

miniCAD7 QuickStart Tutorial

Stage: 3

Transform Field Data and Prepare for Printing

Aim: In this stage we will transform the field data, contour the natural surface, create a lot with annotated boundaries and finally, prepare the job for printing.

Start miniCAD7 and Open the file created from the Stage 2 tutorial which will be named Tutorial-1b (same as the Leica GSI file). This file contains the data created in Stage 1 of this tutorial, merged with the Leica GSI file. The data in Tutorial-1a.mcd has not been modified. This means that if you make a mistake, you can correct things and easily re-run merging the field file.

View Settings

The screen can get very cluttered. To control what is displayed, right click anywhere on the miniCAD drawing screen and select Display>>Settings to open the dialogue box below. You should use this feature during the remainder of these tutorials to modify your screen settings. Alternatively, you could have also right clicked in the drawing screen and turned these settings on or off individually.

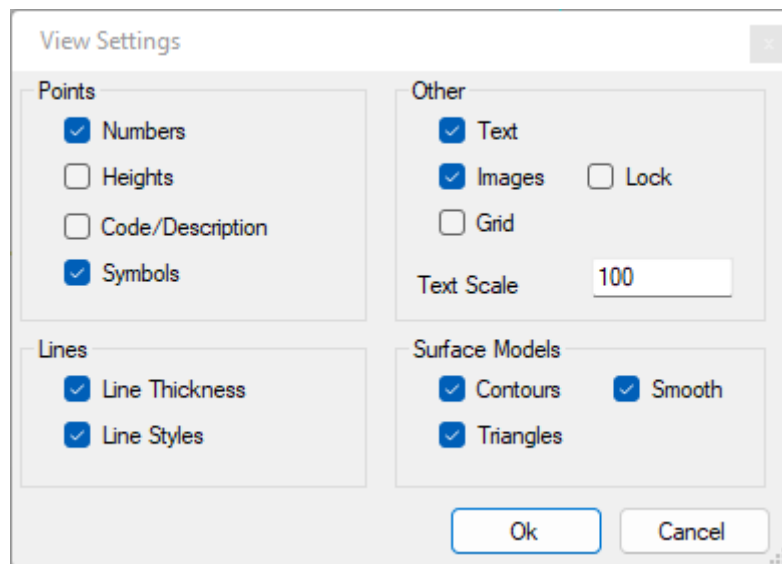


Figure 1 – View Settings dialogue

Point Selections

A powerful feature of miniCAD is the ability to create point selections. This allows you to perform CAD operations only on the points contained in the point selection.

Select Edit>>Point Selection from the menu. You should see something similar to below.

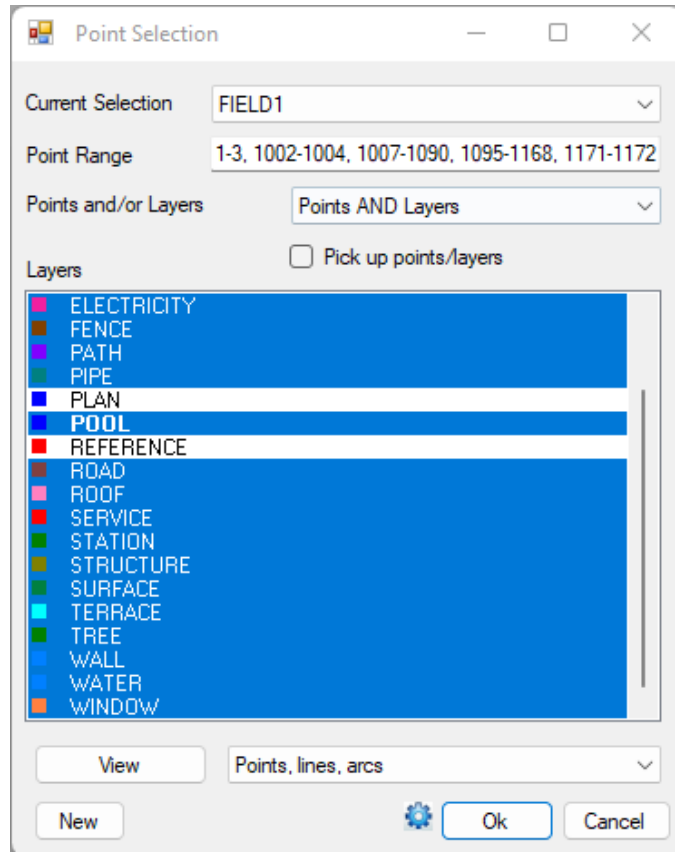


Figure 2 – Point Selection dialogue

The selection FIELD1 is displayed. This is the data we merged in the last tutorial. If you use the Utility New software to merge in further field data, it will automatically be named FIELD2, FIELD3, etc. Jobs can have multiple point selections. They can also be created manually from within miniCAD.

