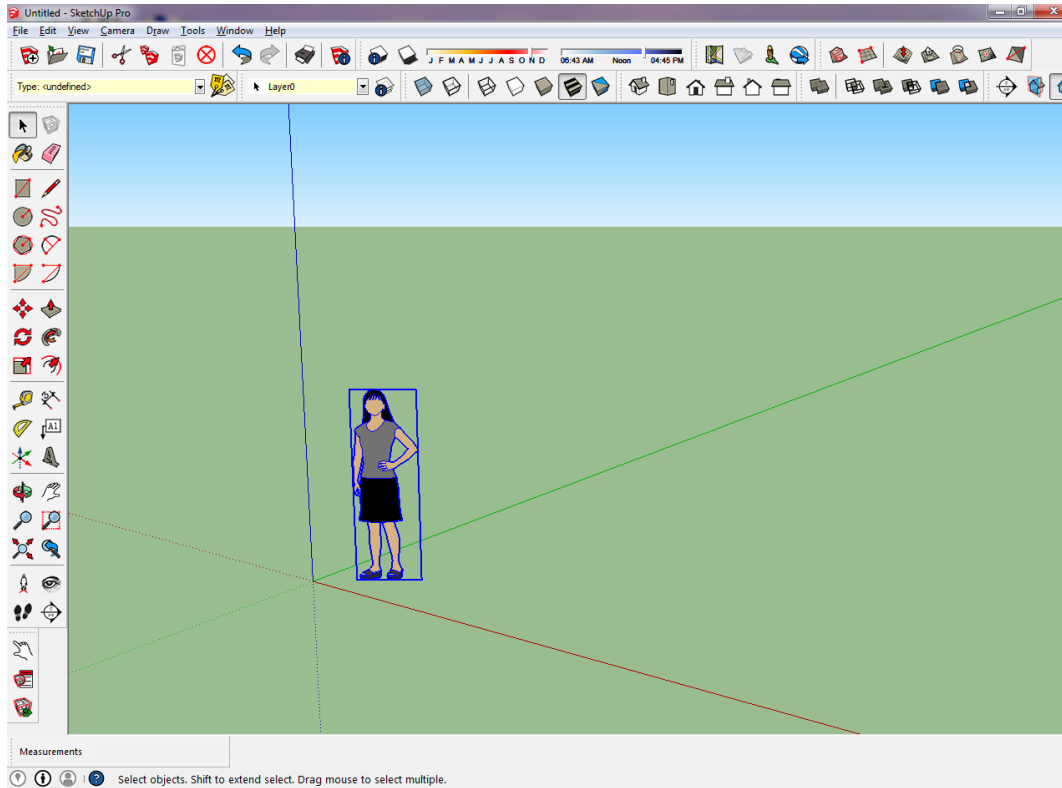


# How to use the VIRVIL SketchUp Extension

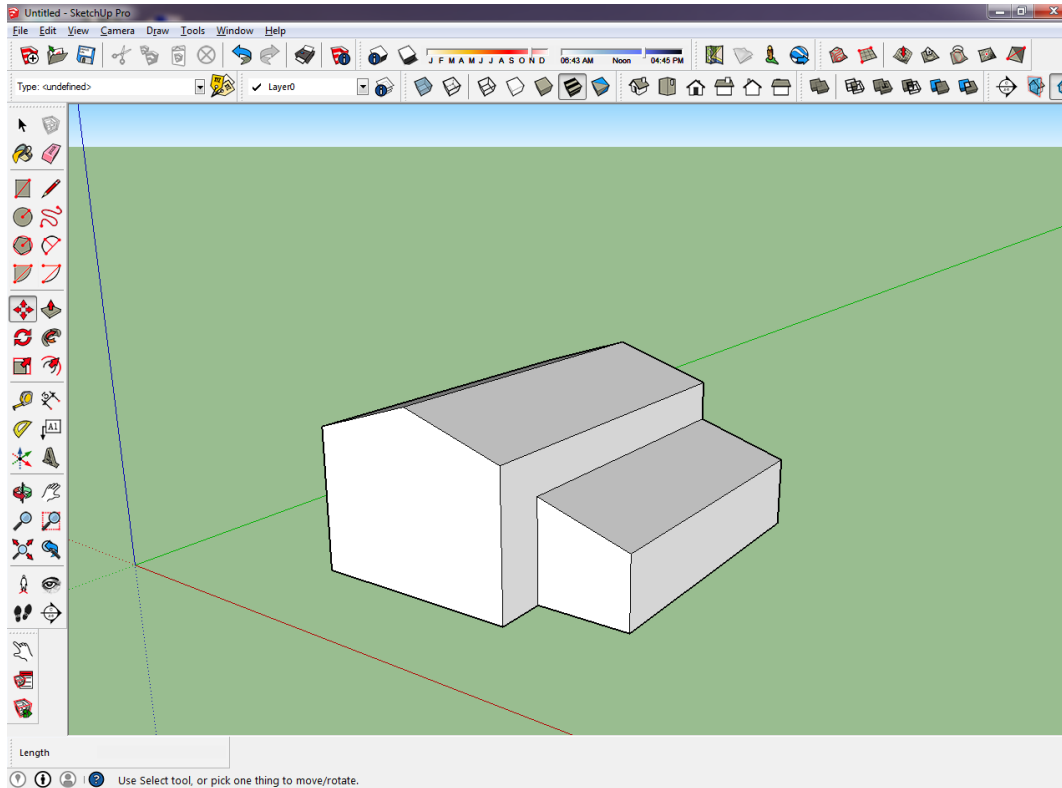
## Starting the 3D model from scratch

# Open SketchUp



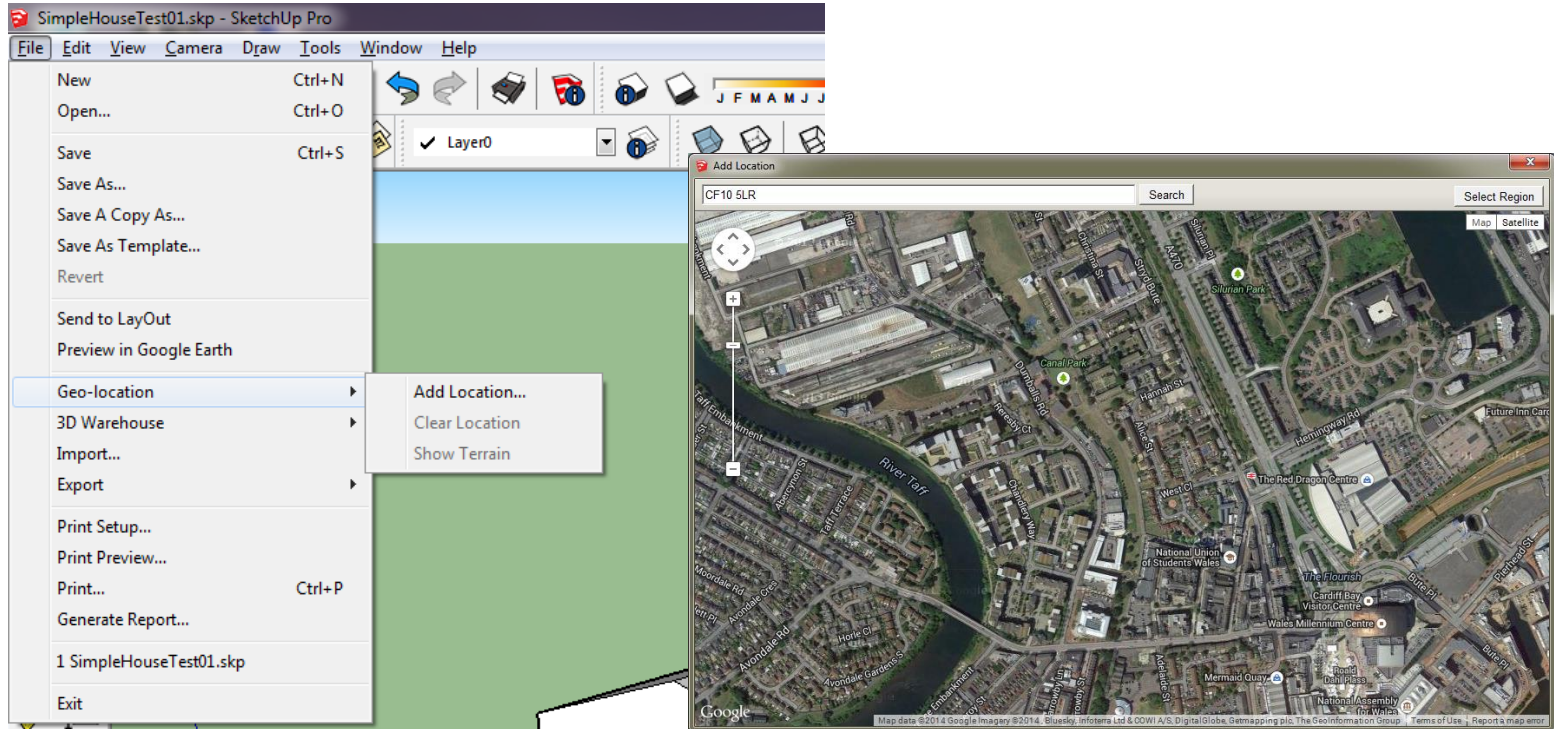
Open SketchUp and delete 'Sophie' (or any of the people that appear in SketchUp when you start)

# Draw building



Draw a simplified version of the building (or buildings) that you want to analyse

