Visual Building

A Training Course in Visual Building

Credits

Copyright

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Dedication

To Amelia Player for showing just what can be achieved with Visual Building.

To Simmi Player for allowing this and encouraging this.

To our many users for asking the right questions.

Author

Les Player, the author of this training course is a qualified engineer (weapons systems) and should be no stranger to those who are familiar with the Atari products during the 1980's. Les held the position of European Technical Director at Atari between the years 1982 – 1990 and was responsible for establishing the software community for the Atari ST and introducing the Atari ST into Europe.

Continuing with the Atari theme, Les became MD and part owner for the GFA company (in UK, Germany and USA), which was responsible for introducing GFA Basic and GFA CAD for the Atari ST. GFA Basic was also introduced to the Amiga and Windows, but became one of the first casualties of Microsoft's marketing/development strength and could not withstand the competition from Visual Basic.

Les then went on to establish Data Player Ltd (trading as Data Becker UK), localising and launching 100+ software applications into the consumer market. One of the most successful products that Data Becker published was a product call 3D Walkthrough / 3D Home Designer. This was developed in 1994 and based upon a German software product called Arcon. Les recognised the potential in Arcon and established Online Warehouse Ltd in 2000 specifically to localise, develop and sell Arcon and Arcon related products.

In 2001, Les established 3D Architect Software Ltd with the objective of becoming more responsible for further development of Arcon associated products, allowing Online Warehouse Ltd to concentrate on sales and marketing. Online Warehouse attended most of the Build It and Home Building & Renovation shows from 2001 onwards until 2005, and through meeting with thousands of self-builders, architects and interior designs adapted the Arcon software to their specific needs. It was Les Player's desire to establish Arcon as the

definitive software tool for self-builders in the UK.

In 2003, Les Player sold the assets of both 3D Architect Software Ltd and Online Warehouse Ltd to Eleco Plc. who at the same time acquired the rights to Arcon from the German development company MB Software. As a result of this sale Les joined Eleco to continue the management and development of the Arcon products. Arcon was rebranded as 3D Architect Software and later as the Grand Design Software range. Both 3D Architect Software Ltd and Online Warehouse Ltd were later merged with Eleco Software Ltd, all part of the Eleco plc. group.

The base source code for Arcon was not .Net and in 2008 Les initiated a new Arcon development by Eleco Software Ltd using .Net technology. In 2010, as a result of Eleco Plc's worsening financial position due to the decline in the UK construction industry, Eleco Software Ltd cancelled the new Arcon development and Les left Eleco, and soon after established Visual Building Ltd.

Acknowledgements

Visual Building is based upon a concept originally designed by Thomas Kubena, based in Hameln Germany. Prior to designing and developing Cygnicon, the engine within Visual Building, Thomas was responsible for developing the Arcon engine between 2001 and 2005.

The Cygnicon engine is a fresh new development based upon new technology that was not available during the early development of Arcon.

Contents

1 Introduction

Welcome to an in-depth training course in the use of Visual Building. This tutorial will use Visual Building Premium; however it is fully usable with all other versions of Visual Building, which includes Visual Building Basic, Visual Building Professional and Visual Building Premium. We will indicate when we use a feature not available to Visual Building Basic or Professional.

This training course has been updated to use the new Ribbon bar user interface. This interface improves the usability and performance of Visual Building, especially for new users.

1.1 Objective

Originally our objective was to create a complete project based upon a semi-detached cottage. We would use this project to create a set of drawings suitable for supporting a planning application.

Every project will be different, because every building is different and so I apologise in advance if I omit features you require, or include features that you do not require. We will hopefully include such features e.g. such as a cellar or creating garage doors in additional projects.

Due to the diverse number of questions, we have created lots of side projects, not part of the original main project. So it became better to cover the many uses of Visual Building with several smaller projects, rather than try and incorporate every aspect into a single project.

The course also includes the building of a conservatory (in our case a conservatory designed and built by Amdega). The methods used here introduce you to the concept of creating your own timber constructions, which could also be used for carports and other free standing structures.

The construction of an inglenook fireplace will introduce you to the software's ability to create additional 3D objects. The same principle once understood, can be applied to designing furniture and other architectural objects you may require, such as the Dutch Barn roof.

Then we move onto some roof editing and construction methods.

I am using Windows 7 and so the screen shots will vary slightly if you are using Windows XP, Vista or Windows 8. Even with Windows 7, it's possible that you may have a difference due to your personal settings and choice of visual theme.

The screenshots are from a 1920 x 1200 screen, and again if you are using a different resolution or aspect ratio, then your screen will again look different to those in the screenshots.

1.2 Level of Detail

Parts of this tutorial will appear very detailed, especially in the early chapters, but the objective is to explain how and why. The methods and tools are not the only way to achieve something, and may not be the best, but I also want to use as many different methods to achieve things in order to use as many of the tools as possible.

If a section is not of interest, then skip it. You can always return to that section if you later feel you missed something.

1.3 The tools

If you are not already a Visual Building user, you can download a free trial version from:

www.visualbuilding.co.uk/trial

The trial version is full featured, but is only licensed for 5 individual days. (For example you could use it every Saturday for 5 weeks.)

1.4 The Tutorial Project

Our first tutorial project will consist of the following:

- A 2D Plan view in A3
- A 2D elevation view in A3
- A 3D visualisation view
- A Block Plan
- A Site Plan

Each of our plans will be presented on its own A3 sheet, though it is possible to present multiple plans on a single sheet using Visual Building Professional or Premium.

We will approach the project in the order listed. This is a matter of preference, as you may later decide to produce the site and block plans first and work down towards the 2D plan and elevation views.

1.4.1 Building Description

The building that we are drawing is a semi-detached cottage, built in 1750. An extension was added either end of the building in 1980. A conservatory was added in 2010.

We will treat each extension as a separate building within the project, so eventually we will create the following buildings:

Building 1: Original Building built 1750, consisting of a pair of cottages.

Building 2: The first extension added 1980 to the east end of the cottage

Building 3: The second extension added 1980 to the west end of the cottage

Building 4: A Conservatory added 2010.

Building 5: A Porch added 2013 to the front of the west cottage.

We will therefore have the opportunity to demonstrate how to use multiple building with a project. In reality they are not separate buildings, although they are very different constructions, and describing them as separate building will help us demonstrate the differences within our project.

Each building apart from the Conservatory and Porch will have a foundation, a ground floor, a 1st floor and an attic.

The next page will give you an idea of what we will be building:

1.5 Saved Projects

As you proceed through this course you will see references to saved projects.

E.g **Project saved as tutorial1-2.cyp**

You can download the project at this point and compare your project to the actual project being followed. You can of course load and continue with any of the saved projects should you have any difficulty.

1.6 Documentation

I don't intend to repeat the contents found in the Visual Building documentation, but I will refer to it many times. So before you start ensure that you have downloaded the latest documentation from:

www.visualbuilding.co.uk/documentation

You can download this as a pdf and refer to it as you proceed through this tutorial. Because the documentation is constantly being updated any page numbers may change, so I will refer to various contents using their paragraph numbers.

1.7 Videos

There are 70+ tutorial videos available on the www.visualbuilding.co.uk website. These are hosted on www.youtube.com and can also be located by searching YouTube for "visualbuilding".

The videos concentrate on specific individual tasks, whereas this course covers the wider aspect of a complete project.

I hope and intend to also supply this tutorial as a video.

1.8 Questions and Feedback

Your questions and feedback are very important to us. If you have any questions, or any suggestions, then please email them to customercare@visualbuilding.co.uk.

We also will publish interesting questions and suggestions that we receive via email onto the forum, (anonymously) .

Alternatively you can add your questions and comments via the Visual Building forum at www.visualbuilding.co.uk/forum

We prefer the forum route because then all our users benefit from the question and answer.

1.9 Preparation

If you have not already installed Visual Building you should do so now. You can use any version of Visual Building. You can also use the trial version of Visual Building downloadable from www.visualbuilding.co.uk/trial

1.9.1 Installing

During the installation process you will have the opportunity to install the Ribbon bar or the Tool bar user interface. This tutorial uses the Ribbon bar, so please install with that option.

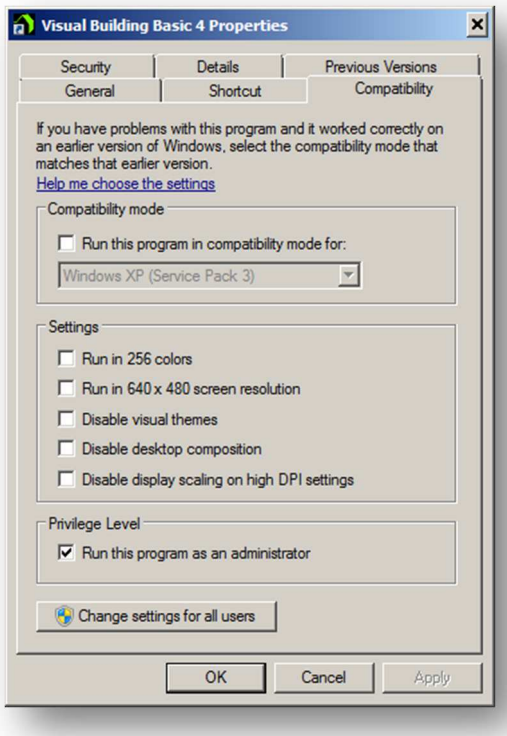
If you have already installed then you can always easily switch between the Ribbon and Toolbar version.

1.9.2 Administration Rights

Normally Windows prevents you from updating the installed catalogue and other support files, and to achieve this you must award Visual Building with Admin rights.

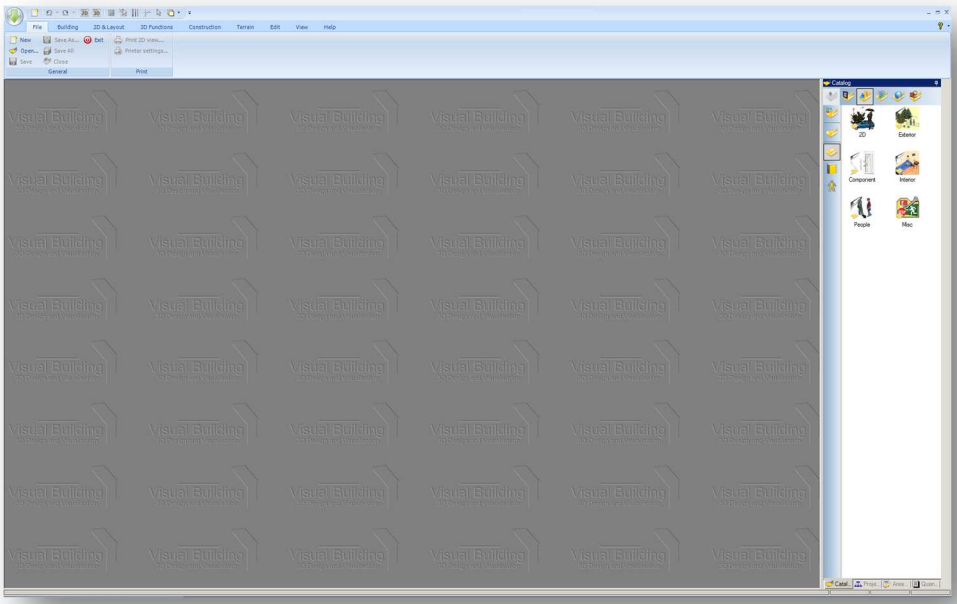
After installing, locate the program in the start menu and right click on the entry and select Properties. In the **Visual Building Properties** panel select the Compatibility tab and select **Run this program as an administrator.** This will allow us to access and update program settings and templates in the reserved Program folder.

Failure to do this may result in not being able to save templates, and other files into the main catalogue.

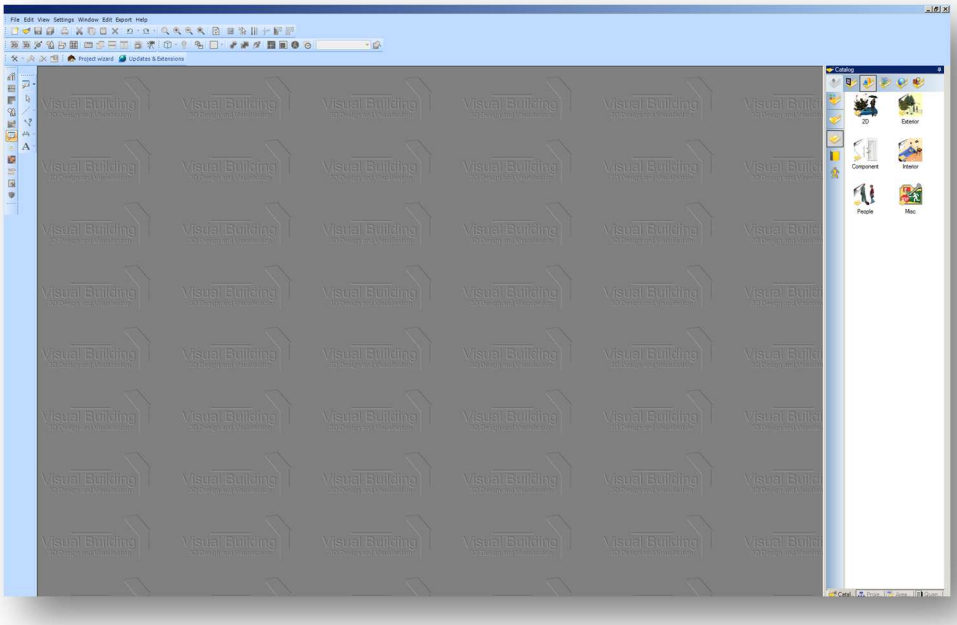


2 Start Visual Building

This is what Visual Building looks like at startup after having selected the Ribbon Bar option during installation..

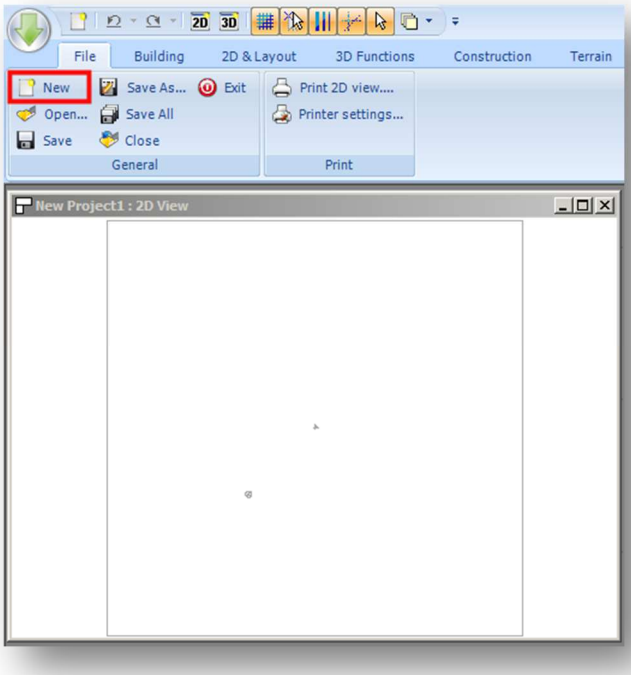


If your screen looks like the following image, then you are using the previous Toolbar based UI and should activate the Ribbon bar to make best use of this training course. The Ribbon bar feature was added with Visual Building v4.0.1.26, if you are using an earlier version, then you should update.



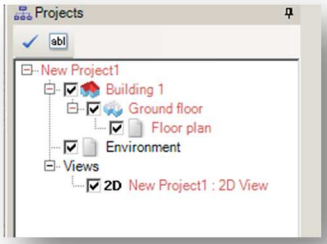
2.1 Start New Project

The first task is to create a new project, so select the **File** tab **General** group **New** tool. Note in future we will refer to this as **File-General-New**, omitting references to tab and group.



A new 2D new window will appear, titled New Project1: 2D View

In the **Projects tab** a new **Project tree** is also created



Every new project will look like this, and will consist of a Building 1. The **Building** contains a **Ground floor** and the Ground floor has a **Floor Plan.** As we add additional buildings, floors and plans to our project, this tree will become more populated.

Projects consist of **Building** and **Views**

Buildings consist of **Floors**

Floors consist of **Plans** and **Layers**

You can think of each entry in this tree as a layer.

The **Environment** layer currently contains the square plinth, compass and origin marker. These are all visible in the 2D View.

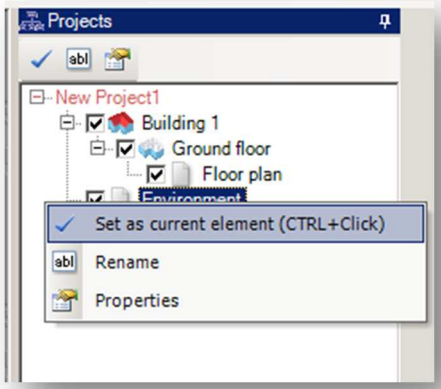
The **Views** section in the project tree contains the current view called **New Project1: 2D View**. This is currently red, indicating that it is our current view, because it is our only view.

Whenever an entry in the project tree is in red, then it means that it is part of the current view.

You can hide components in the project tree, by clicking on the tick box. Deselected items will then not appear in the current view.

For example deselecting the Environment entry will cause the environment to disappear from the 2D view. Right click on the Environment entry in the tree and from the context menu select, **Select as current element.** This results in the environment and its contents becoming active.

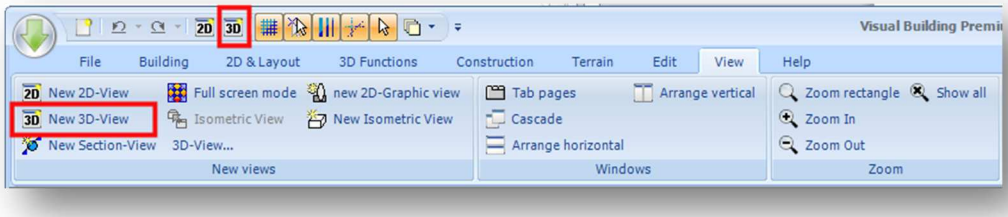
Using this context menu you can also rename an entry, or examine the current layer's properties.



Learn how to use and control the Project tree and you will be able to control your project better.

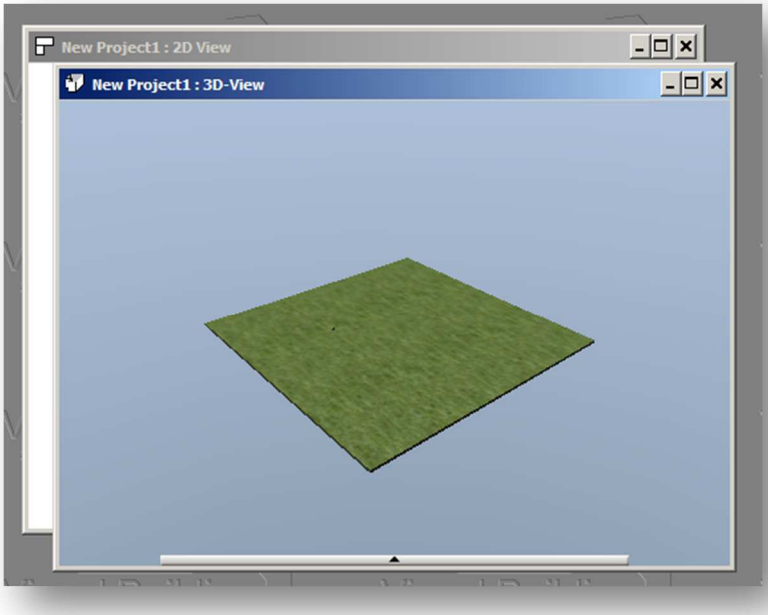
2.2 Create a 3D View

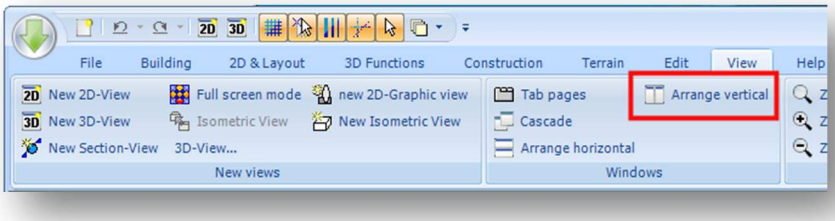
At this moment we only have a 2D view of our project and so we will now create a new 3D View, by selecting the **View-New Views-New 3D View**. Tool. This is a well used tool and so it also exists in the Quick Access toolbar.



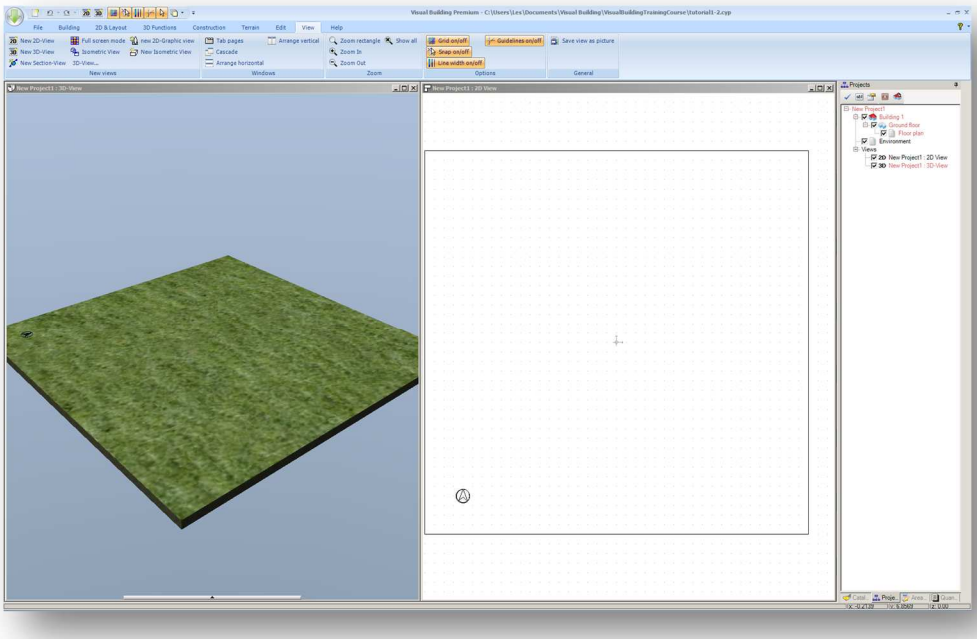
A 3D view is created showing the same almost empty project as our 2D view. You will also notice a new entry in the project tree named **New Project1: 3D View** and it automatically becomes our current selected view.

Each time you click on the **New 2D View** or **New 3D View** tool, a new view is created. These tools are used to create views and not be confused with switching between 2D and 3D views. You can move and arrange the 2D and 3D view windows as you wish. To move a window grab its title bar and drag it to a new location. There are also tools on the ribbon bar tool bar that will automatically arrange the windows. The most useful being **the Arrange vertical** tool located at **View-Windows-Arrange vertical**.



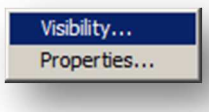


This results in all active 2D and 3D Windows to be arranged vertically



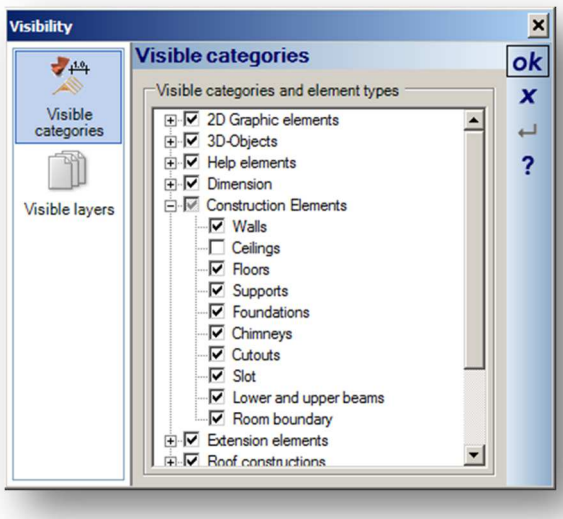
Note that only one window can ever be active at any one time. The current active window is selected by clicking on it; however any changes made in any window are immediately updated in all other windows. The current active window's title bar is blue, and all other window's title bars are grey to indicate that they are not active.

2.3 View Window Context Menu



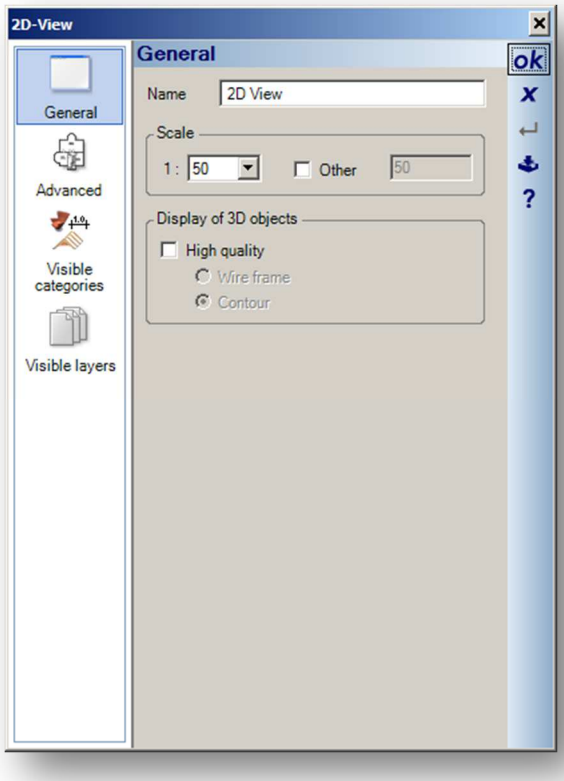
Each view window has its own properties and visibility control. Select the 2D view window, and then right click on it to activate the context menu:

Select the **Visibility** menu entry to display the Visibility dialog:



This is where you can select what is visible in each view. This is not a global setting and applies only to the current view. Click OK to close. So if you wish to all doors in all views, you would need to select the Visibility dialog for each view. Hiding a door in a 2D view will not automatically hide door in other views.

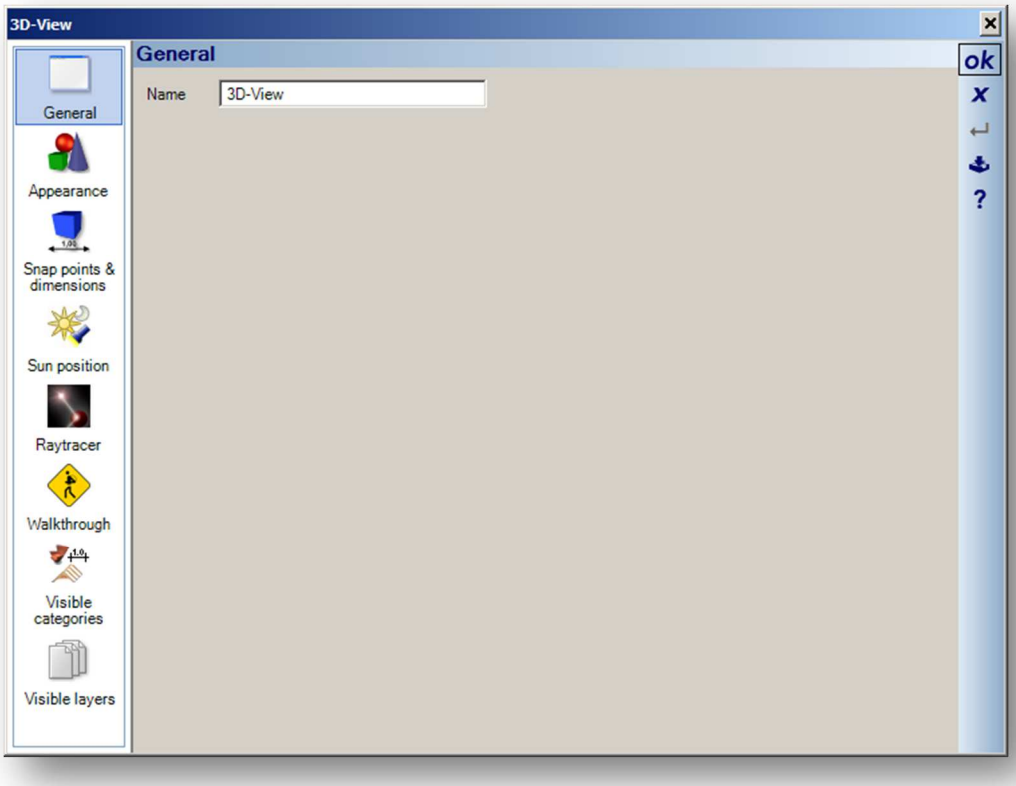
Select the 2D view window again, and then right click on it to activate the context menu again, and this time select **Properties**, which will activate the 2D View properties dialog:



This dialog allows you to set the scale for this view. Each 2D view window can be set to its own scale. Click OK to close. It may take you a while to get to grips with having different scales in different views, so until you fully understand its best to keep all 2D views the same scale.

Now select the 3D view window, right click on the 3D view window to activate the context menu. Selecting **Visibility** will display the 3D View visibility dialog, the same as described for the 2D window. As before, each 3D view window has its own visibility properties. Select OK to close.

Right click again on the 3D view window and from the context menu this time select **Properties to** activate the 3D view properties dialog:



The 3D view properties dialog contains 8 tabs on the left side of the dialog. Simply click on each tab to view the properties in each tab. We will refer to these tabs in more detail later.

Remember that each 2D and 3D view window has its own visibility set of properties and each 2D view window has its own set scale.

3 2D Plan View Drawing – Building 1

The first 2D Plan view will represent part of the building built in 1750. As described earlier, it will eventually consist of 4 buildings representing different parts of the actual building.

3.1 Determine the Scale

The scale of the project depends upon several factors:

The scale requirement. Specific requirements may require a specific scale.

The paper size. The paper size may be determined by the requirement and available printers. However using a pdf printer driver (see the Visual Building forum for a free download), you can print to any pdf paper size without having that printer or paper size. You should also take into account what else you want to display on the paper. Don't forget to allow for information boxes and other text detail.

Project size Is this a simple residential 5m x 5m plan, or a complex commercial site plan measuring 100m x 100m

Plan Layout. Do you want to show a single plan per sheet or multiple plan views, elevations on a single sheet? Please note that Visual Building Professional and upwards support the Presentation Layout feature that allows you to present multiple 2D views on a single sheet. Visual Building Basic and below provides only for a single view per sheet.

For example if I want to print out in A3 size for a project is 15m x 12m, what scale do I need?

A4 Sheet

Note the size of an A4 sheet is 210mm x 297 mm (8.267" x 11.69").
At 1:100 scale I could fit a 21 m x 29m project onto an A4 sheet.
At 1:50 scale I could fit a 10.5 m x 15m project onto an A4 sheet.

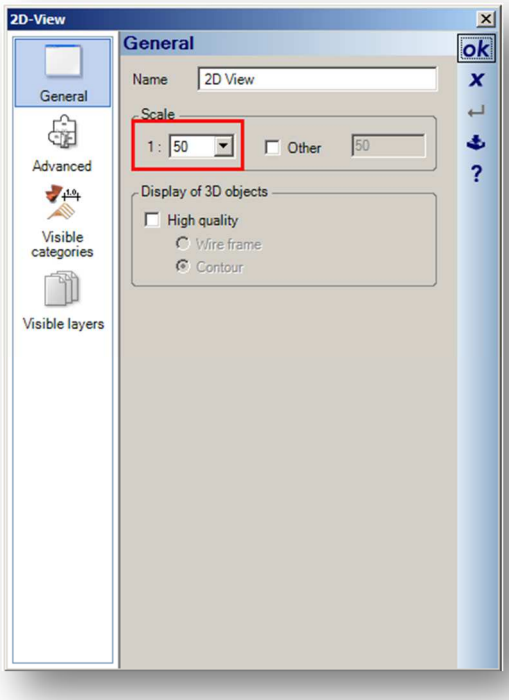
A3 Sheet

Note the size of an A3 sheet is 297mm x 420 mm (11.69" x 16.5").
At 1:100 scale I could fit a 29.7m x 42m project onto an A3 sheet.
At 1:50 scale I could fit a 14.85 m x 21m project onto an A3 sheet.

Our first drawing will be the 2D Plan view in A3 and the building that we wish to draw is approximately 17m x 12m, so we could feel comfortable with a scale 1:50. It is possible to change the scale, but sometimes such a change may upset carefully positioned text labels, so it's best to get it right, but all is not lost if you make a mistake and use the wrong scale.

3.2 Set the scale

Select the 2D view, right click on it and select **Properties**. Set the scale to 1:50

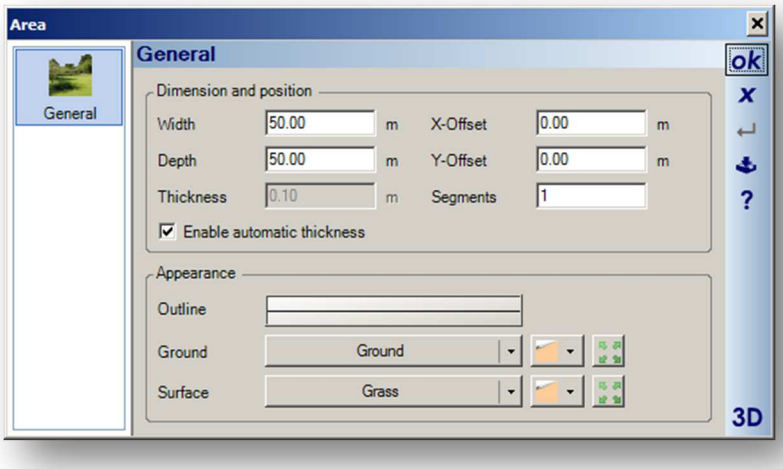


3.3 Change Environment Size

The environment is the green 3D slab in the 3D view and the 2D square in the 2D view.

Select the Environment entry in the Project tree, with a **Ctrl + left click** to make it the current selected item in the tree.

In the 2D view double click the 2D environment square to activate the Area properties dialog:



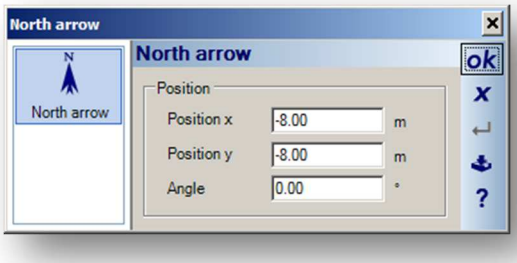
The default size of the environment slab is 50m x 50m. This can be changed at any time or doesn't even have to be changed, but we will change it to 20m x 20m.

With each window selected in turn, click on the **View-Zoom-Show all** to zoom into the full view for each window.

Project saved as tutorial1-2.cyp

3.4 Change Compass Orientation

In the 2D view window you can see the compass (bottom left of 2D view window). To change its orientation, select it and then double click it to activate the North arrow dialog:



Change the value in the **Angle** field to change its direction.

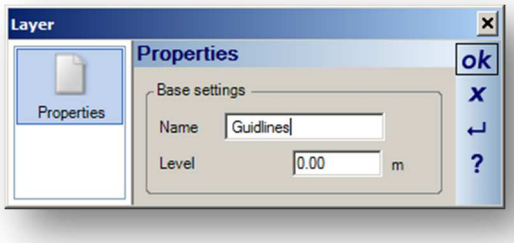
You can also change the position of the North Arrow compass within this dialog, or simply drag it to a new position. We will make no change and select **OK.**

3.5 Create a Guideline Layer

You can add guidelines to your project and using the **View-Visibility-Guidelines On / Off** tool, you can hide and show them as you wish. This tool is also present in the Quick Access toolbar. To introduce and demonstrate layers, we will create a new layer to keep our initial construction guidelines on. You may want to keep a set of guidelines separate to your actual project layer.

This is not essential and can be skipped.

We are going to create a new layer on our Ground floor. In the **Project tree** right click on Ground floor, and from the context menu select **New Layer**. The Layer dialog will activate:



Name the new layer as Guide lines (or any meaningful name). This new layer can now be selected like other elements within the tree.

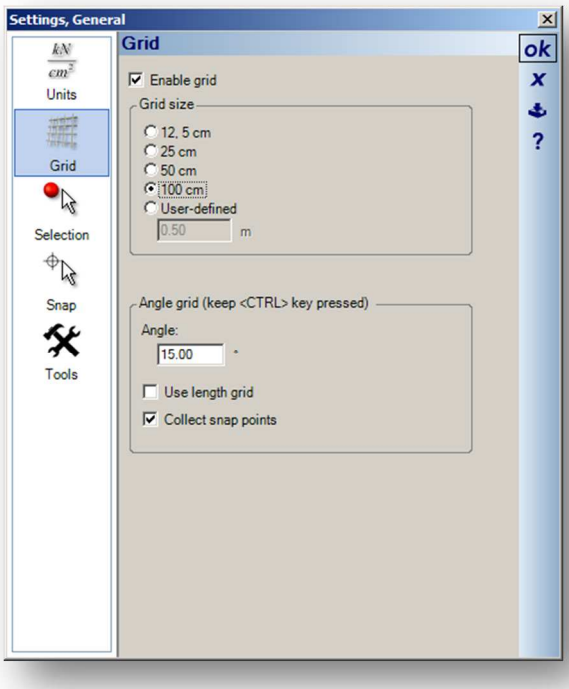
Now that this layer is our current active layer, anything that we add to our project will be associated with this layer. Elements are always added to the current selected layer or floor. For example in our

next step to add guide lines, if we did not create the layer, the guide lines would appear on the Floor Plan layer.

Placing construction elements on the wrong layer is a potential source of problems. So when placing any object, double check that you have the correct layer selected. So many users have complained that they cannot select something, only to find that they placed on a different layer.

3.6 The Grid

You can switch the grid on /off using the **View –Visibility-Grid on/off** tool icon. . This tool is also present in the Quick Access toolbar. If you right click on the grid tool, you will activate the **General settings** dialog. If you then select the Grid dialog tab, you can change the grid properties:



We will set our grid size to 100 cm to help us position our guide lines in the next step.

While this General setting dialog is active, take a quick note of the other dialog tabs:

Units: This is where you can change your measurement system.

Selection: Defines how and what elements are selectable

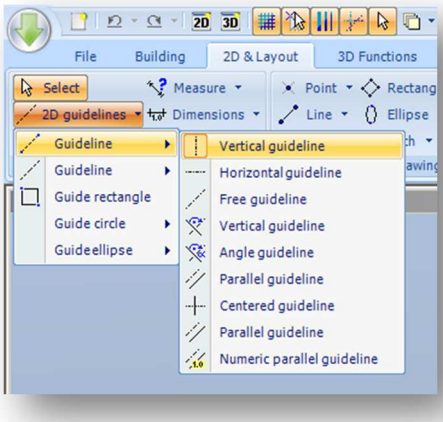
Snap: Defines how and what elements can be snapped to

Tools: You can disable specific tools

3.7 Add Guide Lines

It's possible just to draw your walls directly onto your floor plan, using just the grid to position the walls. There are also additional **Constructional support** tools to support the placement of walls and other elements.

However in this example we will use guidelines to precisely place our walls. We will first place the guidelines and then snap the walls to the guidelines.

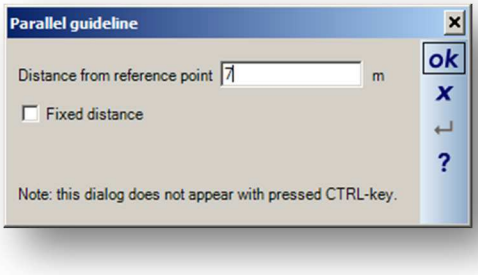


Select the **2D & Layout-General-2D Guidelines tool and** additional guide line tools will appear.

Place a vertical guideline on the origin marker.

These guidelines will represent the internal wall positions of our external walls, and our next guideline position.

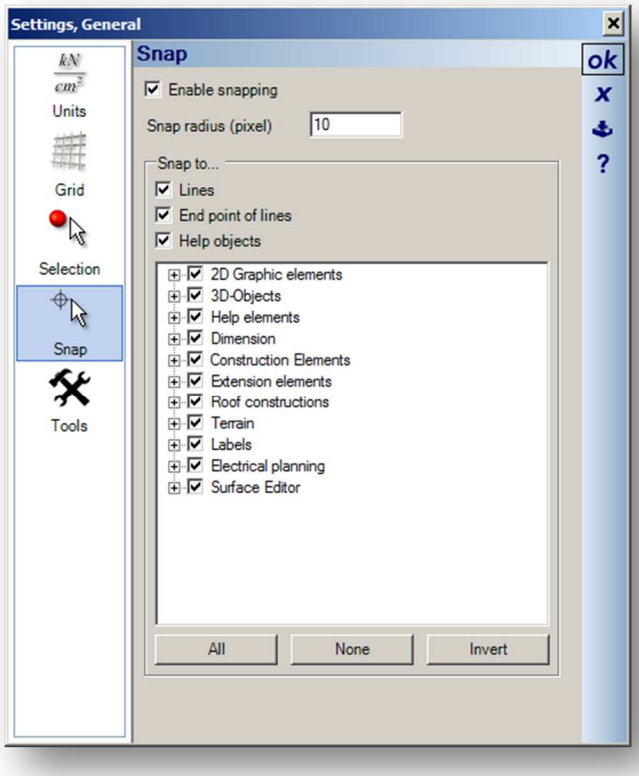
Select the Vertical guideline, and click 3.73m left of the origin marker. To place the guideline exactly 3.73m, using our first guideline as a reference, click on the Numeric guideline tool (bottom right in the above image). Then click on the reference guideline and click again anywhere to the right of the reference guideline, and the following dialog will activate:



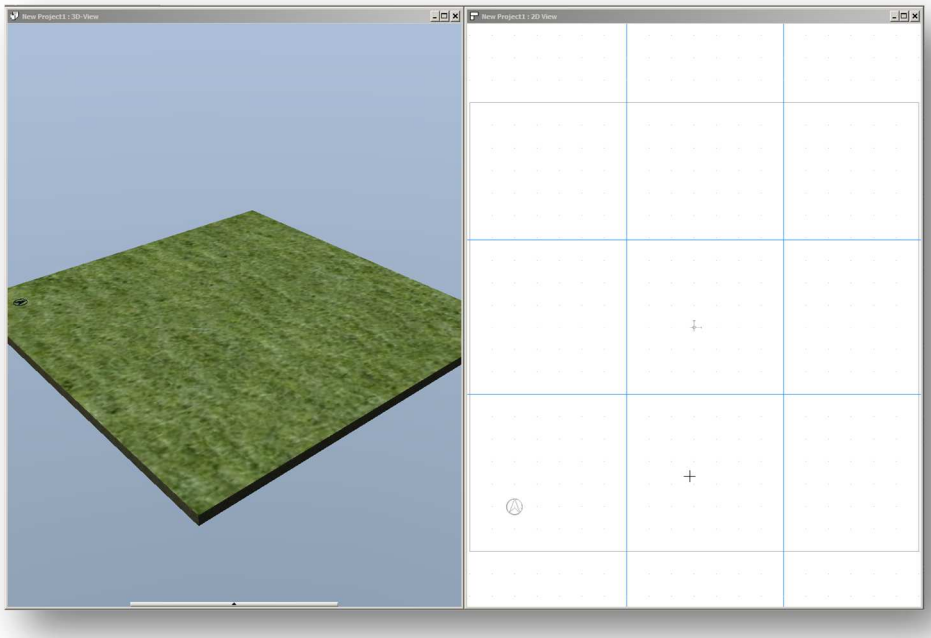
Enter the desired distance of 3.73m; press OK and the new guideline will appear.

Repeat for the horizontal guidelines, the first 2.91m below the origin and the second 2.91m above the first horizontal line using it as a reference point.

If this didn't work, please ensure that you have Snap enabled. To check, right click on the **View – Visibility-Grid on/off** tool , and select the Snap dialog tab. Check that **Enable snapping** is ticked.

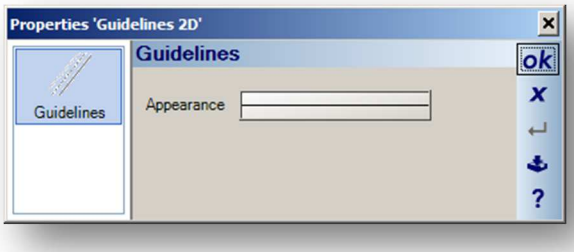


If successful, your project should look like this:



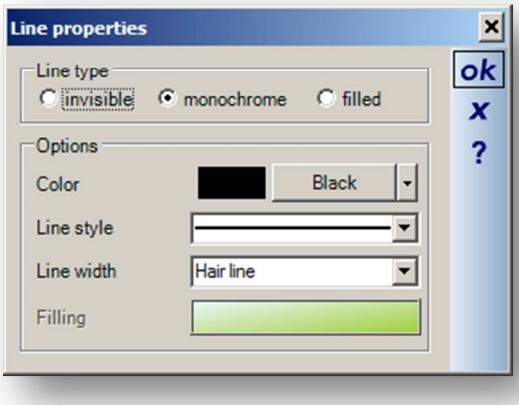
Project saved as tutorial1-3.cyp

3.7.1 Changing Guideline Style and Colour



You can change the guideline style and colour by right clicking on the Guideline tool (e.g Vertical guideline) to activate the Guideline properties dialog:

Click on the Appearance button to activate the Line properties dialog:

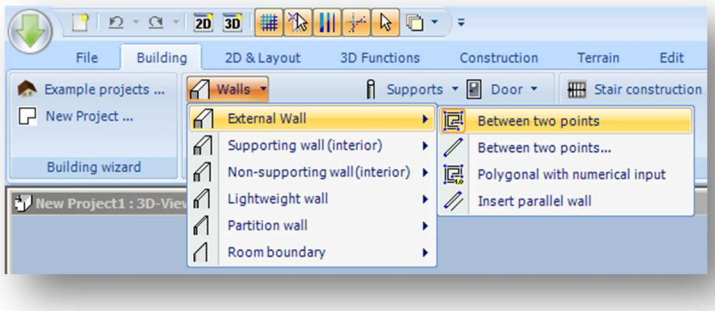


You can now change the style and colour of your guidelines.

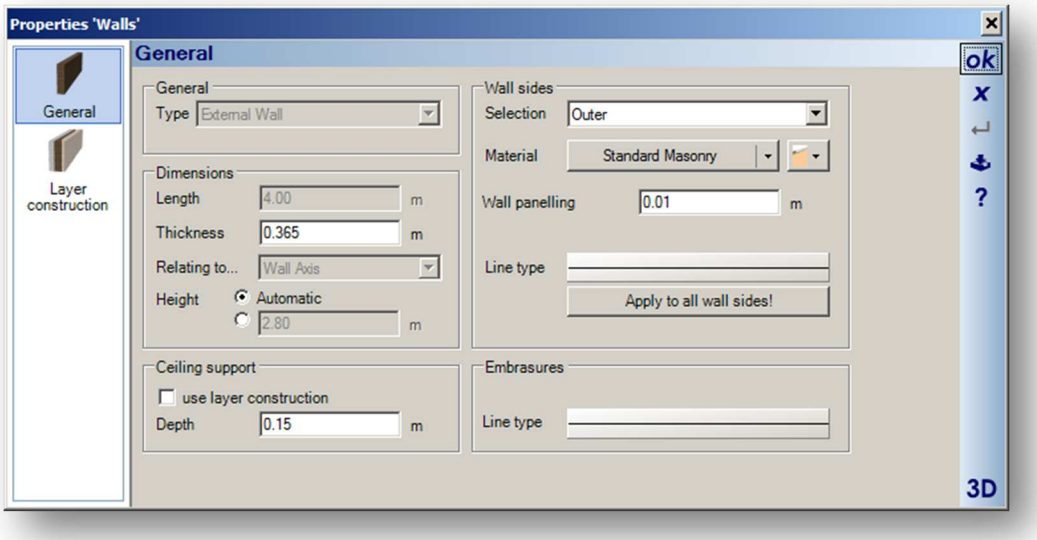
3.8 Placing Walls

Walls are selected from **Walls** tool located at **Building-Building Wizard-Walls.** Selecting this tool will display an additional 6 wall options. These are 6 different wall styles with different wall sizes and properties.

These wall tools also have a sub menu showing the different placement methods, which should be selected to indicate the wall to be placed.



If you right click on the **Building-Construction elements-Walls** tool, the Wall properties dialog is activated:



This dialog has a lot of detail and a lot more detail hidden away, making this a very powerful tool.

You can simply change the wall thickness and start entering your walls using that defined thickness. Change the thickness to 0.3m and then exit the dialog with **OK**

We will now place our 0.3m thick wall using our guidelines.

Left click on the **Building-Construction elements-Walls** tool to select the Wall tool, and then the placement method.

Note the status bar in the bottom left of the screen now gives you information concerning the tool you are using.

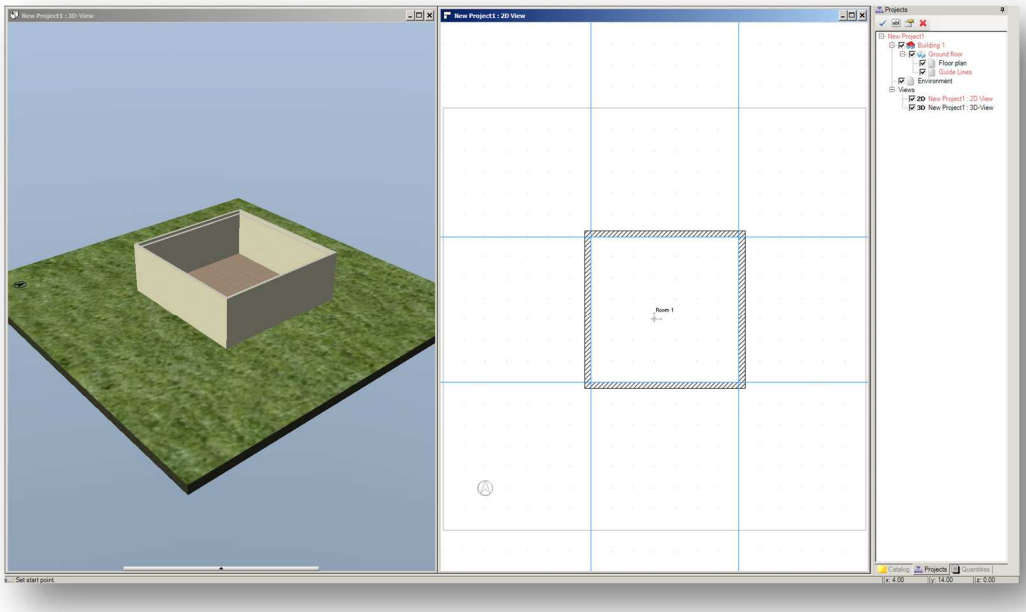
Note also that your mouse cursor has also changed indicating that the wall tool is active.

Click once on the top left guideline intersection, and move the mouse to the top right guideline intersection. A wall will follow the cursor, both in the 2D and 3D view.

Before you place the wall with a second mouse click, use the keyboard key combination **Ctrl + W** to define how the wall should snap to the guideline. There are 3 snap positions, that each **Ctrl + W** will rotate through: Centre line, inside wall edge and outside wall edge. Our guidelines are based on internal wall measurements so we will snap our wall to the inside edge.

Click on each guideline intersection until you have completed your 4 walls. After completing the 4th wall you can cancel the wall tool with the **Esc** key, or alternatively right click and from the context menu select **Cancel with Esc**.

Your project should now look as follows:

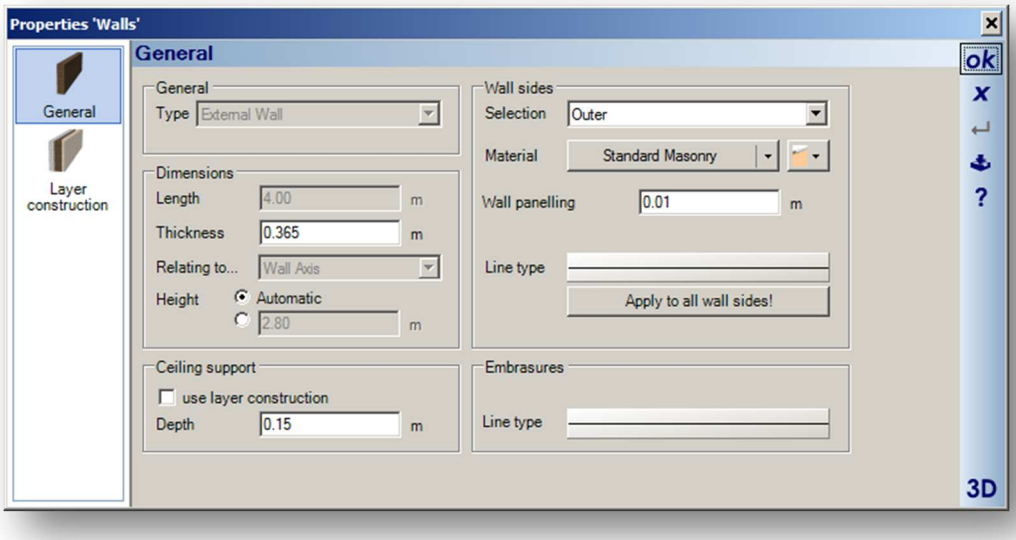


3.9 Changing the Wall Style

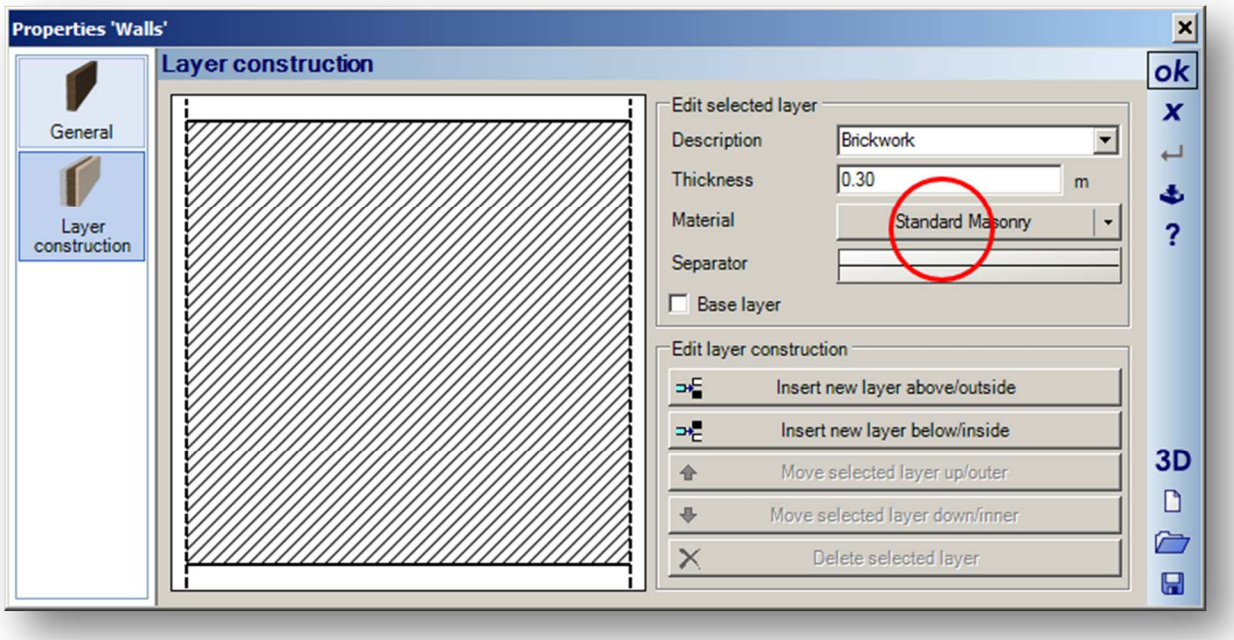
The default wall style is the hatch fill pattern.

If you prefer an alternative hatch or a solid colour proceed as follows:

Right click on the **Building-Construction elements-Walls** tool to activate the Wall properties dialog as before. Alternatively double click on any wall placed in your project.

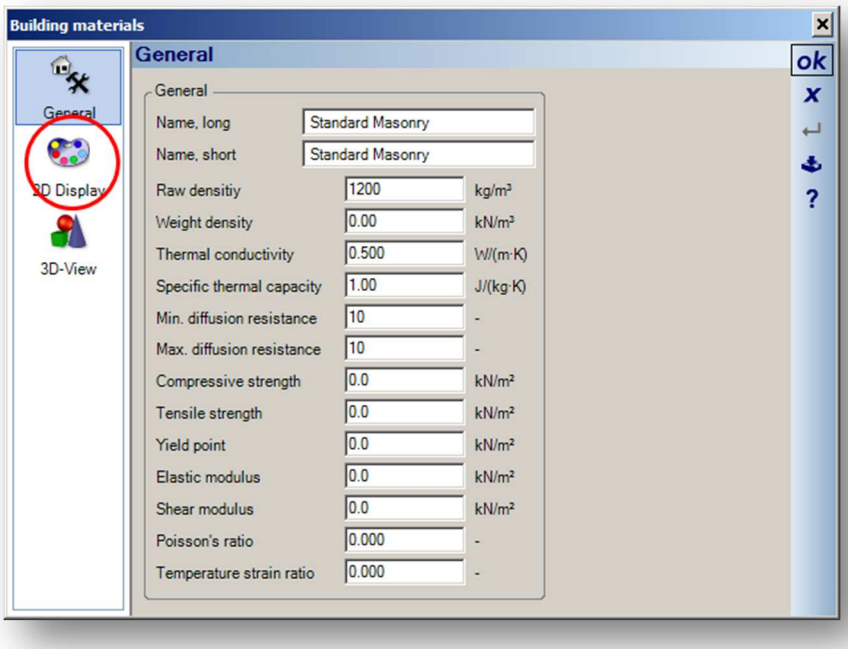


Now select the Layer construction tab which then displays as follows:

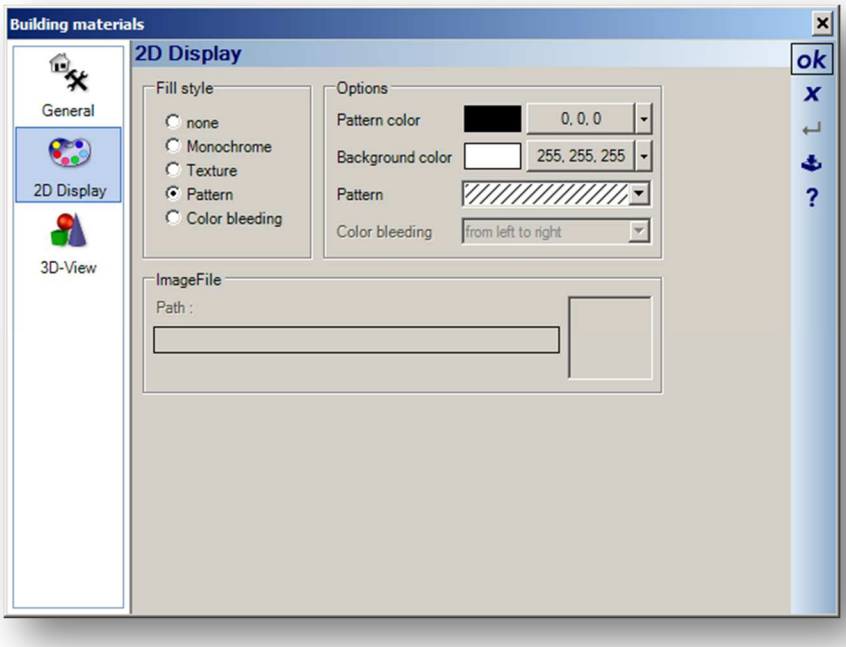


You will see the current hatched being selected.

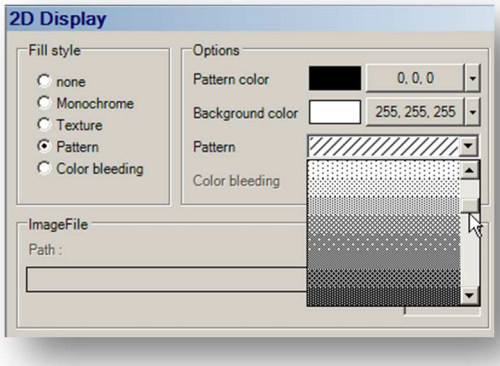
To change this to a solid colour, click on the Material button as indicated above. This will display the Building materials dialog:



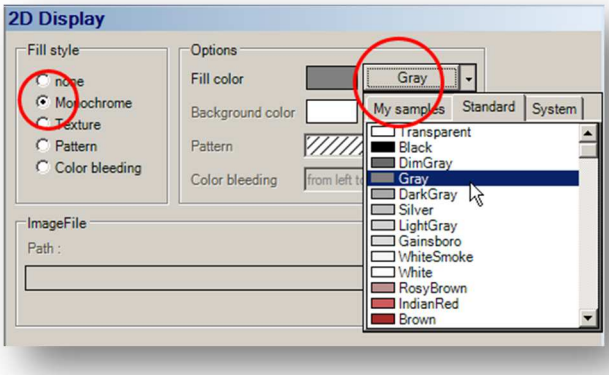
Ignore these advanced features and click on the 2D Display tab, which then displays as follows:



Different hatch styles can be selected from the drop down list:



Select **Monochrome** and then from the Fill colour drop down list choose a solid fill colour:



Select OK will accept your selection. Select OK again to exit the wall properties dialog.

Ok - That changes the wall style of a new wall, but how to change the style of a wall already placed? In either the 2D or 3D view, select the wall to be edited and then double click on it. This will activate the wall properties dialog as above.

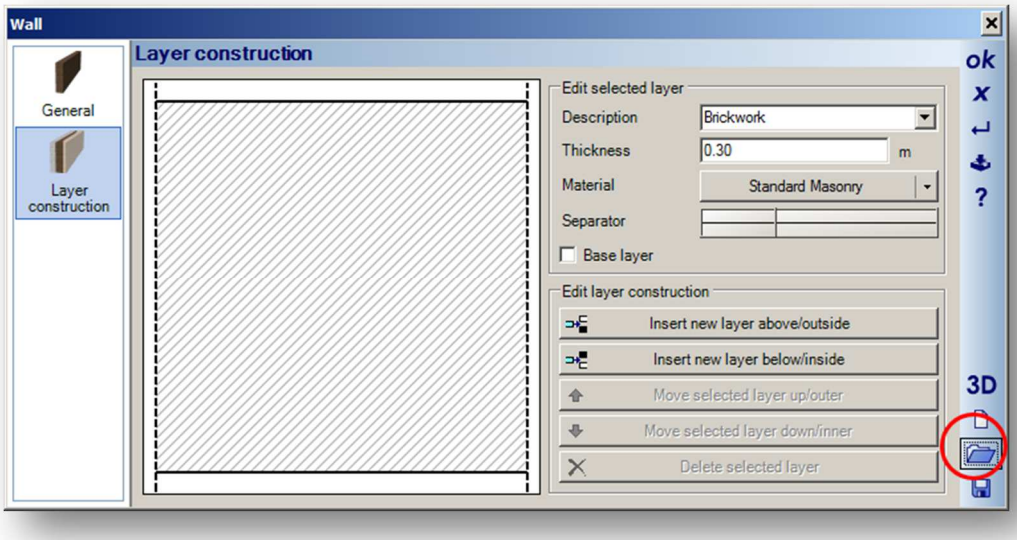
A few examples of different wall styles that can be easily created:

Our project however is required to show cavity walls…

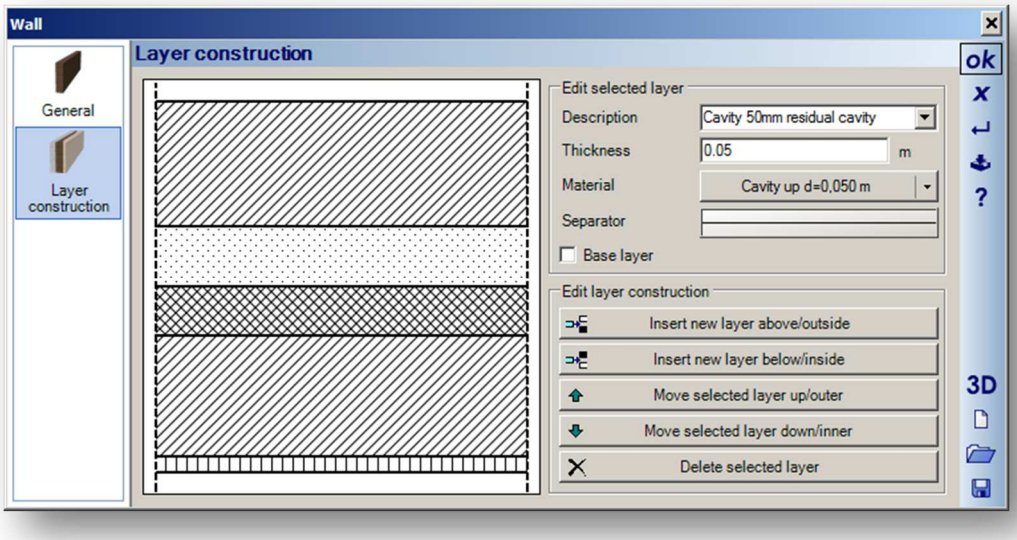
3.10 Creating Cavity Walls

If you don't need to show cavity walls within your project, you can skip this section.

To create a new or load an existing cavity wall design, return to the Layer construction dialog. That's achieved by right clicking on the **Building-Construction elements-Walls** tool to activate the Wall properties dialog as before, and then selecting the Layer construction tab:



Wall designs can be saved as templates. To load a previously created cavity wall click on the Open template icon (indicated above).



The above loaded template shows a 100mm facing brick, 50 mm cavity, 40 mm insulation, 100 mm lightweight block and then 13 mm plaster. The total of these wall components provides a wall thickness of 300mm.My project requires a 390 mm solid wall (built 1750), a cavity wall 10 mm render, 100 mm brick, 50 mm air gap, 100 mm brick and 10 mm plaster.

The wall that we require in the first building is a solid wall 370 mm thick with 20 mm of rendering on the outside. There is no rendering or plaster on the inside.

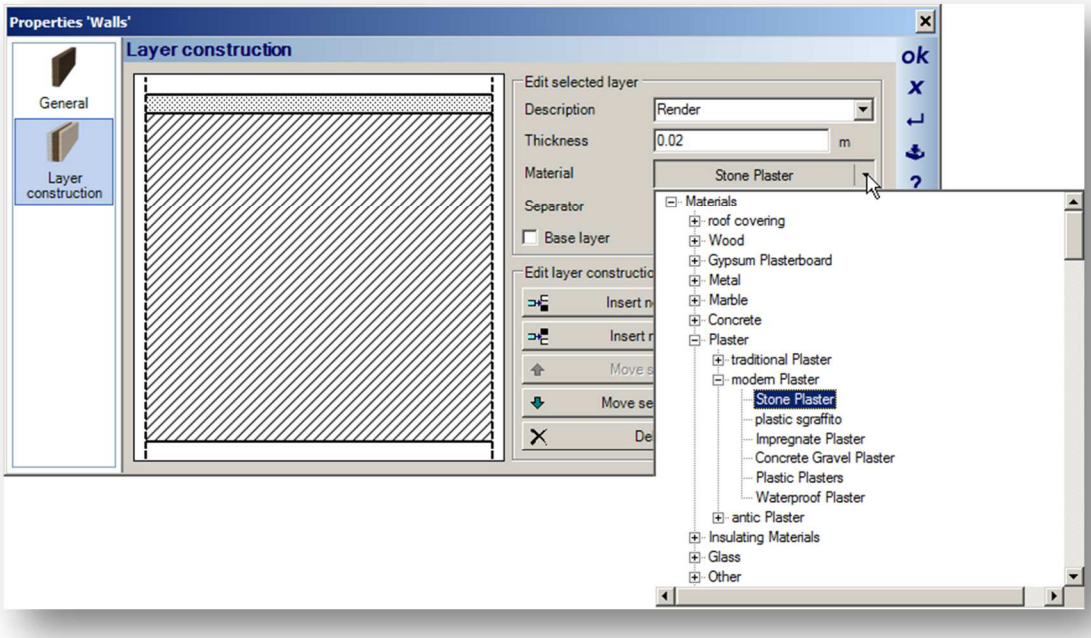
Clear all existing layers, by clicking on each layer in the display in the dialog and press **Delete selected layer**, until all but one layer are deleted. Alternatively you can click on the **New Template** icon in the bottom right of the dialog.

You now name the only visible layer as **Solid fill** and set its thickness to 0.37m. Now to create the external render, click on the **Insert new layer outside** button, and name the new layer Render and set its thickness to 0.02m.

You can also change the 2D hatch / fill patterns for each layer by clicking on the Material button, and then select the 2D Display tab.

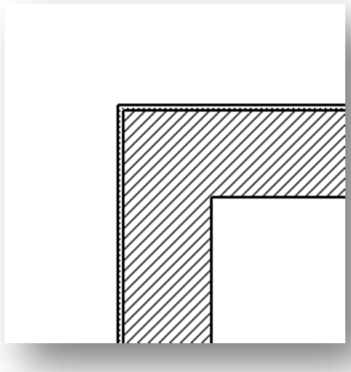
Or

You can select from the list of materials, where each material type has its own fill style defined.



Now save your template using the **Save template** button in the bottom right of the dialog. You can view and load previous templates using the adjacent **Open template.** If you find that you cannot save any files, please refer to section 1.9 at the start of this document.

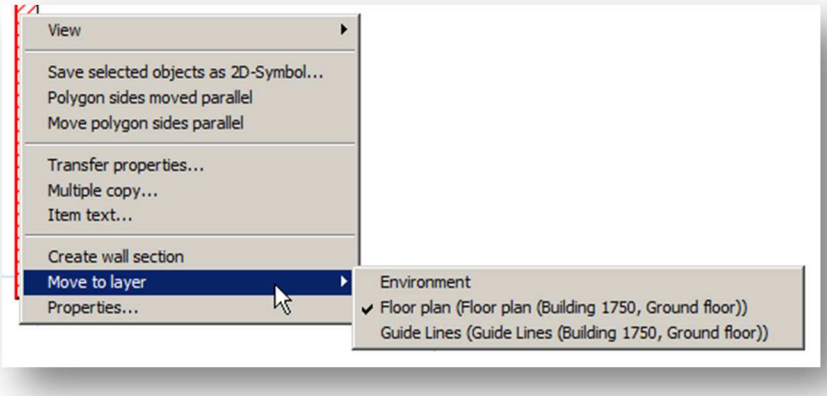
If you want to save the current wall template as the default wall style for this wall type, then click on the **Save as default** button located 4th down top right of the dialog.



We will now delete our 4 walls in our 2D Plan, by selecting each wall and pressing the Delete key. We will do this so that we can draw our walls using our new wall template that we just created.

Now redraw the four walls as before. If you zoom into the wall, you will see we now have our solid fill wall with render. Remember to be sure that the walls are drawn on the **Ground Floor – Floor plan layer**, by ensuring that this is the current selected layer in the Project tree.

If you accidently draw a wall or any element on a wrong layer, e.g the Guide line layer, you can move the element by right clicking on it, and from the context menu, select **Move to layer:**



None of this changes how the wall appears in the 3D view, that's for another time.

3.11 Renaming the Building

We will now rename this **Building 1** to **Building 1750.** To so just double click on the Building 1 entry in the project tree, and in the activated dialog enter the new name **Building 1750**

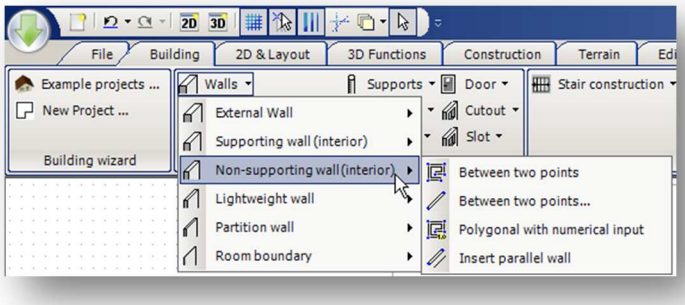
You can change the name of any project tree entry in a similar way.

Project saved as tutorial1-4.cyp

3.12 Adding internal Walls

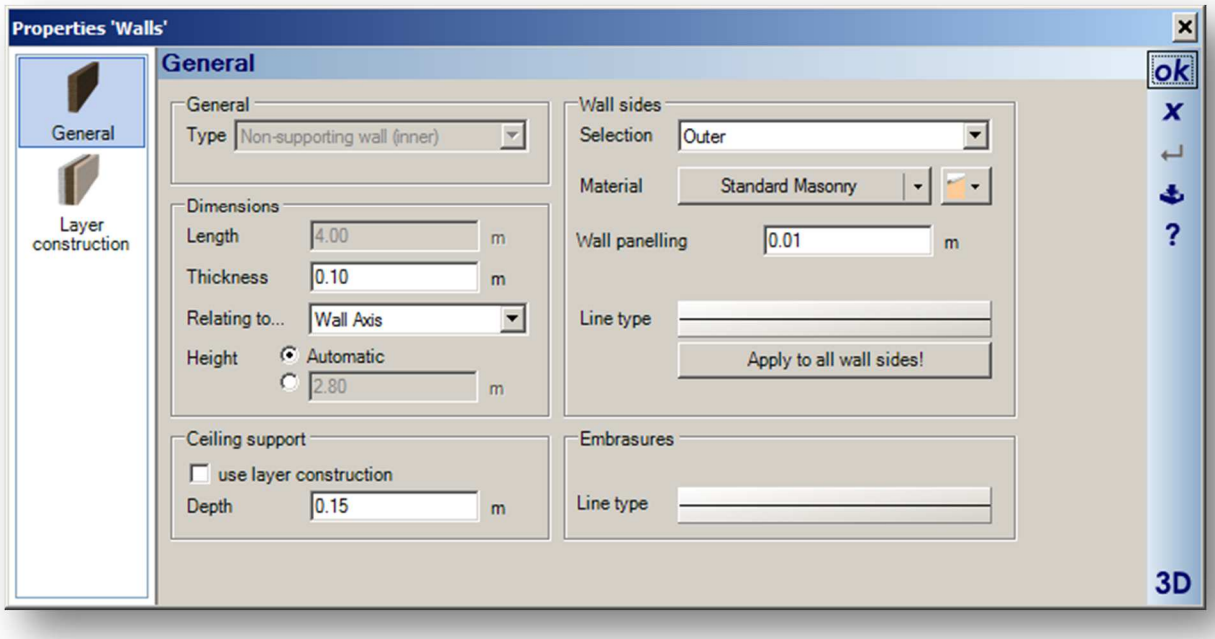
We will now add some internal walls to our Building 1750

We will select another wall type for our internal wall, using the **Non supporting wall (interior):**



Click on this wall type, and then the placement method.

Right click on this and you will display the familiar Wall Properties dialog, where you can set the new wall thickness to 0.10 m:

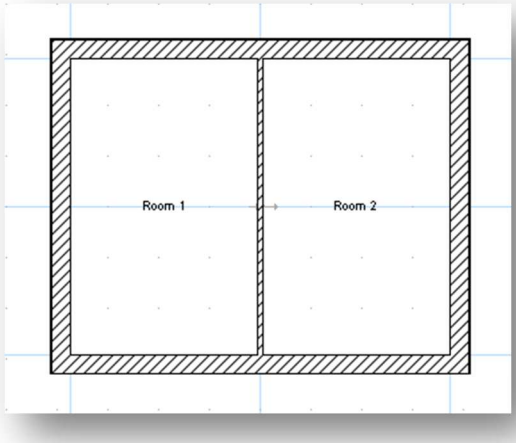


Click on the **Save as default** button in this dialog so that this becomes the default wall size for this wall type.

We will place our first internal wall along the centre guideline. This is in fact a party wall between the two properties forming the semi-detached cottage. To place the wall select the Non supporting wall tool, and then click in the 2D View at the point where the guideline crosses the north horizontal wall. The second click should be where the guideline crosses the south horizontal wall.

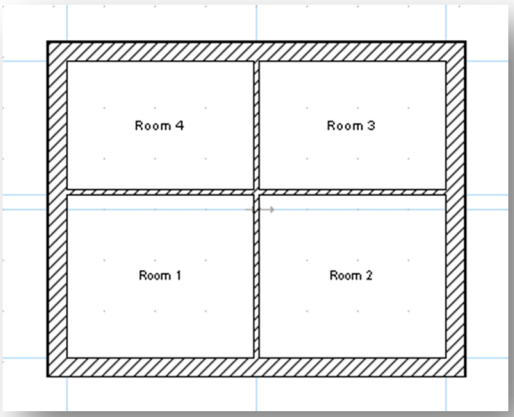
The wall should be snapped to the centre line of the wall, so there is no need to use Ctrl + W

After the second click press Esc to end the wall tool function.



As soon as the wall is placed you will note that 2 rooms have been created named Room 1 and Room 2. This confirms that you have a good wall connection, as the room will only be created if wall connections are good.

We have used internal wall measurements to create our plan, and so we will now place our internal horizontal wall 3.2m from our south wall's internal edge. Use the Numerical parallel guideline tool again, using either the wall edge or the lower horizontal guideline as your reference point.

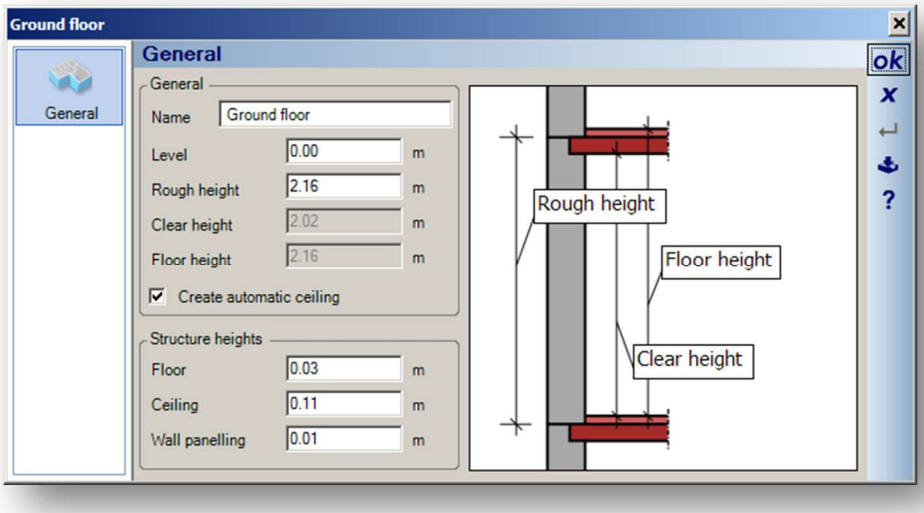


When you have created your new guideline, you can draw your internal wall along it however this time snap to the lower edge of the wall.

Again, notice how the room names are created.

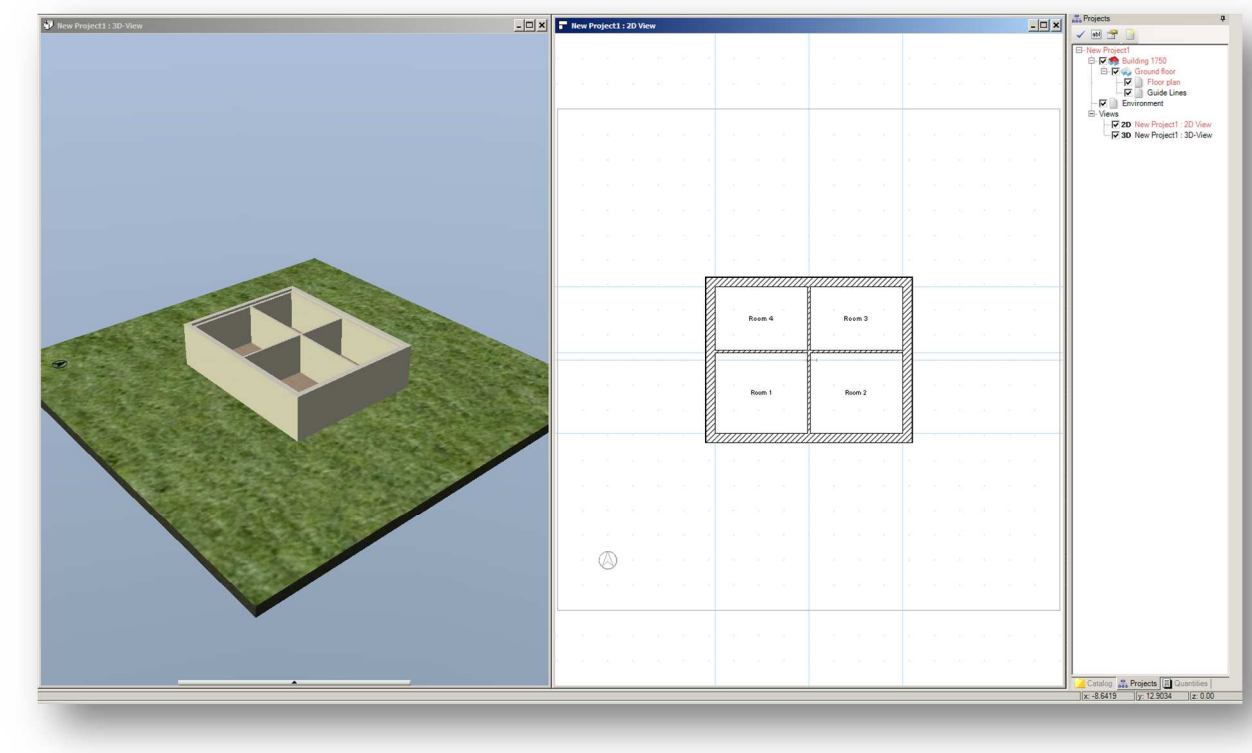
3.13 Setting the Wall height

We have not yet defined the floor ceiling height for the rooms in this building. This is achieved by either by double clicking on the **Ground floor** entry in the **Project tree,** or by right clicking on the Ground floor entry and selecting **Properties** from the context menu. This will activate the Ground floor properties dialog:



Our measured floor to ceiling Clear height is 2.02m. Our Rough height is 2.14 m. The diagram in the dialog helps explain these measurements. Entering these values you will notice the walls will become shorter in the 3D view, but there is no change in the 2D plan view.

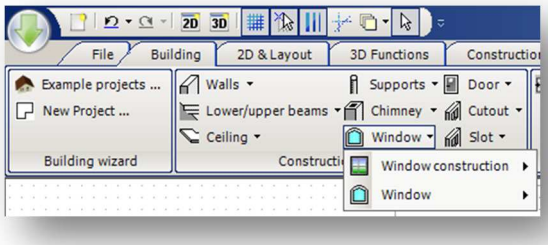
Project saved as tutorial1-5.cyp



3.14 Adding Windows

At this point we will add some windows. There is quite an extensive set of windows, which you can edit and resize. If you have **Visual Building Premium** version you will also have access to the Window Construction tool allowing you to create completely new window designs.

We will use the Window construction tool later, but for now we will edit and resize windows from our standard window catalogue.

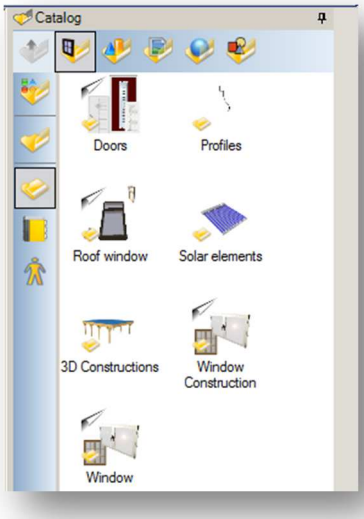


There are in fact two window catalogues. The catalogue called **Window** is based on objects. These can be resized to a certain extent.

The newer form of window is contained within the **Window construction** catalogue. These objects are created using the previously mentioned Window construction tool. These window types are more versatile and more editable and where ever you have a choice, you should use this window type.

There are two ways to access both of these window types, either via the catalogue or via the tools in the Ribbon bar.

3.14.1 Selecting windows via the catalogue

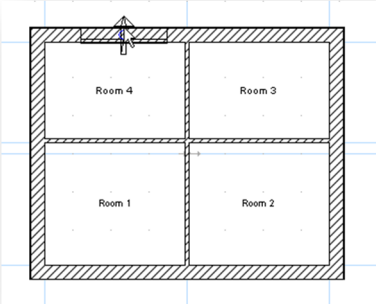


From the catalogue tab select **Construction elements.**

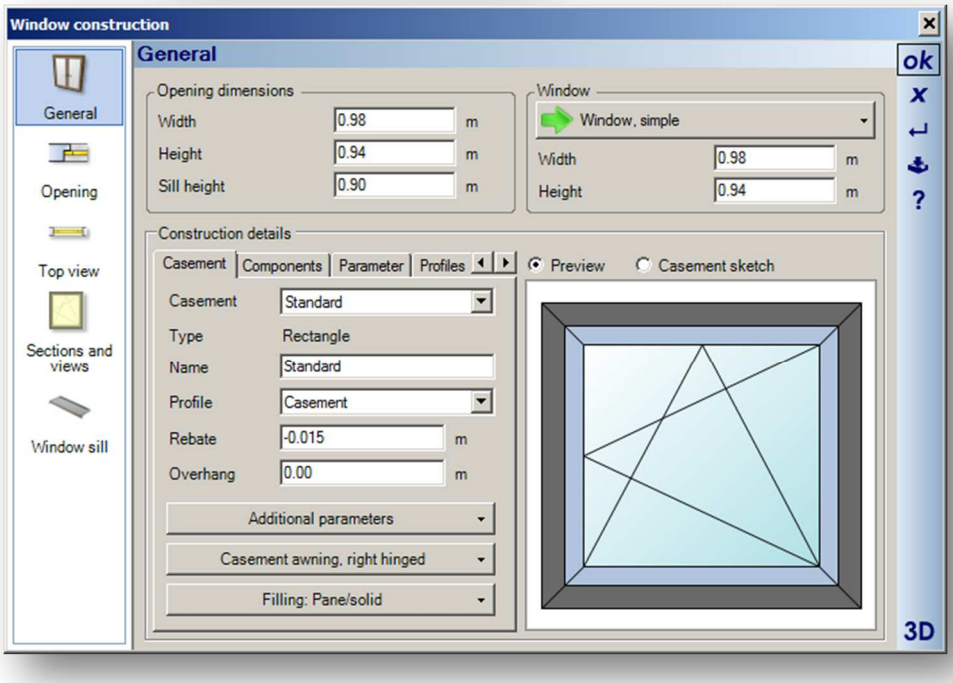
You will find both windows types each have their own catalogue entry

Select any window in either of these catalogues and drag into its position in either the 2D or 3D view. You should drag it onto a wall.

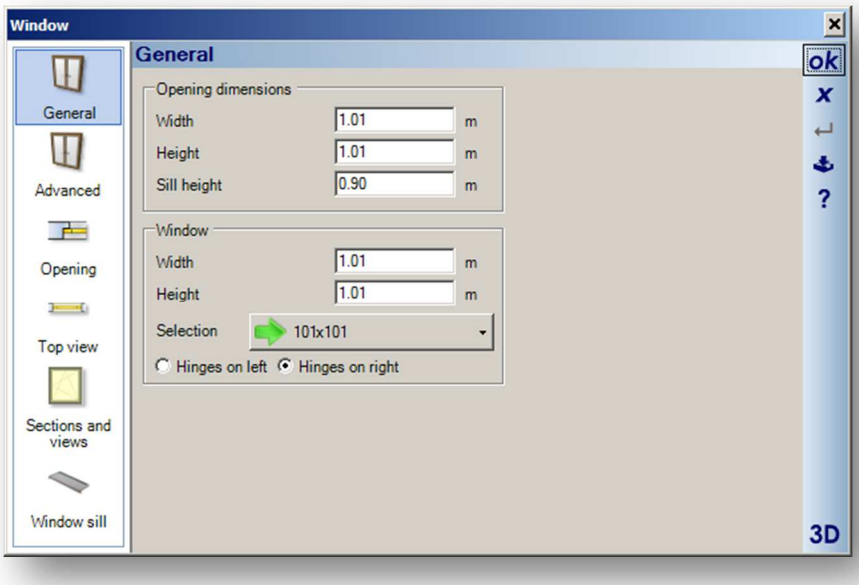
When the window arrow appear. This the window. You the mouse cursor When correctly window will be the window's



is in a valid position you will see an indicates the opening direction of can adjust this direction, by moving closer to either edge of the wall. position do a left click, and the placed. Once placed, you can edit dimensions, by double clicking the



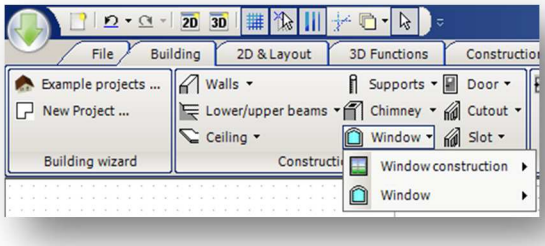
window to activate the Windows's dialog, which differs depending upon the window type that you selected.



For now, we will concern ourselves only with setting the width and height of the window. We will set our window width to 0.98m x 0.94m.

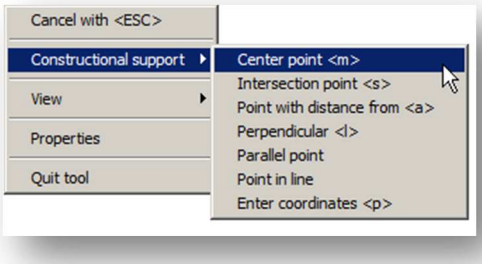
3.14.2 Selecting windows via the toolbar

Alternatively and preferably, you can select windows using the window tools in the ribbon bar. Right click on the **Building-Constructional elements-Window** tool in the toolbar and the Window properties dialog will appear. As before you can resize the window, but now you can placed the window multiple times, just by clicking on the wall.



3.14.3 Window Placement tools

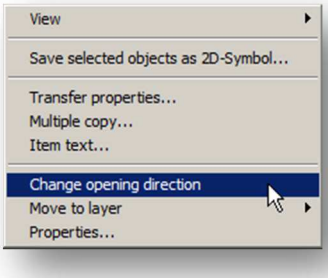
There are **Constructional support** tools available to allow you to place a window exactly. After selecting the window, move the window into its approximate position in the wall, but instead of a left click, make a right click to activate the context menu.



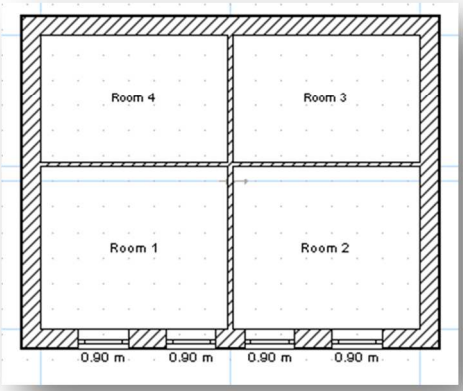
You can now select several tools allow you to place the window midway between two points, or a specific distance from a point. Note the latter is measured from the midpoint of the window.

After placing the windows, you can now select each window and move it to a new position. If you find the window is snapping to something, then switch of the grid.

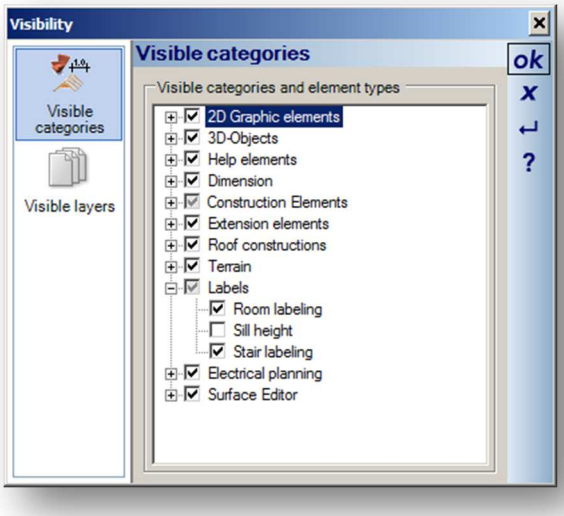
There are many other options concerning windows, and we will return to these later.



If you place a window facing the wrong way, you can easily correct this by selecting the window, and then activating the context menu with a right click and selecting **Change opening direction.**



You will also notice a number (0.90m) by each window. This is the sill height for that window, as specified in the Window properties dialog.

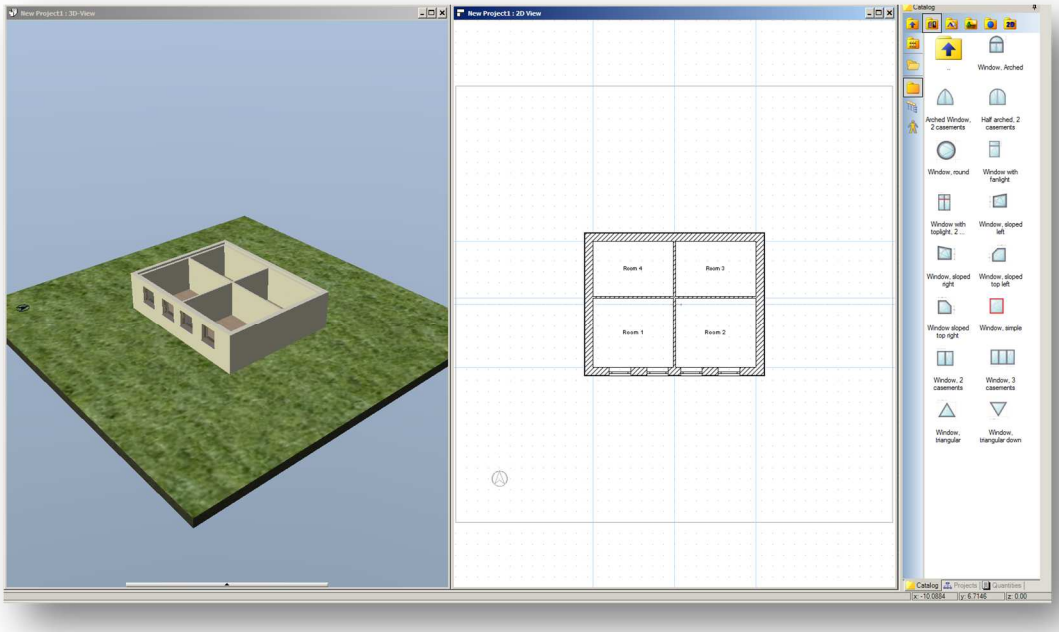


You can hide this measurement by the following:

Right click on 2D View window, and from the context menu select **Visibility**, and the Visibility dialog will display.

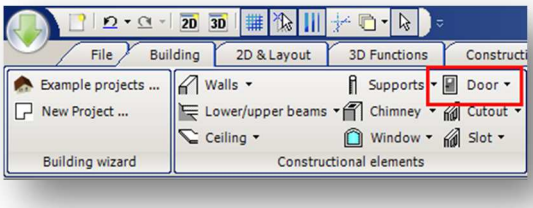
Scroll down the tree to Labels and deselect **Sill height**, and you will see it no more.

Project saved as tutorial1-6.cyp



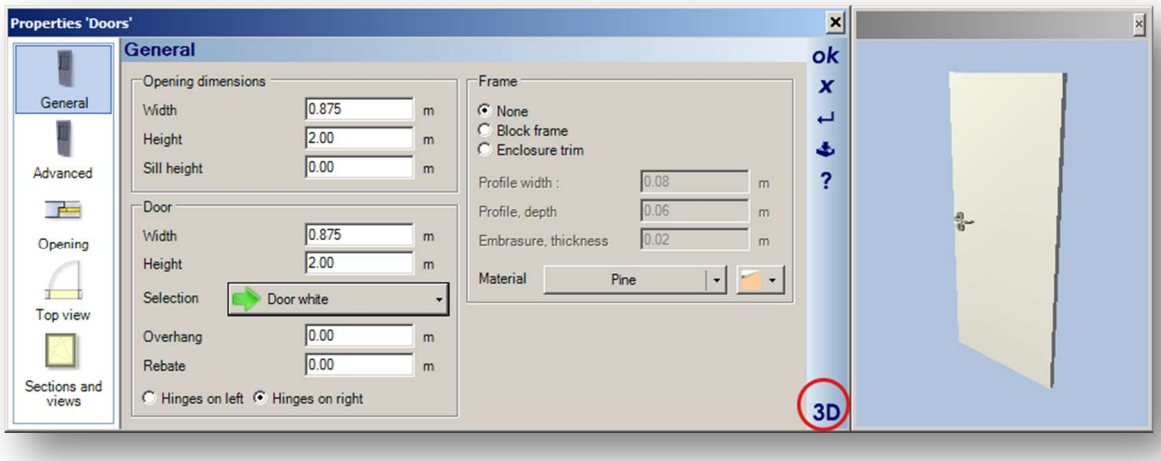
3.15 Adding Doors

Placing doors is very similar to placing windows. The Door tool is also located in the same tab and group as the window tool. You select a door from the catalogue and click on the wall.



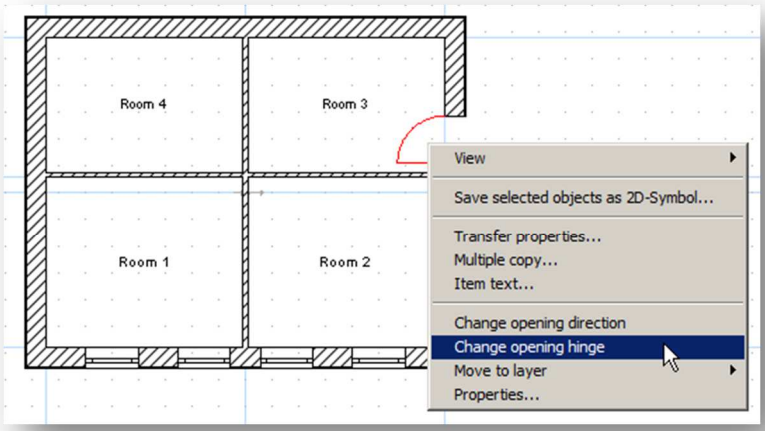
Right click on **the Building-Constructional elements-Door** tool to activate the Door Properties dialog.

Select a door from the drop down list provided by the **Selection** button. If you



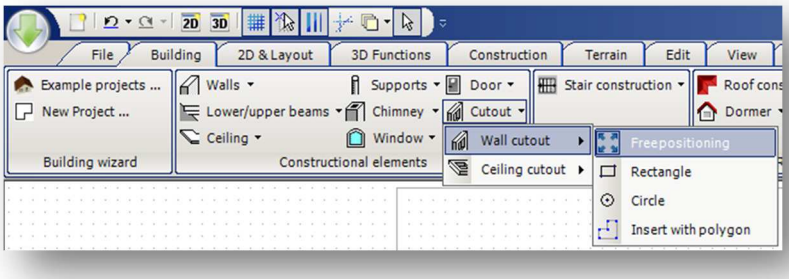
click on the **3D** button an additional window opens allowing you to inspect the door as a 3D object. You can also set the width and height of the door before placing it.

After placing the door, the opening direction, and hinge side are indicated with an arc of the door swing. If you wish to change either the opening direction or hinge side, the right click on the door and from the activated context menu select **Change opening hinge** or **Change opening direction**

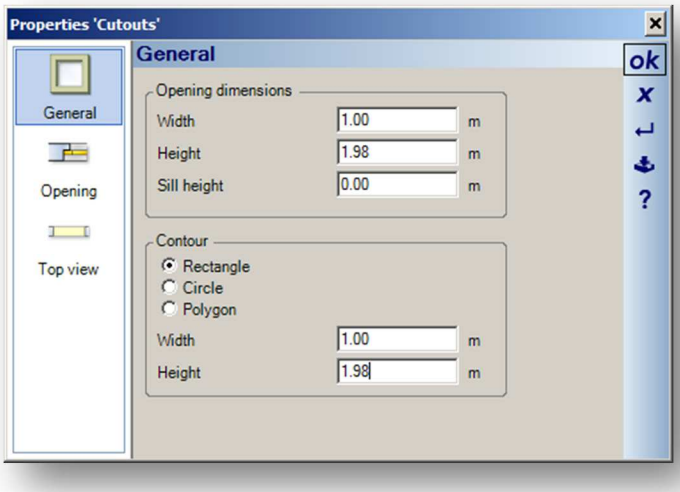


3.16 Adding a wall cut-out

Where you have a situation where you need to cut out a section of a wall, or add a doorway that has no door, you can use the **Building-Constructional elements-Wall cut-out** tool**.**



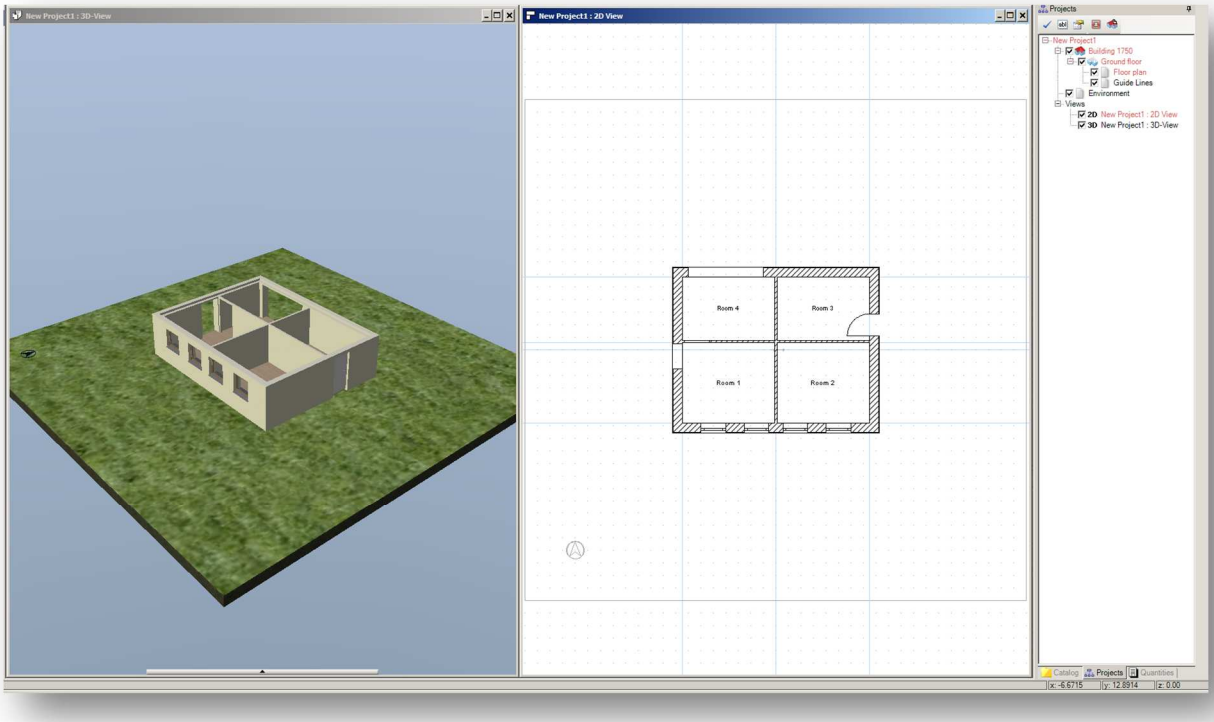
Clicking on wall cut-out tool and then the **Free positioning** tool, will allow you to place the cut out in the same manner as a door or window.



If you right click on the cut-out tool you will activate the Cut-out properties dialog, where you can set the width and height.

You should also note that if a wall cut-out is to be used as a door, then you should set the sill height to 0m.

You can also double click on a placed wall-cut to activate the wall-cut-out properties dialog.

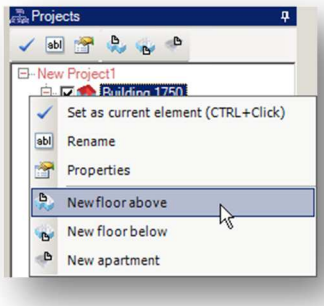


Project saved as tutorial1-7.cyp

3.17 Creating another floor

Everything that we have created so far has been on the Ground floor. We will now create a second floor, using the ground floor as our template. We will copy the wall layout and dimensions and the windows, but not the doors.

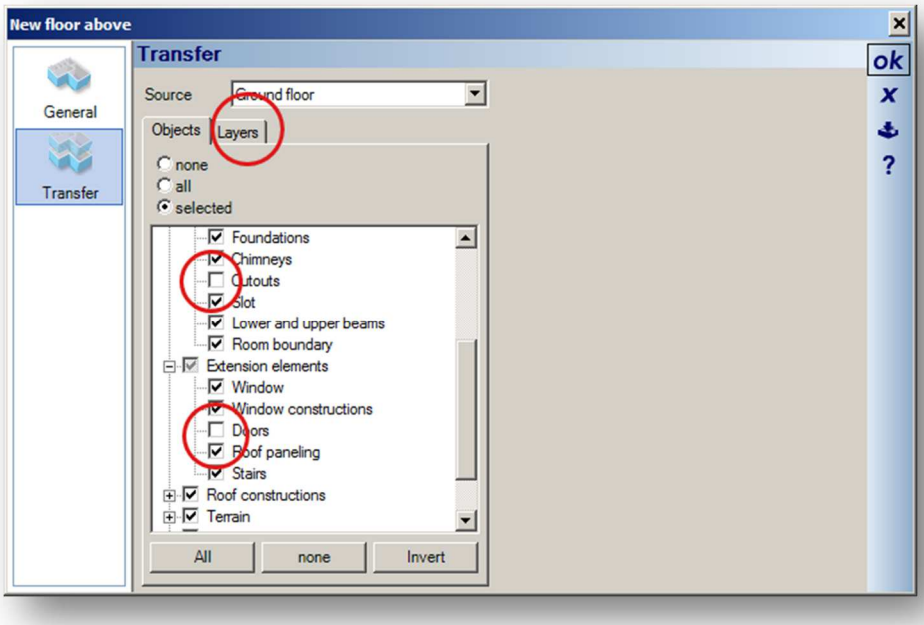
On the Project tree ensure that the current selected layer is **Ground floor – Floor plan** with a **Ctrl + left click** on it.



Now right click on **Building 1750** to activate the context menu, and select **New Floor above**

The **New Floor properties** dialog is activated. This is similar to the dialog that we activated when we wanted to change the floor height in section 3.13. It has an additional tab named **Transfer.**

We will assume (for now) that the floor height is the same as the ground floor and so will not change any of the height values. Click on the **Transfer** button that shows the dialog tab that allows us to choose what ground floor elements we want to copy to the new floor.

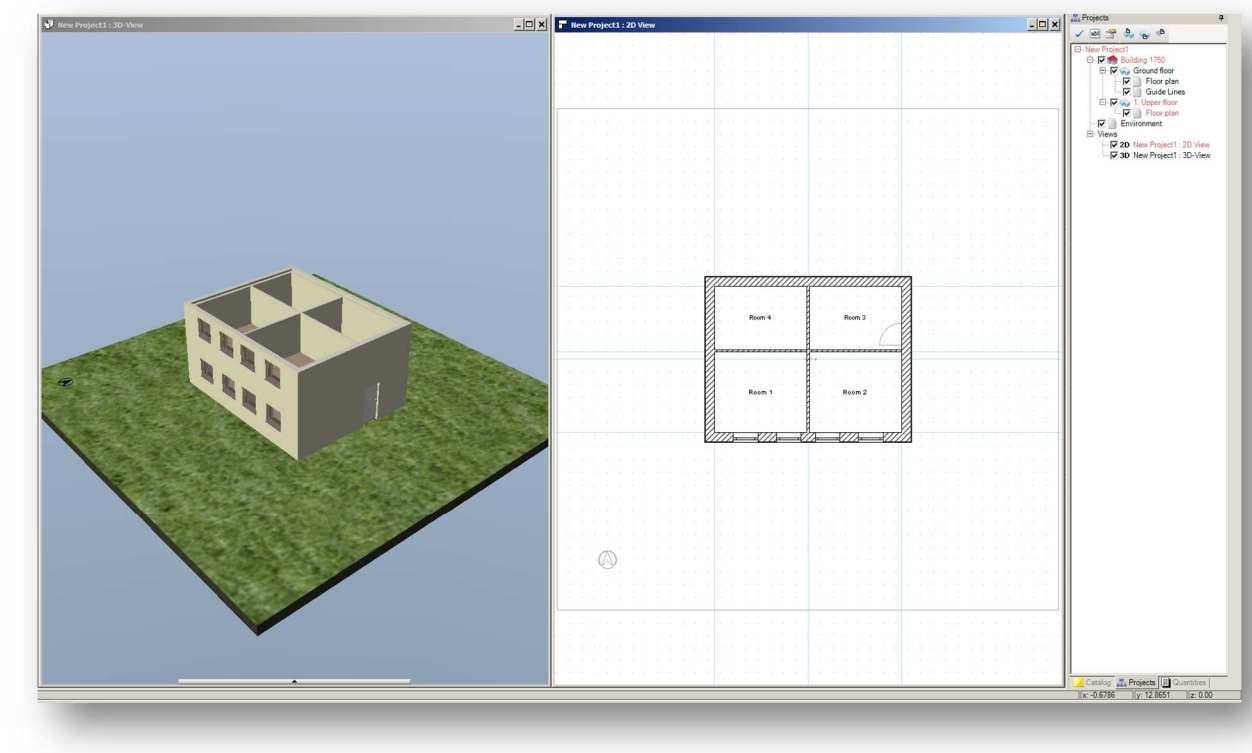


Locate within the tree **Cut-outs** and **Doors** and deselect them, as we do not wish to transfer them to the new floor. Leave **Windows** selected.

Click on the **Layers** tab and deselect **Guide Lines** as we do not need another set of guide lines. Click on OK and a new floor is created named **Upper floor.** A new floor entry appears in the project tree and the 3D view is updated to show the new upper floor. The 2D Plan view is also updated, but this is not so obvious at the moment.

Note that only the windows have been copied from the ground floor to the upper floor.

Project saved as tutorial1-7.cyp

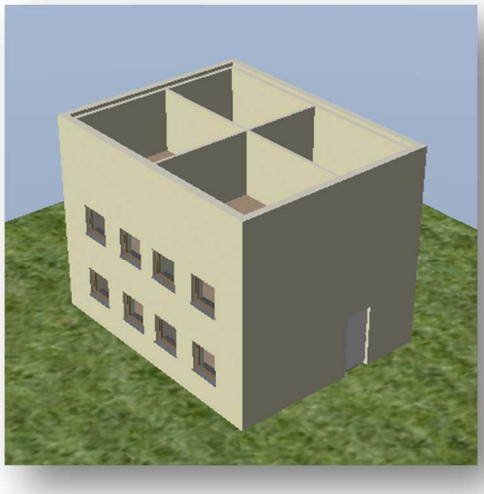


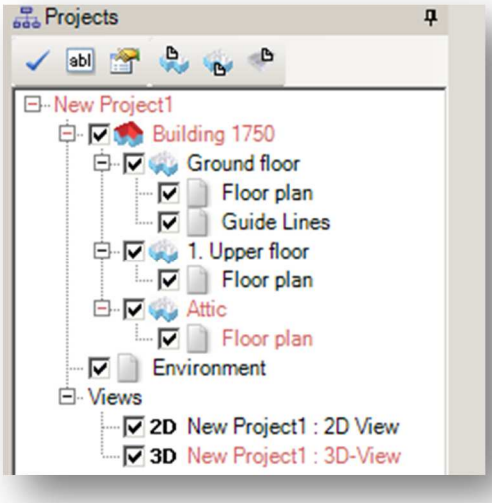
3.18 Creating the Attic

First you must consider if you want to create another floor. If your attic has a floor or any walls, then yes, you should create a new floor for the attic, and eventually place the roof on the attic. This scenario will be the case for most situations. However if your attic has no walls, including gable walls, then you can place your roof directly on the upper floor and adjust its height accordingly.

In our case our attic does have its own floor and the roof also has gable ends. So we will create a new floor to be our attic.

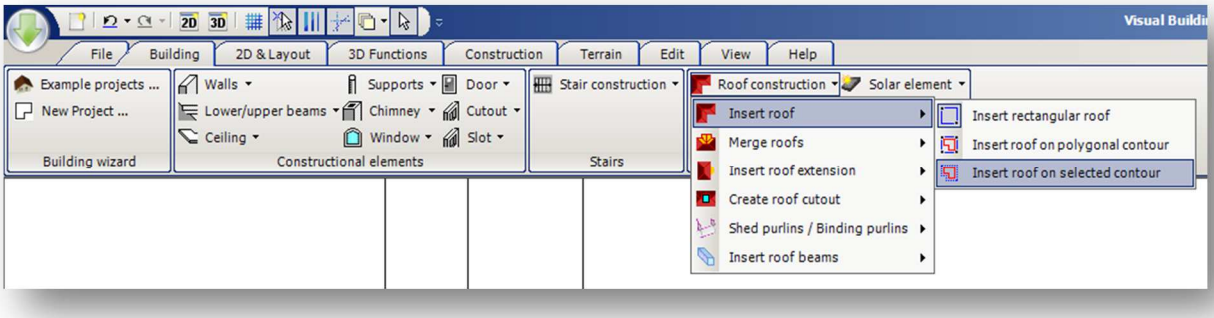
Creating the attic is almost identical to the last section, except this time we will not transfer any doors or windows. So repeat section 3.17, but this time do not transfer any windows. You can also name the new floor Attic.





3.19 Adding a roof

With the 2D view selected, ensure that the Attic is the current selected floor.

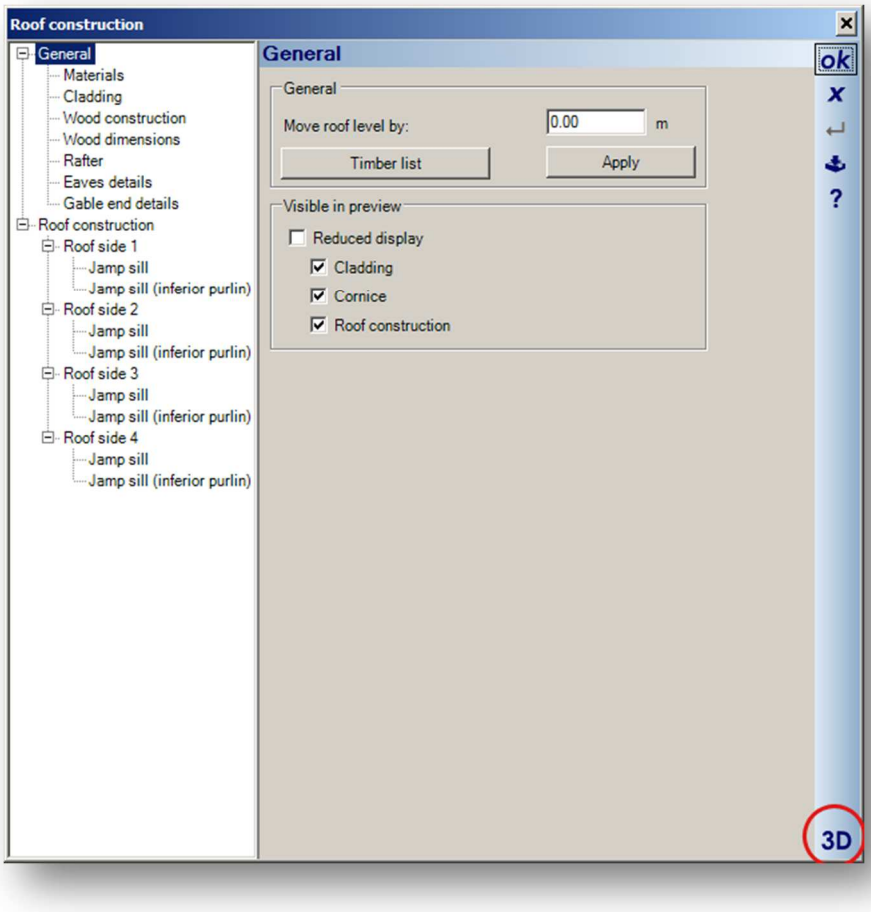


Click on the **Building-Roof and Dormers-Roof Construction-Insert Roof** tool and 3 additional roof tools will appear, allowing different methods of inserting a roof.

Select the **Insert Roof on Contour** tool.

Then in the 2D plan view, click anywhere on the wall contour.

The Roof construction dialog will activate.



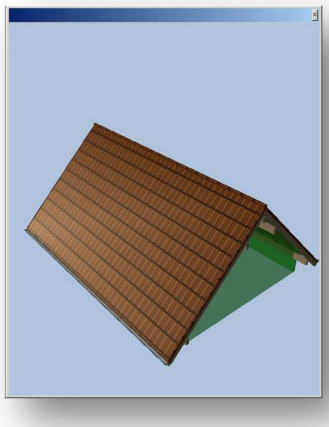
Click on the 3D button and a 3D view of the roof construction will appear in its own window.

All elements of the roof can be selected via the dialog tree, for example selecting Roof side 4 in the tree; will select that specific roof side in the 3D view. Similarly clicking on a roof side in the 3D view will select an entry in the tree.

You can rotate the 3D model roof, by selecting it and dragging the model with the mouse, thus allowing you to examine all elements.

We will now assign a Gable end to Roof side 4. Select **Roof side 4**, and from the **Roof profile** drop down list select **Gable.**

Select Roof side 2, and apply a Gable to that also.



The result shows a roof with a gable end at each end.

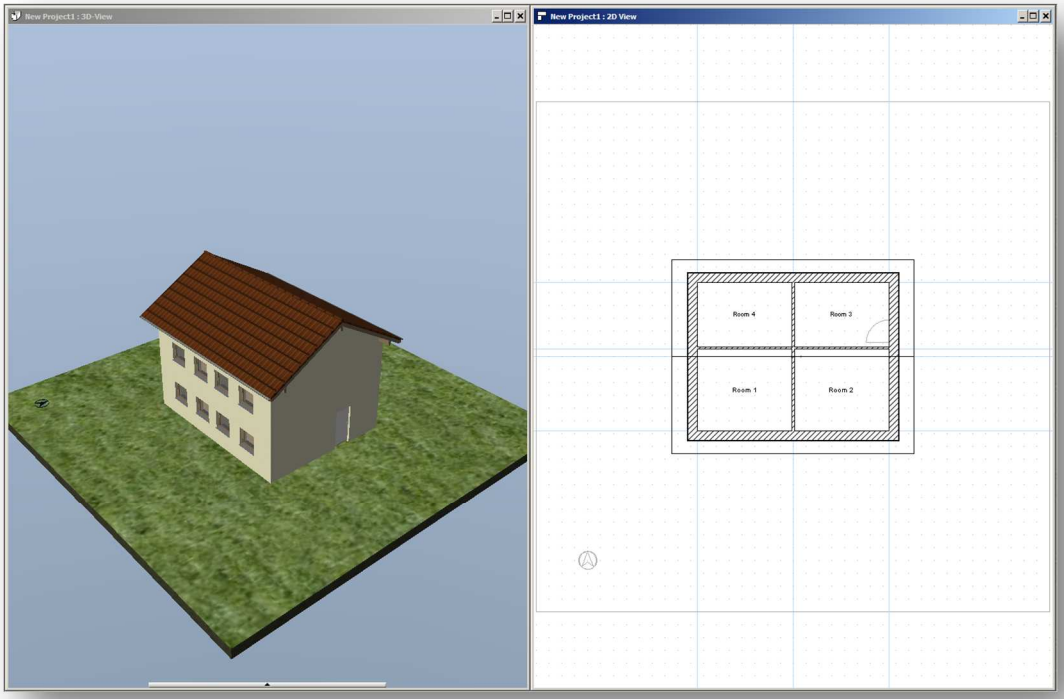
Select Roof Side 3 and in the Roof construction dialog set the Pitch to 30 degrees, and press the Tab key to accept the change.

Select Roof Side 1 and in the Roof construction dialog set the Pitch to 30 degrees, and press the Tab key to accept the change.

Each time you edit an element in the dialog, the 3D roof model is updated

Select OK on the dialog and the roof is applied both to the main 3D view and the 2D plan view.

