



This Month:

Scheduling

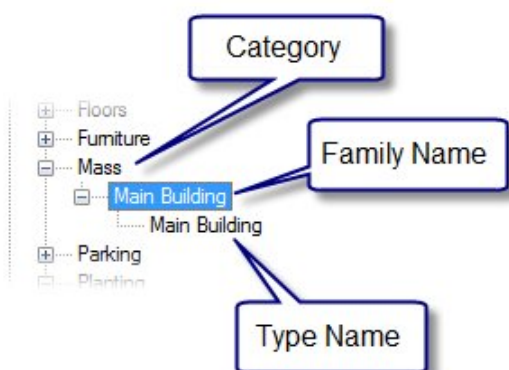
Welcome to **INFOCUS**, C3 Consulting Solution's Monthly Newsletter. This month, we have a look at Scheduling.

The original topic for this paper was going to be Advanced Scheduling, but when given more consideration, scheduling really isn't that complex. It's ultimately nothing more than extracting data from a database. You construct the database queries (i.e. you ask for the information), and the data presented represents your answers. It's like a lucky dip – you put your hand into the box, and pull out what you hoped for – only you're better able to determine what you get in a schedule.

The value in knowledge about scheduling is not so much in the 'how' they are created, but 'what' can be created, and what can't be created (excluding the intervention of the use of Revit's API). Many queries can be made of the database, and a few cannot. While this paper will not seek to list everything that can and can't be done, it will provide some examples for consideration.

If we take a chronological or design approach to scheduling, the first schedule type we'd consider creating from a BIM model might be something spatial – perhaps an Area Schedule. It may depend a little on how design philosophy ('Form follows function vs. Function follows form').

For the following example, we'll construct a schedule to determine the floor area of a mass form – not the area measured by an area scheme. The basic steps are as follows:



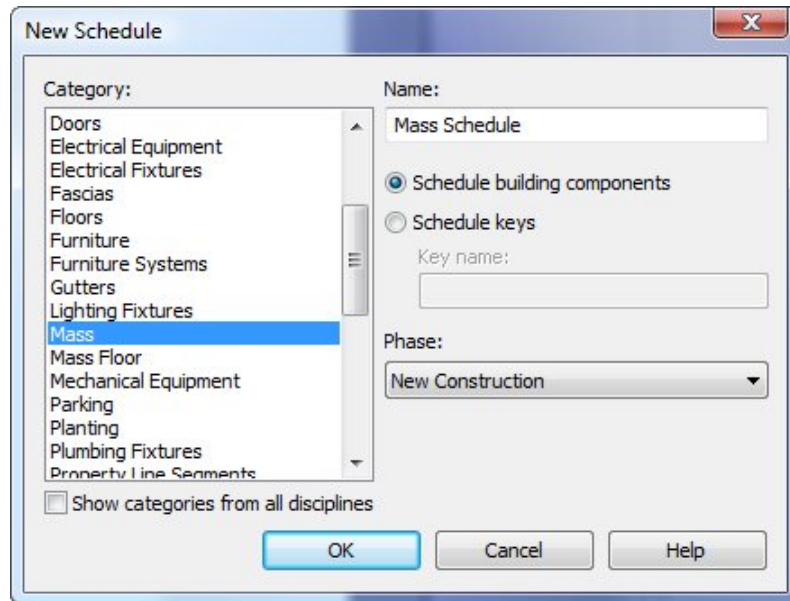
Construct the mass form(s). This is most easily done using Revit's building maker (massing) tools. The specifics of how to create a mass form are not included in this paper because the focus is on scheduling – not modelling.

This form will have a family name ('Main Building') and category (Mass) which distinguish it from other from other elements in the project.

Note that if you don't specify a type name for a family, the default type name created will match that of the family name.

