UCL Depthmap 7: Convex Space Analysis

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Version 7.12.00c

Outline

Drawing the convex map

Linking the spaces

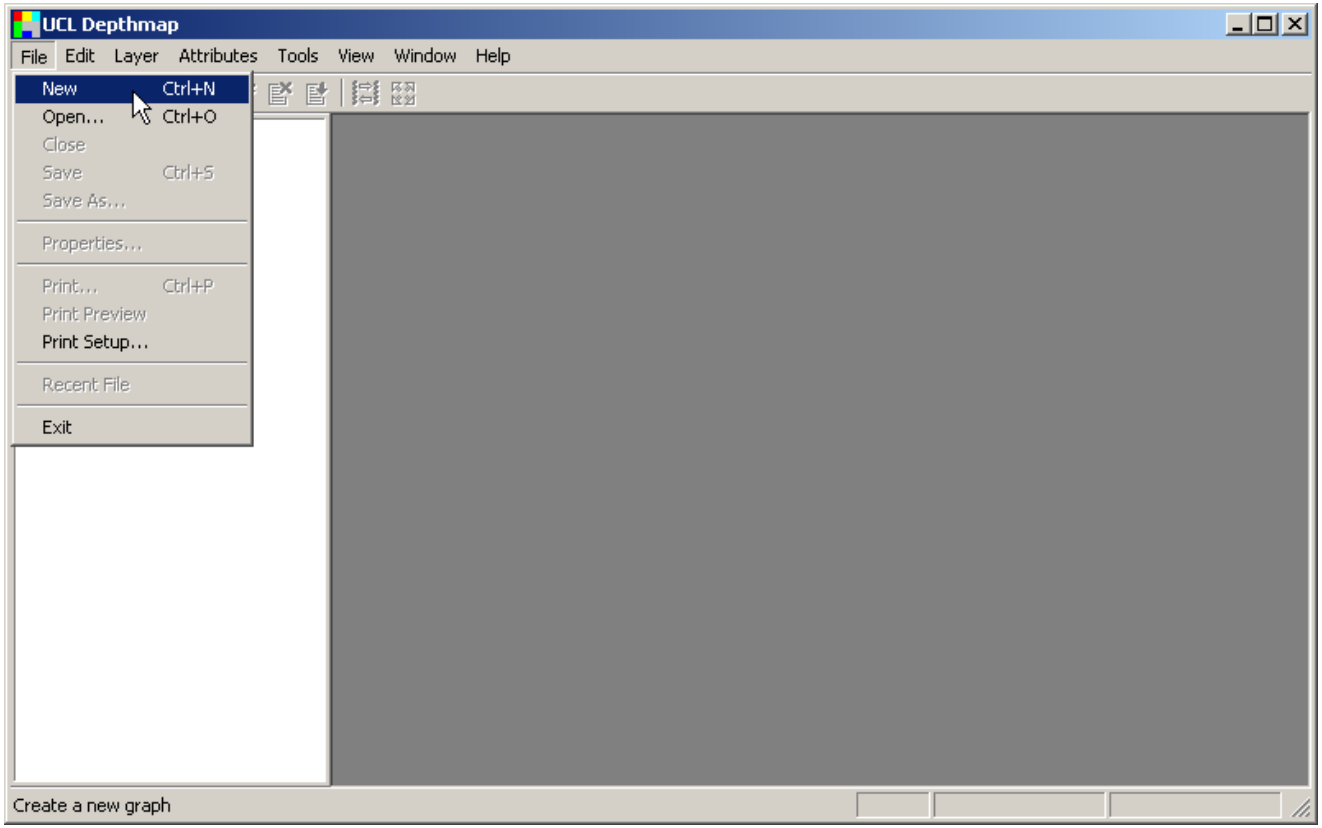
Analysing the map

Conclusion

Drawing the convex map

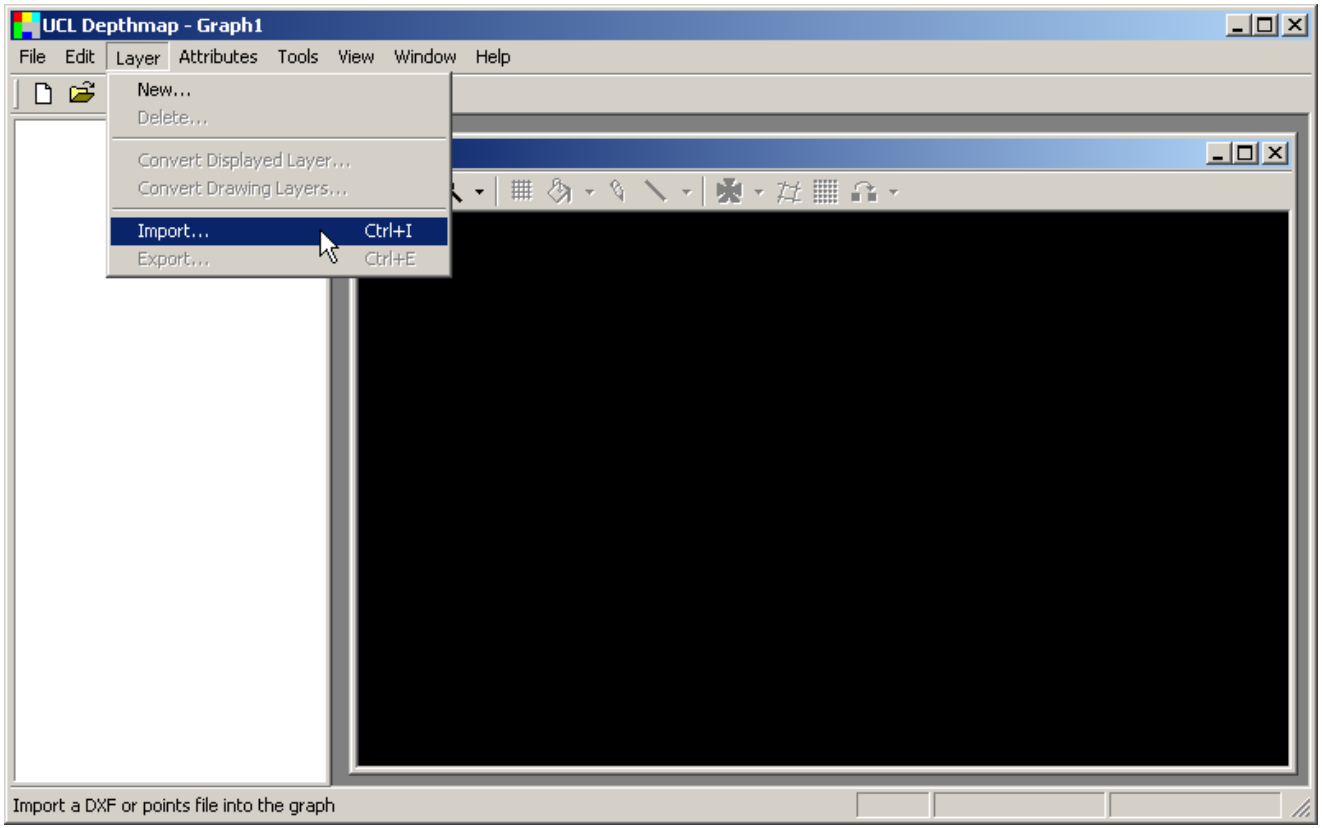
This tutorial will cover drawing a convex map, linking the spaces, and then analysing it.

New file



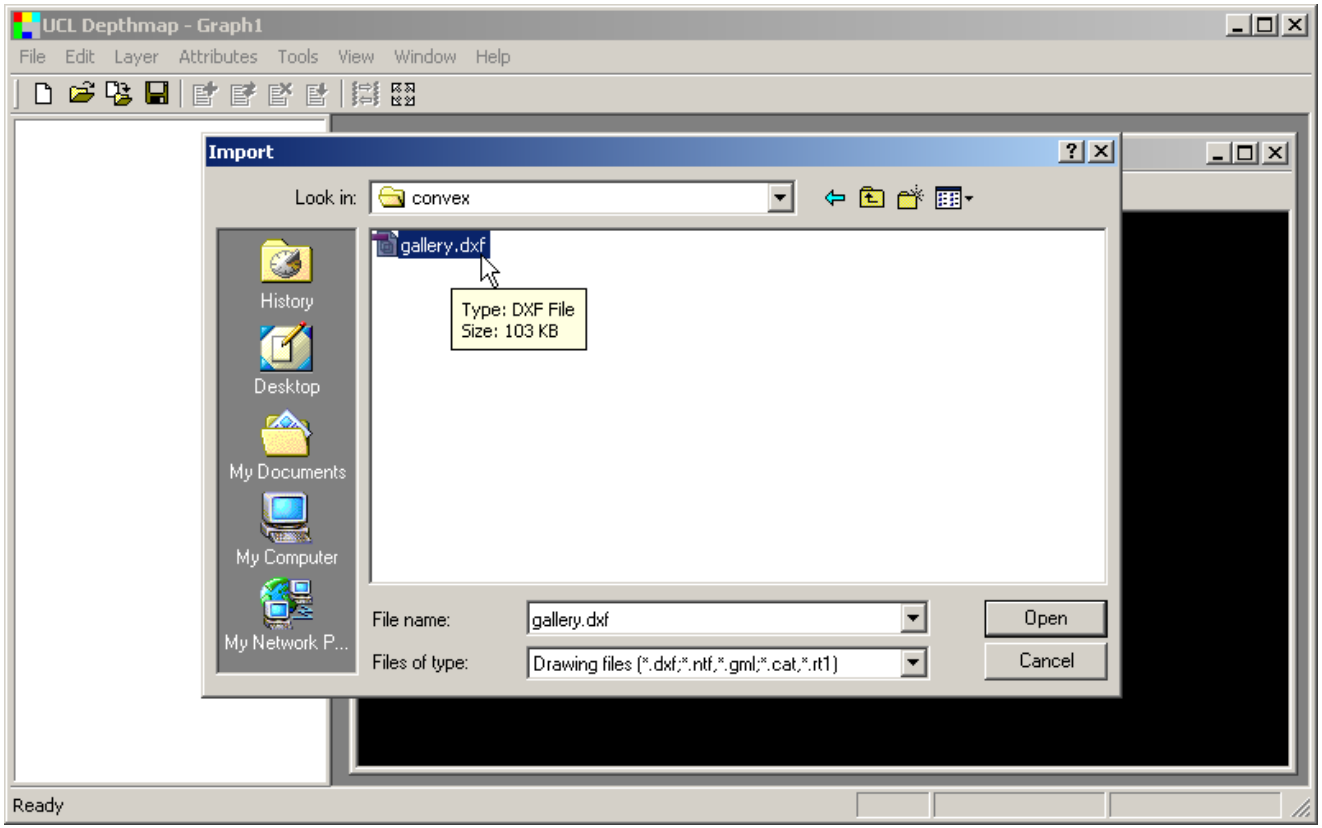
First, begin a ‘New’ file, either from the file menu or using the ‘New’ button on the main tool bar for the plan of the building. You cannot open a DXF file or other drawing file directly, you always need to create a new file and import.

Import file



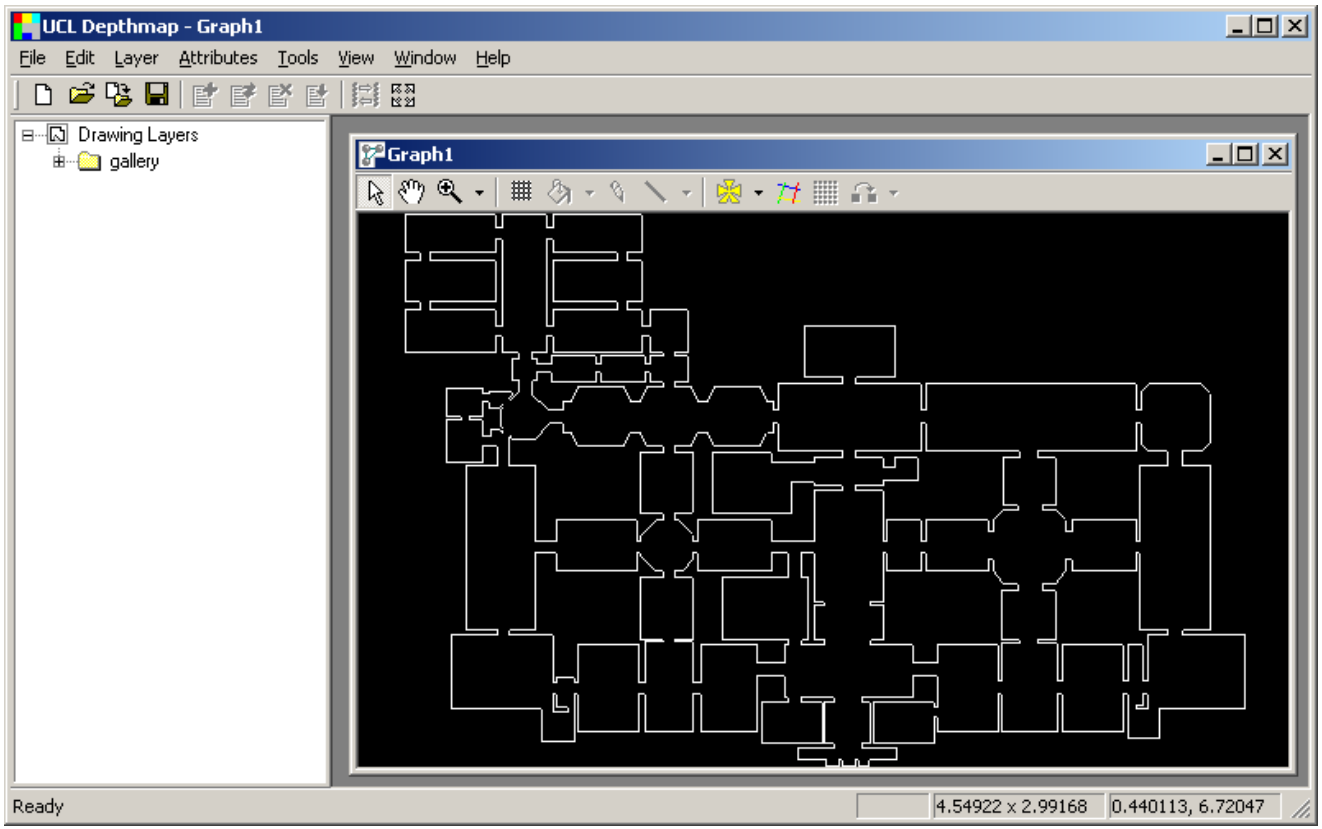
Once you have the new file, select 'Import', either from the layer menu, or using the import button on the main tool bar.

Import file



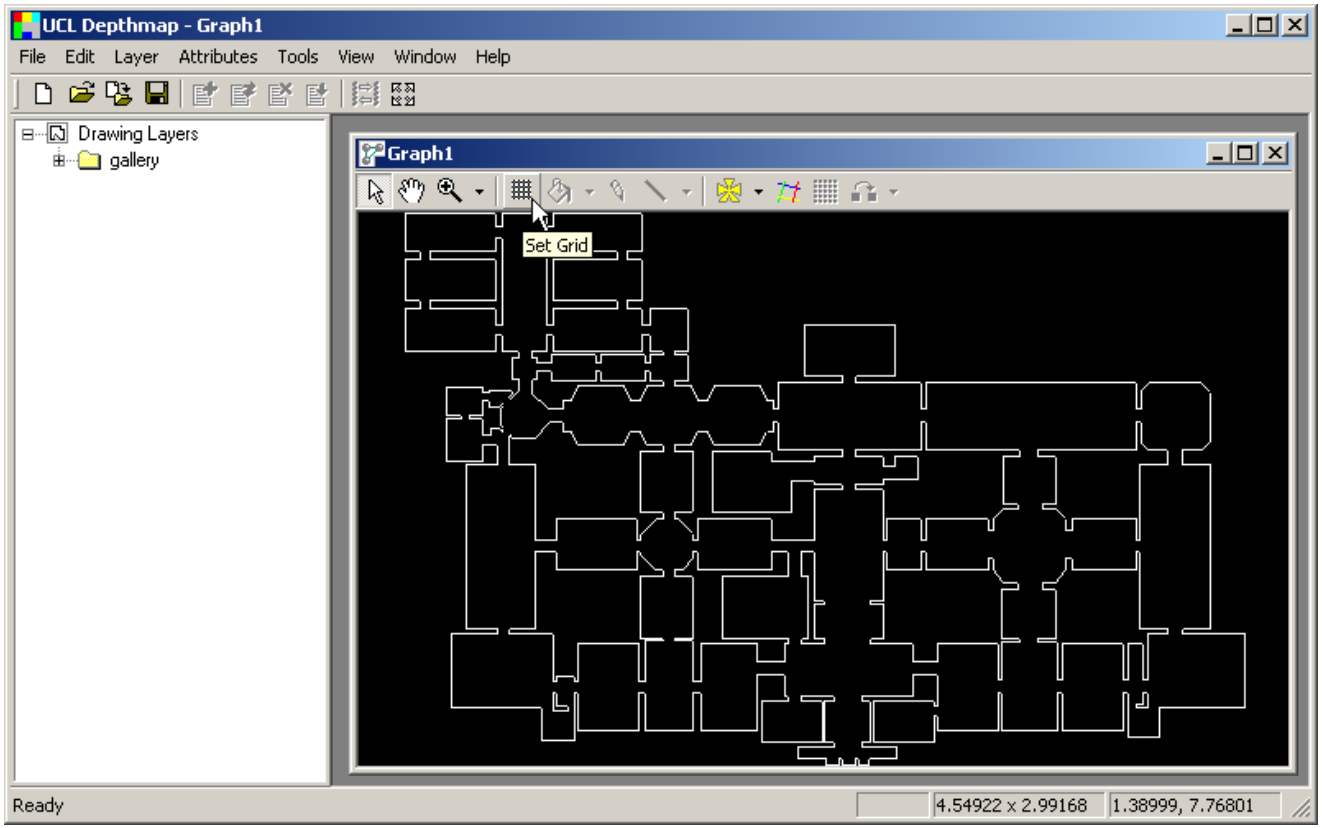
In the examples, there is a plan of a gallery space saved as 'gallery.dxf'. We will use this file for this tutorial.

