Plateia

by CGS Labs

CONSTRUCTION PIT

Tutorial

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Construction pit

Title: **Construction pit**

Document date: 05. 01. 2023

Version: 1.0.

Printing: CGS Labs d.o.o.

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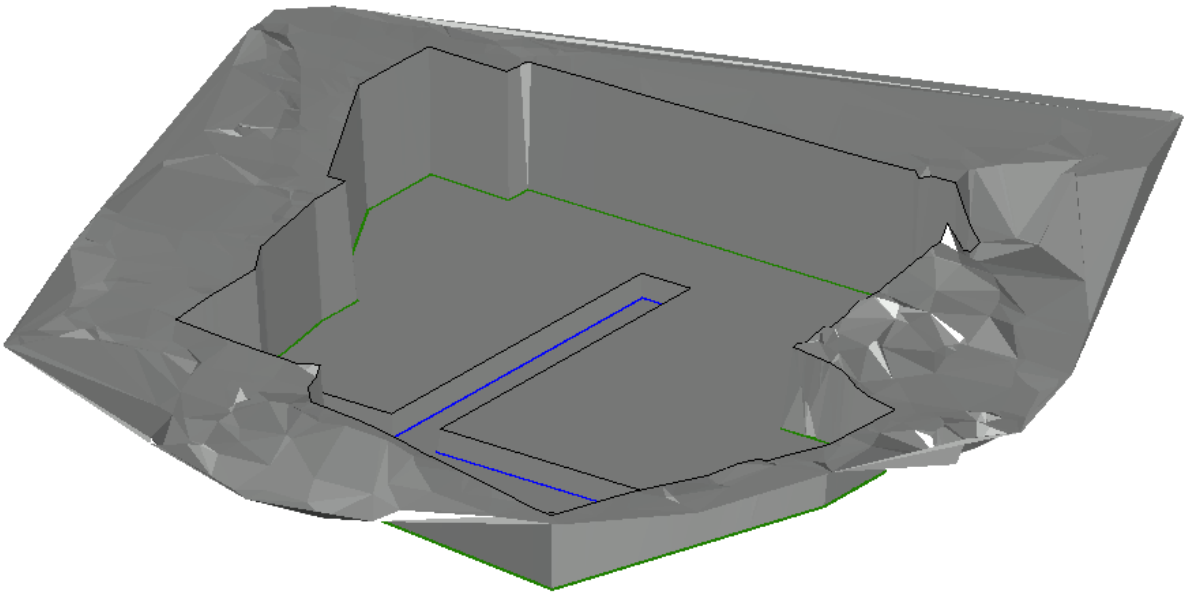
INTRODUCTION

This tutorial shows the following:

- inputting points from XYZ file and creating terrain based on those points,
- creating polylines that represent the walls of the construction pit,
- making a surface of the construction pit,
- volume calculation and
- removal of the construction pit area from the terrain.



Before starting this tutorial, please download the following files:

- ConstructionPit.dwg (There are only two hidden polylines in this drawing, which you will use in one of the steps.) and
- Terrain.xyz file.

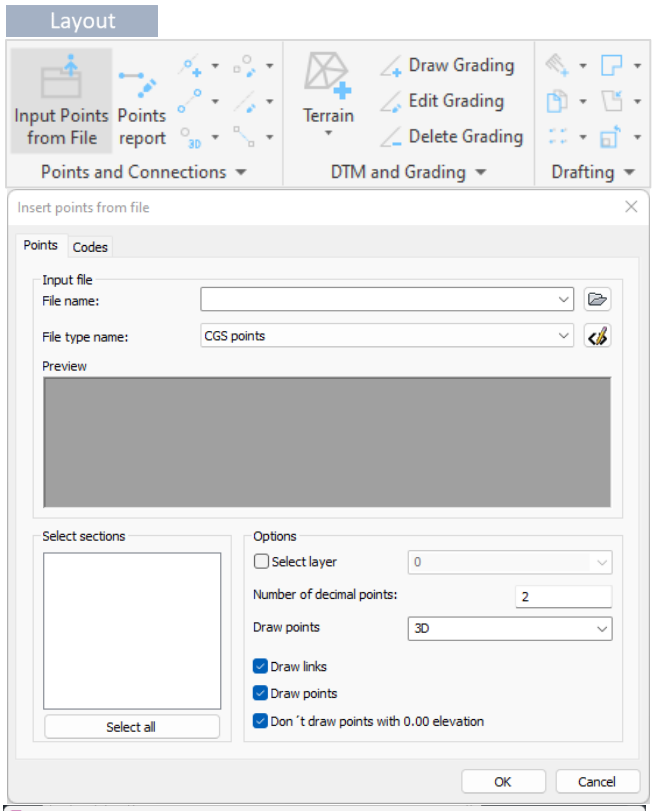
1. Digital Terrain Model

1.1 Input points from file

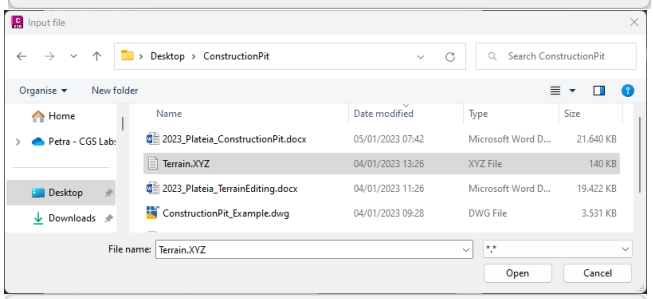
1. Open a ConstructionPit.dwg drawing.

