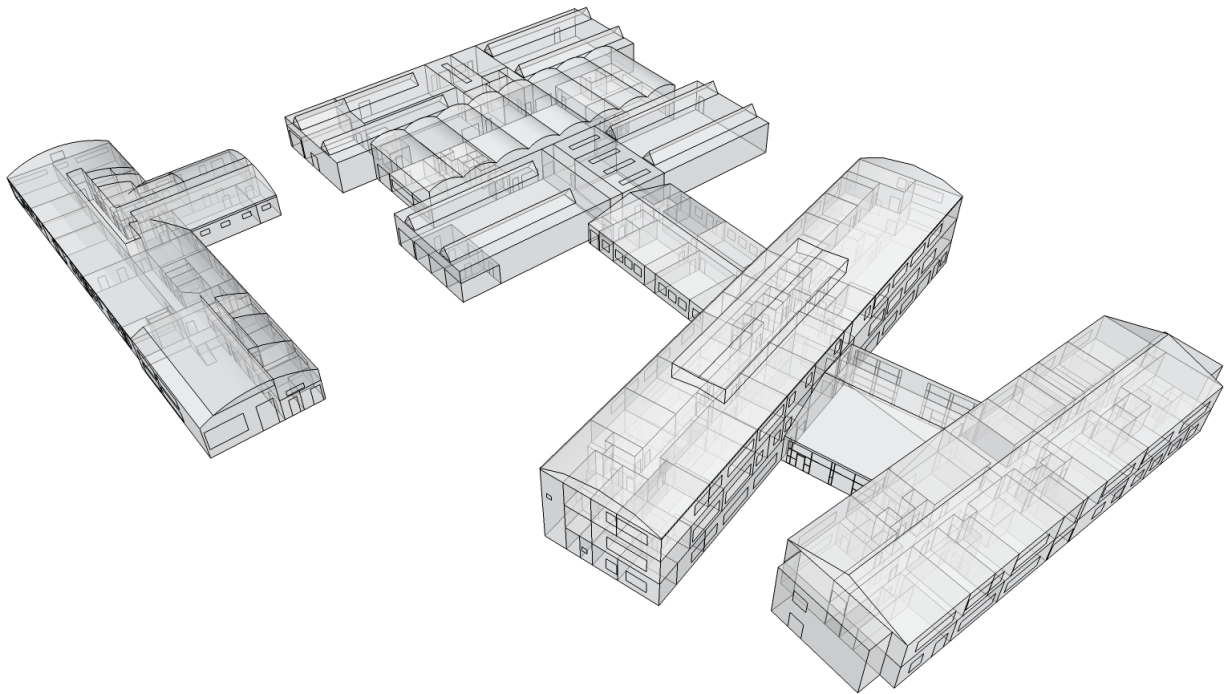




greenspace**Live**™



gModeller™: User Guide

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1. gModeller – How to model your building

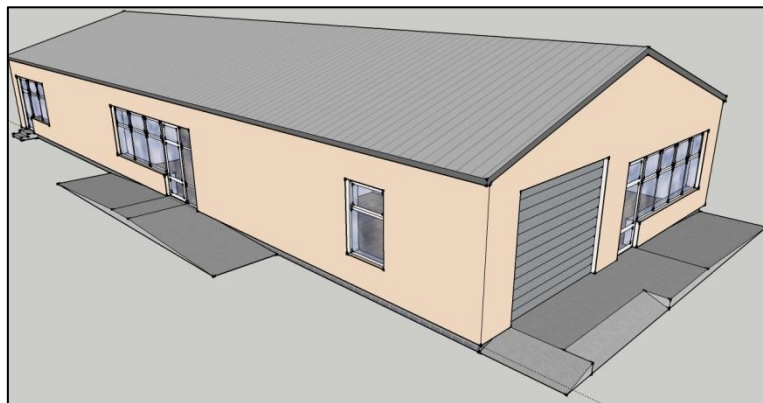
1.1. Introduction

This guide will take you through the process of modelling your building in Google Sketch Up for the purposes of gModeller. There are various methods that a Sketch Up user may adopt when generating their model but this guide will cover a step by step process to follow and highlight best practices when modelling for gModeller purposes.

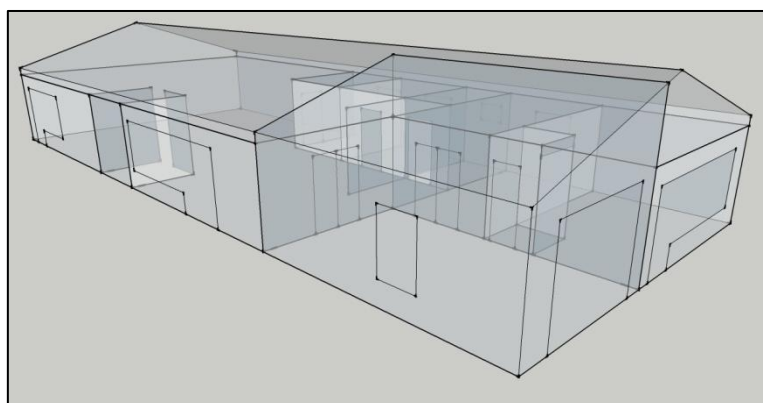
The process and methods described in the guide are also best practice for minimising the risk of creating mistakes and potential problems which you may encounter when modelling your building.

1.2. Level of detail required

It is very important to understand the level of detail required when modelling your building for the purposes of gModeller. Shown below is a typical detailed building created using Google sketch up.



A building model of this level of detail is not suitable for gModeller. A much simpler, less time consuming model is required to give an appropriate gbXML representation of your building. Below is the same building as before but with the level of detail required for generating a gbXML of your building using gModeller.

