

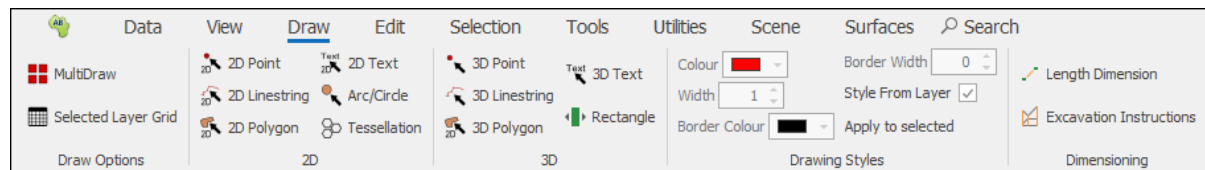


Draw Tab User Guide

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In all our spatial products there is the **Draw** Tab where you can do a number of different drawing operations:



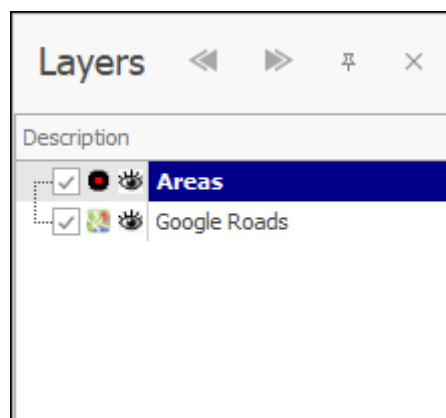
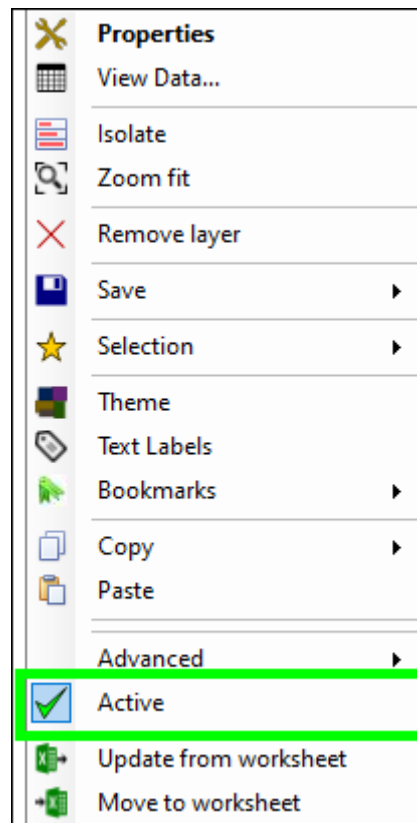
We will take up each section of this tab.

Drawing Basics

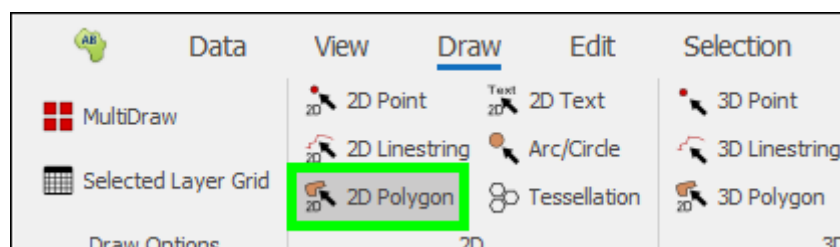
Before we cover all the tools available in this tab, we will go over some basics of how drawing works.

Active Layers

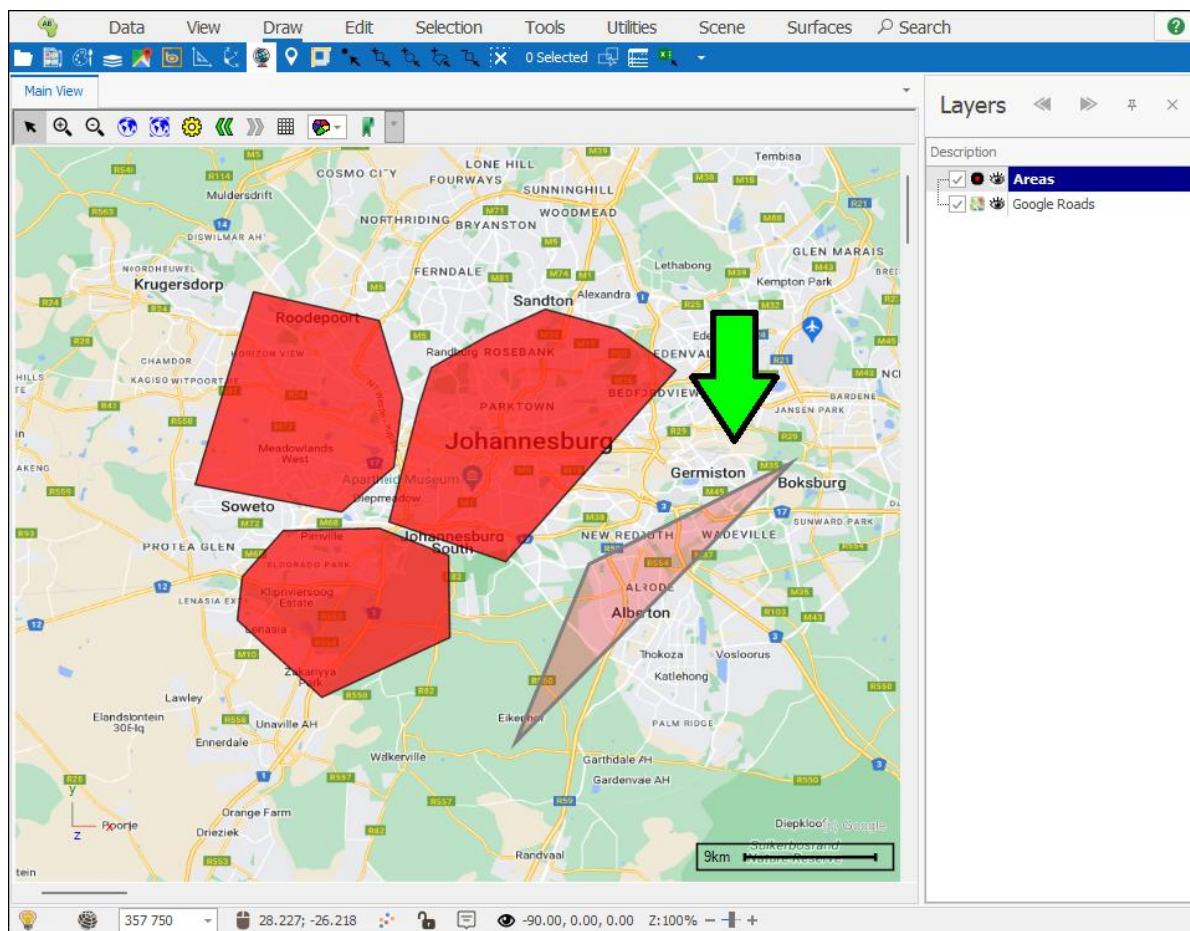
When you draw an object with any one of the drawing tools it gets drawn to any layer that you have set as Active. A layer is made active by right clicking and then selecting **Active**, this will then be greyed indicating it is active and the layer name will appear with bolded letters as well further indicating the layer is now active:



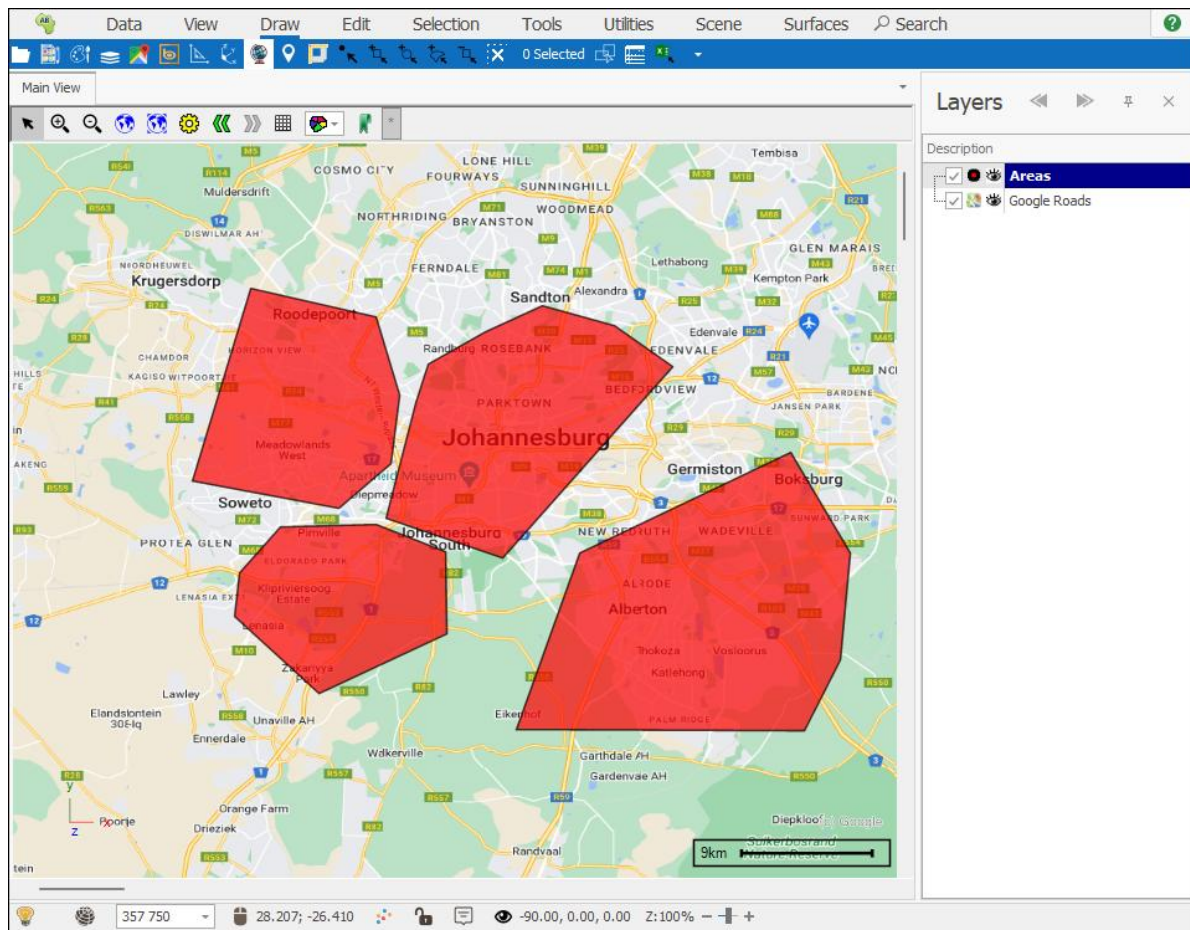
Any item I draw will now be drawn to this layer. The items will automatically pick up the styling you have set for the layer:



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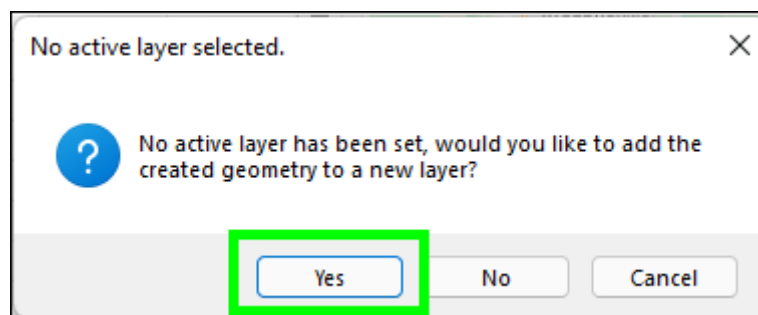
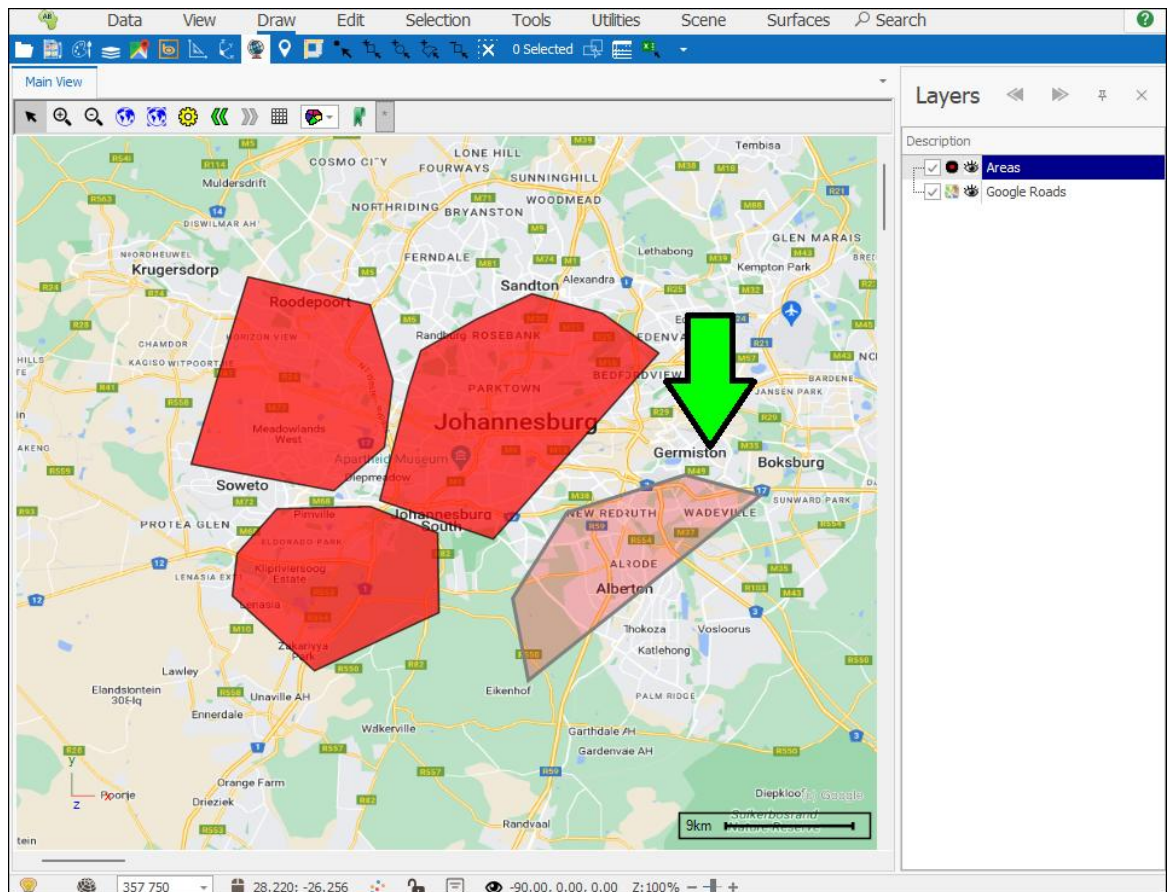


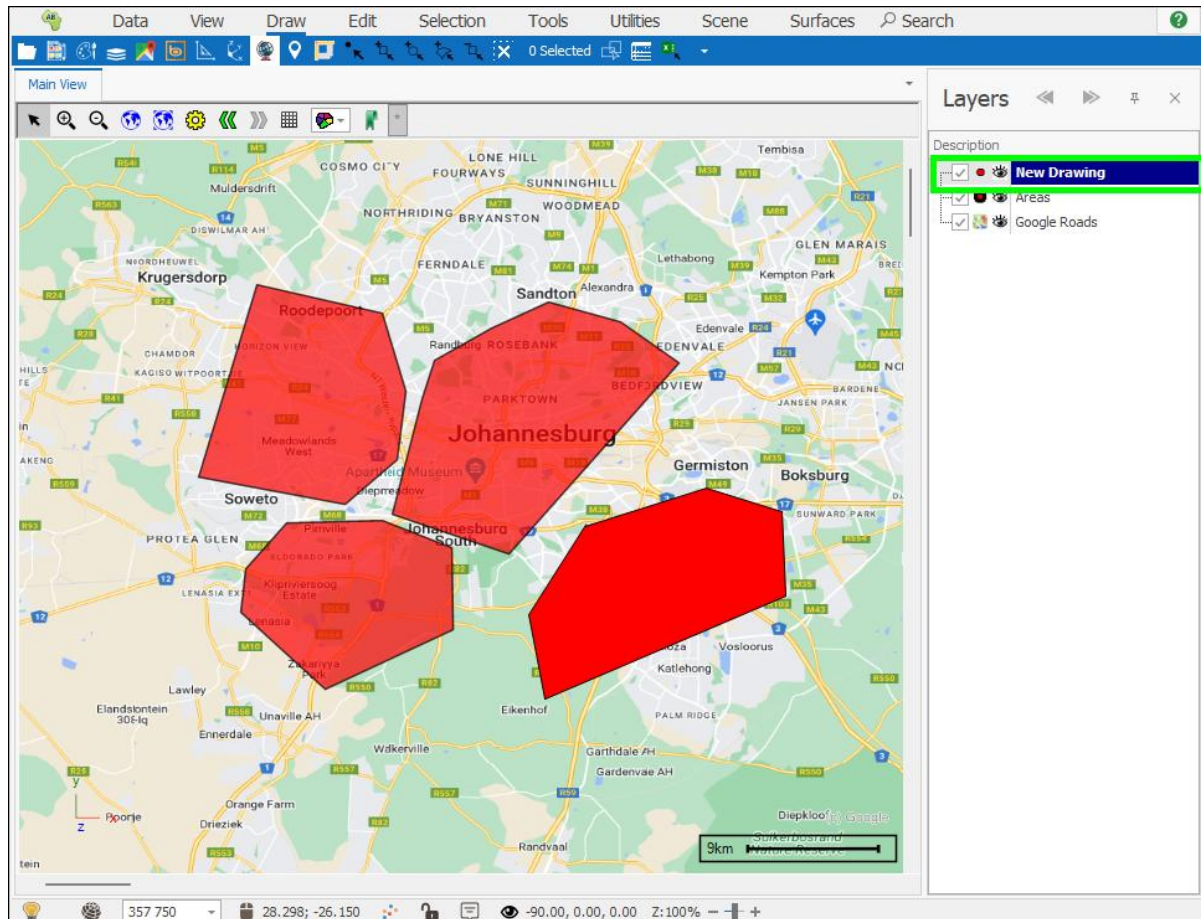
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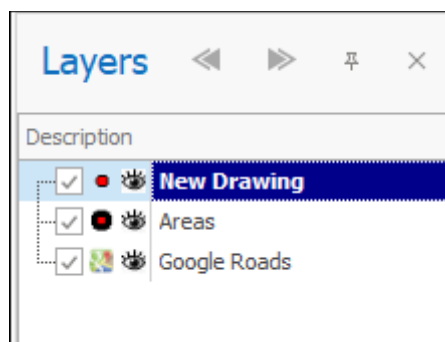
If you have not set any layer as active, when you draw an item, you will be prompted to create a new layer for it, click **Yes** and then a new layer is added for you:

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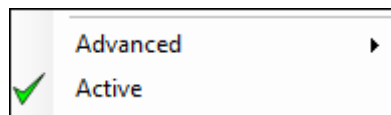
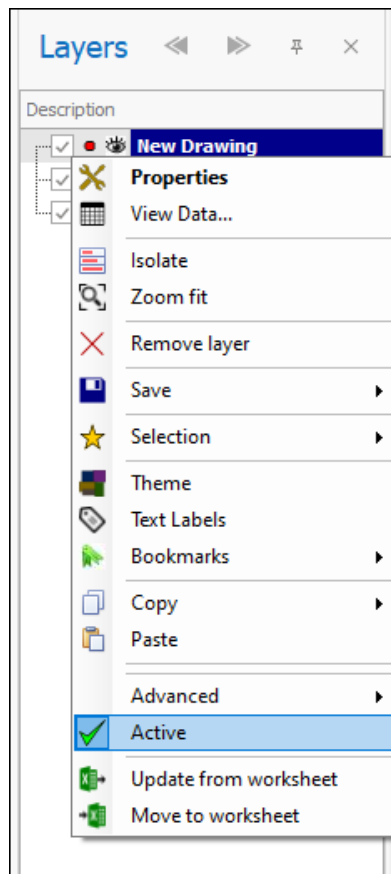




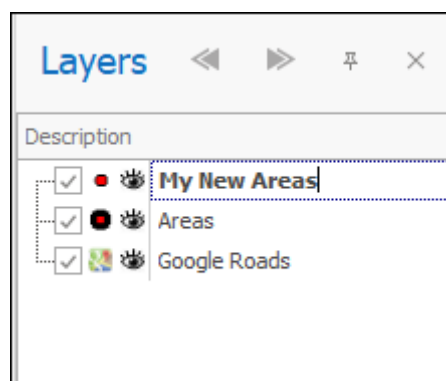
When a new layer is created for you like this, it is automatically made active as you will see by its bolded letters, you can continue drawing objects and they will continue being drawn to this new layer:

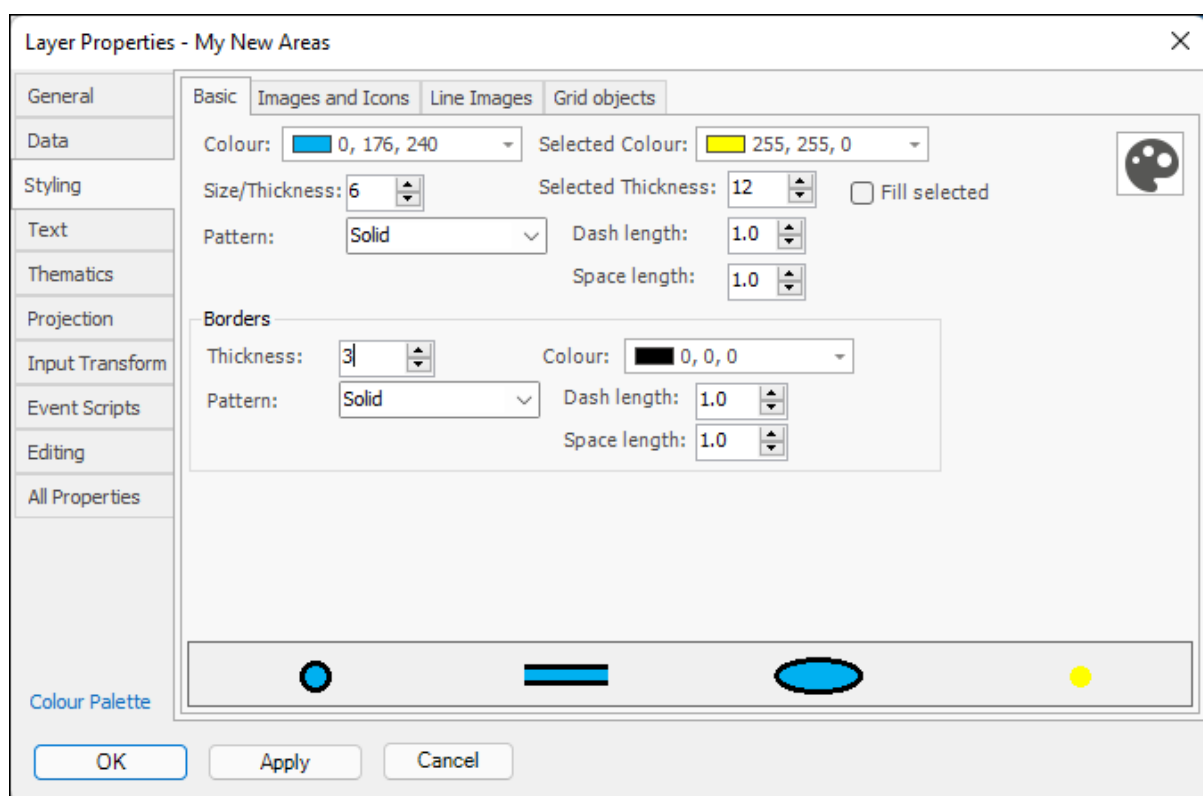
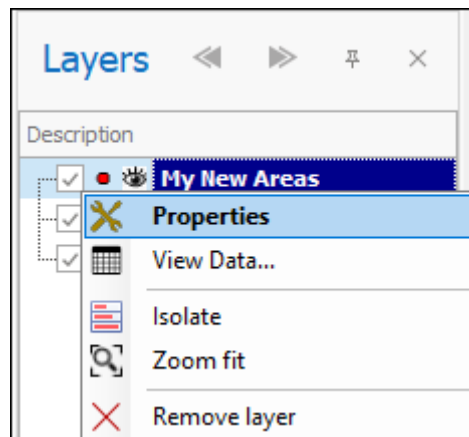


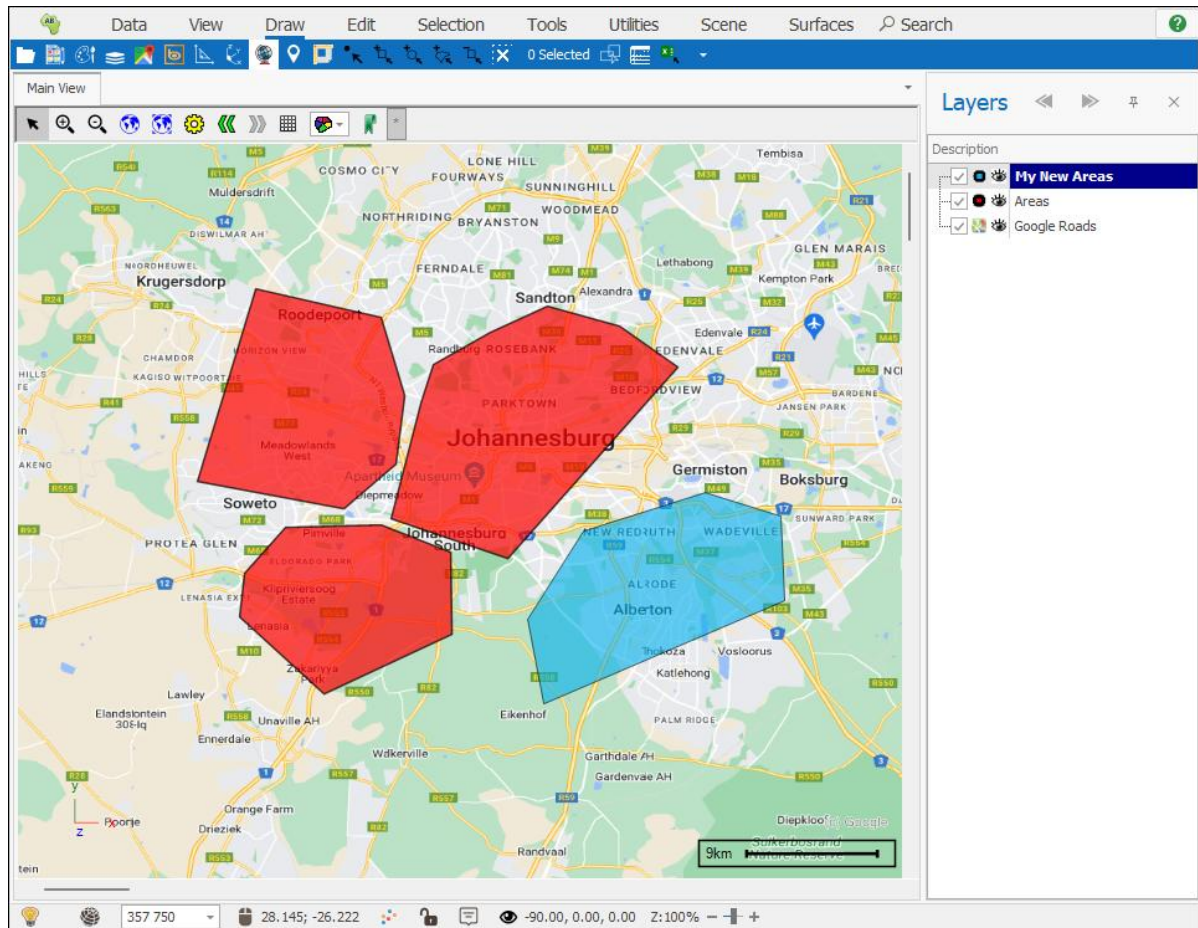
To make it not active you can of course right click on the layer and click this off:



You can change the name of this new layer by double clicking on it and typing it in. You can then go into its Layer Properties by right clicking and selecting **Properties** and then change the styling of the layer:



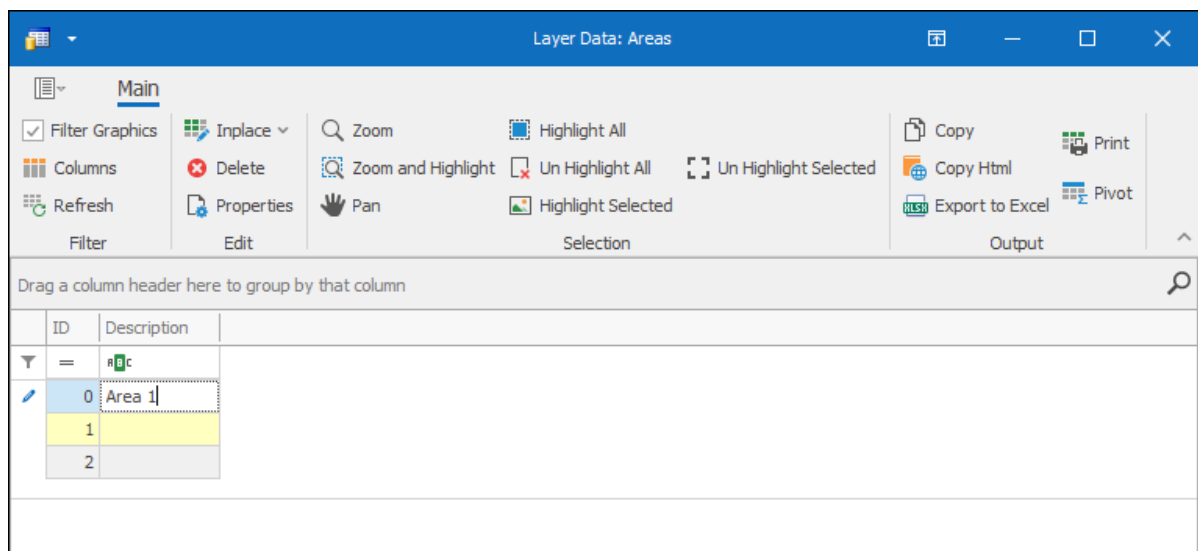
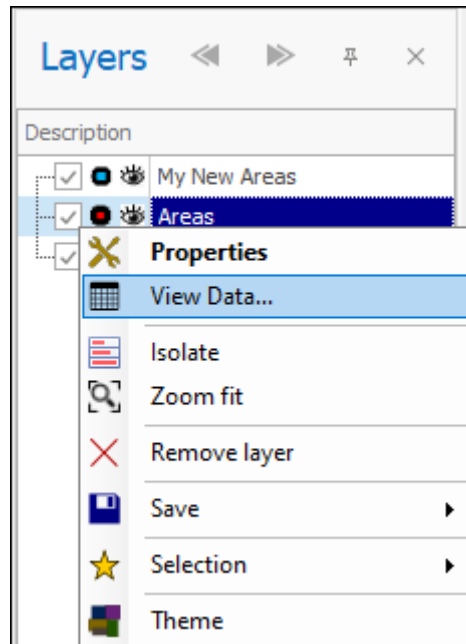




For full information on how the Layer Properties window works refer to the [Layer Properties Guide](#).