2. Click on the Layout tab and run the Input Points from File (11F1) command.

3. It opens a new dialogue box, where you define the file with points and set which data should be imported into the drawing.



3. Click on the Folder ( ) icon and find the Terrain.xyz file. Select it and press Open.

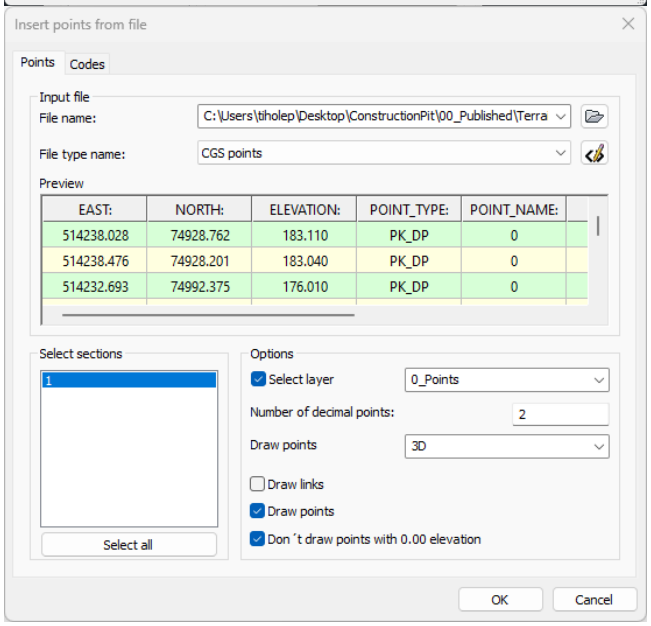


4. Click on the Points tab and select the CGS points for the file type name from the drop-down menu and the data from the file will be automatically displayed in the table.

5. Check the box at the Select Layer and type 0_Points. You can also select a pre-defined layer from the drop-down menu.

6. Type 2 for the number of decimal points.

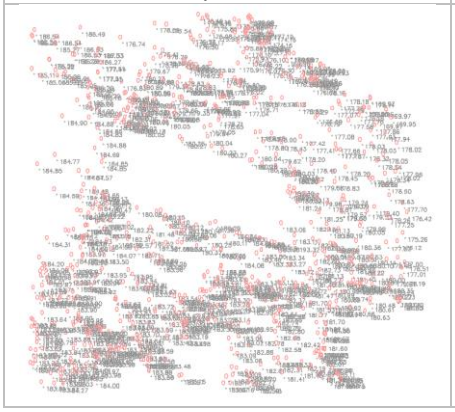
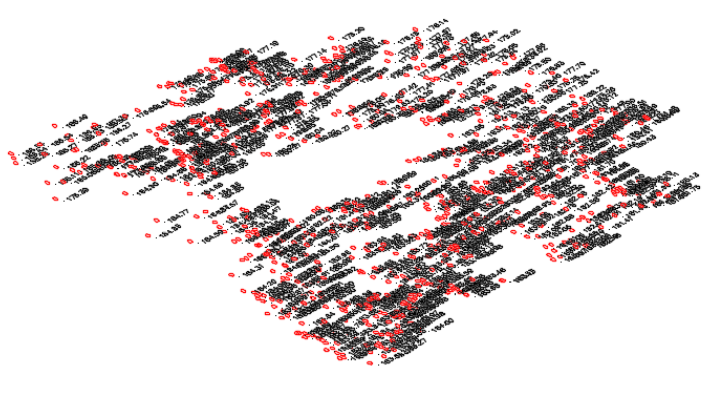
7. In the draw points option, select 3D from the drop-down menu.



8. Uncheck the box at the Draw links option and check Draw points and Don't draw points with 0.00 elevation boxes.

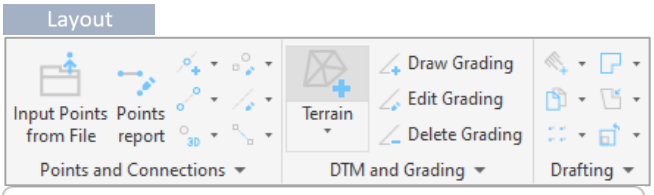
9. Confirm parameters by clicking the OK button.

The points are now inserted in the drawing. These points are defined as blocks. Based on those inserted points, we will create the terrain in the next step.

