PrimeThought
Software Solutions

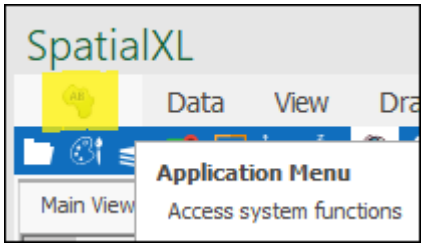
SurfaceIQ Manual

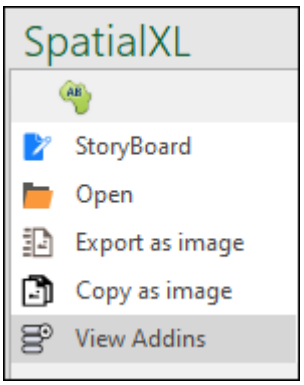
Contents

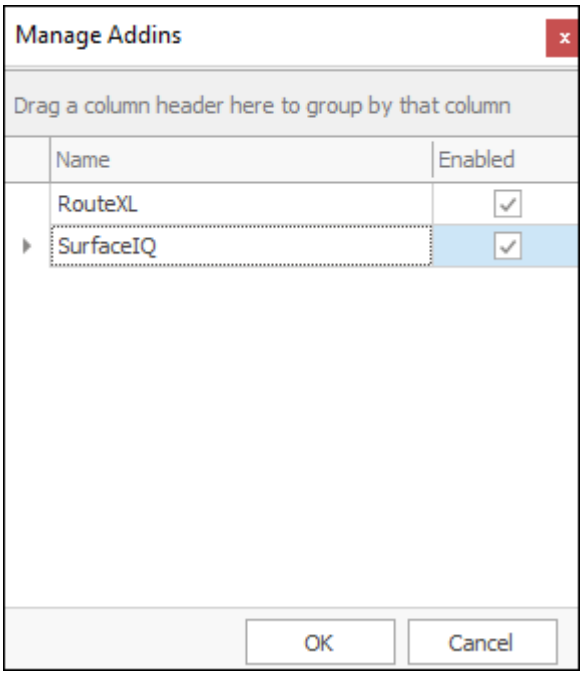
Intro

This is a manual on all the features available with SurfaceIQ. SurfaceIQ is an add-in to SpatialXL and all our other spatial products that allows you to build and work with surfaces of various kinds.

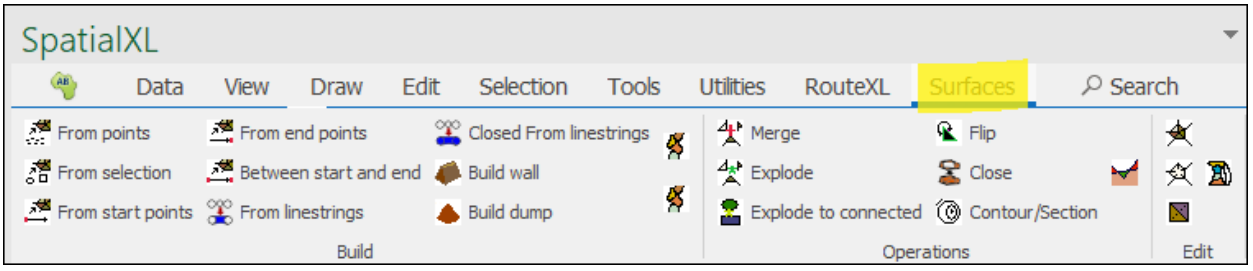
To see if you have SurfaceIQ look in the **Application Menu**> **View Addins:**



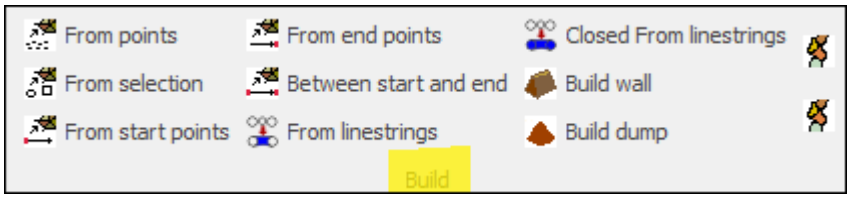




The tools and features available from SurfaceIQ are to be found in the **Surfaces** tab:



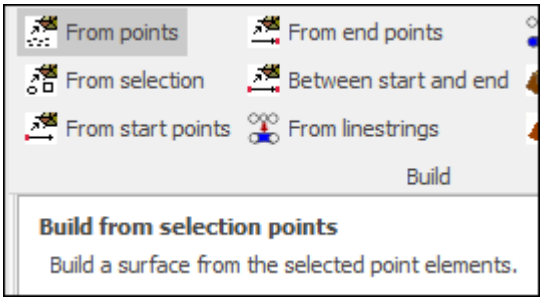
We will start by covering the features in the **Build** section of the tab:



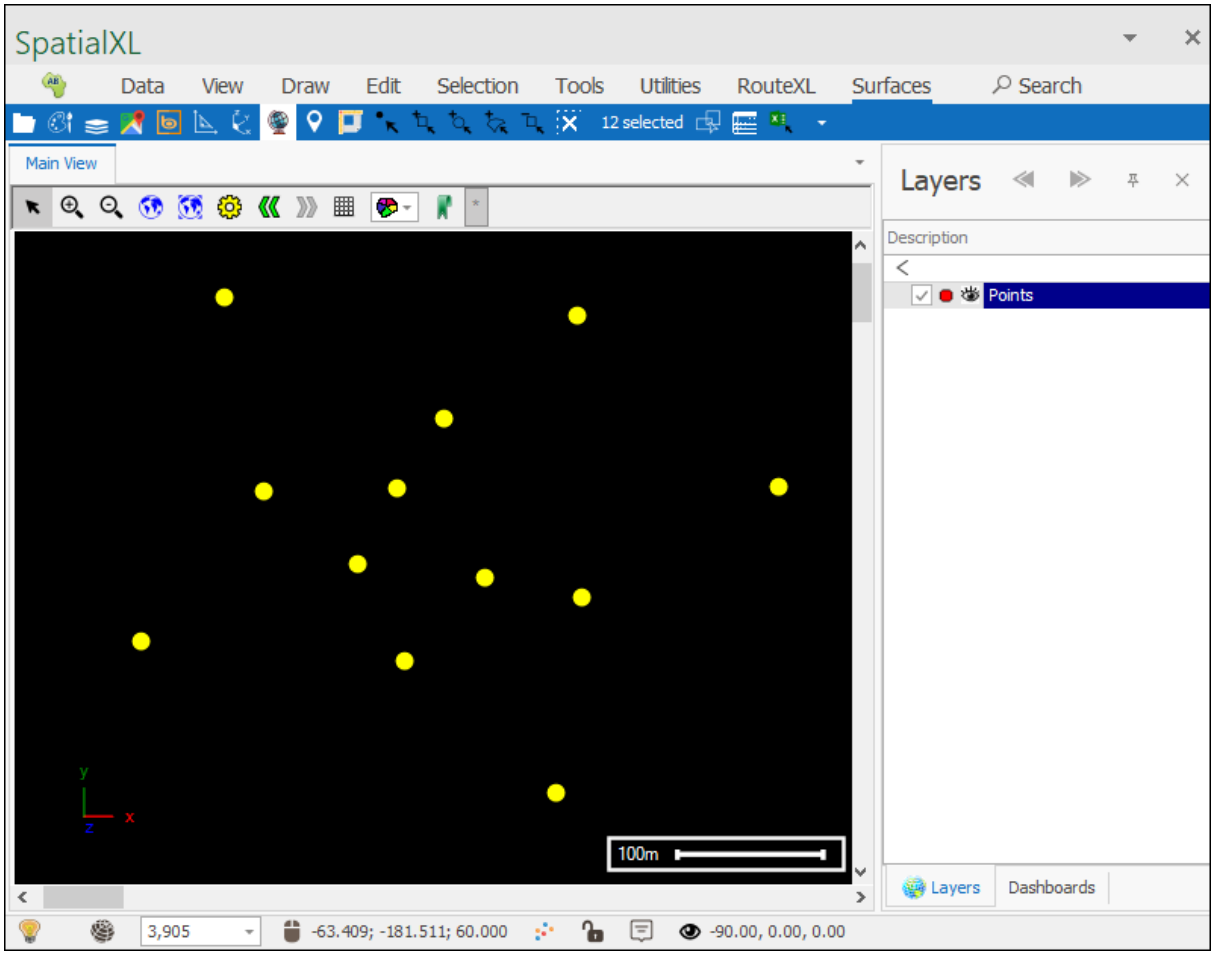
Build

From Points

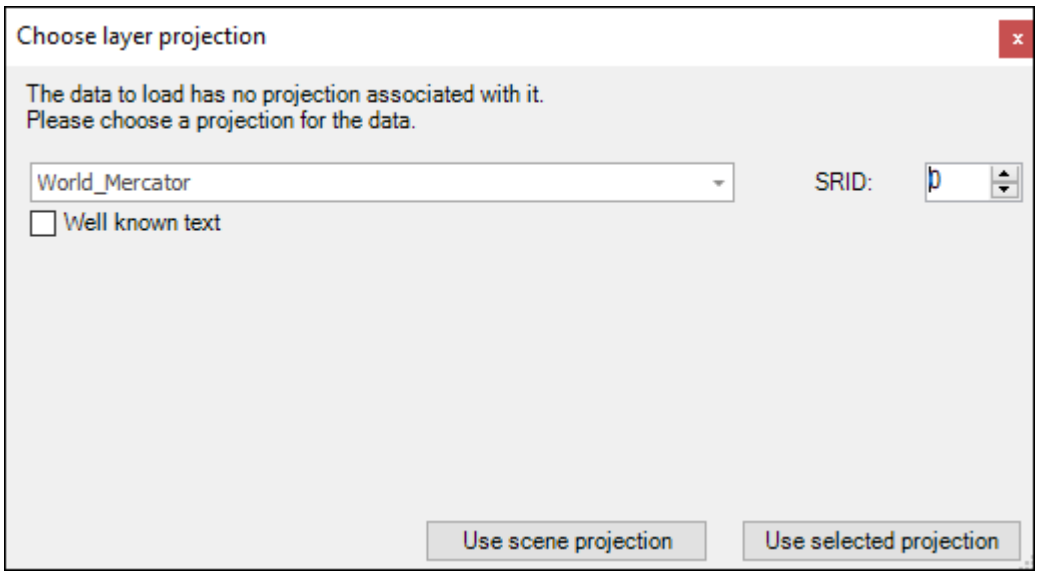
First we have the **From points** tool which will build a surface from selected points in your scene:

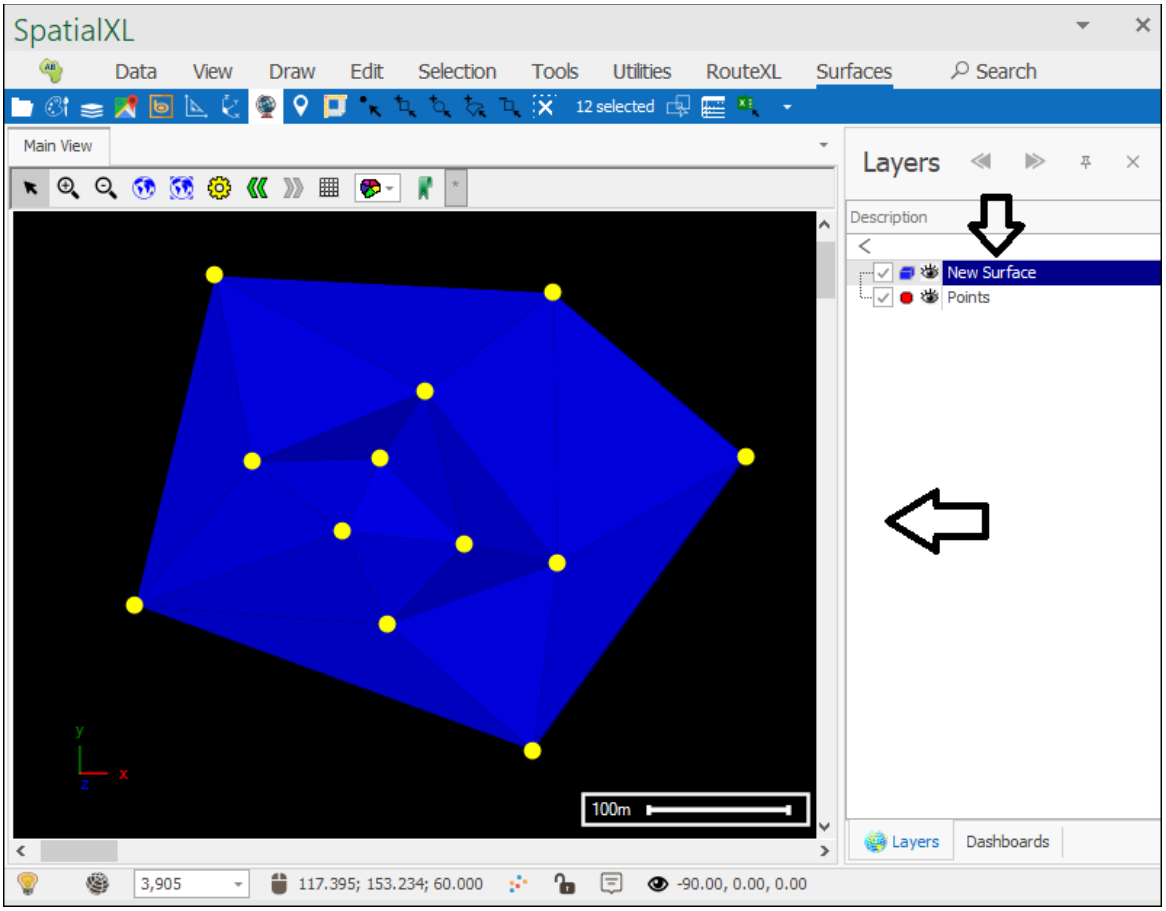


As the first step always, we start by selecting the elements in the scene that we would like to build a surface out of:



You can then go ahead and click **From points**. Now, any surface you create will be drawn to any layer that you have set as active, if you have no layer set as active then you will be prompted to create a new layer, you will just be asked to choose the projection and then your new layer will be created for you:


Choose layer projection
The data to load has no projection associated with it.
Please choose a projection for the data.
World_Mercator
SRID:
0
Well known text
Use scene projection
Use selected projection


SpatialXL
Data
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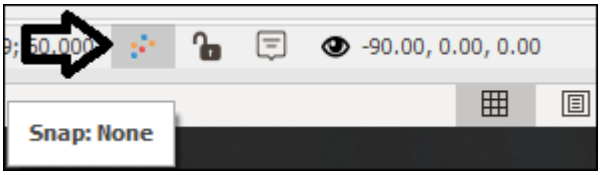
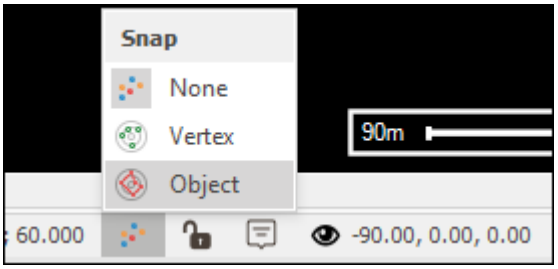
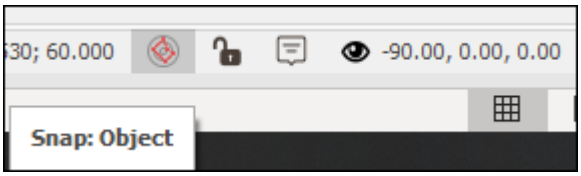
Selection
Tools
Utilities
RouteXL
Surfaces
Search
12 selected
Main View
Layers
Description
New Surface
Points
100m
Layers
Dashboards
3,905
117.395; 153.234; 60.000
-90.00, 0.00, 0.00

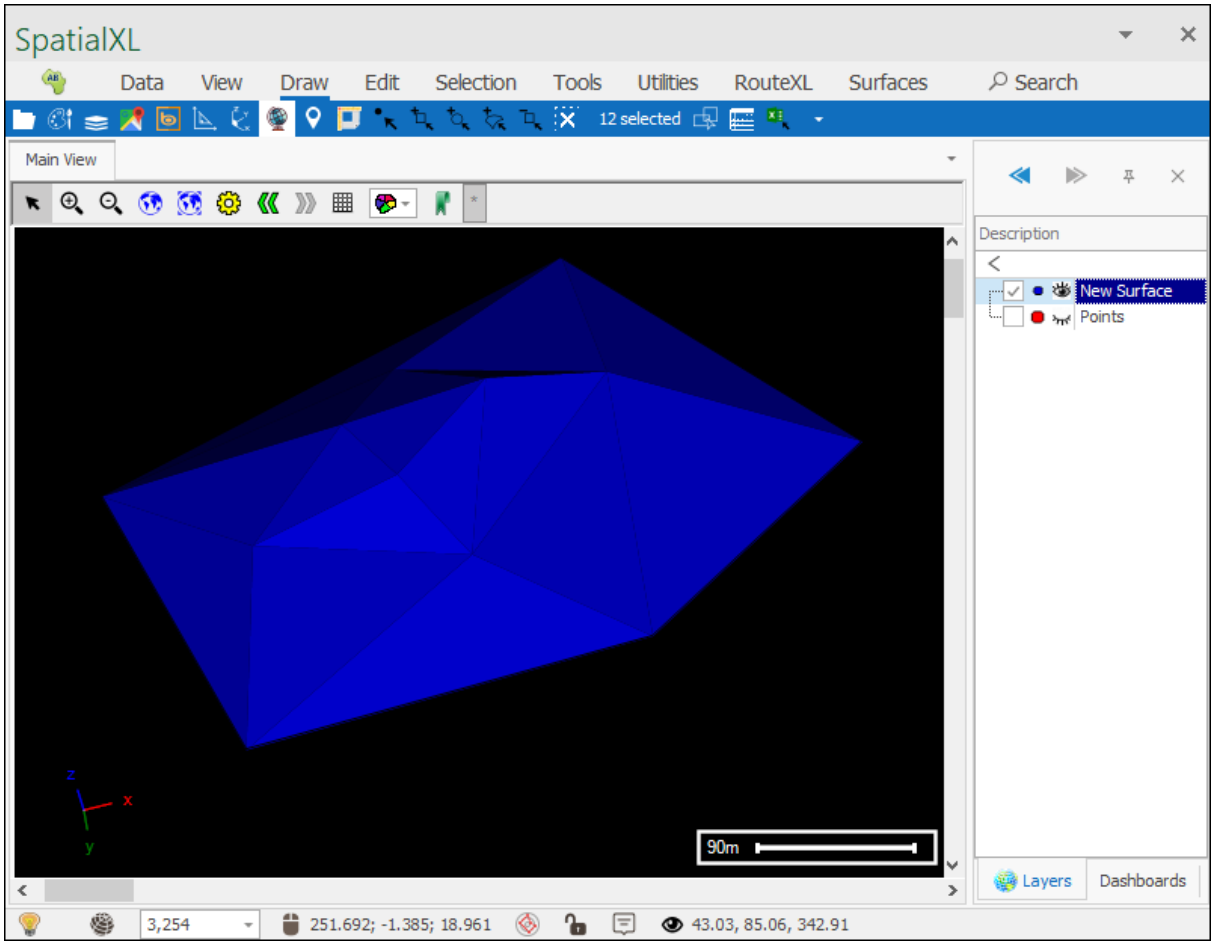
Your surface has been created and you can then turn off the points layer and rotate the surface to see it clearly. To rotate a surface or any 3D object simply choose one of the **Snap** tools by clicking here at the bottom of the spatial pane:





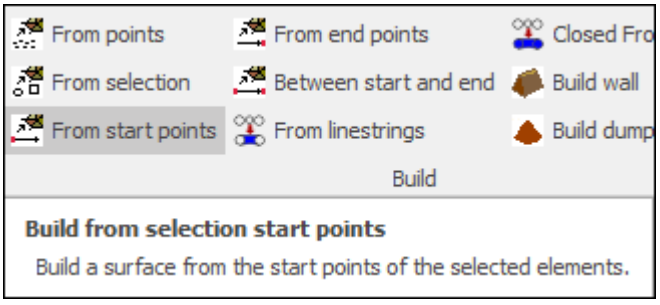


Then hover your mouse over your surface until the cursor turns into a star figure (this means it has found a point to snap to) and then hold down ctrl and click and drag to rotate your surface around:

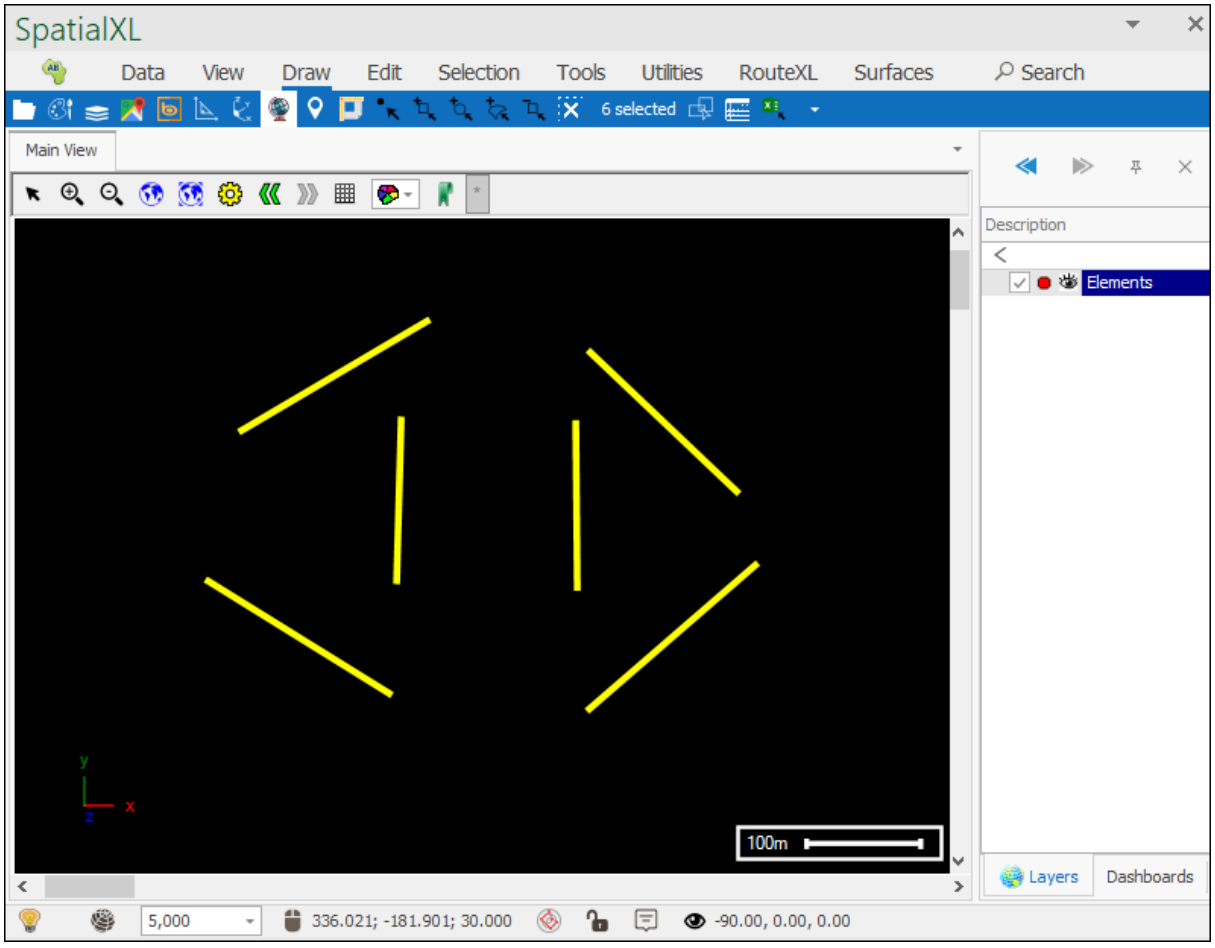


From start points

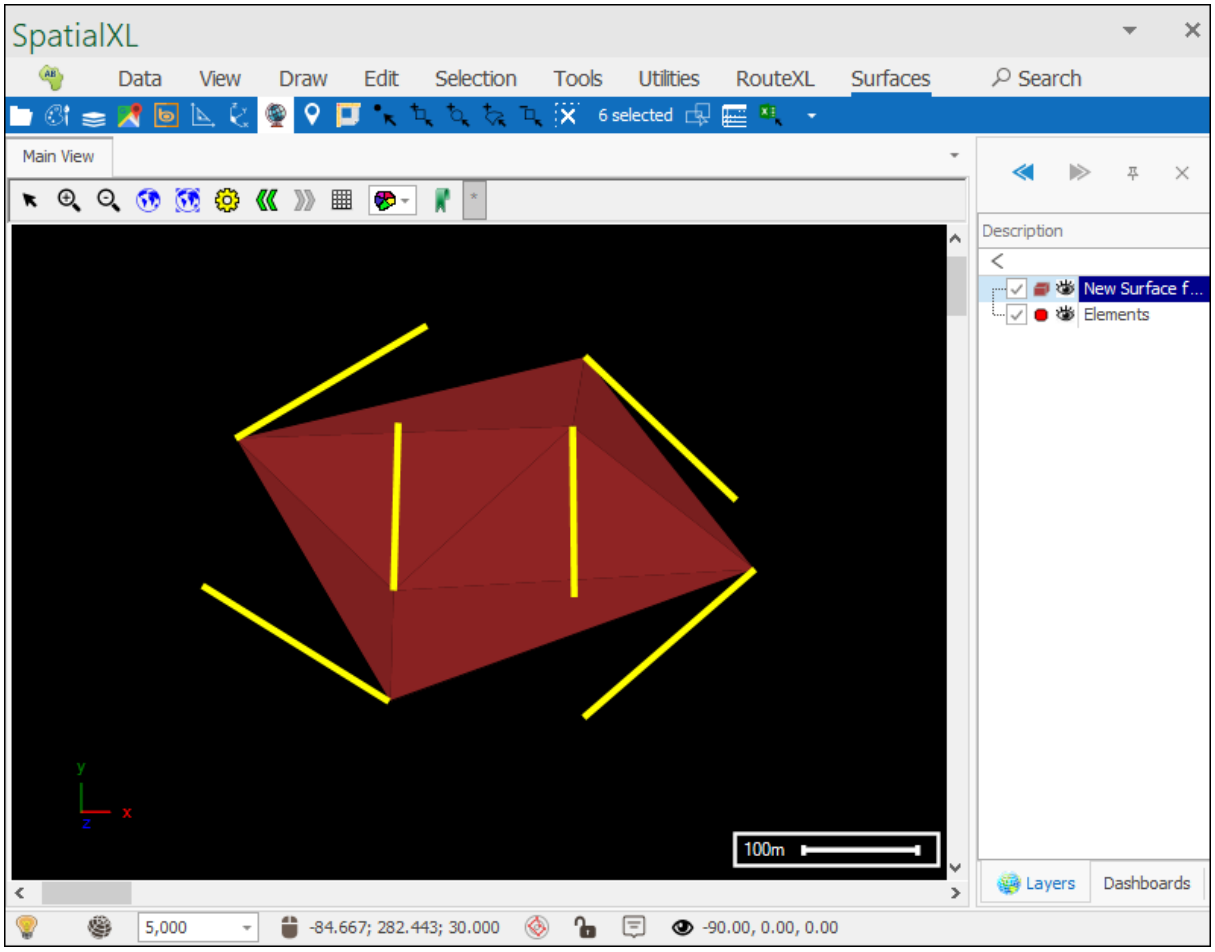
Next is the **From start points** tool which will build a surface from the start points of selected elements only:



First select the elements:



Then click **From start points** and your surface will be created: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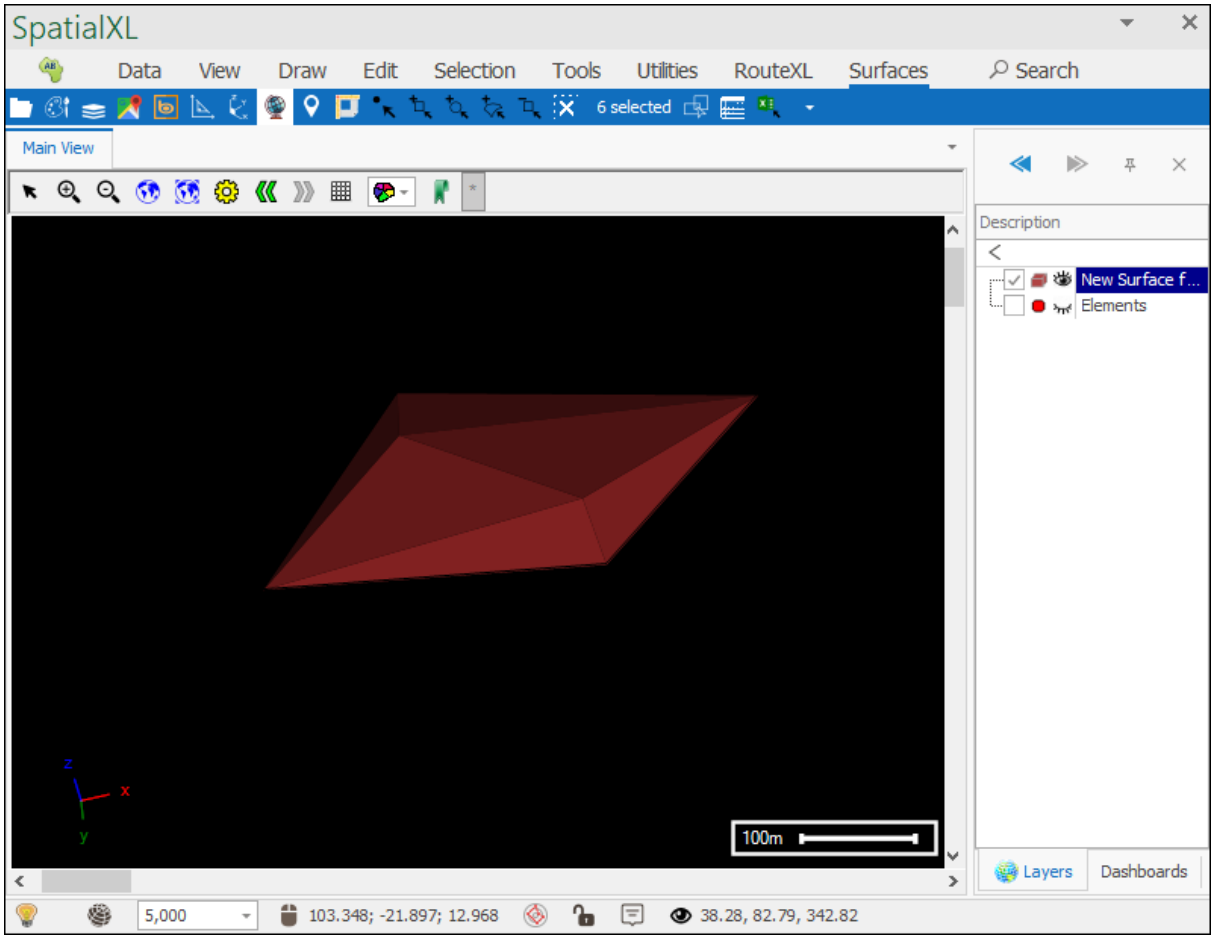
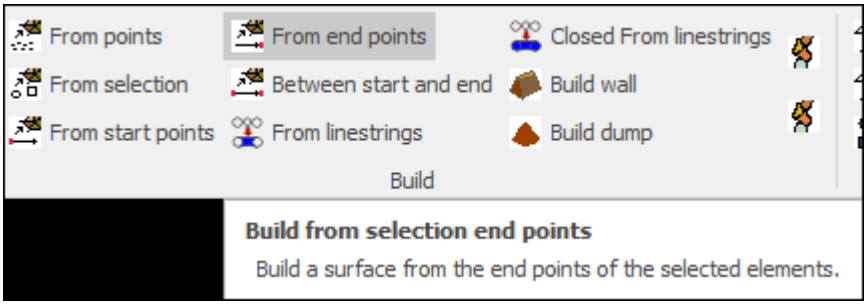
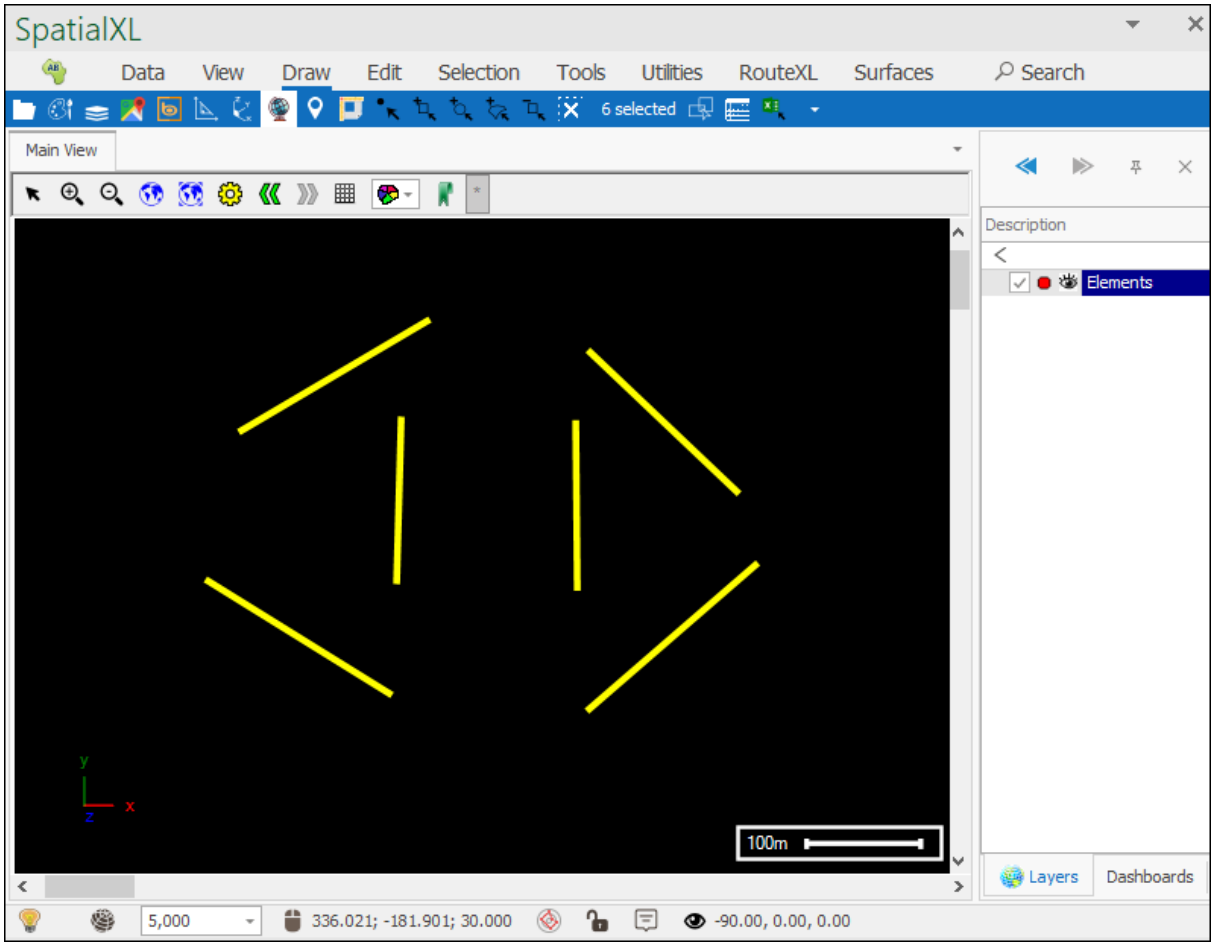


From end points

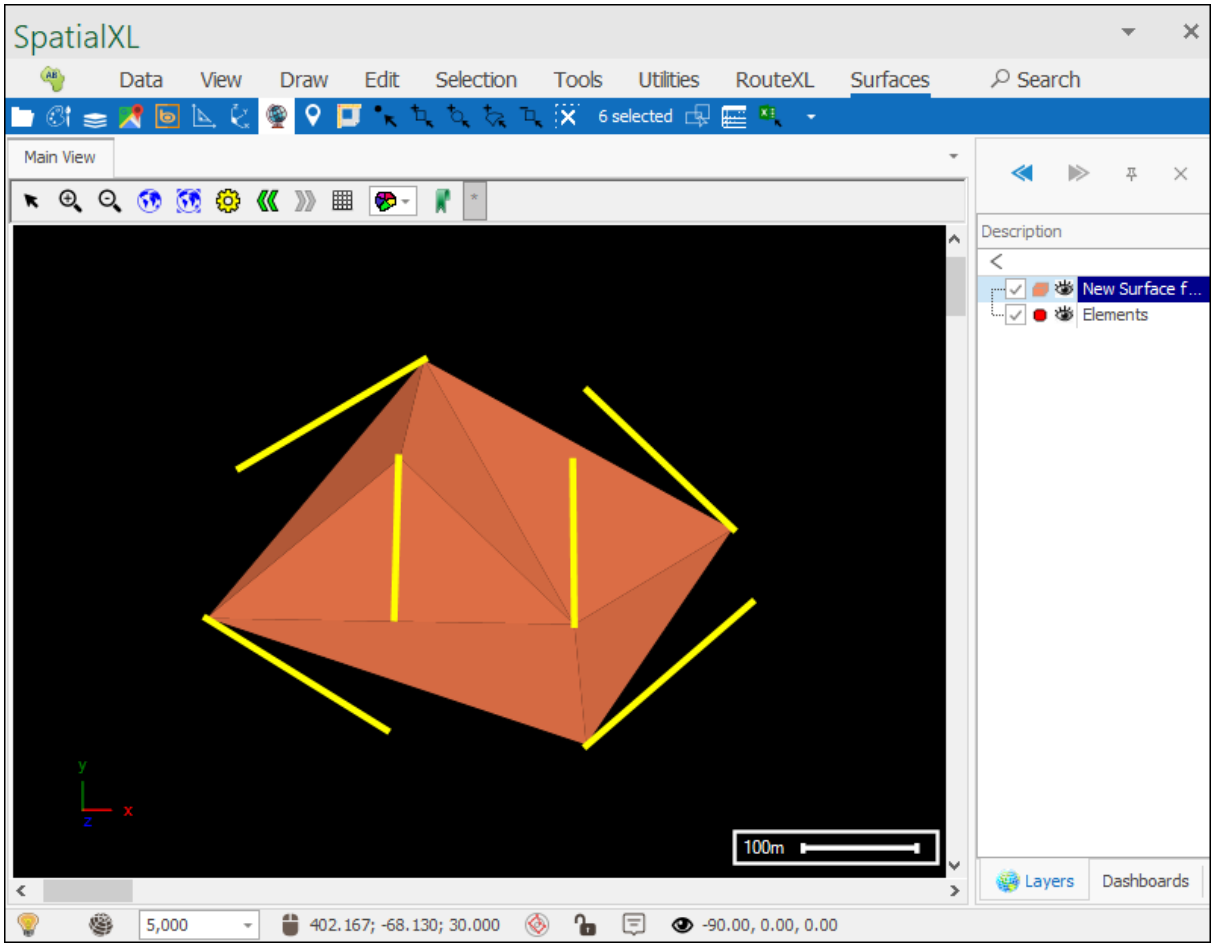
Next is the **From end points** tool which will build a surface from the end points of selected elements only:



First select your elements:



Then click **From end points** and your surface will be created: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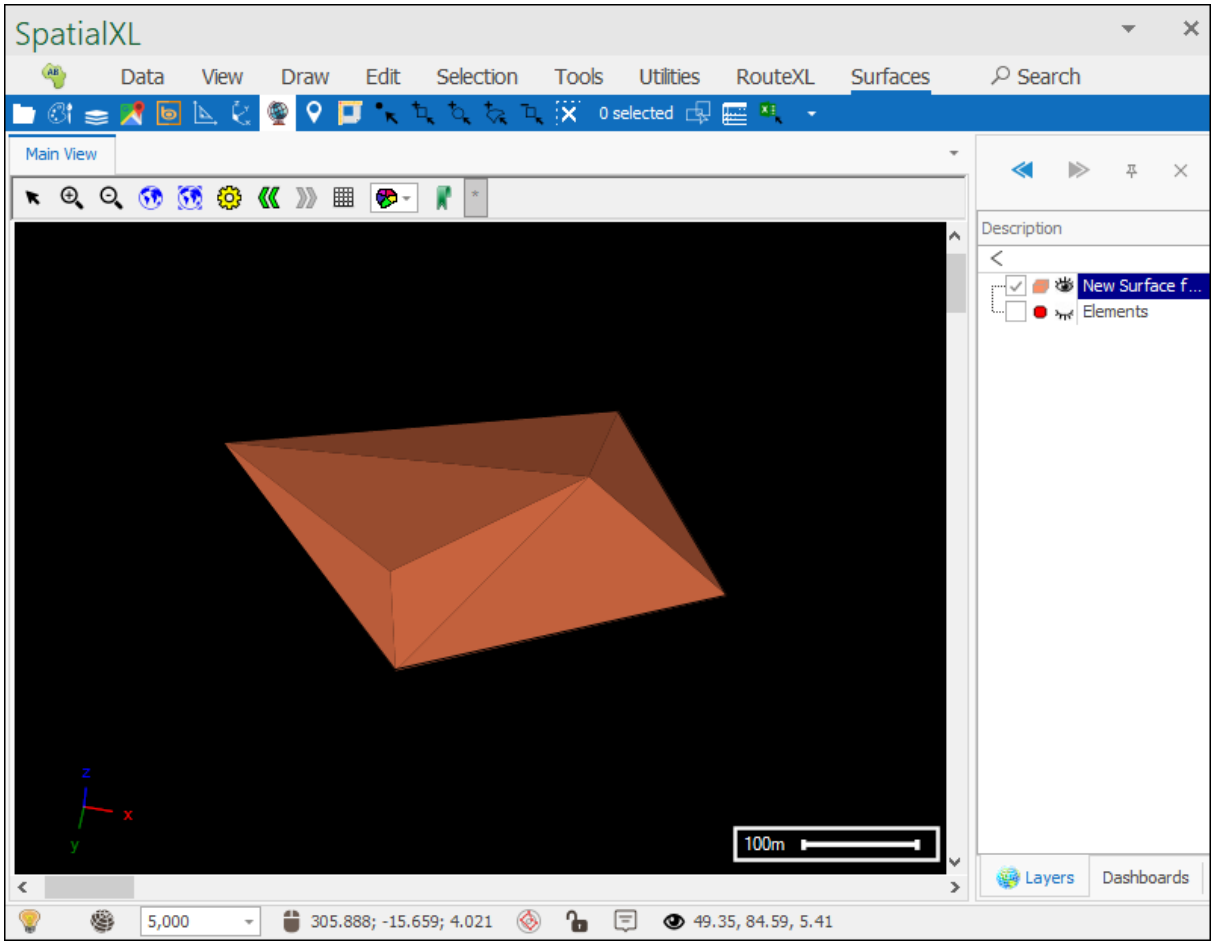
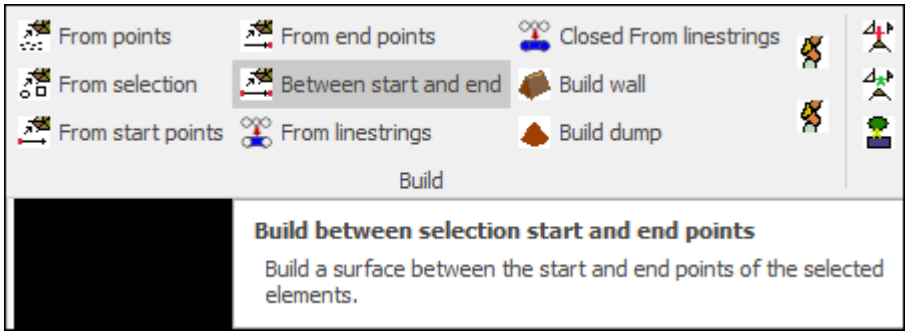
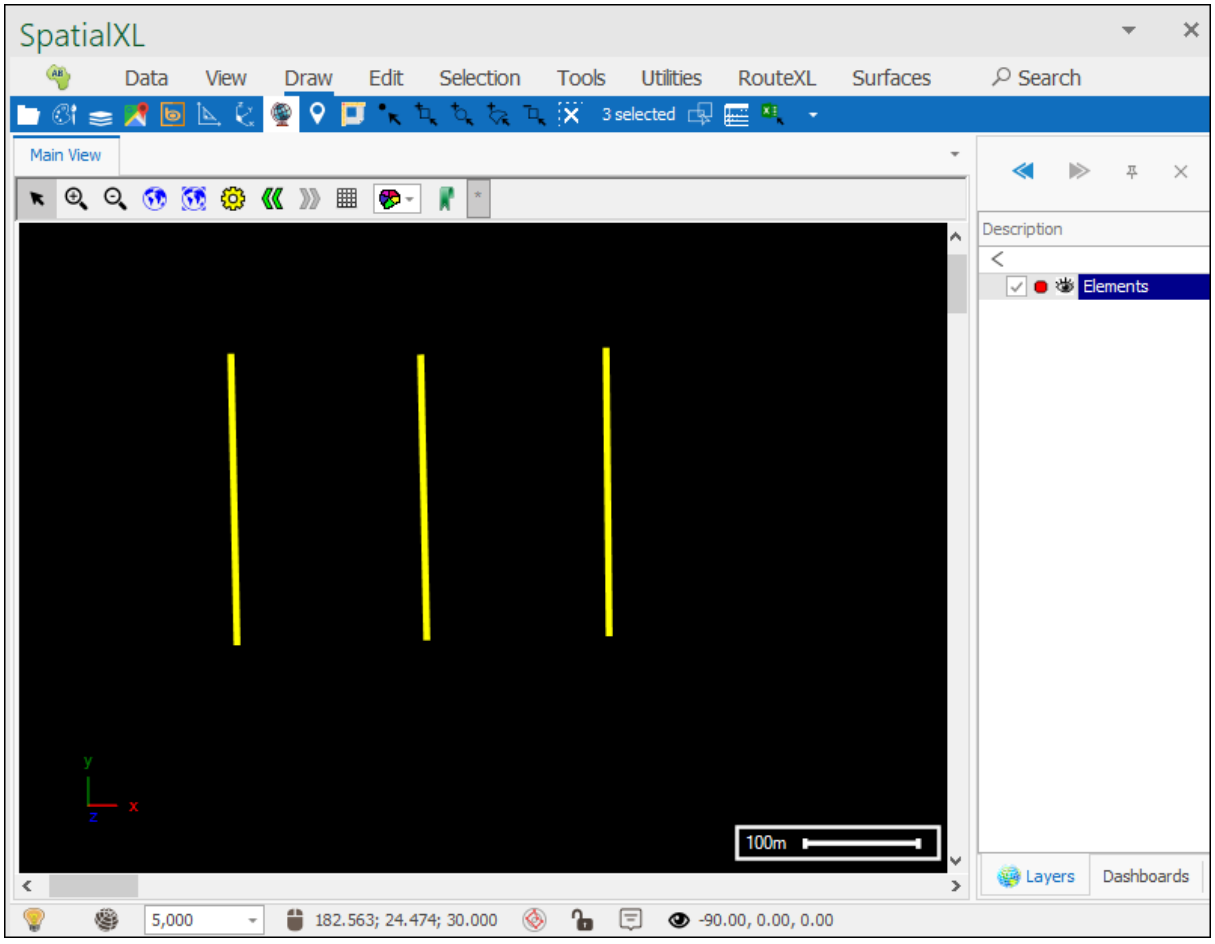


Between start and end points

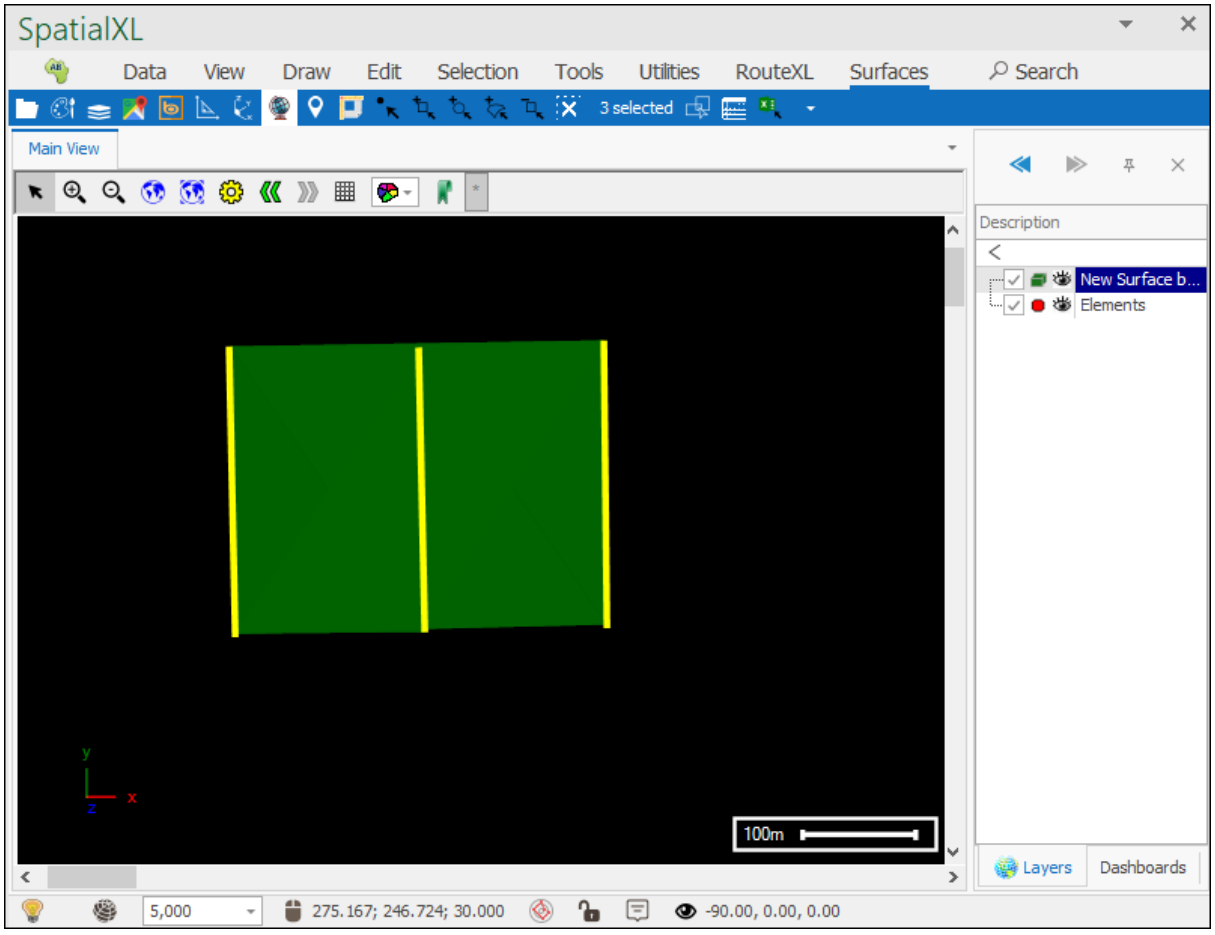
Next we have the **Between start and end** tool which will build a surface between the start and end points of selected elements:



First select the elements:



Then click **Between start and end** and your surface will be created:


SpatialXL
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RouteXL
Surfaces
Search
3 selected
Main View
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Elements
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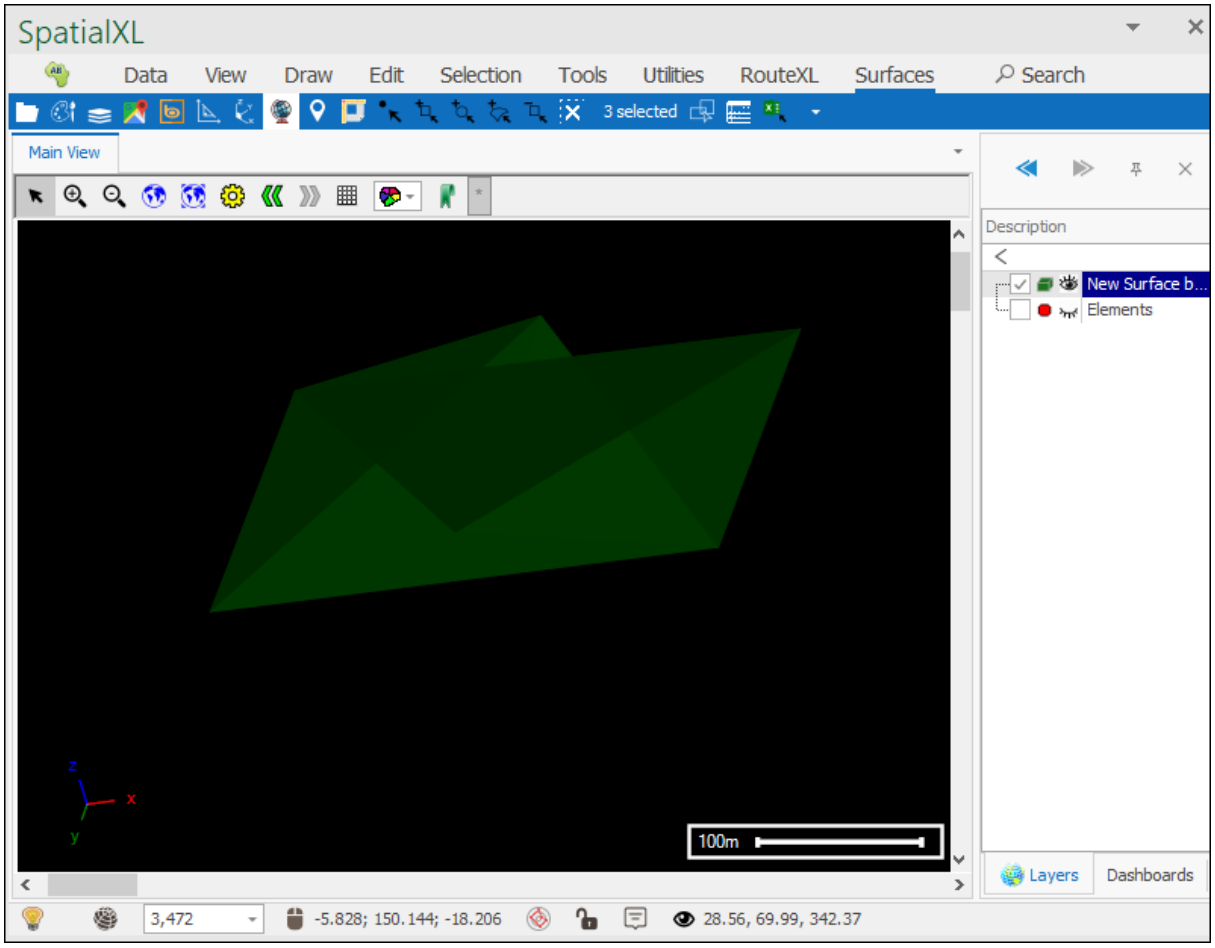
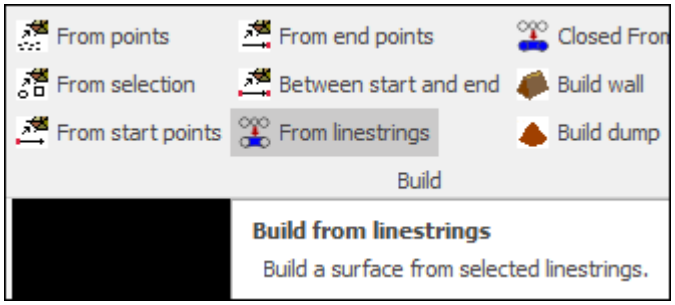
Dashboards
5,000
275.167; 246.724; 30.000
-90.00, 0.00, 0.00

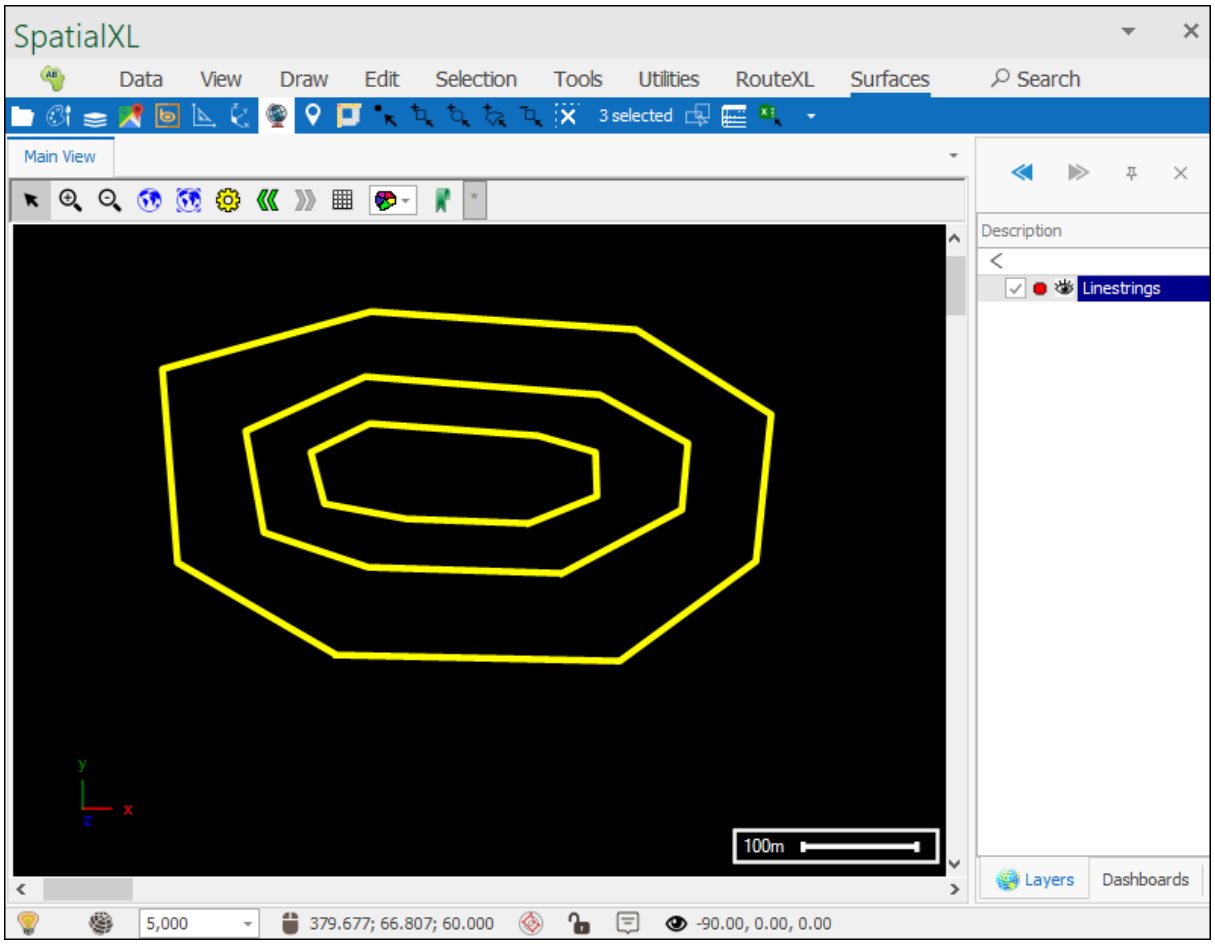


From linestrings

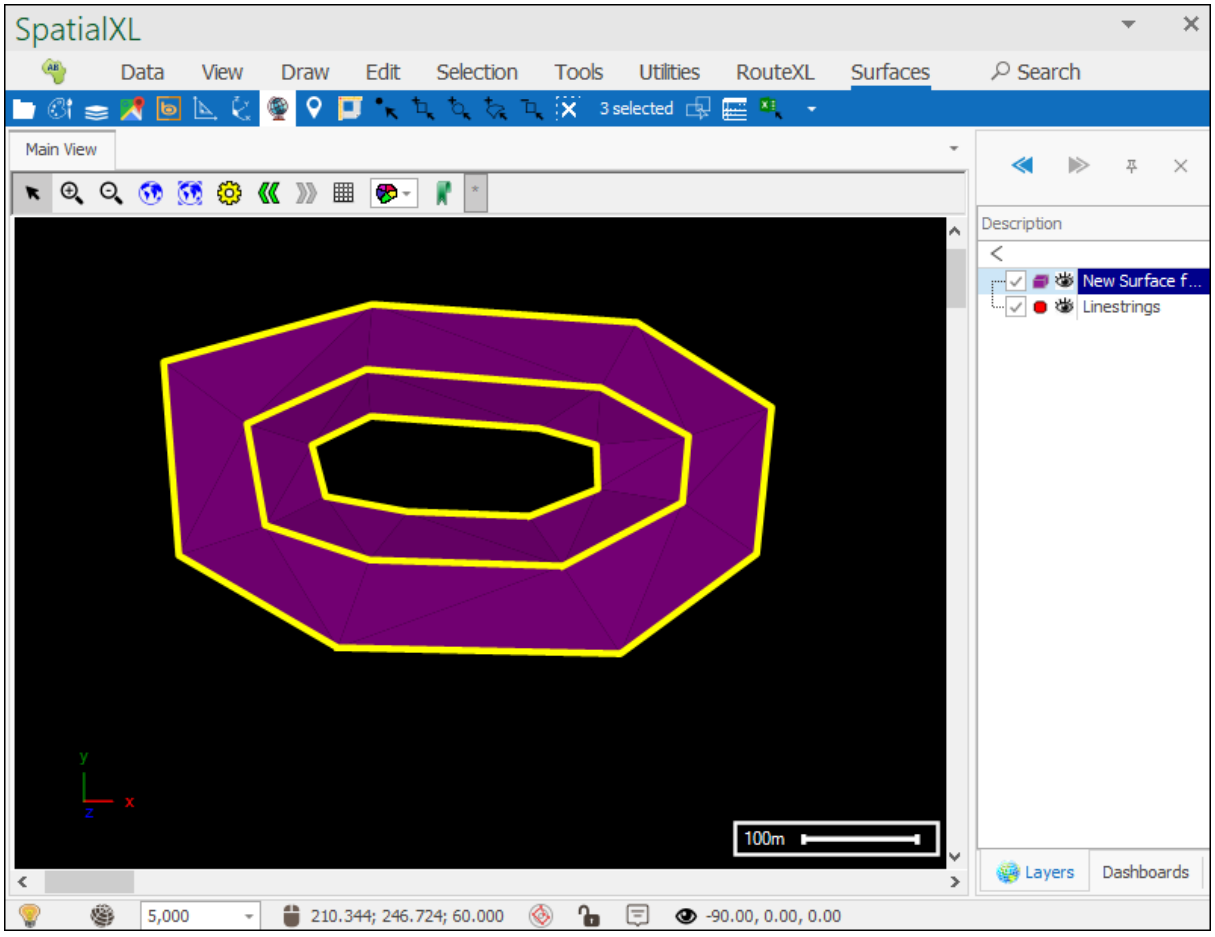
The next tool is the **From linestrings** tool which will build a surface from selected linestrings:



Select the linestrings:



Then click **From linestrings** and your surface will be created: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Utilities
RouteXL
Surfaces
Search
3 selected
Main View
Description
New Surface f...
Linestrings
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Dashboards
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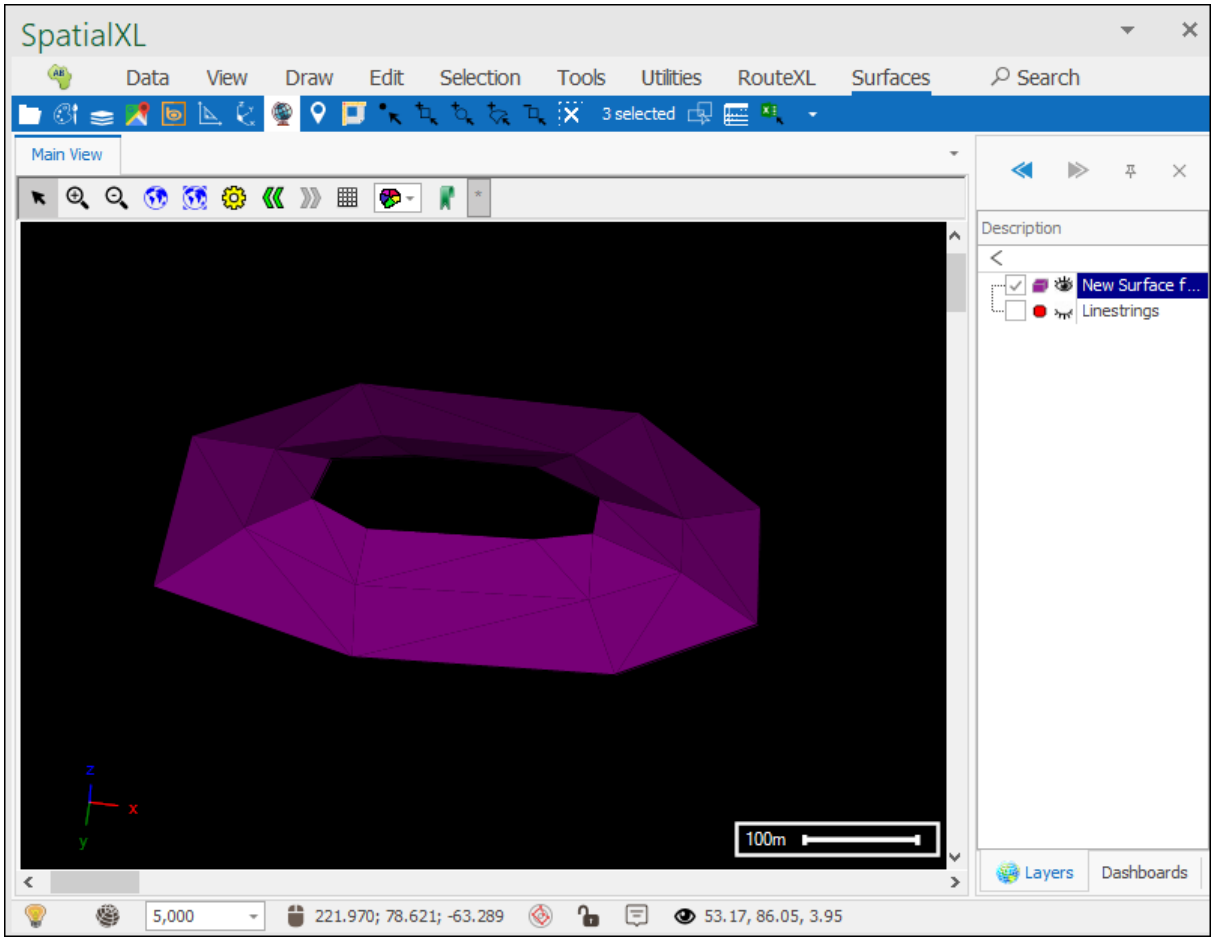
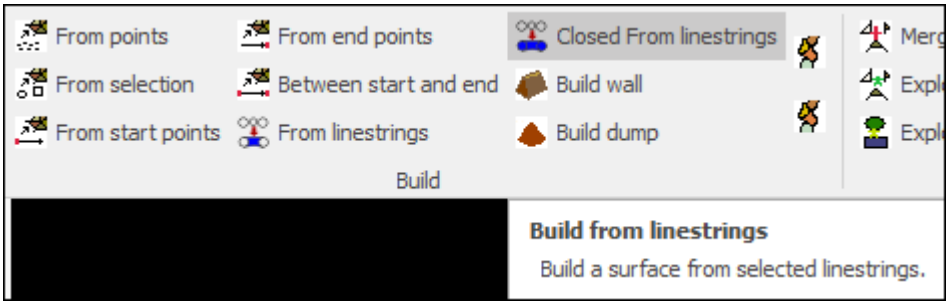
210.344; 246.724; 60.000
-90.00, 0.00, 0.00

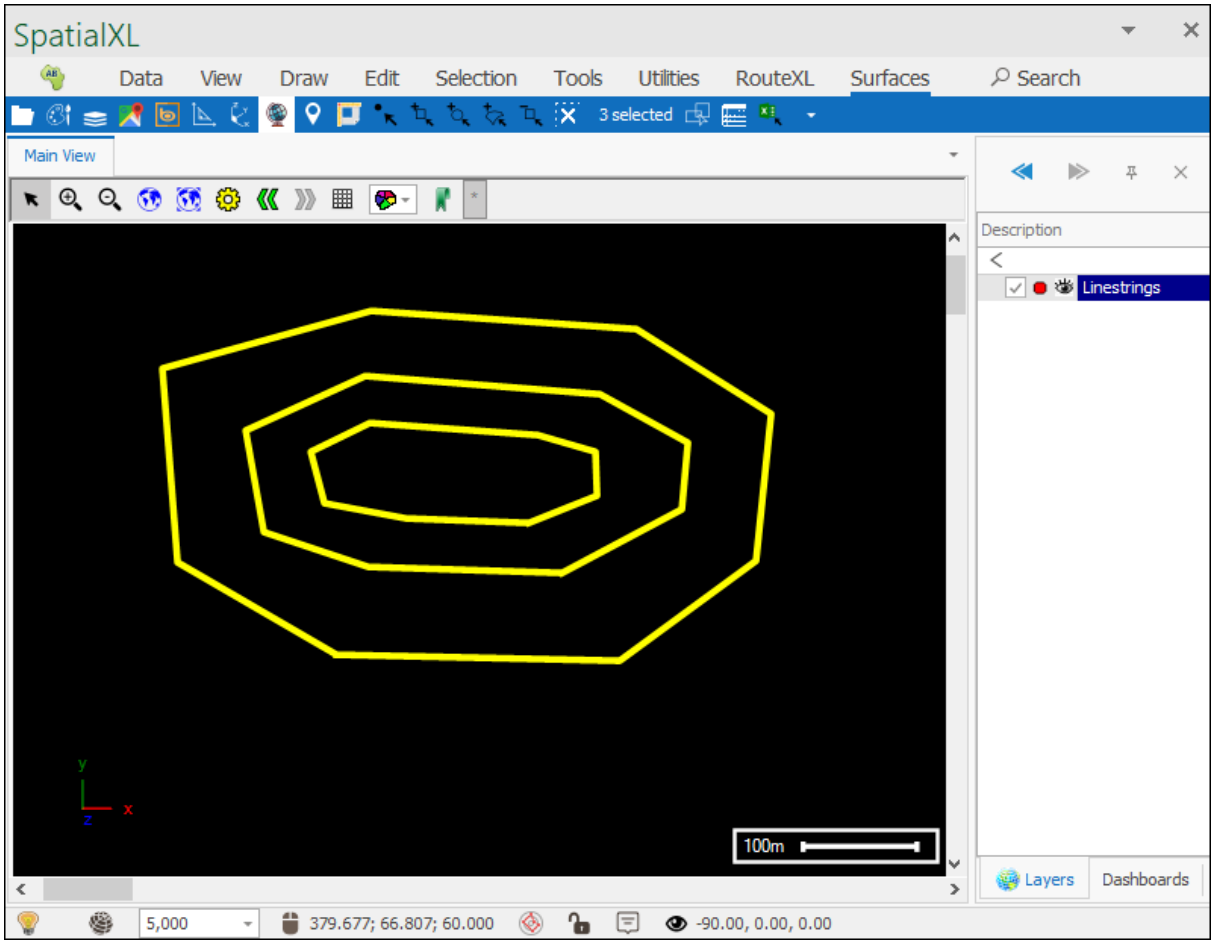


Closed from linestrings

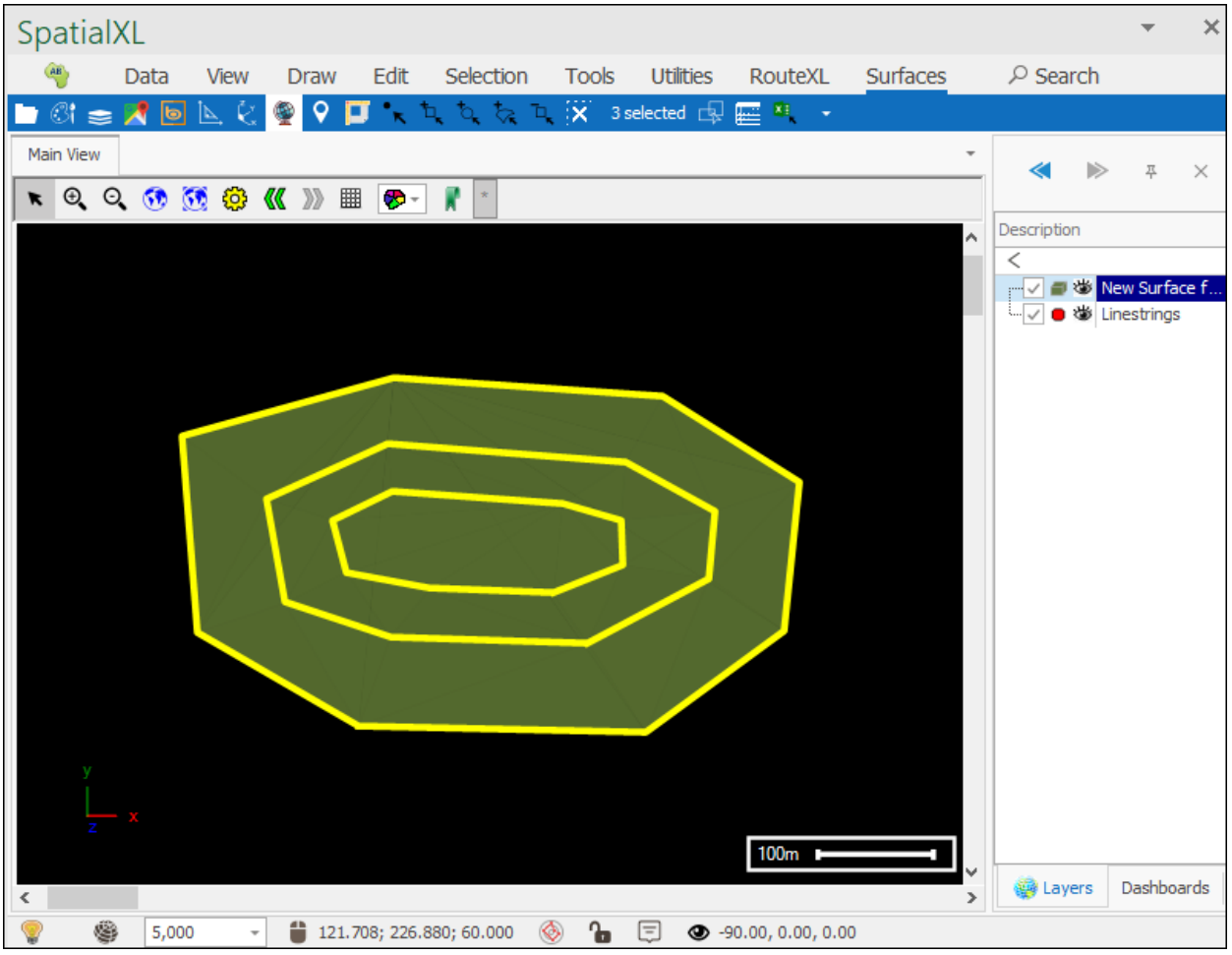
The next tool is the **Closed From linestrings** tool which will build a closed surface from selected linestrings:



Select the linestrings:



Then click **From Closed linestrings** and your surface will be created:


SpatialXL
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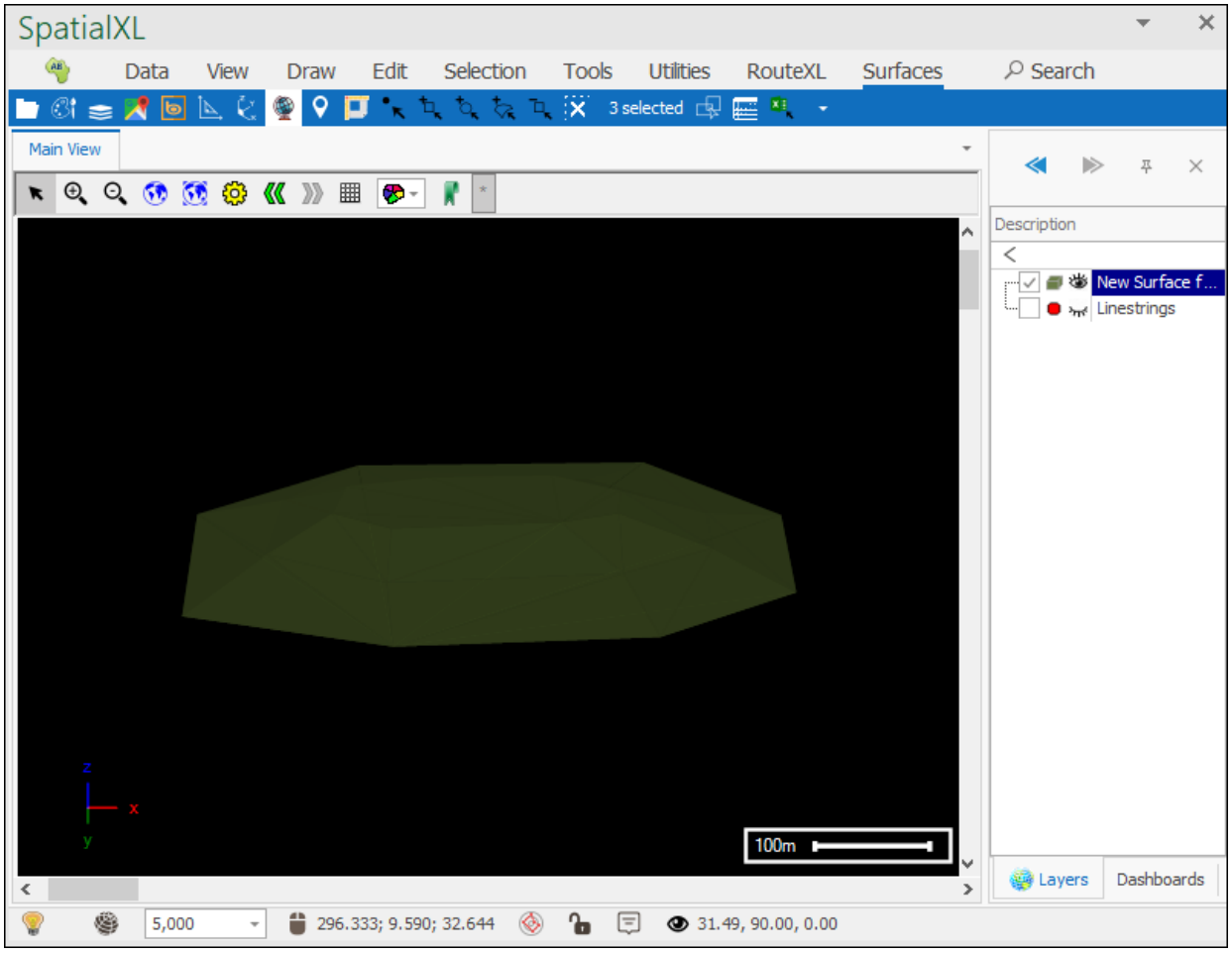
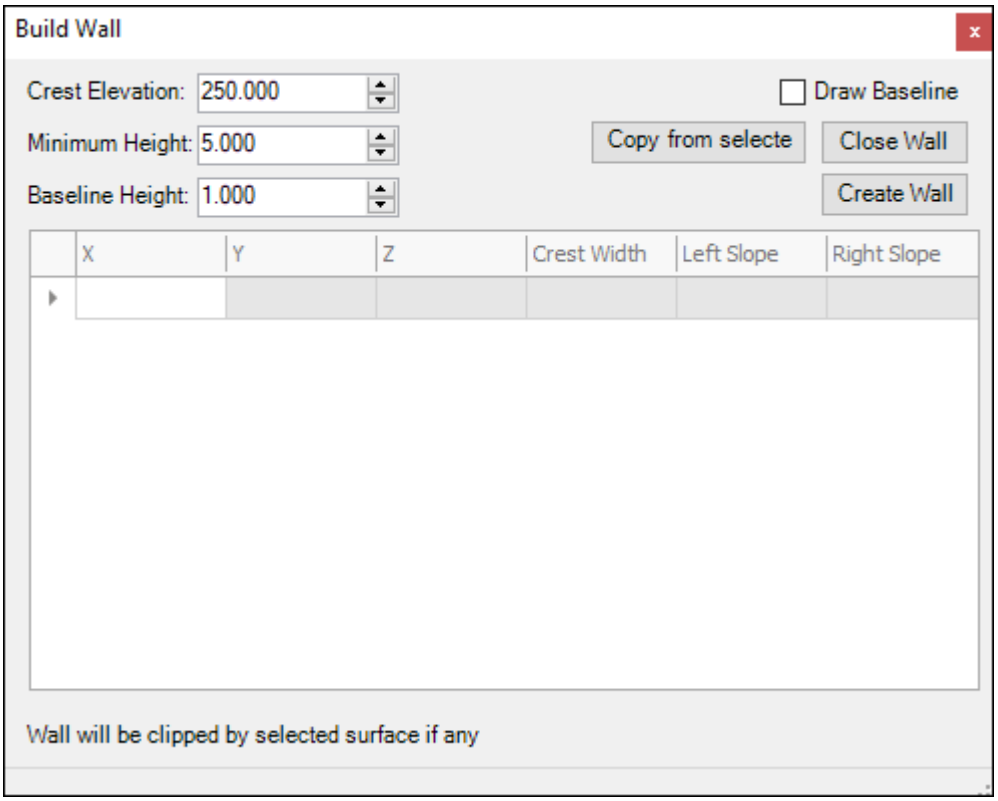
RouteXL
Surfaces
Search
3 selected
Main View
Description
New Surface f...
Linestrings
100m
Layers
Dashboards
5,000
121.708; 226.880; 60.000
-90.00, 0.00, 0.00



Build Wall

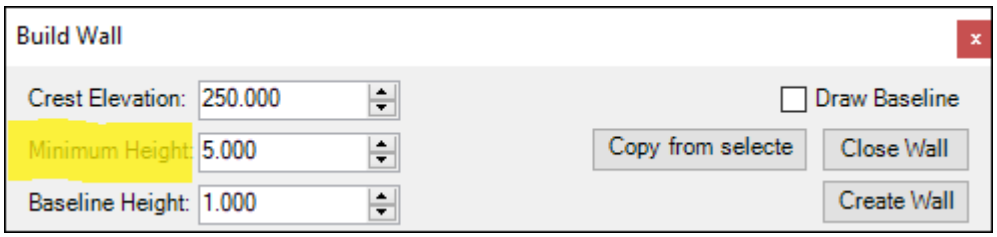
The next tool is the **Build wall** tool which allows you to create a wall with various parameters:

Clicking on it brings up the following dialogue:



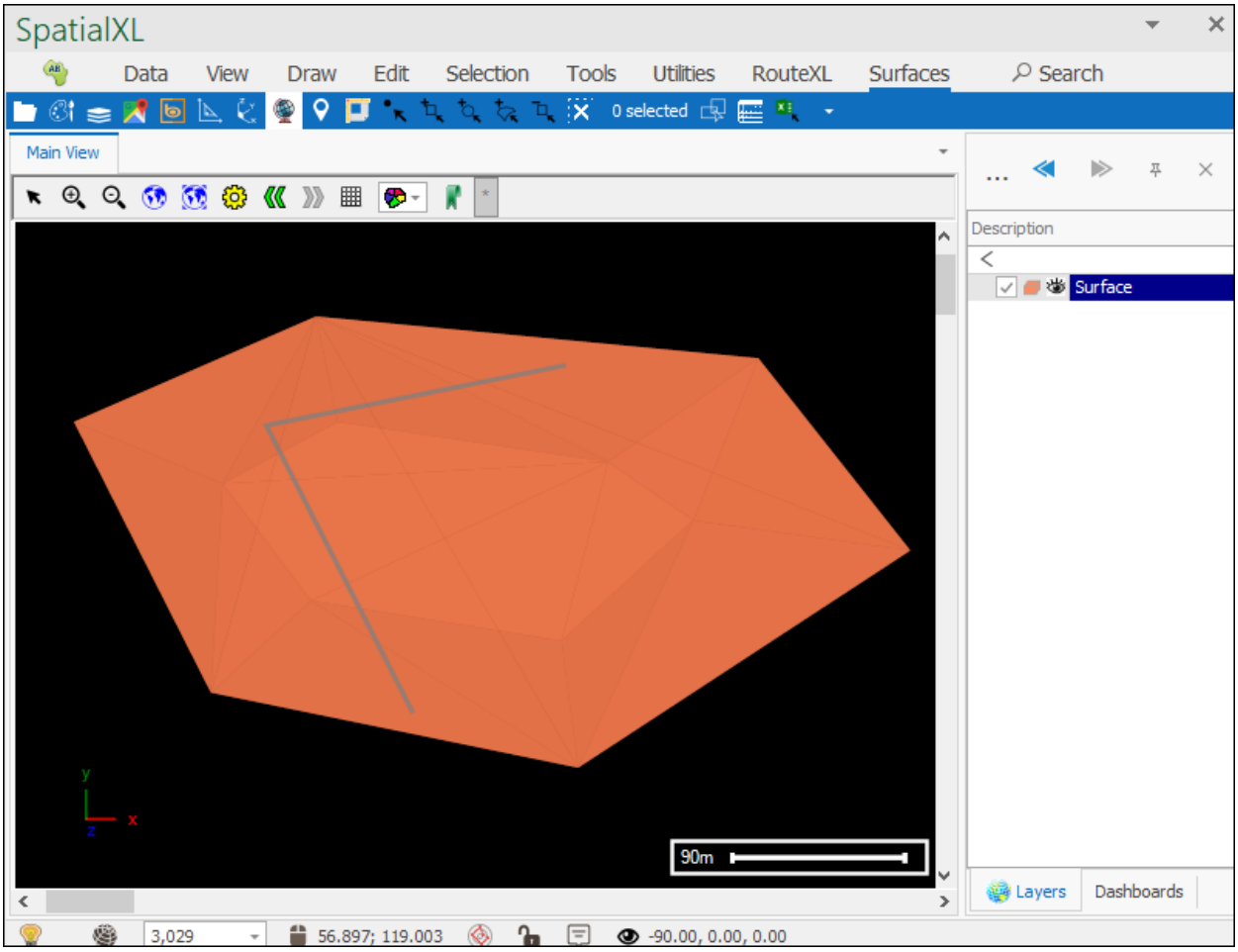
Crest Elevation is the height of the top of your wall in meters:

Minimum Height is the minimum height in meters that you set that the wall can go:

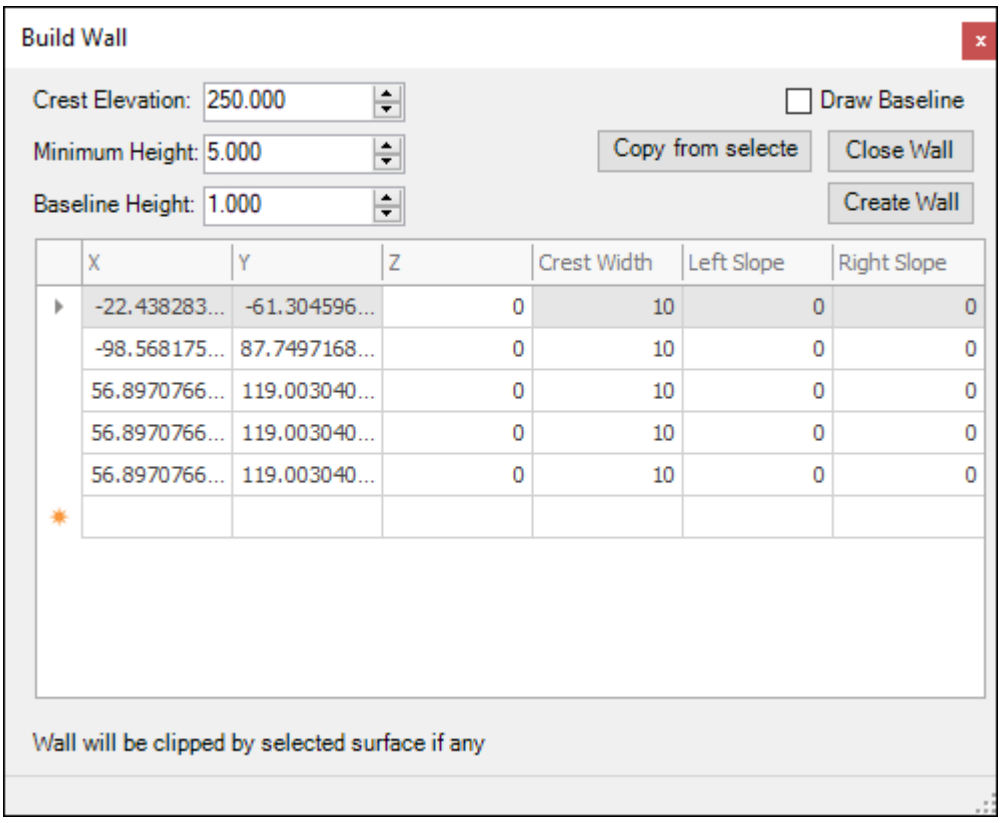


Baseline Height is the height in meters of the drawn baseline above the bottom of the wall; if it is set at zero then the wall will just start exactly at the baseline:

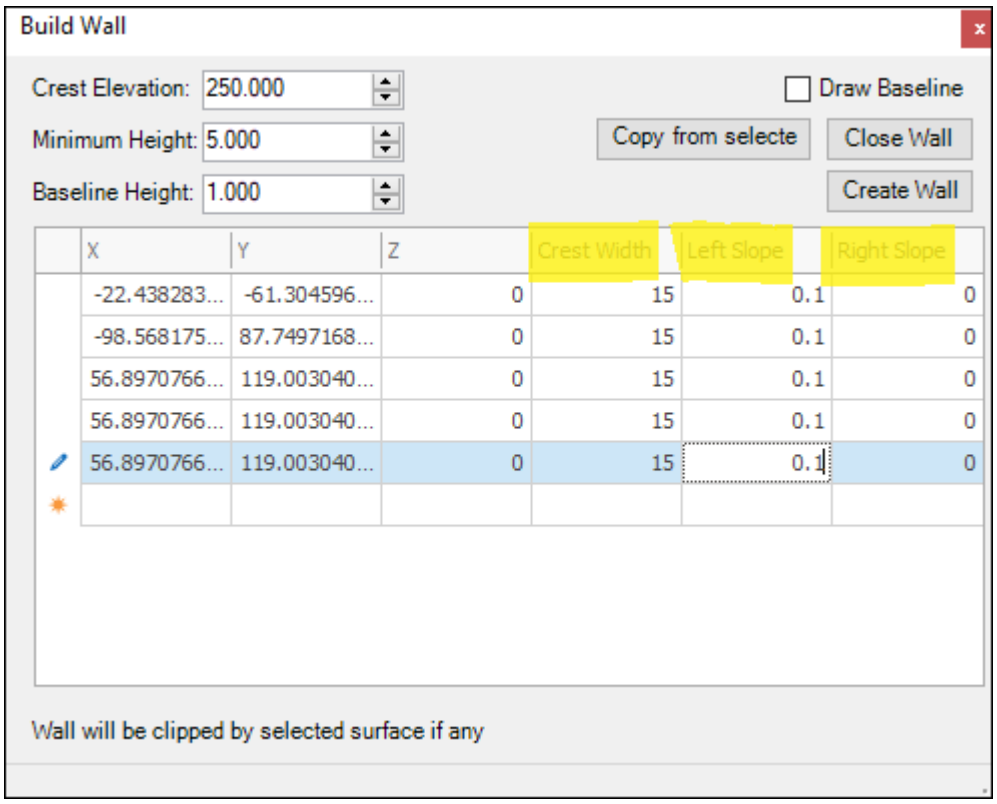
To start drawing your baseline you can tick on **Draw Baseline** and then click in your scene to draw and double click to finish:



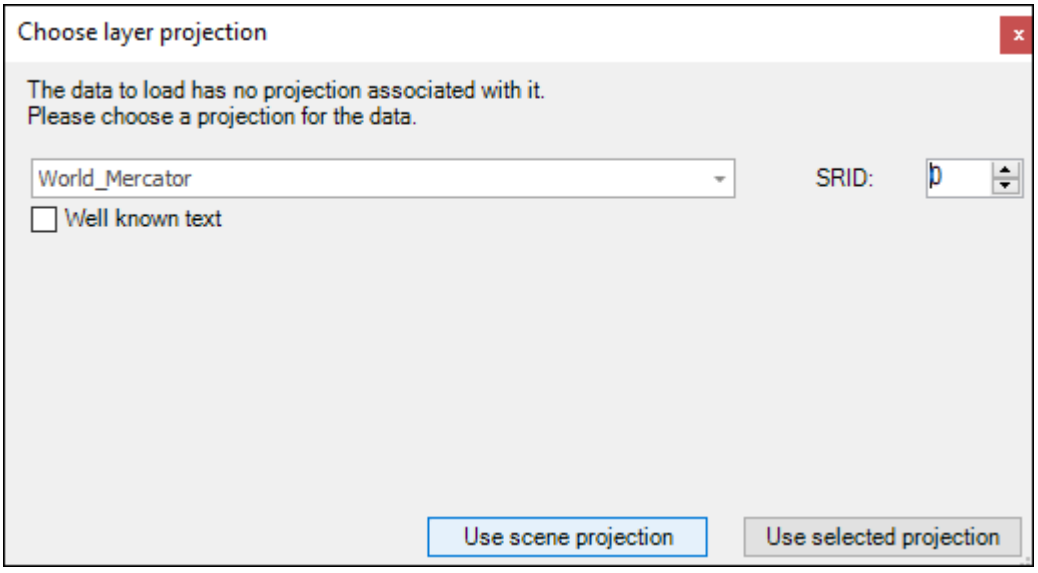
The coordinates of your baseline are now in the grid below:



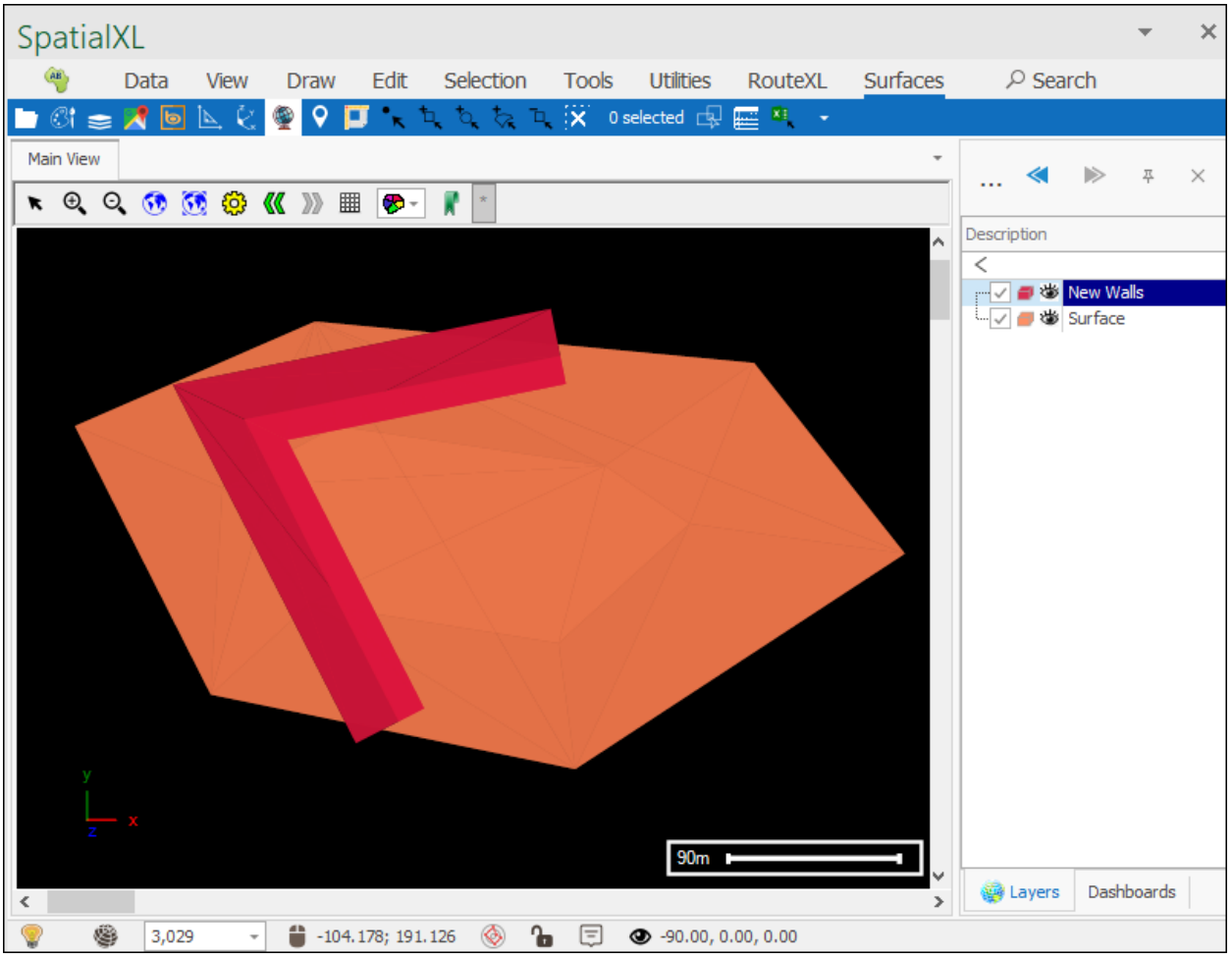
And you can now set the **Crest Width**, **Left Slope** and **Right Slope** (the slopes are expressed in units of horizontal distance divided by height, so if you have a 4 meter high wall and choose 1 meter horizontal distance then this would be 1/4= **0.25** as your slope; smaller numbers means a steeper slope, bigger numbers will give you a more gradual slope):

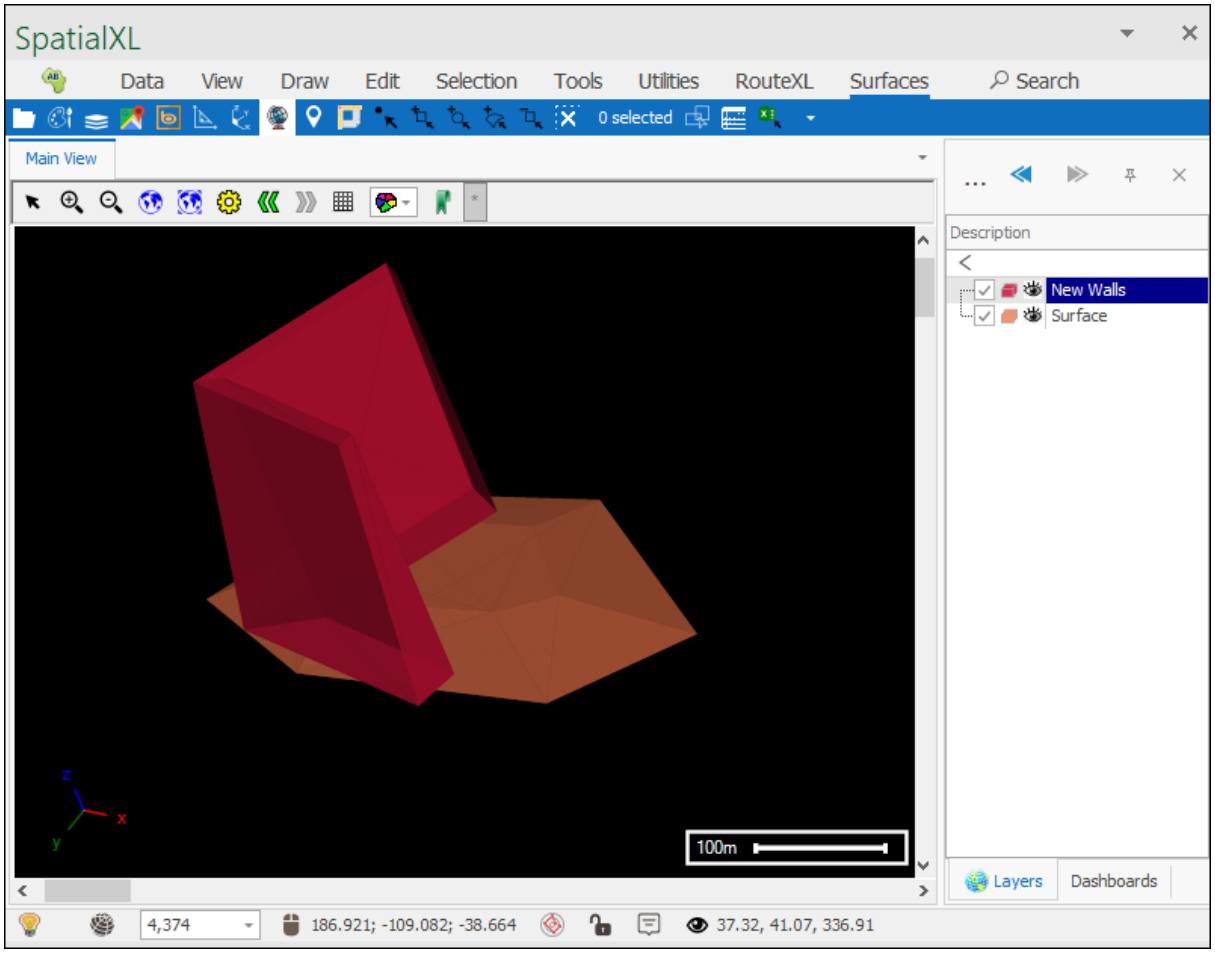


You can now click **Create Wall**, your wall will be drawn to any layer you have set as active, if you have none set as active then a new layer will be made for you and you will be prompted to choose the projection:

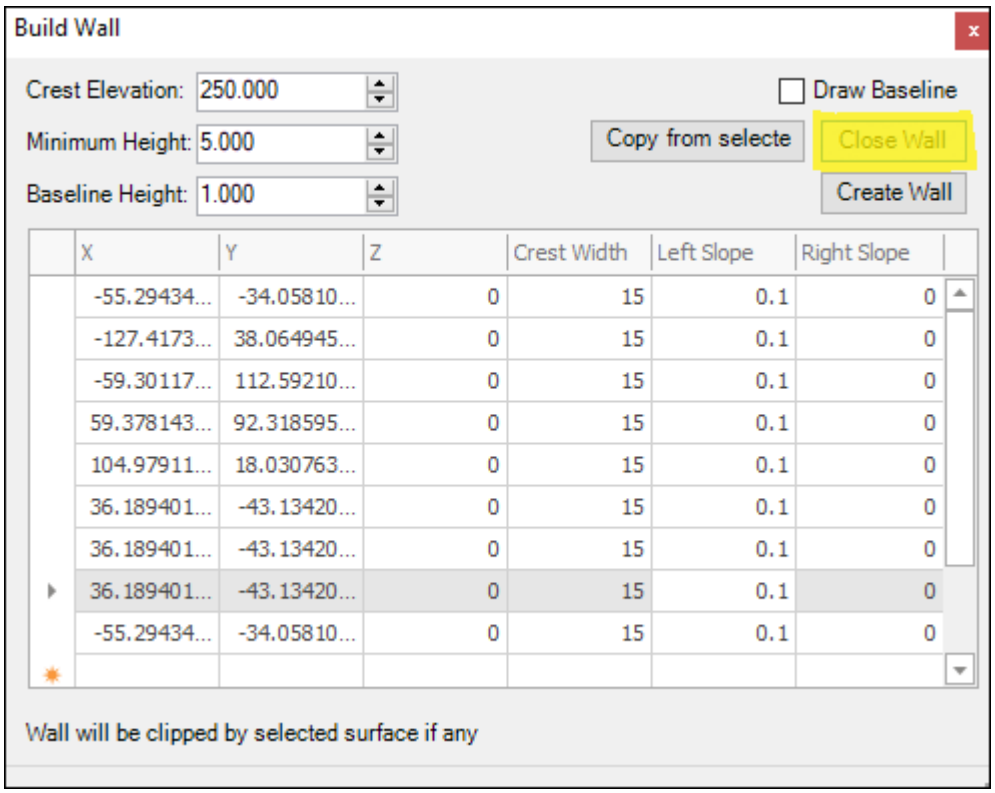


Your wall has now been created and you can rotate it around to inspect it:

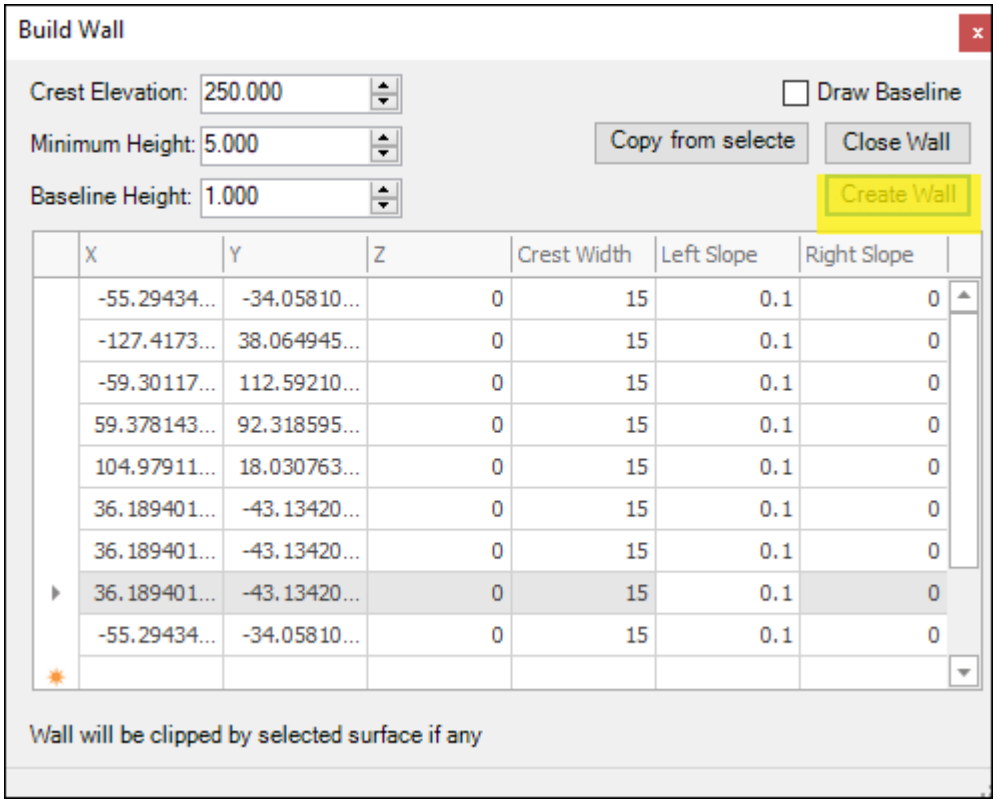


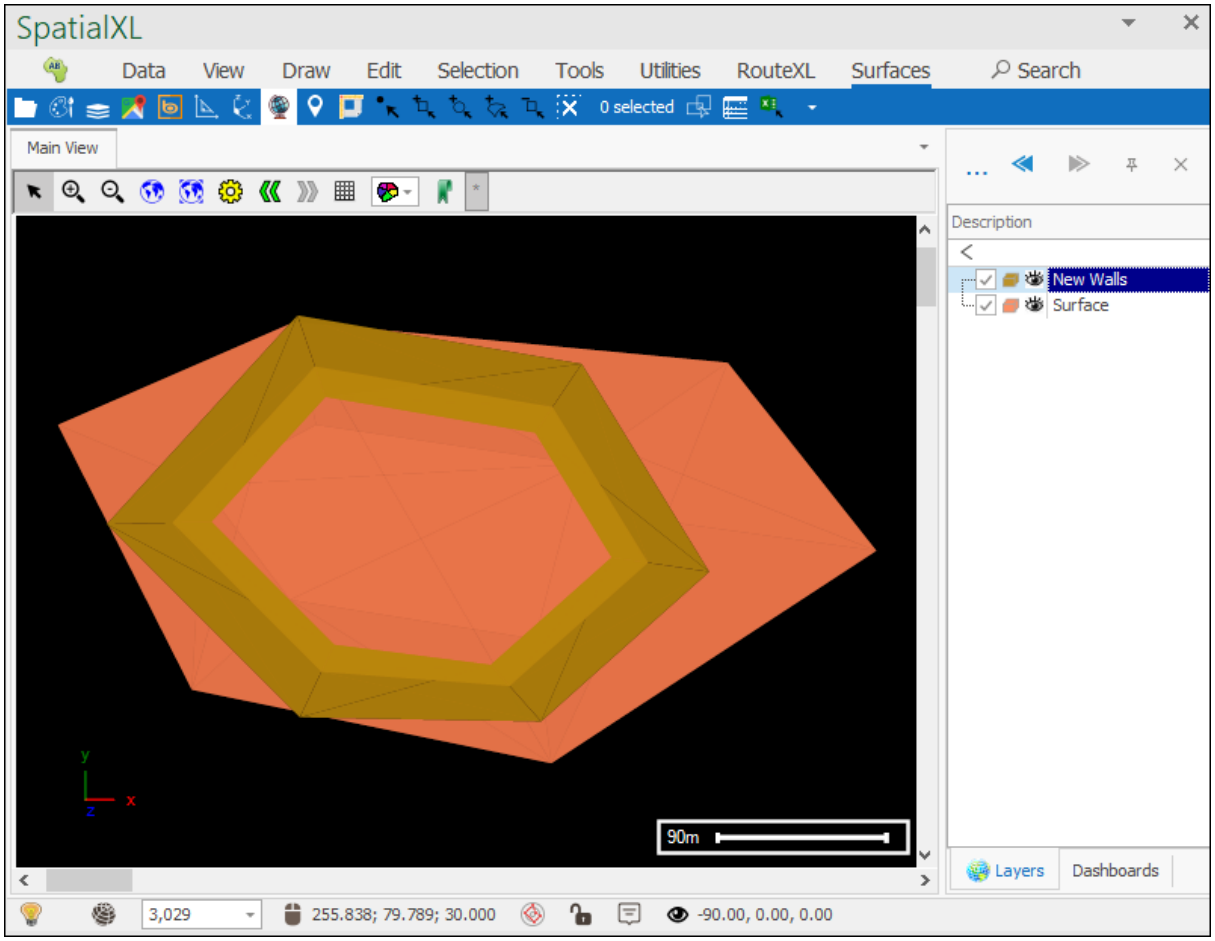


If you want your wall to be closed you would click **Close Wall** which will add extra geometries in the grid(for the closing of the wall):



Then you would click **Create Wall** and a closed wall will have been created for you:


Build Wall
Crest Elevation: 250.000
Minimum Height: 5.000
Baseline Height: 1.000
Draw Baseline
Copy from selecte
Close Wall
Create Wall
X Y Z Crest Width Left Slope Right Slope
-55.29434... -34.05810... 0 15 0.1 0
-127.4173... 38.064945... 0 15 0.1 0
-59.30117... 112.59210... 0 15 0.1 0
59.378143... 92.318595... 0 15 0.1 0
104.97911... 18.030763... 0 15 0.1 0
36.189401... -43.13420... 0 15 0.1 0
36.189401... -43.13420... 0 15 0.1 0
36.189401... -43.13420... 0 15 0.1 0
-55.29434... -34.05810... 0 15 0.1 0
Wall will be clipped by selected surface if any


SpatialXL
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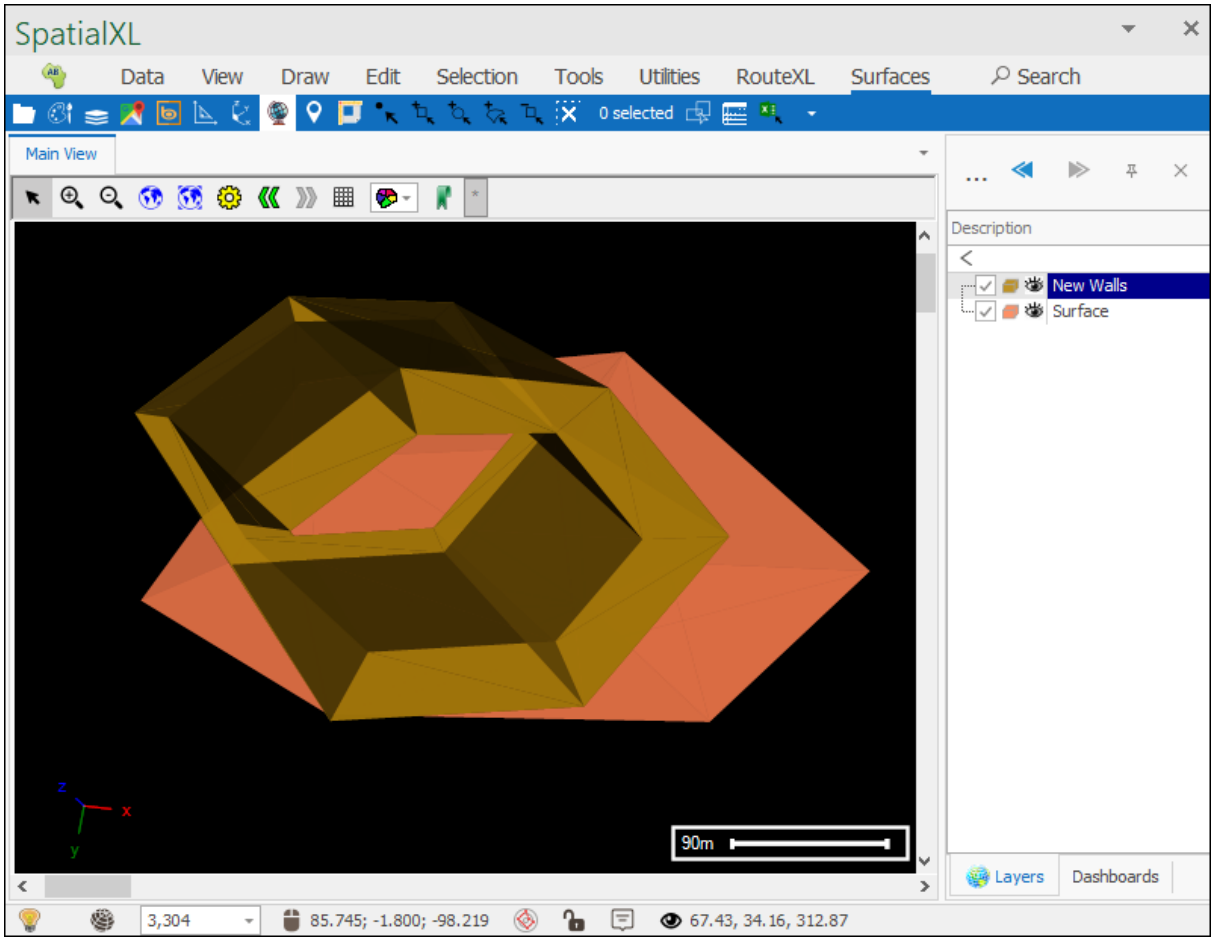
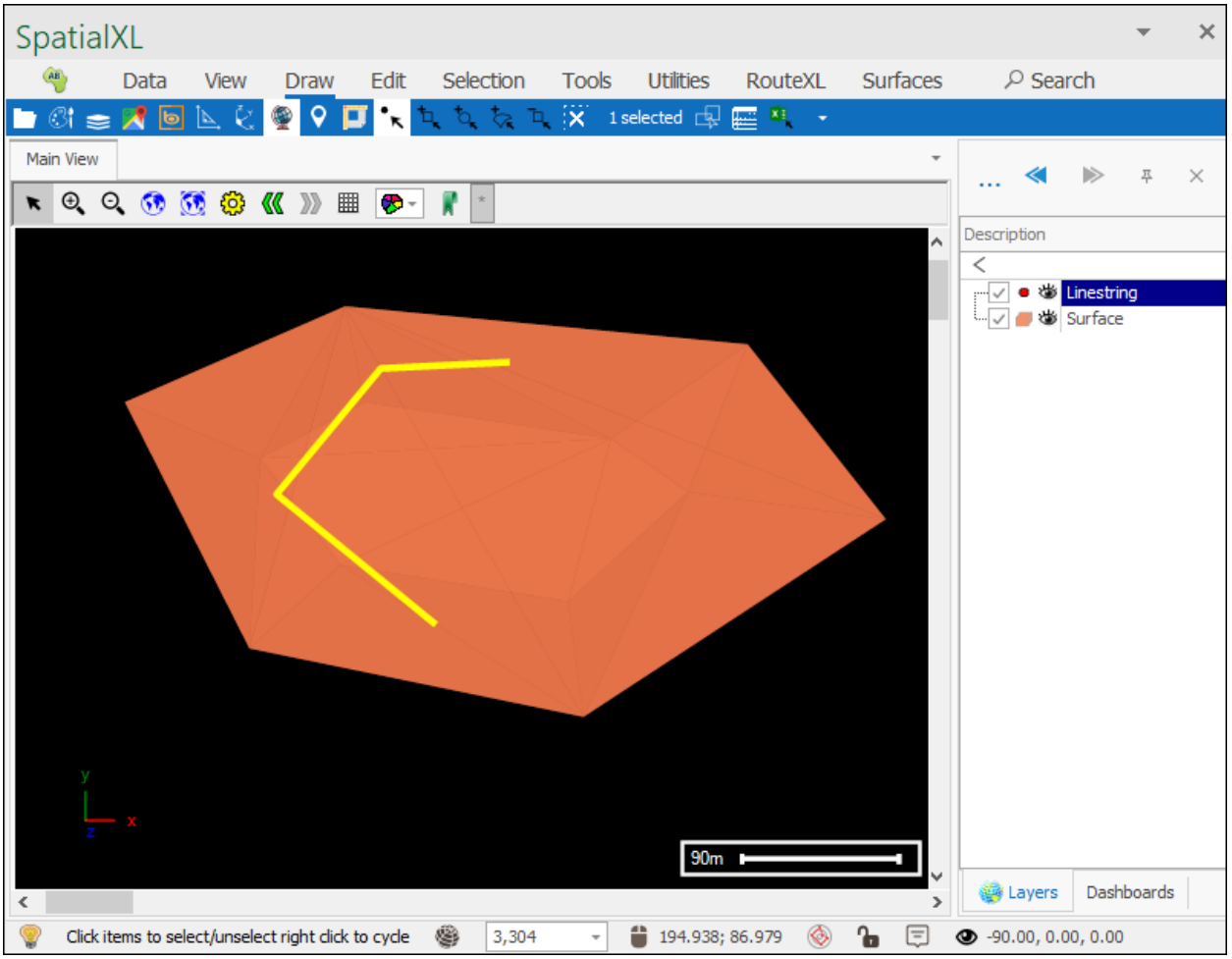
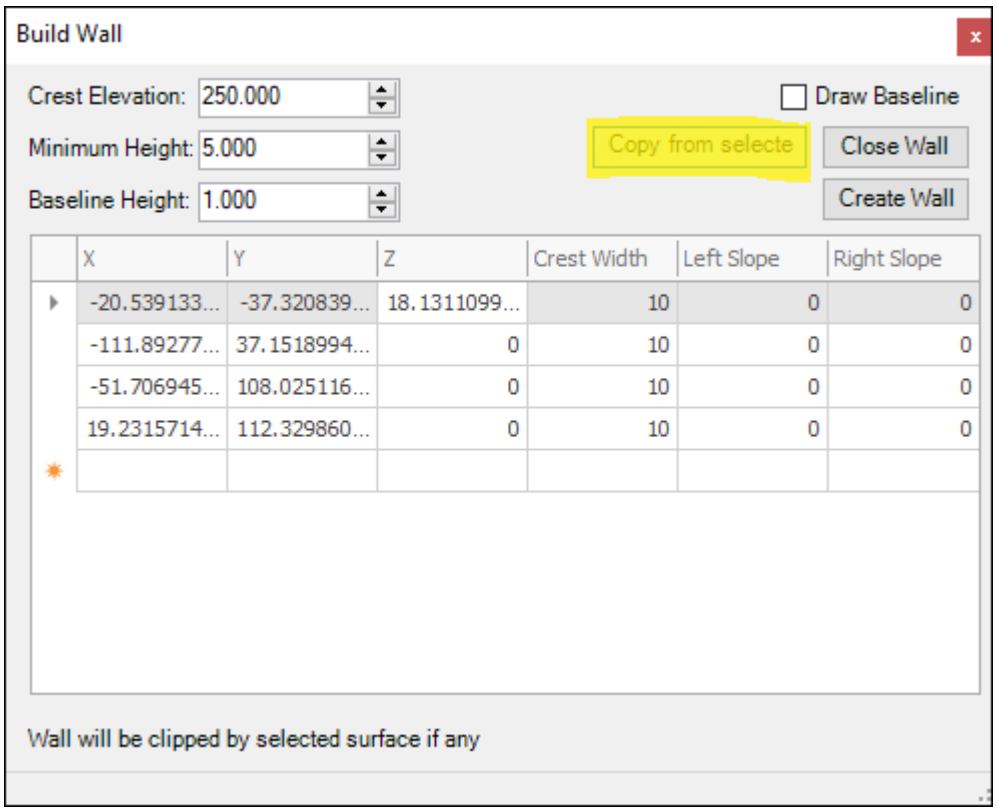
-90.00, 0.00, 0.00

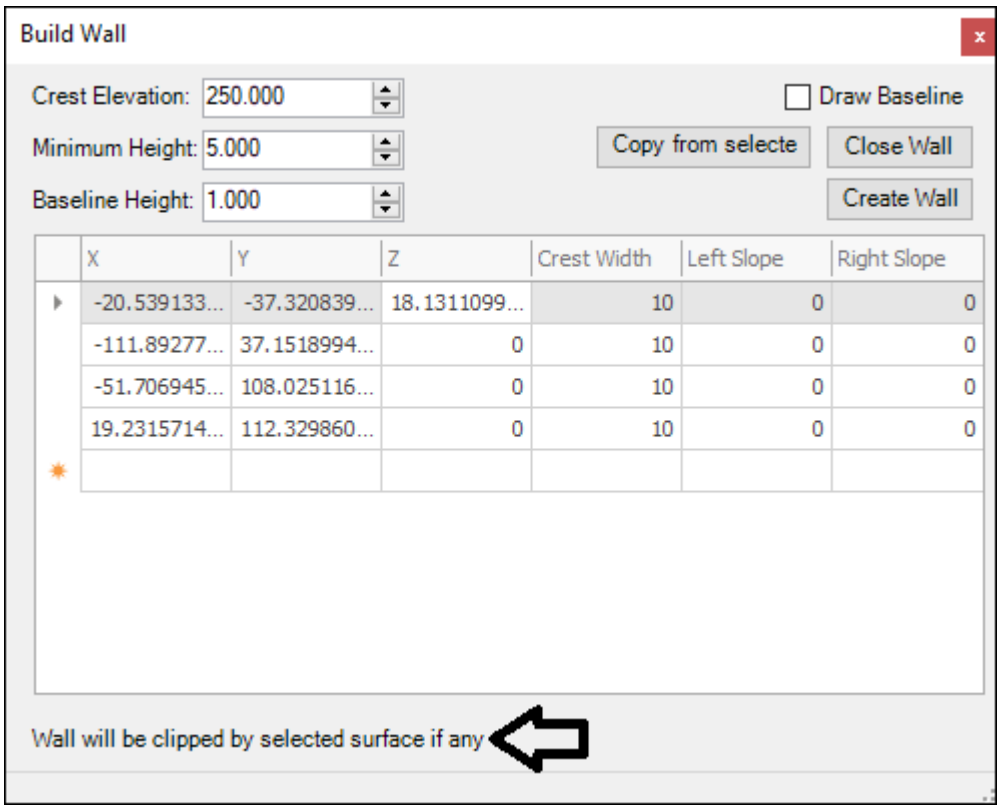


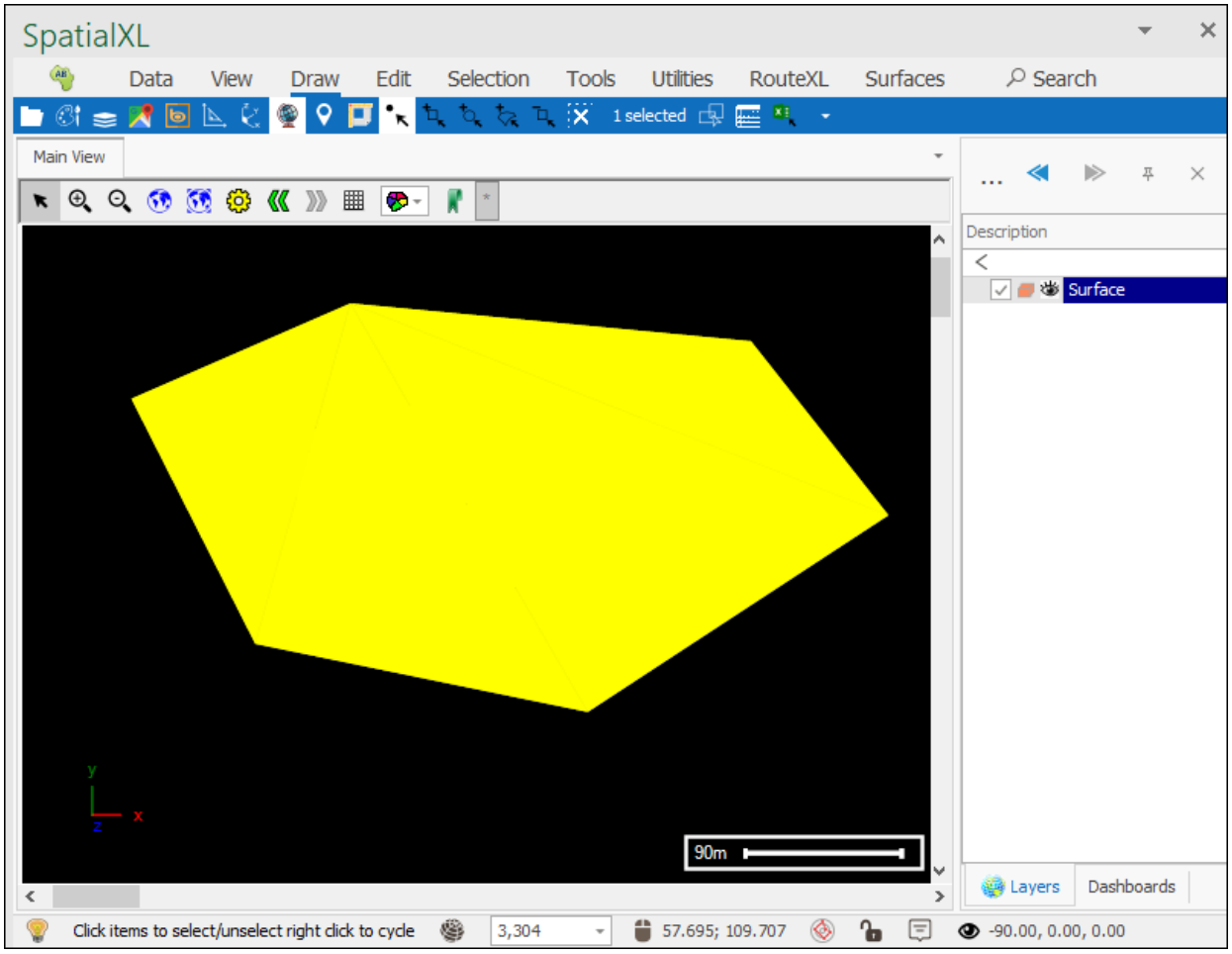
When creating your baseline you don't have to use the **Draw Baseline** option, if you have a linestring layer already in your scene that you would like to use as the baseline then simply select the linestring and then click **Copy from Selected** and the geometries will be pasted in:

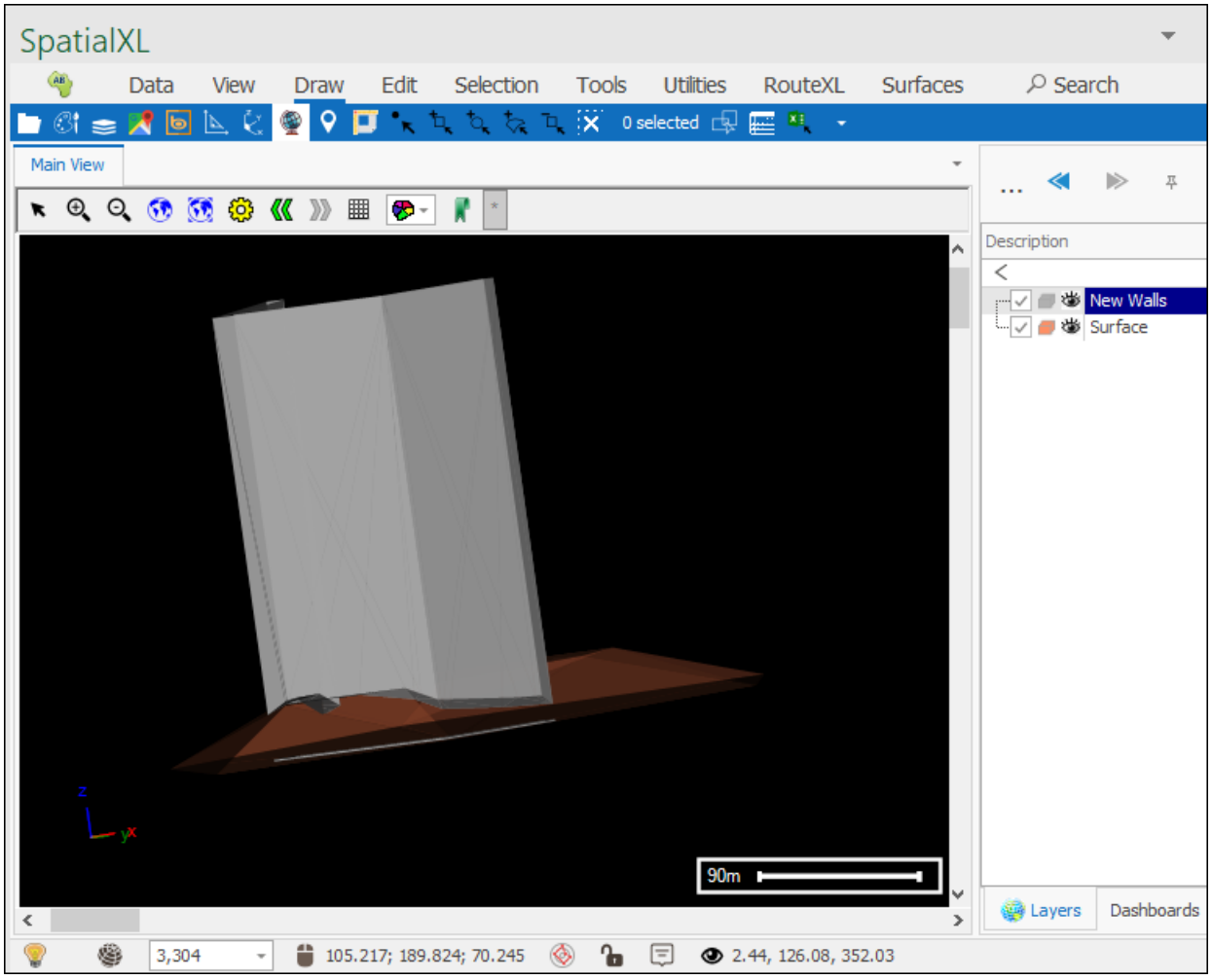

SpatialXL
Data
View
Draw
Edit
Selection
Tools
Utilities
RouteXL
Surfaces
Search
1 selected
Main View
Description
Linestring
Surface
90m
Layers
Dashboards
Click items to select/unselect right click to cycle
3,304
194.938; 86.979
-90.00, 0.00, 0.00



One last point is that if you are creating your wall on an already existing surface then you can choose to have the wall clipped by that surface if you want by selecting the surface before creating the wall:


Build Wall
Crest Elevation: 250.000
Minimum Height: 5.000
Baseline Height: 1.000
Draw Baseline
Copy from selecte
Close Wall
Create Wall
X
Y
Z
Crest Width
Left Slope
Right Slope
-20.539133...
-37.320839...
18.1311099...
10
0
0
-111.89277...
37.1518994...
0
10
0
0
-51.706945...
108.025116...
0
10
0
0
19.2315714...
112.329860...
0
10
0
0
Wall will be clipped by selected surface if any

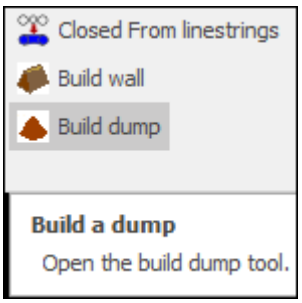

SpatialXL
Data
View
Draw
Edit
Selection
Tools
Utilities
RouteXL
Surfaces
Search
1 selected
Main View
Description
Surface
90m
Layers
Dashboards
Click items to select/unselect right click to cycle
3,304
57.695; 109.707
-90.00, 0.00, 0.00



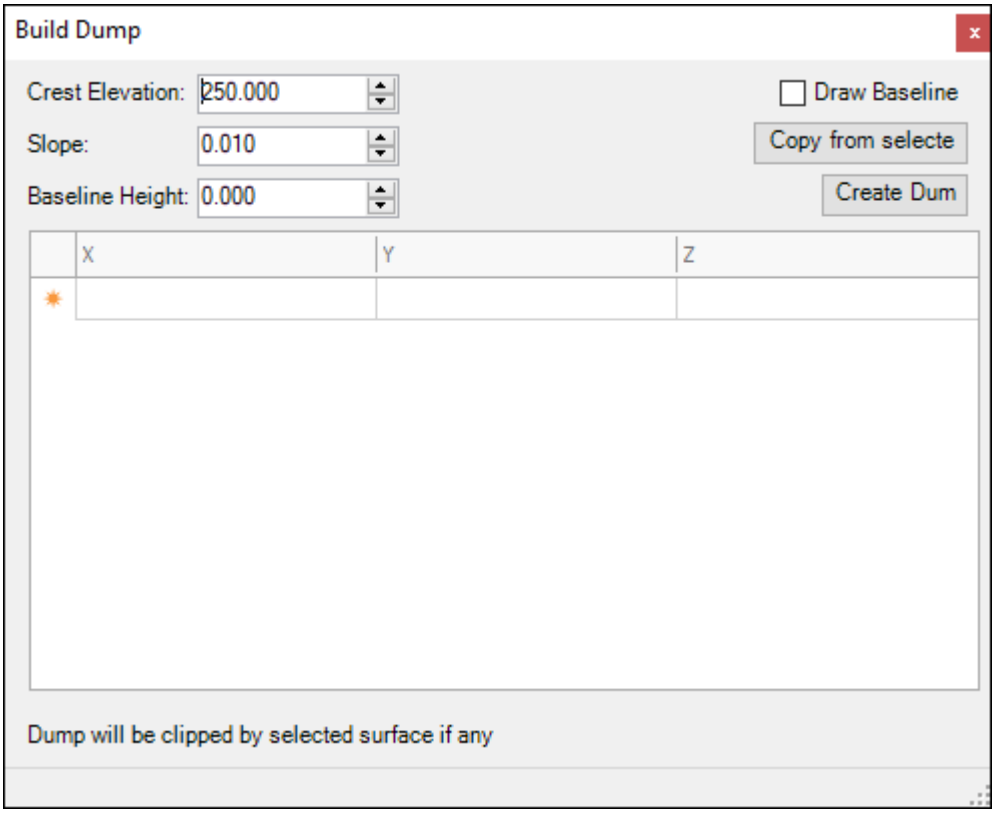
And as you can see the wall has been clipped by the surface.