Project saved as tutorial1-8.cyp



3.20 Remove Gap in the Attic Gable Wall

You will notice a gap in the roof at its apex. This is because when we created the Attic, we used the Upper floor's properties, including the height of the floor. At 2.16m this was insufficient to reach the ridge height of the roof.

To rectify, in the Project tree, select the Attic, and right click on it to activate the context menu, and then select Properties, to activate the Attic floor properties dialog. Set the Rough height to anything higher than the ridge height. This value can be anything as the roof will cut the wall height automatically. Edit 2.16m to be 3m, click and the gap will disappear.

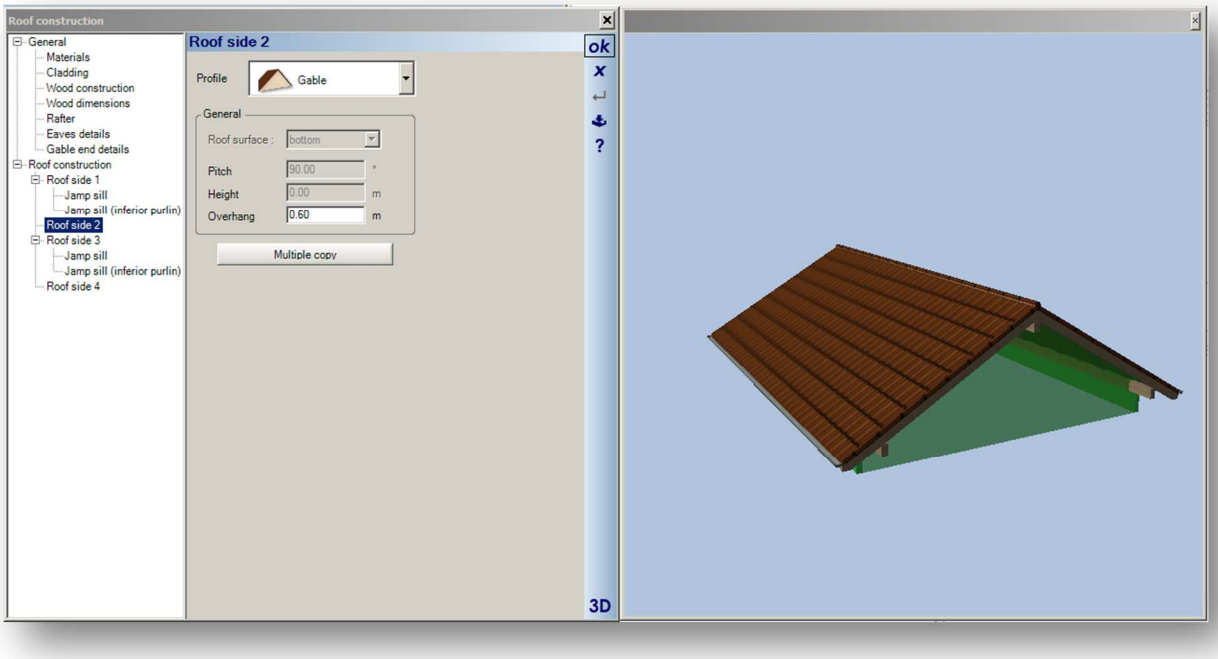
3.21 Remove unwanted Purlins in Gable Wall

Not all buildings have their purlins extending through the gable wall as seen here.

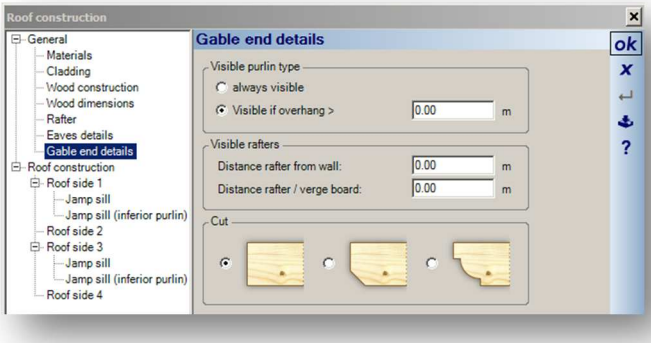
You can hide these purlins and all other wood construction by right clicking in the3D view, and then from the context menu select Visibility. In the Visible categories tab, scroll down to Roof constructions / Roof and deselect Wood construction. Press OK and all timbers will disappear from your view.

A better solution however is to shorten the purlins. (Reverse the action in the previous paragraph to show the purlins again).

Ensure that Building 1750 – Attic is your current floor in the 3D view. Then double click the roof to activate the Roof dialog. In the dialog click the 3D button to see a 3D view of the roof within the dialog. You can resize the 3D roof view to get a better view of it.



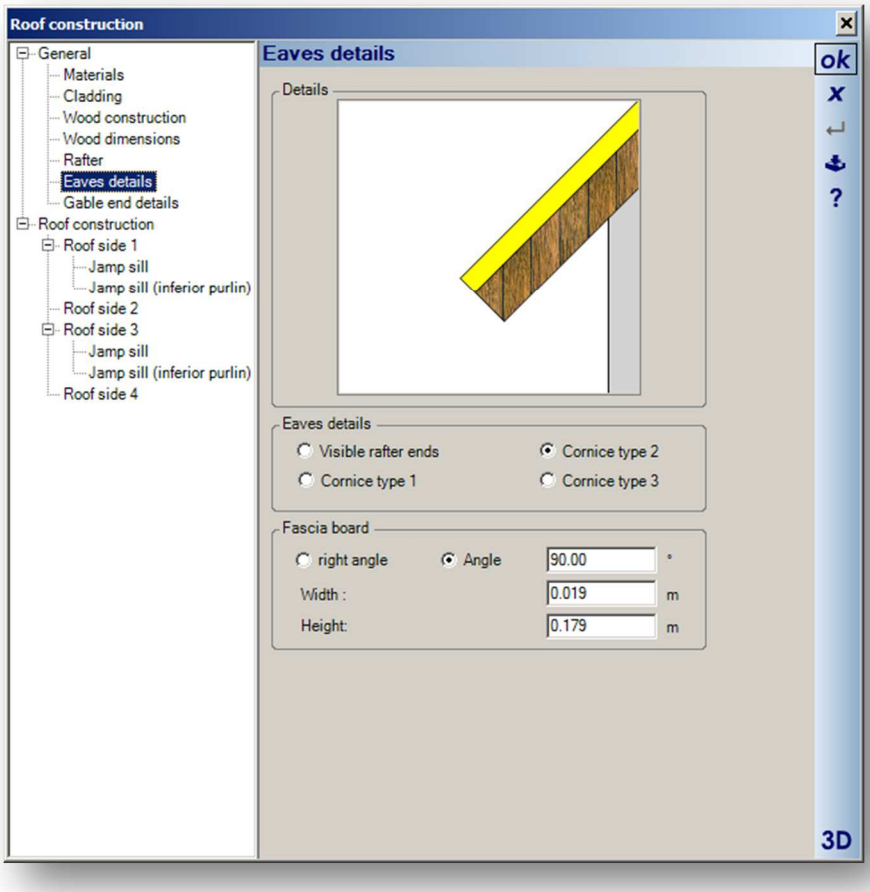
In the dialogs 3D view you can also drag the roof and rotate it to view the roof from different aspects. Clicking on the 3D model will highlight the roof side in green, and also highlight the entry in the roof dialog's tree.



In the dialogs tree, select Gable end details, and set the **Visible if overhang > 1m.** (Its default was set to 0m.) By setting the value to 1m the purlin will only be visible if the overhang is ever > 1m, which it isn't and so does not show.

3.22 Adding Eaves detail

In the Roof Properties dialog tree select the **Eaves details** entry, and you will see a cross section view of the eaves.



You can now select your chosen Cornice; we will use Cornice type 2. We will also set the angle of the Facia board to 90 degrees. Click OK to update the 3D view:

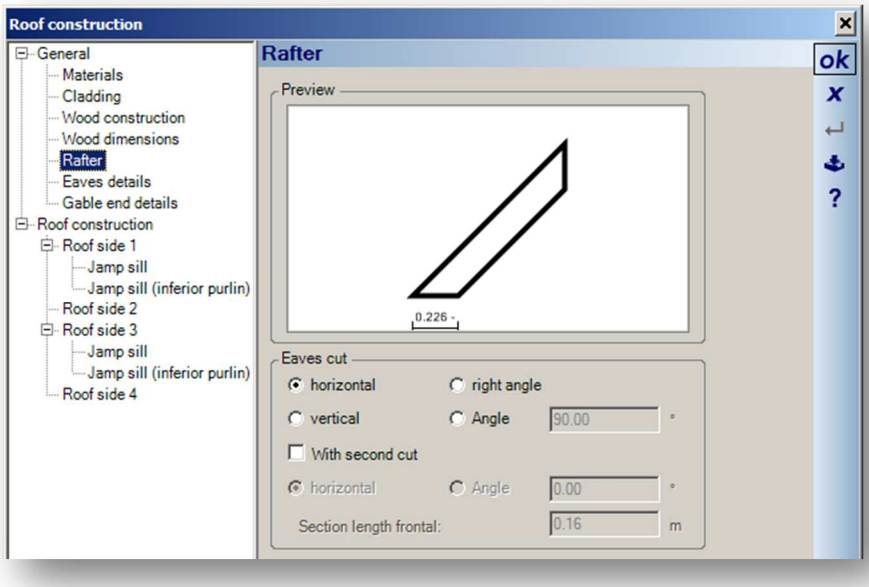
3.23 The Roof Overhang

The default roof overhang of 0.5m is a bit extravagant in our case, and we need to set it to 15cm.

Double click on the roof again to activate the Roof dialog again. In the Roof dialog tree select each Roof side and change the overhang from 0.50 m to 0.15m

3.24 Trim Rafters

We can now also trim the rafter by selecting a horizontal Eaves cut for the rafter, thus preventing the rafter extending through the soffit.

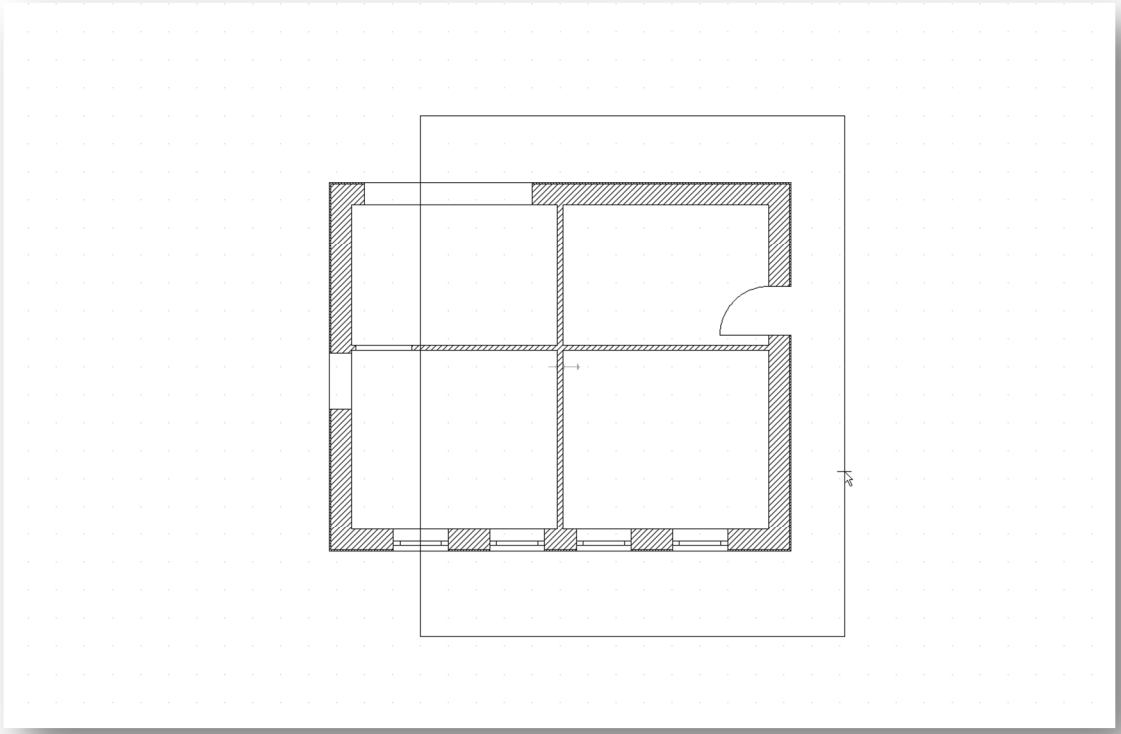


3.25 Adjusting Roof Height

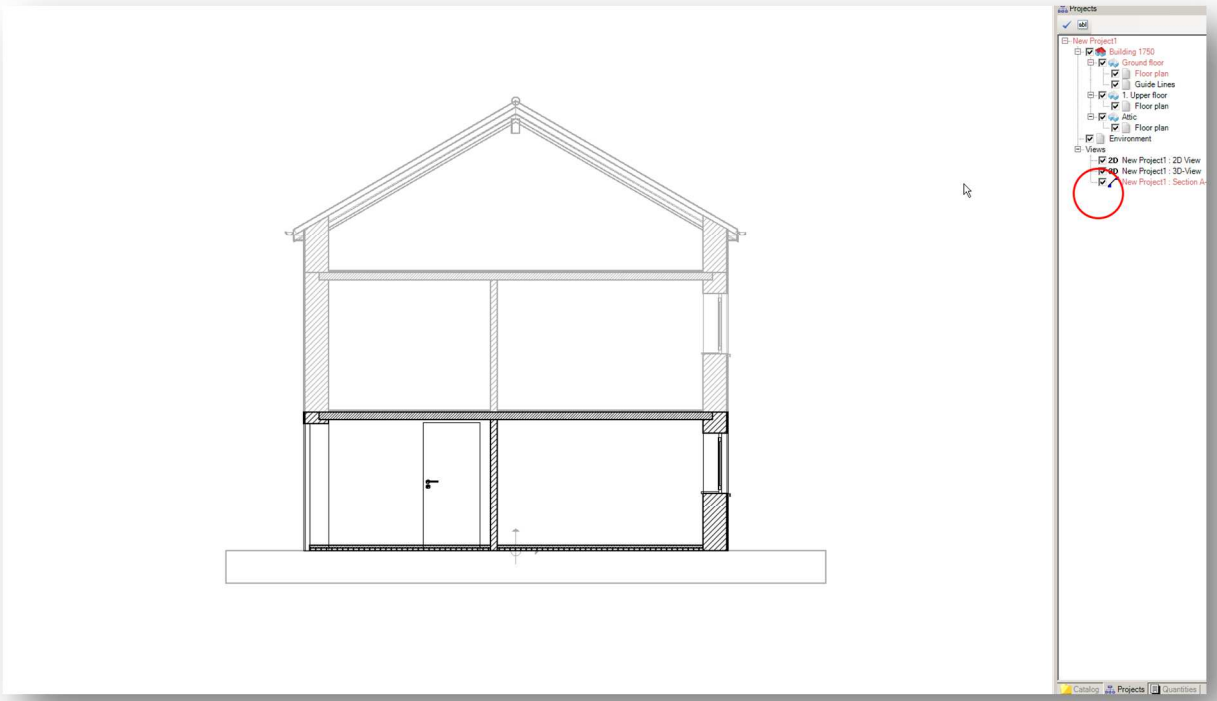
Upper floor height is correct, but our roof is still sitting too high upon Attic floor. So that we can understand what is happening, we shall create a cross section view of our roof.

Ensure that the current floor in the Project tree is is Building 1750 – Ground floor. Close the 3D view, so that only the 2D View window is open.

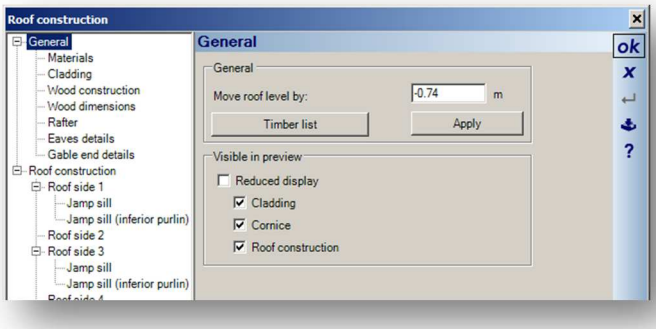
In the tool bar select the New Section View tool and then drag a rectangle through the plan as shown below. It's important that the rectangle cuts the building as shown, because this is where the section will be placed



As soon as you complete the section rectangle a new section view is created:



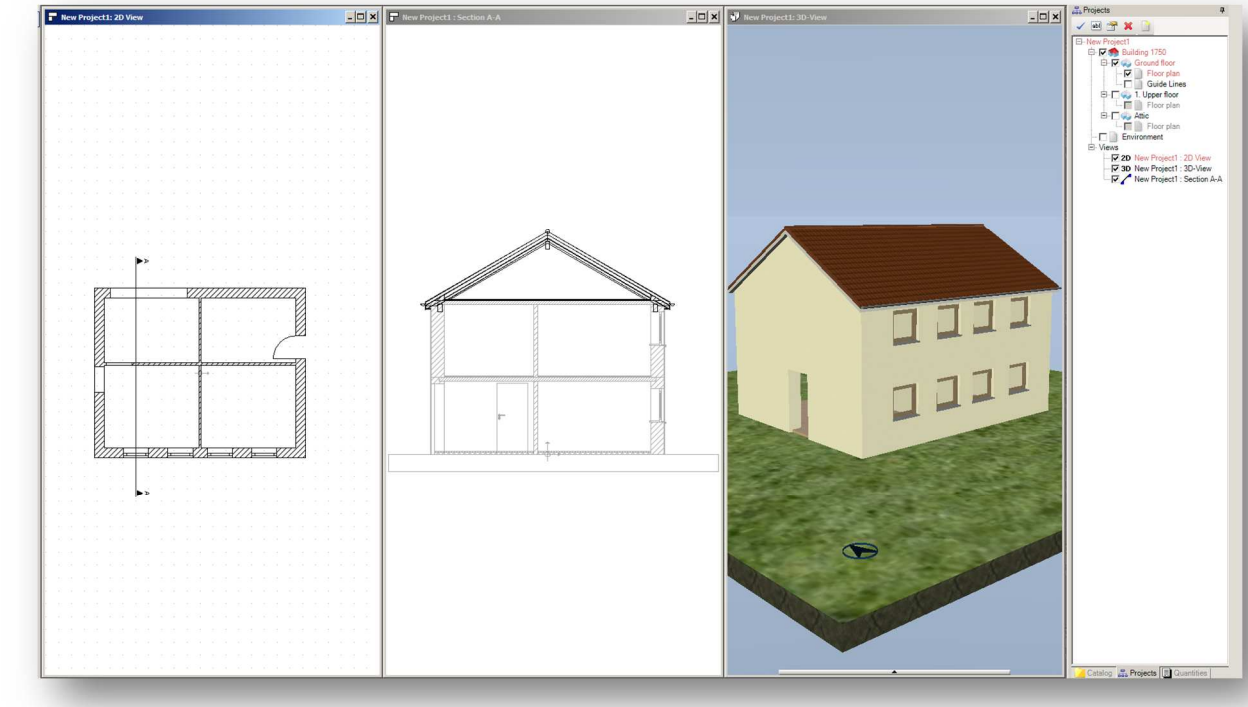
In the Project tree select the Attic – Floor plan to be your current floor and you now be able to select the roof in the Section A-A view by double clicking it. We will now move our roof down by -0.74m.



You can change the height that the roof sits upon a floor also within the Roof Construction properties dialog.

For example to move the entire roof down 0.74m, enter – 0.74 m and then press **Apply,** and then **OK**.

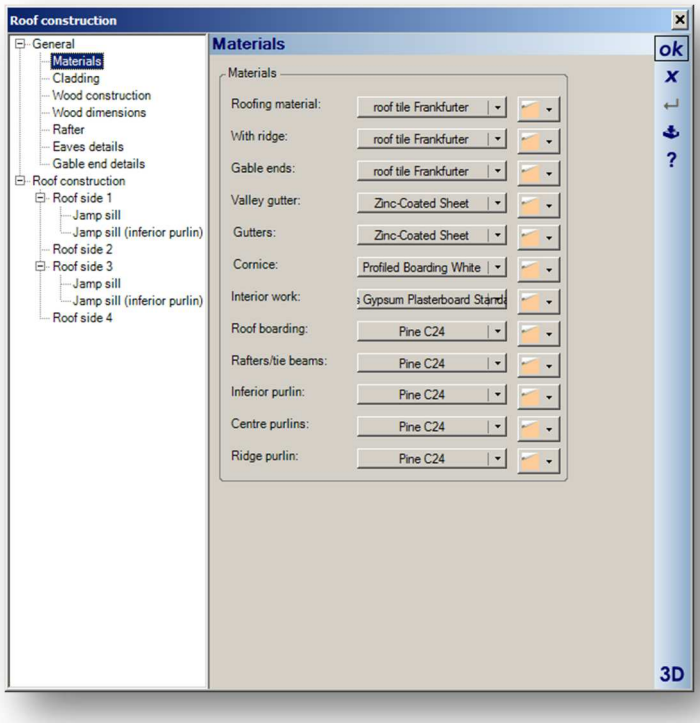
The result is:



Project saved as tutorial1-9.cyp

3.26 Changing Tile Textures

You can drag and drop any material or texture directly from the catalogue onto the roof and timber elements. Alternatively, you can specifically select an element and then select the material or texture.



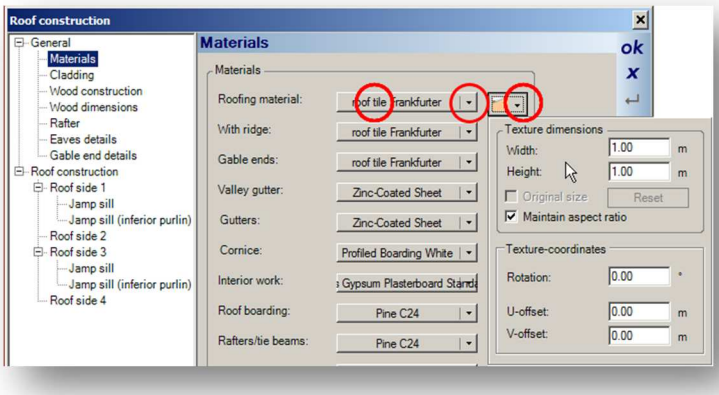
Double click on the roof to activate the Roof properties dialog. In the Roof construction properties dialog tree, select General – Materials.

Each element has 3 selections. The first (default roof tile Frankfurter, allows you to specify the texture used in either the 2D or 3D view.

The next option is to select a material from the predefined materials list.

The 3rd option allows you to set the texture repeat size and rotation.

For our roof tile we will continue to use the default roof tile; however we will change the texture size to reduce the actual tile size. To achieve this click on the drop down to display the Texture dimension options:

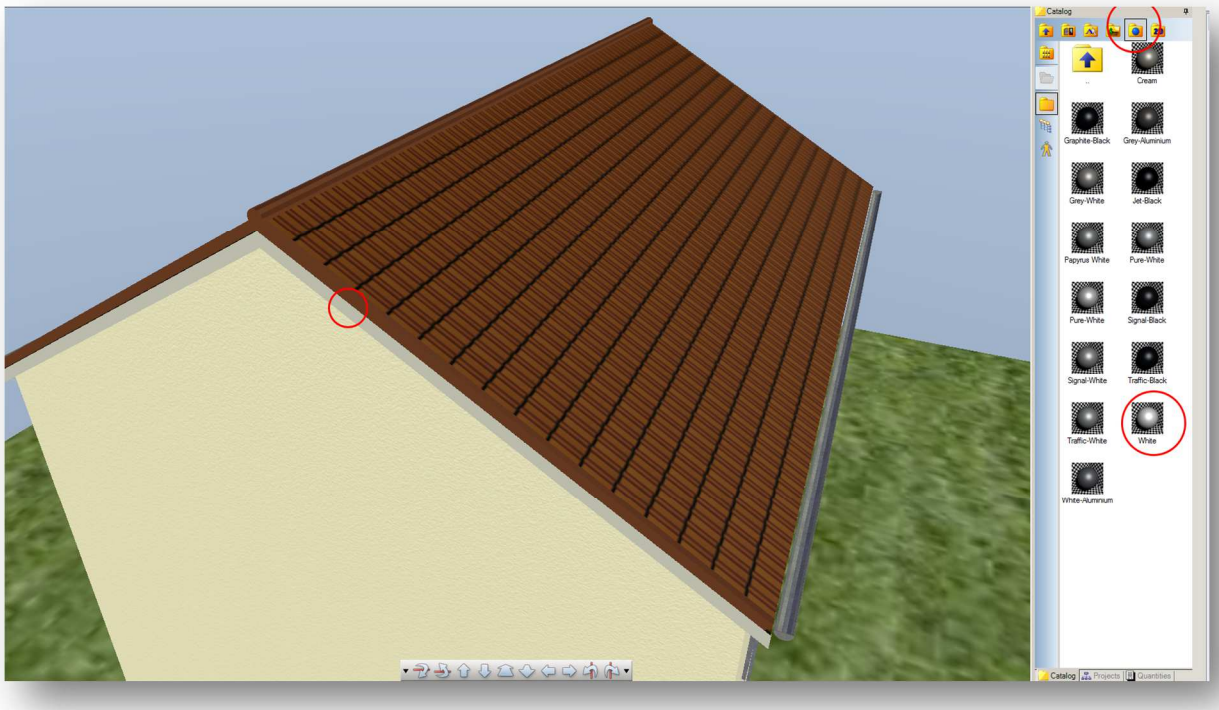


The default texture size is 1.0 m, which you can change to 0.5m to achieve a better tile size. This value will depend on the original texture size. We may go into this in more detail later when looking how to create our own roof tiles.

In a similar way, now change the colour of the ridge, but this time use a solid texture instead of a tile texture.

Using the Transfer Texture and Transfer Material tools, you can copy texture between elements. To copy the texture from ridge to the Gable end boards click on the Transfer Texture tool, then click on the source element and then the target element. The texture will be transferred.

Let's now drop a material from the Catalogue onto the wooden cornice element. Find the White material and drag onto the Cornice element, and the material will be applied.

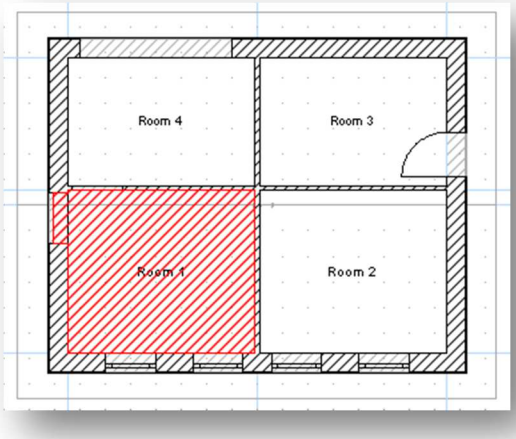


Project saved as tutorial1-9.cyp

We have no need of the section elevation view, so we can now delete it. On the 2D view select the Section A-A line (it will turn red when selected), and press the **Delete** key, and after a confirmation, the 2D section view will close and also be removed from the Project tree.

3.27 Renaming our Rooms

We will now rename the existing rooms so far created. This will also help us in the course when we need to reference a room.

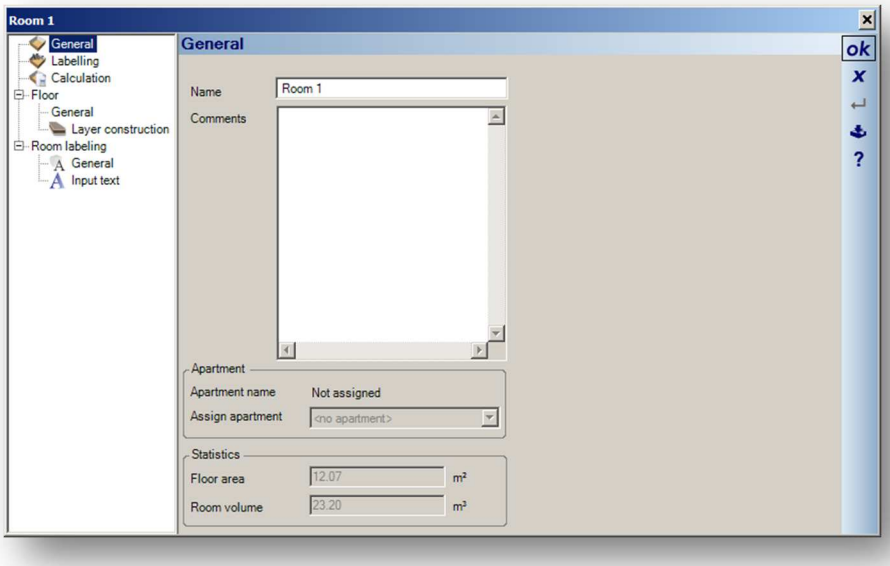


The current rooms names Room 1, Room 2 were automatically given when we created the rooms.

Make your **Ground floor** – **Floor plan** your current floor with a **Ctrl + left click** in the project tree entry.

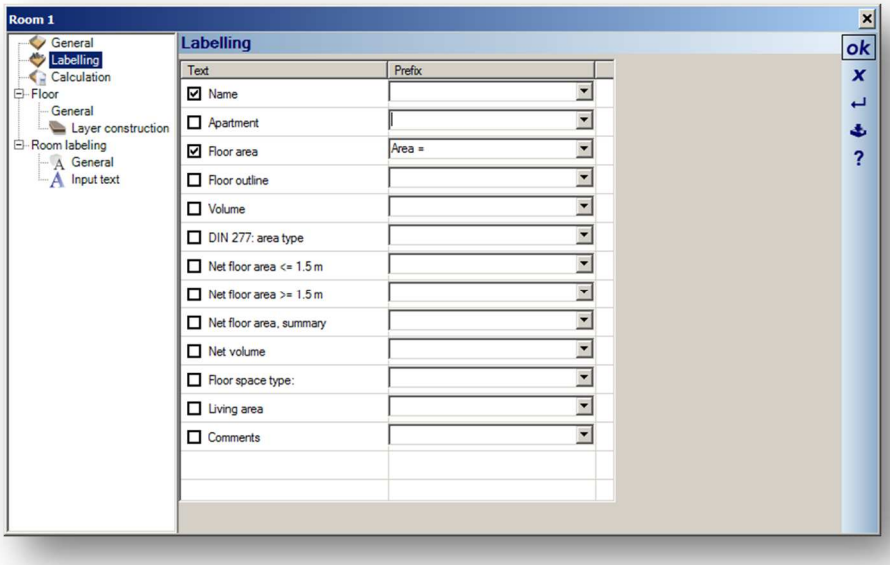
In the 2D View, select Room1, and it should highlight with a red cross-hatch, indicating that the room is selected.

If you now double click the selected room, you will activate the Room properties dialog. This dialog will allow you to change the room name and modify other room properties.

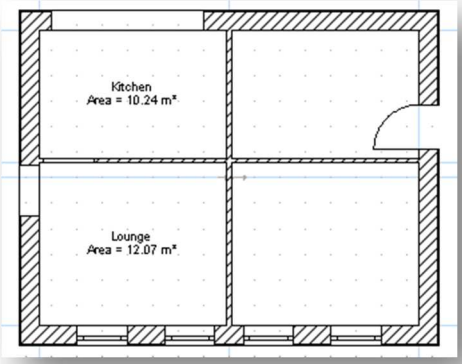


The General entry in the dialogs tree will allow you to change the room name currently being displayed, so we will rename this to Kitchen. You can also add your own comments concerning this room.

Click the Labelling tree entry in the dialog and you will see that you can add additional information alongside the name that is automatically calculated and displayed. For example we can automatically display the Floor area for the room, by selecting Floor are, and if required a prefix from the drop down list.



The **Room labelling – General** entry in the tree allows you to switch off the automatic positioning and text display. The automatic positioning can also be switched off, just by dragging the text in the 2D view.



We can also elect not to display the room names in the adjacent property.

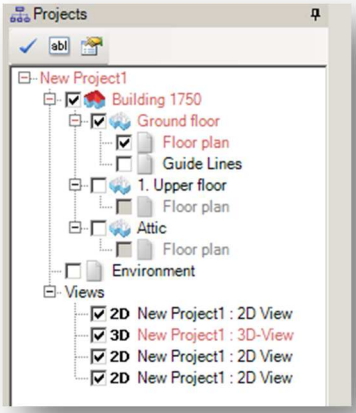
If you xan see two sets of text in the room, that because you have both the Upper floor and Attic being displayed. If you deselect the Upper floor and Attic in the Project tree you will see only the currently selected Ground floor.

Now repeat for each floor, i.e. the Upper floor and attic.

In the Attic we have the same room plan, but here we will delete the horizontal wall, simply by selecting it ()it will turn red when selected), and press the delete key. When the wall is deleted the attic becomes a single room again, which we will rename as Attic.

3.28 Project Tree – Visible floors

When selecting and deselecting the floors in the Project tree, you should note that the selection is specific to the current 3D or 2D view. You could for example view only the Attic floor in the 2D view and view both the Ground floor and Upper floor in the 3D view.

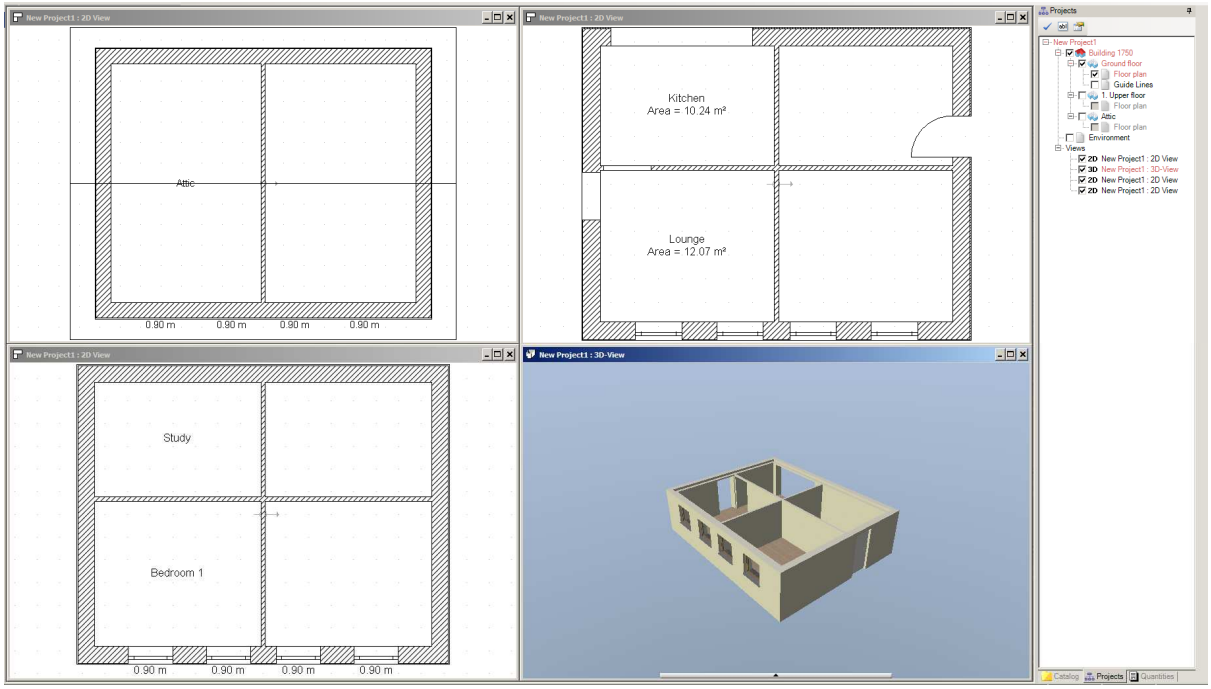


In the Project tree, ensure that only the **Ground floor – Floor plan** is selected.

Now click on the **View-New Views-New 2D** tool. A new 2D view is created with all possible floors being displayed.

Deselect all floors in Building 1750 except the Upper floor.

Now click on the **View-New Views-New 2D** tool again, and this time deselect all floors in Building 1750 except the Attic.



You should now have 3 x 2D Views and 1 x 3D view.

Click on the **View-Windows-Arrange Vertical** tool and your view windows will automatically rearrange.

With 2D View window in turn deselect the Environment layer and then click on the **Show All** tool.

So not to get confused we shall now close the last 2 2D views we created. You can close such a view either by click in the window close icon in top right of each window, or right click in the Project tree entry for each view and select Close view from the context menu.

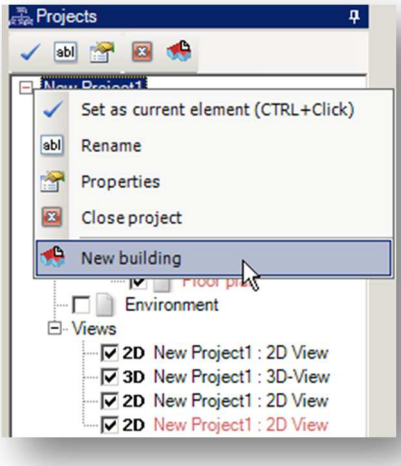
Project saved as tutorial1-10.cyp

4 Adding an extension – Building 2

We will now add an extension to our existing plan. In this example we will create a new building, called **Building 1980 Extension East**. It is not essential to create a new building to add such an extension, but there are several advantages in doing so:

a) The new building can have different Floor properties to the existing building. This is the case here where our new extension has a different floor to ceiling height.
b) It's easier to switch off individual buildings, allowing you present visualisations with and without an extension.
c) Your new building may have a different ground level to your existing building. That's not the case here in this example.

So don't think that the Building feature is restricted to creating new buildings, as it's a powerful feature allowing you to design more complex projects.



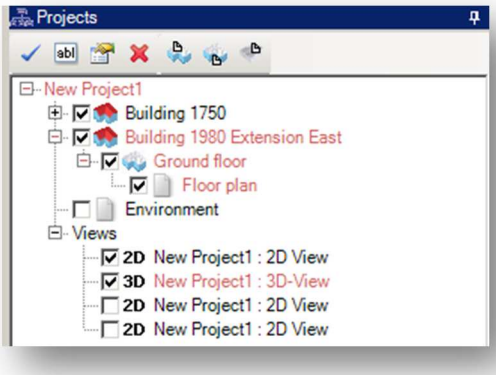
To create a new building right click on the Project entry in the Project tree, and from the context menu select **New Building**.

In the Building properties dialog that is displayed enter its name- in our case Building 1980 Extension East.

Note that a **Ground floor – Floor** plan is automatically created but there are no contents.

In the Project tree select Building 1980 Extension East to be the current selected floor. You can now deselect all views except one of the 2D Vies and the 3D view. Click on Arrange Vertical in the tool bar.

Your project tree should now look like this.



You can see the floor plan of **Building 1750 – Ground floor,** but you cannot edit it because it is not the current floor. You however can still snap guidelines and walls to the greyed out plan.

We will not draw this extension in detail as it is part of the neighbouring building.

We will now add the guidelines to **Building 1980 Extension East - Ground Floor – Floor plan** to position the extension.

4.1 Edit Ground floor

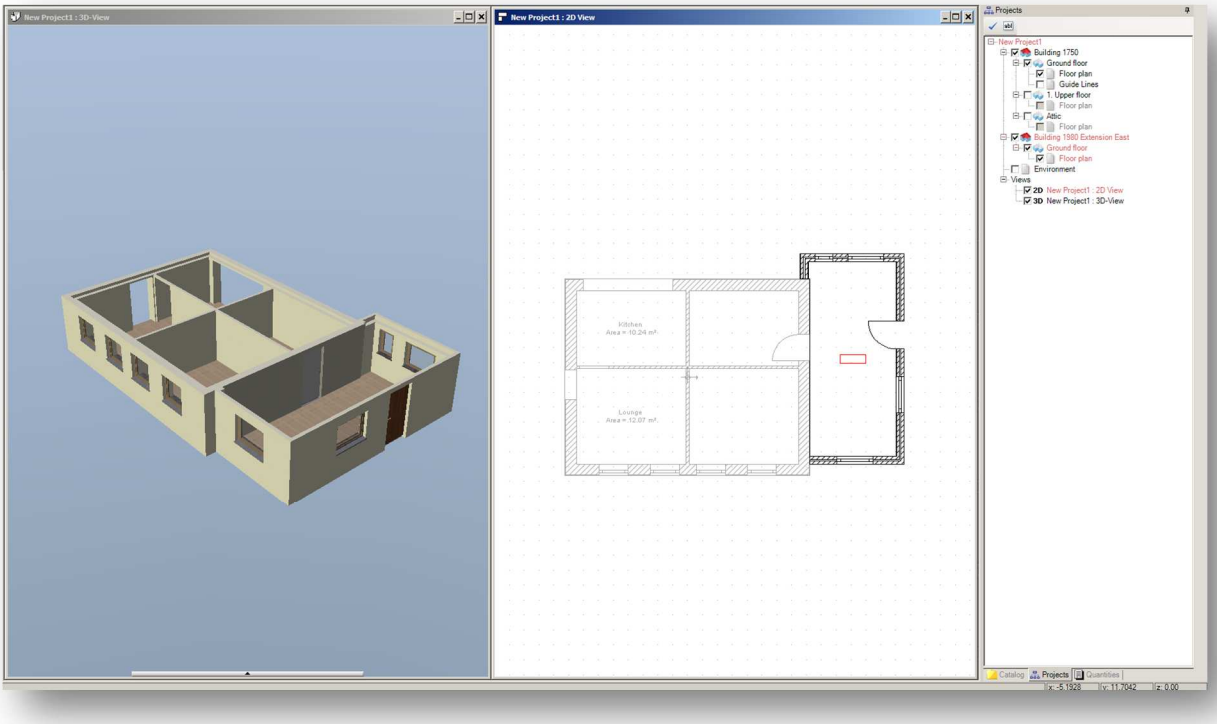
Then add the walls, the thickness and wall layer is not important. We also added a virtual wall using the Room Boundary wall type. (See 5.2.1 for a detailed explanation)

We then set the floor height.

We then add the windows and doors.

Dimensions and detail are not important for this adjoining building, so you could skip this section and just load the saved project to view.

Project saved as tutorial1-11.cyp



4.2 Add Upper floor

Right click on the Project tree entry **Building 1980 Extension East** and from the context menu select **New Floor above**.

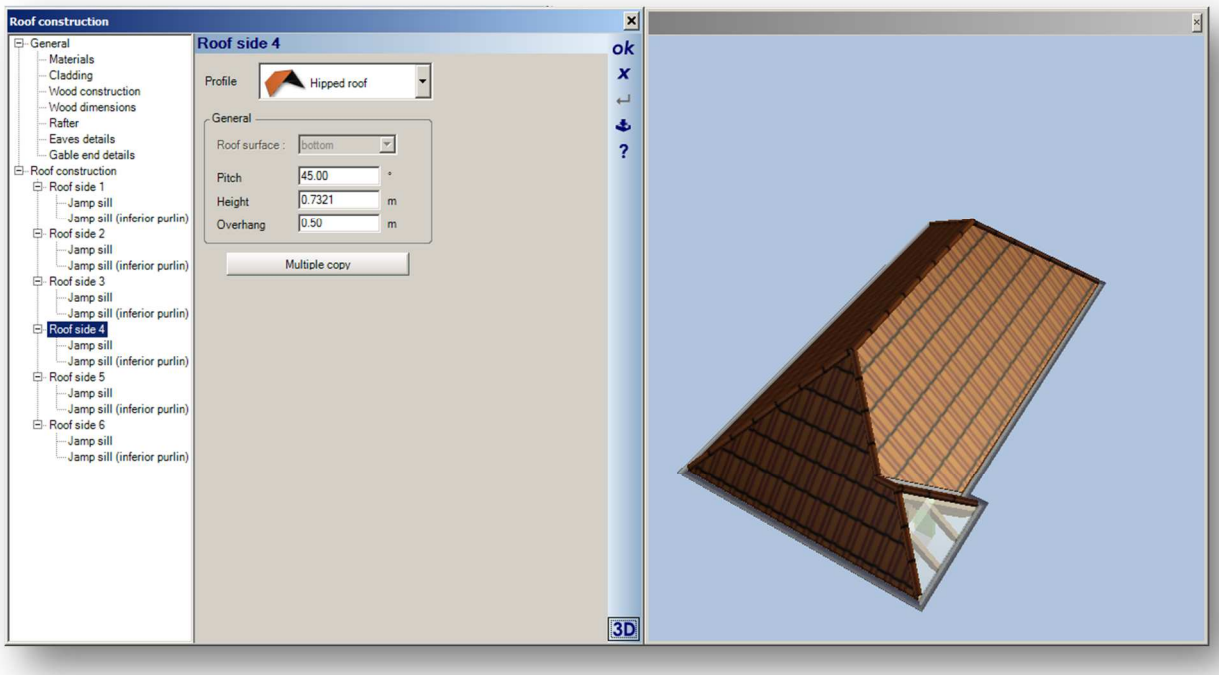
In the New floor above dialog select the options to Transfer all, and then click **OK**. This is a lesson in deleting unwanted objects transferred; in this case the doors and windows.

In either the 2D view or 3D view select each door and window on this floor and press the Delete Key.

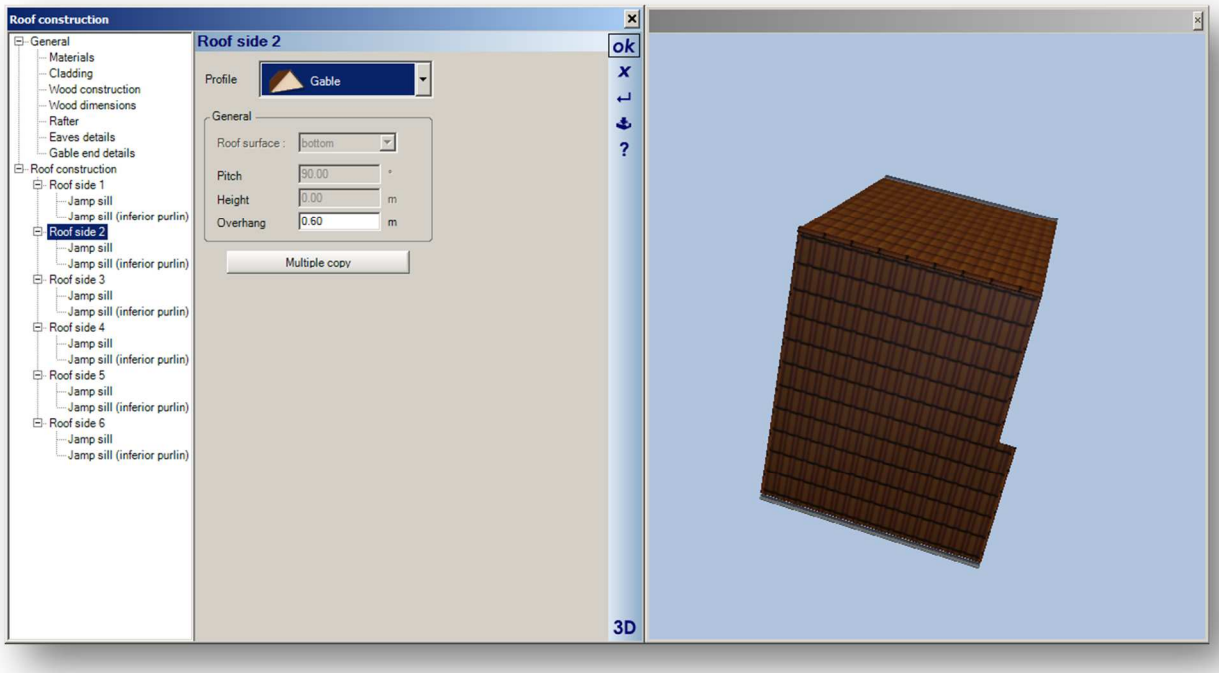
4.3 Add roof to upper floor

You are just repeating the steps in section 3.18, but this time the roof is being added to the Upper floor and not the attic.

Adding a roof to the contour of our extension results in the following roof shape:



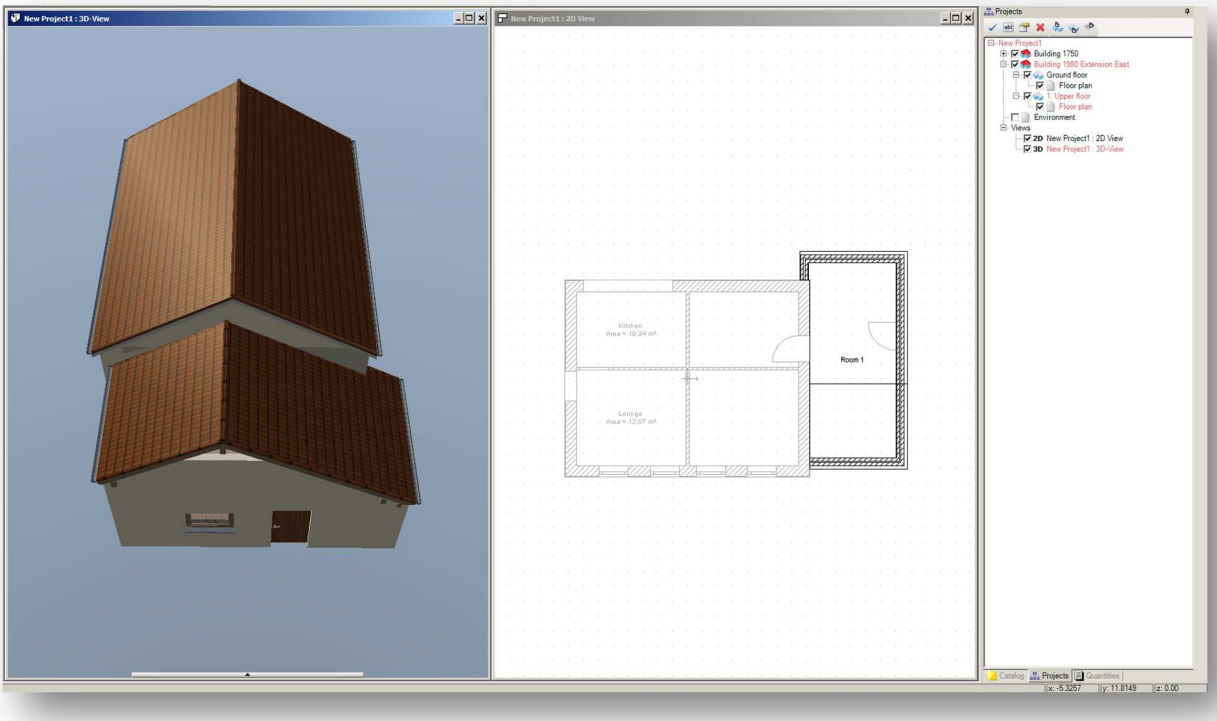
We need to set every roof side to be a Gable, except for Roof Sides 1 and 3 , which will remain as Hipped Roof.



This provides the cut in the roof that we require fitting around Building 1750.

We then need to change the overhang setting for each roof side from 0.6m to o.1m, except for the roof sides that are against the existing building, which should have an overhang setting of 0m

Then set the pitch of the Roof sides 1 and 3 to 30 degrees. While setting the pitch also set the roof height to 0.5m for Roof side 3, and 1.4m for Roof side 1. The different roof heights give us the required offset roof:



Now remove the unwanted purlins, and increase the height of the Upper floor from 2.1m to 3m to remove the hole in the roof apex.

Finally change the Eaves details to match those we set for the Building 1750 roof.

Project saved as tutorial1-12.cyp

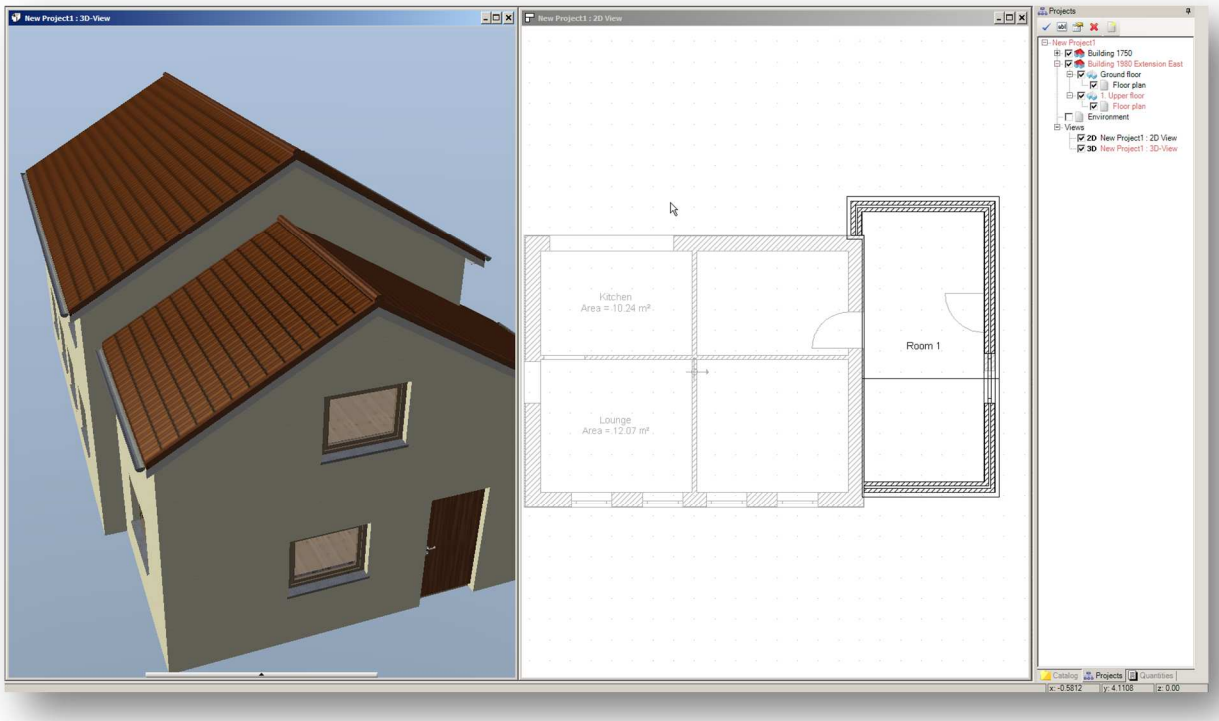
Wall interference: Note how the roof of Building 1980 does not interfere with the wall of Building 1750 in the image above. This is because the roof is on a separate building.

If we were to have created this latest building section on the end of Building 1750 the lower roof will cut into the wall, even if we set the roof overhang to 0.

The effect looks like a horizontal slot in the wall.

So to avoid this whenever you have a building gable, that has a roof section against it, consider using a separate building as we have done in our tutorial.

In many projects if you have a building that was built in stages over time, it's best to create the project in those same stages, i.e. creating each new extension as a separate building.



5 Adding an extension – Building 3

Our third building will be in more detail because this is part of the property that we are interested in.

5.1 The Foundation

We have already had a few questions, asking why we did not create a foundation for our buildings so far. Certainly if this was a new build, or the plans would require showing a foundation, then this possibly would have been our starting point. The first building section created in the project was built in 1750 and does not have any foundation – at least not by modern standars. The solid walls have stood for 250 years and have not moved, so hopefully will remain solid for another 250 years.

The second building section was part of the adjoining building and the foundation and details are of no interest.

We will however add a foundation at the end of this chapter. The extension that we are about to create was built in the 1980's and certainly does have a foundation.

5.2 Create Building 1980 Extension West

To create a new building right click on the **New Project1** entry in the Project tree, and from the context menu select **New Building**.

In the Building properties dialog that is displayed enter its name- in our case Building 1980 Extension West.

Note that a **Ground floor – Floor** plan is automatically created but there are no contents.

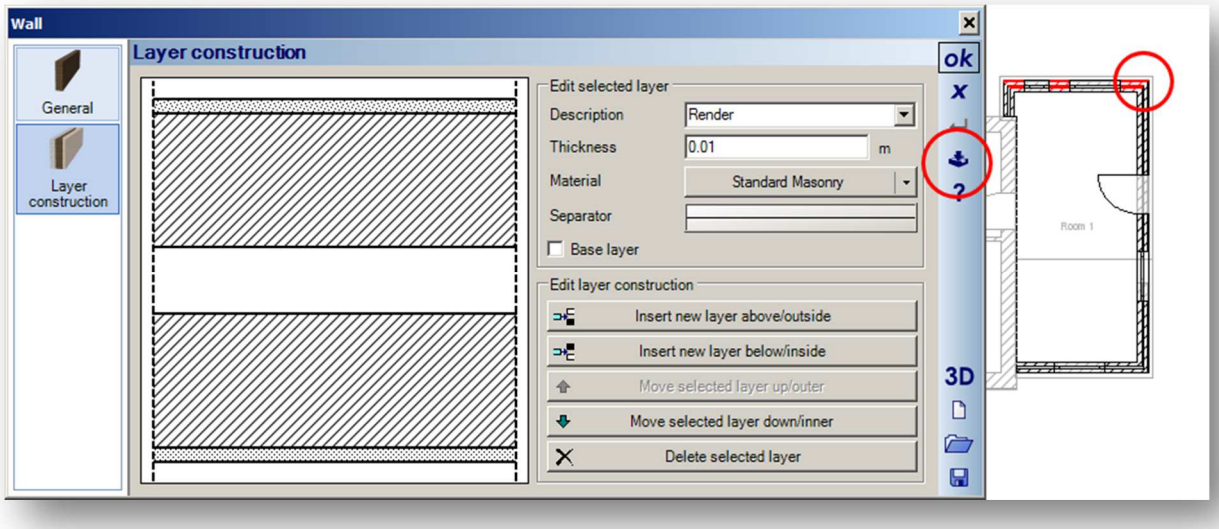
In the Project tree select Building 1980 Extension West to be the current selected floor. You can now deselect all views except one of the 2D View and the 3D view. (In case you still have others visible) Click on **Arrange Vertical** in the tool bar.

You can see the other floor plans**,** but you cannot edit them because they are not the current floor. You however can still snap guidelines and walls to the greyed out plans.

We will now add the guidelines to **Building 1980 Extension West - Ground Floor – Floor plan** to position the extension.

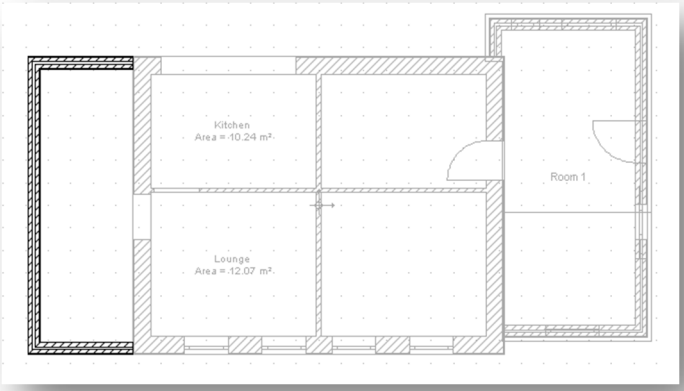
Once the guidelines are placed, we will place our wall. Again we will use a cavity wall. If you select the External wall tool, and the right click on it, selecting the Layer construction tab, you will see that you may not have the wall layer specification that you want. You can of course load any wall layer from the layout folder (it lives in Visual Building Basic\AEC\Layouts).

If you wish to use a wall layer template previously used, as we have, then there is an alternative way of using the same wall layer template. Locate a wall where the wall layer template was used, double click on the wall, and from the activated Wall properties dialog, select the Layer construction tab.



Now click on the **Save as default** icon (see above image). This will then ensure that this wall layout template becomes the new default for this wall type.

Returning to **Building 1980 Extension West - Ground Floor – Floor plan,** when we place our new external wall (remembering to use Ctrl + W to snap the walls outer edge to the guide line), we will use the desired wall template.

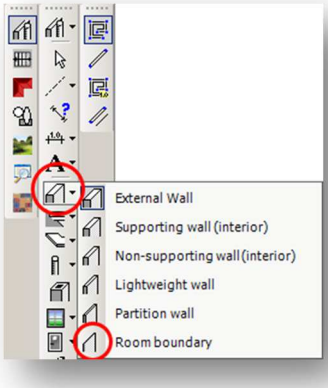


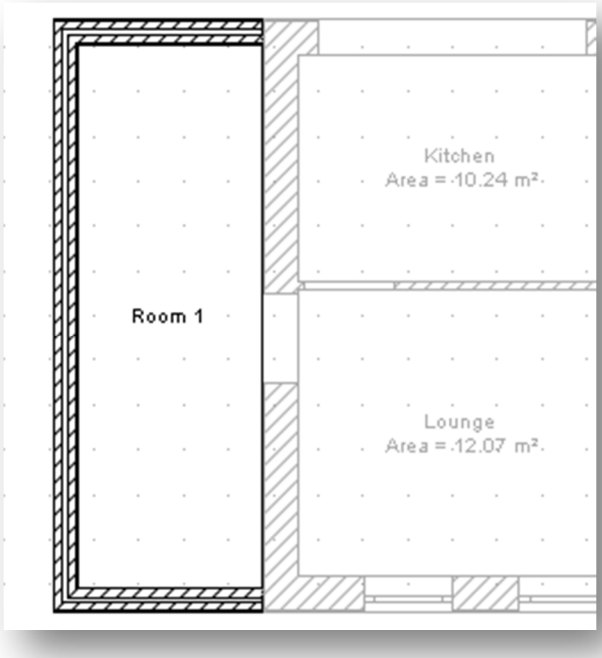
After placing the 3 walls, you will note that no room is created. You should not place a 4th wall over the top of the existing wall. Placing a new wall in parallel and adjacent to the existing wall is also wrong, unless of course this is how the building was constructed.

5.2.1 Room Boundary (virtual wall)

We complete such rooms with a special wall type, the Room Boundary wall type, found at the bottom of the wall type list.

Select this wall type and complete the 4th wall side with it. You will know that the room is complete when the automatic room name appears.





We now need to set the room height. Double click on the Ground floor entry in the Project tree for this building to activate the Ground floor properties dialog. We will use the same values that we used in section 3.13, when we set the room height for Building 1750.

Project saved as tutorial1-13.cyp

5.3 Adding Windows

To add windows in this building we will follow the exact same process defined in section 3.14

Place any two windows at either end of the current building.

5.4 Create Upper floor

We will now create a second floor, using the ground floor as our template. We will copy the wall layout and dimensions and the windows. We will be use the same procedure described in 3.17

On the Project tree ensure that the current selected layer is **Ground floor – Floor plan** with a **Ctrl + left click** on it.

Now right click on **Building 1980 Extension West** to activate the context menu, and select **New Floor above**

The **New Floor above** dialog is activated.

We will assume that the floor height is the same as the ground floor and so will not change any of the height values. Click on the **Transfer** button that shows the dialog tab that allows us to choose what ground floor elements we want to copy to the new floor. In this case we will select **all,** and then click on **OK.**

5.5 Create Attic

Creating the attic is almost identical to the last section, except this time we will not transfer any windows. So repeat section 5.4, but this time do not transfer any windows. You can also name the new floor Attic.

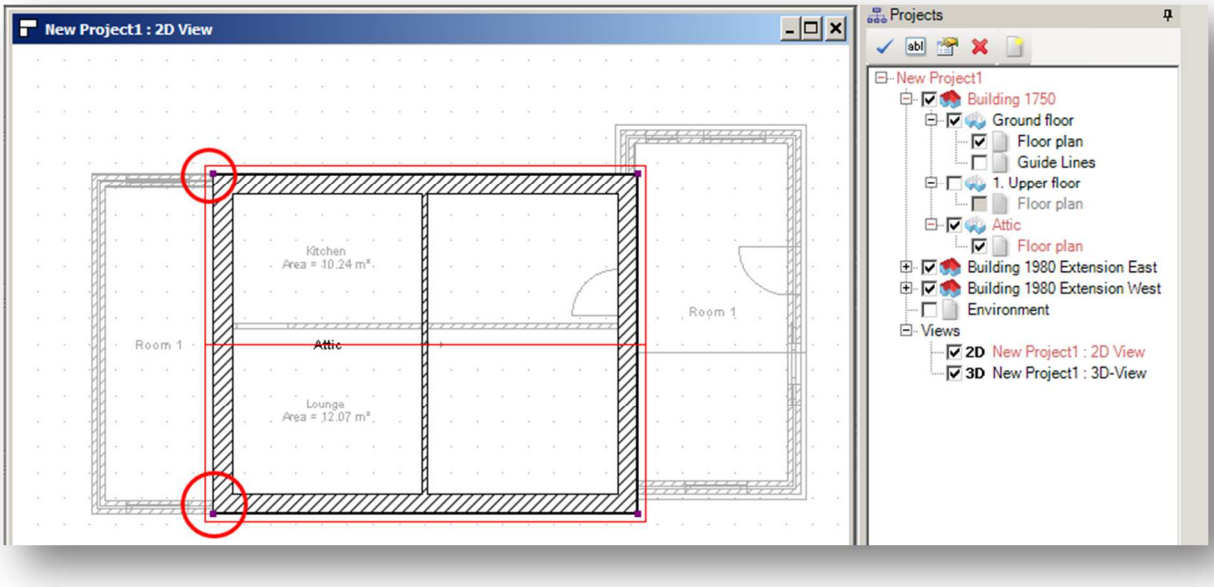
Alternatively you can transfer the windows and then simply delete them.

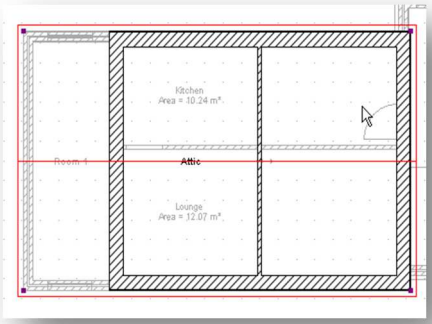
5.6 Extending the Roof

You can either add a new roof with the exact same specifications as used for the roof in Building 1750 or better extend that roof to cover this building as well. We will extend the roof.

In the Project tree, select **Building 1750 – Attic – Floor** plan to be the current floor plan.

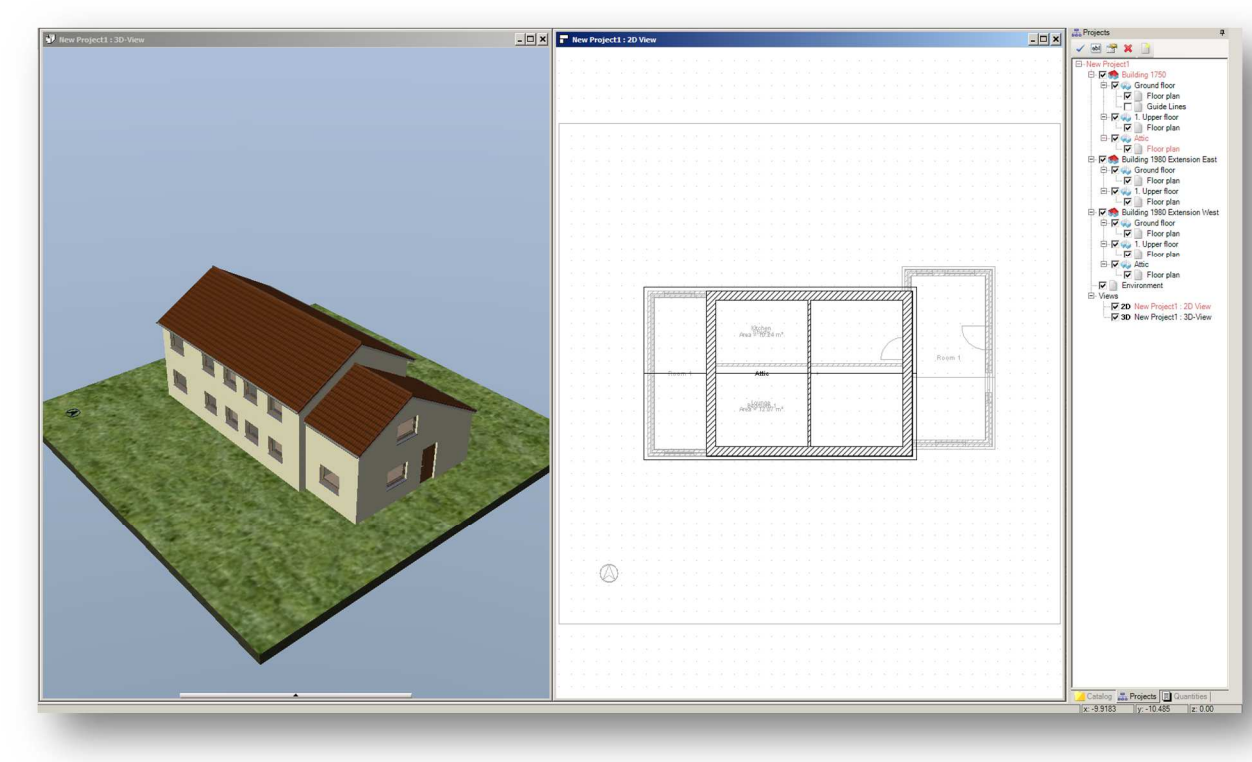
In the 2D View, select the roof and several roof points will become visible, together with the roof outline.





Click a roof point to select it and click again in its new position to place it. Repeat for the other roof point. It's important that these points snap to the correct position otherwise you will get some unwanted effects in the roof.

Project saved as tutorial1-14.cyp



5.7 Adding the Foundation

Creating a foundation is just like adding a floor, except you add the new floor below the ground floor layer. How you proceed with creating the foundation depends on the type of foundation.

Strip Foundation, Pad Foundations, Raft Foundations, Trench Fill Foundations and others are all possible to create and show. The foundation used and its specification will depend upon local ground conditions, building structural requirements and what your Building Control requires.

In our example we will use a modern (450 cm wide x 100 cm deep) trench fill foundation, where the concrete is poured to within 20 cm of the top of the trench, and then for the foundation walls use 2 courses of block work to bring us up to the DPC.

We first create the foundation walls. The foundation walls are 20 cm high are so lay – 20 cm below the Ground floor. Ensure your Ground floor is the current selected floor, and then right click on **Building 1980 Extension West** and from the context menu select **New floor below.**

In the New Floor below dialog, name the Floor as Foundation Wall, set the Rough Height to be 0.2m and switch off the Create automatic ceiling. Ensure the Transfer Tab is set to **Transfer none**. Click OK.

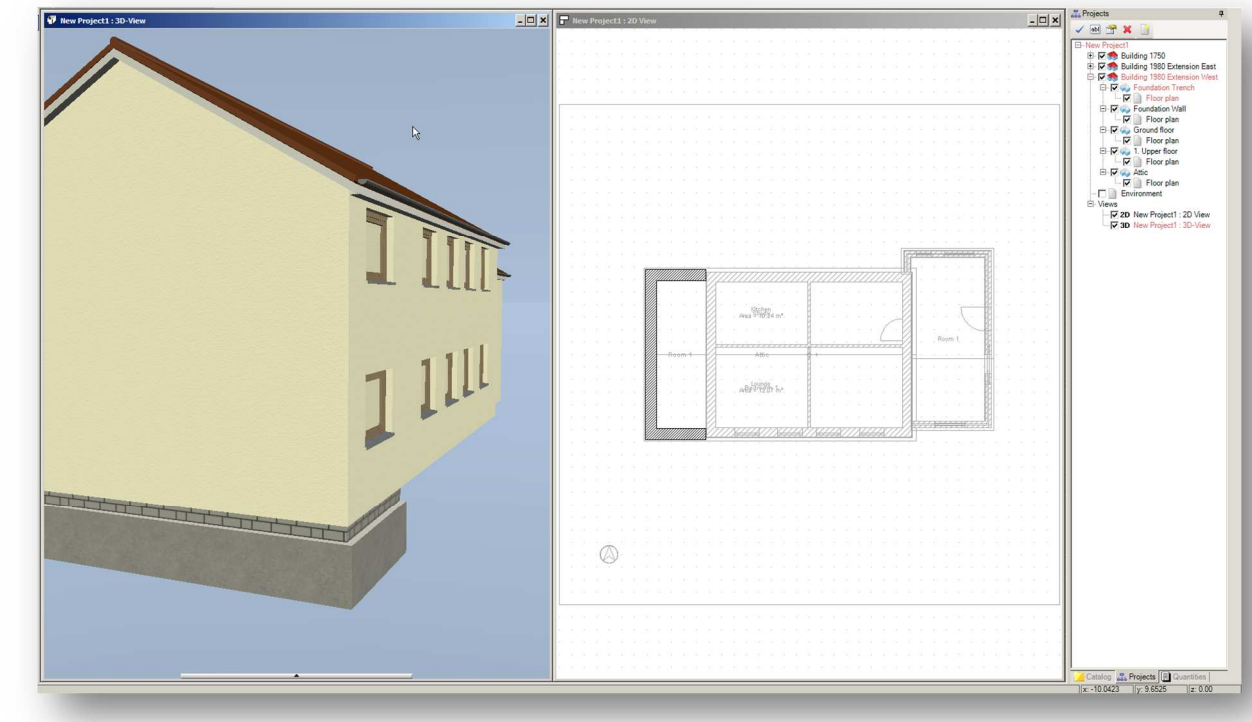
Select the Foundation Wall as your current floor level and draw the foundation wall. To help identify this as being the foundation wall, you can drag a different texture onto the wall in the 3D view.

We next create the foundation trench (filled with concrete) . The foundation trench is 100 cm deep, but 20 cm is filled by the foundation wall, so we need another 80cm. Ensure your Foundation Floor is the current selected floor, and then right click on **Building 1980 Extension West** and from the context menu select **New floor below.**

In the New Floor below dialog, name the Floor as Foundation Trench, set the Rough Height to be 0.8m and switch off the Create automatic ceiling. Ensure the Transfer Tab is set to **Transfer none**. Click OK.

Select the Foundation Wall as your current floor level and draw the foundation trench. You can use a wall to achieve this set with a width of 450cm. To help identify this as being the foundation trench, you can drag a different suitable texture onto the wall in the 3D view.

Project saved as tutorial1-15.cyp



You will need to provide a dimensioned section view of your foundation, which we will complete later using the section tool to create a new view of the foundation.

The above screen shot show the 3D view with the Environment switch off. If you enable the environment you will see that it has become thicker to accommodate the foundation. Select the Environment in the Project tree and then double click the environment block in the 3D view. In the activated Area dialog uncheck the **Enable automatic thickness** and click OK.

6 Adding a Conservatory – Building 4

The next extension to our project is a conservatory. In this case we will build the foundation first a work upwards.

There are several methods you can use to design a conservatory. There is also catalogue of conservatories in the object catalogue:

These can be created using standard window parts, and adding a standard roof, hiding the entire roof construction element and dragging a glass material onto the roof. These catalogue conservatories are OK if you only want a representation of a conservatory, but if you require something more bespoke and detailed then you can construct your own using basic components.

If you are not interested in designing a conservatory, you can skip this section. I will save the completed conservatory as a completed model, which can be used in other objects. Note however that the conservatory that we are about to construct was built from basic components.

In most projects it may make sense to construct the conservatory timber and glass panelas as a separate project, save the result as a 3D model, and then import that 3D model into your conservatory. In this course however we will design and maintain everything within the single project.

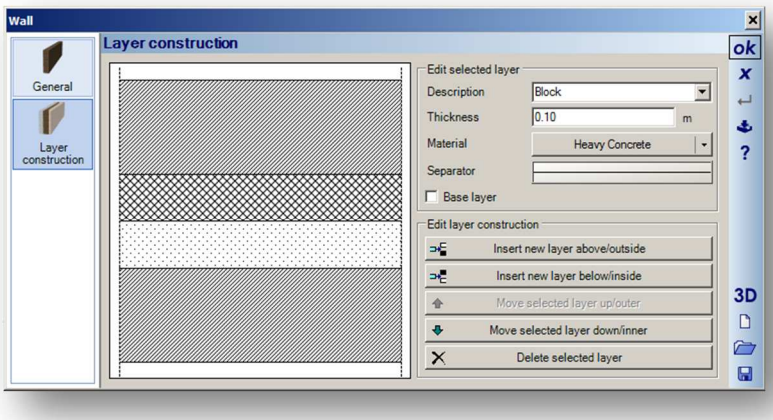
To create a new building right click on the **New Project1** entry in the Project tree, and from the context menu select **New Building**.

In the Building properties dialog that is displayed enter its name- in our case Building Conservatory.

Note that a **Ground floor – Floor** plan is automatically created but there are no contents.

6.1 Create Conservatory Base Wall

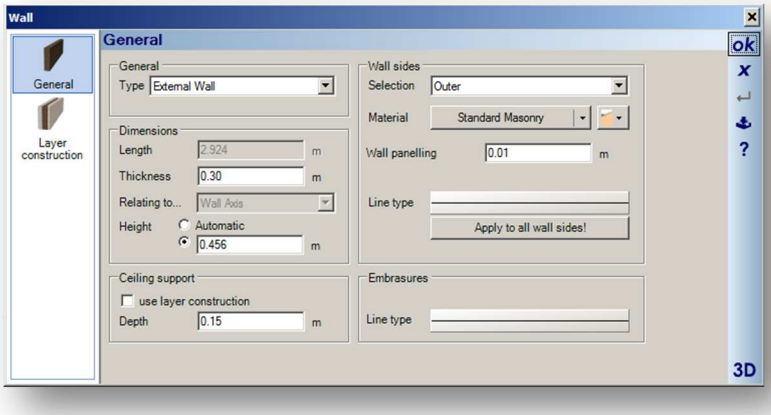
Our conservatory has a base wall, which we shall layout using guidelines.



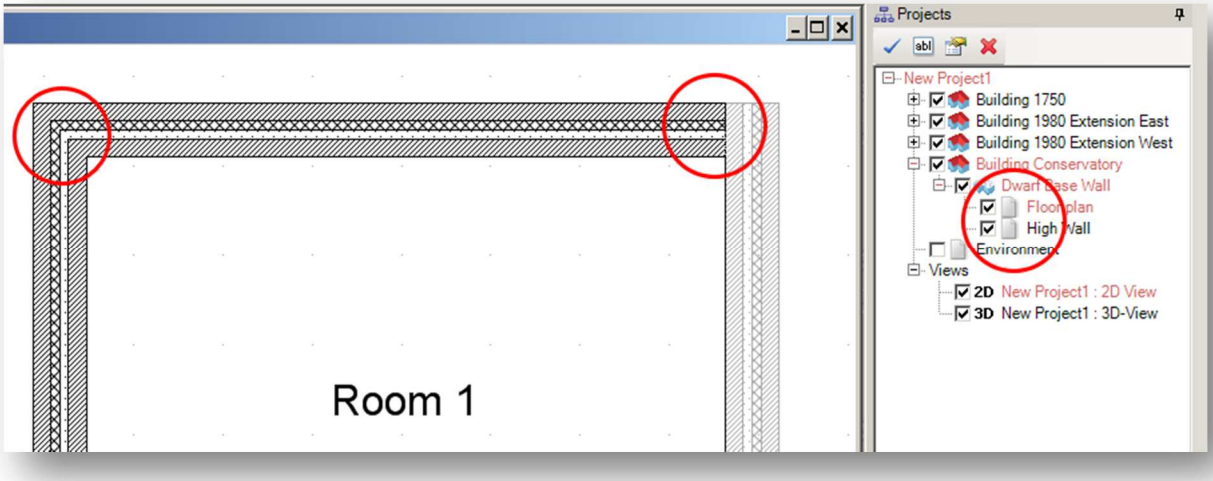
Note that the base wall consists of 2 different wall heights. We have created a dwarf wall of height 0.456 m and a high wall of 2.048m.

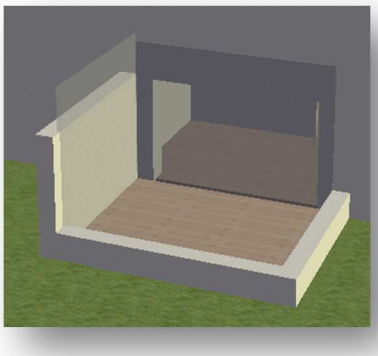
Our wall consists of a different wall template 30cm thick with the following layout:

Previously we used the room height to set the height of our wall, but for this case we will use the height property that can be set in each wall's properties dialog.



The other main procedure where we differ from previous methods is that we have created a separate layer for the High Wall. This was done because we want the high wall and the dwarf wall to be butted together, as opposed to how the two dwarf walls join.





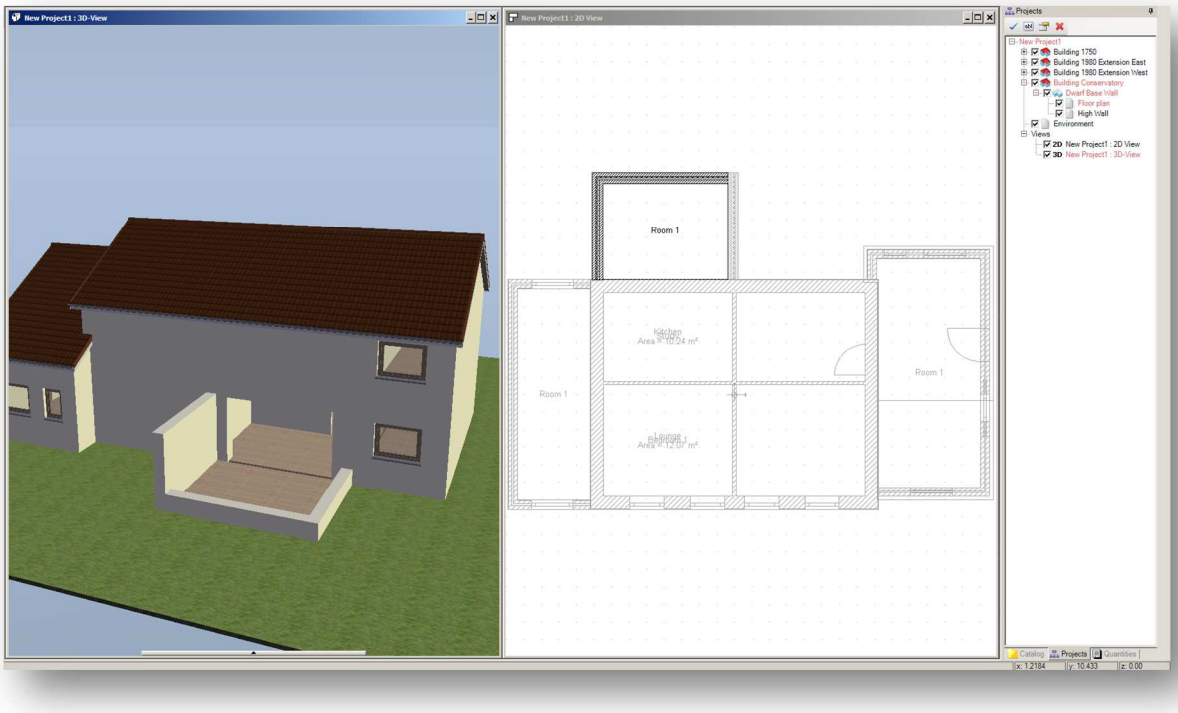
We also need to use the Room Boundary tool to complete the room because the Dwarf wall and high wall are not actually connected.

The Room boundary is visible in the 3D view but can be hidden using the 3D View's Visibility setting, and deselecting **Construction Elements – Room boundary.**

Project saved as tutorial1-16.cyp

6.2 Add Conservatory Foundation Walls

We first create the foundation walls. The foundation walls are 80 cm high are so lay – 80 cm below the Ground floor. Ensure your Ground floor is the current selected floor, and then right click on



Building Conservatory and from the context menu select **New floor below.**

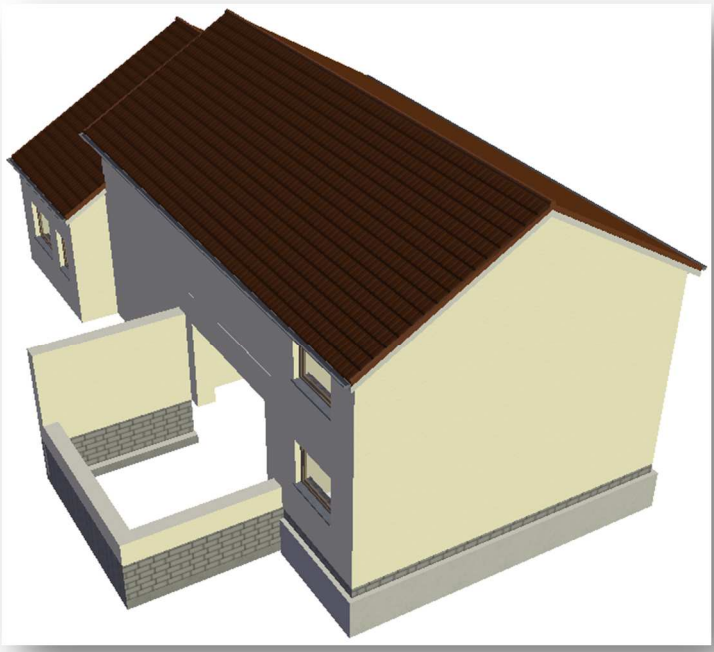
In the New Floor below dialog, name the Floor as Foundation Wall, set the Rough Height to be 0.2m and switch off the Create automatic ceiling. Ensure the Transfer Tab is set to **Transfer none**. Click OK.

Select the Foundation Wall as your current floor level and draw the foundation wall. To help identify this as being the foundation wall, you can drag a different texture onto the wall in the 3D view.

6.3 Add Conservatory Foundation Trench

We next create the foundation trench (filled with concrete). The foundation trench is 100 cm deep, but 80 cm is filled by the foundation wall, so we need another 20cm. Ensure your Foundation Floor is the current selected floor, and then right click on **Building Conservatory** and from the context menu select **New floor below.**

In the New Floor below dialog, name the Floor as Foundation Trench, set the Rough Height to be 0.2m and switch off the Create automatic ceiling. Ensure the Transfer Tab is set to **Transfer none**. Click OK.

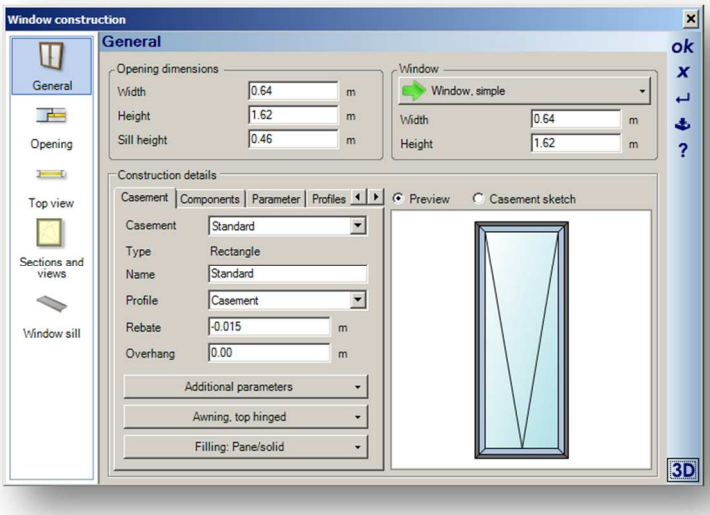


Select the Foundation Wall as your current floor level and draw the foundation trench. You can use a wall to achieve this set with a width of 450cm. To help identify this as being the foundation trench, you can drag a different suitable texture onto the wall in the 3D view.

Project saved as tutorial1-17.cyp

6.4 Placing Windows and Door Panels

Before we place any window panels, we should find a suitable panel and edit its size.



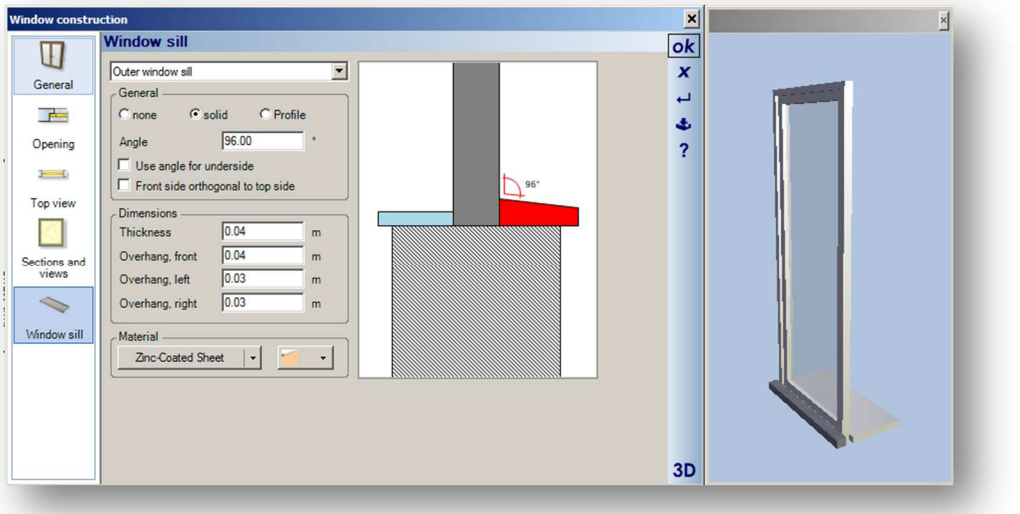
Click on the **Window Construction** tool to activate the Window Construction dialog. In the dialogs catalogue locate and select the **Window, simple** design. The width of this window casement will be set to 064m and the height to 1.62. The Sill height should be set to the height of our dwarf wall 0.46m.

We should now edit the casements component dimensions such as its frame dimension. This is achieved by selecting the **Profiles** tab. Select the **Casement** and set the **Profile width** to 0.04m. Select the **Frame** and set its **Profile width** to 0.04m.

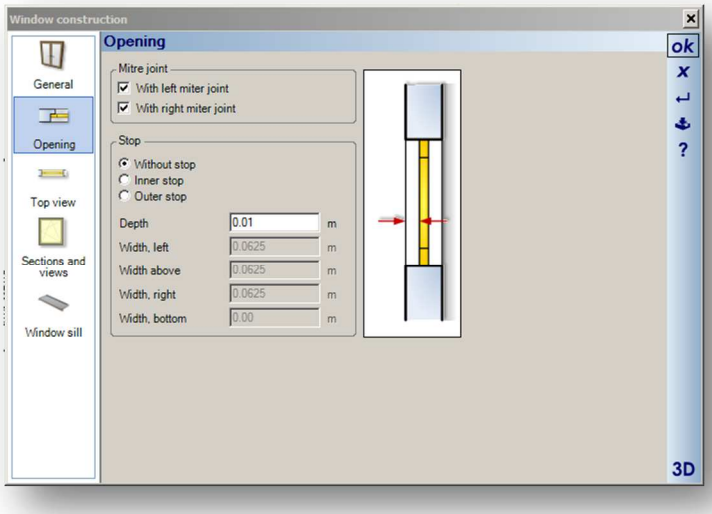
On the Casement tab we can also define the opening mechanism to be **Awning top hinged.**

Click the Window sill tab and we can set the sill dimension and shape. You can also click on the 3D button to get a good 3D view of your window.

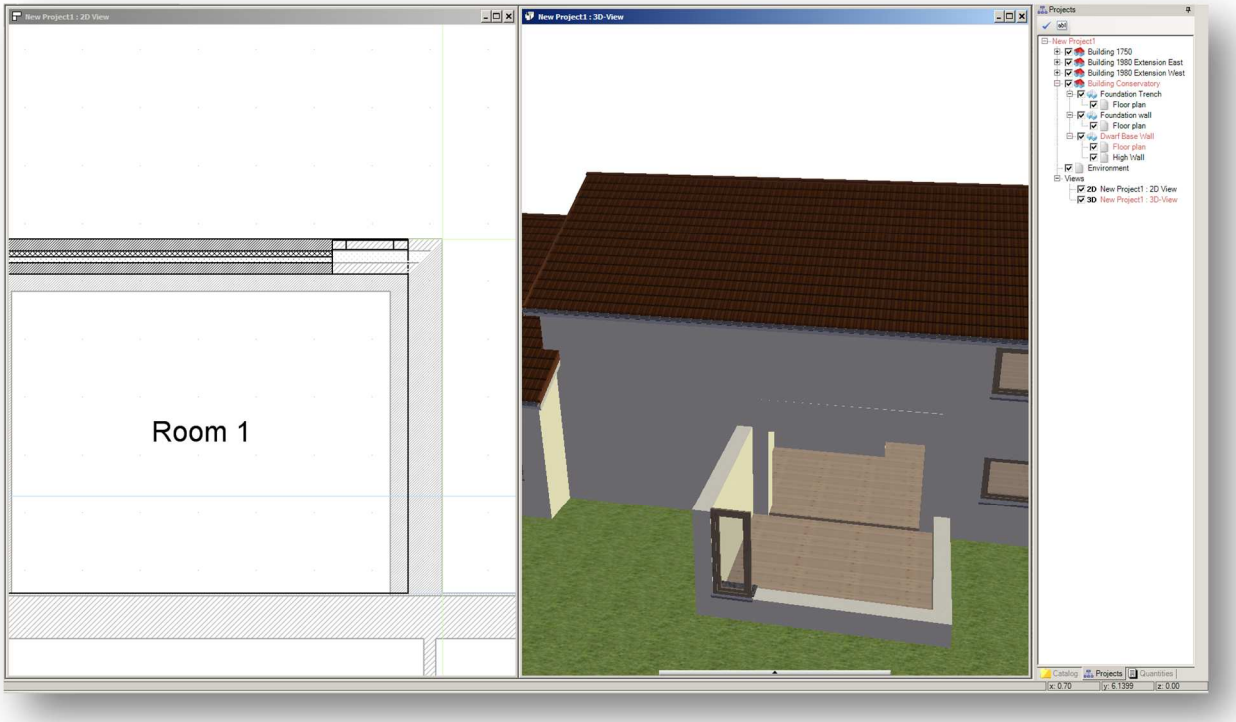
Selecting the Outer Window Sill and Inner Window Sill in turn set their shape and dimensions.



Select the Opening tab to set the Depth of the window. Setting this to 0.01m will ensure the window sits on its outside edge of the wall, opposed to the default of centre. Click on Save as default button in the dialog, so that we remember all our settings, and then OK.



In the Project tree, ensure that the current Floor is the **Building Conservatory – Dwarf Base Wall**, as this is where we will now place the window.

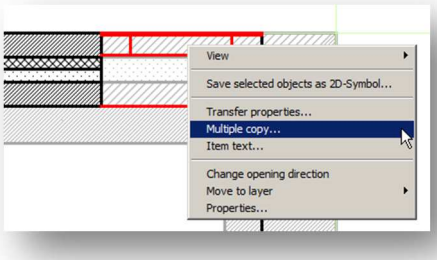


Before we duplicate this window, we can add textures /materials to the frame and sill. We will drag a Gloss White material from the catalogue onto the wood components of the window.

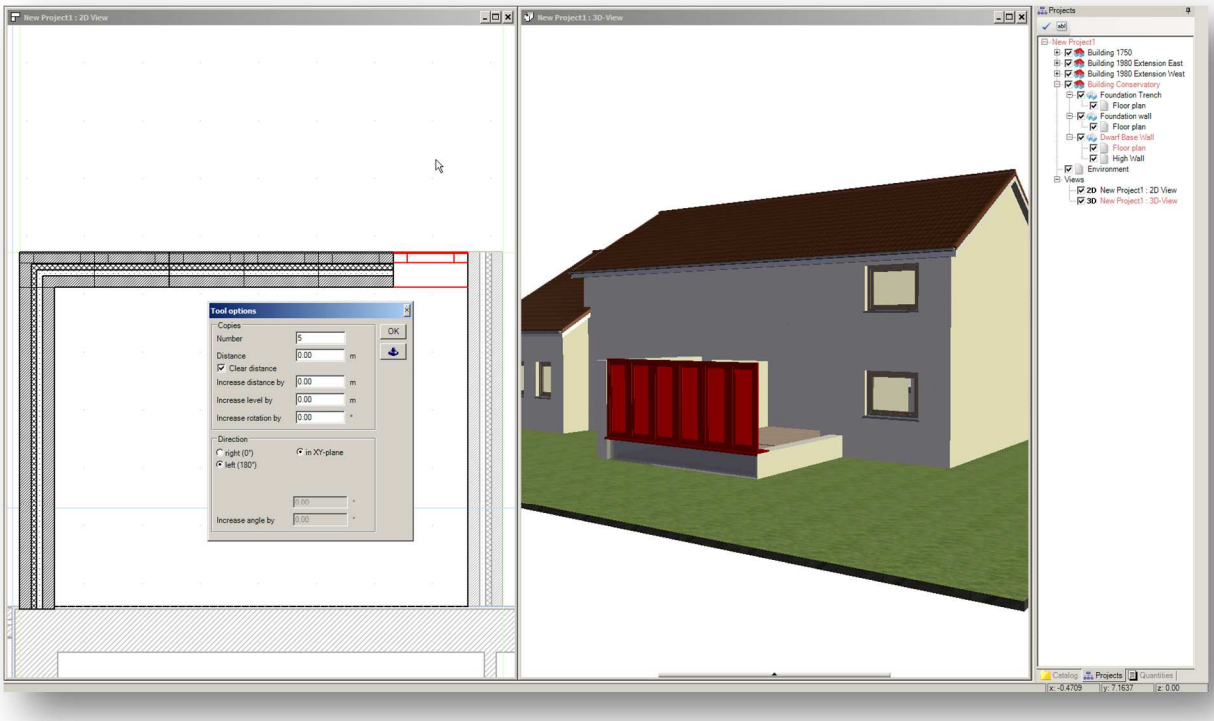
You can now place another 5 windows to the left of the first window placement, in a similar way, but it's easier and more accurate to use the multiple copy tool.

6.4.1 Using Multiple Copy

First, in the 2D view, select the window (it will turn red when selected), and then right click the selected window to activate the context menu. Select the Multiple Copy menu entry, and the Tool options dialog will activate.

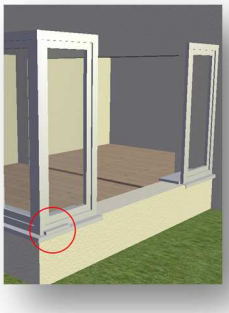


In Tool options dialog, set **Clear distance**, set **Distance** to 0m, set **Number** to 5 and direction to left.
If your window does not fir to the wall end exactly then you have either got the window width wrong or your wall length wrong.



[I noted a bug here in that during the multiple copies, the sill dimensions were calculated on the underlying foundation size and were therefore too large, although we were placing the window on the dwarf wall. We resolved this by hiding the foundation in the 2D view by de-selecting them in the Project tree.]

The Multiple copy tool is a very powerful tool and helpful in many similar object placements situations.



The next 2 windows panels that we will place are different width, so we will adjust the width in the windows properties before placement. Place the next two side panels.

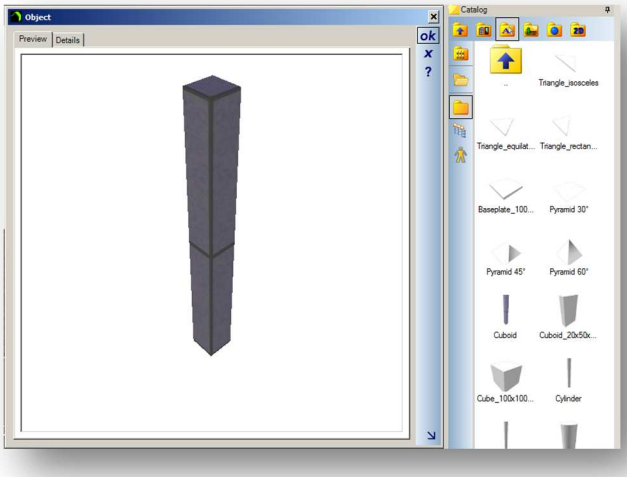
You may notice problems such as sill overlap. This can easily be rectified by changing offending window's **Inner window sill Overhang , left** from 0.03m to 0m

Our next two panels are in fact door panels. We can use the same panels, but change both the width and height properties before placing.

Project saved as tutorial1-18.cyp

6.4.2 Adding Conservatory Timbers

Now to place a 0.15m wall plate around the top of the windows. Use a Cuboid object found in the Objects/Misc/Basic Forms object catalogue. Drag it anywhere into the 2D window, and then double click on it to resize it. This will activate the 3D Object dialog, where you can set its width height and depth.



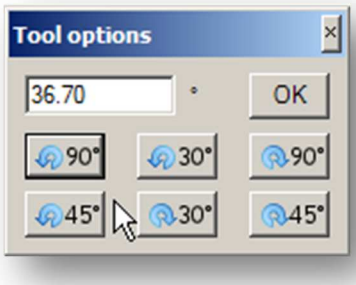
Before you change any values, ensure that you have set **Scale distorted**; otherwise changing one dimension will rescale the other two.

The timber to run along the top front of the conservatory should be 0.05 m x 3.0m x 0.15 m.

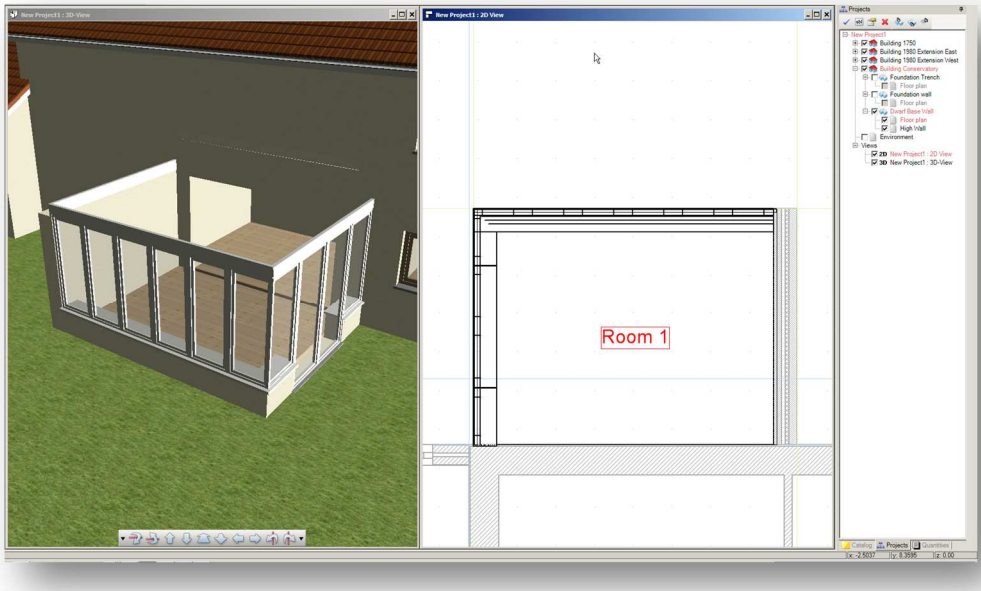
To rotate a selected object use the rotation tools located in the toolbar.

The Tool options dialog will appear allowing you to either click on the desired rotation or to enter it numerically.

When you have the correct value press **Esc** Key to enter the value.

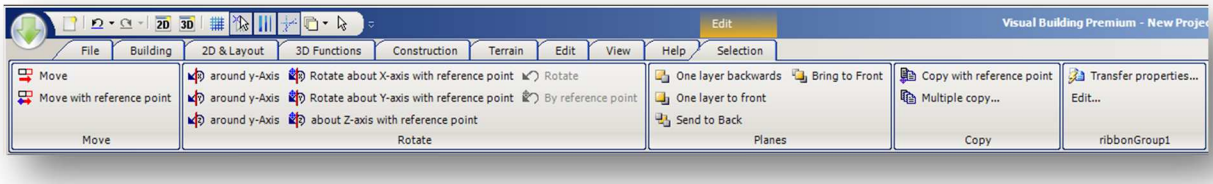


You can move the selected object in either the 2D or 3D view window, but it is difficult to place objects exactly in 3D, so it is best to do so in 2D.

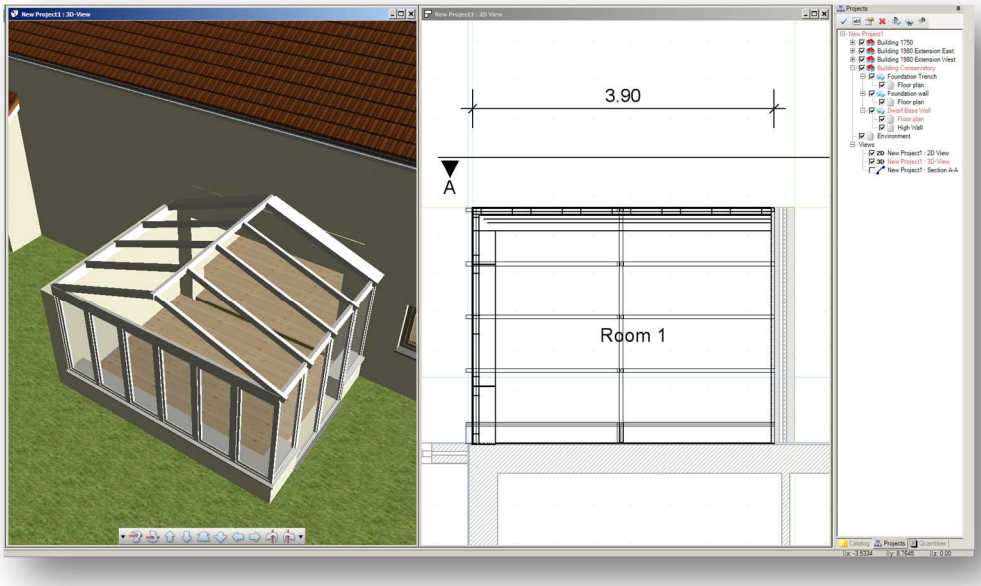


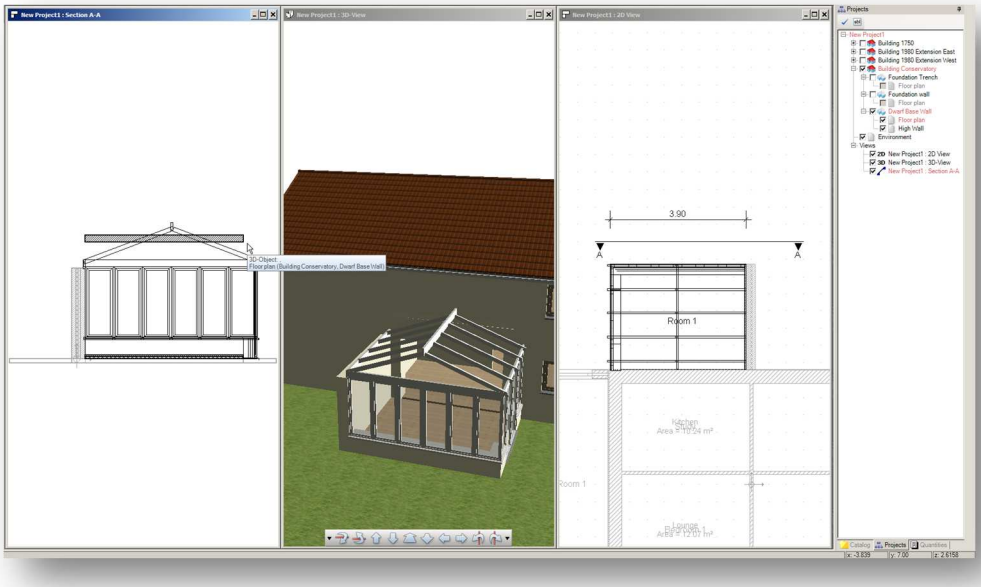
There is an alternative method where you can create an elevation view of your project and then move the object in the elevation view. This limits the object to moving only in 2 dimensions.

Alternatively use the **Selection-Move-Move** tool which allows you to lock either the x, y or z planes, thus giving you greater control over placing objects. Note that this ribbon tab only appears when an object is selected.



The same principle is used to create the roof beams, which also have to be rotated into position. You need only place one beam in this way, and then use the multiple copy tool to place the remaining beams.

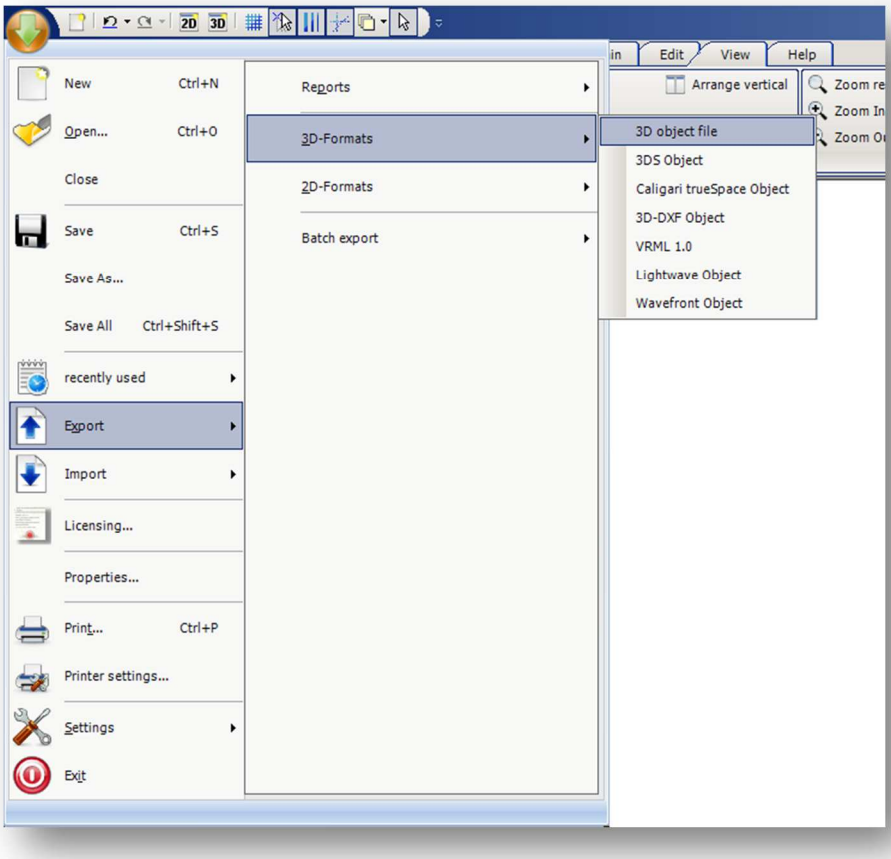




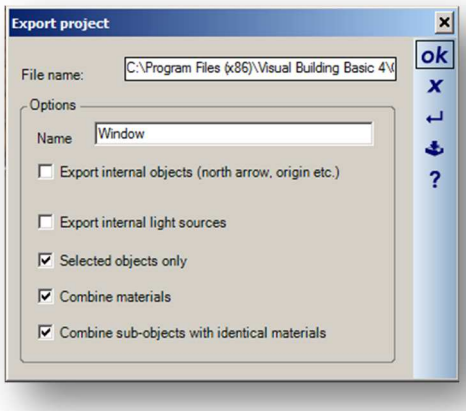
6.4.3 Adding Conservatory Roof Windows

The roof windows were created from the same window used in the walls. The required length of the window can be determined by measuring the dimension in the plan and side elevation views. Resize the window to the measured dimensions.

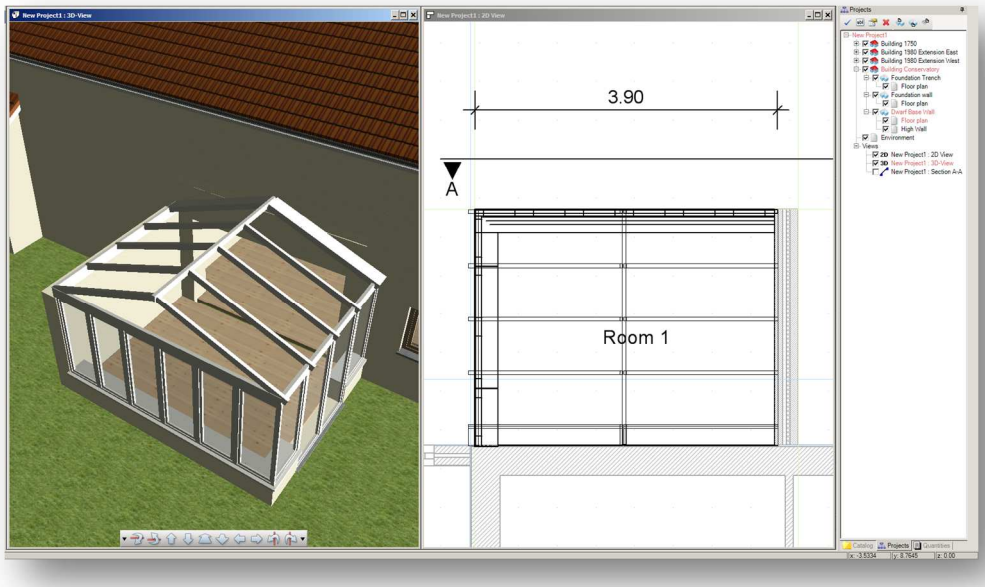
You can now create a 3D object from this window. Select the Application drop down menu, and then select the menu entry **Export – 3D Formats – 3D Object.**



This will activate the Export project dialog, where you should select **Selected objects only.** Save the object either to your desktop or catalogue.



You can now locate this new window object in your 3D Object catalogue, place and rotate it exactly as with the previous timber objects.



Project saved as tutorial1-19.cyp

Of course you can always use a standard roof in the same way the conservatories in the catalogue were created.

7 Cosmetic Changes to Project

The following was completed during the next step, but was just a matter of repeating what had already been achieved in previous sections.

Add 3 windows rear of Building 1750

Add foundations to Building 1750

Add foundations to Building 1980 Extension East

Delete Section A-A

Rename the Conservatory from Room 1 to Conservatory.

Project saved as tutorial1-20.cyp

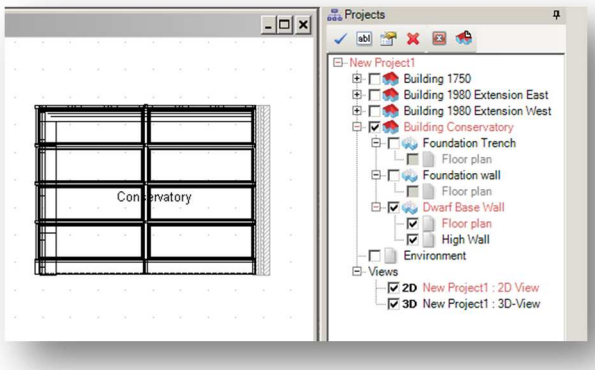
7.1 Moving select Objects to New Layers

When we created the conservatory timbers we created them as part of the Dwarf Base Wall. You can verify this by switching the Dwarf Base Wall on/off in the Project tree for either the 3D view or 2D view.

Let's create a new layer called Conservatory timber and then move those timbers to this new layer. This will then allow us to switch on/off the timbers individually. We could also create an alternative style of conservatory timbers on yet another layer if we wished.

So to be clear what we are editing, ensure the 2D view is your current window, in in the Project tree, disable all buildings except the Building Conservatory. (You also do the same in the 3D view if you wished, but I suggest not).

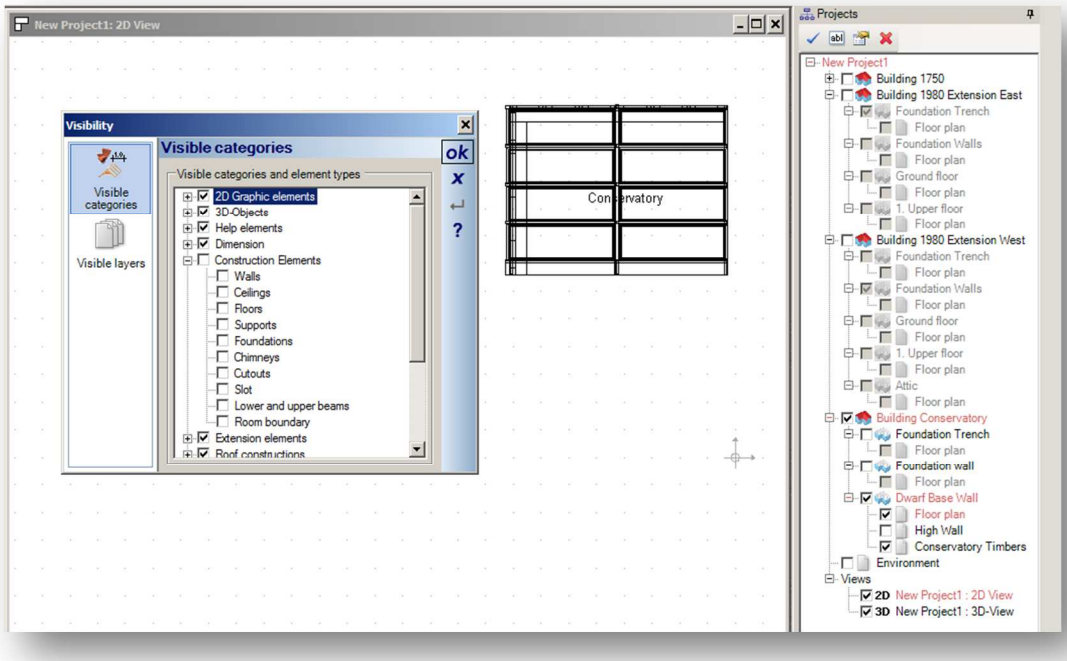
Your Project tree and 2D view should look like this.



Right click on the Dwarf Base wall entry to active the context menu and select **New Layer**. The Layer dialog will then activate allowing you to enter **Conservatory Timbers** as the new layer name.

If you now drag a selection box around the conservatory in the 2D view, you will see that the entire conservatory in the 3D view becomes selected.

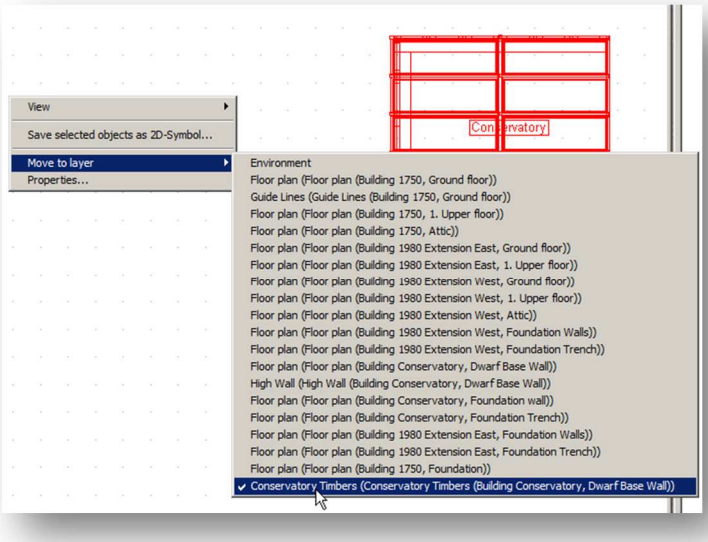
We can switch off the items that we don't want to select, by right clicking the 2D view, select Visibility from the context menu, and disable all the construction elements.



If you now draw a selection box around the Conservatory in the 2D view, you will see only the timbers and windows now become selected in the 3D view.

While these are selected, right click the 2D view and from the context menu, select **Move to layer,** and a list of all floors and layers will display.

Select the Conservatory Timbers and all the selected objects will move to the new layer.



You can verify these have moved by, by switching on/off the Conservatory Timbers, within the 3D view. This is a powerful feature and allows you to move almost any object between floors or layers. Also hopefully now you will begin to realise that Buildings, Floors and layers are all layers within your project.

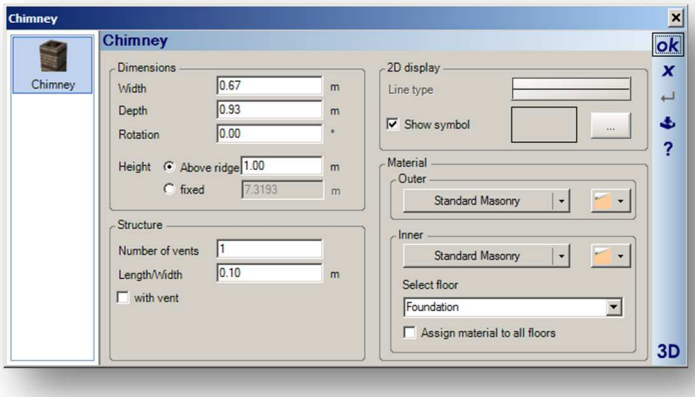
Remember to enable your Construction elements again in the 2D Views Visibility dialog.