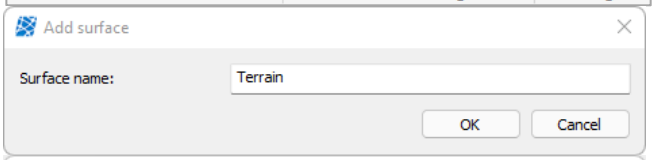
Top View	3D View
	

1.2 Create terrain

1. Click on the Terrain (11L1) icon.

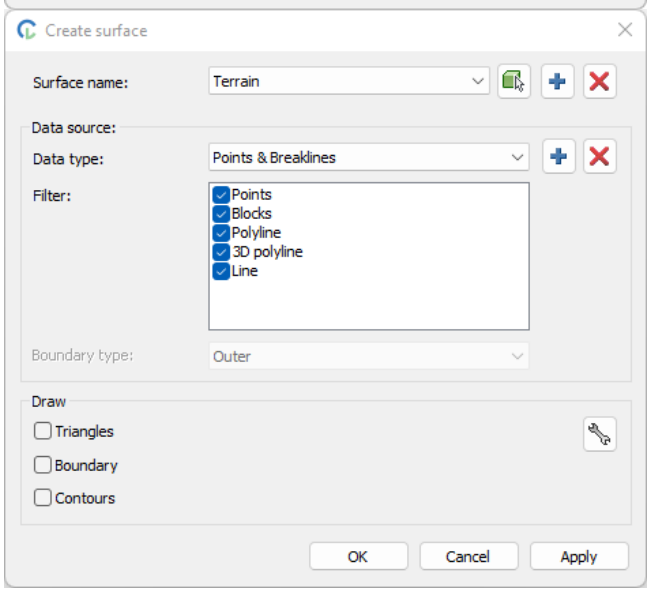


2. Define a surface name and press OK.

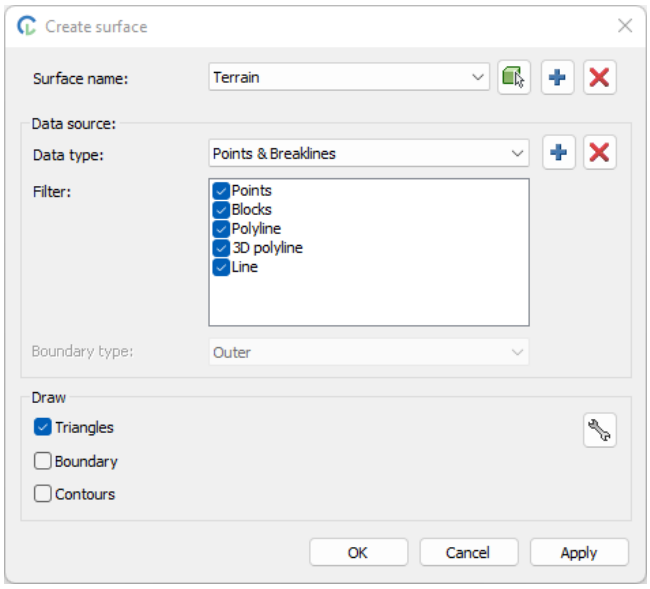


3. As input data in the drawing are elevation points, you select »Points & Breaklines« option from the drop down-menu. Then click on the Plus button ( ), select all the points in the drawing and press Enter.

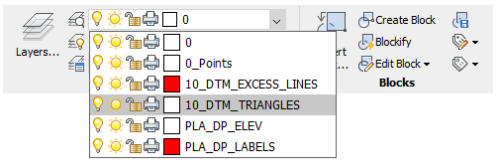
4. After that you need to choose the way the terrain will be shown in the drawing. There are several different ways available. If you do not check any of the options and confirm by clicking OK, the drawing won't change, but the software will remember the terrain and use it for drawing the profile and cross-sections.

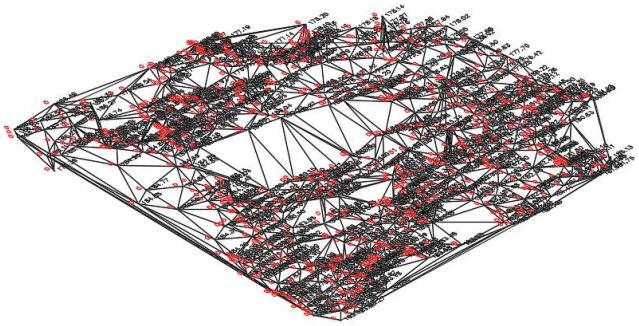


5. To show the terrain as triangulated irregular network click again on the Terrain(11L1) icon. Check the Triangles box at the bottom of the dialogue box and press OK.



If you want you can then simply change the colour of the terrain by changing the colour of the layer.

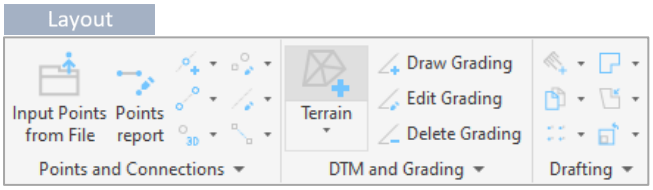




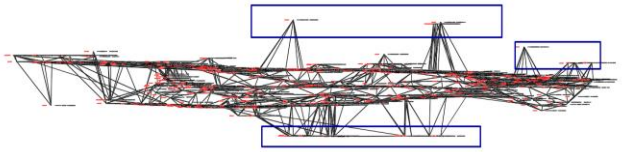
1.3 Edit terrain

To edit terrain run the Terrain command again and select terrain you want to edit from the drop-down menu.