Import file



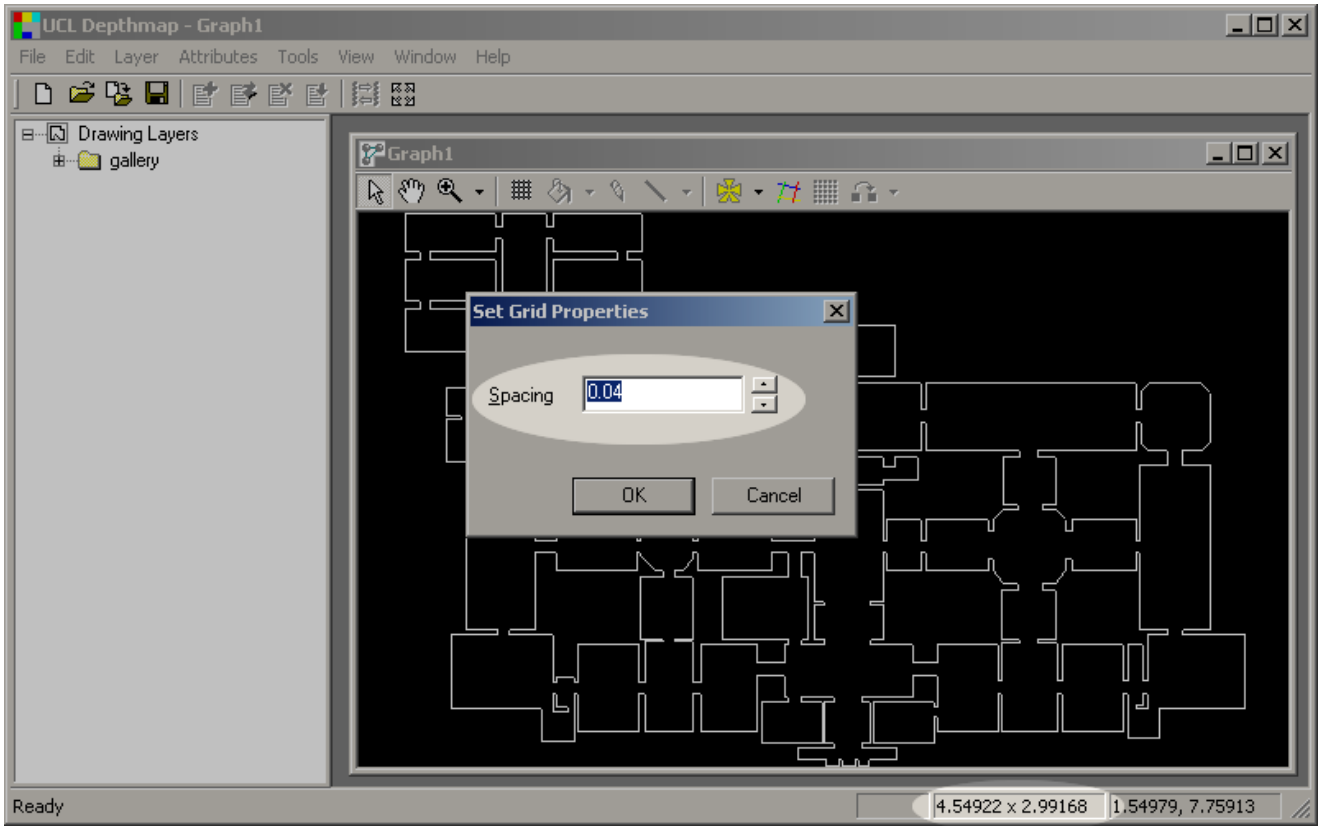
We will use the plan as a guide, but you may find you want to align the drawing to a grid.

Setting the grid



To set the grid, either choose ‘Set Grid’ from the map tool bar as shown above, or from the ‘Tools’, ‘Visibility’ menu.

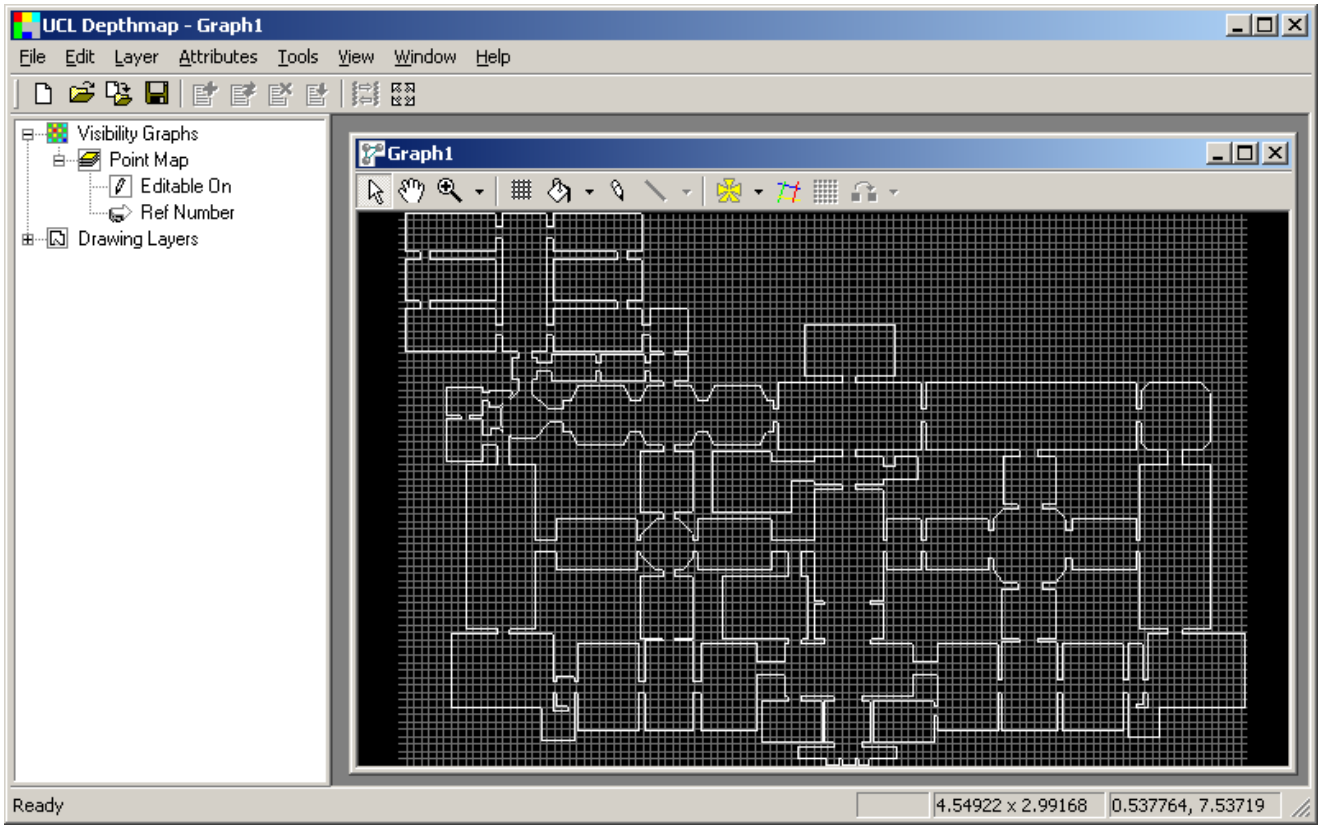
Setting the grid



Set the grid to a reasonable scale for the drawing. The size of the drawing, in this case about 4.5 by 3 is arbitrary units, is shown on the status bar.

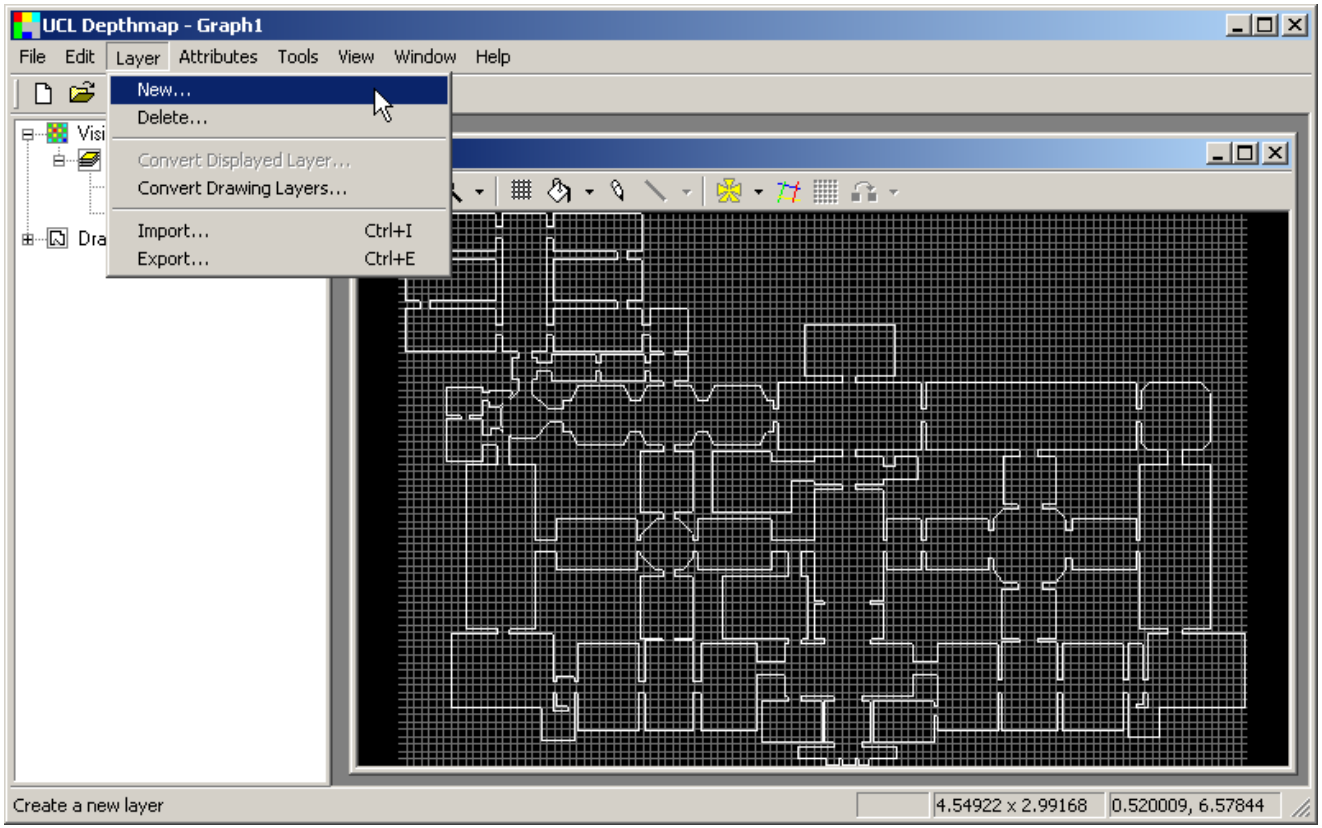
For this example, I will leave it as the default chosen by Depthmap: 0.04 units.

Setting the grid



Now we have a grid, but Depthmap has also created a visibility graph! Do not worry about this, we can delete it later.

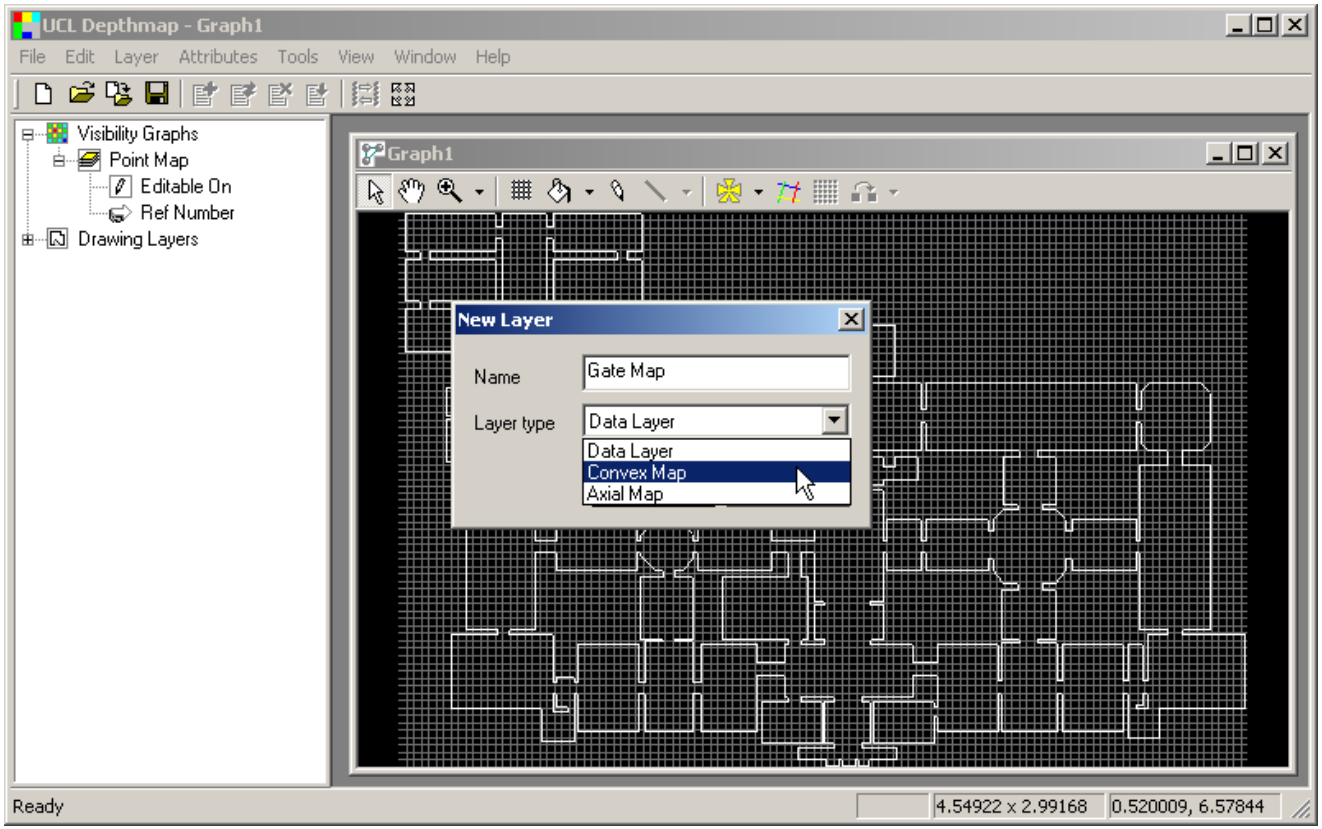
Creating a new convex map layer



Now we have a plan and a grid, we can create a new layer to hold the convex map.

