Creating a simple model

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Creating a simple model

- *Background/skills required: Basic understanding about buildings and computers*
- *Resources required: P-IV or above computer with 256MB RAM, internet connection (not for entire duration of use), installed DB software*
- *Expected duration of tutorial: Half hour*
- *Outcome of tutorial: Creating a simple building model, visualization and energy simulation of the created building*

Step-1: Open design builder from shortcut on the desktop or from program menu

Starting screen of Design Builder showing recent available and template files would look similar to the screen shown in Illustration 1.1.

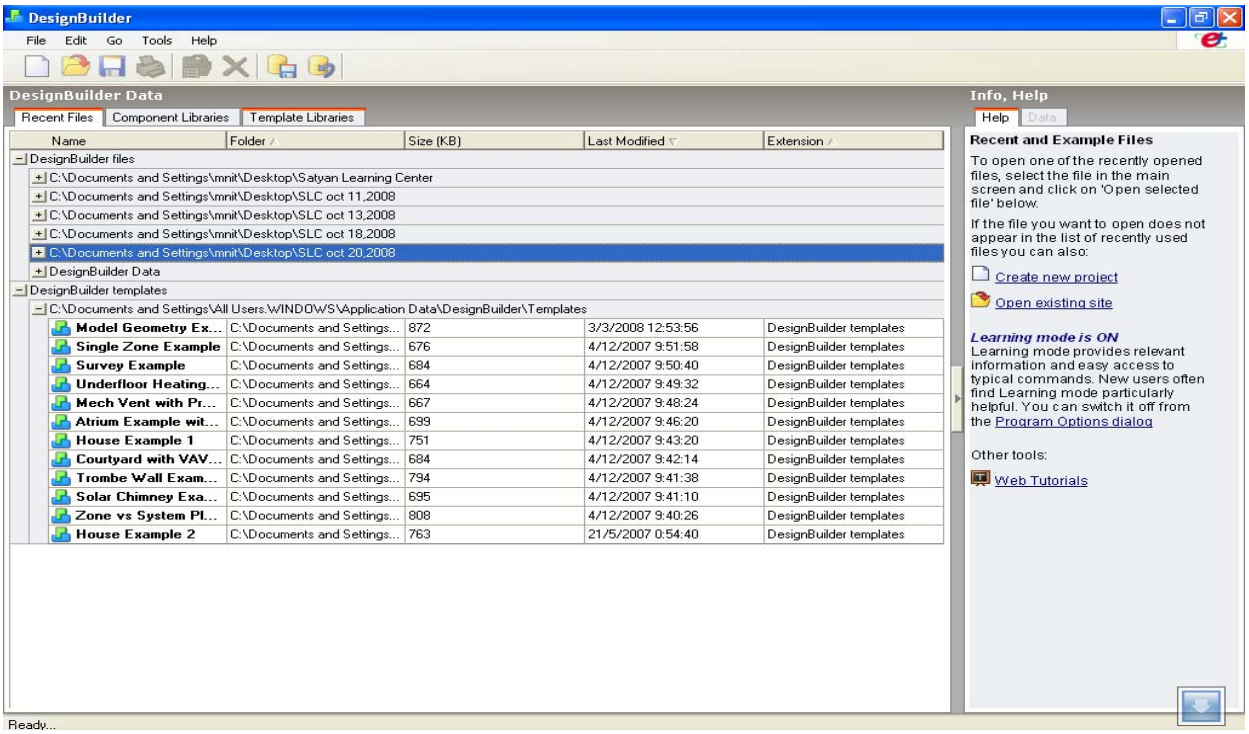

Illustration 1.1: Starting screen of Design builder

Step-2: Creating new project

Click at 'Create New Project' from the right as shown in Illustration1.2.

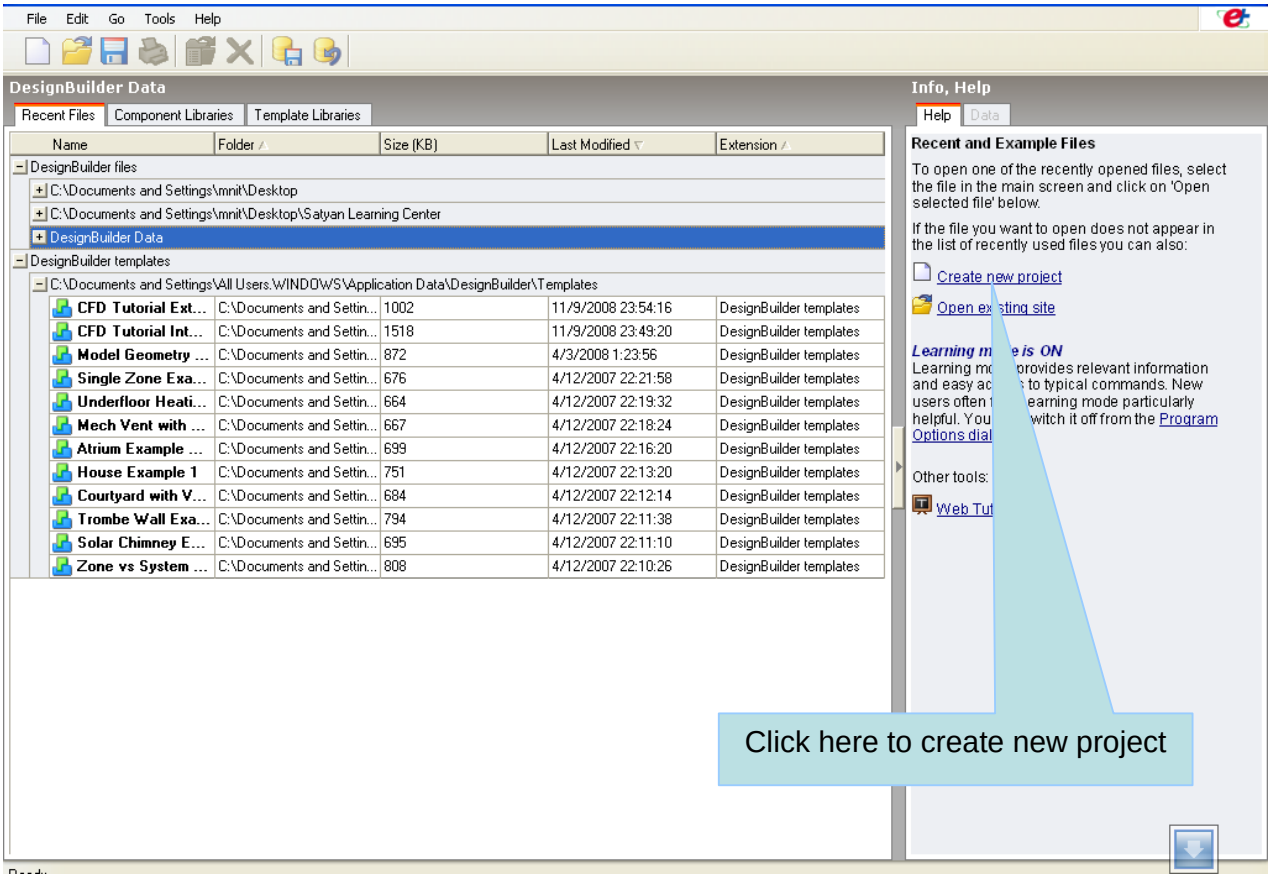

Illustration 1.2: Creating new project

Step-3: Choosing weather file for desired location

On choosing to create new project, a window shown in Illustration 1.3 asks you to provide basic information about the project, most important of which is weather file. Following steps can be adopted to choose weather file:

- Click on the field "Location", three dots would appear to the right of this field as shown in Illustration 3.
- On clicking these three dots, in the field to the right of it, a list of countries and cities appears.
- On selecting the country name, list of cities opens
- By double clicking the name of city, the weather file can be selected.
- On selection, name of the city should appear in the field in front of "Location".

If you are doing simulation for the first time for this location, during simulation, it would first need internet connection for downloading weather data. Whereas, on subsequent usage, the previously downloaded weather data is used from within the previously stored data with the software.

This means, you do not need internet connection every time you are doing simulation. Whenever you are doing simulation for a new location, that time internet is required.

It is quite possible that the city in which your building is located, does not appear in the list of cities. In that case, you will need to choose a nearby/similar city for simulation.

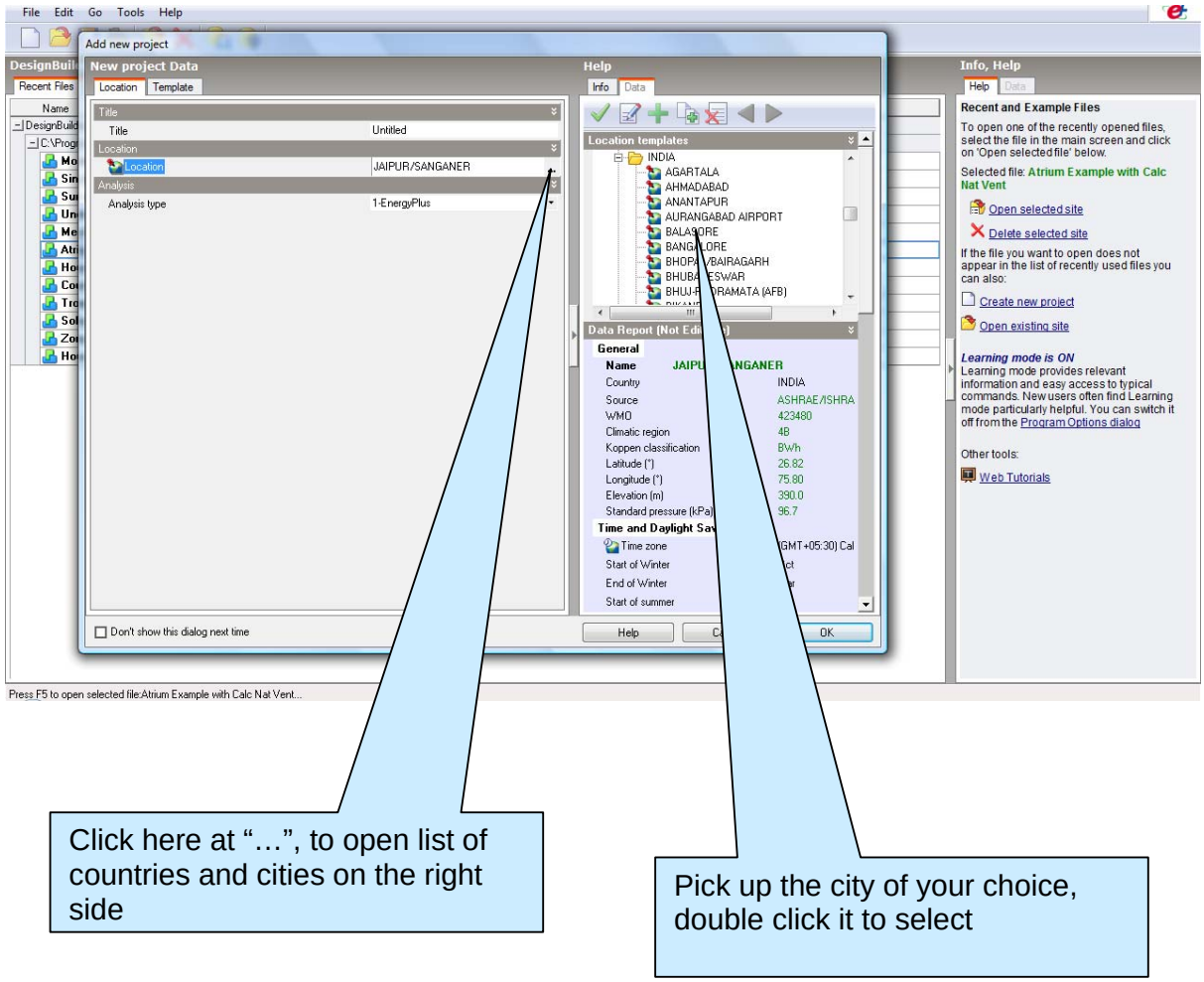

Illustration 1.3: Selecting weather file

Step-4: Choosing to create a new building

On selecting the weather file, the main screen of Design Builder opens which looks like Illustration 1.4.

There are three vertically divided areas in this screen:

- leftmost area is the Navigation Panel
- right most area is information panel
- middle area is editing panel