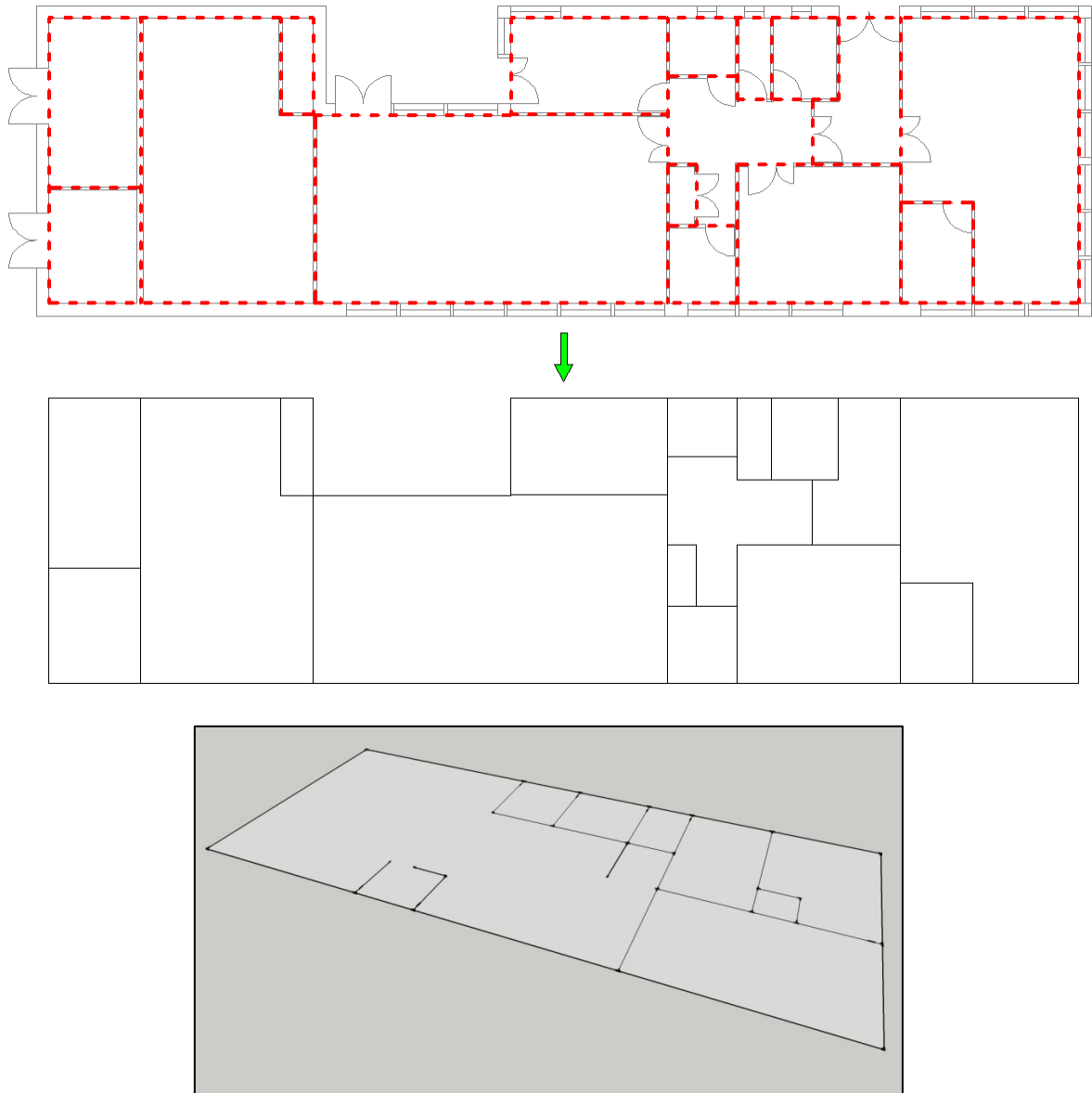


The reason for this simplified building model is that gModeller only requires a single face whether it is a wall, floor, roof etc for applying building information to.

1.3. Revising Floor Plans

1.3.1. Simplifying

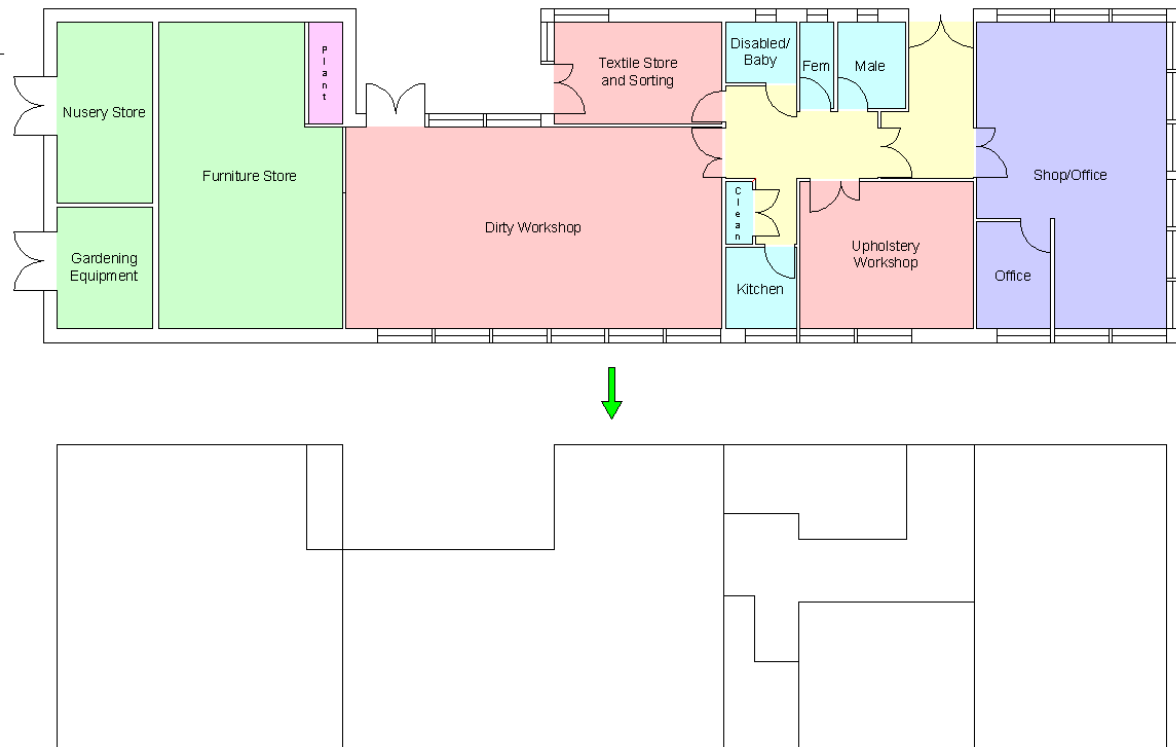
The first task is to simplify your building plans. The fabric of your building will be made up of single surfaces meaning that walls, floors etc depths will not be modelled therefore you are required to simplify your floor plans taking the centrelines of all internal walls and the inside line of all external walls in order to achieve as accurate zone areas and volumes as possible as shown below.



