will override the user selection to temporarily turn off size estimation in documents that are very slow. This is determined the first time a view size is estimated (which means that it can be slow on startup if it is turned on in settings). If the process is found to be overly slow, it will be disabled until the next time a model is opened.

Renaming Sheets and Views

To rename multiple sheets and views in one operation (such as when rooms are renamed and the documentation needs to match), click on “View and Sheet Names… “ on the main toolbar.

The View and Sheet Names form will appear. Any views that have a room association will be presented in the list with the “Room or Space” and “Name Template” values populated.



Here, the values can be changed by modifying them and checking the “Update” box at the end of each line.

Repeat the changes as desired and click OK to apply them.

Room Family Manager

Introduction

Room Family Manager facilitates defining, maintaining, and validating the family content of each room using room type definitions.

- Build room type definitions in a spreadsheet
- Build room type definitions from existing Revit rooms
- Automatically place family content in your model based on room type assignments
- Validate that rooms in your model contain required families

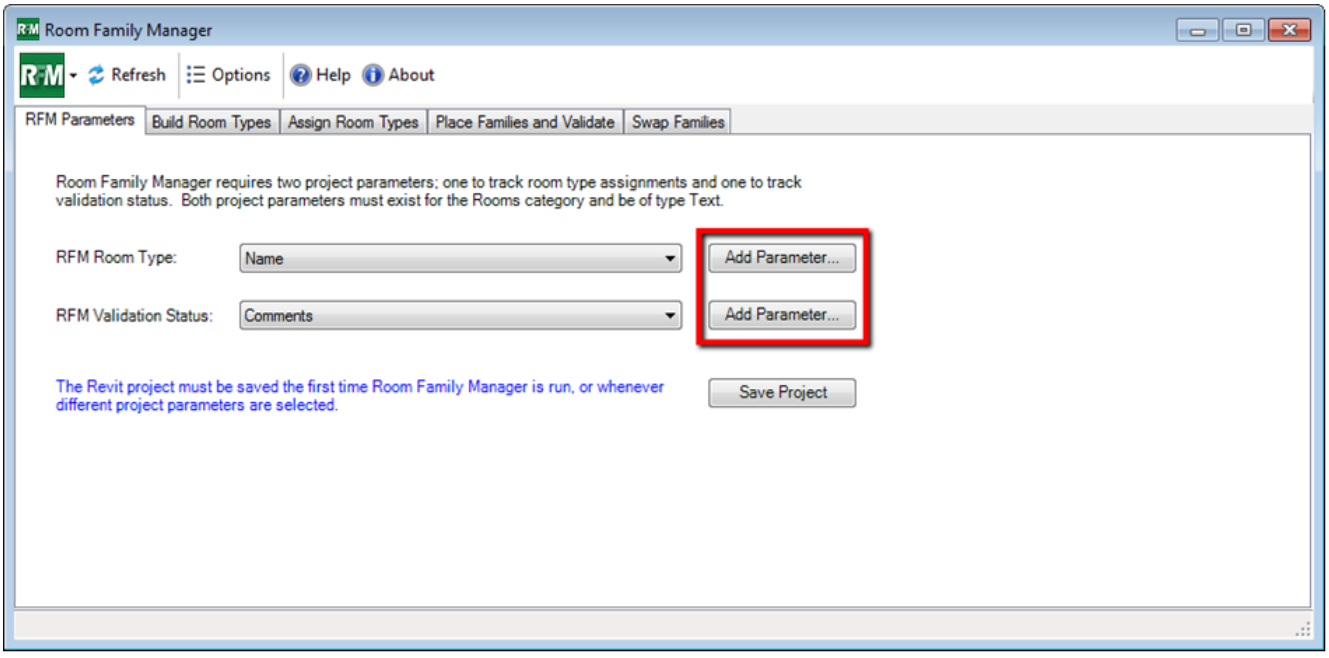
Starting Room Family Manager

On the Revit ribbon, click on the “Room Family Mgr” button.

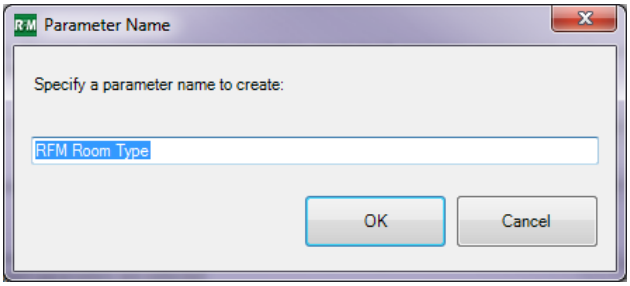
Parameters

Two text based parameters assigned to the “Rooms” category are required to use Room Family Manager. These two parameters track room type assignments and validation statuses, both of which will be explained later in this document.

If suitable parameters already exist they can be selected from the dropdown lists. If new parameters are required the “Add Parameter…” button can be used to create a new project text parameter for the Rooms category.



When adding a parameter, a default parameter name “RFM Room Type” or “RFM Validation Status” is suggested, but can be changed if desired.



Building Room Types

A room type, as it pertains to Room Family Manager, defines a specific list of families that must exist in a room. For example, a “hospital patient” room type may need to include 1 bed, 1 nightstand, 1 trash receptacle, and 2 chairs. A “double occupant hotel room” room type may need to include 2 beds, 1 desk, 1 desk chair, 1 television and 2 nightstands.

Room type definitions are built in a spreadsheet using a specific format. The spreadsheet workbook can have any number of sheets defined to help organize the room type definitions. Each sheet can have any name, because Room Family Manager will always use all sheets in the workbook.

Each spreadsheet row of a room type definition must contain values for:

- Room Type (name)
- Equipment Name
- Quantity

Room Types may need to be defined early in a project, before specific families have been selected. To facilitate this need, Room Family Manager has the ability to use generic “placeholder” content.

When defining placeholder content in the Room Types spreadsheet, the room type definition rows must also contain values for:

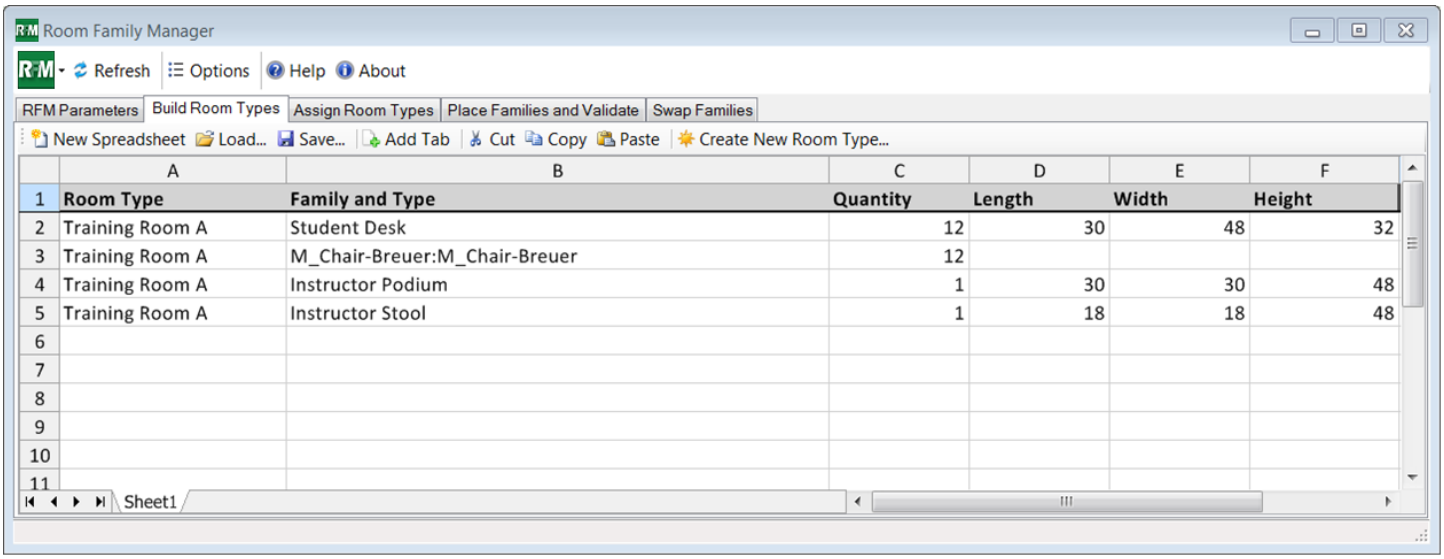
- Length
- Width
- Height

All dimensional values must be supplied in inches. The generic Placeholder family is simply a box that is sized to match the given Length, Width and Height values.

When a specific family is to be listed in the room type definition, both the family name and the type name to use must be provided, separated by a colon and a space character. For example:

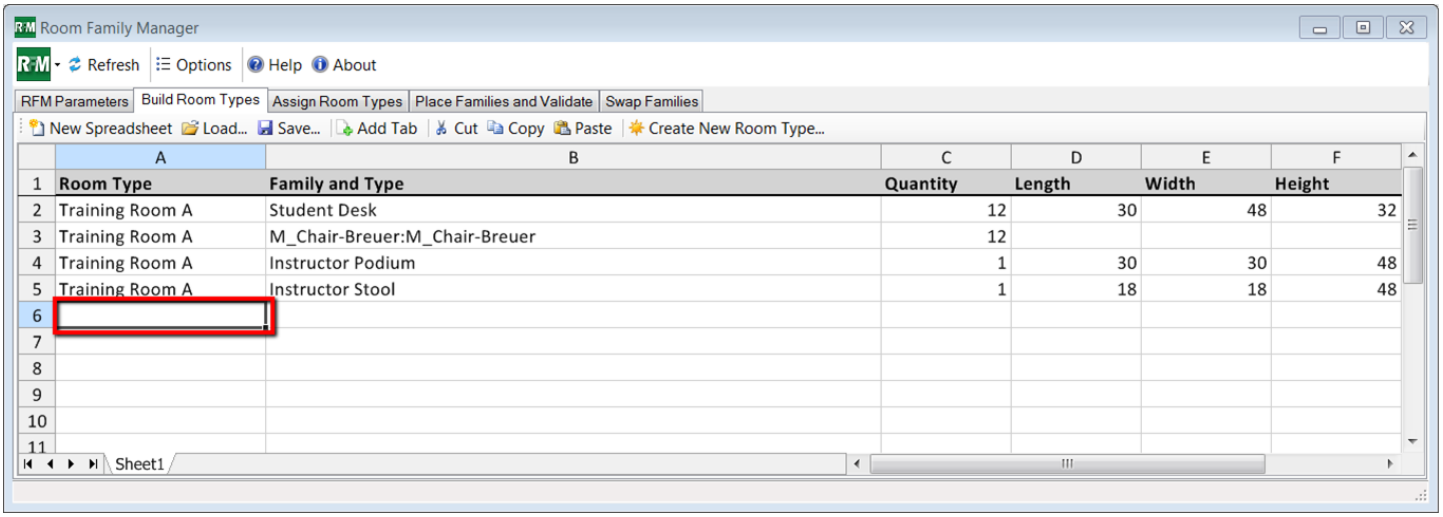
M_Chair-Breuer: M_Chair-Breuer

Here is an example of a room type definition using both the placeholder content (which provides dimensions) and actual content:



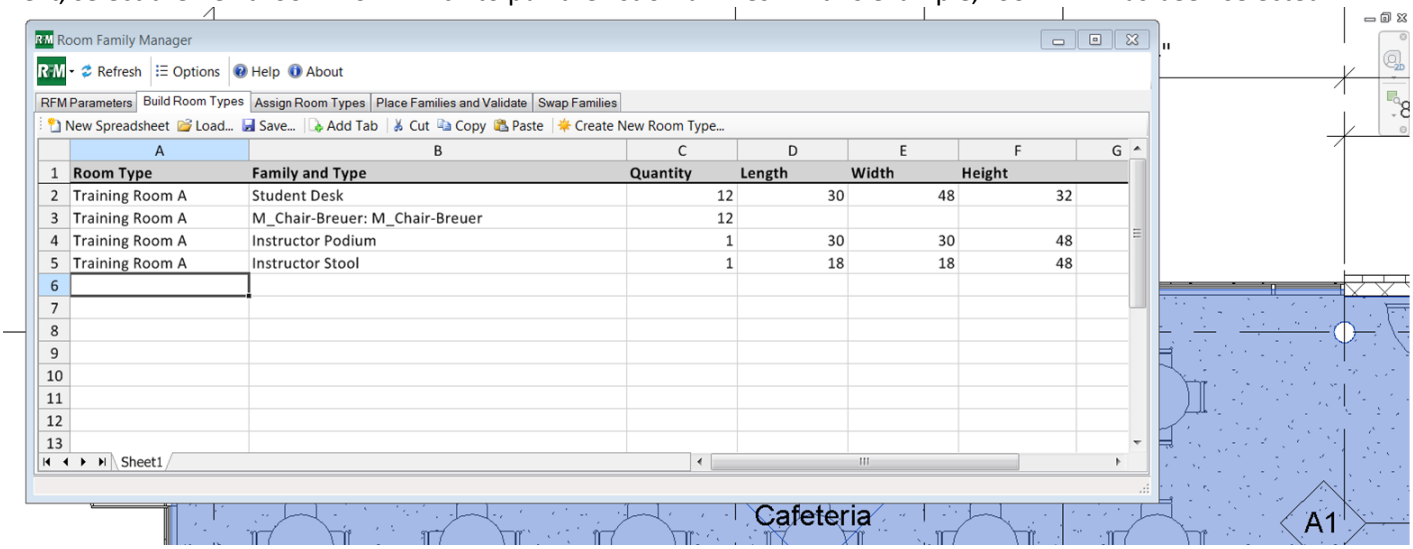
	A	B	C	D	E	F
1	**Room Type**	**Family and Type**	**Quantity**	**Length**	**Width**	**Height**
2	Training Room A	Student Desk	12	30	48	32
3	Training Room A	M_Chair-Breuer:M_Chair-Breuer	12			
4	Training Room A	Instructor Podium	1	30	30	48
5	Training Room A	Instructor Stool	1	18	18	48
6						
7						
8						
9						
10						
11						

Room types can also be built from existing rooms within the Revit model. To build a room type using the Revit model, start by selecting the first cell in the row to be used.



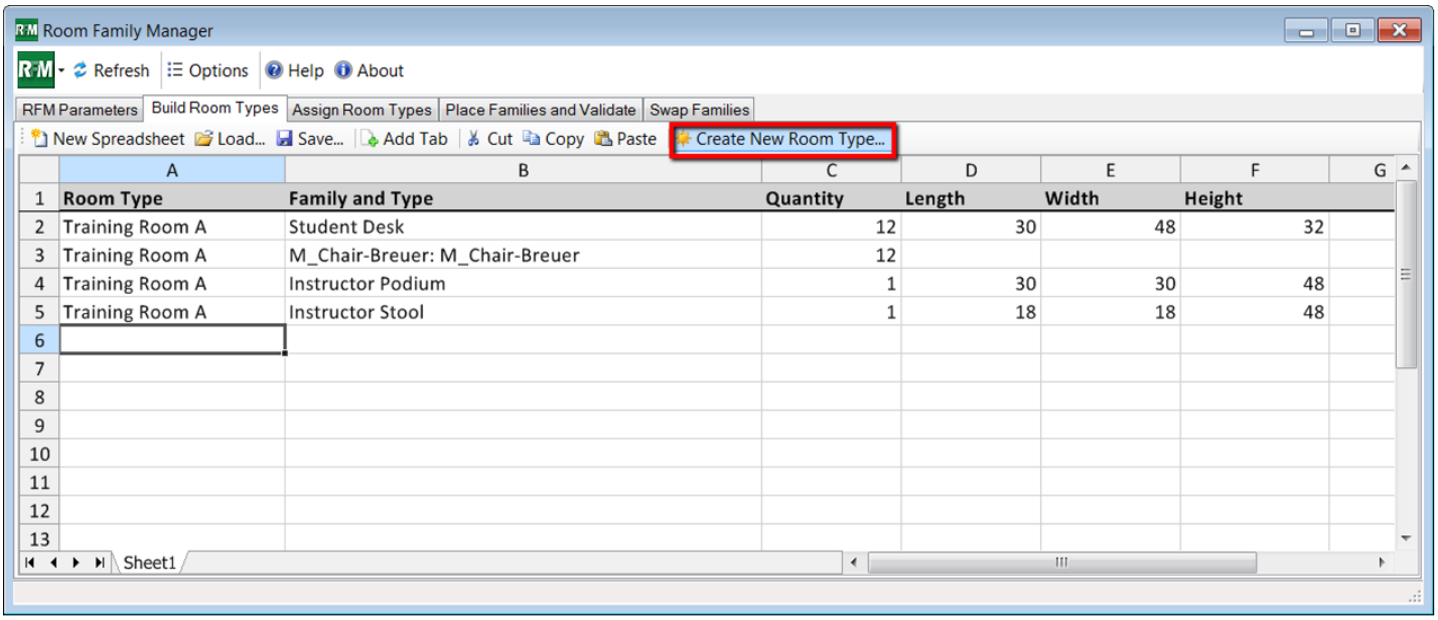
	A	B	C	D	E	F
1	**Room Type**	**Family and Type**	**Quantity**	**Length**	**Width**	**Height**
2	Training Room A	Student Desk	12	30	48	32
3	Training Room A	M_Chair-Breuer:M_Chair-Breuer	12			
4	Training Room A	Instructor Podium	1	30	30	48
5	Training Room A	Instructor Stool	1	18	18	48
6						
7						
8						
9						
10						
11						

Next, select the Revit room from which to pull the list of families. In this example, room 121 has been selected.



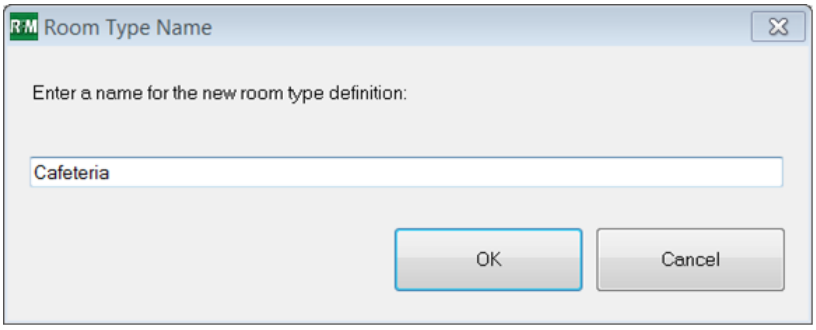
	A	B	C	D	E	F	G
1	Room Type	Family and Type	Quantity	Length	Width	Height	
2	Training Room A	Student Desk	12	30	48	32	
3	Training Room A	M_Chair-Breuer: M_Chair-Breuer	12				
4	Training Room A	Instructor Podium	1	30	30	48	
5	Training Room A	Instructor Stool	1	18	18	48	
6							
7							
8							
9							
10							
11							
12							
13							

With the desired worksheet cell and Revit room selected, click the “Create New Room Type…” button.

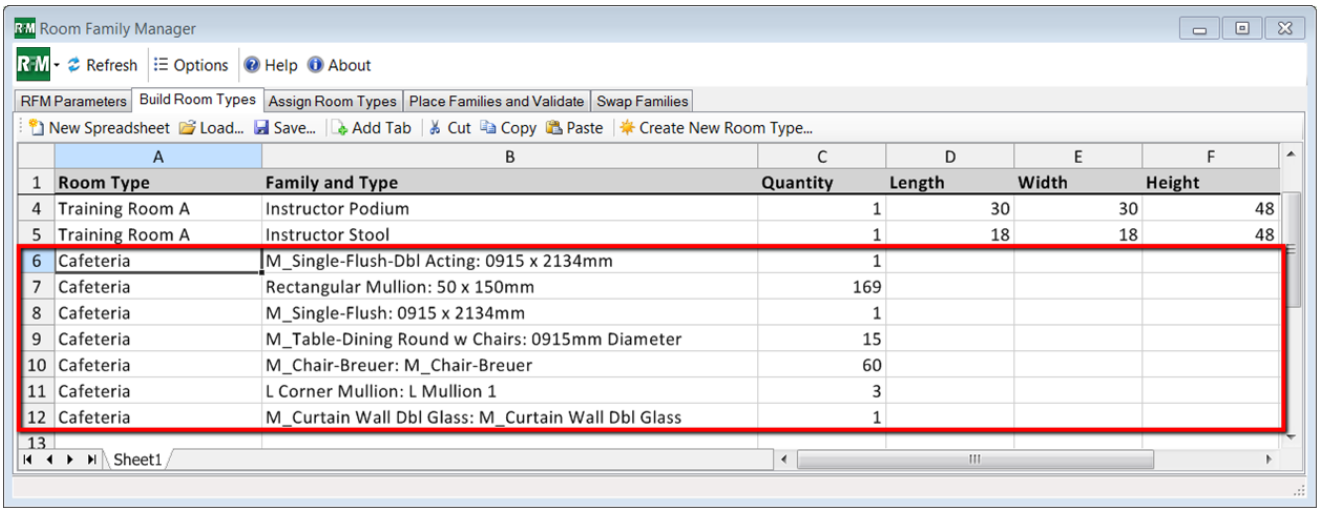


	A	B	C	D	E	F	G
1	Room Type	Family and Type	Quantity	Length	Width	Height	
2	Training Room A	Student Desk	12	30	48	32	
3	Training Room A	M_Chair-Breuer: M_Chair-Breuer	12				
4	Training Room A	Instructor Podium	1	30	30	48	
5	Training Room A	Instructor Stool	1	18	18	48	
6							
7							
8							
9							
10							
11							
12							
13							

The “Room Type Name” dialog will appear. Enter the desired room type name and click the “OK” button.

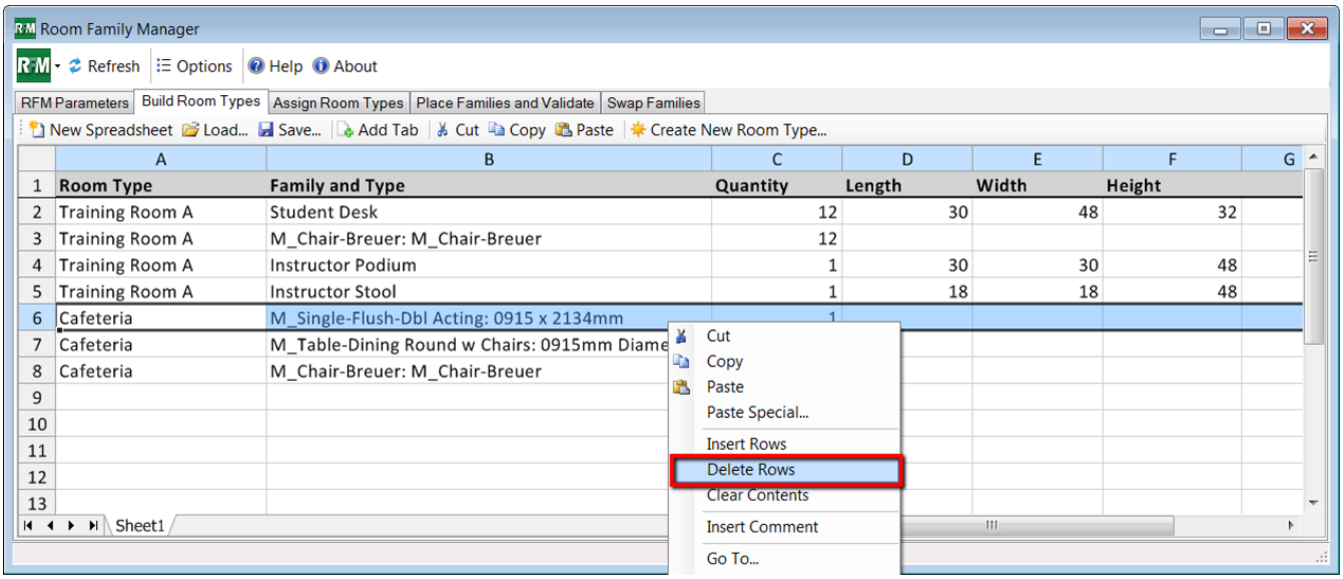


The room type definition will be written to the spreadsheet.



	A	B	C	D	E	F
1	**Room Type**	**Family and Type**	**Quantity**	**Length**	**Width**	**Height**
4	Training Room A	Instructor Podium	1	30	30	48
5	Training Room A	Instructor Stool	1	18	18	48
6	Cafeteria	M_Single-Flush-Dbl Acting: 0915 x 2134mm	1			
7	Cafeteria	Rectangular Mullion: 50 x 150mm	169			
8	Cafeteria	M_Single-Flush: 0915 x 2134mm	1			
9	Cafeteria	M_Table-Dining Round w Chairs: 0915mm Diameter	15			
10	Cafeteria	M_Chair-Breuer: M_Chair-Breuer	60			
11	Cafeteria	L Corner Mullion: L Mullion 1	3			
12	Cafeteria	M_Curtain Wall Dbl Glass: M_Curtain Wall Dbl Glass	1			
13						

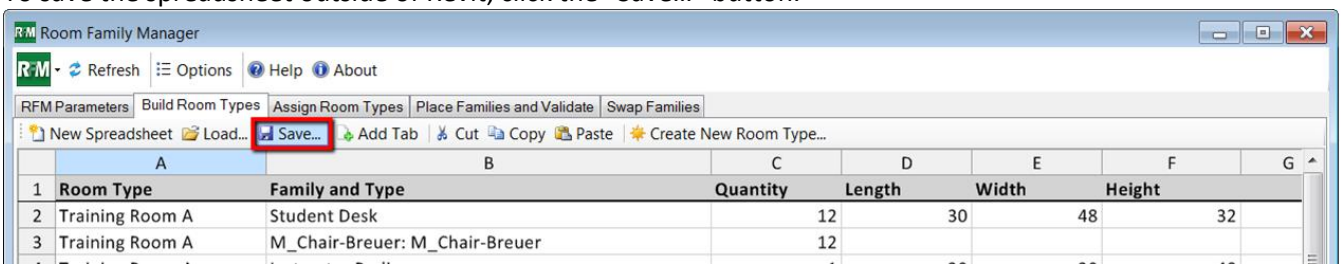
It may be necessary to remove families not relevant to the Room type. To delete a row, first select the row, then right click on it and choose the “Delete Rows” option.



	A	B	C	D	E	F	G
1	**Room Type**	**Family and Type**	**Quantity**	**Length**	**Width**	**Height**	
2	Training Room A	Student Desk	12	30	48	32	
3	Training Room A	M_Chair-Breuer: M_Chair-Breuer	12				
4	Training Room A	Instructor Podium	1	30	30	48	
5	Training Room A	Instructor Stool	1	18	18	48	
6	Cafeteria	M_Single-Flush-Dbl Acting: 0915 x 2134mm	1				
7	Cafeteria	M_Table-Dining Round w Chairs: 0915mm Diame					
8	Cafeteria	M_Chair-Breuer: M_Chair-Breuer					
9							
10							
11							
12							
13							

The room type definition spreadsheet can be edited within the Room Family Manager interface, or the spreadsheet can be saved to a file for editing in many popular spreadsheet applications, including Microsoft Excel. XLS and XLSX files are natively supported in Room Family Manager, among other file formats.

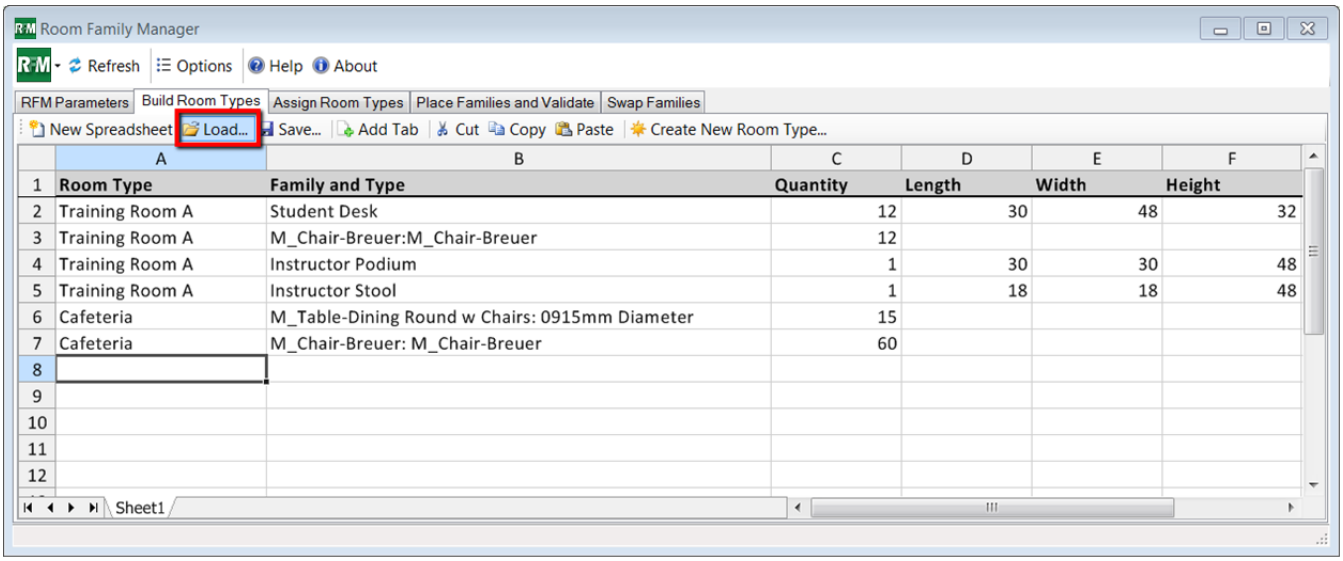
To save the spreadsheet outside of Revit, click the “Save…” button.



	A	B	C	D	E	F	G
1	**Room Type**	**Family and Type**	**Quantity**	**Length**	**Width**	**Height**	
2	Training Room A	Student Desk	12	30	48	32	
3	Training Room A	M_Chair-Breuer: M_Chair-Breuer	12				

Externally edited spreadsheets can also be opened with Room Family Manager. To open a spreadsheet file, click the “Load…” button.

IMPORTANT: Loaded spreadsheet files are still required to use the format shown above.



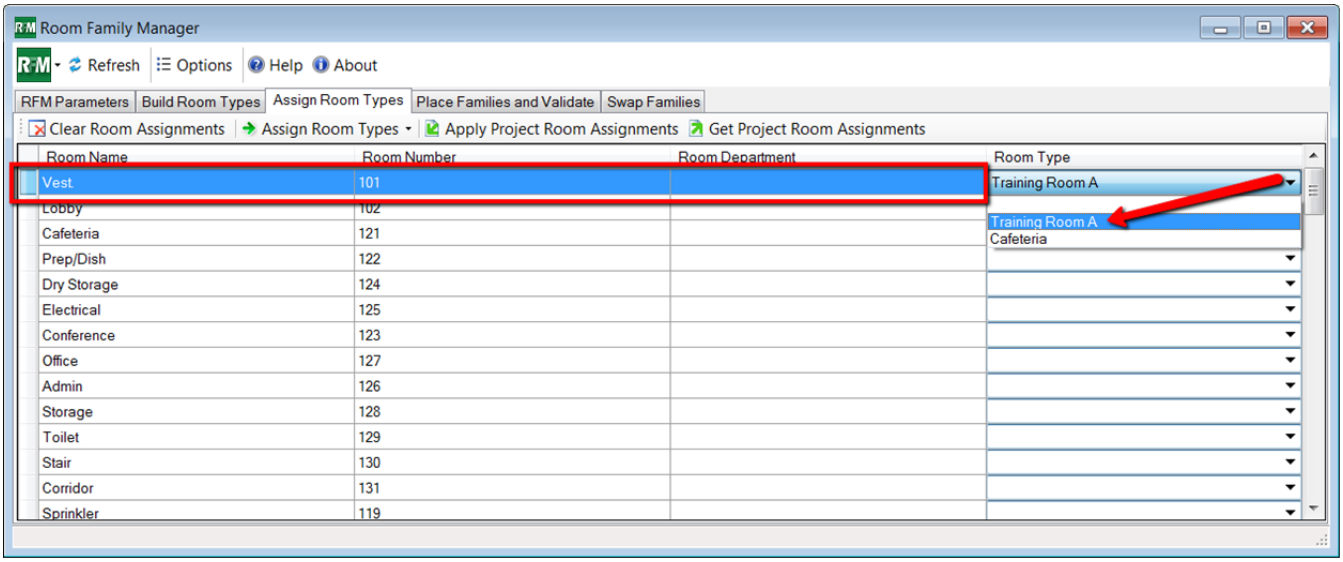
	A	B	C	D	E	F
1	**Room Type**	**Family and Type**	**Quantity**	**Length**	**Width**	**Height**
2	Training Room A	Student Desk	12	30	48	32
3	Training Room A	M_Chair-Breuer:M_Chair-Breuer	12			
4	Training Room A	Instructor Podium	1	30	30	48
5	Training Room A	Instructor Stool	1	18	18	48
6	Cafeteria	M_Table-Dining Round w Chairs: 0915mm Diameter	15			
7	Cafeteria	M_Chair-Breuer: M_Chair-Breuer	60			
8						
9						
10						
11						
12						

Assigning Room Types

Room type assignments are what bind the room type definitions to room objects in the Revit model. This assignment is accomplished on the "Assign Room Types" tab in Room Family Manager.

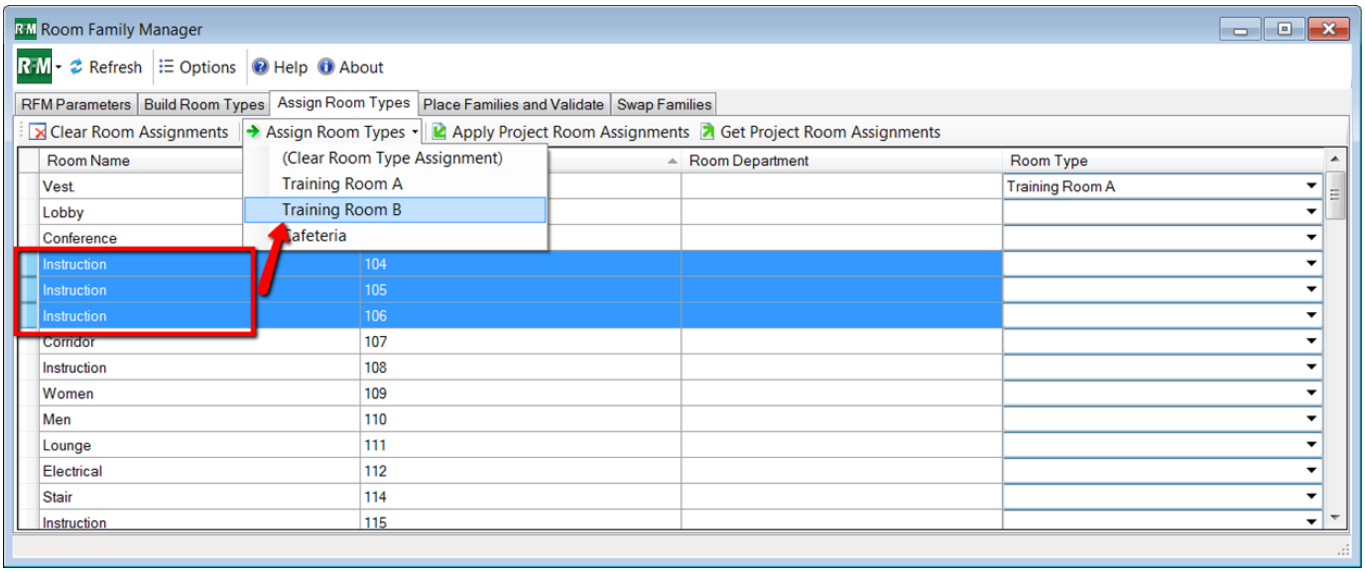
On this tab, all of the room objects in the Revit model are listed. Next to each Revit room is a list of the available room types. To assign a room type to a room object, select the associated room type from the list.

In this example, room 101 will be assigned the room type "Training Room A."

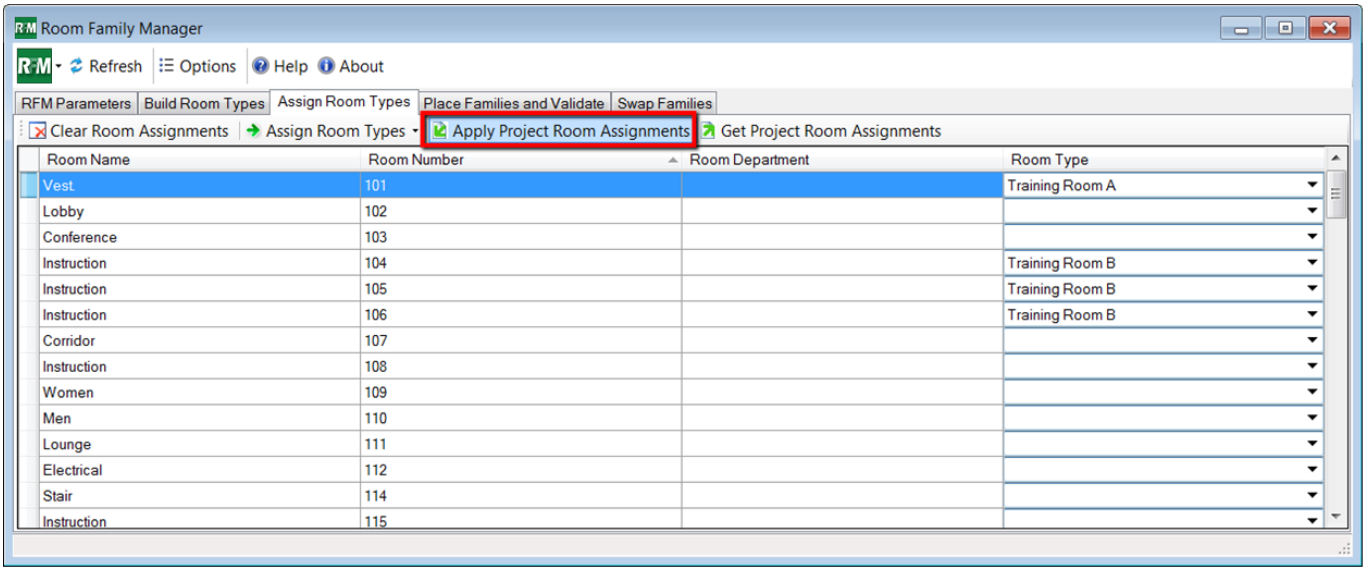


Room Name	Room Number	Room Department	Room Type
Vest	101		Training Room A
Lobby	102		
Cafeteria	121		
Prep/Dish	122		
Dry Storage	124		
Electrical	125		
Conference	123		
Office	127		
Admin	126		
Storage	128		
Toilet	129		
Stair	130		
Corridor	131		
Sprinkler	119		

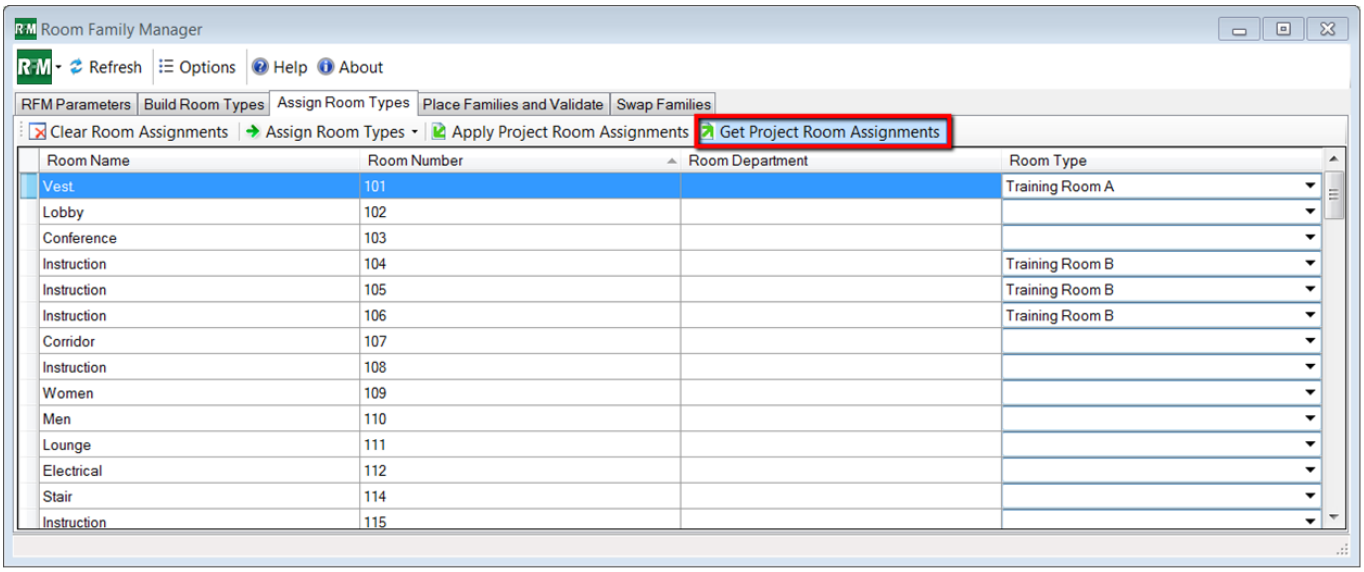
To assign a room type to multiple rooms, first select the rooms and then click the "Assign Room Types" dropdown option from the toolbar above the list of rooms. Click on the desired room type from the list to assign it to all of the selected rooms.



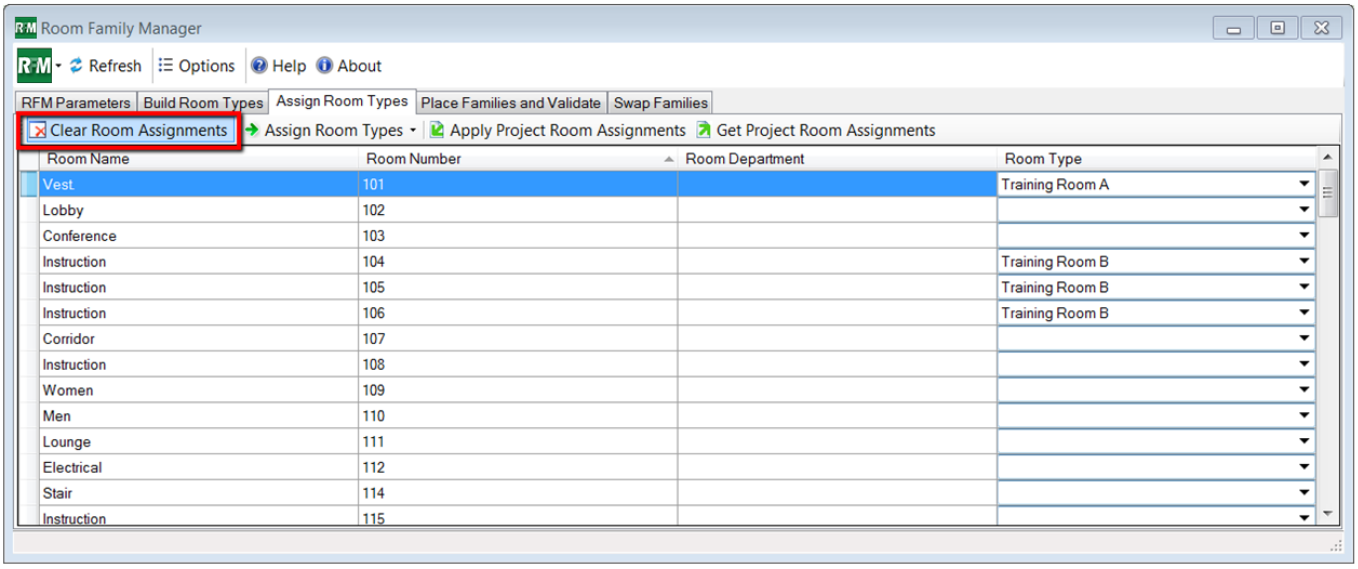
Once the room type assignments have been made, click the “Apply Project Room Assignments” button to write the values into the project parameter previously specified for “RFM Room Type” from the “RFM Parameters” tab.



The “Get Project Room Assignments” button will query all rooms in the Revit model and display their room type assignments in the list. This function is useful if room type assignments are edited outside of the Room Family Manager interface, such as in a schedule or using the Spreadsheet Link tool.



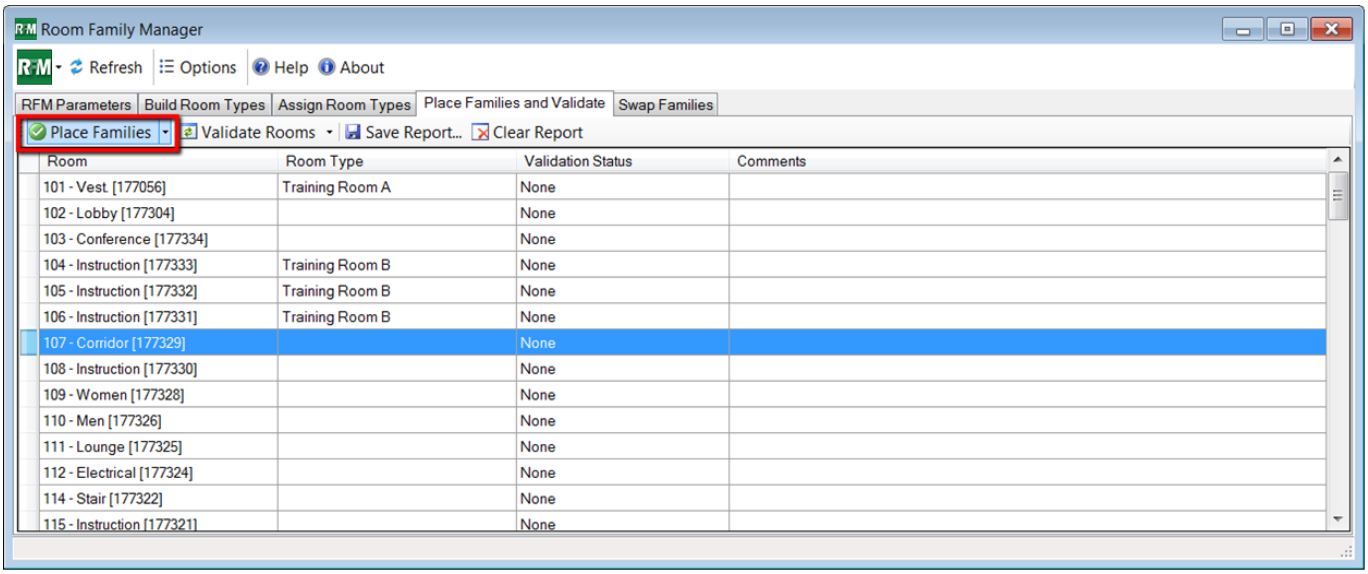
The “Clear Room Assignments” button will clear any room assignments.



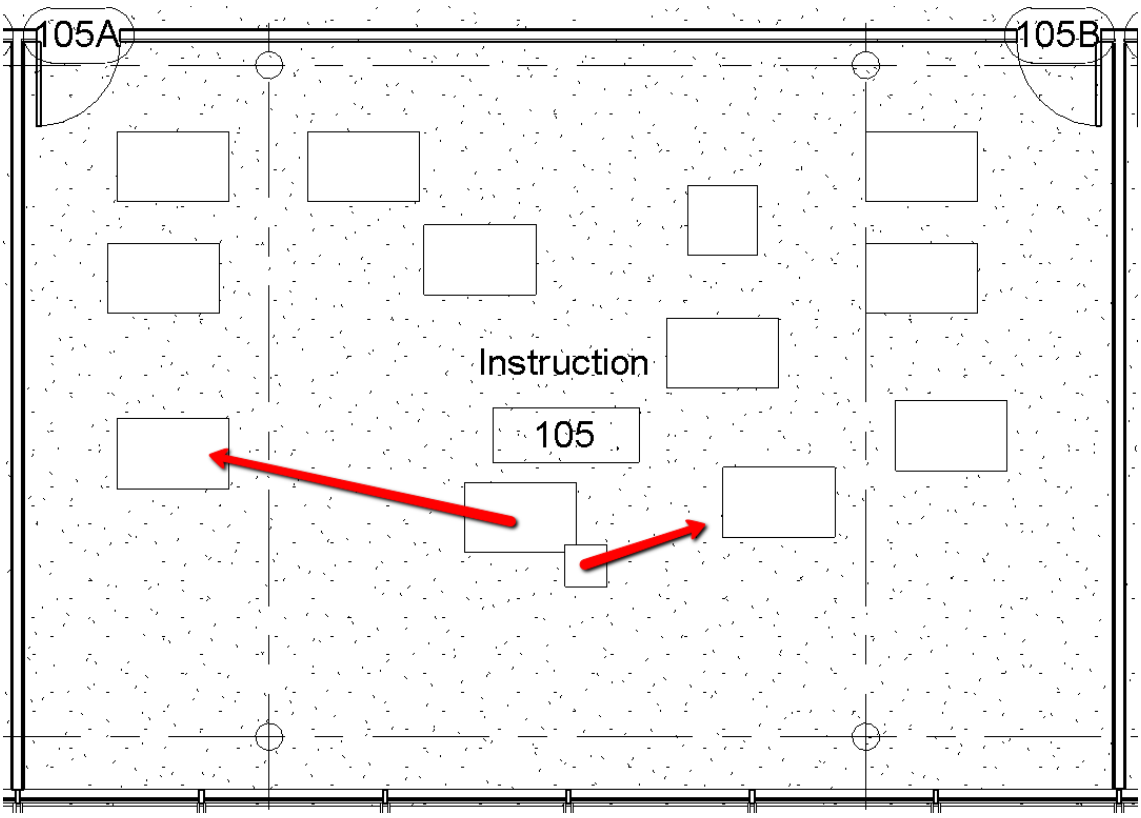
Placing Families and Model Validation

Once room types have been built and assigned, the “Place Families and Validate” tab can be used to both place families and validate that room type assignment requirements have been fulfilled.

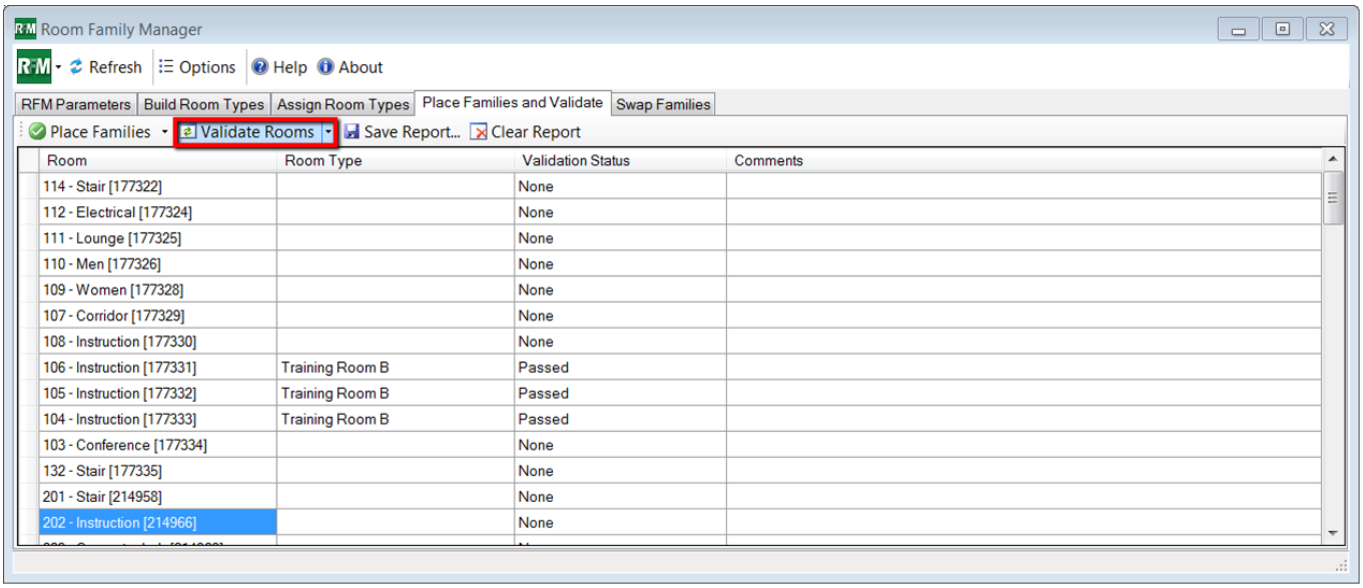
To place families, click the “Place Families” button. Families will be placed with the family origin at the room insertion point.



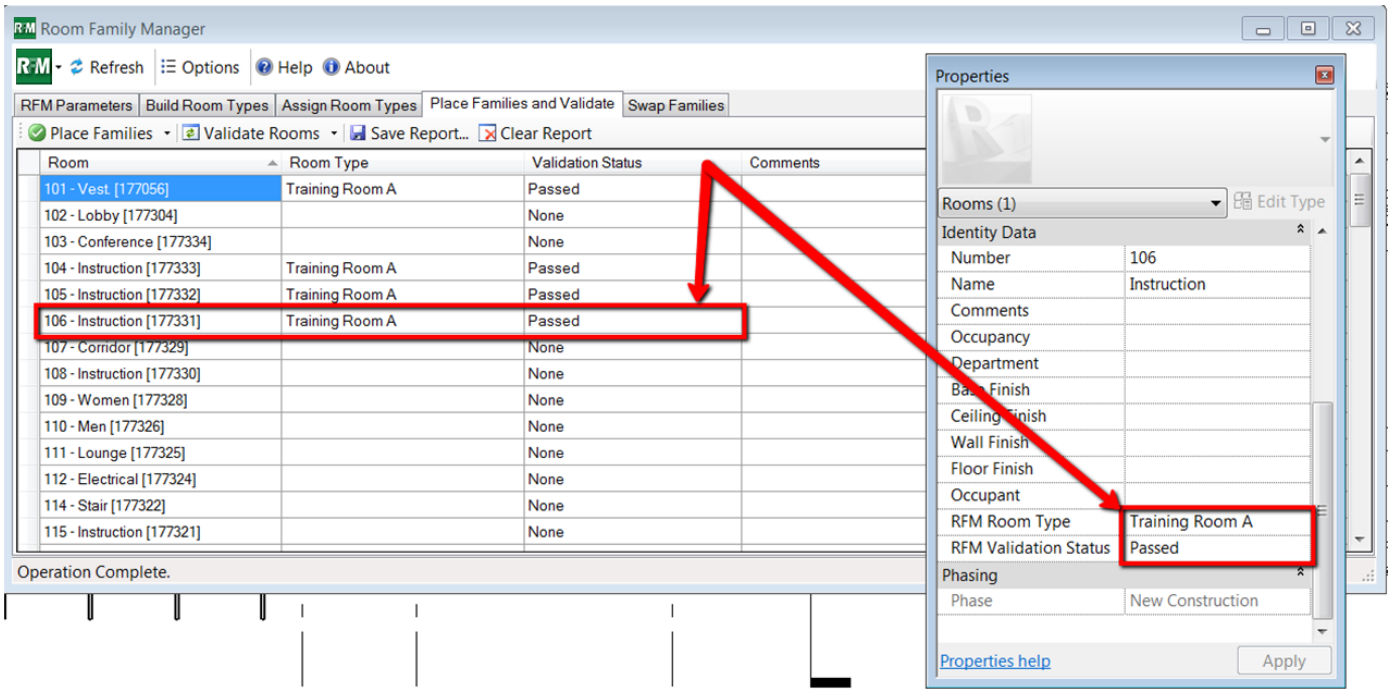
Once families are placed in each room, they can be moved into the proper location within the room.



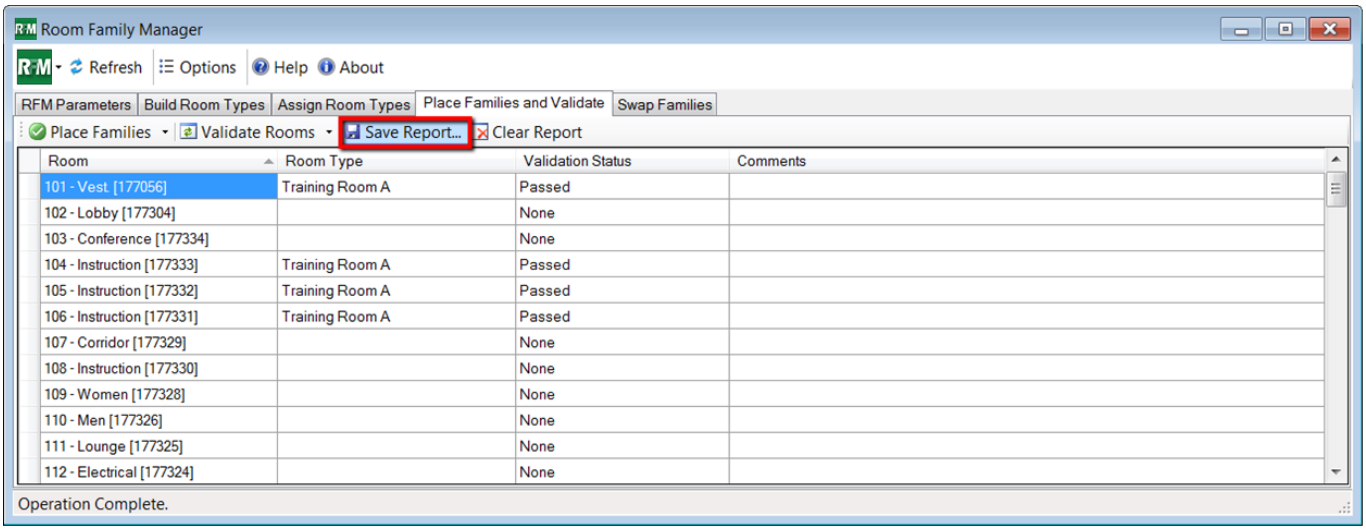
The “Validate Rooms” button will query each room to verify it contains the equipment specified in the assigned room type. Options exist to control how the validation is performed. These will be discussed below.