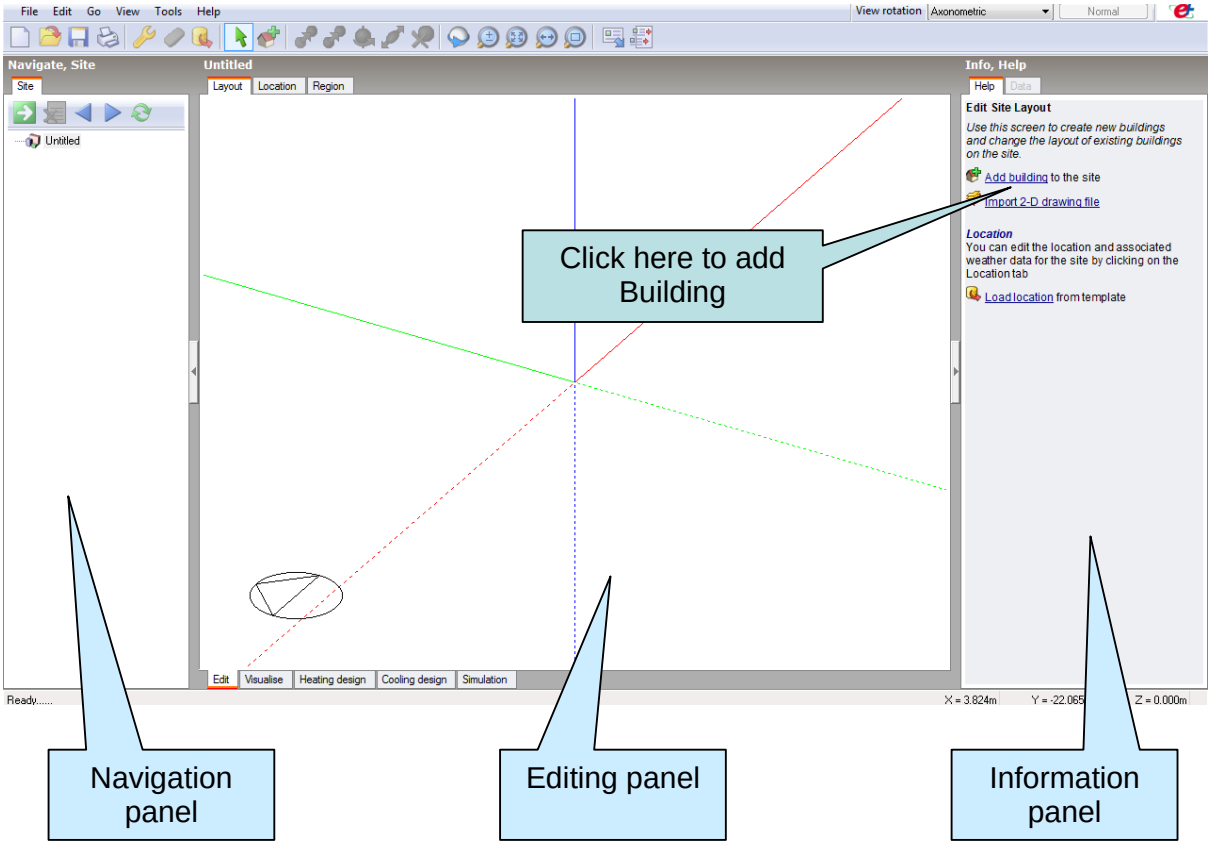

Illustration 1.4: Editing screen of DB

As shown in illustration 1.4, click at the command ‘Add building’ In the information panel..

Step-5: Basic building information:

- After choosing to create new building, a window comes up (as shown in Illustration 1.5), in which besides name and address of the project, thre will be a field named as ‘Project details’; after clicking that, an entry against the ‘Sector’ would be seen.

- Further selecting this entry by click of mouse a list of various types of buildings such as airport terminal, bus stand, office, hospital, hotel etc. appears in the information panel..

- Double click the closest building type if the exact matching type is not available in this list. before saying ‘OK’ at the bottom of this screen.

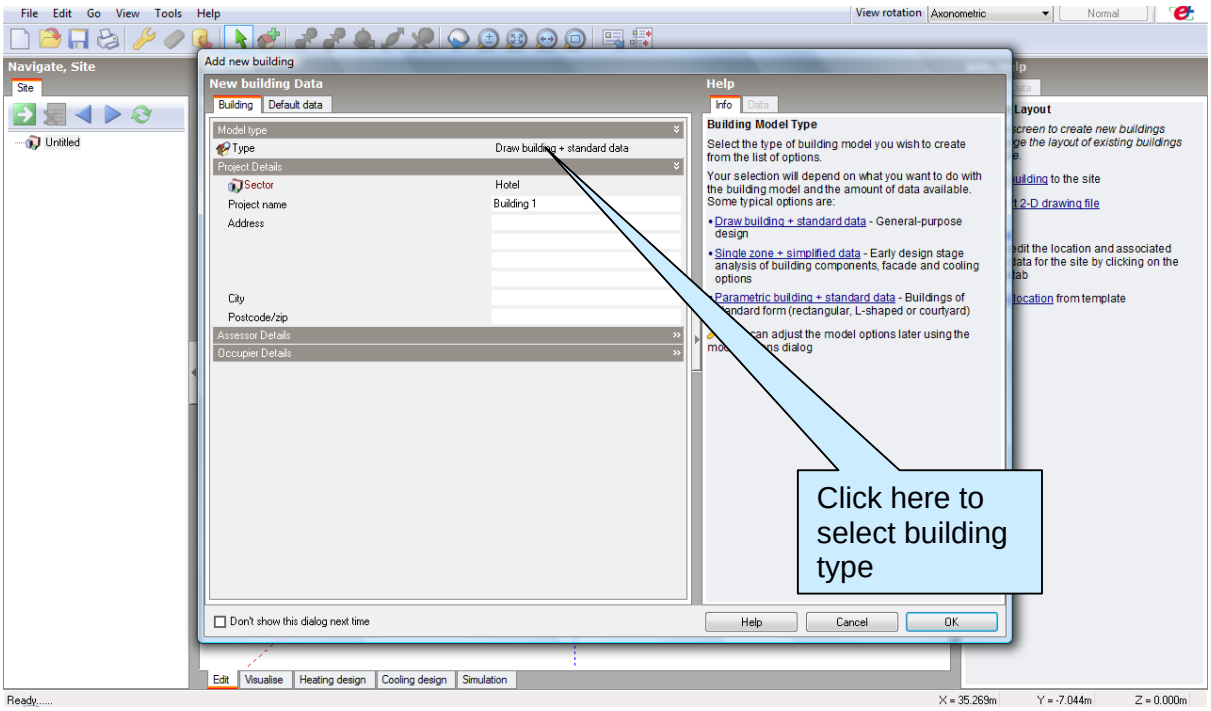

Illustration 1.5: Selecting building type as per usage

Step-6: Starting to create building geometry

- After defining the building type, the screen similar to one shown in Illustration 1.6 would be appearing.

- Among the icons appearing on the top of screen, select the one for adding new block as shown in Illustration 1.6.

- In selecting this, a cursor in the form of a pencil appears in the editing panel with a North pointer in the bottom of the panel to show the orientation.

- Before starting to define the building shape, it is suggested to enter the building height (floor height) and external wall thickness in the left navigation panel as shown in the illustration 1.6.

  Note: Setting height at this stage is crucial because there might be some problem in the model if we try to manipulate the height after creating the block.

- To help the creation of geometry, direction snaps should be switched on from the bottom of navigation panel under the heading ‘Direction Snaps’.

