

HOK Utilities



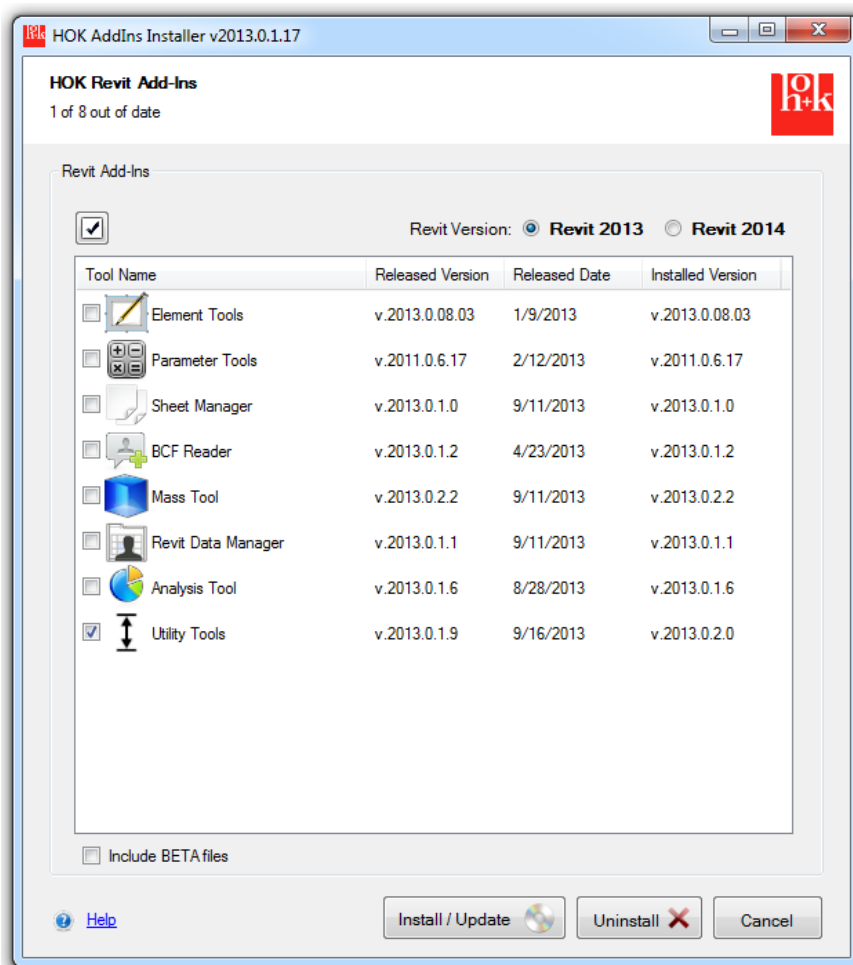
(Updated 2015-02-05 by Jinsol Kim)

Overview

This package of utility tools has been developed based on special requests from BIM managers. The lists of tools mostly have simple functionality that measures the dimension of model elements, creates new elements and writing parameter values.

Installation

Select the check box, Include BETA files, and select the Utility Tools and confirm the version released and installed.



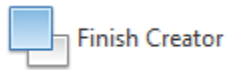


Contents

Overview	1
Installation	1
1. Finish Creator	3
1.1 Creating Finishes	3
2. Ceiling Height	5
2.1 Measuring Ceiling Heights	6
2.2 Creating Shared Parameters	7
3. Level Manager	8
3.1 Selecting Elements	8
3.2 Maintaining Physical Location	10
3.3 Deleting Levels after Re-hosting	12
3.4 Copying Rooms (2014 Only)	12
4. View Depth	14
5. Leader Arrowhead	17
6. View Creator	18
7. Door Link	20
7.1 Copying Revit Internal Room Data	21
7.2 Retrieving Rooms from Linked Models	22
8. Room Updater	24

9. Room Elevation..... 26

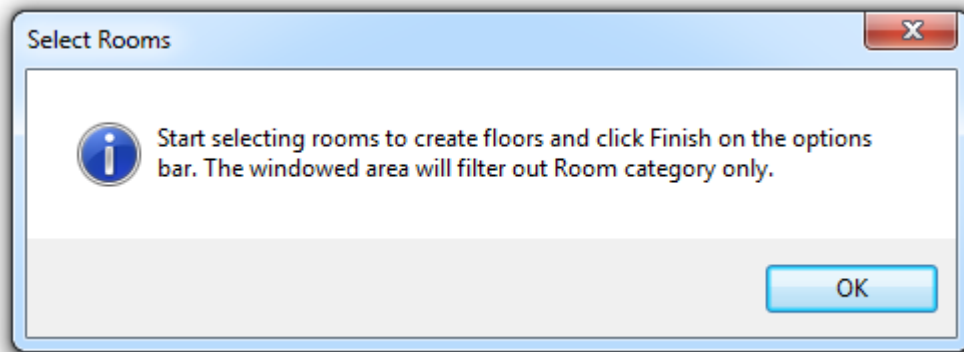
1. Finish Creator

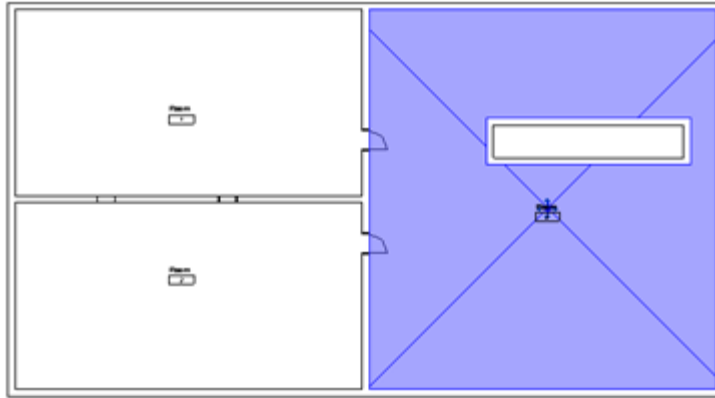


To represent finishes as an element, this tool will create a thin floor with default thickness ¼" based on boundary lines of selected rooms, and place the new floor on top of the actual floor element the room bounded by.

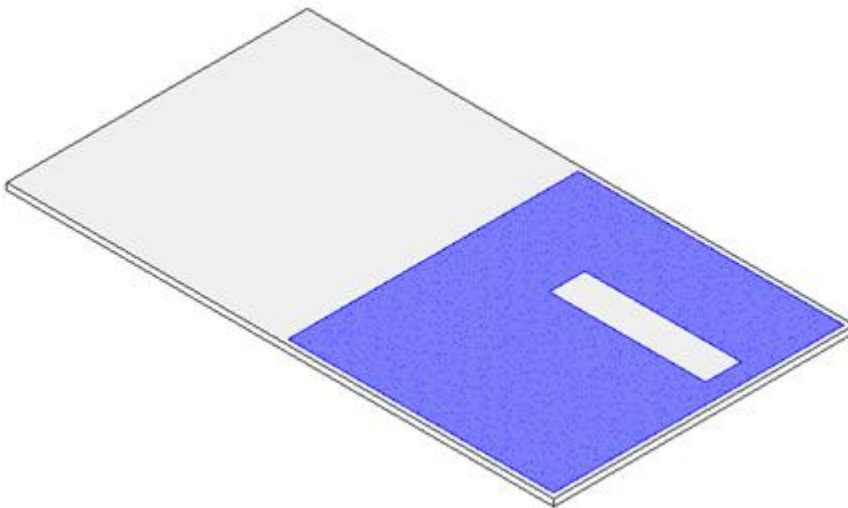
1.1 Creating Finishes

- Find the Finish Creator command button in HOK Utilities panel under the Add-ins tab, and click the button
- It will notify you to start selecting rooms. After the completion of the selection, click Finish on the options bar on left-top corner.

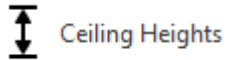




- You will be able to find the new floor elements created on top of the existing floor element. The base lines of each finish floor will be created based on the boundary lines of each room and the bottom surface will be extruded up to ¼" as default.



2. Ceiling Height



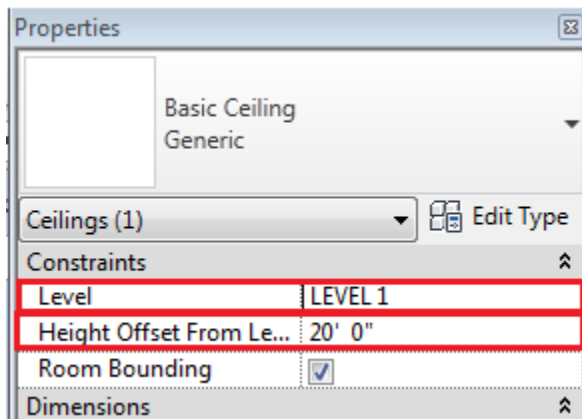
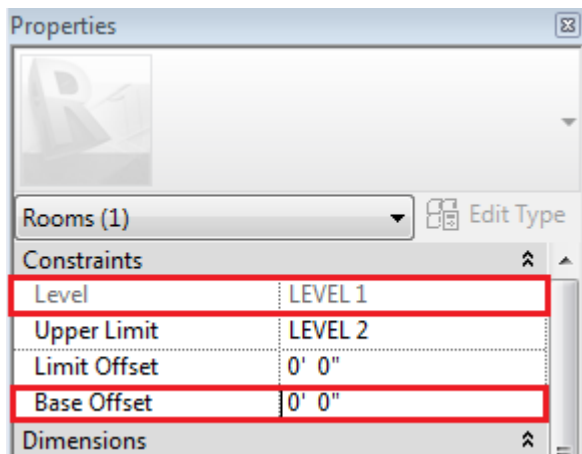
This tool will calculate the ceiling height by measuring distance from the base elevation of rooms to the elevation of ceiling.