1.3.2. Zoning

It is important to minimise the number of surfaces and zones your building.

It is advisable that you merge adjacent zones if they are of the same activity/use. This is particularly important when modelling larger buildings in order to speed up the modelling and energy analysis process while minimising file size and data input.



1.3.3. 2D CAD imports

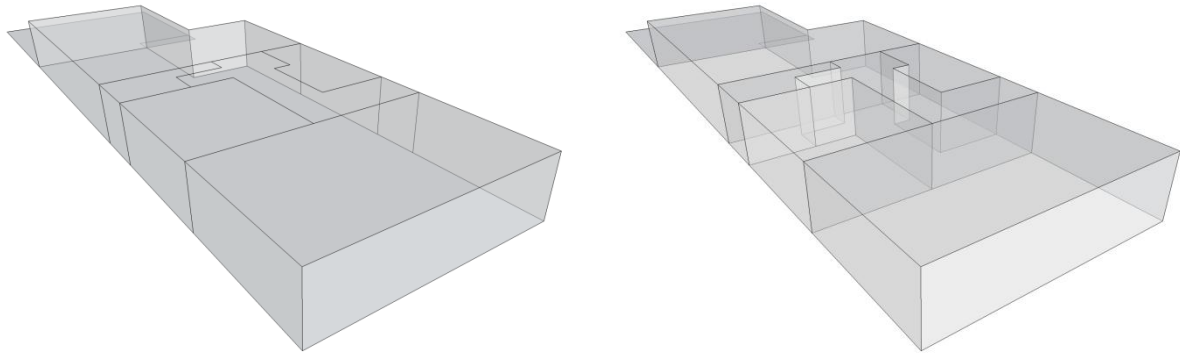
Google Sketch Up Pro allows you to import dwg or dxf files which can be generated with software such as AutoCAD from Autodesk meaning you can save modelling time by importing existing 2D drawings which can be exploded and used to model your building or used as a guide. The free version of Google Sketch Up does not have this capability but there is a plug in you can download from Google which allows you to import dwg/dxf files.

1.4. 3D Model generation

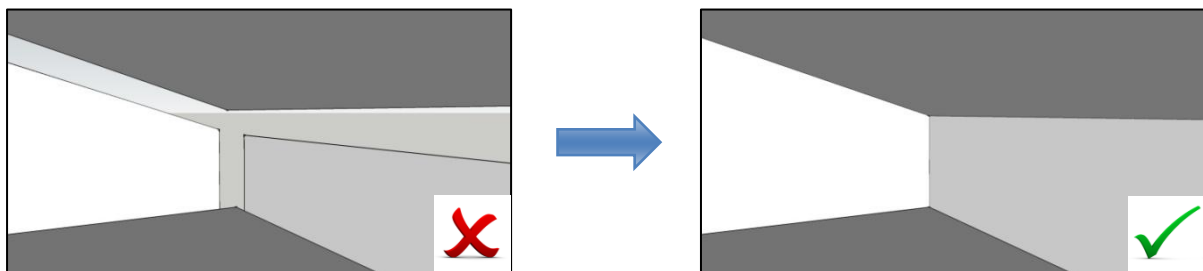
1.4.1. Extruding Surfaces

Once you have your revised floor plans you are then ready to begin creating your 3D building model. The building envelope can be modelled in a variety of ways depending on the preference of the user i.e. by extruding the multiple faces created by the floor plan or by using the floor plan and drawing the different planes through use of line tools.

We recommend that you select the Sketch Up extrude tool, click on the surface you wish to extrude and press ctrl and repeat the process for all surfaces on your floor plan. The reason for pressing control on extrusion is that it will also create the internal walls of your model, if you don't press control when extruding the surfaces then the internal walls will not be created as shown below.



Another reason we advise you to model your building this way is that it is the best method for ensuring that no gaps occur between faces which may occur if you are drawing all walls manually. It is also the quickest method of generating your building model.



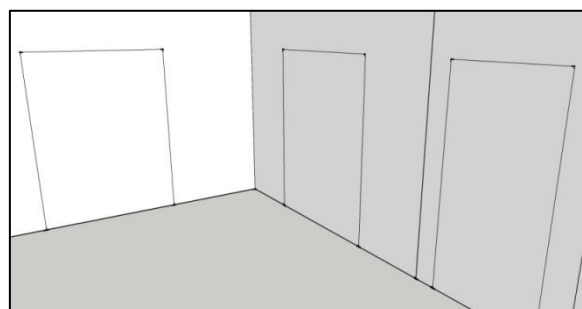
1.4.2. Components

For more complex buildings particularly, you may decide to make your building model using the Sketch Up grouping or component tool. These tools are very useful for managing and modifying your building model, however, the gModeller does work with components or groups therefore you must explode all components and groups prior to using the gModeller plug in.

If you do use components or groups when making your building model then care must be taken when exploding your model. Ensure that the components are aligned correctly to avoid gaps or any other deficiencies that may result when exploding.

1.4.3. Window & Door Openings

A potential pitfall when generating your building model is when you begin to draw openings onto the external faces of your model. You must ensure that the opening is drawn directly onto the parent face otherwise an opening will not be applied when you begin to apply surfaces using gModeller. Particular care should be taken when drawing openings on surfaces that don't run parallel to the green or red axis.