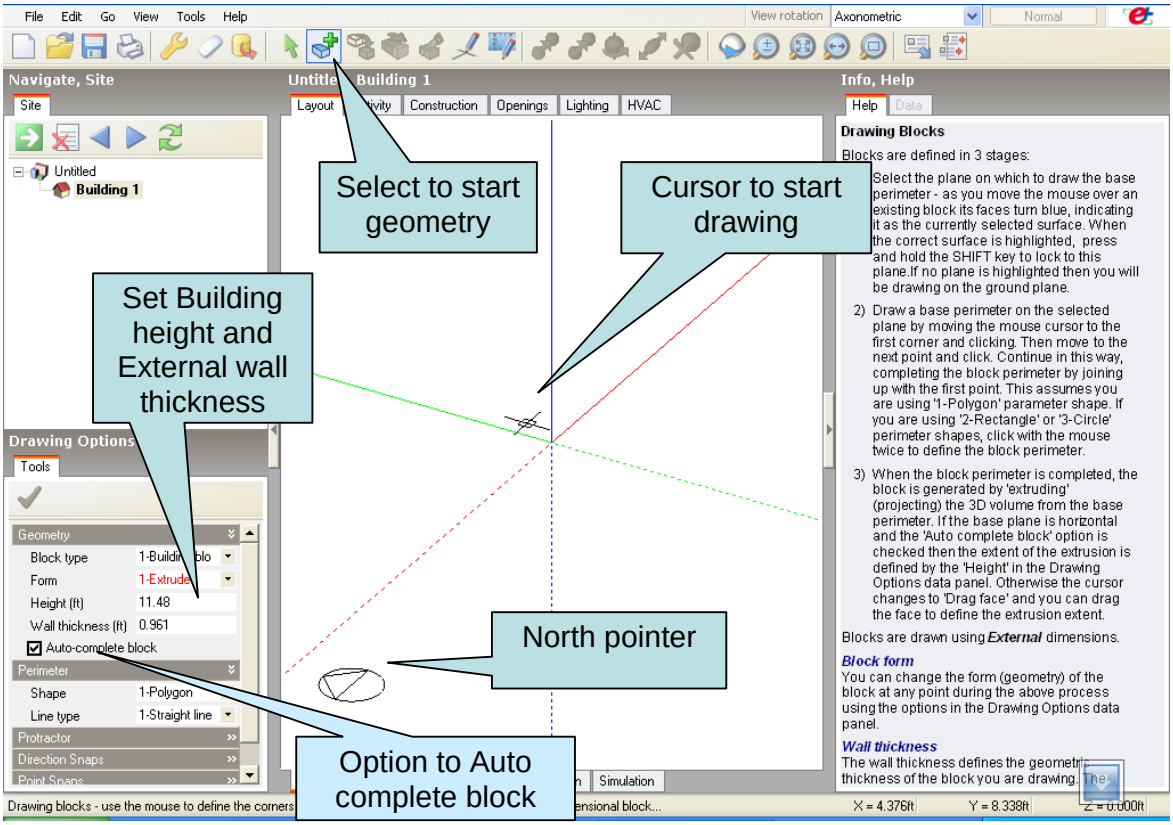

Illustration 1.6: Starting to create geometry

Step-7: Creating building geometry

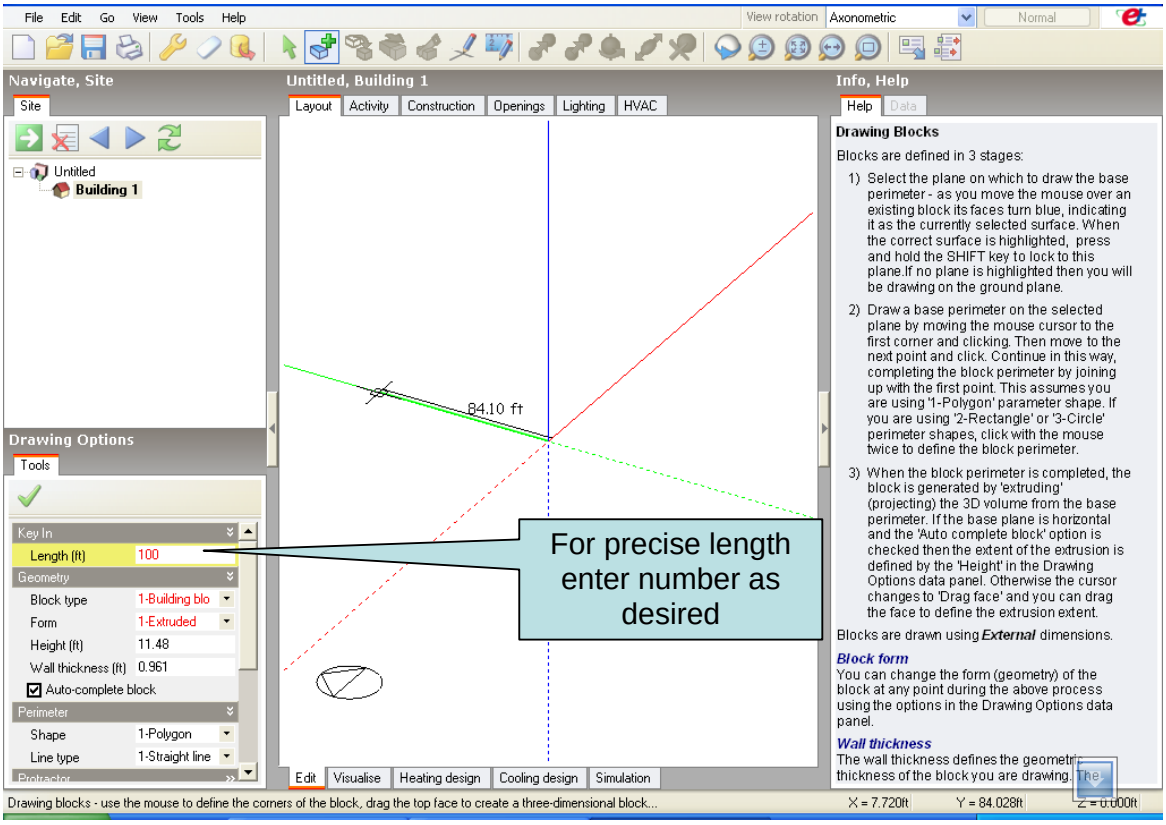

Illustration 1.7: Drawing a wall

- Click the mouse at the point you want to start the geometry
- Movement of mouse shows a wall with its dimension appearing automatically with the cursor, as indication, as shown in Illustration 1.7.
- Précised length of wall can also be entered in the navigation panel as an alternative to dragging the mouse, as shown in illustration.
- Wherever, the mouse is clicked, that point is treated as terminating point of that line (wall) and subsequent movement of mouse starts next wall.
- In case of angular wall or for measuring angle between two walls, a protector can be picked up from the left navigation panel as sown in Illustration-1.8.

