Exercise: Façade windows and shading objects

Purpose

Learn how to insert and relocate windows and shading objects on a building body façade using a picture as background.
Learn how to create and edit a grid of façade windows and shading objects.

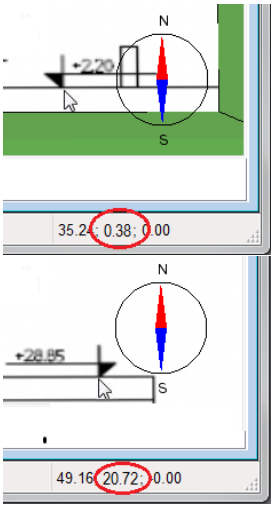
Background

Once the exterior of a building has been designed it is often likely to stay intact, while the interior, such as the division into zones, is more prone to changes, possibly even after the building has been taken into use. A good practice, which also speeds up the workflow significantly, is then to insert the exterior windows into the building body façades instead of into the zone walls. Shading objects, such as balconies, are also typically fixed with the façade design. Inserting a shading object onto the building body façade instead of relative to a window also enables it to shade neighboring windows. Façades often contain large groups of similar windows and shading objects. A grid object enables efficient management of such repeated objects.

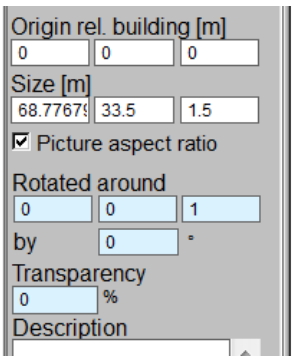
Instruction

1. Start a new standard IDA ICE building. Open the 3D view. Select a wall on the zone twice to select the entire zone. Delete the zone.

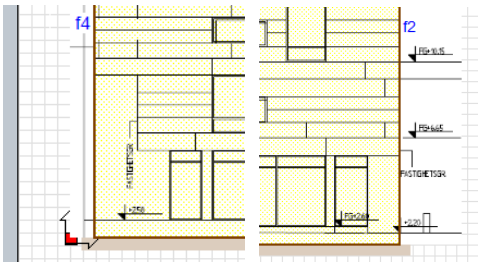
2. Select Insert > Import CAD from the program Insert menu. Import the distributed façade.png. Let's start by setting the correct scale. Cut the 3D model in z-axis with . Rotate the 3D view with the left mouse button so that you can see the picture from above and zoom in with the right mouse button on the +2.20 height value in the lower right corner of the picture. While zooming, press both mouse buttons to move the view in order to zoom close enough to the target. Check the y-coordinate at this point by pointing on it with the mouse cursor. Do the same thing with the +28.85 height value in the top right corner of the picture.

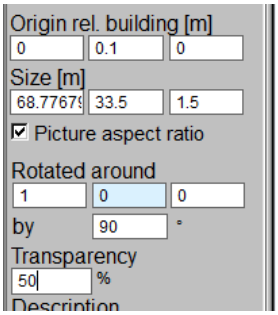
   Select the picture in the 3D view. The picture dimensions in IDA ICE x = 52.5 m and y = 25.57 m are seen in the property page on the left. The size in y-direction should be (28.85 – 2.2) / (20.72 – 0.38) * 25.57 = 33.5 m. Enter this number in the second size box in the property page on the left.