Make sure that Points, lines, arcs is selected in the bottom right. If not, use the pull-down arrow and select it.

Select View>>All and use the wheel on your mouse to zoom out a little so that all the data is visible.

Now hit the View button. Notice that only the field data that has been merged is selected.

Hit OK or Cancel.

Transform the field information onto the plan information.

- Select Change>>Transform. Use the pull-down arrow to select the FIELD1 point selection.
- Type 2 in the Point from (1) field.
- Type 1004 in the Point to (1) field.

- Move the cursor to the Point from (2) field. Now zoom in on the plan information. Right click and select Display>>Numbers to turn them on.
- Select point 101 with the mouse.
- Select point 103 with the mouse.

Note: The scale and rotation fields are automatically entered. The scale should be close to 1, which it is. We do not want our survey distances to be scaled.

- The Unity Scale box must be checked. See the figure below.
- Press the OK button to perform the transformation.

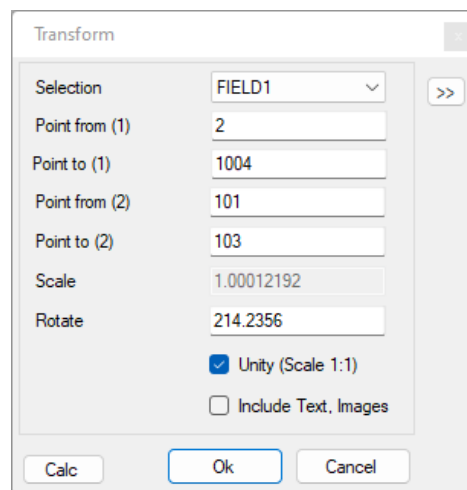


Figure 3 - Transform dialogue

Select View>>All from the menu.

Note1: If the station point numbers in the Leica GSI field file were the same as the point numbers of the miniCAD file from the Stage 1 tutorial, the transformation of the field data would have automatically been performed.

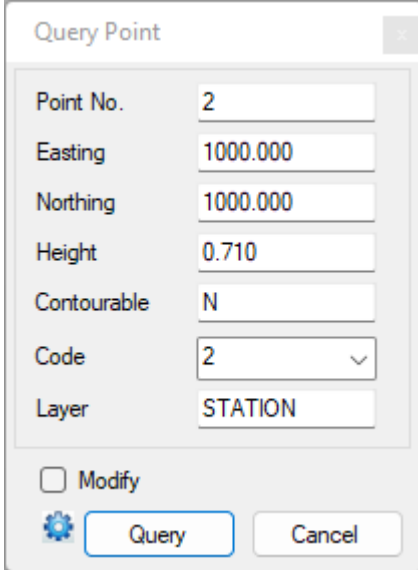
Note2: There is a more powerful transformation feature in miniCAD known as localisation, which matches multiple points from the field data and the survey plan and then performs a 3D (ie height as well) transformation. This is beyond the scope of this tutorial. A video can be found on the website.

Set our Heights

Next, we need to get our heights onto a correct datum as they are on a local system (station 1 in the data recorder file was arbitrarily set to 0.00). Point 2 is SSM 52301 which has a height of 25.471 on Australian Height Datum (AHD).

- Select Query>>Point and type 2 into the Point No. field and press the QUERY button. (or snap to point 2 with your mouse)

Note the local height of 0.710 shown in the figure below.