1. Run the run the Terrain (11L1) command.



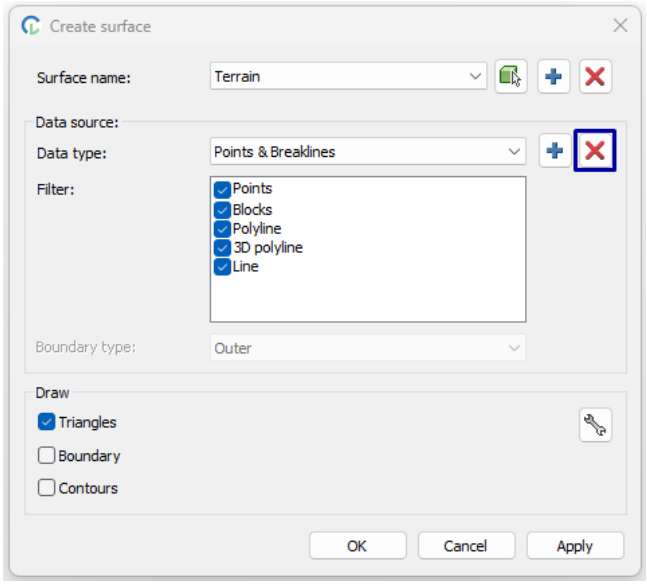
In this step, we will remove the redundant points.

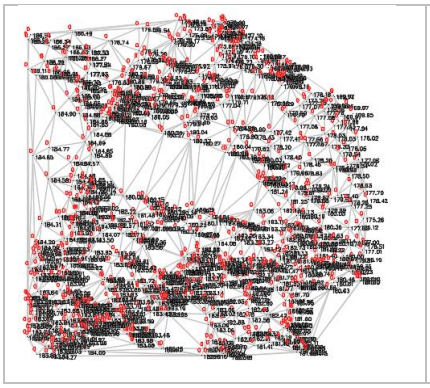


2. Select the »Points & Breaklines« option from the drop-down-menu.

3. Then press cross ( ), select the points that you want to delete and press Enter.

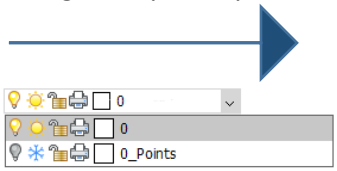
4. Press apply and the terrain will be refreshed.

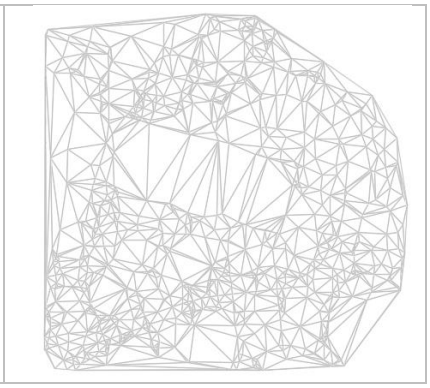




HIDE POINTS

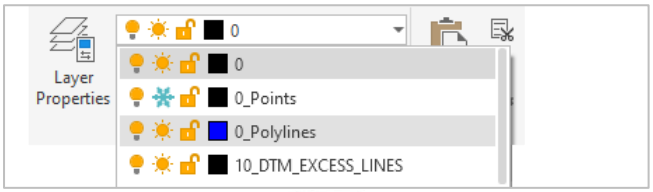
You can hide points by hiding the layer they are on.



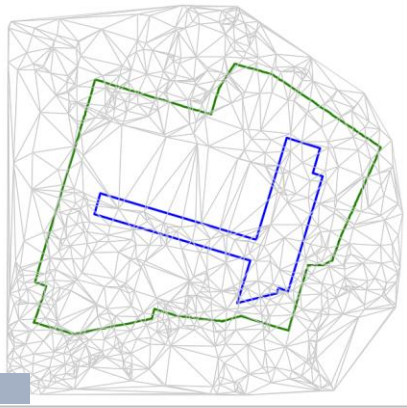


2. 3D Grading

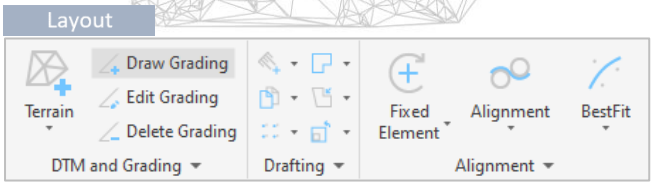
1. First, you show the layer 0_Polylines. You can then see two polylines in the drawing.



The bottom one (blue polyline) shows the bottom of the construction pit.