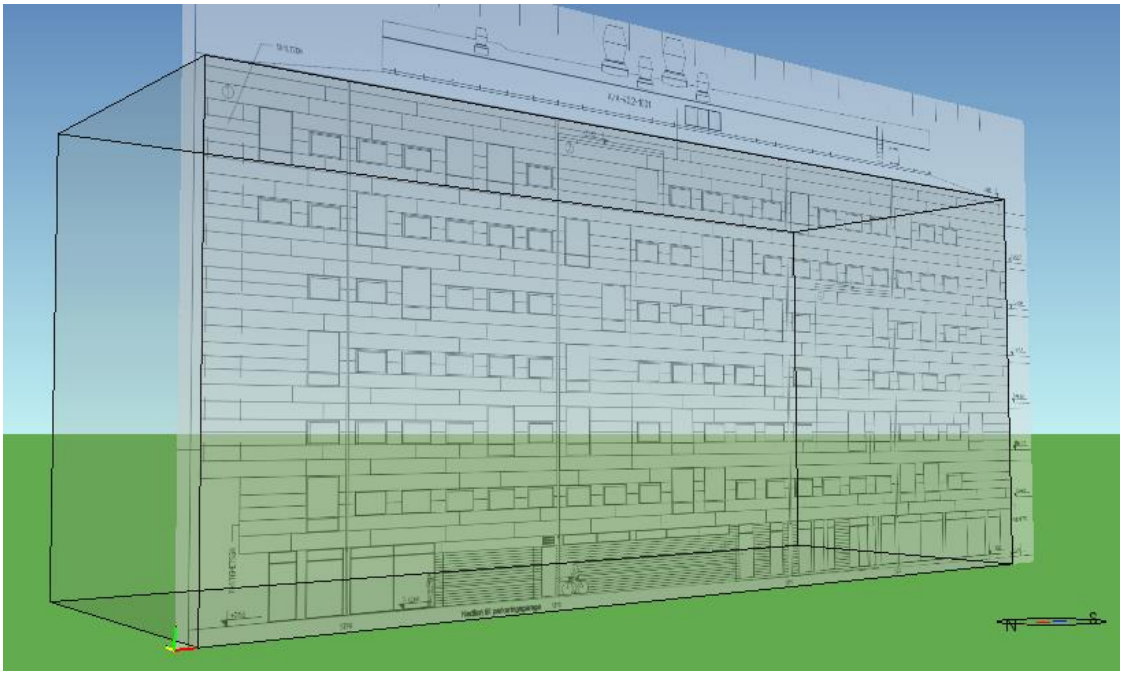
3. On the floor plan, first resize the plan background by dragging its edges so that the whole façade picture is visible in the view. Then select the building body and resize it by dragging its edges so that f4 aligns with the left side of the façade and f2 aligns with the right side of the façade. If needed, select Zoom in from the program View menu to zoom in close enough to the façade edges.



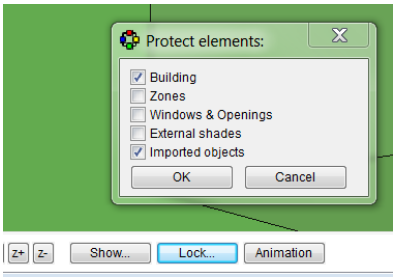
4. Go back to the 3D view and select the picture. Rotate the picture 90° around the x-axis by entering 1, 0, 0 and 90° in Rotated around in the property page. Change the transparency value to 50%. Also move the picture slightly behind the building body face by setting the origin to 0, 0.1, 0.



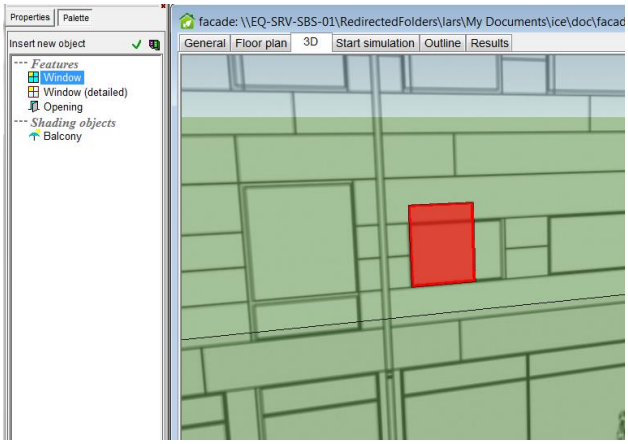
5. Select the building body. In the property page on the left, change the z floor of the building body to 0 and z ceiling to 27.1 to align with the roof of the façade picture.



6. To make sure that we do not move the location of the building body or the picture, lock them in the Protect elements dialog.