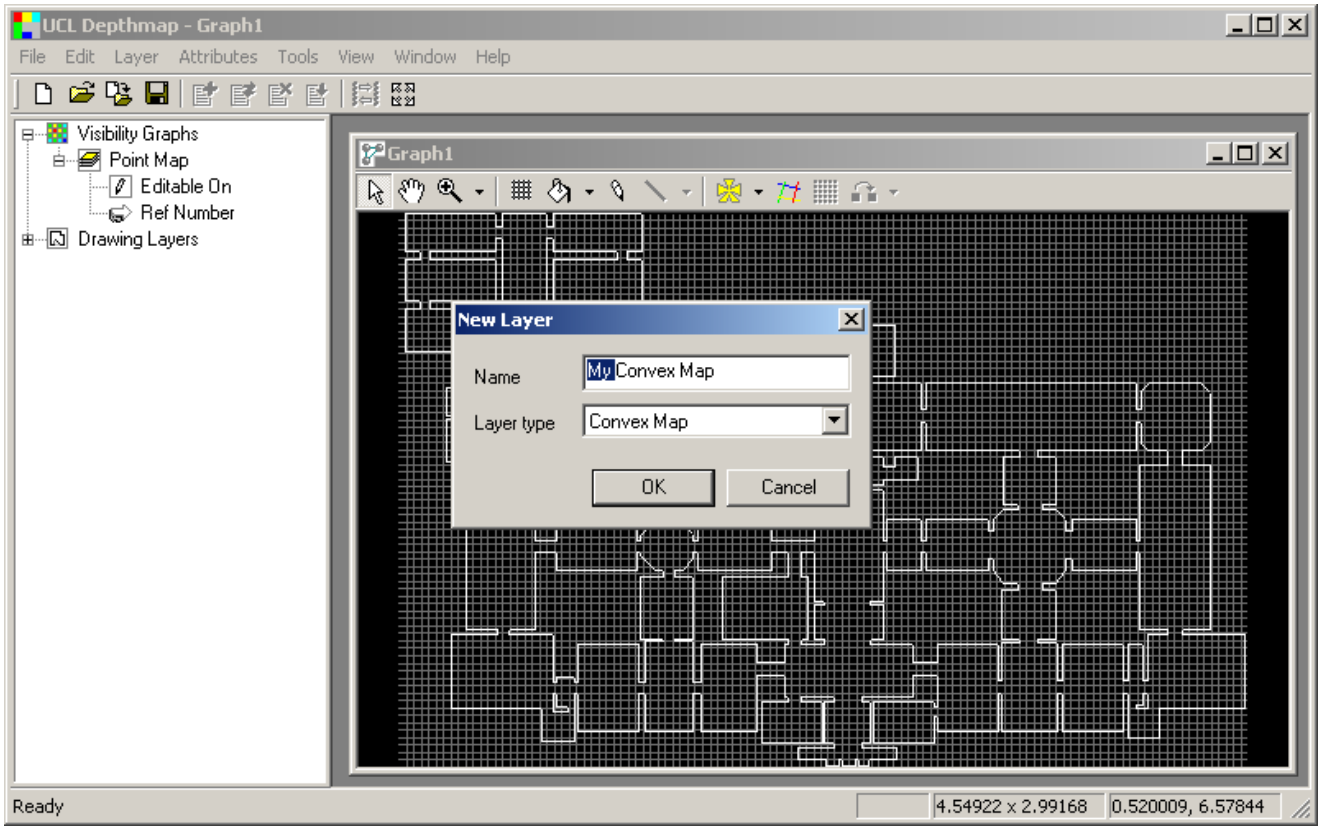
From the ‘Layer’ menu, select ‘New’.

Creating a new convex map layer



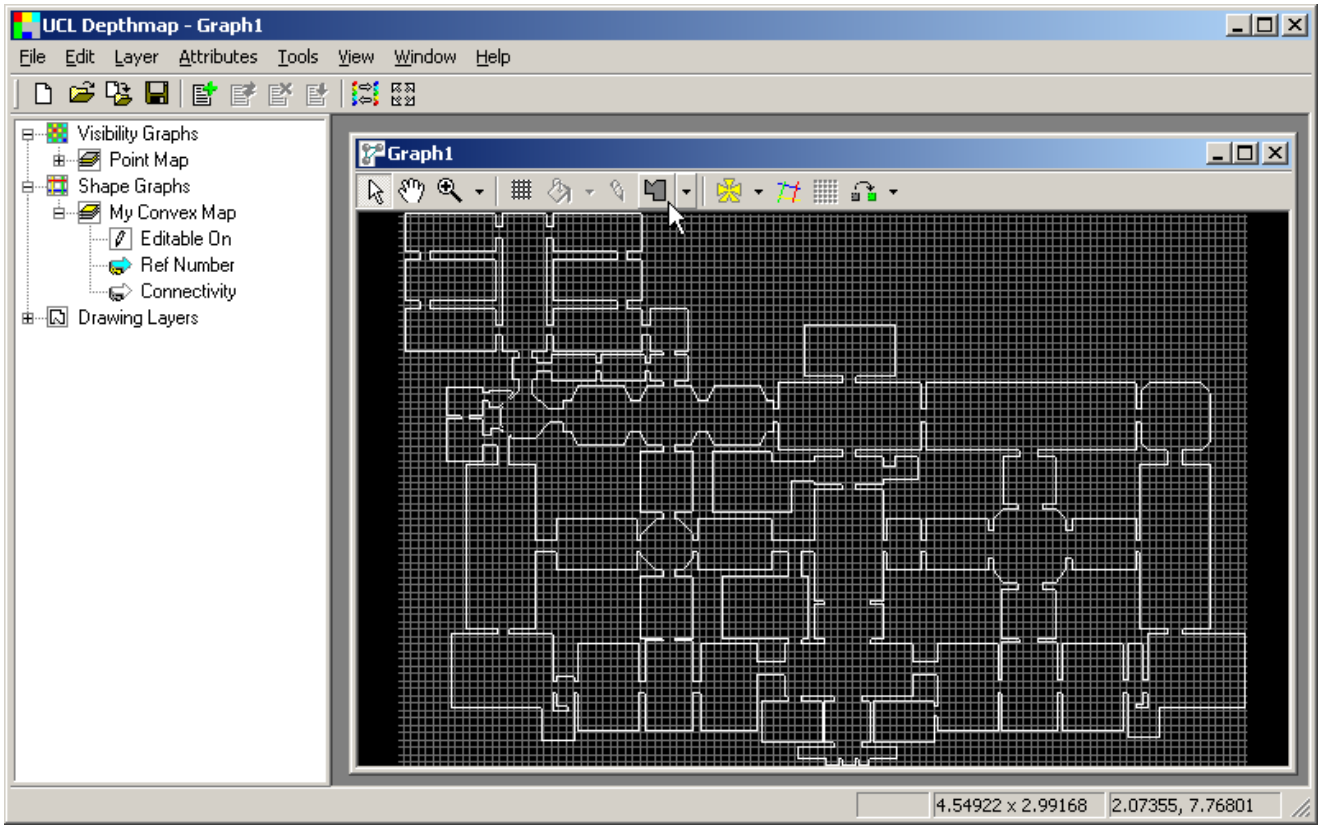
From the drop down menu, select the layer type: ‘Convex Map’.

Creating a new convex map layer



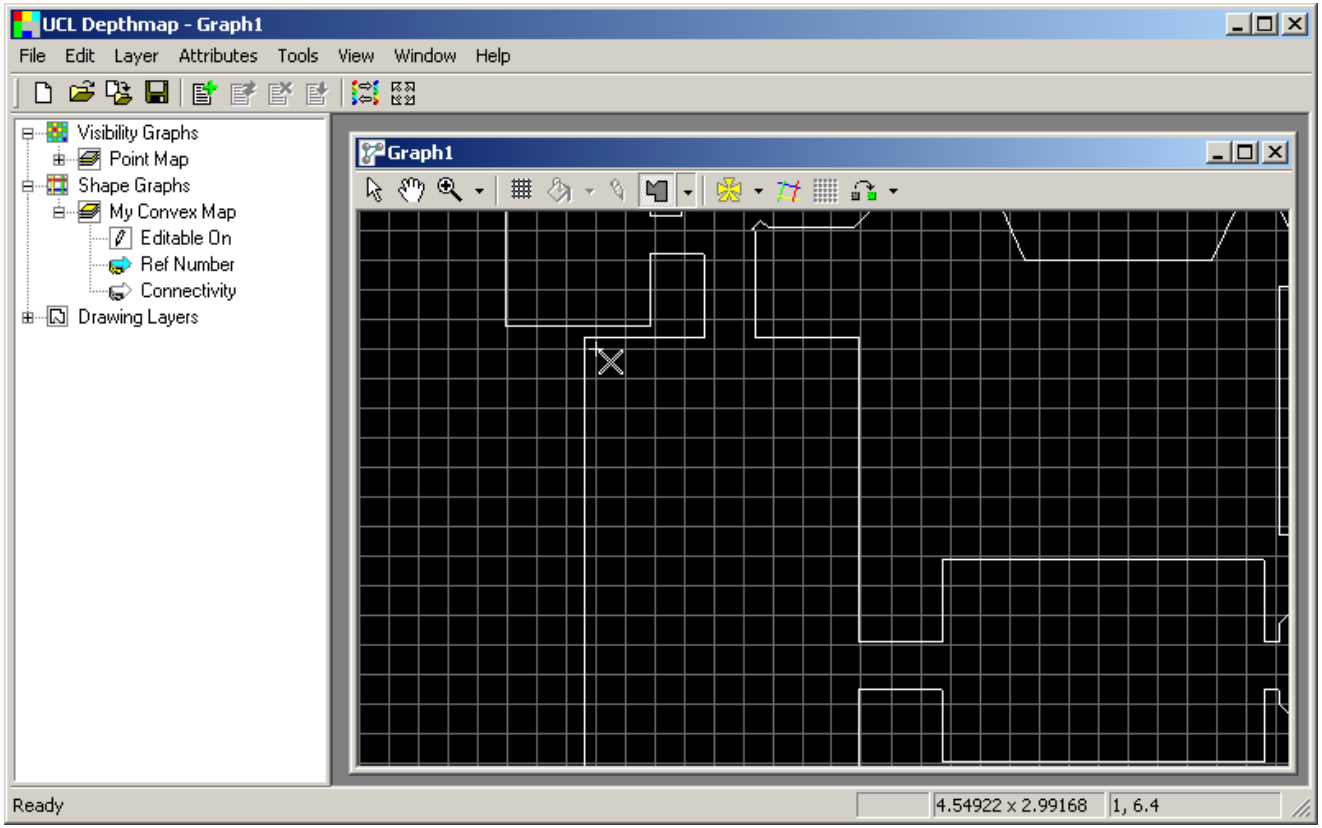
If you wish, you can change the name of the map layer to be created.

Drawing convex spaces



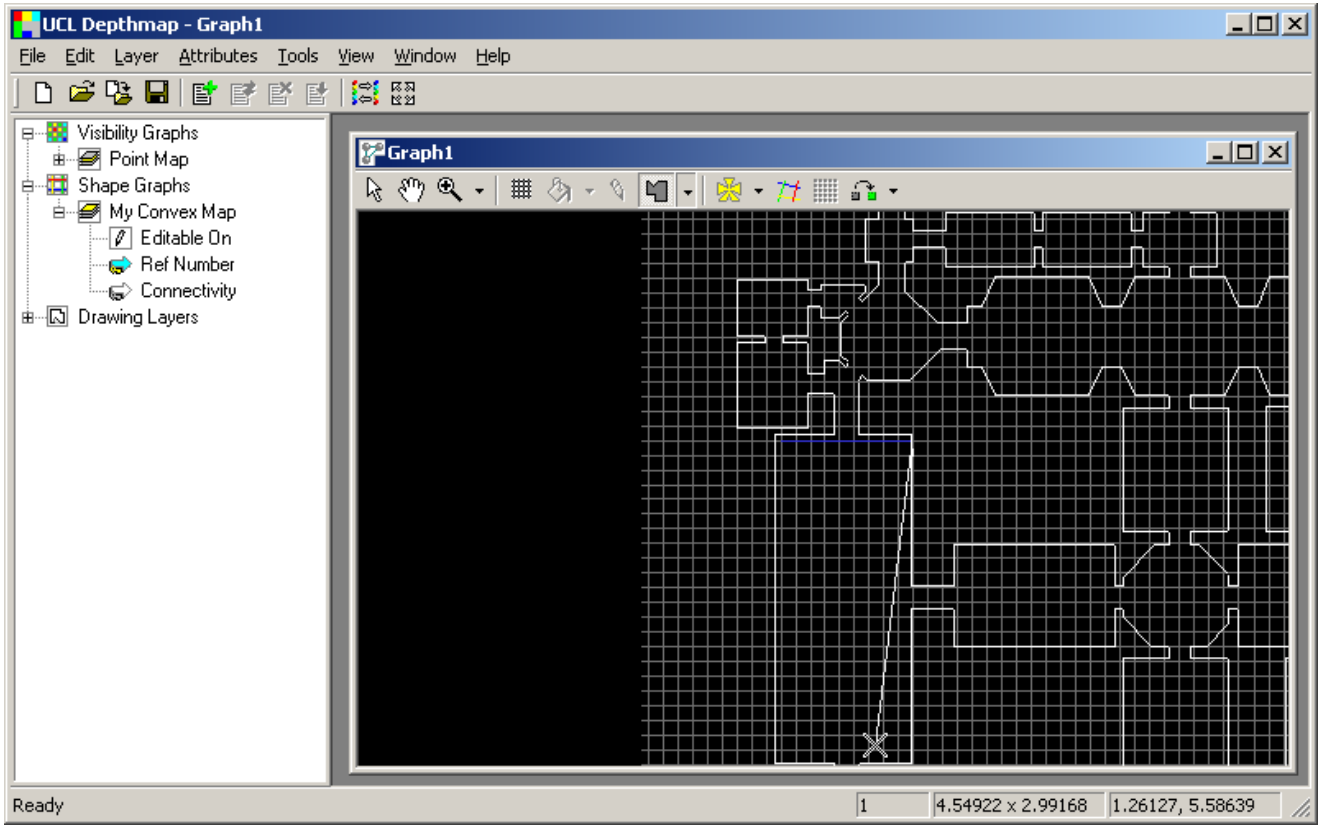
In order to draw the convex spaces, select the polygon drawing tool from the map tool bar.

Drawing convex spaces



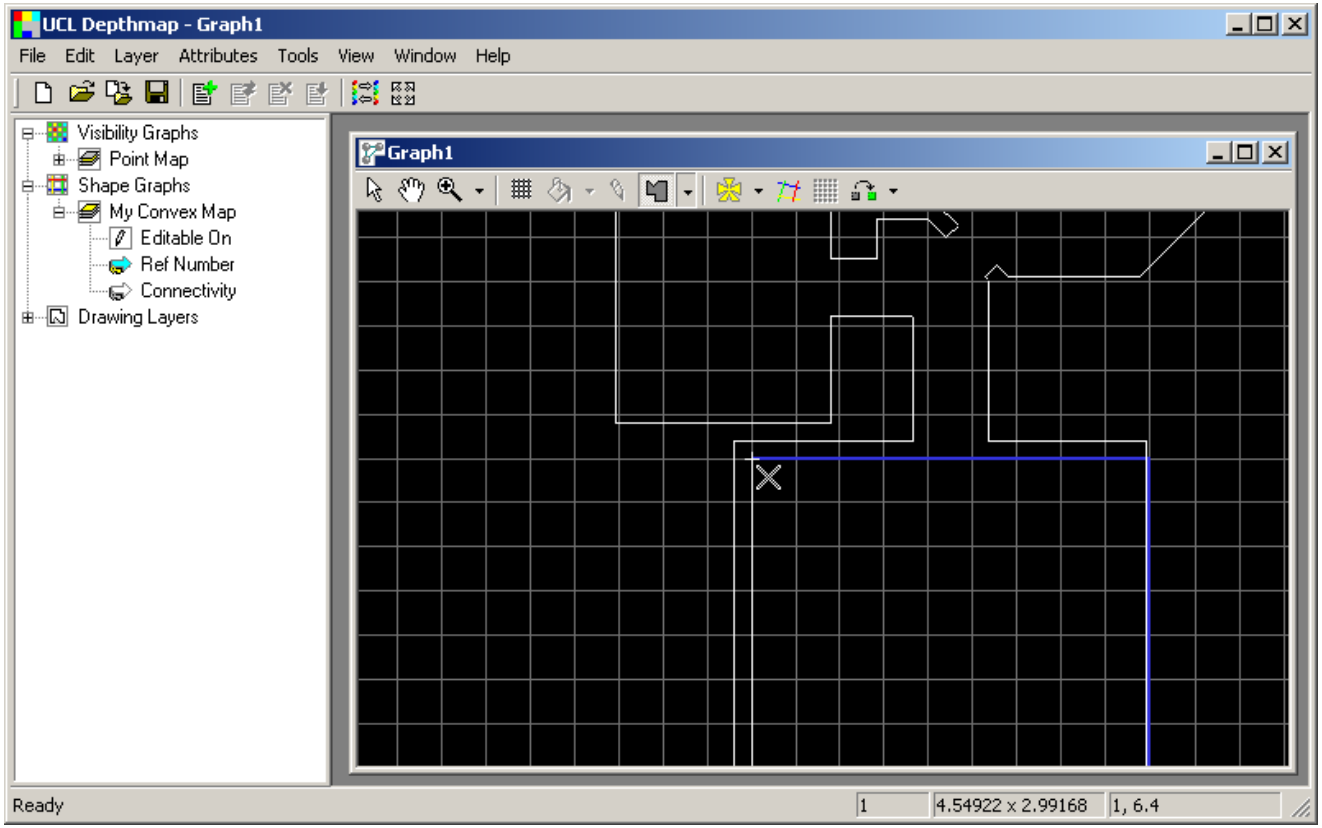
To start a polygon, click once with the cross cursor placed where you want to begin. If you wish to align to the grid *hold down* the `Ctrl` key while you draw. A small white cross will show where the point will snap to when you click the mouse.