Note: Level parameter of a ceiling should be set as same as Level parameter of a room to be regarded as the ceiling is pertained to the room.

If level values are same between a room and a ceiling, it will calculate the ceiling height like the followings. The actual room height is not important.

Ceiling Height (room parameter)

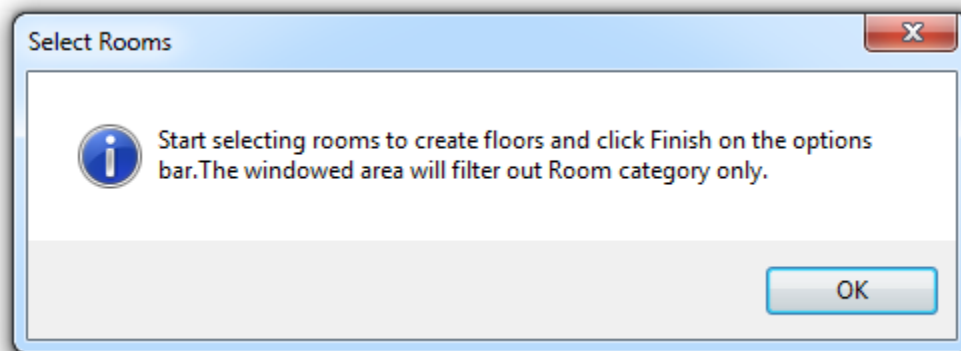
= Height offset From Level (ceiling parameter) - Base Offset (room parameter)



Ceiling Height: 20' = Height Offset From Level: 20' – Base Offset: 0'

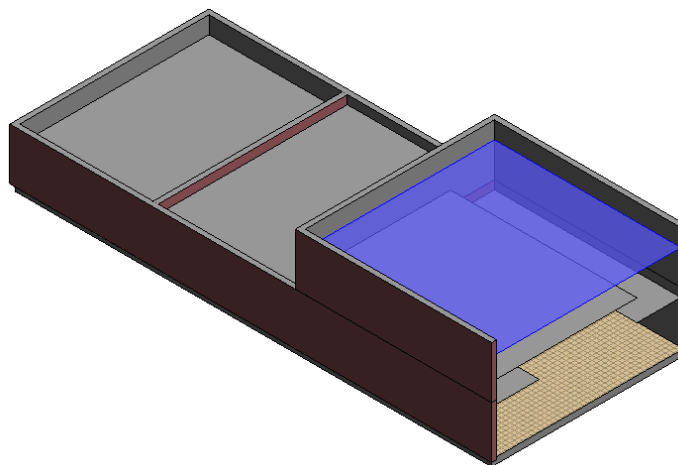
2.1 Measuring Ceiling Heights

- Find the Ceiling Height command button in HOK Utilities panel under the Add-Ins tab, and click the button
- It will notify you to start selecting rooms. After the completion of the selection, click Finish on the options bar on left-top corner.



The tool will find appropriate ceilings following rules below.

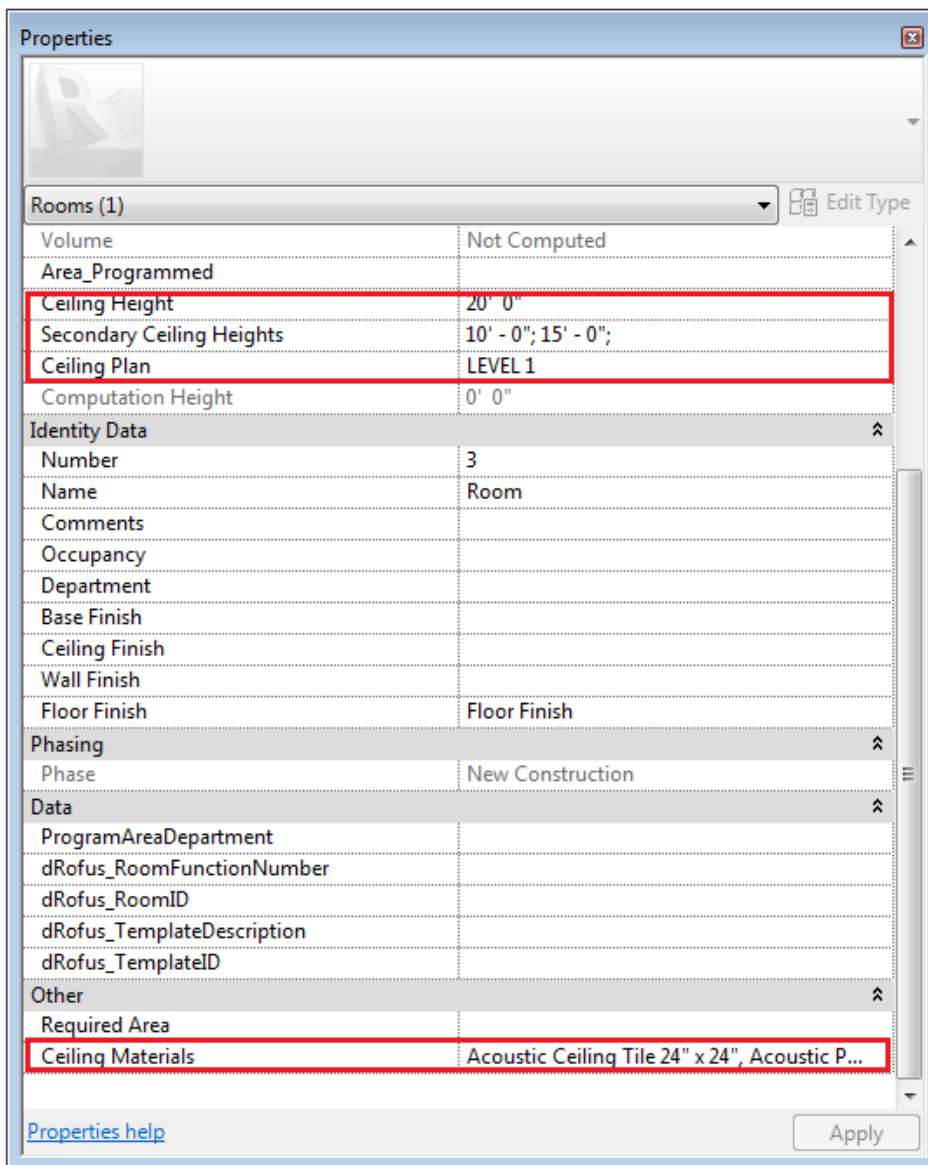
1. If ceilings exist and intersect with a virtual solid created by room boundary lines with its height defined in room constraints, the ceilings will be mapped to the corresponding room.
2. If no ceiling is enclosed by the room solid, the tool will recursively create temporary bounding boxes to see if there are some intersecting ceilings with the bounding box. If any ceilings are found, they will be returned.
3. When multiple ceilings are found on top of the room following those two methods, this tool will determine a major ceiling that has the largest overlapping area among other ceiling elements.



2.2 Creating Shared Parameters

After measuring the ceiling height, this tool will create shared parameters and write the information in room elements.

1. **Ceiling Heights:** the height of the largest ceiling
2. **Secondary Ceiling Heights:** lists of ceiling heights existing on the room (*this will not include the major ceiling height - updated v.2013.0.1.5*)
3. **Ceiling Plan:** the name of ceiling plan in which the largest ceiling exists.
4. **Ceiling Materials:** lists of the name of ceiling materials obtained from the type mark of the ceiling type



Properties	
Rooms (1) Edit Type	
Volume	Not Computed
Area_Programmed	
Ceiling Height	20' 0"
Secondary Ceiling Heights	10' - 0"; 15' - 0";
Ceiling Plan	LEVEL 1
Computation Height	0' 0"
Identity Data	
Number	3
Name	Room
Comments	
Occupancy	
Department	
Base Finish	
Ceiling Finish	
Wall Finish	
Floor Finish	Floor Finish
Phasing	
Phase	New Construction
Data	
ProgramAreaDepartment	
dRofus_RoomFunctionNumber	
dRofus_RoomID	
dRofus_TemplateDescription	
dRofus_TemplateID	
Other	
Required Area	
Ceiling Materials	Acoustic Ceiling Tile 24" x 24", Acoustic P...

[Properties help](#) Apply

3. Level Manager



This tool will allow for elements to be re-hosted by another level, so that a duplicated level can be eliminated. The deprecated level elements can be deleted only if all elements are successfully migrated to the new level. Otherwise, the tool will navigate through not movable elements in the background with highlighted.

The Level Manager will work with Family Instances which has Level parameter and System Families with following parameters.