# Geographic location

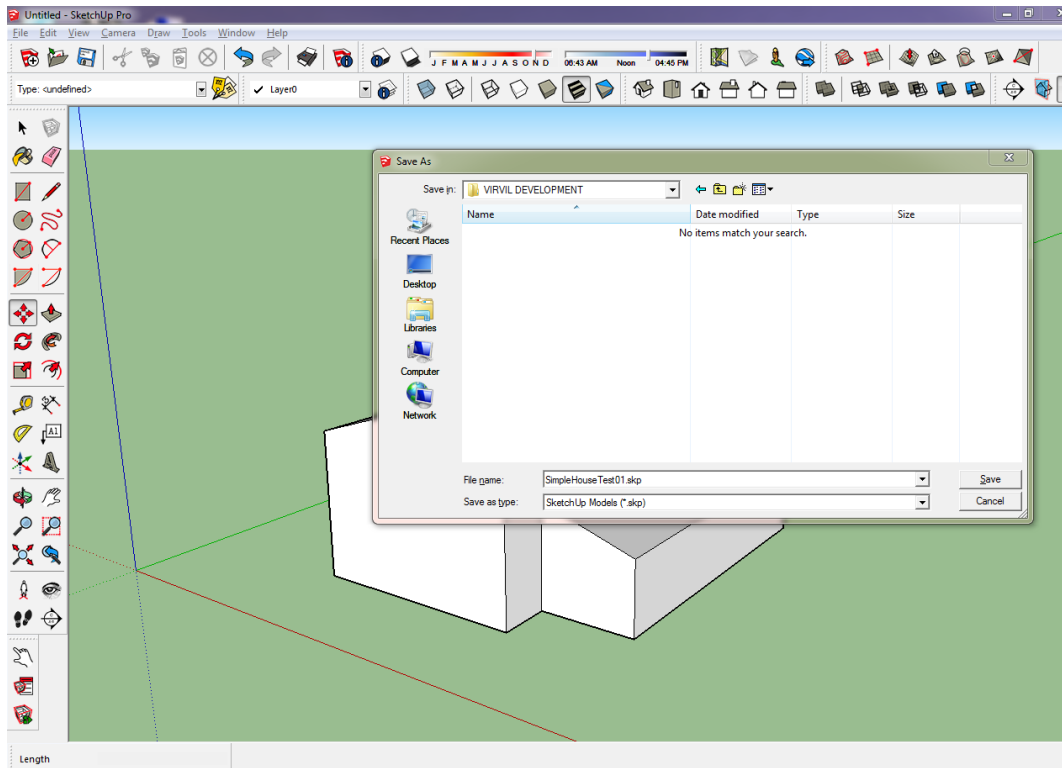


Give a geographic location to the model:

Go to: >File >Geo-location >Add Location...

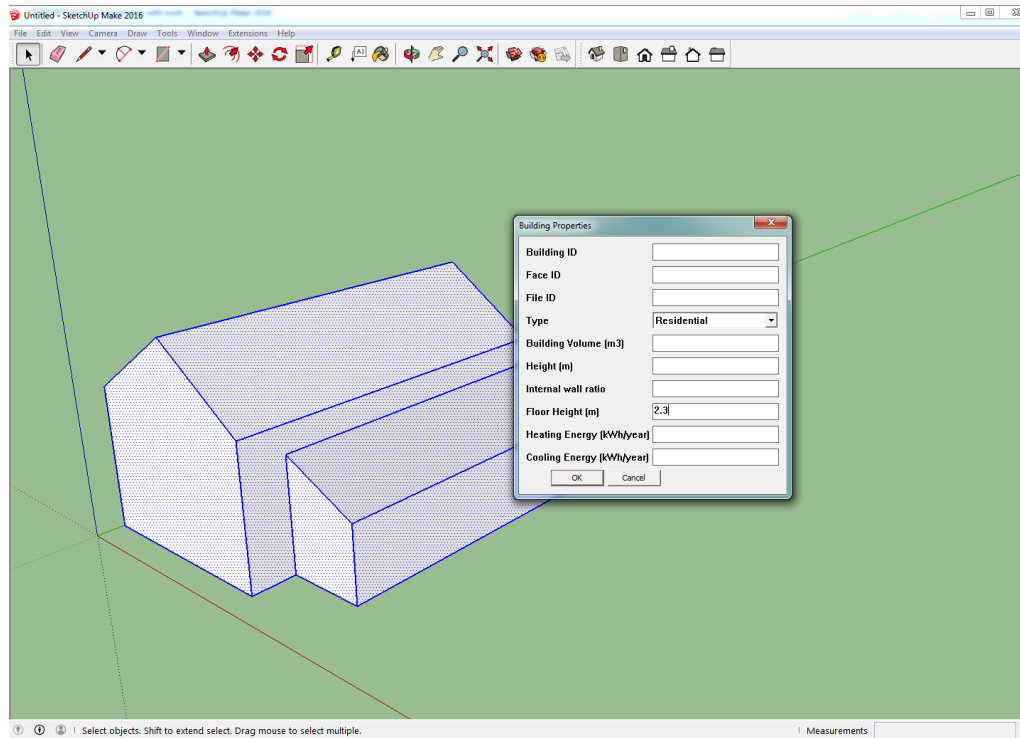
*Tip:* if you don't want to have the visualised geo-location in your SketchUp model, you can turn the view off. Go to: >Window > Layers > and **un-tick** the layer named 'Google Earth Snapshot'.