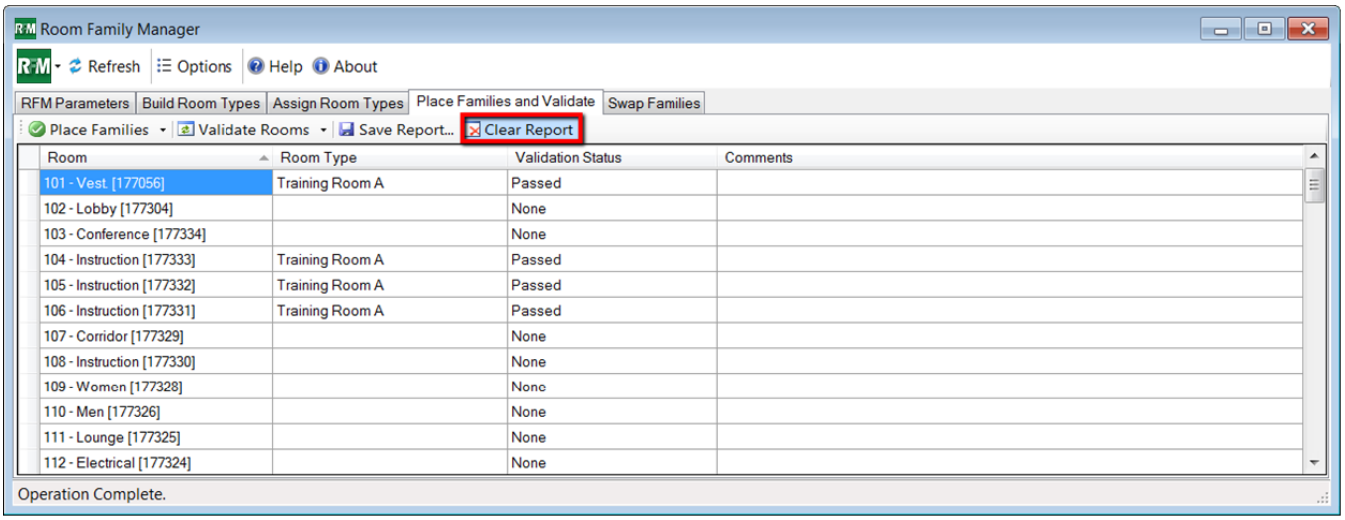
Pass or fail results will be reported in the "Validation Status" column as well as be written to the "RFM Validation Status" parameter specified on the "RFM Parameters" tab. This parameter could be used, for example, in a color scheme or shown on a schedule.



The "Save Report" button can be used to save the validation status report out to an .XLS spreadsheet file.



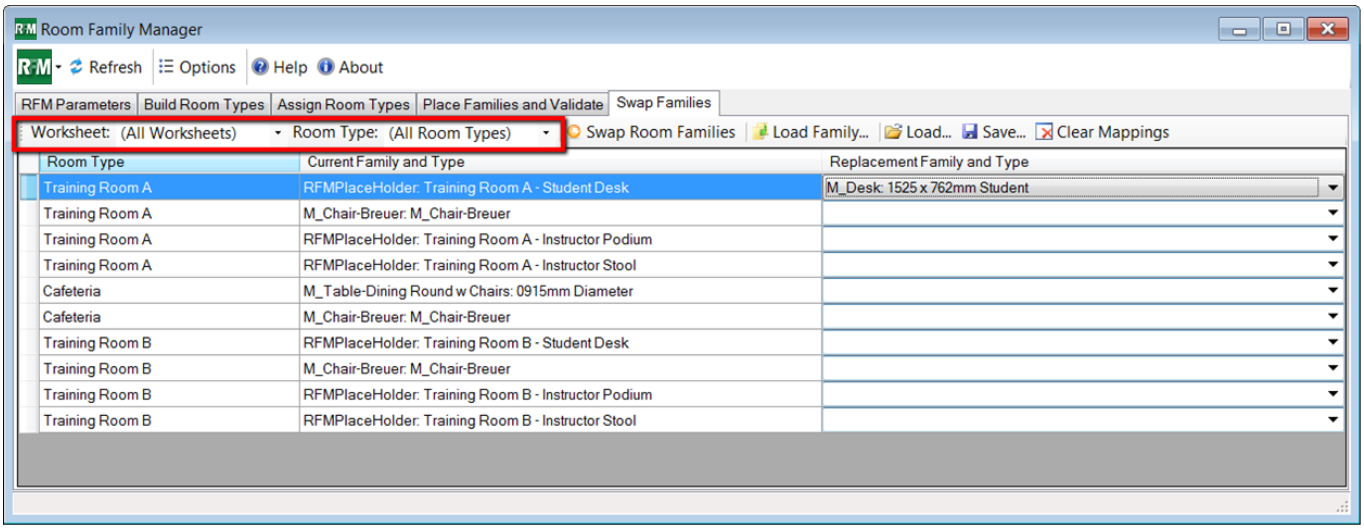
The “Clear Report” button will clear all report results.



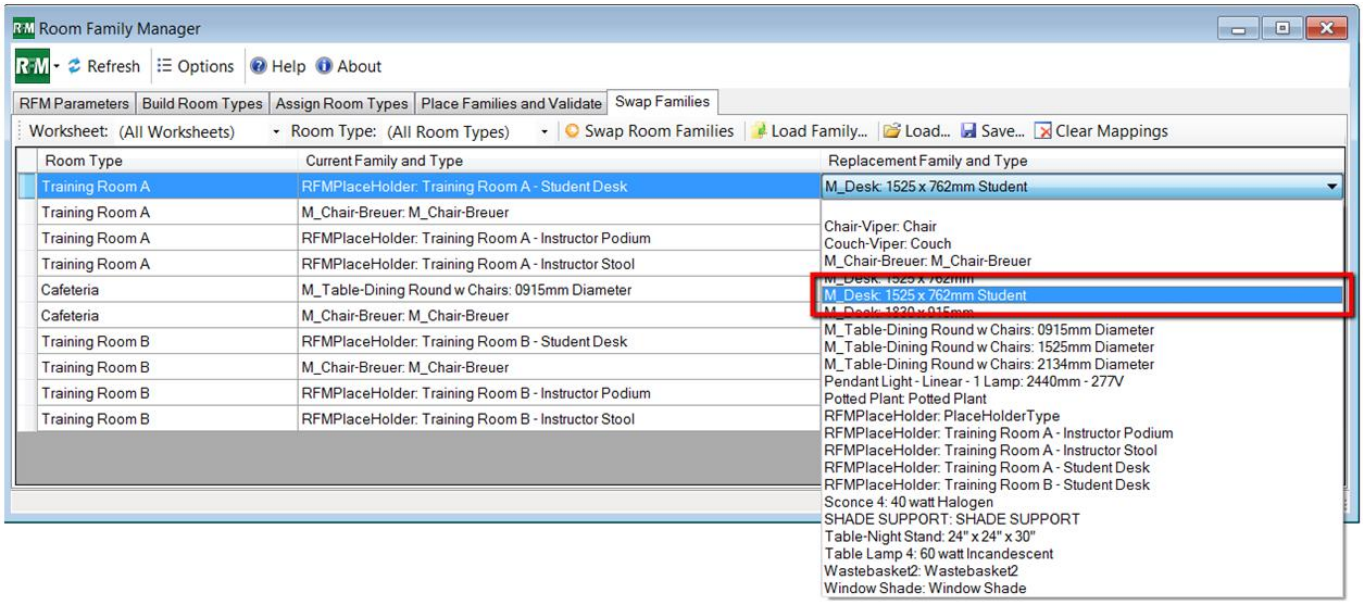
Swap Families

Placeholder content may eventually need to be replaced with more specific content. The “Swap Families” tab facilitates this replacement on a per-room-type basis.

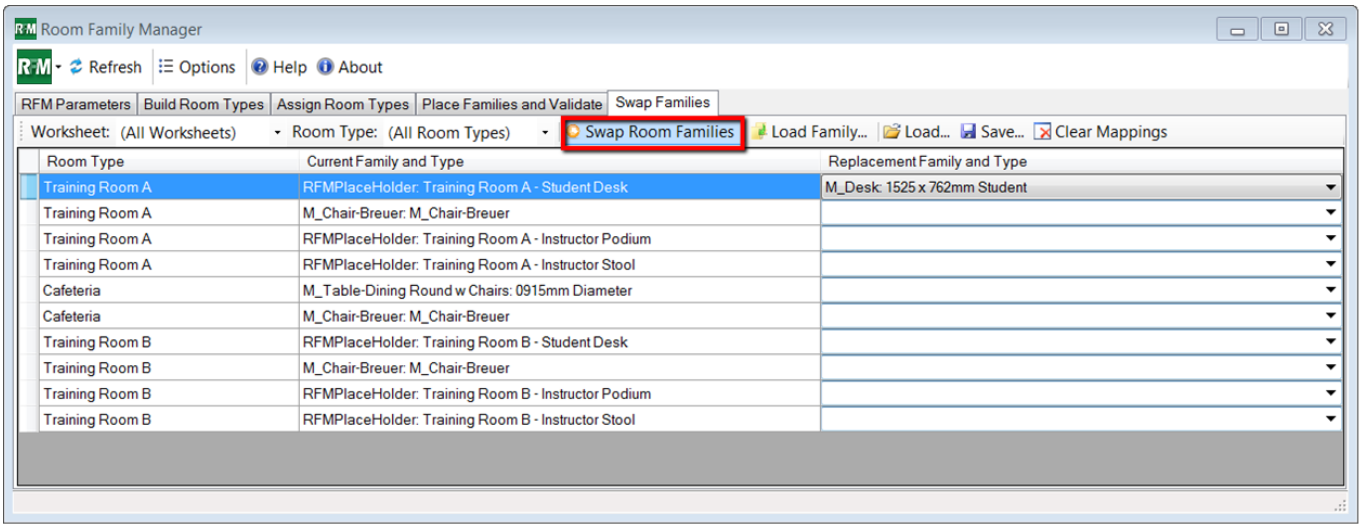
To view the list of families required for a specific room type, select the sheet and room type from the “Worksheet” and “Room Type” drop down menus.



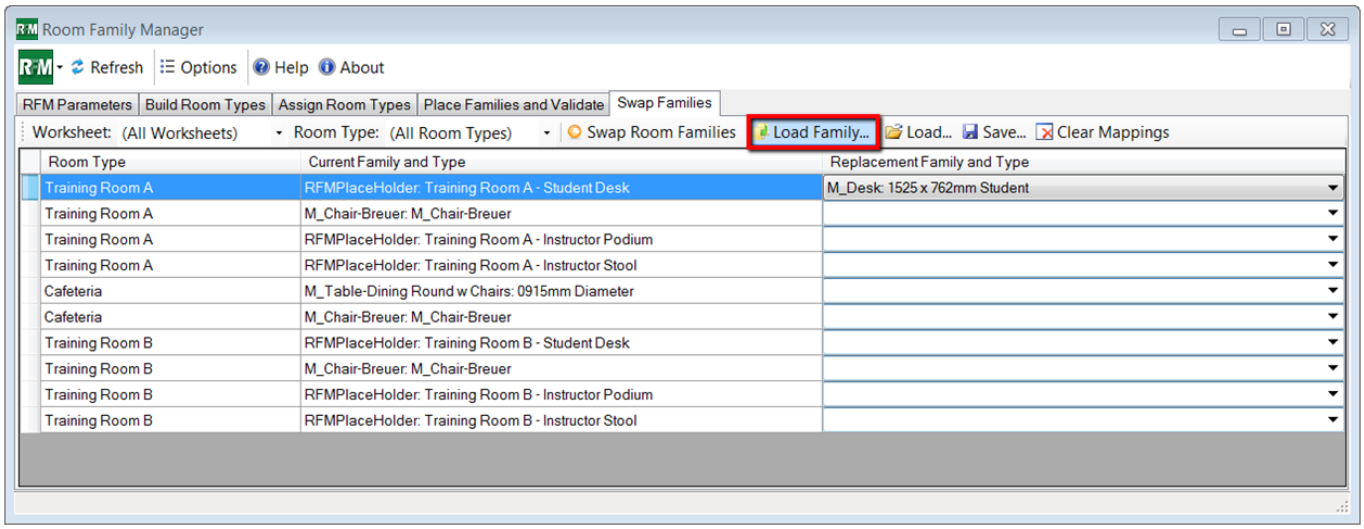
To swap a family, locate the family in the Current Equipment list and select the family and type to replace it with from the Replacement column.



Once all swaps have been selected, click the “Swap Room Equipment” button. The “Swap Room Equipment” button both swaps the content in the Room Type and writes the swap into a mapping file. The mapping file keeps track of which families were specified in the original spreadsheet and what they have been swapped out for. This mapping file is used for model validation to ensure that even after swapping a room will still validate based on the original room definition.

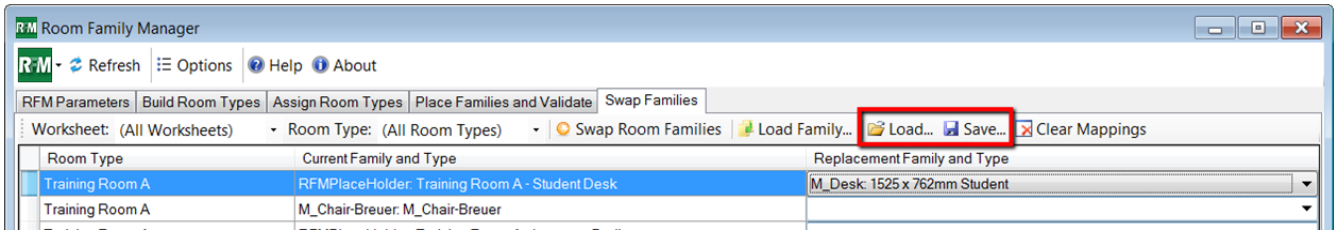


The “Load Family…” button can be used to load new families into the Revit project. This will make them available in the “Replacement Equipment” drop down.

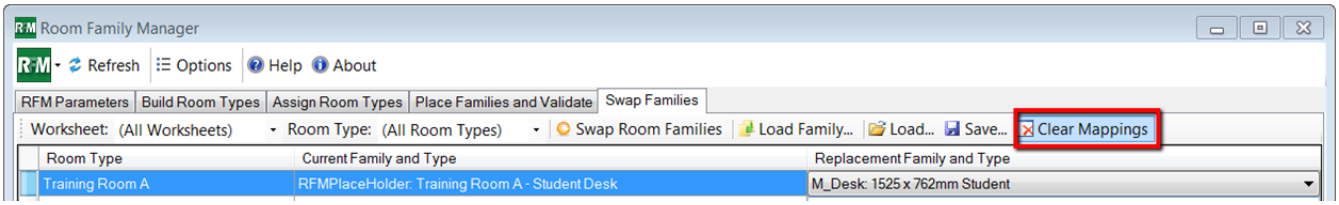


Mappings can be saved and loaded using the “Save…” and “Load…” buttons. Saved mappings use the .XLS spreadsheet format.

Saving and loading mappings is needed when using Room Family Manager and switching between different projects.



The “Clear Mappings” button will clear out any mapped families.

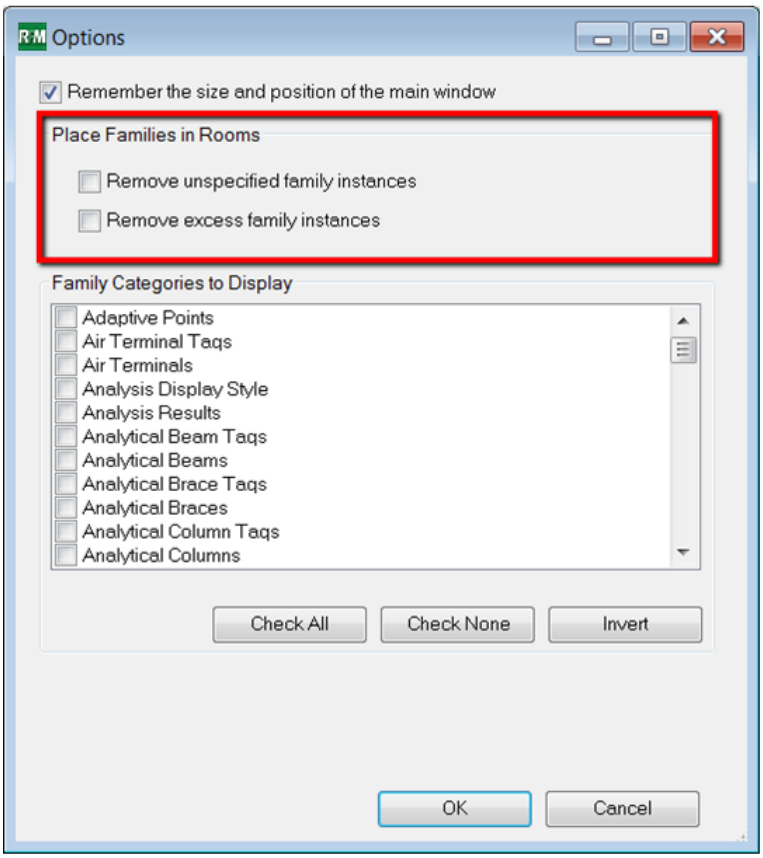


Options

The “Place Family in Rooms” option s control the handling of families either not listed in the room type definition or exceeding the quantity specified.

“Remove excess equipment” – If this option is checked, Room Family Manager will remove each instance of a family found that exceeds the quantity specified in the room type definition. For example, if there are 6 “desks” in the room type definition, and the room actually has 7 “desks”, the last desk identified by Room Family Manager will be removed.

“Remove irrelevant equipment” – If this option is checked, any families in a room that are not specified in the room type definition.



The “Family Categories to Display” options control which categories of families will appear as options in the “Swap Families” tab.

Schedule XL

Introduction

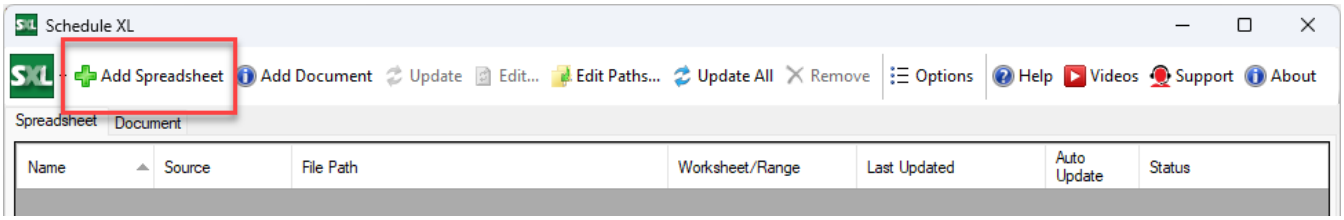
Schedule XL allows you to load non-BIM data into a Revit project by importing a spreadsheet into a new schedule view, allowing it to be placed on one or more sheets. When opening a project file, Schedule XL can automatically update the schedule(s) if the source spreadsheet has changed, otherwise the schedule(s) can be updated using the Schedule XL tool manually at any time. Auto updates can be enabled or disabled for each link independently or globally in the Options of Schedule XL. Disabling globally disregards the Auto Update setting of each link.

Starting Schedule XL

On the Revit ribbon, click on the “Schedule XL” button.

Creating a New Spreadsheet Link

Once open, select the ‘Add’ button:

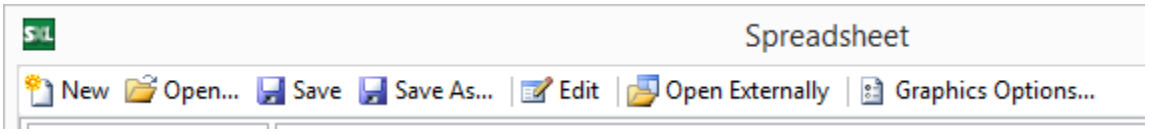


The ‘Add Spreadsheet’ button will open the spreadsheet editing environment to allow creation of a new spreadsheet. If desired, an existing spreadsheet can be specified and used to create a schedule. Spreadsheets must be saved as files in order to be linked to the project using Schedule XL.

Spreadsheet Editor

The spreadsheet editor allows for basic editing of spreadsheets. If more formatting and styling is desired, it is best to open a spreadsheet using dedicated spreadsheet software such as Microsoft Excel or OpenOffice Calc. Schedule XL is able to replicate much of the appearance and formatting commonly used in spreadsheets such as fonts and font styles, cell background colors, single line borders, merged cells and images.

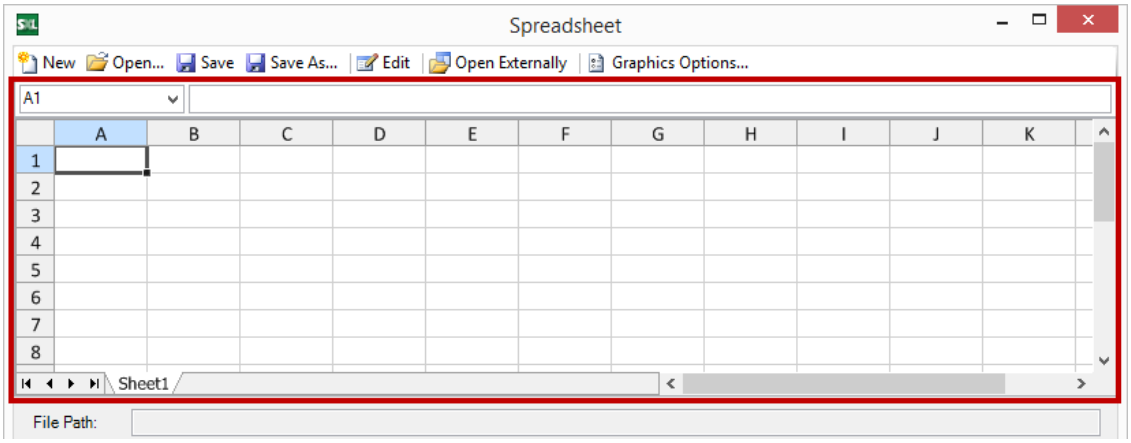
Spreadsheet Editor Toolbar



The toolbar of the spreadsheet editor allows general file management, minimal spreadsheet column/row management and the ability to open the active spreadsheet in the default spreadsheet application (if installed on the system). Additionally, the Graphic Options for the current sheet are accessed here.

When adding a spreadsheet link for the first time to a Revit project, typically the “Open” button should be used.

Spreadsheet Editor ‘Edit Pane’

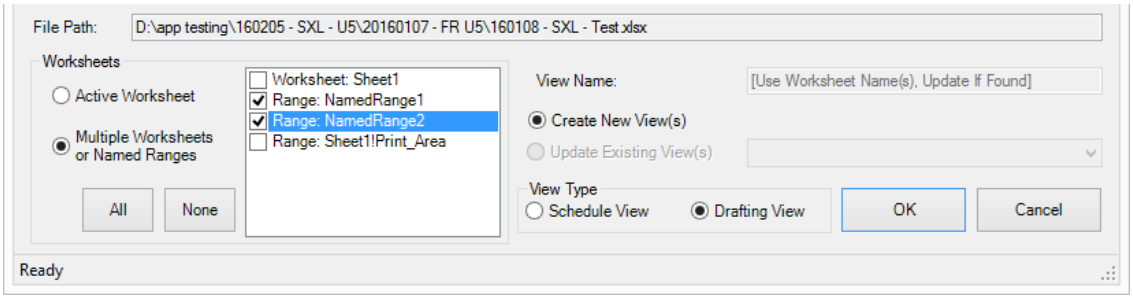


The edit pane in the spreadsheet editor window allows data manipulation of an open spreadsheet. Most Microsoft Excel formula functions will work in this window, though no heads-up display will appear when authoring formulas. It is generally best to execute major spreadsheet edits using dedicated spreadsheet editing software. The editor pane in the spreadsheet editor is primarily used for verification that the correct spreadsheet(s) have been selected. Additionally, Named Ranges can be defined here in the same manner as in Excel (select the range and type a name in cell name combo box).

If minor editing is required, the editor pane can be used directly to make rapid changes. Once changes are made, the ‘Save’ or ‘Save As…’ options on the toolbar should be used to preserve those changes.

Files can be saved in Microsoft’s .xls, .xlsx or .xlsm formats, or alternately a file can be saved as a tab-delimited text file and opened in non-spreadsheet editing tools.

Spreadsheet Editor 'Worksheet Selection Pane'



The bottom portion of the spreadsheet editor window allows the selection of either the active worksheet, or selection of multiple worksheets.

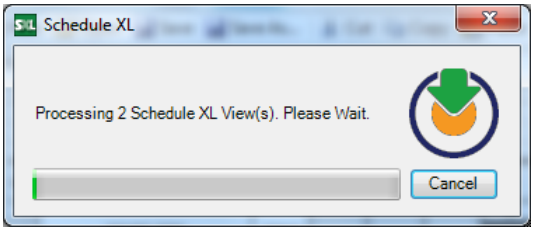
If the 'Active Worksheet' option is selected, an alternative view name can be specified for the generated view in Revit. If the 'Multiple Worksheets' option is used, any number of worksheets, named ranges or print areas available in the active spreadsheet can be selected. Schedule XL will automatically generate views in Revit using the name(s) of the selected tab(s).

Choosing the Appropriate View Type

The two view types available when creating tables from spreadsheets are Schedule and Drafting. Schedule views have many advantages over drafting views, depending upon the source spreadsheet and desired result.

Feature	Schedule Views	Drafting Views
Can be placed on multiple sheets	Yes	No
Can contain filled cells	Yes	No
Can have images	Yes	No
Supports very long spreadsheets	Yes, slower when placing	Yes, easier to place
Better format multiple merged/centered cells	No	Yes
Easy to edit in Revit view (zoom and pan)	No	Yes

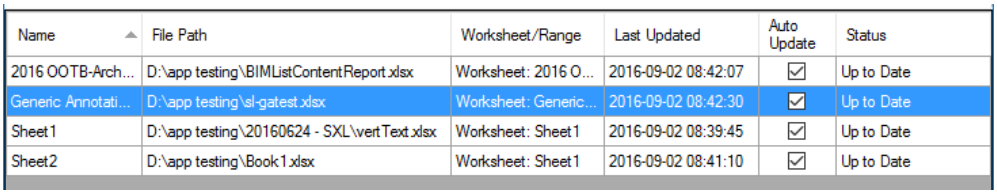
When the OK button is clicked, Schedule XL will show a progress dialog as it builds the schedules.



IMPORTANT: *By default, if a Print Area or Named Range is specified on a worksheet, only the Print Area will be included in the schedule view for that worksheet. This is useful to exclude cells that contain calculations or uncecessary information from the resulting schedule. This can be turned off in the Options dialog. If turned off, the data in entire worksheet will be included in the schedule view.*

Once complete, the resulting worksheet link(s) will be displayed in the main Schedule XL window.

For example:



Name	File Path	Worksheet/Range	Last Updated	Auto Update	Status
2016 OOTB-Arch...	D:\app testing\BIMListContentReport.xlsx	Worksheet: 2016 O...	2016-09-02 08:42:07	☑	Up to Date
Generic Annotati...	D:\app testing\sl-gatest.xlsx	Worksheet: Generic...	2016-09-02 08:42:30	☑	Up to Date
Sheet1	D:\app testing\20160624 - SXL\vertText.xlsx	Worksheet: Sheet1	2016-09-02 08:39:45	☑	Up to Date
Sheet2	D:\app testing\Book1.xlsx	Worksheet: Sheet1	2016-09-02 08:41:10	☑	Up to Date

The “Name” column displays what the name of the schedule will be in Revit.

New links will default to ‘Auto Update’, an option that allows Schedule XL to update linked spreadsheets every time a Revit model containing linked spreadsheets is opened.

Whenever Schedule XL is opened, existing links will be displayed in the main window. To edit a link, simply double-click on the link, or click on the link and click the “Edit” button in the ribbon.

Editing a link will open the original spreadsheet file in the spreadsheet editor window and select the linked worksheet automatically.

If changes to the spreadsheet content itself are made, it is important to save them back to the spreadsheet file.

Clicking the OK button will update the existing schedule view, reloading the latest spreadsheet version.

When Schedule XL generates a schedule, it will attempt to ensure cell borders and fills are maintained. There may be specific cell infills that are not possible in the resulting schedule, but users can always return to the original spreadsheet and update cell infills until a reasonable result can be achieved in the Revit schedule environment.

It is important that spreadsheet authors merge cells, though if values in unmerged cells happen to flood across into other cells, Schedule XL will attempt to mimic the spreadsheet graphics. Users can modify Schedule XL options to select explicit functionality for handling cell sizing, merging and borders.

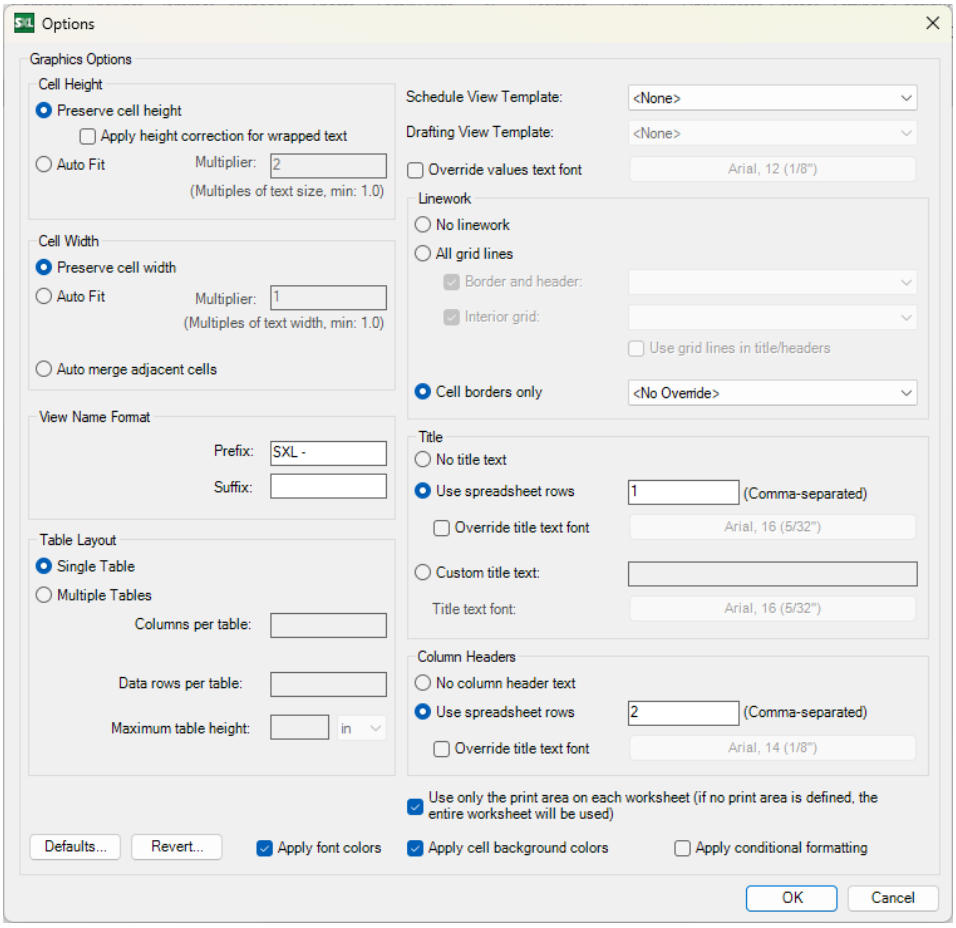
Excel Worksheets with Embedded Images

Schedule XL can insert images into Revit schedules and drafting views if they exist in the source spreadsheet. Schedule XL will extract the images from the spreadsheet to the same folder containing it. The images used will then be linked into Revit and placed in their corresponding locations. This capability requires that Microsoft Excel is installed on the system.

Note: If Excel is not found on the system running Schedule XL, a schedule can be created but images will not be placed. If a Revit project contains previously created schedules with images and is opened on a system without Excel, the schedules will not be updated automatically.

Schedule Graphic Options

The schedule graphics options dialog can be accessed when creating or editing schedules. Graphics Options are specific to each link. On the main window, click Add or double click an item in the list.



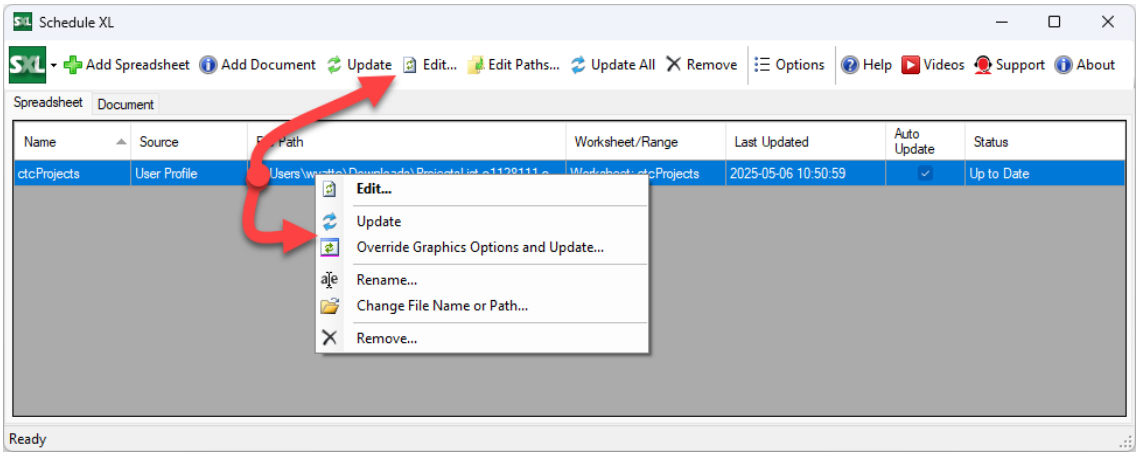
Graphic options are useful to override the appearance of the schedule in Revit. The effect of each option varies depending upon the source worksheet and its settings or formats.

- Cell Height/Width: use this to force a size other than what is defined in the spreadsheet. Set Auto Merge adjacent cells to force multiple cells in a row to become one.
- View Name Format: specify a prefix/suffix which Schedule XL will include in the name of the views that are created
- Table Layout: Schedule XL can optionally create multiple schedule tables as specified. These options are useful when working with many rows in a schedule that need to be split up to fit on sheets. Combine with Column Headers option to repeat headers at the top of each table.
- Schedule/Drafting View Template: select a template from the model to apply to the schedule view
- Override Text Font: set this to force a single font or Revit text style to be used for all of the schedule text.
- Cell Borders: Schedule XL can create borders if they don't already exist in the spreadsheet. The styles and widths of borders are limited to what Revit will allow (i.e. no double lines, left/right/top/bottom, etc.)
- Title: use this feature to add a center justified row and title at the top of the schedule.
- Column Headers: similar to Title but requires header text to exist in the specified rows.
- Print Areas: check this option to force Schedule XL to only use print areas in the spreadsheet for the schedule
- Colors and Formatting: check the boxes next to these options to apply cell colors in the schedule

Manually Updating one or More Schedules

One or more schedules can be manually updated from the spreadsheet by:

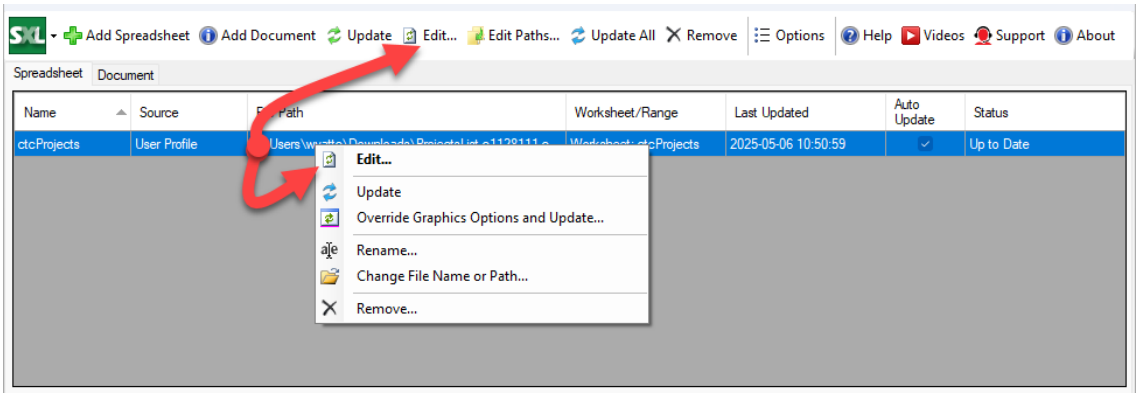
- Clicking the “Update All” button on the ribbon
- Selecting one or more schedule items in the main list and using the “Update” choice on the “SXL” drop-down menu
- Right-clicking on any one or more items and selecting the “Update” choice



Editing a Schedule Definition

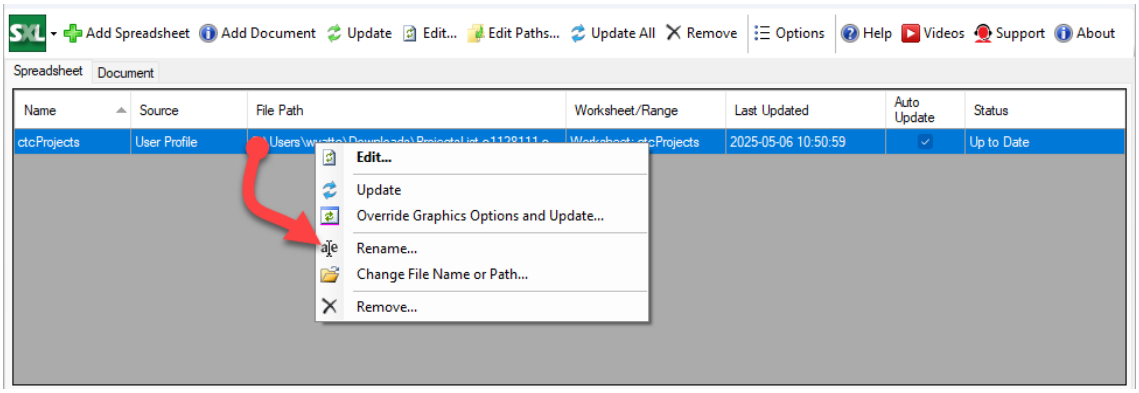
A schedule definition can be manually updated from the spreadsheet by:

- Selecting a schedule item in the main list and using the “Edit” choice on the “SXL” drop-down menu
- Double-clicking on a schedule item
- Right-clicking on any one item and selecting the “Edit” choice



Custom Naming a Schedule

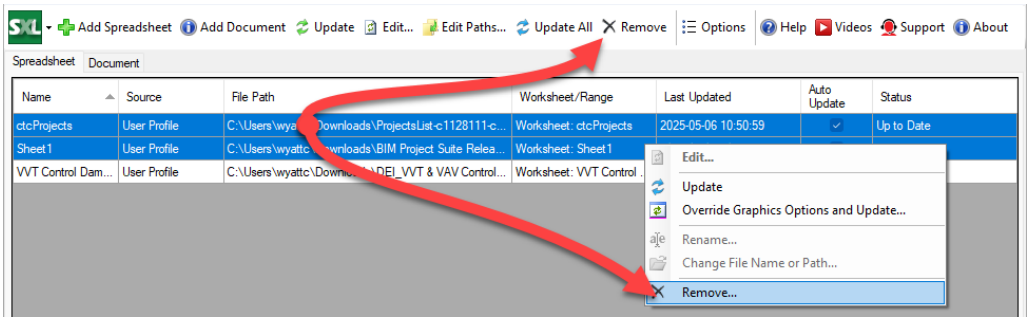
A schedule can get a custom name when adding only the active sheet from a workbook. However, it can be renamed after the fact by right-clicking on the item in the main window and selecting the “Rename” choice



Removing one or More Schedule Definitions

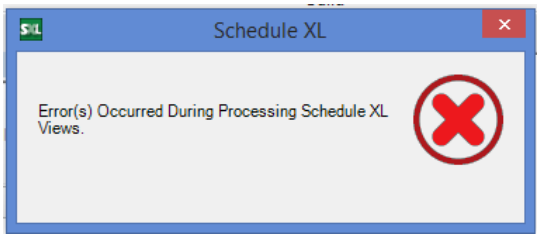
A schedule definition can be removed from the list by first selecting one or more items from the list, then either:

- Clicking the Remove button in the toolbar
- Clicking the Remove button on the “SXL” dropdown list
- Right-clicking on the items and selecting the Remove choice



Re-Linking to a Moved or Renamed Spreadsheet File

If a spreadsheet file is moved or renamed, when opening the project file where Auto Update was turned on, the following message will briefly appear:



When opening the Schedule XL tool in this situation, the status for the associated items will appear as “Not Found.”

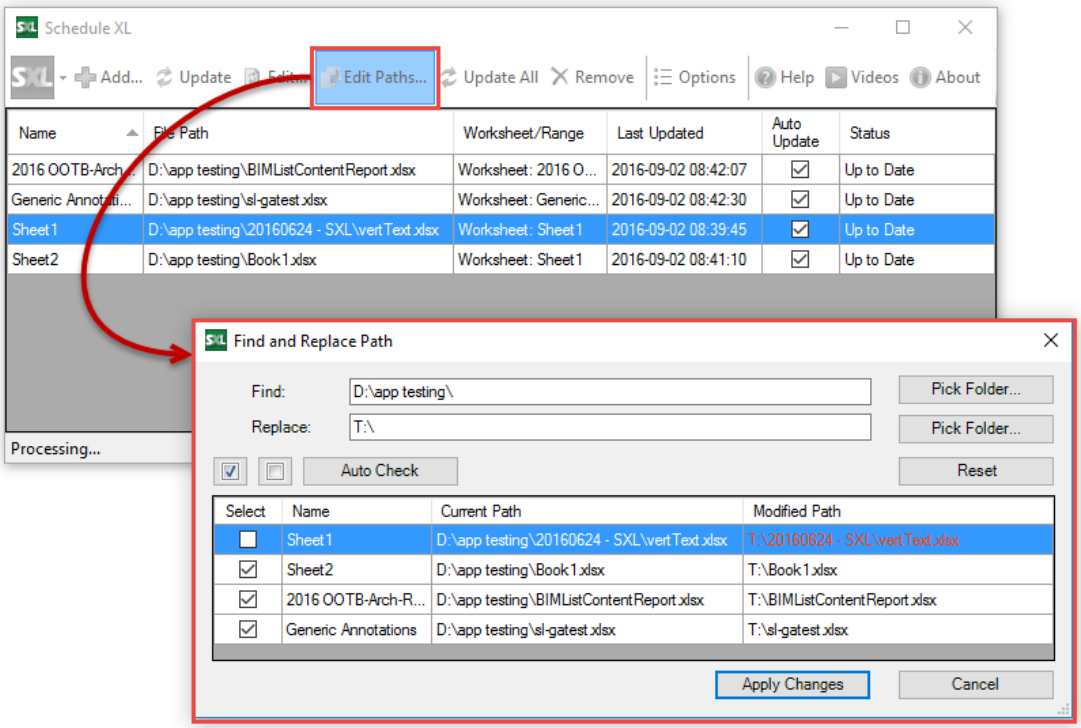
This can be fixed by right-clicking on any item and selecting the “Change File Name or Path” choice.

When selecting this choice, a file browser dialog will appear which allow you to choose the location of the new file to associate with that definition.

NOTE: Doing this for one item will repair the links for all items that had been pointing to the old file and reassign them to using the newly selected file.

Edit/Replace Paths

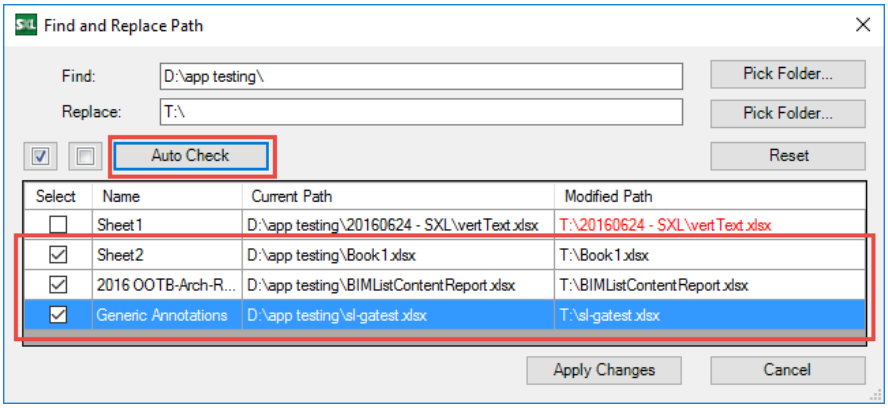
If entire directories of spreadsheets have been relocated, use the Edit Paths… function to quickly re-map to the new location.



In the Find: text box, type or browse to the portion of the original path which is no longer applicable

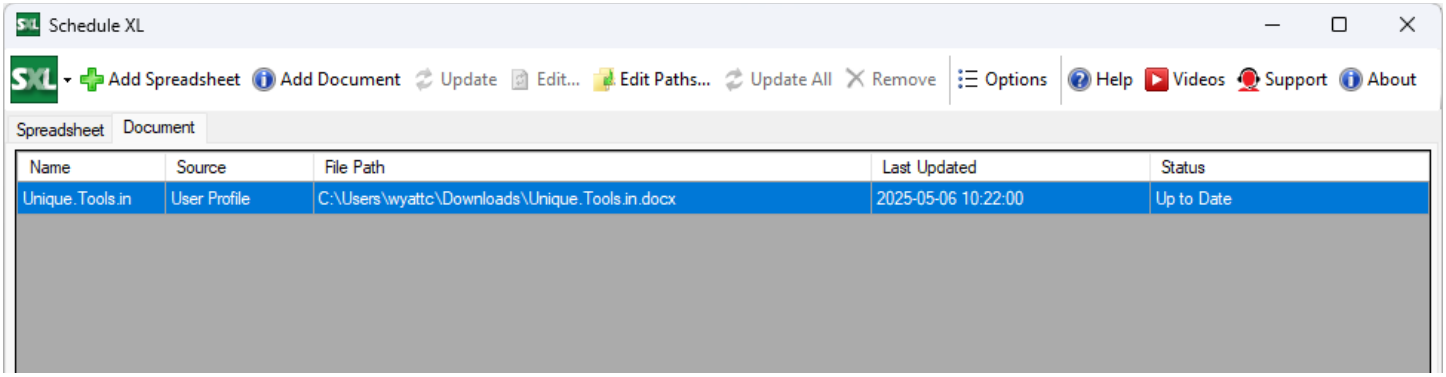
In the Replace: text box, type or browse to the portion of the new path. Schedule XL will indicate whether the new path is valid in the Modified Path column of the grid. If the path is displayed in red, the spreadsheet cannot be found at that location.

Simply check the box in the Select column of each link that needs to be re-pathed. If desired, click Auto Check to have Schedule XL select all of the resolved links automatically. In the image below, three of the four spreadsheets were found and selected.



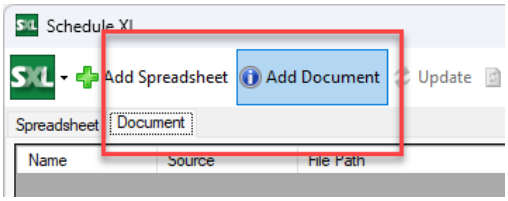
Linking Word Files into Revit

Schedule XL can create detail views sourced from Microsoft Word .docx files. When a docx is linked, the text, images and formatting is recreated as Revit native objects. If a file is changed after it has been linked, a manual update must be performed to reflect the changes in Revit.

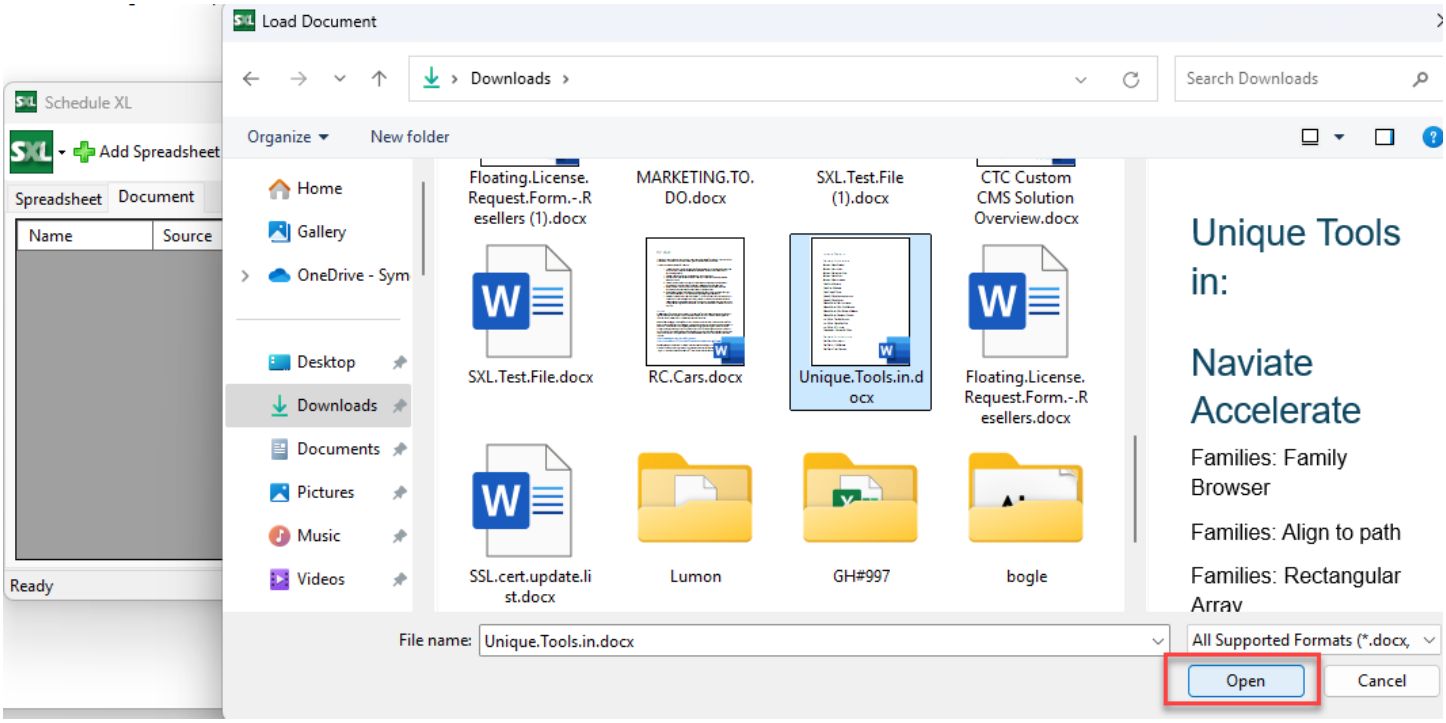


While most regularly formatted Word documents can be replicated in Revit with good fidelity, some may require adjustment of the options to refine the results.

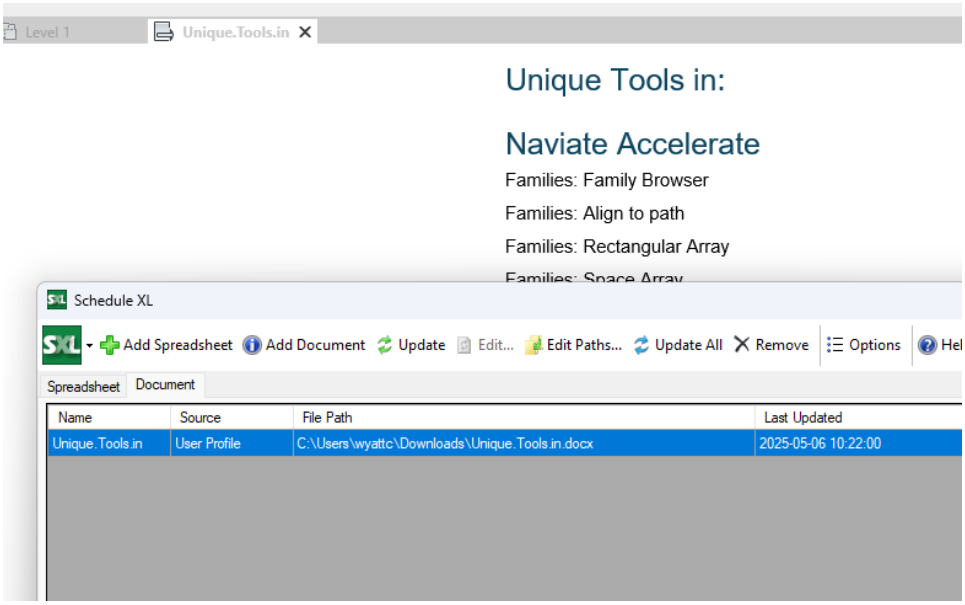
To link in a document, switch to the 'Document' tab and click the 'Add Document' button on the main toolbar.



Browse to the location of a document and select it then press ‘Open’ to accept.



Schedule XL will parse the document, translate the text, formatting and images to Revit text and image imports. A view will be generated and made current.



Options

Common

- Remember size and position of app windows: windows will keep the user adjustments to size and position
- Enable Auto-Updates on document load: will always load the most current version of the spreadsheets. For large numbers of schedules, disabling this can improve performance but requires users to initiate the updates.
- Warn when manually editing Schedule XL views: enable this to deter users from editing schedules which will later be overwritten with they are updated.

Settings for New Tables

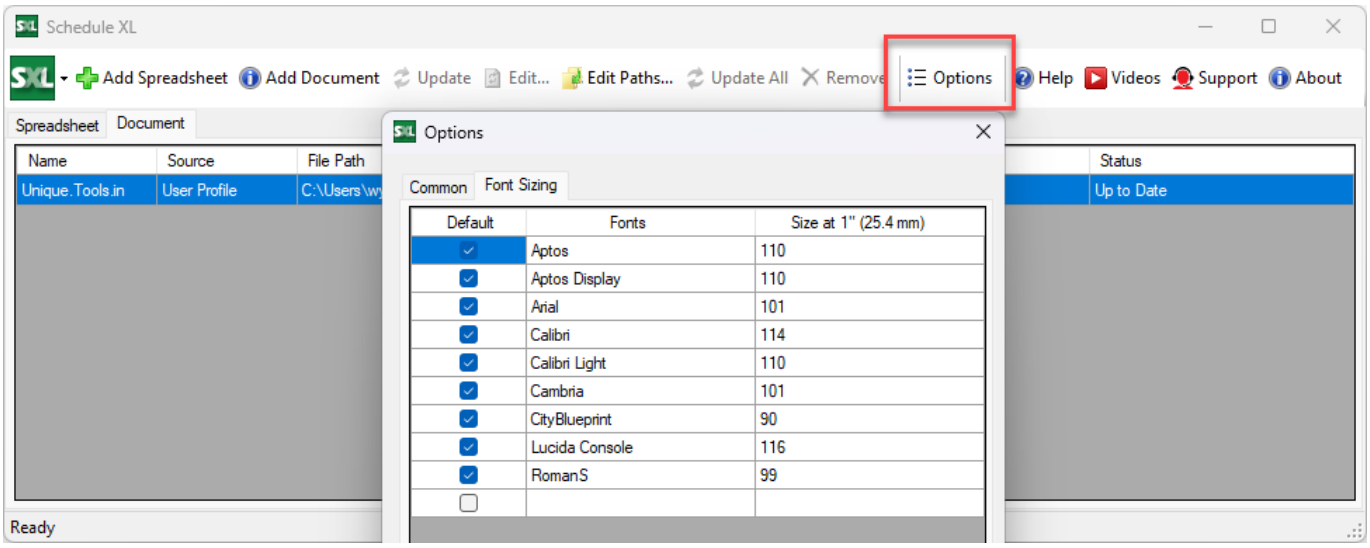
- Use only print area on each worksheet: check this to enable for every new Schedule XL view
- When adding sheets, turn on Auto Update: enable auto-updating of views for new links
- Maintain schedule cell sizes in updates: only use cell sizes from the spreadsheet during updates

Default View Types

- Select the preferred default view type when creating new views

Font Sizing

The options for adjusting the way that documents are reproduced in Revit views can be changed in the Font Sizing tab.



CTC has preset some defaults that work in many cases.

To add fonts and sizes, type the name of the font and the desired size (at 1”). Set each that should be the default for the font by checking the box.

Sheet Assistant

Introduction

The Sheet Assistant tool expedites the process of creating consistent sheet collections for all types of projects and disciplines. Using Sheet Assistant, teams can ensure that sheets have accurate placement of views relative to other sheets of the same series types.