Revit Categories	Parameters Associated
Building Pads	Level, (Height Offset from Level)
Cable Tray	Reference Level, (Offset)
Ceilings	Level, (Height Offset from Level)
Columns	Base Level, (Base Offset, Top Level, Top Offset)
Conduit	Reference Level, (Offset)
Duct	Reference Level, (Offset)
Flex Duct	Reference Level, (Offset)
Floors	Level, (Height Offset from Level)
Model Groups	Reference Level, (Origin Level Offset)
Pipe	Reference Level, (Offset)
Roofs	Base Level, (Offset)
Rooms**	Level
Shaft Openings	Base Constraint (Base Offset, Top Constraint, Unconnected Height)
Stairs	Base Level, (Base Offset, Top Level, Top Offset)
Walls	Base Constraint, (Base Offset, Top Constraint, Unconnected Height)

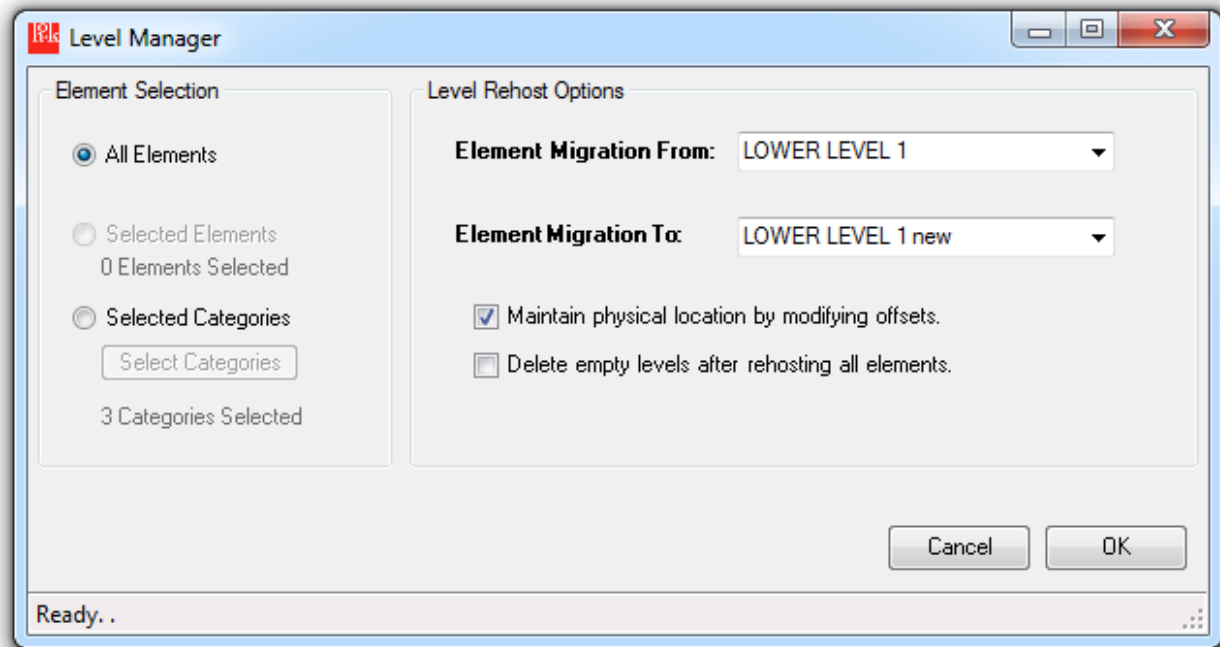
**The option for copying and pasting rooms is only available in Revit 2014

3.1 Selecting Elements

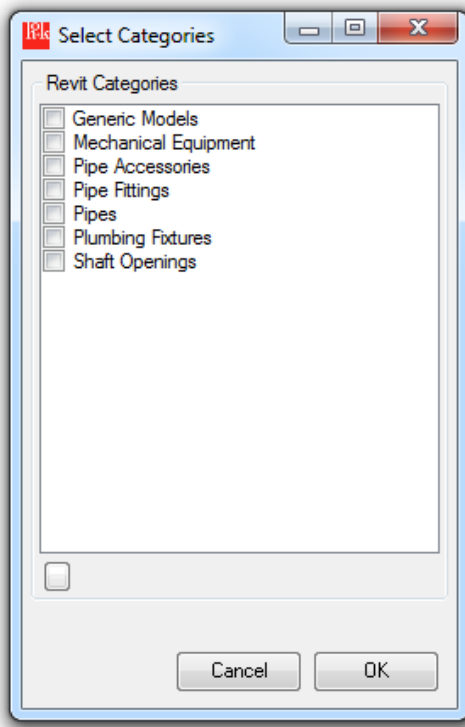
There are three options to make a group for elements to be re-hosted to a new level.

1. All Elements: It will collect all elements hosted by the level assigned in Element Migration From, and re-host to a new level in Element Migration To.

2. **Selected Elements:** It will make the Element Migration From option disabled, and re-host all selected elements to a new level assigned in Element Migration To.
3. **Selected Categories:** elements can be filtered out by selected categories , and re-host them to the new level.

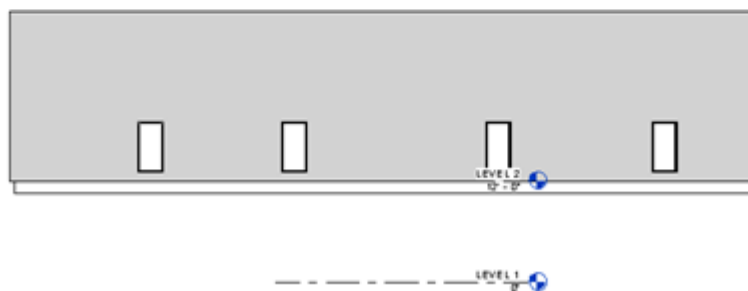
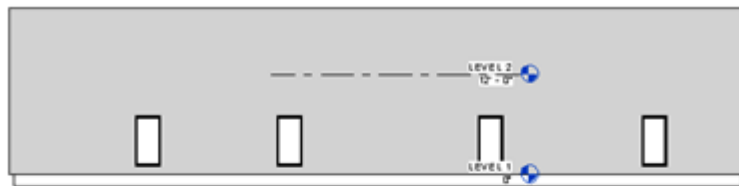


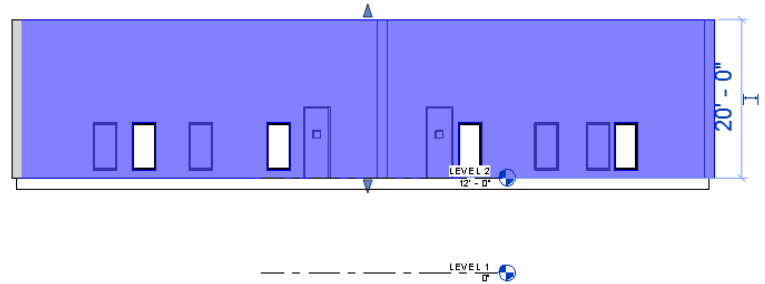
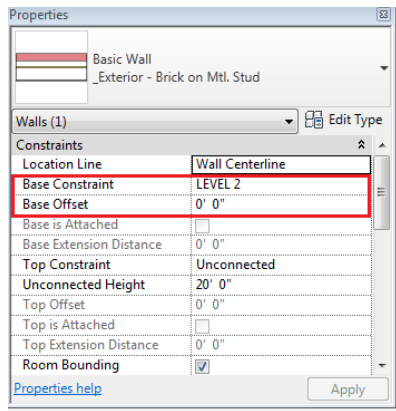
Only categories that have Level parameter which is not read-only will be listed in the category option window.



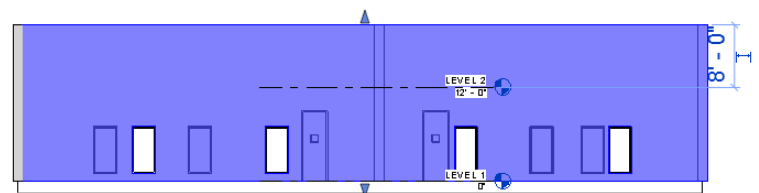
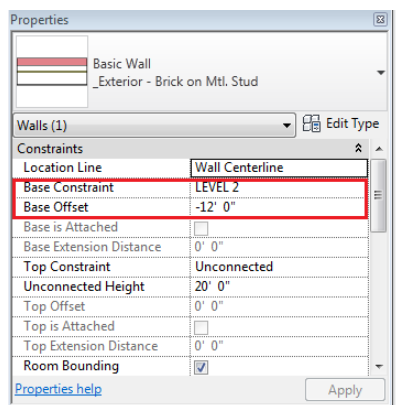
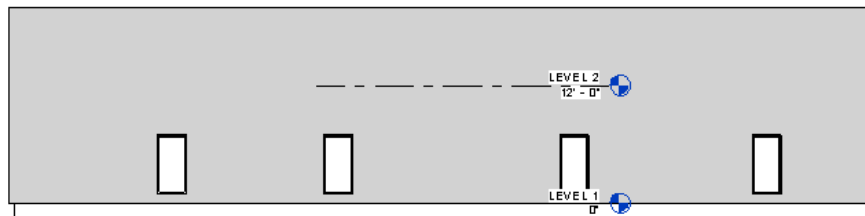
3.2 *Maintaining Physical Location*

1. When the check box, Maintain physical location by modifying offsets, is not selected, the elements will be simply relocated from one level to another with a same base offset value as the original element has.



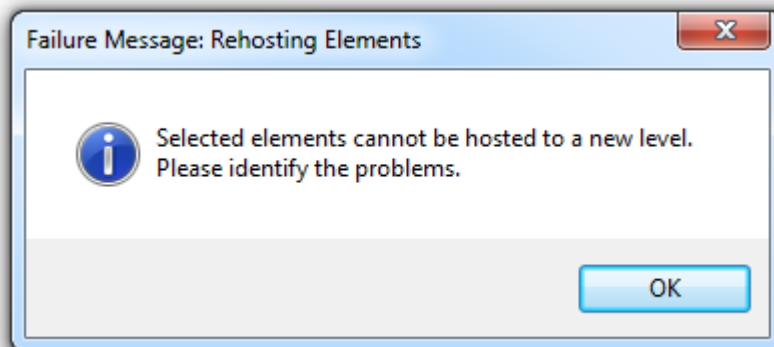


- When the check box, Maintain physical location by modifying offsets, is selected, all level parameters of elements will be set to a new level, but their physical location will remain same by adjusting their offset values.