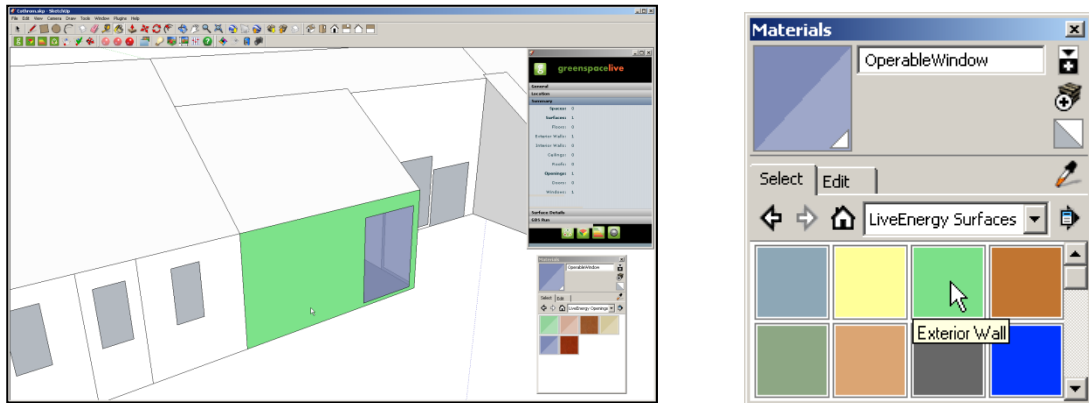


2. INTRODUCTION TO gModeller

gModeller allows you to export and import gbXML files in *Google SketchUp*.

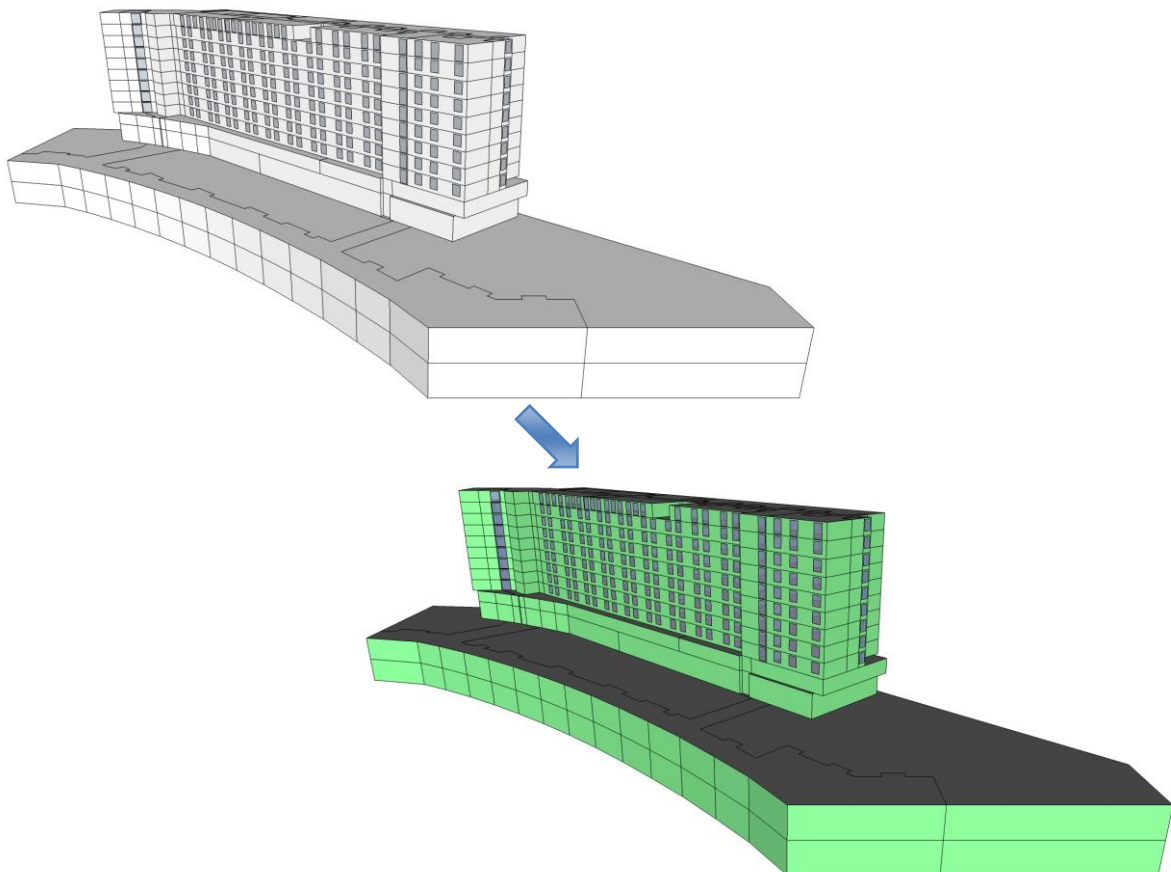
Create your building model in *Google SketchUp* following the *gModeller* guidelines in the help guide.

Apply surfaces to your model using the *gModeller surfaces and openings* palettes in Sketch Ups *paint bucket tool*.



Identify spaces in your building model using the *gModeller select space* and *create space* tools.

Once you have assigned all your surfaces and identified all your spaces you are then ready to export a gbXML of your building Model.



3. GETTING STARTED

3.1. Downloading gModeller

It is advisable that you download *Google Sketch Up* (<http://sketchup.google.com/>) prior to downloading the *gModeller* plug-in (<http://greenspacelive.com/>) from Greenspace Live. Having downloaded the *gModeller* plug-in, the *gModeller toolbar* and *Greenspace Live interface* should be visible every time you open *Google Sketch Up* once *gModeller* has been installed.

3.1.1. Switching off gModeller plug in

If for any reason you require to switch off the *gModeller* plug, on the *Google Sketch Up* menu bar go to **Window, Preferences, Extensions** and simply un-tick the **GreenspaceLive gModeller** box from the Extensions list. You will then be required to close and re-open *Google Sketch Up* for the plug in to be switched off.