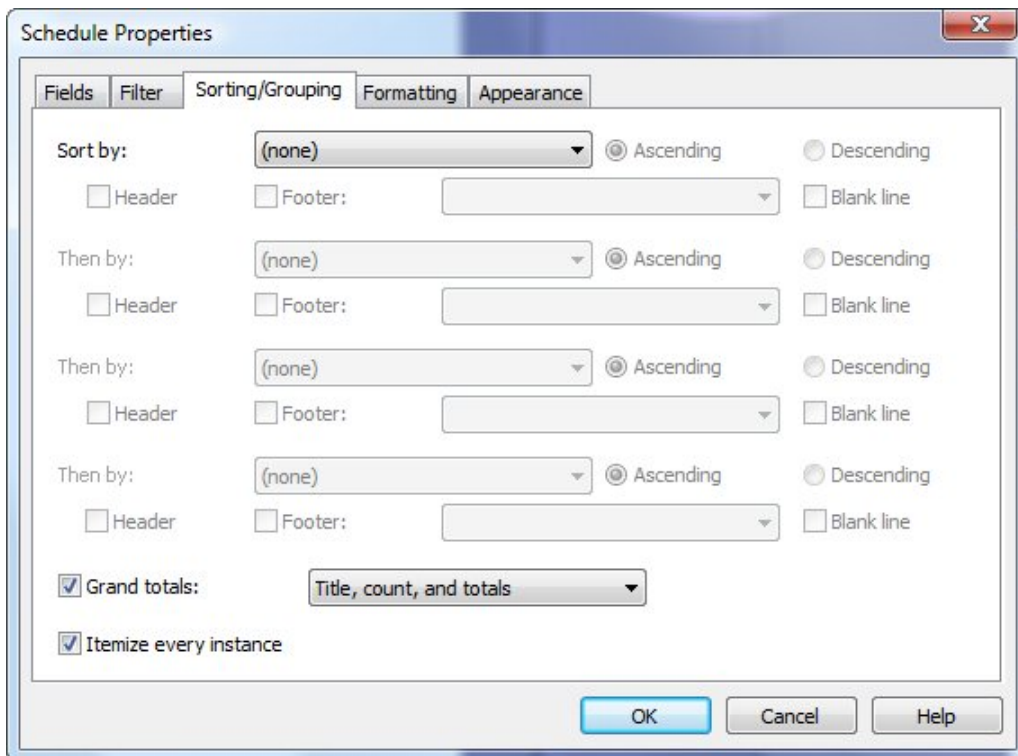
Even before we divide it further, we can create our first Mass Area Schedule.

From the view tab on the design bar, or the view menu, choose Schedule/Quantities, and select the appropriate category for the schedule you intend to create. In this case, we're choosing the Mass category.

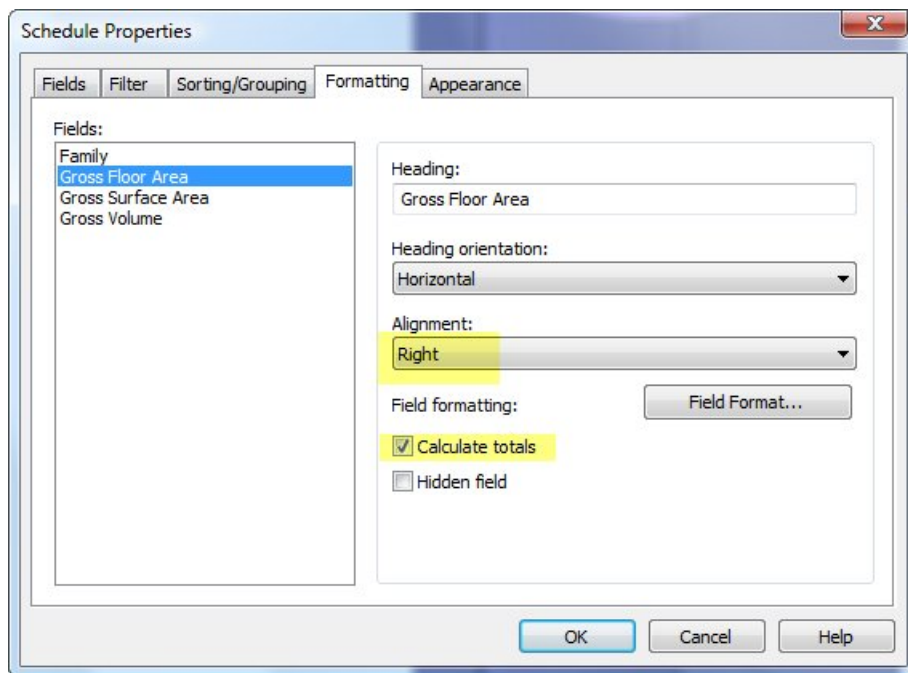


Then add Family, Gross Floor Area, Gross Surface Area and Gross Volume as fields. These are parameters you use in the schedule – typically (though not always) as column headers.

