

Introduction to QGIS For Desk Based Assessments

Workshop 4 – Preparing and Printing Maps



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1 Aims

The aim of this workshop is familiarise yourself with QGIS. In this session you will undertake the following tasks:

- Set up a print layout
- Create a map template that you can reuse with different projects
- add map data
- add map elements (scale, grid, north arrow, legend)
- add a vector file's attribute table

Each of these tasks stand alone as useful GIS tools but together they provide a workflow for working with airborne and map data.

2 How to use this booklet

Illustrations in this booklet show the icons on screen for each task. The full menu options are notated as follows: layout > Open.

3 Preparing a map layout for printing or presentation

Any map needs the following items:

- a) title
- b) a scale bar
- c) a north arrow
- d) a legend (if more than one layer is shown)
- e) its real world location

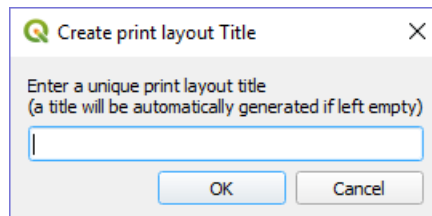
Without these it isn't a map!

In addition you will need to properly credit the sources of any data / basemaps that you are reproducing to make sure you don't fall foul of copyright law. e.g.

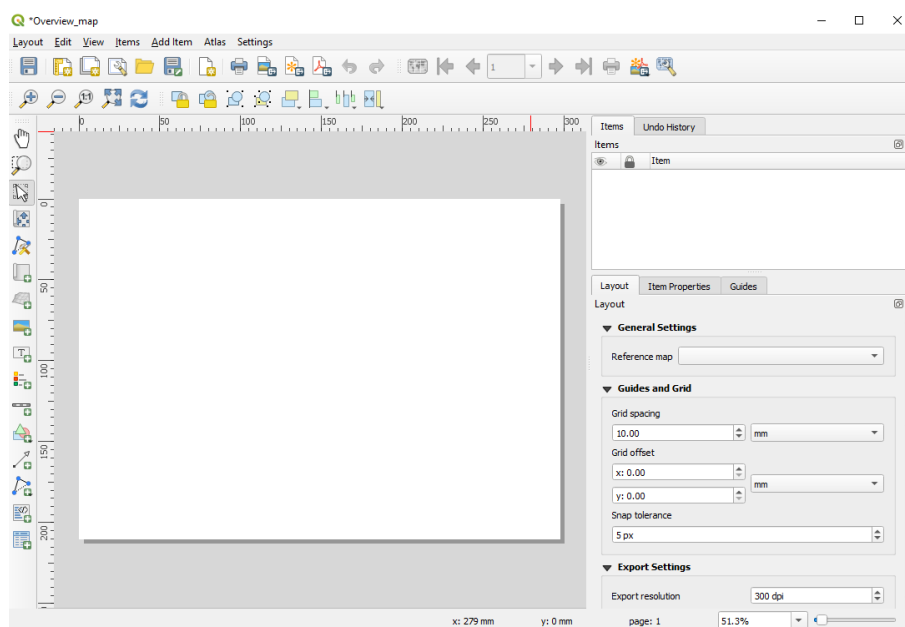
OS open data – Contains OS Data © Crown copyright and database right (year of production)

We are going to produce a map that shows our study area

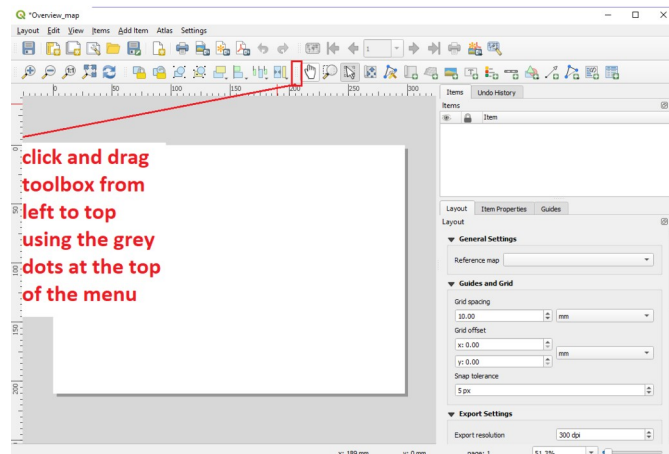
1. Open the layers you require in the map window. Edit their properties to match how you'd like them to appear in the printed map.
2. Go to Project > New Print layout. Give your new print layout a title, Stanton Map in the pop up and click OK.



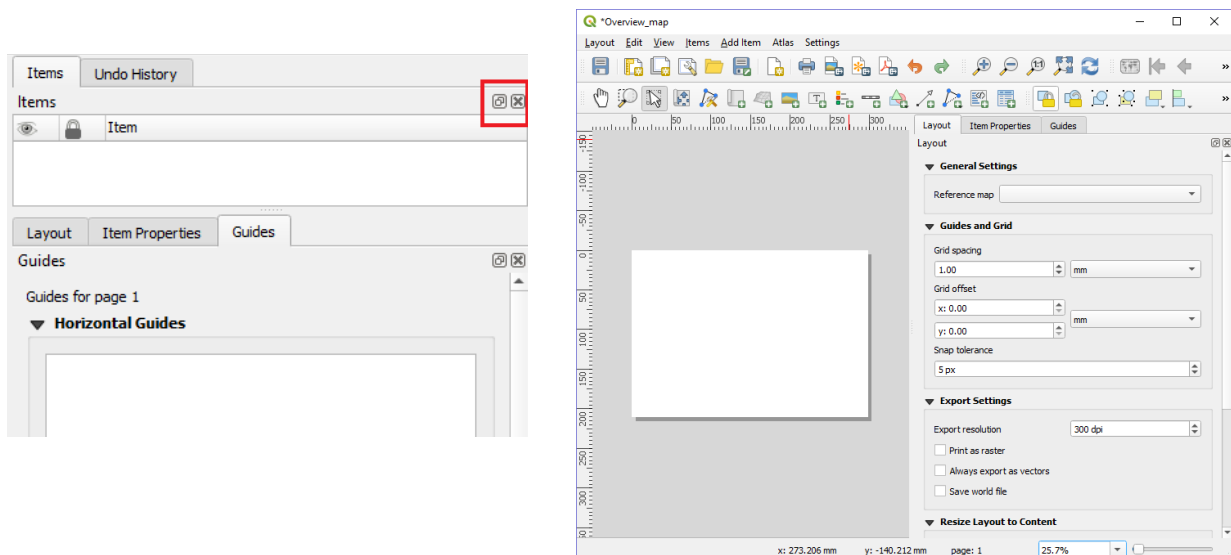
3. You will see the map layout on the left and the composition properties on the right.



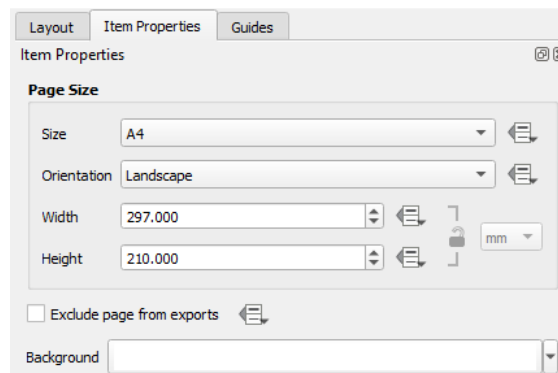
4. The toolbox with the most frequently used icons is on the left of the map layout but can be moved to the top bar by clicking and dragging on the grey dots at the top of the bar (personally I find it much easier to have the toolbars together at the top).



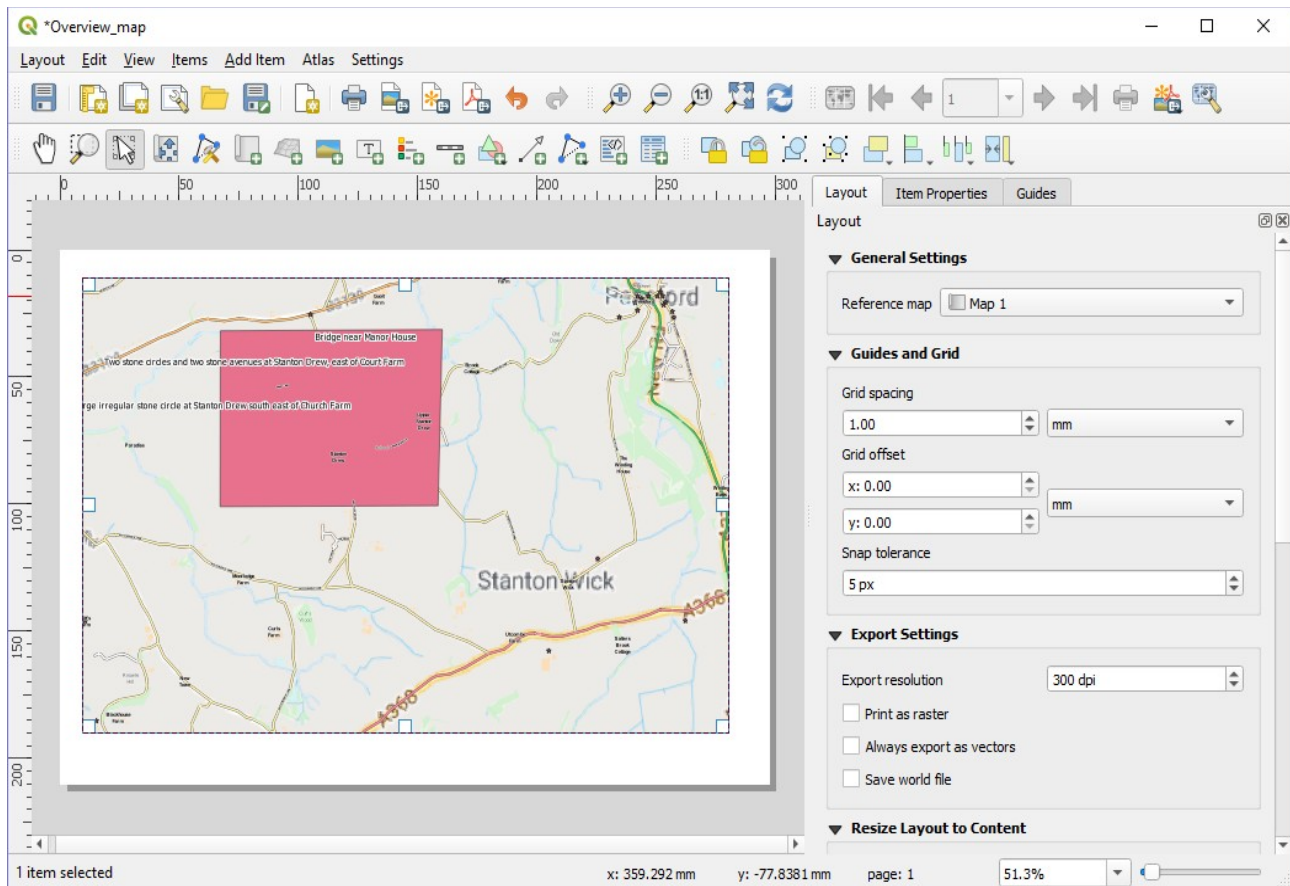
5. To tidy up the screen we can also close the “Items” and “Undo History” Tabs so that Layout / Item Properties can expand to the whole space to the right of the lay out window



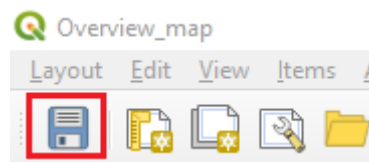
6. Right click anywhere on the white page and select Page Properties. This will open the page properties dialogue as a panel on the right. Edit the settings so that the map is A4 and landscape in orientation



7. Use the Add New Map icon to draw an area for your map in the map layout. The map from your GIS window will appear in the print layout.