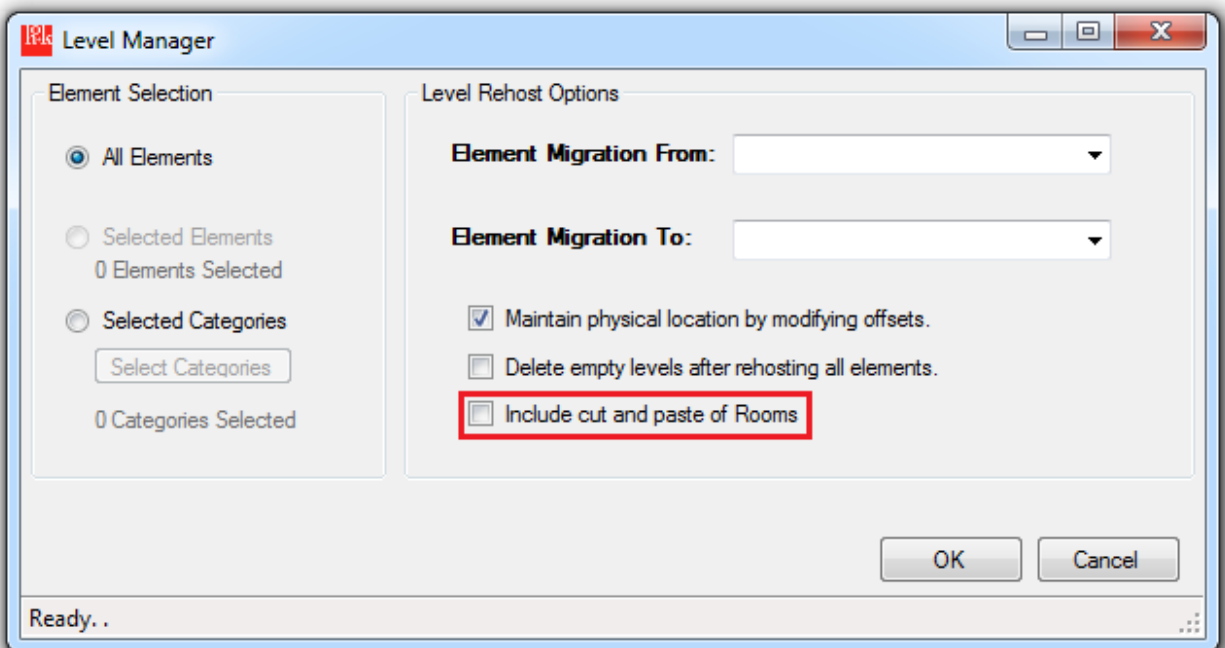


3.3 Deleting Levels after Re-hosting

If the checkbox, Delete empty levels after re-hosting all elements, is selected, this tool will delete the level element after the migration of all elements. If this process is failed, this error message will be prompted showing the failed elements with highlighted in Revit background.



3.4 Copying Rooms (2014 Only)

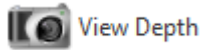




If room elements exist in the collected elements to proceed, by selecting the option, Include cut and paste of Rooms, the tool will copy and paste rooms into the new migrating level. At the event, if rooms are bounded by room separation lines, the tool will also copy and paste them at the equivalent XY coordinates on the new level without any translation. If rooms and room separation lines are successfully copied, all the original rooms will be deleted.

One limitation of this functionality is that it won't copy room tags, which are view specific elements.

4. View Depth



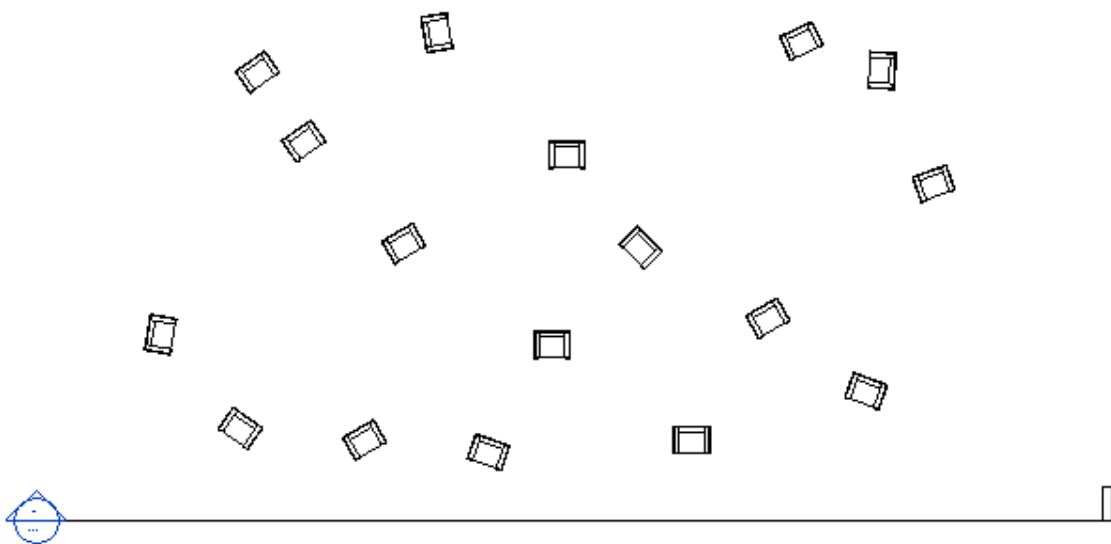
The View Depth tool will override graphics in a view by elements adjusting the color of project lines based on the distance of elements from the view point. This tool will measure the depth of each element and classify them into three groups by distance so that the color of project lines will be applied like following.

Element Group 1 – the most adjacent: will preserve the original color of the project lines.

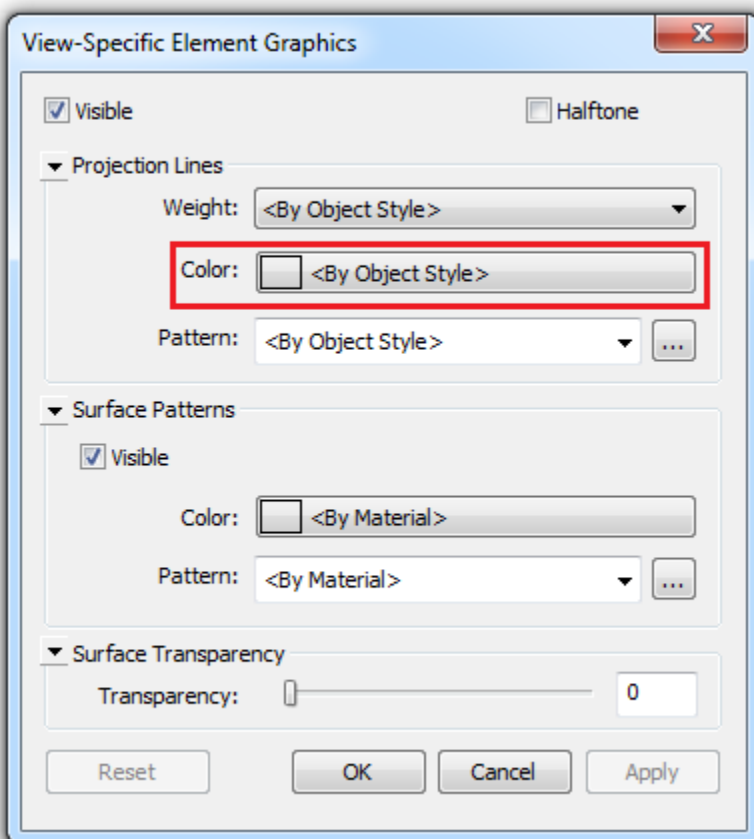
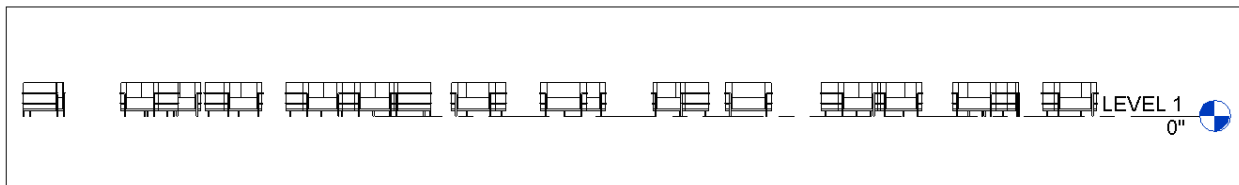
Element Group 2 – located in the middle: will change to a new color as R-128, G-128, B-128

Element Group 3 – the most distant: will change to a new color as R-192, G-192, B-192