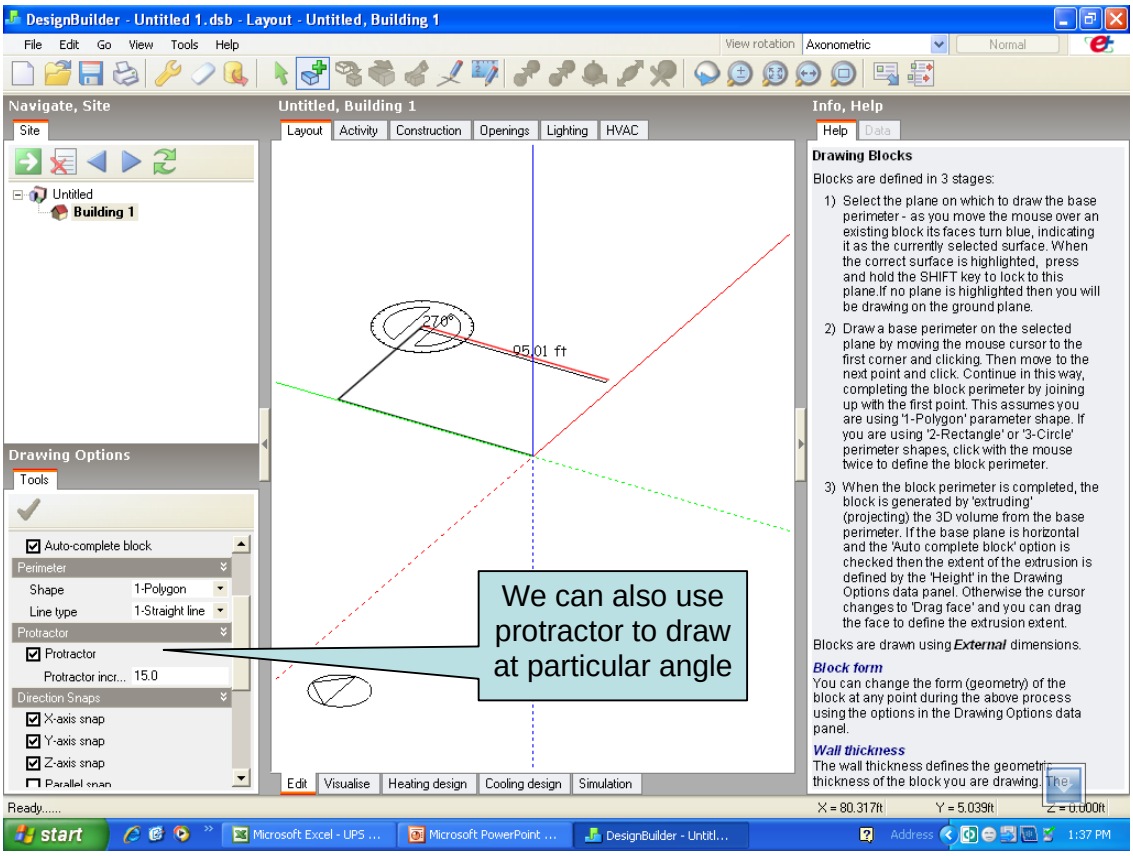

Illustration 1.8: Using protector for angle measurement

- When the polygon gets closed, a green dot appears at the last point as shown in Illustration 1.9. If the green dot is not appearing, it means the polygon has not closed and it needs to be corrected, as shown in illustration 1.9.

- When the polygon (rectangle in this case), gets completed, as per the block height specified earlier in Step-6, the building gets created automatically by the software, as shown in Illustration 1.10.

