

FirstRate5® Guidance Note

GN04 Floor Builder – Examples

(version 1.0, 06 Dec 2018, FR5 5.2.10)

Prior Reading

Before proceeding with this Guidance Note it is essential that you read the following:

GN03 Floor Builder & Project File Upgrade Process

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Using This Guidance Note

Numbers **in red** on images refer to the steps described below each image.

Example 1 – Using a System Floor

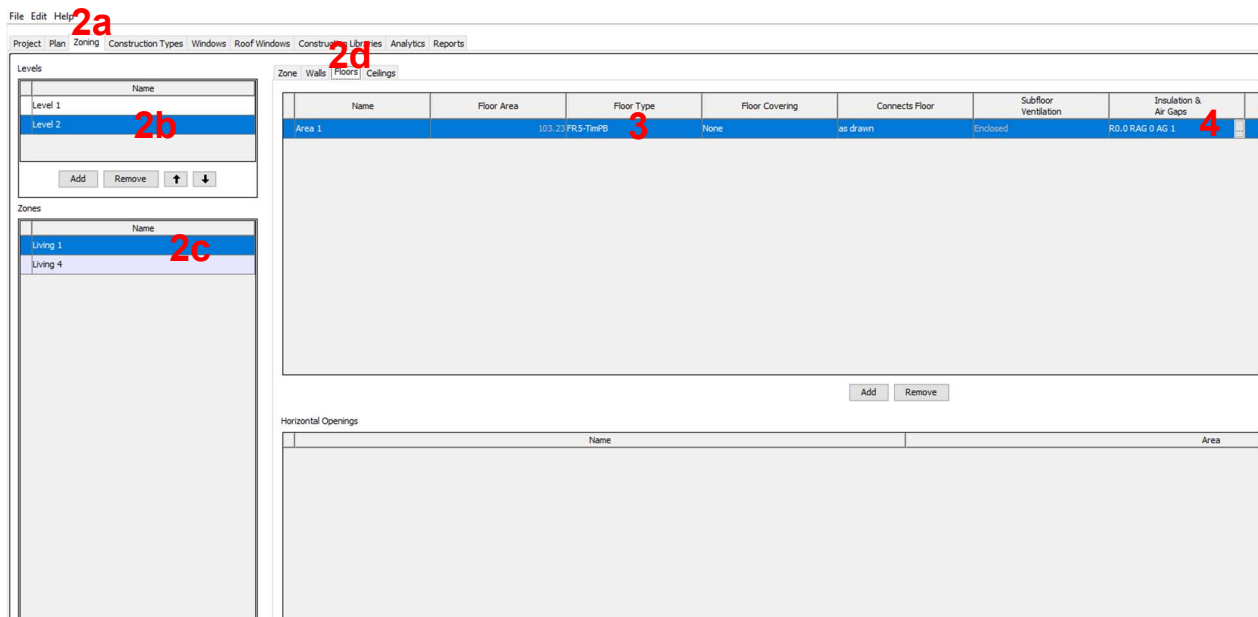
We want to create a first floor with the following build-up:

Top

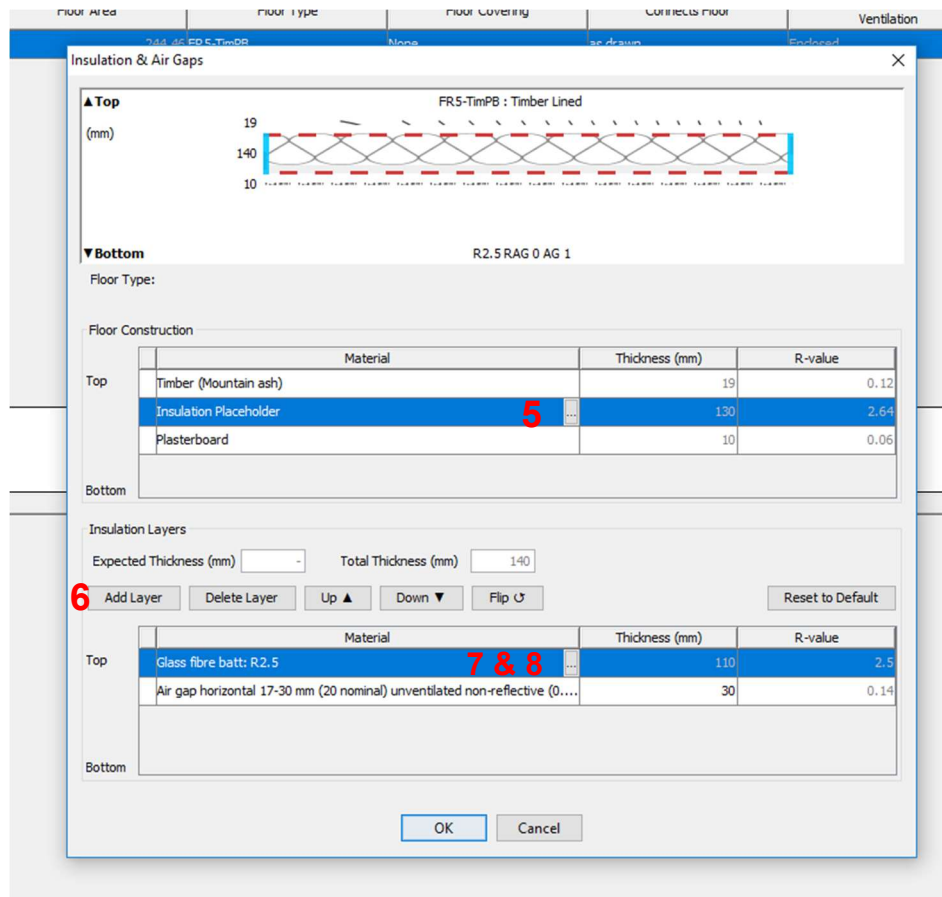
19mm	Timber (Mountain Ash)
140mm void	Glass fibre batt R2.5
	Air Gap (unventilated with no foils) to fill remainder of void after bulk insulation added (see below)
10mm	Plasterboard

Bottom

This build-up is identical to the Timber Lined System floor, except for the added insulation and joist thickness of 140mm. We can use System floor *FR5-TimPB* and add the appropriate bulk insulation and air gap details.



1. Draw a simple two storey house with two zones on both the first and second level.
2. Click on the *Zoning* tab, select *Level 2*, select the first Zone and then click on the *Floors* tab. You'll notice that the floor displayed has used the default System floor type, *FR5-Tim : Timber*.
3. With the area selected, under the *Floor Type* column, change to *FR5-TimPB : Timber Lined* from the drop-down menu. (Note: Only the floor constructions that have been added to Construction Types are visible in the drop-down list. Refer to the FR5 Manual or Guidance note GN03 for adding additional floors to Construction Types.
4. In the *Insulation & Air Gaps* column click on the edit button to open the *Insulation & Air Gaps* editor. (Note: Alternatively, we could have reached this point by selecting the floor in the *Plan* tab and editing the *Type* and *Insulation & Air Gaps* fields in the *Properties* Panel).



5. Click on the insulation placeholder. By default, you will see an insulation placeholder containing a non-reflective air gap.
6. In addition to the non-reflective air gap we want to add a layer of bulk insulation. Click *Add Layer* to add a second layer to the placeholder. Then move the new layer to the top by selecting the *UP* button.
7. Click on the edit button on the top insulation layer (the top layer in the table). Specify the type and R-value of the insulation from the *Specified resistance* list (*Glass fibre batt R2.5*) and click *OK*. Note that the thickness displayed is 110mm. This means the remaining air gap in the void will be 30mm (140mm-110mm = 30mm).
8. Now click on the edit button on the bottom insulation layer (the bottom layer in the table). Select the *Air gaps (unventilated 17-30mm; 20 nominal) > Horizontal > Air gap horizontal 17-30mm (20 nominal) unventilated non-reflective (0.9/0.9; E = 0.82)* and click *OK*. General building materials are considered to have an emissivity of 0.9, reflective foils have a lower emissivity value. Note that the thickness displayed will be the nominal thickness (i.e. 20mm). Manually change this to 30mm. The graphic changes at the top of the dialogue box to 140mm total for the insulation placeholder. If necessary use the *Up*, *Down*, or *Flip* buttons to arrange the order of the insulation layers. When you're satisfied, click *OK*.
9. We have changed the floor type and insulation specification of just one floor. We want the remaining floor to match. Use the Shift or Ctrl key to highlight both zones and then highlight both floors; once you have completed highlighting release the Shift or Ctrl keys. Now, in the *Floor Type* column, change any of the *FR5-Tim* entries to *FR5-TimPB*. All selected floors change to *FR5-TimPB*. Finally, with all floors still selected, click on the edit button of the updated floor in the *Insulation & Air Gaps* column to open the editor and then click *OK*. You will notice all floors have now inherited the insulation properties of the first floor you updated.
10. You have just specified the insulation properties of a standard timber floor using a System floor. These insulation properties will be saved to this project only.