Build Dump

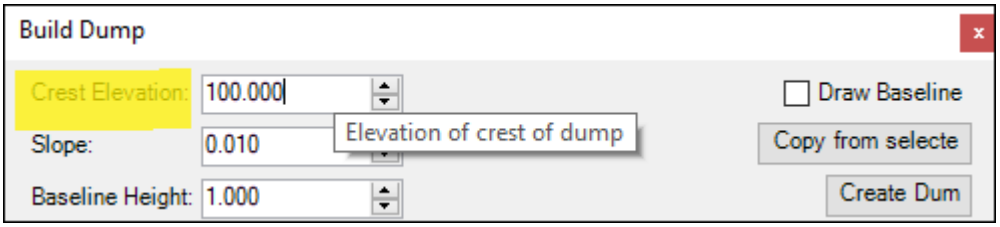
The next tool is the **Build dump** tool which allows you to create a dump with various parameters:



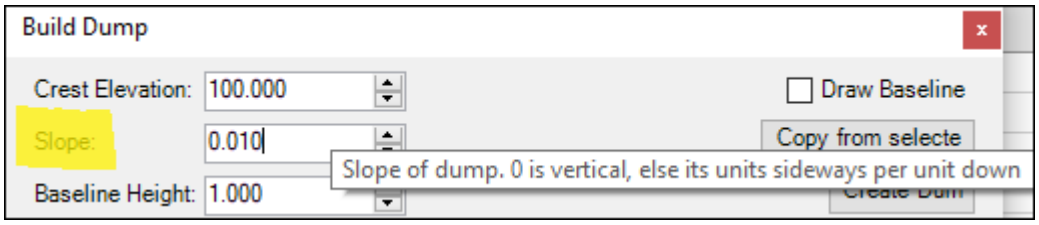
Clicking on it brings up the following dialogue:



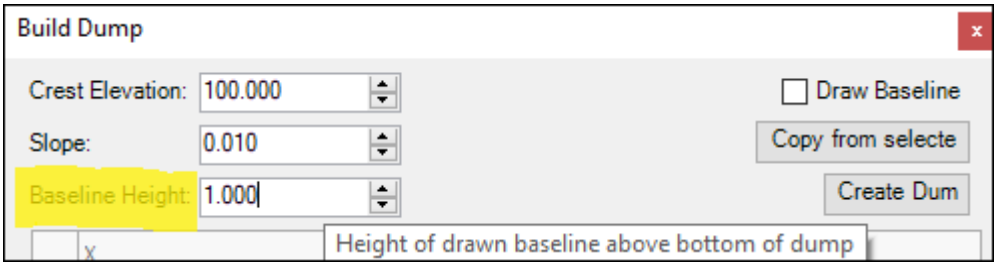
Crest Elevation is the height of the top of your dump in meters:



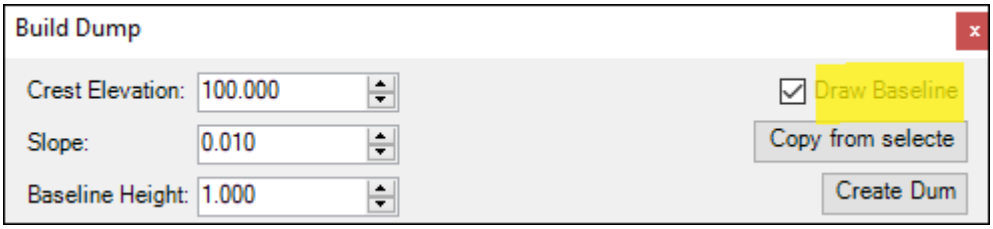
You can then specify the **Slope** for the dump (the slope is expressed in units of horizontal distance divided by height, so if you have a 4 meter high dump and choose 1 meter horizontal distance then this would be 1/4= **0.25** as your slope; smaller numbers means a steeper slope, bigger numbers will give you a more gradual slope):

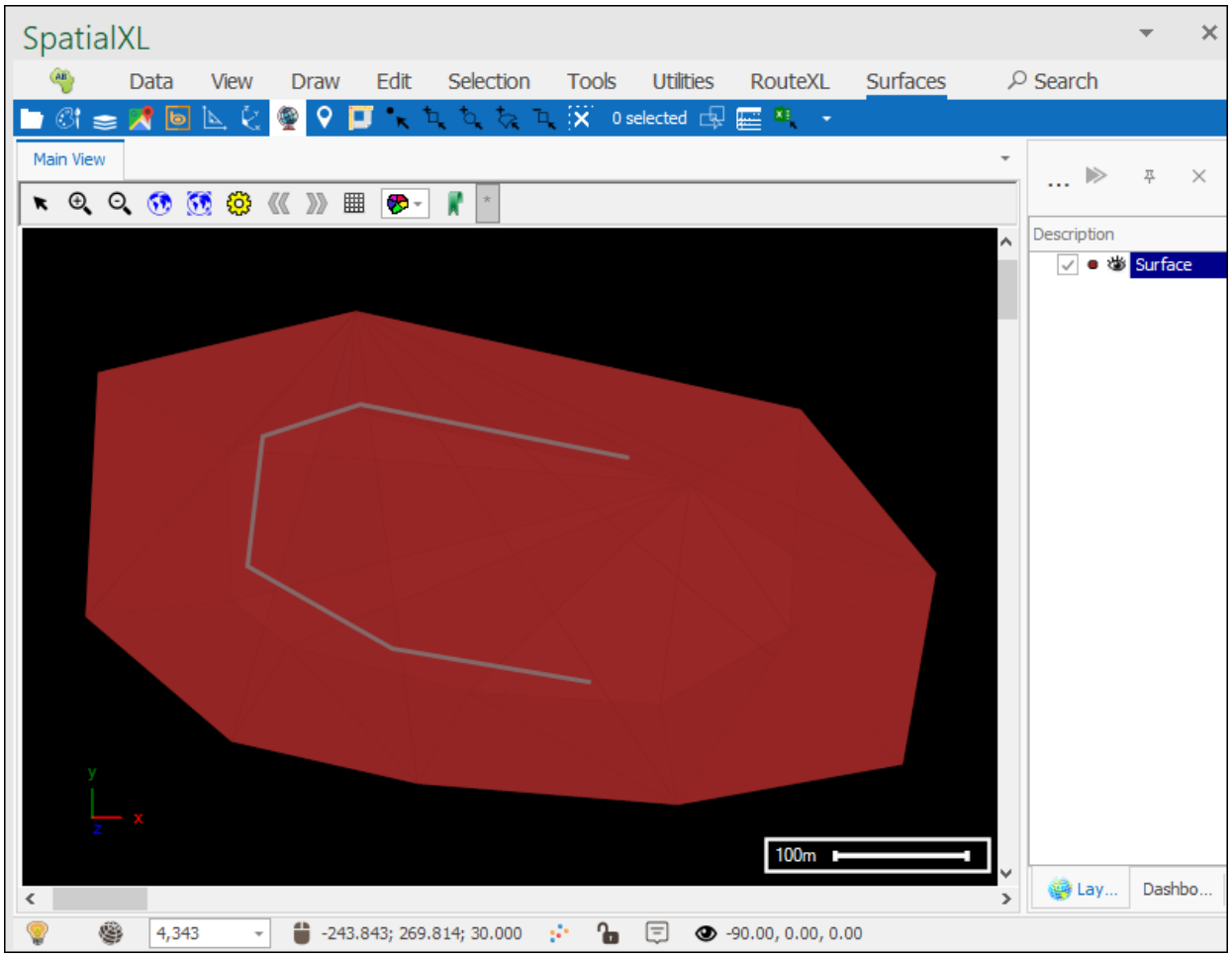


Baseline Height is the height in meters of the drawn baseline above the bottom of the dump; if it is set at zero then the dump will just start exactly at the baseline:

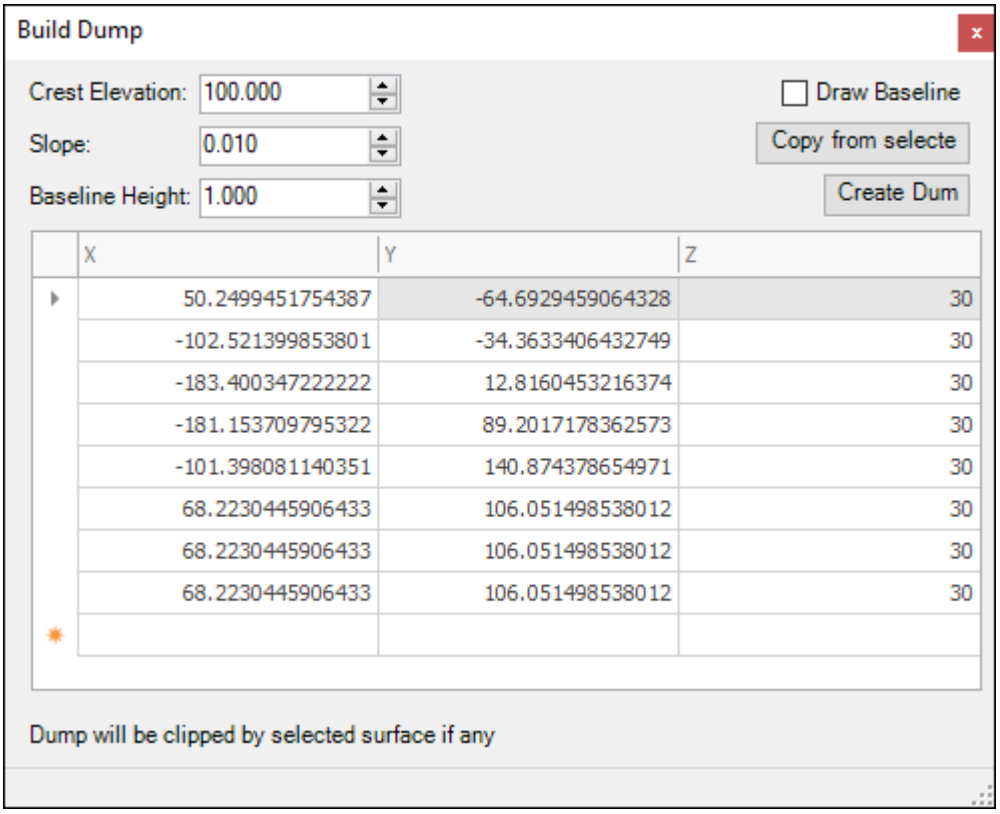


To start drawing your baseline you can tick on **Draw Baseline** and then click in your scene to draw and double click to finish:

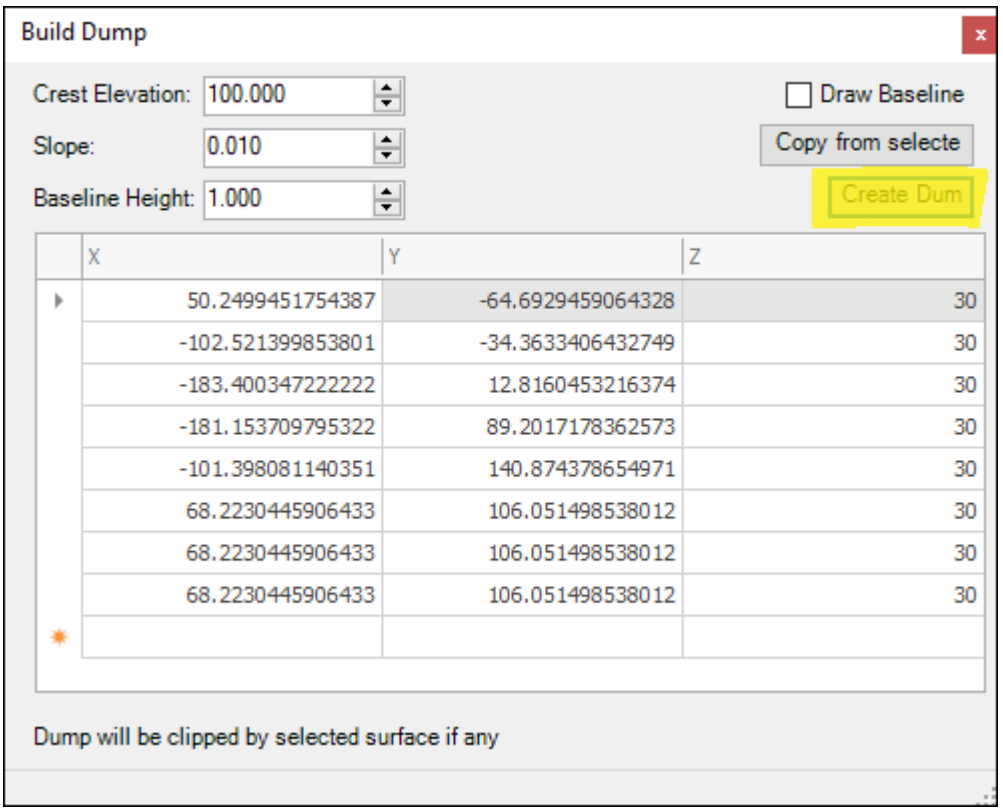


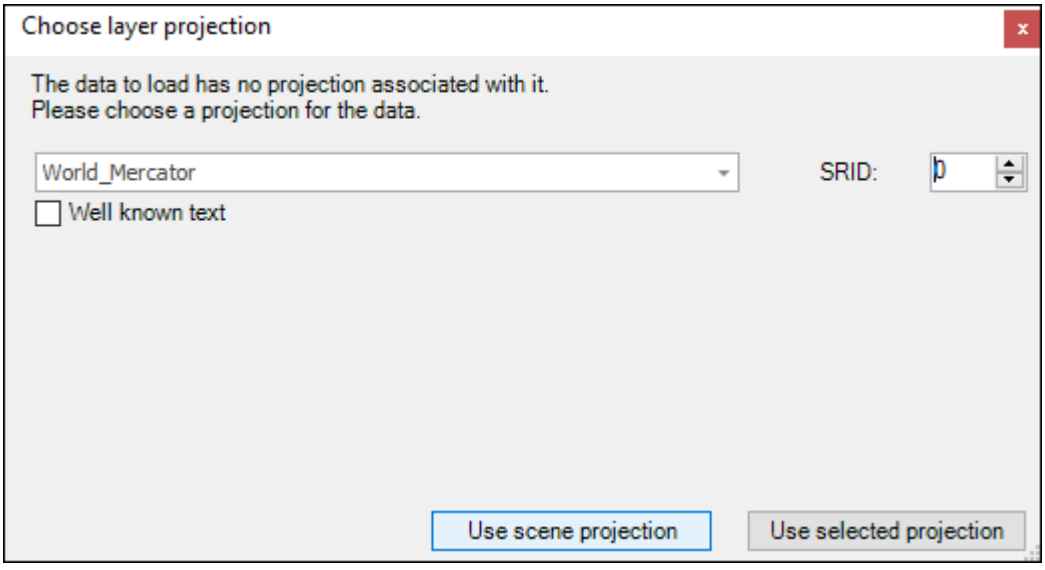


The coordinates of your baseline are now in the grid below:

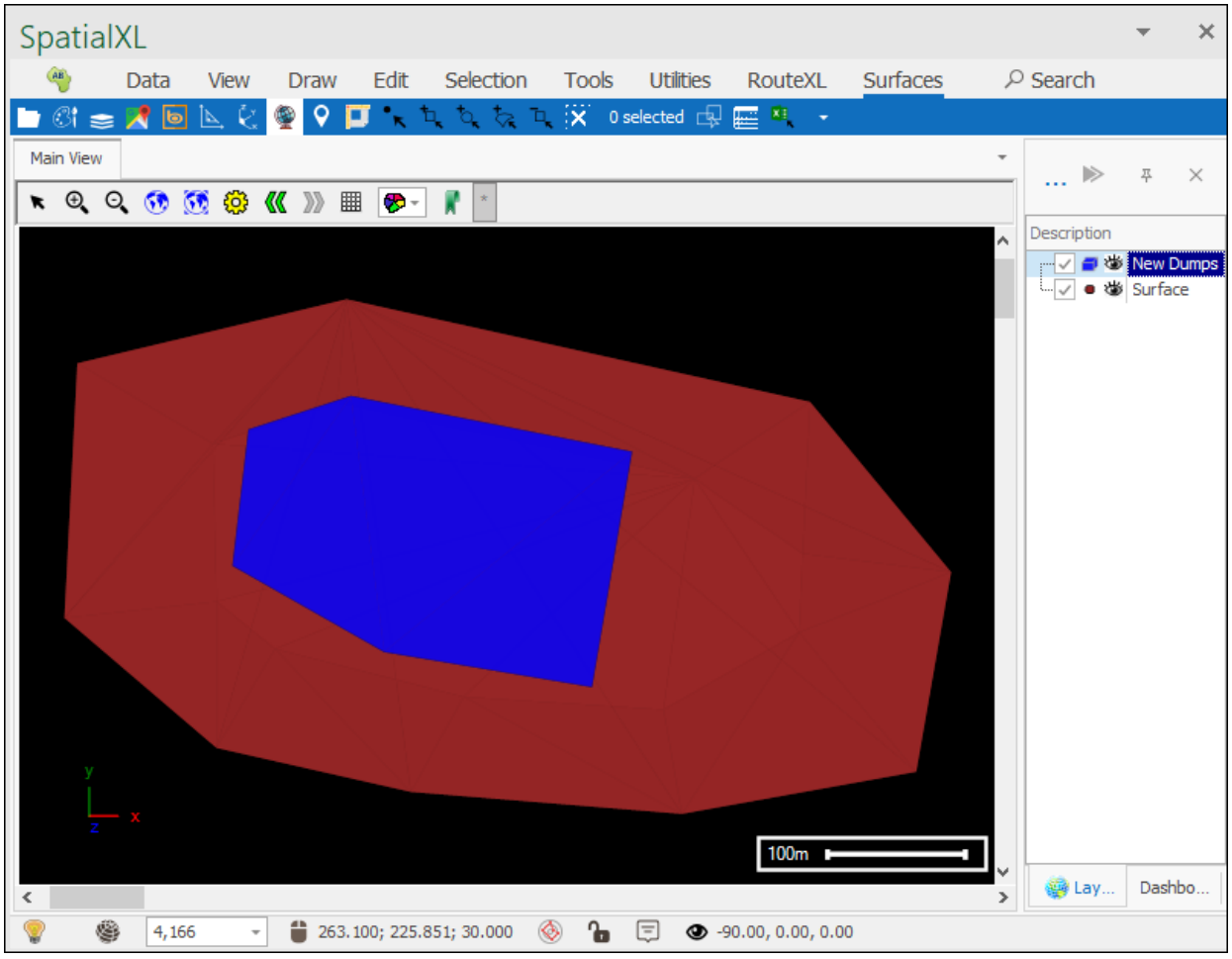


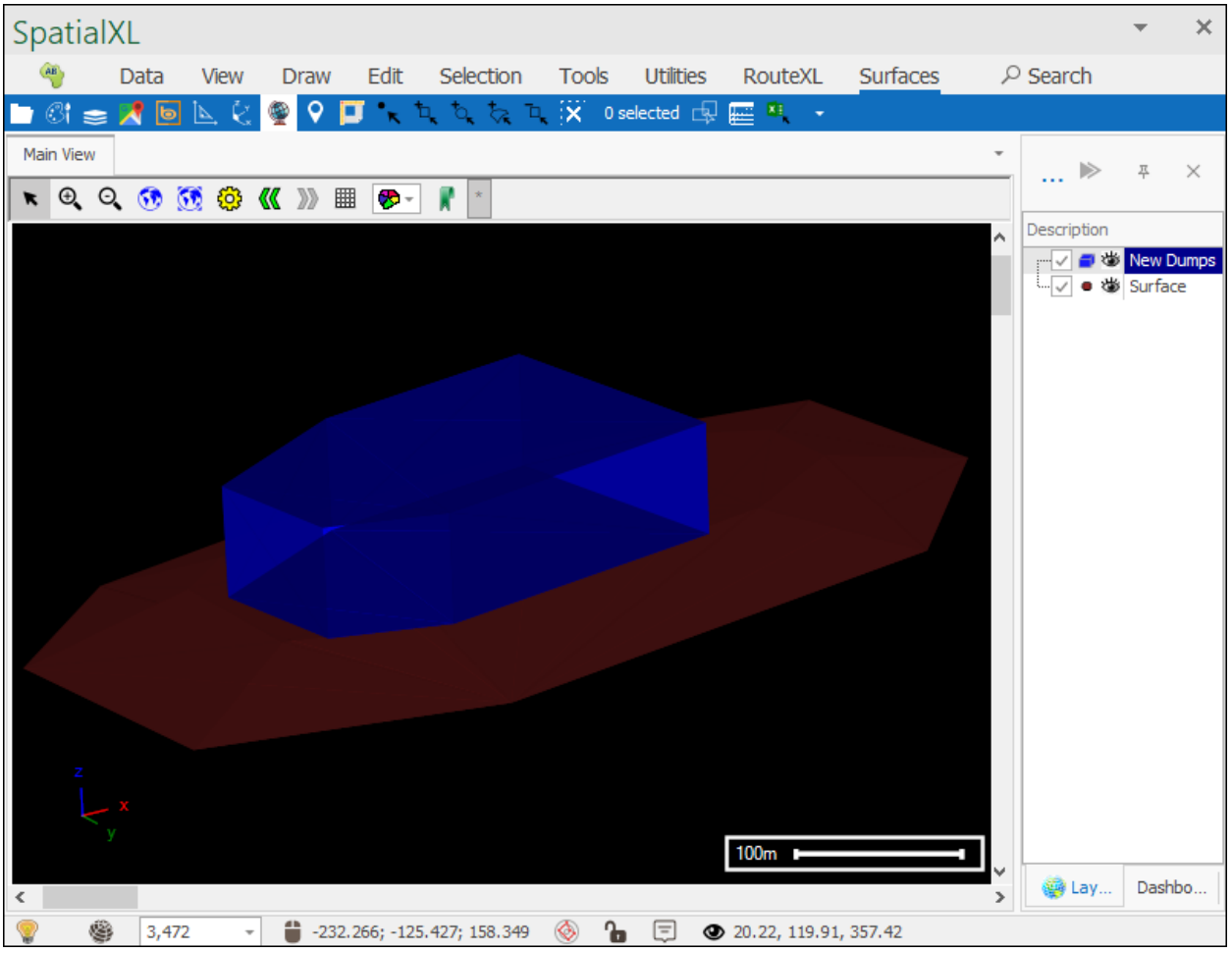
You can now click **Create Dump**, your dump will be drawn to any layer you have set as active, if you have none set as active then a new layer will be made for you and you will be prompted to choose the projection:



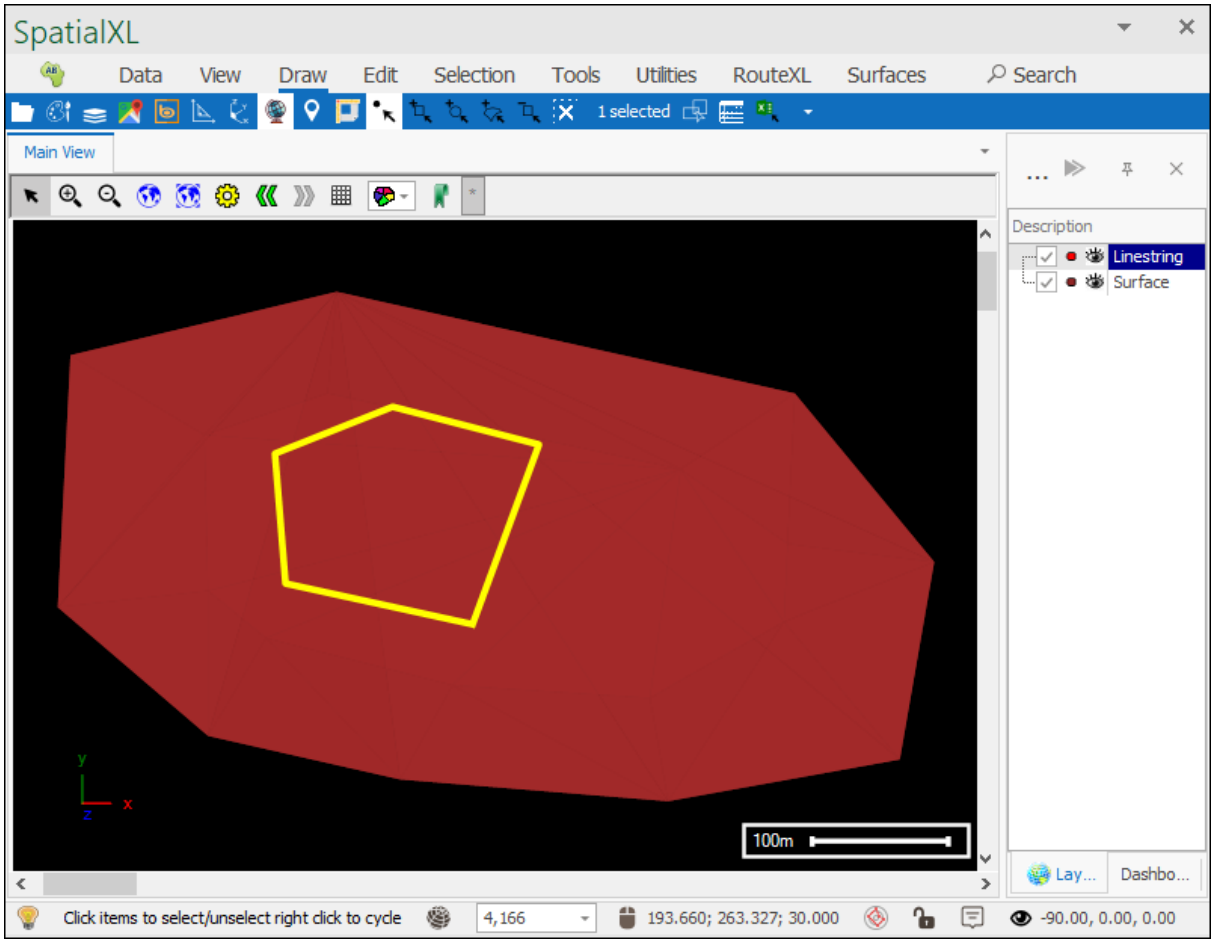


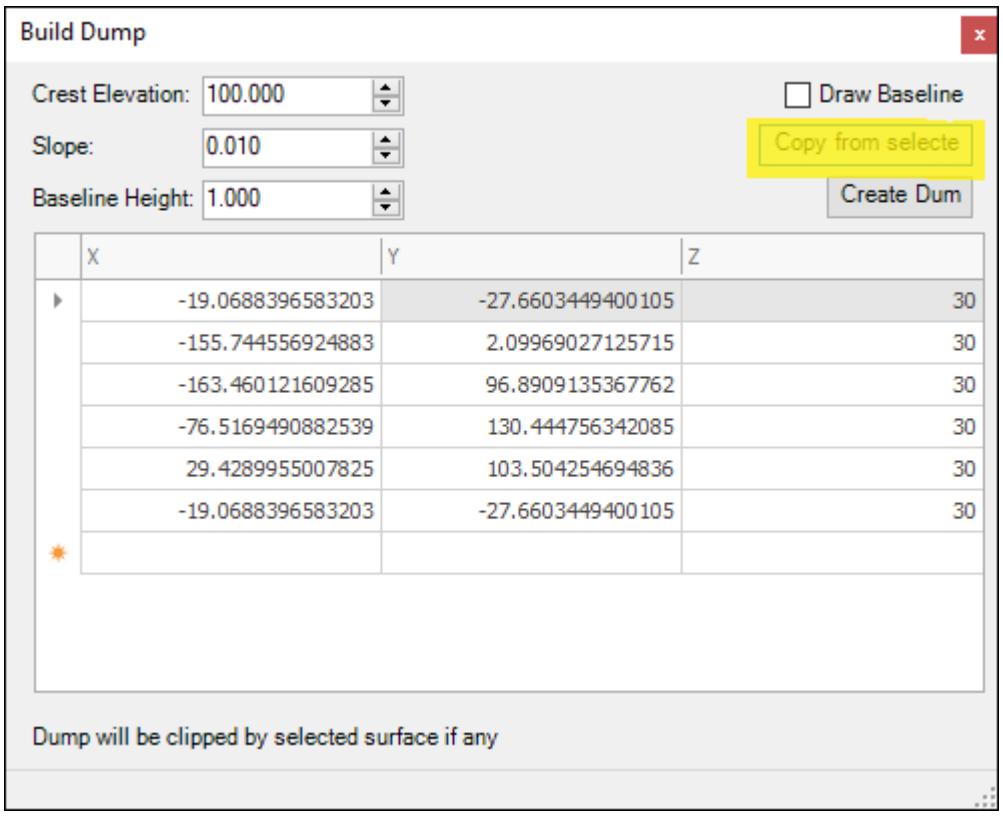
Your dump has now been created and you can rotate it around to inspect it:


SpatialXL
Data
View
Draw
Edit
Selection
Tools
Utilities
RouteXL
Surfaces
Search
0 selected
Main View
Description
New Dumps
Surface
100m
Lay...
Dashbo...
4,166
263.100; 225.851; 30.000
-90.00, 0.00, 0.00

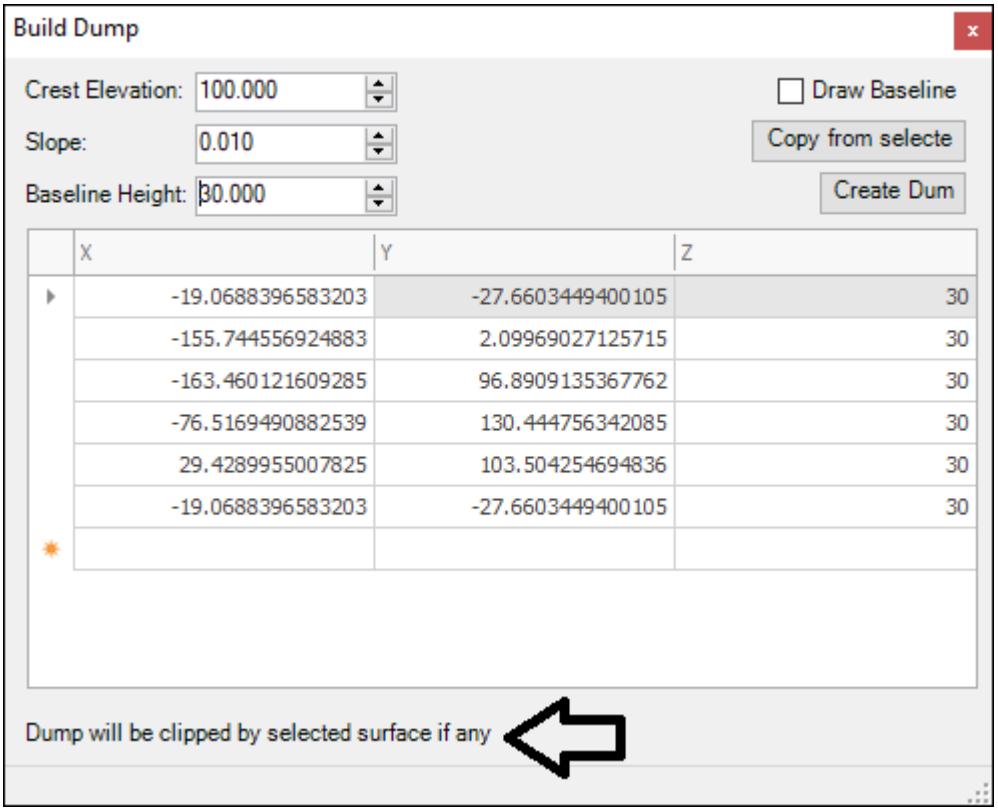


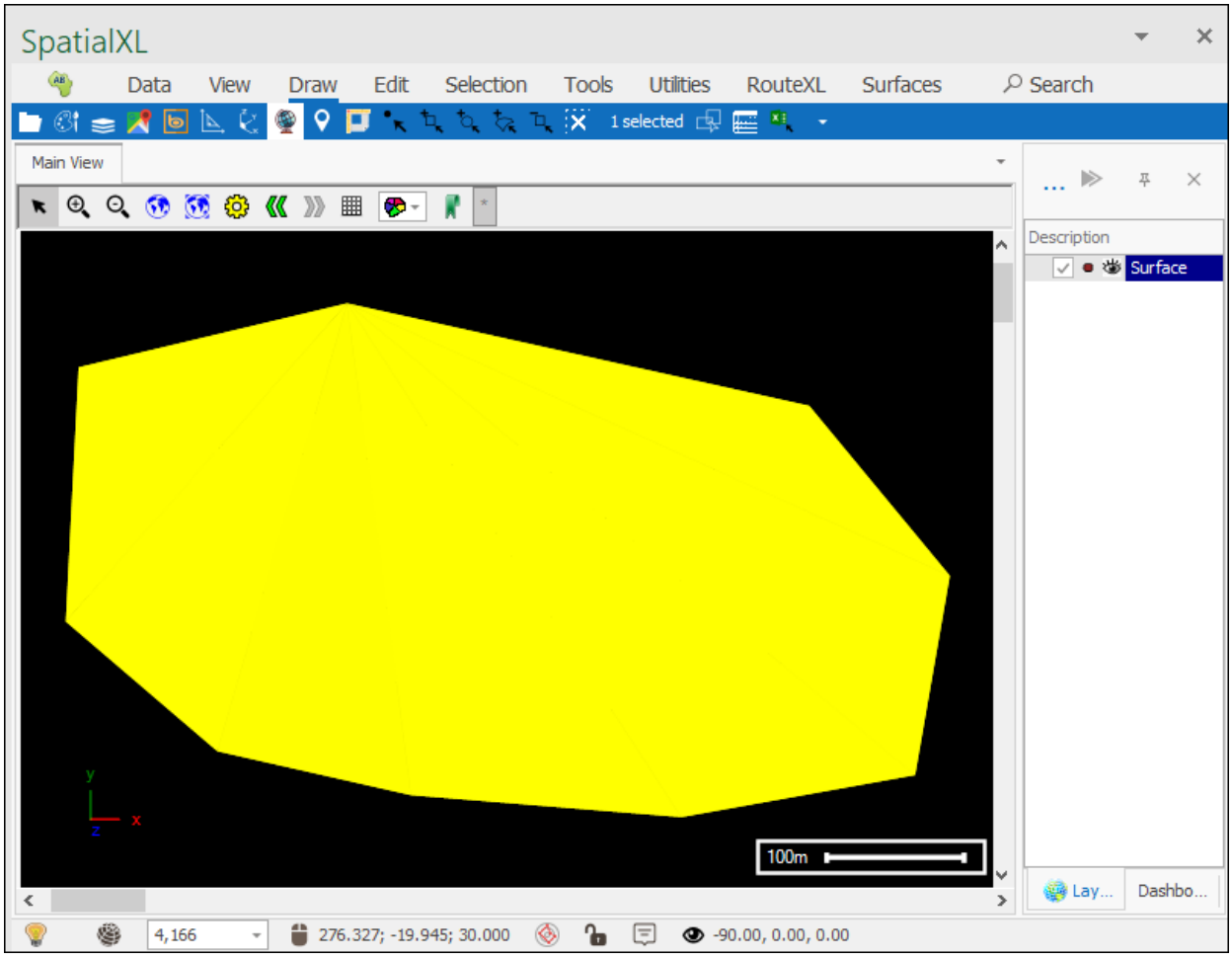
When creating your baseline you don't have to use the **Draw Baseline** option, if you have a linestring layer already in your scene that you would like to use as the baseline then simply select the linestring and then click **Copy from Selected** and the geometries will be pasted in:


SpatialXL
Data
View
Draw
Edit
Selection
Tools
Utilities
RouteXL
Surfaces
Search
1 selected
Main View
Description
Linestring
Surface
100m
Lay...
Dashbo...
Click items to select/unselect right click to cycle
4,166
193.660; 263.327; 30.000
-90.00, 0.00, 0.00



If you are creating your wall on an already existing surface then you can choose to have the wall clipped by that surface if you want by selecting the surface before creating the wall:


Build Dump
Crest Elevation: 100.000
Slope: 0.010
Baseline Height: 30.000
Draw Baseline
Copy from selecte
Create Dum
X
Y
Z
-19.0688396583203 -27.6603449400105 30
-155.744556924883 2.09969027125715 30
-163.460121609285 96.8909135367762 30
-76.5169490882539 130.444756342085 30
29.4289955007825 103.504254694836 30
-19.0688396583203 -27.6603449400105 30
Dump will be clipped by selected surface if any


SpatialXL
Data
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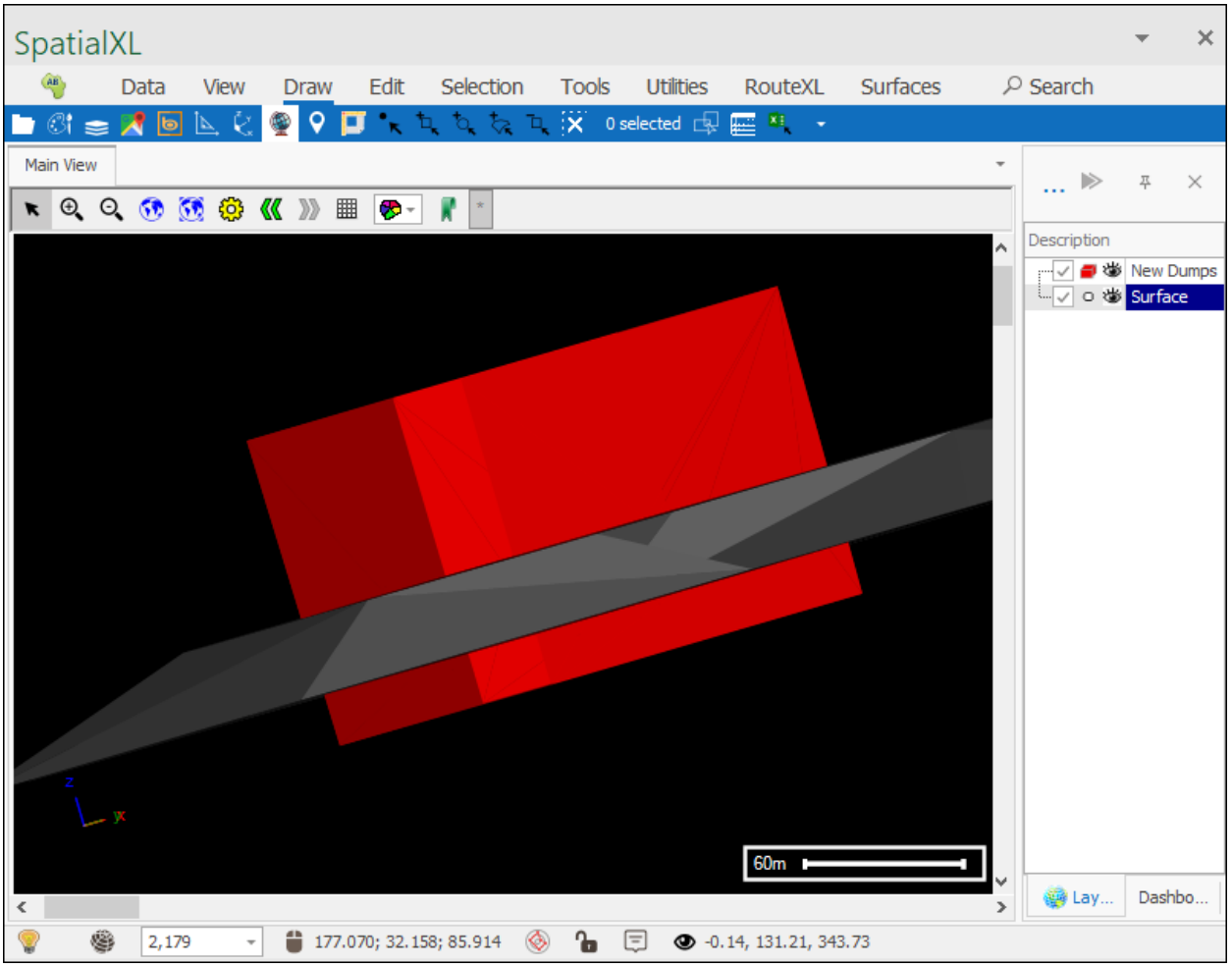
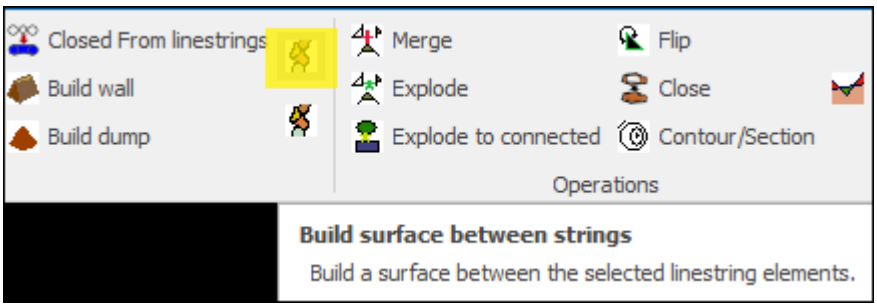
Draw
Edit
Selection
Tools
Utilities
RouteXL
Surfaces
Search
1 selected
Main View
Description
Surface
100m
Lay...
Dashbo...
4,166
276.327; -19.945; 30.000
-90.00, 0.00, 0.00



And as you can see the wall has been clipped by the surface.

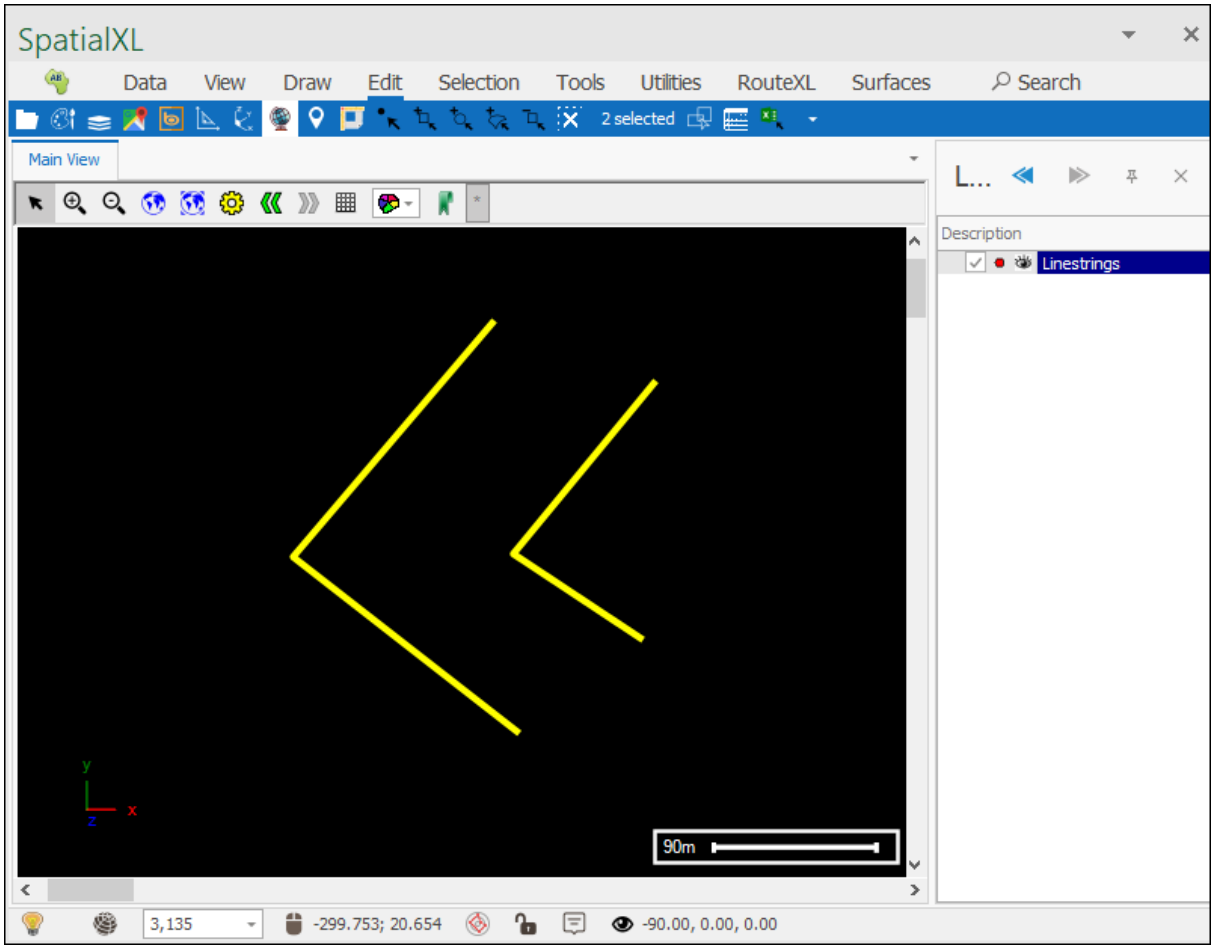
Build surface between strings

The next tool is the **Build surface between strings** tool which is seen as the first little icon here:

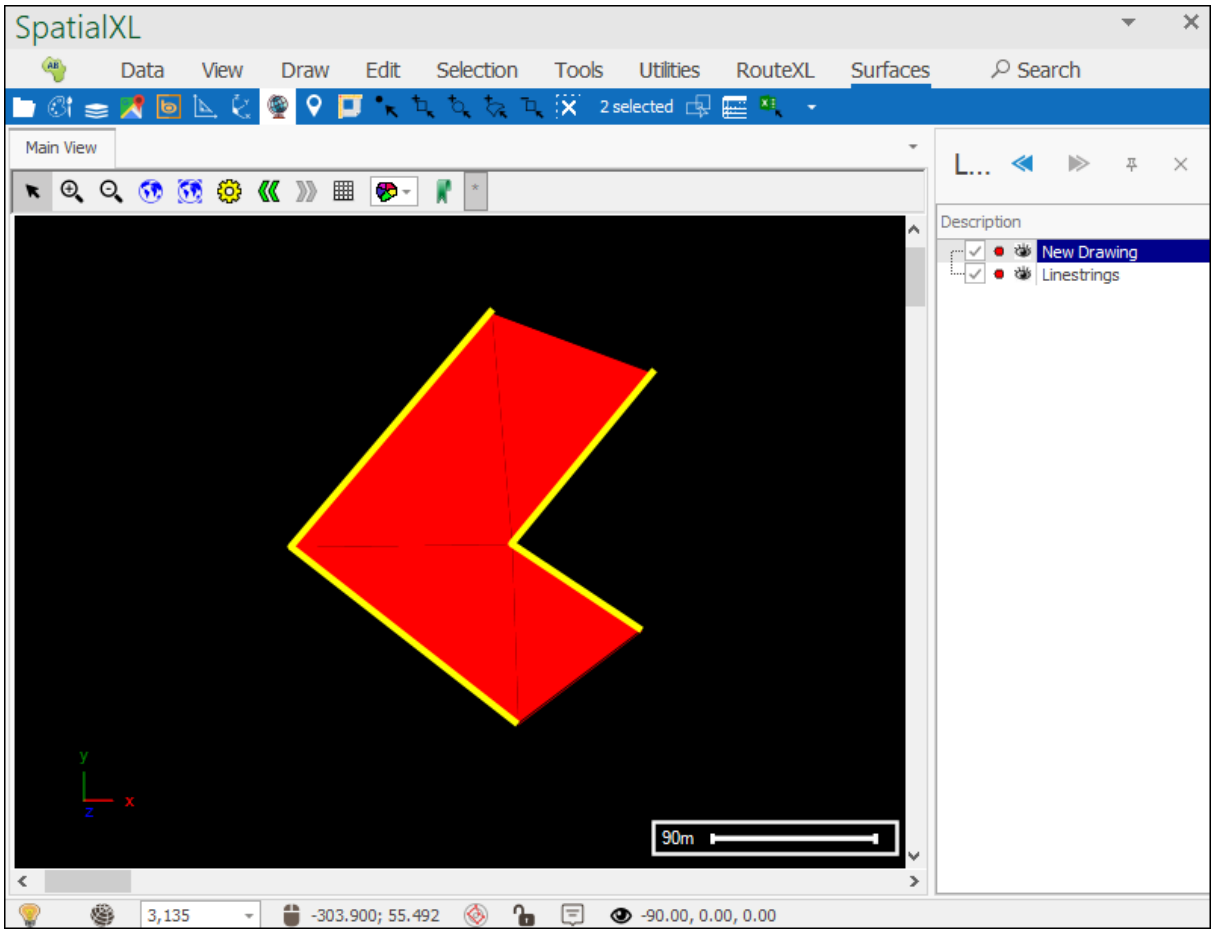


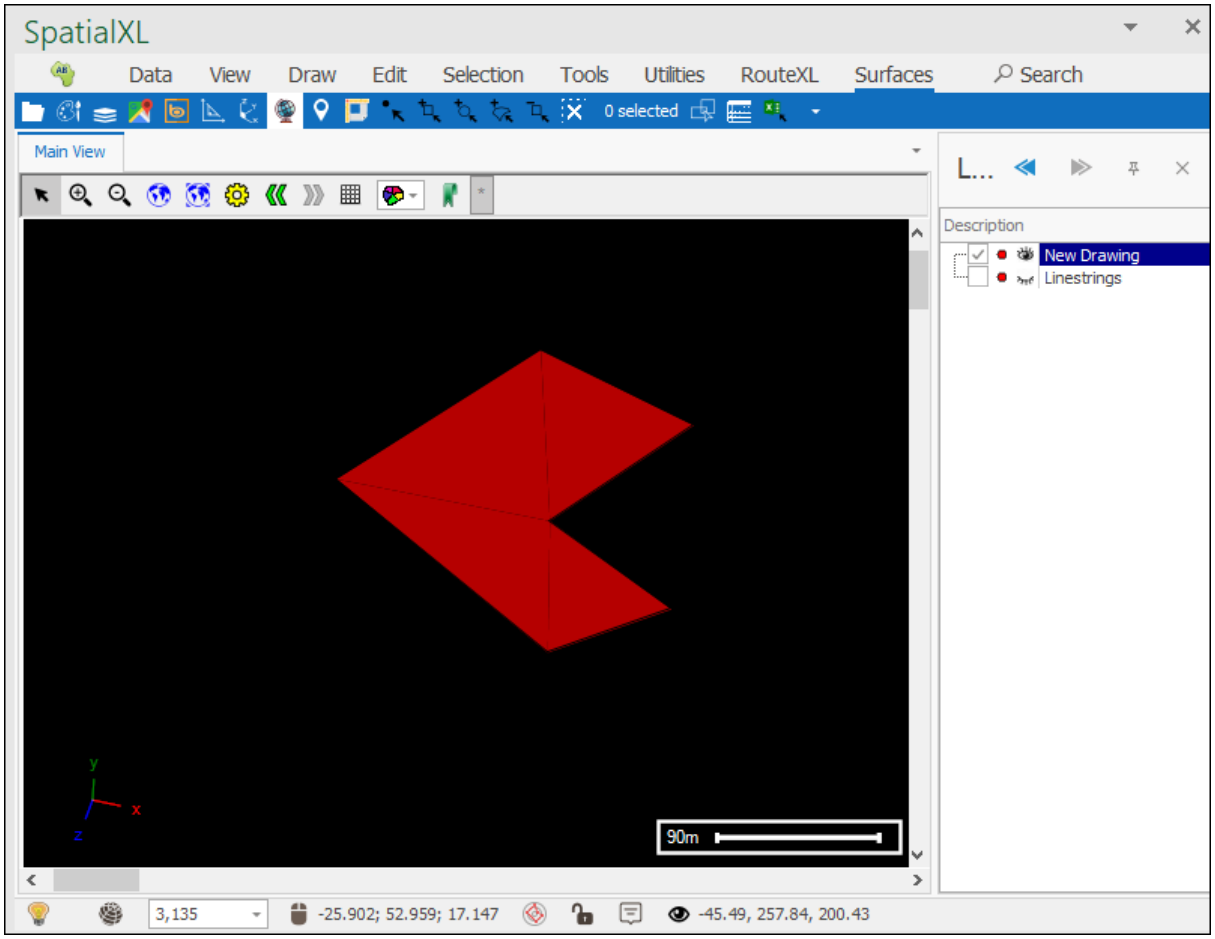
This tool allows you to build a surface between a pair of linestrings.

First select your linestrings:



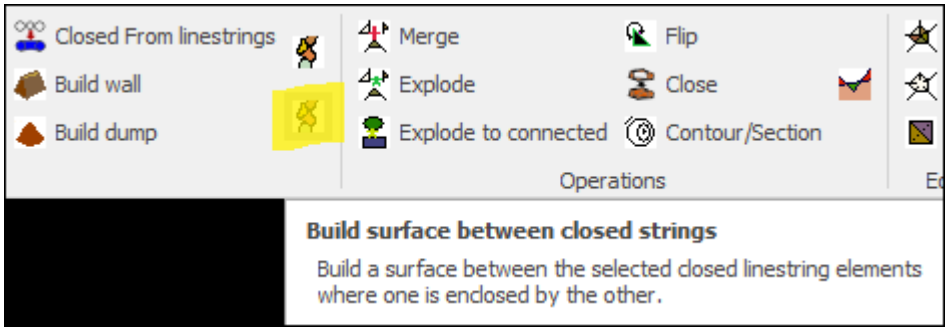
Then click the **Build surface between strings** tool and your surface will be created:


SpatialXL
Data
View
Draw
Edit
Selection
Tools
Utilities
RouteXL
Surfaces
Search
2 selected
Main View
Description
New Drawing
Linestrings
90m
3,135
-303.900; 55.492
-90.00, 0.00, 0.00



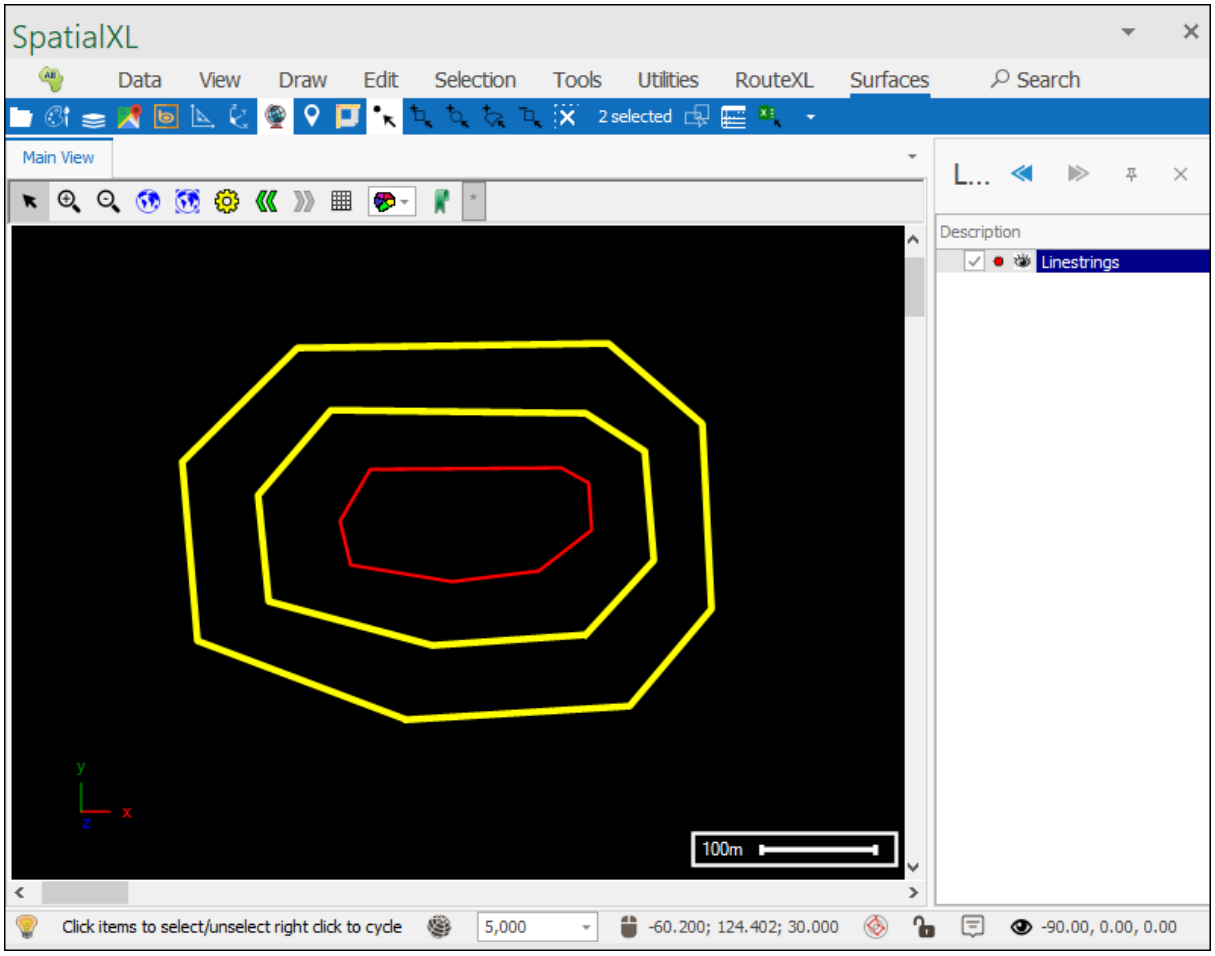
Build surface between closed strings

The next tool is the **Build surface between closed strings** tool which is seen as the second little icon here:

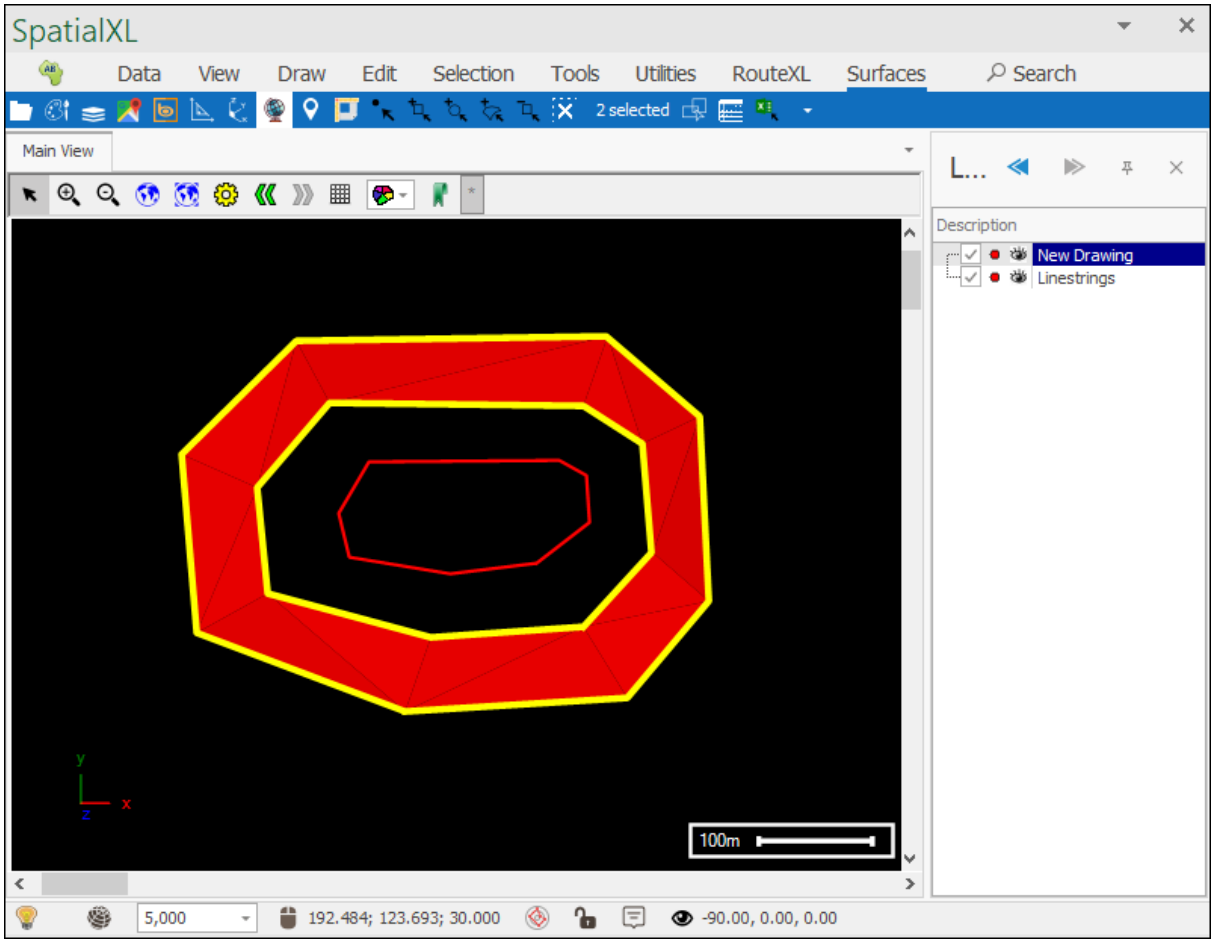


This tool will build a surface between a pair of selected closed linestring elements where one is enclosed by the other.