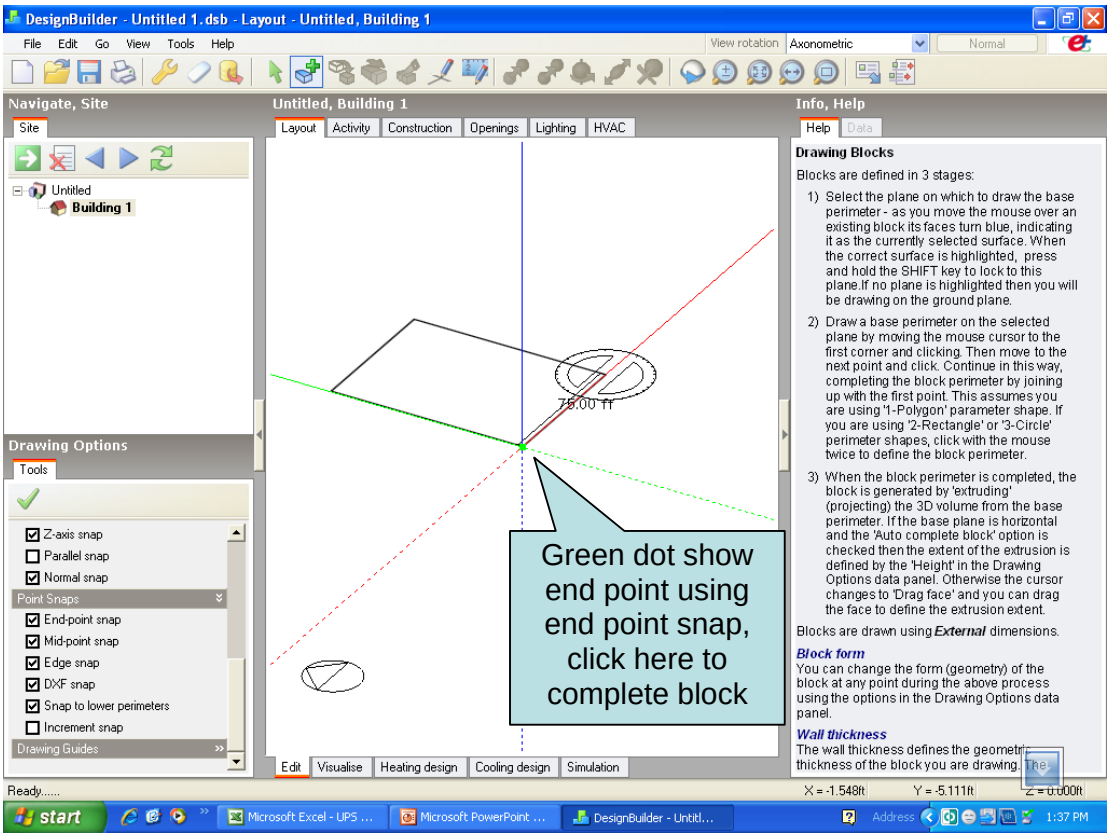

Illustration 1.9: Completing a polygon

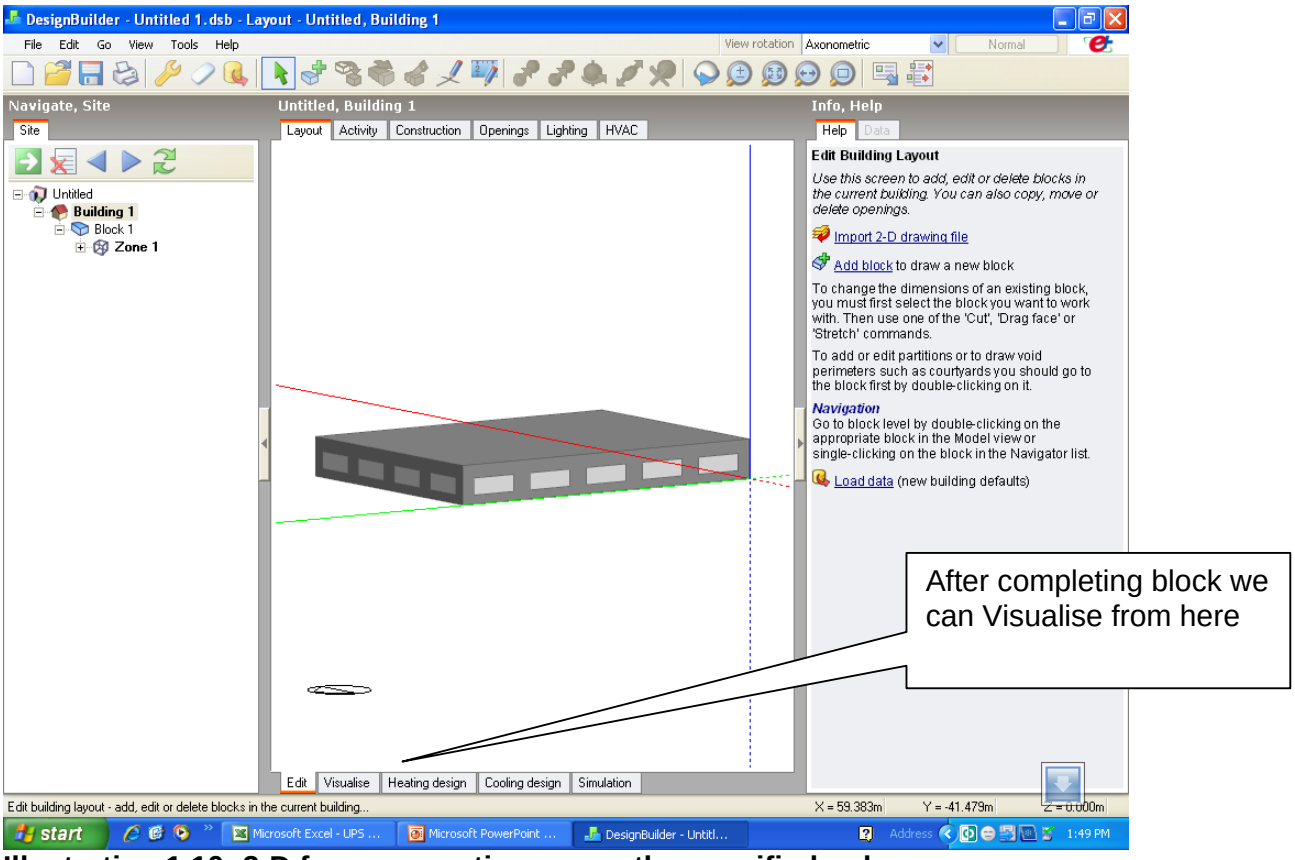

Illustration 1.10: 3-D form generation as per the specified polygon

Step-8: Visualizing created building

On selecting to visualize the building, the 3-D object turns into a rendered 3-D image, which can be checked by various visualization operations given in to top tool bar as shown in Illustration 1.11.