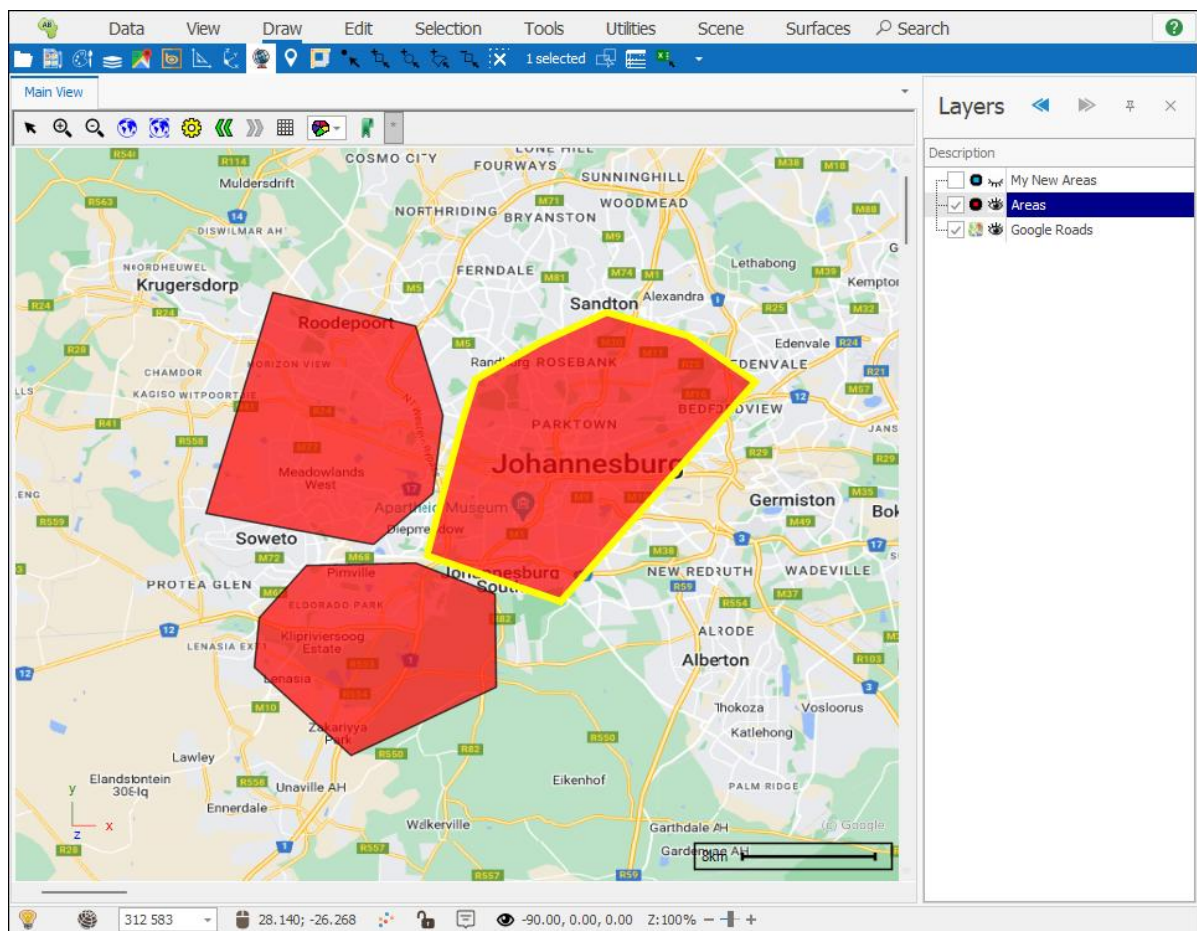
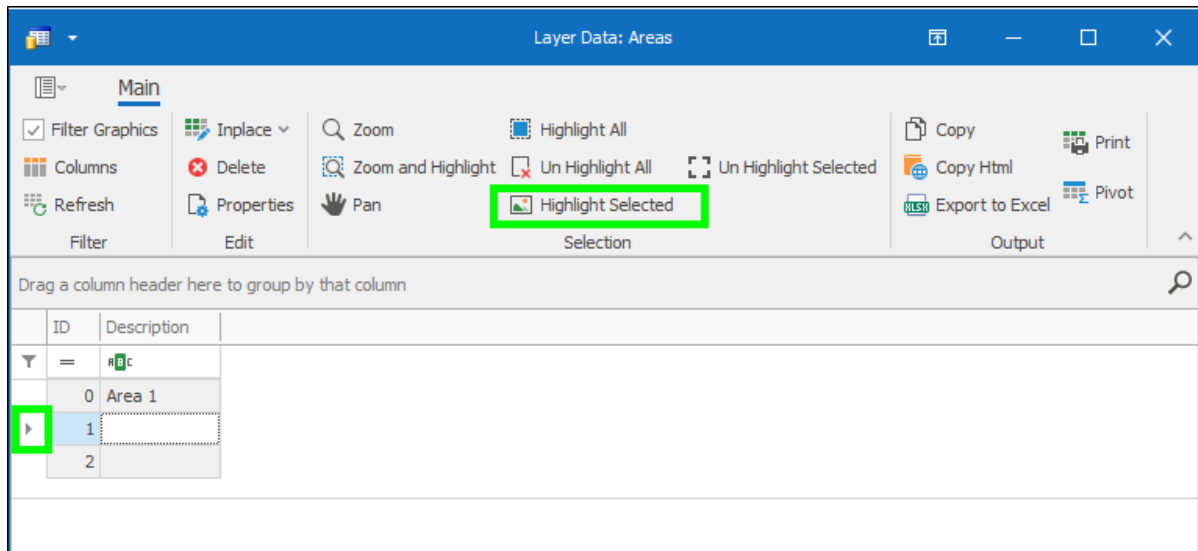
Capturing Attribute Information

To enter attribute information about the objects in your layers right click on the layer then select **View Data**, this will bring up the Layer Data Grid which contains all attribute information associated with a layer, here you can enter in a description for each object, in the **Description** column:

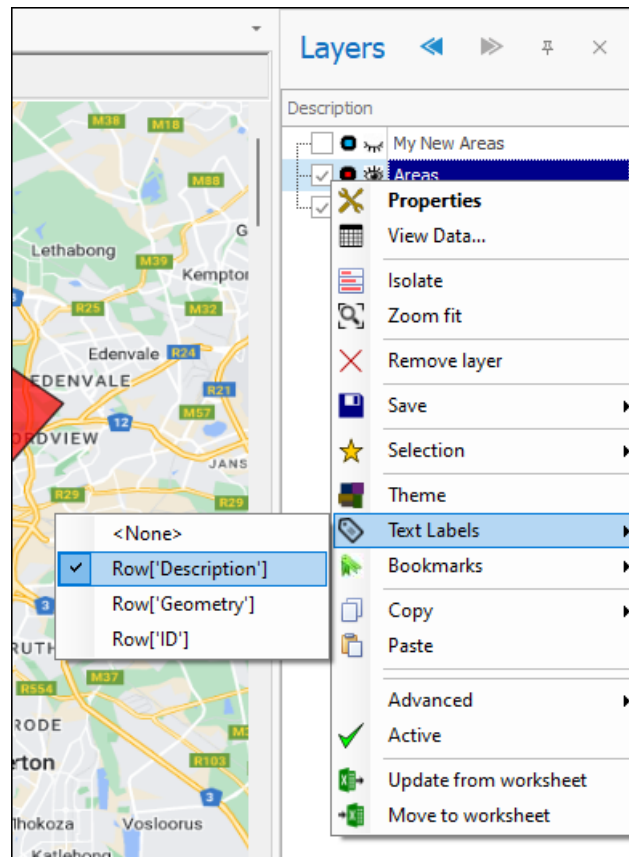
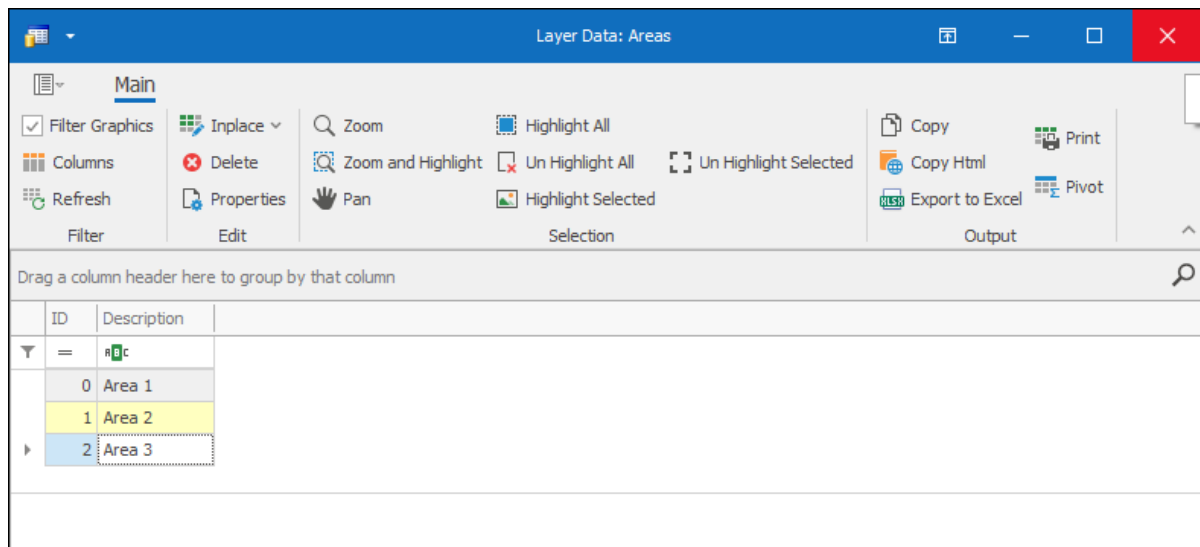


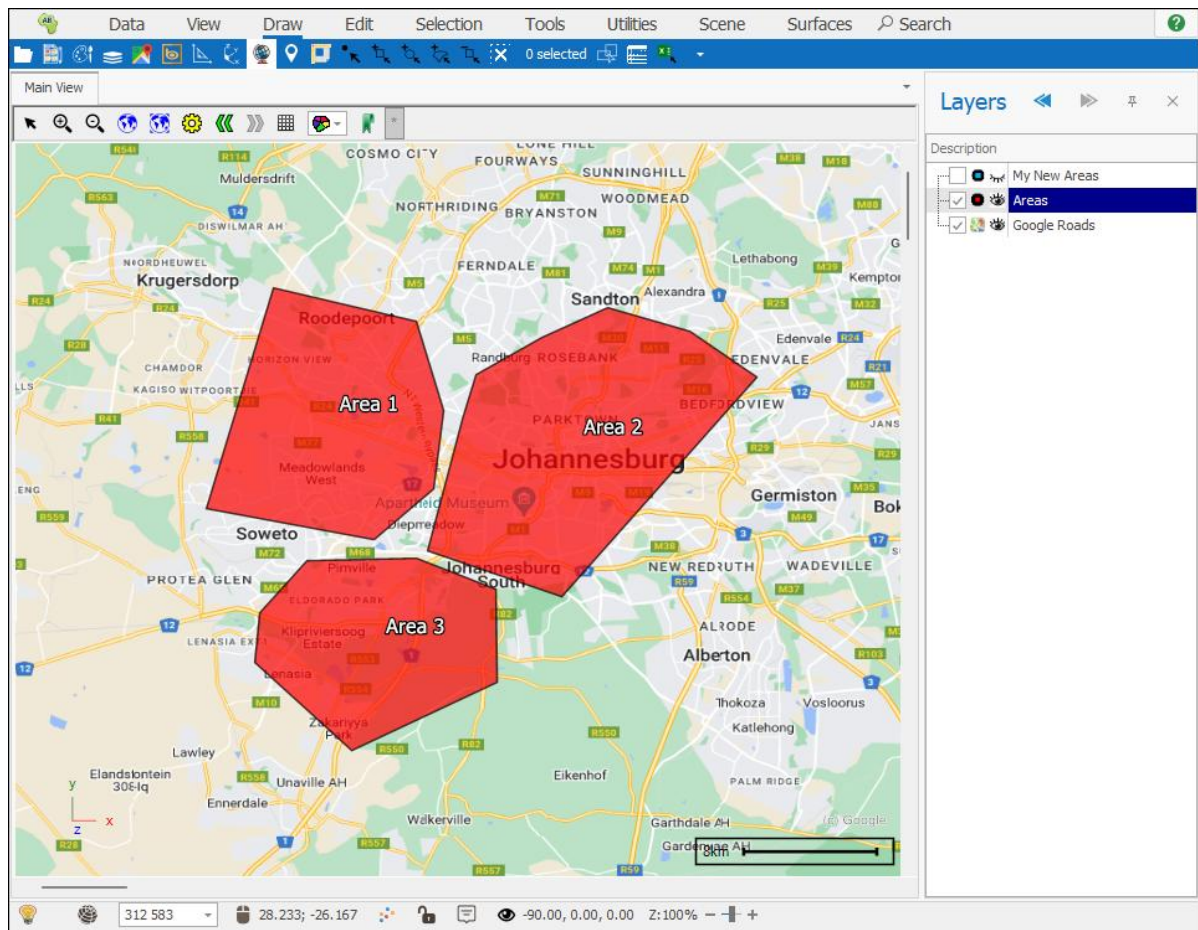
To find out which object each row in this grid relates to you can select the row by clicking next to it on the left in the white area, then click **Highlight Selected** and the object will be highlighted in the scene:

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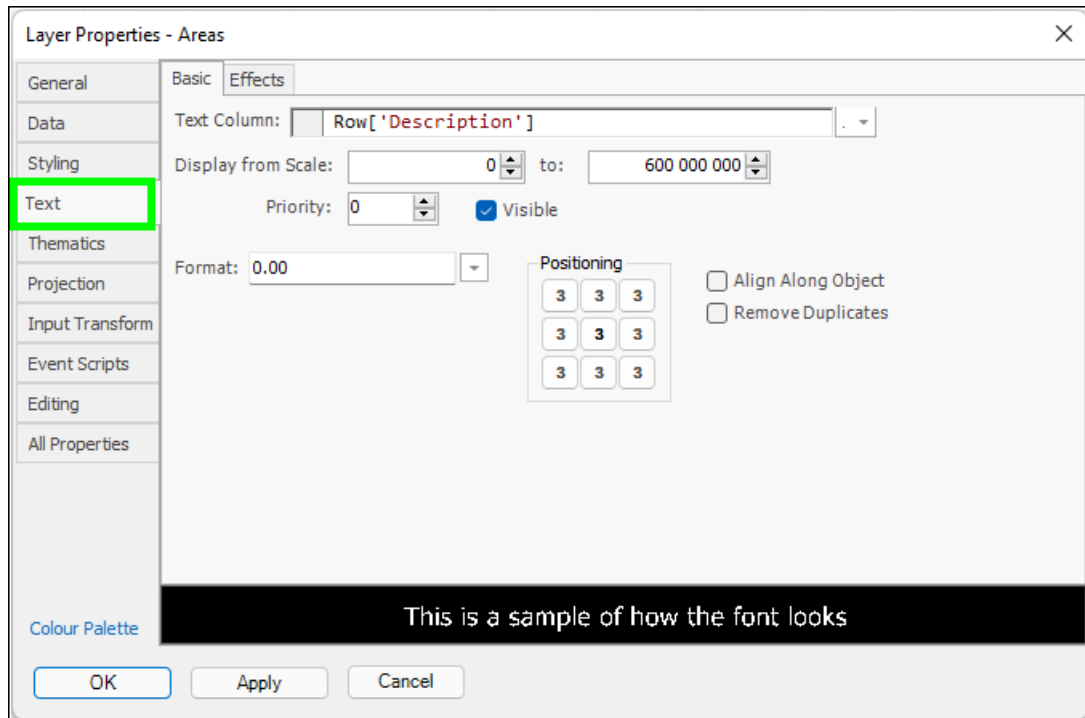


Once I'm done capturing information for this layer, I can exit the Layer Data Grid and the data is saved, then I can put a text label on so I can see the name of each object by right clicking on the layer, hovering on **Text Labels** and then selecting the column I want to put a text label for:





How text labels appear can be styled in the Layer Properties window under the **Text** tab:

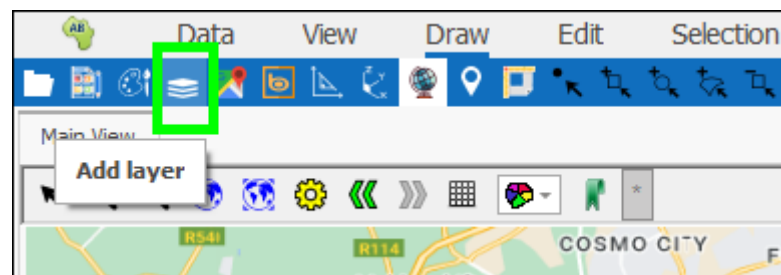


For full information on how the Layer Properties window works refer to the [Layer Properties Guide](#).

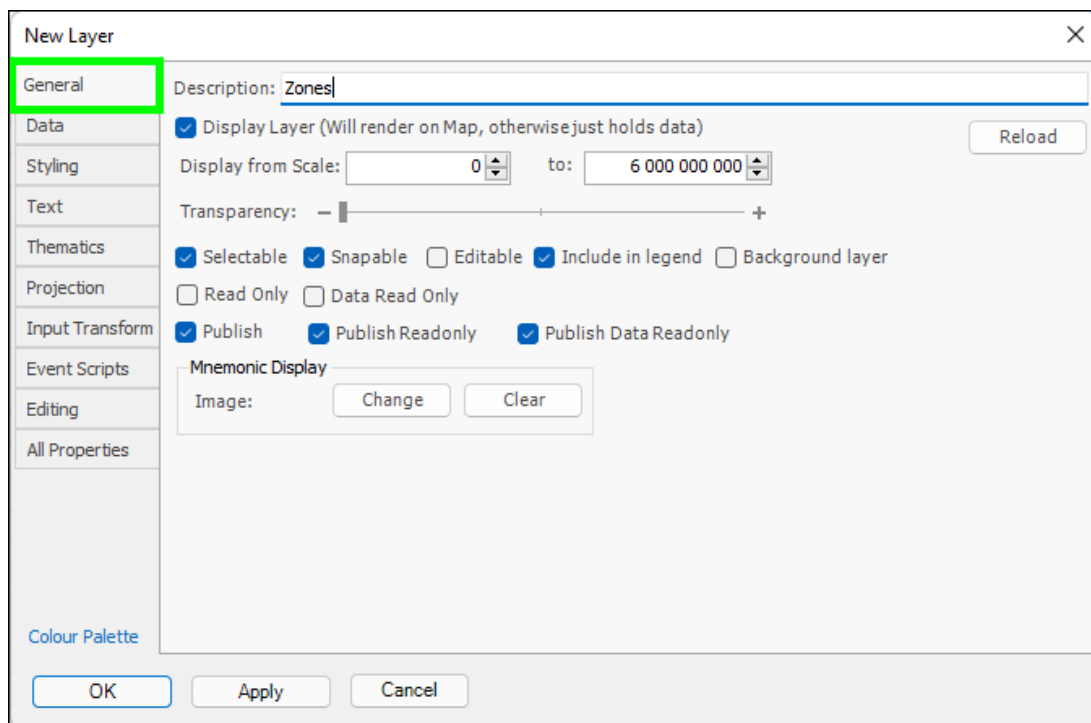
Further columns can be added in the Layer Data Grid and existing columns can be edited and deleted, for full information on how the Layer Data Grid works refer to the [Layer Data Grid Guide](#).

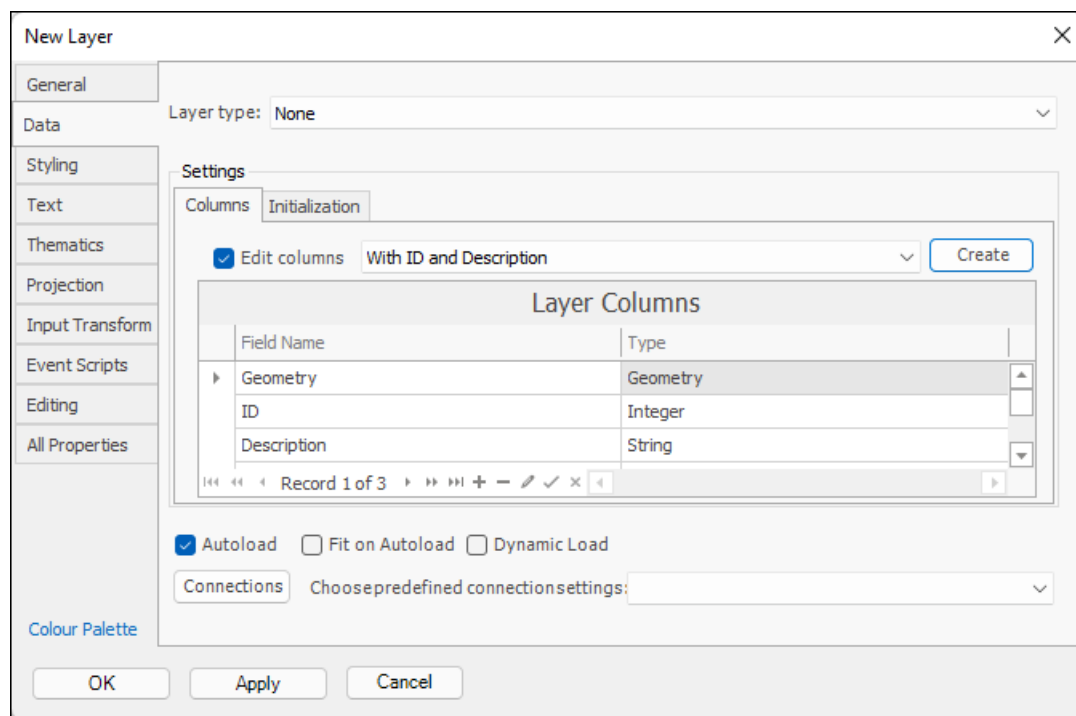
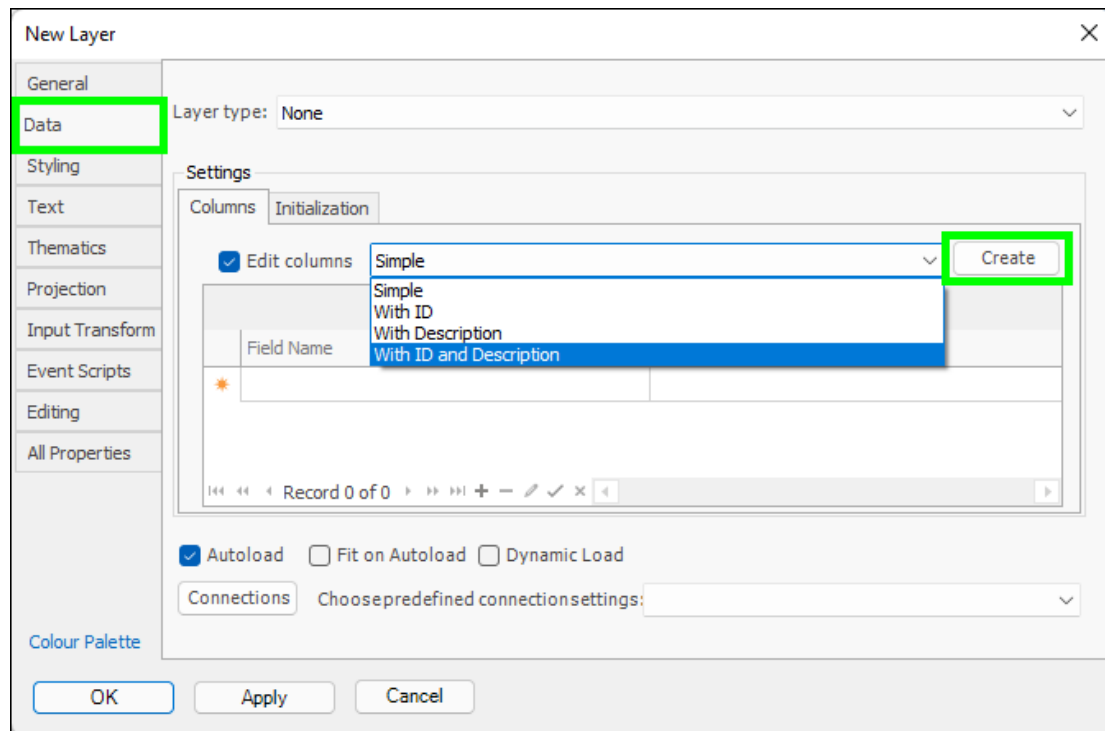
Adding a New Layer

To add a new layer yourself that you can then draw to, select the **Add Layer** button in the quick access toolbar:

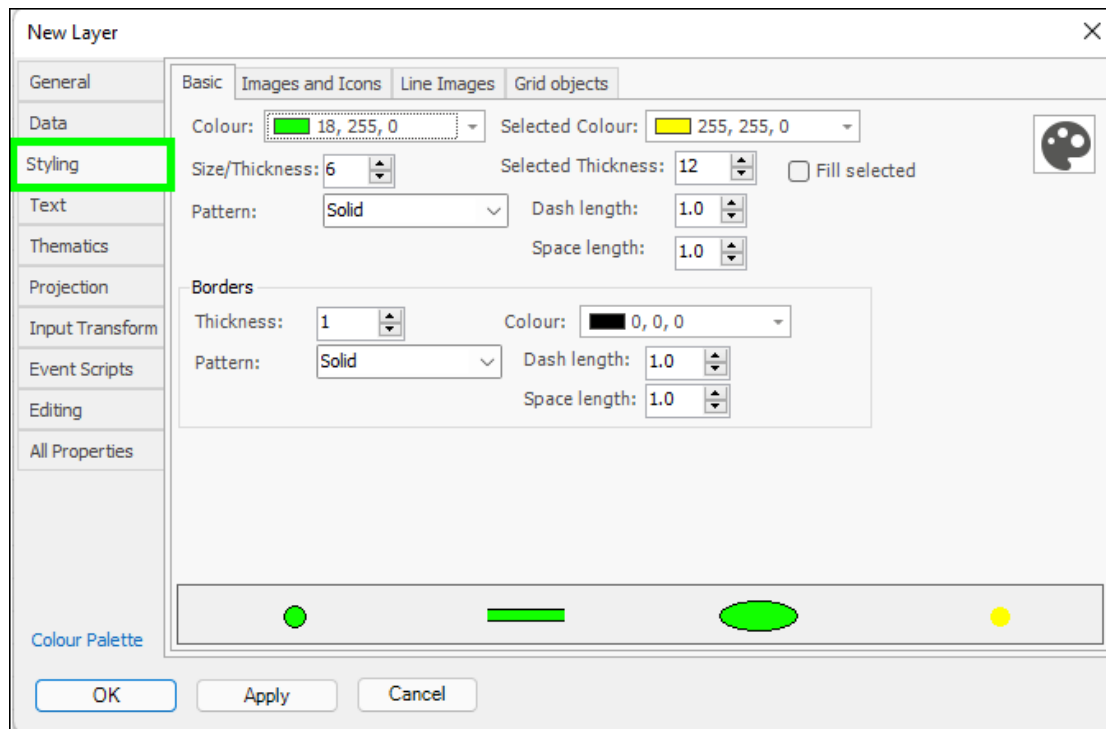


This will then bring up the Layer Properties window where you will set the properties of the new layer you are adding, under the **General** tab you can type in the name of the layer, then under the **Data** tab you must initialize some basic columns for the new layer so that geometries can be drawn to it, **Simple** will just create a Geometry column, but recommended is to choose **With ID and Description**, which will create a geometry column and an ID and Description column, then click **Create**, you can then change the names of these columns if you like and even add further columns in the grid below but for now we will just leave it like that:

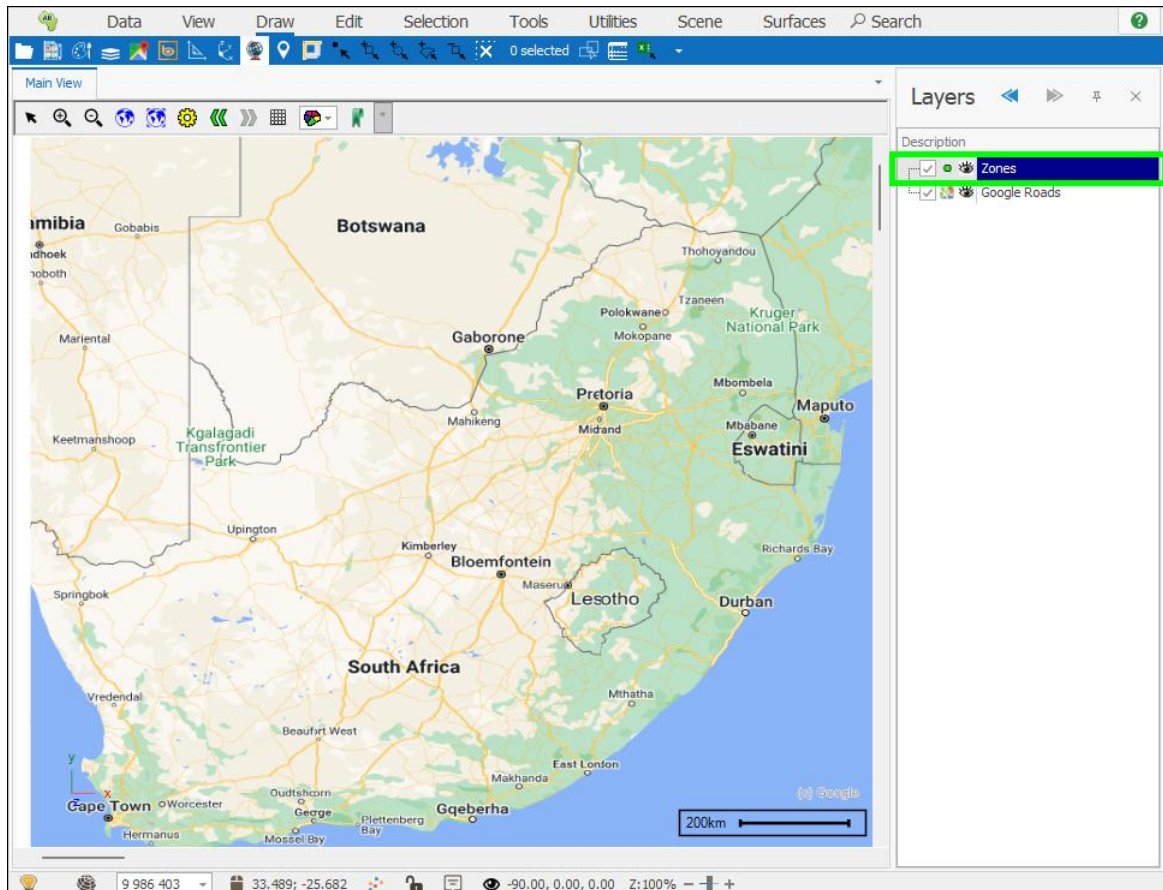




Then in the **Styling** tab you can set up the styling for the new layer:

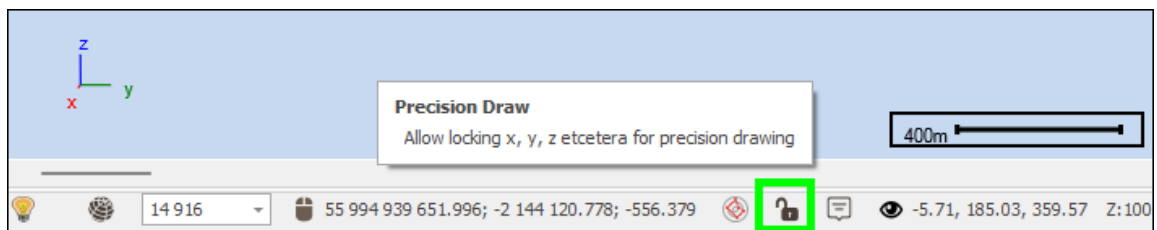


You can then click **OK** and the new layer is added, this layer is of course empty but you can now start drawing to it by right clicking and making it Active and then start drawing:

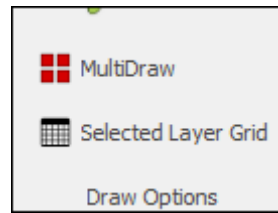


Precision Draw

Precision Draw is a tool available in all our spatial products that allows you to lock your scene in various ways to allow for precision drawing. It is found at the bottom of the spatial pane. For full info on this tool refer to the [Precision Draw Guide](#):

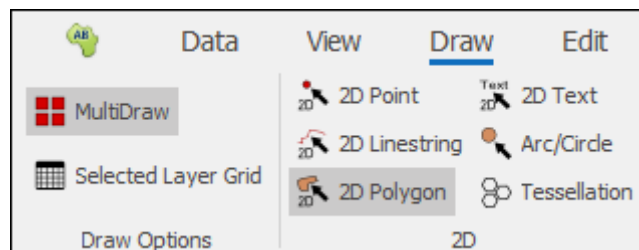


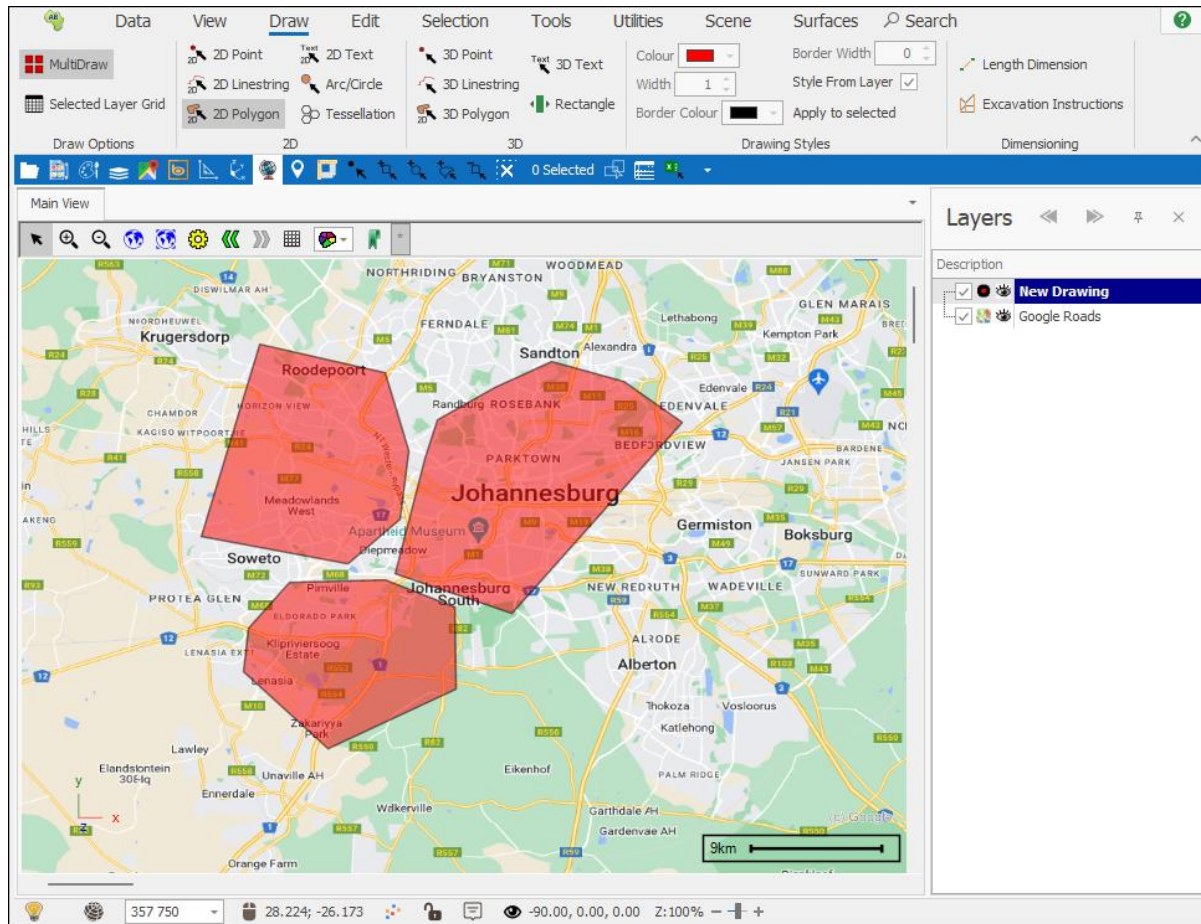
Draw Options



MultiDraw

MultiDraw will keep whatever drawing tool you choose active and allow you to keep drawing objects in the scene without the need to go back and reselect the drawing tool. Click on **MultiDraw** to make it active (this is indicated by it being greyed) then choose your drawing tool and you can then begin drawing in your scene:

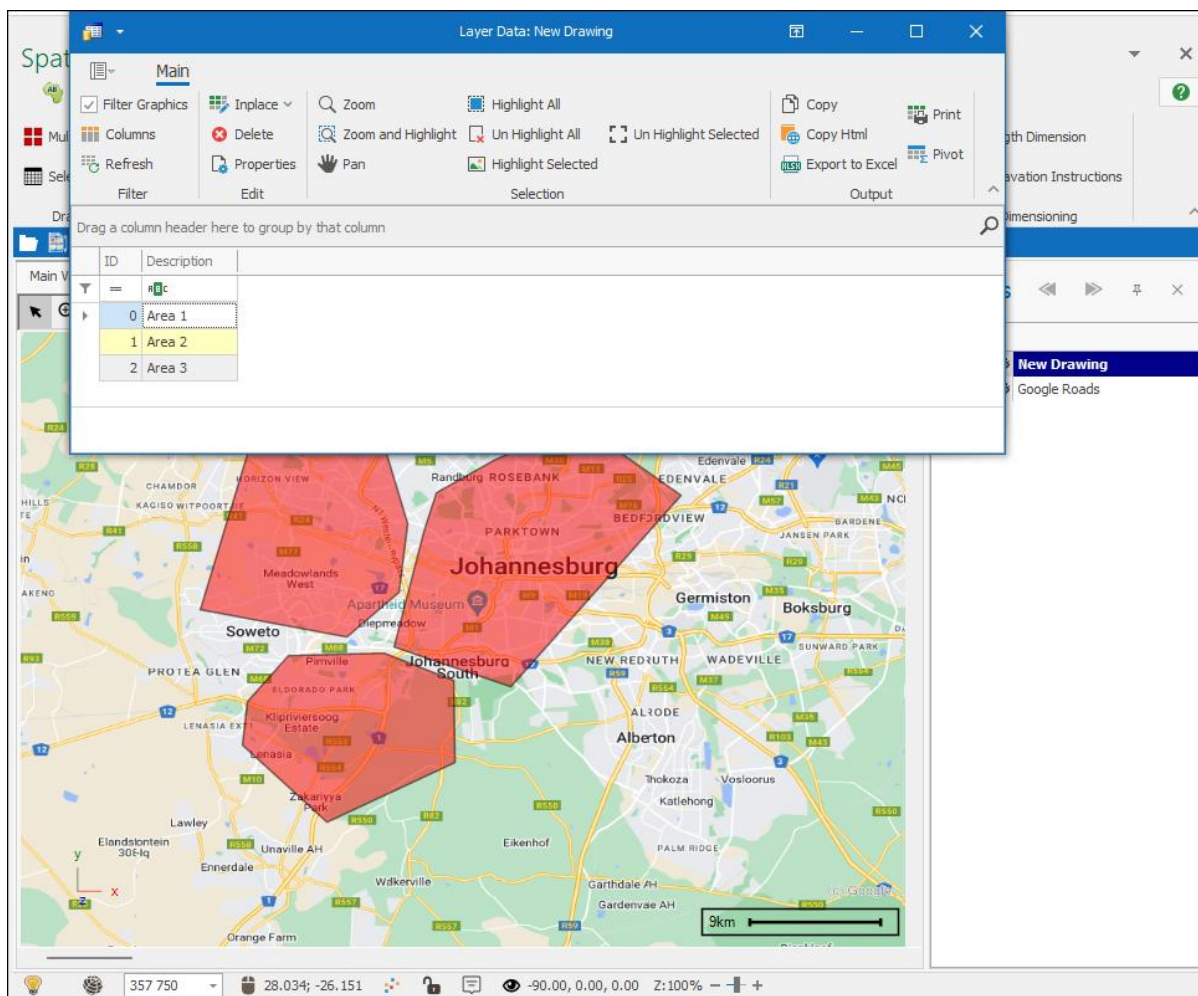
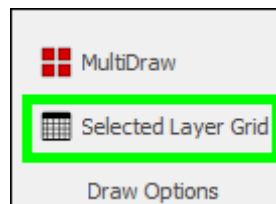
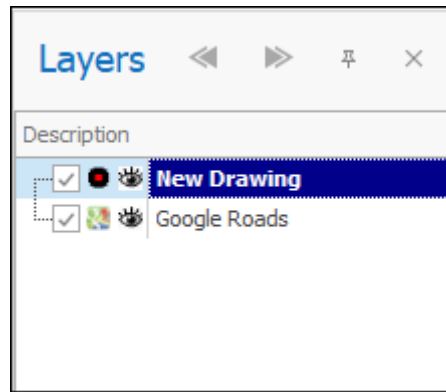




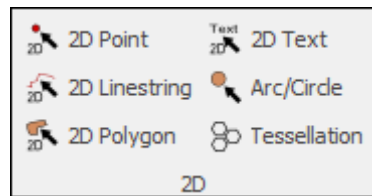
The drawing tool you have chosen will remain active until you choose another tool or cancel **MultiDraw** by clicking it off.

Selected Layer Grid

You can bring up the Layer Data Grid of the layer that is highlighted in the layer control by clicking **Selected Layer Grid**. Here you can view the attribute data of the layer and edit it if you want as well:



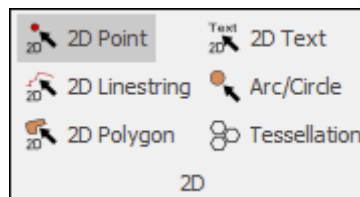
2D



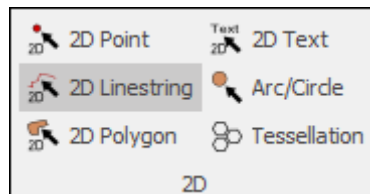
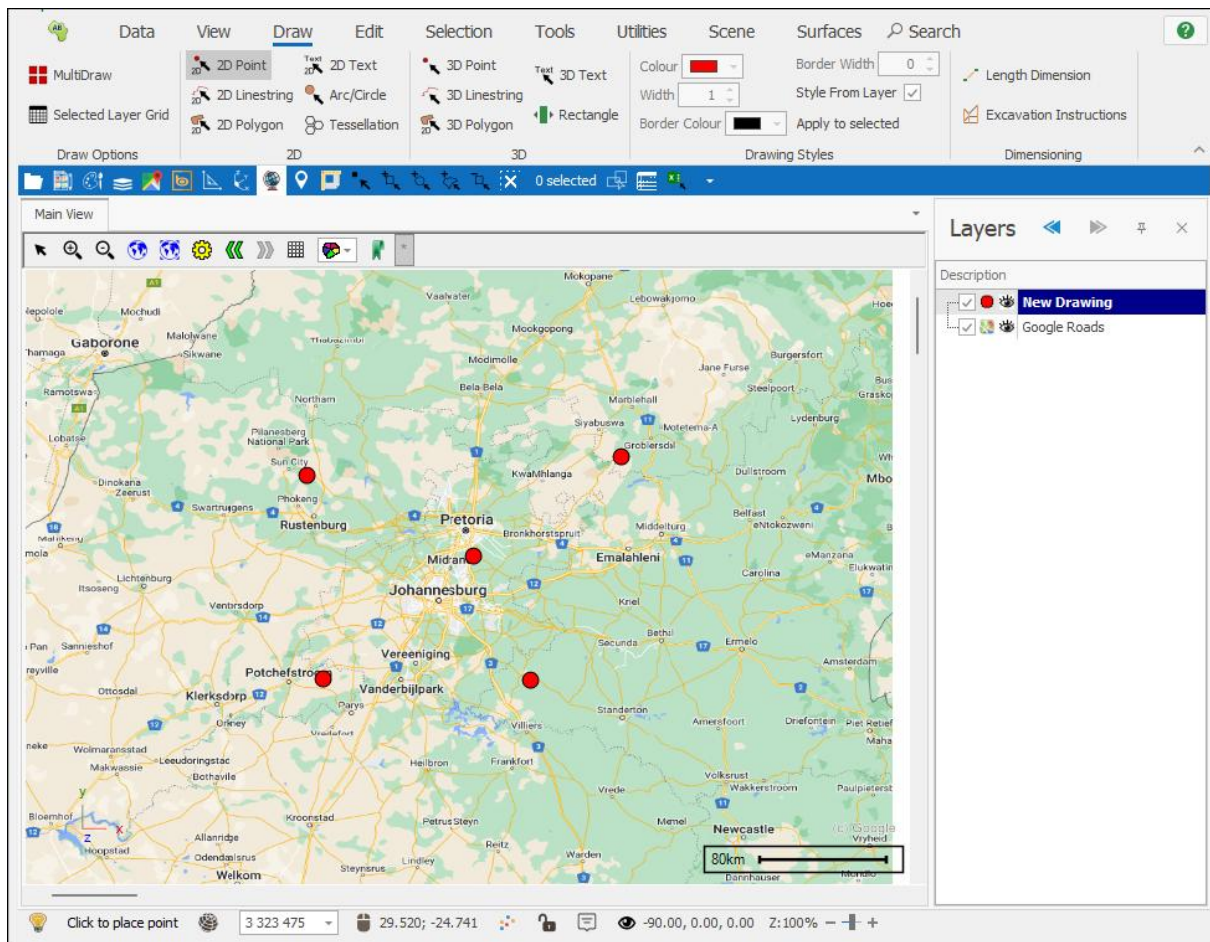
In the **2D** tab are various drawing tools you can use to draw 2D objects.

2D Point, 2D Linestring, 2D Polygon

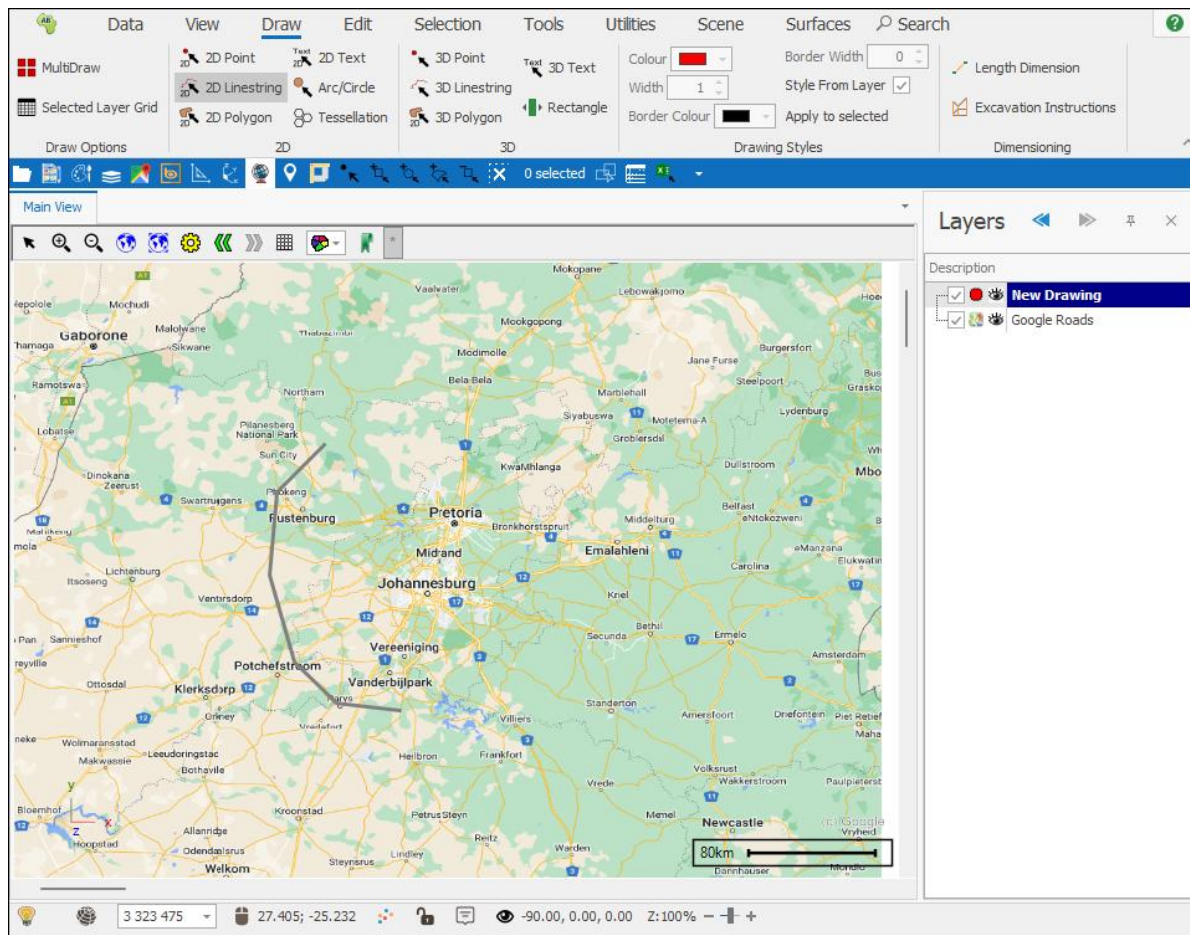
To use one of these tools, click on it and it will then be greyed indicating it is now active, you can then click in your scene to start drawing. To draw points, you just click. To draw a linestring or polygon, click to draw each vertex of the object until you are done at which point you will double click to end the drawing.



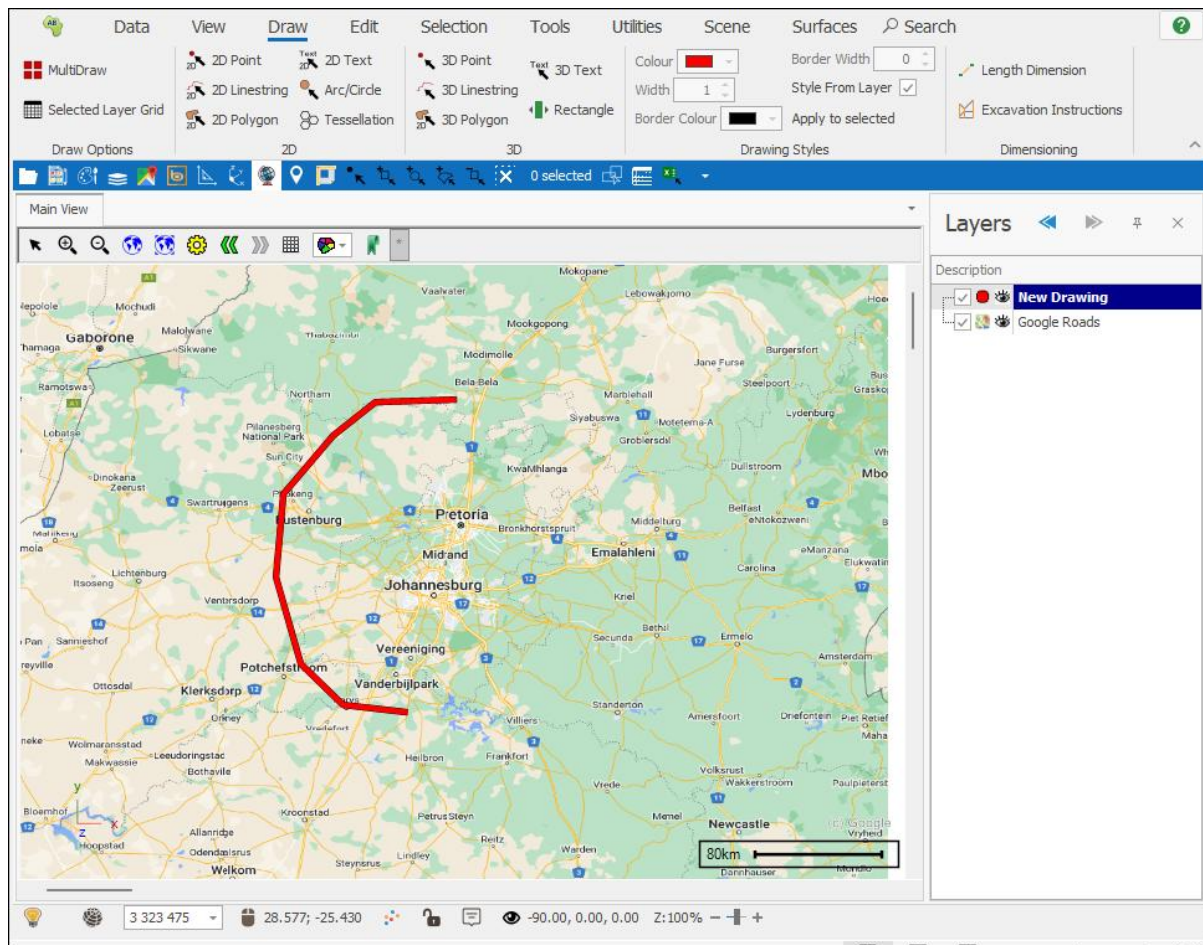
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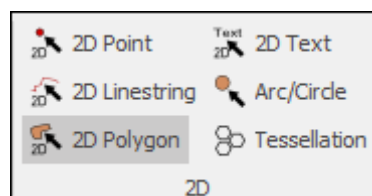
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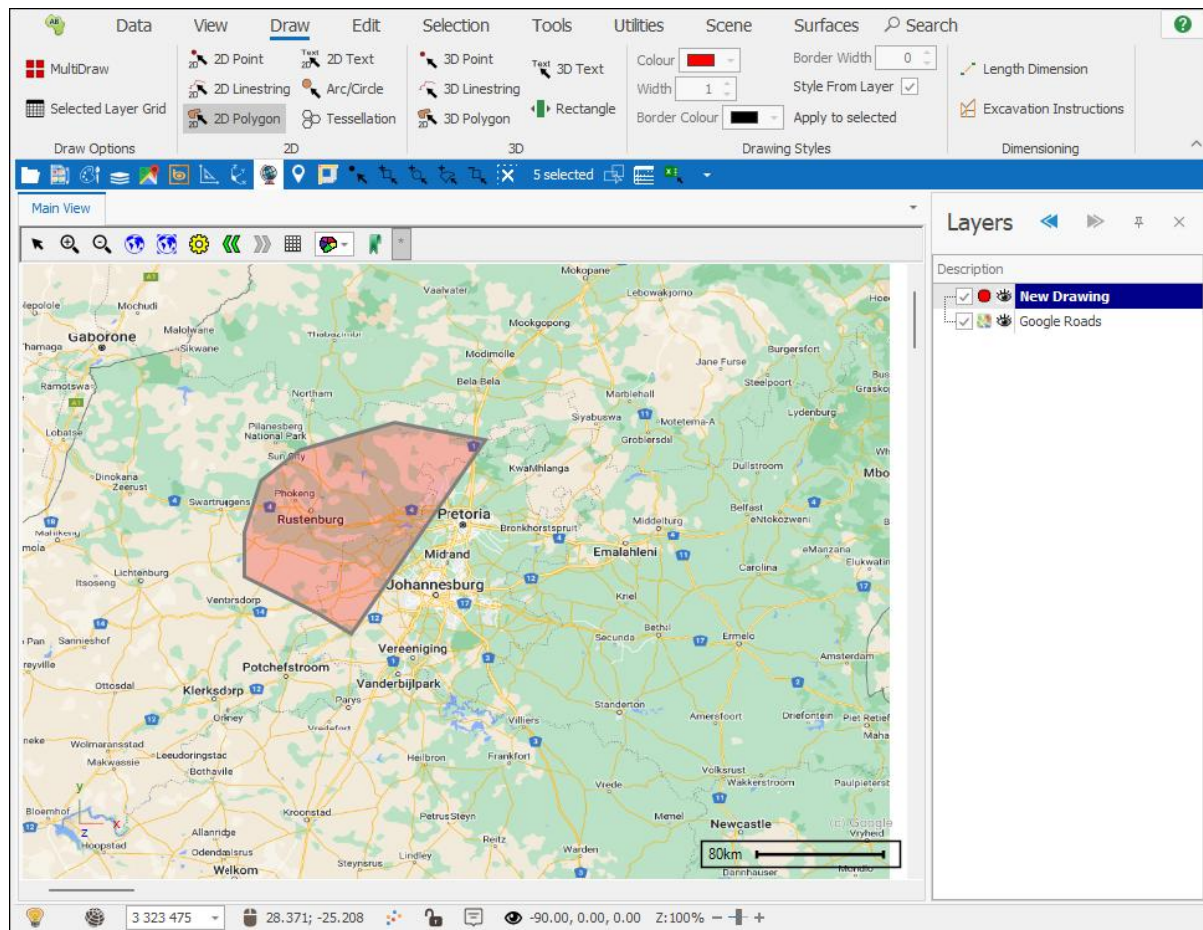
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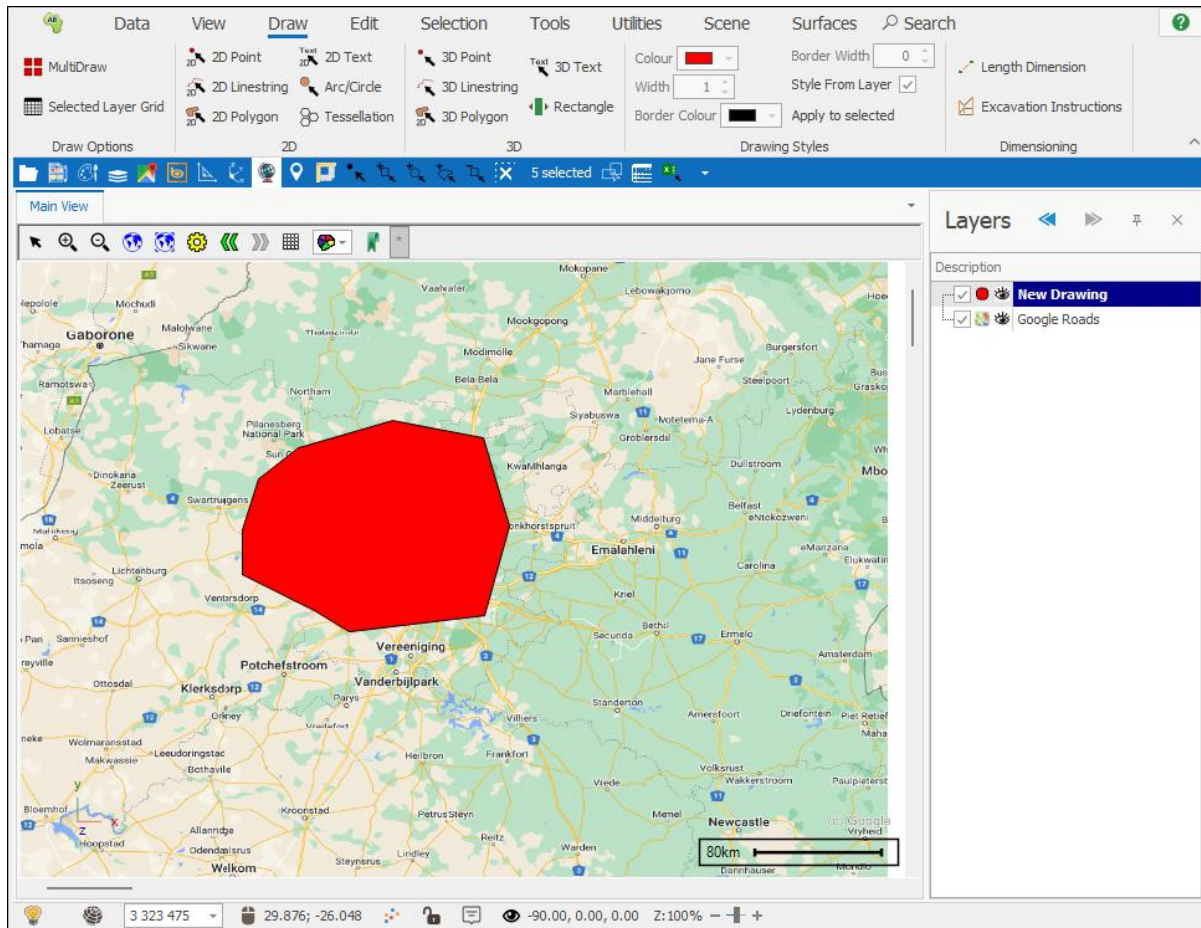


To close a linestring, press the **C** key on your keyboard instead of double clicking to end the drawing.