Example 2 – Creating a Particleboard floor from the Construction Library tab

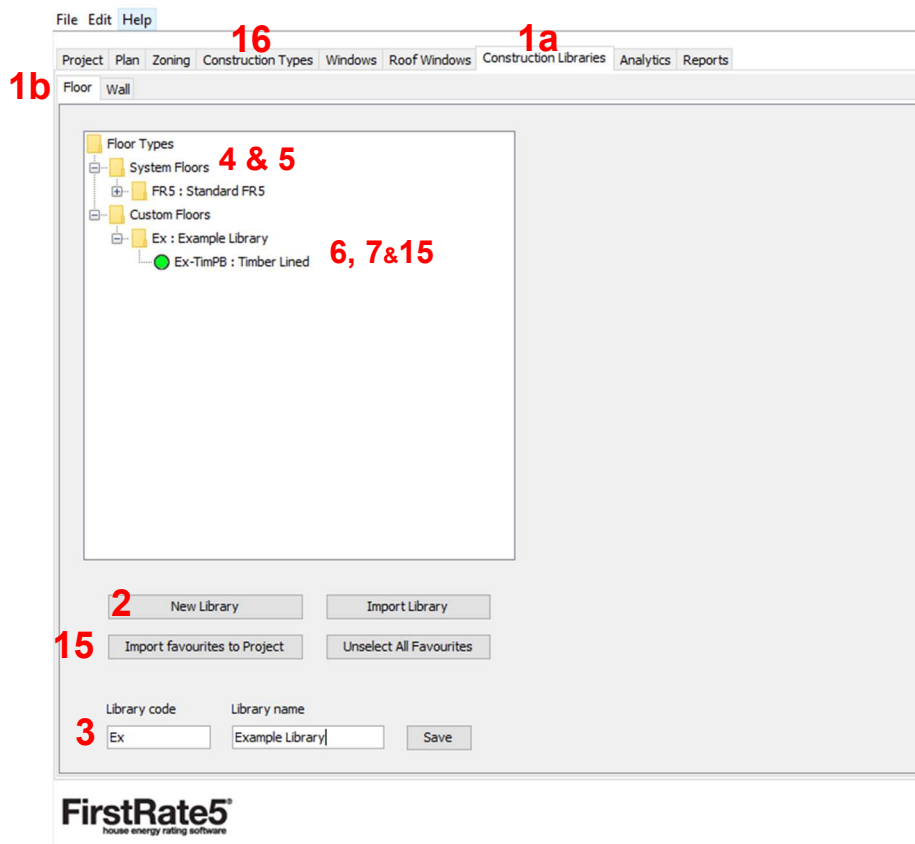
In the following example a Custom floor will be created from a System floor and saved as a Favourite floor in a new library. The floor will be built with the following build up:

Top

22mm	Particleboard Structural Flooring
300mm Void	15mm Polystyrene extruded with reflective foil
	285mm Air Gap (unventilated with reflective foil) to fill remainder of void after polystyrene extruded insulation added (see below)
10mm	Plasterboard

Bottom

This floor construction is very similar but not identical to the System floor *FR5-TimPB*. For that reason, we will use the System floor as a starting point for the construction of our Custom floor.