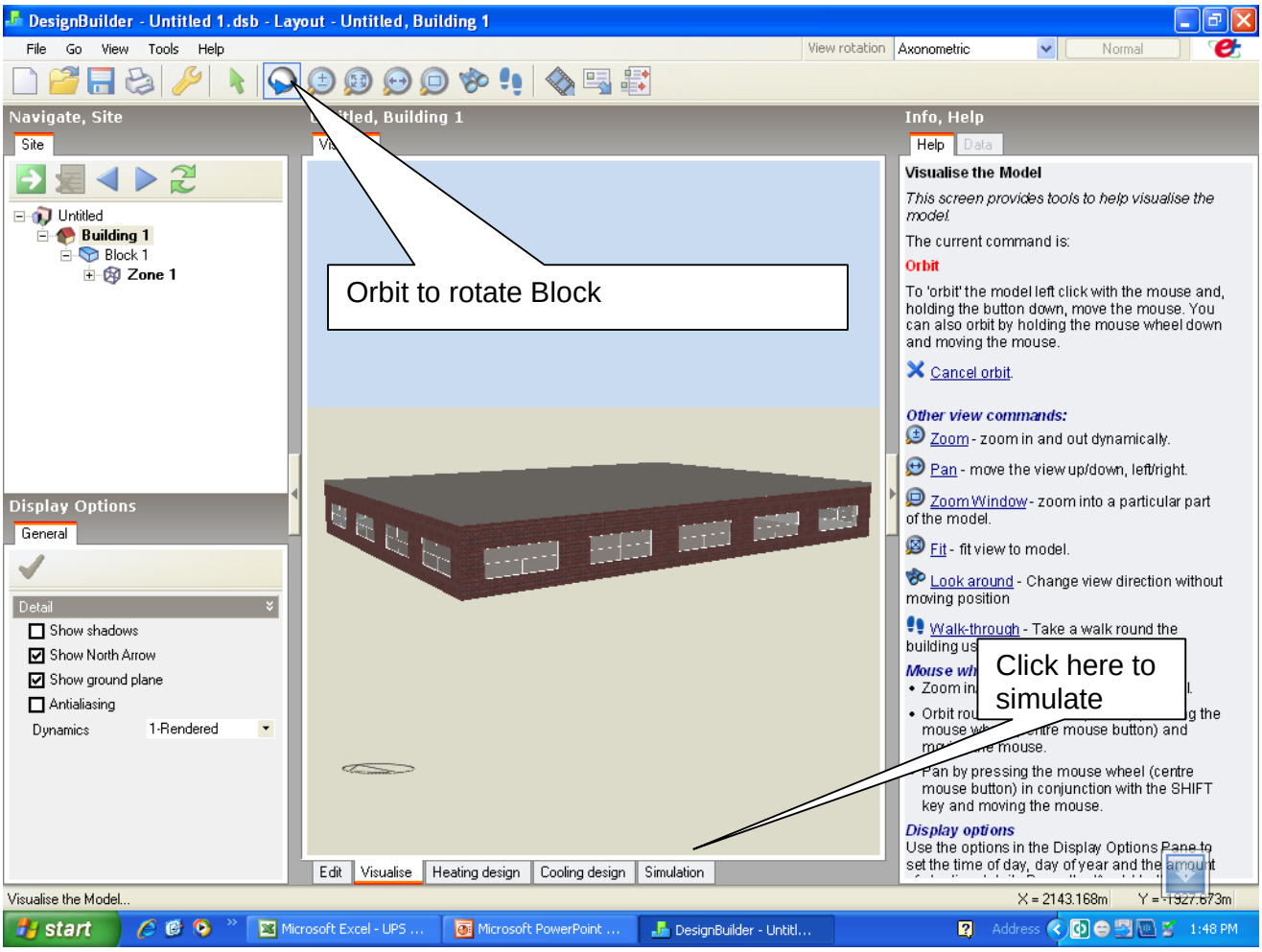

Illustration 1.11: Visualizing the created building

Step-9: Simulating the building

- On selecting to simulate through the key (shown in illustration 1.11) at the bottom of the middle editing screen of DB, information related to license appears on the screen.
- Press ‘continue’ to proceed for simulation. An ‘edit calculation options’ screen would then come up, in which the period of simulation, result reporting interval, selection of output reports can be specified.
- If this is your first simulation, you can keep the default entries, and press ‘OK”.
- If the weather file for the city selected in Step-3 is not already there in its position, it would ask your permission to download the weather file from internet server of DB. Let the weather file get downloaded and say ‘continue’ if asked for.
- The progress bar as shown in Illustration 1.13 would then appear showing progress of your simulation.