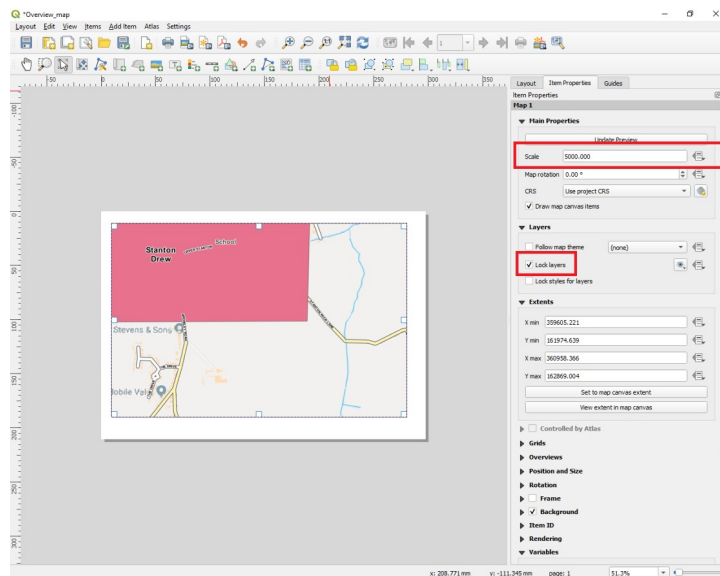


8. Save the print layout using the floppy disk icon (it's good to get into the habit of doing this regularly as you work on the print layout).



4 Setting the Map Scale and Extent

1. On the right hand menu, click the Item Properties tab. Here you can edit all elements of the map window. There are a lot of options, each expanded by clicking the arrow to the left of the option name. The first thing we will edit is the scale of the window, under the main properties section. Edit the maps' scale to 5,000, by simply typing in the box.



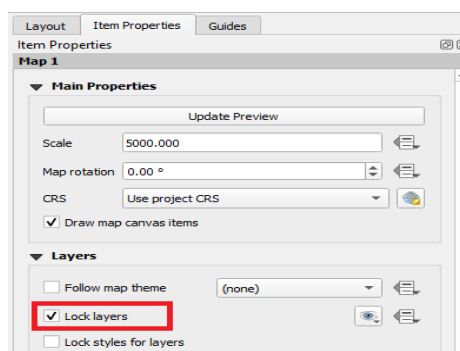
2. You'll see that when we changed the scale the map moved and might no longer be centred where we want. To move the map use the Move Item content Icon. This allows you to click on the map and drag it to change it's centre.



When you are happy, click on the Select / Move Item icon to continue to edit the print layout.



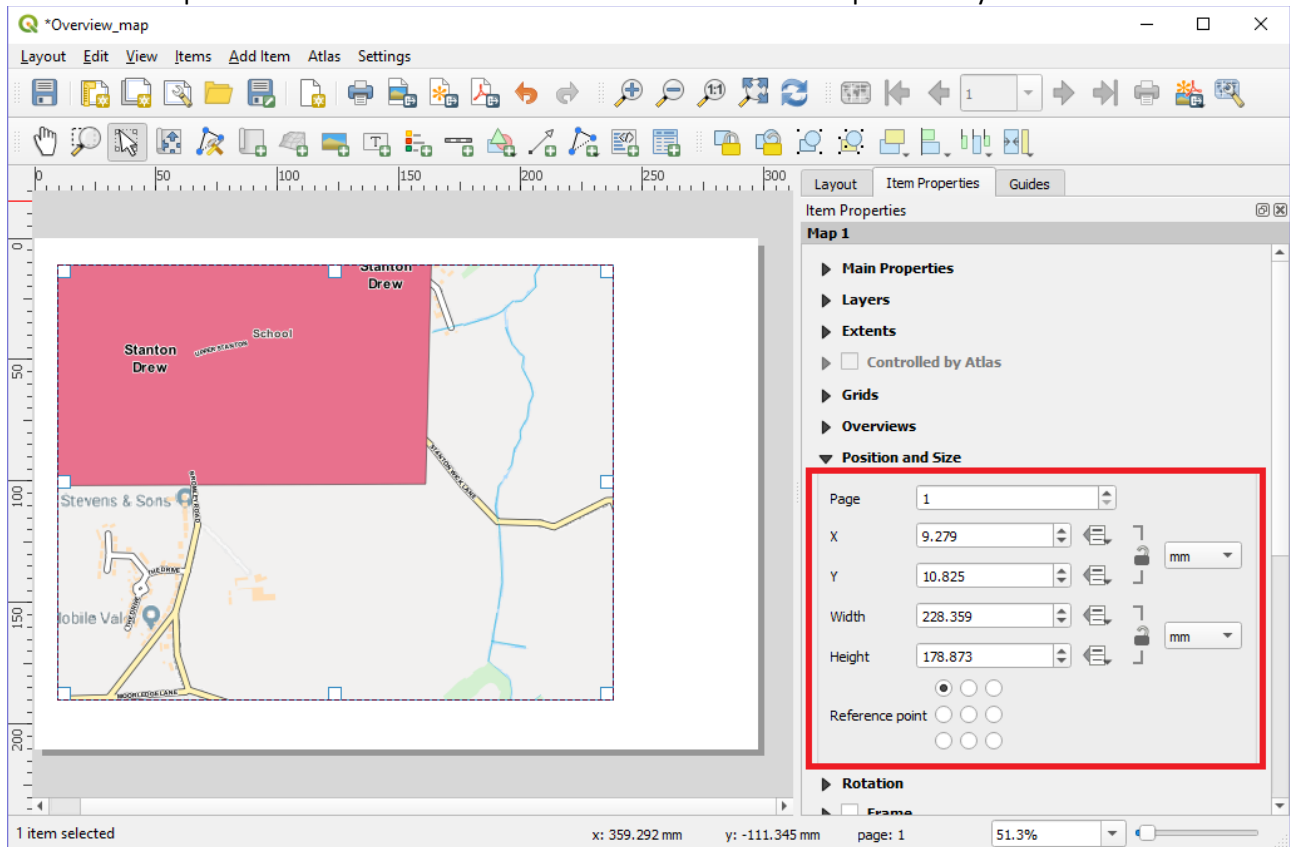
3. If you lock the layers in the print view any changes you make in the map window will not come through to the print view (very handy once you have your extents and scale set!)



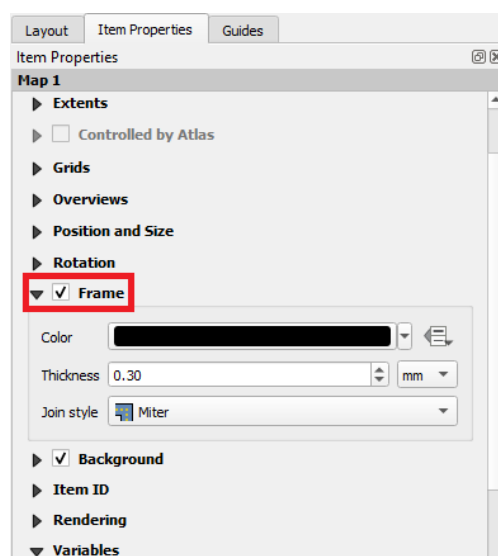
4. Save your layout

5 Changing the Map size and Adding a Frame

1. Click on the position and size menu to edit the dimensions of the map window you've drawn.



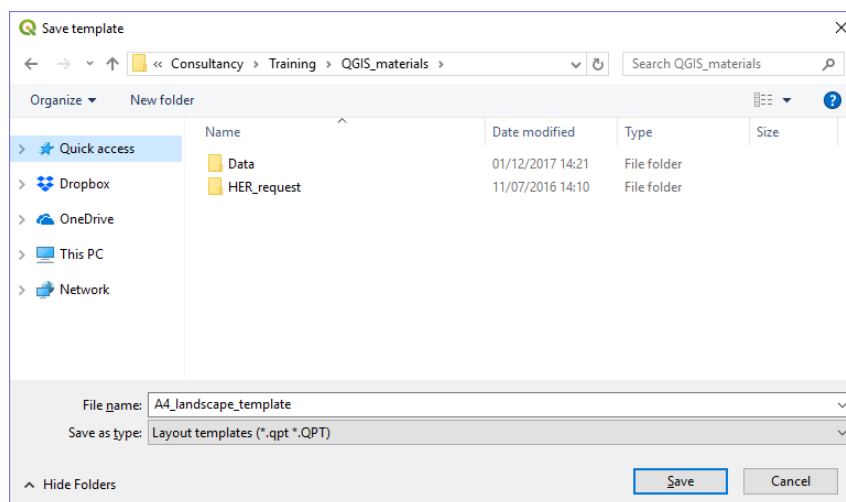
2. In the general options we can elect to show a frame by putting a cross beside “Frame” and alter its properties. Change the outline width to be 1 px



3. Save your layout.

6 Saving Your Current Layout as a Map Template

1. You should regularly save your current print layout to the QGIS project using the floppy disc icon top left of the window but you can also create a template to reuse in other QGIS projects. Map templates record the elements of the current layout (map size, title, scale etc.) and allow them to be instantly imported into a new project. It is recommended to do **both types of save** throughout this workshop to create your first map template as you go.
2. To save the current layout as a template select Layout > Save as Template. Save the template with a name that reflects its size and orientation e.g. A4_landscape_print



3. By choosing this option you can save yourself lots of time making maps in future as you will be able to load the template with all your map elements already placed. See section 15 - Reusing your Print Template (p26) for step by step instructions to use a template in a new print layout.