Drawing convex spaces



Move the mouse to where you want to place the next vertex of the polygon and click.
Remember to hold down the `Ctrl` key while you click in order to snap to the grid.
If you want to abandon the polygon, right-click rather than left-click.

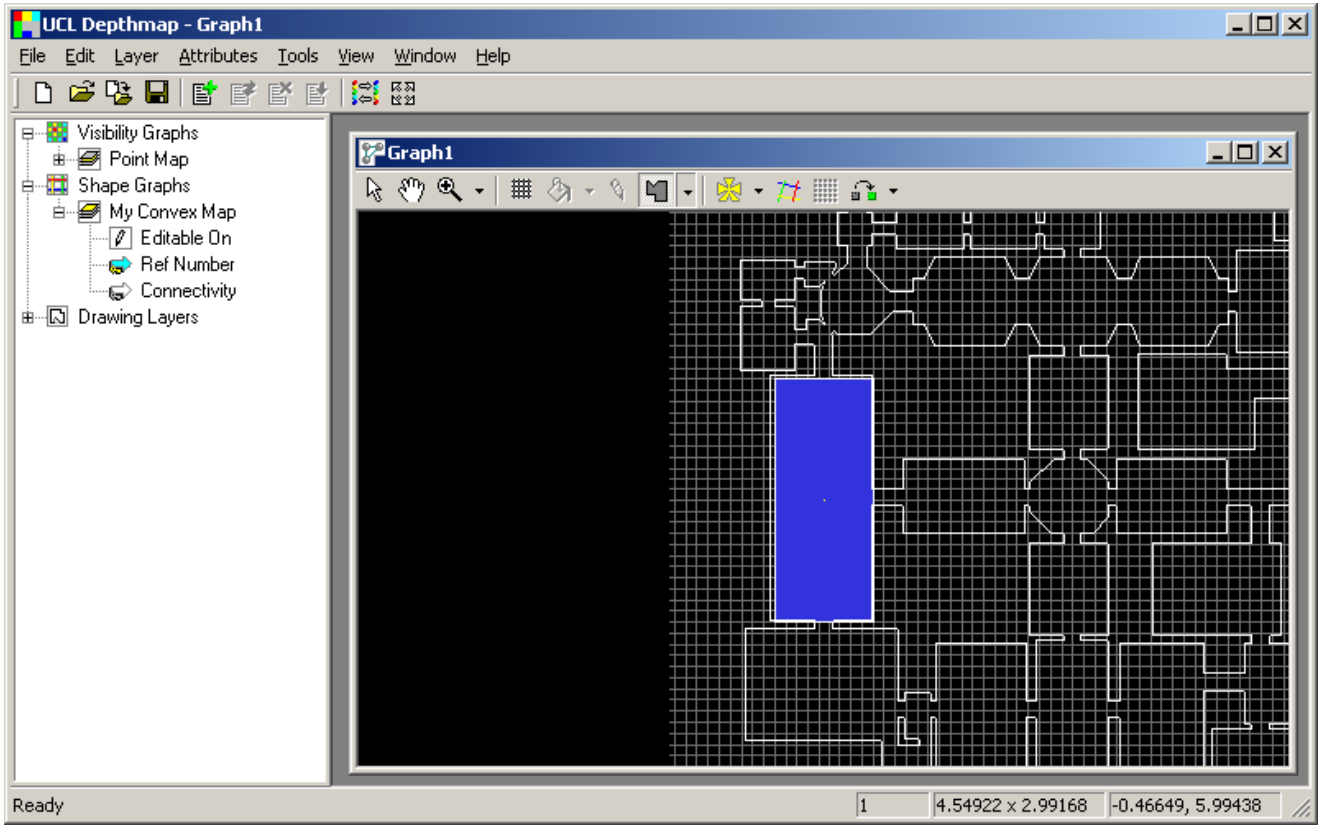
Drawing convex spaces



You can zoom in or out of the map while you are drawing by using the scroll wheel on your mouse, or the + and − keys on your keyboard.

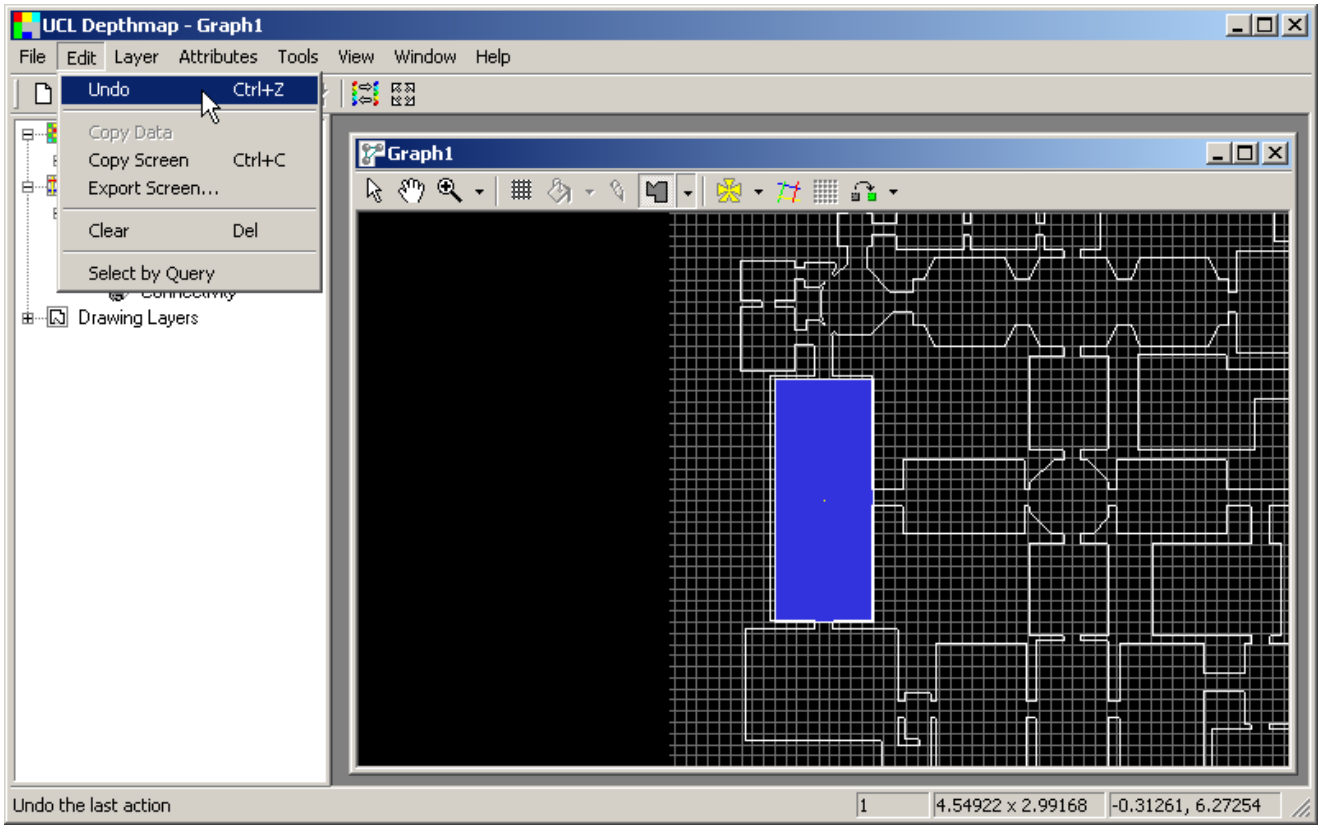
You can pan by holding down the right mouse button and dragging, or by using the arrow keys on your keyboard.

Drawing convex spaces



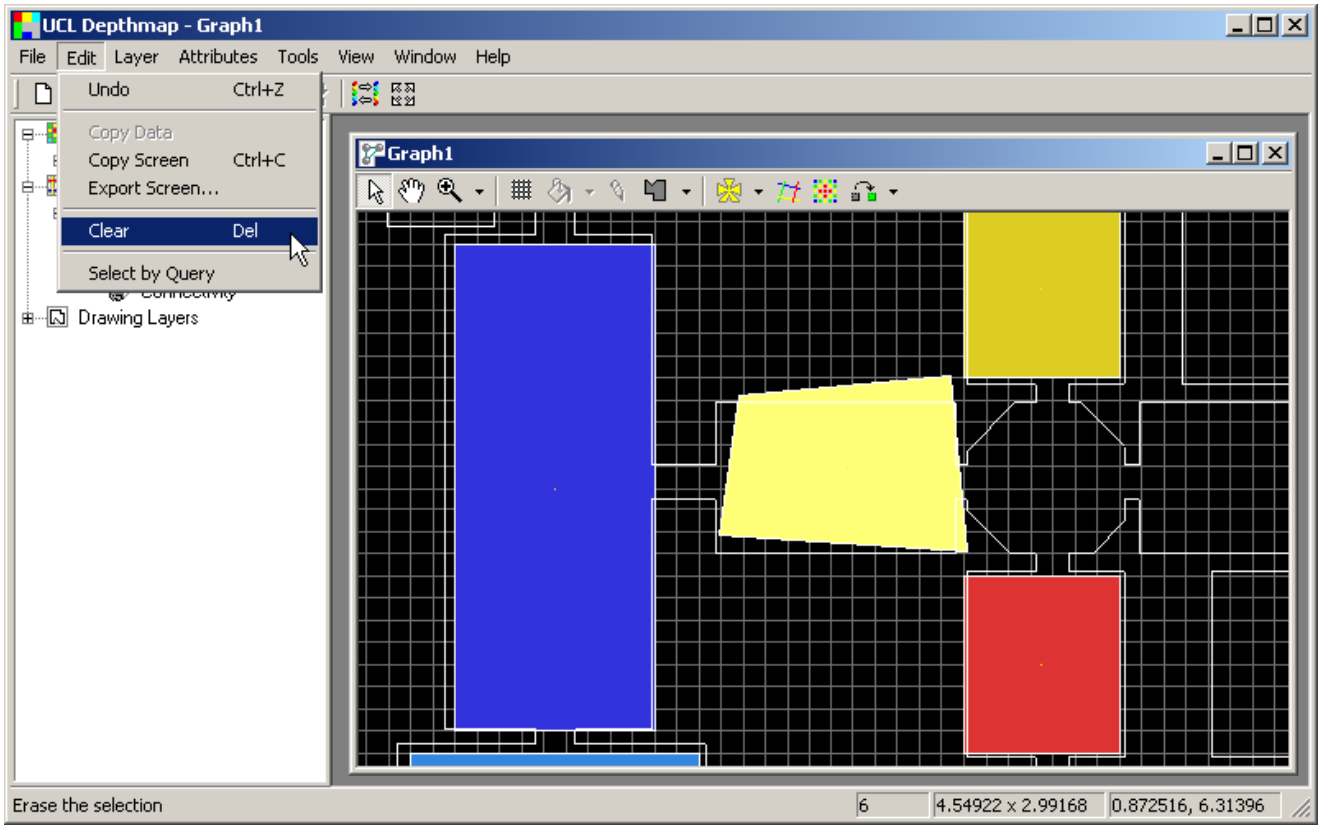
In order to finish the polygon, click roughly in the same position as your first point. Depthmap will automatically close the polygon for you.
(Do *not* double click to close a polygon. Only ever single click to avoid accidentally starting another polygon.)

Drawing convex spaces



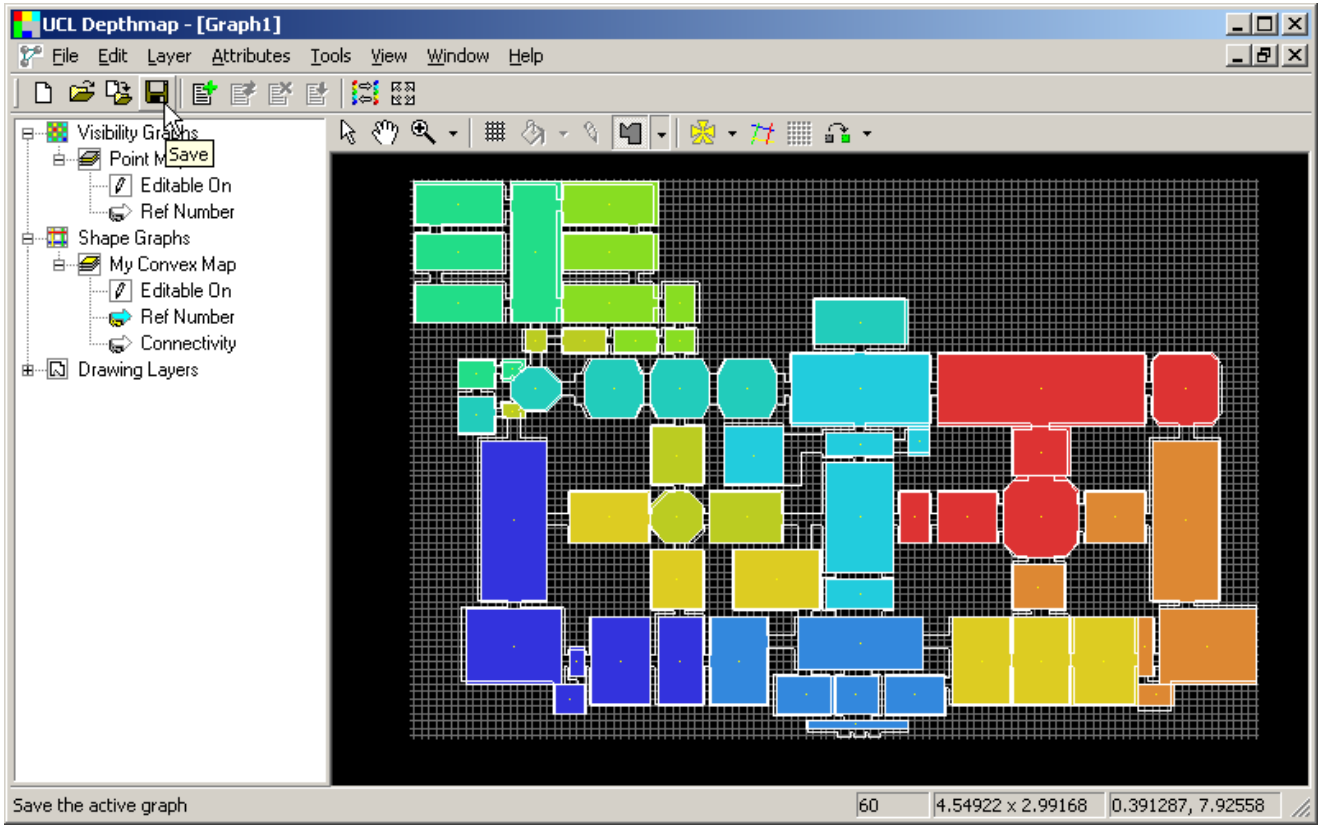
If you are unhappy with your polygon, you can undo by selecting 'Undo' from the 'Edit' menu, or by pressing `Ctrl+Z`.