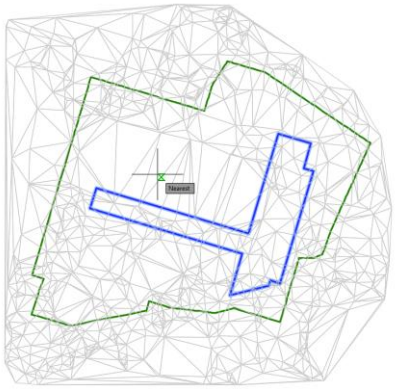


2. Run the Draw Grading (21P2) command and select blue polyline.



3. After that select the side. It is necessary to choose the outer side. This means that you click somewhere on the outside of the polyline (outside the blue polygon).

4. Then click Enter twice to draw the 3D grading along the entire polyline.

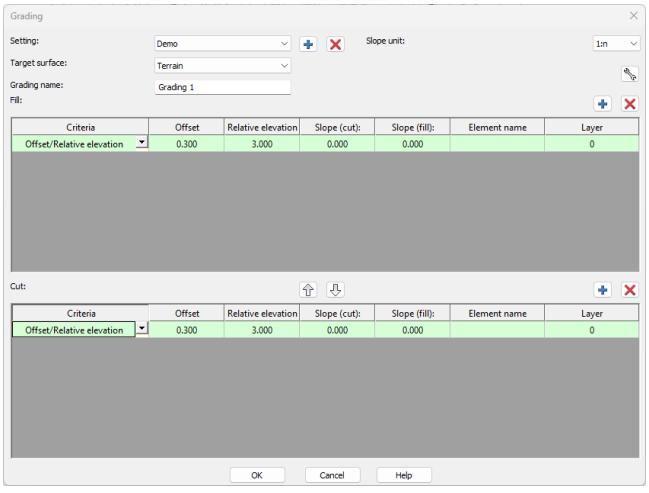


5. A new dialogue box opens. Select the Terrain from the drop-down menu for the target surface.

6. Next, define the grading name.

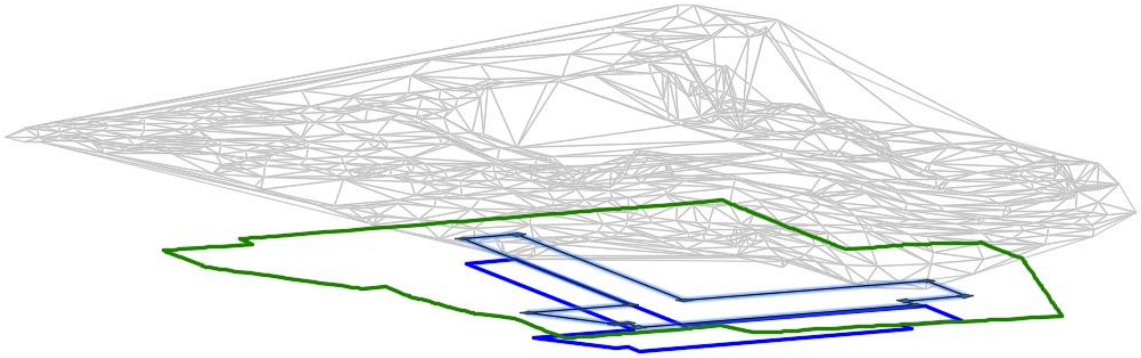
7. Then set the criteria for the fill. Select the Offset/Relative elevation from the drop-down menu. After that define offset (0.3) and relative elevation (3.0).

8. Then click this arrow ( ) and the same values will be entered automatically for the cut.

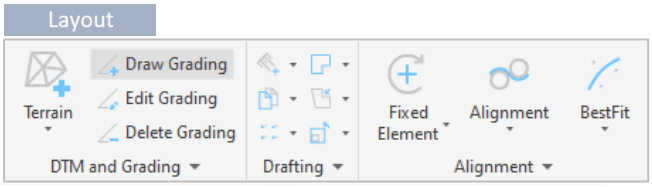


9. Confirm parameters by clicking the OK button.

Based on the entered criteria, a new polyline is drawn:



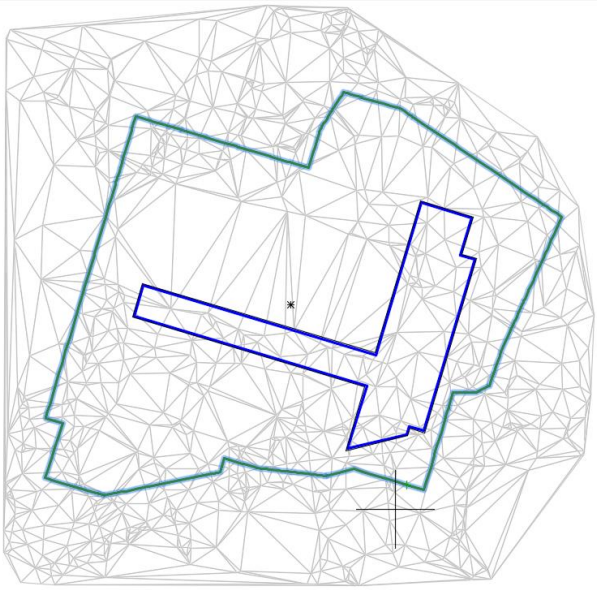
10. Run the Draw Grading (21P2) command again.