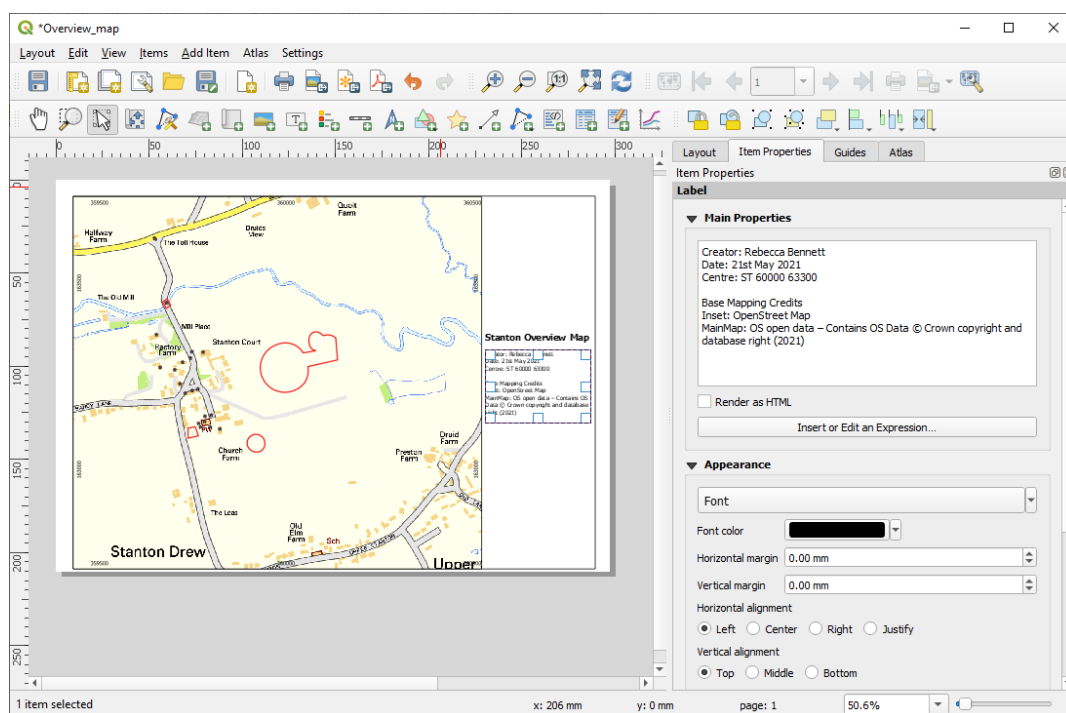
7 Adding Map Elements

Title, Text and Data Statement

1. Next we'll add the items that make this a map! First the title. Click on the add label icon and draw a box to the right of the map in the remaining space on the paper.



Add the title of the map by typing in the text box in the Item properties section. You can also add your name, date and contact details.



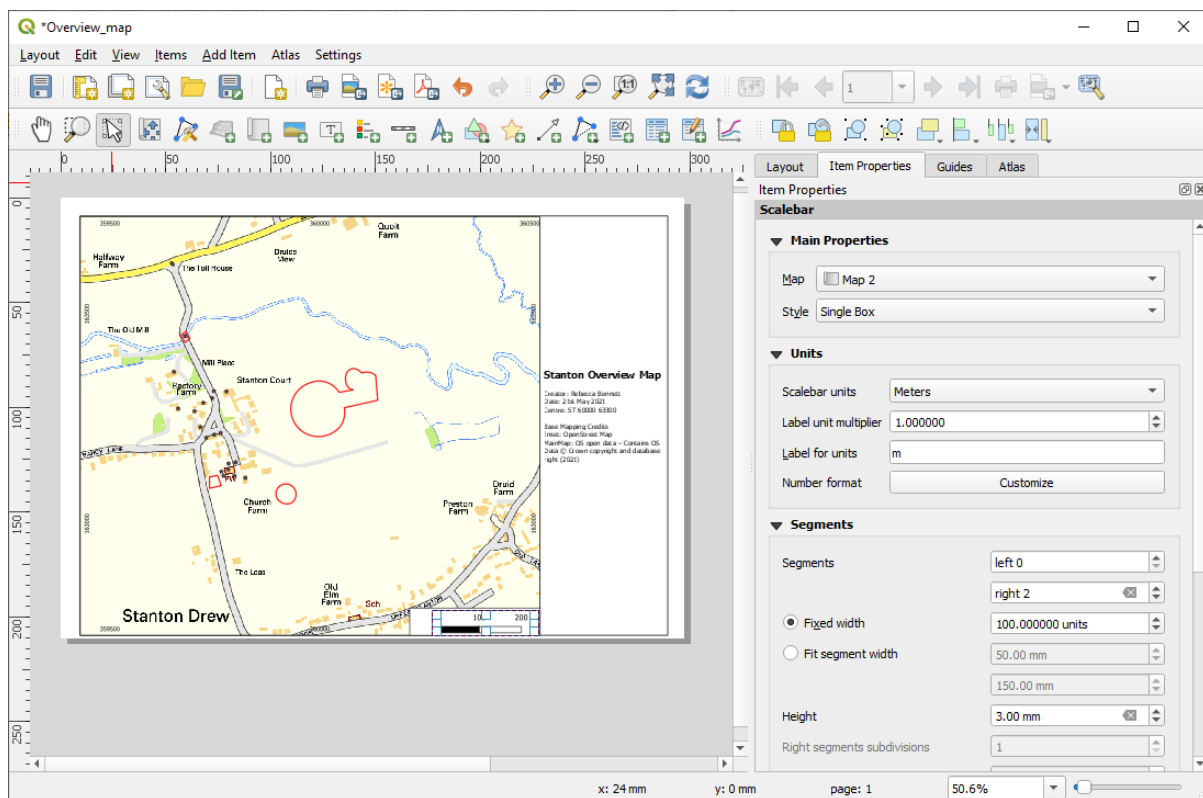
2. Repeat the add text procedure to add the OS data statement at the bottom of the map using the current year. Make sure that it is legible! **OS open data – Contains OS Data © Crown copyright and database right (2021)**
3. **Save the template Layout > Save as Template**

Scale Bar

1. Next we'll add a **scale bar** to the map. Click on the Add Scale Bar Icon and click on your map to place it in the layout.



2. You can edit the size and number of segments in the item properties. Make each segment represent 100m and the total scale cover 200m. You can also change the shape of the scale bar - narrow it to 2mm. Don't forget to add the units of the scale (these are the same as your map units). Experiment with the different types of scale bar until you find one that works well.



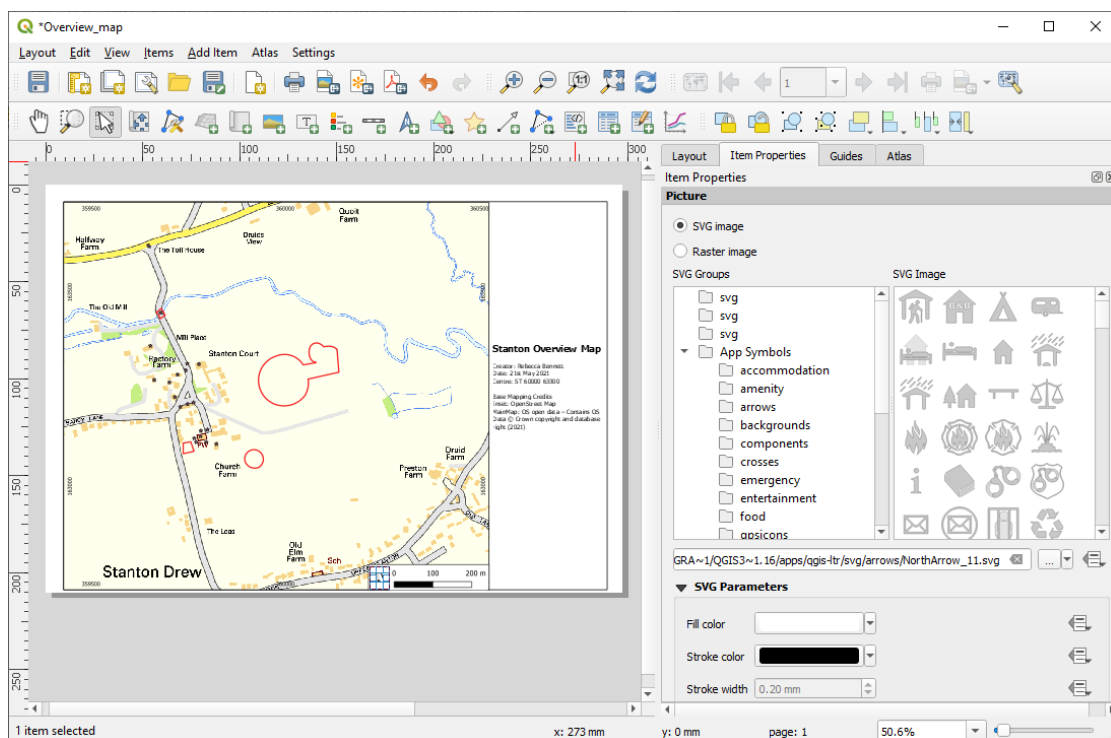
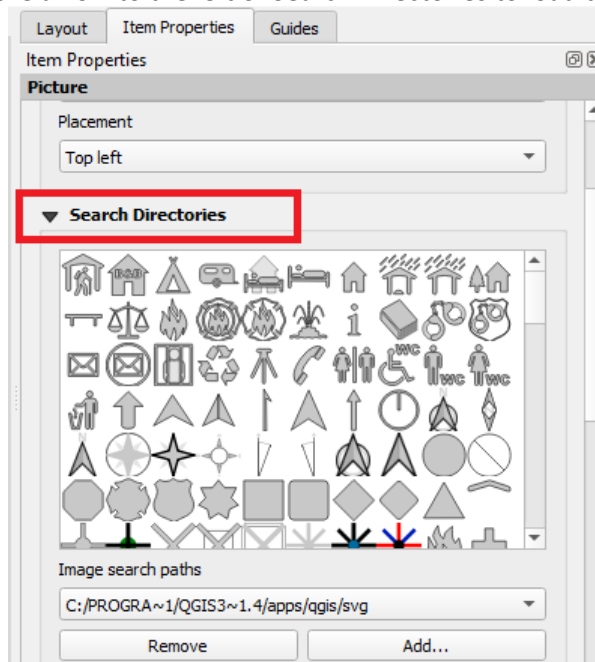
3. Save your print template.