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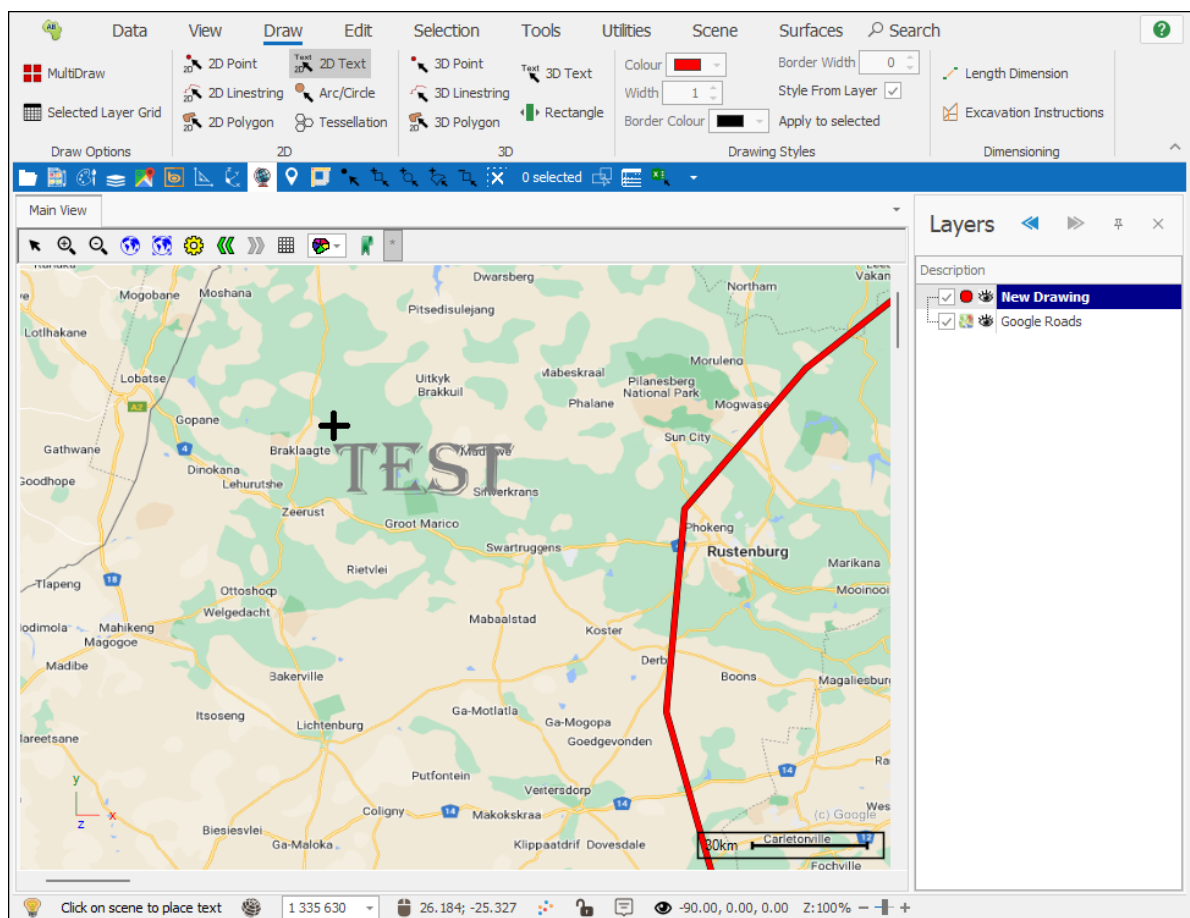
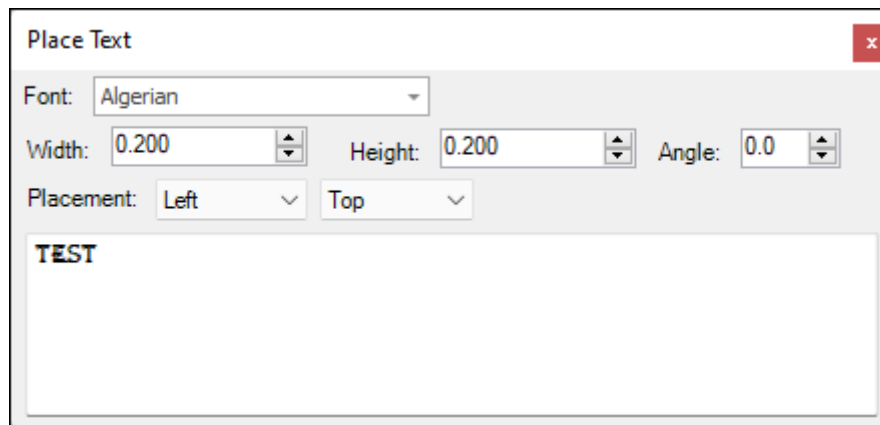


After drawing the first object you will need to click on the tool to make it active again for each new object you draw, if you want it to stay active you will click **MultiDraw** before selecting the tool, refer to [Draw Options](#) section for data on this.

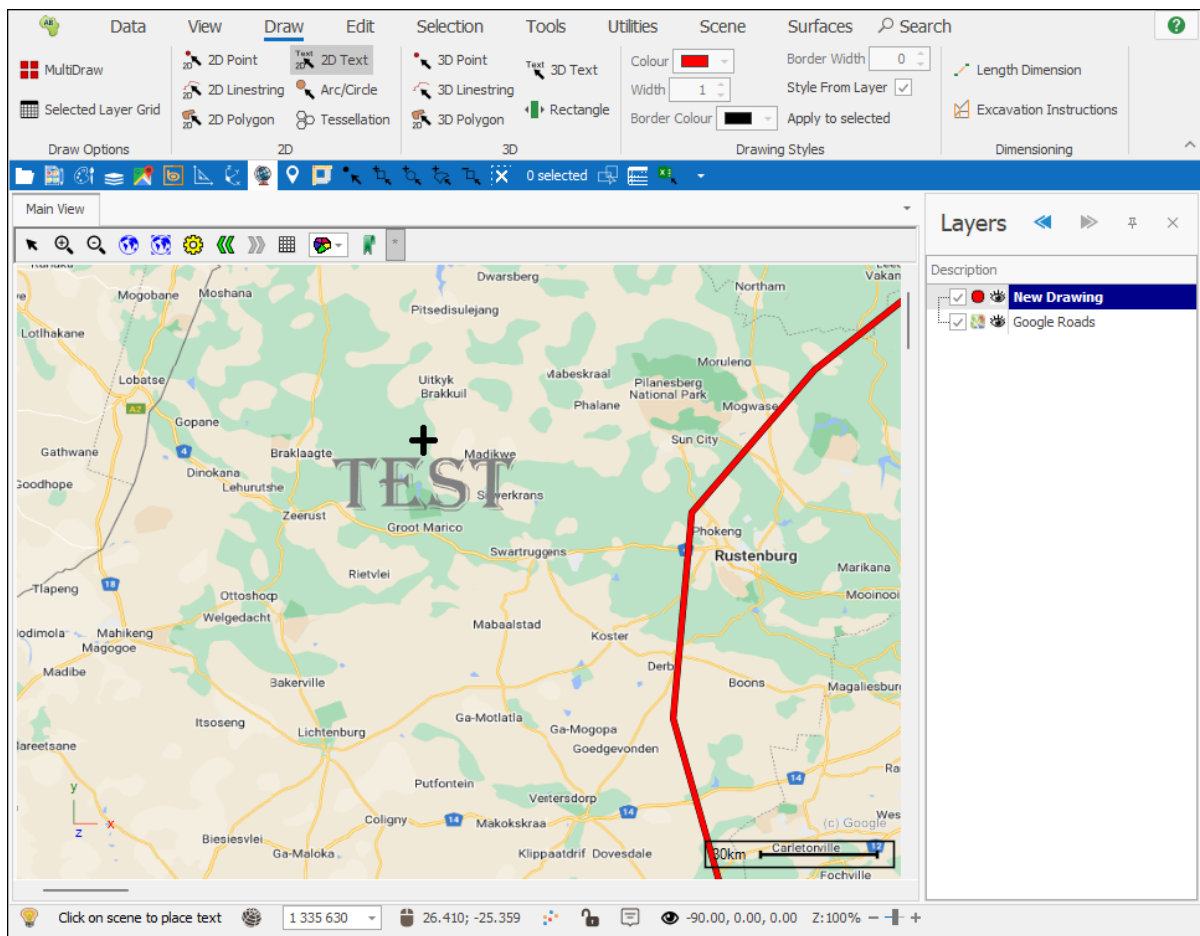
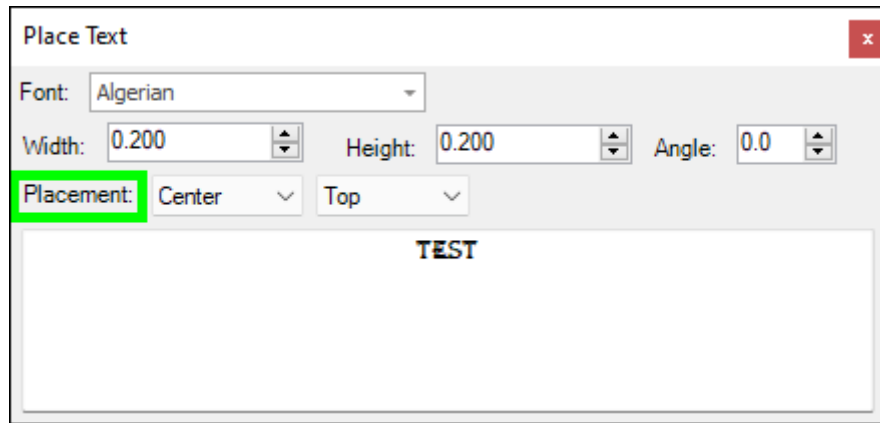
2D Text

Clicking on the **2D Text** tool will bring up a dialogue where you will specify the text you want to draw and the font, size and angle of this text.

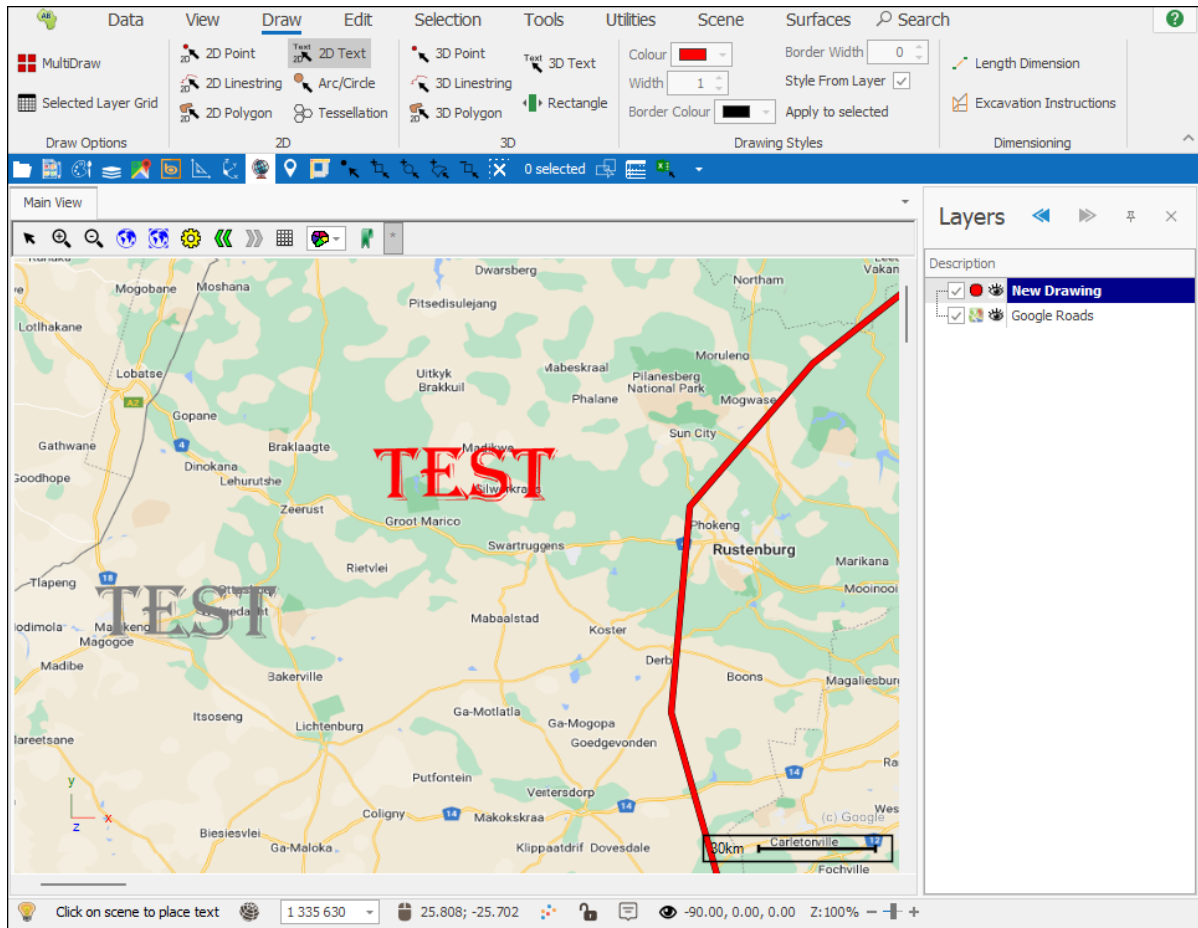
In the box below type in the text, you will see this text then appears on your cursor as you hover in your scene. (The size units of the text were originally in degrees, in later versions in meters):



Placement refers to the placement of the text in relation to the cursor, so you can put it to the bottom right of the cursor, the centre etc.



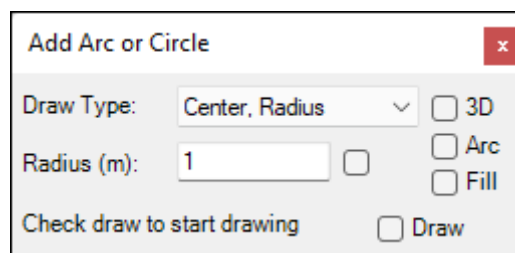
Once you have entered the text and chosen its settings, you can then just click at the point in the scene where you want to place it and it will be drawn:



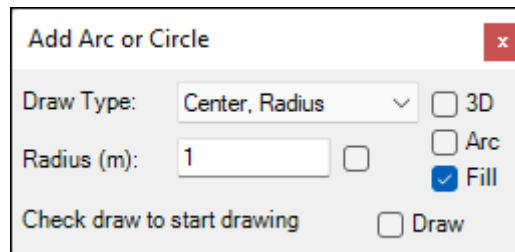
You can keep clicking and placing the same text or type in new text in the dialogue and change its properties if you want and then place that, when you are done exit the dialogue and the tool will no longer be active.

Arc/Circle

Clicking on the **Arc/Circle** tool will bring up a dialogue where you can specify the parameters of a circle or arc you can draw:



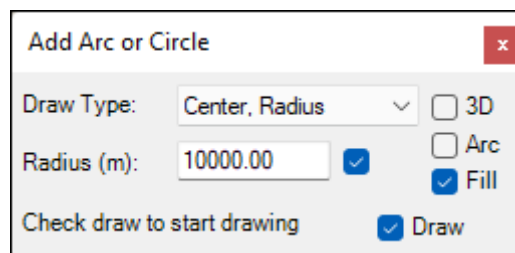
First you will choose whether you want to draw a circle or arc; circle is the default, and you will have to specify specifically by ticking on **Arc** to draw an arc. Then choose whether you want a filled circle/arc (**Fill**) and whether you want it to be 3D or not (**3D**). In this example I will just be drawing a 2D filled circle:



The screenshot shows the 'Add Arc or Circle' dialog box. The 'Draw Type' dropdown is set to 'Center, Radius'. The 'Radius (m)' input field contains the value '1'. The '3D' checkbox is unchecked, the 'Arc' checkbox is unchecked, and the 'Fill' checkbox is checked. The 'Check draw to start drawing' checkbox is unchecked, and the 'Draw' checkbox is unchecked.

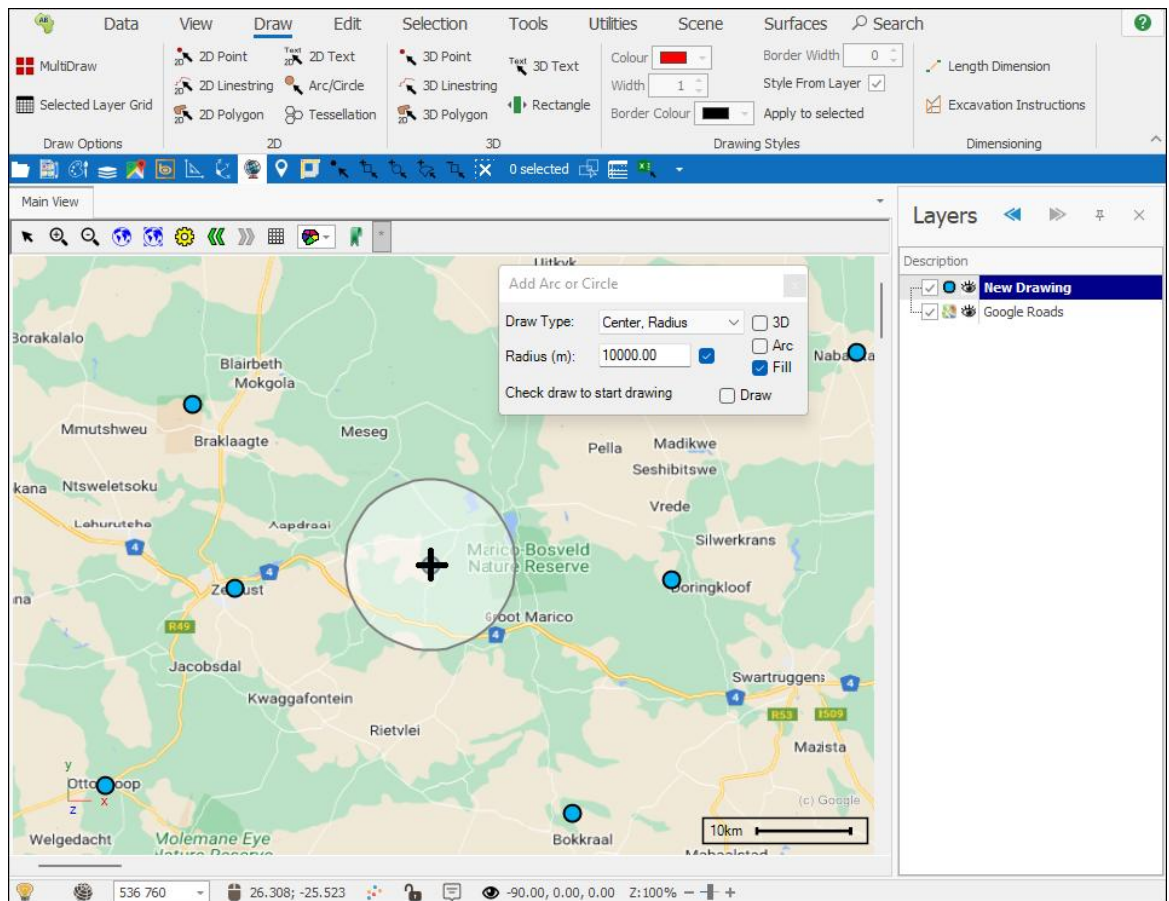
Next choose the **Draw Type** which is how you will draw the circle/arc, I will just leave the default which is from the centre outwards as a radius (**Center, Radius**). Finally, you can choose to have a prespecified radius by entering it in by **Radius(m)**, this is in meters, I have chosen to have a 10 kilometre radius, then you will tick on the checkbox next to it.

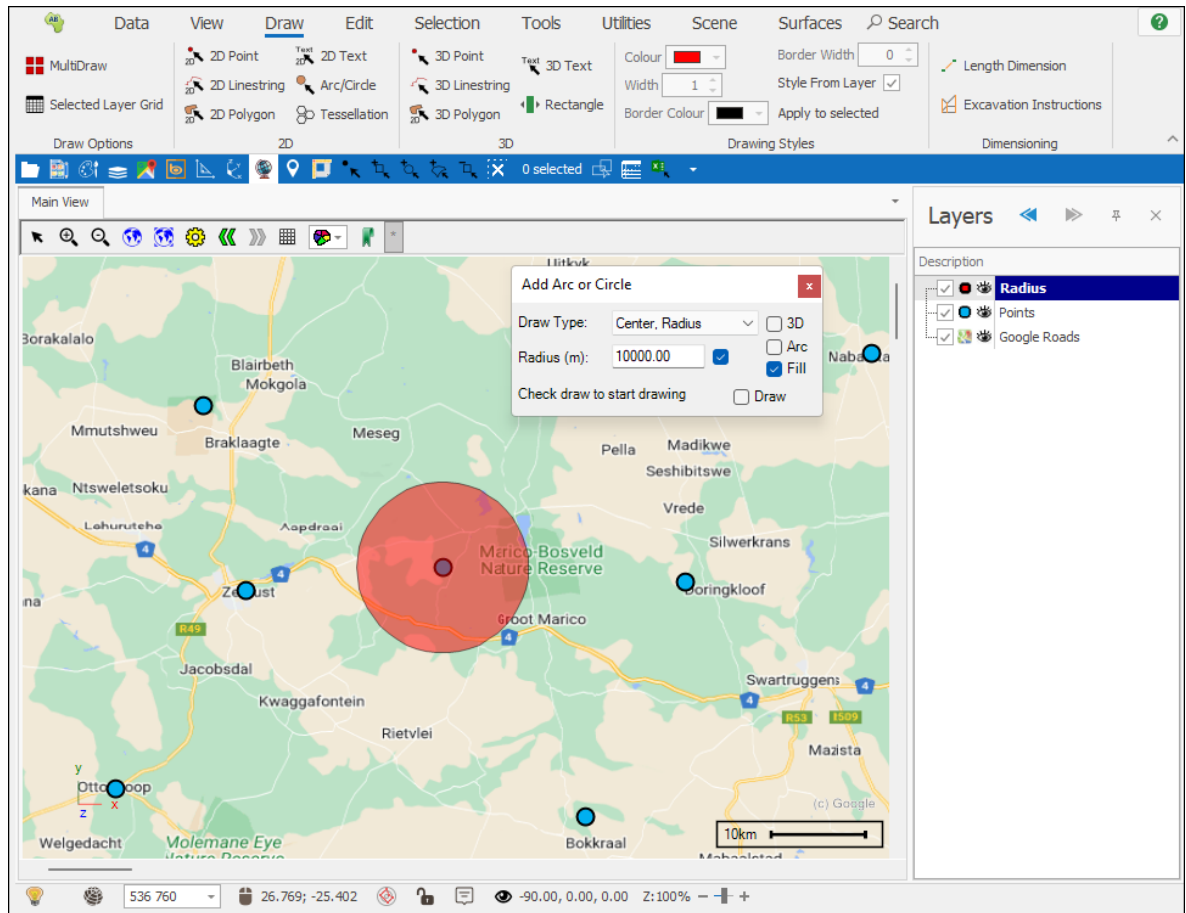
Then tick on the **Draw** checkbox and as you hover in your scene you will see the prespecified circle/arc on your cursor, you can then double click at the desired point to place it:



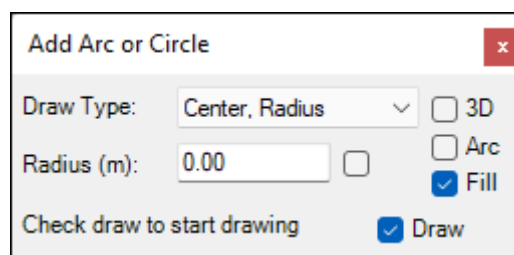
The screenshot shows the 'Add Arc or Circle' dialog box with updated settings. The 'Draw Type' dropdown is still 'Center, Radius'. The 'Radius (m)' input field now contains '10000.00' and has a blue checkmark to its right. The '3D' checkbox is unchecked, the 'Arc' checkbox is unchecked, and the 'Fill' checkbox is checked. The 'Check draw to start drawing' checkbox is unchecked, and the 'Draw' checkbox is now checked.