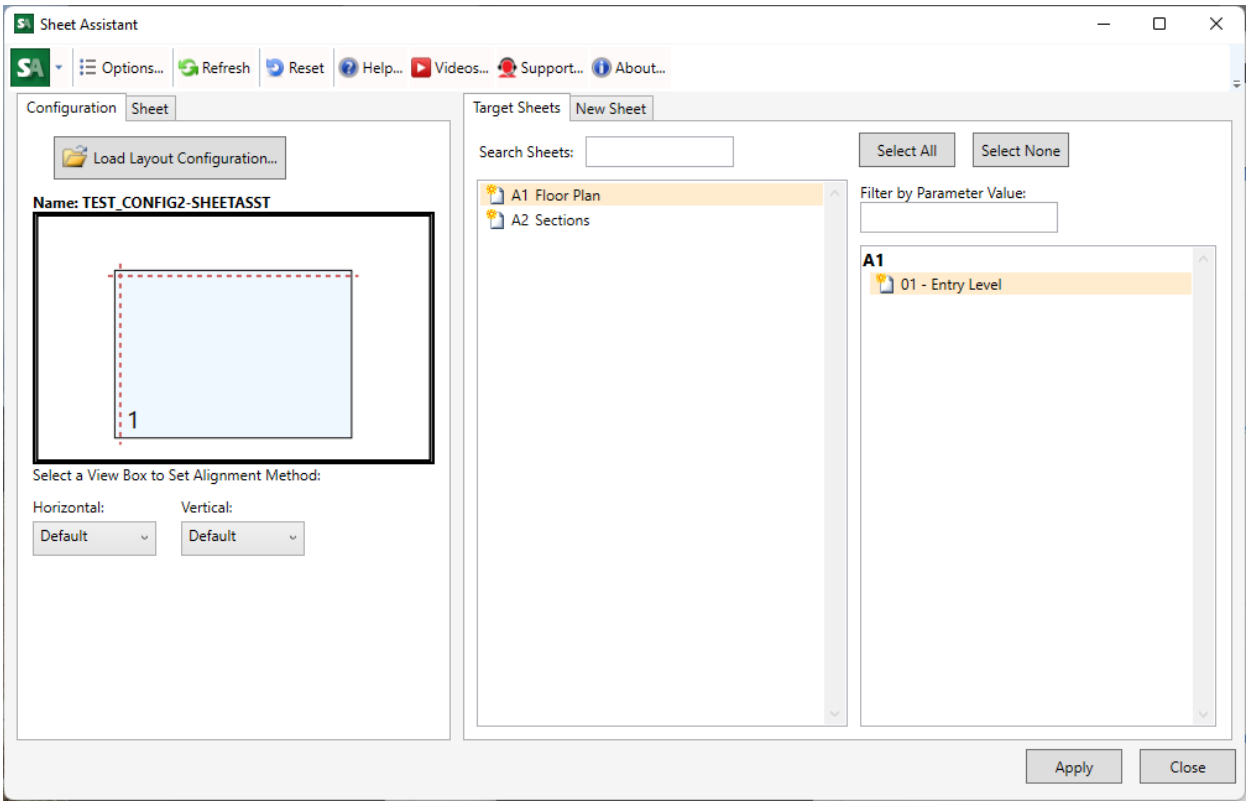
For example, a plan set of multiple floor buildings can be produced with precise placement and specification of views and their respective view templates.

This tool can be used to place views on new sheets, align views on existing sheets and adjust positioning of views based on standard configurations.

Starting Sheet Assistant

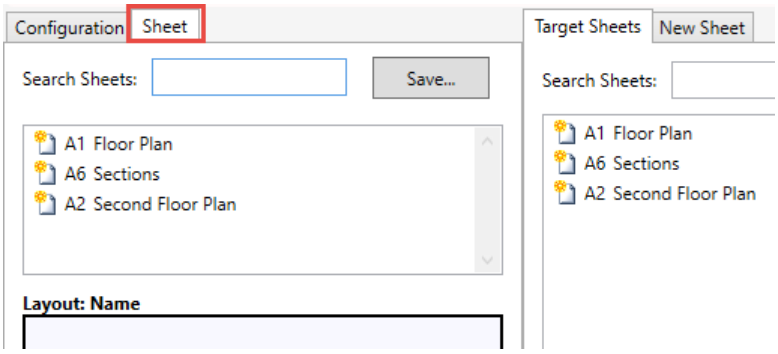
On the Revit ribbon, click on the “Sheet Assistant” button.

When Sheet Assistant is run, it will take a moment to parse the project model for sheets and views. This may take longer for models with a large number of views and sheets.



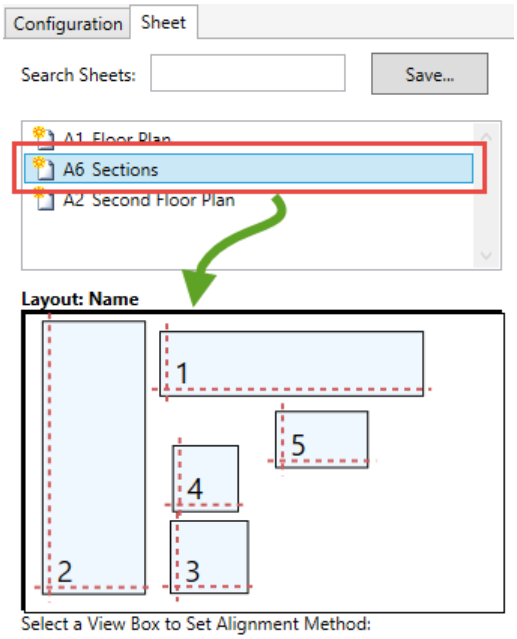
Getting Started

The Sheet Assistant has multiple workflows. Most often, however, users will need to start with the Sheet tab.



HINT: Use the search boxes to find sheets by name more quickly.

Select a single sheet as the source. Notice the graphic representation of the approximate sizes and positions of the views found on the source sheet selection.

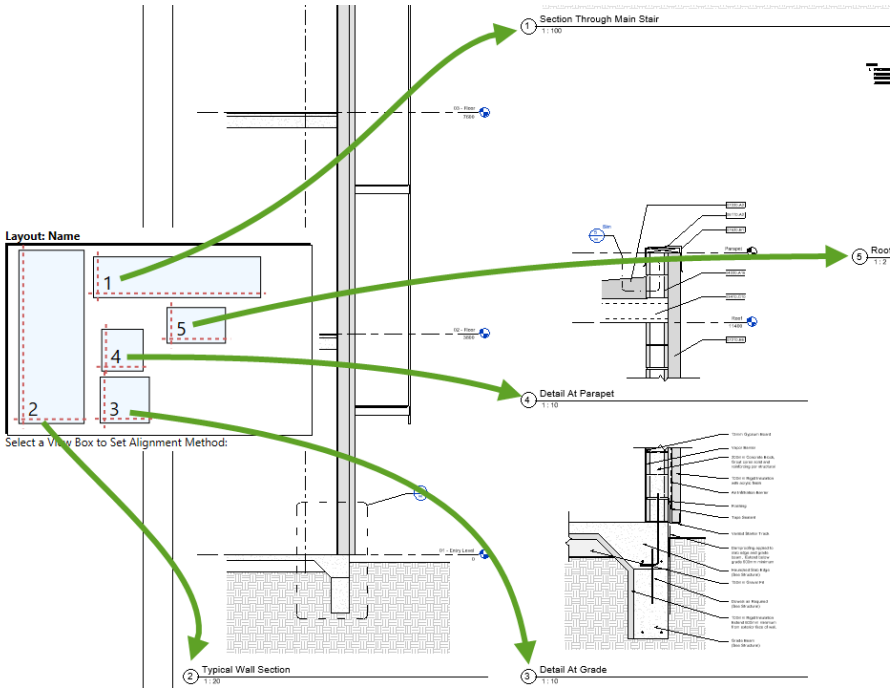


The graphic represents the approximate positions, alignment locations and sizes of the views which includes the annotation crop if enabled. There can be some discrepancies between the graphic representation and the actual appearance on the sheet due to view 'extents', view titles and view types.

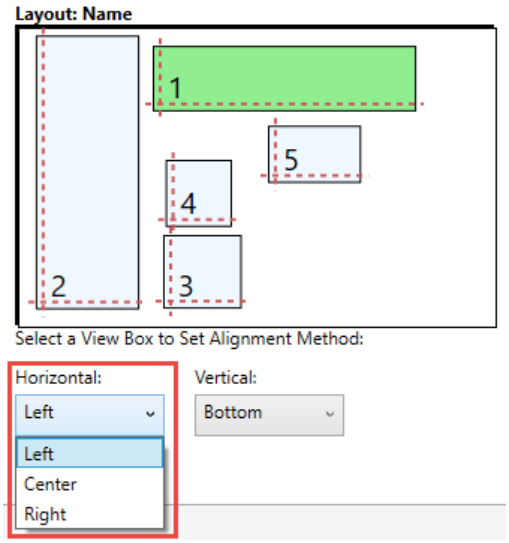
Working with the Layout Graphic and Alignment Methods

The graphic representation below the source sheet selector is a close approximation of the views on the sheet as well as their size, proportion, position and types. This can be extremely helpful to understand the outcome of applying the layout to other sheets.

Their numbers correspond to the number for each view on the sheet.



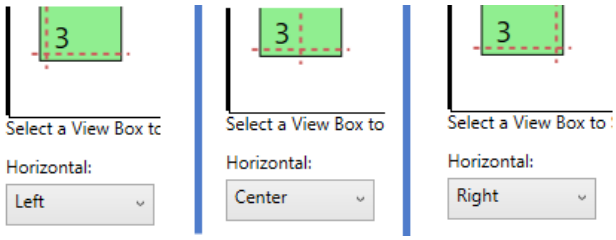
Each of the views in the graphic can be selected to perform changes to the method of positioning (Alignment Method).



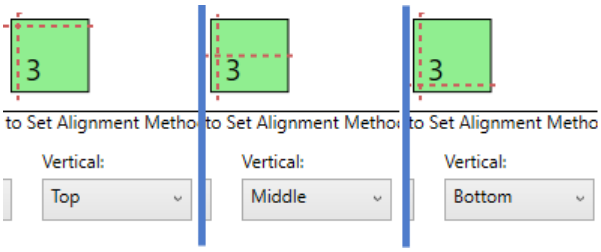
The dotted lines on the view graphic display the method of alignment that will be used for the view.

Methods:

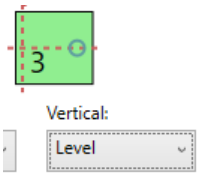
Horizontal – determines the location point along the horizontal (x) axis of the sheet.



Vertical – determines the location point along the vertical (y) axis of the sheet.



By Level – uses the levels in the view to align by.

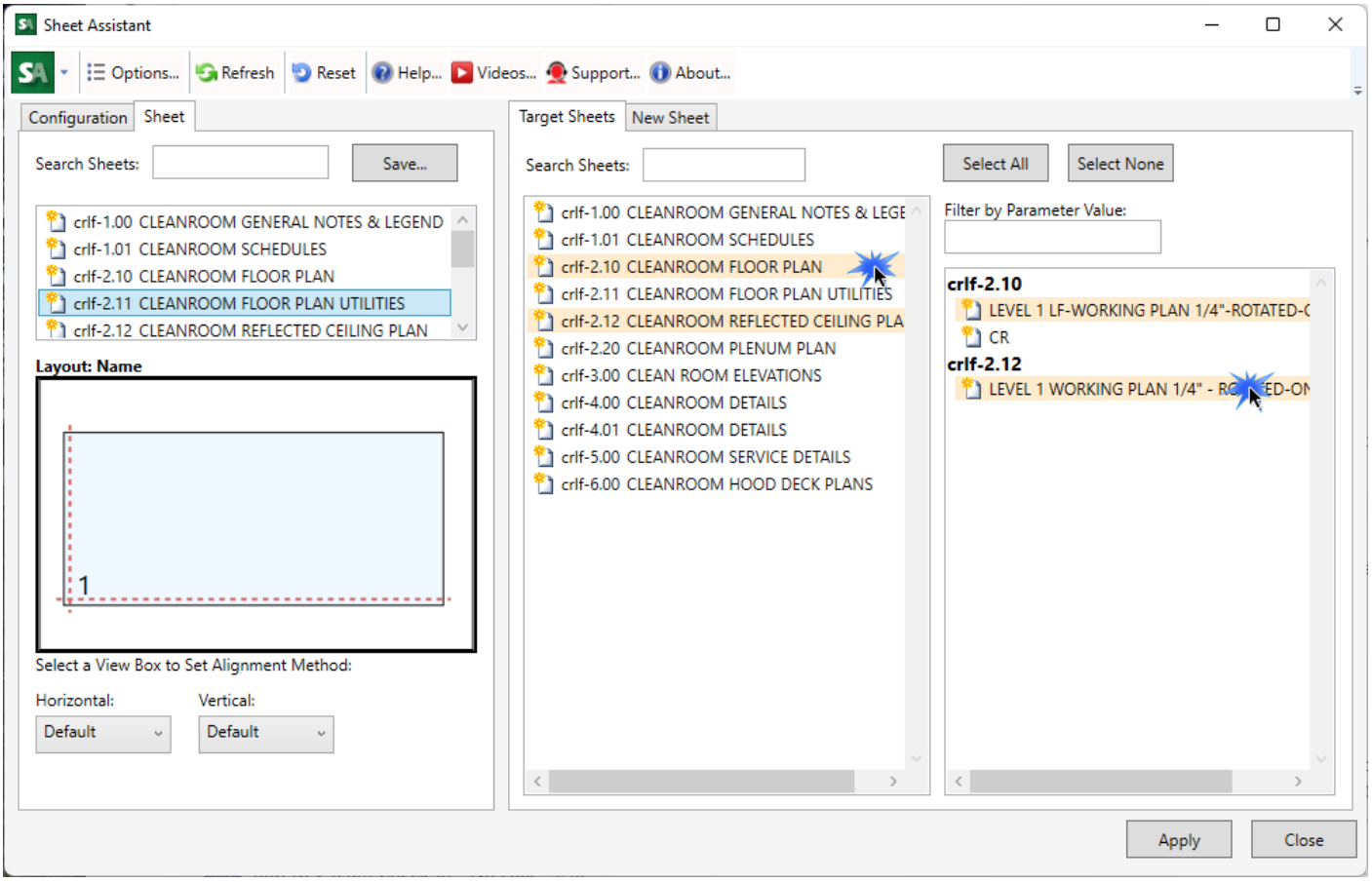


Notes about alignments:

1. Alignment is accomplished in various ways. Some methods work better if the extents of the crop and annotation crop are understood.
2. Alignment is dependent upon absolute coordinates as determined by Revit. If titleblocks are not the same size or in the same position as the source view, alignment may appear off.
3. Not all views can be aligned in the same manner.
4. In some cases, manual adjustment of the views on the sheet may be necessary.

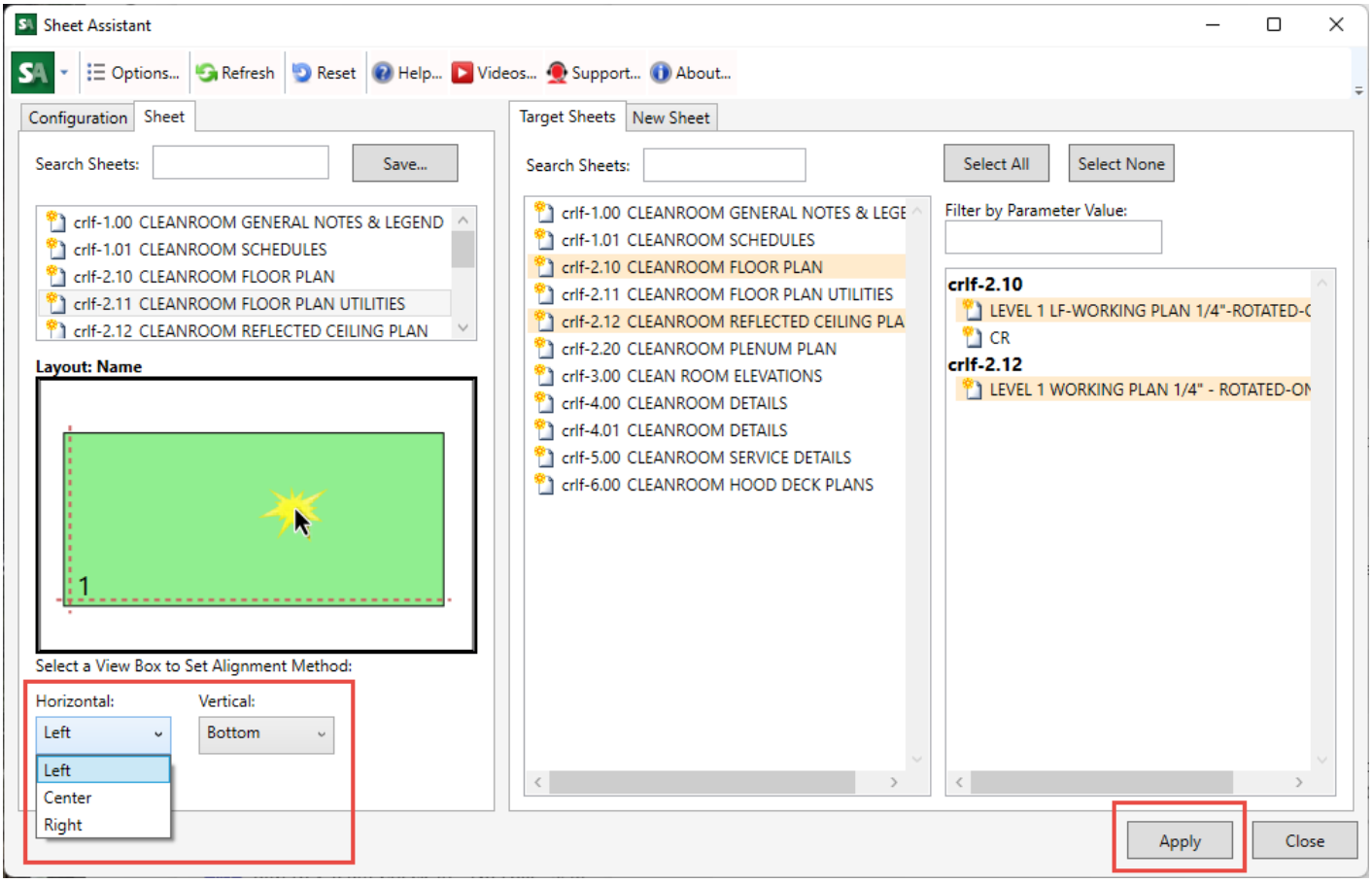
Applying Layouts to Existing Sheets Based on a Sheet

Determine the target sheet or sheets to apply alignments or views to. Select the target sheets in the list by left-click. Deselect by clicking the sheet again.



While clicking, notice the list of sheets with their views appearing in the right-most selection window. This is where the selection of which views to align is made. Select and deselect the views in the same manner.

Adjust the source sheet views method of alignment as needed. Then, when satisfied with the placements and selections, click apply.



Double-check the target sheets to verify the desired results. If some adjustment needs to be made, run through the process again, this time picking different alignment methods.

Applying Layouts to New Sheets

The Sheet Assistant can create sheets and place views on them based on a source sheet selection. Views that can be duplicated or shown on more than one sheet can be placed and positioned similarly to the source.

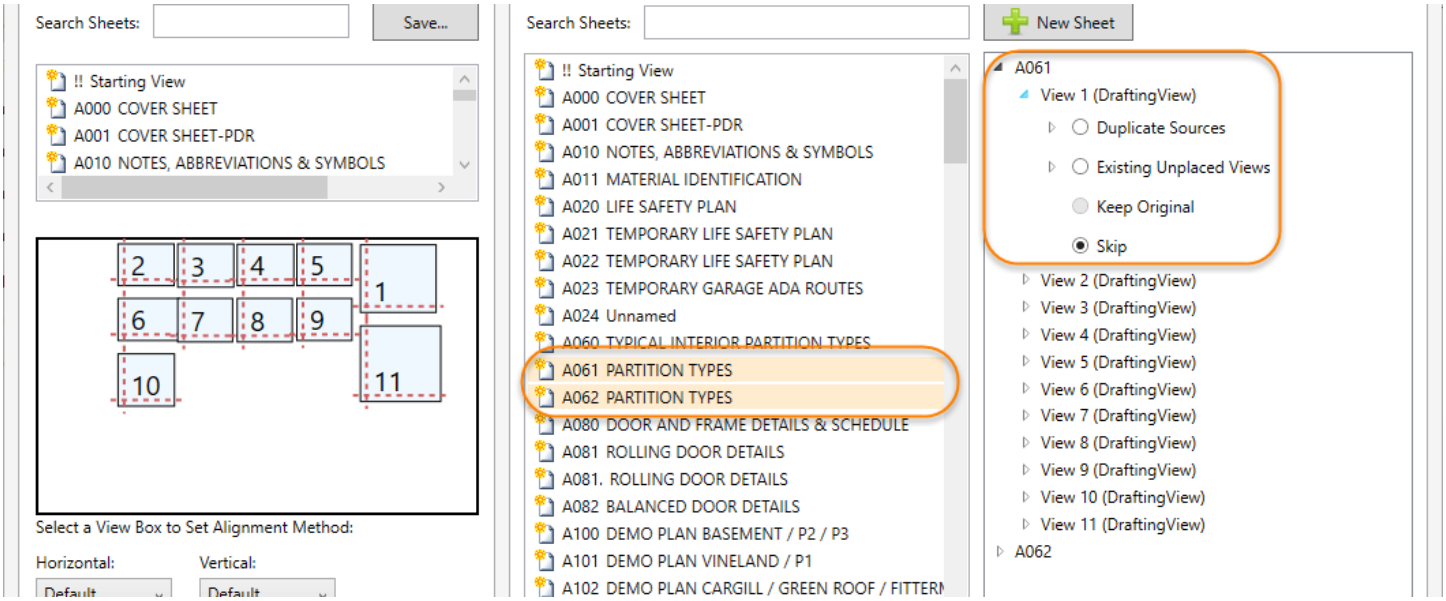
On the 'Sheet' tab select a source sheet and make any desired adjustments to the alignment methods.

Click the 'New Sheet' tab.

Click the "New Sheet" button to begin adding sheets.

When this button is pressed, Spreadsheet Link will launch, allowing the add sheets functionality in it to be used. Refer to the section in this guide regarding Spreadsheet Link sheets creation. Creating New Elements

The new sheets will appear in the list of the middle pane. They will be selected and represented in the right pane. Click the arrow to reveal the views that will be placed on the new sheet.



Each view in the list will present some options:

Duplicate Sources – This places the same instance of the source sheet view on the target sheet.

Existing Unplaced Views – This places the selected view on the sheet. This list only shows unplaced views.

Keep Original – If the type of view supports it, this will place the existing view on the sheet. This does not remove from the sources sheet or duplicate it.

Skip – By default, don't add a view in this place.

Depending upon the source sheet view, the methods above are enabled and disabled according to the workflow. For example, some view types cannot be placed on more than one sheet. Therefore, if the source view is a plan, 'Keep Original' will be disabled.

For 'Duplicate Sources', specify a suffix to avoid Revit's default copy naming behavior. Enter the characters (no special characters) that should be used to prefix the name of the new copy.

When all of the desired selections have been made, click apply.

After the sheets are updated, check them for accuracy and make adjustments as needed.

Accuracy is dependent on how similar the source sheet is to the choices made during creation (which views, settings, titleblock, view title, view templates, etc.).

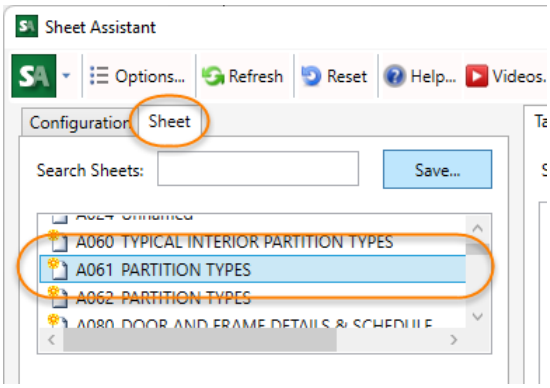
Creating and Using Sheet Configurations

Sheet configurations are files that store information about a sheet layout. They can be used to apply standard sheet layouts from one project to another.

The configuration file only stores positions, view types and names. The views they place depend on what is available in the target project.

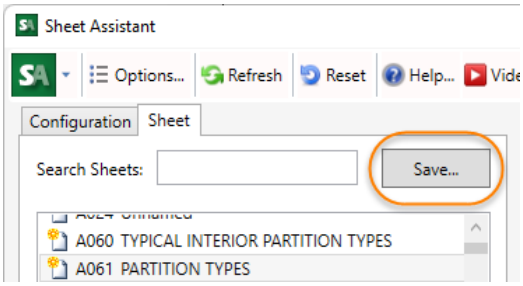
To Create a Configuration

Switch to the 'Sheet' tab to create a sheet configuration and select an existing sheet from the list.

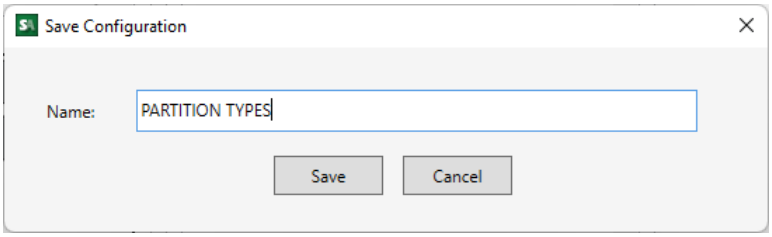


Adjust any of the alignment methods to be used by the views as desired.

Click the 'Save' button.



In the form that appears, give the configuration a name. This will be stored with the configuration to help identify it's intended application.

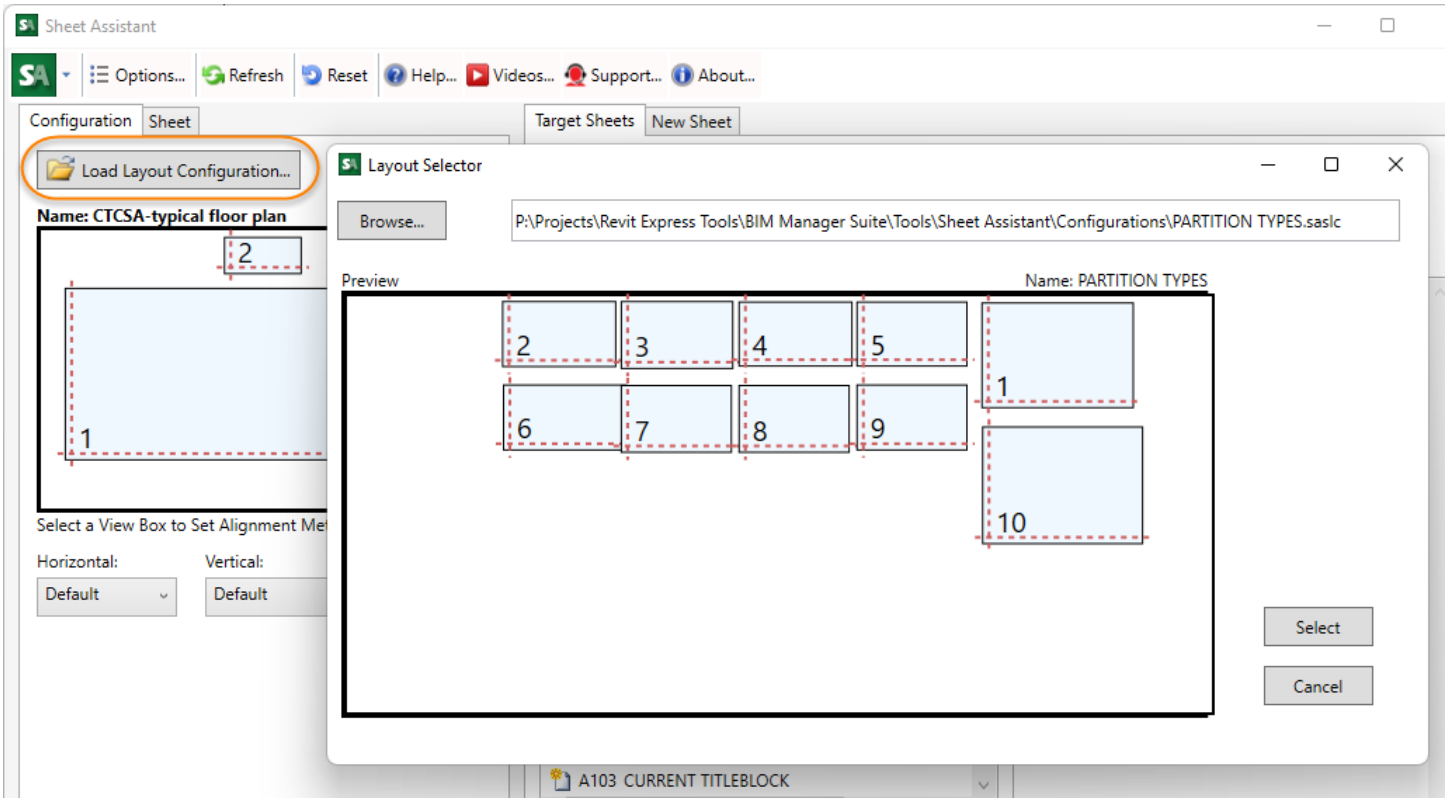


Click 'Save' and browse to a location to store the configuration.

To Use a Configuration

Load up a configuration by switching to the 'Configuration' tab and clicking 'Load Layout Configuration'.

Browse to the location of the sheet configuration files. Configurations are displayed in the configuration picker. This is a graphic representation of the configuration.



When the configuration is loaded, adjustments can be made if necessary. These changes are not automatically saved to configuration file. To save the changes, switch to the Sheet tab and choose to save over the previous file by browsing to it.

Apply the sheet configuration to Target and New Sheets in the same manner as using a source sheet from the current project.

Options

[X] Remember the size and position of the main window. – this determines how the tool behaves when launched

[X] Pin views on sheets – sets the default when the tool places or adjusts views on sheets. Can be overridden individually.

[X] Default Alignment Method – set the desired methods here to define the initial state when working with source sheet views.

Spreadsheet Link

Introduction

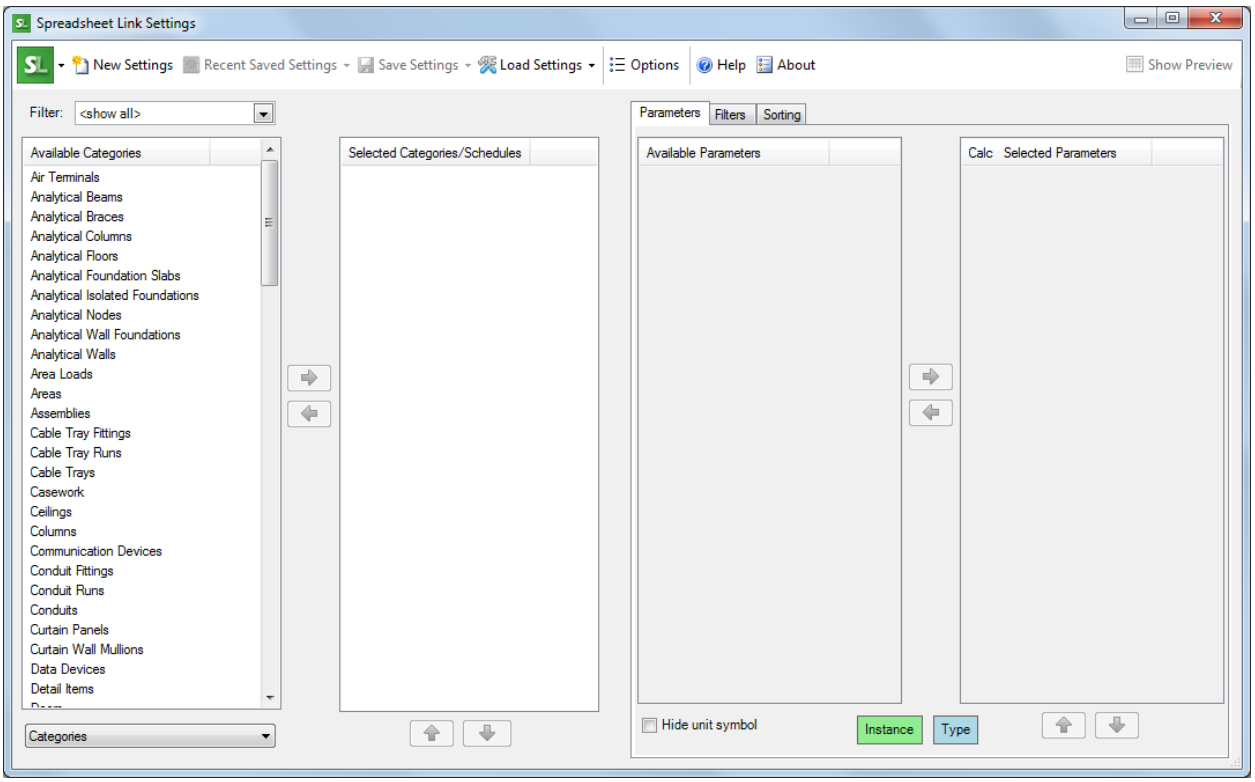
Spreadsheet Link exports data from Revit elements to a spreadsheet where the data can be edited and then imported and applied back in to the Revit model. This allows making changes to the Revit model by simply editing data in a spreadsheet. Spreadsheet Link includes spreadsheet editing functionality, allowing the Revit user to easily edit data without ever leaving the Revit environment. The Revit user may also save the exported data to one of several spreadsheet file types, allowing others to view or edit the data in third-party spreadsheet software. The updated spreadsheet data may then be loaded into Spreadsheet Link and reapplied to the Revit model.

Starting Spreadsheet Link

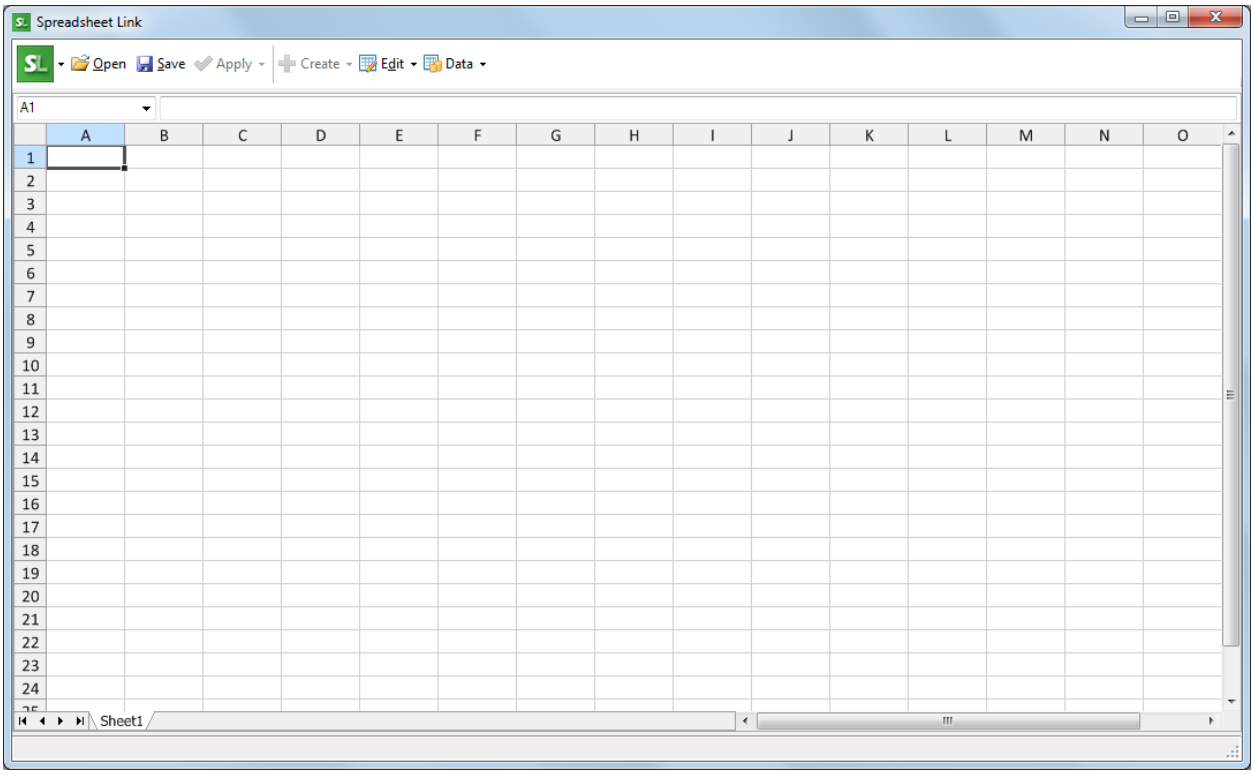
On the Revit ribbon, click on the “Spreadsheet Link” button.

When Spreadsheet Link is opened, two windows will be displayed:

The Settings window:



The Spreadsheet window:



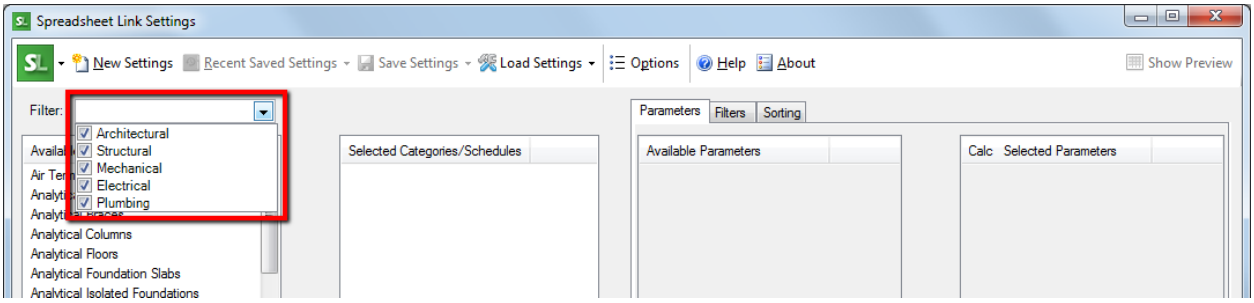
The spreadsheet window can be closed without exiting Spreadsheet Link completely. Closing the “Spreadsheet Link Settings” window will close Spreadsheet Link.

Adding Categories & Parameters

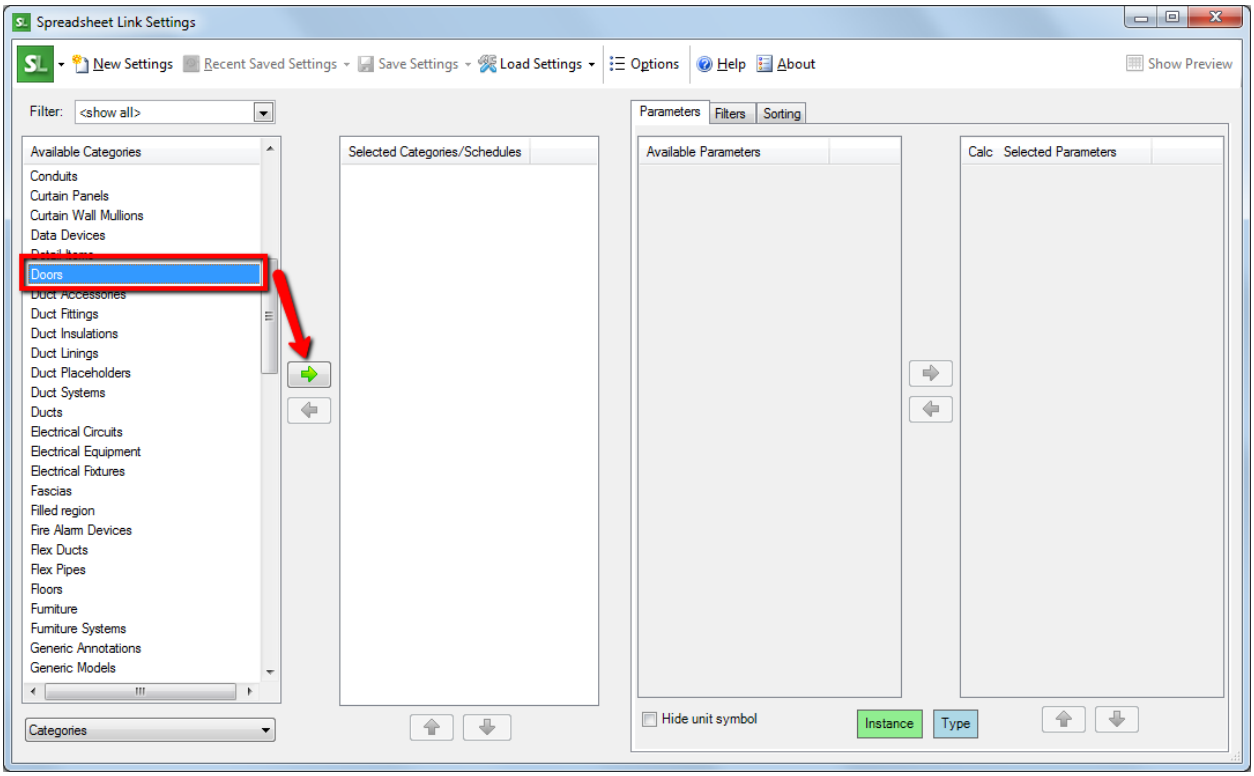
The settings dialog is used to configure the category, parameters and filters that dictate which Revit elements should be included in the spreadsheet for editing.

To add a category, first select it from the list of “Available Categories.”

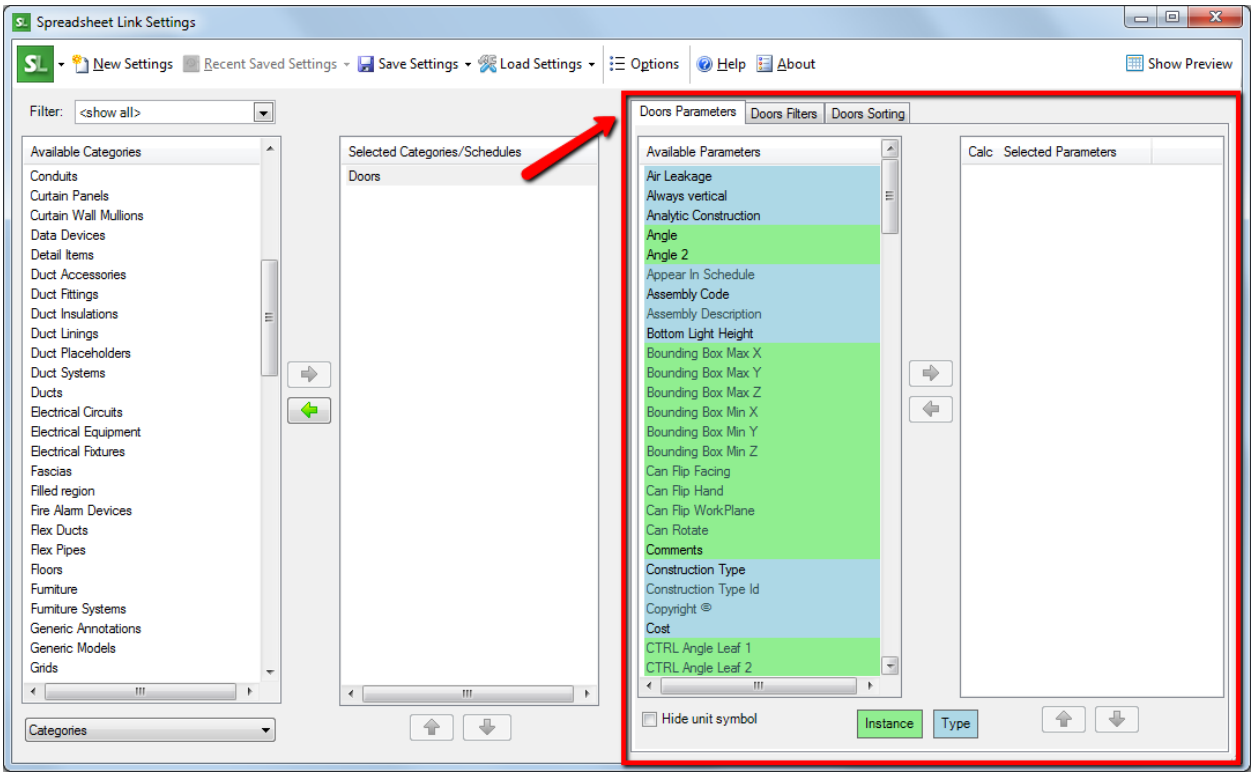
The list of categories can be filtered by discipline from the “Filter” combo box. A single discipline or multiple disciplines can be applied using the checkboxes.



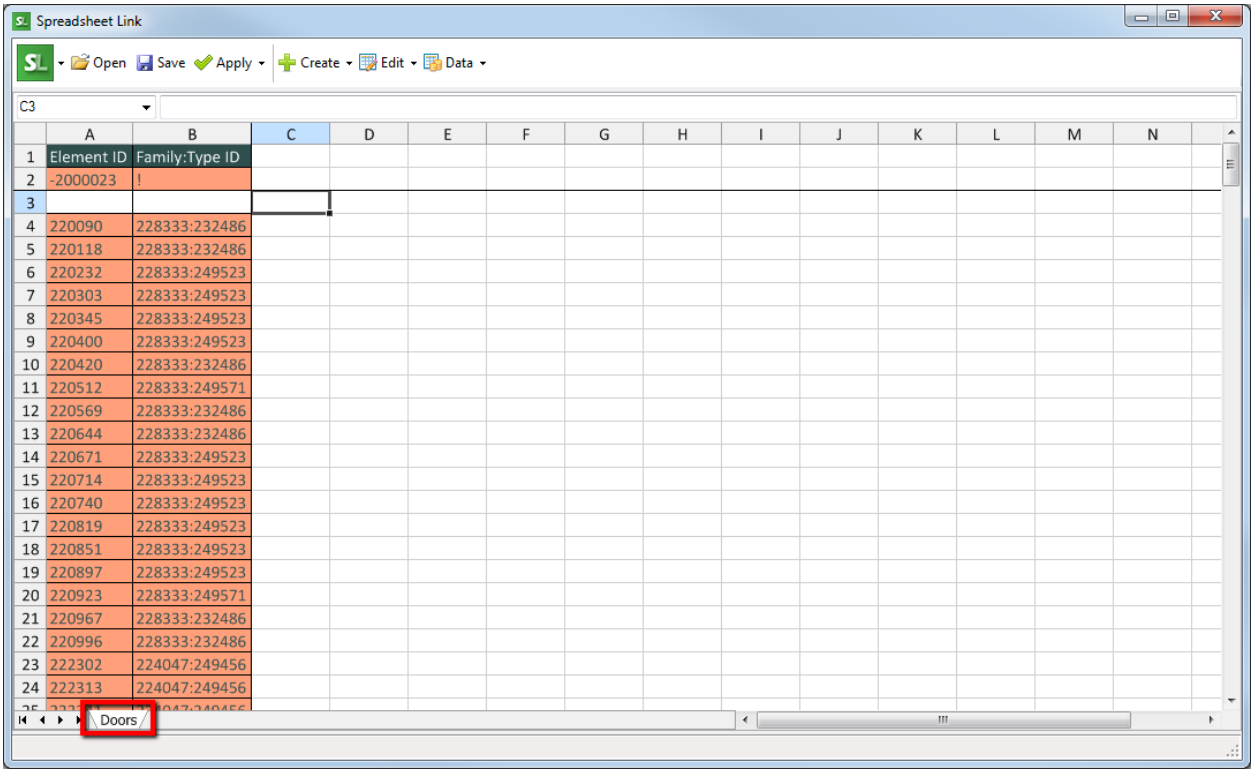
When the desired category has been selected click the “→” button or double-click on the category name.



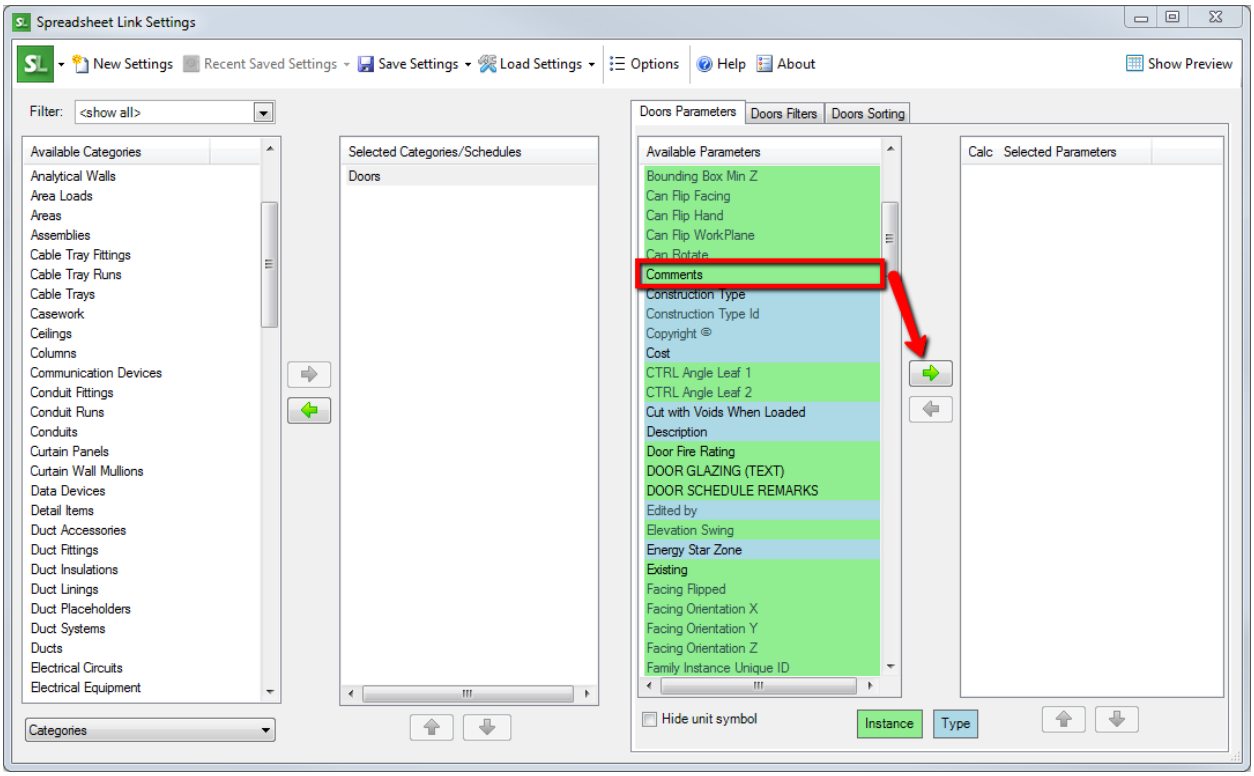
Adding the category will move the category to the “Selected Categories/Schedules” list and populate the “Parameters”,“Filters” and “Sorting” tabs.



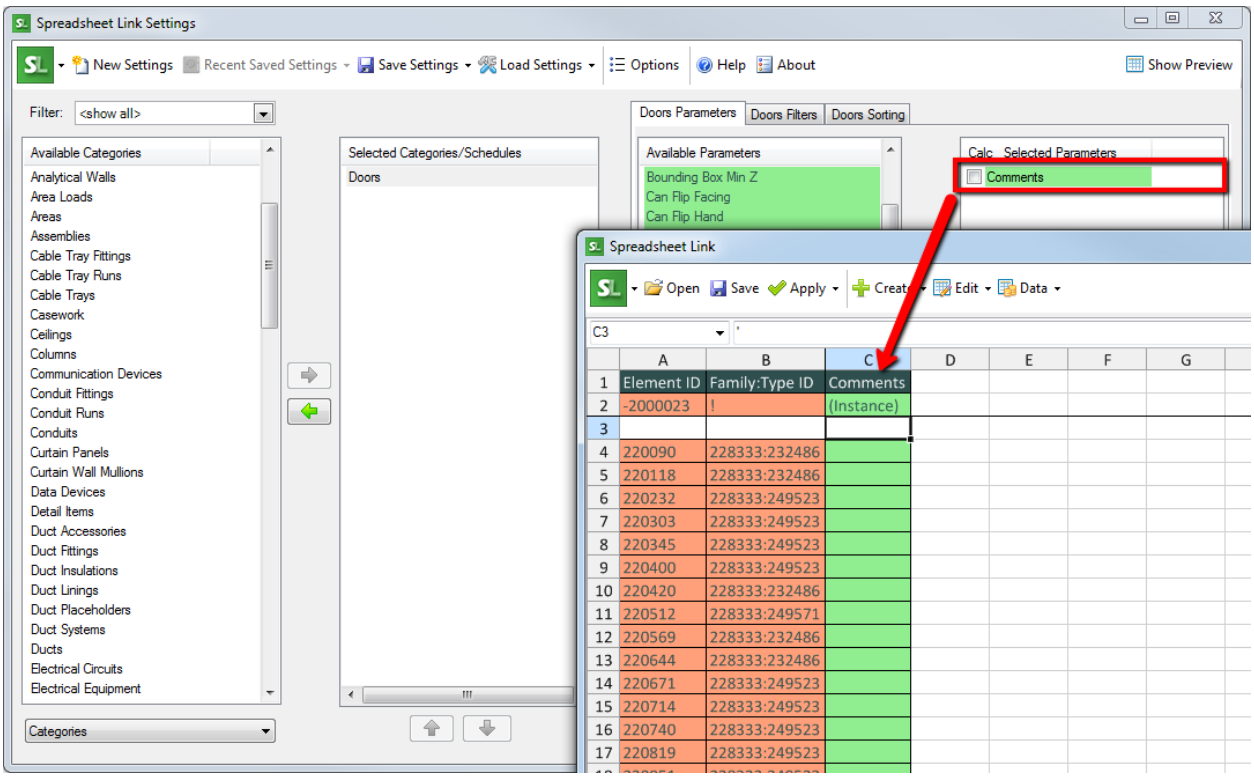
Adding the category will also add a tab in the “Spreadsheet Link” dialog for the selected category, build some columns for identifying each Revit element and add a row to the worksheet for each element found. This provides a “real-time preview” of what the ultimate spreadsheet file will be.



To add a parameter, select the category from the “Selected Categories/Schedules” list, then locate the desired parameter from the “Available Parameters” field on the parameters tab. Select the desired parameter and double click or click the “→” button. The green and blue background colors indicate whether a parameter is an instance or type parameter, respectively. Parameters with black text may be edited and reimported into the model. Parameters with light gray text are read-only, and may not be edited.



The chosen parameter will be moved to the Selected Parameters list and a column will be added to the spreadsheet. The new column will have either a green or blue background, indicating whether the parameter is instance or type, the same as can be seen in the Spreadsheet Link Settings window. Also, the words “(Instance)” or “(Type)” will appear near the top of the column in the spreadsheet. Again, this is part of the real-time preview system.



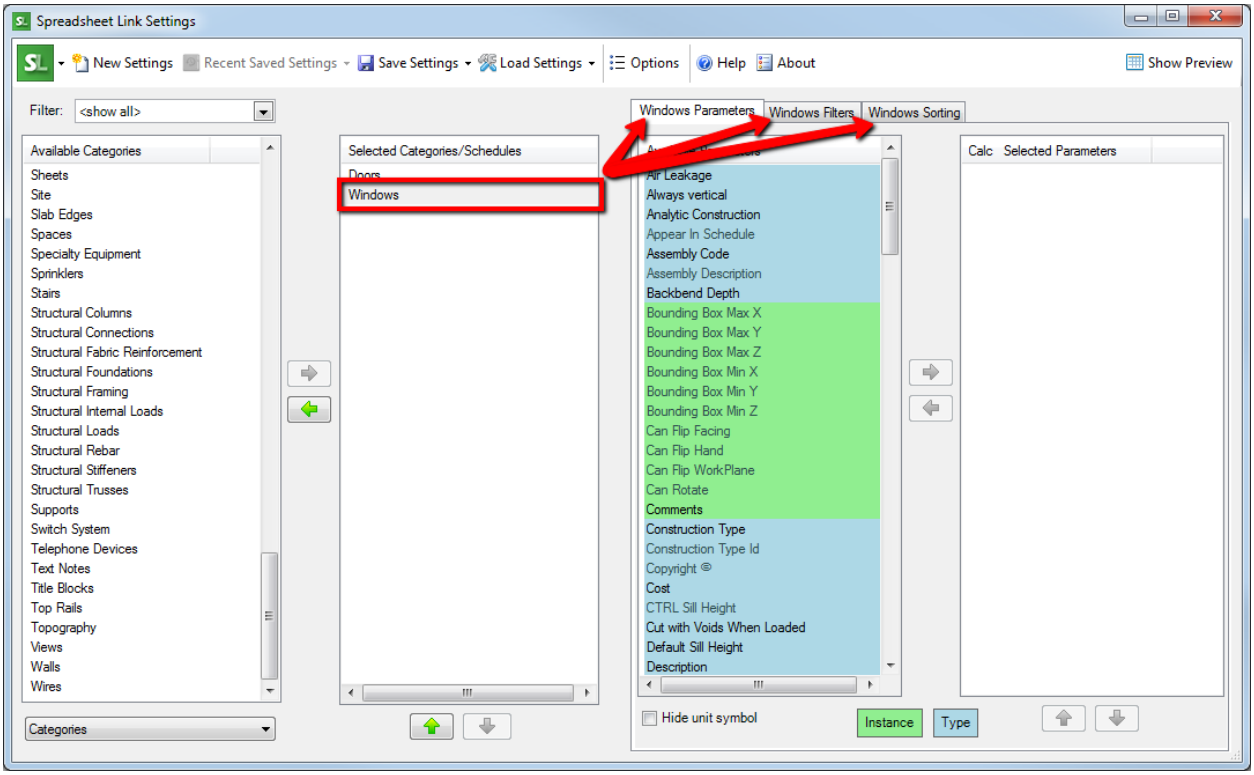
Working with Raw Numeric Values

Below the “Available Parameters” column is a checkbox labeled “Hide unit symbol” that, when checked, will output values that have units of measure to the spreadsheet as numbers instead of as text. Further, those numbers will be values in the current project units, with the unit symbols appearing in the column header to show what units of measure were used when the spreadsheet was populated with data.