# Save the file



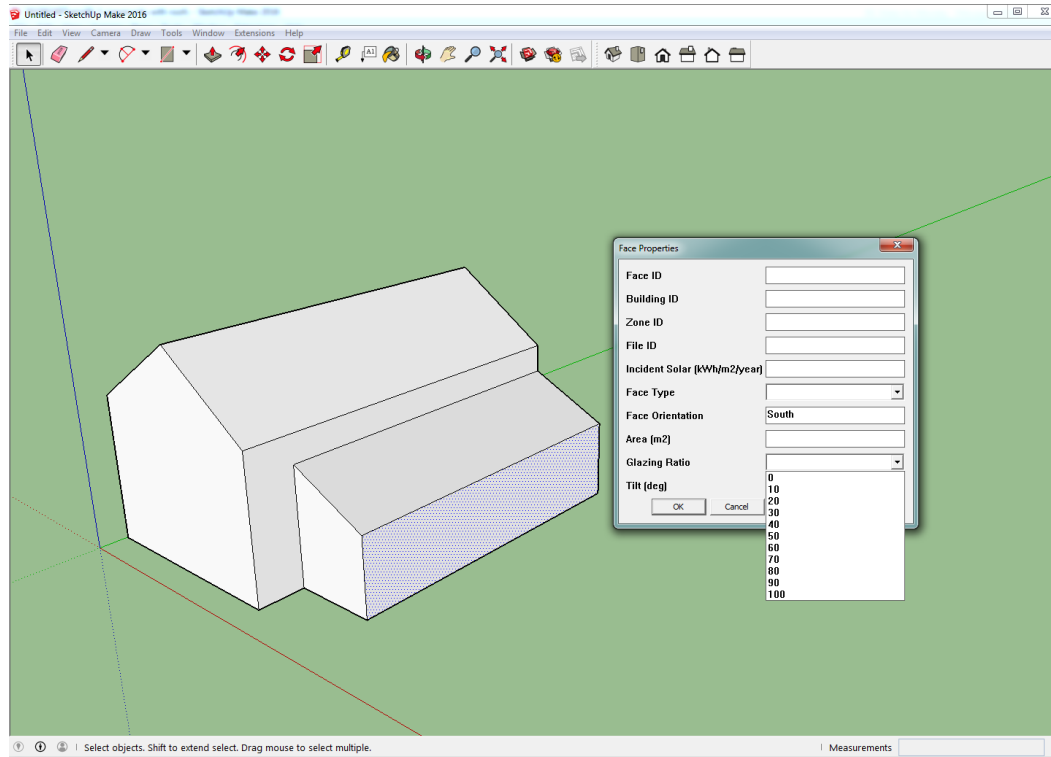
Save the file in a simple manner and creating a folder solely for this Sketchup model since other HTB2 files will also be saved automatically in this folder at a later stage. *Important!* Save this in a folder easy to find in your computer, with a simple name with plain characters (don't use Chinese, Japanese, or other languages with different alphabet to English, for any of the folders and files involved)

# Building properties



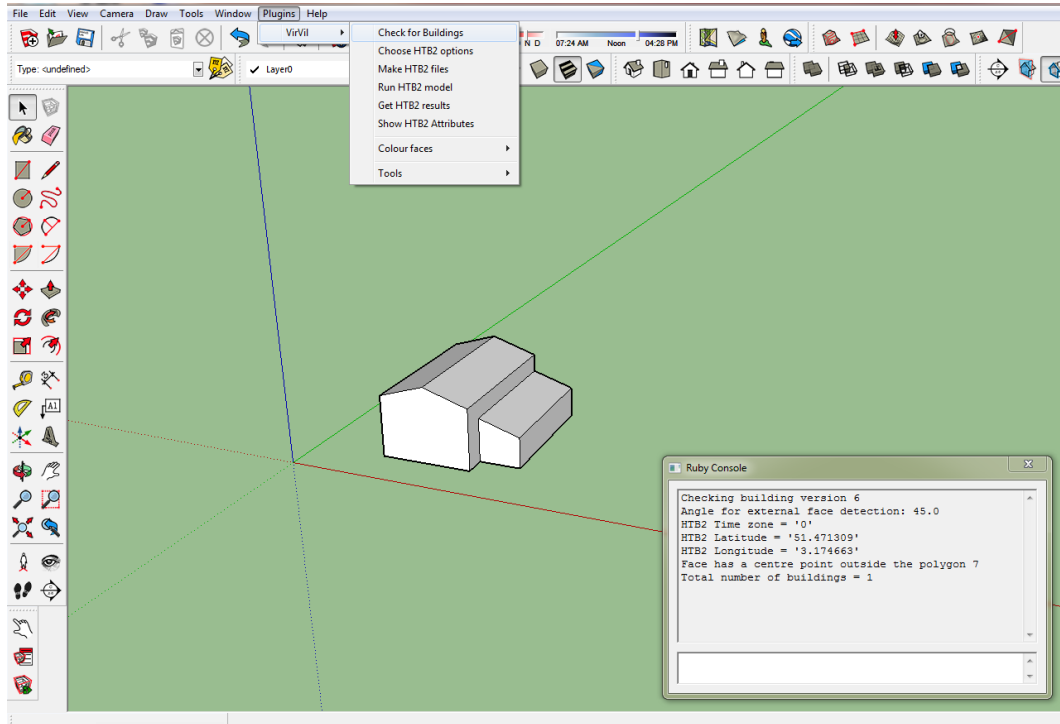
Triple click to select the whole building, then right click and open the window of Building properties, select the building type, and input the floor height. The default building type is residential, and default floor height is 3m.

# Face properties



Select faces to set the glazing ratio or correct the face type. Just right click the face and open the window of face properties, then input the glazing ratio for that façade or roof. The default glazing ratio is 50%.