1. Click on the *Construction Library* tab. There are now two tabs set up for both floors and walls.
2. If you have not already done so, create a custom library by clicking on the *New Library* button.
3. Type Library Code and Library Name followed by the *Save* button. A new folder with these details will be created in the Custom Floors library.
4. Click on *System Floors > FR5: Standard FR5* and select the System floor to be modified, in this case *FR5-TimPB*.
5. Right click on the floor to be modified and click *Copy*. Ensure the correct folder in your Custom Library is displayed below the 'Import Favourites to Project' button and click *Save*.
6. Navigate to the copied floor in your Custom Library folder.

7. Right click on the copied floor and click *Edit*.

Floor Builder

1. Give your floor a name and code

Floor Name: **8a** Floor Code: **8b**

2. Build up your floor layers

▲ **Top** (mm)

Ex-ParPB : Particleboard Lined

22 90 10

▼ **Bottom** Particleboard

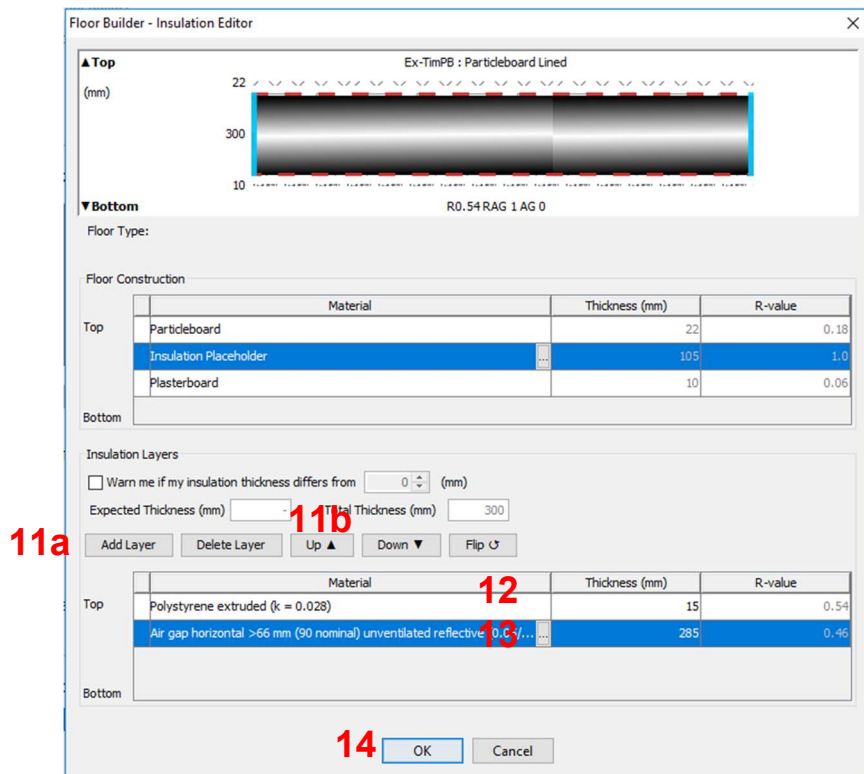
Add Layer Delete Layer Up ▲ Down ▼ Flip ⇅ Add Insulation Layer

	Material	Thickness (mm)	R-value
Top	Particleboard 9a	22 9b	0.18
	Insulation Placeholder	90	0.15
	Plasterboard	10	0.06
Bottom			

3. Add / Edit your floor's default insulation

Edit default insulation **10** OK Cancel

8. The *Floor Builder* dialogue box opens and allows you to edit floor construction and insulation layers. Manually change the *Floor Name* to Particleboard Lined and *Floor Code* to ParPB
9. Manually change the top layer from *Timber (Mountain ash)* to *Particleboard* and the thickness to 22mm.
10. Click on the insulation placeholder followed by the *Edit Default Insulation* button. The *Floor Builder – Insulation Editor* dialogue box opens.