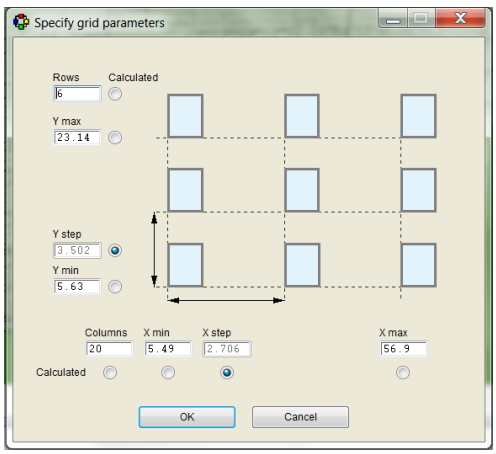


7. Let's now add windows to the façade. Zoom in on one of the small windows on the façade picture with the right mouse button. Click Palette on the side bar. Drag a window from the palette to the façade and align it with the window on the picture. Click on Properties and change the size of the window to 1.8 x 1.15. Right-click on the window and choose Convert to resource… from the menu. Enter a name and click OK. The new window resource is added to the palette.



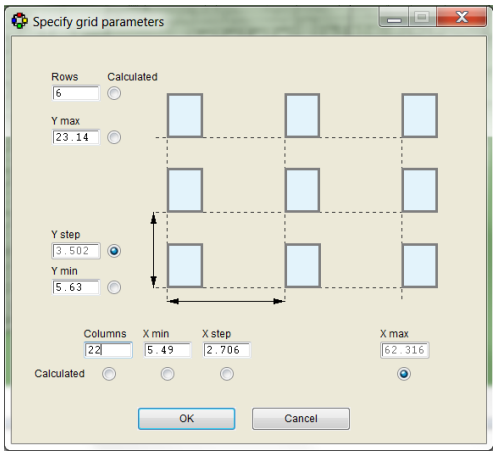
8. Move the window you added to the top left of the façade by selecting it in the 3D view and dragging it while holding down the ctrl-key. Add a second window by dragging a window of the new type from the palette. Place it in the lower right of the façade.

9. Select the two windows with the mouse while holding down the shift-key. Place the cursor on top of one of the windows, right-click and choose Grid from the menu. The Specify grid parameters dialog is opened with X min, X max, Y min and Y max taken from the two existing windows. X step and Y step are calculated from these and from the number of rows and columns. Change the number of rows to 6.

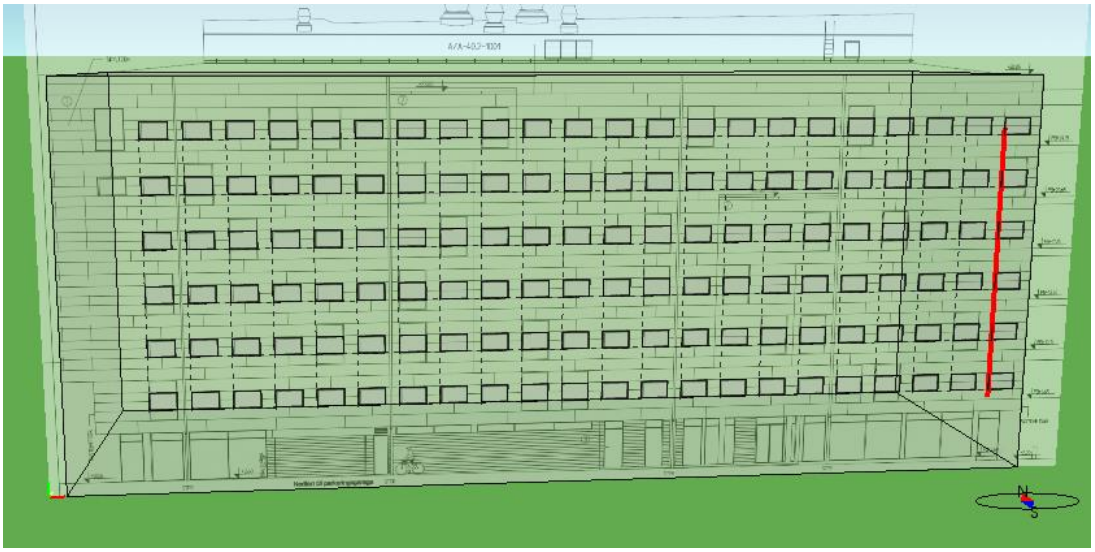


In this case we would like to add two extra columns but keep the calculated distance between the windows. Mark X max as calculated by selecting the corresponding radio button in the low right corner. Change the number of columns to 22.