# Check for Buildings

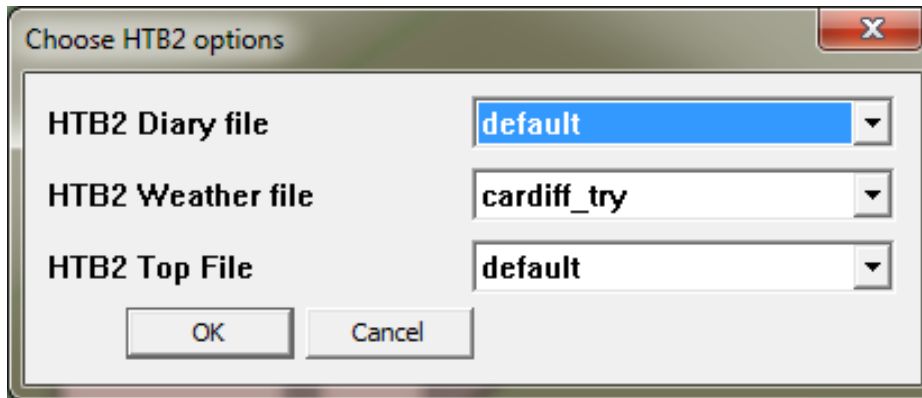


Go to >Extensions>VirVil >Check for Buildings.

*Tip:* You can view the progress of the processed followed with VirVil by opening the 'Ruby Console', which is the window that helps to visualise the instructions given to the software. Go to: >Window >Ruby Console. You can just drag the small window and keep it out of the way of your workspace, but it is good to keep an eye on the changes that are shown in that window to make sure the extension is running correctly. Errors will be noticeable in this window (Ruby Console).

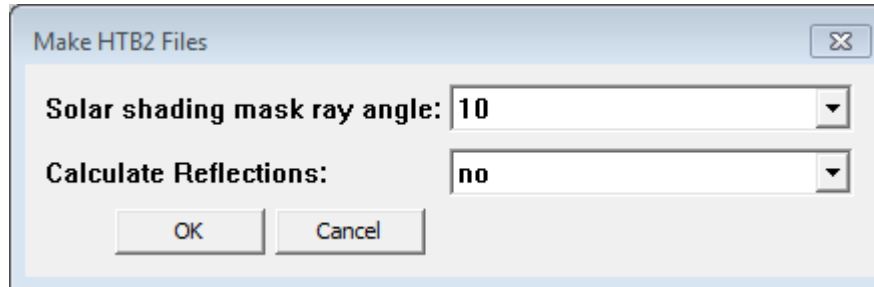


# HTB2 options



Go to >Extensions >VirVil > Choose HTB2 options, and select the default options to begin with and choose one of the cities available in the given menu

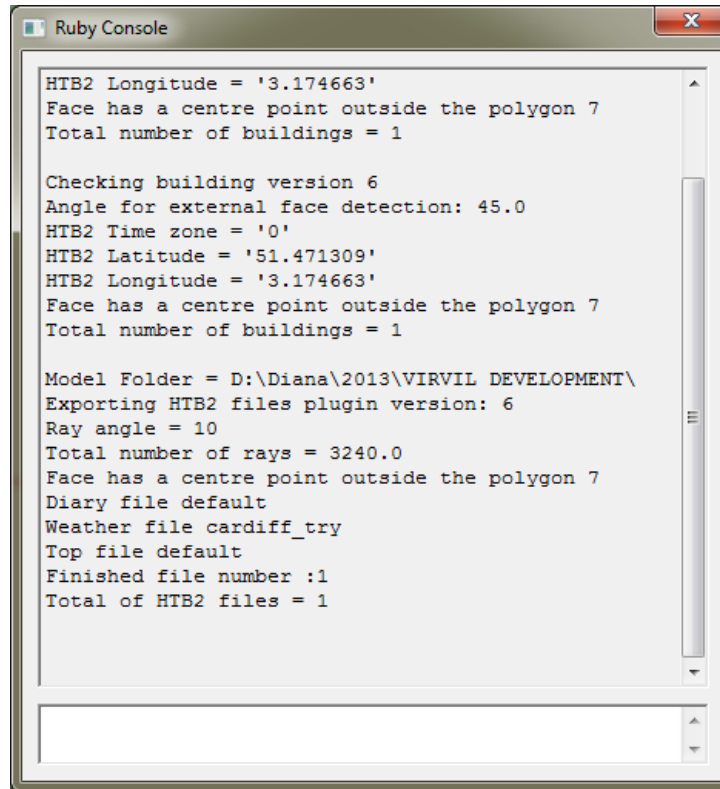
# Make HTB2 files



Go to > Extensions >VirVil >Make HTB2 files, and keep the stated options as they are, to begin with. You can experiment with these options in the next attempts to run the extension.

*FYI:* these options are to increase/decrease the angles that determine the shading mask of all the facades of the model. Therefore, it alter the accuracy of the calculations affected by the solar access. It will also affect the calculation TIME rather significantly in some cases!