Next, go to the Sorting/Grouping tab, and check 'Grand Totals', then select 'Title, Count and Totals'.

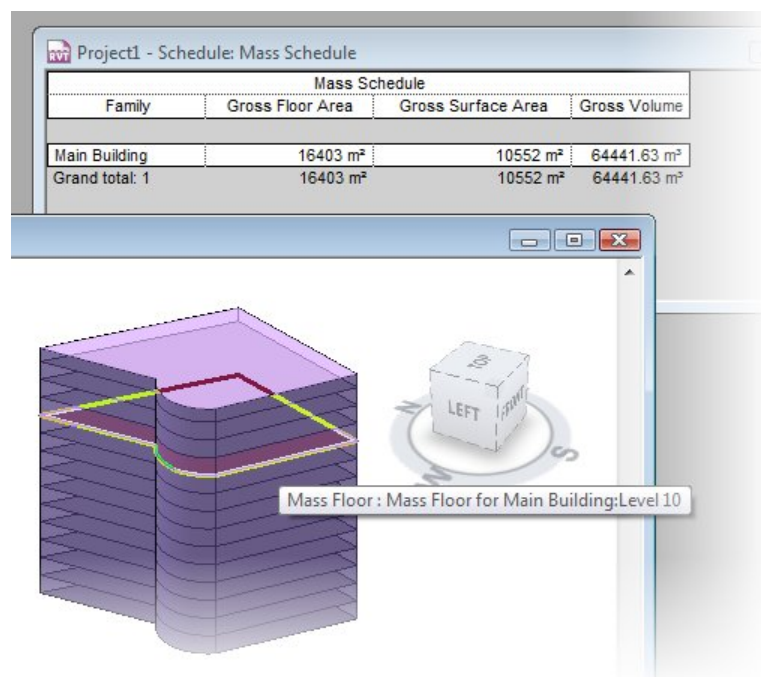


Next, go to the Formatting tab, and select the 'Gross Floor Area' field. Change the field's alignment setting to 'Right', and check the 'Calculate Totals' checkbox. Do this also for 'Gross Surface Area' and 'Gross Volume'. Then click 'OK' to complete and view the schedule.

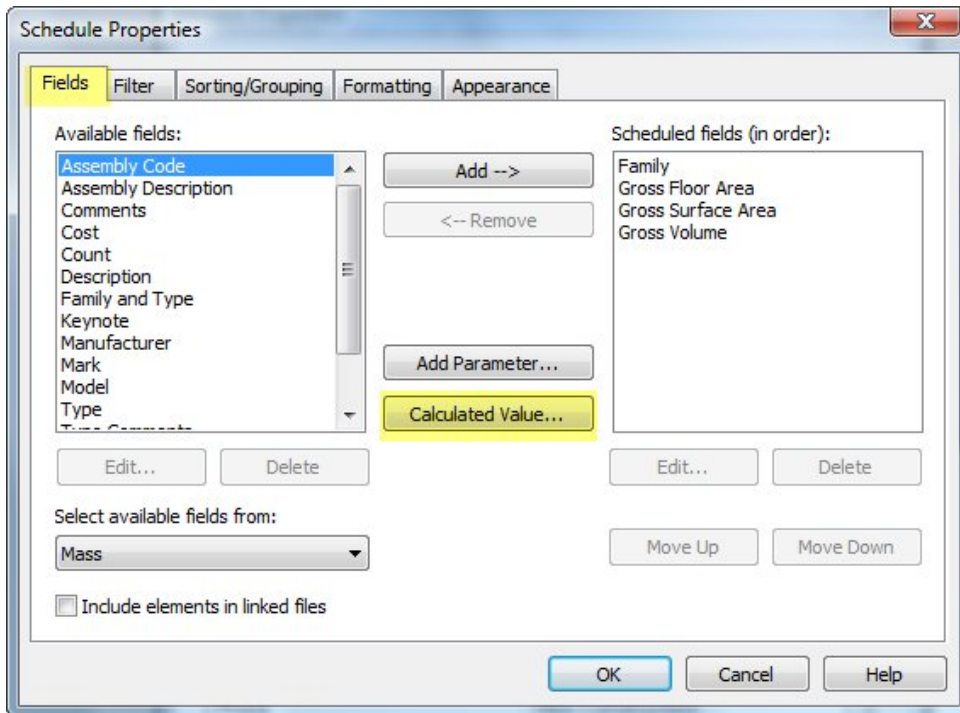


At this point, the Gross Floor Area does not show a value. This is because the Mass family currently does not contain any floors. Once Mass Floors are added to the element, this value will be populated.