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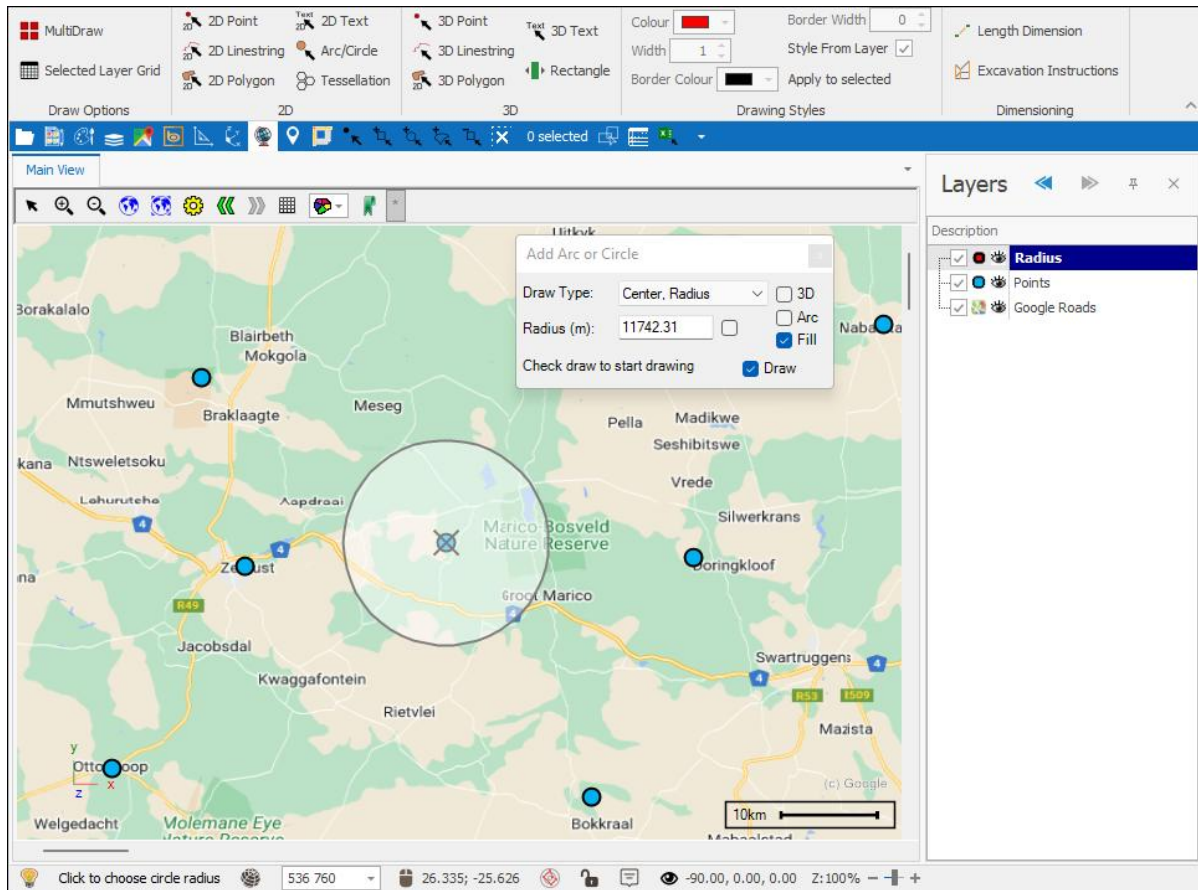


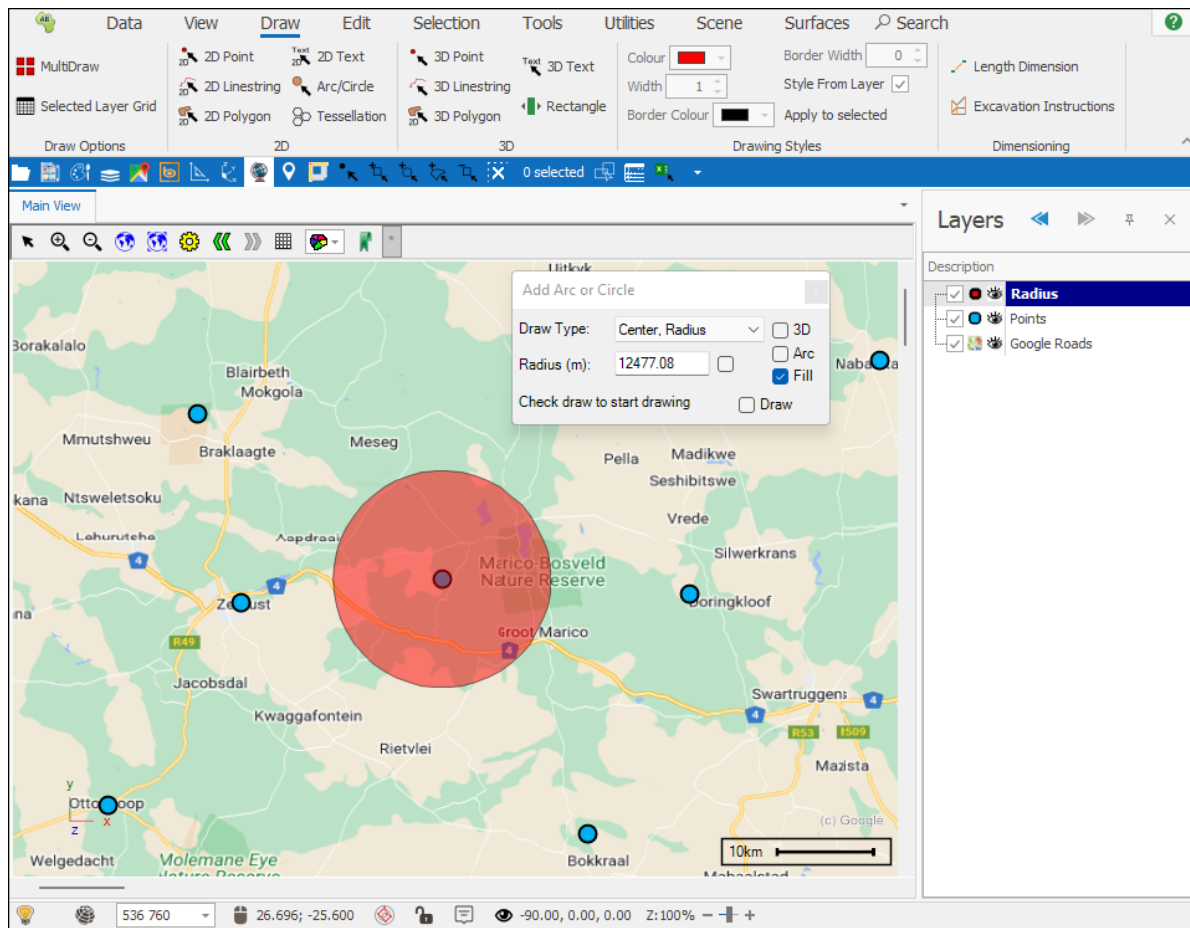


Alternatively, you can draw the radius dynamically in the scene, just leave the **Radius(m)** checkbox ticked off and then tick **Draw**. Then click and drag in your scene to start drawing the circle/arc, as you draw the radius will show dynamically by **Radius(m)**, double click to finish:



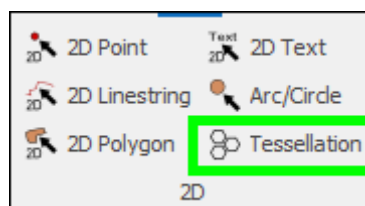
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Tessellation

The **Tessellation** tool allows you to build a tessellation - a repeating pattern of polygons that covers an area with no gaps or overlaps.



Create Tesselation

Shape: Rectangle

Boundary mode: Select

Origin: 0.000 0.000 0.000

X Axis: 1.000 0.000 0.000

Y Axis: 0.000 1.000 0.000

Z Axis: 0.000 0.000 -1.000

Width (m): 100.000 Height (m): 100.000

Get scene axes Draw Tesselation

First you will choose what **Shape** you want to use in the tessellation- **Rectangle** or **Hexagon**. Then for the **Boundary Mode** you can choose either **Select**, which will make the boundary from selected elements in an existing layer that you have selected with one of the selection tools, or you can choose **Draw** and this will allow you to draw your own boundaries. In this example we will choose **Rectangle** and the **Draw** option:

Create Tesselation

Shape: Rectangle

Boundary mode: Rectangle Hexagon

Boundary mode: Draw

Draw boundary

Now we click the **Draw Boundary** button and go to our scene to draw the boundary, left click to start drawing, each click is a vertex of the boundary, double click to finish. **Show Boundaries** is ticked on by default, if you tick it off you will not see the boundaries on the scene when you draw them:

Create Tessellation

Shape

Rectangle

Boundary mode

Draw

Draw boundary

Clear boundaries

☒ Show Boundaries

Origin

0.000

0.000

0.000

X Axis

1.000

0.000

0.000

Y Axis

0.000

1.000

0.000

Z Axis

0.000

0.000

-1.000

Width (m)

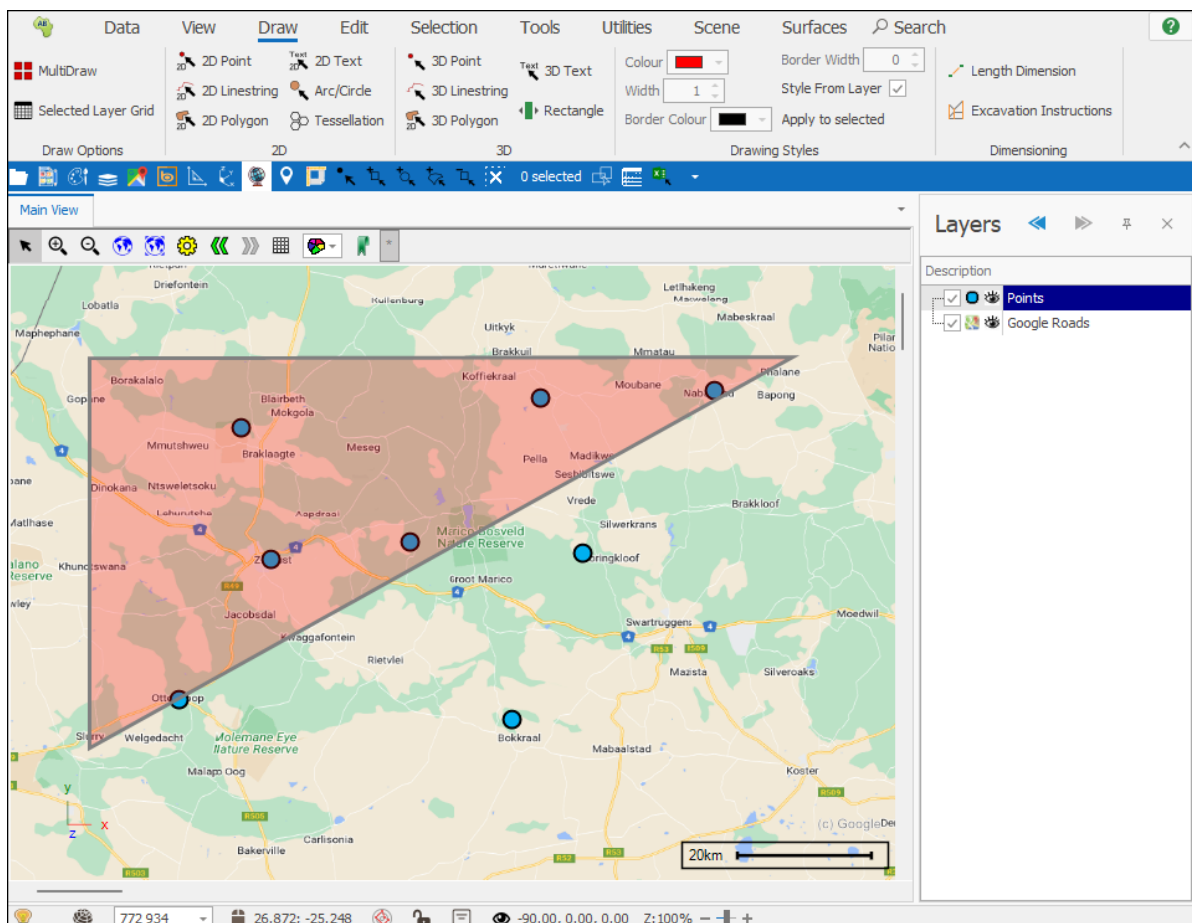
100.000

Height (m)

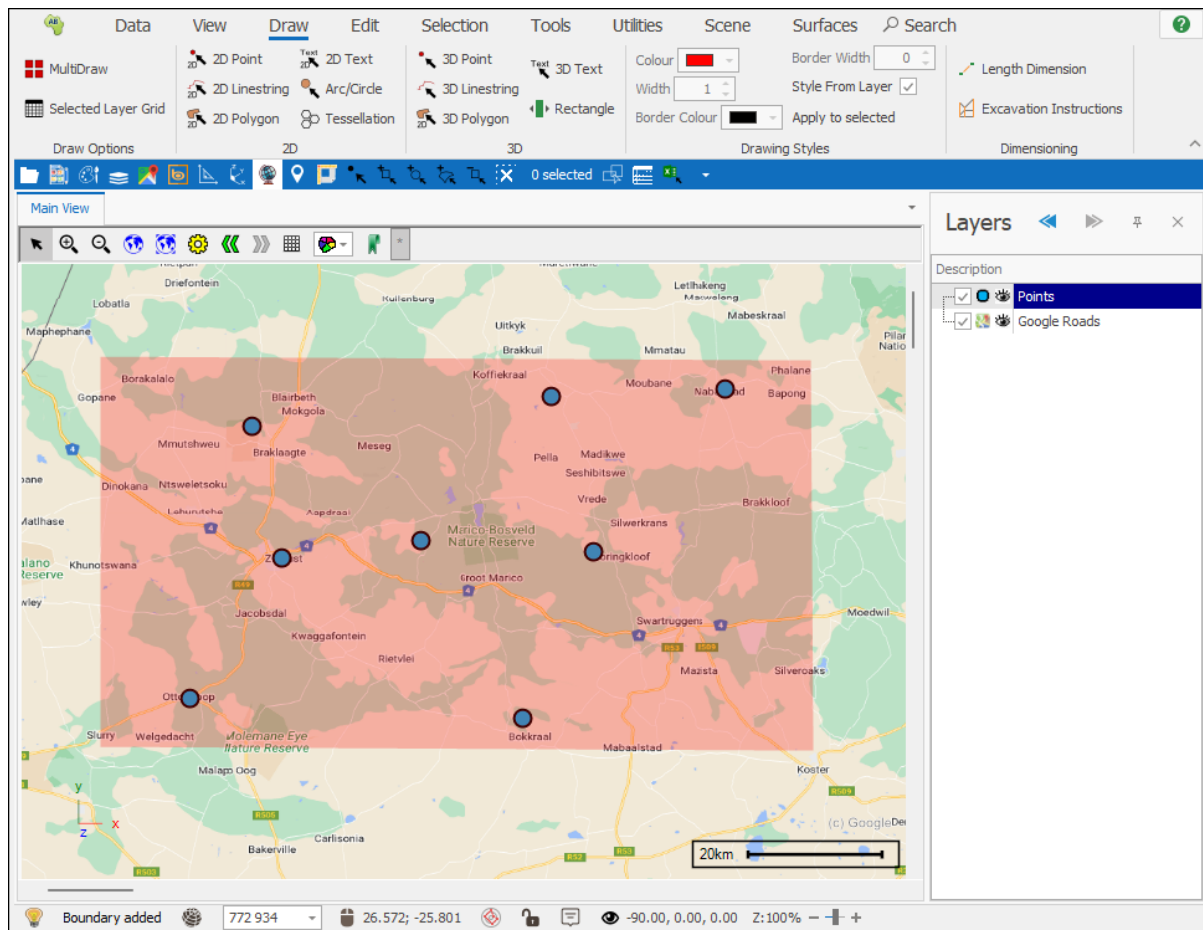
100.000

Get scene axes

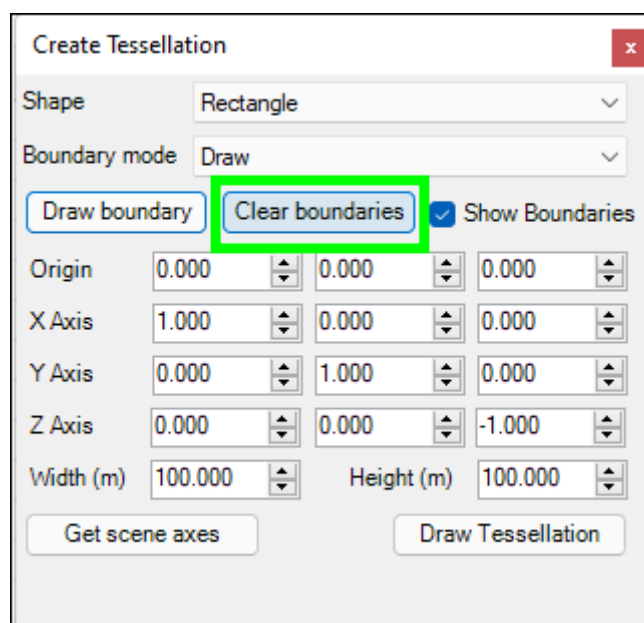
Draw Tessellation



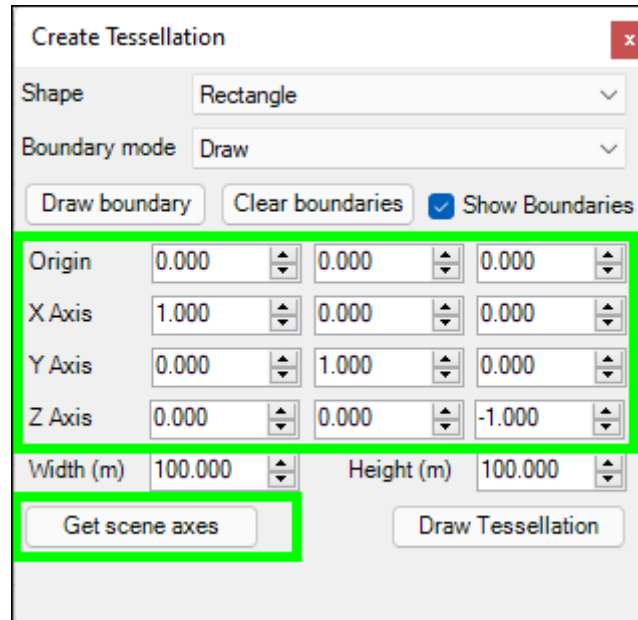
You can right click to undo a vertex of the boundary as you are drawing.



Your boundary is now drawn, if you want to redraw it you can click **Clear Boundaries** and then draw it again:



The **Origin**, **X Axis**, **Y Axis** and **Z Axis** of the tessellation can be custom set, to get back the regular scene axes, click **Get scene axes**:



Create Tessellation

Shape: Rectangle

Boundary mode: Draw

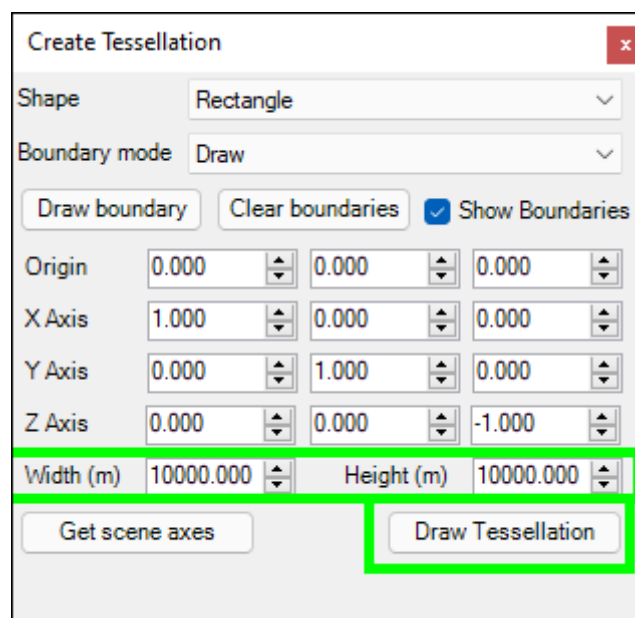
Draw boundary Clear boundaries ☒ Show Boundaries

Origin	0.000	0.000	0.000
X Axis	1.000	0.000	0.000
Y Axis	0.000	1.000	0.000
Z Axis	0.000	0.000	-1.000

Width (m) 100.000 Height (m) 100.000

Get scene axes Draw Tessellation

The next step is to specify the **Width** and **Height** in meters of the cells of the tessellation, in this example I will make them 10 kilometres (10 000 meters), finally click **Draw Tessellation** and your tessellation will be drawn in a new layer:



Create Tessellation

Shape: Rectangle

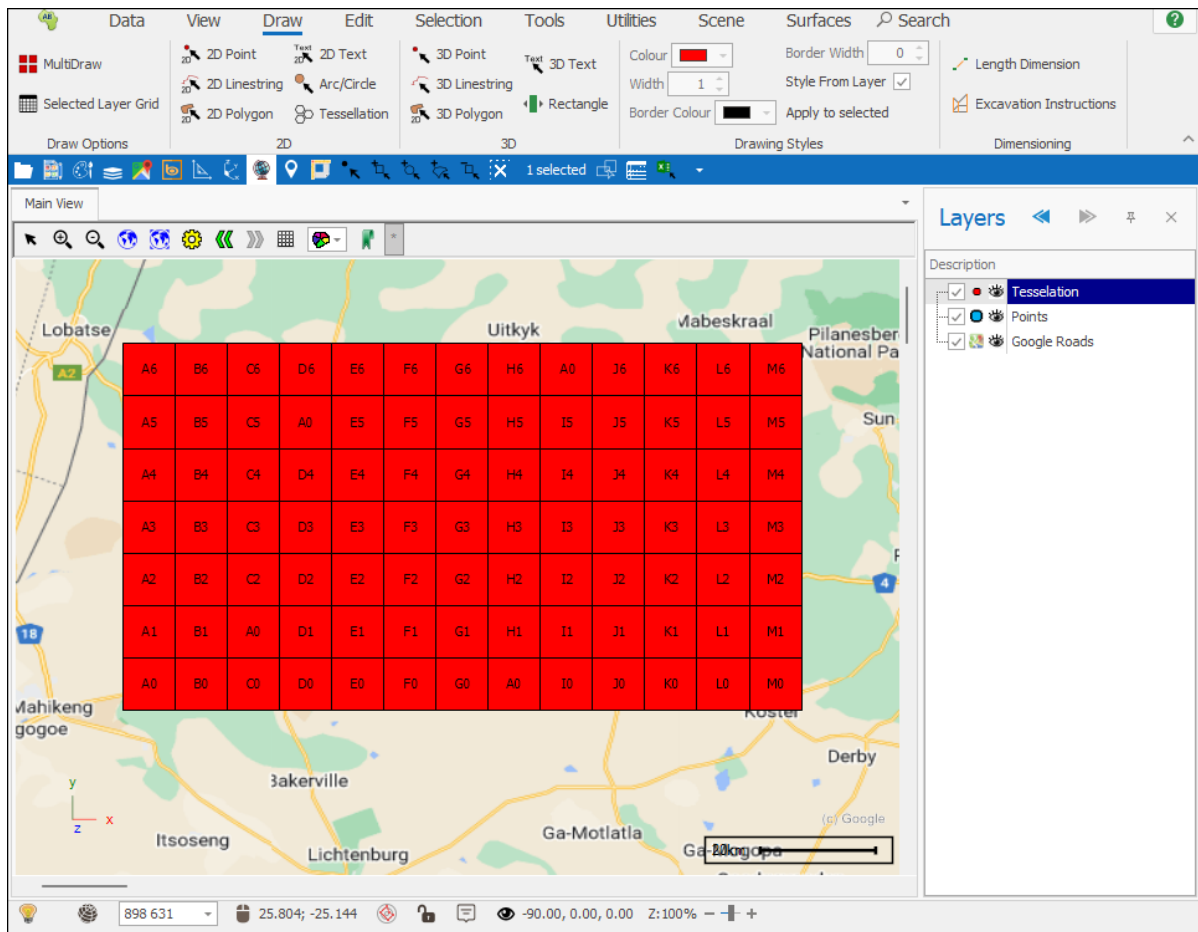
Boundary mode: Draw

Draw boundary Clear boundaries ☒ Show Boundaries

Origin	0.000	0.000	0.000
X Axis	1.000	0.000	0.000
Y Axis	0.000	1.000	0.000
Z Axis	0.000	0.000	-1.000

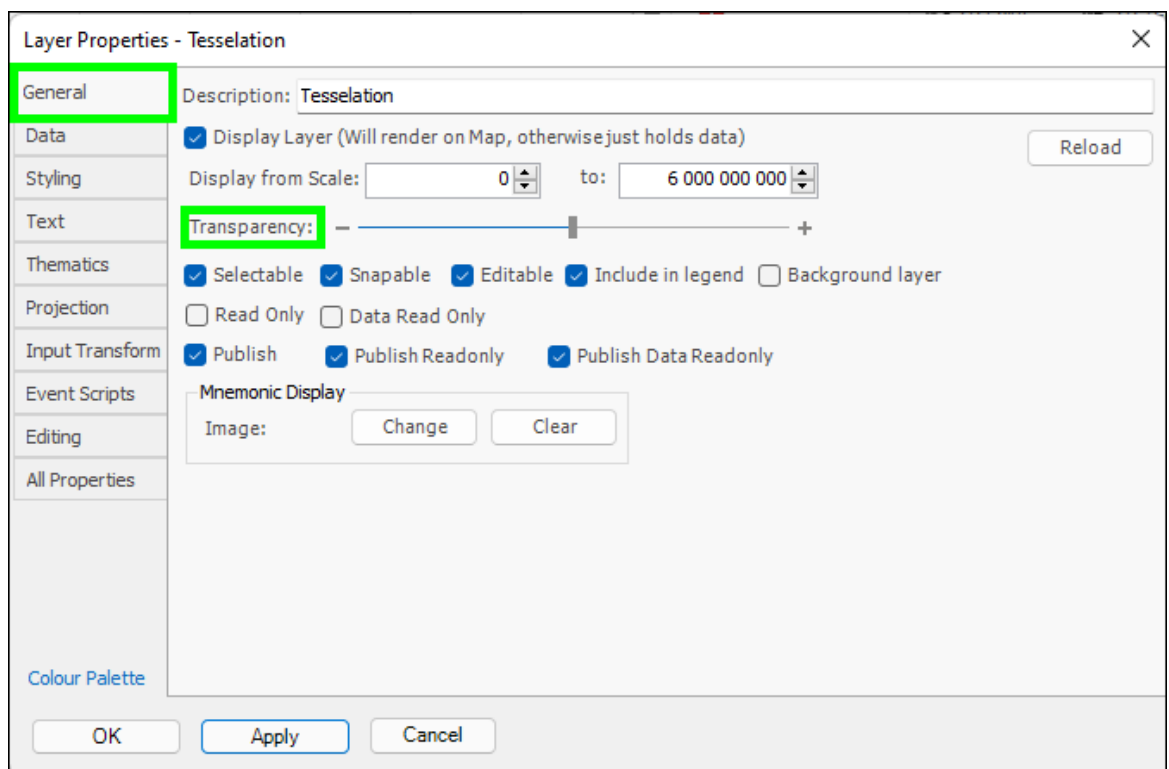
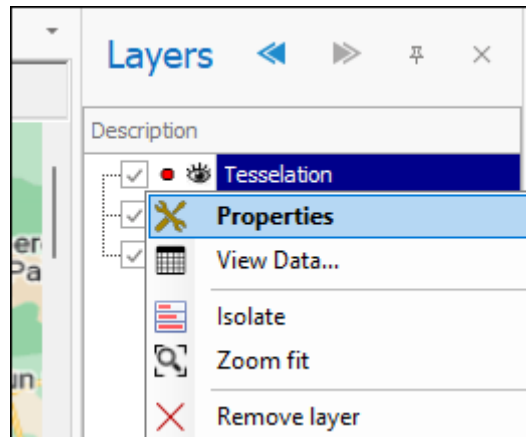
Width (m) 10000.000 Height (m) 10000.000

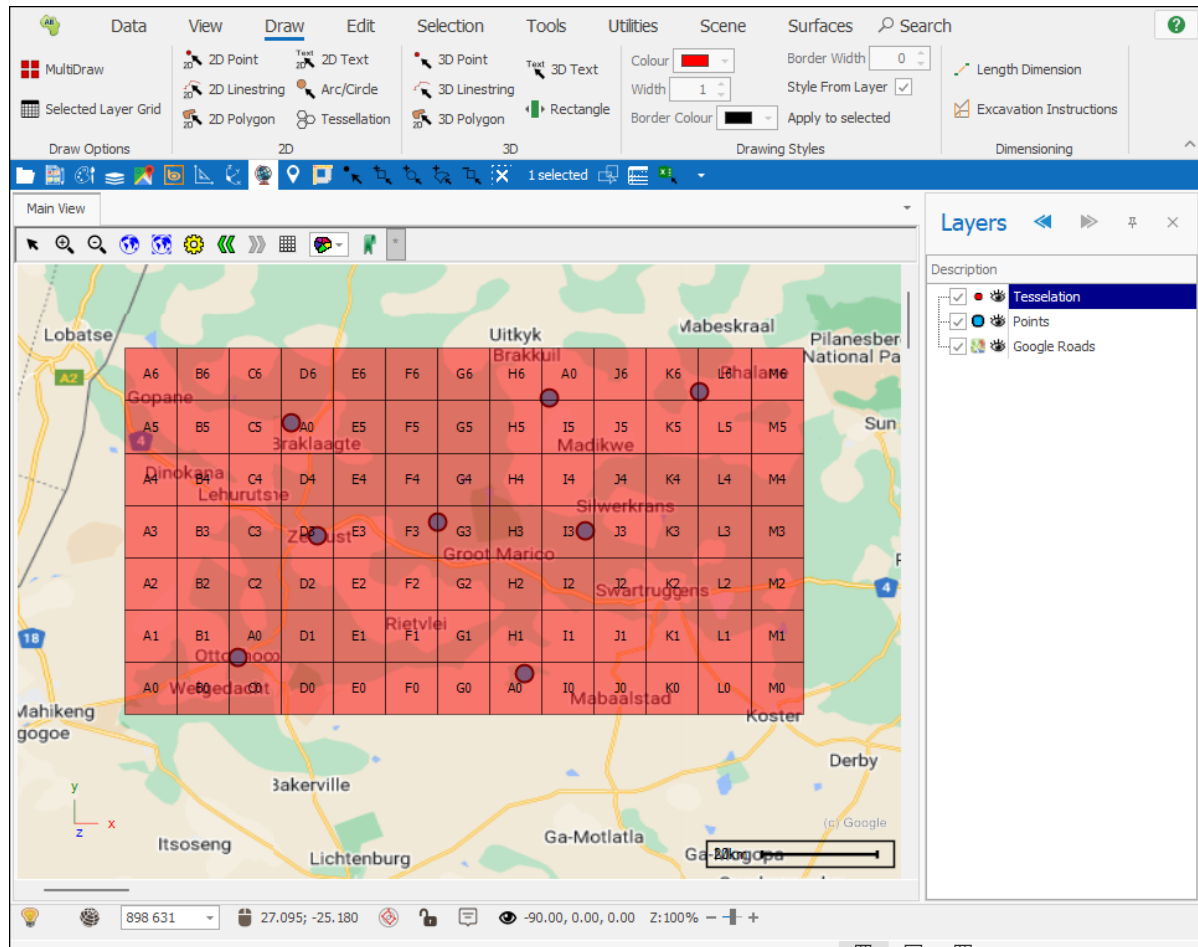
Get scene axes Draw Tessellation



Each block of the tessellation is automatically assigned an ID which then displays on the blocks as a text label.