11. Add Layer and then move to the top by selecting the Up button
12. Click on the edit button on the top insulation layer. Specify the type and K-value of the insulation from the Specified conductivity list (Polystyrene extruded $k=0.028$) and click OK. Change the thickness displayed to 15mm.
13. Now click on the edit button on the bottom insulation layer.
Select the Air gaps (unventilated >66mm; 90 nominal) > Horizontal > Air gap Horizontal >66mm (90 nominal) unventilated reflective (0.05/0.9; $E = 0.05$) and click OK. Here we have selected a reflective foil with an emissivity value of 0.05 and plasterboard with an emissivity 0.9 resulting in a total emissivity of 0.05. General building materials are considered to have an emissivity of 0.9, reflective foils have a lower emissivity value. Note that the thickness displayed will be the nominal thickness (i.e. 90mm). Manually change this to 285mm (300mm-15mm = 285mm). The graphic changes at the top of the dialogue box to 300mm total for the insulation placeholder. If necessary use the Up, Down, or Flip buttons to arrange the order of the insulation layers. When you're satisfied, click OK.
14. Click OK to save your floor.
15. Locate the new custom floor in your library and make sure the selection button is highlighted in green and click on the Import Favourites to Project button. If you only want to import this one floor, then click Unselect All Favourites before carrying out this step.
16. It will now appear in the Floor sub-tab under the Construction Types tab and be available for use in the project. It will also be stored in your library for future projects.

Example 3 – Creating a Concrete Slab floor from the Construction Types Tab and incorporating a Battened Timber Floor Covering

In the following example a Custom floor will be created from scratch in the *Floor* sub-tab within the *Construction Types* tab and then subsequently saved into the Construction Library. This example demonstrates how a floor covering can be incorporated into the floor system.

Top

19mm	Timber Floor Boards (Floor Covering)
45mm	Battened Air Gap (unventilated with no foils)
100mm	Suspended Concrete Slab
70mm	R2.5 Rigid under slab insulation

Bottom

This construction resembles Suspended Slab, so we could use that as a starting point for this Custom floor. However, for the purposes of this exercise we will start from scratch.

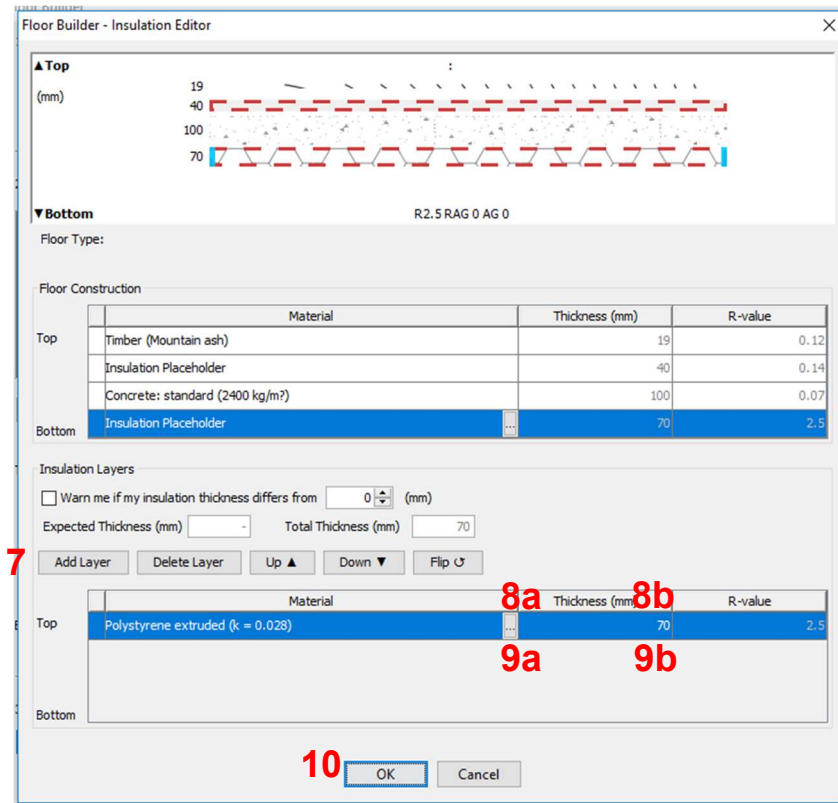
The screenshot shows the 'Floor Builder' dialog box with the following components and annotations:

- 1. Give your floor a name and code:**
 - 2:** Points to the 'Floor Name' input field.
 - 'Floor Code' field is also present.
 - Red text: 'Please enter floor name.'
- 2. Build up your floor layers:**
 - Visual diagram showing 'Top' and 'Bottom' layers with thicknesses (0 mm).
 - 3a:** Points to the 'Add Layer' button.
 - 4:** Points to the 'Up' button in the layer controls.
 - 3b:** Points to the 'Add Insulation Layer' button.
 - 5a:** Points to the first '...Select a material' placeholder in the layer list.
 - 5b:** Points to the first 'Insulation Placeholder' in the layer list.
 - Red text at the bottom: 'One or more layers do not have a material selected. These layers will be deleted.'
- 3. Add / Edit your floor's default insulation:**
 - 6:** Points to the 'Edit default insulation' button.

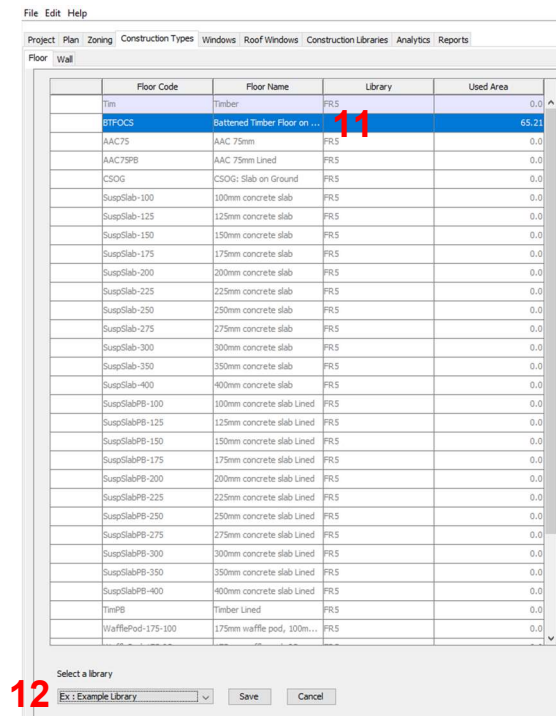
Buttons at the bottom: OK, Cancel.

1. Go to the *Construction Types* tab, then go to the *Floor* sub-tab and click on the *New Floor Type* button at the bottom.
2. Give your floor a name. Note that the Floor Code field will automatically populate with the initials of the floor name.
3. Add two construction layers (click *Add Layer* twice) and two insulation placeholders (click *Add Insulation Layer* twice).
4. Move the first insulation placeholder between the two construction material placeholders by selecting it and pressing the *UP* button to match the order in the above diagram.

5. Select the top material construction layer and then assign 19mm thickness: *General > Timber (Mountain Ash)*. Select the second material construction layer and then assign 100mm thickness: *General > Concrete*.
6. Highlight the top insulation placeholder and then click on the *Edit Default Insulation* button.



7. Add one insulation layers (click *Add Layer*).
8. Select the Air gaps (unventilated 31-65mm; 40 nominal) > Horizontal > Air gap horizontal 31-65mm (40 nominal) unventilated non-reflective (0.9/0.9; E = 0.82) and click *OK*. Note that the thickness displayed is 40mm (i.e. the nominal thickness of the selection). Manual change this to 45mm to represent a 45mm timber battened air cavity.
9. Now select the bottom insulation placeholder and select a rigid bulk insulation material from the *Specified conductivity* list. Select *Polystyrene Extruded (k=0.028)* and click *OK*. Note that the thickness displayed is 0mm. Manually change this to 70mm.
10. Click *OK* to save the floor. Note that this has only been created in the *Construction Types* tab under the *Floor* sub-tab and will be saved project file only.