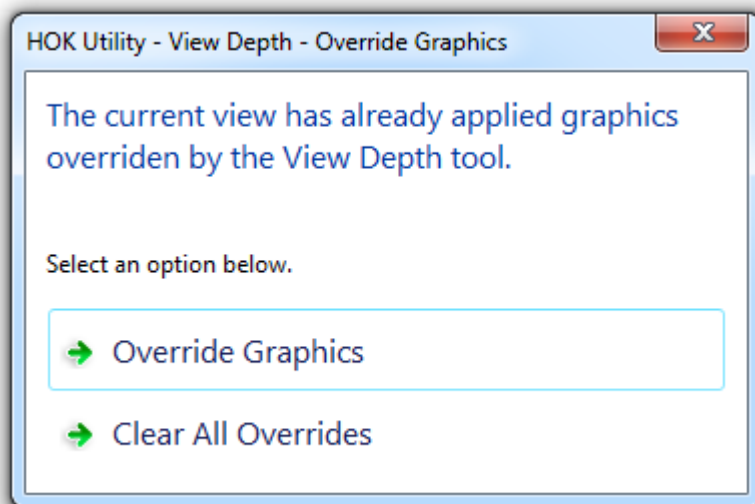
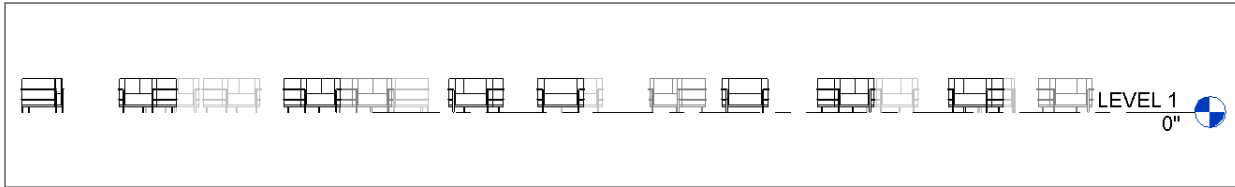
The limitation of this tool is not to support for views created from linked files and any types of 3D views. It is recommended to create a section view to be covered with groups of elements placed in a variety of view depth.



The section view below is represented with pre-defined colors of project lines varying depending on the object style.

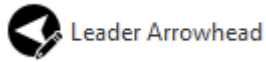


After running the command of View Depth, different colors of project lines will be applied, if certain elements are placed in a range of middle distance of area or much further from the view point.



In order to reinstate a view from the graphics overrides applied by the View Depth tool, you can simply execute the tool in the same view and select an option, "Clear All Overrides" in the task dialog box.

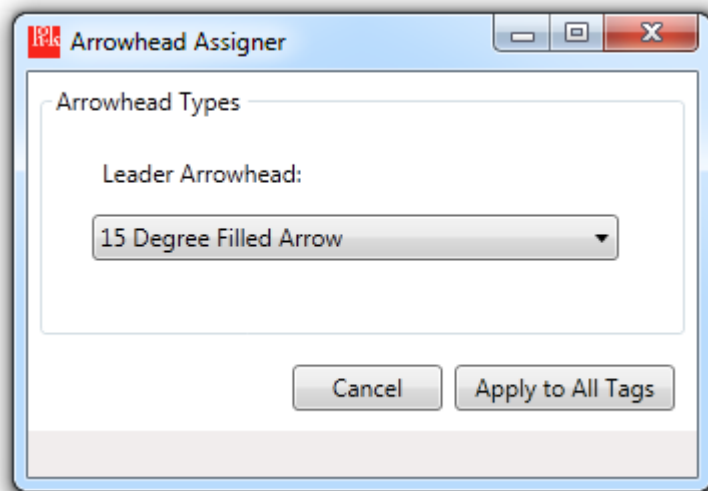
5. Leader Arrowhead



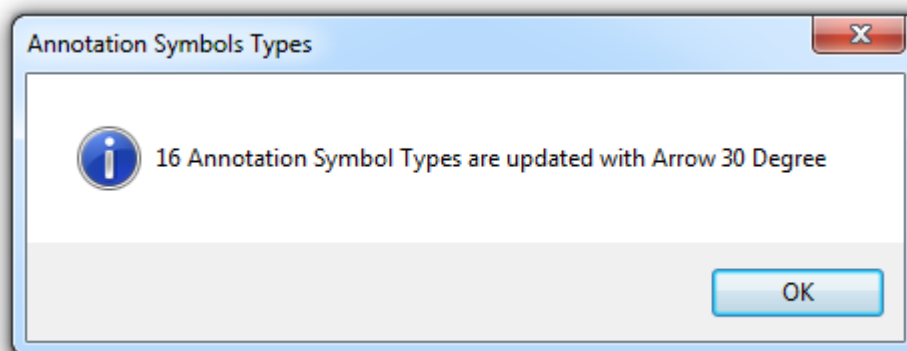
The Leader Arrowhead tool will assign a specific arrowhead style to all family types by switching the value of the parameter named Leader Arrowhead to the chosen style.

In the HOK Utilities pane, find the command button for the Leader Arrowhead among the list of buttons.

The main command window will be shown with the option to select one of arrowhead styles.



Select one of styles and click the button, Apply to All Tags. At the end of the process, you will be able to see the completion message like below.

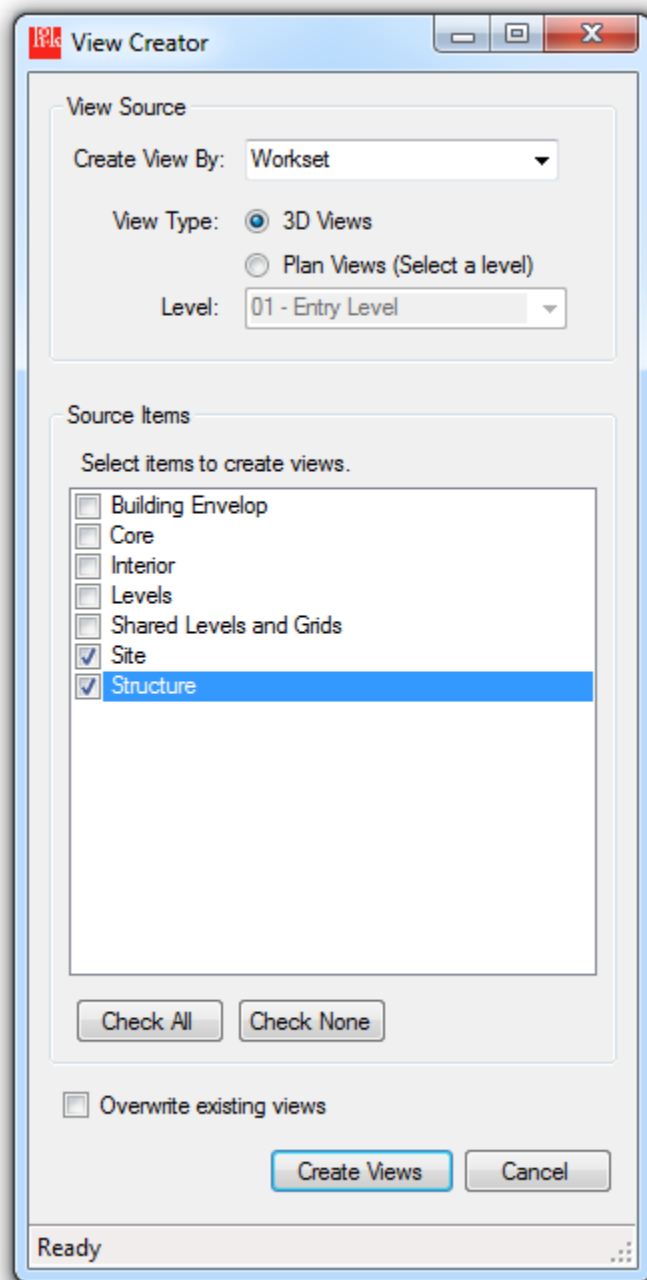


6. View Creator



The View Creator tool will create new 3d views or plan views or update already created views based on the information of the chosen items among Worksets, Phases or Design Options.

Go to the HOK Utilities panel and select the View Creator button and then you will see the main window.

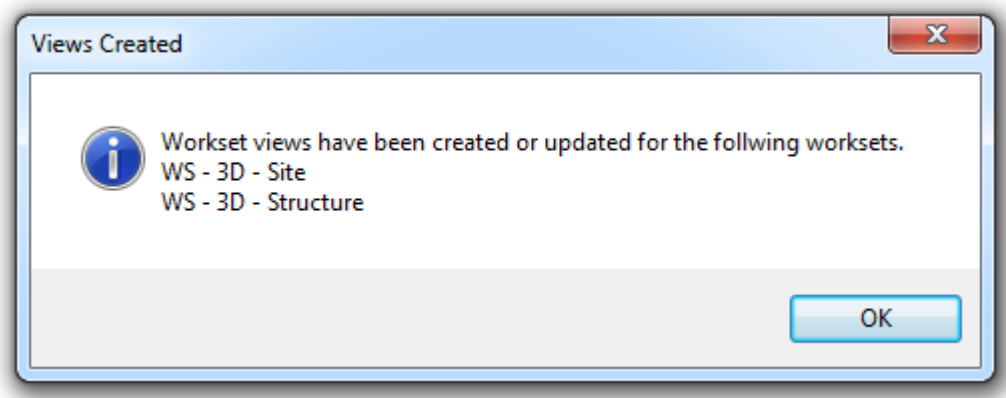


Select one of options among Worksets, Phases and Design Options from “Create View By”, and then select either 3D Views or Plan Views. The selection of Level will be required when creating plan views.

Make a selection of source items in the checked list box for the views to be created.

If the option, ☐ **Overwrite existing views**, is selected, the existing views will be updated with the pre-defined settings of this tool.