Adding A North Arrow

1. Now we will add the **north arrow**. Click on the Add Image icon and draw an area in the print window



2. In Item properties select the arrow to the left of Search Directories to load the default icons.

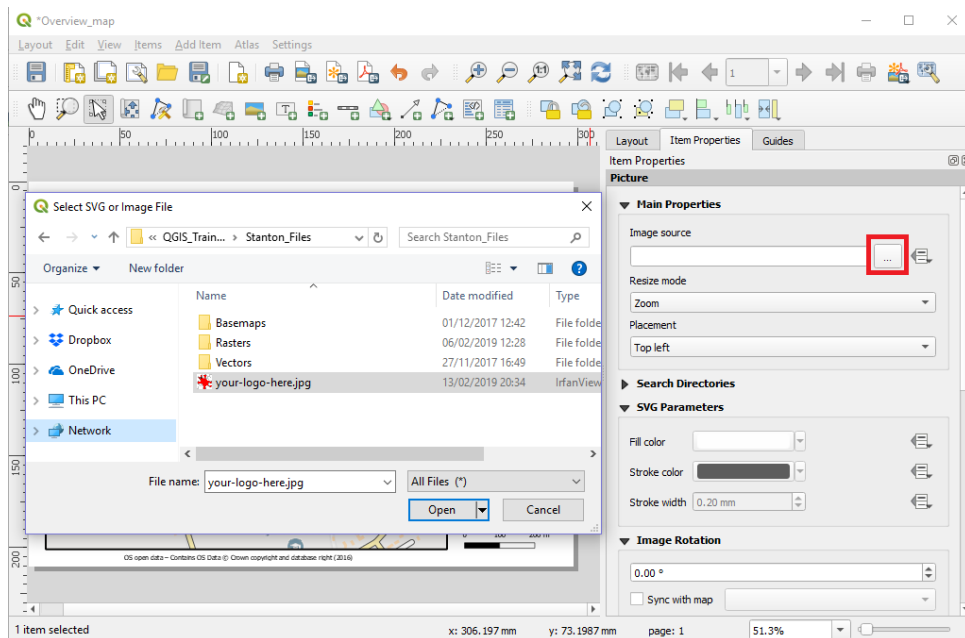


3. Scroll through the Item options to find a north arrow. Edit the height and positioning.

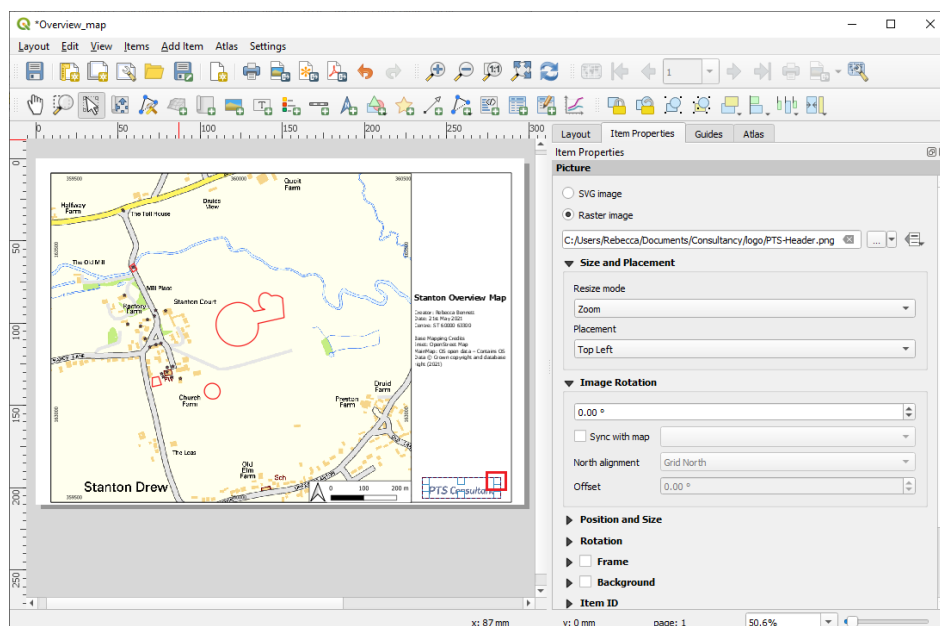
4. Save your print template.

Adding an Image or Logo

1. Now we will add an image from file, in this case a business logo. Click on the Add Image icon again and draw an area in the print window.
2. In the Main Properties section click on the three dots after the Image source to browse to the USB drive and find the your-logo-here.jpeg (or add your own logo image file) and select open to add the image to the print window.



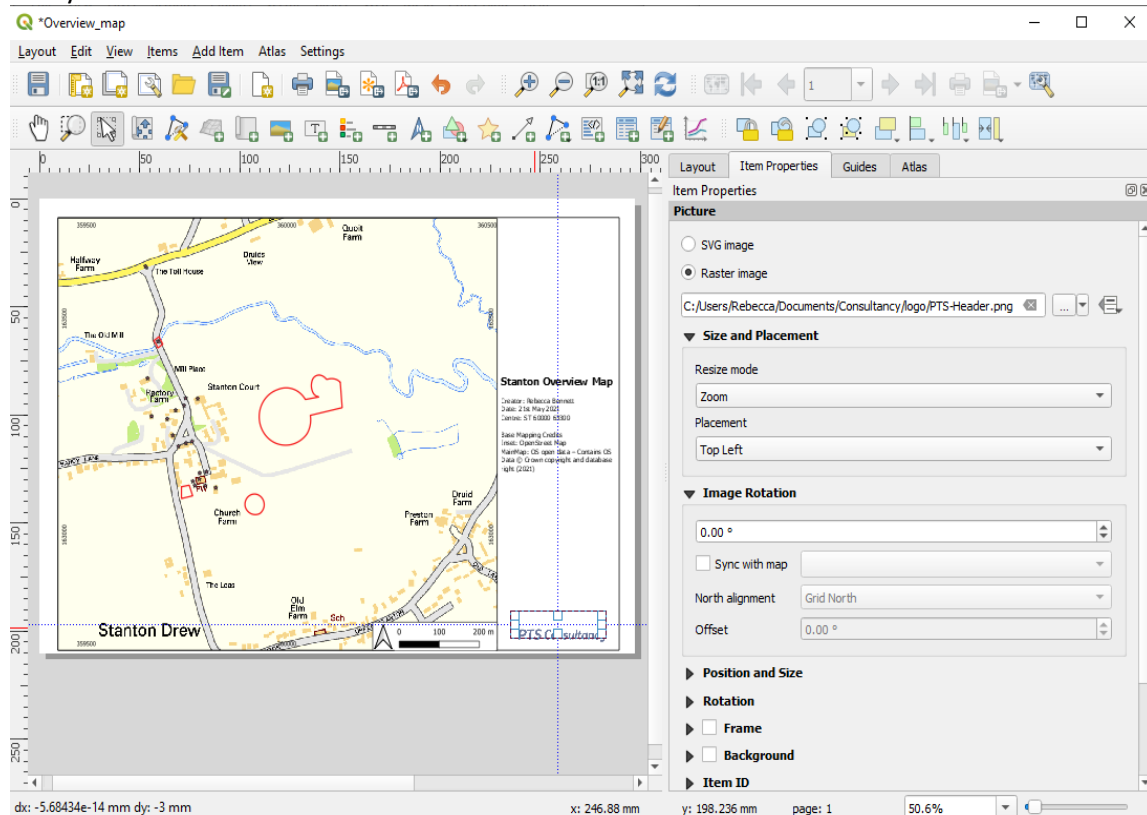
3. Click and move the white boxes around the logo image in the print window until you are happy with the size and placement of the logo.



4. Save your print template.

8 Moving Items Around the Print View

1. You can move any item in the layout by clicking and dragging it. Switch the locations of the legend and north arrow / scale bar to practise.
2. As you click and drag or edit an item you'll see dotted guidelines appear to help you align the items in your layout



3. You can also align items in the layout window using the Align Icon. Check that your map and text space are aligned



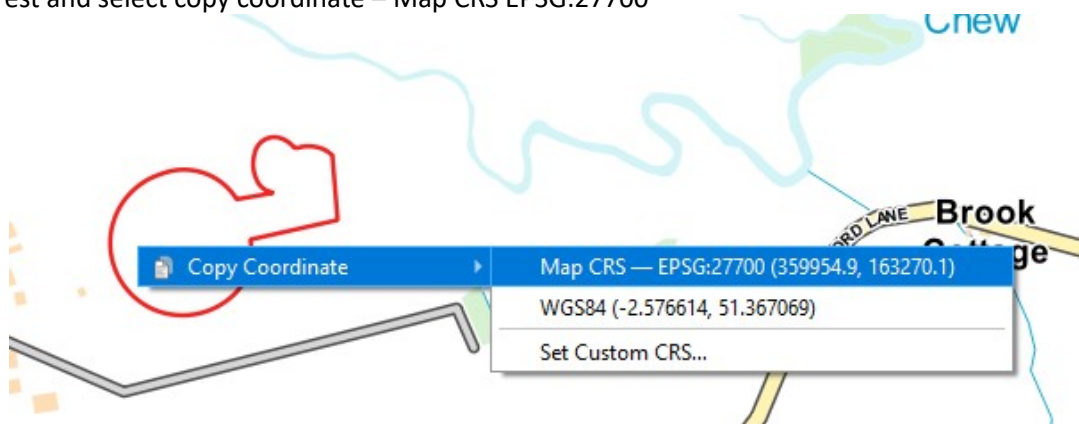
4. Save your print template.

9 Locating Your Map in the Real World

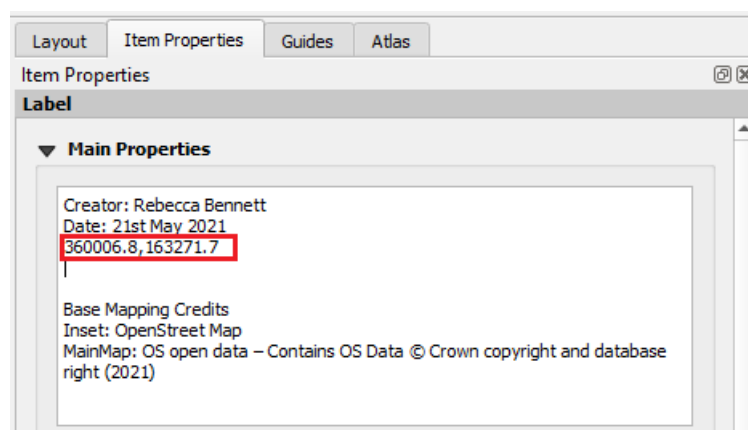
Finally we must make sure that viewers know **where the map is in the real world**. There are two ways to do this: you can add the coordinates of the centre of the map to the Info Space or you can add a grid to the map.