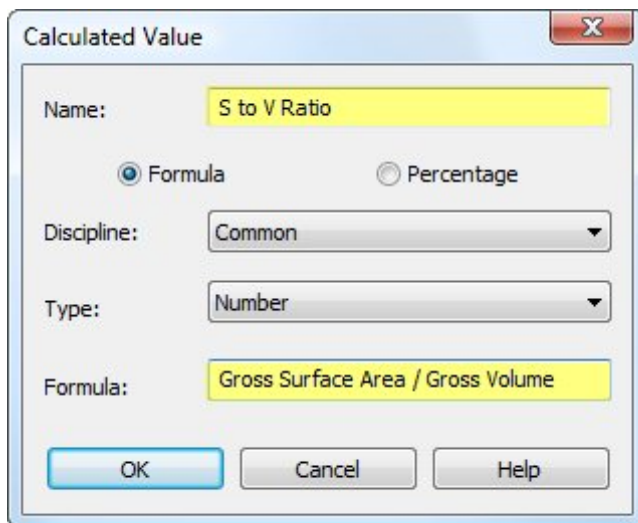
You might choose, at this point, to calculate a value from this data that is useful for further analysis, such as a surface to volume ratio, which might indicate some level of energy performance based solely on form. Right-click on the schedule, go to its View Properties, then click on the Edit button in the Fields value. This will return you to the Schedule Properties dialog.



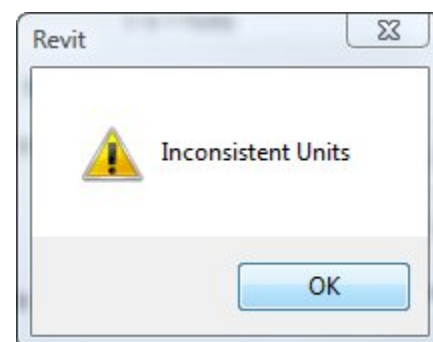
Because the data we'd like to establish is determined using the fields already in the schedule, we'll use a Calculated Value.

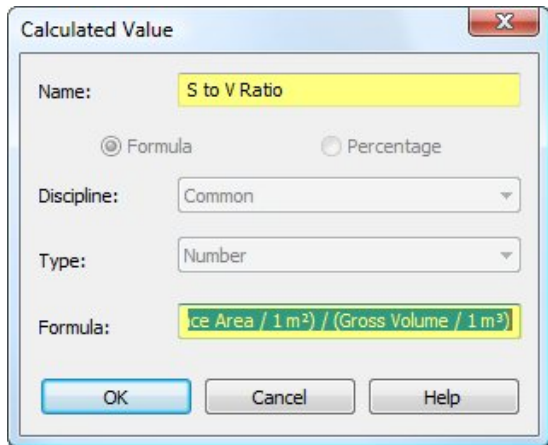


Provide a name for the value (it is best to avoid using non-alphanumeric characters, as they might be confused with mathematical operators), and enter the formula. The formula must use parameters and mathematical syntax, and is case-sensitive.