Drawing convex spaces



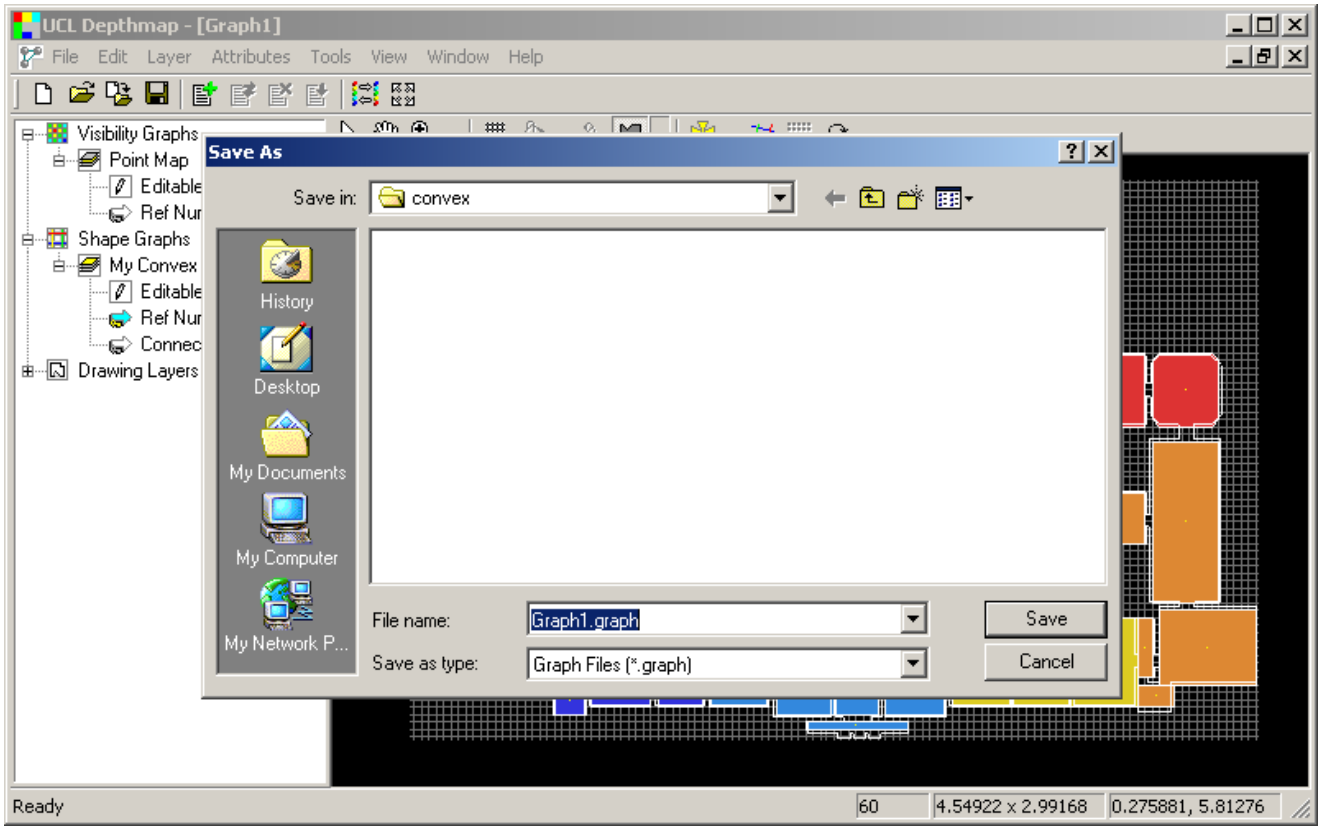
If you need to delete a polygon, select it in selection mode, and then choose ‘Clear’ from the ‘Edit’ menu, or press the `Del` key.

Drawing convex spaces



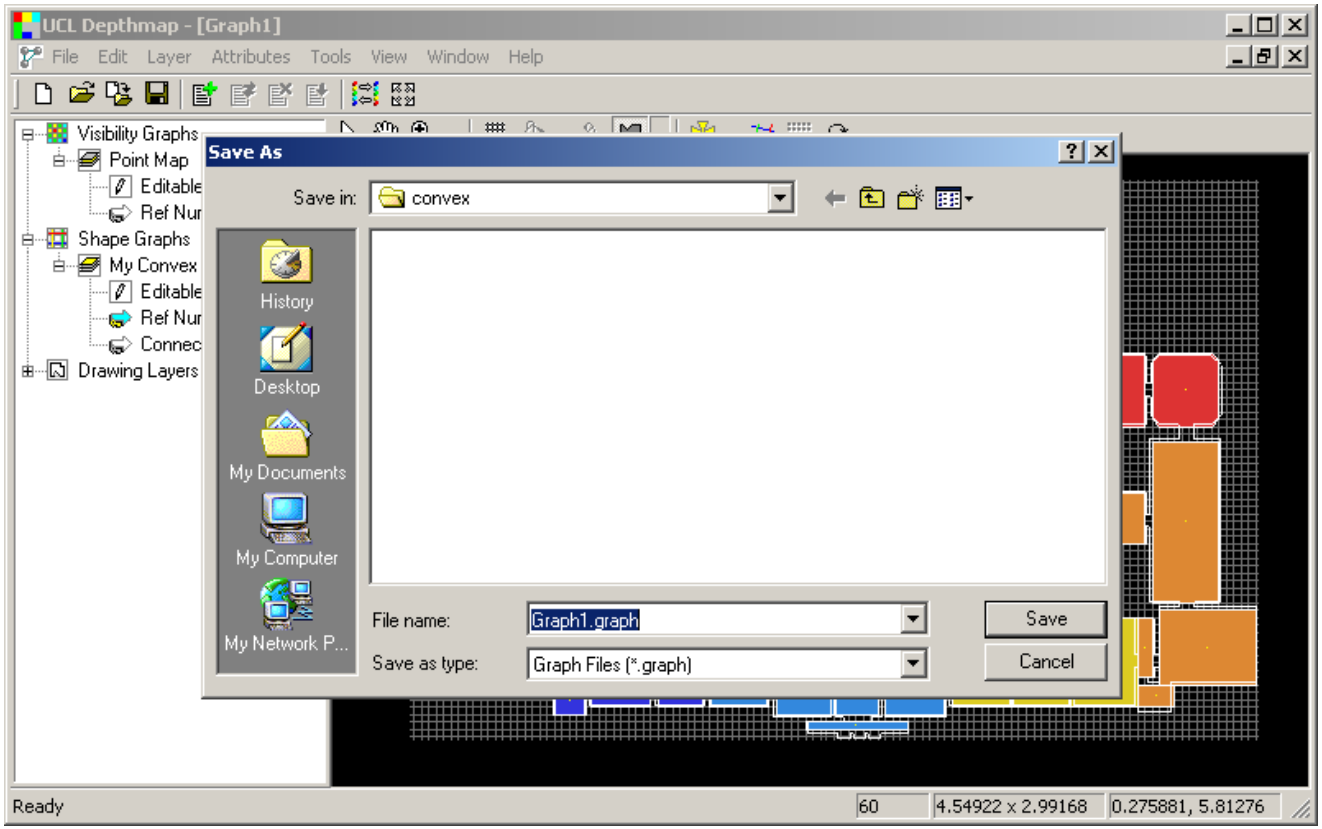
Once you are happy with your convex spaces, it is probably best to save the graph, if you have not already done so.
Either choose ‘Save’ from the ‘File’ menu, or the ‘Save’ button on the main tool bar.

Drawing convex spaces



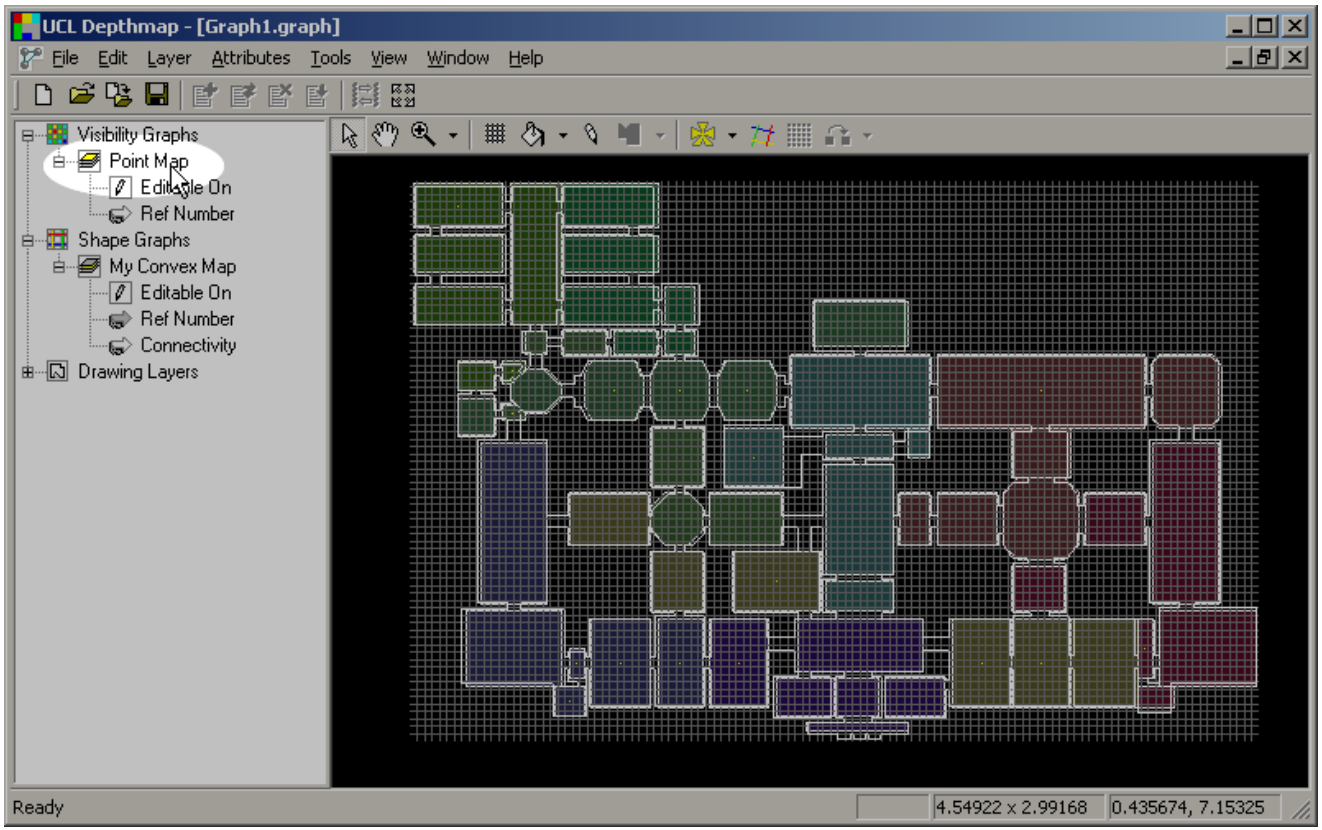
The save dialog box prompts you to enter a name for the graph file.

Drawing convex spaces



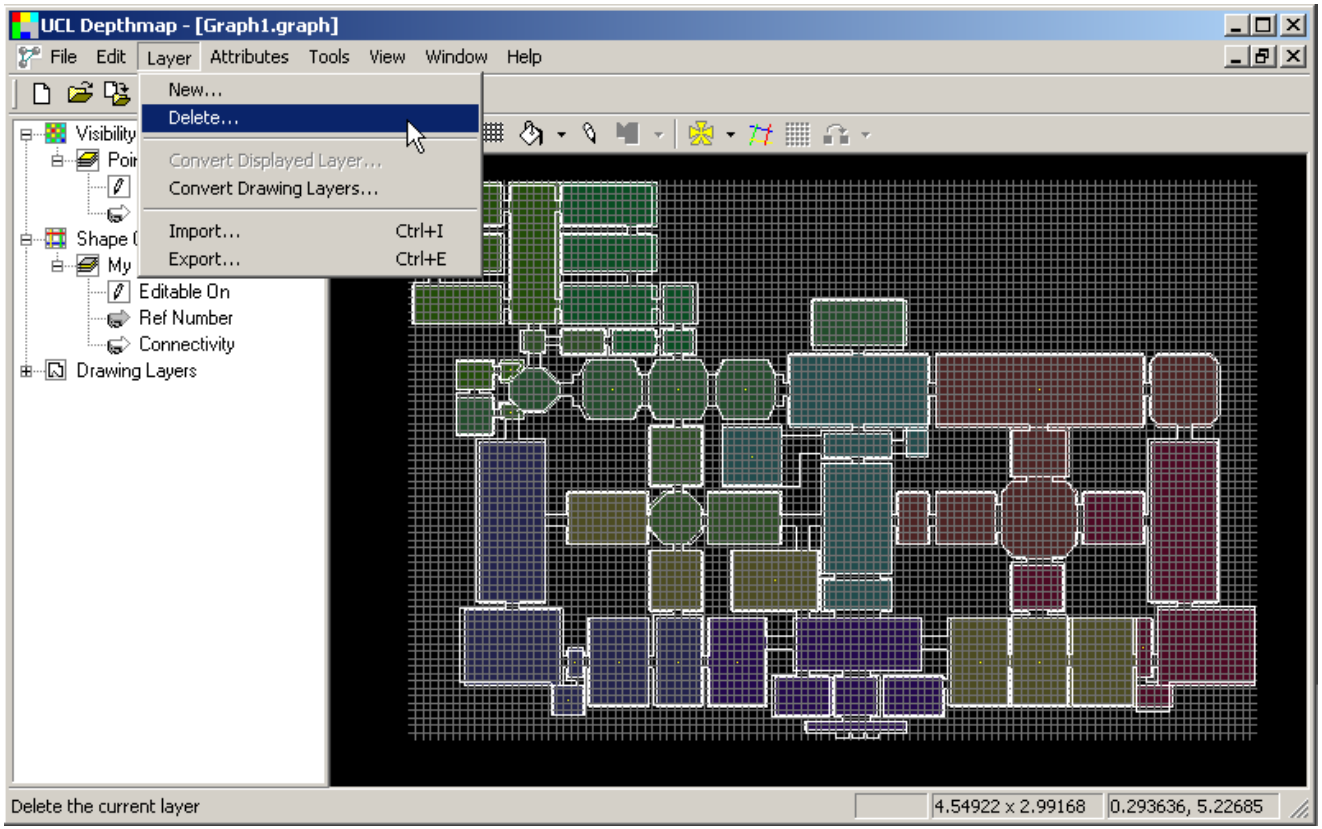
The save dialog box prompts you to enter a name for the graph file.

Drawing convex spaces



You may also wish to delete the empty visibility graph which has provided the grid. To do so, first highlight the visibility graph (called 'Point Map' by default) by clicking on it in the sidebar.

Drawing convex spaces

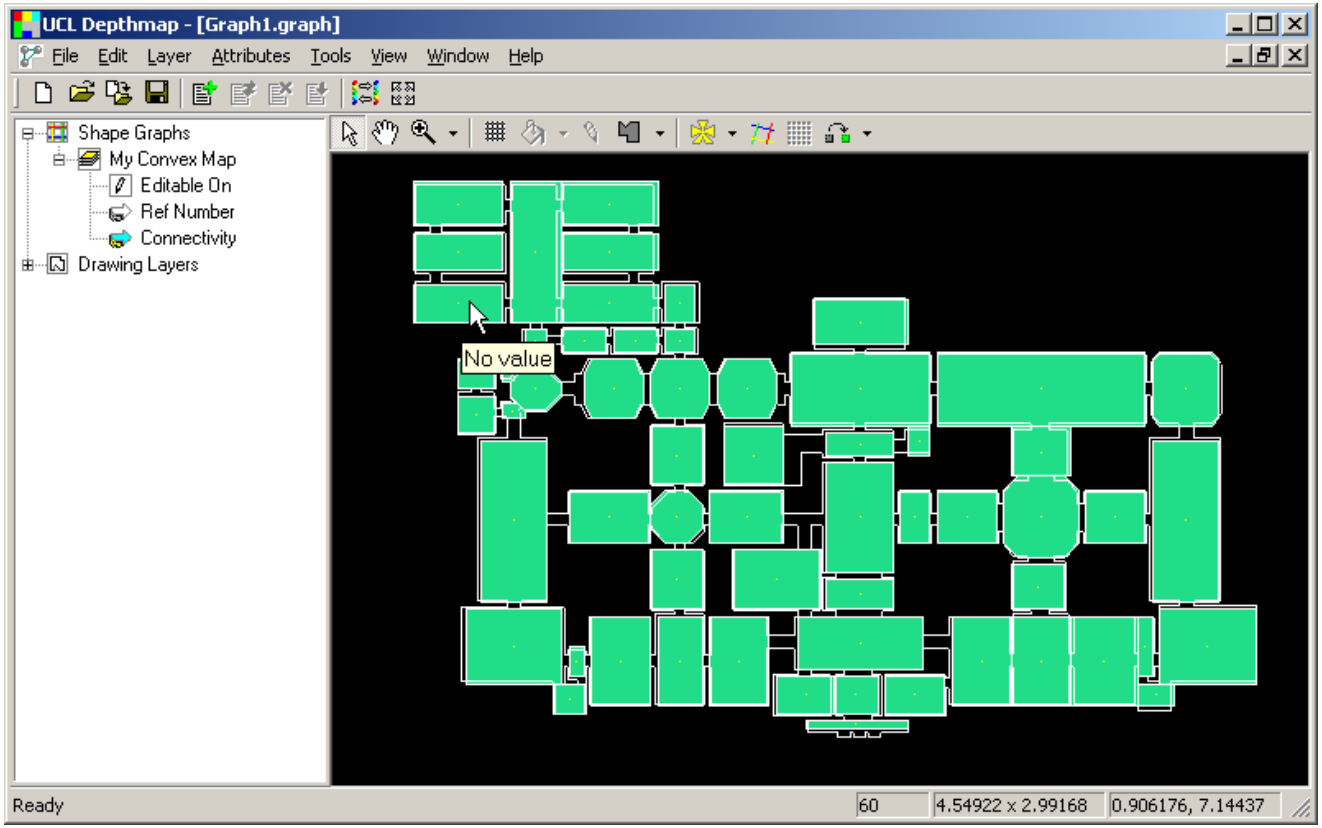


Next choose ‘Delete’ from the ‘Layer’ menu.