Project saved as tutorial1-21.cyp

8 Adding a Chimney

We will add a chimney to **Building 1750 – Ground floor,** so ensure that this is your current layer.

There is a chimney tool in the tool bar which when selected will activate the Chimney properties dialog.



Set the Chimney dimensions and its height above the roof ridge.

Place the chimney in the 2C view and it will automatically extend through all floors.

We have placed the chimney on the ground floor, and so it will appear when the ground floor is selected. Our chimney is not the same width through its height, so we will just add the core column dimensions for now.

Project saved as tutorial1-22.cyp

9 Creating an Inglenook

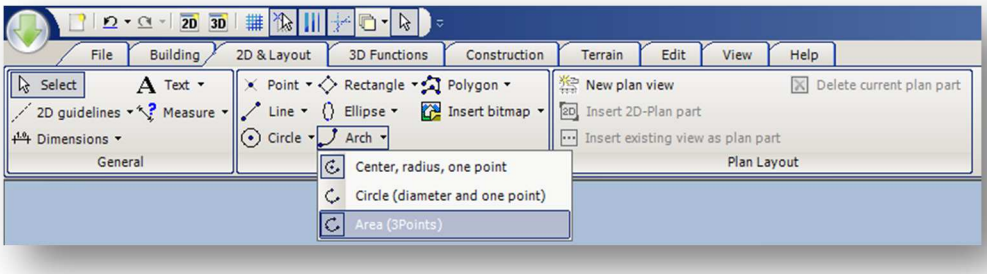
To accompany our chimney, we will now reproduce a small inglenook fireplace. To achieve this we will use the 3D Constructor tool. This tool is a feature only in the Professional and Premium versions. If you are not using these versions then you can either skip this section.

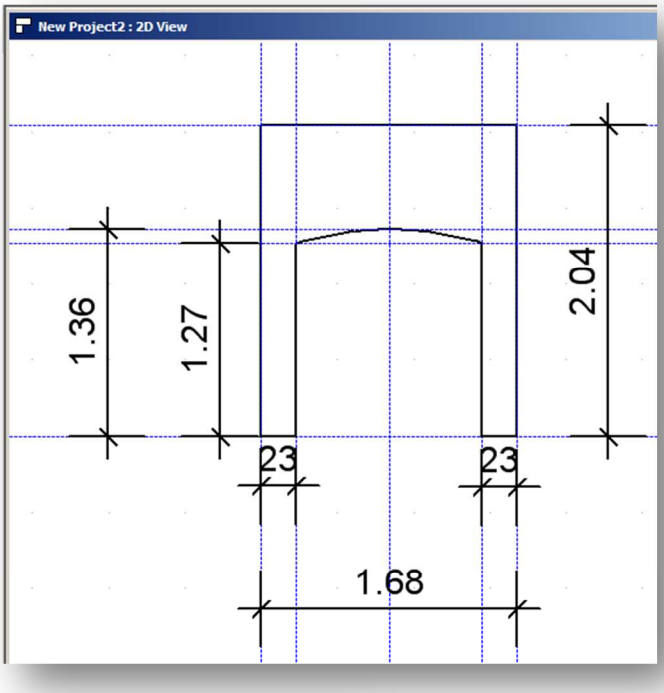
You can also skip this section if you are not interested in an inglenook fireplace; however the methods and tools used here are tools that you can use in many similar situations and so well worth understanding.

To accomplish this you can create within your current project or start a new project. I have opted to create this in a new project.

9.1 Method 1 Using Outline shape

We will first create a scaled measured outline front elevation view of the inglenook.



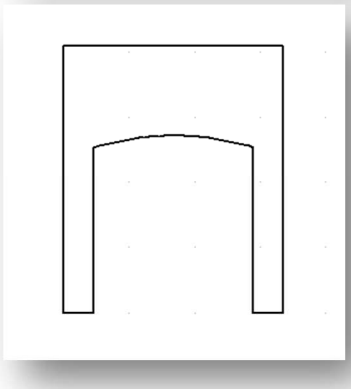


We will set out some guidelines to define our block size 1.68m x 2.04m

The side walls are 0.23m wide and the arch base ia 1.27m with a peak at 1.36m

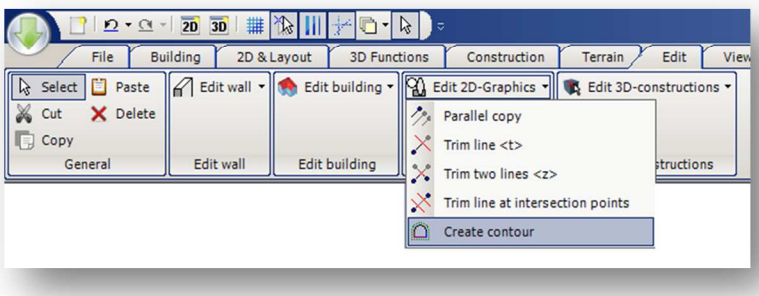
We will now use the **2D Graphics** tools to draw the outline, first drawing the arch between 3 points.

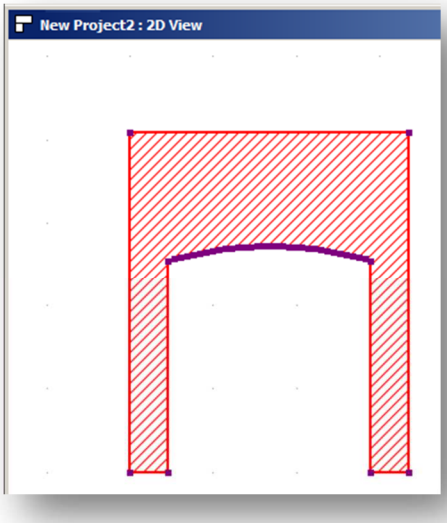
The dimension lines are solely for reference here and are not required.



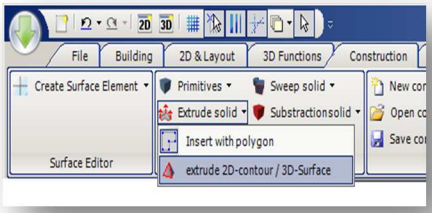
Using the 2D line tools complete the front elevation outline.

We will use the Edit 2D Graphics tool to create a contour from our outline. This toll is located in the Edit tools.

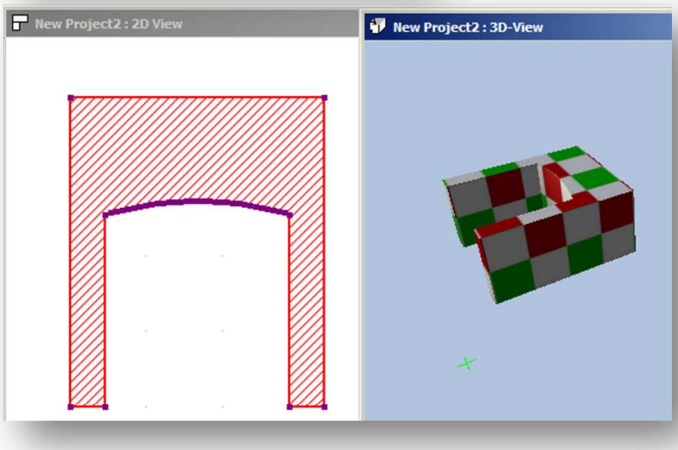




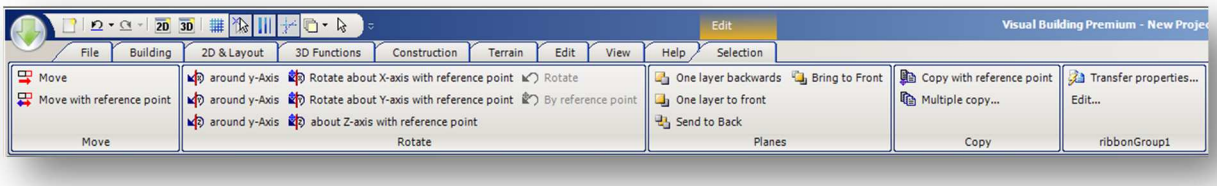
Select all the points by dragging a selection box around them. Then click on **Create Contour.**



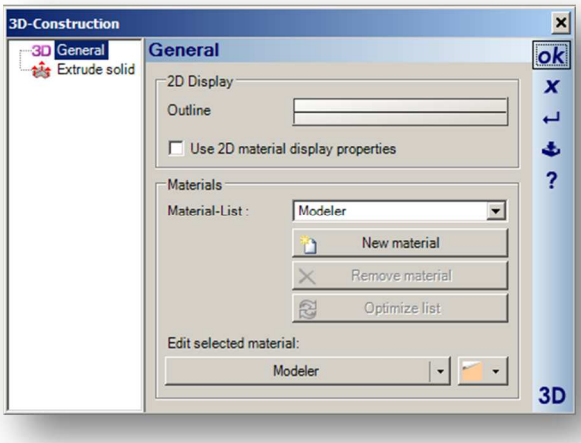
We will then extrude the 2D outline into a 3D object, using the **Extrude solid / extrude 2D contour**



Using the Rotation tool, rotate the 3D Construction object by 90 degrees in its x-axis. Note that the

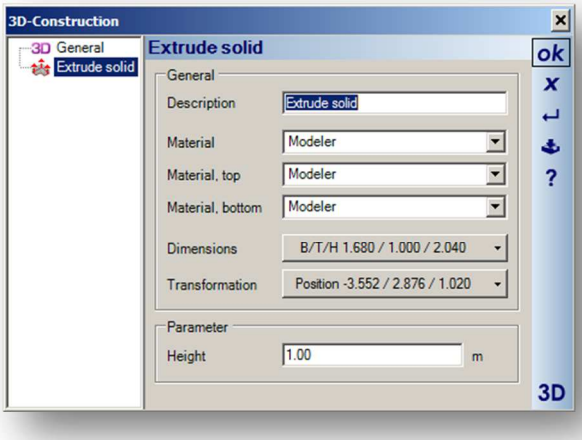


Ribbons selection tab only appears when you have an object selected.

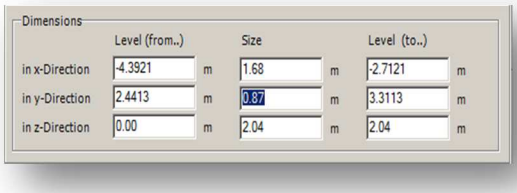


We can now edit the 3D Construction objects dimension, in this case its depth, by double clicking the object and activating the 3D Construction dialog.

The tree will display the 3D Construction objects parts, and in this case only includes The Extrude object, which you should select.

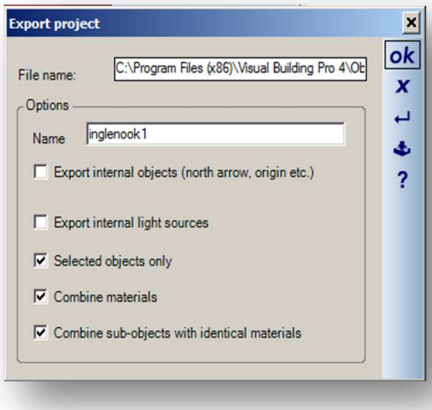


Click the **Dimensions** button and you can edit the dimensions, in this case changing the depth from the default 1m to 0.87m.



Now to save the edited object into the catalogue as an object, select the object and then select the menu **Application menu-Export- 3D Formats-3D Object**

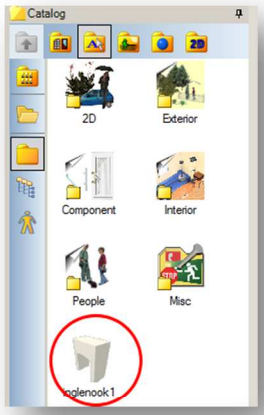
Select the file location to save your object.



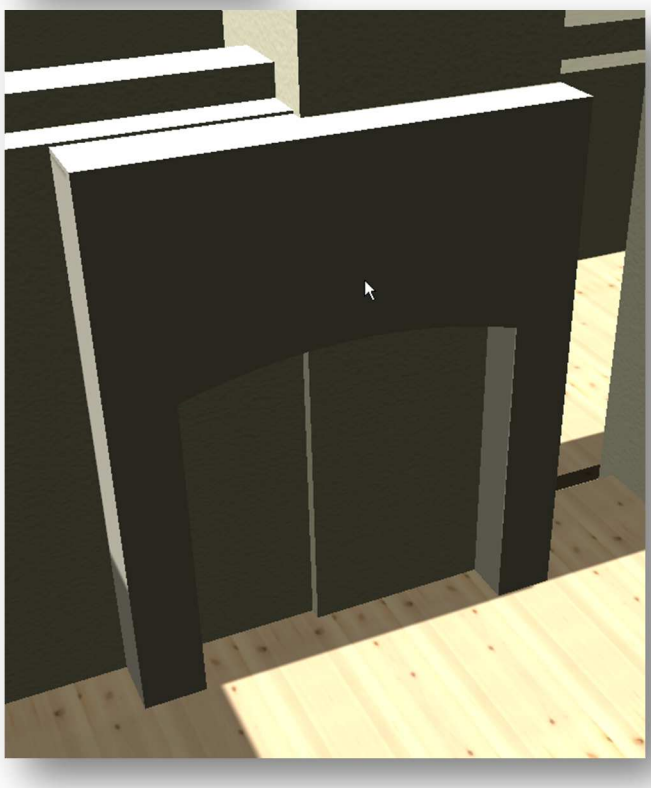
Then from the Export project dialog, name the object and check the bottom 3 options.

If you get an error and attempted to save into the catalogue see section **35.4 Where are my files located**

You can either save the object to the desktop, another legal location or raise the level of your program to Administrator. I suggest the latter as explained in section 35.4, in which case t=you will need to save your project, make the admin changes and restart your program and reload your project.



So when you have administrator rights and have saved the object into the catalogue, you will locate the object in the catalogue.



Project saved as tutorial1-23.cyp

Now when you open your main project (saved as **tutorial1-21.cyp),** you can select and drag your Inglenook into position.

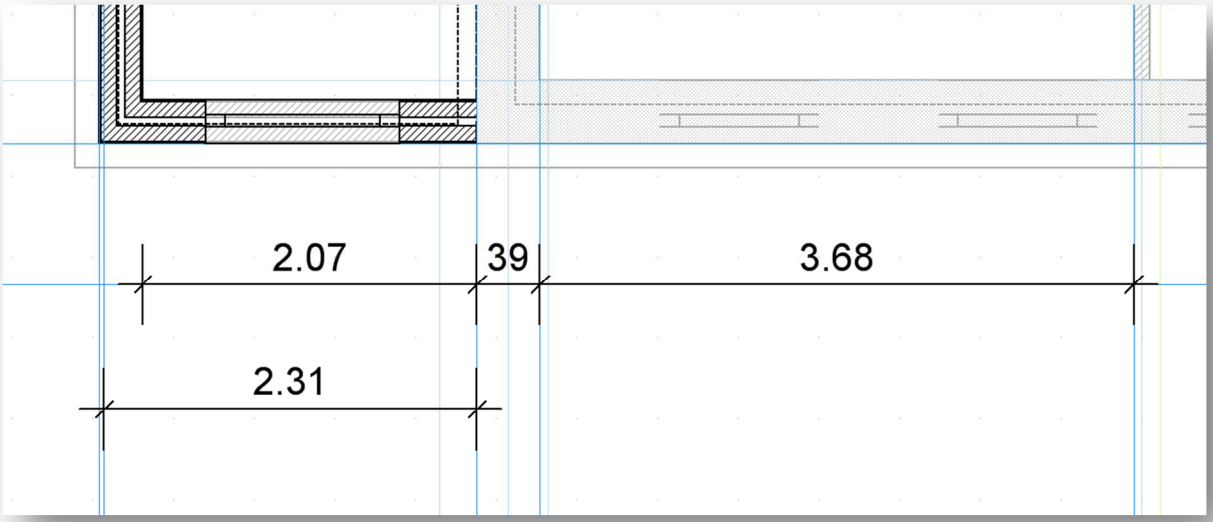
Project saved as tutorial1-24.cyp

10 Wall Editing / Moving

So far we have simply placed walls at measured locations, but what if we want to move the walls or resize walls?

To demonstrate these wall edit tools we will move our west external wall.

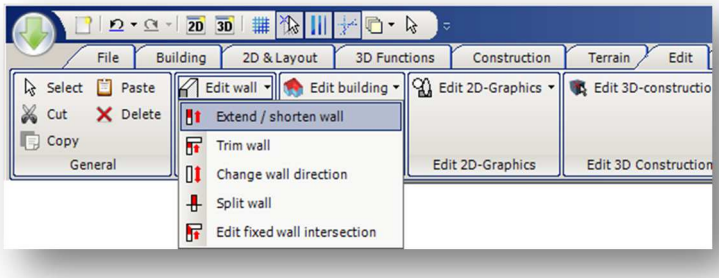
Lets assume that the internal wall length currently 2.07 m should have been 2.31 as below:



This edit could be for any number of reasons, for example a change of mind, an error or part of a redesign process.

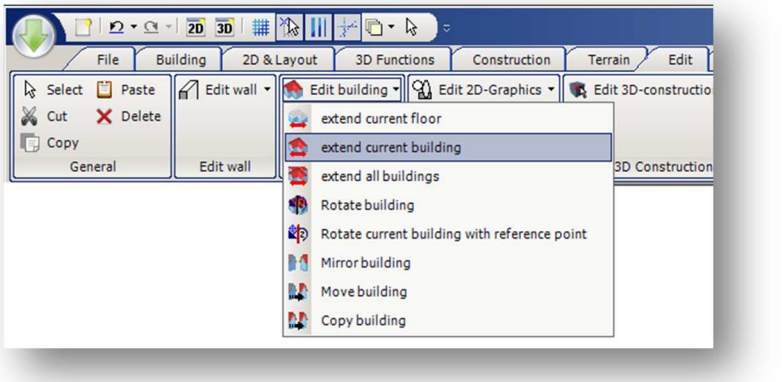
Project saved as tutorial1-25.cyp

If you need to extend a single wall then you would use the **Edit-Edit wall Edit wall** tools.



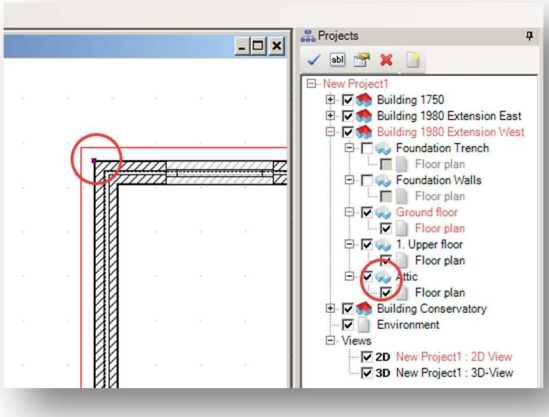
These are the tools you can use to move or cut a wall. It is possible to move each wall, one at a time

However we need to several walls including the foundations, (a total of 4 walls) and we can achieve this by using the **Edit-Edit building** -**Edit building** tools.



Click on the **Extend current building**. You will then be invited to draw a rectangle using 3 points to define the section of the building that you wish to move. (Follow the prompts in the Status bar. Bottom left of the screen). Then select a reference point, for example a wall edge. The toll options dialog will then activate allowing you to set the dx distance to be moved. A negative number should be inserted to move the wall left. So to move the wall left 14 cm, enter -0.14.

The wall will then move. You will now need to adjust the roof. Note that the roof was constructed on Building 1750 and the extended over Building 1980 Extension West, so select the Attic in Building 1750 to select the roof.



When the roof is selected, the roof points will become visible. Click each point once to select it and a second click to place it. You should use a vertical guideline to ensure that the roof points are placed correctly. Failure to place the roof points in the correct position will result in strange effects upon your roof.

Project saved as tutorial1-26.cyp

11 Adding a Porch

You can add the porch within the existing project or create a new separate project for the porch. Normally such a porch would be a separate building project to an existing building and so we will create a new project. On completion the porch can then be added into any existing or future project.

Our Porch Specification:

Foundation: 1200mm deep x 600mm wide This will be determined by your local soil conditions

Floor construction: 75mm concrete on 25mm Jablite on 1000 gauge DPM on 50mm sand blinding on75mm well compacted type one hard-core

Wall construction: 100mm outer leaf of brick construction, 50mm cavity, 100mm Thermalite blocks for inner leaf, tied together with proprietary wall ties and cavity insulation.

Wall securing: Fir fix, mechanical fixings to secure the new structure to the existing.
Three coat plaster finish for internal walls

Roof: to be 100mm x 50mm C16 timbers on a wall plate to attach to the house
Redland 49 roof tiles with slates under felt and batten, lead fillet at the abutment joint

Ceiling: to 100mm x 50mm C16 timbers with 12.5mm plaster board, two coat plaster finish
Windows and doors to match existing.

11.1 Create New Porch Project

Create a new project using a scale of 1:50

As our porch will join onto an existing building we will first draw just a portion of that building, in order to resolve the porch position relative to the building, including the floor heights.

So we will name our project as **Porch** and name Building 1 as **Existing Building**

We will also change the measurement system to mm. (Right click on the grid icon in the toolbar).

You can also change the grid to 100 mm if you wish, but we don't onto to use the grid so much.

Project saved as Porch Tutorial 1.cyp

11.2 Place Walls of Existing Building

We will first place some guidelines

We will now create the existing wall, which consists of render, block, cavity, block and plaster.

In order to show the floor level of our partial building, we can insert some **Room Boundaries** as walls.

Our Porch is to be accessed via an existing window, which will become a doorway, so let's also insert that window.

We can place some dimensions just to check we have the correct placement, and then delete them again if not required.

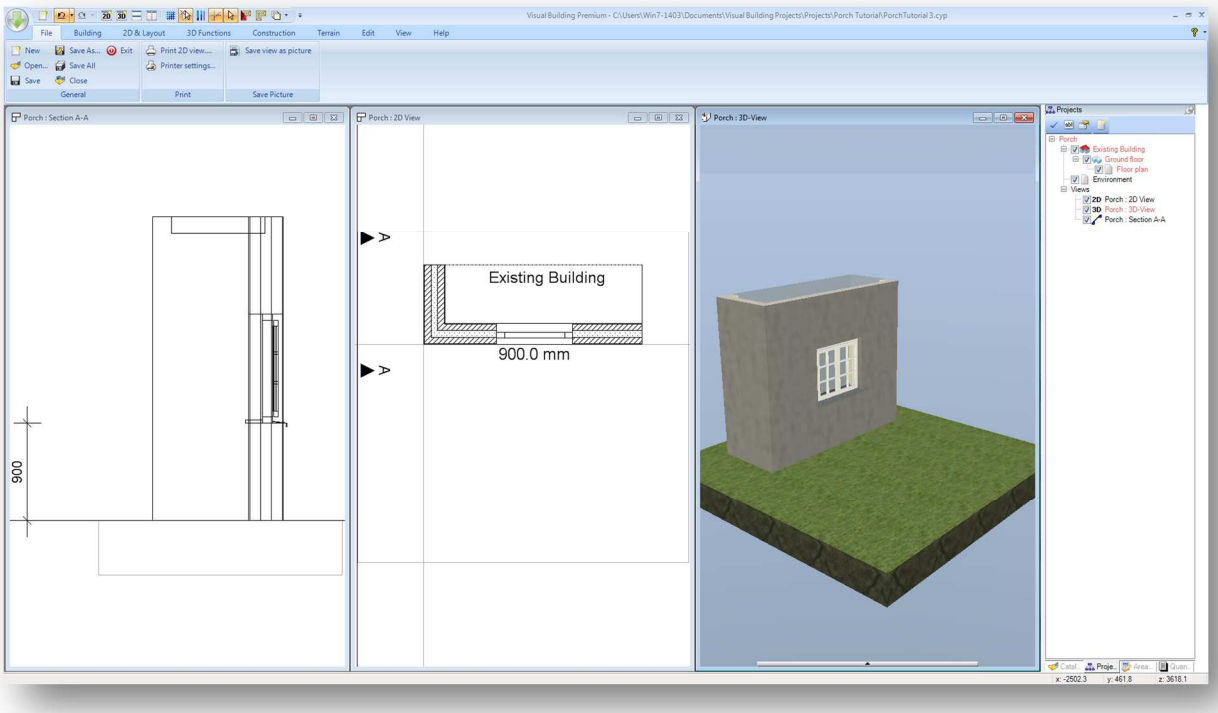
Project saved as Porch Tutorial 2.cyp

11.3 Set Floor Height of Existing Building

We are not interested in the structure of the existing floor, but its height is important as we will use it as a reference point for our new porch floor.

11.4 Placing the Porch Walls

Place the walls where we require them. I prefer to place the walls first, and then the required foundations that the walls need. So we will create an elevation view of the existing building to check and set the floor height.



Note that the section view is set to show hidden lines so that we can see the floor and window positions. To change the hidden line status right click on the section / elevation view and select Properties to activate the 2D view properties dialog, where you can select **Hidden line removal**.

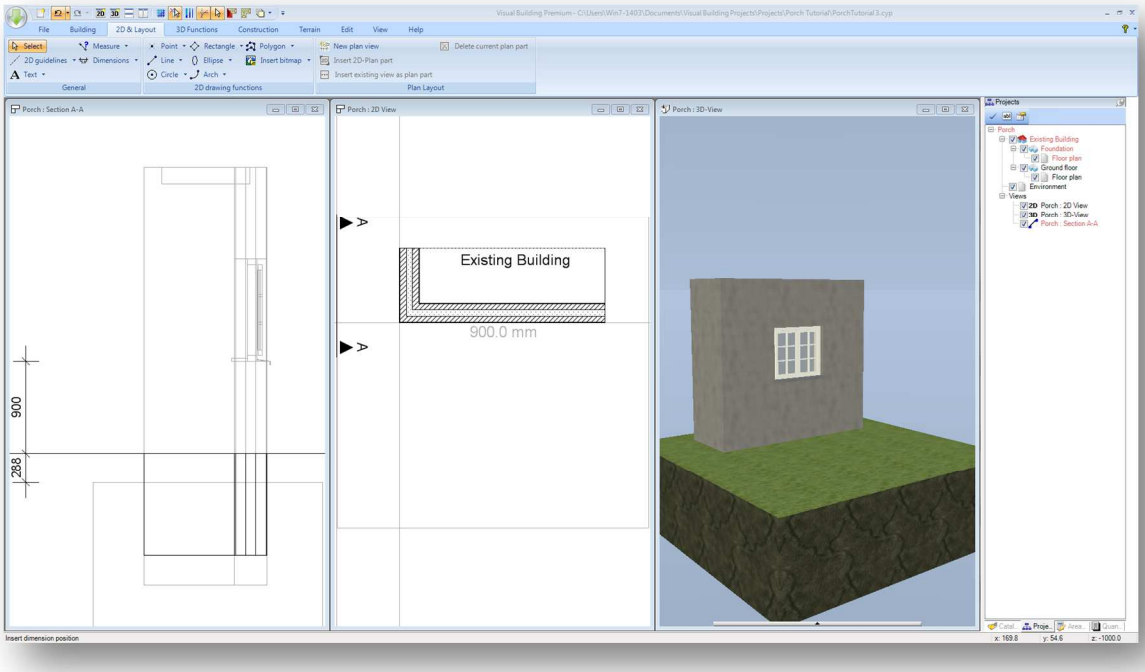
Project saved as Porch Tutorial 3.cyp

11.5 Setting the Natural Ground Level

We will use the environment block to represent the Natural Ground Level. Currently the position of the environment block is set to be the same height as the existing floor level. It should be lower as in

our case the external natural ground level is 288 mm lower, and so we will lower the Environment block by 288 mm. But first we shall add a new floor below and call it the foundation.

Project saved as Porch Tutorial 4.cyp



11.6 Create Porch floor plan

We can now create a new building a name it Porch.

Our porch external dimensions are not to exceed 3 sq m external measurement, and will be centred on the existing window aperture. Our porch external width will be 1800 mm and so to keep under the 3 sq. m our depth will be 1610 mm. These dimensions include any rendering to be applied.

11.7 Place Guidelines to define porch position

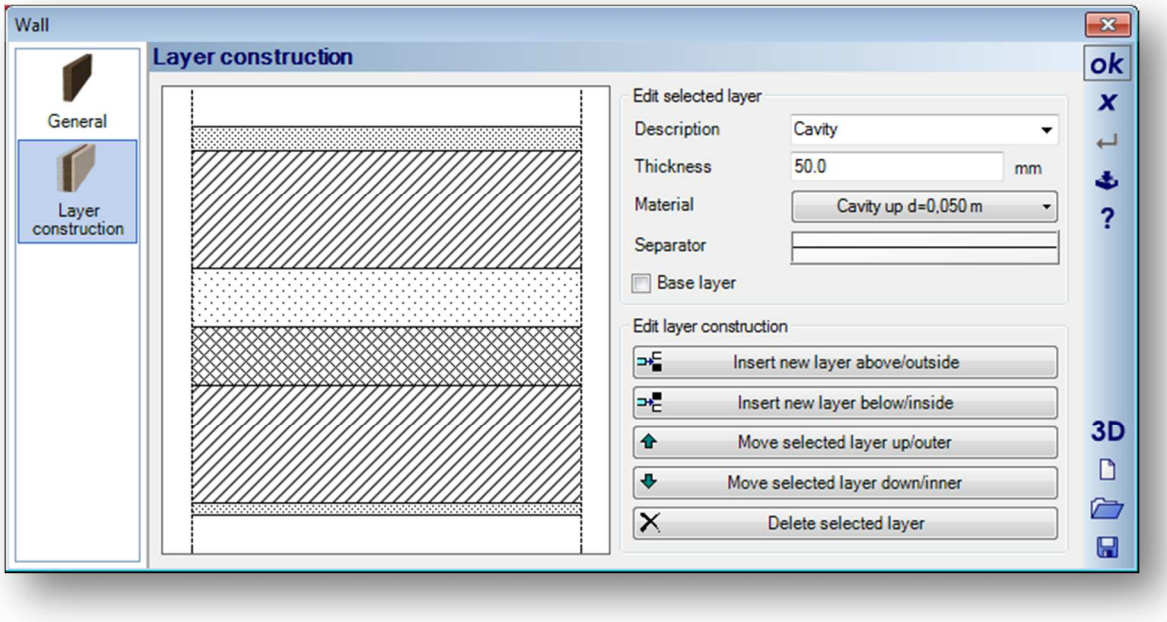
On the **Porch - Ground floor - Floor plan layer**, draw a guideline through the centre of the existing aperture. Using the numeric guideline tool place a guideline (1850/2 mm) each side of the centre line. Remember how you can actually enter the value 1850/2 which will automatically calculate 925mm either side of the centre guideline.

Project saved as Porch Tutorial 5.cyp

11.8 Define Porch Walls

We will now define the wall layer construction that we will use for the porch. In our tutorial we will use 100mm block, 50 mm cavity, 50mm insulation 100mm block. We are using 100 mm block on the external wall because the final finish will be rendered (20mm). The internal block will have 12mm plasterboard applied to it.

Your wall construction may and will differ, for example your external walls may be brick, and your cavity and insulation will differ, often determined by building regulations if applicable. Your may decide to apply wet plastering instead of plasterboard. You may need to batten your wall, or prefer to uses dot and dab to apply the plasterboard. Whichever construction you decide, you can detail it within your wall layer construction.



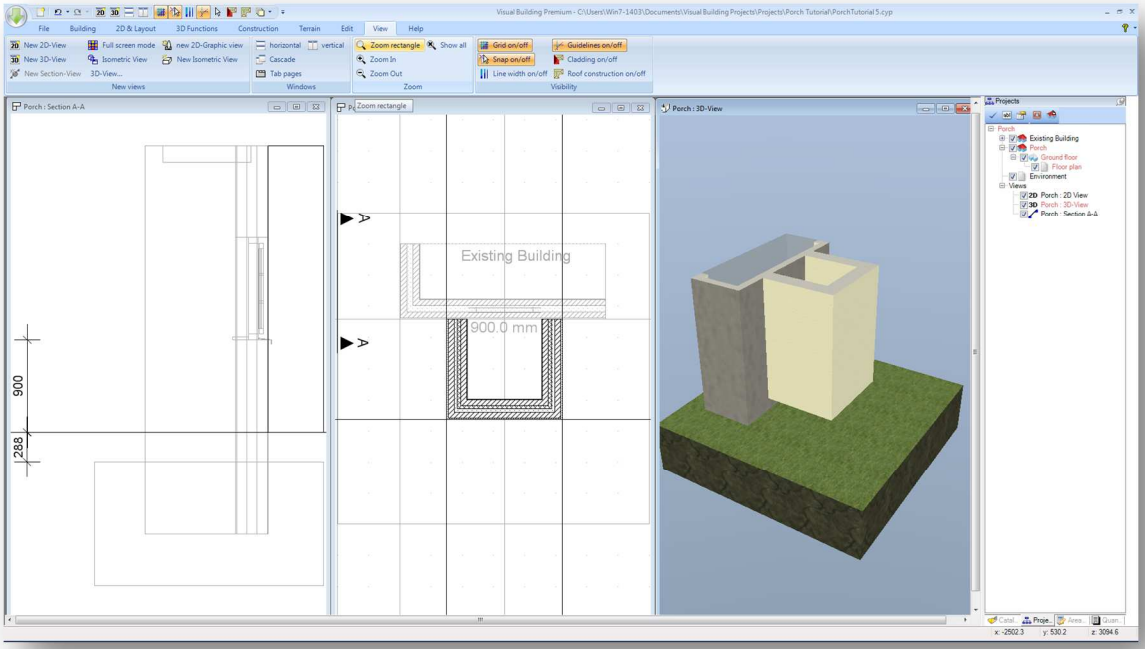
When you have designed your wall construction, you should save it as a wall template for future use, using the Save as template button, bottom right of the Layer construction dialog.

11.9 Add Porch walls

Using this wall layer construction. Place your wall, snapping it to the external wall guide lines drawn earlier. While placing the wall, use **Ctrl + w to** select the outer wall edge as the snapping edge**.**

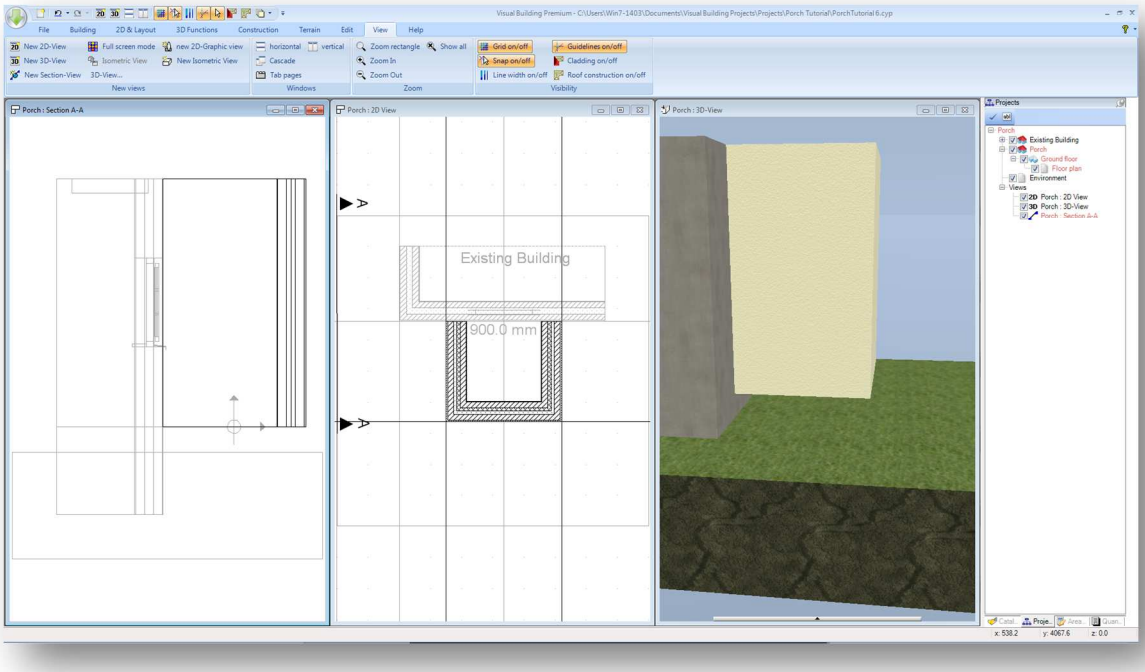
The following view shows the new porch wall. Note that the wall is floating, and that because we have not set the starting height of the wall, or added any foundation.

Project saved as Porch Tutorial 6.cyp

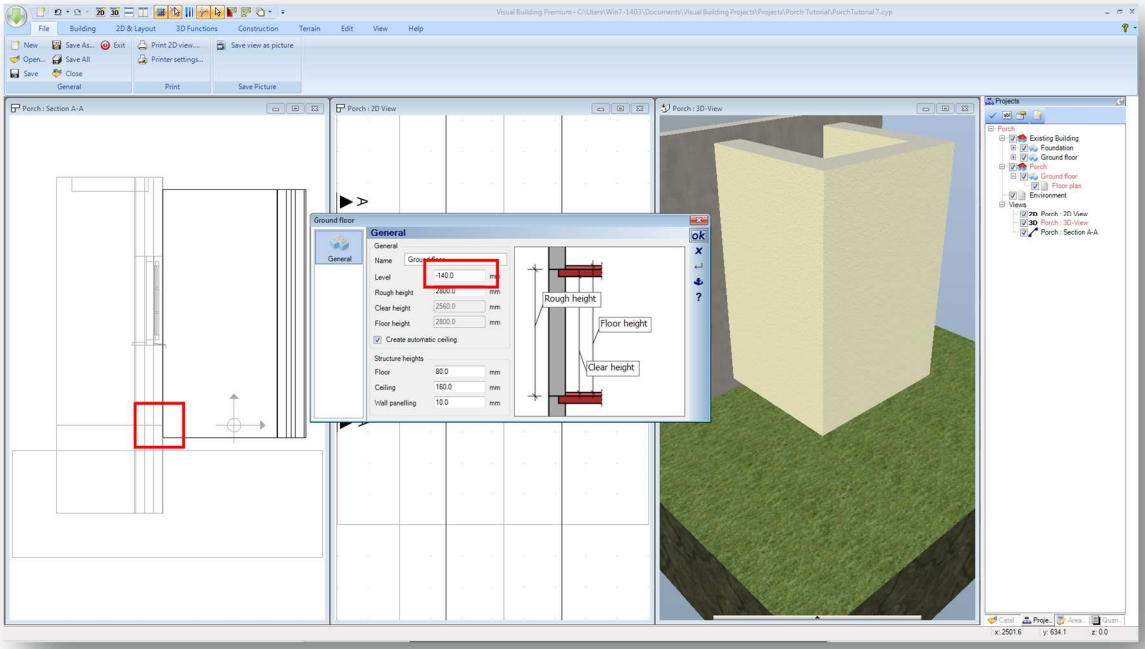


11.10 Adjust Porch ground height

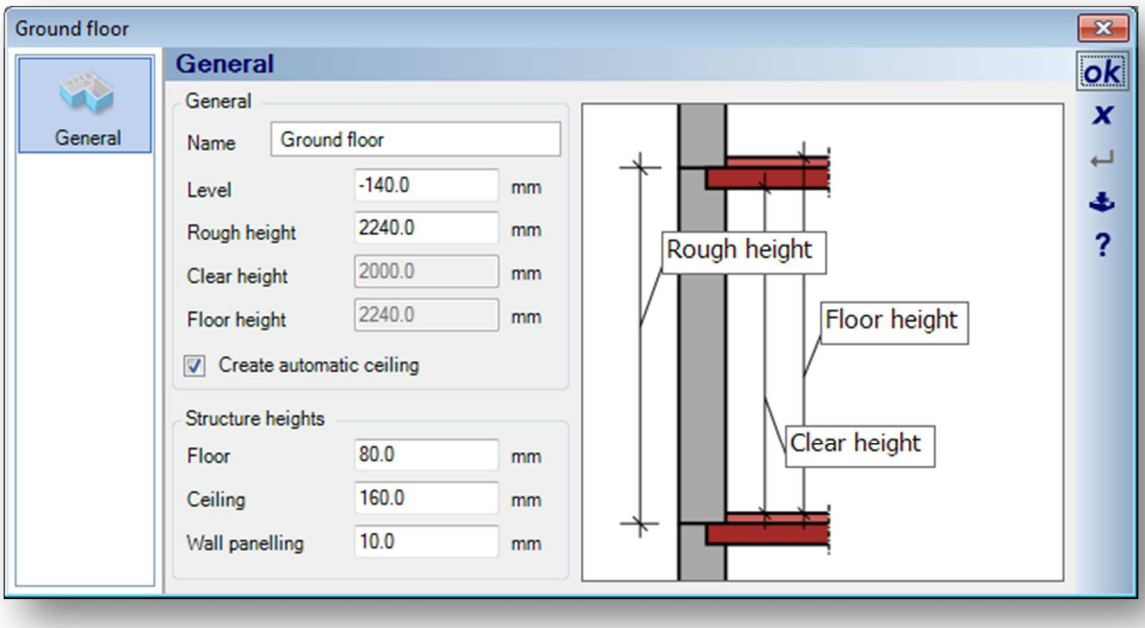
First we will rectify an error, as our elevation view is not wide enough to show the entire porch elevation. To rectify this, delete Porch section A-A view and delete the elevation A-A marker in the plan view. Redraw it taking care that the entire porch elevation is contained within the view.



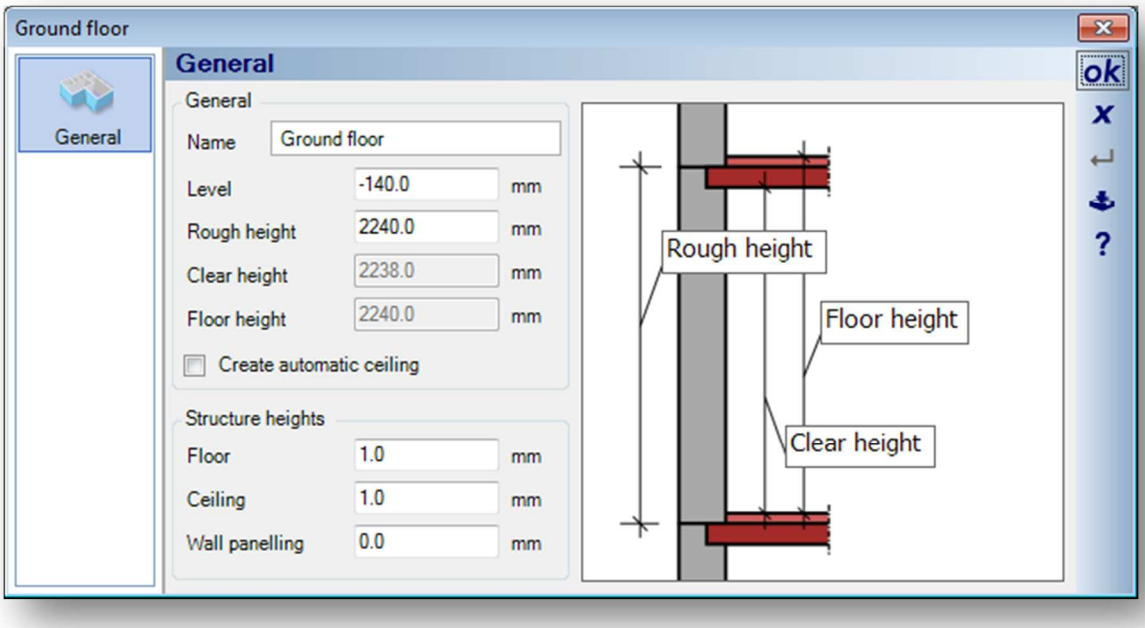
The floor level of our porch will be 140mm lower than the floor level of our existing buildings floor. To achieve this double click on the **Porch – Ground Floor layer**, and in the Level field enter -140mm. On clicking OK, you will see the floor level of the porch drop by this amount.



At the same time we will also reduce the floor to ceiling height to be 2m by reducing the Rough height by 560mm. In the Rough height field after 2800, type -560, then OK



Also now let's remove the automatic ceiling and the floor and ceiling dimensions. We do this because our porch will have a vaulted ceiling, and so wont need the automatic ceiling that is normally created.

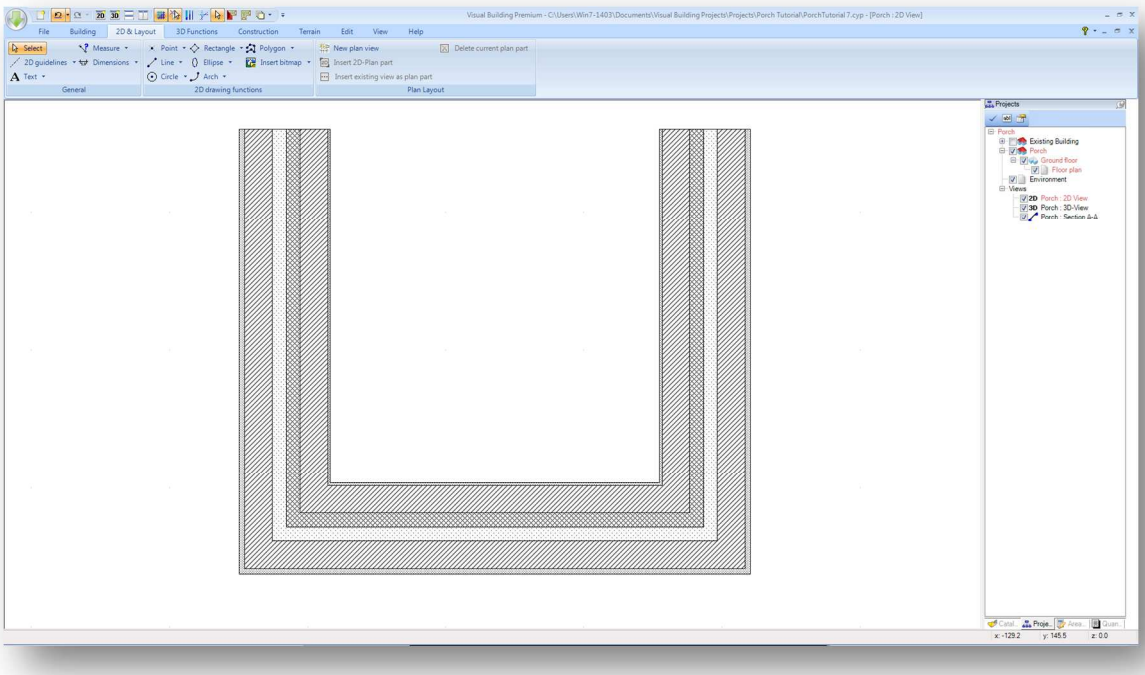


Project saved as Porch Tutorial 7.cyp

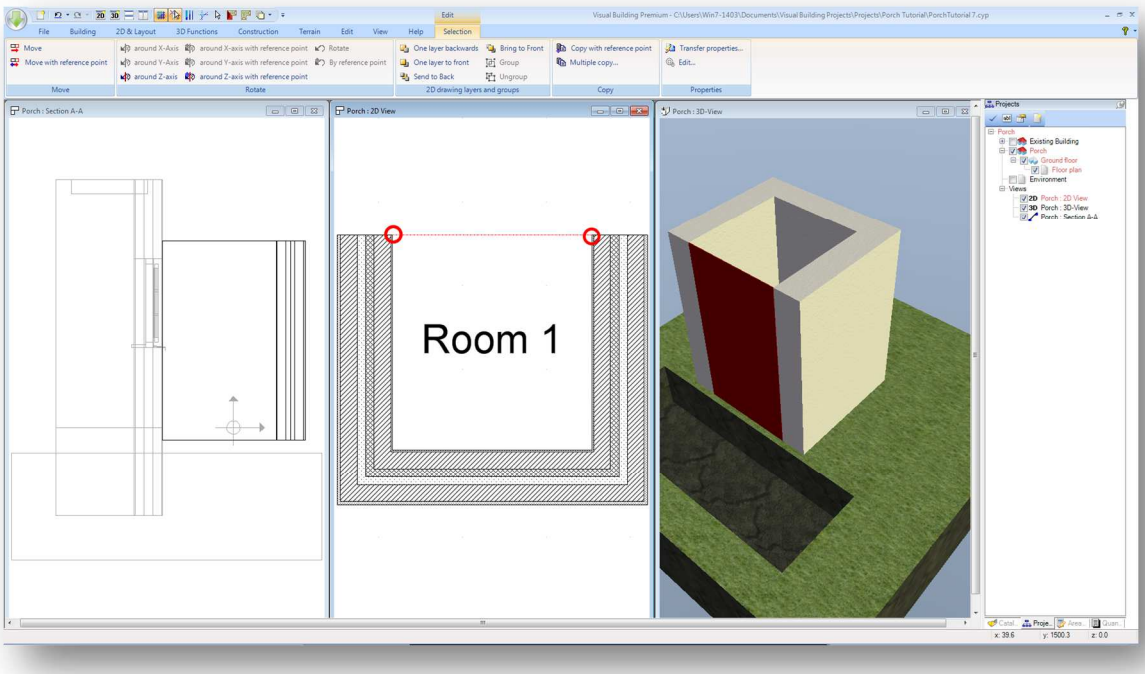
11.11 Adding a virtual wall using Room Boundary

The porch is currently defined by 3 walls, the 4th being the existing building. We will use the Room Boundary wall tool to close off the porch.

To see exactly what we are doing, switch off guide lines and the **Existing Building** layer, and then zoom in:



Now draw a Room Boundary between the two wall ends, clicking on the wall edge as indicated:



When the Room Boundary is added, notice that three things occur:

- A red dashed line appears in the 2D plan view,
- A default room name appears indicating we have a new room,
- In the 3D view a wall element appears. It's red because it's currently selected.

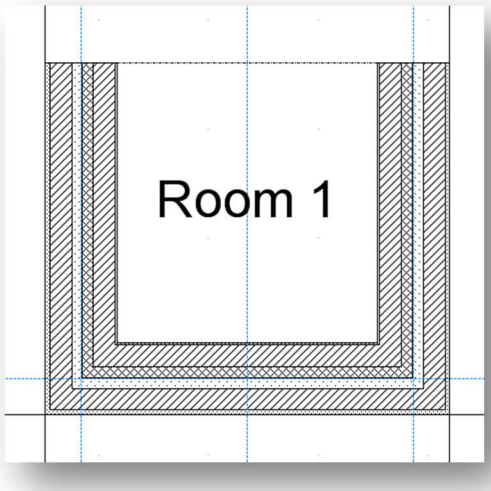
If none of these appear you will not have placed the room boundary correctly.

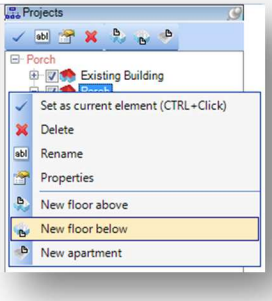
Project saved as Porch Tutorial 8.cyp

11.12 Add Porch Foundation

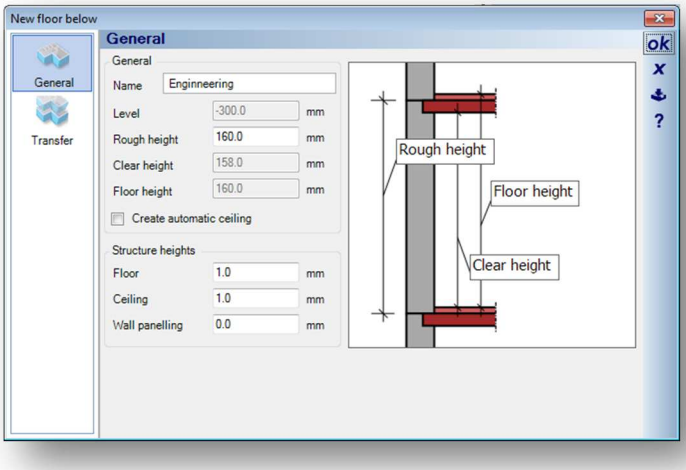
Now that we know where the walls are located it's easier to add our engineering bricks and then foundation.

Using the Centred Guideline tool, click on each wall edge to place a centre line down each wall. It helps if you change the colour and style of your guideline. To do this right click on the **Centred Guideline** tool.

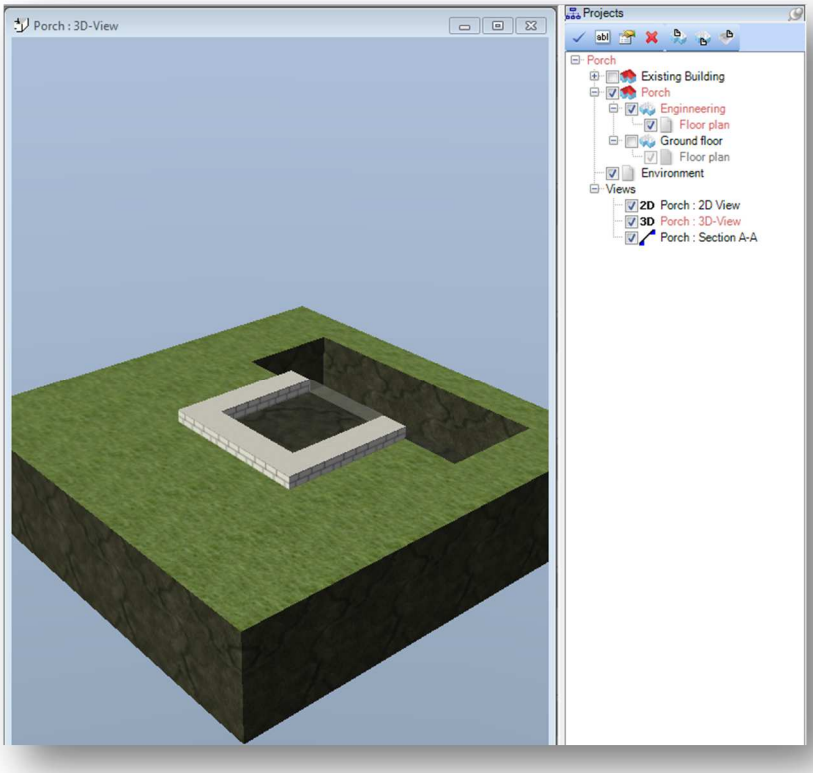




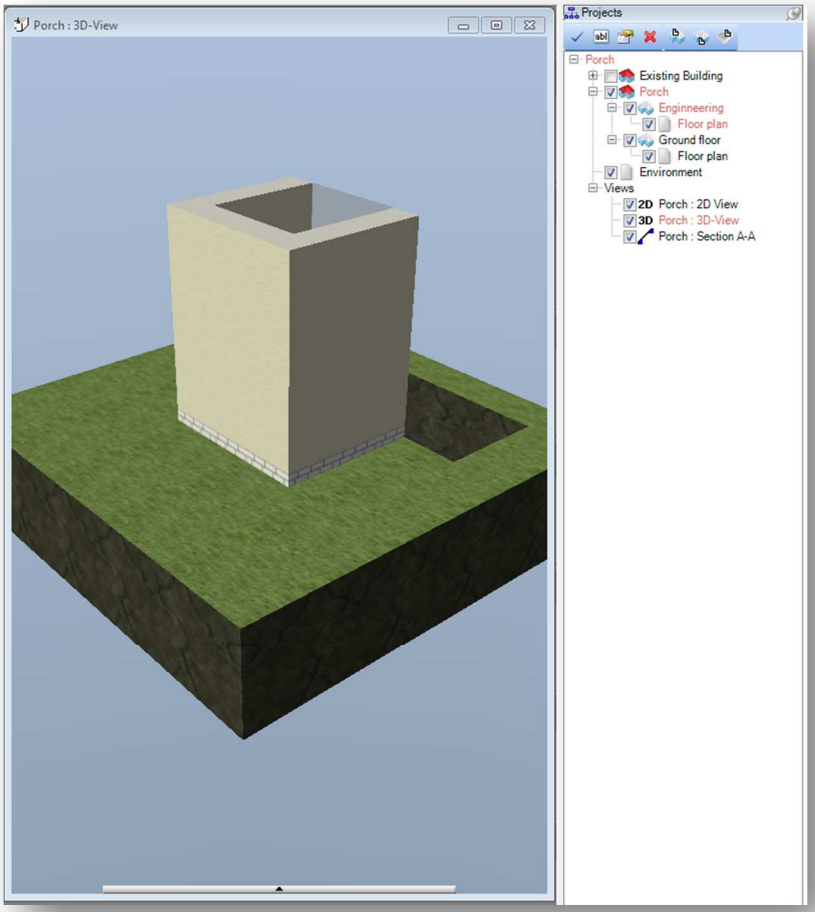
Next create a new floor below the Ground Floor to accommodate the engineering bricks, by right kicking on the Porch layer and selecting **New Floor below**



In our case we will have two rows of bricks, each 65mm high, in addition to 10mm mortar, this is 160mm, make the Rough height of this level 160mm.

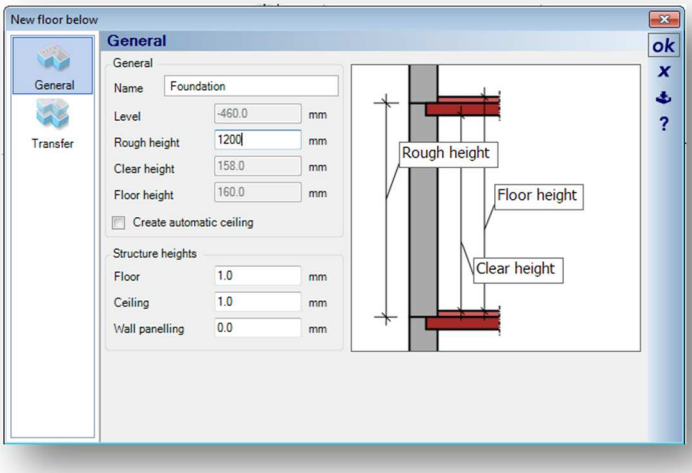


This image shows just the Engineering bricks layer. I have also applied a texture to this layer.

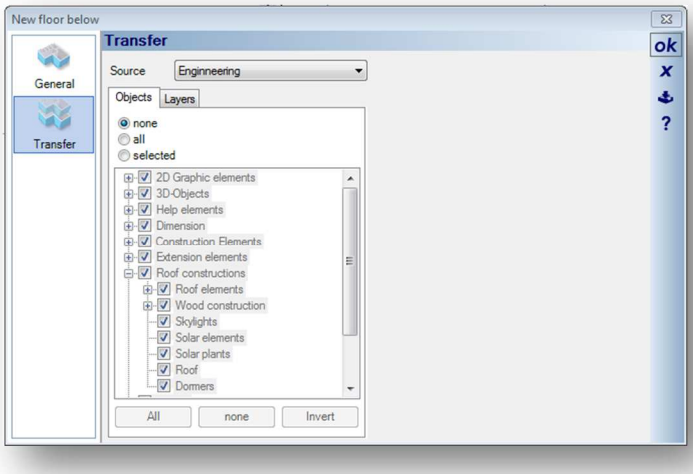


This view shows both layers

We will now add another floor to represent the foundation, so ensure your current layer is the Engineering layer the right click on Porch and select **New Floor below** from the context menu.



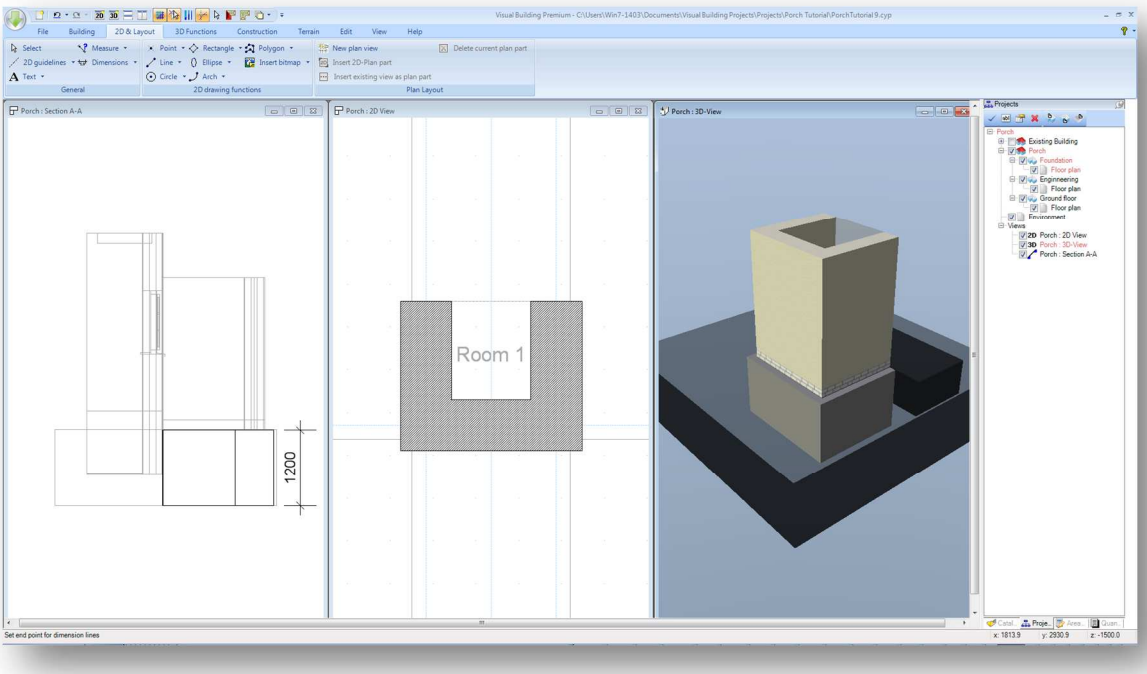
Our foundation is 1.2 m deep, (as stipulated by local Building Regulations for our area) and so we enter 1200mm into the Rough height field, and call the layer Foundation.



Before you click on OK, select **Transfer,** and select **none.** This will create an empty layer without any walls.

We have done this because our foundation wall is wider than the previous walls, and so we now have to insert this new wall size.

Our foundation wall is to be 600 mm wide, so create a new wall type, with a single layer, and then place this wall along the centre lines of the established wall:

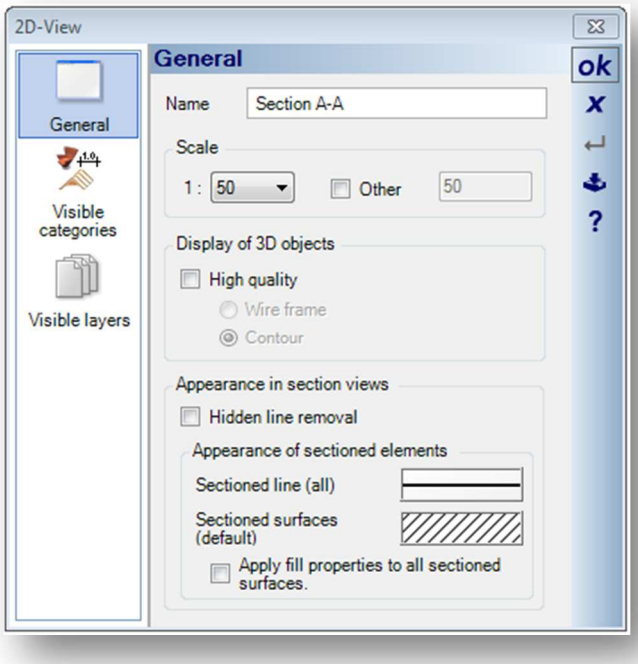


We can now see the foundation depth in the section view. In the 3D view I have applied a glass texture to the Environment block so that we can see the foundation below the ground level.

Project saved as Porch Tutorial 9.cyp

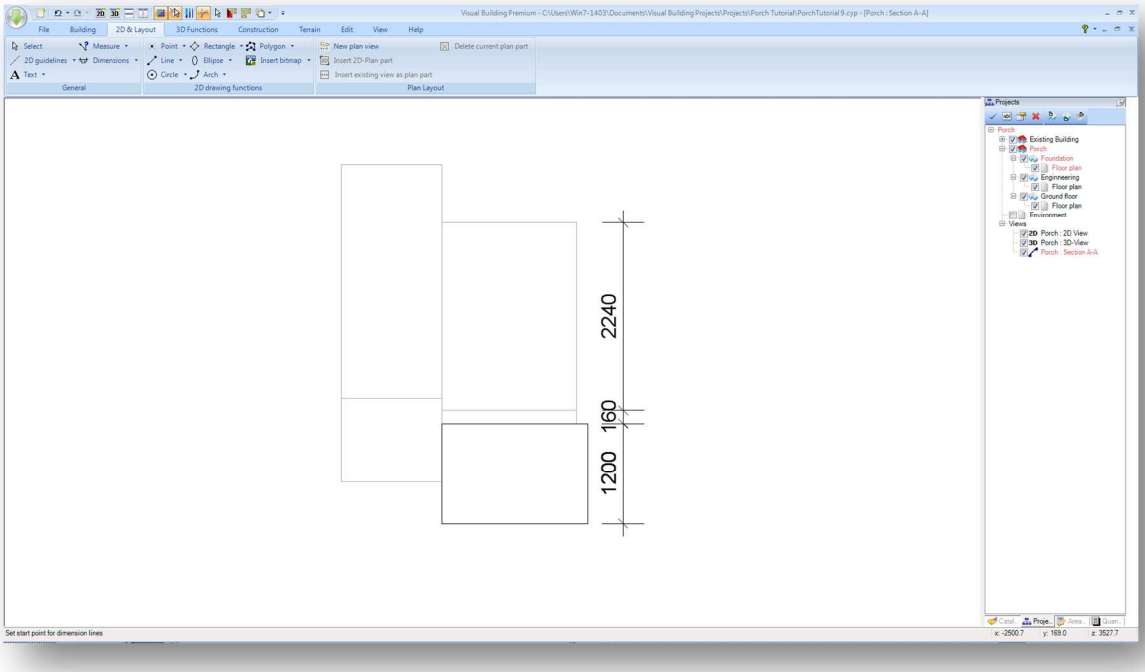
If you examine the section view, you will note that it is showing the hidden detail such as the cavity wall.

Right click on the section view and from the context menu select **View – Properties**

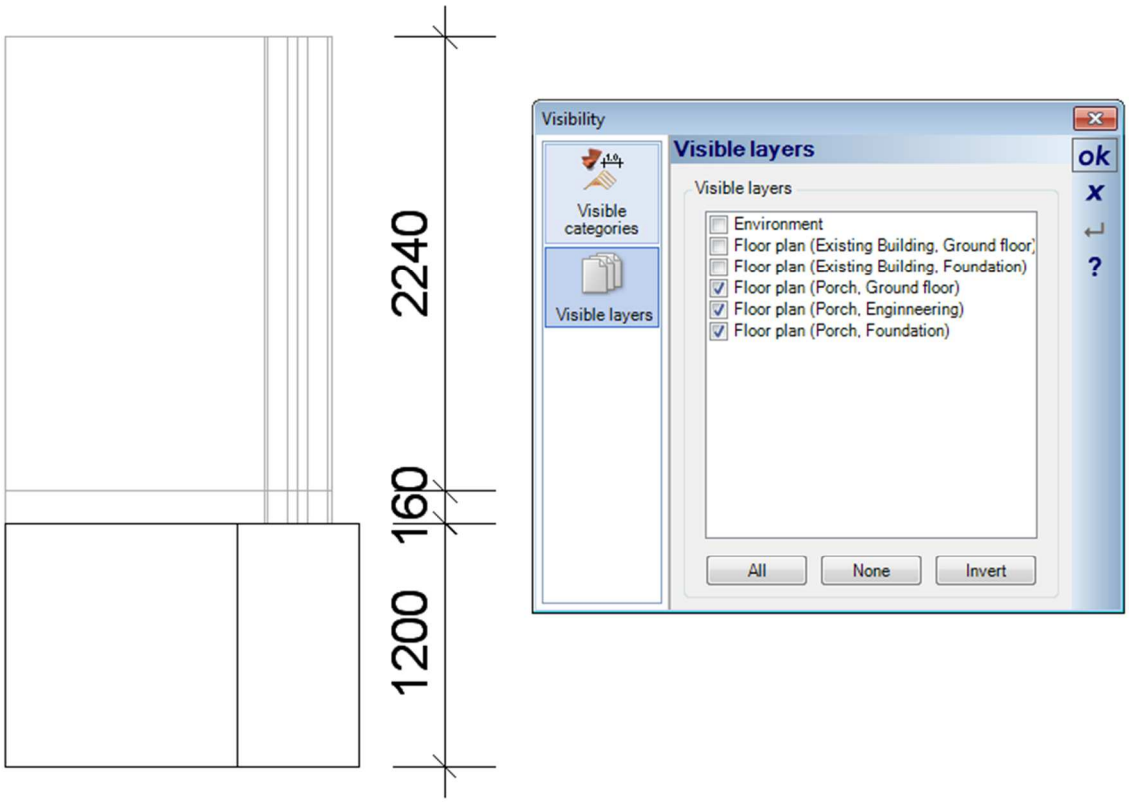


In activated 2D- View dialog, you can now select **Hidden line removal.**

This now creates a clearer view into which you can add dimension lines.



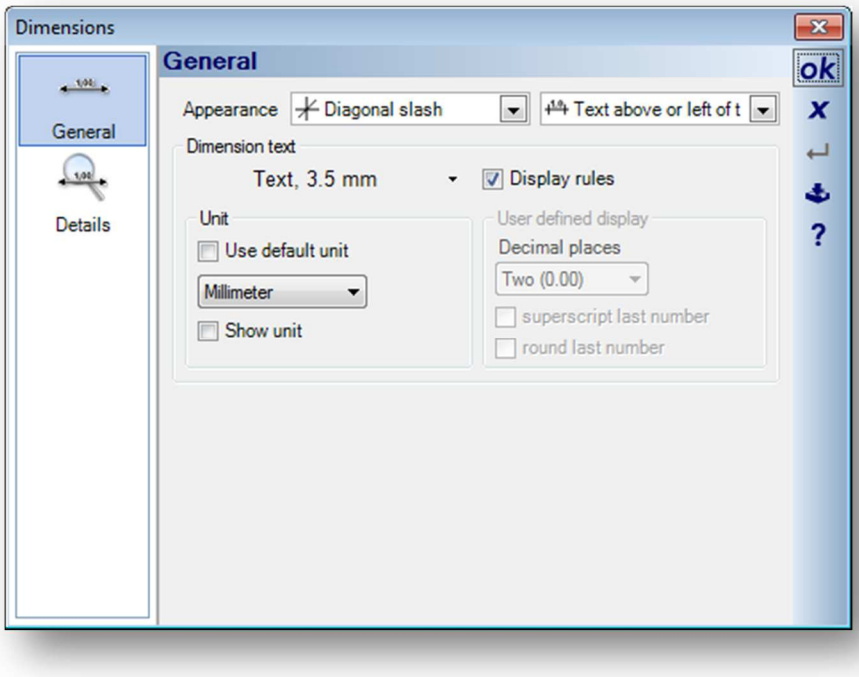
Right click on the 2D section view and from the context menu select Visibility, and this will activate the Visibility dialog from which you can choose to hide / show specific views:



Project saved as Porch Tutorial 11.cyp

11.13 Edit Section View

We can use this view to add section elevation or section details, but first let's edit the dimension text size. To do this select and then double click on the dimension line and this will activate the Dimensions dialog:

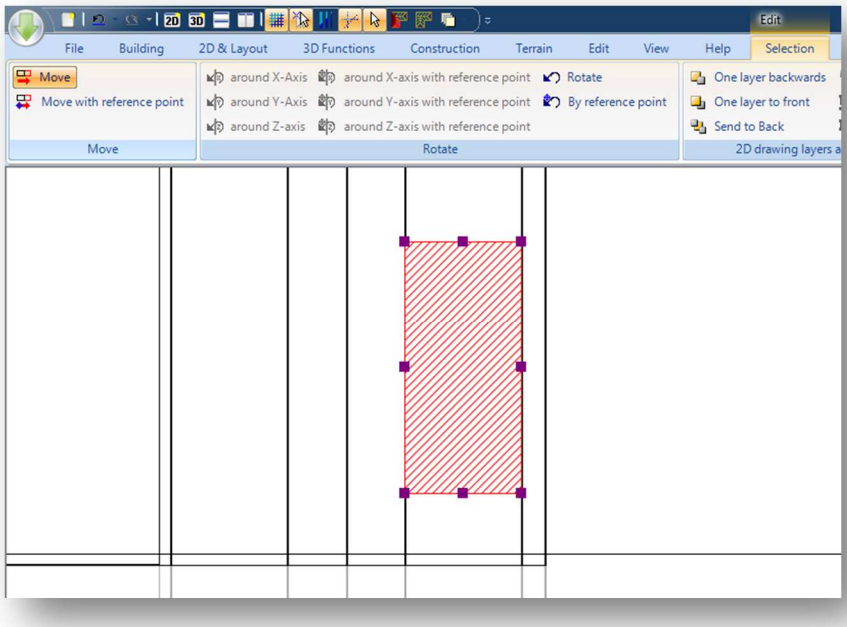


Using this dialog, you can change the appearance of the dimension line, but now we will change just the numeric size. It's currently set to 3.5 mm and we will change it to 1.8 mm. If you click on the **Save as Default** button in this dialog, then all new dimension lines will use this new

numeric size. Other existing dimension lines will not change and either have to be edited using the same method, redrawn, or modified using the Transfer Properties editing tools.

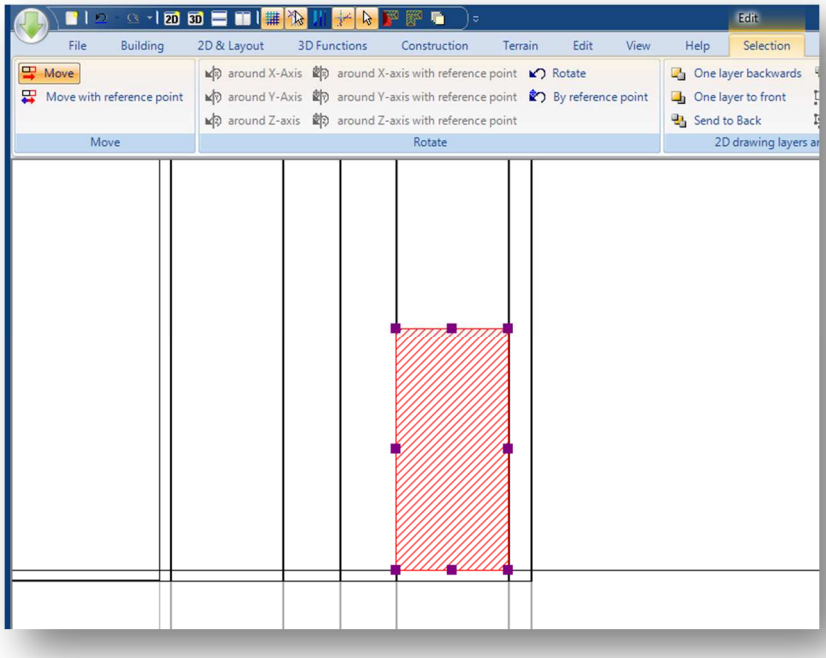
You can if you wish, add other detail to this section view, such as hatching detail, cavity insulation detail and floor construction detail. This next step is entirely optional, and is done only to demonstrate visually where the wall plates will sit.

We will now draw the block work on our section view. Using the 2D Rectangle tool draw a block. Our block is a standard Celcon block and so is 100 mm wide and 215 mm high. It will also sit on 10mm of mortar, and so we will raise it 10mm from the floor.

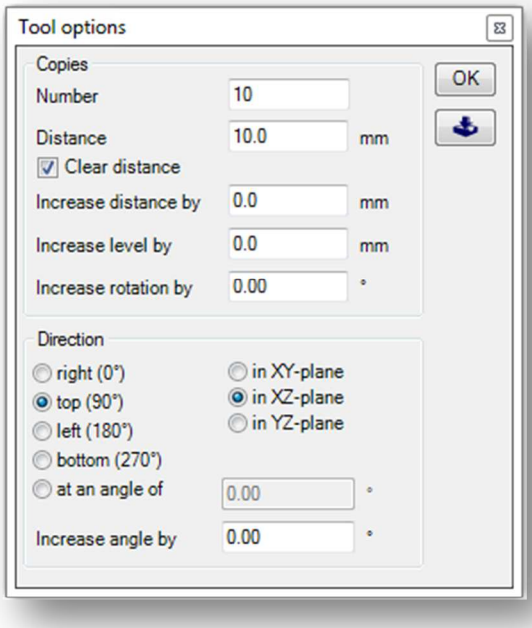


We will use the placement of this block to demonstrate the use of the Move tools.

If you now select the block, the Select tab is activated. You can now use the **Move with reference point** tool to exactly place the block.



Select the **Move with reference point,** and then click on the bottom left corner point of the block, and then next click on its destination point, which in our case is the 10 mm guideline intersection with the wall.



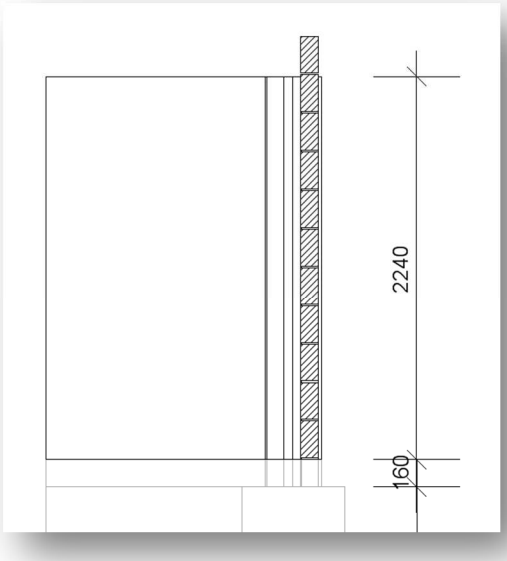
In the resulting dialog, set the following:

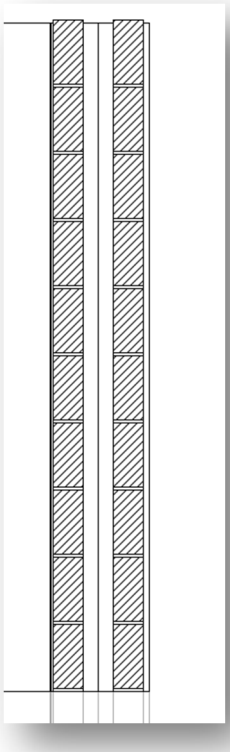
Number: 10, Distance: 10mm, Clear Distance: Set, Direction: Top in XZ plane.

As you change the parameters, you will see a live update.

We will now use the multiple copy tool to copy this 2D block vertically, with 10mm spacing (the mortar).

Select the repositioned 2D block, then right click on it to activate the context menu and select **Multiple copy…**





Pressing OK will then place the additional 10 new 2D blocks.

Repeat the same for the internal wall layer. Note that in this example we have a block and block construction, but of course you may have a brick and block or a block and timber frame.

Remove any excess blocks, and/or reduce the size of the top block if you intend to cut them to size.

We are now ready to add our wall plates on our internal wall.

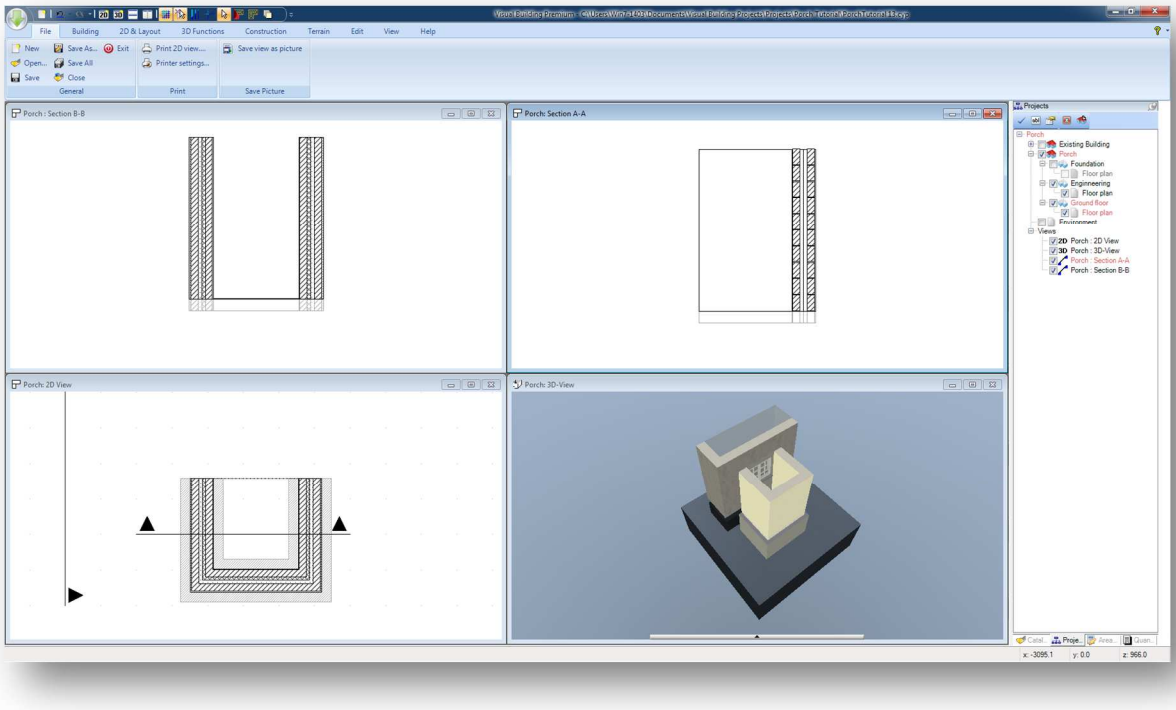
Project saved as Porch Tutorial 11.cyp

We could have drawn our section from the front elevation, and on reflection it possibly would have been better, but this does not alter the calculated height of the wall plate.

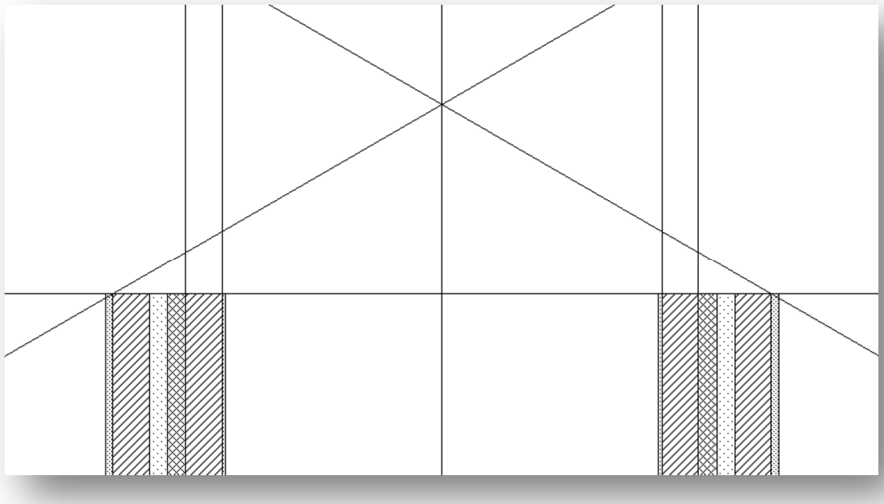
Where we did not create 3D objects from the Celcon blocks, we will create 3D objects for the wall plates.

11.14 Create front elevation view

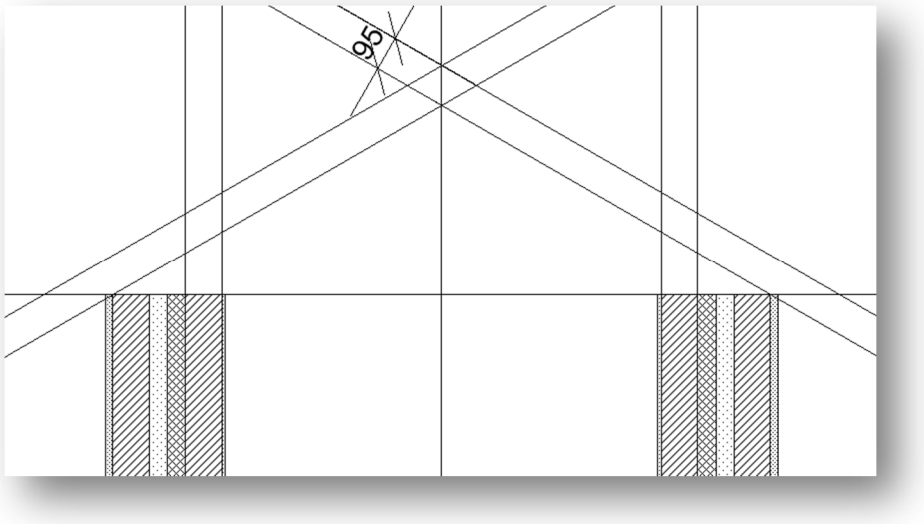
In the 2D view create a new front elevation section (shown top left below):



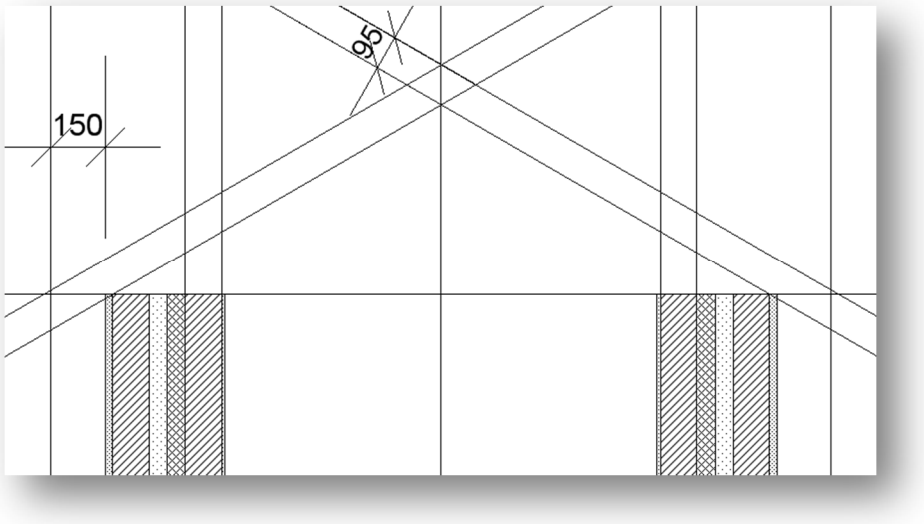
Our wall plate will sit on a raised block on the internal wall block. Our roof pitch is going to be 30 degrees and we can place some guide lines to show this:



These guidelines show the lower edge of our rafters so let's add a guideline to show the top edge, the rafter being 45mm x 95mm (planed size):



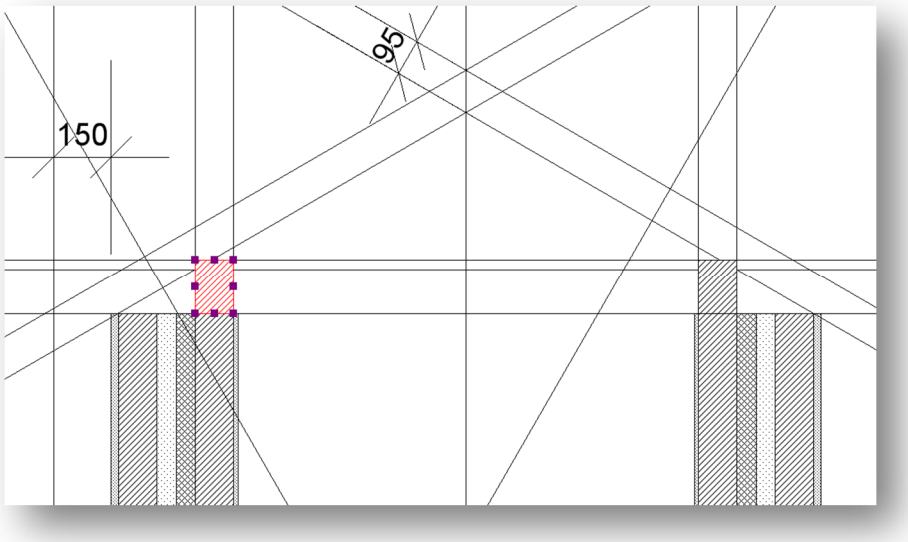
We now draw in the rafter end giving us a 150mm overhang. Note we have allowed for some render thickness.



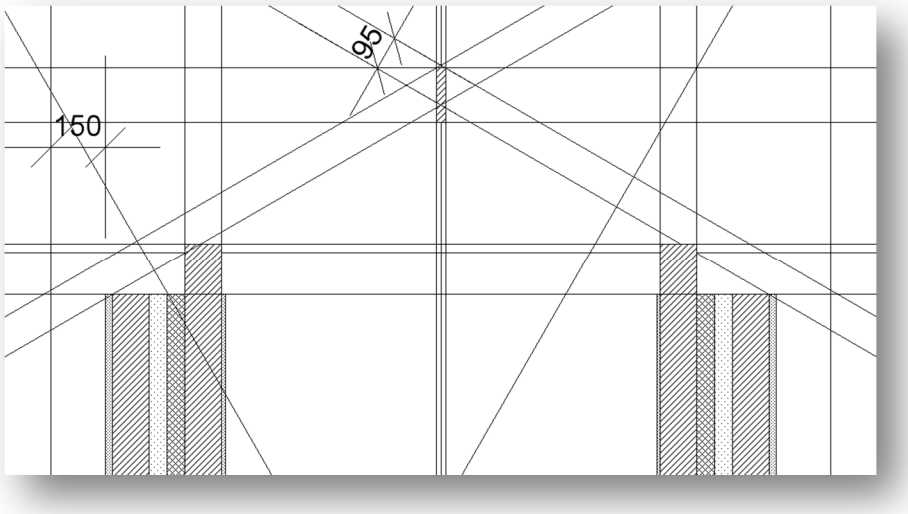
We nearly have the complete rafter profile, but first we need to add the birdsmouth cuts to the rafters (that cut that sits on the wall plate). The depth of the birdsmouth should normally not exceed 25% of the depth of the rafter. At this point you need to adjust for the vertical depth of the cut (Heel cut) and the horizontal depth of the cut (Seat cut) according to your building regulations.

Now that we have the birdsmouth in the rafter, we can set the height of the wall plate, and any additional blocks required on the internal wall.

Use the 2D rectangle tool to draw in the wall plate:

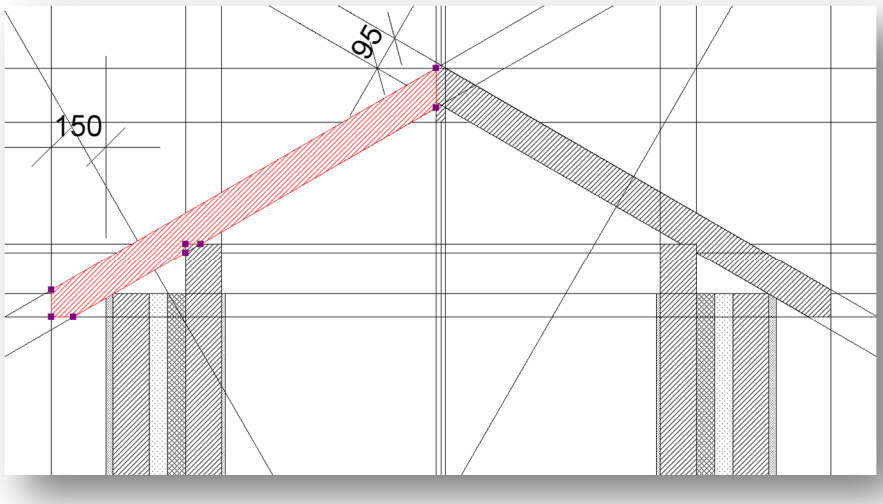


We can now add our ridge board. The planed size is 26mm x 150mm



If required, make the cut on the rafter end required to support the soffit board.

And now finally we will draw the left and right profiles of the rafters, using the 2D Polygon tool with the closed polygon option.

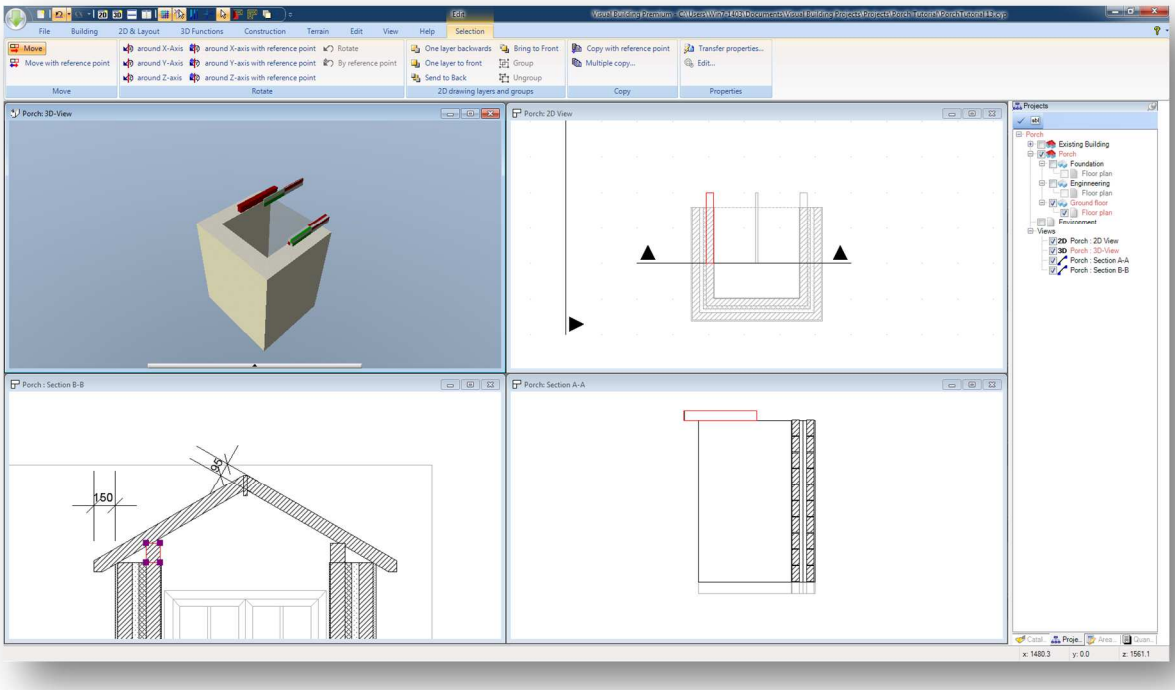


Project saved as Porch Tutorial 13.cyp

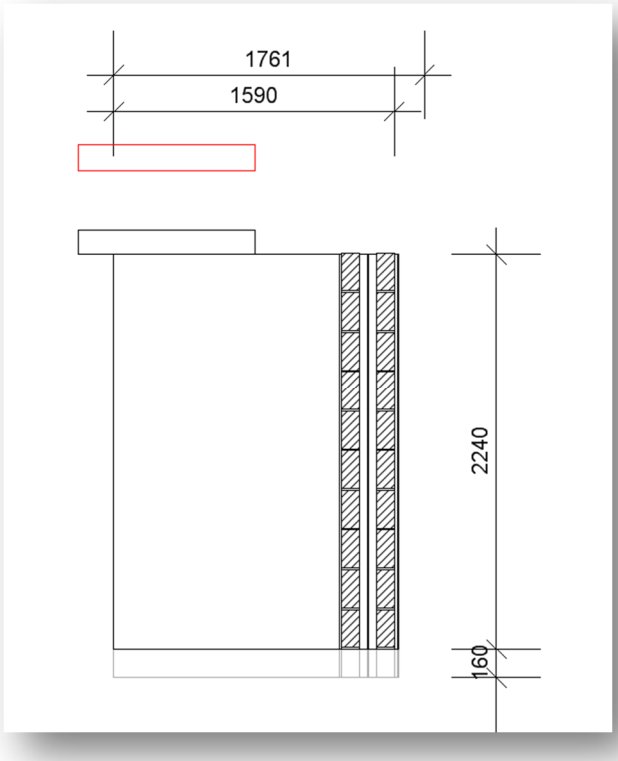
Everything we have drawn so far in this view is only 2D, so let's convert the 2D objects to 3D Objects

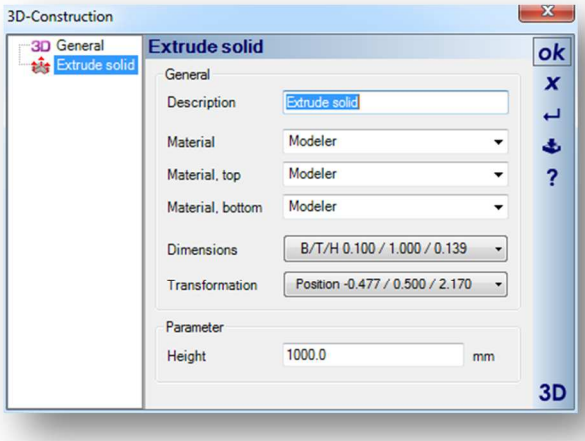
Ensure your Ground floor layer is your current layer, because that's where your new 3d objects will appear. Alternatively you could create a new layer just for these roof objects.

Now select the wall plate rectangle, then select the **Construction tab- Extrude solid – Extrude 2D Contour tool,** and click on the wall plate rectangle. Nothing will appear to have happened until you look at the 3D view. Repeat for the other wall plate and ridge board.



When you extrude a 2D contour into a 3D object, its default length will always be 1m. The length of the wall plate needs to be 1590mm and the length of the ridge board 1761mm.



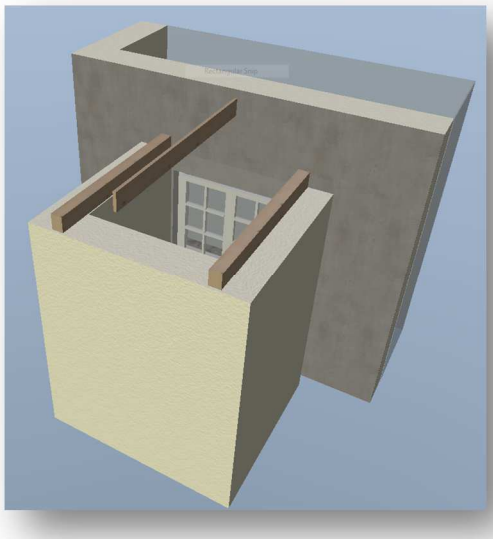


To change the length of a 3D object, select the object and then double click on it in any view to activate the **3D-Construction** dialog. Select the **Extrude solid** tab and change the value in the Height field to 1590 mm for the wall plate (or 1761 mm for the ridge board).

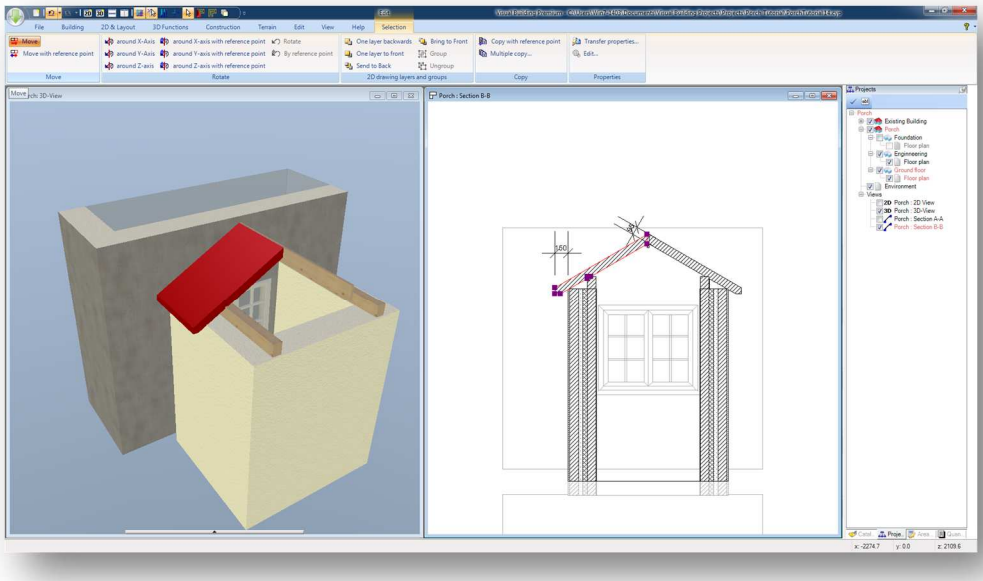
In the elevation view, select each object in turn, and using the Move with reference point, move the object into its correct position. It will help if you use guidelines to snap the objects to.

In the 3D view, you can now drag a suitable texture onto the 3D objects.

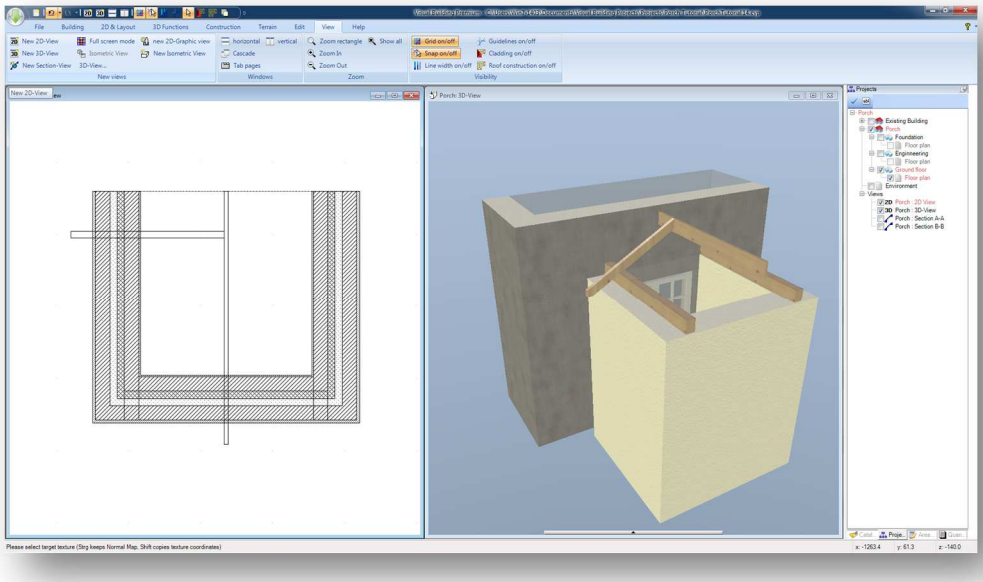
Project saved as Porch Tutorial 14.cyp



We can now repeat the process for the rafters. Now in the 2D front elevation view select the left rafter, then select the **Construction tab- Extrude solid – Extrude 2D Contour tool,** and click on the rafter polygon. Nothing will appear to have happened until you look at the 3D view. Repeat for the other wall plate and ridge board.

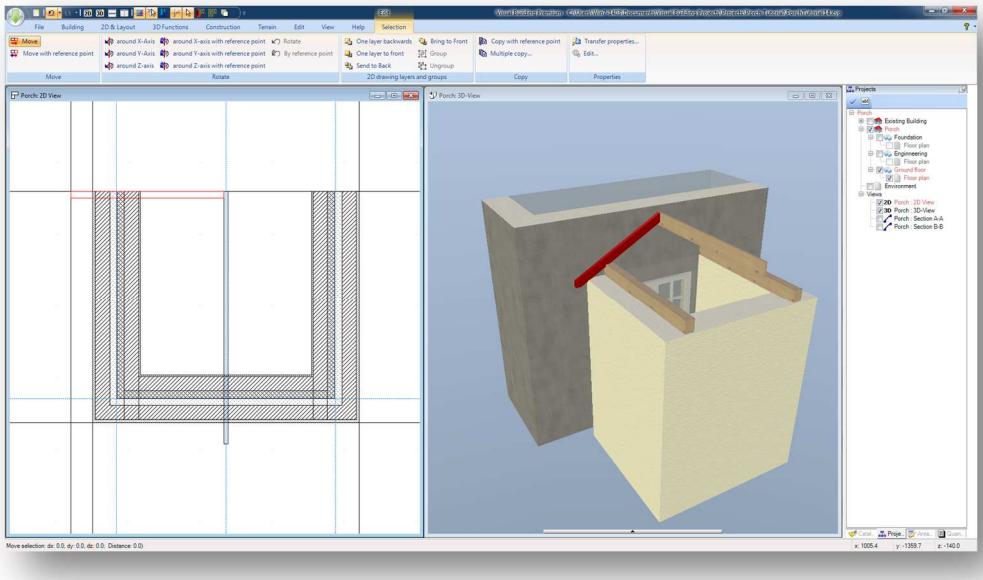


Note that the rafter is again default to a width of 1000 mm. To change the length of a 3D object, select the 3D rafter object and then double click on it in any view to activate the **3D-Construction** dialog. Select the **Extrude solid** tab and change the value in the Height field to 45 mm. In the 3D view, you can now drag a suitable texture onto the 3D rafter object.



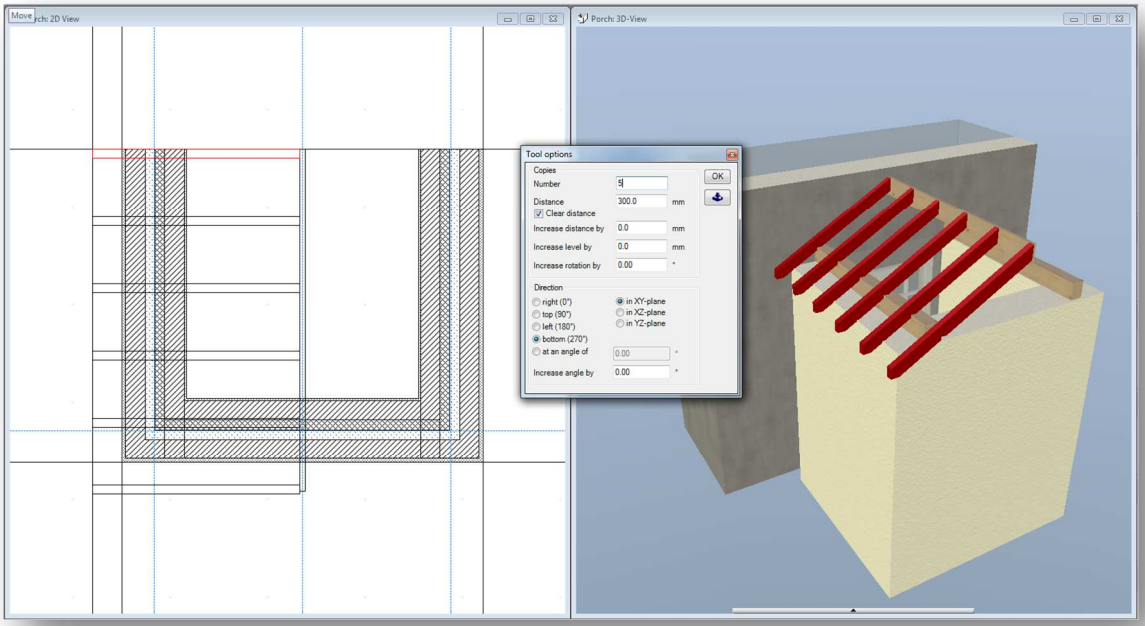
We now have a single rafter displaying in both 2D and 3D views.

Using the Move with reference point, move the rafter object into its correct position in the 2D plan view. It will help if you use guidelines to snap the objects to.



Rather than create each rafter individually, we can create copies and position them at the same time using the **Multicopy tool.**

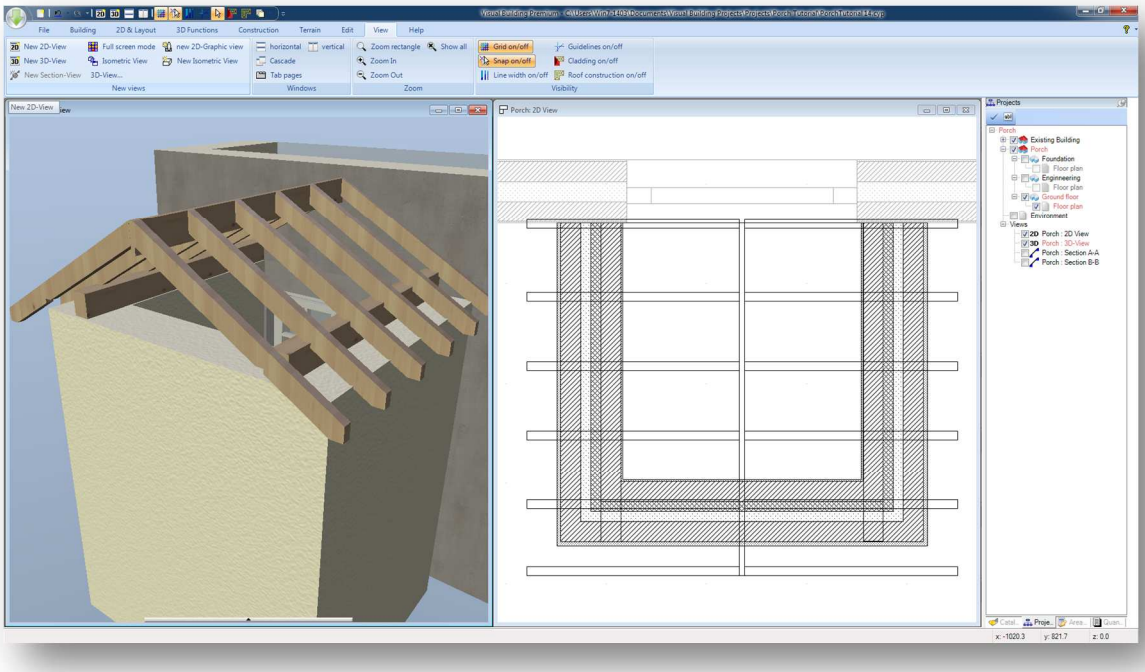
In the 2D plan view select the rather, and right click on it to activate the context menu.



Select the number of copies (5), and the spacing between each rafter (300 mm), and the direction of copy.

You can then adjust the position of the last rafter.

Now repeat for the right hand rafters.

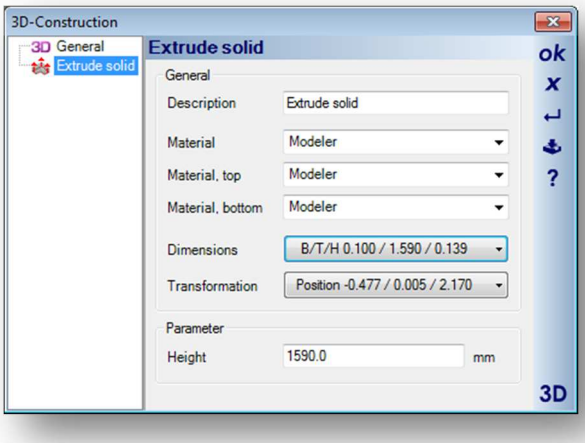


Project saved as Porch Tutorial 15.cyp

Before we continue, we must first rectify a few mistakes. You will always make mistakes so this is a good exercise.

The wall plate object should consist of a brick and upon which is the wall plate timber. So we will make two objects out of this, a 50mm brick and a 50 mm timber wall plate.

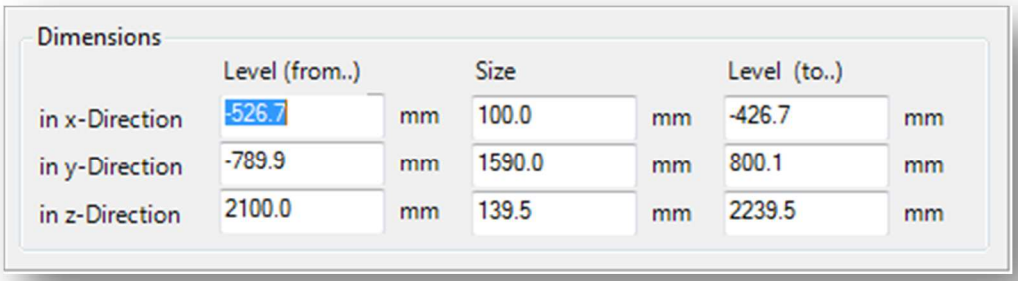
Click on the wall plate and the following dialog appears:



This dialog gives us the objects dimensions.

We could also apply different textures to different surface should we wish to.

Click on the dimensions drop down button and the following is displayed:



The names x, y and z direction are relative as the object has been rotated, but we know the y-Direction is its length, and x-Direction is its width.

The Level from and Level to fields allow us to specify the start and end points of the object relative to the Origin point, the difference between these two points being the length. If you edit the Level (from..) or Level (to…), you won't change the Size dimension. To change the length you must edit the Size filed.

There is also a similar Transformation set of parameters activated by clicking on the Transformation button:

So we will change the z-Direction from 139.5mm to 89.5mm to represent the height of the brick and mortar that supports the wall plate.

The wall plate needs to extend to the outer joist. At the movement it ends in line with the wall.

To be continued…

12 Door Construction

The standard door catalogue has a wide range of doors, but you can extend and add to this choice using several methods:

a) You can import a door created in other software products such as Sketchup. This is achieved by exporting the Sketchup model as a .3ds object, which can then be imported into Visual Building.

b) You can also use the Window Construction tool that is available with Visual Building Premium to create a door object

c) You can also construct a door and doorframe using the powerful object construction tools available in Visual Building Professional and Premium. This next part of this chapter will demonstrate how to achieve this.

12.1 Door Object Project Start

The objective of this exercise is to replicate a door similar to this:

The door dimensions are given as 860 x 2080 x 50 mm with the 4 panels being 12 mm above the door surface.

Start a new project. It's always easier to create such objects independent of your main project. On completion you can then save the object into your catalogue allowing you to load in into your main project.

It does not matter about the scale, but I suggest 1:50.

12.2 Door Frame

The frame aperture is 866 x 2095 mm

Jambs are 842 mm apart.

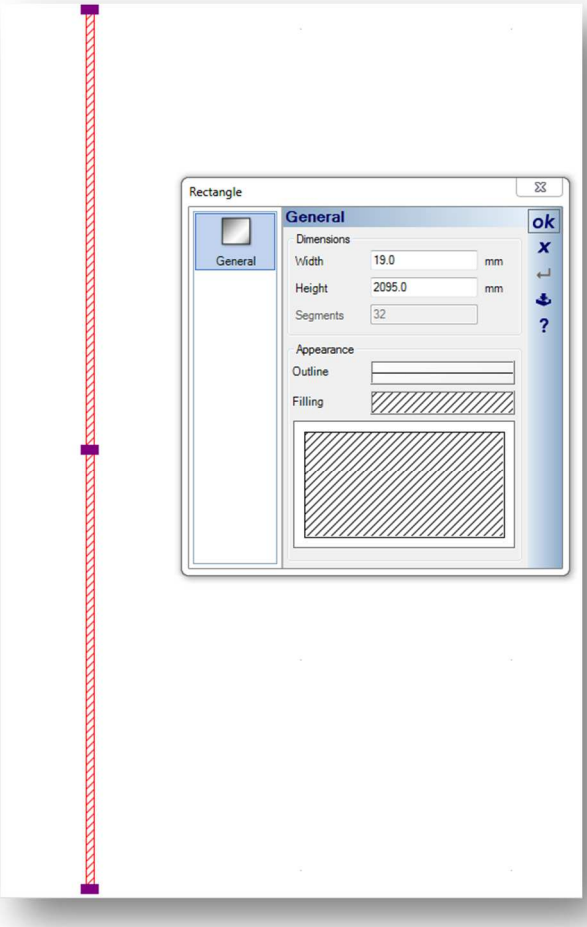
The frames are constructed from 3/4" 19mm thick timber over shims.

The architrave is 150mm wide and is 45mm thick at the outer edge decreasing to 15mm at the door.

The stops are 12mm, top and sides with no threshold. The stops are the depth of the frame less the door thickness i.e. 100.

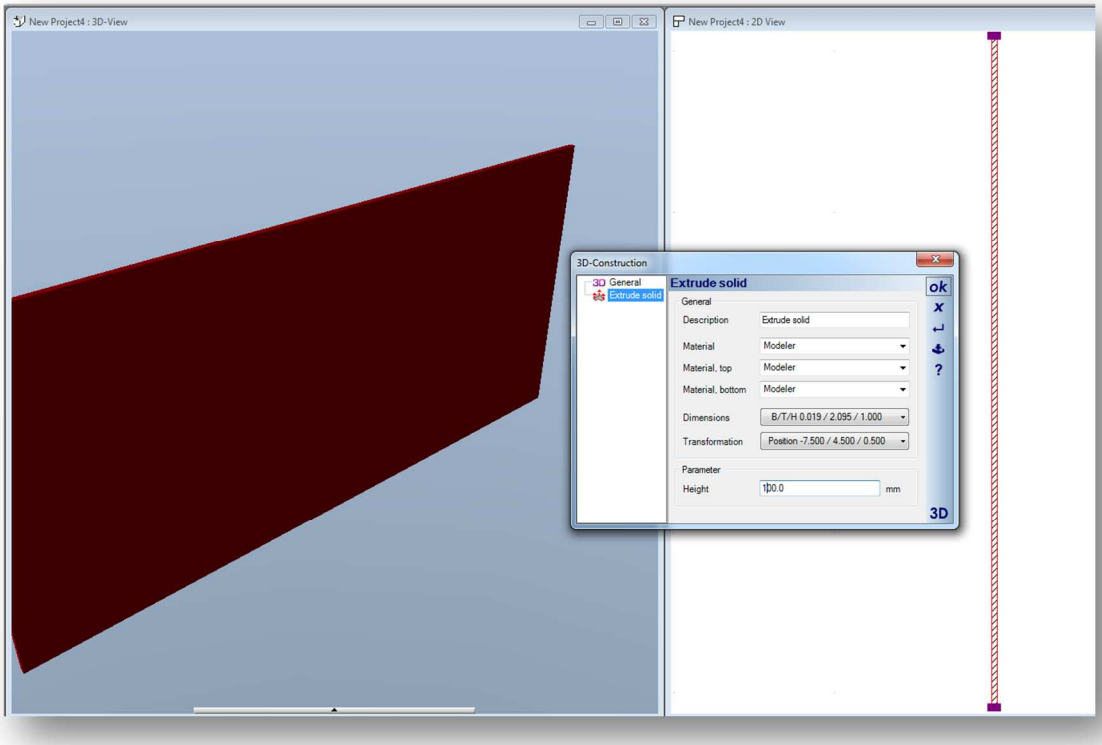
We will create the door frame in two sections, the inner frame and the outer decorative frame.

First we will create the door jamb. So using the **2D & Layout – 2D Drawing functions – Rectangle** tool draw the jamb profile 2096 mm x 19 mm



This is the 2D profile which we will extrude to 100 mm using the **Construction – Extrude Solid – Extrude 2D contour** tool.