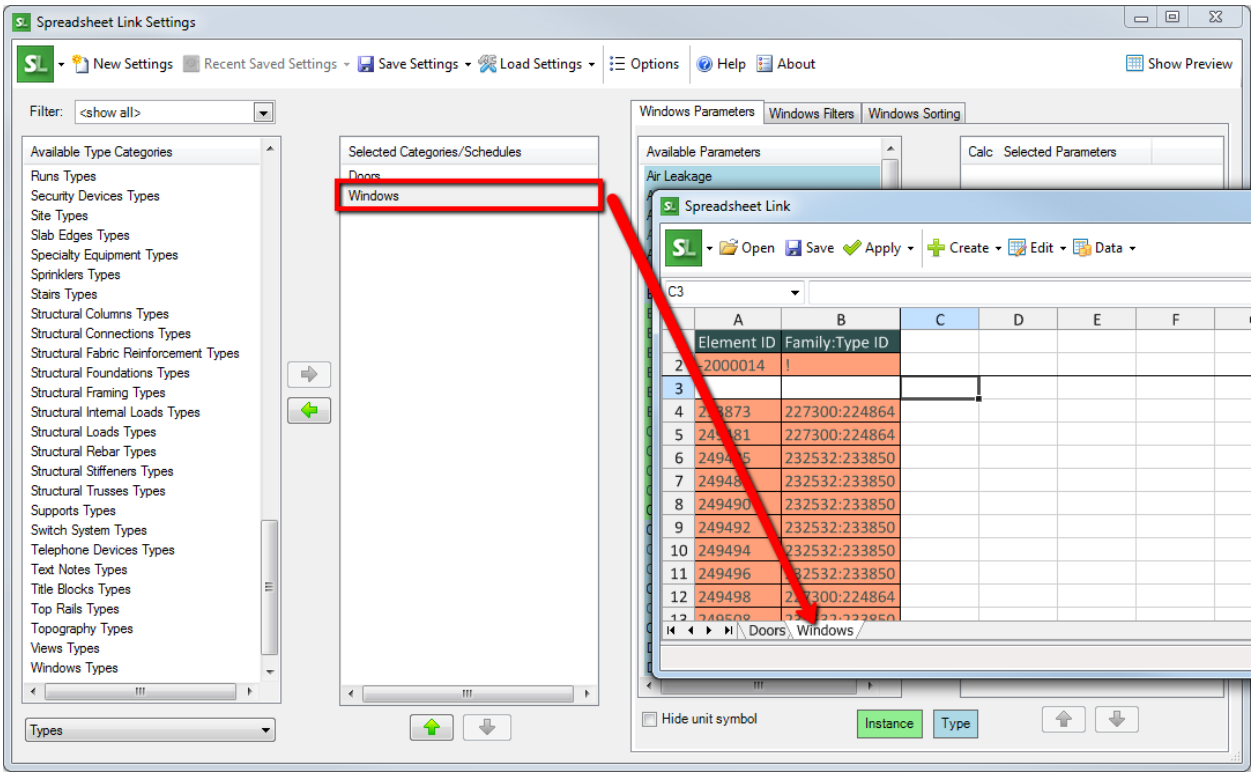
This makes it much easier to use those values in formulas. When the unit symbols are included (the default setting) the values will appear in each cell as text with the unit symbols next to them. For example: 17 mm

Working with Multiple Categories

Multiple categories can be edited in the same session. Adding additional categories to the list of “Selected Categories/Schedules” will cause corresponding tabs to be built in the spreadsheet window in real-time. Only one category will be active at a time. To switch the active category select it from the list of “Selected Categories/Schedules.” Selecting a category here will set the list of available parameters, selected parameters, filters and sorting to match the selected category.



Selecting a category will also make the corresponding tab active in the spreadsheet window.



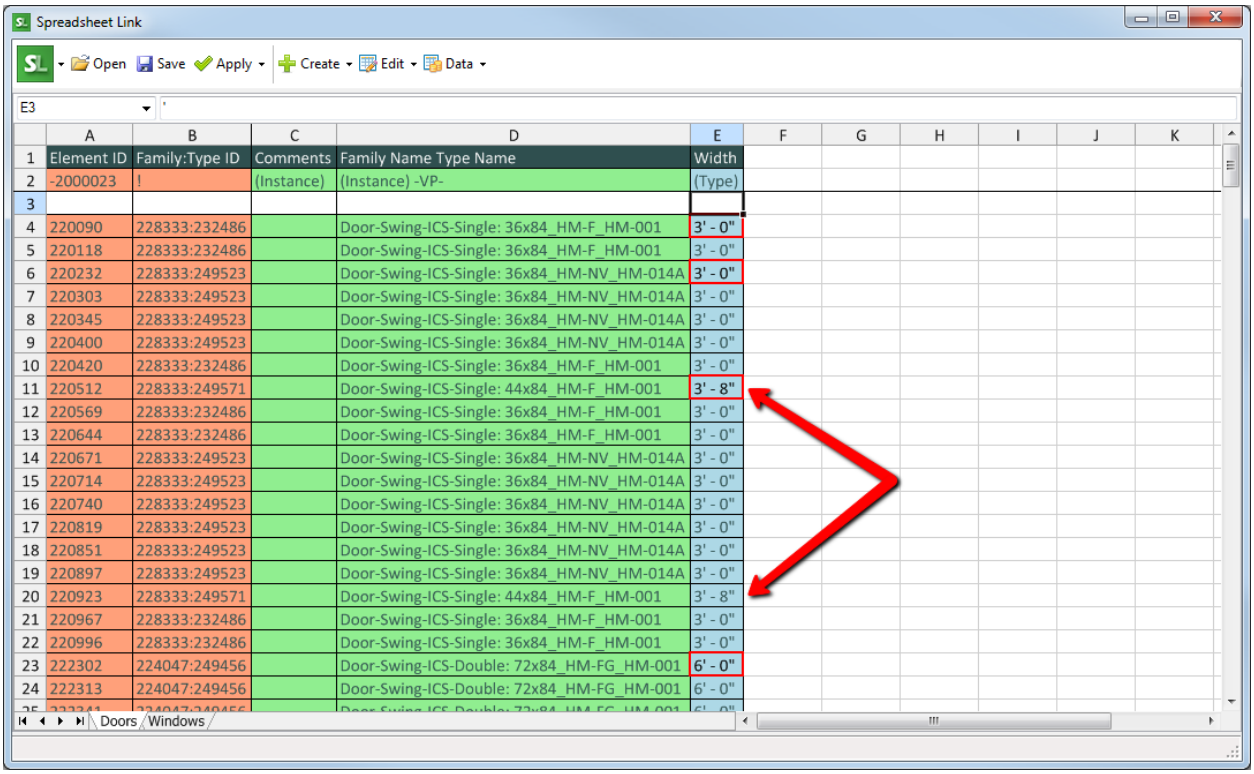
Type Parameters in the Spreadsheet Window

Spreadsheet Link can export both instance and type information together in the same spreadsheet. There is also an option to export type information alone, which will be discussed in more detail later in this user guide.

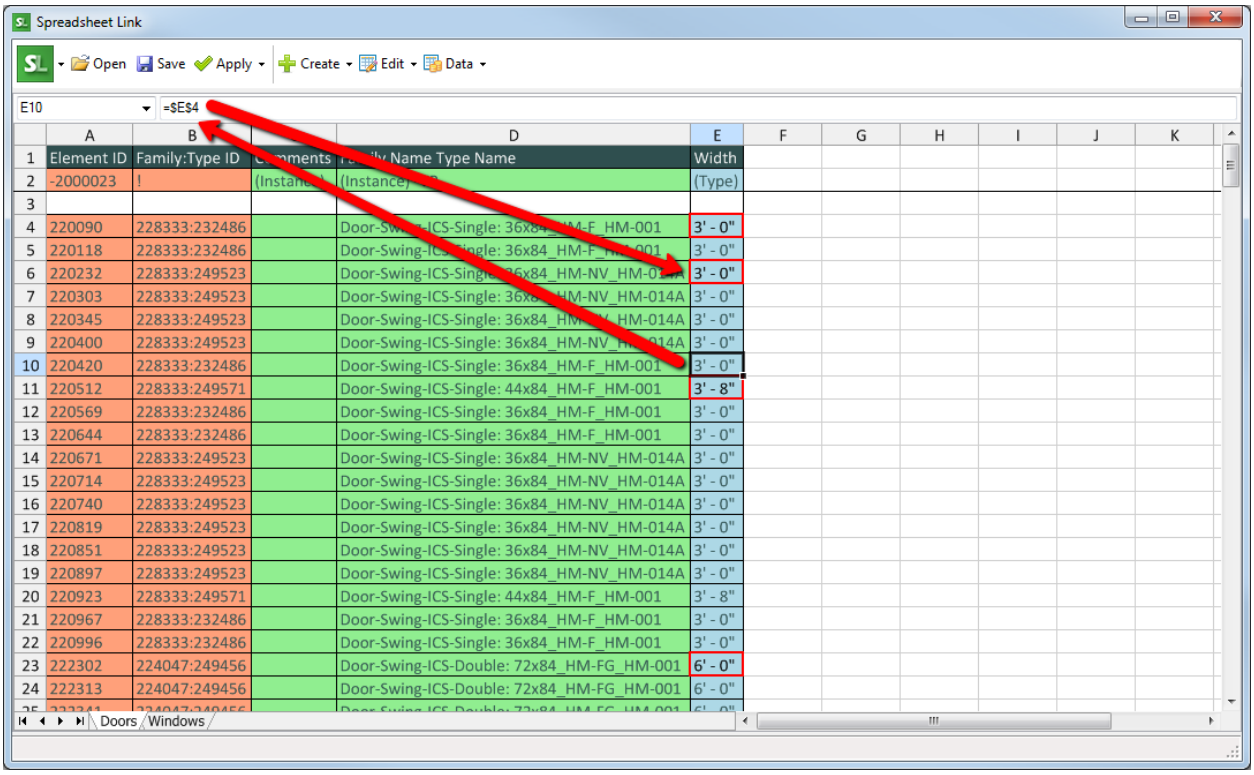
When exporting instance and type parameters together, type parameters behave differently than instance parameters in the spreadsheet. This is to mimic how type parameters behave differently than instance parameters in Revit itself.

Because spreadsheet applications have no concept of a “Type” value, formulas have been added to the spreadsheet to help emulate the behavior of type values in Revit. When a type parameter (blue) is added to the list of “Selected Parameters” a new column of data is built in the spreadsheet window.

As the column is built, each time a new Revit type is detected a “key cell” is created which will control the values of all subsequent rows of the same type. Key cells are bordered in red. If the value of a key cell is changed, the change will automatically be updated in any other rows for instances of that type.



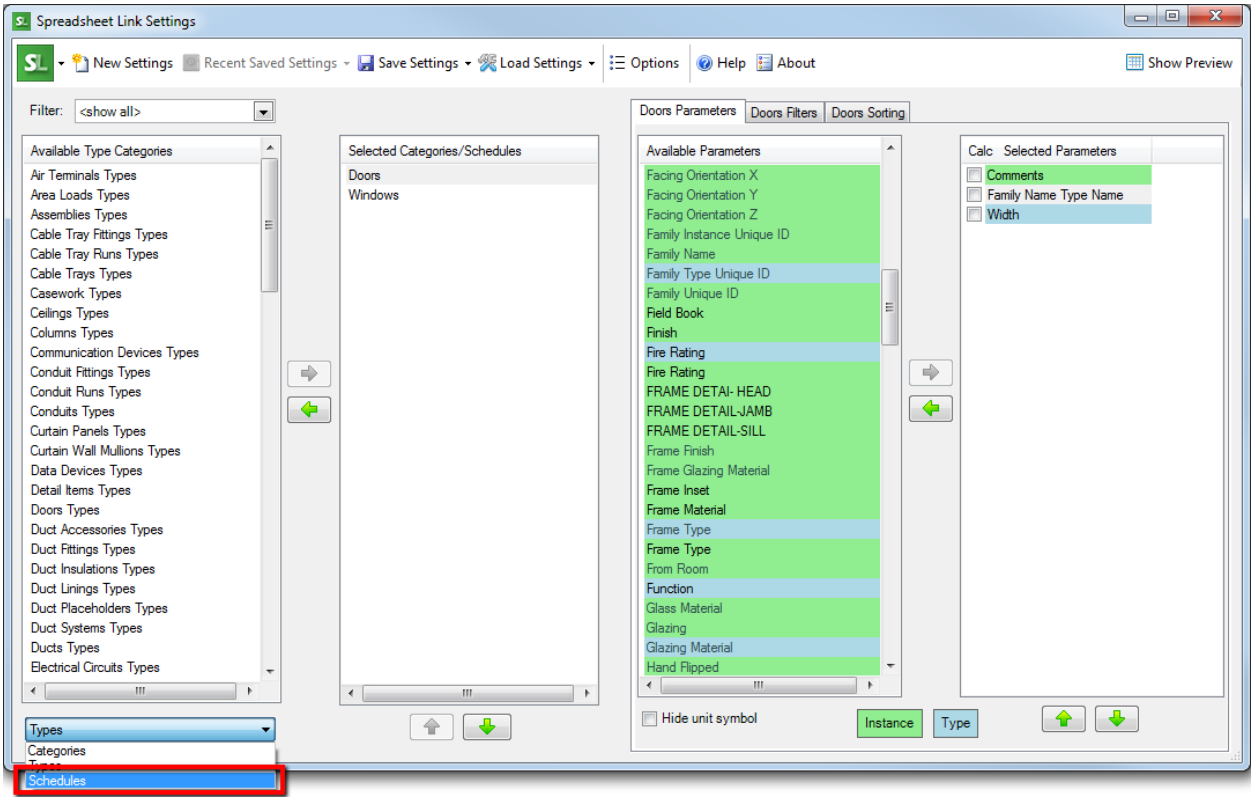
An easy way to quickly identify which cell is the key cell for a value is to select the desired cell and look at the formula bar. In this example the key cell is identified as cell E4.



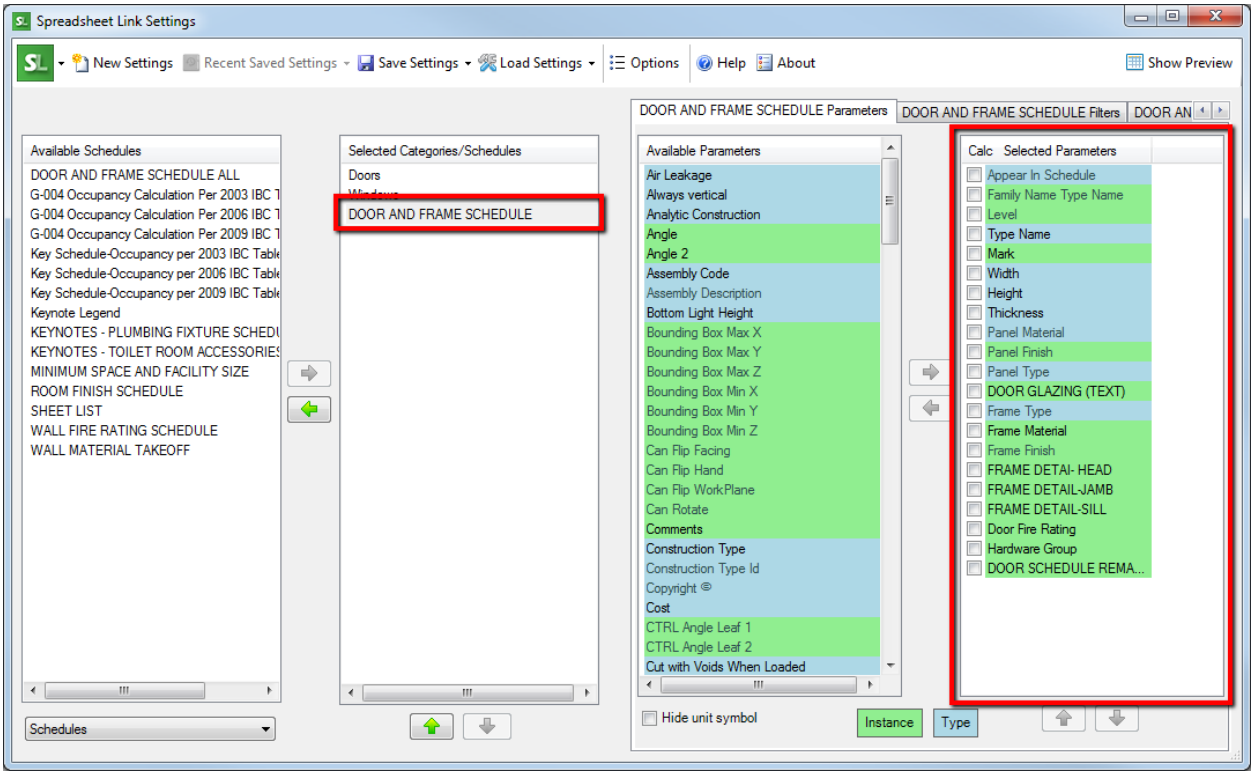
As with read-only parameters, those values that are not key cells have gray text to indicate that you cannot edit them directly. Only the key cells may be edited for type parameters.

Building the Spreadsheet From Schedules

The versions of Spreadsheet Link included for Revit 2013 and later have the ability to source the category, parameters and parameter order from an existing Revit single-category schedule. To add a schedule to the list of "Selected Categories/Schedules" first select "Schedules" from the drop down menu below the first column.



Next, select the desired schedule from the list and click the "→" button. In this example, the "DOOR AND FRAME SCHEDULE" has been added. All the parameters from the Revit schedule are pre-selected, in the same order as they appear in the Revit schedule.



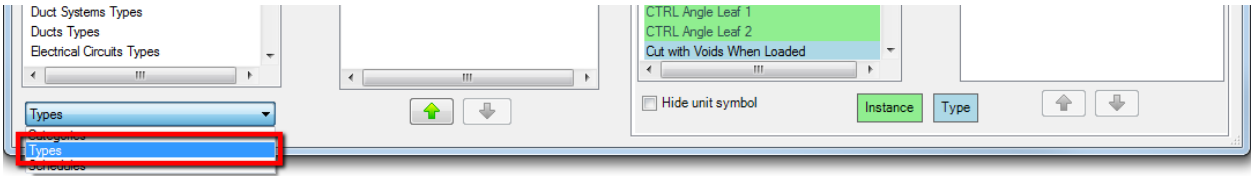
The "Available Parameters" list includes all the parameters that are available for the category of the schedule. This allows adding more information to the spreadsheet than appears on the schedule.

IMPORTANT NOTE: When selecting multi-category schedules, the addin will take more time to gather the data due to the fact that there are significantly more relationships which must be queried. Very large models and schedules could require several minutes to complete the process.

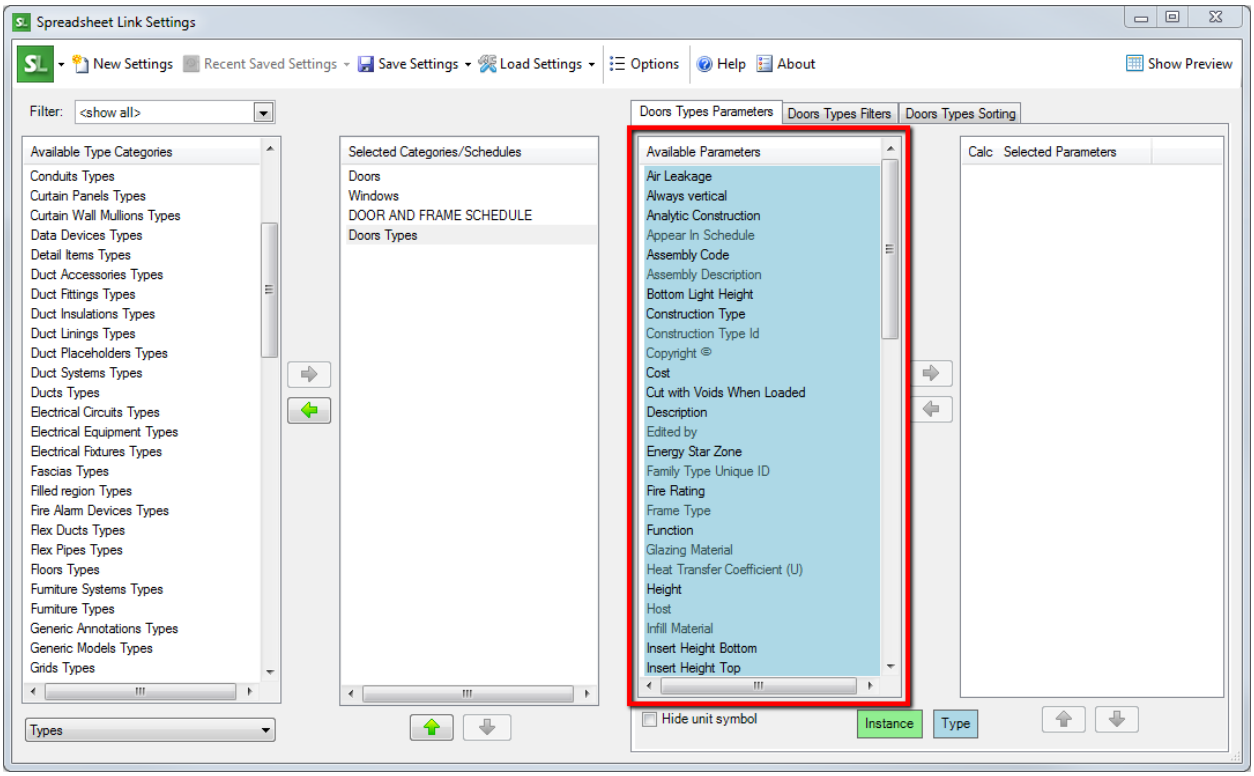
Please note that calculated values, sorting methods, formatting and filters as defined in the Revit schedules will **not** be represented in Spreadsheet Link.

Exporting Types

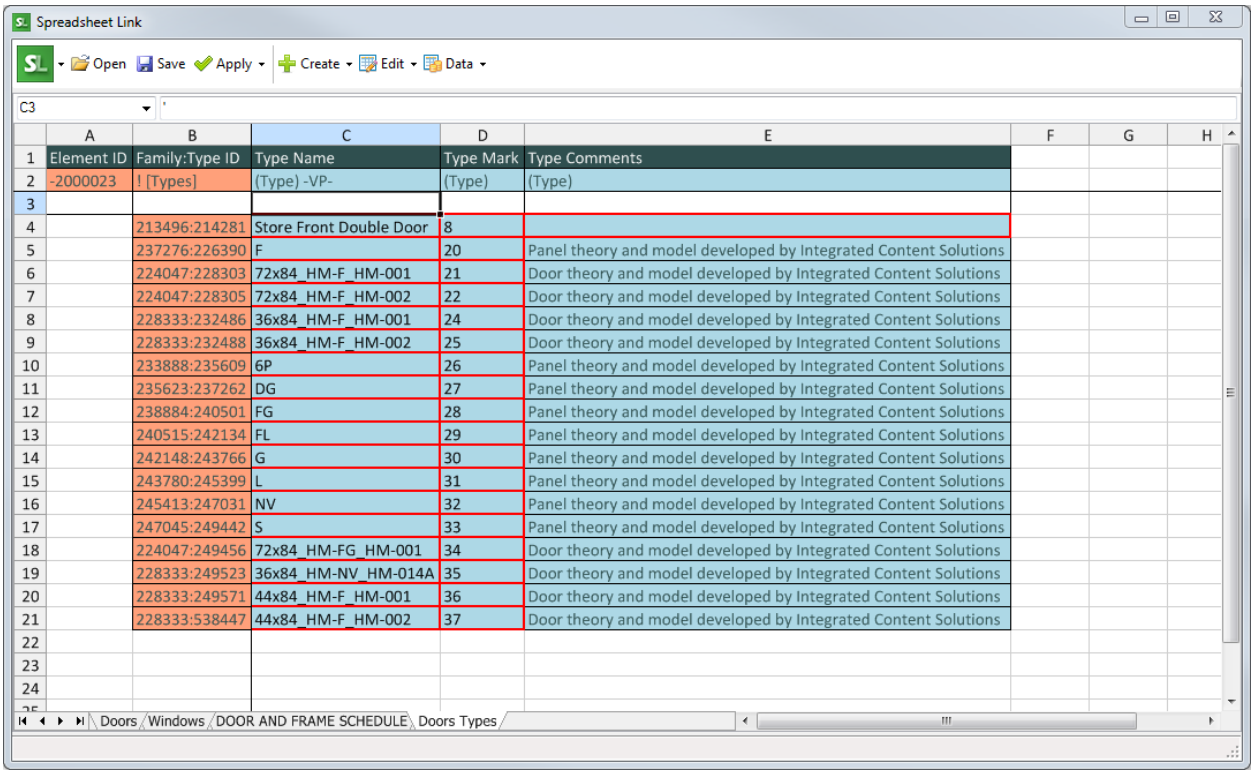
Types can be exported by selecting "Types" from the dropdown menu. When exporting type information, Spreadsheet Link will find all types that exist for the selected category, regardless of whether or not any instances exist for the type.



To begin the process, select the category type to export and add it to the list of "Selected Categories/Schedules" as before. In this example the "Door Types" category has been added. Note that only type parameters are available from the "Available Parameters" list.



When exporting Types only, a single row will be added to the spreadsheet for each type, and no formulas will be used as they are when exporting types and instances together. Note the type name parameter in column C below.

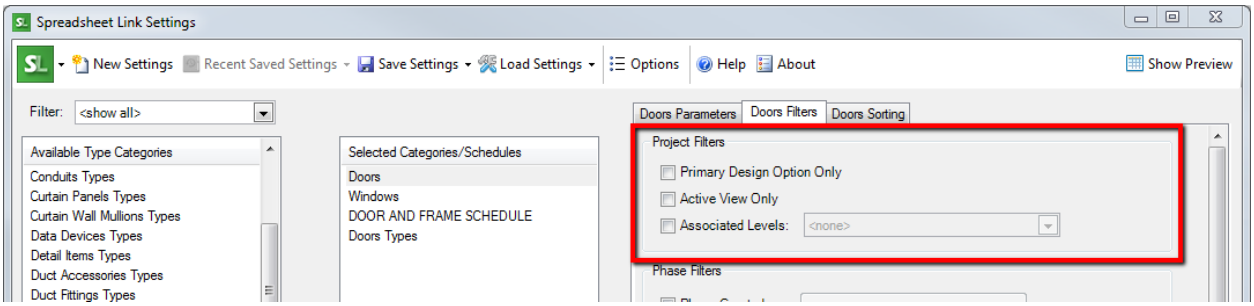


	A	B	C	D	E	F	G	H
1	Element ID	Family:Type ID	Type Name	Type Mark	Type Comments			
2	-2000023	! [Types]	(Type) -VP-	(Type)	(Type)			
3								
4		213496:214281	Store Front Double Door	8				
5		237276:226390	F	20	Panel theory and model developed by Integrated Content Solutions			
6		224047:228303	72x84_HM-F_HM-001	21	Door theory and model developed by Integrated Content Solutions			
7		224047:228305	72x84_HM-F_HM-002	22	Door theory and model developed by Integrated Content Solutions			
8		228333:232486	36x84_HM-F_HM-001	24	Door theory and model developed by Integrated Content Solutions			
9		228333:232488	36x84_HM-F_HM-002	25	Door theory and model developed by Integrated Content Solutions			
10		233888:235609	6P	26	Panel theory and model developed by Integrated Content Solutions			
11		235623:237262	DG	27	Panel theory and model developed by Integrated Content Solutions			
12		238884:240501	FG	28	Panel theory and model developed by Integrated Content Solutions			
13		240515:242134	FL	29	Panel theory and model developed by Integrated Content Solutions			
14		242148:243766	G	30	Panel theory and model developed by Integrated Content Solutions			
15		243780:245399	L	31	Panel theory and model developed by Integrated Content Solutions			
16		245413:247031	NV	32	Panel theory and model developed by Integrated Content Solutions			
17		247045:249442	S	33	Panel theory and model developed by Integrated Content Solutions			
18		224047:249456	72x84_HM-FG_HM-001	34	Door theory and model developed by Integrated Content Solutions			
19		228333:249523	36x84_HM-NV_HM-014A	35	Door theory and model developed by Integrated Content Solutions			
20		228333:249571	44x84_HM-F_HM-001	36	Door theory and model developed by Integrated Content Solutions			
21		228333:538447	44x84_HM-F_HM-002	37	Door theory and model developed by Integrated Content Solutions			
22								
23								
24								

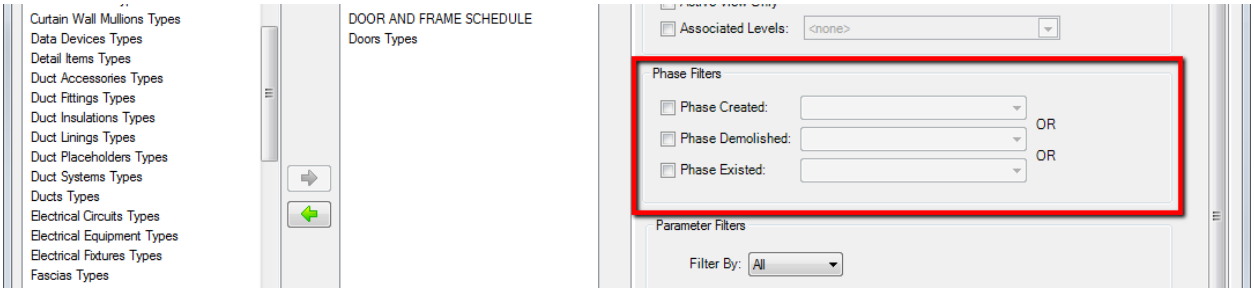
Filters

Results displayed in the spreadsheet can be filtered using the filters tab. Filters, like parameters, are uniquely configured for each category or schedule added to the "Selected Categories/Schedules" list. To activate a filter, click the associated checkbox and configure the filter options.

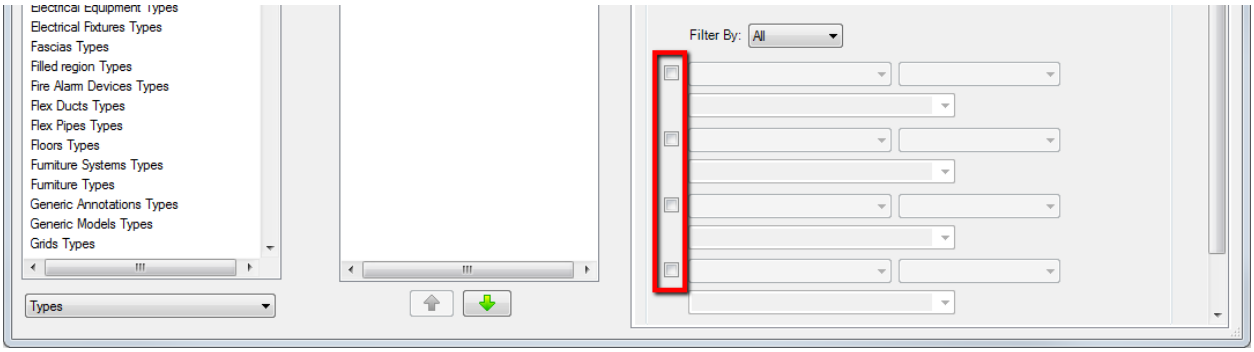
Project-Level filters allow for filtering by design option, active view and associated level.



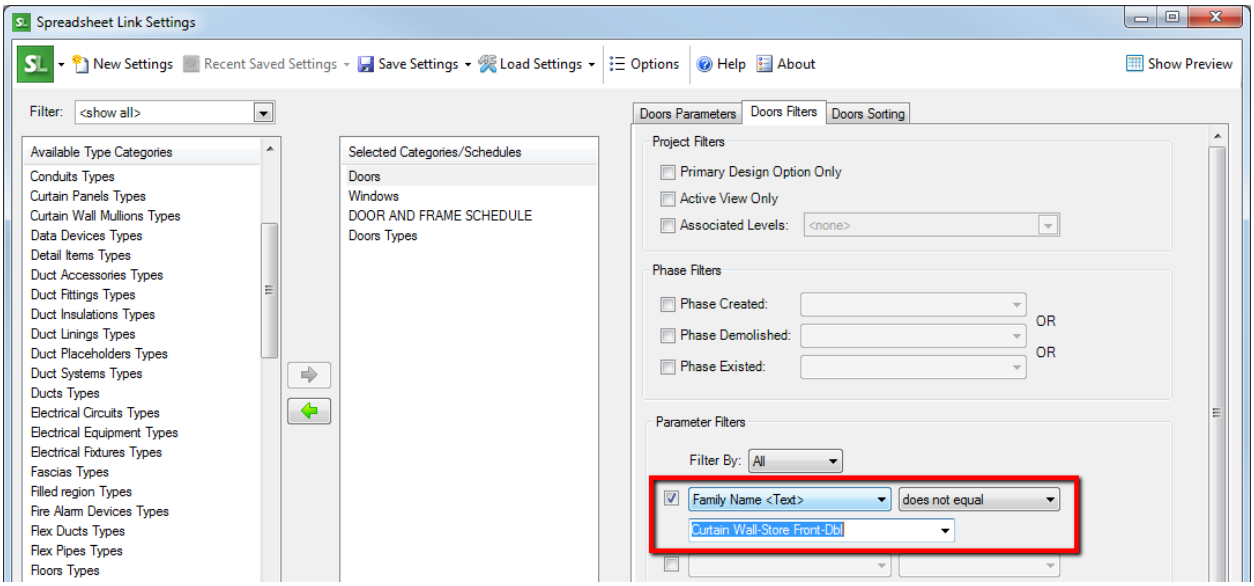
The Phase Filters allow for powerful phase filtering. The Phase Created and Phase Demolished filters emulate standard Revit phase filtering. The Phase Existed filter, however, will allow elements to be filtered down to just the elements that existed for a particular phase.



Parameter-Level Filters allow filtering of elements by up to 4 parameters and values. To enable a Parameter-Level Filter check one of the associated checkboxes.



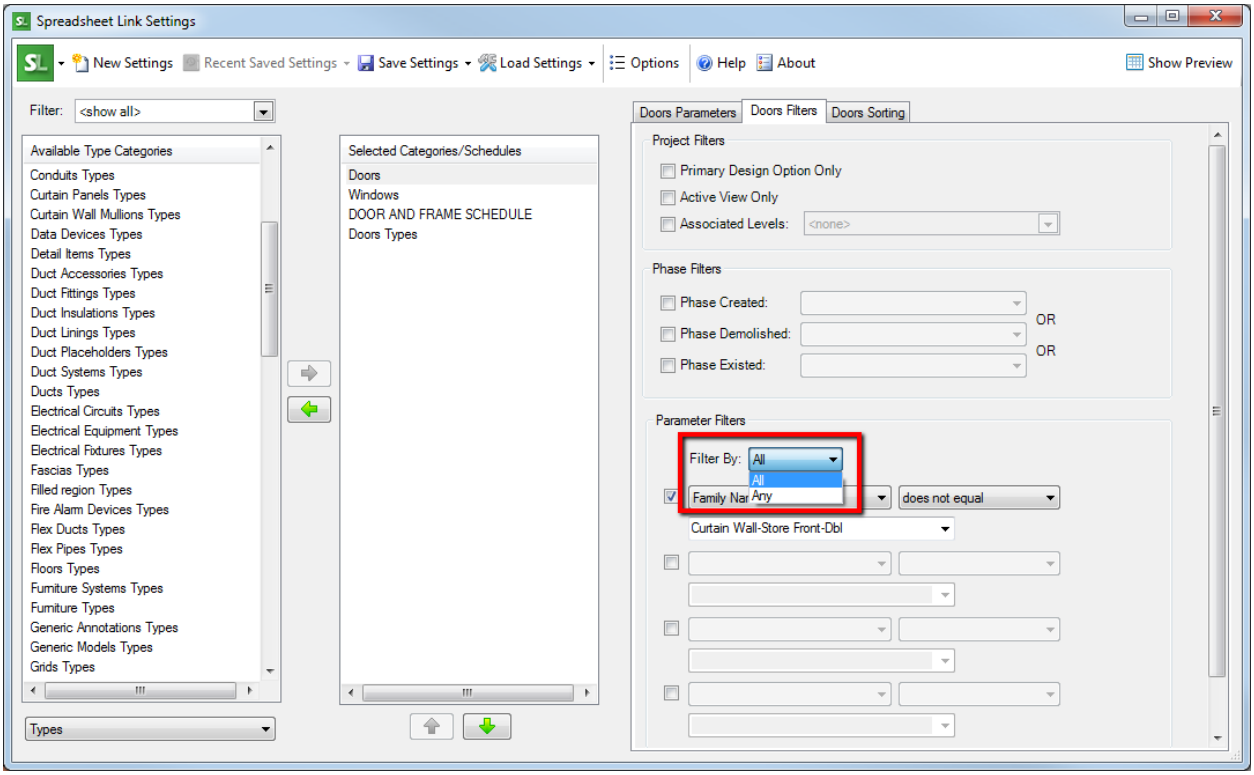
Once the filter is enabled, select the desired parameter by which to filter, the operator to apply and the value for comparison from the drop down lists.



Once all three parameter filtering fields have been defined, the filter will be applied to the spreadsheet.

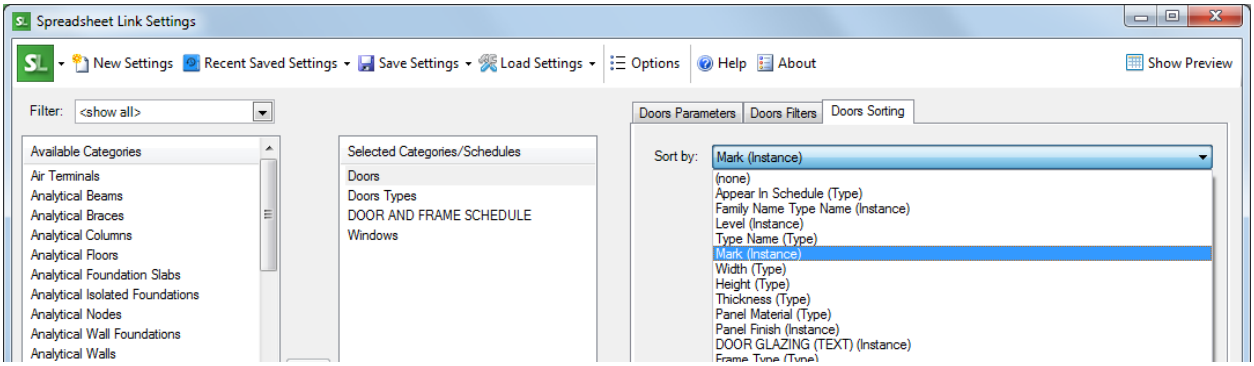
IMPORTANT: Any values in the spreadsheet that have been manually modified but not applied to the Revit model will be lost when changing any filter settings.

The “Filter By” option controls whether elements must match “Any” of the parameter filter criteria (using “or” logic) or “All” of the parameter filter criteria (using “and” logic).



Sorting

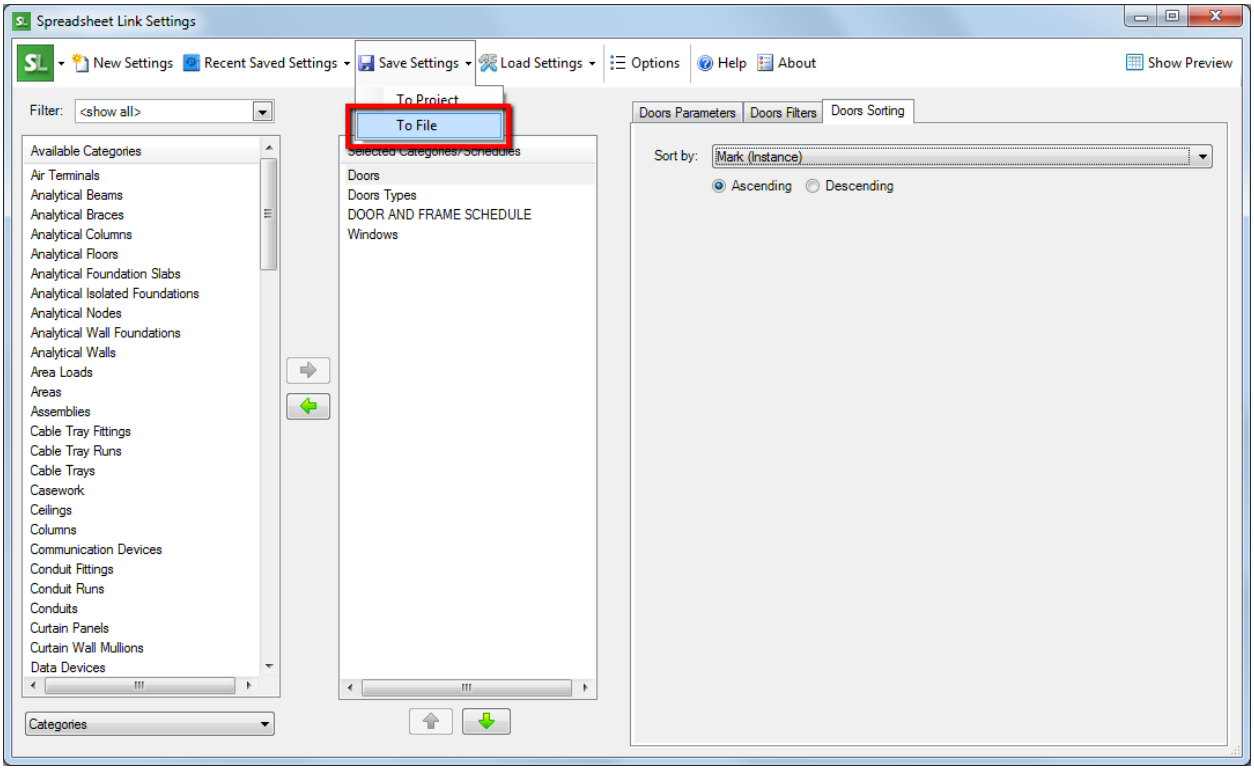
The “Sorting” tab can be used to sort a selected category by one of the parameters that have been added to the export. In this example the “Mark” parameter has been selected for the Doors category.



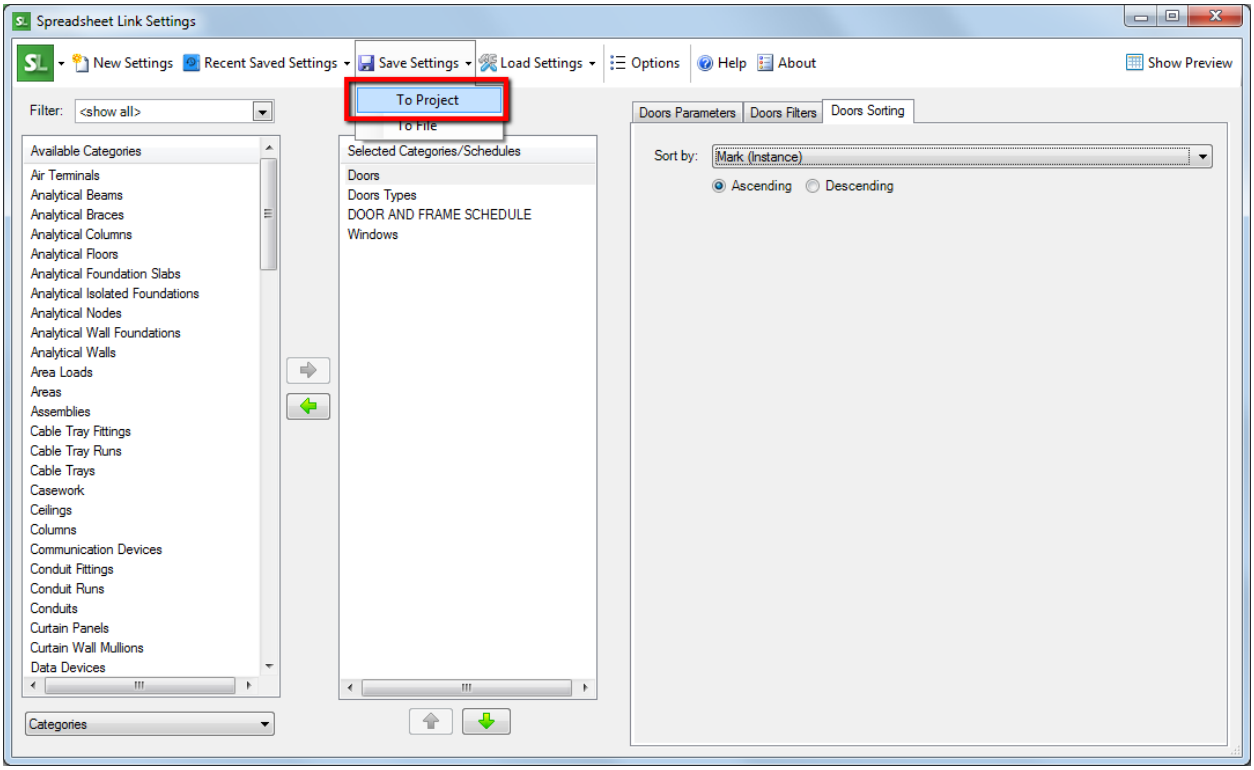
Sorting using this method will ensure all type parameter key cells remain intact in the spreadsheet. An additional method of sorting is available in the spreadsheet itself and will be discussed later in the user guide. That method disrupts the type parameter key cell system, but it also allows for more powerful sorting and filtering of the results.

Saving & Reloading Settings

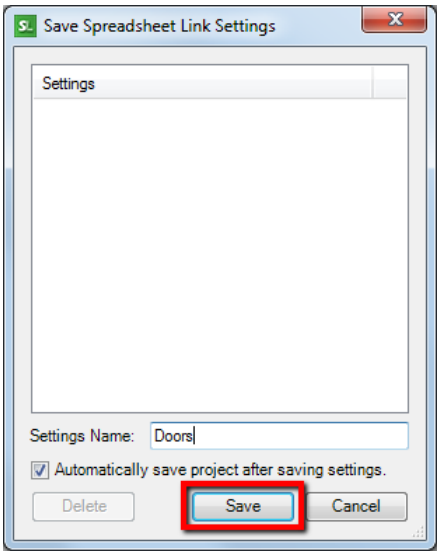
Spreadsheet Link settings can be saved and reloaded. There are two options for saving settings, either to an external file or into the project file itself. Settings saved externally will have a .slsettings file name extension. To save settings externally click the “Save Settings” button and chose the “To File” option.



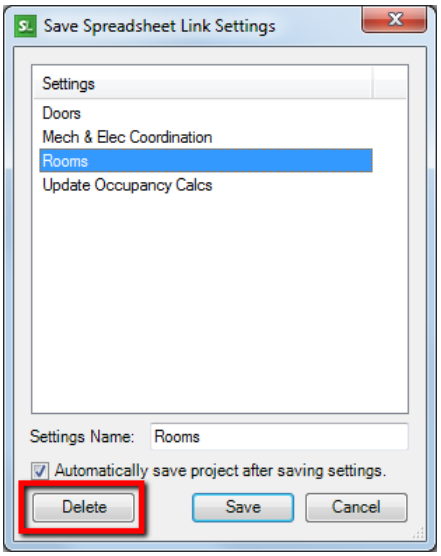
Settings can also be saved directly to a project file. This is particularly useful if settings are to be shared by several users. To save the Spreadsheet Link settings to the current project file, click the “Save Settings” button and choose the “To Project” option.



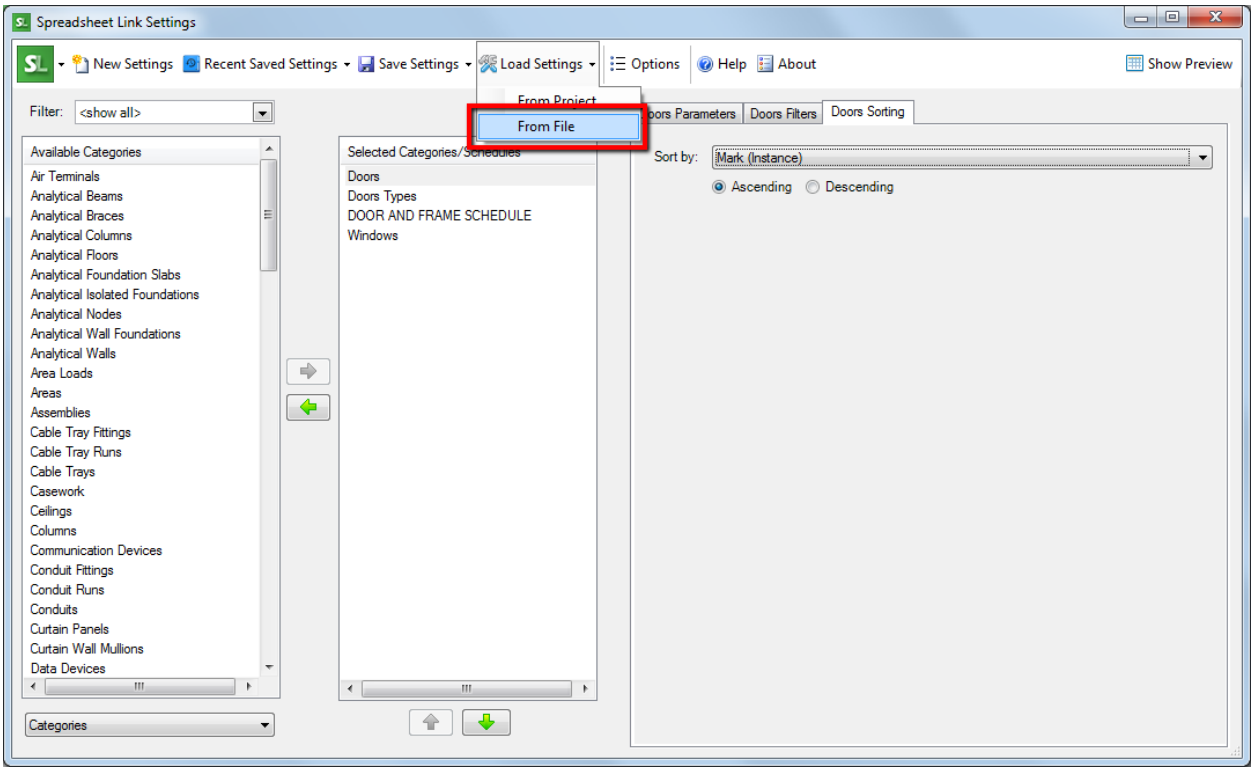
The “Save Spreadsheet Link Settings” dialog will appear. The project file itself must be saved when Spreadsheet Link settings are saved to the project. The “Automatically save project after saving settings” checkbox controls whether or not Spreadsheet Link will automatically save the project file when saving settings. Enter a name for the saved settings and click the “Save” button



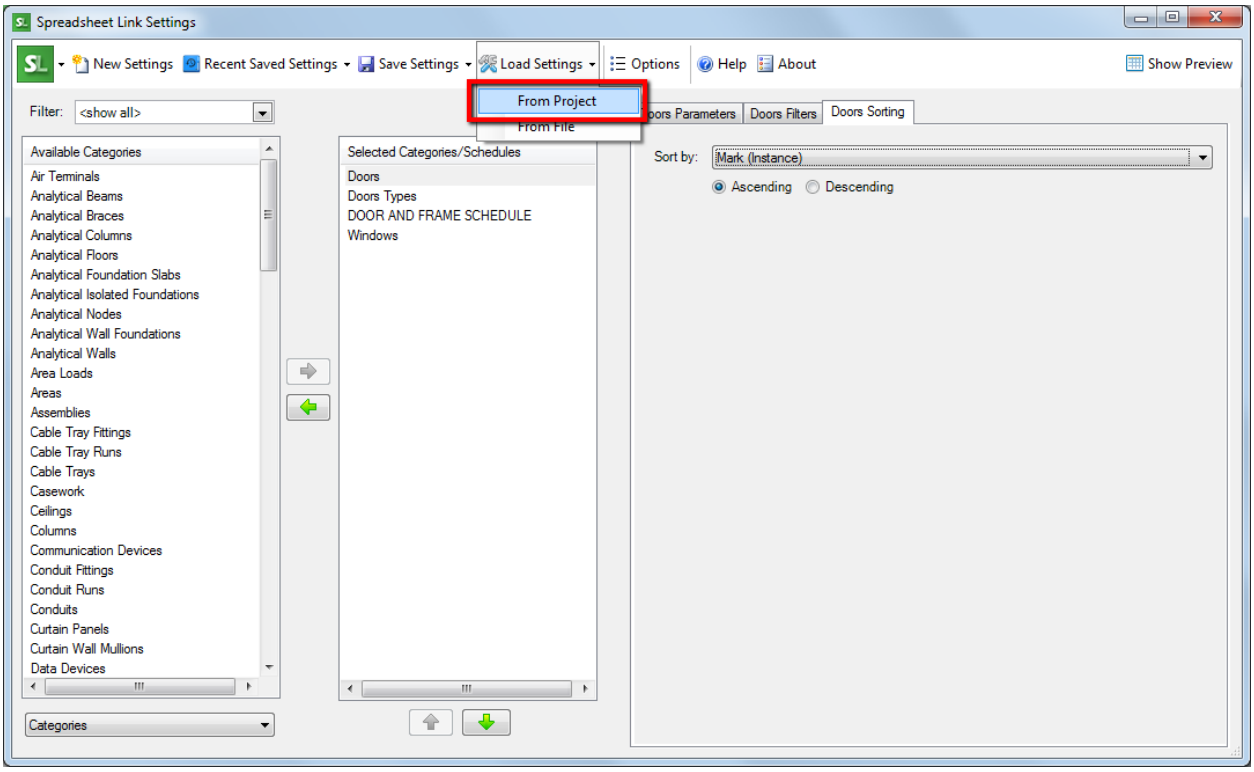
The “Save Spreadsheet Link Settings” dialog is also used to delete settings from a project. To delete a saved selection of settings, select the settings to remove and click the “Delete” button. In the example below the “Rooms” settings would be deleted.



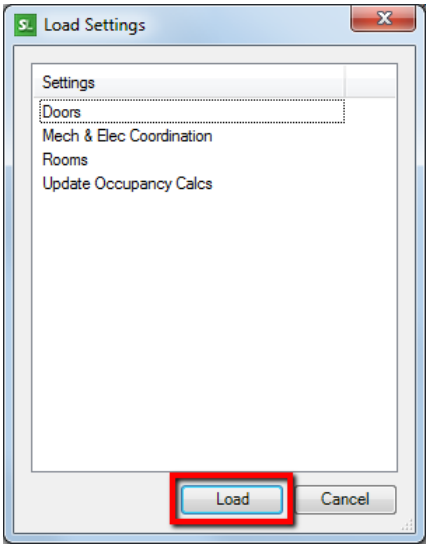
To load previously saved settings from a file, click the “Load Settings” button and select the “From File” option then browse to the desired .slsettings file.



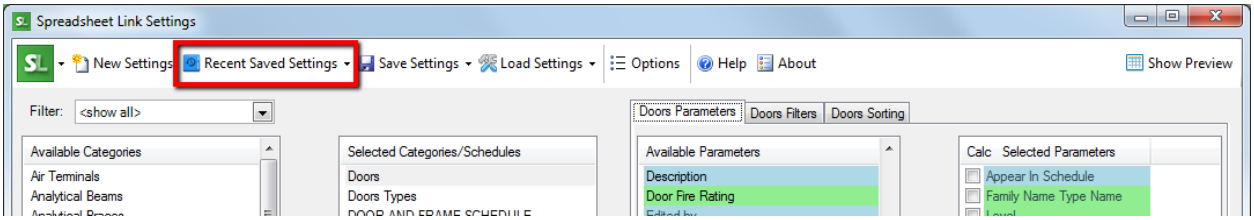
To load settings from a project file, click “Load Settings” and then select the “From Project” option.



In the “Load Settings” dialog, select the desired saved settings and click the “Load” button.



Spreadsheet Link will retain a list of the last 10 settings saved to a file. To load one of these settings files, select it from the list of "Recently Saved Settings."

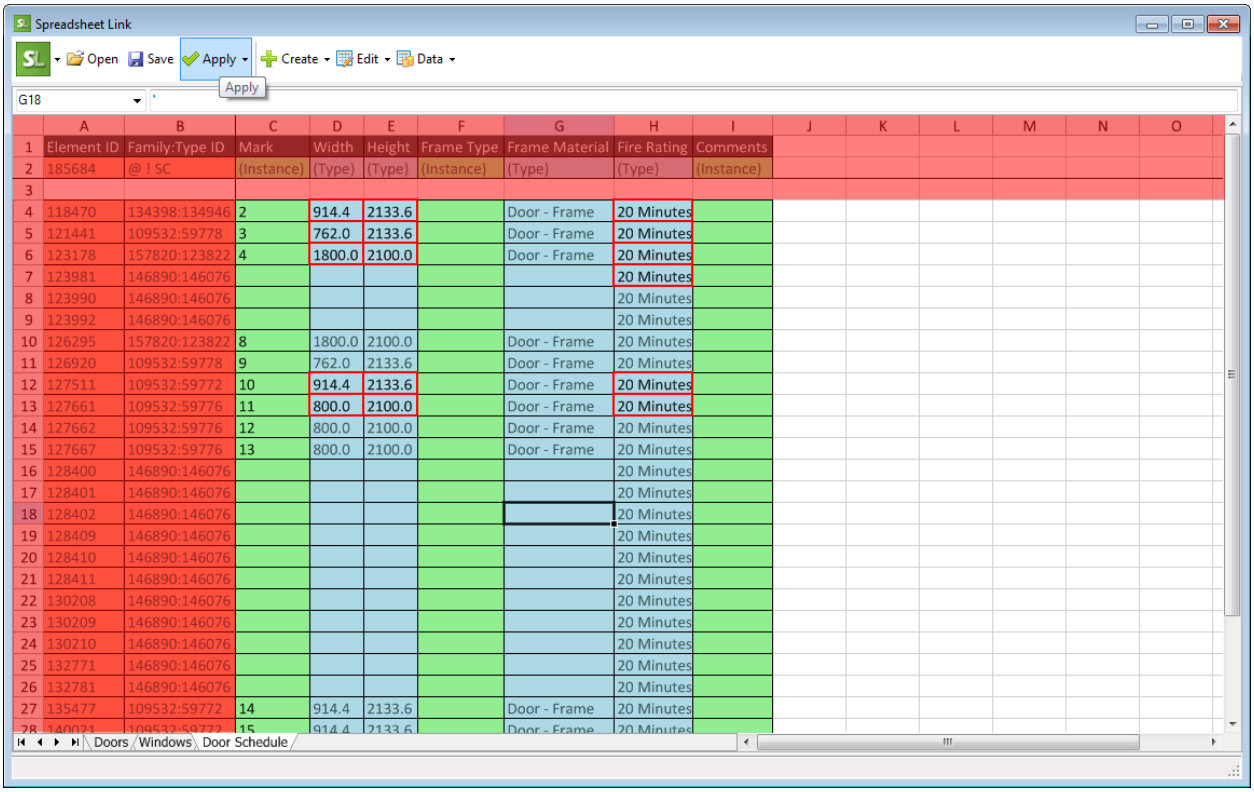


Spreadsheet Window

Once desired exports have been configured, the spreadsheet window can be used to perform a number of tasks including changing exported data, saving and opening exports to and from .xlsx files (or other spreadsheet file formats), and applying changes to the Revit model.