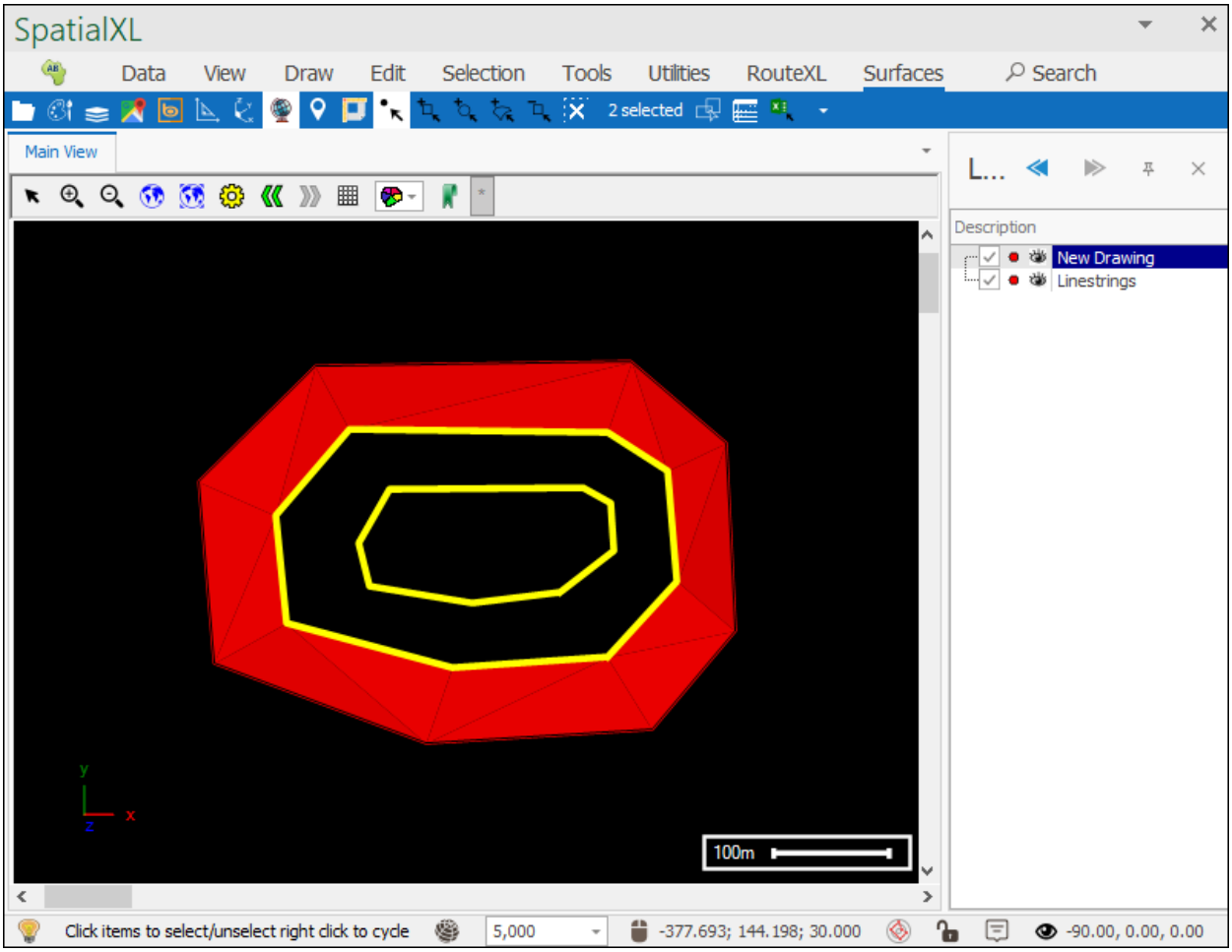
First select the linestrings:



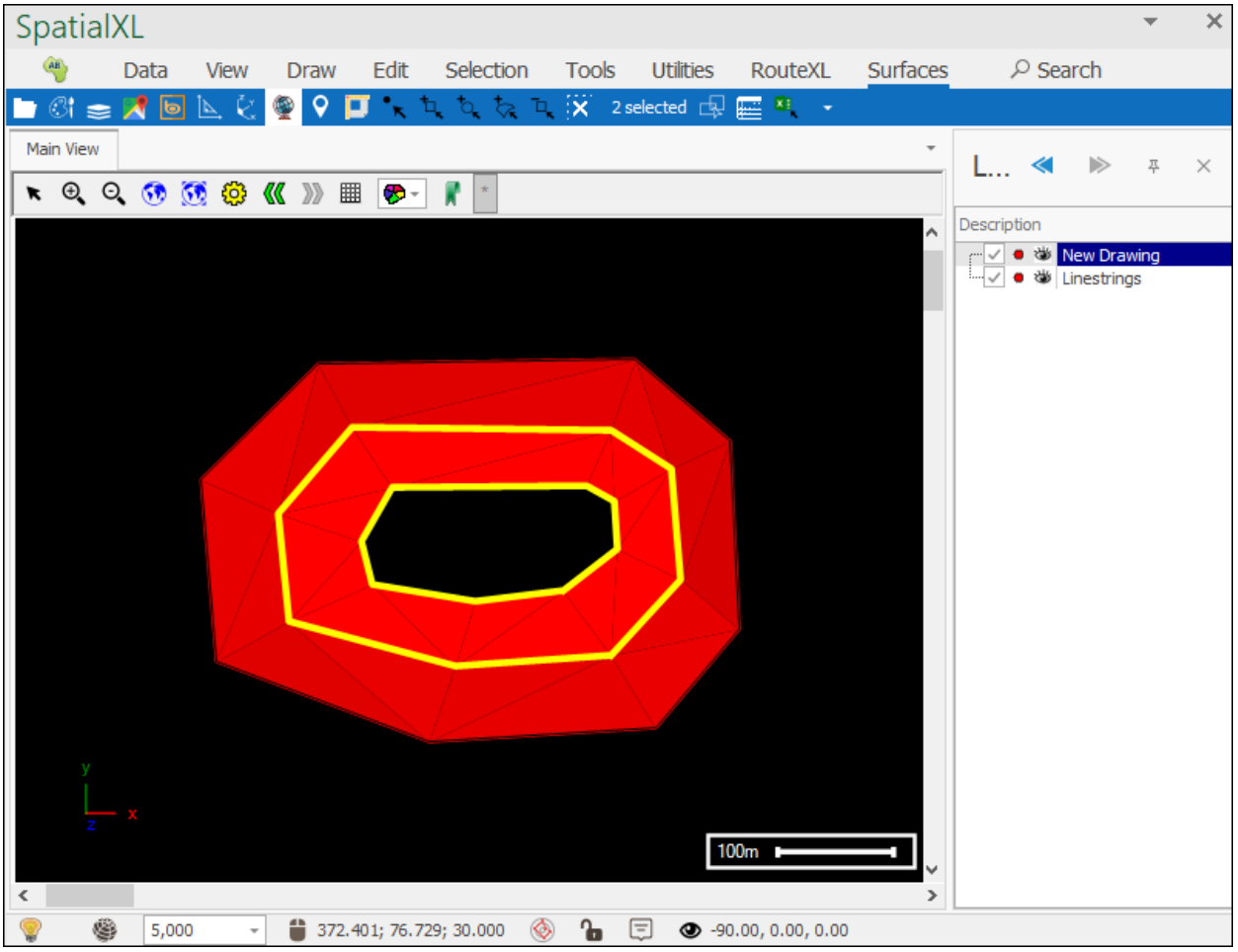
Then click the **Build surface between closed strings** tool and your surface will be created:

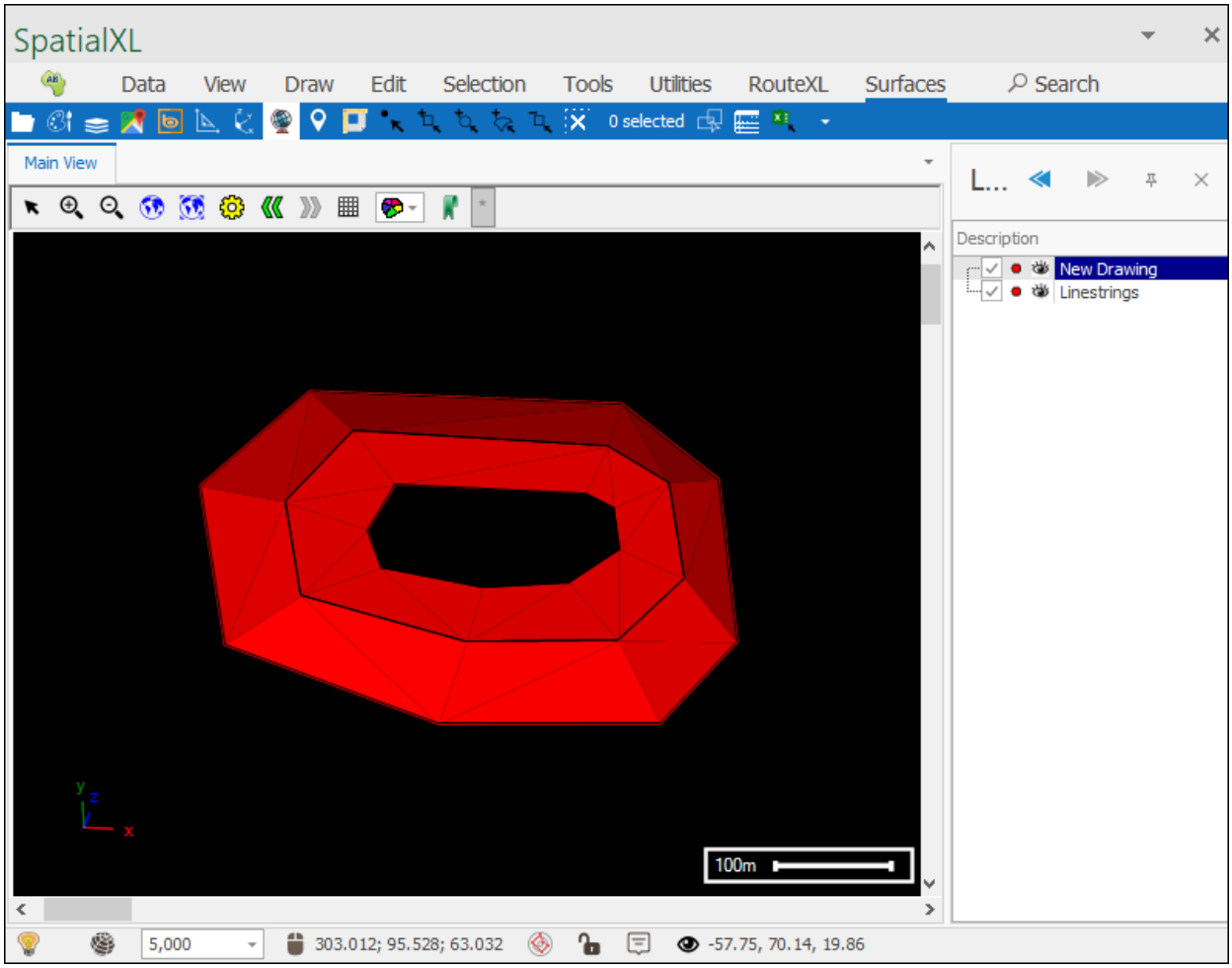


I can the select the next two closed linestrings:



And click the **Build surface between closed strings** tool to build the next surface:


SpatialXL
Data
View
Draw
Edit
Selection
Tools
Utilities
RouteXL
Surfaces
Search
2 selected
Main View
Description
New Drawing
Linestrings
100m
5,000
372.401; 76.729; 30.000
-90.00, 0.00, 0.00

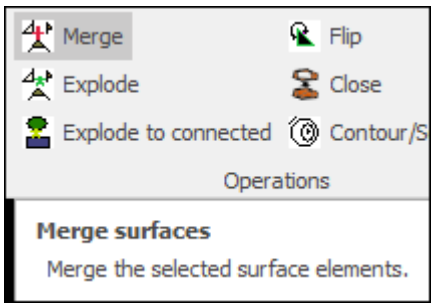


These last two tools are useful for creating surfaces where if you just used the **From linestrings** tool the surface might not be created so accurately. Here you can step by step create each part of the surface by only making a surface between two closed linestrings at a time.

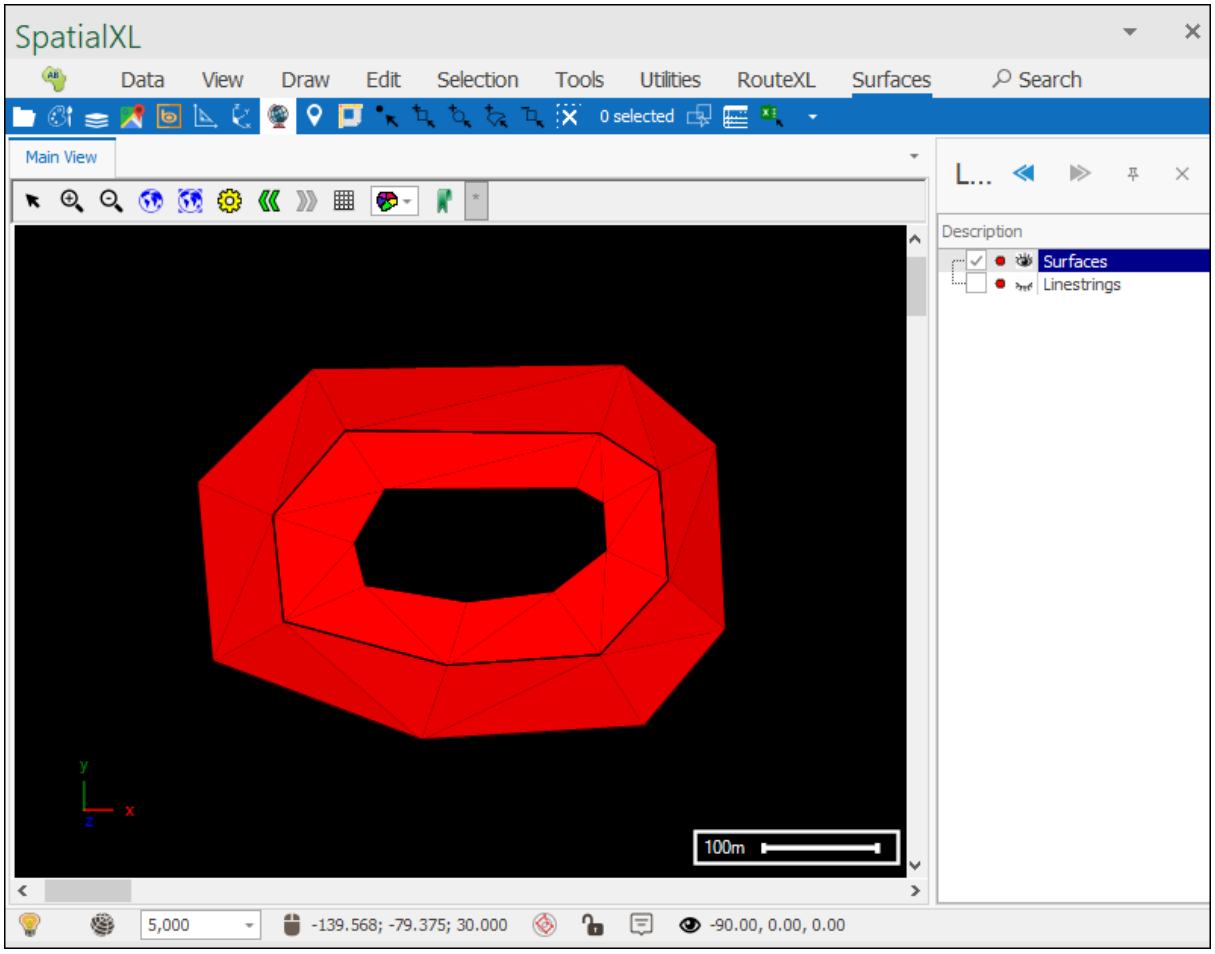
Operations

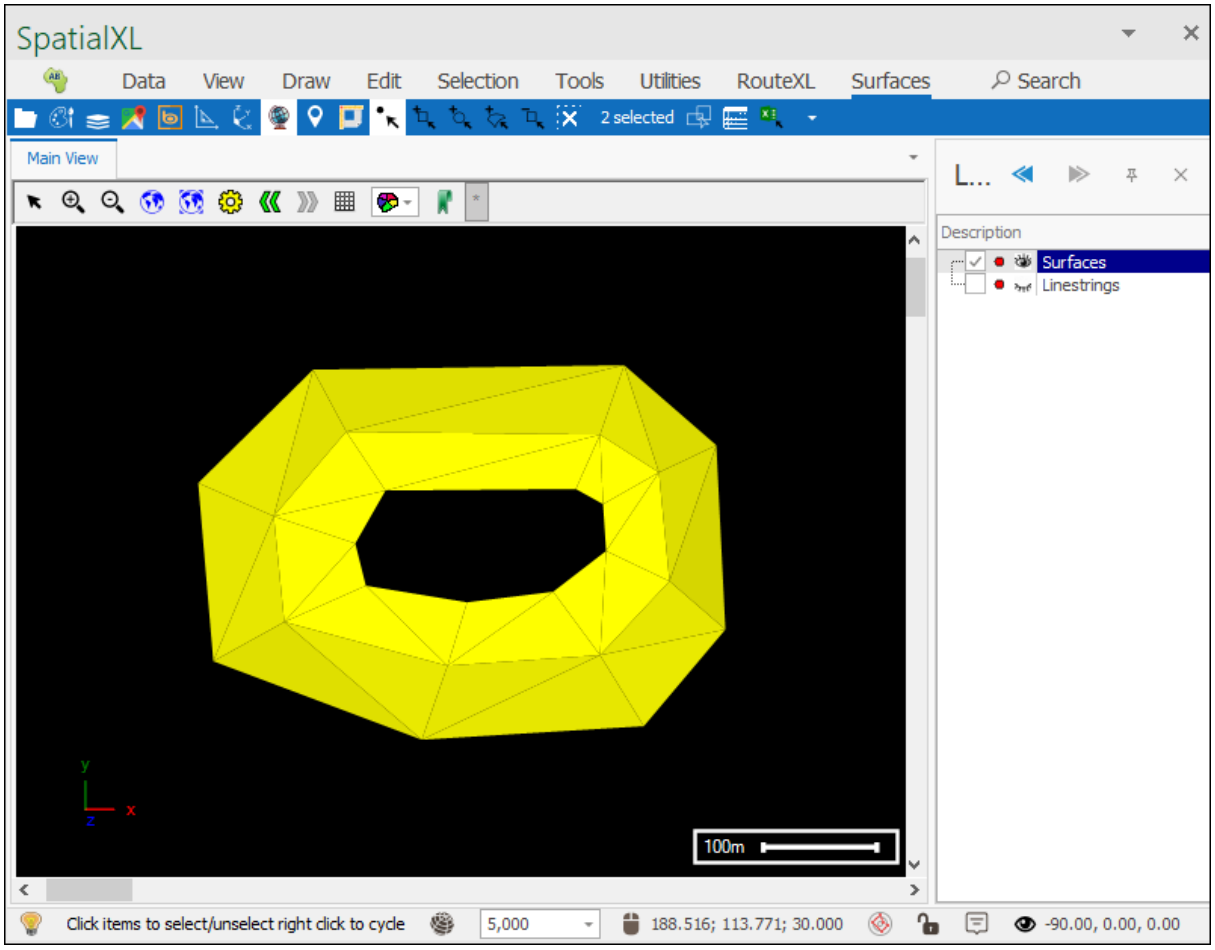
Merge

The first tool in the Operations section of the Surfaces tab is the **Merge** tool which allows you to merge selected surfaces together:

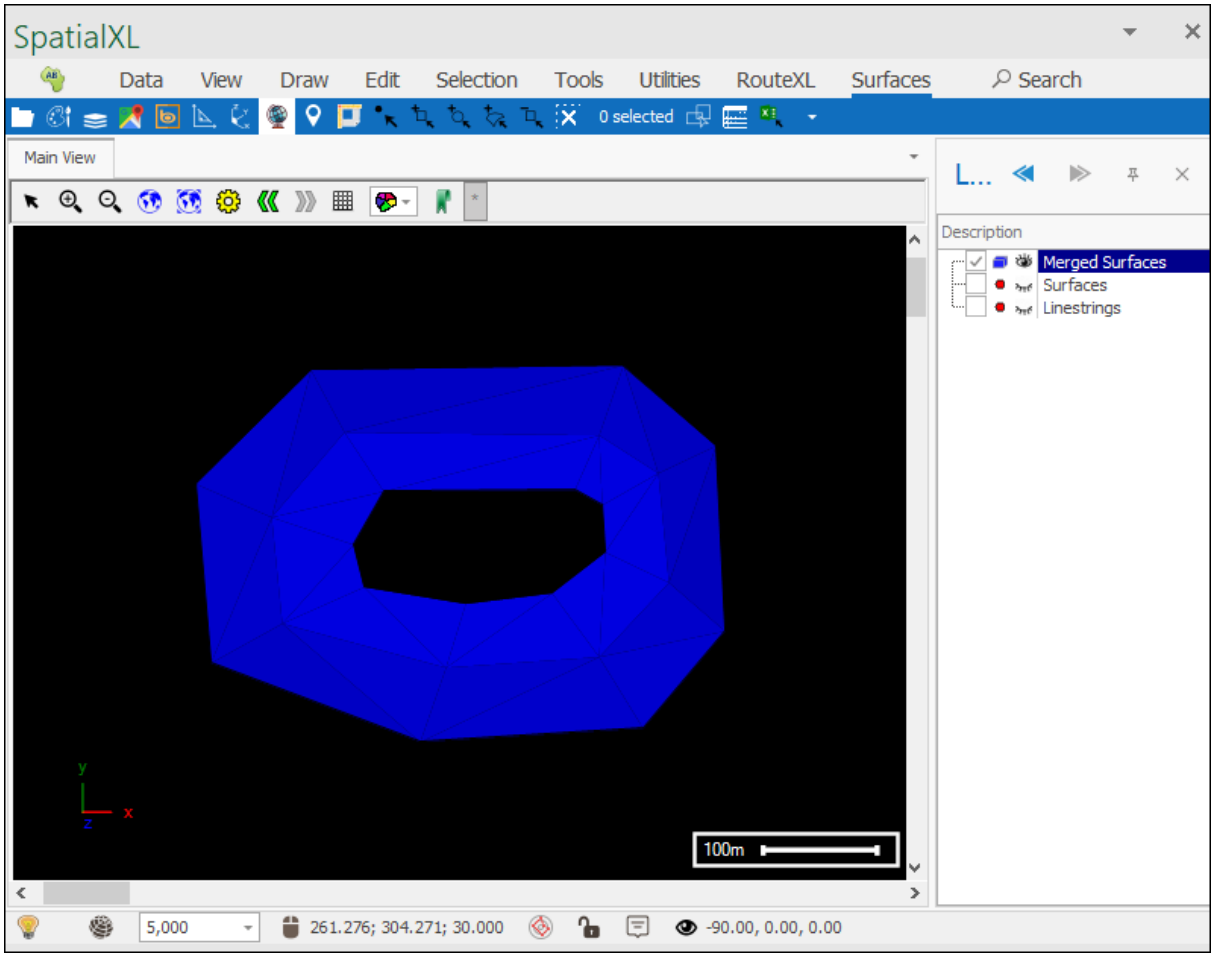


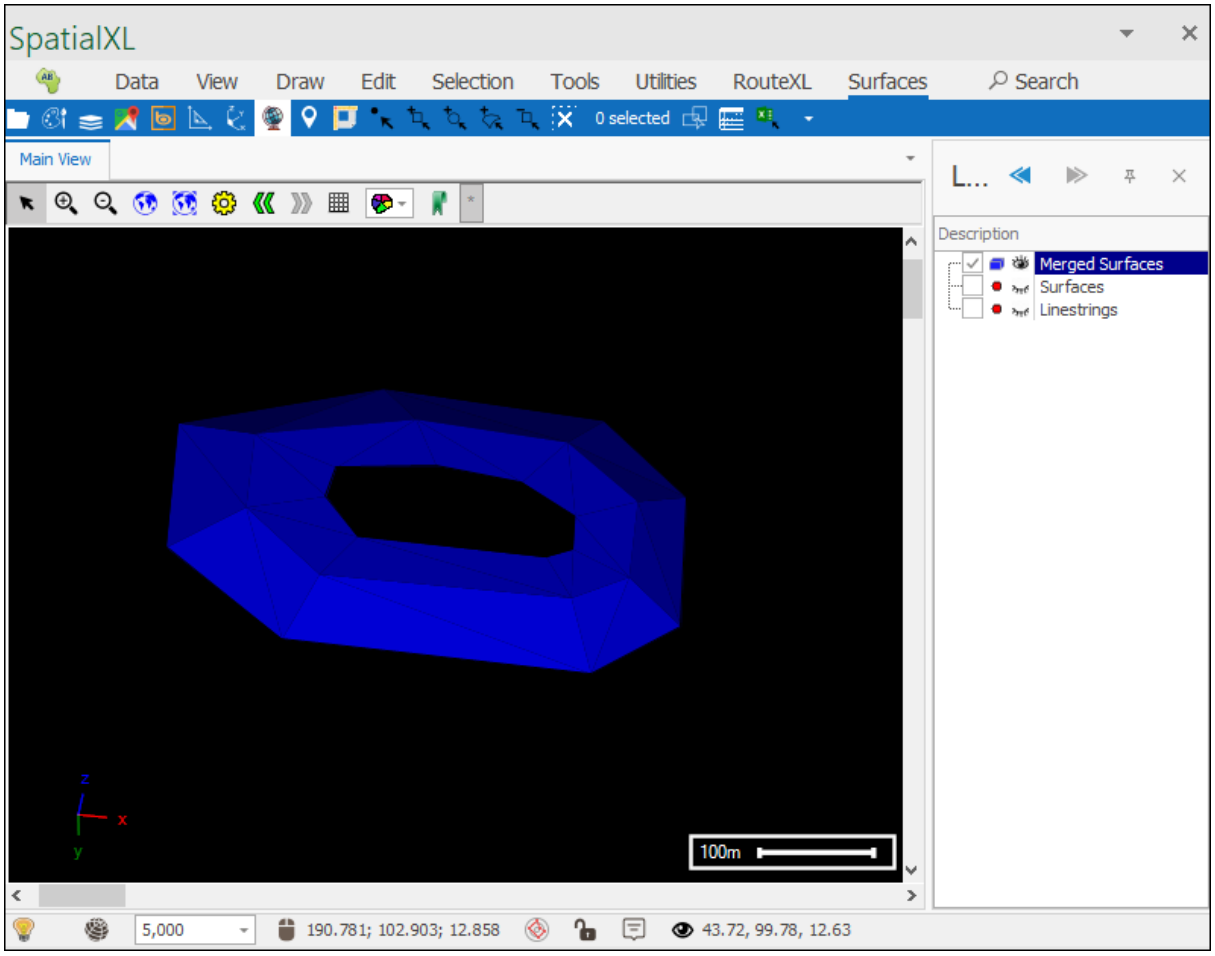
First select your surfaces:





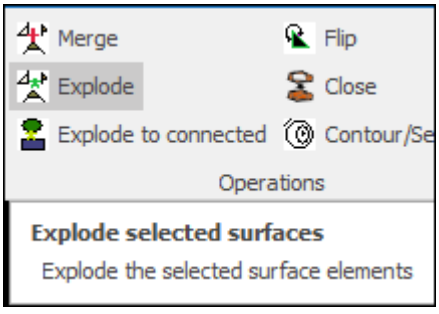
Then click **Merge** and your surfaces will have been merged:


SpatialXL
Data
View
Draw
Edit
Selection
Tools
Utilities
RouteXL
Surfaces
Search
0 selected
Main View
Description
Merged Surfaces
Surfaces
Linestrings
100m
5,000
261.276; 304.271; 30.000
-90.00, 0.00, 0.00

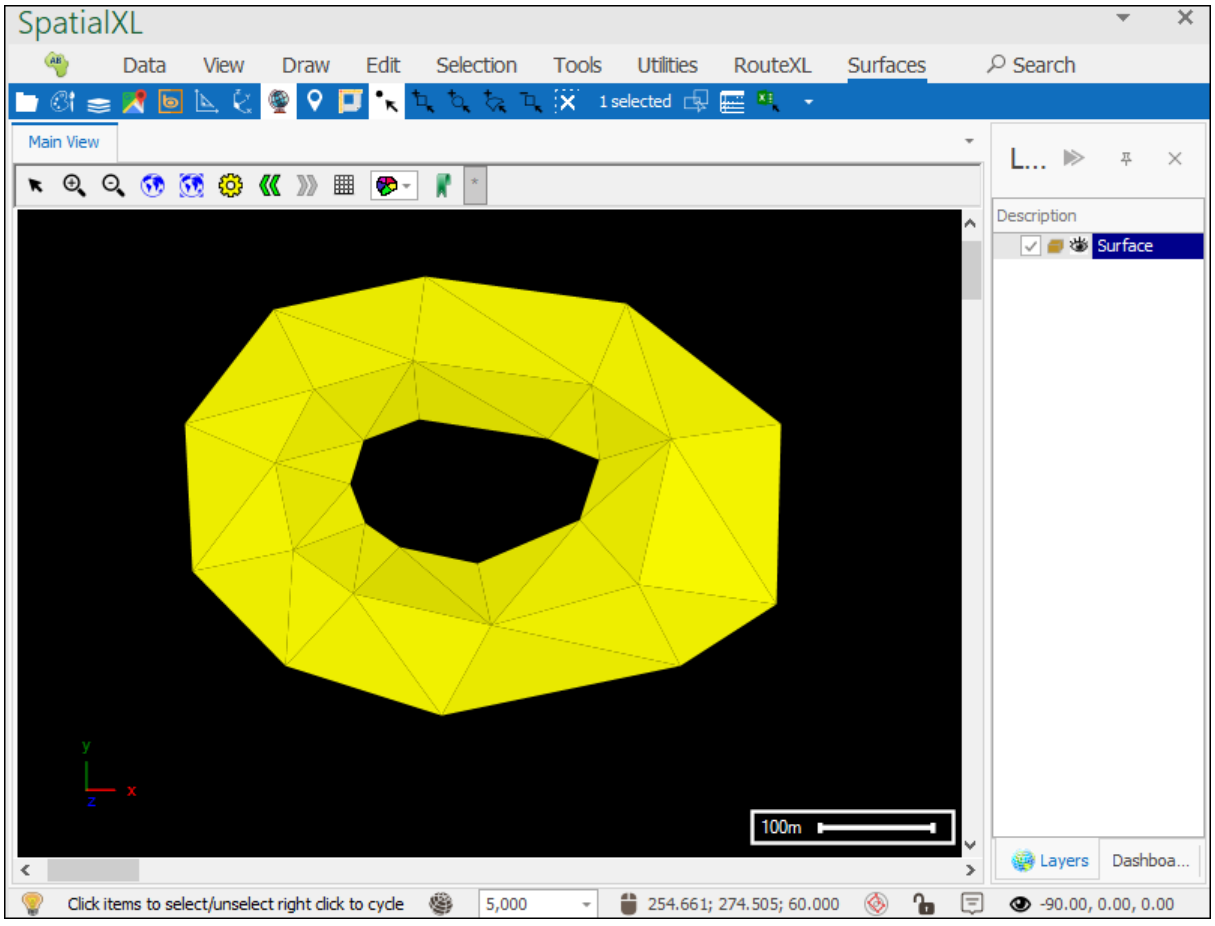


Explode

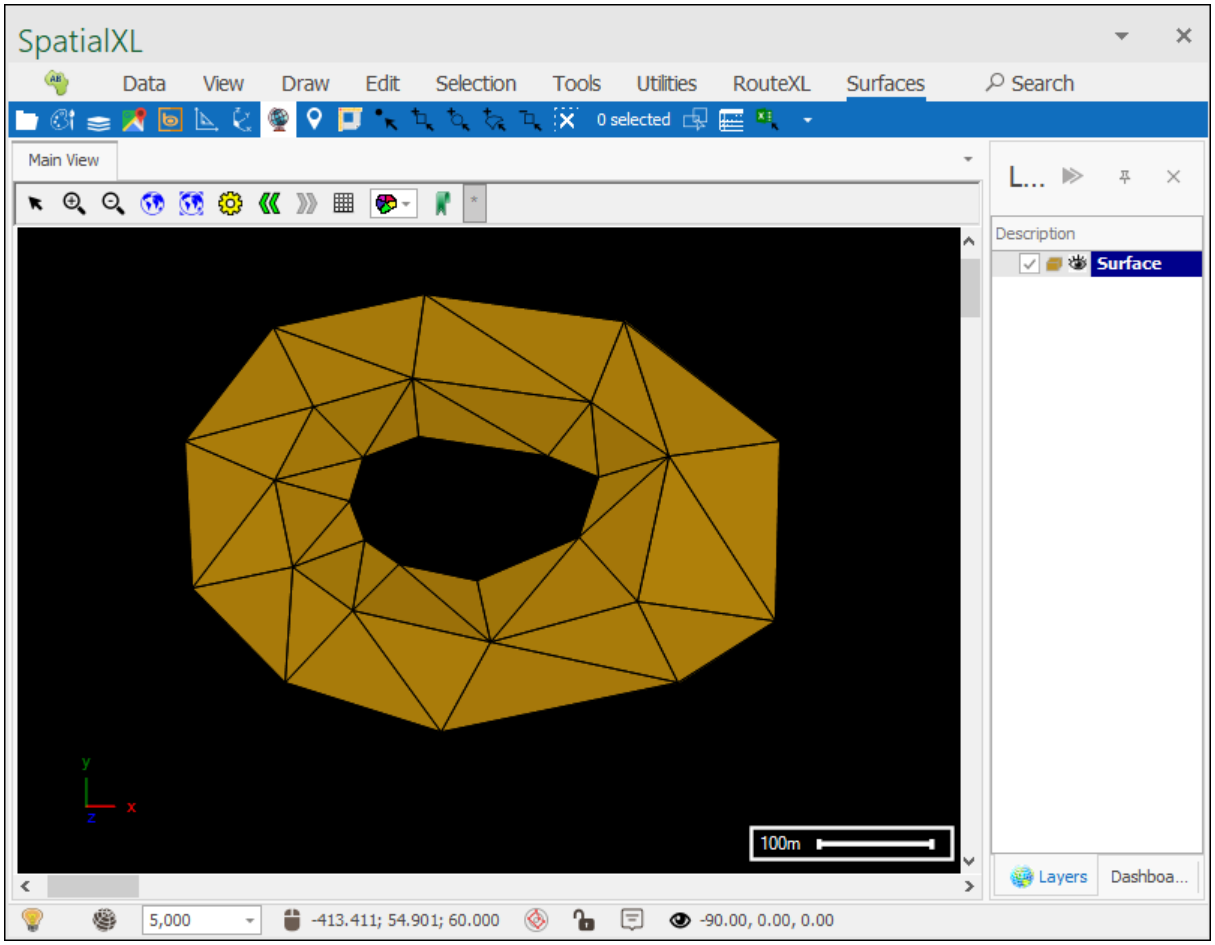
The next tool is the **Explode** tool which will separate each facet of a surface into its own separate surface:



Select the surface you want to explode:

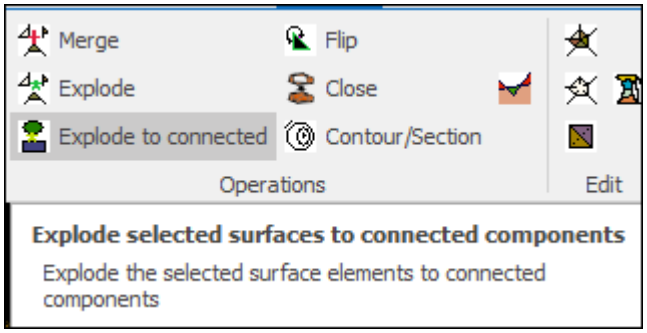


Then click the **Explode** tool and your surface will have been exploded:

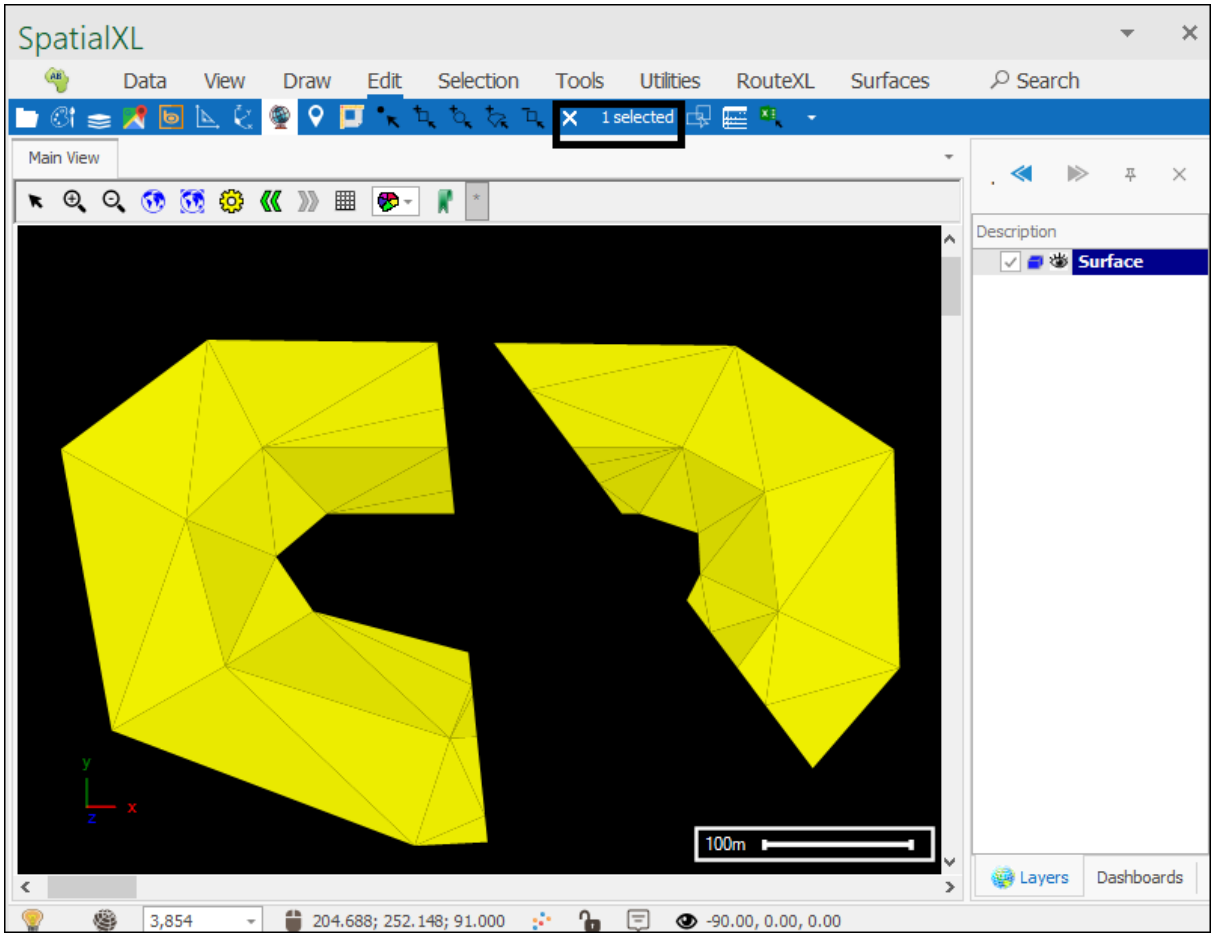


Explode to connected

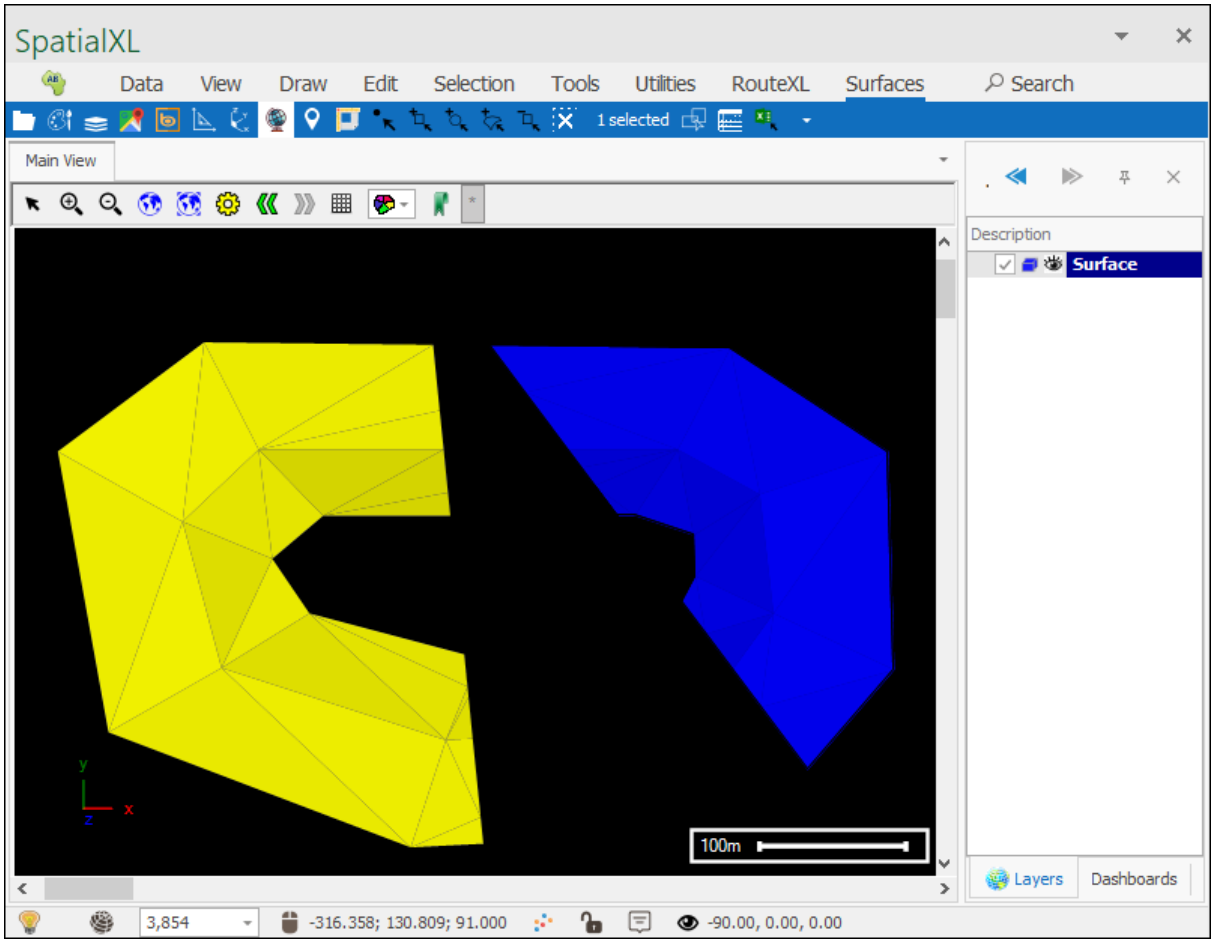
The next tool is the **Explode to connected** tool which will separate the parts of a surface, that are not physically touching in space but which are connected and form one surface, into separate surfaces:



First select the surface:

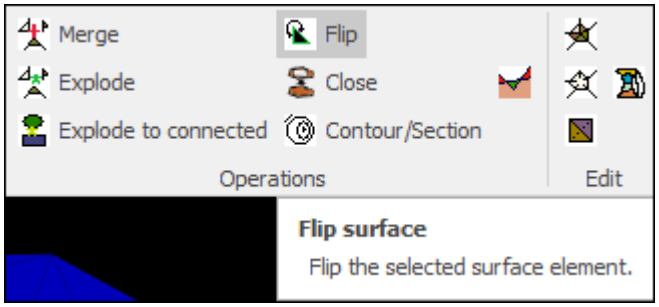


Then select the **Explode to connected** tool and the components will have been separated into two different surfaces:

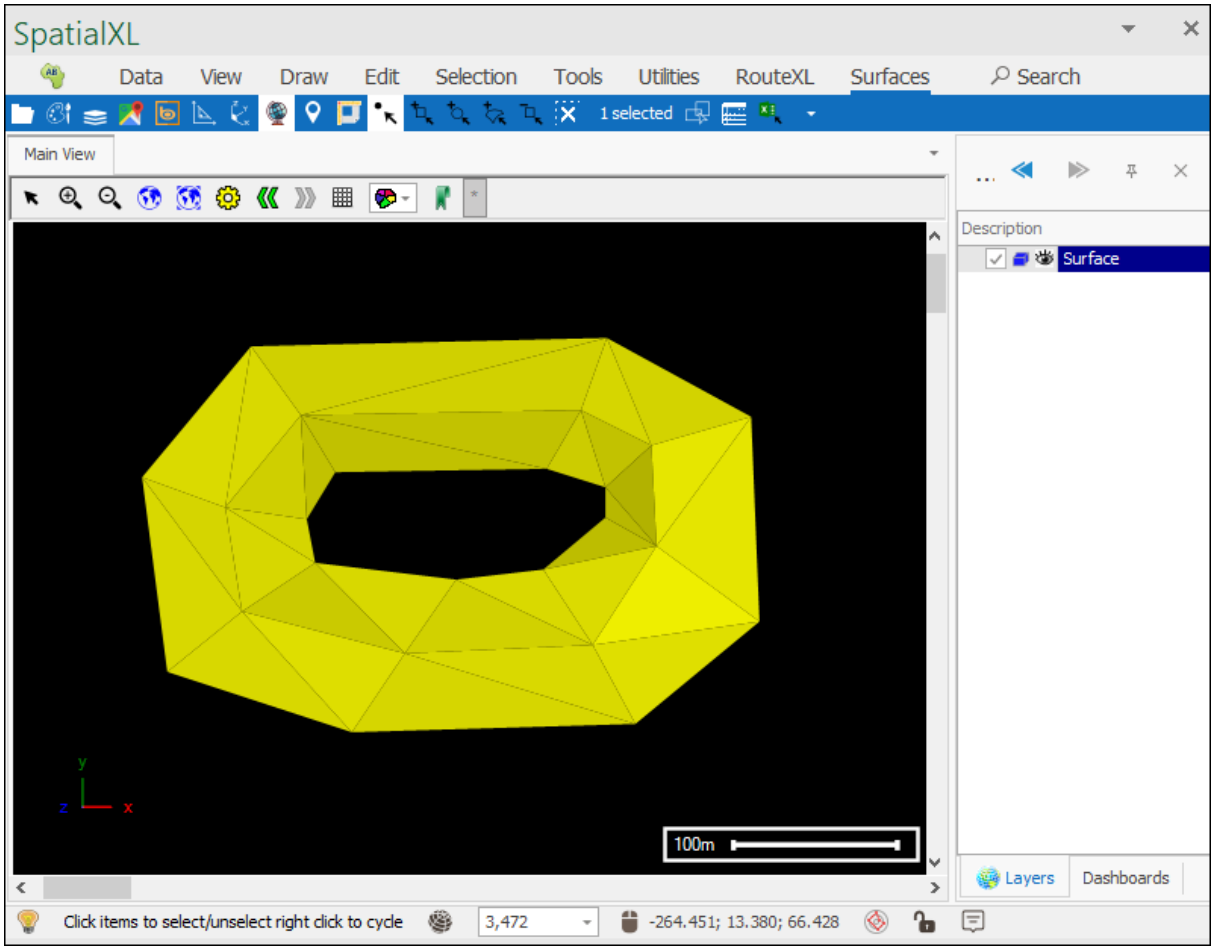


Flip

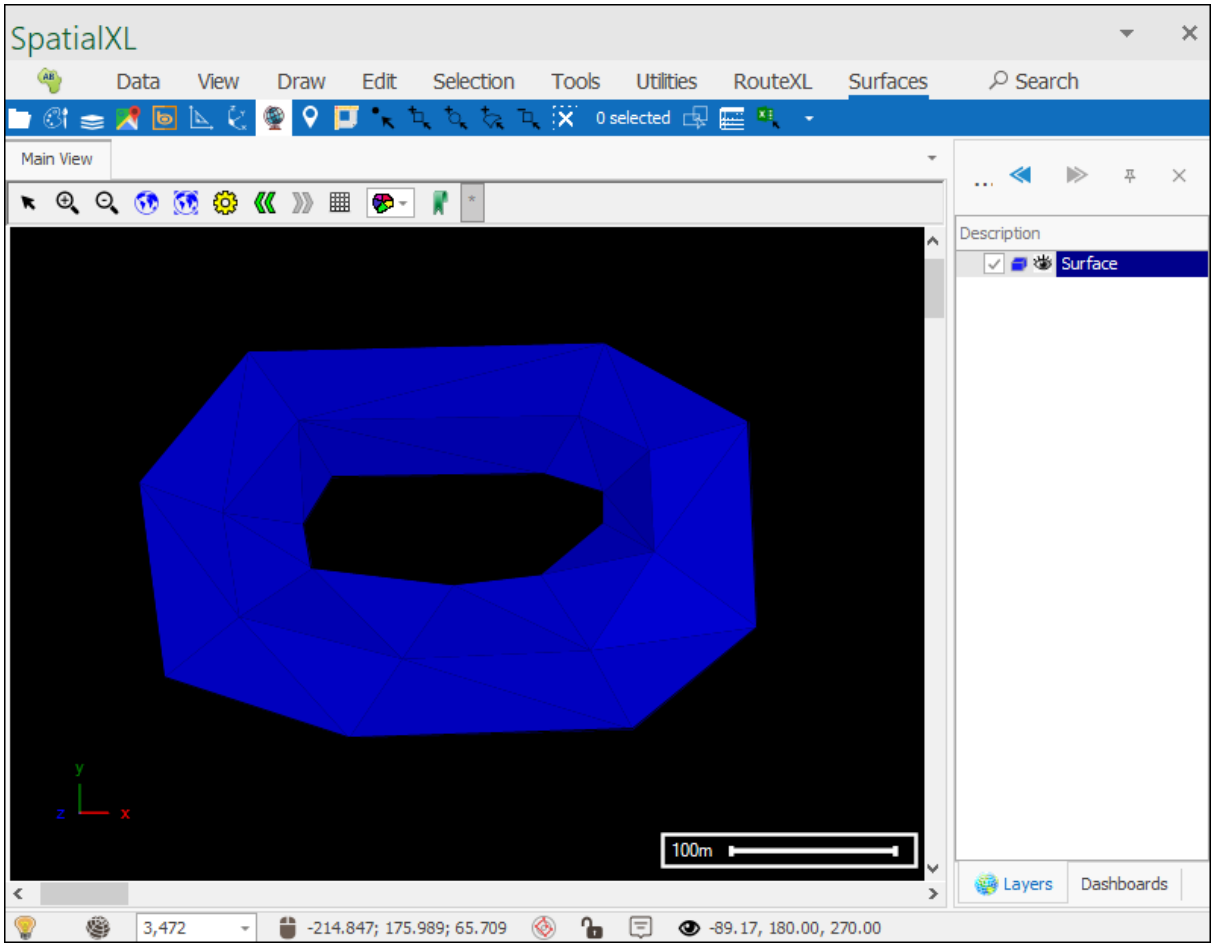
The next tool is the **Flip** tool which will flip the orientation of facets of a surface so that the surface can be exported to another system or so that it can merge with another surface:



First select the surface:

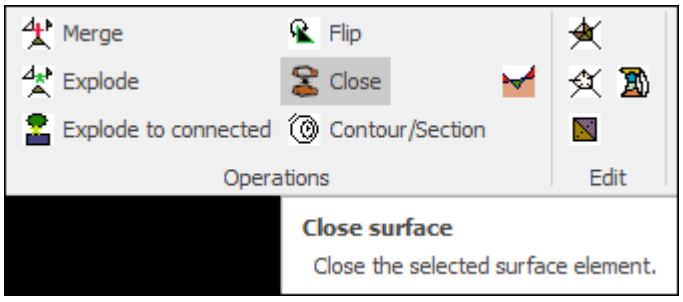


Then click the **Flip** tool and your surface facets will have been flipped in orientation (**Note**: this is not a change you would physically see but it does occur):

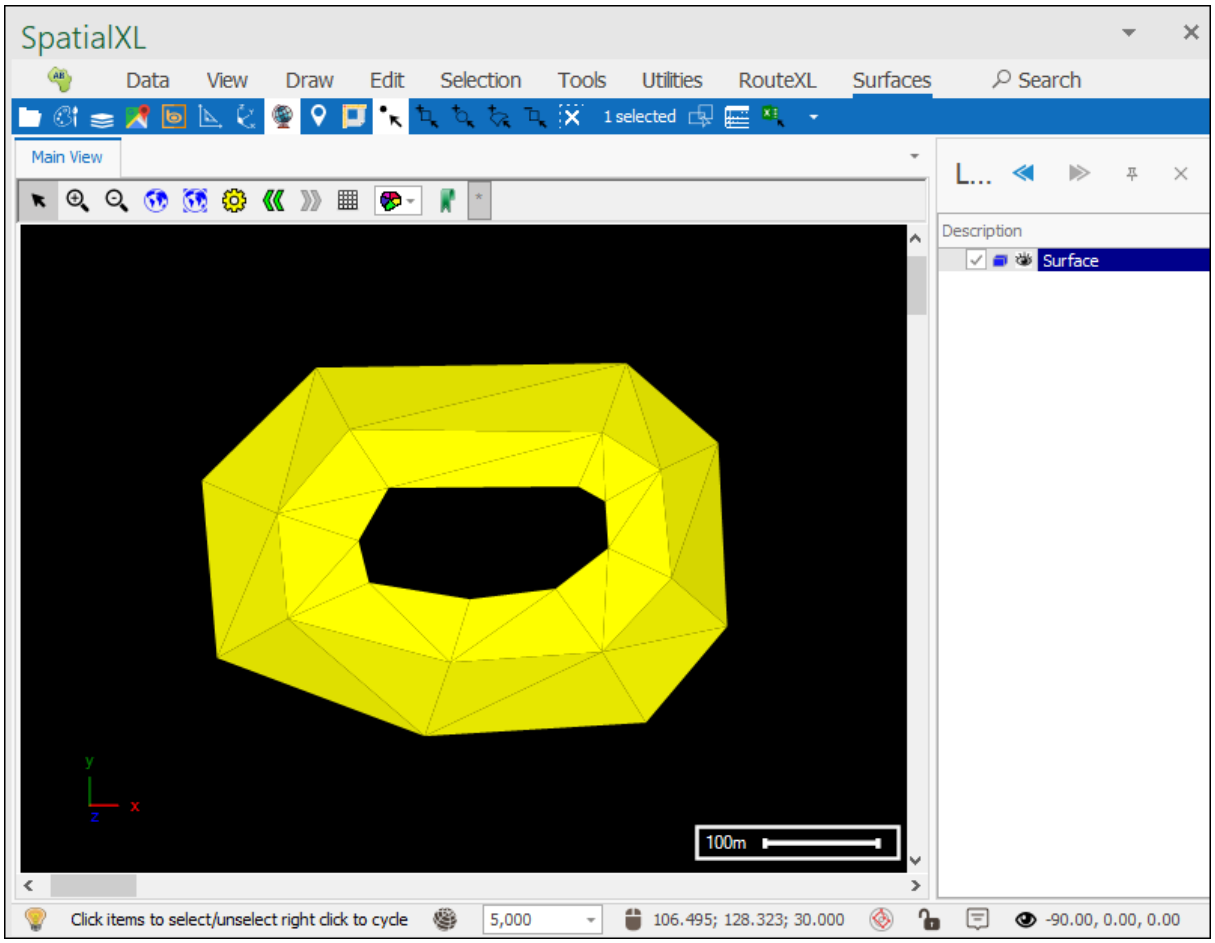


Close

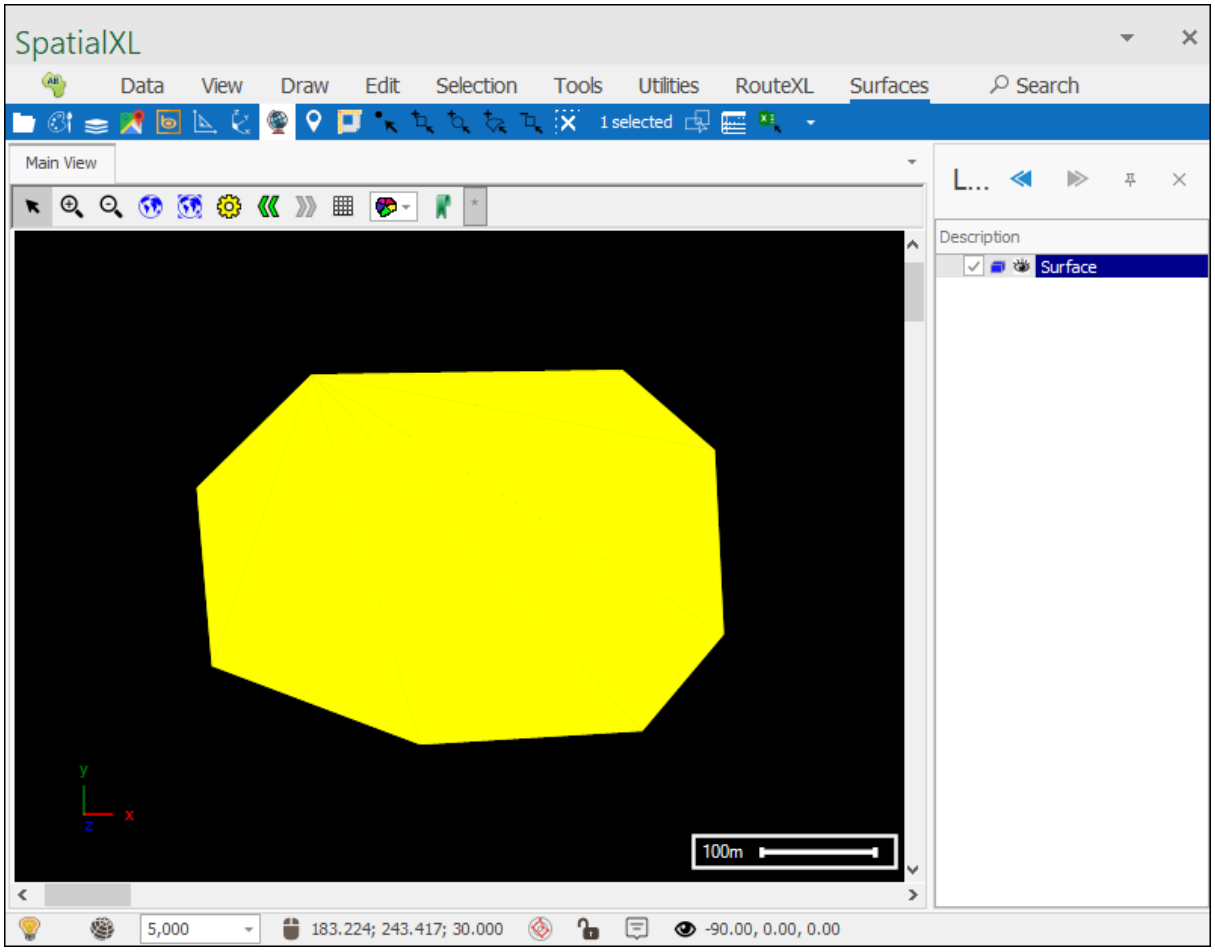
The next tool is the **Close** tool which will close a selected surface:

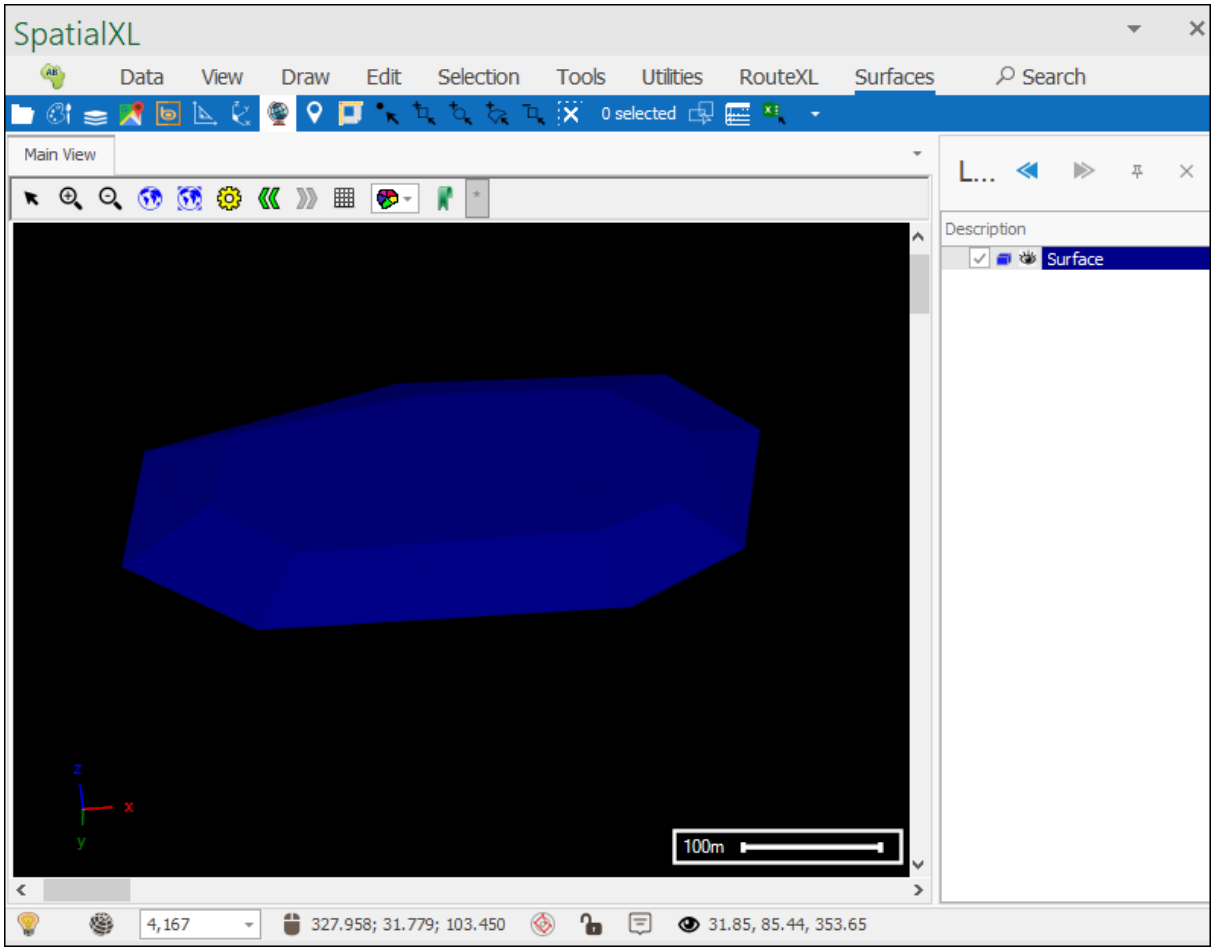


First select the surface:



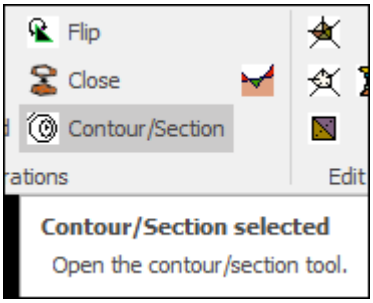
Then click **Close** and your surface will be closed:


SpatialXL
Data
View
Draw
Edit
Selection
Tools
Utilities
RouteXL
Surfaces
Search
1 selected
Main View
Description
Surface
100m
5,000
183.224; 243.417; 30.000
-90.00, 0.00, 0.00

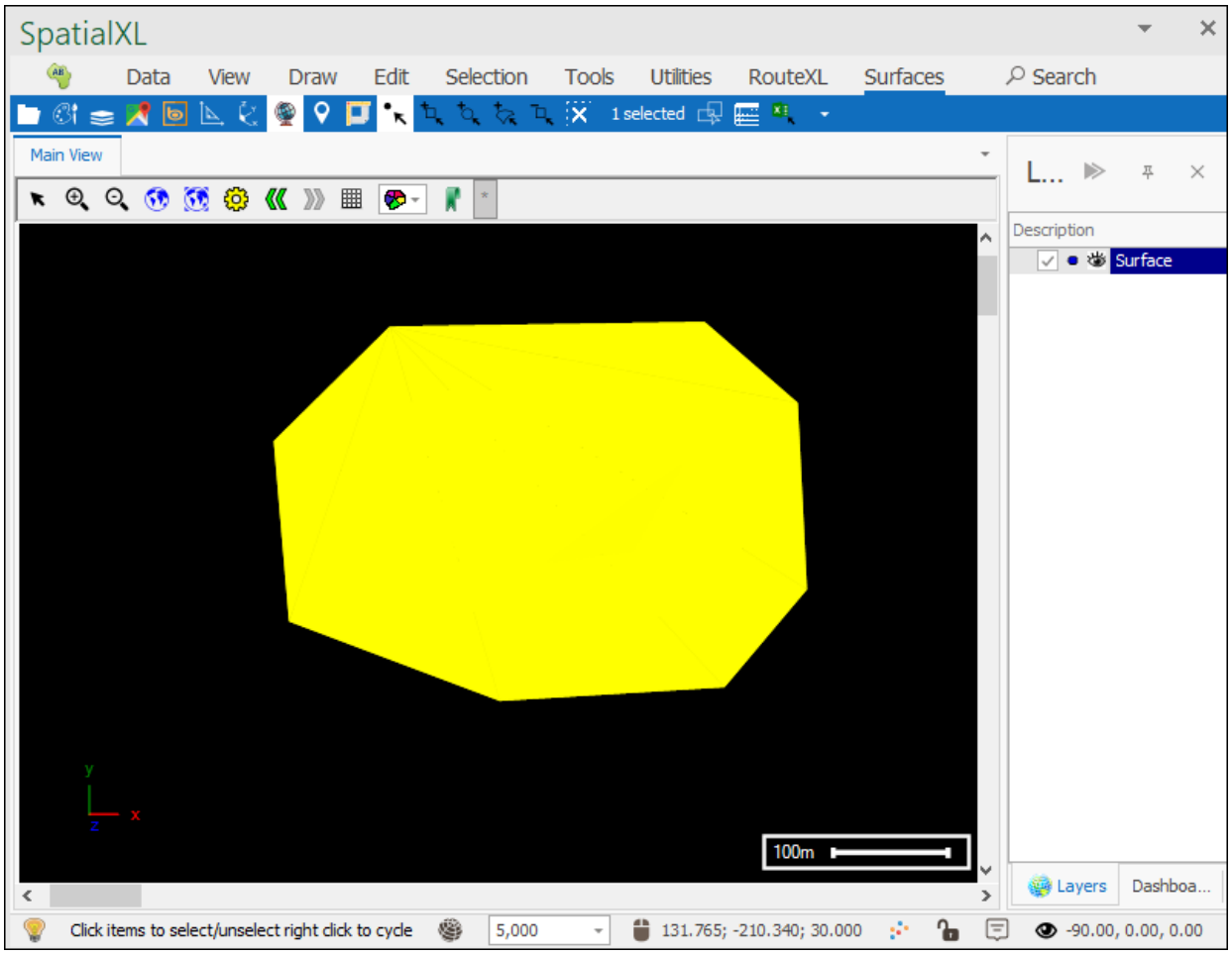


Contour/Section

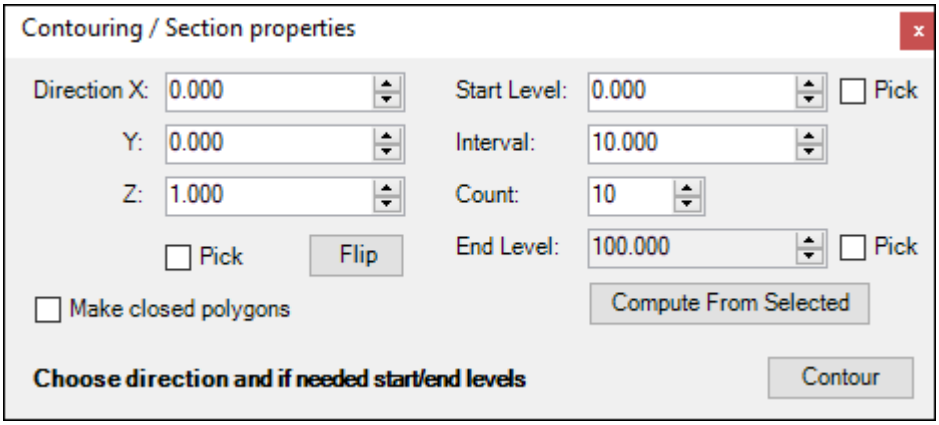
The next tool is the **Contour/Section** tool which allows you to create contours/sections for any surface:



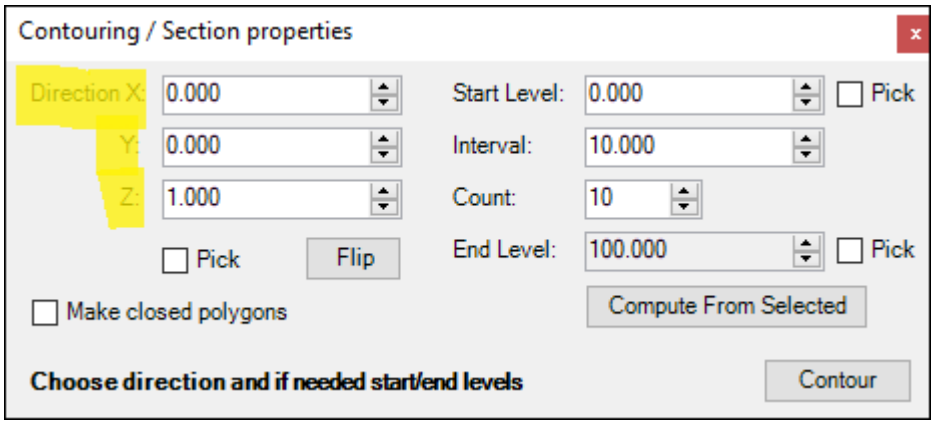
First select your surface:



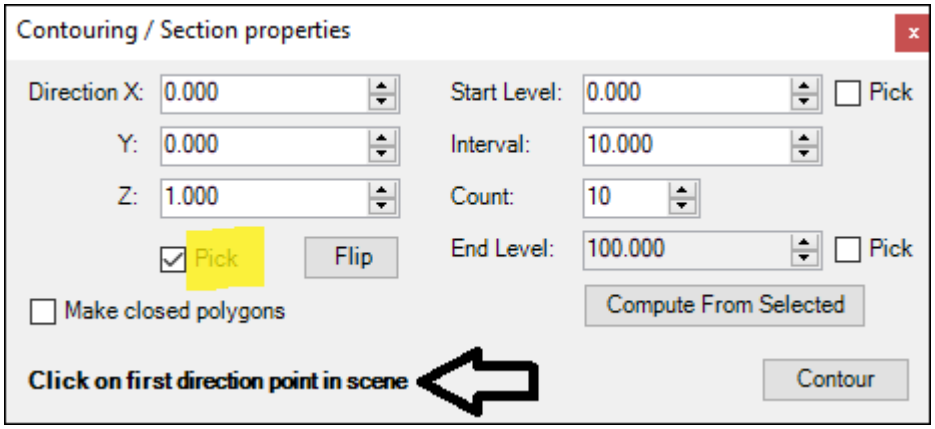
Then open the tool which will bring up the following dialogue:



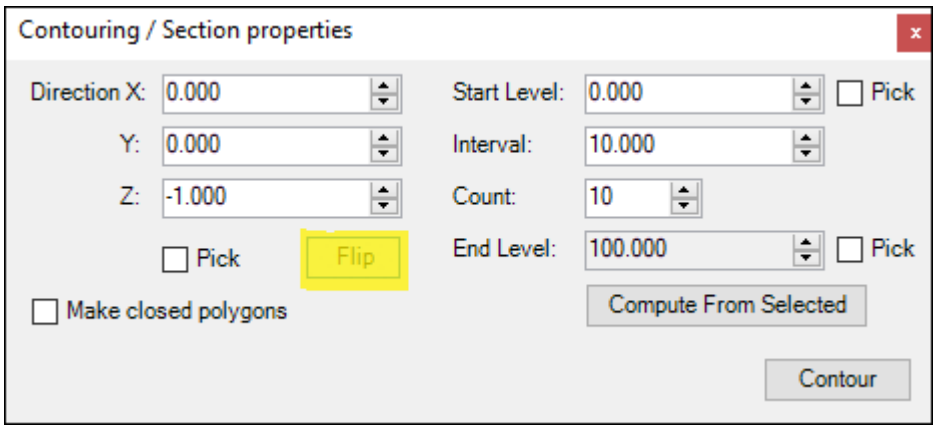
First you can choose the direction of the contours/sections (in this example I will leave it at the default):



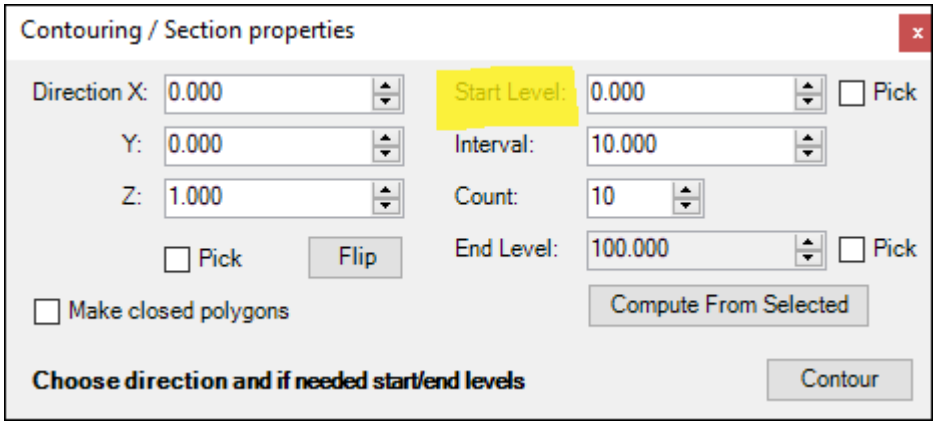
Optionally you can tick on the **Pick** box and click in your scene to choose your directions:



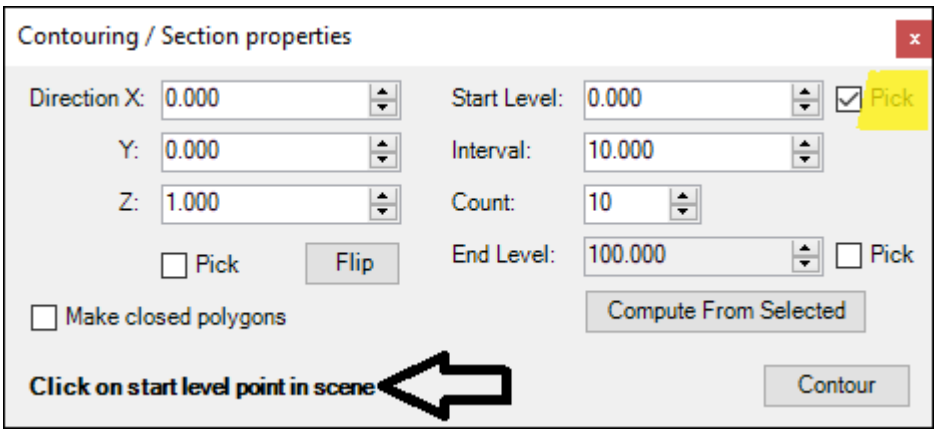
Clicking the **Flip** button will reverse the directions:



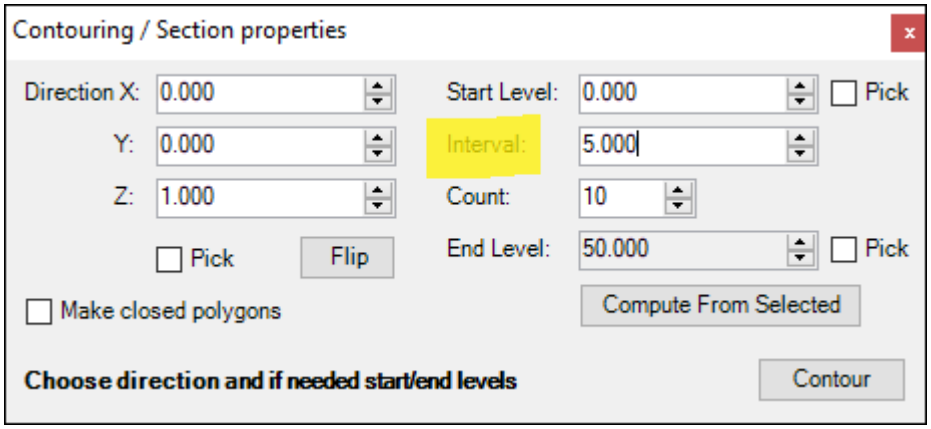
Next you can choose the level at which you would like the contours/sections to start:



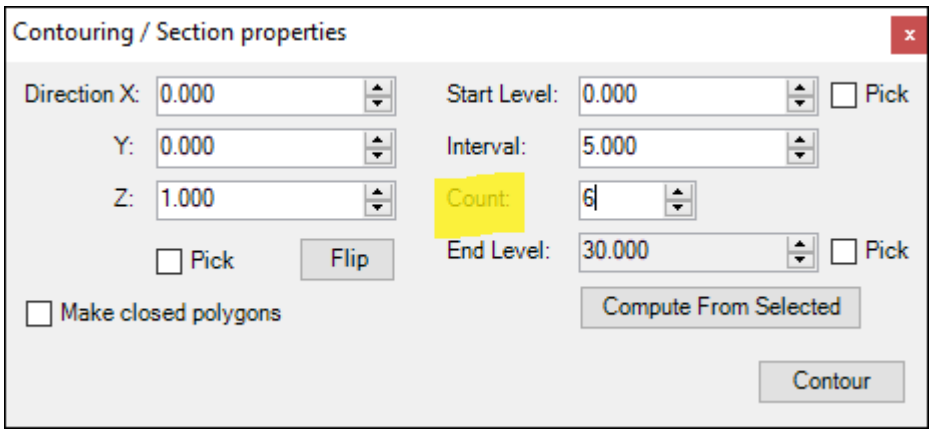
Optionally you can tick on the **Pick** box and then click in your scene to choose the **Start Level**:



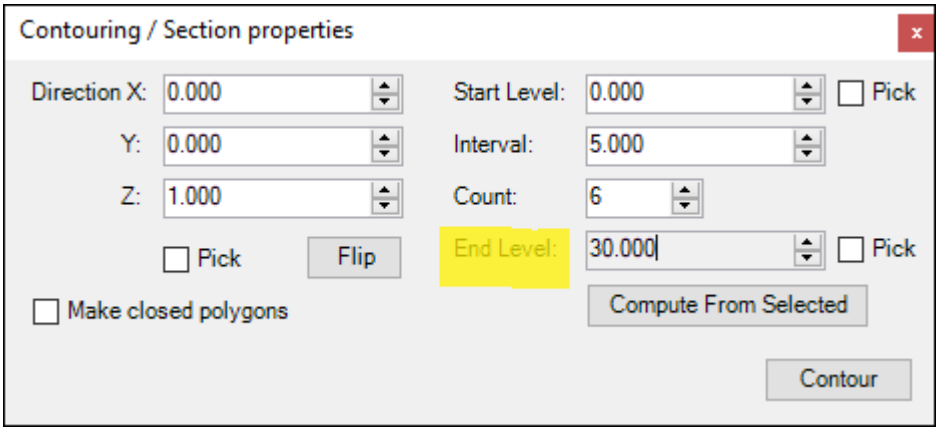
Then choose how much of an interval you would like between each contour/section:



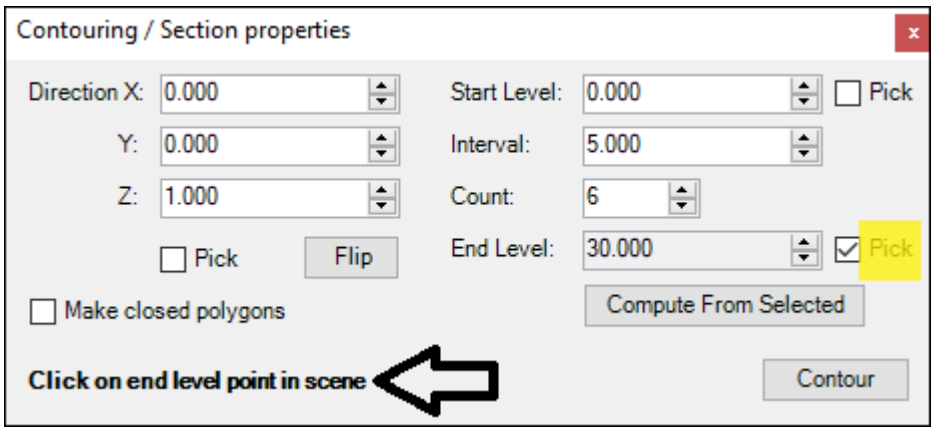
Then choose how many contours/sections you would like to be made:



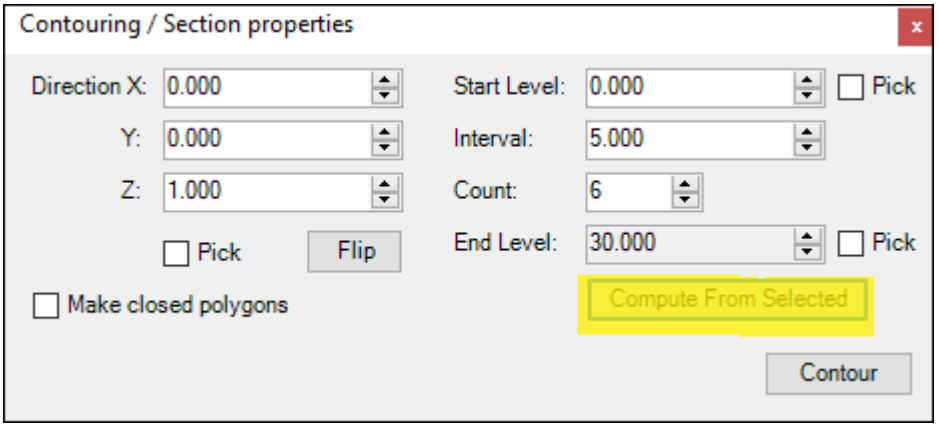
Next you can choose what level you would like the contours/sections to end at (this will be adjusted automatically on changing the **Count** field):



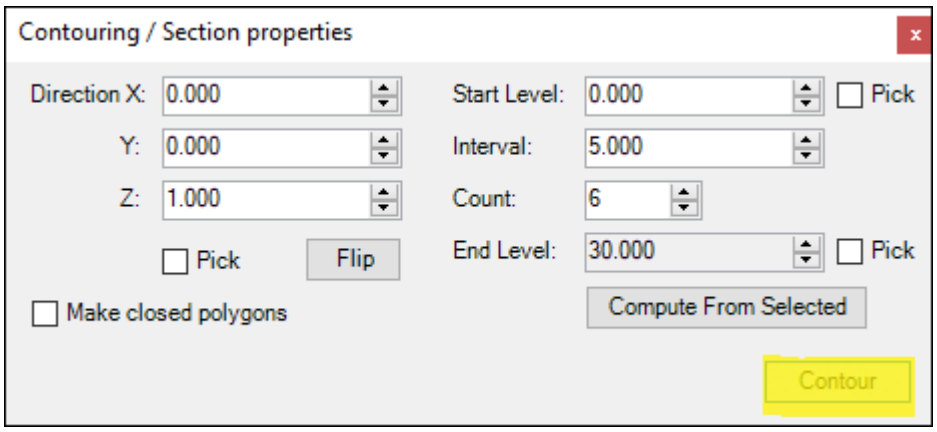
Optionally you can tick on the **Pick** box and click in your scene to choose the **End Level**:



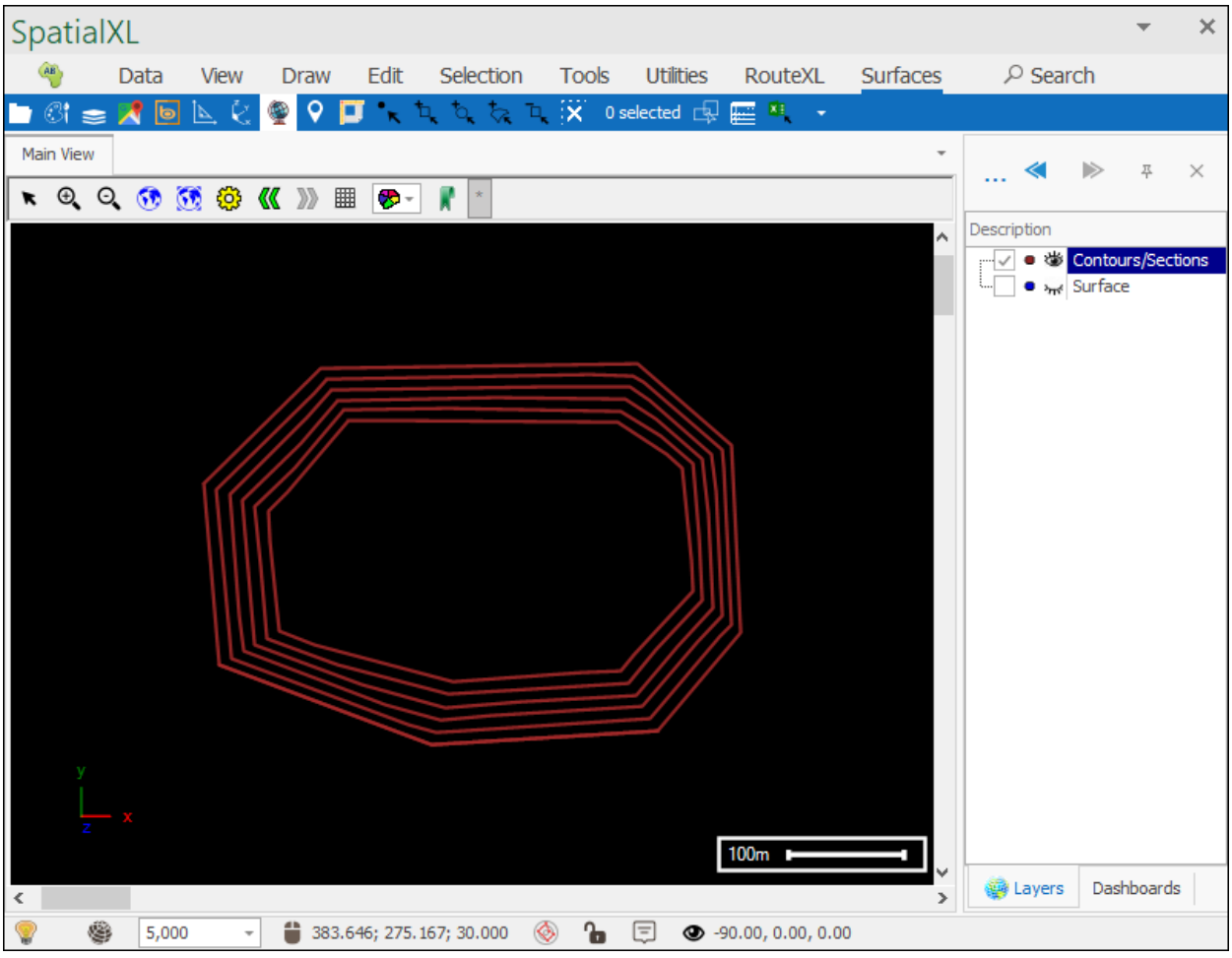
Clicking on the **Compute From Selected** button will compute start and end levels from the selected surface (if the parameters you have entered in make sense, then nothing will change):



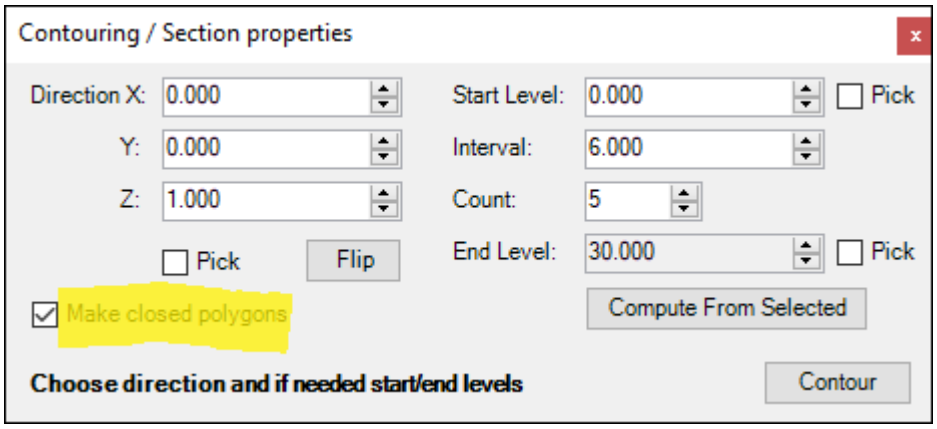
Finally click **Contour**:



Your surface has now been contoured:

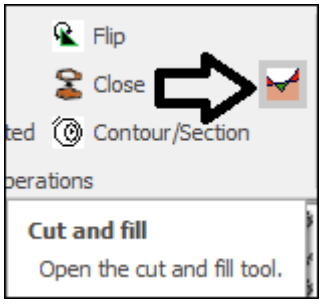


If you want to make closed polygons between levels instead of contours then make sure to have **Make closed polygons** ticked on before contouring:

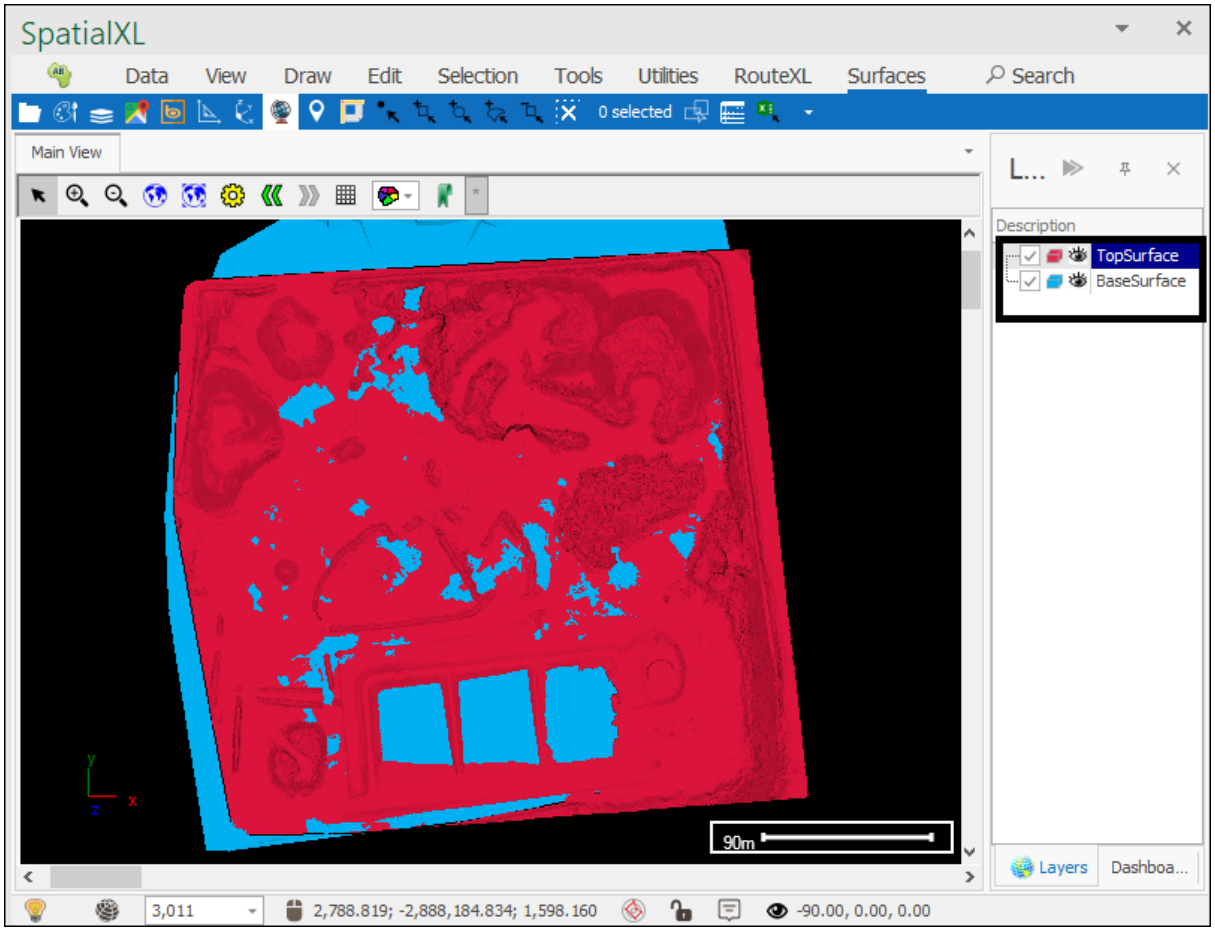


Cut and fill

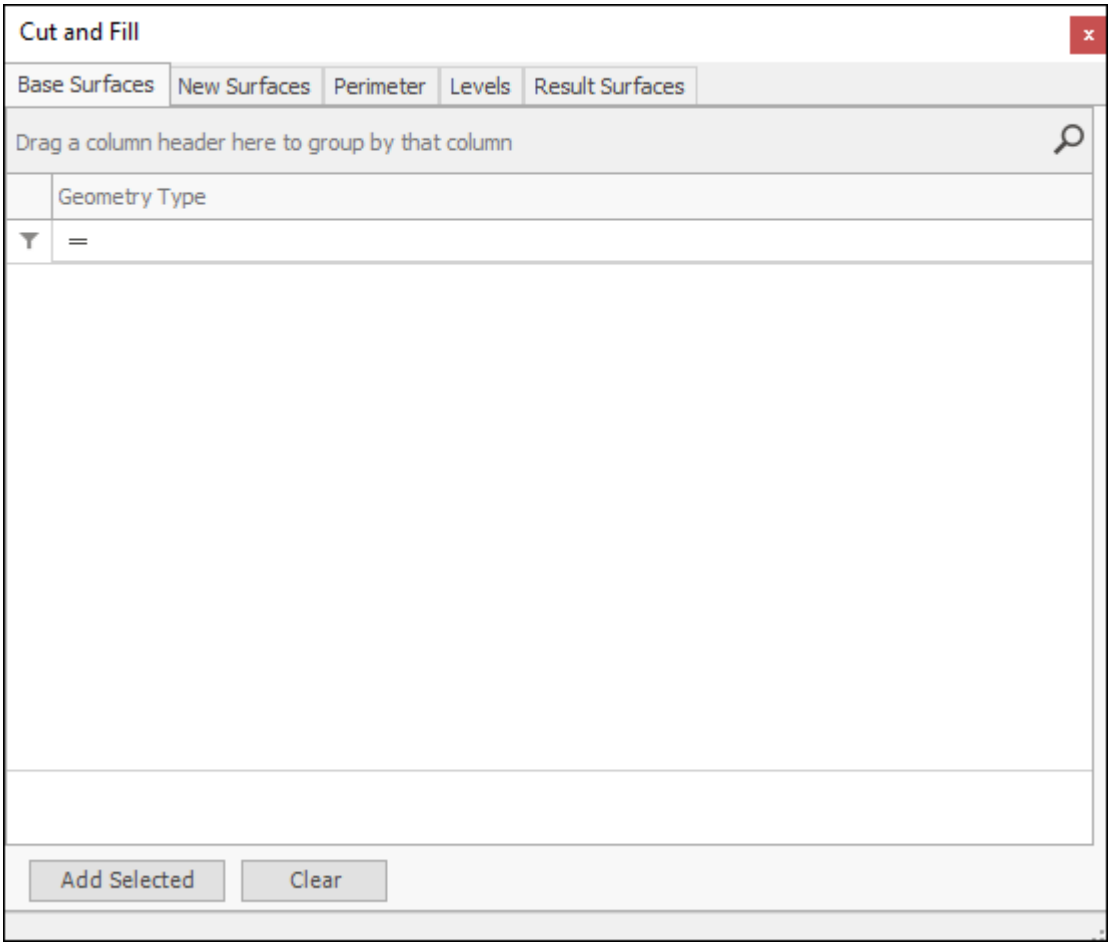
The next tool is the **Cut and fill** tool which will calculate how much one surface cuts (goes into) and fills (goes over) another:



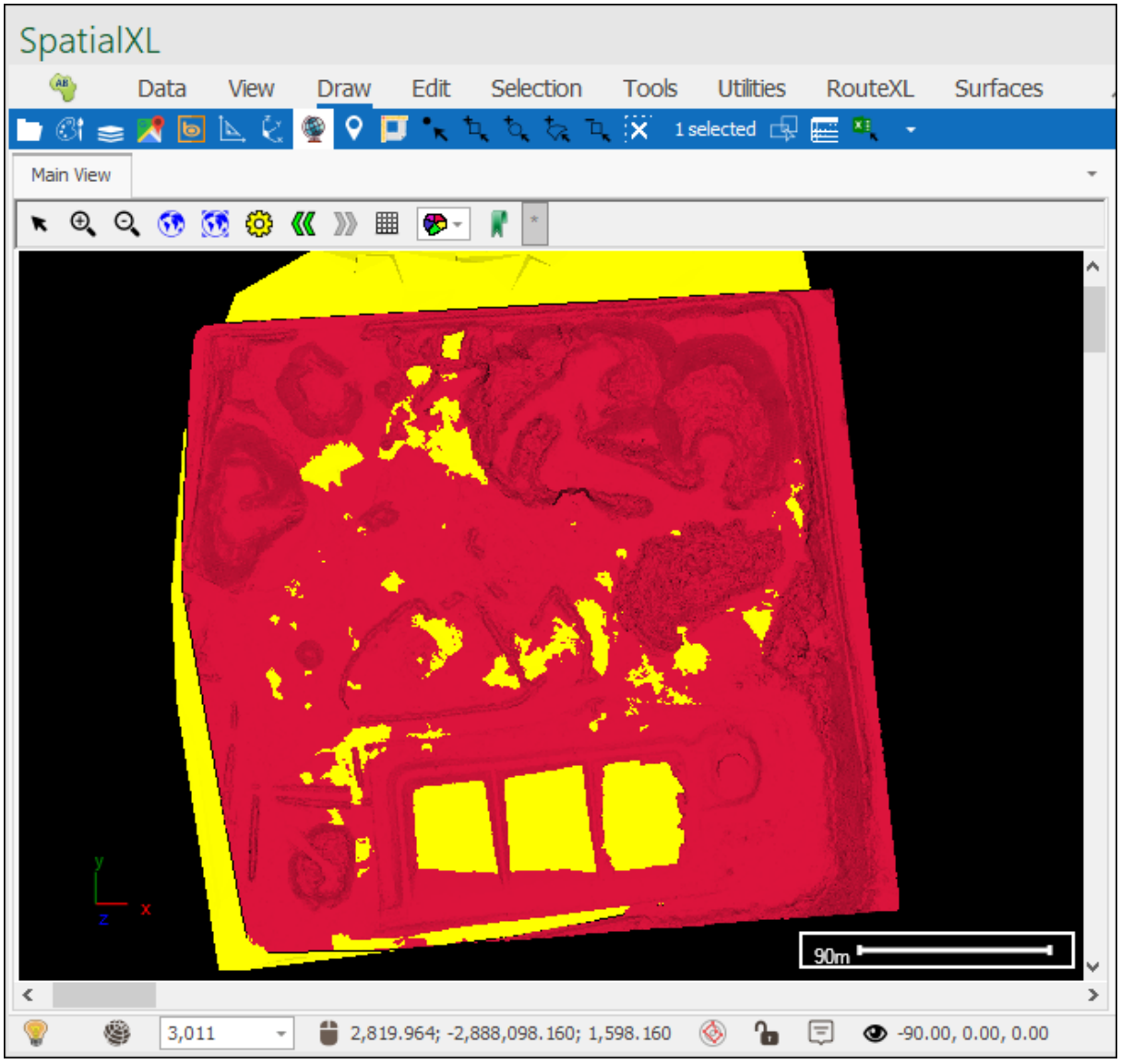
You would need a base surface and an over or underlying surface to do this operation:



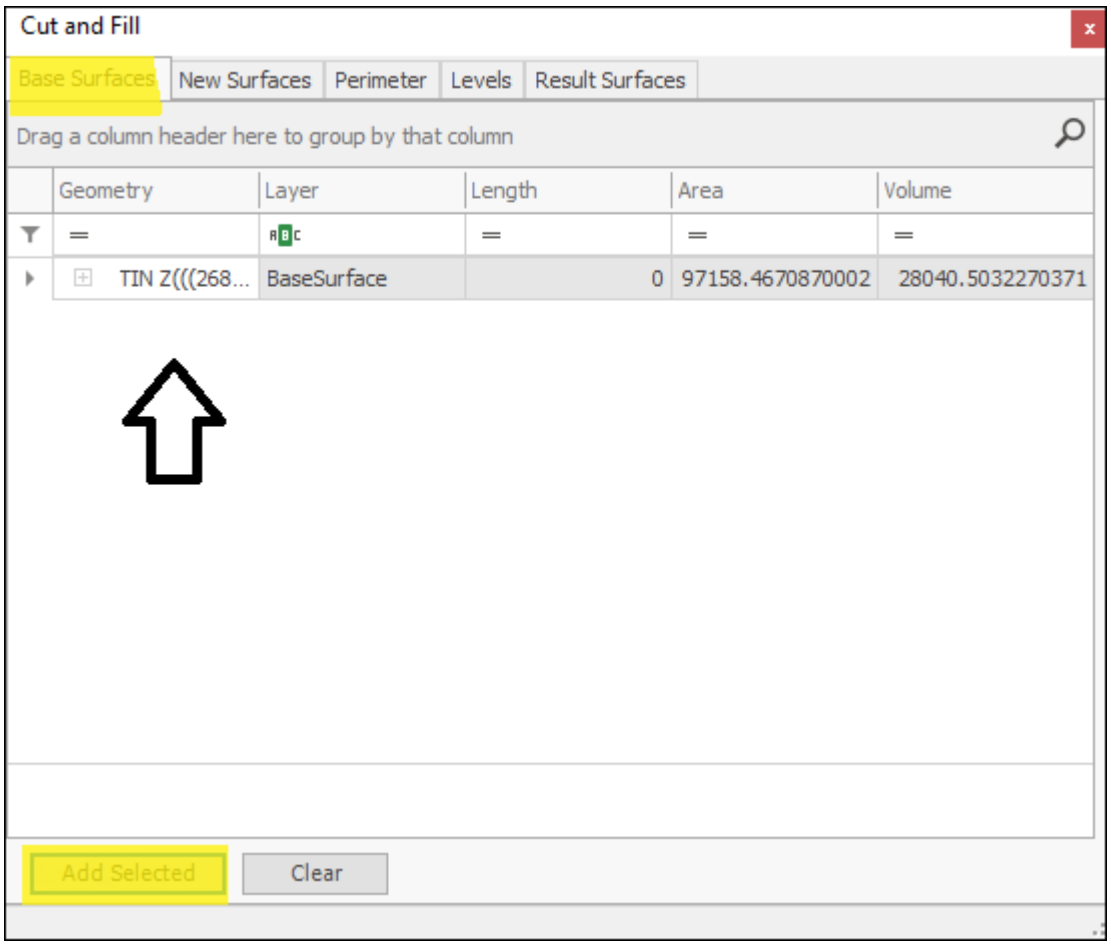
Then you would open the tool which brings up the following dialogue:



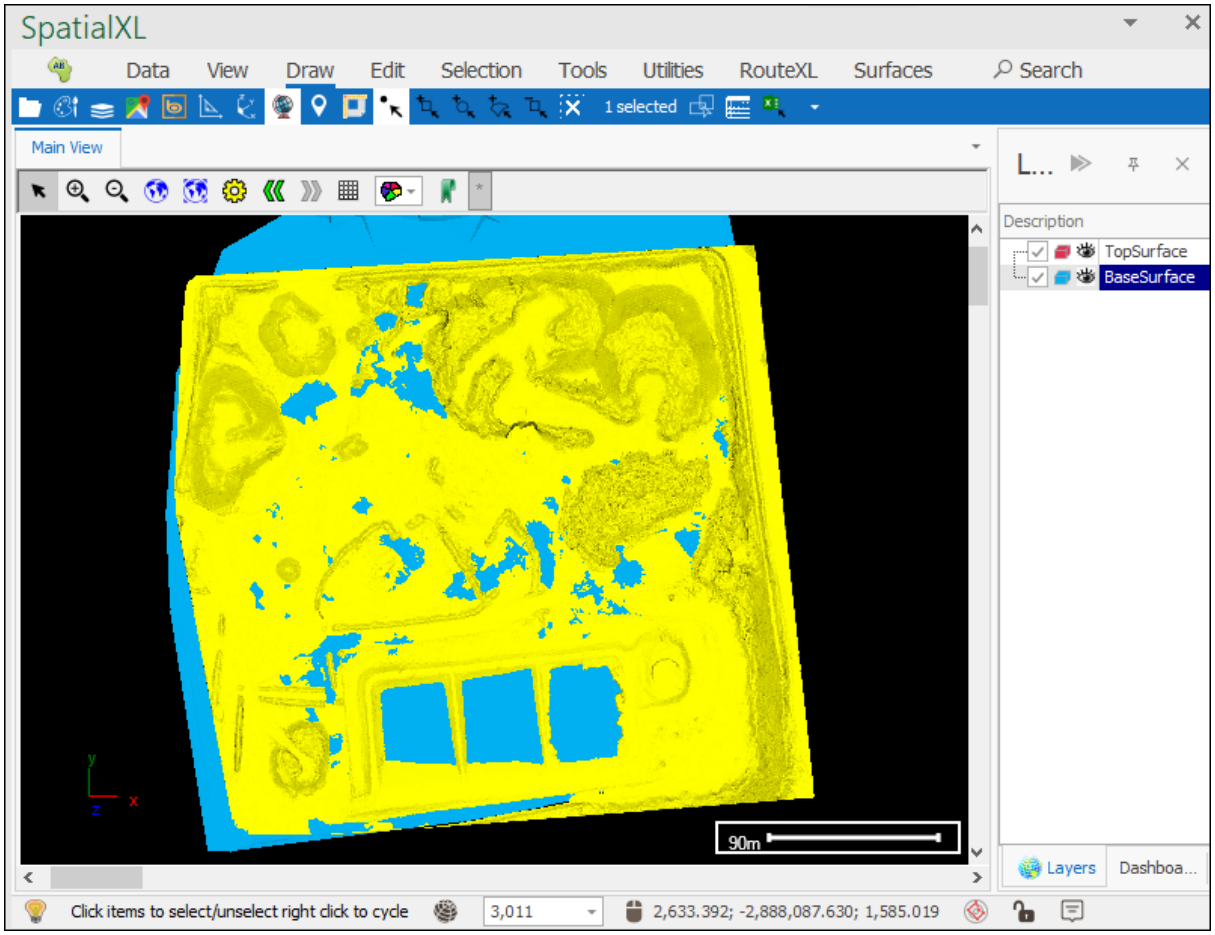
First select your base surface:



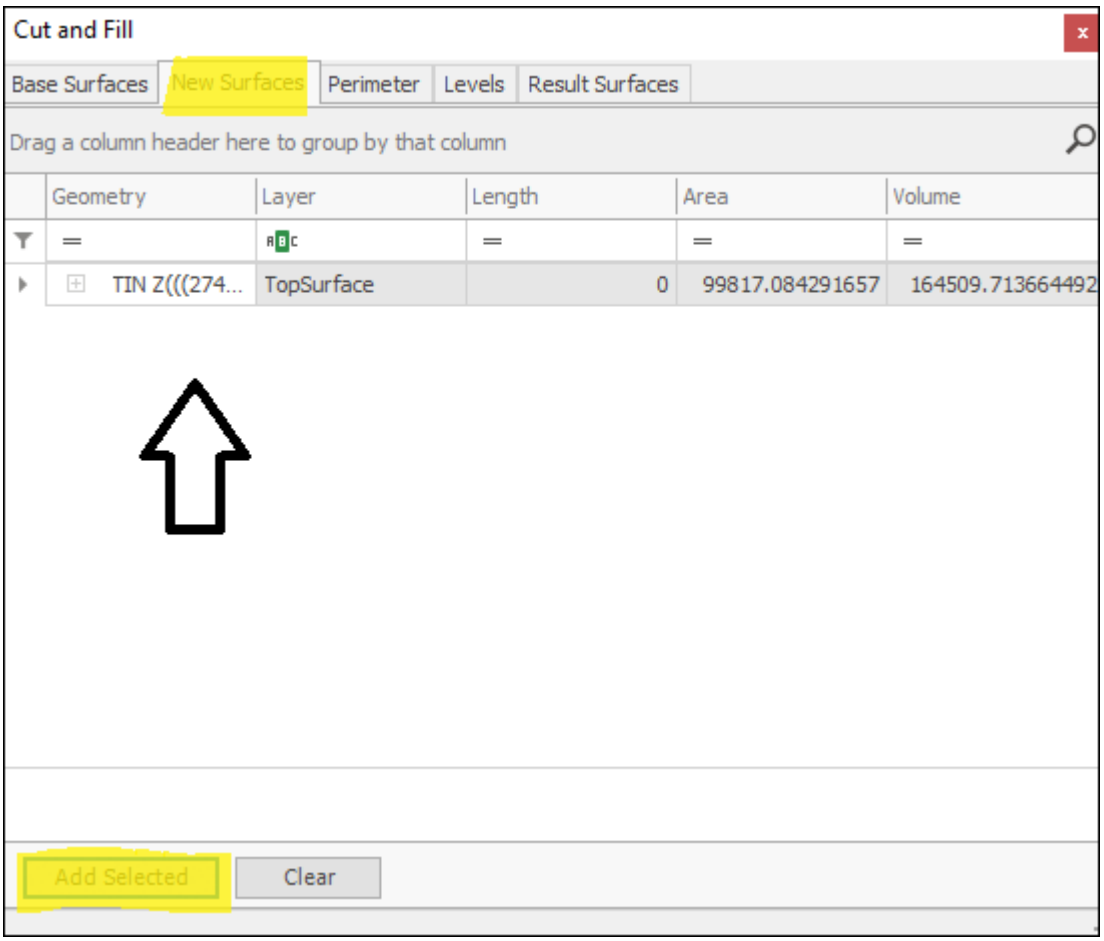
Then in the **Base Surfaces** tab click **Add Selected** to put in the geometries of the base surface:



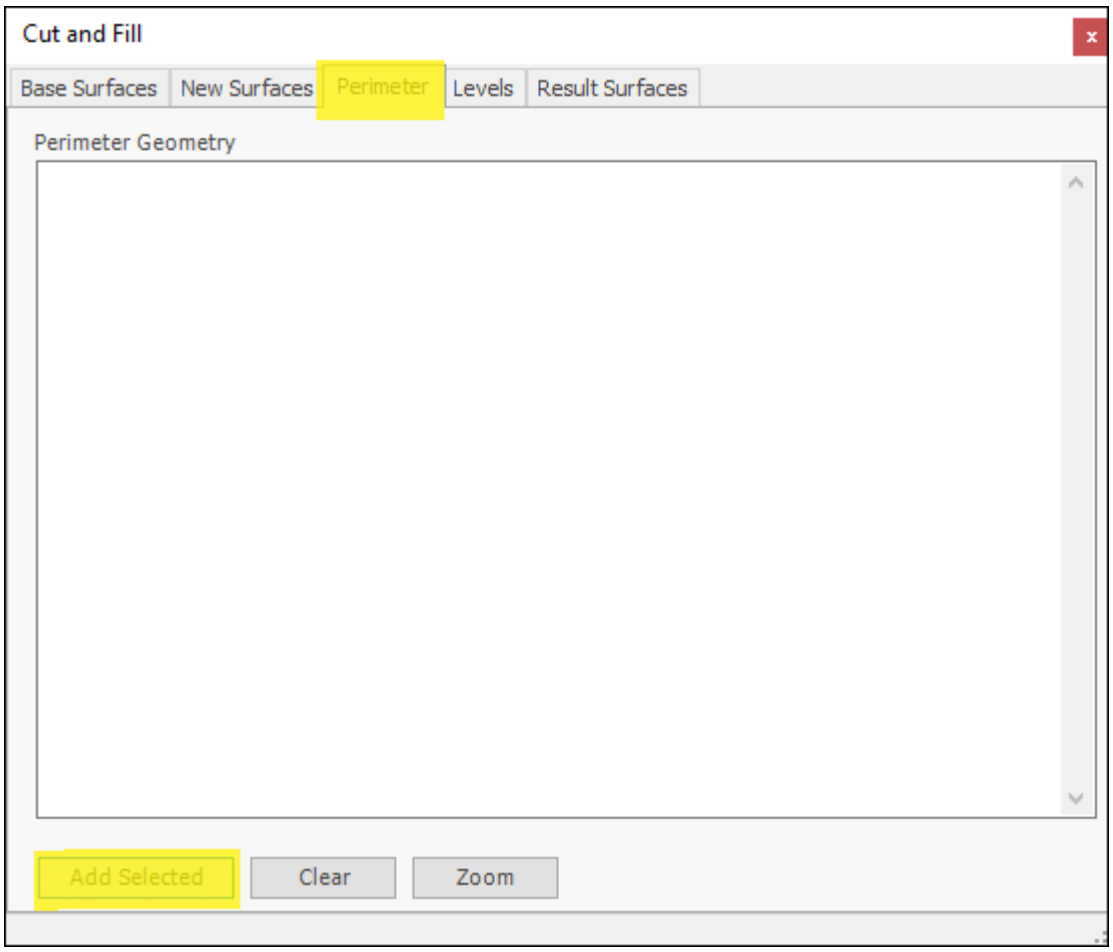
Next select your over or underlying surface:



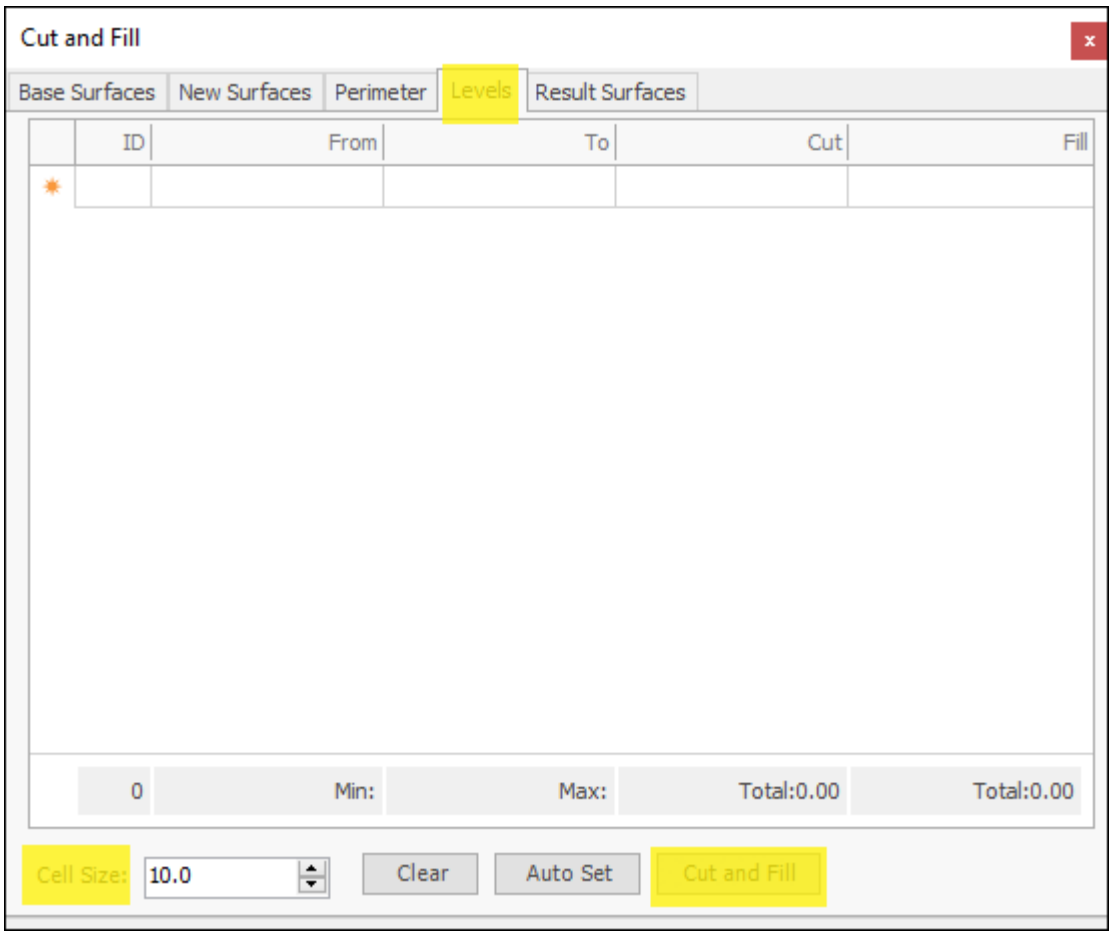
Then go to the **New Surfaces** tab and click **Add Selected** to put in the geometries for the surface:

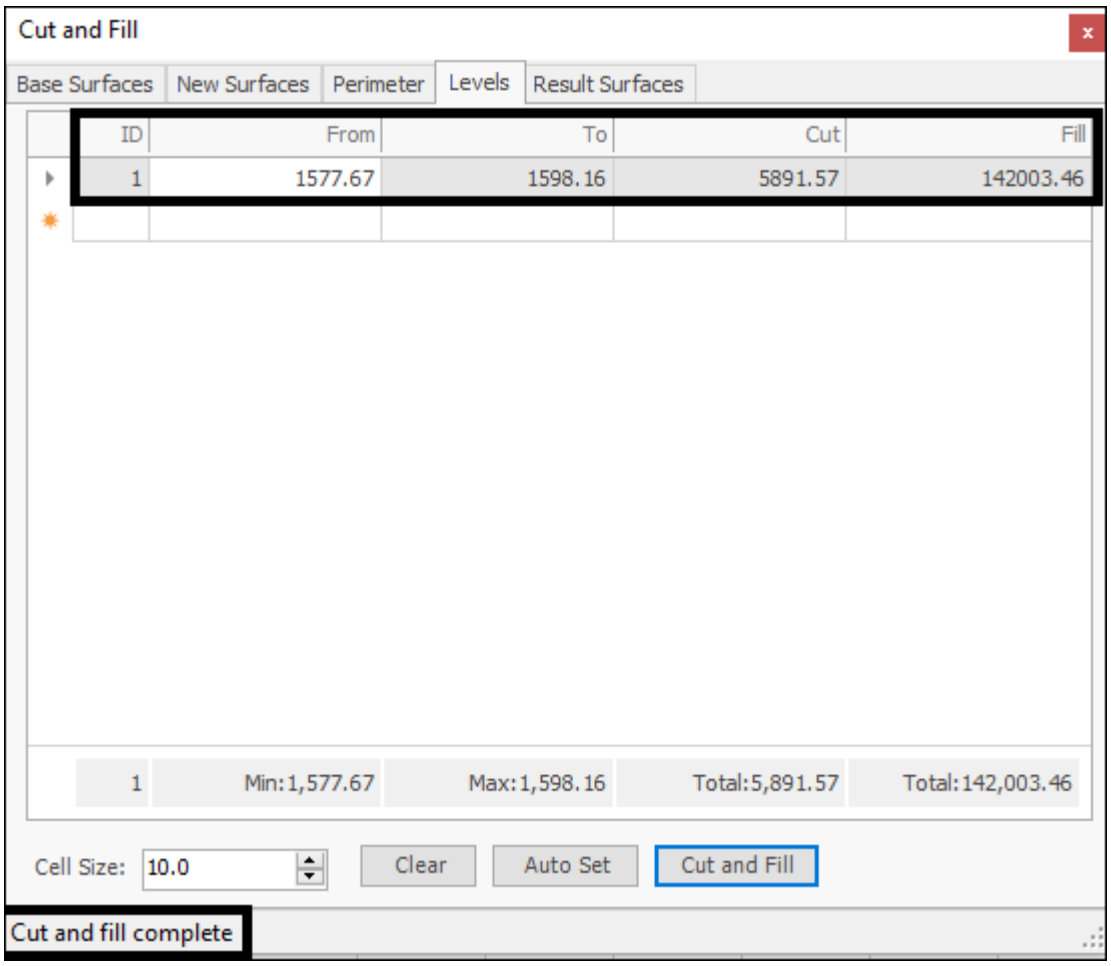


Next, optionally, if you only wanted to do the cut and fill operation within a certain perimeter then you would select the polygon that defines such a perimeter on the surface and then add it in here by the **Perimeter** tab:



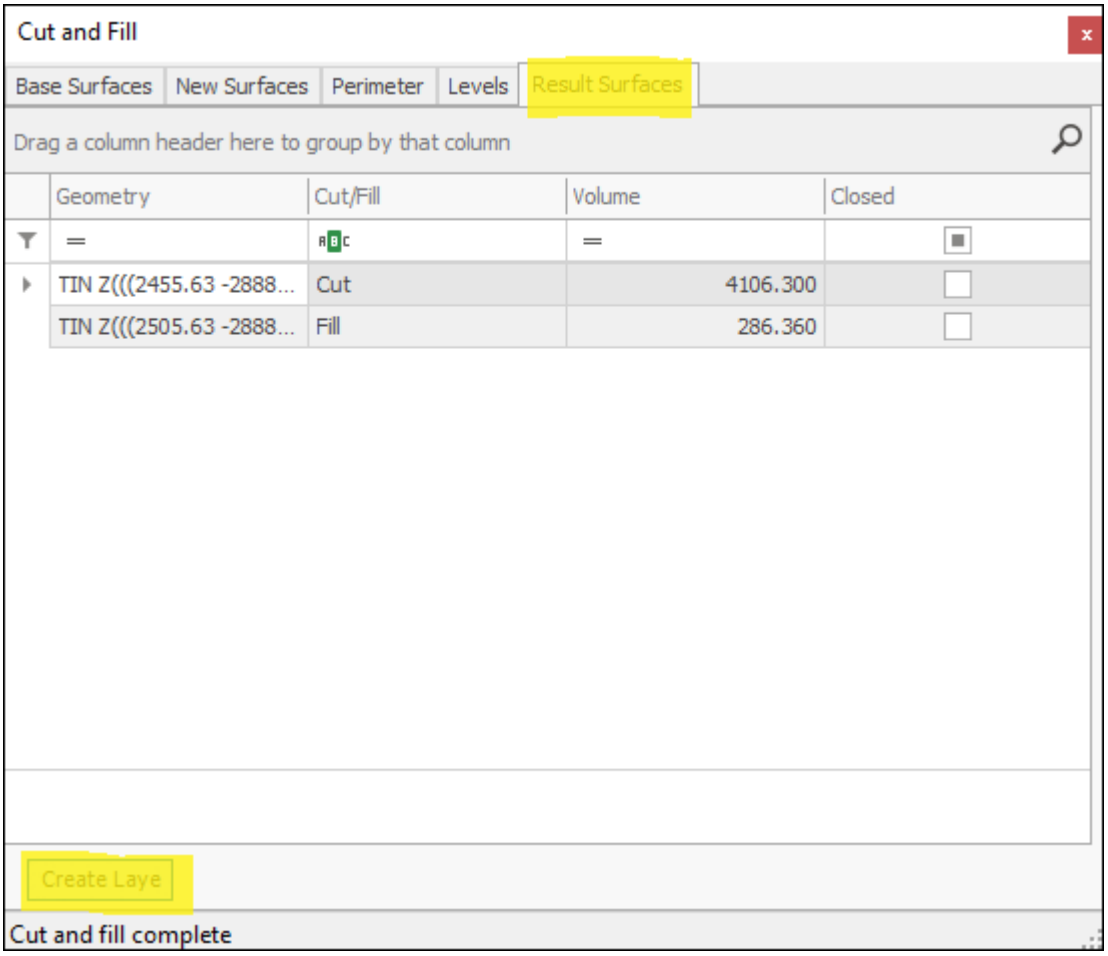
Next, in the **Levels** tab, if you just want to do the cut and fill operation on one level then click **Cut and Fill** (The **Cell Size** is by default 10 but can be changed, these are the cells used between the surfaces in doing the calculation, the smaller the cell the more precise the calculation):

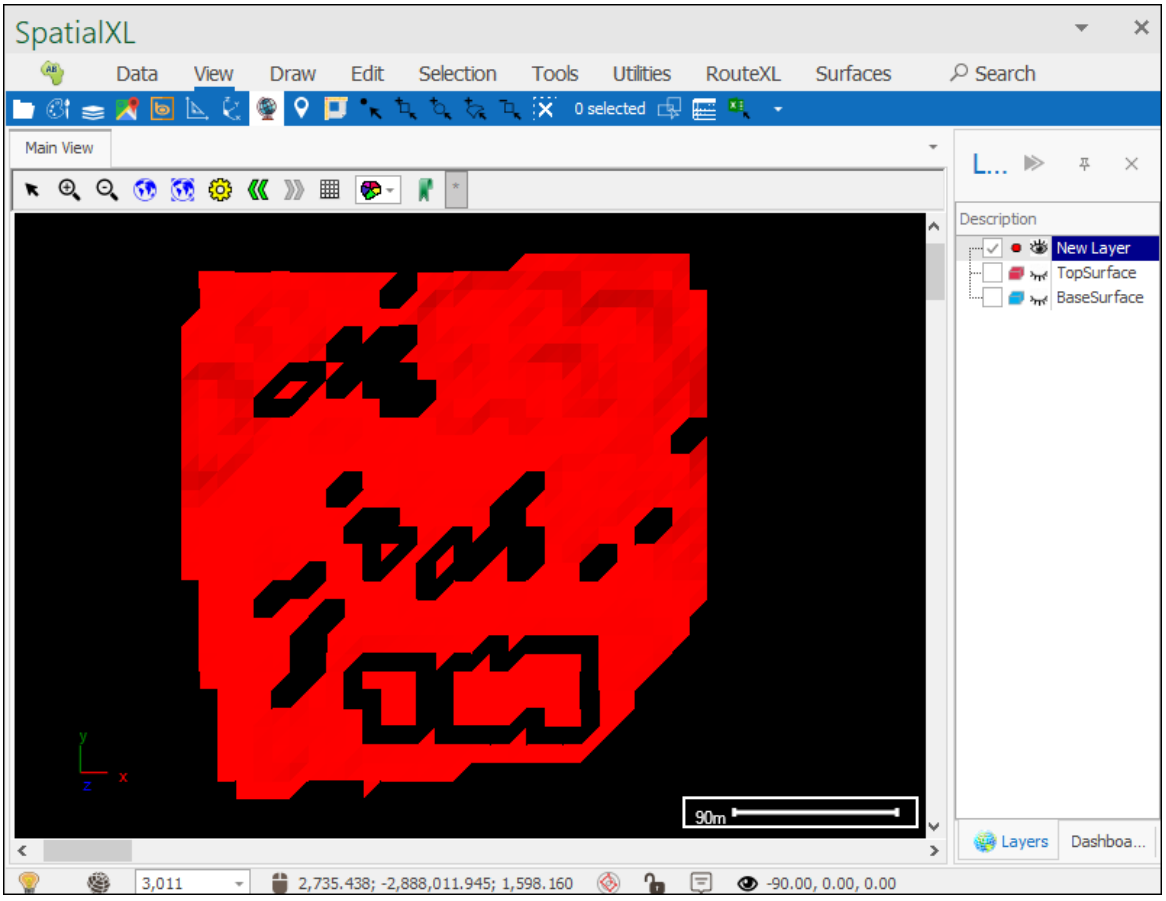

Cut and Fill
Base Surfaces
New Surfaces
Perimeter
Levels
Result Surfaces
ID
From
To
Cut
Fill
0
Min:
Max:
Total:0.00
Total:0.00
Cell Size:
10.0
Clear
Auto Set
Cut and Fill