I will just make this tessellation layer more transparent so I can see underneath it better by going into its Layer Properties, and under the General tab, adjusting the transparency slider:





Here is one more example using some different parameters. Here I have chosen the **Select Boundary Mode**. I have also chosen to have **Hexagons** instead of Rectangles for the cells of the Tessellation. The cell Width and Height I have chosen as 1000 metres (1KM):

Create Tessellation

Shape

Hexagon

Boundary mode

Select

Origin

0.000

0.000

0.000

X Axis

1.000

0.000

0.000

Y Axis

0.000

1.000

0.000

Z Axis

0.000

0.000

-1.000

Width (m)

1000.000

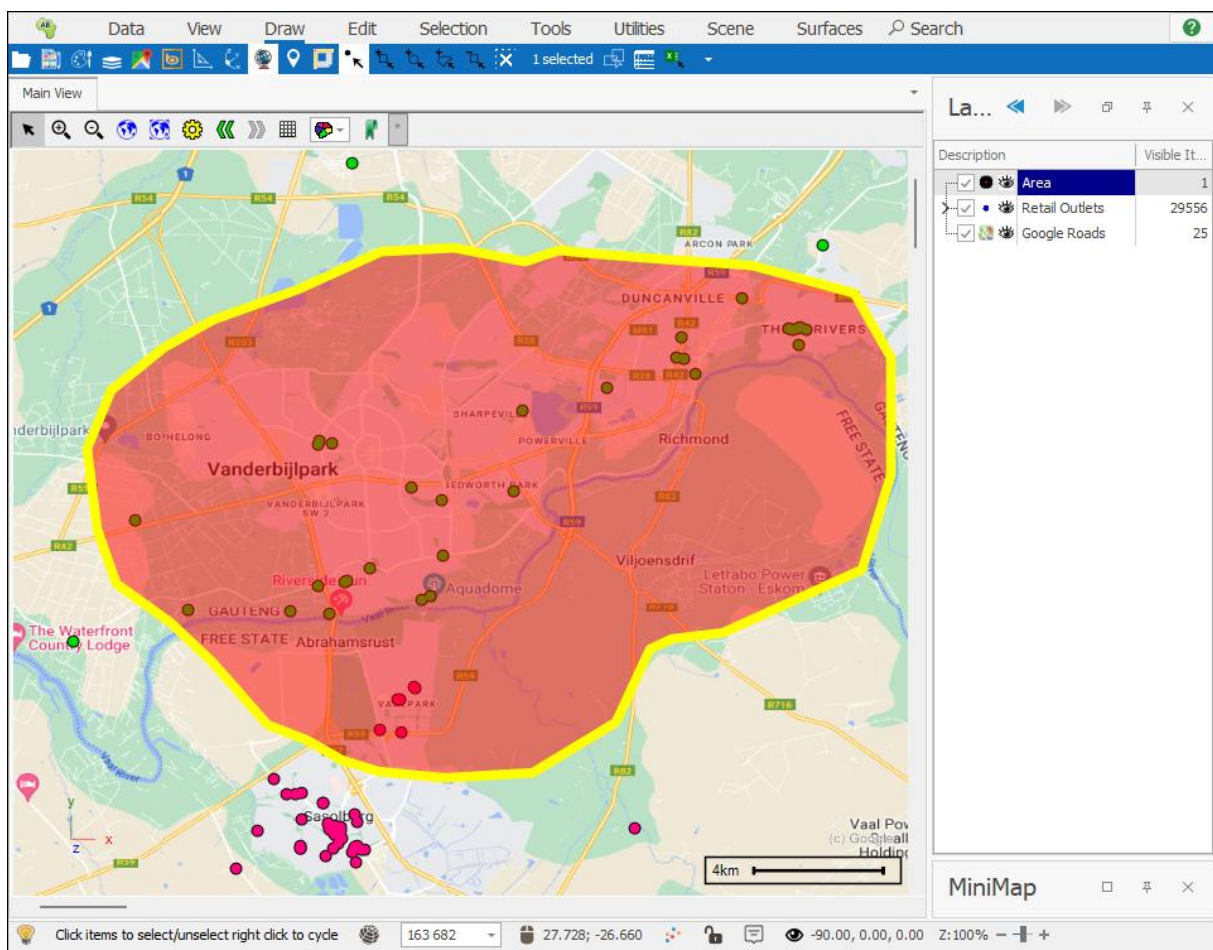
Height (m)

1000.000

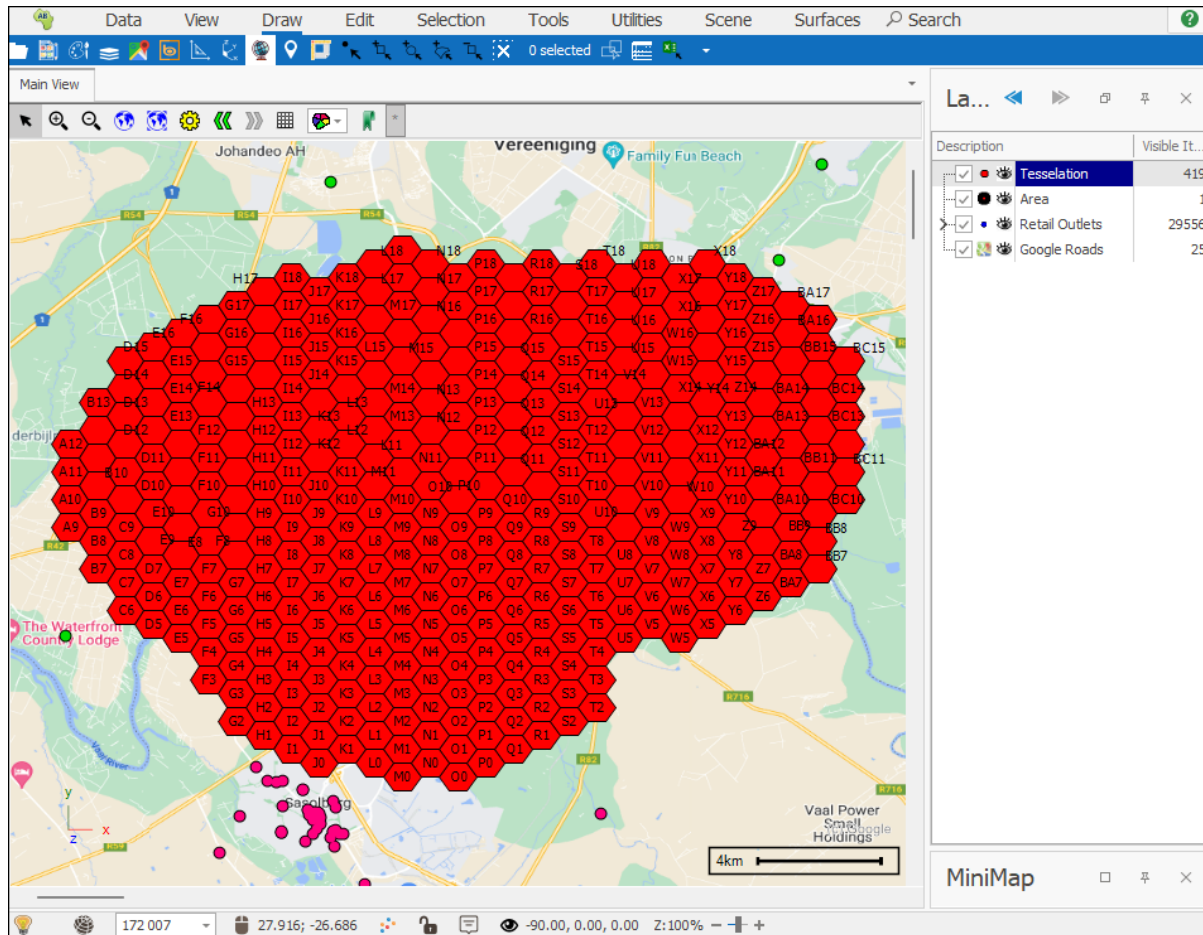
Get scene axes

Draw Tessellation

I have also selected the object in my scene that I will use as the boundaries for my Tessellation:



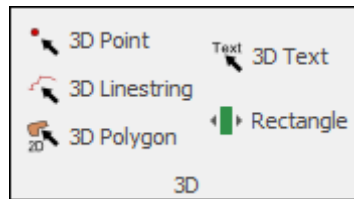
I then click **Draw Tessellation** and my tessellation is drawn:



Once you have created your tessellation you can do aggregations into the tessellated area, select points that lie within it, theme on the different blocks etc. For data on operations like these refer to these guides:

- [Aggregate Tool](#)
- [Select by Location](#)
- [SpatialXL Guide](#), *Theming* section.

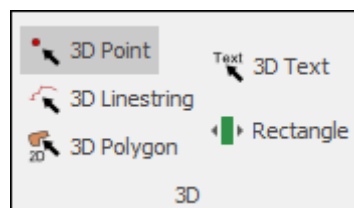
3D

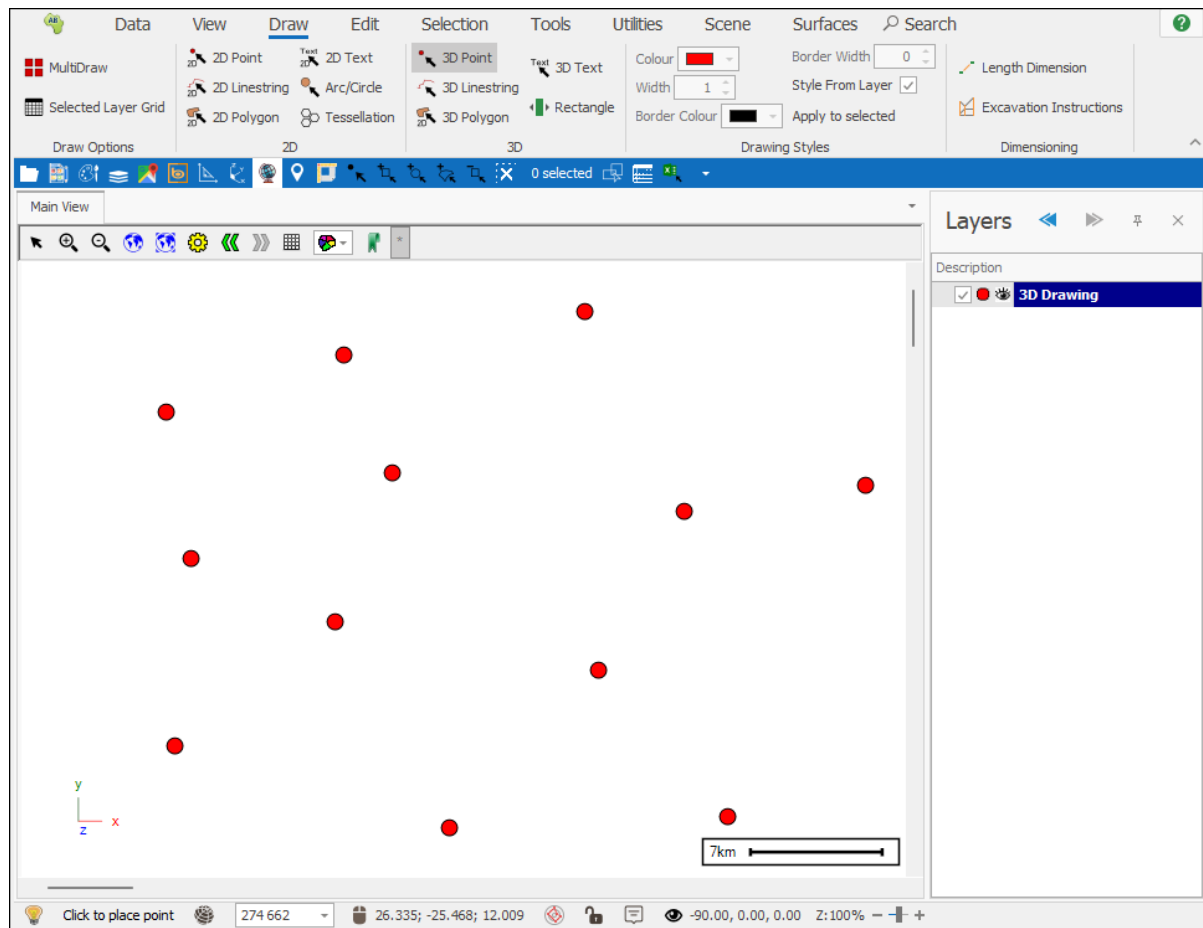


In the **3D** section of the Draw tab are various 3D drawing tools.

3D Point, 3D Linestring, 3D Polygon

The **3D Point**, **3D Linestring** and **3D Polygon** tools work by clicking on them, they will then be greyed to indicate they are active, then you will click in your scene to begin drawing, for **3D Point** simply click once to draw the point, for the **3D Linestring** and **3D Polygon** tools, click to draw each vertex of the object and then double click to finish:

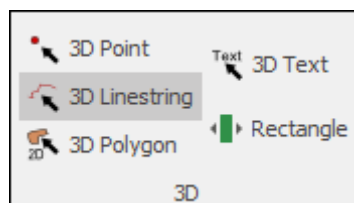
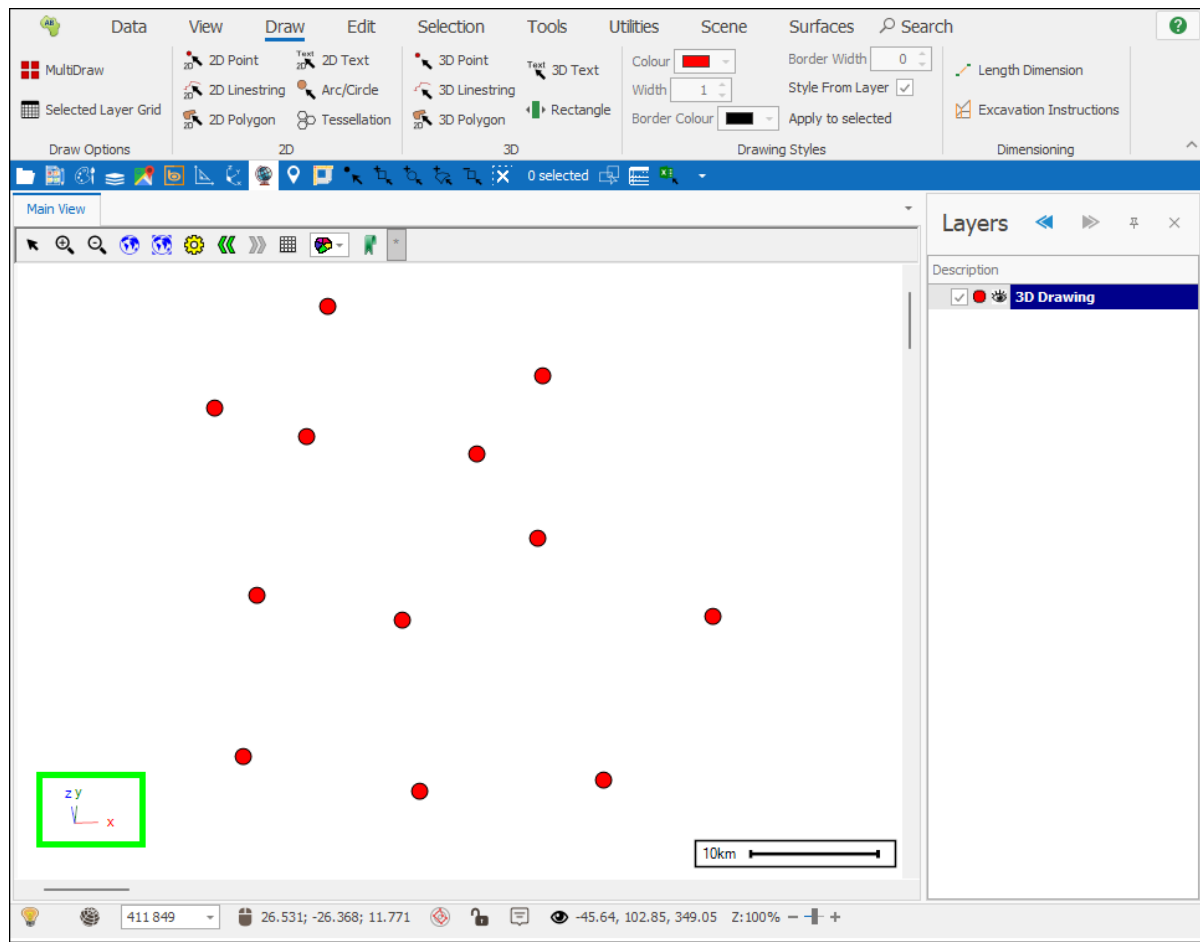




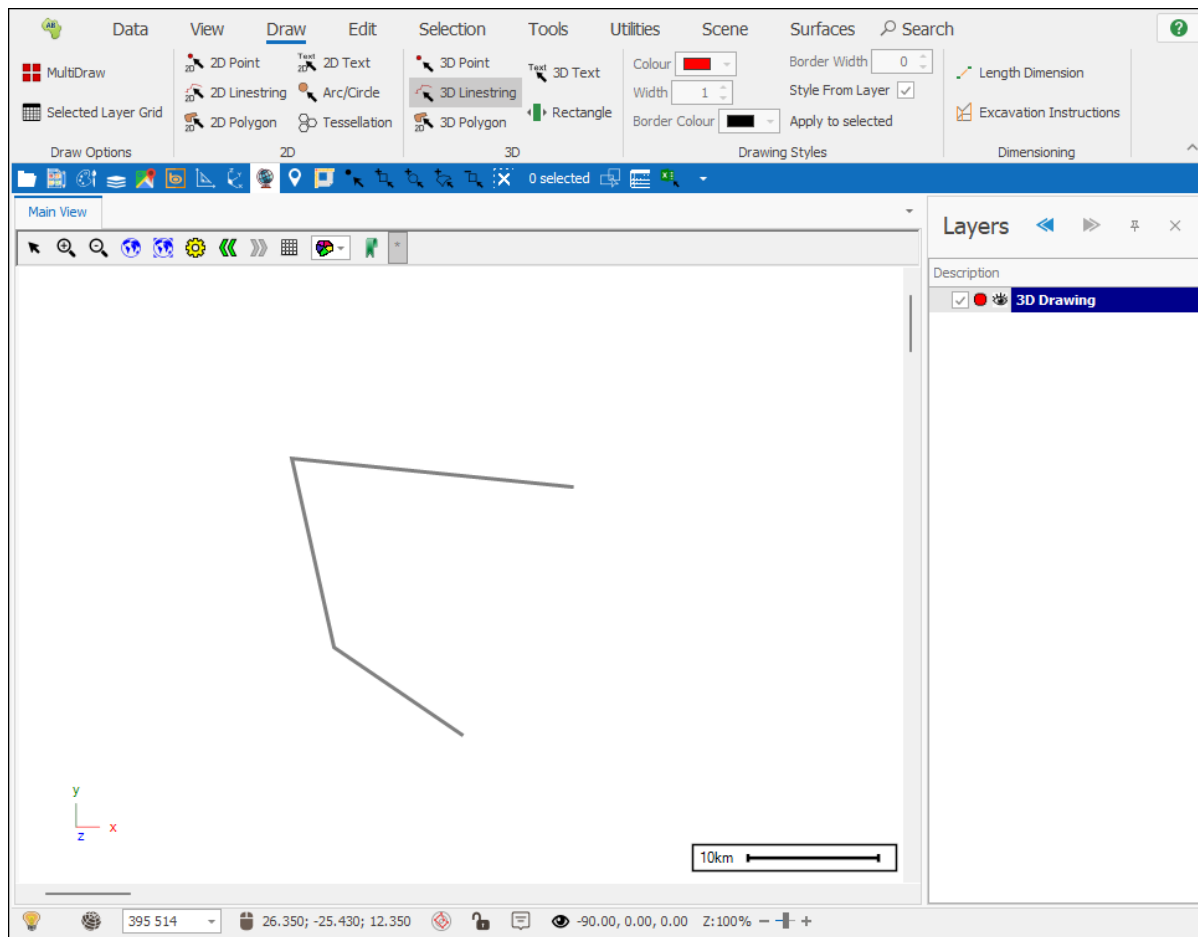
You can rotate the objects by selecting one of the snapping tools and then snapping to the object. Your cursor will change to a star when it has found an object or vertex to snap to, then click on it, hold down ctrl and then drag to rotate:



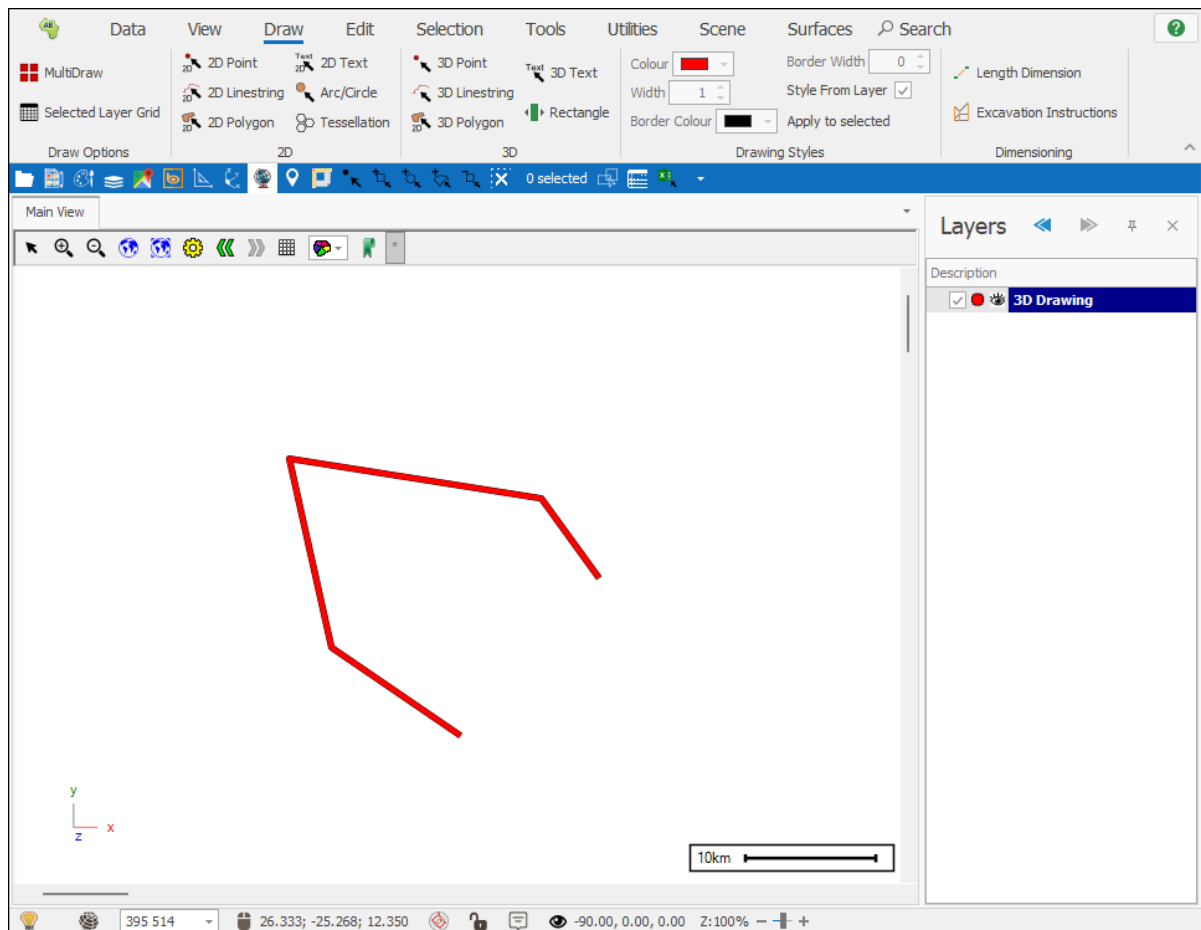
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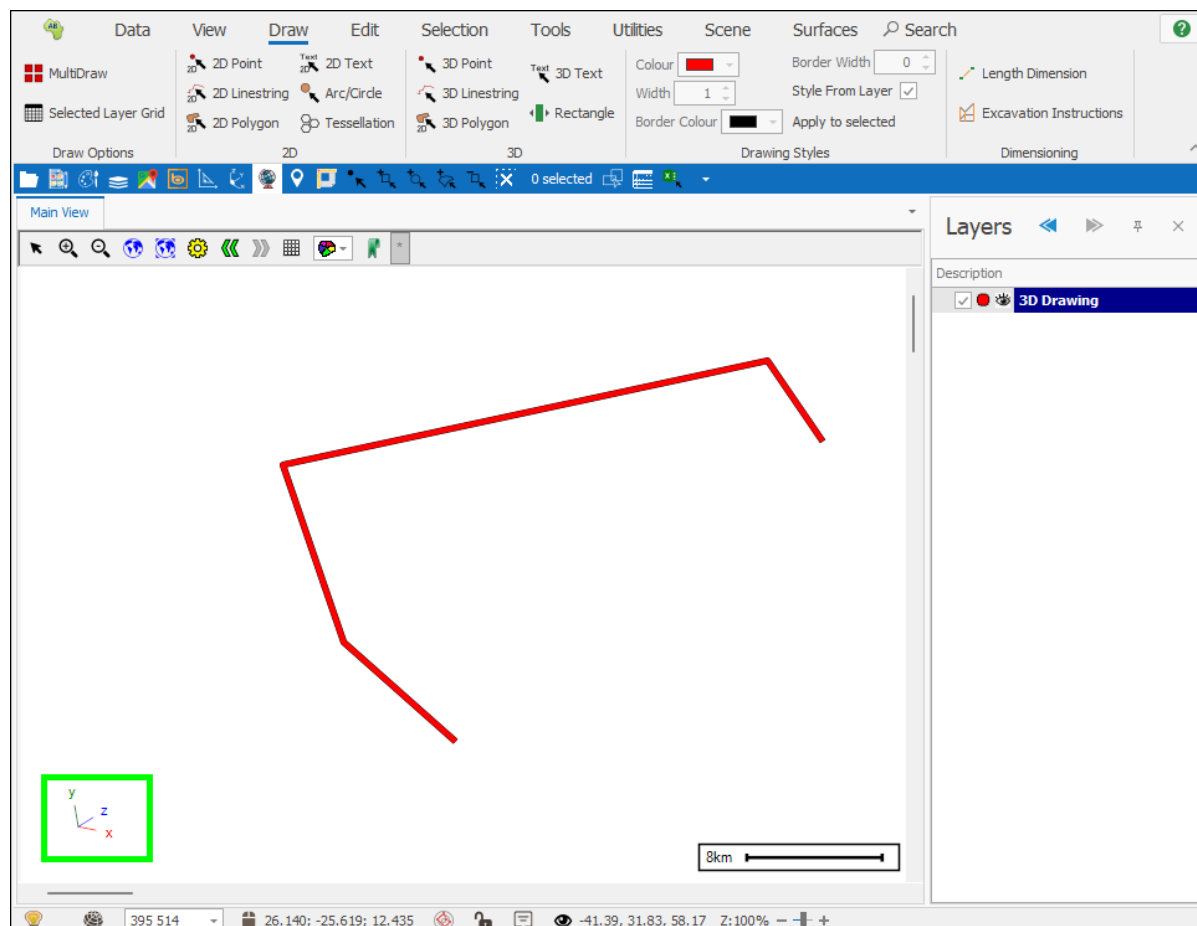


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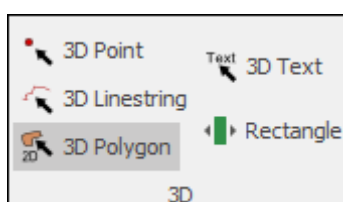


