

Session 3

You've Been Warned

Helen Gorina, Perkins+Will

Class Description

Revit warnings are not nuisance! They can indicate serious design problems, model problems and QA/QC issues. Warnings affect Revit performance. Learn to triage, prioritize and resolve Revit warnings. Make them your allies in QA/QC. This class is part Lab, part Clinic. Students are encouraged to bring their own Revit projects for review.

Key Learning Outcomes:

1. Strategies and techniques of resolving Revit warnings.
2. Learn to triage Revit warnings
3. Use warnings in your QA/QC procedures

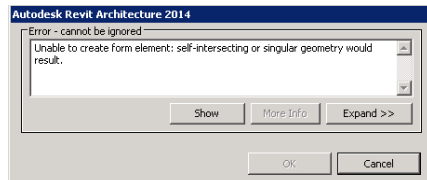
About the Speaker:

Helen Gorina is a Regional Digital Practice Manager at Perkins+Will. Her responsibilities include the Northeast region and span multiple locations and projects. She has more than 20 years of design technology leadership experience in multidiscipline, multi-office environments; 25 years of experience in the architectural, structural, and civil engineering fields. Her understanding of design and drawing production processes, coupled with her interests in Parametrics and Computational Design, enables her to offer ingenious solutions for Autodesk® Revit® from both a high-level planning and on-the-ground implementation perspective: both the strategy to plan where you want to go and tactics you need to get the job done.



Revit warnings overview

As you work, Revit tries to communicate with you and inform you of possible problems while you work. Some errors require you to cancel your last action. These are the errors you need to correct right away.



Some errors are rather cryptic and seem not to make much sense – they are bugs - report them to Autodesk.



You can find these and more here:

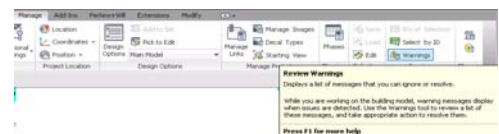
<http://bdmackeyconsulting.com/revit-weight-warning/>

<http://whatrevitwants.blogspot.com.au/2012/08/another-dimension-beyond-xyz-inches-to.html>

We will focus on the warnings you can temporarily ignore. If they are not addressed immediately, they accumulate and make your file sluggish. You may have problems editing certain elements; some elements may not be visible. Some warnings may inform you of problems with the model which affect quality of documentation and should be routinely resolved as a part of your QA/QC procedures.

There are two ways to see the warnings:

1. **All warnings in the file – best for triage.** If you are in an “all file” dialog box and the element you selected is not visible in any open view, you can click on Show button and pray that Revit will find an existing view where that element is visible. Some elements can only be visible in a single view (dimensions), some are very hard to find (curtain grid in a wall deep in the building) so trying to fix the warnings from “all warnings” dialog box is not the best way.
Danger: delete –means delete selected element, not just the warning.



From Revit Help:

In the error message dialog, click Show to zoom in on the highlighted elements involved in the error.

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When you click Show, Revit tries to display the elements in one of the following ways:

- *The only view an element is visible in, if it is only visible in one view. Dimensions are such an example.*
- *A plan view that shows all the elements.*
- *An elevation view that shows all the elements.*
- *A drawing sheet that shows all the elements.*
- *A 3D view.*
- *Any view where many of the elements are visible.*

If the element cannot be shown in any view, Revit informs you.

2. Warnings pertaining to selected elements only – best for repairs.

When you select Revit elements which have associated warnings, you will see the warning icon popping up on the Modify tab. When multiple elements are selected, the warning list can be quite long. However we can take advantage of the fact that the elements are selectable in current view and we do not need to jump around. When you select the text of a warning, the element highlights in all open views where it is visible. Warning dialog box for selected elements often has additional options to fix the warning. To see these special options, you may want to filter selected elements. For example for room tags there is an option to move tag into its room.



[Video – warnings all and selected](#)

Tips:

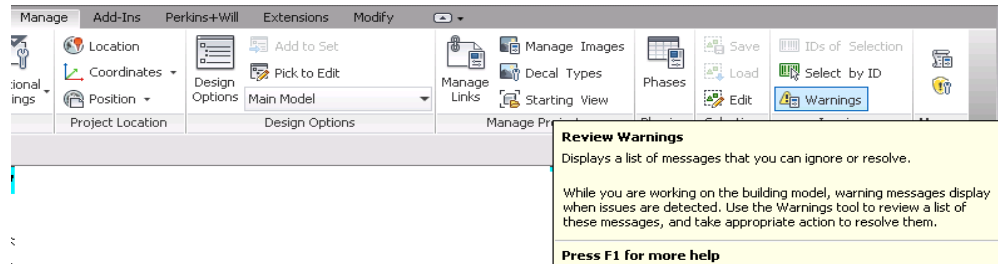
- *All file warnings* does not show total amount of warnings on top – you need to scroll down and open the last warning,
- *Selected elements warnings* show the number of warnings on top.
- When you select a group, the warnings pertaining to the elements within this group are not reported. They still show in the *all file warnings*
- Warnings from the linked files and from within loadable families are not reported in the host.