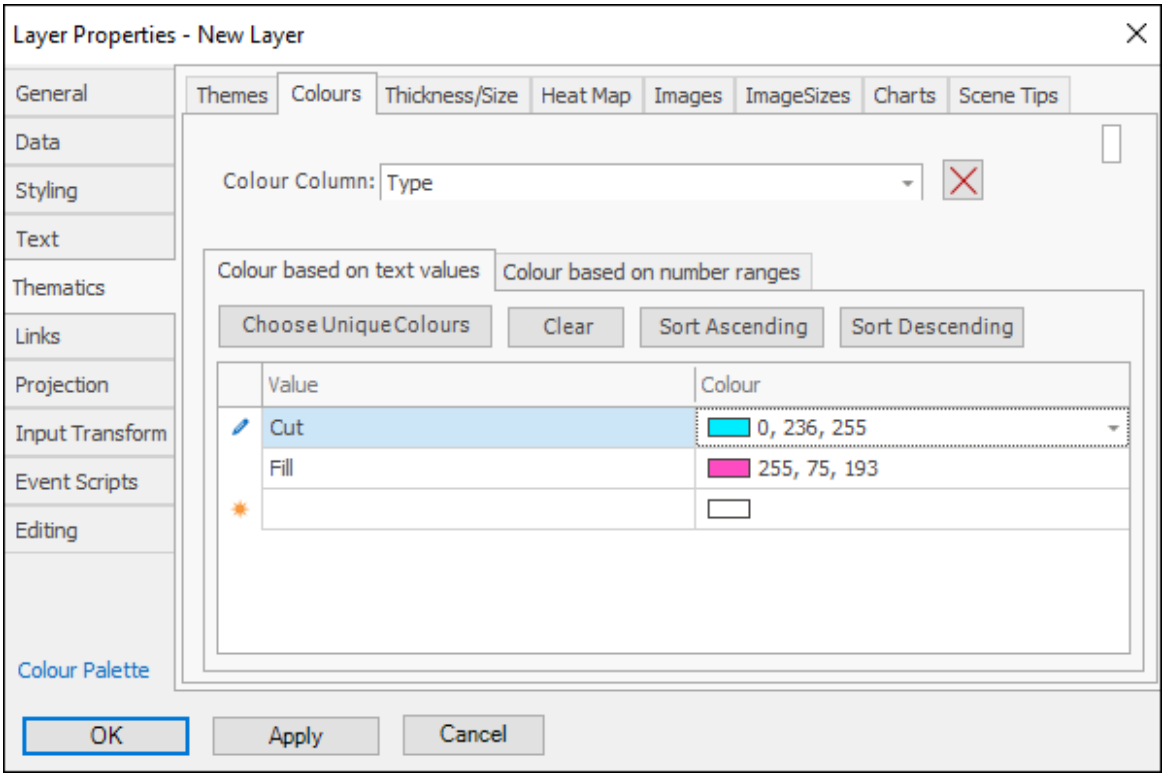
The elevations **From** and **To** are populated together with the square meters for the **Cut** and **Fill.**

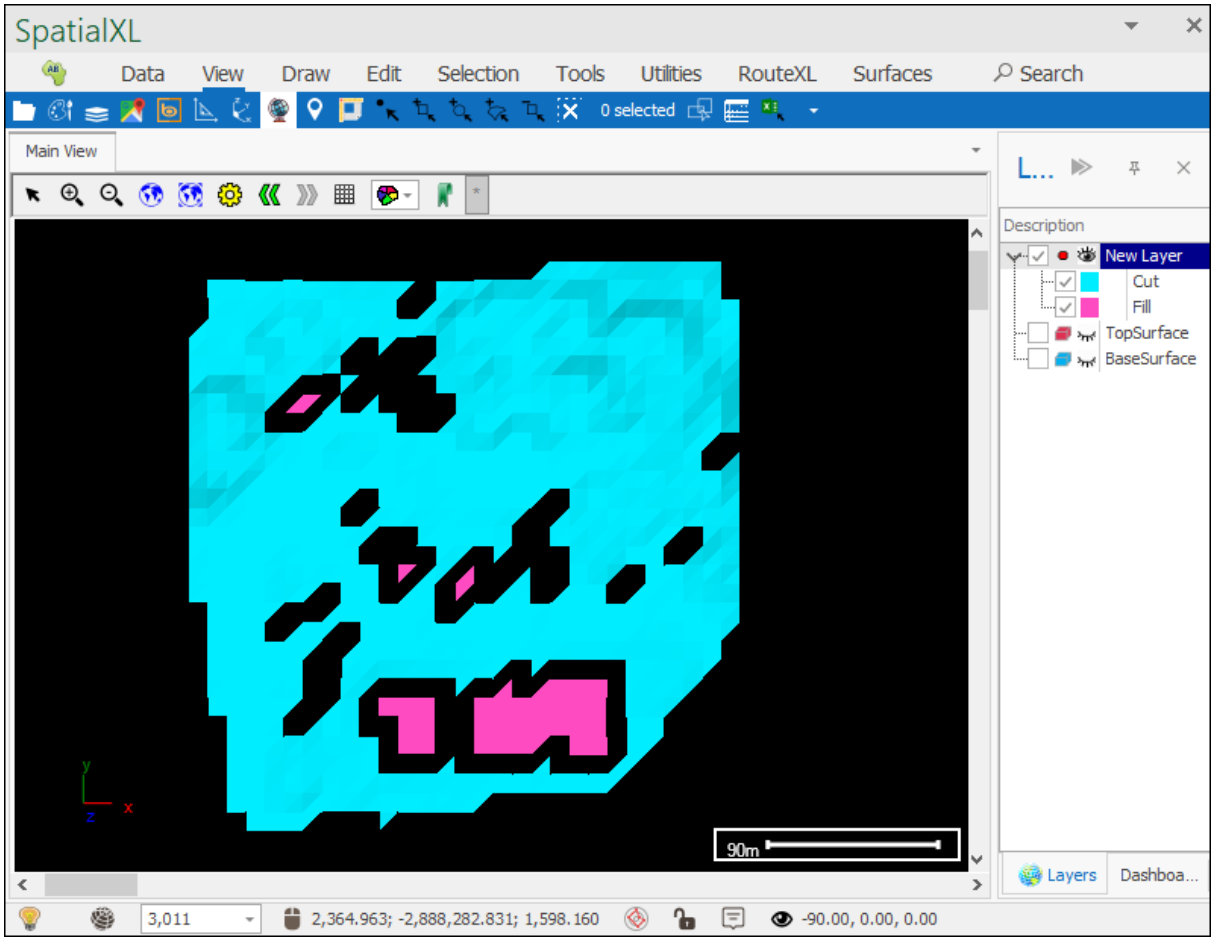
In the **Result Surfaces** tab are the resulting Cut and Fill surfaces together with their volumes, to create a layer out of these click **Create Layer:**

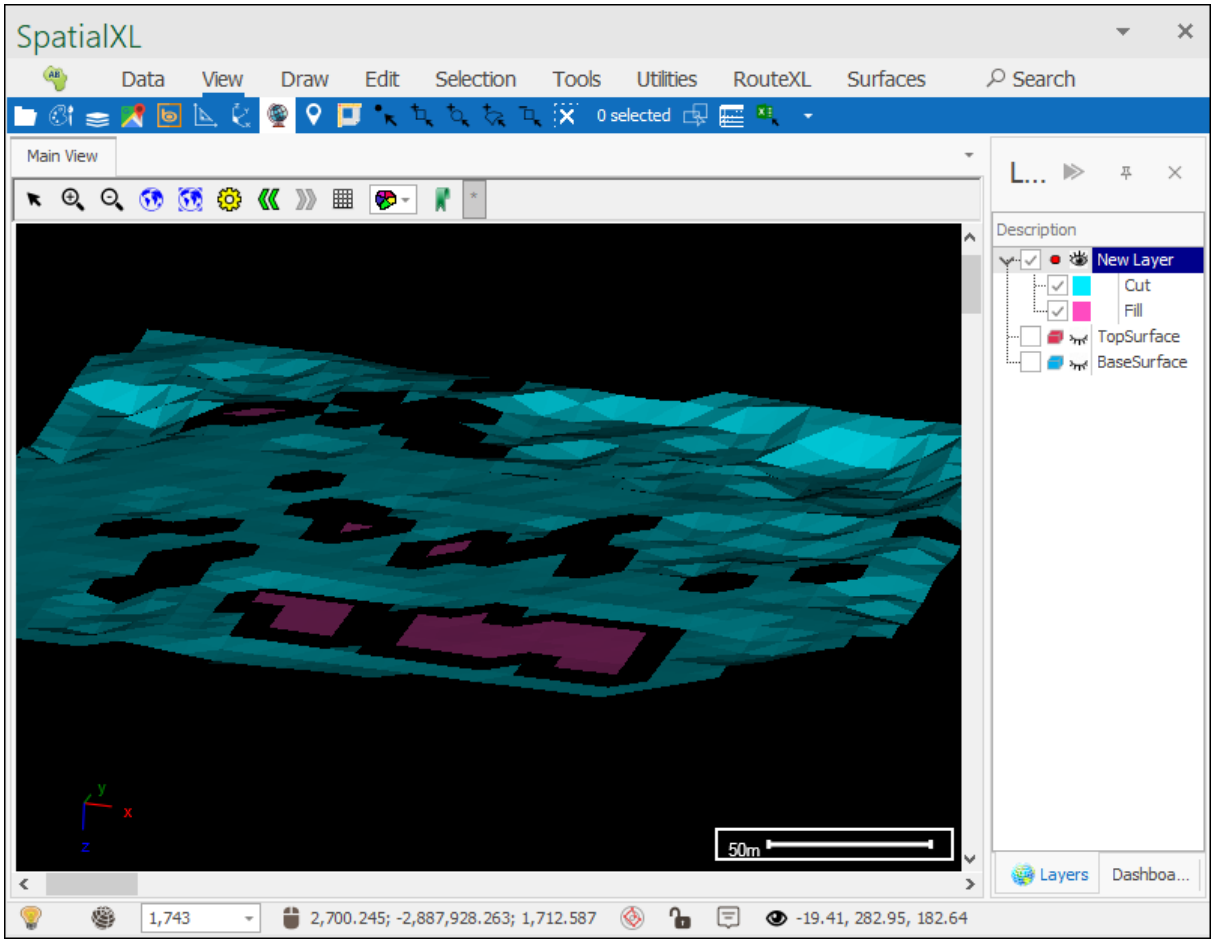

Cut and Fill
Base Surfaces
New Surfaces
Perimeter
Levels
Result Surfaces
Drag a column header here to group by that column
Geometry
Cut/Fill
Volume
Closed
TIN Z(((2455.63 -2888...
Cut
4106.300
TIN Z(((2505.63 -2888...
Fill
286.360
Create Laye
Cut and fill complete



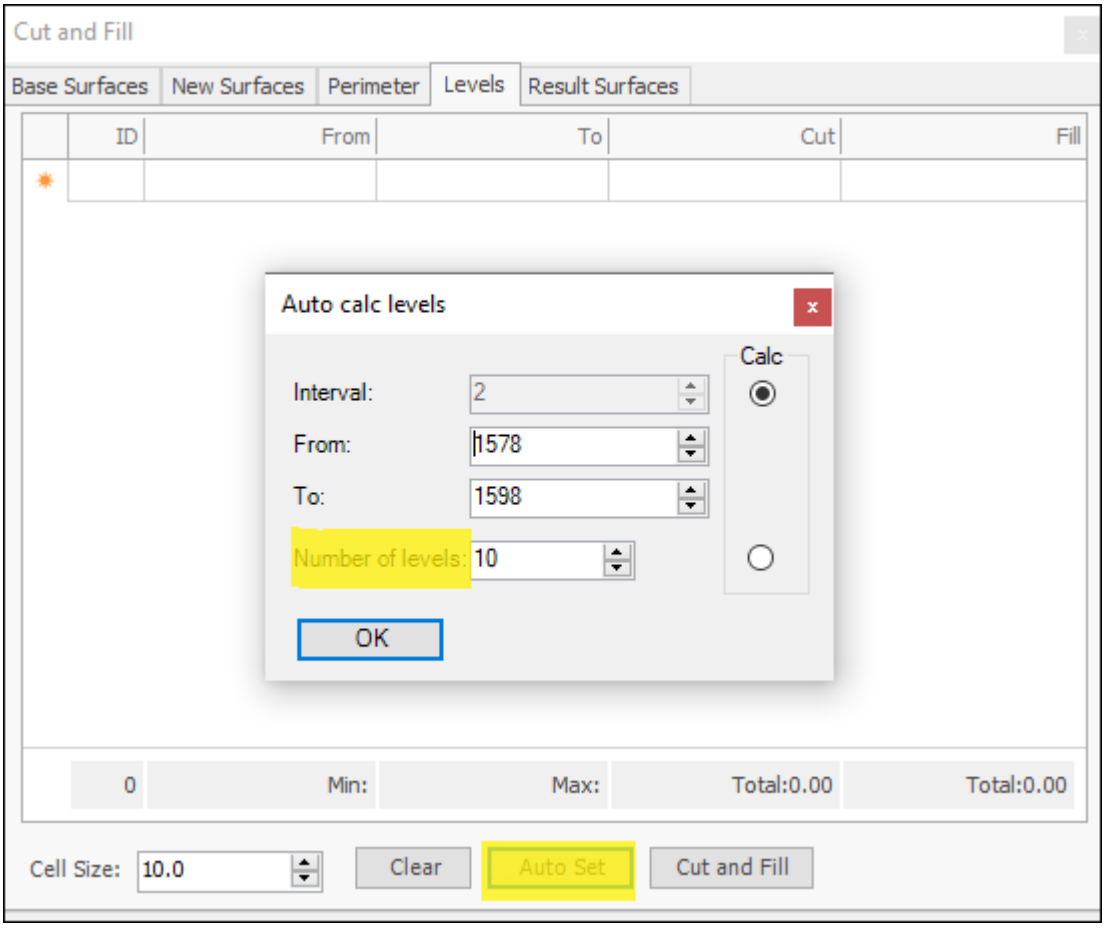
You can then theme this layer to clearly see the cut and fill:


Layer Properties - New Layer
General
Data
Styling
Text
Thematics
Links
Projection
Input Transform
Event Scripts
Editing
Colour Palette
Themes
Colours
Thickness/Size
Heat Map
Images
ImageSizes
Charts
Scene Tips
Colour Column:
Type
Colour based on text values
Colour based on number ranges
Choose Unique Colours
Clear
Sort Ascending
Sort Descending
Value
Colour
Cut
0, 236, 255
Fill
255, 75, 193
OK
Apply
Cancel

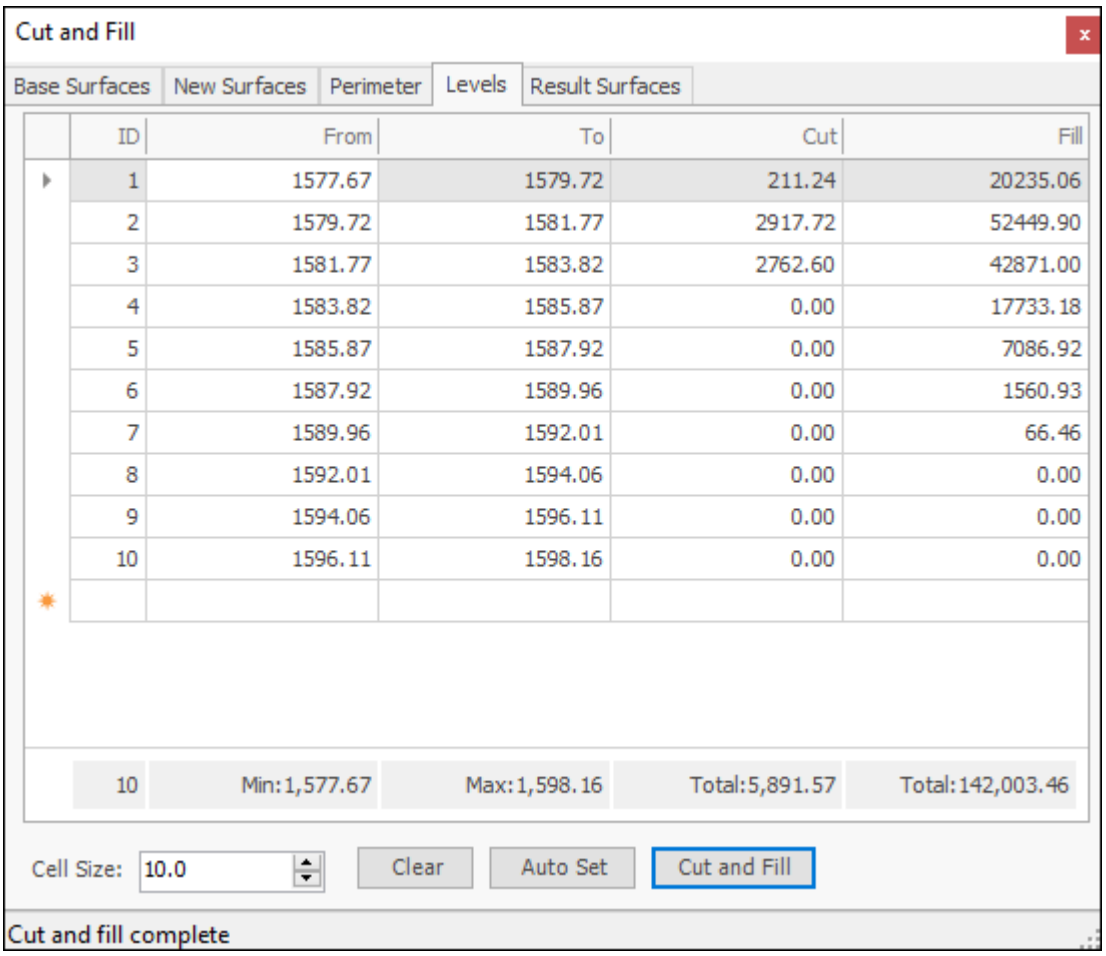

SpatialXL
Data
View
Draw
Edit
Selection
Tools
Utilities
RouteXL
Surfaces
Search
0 selected
Main View
Description
New Layer
Cut
Fill
TopSurface
BaseSurface
90m
Layers
Dashboa...
3,011
2,364.963; -2,888,282.831; 1,598.160
-90.00, 0.00, 0.00



If you want to do the cut and fill on levels then you can set this in the **Levels tab** by clicking **Auto Set** and then putting in the number of levels you want by **Number of levels:**



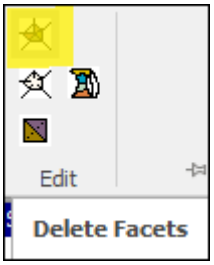
Then click **OK** and then **Cut and Fill** and your results are now on levels:



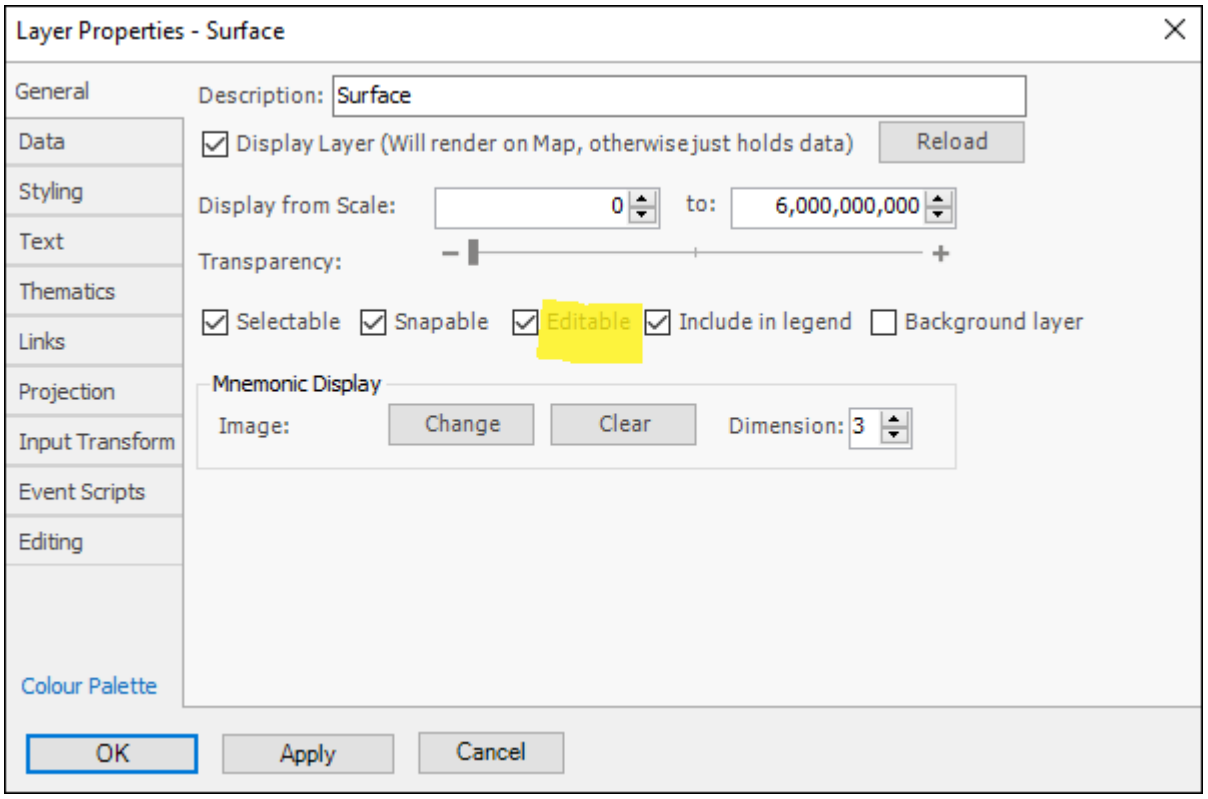
Edit

Delete Facets

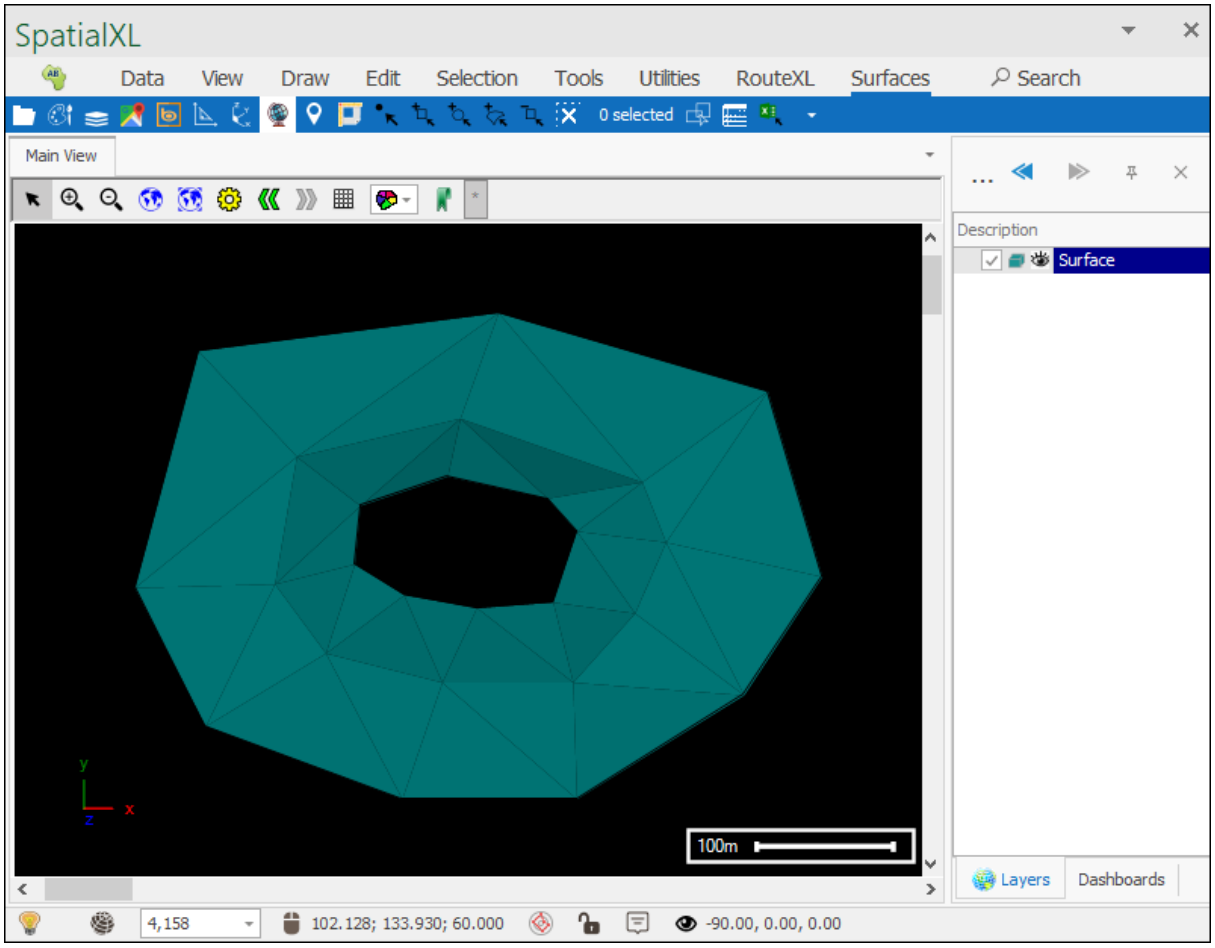
The **Delete Facets** tool allows you to delete facets of a surface:

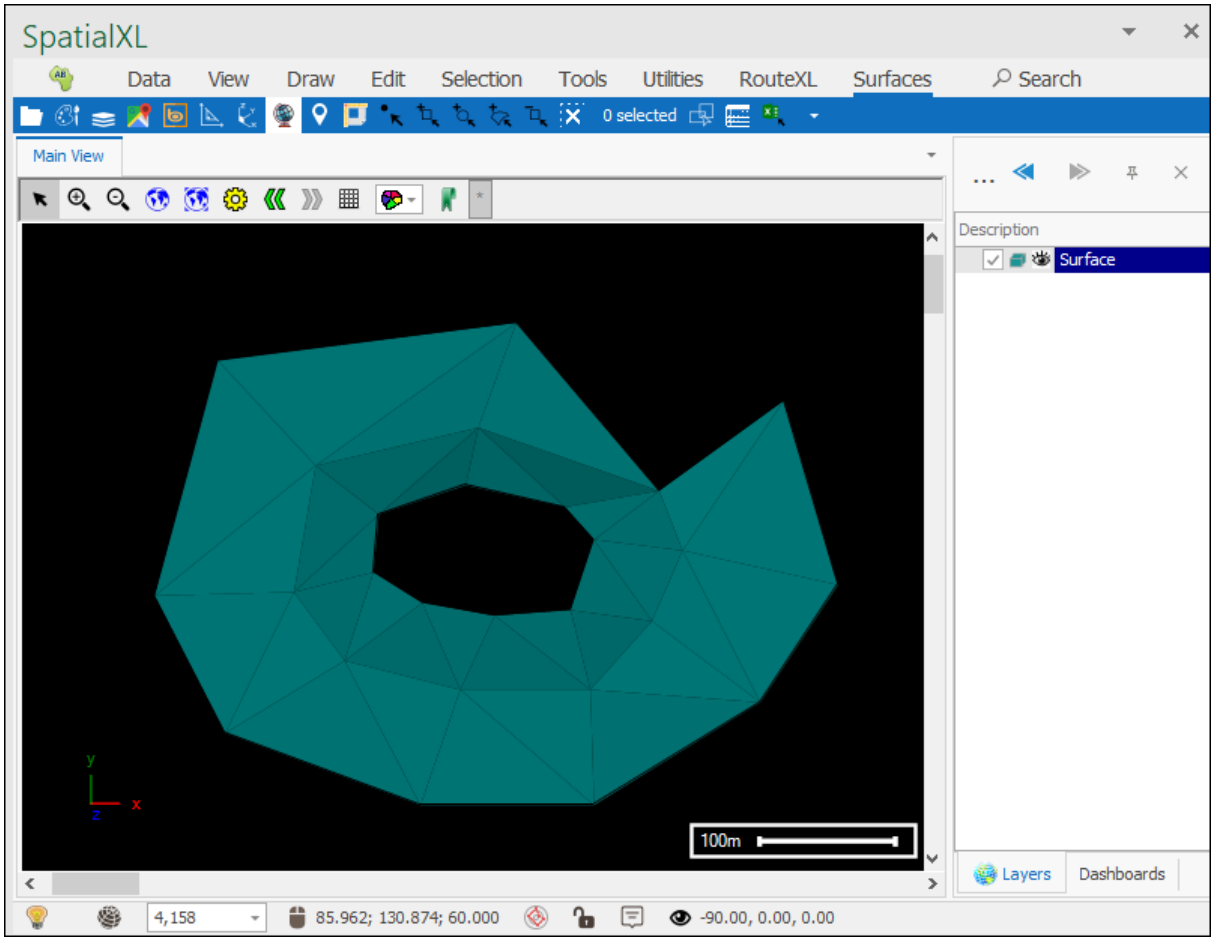


Before using this tool make sure that your surface layer has **Editable** ticked on in its Layer Properties box:



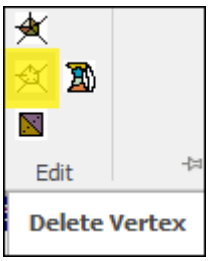
Select the tool and then click on the facets of your surface that you want to delete:


SpatialXL
Data
View
Draw
Edit
Selection
Tools
Utilities
RouteXL
Surfaces
Search
0 selected
Main View
Description
Surface
100m
Layers
Dashboards
4,158
102.128; 133.930; 60.000
-90.00, 0.00, 0.00

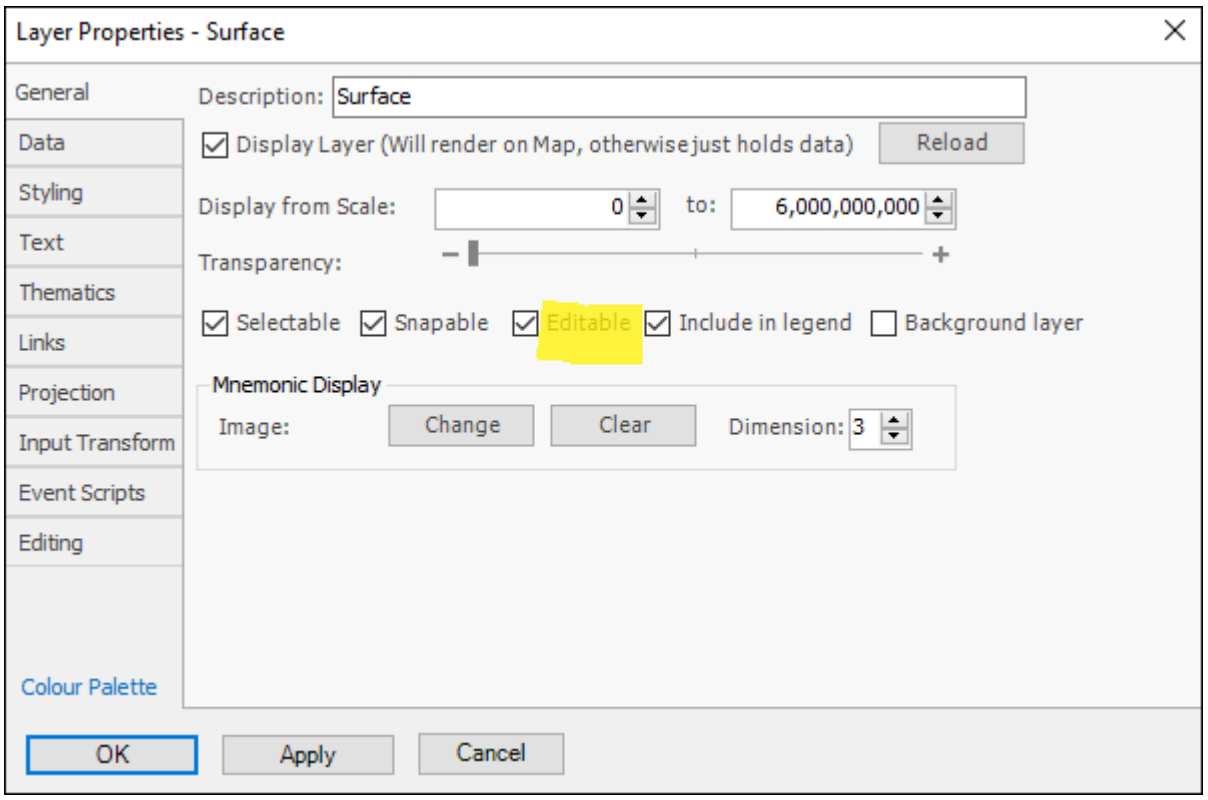


Delete Vertex

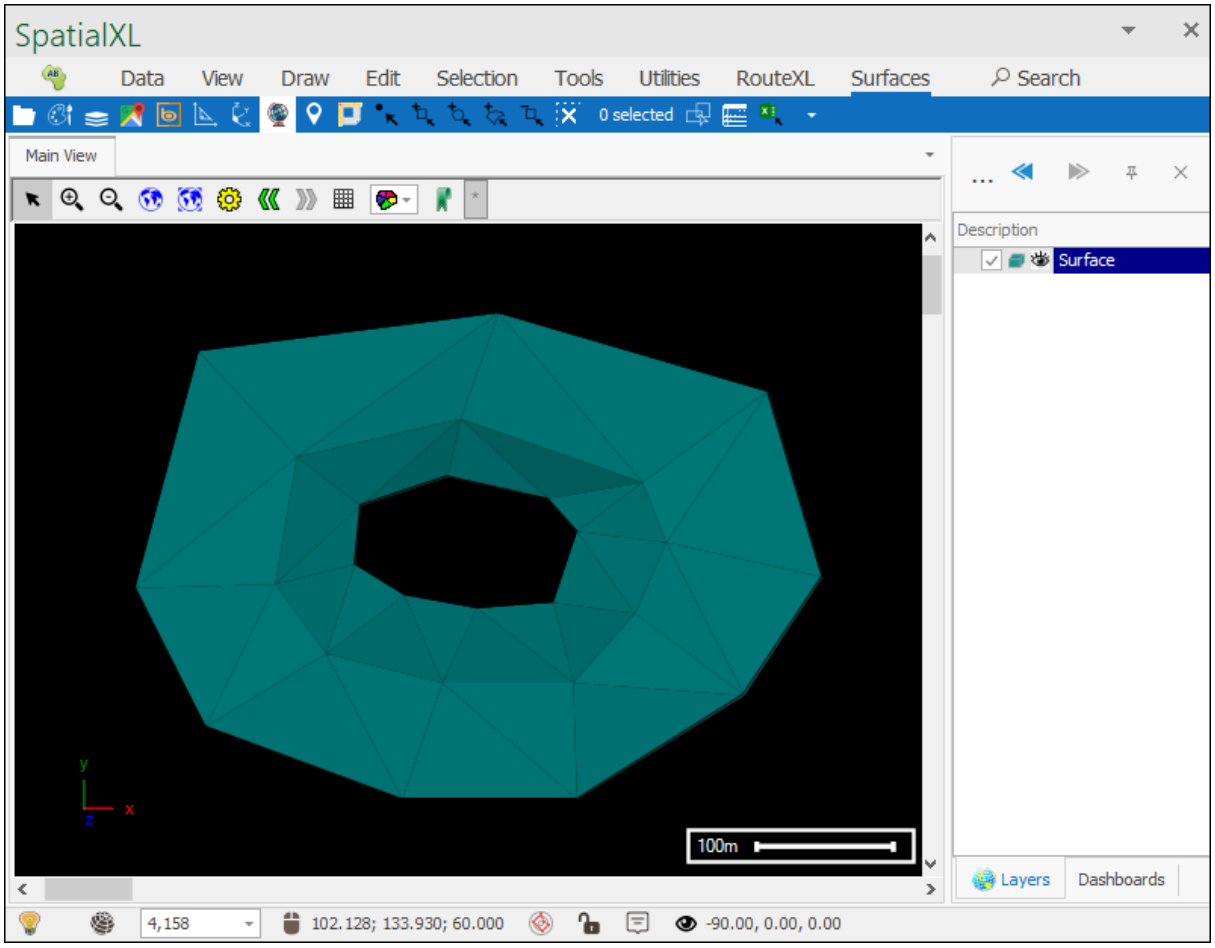
The **Delete Vertex** tool allows you to delete vertices from your surface:

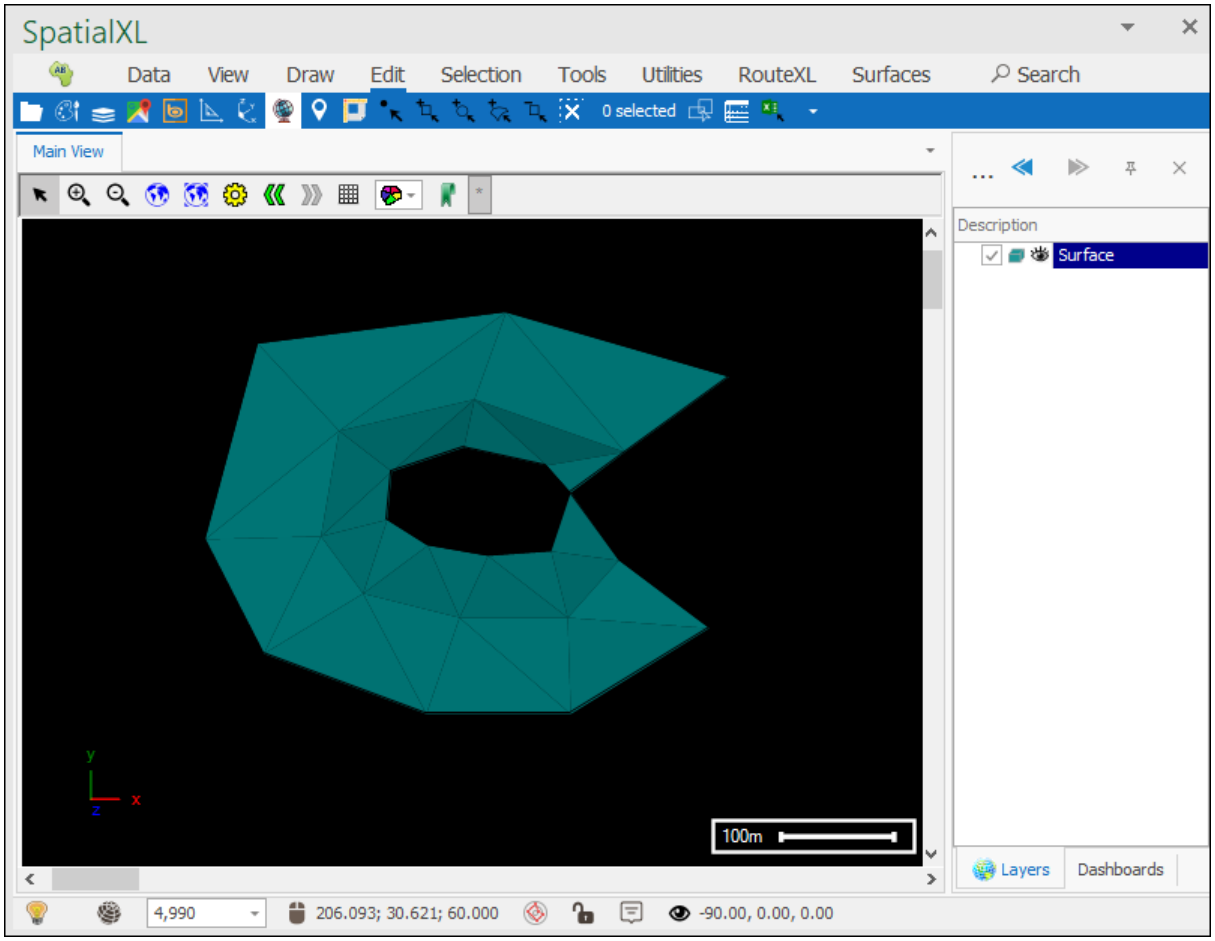


Make sure **Editable** is ticked on in the layer before using the tool:



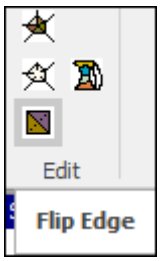
Select the tool and then click on the vertices you would like to delete from your surface:


SpatialXL
Data
View
Draw
Edit
Selection
Tools
Utilities
RouteXL
Surfaces
Search
0 selected
Main View
Description
Surface
100m
Layers
Dashboards
4,158
102.128; 133.930; 60.000
-90.00, 0.00, 0.00

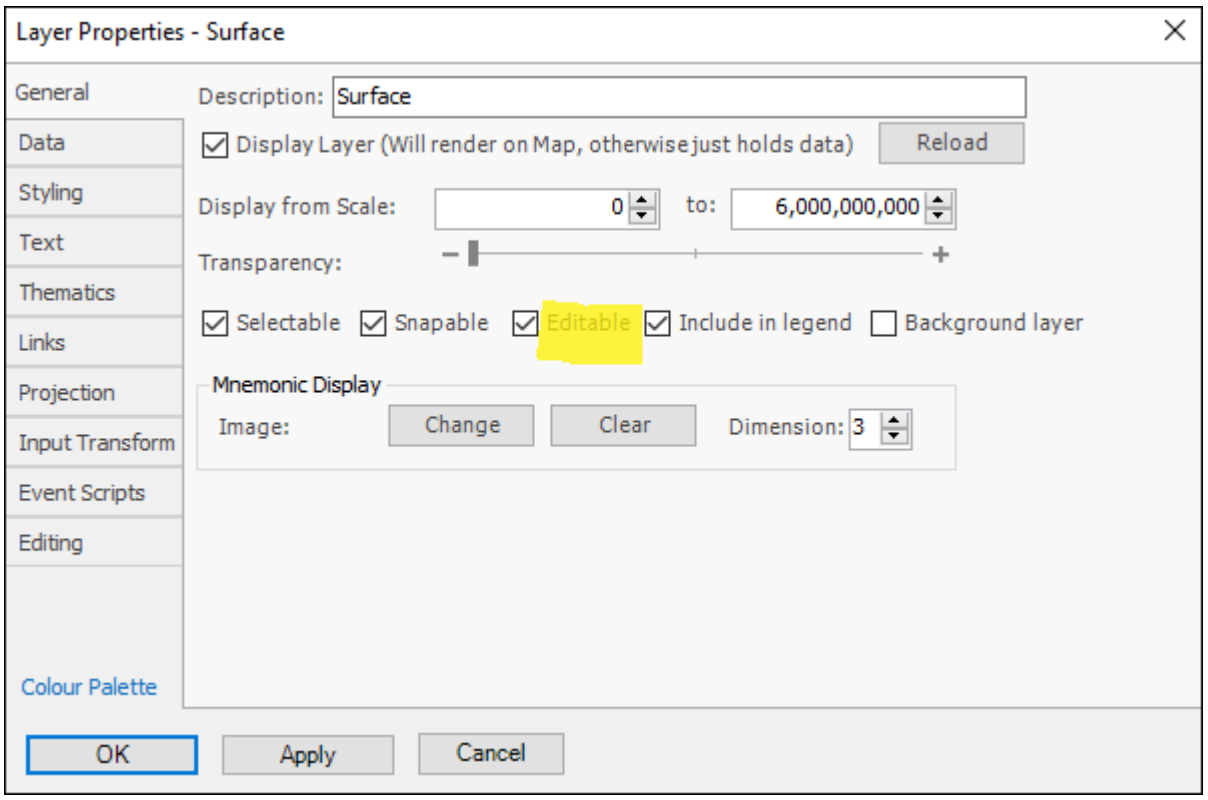


Flip Edge

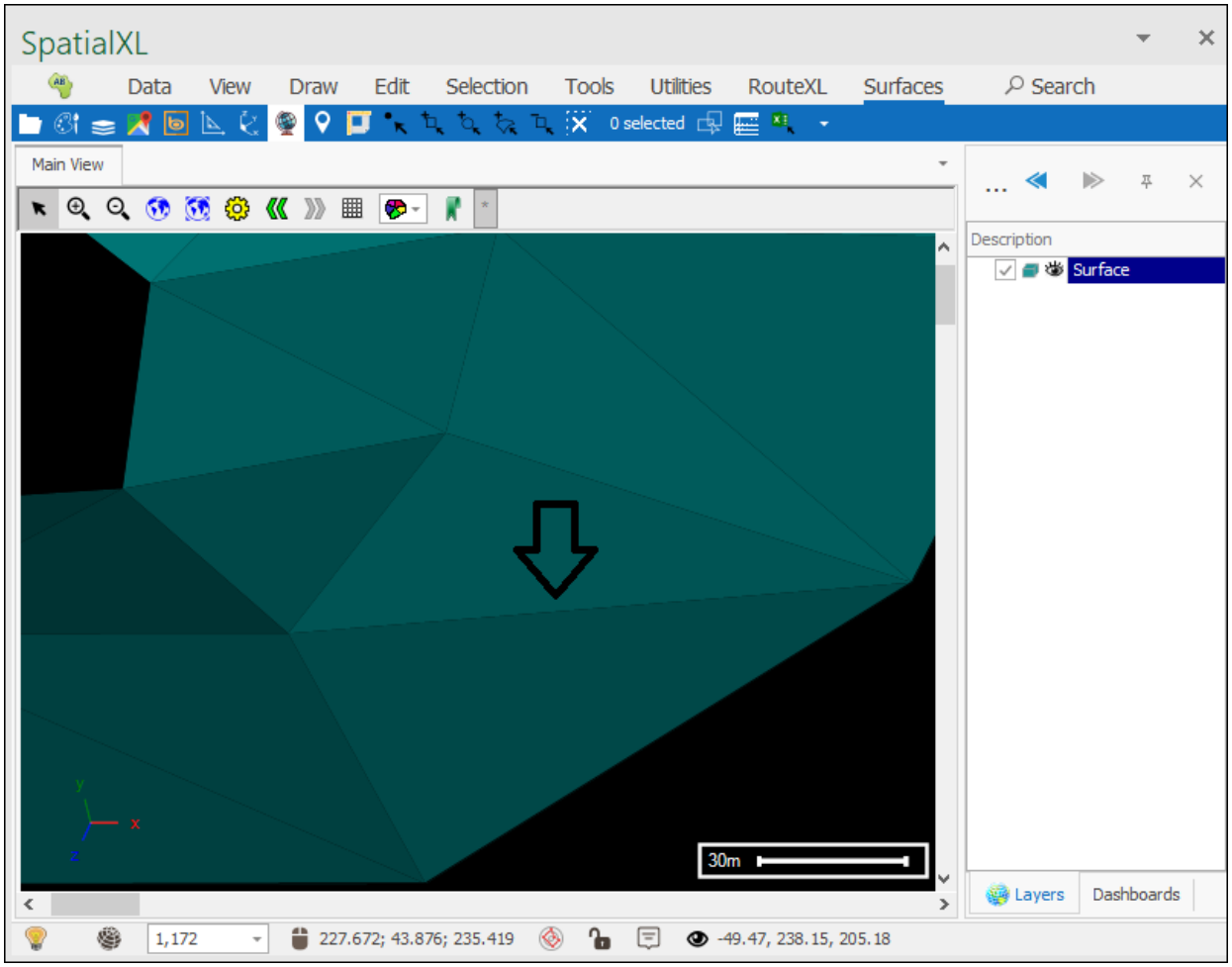
The next tool is the **Flip Edge** tool which allows you to flip the edges of a surface:

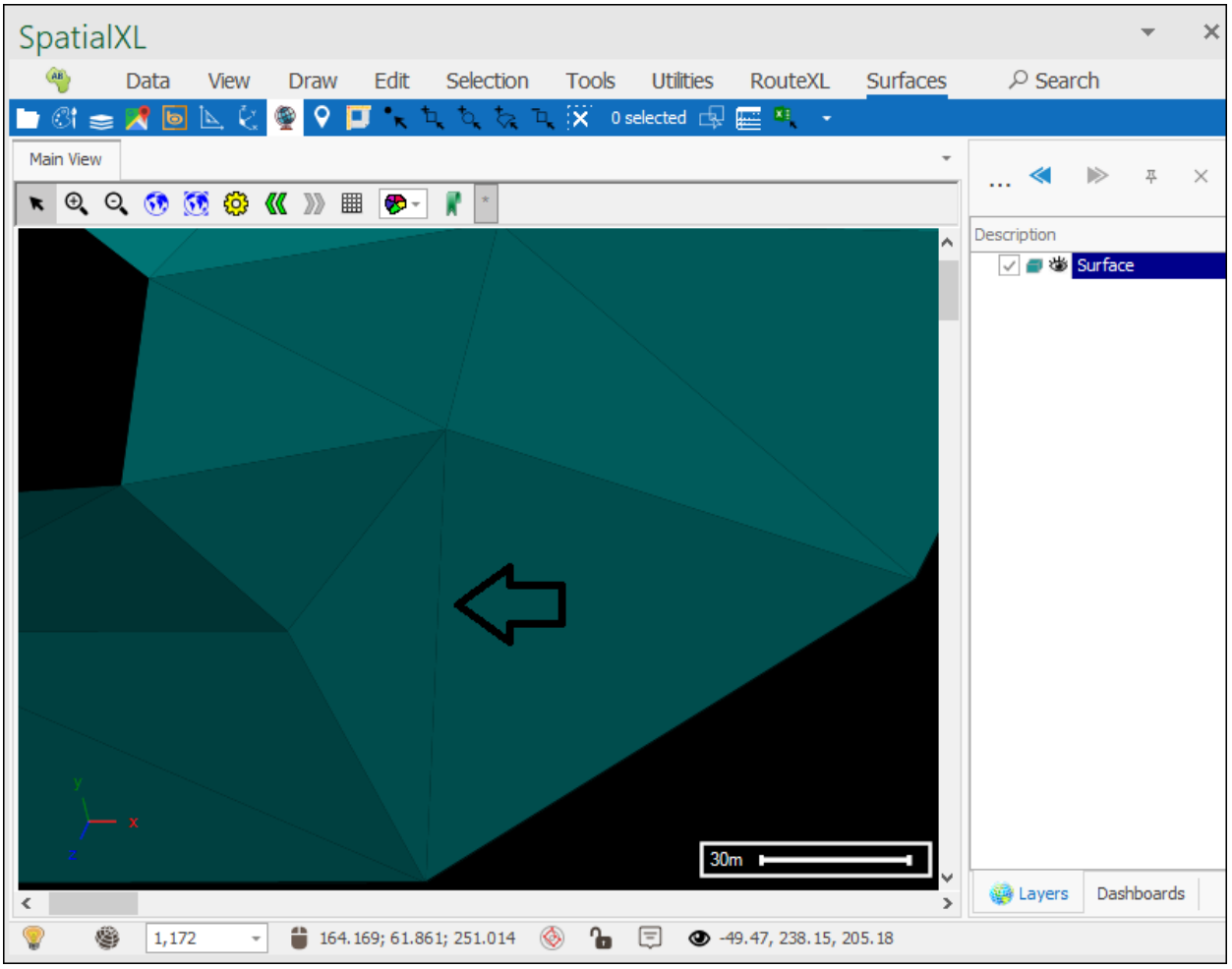


Make sure **Editable** is ticked on in the layer before using the tool:



Select the tool and then click on the edges you want to flip in your surface:

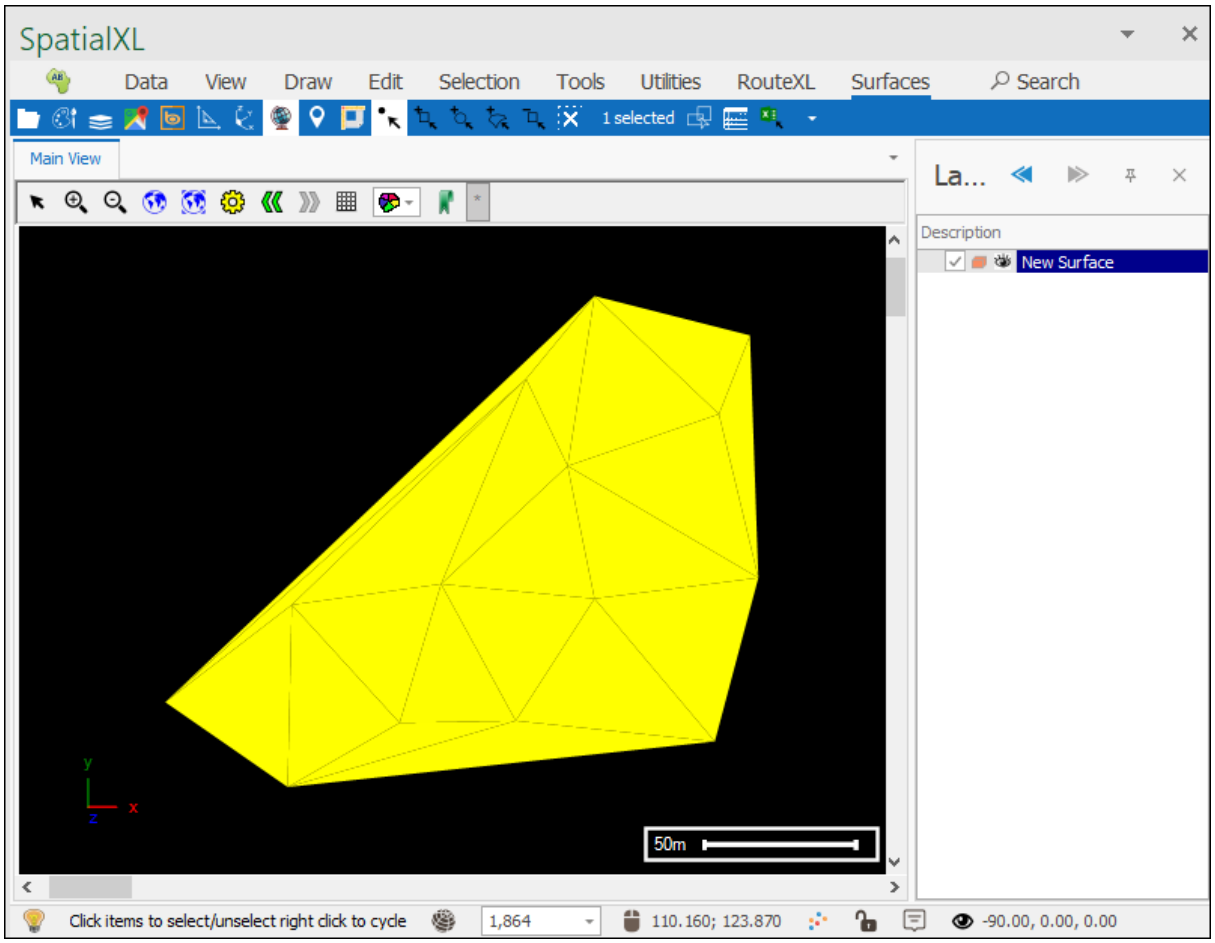

SpatialXL
Data
View
Draw
Edit
Selection
Tools
Utilities
RouteXL
Surfaces
Search
0 selected
Main View
Description
Surface
30m
Layers
Dashboards
1,172
227.672; 43.876; 235.419
-49.47, 238.15, 205.18



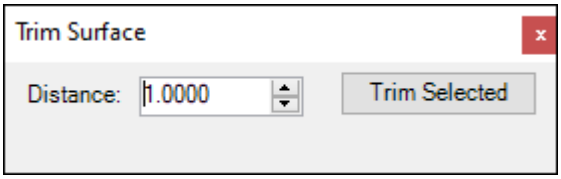
Trim Surface

The Trim Surface tool can be used to trim off unwanted parts of a surface:

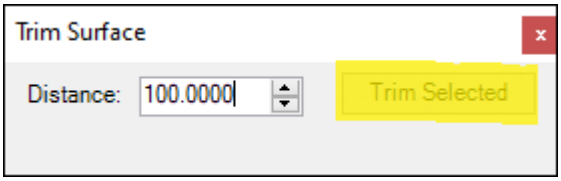
First select the surface you want to trim:

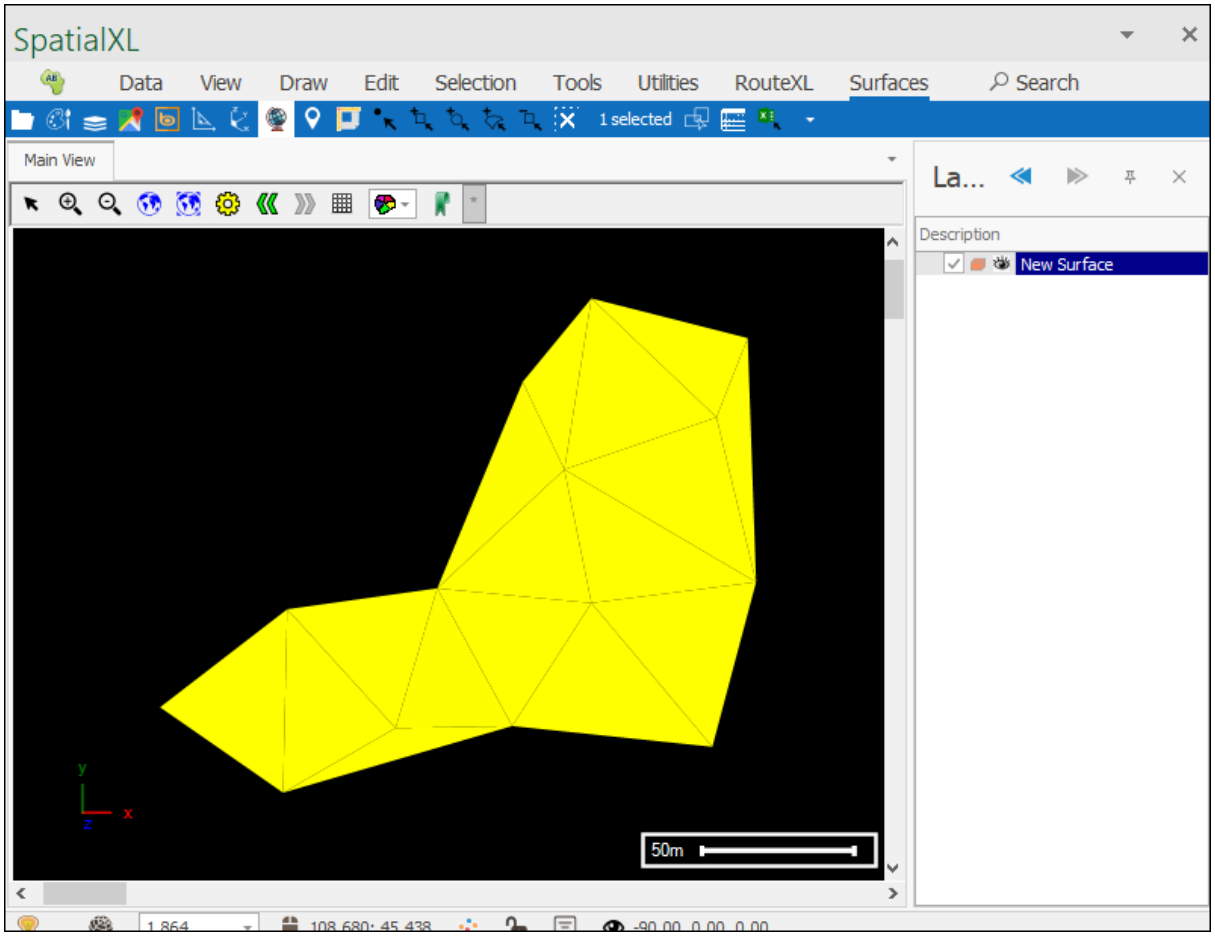


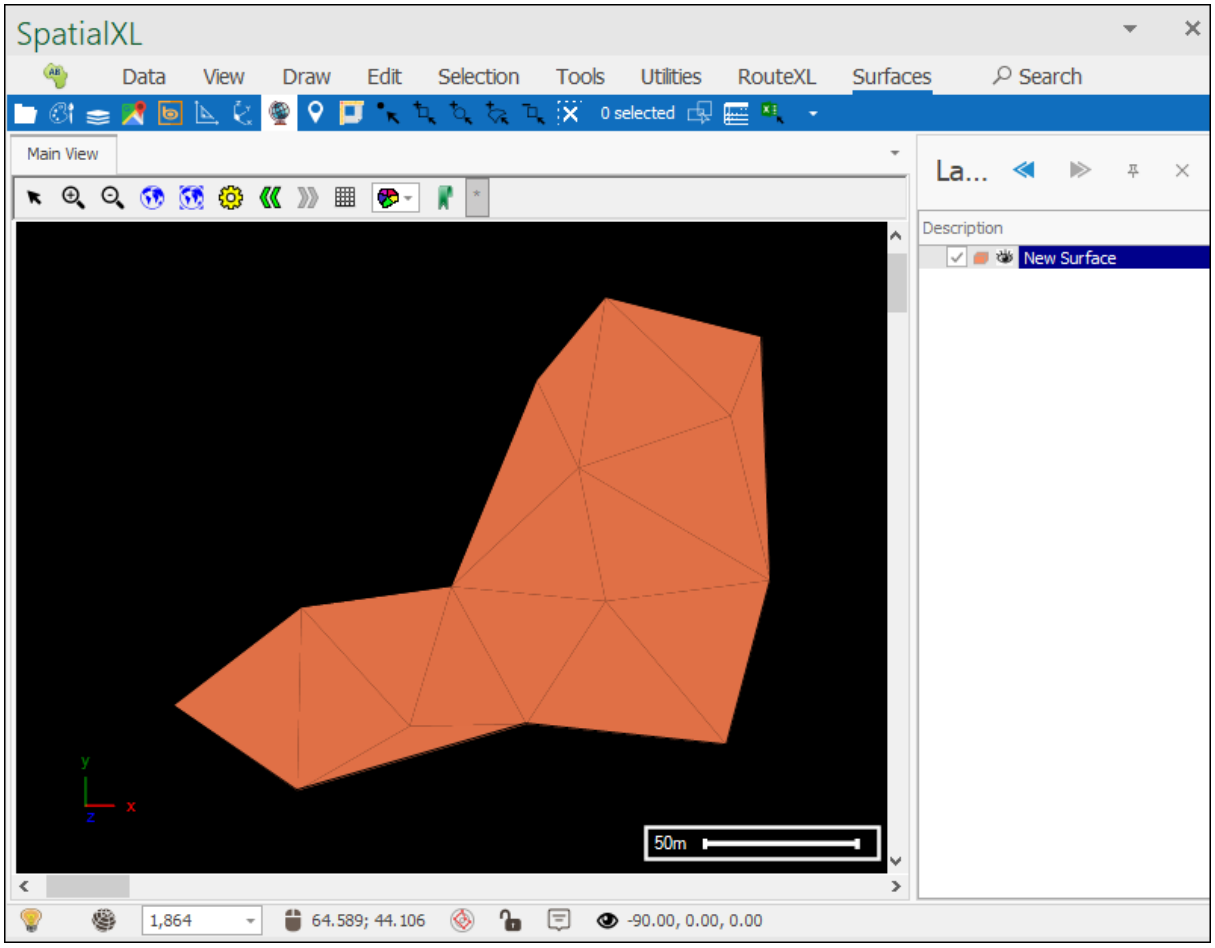
Then open the Trim tool which will bring up the following dialogue:



Here you are choosing the distance of edges of the facets of your surface beyond which you would like the facets to be trimmed. For example, here I want any facets with edges over 100 meters long to be trimmed, once you have entered in your distance click **Trim Selected**:


Trim Surface
Distance:
100.0000
Trim Selected


SpatialXL
Data
View
Draw
Edit
Selection
Tools
Utilities
RouteXL
Surfaces
Search
1 selected
Main View
La...
Description
New Surface
50m

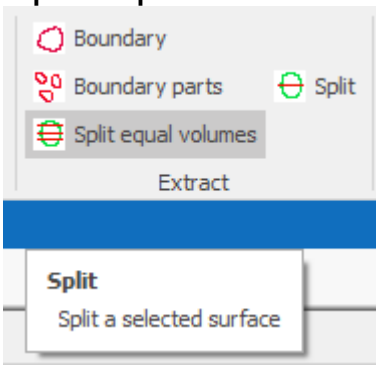


And as you can see my surface has been trimmed.