3.2. Greenspace Live Interface

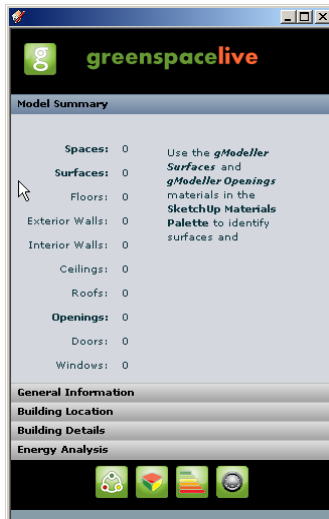
Once you have downloaded and installed *gModeller* the *Greenspace Live Interface* will appear every time you open *Google Sketch Up*. The interface displays 4 large icons each related to a different tool in the *Greenspace Live toolset*. By clicking on an icon the interface will then display data in your *Greenspace Live account* in relation to the tool selected, therefore, for *gModeller* information click on the *gModeller* to display the *gModeller interface*.



3.2.1. gModeller icon



When working in *Google SketchUp*, if you click on the *gModeller* icon  on the *greenspaceLive* interface start page, the *gModeller* interface will appear and displays the gbXML information that you have assigned to your *Sketch Up* model using *gModeller* including General, Location, Summary, Surface Details and GBS Run data.




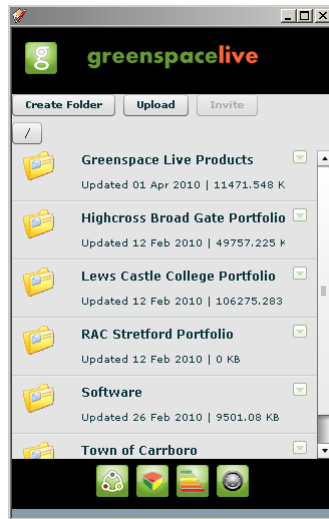
3.2.2. gEnergyEPC

The *gEnergyEPC* icon when working in *Google SketchUp*  displays all your portfolios/files from *gWorkspace* and by selecting a portfolio/file it displays all your gbXML files for the selected portfolio/file.



3.2.3. gWorkspace

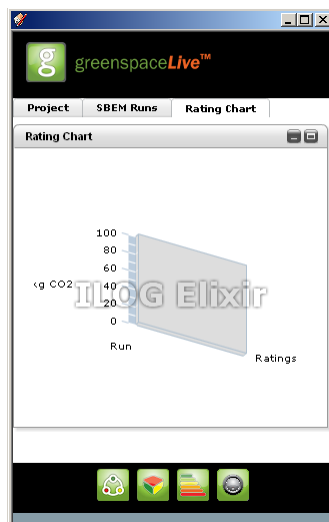
By clicking on the *gWorkspace* icon  all your gbXML and Sketch Up files in each *gWorkspace* project will be displayed when working in *Google SketchUp*.



3.2.4. gDashboard



By selecting the gDashboard icon you will be able to view your energy analysis runs for all your buildings in each of your projects that you generated in gEnergyEPC.



3.3. Modeller Interface

The *gModeller interface* will display information related to the building model you are working on at that present time in *Google Sketch Up*. If you are working within another tool from *Greenspace Live* by clicking on the *gModeller* link, all Sketch Up files will be accessible through their associated portfolio or project file.



3.3.1. General

The *General tab* on the *gModeller interface* is used for entering Building Information regarding your building model including name and description. The information under this tab is not required for *gEnergyEPC* but the information may be required for other energy analysis software.

General	
Building id	bld-1
Building Name	
Building Description	
Building Area (m ²)	0

3.3.2. Location

Like the *General tab* the *Location tab* data is only required if your intentions are for software other than *gEPC*. This section requires you to fill in the location data regarding your building model. It is advisable that you use *Google Sketch Up's* own Location entry (**Window, Model Info, Location**) and *Google earth* to determine the exact Location and orientation of your building model.

Location	
Location Name	Test
Location Address	
Building Postal Code	HS2 0XR
Latitude	
Longitude	
Elevation	

3.3.3. Summary

The *Summary tab* is an important section in the *gModeller interface*. The *Summary tab* records all the types of surfaces and openings along with the spaces that you are adding to your building model and it is recommended that you have this tab displayed when you are adding surfaces, openings and spaces to your model to ensure that they are being recorded correctly.

Summary	
Spaces:	0
Surfaces:	0
Floors:	0
Exterior Walls:	0
Interior Walls:	0
Ceilings:	0
Roofs:	0
Openings:	0
Doors:	0
Windows:	0

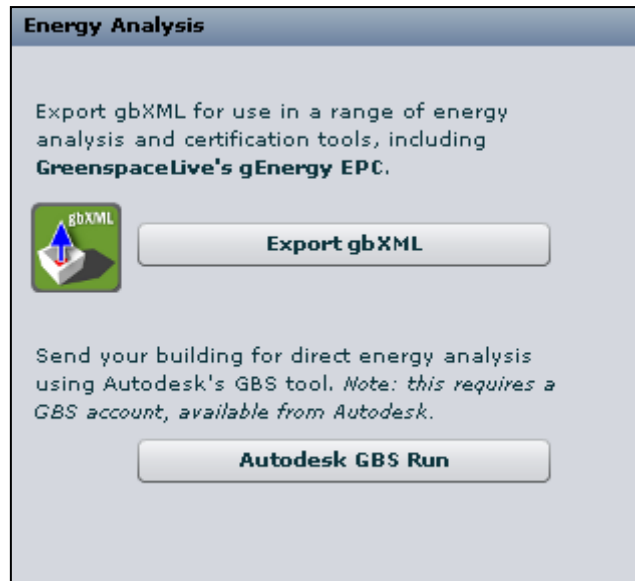
3.3.4. Surface Details

Like the *Summary tab*, the *Surface Details tab* is important when adding your surfaces, openings and spaces to your model. If you make a mistake during the populating process you can rectify the mistake by locating the incorrect surface or space added to your building model from the associated list and deleting. To allow you to easily locate when searching for a surface, opening or space in your model, by selecting one from the list, that surface, opening or space will become highlighted in your model. You can also use this section to track the spaces you are adding to your model to ensure you have added all the spaces in your building or that you have not added the same space twice.