Adding Coordinates

1. To add coordinates go back to your QGIS map window right click on the map in the centre of your area of interest and select copy coordinate – Map CRS EPSG:27700



2. Return to your print layout and highlight your text box, paste the clipboard contents into the text box.

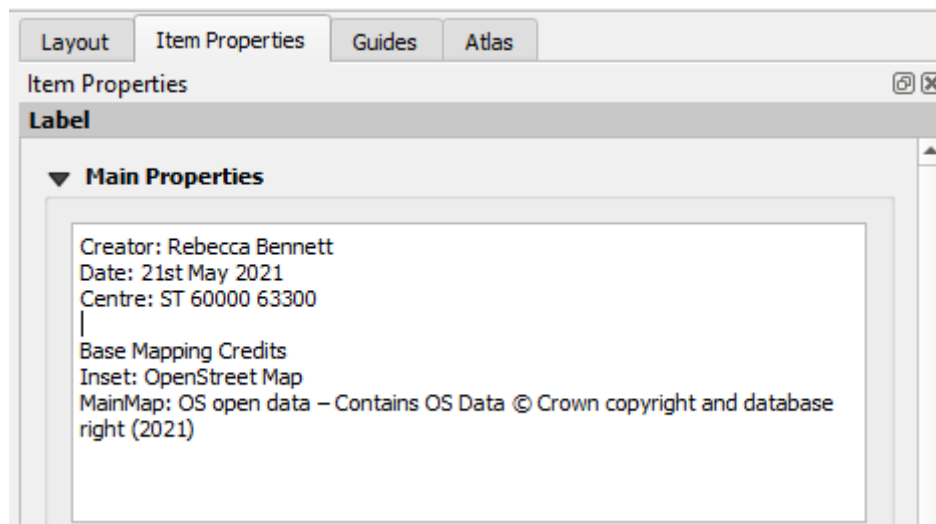


3. The level of precision of the co-ordinates is inappropriate, so round them to the nearest 100m

359919.618,163286.631 becomes 360000, 163300

4. If you need to convert to the OS grid letters take away the first two numbers (use this [reference sheet](#) if needed).

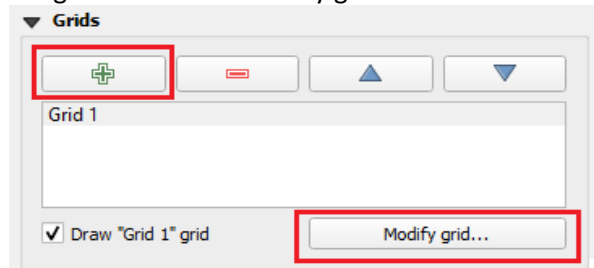
360000, 163300 becomes ST 60000 63300



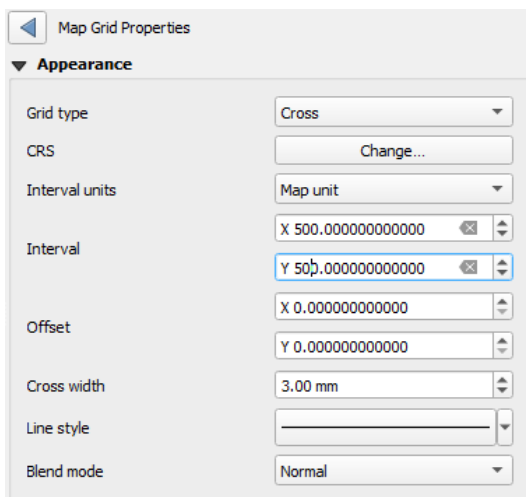
5. Save your print template.

Adding a Grid

1. The second method adds a grid to the map area in the layout. Select the map area and click on the Grid tab in the item properties (you may need to scroll down to see this).
2. Click on the Green + to add a grid then select modify grid.

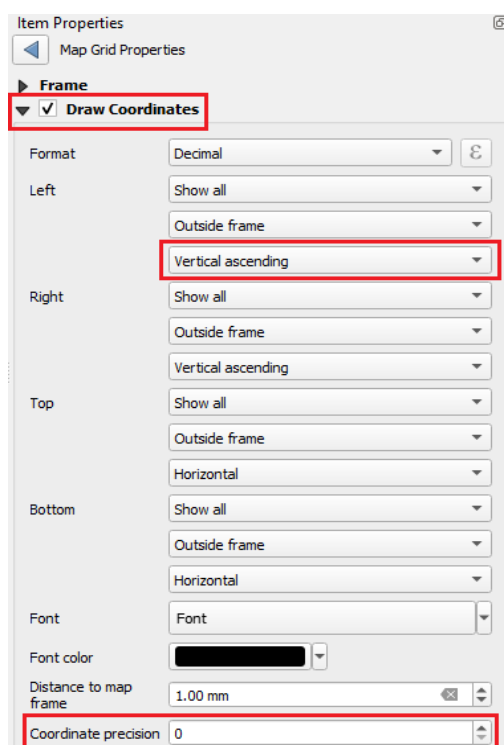


3. Select **Draw Grid**, and pick your grid type



Edit the style of your crosses or grid

Select your **x and y intervals** to determine the size of your grid in map units (500m is a good starting point)



Scroll down and check the box to **Add co-ordinate labels to your grid** (critical part!)

Edit their properties, **change font direction, position and spacing** from frame

Edit the **precision** of the labels so it looks tidy (i.e. from 3 decimal places to none)

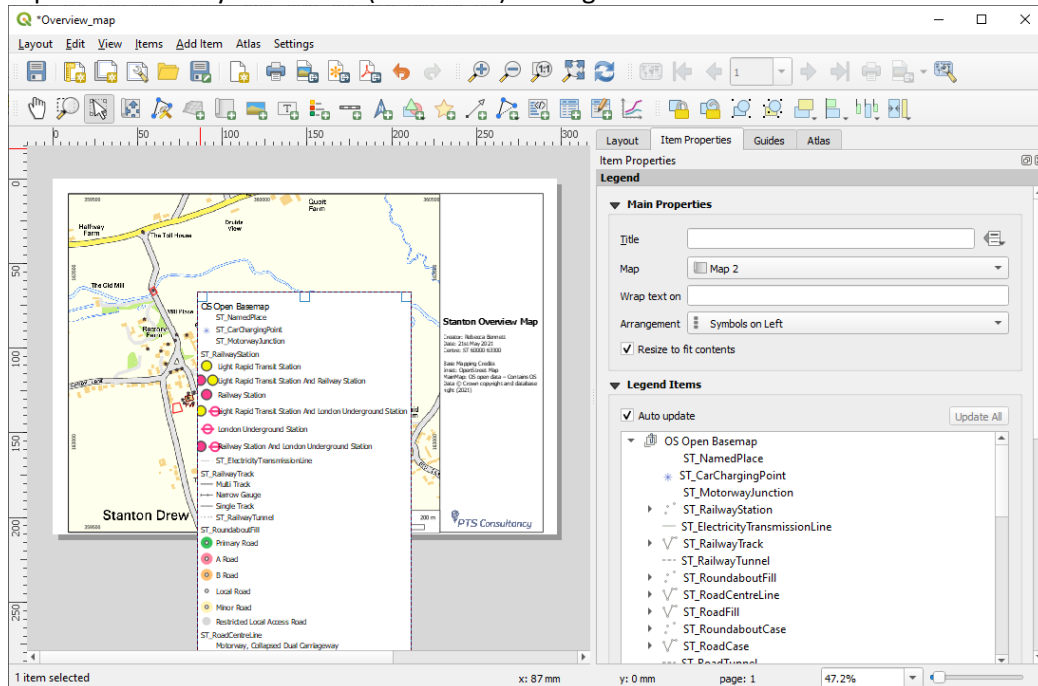
4. Save your print template.

10 Adding a Legend

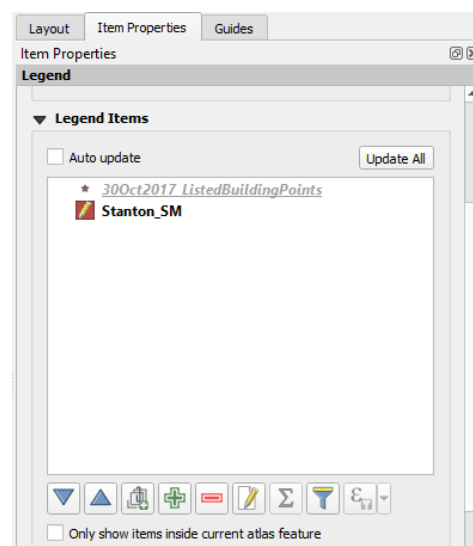
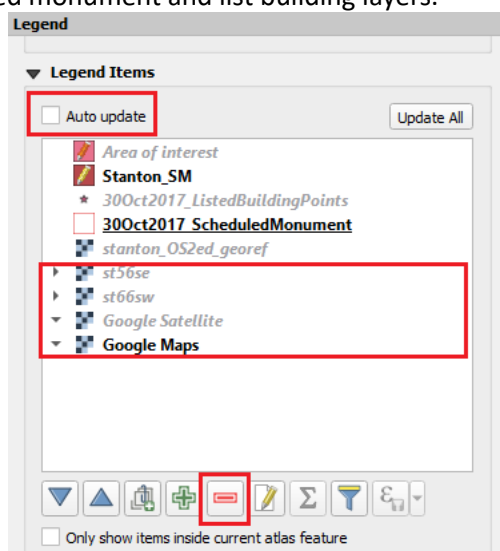
1. You can add a legend for your map items using the add legend icon. Click and drag to draw the extent of your legend.



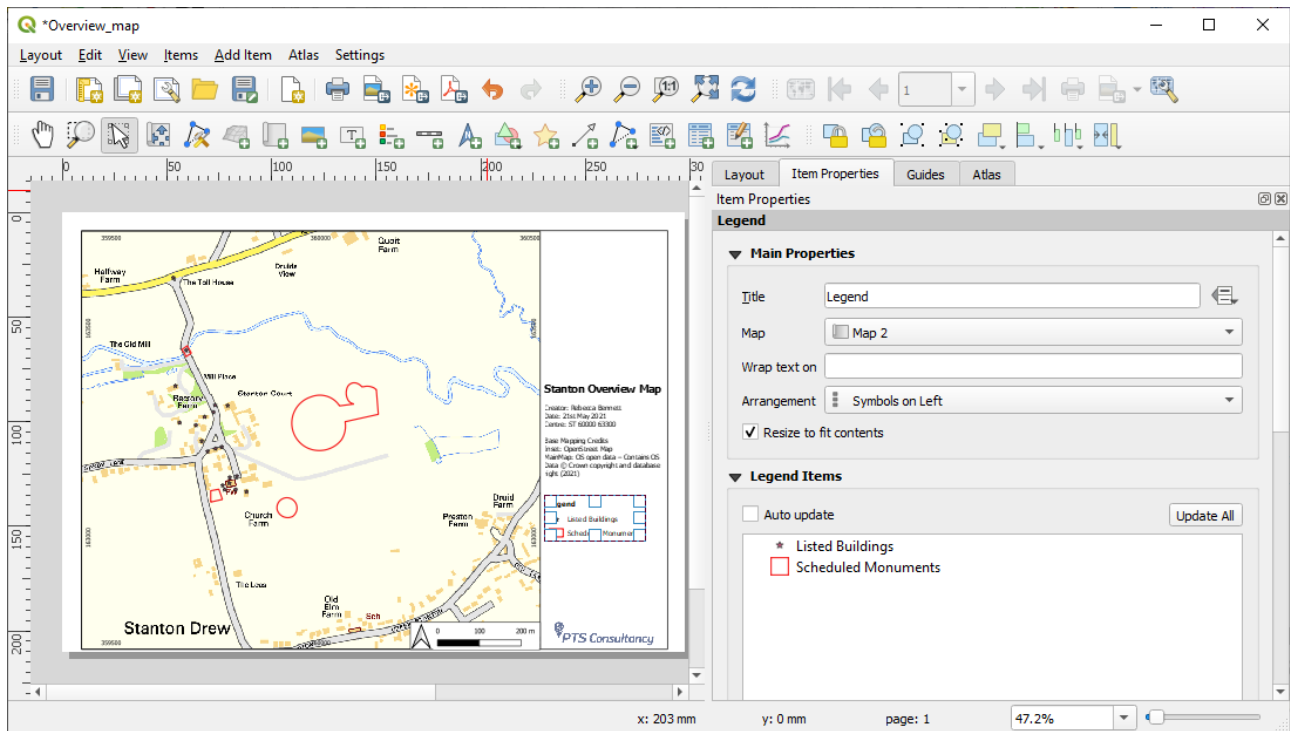
2. In the properties section you can edit (or remove) the legend's title.