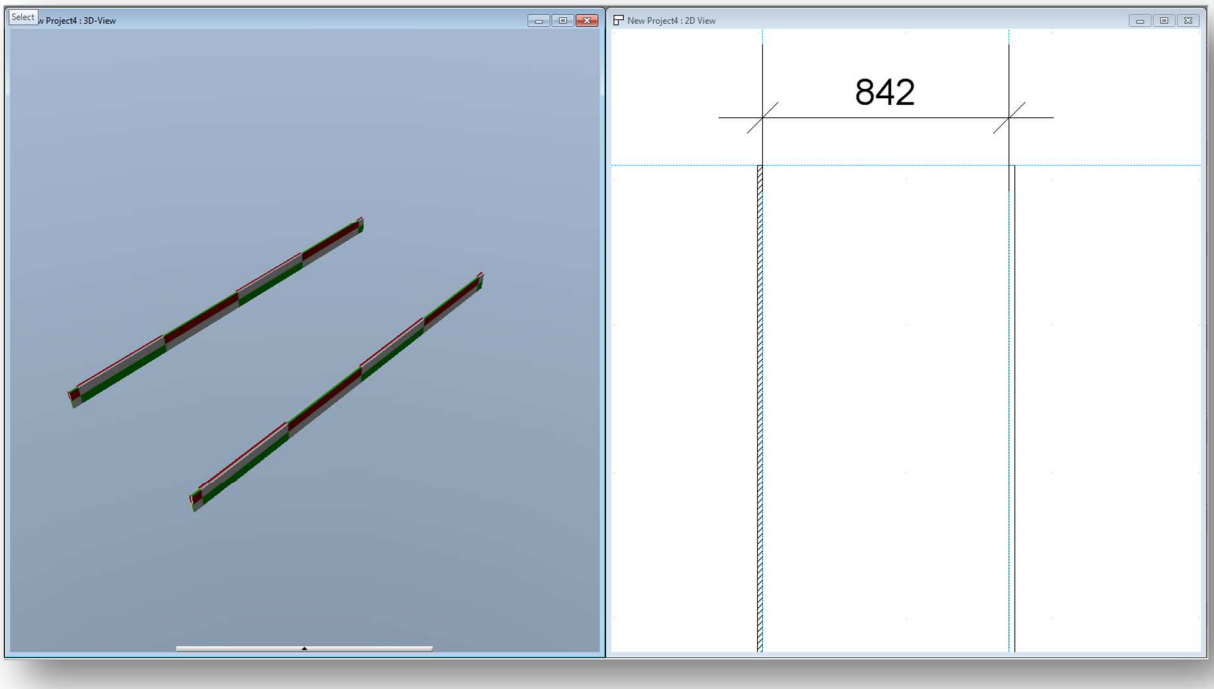
After selecting the 2D object to extrude, you will need to create a 3D view to view the 3D object created.



Select the object and change its height to 100mm

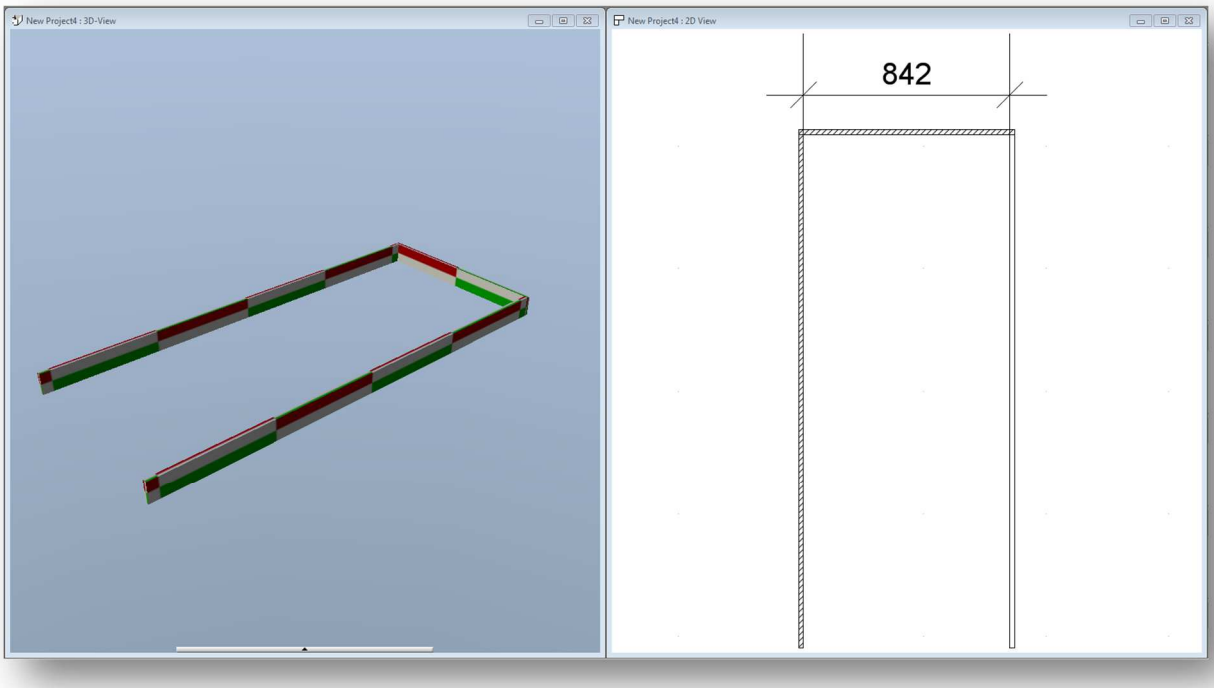
Select Jamb object, and Right click and from the activated context menu use the **Multiple copy** tool to copy the door jamb.

Use guidelines to measure the door jamb spacing to be 842mm



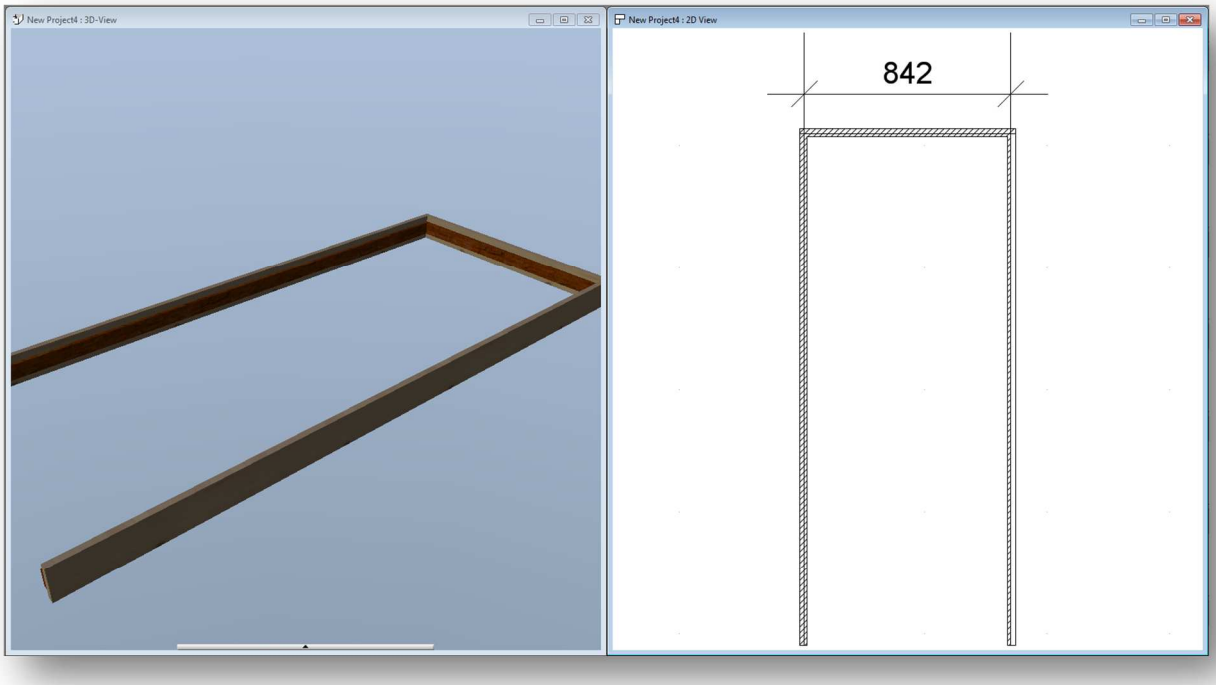
Use the **Selection – Move – Move with reference point** to move the door jamb onto the measured guideline.

In the 2D View draw the head profile adding more guidelines if you need. Select the 2D head object extrude it to 100 mm using the **Construction – Extrude Solid – Extrude 2D contour** tool.

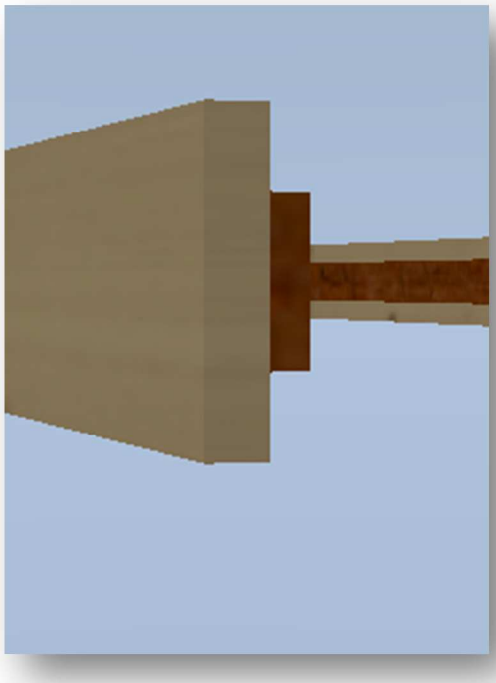


So this completes the door jambs and head. You could of created this in a single step using the **2D & Layout – 2D Drawing functions – Polygon** tool instead of the **Rectangle** tool.

Note: When extruding a 2D object to a 3D object, you may have difficulty selecting the 2D object because you may be snapping to other objects such as guidelines. In the case of guidelines just simply hide them. When other objects are confusing the issue move the object that you want to extrude to another layer and hide the other layers.



Note that in the 3D view you only see the extruded 3D object, but in the 2d view you will see both the extruded 3D object and the original 3D profile. As soon as you have extruded the object you can delete the 2D profile. The 2D profile is the hatched object.



We will now add the door stops using the same method as for the door jambs, but this time we will draw out the entire stop shape using the **2D & Layout – 2D Drawing functions – Closed Polygon** tool and then extrude it.

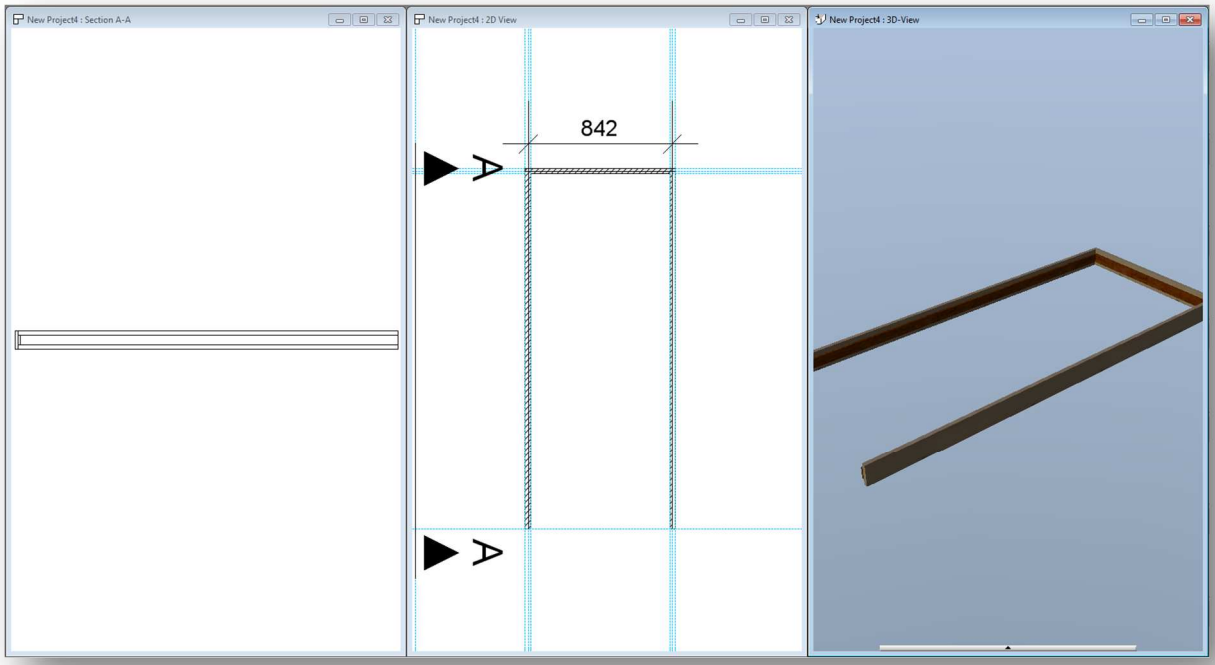
We should now drag some textures onto the objects so that it is easier to see in 3D.

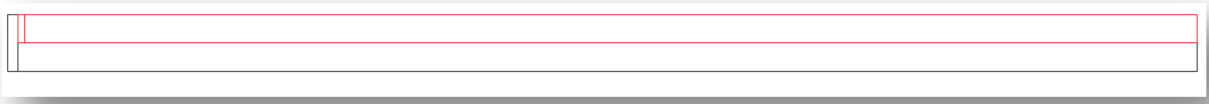
The door stop is in the wrong position, so we need to move it to be flush with the edge of the door jamb.

This is achieved by creating an elevation view using the **View – New section view** tool, in the 2D view.

Note that we have switched off the Environment block and hidden the Origin and North arrow in each view.

In the Section A_A view select the door stop object and use the **Selection – Move – Move with reference point** to move it to be flush with the door jamb.





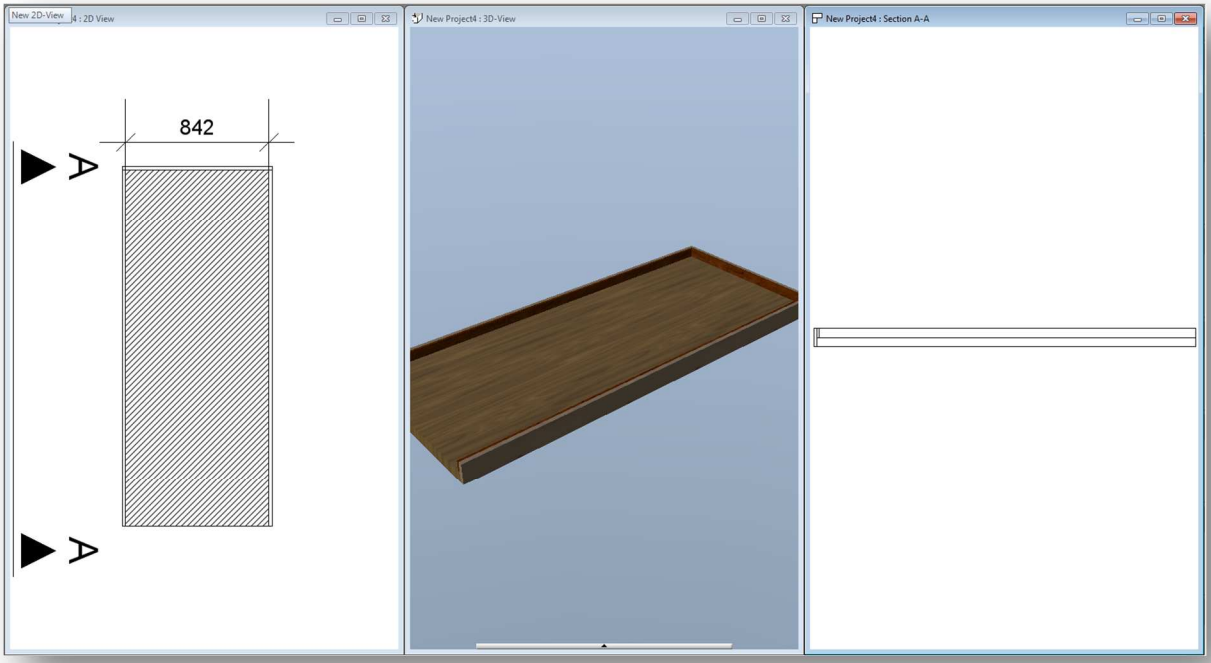
So that compete the basic door frame.

12.3 Create the door Panel

In the 2d View, draw the door panel with the **2D & Layout – 2D Drawing functions – Rectangle** tool, and then extrude it with the **Construction – Extrude Solid – Extrude 2D contour** tool. After extrude it set its height to 50mm.

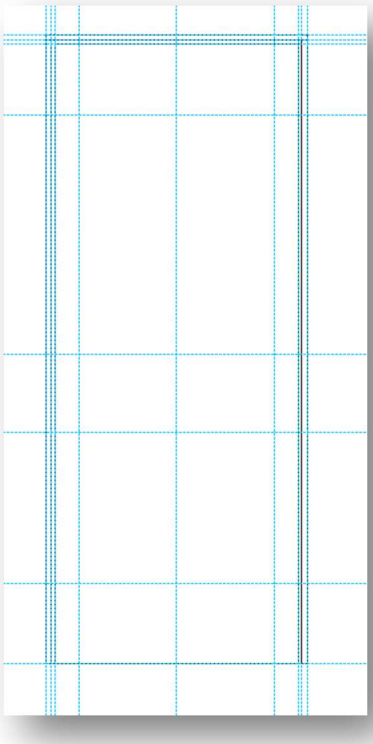
If you have problems extruding, because the extrude tool snaps to the other objects then move the other objects or the door panel to a new layer.

In the 2D Section AA view, move the new door panel to fit against the door stop. In the 3D view add a texture to the door panel.

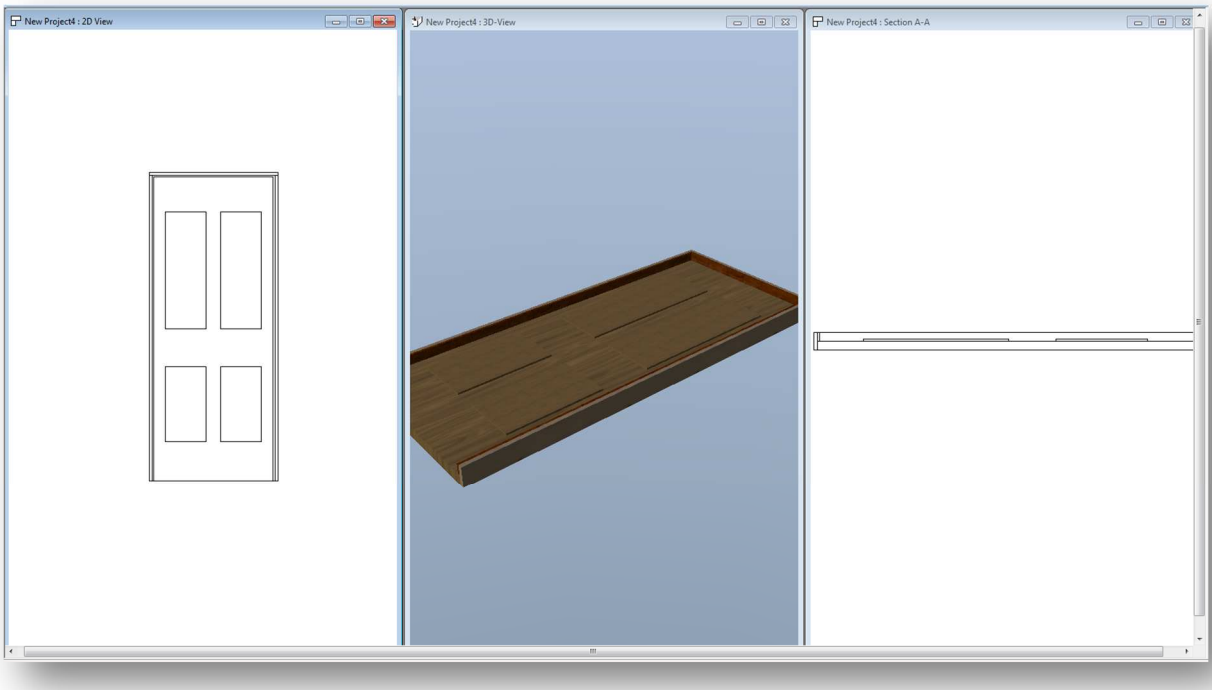


12.4 Create Door Decorative Panels

As before, layout the position of the 4 panels using guidelines.

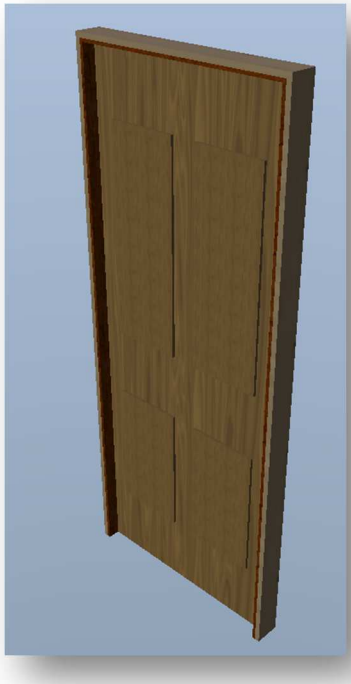


The panel beading elements can then be placed. You can give as much detail to these panels as you need, but for the purpose of this tutorial we will just use square inserts



We created the door laying on the floor, and so we need to rotate it 90 degrees about the x-axis. In the 2D view, group the entire object with a bounding box and then use the Select – Group tool to group the object.

Then select the grouped object and rotate it by 90 degrees:

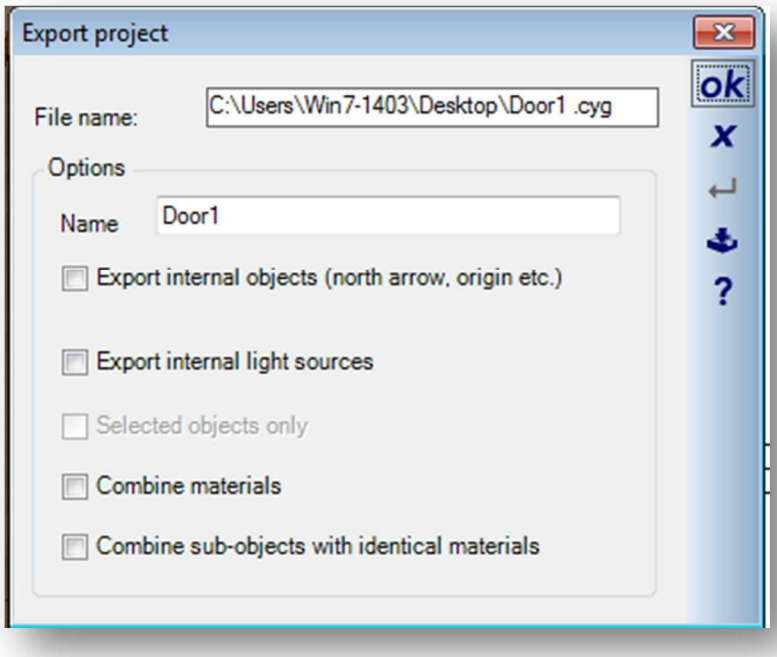


We will now save the door object as is without the decorative frame. This is so we could then use the door in different scenarios. The decorative frame can be created later.

To save the door as a 3D object ensure the 3D view is the current view, the select **Application menu – Export - 3D Formats - 3D Object file** and the Export project dialog will activate:

If you did not save it to the Catalogue folder, the copy the object to:

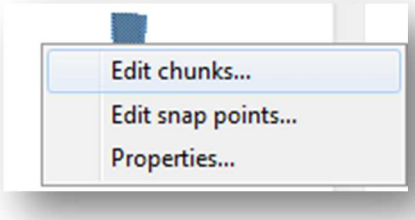
C:\Program Files\Visual Building Premium 5\Objects\My Objects



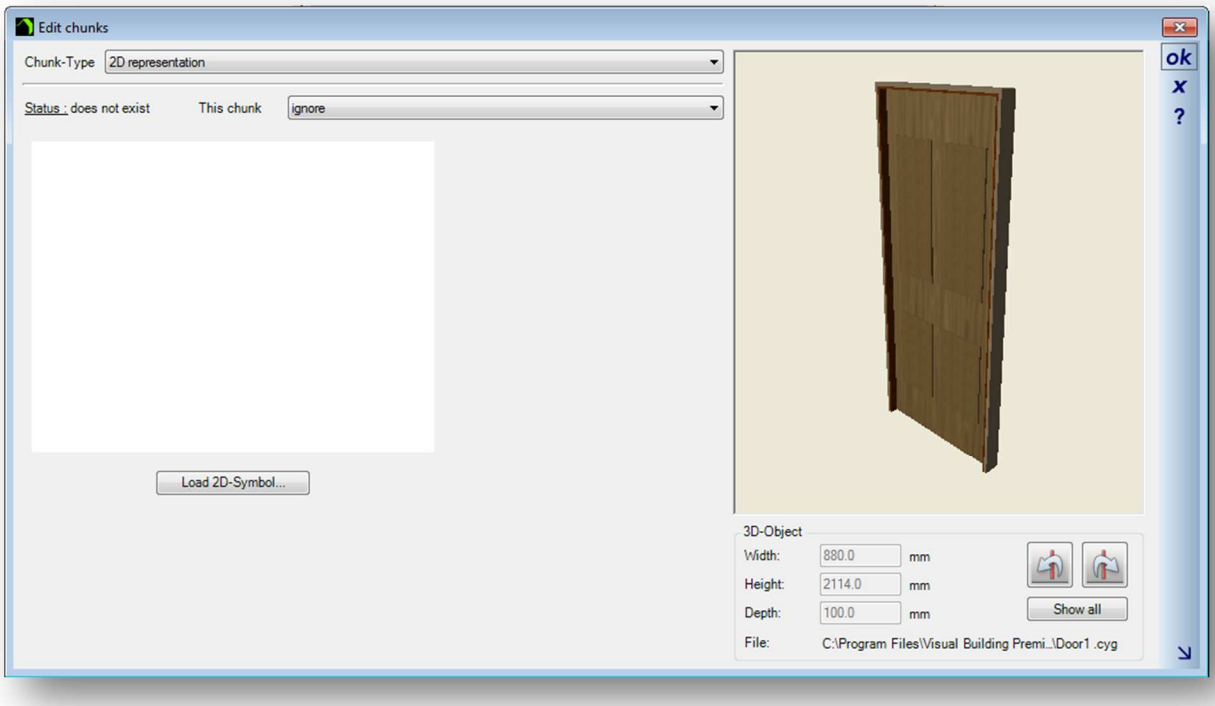
The new door object will then appear in your catalogue. However it is just an ordinary 3D object, and it does not know it is a door, so if you drag this object onto a wall, the wall will not react to the object and automatically created a cut out. You can still use it in this way, but with a little more effort, you can convert this into a door object.

12.5 Applying Door Properties

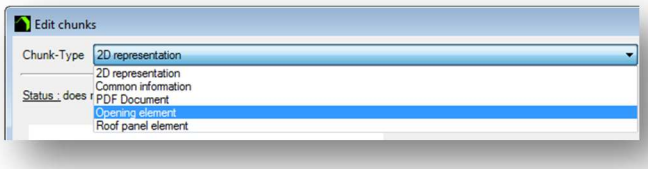
Locate your new door object in the catalogue and right click on it to activate a context menu:



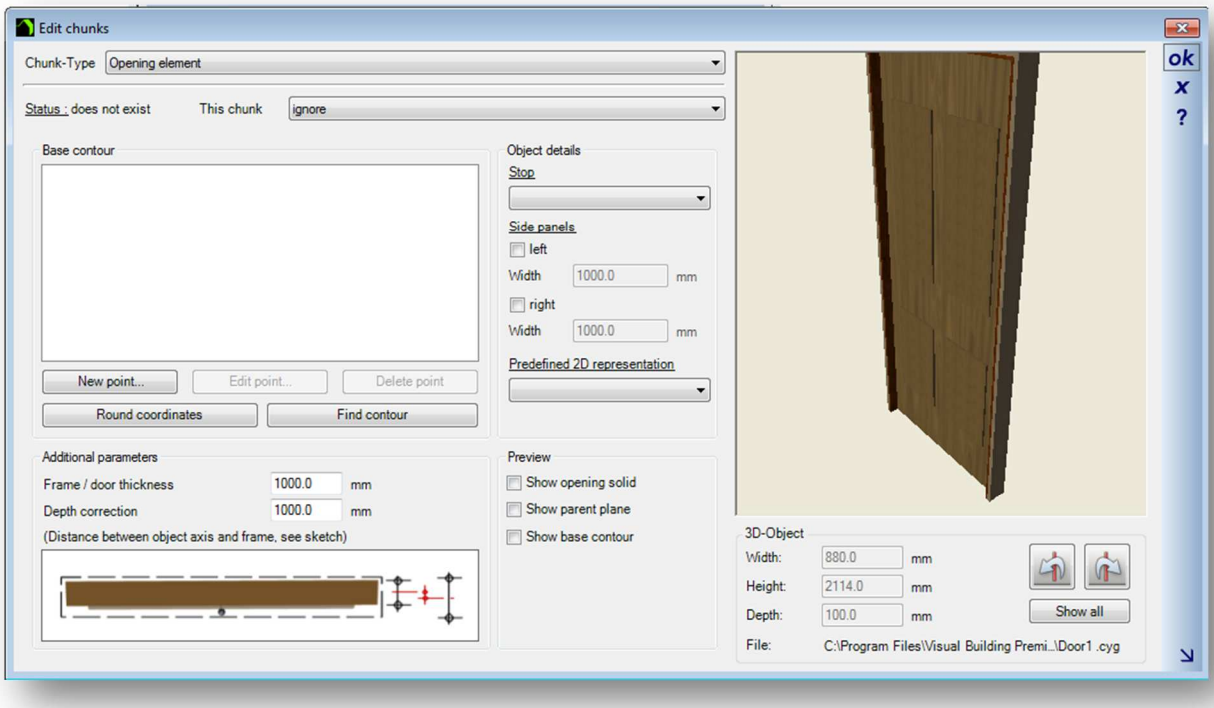
Select Edit chunks and the Edit chunks dialog will activate:



In the **Chunk type** drop down list select **Opening element**

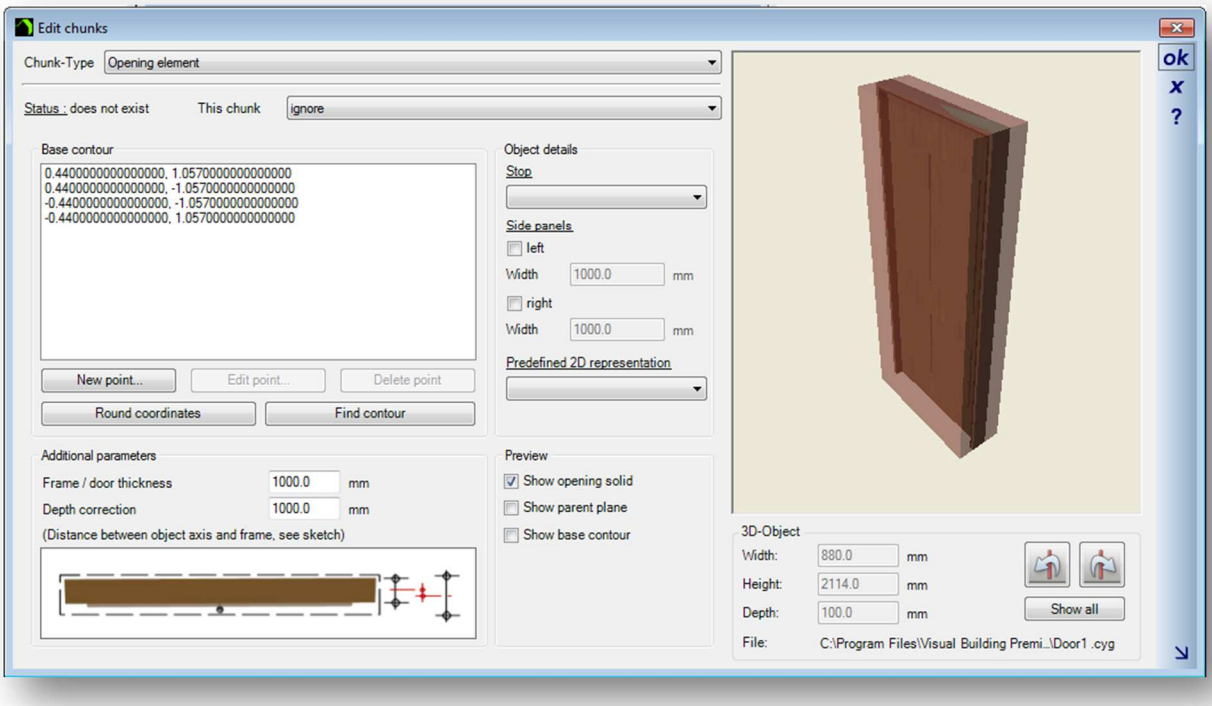


The edit Chunks dialog will then acquire the property fields for a door:



Click on **Find Contour** and then **Round Coordinates**

Click **Show opening solid**



The numbers in the Base contour, which are represented in the 3D image represent the opening in a wall that will be created for this object.

In **Chunk Type,** select Common Information and set Object type to Door 3D Object.

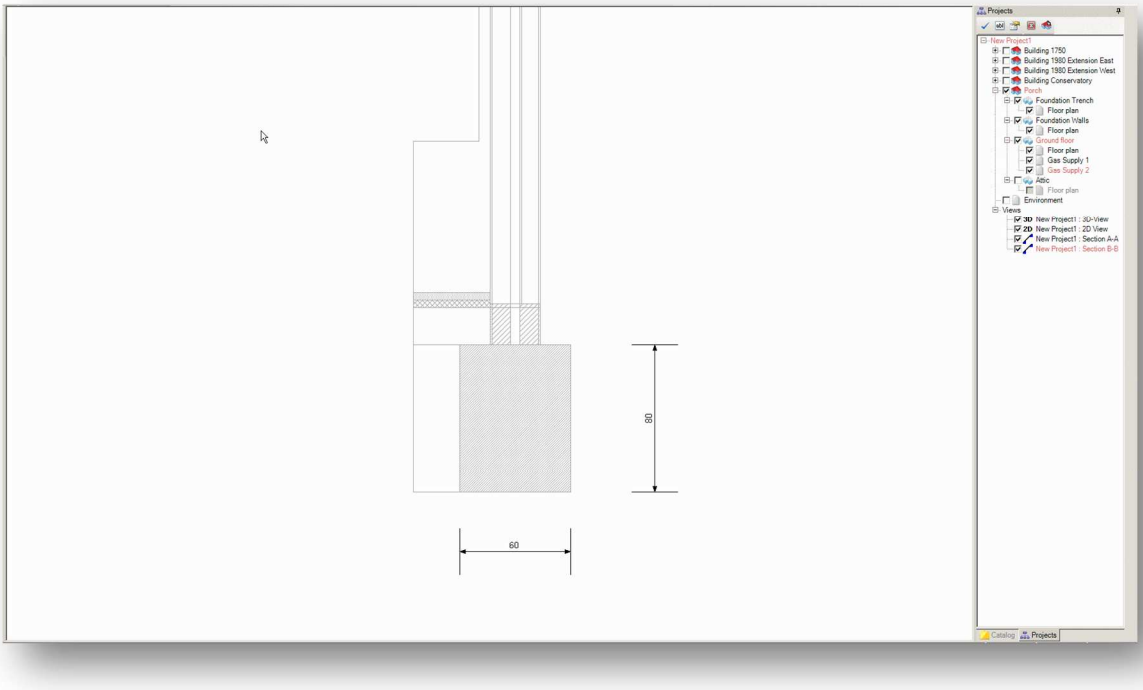
IMPORTANT: In the **This chunk** field select **Add or replace**, otherwise these changes will not be applied to your door object.

The door can now be placed into your object catalogue.

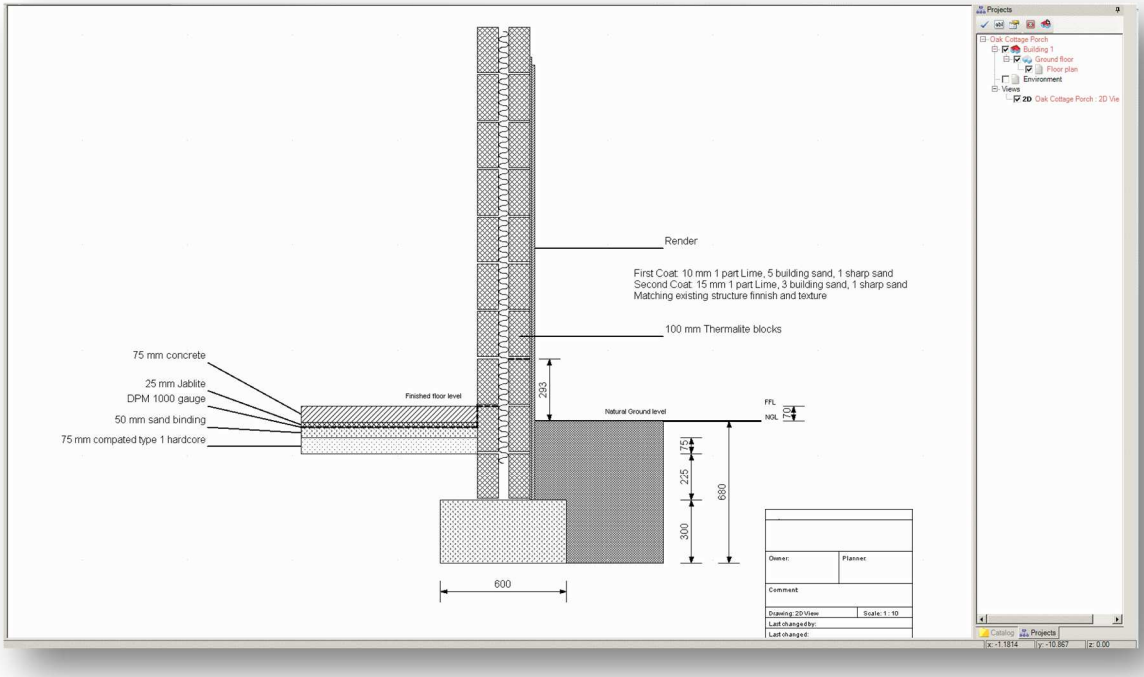
13 Creating a sectional foundation drawing

If you are providing drawings for building regulations, then you will often need to demonstrate how your foundation and cavity wall is constructed.

It is possible to create a section view and using the **Visibility** dialog, hide all the elements that you do not want to show. (Right click on the 2D section view and select **Visibility** from the context menu).



It is of course possible using the 2D tools, to add additional information to this view, for example.

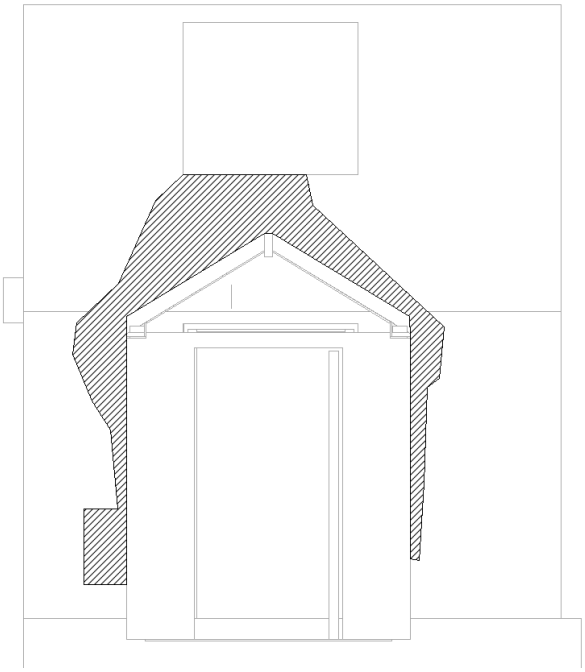

Render
First Coat: 10 mm 1 part Lime, 5 building sand, 1 sharp sand
Second Coat: 15 mm 1 part Lime, 3 building sand, 1 sharp sand
Matching existing structure finnish and texture
100 mm Thermalite blocks
75 mm concrete
25 mm Jablite
DPM 1000 gauge
50 mm sand binding
75 mm compated type 1 hardcore
Finished floor level
Natural Ground level
FFL
NGL
293
175
225
300
680
600
Owner:
Planner
Comment
Drawing: 2D View
Scale: 1 : 10
Last changed by:
Last changed:
Projects
Oak Cottage Porch
Building 1
Ground floor
Floor plan
Environment
Views
2D
Oak Cottage Porch : 2D Vie
Catalog
Projects

14 Quantity Calculations

This snippet uses some tools available to Visual Building Professional / Premium

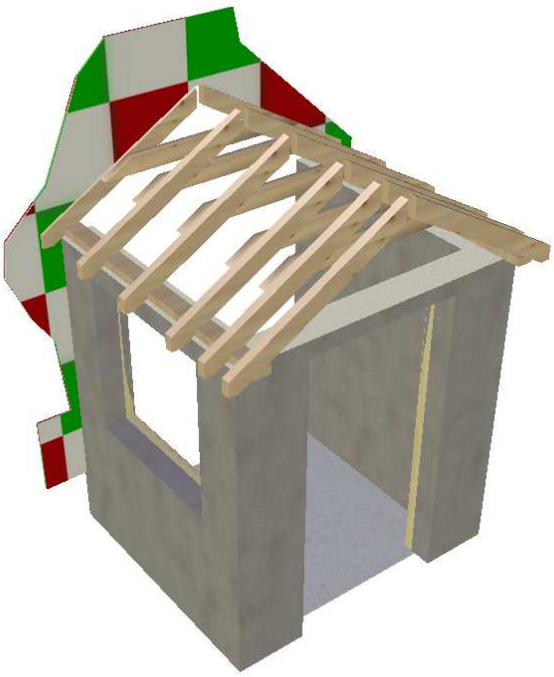
During the course of adding the above porch, it was necessary to remove render from the existing wall, which of course needed to be replaced. The question arises what is the surface area of the render that needs to be replaced.

This image shows the problem.



Using the **2D Polygon** tool I have drawn the area of the render that needs to be replaced.

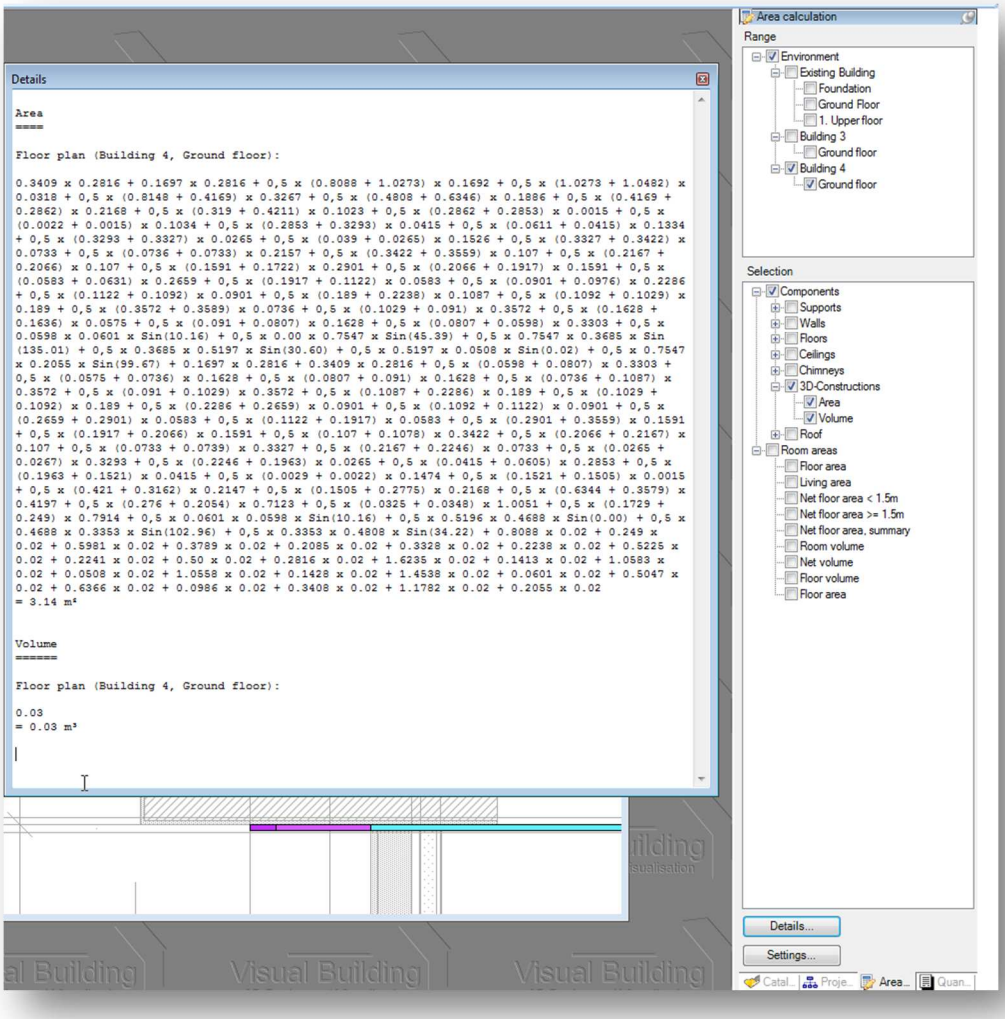
I then used the Extrude solid tool to create a 3D object of this area, to which I gave a depth of 20mm, the thickness of the render.



This image shows the rendered area created as a 3D object.

If you now select the **Area calculation** tab, you will see that you can select the 3D object as the subject of the area and volume report, which is provided when you click the **Details** button.

The report shows that the total area of the area to be rendered is 3.14 sq. m, together with the calculation used.


Details
Area
====
Floor plan (Building 4, Ground floor):
0.3409 x 0.2816 + 0.1697 x 0.2816 + 0,5 x (0.8088 + 1.0273) x 0.1692 + 0,5 x (1.0273 + 1.0482) x 0.0318 + 0,5 x (0.8148 + 0.4169) x 0.3267 + 0,5 x (0.4808 + 0.6346) x 0.1886 + 0,5 x (0.4169 + 0.2862) x 0.2168 + 0,5 x (0.319 + 0.4211) x 0.1023 + 0,5 x (0.2862 + 0.2853) x 0.0015 + 0,5 x (0.0022 + 0.0015) x 0.1034 + 0,5 x (0.2853 + 0.3293) x 0.0415 + 0,5 x (0.0611 + 0.0415) x 0.1334 + 0,5 x (0.3293 + 0.3327) x 0.0265 + 0,5 x (0.039 + 0.0265) x 0.1526 + 0,5 x (0.3327 + 0.3422) x 0.0733 + 0,5 x (0.0736 + 0.0733) x 0.2157 + 0,5 x (0.3422 + 0.3559) x 0.107 + 0,5 x (0.2167 + 0.2066) x 0.107 + 0,5 x (0.1591 + 0.1722) x 0.2901 + 0,5 x (0.2066 + 0.1917) x 0.1591 + 0,5 x (0.0583 + 0.0631) x 0.2659 + 0,5 x (0.1917 + 0.1122) x 0.0583 + 0,5 x (0.0901 + 0.0976) x 0.2286 + 0,5 x (0.1122 + 0.1092) x 0.0901 + 0,5 x (0.189 + 0.2238) x 0.1087 + 0,5 x (0.1092 + 0.1029) x 0.189 + 0,5 x (0.3572 + 0.3589) x 0.0736 + 0,5 x (0.1029 + 0.091) x 0.3572 + 0,5 x (0.1628 + 0.1636) x 0.0575 + 0,5 x (0.091 + 0.0807) x 0.1628 + 0,5 x (0.0807 + 0.0598) x 0.3303 + 0,5 x 0.0598 x 0.0601 x Sin(10.16) + 0,5 x 0.00 x 0.7547 x Sin(45.39) + 0,5 x 0.7547 x 0.3685 x Sin (135.01) + 0,5 x 0.3685 x 0.5197 x Sin(30.60) + 0,5 x 0.5197 x 0.0508 x Sin(0.02) + 0,5 x 0.7547 x 0.2055 x Sin(99.67) + 0.1697 x 0.2816 + 0.3409 x 0.2816 + 0,5 x (0.0598 + 0.0807) x 0.3303 + 0,5 x (0.0575 + 0.0736) x 0.1628 + 0,5 x (0.0807 + 0.091) x 0.1628 + 0,5 x (0.0736 + 0.1087) x 0.3572 + 0,5 x (0.091 + 0.1029) x 0.3572 + 0,5 x (0.1087 + 0.2286) x 0.189 + 0,5 x (0.1029 + 0.1092) x 0.189 + 0,5 x (0.2286 + 0.2659) x 0.0901 + 0,5 x (0.1092 + 0.1122) x 0.0901 + 0,5 x (0.2659 + 0.2901) x 0.0583 + 0,5 x (0.1122 + 0.1917) x 0.0583 + 0,5 x (0.2901 + 0.3559) x 0.1591 + 0,5 x (0.1917 + 0.2066) x 0.1591 + 0,5 x (0.107 + 0.1078) x 0.3422 + 0,5 x (0.2066 + 0.2167) x 0.107 + 0,5 x (0.0733 + 0.0739) x 0.3327 + 0,5 x (0.2167 + 0.2246) x 0.0733 + 0,5 x (0.0265 + 0.0267) x 0.3293 + 0,5 x (0.2246 + 0.1963) x 0.0265 + 0,5 x (0.0415 + 0.0605) x 0.2853 + 0,5 x (0.1963 + 0.1521) x 0.0415 + 0,5 x (0.0029 + 0.0022) x 0.1474 + 0,5 x (0.1521 + 0.1505) x 0.0015 + 0,5 x (0.421 + 0.3162) x 0.2147 + 0,5 x (0.1505 + 0.2775) x 0.2168 + 0,5 x (0.6344 + 0.3579) x 0.4197 + 0,5 x (0.276 + 0.2054) x 0.7123 + 0,5 x (0.0325 + 0.0348) x 1.0051 + 0,5 x (0.1729 + 0.249) x 0.7914 + 0,5 x 0.0601 x 0.0598 x Sin(10.16) + 0,5 x 0.5196 x 0.4688 x Sin(0.00) + 0,5 x 0.4688 x 0.3353 x Sin(102.96) + 0,5 x 0.3353 x 0.4808 x Sin(34.22) + 0.8088 x 0.02 + 0.249 x 0.02 + 0.5981 x 0.02 + 0.3789 x 0.02 + 0.2085 x 0.02 + 0.3328 x 0.02 + 0.2238 x 0.02 + 0.5225 x 0.02 + 0.2241 x 0.02 + 0.50 x 0.02 + 0.2816 x 0.02 + 1.6235 x 0.02 + 0.1413 x 0.02 + 1.0583 x 0.02 + 0.0508 x 0.02 + 1.0558 x 0.02 + 0.1428 x 0.02 + 1.4538 x 0.02 + 0.0601 x 0.02 + 0.5047 x 0.02 + 0.6366 x 0.02 + 0.0986 x 0.02 + 0.3408 x 0.02 + 1.1782 x 0.02 + 0.2055 x 0.02
= 3.14 m²
Volume
======
Floor plan (Building 4, Ground floor):
0.03
= 0.03 m³
Area calculation
Range
Environment
Existing Building
Foundation
Ground Floor
1. Upper floor
Building 3
Ground floor
Building 4
Ground floor
Selection
Components
Supports
Walls
Floors
Ceilings
Chimneys
3D-Constructions
Area
Volume
Roof
Room areas
Floor area
Living area
Net floor area < 1.5m
Net floor area >= 1.5m
Net floor area, summary
Room volume
Net volume
Floor volume
Floor area
Details...
Settings...
Catal...
Proje...
Area...
Quan...
Visual Building
Visual Building
Visual Building

15 Create a Scale Bar

If your drawings are for use for planning applications or to support building regulation requirements then you will need to supply a scale bar with your drawings. These are not supplied within the catalogue a) because they are so easy to create and b) there are so many variations.

We will create a 5m scale bar for use in a 1:50 scale drawing.

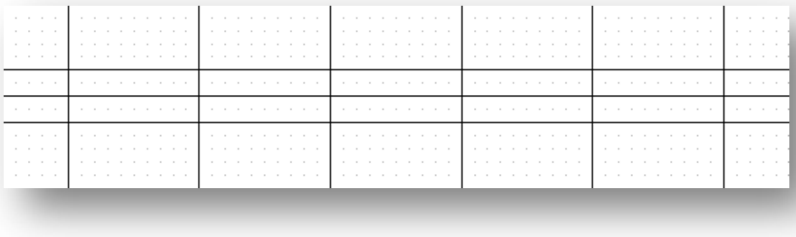
Create a new project

Set the scale 1:50

You can use the grid, but I prefer to use guidelines.

Place a vertical guideline which will act as your reference point

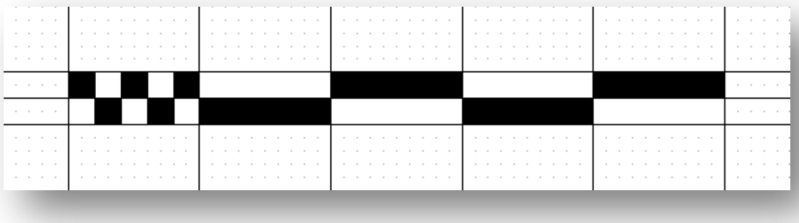
Select the Numeric Parallel guideline tool, and place 5 vertical guidelines, spaced 1m apart.



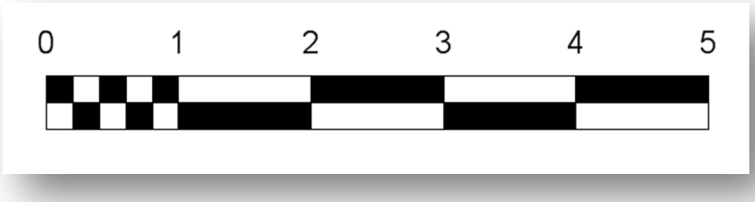
Now place a horizontal guideline, and two more horizontal guidelines spaced 0.2m apart.

You should now have something looking like the above image.

Now use the 2D Graphic – Rectangle tool to draw 9 black filled rectangles, snapping to the guidelines. Then repeat with 9 white filled rectangles



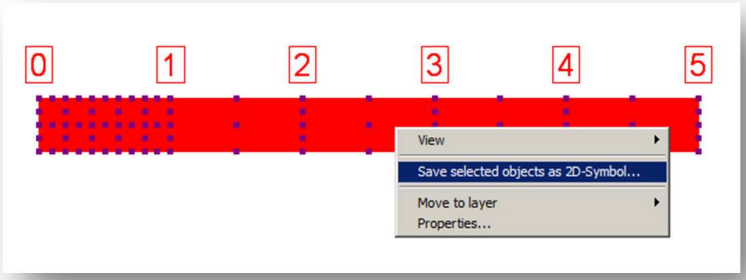
Select the text tool and add the numerals. Switch off grid and guidelines and you should have this:



You can also save this to the 2D catalogue for future use. Draw a selection box around the entire scale bar and text, so all is selected.

Use the Group tool to group together.

Right click on the group and from the context menu select



In the dialog enter your file name e.g scalebar5 1to50.cys.

The scale bar is now saved as a 2D symbol which you can use again in future 1:50 projects. Such objects are normally saved in the Graphics 2D catalogue, where you will also find existing similar 2D symbols and title blocks.

Note that due to Microsoft Window's UAC (User Access Control), if you have not given administration privileges to Visual Building, you won't be able to save to any of the main catalogues located at :

C:\Program Files\Visual Building Premium 5

(or similar path that you may have selected during installation). You can save such objects in the user accessible catalogues located at :

C:\Users\YOURUSERNAME\Documents\Visual Building Premium 5

16 Create a Title Block

Title Blocks (also known as Info Panels) are made up of 2D objects and lines exactly as used in the Scale bar example.

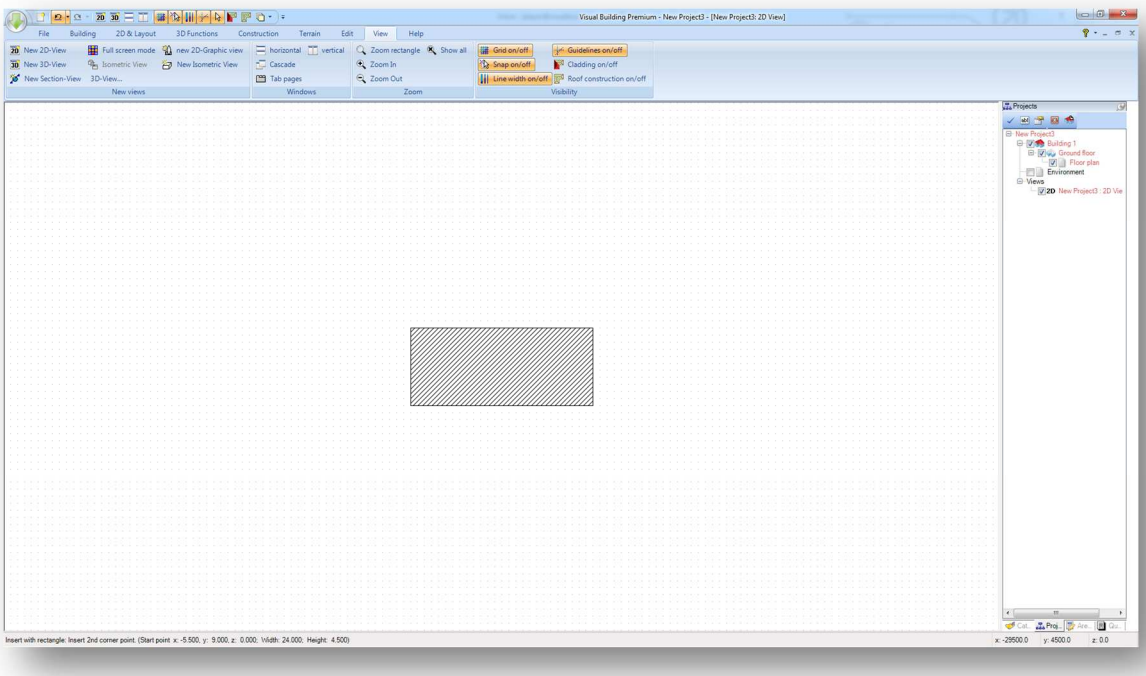
Use the **2D&Layout – 2D Drawing functions** to draw your title block. It's useful to enable the grid so that you can snap your rectangles and lines to the grid. For best results its best to draw the title block in the scale that you wish to use it. If you want to use a similar title block in a 1:50 drawing and a 1:100 drawing then create the title block in both scales.

Let's create a title block in 1:100 suitable for an A4 sheet.

Create a new project and in the 2D View right click, and in the properties dialog set the scale 1:100.

We will now create a Frame the size of an A4 sheet, so that we can better estimate the size of our title block. You can also hide the Environment block.

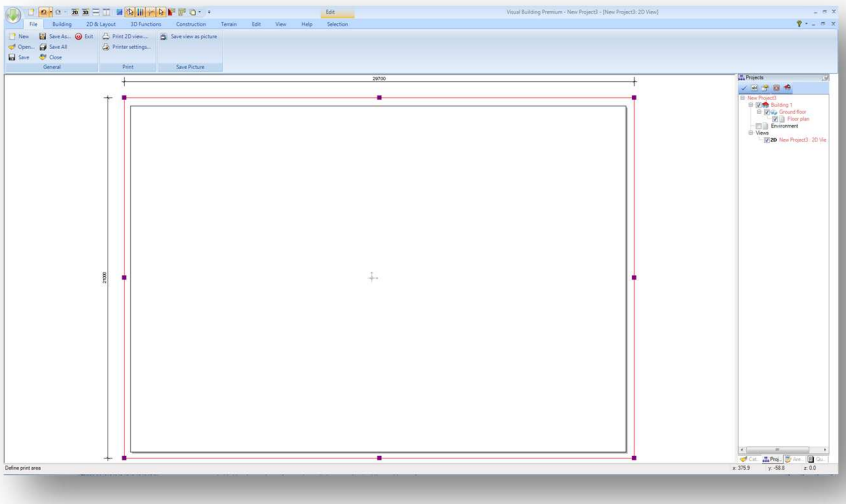
In the 2D View using the **2D&Layout – 2D Drawing functions – Rectangle tool,** draw a rectangle in the centre of the screen. This can be any size.



Now select the block and double click on it to activate the Rectangle's properties dialog. Remove the Filling and set the Width and Height to that of an A4 sheet (29700 mm x 21000 mm). Because we are on 100 scale the A4 sizes are x 100. You can place some dimensions lines to check the sizes yourself.

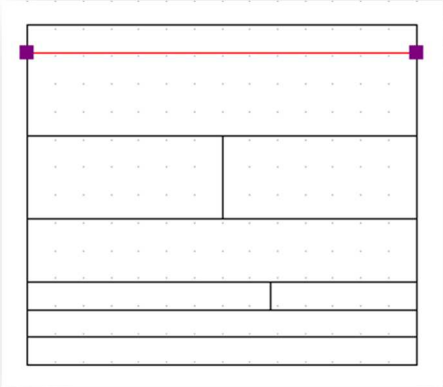
Click on Show All in the Zoom tab so that you now only see the box representing the A4 sheet.

Note: If you click on the **Print Preview** tool in the **File – Print** tab, you will notice that your A4 sheet does not quite fit into the A4 print preview rectangle. This is because your printer can not print right to the edge of your A4 paper and the print preview rectangle shows what can actually be printed. So if you have an A4 drawing in your A4 sheet, be sure to keep your drawing away from the edges.



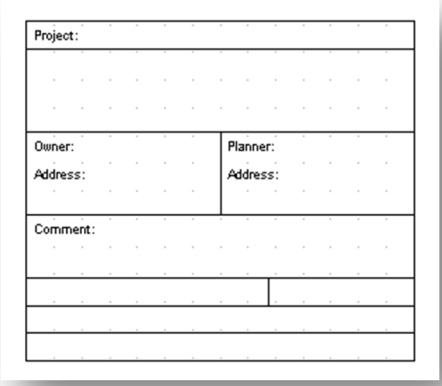
This image shows the A4 block with dimensions and the inner box is the print preview box for an A4 landscape sheet.

Using the **2D&Layout – 2D Drawing functions – Rectangle tool,** draw a rectangle anywhere on the sheet. This rectangle will represent your title block frame. You don't have to use the rectangle, and you can if you wish use the Line tool.

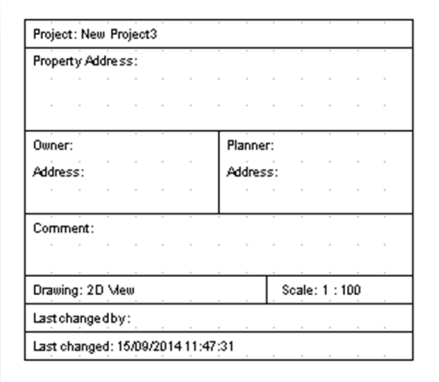


It will also help if you place some text in your title block so that you can size the block to accommodate the text size that you wish to use.

Add any text that you want to appear in your title block.



You can just add the field titles that you want displayed, and then manually fill in the details for each project that uses the template



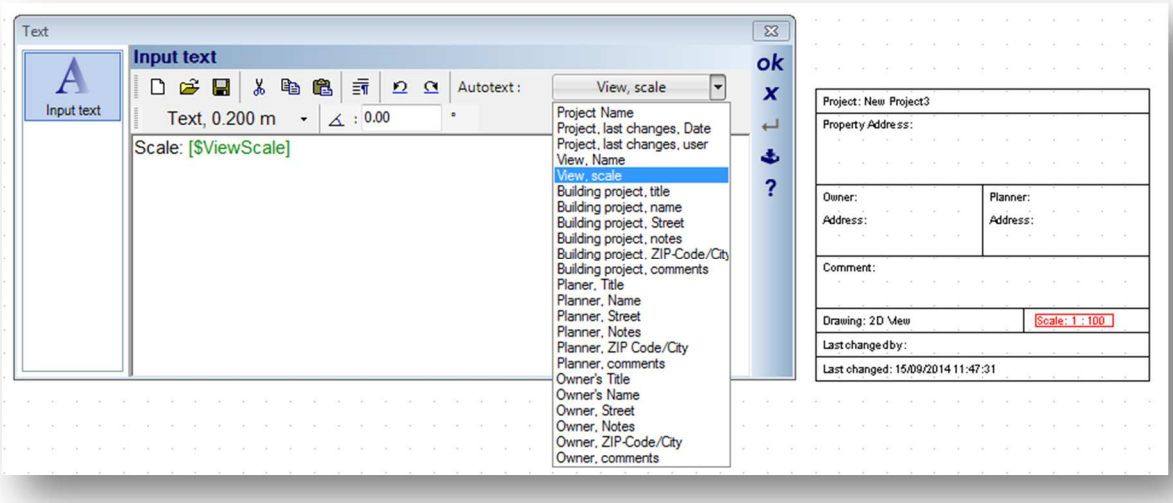
Alternatively you can use the auto fill feature that enters data from the individual project.

Here for example the title block automatically enters the project name and date and scale.

This is achieved by Autotext feature to assign specific fields to a text entry.

Double click on the text and select the field that you want to assign from the field list in the drop down list. In the example we are using the Scale which is acquired from the 2D view settings.

Other data such as name and address data is acquired from the Project settings. The date and time is acquired from the field [$DocumentLastEditDate]. These auto text fields are described in detail in the Visual Building User manual.



Now select all the title block and text (not the A4 sheet size) and then right click on the selected objects (they will appear red) and select **Save selected objects as 2D Symbols**.

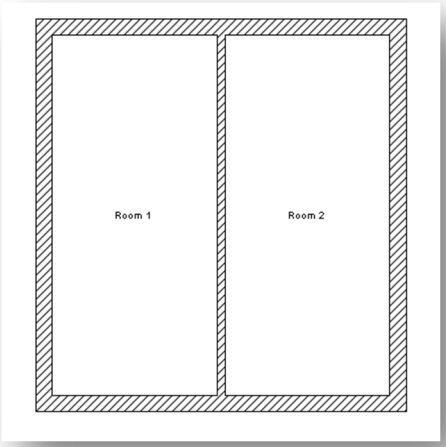
You can now save your template into the 2D Symbol folder to be used for future projects.

You can also include an image if you want to include a logo.

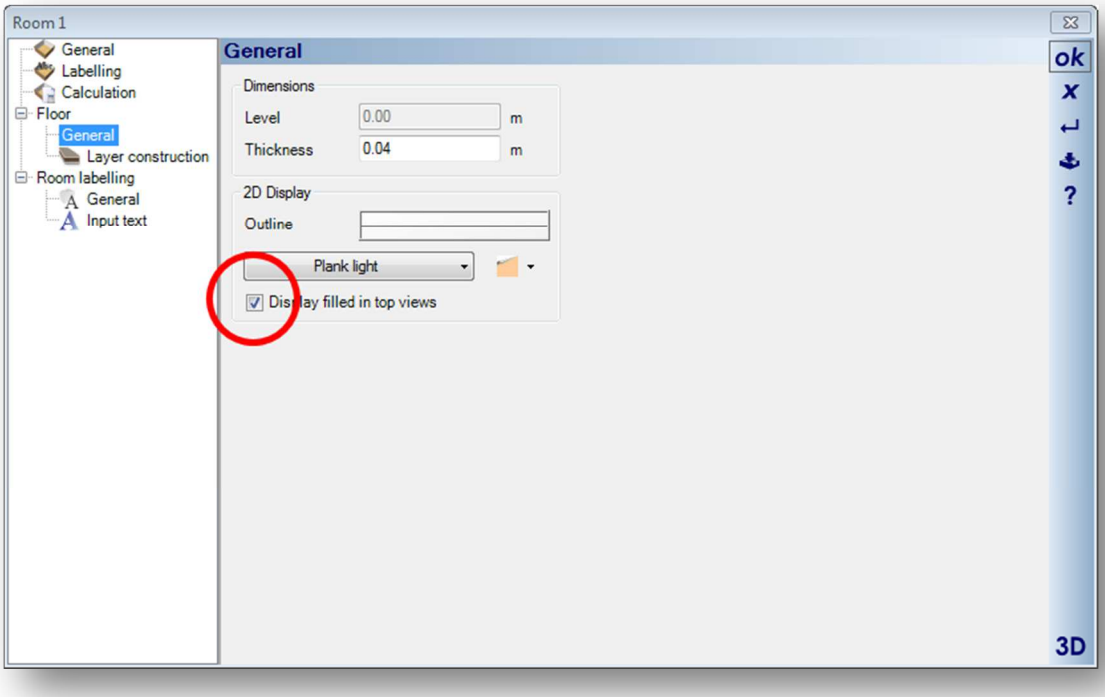
You can also edit any title block in the catalogue. Drag the title block into your project, select it and the right click on it, and select **2D Symbols, separate to base objects**. You can now edit the title block and save it to the 2D catalogue.

17 Filling 2D views - Floors

We wish to apply a colour to the following floor:

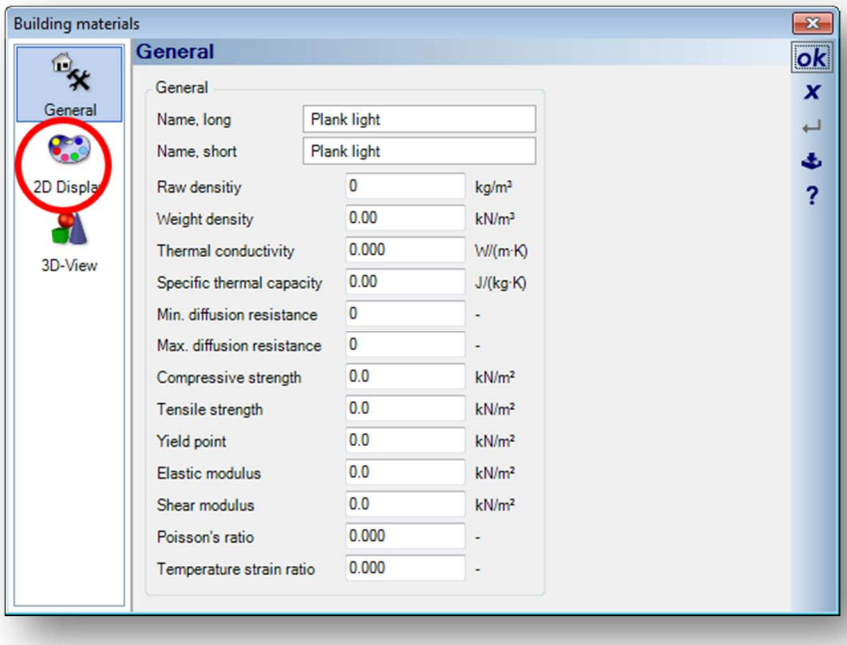


First select the floor of a room (a red hatch appears to indicate its selection). Then double click the selected floor to activate the Room dialog:

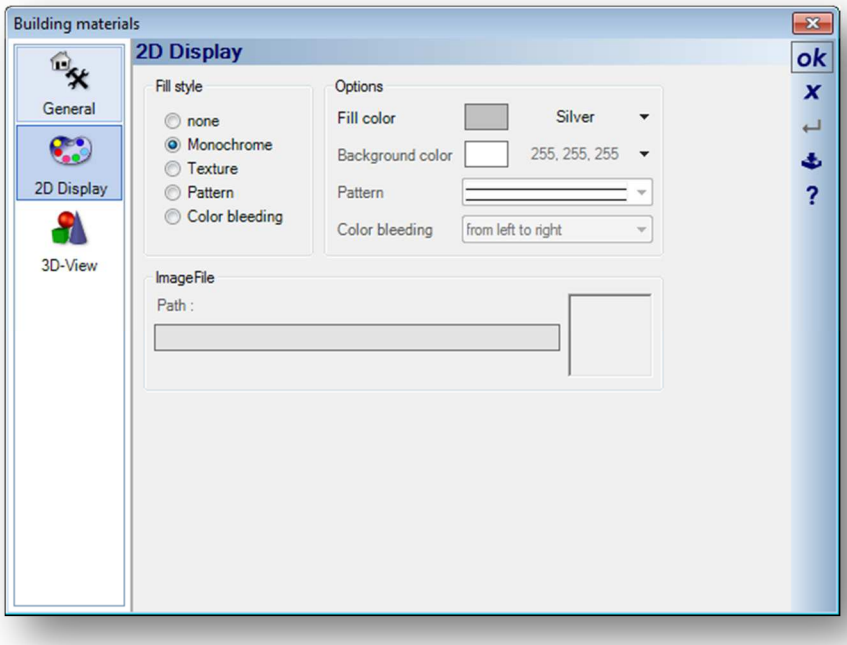


To view the floor colour or filling in the 2D plan view you must enable **Display filled in top views**

Now click on the button that currently says **Plank light,** which will then activate the **Building Materials dialog:**



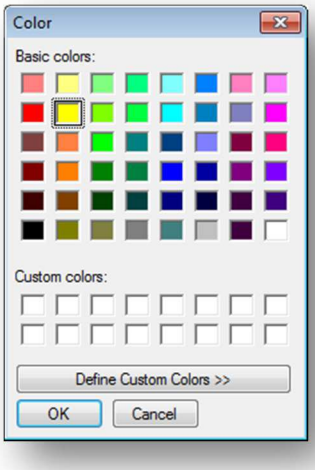
As we are interested in how the floor is displayed in the 2D view click **2D Display,** which will activate the **2D Display dialog:**



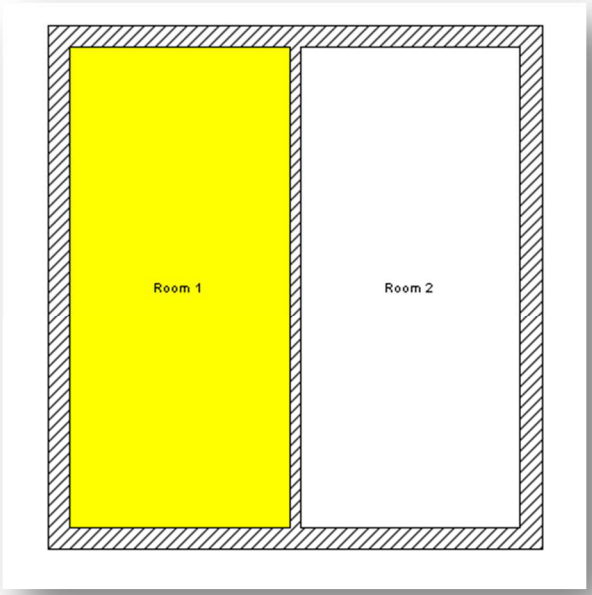
This dialog gives us the option to fill the floor with a **Monochrome colour**, a **Texture** or a **Pattern**.

17.1 Filling with a Monochrome Colour

Select Monochrome in the Fill style section. Then in the Fill colour section, select your colour from the colour palette.

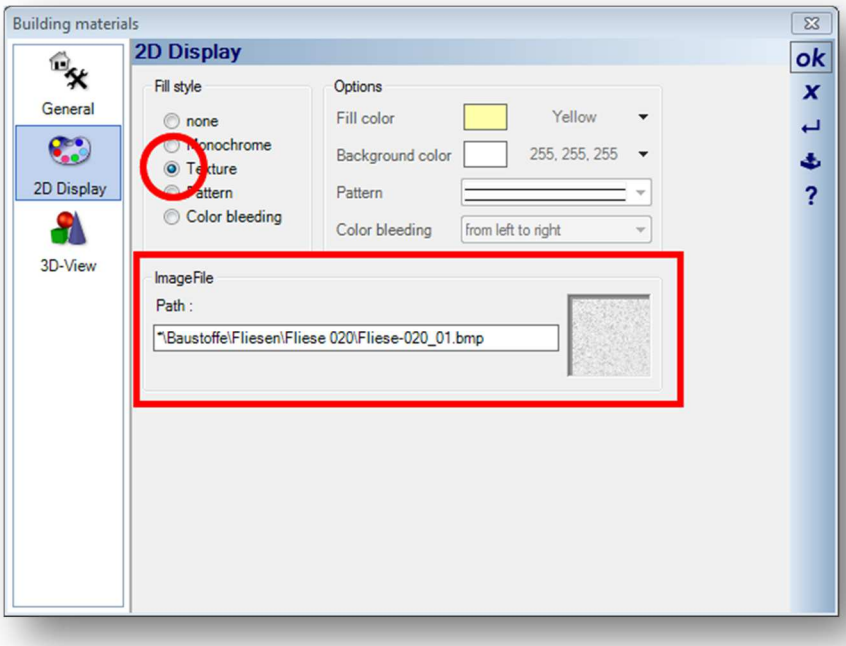


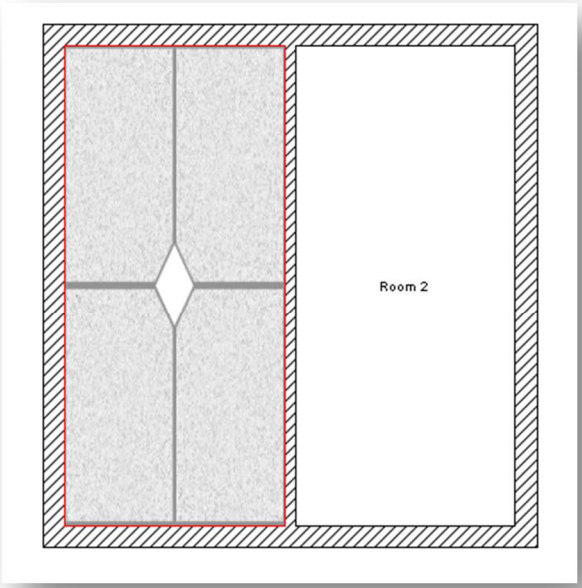
Click OK on each dialog to get back to your 2D plan view (3 OK clicks) and you will have filled your floor with colour:



17.2 Filling with a Texture

Return to the 2D Display dialog but this time select **Texture** from the Fill style section. Then click on the Path to locate any texture.

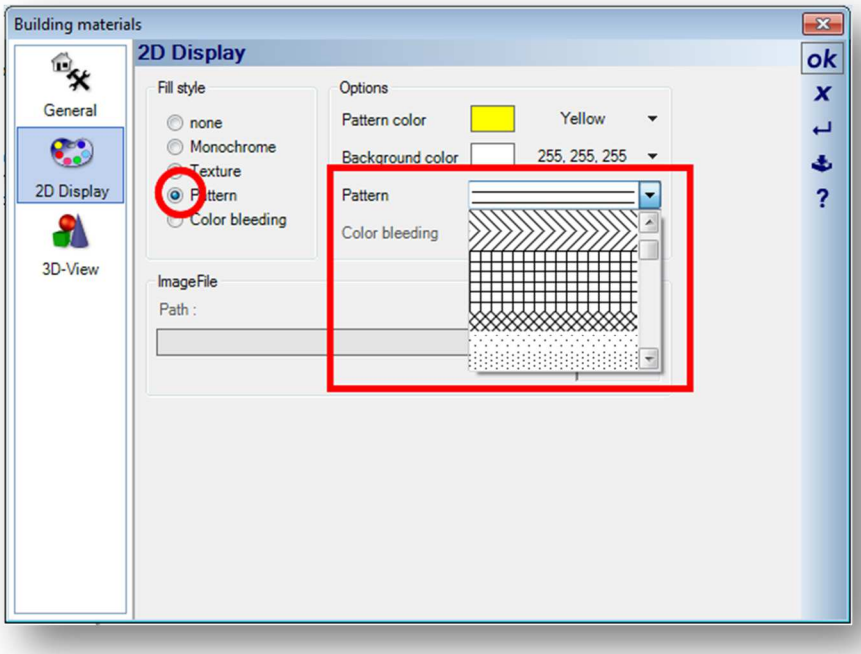




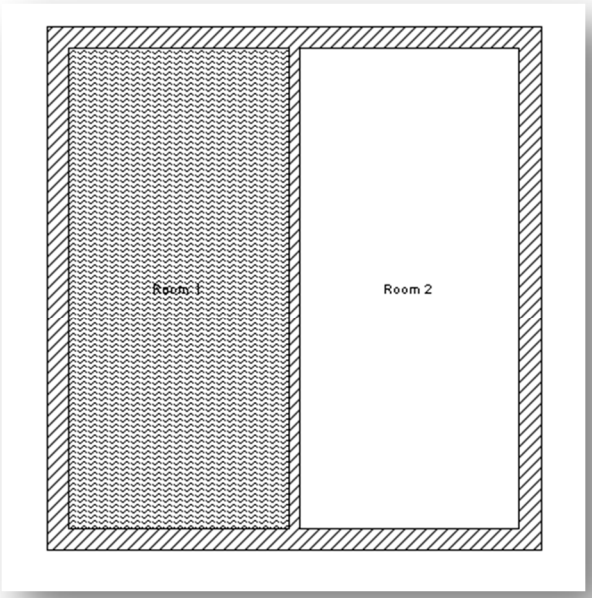
This has filled the area with a texture using the textures default size and orientation.

17.3 Filling with a Pattern

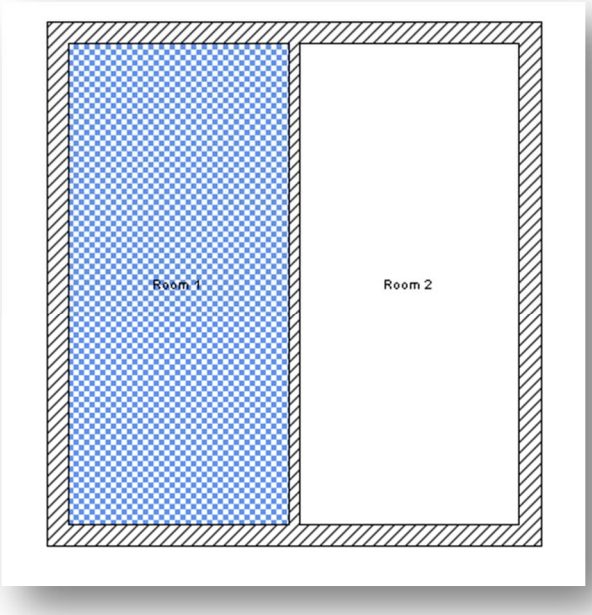
Return to the 2D Display dialog but this time select **Pattern** from the Fill style section. This time select Pattern from the Fill style section:



You can now select a pattern from the Pattern drop down list. You are currently limited to a choice of 60 standard Windows fill patterns.



You can also apply a colour to the pattern:

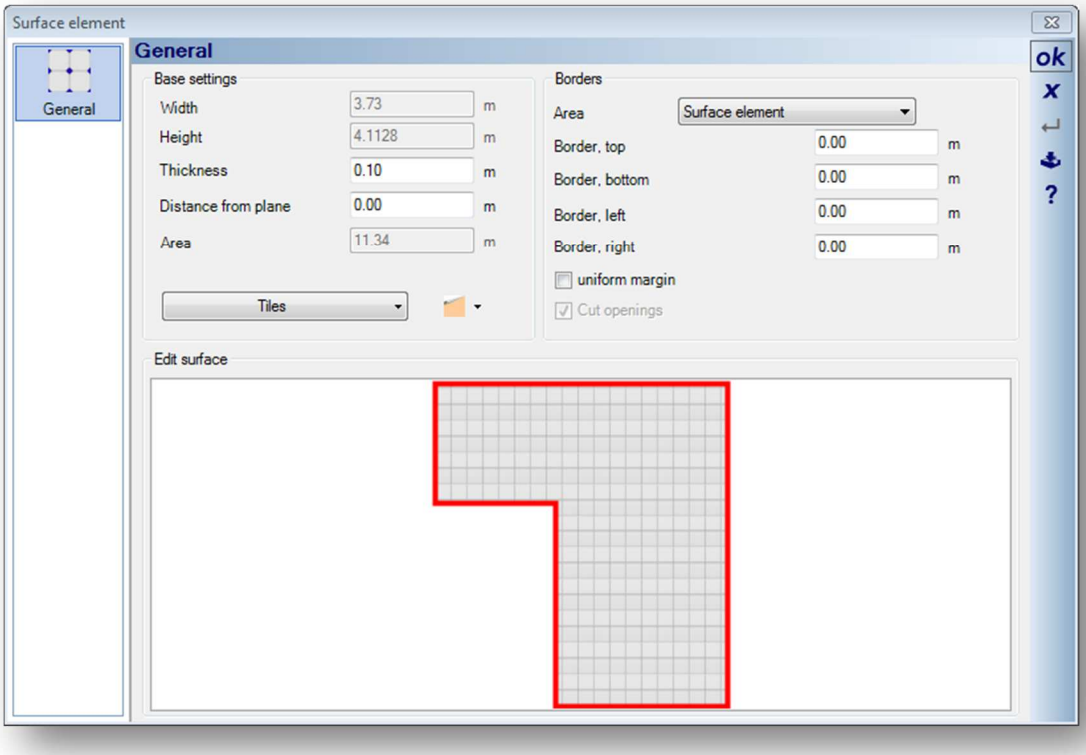


17.4 Using Surface Editor to fill a floor area

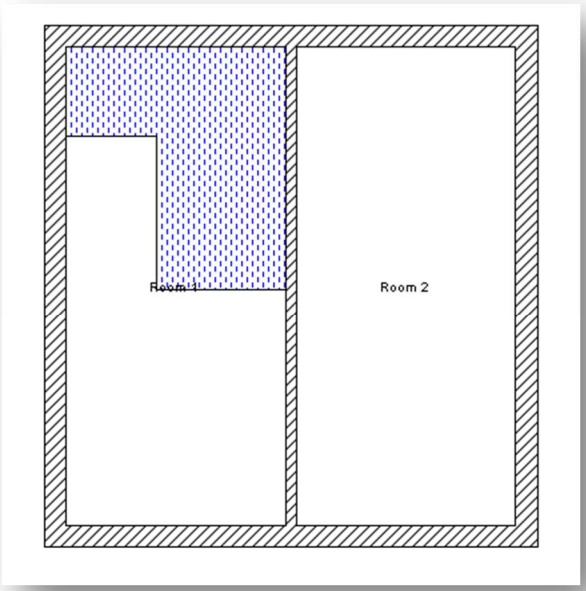
There are additional advantages in using the **Surface Area** tool, the main advantage being that you can apply colour and pattern fills to a specific area.

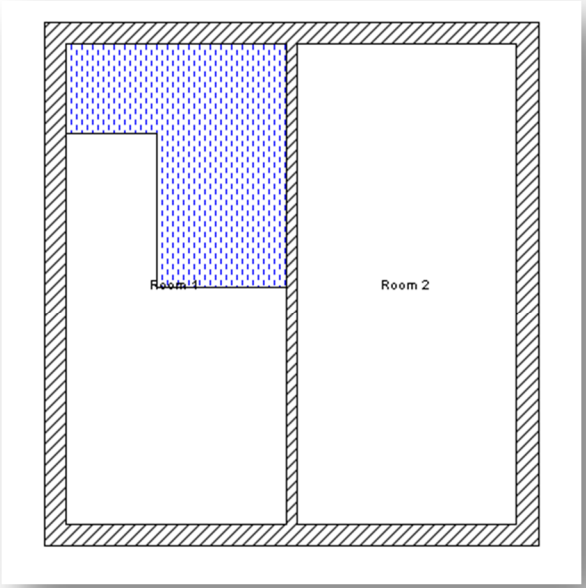
The Surface Editor tool is located in the Construction tab. Clicking on the tool will give you 3 options: **Insert Rectangle, Insert Polygon** or **Insert** in **Plane.**

We will use this tool to insert an L shape area into our room. Drawing a polygon will activate the Surface element dialog:



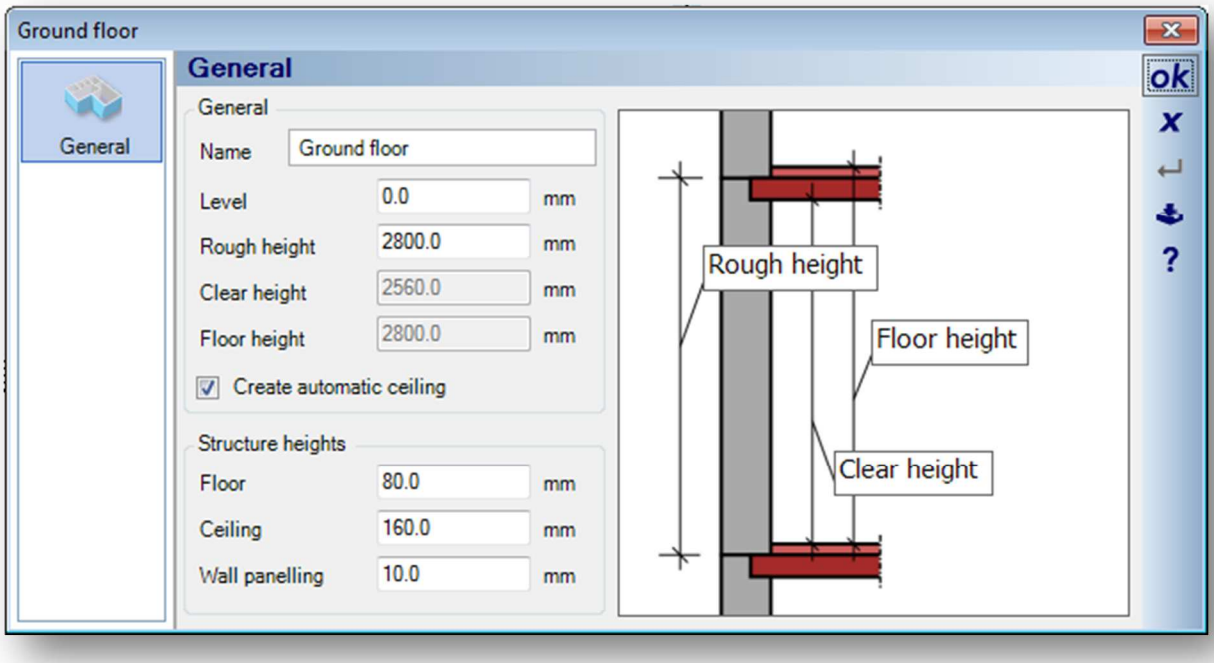
As with the previous method you can fill the created area with Monochrome colour, Texture or a Fill Pattern:



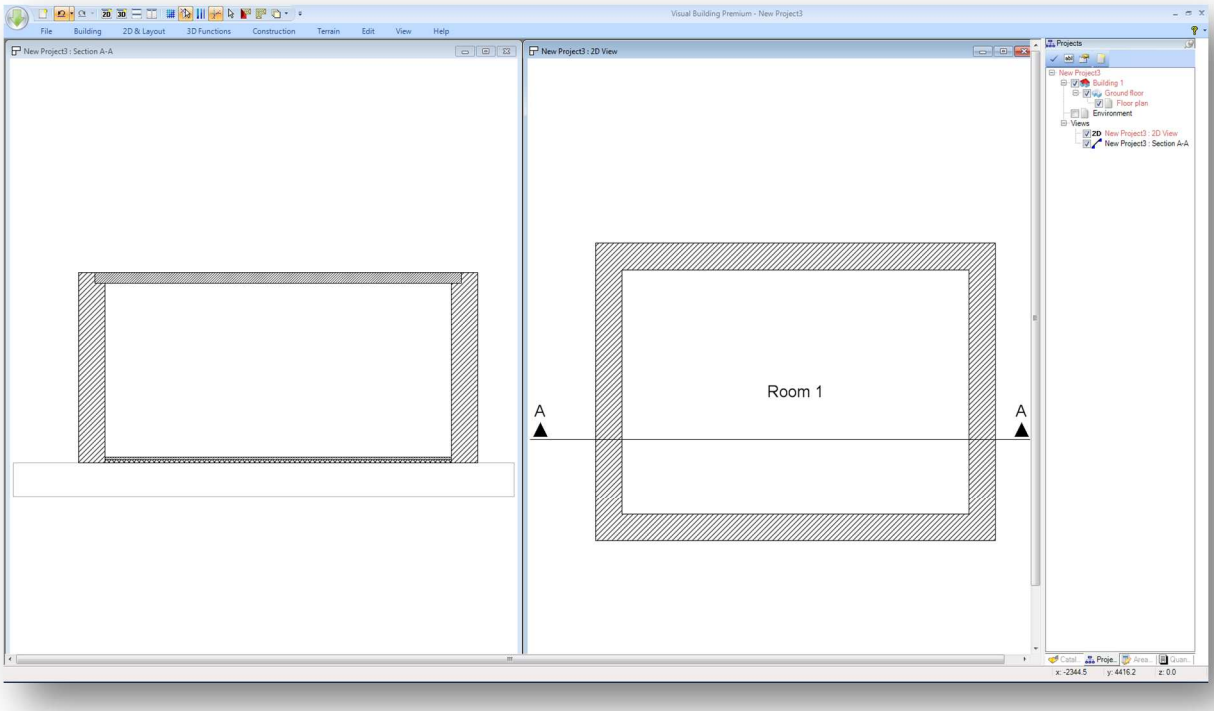

Room 1
Room 2

18 Floor Construction

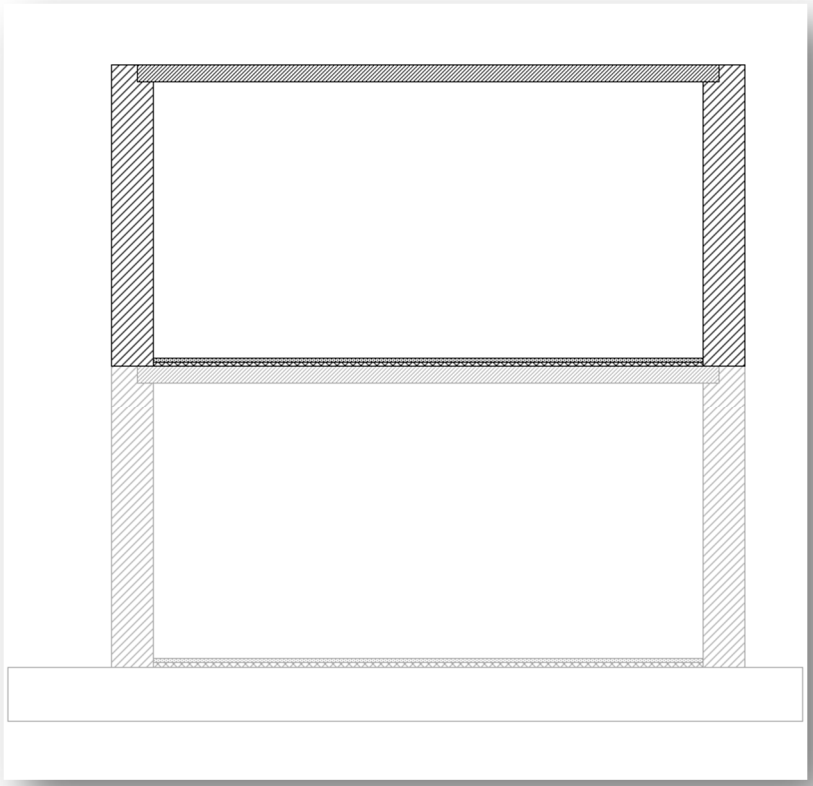
Here is a more detailed explanation of the Floor Height Properties dialog, using the default values.



We will create a simple plan and create cross section through it:



We will create an upper floor using the same default values:

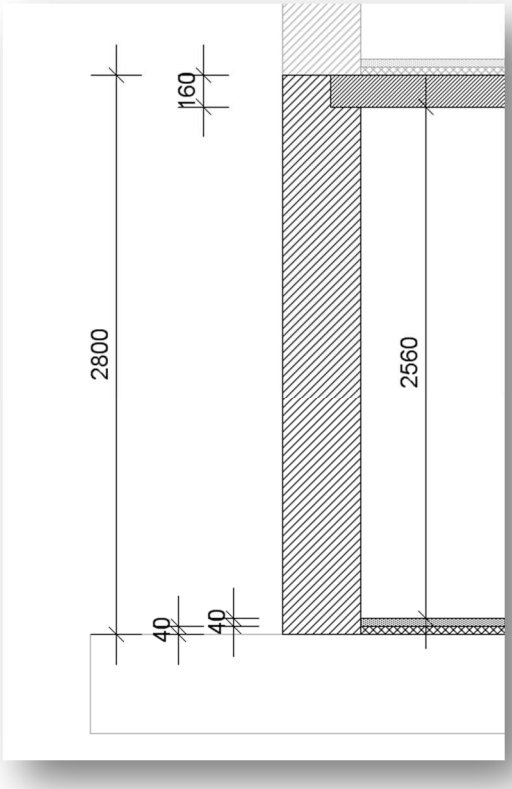


If we apply dimensions lines to our cross section, we can see how the values in our dialog were applied.

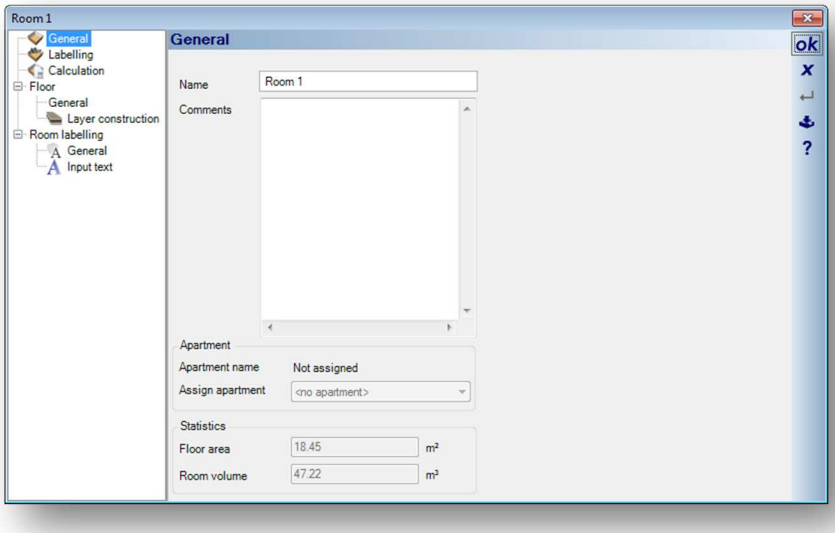
Note that the floor here consists of 2 layers each 40 mm high giving a total of 80mm.

The Rough height is 2800mm

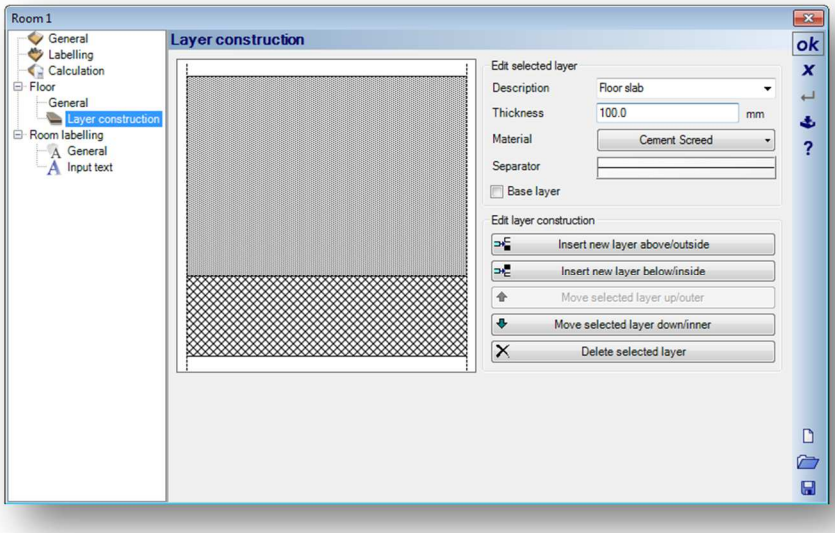
The Clear Height is 2560, all has defined in our dialog.



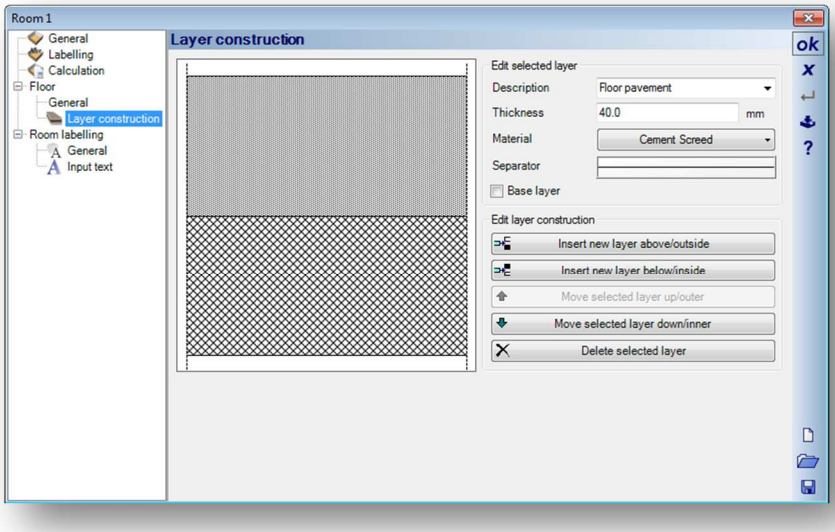
We can enhance our drawing my further defining both our floor and ceiling objects. In the section view double click on the floor and the Room dialog is activated.



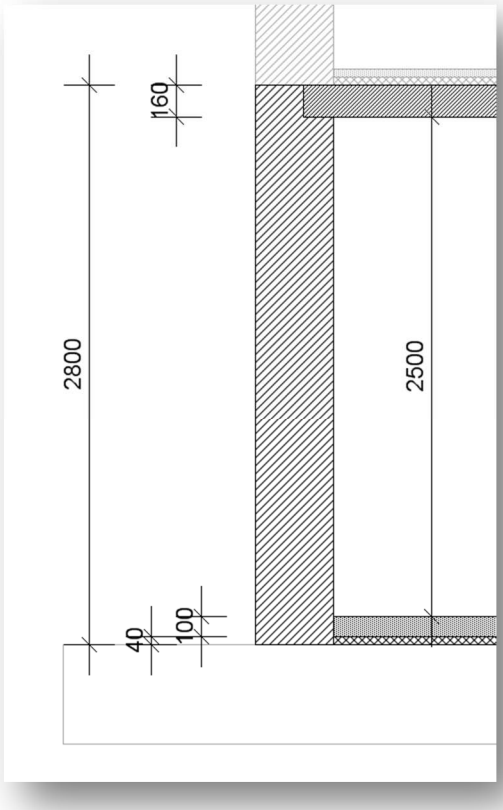
Here we can select the Floor – General – Layer construction to further define our floor construction:



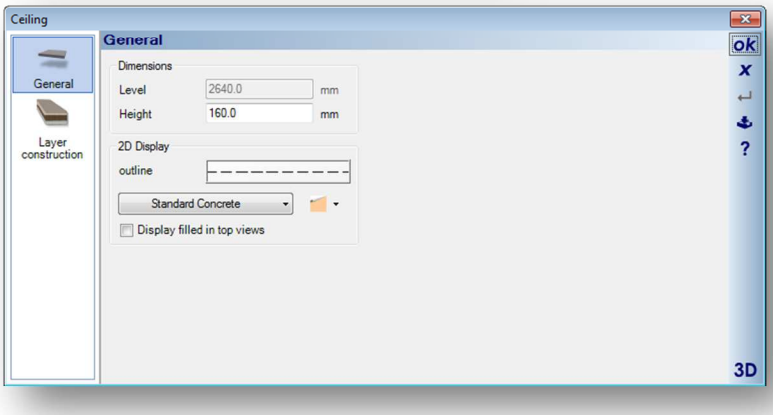
In this dialog you will see the floor consists of 2 segments- the Floor slab, and the insulation, both 40mm thick. You can remove or add additional layers or change the thickness of each layer using this dialog.



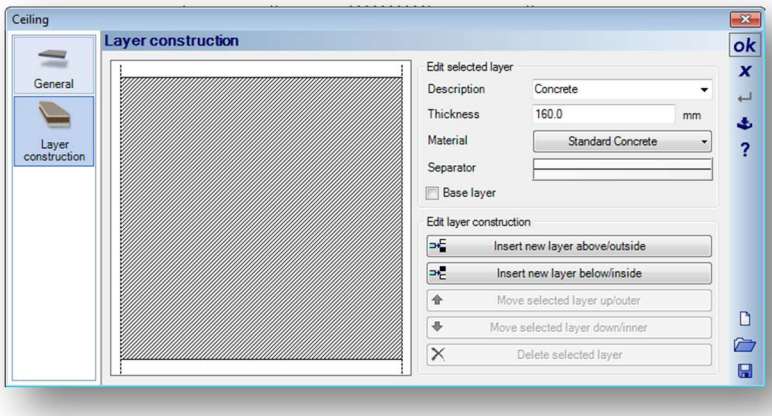
Let's double click the top floor slab layer and increase its thickness to 100mm. I also renamed the layer to Floor slab.



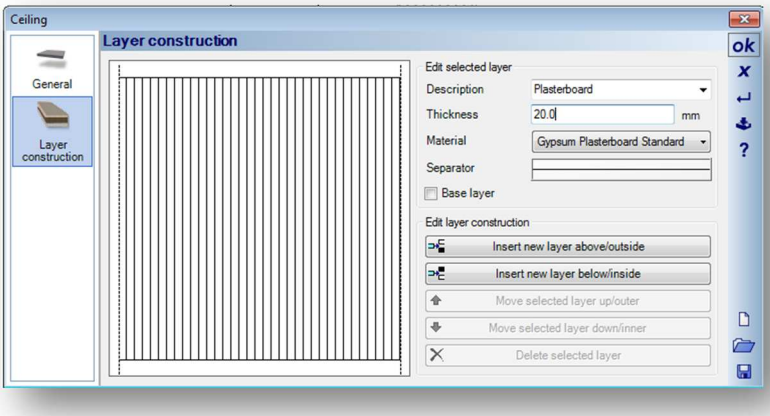
If we apply the dimensions again we can see our new values. The floor has increased by 60 mm to 100mmand the Clear height has shrunk by 60mm to 2500mm



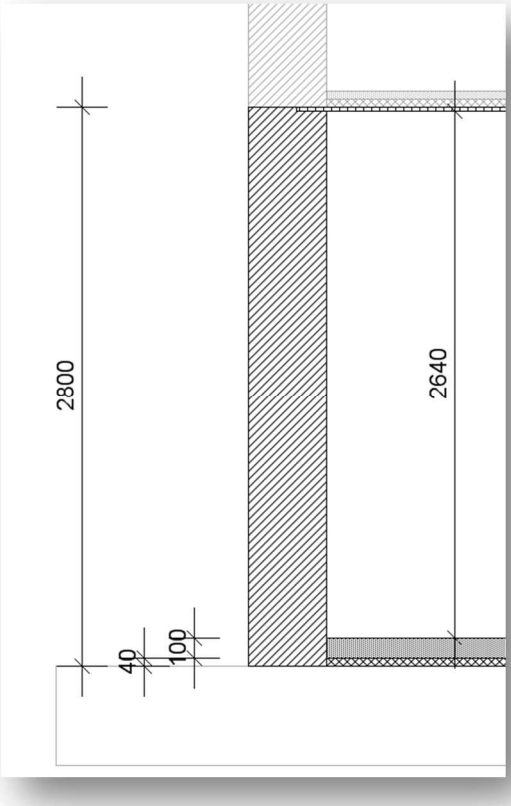
Similarly, if we want to edit the ceiling construction, in the section view double click on the ceiling, which will activate the Ceiling dialog where we can select the Layer construction:



We now see the ceiling which comprises of a single block 160mm thick.



We will convert our ceiling to consist of a 20 mm Plasterboard.

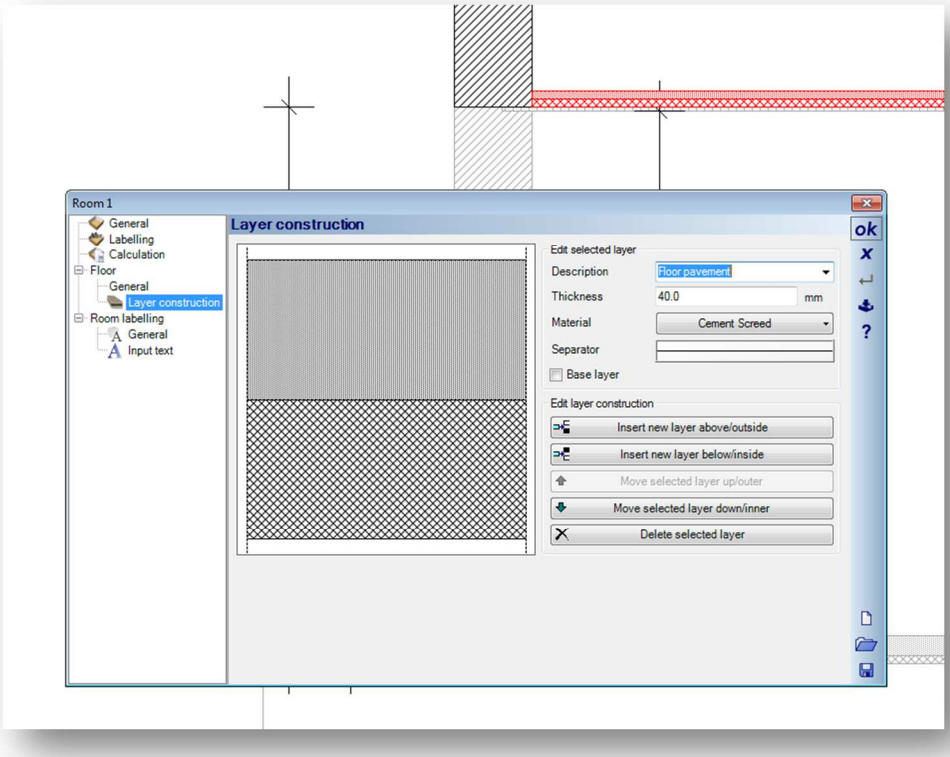


And our actual floor dimensions have changed again.

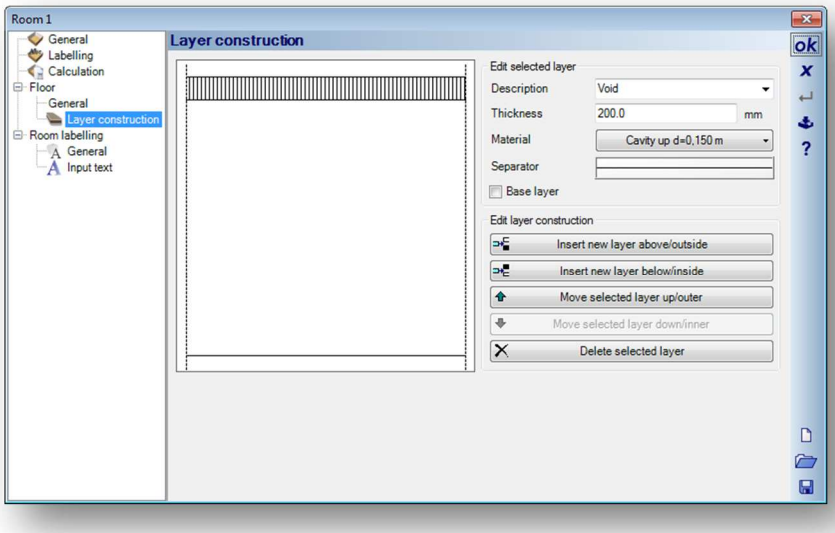
Note however that although our Rough height of 2800 mm has remained consistent with our original definition the Clear height has varied due to changes in the Floor and ceiling thickness.

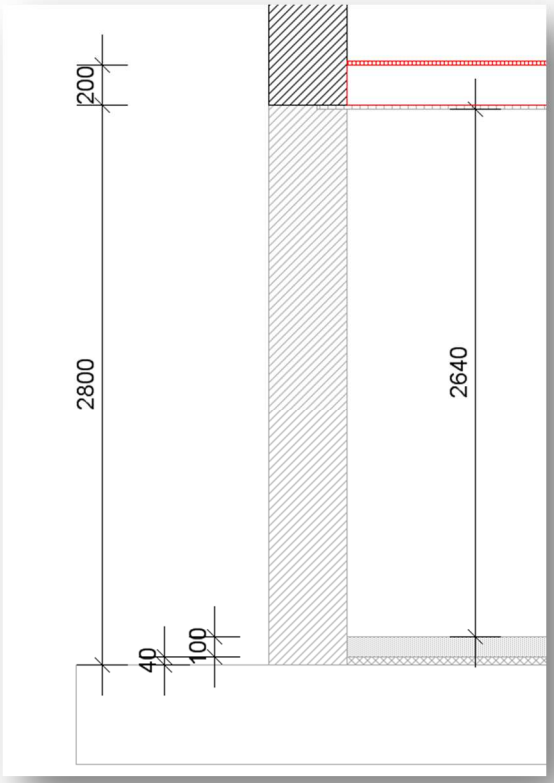
These changes are not reflected in the Floor properties dialog, so as soon as you start changing the floor or ceiling layer makeup, you should no longer rely on the Ceiling and Floor values.

Let's get a little more realistic and add some floor joists and additional flooring. Our ceiling has already been defined as consisting of the plasterboard and in this project we shall assume the floor joists are part of the next floor. So we select the next floor and double click on the floor section, and as before select the Layer construction:

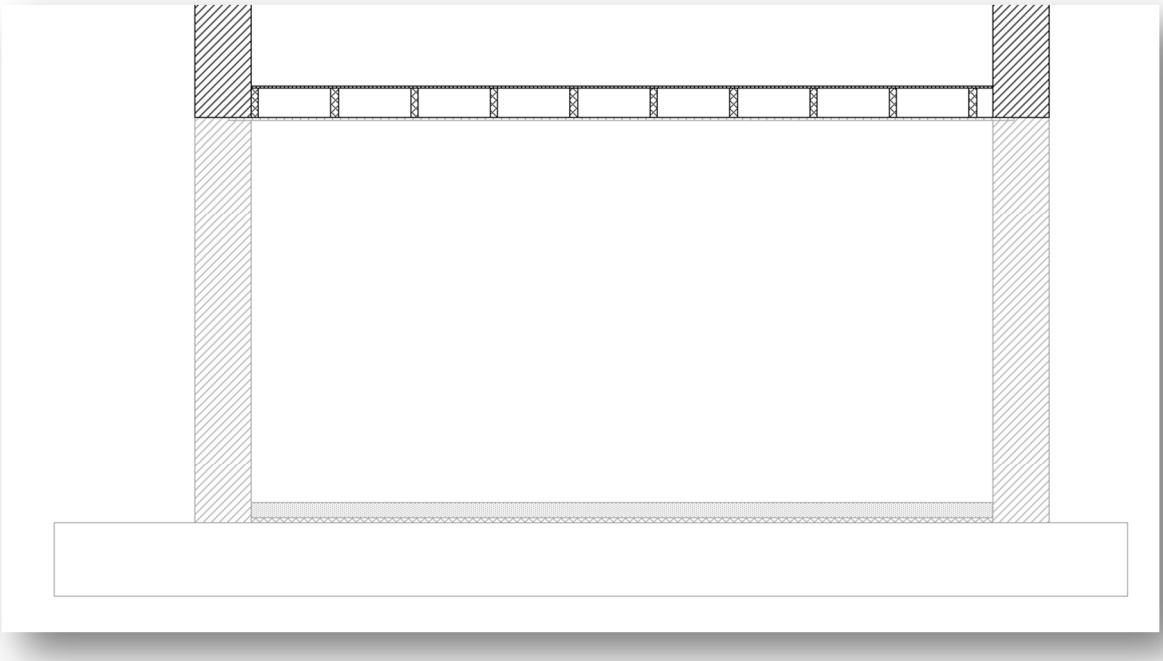


We will create a void of 200mm containing our joists and chipboard flooring of 18mm:





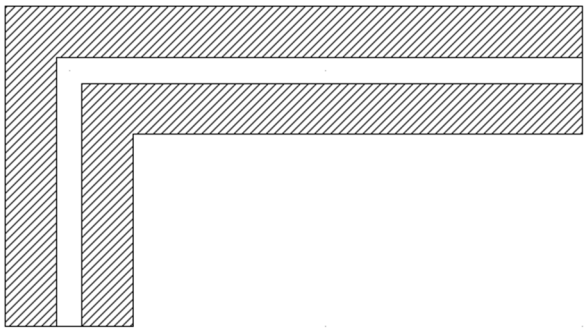
You can of course now add joist details in this void, either as 2D or 3D representation. If applied as 2D the details will only be seen in the section view.



19 Create your own Fill and Hatch patterns

Visual Building v5 introduced the ability to create custom fill patterns. This feature is only available to Visual Building Professional and Premium versions.

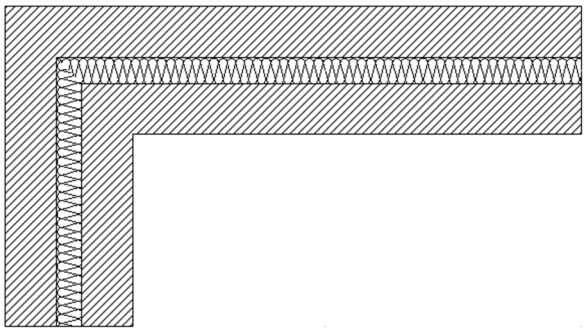
Previous fill patterns were based on the standard patterns supplied by Windows, and although there is a long list of patterns (about 56), not all patterns used in architectural drawings are there.



A typical scenario is to create a wall fill pattern. Using the standard wall fill a 100m brick – 50 mm cavity – 100 brick wall looked like this.

This appears OK on the screen, but when printed the fill pattern lines may converge and the fill pattern becomes too darker.

There are several new custom fill patterns supplied, for example the insulation material



We will now create our own new fill pattern, but first let's look at an existing hatch pattern, namely Concrete 1

20 Stair Wizard

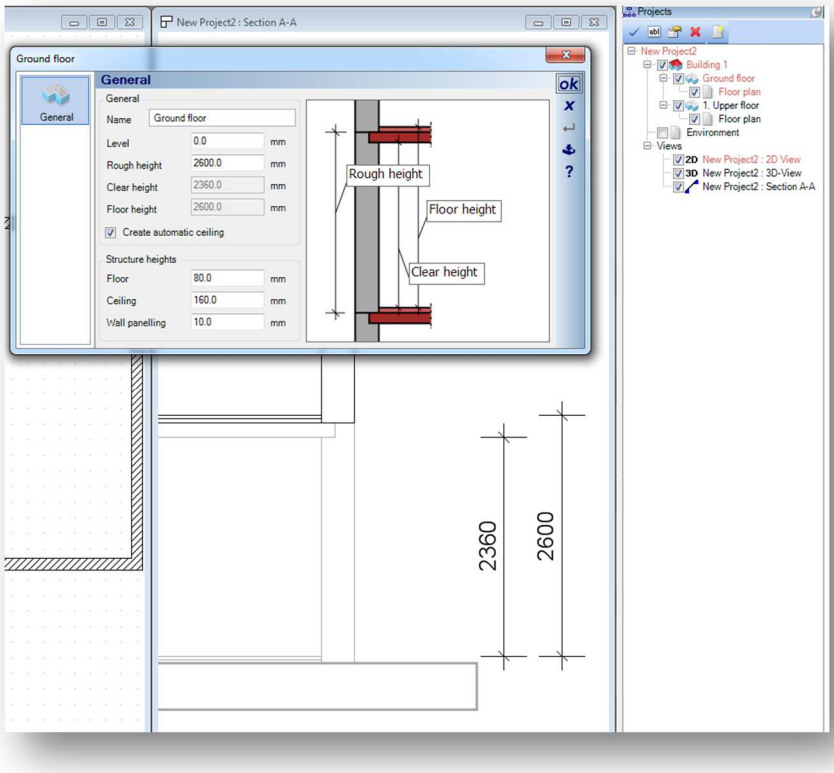
The stair wizard is described in the Visual Building User Documentation, but here we will describe the process to create a stair.

First you must decide upon the stair style. The wizard supports either solid concrete stairs of timber stairs.

The shape of your staircase layout will often be determined by the space available, building regulations (Building Regulations document K), is it a replacement or new staircase.

Although you can plan your staircase directly into your main project, if you have a complex requirement, you may often find it easier to design and play within its own project.

In your project, you will have possibly already determined the total rise for the staircase. The rise is the distance from the finished floor to finished floor level, which in the Ground floor properties



dialog below is shown as 2600mm. This dialog is activated by right clicking on the Ground floor layer in the Project tab and selecting Properties from the context menu. Note that the following view shows a section elevation of our example project.

You next need to determine the number of risers required for this staircase.

For a domestic staircase design we will our step rise must not exceed 220mm (Building Regulations document K), but you may require a value less than this, possibly closer to 200mm.

In our example a 2600mm rise using 13 risers would give us an individual step rise of 200mm (2600 / 13).