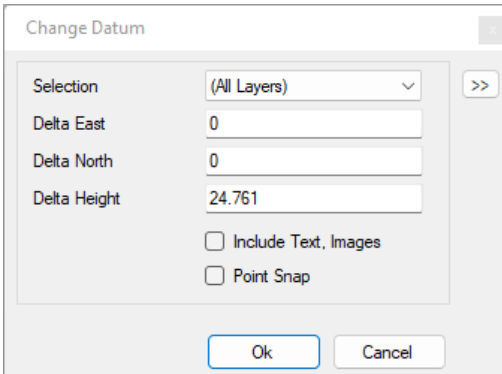


The 'Query Point' dialog box contains the following fields and controls:

- Point No.: 2
- Easting: 1000.000
- Northing: 1000.000
- Height: 0.710
- Contourable: N
- Code: 2 (dropdown menu)
- Layer: STATION
- Modify
- Buttons: Query, Cancel

Figure 4 - Query Point

- Now select Change>>Datum. We need to increase the height of all points by 24.761. (i.e. $25.471 - 0.710$)
- Select (All Layers)
- Enter 24.761 into the Delta Height edit field.
- Press the OK button. (Delta East and North must be 0, See the figure below.)



The 'Change Datum' dialog box contains the following fields and controls:

- Selection: (All Layers) (dropdown menu)
- Delta East: 0
- Delta North: 0
- Delta Height: 24.761
- Include Text, Images
- Point Snap
- Buttons: Ok, Cancel

Figure 5- Change Datum

If you query Point 2 again, you should now see that the height is 25.471.

Contouring the site.

We will contour the job twice, first to see what happens and then to see the final result.

- Select Terrain>>Create. Enter the data in the Create Terrain dialogue box as it appears in the figure and press the CREATE button. To set the contour interval, press the >> to the right of the Surface at the top of the dialogue box.

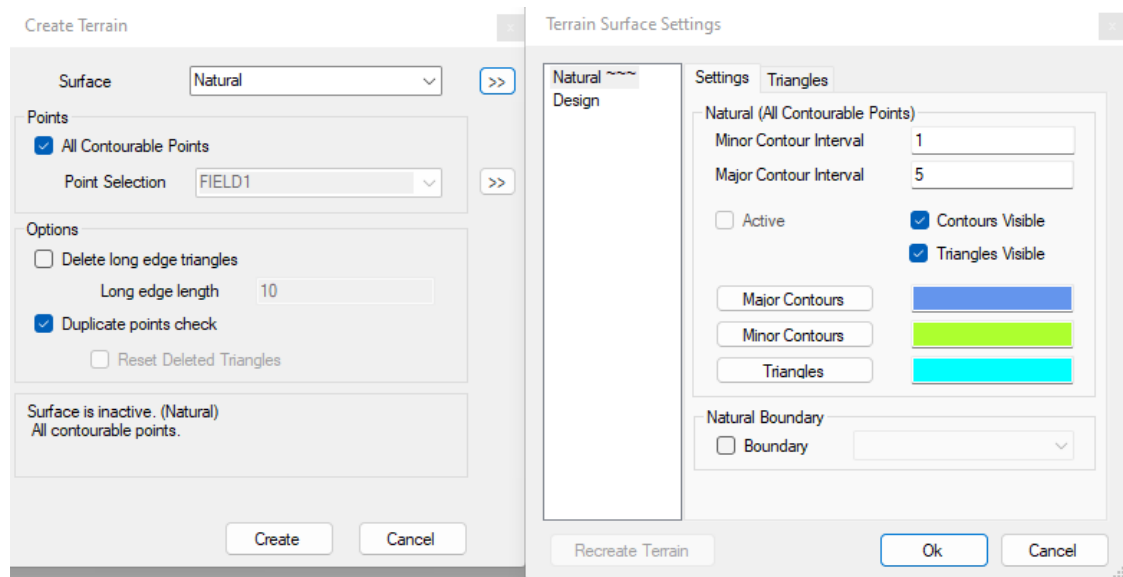


Figure 6 - Create a Surface

You can see that you have contours everywhere, whereas you have only really contoured the subject lot. To clean this up, use Query>>Line to check the largest spacing between survey points on the site. It appears to be under 10 metres so that is a good second attempt. Check the Delete long edge triangles box and enter 10 in the Long edge length field. Press the CREATE button.

I think you will agree that the contours now look much better, but where did the other triangles go? If you select Terrain >> Settings, and then the triangles TAB at the top of the dialogue box, you can scroll down and see that the long edge triangles have been flagged: 'Delete'. (See the figure below).