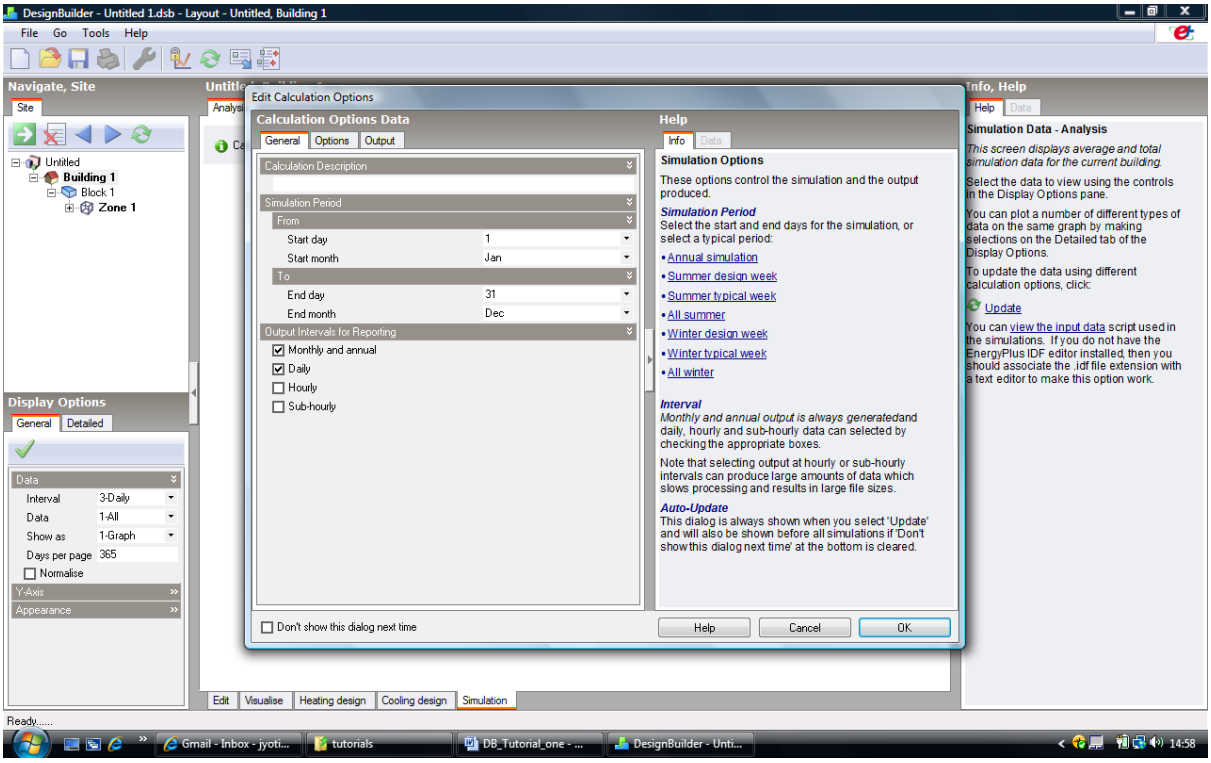

Illustration 1.12: Edit calculation options screen

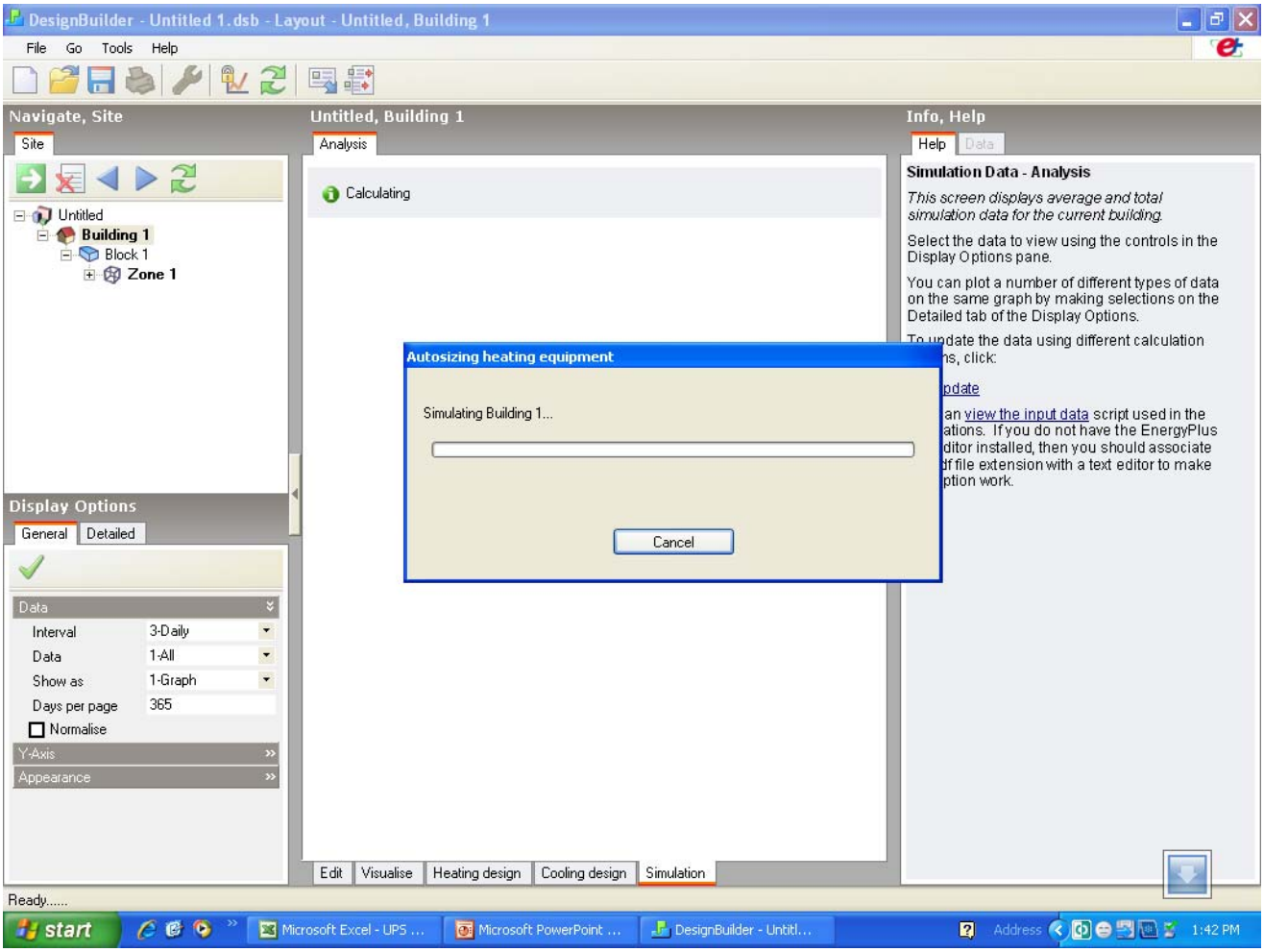

Illustration 1.13: Simulation in progress

Step-10: Viewing simulation output

- Upon completion of simulation process, DB directly takes you to simulation output viewing mode.
- in the left navigation panel, if interval - ‘Daily’ and show as - ‘Graph’ are selected, the screen would appear something similar to the illustration 1.14.
- if the selections are changed, to interval- ‘monthly’ and show as – ‘grid’, the output would change to as shown in Illustration 1.15.

Illustration 1.14: Simulation output mode

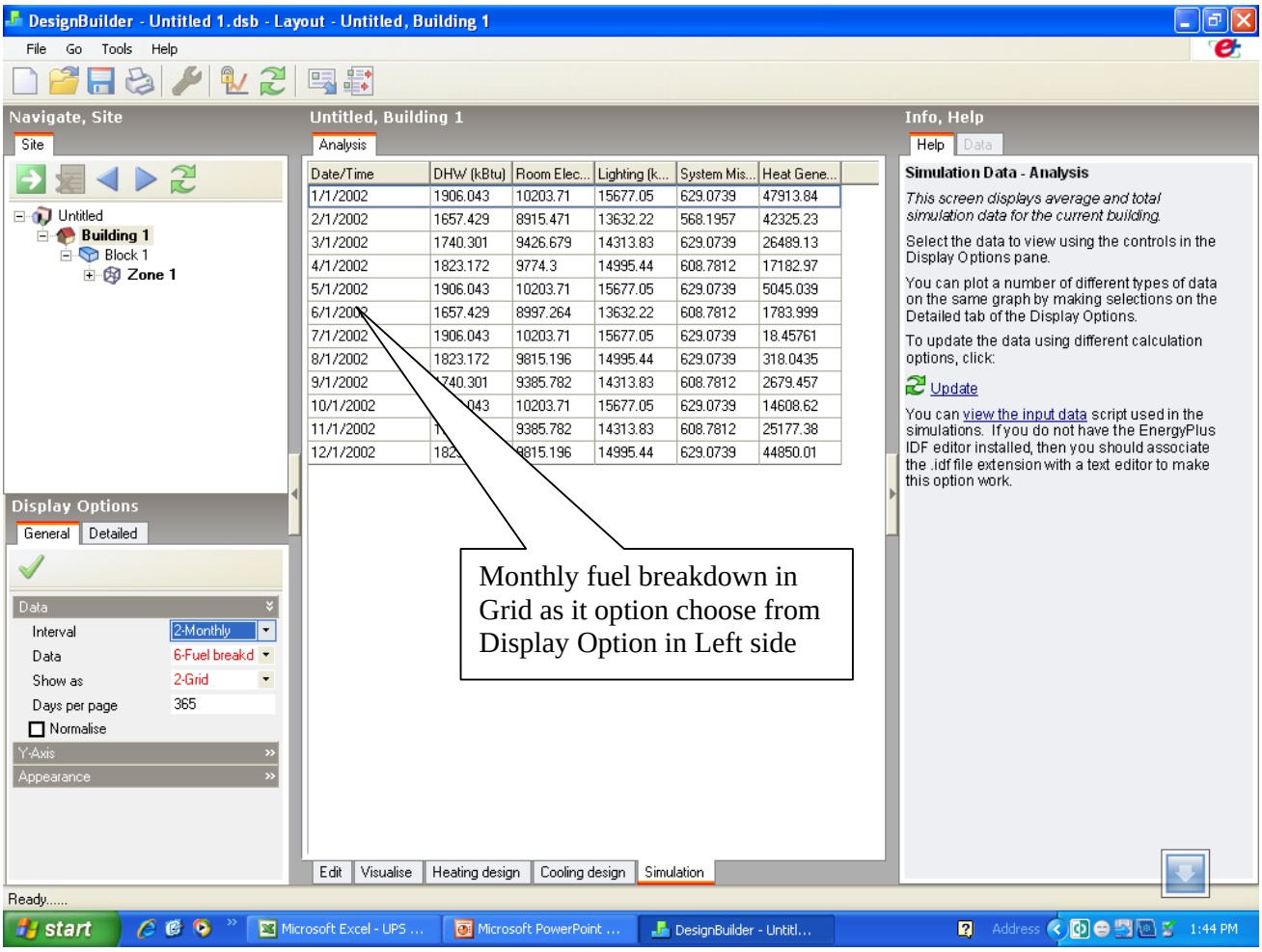

Illustration 1.15: Monthly results in tabular form

If you are at this stage, your first simulation is successfully over. Interpretation of results and use of results for improving energy efficiency would be taken up in subsequent tutorials.