11. To save it to the *Construction Library* locate the floor in the *Construction Types* table. Right click on the newly created floor and click on *Add To Library*.
12. Select the appropriate Custom Library folder and click *Save*.
13. As the timber floor board covering is incorporated in to the system floor, make sure to assign the *Floor Covering* as *None* for the relevant areas. This can be done in either the *Zoning* tab or the *Plan* tab with the area selected. Only specify a floor covering in the *Floor Covering* field if there is an additional floor covering on top of the timber floor boards, such as carpet.

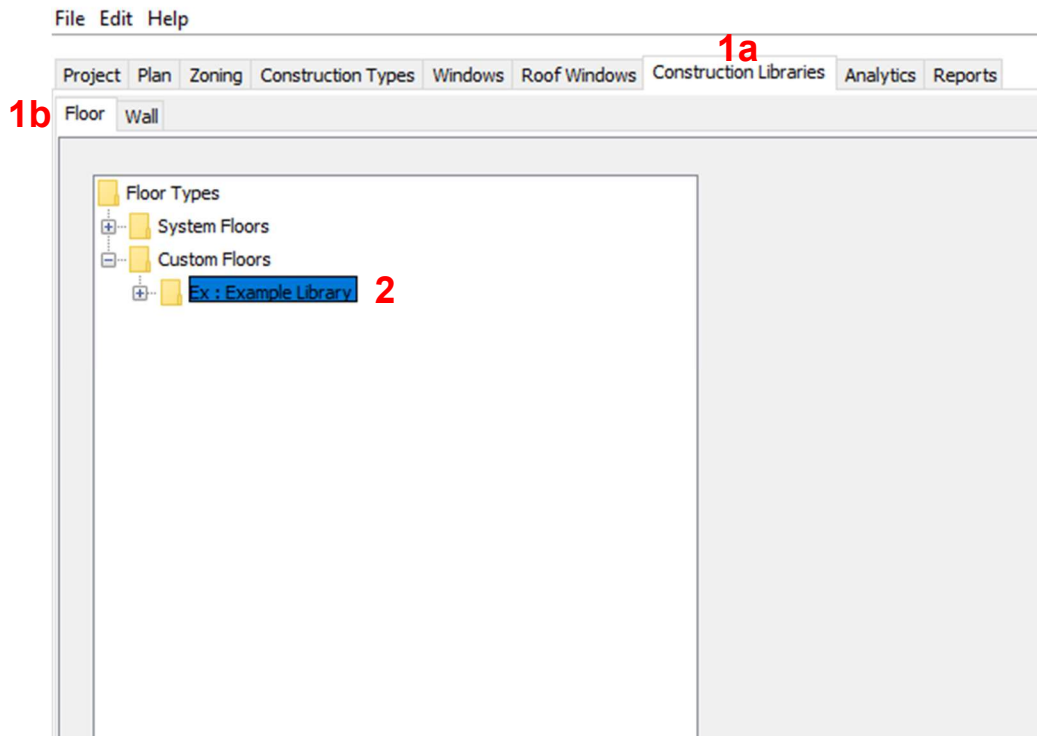
Example 4 – Creating a Cross Laminated Timber floor from the Construction Library tab

In the following example a Custom floor will be created with the following build up in the Floor Library and saved into the current project.

Top

150mm	Cross Laminated Timber (Plywood)
100mm void	Glass fibre batt R2
	Air Gap (unventilated and non-reflective) to fill remainder of void after bulk insulation added (see below)
10mm	Suspended Plasterboard Ceiling

Bottom



1. Go to the Construction Library Tab. Select the Floor Tab.
2. Right click on the Custom library folder where you want to create the new floor and click on New Floor Type.

Floor Builder

1. Give your floor a name and code

Floor Name: **3** Floor Code:

2. Build up your floor layers

▲ **Top** Ex-CLT : Cross Laminated Timber

(mm) 150
0
10

▼ **Bottom** R0.0 RAG 0 AG 0

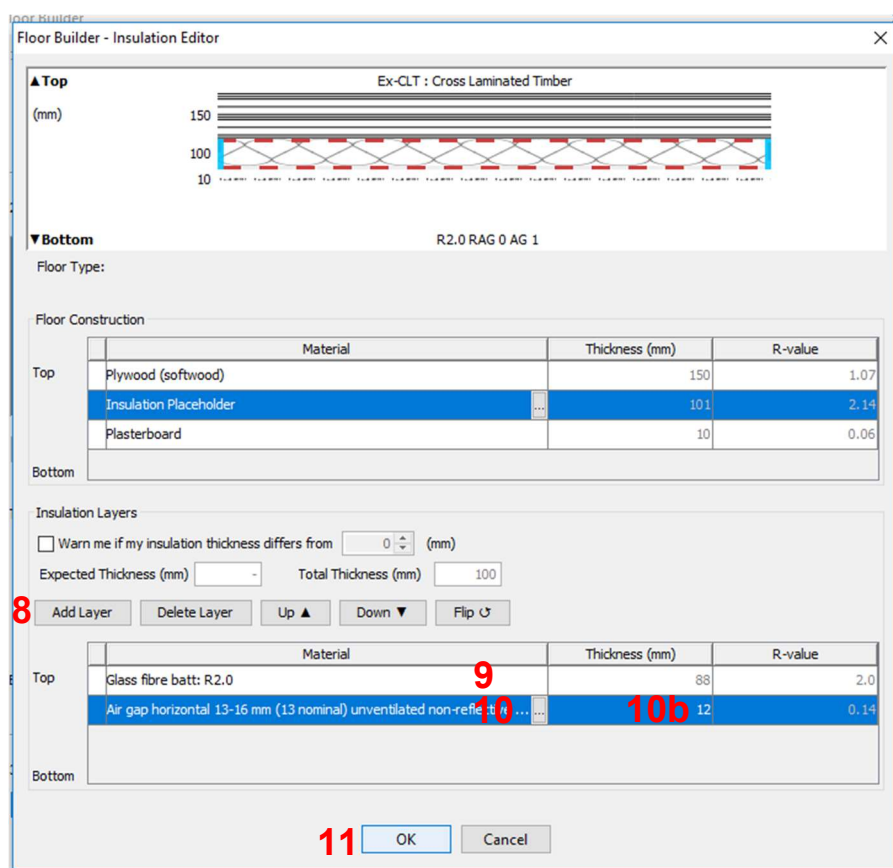
4b **4a**

	Material	Thickness (mm)	R-value
Top	Plywood (softwood) 5	150	1.07
	Insulation Placeholder 6	0	0.0
	Plasterboard	10	0.06
Bottom			

3. Add / Edit your floor's default insulation

7

3. Give your floor a name.
4. Insert one insulation placeholder (click *Add Insulation Layer* once) and two construction layers (click *Add Layer* twice). Locate the Insulation layer between the two construction layers by selecting the insulation layer and selecting *Down*.
5. Click on the top construction layer and select *General > Plywood*. Manually change the thickness to 150mm.
6. Click on the bottom construction layer and select *General > Plasterboard*. The default thickness for the plasterboard is 10mm.
7. Highlight the insulation placeholder and then click the *Edit Default Insulation* button.



8. Click **Add Layer** twice.
9. Click on the edit button on the top insulation layer (the top layer in the table). Specify the type and R-value of the insulation from the *Specified resistance* list (*Glass fibre batt R2*) and click **OK**. Note that the thickness displayed is 88mm. This means the remaining air gap in the void will be 12mm (100mm-88mm = 12mm).
10. Highlight the bottom insulation layer, click on the *Edit* button and select *Air gaps (unventilated 13-16mm; 13 nominal) > Horizontal > Air gap horizontal 13-16mm; (13 nominal) unventilated non-reflective (0.9/0.9; E = 0.82)* and click **OK**. Manual change the thickness to 12mm. Click **OK**.
11. Click **OK** to save the floor to your Custom Library folder.
12. Locate the new custom floor in your library and make sure the selection button is highlighted in green and click on the *Import Favourites to Project* button.
13. It will now be available for use in the project and stored in your library for future projects.

Further Reading

- Please refer to the FR5 User Manual for further detail. The FR5 User Manual is a PDF document that be opened by clicking on User Manual under Help on the File menu.
- Please also refer to FAQs on the FirstRate5 website (www.fr5.com.au/faqs)