About Triangle Deletion: You may delete triangles in several ways. To delete individual triangles use Command: Erase >> Triangle or Command Terrain >> Settings and check the Delete checkbox on the desired triangle. You may delete by length (Long edge) or use a boundary to delete those that fall outside a region. In each case you may use Command Terrain >> Settings to reinstate individual triangle (or all triangles). Rerunning Terrain Create and checking the Reset Deleted Triangles checkbox will reinstate all triangles (see figure above)

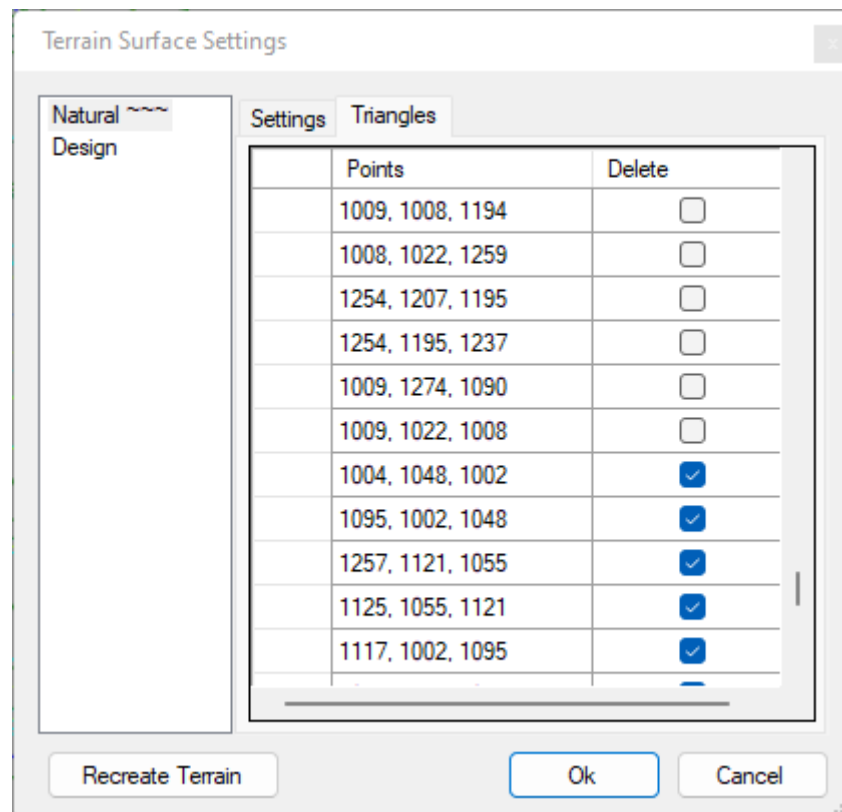


Figure 7 - Terrain settings after the second attempt.

Clean-up Line Work.

On a job like this there would be much clean-up of the line work. There are several sheds on this site, where the lines have not been joined. In the interests of keeping this tutorial manageable, only one shed will be completed.

- Select Edit>>Find Point/String, check the Point radio button, enter 2 for the scale and Point 1243 (See Figure below). Then hit the Scale button a few times until you can clearly identify points 1243 and 1242 to the SE of 1243.
- Select Draw>>Angle + Distance.
- Snap to line 1243 to 1242 near the point 1243. Now to make sure you are drawing in the shed layer, right click in the drawing area and select Layer>>Set Current. The layer name in the bottom left corner should now read STRUCTURE. Then return to the Angle + Distance dialogue.

About Finding Points: The Command Zoom >> Scale can be used to find points and strings. Press Ctrl-F to open the tool. Enter a scale of 2 and the point you wish to find. Press scale (or the enter key) as many times as you need to set the zoom at the correct level for your current task. Zoomed in too far? Press F8 to zoom out a bit.

- Enter the angle as 90.
- Right click on the blue cog at the bottom LHS of the dialogue box and make sure *Focus on distance* is checked. This means we will use only 1 angle as the building is a shed, we will assume all angles are 90 degrees. If you were drawing a bay window (where you need to change the angle constantly), you would uncheck *Focus on distance*.

- Enter the distance 4.27. Note that this distance is positive, so the line will go to the right of point 1243 at right angles to the line 1243 – 1242. If a negative distance is entered, then the line would go to the left instead. See the figure below.
- Press the STORE button.

Then use Draw>>Line to join a line from the new point created to 1238.