3. To remove layers from the legend, remove the check from Auto Update and then select the layer(s) you want to remove and click on the remove icon. We will remove everything from the legend except the scheduled monument and list building layers.



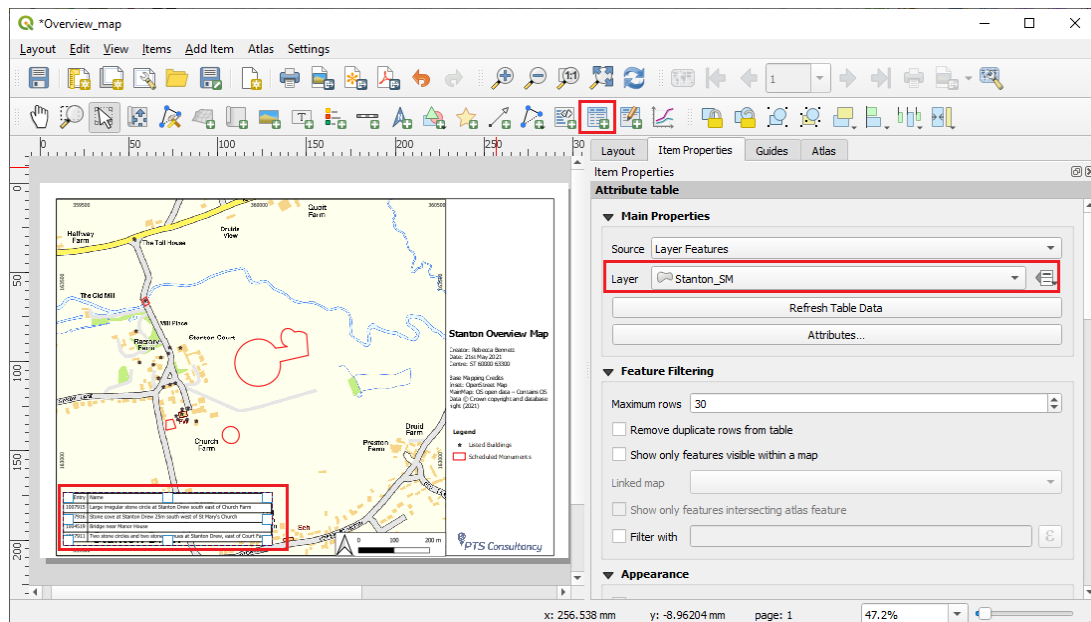
4. You can also edit the display name of the layer selecting it and by clicking the edit icon (or double clicking the layer name). Change the scheduled monument and listed building names



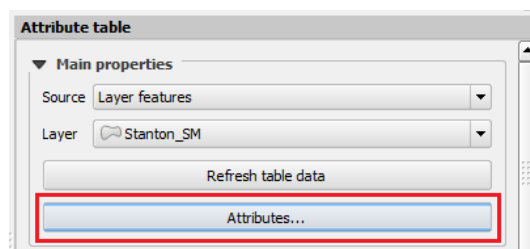
- ### 5. Save your print template.

11 Displaying Attribute Data

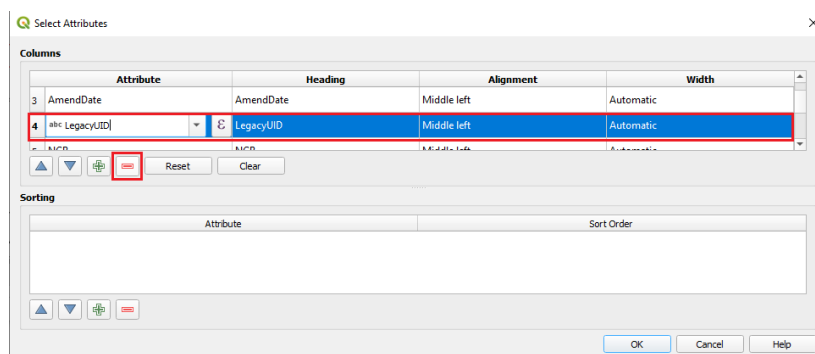
1. Using the Add Attribute Table function, you can display the attribute data for a shapefile in your map. We will use our scheduled Monument data as an example. Click on the icon and draw the location of your table in the print window



2. In the properties pick the layer you want to add (in this case Stanton Monuments)
3. Using the Attributes menu you can remove fields from the display.



4. We'll remove all fields except listentry and Name. Select the row to be removed then click on the remove icon. Click OK when only the rows you want are left.

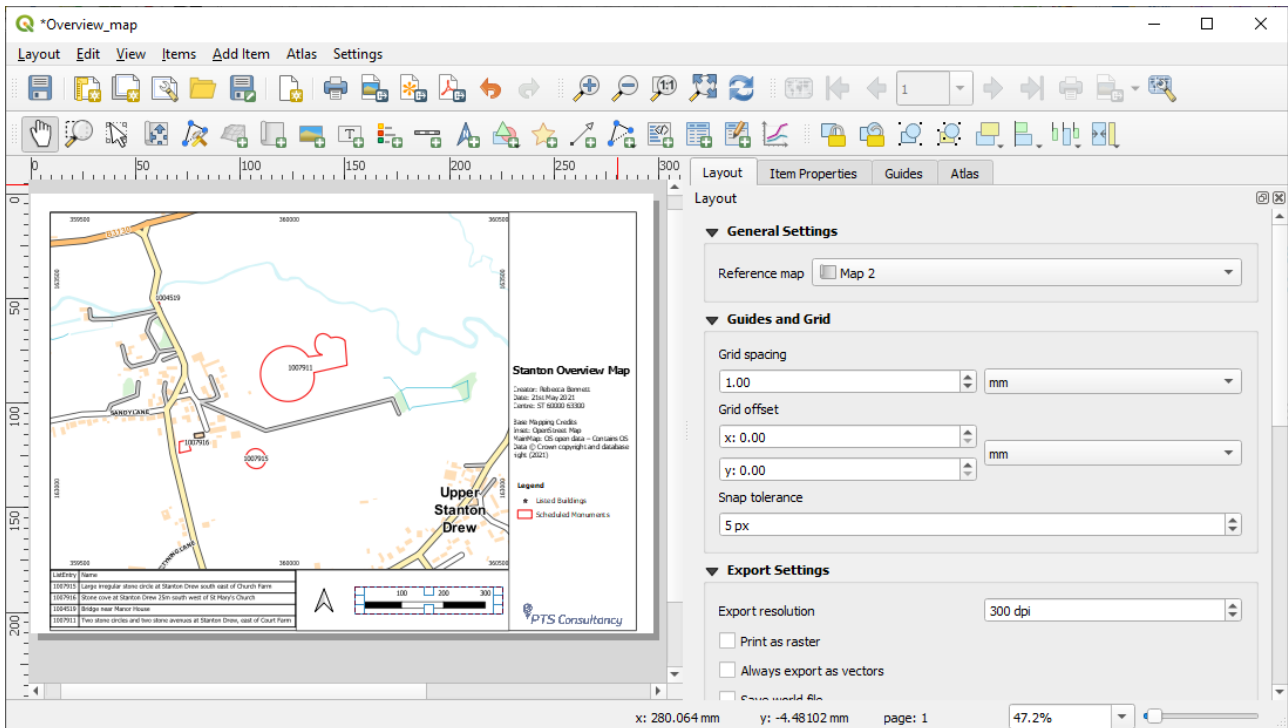


5. Save your print template.

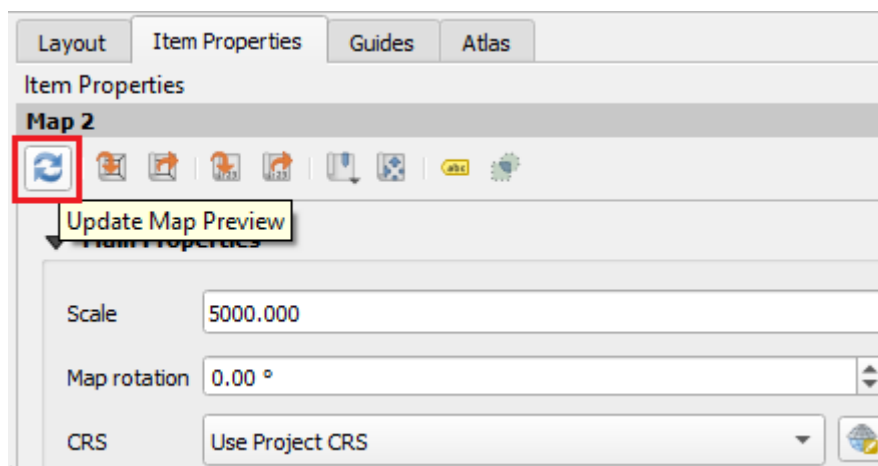
12 Adjusting Your Map

- Now we have added the attribute table the map layout we designed doesn't quite work, as the names on the attribute table are too long to fit in our side bar. Experiment with rearranging the elements of the map until they all fit comfortably.

