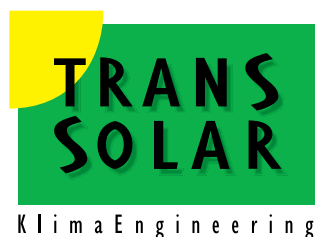


Trnsys3d Tutorial

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Introduction

TRNSYS 17 Background

TRNSYS is a complete, modular, and expansible simulation environment for the transient simulation of thermal systems including multi-zone buildings. It is used by engineers and researchers around the world to validate new energy concepts, from simple solar domestic hot water systems to the design and simulation of buildings and their equipment, including control strategies, occupant behavior, alternative energy systems (wind, solar, photovoltaic, hydrogen systems), etc.

One of the key factors in TRNSYS' success over the last 25 years is its open, modular structure. The source code of the kernel as well as the component models is delivered to the users. This simplifies extending existing models to make them fit the user's specific needs.

The DLL-based architecture allows users and third-party developers to easily add custom component models, using all common programming languages (C, C++, PASCAL, FORTRAN, etc.). In addition, TRNSYS can be easily connected to many other applications, for pre- or post-processing or through interactive calls during the simulation (e.g. Microsoft Excel, Matlab, COMIS, etc.). TRNSYS applications include:

- Solar systems (solar thermal and PV)
- Low energy buildings and HVAC systems with advanced design features (natural ventilation, slab heating/cooling, double façade, etc.)
- Renewable energy systems
- Cogeneration, fuel cells
- Anything that requires dynamic simulation!

Trnsys3d Plug-in

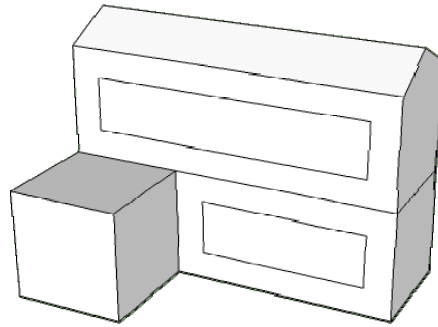
The new building model contains 3D geometric surface information that is required for the new detailed radiation calculations. To easily input the geometric information into the building model, a plug-in called TRNSYS3d for Goggle SketchUp™ has been developed. The Trnsys3d plug-in is based on the open source program OpenStudio™ (<http://sourceforge.net/projects/openstudio>). Therefore, it can't be included into the TRNSYS package but is available for free download under GNU-GPL.

Note that the plug-in is not a full-featured interface. It will not help you create non-geometry data, such as materials, constructions, controls, internal heat gains, HVAC equipment and systems, etc..

To use the plug-in as intended, you must have the energy model in mind (NOT the architectural model) from the beginning as you create your SketchUp model. This means you should have your thermal zones defined before you start. The following section discusses the differences between SketchUp Zones and Trnsys3d Zones.

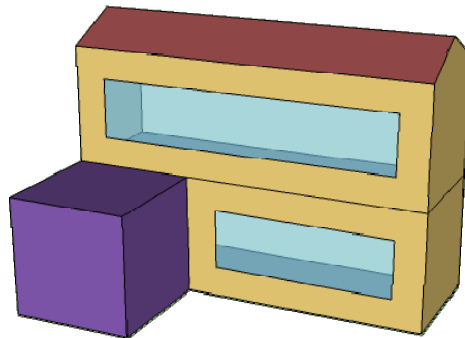
Zoning Differences

SketchUp Zones

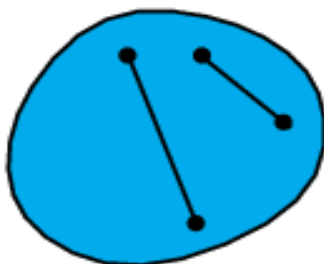


In SketchUp, the interior walls make up the zones. For example, in the building pictured above, there are no interior walls so it is modeled as one large rectangular zone. Note that the smaller cube represents an exterior shade and is not a zone.

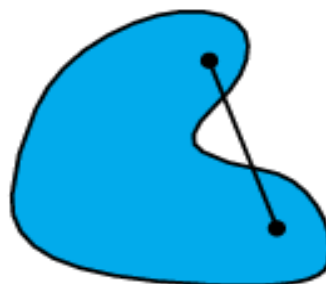
Trnsys3d Zones (=AIRNODES)



Trnsys3d zones are different from SketchUp zones, particularly because Trnsys3d zones are used to simulate the dynamic flow of energy. An energy model of a building should typically be separated into perimeter and core zones. This is important to separate the effects of infiltration from the perimeter and core, and to correctly account for solar gains into the building. In this tutorial, the example building is divided into two zones: the first floor with a shade (see the purple box), and the second floor, without shading. It is also important to note that, unlike SketchUp zones which can be any shape imaginable, Trnsys3d thermal zones must be convex, meaning that every surface in the zone should be in the line of sight with all other surfaces of the zone.



convex



concave

Creating a Simple Energy Model


Download and Launch the Software

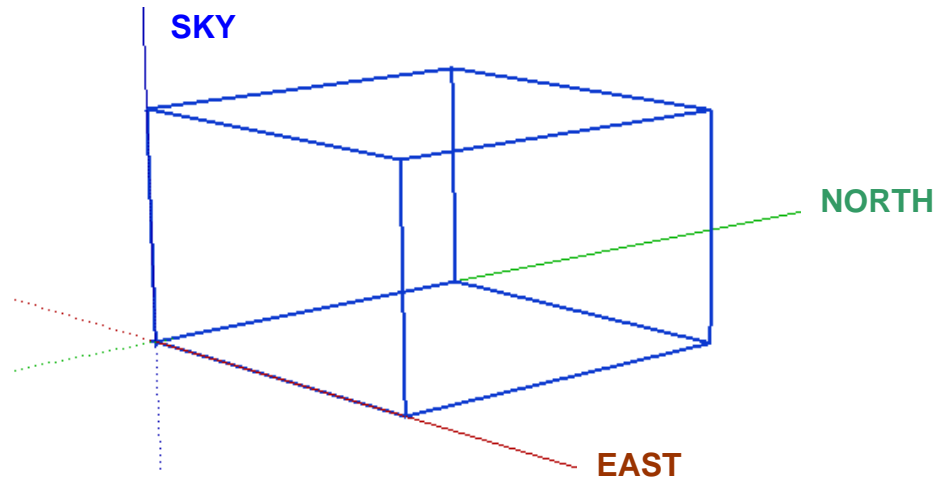
- Download and install Google SketchUp 7 from <http://sketchup.google.com/>.
- Download and install Trnsys3d
http://www.trnsys.de/docs/userservice/userservice_updates_de.htm
- Start Google Sketchup. You will be prompted to choose a template.



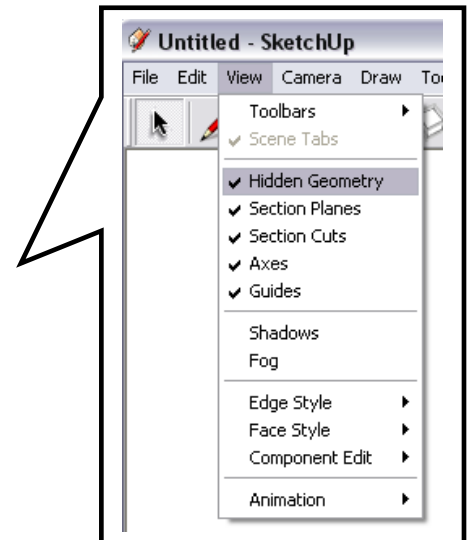
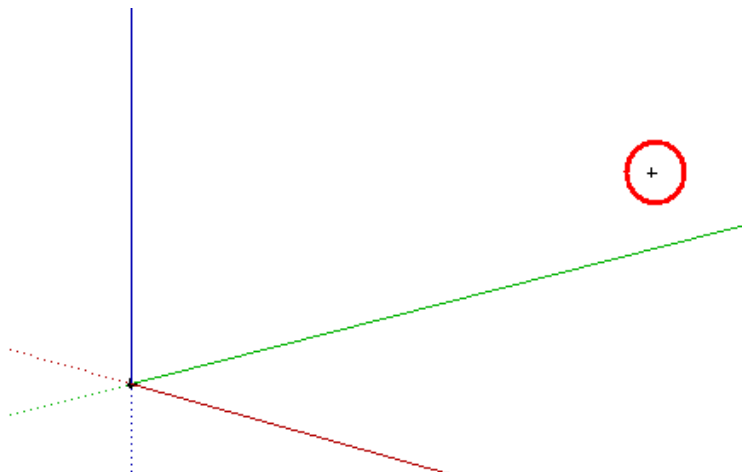
- Choose the 'Engineering – Meters' template and click 'Start using SketchUp'.
- Delete the drawing of the person standing at the axis origin by clicking on it and pressing 'Delete'

Create a Trnsys3d Zone

Create a new Trnsys3d zone by choosing Plugins -> Trnsys3d -> New Zone Tool  from the main menu. A small, blue cross-hair will appear at the tip of the cursor arrow. Hover over the axis origin until a small yellow dot appears and click. This will place a blue box on the screen, which represents the Trnsys3d zone. If the blue box is not visible, try changing the view to fit the object by going to Camera -> Zoom Extents from the main SketchUp menu. Now you can zoom in and out with the mouse wheel to fit the object in the window as desired.