11. Select the green polyline.

12. After that select the side. It is necessary to choose the outer side.

13. Then click Enter twice to draw the 3D grading along the entire polyline.

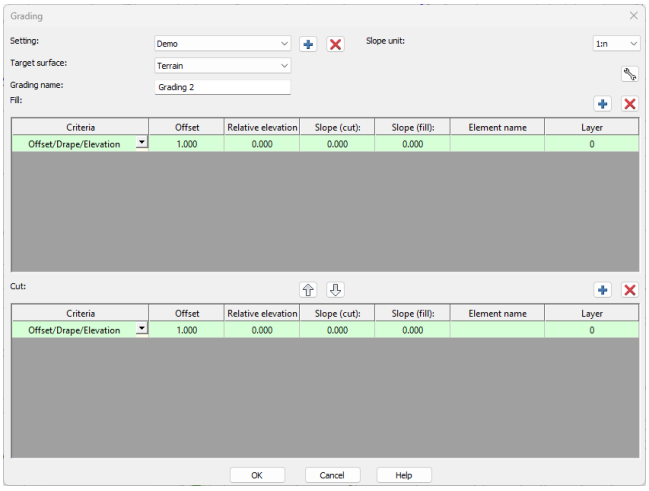


14. A new dialogue box opens. Select the Terrain from the drop-down menu for the target surface.

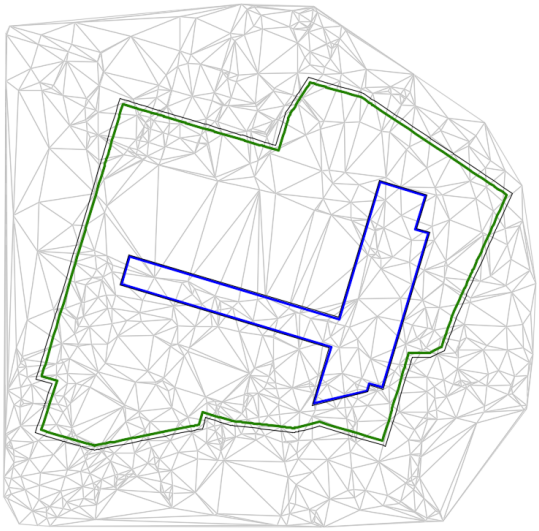
15. Next, define the grading name.

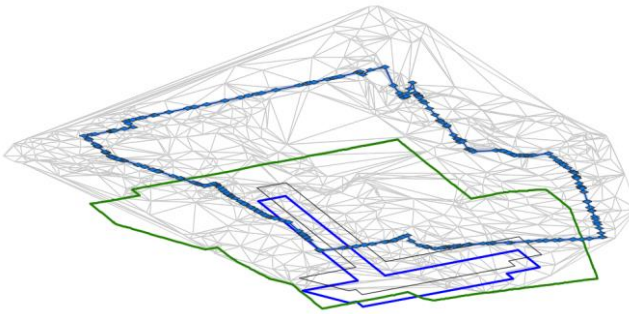
16. Then set the criteria for the fill. Select Offset/Drape/Elevation from the drop-down menu. After that define offset (1.0).

17. Then click this arrow ( ) and the same values will be entered automatically for the cut.



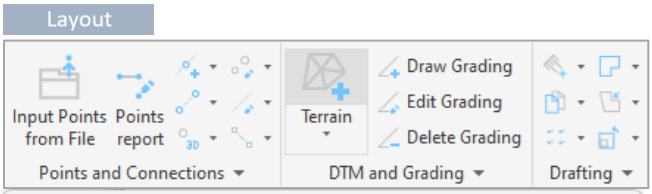
18. Confirm parameters by clicking the OK button.



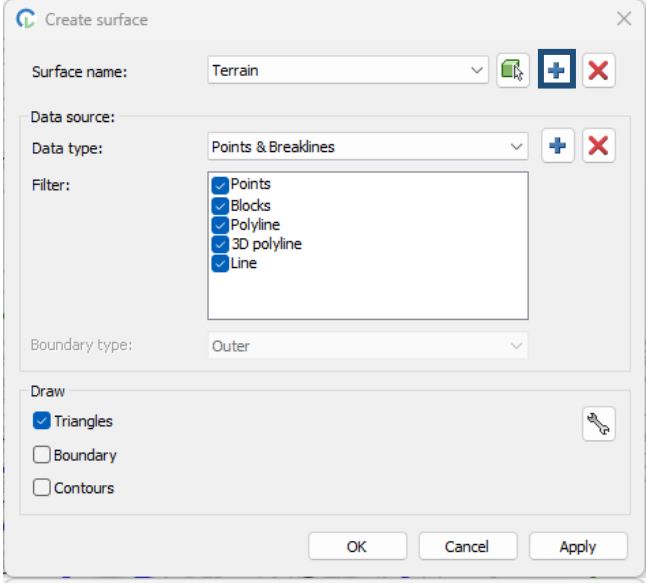


2.1 New terrain – Construction pit

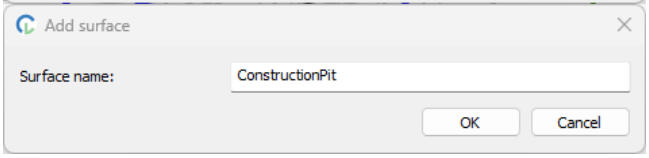
1. Click on the Terrain (11L1) icon.