# Make HTB2 files



```
Ruby Console

HTB2 Longitude = '3.174663'
Face has a centre point outside the polygon 7
Total number of buildings = 1

Checking building version 6
Angle for external face detection: 45.0
HTB2 Time zone = '0'
HTB2 Latitude = '51.471309'
HTB2 Longitude = '3.174663'
Face has a centre point outside the polygon 7
Total number of buildings = 1

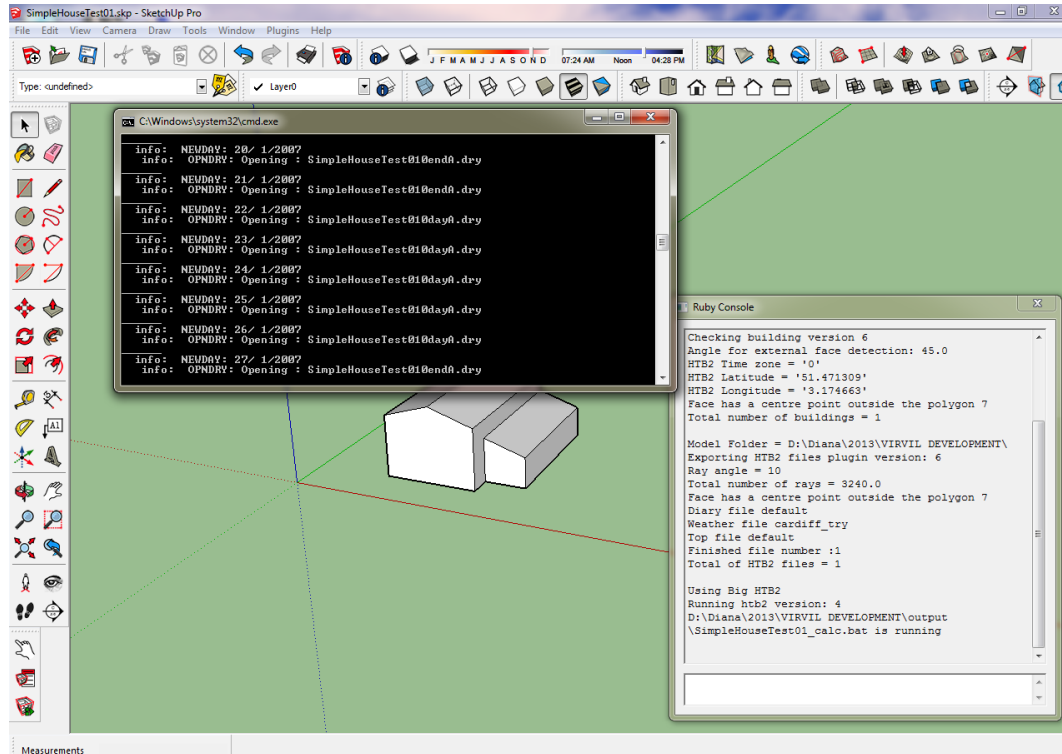
Model Folder = D:\Diana\2013\VIRVIL DEVELOPMENT\
Exporting HTB2 files plugin version: 6
Ray angle = 10
Total number of rays = 3240.0
Face has a centre point outside the polygon 7
Diary file default
Weather file cardiff_try
Top file default
Finished file number :1
Total of HTB2 files = 1
```

After selecting OK, you can see the progress in the Ruby Console window. This progress represents the creation of the files that the model require to run the initial energy modelling calculations.

*Tip:* if you check the folder that you created when you saved your model, you will find that 3 new folders have been created: **htb2file**, **output** and **results**.

Do not attempt to go the next step before the extension finished creating these new files!

# Run HTB2 model



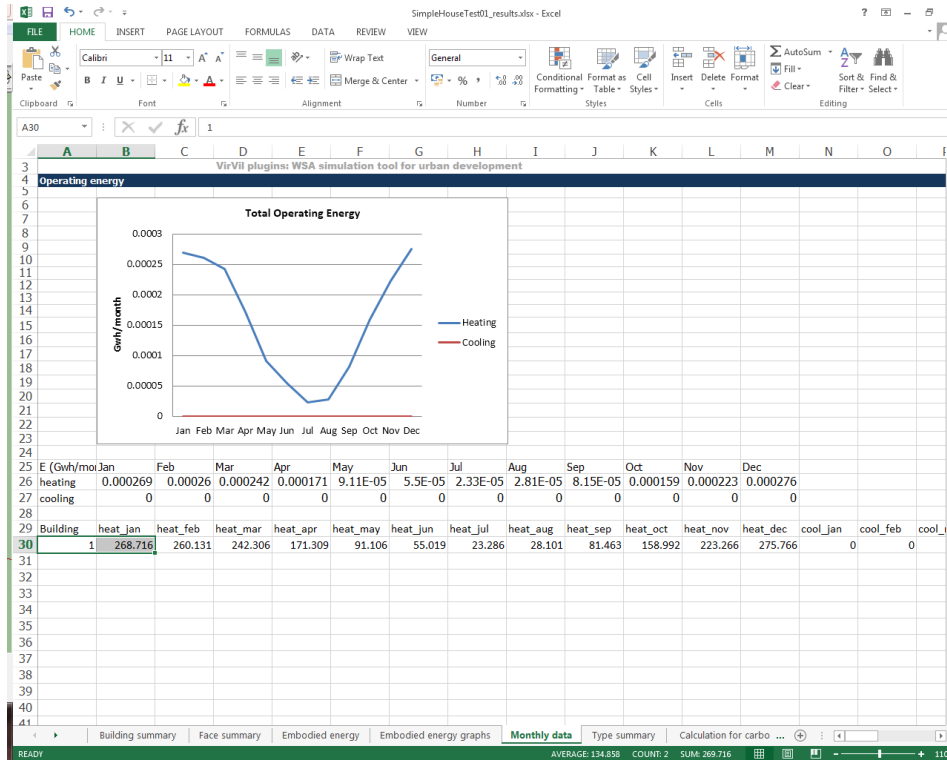
Go to > Extensions > VirVil > Run HTB2 Model.