You will be able to end up seeing the completion message like below.



The name of views will be created with the following prefix and suffix.

	3D Views	Plan Views
Worksets	WS – 3D – [Workset Name]	[Level Name] – [Workset Name]
Phases	PH – 3D – [Phase Name]	[Level Name] – [Phase Name]
Design Options	OP – 3D – [Option Name]	[Level Name] – [Option Name]

Workset Views: visibility settings that controls the display of worksets will be applied to the creating views. Only the source workset will be visible in the created view.

Worksets	Visibility Setting
Building Envelop	Hide
Core	Hide
Interior	Hide
Levels	Hide
Shared Levels and Grids	Hide
Site	Show
Structure	Hide

Phase Views: the phase of the view will be set to the one chosen by the tool.

Design Options Views: the tool will simply create views with the name of design options.

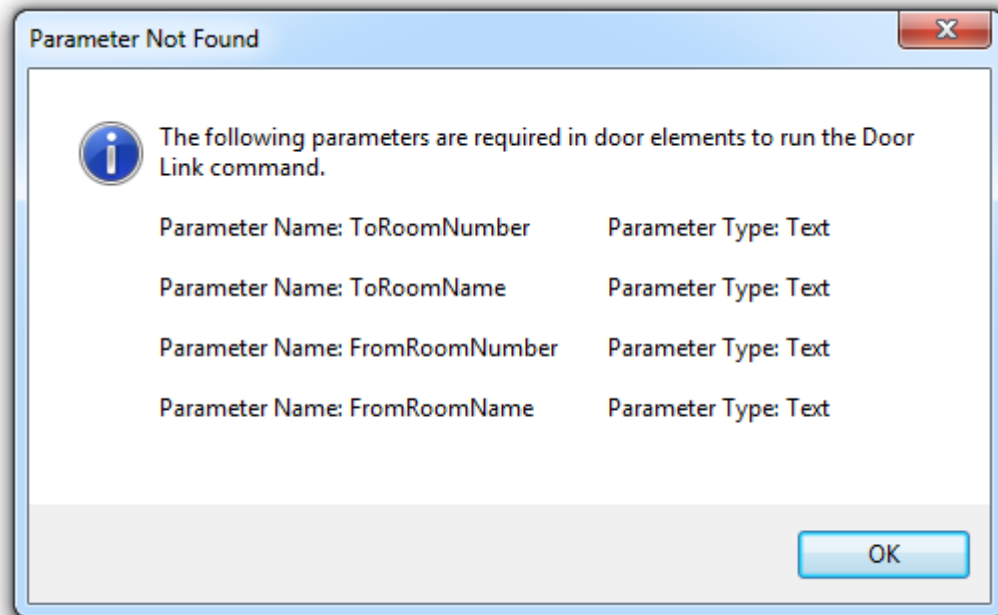
7. Door Link



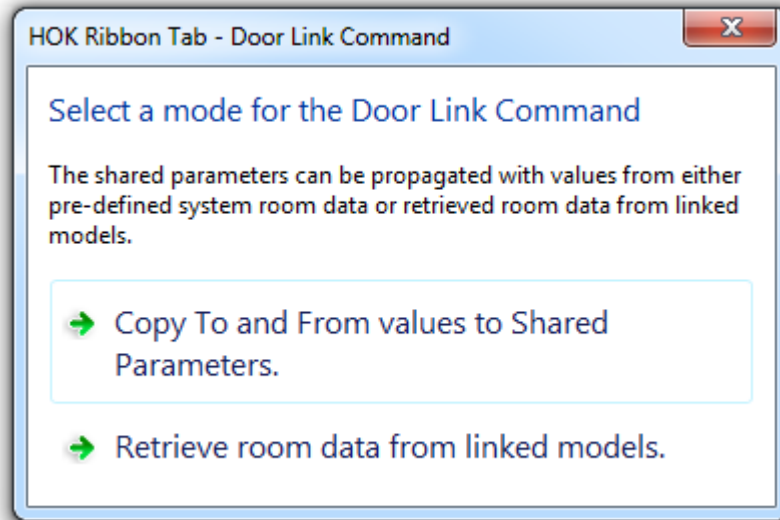
The Door Link command will define the two pair of adjacent rooms, From-Room and To-Room, to door elements by the geometric location of the rooms and doors. If the command finds corresponding rooms, the information of room will be written in door parameters.

Requirement – Shared parameters

Before running the Door Link command, the following four shared parameters in the message box shown below should be prepared under the Door category.

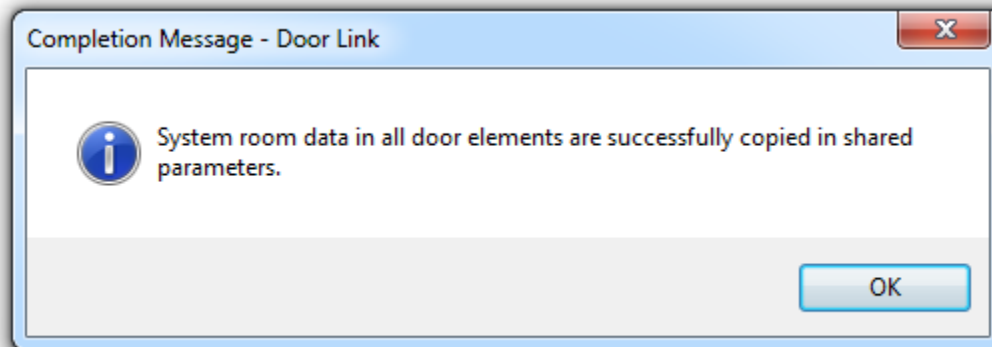


7.1 Copying Revit Internal Room Data



Select the first option, “Copy To and From values to Shared Parameters.”

This command options will gather the information of all door instances and determine whether the ToRoom and FromRoom values from Revit internal data has been set correctly. For example, sometimes when a door is facing flipped, the internal parameters of ToRoom and FromRoom are not updated based upon the changes. Once the ToRoom and FromRoom are verified, the information will be written in shared parameters. You will get a completion message if all values are successfully written in shared parameters of door elements.

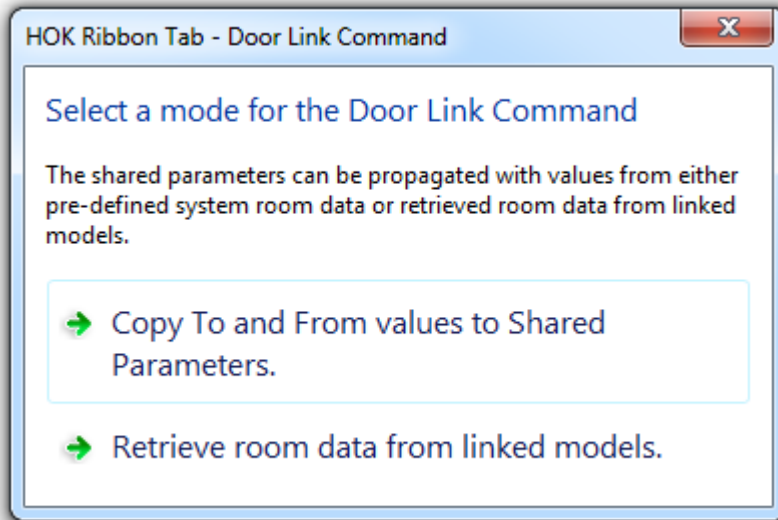


<Door Schedule>								
A	B	C	D	E	F	G	H	I
vv	From Room: Name	From Room: Number	To Room: Name	To Room: Number	ToRoomName	ToRoomNumber	FromRoomName	FromRoomNumber
3	Room	2	Room	3	Room 3	3	Room 2	2

Revit internal room data

Copied values to shared parameters

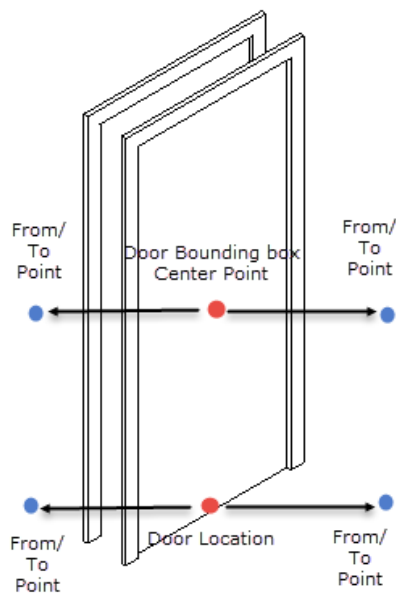
7.2 Retrieving Rooms from Linked Models

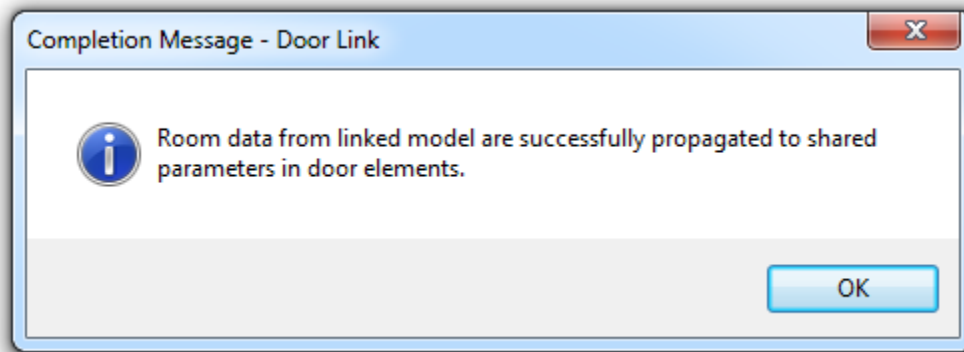


Select the second option, "Retrieve room data from linked models."