Linking the spaces

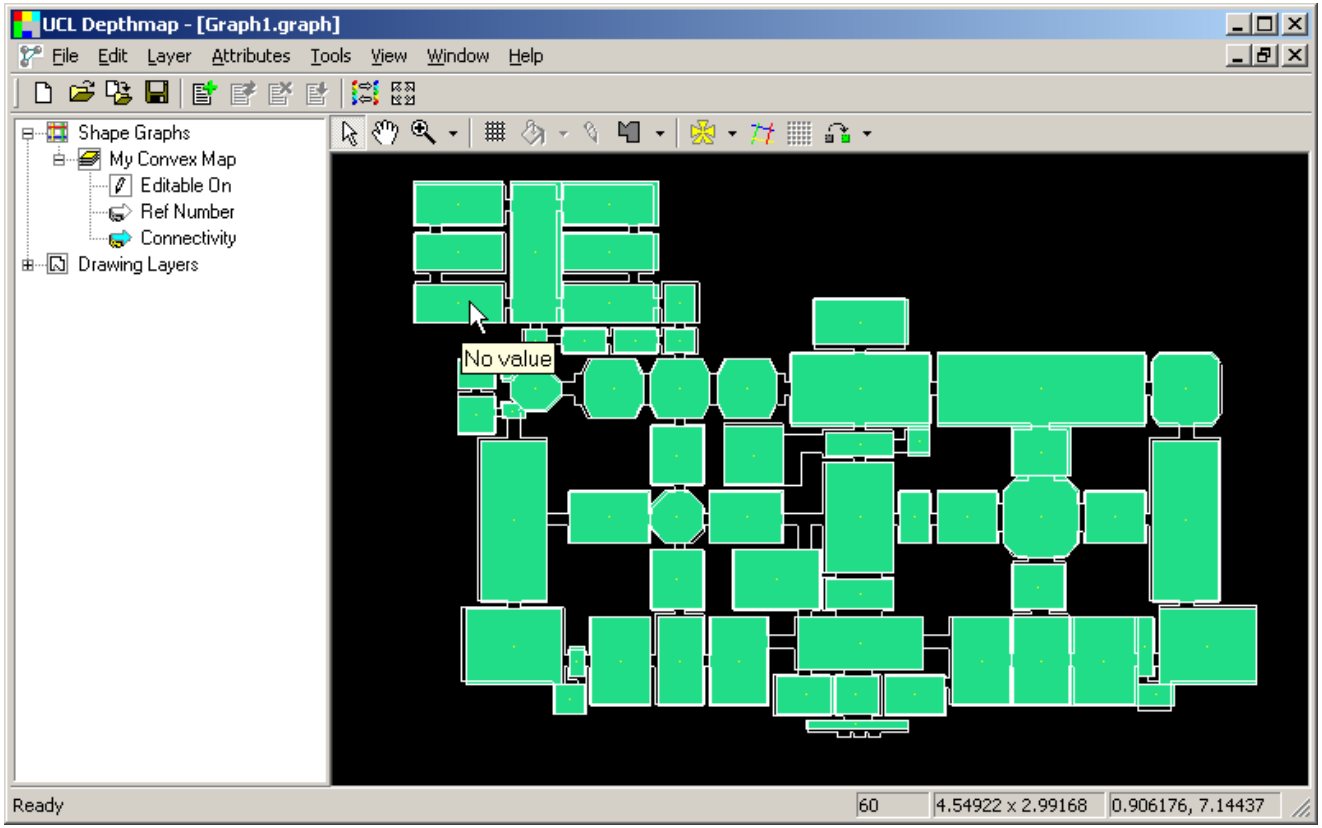
This section of the tutorial describes how to link the convex spaces, which at the moment are only polygons, into a graph.

Linking the spaces



If you switch to viewing connectivity, by selecting ‘Connectivity’ on the side bar, you will see that all the polygons are coloured green, and, if you let the mouse hover over any of them, that they have ‘No value’ for their connectivity.

Linking the spaces



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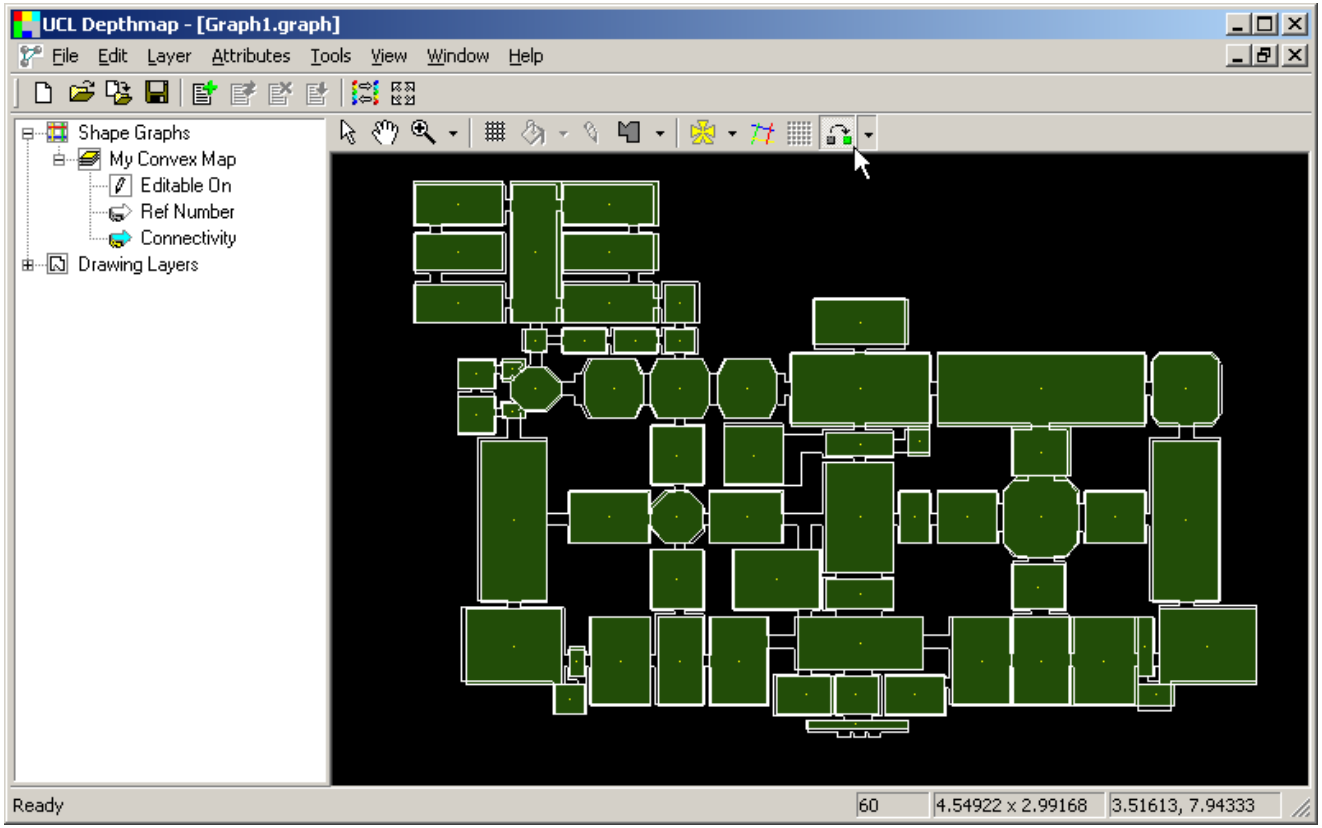
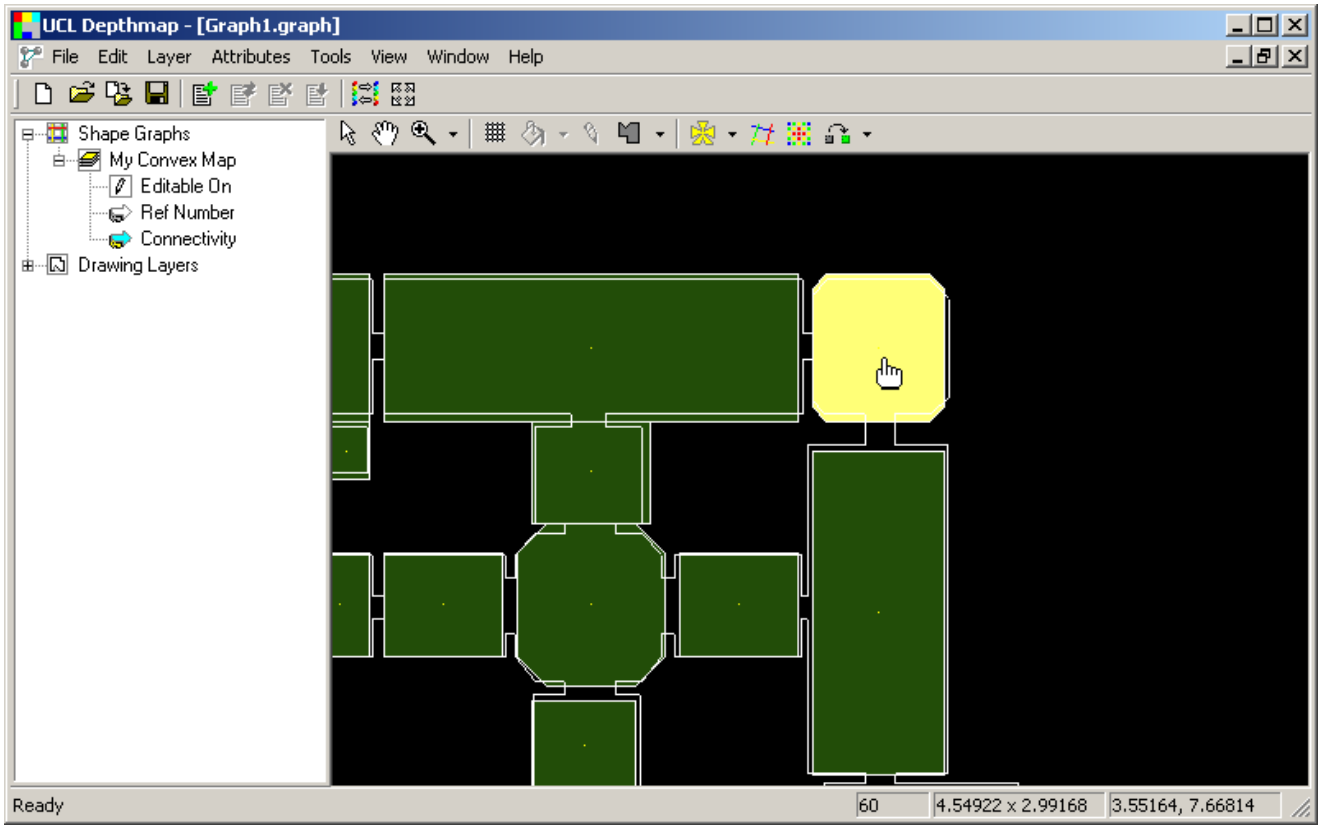
Linking the spaces



In order to link spaces, select the ‘Link’ tool from the map tool bar. As soon as you do so, the screen will dim, which is to allow you to see links more clearly.

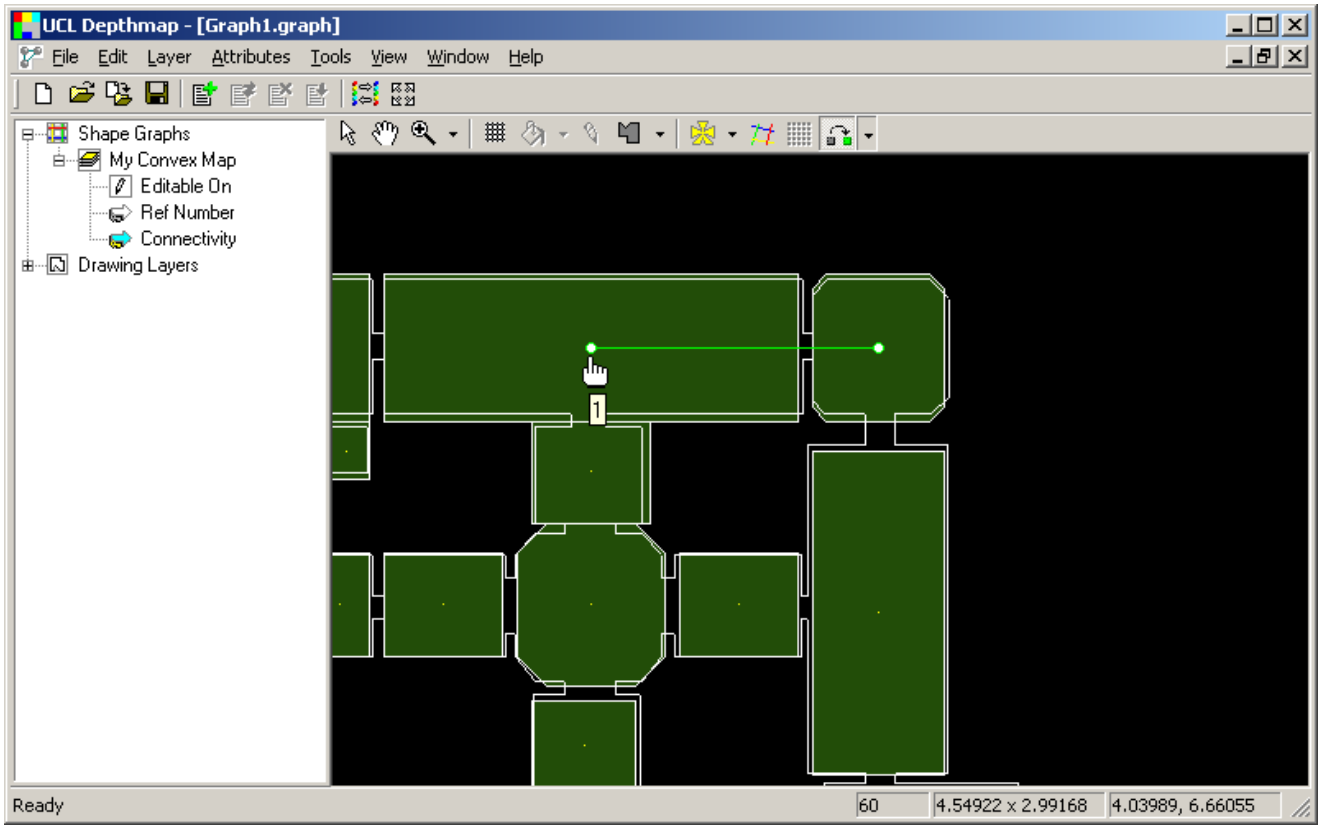
To undim, you can return to selection mode.