Addressing a lot of different warnings is a tedious process which requires not only expertise in Revit but also an intimate knowledge of the project, design intent and decisions, and it is best performed by the staff familiar with the project or as a minimum with their participation.

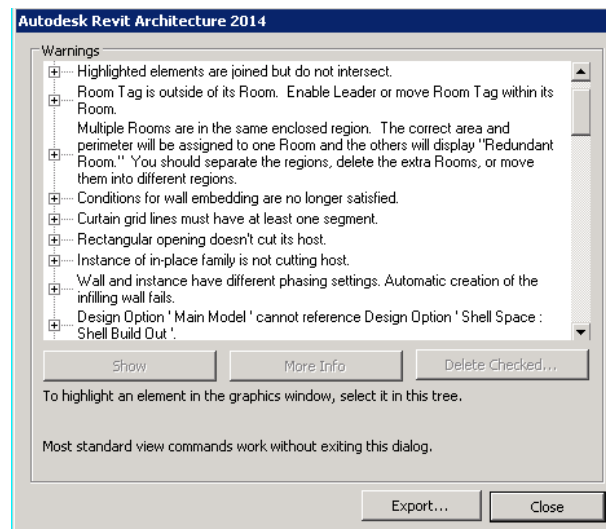
Exercise1. Warnings triage with Excel

[Video-Warnings-Excel.mp4](#)

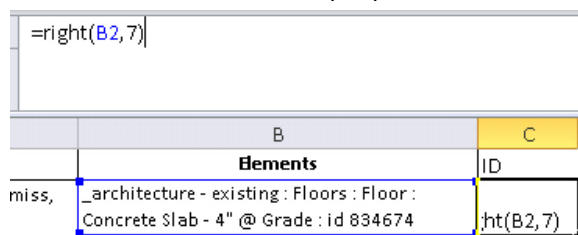
1. (Optional) Export the warnings to HTML file for triage. (if you do not have a file you want to diagnose, you can skip this step)
 - a. Manage->Warnings



- b. Scroll down to the last warning and click on [+]; you will see the total number of warnings. The goal to have no warnings is not always achievable, but the number of warning should be kept to minimum.



- c. Click on Export and save the HTML file as Triage.html.
2. Open Triage.html in Excel. (If you skipped the previous step, the file is ... \dataset\Ex.1\Triage.html)
3. Delete first two rows.
4. Add an ID text to a header of the first column and use the formula as shown to populate the column value.



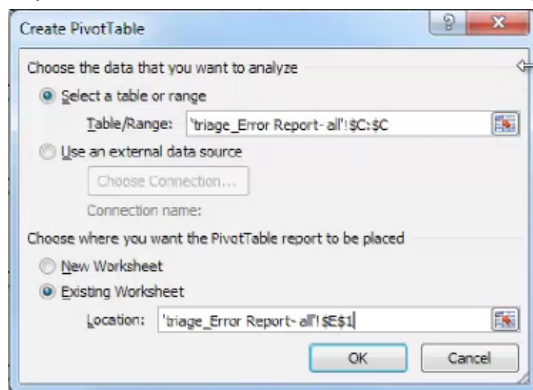
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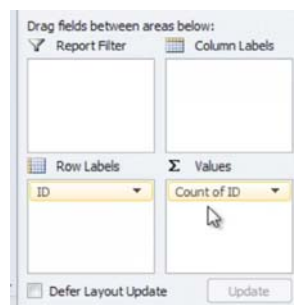
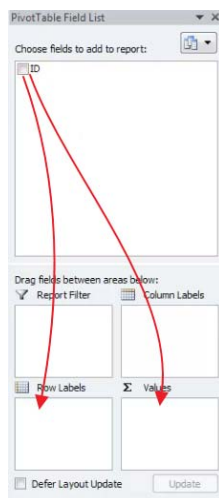
5. Apply the formula to all cells in ID column by dragging the cell lower right corner down. You have now extracted all IDs.
6. To find out which elements have multiple errors associated with them, create Pivot Table



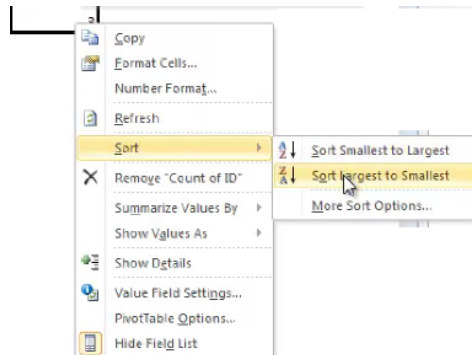
7. For the data range select the ID column (in this case it is column C), for placement select any cell (I selected E1)



8. Fields to add to report: drag ID to Row Labels and to Σ values.



9. To sort Pivot table right click on any field in **Count of ID** column



Now you can prioritise warning resolution from the elements which have most problems.