A new window will pop up, which shows HTB2 running within the SketchUp environment. You will need to wait until the energy calculations finish. The analysis by default runs for a full year, so this can take a relatively long time, depending on the complexity of the 3D model.

Once the calculation finishes, the HTB2 window will state: 'Press any key to continue ...'. That means the results are ready to be harvested!

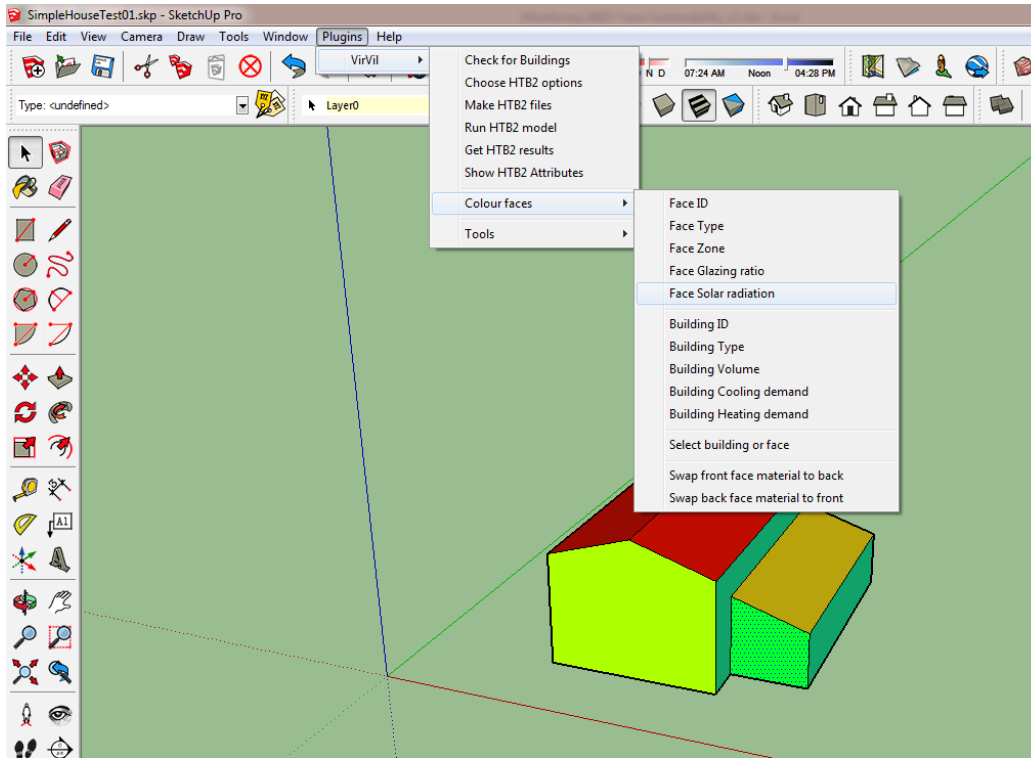
Press any key...

# HTB2 results



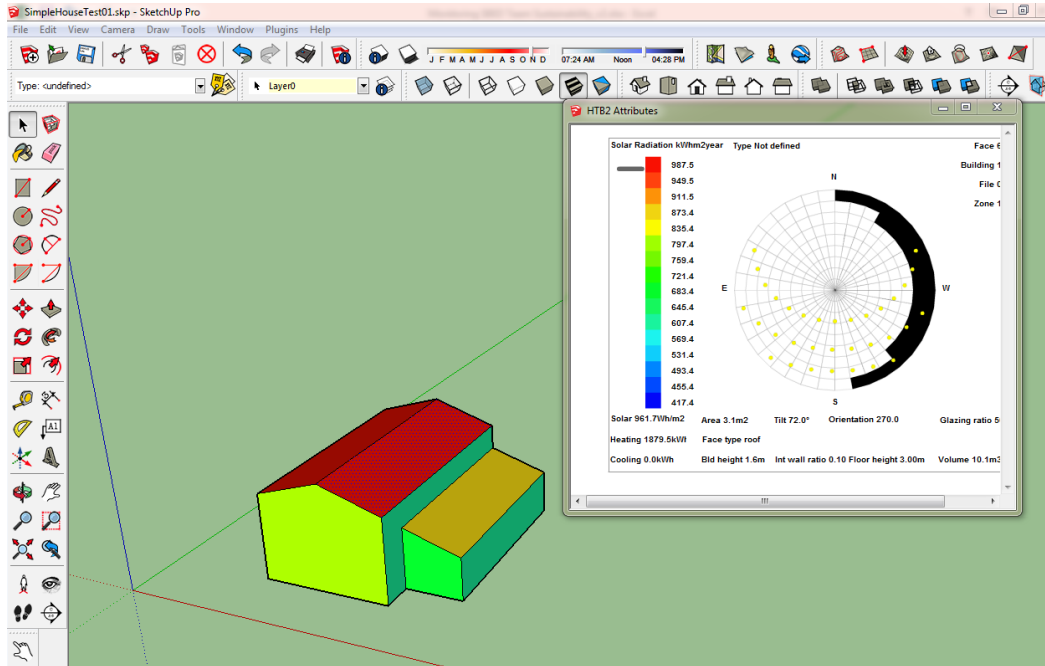
Go to > Extensions > VirVil > Get HTB2 results > press OK in the dial box.  
You will see that an excel spreadsheet is evoked, the spreadsheet contains all the results. Give it time to load all the information...