Spreadsheet Format

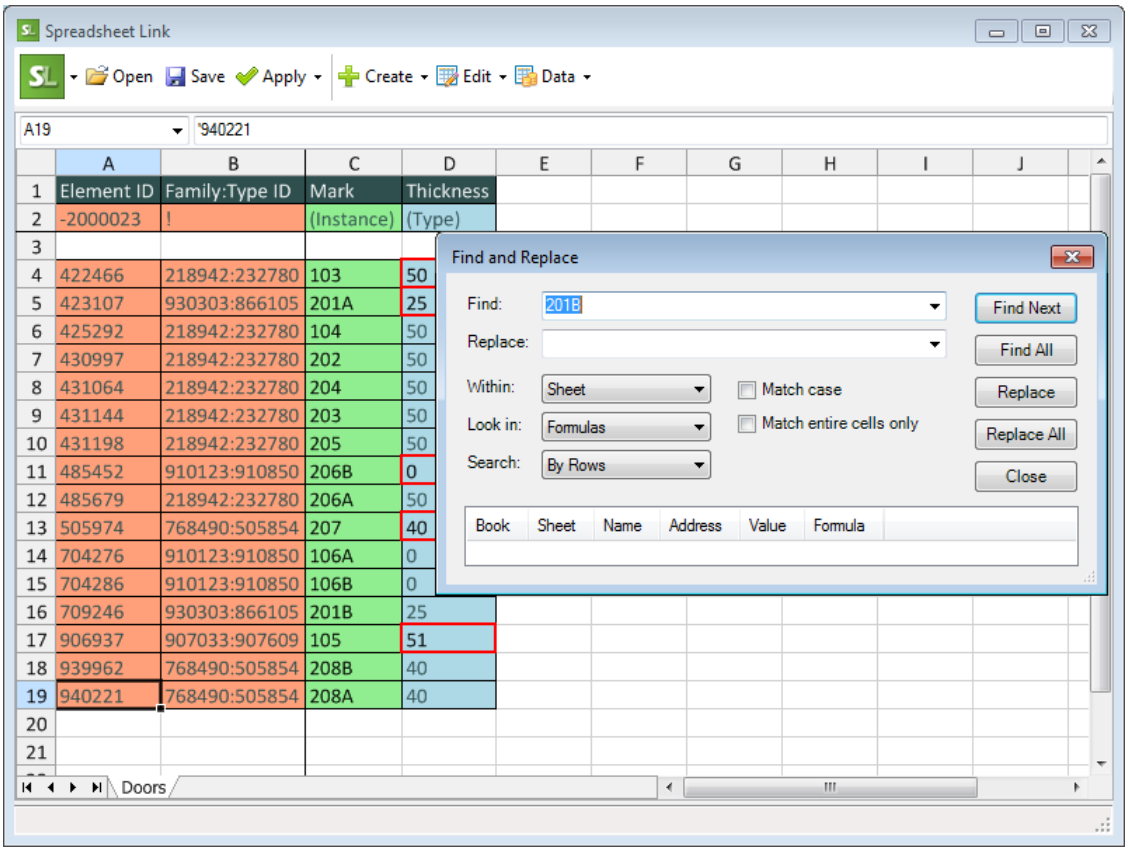
The first three rows and two columns should NOT be edited manually. These are used by Spreadsheet Link to manage the import process.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Element ID	Family:Type ID	Mark	Width	Height	Frame Type	Frame Material	Fire Rating	Comments						
2	185684	@ ! SC	(Instance)	(Type)	(Type)	(Instance)	(Type)	(Type)	(Instance)						
3															
4	118470	134398:134946	2	914.4	2133.6		Door - Frame	20 Minutes							
5	121441	109532:59778	3	762.0	2133.6		Door - Frame	20 Minutes							
6	123178	157820:123822	4	1800.0	2100.0		Door - Frame	20 Minutes							
7	123981	146890:146076						20 Minutes							
8	123990	146890:146076						20 Minutes							
9	123992	146890:146076						20 Minutes							
10	126295	157820:123822	8	1800.0	2100.0		Door - Frame	20 Minutes							
11	126920	109532:59778	9	762.0	2133.6		Door - Frame	20 Minutes							
12	127511	109532:59772	10	914.4	2133.6		Door - Frame	20 Minutes							
13	127661	109532:59776	11	800.0	2100.0		Door - Frame	20 Minutes							
14	127662	109532:59776	12	800.0	2100.0		Door - Frame	20 Minutes							
15	127667	109532:59776	13	800.0	2100.0		Door - Frame	20 Minutes							
16	128400	146890:146076						20 Minutes							
17	128401	146890:146076						20 Minutes							
18	128402	146890:146076						20 Minutes							
19	128409	146890:146076						20 Minutes							
20	128410	146890:146076						20 Minutes							
21	128411	146890:146076						20 Minutes							
22	130208	146890:146076						20 Minutes							
23	130209	146890:146076						20 Minutes							
24	130210	146890:146076						20 Minutes							
25	132771	146890:146076						20 Minutes							
26	132781	146890:146076						20 Minutes							
27	135477	109532:59772	14	914.4	2133.6		Door - Frame	20 Minutes							
28	140021	109532:59772	15	914.4	2133.6		Door - Frame	20 Minutes							

Finding and Replacing Values in the Spreadsheet

While on the Spreadsheet Link window, pressing the Ctrl + F key or using the "Find/Replace" choice on the "Edit" toolbar dropdown button will open the *Find and Replace* dialog.



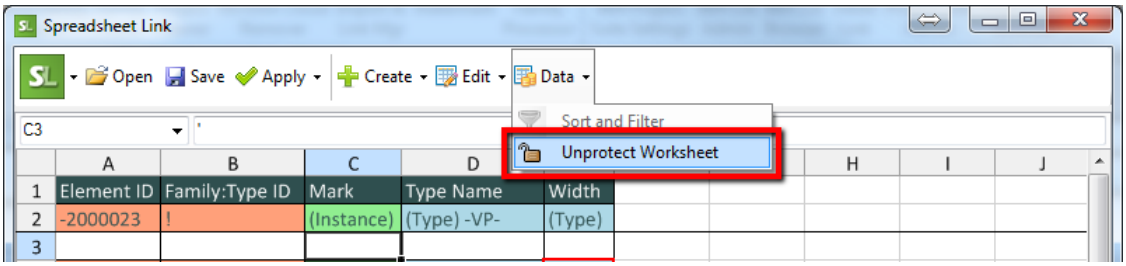
This option can be useful for locating information about a specific family instance, such as a door with a specific door number (Mark) value.

Sorting and Filtering the Spreadsheet

To follow the type parameter concept, and also to show which parameter values Revit itself will not allow to be changed, some spreadsheet cells may not be editable in the spreadsheet view. These non-editable cells are shown with gray text.

In order to make these cells non-editable in the spreadsheet, the spreadsheet must be protected with a password. However, when a spreadsheet is protected, the data in it cannot be sorted.

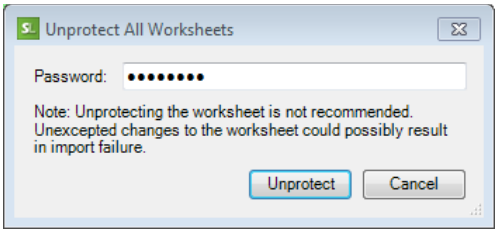
To sort the data in the spreadsheet first requires that the spreadsheet be unprotected. To do this, use the "Unprotect Worksheet" choice from the "Data" toolbar dropdown button:



The default password to unprotect a Spreadsheet Link spreadsheet is:

password

This password is typed in for you automatically in the dialog that appears.



Another password may be entered, which could be useful if importing a workbook that someone else had last protected using an external spreadsheet program, such as Microsoft® Excel®.

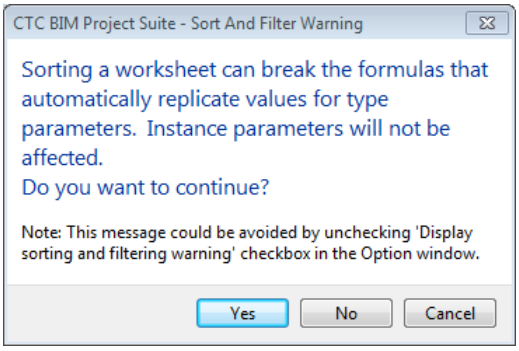
Once the sheet is unprotected, the data can be sorted.

The sorting is very similar to how Microsoft Excel operates.

First, select a row to be the last row that is **unsorted**. All rows below this row will be sorted depending on the settings. To sort or filter all rows of data, start by selecting Row 3.

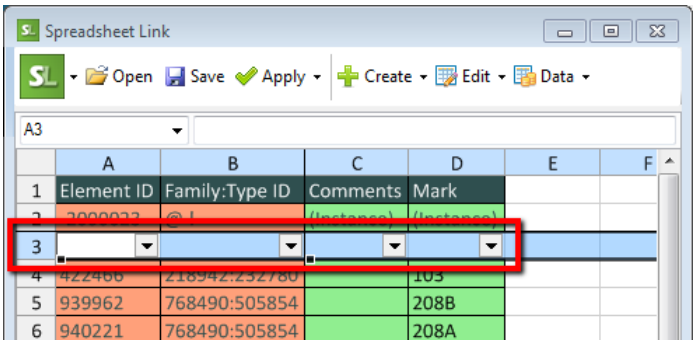
Then select the "Sort and Filter" choice from the "Data" dropdown button in the toolbar. This will provide dropdown buttons in each column that can be used to control sorting and filtering.

When you select this option, the following warning will be displayed:

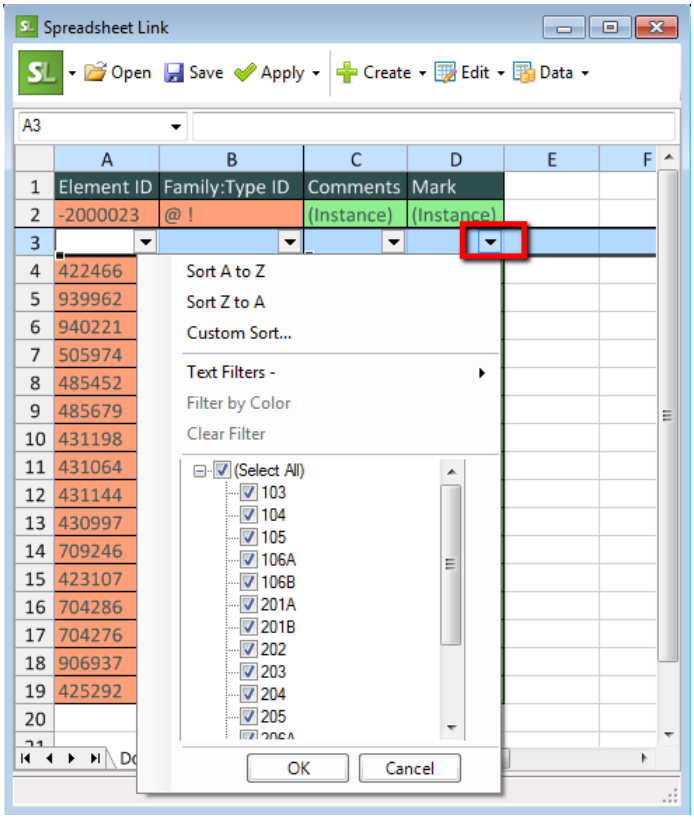


As the warning states, sorting a spreadsheet containing formulas can break the formulas and cause the automatic replication of values for type parameters to stop working.

When the "Yes" button is clicked, the sorting and filtering tools are added to the row that had been selected:



Click the dropdown button for a column to display the tools for sorting and filtering the data in that column.



This method of sorting is more powerful, but will break the formulas used to emulate type parameter functionality in the spreadsheet.

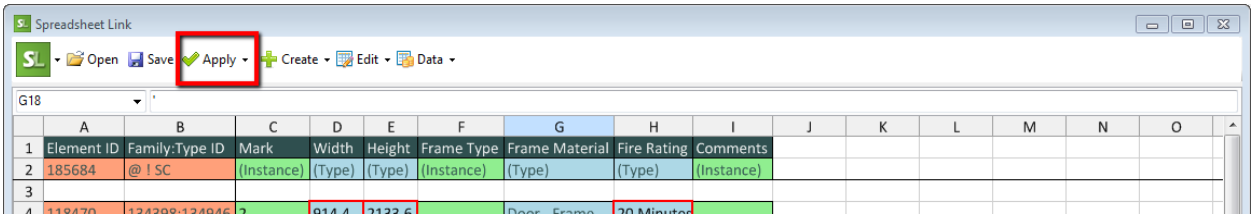
This method of sorting is best used when only instance parameters have been chosen for the category, or a type category is being used. When a mixture of instance and type parameters are being used for a category, the simpler sorting method within each category's settings (on the third tab) works best.

To exit this method of sorting and filtering on the current sheet, use the "Exit Sort and Filter" choice on the "Data" toolbar dropdown button.

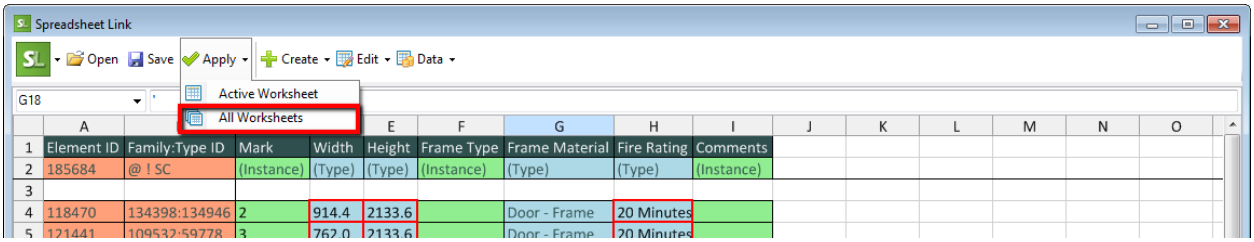
To protect the worksheet again, use the "Protect Worksheet" choice on the "Data" toolbar dropdown button.

Applying Changes to the Revit Model

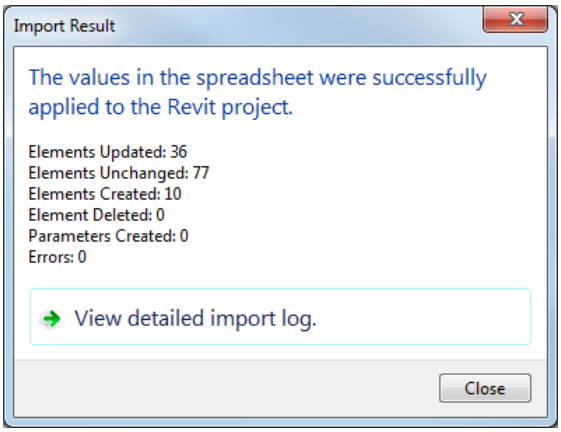
To apply changes made in the spreadsheet to the Revit model, be sure to make the desired tab active and click the "Apply" button.



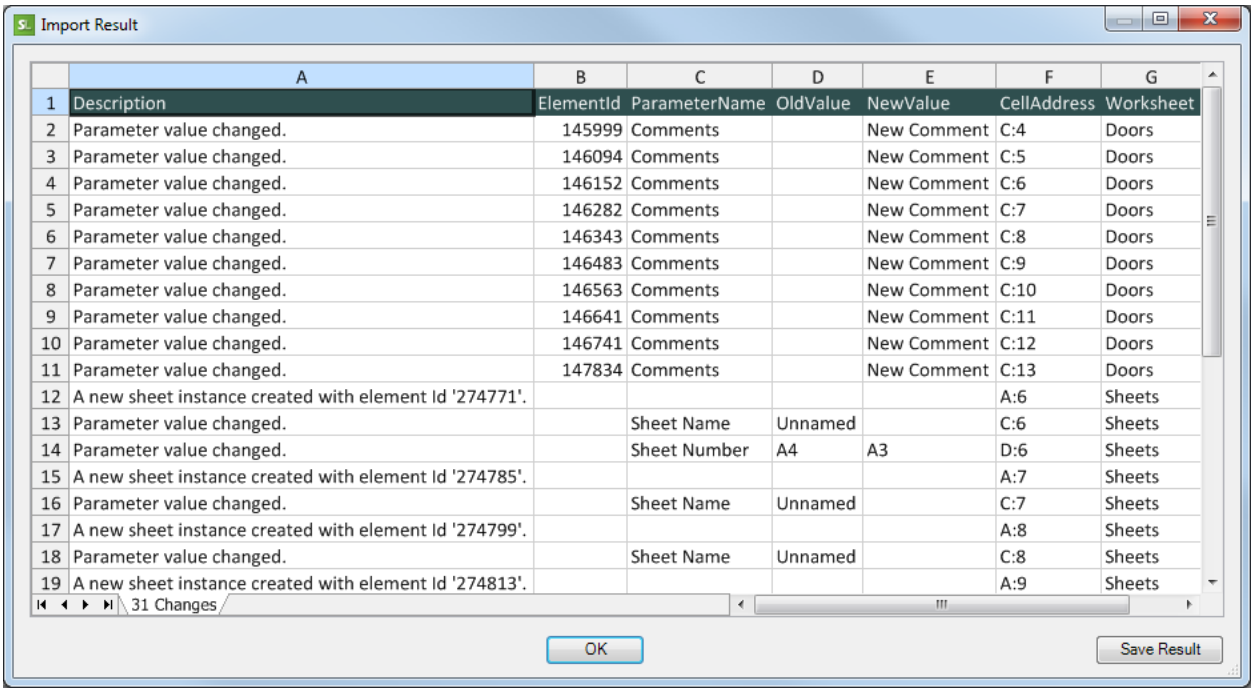
If multiple categories have been defined (multiple worksheets exist), changes from all worksheets can be applied simultaneously by clicking the dropdown arrow next to apply and selecting "All Worksheets"



Once the changes have been applied an "Import Result" screen will appear to display the results of the import.



For more details, click the “View detailed import log” button:

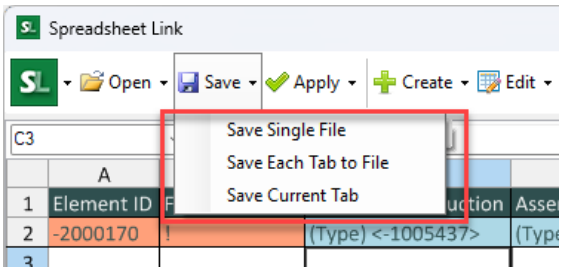


	A	B	C	D	E	F	G
1	Description	ElementId	ParameterName	OldValue	NewValue	CellAddress	Worksheet
2	Parameter value changed.	145999	Comments		New Comment	C:4	Doors
3	Parameter value changed.	146094	Comments		New Comment	C:5	Doors
4	Parameter value changed.	146152	Comments		New Comment	C:6	Doors
5	Parameter value changed.	146282	Comments		New Comment	C:7	Doors
6	Parameter value changed.	146343	Comments		New Comment	C:8	Doors
7	Parameter value changed.	146483	Comments		New Comment	C:9	Doors
8	Parameter value changed.	146563	Comments		New Comment	C:10	Doors
9	Parameter value changed.	146641	Comments		New Comment	C:11	Doors
10	Parameter value changed.	146741	Comments		New Comment	C:12	Doors
11	Parameter value changed.	147834	Comments		New Comment	C:13	Doors
12	A new sheet instance created with element Id '274771'.					A:6	Sheets
13	Parameter value changed.		Sheet Name	Unnamed		C:6	Sheets
14	Parameter value changed.		Sheet Number	A4	A3	D:6	Sheets
15	A new sheet instance created with element Id '274785'.					A:7	Sheets
16	Parameter value changed.		Sheet Name	Unnamed		C:7	Sheets
17	A new sheet instance created with element Id '274799'.					A:8	Sheets
18	Parameter value changed.		Sheet Name	Unnamed		C:8	Sheets
19	A new sheet instance created with element Id '274813'.					A:9	Sheets

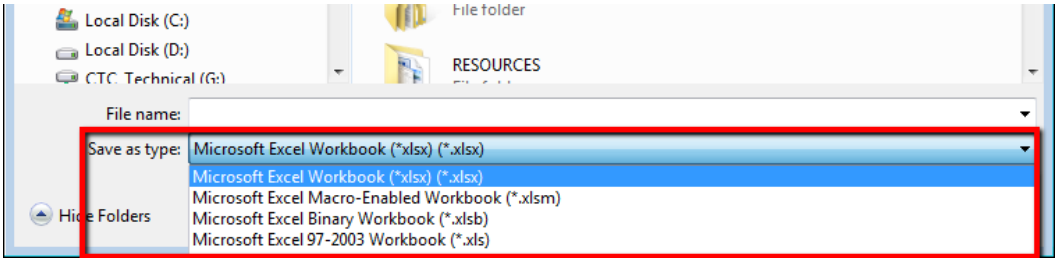
Exporting and Opening Files from Spreadsheet Link

Exporting data from Revit to a spreadsheet allows staff that either doesn't have Revit or doesn't know Revit to be utilized as part of the design process. The "Save" button is used to save Revit data to any of the following file formats: .xlsx, .xlsm, .xlsb, .xls, .txt, .csv

Three options are available: 'Single File' creates a spreadsheet/workbook with all worksheets/tabs included, "Each Tab" creates separate files per tab and 'Current Tab' exports only the data from the current worksheet.

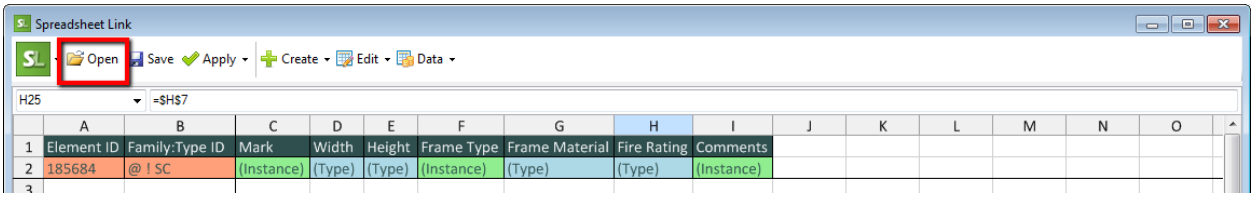


In the "Export Spreadsheet" window, the export format can be selected from the "Save as type:" drop down menu.



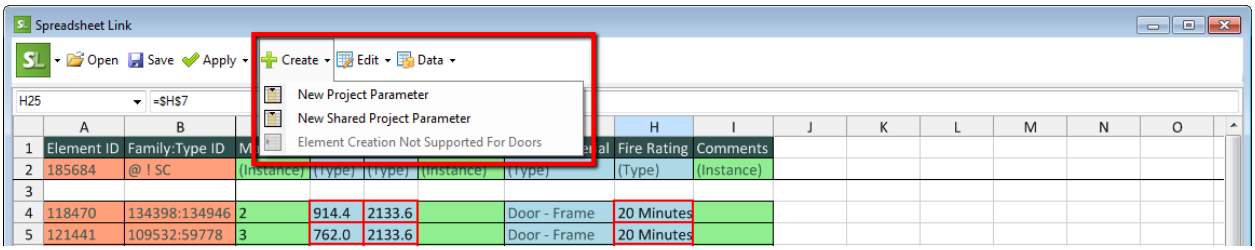
To open a spreadsheet, click the "Open…" button and browse to the desired spreadsheet file.

IMPORTANT: Spreadsheet Link can only import data into Revit from spreadsheet files it originally created.

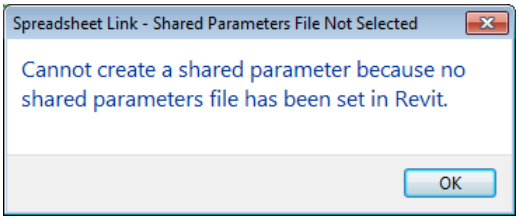


Creating New Project Parameters

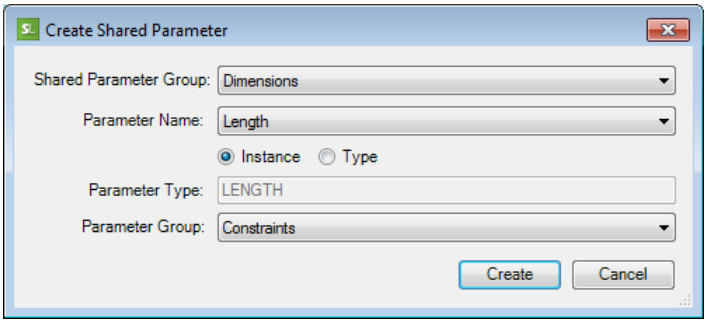
Spreadsheet Link has the ability to create new project parameters which can then be populated with data from the spreadsheet. To create a new parameter from the Spreadsheet Link interface, click the "Create" toolbar dropdown button and select the desired parameter type.



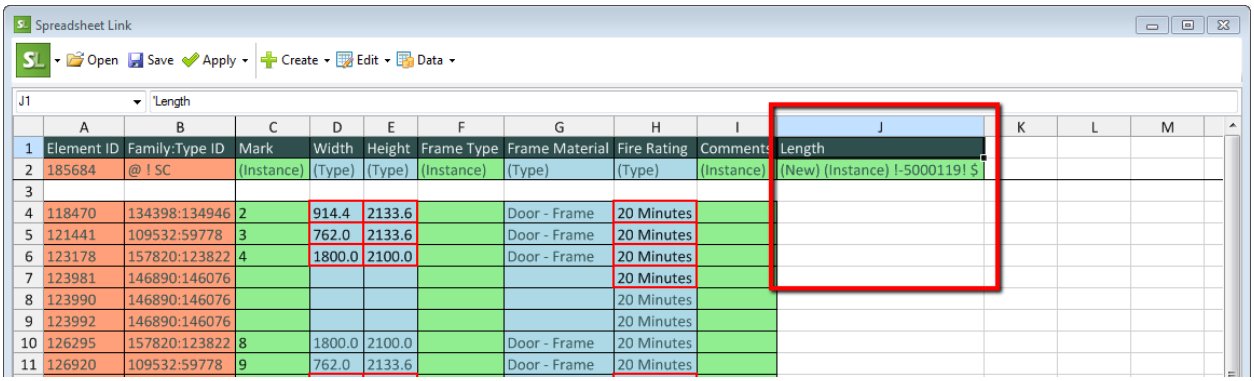
When creating shared project parameters, Spreadsheet Link will use the shared parameters file currently being used by Revit. If no shared parameters file is specified in Revit, the following message will be displayed when attempting to create a new shared project parameter:



As long as a shared parameters file is specified and accessible, the "Create New Parameter" dialog will appear. Select the options to define the new parameter and click "Create"

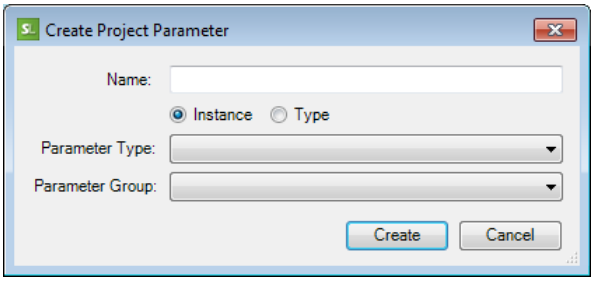


The new parameter will be added to the end of the spreadsheet and is ready to be populated with information.



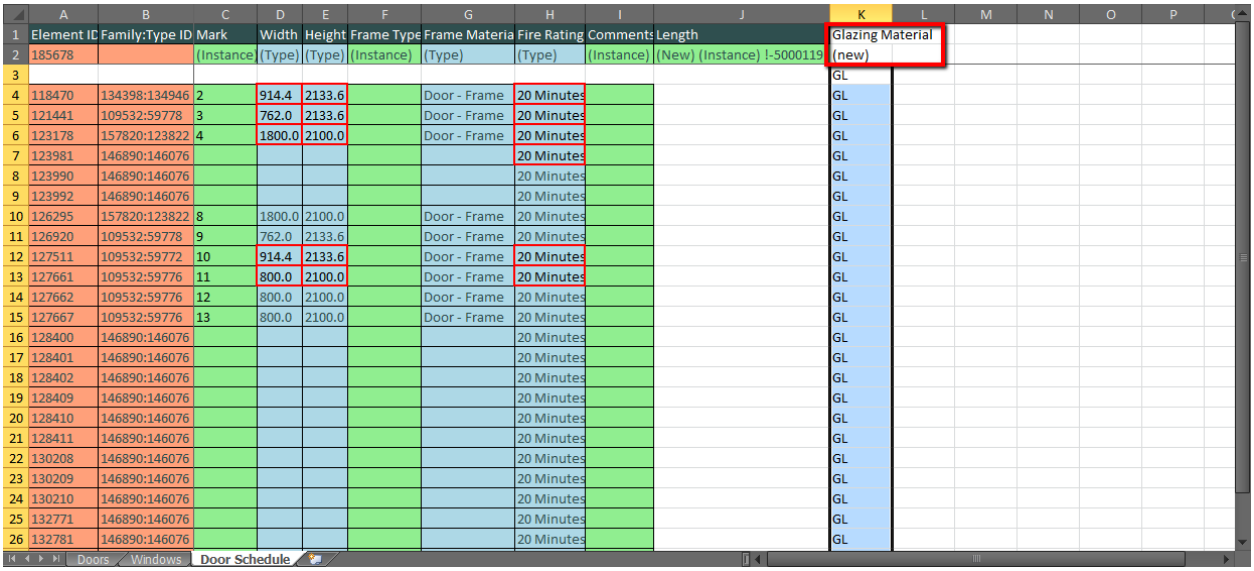
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Element ID	Family:Type ID	Mark	Width	Height	Frame Type	Frame Material	Fire Rating	Comments	Length			
2	185684	@ ! SC	(Instance)	(Type)	(Type)	(Instance)	(Type)	(Type)	(Instance)	(New) (Instance) !-5000119! $			
3													
4	118470	134398:134946	2	914.4	2133.6		Door - Frame	20 Minutes					
5	121441	109532:59778	3	762.0	2133.6		Door - Frame	20 Minutes					
6	123178	157820:123822	4	1800.0	2100.0		Door - Frame	20 Minutes					
7	123981	146890:146076						20 Minutes					
8	123990	146890:146076						20 Minutes					
9	123992	146890:146076						20 Minutes					
10	126295	157820:123822	8	1800.0	2100.0		Door - Frame	20 Minutes					
11	126920	109532:59778	9	762.0	2133.6		Door - Frame	20 Minutes					

The “New Project Parameter” dialog is similar to the “New Shared Project Parameter” dialog, but a parameter name will have to be specified.



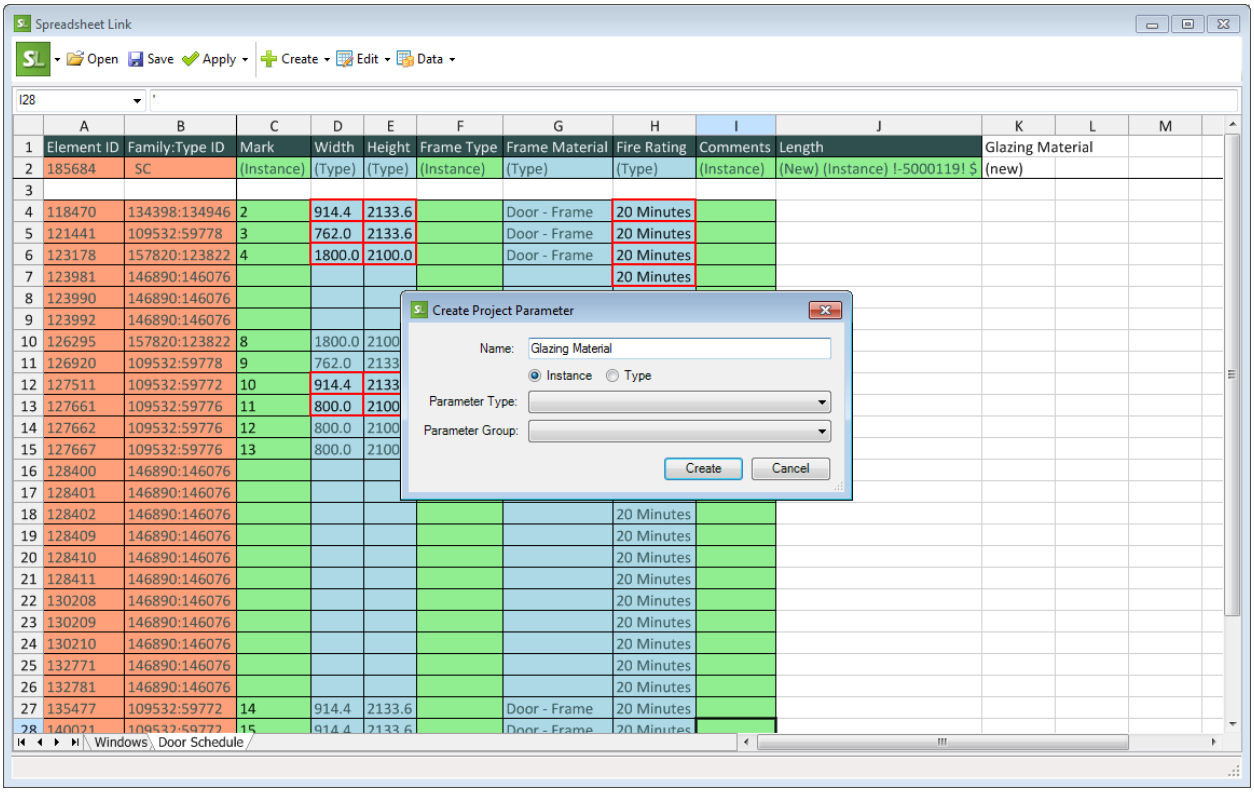
New project parameters can also be defined when editing the data in a spreadsheet application. Only new instance parameters can be defined when using this approach.

To create a new instance project parameter using a spreadsheet application (outside of Spreadsheet Link), start by opening a spreadsheet file that was exported from Spreadsheet Link. In the first unused column, enter the desired parameter name in row 1 and in row 2 enter: (new)



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Element ID	Family:Type ID	Mark	Width	Height	Frame Type	Frame Materia	Fire Rating	Comments	Length	Glazing Material					
2	185678		(Instance)	(Type)	(Type)	(Instance)	(Type)	(Type)	(Instance)	(New) (Instance) !-5000119	(new)					
3											GL					
4	118470	134398:134946	2	914.4	2133.6		Door - Frame	20 Minutes			GL					
5	121441	109532:59778	3	762.0	2133.6		Door - Frame	20 Minutes			GL					
6	123178	157820:123822	4	1800.0	2100.0		Door - Frame	20 Minutes			GL					
7	123981	146890:146076						20 Minutes			GL					
8	123990	146890:146076						20 Minutes			GL					
9	123992	146890:146076						20 Minutes			GL					
10	126295	157820:123822	8	1800.0	2100.0		Door - Frame	20 Minutes			GL					
11	126920	109532:59778	9	762.0	2133.6		Door - Frame	20 Minutes			GL					
12	127511	109532:59772	10	914.4	2133.6		Door - Frame	20 Minutes			GL					
13	127661	109532:59776	11	800.0	2100.0		Door - Frame	20 Minutes			GL					
14	127662	109532:59776	12	800.0	2100.0		Door - Frame	20 Minutes			GL					
15	127667	109532:59776	13	800.0	2100.0		Door - Frame	20 Minutes			GL					
16	128400	146890:146076						20 Minutes			GL					
17	128401	146890:146076						20 Minutes			GL					
18	128402	146890:146076						20 Minutes			GL					
19	128409	146890:146076						20 Minutes			GL					
20	128410	146890:146076						20 Minutes			GL					
21	128411	146890:146076						20 Minutes			GL					
22	130208	146890:146076						20 Minutes			GL					
23	130209	146890:146076						20 Minutes			GL					
24	130210	146890:146076						20 Minutes			GL					
25	132771	146890:146076						20 Minutes			GL					
26	132781	146890:146076						20 Minutes			GL					

Spreadsheet Link will recognize this as a new project instance parameter when importing values to the Revit model. Upon import, the parameter type and group will need to be specified.

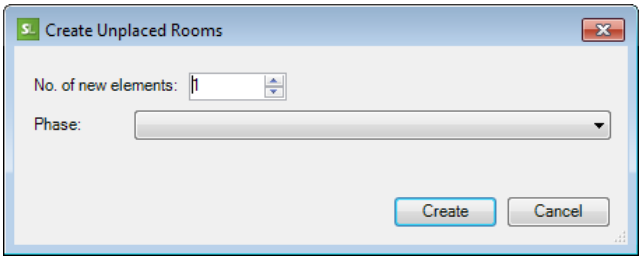


Creating New Elements

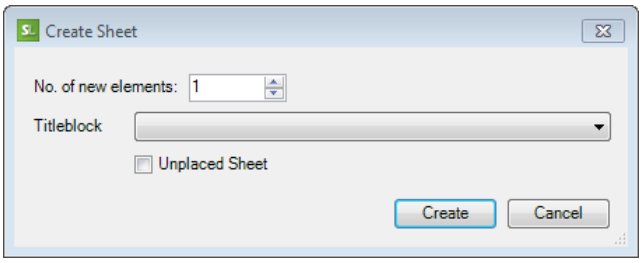
Spreadsheet Link has the ability to create unplaced rooms, spaces, HVAC zones and sheets. To create a new element from the Spreadsheet Link interface, first configure an export for one of the four supported categories mentioned above.

From the spreadsheet window click the “Create” button, and then “New Element…” option.

For rooms, spaces, areas and zones specify the desired number of new elements and the desired phase.



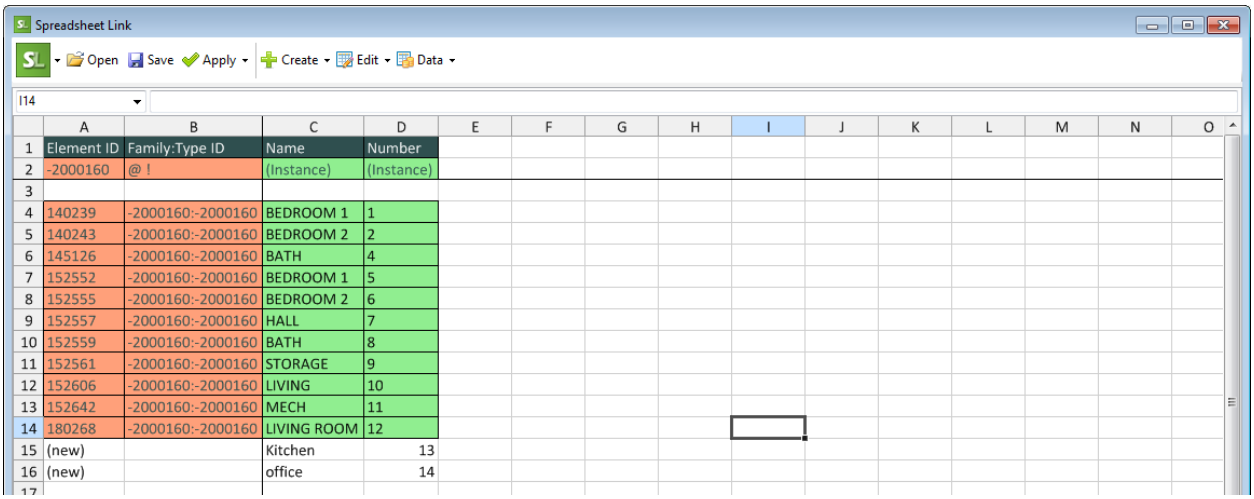
For sheets, specify the desired number of new sheets, the title block and whether or not they should be unplaced sheets.



New elements can also be created in spreadsheets that have been exported when using an external spreadsheet application. To create a new element using a spreadsheet application, open an export from Spreadsheet Link.

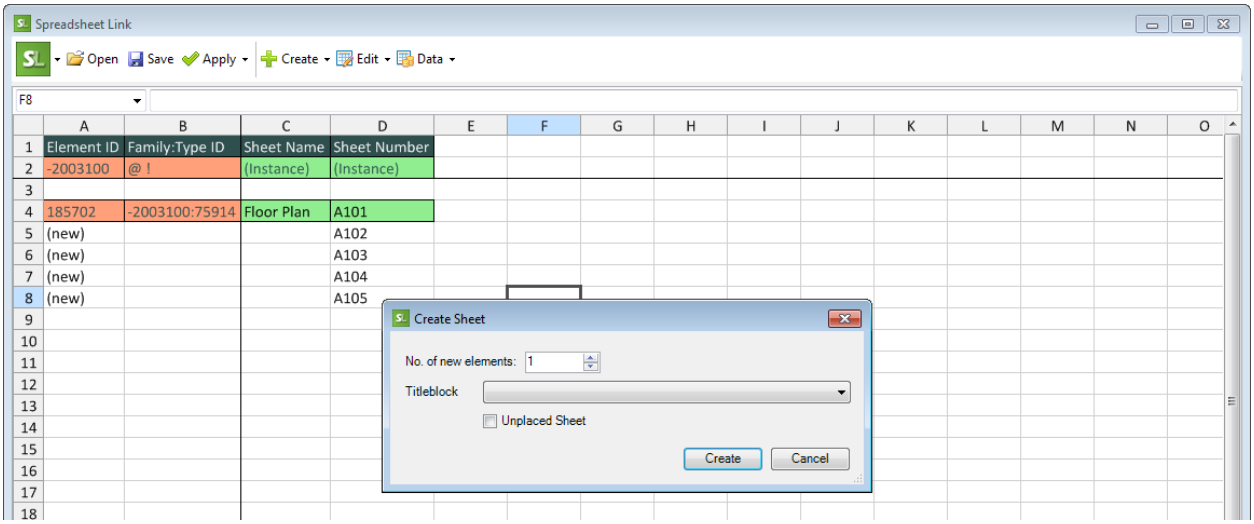
To create a new unplaced Room, Space, Zone or Sheet enter "(new)" without the quotes in the first empty row of column A for each new element desired on the sheet for the type of element to be created.

Values entered for read-only parameters will not be applied when the data is imported back into the Revit model.



	A	B	C	D
1	Element ID	Family:Type ID	Name	Number
2	-2000160	@ !	(Instance)	(Instance)
3				
4	140239	-2000160:-2000160	BEDROOM 1	1
5	140243	-2000160:-2000160	BEDROOM 2	2
6	145126	-2000160:-2000160	BATH	4
7	152552	-2000160:-2000160	BEDROOM 1	5
8	152555	-2000160:-2000160	BEDROOM 2	6
9	152557	-2000160:-2000160	HALL	7
10	152559	-2000160:-2000160	BATH	8
11	152561	-2000160:-2000160	STORAGE	9
12	152606	-2000160:-2000160	LIVING	10
13	152642	-2000160:-2000160	MECH	11
14	180268	-2000160:-2000160	LIVING ROOM	12
15	(new)		Kitchen	13
16	(new)		office	14

When creating new sheets, during the import a prompt will appear which requires having the Title block specified. If the sheet is intended to be a placeholder, checking the "Unplaced Sheet" checkbox will allow not specifying a title block. If numerous new sheets are to be created, the "Apply this option to remaining new elements" checkbox can be used.

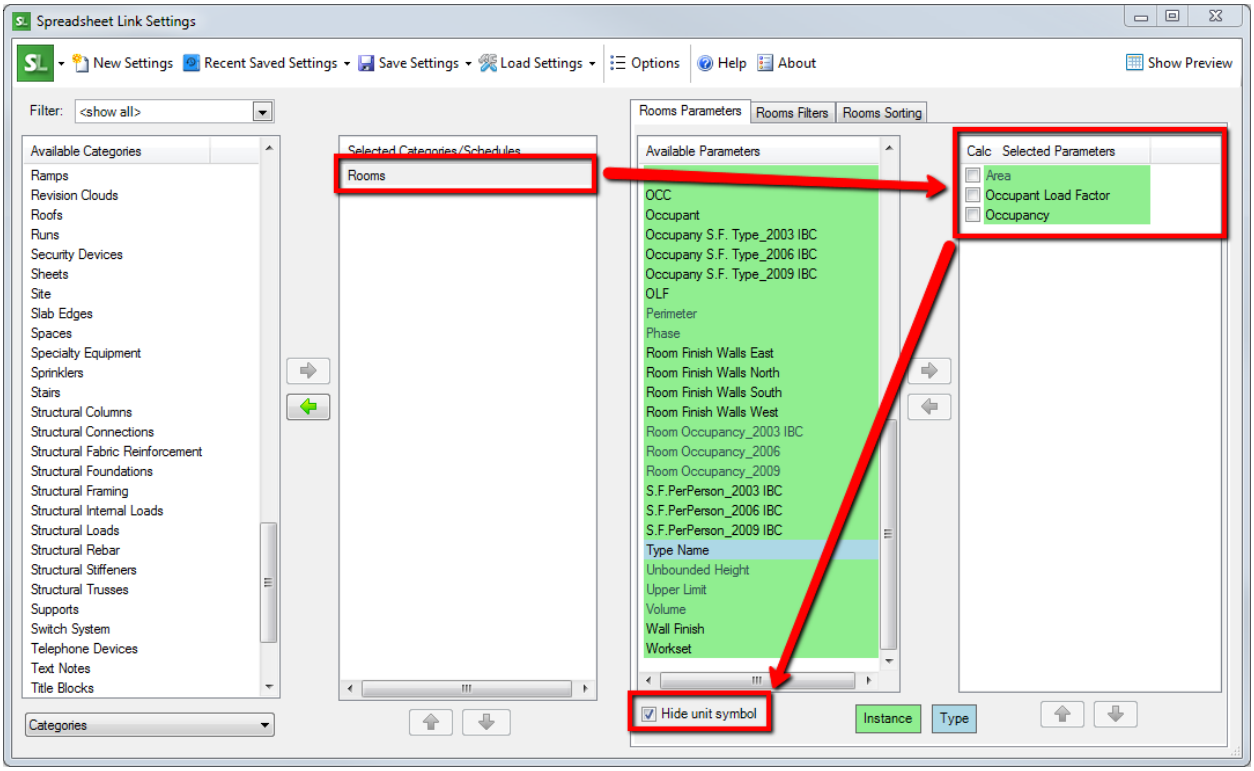


	A	B	C	D
1	Element ID	Family:Type ID	Sheet Name	Sheet Number
2	-2003100	@ !	(Instance)	(Instance)
3				
4	185702	-2003100:75914	Floor Plan	A101
5	(new)			A102
6	(new)			A103
7	(new)			A104
8	(new)			A105

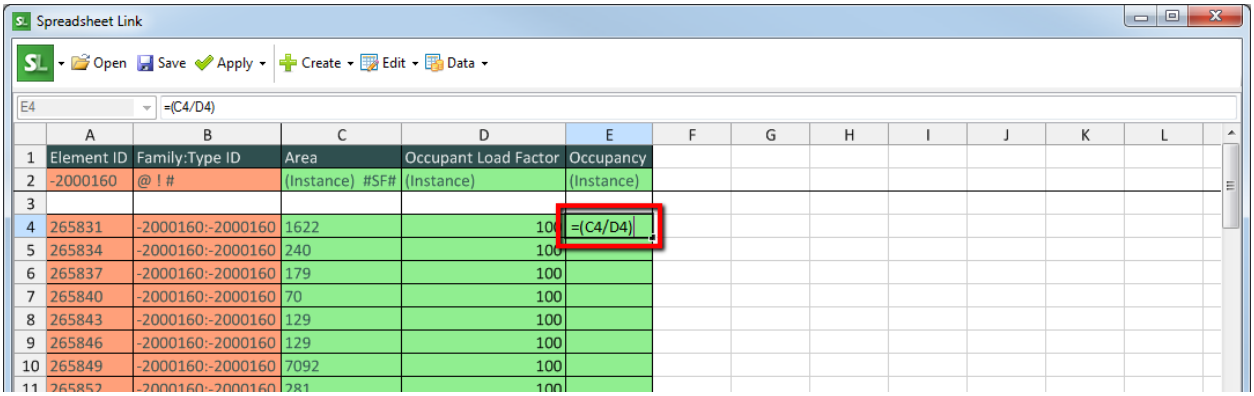
Calculated Values

One of the advantages of exporting information from Revit to a spreadsheet format is the ability to modify that information with the use of formulas in the spreadsheet environment. The calculated value setting in Spreadsheet Link takes these formulas to the next level by saving them into the spreadsheet and the Spreadsheet Link settings files for repeat use. The following is an example of using the Calculated Value function to update the occupancy load of the rooms.

The “Rooms” category has been selected and the “Area”, “Occupancy Load Factor” and “Occupancy” parameters have been added. The “Hide unit symbol” checkbox has also been enabled. This strips the unit symbol from the value in the spreadsheet so the values can more easily be used in formulas.

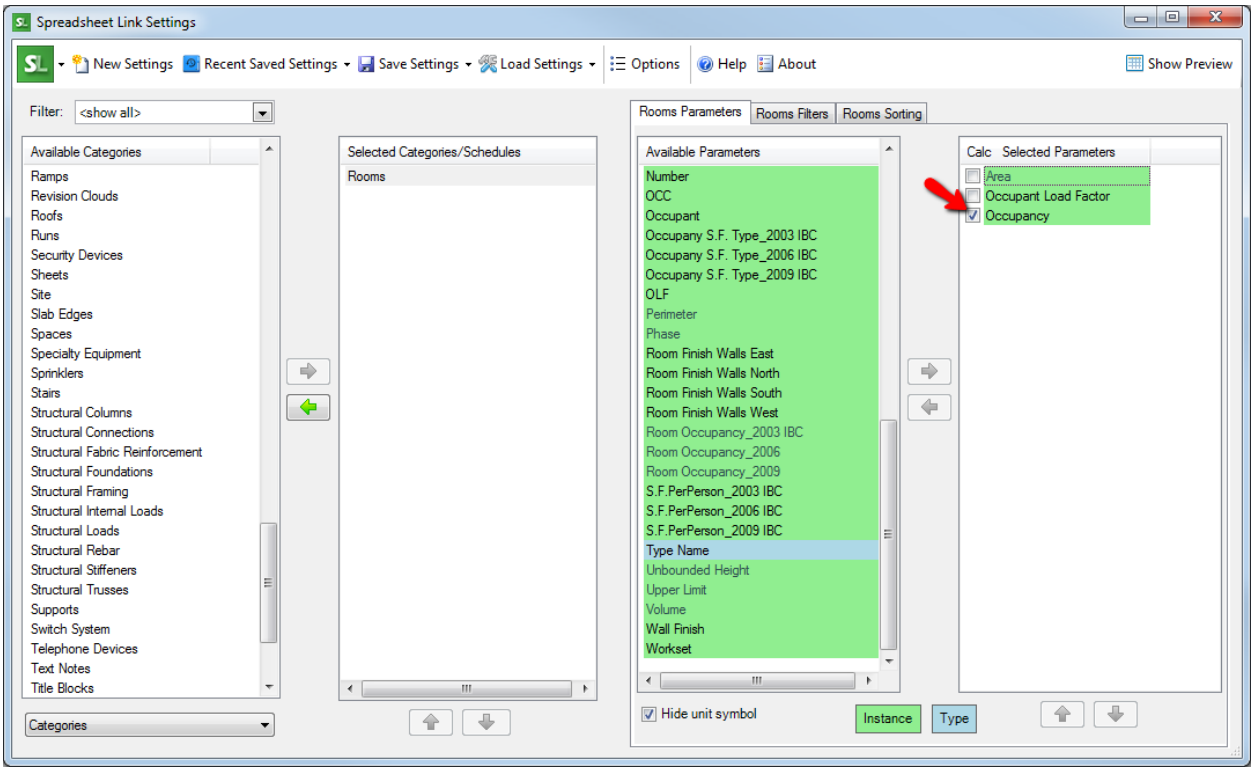


In the spreadsheet, a formula is typed in to the **first value cell** (in row 4) of the “Occupancy” parameter to calculate the occupancy value.

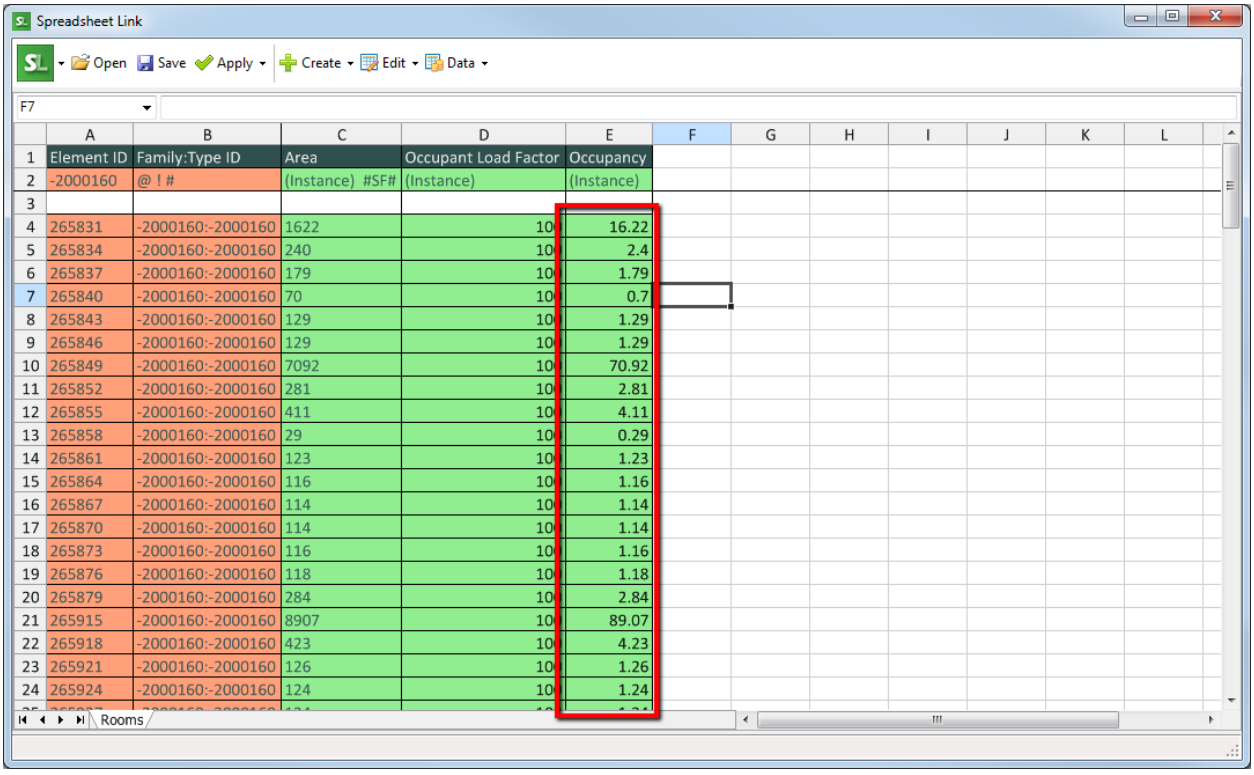


	A	B	C	D	E
1	Element ID	Family:Type ID	Area	Occupant Load Factor	Occupancy
2	-2000160	@ ! #	(Instance) #SF#	(Instance)	(Instance)
3					
4	265831	-2000160:-2000160	1622	100	=(C4/D4)
5	265834	-2000160:-2000160	240	100	
6	265837	-2000160:-2000160	179	100	
7	265840	-2000160:-2000160	70	100	
8	265843	-2000160:-2000160	129	100	
9	265846	-2000160:-2000160	129	100	
10	265849	-2000160:-2000160	7092	100	
11	265852	-2000160:-2000160	281	100	

Back in the settings window, activate the “Calc” checkbox for the “Occupancy” field.