When room elements exist in linked models and doors in the host model, this tool will iterate all door elements to retrieve corresponding To-Room and From-Room based upon the geometric adjacency. *(Note: door elements from linked models will NOT be regarded as the input of this tool)*

In order to find To-Room and From-Room, this tool will create two virtual offset points along the direction of the door facing. If To-Point lies in the volume of a room, the room will be defined as To-Room, and the same method will be applied to From-Room.





After the completion message, you will be able to find the shared parameters updated either door properties or door schedules.

As you can see the door schedule below, Revit cannot define the relationship between doors and their adjacent rooms, when the room elements reside in linked models. All the adjacent rooms will be programmatically defined and set those values in shared parameters by the Door Link command.

<Door Schedule>

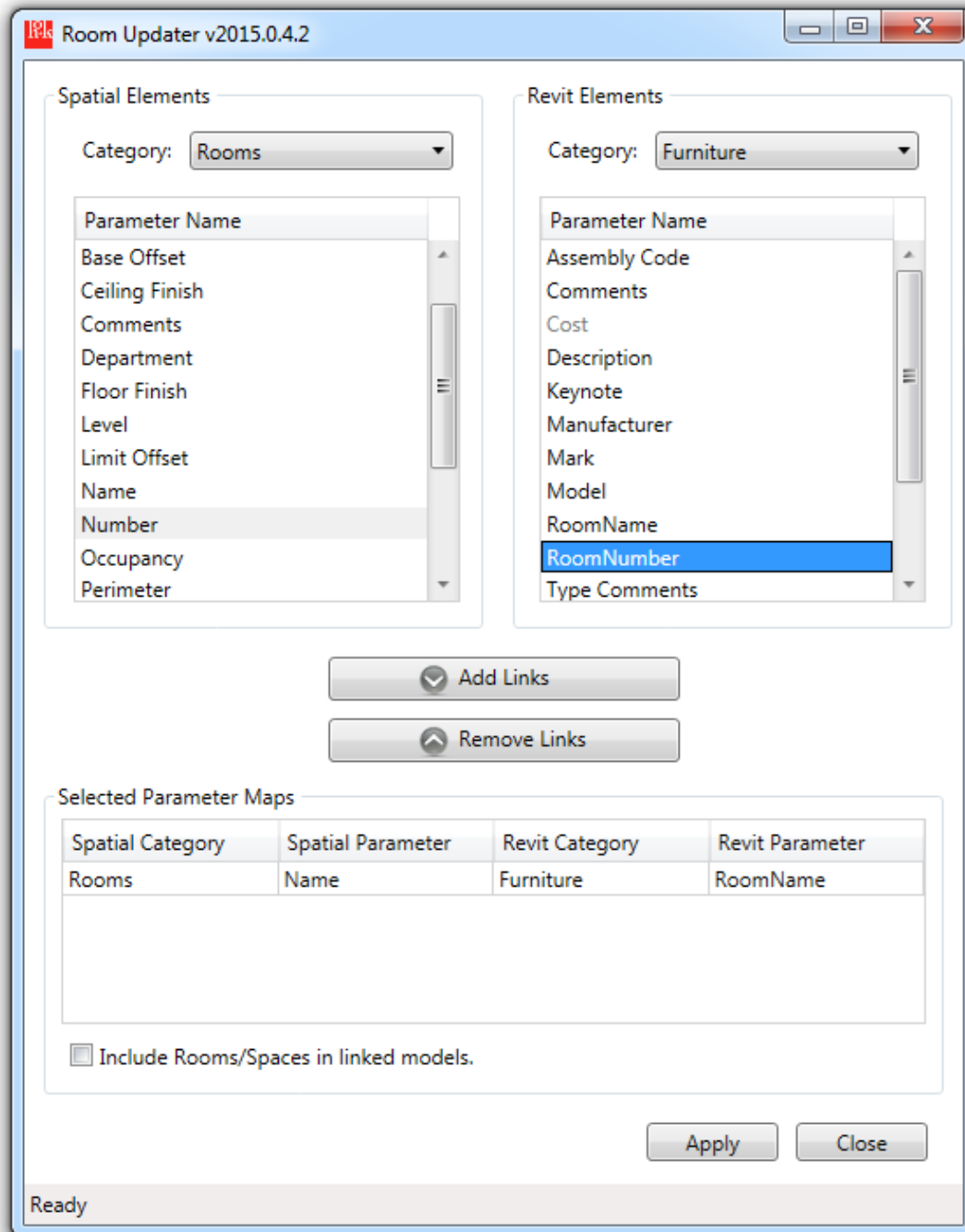
A	B	C	D	E	F	G	H	I
Mark	From Room:Name	From Room: Numb	To Room: Name	To Room: Number	FromRoomName	FromRoomNumber	ToRoomName	ToRoomNumber
1					Room 7	7	Room 6	6
2					Room 1	1	Room 6	6
3					Room 2	2	Room 6	6
4					Room 4	4	Room 6	6
5							Room 3	3
6							Room 8	8
7					Room 8	8	Room 6	6
8					Room 6	6	Room 7	7
9					Room 9	9	Room 6	6
10					Room 7	7	Room 6	6
11					Room 6	6	Room 5	5
12							Room 5	5

8. Room Updater



Room Updater

The Room Updater will capture parameter values from spatial elements and populate the values to elements enclosed by each solid of the spatial elements.



Room Updater v2015.0.4.2

Spatial Elements

Category: Rooms

Parameter Name

- Base Offset
- Ceiling Finish
- Comments
- Department
- Floor Finish
- Level
- Limit Offset
- Name
- Number
- Occupancy
- Perimeter

Revit Elements

Category: Furniture

Parameter Name

- Assembly Code
- Comments
- Cost
- Description
- Keynote
- Manufacturer
- Mark
- Model
- RoomName
- RoomNumber
- Type Comments

▼ Add Links

▲ Remove Links

Selected Parameter Maps

Spatial Category	Spatial Parameter	Revit Category	Revit Parameter
Rooms	Name	Furniture	RoomName

☐ Include Rooms/Spaces in linked models.

Apply Close

Ready



In order to create parameter maps,

- **Spatial Elements Category:**
Select a category from the pull-down menu of Spatial Elements Category.
It only has two options, either Rooms or Spaces
- **Revit Elements Category:**
Select a category from the pull-down menu of Revit Elements Category.
Only model categories existing in the Revit project will become options in the menu.
- **Spatial Elements Parameter:**
Select a parameter of spatial elements in the list.
Only built-in parameters and project parameters of the selected category will be displayed in the list.
- **Revit Elements Parameter:**
Select a parameter of Revit elements in the list.
Note: by selecting an item among the spatial elements parameter, the color of items in the Revit elements list will be differentiated based on the storage type of the selected parameter.
e.g. If the string type of parameter, “Name”, is selected in Spatial Elements, parameters which have different storage types such as integer, ElementId will be grayed out in the Revit Elements list.

*black text: selectable parameter

*gray text: not selectable (storage type does not match)

Click “Add Links” button and “Apply” button to populate parameter values.

Remove Links: You can also select a parameter map from the Selected Parameter Maps, and click “Remove Links” button to disable the parameter map for the Room Updater.

Settings: When you revisit the UI after executing the command, you will notice that user defined settings in the previous run are stored and displayed in the UI.

Model Groups: If some of elements belong to model groups, the Room Updater will skip those elements. Parameters in model groups cannot be editable, unless ungrouping the groups to each individual elements.