You can move elements (as per section 8 above), resize them and add bounding boxes. In the example below the main map has been resized and the attribute table, north arrow and scale moved to the new white space below



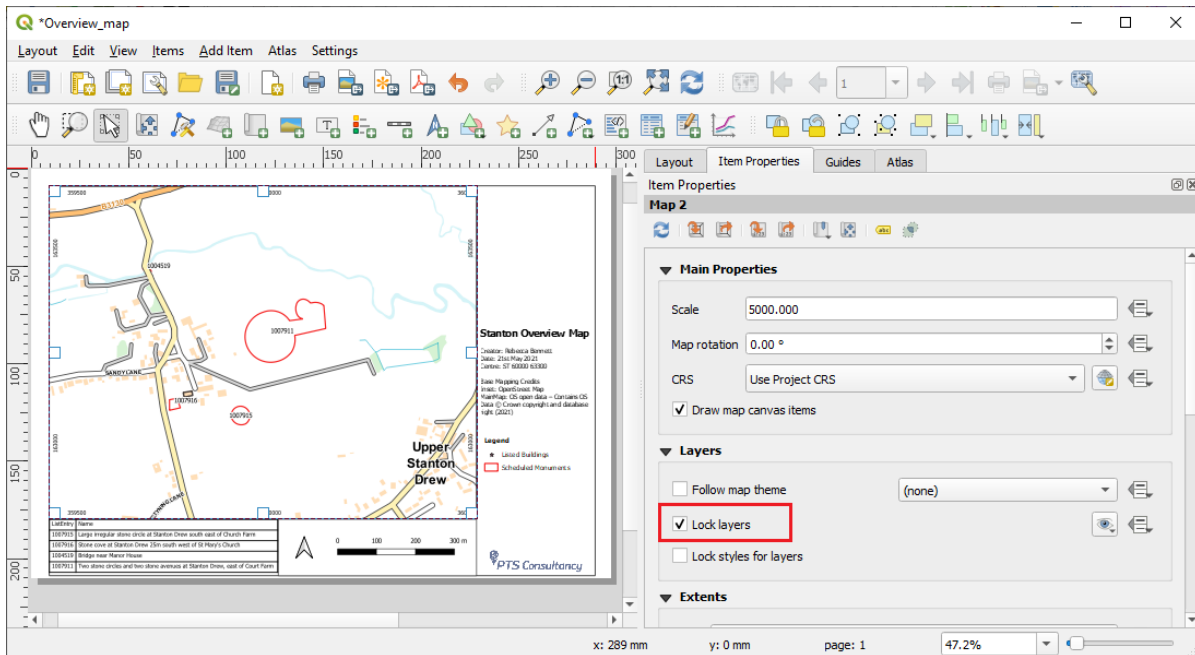
For one final tweak, see if you can change the labels of the monuments to the listentry number in your QGIS project to neaten up the map. (Hint you will need to update the preview for the map window in your print layout to see the changes to labels!)



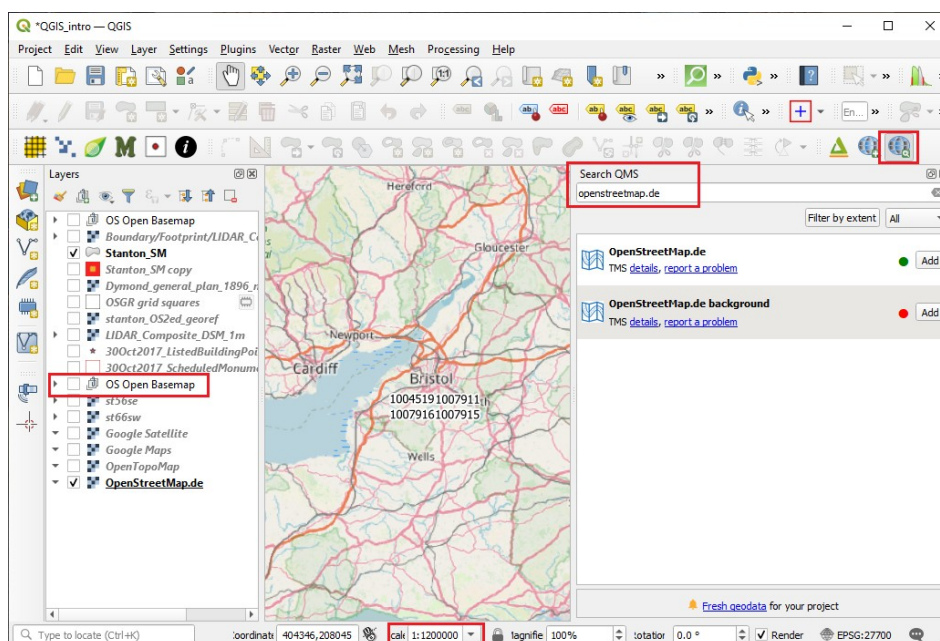
- Save your print template!

13 Adding an Inset Map

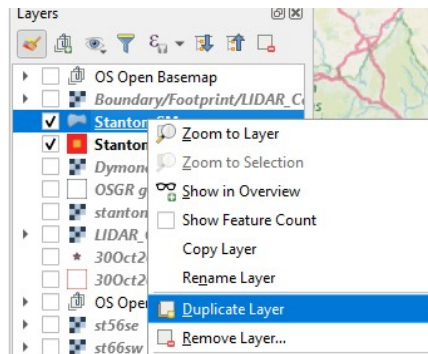
1. For location maps we often want to add an inset showing the general location of the site detailed in the main map. We can do this by adding another map window. First we will make sure that our layers in the first map window are locked to avoid accidental edits.



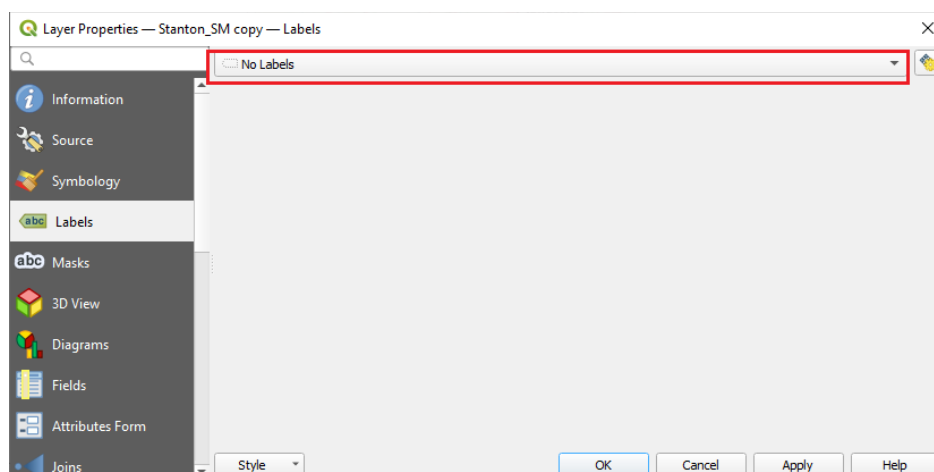
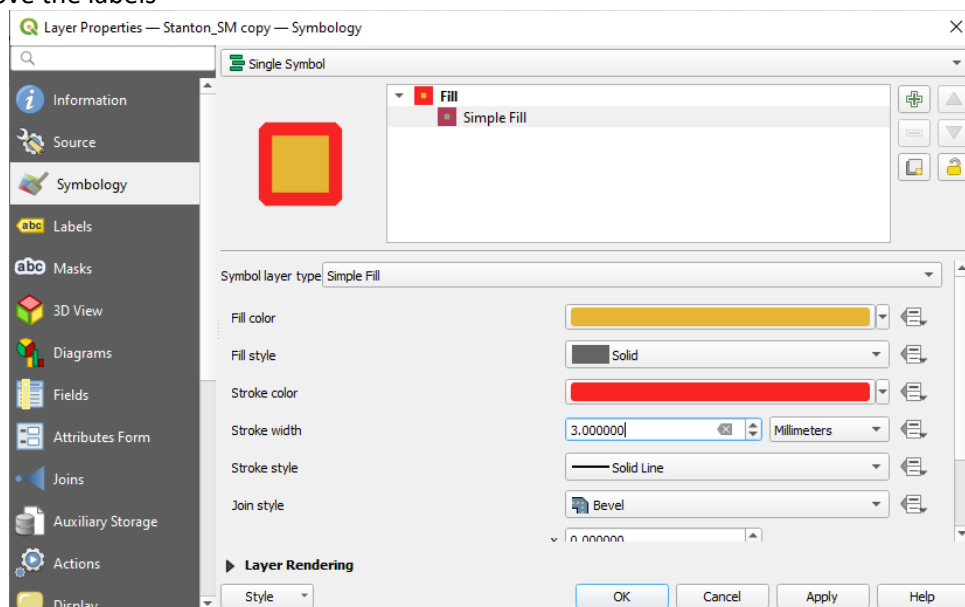
2. Next we will ensure we have a suitable scale base map in our QGIS project. Return to your QGIS window and open the QuickMap Services plugin (see Workshop 1) and type openstreetmap.de to search for OpenStreetMap. Add this to your map, switch off your OS open data layers and zoom out to a regional scale (e.g. 1:1200000).



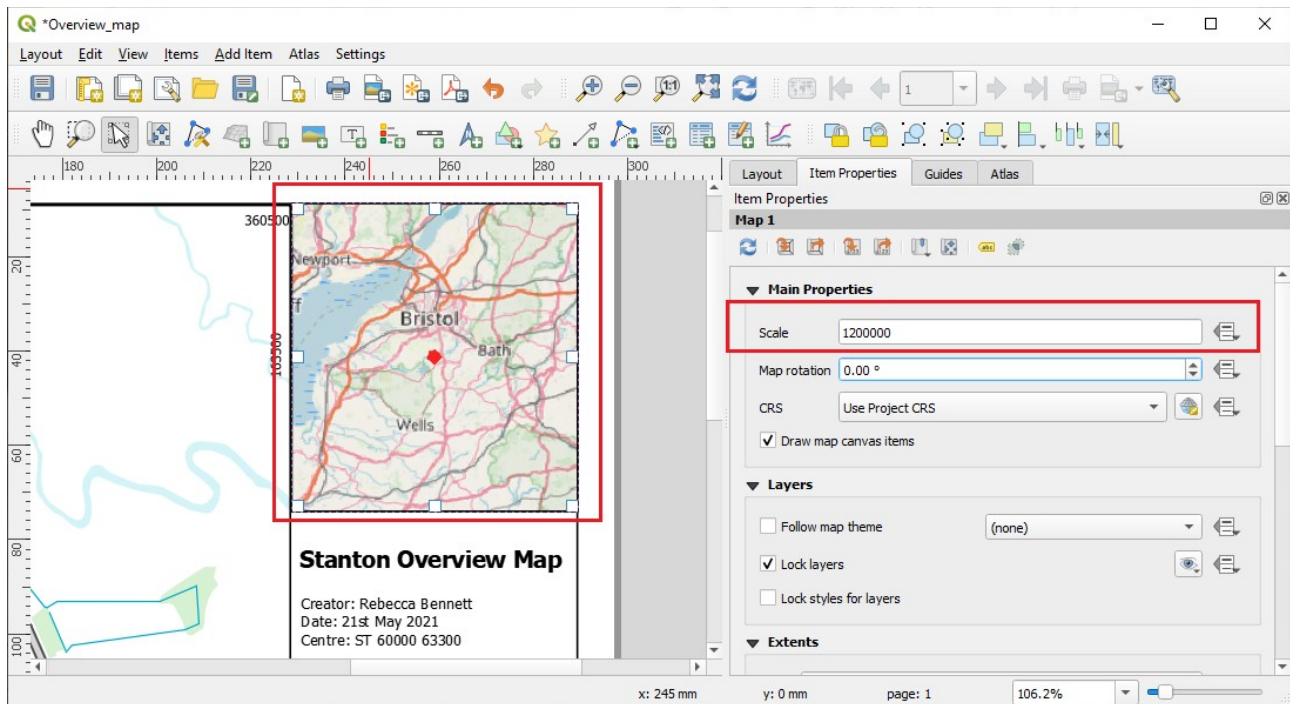
- Next we will make a copy of your Scheduled monument layer and edit the labels and style to create a “red dot” location. Right click on the Stanton SM layer and select duplicate layer.