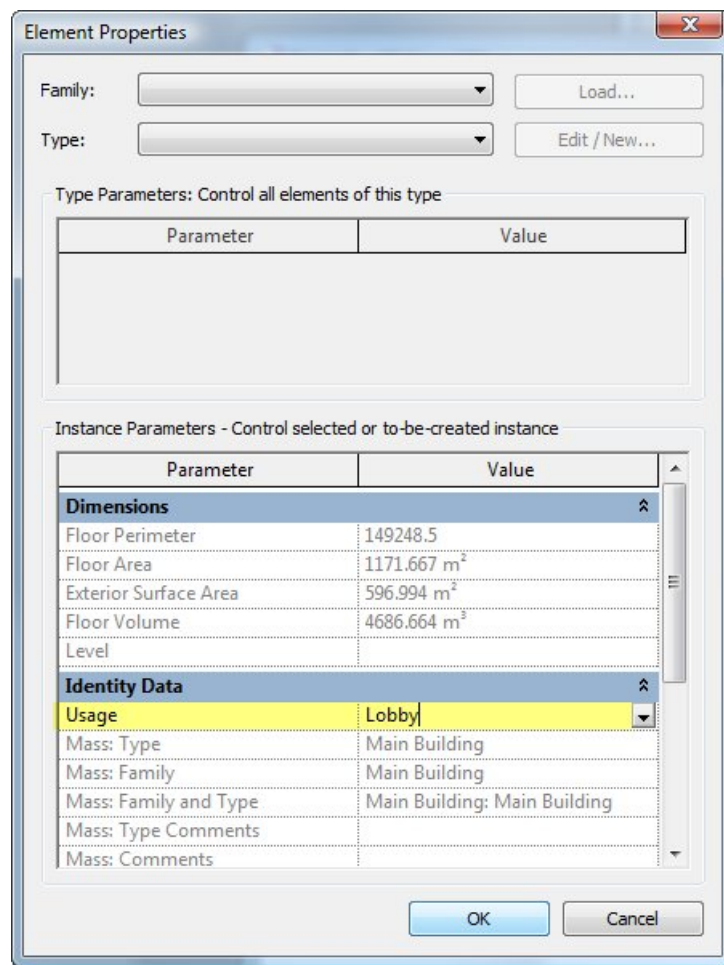
The formula used above will result in an error "Inconsistent Units", because Gross Surface Area is measured in square metres, and Gross Volume is measured in cubic metres. Dividing each parameter by one (of itself) will correct this problem.



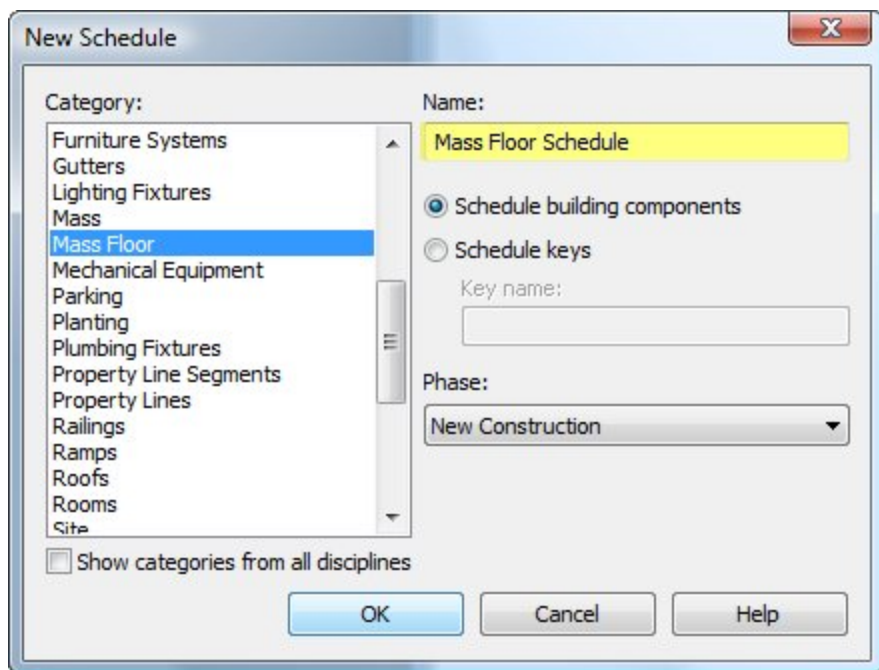


The formula in this instance should finish as $(\text{Gross Surface Area} / 1 \text{ m}^2) / (\text{Gross Volume} / 1 \text{ m}^3)$, but it can be tricky getting around the 'Inconsistent Units' error, given that Revit doesn't easily allow you to type in superscript text or exponents. It's usually best to copy/paste these values from your character map, or from your word processing program – yes, it's a crude workaround, but it is ultimately quickest.