When the “calc” checkbox is activated, if there is a formula in the first cell for that parameter it will be propagated through all of the cells for that column. The resulting change in the spreadsheet will look like this:

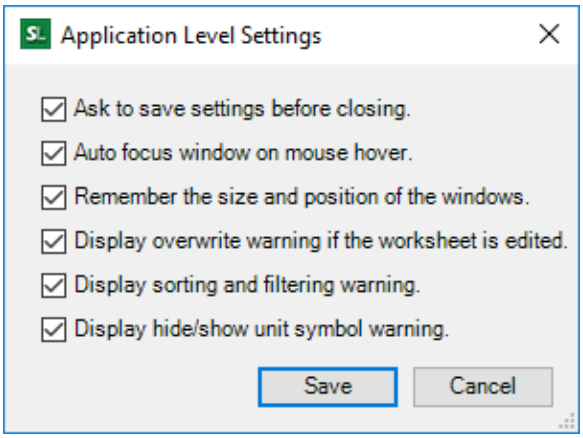


	A	B	C	D	E	F	G	H	I	J	K	L
1	Element ID	Family:Type ID	Area	Occupant Load Factor	Occupancy							
2	-2000160	@ ! #	(Instance) #SF#	(Instance)	(Instance)							
3												
4	265831	-2000160:-2000160	1622	10	16.22							
5	265834	-2000160:-2000160	240	10	2.4							
6	265837	-2000160:-2000160	179	10	1.79							
7	265840	-2000160:-2000160	70	10	0.7							
8	265843	-2000160:-2000160	129	10	1.29							
9	265846	-2000160:-2000160	129	10	1.29							
10	265849	-2000160:-2000160	7092	10	70.92							
11	265852	-2000160:-2000160	281	10	2.81							
12	265855	-2000160:-2000160	411	10	4.11							
13	265858	-2000160:-2000160	29	10	0.29							
14	265861	-2000160:-2000160	123	10	1.23							
15	265864	-2000160:-2000160	116	10	1.16							
16	265867	-2000160:-2000160	114	10	1.14							
17	265870	-2000160:-2000160	114	10	1.14							
18	265873	-2000160:-2000160	116	10	1.16							
19	265876	-2000160:-2000160	118	10	1.18							
20	265879	-2000160:-2000160	284	10	2.84							
21	265915	-2000160:-2000160	8907	10	89.07							
22	265918	-2000160:-2000160	423	10	4.23							
23	265921	-2000160:-2000160	126	10	1.26							
24	265924	-2000160:-2000160	124	10	1.24							

The calculated value settings and formulas will be saved if the settings are saved. This allows for repeat use and can make updating certain values much easier. Spreadsheet Link's interface can interpret most common functions and formulae. For a complete list of functions that can be used, refer to the table in Appendix C.

Spreadsheet Link Options

There are several options to control the default behavior of Spreadsheet Link.



1. When SL is closed, a message will offer the option to save the current settings, even if no changes were made
2. When checked, SL will switch between the settings and spreadsheet windows without have to click on them
3. If a previously created spreadsheet exists at the same location, SL will warn before overwriting
4. If changes have been made to the spreadsheet data, applying filters or sortings may discard the current changes
5. SL can show/hide unit symbols – uncheck this to disable the warning

Spreadsheet Link Express

Introduction

Spreadsheet Link Express is intended to rapidly re-apply previously saved settings for Spreadsheet Link. This is particularly useful when the settings have been configured to use the calculated value feature.

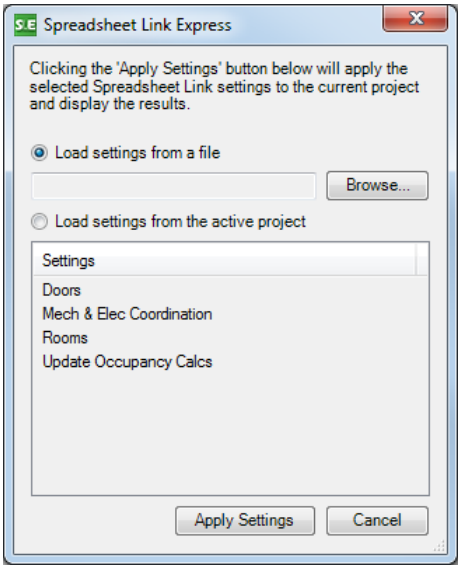
This can be very beneficial in environments where some users are more experienced with creating spreadsheet formulas than others. Those with less experience can simply run the settings created by others against the Revit project.

Starting Spreadsheet Link Express

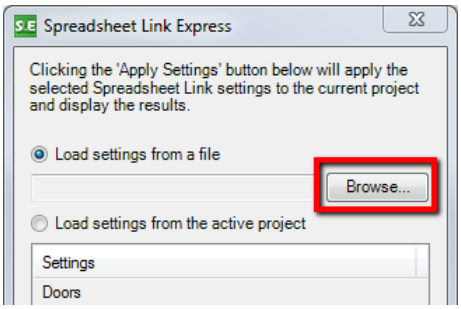
On the Revit ribbon, click on the “Spreadsheet Link Express” button.

Main Dialog

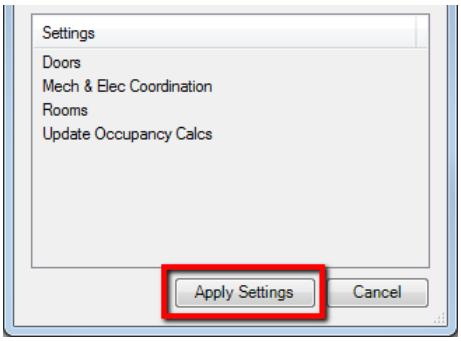
Here is the main dialog for Spreadsheet Link Express.



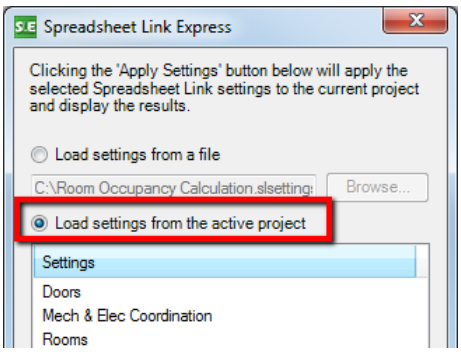
To load settings that have been saved to an .slsettings file, click the browse button and locate the desired settings file.



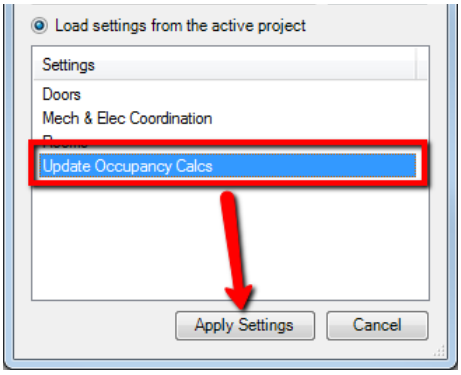
Once selected, click the “Apply Settings” button. This will re-load and automatically apply the settings to the project.



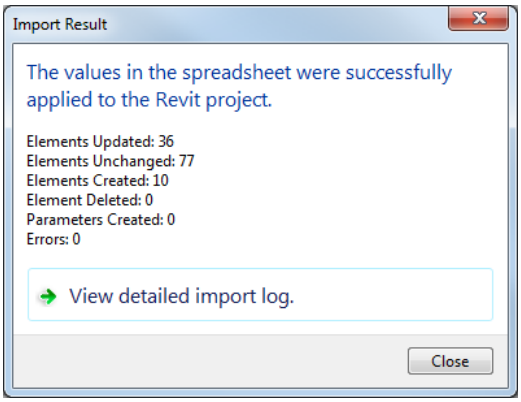
Settings that have been saved inside the project itself can also be loaded and applied. To select settings from a project, click the “Load settings from the active project” button.



Select the desired settings from the project and click the “Apply Settings” button.



When the “Apply Settings” button is clicked, Spreadsheet Link invisibly runs and applies the settings to the project. When complete, the results dialog is displayed:


Import Result
The values in the spreadsheet were successfully applied to the Revit project.
Elements Updated: 36
Elements Unchanged: 77
Elements Created: 10
Element Deleted: 0
Parameters Created: 0
Errors: 0
View detailed import log.
Close

View Creator

Introduction

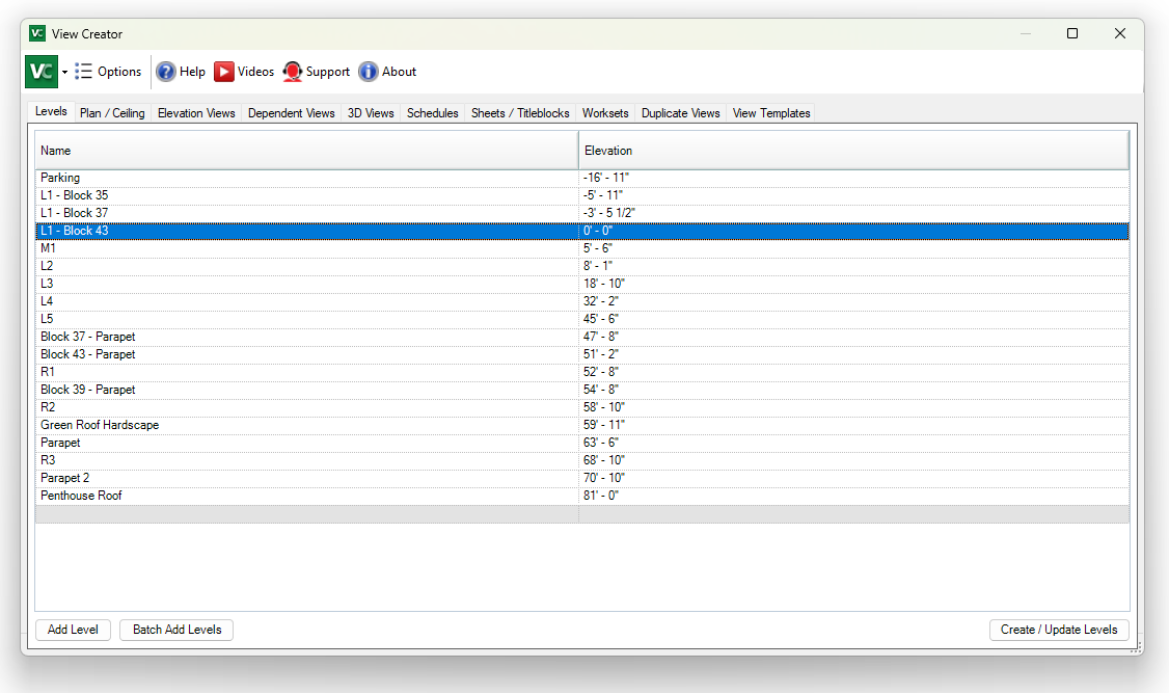
View Creator has several functions that aid in the rapid creation of many Revit view types based on settings and templates.

Starting View Creator

On the Revit ribbon, click on the “View Creator” button.

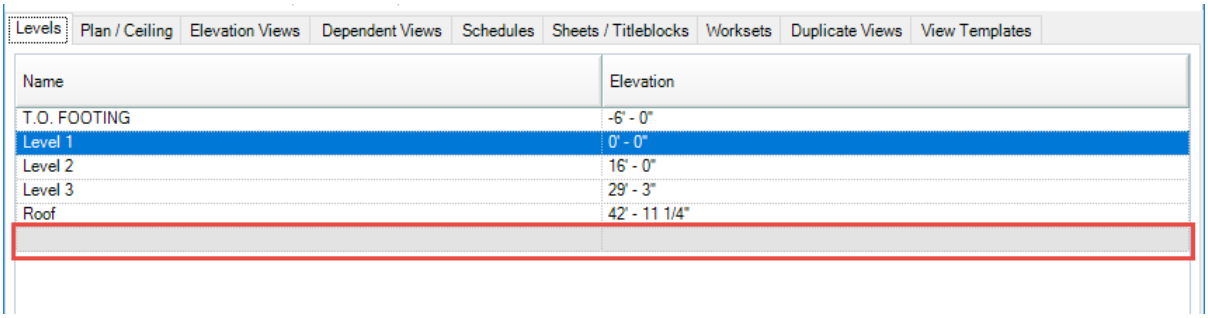
The View Creator User Interface

The View Creator dialog will open.

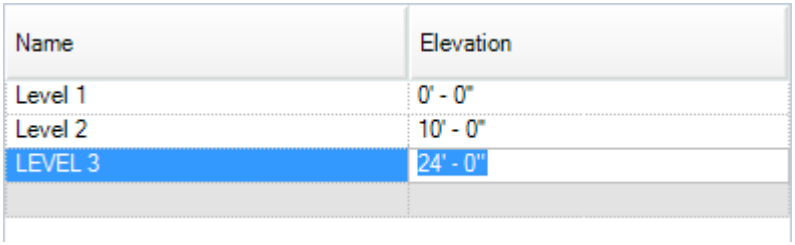


There are several tabs on the main interface, each one designed to assist with different aspects of view creation. The first tab is used to modify existing or to create additional levels in the project. This is particularly useful for initial project setup.

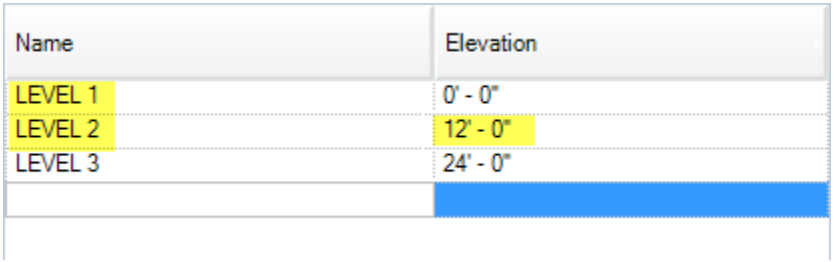
To create a new level, click in the grey space at the bottom of the list of levels.



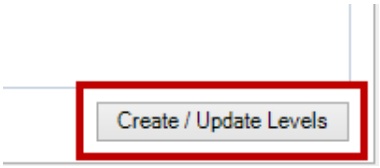
A new row will be created, supply a name and elevation for the new level to be created. In this example the level name "LEVEL 3" has been entered.



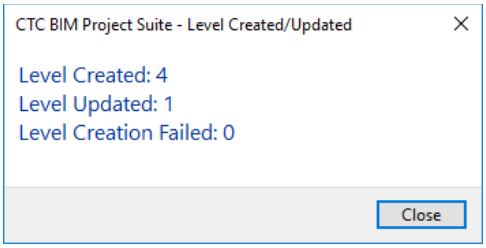
Names and elevations of existing levels can be modified in this dialog as well. In this example levels 1 and 2 have been changed to upper case and the elevation of level 2 has been changed to 12' – 0".



Once all level names and elevations have been set, click the “Create/Update Levels” button in the lower right corner of the window to apply the configuration to the project.

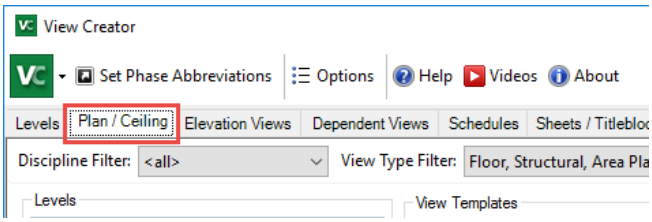


A confirmation dialog will indicate the results.

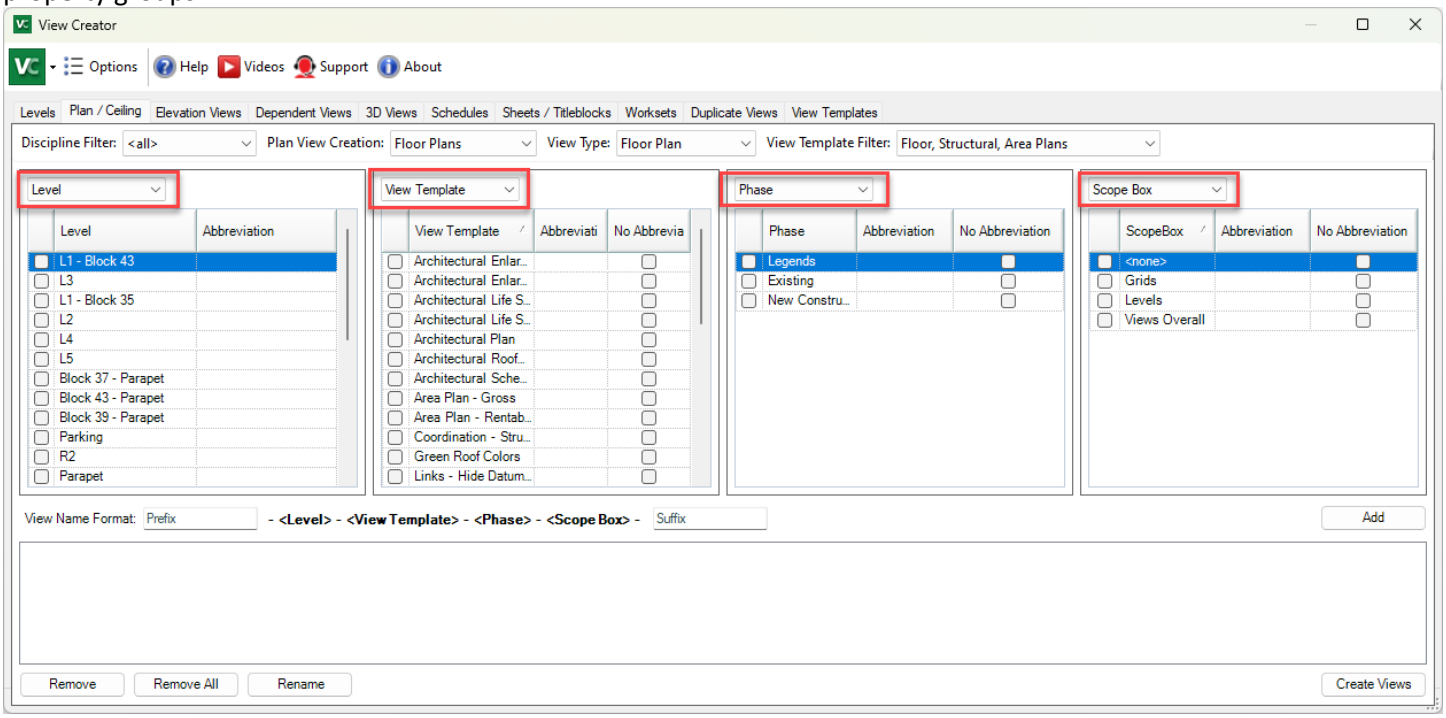


Plan & Ceiling Views

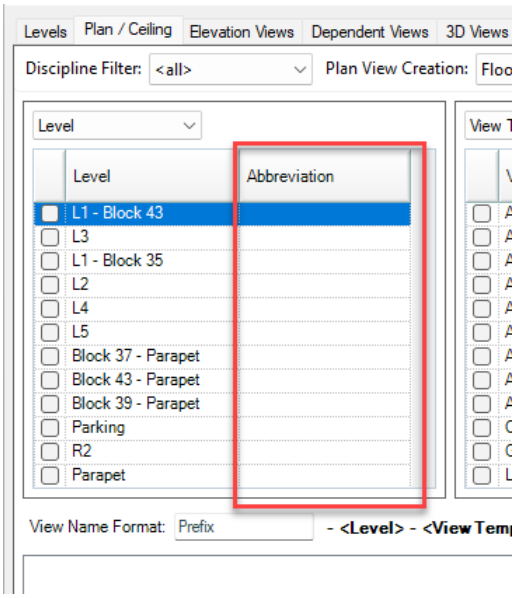
The Plan/Ceiling view tab is used to create floor plan and reflected ceiling plan views by selecting a combination of level, view template and phase.



The view names will be generated automatically based on the name of the level, view template, phase and scope box. Additionally, the order of each name part can be rearranged by selecting a different property from the drop list of the property groups.

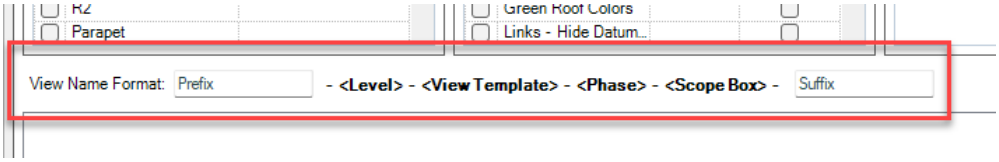


If the names of the level, view template, phase and scope box are not desired for the view name, the abbreviation fields can be used instead. To set an abbreviation click in the abbreviation cell for the desired level, view template or phase and enter a value.

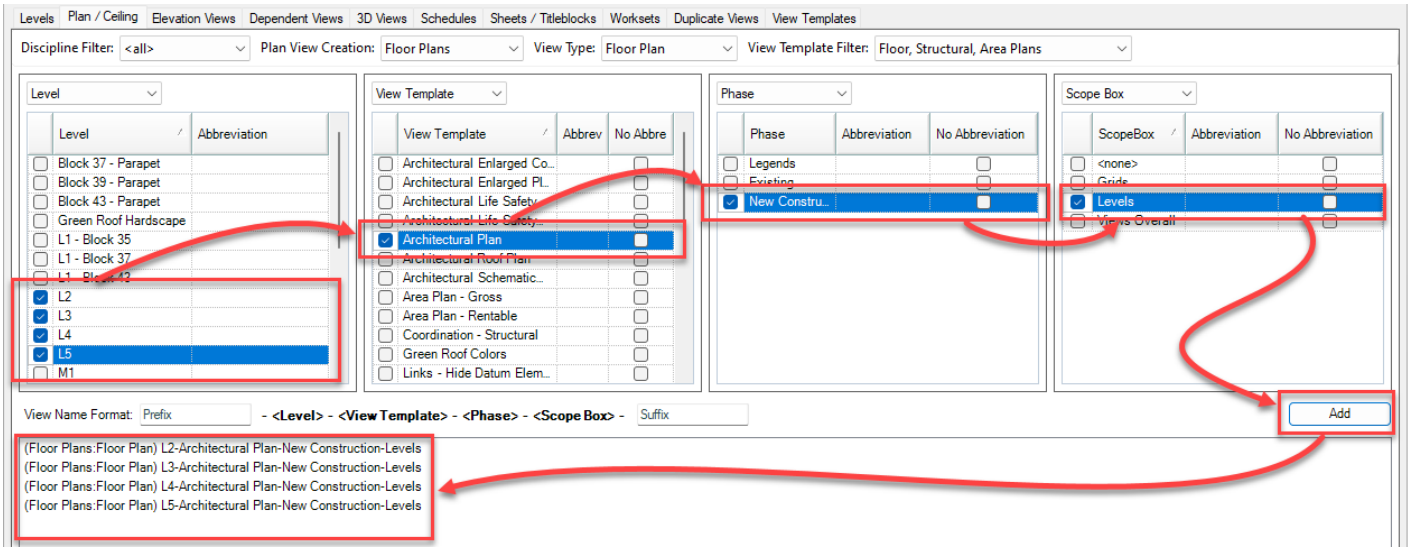


Phases have an additional option to allow “No Abbreviation” which, for example, is common practice for New Construction views. These values can also be set by clicking the “Set Phase Abbreviation” button.

The format used to name each view can be adjusted using the drop-down boxes. Also, a prefix and/or suffix can be added to each view.



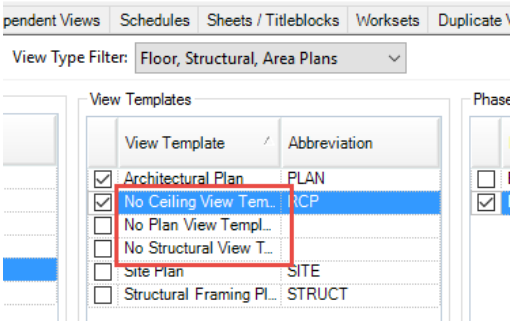
Once the abbreviations and view name format has been setup, to create views check at least one box from each of the 3 columns and click the “Add” button. A row will be added to the list at the bottom with the same name that will be applied to the newly created view. The separator characters are set in the options dialog and discussed later in this user guide. In this example Levels 2,3,4 and 5 are selected. The Architectural Plan template will be applied and the new construction phase has been selected along with the scope box for Levels resulting in the view names “(L2,L3,L4,L5)-Architectural Plan-New Construction-Levels” being added to the list.



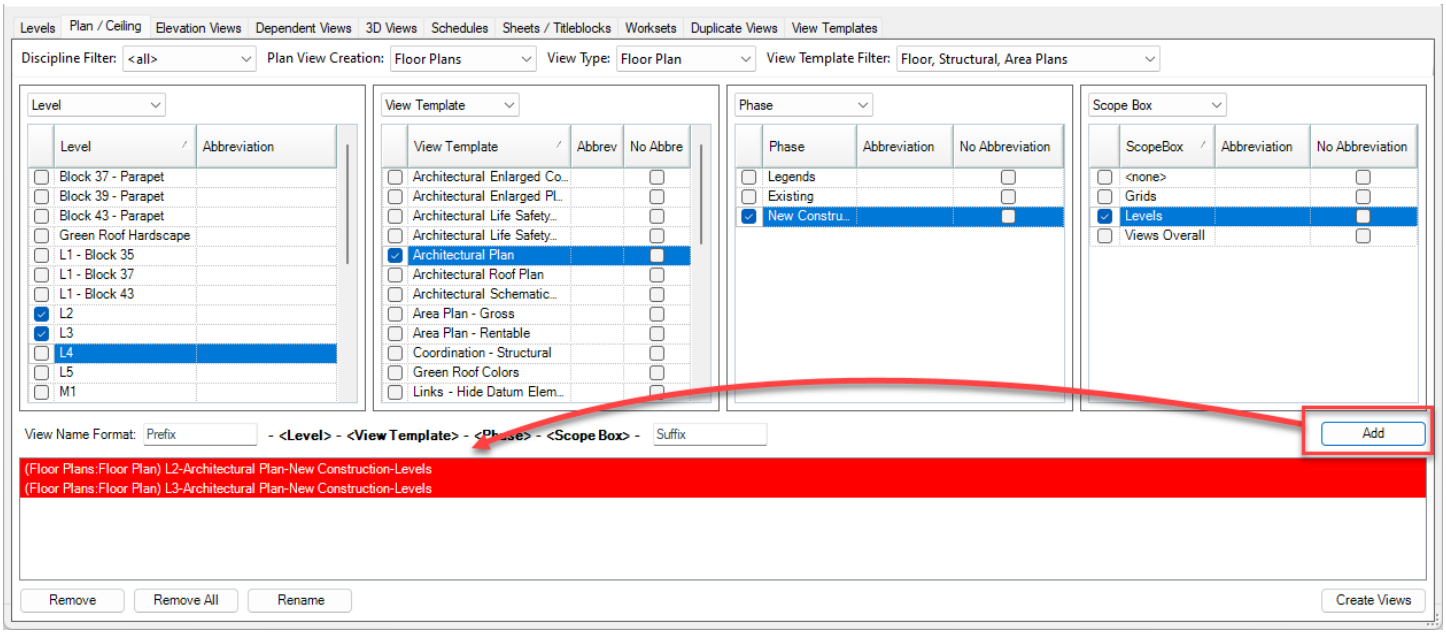
At this point, selections can be modified and additional items can be added to the list.

When one or more views have been added to the queue for creation, click the “Create Views” button.

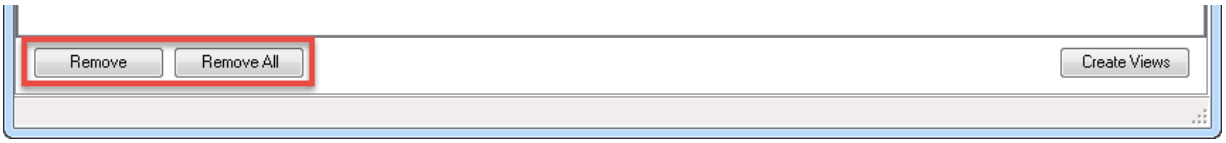
When selecting an option from the view template column, if one of the ‘No …Template’ options are selected any view created will have all proper view names associated based on naming rules, but no view template will be associated to the created view.



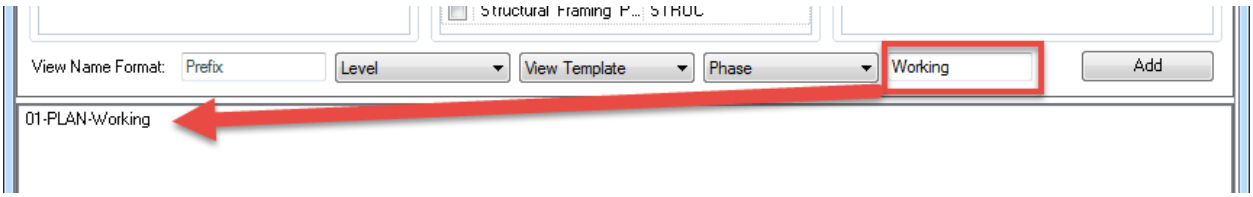
It is possible to add to the queue a combination of level, view template and phase that already exist in the project. To indicate that a view would be a duplicate, and therefore not created, view combinations that already exist will be indicated in red in the queue.



Items can be removed from the queue using either the “Remove” or “Remove All” buttons.

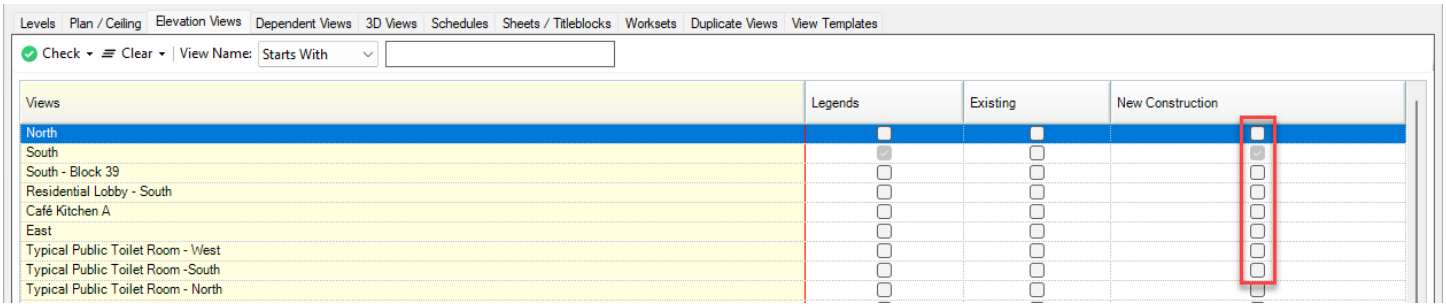


If a duplicate of an existing combination is needed, use the “Suffix” or “Prefix” option to generate a unique name for the view. In this example “Working” has been added to the end of the view name by using the “Suffix” option.

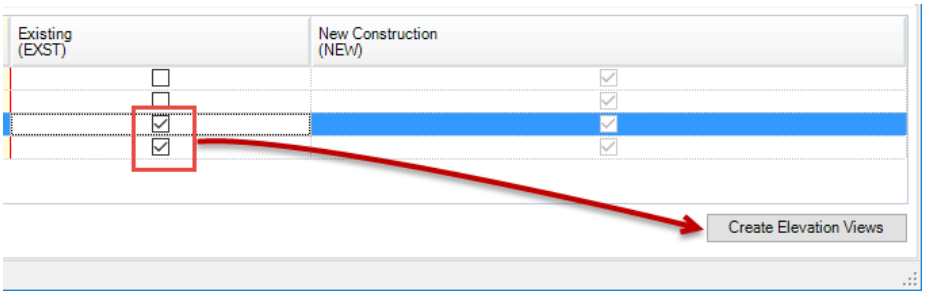


Elevation, Section and Detail Creation

The Elevation/Section/Detail tab is used to copy an elevation, section or detail view from one phase to another. Greyed out checkboxes indicate for that view name, a view already exists for that phase. To speed the process of selection, use the Check and Clear tool button menus. This function is also available on several other tabs and in a right-click menu.



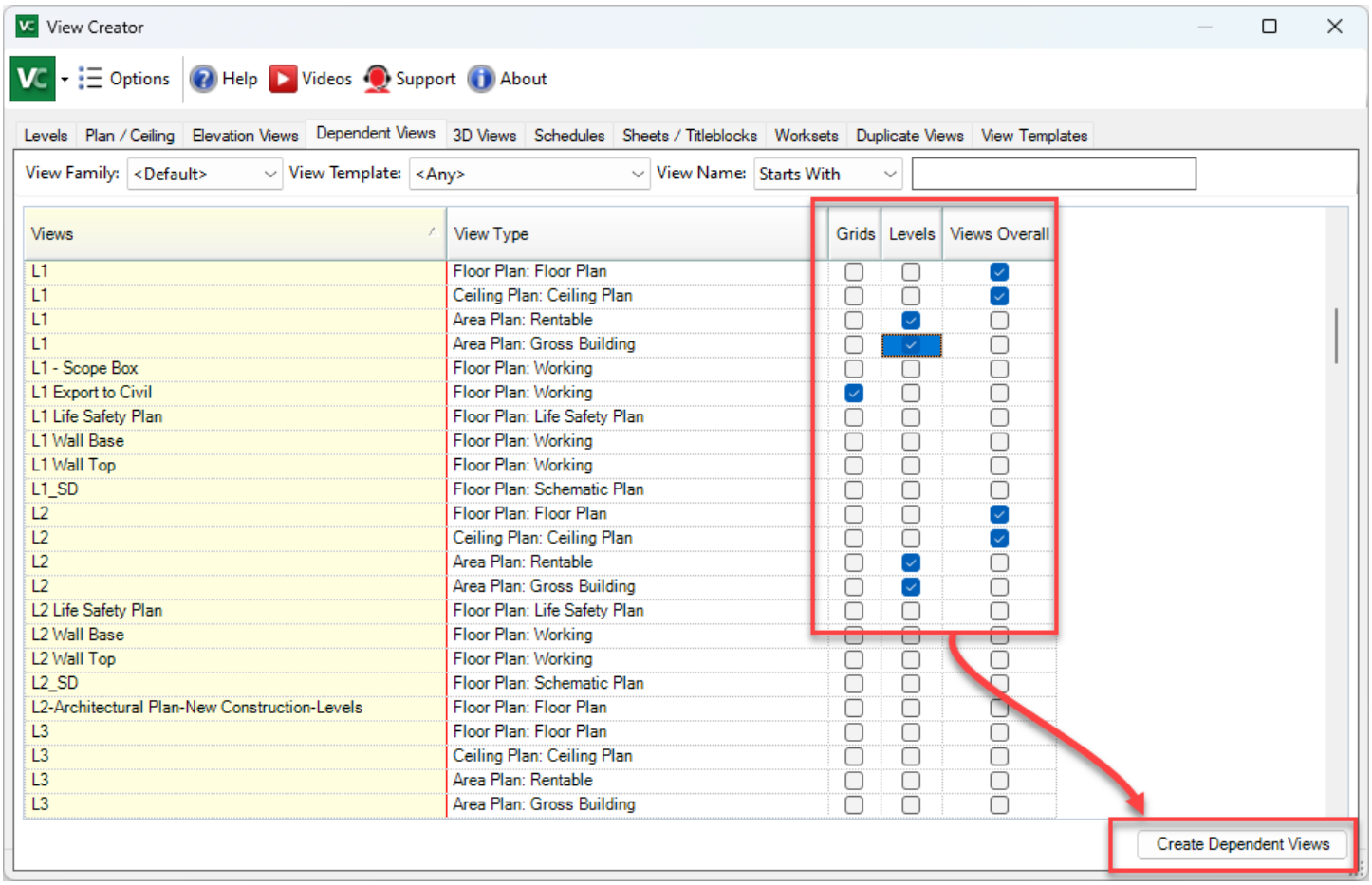
To copy a view into another phase, select the checkbox for the desired phase and view. Once all selections have been made, click the “Create Views” button.



Dependent Views

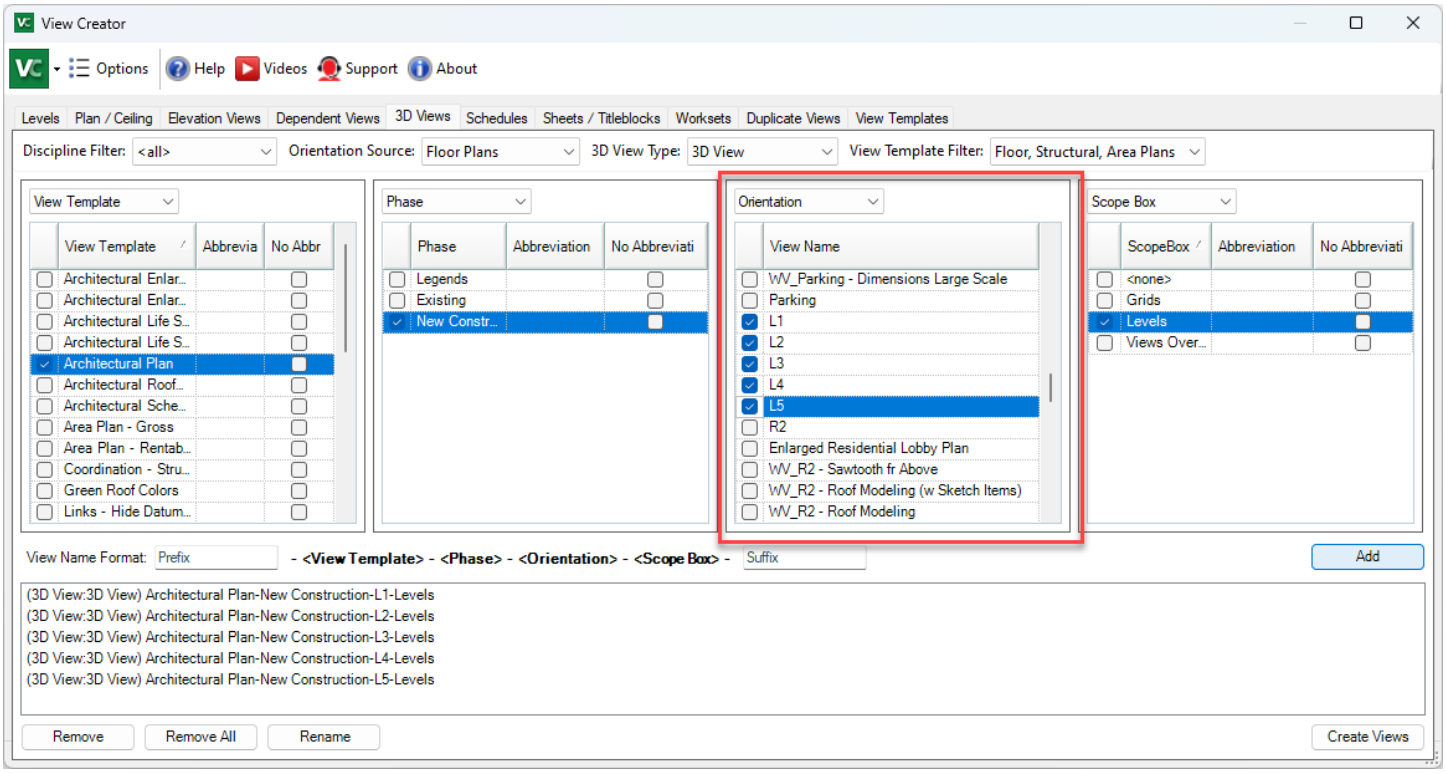
This tool supports a dependent view workflow based on the use of Scope Boxes. Create a scope box for each area of a building that will require a dependent view. Once the scope boxes have been created, a column will appear in the "Dependent Views" tab for each scope box in the project.

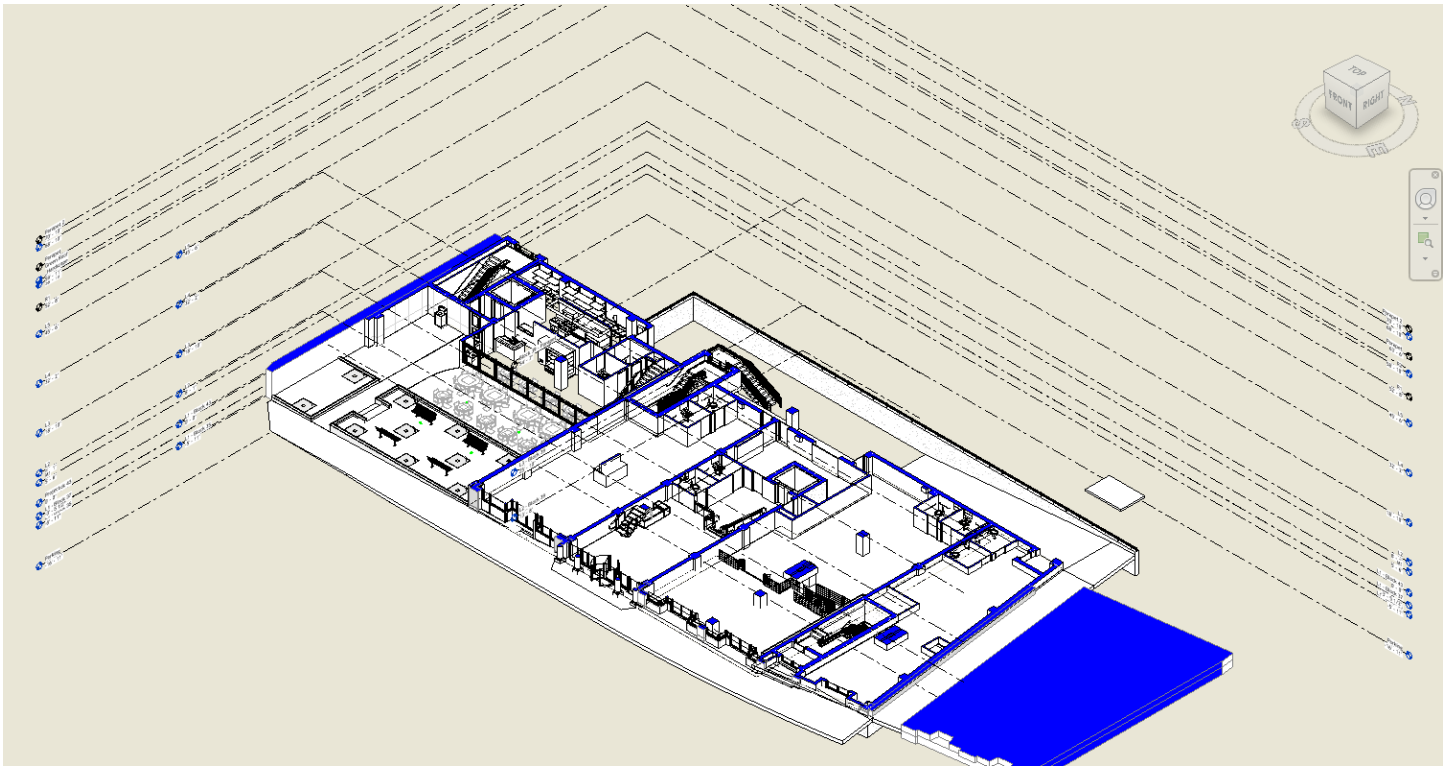
Check the box for each combination of view & scope box for which a dependent view should be created. Once all selections have been made, click the "Create Views" button.



3D Views

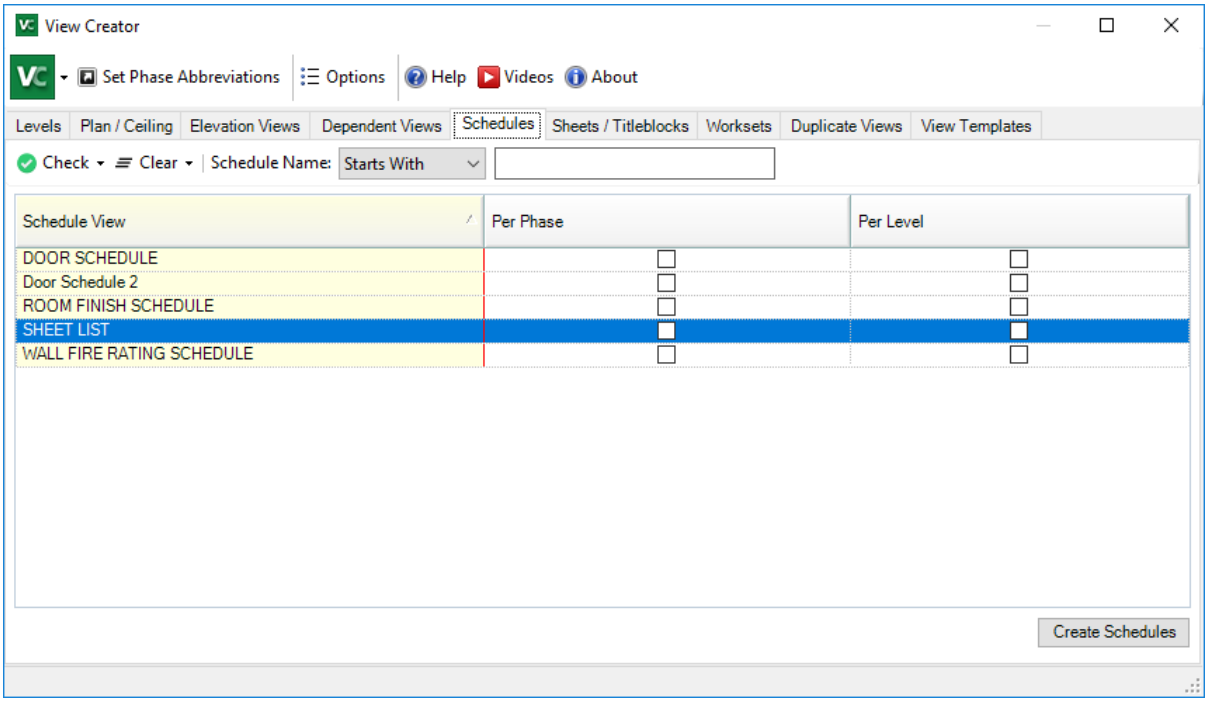
Similar in workflow, 3D views can be created as quickly and easily as Plan/Ceiling views. Additionally, the views orientation can be selected to create 3D plan views, elevations, sections, etc.



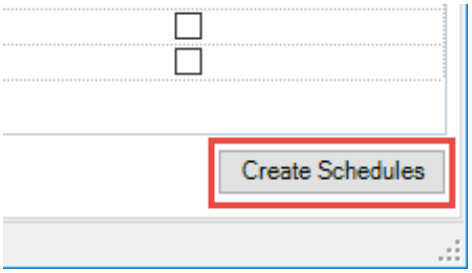


Schedules

The schedules tab can be used to duplicate schedules either by phase or per level.

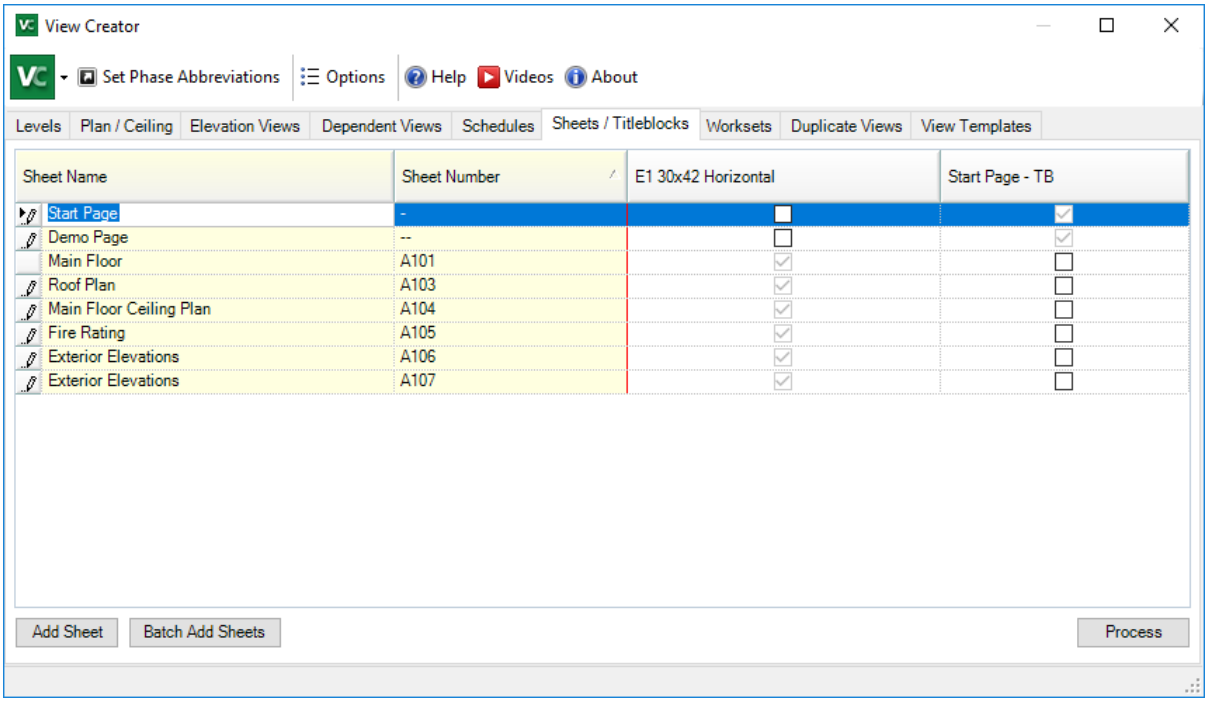


Check the box for each desired copy operation. Once all settings are configured, click the “Create Schedules” button.

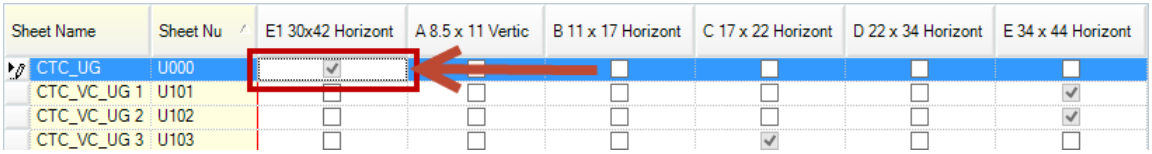


Sheets & Title Blocks

The main function of the “Sheets” tab is to view and control title block usage across the sheets in a project. Each sheet in the current project is represented on a row. Columns are created for each title block loaded into the project. Checkboxes indicate which title blocks have been found on each sheet.



To change the title block on a specific sheet select the checkbox for the desired title block. In this example, sheet A101 has been set to use the “C 17 x 22 Horizontal” title block.

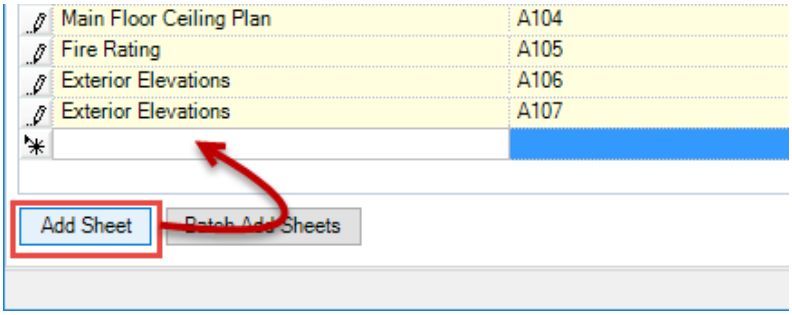


It is also possible to assign a specific title block to multiple sheets at the same time. Shift or CTRL select in the first column of row for the sheets to include in the assignment.

When all sheets have been configured with the desired title blocks, click the “Process” button.

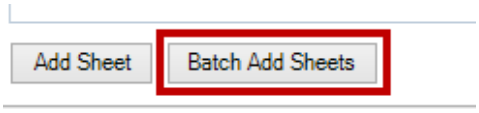
Sheet Creation

To create a new sheet, click in the blank space at the bottom of the list of sheets.



Supply a name and number for the sheet and select the desired title block.

Multiple sheets can be created at the same time using the “Batch Add Sheets” button.

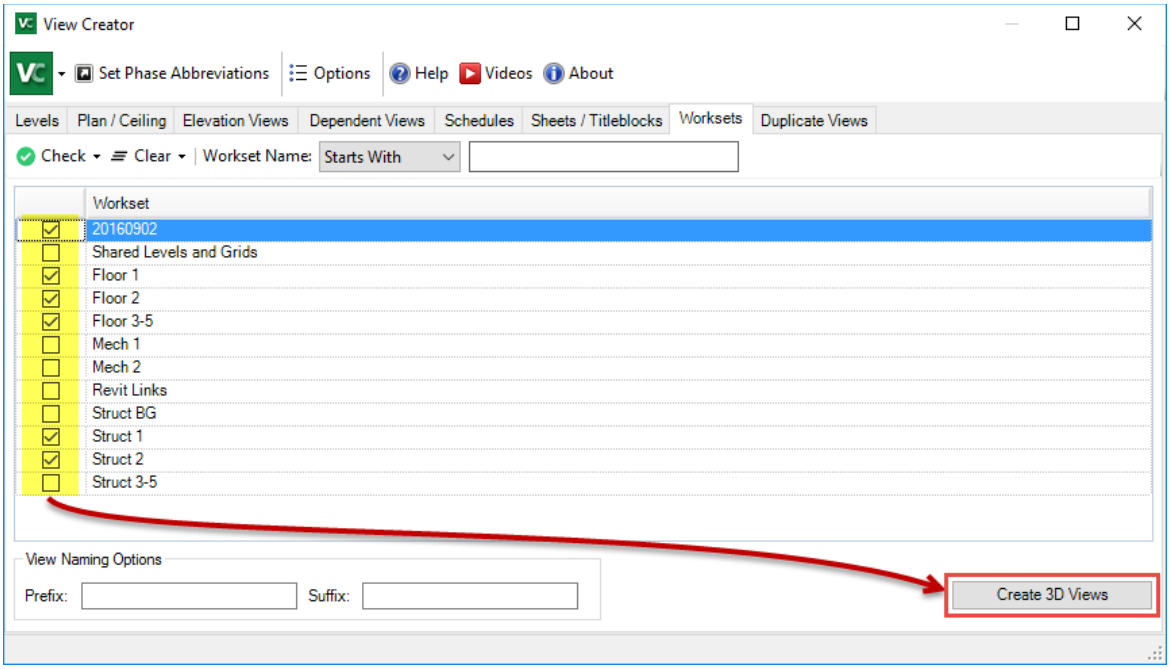


When this button is pressed, Spreadsheet Link will launch, allowing the add sheets functionality in it to be used. Refer to the section in this guide regarding Spreadsheet Link sheets creation. Creating New Elements

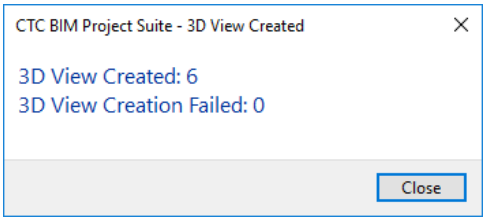
Worksets

The main function of the “Worksets” tab is to create new 3D views that display a specific workset per view. Each view will be associated to the latest phase and use default view settings.

To generate 3D views, select any number of worksets then select “Create Views”

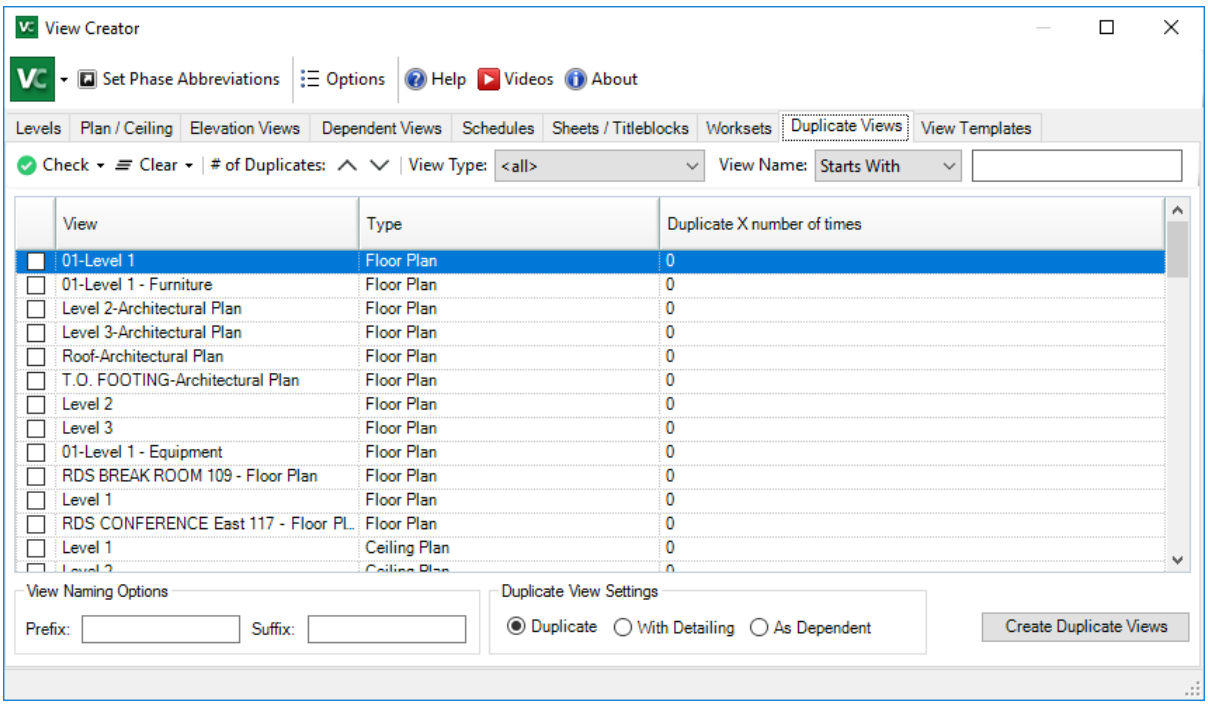


Upon creation a confirmation dialog will be displayed.