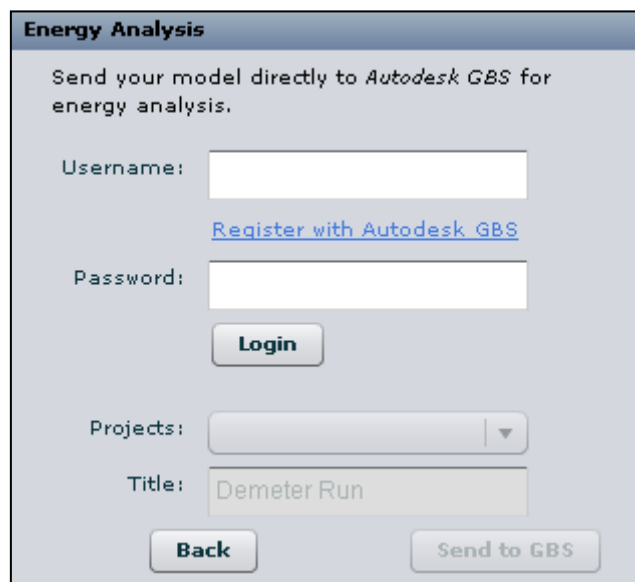
Surface Details		
<input checked="" type="radio"/> Surfaces <input type="radio"/> Openings <input type="radio"/> Spaces		
ID	Name	Type

3.3.5. Energy Analysis

From here you can export a gbXML representation of your building model by clicking on the Export gbXML button or create a direct run to *Autodesk's Green Building Studio (GBS)*.



This *GBS Run* is only applicable to users who have a GBS account as you are required to log into your GBS account through the *gModeller interface* in order to create a direct run.




3.4. Toolbar


The *gModeller* toolbar will automatically appear in Google SketchUp once you have downloaded and installed the *gModeller* plug in.





3.4.1. Greenspace icon


The Greenspace icon  opens the *gModeller* interface if closed or reverts back to the *Greenspace Live* toolset start page if you have navigated away from it. To open the *gModeller* interface from the start page simply click on the *gModeller* icon.





The Export gbXML tool  exports a gbXML representation of your building model once you have applied all your gModeller surfaces, openings and spaces to your model.

The Import gbXML tool  allows you to import a gbXML into Google SketchUp. This gbXML import functionality is not limited to gbXML's generated in SketchUp using gModeller. It can import gbXML's generated with any other modelling tool such as Revit or ArchiCAD.


The Select Space tool  is an automatic space selection tool you can use when adding spaces to your model. This will save you from having to select each surface of the desired space manually. If the select space tool fails to recognise all the surfaces of your space a warning will appear and you can add missing surfaces by holding control and selecting the surface using SketchUp's select tool. The select space may sometimes select a surface outside the desired space so ensure that you have checked that the space has been identified correctly before creating the space; select space manually if the select space fails to recognise boundaries of the desired space.

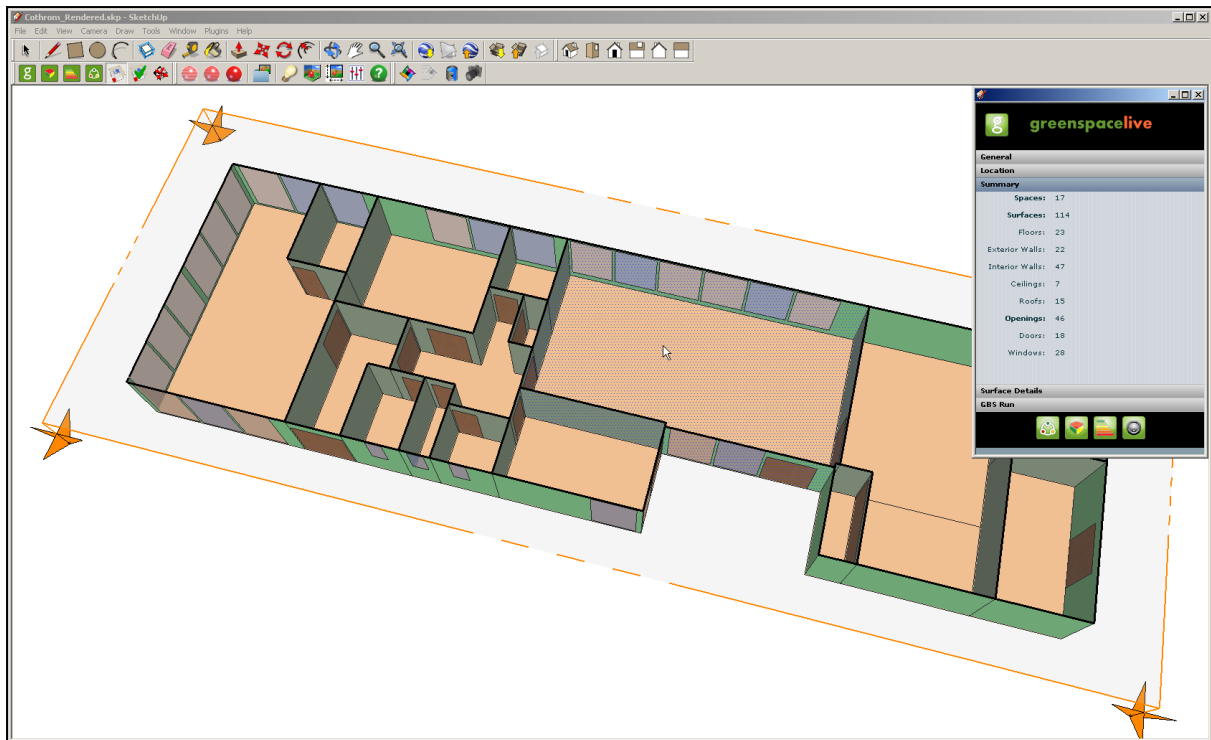
The create Space tool  is selected when a space has been highlighted manually or by using the select space tool successfully and records the space in the gModeller interface. You will be asked to name the space before the space is recorded in the gModeller interface.