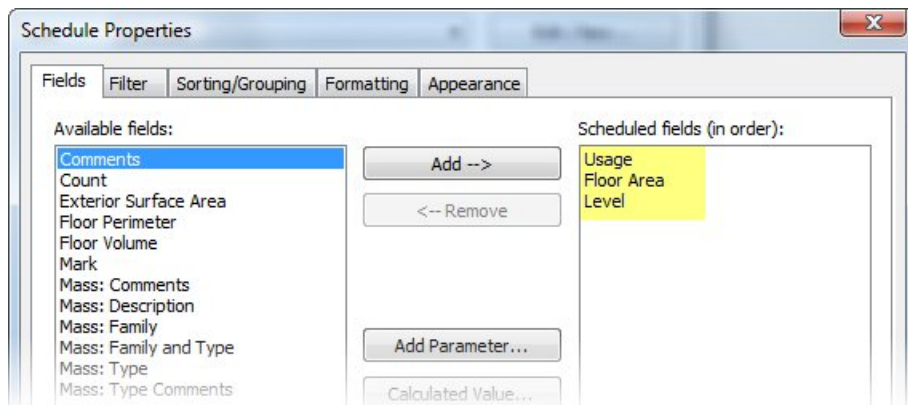
Now that our building form contains Mass Floors, we can schedule these separately to the Mass by itself, and determine other values. Perhaps this is a hotel building, requiring Lobby space, Plant Area, Conference Facilities and Accommodation. We can assign (and schedule) these uses to the Mass Floors, and then compare them to the total floor area. We start this by assigning values for each Mass Floor to their Usage parameter.



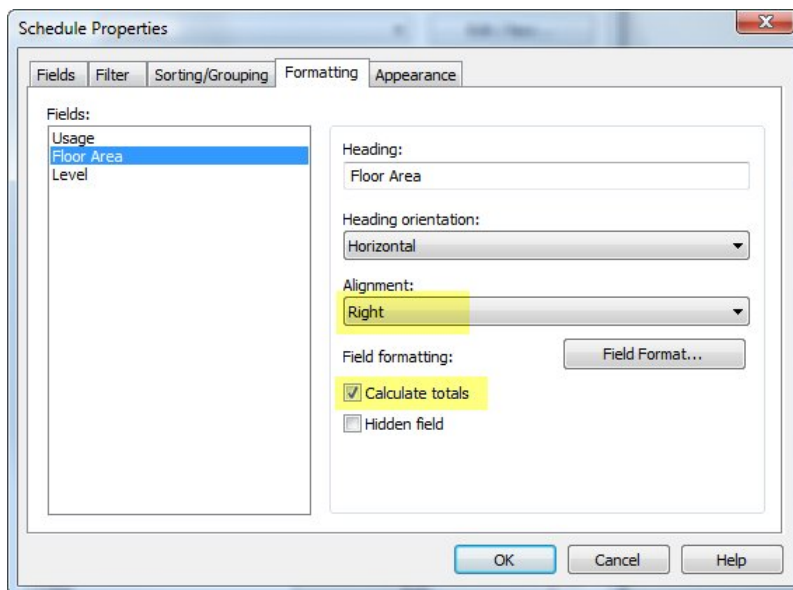
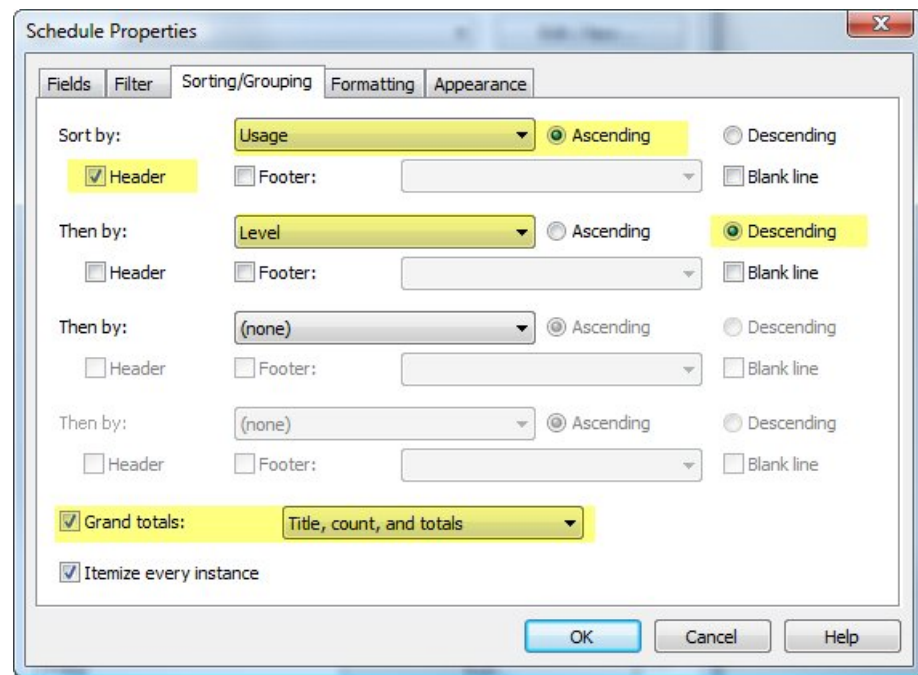
When each Mass Floor has a Usage parameter value, we can create a Mass Floor schedule, and calculate the proportion of each use against the total.