Linking the spaces



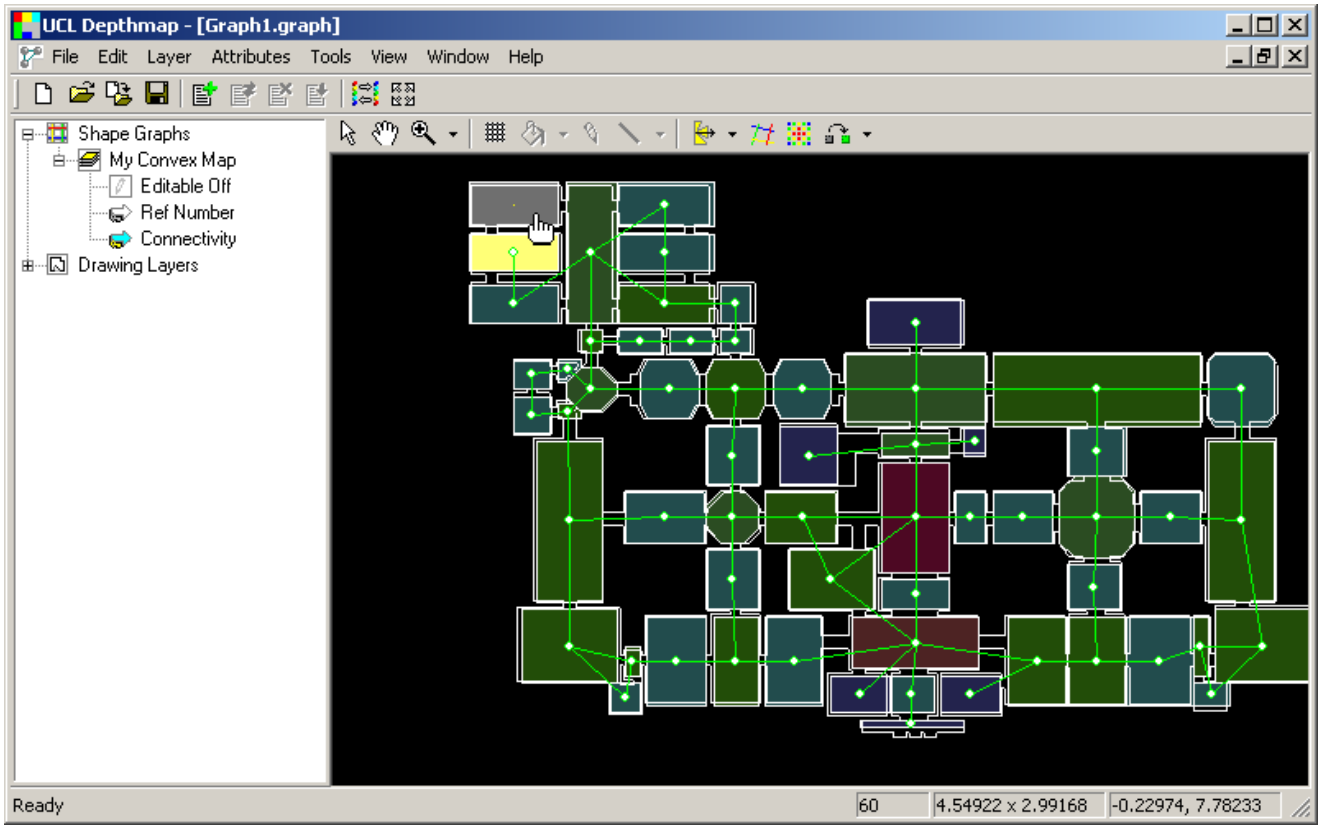
To link two convex spaces, click on each one in turn. As soon as you click on the first space it will be highlighted.

Linking the spaces



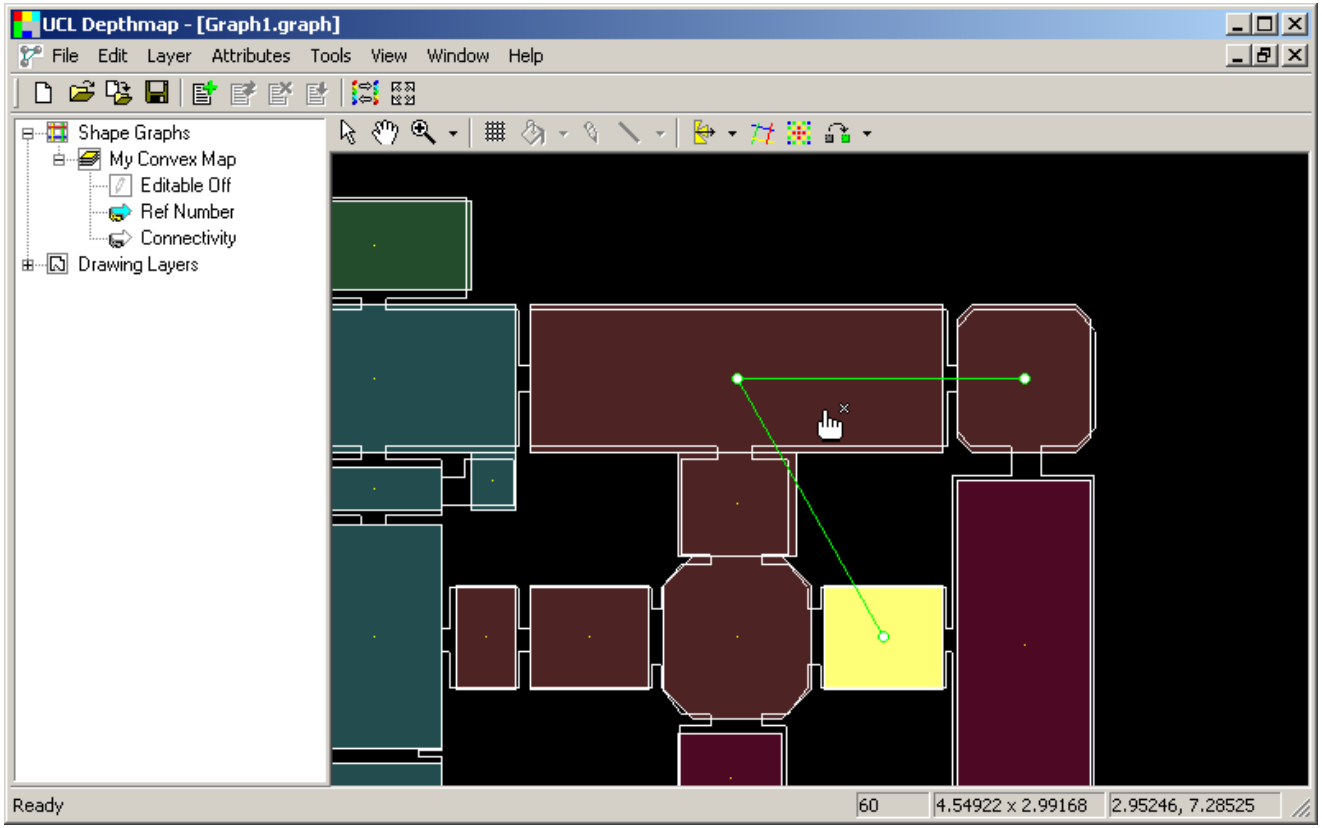
As soon as you click on the second space, a green line will be shown which connects the two spaces. Note that the connectivity is immediately incremented to one as these spaces are link.

Linking the spaces



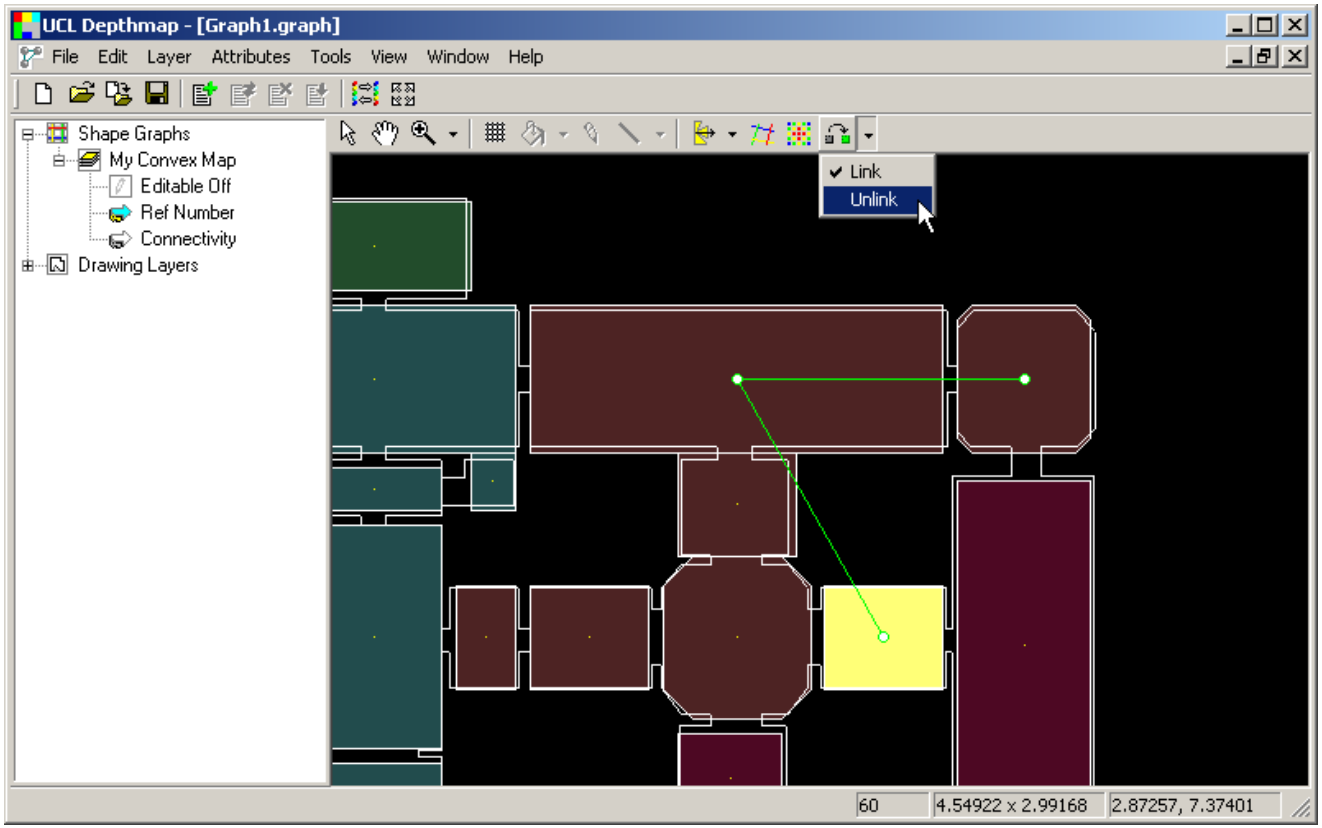
Proceed by linking all pairs of spaces that are adjacent to each other, although you may of course like to test out other methods for deciding which spaces should be linked.

Unlinking the spaces



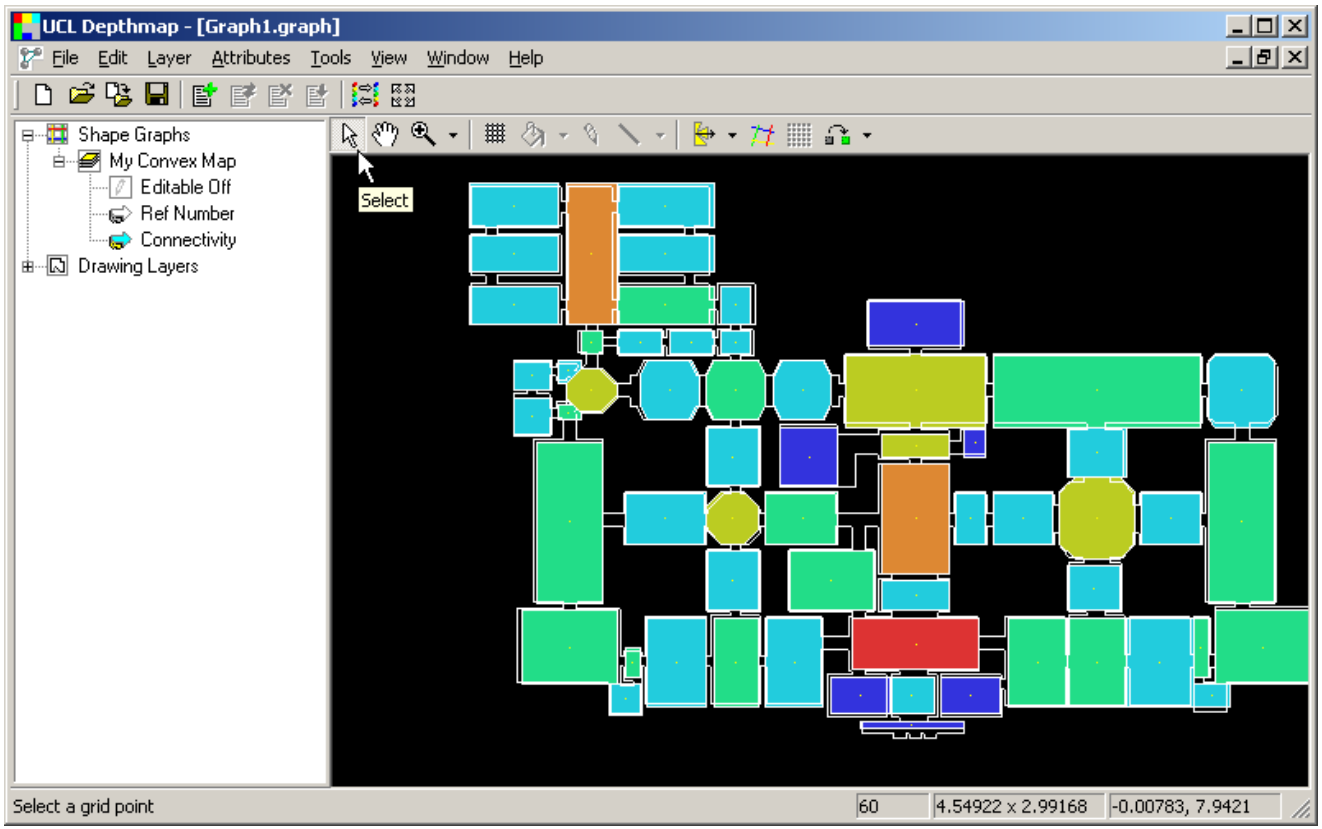
If you make a mistake, first select one of the polygons that you want to unlink, and then hold down the `Alt` key while you click on the second one. A little cross will appear next to the hand cursor to show that you are about to unlink.

Unlinking the spaces



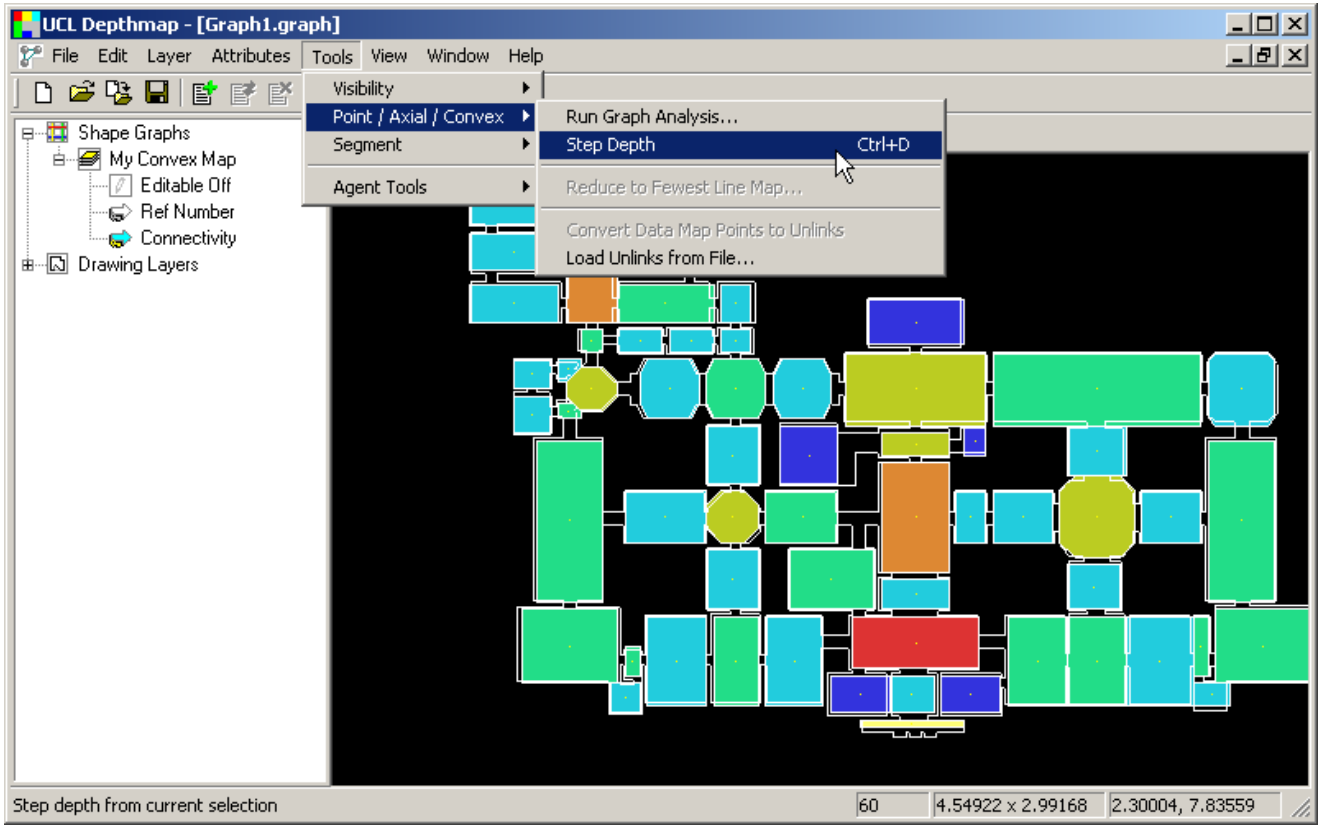
Alternatively, if you prefer (or you need to unlink several shapes), you can switch to unlink mode by selecting 'Unlink' from the drop down menu on the map tool bar.