The Move Plane tool  allows you to move a section plane when adding spaces to your model without distorting the model which would result from trying to move the section plane using SketchUp's own move tool.



The Create Plane tool  is one of Google SketchUp's tools which allow you to view the internal areas of your building model. It is located on the gModeller toolbar for convenience sake as it will be required when you start adding spaces to your model.

4. Section Plane Tool


An essential tool when using the *gModeller* plug in is Google Sketch Ups own *section plane tool* which is found on the menu bar under **Tools, Section Plane** or by clicking on the *section plane* icon  on the *gModeller* toolbar. Once you have made your building model you can use the *section plane tool* to view internal elements and allows you to easily add *surfaces, openings and spaces* to the internal faces of your building model.

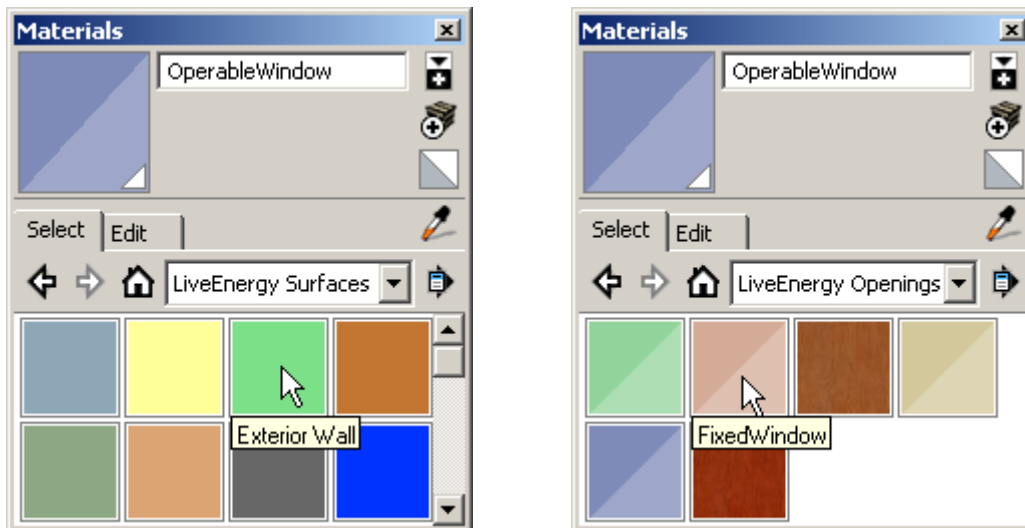


The *section plane* can be deleted using Sketch Ups select tool and clicking on the *section plane* and pressing delete on your keyboard.

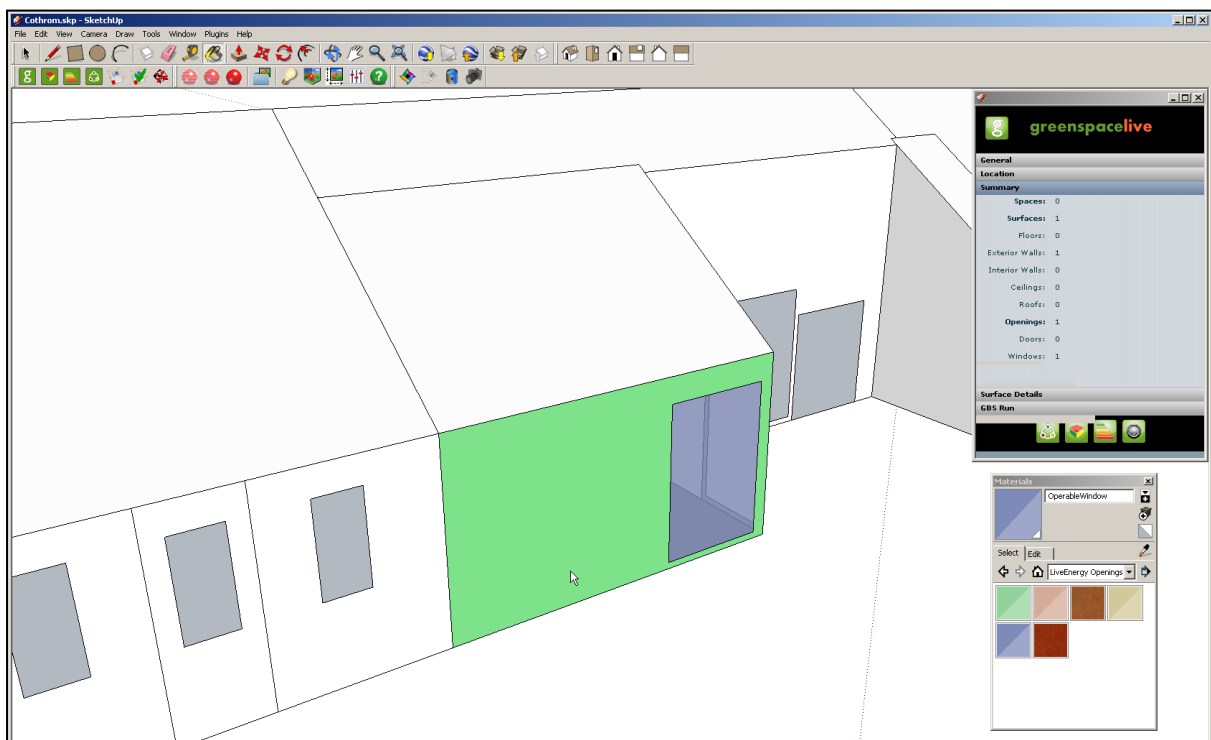
The *gModeller* *move plane tool*  allows you to move the *section plane* without distorting the building model when you are in the middle of identifying a space in your building model which would occur if you tried to move the section plane with Google Sketch Ups own *move tool* .