In the example below, only Usage, Floor Area and Level are added as fields:



Make Usage a Hidden Field; Floor Area aligned to the right, and totals calculated; Level aligned to the right.



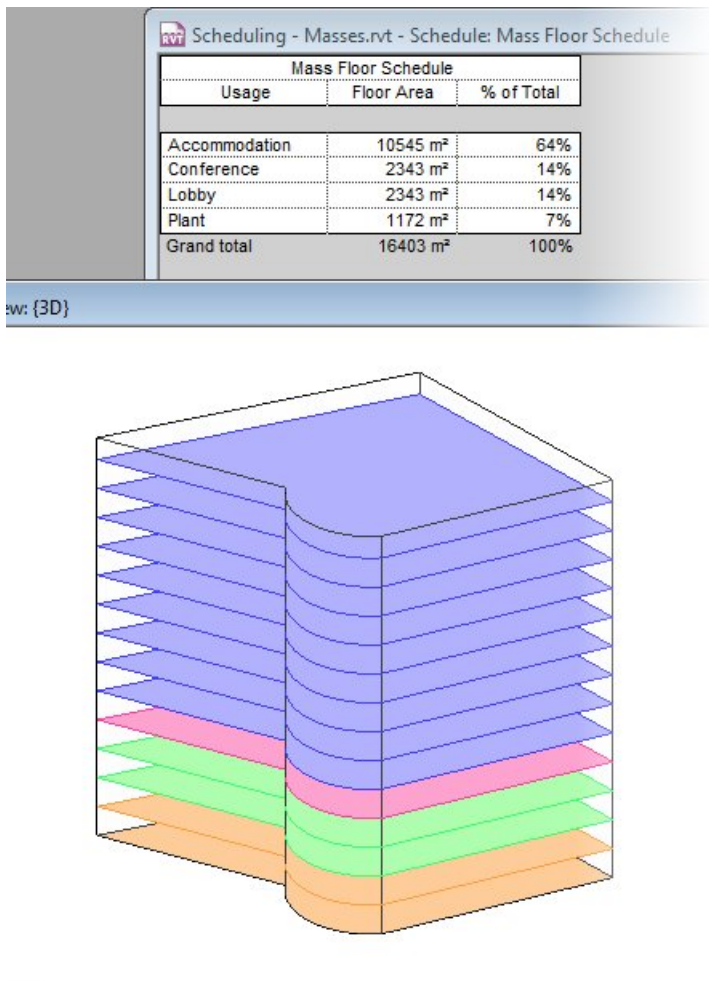
| Mass Floor Schedule | |
|----------------------|--------------|
| Floor Area | Level |
| Accommodation | |
| 1172 m ² | Level 13 |
| 1172 m ² | Level 12 |
| 1172 m ² | Level 11 |
| 1172 m ² | Level 10 |
| 1172 m ² | Level 9 |
| 1172 m ² | Level 8 |
| 1172 m ² | Level 7 |
| 1172 m ² | Level 6 |
| 1172 m ² | Level 5 |
| Conference | |
| 1172 m ² | Level 3 |
| 1172 m ² | Level 2 |
| Lobby | |
| 1172 m ² | Level 1 |
| 1172 m ² | Ground Floor |
| Plant | |
| 1172 m ² | Level 4 |
| 16403 m ² | |

You then finish with each area per floor level grouped by Usage.

For useful preliminary data, we may wish to see something that better summarizes the results, such as in the image overleaf.

The mass floors are colour-coded, while the Building Usage is shown as a percentage of the total area. For more detail on this approach, however, you'll have to wait until the next edition!

Stay tuned!



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