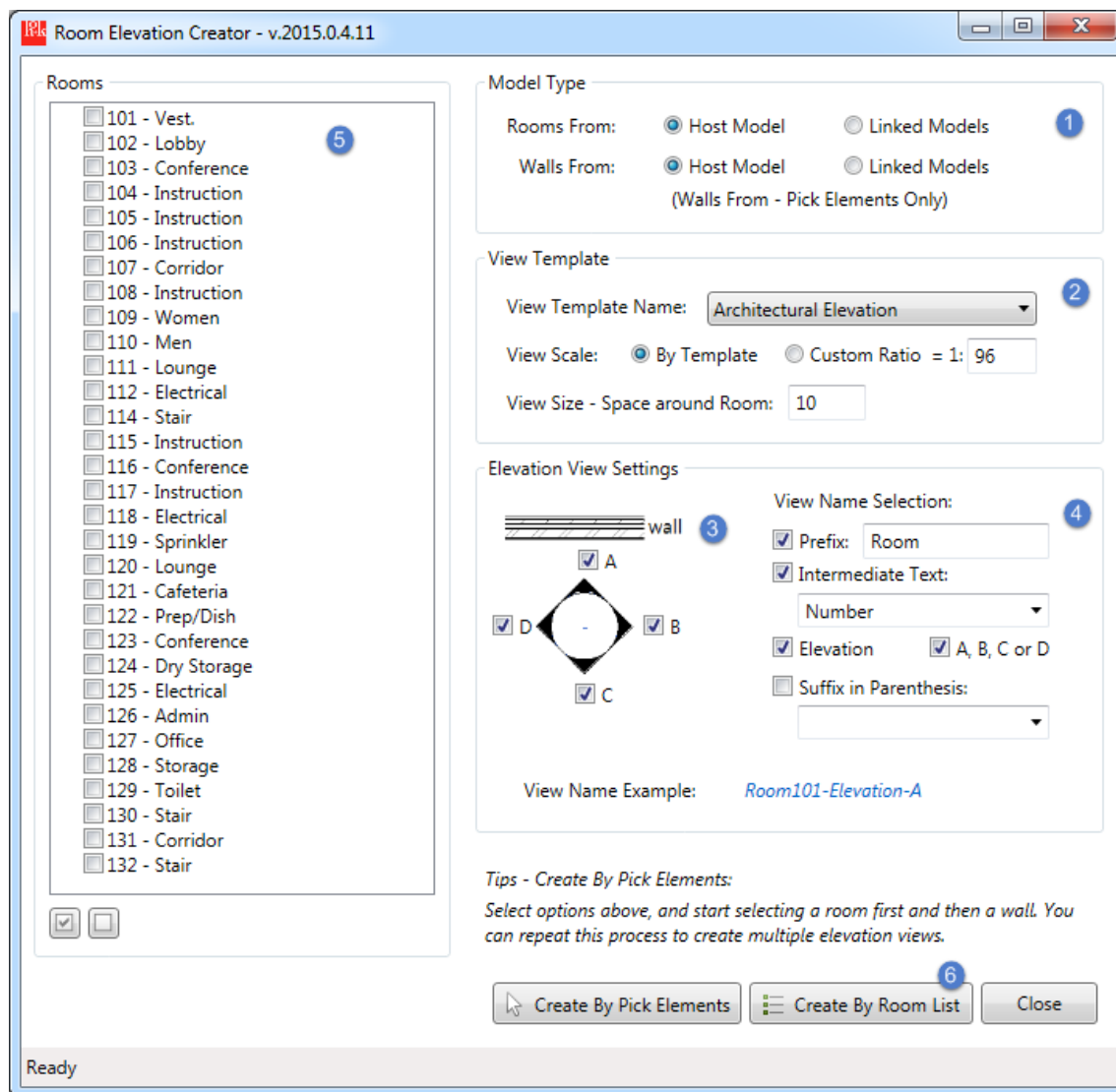
9. Room Elevation



The Elevation Creator consists of two mode, “Create by Room List” and “Create by Pick Elements”.

The first mode, Create by Room List, has been built based on the function called Create Views from Rooms in the Element Tools but with different layouts and extended features like options for Model Type and elevation view specific settings.

The second mode, Create by Pick Elements, will create an elevation marker and views by three users’ inputs, a room, a point location for the marker, and a wall for the elevation marker to be rotated until it faces perpendicular to the wall. At the end of each process, it will ask users if they want to repeat this process for the creation of elevation views from other rooms.



9.1 Create By Room List (one elevation marker per room)

1. Model Type:

Determine the type of the source model room elements are placed in. (walls from can be ignored for this mode)

2. View Template:

Select one of view template name from the pull-down menu.

For the view scale, it can be defined by the same value as the template has, otherwise, a custom value can be applied.

The crop box of each elevation view will be extended from the room bounding box to the value entered in View Size.

3. Selection of Elevation Views:

Select directions for elevation views to be created. The wall location in the drawing can be disregarded.

4. View Name Selection:

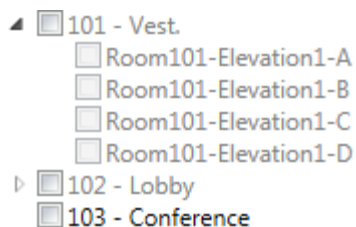
Select each check box if the certain part should be included to form the elevation names. It can be either constant string value or values from rooms' parameters. The blue text will demonstrate an example of the view name by the selections.

5. Room List:

Select rooms from the list, one elevation marker will be placed in the center point of the bounding box of the respective room applying all settings above.

6. Create By Room List:

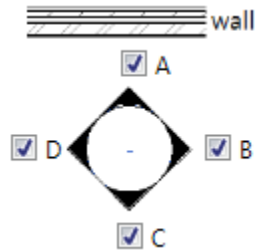
After the completion of creating elevation views, the tree view will be refreshed with updated child nodes named elevation views from the room of the parent node.



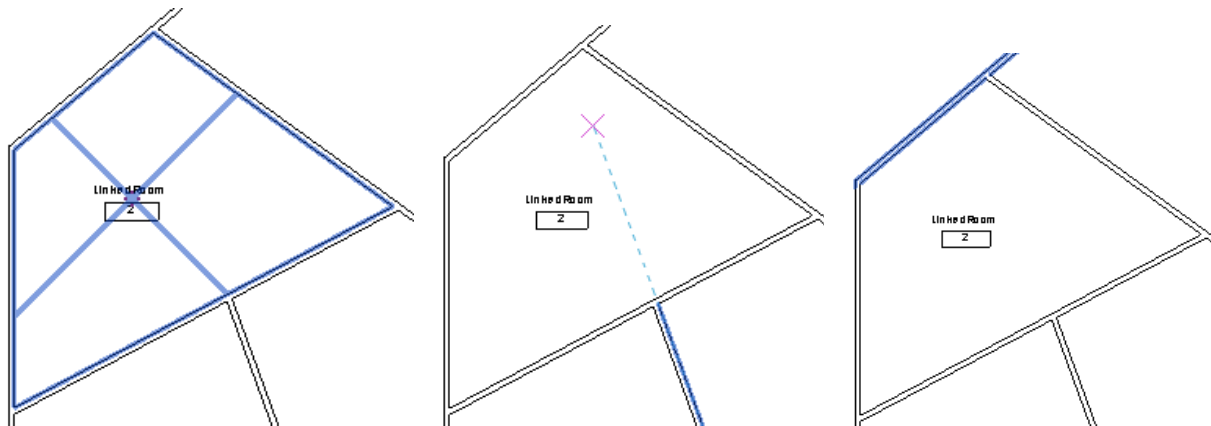
9.2 Create By Pick Elements (multiple elevation markers per room)

Select “Rooms From” and “Walls From” option for the selection of elements and modify other settings like the steps for Create By Room List. (The selection in the room list won’t affect for this command)

The direction of each elevation marker will be strictly defined as the wall and marker in the drawing.

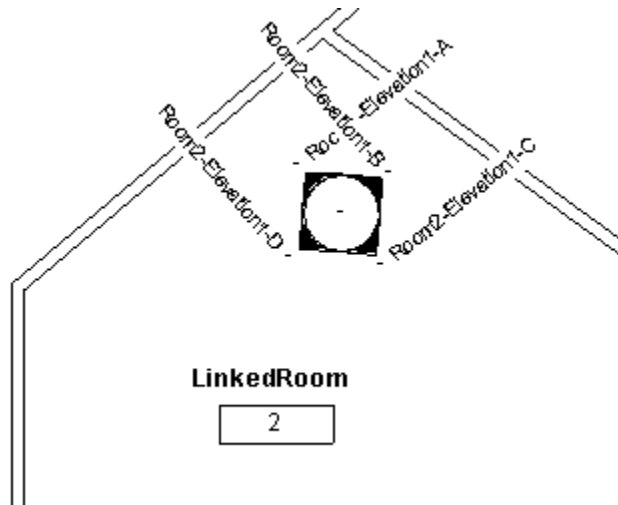


Click the command button, Create By Pick Elements, it will ask you three types of selection, a room, and a point for the location of elevation marker, and a wall to determine the rotational angle.

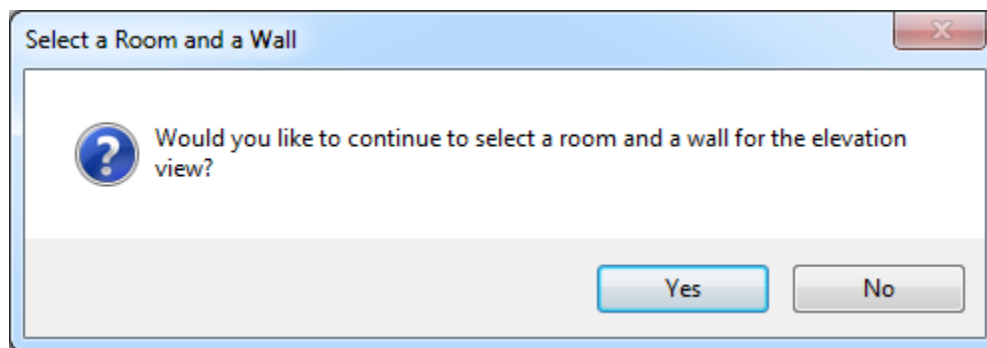


The status label in the bottom of the Revit UI will give you instruction for which element should be selected at the current state.

1. Select a room from the host model to create an elevation view.
2. Pick a point to locate the elevation mark.
3. Select a wall from the host model to rotate an elevation view perpendicular to the wall.



After the completion of the process, it will ask you whether you would like to repeat this command.



The information of the elevation views created by this command will be also updated in the tree view in the command window.

- ☐ 1 - LinkedRoom
- ▲ ☒ 2 - LinkedRoom
 - ☐ Room2-Elevation1-A
 - ☐ Room2-Elevation1-B
 - ☐ Room2-Elevation1-C
 - ☐ Room2-Elevation1-D
 - ☐ Room2-Elevation2-A
 - ☐ Room2-Elevation2-B
 - ☐ Room2-Elevation2-C
 - ☐ Room2-Elevation2-D
- ☐ 3 - LinkedRoom