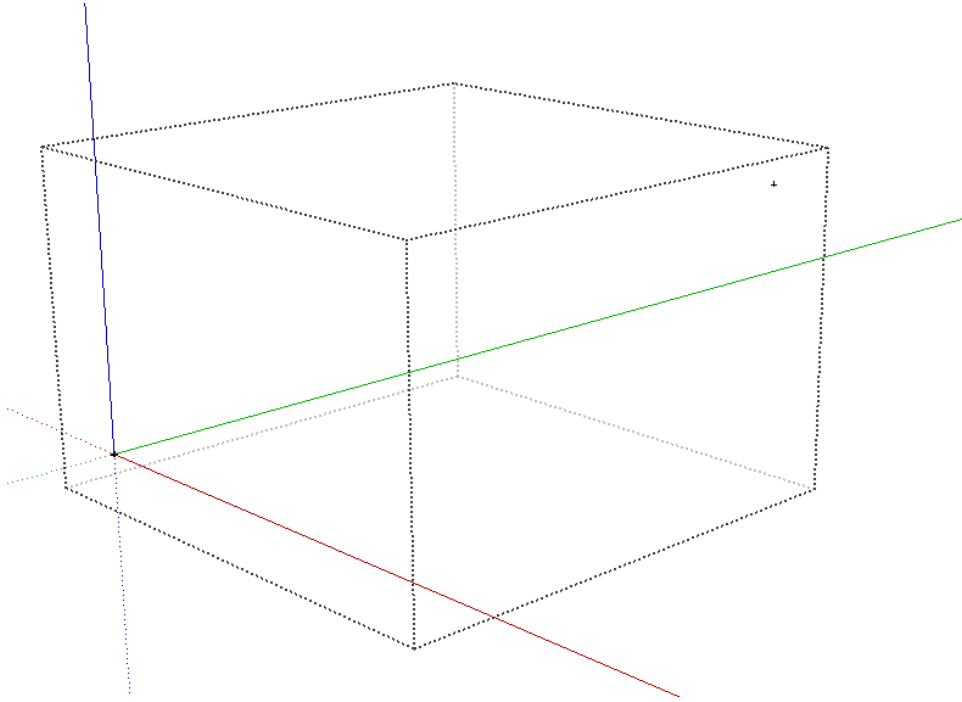
Note that by clicking on the screen outside of the blue box, the object will disappear from view. This is normal. Turn on hidden geometry (Go to View -> Hidden Geometry from the main menu) and a small gray cross-hair will be visible at the opposite corner of the box.



This cross hair allows the user to find the Trnsys3d zone more easily. Note that if you click on the gray cross-hair, the Trnsys3d zone is outlined in blue again.


Trnsys3d Zone Details

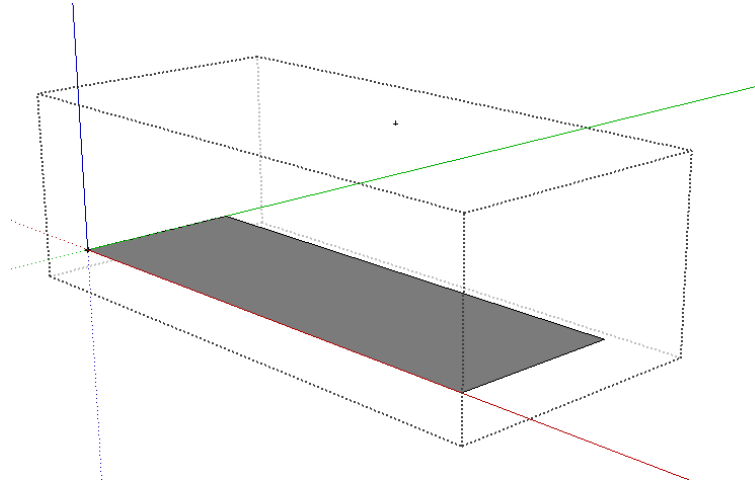
Double click on the small cross-hair, which is now visible with hidden geometry turned on. The blue outline of the Trnsys3d zone should be replaced with a slightly larger box with a broken, black outline. This 'activates' the Trnsys3d zone. Note that in order to modify the Trnsys3d geometry the Trnsys3d zone MUST be 'activated' (outlined with the broken black line). Alternative to clicking on the crosshair, you can double click inside the blue box.



This is what separates the Trnsys3d geometry from SketchUp geometry. Any object drawn in a 'unactivated' Trnsys3d zone is only SketchUp geometry and will not be written out to the Trnsys3d IDF file. It is VERY important to make sure the zone is activated before you start creating geometry.

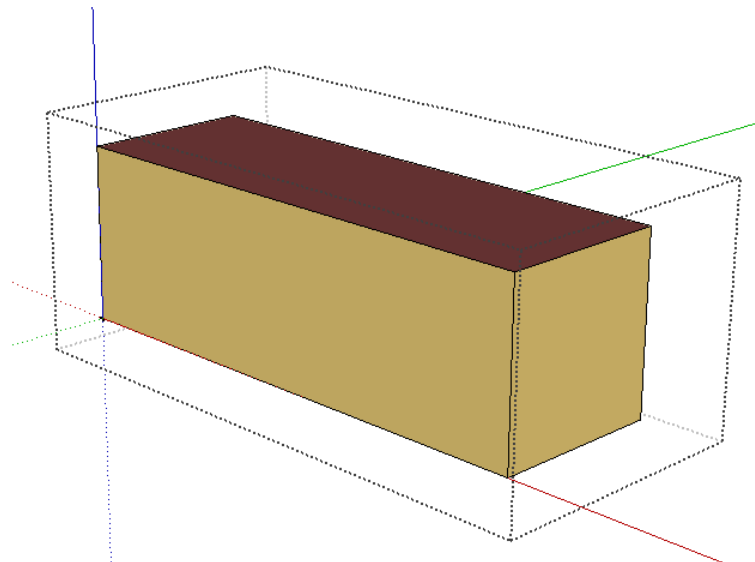
Modifying Geometry within the Trnsys3d Zone

Make sure that the Trnsys3d zone is still 'active' (outlined with the broken black line). Then create the floor for the model by going to Draw -> Rectangle  from the main menu. Start the rectangle at the axis origin by clicking on the origin. Next designate the size of the rectangle by typing '12, 4' and pressing enter (you can see the numbers being input in the lower right hand corner of the screen, the comma between the numbers is operating system language dependent and can also be ;,.). This will create a 12m by 4m floor.




Note the gray color of the floor. This color is automatically generated by Trnsys3d and designates this surface as a floor in Trnsys3d. Similarly, the walls and roof will be colored accordingly, in the next few steps.

Next 'pull' the rectangle up to create a rectangular prism. Make sure that the Trnsys3d zone is still 'active' (outlined with the broken black line). Choose Tools -> Push/Pull from the main menu. Hover over the rectangle until small blue dots appear on the floor surface and click ONCE with the mouse. The tool will 'grab' the rectangle surface. Move the mouse up and down to see how the tool works. Move the mouse slightly up (so that the rectangle is projecting towards the top of the screen), type '4', and press enter. This will 'pull' the rectangle up to create a 4m tall prism.




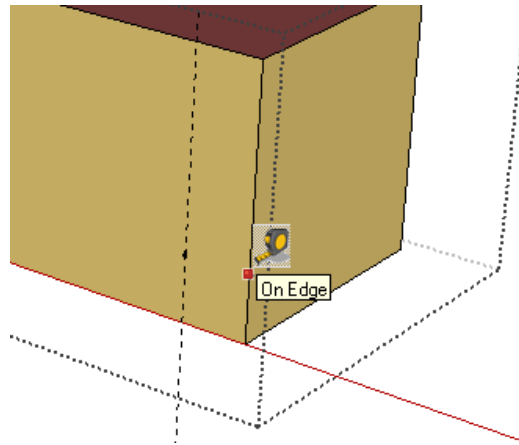
Saving the IDF File



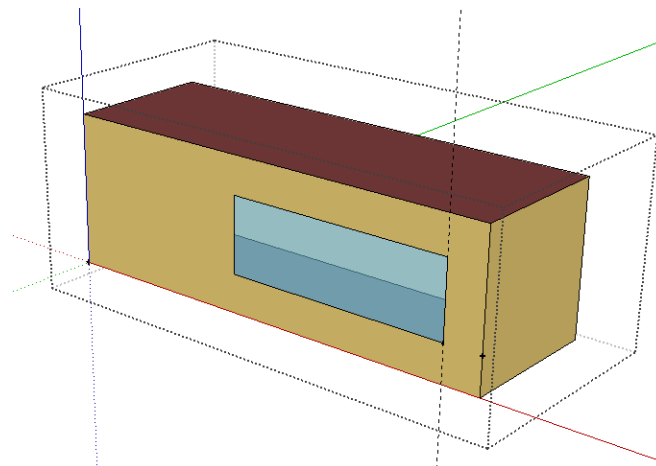
It is crucial to save the IDF file early and often. The IDF file is separate from the SketchUp file and saving the SketchUp file will not preserve the IDF information. To save the IDF file, choose Plugins -> Trnsys3d -> Save from the main menu . If it is the first time you are saving the file a dialog box will prompt you for a location and name. Call the file 'tutorial1.idf'. Again, it is very important to save the IDF file early and often.

Creating Fenestration Objects


Trnsys3d can also be used to generate fenestration objects. Make sure that your Trnsys3d zone is still 'active' (outlined with the broken black line). Use the tape measure tool to create a 1m offset guides from the corner of the wall. Select Tools -> Tape Measure  and click once on the lower right hand corner. Hover to a point above the corner, type in '1' and press enter. A small black crosshair will appear. Using the tape measure tool again, click once on the new crosshair and hover to a point left of it, type in '1' and press enter. A dotted vertical guide and another crosshair will now appear on the wall surface.

