



# Sewerage system in the Plateia software

Tutorial





**CGS Labs d.o.o.** Brnčičeva ulica 13 1000 Ljubljana

#### Sewerage system in the Plateia software

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# INTRODUCTION

This tutorial will show you how to transfer any polyline from a layout to a longitudinal profile and crosssections. In our case, it will be a sewer pipe, but the polyline could also represent a telecommunication cable or any other infrastructure object. In the second part of the tutorial, it will also show you how to calculate the amount of material needed for excavation and filling in cross-sections.

It should be noted here that you can also transfer points and 3D solids from the layout to longitudinal profiles or cross-sections, and vice versa, in a similar way. You can read more about it on the following website:

https://cgs-labs.zendesk.com/hc/en-us/articles/360060805974-Plateia-Design-Workflow-Projection-Lines-Tutorial

### PREPARATION

In this tutorial, we will work on a drawing in which the alignment, sample lines, profile, and crosssections are drawn. In addition, a 3D polyline representing the top of the sewer pipe is also inserted into the layout.



# 1. Editing 3D polyline

In the drawing, we have a 3D polyline representing a sewer pipe. The heights of this pipe can be easily edited using the "Polyline Editor" tool found in the Site Design tab.

Upon running the command, a dialogue box opens where we can modify the heights of the vertices of the 3D polyline. Right-clicking on the name of the 3D polyline reveals additional options. For instance, you can project the 3D polyline onto a specific surface and then adjust its height, such as lowering it by 1 meter.

1. Run the <u>Polyline editor</u> command.

2. Select the 3D polyline directly in the drawing.



3. In the dialogue box, you can view and edit the heights of the vertices of the 3D polyline.

💮 3D polyline	editor						×	
Entity name		Point number	Station	Elevation	Length	Gradient back	Gradient ahead	
AcDb3dPoly			0.000	0.40.407	32.803		2.269 %	
	Drop all but selected Filter 3D polyline only Baise to surface elevation (vertices only)					-2.269 %	-1.773 %	
						1.773 %	-3.479 %	
						3.479 %	-0.514 %	
	Ruise to	surface elevation (	venices only)		25.347	0.514 %	-2.825 %	
	Raise to	surface elevation (	add vertex on surfa	ce break)		2.825 %		

By highlighting cells and right-clicking, you are also provided with the "Raise/Lower elevation" option.

🕠 3D polyline editor						×
Entity name	Point number	Station	Elevation	Length	Gradient back	Gradient ahead
AcDb3dPolyline	Point 1	0.000	242 407	22.002		2.269 %
	Point 2	32.803	24	Raise/Lower eleva	tion 😽	-1.773 %
	Point 3	64.710	243.586	35.794	1.773 %	-3.479 %
	Point 4	100.505	242.341	31.354	3.479 %	-0.514 %
	Point 5	131.859	242.180	25.343	0.514 %	-2.207 %
	Point 6	157.201	241.621		2.207 %	

## 2. Projection Line

Plateia offers the possibility to transfer points, 2D/3D polylines, and 3D objects from layout to profile and cross-sections, and vice versa. This allows users to easily transfer and display objects between different views.

#### 2.1 Define Projection Line

To define the projection line, select the "Define Projection Lines" command (21M3). This command establishes a line in the layout, the projection of which can be displayed later in a longitudinal profile and cross-sections. The label is used for identification when transferring data from the layout drawing to longitudinal and cross-sections.



#### 2.2 Insert Projection Lines in Profile

1. Run the <u>Draw Projection Lines (31E2)</u> command.

2. It opens a new dialogue box. Check the box next to the SEWERPIPE option and click OK.

If you are interested in understanding the additional settings, please refer to the next tutorial: <u>Projection lines labelling options in profile</u>

view band

The projection line is inserted into the profile, and its name is also displayed, as shown in the image on the right.





#### 2.3 Insert Projection Lines in Cross-Sections

1. Run the <u>Draw Projection Points (41K2)</u> command.

2. Check the box next to the SEWERPIPE option and click OK.



The projection line is inserted into the crosssections as points, and its name is also displayed, as shown in the image on the right.



## 3. Calculation of the amount of material for excavation and fill

#### 3.1 Insert block in cross-sections

In the cross-sections, we will first insert a block that represents the pipe and layers of materials. We will insert a regular CAD block, and it is crucial to determine the Base Point. In our example, the Base Point is placed at the location representing the top of the pipe.