Click OK. The façade is populated by windows.

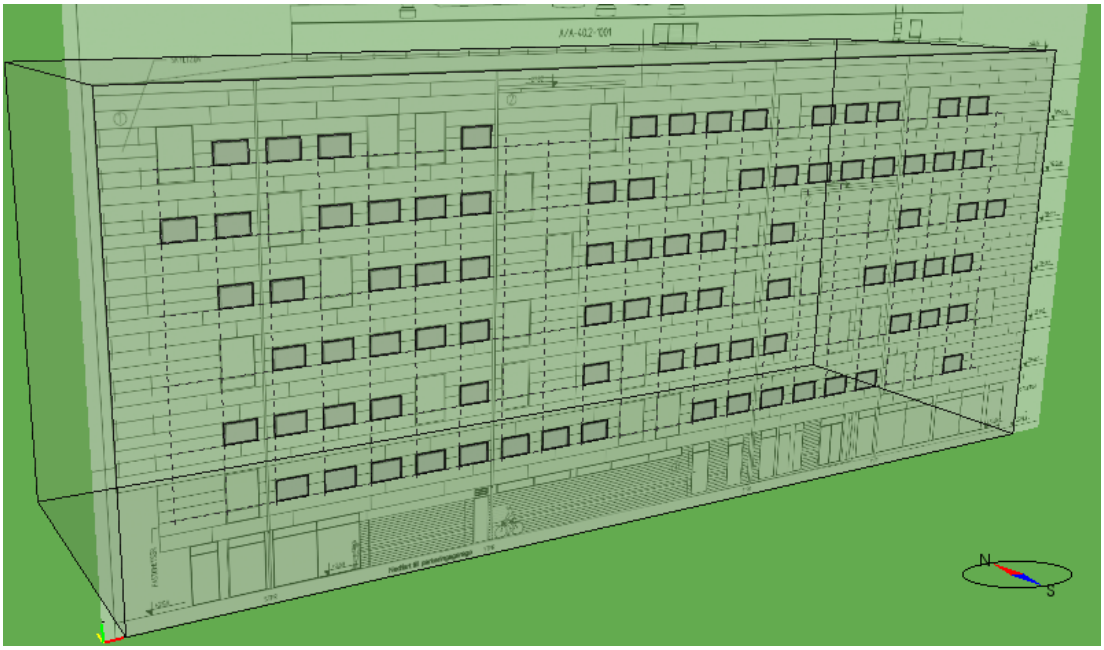


10. Select the rightmost vertical grid line.



Drag the grid line to the left while holding down the ctrl-key. Align the column with the windows to the left.

Now simply delete all windows that do not correspond to a small window on the picture.

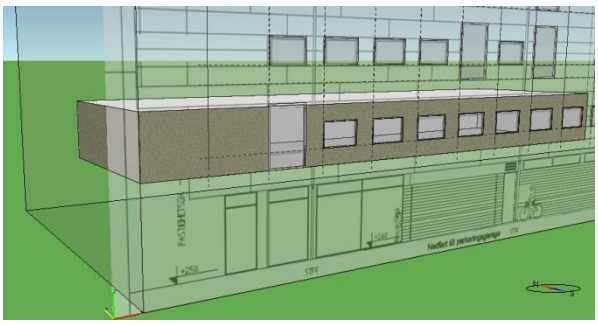


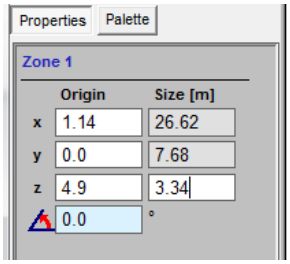
11. Follow the same procedure to create the large windows.