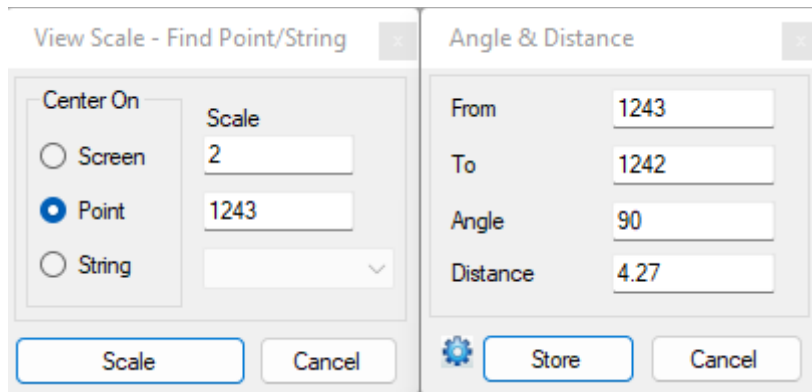


Figure 8 – Find Point and Angle & Distance dialogues

Geo-Referencing an image

miniCAD provides a simple way to geo-reference an aerial photograph to a job. It is also possible to insert photographs of elevations. For instance if a client was interested in the location and height of all the window positions on the neighbouring residences, you could include a photograph of these then use Add>>Text to annotate the heights and dimensions of the windows. You could also possibly geo-reference this photo and calculate the corner coordinates of the windows more accurately.

- Select Layer>>Layers, hit the New Layer button, create a new layer called IMAGE and hit the Ok button.
- Select Draw>>Insert Image. Drag a rectangle of a reasonable size on the miniCAD job work area to place the image.
- At the File>>Open prompt, select JPEG (*.jpg) files in the bottom right and open the file Tutorial1.jpg.
- Use lot boundary points 110 and 105 for the next step. Select the corresponding points on the red boundary lines in the image first, then snap to points 110 and 105.
- Select the inserted image and right click. Select **Geo Reference image**. Follow the prompts in the message bar on the status line. Steps 1 and 2 are to select two points in the image (Zoom in to each red boundary corner in the image to make the selection more accurate) and Steps 3 and 4 are to select the same two points in the miniCAD job (Snap to points 110 and 105). After completing Step 4 the image is automatically shifted, scaled and rotated. Once complete the image is locked in position.

- If you make a mistake, select the image again by dragging the mouse from top right to bottom left on the top right corner of the image, right click, select Reset Image, right click again, select Geo Reference image and start again.

More About Images: Images may be locked, to avoid accidental selection, and they may also be displayed at 50% transparency to make the line work easier to see. The lock applies to all images in the job. (You can also hide them).

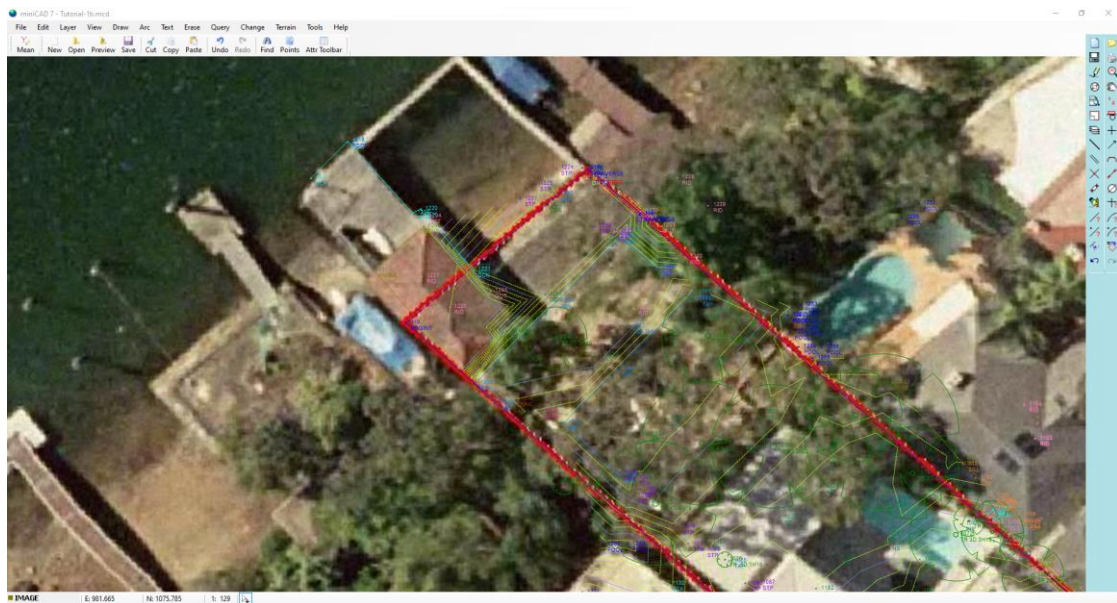


Figure 9 Geo-referenced image.

The figure above clearly shows the location of the boatshed walls in relation to the plan and the aerial photo of the boatshed roof. (Yes! The Boatshed extends off the property onto Crown Land, so this owner will be paying fees to lease this land from Council and additional fees for the water and foreshore payable to Transport for NSW (formerly Maritime Services). Half their luck!).

Freehand sketching

Now to add the waterline to the job.

- Create a new layer called WATERLINE and allocate a solid line and appropriate colour to this layer.
- Select Draw>>Pencil.
- Right click anywhere in the drawing screen and select Set Step. Enter 5 in the Spacing in World Units and World under POINT or WORLD?
- Place the mouse cursor over the waterline in the photo, left click and drag the mouse along the waterline.

It is also possible to sketch more regular objects as well, such as the rectangular swimming pool two lots north east of the subject lot.

- Make POOL the current layer.

About Current Layers: There are four ways to make a layer current. Use the SET CURRENT button in the layer dialogue, right click on the Current Layer in the status bar, select an object on screen that is already in that layer, right click and use Layer>>Set Current or probably the easiest, select an object on screen that is already in that layer and select the icon immediately to the right of the layer name (see below).



Figure 10 – Simplest way to change layers

- Select Draw>>Line from the menu bar. Right click and make sure **Allow new Points** is selected. Make sure the check box for Join 2 points is not selected. Left click on each of the pool corners on the block to the SW of the subject lot to trace out the line of the pool, right click and deselect Allow new points and close the pool by snapping back on the first point created.

Adding Text –Create a new layer called TEXT and select a pink shade colour. Select Text>>Add. Left click a point in the bay where you would like the middle of your text to be. Type Sailors Bay, set the Rotation angle to 50 degrees, the Height to 5mm the font to Arial.

Centre the text in both horizontal and vertical directions and select the OK button. Then close the dialogue by clicking the cross in the top right corner. If you make any mistakes, you can select the text using Text>>Modify.

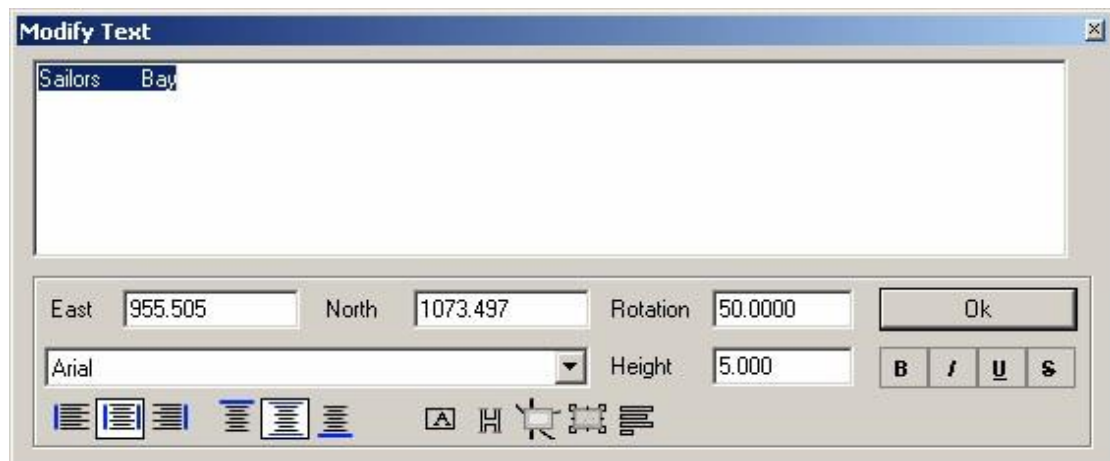


Figure 7 - Add / Modify Text

About Text: In Stage 1 of this tutorial, you selected a plot scale of 1:400 in the Job Settings. That means that 'Sailors Bay' will be plotted at a height of 5mm at 1:400. You can confirm this by selecting Tools>>Annotation Settings and looking at the Current Text Scale setting. To make the text on screen appear the same as when it is printed it is necessary to zoom in and out until the screen plot scale displayed in the bottom line at the left (to the right of the layer and coordinates) is roughly the same, in this case 1:400.