Extract

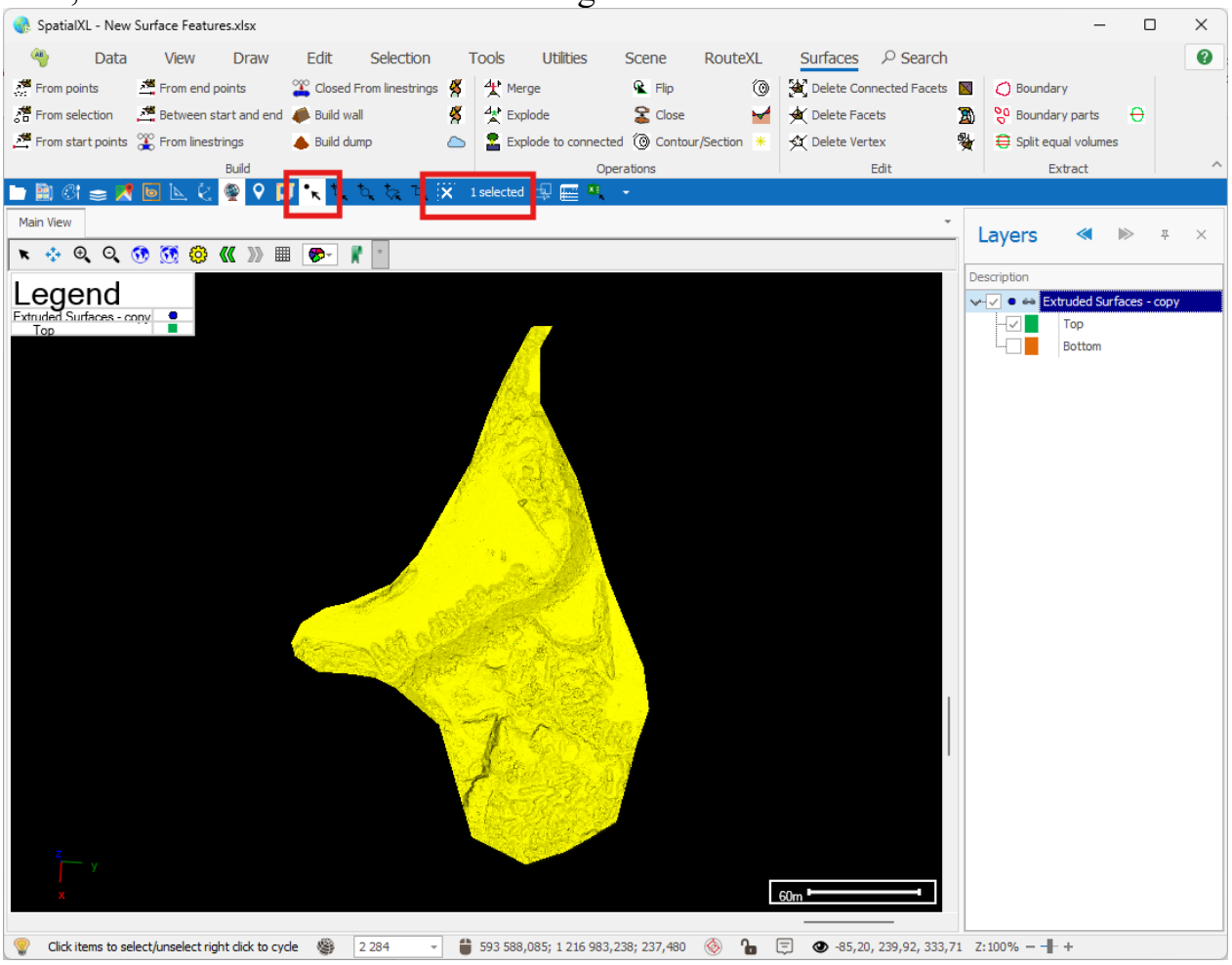
The Extract section of the Surfaces tab has tools to extract the boundaries of surfaces and also to split surfaces.

Split equal volumes



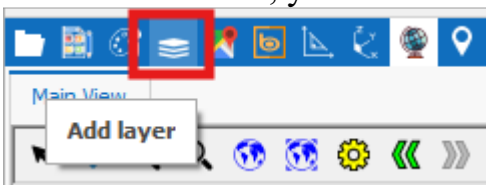
The Split equal volumes tool allows you to split one or more surfaces that you select, into equal volumes based on the parameters you set.

First, select the surface or surfaces using one of the selection tools:

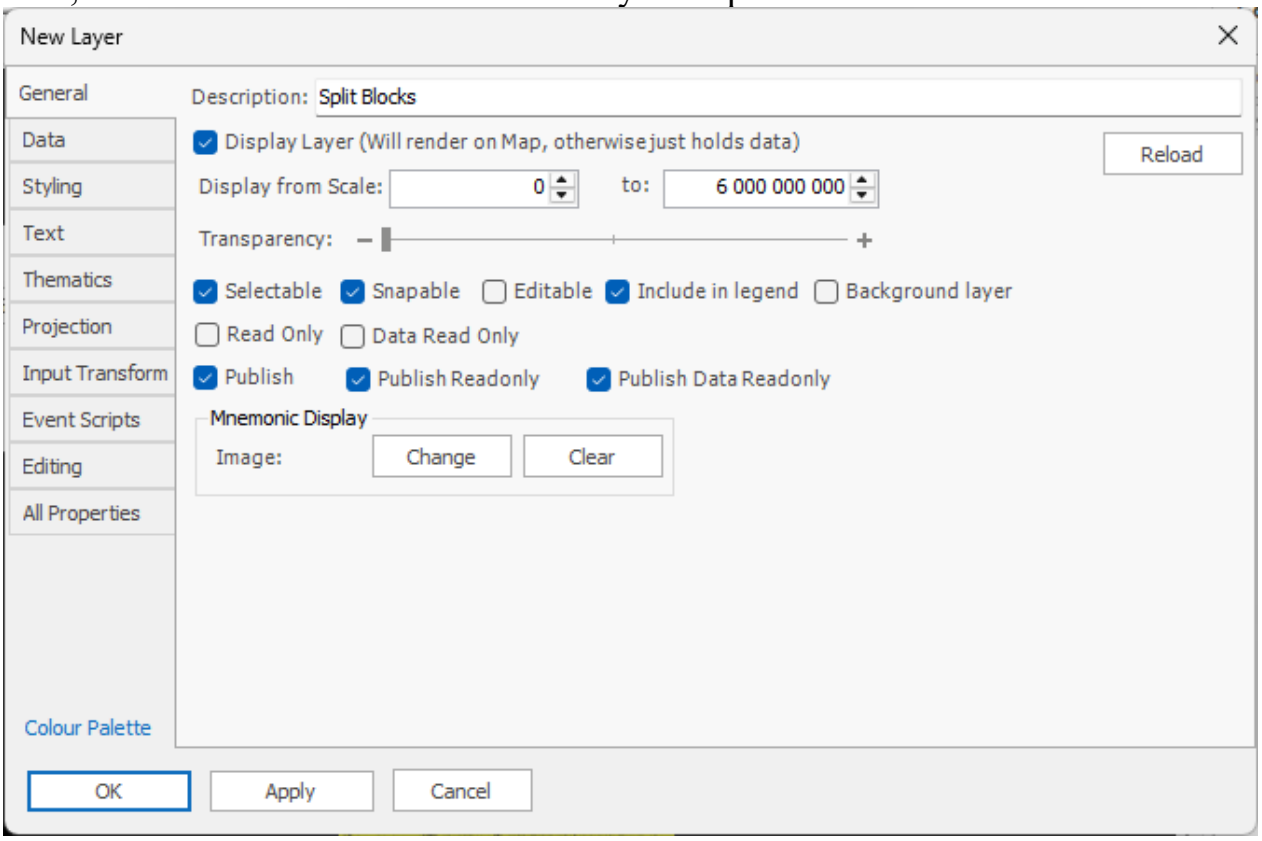


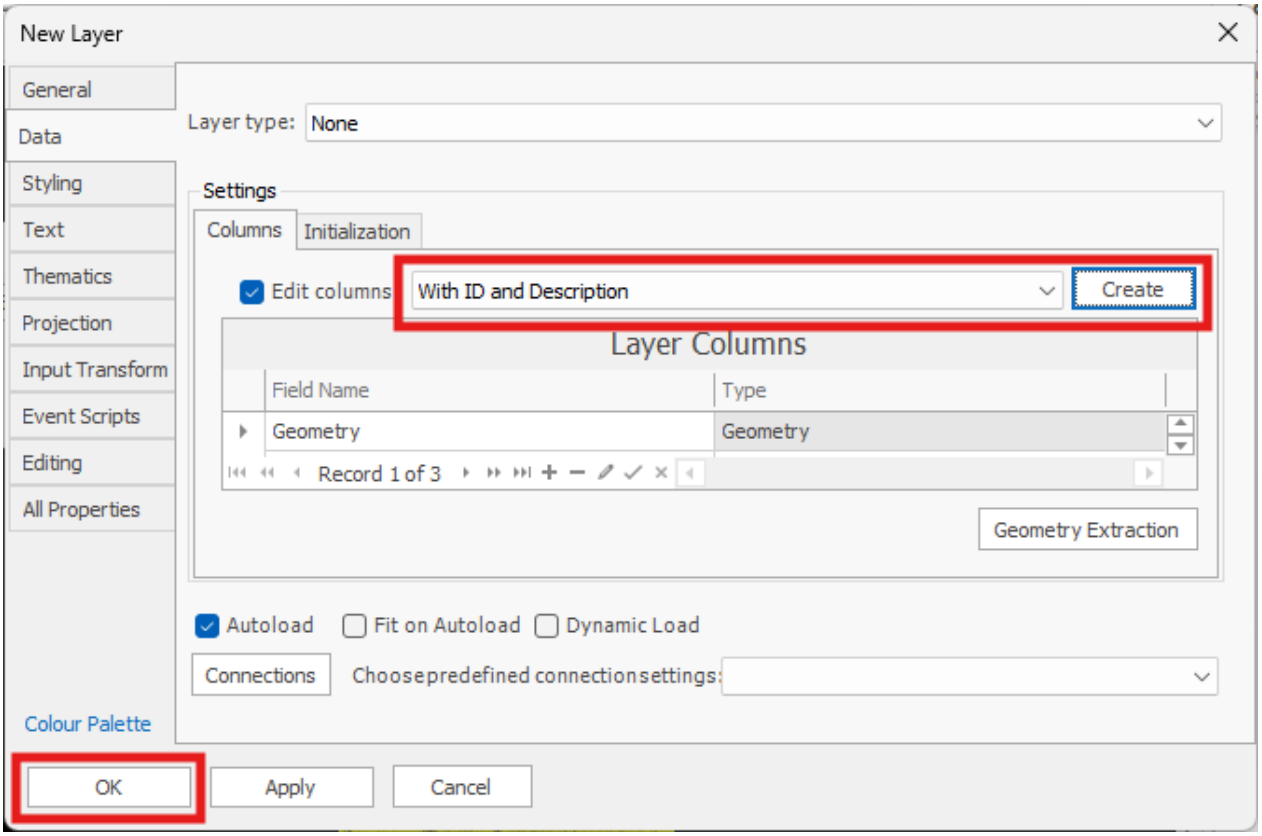
Next, you will need to make sure you have an active layer for the split surfaces to go into. You can make an existing layer active (by right clicking on the layer and selecting “Active”) or add a new one.

To add a new one, you can click the “Add layer” button in the quick access toolbar:

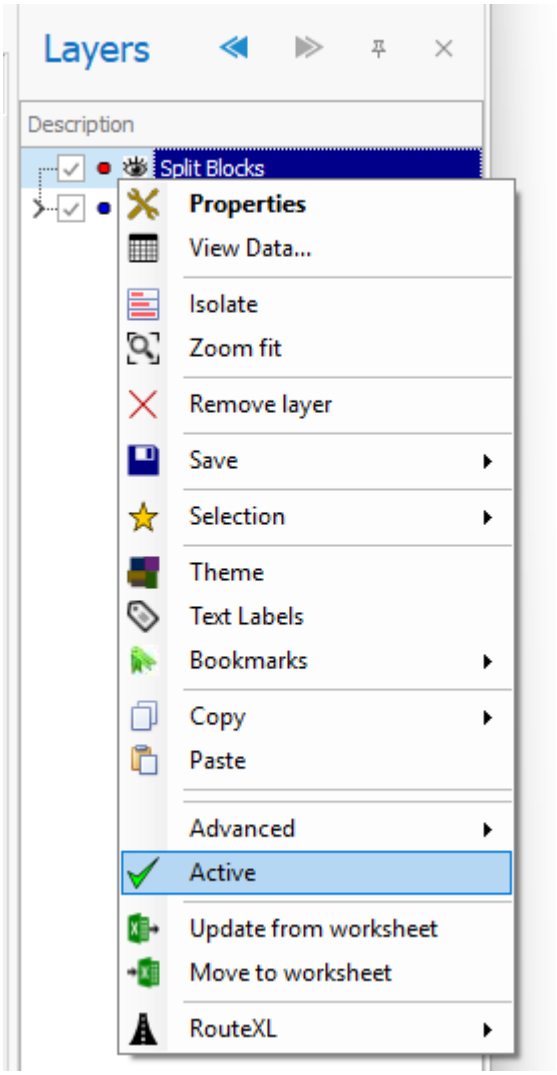


Then, give the layer a name in the Description field of the Layer Properties box, then in the Data tab choose the layer to be created with an ID and Description column, then click Create and OK on the Layer Properties box:

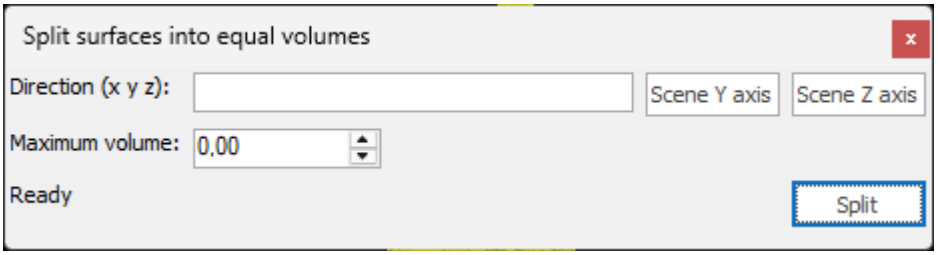




Finally, make the newly added layer Active, by right clicking on the layer and selecting “Active”, so it can receive the surfaces we will split:

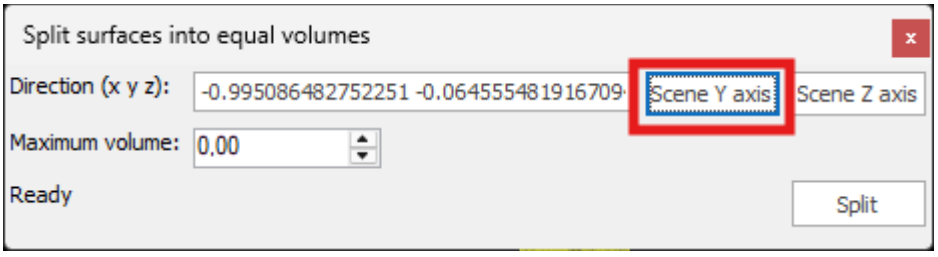


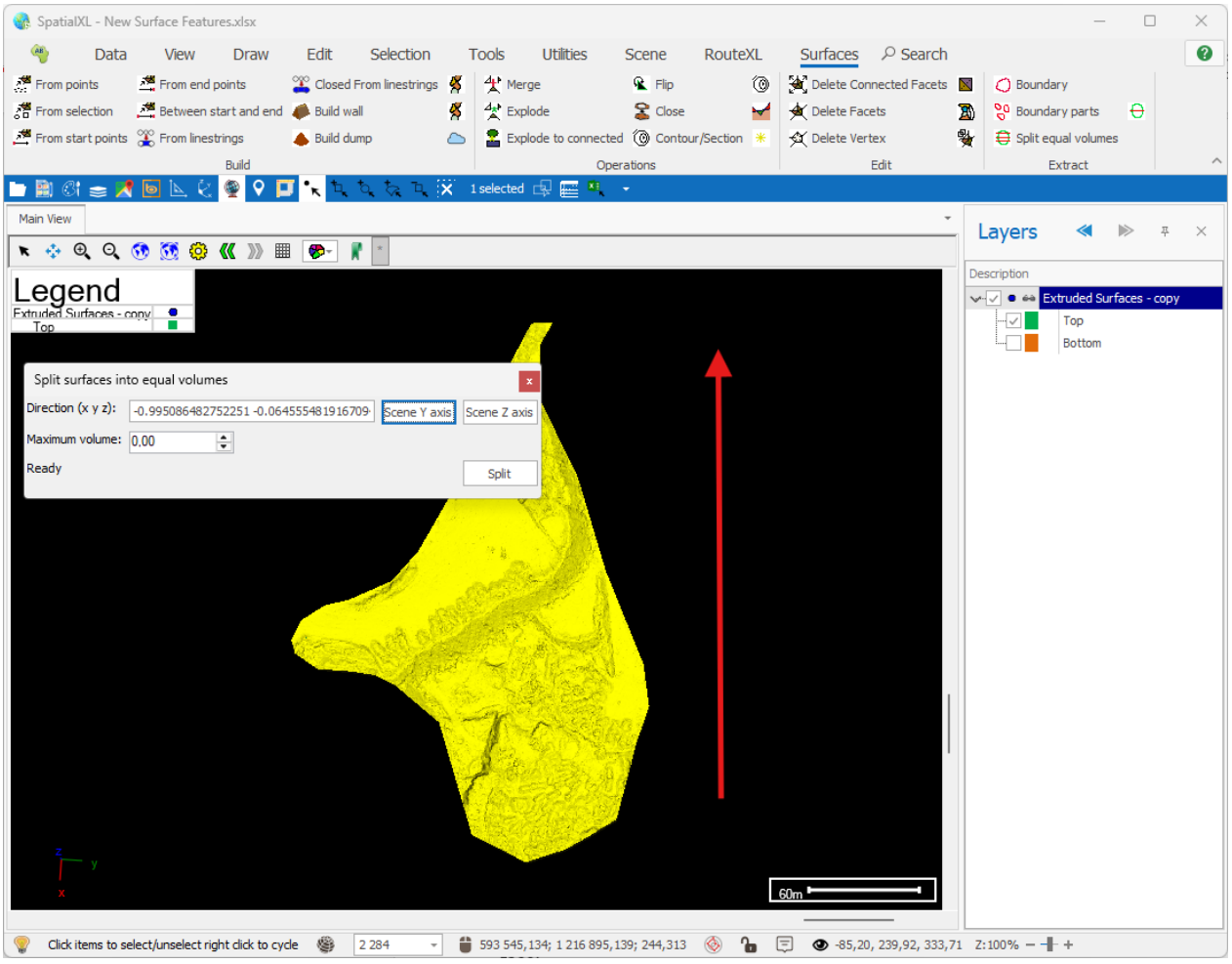
You can now open the Split equal volumes tool. It will bring up the following dialogue:



The Direction (x y z) field can be specified manually, or you can get the Y or Z axis of your current scene by clicking the “Scene Y axis” or “Scene Z axis” button.

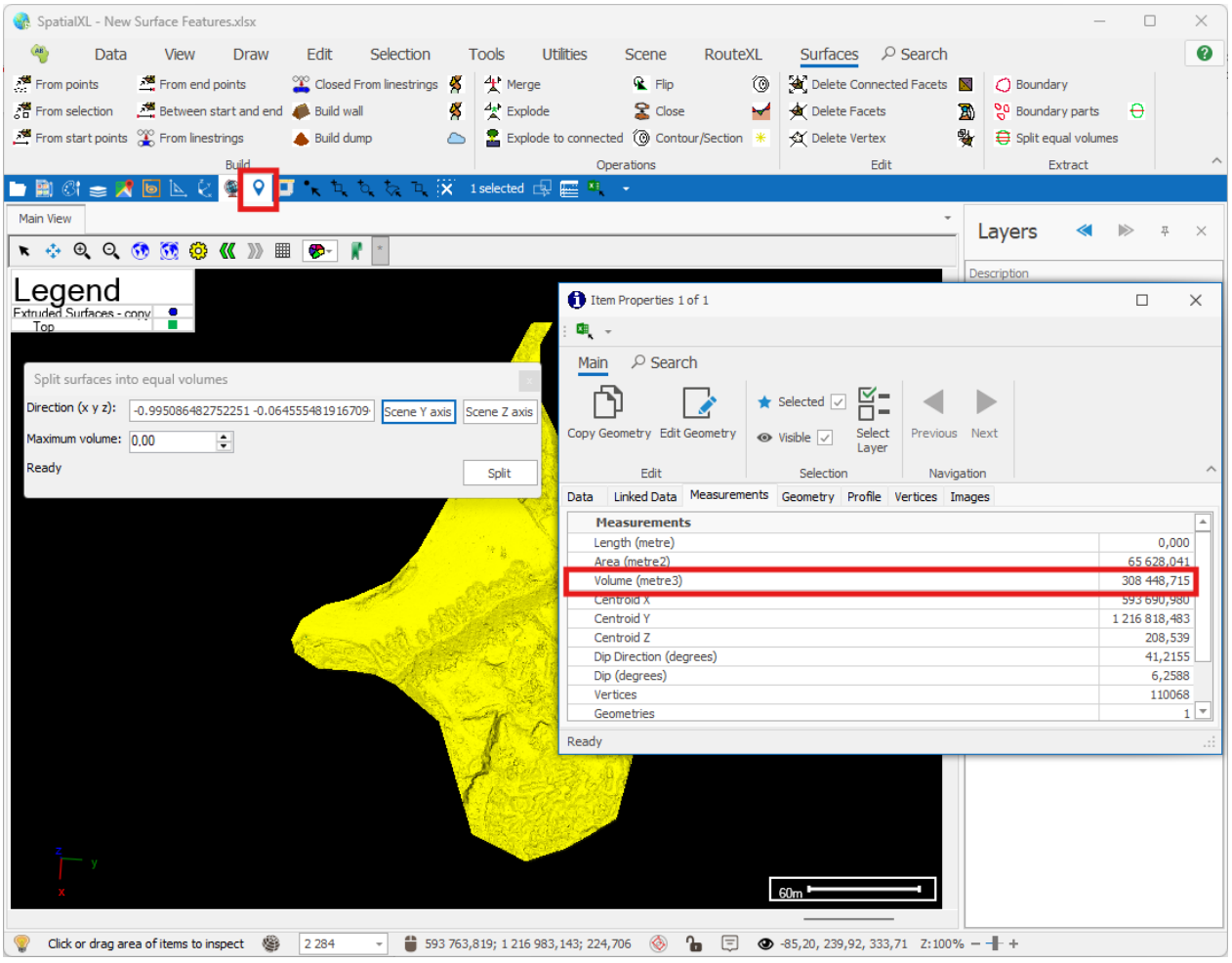
I will click the “Scene Y axis” button so that the direction of the split is in my Y axis direction:

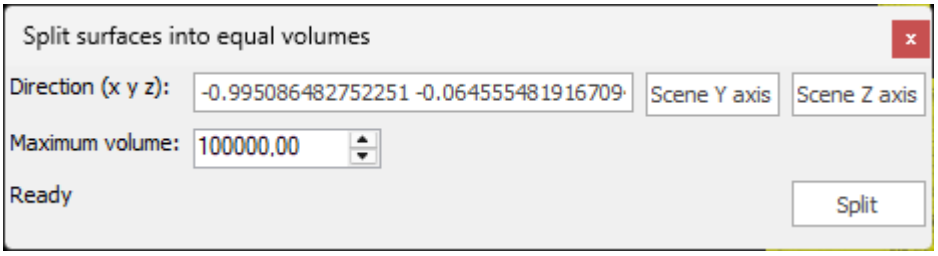




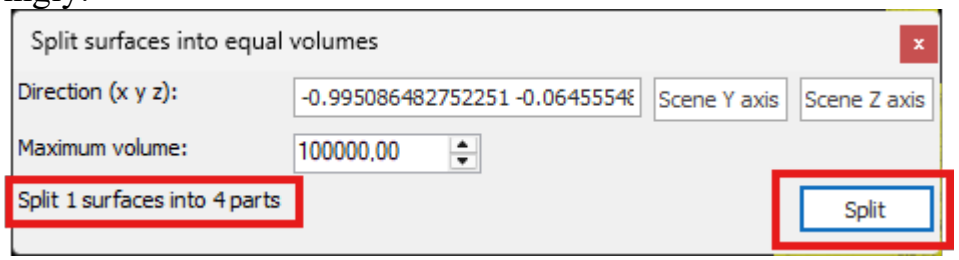
Next, you will specify the maximum volume of each split section when the surface is split.

Using the Inspector tool I can see the volume of my current surface is approxi-mately 300,000 m3 and so I will put a maximum volume of 100,000.

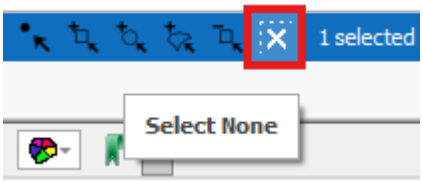




I can now go ahead and click the “Split” button and my surface will be split accordingly:

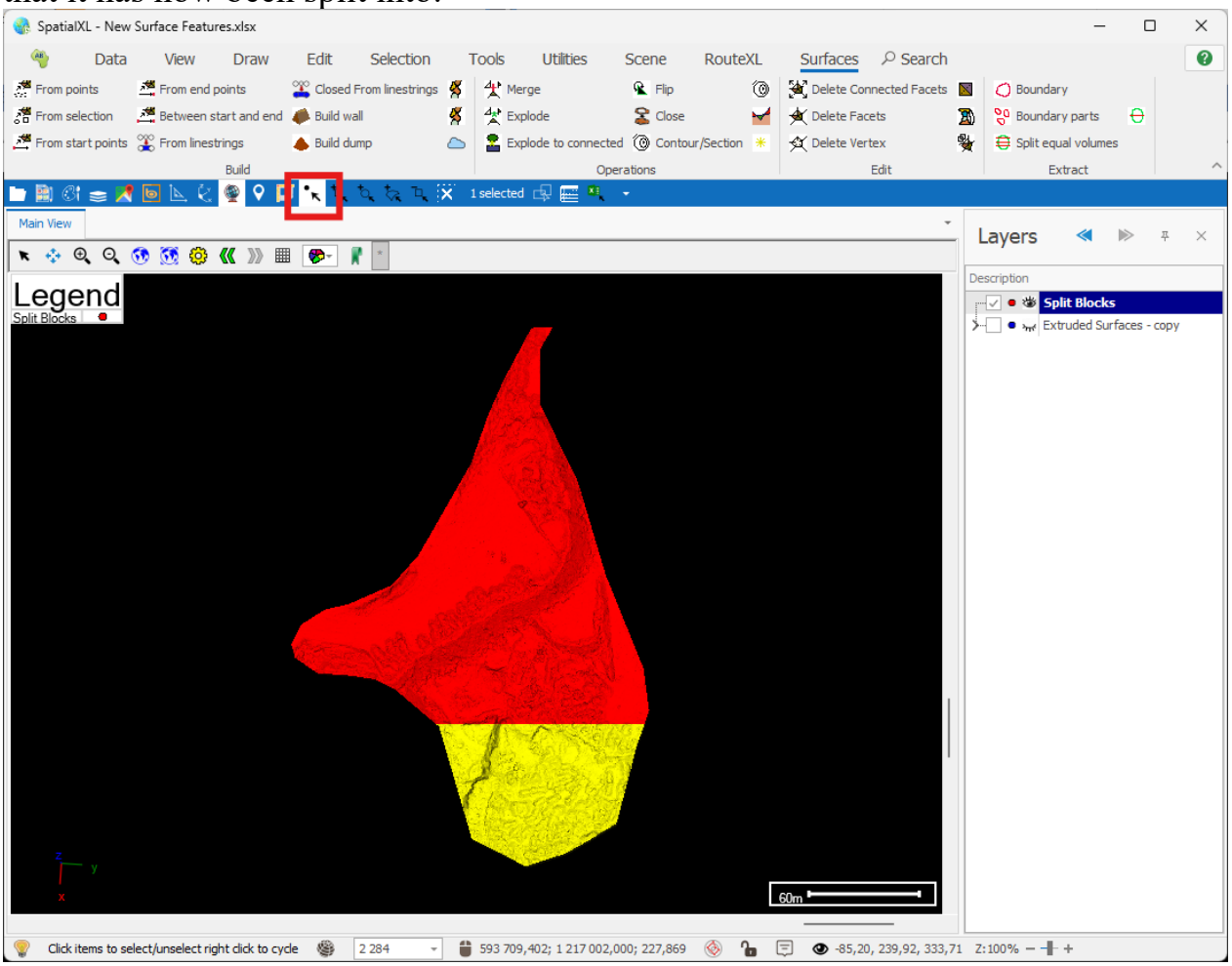


The split has now been done. To see the result, first clear your selected items in the scene:

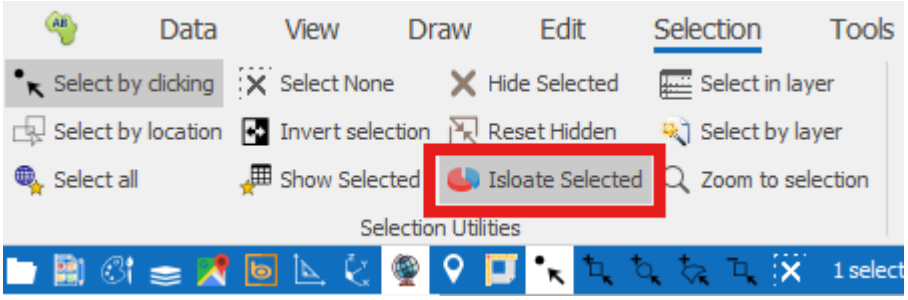


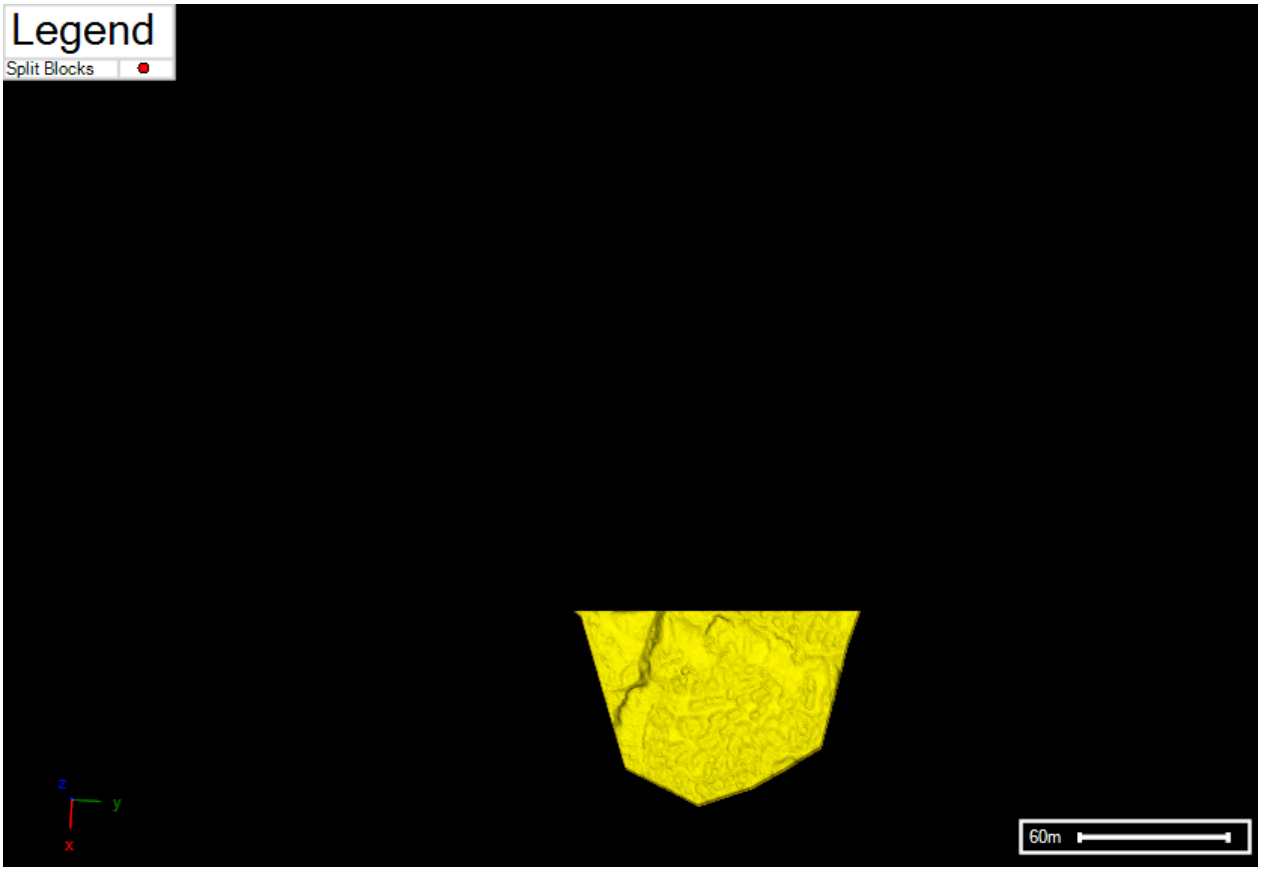
Then turn off your original layer with the surface so that only the layer with the new split surface is showing.

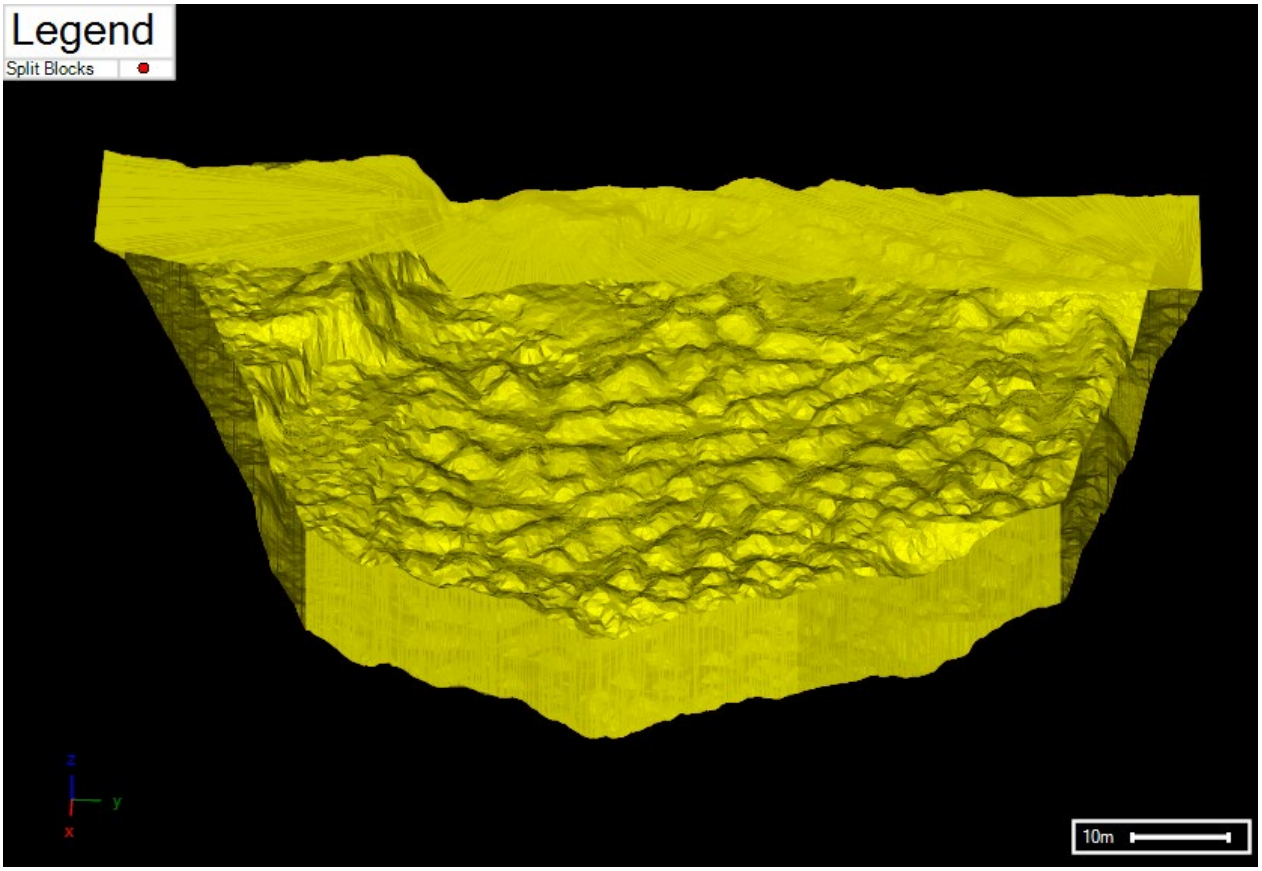
Then using one of the selection tools you can now select each part of the surface that it has now been split into:



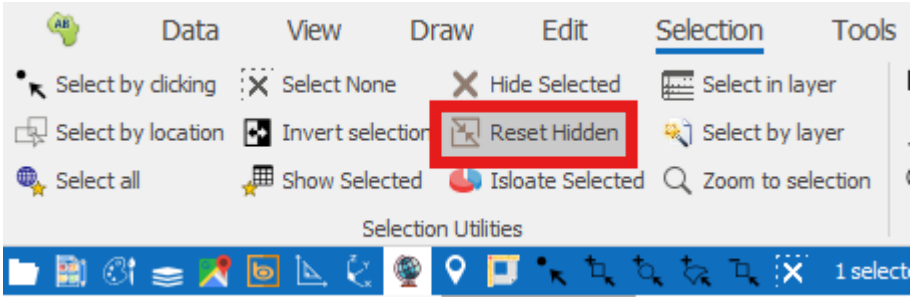
If you go to the Selection tab and click “Isolate Selected” it will then just show the exact section that you have selected:


Data
View
Draw
Edit
Selection
Tools
Select by clicking
Select None
Hide Selected
Select in layer
Select by location
Invert selection
Reset Hidden
Select by layer
Select all
Show Selected
Isloate Selected
Zoom to selection
Selection Utilities
1 select

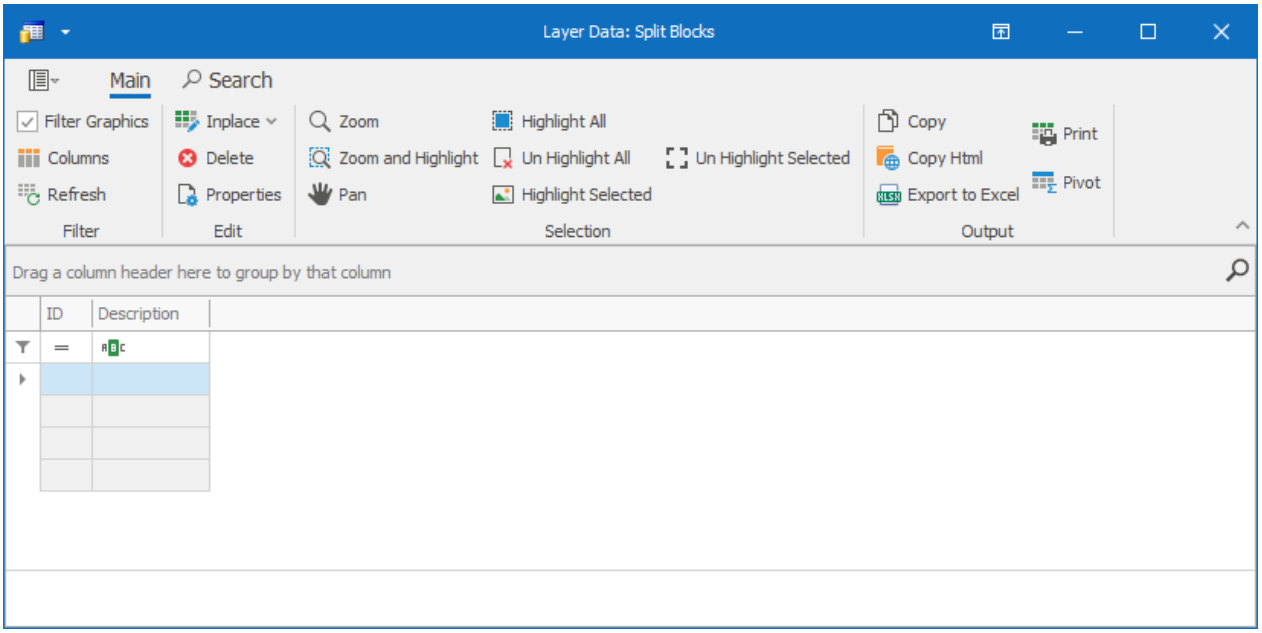

Legend
Split Blocks
z
y
x
60m



To reshow the hidden items simply click the “Rest Hidden” button in the Selection tab:

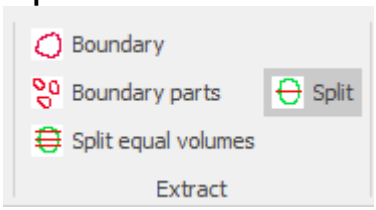


If you right click on the split surfaces layer you will see the data table for it with the 4 split sections that it was split into.



You can then capture IDs and Descriptions for the different split surfaces by typing them in the Layer Data Grid. For more data on working in the data grid please refer to the Layer Data Grid Guide.

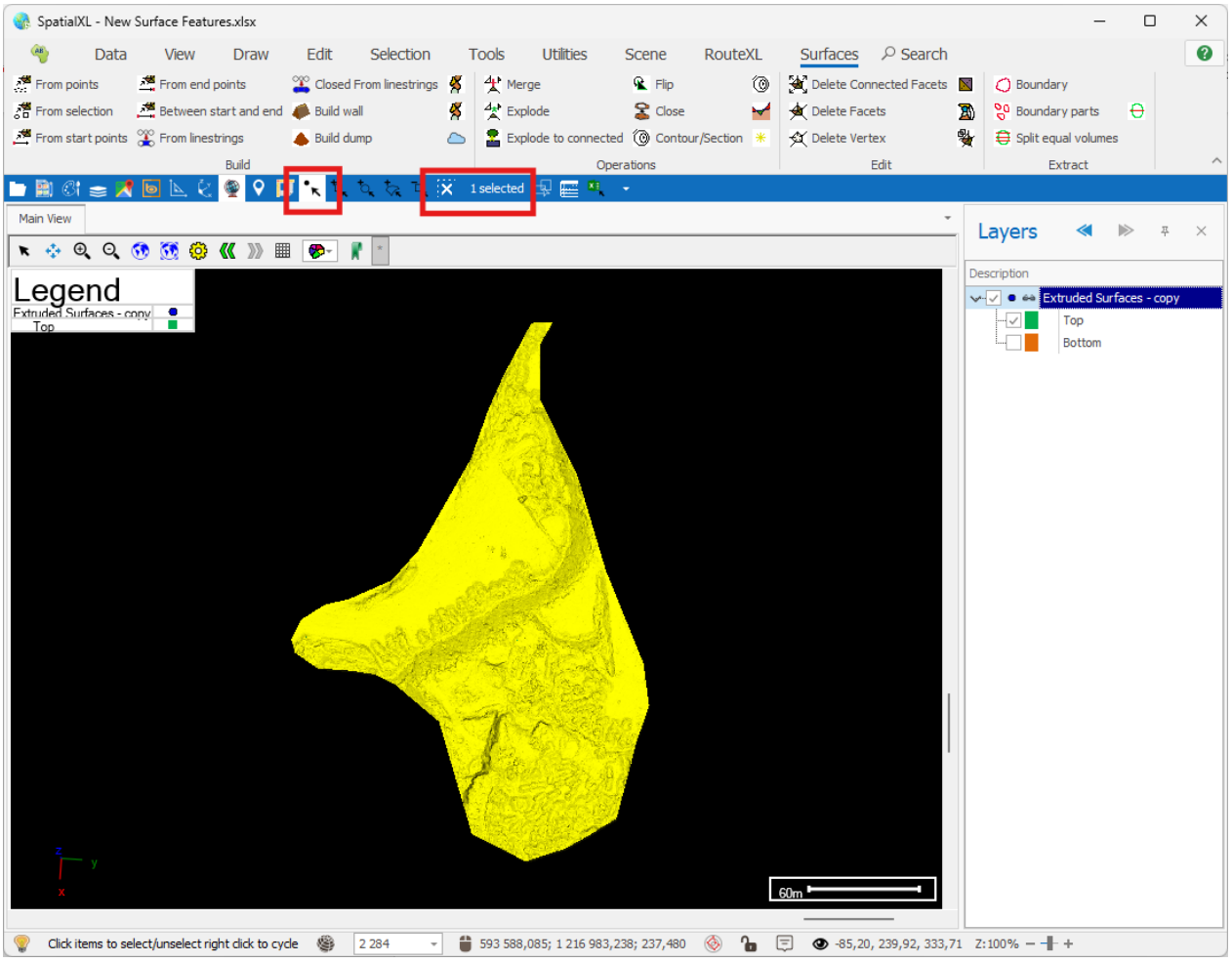
Split



The “Split” tool will allow you to do a manual split of a surface that you select.

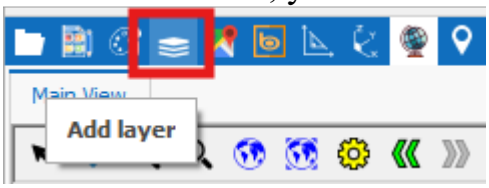
It will by default do the split in the Y axis direction and it will allow you to see what the volume split would be when you click on different parts of the surface before you go ahead and do the split.

First, select the surface or surfaces using one of the selection tools:

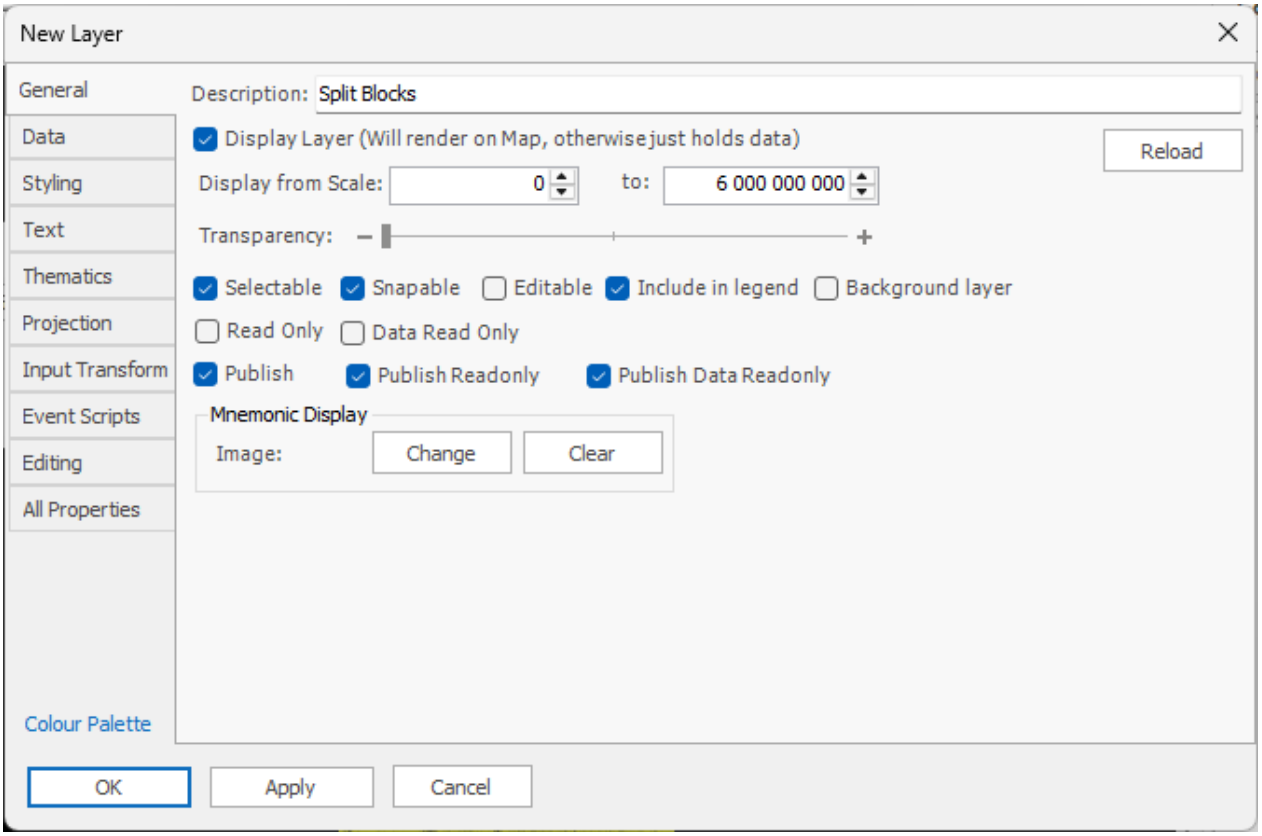


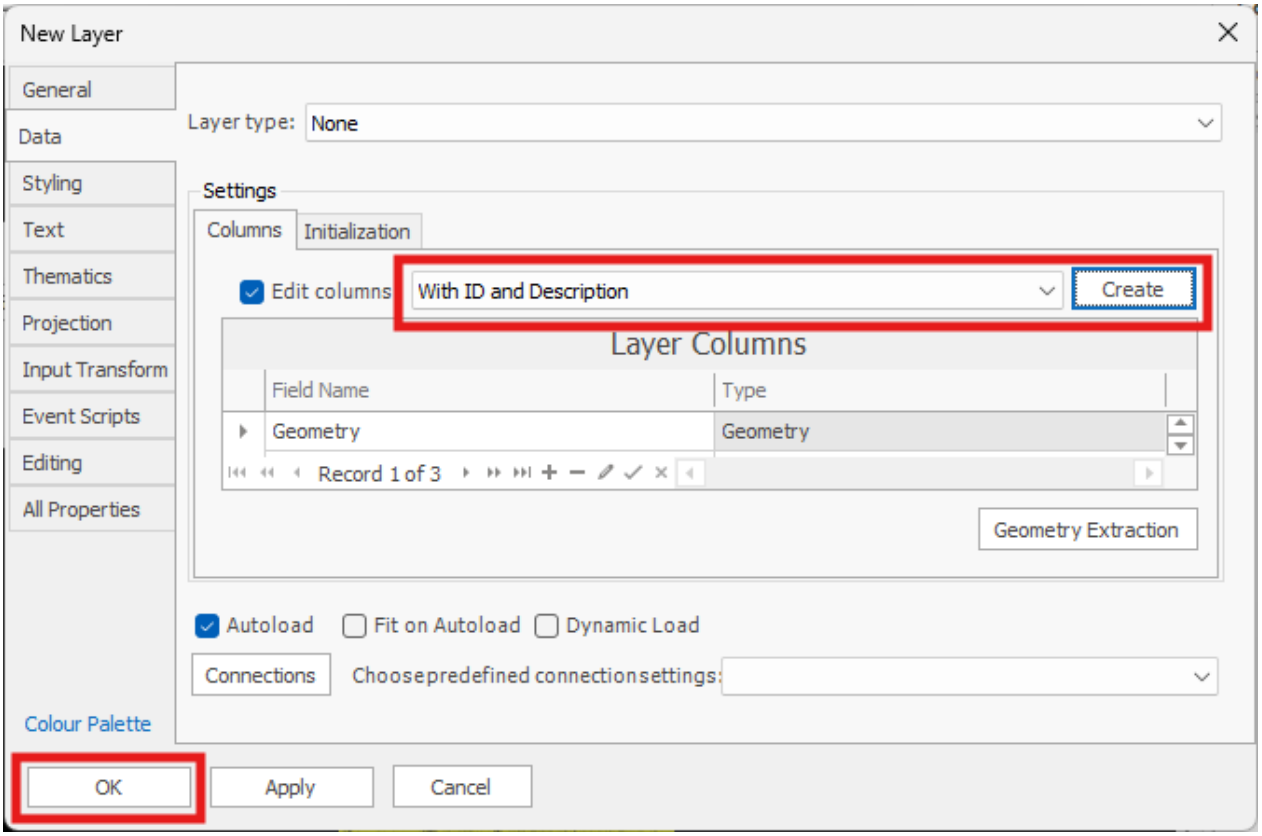
Next, you will need to make sure you have an active layer for the split surfaces to go into. You can make an existing layer active (by right clicking on the layer and selecting “Active”) or add a new one.

To add a new one, you can click the “Add layer” button in the quick access toolbar:

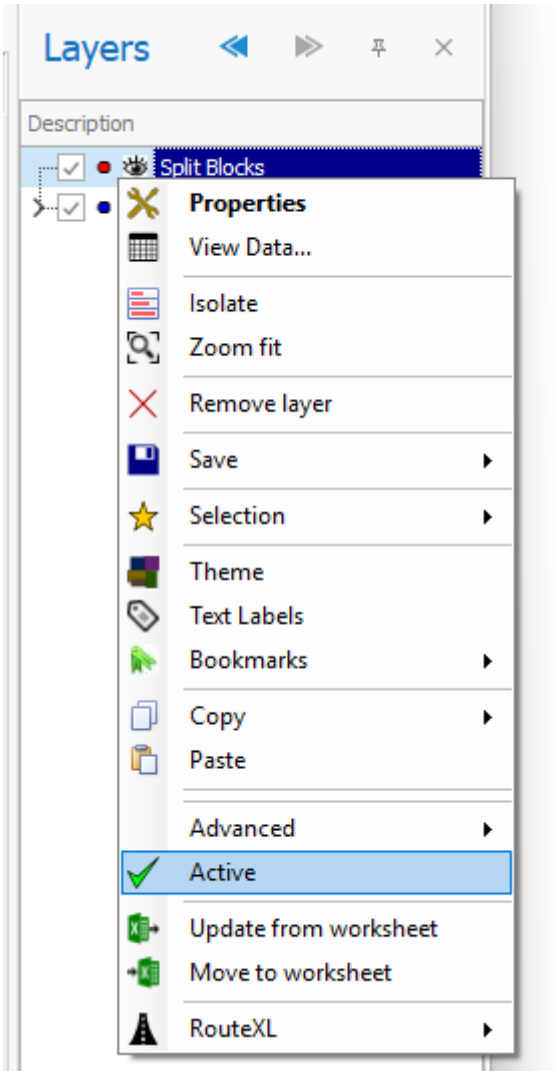


Then, give the layer a name in the Description field of the Layer Properties box, then in the Data tab choose the layer to be created with an ID and Description column, then click Create and OK on the Layer Properties box:

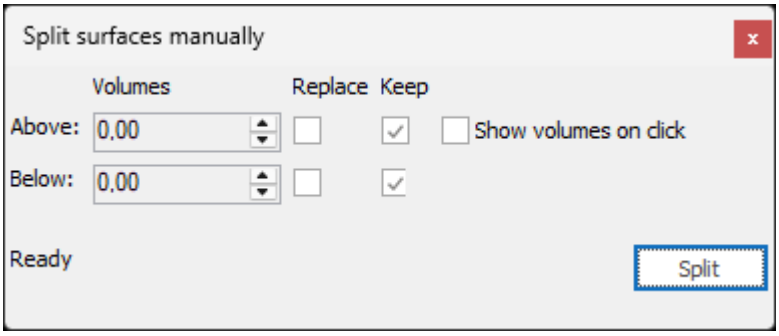

New Layer
General
Data
Styling
Text
Thematics
Projection
Input Transform
Event Scripts
Editing
All Properties
Description: Split Blocks
Display Layer (Will render on Map, otherwise just holds data)
Reload
Display from Scale: 0
to: 6 000 000 000
Transparency:
Selectable
Snapable
Editable
Include in legend
Background layer
Read Only
Data Read Only
Publish
Publish Readonly
Publish Data Readonly
Mnemonic Display
Image:
Change
Clear
Colour Palette
OK
Apply
Cancel


New Layer
General
Data
Styling
Text
Thematics
Projection
Input Transform
Event Scripts
Editing
All Properties
Layer type: None
Settings
Columns
Initialization
Edit columns
With ID and Description
Create
Layer Columns
Field Name
Type
Geometry
Geometry
Record 1 of 3
Geometry Extraction
Autoload
Fit on Autoload
Dynamic Load
Connections
Choose predefined connection settings:
Colour Palette
OK
Apply
Cancel

Finally, make the newly added layer Active, by right clicking on the layer and selecting “Active”, so it can receive the surfaces we will split:

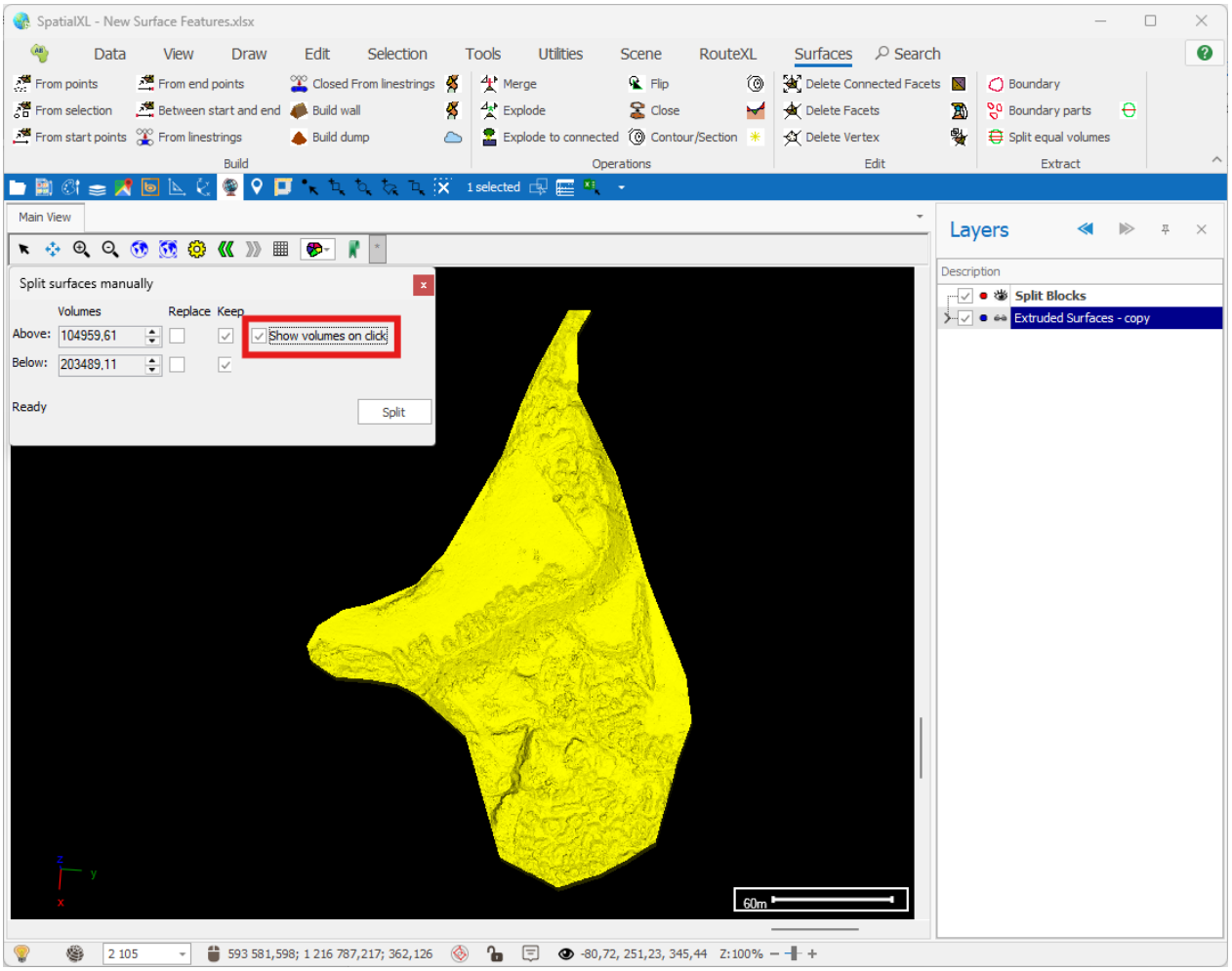


You can now open the “Split” tool.



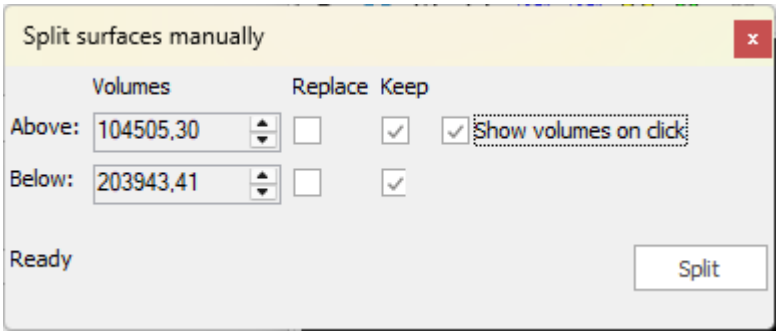
The “Above” field will show what the volume of the higher elevation section of the surface split will be and the “Below” field will show the volume of the lower elevation section of the split.

Check on the “Show volumes on click” box and then as you click on different parts of your surface the volumes will populate. Once you are happy with the Above and Below breakdowns you can go to the next step.



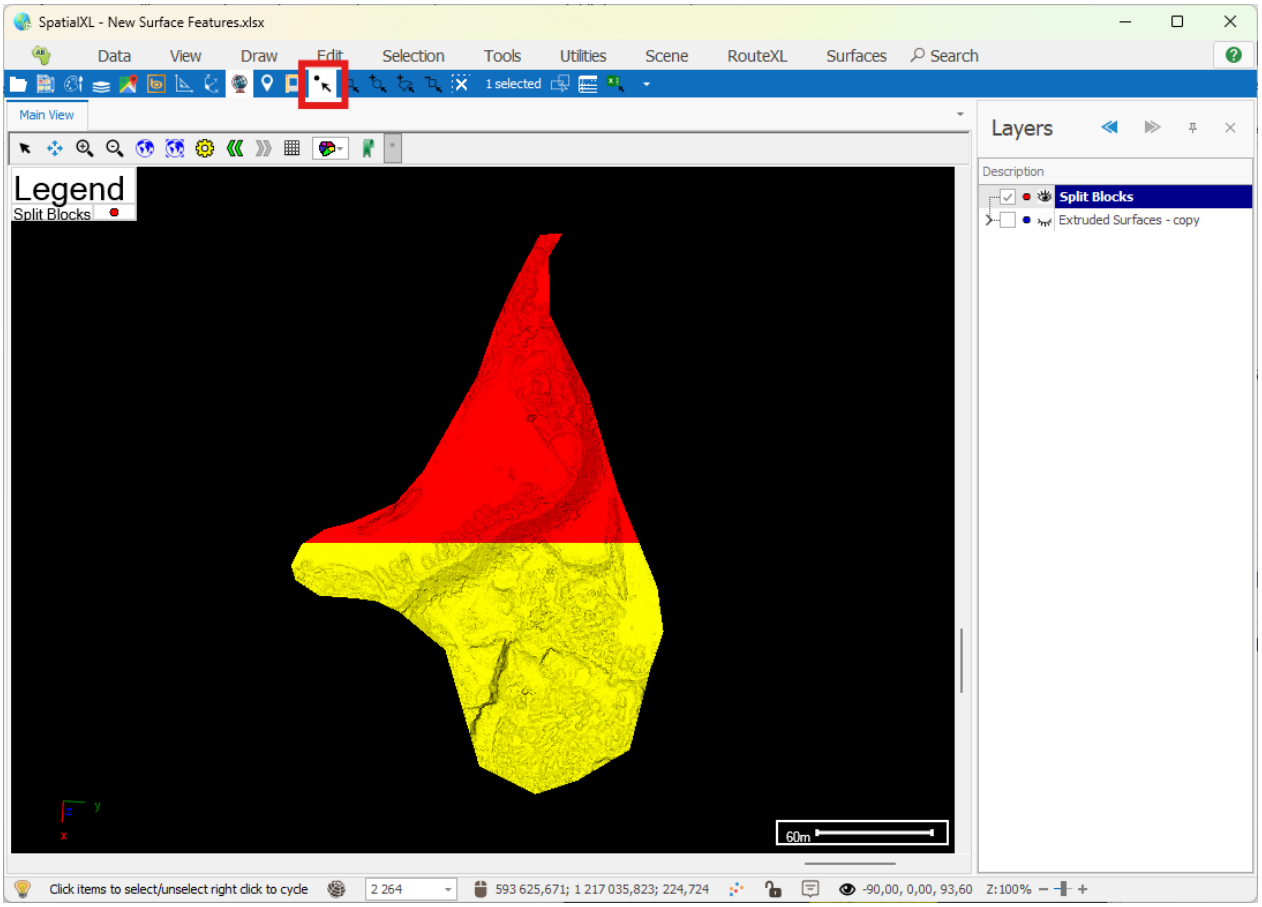
The “Replace” and “Keep” checkboxes work as follows. You can choose to have either of the two halves of the surface *replace* that part in the original whole surface. You can also choose to keep only one of the halves of the surface or both. If you have “Replace” checked on for either part, then the “Keep” checkboxes will not apply and just the section that replaces will be kept.

In this example I will keep both parts and will not replace the original surface.

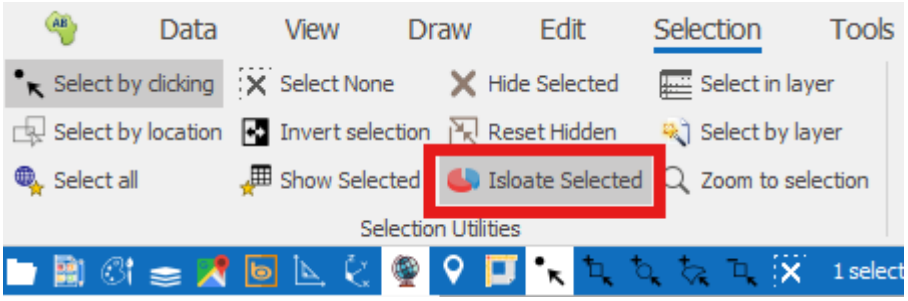


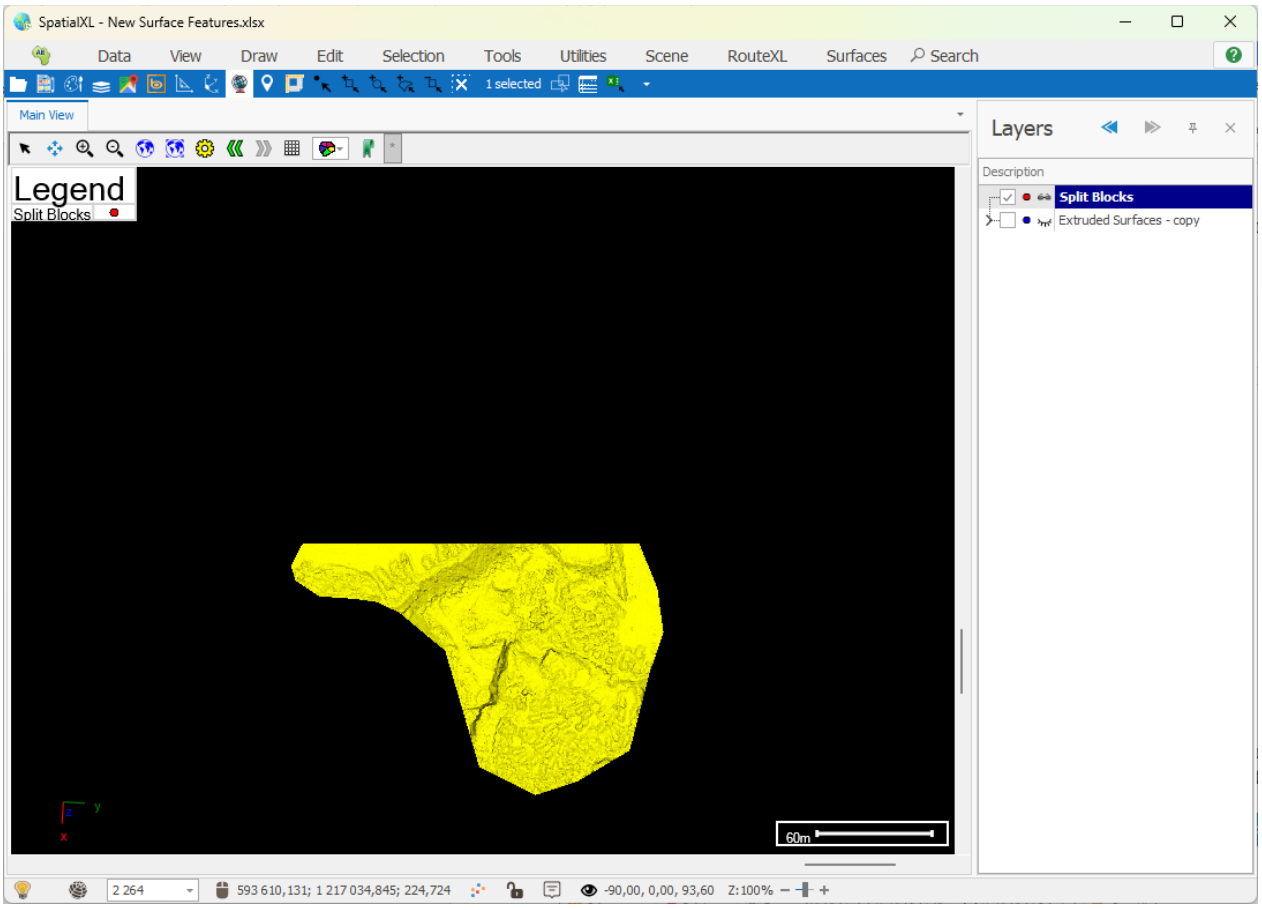
You can then go ahead and click the “Split” button and the newly split surfaces will be added to your active layer.

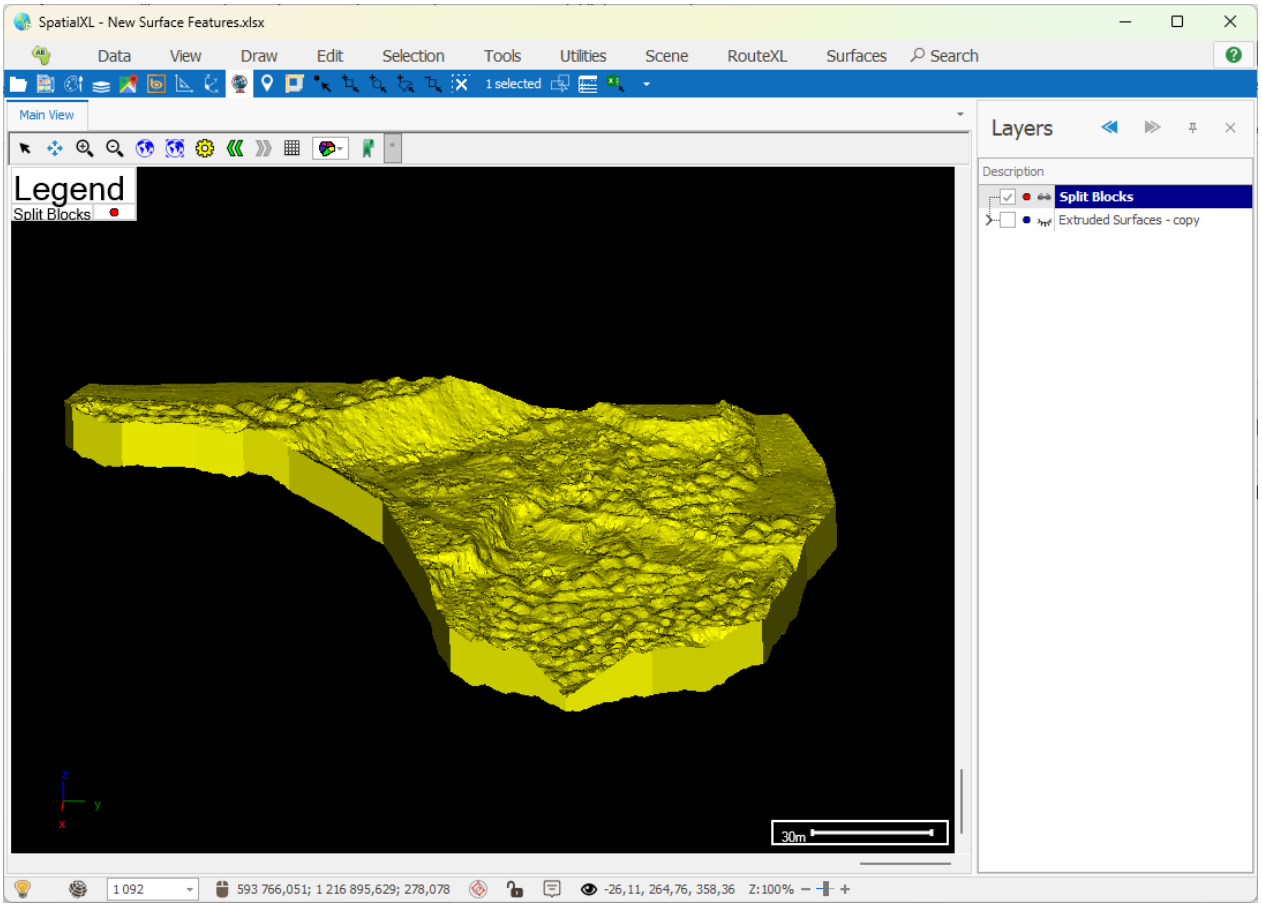
Then using one of the selection tools you can now select each part of the surface that it has now been split into:



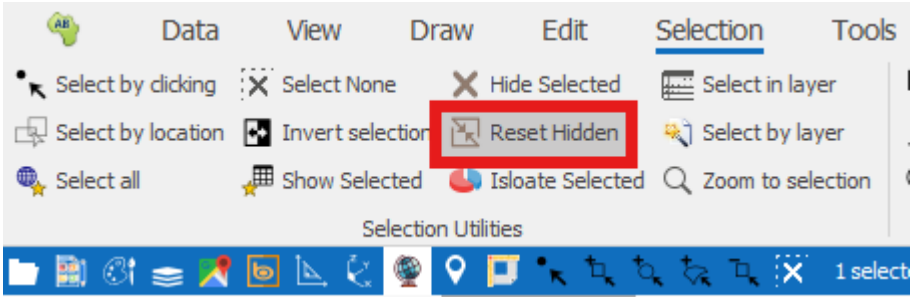
If you go to the Selection tab and click “Isolate Selected” it will then just show the exact section that you have selected:





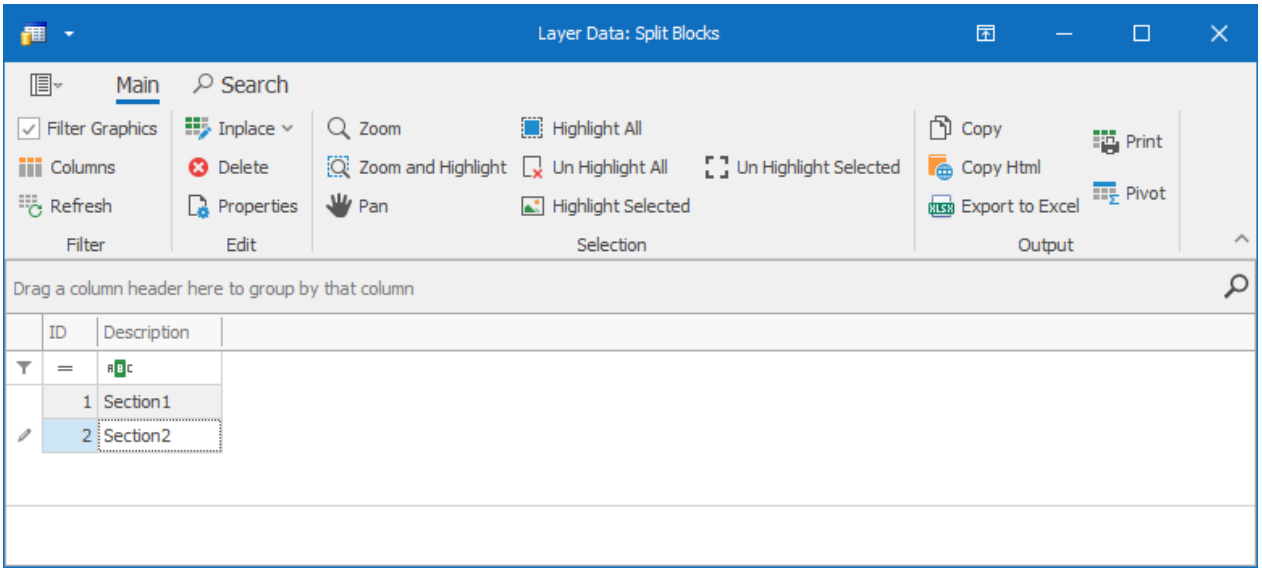


To reshow the hidden items simply click the “Rest Hidden” button in the Selection tab:



If you right click on the split surfaces layer you will see the data table for it with the 2 split sections that it was split into.

You can then capture IDs and Descriptions for the 2 split surfaces by typing them in the Layer Data Grid. For more data on working in the data grid please refer to the Layer Data Grid Guide.



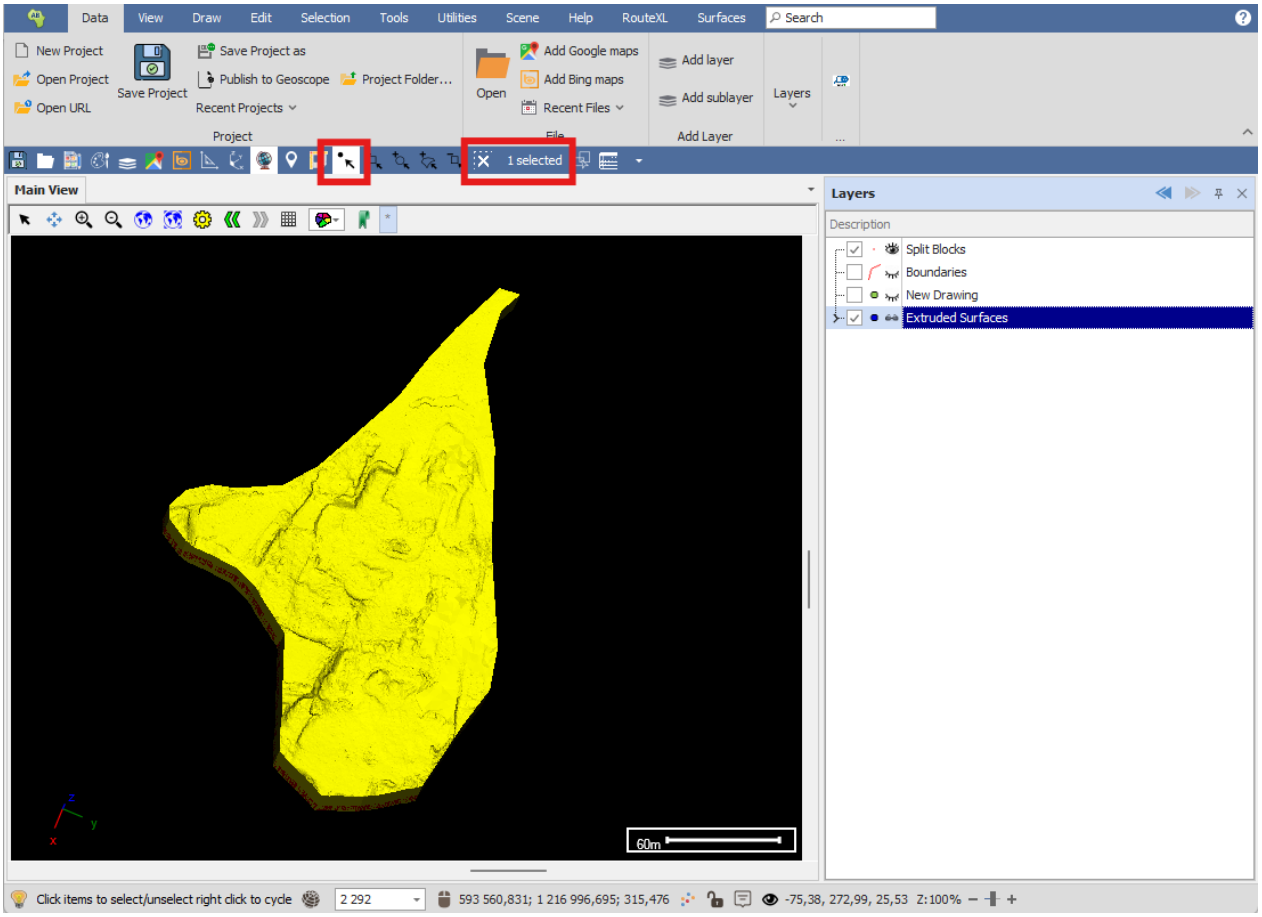
Tips and Extra Information

Volumetrics

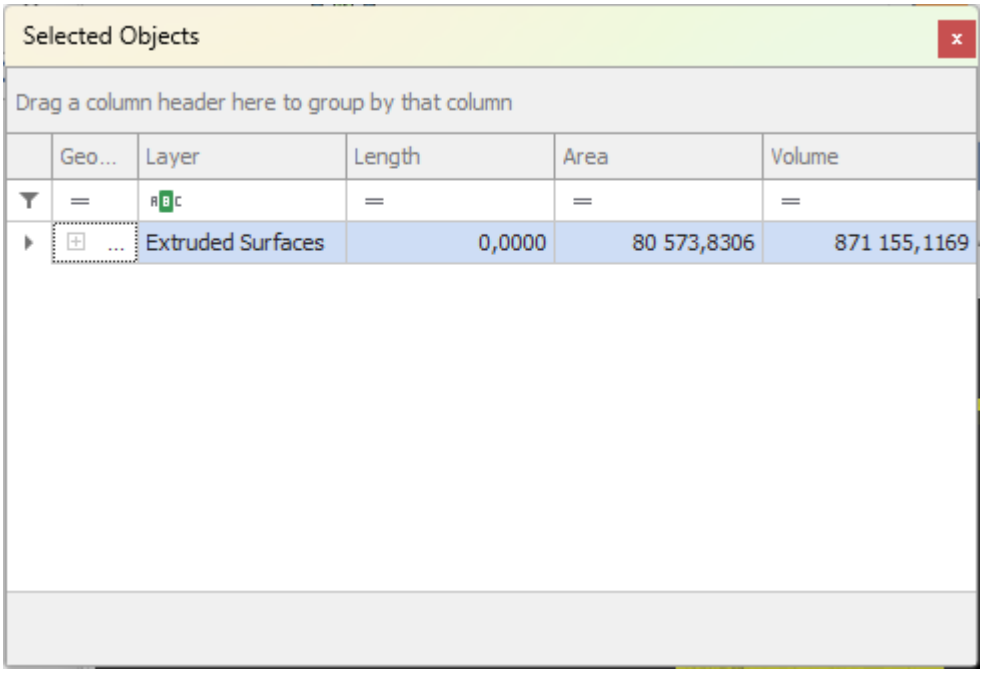
You can get volume and other measurements of your surfaces in a couple of ways.

Selection

Simply select the surface using one of the selection tools. Then, click on the Selected Items box where it shows the number of selected items:



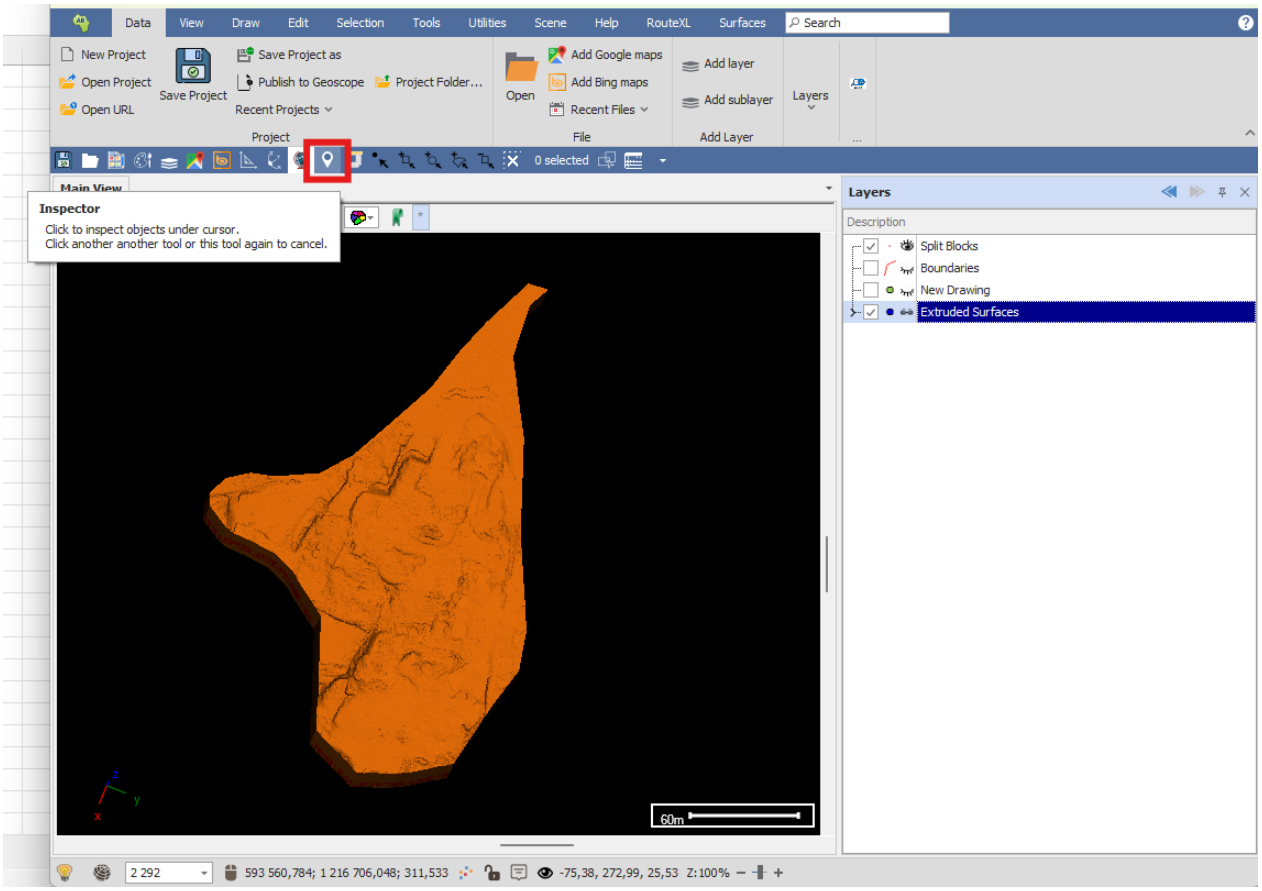
This will bring up data about the selected object including Area and Volume. Units are by default always in meters.



Inspector Tool

You can use the Inspector tool to get detailed measurement information about your surface.

Launch the Inspector tool, then click on the surface in the scene and the Inspector window will populate with information about the selected object. Then go to the Measurements tab of the Inspector window and you will see detailed measurement information about the object. Units are by default always in meters:


Data
View
Draw
Edit
Selection
Tools
Utilities
Scene
Help
RouteXL
Surfaces
Search
New Project
Open Project
Open URL
Save Project
Save Project as
Publish to Geoscope
Project Folder...
Recent Projects
Project
Open
Add Google maps
Add Bing maps
Recent Files
File
Add layer
Add sublayer
Add Layer
Layers
0 selected
Main View
Inspector
Click to inspect objects under cursor.
Click another another tool or this tool again to cancel.
Layers
Description
Split Blocks
Boundaries
New Drawing
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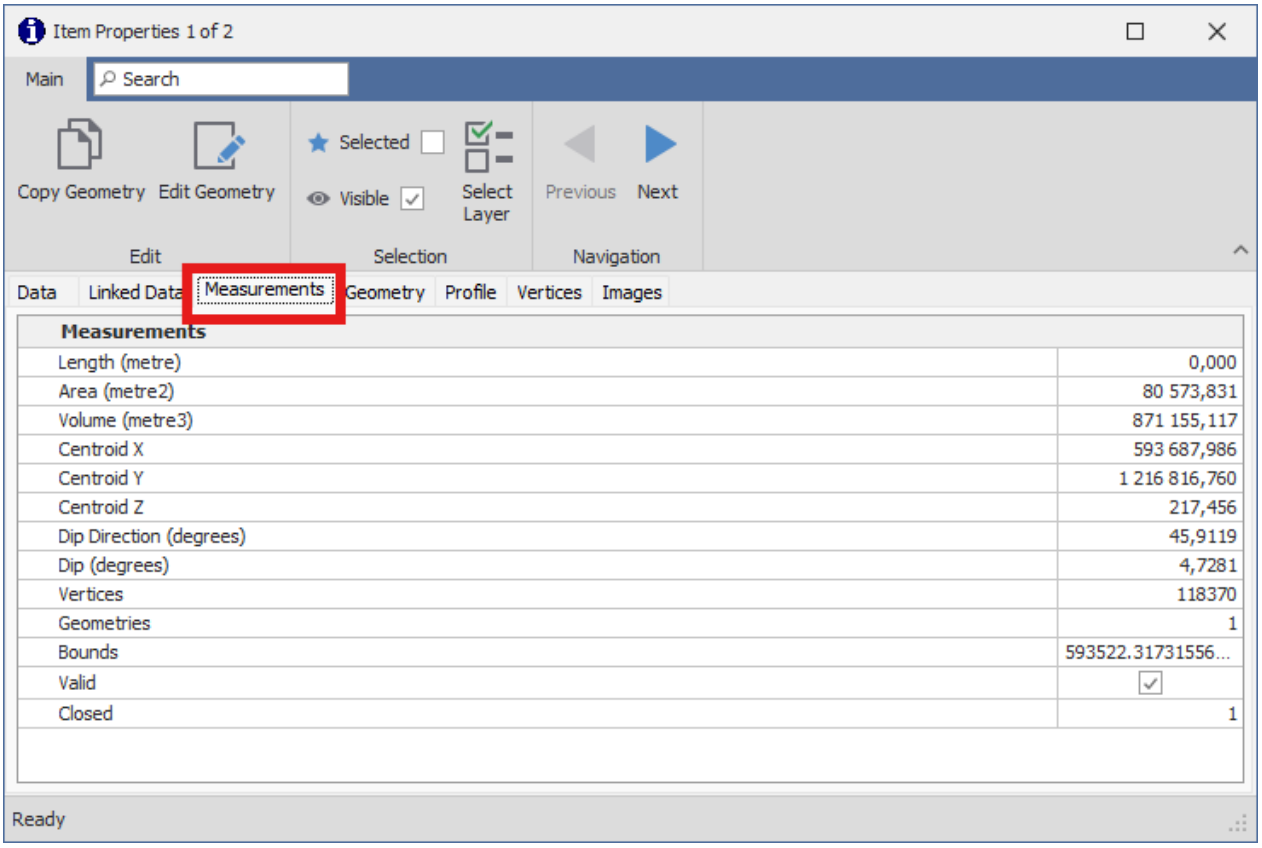
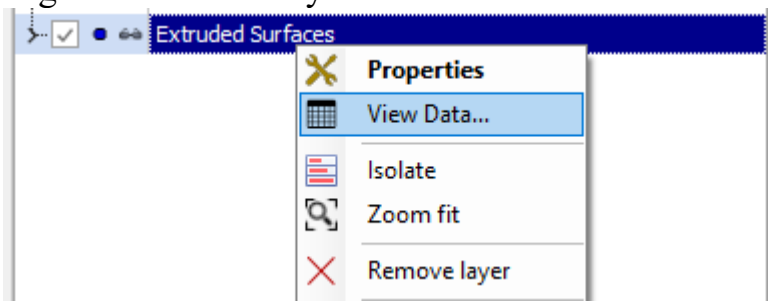
60m
2 292
593 560,784; 1 216 706,048; 311,533
-75,38, 272,99, 25,53
Z:100%



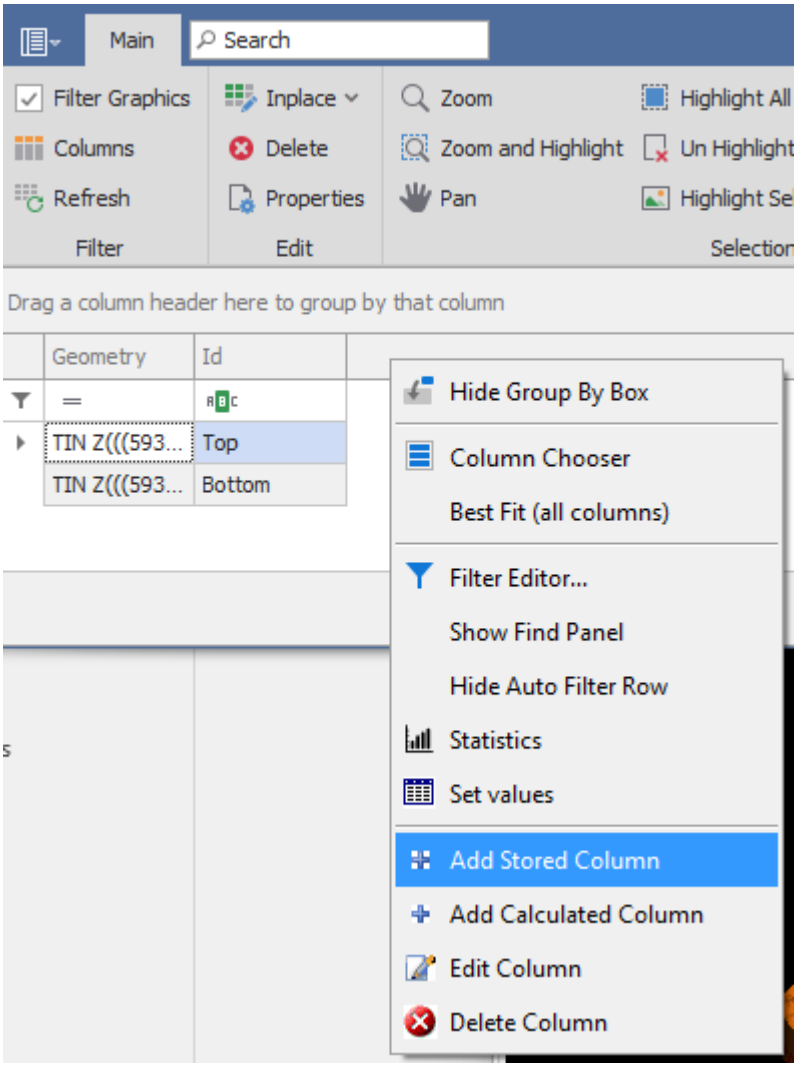
Adding Columns in the Layer Data Grid

If you want to actually store the volume or area etc. information in the data table of the surface layer, you can add a column as follows.

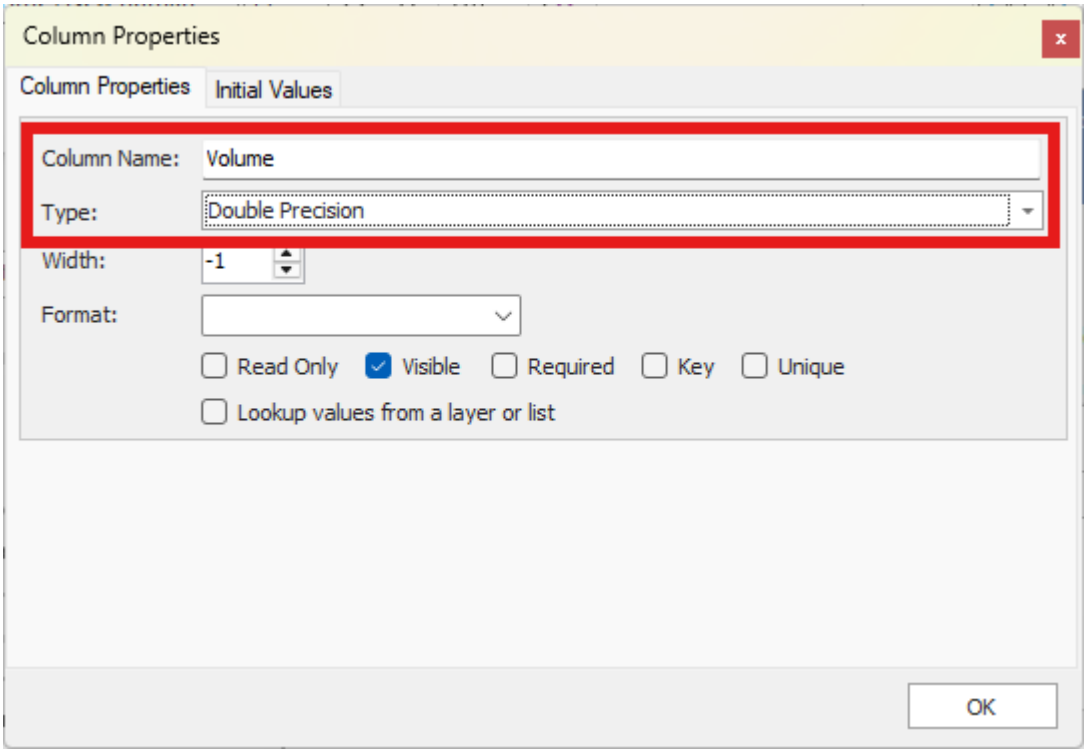
Right click on the layer and select “View Data”:



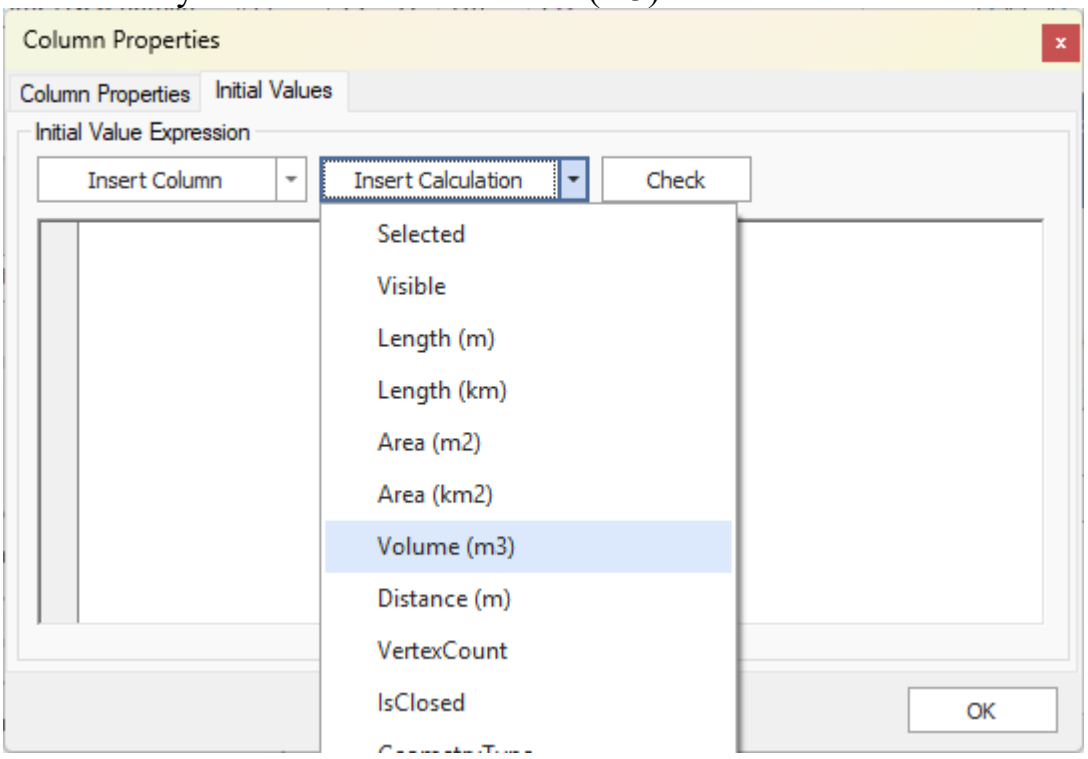
Right click in the column header area of the grid and select “Add Stored Column”:



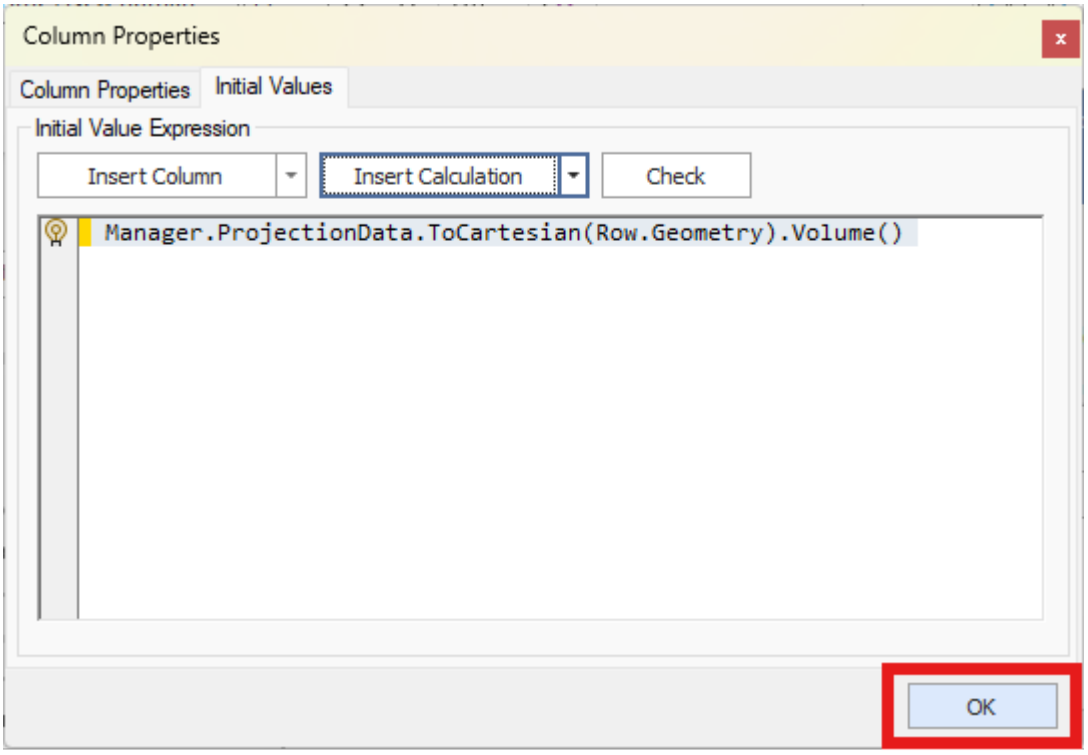
Give the column a name and make sure it is of a number type; Double Precision is normally a good type to choose for number columns:

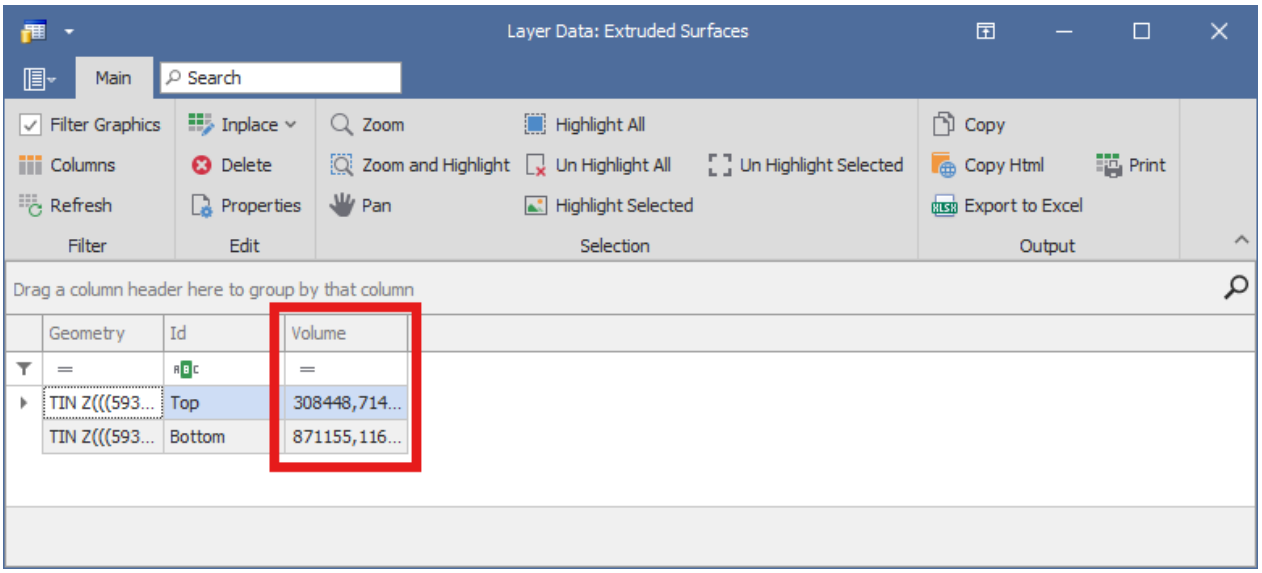


Go to the Initial Values tab and drop down on “Insert Calculation”, then choose the calculation you want such as “Volume (m3)”:



Finally, click OK and the column will be added:





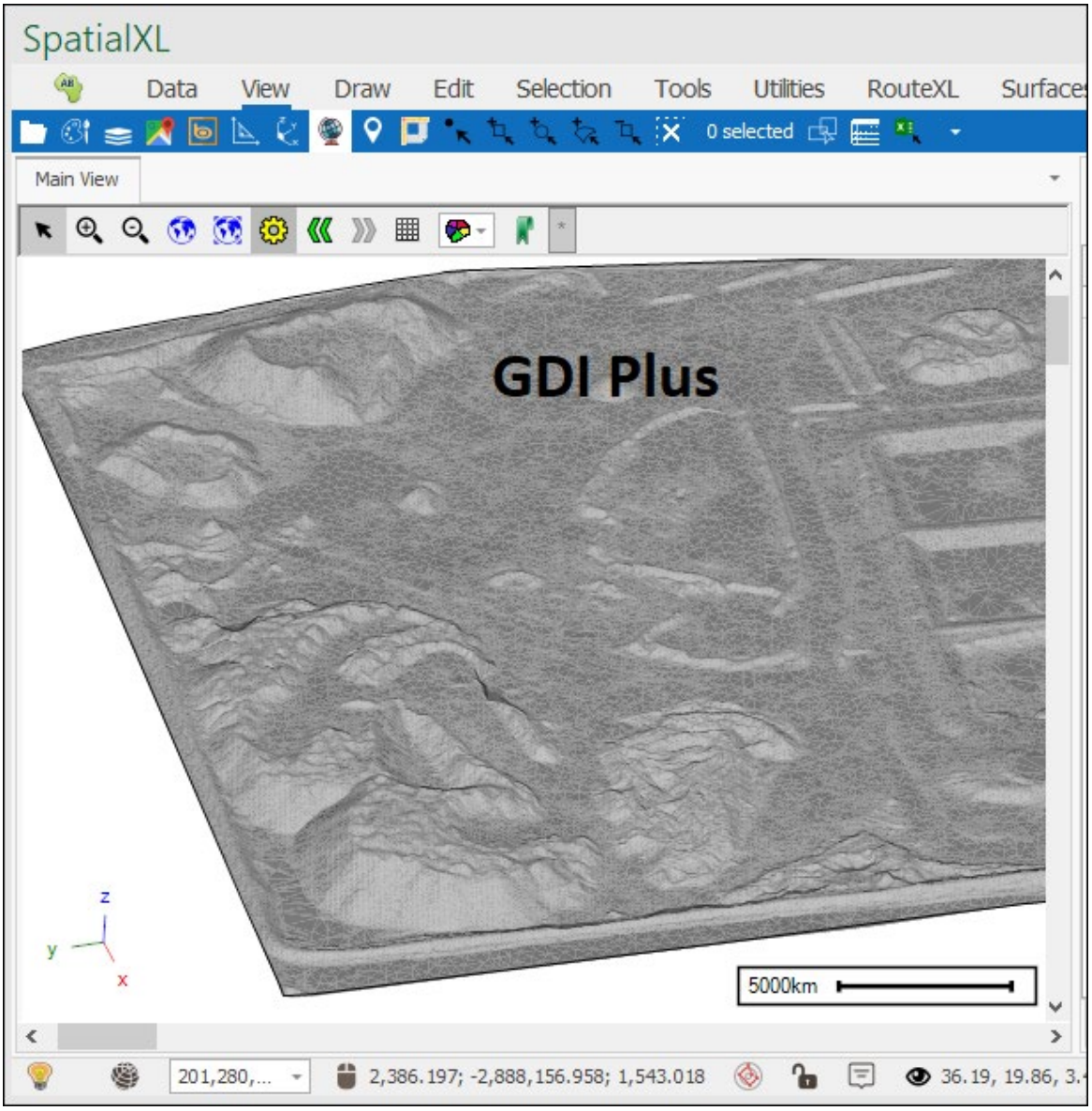
You can then add more columns following the steps above for other calculations such as Area.

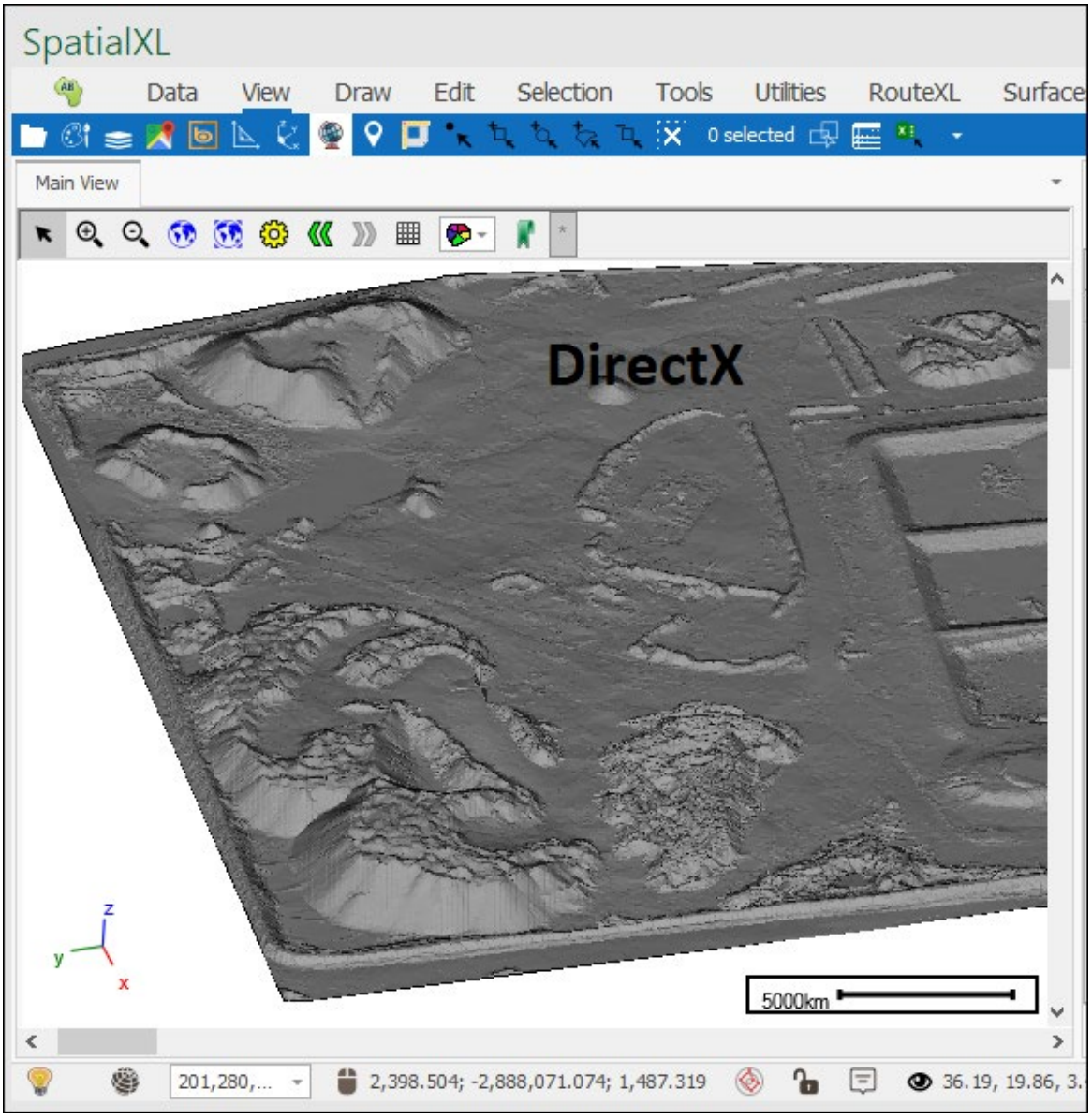
Warning: If your layer is externally referenced, meaning it is pointing to a file stored elsewhere on your computer and not internalized into the project, then when you add new columns to the layer data grid they will not automatically be remembered the next time you reopen your project and the file is reloaded.

You will either need to save the layer by right clicking and selecting Save>Save Layer Data, in order to save the new columns back to the original external file, or alternatively, you will need to internalize the layer so that it is no longer externally referenced by right clicking on it and selecting Advanced>Make Internal.

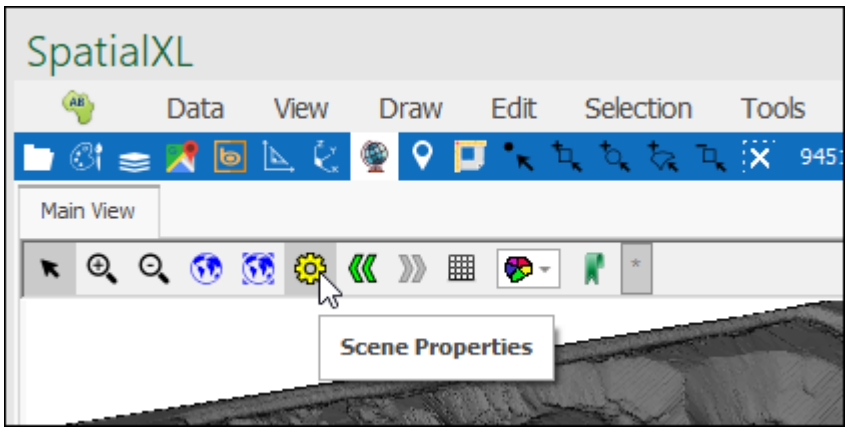
DirectX

When using SurfaceIQ to create various surfaces the best renderer to use is DirectX. This renderer is higher performance than GDI Plus and shows a smoother surface whereas GDI plus will show the triangulated irregular network on the surface:

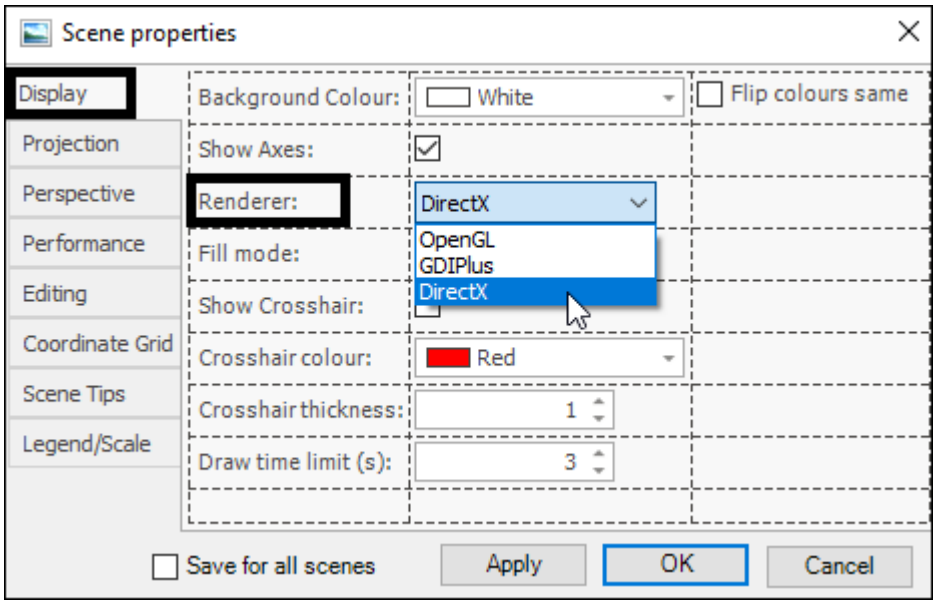

SpatialXL
Data
View
Draw
Edit
Selection
Tools
Utilities
RouteXL
Surfaces
0 selected
Main View
GDI Plus
z
y
x
5000km
201,280,...
2,386.197; -2,888,156.958; 1,543.018
36.19, 19.86, 3.



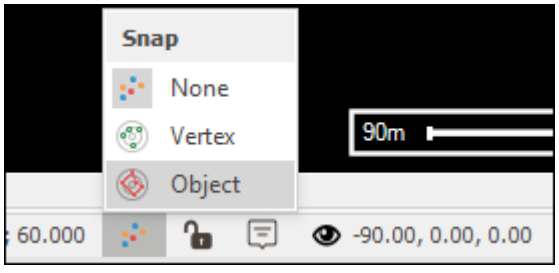
To set the renderer go to **Scene Properties**:



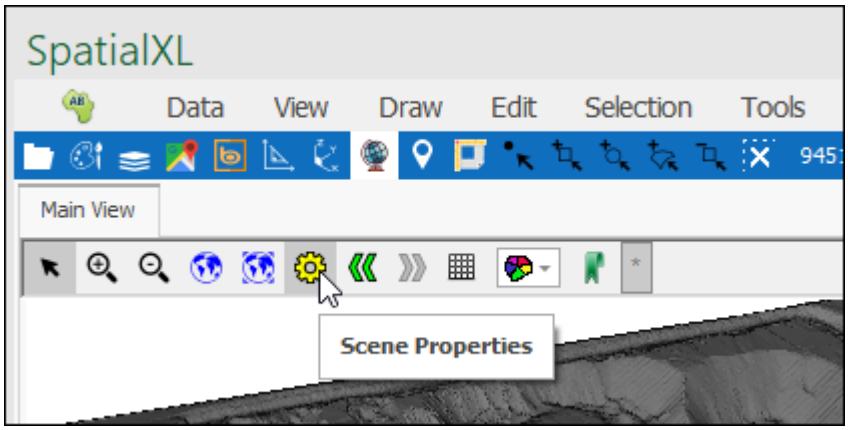
And in the **Display** tab by **Renderer** you can choose the renderer:

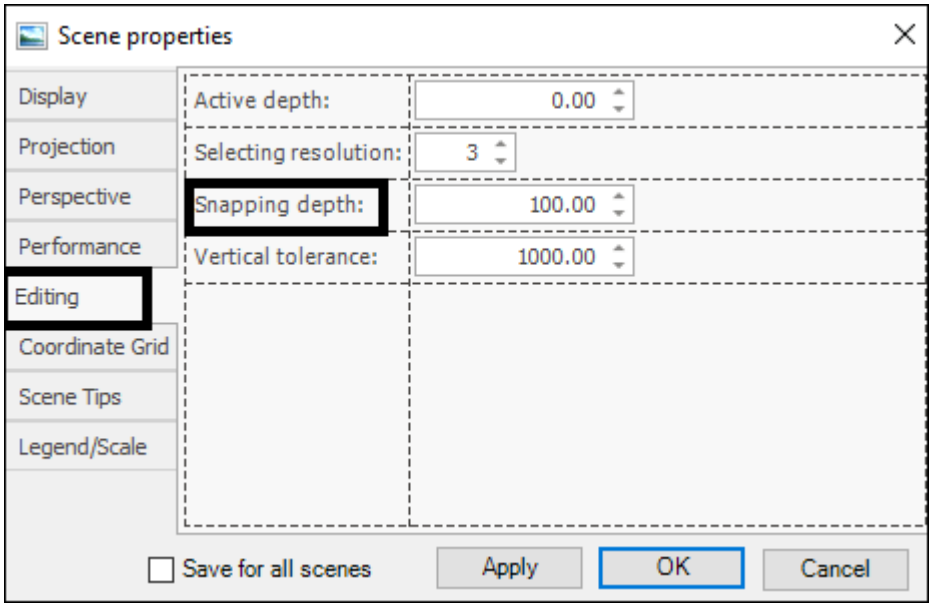


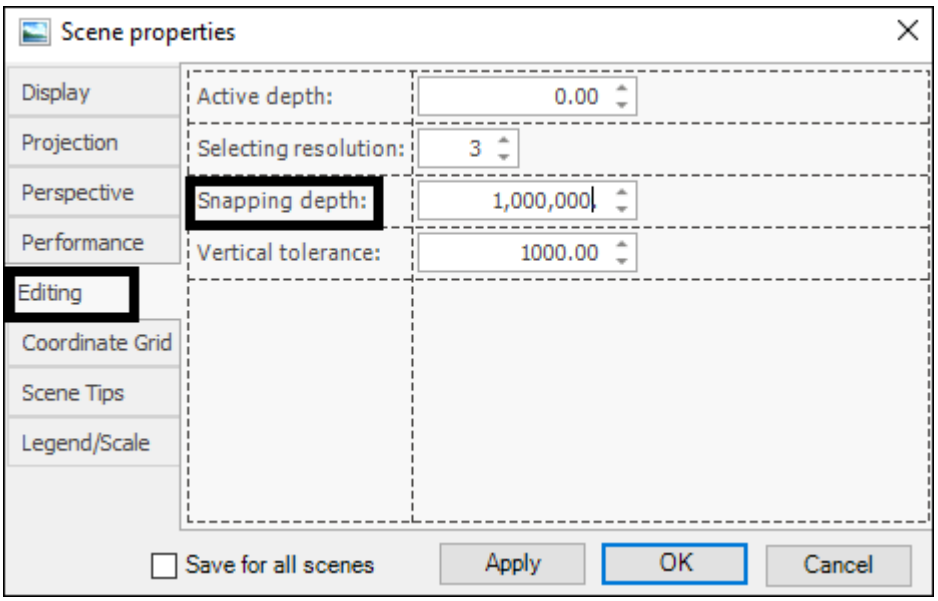
Snapping Depth



In using any of the snapping tools sometimes you might find that you are unable to locate a point to snap to on your surface and in this case it means your snapping depth is set too low. To fix this go to **Scene Properties**, **Editing** tab, and by **Snapping depth** you can change this to a higher amount:

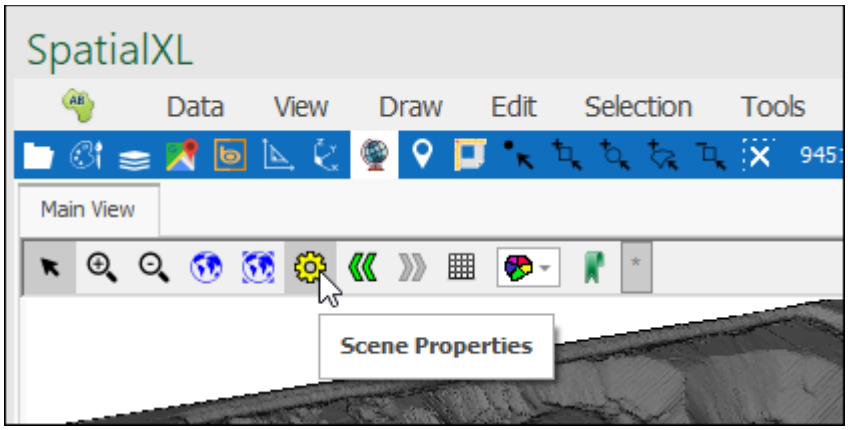


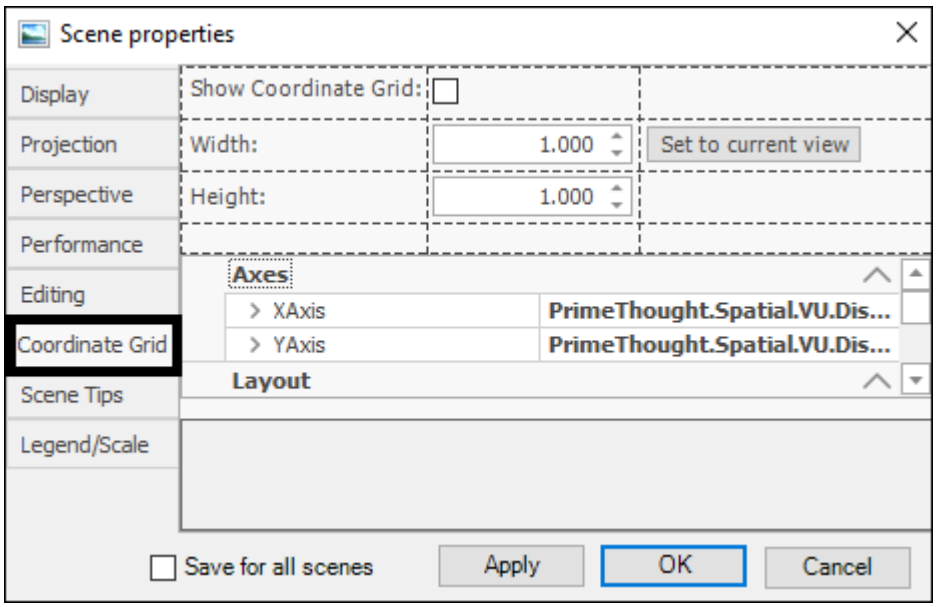




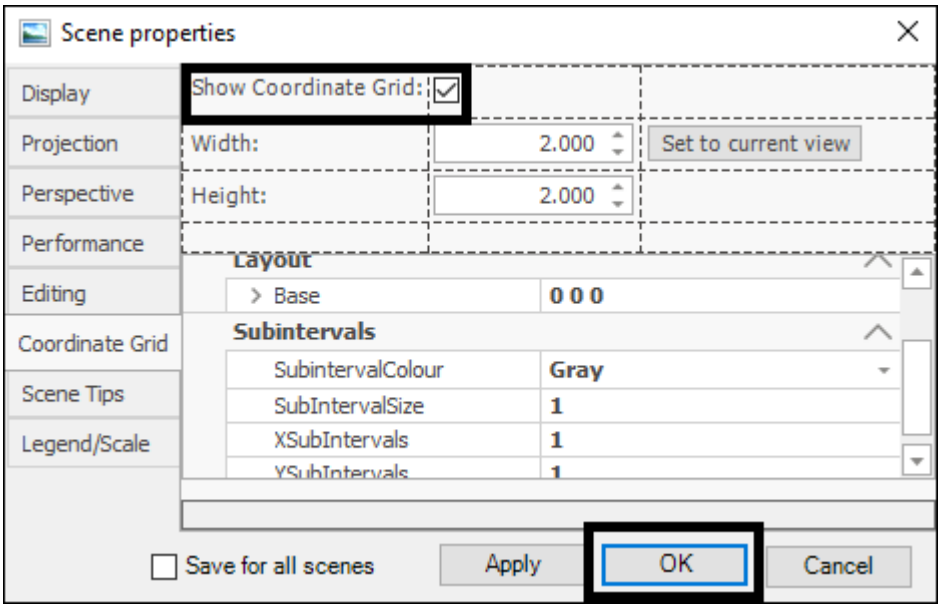
Coordinate Grid

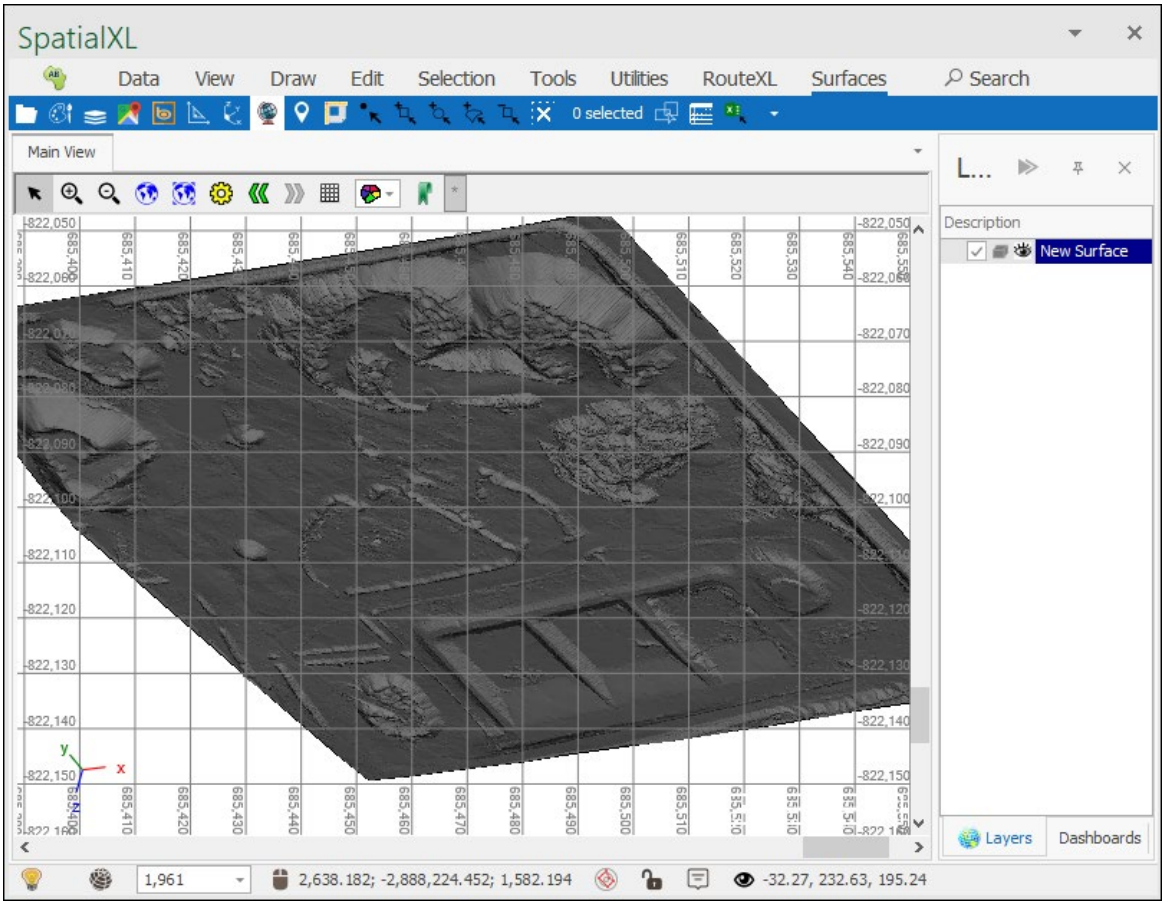
In your scene you can turn on a coordinate grid which can be useful when working with surfaces, to do so got to **Scene Properties**, **Coordinate Grid** tab:





Make sure to have **Show Coordinate Grid** ticked on and then you can choose various settings for the grid below, when done click **OK:**





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1684, South Africa