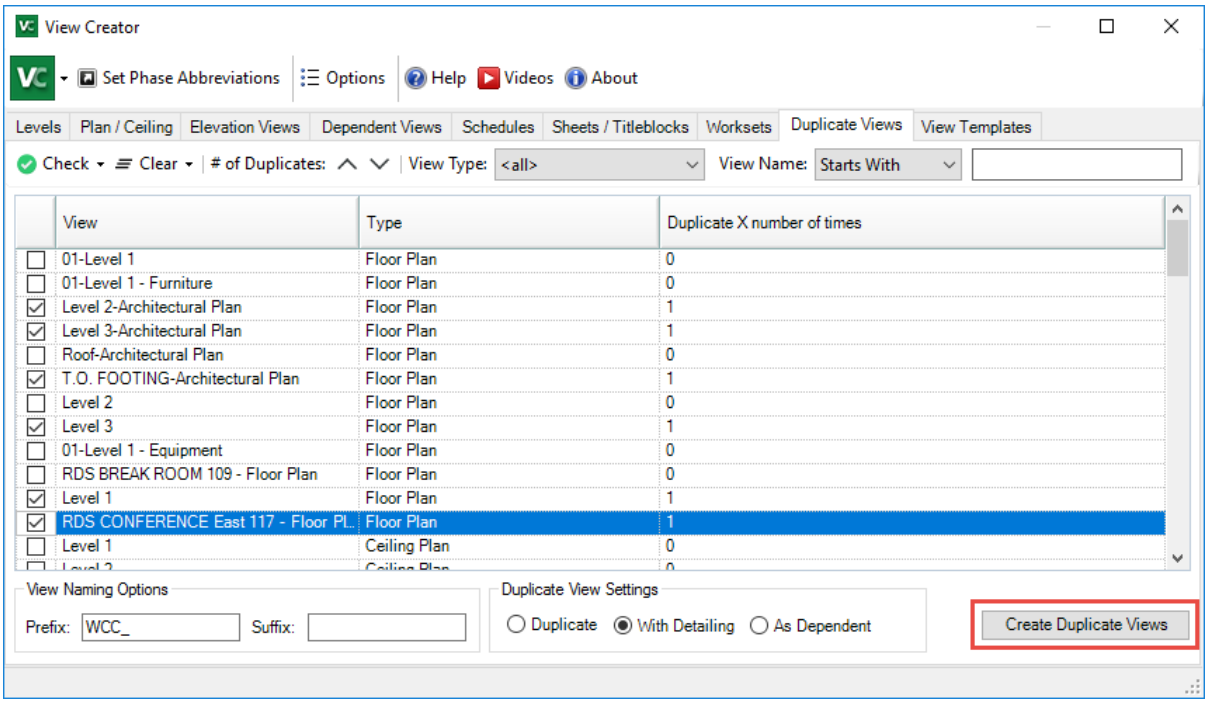


Duplicate Views

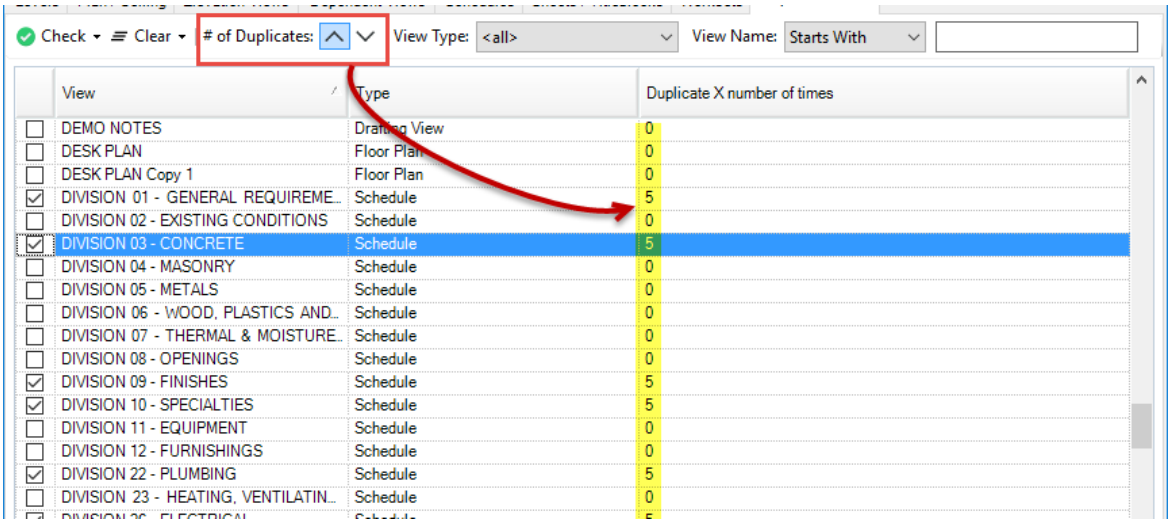
The main function of the “Duplicate Views” tab is to allow for mass/repetitive duplication of multiple views.



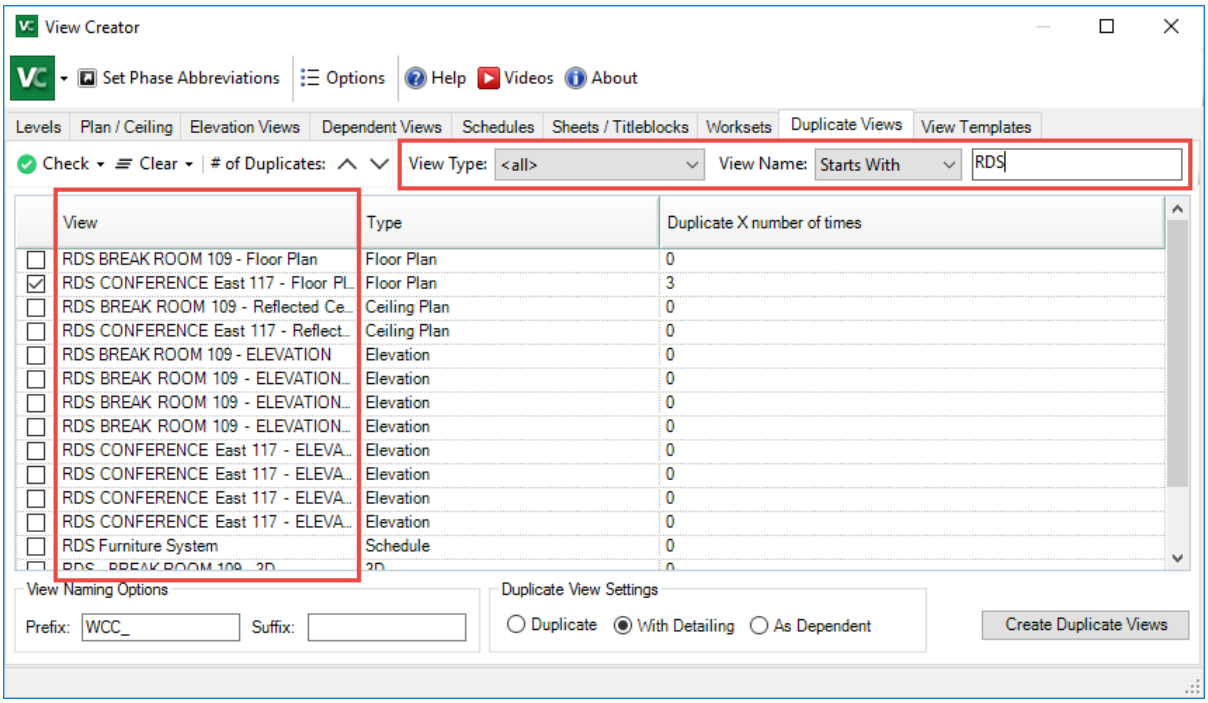
To duplicate a view, select the check box preceding its row and enter a quantity. Then click 'Duplicate Views'



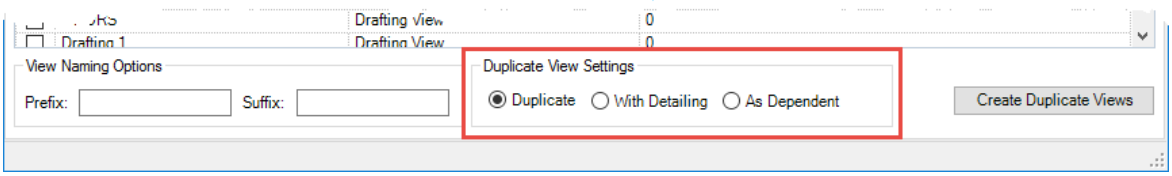
Using the Up and Down arrows will automatically increase or decrease the quantity of all selected views



As the list of views may get quite long, it is possible to filter the list by both view type and view names.

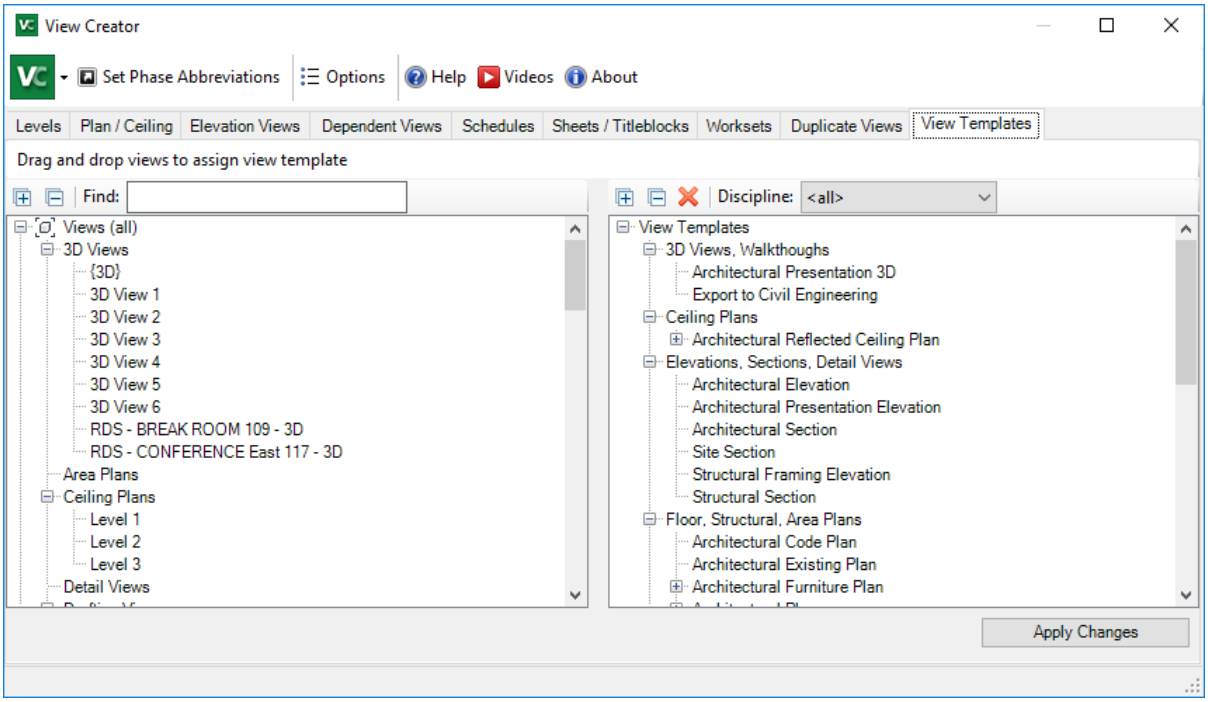


When duplicating model and detail views it is possible to select how views are duplicated. At the bottom of the selection list are options to select how duplication of all selected views is handled.

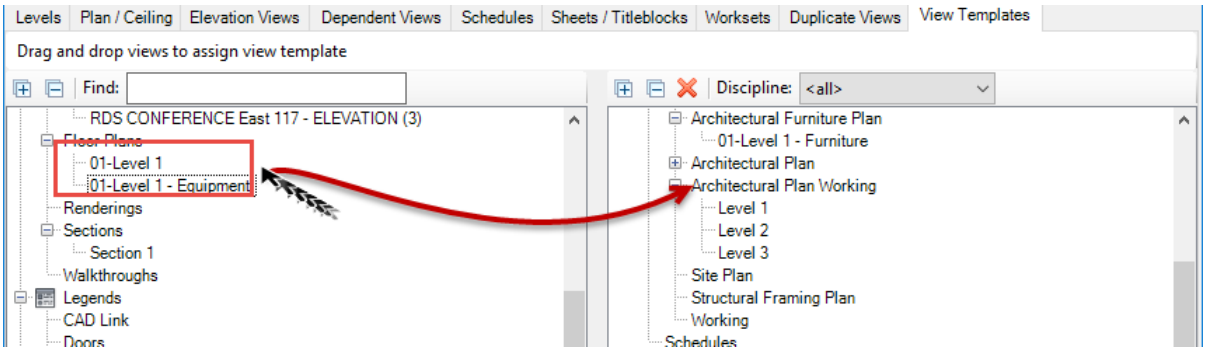


View Templates

Using the View Templates it is possible to assign view templates to multiple views quickly and easily. View Creator will not allow a view template of the incorrect category to be assigned to views.



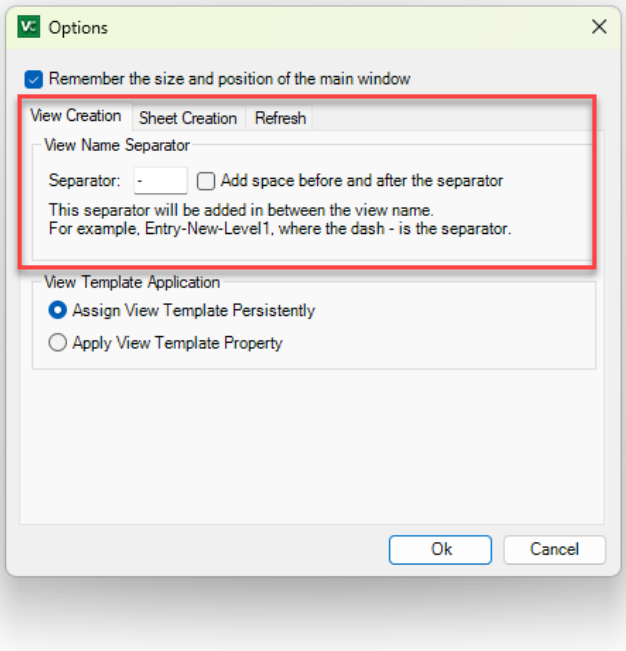
To assign view templates, simply drag the desired views from the left onto the appropriate view templates in the right pane.



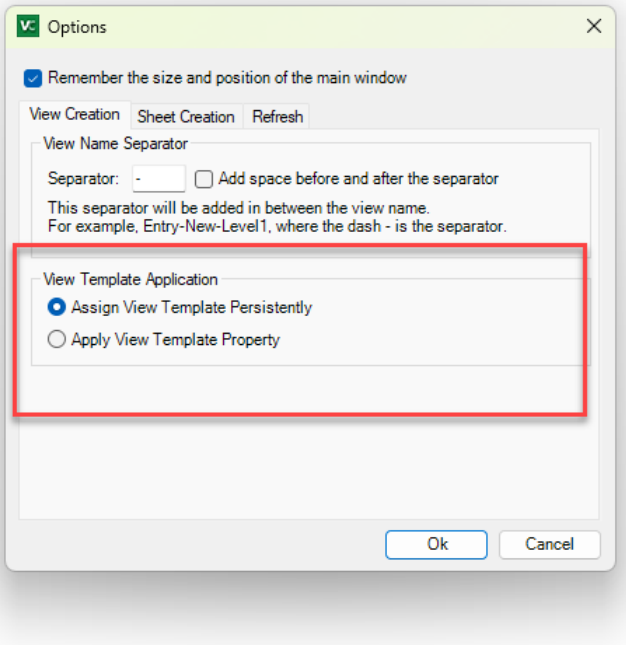
Options

View Creation Options

The “View Name Separator” section is used to control the characters that are inserted between name parts for any view created by this tool.



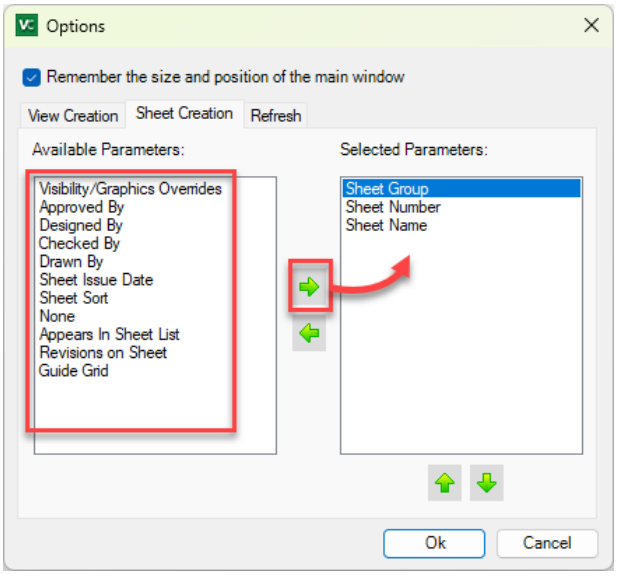
View Template Application determines how template properties are controlled. If the second option is selected, only the properties of the view will be set to match the view template.



Sheet Creation Options

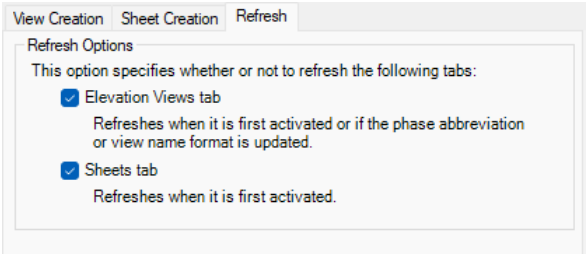
The options under sheet creation allow the application of view properties to the naming of the sheets when they are created in View Creator.

Select properties in the left pane to move to the right. The order in which they appear determines their place in the name.



Refresh Options

The Refresh options control whether to populate the checkboxes on the “Elevations/Sections/Details” tab and the “Sheets” tab with current information in the project. Projects with more than 50 elements of either type may take several minutes to refresh. Even if the tabs are not refreshed View Creator will still function properly. Parsing the project provides additional context that may be helpful when making decisions about what views to copy or which title blocks to assign to a sheet.



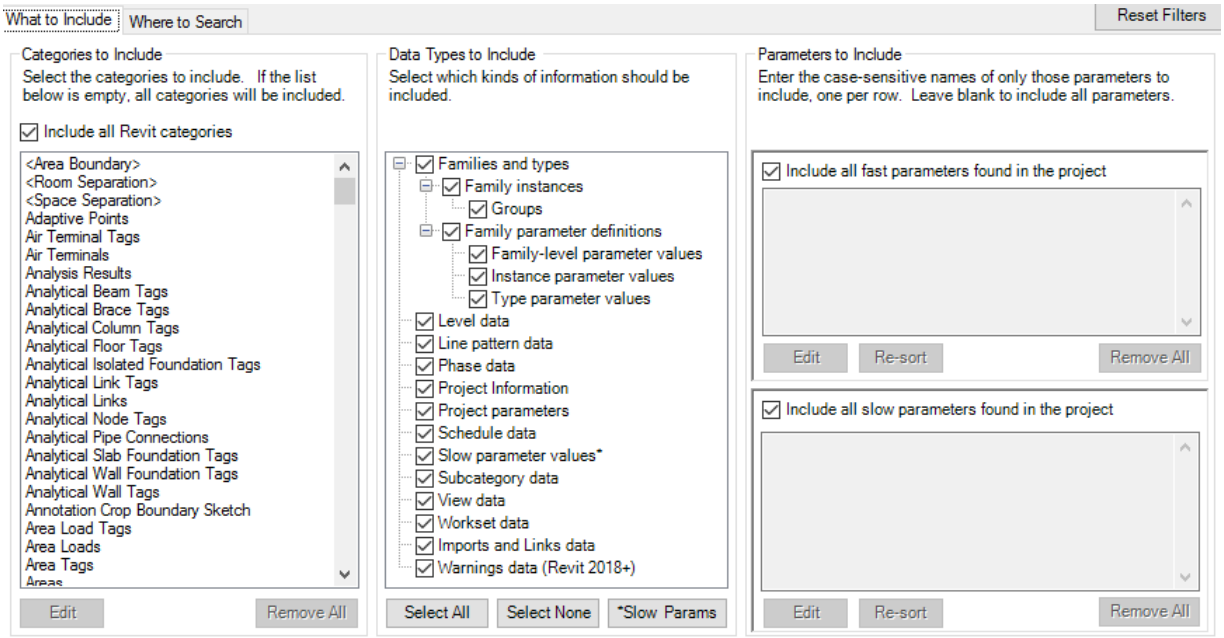
Appendix A – Using Snapshot Filtering

IMPORTANT: While the software for querying Revit for information has been optimized for speed, if all data is to be extracted from a Revit project, **taking a snapshot can take a long time**, depending on the size and complexity of the project. Snapshot times of 20, 30 or 40 minutes or more are quite possible.

If, however, only a subset of information from a Revit project is needed, filtering out unnecessary information queries can dramatically speed up the time it takes to create a snapshot from a Revit project. This is particularly true if "slow" parameter values are not needed.

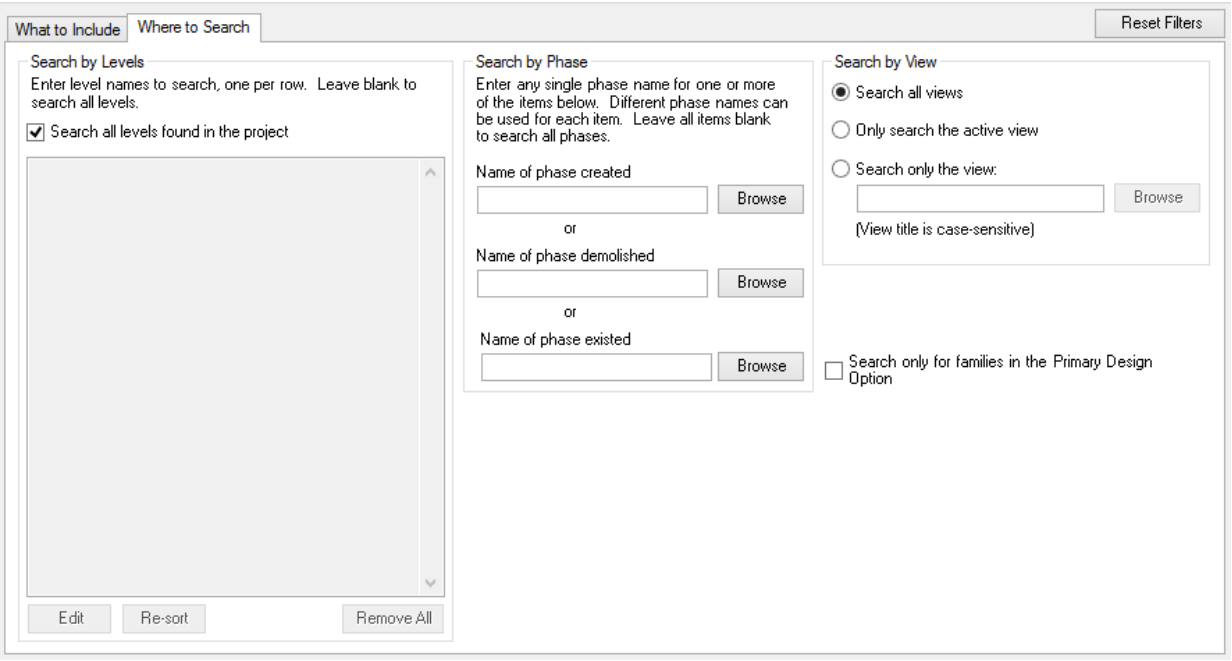
Snapshot filtering enables controlling (reducing) what is queried in order to help speed up the time it takes to create a snapshot, and to reduce the amount of data in the results that needs to be evaluated.

This is what the first tab ("What to Include") of the filtering controls looks like:



Note that the "Reset Filters" button in the upper right corner will clear all filter settings, resulting in all the data in the project that this tool knows how to extract being included in the export. These are the default settings.

This is what the second tab ("Where to Search") of the filtering controls looks like:



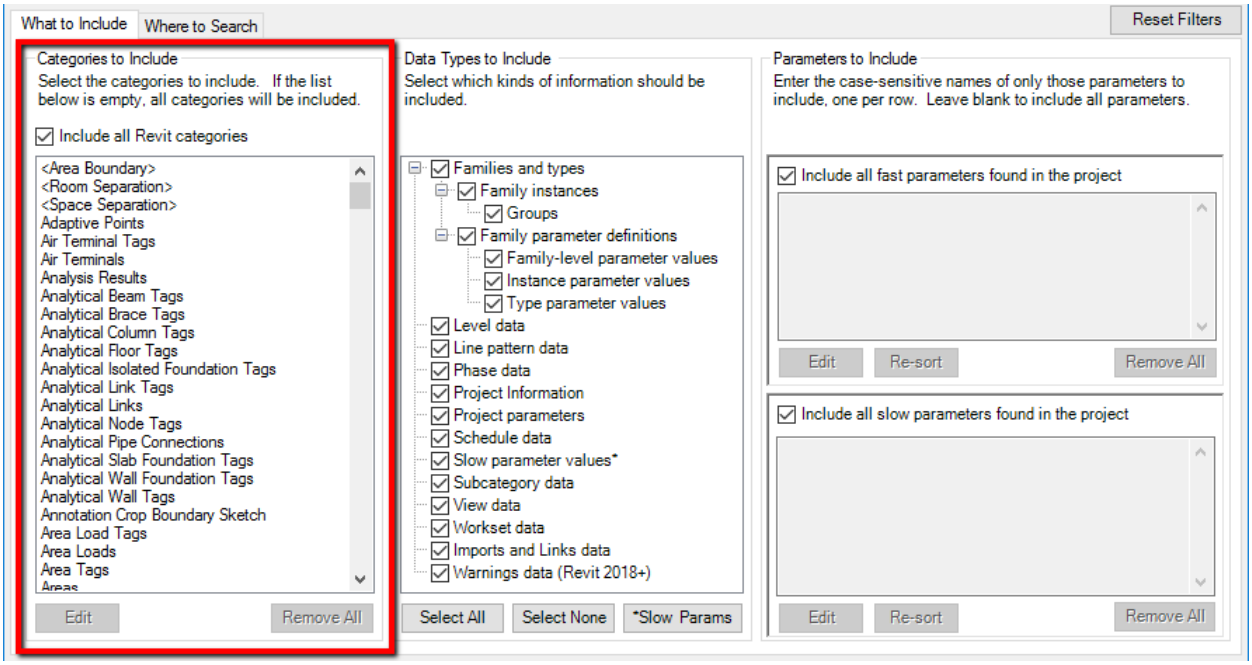
Each of the areas on these tabs will be discussed in detail.

Selecting What to Include

The first tab in the filters dialog allows selecting what values to include in the export.

Categories to Include

The first setting that can be defined is to filter by one or more categories.



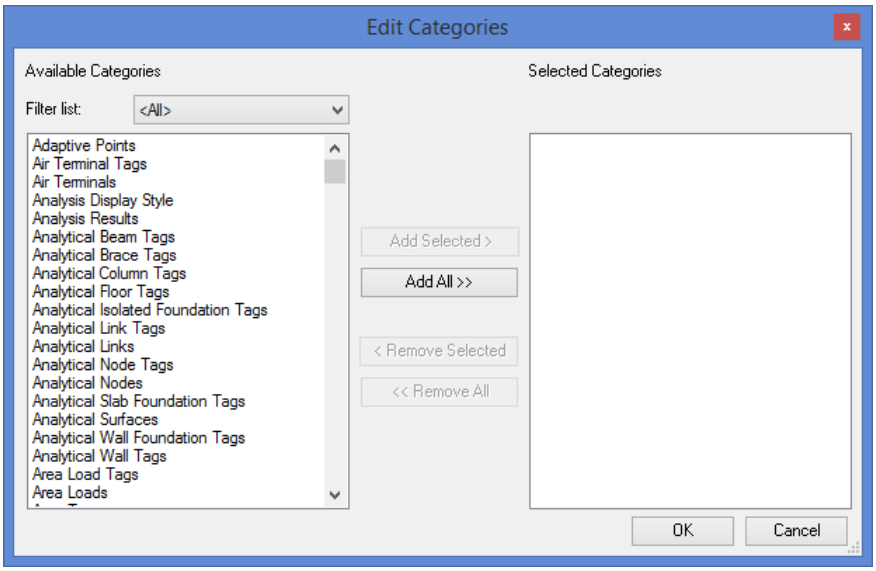
When the “Include all Revit categories” checkbox is selected, all categories will be included and the list will not be editable. To edit the list requires deselecting this checkbox.

Once the list is editable, both the “Edit” and “Remove All” buttons below the categories list can be clicked. Clicking the “Remove All” button will clear the list.

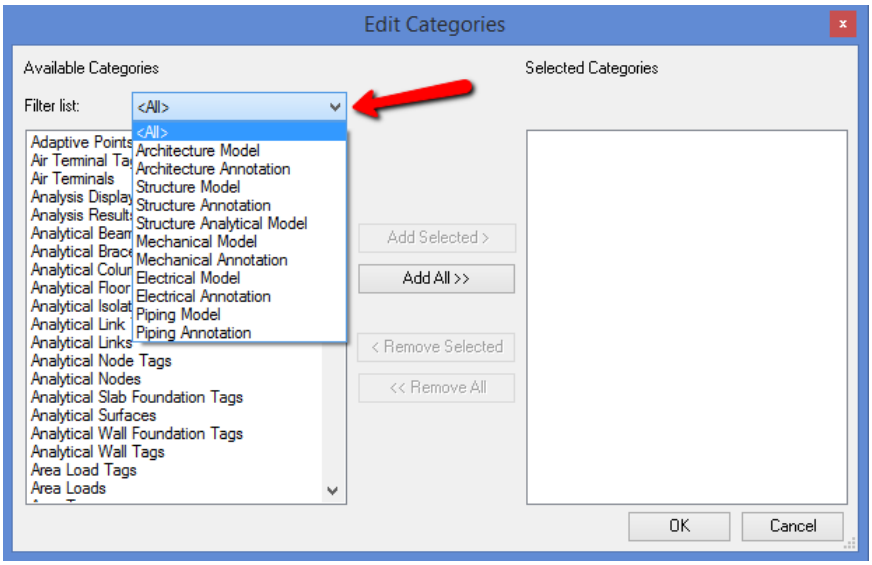
NOTE: If there are no categories in the list, **all** categories will be included in the snapshot. Keeping the checkbox selected essentially just shows the list of the categories that will be used.

NOTE: Depending on the specific add-in which is taking a snapshot, some categories that are required for that specific add-in may not be visible to choose from.

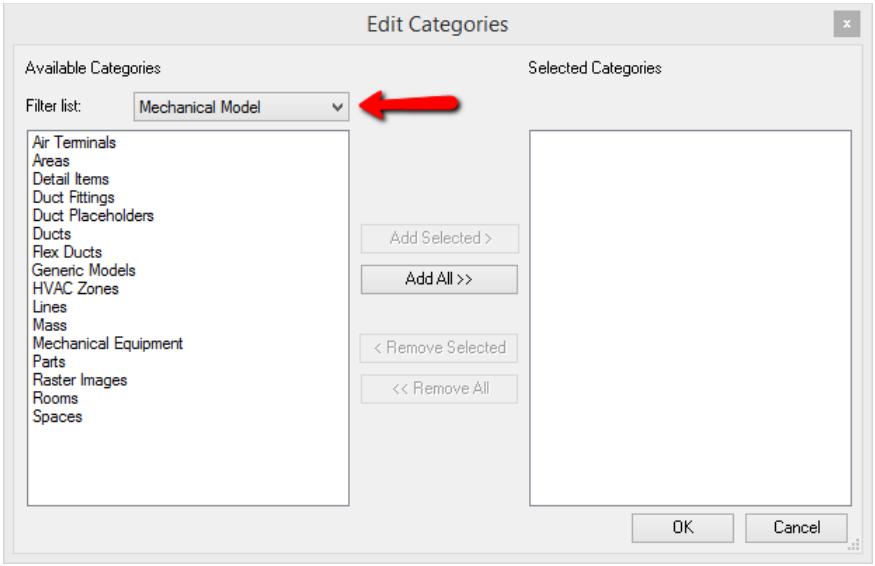
If the “Edit” button below the categories list is clicked, the following dialog will allow selecting only specific categories for inclusion in the snapshot:



All categories that are not already in the “Selected Categories” list (which will initially be populated from the previous screen) are shown in the “Available Categories” list on the left. However, the “Filter list” choice allows narrowing down the available category choices by discipline.

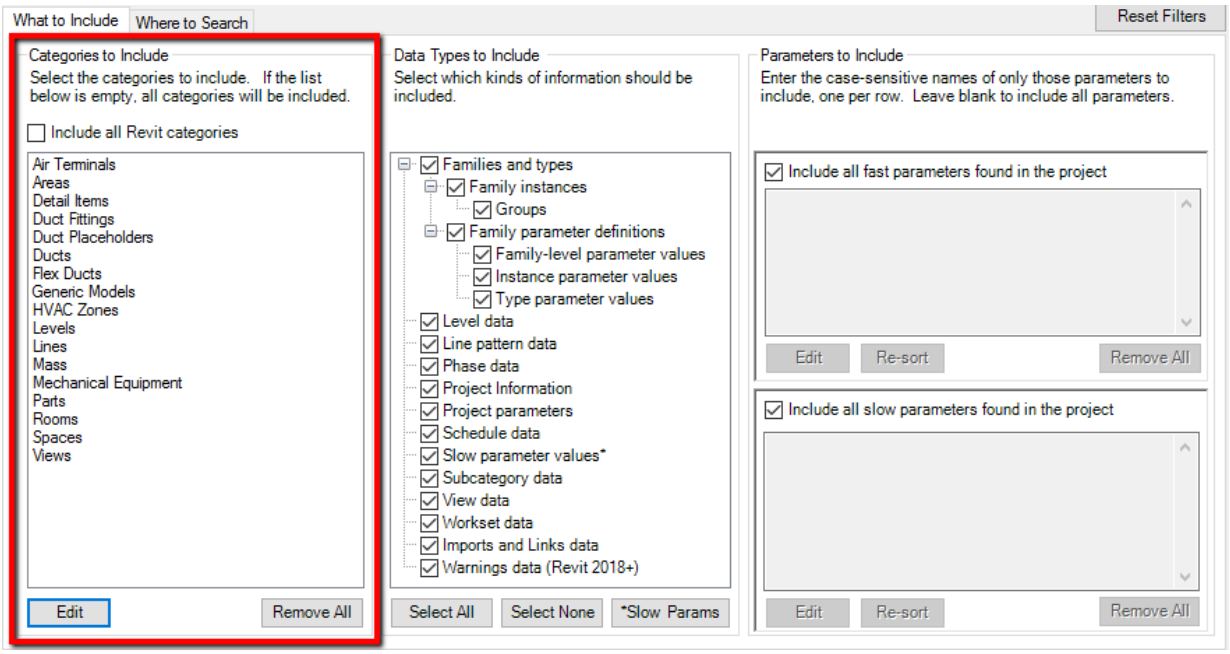


For example, if we select the “Mechanical Model” filter, the list of available categories gets much shorter, because only those associated with mechanical models are displayed:



Clicking the “Add All” button will add all the visible categories in the “Available Categories” list to the “Selected Categories” list. However, one or more categories can be selected in the “Available Categories” list and moved to the “Selected Categories” list using the “Add Selected” button.

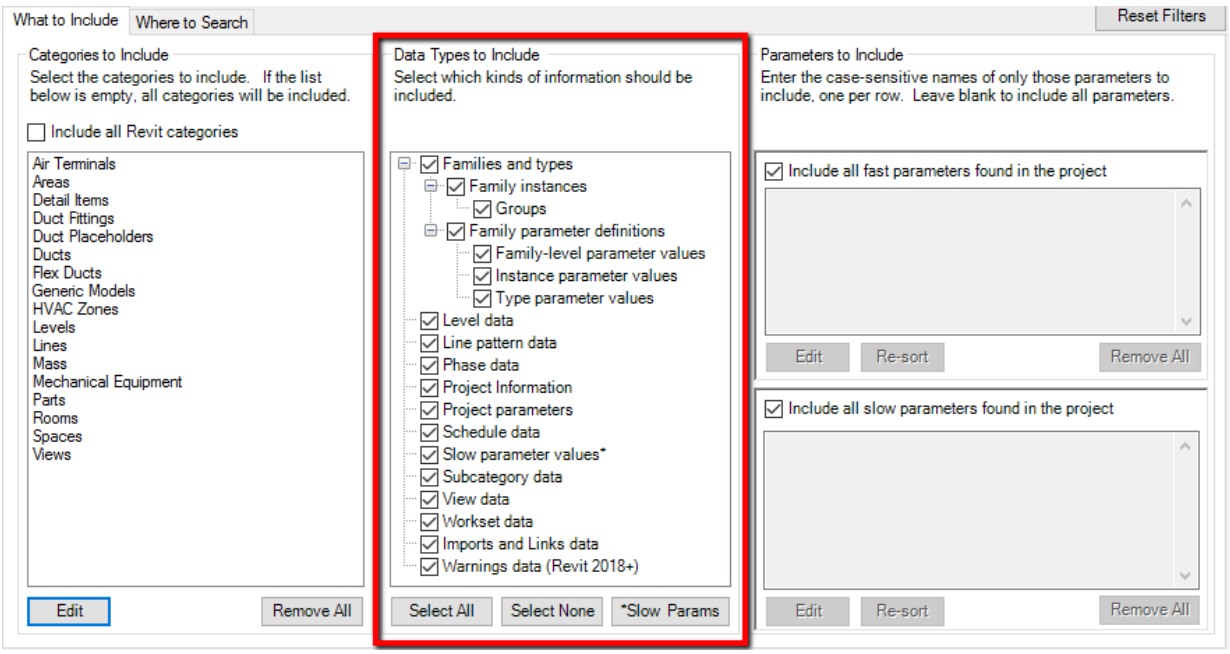
Once the list of Selected Categories is correct, clicking the “OK” button will result in them being selected on the “What to Include” tab of the filter settings dialog:



NOTE: If after editing the list you re-select the "Include all Revit categories" checkbox, your edits will be lost and all categories will once again be shown in the list.

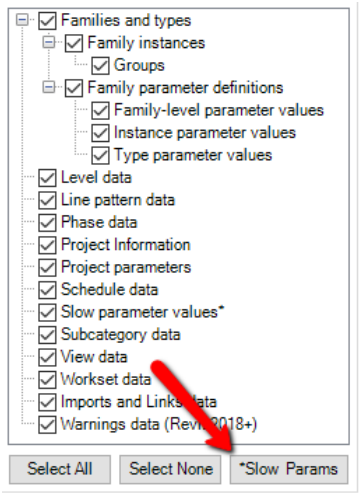
Data Types to Include

The next filters to explore are for the "Data Types to Include" --



NOTE: Depending on the specific add-in which is taking a snapshot, some data types that are required for that specific add-in may not be visible to toggle on or off. The image above shows all data types available.

- Families and types will include all of the family definitions and type definitions within each family definition *for the categories that have been selected*.
- Family instances will include information about each family instance that has been placed in the project for the family and type definitions that were collected.
- Groups will include information about the groups that have been defined which include instances of families that were collected. Note that if families of non-selected categories are included in the groups, no information about those families will be included in the results. In other words, only a *subset* of the group definitions will be included in the snapshot.
- Family parameter definitions will include the definitions of the parameters in each family, *but not any values*. This will include such things as the names, parameter types, GUIDs if the parameters are shared, whether or not they're project parameters vs. family parameters vs. built-in parameters, etc.
- Family-level parameter values will include the actual values for those parameters that are found at the family level.
- Instance parameter values will include the actual values for those instance parameters that exist on each family instance that was found. This requires the Family instances to have been collected.
- Type parameter values will include the actual values for those type parameters that exist on each family type that was collected.
- Level Data will include **basic** information about the levels in a project. Note that this is a subset of the data that is gathered for Levels when the "Levels" category is chosen. The category approach gathers more information, but this approach makes it much easier to search for level-based information from the resulting data, for example if writing reports.
- Line pattern data will include information about line styles, line patterns and line pattern segments.
- Phase data will include information about the different phases defined in the project
- Project Information will include information about the Project Information parameters seen in the project
- Project parameters will include information about the Project Parameters that have been defined.
- Schedule data will include information about the project schedules.
- Slow parameter values will attempt to get information from Revit which can take a long time to query. Clicking the "*Slow Params" button below the list will show the list of all the parameters that may take longer for Revit to provide values than normal parameters. These are typically special parameters, such as for the insertion point X, Y and Z positions in space, the room in which a family exists, or the rotation of the family instances.



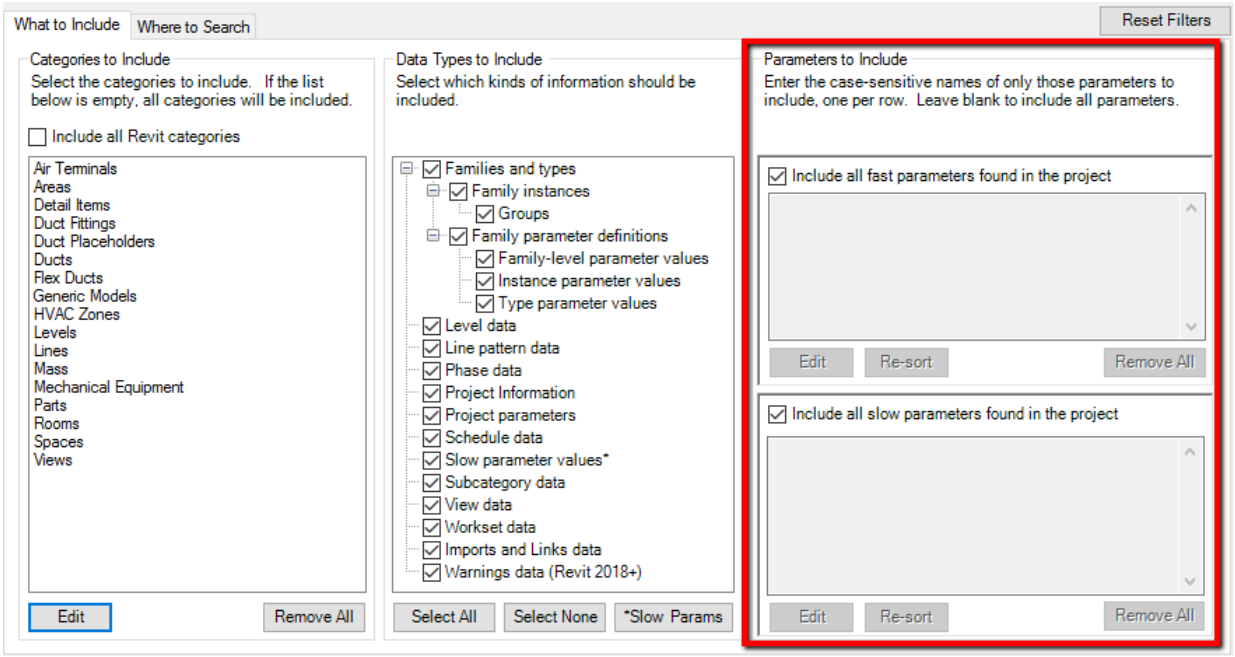
The list of the names of "slow parameters" is included in Appendix B of this document.

- Subcategory data will include information about subcategories within the project

- View Data will include **basic** information about the views in a project. Note that this is a subset of the data that is gathered for Views when the "Views" category is chosen. The category approach gathers more information, but this approach makes it much easier to search for view-based information from the resulting data, for example if writing reports.
- Workset data will include information about the worksets that have been defined within the project.
- Imports and Links data will include information about files that have been imported into the model or that are linked into the model
- Warnings data (Revit 2018+) will gather information about warnings in the project. Data will only be gathered if the snapshot is being taken with Revit 2018 or later.

Parameters to Include

The next filters to explore are for the "Parameters to Include" --



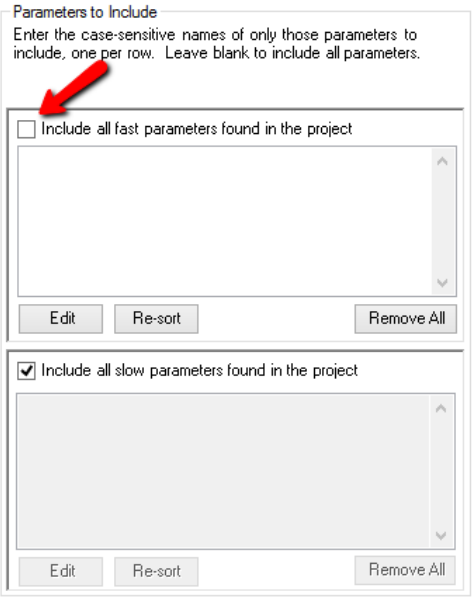
This section allows specifying to gather only information about parameters with specific names. When the "Include all fast parameters found in the project" checkbox is selected, you cannot change which fast parameters have data about them gathered: all fast parameters in the project for the selected categories will have data about them gathered.

Fast parameters include built-in parameters, custom shared parameters or custom family parameters.

When the "Include all slow parameters found in the project" checkbox is selected, you cannot change which slow parameters have data about them gathered: all slow parameters in the project for the selected categories will have data about them gathered.

Slow parameters are special values built into Revit itself. Clicking the "*Slow Params" button on the dialog will present a list of those parameters. The list of the names of "slow parameters" is also included in Appendix B of this document.

When the either checkbox is unselected, the remaining associated controls identified in the image above are enabled. For example:



Either list of parameter names is actually a simple text editor. This allows either free-form typing of parameter names, or pasting in a list of parameters from another source, such as from a word processing or spreadsheet document.

IMPORTANT: As in Revit itself, parameter names are case-sensitive.

Clicking the "Remove All" button will clear the list.

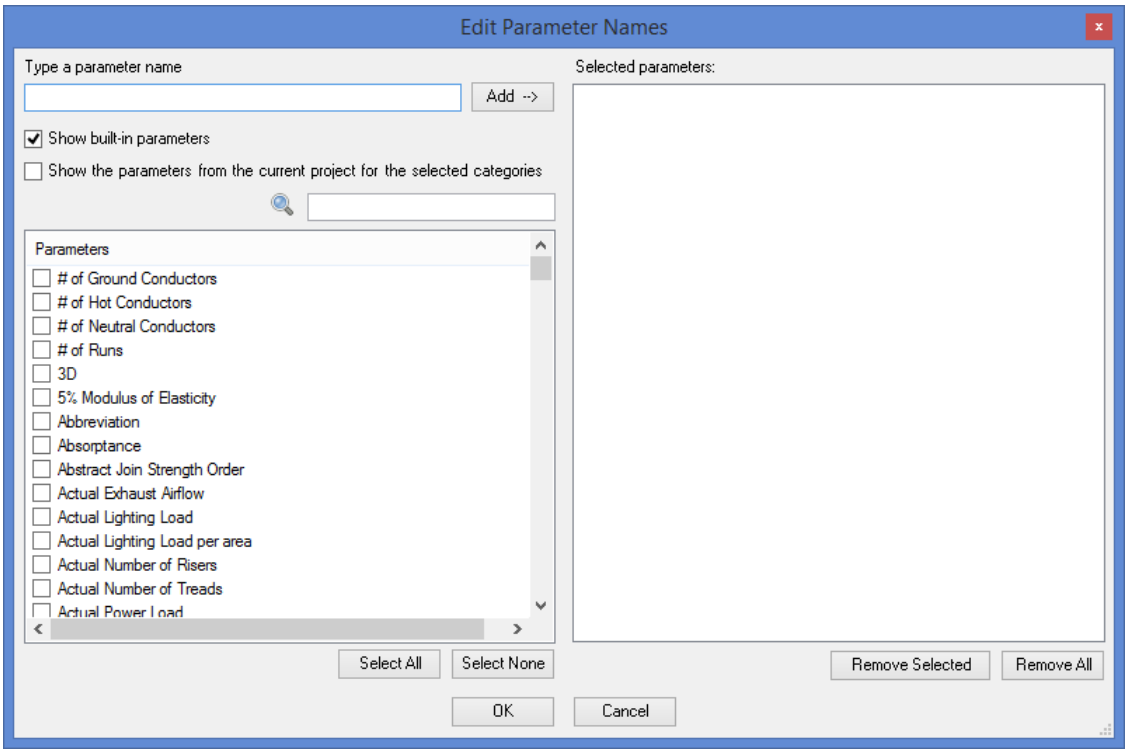
IMPORTANT: If the list has no parameter names in it, *all fast parameters in the project will be queried*.

This allows for some very flexible filtering. For example, you can get parameter information for all the fast parameters and only one slow parameter (for example, Room, which returns the room in which the family exists [where applicable]). This would be much faster than getting information for all the slow parameters.

Clicking the "Re-sort" button will resort the list alphabetically. This may be particularly useful for reviewing the list after pasting in parameter names from different sources.

Clicking the "Edit" button will bring up the Edit Parameter Names dialog.

For fast parameters, the dialog looks like this:



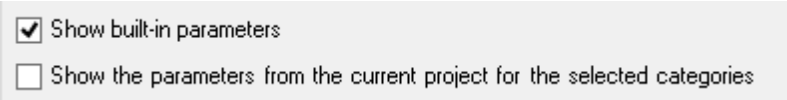
If parameter names had been listed on the previous screen, they would also appear in the "Selected parameters" list when this dialog first appears.

Whatever is in the "Selected parameters" list will be returned to the previous screen if the "OK" button is clicked. On the previous screen the list will be replaced with the parameter names in the "Selected parameters" list.

The "Type a parameter name" and "Add" button next to it allow manually typing in a (case-sensitive) parameter name for addition to the Selected parameters list. This is similar to simply typing in a new name on the previous screen.

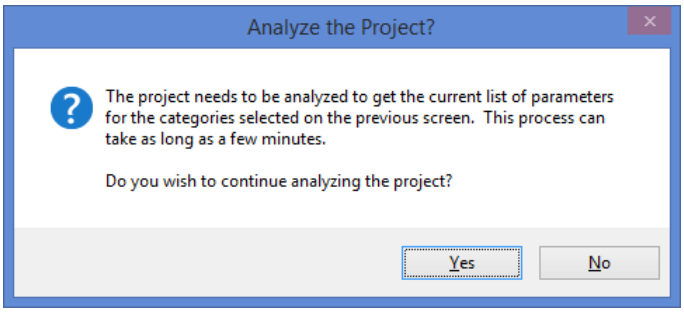
The list of parameter names on the left side provides known parameter names to make it easier to ensure the correctly-spelled (and case-sensitive) parameter names make it to the final "Selected parameters" list. As the items in the list on the left are checked or unchecked, the list of "Selected parameters" on the right will change.

The checkboxes above the list on the left control what appears in the list on the left.



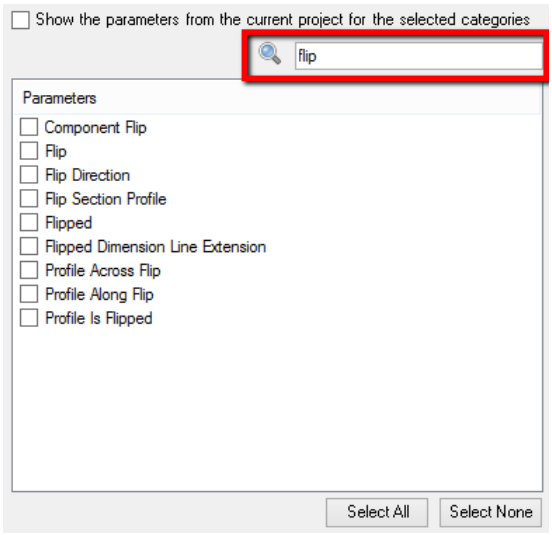
"Built-in parameters" are those defined in Revit itself. That list include things such as "Offset," "Manufacturer," "Mark" and "Zone" among many, many others.

The second checkbox will scan the current project and show all the parameters found for the categories that were selected on the previous screen. As this can take some time, a warning is shown when selecting this checkbox:

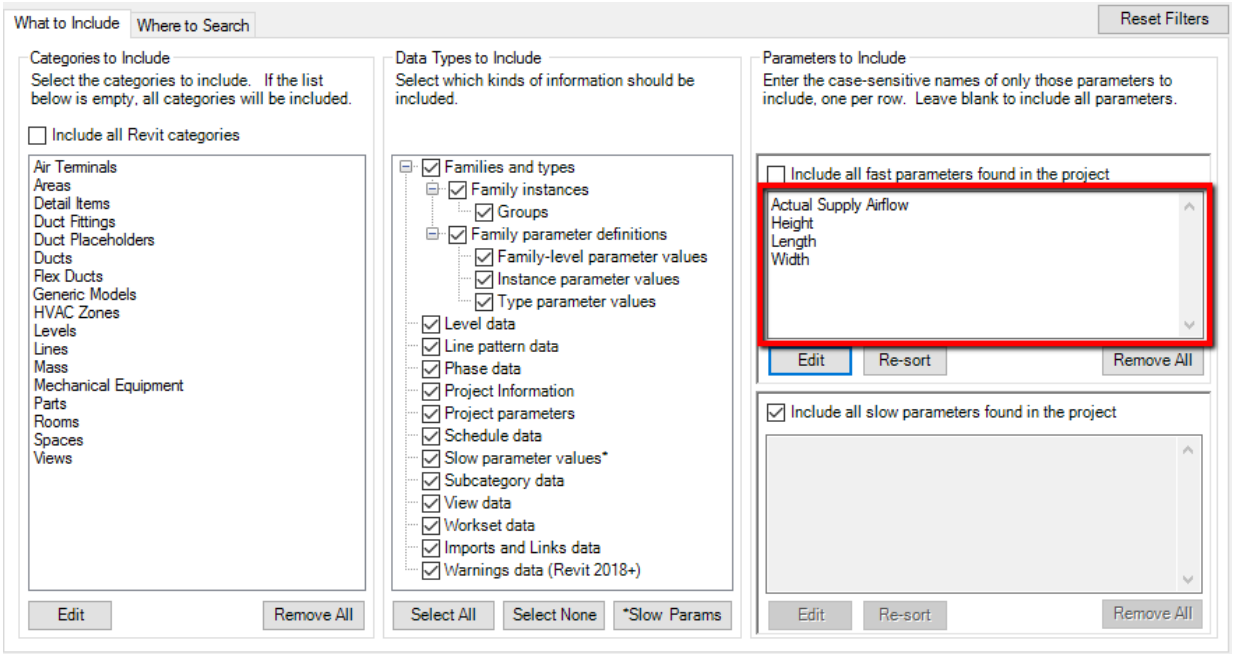


Once complete, the names of all parameters found in the current project for the selected categories will be added to the list of choices on the left.

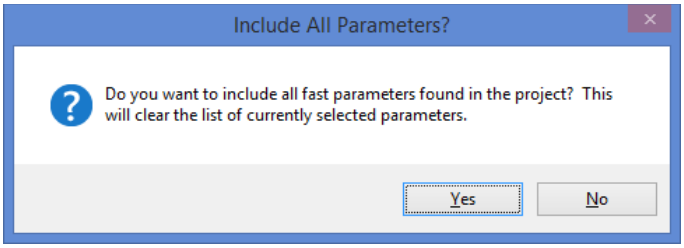
The box above the list on the left will filter the list of choices based on whatever is typed in (case insensitive filter):



Once you are done editing the “Selected parameters” list, clicking the OK button will change the list on the previous screen to match what was selected:



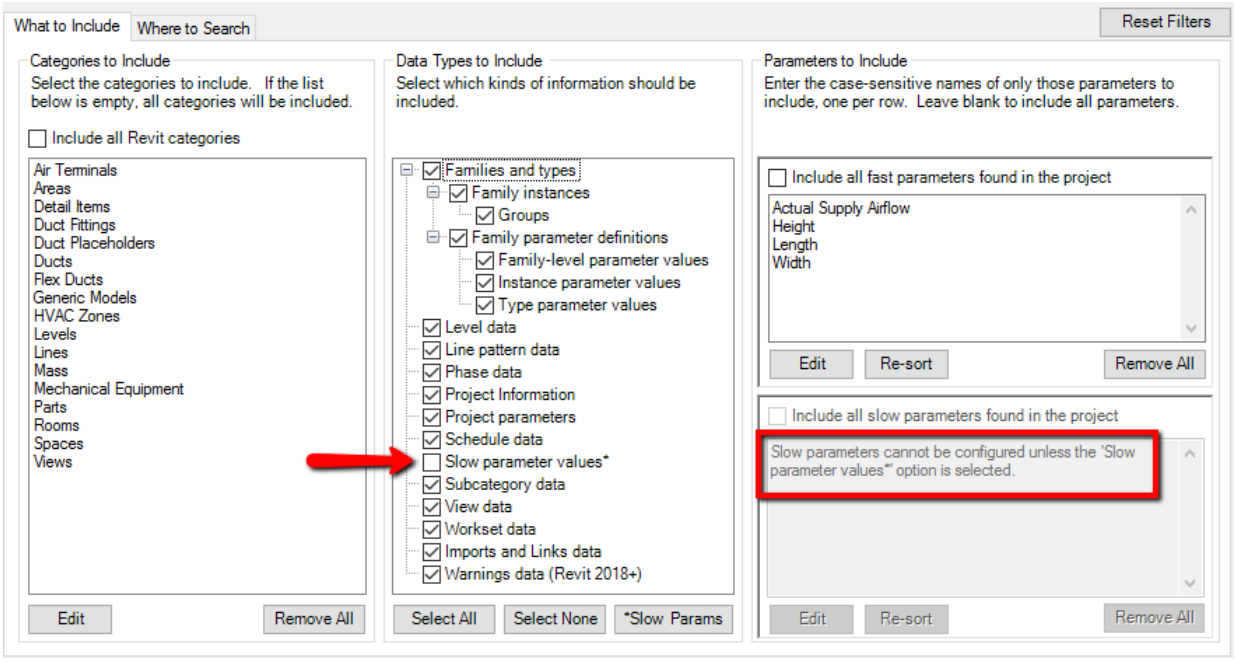
NOTE: Re-selecting the "Include all fast parameters found in the project" checkbox will provide the following confirmation question:



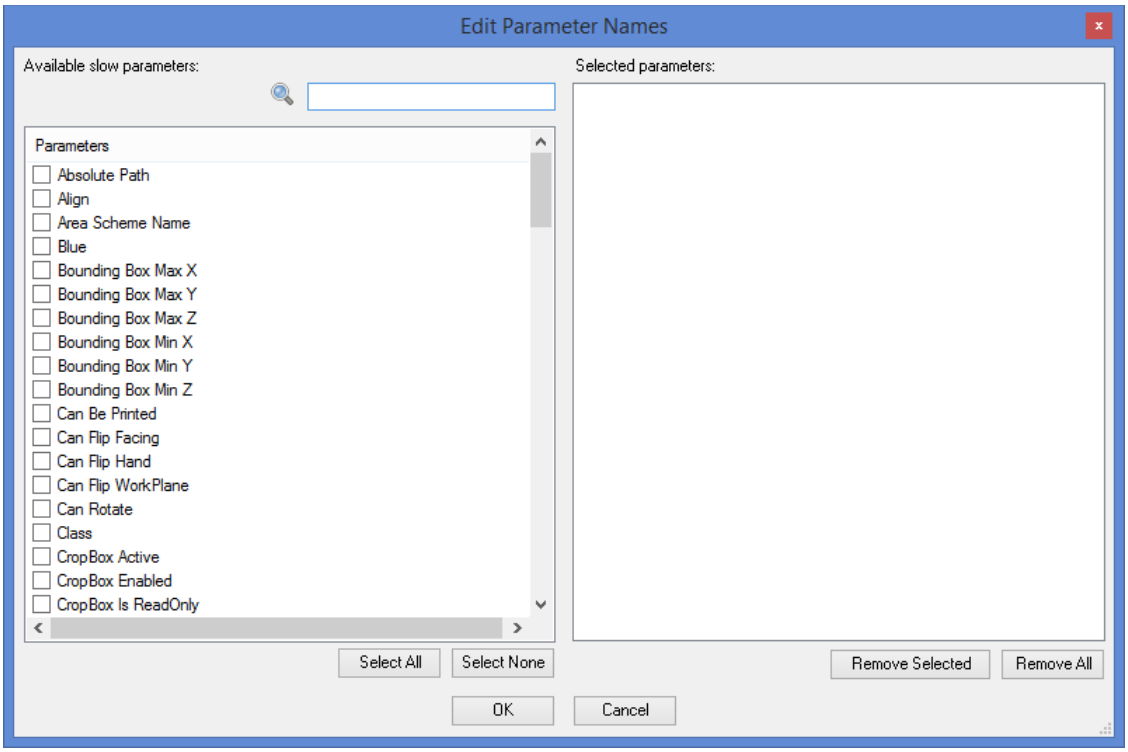
Clicking "Yes" will clear the list and disable the editing controls.