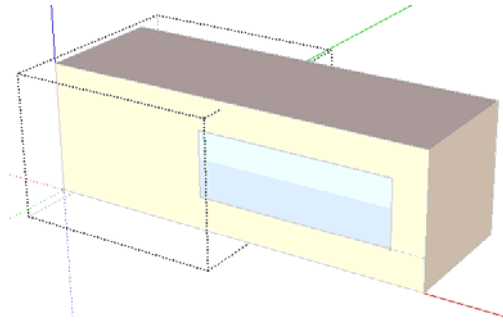


Now, select Draw -> Rectangle and click once on the crosshair located on the wall surface. Type in '6,2' and press enter. Note that as long as the rectangle is completely contained within the wall surface, Trnsys3d will recognize it as a window and automatically color it a transparent blue. A skylight is created the same way as a window, but the rectangle is drawn on a roof instead of a wall. The guide lines can be removed by going to Edit -> Delete Guides. This will also remove the hidden geometry.

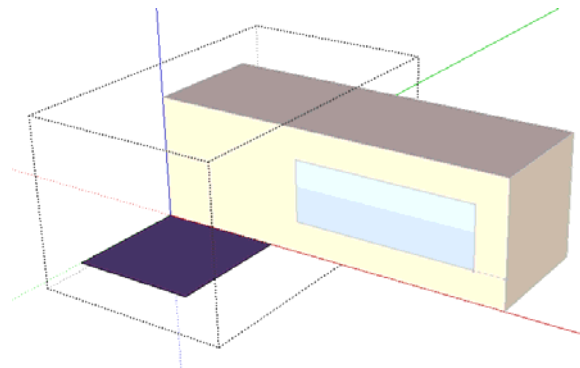


Create Shading Objects

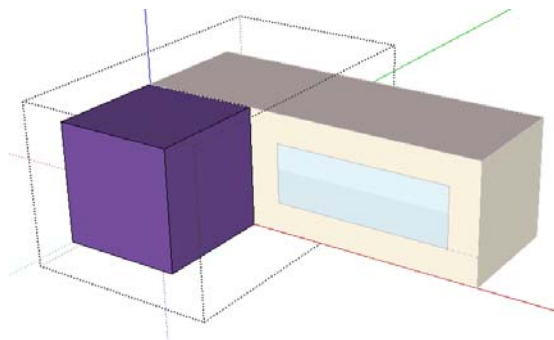
Trnsys3d can be used to create shading objects, including overhangs and detached shading objects to represent other buildings. Select Plugins -> Trnsys3d -> New Shading Group Tool , which is very similar to the new zone tool. For this example, place the new shading group at the axis origin. Just like the new zone tool, in order to edit the shading group geometry you must make the group 'active'. To do this, double click on the small gray cross-hair that was created when you placed the new shading group. When the shading group is 'active' you should see the rest of the model become lighter.




Use the rectangle tool to create the footprint of a detached shading object. Click the origin once and move the mouse so that the footprint is previewed in the correct quadrant. Type in '4,4', which will create a floor surface of 4m by 4m. Notice that the gray dotted box extends itself to include the floor surface.

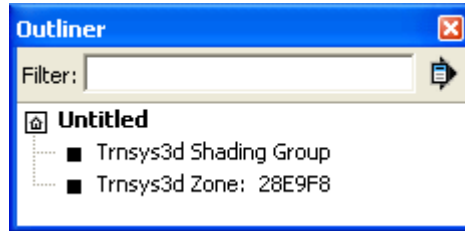


Similar to creating a new zone, use the Push/Pull tool  to 'pull' the shading surface up to 4m.




Using the Outliner Window

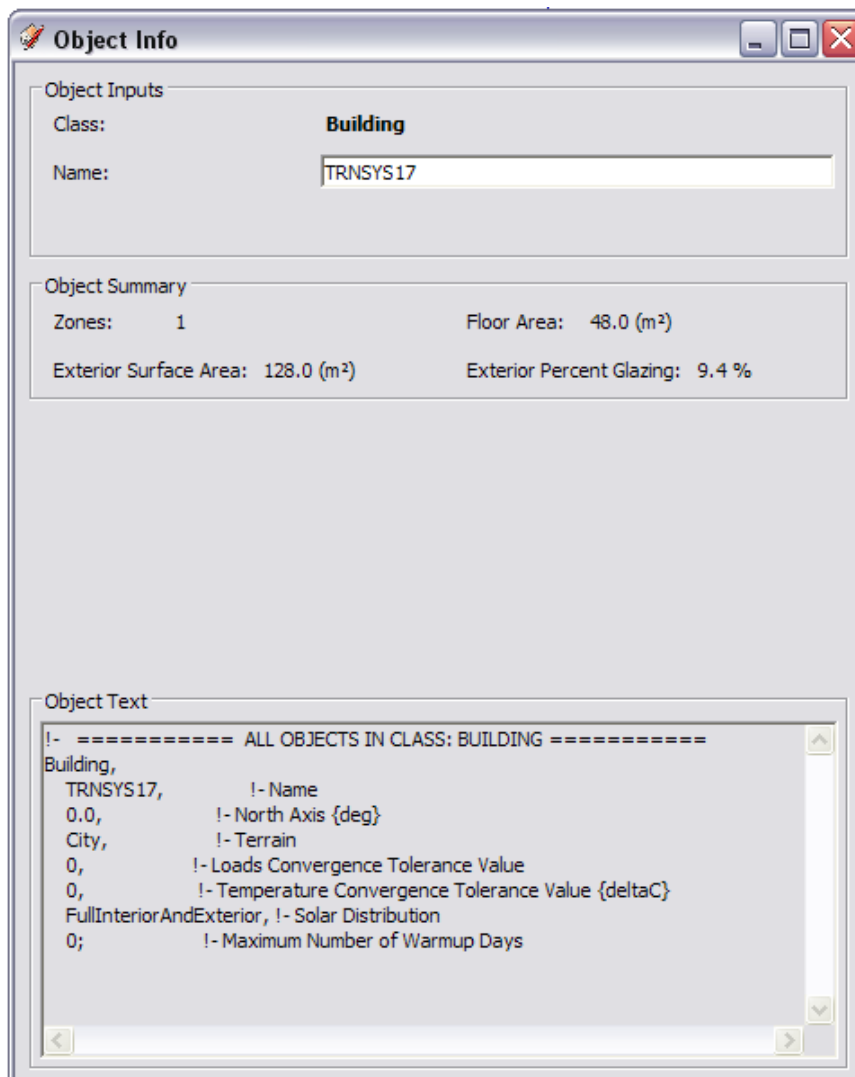
We will now use the outliner window to review the zones that we have created. To access the outliner window from the main menu choose Window -> Outliner :



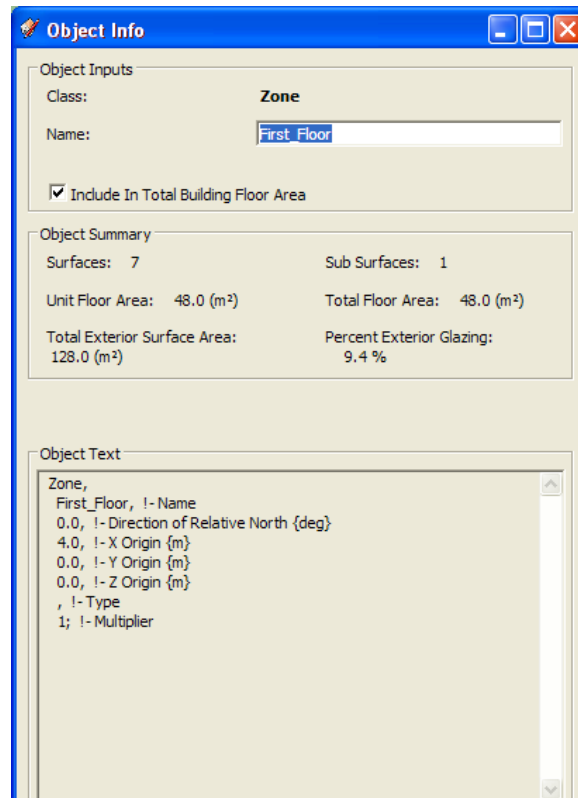
You can use the outliner window to select the Trnsys3d objects by clicking on them. Double clicking on an object in the outliner window will 'activate' the object. You should have one Trnsys3d shading group and one Trnsys3d zone with a random six-digit alphanumeric name. If you have any additional objects placed on accident select them in the outliner window and delete them.

Using the Object Info Tool

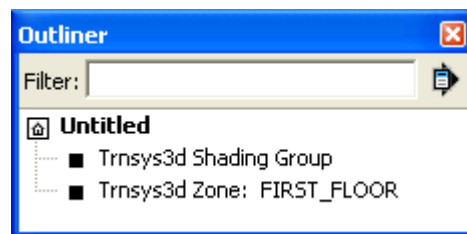
Trnsys3d also has the ability to modify the Trnsys3d object information. Choose Plugins -> Trnsys3d -> Object Info . The class type will change as objects are selected on the screen. If nothing is selected, the class type is 'Building'. Change the name of the building to 'TRNSYS17'



Click on the zone in the main SketchUp drawing area and you will see the class type change to 'Zone' in the object info window. Change the Zone name from the default six digit alphanumeric zone name to 'First_Floor' (!!!NOTE: No Spaces!!!).



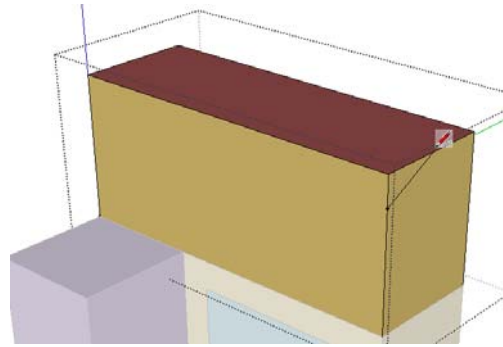
Open the outliner window again; notice that the Trnsys3d zone name has changed.