Analysing the map



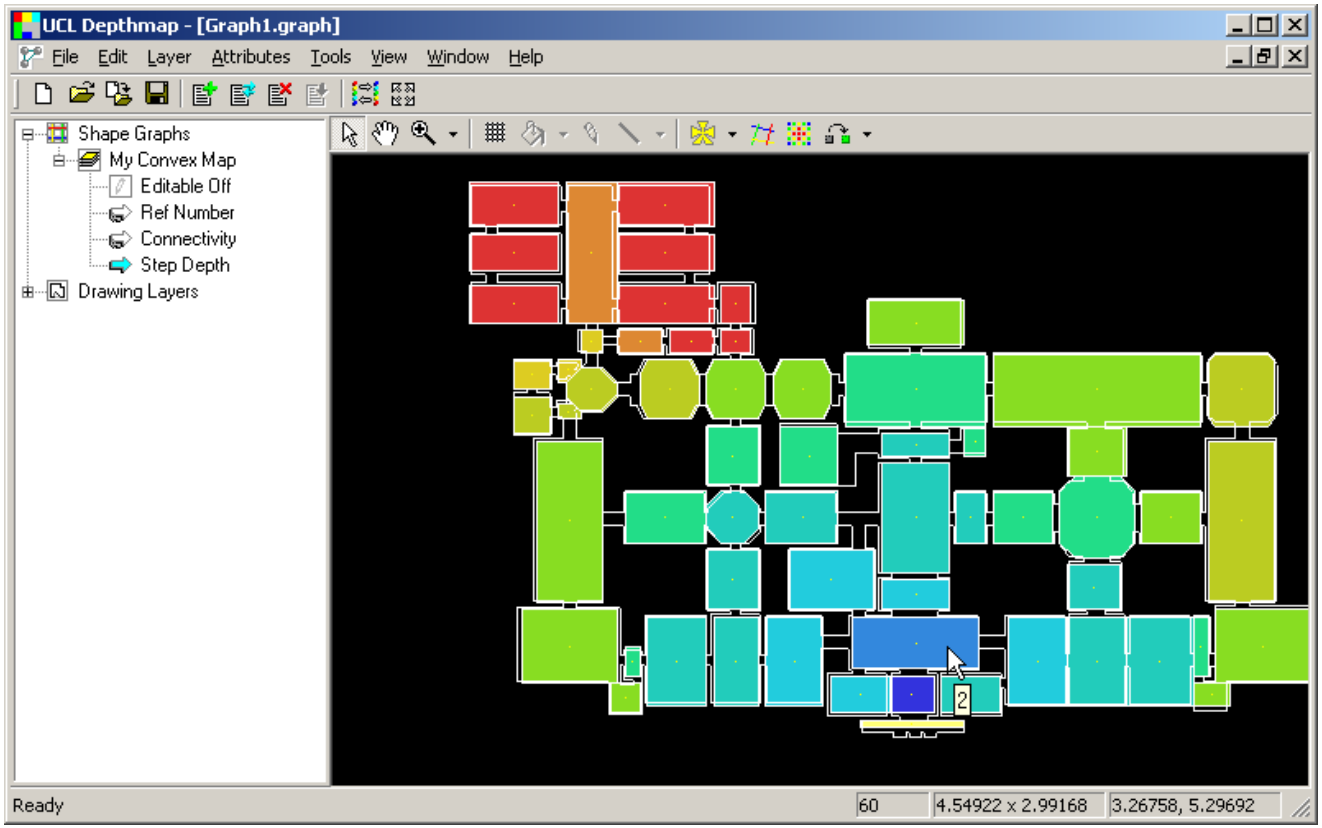
Once you have linked all the spaces, you can switch back to selection mode by choosing the arrow icon from the map tool bar.

Analysing the map



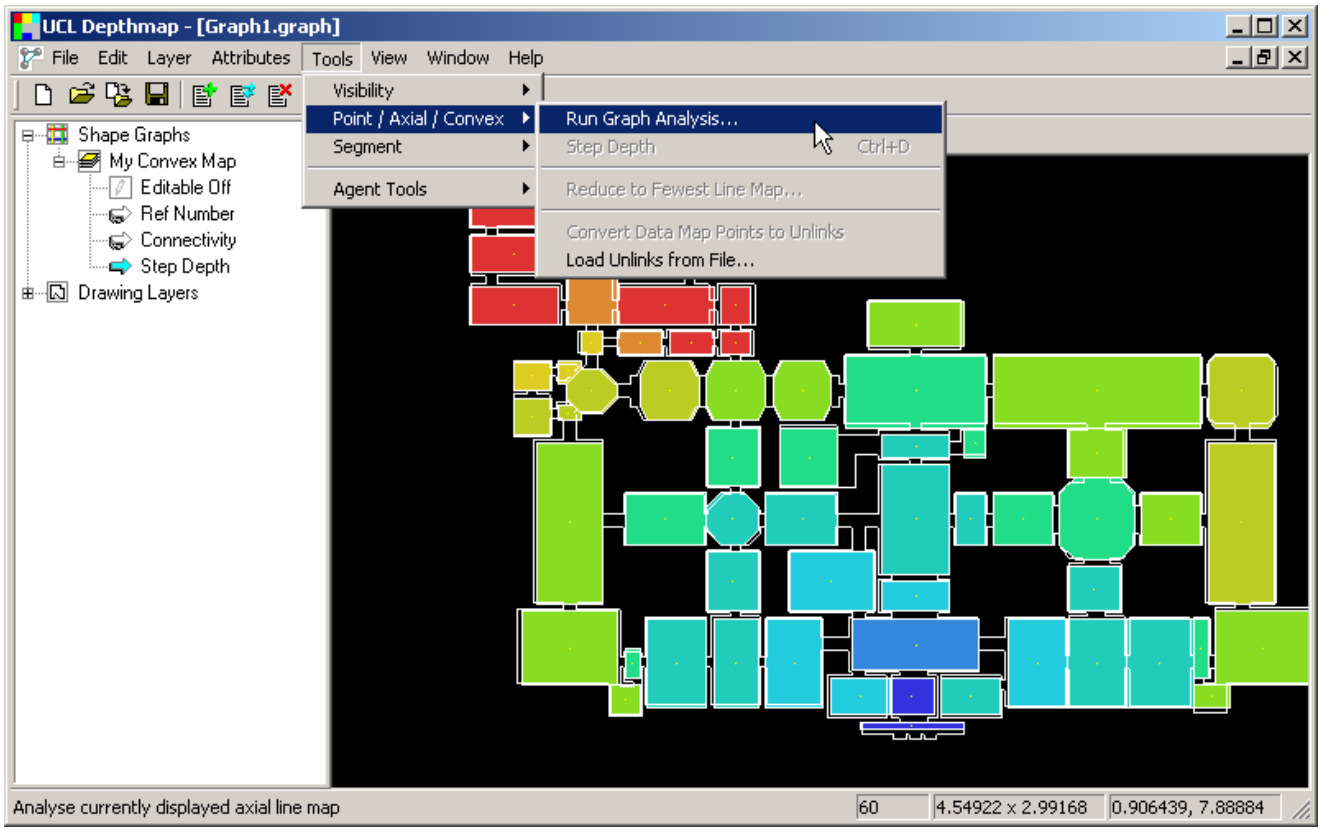
You can analyse the map in the same way as visibility graphs and axial maps. For example, to find the step depth from a convex space, first select a space, and then select ‘Step Depth’ either from the map tool bar, or by selecting ‘Step Depth’ from the ‘Tools’ menu under ‘Point / Axial / Convex’.

Analysing the map



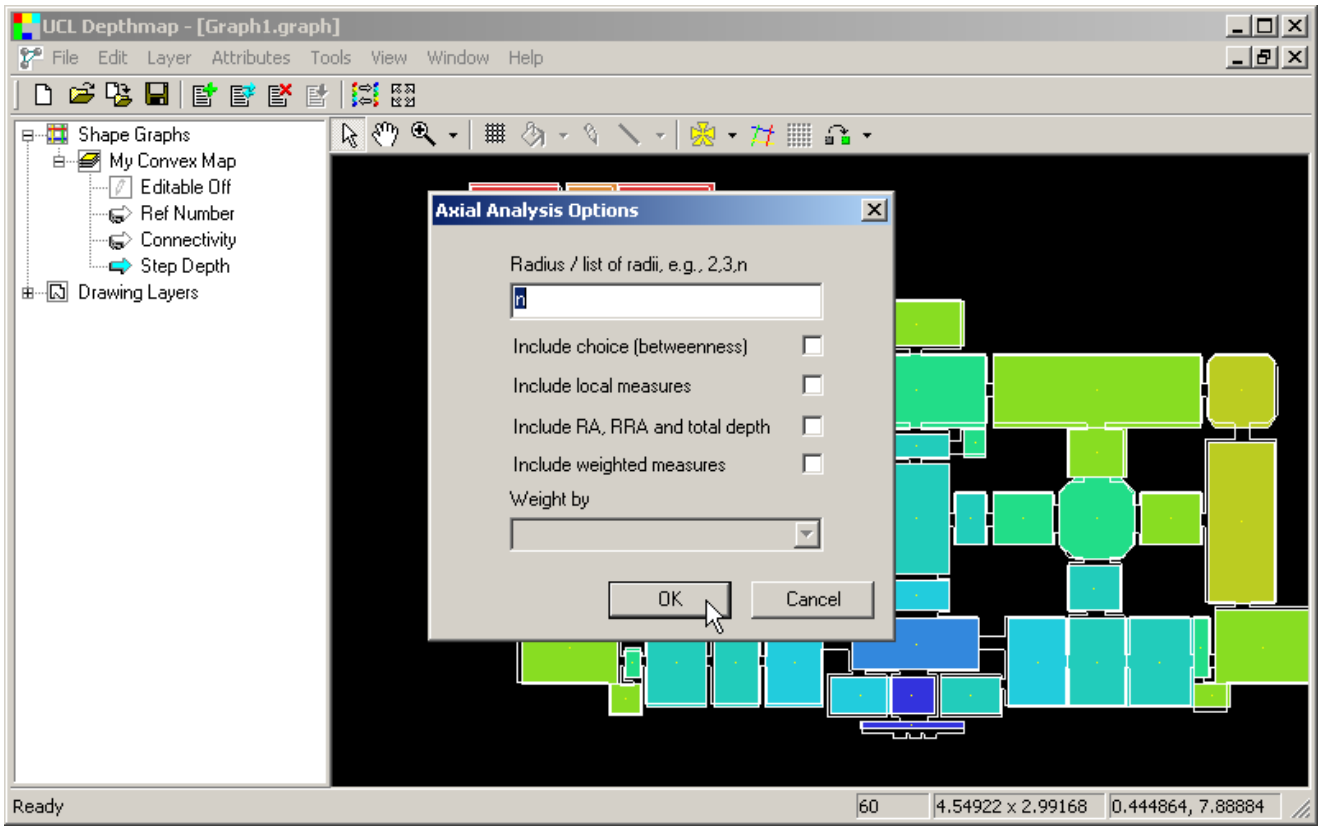
As with VGA and axial analysis, convex spaces that are one step away from the root space are at depth 1, those two steps away at depth 2 and so on.

Analysing the map



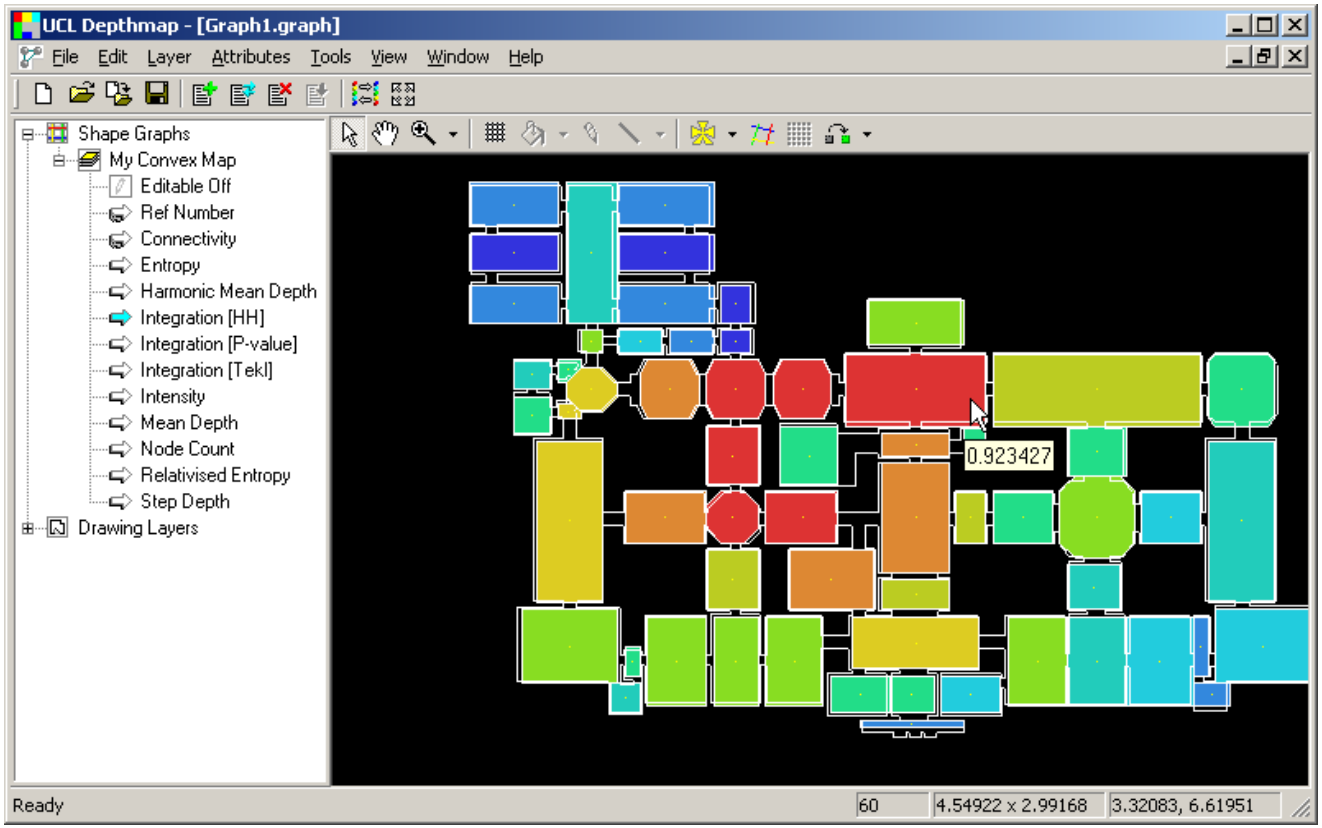
Graph analysis, such as finding the integration of the spaces, follows the same method as axial analysis. First select ‘Run Graph Analysis’ from the ‘Point / Axial / Convex’ menu under the ‘Tools’ menu.

Analysing the map



Next choose any analysis options that you would like to incorporate, and click ‘OK’ to analyse.

Analysing the map



The default measure shown is ‘Integration [HH]’. ‘HH’ stands for ‘Hillier and Hanson’, and is the value of integration as calculated in the Social Logic of Space.

Conclusion

This tutorial has covered drawing a convex map, linking the spaces, and then analysing it.
For a description of the other measures available and further explanation of the analysis, please refer to the Depthmap Researcher's Handbook, under the chapter on axial analysis.