5. Assigning Surfaces and Openings

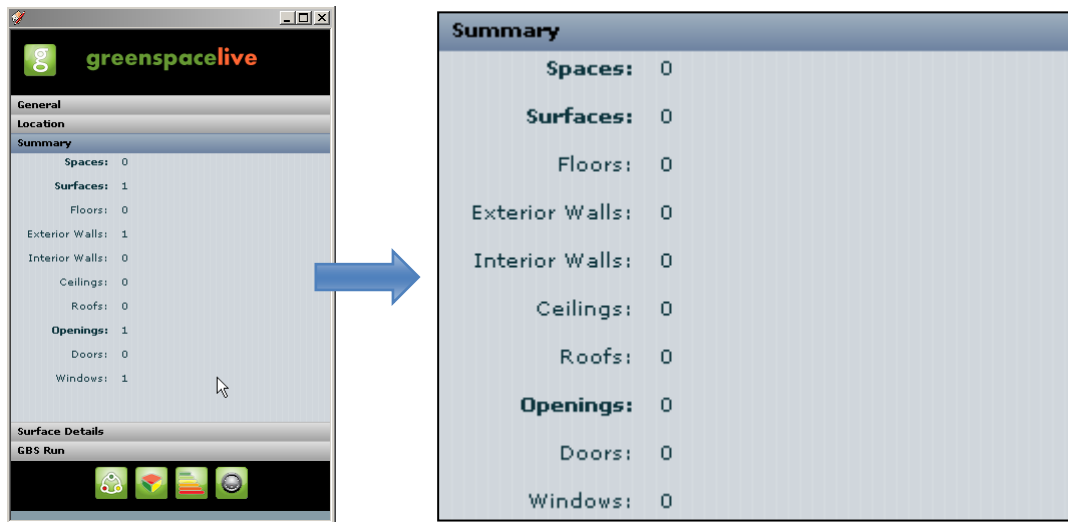
The first task involved in generating your gbXML using *gModeller* is to *assign surfaces and openings* to it. This means telling the *gModeller* where the walls, floors, windows etc are in your model and this is done using Google Sketch Ups own *paint tool* . When you download and install *gModeller* two new folders are automatically added to the paint tools *materials palette*. The folders are named *gModeller surfaces* and *gModeller openings* and each contain a variety of surface types to be applied to your model using the *paint bucket tool*.



To apply the surfaces select *the paint bucket tool* and select your desired *surface material* and click on the surface of your model you wish to assign that surface type to.



If assigned correctly the surface of your model will change to the colour of the associated material selected and under the *summary tab* on the *gModeller* interface an extra surface or opening will be added to the associated surface type.




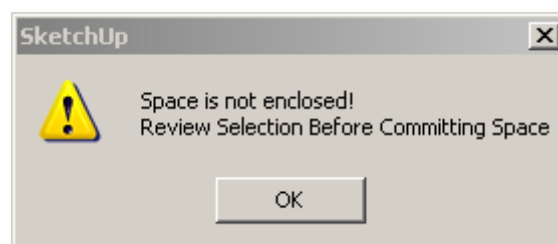
It is recommended that you apply *gModeller surfaces* prior to adding *gModeller openings* and it is also recommended that you assign all openings to their parent surface prior to saving and closing your building model to ensure that *gModeller* recognises an opening in a surface i.e. if you add an external wall surface which has an opening, ensure you apply a *gModeller opening surface* to that opening prior to closing and/or saving your model.


6. Adding spaces to your building model

Having assigned all your surfaces and openings to your model, the next task is to *add spaces* to the model.

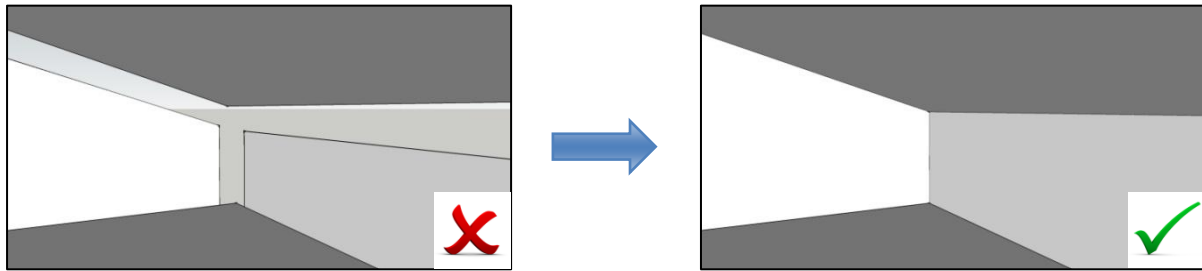
6.1. Select Space

The *select space tool*  enables you to quickly select an individual space in your building model. It automatically detects all the surfaces of a space when you double click on the floor surface of that space, saving you from having to select every individual surface of the space manually. However, this automatic space selection tool does not always detect every surface of the space and a warning may appear on your screen if this is the case telling you that the selected space is not enclosed.




To include the missing surfaces of the space, hold **ctrl** and use the *select tool*  to add the missing surfaces to the space you wish to create. Another reason this warning may appear is that



there could be a gap between two surfaces and to avoid this care must be taken when building your model and by examining spaces prior to assigning surface, openings and spaces to your model.



6.2. Create Space

Having selected your space, save the space by clicking on the *create space icon* . Once you've clicked on the *create space icon* you will be asked to name the space. To ensure that the space has been added, select the *summary tab* on the *gModeller interface* and the space should be listed along with any other spaces you have added to your building model.

6.3. Moving Section Plane

The *gModeller move plane tool*  is an essential tool for when you are identifying spaces in your building model. It allows you to move the *section plane* without distorting the building model when you are in the middle of identifying a space in your building model which would occur if you tried to move the section plane with Google Sketch Ups own *move tool* .

7. Exporting/Importing your gbXML

7.1. How to export your gbXML

Once you have applied all your surfaces, openings and spaces to your building model you are ready to export your gbXML. This can be done via the menu bar, **Plugins, gModeller, Export gbXML**. You will then be required to name and save your gbXML.

7.2. Importing a gbXML file

You can import a gbXML file into Google Sketch Up by going to **Plugins** on the menu bar, **gModeller**, and selecting **Import gbXML**.