Draw Tab User Guide

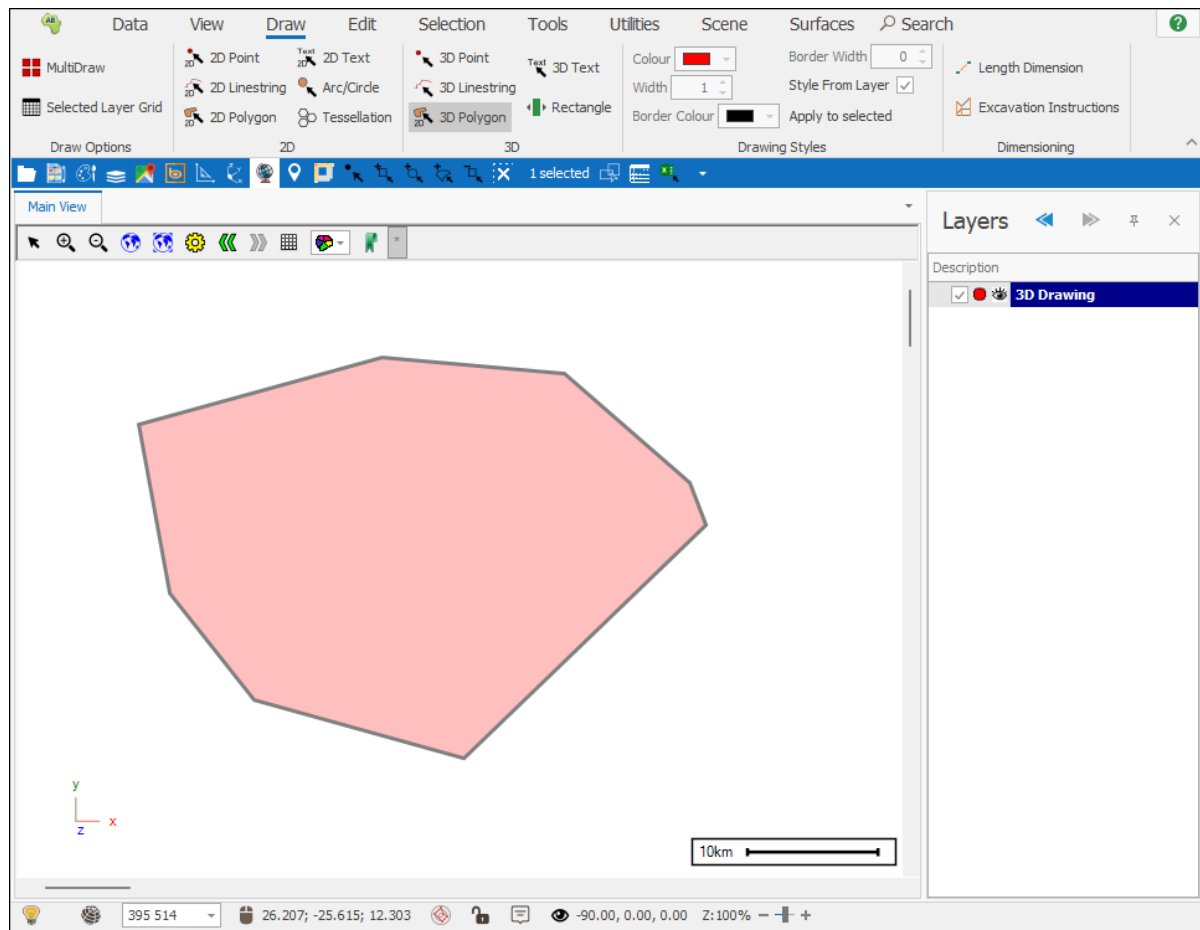




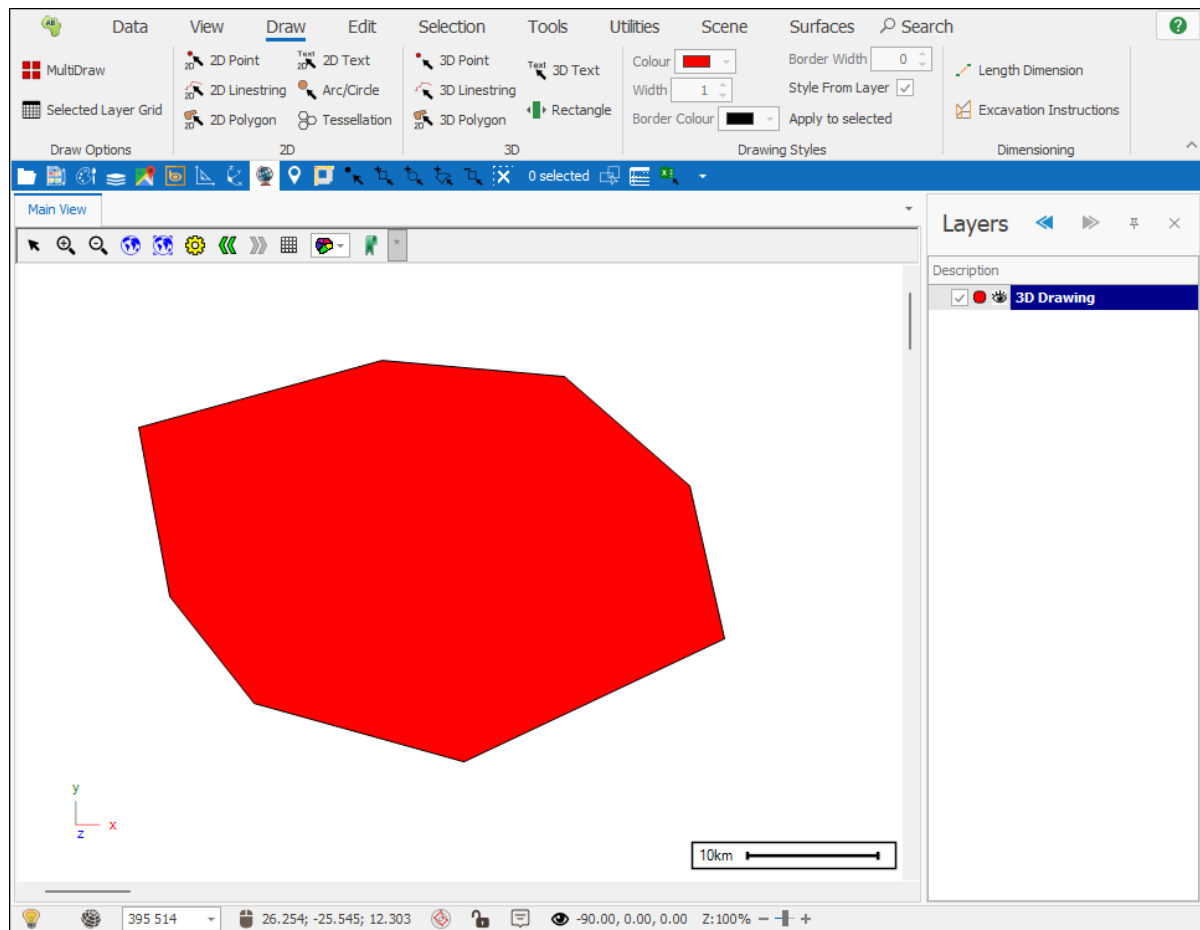
To close a linestring, press the **C** key on your keyboard instead of double clicking to end the drawing.

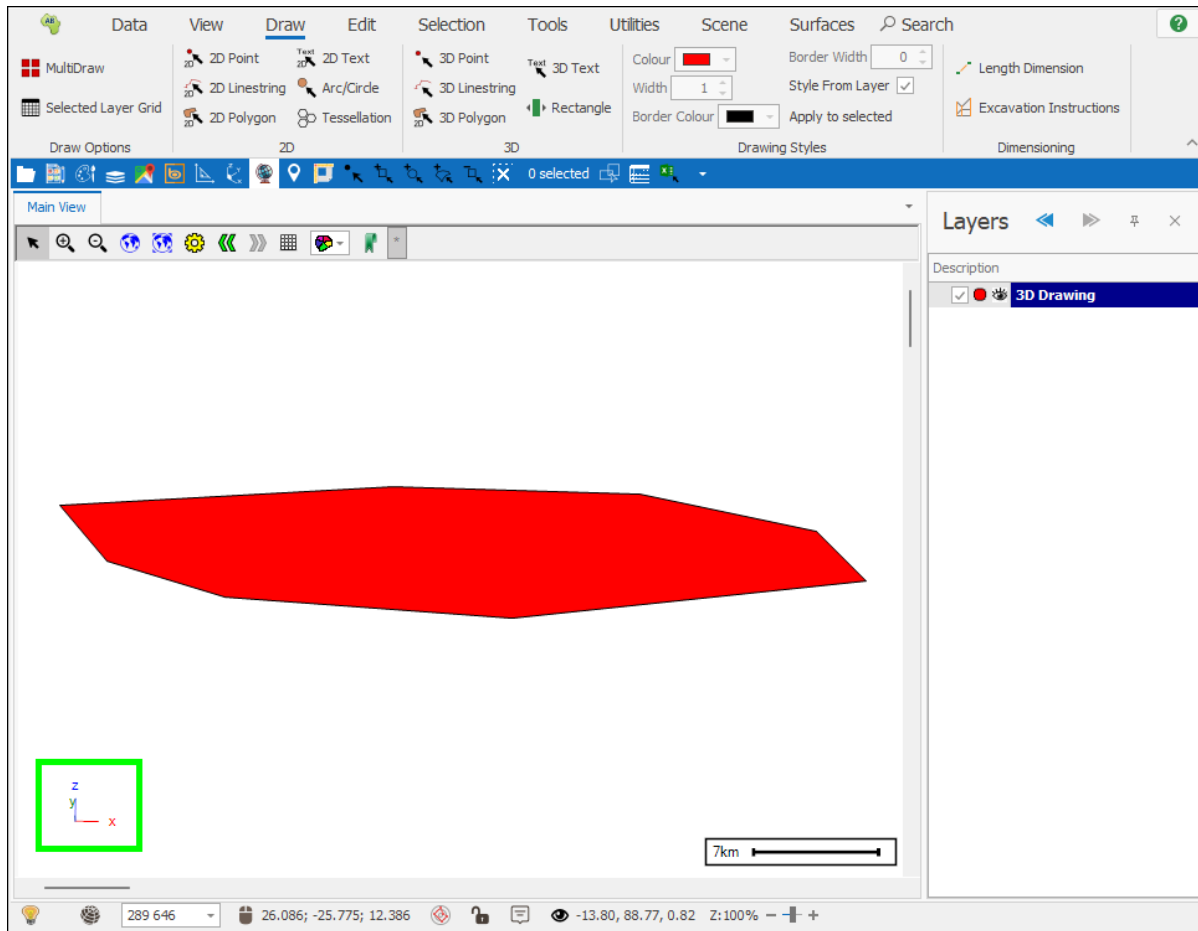


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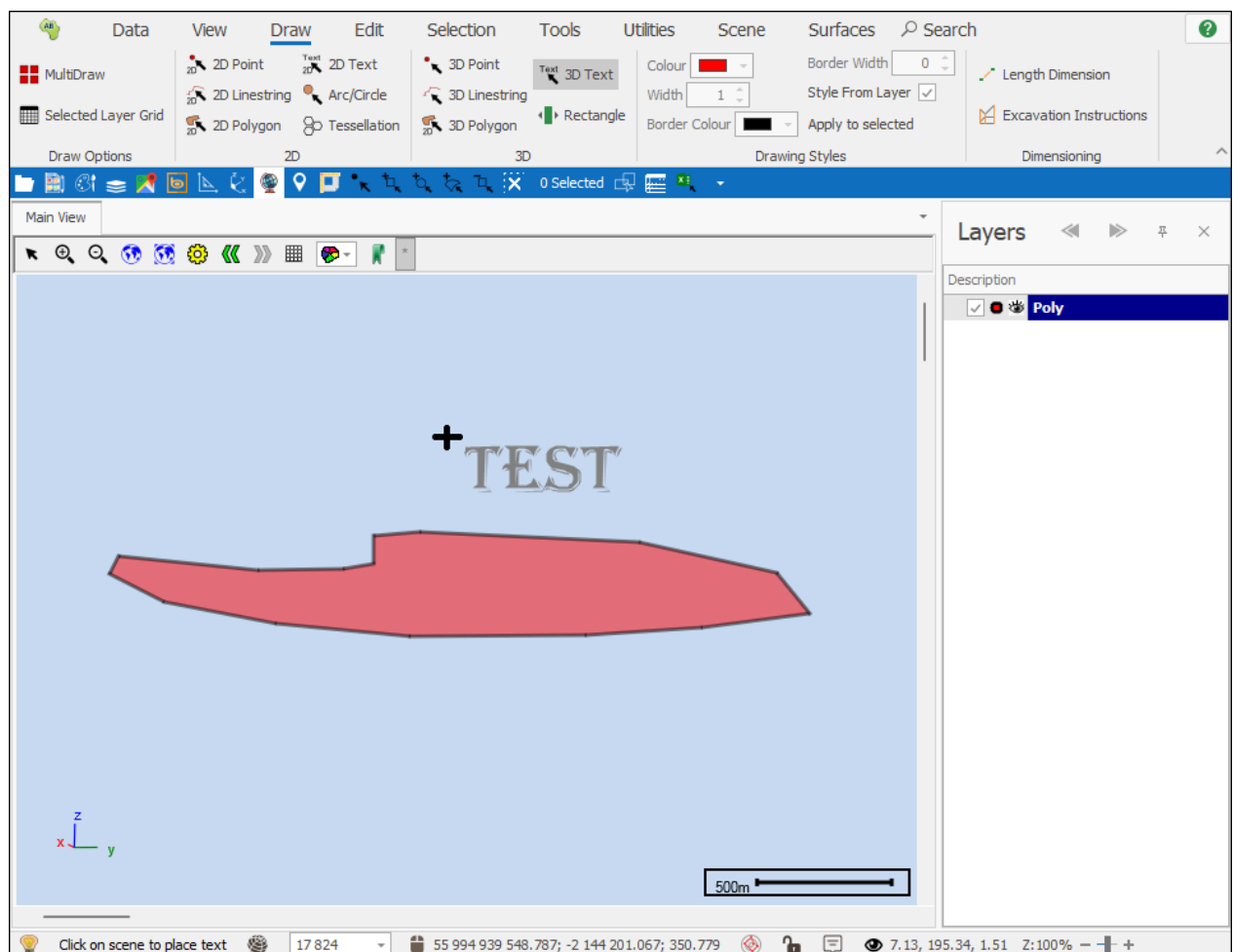
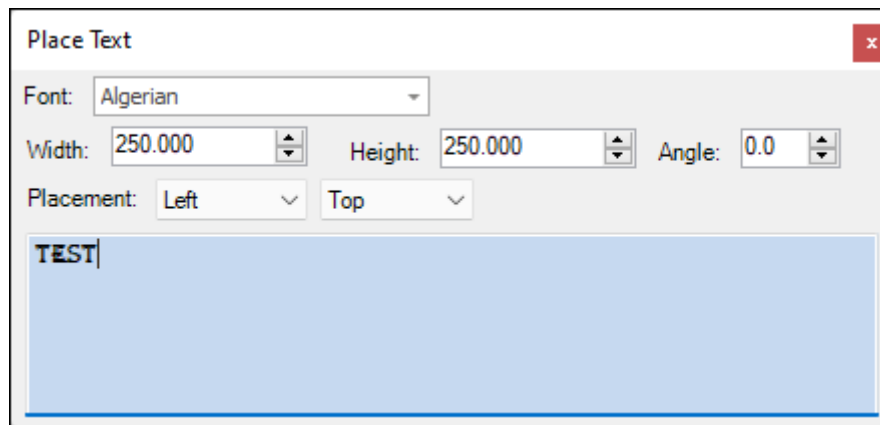




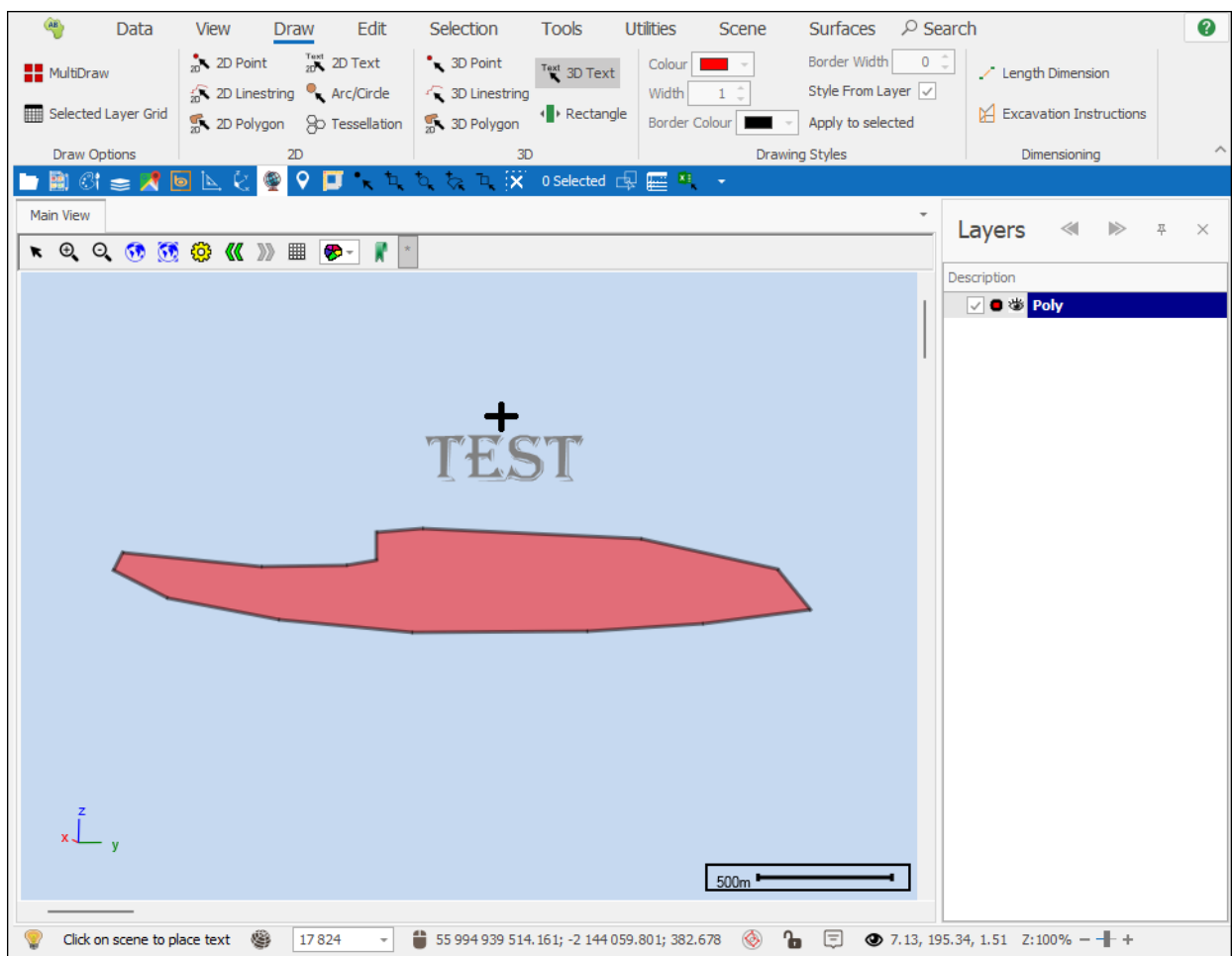
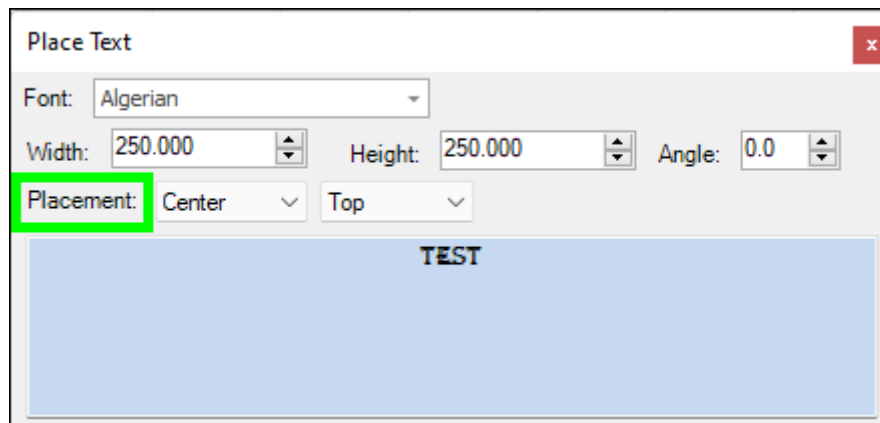
After drawing the first object you will need to click on the tool to make it active again for each new object you draw, if you want it to stay active you will click **MultiDraw** before selecting the tool, refer to [Draw Options](#) section for data on this.

3D Text

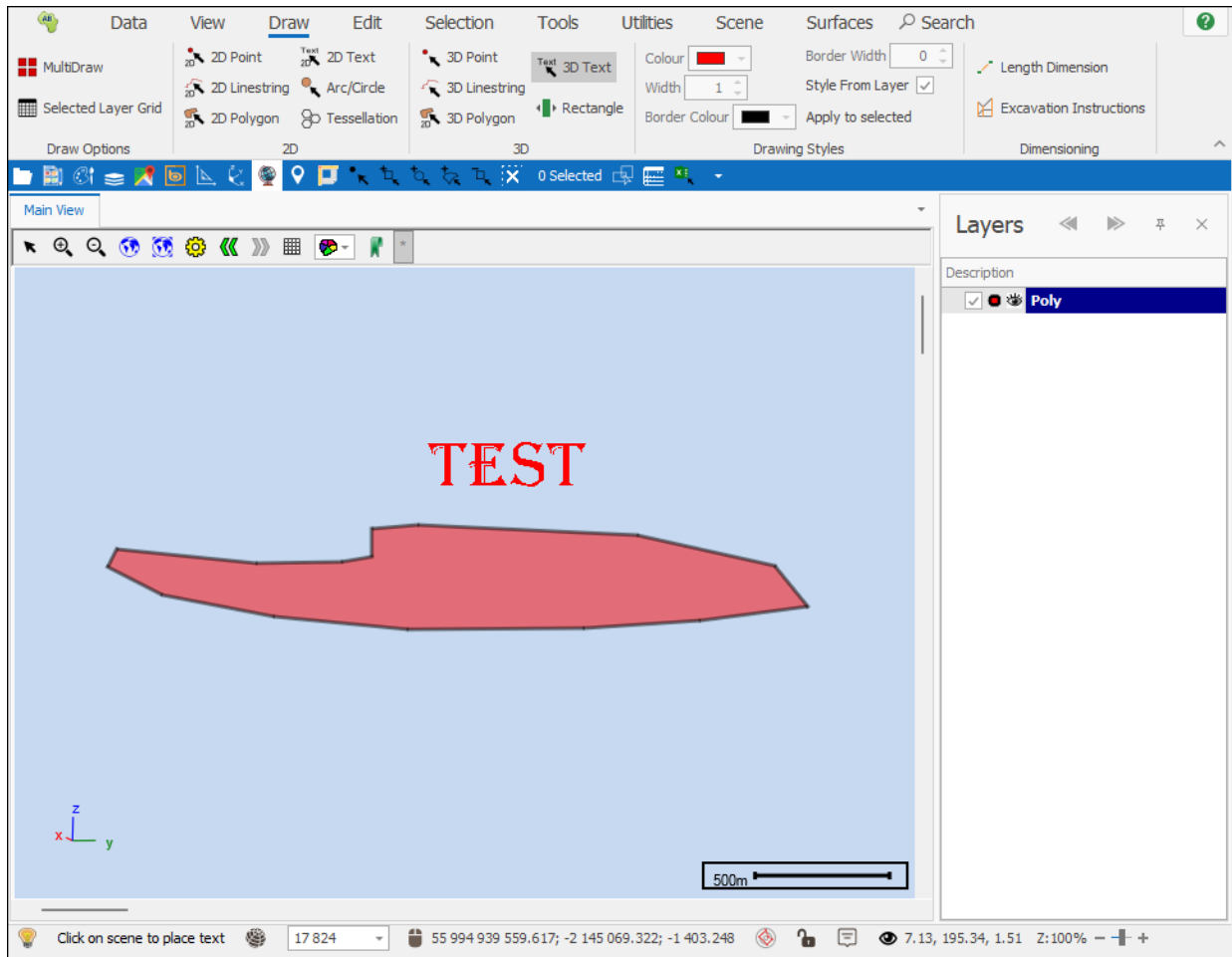
Clicking on the **3D Text** tool will bring up a dialogue where you will specify the text you want to draw and the font, size (units in meters) and angle of this text. In the box below type in the text, you will see this text then appears on your cursor as you hover in your scene:



Placement refers to the placement of the text in relation to the cursor, so you can put it to the bottom right of the cursor, the centre etc.



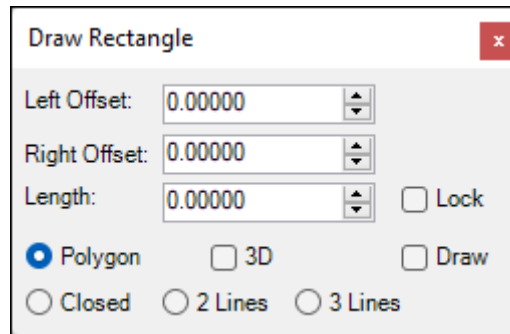
Once you have entered the text and chosen its settings, you can then just click at the point in the scene where you want to place it and it will be drawn:



You can keep clicking and placing the same text or type in new text in the dialogue and change its properties if you want and then place that, when you are done, exit the dialogue and the tool will no longer be active.

Rectangle

The **Rectangle** tool allows you to draw a rectangle, clicking on it brings up the following dialogue:



Draw Rectangle

Left Offset: 0.00000

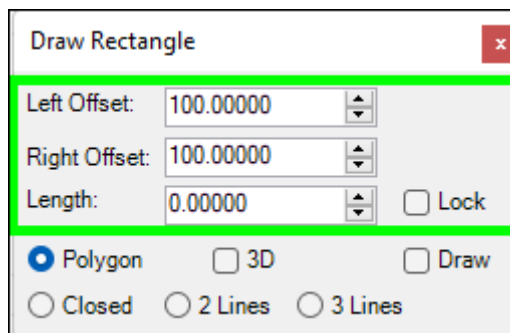
Right Offset: 0.00000

Length: 0.00000 ☐ Lock

☒ Polygon ☐ 3D ☐ Draw

☐ Closed ☐ 2 Lines ☐ 3 Lines

You will specify left and right offsets from the centre line of the rectangle, this sets the width, then you can prespecify a length for the rectangle as well and then tick on **Lock** next to it to lock this length, if you do not have **Lock** ticked on you can choose the length as you draw it, in this example I have made offsets of 100 meters on either side giving a total width of 200 meters for the rectangle, then the **Length** I have chosen not to specify:



Draw Rectangle

Left Offset: 100.00000

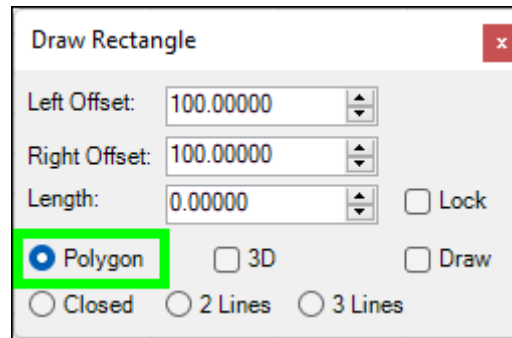
Right Offset: 100.00000

Length: 0.00000 ☐ Lock

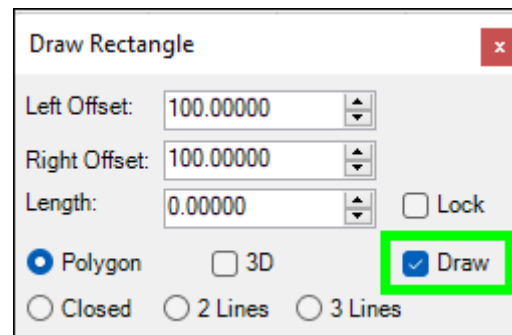
☒ Polygon ☐ 3D ☐ Draw

☐ Closed ☐ 2 Lines ☐ 3 Lines

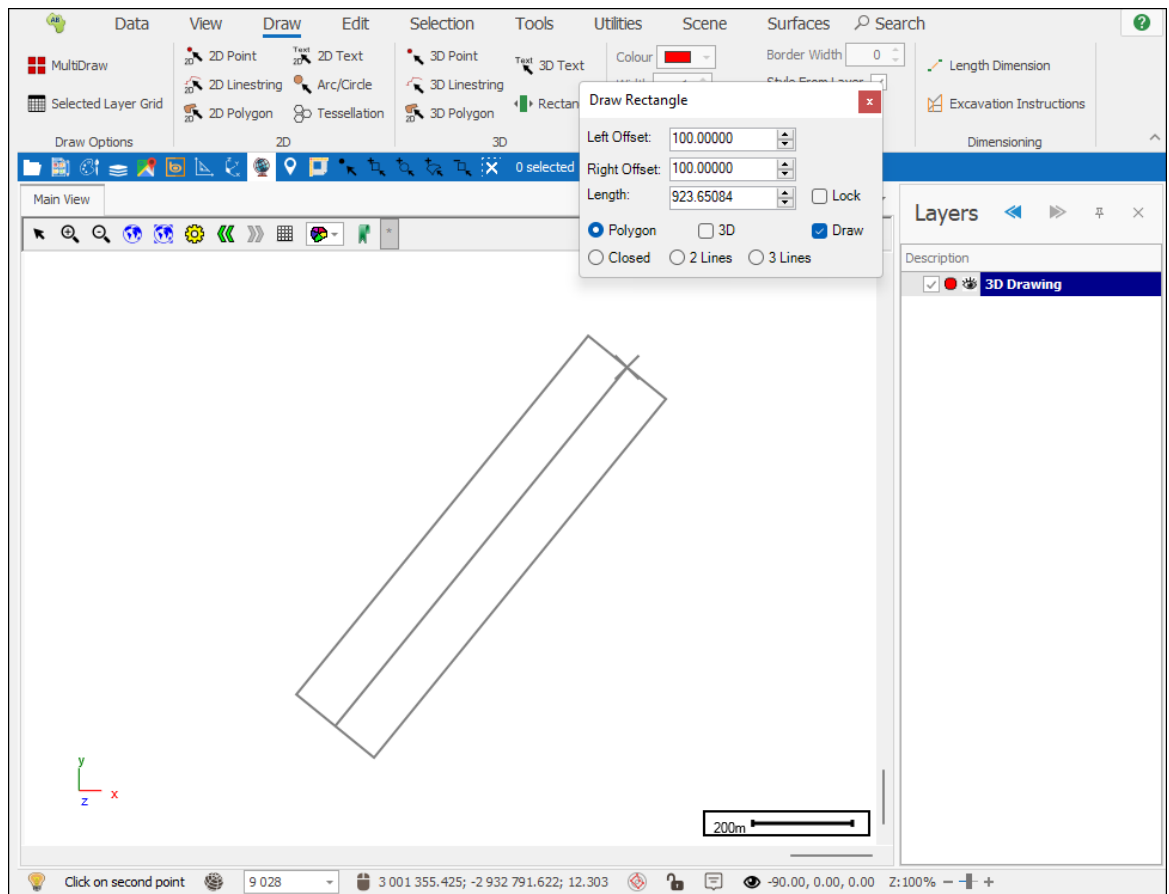
Next, choose what kind of drawing to make of the rectangle, you can choose **Polygon** (filled, solid rectangle), **Closed** (a closed linestring showing just the border of the rectangle), **2 Lines** (2 lines showing the border of either side of the rectangle), **3 Lines** (2 Lines showing outside borders of either side of rectangle and 1 centreline) and lastly you can choose whether you want this to be a **3D** rectangle or not, in this example I will do a 2D **Polygon**:

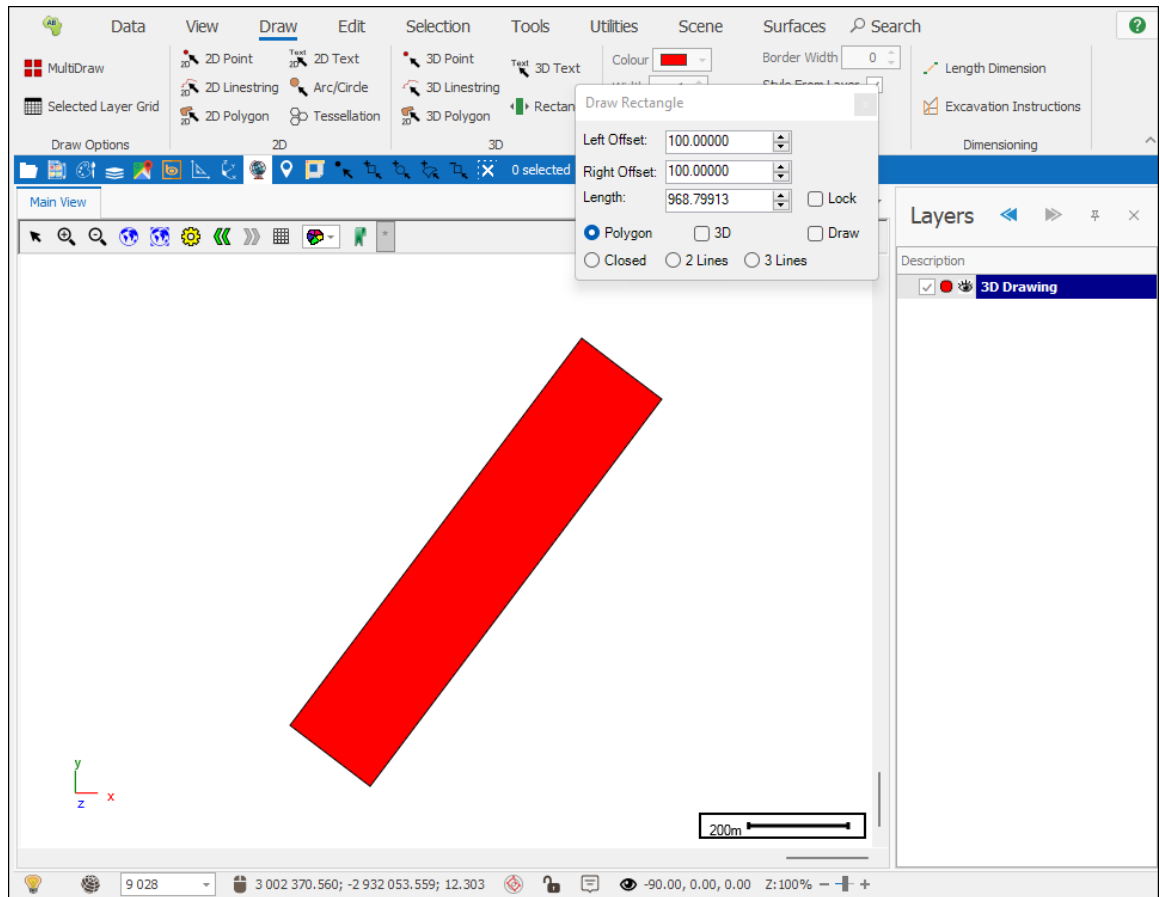


Lastly, tick on **Draw** to start drawing, click in the scene at the desired point and then move your mouse to place the rectangle exactly as you want, click one more time to finish (as you are drawing, you can right click to unplace the rectangle and replace again at another point):

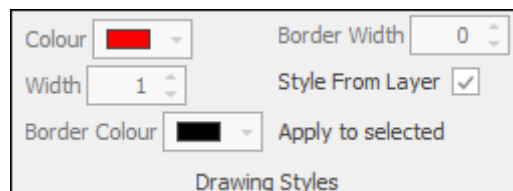


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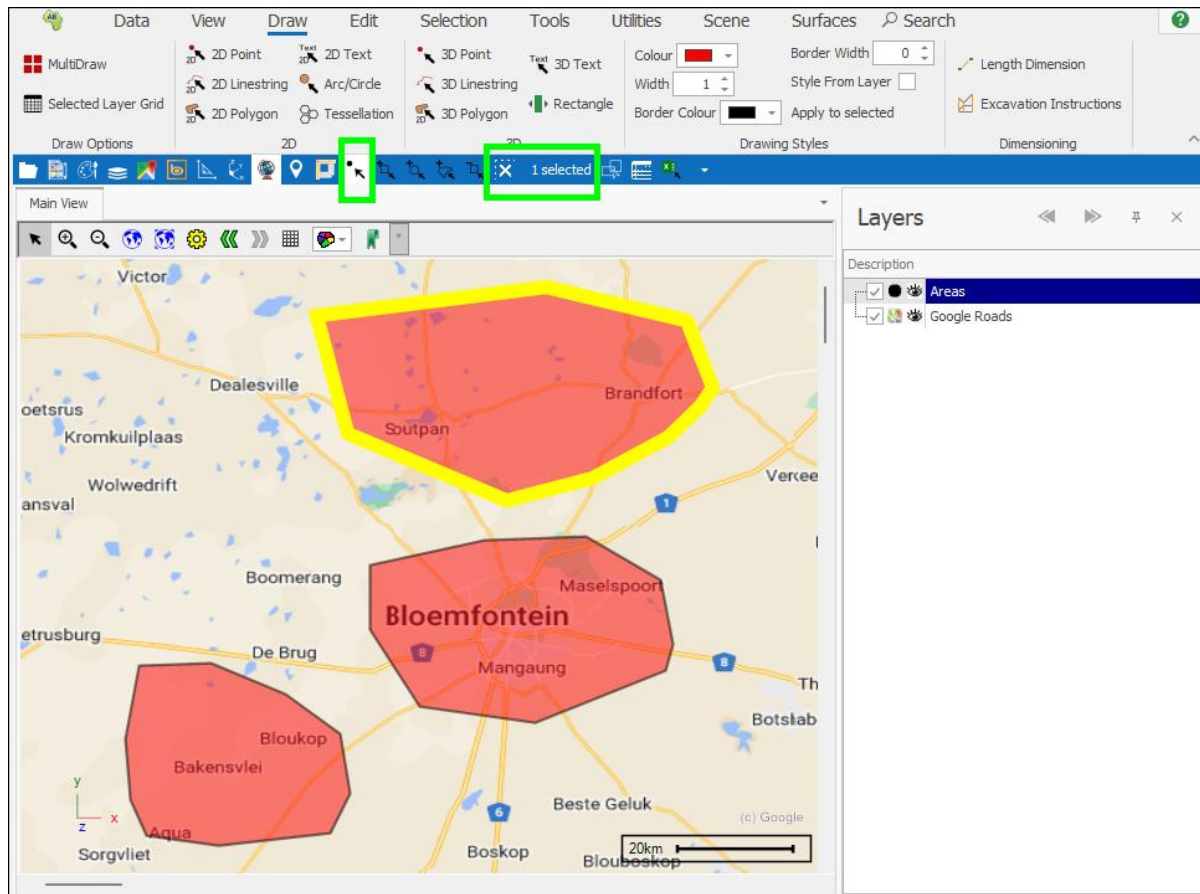
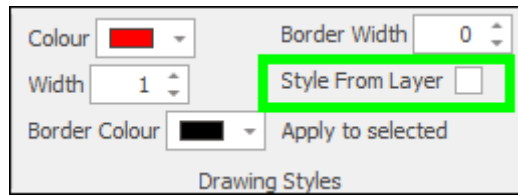


Drawing Styles

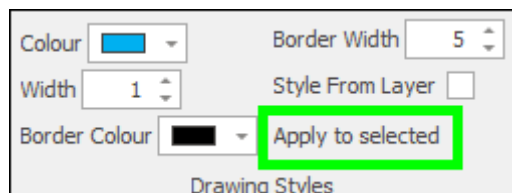


The **Drawing Styles** section of the Draw tab is where you can specify styling for specific elements in a layer. The styling for a layer is set in the Layer Properties of that layer, but you can choose to style specific elements in that layer differently.

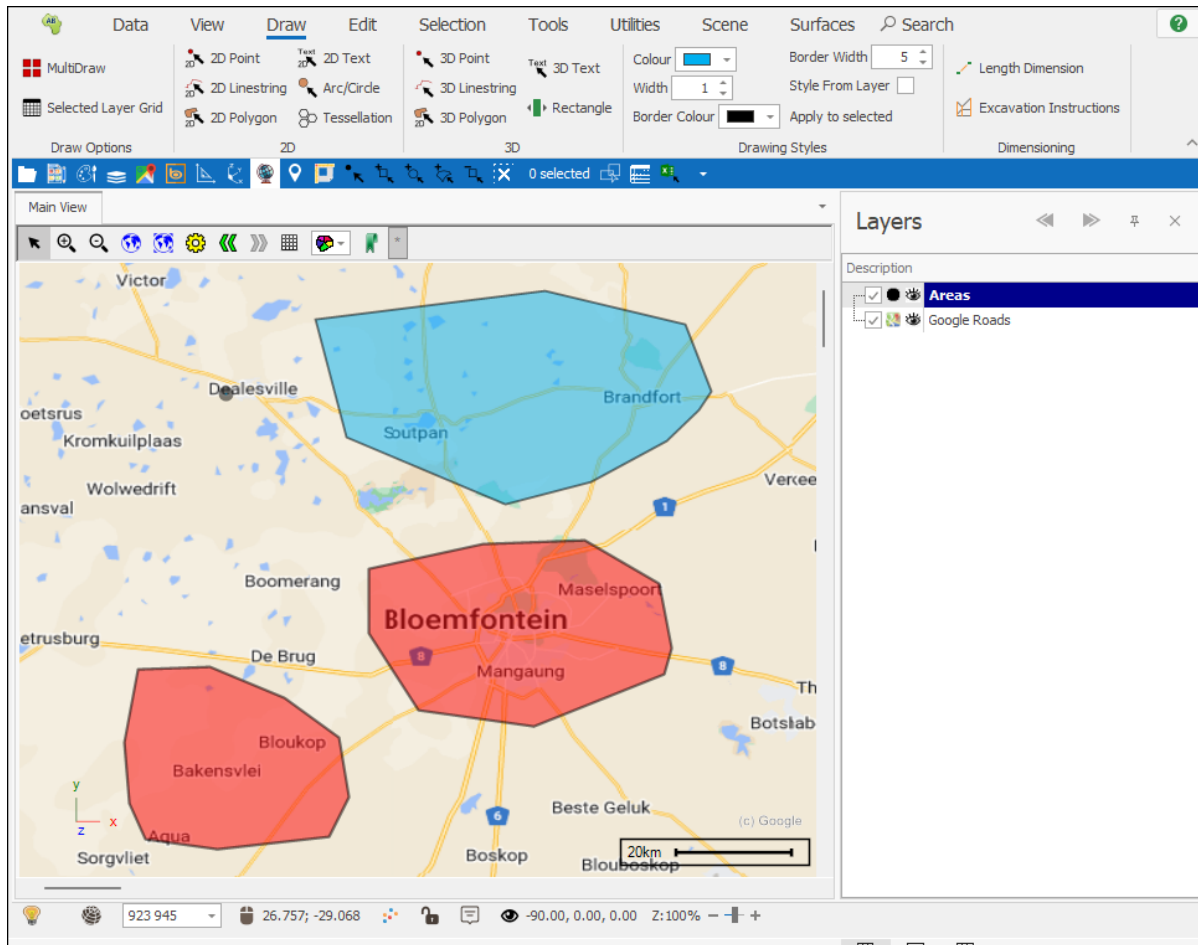
First you would tick off **Style From Layer**, this will ungrey these settings and allow you to edit them. Then you would select the element/ elements you want to style with one of the selection tools:



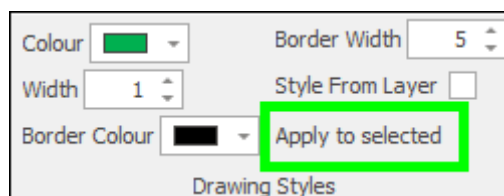
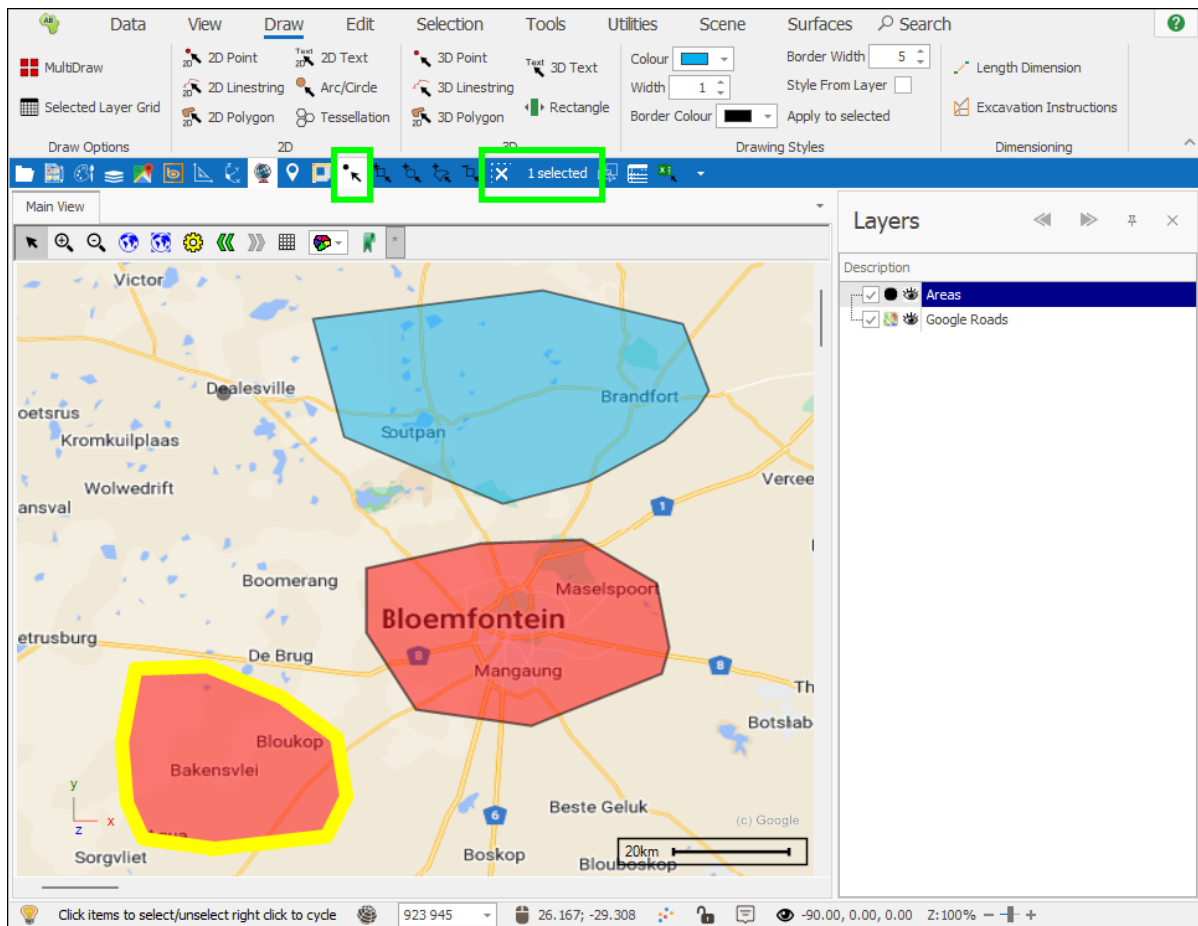
Then choose the properties you would like to set for that selected element, when done click **Apply to selected** and the styling will be applied to that element:

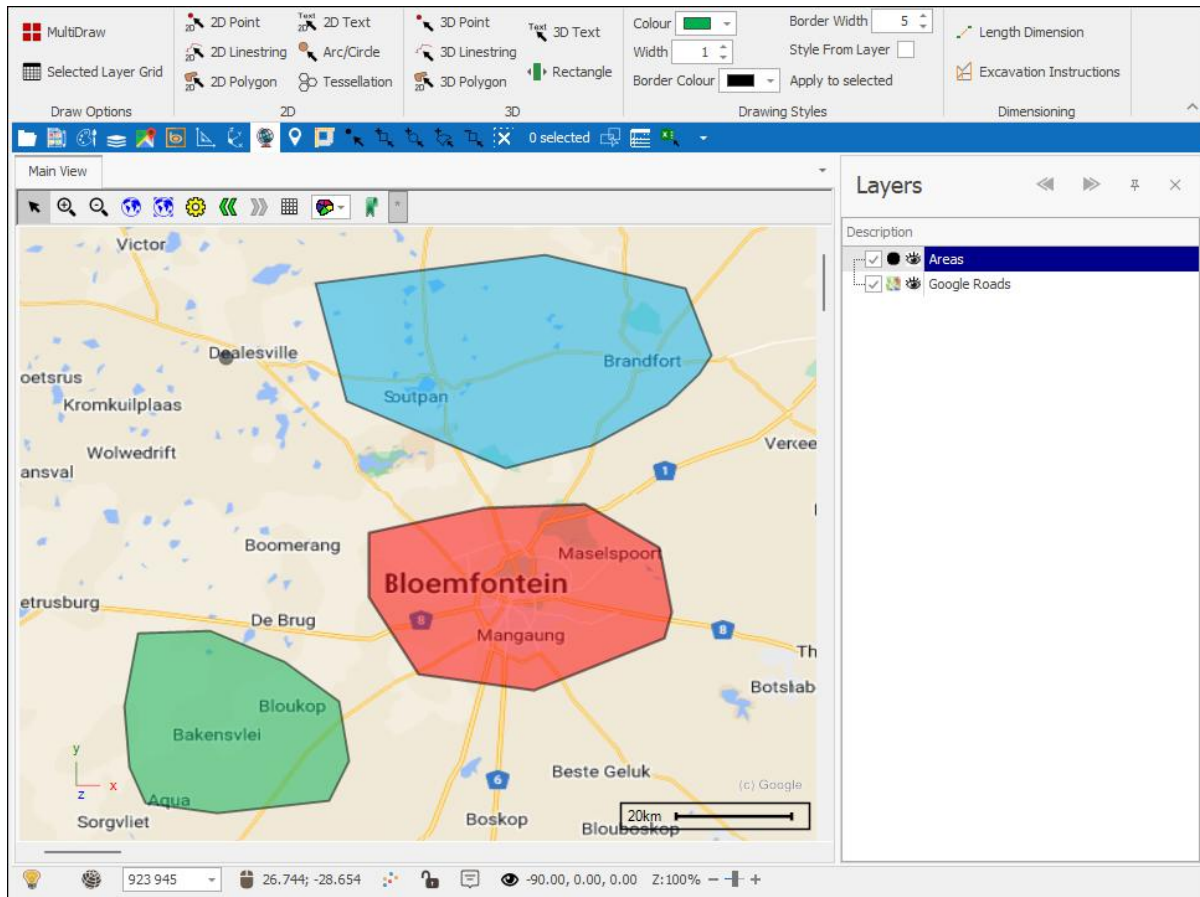


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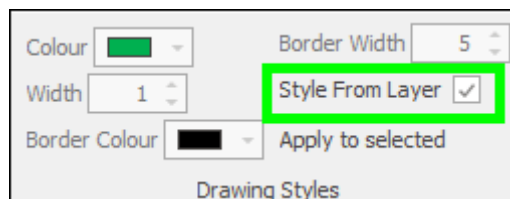


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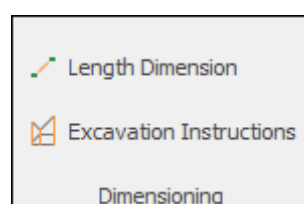




As long as **Style From Layer** remains ticked off every new element you draw will have the styling specified here. Once you are done setting styling for specific elements you should tick this back on, and these settings will be greyed out again:



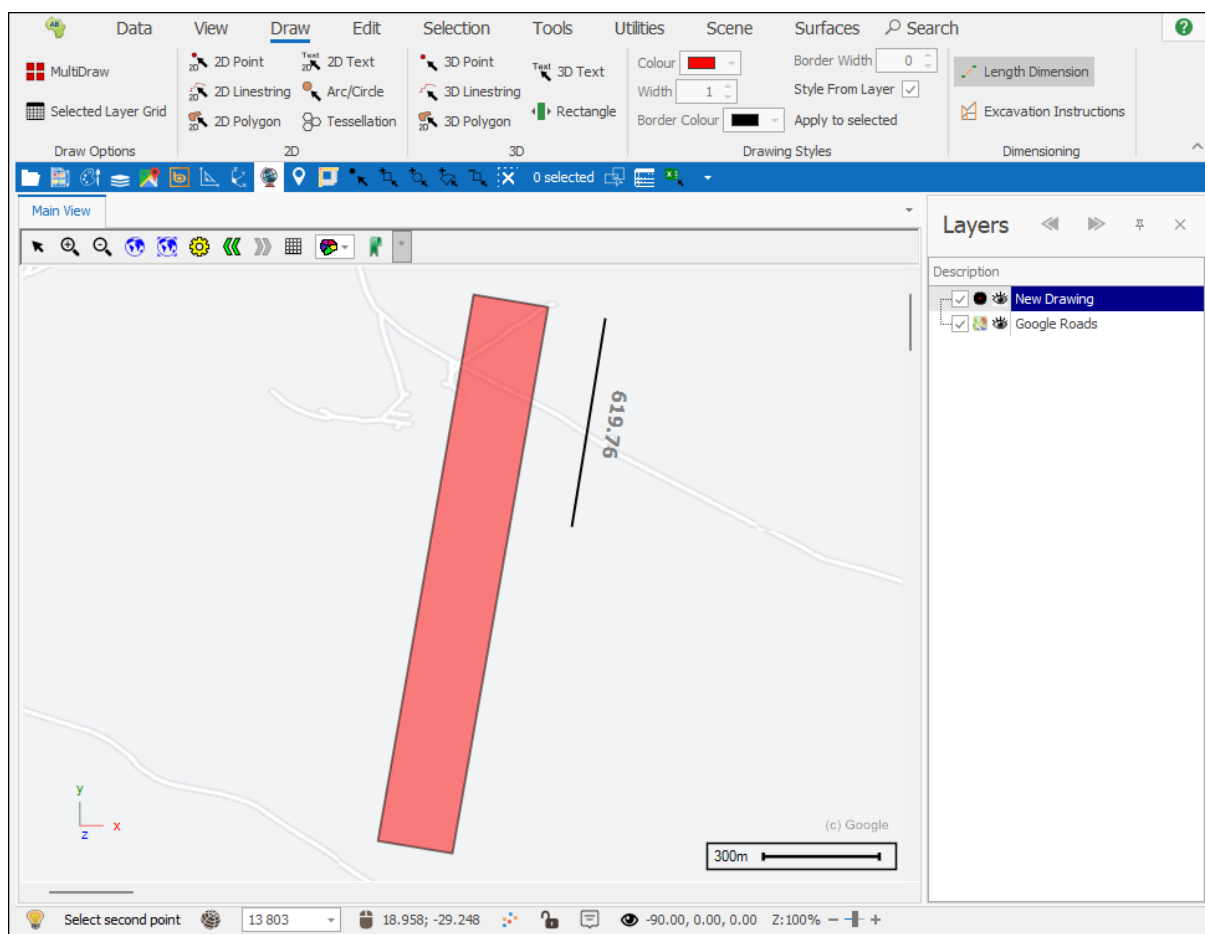
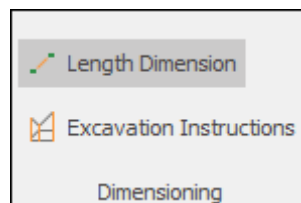
Dimensioning

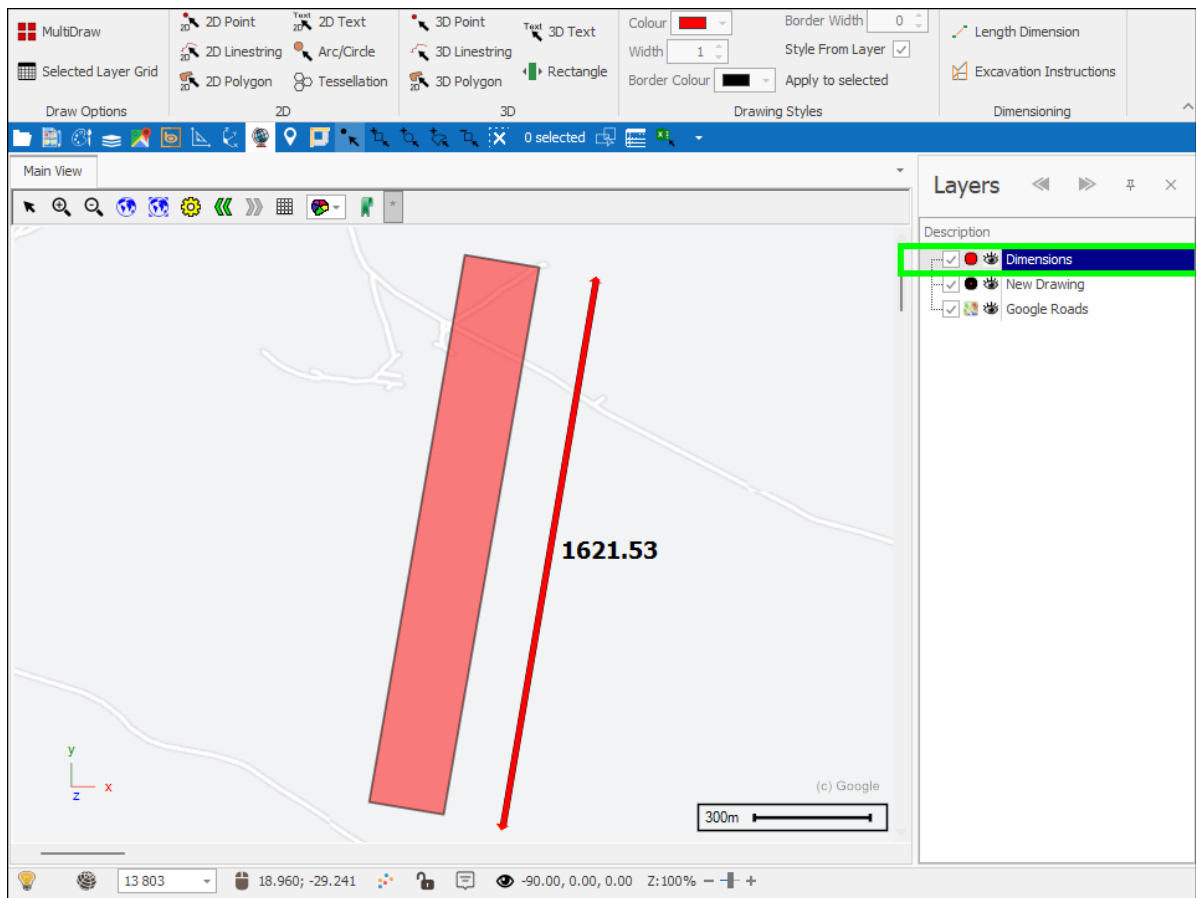


In the **Dimensioning** section of the Draw tab you can draw elements specifying dimensions of various sorts.

Length Dimension

The **Length Dimension** tool can be used to draw a length indicator in metres next to objects in your scene, simply click on the tool to make it active, it will then be greyed, then click in your scene and move to the end point, then click again to finish (while drawing you can right click to undo and then replace it):

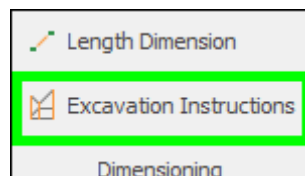




Your length dimension has been drawn and added in a new layer called **Dimensions**. This layer can of course be styled like any other in its Layer Properties.

Excavation Instructions

The **Excavation Instructions** tool is covered in the [Excavation Instructions](#) guide:



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