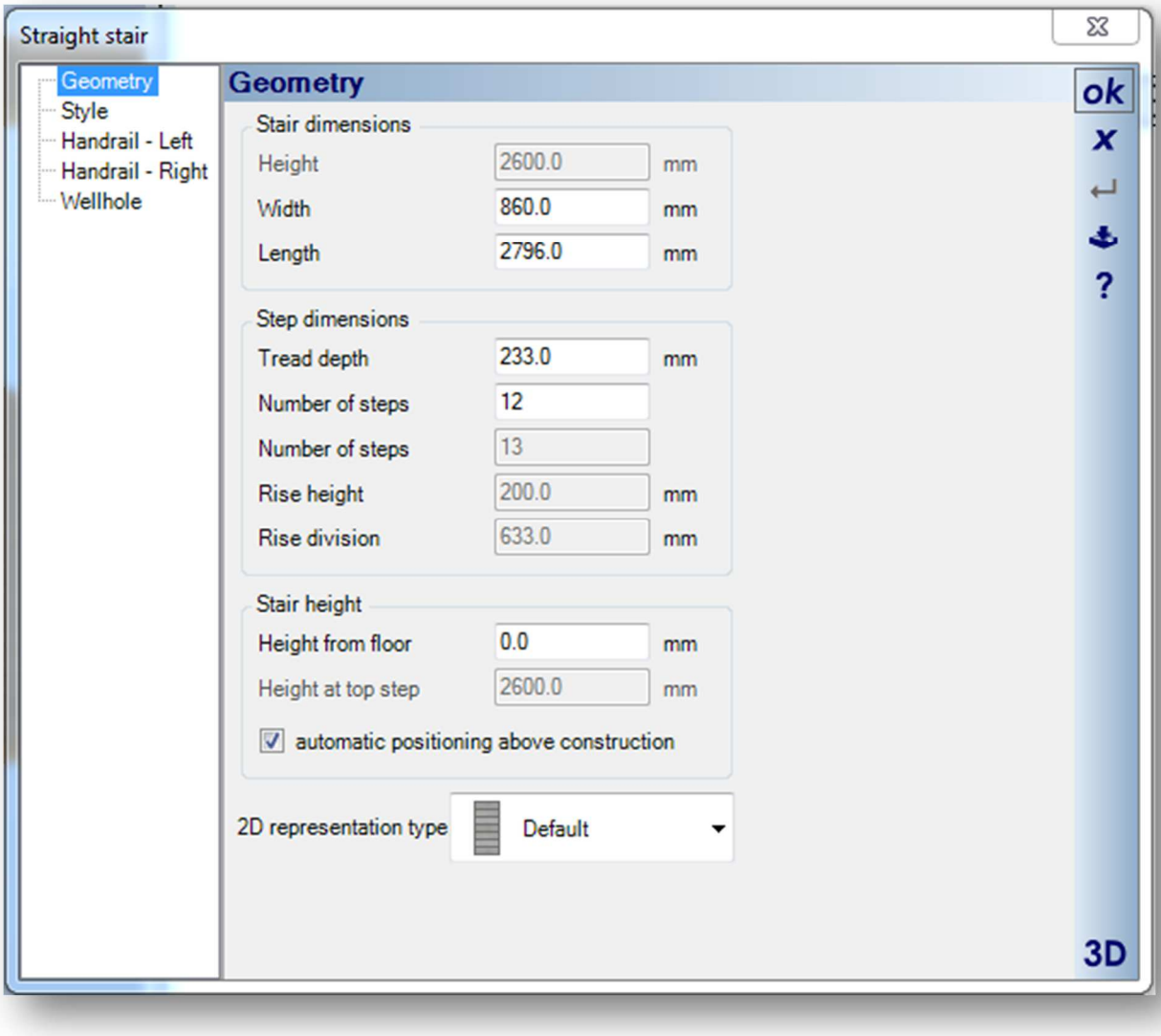
The number of treads required is always number of risers -1, which in our example will be 12.

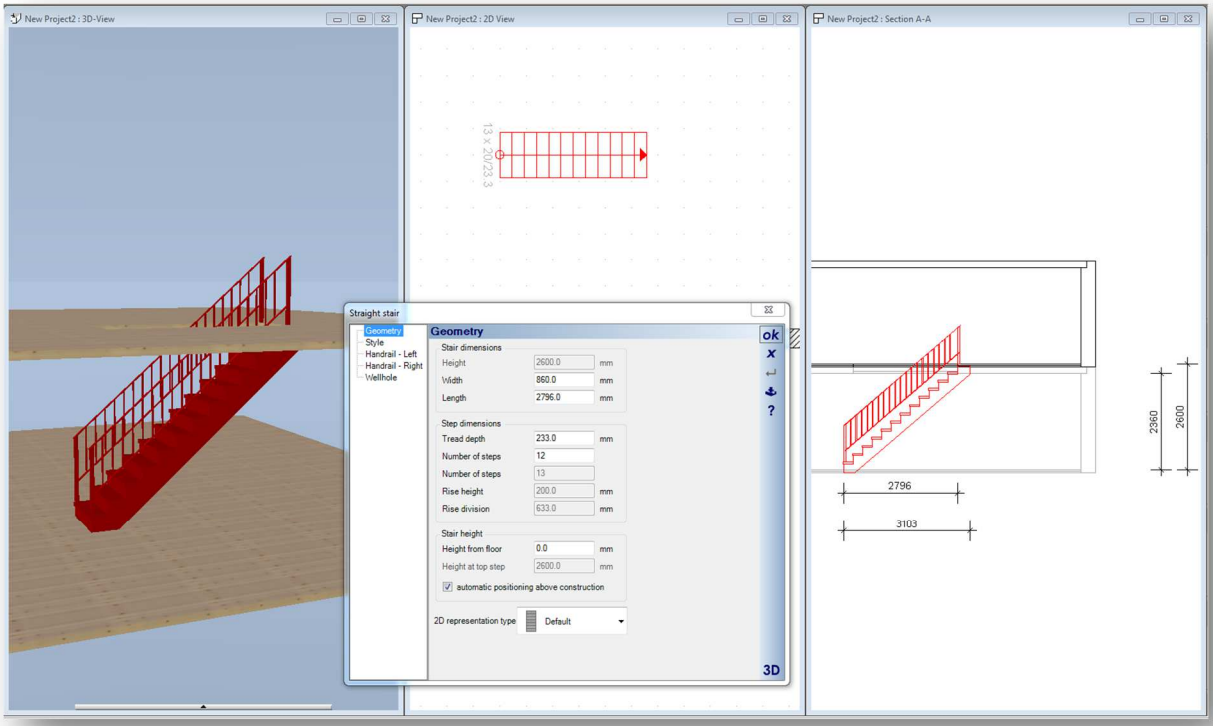
We now determine the tread size, also known as the going, which is the distance from the face of riser to the next riser. Again for a domestic staircase, to comply with Building Regulations document K, the minimum is 220mm with the pitch of the staircase not exceeding 42 degrees.

For a riser of 200mm a going of 223mm should be used.

The width of a standard staircase is 860mm, but you are able to determine your own staircase width.

Now that you have the number of treads and the going for each tread, you now have the total going (or length) for the staircase. So we will enter these values into oor stair dialog:





The total length of our staircase is 2796mm, but to this you need to add the length of the top riser, which in our example brings the total length to 3103mm.

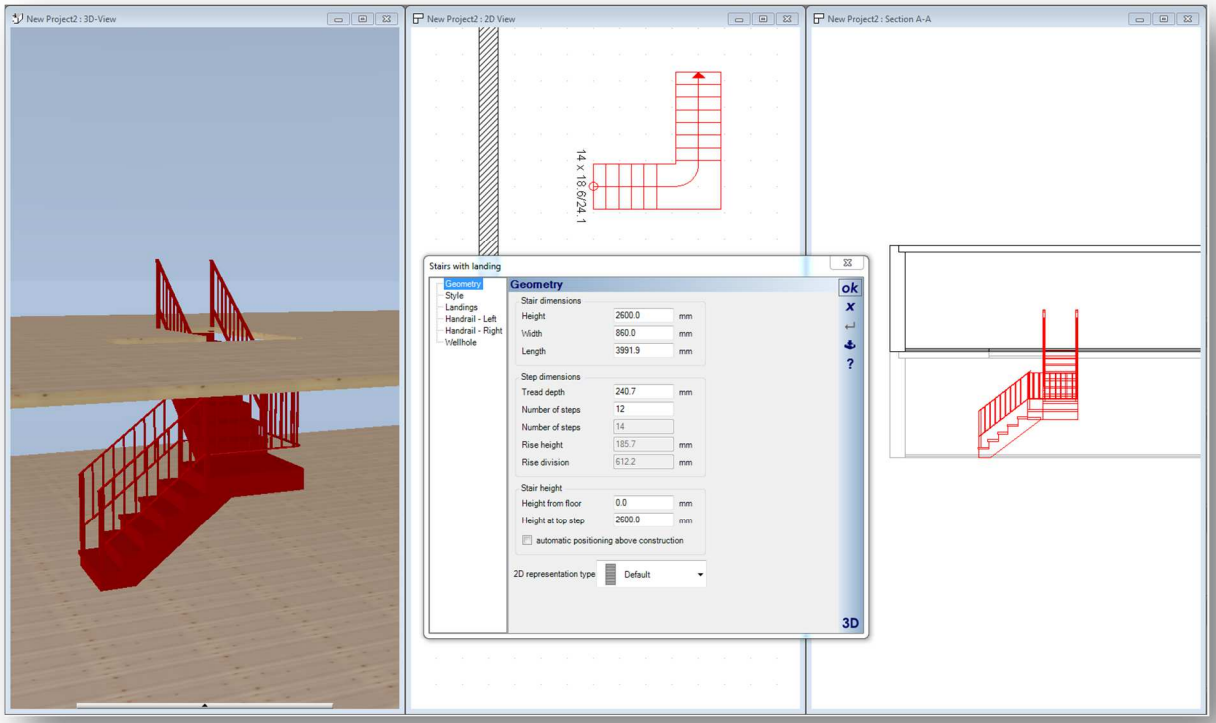
The distance required beyond the top of the staircase needs to be at least the width of the staircase, more if you have a door opening into this area.

You should allow 2000mm headroom above the central pitch line in order to comply with domestic building regulations.

If a straight staircase will not fit then you should now consider a staircase with a 90 degree quarter turn landing.

You should not rely on the dimensions and calculations provided by the staircase wizard. Consult with your architect or staircase supplier and of course always comply with the Building Regulations.

The following illustrates how to accommodate a staircase with the same rise but in a smaller area.



21 Space saver staircase

The staircase wizard is not suitable for the design of a space saver staircase. However we can still create such a staircase in Visual Building.

Normally the tread going is about half the normal going for a straight staircase.

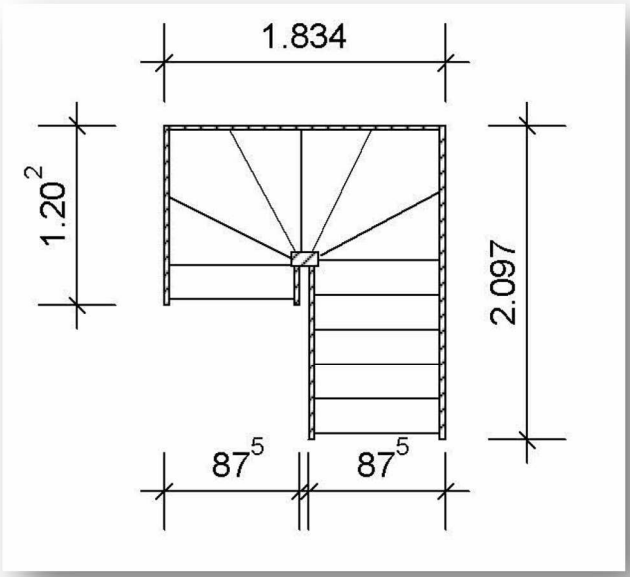
So as with our previous example, let's assume our floor to floor height is 2600mm. We will use 13 risers each with a tread depth of 116mm giving a staircase going of (13x116mm) 1508mm, but manufacturers will vary and I found a 12 riser space saver stair with a going length of 1350mm

The above model was created by drawing P shaped step as a 2D outline (I cheated by tracing an image from the web). I then converted this to a 2D Contour, which I then extruded. I then used the multi copy too to place 6 copies of the right hand step, and then repeated same for left hand step.

Side panels where then added. All completed with Visual Building Premium 2D / 3D tools.

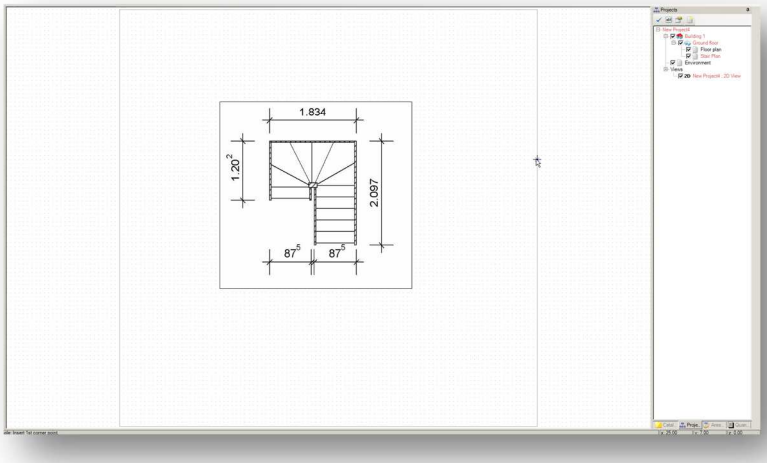
22 Bespoke Stair Designs

The Visual Building Stair Design tool is limited to a specific set of stair designs, which is adequate for many types of stairs. However many users are now able and willing to design their own stairs, subject to building regulations and need stairs beyond the capability of the standard stair designer tools.



Here is an example of using **Visual Building Professional's** internal 3D design tools to create such a staircase.

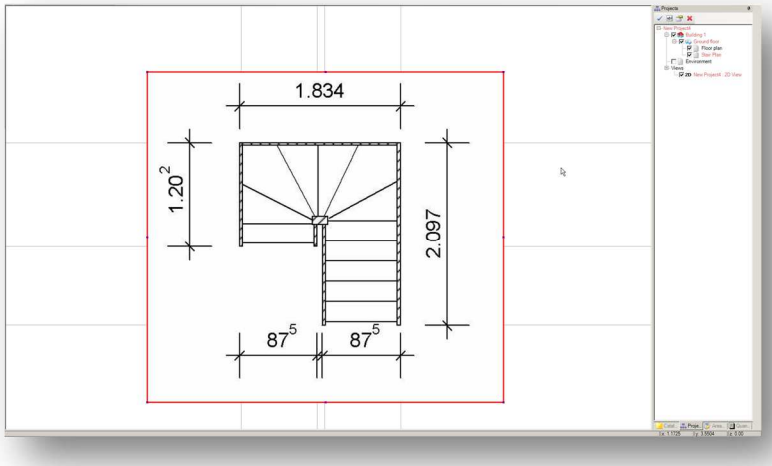
Obtain or create a 2D plan drawing of your staircase. You can use Visual Building to create such a 2D plan drawing.



If you are using a supplied drawing then you can import that drawing using the **2D Graphic – Insert Bitmap** tool. It's best to create a new layer for the imported image as its then easier to hide/show.

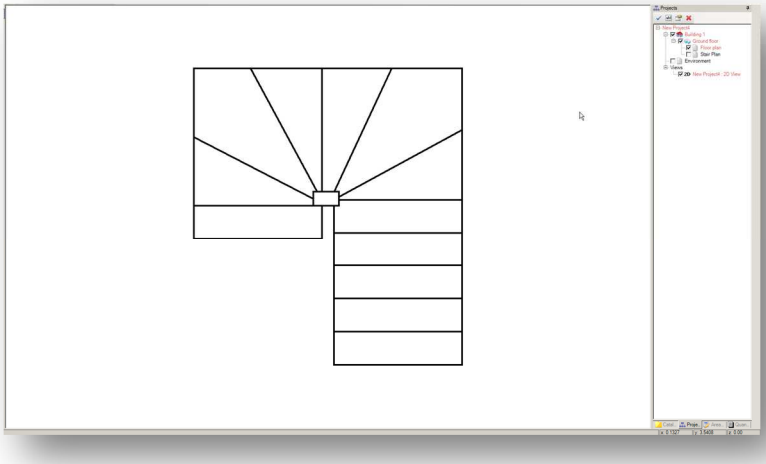
After placing the image you will need to rescale it. Right click on the image and select **Adjust scaling**.

Now add some guide lines and dimensions if required.

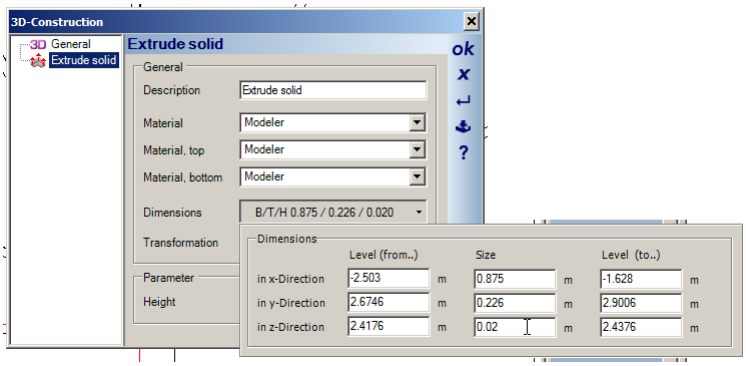


We will now use the **3D Construction** tool **Extrude solid** from a polygon.

Use the polygon tool to trace around each step. We added the guide lines earlier to define all the critical snap points to make this easier.

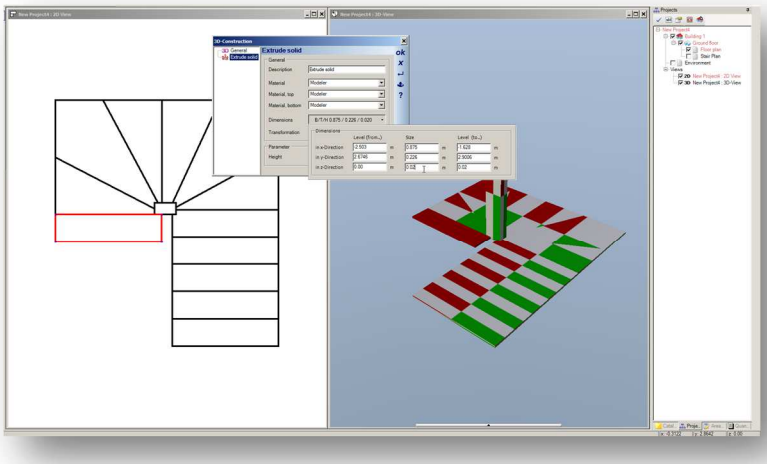


We now need to set the thickness of each individual step to 200 mm.

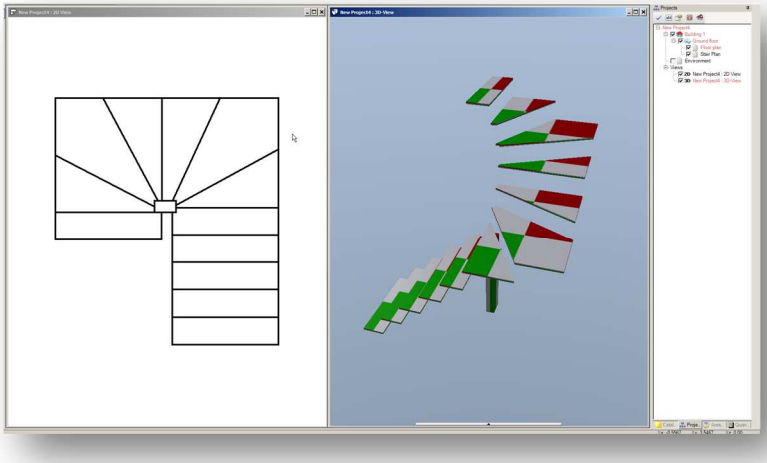


This is achieved by double clicking on each step and activating the **3D Construction dialog**. Select the **Extrude solid** from the tab tree and click **Dimensions**, setting the size for z to 0.02 (the height).

Repeat this for each step:



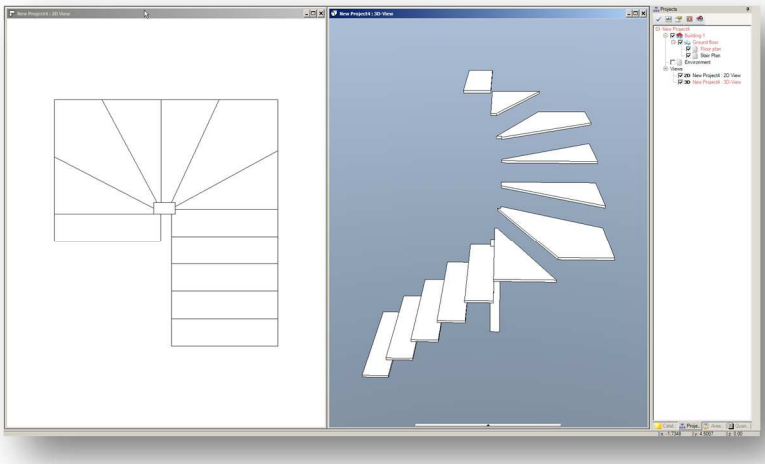
We now need the set the height for each step. In this case the rise per tread is 202.3 mm, and so we will increase the height of each tread by 202.3mm.

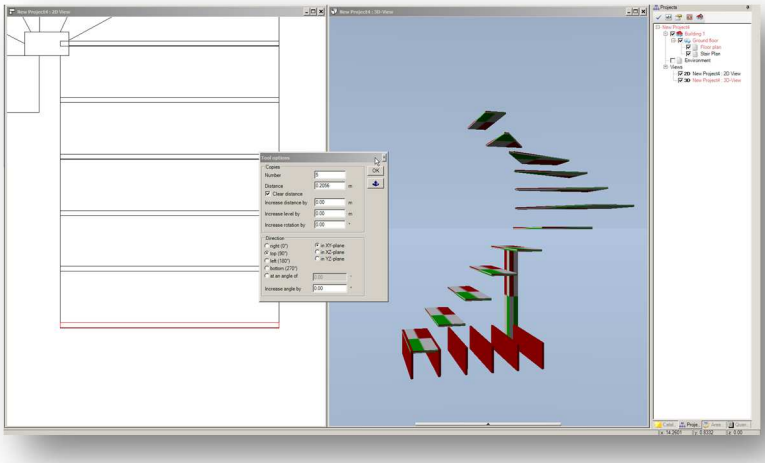


This is achieved by clicking on the Transformation button in the **3D Construction dialog,** and increasing the z value. There is a shortcut here because you can insert into each field a calculation, instead of a value e.g 0.2023 * 4 , saves you calculating each step height manually.

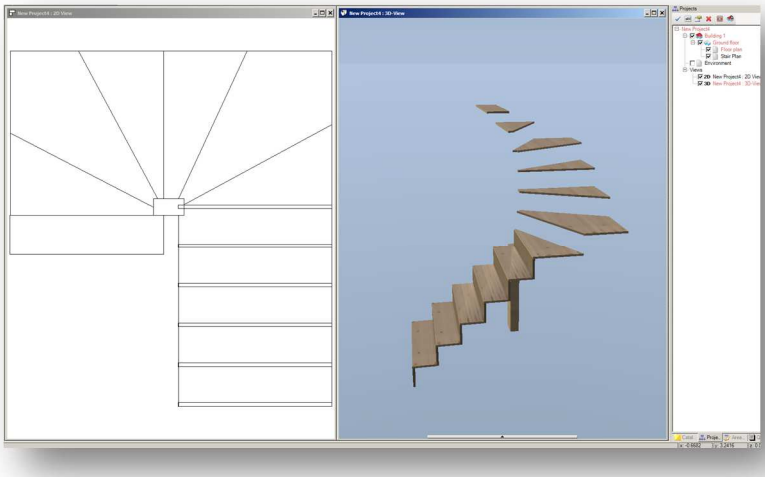
Repeat for each step:

You can change the view style using the Display mode tool.





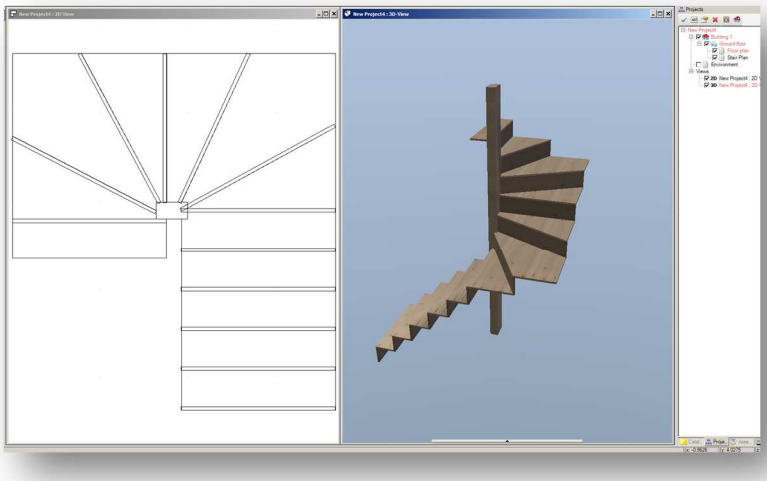
We will now add the risers. Create only one riser and use the **Multiple copy** tool to make additional copies. The risers can then be positioned horizontally, and then vertically using the **3D Construction dialog** as before.



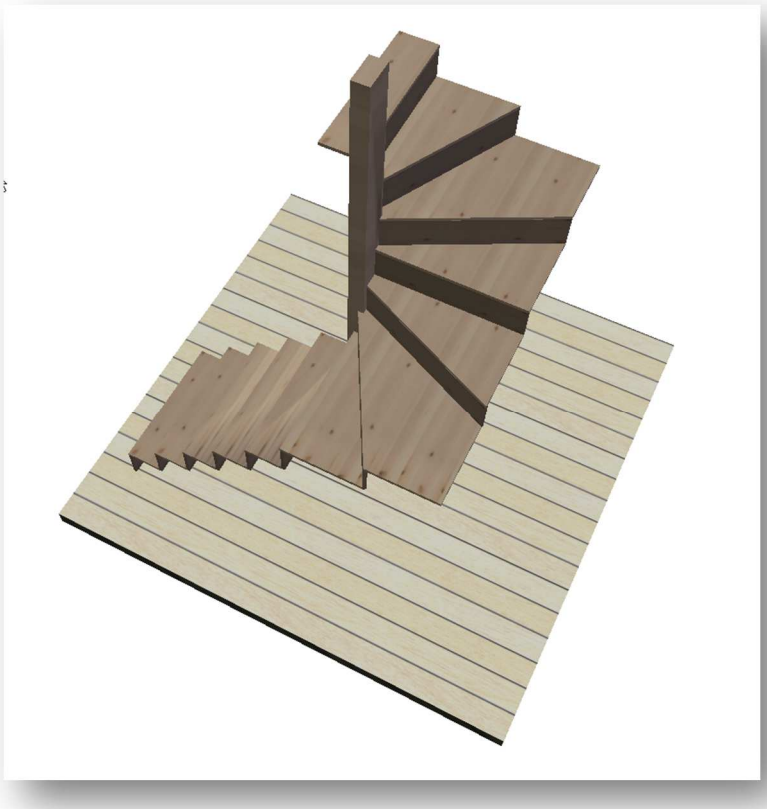
You can also drag a wood grain texture from the texture catalogue onto each step.

For the angled risers don't use the rotational tools. It's easier to measure the angle of each step and then set the angle for the riser in 3D **Construction dialog.** Use the **Transformation**'s **Rotation** button to set the angle.

The complete staircase should then look like the following.



You can now export this as a catalogue object. Note as a catalogue object this object can then be used in all versions of Visual Building.

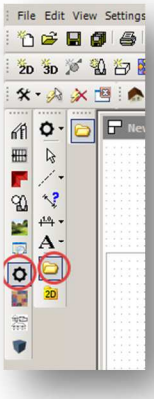


23 How to Import a Stair project from Stair Designer

Many professionals and carpenters use specialised software tools to design and build their stairs. There are several such tools available and I highly recommend **Stair Designer**. You will find more information concerning **Stair Designer** on our web site.

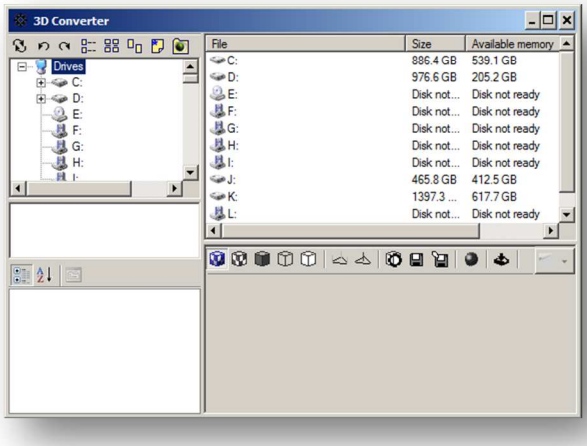
These instructions will work with any 3D DXF file, but in this particular case we are using a 3D DXF stair file created with **Stair Designer**.

You should create a new project into which you will import your 3D DXF file. You need Visual Building Professional or Visual Building Premium in order to import a 3D DXF file.

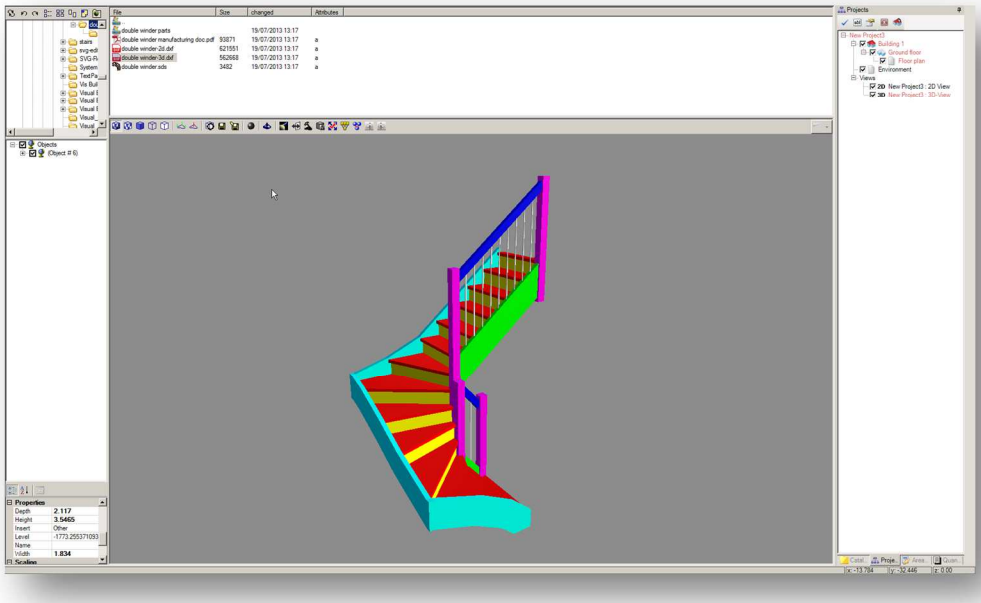


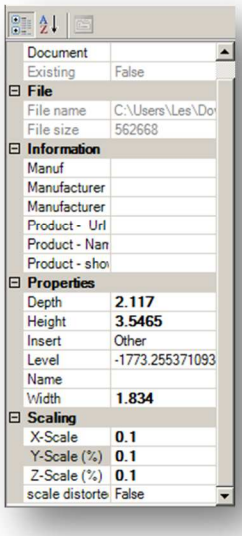
From the toolbar locate the **3D Converter** and the **Browse** tool.

The 3D Converter browse dialog will then open, allowing you to navigate through your file system to locate your 3D DXF file.



When selected the 3D DXF file will load and display.





In the bottom left of the screen is a property panel for the loaded staircase. Note the height of the object and adjust the scaling accordingly. In our example we had to set the scale to 0.1% in order to ensure the staircase was the correct height.

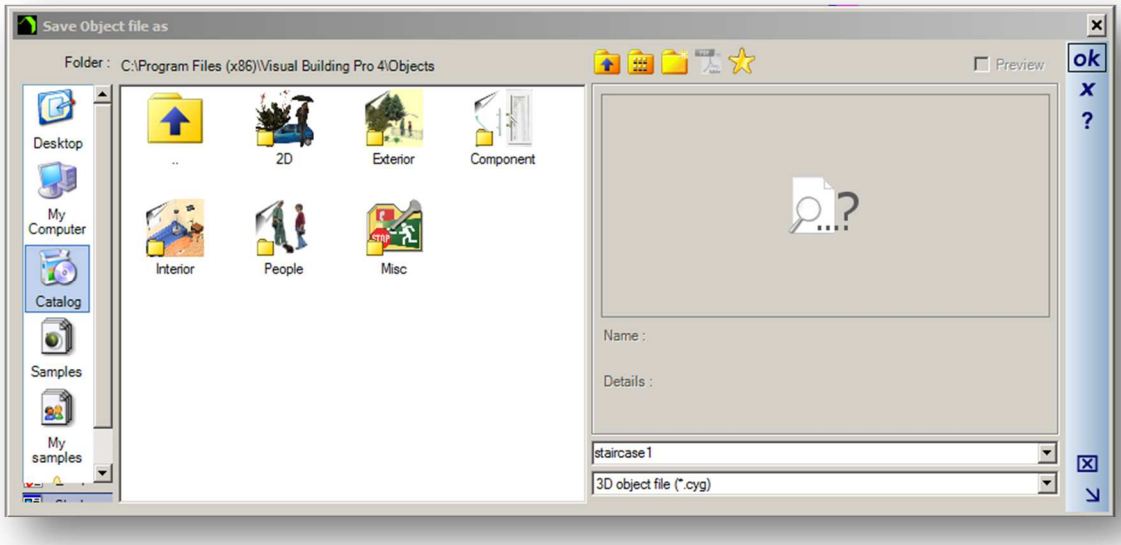
If after applying the scale factor the object disappears, then right click in the view window and select **Show all**.

The colours of the stair case components are those defined by Stair Designer and can be changed later.

Normally there will be no need to make any changes to the object, but you can do so if you wish.

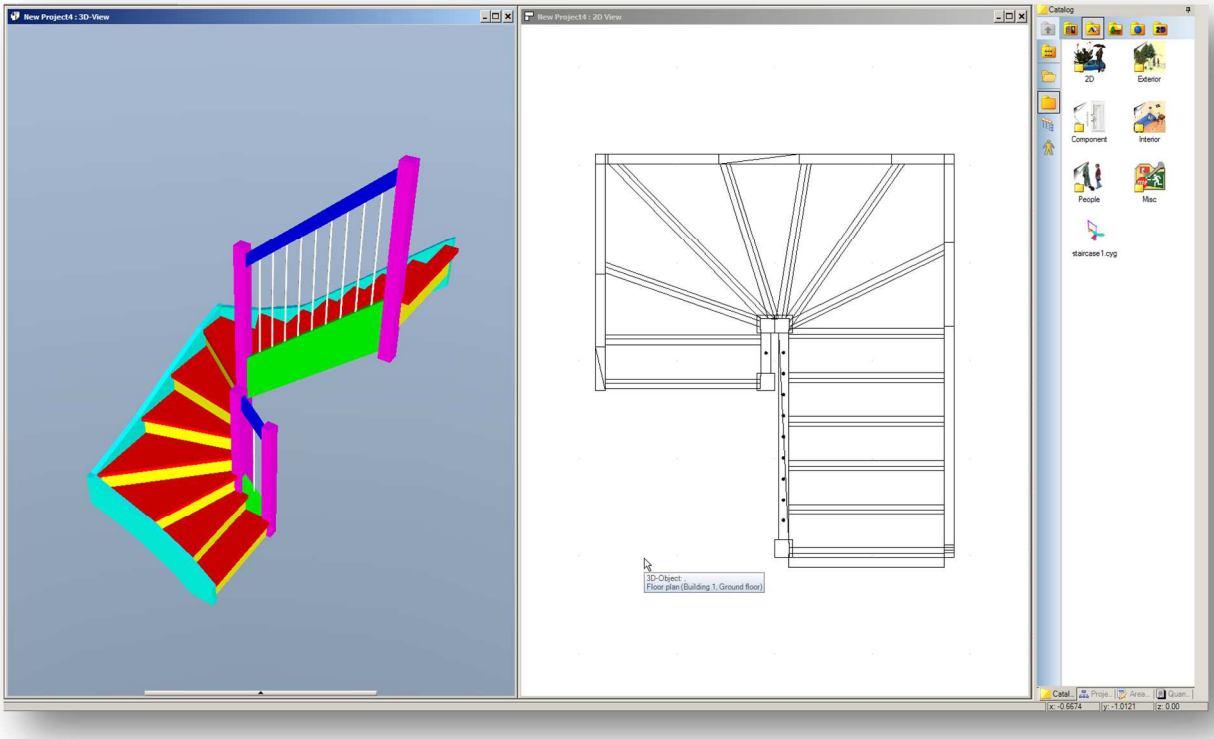
To save the staircase as a Visual Building 3D Object click on the Save As icon. This will allow you to navigate to the object catalogue and save the object file.

Note: to save in the main catalogue folder you must assign Admin privileges to Visual Building.



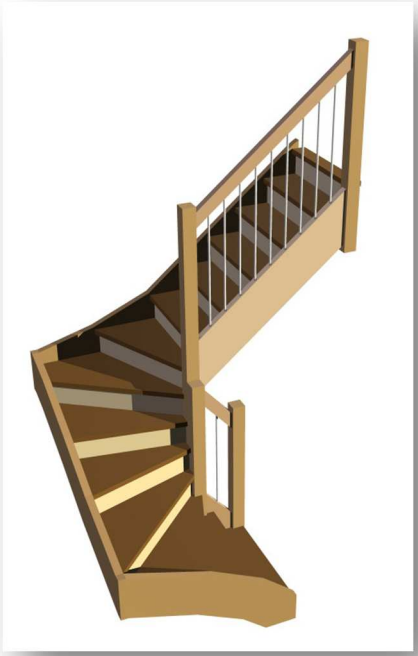
Before the object appears in your catalogue, you will need to fresh the catalogue, simply by closing and reopening any folder in the catalogue.

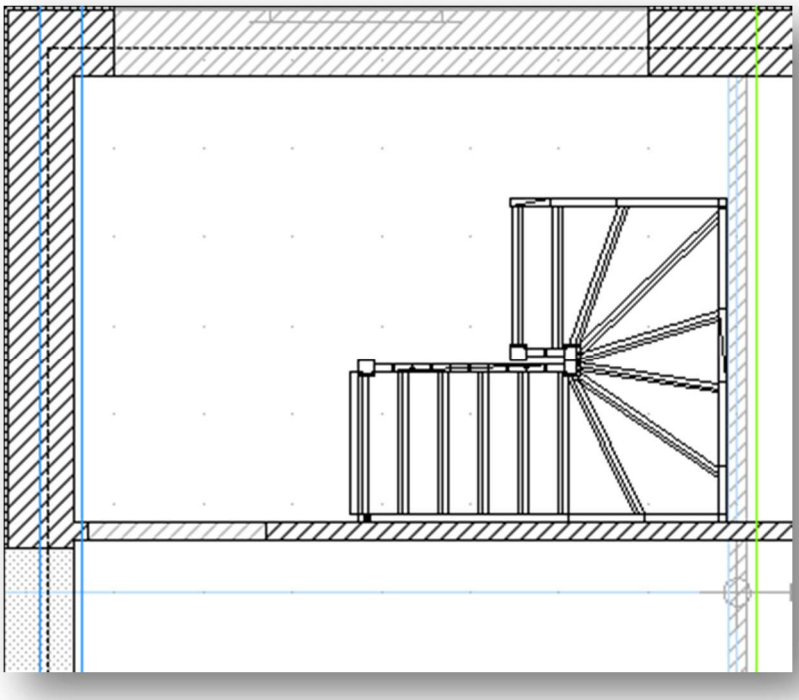
You can now close the 3D Converter window as this is no longer required.



Now that the new staircase object is located in the catalogue, it can be selected and placed in your project just like any other object.

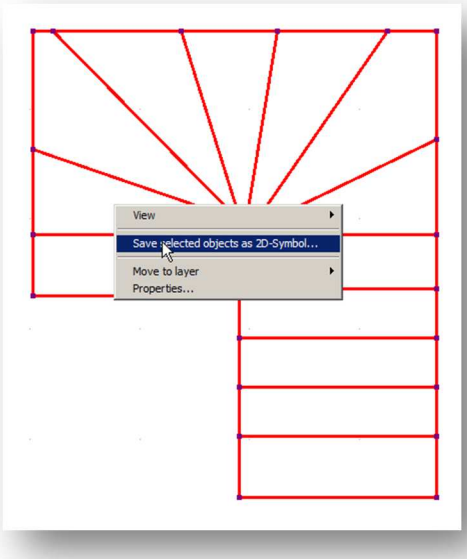
You can now apply wood and other textures to the stair object.





23.1 Replacing Stair 2D Symbol

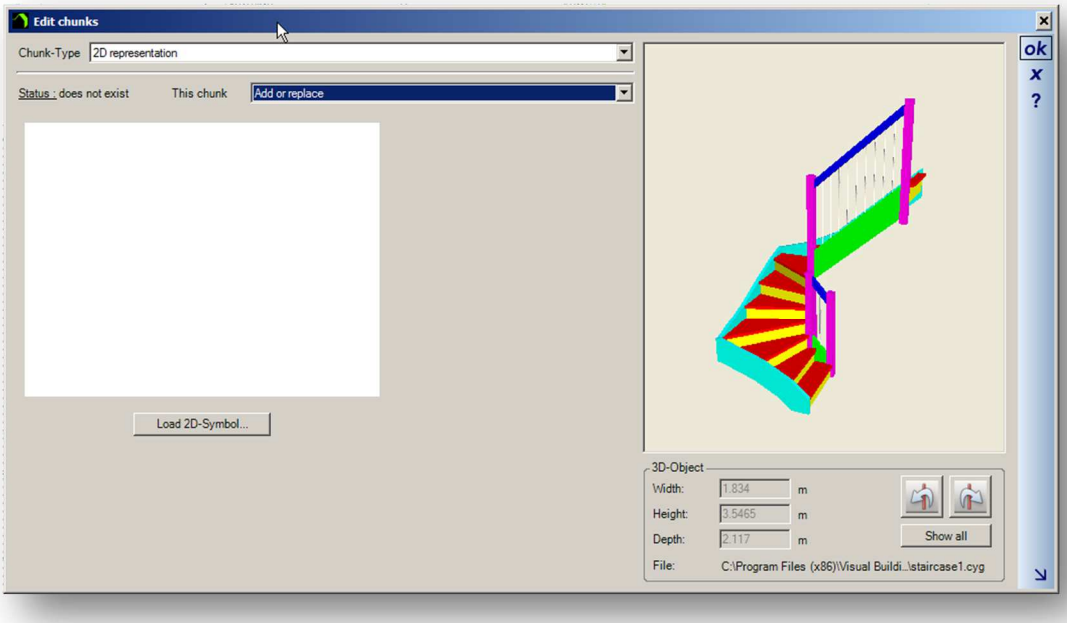
If you need to replace the default 2D outline drawing with a standard stair symbol then proceed as follows.



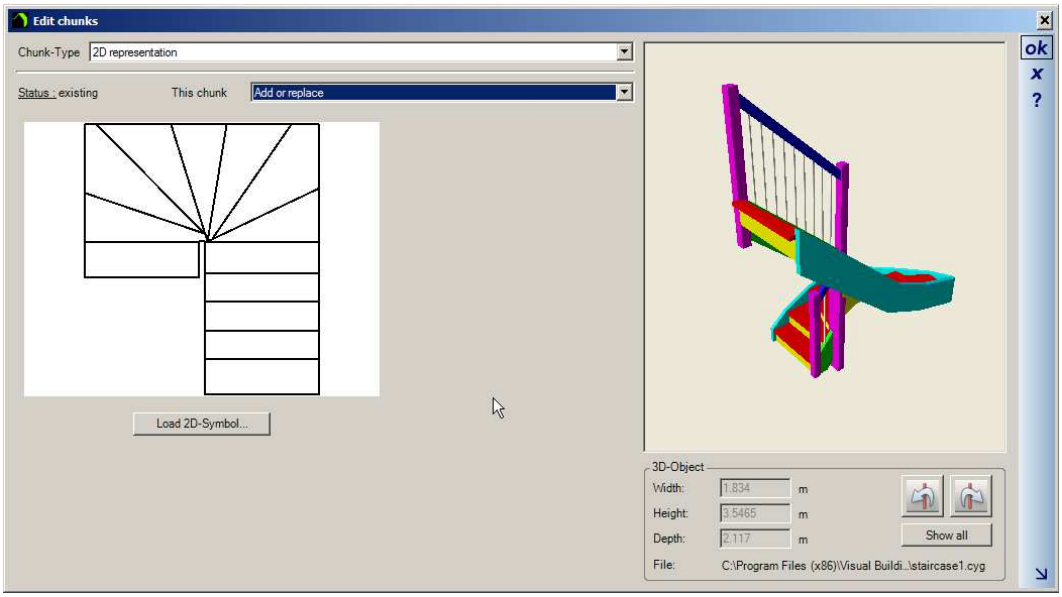
Draw a 2D Stair symbol using the 2D drawing tools and then save as a 2D symbol. You can use the 3D objects default 2D symbol to trace around. Select your new 2D symbol and the right click to activate the context menu and then select **Save selected objects as 2D symbol.**

In the Catalogue, right click on the object and from the activated context men select **Edit chunks**.

The Edit Chunks dialog will appear. Select **Chunk Type** = **2D representation** and select **This chunk** = **Add or replace**



Select the **Load 2D Symbol** button and load the 2D symbol that you just created.

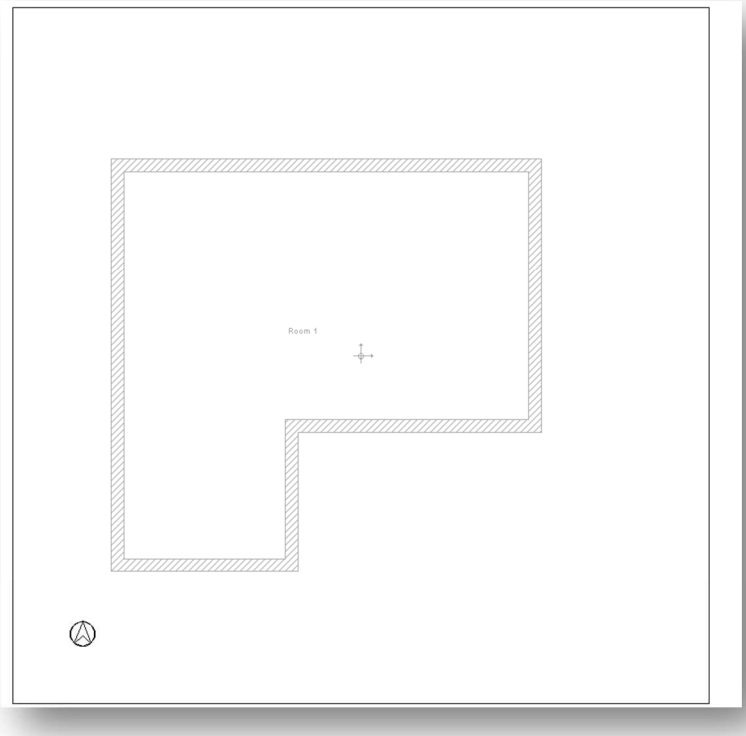


Close the dialog with **OK**. The new 2D symbol is now saved with your stair object and will be displayed in your 2D view.

24 Roof Editing

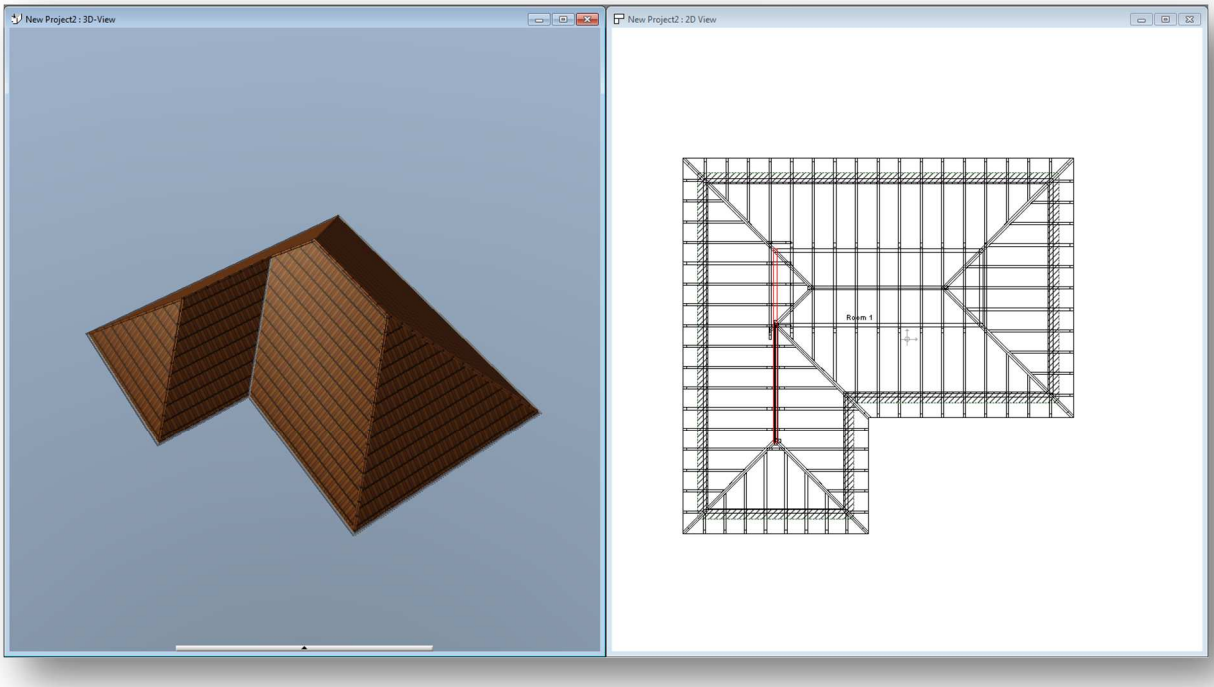
This section contains some roof editing tips. Please refer to the Visual Building User Manual for the basic description of the Roof tools.

24.1 Adding a Gable end to a flat / straight roof surface

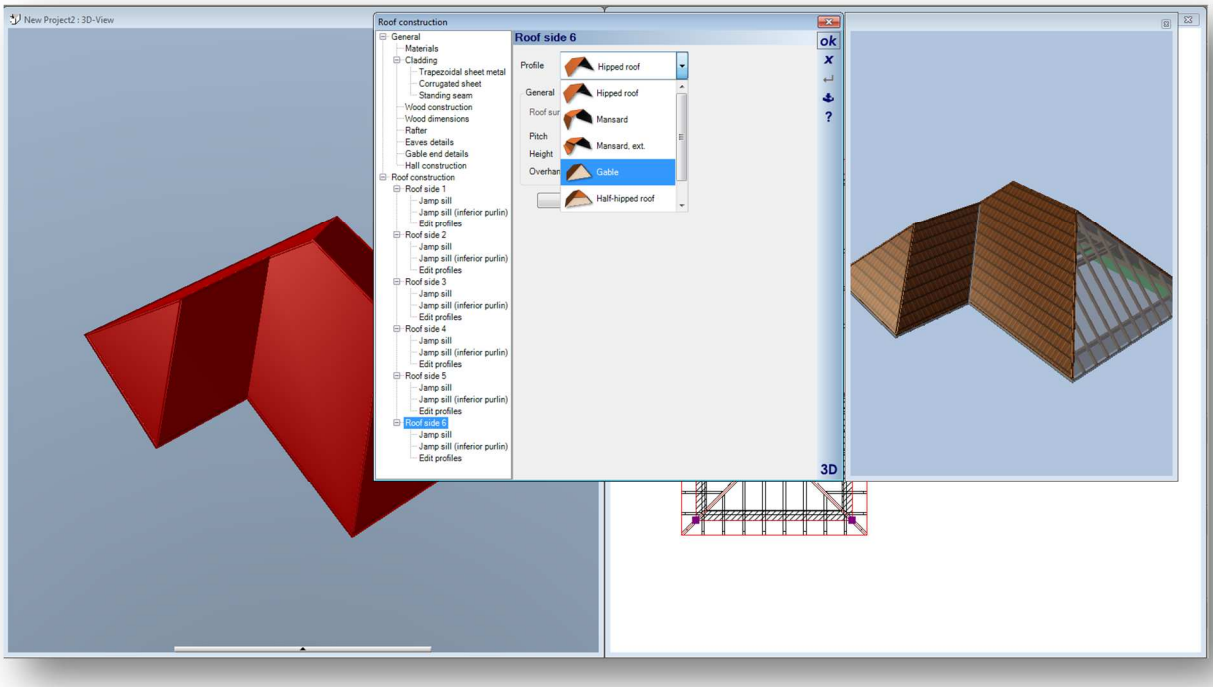


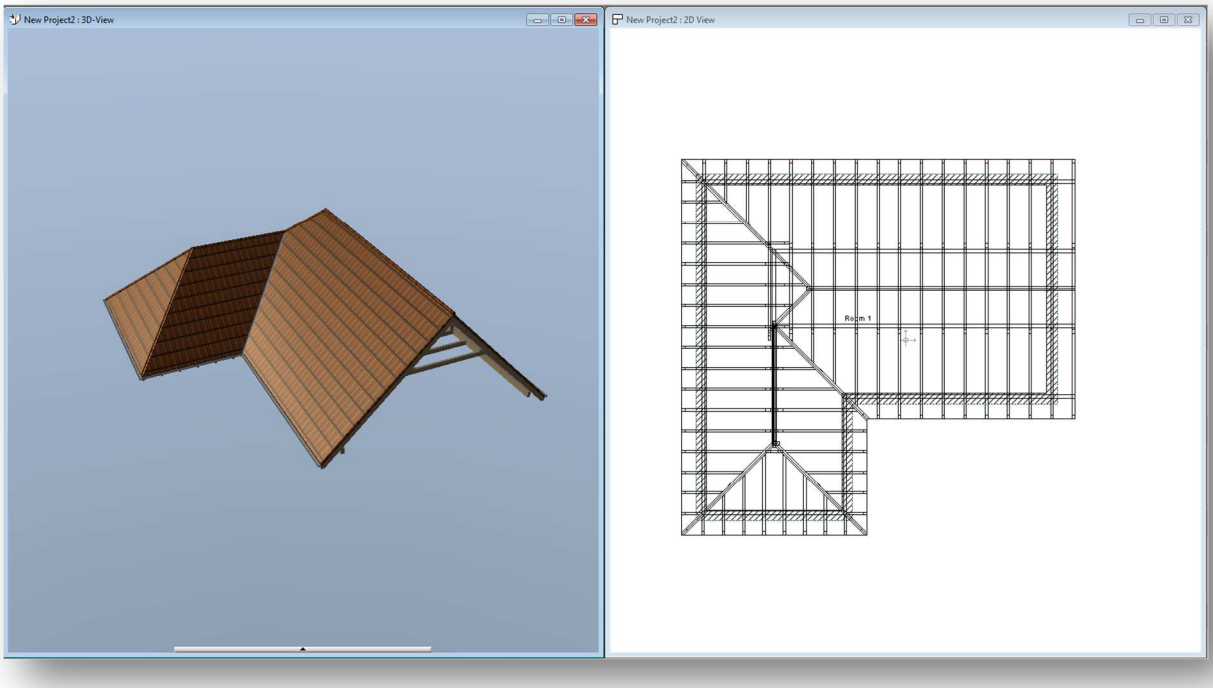
If we use the standard Roof Insert tool **Building – Roof Construction – Insert Roof – Insert Roof on Contour**, we achieve the image below.

This is achieved by using all default settings.

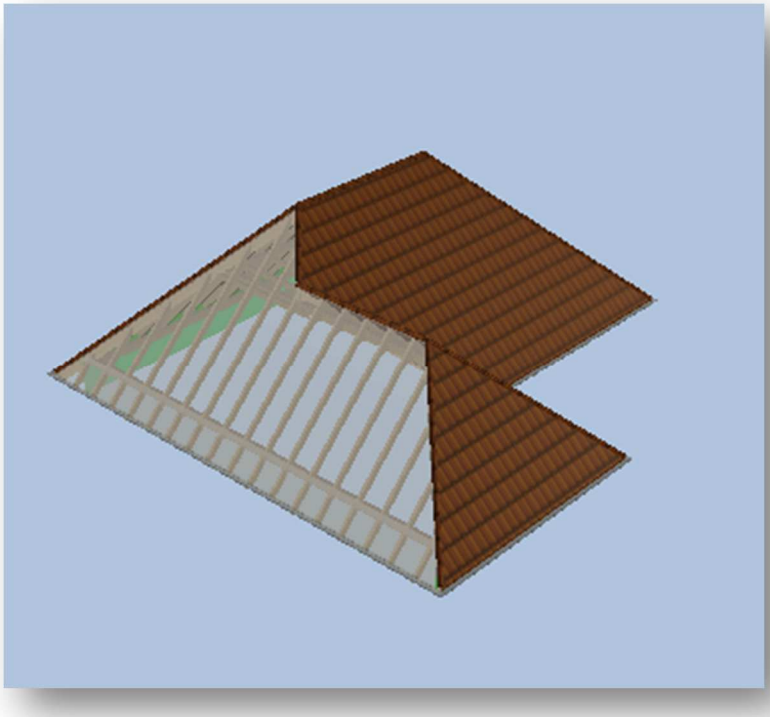


However what if we want the large roof section to have a gable at both ends. We can easily add the gable at one end using the roof editor:



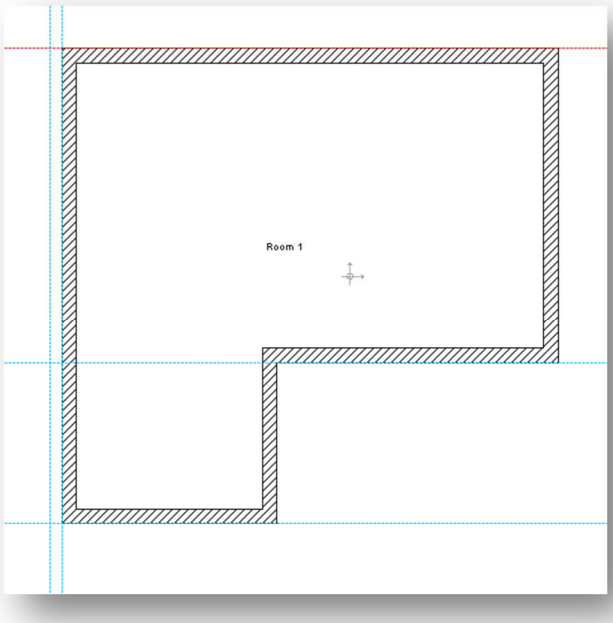


The other end of the large roof section is currently part of the smaller roof surface



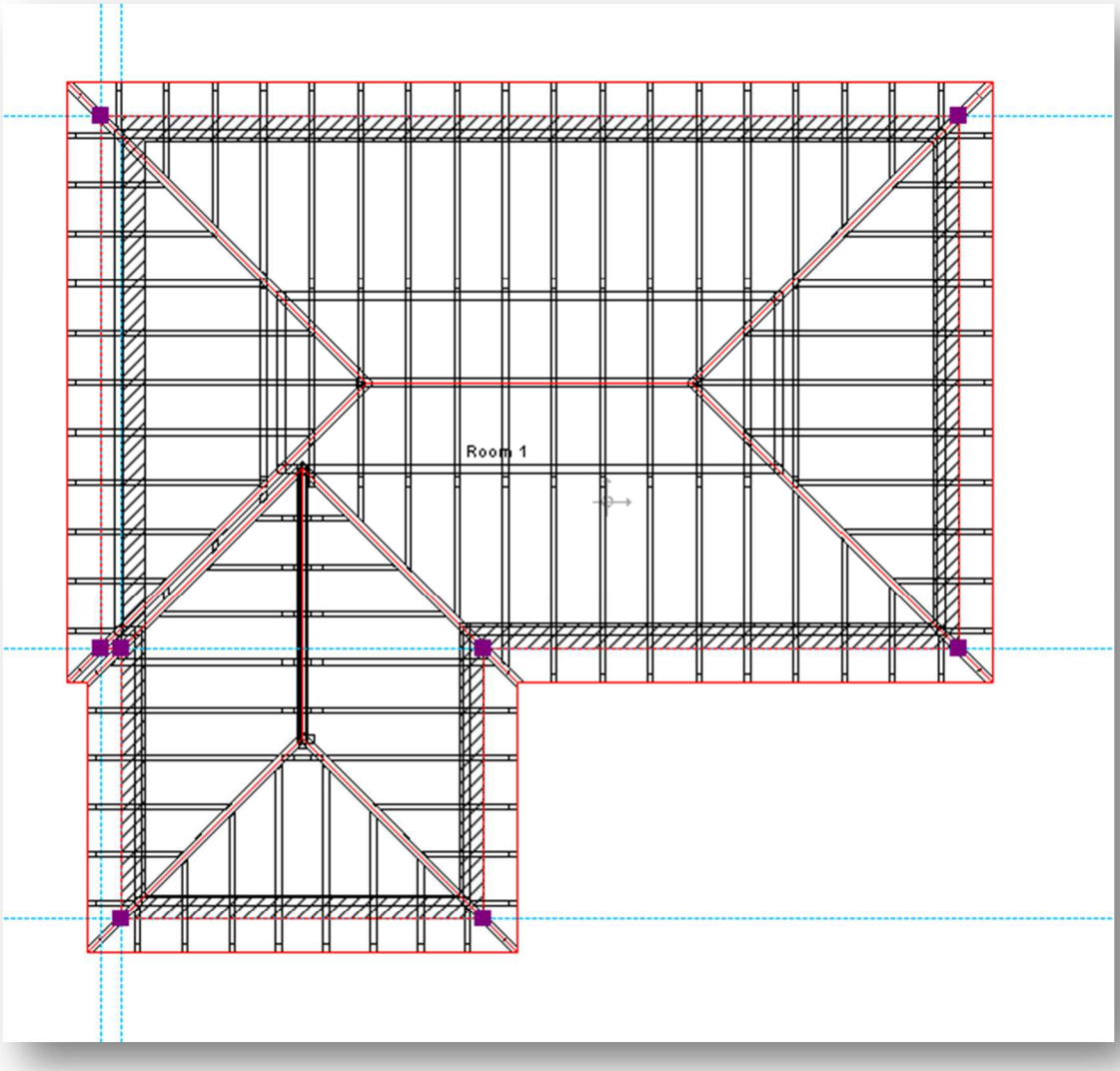
So we need to split this roof surface in order to insert a gable. This is achieved prior to inserting the roof. So delete the roof…

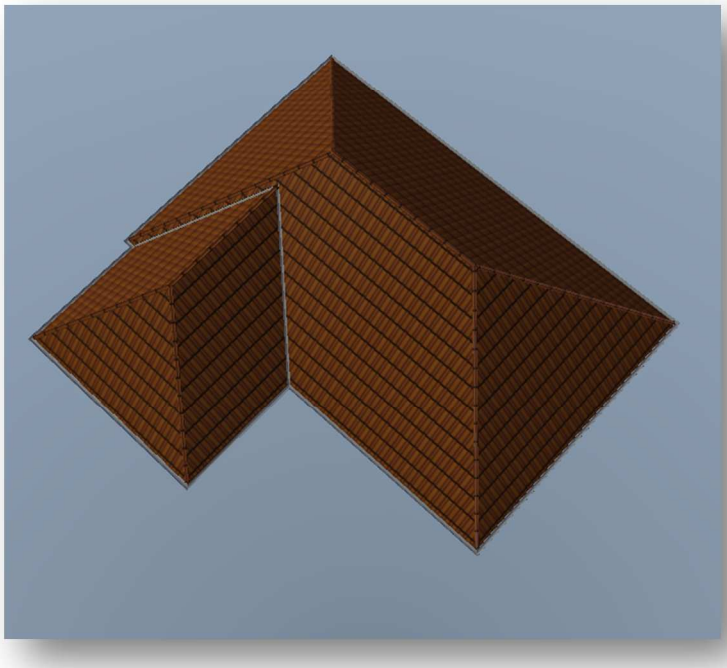
First we will add some guidelines to enable us to snap the roof polygon to:



Note the far left vertical guideline is offset from the wall.

This small offset is sufficient enough to allow us to specify an additional point in the roof polygon.



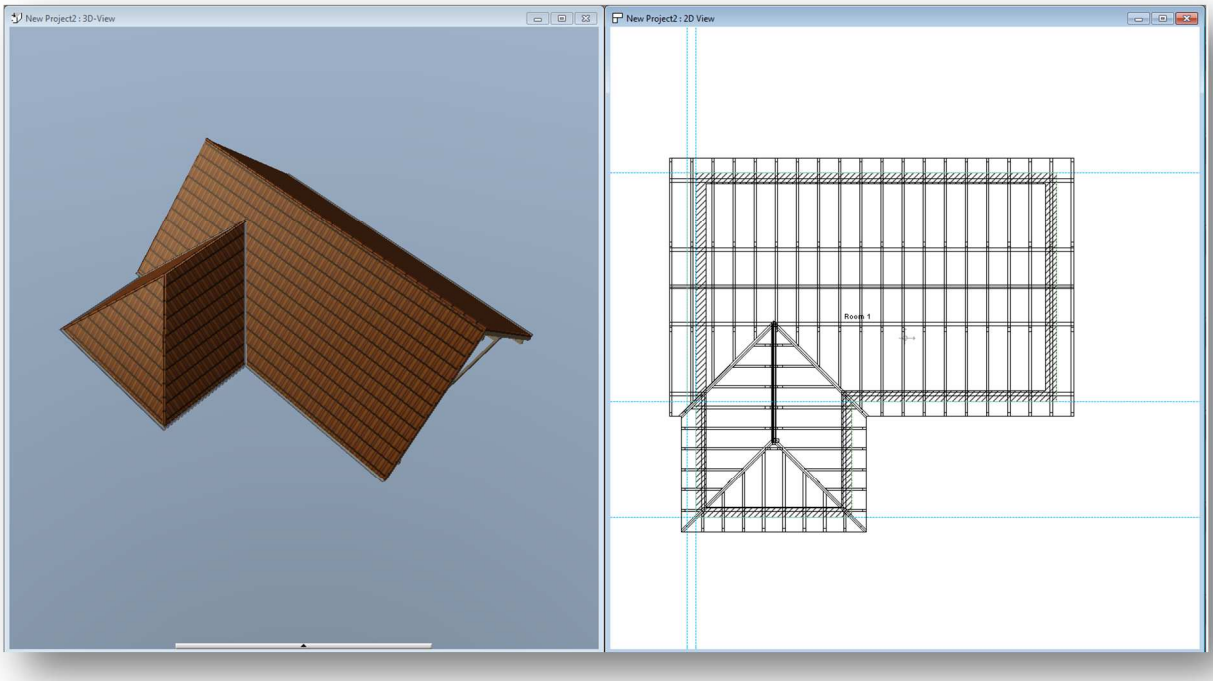


We have now snapped the roof polygon to the offset guideline at two points.

The offset in this example is 30 mm but only for the purpose of demonstration. It can be as small as you wish, as long as you are able to differentiate between the adjacent points when you snap your roof polygon.

In the 3D view it is more obvious what we have done.

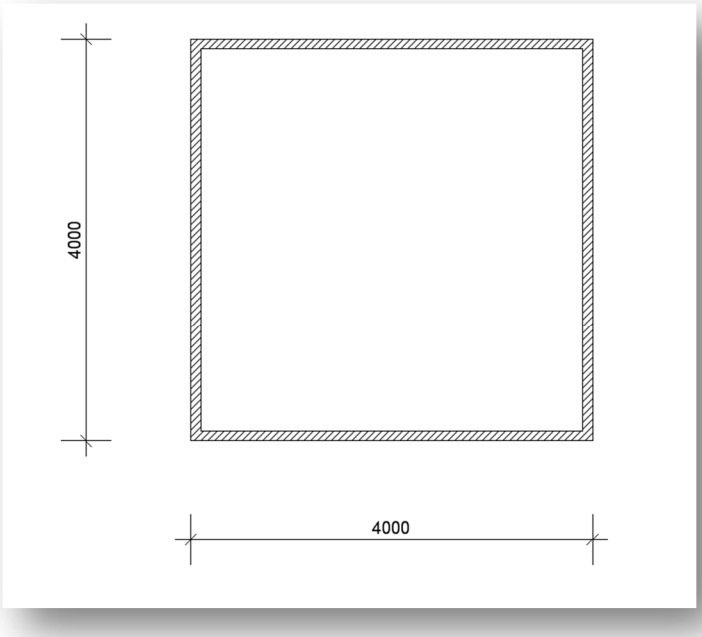
Using the Roof construction properties dialog as before, we can apply a Gable end to both ends of this roof section.



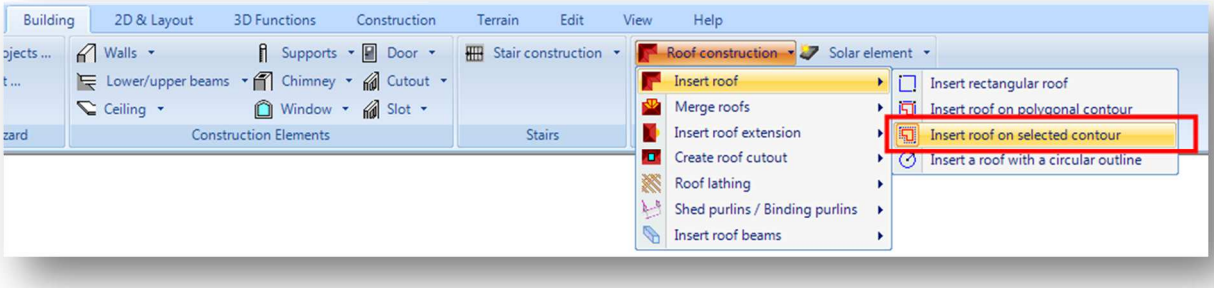
This method can be achieved by all Visual Building versions.

24.2 Adding or moving a Wall Plate

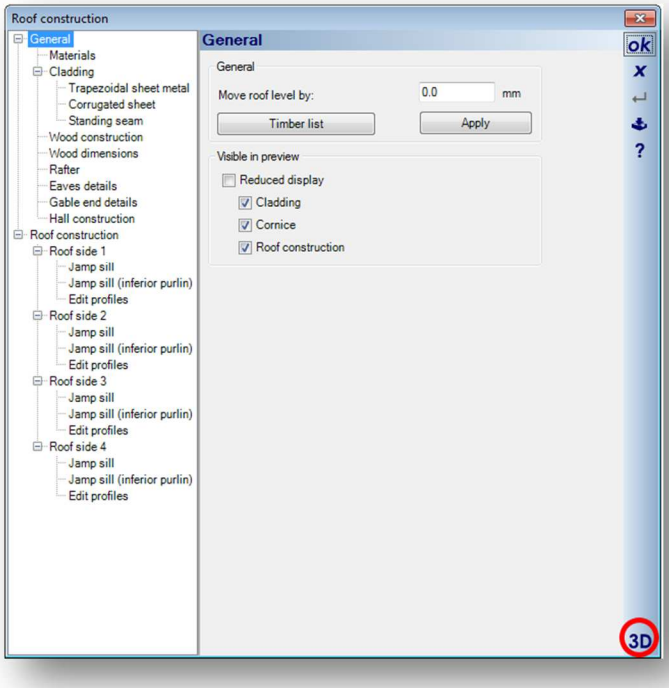
Create a simple wall construction 4m x 4m, with 100 mm thick wall- a typical garage.



We will use the standard roof tools to add a roof to this wall construction, using:



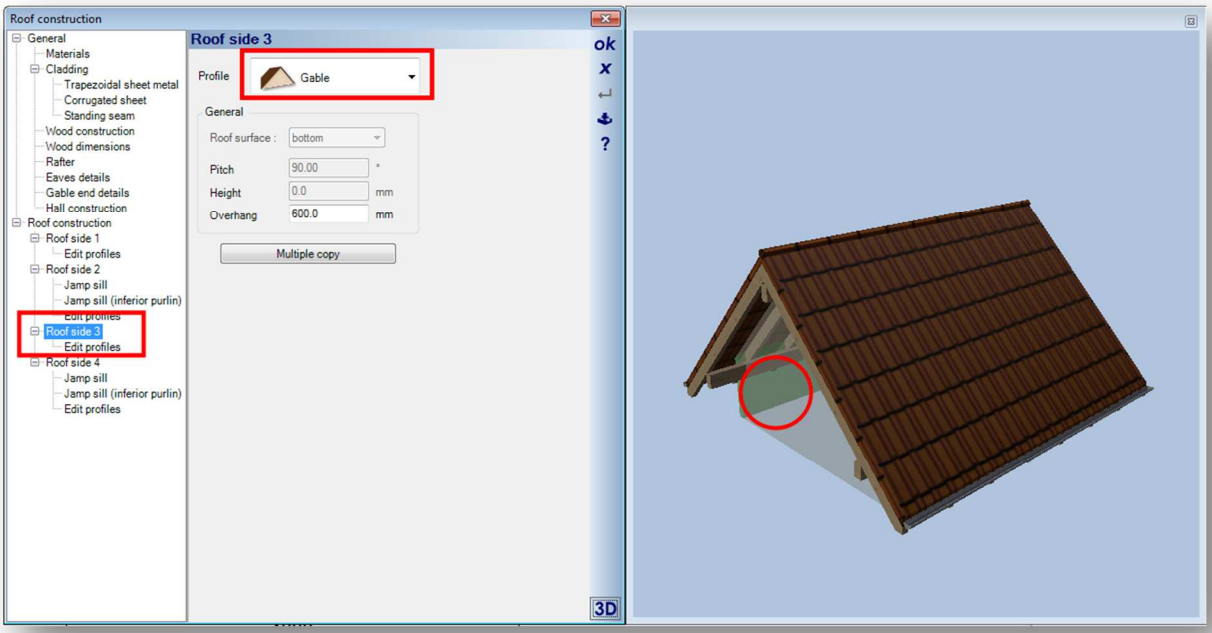
When you move your cursor over any part of the wall, it will highlight in green, and a left click will then activate the Roof Construction dialog:



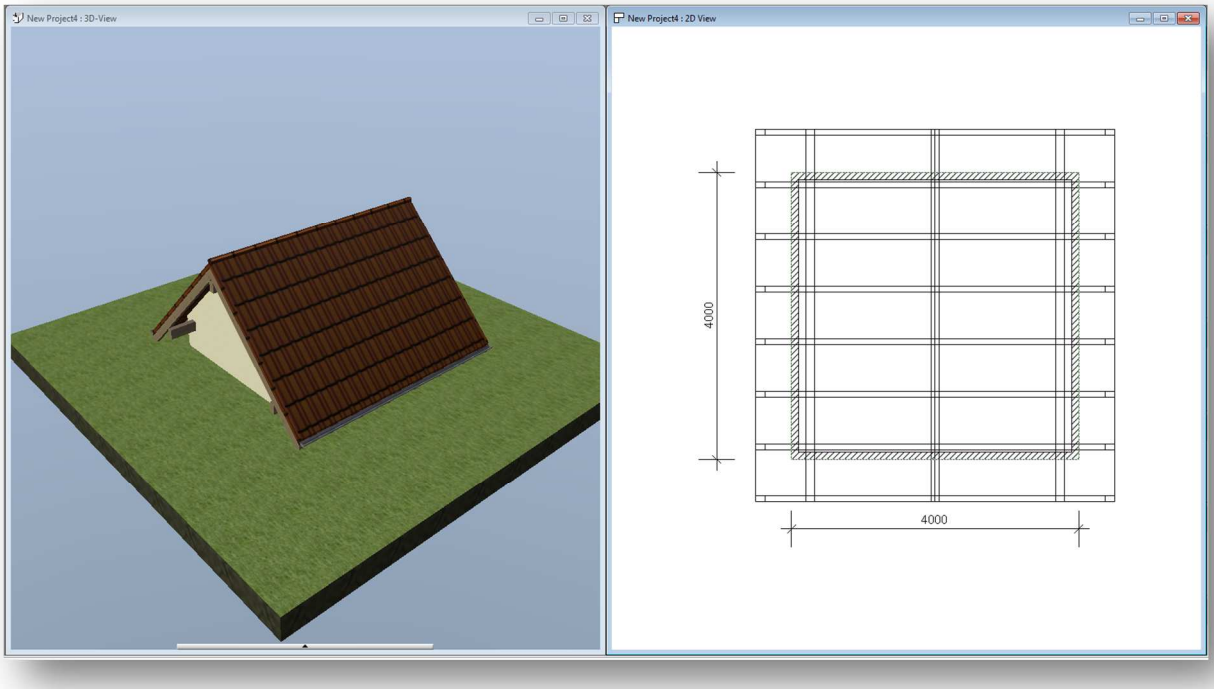
Now click on the 3D button in the bottom right corner to display the preview of roof created:

In the 3D preview, if you click on any of the roof sides, the corresponding entry will highlight in the Roof construction tree in the dialog.

We will first set the profile of 2 of the opposite roof sides to be Gable ends, by selecting the roof side and then selecting Gable in the Profile drop down list. The selected roof side will then change to a gable end. This is still a preview and to add the roof edit to your project click on OK.

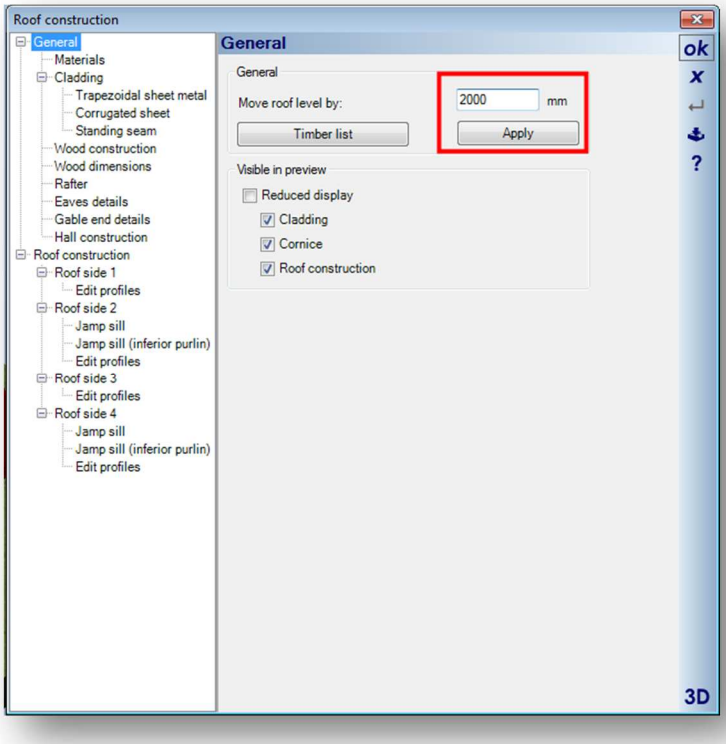


The project will then look like this, after adding a 3D view:



A roof will always be added to the floor on the current select floor, and as we have only a single story the roof is sitting on the ground. This can be resolved in one of two ways. We could have added a second floor, e.g an attic, and added the roof to the attic, and the roof would then sit on the floor of the attic. In our case we will continue with a single storey, and move the roof 2m from the ground.

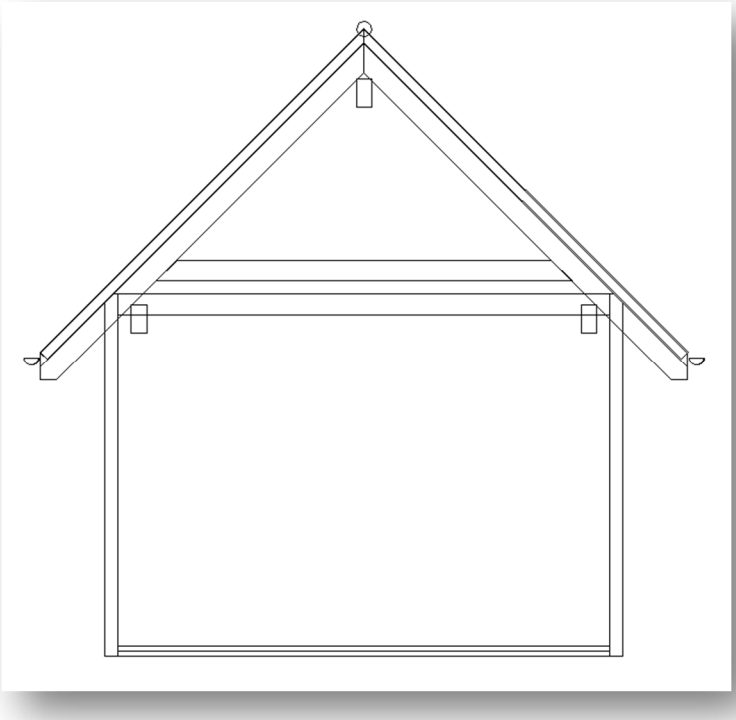
This is achieved in the Roof construction dialog, so double click on the roof to activate it again:



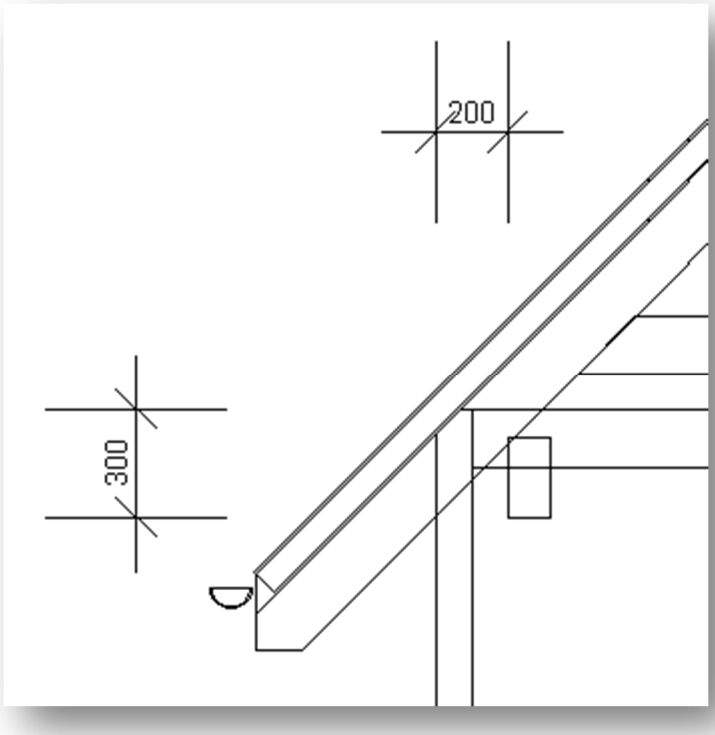
Enter 2m into **the Move roof level by** field and click **Apply**. Then click **OK**.

If you don't click Apply, nothing will happen so be sure to click Apply, before you click OK.

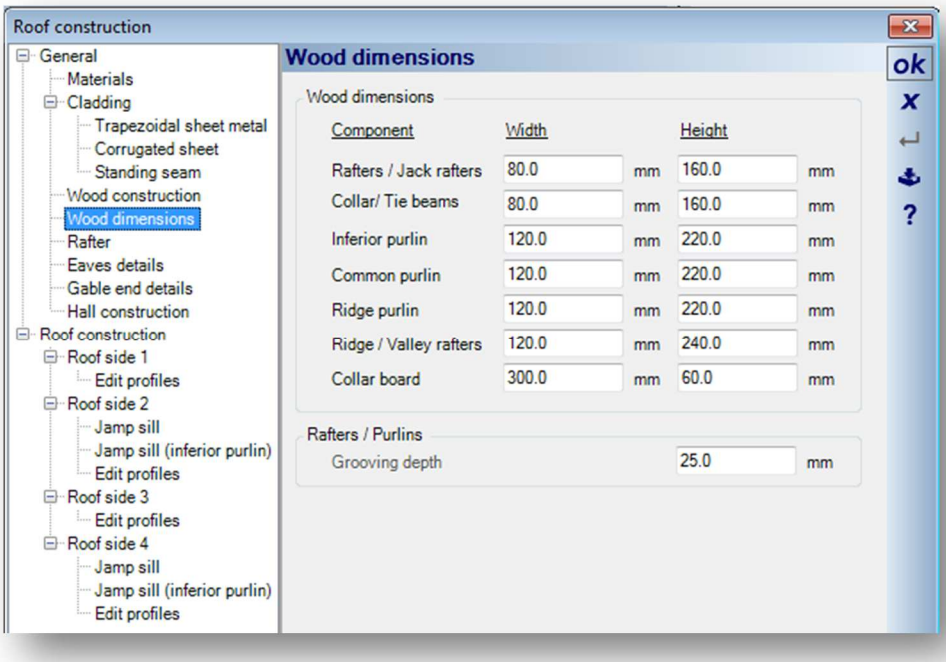
We will now add an elevation view, so that we can see exactly what is happening to our roof construction:



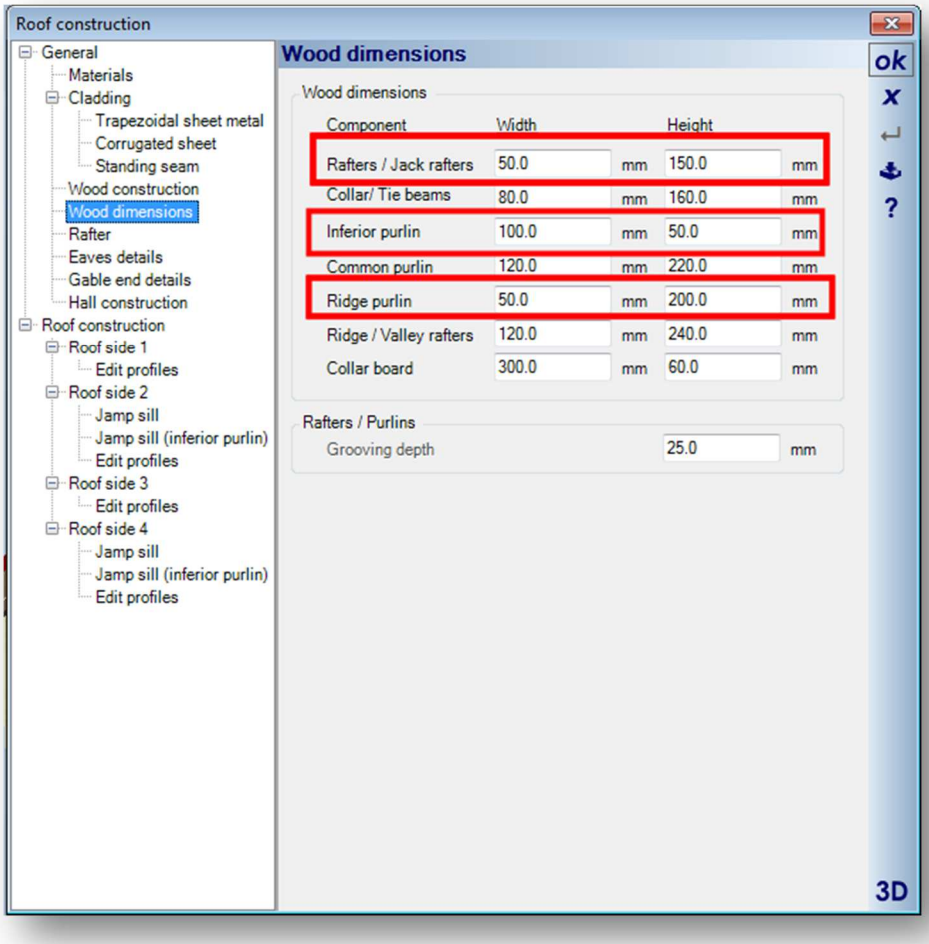
Let's now add some dimensions to this view:



The wall plate, (also called lower purlin or Inferior Purlin) needs to be moved so that it sits on top of the wall. But first we shall change the dimensions of our wall plate. Activate the Roof Dialog again, and this time select **Wood dimensions**.

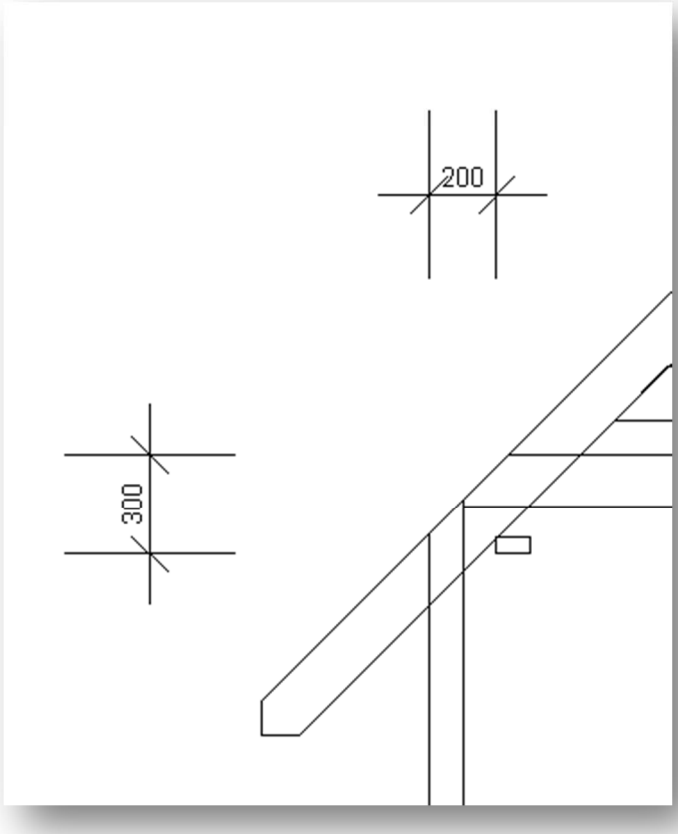


We can now edit the sizes of the various timber components

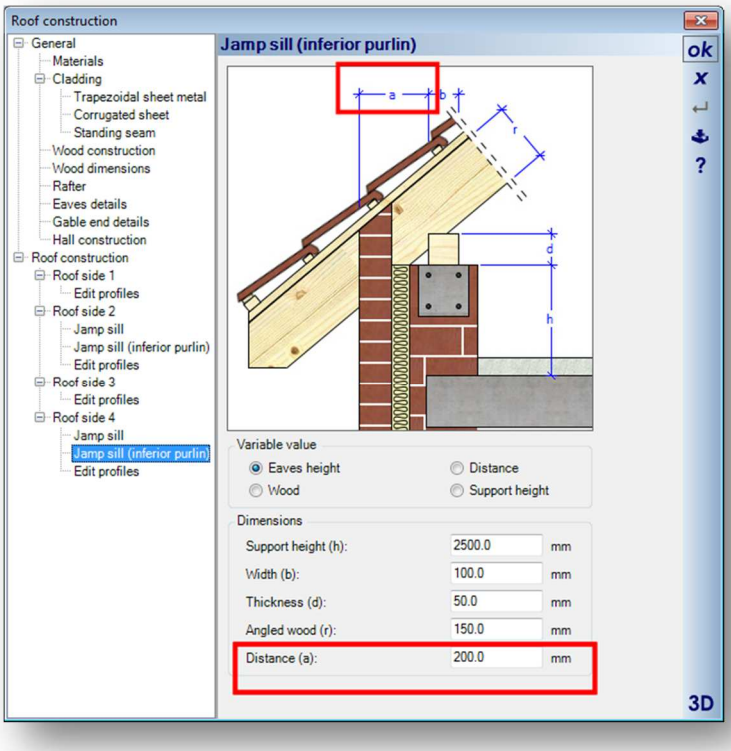


We will edit the size of the Rafters, Ridge purlin, and Inferior Purlin.

Click OK and the timber sizes in our project changes.



In the elevation view you can make things clearer by hiding the tiles (cladding).

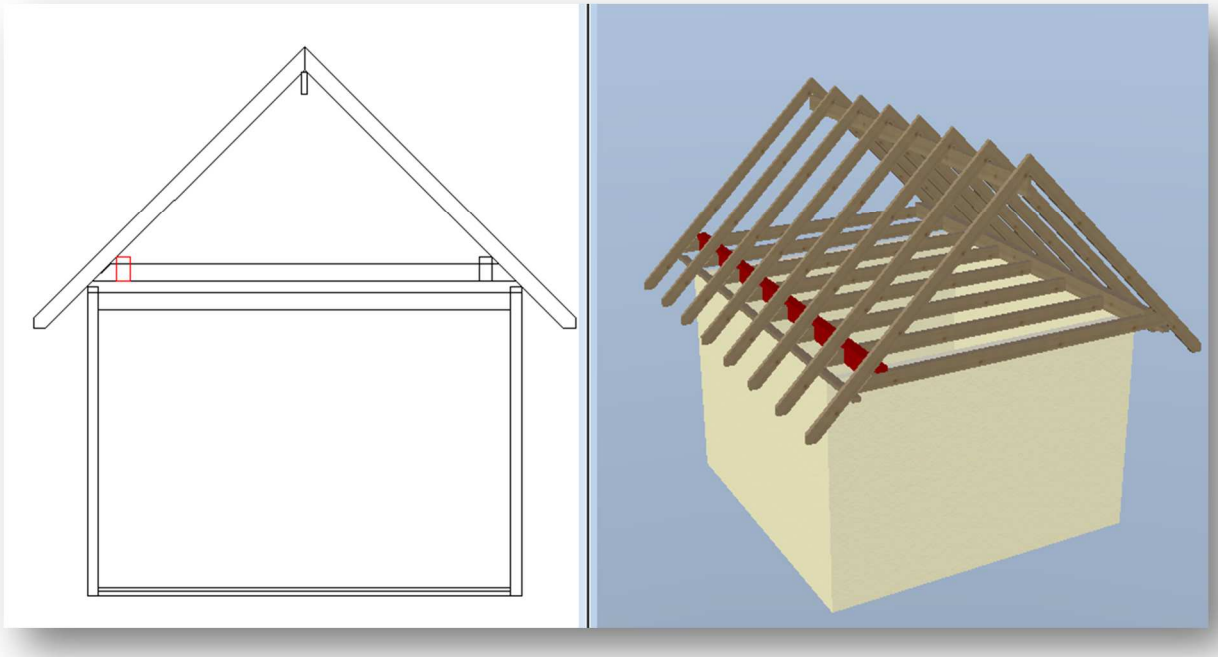


The dimension 200mm corresponds with the value in the Distance (a) field, and we shall edit this to 0 mm so that our wall plate sits on our wall.

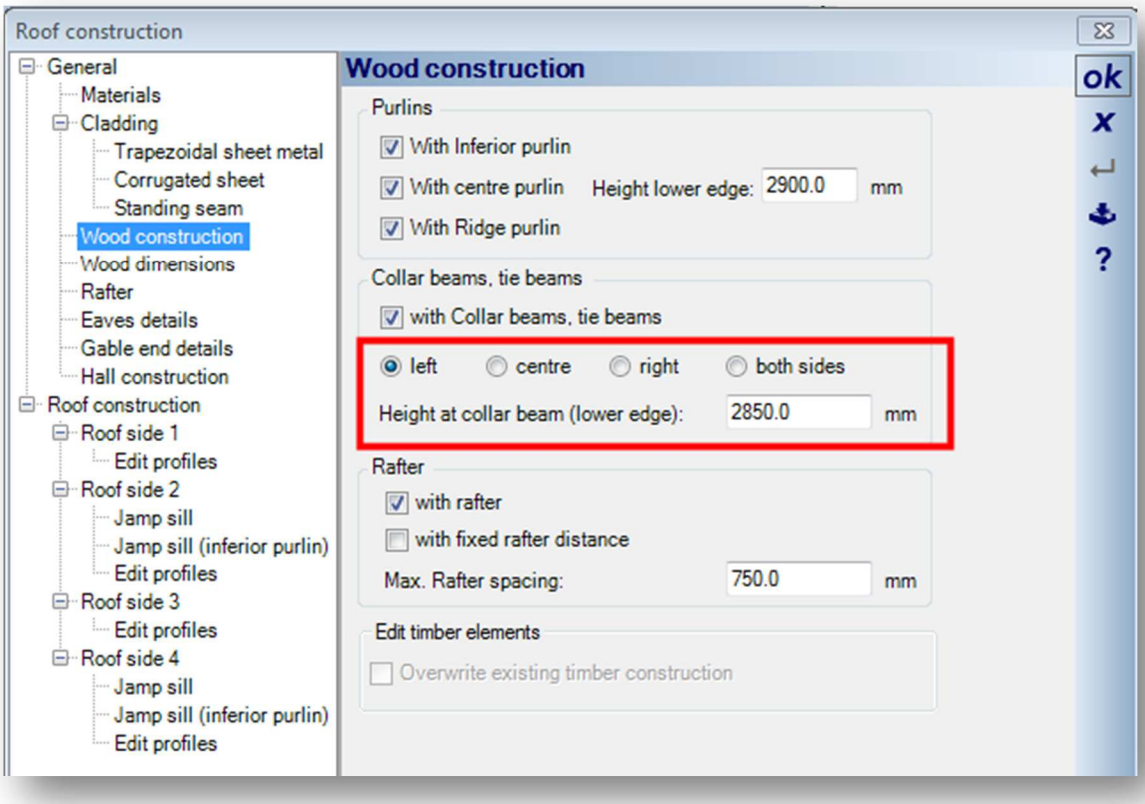
This has to be done for both wall plates i.e. for both Roof side 2 and 4.

The roof then needs to be raised a further 300mm so that the wall plates sit on top of the wall.

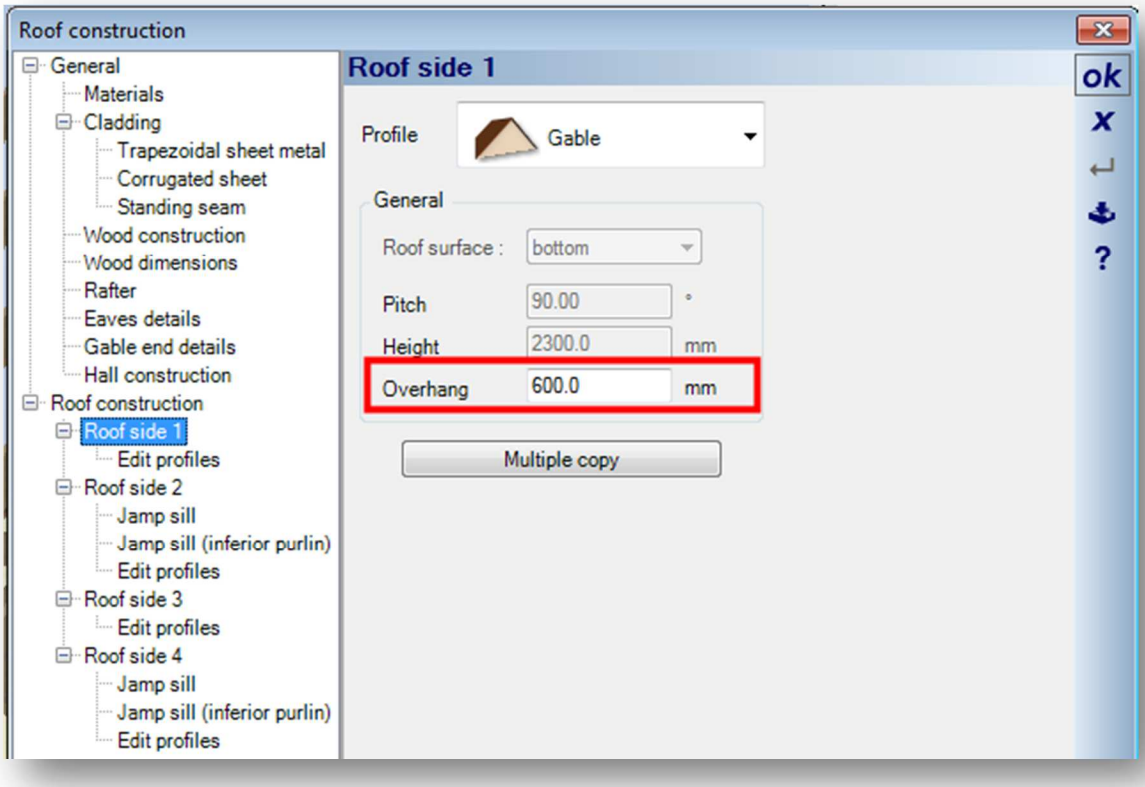
Our roof construction does not have any purlins, so we can simply select the purlins in either a 2D or 3D view and delete them.



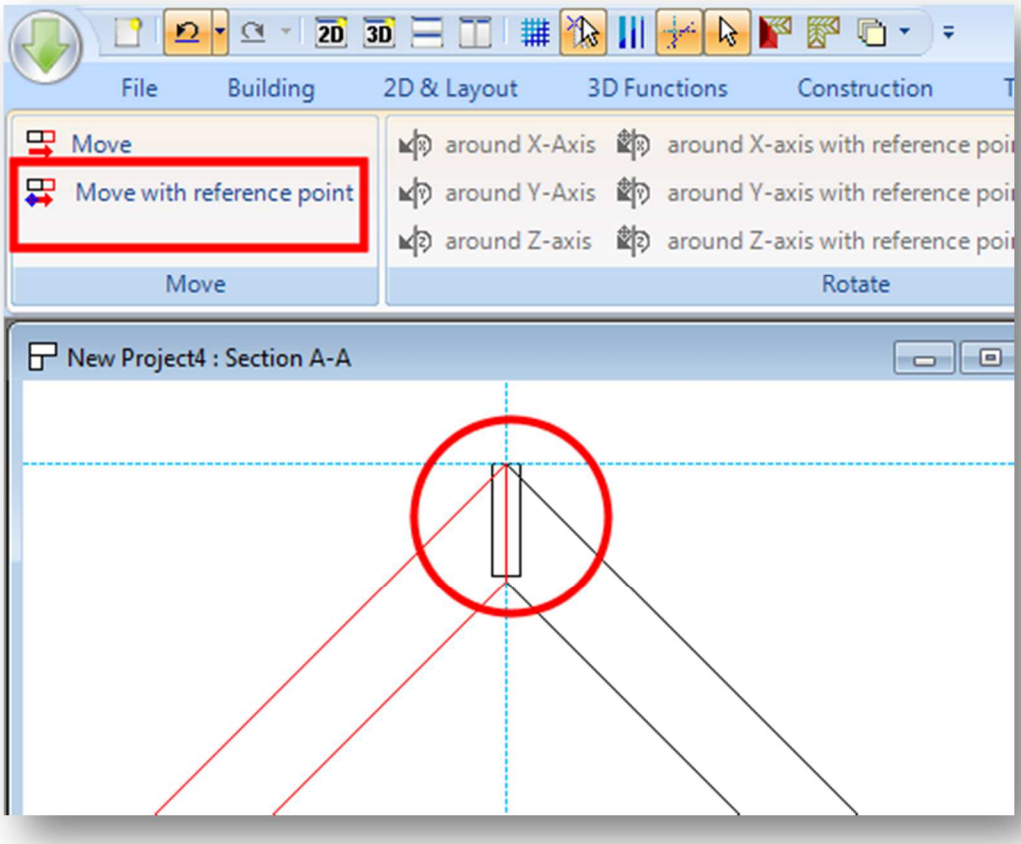
You can use the collar ties as rafter but first you should resize them and also lower them. Resize the collars in the wood dimensions section, and lower the Collars in the Wood construction section.

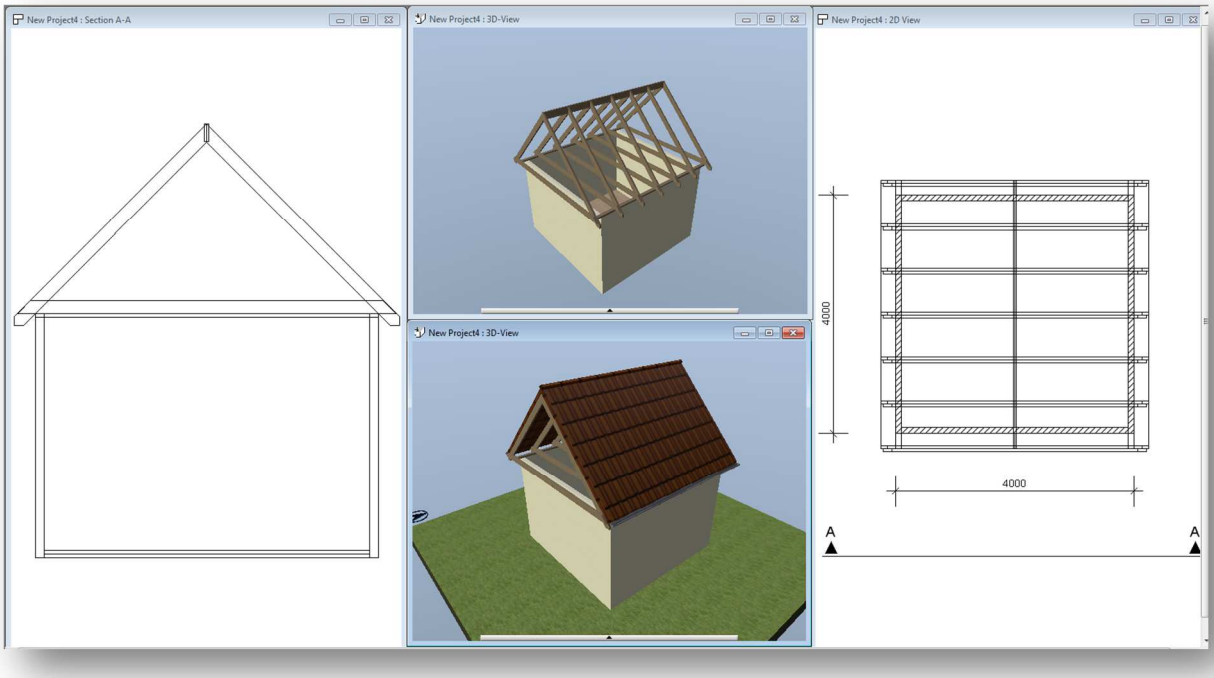


You can now adjust the overhang for each roof side, from 600mm to 250 mm:



In the 2D elevation view select the Ridge board and using the **Move with reference point**, move the ridge board into desired position:

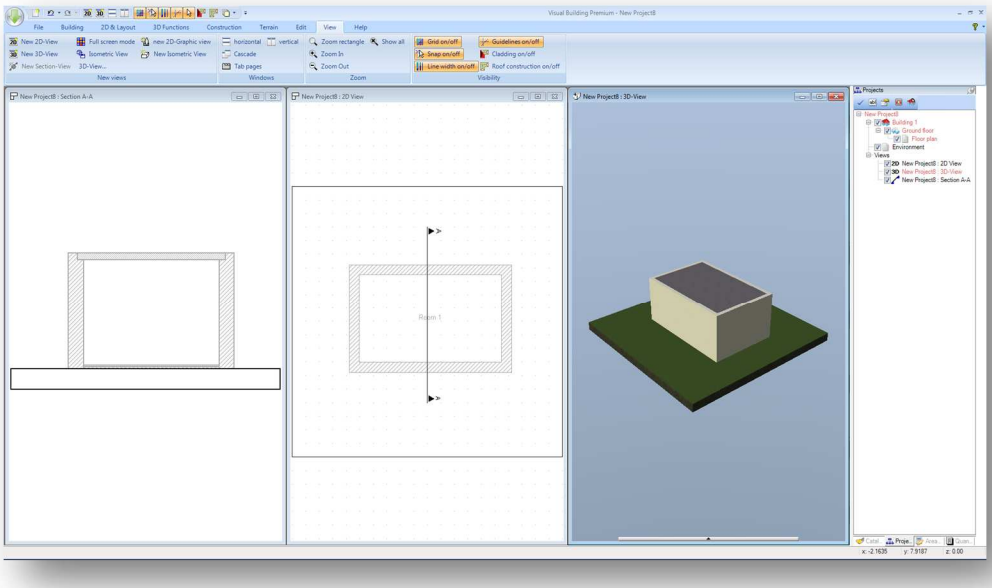




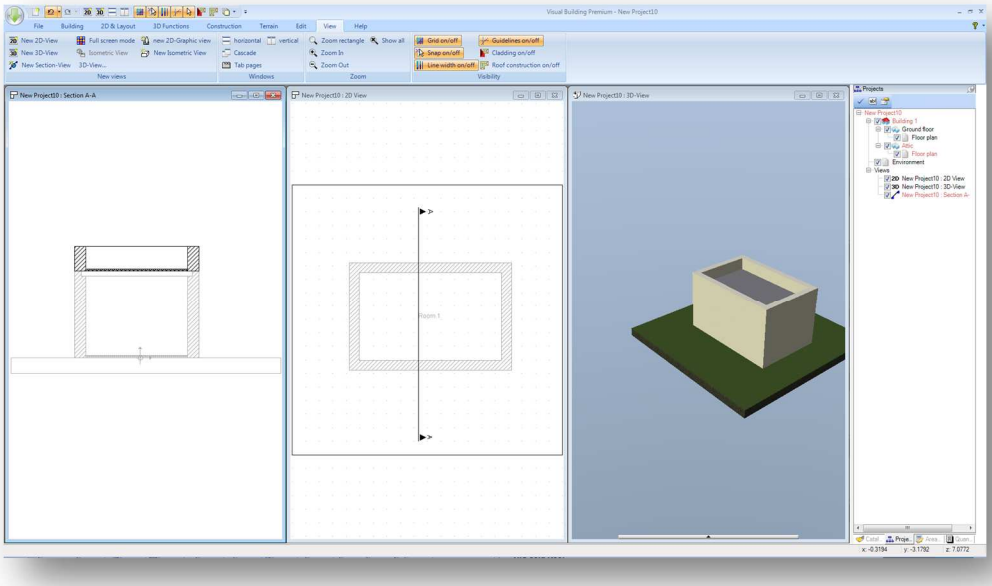
24.3 How to Create a Flat Roof

24.3.1 Using the Building Wizard

In the Building Wizard there is a flat roof option with or without a parapet. The flat roof with the parapet option is the Fascia option. If you use the building wizard you will see the roof in both cases are not in fact roofs, but a ceiling in the case of the flat roof option, and a floor in the case of the parapet option.



You can of course assign multiple layers to either the floor or ceiling to show the materials and construction used for example Plasterboard, Vapour control layer, Insulation, Air gap, Plywood, Felt and Chippings. If you use the Facia option, then the floor of the attic represents the roof, which can also be layered.



24.3.2 Using the Roof Editor

There is an alternative method where you can use the roof edit to define a flat room construction.

Create your building, and then add a roof to it.

Create 2 gable ends.

Set all roof overhangs to 0m

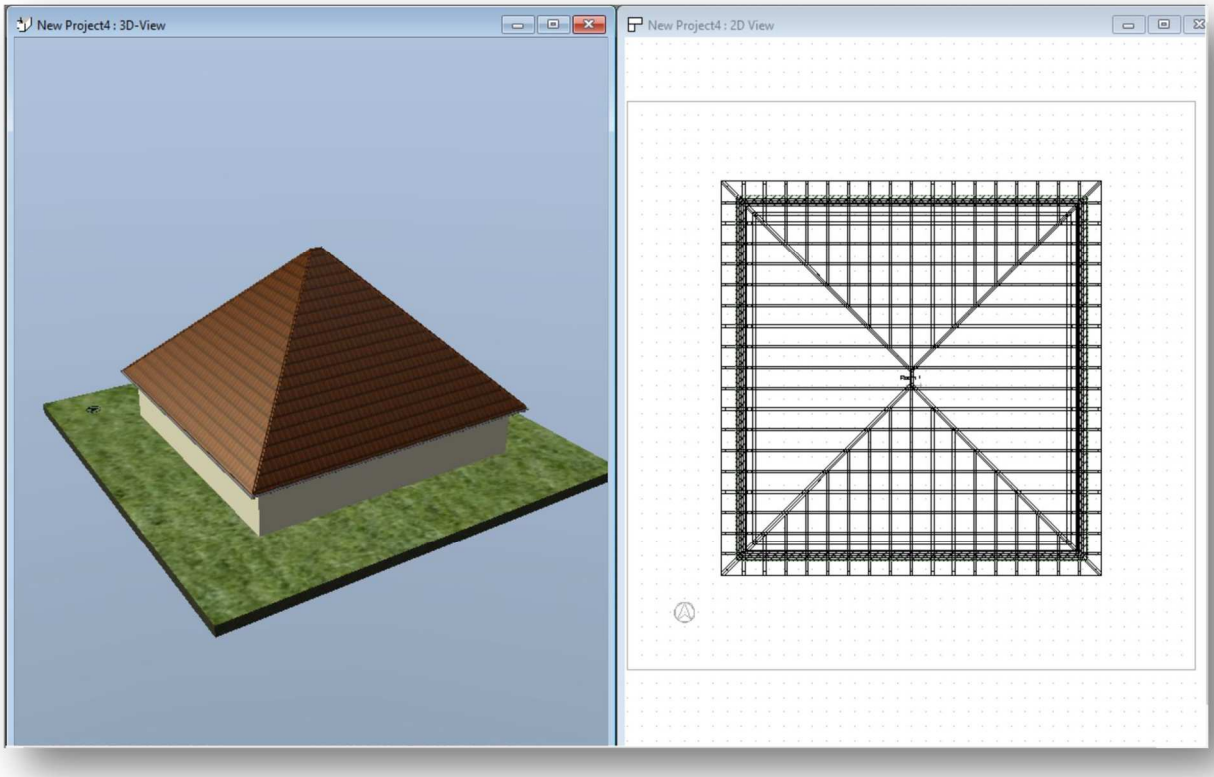
Set the remaining 2 roof pitches to 0 deg.

Delete any unwanted wall plates (Visual Building Premium only)

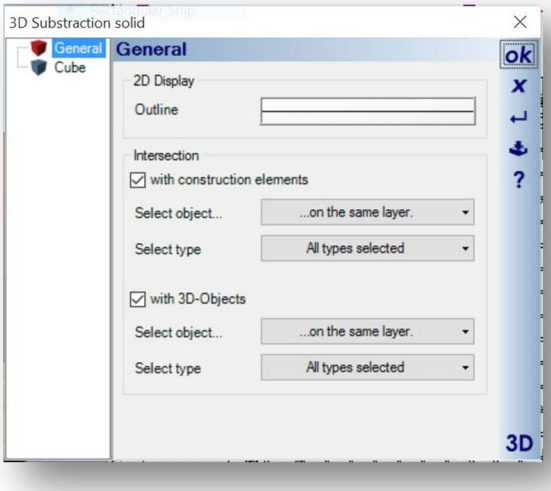
24.3.3 Creating a Pitched Roof with a Flat Roof

In this example we will add a flat roof to a pitched roof and use tools applicable only to Visual Building Professional and Premium.

First we will create a roof that has the desired roof pitch.

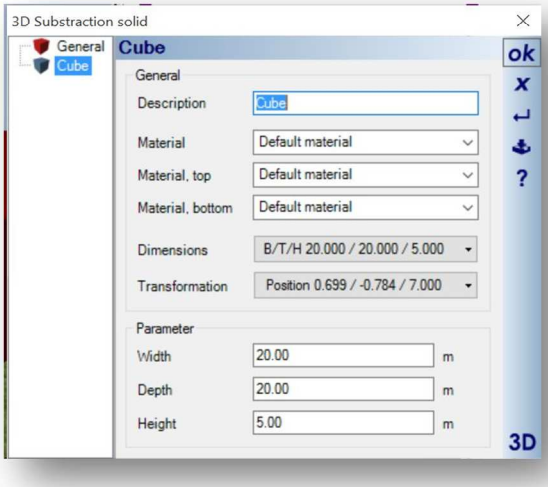


We will then create a subtraction solid to remove the parts of the roof not required. This is achieved **Construction – Subtraction Solid – Cube** tool. Create the subtraction cube and adjust it's size and position so that it intersects with the roof parts not required. To do this double click on the created cube and the 3D subtraction solid dialog will display:



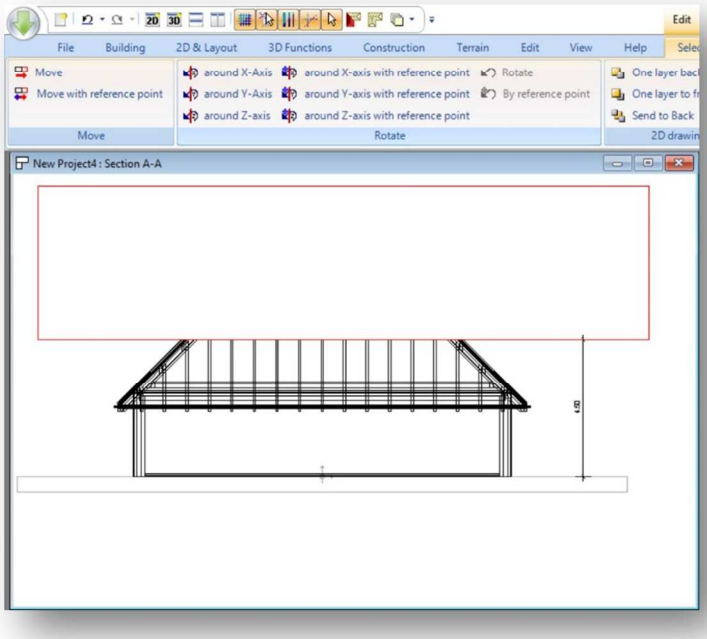
In this dialog you can define what layer and object the subtraction cube will interact with, and we will just accept the default settings.

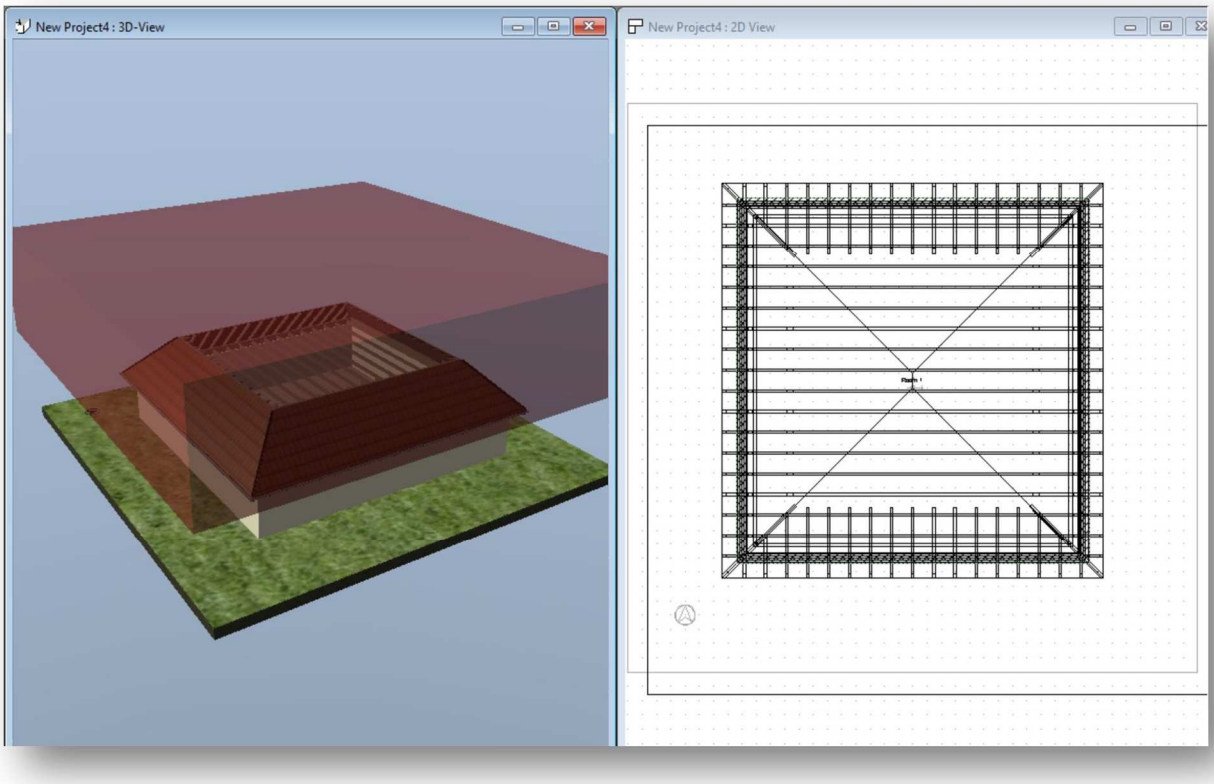
Now click on the **Cube** entry in the side bar.