Alternatively, instead of using a block, you can draw individual lines using the commands found in the "Draw TCS elements" tab.



1. Run the Insert Block (41GB) command.

2. Select a block from the drop-down menu.

3. Then, check the box next to the Explode option.

If desired, you can also specify the layer name. You can choose it from the drop-down menu or enter a new name directly in the box.

4. Click OK.

5. Select the element and the insertion point. In this case, you click on the projection point that represents the sewer pipe.

The block is now inserted in the drawing. In order to be able to calculate the quantities accurately, in the next step, we need to extend the edges to the terrain line.



#### 3.2 Extend

- 1. Run the Extend (4112) command.
- 2. Select all cross-sections and click OK.



3. Select the edge (terrain line) and press Enter.

4. After that select the outer edge of the block and press Enter.

Repeat the same process on the other side.

The final result is shown in the picture on the right.

#### 3.3 Planimetry

#### Gravel

1. Run the <u>Planimetry(41M1)</u> command.

2. Select all cross-sections.

3. Choose the material from the drop-down menu.

4. Select the planimetry-polygon definition and additional settings from the drop-down menu.

5. Click OK.

6. Select elements for reference polygon and press Enter.

7. Select elements for the second polygon and press Enter.

The planimetry quantity of gravel is shown in the picture on the right.

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Mass Calculation Tools - Zoom Plot Refresh and Uno										
Define quantities				×						
Select method										
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Planimetry quantity										
Type of planimetry quartery	ntity									
Area (2)										
List of materials										
Gravel 🗸 🔧										
Settings										
Planimetry-polygon defi	niton									
Between two polylines				~						
Additional setting										
Under reference-polylir	ne			~						
		ок	Cancel	Help						
		LANE_L	1	LANE_R1						
EWERPIPE										

#### Soil fill

- 1. Run the <u>Planimetry(41M1)</u> command.
- 2. Select all cross-sections.

3. Choose the material from the drop-down menu.

4. Select the planimetry-polygon definition and additional settings from the drop-down menu.

5. Click OK.

6. Select elements for reference polygon and press Enter.

7. Select elements for the second polygon and press Enter.

The final result is shown	in the	picture	ont	the
right.				

				Cross Section			
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Mass Calculation	Tools 👻	Zoom	Plot	Refresh and Undo			
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		ОК	Cancel	Help			
		LANE 11		LANE_R1			
WERPPE							

#### 3.4 Quantity Take-Off Report

1. Run the <u>Quantity Takeoff (41M6)</u> command.

2. Select all cross-sections.

3. In the section "Calculate by cross-sections," check the box next to the "Insert in drawing" option, and then select the location for planimetry labels in the drawing.

3. In the section "Summary of quantities," check the box next to the "Insert in table" option, and select the insertion point of the quantity table.

4. Click OK.

						Cross S	ections
Planimetry	Quantity Takeoff	🛃 🛃	+*	TCS Elements Manager	Plot	Refresh Cross Sect	h ions
Mass C	alculation		lools 🔻	Zoom	Plot	Refresh ar	nd Undo
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🖂 Add	alignment	name	alongside	profile name la	abel		
				ок	Cancel	He	p

Display of quantities in cross-sections:	Summary of quantities:
GRAVEL = 0.240 m2	Quantity takeoff
SOLFILL = 1.140 m2	Sect. Stat GRAVEL Dist SOUFILL Dist. Dist. [m³/m³] [m³/m³]
	P15 ROAD 0+280.00 0.240 1.140
LANE_R1	20.000 4.800 20.000 22.807 20.000
	P16 R0AD 0+300.00 0.240 1.140
and the second	20.000 4.800 20.000 22.806 20.000
SEWERPPE.	P17/ROAD 0+320.00 0.240 1.140
628NG	20.000 4.800 20.000 22.788 20.000
	P18 R0AD 0+340.00 0.240 1.138
	20.000 2.400 20.000 11.385 20.000
88.1154	P19 R0AD 0+360.00 0.000 0.000
	20.000 0.000 0.000 0.000 0.000
¥	P20 R0AD 0+380.00 0.000 0.000
174.000	20.000 0.000 0.000 0.000 0.000
0-2003         0-2003           ROUTINAY         8         8           TROUTINAY         8         8	Sume: 38.400 182.401
Image: 1         Image: 2         Image: 2	GRAVEL SOUFILL [m <sup>1</sup> ] [m <sup>1</sup> ]
	Calculation method: Standard