2. Click the Plus button to add a new terrain.



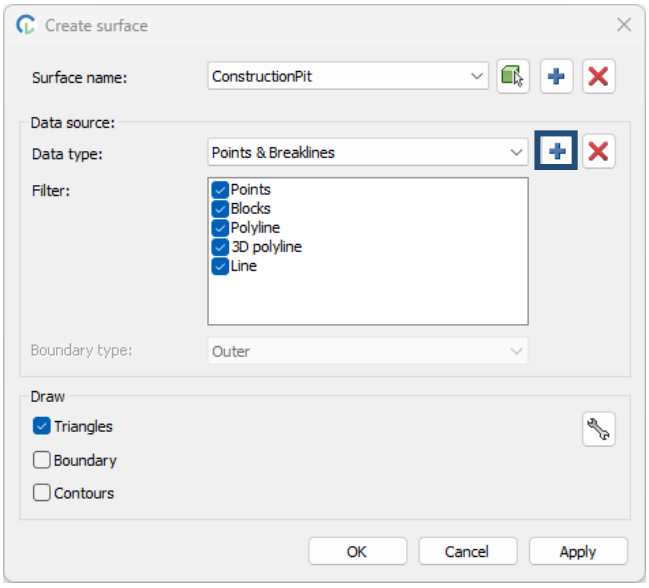
3. Define a surface name and press OK.



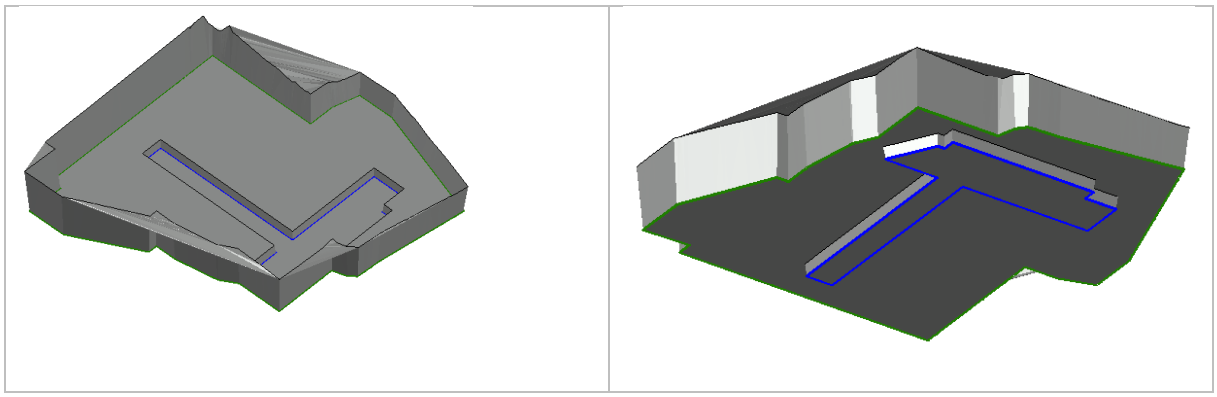
4. Select »Points & Breaklines« option from the drop down-menu. Then click on the Plus button () and select all 4 polylines and press Enter.

5. Check the box at the Triangles option.

6. Confirm by clicking the OK button.

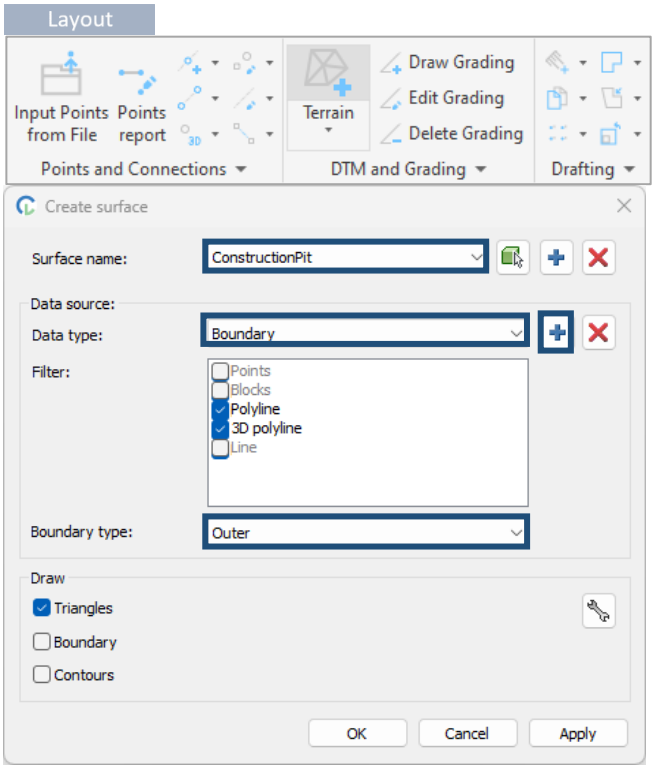


Construction pit in 3D view:



2.1.1 Boundary

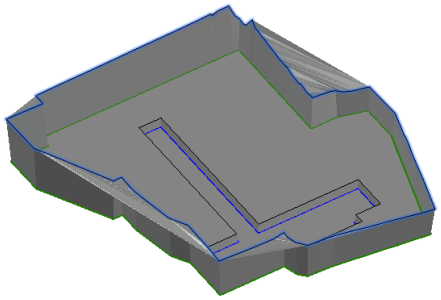
1. Run the Terrain (11L1) icon again.