Basic cleaning.

When you have many warnings, start with general clean up. Perhaps, these clean up procedures should become part of your file maintenance routines because they are relatively easy and prescriptive and some of them can be automated.

1. Delete unneeded views
2. Find and delete all unneeded imports and CAD format links: DWG, SAT, SKP, etc.
3. Delete identical instances of loadable families.
4. Resolve Identical Marks and Identical Numbers
5. Resolve all warnings related to rooms

Delete unneeded views.

Many warnings can be deleted by deleting unneeded views – perhaps this should be done first, even before triage. It will clear all warning related to room tags, dimensions, detail lines and DWG imports located in these views.

We routinely delete all views that are

- not on the sheets and
- not “claimed” by any user and
- not a parent view to dependent views and
- not a “special view” (these are PW diagnostic, QC and workflow views)

It is good practice to create schedules for managing views and delete them from there.

Build your cleaning tool kit.

Model Review- quick configuration.

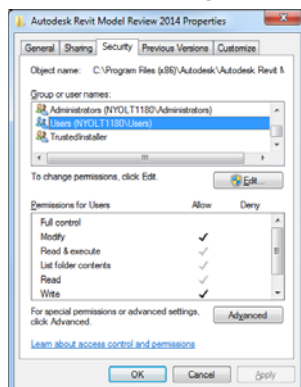
[Video-ModelReview configuration](#)

Model Review is a free Autodesk tool available with subscription. It can be used for many clean-up and QA/QC tasks.

Model review is not the friendliest of tools and the help is somewhat cryptic and outdated. Enterprise deployment can be a topic of its own class. For the purpose of this class, we will take some shortcuts. I hope to be able to configure the class machines ahead of time, but here are the steps.



1. Configure Model Review on your local machine. Give yourself (or anyone using your machine) permission to edit Model Review folder. *C:\Program Files (x86)\Autodesk\Autodesk Revit Model Review 2014*

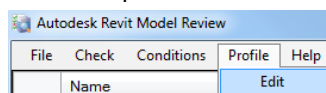


2. Copy RTC-Duplicates.bcf and RTC-DWG&SAT.bcf from the dataset\ModelReview folder to *C:\Program Files (x86)\Autodesk\Autodesk Revit Model Review 2014*
3. Configure Model Review profile. In Model Review Panel, go to

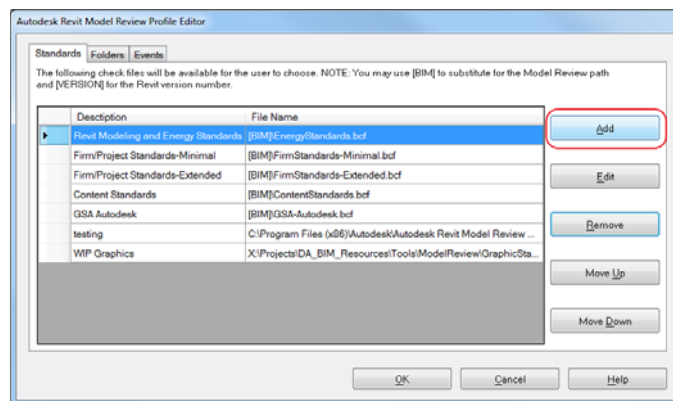


Manage

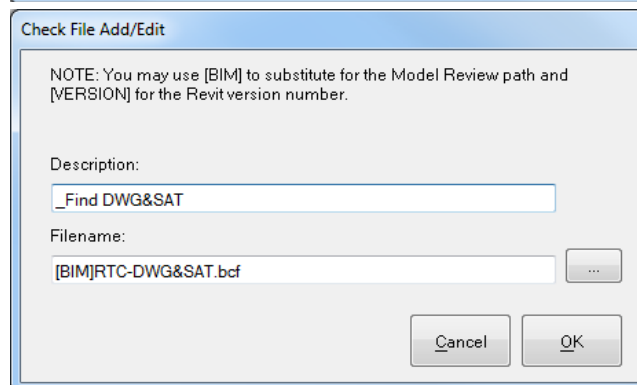
a. Edit profile



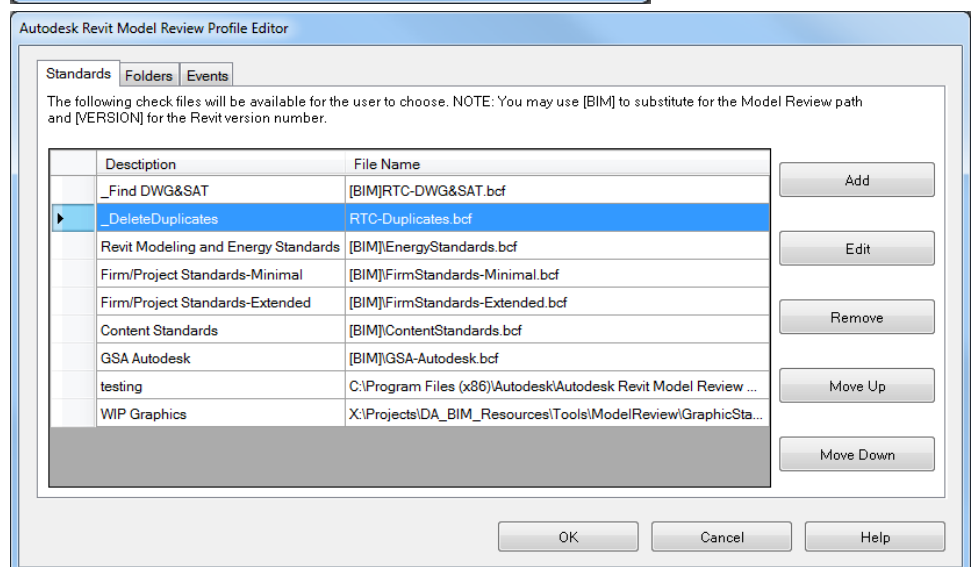
- b. Add location of the two .bcf files you just copied in step 2. Instead of full path you can just type [BIM]



i.



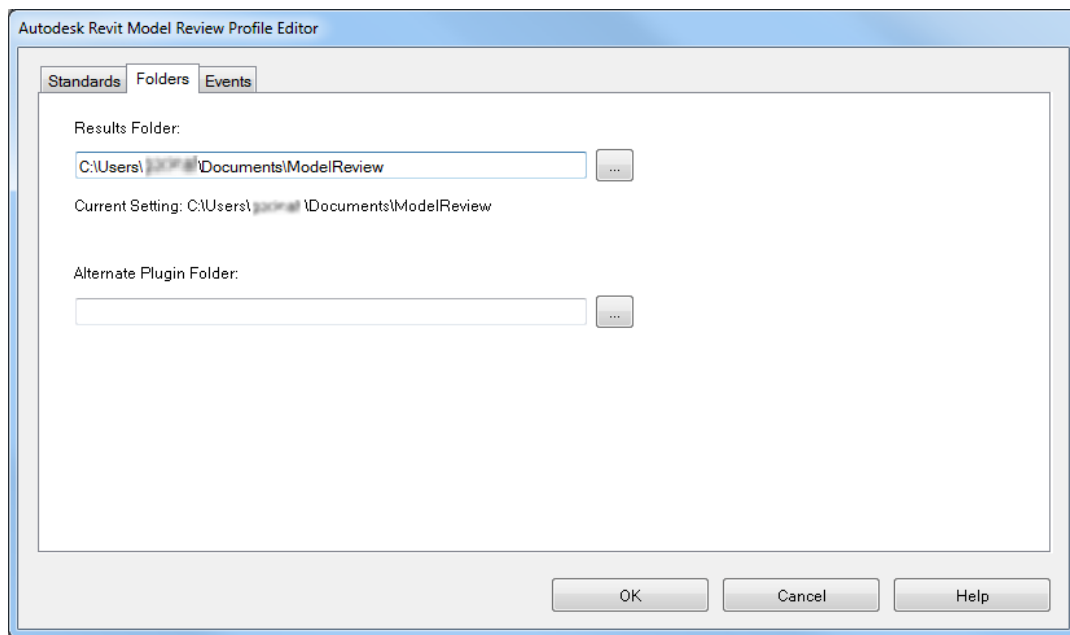
ii.



iii.

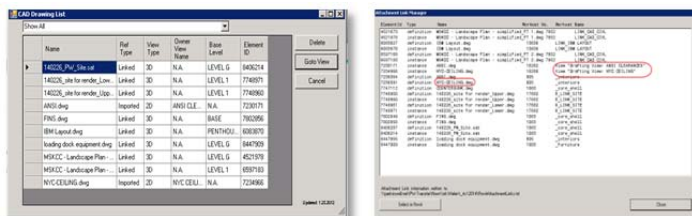
- c. The results will be written in the user specific folder unless you change it

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Exercise 2 –Finding unneeded CAD imports and links

To decide if the CAD import/link can be deleted, you need to first find it! There are many third party tools to find “missing” DWG and other CAD formats which may be linked/imported just in one view.



If you do not have another favourite free tool, use Model Review

[Video1](#)

[Video2](#)

Exercise 3 - Deleting Identical Instances.

[Video](#)

[Another method](#)

<http://boostyourbim.wordpress.com/2013/03/20/using-the-api-to-resolve-identical-instances-in-same-place-warnings/>

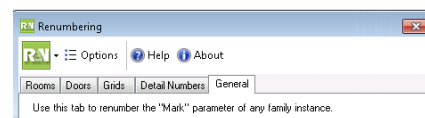
Exercise 4 – Resolve Duplicate Marks and Duplicate Numbers.

Some elements (doors) are required to have a Mark.

In a workshared file, when two people are placing doors, doors may get the same mark, and after Sync there will be a warning. This can happen whether or not they are tagged. This situation is easily resolved from the schedule. Usually this situation is happening in very early stages - when the room numbers are not finalized and door marks do not need to be tied in to rooms yet.

For elements which do not require Mark (furniture), you can delete the Marks if you do not need them (yet) or use schedule similarly with the door example.

This is a popular topic, there are many free and powerful solutions



- Free Tool <http://www.cadtechnologycenter.com/products/revit-expresstools.html>
- Model Review <http://www.youtube.com/watch?v=1YoAHxQTSVE>
- API solution: <http://boostyourbim.wordpress.com/2012/12/03/using-the-api-to-solve-the-duplicate-type-mark-warning/>

[Video](#)

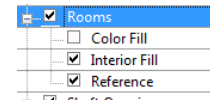
Exercise 5 – Room clean-up.

Room element talks to its surrounding all the time. That is why if you have many room related warnings, your model can get sluggish. Equally important are QA issues with whatever else you place in the room.

Here are some tips for clearing room warnings.

1. Delete unplaced rooms from the schedule (unless they are there for a reason. Perhaps they were entered ahead of time as a part programming workflow?)

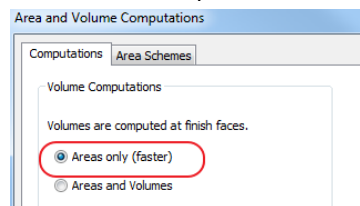
2. Create diagnostic views for each level and turn *Interior Fill* and *Reference* on. Alternatively, use partial view template with *Temporary View Properties*. Color fill is deeper blue where rooms overlap.
3. Check Revit links for room bounding property. Do not unload the link. Better to turn off the workset the link resides on.
4. Check room height – manage from schedule



<Room Schedule>

A	B	C	D	E	F
Name	Number	Level	Unbounded Height	Upper Limit	Limit Offset
Room	1	Level 1	20' - 0"	Level 1	20' - 0"
Room	2	Level 1	20' - 0"	Level 1	20' - 0"
Room	3	Level 1	20' - 0"	Level 1	20' - 0"
Room	4	Level 1	20' - 0"	Level 1	20' - 0"
Room	11	Level 1	20' - 0"	Level 1	20' - 0"
Room	12	Level 1	20' - 0"	Level 1	20' - 0"
Room	5	Level 2	10' - 0"	Level 2	10' - 0"
Room	6	Level 2	10' - 0"	Level 2	10' - 0"
Room	7	Level 2	10' - 0"	Level 2	10' - 0"
Room	8	Level 2	10' - 0"	Level 2	10' - 0"
Room	9	Level 2	10' - 0"	Level 2	10' - 0"
Room	10	Level 2	10' - 0"	Level 2	10' - 0"

5. Do not compute volume unless absolutely necessary



Beware of “trapped” rooms – if you have raised floors and they are room bounding, rooms could become trapped under the floor.

6. If there are many warnings about room separation lines overlapping the walls, it could be quicker to delete them all from 3D view, then in plans separate the rooms using colour clue.

[Video](#)

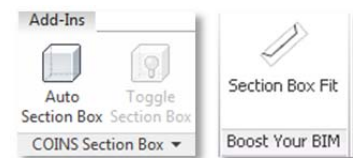
Useful Techniques

Create diagnostic views

It is easiest to address the warnings from diagnostic views.

Divide and conquer!

- Start by selecting elements in plans, many warnings can be resolved from there.
- Create a diagnostic 3D view where everything is on, view phase is set to the latest phase and the phase filter is set to "none".
- Select elements by IDs then temporary isolate elements in the view.
- If you need to see a problem in context, use **COINS Section Box** or **Boost Your BIM Section Box Fit**
- If one element generates a lot of warnings, create its own HTML report, extract all related IDs and save them in the selection set - saves a lot of typing.
- There is a free tool for creating diagnostic views – love it!



[#RTCEUR Wish 2 – Highlight and Isolate Warning Elements](#)

Common warnings.

Slightly off axis...

PLEEESE, fix items that are slightly off axis right away. If you do not, Revit will snap to it and soon you may have much more off-axis elements.

- *Wall is slightly off axis and may cause inaccuracies.*

Depending on your design, off axis might be intentional. Try to keep minimum angle to horizontal and vertical axis greater than 0.21 degree if you can control it.

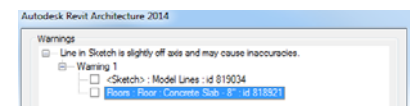
This warning might lead to other problems:

- The curtain wall might not embed into the host wall,
- Problems with wall dimensioning in sections.

To fix, use align tool or align manually.

- *Line in Sketch is slightly off axis and may cause inaccuracies.*

This could be a benign warning but if it refers to a sketch of an element you will align the



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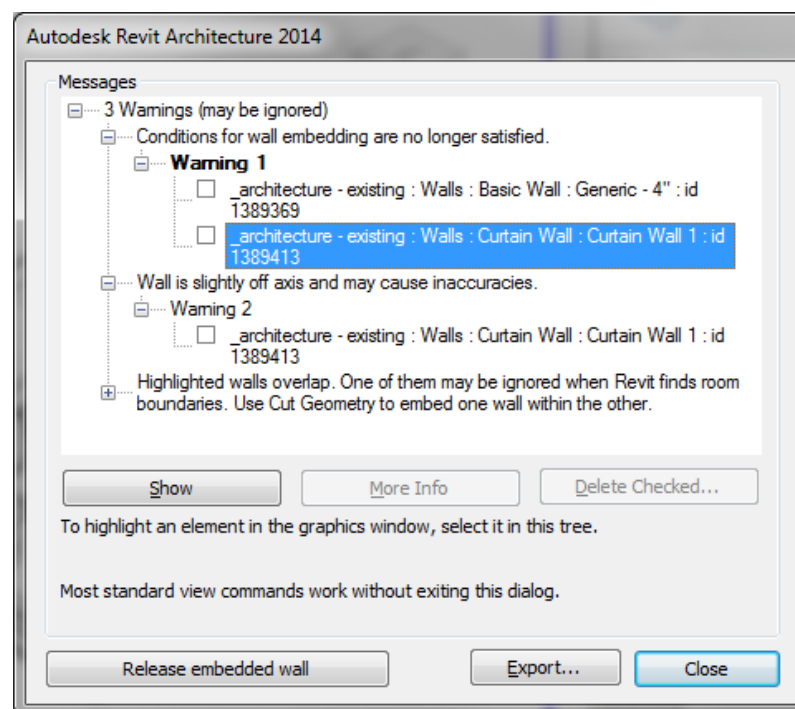
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walls to, the walls will be off axis as well. Fortunately, this warning comes with parent element ID

- *Area separation line is slightly off axis and may cause inaccuracies.*
- *Line is slightly off axis and may cause inaccuracies.*
- *Reference Plane is slightly off axis and may cause inaccuracies.*
- *Room separation line is slightly off axis and may cause inaccuracies.*

Ideally you want to clean up all of them but the walls are most important.

Warnings about walls



Do not always listen to Revit suggestions...

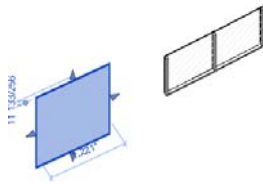
I definitely do not want to release embedded wall! The chances are that it stopped being embedded because it is slightly off axis.

Cut geometry is not always a great idea either. It is best to see both walls in 3D to determine what the best course of action is.

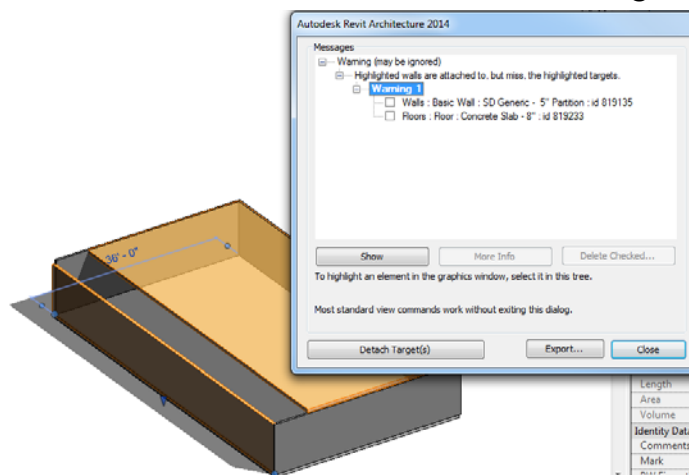
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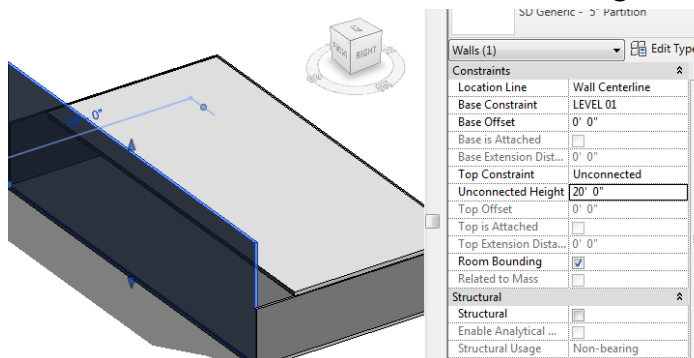
- *Opening does not cut its host- delete the opening*



- *Highlighted walls are attached to, but miss, the highlighted targets.* Usually happens when the wall's top or base is attached to the floor, then the floor outline is changed.



To fix, detach the targets, but watch out for unconnected walls! Constrain the walls to the level or change the height.

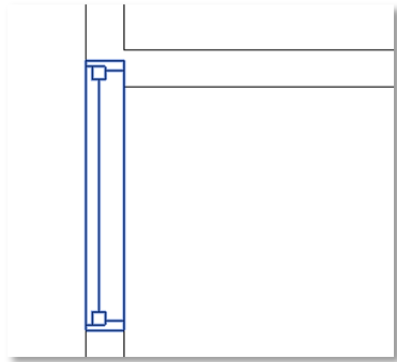


- *Two elements were not automatically joined because other elements at join are not editable.* This is a temporary warning typically happens in workshared file when one of two elements (most frequently, walls) was borrowed or owned by one user, when another was editing the second element. It sometimes disappear after all users sync, but if it persists, try to trim the walls, nudge them, sometimes you need to recreate one of them to re-join.

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- *Insert conflicts with joined Wall.* This is a QA issue - you do not want the wall to hit the door or window.



Warnings about curtain walls

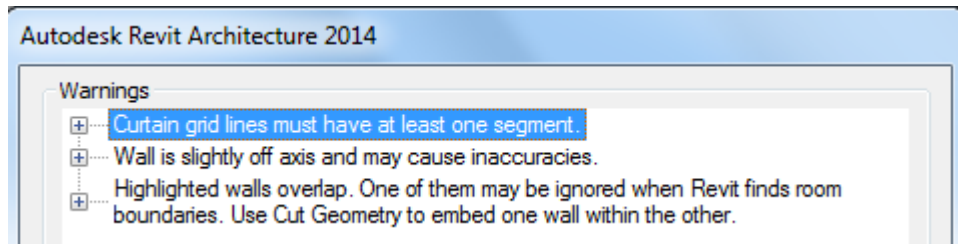
Embedding

Corner mullion

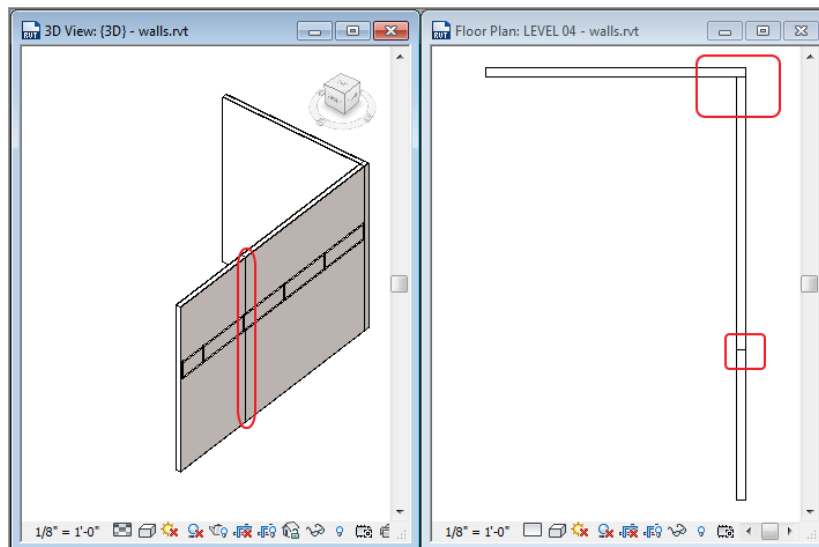
Identical mullions

Curtain grid must have at least one segment

Exercise 6. Wall



In this example we have a fragment with several warnings. If it was a project file we would just isolate some walls in the view to investigate.

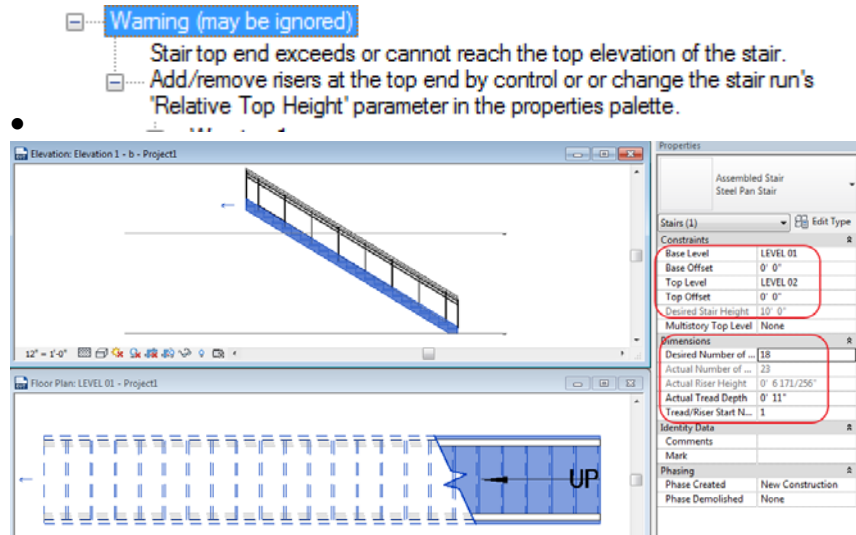


Start with overlapping walls which are not curtain walls. Curtain walls overlapping regular wall may just mean it did not embed as was intended. After looking in 3D you can see that the shorter wall can be deleted.

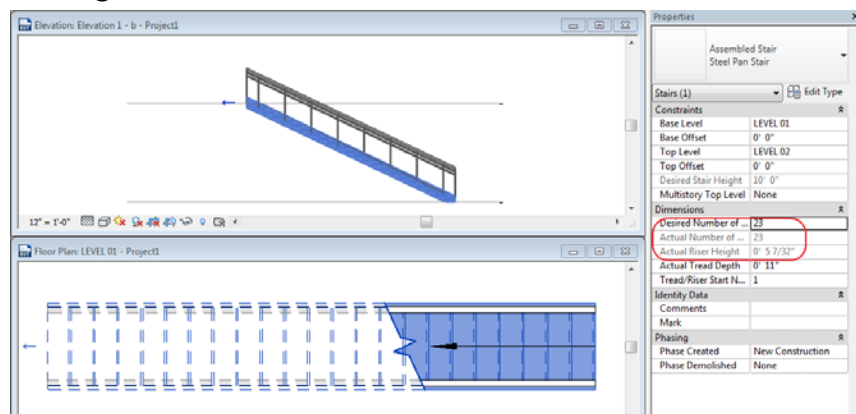
Stairs and railings warnings

These deserve their own class, and I want to be a student there!

Some common warnings are:



Depending on design intent I might listen to Revit's advice or change *desired number of risers*. This results in lesser slope.



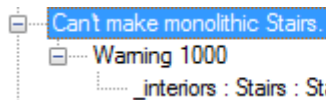
Warning (may be ignored)
Actual Number of Risers is different from Desired Number of Risers.
Add/remove Risers or change Desired Number of Risers in Stairs Properties.



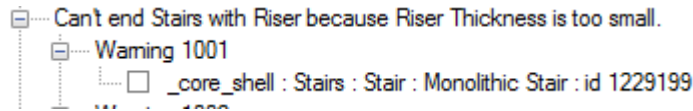
Again, Revit suggestion does not work here. If the stair looks correct in section and 3D view, adjust *Top Offset*.

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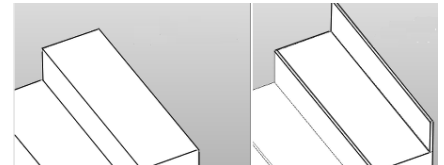
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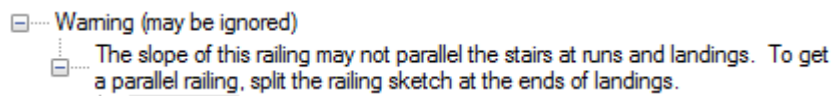
- 

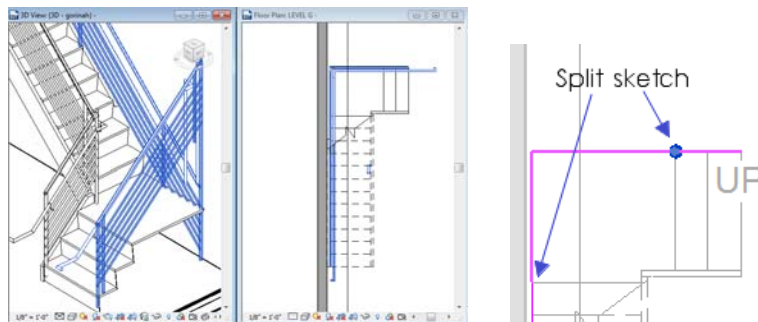
Well, if Revit could not make it, select by ID and delete, most likely the sketch was invalid.

- 

This may happen in sketch based monolithic stair with "end with riser" and zero for a riser thickness. Use component based stair instead or give riser some minimal thickness.



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This time I will do what Revit wants of me.

- Landing depth is less than run width.

Here Revit tries to check the code...

Same approach could be taken with ramps.

Railings is a powerful yet stubborn and a little silly component.

For more in depth analysis go to

<http://revitcat.blogspot.com.au/2014/02/revit-multistorey-railings-story-2.html>

Group technique

It can be useful to group some elements and then save them into a separate file to resolve problems. After you are done, you can simply reload the group and ungroup the elements.

However it should only be used for the elements within the same workset – when you save a group as a file, the worksets are not supported.

By the same token, this workflow immediately resolves all issues associated with elements in groups being on different worksets – just save them out and reload.

Conclusions

- Avoid snowball effect. Warnings generate other warning.
- Get the biggest bang for your buck- start with pre-cleaning and warnings you can address fast.
- Involve the team in the process. Whodone it? [#RTCEUR Wish 5 – Who Created Those Warnings?](#)