# Colour faces



To view some other results (besides the ones presented in the spreadsheet), you can go to the SketchUp environment and select > Extensions >VirVil > Colour Faces. This menu will offer you a number of options for you to visualise the results, such as colour-coding the facades for different parameters, as well as further features. Explore them!

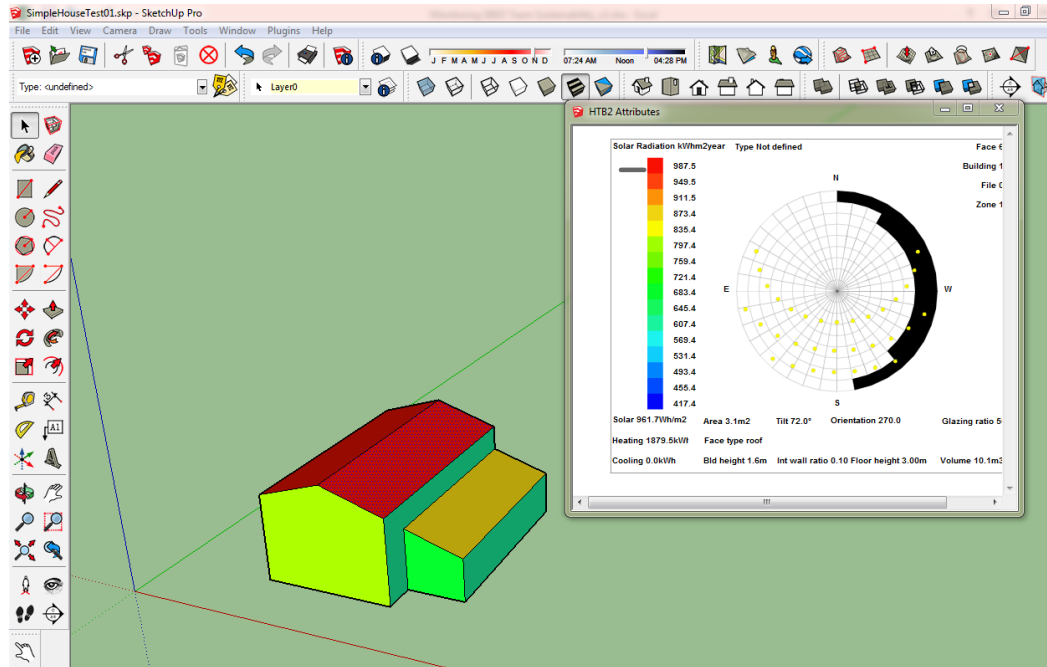
# Solar radiation on faces



If you right-click on any façade, you will also be able to access further information about the facades and the buildings

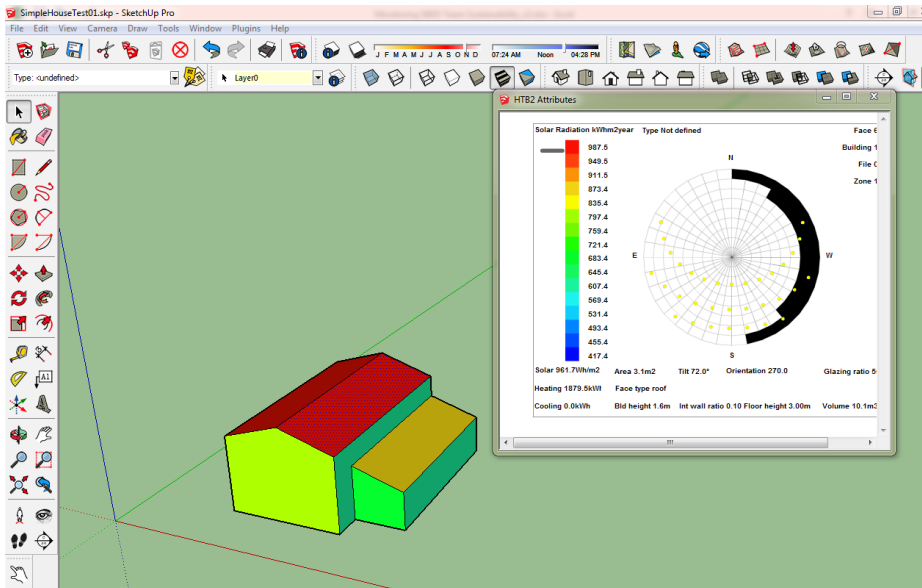
To visualise the shading mask for any given façade, go to > Extensions > VirVil > Show HTB2 Attributes, a new small window will appear, click on the desired façade and information about the selected face would be displayed in the 'HTB2 Attributes' window. You can click on any façade without closing the small window, the information will update with the click of the mouse on the different facades.

# Import weather files



To import an EnergyPlus weather file in to the VirVil Sketchup Extension, go to > Extensions > VirVil > Tools > Add HTB2 files Attributes, a new small window will appear, click on the “EPW” file you require and press Open. VirVil will convert the file into a HTB2 Weather file ready for use in your modelling.





**Now you know the basic features of the VirVil SketchUp Extension, please continue to explore it further...!**

**Thank you**

**Simon Lannon and Diana Waldron  
Welsh School of Architecture  
Cardiff University  
UK**