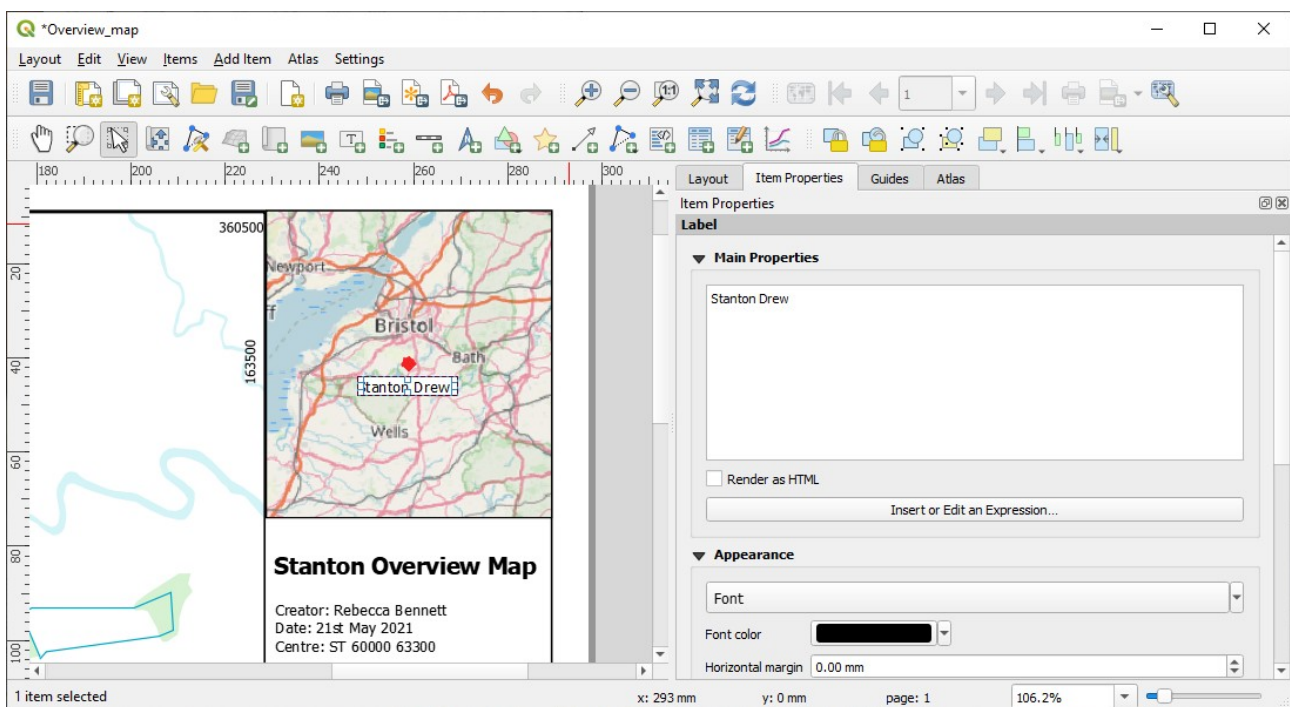
- Double click the duplicate layer to edit the properties to increase the line (stroke) width of the polygons and remove the labels



5. Now go back your print layout and draw a new inset map using the Add Map icon. Adjust the scale to suit, then select lock layers.



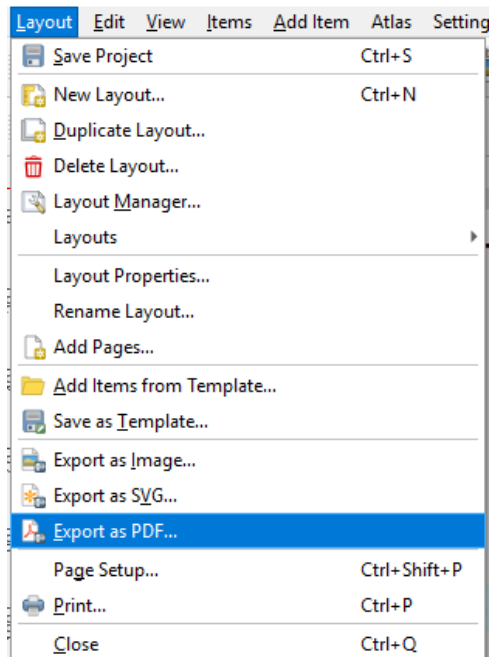
6. If you want you can add a text box with a specific placename as shown below and it is good practice to also add reference to the OpenStreetMap base map alongside the OS copyright statement



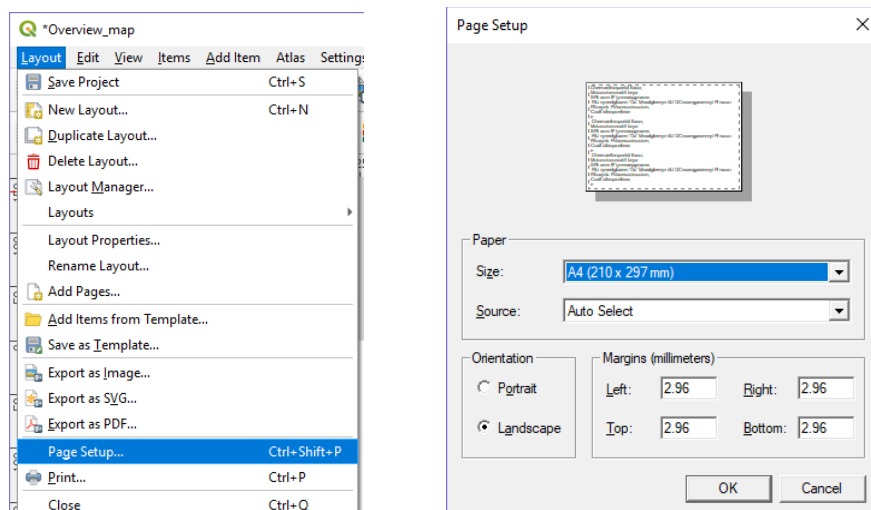
7. Save your print template

14 Exporting Your Map

1. When you are happy with your map save your template and print the map layout to a pdf using Layout > Export.

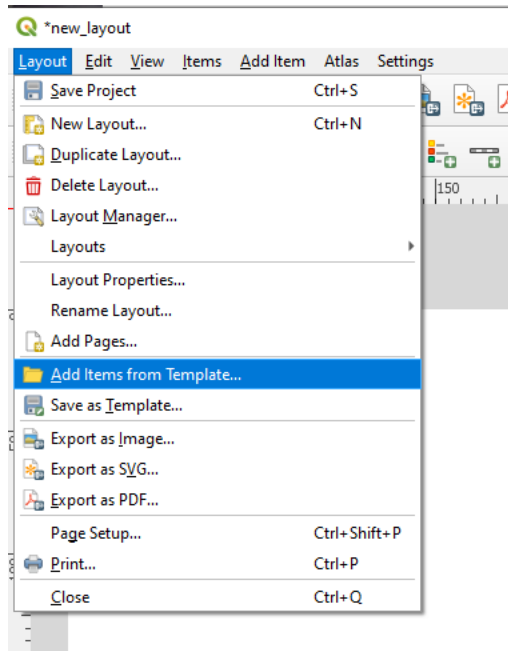


2. You can also export the map layout as an image(jpeg) to embed in presentations or documents using the Export as Image option.
3. If sending directly to a printer you can check the print settings using Layout > Page Setup

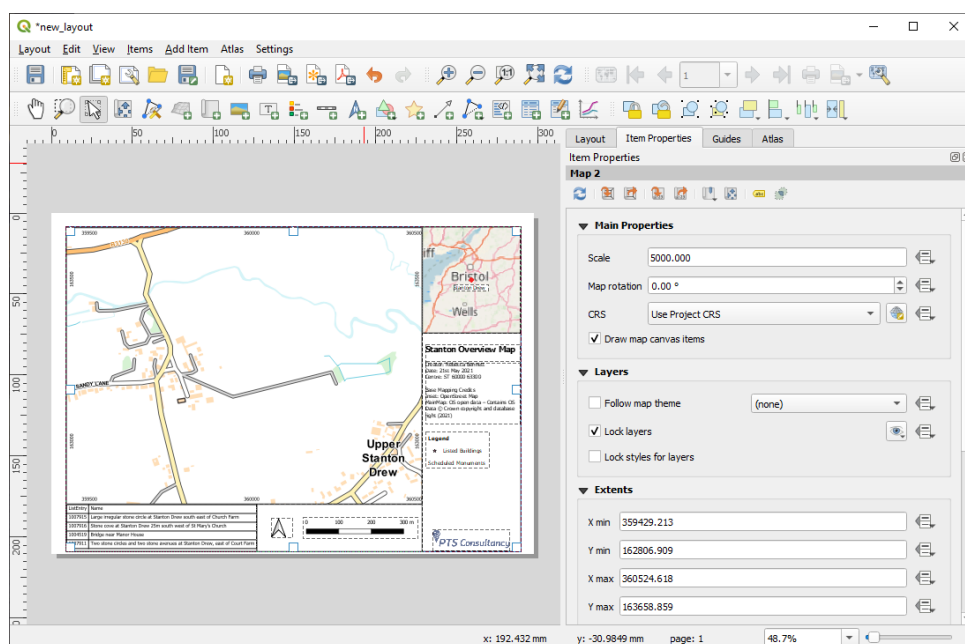


15 Reusing your Print Template

1. As you have saved your print layout as a template you can reuse it to quickly reload these map elements in any QGIS print layout. Simply start a new layout from the map window, then go to File > Add items from template.



2. Select your template file .qpt to import the print elements. You can now customise and save your layout.



3. It is worth taking the time to set up your templates for the standard print sizes (A4 and A3, landscape and portrait) to ensure that you are quickly able to reproduce professional and consistent maps.