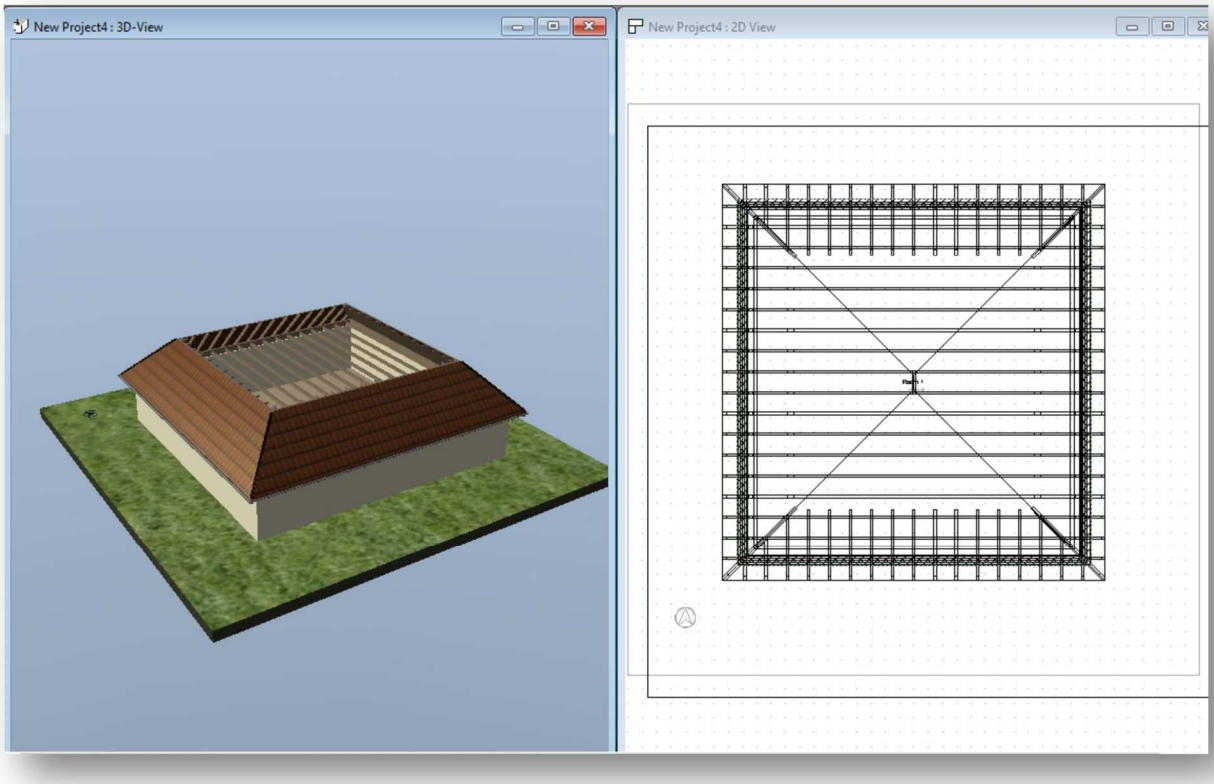
In this dialog you can adjust the cube's size and position using the **Dimensions** and **Transformation** entries.

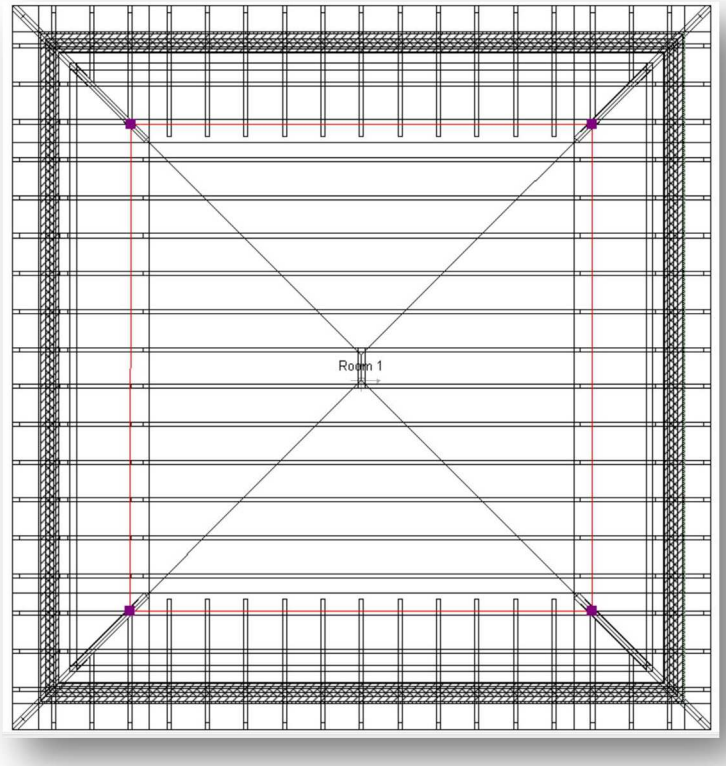
You may find it useful to also create an elevation view so you can then adjust the subtraction solids position more accurately using the Move or Move with reference point tools:





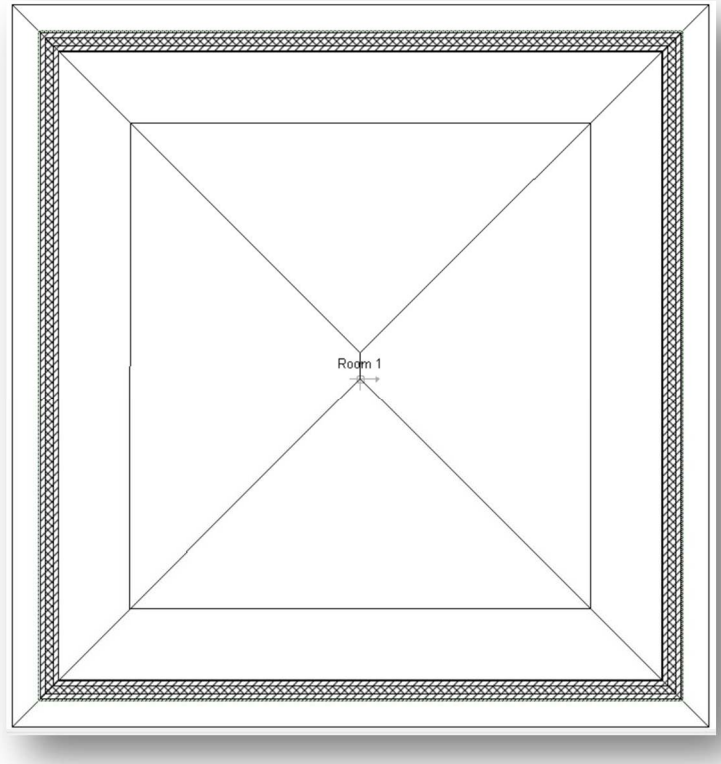
Once you have positioned the subtraction solid, we can hide it. This is achieved in each view, by right clicking in the view and from the context menu select **View** and then **Visibility.** In the Visibility dialog, locate **3D Object – Subtraction solid** in the tree and deselect it.





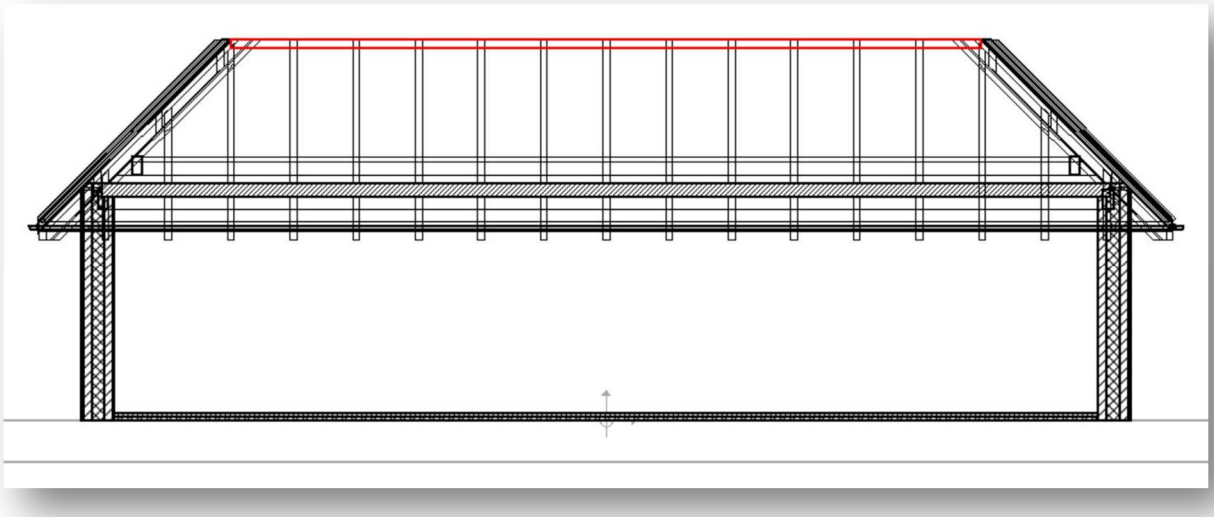
Now we will create a new flat roof to fit the roof void using the **Construction – Extrude Solid – Insert with Polygon** tool. This can then be drawn to fit the void and then repositioned so its height is correct.

You can use guide lines to help position the placement and sizing of the extruded block.

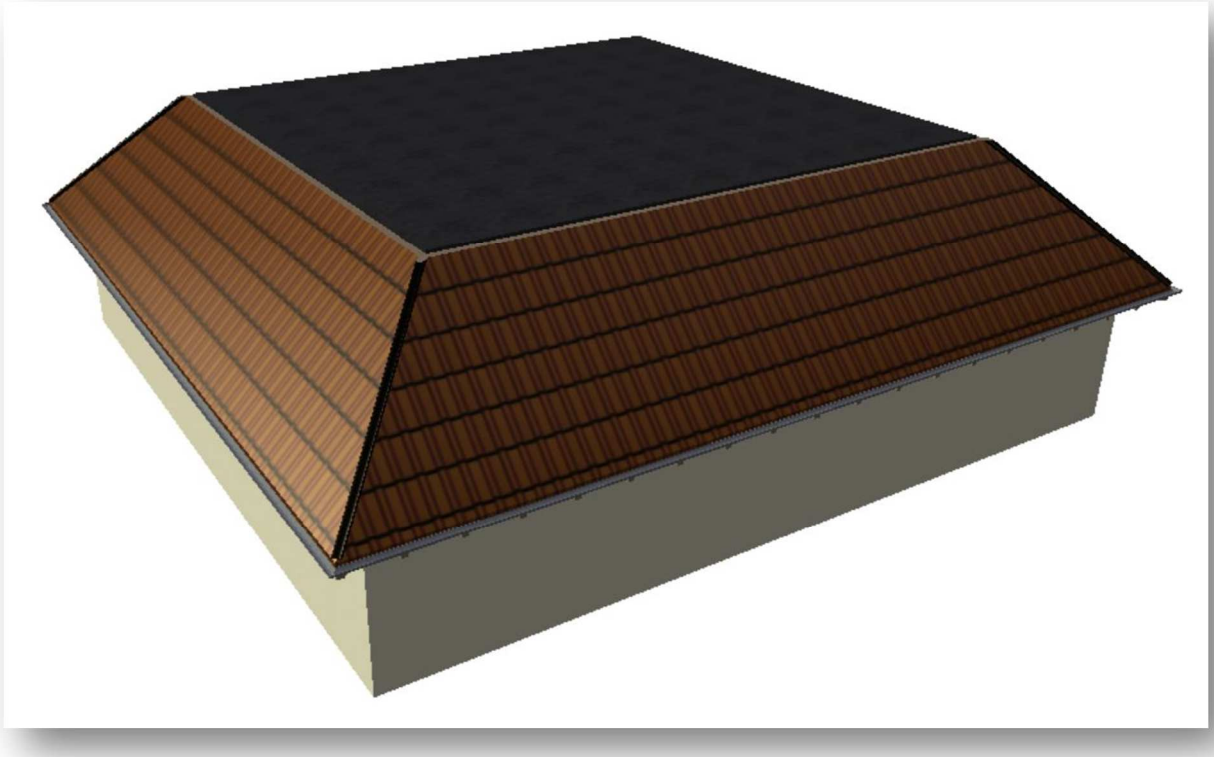


You can also clarify the drawing by hiding the roof timbers, allowing you to position the flat roof object precisely.

As before create an elevation view to allow you to place the roof height exactly using the **Move with Reference Point** tool



Then add a texture or material to the flat roof section.

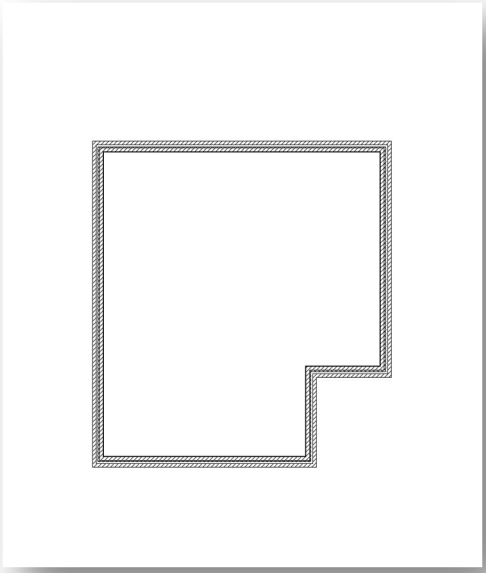


If you need to add additional holes to the flat roof too accommodate skylights, stairs ets, just use another subtraction object.

24.4 How to create a standard sloped roof extension

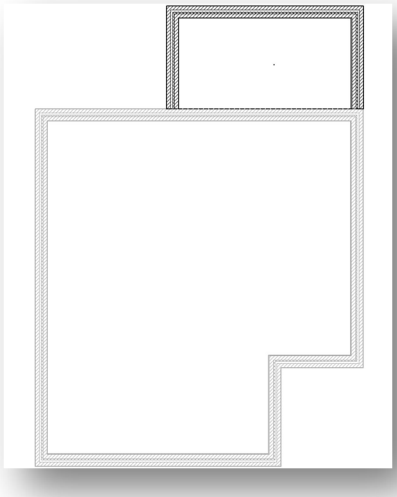
When adding an extension, it's better to add it using a new building. By creating a new building it's then easier to define a different floor to ceiling height which the new extension may have. Another advantage of placing such an extension on a separate building layer is that it's easier to hide the extension, and allowing you to view the project with and without the added extension.

In this example we will add an extension to the rear of this plan (top).

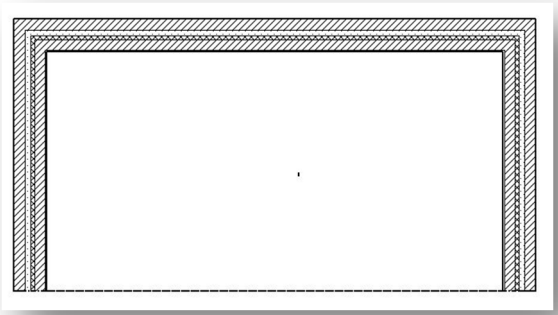


Create a new building and label it "Rear". In our example, the 4th wall already exist as we are using the existing wall of the main build

On the new layer add the 3 walls that represent your new extension.



In order to close off the new room with only 3 walls, use the **Room Boundary** wall type for the 4th wall.

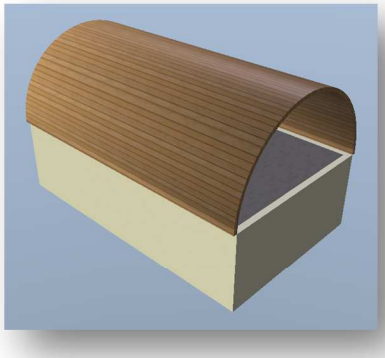


24.5 How to create a L shaped sloped roof extension

24.6 How to Create a Dutch Barn Roof

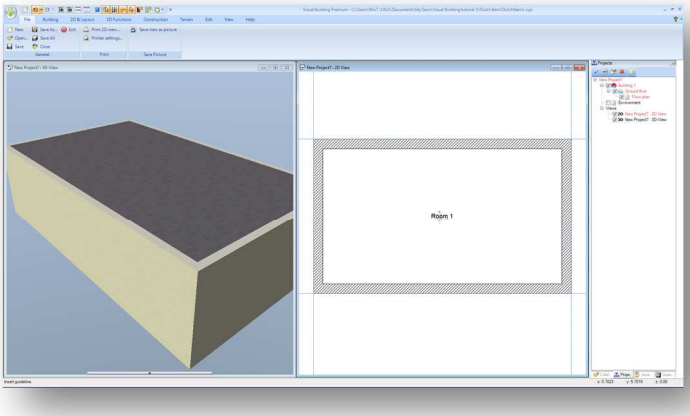
There are many variants of a Dutch Barn Roof, and most differences depend upon if you are in UK, USA or mainland Europe. If you Google Dutch Barn, you will find many different styles for the same thing. Where the Dutch Barn roof surfaces consist of flat surfaces, this is easy to achieve using the stand roof editing tools.

The example right was created by applying a gable at the two end roof surfaces and a Mansard roof type for the longer roof surfaces.

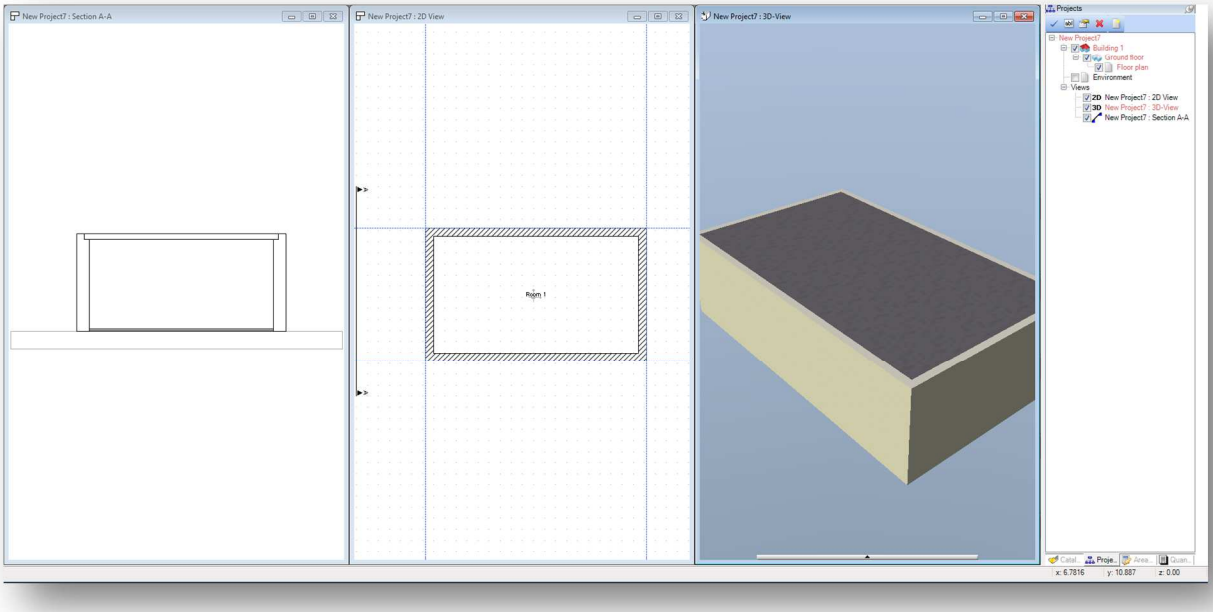


We will now create the more common form of Dutch Barn, using 3D editing tools.

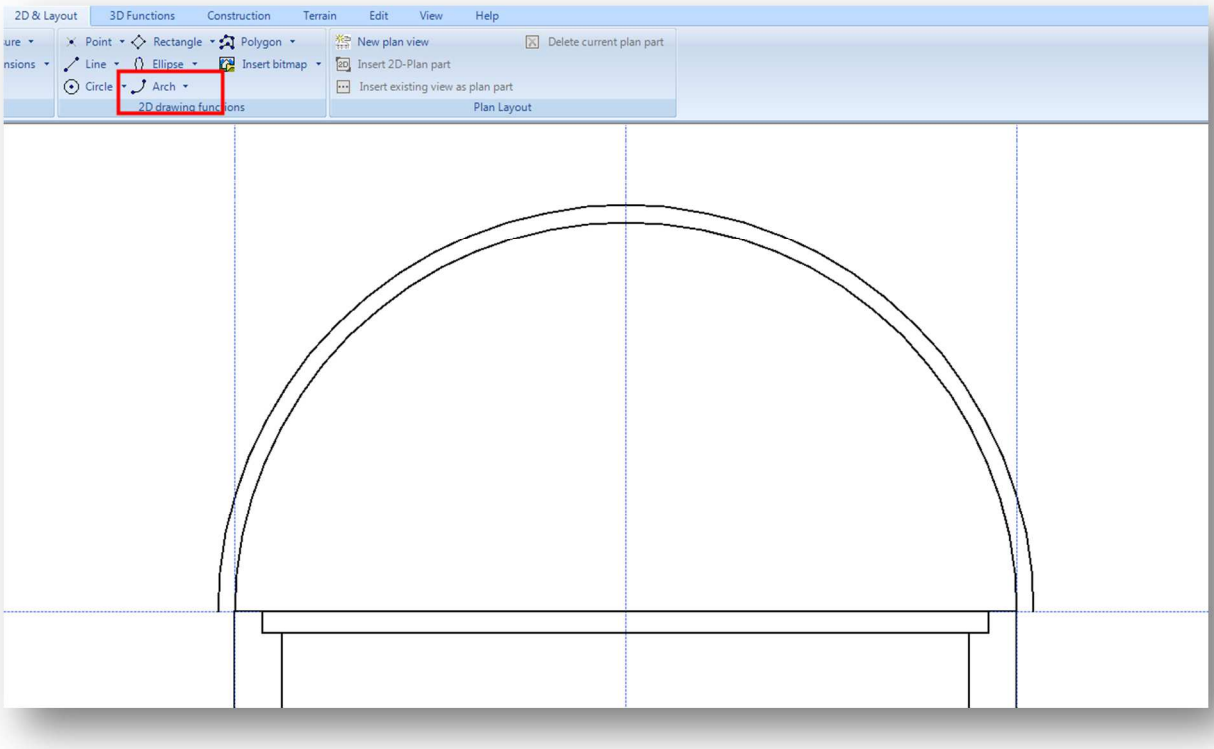
Create your supporting walls. This step is not necessary, especially if your barn has open sides. But if you don't create walls then draw some dimension lines to represent the footprint of the building.



Now create an elevation view:

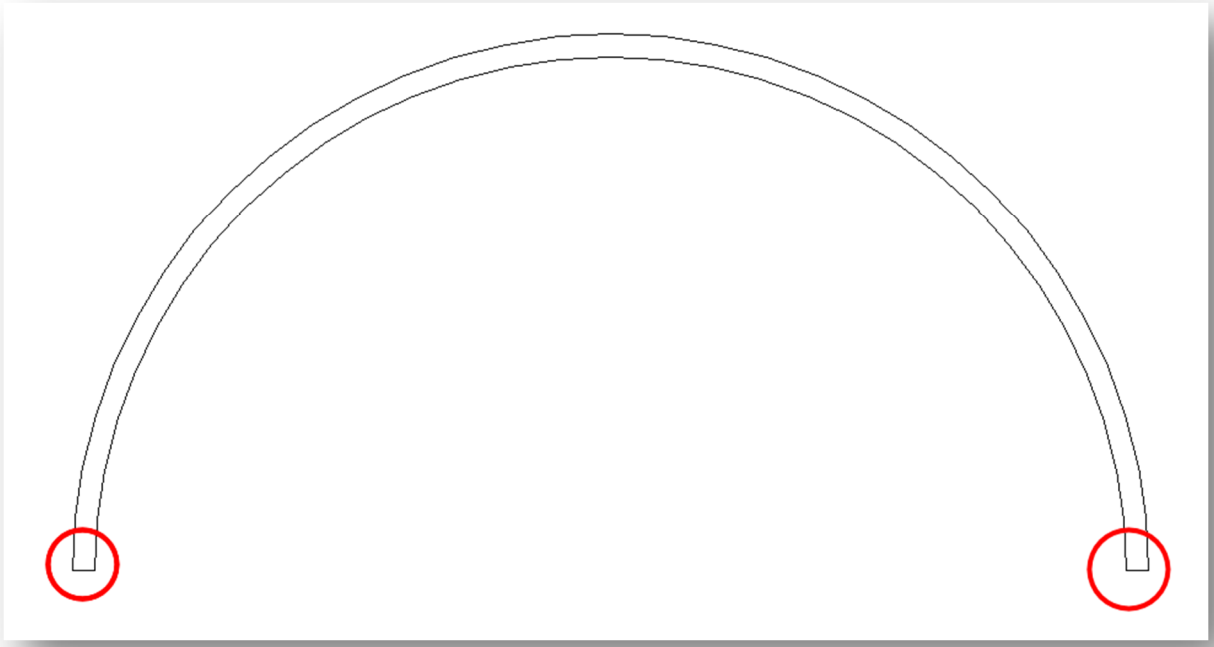


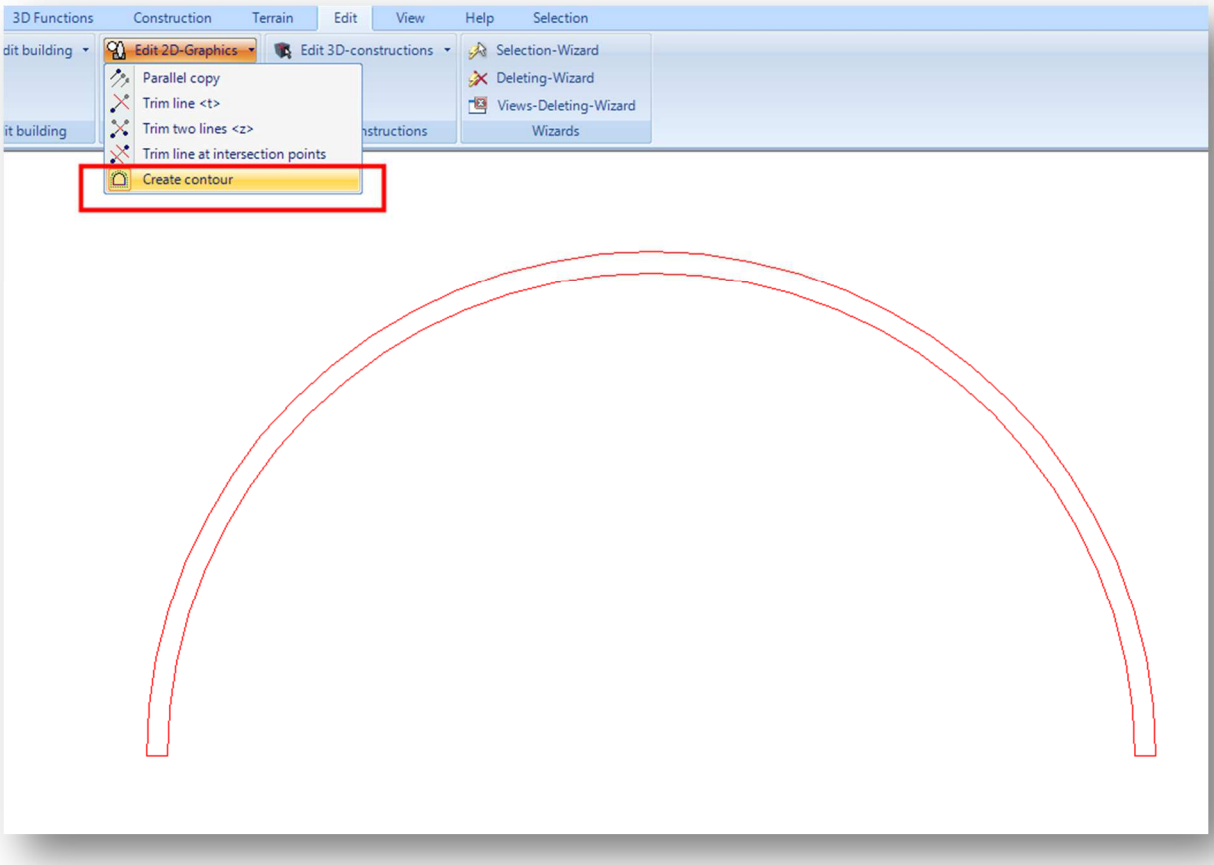
We will now draw the curved profile of our barn on the elevation view, using the **2D & layout – 2D Drawing functions**. Use **the Arc – Centre radius** to draw to curves:

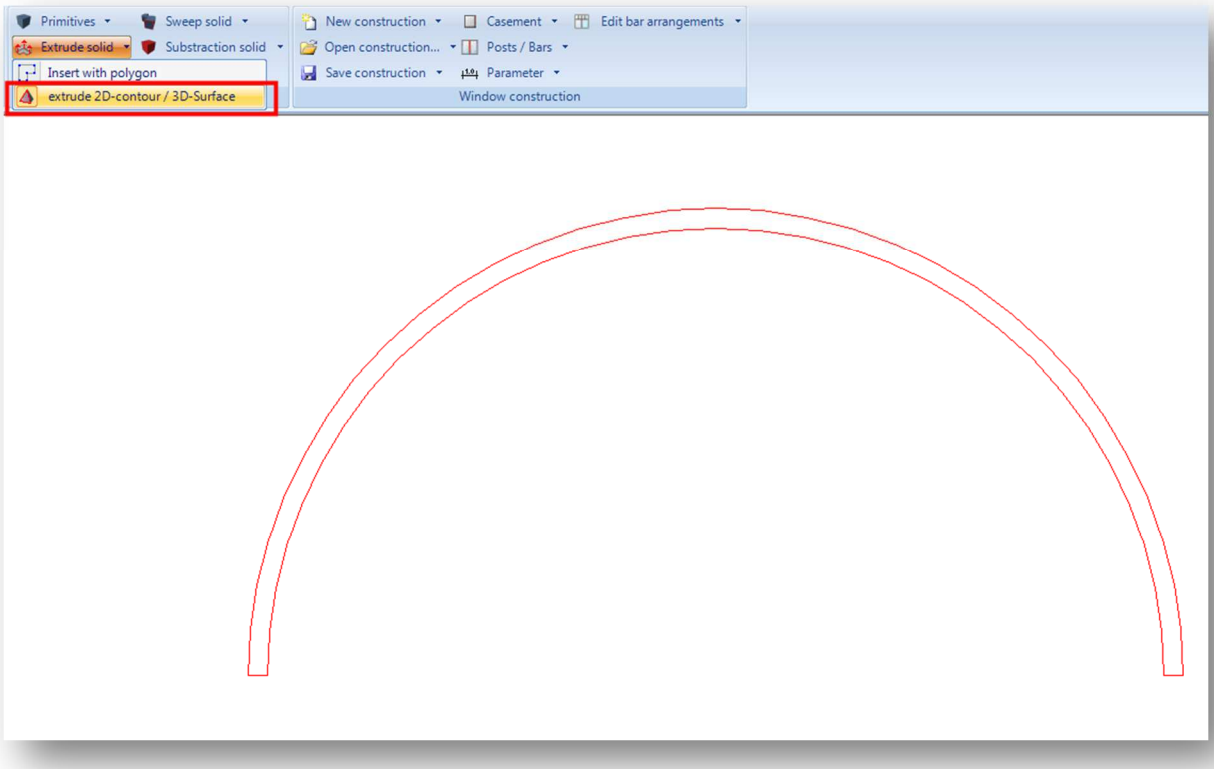


You can hide the walls and ceiling from the elevation view to make things clearer. Then use the Line tool to connect the curved lines at each end.

We now need to convert the lines into a contour, and that is achieved using the Create contour tool found in the Edit tab.




3D Functions
Construction
Terrain
Edit
View
Help
Selection
Edit 2D-Graphics
Edit 3D-constructions
Selection-Wizard
Deleting-Wizard
Views-Deleting-Wizard
Wizards
Parallel copy
Trim line <t>
Trim two lines <z>
Trim line at intersection points
Create contour

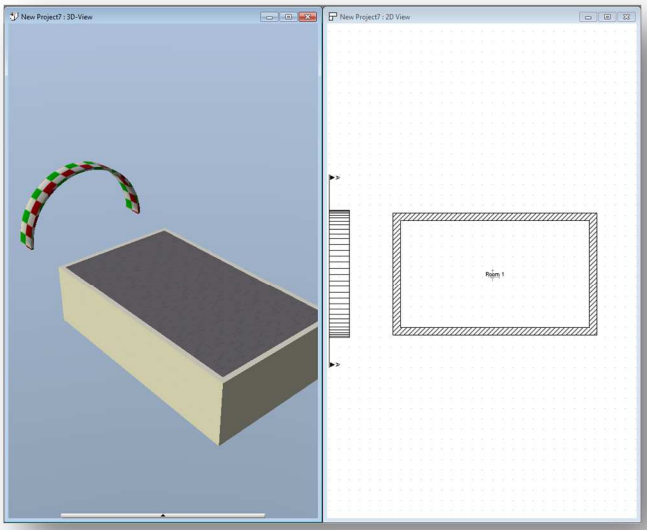

Primitives
Sweep solid
Extrude solid
Substraction solid
Insert with polygon
extrude 2D-contour / 3D-Surface
New construction
Casement
Edit bar arrangements
Open construction...
Posts / Bars
Save construction
Parameter
Window construction

We will now extrude the curved 2D profile of the roof using the **Extrude 2D contour** tool, found in the **Construction** tab. With the tool select click on the contour which will highlight when the cursor is over it.

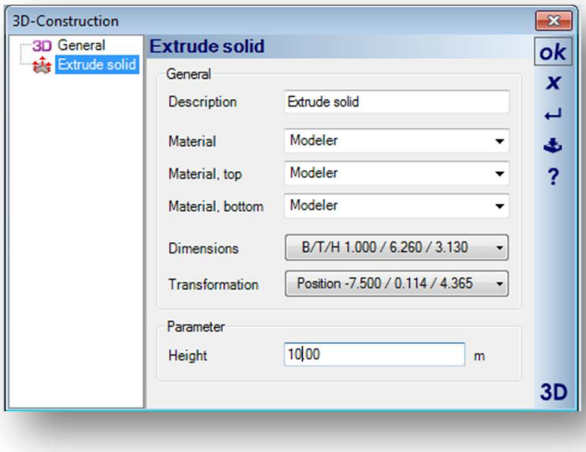
You will see no change in the 2D elevation view, but if you examine the 3D and plan view, you will see that you have created a new curved object.

The new 3D object is at a default length of 1m.

In the 3D view double click on the 3D roof object to display the 3D construction dialog.

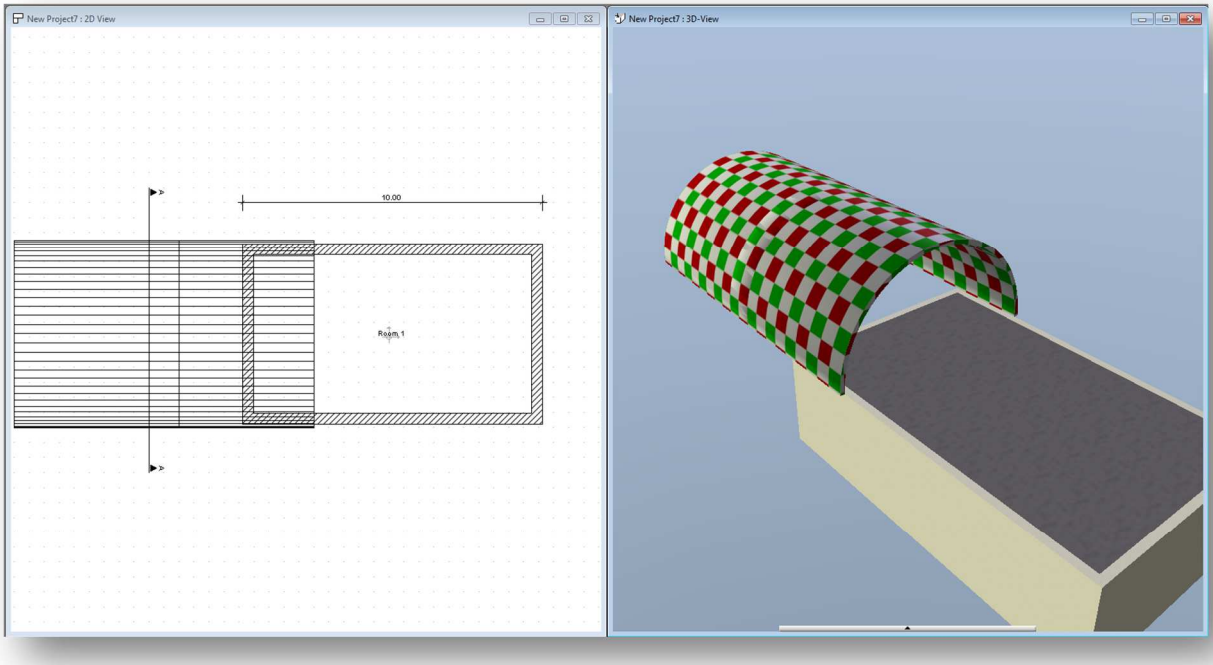


Now select the **Extrude solid** tab in the dialog and change the **Height** value from 1m to the actual length you require for the roof. In this example we will change 1m to 10m.



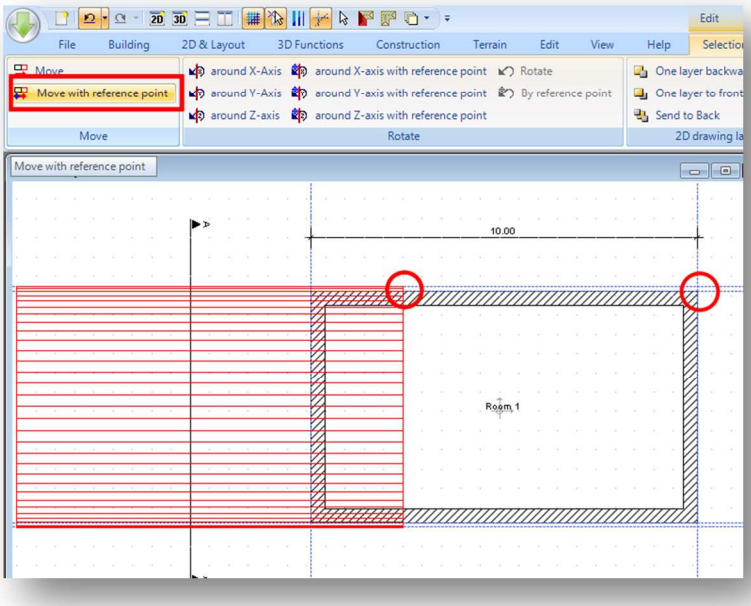
The length of the curved roof will now extend to 10m.

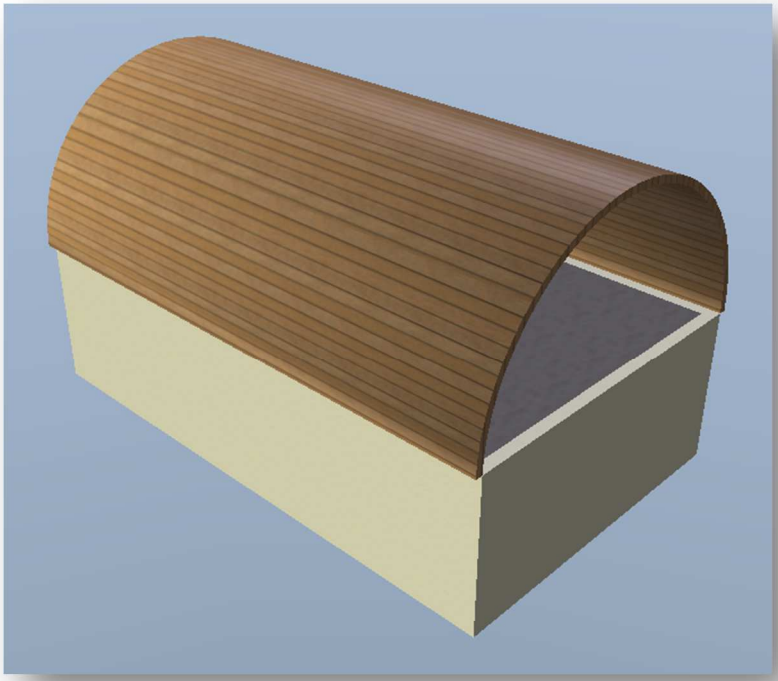
The red / green/white texture is the default texture applied to the object. You can bow apply any



texture / material to the roof. Simply drag the required texture onto the 3D roof.

Now to move the roof into its correct position. In the 2D plan view select to roof and then use the **Move with reference point** tool in the **Selection** tab to select the corner point of the roof and then click again to select the roof's new position. Using guide lines will help.





Note that the 3D object does not know it's a roof, but what's important is that it looks like a roof. You can also export this as a 3D object and save in your 3D catalogue to use in other projects.

If you need a shallow curve then bring the centre lines of the 2 curves down closer to the floor (it's just a matter of geometry). You can then create the gable front and rear of the barn, by similarly extruding a surface. Add a corrugated texture and iron supports:

25 Walls

Here is a collection of thoughts about walls…. I do not intend to duplicate the contents of the **Visual Building User Manual** here, so you should be familiar with its contents, specifically the chapter concerning walls, before understanding the following.

25.1 Not all walls work the same

The first 4 walls in the wall drop down menu do operate in the same manner, however the **Partition Wall** and the **Room Boundary** work very differently, and are used for different puposes.

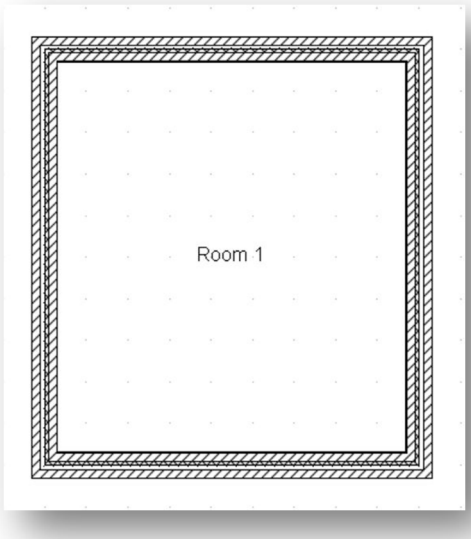
Partition Wall
The **Partition wall** should be used in cases where you do not want the wall to create a separate room. Normal walls when connected correctly will form a room.

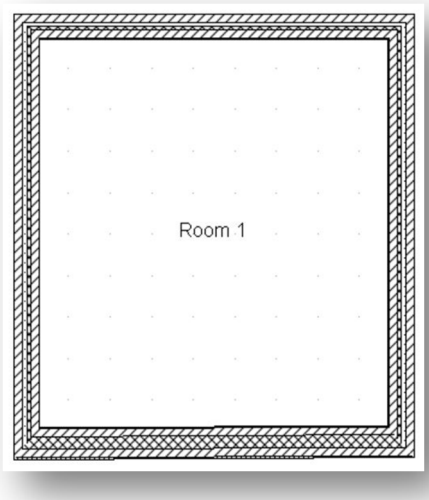
Room Boundary Wall
The **Room boundary** wall is a virtual wall that will divide an area into two rooms, but not display a solid wall, as do the other wall types.

25.2 Wall Alignment

One of the most common problems for the new user is not connecting two walls correctly, or more to the point, not realising that there is not a good wall connection.

When a set of walls are connected correctly they will automatically form a room.

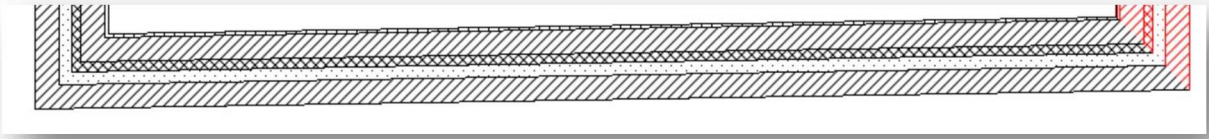




The above room is good, but the left room is bad. Can you see the difference?

Even though you may have a good wall connection, it's possible that your wall is not aligned correctly and this is indicated by steps in the wall.

The following image is a zoomed in image of the above bad wall placement. This is indicated by the steps in the horizontal wall. Although this will provide you with an automatic room, this wall alignment will cause problems with ceilings and roof constructions later.



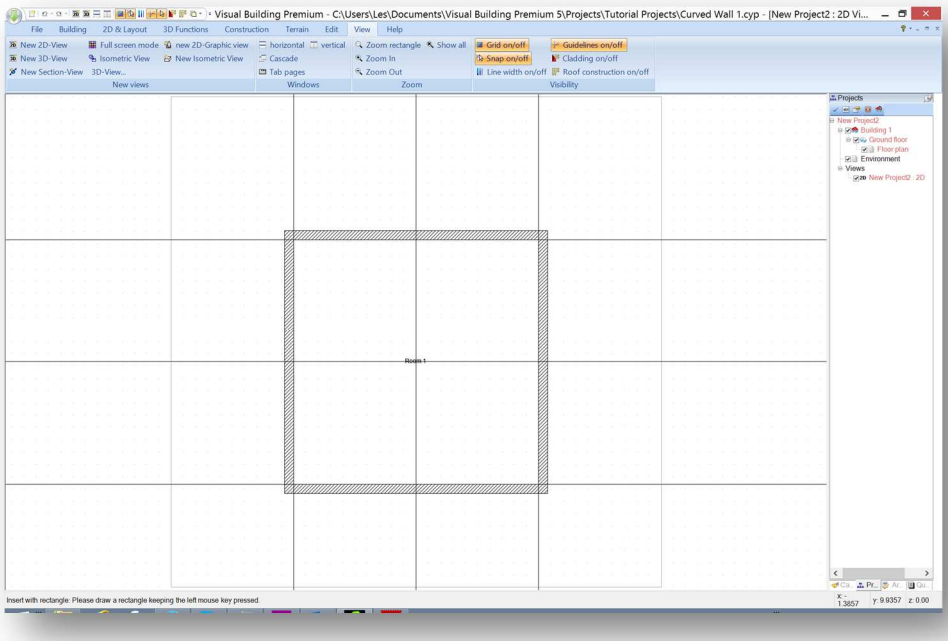
Such a misplaced wall is often created by snapping to a grid point or to a part of a wall that was not intended. To avoid such bad wall placements hold down the **Ctrl** key while drawing the wall and this will ensure that the wall is placed either perfectly horizontally or vertically.

25.3 Wall Connections

Sometimes a wall not be connected correctly, which can create undesirable affects later. The later you leave identifying rectifying such wall connections, the more difficult it becomes, because often the best solution is to delete a wall a redraw it. This of course poses additional work if you have already inserted doors and windows into a wall that needs to be redrawn.

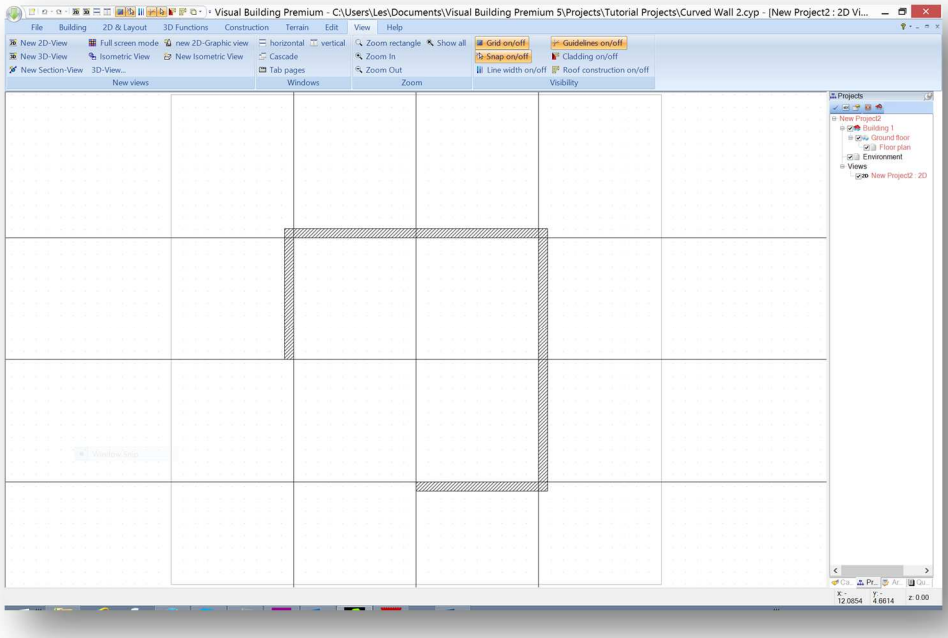
25.4 Curved Walls

Following on from the previous curved roof example, we can use the same method to create a curved wall. Currently Visual Building does not support a curved wall or window in its standard set of construction, but we won't let that stop us.

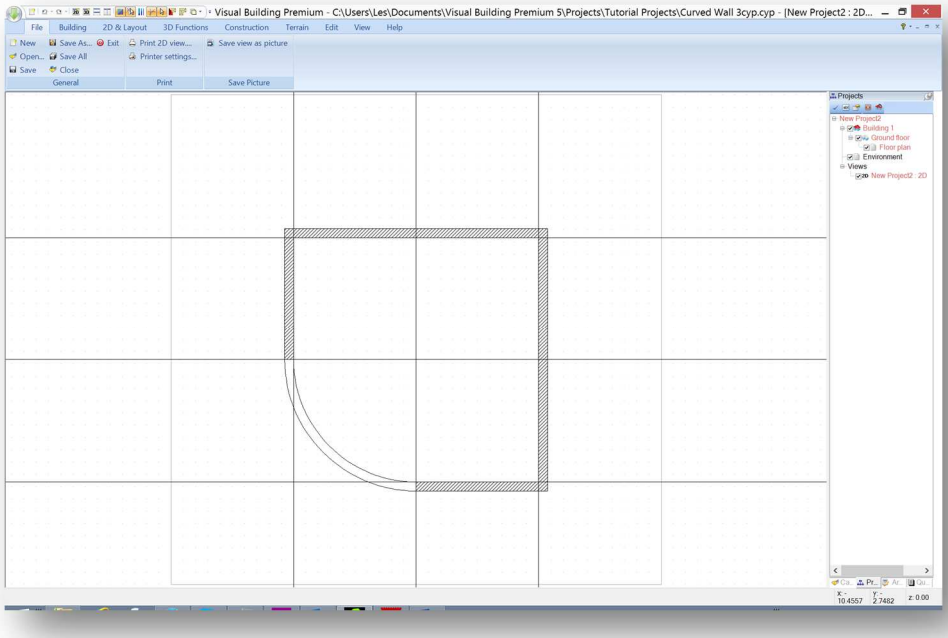


So, first we will draw the walls onto which we want to place a curved wall. We will use guidelines to help us define the centre of a circle to draw the curved wall.

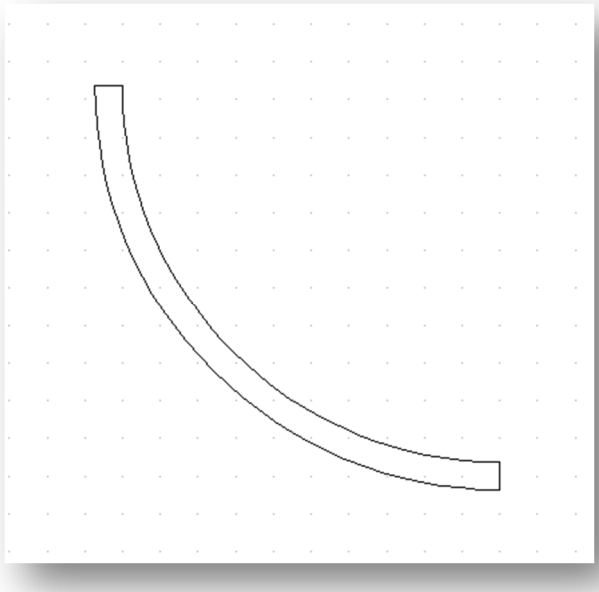
Then using the wall edit tools, we cut back the wall section that we wish to replace with a curve:



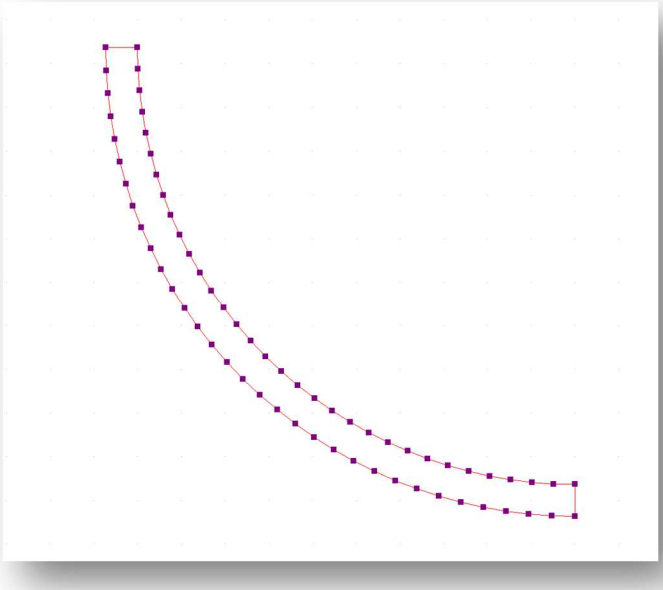
Now using the 2D tools draw 2 arcs to represent the width of the curved wall.



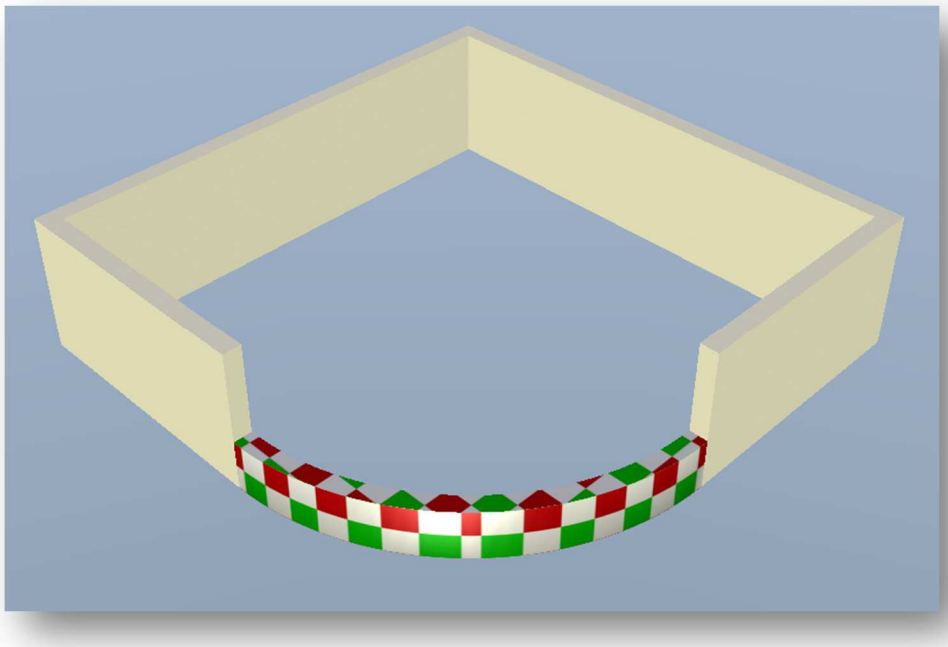
Again using the 2D drawing tools, join the two circle segments. Hiding the walls and guidelines will give you a clearer view of what you have drawn:



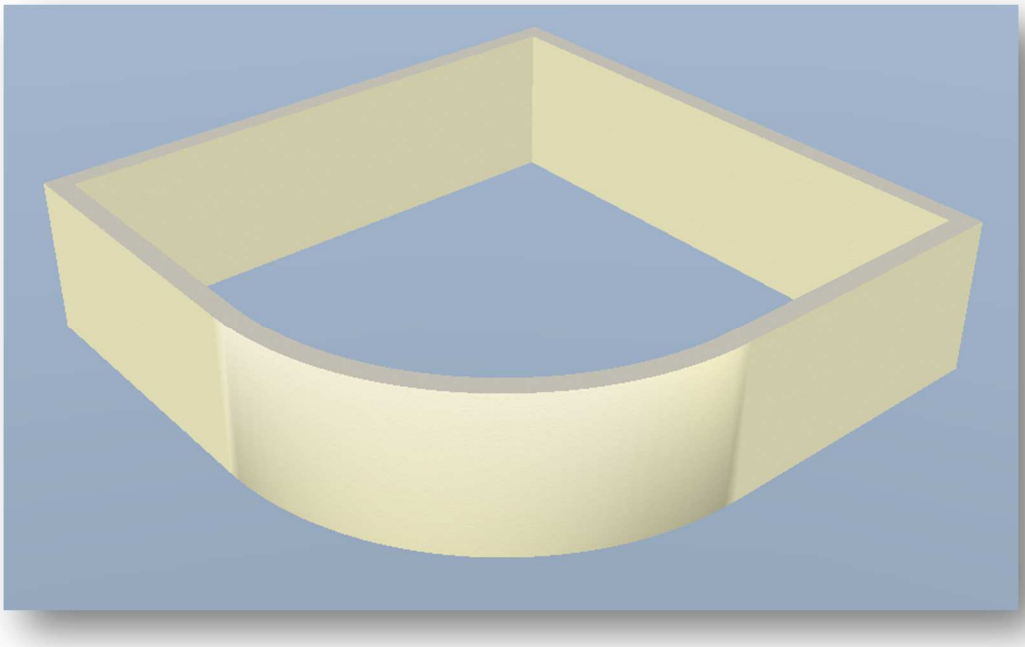
Group select all 4 lines, i.e. the 2 curves and the 2 end lines, use the Edit – Edit 2D graphics – Convert contour too to convert the selected lines to a single contour.



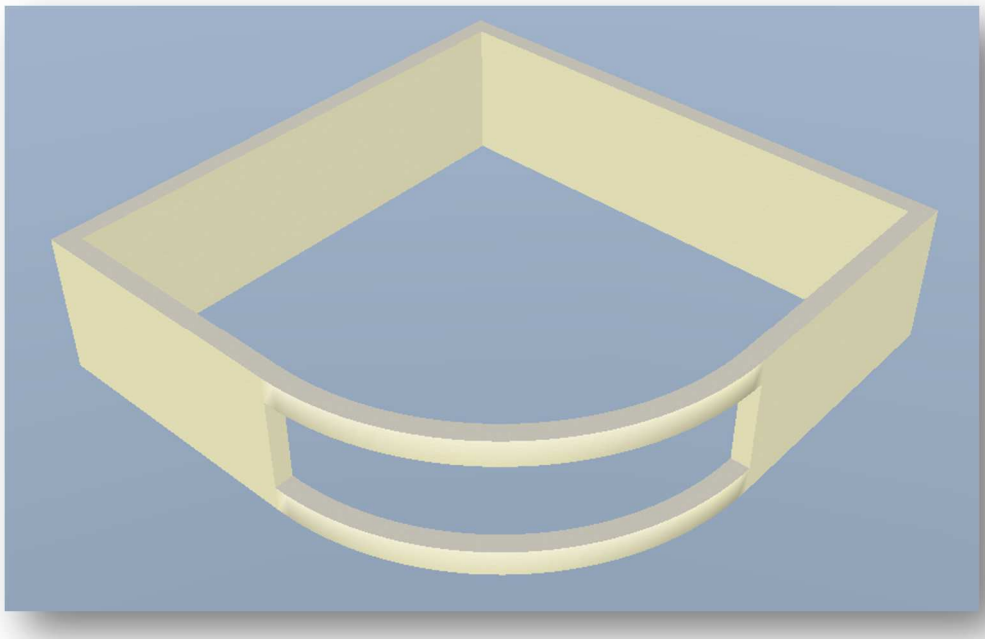
Now that we have our curved wall shape defined as a contour we can use the Construction – Extrude solid – Extrude 2D contour to extrude the contour into a 3D object:



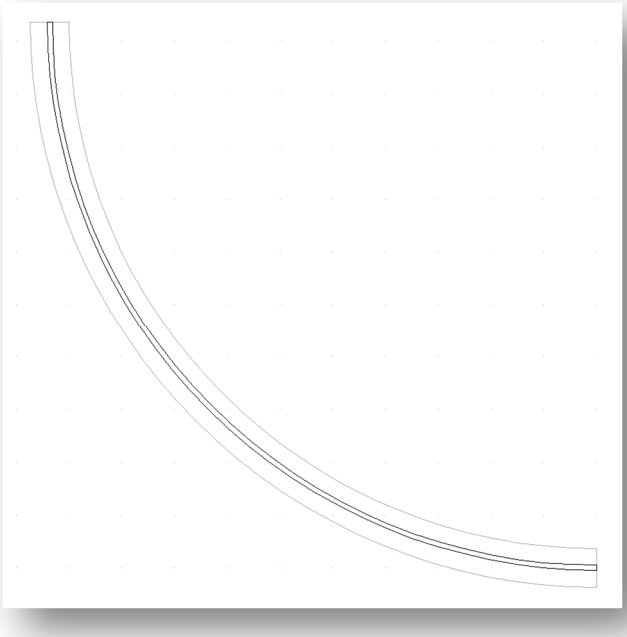
Using the 3D object's transformation setting you can adjust its, height and position. You can also drag your existing wall material onto the curved wall section.



You can also resize and duplicate this new 3D object:



Let's now create curved glass, using exactly the same procedure, but of course the glass will be much thinner than the wall section. Here we see the thin glass drawn on top of the curved wall. For convenience you can place these on different layers, thus allowing you to select the lines defining the window easier.

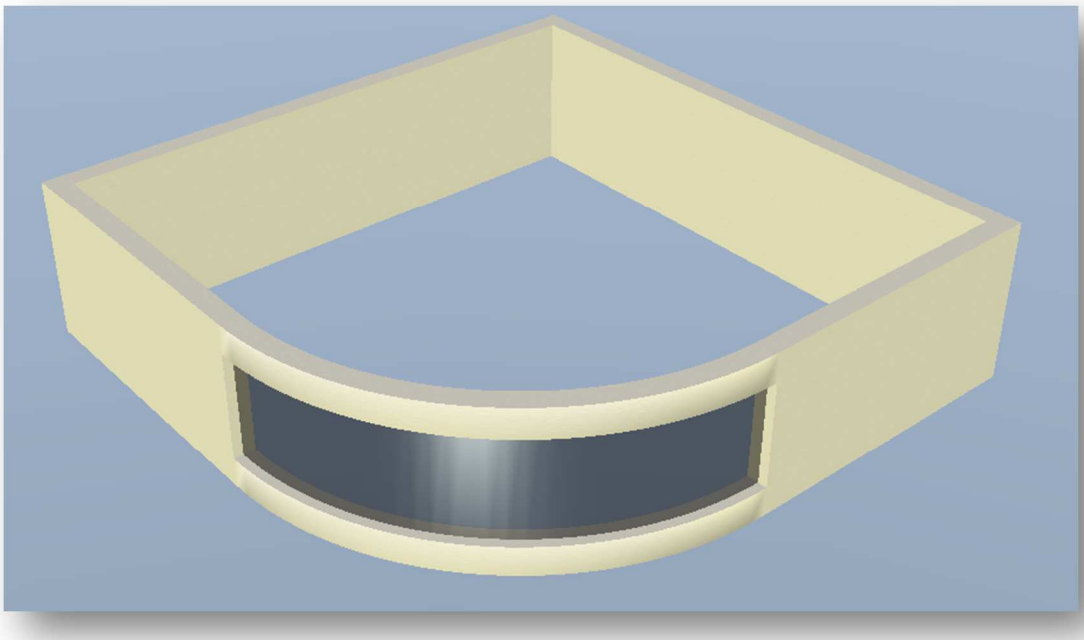


Use exactly the same procedure for the curved window object as you did the curved wall, i.e.

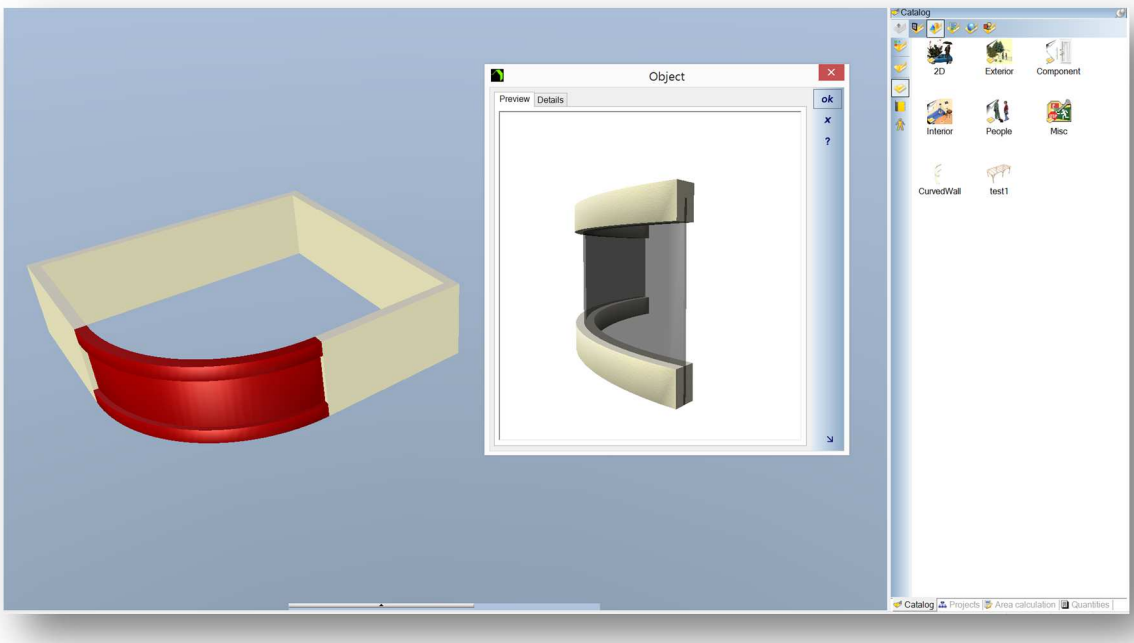
Group select all 4 lines, i.e. the 2 curves and the 2 end lines, use the Edit – Edit 2D graphics – Convert contour too to convert the selected lines to a single contour.

Now that we have our curved wall shape defined as a contour we can use the Construction – Extrude solid – Extrude 2D contour to extrude the contour into a 3D object.

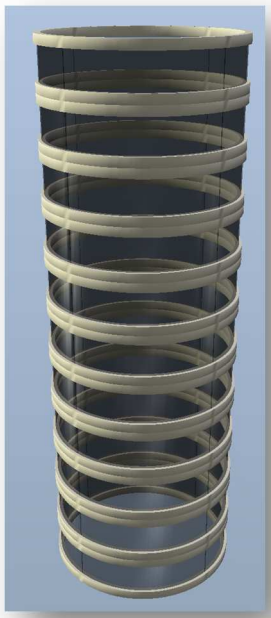
Using the 3D object's transformation setting you can adjust its, height and position, but only in the z plane. Apply a glass material to the curved window, and you have your result:



You can even select your curved wall and window and save to the catalogue as a single object for future use in other projects:



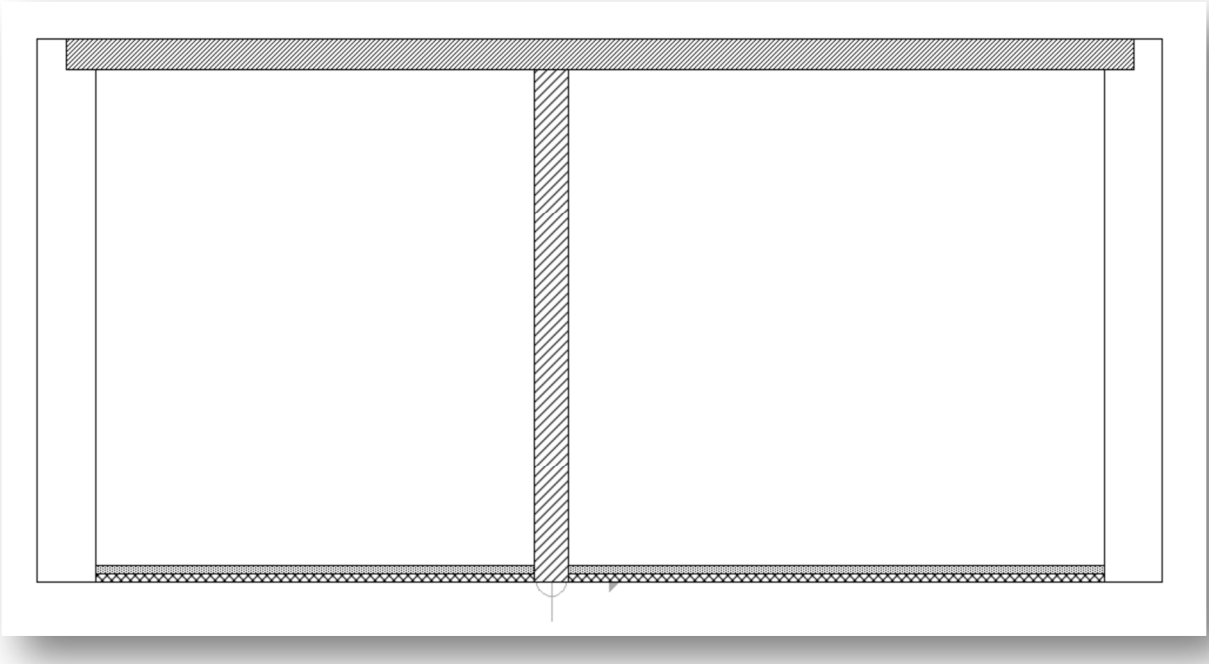
Once saved to the catalogue, you can quickly combine your objects and make interesting constructions:



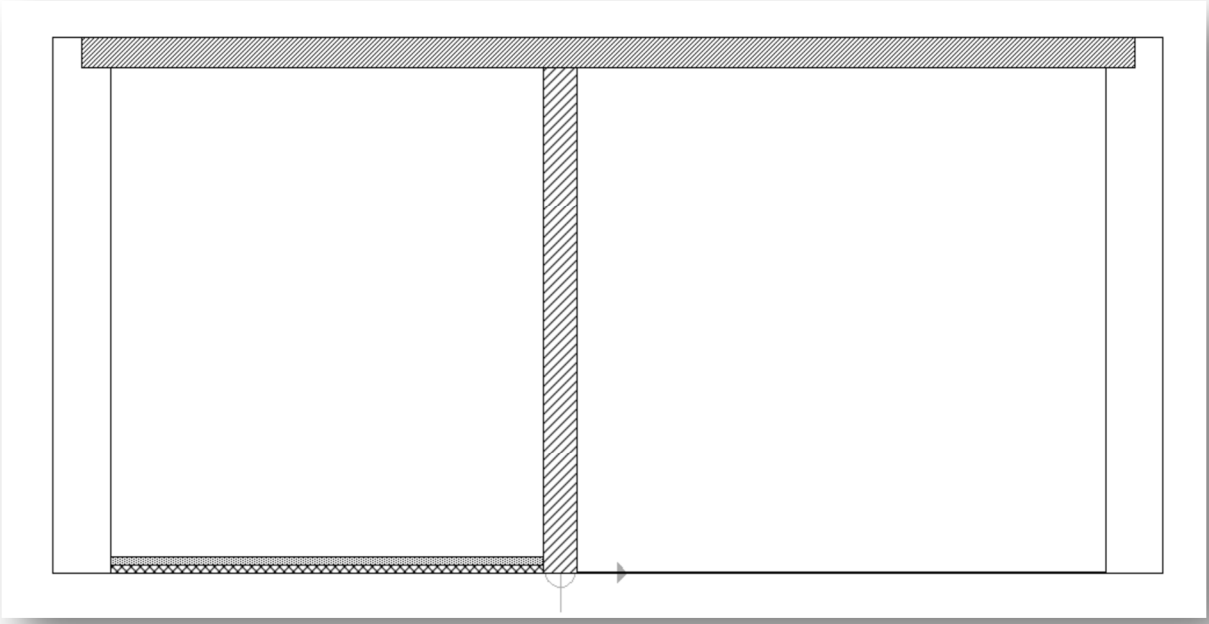
But remember this is not a wall and window object, and will not be seen by the software as a wall or window. To the software it is just another 3D object.

25.5 Walls need to sit on floor

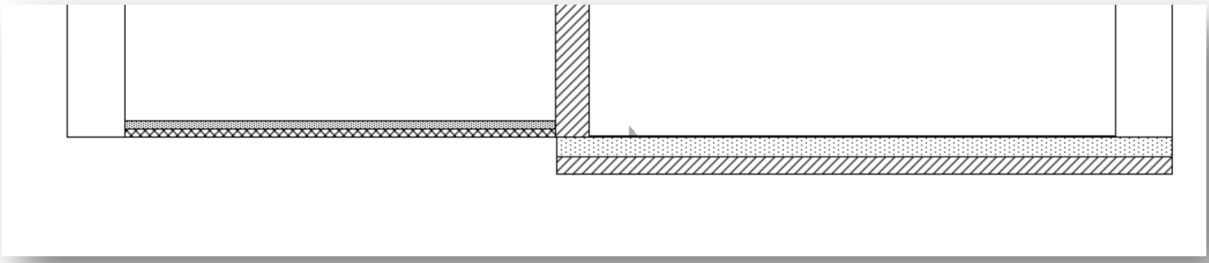
The default for all wall is to place the walls at the same base heights as the floor. Where you are using floor layers this has the following effect:



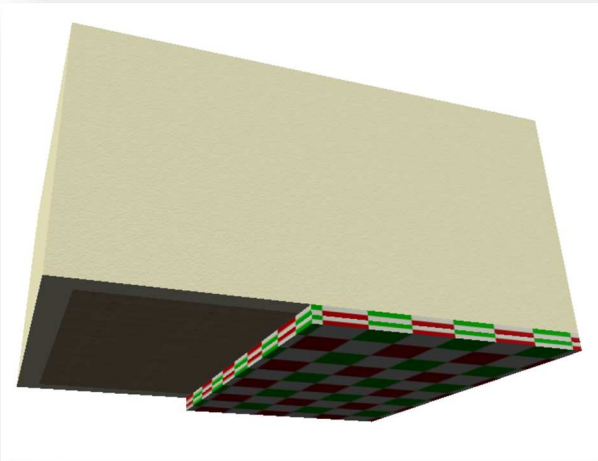
In cases where you need to show the wall sitting on the floor, which is often the case for internal walls, this can only be achieved by drawing your own floor layer. First you must delete the existing floor layer, or set the height for each layer to 0.

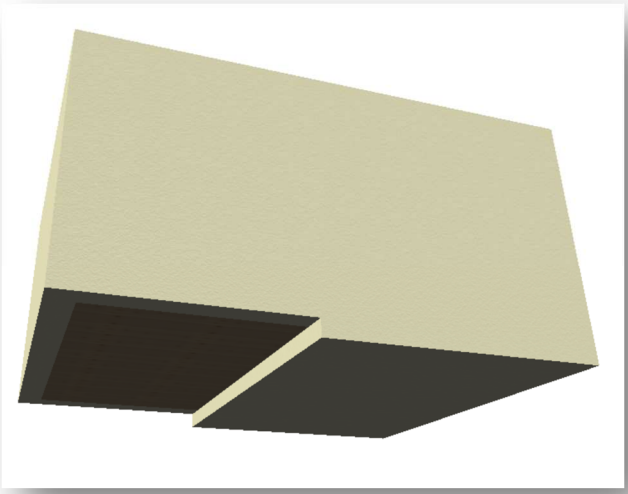


In the section view draw the 2D profile of your floor layer:



If you need to show in other 2D views or within a 3D view you can extrude these 2D profiles using the **Construction – extrude solid – extrude 2D contour** tool. You will need to adjust the size of the resulting object to fit the depth of your building / room.





You can of course match the texture and material of the wall to your ne floor layer structure.

You will need to take into account any change to your external wall height when using this method.

26 Timber Frame

Visual Building does not currently support automatic timber framed walls. It is possible to define in your wall layers, a cavity and / or insulation layer, and block layer and of course a layer that includes your timber frame, but the timber elements are not automatically displayed in 2D or 3D. However using the advanced 3D tools it is quite easy to add a timber frame that can be viewed both in 2D and 3D views. It's not automatic, but it really is easy.

26.1 Define wall layer construction

This is a 2D option and does not really affect the contents of your 3D view. There are separate tutorials and references to how to create a new wall layer, so we will not go into the detailed aspect of wall layer construction here.

A typical timber frame wall construction would consist of (from inside to out):

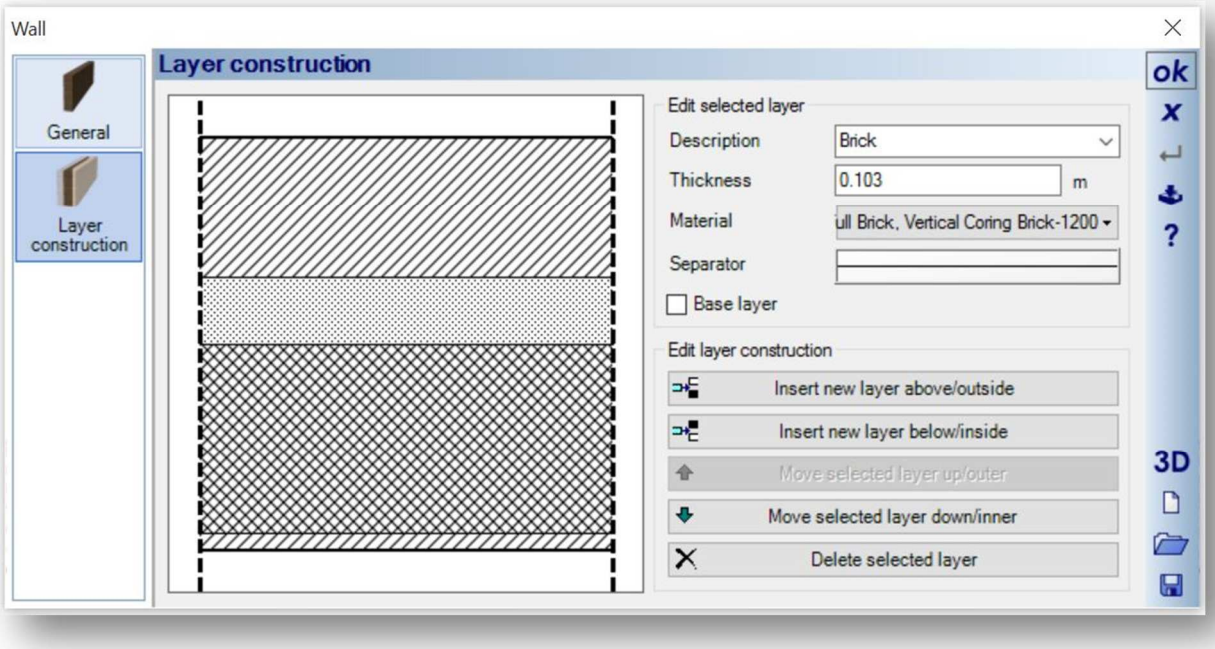
Plasterboard
Vapour Control Layer
Thermal Insulation and Timbers
Sheathing Board
Breather Membrane
Cavity
Outer Brick Cladding

For the purpose of our construction drawing we will create a wall construction layer showing: Plasterboard, Timber Layer, Cavity, and Brick Cladding. The Plasterboard layer we will assume to always contain the Vapour Control Layer. The Timber layer we will assume to always contain the thermal insulation, as this is inserted in between the timber frame. The Sheathing board and breather membrane will also always be assumed. The cavity and Outer Brick cladding will be included. You could of course include every layer into your wall construction, but for our demonstration we will create a wall layer as described above.

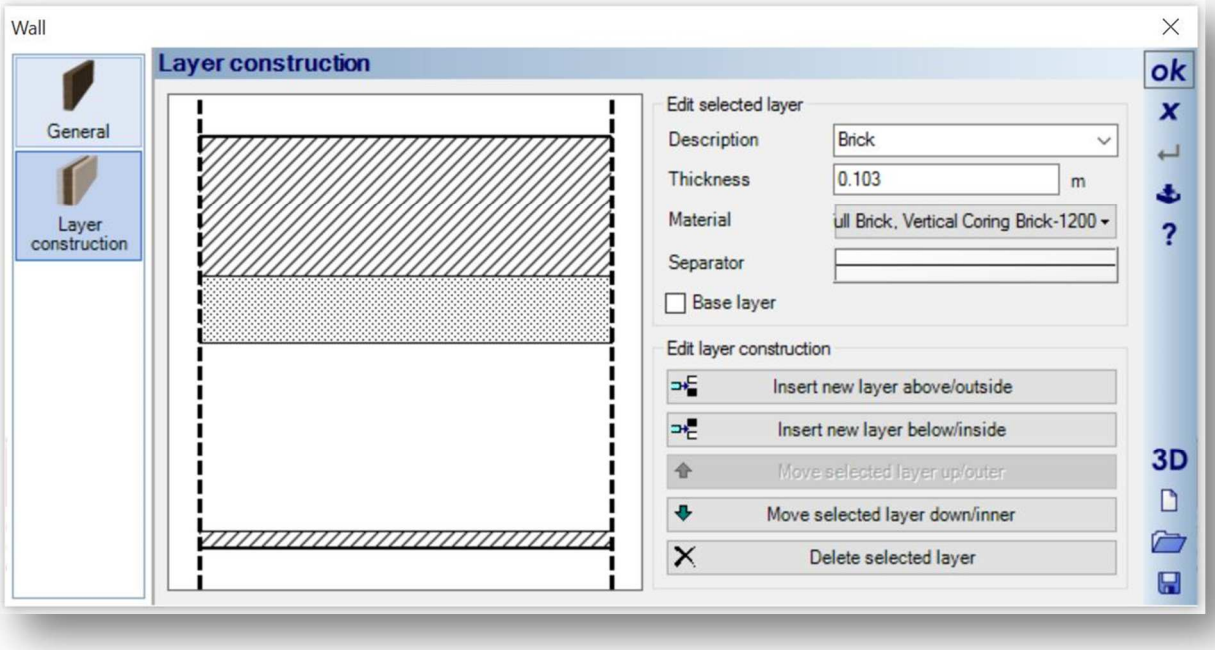
Plasterboard layer
Timber layer
Cavity layer
Outer Brick Cladding layer

There are many different types of timber frame construction, and yours may well be different to include additional insulation layers, timber thickness etc. The Closed Panel, Open Panel, Structural Insulated Panels (SIP), Cross Laminated timbers systems of timber framing can all be represented using this method. You could also demonstrate traditional Oak framing if needed.

The following wall construction shows 12.5 mm plasterboard, 140 mm timber layer, 50 mm cavity and a 102.5 mm brick. This gives us a wall thickness of 306mm. If you need to adjust any of these layers to allow for additional insulation or sheathing now is the time to do so.

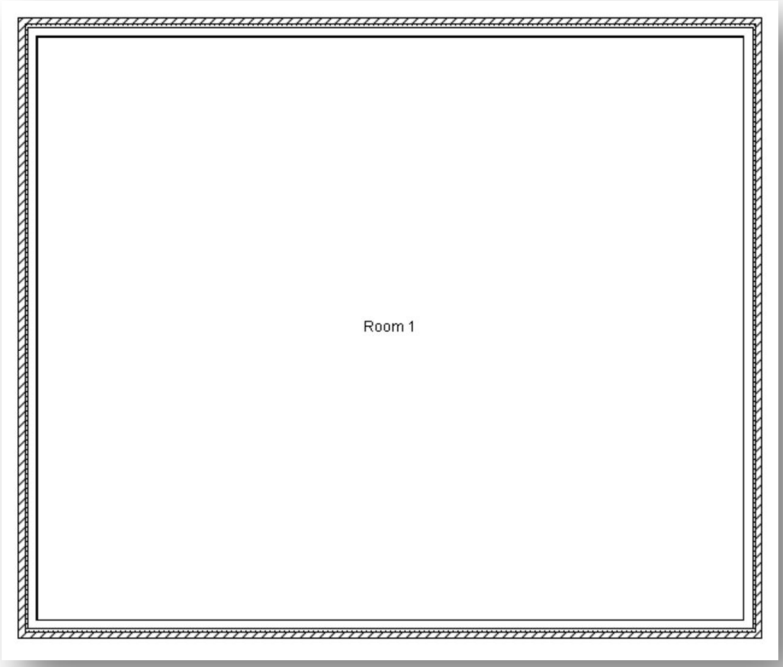


We will however change the insulation layer with a white fill, so that we may visualise the timber elements in the 2D plan view.

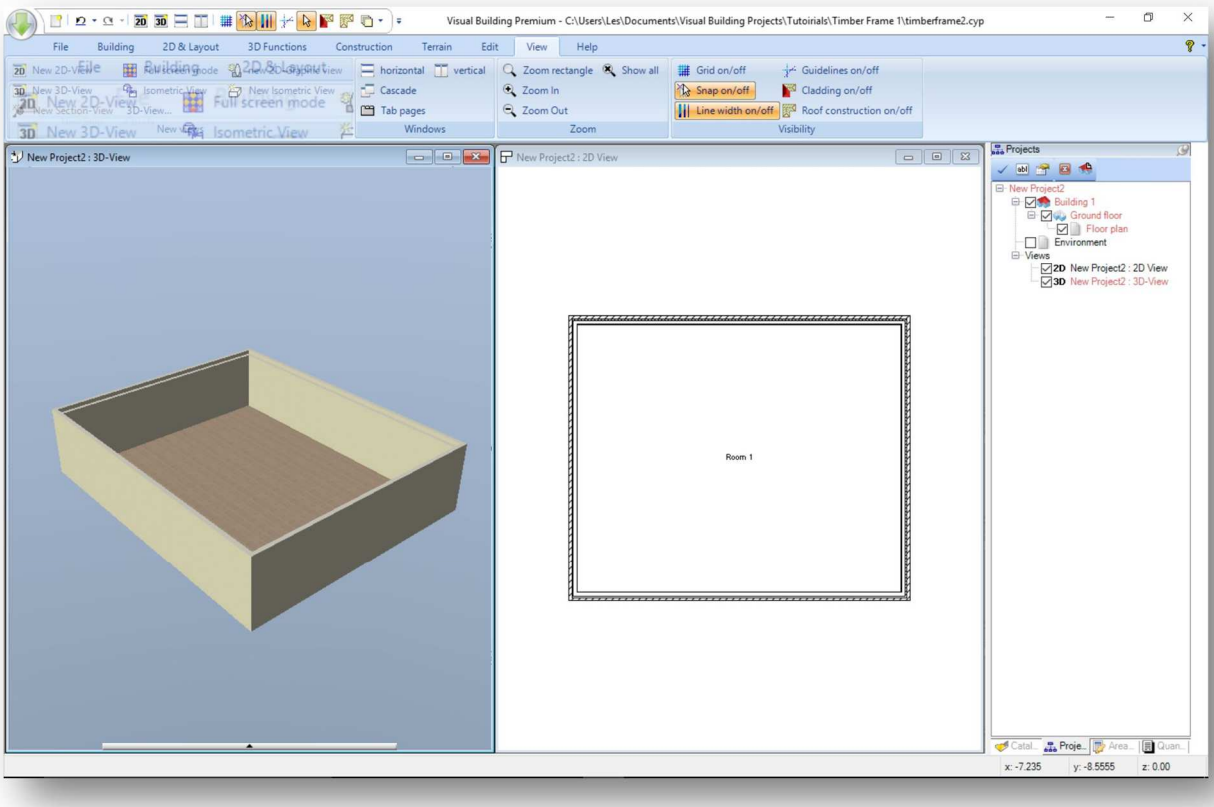


26.2 Draw your External Walls

Drawing 4 external walls using this wall construction then looks like this:



The complete project view:



26.3 Create Timber Elements

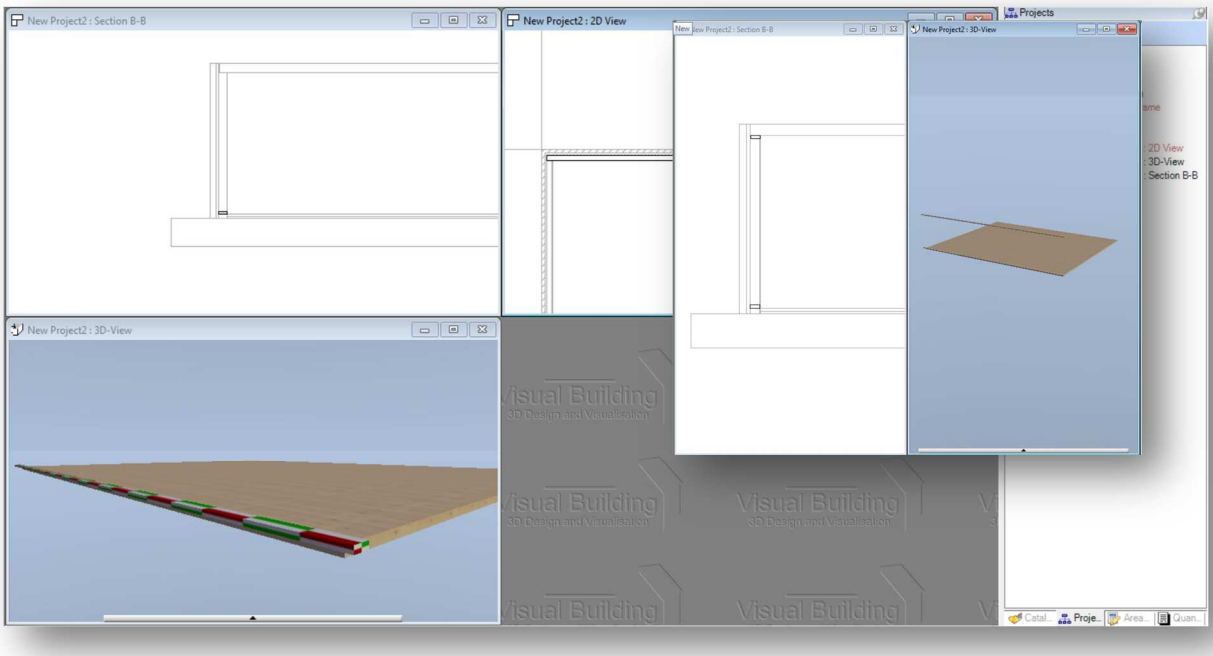
Create an elevation view, into which we will create a profile of the sole plate. Using the **2D Layout – 2D Drawing Functions – Rectangle** tool we will draw a plan profile of the sole of size 140 mm x 50 mm. If your timber sizes are different then this is where you make your profile different. We are going to convert this 2D profile of our timber into a 3D object.

We will also create new layer and call it Timber Frame. Then select the 2D profile and move it to the new layer. This will enable us to easily select the 2D profile and also hide show the 3D timber frame.

We will now convert the 2D profile to a 3D object, using the **Construction – Extrude Solid – Extrude 2D Contour** tool.

Select the tool and then click on the 2D timber profile. Nothing appears to have happened, but if you disable the walls in the 3D view you will see that you have created your first 3D horizontal timber.

The length of the sole plate is by default 1m, but we can adjust this to fit the length of our wall.



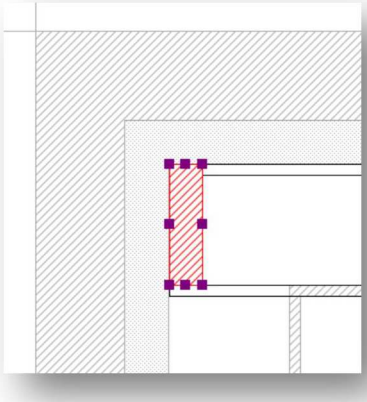
We will now apply a wood texture to this object, by opening the texture catalogue and dragging a wood texture onto the object. We can now create the top plate simply by duplicating the sole plate. Select the sole plate and then right click on it and from the context menu select Multiple Copy. In the activated Tool options dialog select the YX plane and the number of copies to 1. It does not matter where this copy is placed, as we now move it to its final position.

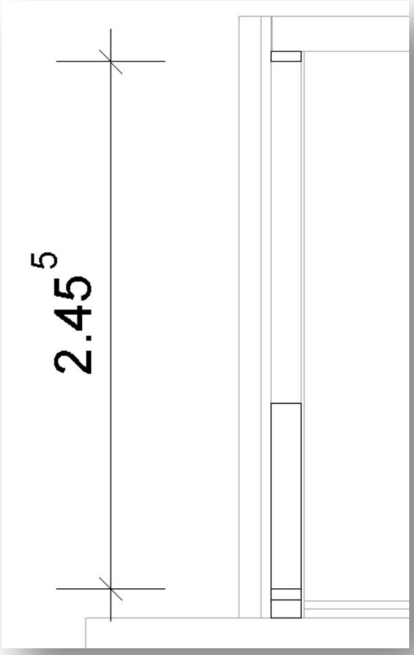
You will now see the usefulness of having multiple views showing the elevation, plan and 3D view.

The object can be selected in each view and moved exactly using the **Move with reference point** tool.

Now to create a vertical strut.

Using the **2D Layout – 2D Drawing Functions – Rectangle** tool we will draw a plan profile of a vertical timber of size 140 mm x 38 mm. Again, if your timber sizes are different then this is where you make your profile different. In the 2D plan view use the 2D Rectangle tool to create the plan profile of your vertical stud.



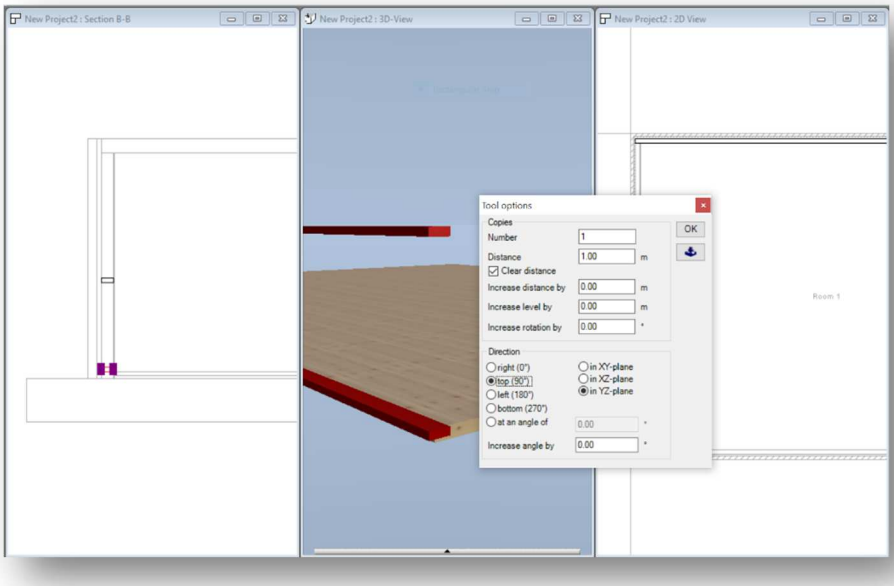


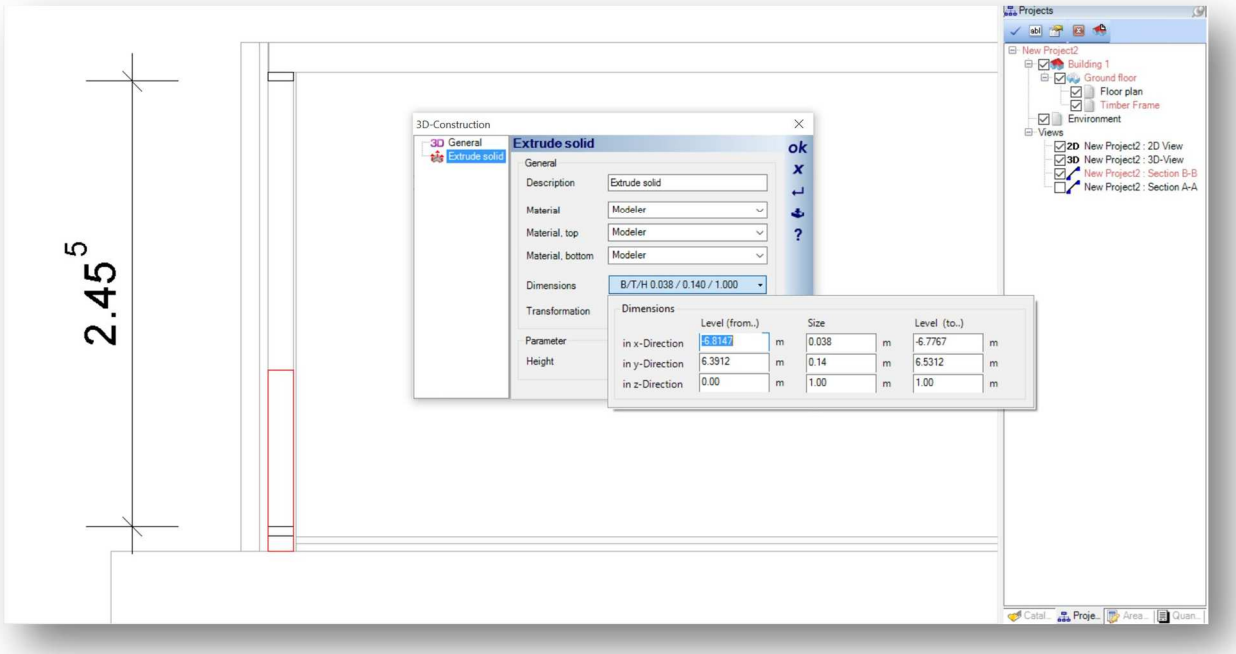
We will now convert the 2D profile to a 3D object, using the **Construction – Extrude Solid – Extrude 2D Contour** tool.

Select the tool and then click on the 2D timber profile, and a 3D stud object will be created with a default length of 1m.

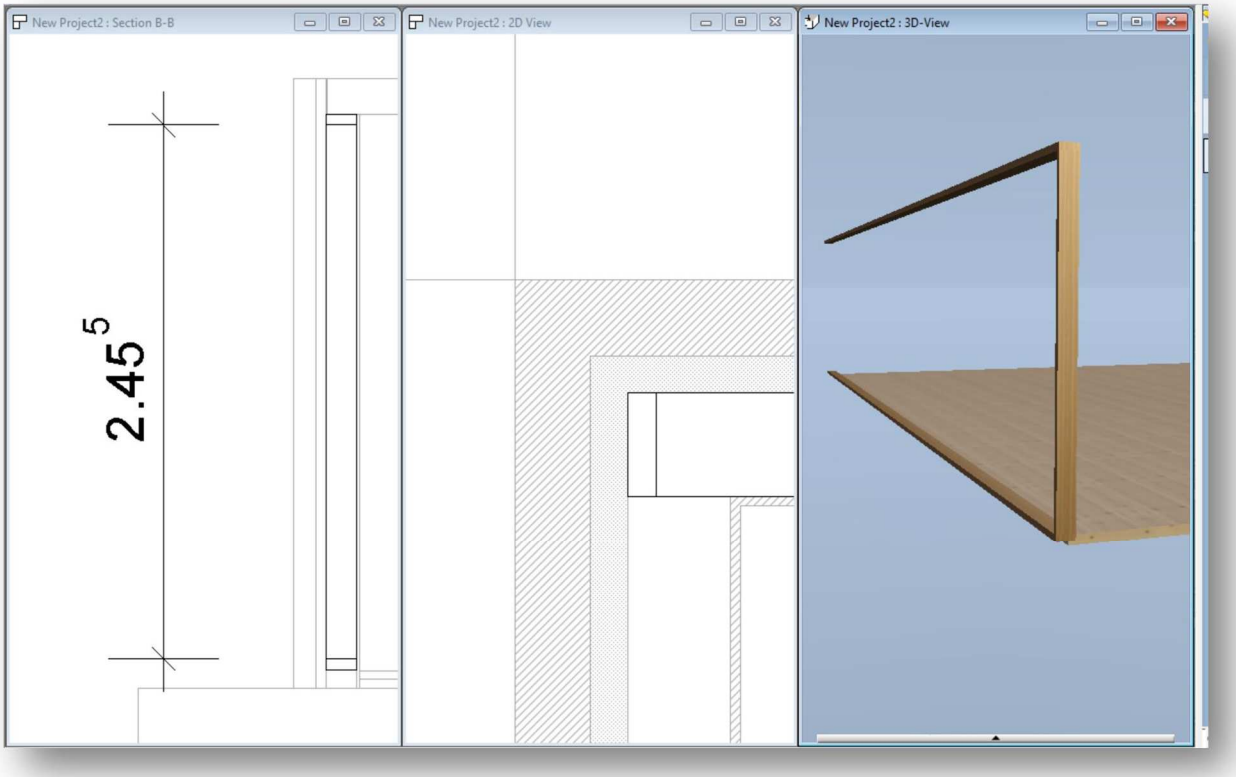
In the elevation view double click on the timber to activate the 3 Construction dialog, and select the Extrude solid option in the side bar. In most cases you will know the strut timber height, but if not you can measure its length.

So double click on the new vertical strut and in the Dimensions field insert its length, in our case 2.455 m.

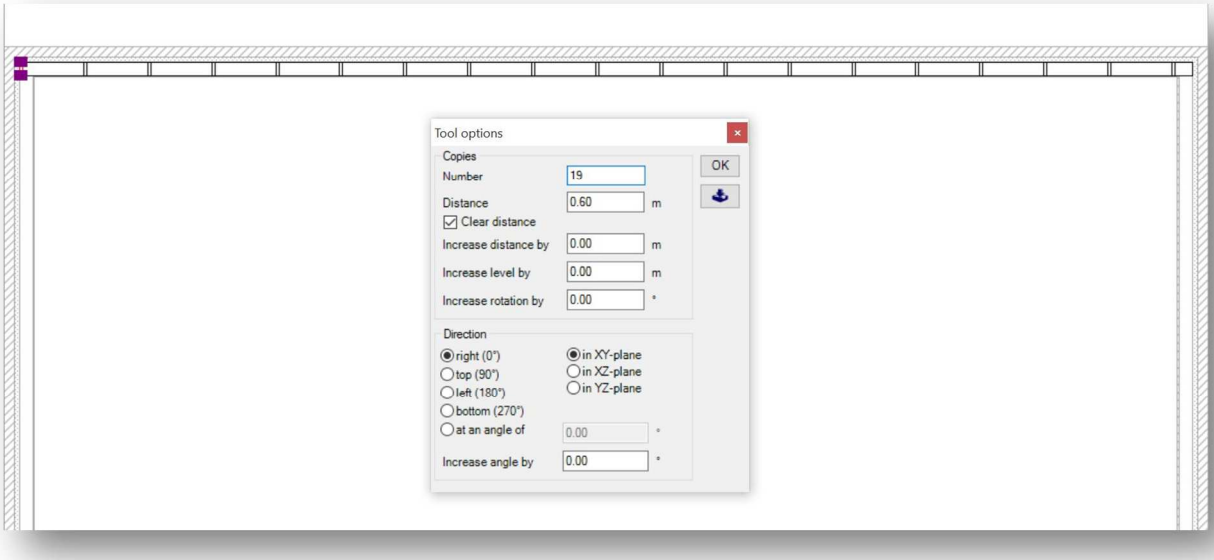




Select the timber and use the **Move with reference point,** to place the timber stud in its correct position. This is now are first stud. After selecting the timber element activate the tool with the r shortcut key. This will save you a lot of time!

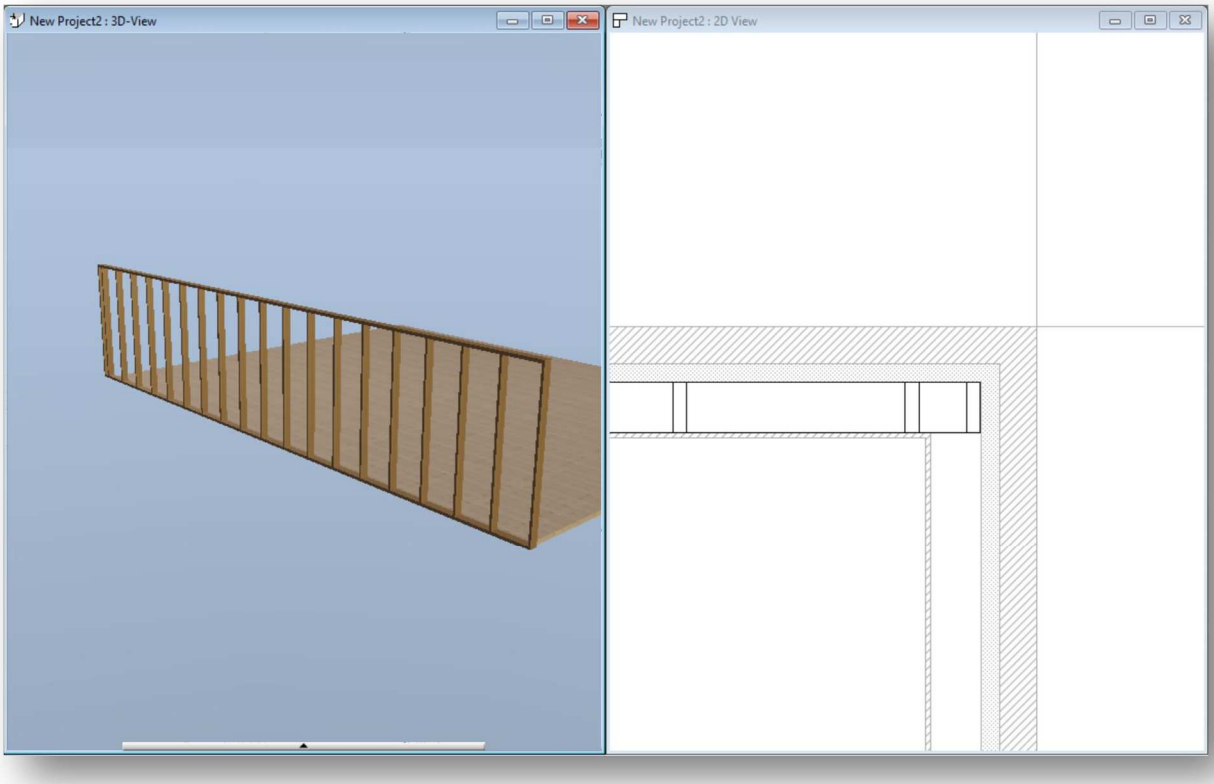


It's now easy to duplicate our stud at the desired spacing along the length of our wall. Select the stud, and then right click on it and from the context menu select **Multiple Copy**

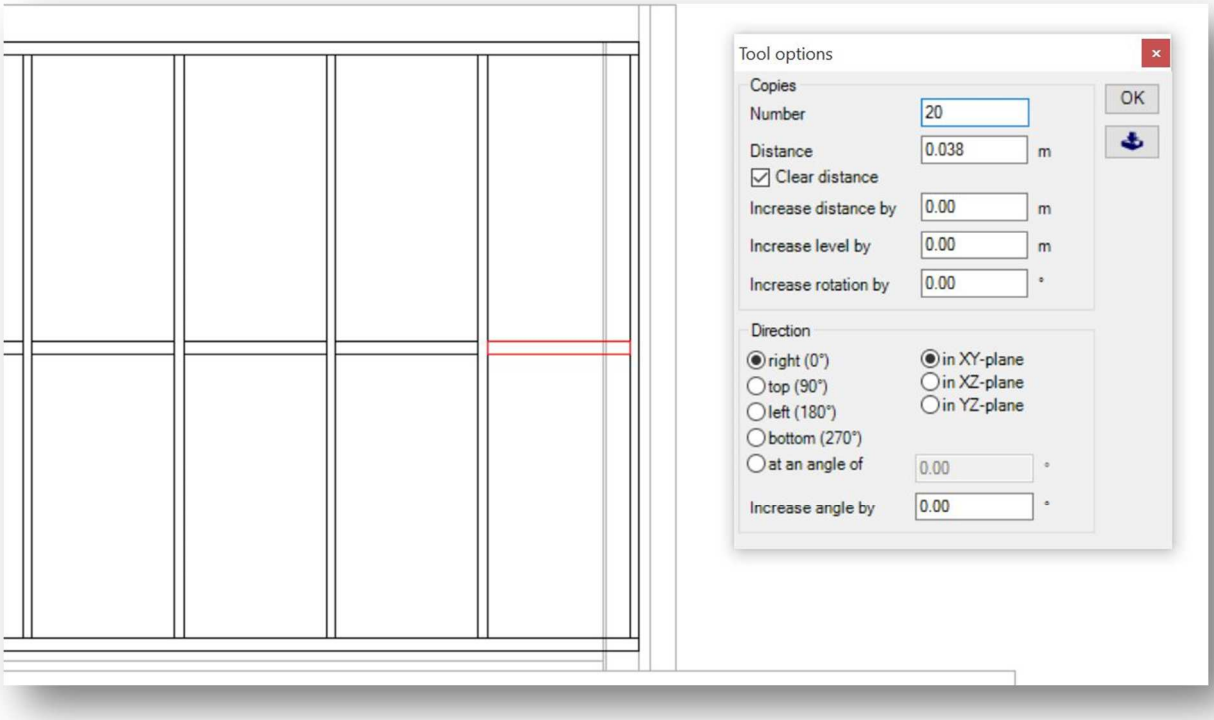


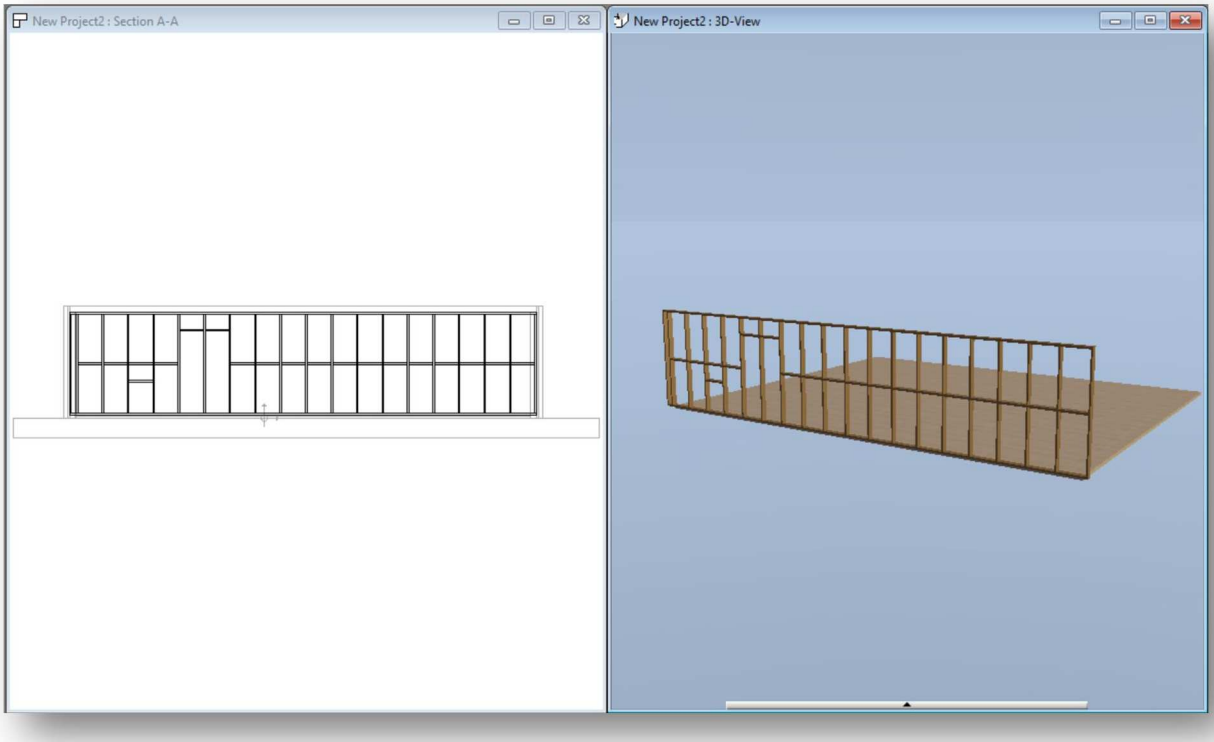
In the Multiple copy tools options dialog, you should enter the number of copies and the desired spacing and direction of each

If you need to adjust the position of the last (or first) stud then this can be done in the plan view, using the **Move with reference point** tool.

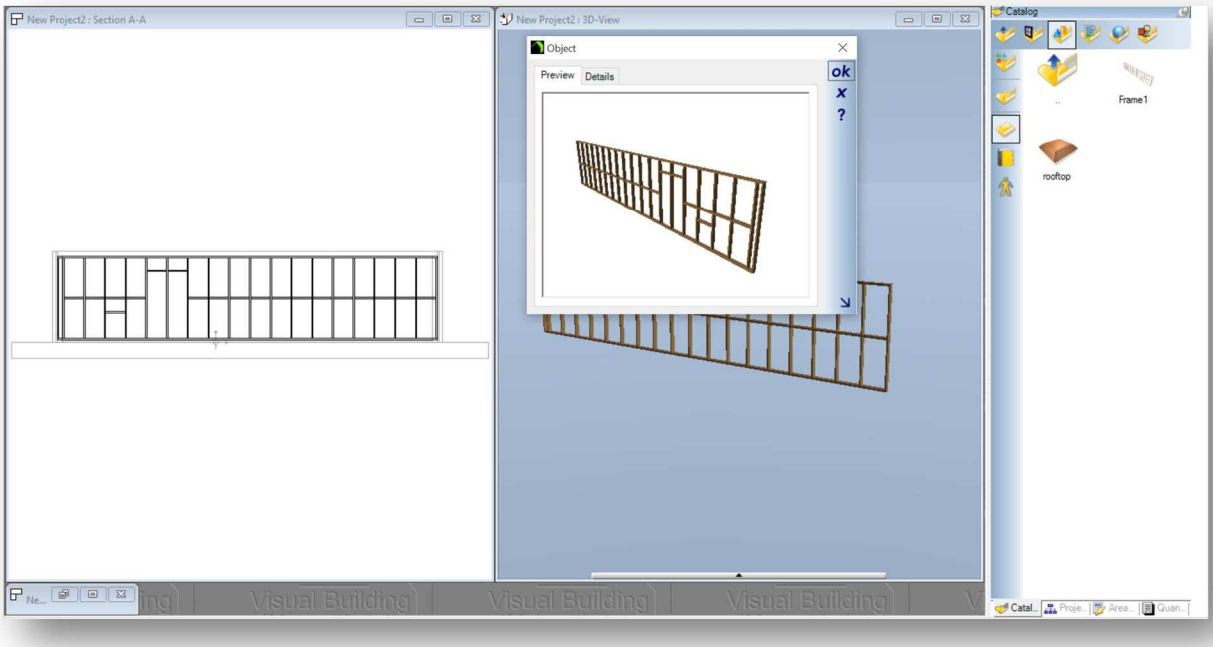


Let's now create and place the noggins. In fact we can copy the head plate and resize its length to be a noggin. In our example each noggin is 60 cm long. Not that we use an offset which is the width of the stud.



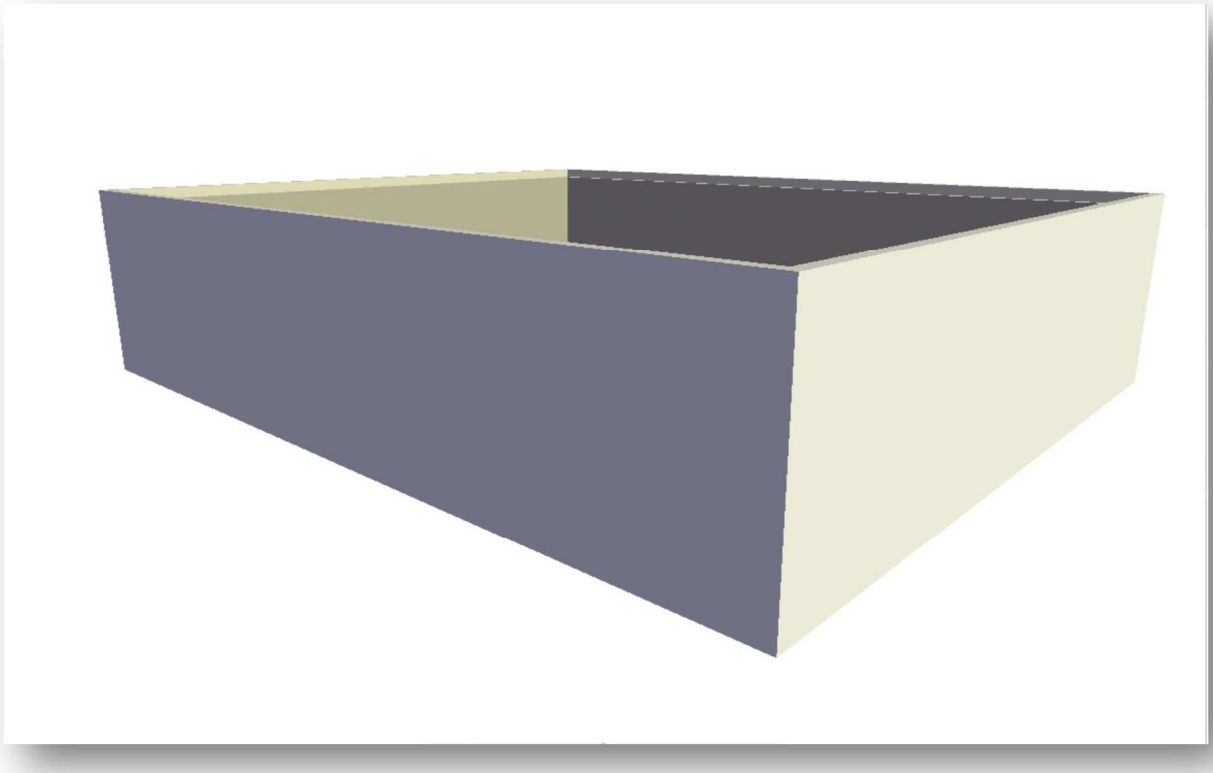


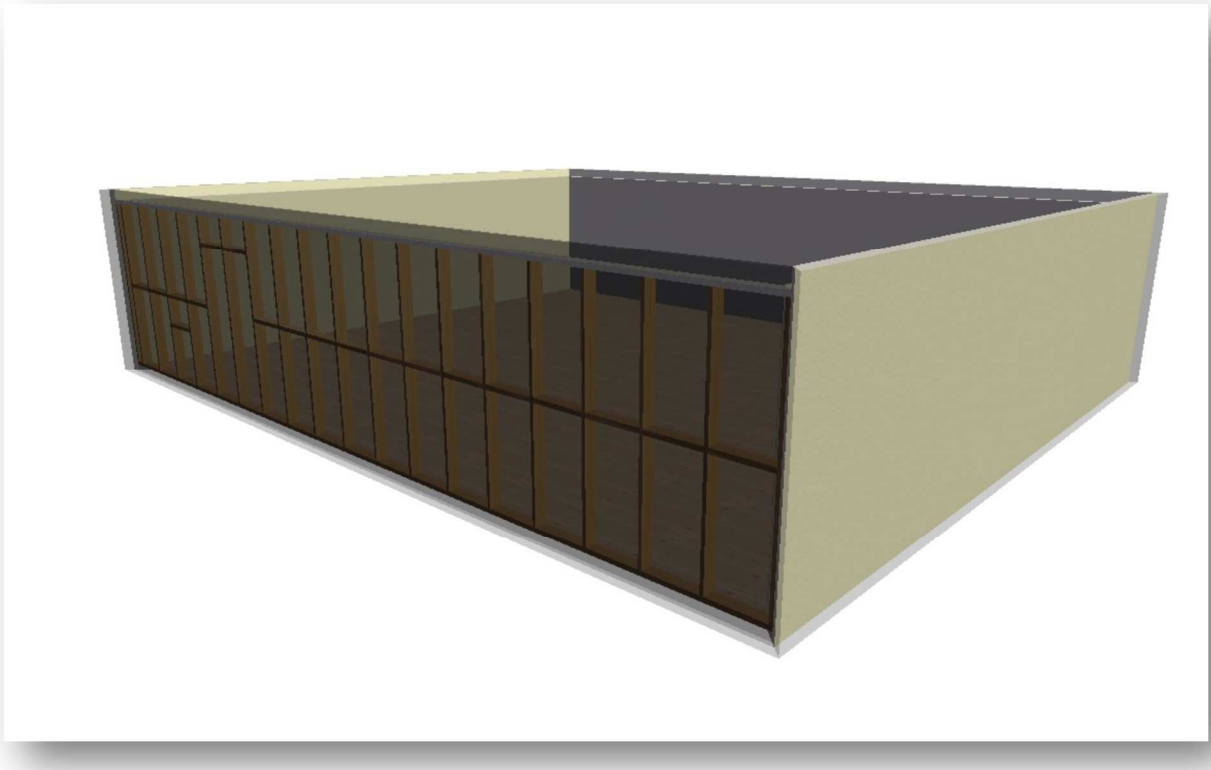
You can create your own standard timber frame objects and save them to the catalogue to be reused in other parts of your project or other projects. To achieve this select the 3D view and disable all layers except the Timber Frame layer.