Defining the slow parameters for which to gather information works in a very similar manner, with two exceptions:

1) If not allowing the snapshot to include any information for slow parameters (in the “Data Types to Include” section), then providing a list of specific slow parameters to query will be unavailable. For example:

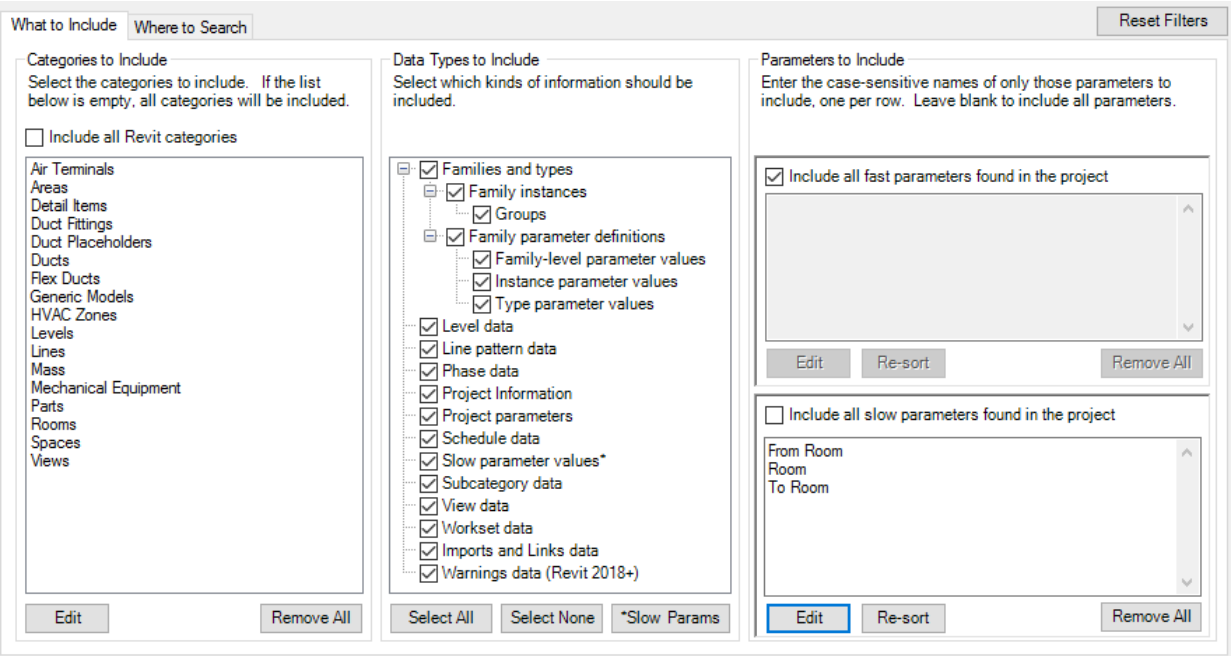


2) When the “Edit” button is clicked for the slow parameters section, the dialog changes:



Because the list of slow parameters is fixed, there is no option to type in a parameter name or scan the current project for parameter choices.

Here are example settings for gathering all the information about elements associated with an architectural model which gather all the fast parameter information as well as just the “From Room,” “To Room” and “Room” slow parameters:



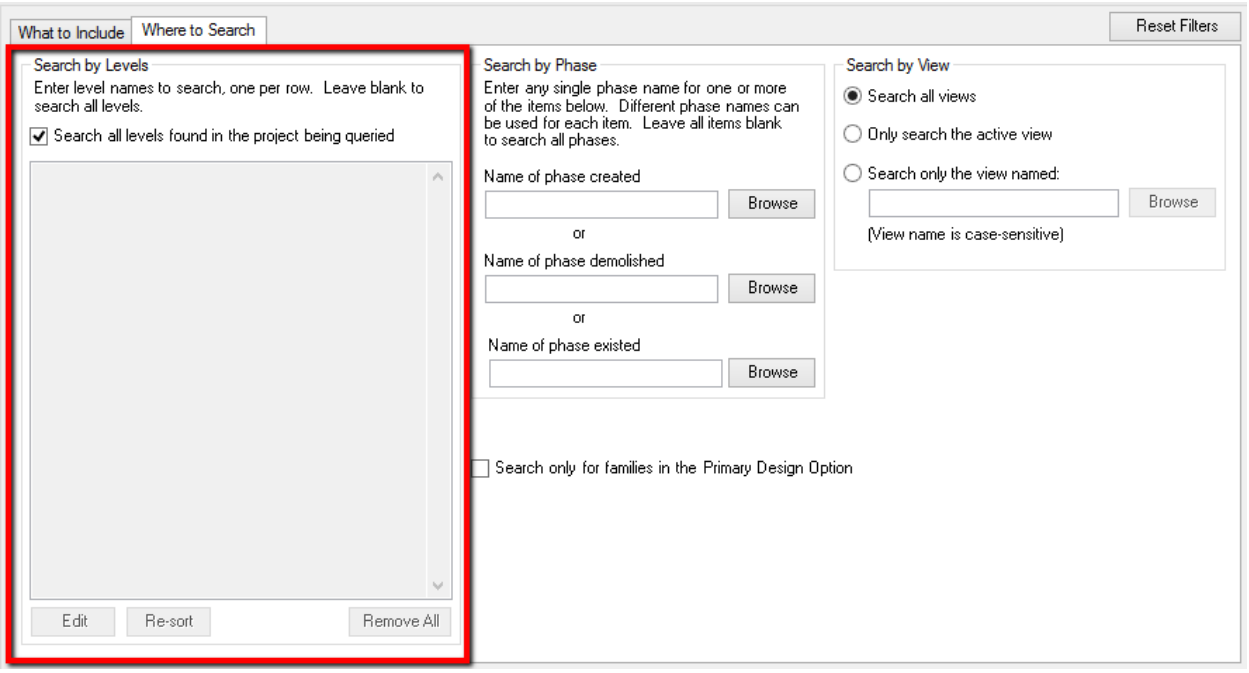
NOTE: As of the 20.0.0 release, by customer request when Project Parameters are selected for gathering they will NO LONGER be filtered based on these settings. Now when Project Parameters are selected, **ALL** project parameters will always be gathered.

Selecting Where to Search

The second tab controls where in the Revit project to search for elements from which to gather data.

Search by Levels

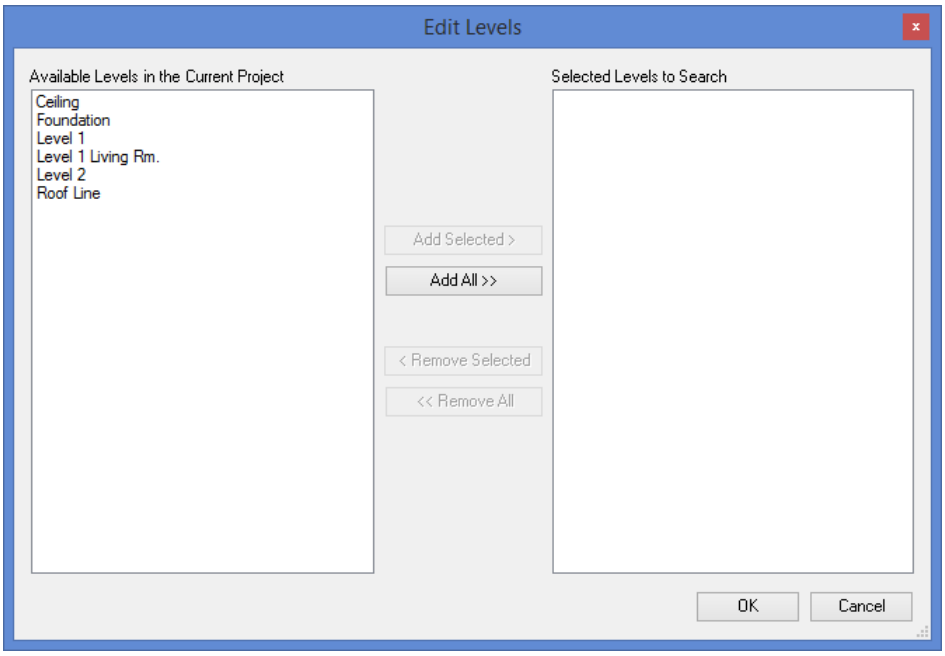
Searching by levels allows only gathering data from elements that exist in the project on one or more selected levels.



This works in very much the same way as listing only specific parameters to query, discussed immediately above.

The list of level names is a simple text editor, which allows typing or pasting in the names of levels to examine.

Clicking the “Edit” button will display the following dialog:

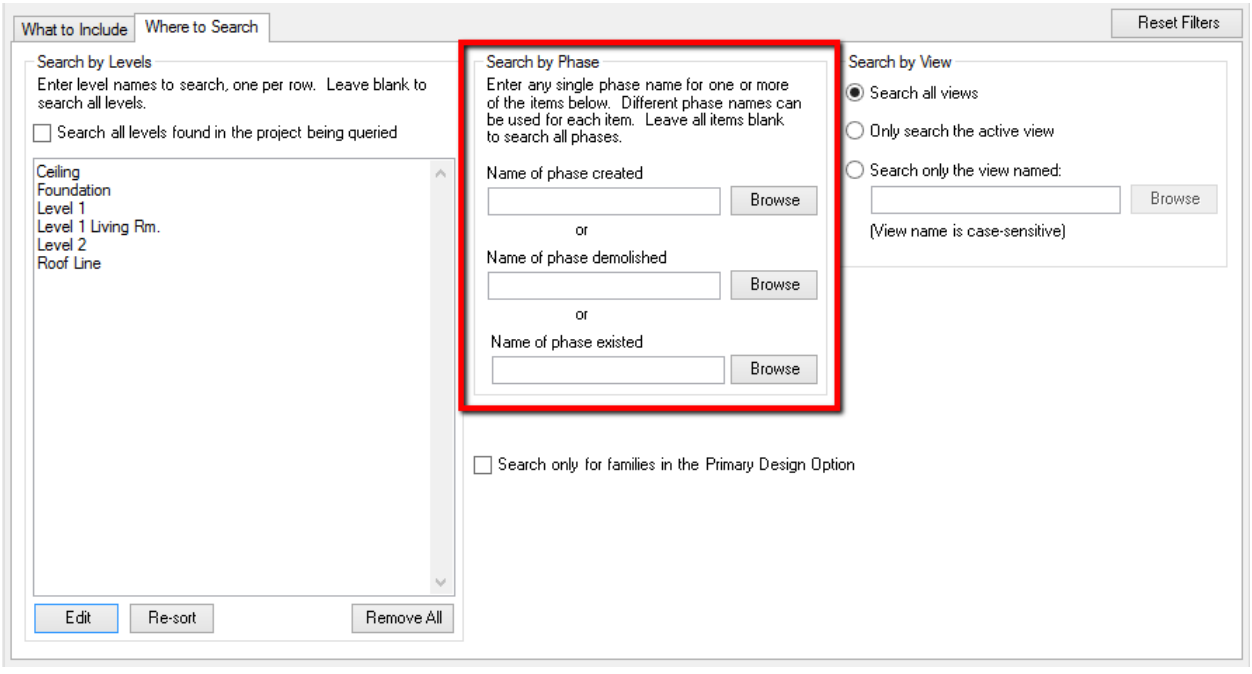


The list on the left contains the names of levels from the currently open project. The list on the right will initially be filled with the selected level names from the previous screen.

When the "OK" button is clicked, the list of "Selected Levels to Search" will replace the list on the previous screen.

Search by Phase

You can also specify to only include the results for elements that are in one or more building phases:



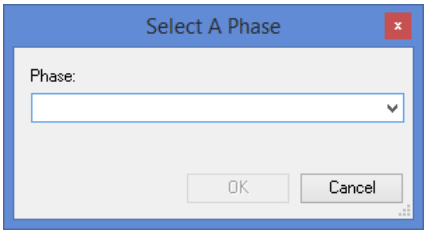
Any element that matches any one of these settings will be searched and included in the results.

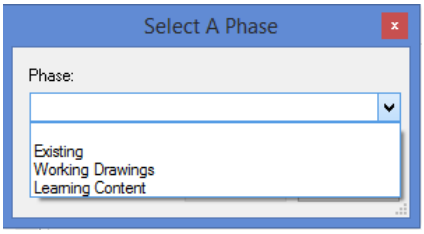
Typing in a phase name for the “Name of phase created” option will return elements that were created in the phase with the name specified.

Typing in a phase name for the “Name of phase demolished” option will return elements that were demolished in the phase with the name specified.

Typing in a phase name for the “Name of phase existed” option will return all elements that existed in the phase with the name specified. This will include elements that were created in that phase.

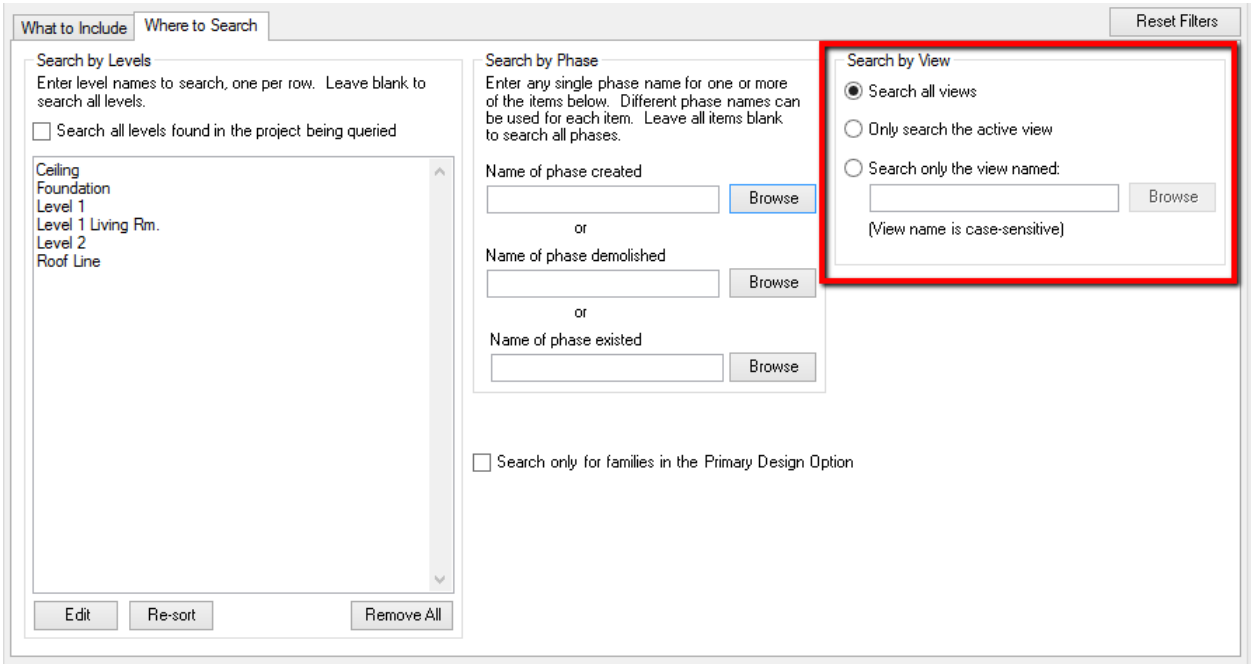
Clicking any of the “Browse” buttons will bring up a dialog which shows the names of the phases in the current project, as a tool which may be helpful in specifying the correct name which may be used in whatever project is being queried:



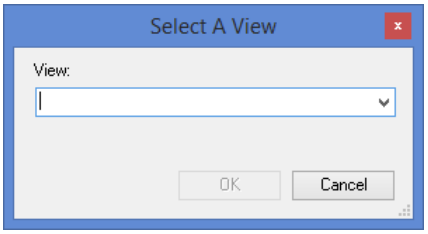


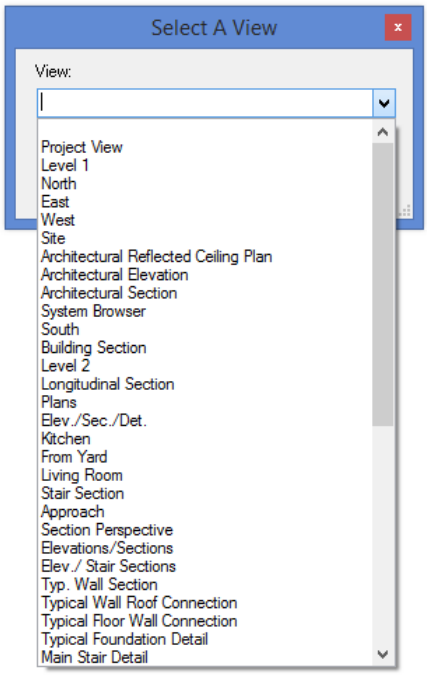
Search by View

You can also specify to only include the results for elements that are in a particular view:



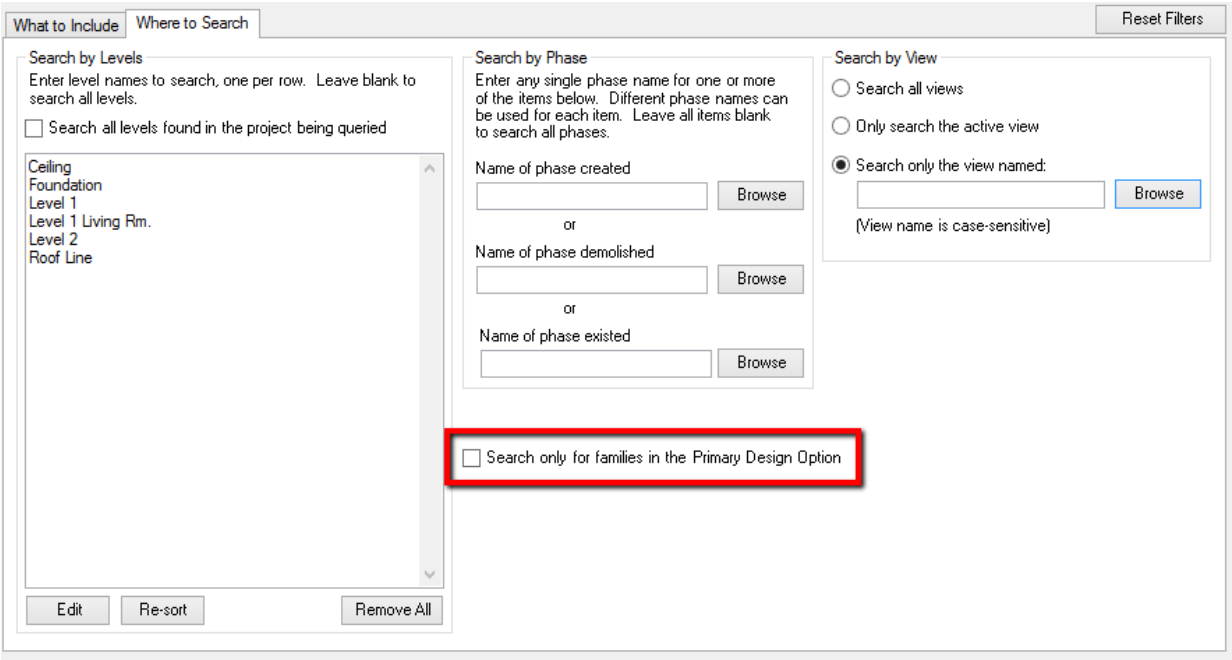
This section is fairly self-explanatory. When specifying a view by its (case-sensitive) name, it can either be typed in or the “Browse” button can be used to select from the list of view names in the currently open project:





Search by Primary Design Option

You can also specify to only search for family elements that are in the Primary Design Option:



Once all of the settings have been specified, a snapshot taken of a Revit project will only include a subset of the elements in the project. This may allow the snapshot to be taken in dramatically less time than if the snapshot were to include all of the elements in the project.

Appendix B – List of Slow Parameters

Some parameters (listed below) require extra time for Revit to provide their values. Turning off "Slow Parameters" or ensuring as few as possible of these names are in the list of only selected parameters to gather can significantly speed up the time it takes to query information from Revit.

Absolute Path
Align
Area Scheme Name
Attachment Type
Blue
Bounding Box Max X
Bounding Box Max Y
Bounding Box Max Z
Bounding Box Min X
Bounding Box Min Y
Bounding Box Min Z
Can Be Printed
Can Flip Facing
Can Flip Hand
Can Flip WorkPlane
Can Rotate
Class
Coordinate Project End X
Coordinate Project End Y
Coordinate Project End Z
Coordinate Project Start X
Coordinate Project Start Y
Coordinate Project Start Z
Coordinate Project X
Coordinate Project Y
Coordinate Project Z
Coordinates Project End X
Coordinates Project End Y
Coordinates Project End Z
Coordinates Project Start X
Coordinates Project Start Y
Coordinates Project Start Z
Coordinates Project X
Coordinates Project Y
Coordinates Project Z
CropBox Active
CropBox Enabled
CropBox Is ReadOnly
CropBox Max X
CropBox Max Y
CropBox Max Z
CropBox Min X
CropBox Min Y
CropBox Min Z
CropBox Visible
Curtain Panel Horizontal Spacing
Curtain Panel Tile Pattern
Curtain Panel Vertical Spacing
Cut Pattern Color Blue
Cut Pattern Color Green
Cut Pattern Color Red
Design Option
Direction Angle
Direction X
Direction Y
Direction Z
Display Style
End Point X
End Point Y
End Point Z
External File Last Modified Time
External File Reference Type
Facing Flipped
Facing Orientation X
Facing Orientation Y
Facing Orientation Z
Family Instance Unique ID
Family Name
Family Name Type Name
Family Placement Type
Family Type Unique ID
Family Unique ID
Field Count
File Size in Bytes
From Room
Generated From Level
Green
Hand Flipped
Hand Orientation X
Hand Orientation Y
Hand Orientation Z
Has Embedded Schedule
Height
Host
Host View Name
Include Linked Files
Instance Name
Invalid
Invisible
Is Conceptual Mass Family
Is Curtain Panel Family
Is Design Option Primary
Is Editable
Is Embedded
Is InPlace
Is Internal Keynote Schedule
Is Itemized
Is Key Schedule
Is Linked
Is Material TakeOff
Is Pinned
Is Slanted Column
Is System Family
Is Template
Is Title Block Revision Schedule
Is View Specific
Is WorkPlane Flipped
Key Schedule Parameter Name
Link Type Display Name
Linked File Status
Local Alias
Material Name
Mirrored
Outline Max U
Outline Max V
Outline Min U
Outline Min V
Owner View
Path
Path Type
Pinned
Plane Reference Global Point X
Plane Reference Global Point Y
Plane Reference Global Point Z
Plane Reference Type
Plane Reference UV Point U
Plane Reference UV Point V
Position X
Position Y
Position Z
Project Elevation
Red

Referencing Sheet Name
Referencing Sheet Number
Relative Path
Right Direction X
Right Direction Y
Right Direction Z
Room
Rotation
Schedule Category
Show Spatial Element Calculation
Point
Single Host View ElementID
Space
Start Point X
Start Point Y
Start Point Z
Structural Material
Structural Material Type
Structural Type
Structural Usage
Surface Pattern Color Blue
Surface Pattern Color Green
Surface Pattern Color Red
Text
To Room
Type Name
Up Direction X
Up Direction Y
Up Direction Z
View Direction X
View Direction Y
View Direction Z
View Id
View Specific
View Title
View Type
Width
Workset Name

Appendix C – Table of Supported Spreadsheet Functions

Link to List of Supported Features

Database and List Management Functions	
DAVERAGE	Indicates the average of the values that meet the specified criteria.
DCOUNT	Counts the number of cells containing numbers that meet the specified criteria.
DCOUNTA	Counts nonblank cells containing numbers or text that meet the specified criteria.
DGET	Returns a single value that meets the specified criteria.
DMAX	Extracts the highest value that meets the specified criteria.
DMIN	Extracts the lowest value that meets the specified criteria.
DPRODUCT	Returns the product of the values that meet the specified criteria.
DSTDEV	Estimates the standard deviation of a population, based on a sample of selected entries from the database.
DSTDEVP	Returns the calculation of the standard deviation of a population, based on the sum of the whole population.
DSUM	Returns the total of the values that meet the specified criteria.
DVAR	Estimates the variance of a sample population based on the values that meet the specified criteria.
DVARP	Returns the calculation of the true variance of an entire population based on the values that meet the specified criteria.

Date and Time Functions	
DATE	Returns the serial number that represents a date.
DATEDIF	Returns the difference of two dates in years, months or days.
DATEVALUE	Converts date text to a DATEVALUE serial number.
DAY	Returns the corresponding day of the month serial number or date text from 1 to 31.
DAYS	Returns the number of days between the two specified dates.
DAYS360	Returns the number of days between two set dates based on a 360-day year.
EDATE	Returns the value or serial number of the date which is a certain number of months before or after a user-specified date.
EOMONTH	Returns the date at the end of the month a specified number of months before or after a specified date.
HOUR	Returns the hour as a serial number integer between 0 and 23.
ISOWEEKNUM	Returns the ISO week number for a specified date.
MINUTE	Returns the serial number that corresponds to the minute.
MONTH	Returns the corresponding serial number of the month of a date between 1 and 12.
NETWORKDAYS	Returns the number of working days between two dates. Excludes weekends and specified holidays.
NETWORKDAYS.INTL	Returns the number of whole workdays between two dates using parameters to indicate which and how many days are weekend days.
NOW	Returns the current date and time in the form of a serial number.
SECOND	Returns the seconds portion of a serial time value.

TIME	Returns the decimal value of a given time.
TIMEVALUE	Returns the decimal number for a given time.
TODAY	Returns the current date as a serial number.
WEEKDAY	Returns the corresponding day of the week as a serial number.
WEEKNUM	Returns the number where a week falls numerically within a year.
WORKDAY	Returns a date that is a specified number of working days before or after a given date.
WORKDAY.INTL	Returns the serial number of the date before or after a specified number of workdays using parameters to indicate which and how many days are weekend days.
YEAR	Returns the corresponding year as a serial number in the form of an integer.
YEARFRAC	Calculates the fraction of the year between two dates.

Engineering Functions	
BESSELI	Returns the BESSEL function in modified form for imaginary arguments.
BESSELJ	Returns the actual BESSEL function.
BESSELK	Returns the BESSEL function in modified form for imaginary arguments.
BESSELY	Returns the BESSEL function, also known as the Weber or Neumann function.
BIN2DEC	Converts a binary number to decimal form.
BIN2HEX	Converts a binary number to a hexadecimal.
BIN2OCT	Converts a binary number to octal form.
BITAND	Returns the bitwise AND of the two specified numbers.
BITLSHIFT	Returns the specified number shifted left by the specified amount.
BITOR	Returns the bitwise OR of the two specified numbers.
BITRSHIFT	Returns the specified number shifted right by the specified amount.
BITXOR	Returns the bitwise XOR of the two specified numbers.
COMPLEX	Converts real and imaginary coefficients into a complex number of the form x + yi or x + yj.
CONVERT	Interprets data from one measurement system to another.
DEC2BIN	Converts decimal numbers to binary form.
DEC2HEX	Converts decimal numbers to hexadecimal.
DEC2OCT	Converts decimal numbers to octal.
DELTA	Tests whether numbers or values are equal with a number result. Returns "0" for unequal, "1" for equal.
ERF	Returns the integrated error function between a lower and upper limit.
ERF.PRECISE	Returns the error function
ERFC	Returns a complementary ERF function integrated between 'x' and infinity.
ERFC.PRECISE	Returns the complementary ERF function integrated between x and infinity
GESTEP	Returns the value 1 if the number is greater than or equal to a specified step value, otherwise it returns 0.
HEX2BIN	Converts hexadecimal numbers to binary form.
HEX2DEC	Converts hexadecimal numbers to decimal form.
HEX2OCT	Converts hexadecimal numbers to octal form.

IMABS	Returns the absolute value (modulus) of a complex number in x+yi or x+yj text format.
IMAGINARY	Returns the coefficient of a complex number in x+yi or x+yj text format.
IMARGUMENT	Returns the theta argument - an angle expressed in radians.
IMCONJUGATE	Returns the complex conjugate of a complex number in x+yi or x+yj text format.
IMCOS	Returns the cosine of a complex number in x+yi or x+yj text format.
IMCOSH	Returns the hyperbolic cosine of the specified complex number.
IMCOT	Returns the cotangent of the specified complex number.
IMCSC	Returns the cosecant of the specified complex number.
IMCSCH	Returns the hyperbolic cosecant of the specified complex number.
IMDIV	Returns the quotient of complex numbers in x+yi or x+yj text format.
IMEXP	Returns the exponential of a complex number in x+yi or x+yj text format.
IMLN	Returns the natural logarithm of a complex number in x+yi or x+yj text format.
IMLOG10	Returns the common logarithm (Base 10) of a complex number in x+yi or x+yj text format.
IMLOG2	Returns the common logarithm (Base 2) of a complex number in x+yi or x+yj text format.
IMPOWER	Returns a complex number raised to a power in x+yi or x+yj text format.
IMPRODUCT	Returns the product from 2 to 29 complex numbers in x+yi or x+yj text format.
IMREAL	Returns the real coefficient of a complex number in x+yi or x+yj text format.
IMSEC	Returns the secant of the specified complex number.
IMSECH	Returns the hyperbolic secant of the specified complex number.
IMSIN	Returns the sine of a complex number in x+yi or x+yj text format.
IMSINH	Returns the hyperbolic sine of the specified complex number.
IMSQRT	Returns the square root of a complex number in x+yi or x+yj text format.
IMSUB	Returns the difference of two complex numbers in x+yi or x+yj text format.
IMSUM	Returns the sum of 2 to 29 complex numbers in x+yi or x+yj text format.
IMTAN	Returns the tangent of the specified complex number.
OCT2BIN	Converts an octal number to binary form.
OCT2DEC	Converts an octal number to decimal form.
OCT2HEX	Converts an octal number to hexadecimal form.

Financial Functions	
ACCRINT	Returns accrued interest for securities that pay periodic interest.
ACCRINTM	Returns the accrued interest for securities that pay interest at the maturity date.
AMORDEGRC	Returns the depreciation for each accounting period within the formula.
AMORLINC	Returns the depreciation for each accounting period.
COUPDAYBS	Returns the number of days from the beginning of the period to the coupon-period settlement date.
COUPDAYS	Returns the number of days in the period that contains the coupon period settlement date.
COUPDAYSNC	Returns the number of days between the settlement date to the next coupon date.
COUPNCD	Returns the next coupon date after the settlement date.
COUPNUM	Returns the total number of coupons to be paid between the settlement and maturity dates,

	rounded up to the nearest whole coupon.
COUPPCD	Returns the coupon date previous to the settlement date.
CUMIPMT	Returns the cumulative interest on a loan between start and stop dates.
CUMPRINC	Returns the cumulative principal amount between start and stop dates on a loan or mortgage.
DB	Returns the asset depreciation for a period using the fixed declining balance method.
DDB	Returns the asset depreciation for a period using the double-declining balance method or another specified method.
DISC	Returns the security discount rate.
DOLLARDE	Converts a fraction dollar price into a decimal dollar price.
DOLLARFR	Converts a decimal dollar price into a fraction dollar price.
DURATION	Returns the Macauley duration for an assumed par value.
EFFECT	Returns the effective interest rate annually. This is based on the nominal annual interest rate and the number of compounding periods per year.
FV	Returns the future value of an investment that makes payments as a lump sum or as a series of equal periodic payments.
FVSCHEDULE	Returns the future value of a principal amount after applying several, or a series of compound interest rates.
INTRATE	Returns the interest rate of a security that is fully invested.
IPMT	Returns the interest for a period of time based on an investment with periodic constant payments and a constant interest rate.
IRR	Returns the internal rate of return for a series of cash flows represented by numbers in the form of values.
ISPMT	Calculates the interest paid during a defined period of an investment.
MDURATION	Returns the modified duration of a security with a par value assumed to be $100.
MIRR	Returns a modified internal rate of return for several periodic cash flows.
NOMINAL	Returns the nominal annual interest rate given an effective rate and the total number of compounding periods for the year.
NPER	Returns the total number of periods for an investment. This is based on a periodic constant payment and a constant interest rate.
NPV	Calculates the net present value of an investment from the discount rate and several future payments and income.
ODDFPRICE	Returns the value of a security based on a per $100 face value and an odd (short or long) first period.
ODDFYIELD	Returns the security yield with an odd first period.
ODDLPRICE	Returns the per $100 face value of a security having an odd last coupon period.
ODDLYIELD	Returns the security yield that has an odd last period.
PDURATION	Returns the number of periods for the specified present value to reach the specified future value given the specified interest rate.
PMT	Calculates the loan payment for a loan based on constant payments and constant interest rates.
PPMT	Returns the principal payment for a period of an investment based on periodic constant payments and a constant interest rate.
PRICE	Returns the value of a security based on price per $100 face value and periodic interest payments.
PRICEDISC	Returns the value of a discounted security based on a price per $100 face value.

PRICEMAT	Returns the value of a security that pays interest at maturity and price per $100 face value.
PV	Returns the present value based on an investment.
RATE	Returns per period the interest of an annuity.
RECEIVED	Based on a fully invested security, returns the amount received at maturity.
RRI	Returns the effective interest rate required for the specified present value to reach the specified future value in the specified number of periods.
SLN	Returns the straight-line depreciation on an asset.
SYD	Based on a specified period, SYD returns the sum-of-years' digits depreciation of an asset.
TBILLEQ	Returns the bond equivalent yield for a treasury bill.
TBILLPRICE	Returns the price per $100 face value for a treasury bill.
TBILLYIELD	Returns the yield of a treasury bill.
VDB	For a period you specify, returns the depreciation of an asset.
XIRR	Returns the internal rate of return for a schedule of cash flows that is not necessarily periodic.
XNPV	Returns the net present value for a schedule of cash flows that is not necessarily periodic.
YIELD	Based on a yield that pays periodic interest, returns the yeild of the security.
YIELDDISC	Returns the annual yield for a discounted security.
YIELDMAT	Returns the annual yield based on a security that pays interest at a maturity.

Information Functions	
CELL	Returns information about a cell's location, formatting, or contents in the upper-left cell in a reference.
ERROR.TYPE	Returns the corresponding number value associated with an error type in Microsoft Excel.
INFO	Returns operating environment information.
ISBLANK	Returns TRUE if the cell is empty, FALSE if it contains data.
ISERR	Returns TRUE if value contains any error value except #N/A, FALSE if it does not.
ISERROR	Returns TRUE if value contains any error value (including #N/A), FALSE if it does not.
ISEVEN	Returns TRUE if value is an even number, FALSE if it is not.
ISFORMULA	Returns TRUE if the specified cell contains a formula.
ISLOGICAL	Returns TRUE if value is a logical value, FALSE if it is not.
ISNA	Returns TRUE if value is #N/A, FALSE if it is not.
ISNONTEXT	Returns TRUE if value is not text, FALSE if it is.
ISNUMBER	Returns TRUE if value is a number, FALSE if it is not.
ISODD	Returns TRUE if value is an odd number, FALSE if it is not.
ISREF	Returns TRUE if value is a reference, FALSE if it is not.
ISTEXT	Returns TRUE if value is text, FALSE if it is not.
N	Returns a value converted to a number.
NA	An alternative representation of the error value #N/A.
SHEET	Returns the one based index of the specified sheet, or the index of the sheet containing the formula if no sheet is specified.
SHEETS	Returns the number of sheets in a 3d cell reference, or the number of sheets in the workbook containing the formula if no reference is specified.

TYPE	Determines the type of value in a cell.

Logical Functions	
AND	Returns TRUE if all the arguments are TRUE in the formula, and FALSE if any one argument is FALSE.
FALSE	Returns the value FALSE. May be typed directly into the cell as "FALSE".
IF	Returns a value if one condition is TRUE and returns another value if the condition is FALSE.
IFERROR	Returns a value you specify if a formula evaluates to an error; otherwise, returns the result of the formula
IFNA	Returns the specified first argument unless it is #N/A, in which case it returns the specified second argument.
NOT	Returns the reverse value of its arguments; TRUE becomes FALSE and FALSE becomes TRUE.
OR	Returns FALSE if all arguments are FALSE, and TRUE if at least one argument is TRUE.
TRUE	Returns the value TRUE. May be typed directly into the cell as "TRUE".
XOR	Returns TRUE if the specified arguments contain an odd number of TRUE values, or FALSE if the values contain an even number of TRUE values.

Lookup and Reference Functions	
ADDRESS	Given specified row and column numbers, creates a cell address as text.
AREAS	Returns the number of areas based on a reference.
CHOOSE	Returns an item from a list of values..
COLUMN	Returns the column number(s) based on a given reference.
COLUMNS	Returns the number of columns based on an array or reference.
HLOOKUP	Searches for a specified value in an array or a table's top row.
HYPERLINK	Creates a shortcut to jump to a document stored on a network server.
INDEX	Returns the value of an element selected by the row number and column letter indexes.
INDIRECT	Returns the contents of a cell using its reference.
LOOKUP	Looks in the first row or column of a range or array, and returns the specified value from the same position in the last row or column of the range or array.
MATCH	Returns the relative position of an item in an array that matches a specified value in a specified order, or the position of an item.
OFFSET	Returns a reference to a range that is a specific number of rows and columns from a cell or range of cells.
ROW	Returns the row number based on a reference.
ROWS	Returns the number of rows in a reference or array.
TRANSPOSE	Returns a horizontal range of cells as vertical or vice versa.
VLOOKUP	Searches for a value in the leftmost column of a table and returns a value from the same row in a column number that you specify.

Math and Trigonometry Functions	
ABS	Returns the absolute value of a number.
ACOS	Returns the arccosine of a number in radians in the range 0 to pi.

ACOSH	Returns the inverse hyperbolic cosine of a number.
ACOT	Returns the inverse cotangent of the specified number.
ACOTH	Returns the inverse hyperbolic cotangent of the specified number.
AGGREGATE	Returns an aggregate in a list or database
ARABIC	Converts the specified Roman numeral to a number.
ASIN	Returns the arcsine of a number in radians in the range -pi/2 to pi/2.
ASINH	Returns the inverse hyperbolic sine of a number.
ATAN	Returns the arctangent of a number in radians in the range -pi/2 to pi/2
ATAN2	Returns the four-quadrant arctangent of the specified x- and y- coordinates in radians between -pi and pi excluding -pi. A positive result represents a counterclockwise angle from the x-axis, a negative result represents a clockwise angle.
ATANH	Returns the inverse hyperbolic tangent of a number.
BASE	Converts the specified number to text with the specified radix and minimum length.
CEILING	Returns a number rounded up, away from zero, to the nearest multiple of significance.
CEILING.MATH	Returns the specified number rounded up using the specified significance and mode.
CEILING.PRECISE	Rounds a number to the nearest integer or to the nearest multiple of significance. Regardless of the sign of the number, the number if rounded up.
COMBIN	Returns the number of combinations for a given number of items.
COMBINA	Returns the number of combinations with the specified number of items.
COS	Returns the cosine of the given angle.
COSH	Returns the hyperbolic cosine of a number.
COT	Returns the cotangent of the specified angle.
COTH	Returns the hyperbolic cotangent of the specified angle.
CSC	Returns the cosecant of the specified angle.
CSCH	Returns the hyperbolic cosecant of the specified angle.
DECIMAL	Converts the specified text to a number using the specified radix.
DEGREES	Converts radians into degrees.
EVEN	Returns a number rounded up to the next even integer for positive integers and rounded down to the next even integer for negative numbers.
EXP	Returns e (2.71828182845804) raised to the power of a specified number.
FACT	Returns the factorial of a number.
FACTDOUBLE	Returns the double factorial of a number.
FLOOR	Returns a number rounded down, toward zero, to the nearest multiple of significance.
FLOOR.MATH	Returns the specified number rounded down using the specified significance and mode.
FLOOR.PRECISE	Rounds a number to the nearest integeror to the nearest multiple of significance. Regardless of the sign of the number, the number is rounded up.
GCD	Returns the greatest common divisor of two or more integers.
INT	Rounds a number down to the nearest integer.
ISO.CEILING	Returns the specified number rounded up using the specified significance.
LCM	Returns the least common multiple of integers.
LN	Returns the natural (base e) logarithm of a number.

LOG	Returns the logarithm of a number of the base you specify.
LOG10	Returns the base-10 logarithm of a number.
MDETERM	Returns the matrix determinant of an array.
MINVERSE	Returns the inverse matrix for the matrix stored in an array.
MMULT	Returns the matrix product of two arrays. The result is an array with the same number of rows as array1 and the same number of columns as array2.
MOD	Returns the remainder of a division operation (modulus).
MROUND	Returns a number rounded to the desired multiple. Rounds up if the remainder after dividing the number by the multiple is at least half the value of the multiple.
MULTINOMIAL	Returns the ratio of the factorial of the sum of the values to the product of the factorials.
MUNIT	Returns an identity matrix with the specified n by n dimension.
ODD	Returns a number rounded up away from zero to the nearest odd integer.
PI	Returns the approximate number 3.14159265358979, the mathematical constant pi, accurate to 15 digits.
POWER	Returns the result of a specified number raised to a specified power.
PRODUCT	Multiplies all the numbers given as arguments and returns the product.
QUOTIENT	Returns the integer portion of a division.
RADIANS	Converts degrees to radians.
RAND	Returns an evenly distributed random number greater than or equal to 0 and less than 1. A new random number is returned every time the worksheet is calculated.
RANDBETWEEN	Returns a random integer between the integers you specify. A new random number is returned every time the worksheet is calculated.
ROMAN	Converts an Arabic numeral to Roman, as text.
ROUND	Round a number to a specified number of digits.
ROUNDDOWN	Rounds a number down, towards zero.
ROUNDUP	Rounds a number up, away from zero.
SEC	Returns the secant of the specified angle.
SECH	Returns the hyperbolic secant of the specified angle.
SERIESSUM	Returns the sum of a power series.
SIGN	Determines the sign of a number. Returns 1 if the value is positive, 0 if the value is 0, and -1 if the value is negative.
SIN	Returns the sine of a given angle.
SINH	Returns the hyperbolic sine of a number.
SQRT	Returns a positive square root.
SQRTPI	Returns the square root of (NUMBER * Pi)
SUBTOTAL	Returns a subtotal in a list or database.
SUM	Adds all the numbers in a range of cells.
SUMIF	Adds the cells specified by a certain criteria.
SUMIFS	Adds the cells in a range that meet multiple criteria
SUMPRODUCT	Multiplies corresponding components in the given arrays, and returns the sum of those products.
SUMSQ	Returns the sum of the squares of the arguments.

SUMX2MY2	Returns the sum of the difference of squares of corresponding values in two arrays.
SUMX2PY2	Returns the sum of the sum of squares of corresponding values in two arrays.
SUMXMY2	Returns the sum of squares of differences of corresponding values in two arrays.
TAN	Returns the tangent of the given angle.
TANH	Returns the hyperbolic tangent of a number.
TRUNC	Truncates a number to an integer by removing the fractional part of a number.

Pre-Excel 2010 Statistical Functions	
BETADIST	Returns the cumulative beta probability density function.
BETAINV	Returns the inverse of the cumulative beta probability density function.
BINOMDIST	Returns the individual term binomial distribution probability.
CHIDIST	Returns the one-tailed probability of the chi-squared (X^2) distribution; the area in the right tail under the chi-squared distribution curve.
CHIINV	Returns the inverse of the one-tailed probability of the chi-squared (X^2) distribution.
CHITEST	Returns the test for independence of the characteristics in a table.
CONFIDENCE	Returns the confidence interval for a population mean.
COVAR	Returns the covariance, the average of products of deviations, for each data point pair.
EXPONDIST	Returns the exponential distribution.
FDIST	Returns the F probability distribution.
FINV	Returns the inverse of the F probability distribution.
FTEST	Returns the result of an F-test.
GAMMADIST	Returns the gamma distribution.
GAMMAINV	Returns the inverse of the gamma cumulative distribution.
LOGINV	Returns the inverse of the lognormal cumulative distribution function of x, where ln(x) is normally distributed with parameters mean and standard deviation.
LOGNORMDIST	Returns the cumulative lognormal distribution of x, where ln(x) is normally distributed with parameters mean and standard deviation.
MODE	Returns the most frequently occuring, or repetitive, number in an array or range of data.
NEGBINOMDIST	Returns the negative binomial distribution.
NORMDIST	Returns the normal cumulative distribution for the specified mean and standard deviation.
NORMINV	Returns the inverse of the normal cumulative distribution for the specified mean and standard deviation.
NORMSDIST	Returns the standard normal cumulative distribution function.
PERCENTILE	Returns the k-th percentile of values in a range.
PERCENTRANK	Returns the rank of a value in a data set set as a percentage of the data set.
POISSON	Returns the Poisson distribution.
QUARTILE	Returns the quartile of a data set.
RANK	Returns the rank of a number in a list of numbers.
STDEV	Estimates standard deviation based on a sample.
STDEVP	Estimates standard deviation based on a sample assuming that the arguments represent the total population.

TDIST	Returns the percentage points (probability) for the student t-distribution, where a numeric value (x) is a calculated value of t for which the percentage points are to be computed.
TINV	Returns the t-value of the Student's t-distribution as a function of the probability and the degrees of freedom.
TTEST	The probability associated with t-test.
VAR	Returns an estimate for the variance of a population based on a sample data set.
VARP	Calculates variance based on the entire population.
WEIBULL	Returns the Weibull distribution.
ZTEST	Returns the two-tailed P-value of a z-test.

Statistical Functions	
AVEDEV	Retuns the average of the absolute deviations of data points from their mean.
AVERAGE	Returns the average of its arguments.
AVERAGEA	Returns the average of the values in its list of arguments including text and logical values.
AVERAGEIF	Returns the average (arithmetic mean) of all the cells in a range that meet a given criteria
AVERAGEIFS	Returns the average (arithmetic mean) of all cells that meet multiple criteria
BETA.DIST	Returns the beta cumulative distribution function
BETA.INV	Returns the inverse of the cumulative distribution function for a specified beta distribution
BINOM.DIST	Returns the individual term binomial distribution probability
BINOM.DIST.RANGE	Returns the probability of the specified trial using a binomial distribution.
BINOM.INV	Returns the smallest value for which the cumulative binomial distribution is less than or equal to a criterion value
CHISQ.DIST	Returns the chi-squared distribution
CHISQ.DIST.RT	Returns the one-tailed probability of the chi-squared distribution
CHISQ.INV	Returns the inverse of the left-tailed probability of the chi-squared distribution
CHISQ.INV.RT	Returns the inverse of the right-tailed probability of the chi-squared distribution
CHISQ.TEST	Returns the test for independence.
CONFIDENCE.NORM	Returns the confidence interval for a population mean.
CONFIDENCE.T	Returns the confidence interval for a population mean, using a Student's t distribution
CORREL	Returns the correlation coefficient between two data sets.
COUNT	Counts the number of cells that contain numbers (including dates and formulas that evaluate to numbers) within the list of arguments.
COUNTA	Counts the number of cells that are not empty.
COUNTBLANK	Counts the empty cells in a specified range.
COUNTIF	Counts the number of cells in a range that meet a given criteria.
COUNTIFS	Counts the number of cells within a range that meet multiple criteria
COVARIANCE.P	Returns covariance, the average of the products of paired deviations
COVARIANCE.S	Returns the sample covariance, the average of the products deviations for each data point pair intwo data sets
CRITBINOM	Returns the minimum number yields a binomial distribution less than or equal to the specified criteria
DEVSQ	Returns the sum of the squares of deviations of a data set from their sample mean.

EXPON.DIST	Returns the exponential distribution.
F.DIST	Returns the F probability distribution.
F.DIST.RT	Returns the (right-tailed) F probability distribution (degree of diversity) for two data sets
F.INV	Returns the inverse of the F probability distribution
F.INV.RT	Returnd the inverse of the (right-tailed) F probability distribution
F.TEST	Returns the result of an F-test.
FISHER	Returns the Fisher transformation at x.
FISHERINV	Returns the inverse of the Fisher transformation at y.
FORECAST	Calculates or predicts a future value by using existing values.
FREQUENCY	Calculates how often values occur within a range of values and then returns a vertical array of numbers.
GAMMA	Returns the gamma funnction result for the specified number.
GAMMA.DIST	Returns the gamma distribution.
GAMMA.INV	Returns the inverse of the gamma cumulative distribution.
GAMMALN	Returns the natural logarithm of the gamma function.
GAMMALN.PRECISE	Returns the natural logarithm of the gamma function.
GAUSS	Returns the probability that a number will fall between the mean and the specified standard deviation in a normal distribution.
GEOMEAN	Returns the geometric mean of an array or range of positive data.
GROWTH	Calculates predicted exponential growth by using existing data.
HARMEAN	Returns the harmonic mean of a data set.
HYPGEOM.DIST	Returns the hypergeometric distribution.
HYPGEOMDIST	Returns the hypergeometric distribution.
INTERCEPT	Calculates the point at which a line will intersect the y-axis by using existing x and y values.
KURT	Returns the Kurtosis of a data set.
LARGE	Returns the k-th largest value in a data set.
LINEST	Calculates a straight line that best fits your data using the least squares method.
LOGEST	Calculates an exponential curve that fits your data and returns an array of values that describes the curve.
LOGNORM.DIST	Returns the lognormal distribution, of x, where ln(x) is normally distributed with mean and standard deviation.
LOGNORM.INV	Returns the inverse of the lognormal cumulative distribution.
MAX	Returns the largest value in a set of values.
MAXA	Returns the largest value in a set of values including text and logical values.
MEDIAN	Returns the median of the given numbers.
MIN	Returns the smallest value in a set of values.
MINA	Returns the smallest value in a set of values including text and logical values.
MODE.MULT	Returns a vertical array of the most frequestly occurring, or repetitive values in an array or range of data.
MODE.SNGL	Returns the most common value in a data set.
NEGBINOM.DIST	Returns the negative binomial distribution.

NORM.DIST	Returns the normal cumulative distribution.
NORM.INV	Returns the inverse of the normal cumulative distribution.
NORM.S.DIST	Return the standard normal cumulative distribution.
NORM.S.INV	Returns the inverse of the standard normal cumulative distribution.
NORMSINV	Returns the inverse of the standard normal cumulative distribution function.
PEARSON	Returns the Pearson product moment correlation coefficient, r, a dimensionless index that ranges from -1.0 to 1.0 inclusive and reflects the extent of a linear relationship between two data sets.
PERCENTILE.EXC	Returns the k-th percentile of values in a range, where k is in the range 0..1, exclusive
PERCENTILE.INC	Returns the k-th percentile of values in a range.
PERCENTRANK.EXC	Returns the rank of a value in a data set as a percentage (0..1, exclusive) of the data set
PERCENTRANK.INC	Returns the percentage rank of a value in a data set
PERMUT	Returns the number of permutations for a given number of objects that can be selected from a range of numbers.
PERMUTATIONA	Returns the number of permutations given the specified total number of items and the specified number of items chosen for each permutation.
PHI	Returns the value of the probability density function of the specified number for the standard normal distribution.
POISSON.DIST	Returns the Poisson distribution.
PROB	Returns the probability that values in a range are between two specified limits.
QUARTILE.EXC	Returns the quartile of the data set, based on percentile values fro 0..1, exclusive.
QUARTILE.INC	Returns the quartile of a data set.
RANK.AVG	Returns the rank of a number in a list of numbers.
RANK.EQ	Returns the rank of a number in a list of numbers.
RSQ	Returns the r^2 value of a linear regression line.
SKEW	Returns the skew of a distribution.
SKEW.P	Returns the population skewness of the specified distribution.
SLOPE	Returns the slope of a regression line through data points in KNOWN_Y'S and KNOWN_X'S.
SMALL	Returns the k-th smallest value in a data set.
STANDARDIZE	Returns a normalized value from a distribution characterized by MEAN and STANDARD_DEV.
STDEV.P	Calculates standard deviation based on the entire population
STDEV.S	Estimates standard deviation based on a sample.
STDEVA	Estimates standard deviation based on a sample. Includes text and logical values.
STDEVPA	Estimates standard deviation based on a sample assuming that the arguments represent the total population. Includes text and logical values.
STEYX	Returns the standard error of the predicted y value for each x in the regression.
T.DIST	Returns the percentage points (probability) for the student t-distribution.
T.DIST.2T	Returns the percentage points (probability) for the student t-distribution.
T.DIST.RT	Returns the Student's t-distribution.
T.INV	Returns the t-value of the Student's t-distribution as a function of the probability and the degrees of freedom.
T.INV.2T	Returns the inverse of the Student's t-distribution.

T.TEST	Returns the probability associated with a Student's t-test.
TREND	Returns the y-values along a linear trendline that best fits the values in a data set.
TRIMMEAN	Returns the mean of the interior of a data set.
VAR.P	Calculates variance based on the entire population
VAR.S	Estimates variance based on a sample.
VARA	Returns an estimate for the variance of a population based on a sample data set and may include text or logical values.
VARPA	Calculates variance based on the entire population and may include text or logical values.
WIEBULL.DIST	Returns the Weibull distribution.
Z.TEST	Returns the one-tailed probability-value of a z-test.

Text Functions	
CHAR	Returns the character specified by a number.
CLEAN	Removes all nonprintable characters from text.
CODE	Returns a numeric code from the first character in a text string. The opposite of the CHAR function.
CONCATENATE	Joins several text strings into one text string.
DOLLAR	Converts a number to text using Currency format, with the decimals rounded to the specified place.
EXACT	Compares two text strings and returns TRUE if they are exactly the same, and FALSE otherwise.
FIND	Locates one text string within another text string, and returns the number of the starting position of of FIND_TEXT from the leftmost character of WITHIN_TEXT.
FINDB	Returns the position of specified text within another specified text string based on the number of bytes each character uses from the first character of WITHIN_TEXT.
FIXED	Rounds a number to a specified number of decimals, formats the number in decimal format using a period and commas, and returns the result as text.
LEFT	Returns the first character(s) in a text string.
LEFTB	Returns the first character(s) in a text string based on a specified number of bytes
LEN	Returns the number of characters in a text string.
LENB	Returns the number of characters in a text string expressed in bytes.
LOWER	Converts all letters in a text string to lowercase.
MID	Returns a specific number of characters from a text string starting at the position you specify.
MIDB	Returns a group of characters based on a specified number of bytes from a text string starting at the position you specify.
NUMBERVALUE	Converts the specified text to a number using the specified decimal seperator and thousands separator.
PROPER	Capitalizes the first letter of each word in a text string or sentence.
REPLACE	Replaces part of a text string with a different text string based on the number of characters you specify.
REPLACEB	Replaces part of a text string with a different text string based on the number of characters you specify in terms of bytes.
REPT	Repeats specified text a given number of times.
RIGHT	Returns the last character(s) in a text string.

RIGHTB	Returns the last character(s) in a text string based on a specified number of bytes.
SEARCH	Returns the number of the character at which a specific character or text string is first found, reading from left to right.
SEARCHB	Returns the number of the character at which a specific character or text string is first found in bytes, reading from left to right.
SUBSTITUTE	Substitutes NEW_TEXT for OLD_TEXT in a string.
T	Returns the text referred to by a value.
TEXT	Converts a value to text in a specific number format.
TRIM	Removes all spaces from text except single spaces between words.
UNICHAR	Convert the specified UTF-32 code point to text.
UNICODE	Convert the first character in the specified text to a UTF-32 code point.
UPPER	Converts text to uppercase.
USDOLLAR	Converts a number to text using US Dollar format, with the decimals rounded to the specified place.
VALUE	Converts a text string that represents a number to a number.

Web Functions	
ENCODEURL	Returns the specified string as an encoded URL.
FILTERXML	Returns the selected node(s) from the specified xml and xpath expression.
WEBSERVICE	Returns the text result of an HTTP request from the specified URL.