Saving and loading views – This is a powerful tool for navigating around large jobs. Zoom in on one of the many swimming pools in the aerial photo, so that the pool fills the screen. Select View>>Save View from the menu bar. Now do the same for a different pool. You should now have 2 saved views. To see them select View>>Load from the menu bar. Zoom in on yet a third pool and select the ADD VIEW button. Now click on the view you require in the Load Saved Views dialogue box shown in figure 19 below. You can easily jump from one view to the next using this feature by clicking on the image in the Load Saved Views dialogue. You can delete views (and resize the thumbnail image using the icons at the bottom right of the dialogue).



Figure 8 - Load Saved Views

Congratulations. Apart from printing your job out, you have now finished it. See figure 9 below to see what it should look like. Waterfront bliss. Only your yacht is missing!

Select File>>Save to make sure that you don't lose your masterpiece!

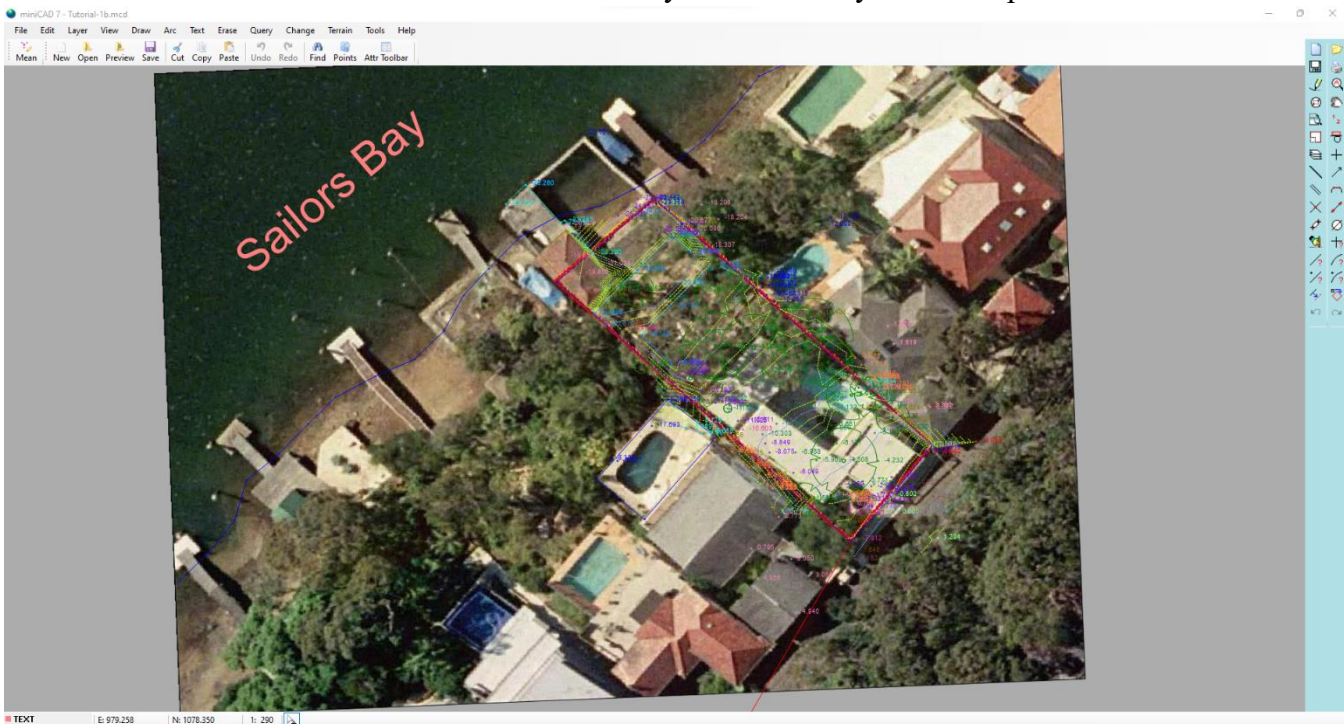


Figure 9 - The finished product

Congratulations on reaching the end of this tutorial. By now you will have a feel as to how easy miniCAD7 is to use. You are encouraged to explore the extensive help files

associated with the program and found online. Should you have further queries, do not hesitate to contact us directly.

We hope that you are enjoying these introductory miniCAD tutorials and will continue onto the next one!

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