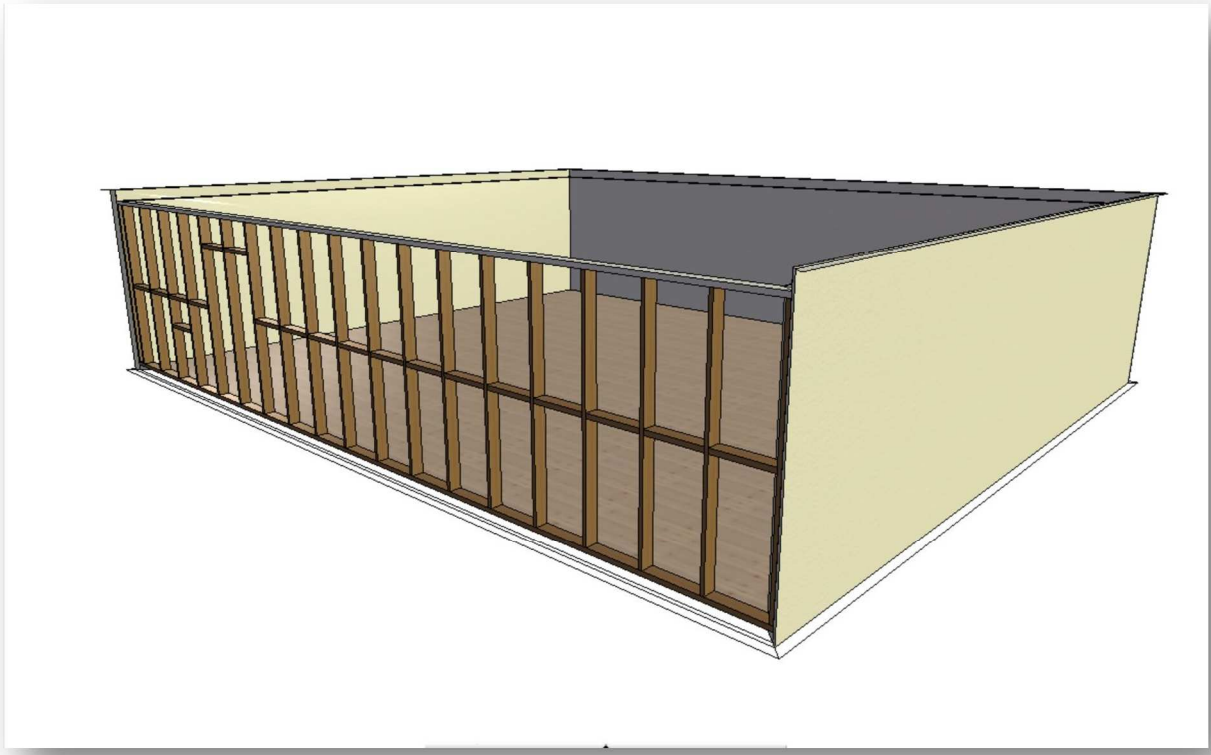


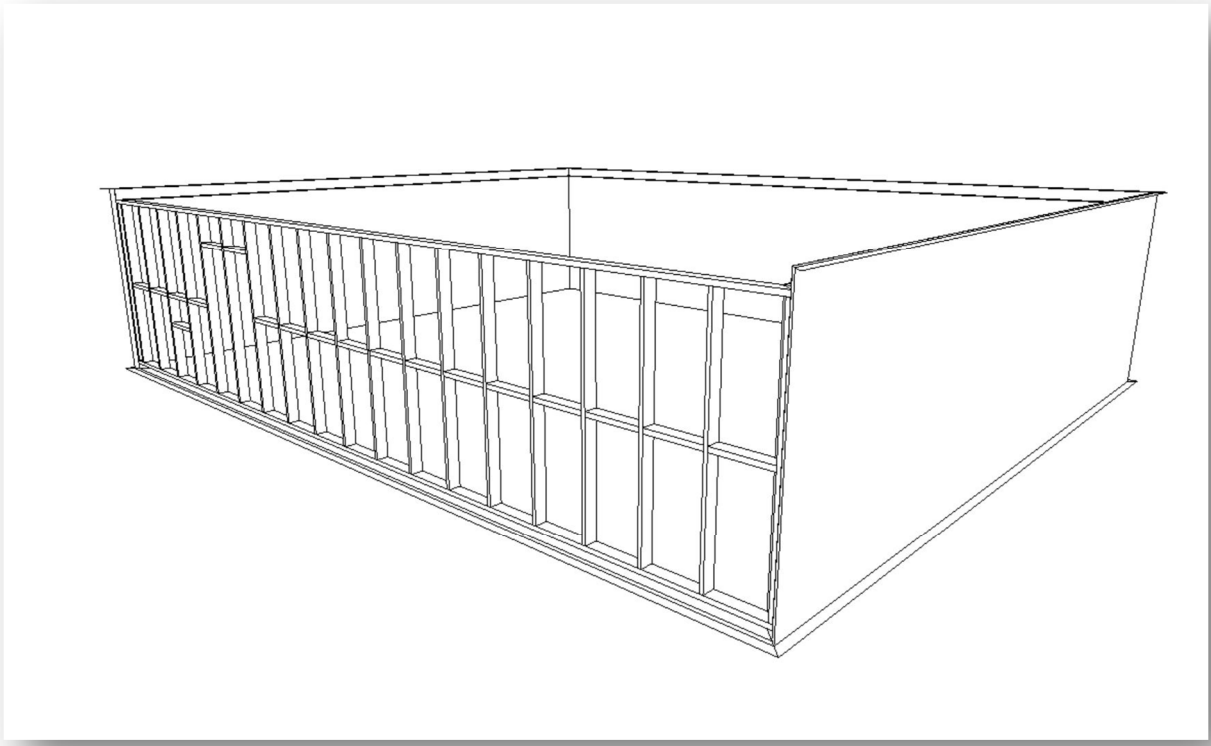
Now use the Export 3D Object tool to export your object direct to your catalogue.

You can of course also now view your timber frame wall using the different display modes:









In the 3D view, an 80% glass material can be applied to the solid wall so that you may visualise the internal timber frame.

26.4 Creating or converting a timber frame project

We took one of our standard tutorial projects and turned it into a timber frame project. This is harder than creating a timber frame project from scratch, because more than likely your doors and windows will not align to your timbers. So you must either move your windows, or insert additional timbers as we did here.

To achieve this the tools that you will need to become familiar with are:

Wall Layer, to enable you to create a timber layer, which will help you align your timber frame.

Extrude Solid tool, to allow you to create a 3D timber from a 2D profile. You possibly need only create 2 such 3D timbers, because you can use Multi copy to create more from those.

Multiple Copy tool, to allow you to place multiple timbers at set spacing.

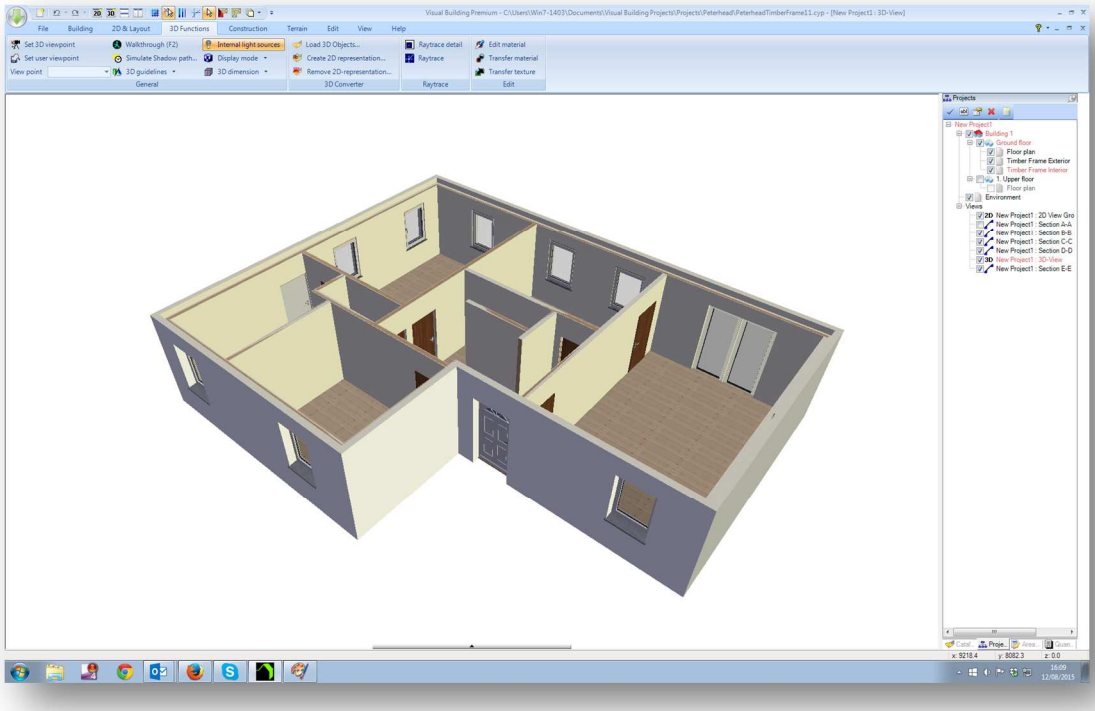
Rotate object tool, normally your objects will only be rotated about the Z axis

Move with reference point. This tool will become your friend. Learn to use it shortcut key: r

Dimension Line. Use the dimension line tool to measure the space so that you know exactly what length to make your timber. Tip: Work in mm.

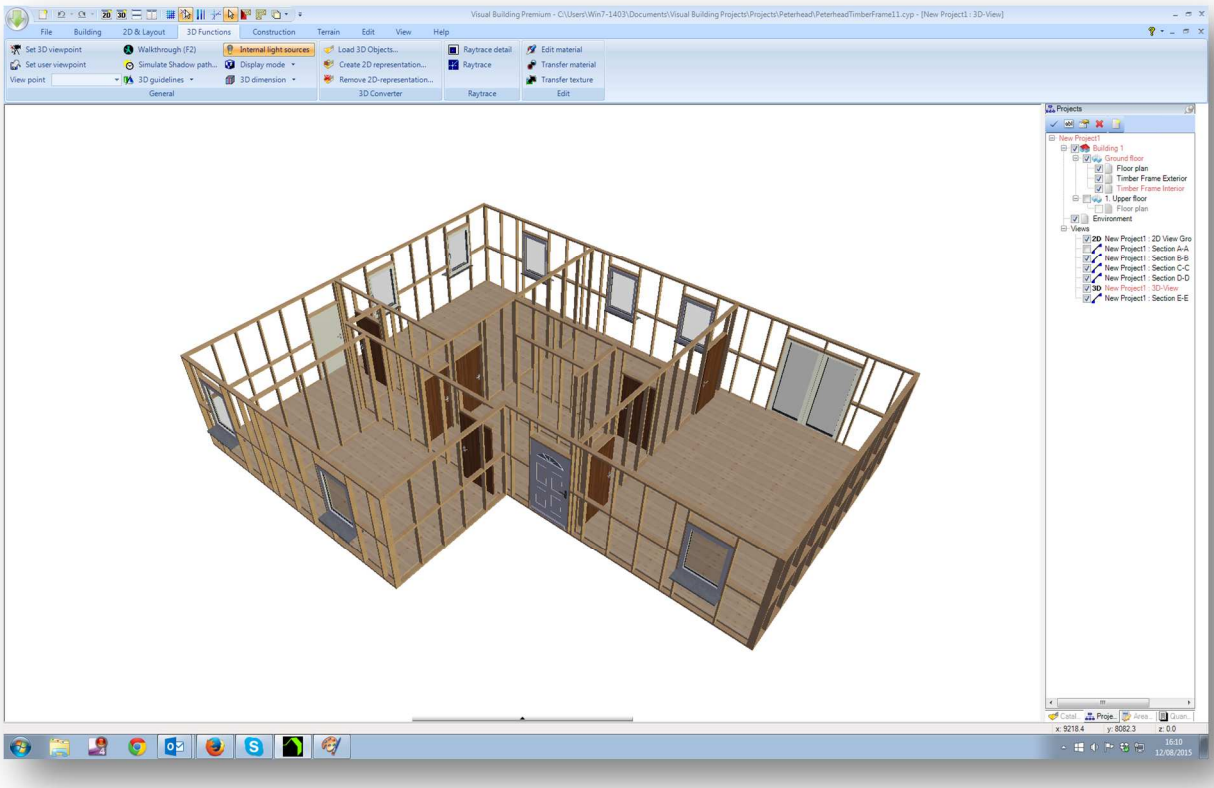
Layers. Use a separate layer to create your external timber frame and another layer for your internal frame. This then allows you to switch these layers on and off.

The creation of a timber frame is not automatic, but when you have mastered the above few tools, you can quickly put together your own timber frame project.

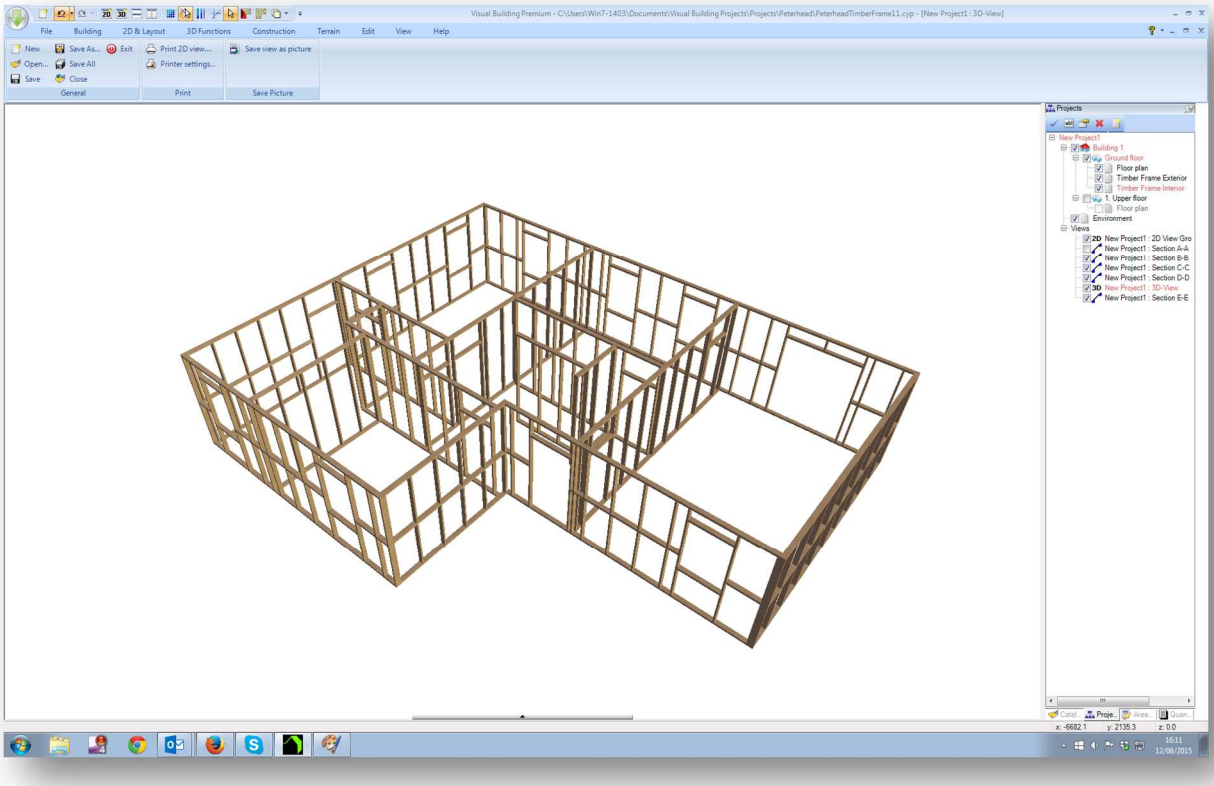


Here we show our solid walls. You can't see the timber frame because it's inside the wall of course.

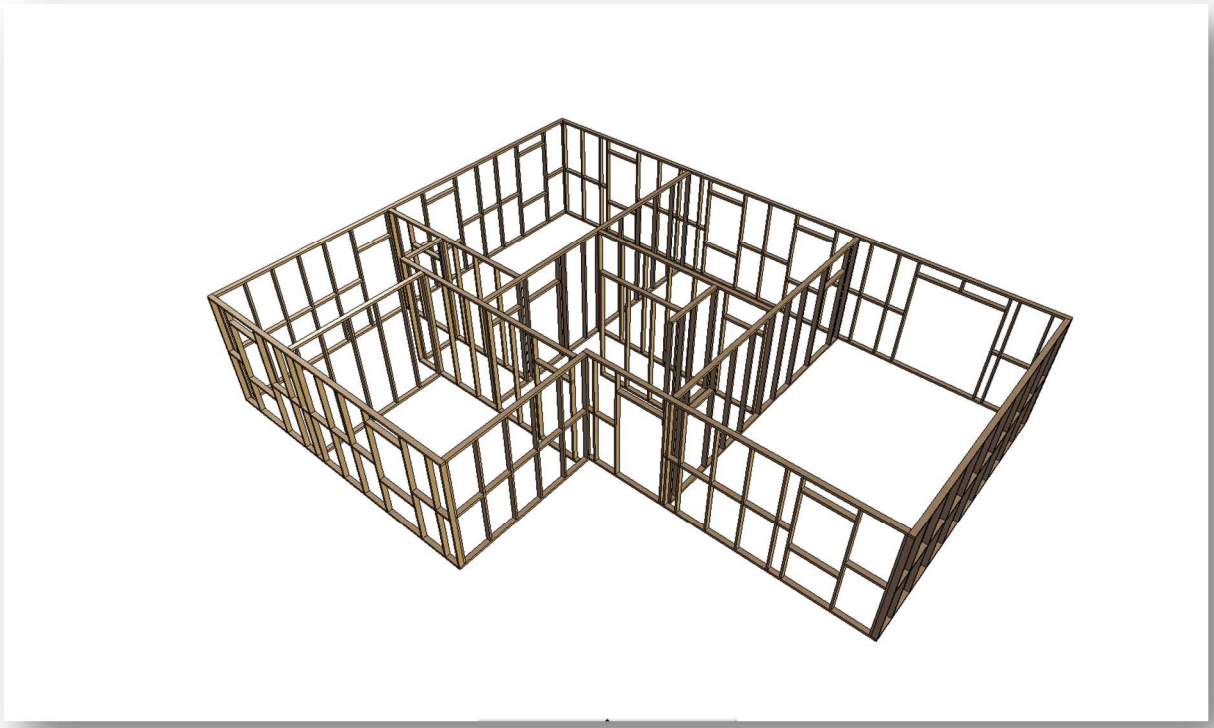
However applying a glass material to the walls and you can see the timber frame.



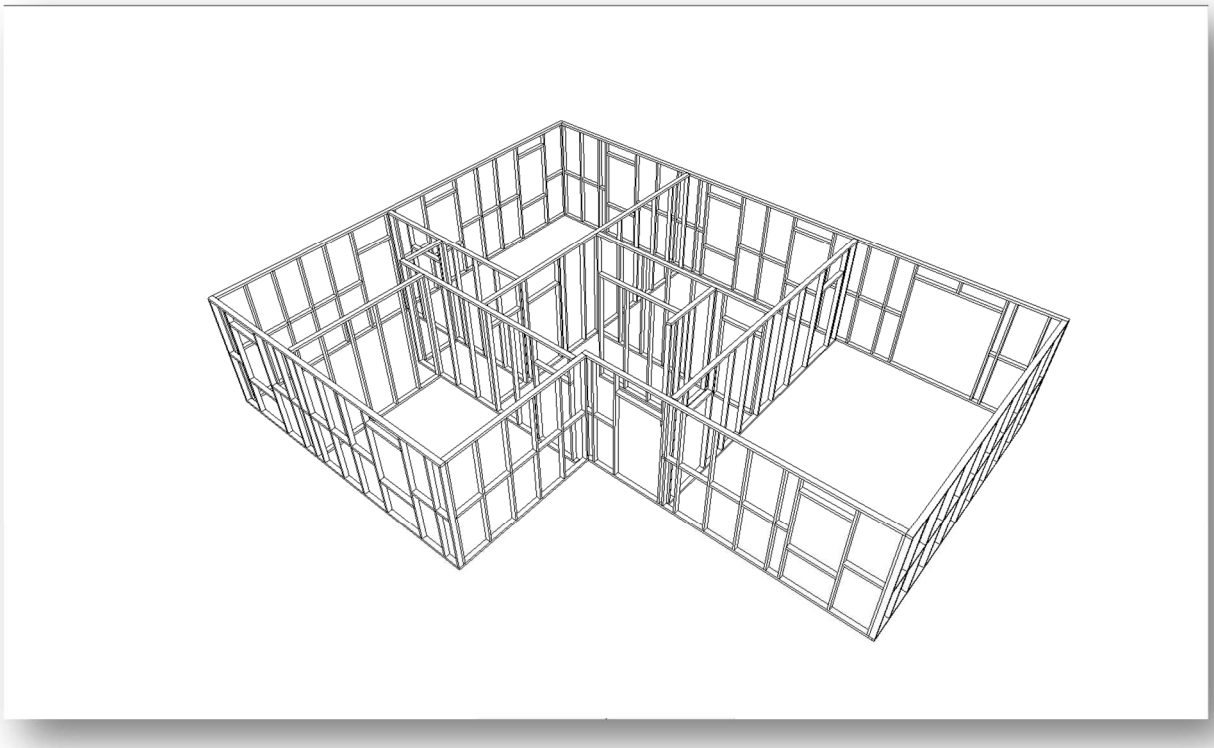
The timber frame with doors and windows showing.



The timber frame with no floor, doors or windows, viewed in standard view mode.

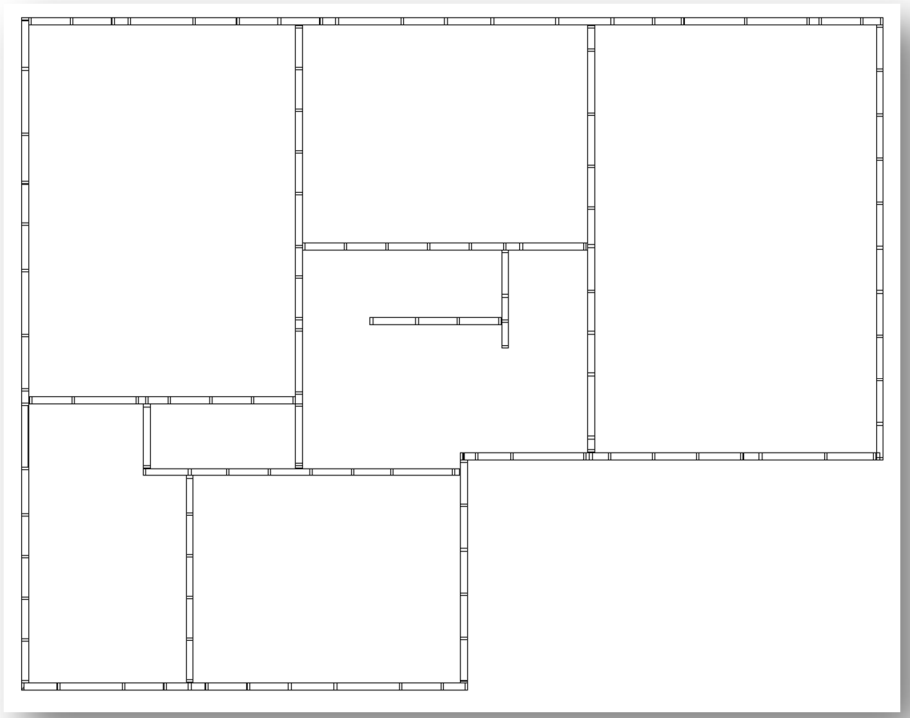


Viewed in sketch view

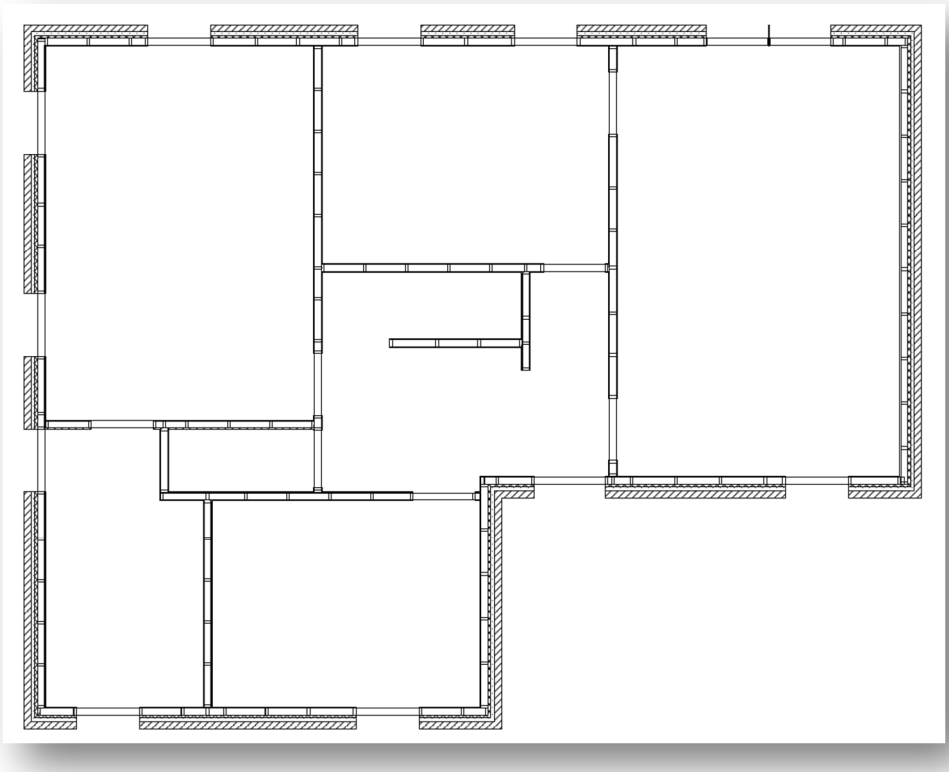


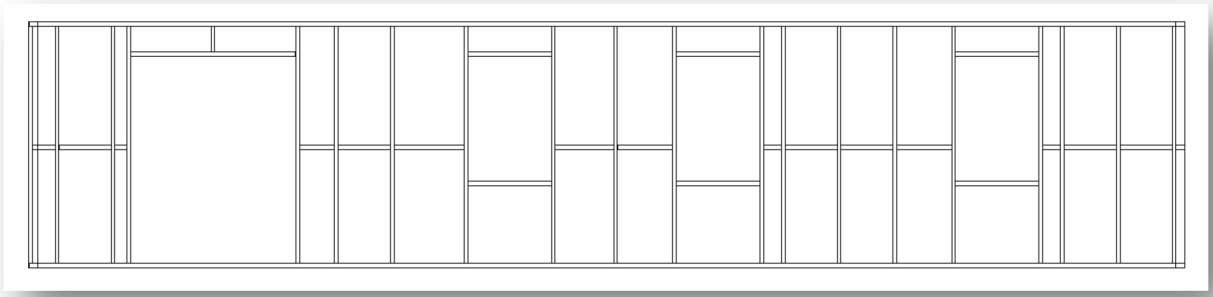
Viewed as wire frame with hidden lines.

A plan view without walls showing timber positions…



A plan view timber positions inside wall cavity…





You can of course view any profile using the **New Section View** tool.

27 SIP

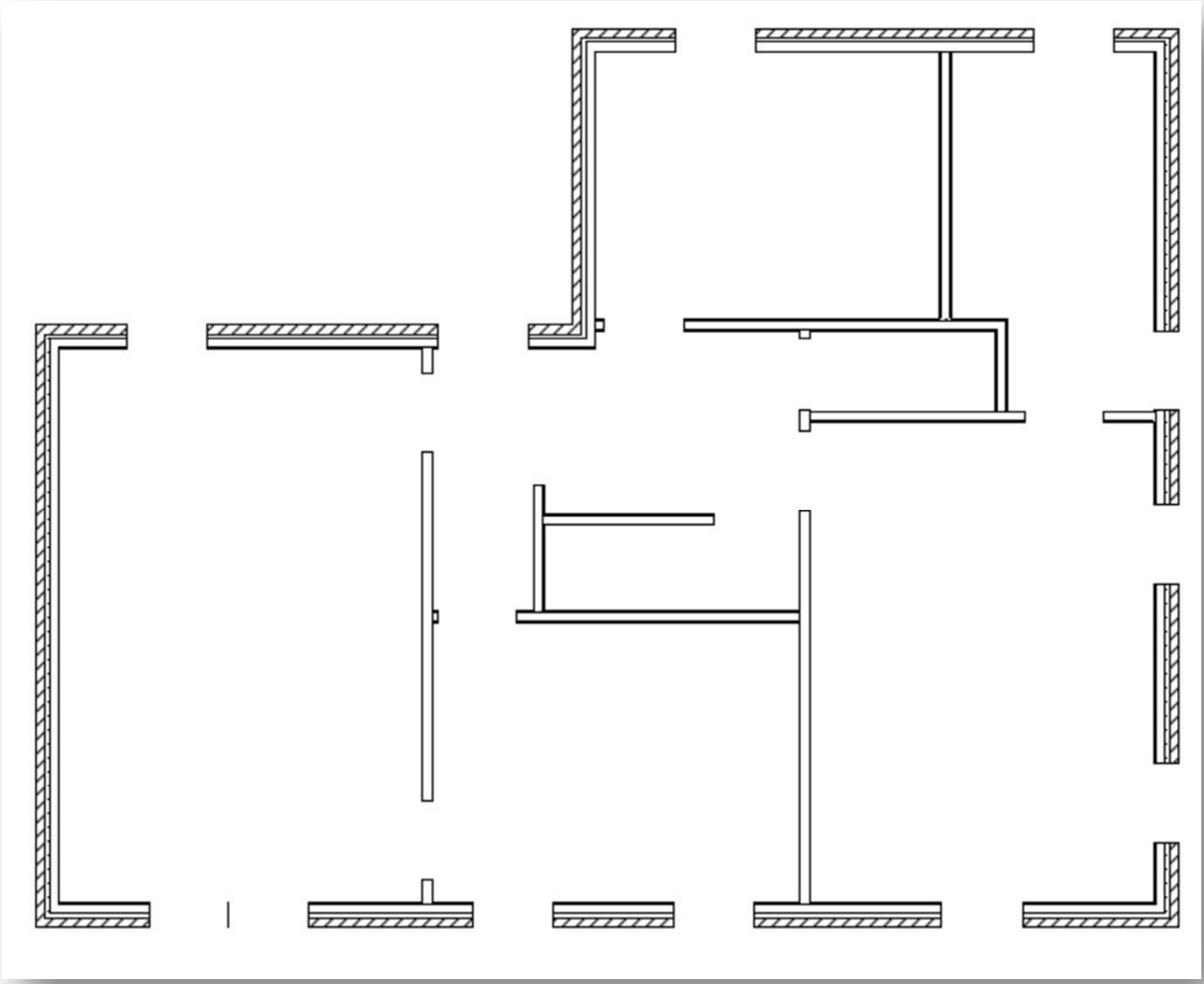
A **Structural insulated panel** or **SIP**, is a composite building material. They consisting of an insulating layer sandwiched between two layers of structural board. The board can be sheet metal, plywood, cement, MgO or OSB and the core can be either expanded polystyrene foam extruded polystyrene foam, polyurethane foam or composite honeycomb.

As with timber framing, Visual Building does not have an automatic generation of a SIP, but using the wall layer mechanism it is very easy to include within your project.

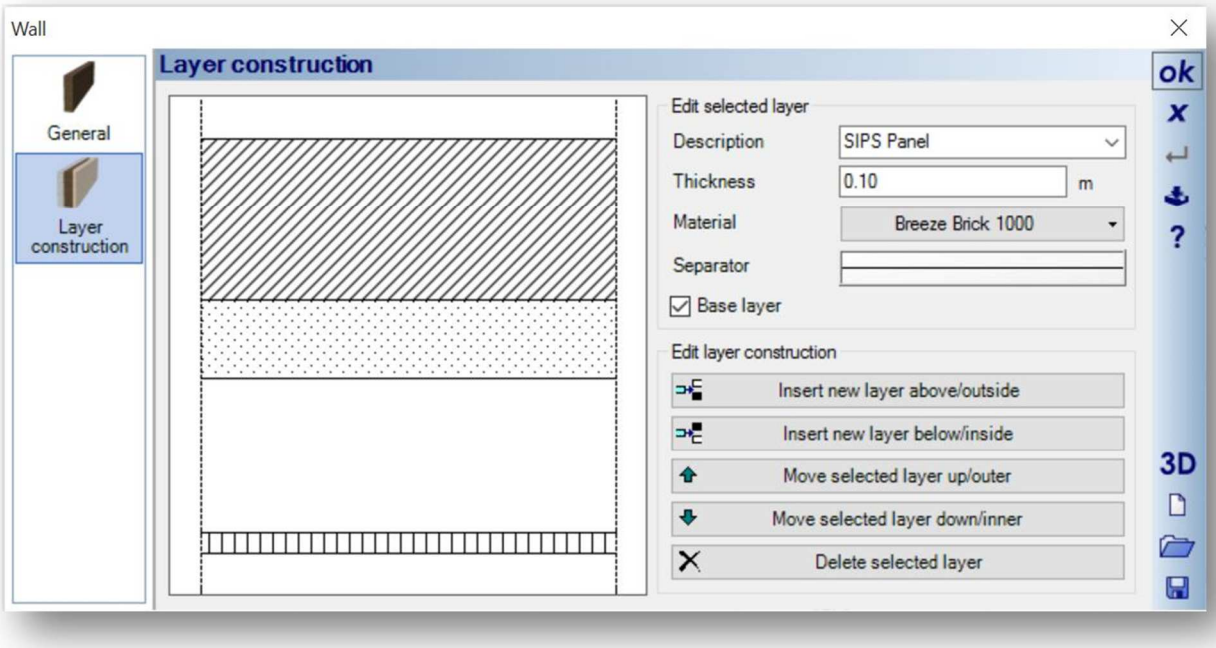
You may have a project where you are using a set standard factory pre-cut SIP, or you may have a floor plan to which you want to apply a SIP design.

27.1 How to create a SIP from a floor plan

We will use an existing tutorial project to demonstrate how we can adapt an existing project to use SIP's, ignoring the standard sizes.



First we will apply a wall layer that can accommodate our SIP. The above floor plan shows that we have applied the following wall layer to each of the external walls.



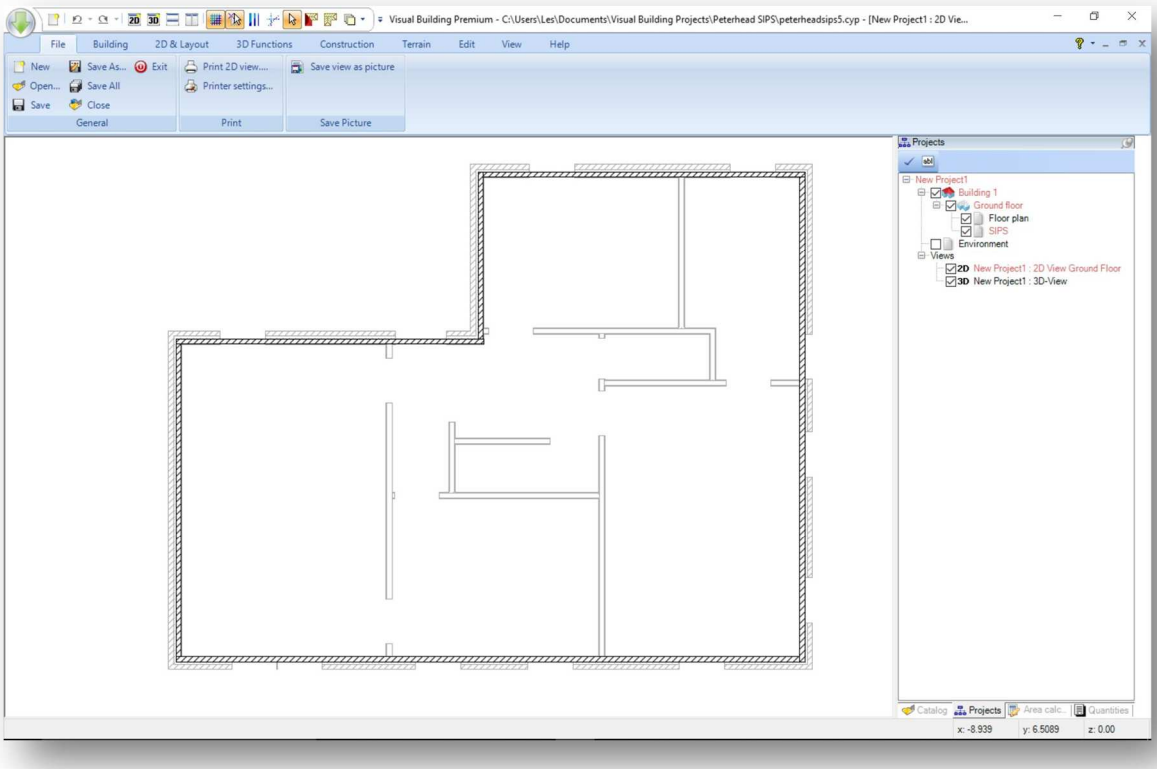
This wall layer consists of our SIP then a cavity and then the external brick. You need to adjust the cavity and the depth of your SIP layer to suit your requirement. Note that the SIP layer is left white without any hatching.

Now create a new layer and call its SIP. We will place all the detail that relates to the SIP allowing us to switch it on / off as required.

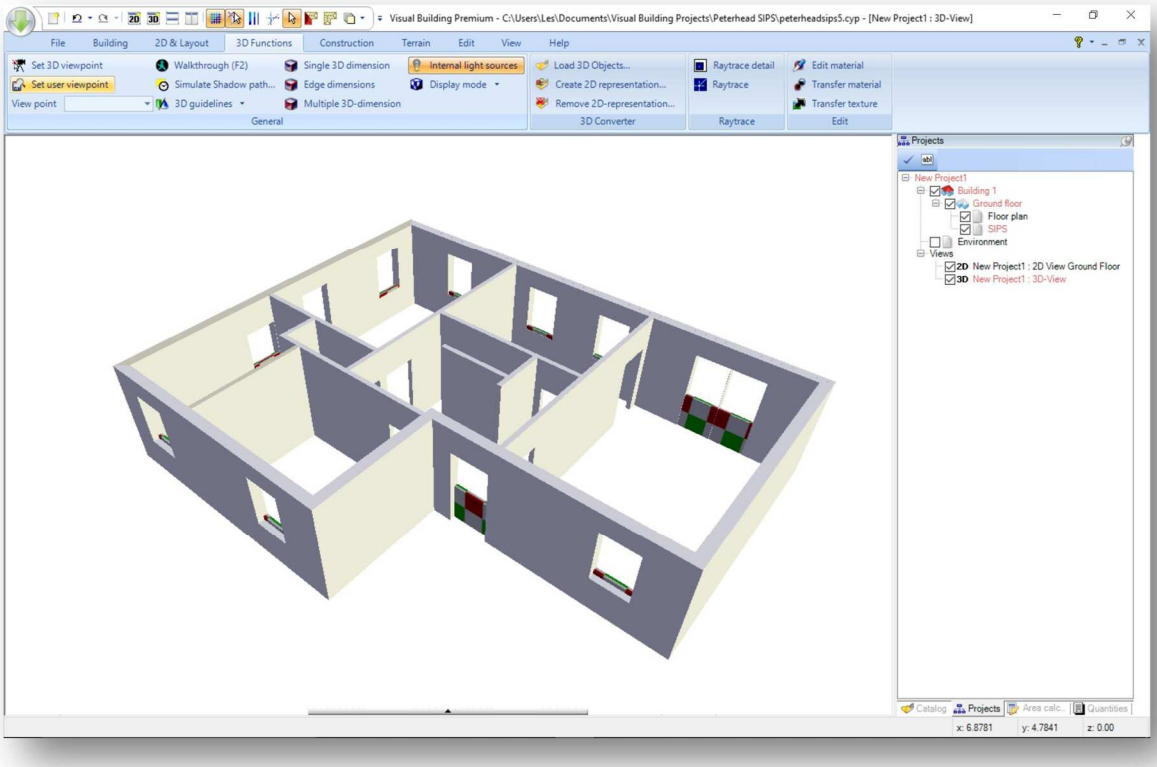
Using the **2D Layer & Layer – 2D Drawing Functions– Rectangle** tool, draw a plan profile for each SIP. The underlying wall layer is still visible and can be your guide. Be sure to draw the rectangle within the wall layer that you previously created. Don't worry about doors and windows and other cut outs, they will come later. The above drawing shows that we have created such a hatched rectangle in our SIP layer.

When you have created a rectangle for each SIP, we will now convert that rectangle to a 3D object using the **Construction – Extrude Solid – Extrude 2D** Contour tool. We could have skipped using the rectangle and draw the 2D profile directly using this tool, but it's better to draw all your SIP as 2D

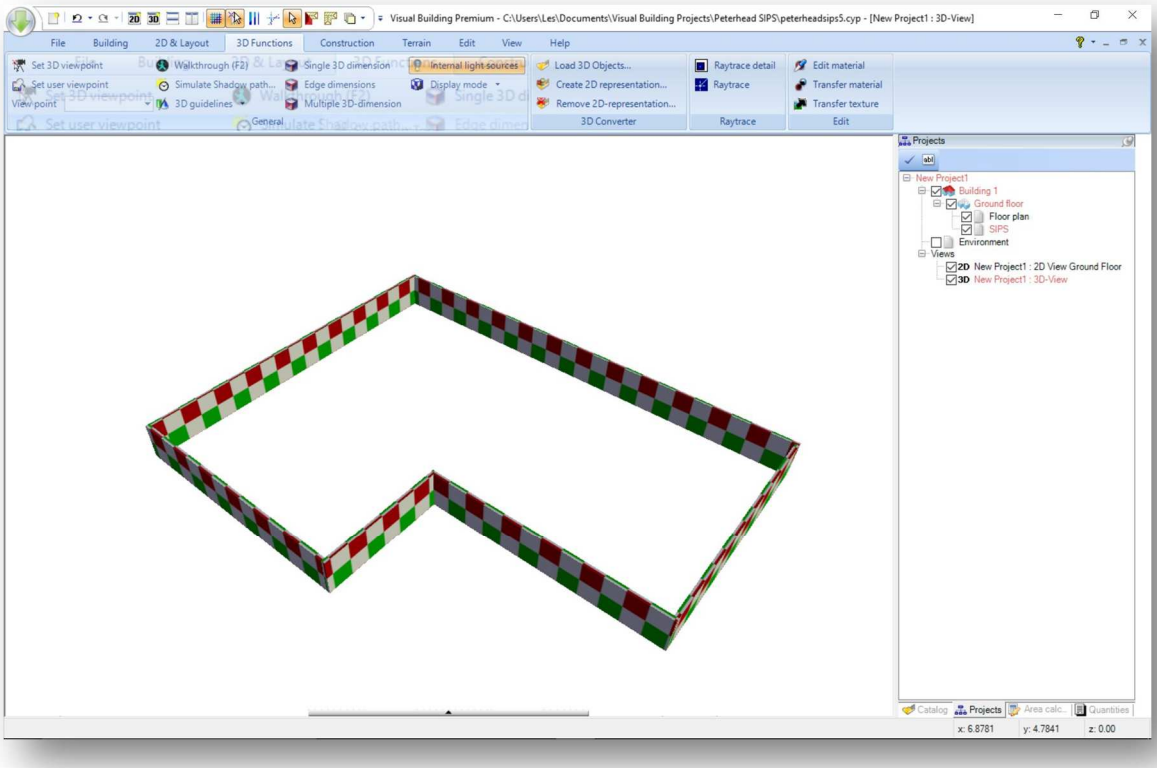
objects first to ensure all are positioned and joined correctly.



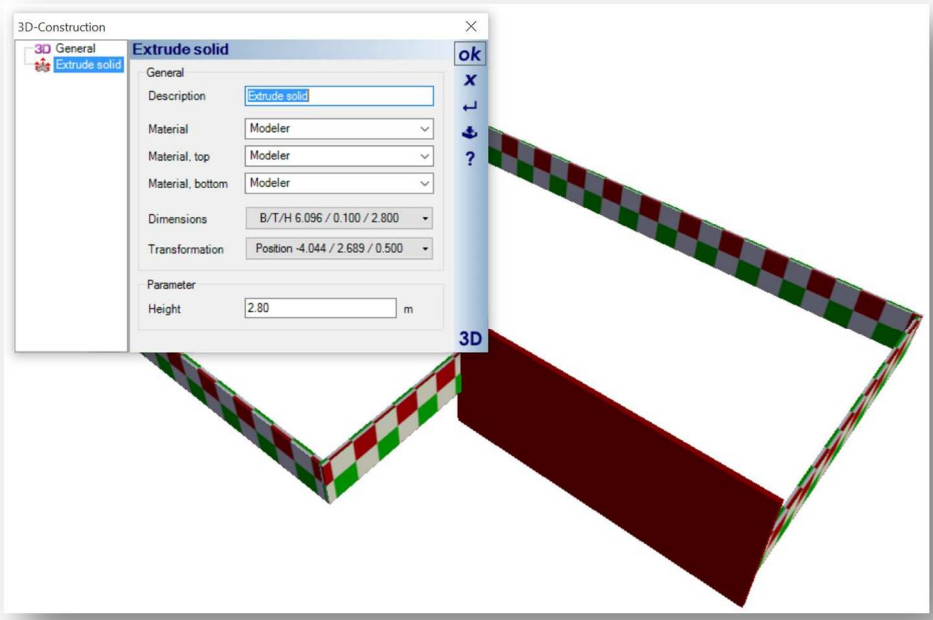
Select the **Construction – Extrude Solid – Extrude 2D** tool and then in turn click on each 2D rectangle representing each SIP. Select the 3D view and you will see the following:



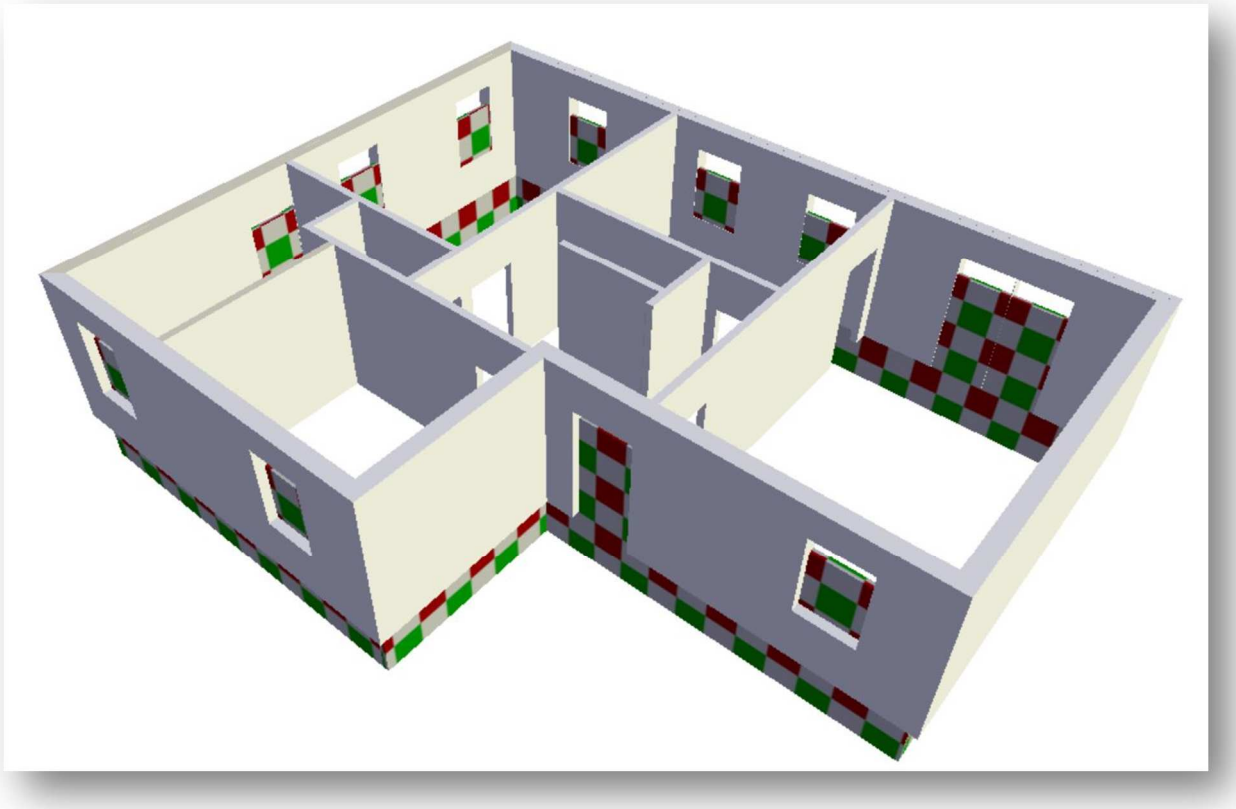
If you hide the wall construction the 3D view will show you only the 3D objects that you have created.



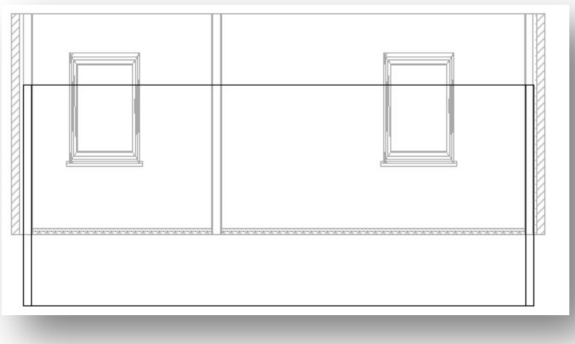
The objects are by default only 1m high, so change that to 2.8m, or whatever your SIP heights are.

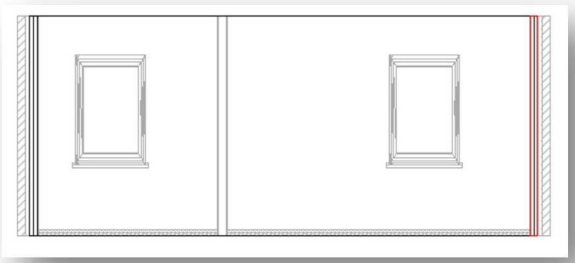


The panels are not on the same level as the walls.

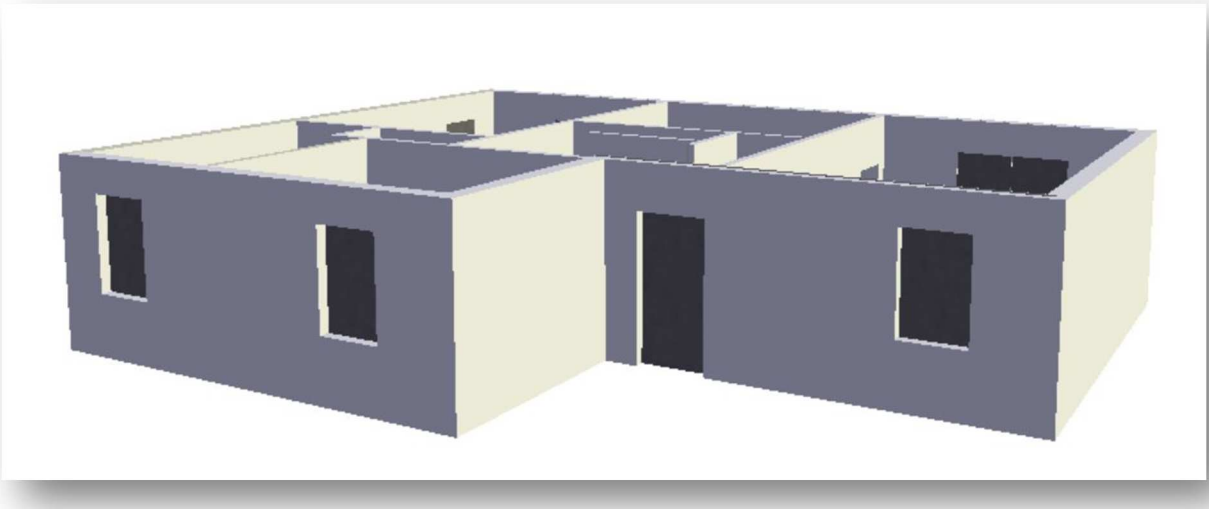


So we will create elevation views to allow us to use the tool to move to the same level.



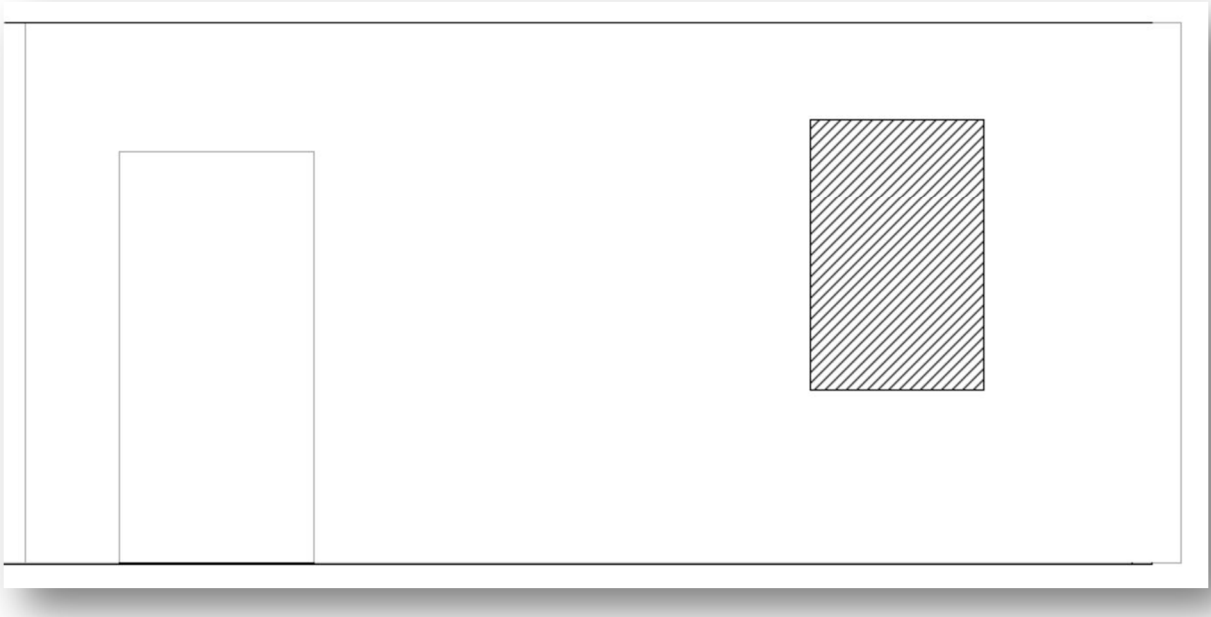


Now look at the 3D view, you will see the SIP through the doors and windows of the exterior walls. We have also applied a grey texture to the SIP.

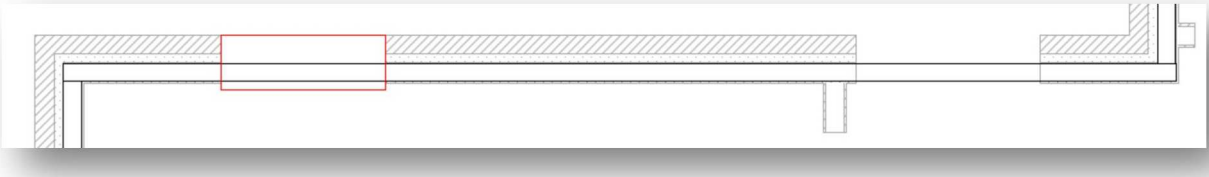


We will now use the **extrude solid** tool to create a 3D solid the same shape as our windows, then convert that 3D solid to subtraction solid that will create the window opening within the SIP.

In an elevation view draw a 2D rectangle to snap to a window opening.

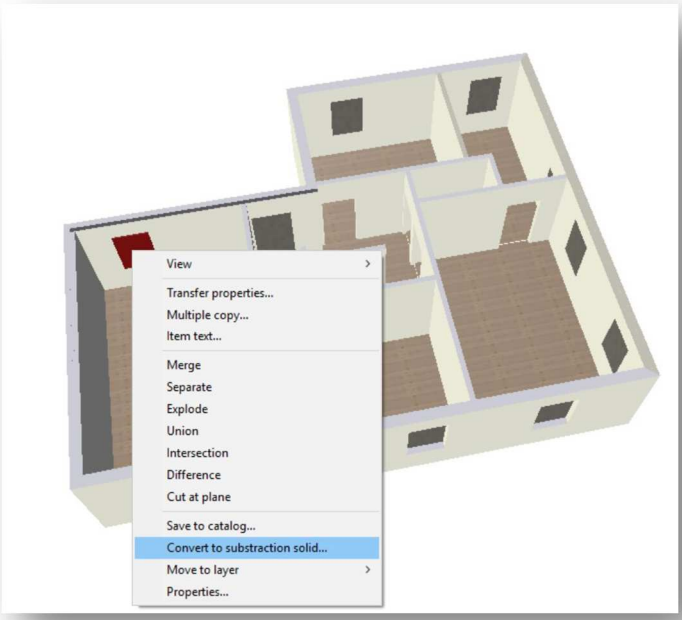


Select the 2D rectangle and using the **Construction – Extrude solid – extrude solid** tool convert this into a 3D solid.

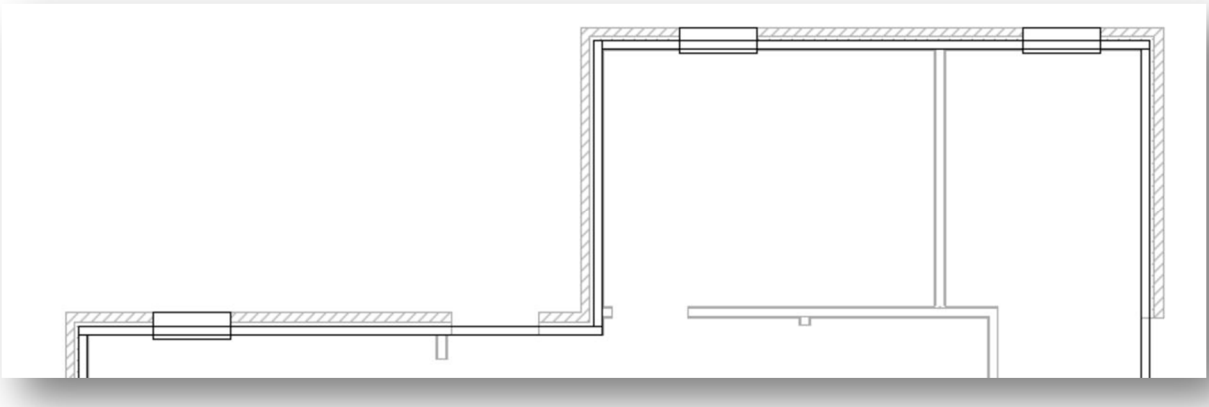


You can resize the depth of the 3D solid (its default is 1 m) and then place it within a window.

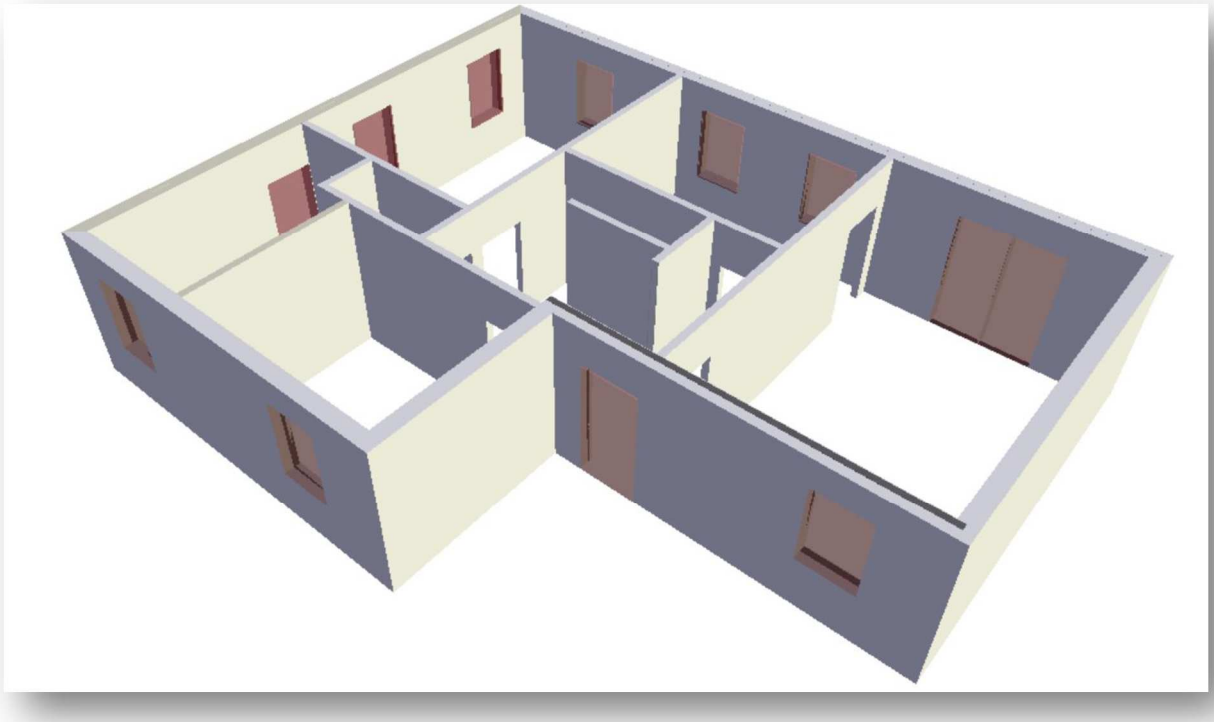
Right click on the 3D Object, and select Convert to subtraction object:



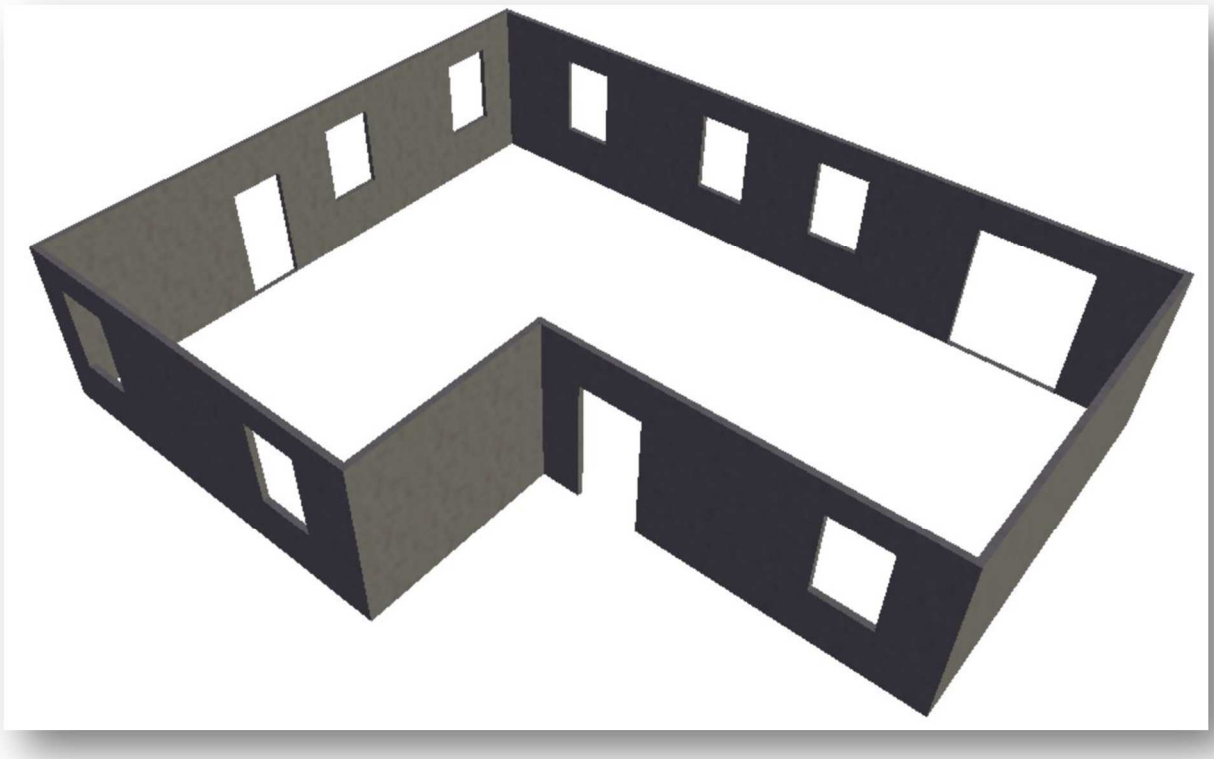
Now select and copy the subtraction object and place in every window position. This is best achieved on a plan view.



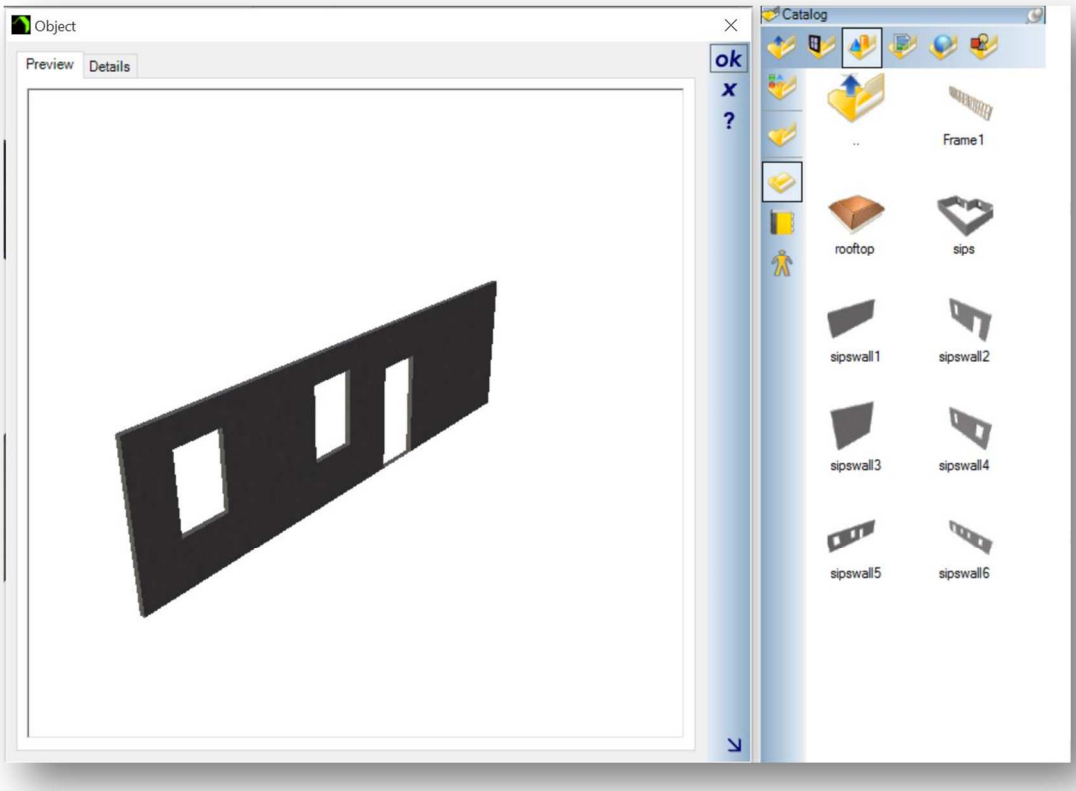
Repeat this for doors and any other opening you want to place in the SIP.



In the 3D view we can hide the subtraction objects (Use Visibility to deselect Walls and subtraction object). We then have a complete set of SIP.



You can now select each individual SIP and save it to your catalogue. This allows you to create standard SIP for use in other projects.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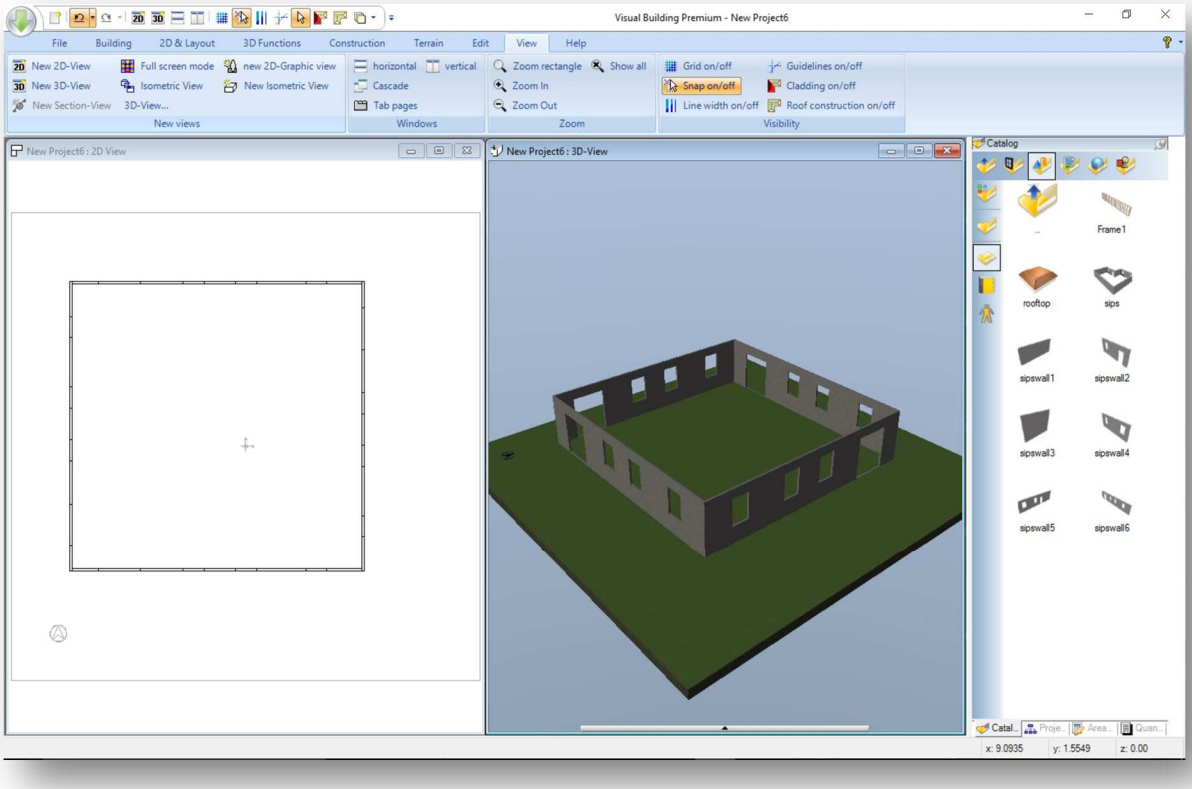
Visual Building Premium - New Project6
File
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2D & Layout
3D Functions
Construction
Terrain
Edit
View
Help
New 2D-View
New 3D-View
New Section-View
Full screen mode
Isometric View
3D-View...
new 2D-Graphic view
New Isometric View
horizontal
vertical
Cascade
Tab pages
Zoom rectangle
Zoom In
Zoom Out
Show all
Grid on/off
Snap on/off
Line width on/off
Guidelines on/off
Cladding on/off
Roof construction on/off
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Zoom
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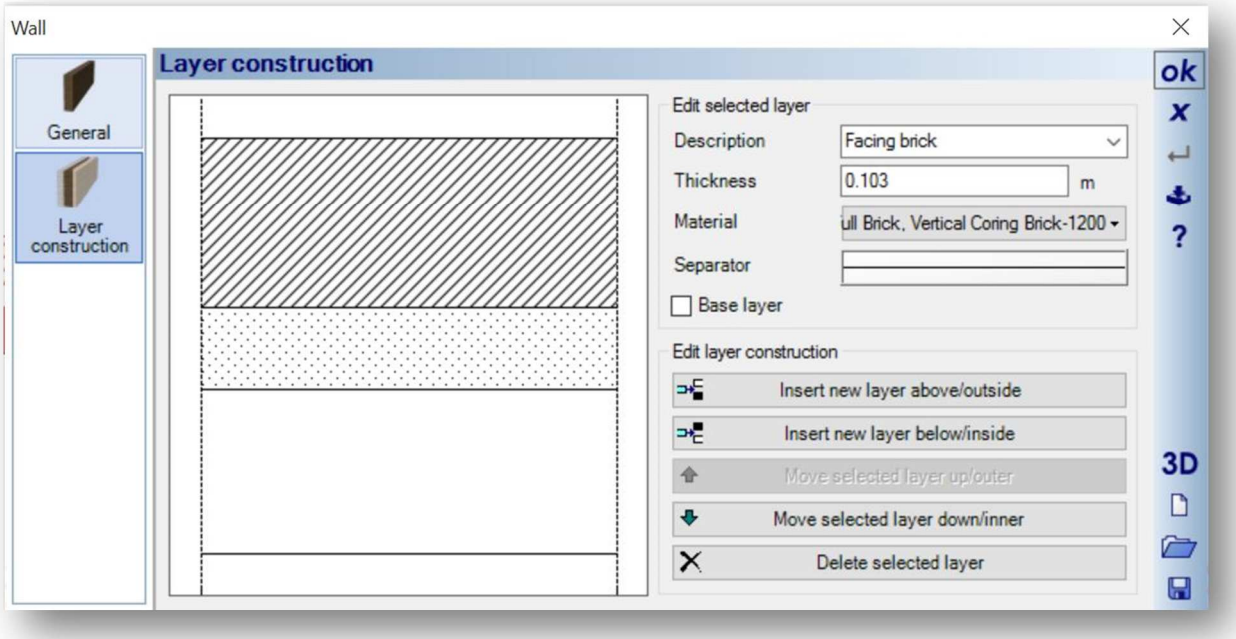
sipswall4
sipswall5
sipswall6

27.2 How to assign a 3D wall and layer to a predefined SIP

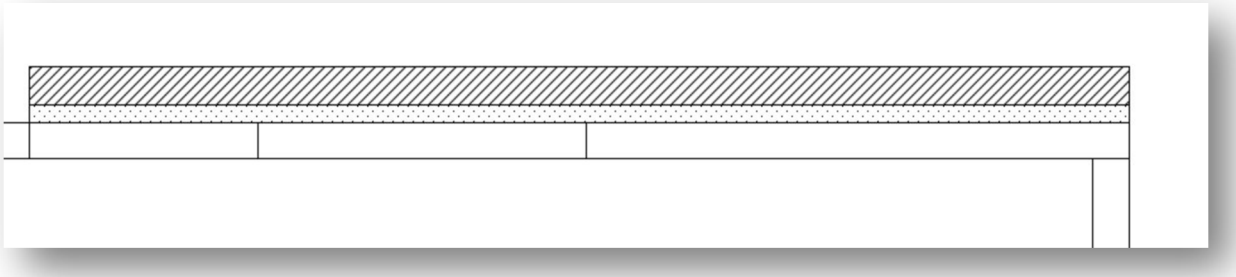
Here we will create a new project and use the SIP to define our walls. We now need to assign our wall layer in the 2D plan view to match the SIP positions. Assigning a wall consisting of layers to align with an existing SIP is more difficult than our previous project example, but can be easily achieved as follows.

When creating a wall layer to match the SIP, it's important that the wall layer inside edge matches the inside edge of the SIP, because this is the edge that we will snap onto the SIP, using **Ctrl + W**.

Ensure that the wall direction is correct so that the inside layer of the wall matches the inside edge of the SIP.

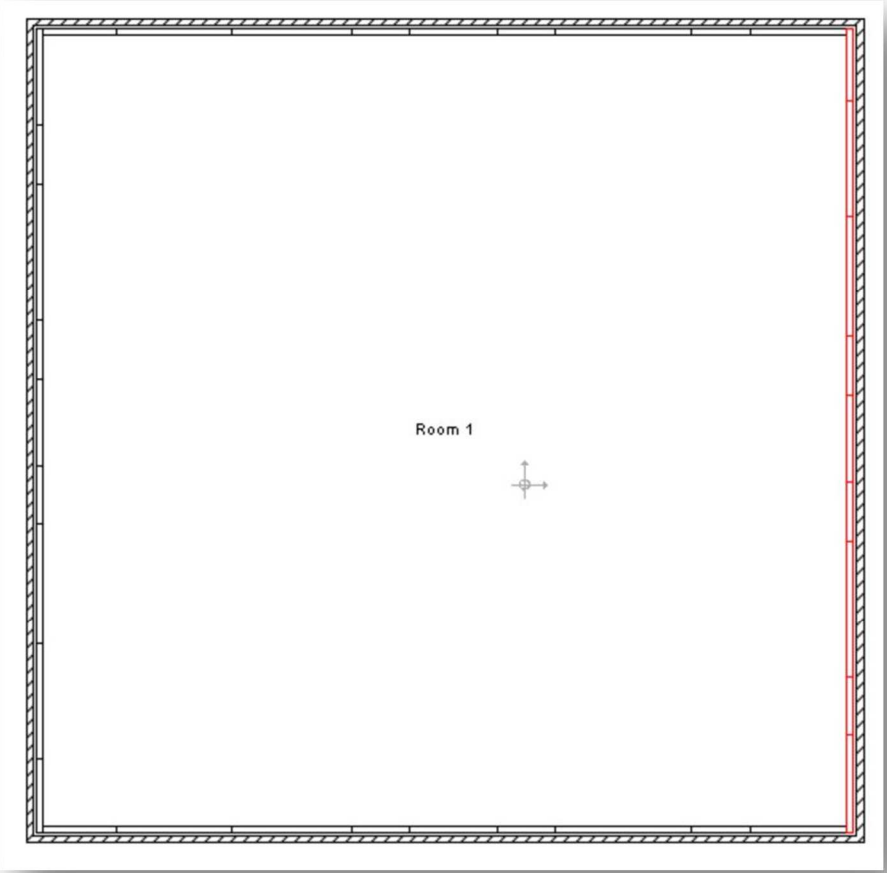


Use Ctrl + W to ensure the wall edge snap to the SIP edge.

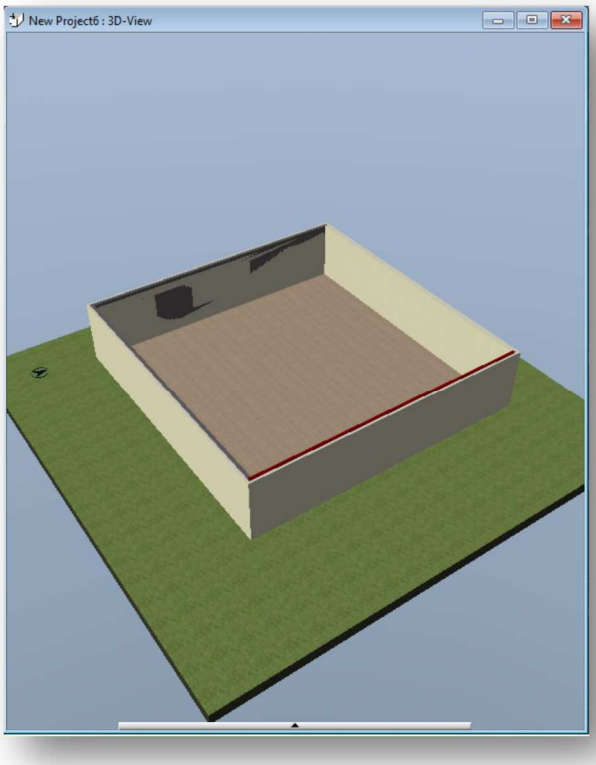


When the wall is complete, the room is created as normal.

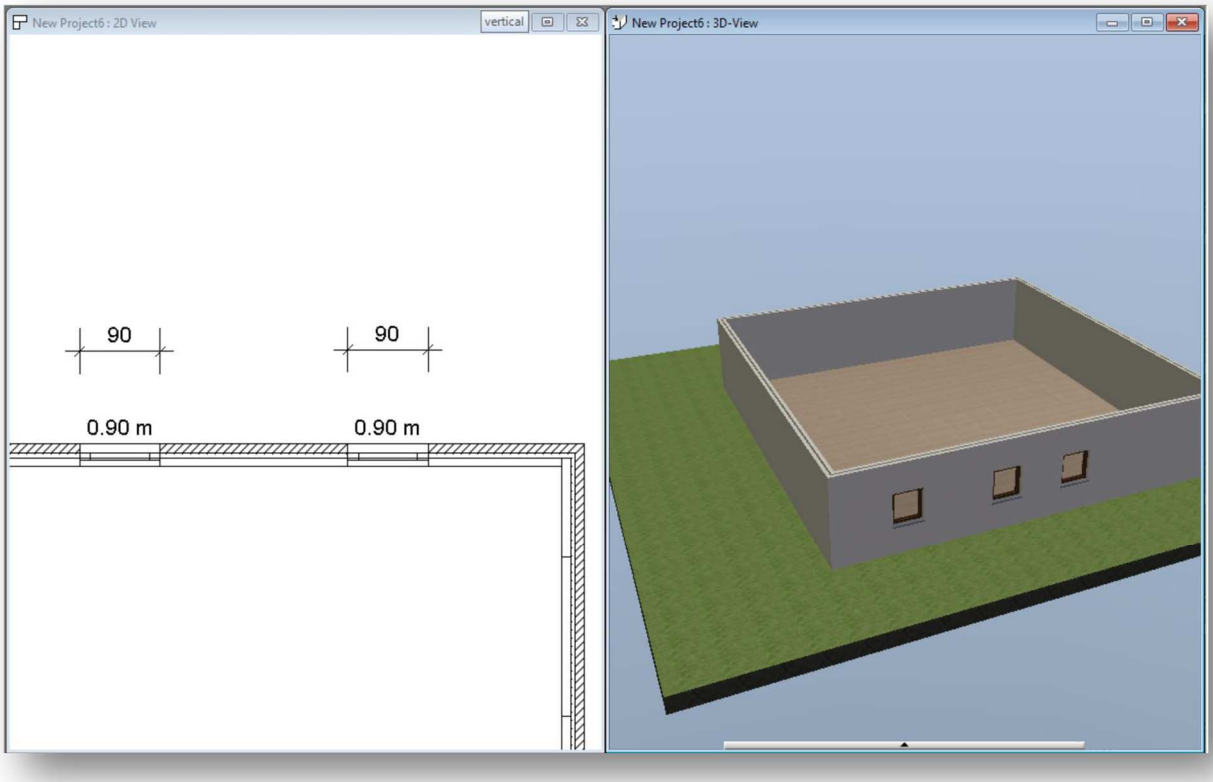
Note that you can now see the door and window sections present in the SIP



If you view and rotate the 3D view, you will get surface interactions between the wall and the SIP, this is because they share the same surface, but have different textures. To resolve this apply the same texture to both the SIP and the wall.



Now insert doors and windows in the 2D plan view using the holes in the SIP as position and size for the door and window.



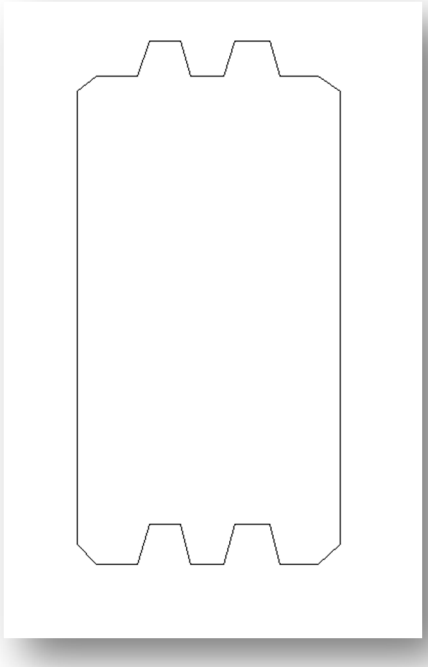
28 Timber Cabins

Visual Building is designed for the purpose of designing building constructed with brick and block, but with the powerful 3D editing tools within Visual Building Professional and Premium, it is possible to create your own objects, which can be used for constructing other buildings such as interlocking timber buildings.

In this example we will create an interlocking timber building.

28.1 Create basic interlocking timber component

Using the 2D Polygon tools draw the profile of the interlocking timber.



Using the Construction – Extrude solid tool, you can now extrude this into a solid object.

Now save this to your catalogue. It has a default
length of 1m, but you can save several versions of this, say 3m and 6m lengths.

28.2 Create Wall sections

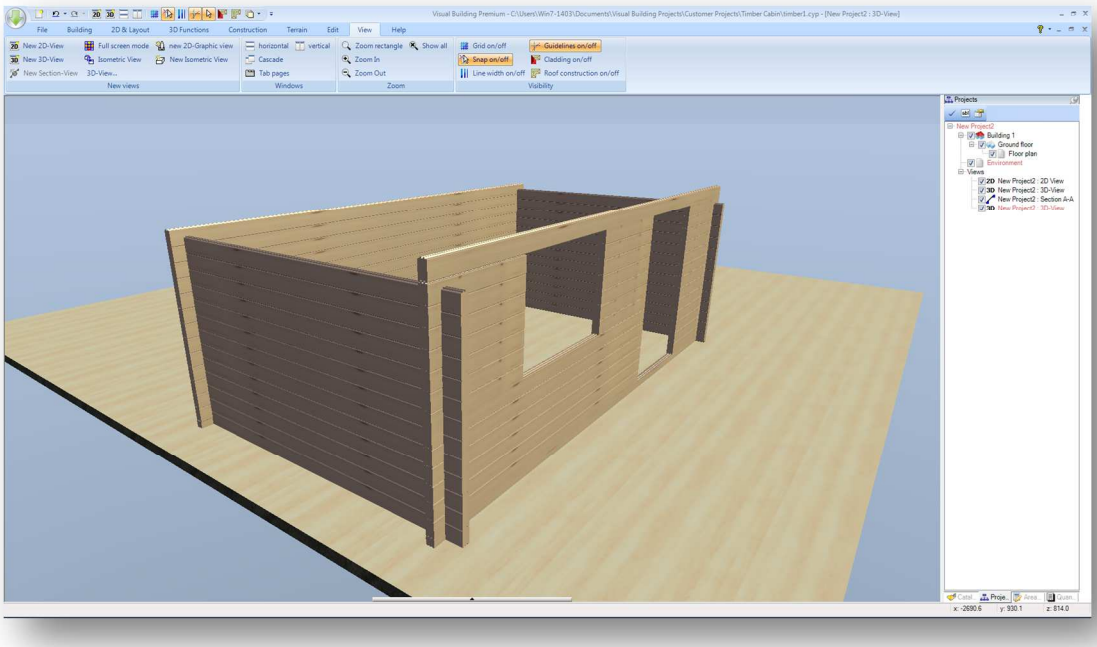
Using the Multiple copy tools. You can build an entire will section. And then also save this to your catalogue as an object. Again you can save different wall lengths.

You can then also create standard sections consisting of a door and window.

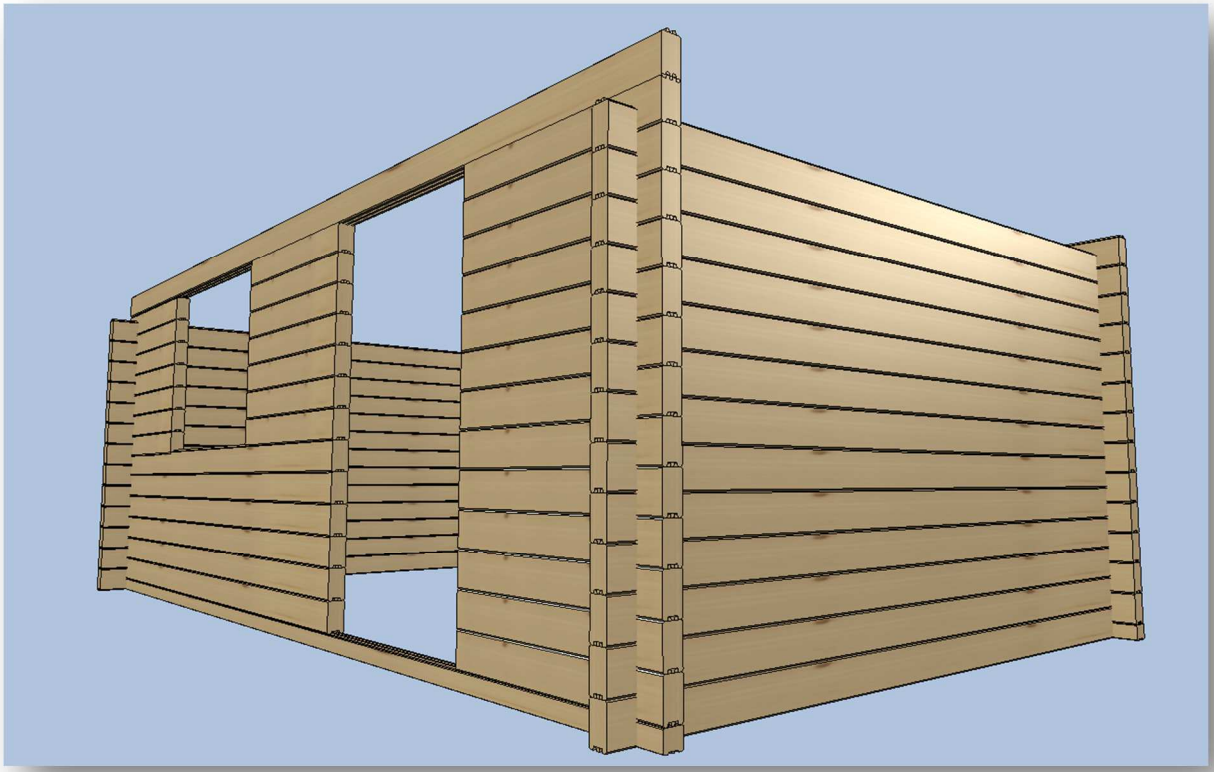
Note that you cannot use Visual Building's door and window tools, because the timber wall is not recognised as a wall.

28.3 Assemble

Now add all the components that you have created:



Note the detail that you can achieve, ideal for assembly instructions:



You can also give your wall sections their own 2D symbol that is displayed on the 2D plan. This is achieved by using the Edit Chunks tool which is activated if you right click on an object in the catalogue.

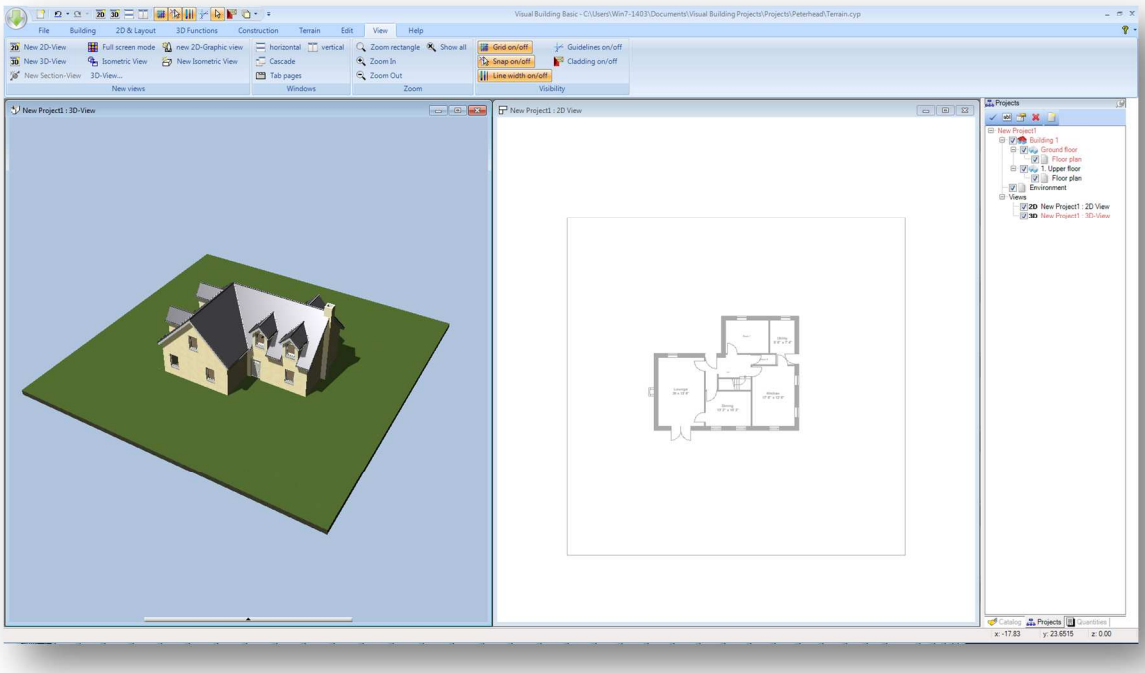
29 Environment Block

Normally the environment block is used to define the project boundaries. The environment block also has its own layer which can be enabled/disabled for each view.

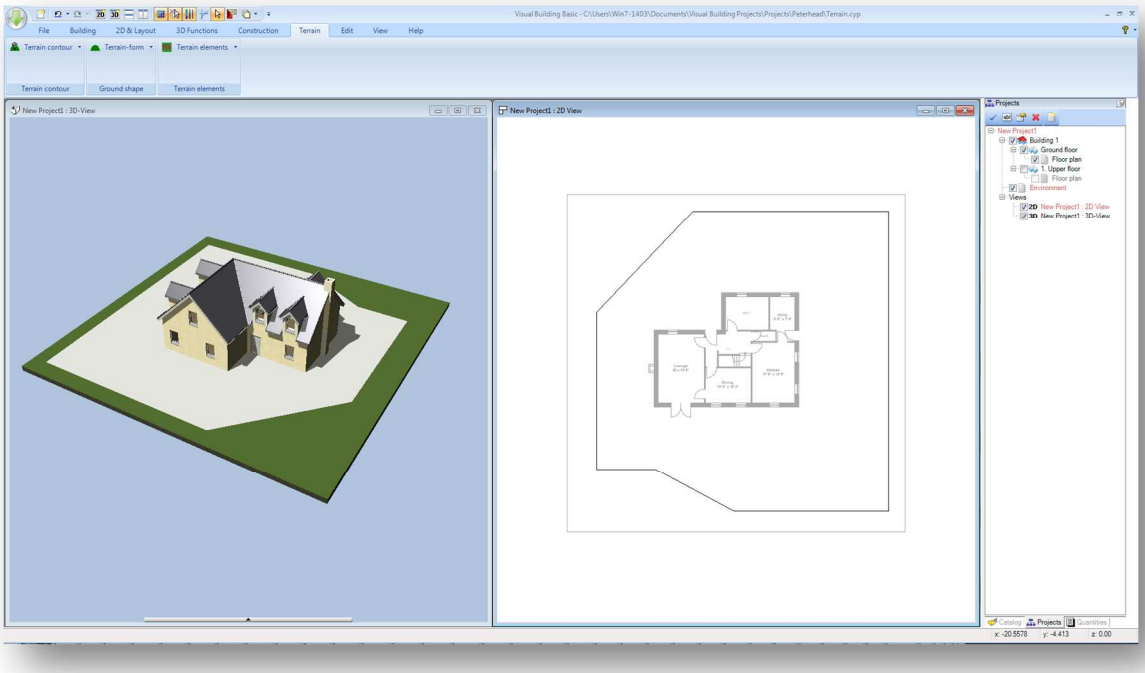
The environment block can be edited by selecting the Environment as the current layer and then double clicking on it in either a 2D or 3D view. In the Area dialog you can then change the environment block's size and texture and hence how it looks in either the 2D or 3D view.

By default the environment block is always rectangular.

If you want to create an irregular plot shape then you can use the Terrain tool to insert a polygon to represent your plot boundary.

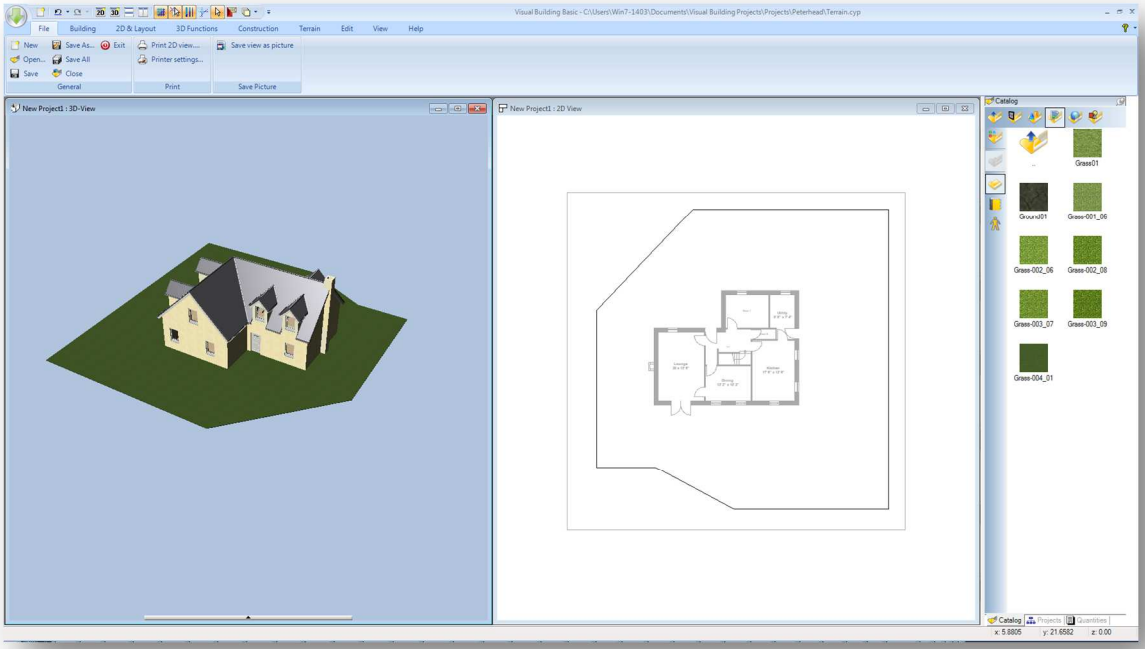


Default Environment Block



Terrain polygon added to project.

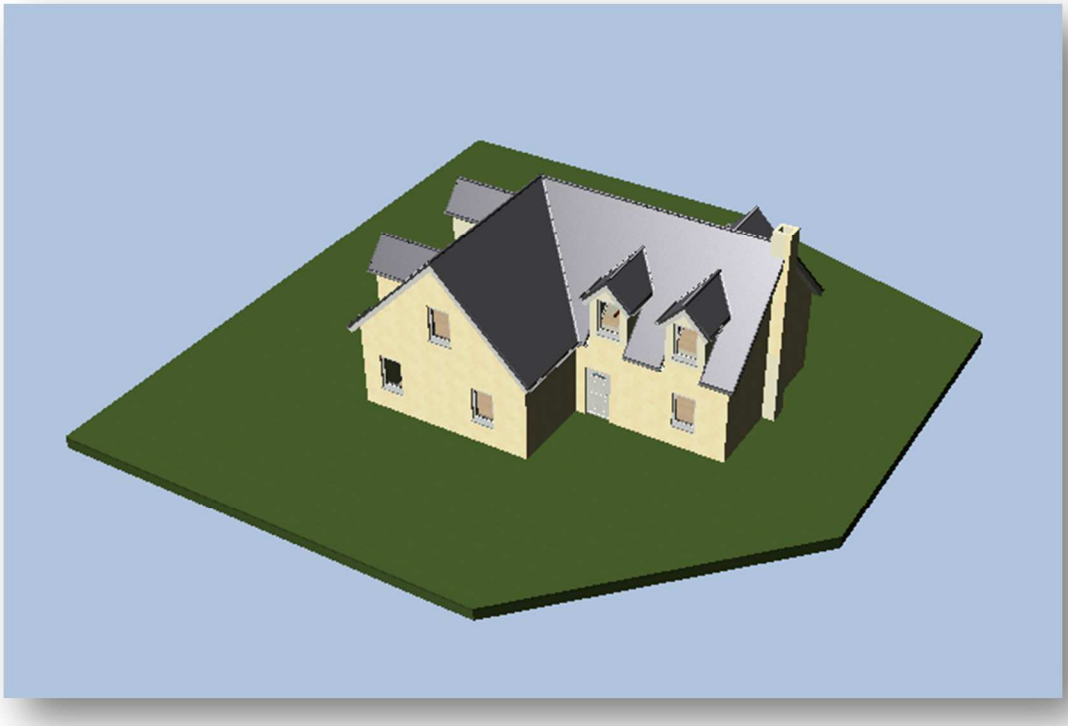
Note that the terrain polygon and other terrain elements are placed on the environment layer.



To hide the environment block, apply a glass material to it. Drag the glass material (Glass white 100) from the **Materials – Glass – White** catalogue onto the environment blocks top and side surfaces.

Use the Terrain tool to create a polygon to define your plot size. (**Terrain - Terrain elements - Bed - Insert with Polygon**)

If you want to have a solid block similar to the Environment block, then use Extrudes solid tool to create an irregular shaped block. (Applicable to Visual Building Professional/Premium only)

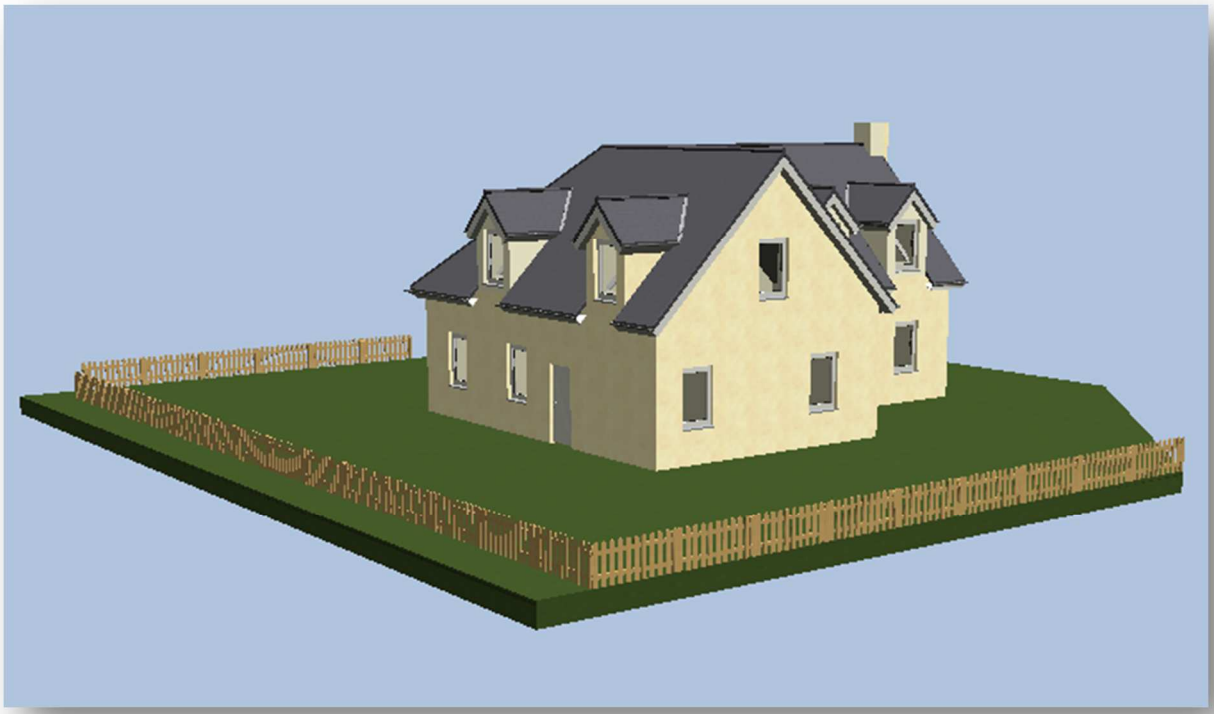


You will have to modify the extruded block size and position to suit your requirements.

29.1 Adding Plot Boundary Fence

If you want to add a boundary fence, you should create a new layer normally on the buildings ground floor. Alternatively you can add the boundary fence to the environment layer.

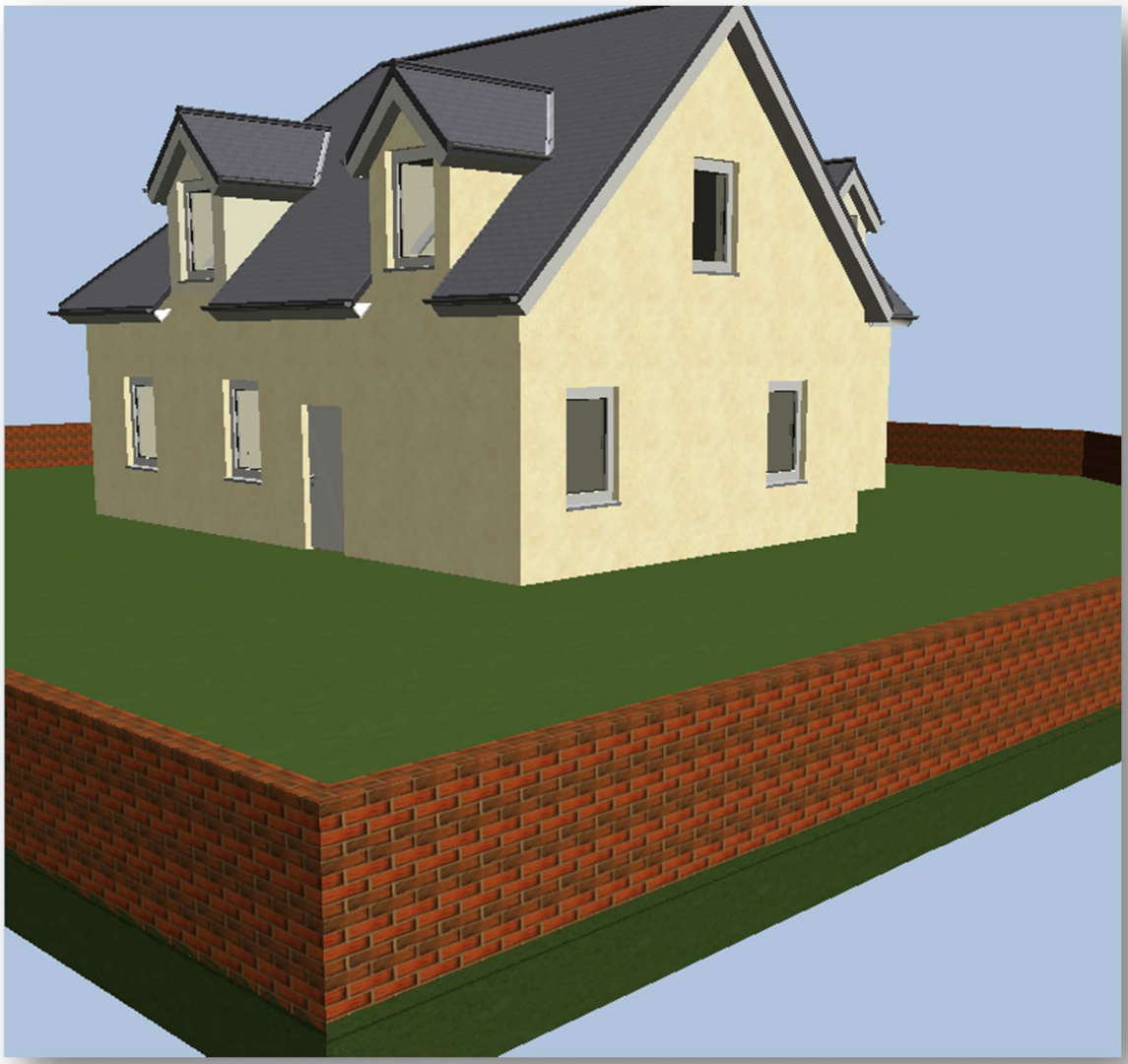
Place a fence from the Objects catalogue (Exterior – Garden – Fence into your project. It's easier to place the fence in the 2D view and use the Multi copy tool to place copies.



29.2 Using a wall as a boundary

You can also use a wall to form a boundary. Create a new layer and add the wall to this layer. Try and not to completely enclose an area with the wall as you will then create a new room. Leave a small gap.

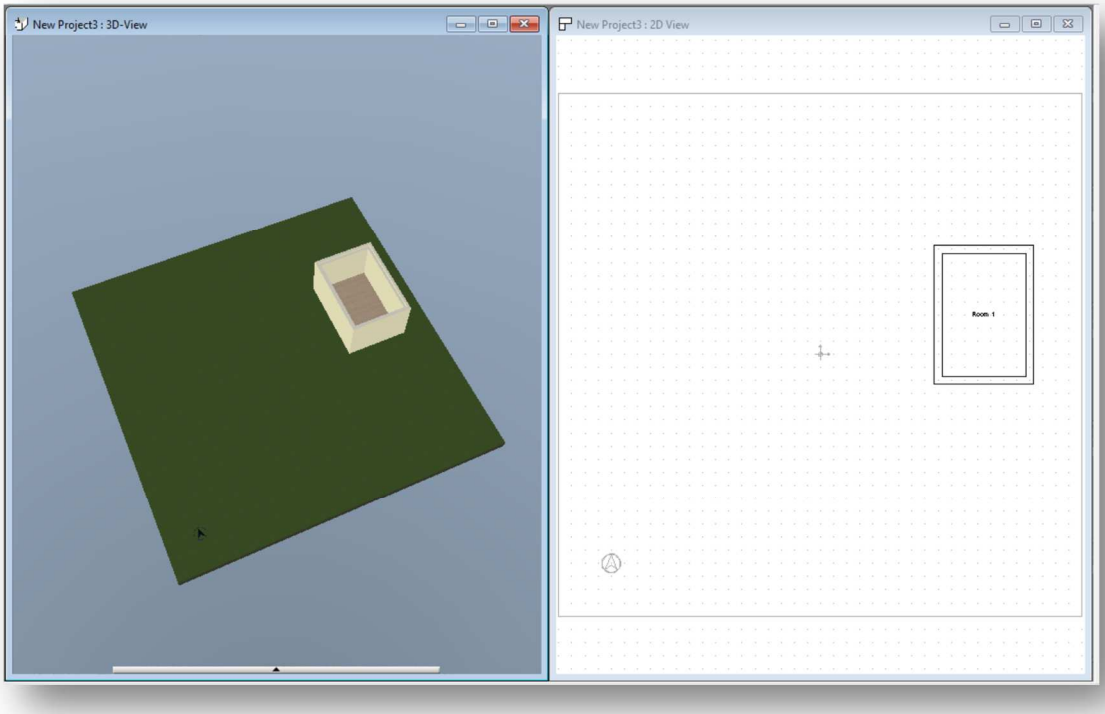
Then in the 3D view double click on each wall section and in the wall's General dialog select the wall' height from Automatic to the manual, by inserting a wall height.