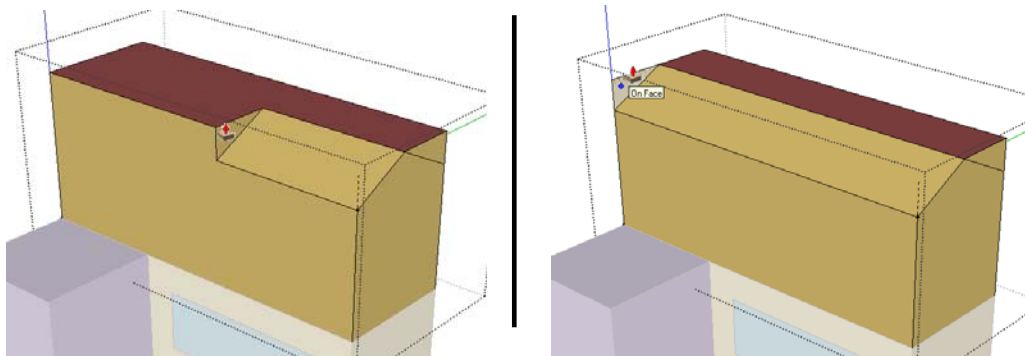
! With the object info window still open double click on 'First Floor' in the SketchUp model to 'activate' the zone. Notice how the object info changes as you select a wall, roof, or window (note characteristics like surface name, type, construction, zone, outside boundary conditions, and the ground view factor). You can change the name, the surface, the surface type, and the construction for each surface. ! Note: Leave the surface name as it is, this will be automatically changed later on!. Toggle between surfaces by clicking on them on the main SketchUp window.

Adding a Second Zone to the Simple Model

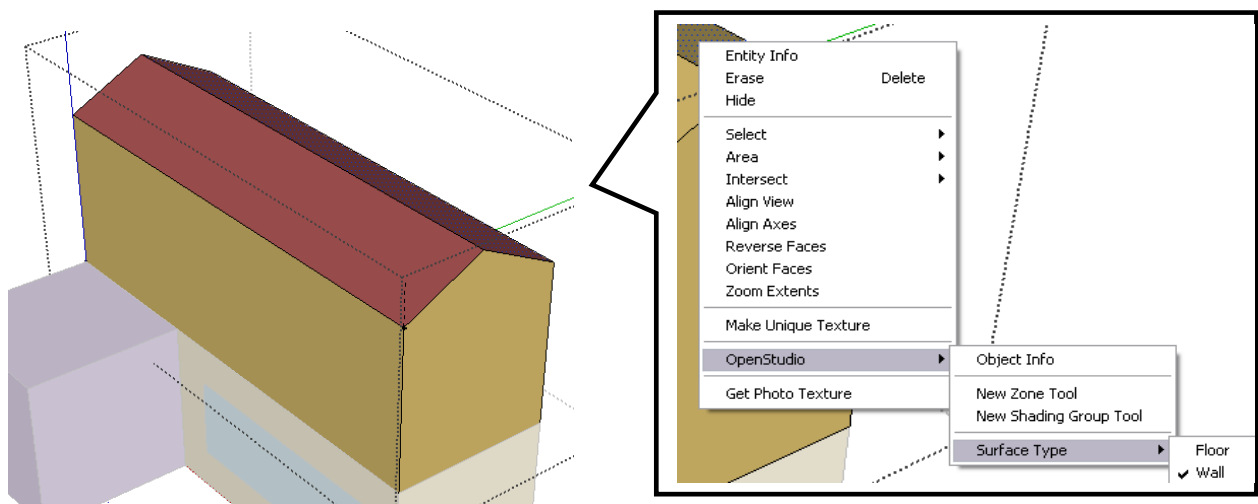
Create the second floor of the example model by creating a new Trnsys3d zone and repeating the previous steps, but 'pull' this floor to 5m instead of 4m. To create a sloped roof, portions of the rectangular prism will be 'sliced' off. Using the tape measure tool, place a crosshair guide 1m below the upper corner, as shown below. Then select Draw -> Line and draw a line from the crosshair to the midpoint of the top edge. (The midpoint shows up in blue when you hover over it.) Draw another line connecting the midpoint to the edge opposite of the one with the crosshair, outlining the shape of the sloped roof.



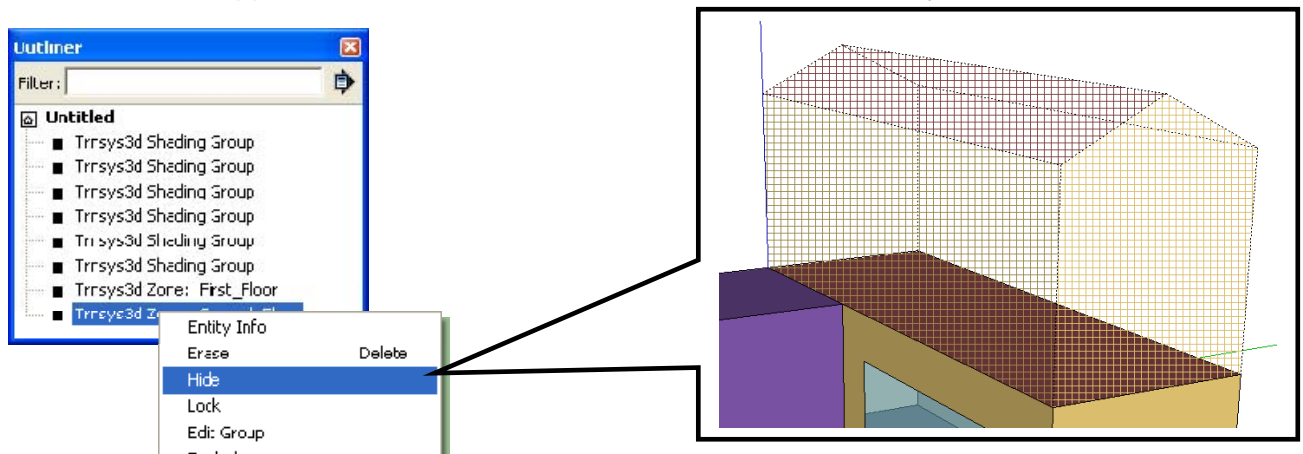
Select Tools -> Push/Pull, hover over a triangle until the blue dots appear and click once inside the triangle. Move the mouse towards the other end of the prism until the cut follows through the entire length of the prism and click to complete the 'slicing' (the cursor will snap to a triangle at the other end.) Repeat for the other triangle.



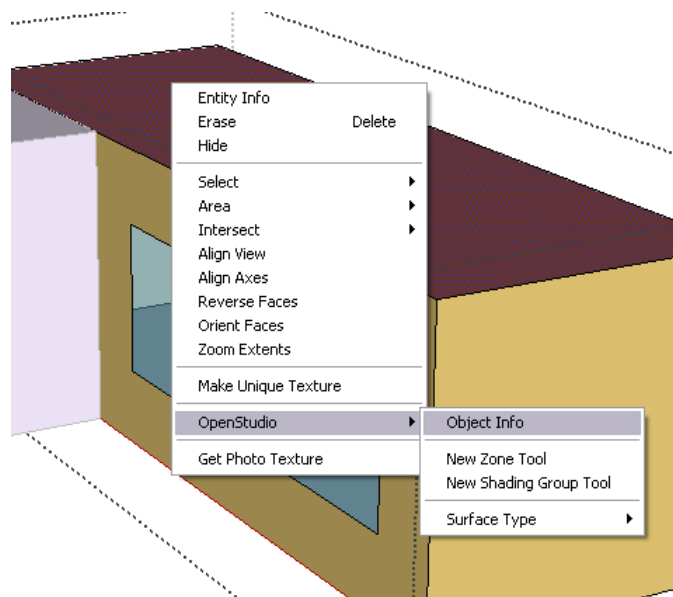
Note that the sloped roof you just created is now the same color as the walls. To re-assign the surface type in Trnsys3d, right-click on the surface make the selections as shown below to finally choose 'Roof' for each sloped surface. Repeat previous steps to rename this zone as "Second Floor"



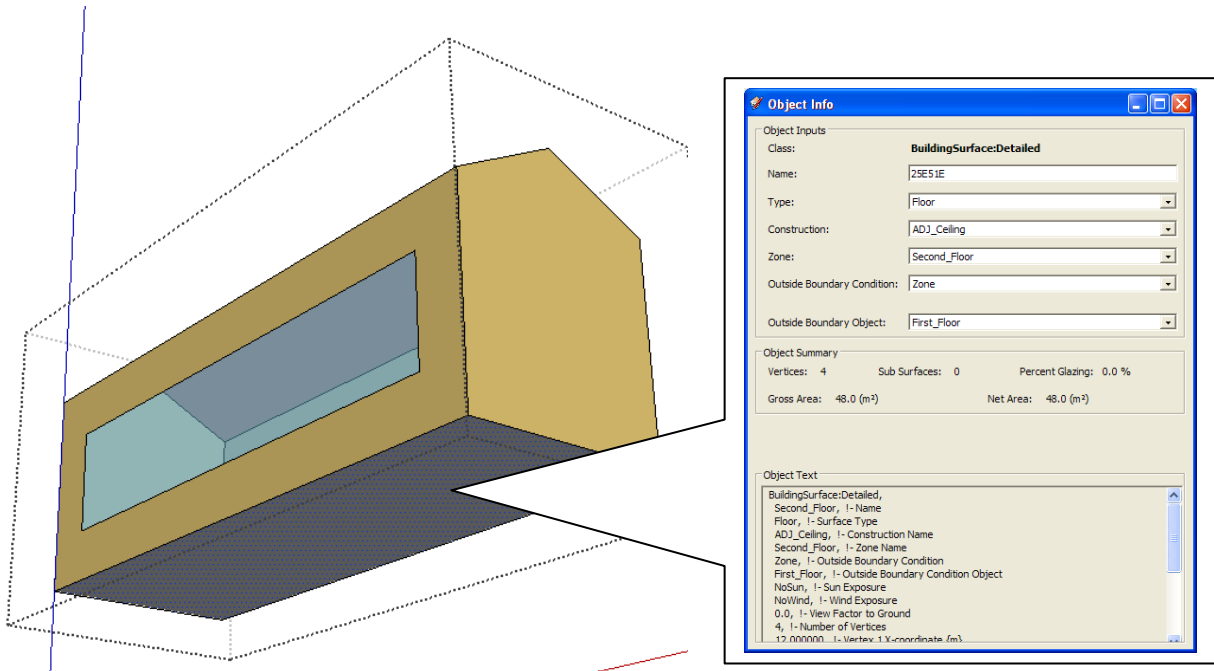
Finally, the interzonal adjacencies must be considered. The mating surfaces between the First Floor and Second Floor must be linked together. First, open Window -> Outliner, and right click on the Second Floor to 'Hide' it. If View -> Hidden Geometry is checked, then the second floor will appear hatched. You must uncheck it, to hide it entirely.



Next, double click the First Floor zone to 'activate' it. Right Click on the roof of the first zone and select Trnsys3d -> Object Info. Change the Type to "Ceiling" and construction to "ADJ_CEILING". The outside boundary condition should be "Zone" and the outside boundary object is "Second Floor."



Right click on the Second Floor in the Outliner to unhide it. Repeat the same steps above to hide the First Floor and reassign the floor of the Second Floor correctly. See the Object Info entries below. Note that although the type of the Second floor is 'Floor', the construction must match the First Floor (ADJ_Ceiling). This is critical for adjacency recognition, when importing into TRNBUILD.



Alpha Feature: method for matching surfaces

An experimental method for matching surfaces is currently in alpha testing and may be accessed through the SketchUp ruby console through the following steps:

1. Open the SketchUp Ruby console through 'Window->Ruby Console'
2. Type 'Trnsys3d::match_surfaces' to match walls, roofs, and floors
3. Wait, this is currently a slow process for large models

Note that this method requires several key assumptions.

First, in order to match two surfaces the method requires that they both have the same number of vertices and that the vertices exactly line up. This can most easily be accomplished using the snap functionality of the SketchUp drawing tool.

Secondly, construction names of the matched surfaces will be changed to (for each corresponding surface or sub surface type): "ADJ_CEILING" and "ADJ_WALL" if construction objects of those names appear in the current idf file. If construction objects with the assumed names are not found, then the construction of the matched surface will not be changed.

VirtualSurface Definition

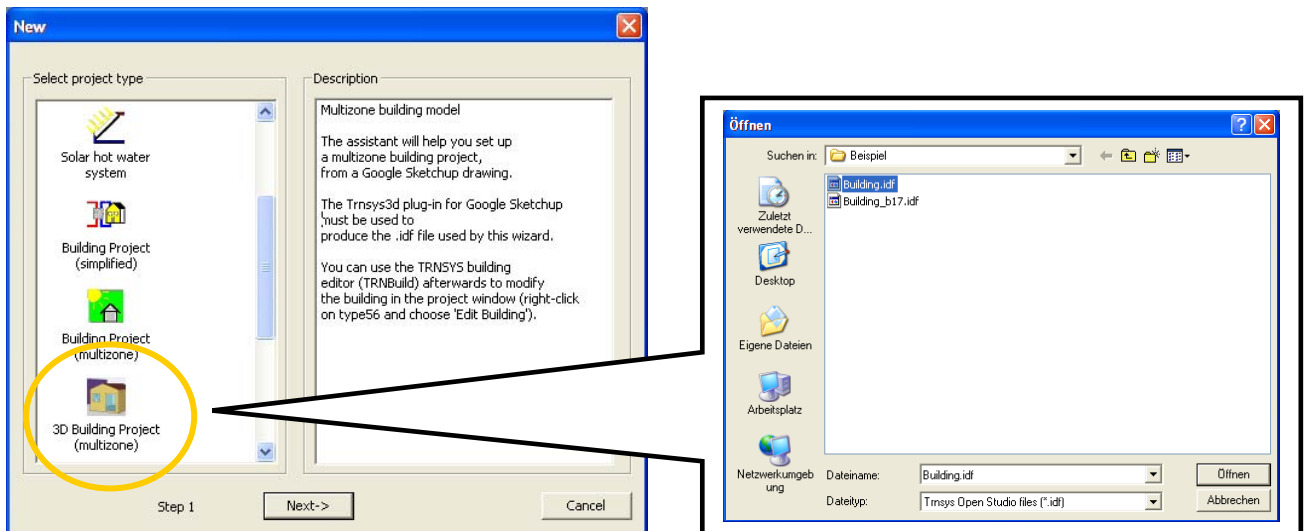


Note that thermal stratification is normally modelled with a stack of several zones. To model this, for example an atrium, assign the construction as 'VirtualSurface'. When it gets imported into the TRNSYS TRNBUILD, the VirtualSurface will automatically be deleted and reflect an accurate radiative model.

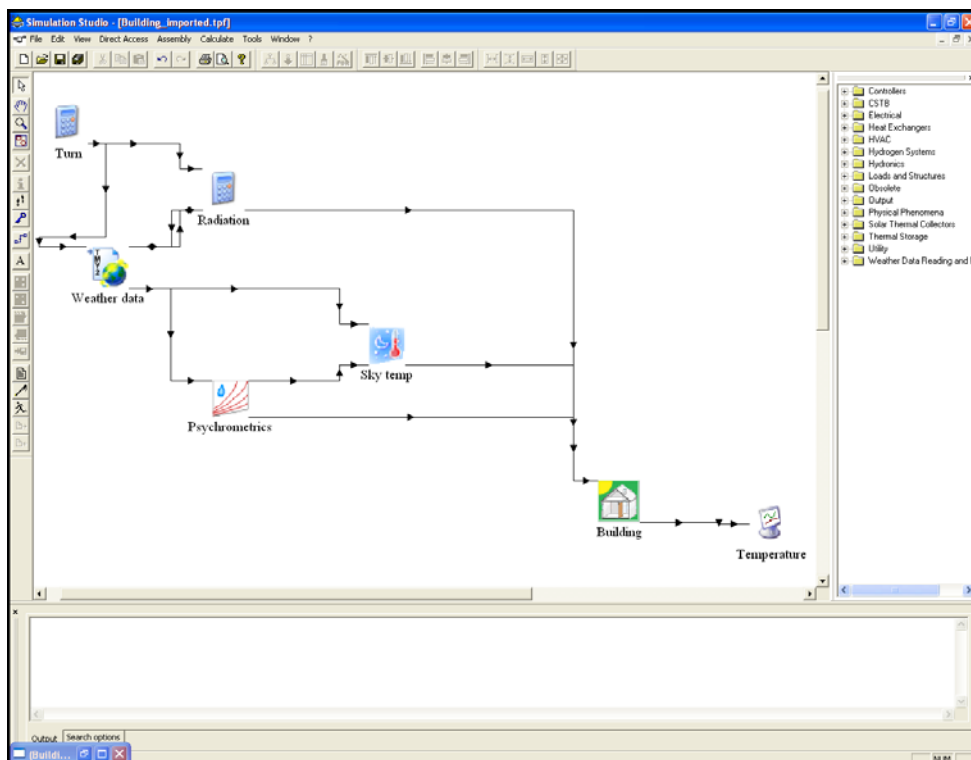
Using the 3D-Building WIZARD in the TRNSYS Simulation Studio

Importing the *.IDF file

For the first run of a simulation, the TRNSYS17 Simulation Studio offers the opportunity to automatically set up a simulation by importing the *.idf file with the 3D-Building Wizard. After opening the Simulation Studio you can select 'New Project' in the menu and the 3D-Building Project Wizard can be chosen. The Wizard prompts you for the *.idf file that you previously generated using the Trnsys3d in Sketchup. Select the *.idf file and a simulation with the most important links for a first run are automatically generated. Check the assigned weather data and run the model. After importing the model, a new *.idf file will be generated which includes, the original name, an underscore and 'B17', for example 'Building_B17.idf'. This file is including the surfacelD's as shown in the building description file.

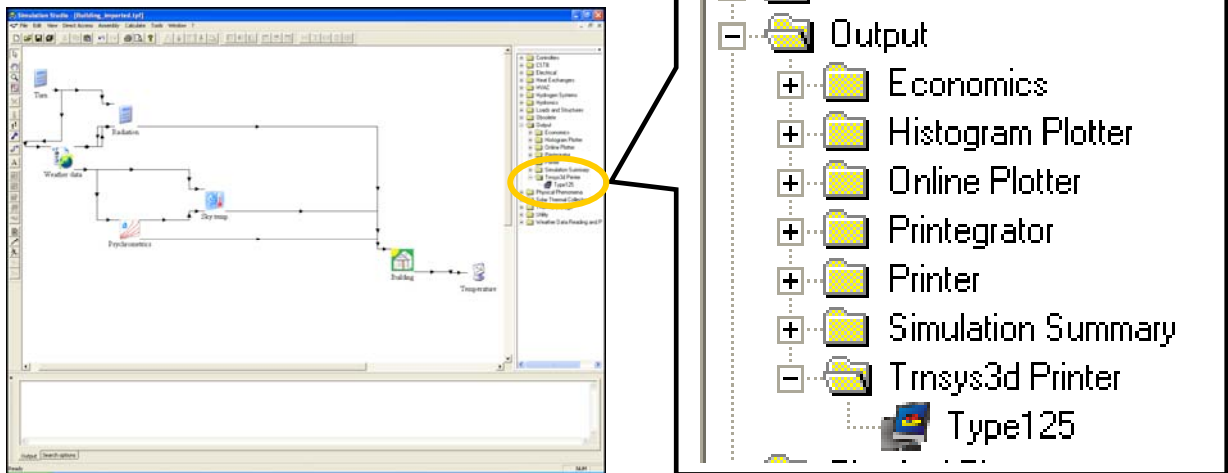


A great advantage of the 3D-Building Wizard is that all orientations of the Building are linked automatically. This reduces errors and time used to link this information manually.



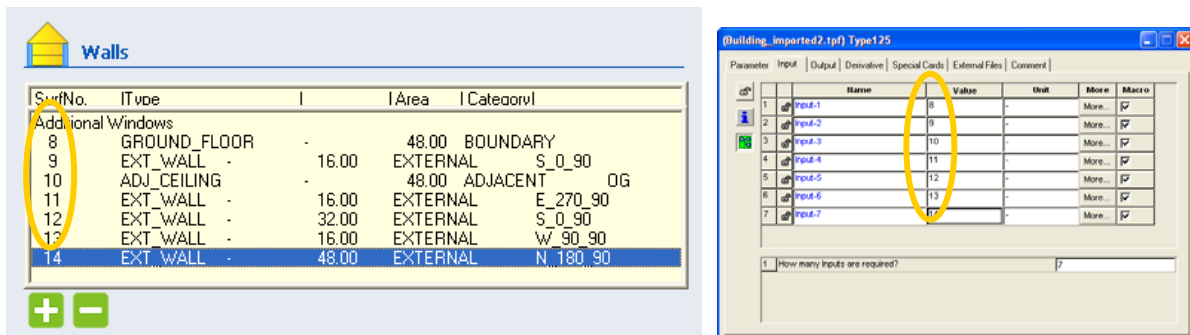
Viewing Results

Trnsys3d can be used to view Trnsys3d results. But first, the Trnsys3d requires results to be printed from the Trnsys3d Printer (Type 125), which is retrieved from the Direct Access Toolbar in the TRNSYS Simulation Studio.

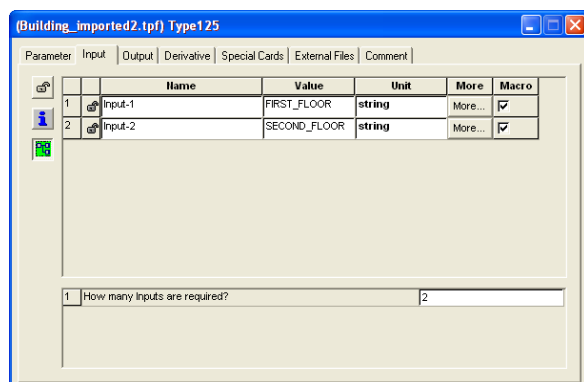
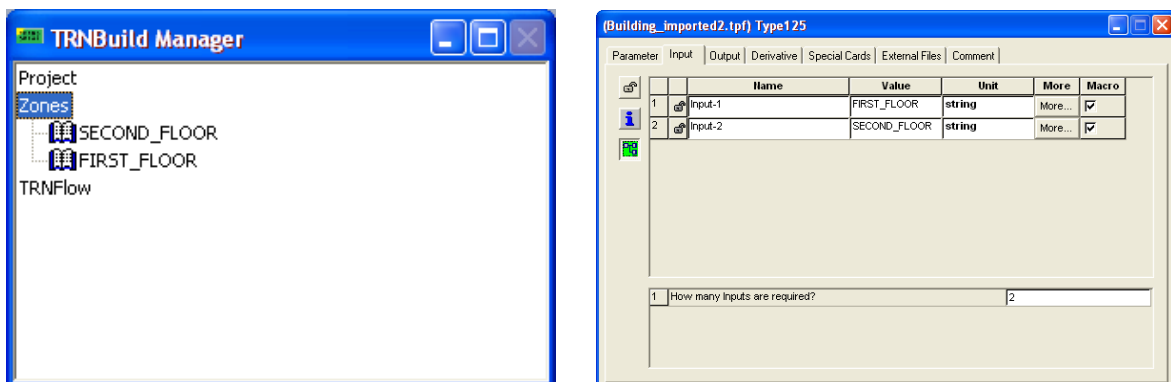


The Trnsys3d Printer will generate *.eso files that can be read by the Trnsys3d plugin to visualize results. The Trnsys3d printer can be configured in two different ways.

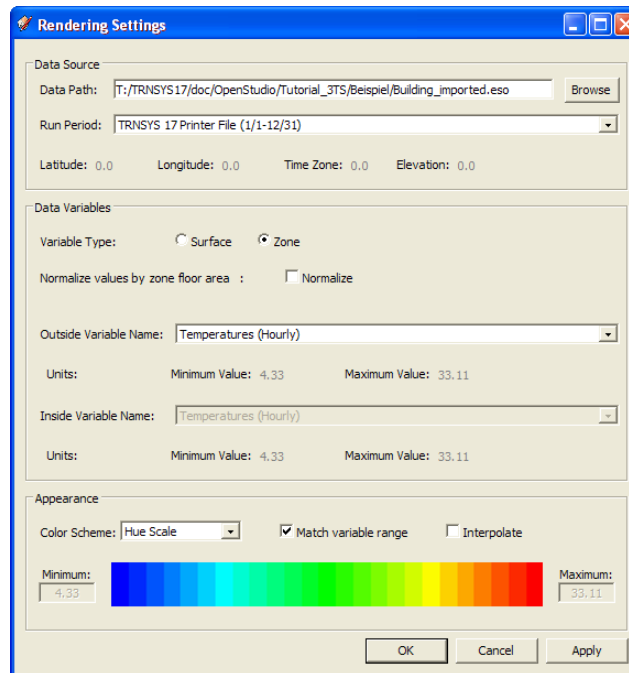
- 1) The SurfacesID's (corresponding to the ID's in TRNBUILD) are required as initial values.




- 2) The ZONE Names (corresponding to the names in TRNBUILD) are required as initial value. Initial value has to be defined as STRING. NO SPACES!

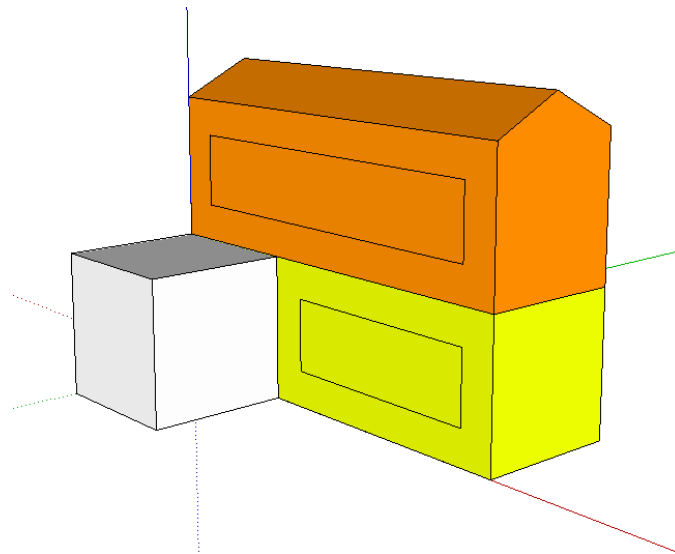


The information from the surfaces and zones can now be linked to Type125. After linking the surfaces and zones, the ***_B17.idf model can be reloaded into Trnsys3d. First, go to the main SketchUp menu and chose Plugins -> Trnsys3d -> Renderings -> Settings. This will open the rendering settings dialog box.

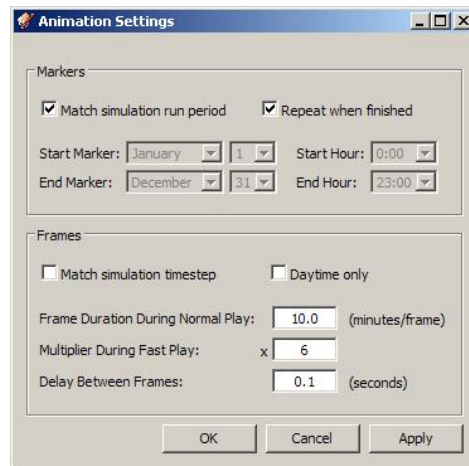


Set the data path by browsing to the directory where you saved your IDF file. There should now be an ESO file generated by the Simulation Studio during the simulation. Choose the ESO file for the data path. The run period will automatically be filled once the ESO file is selected. Set the rest of the Rendering settings as shown above and click 'OK'. The dialog box will close and nothing will appear to change. We now need to set Trnsys3d to render by data value instead of by surface class. To do this go to the main SketchUp menu and chose Plugins -> Trnsys3d -> Renderings -> By Data Value .

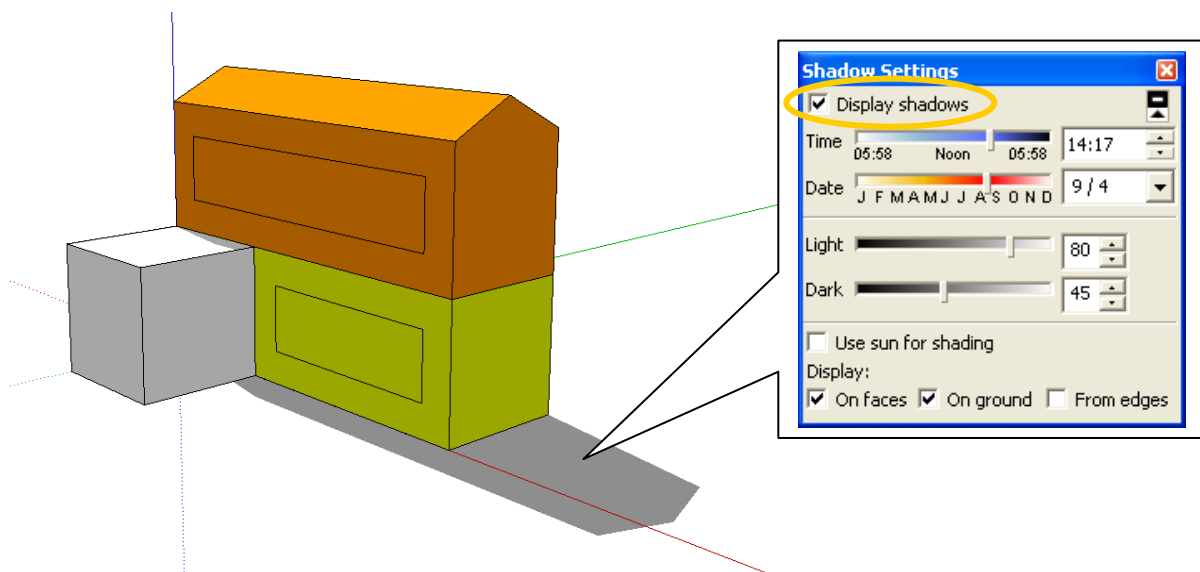
If any portion of model appears white, it indicates that no data results are available from the TRNSYS simulation for the selected date for that zone. The model should be colored based on the zone air temperature, as shown below.





Try matching the simulation run period in Trnsys3d with the Trnsys Simulation Studio results by setting it to the first week of January. In the SketchUp main menu, choose Plugins -> Trnsys3d -> Animation -> Settings. This will open the Animation Settings dialog box.



Check the 'Match simulation run period' and the 'Repeat when finished' checkboxes as shown above and hit 'OK'. Lastly we need to reset the time to the beginning of the run period. In the SketchUp main menu, chose Plugins -> Trnsys3d -> Animation -> Reverse to Marker. Make sure that the bottom left corner of the screen indicates January 01. If it says January 08, choose Plugins -> Trnsys3d -> Animation -> Reverse to Marker again. Now the bottom left corner of the screen should say January 01. Also, turn on shadows to see the position of the sun by going to View -> Shadows from the main SketchUp Window.



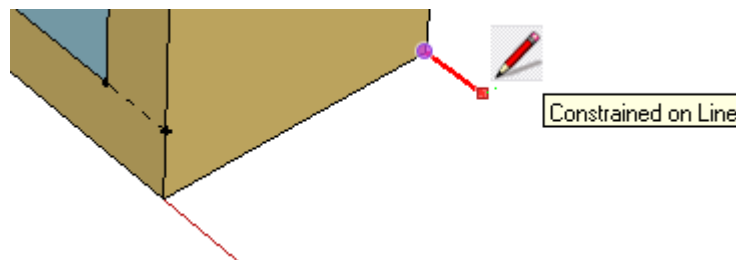
Now that we have reset the time and have shadows on, we are finally ready to view the animation. To begin the animations go to the SketchUp main menu and chose Plugins -> Trnsys3d -> Animation -> Play. At the bottom left of the screen you will see the time and date as the animation progresses. Notice that the zones are all slightly different colors, meaning that their temperature is different because of their construction, occupation,.....

While the simulation is running we can view the temperature scale by going to the main SketchUp menu and chose Plugins -> Trnsys3d -> Renderings -> Color Scale . Stop the animation the same way you started it, by going to the SketchUp main menu and chose Plugins -> Trnsys3d -> Animation -> Play . Once the date passes the end of our run period the model will turn white because there is no data for it to display. The animation can begin from the beginning by first halting playback by going to the SketchUp main menu and chose Plugins -> Trnsys3d -> Animation -> Play and then resetting the time by going to the SketchUp main menu and chose Plugins -> Trnsys3d -> Animation -> Reverse to Marker.

Using Trnsys3d for TRNSYS17 - Tips & Tricks

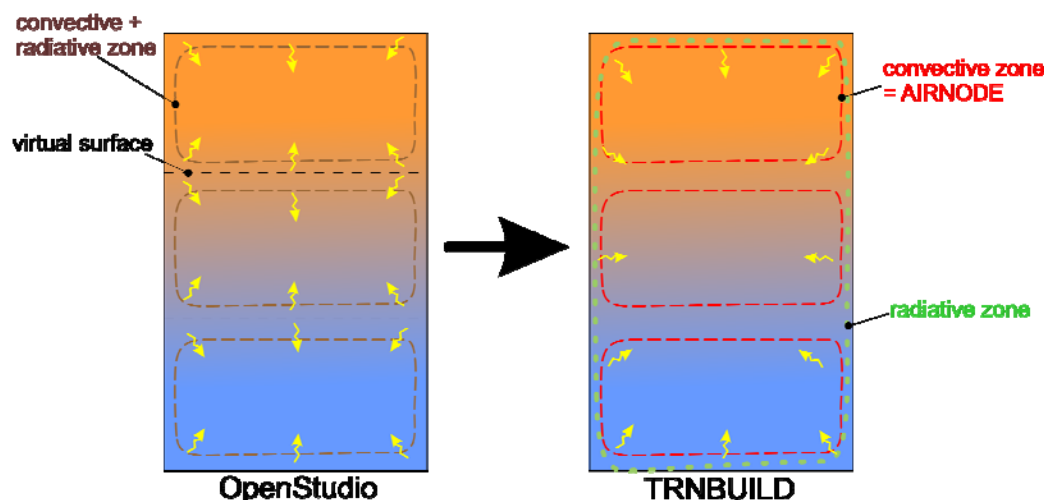
General

- Read the SketchUp documentation.
- Check that unit settings are set to “High” accuracy
- You may encounter difficulties using directories with “ä”, “ö”, “ü”, blanks etc.
- To position vertices with precision or create surfaces with exact dimensions, use the Value Control Box (VCB) in the lower right corner or use construction lines.
- To draw quickly and accurately, use SketchUp’s snapping capabilities. For example, to match the x-, y-, or z-position of the endpoint of a line, hover the cursor over the endpoint until the tooltip appears. Click ONCE. As you move the mouse, SketchUp will let you know when you are parallel to the reference line. To lock an snapping functions along an axis, hold down the shift key while you draw, and the line will appear bold and in the same color as the parallel axis.



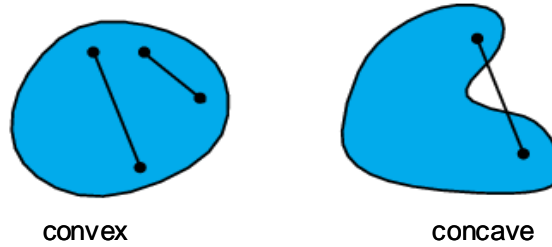
Zones

- In TRNbuild, a zone can include multiple air-nodes. However, it is recommended to draw each air-node as one zone in Trnsys3d. For example, in an atrium, thermal stratification is often represented with multiple air-nodes. In Trnsys3d, each air-node should be defined by a separate zone and the construction of the adjacent ‘surfaces’ between the zones should be assigned to ‘VirtualSurface’. These surfaces are then deleted automatically, when importing into TRNbuild, allowing for an accurate model of the radiative zone.
 - Within TRNbuild you can move air nodes from one zone into another (including the geometric information). This way you can create radiative zones with multiple air nodes.

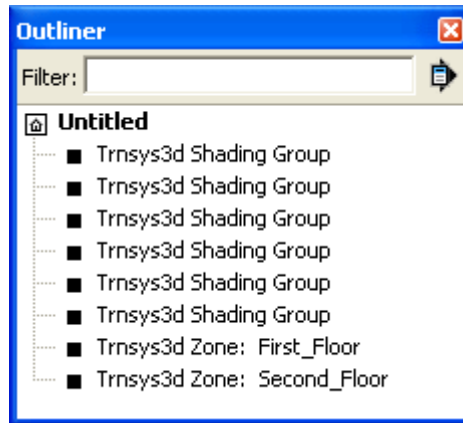


- Radiative zones must be enclosed with surfaces for the correct calculation of the volume.

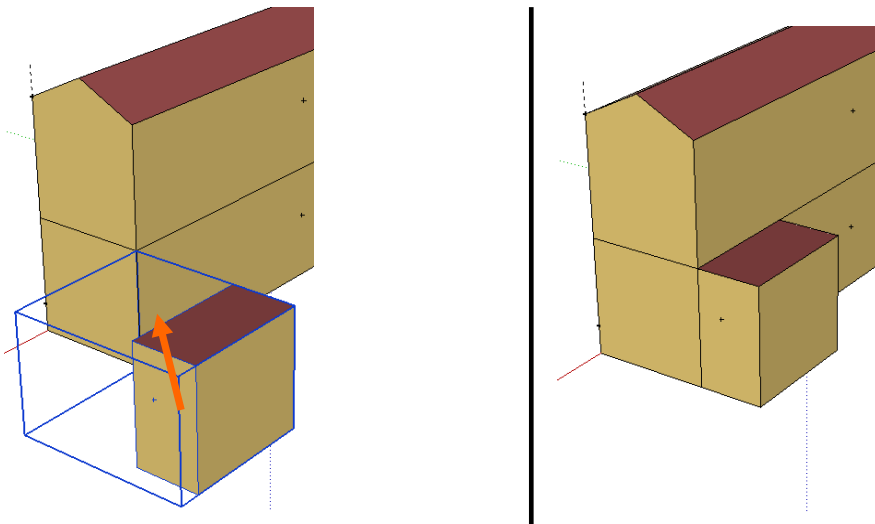
- To use the detailed radiation mode, the radiative zones must be convex polyhedrons.



- It is preferable to place the zone origin close to the origin of the world coordinate system (WCS). However, if the WCS is far away, you may not see the zone's surfaces when the zone is selected. A possible solution is to edit the zone origin in the *.IDF file manually.
- Give zones "meaningful" names. No blanks are allowed!!
- Use the Outliner window (Window/Outliner) to view a list of all of your zone groups and shading groups. Groups can be selected by clicking items in the outline. Groups can be opened for editing by double-clicking items in the outline.

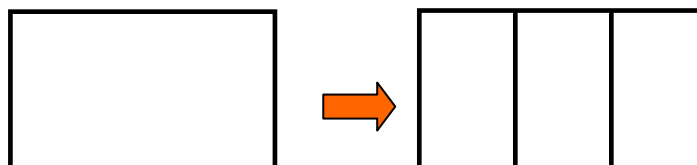


- Use the command View/Component Edit/Hide Rest Of Model to hide all other groups (and the rest of the model) when you are editing a group. When used with the Outliner, this command helps you get to zones that are buried in the core of a building.
- When drawing two or more zones with interzonal adjacencies, it is easier to draw the zones completely apart from each other, set the interzonal connections with the Object Info window, and then move them into final position using the Move tool.



Surfaces

- In Trnsys3d, all building surfaces (walls, floors, etc.) are represented in 3-D coordinates as infinitesimally thin. Zone volume and surface area, which are automatically calculated entities, are derived from those 3-D coordinates. However, you may modify the volume within TRNBuild.
- The construction that you select for each surface determines the thickness for the purposes of the heat transfer calculation, but it does not affect any geometric considerations.
- Typically, the building surfaces are measured from the outside edge of exterior walls, and the centerline for adjacent walls. At the building corners, measuring from the outside edge will overestimate the total mass of the walls, while measuring from the inside edge will underestimate it. It is easier to measure the outside edge from the blueprints, but measuring from the centerline is the more accurate approach. If the walls are especially thick, consider measuring from the centerline of the exterior walls.
- The y-Axis is pointing north. There is no way to change this.
- To add surfaces to a zone, the zone must be 'activated' by double clicking the blue outline. An activated zone will be outlined in a grey dotted line.
- Surfaces have to be drawn with an outward-pointing normal vector! Occasionally when you draw a surface, SketchUp will guess the wrong side to face out. You can tell because the side facing inside is a lighter color than the side facing outside. To correct this, use the SketchUp command Edit/Face/Reverse Faces.
- Note that even if you rename your surfaces, they will be replaced with the surface IDs that are generated automatically when importing into TRNBuild.
- Check and set the correct "Type" of all adjacent surfaces (Wall, Floor, Roof, Ceiling).
- Select a "construction" for each surface. Otherwise the surface cannot be imported into TRNBuild correctly. The constructions can be modified within TRNBuild later.
- This shows the translation of "Outside Boundary Conditions" into TRNBuild syntax:
 - Outdoors => EXTERNAL
 - Ground => BOUNDARY = INPUT 1*TGROUND
 - Zone => ADJACENT = zonename
 - Other Side Coefficients => BOUNDARY
- Adjacent surfaces have to exist twice (once for each radiative zone), but with different normals. Despite 'Type' differences (floor/ceiling, wall/wall, etc), adjacent surfaces must have the same construction for proper syncing within TRNBuild.
- Active slab surfaces should be divided in Trnsys3d (3 partitions for the active slab system are sufficient). To create divisions, simply draw a line.



- Check for holes in surfaces. Holes will generate errors when importing into TRNBuild
- Windows are linked to its base surface and should not have more than four vertices.
- It is better to model the window frame as a Wall and set FFRAME = 0.

- If you copy and paste surfaces make sure that the destination zone is active. You can copy surfaces from one Trnsys3d file into another, but sub-surfaces (windows) will not be recognized. Review Trnsys3d surface entities by checking “Object info”

Shading groups

- Draw shading groups after you have finished your building

Troubleshooting

- Use “Wireframe View” for checking if adjacent surfaces are mated.
- Check the number of surfaces and sub-surfaces in each zone.
- Always OPEN and SAVE the file within the Plug-in.
- Before closing the IDF file in Trnsys3d, save it and open it in another Sketchup file to check that everything works accordingly.
- Before closing the IDF file in Trnsys3d, translate the IDF file into B17 and check if everything is translated and make sense.

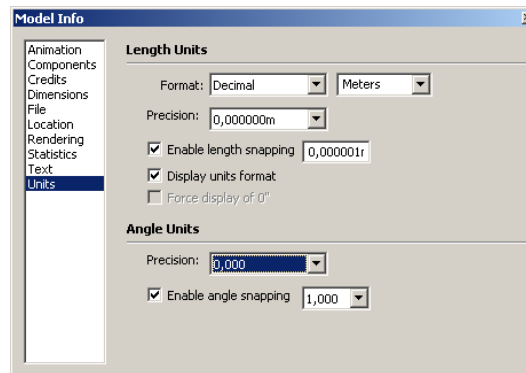
Importing geometry created in AutoCAD into Sketchup

Creating the geometry in AutoCAD

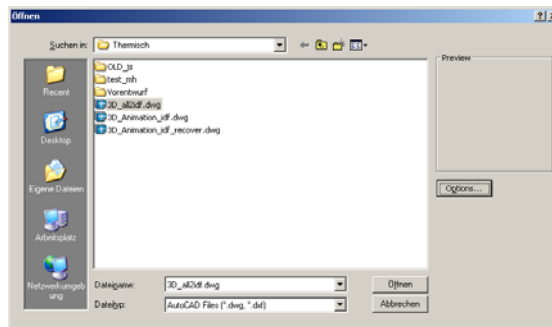
- Create one big volume, cut off surplus volume with volume cut function (e.g. atrium or undercutting volumes). Make that all edges meet, creating a sealed volume!
- Divide this volume into zones/airnodes by using the cut function). In this way, groups are created automatically after exporting.
- When drawing windows, keep a small distance from the edges of walls and stay within wall boundaries. A common mistake is applying a scaling factor to the wall to create the window.
- For each air-node, use two groups: one group for walls and one group for windows.
- Move the model to the xyz origin 0,0,0. This is critical for SketchUp to create the *.idf files properly. Also, it would be easy to add elements later.)
- Save this file as *.dwg

Importing the *.DWG model into Sketchup

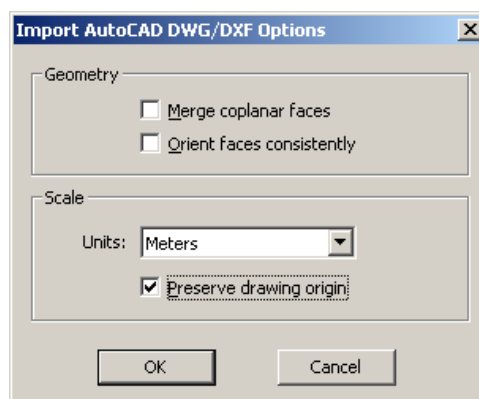
- Open SketchUp
- Adjust the units parameters as shown:



- Import the DWG file



- Press the “options” button and adjust the settings like this:

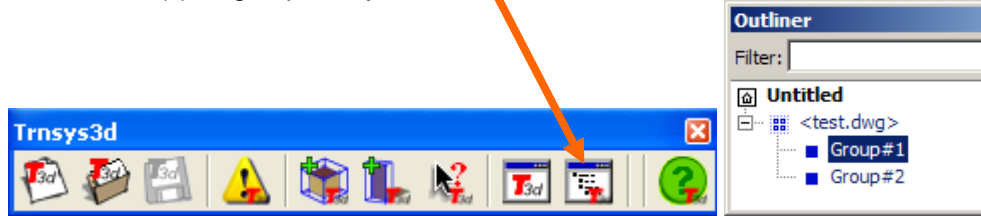


- Sign the “preserve drawing origin” and click OK
- Save this file in Project folder as *.skp

Copying geometry from an imported *.DWG into the Open Studio

Preparing the *.skp model for use in Trnsys3d and TRNSYS17

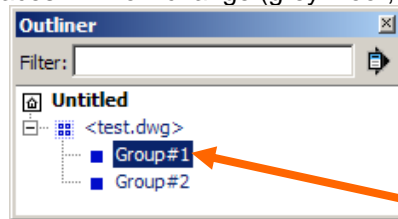
- Open the “Show outline window” of Open Studio plugin to see the imported data. You will find the zone(s) as grouped objects.



- Copy the wall surfaces of a zone by highlighting one group and right-click/copying it.
- Open another Sketchup window to use the Trnsys3d plugin. (This minimizes error messages and provides a better overview what’s already copied into zones)
- Create a new Trnsys3d zone and assign a short name (no blanks).



- Activate the zone by double clicking it in the outliner (a dotted grey line will outline the zone)
- Select Edit-> Paste in place and the wall elements are now walls of the zone.
- Explode the copied zone by pressing right mouse button on the group and selecting “explode”. The color of surfaces will now change (grey: floor, beige: wall, dark red: ceiling).



right mouse click

- Switch to the other Sketchup with your imported *.dwg file and “Copy” the window surfaces of the zone you just copied.
- Switch to the Open Studio Sketchup window and check that the zone is still active (grey dotted outline). Then, select Edit->Paste in place, and the window elements are now windows related to the base surface of the zone. The windows should now be cut out of the wall.
- Save in Trnsys3d by choosing Plugins -> Trnsys3d -> Save from the main menu.
- Repeat this procedure for every zone.
- When all zones are finished, adjust the boundaries and the adjacencies in each Trnsys3d zone, use “Object Info” to assign the Construction, Zone, Outside Boundary Condition and Outside Boundary object. Adjust only the walls, ceilings, roofs, and floors. The integrated windows will adjust themselves.



- Save the Trnsys3d file one final time and *.idf file is now readable for TRNSYS 17
- Save Sketchup
- Reimport this *.idf file into a new SketchUp file within Trnsys3d mode and all model elements should appear correctly.