12. We will now use the picture of the façade to insert zones at the correct height.

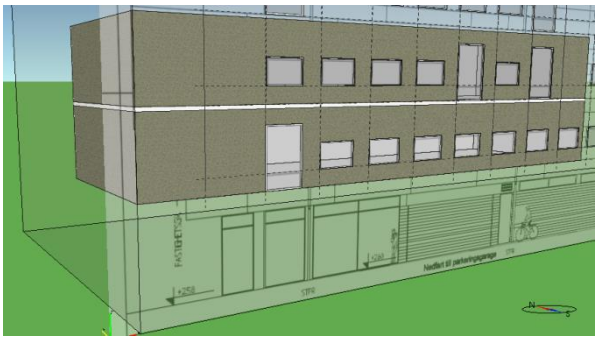
    Add a new zone on the floor plan. Go back to the 3D view and select the zone by clicking on a wall twice. Move the zone upwards to the lower row of windows by dragging it while holding down the ctrl-key and the shift-key. Holding down the shift-key will allow the zone to move in the z-direction (otherwise it will move in the x-y-plane).

    Change the height of the zone to 3.34 m in the property page on the left.

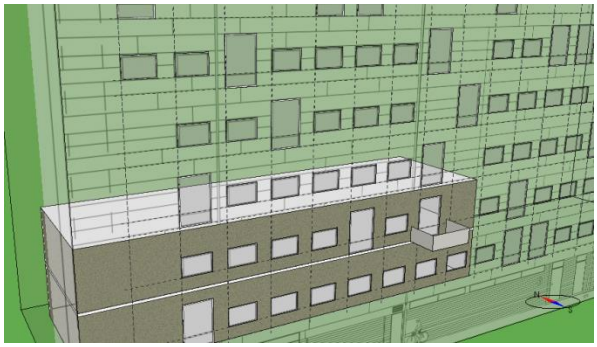




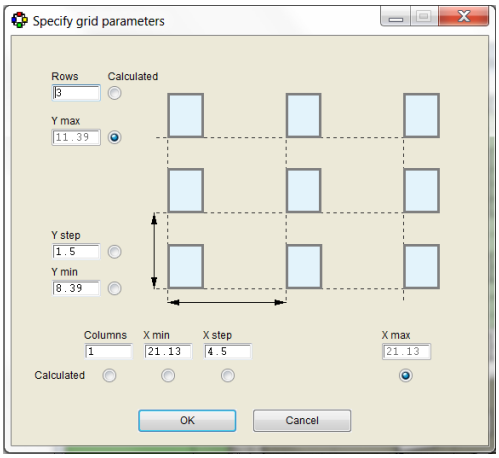
13. Go to the floor plan and find the level at which the zone is placed (about 4.9 m). Select the zone and make a copy of it. Change to level 0 and paste the zone with ctrl+v keys. Go back to the 3D view and move the new zone to the floor above the first zone.



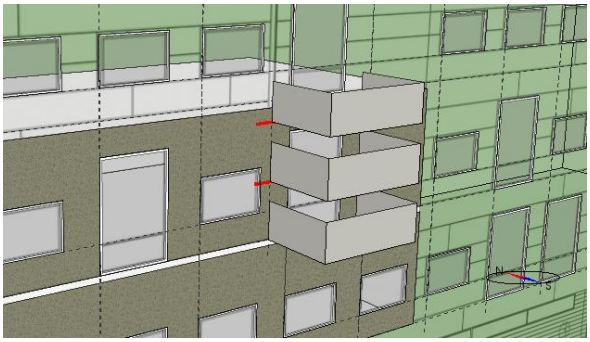
14. Shading objects are added similarly to windows. Insert a balcony on the building body façade by dragging it from the palette.



15. A grid of shading objects can be created in the same way as for windows. Here we will make a grid from a single object. Right-click on the balcony and choose Grid from the menu. Change the number of rows to 3 and click OK. A vertical grid of three balconies is created.



16. Move the upper two balconies to the windows above by selecting and dragging their horizontal grid lines while holding down the ctrl-key. Multiple grid lines can be dragged together if they are all selected.



A shading object that has been inserted onto the building body façade will shade neighboring windows. If it was inserted in the window object it would only shade that window.

An entire grid can be moved to a different location. Select one of the objects in the grid and drag it while holding down the ctrl-key. The whole grid will move.