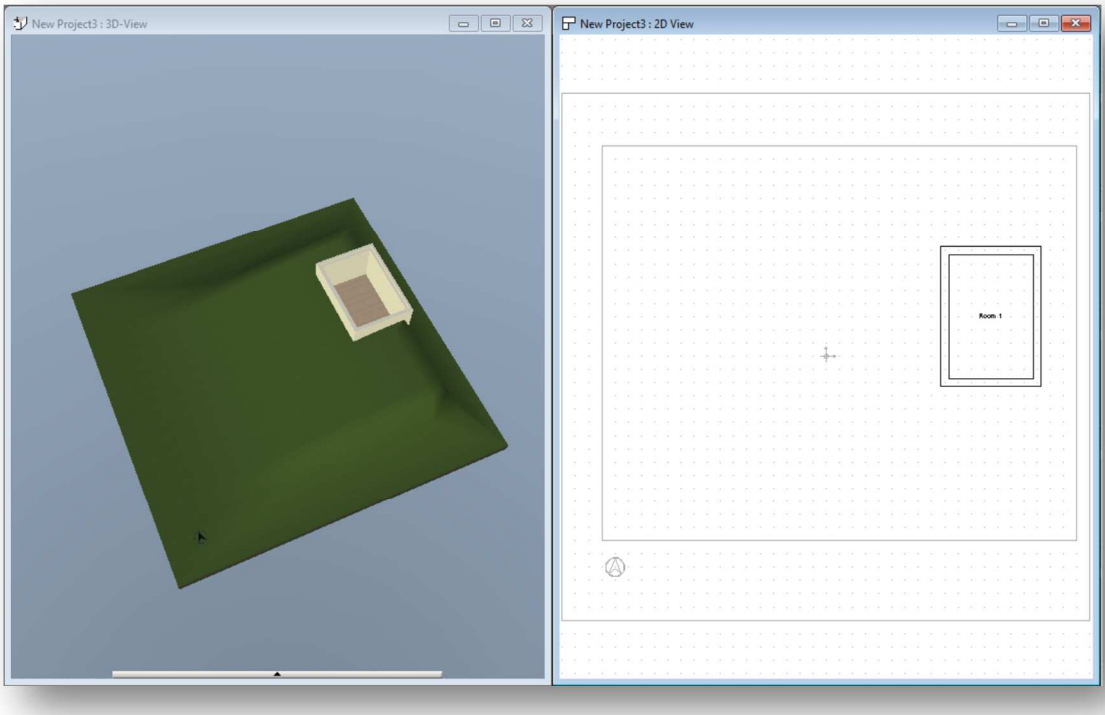
30 Terrain

30.1 Adding a slope with path

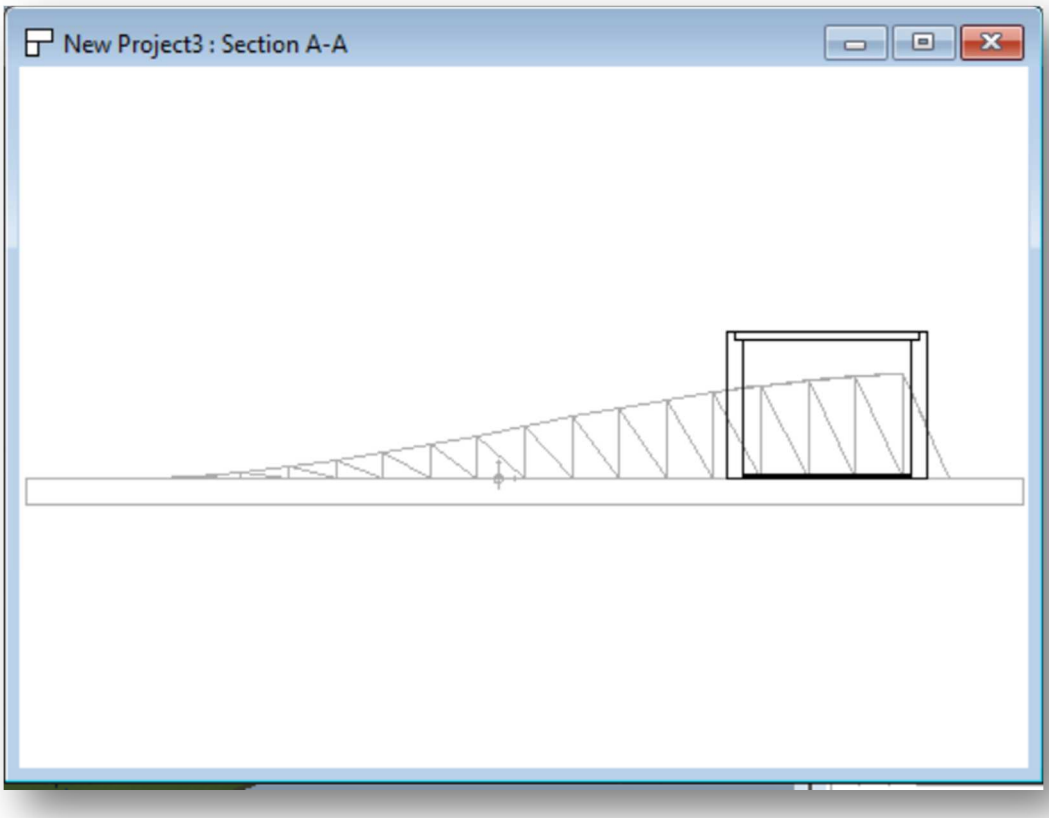
Starting with a simple project:



We start with a flat terrain with a building sat at ground level. Lets place a 2m slope terrain:

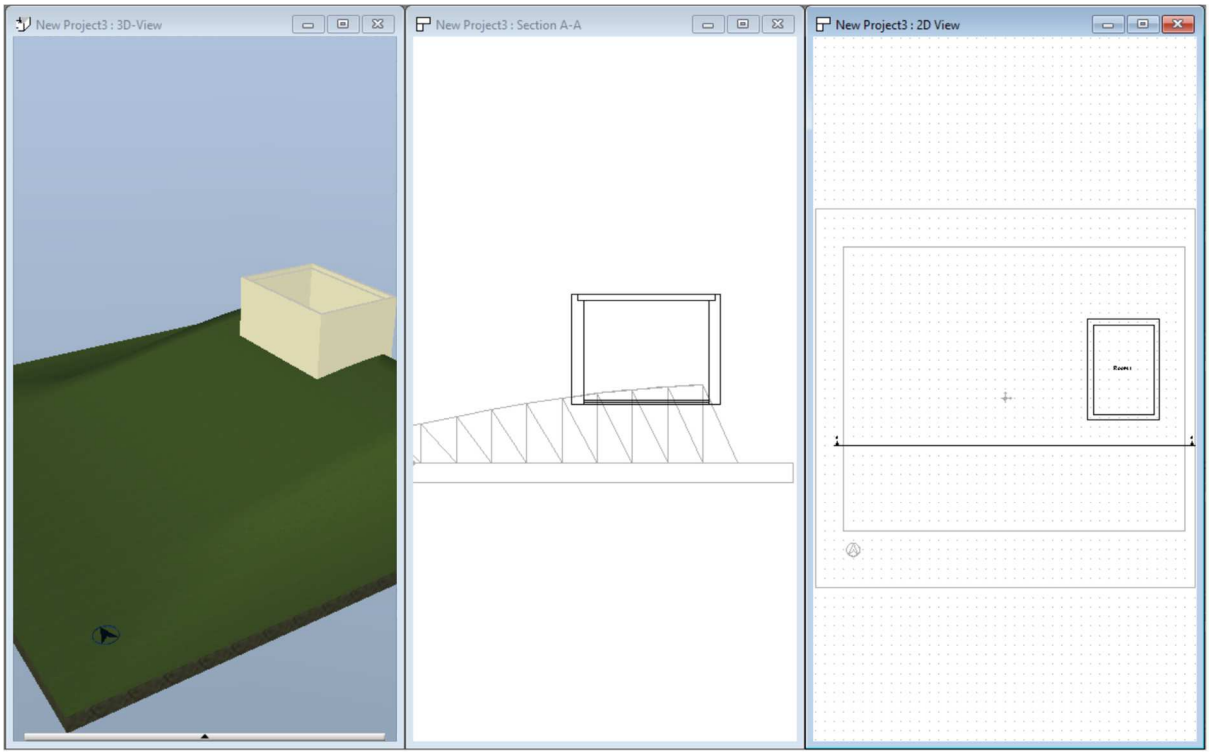


We can see better what is happening if we create a section view:

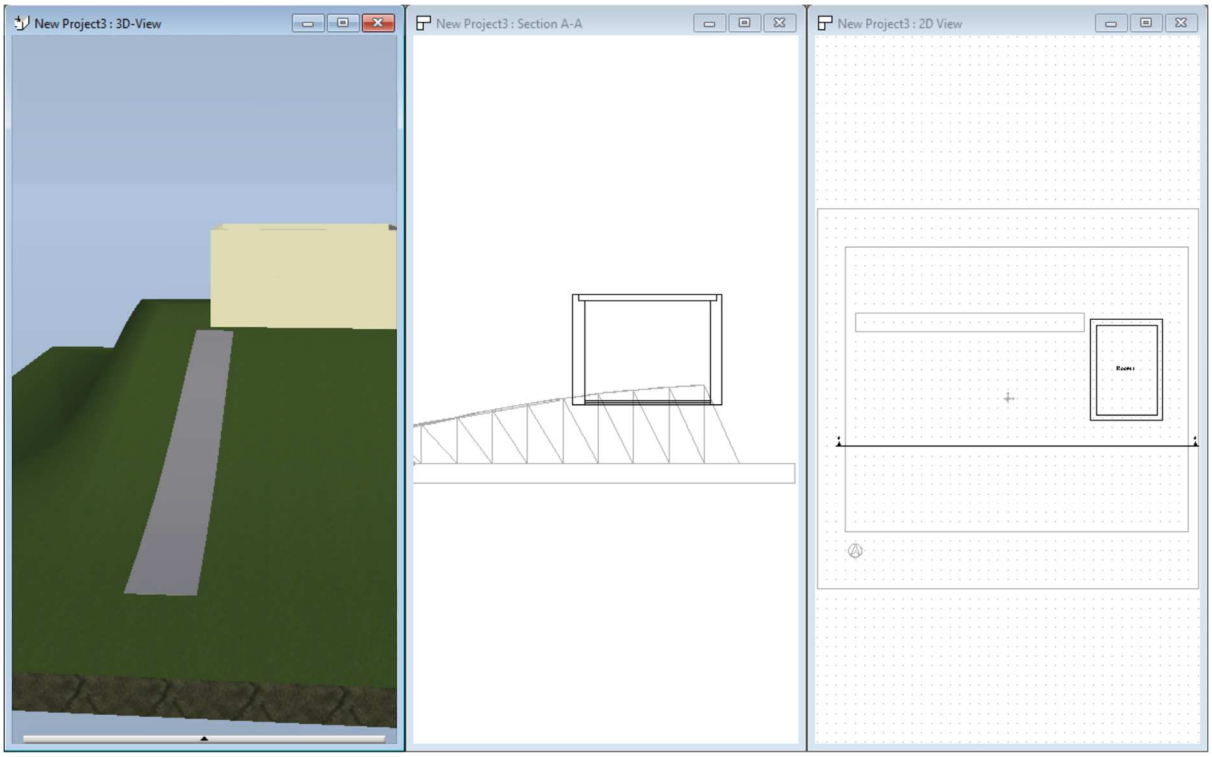


We can now adjust the floor height of our building to be 1.5:

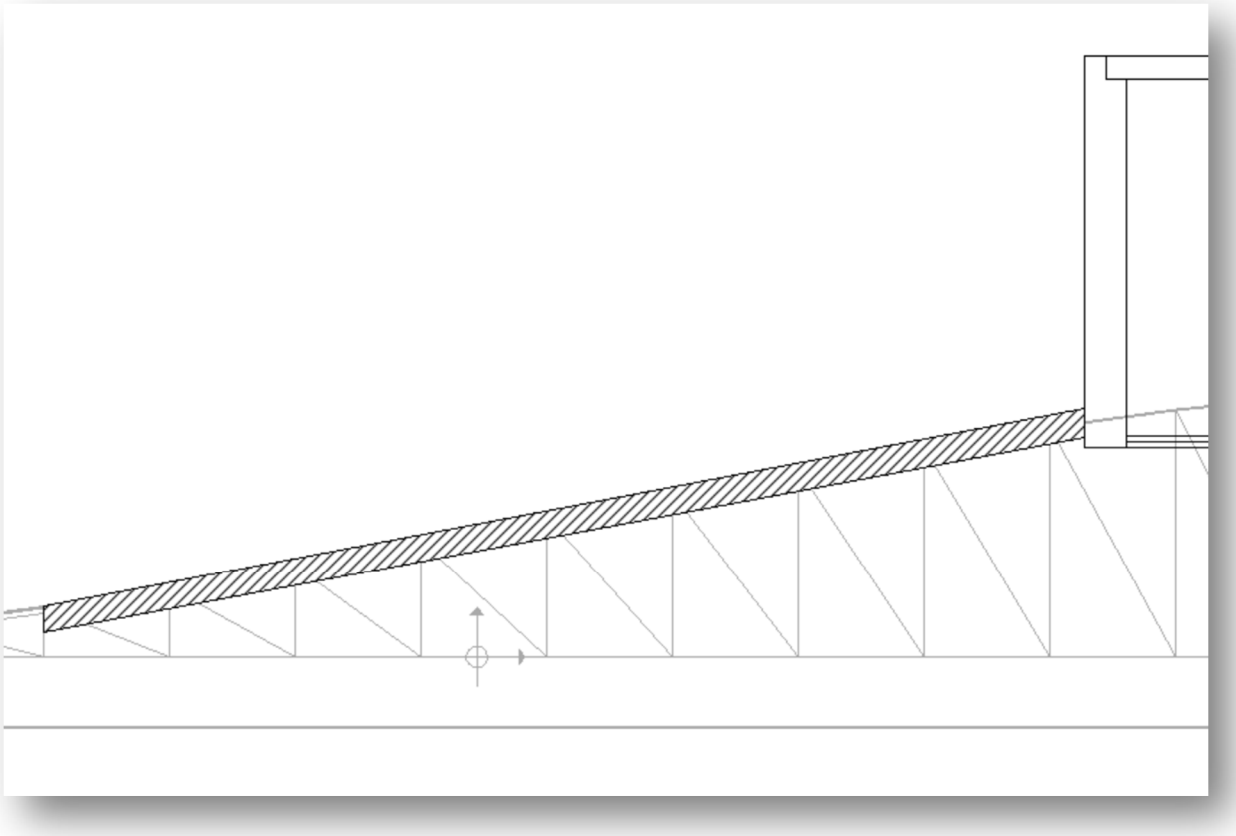
m



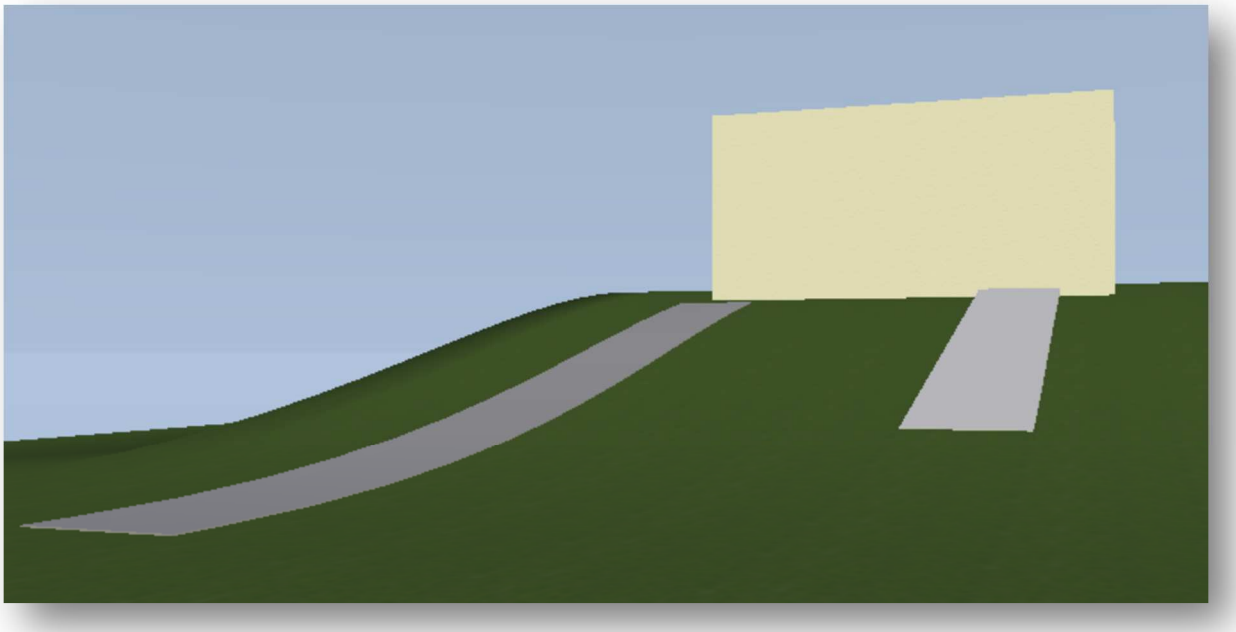
I can add a Terrain – Terrain Elements – Path that will then following the existing terrain path.



Add a 2D profile to the elevation view:



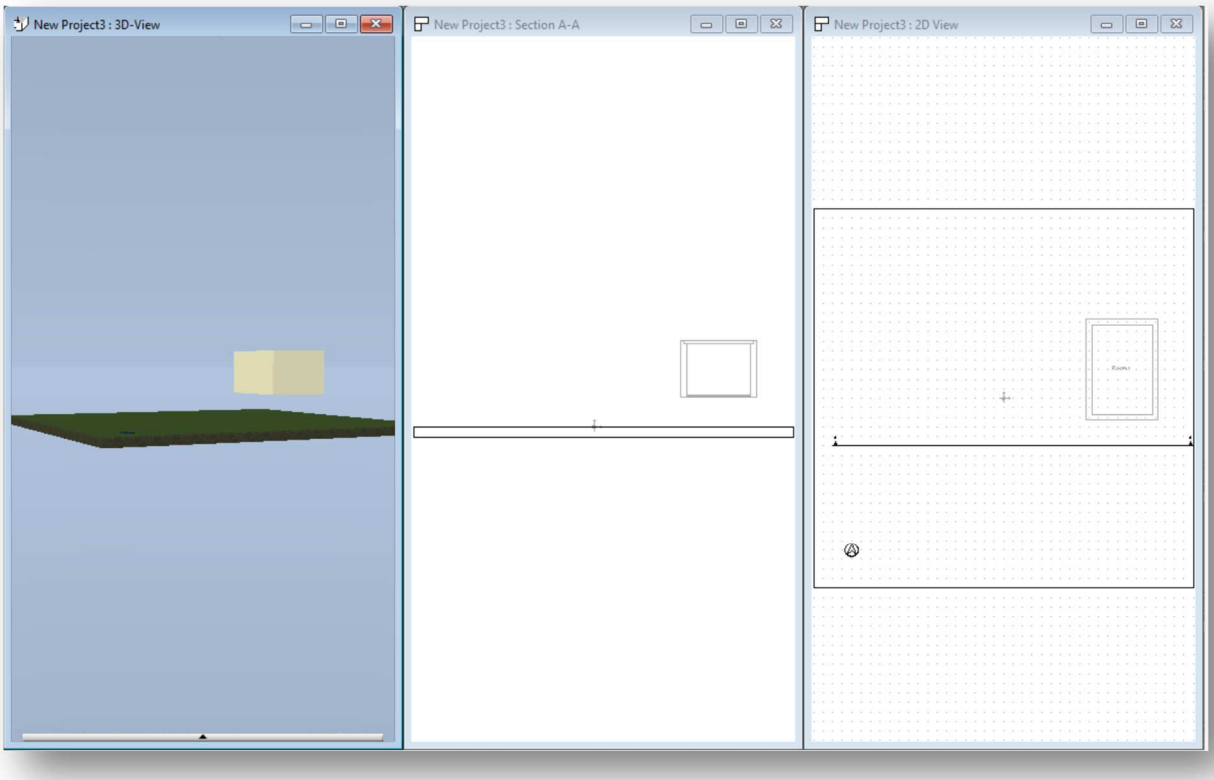
And use the Extrusion tool to create a 3D object:



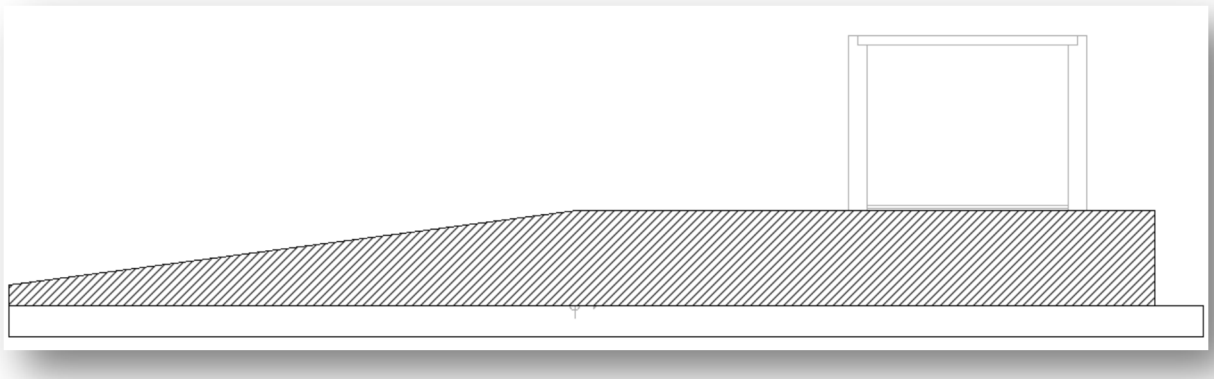
30.2 Adding a slope without using the terrain tools

The terrain tool is ideally used where it is representing actual sloped ground, but where the slope is created because of other structures or concrete then it is best to use just the extrusion tool.

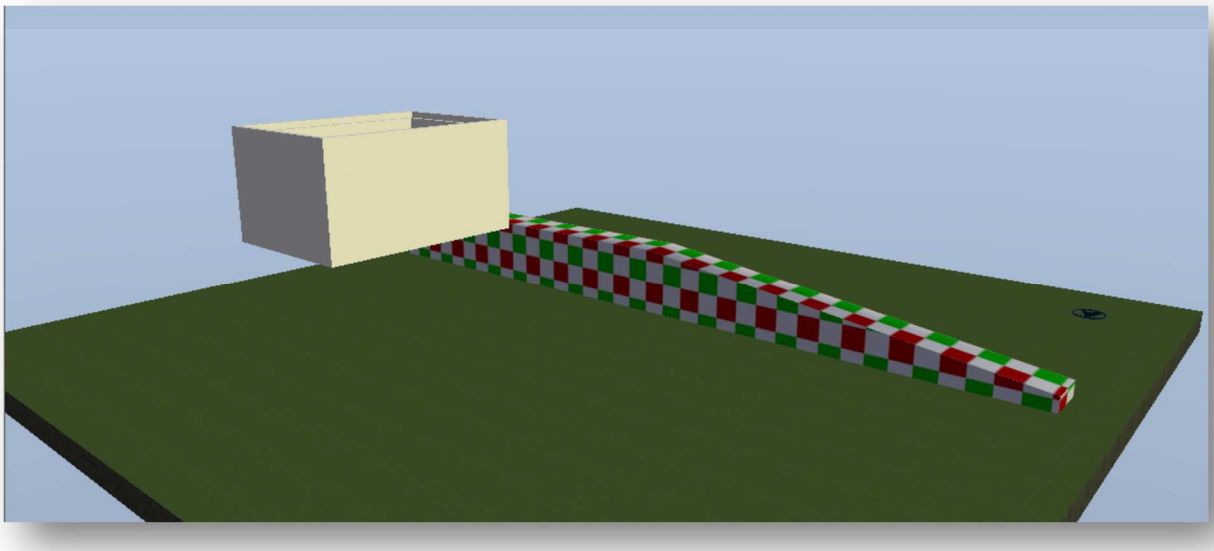
So returning to our previous terrain project, where we can select the terrain and delete it:



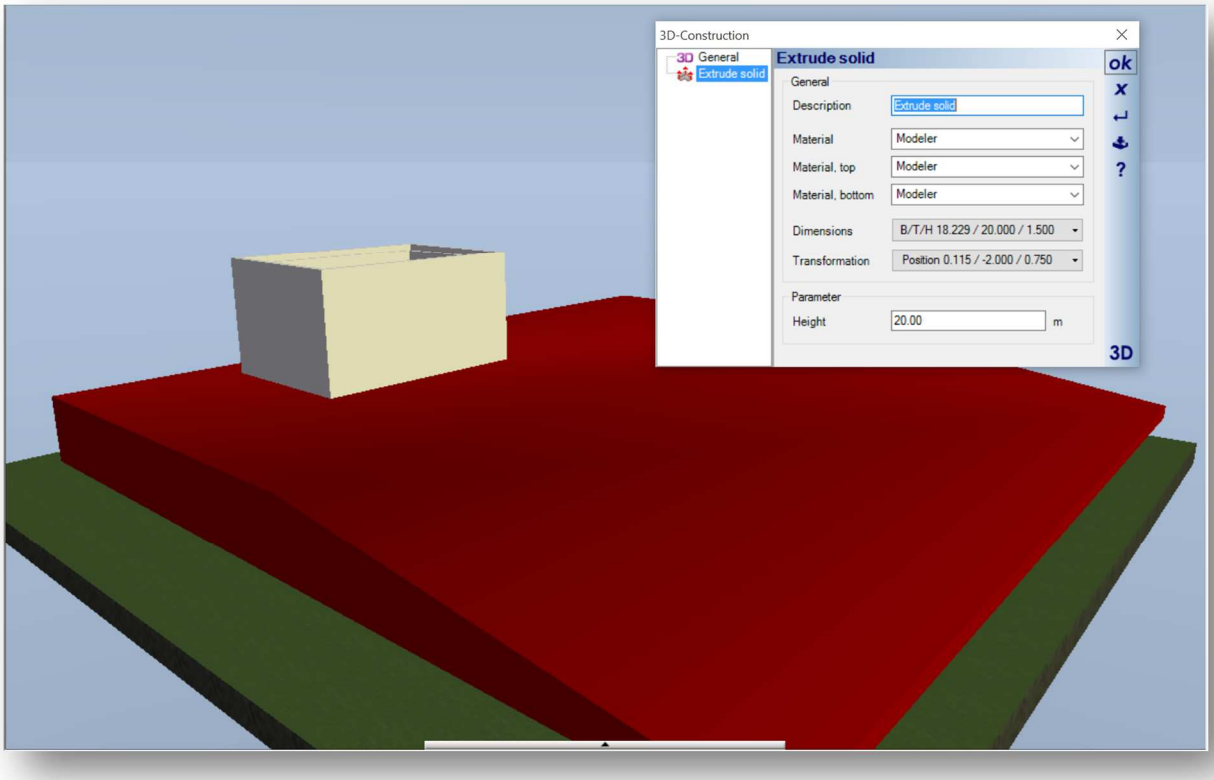
Now, on the section / elevation view draw the profile of your concrete terrain:



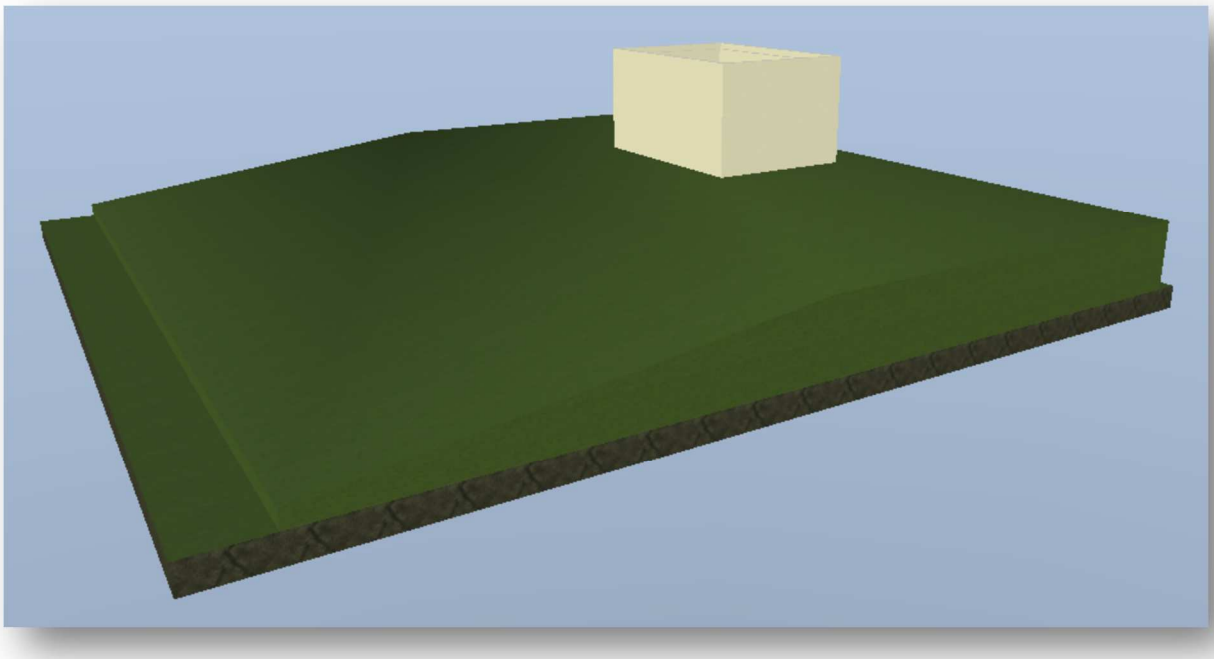
Then use the **Construction – Extrude solid – extrude 2D contour** tool to extrude the 2D outline into a 3D object:



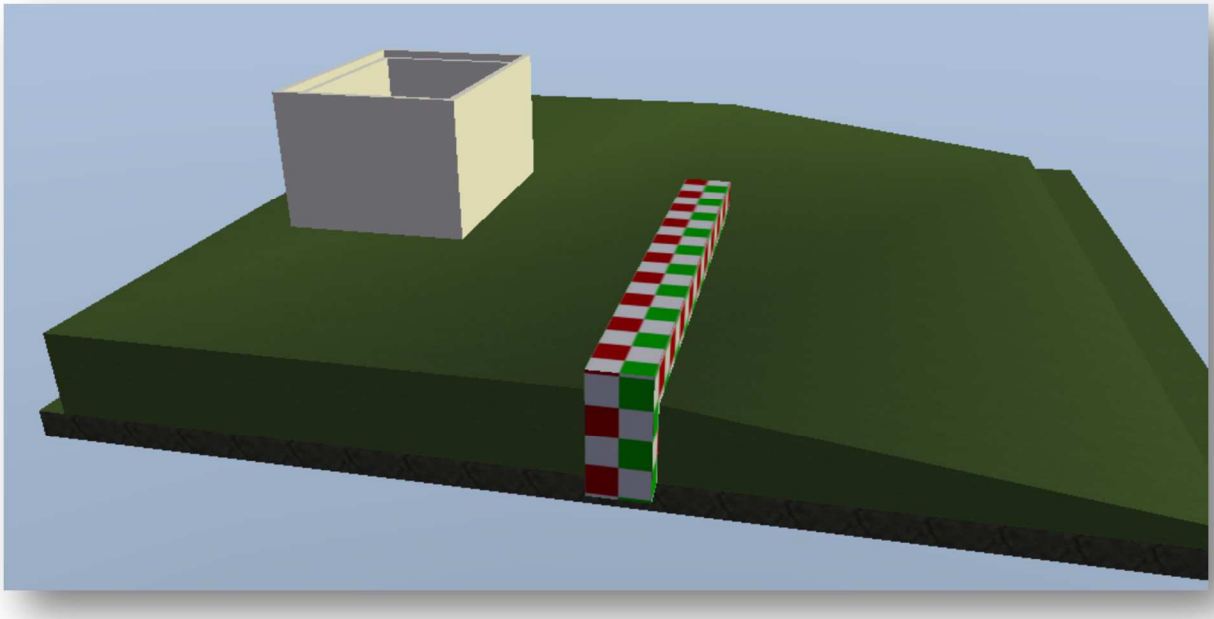
The default width of any extruded object is 1000 mm, so double click on it and in its dialog box enter the desired width, which in this example we will make the same as our environment block 20m.



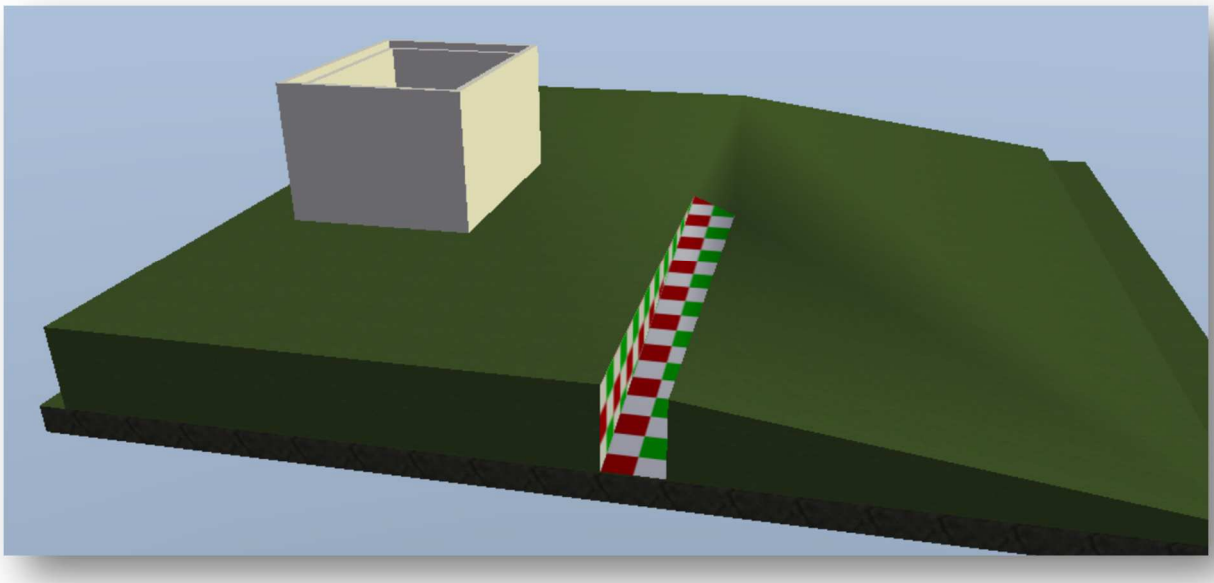
You can of course apply a texture to your new terrain block:

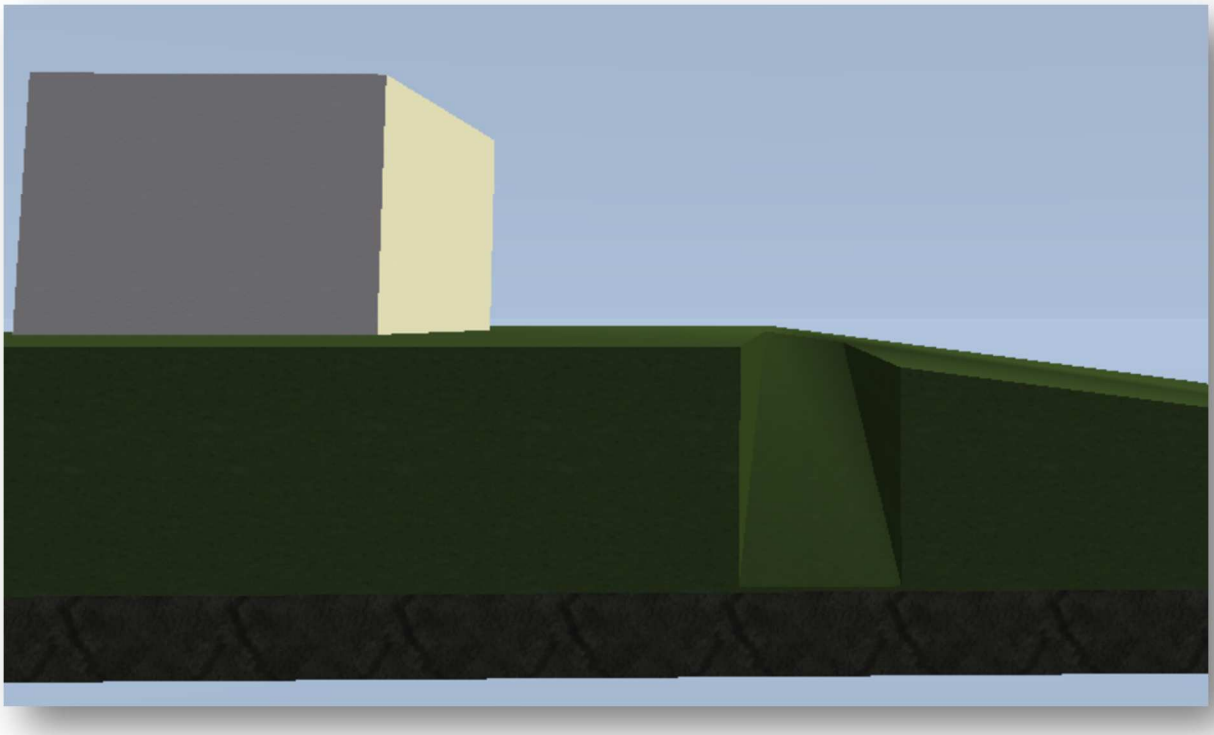


This works well if you have 1 slope but what about if you have another shape you want to detract from the slope:



Draw any 3D shape you need, and then using **the Edit – Edit 3D constructions – difference** tool you can remove any shape you require from your existing shape.





So again we have shown how powerful the 3D editing tools are.

31 Plan Layout

Visual Building Professional and Premium versions allow you to place multiple views on a single sheet. This is achieved using the **Plan Layout** tool, located in the **2D & Layout** tab.

Let's revisit paper size and scale, as many users still can't understand why their drawing at a 1:100 scale won't fit on an A2 sheet. This becomes even more of a problem when they are trying to place multiple drawings on an A2 sheet.

Consider an ISO A2 landscape sheet: 420 x 594 mm

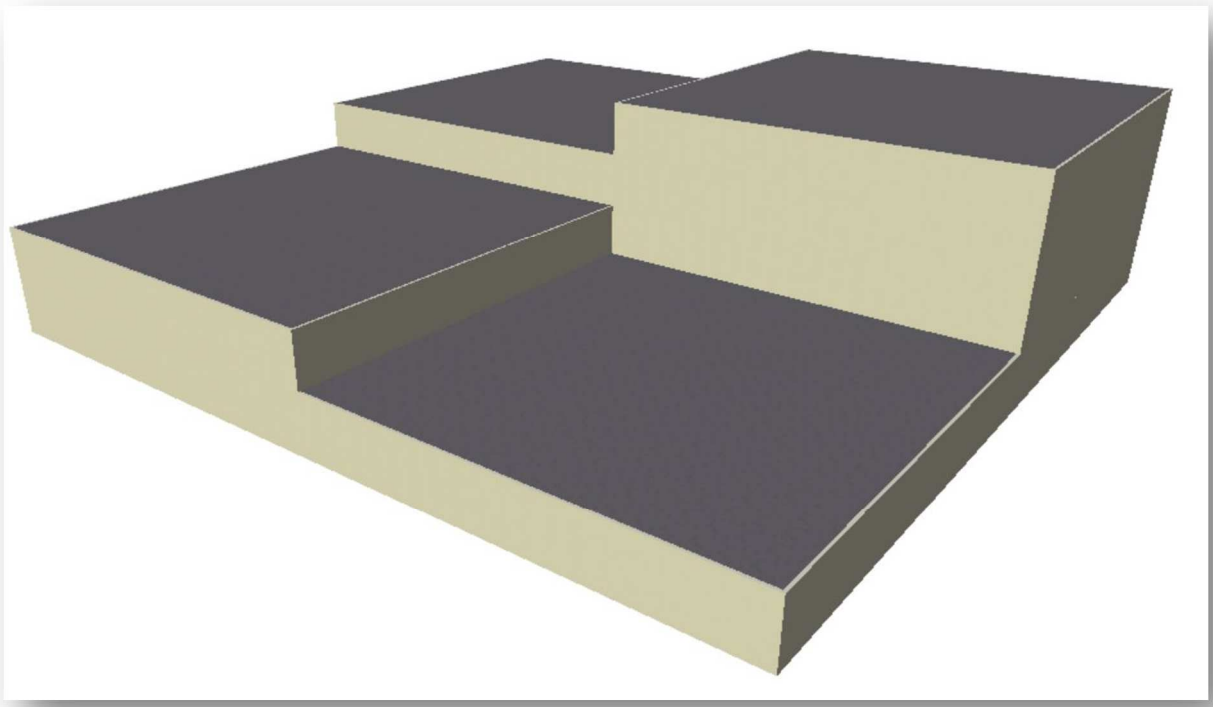
At 1:100 scale the maximum building width you will ever squeeze onto this sheet, and ignoring margins is 59400 mm. Nobody wants their plan to be write up to the paper edge, and so allowing a reasonable 25mm border that would allow a building plan width of 59,350 mm.

If you wanted to show two elevations side by side then your max building width size at 1:100 would be 29,675 mm

If you wanted to show three elevations side by side then your max building width size at 1:100 would be 19,783 mm

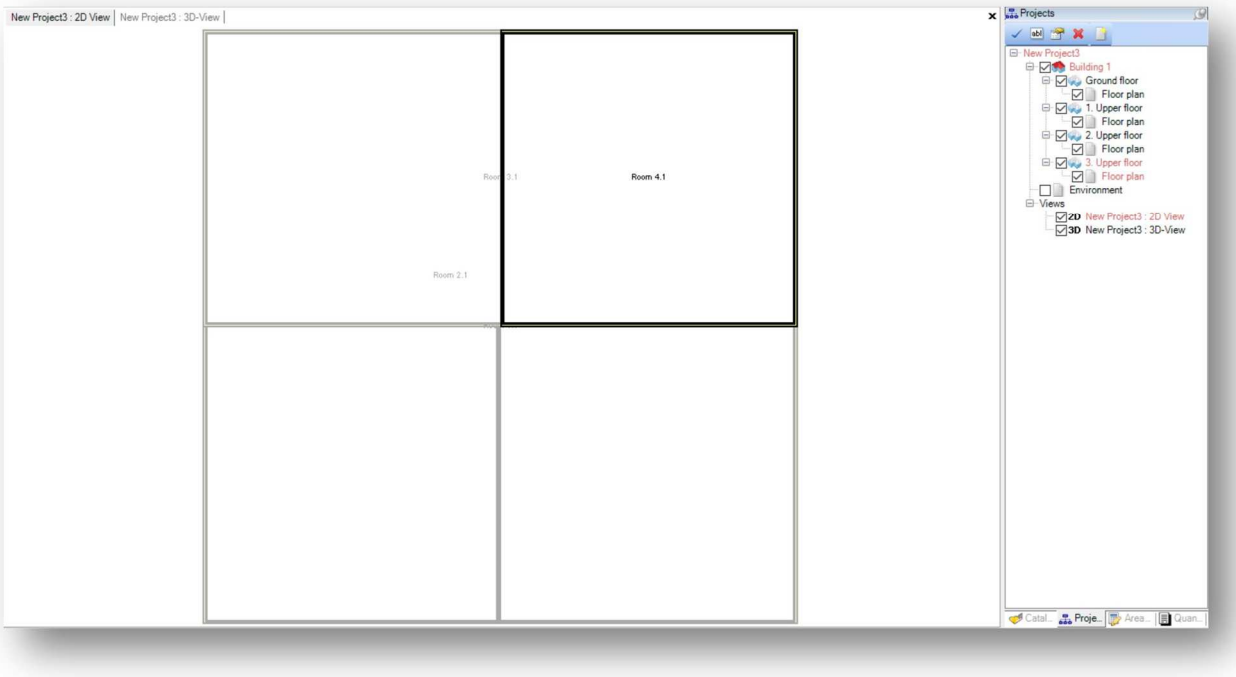
If you want a larger building, then you must either use a larger scale, say 1:200 or a larger sheet size, i.e A1.

Let's consider that we want to place the 2D plans of the following 4 storey building onto an A2 sheet.

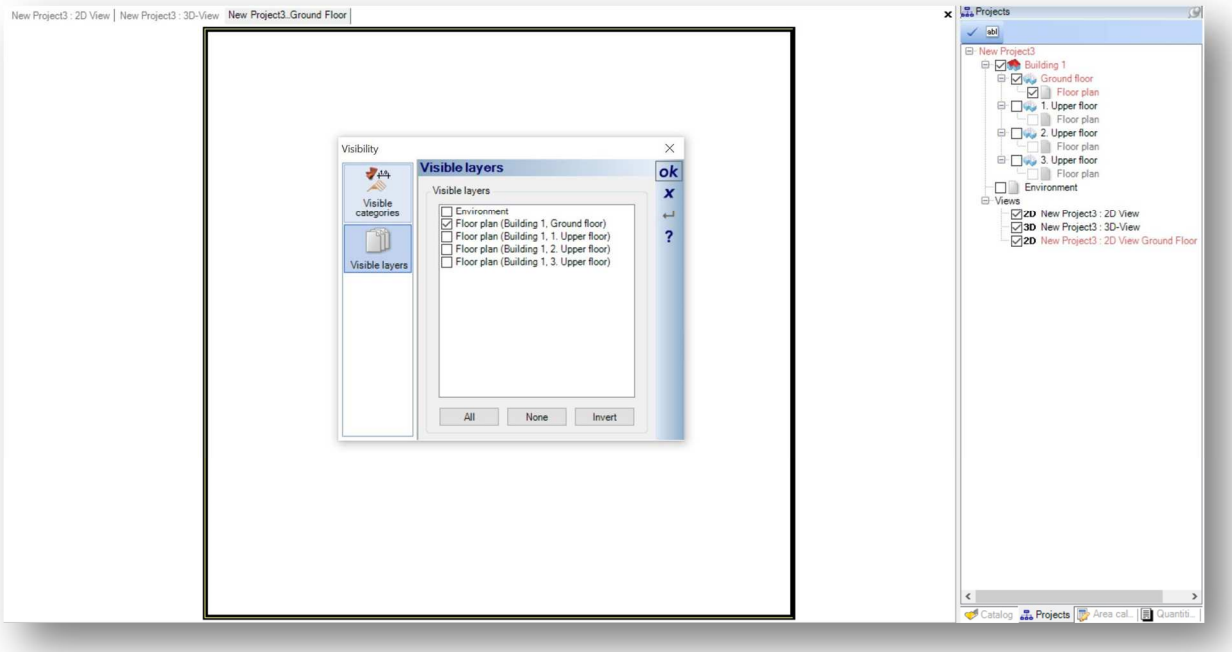


Each floor has a different size and shape solely for ease of recognition in this tutorial.

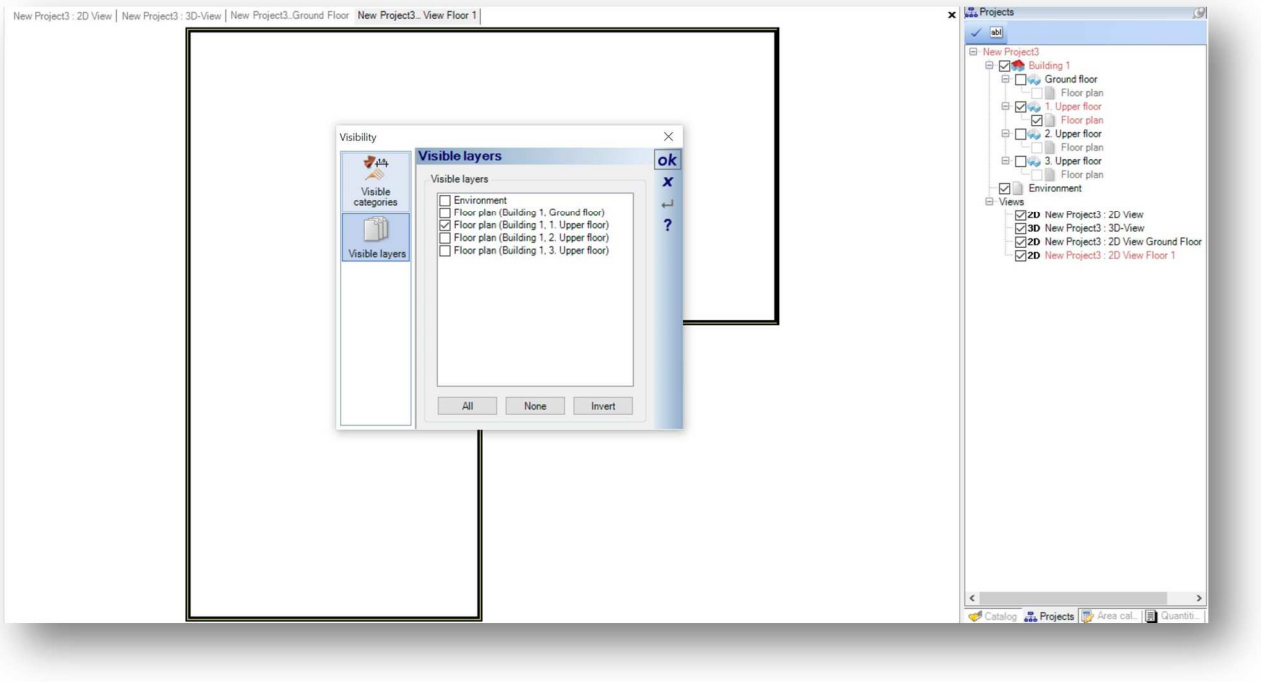
The 2D Drawing plan to describe this building is as follows:



We now need to create 4 new 2D plan views each only displaying the contents for that floor. Here we create 2D View floor 1, and set it to display only the Ground Floor:



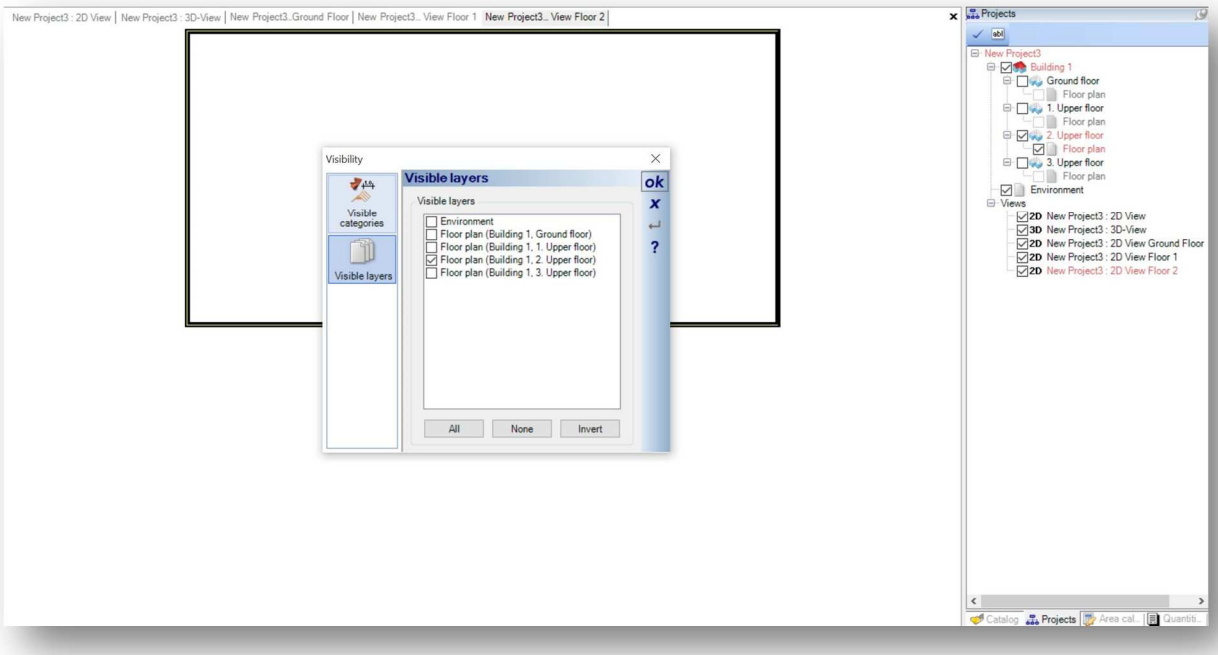
Now we do the same for floor 1:



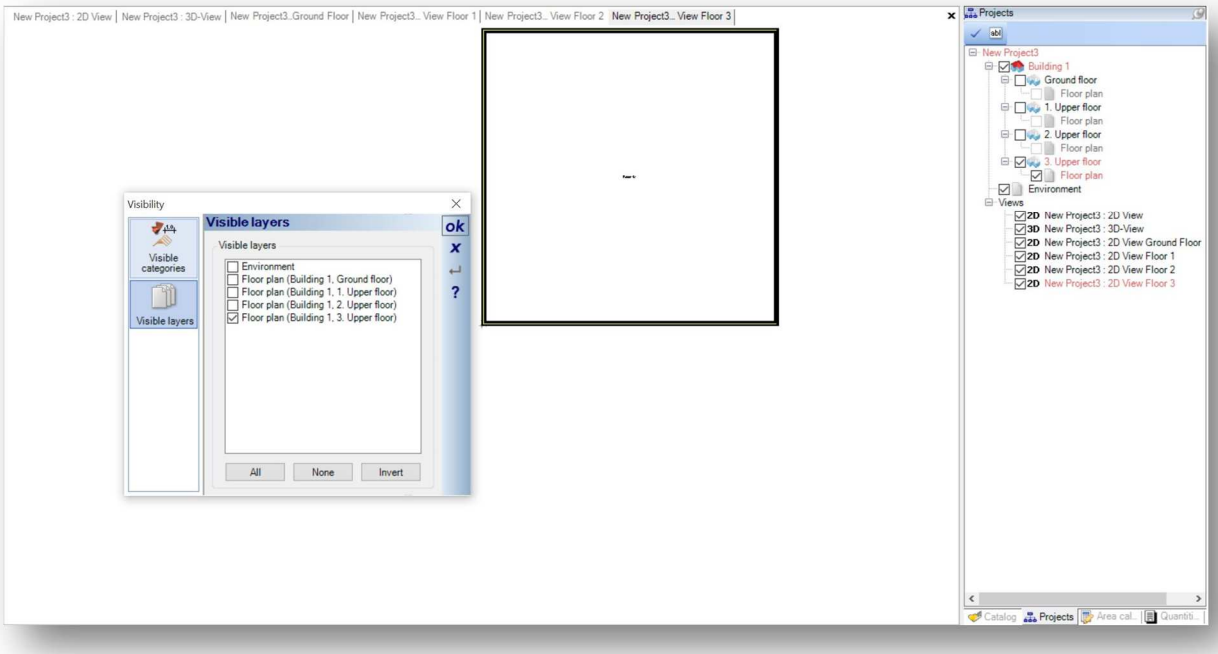
Not that each floor is a different shape.

We create each new 2D Floor View using the **New 2D View** tool in the **New Views** section, in the **View** tab. As this is a popular button there is also a New 2D View icon within the Quick Access bar above the menus. Do not confuse the **New 2D View** tool with the **New 2D Graphic View** as this is something completely different.

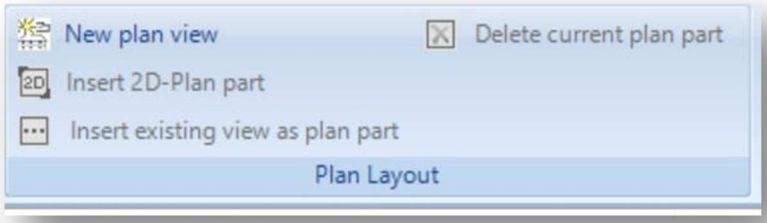
Now we do the same for floor 2:

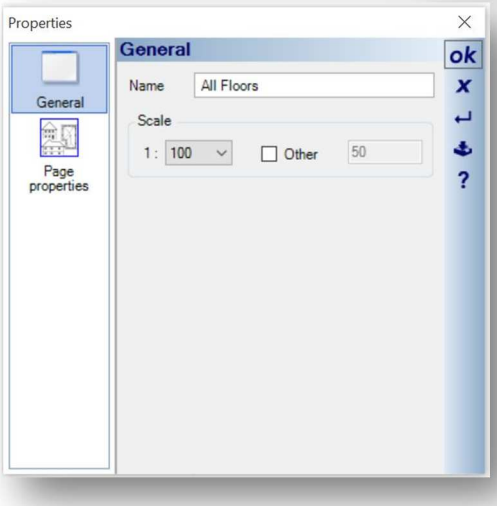


Now we do the same for floor 3:



In the **2D & Layout** tab, locate the **Plan Layout** group. Within this group are the tools that allow you to place all your views within a single view.

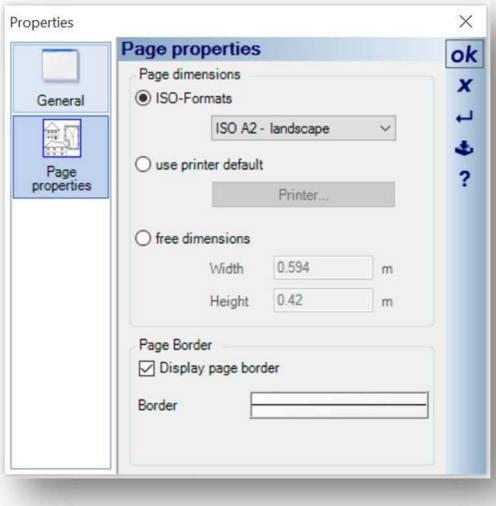




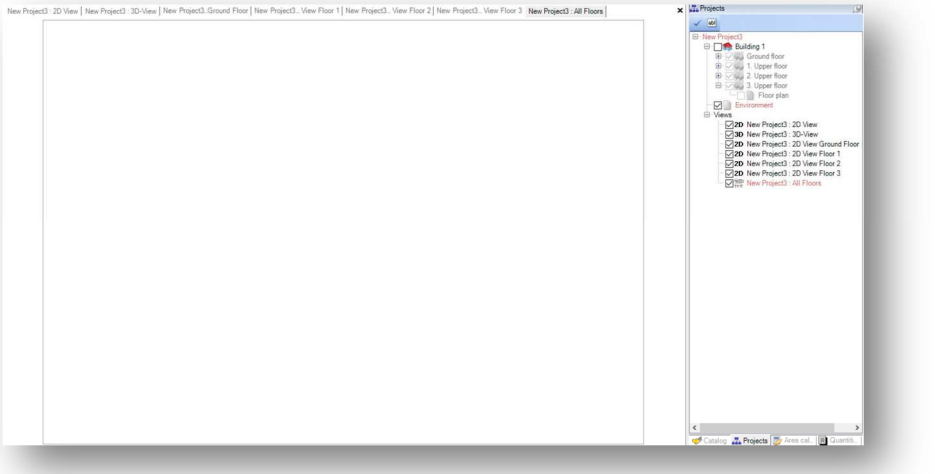
To create such a view layer, click on **New Plan view,** and a properties dialog appears.

You can now set the scale, which in our case will be 1:100.

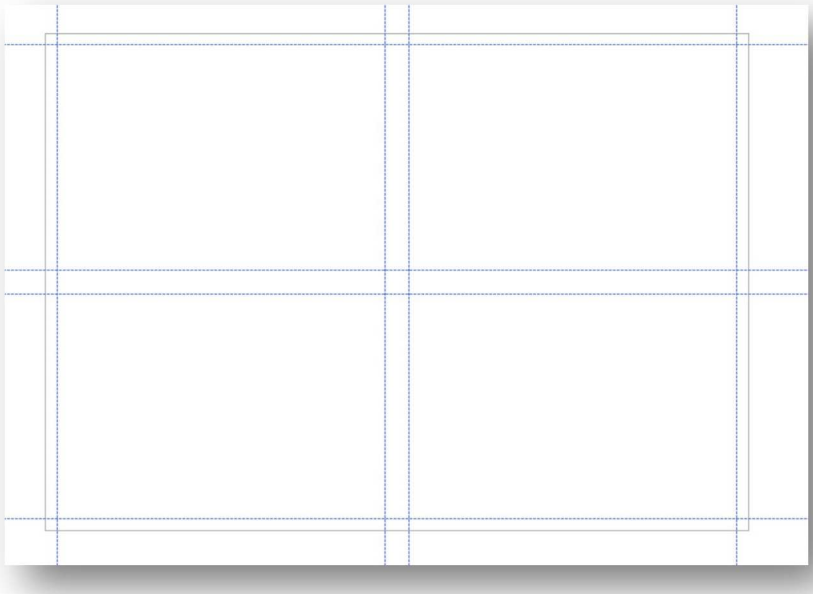
Click on the Page Properties tab within the dialog and a new dialog tab appears that allows you to set the sheet size, which in our case will be A2 landscape.



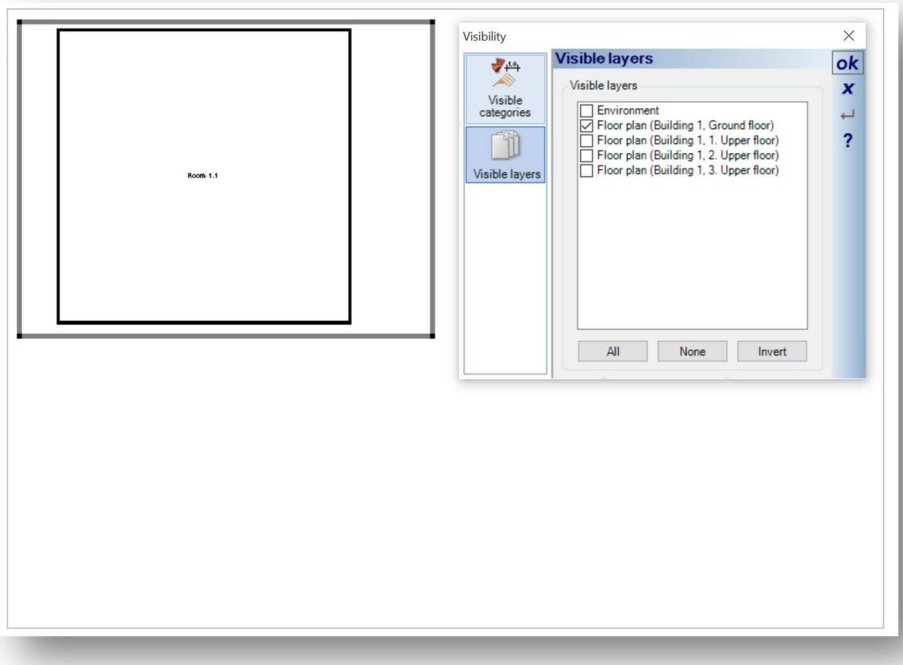
Note that now we have another new view which we called All Views.



Hint! Before you place any views or part views into you multi view plan place some guide lines to help you align the view panels:

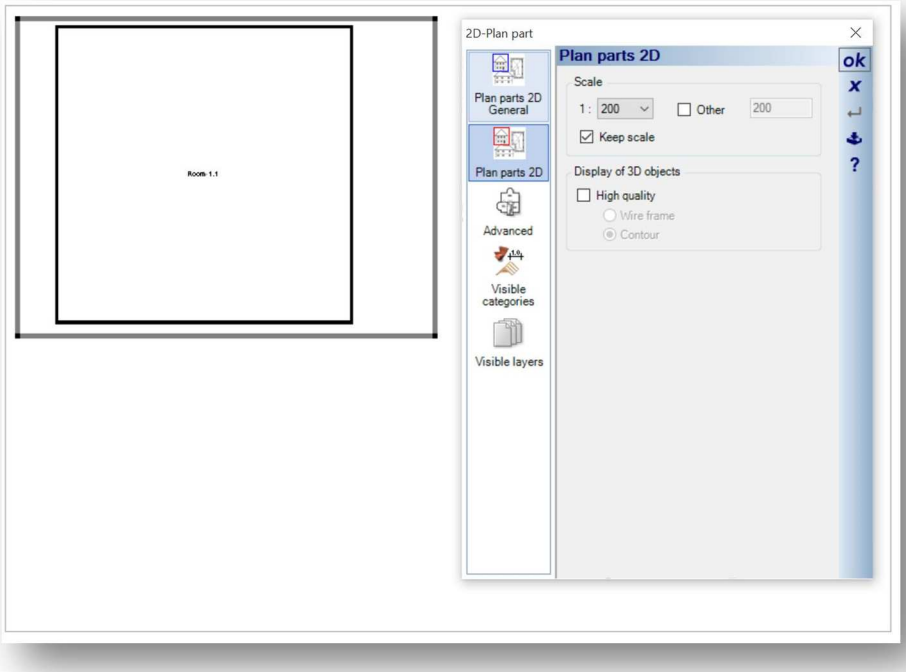


With the **All Views** view set as the current view, click on the **Insert existing view as plan part,** and snap the resulting drag box to the guide lines.

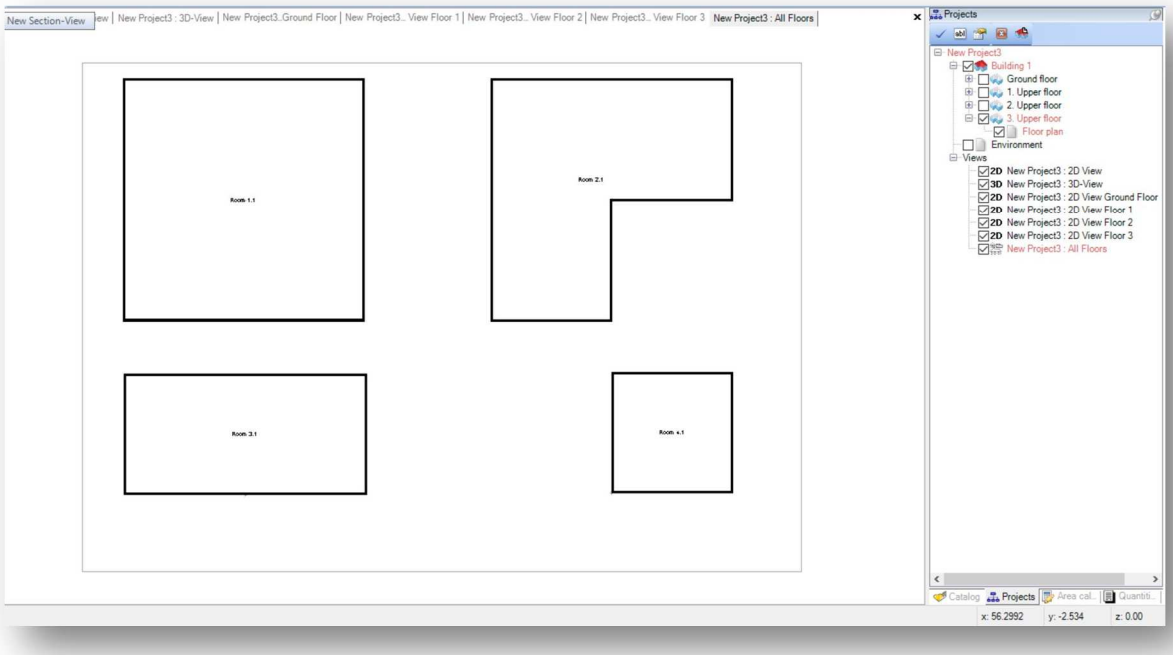


For each Plan you insert right click and select **Visibility** and then **Visible Layers** to define the actual layers you want in this view, which in our case will be the Ground Floor view we recently created.

For each Plan you insert right click and select **Properties** and then **Plan Parts 2D** to define the actual scale you want in this view. In this case we will select 1:200.



Repeat for each viewport until, you are displaying all four plan views, on your A2 landscape sheet.



If you can't fit your drawings onto your sheet, you must either change the sheet size or drawing scale.

There is more detail concerning the **Plan Layout** tool in the **Visual Building User Manual**.

32 Using the Surface Area Tool

In the video tutorials there is a demonstration of the use of the Surface Area tool to apply a textured area to a wall, for example a tiled area above a sink.

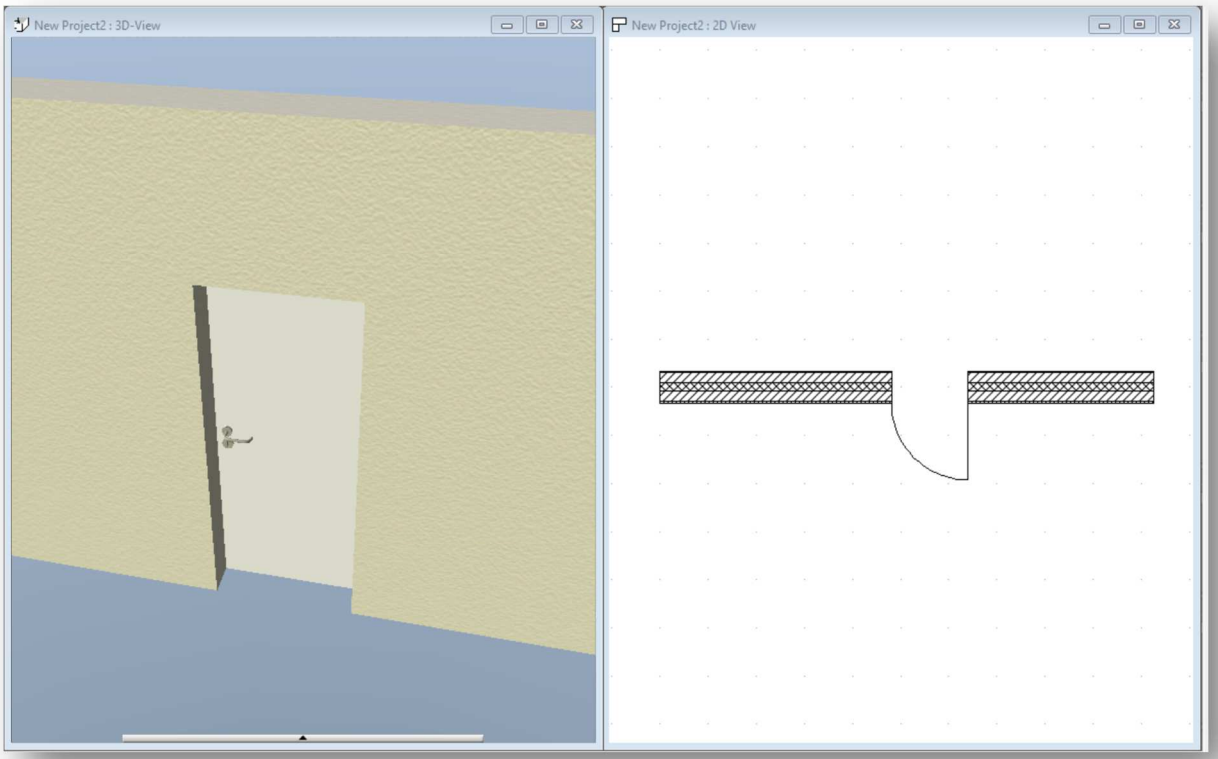
This tool can also be used to add textured areas to external walls. Applying a texture to these wall objects is simple, because the wall object is simple, consisting of a simple object with a simple UV arrangement. Using the Surface Area tool is equally simple for walls and floors.

However try to apply a texture using drag and drop to a door, window or other 3D object can be complicated. This is because the 3D object often consists of multiple objects and sub objects each with its own UV settings.

However in this section we will demonstrate its use on how to apply a textured panel to a door object. Often it may prove difficult to apply a texture to a 3D object, because the original author of the object did not set up the texture UV values correctly.

This is often the case with some simple objects such as doors.

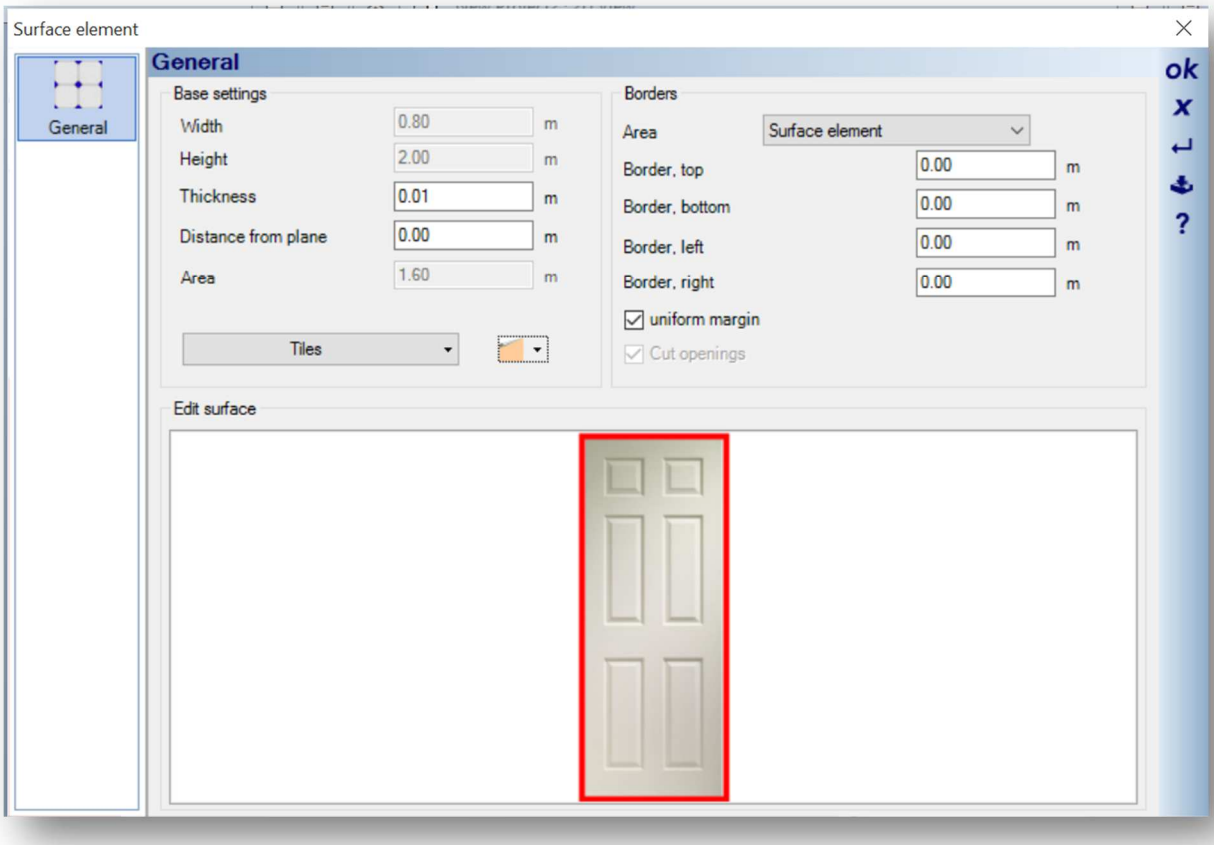
We can use the Surface area tool to apply a new texture over the door, and therefore there is no need to rely on the door's original UV data. Our following door is 800 mm wide by 2000 mm high.



To simplify matters, we will hide the wall, by using the visibility settings in the 3D view.

Now use the **Create Surface Element** tool, located in the **Construction** tab, and select **Insert in plane**. Now click on the door objects surface.

The surface element dialog will activate when you can now assign the texture, the texture size an UV values. The UV values will only make sense if the objects UV values have been set correctly by the objects author.



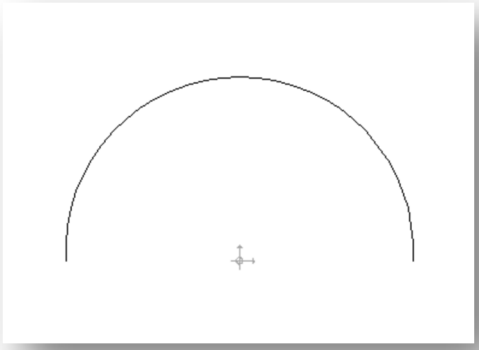
Note that we must use a thickness of 10mm. 1 mm is better, but I used 10mm so you can see the thickness in the following image.

33 Using the Sweep Solid Tool

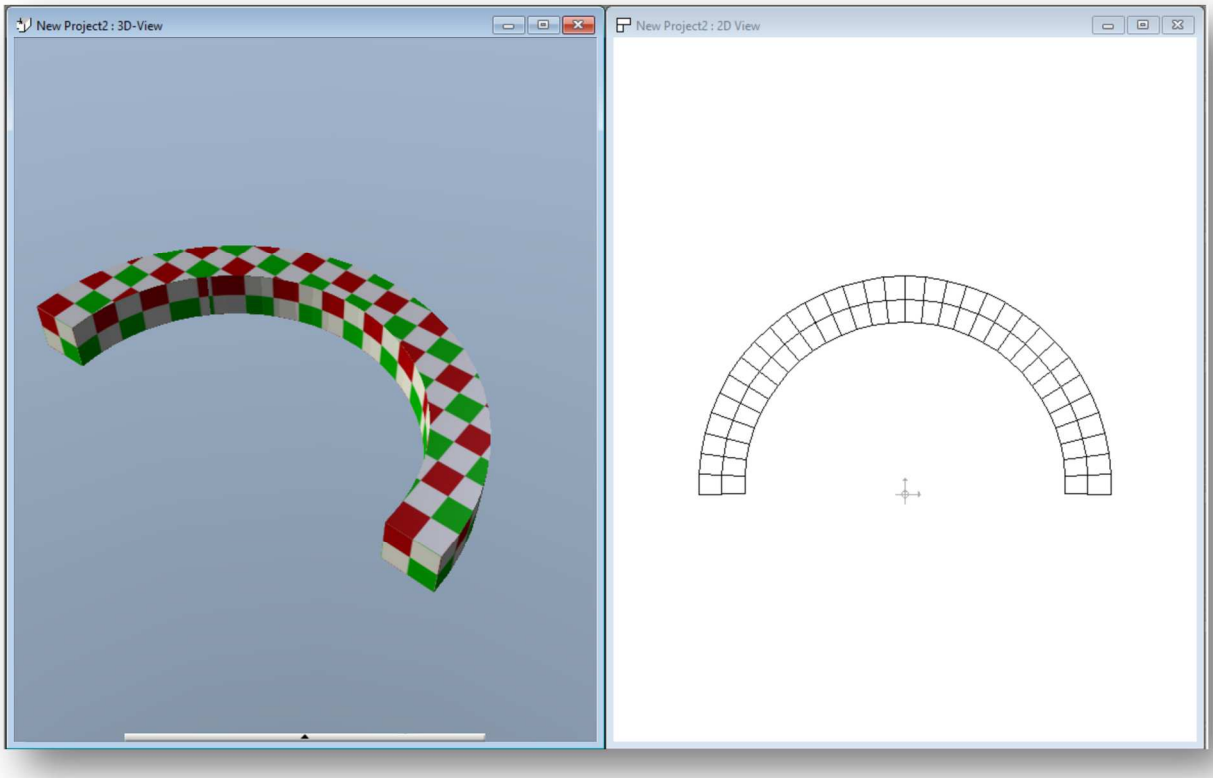
33.1 Curved Glass Roof with support I Beams

We have seen several examples of how to extrude an object from a 2D contour, which will create a 2D polygonal shape or 2D irregular shape into a 3D object with a depth. However with the Sweep Solid tool, we can also do some interesting things.

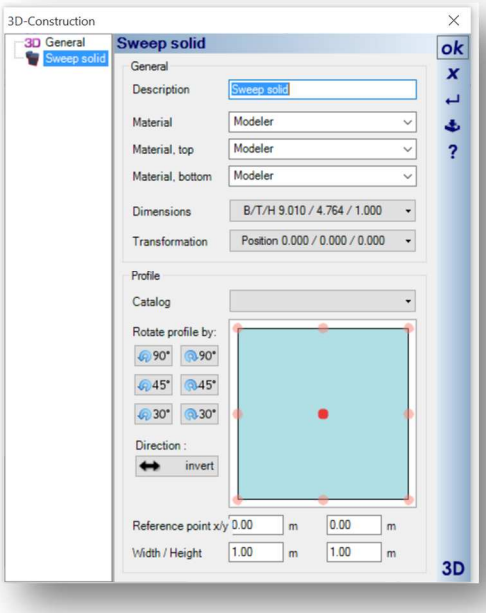
Draw a 2D semi circle using the 2D drawing tools.



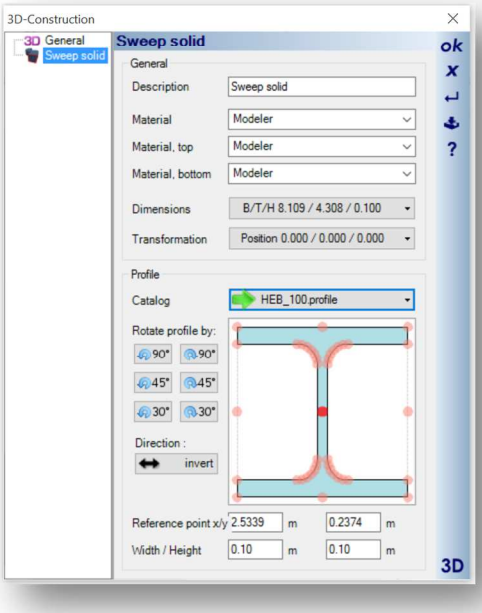
Now select **the Construction – Sweep Solid Select Path/Contour** tool, and then click on your 2D semi circle in the 2D view. This will create the following 3D object using the default 2D profile.



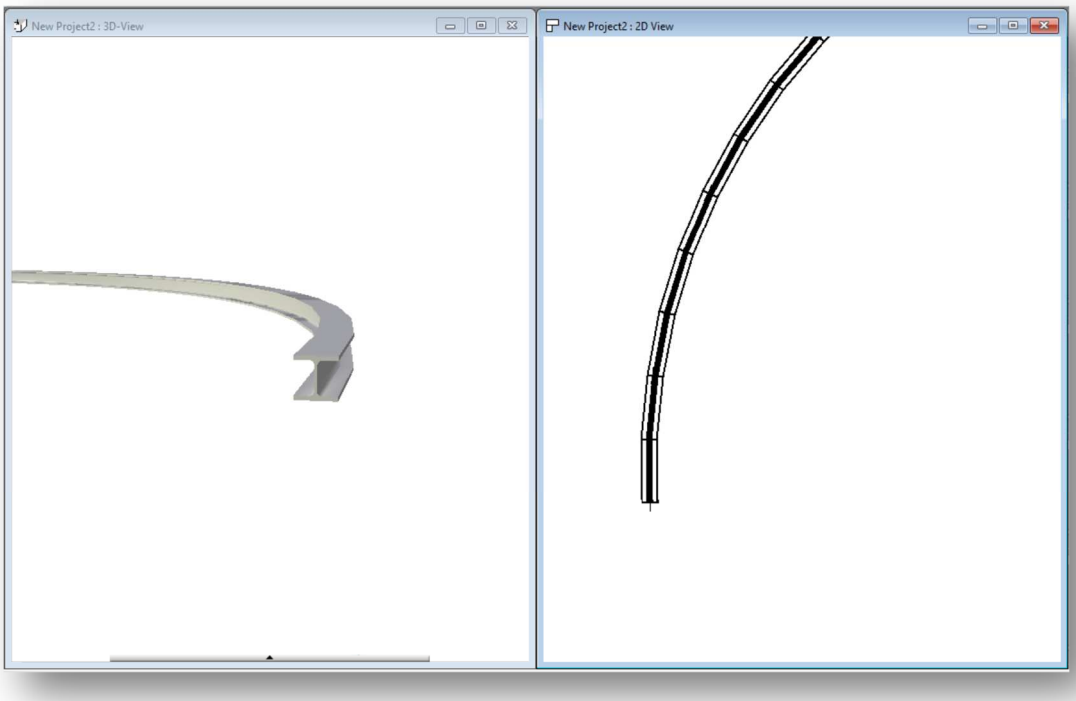
If you double click on the created object you will activate the 3D Construction dialog with a Sweep solid tab. Here you will see the default rectangle profile.



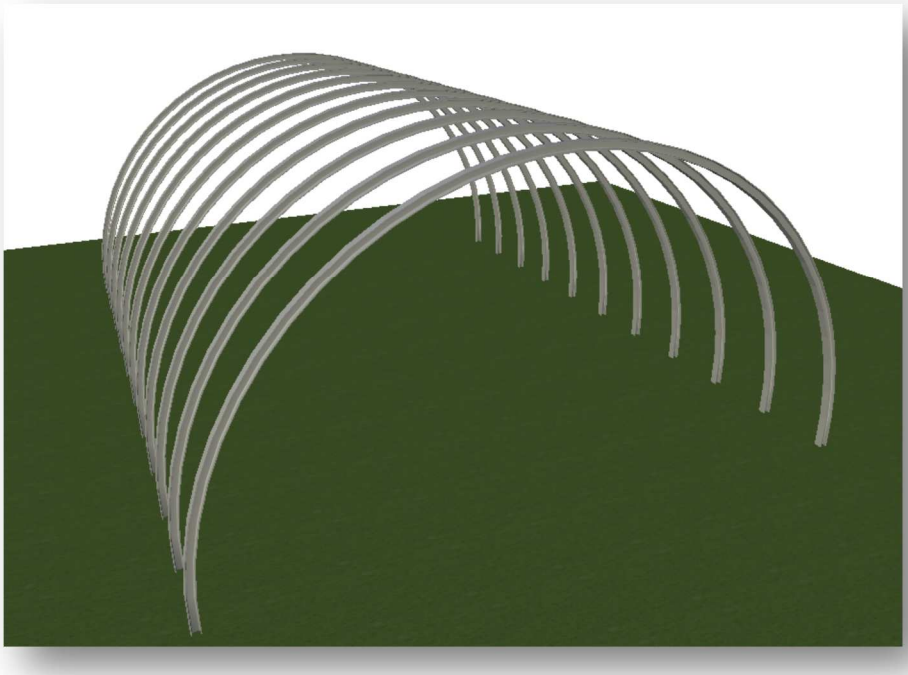
You can select any profile from the from catalogue, as we have in the following image where we have selected an I Beam



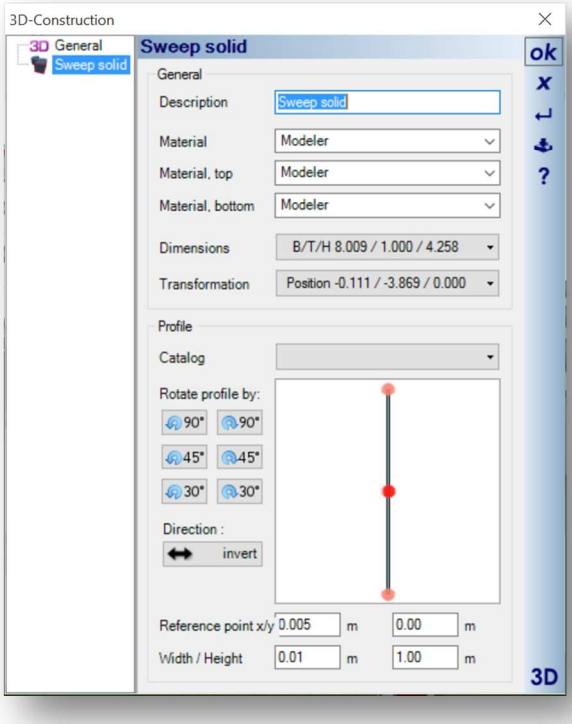
This will create the following I Beam shape that follows are curve:

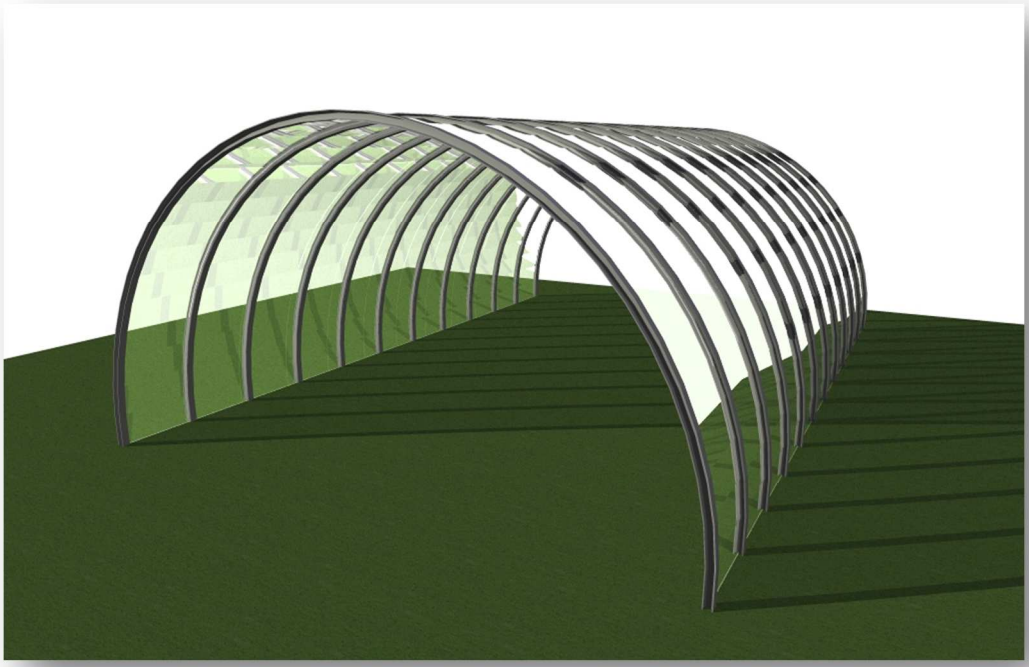


Rotate the object, apply a texture and using multi copy will quickly create:



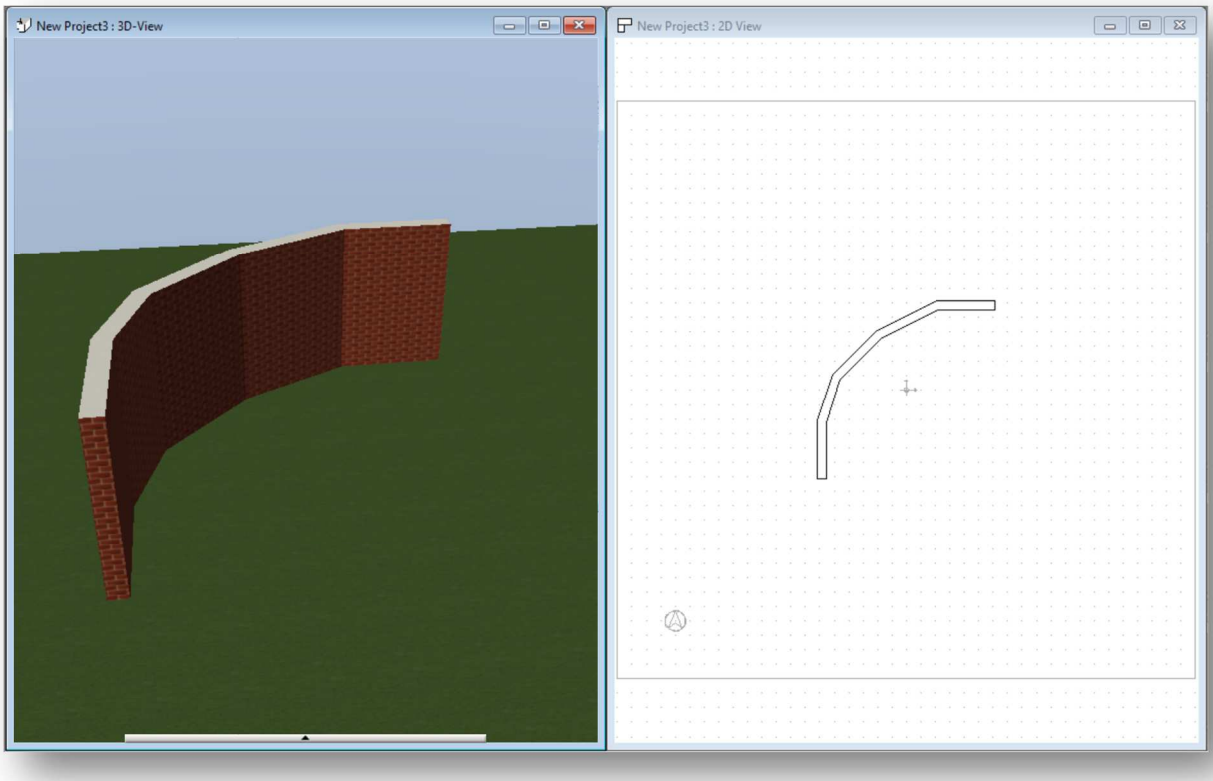
Replace one of the curved girder progile for a flat profle, and change the profile snapping point to a centre point, add a glass material, and then mulicopy the object:



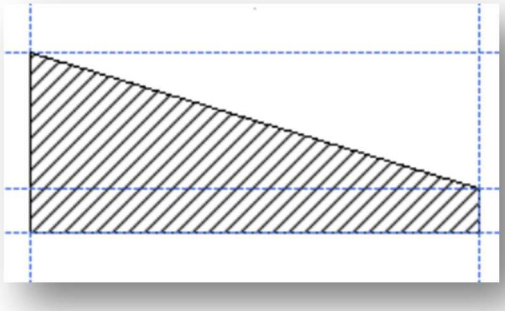


33.2 Banked Verge

This example shows how to add a banked verge to an existing wall. Consider that we have a wall section against which we want to add banked verge.



First we will draw a 2D profile of our banked verge, using the 2D closed polygon tool. Our verge is 1m wide and 0.3m high. It does not matter if you create the profile in the same project or within its own project.



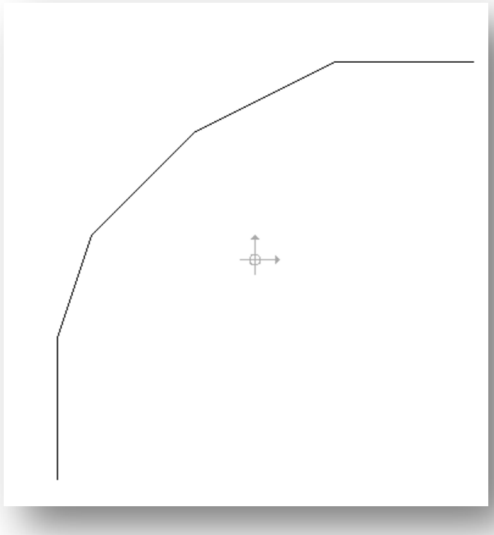
Right click on the selected 2D profile and from the activated context menu, select **Save object as 2D Profile**.

Then save the profile together with all your default profile shapes located at:

C:\Program Files\Visual Building Premium\AEC\Profiles

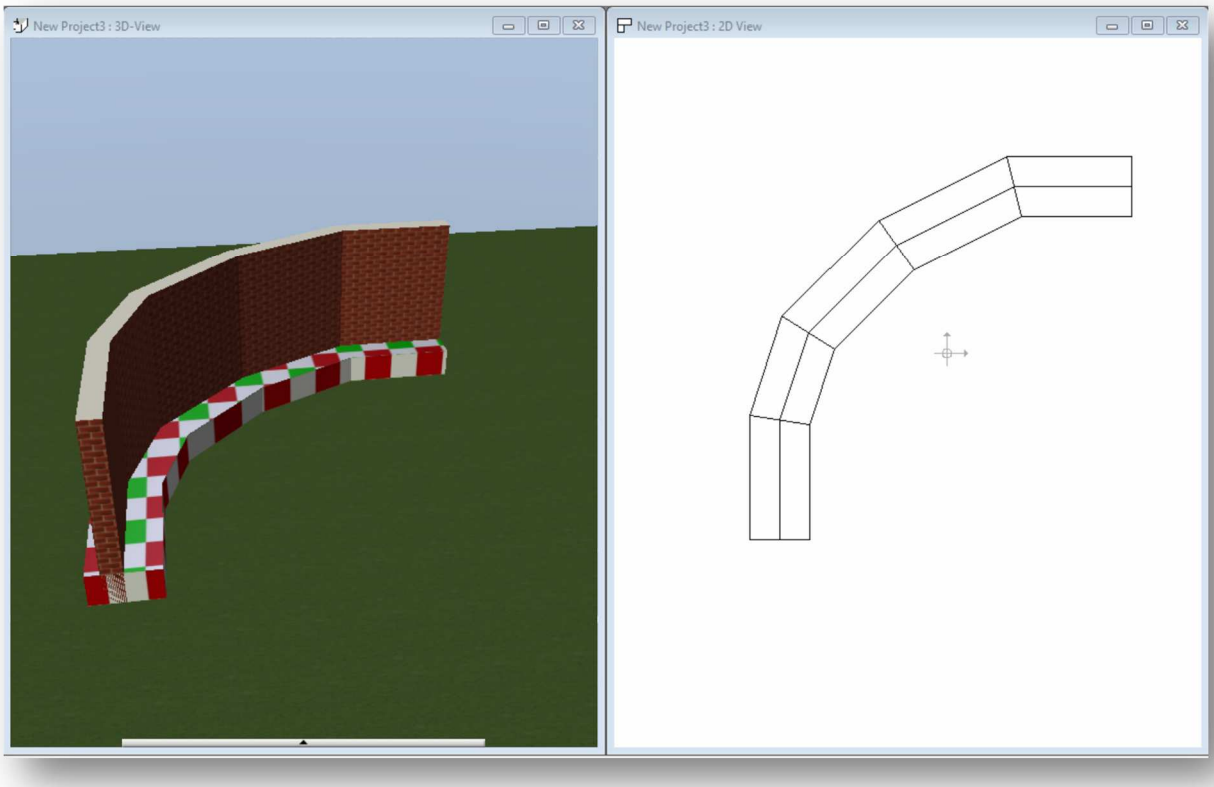
These are saved as .profile files, and will appear in the catalogue after refreshing the catalogue view.

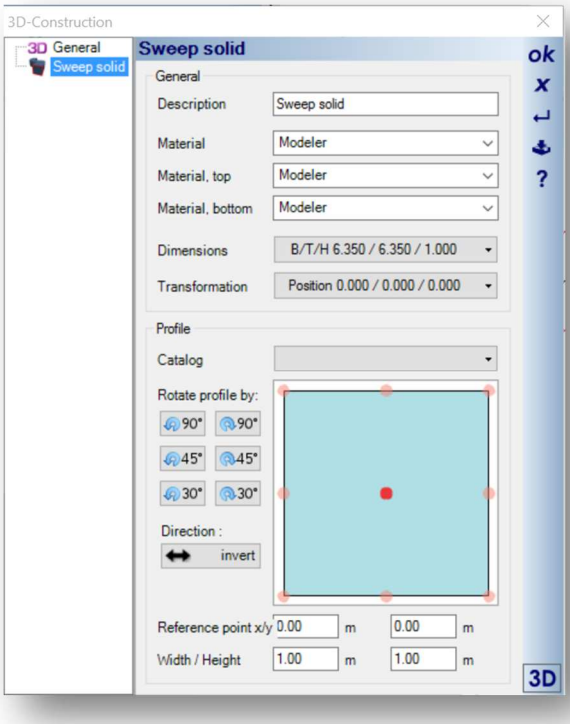
We will now use the 2D **Polygon** tool to draw the path for our profile to follow. This is achieved in the 2D view and after switching the wall off in the 2D view, you can see the path drawn.



Now select the **Construction – Sweep Solid – Select Path / Contour** tool, and then click on the path for your profile to follow. The default rectangle profile will be added in both the 2D and 3D view.

You could of course have skipped the step of inserting the polygon path separately and used the **Construction – Sweep Solid – Insert with Polygon.**

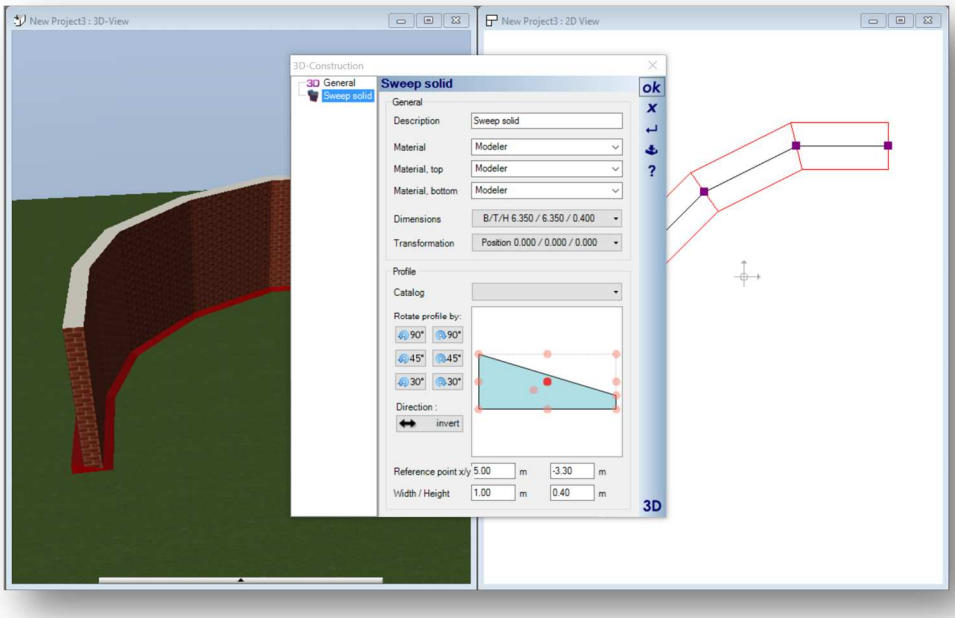


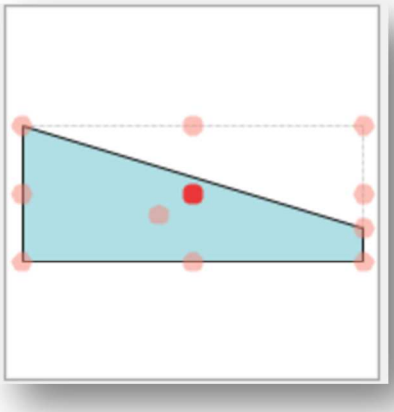


Double click on the new created object and the 3D Construction dialog will be activated showing the default rectangular profile just create.

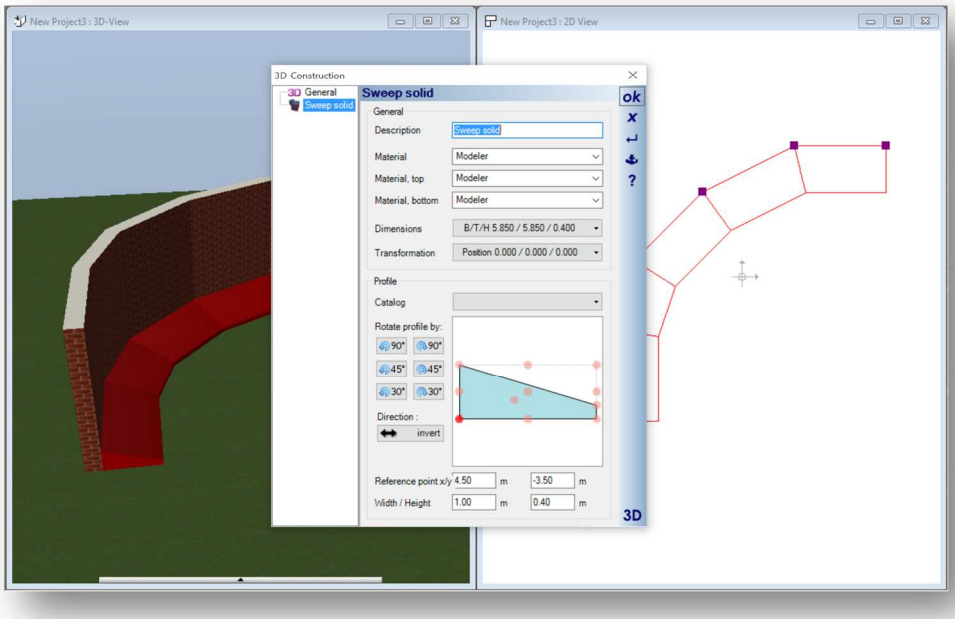
We will now replace the rectangle profile with our sloped verge profile that we recently created. This is achieved by clicking on the Catalogue button and selecting the new profile from the catalogue.

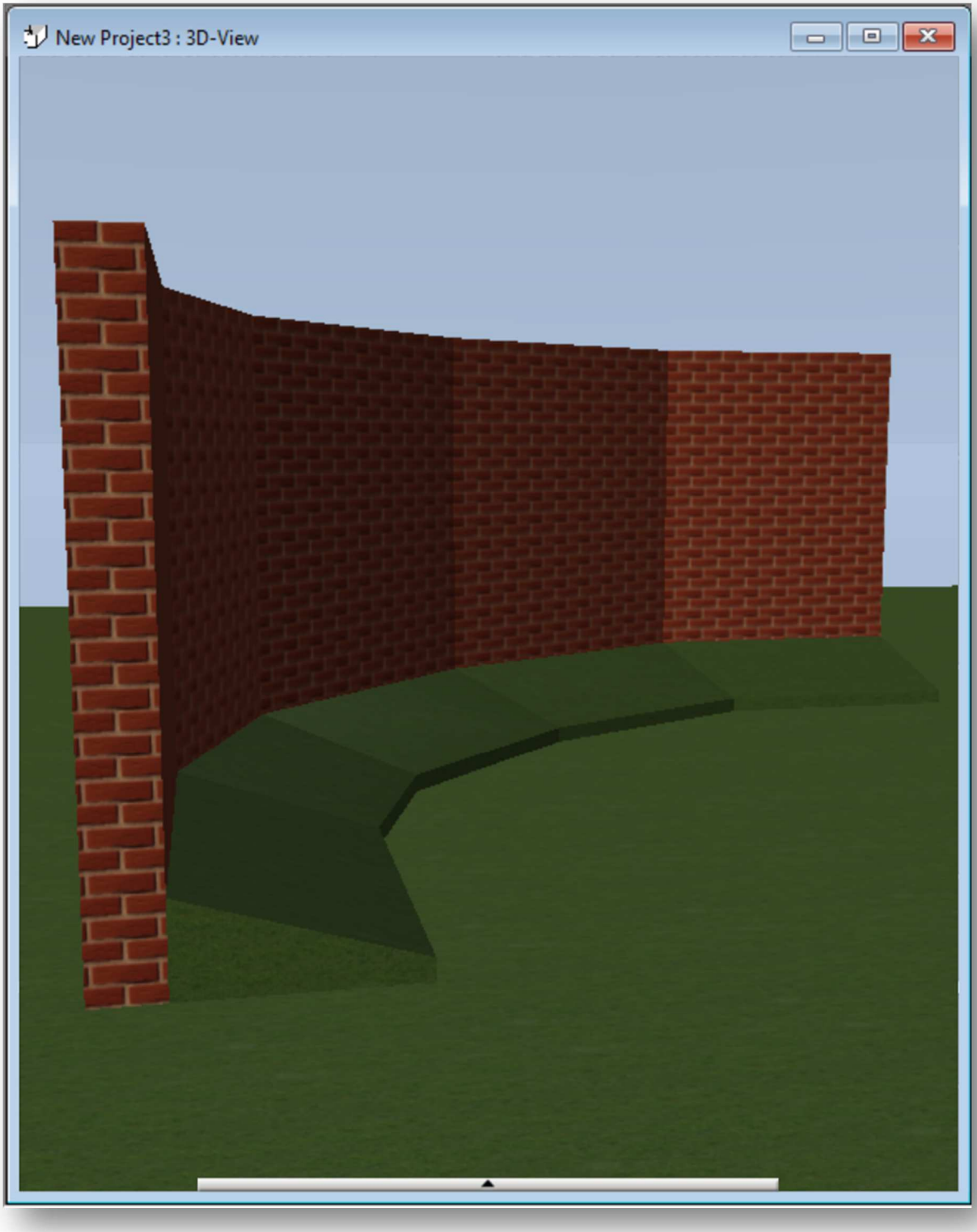
Notice however that the verge is not snapped correctly to the wall edge, which corresponds to the 2D polygon line created. That because the snapping point selected in the 2D profile is still the default centre point.





If we select the snapping point in the bottom left of our verge profile, we achieve what we want.




New Project3 : 3D-View

34 Using Advanced 3D Editing Tools

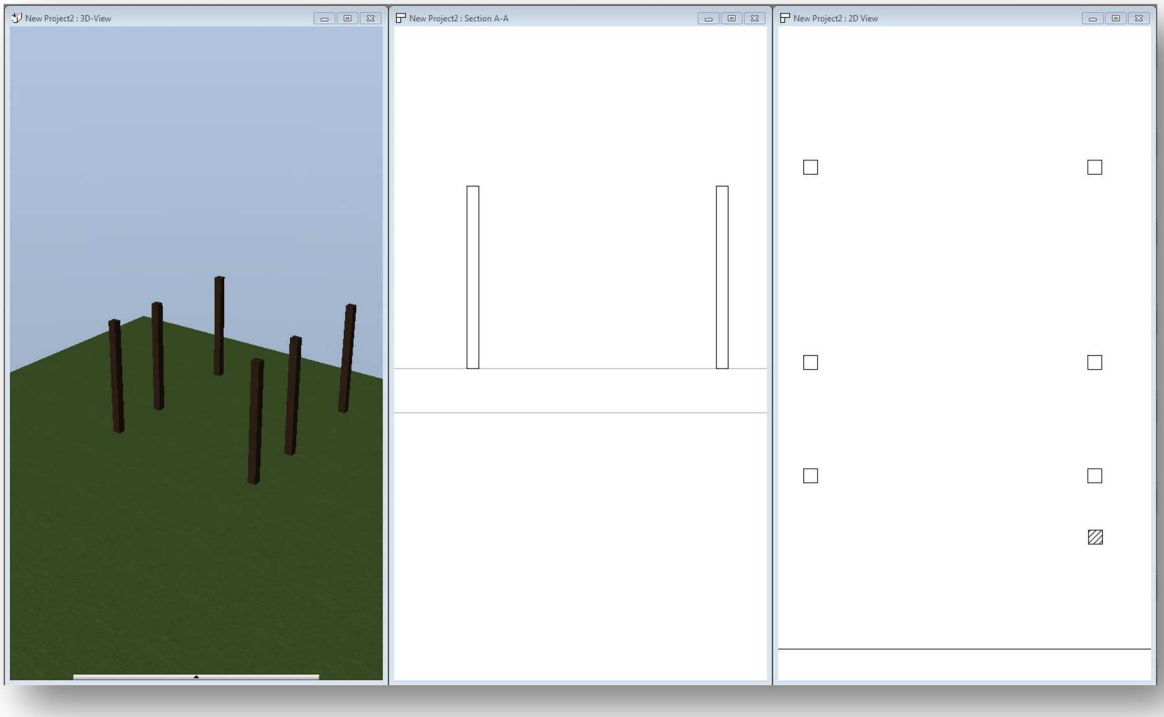
Not all building are constructed using standard construction methods and as a result not all roof constructions can be built with the standard roof designer. Take the following timber barn for example.

The posts and beams could not be constructed using the standard tools, and the wood cladding is not part of the standard wall design. We could have uses a wood texture to represent this but it's more realistic to add the cladding as a 3D object.

The first thing we do is to create the vertical posts. A 2D profile is drawn in the 2D view using the **2D Layout Rectangle – 2D drawing functions – Rectangle** tool (or Polygon tool). Select the 2D rectangle and use the **Construction – 3D Construction – Extrude solid – Extrude 2D Contour** tool to extrude the 2D object to be a 3D object.

The default 1m extrude length can be changed to 2100mm length.

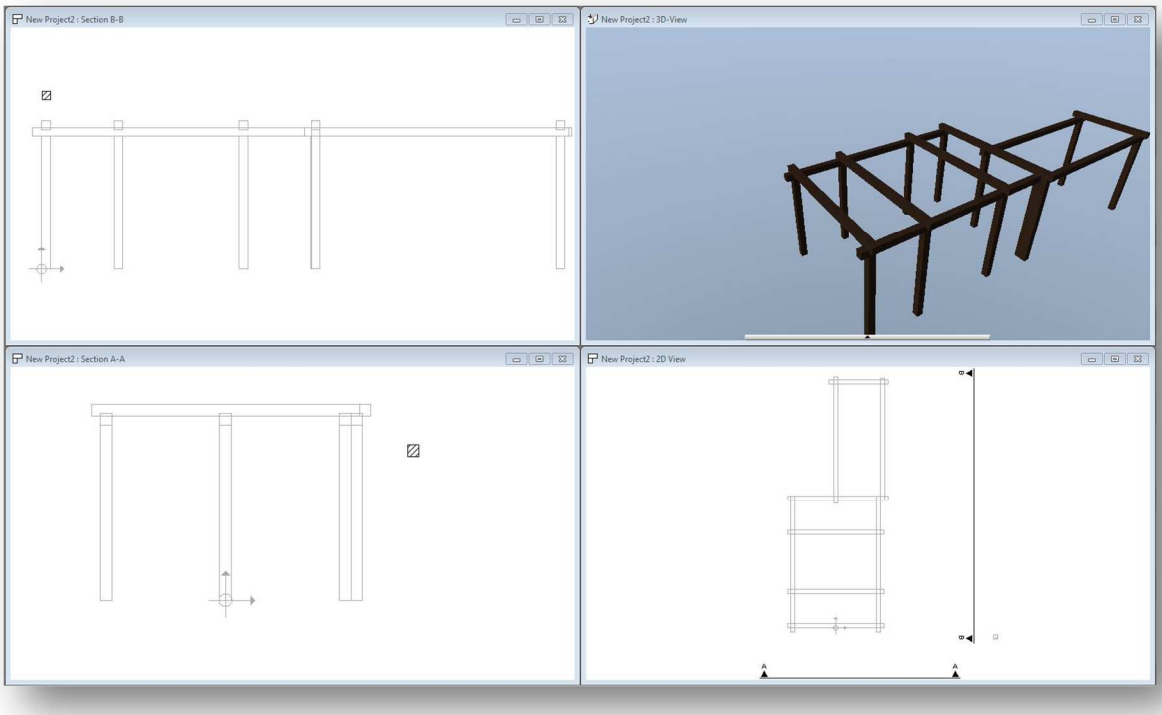
In the 2D view, you can now multi copy and place the the 6 posts, using guide lines and the **Selection – Move – Move with reference point** tool. This tool has a short cut key **r**, so you can activate the tool by selecting the object and then press the **r** key. Move and place the posts in the 2D plan view, not the 3D view.



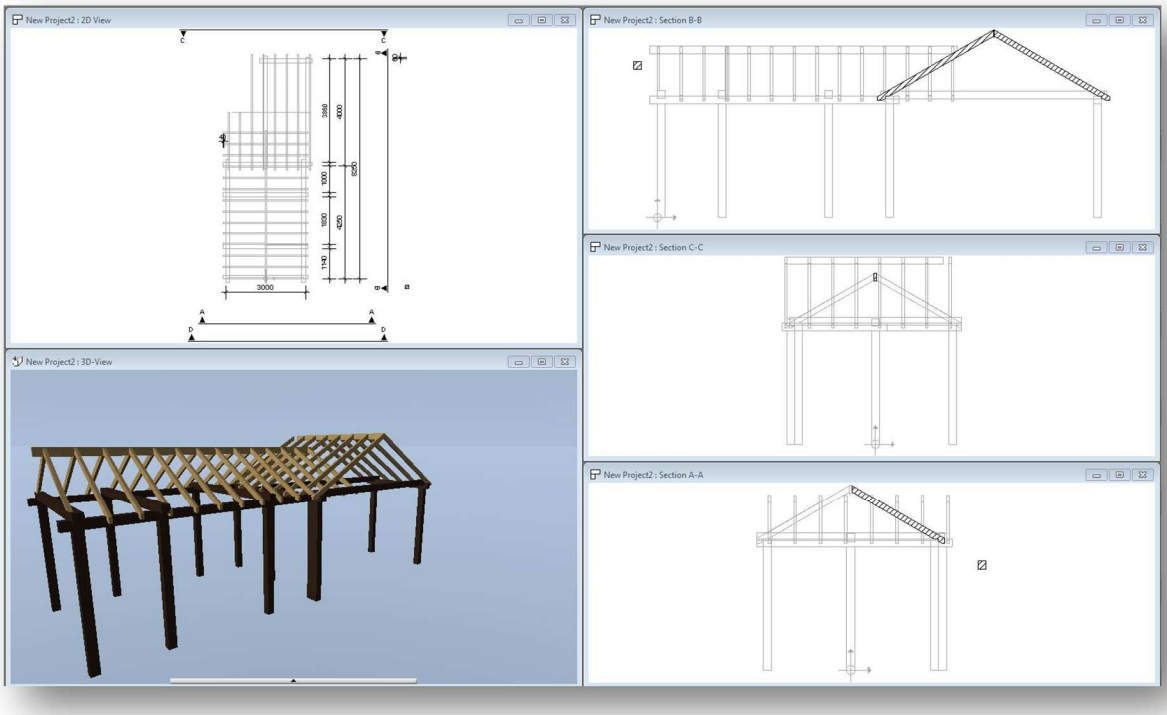
Repeat for the horizontal beams. This is achieved by creating additional elevation views, and drawing the beam profile in the elevation view.

As before, extrude the 2D beam profile into a 3D beam object.

In the 2D elevation views, you can now multi copy and place the 6 beams, using guide lines, the existing posts and the **Selection – Move – Move with reference point** tool.

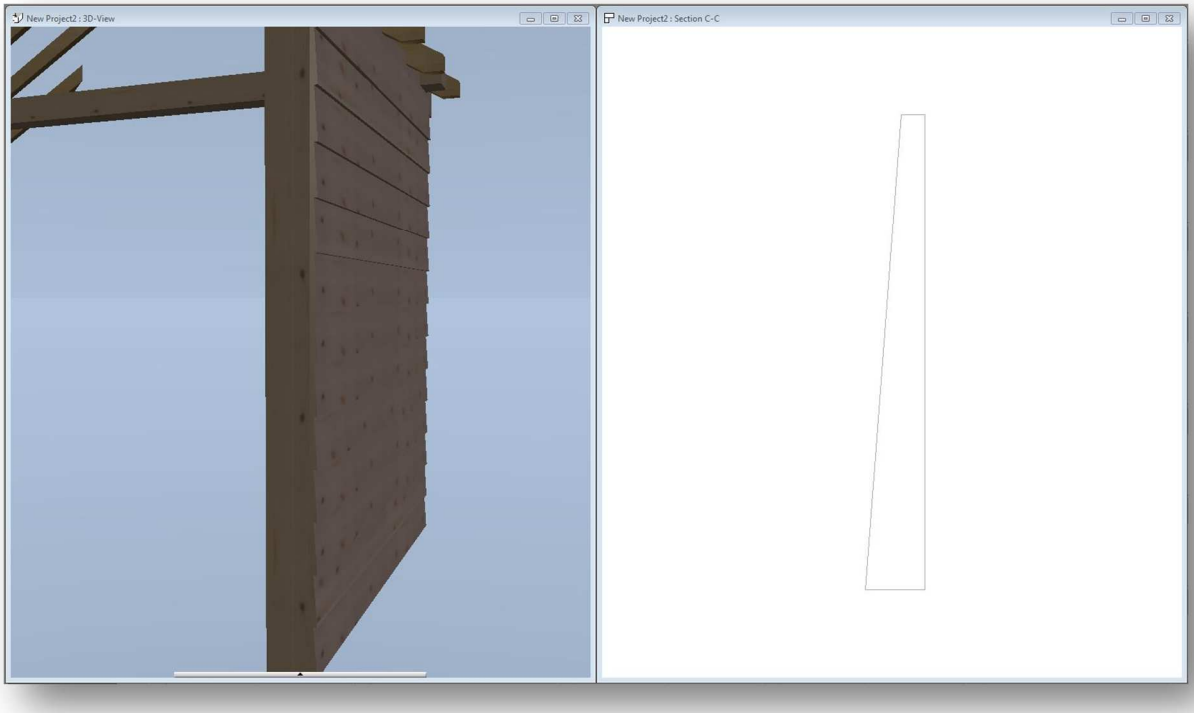


In the elevation view draw the 2D profile of a rafter and as before, extrude the 2D rafter profile into a 3D rafter object.



In the 2D elevation views, you can now multi copy and place the rafters, using guide lines, the existing posts and beams and the **Selection – Move – Move with reference point** tool.

We can now create the cladding, again as a 2D profile, and then extruding it into a 3D Object.



Use the multi-copy tool to place cladding, remembering that the cladding does overlap.

If you have doors and widows it's easier to create the entire cladded wall, insert a door frame, again using extruded objects and then using the **Edit – Edit 3D Constructions – Cut at plane** tool, so that the cladding is cut by door frame.

35 Appendix A: Frequently Asked Questions

35.1 How do I Lock my toolbars?

If you are using the old toolbar option of Visual Building, many of the screenshots used in this course may look different because you may have moved the toolbar. New users may accidently move the toolbars without realising. Until you are familiar with the toolbar layout, it is sometimes best to lock them in place, so they are then always where you expect them.

To lock your toolbars, right click on an empty area within the top toolbar area. At the bottom you will find an option to lock all toolbars in their current position.

Also this is the place to look if a toolbar has also been accidently disabled.

35.2 How do I reset my toolbars to their original position?

The toolbar position and other user defined defaults are stored in the **userConfig.xml** file

C:\Users\YOUR NAME\Documents\PPROGRAM NAME**userConfig.xml**

You can recover / reset your tool bars as follows:

You can delete or rename the **userConfig.xml** and **userConfig.bak**, while your program is not running. When you restart the program, a new default file will be automatically created, and all your tool bars will be in their original installed positions.

Note however that you will lose any other saved defaults that you may have saved.

35.3 Creating new Windows

Normally new windows can only be created with the Windows Construction Editor, however…

You may want to create your own style of windows based upon the standard styles found in the catalogue.

The window catalogue can be viewed in several ways:

a) Using the Window dialog activated by right clicking on the Window icon in the tool bar.

   Here you can browse the catalogue, change sizes and window component details. You can then save these details to be the new default for that specific window.

b) Double clicking on a placed window in a plan will also activate the Window dialog

c) Use the Catalog tab to browse through the catalogue. The same windows viewed via the Windows dialog can be found in the Window construction folder.

   You can drag the windows onto a wall in your 2D plan or 3D View. Further editing of the window is then possible by double clicking the placed window.

Using the Windows file explorer you can navigate to the folder where these windows are located:

C:\Program Files (x86)\Visual Building Basic 4\AEC\WindowConstructions

These are the files as installed. You can copy these .con files and rename the new .con file.

Using method 4, you can create a new file, and locate it using the Window dialog using method 1 or 2. Change the windows properties and save them using the Set default. The changes will only affect the copy and not the original window.

Each window has multiple properties that can be edited, however advanced editing and new style windows can only be achieved using the Window Construction Editor, available in Visual Building Premium. Any version can use the windows created with the Window Construction Editor- just copy the .con files to C:\Program Files (x86)\Visual Building Basic 4\AEC\WindowConstructions

35.4 Where are my project / catalogue files located

The Windows operating system determines where you can and cannot save files. This can be sometimes confusing, due to part of the operating system called **User Account Control.**

A full explanation of the UAC can be found at shttp://technet.microsoft.com/en-us/library/cc709691%28v=ws.10%29.aspx, but this control results in the following:

When you install your program on Window 7, the programs are normally installed at the following default path location:

C:\Program Files\Program Name for a 32bit system
C:\Program Files (x86) \Program Name for a 64bit system

This is the default path and can be redefined at installation time.

Your sample project files are located in the install path **\Projects**

The original object catalogues are located in the install path **\Objects**

The original texture catalogues are located in the install path **\Textures**

The original 2D object files are located in the install path **\Graphics2D**

The original background image files are located in the install path **\Backgrounds**

The original material lists files are located in the install path **\Materials**

The original Window Construction files are located in the install path **\AEC\Window Constructions**

The original Wall Layout template files are located in the install path **\AEC\Layouts**

Normally programs cannot write into the install path as it is protected by the UAC, and an alternative set of folders are located at:

C:\Users\YOURNAME\Documents\PROGRAM NAME

You can however giver your program permission to access the installed path name by giving it permission. This is achieved by locating the main program .exe file, right clicking the file, select **Properties** menu, and then select the **Compatibility** tab, then check **Run this program as administrator**.

36 Appendix B Reference UK

36.1 Brick Sizes

Standard brick:

215 x 102.5 x 65 mm (add 10mm on each side for mortar)

36.2 Block Sizes

Standard block face:

440 x 215 mm
440 x 140 mm

With thickness 75, 90, 100, 140, 150, 190, 200, 215 mm

Foundation blocks:

440 x 215 mm
440 x 140 mm

With thickness 224, 275, 305, 355 mm

36.3 Block Types and Uses

36.3.1 Solid

Normally 440 x 140 x215mm used for load bearing and external face work.

36.3.2 Hollow

Open at both ends. Can be used for vertical reinforcement

36.3.3 Cellular

Closed at one end. Lighter and cheaper than solid blocks.

36.4 Door Sizes

Doors are now available in bespoke sizes, but for many rears were available in standard imperial sizes.

36.5 Window Sizes

Windows are now available in bespoke sizes, but for many rears were available in standard imperial sizes.

36.6 Stair Rule

- Riser + Tread = 17.5 inches: 7.5 inches for the riser height; 10 inches for the tread depth.
- Riser * Tread = 75 inches.

- 2(Riser) + Tread is greater than or equal to 24 inches (minimum threshold) or less than or equal to 25 inches (maximum threshold).

36.7 Metric Paper Sizes

Format Size	A Series mm	A Series mm	A Series mm
0	841 x 1189	1000 x 1414	917 x 1927
1	594 x 841	707 x 1000	648 x 917
2	420 x 594	500 x 707	458 x 648
3	297 x 420	353 x 500	324 x 458
4	210 x 297	250 x 353	229 x 324
5	148 x 210	176 x 250	162 x 229

36.8 Wall Type Terminology

Throughout the documentation we make reference to different wall types. Here is our meaning:

36.8.1 Unconventional to fill cavities

Non-Standard cavities – fillable narrow cavities less than 50mm wide

Standard cavities – some issues

High rise walls, or high exposure to wind and rain

Non-standard cavities – to be left unfilled

E.g. Timber frame construction where studwork cavity contains insulation and the masonry cavity does not contain insulation.

20.8.2 Filled cavity walls

Fully filled

Masonry cavities that are already filled

Partial fill

Masonry cavities where insulation had installed to a fraction of the cavity width

20.8.3 Solid walls/other – not fillable

Solid masonry wall

Typically a brick, stone or in-situ concrete wall with no significant cavities. These cannot be filled.

Solid walls/other – fillable

Timber frame uninsulated studwork. The studwork cavity could potentially be filled.

Lath and plaster

A solid mass wall typically with a 40mm internal cavity between the

20.8.4 Standard cavities

A standard cavity greater than 50mm.

36.8.2 Timber Frame Sizes

No load bearing

Timber sizes 44 x 69mm finished size PSE (Planed, Square Edge), 47 x 75mm finished size sawn timber or 36 x 63mm studwork timber, for the head and sole plates, and for the studs and noggins.

When using 12.5mm plasterboard the studs must be at maximum 600mm centres.

If using 9.5mm plasterboard the studs must be spaced at maximum 400mm centres. Plasterboard standard sheet size is 1200 x 2400mm.

Typical timber sizes:

External Wall Panels : (Treated) 38x140mm.

Prefabricated Panels - 38x140mm

External Boarding - 9mm OSB (Orientated Strand Board) nail fixed to the timber studwork.

Head Plate - 38x140mm

Window/ Door Closers - 38x89mm

36.9 Scaffold Pole Sizes

Feet	Metric
5	1.5
6	1.8
8	2.43
10	3.0
13	3.9
16	4.86
21	6.4

Index