2. Select the ConstructionPit from the drop-down menu.

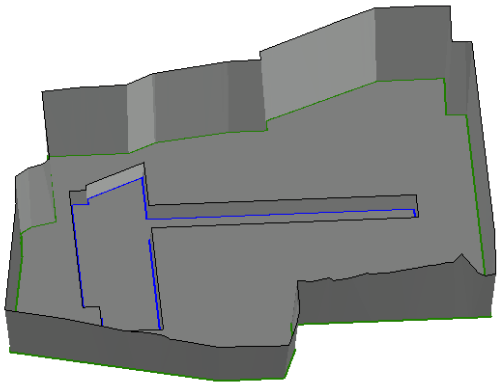
3. Select Boundary for data type and outer for the boundary type.

4. Then click the Plus button and select the boundary directly in the drawing.



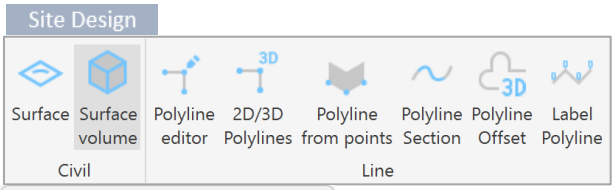
5. Press Enter and then click OK.

Completed construction pit:



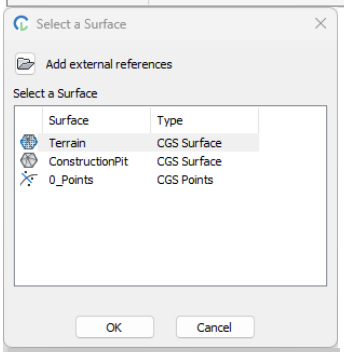
2.2 Volume calculation

1. Run the Surface Volume command.

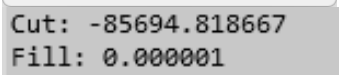


2. Select the base surface (Terrain) from the list.

3. Select the target surface (ConstructionPit) from the list.

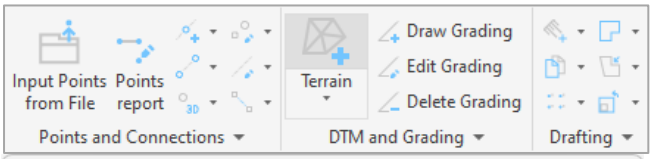


4. The result is cut and fill volume quantity, which is written in the command line.



3. Removal of the construction pit area from the terrain

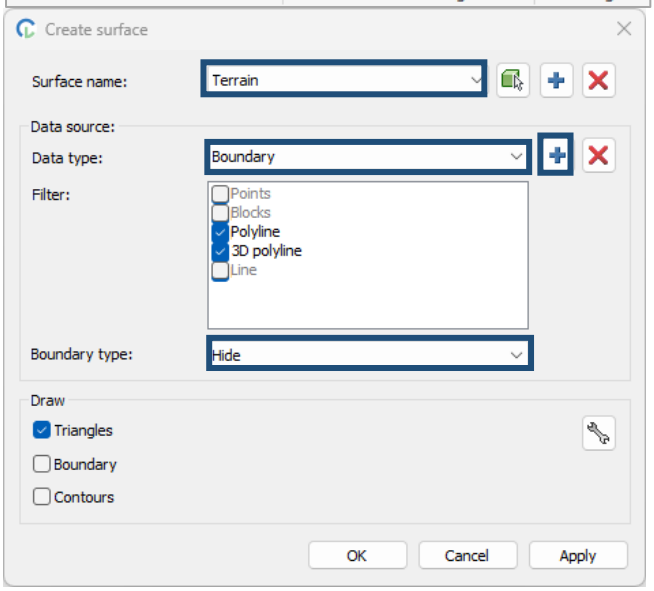
1. Click on the Terrain (11L1) icon.

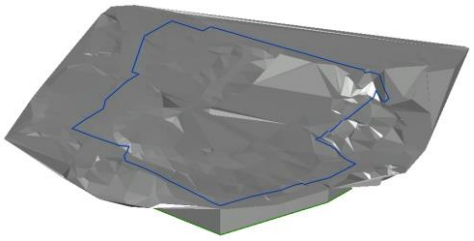


2. Select the Terrain from the drop-down menu.

3. Select Boundary for the data type and Hide for the boundary type.

4. Then click the Plus button and select the boundary directly in the drawing.





5. Press Enter and then click OK.

The result: