Plateia

by CGS Labs

Designing Ditches

Tutorial

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Designing Ditches

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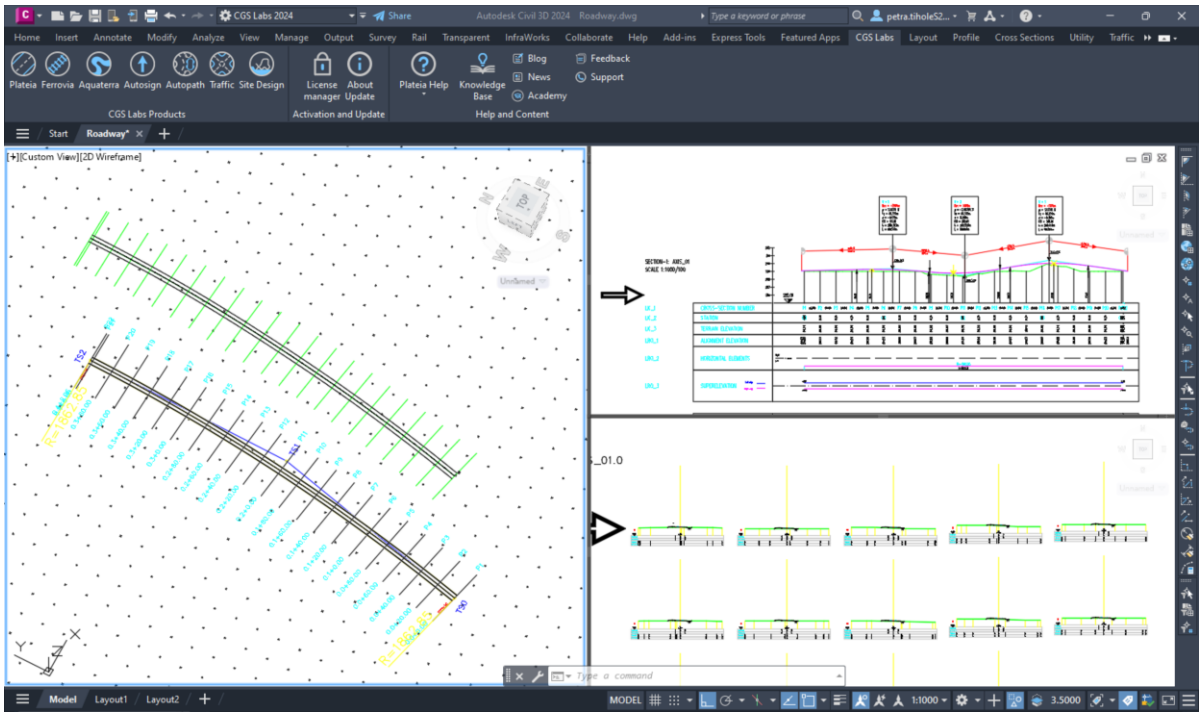
INTRODUCTION

In this tutorial, two examples will be presented to demonstrate how to draw a ditch in the Plateia program:

- Method 1: Drawing a ditch in the longitudinal profile.
- Method 2: Drawing a ditch directly in cross-sections.

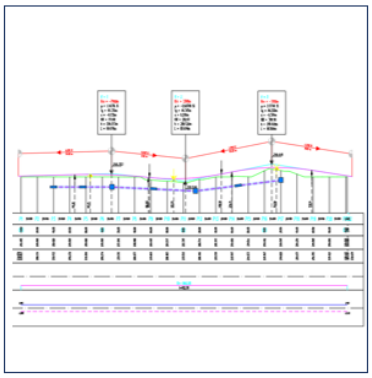
DWG drawing that will illustrate an example

In this tutorial, we will work on a drawing in which the alignment, sample lines, profile, and cross-sections are drawn. Cross-sections include only basic elements such as the roadway and shoulders; how to add a ditch will be demonstrated in this tutorial.

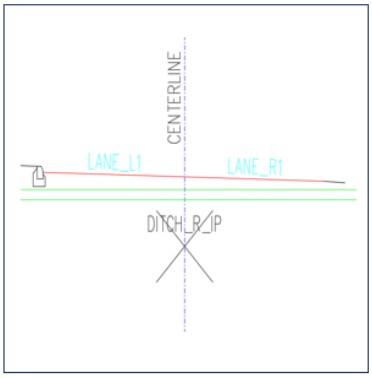


METHOD 1: Drawing of a Ditch in the Longitudinal Profile

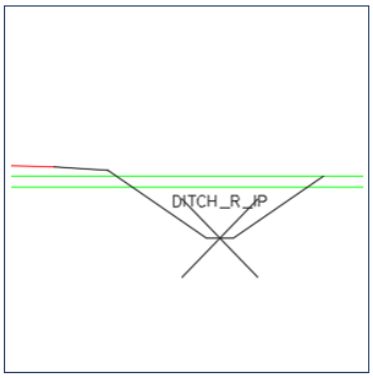
In this method, we begin by drawing the ditch as a polyline in the longitudinal profile. Additionally, besides determining the depth, we also specify on which side of the road it will be located. Then, we insert this polyline as a projection point into cross-sections, and next we insert the ditch element. The ditch is drawn in such a way that its depth is at the same elevation as the projection point, and its position is adjusted based on the connection element, such as the shoulder of the road or any other road element.



Profile



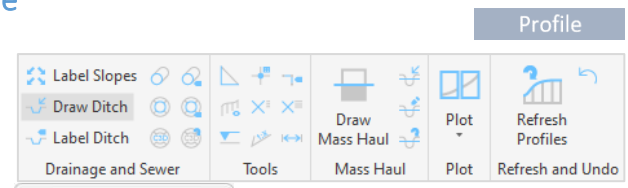
Projection Point in Cross-Sections



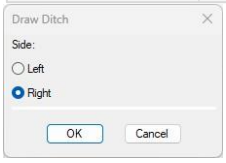
Ditch Element

1. Drawing Ditch in the Longitudinal Profile

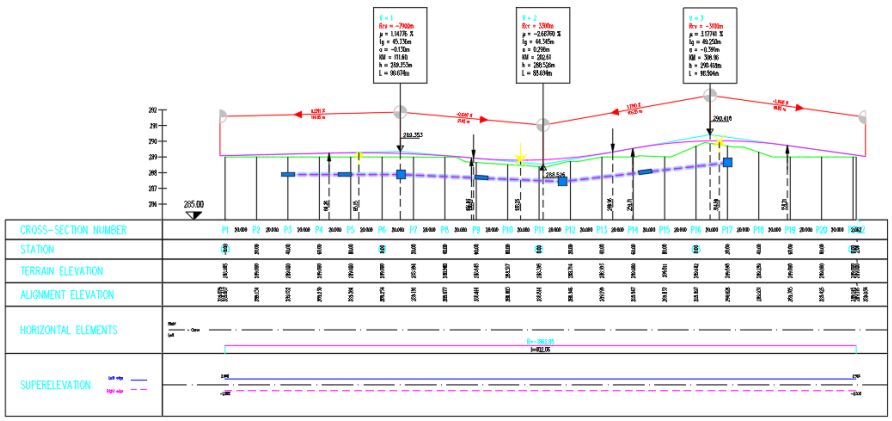
1. Run the "Draw ditch (31R3)" command.



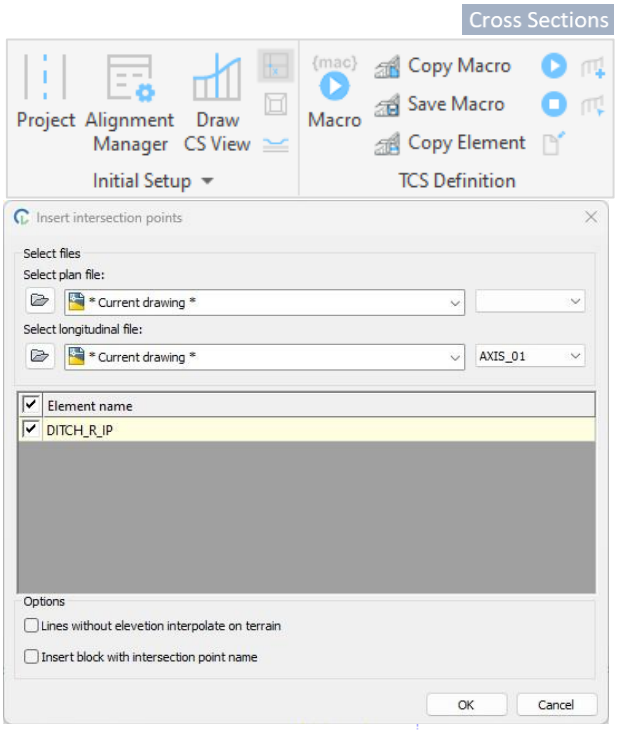
2. Define the side of the road on which the ditch will be drawn.



3. In the longitudinal profile, you draw a ditch. When you finish, click Enter.



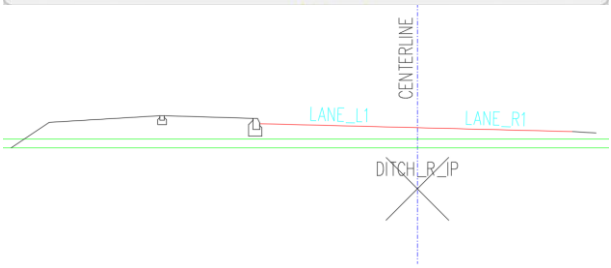
2. Transferring the Ditch from the Longitudinal Profile to the Cross-Sections



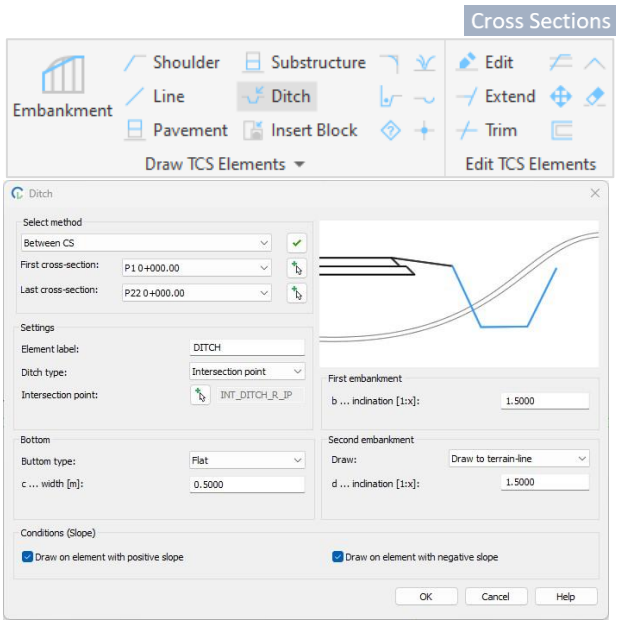
1. Run the "Draw projection points (41K2)" command.

2. Check the box at the element and press OK.

In the cross-sections, a projection point is inserted that represents the depth of the ditch. The ditch is drawn on the centerline of the axis itself, and you must determine the left/right distance yourself. The process will be shown in the next step.



3. Inserting a Ditch Element into Cross-Sections



1. Run the "Ditch (41G6)" command.

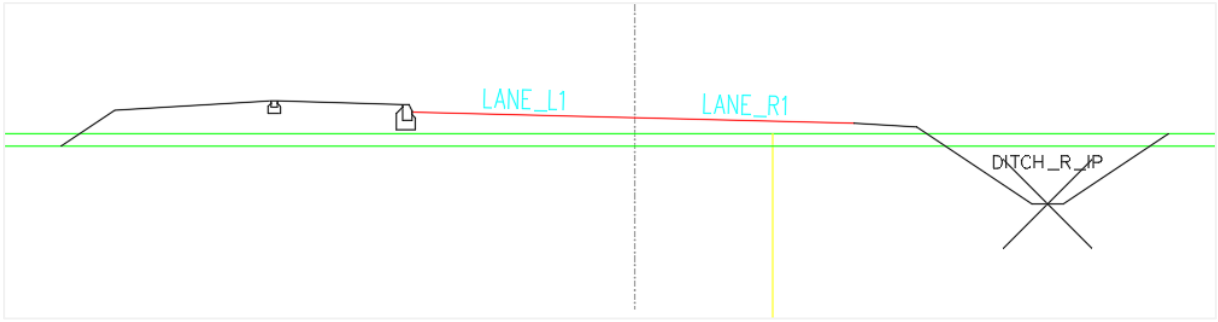
2. In the dialogue box, first specify the element label.

3. Then, for the ditch type, it is important to select the intersection point. Next, click on this button  **and choose the previously inserted projection point in cross-sections. The name of the projection point will be displayed next to the button.**

After that, define the parameters for the bottom, and the first and second embankment, and click OK.

After that select Ditch connection element. In our case, the connection element is the shoulder.

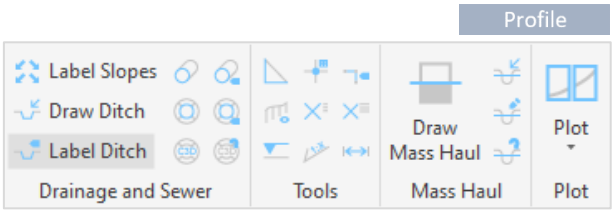
The example of the drawn ditch is shown in the image below:



4. Labeling Ditches in the Profile View

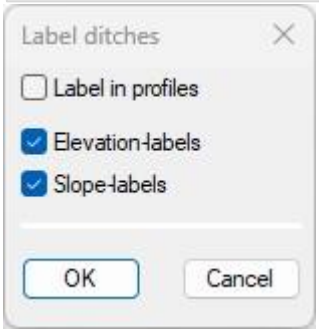
If you wish, you can label the values of elevation and slopes of the ditch in a table below the profile.

1. Run the "Label Ditch (31R5)" command.



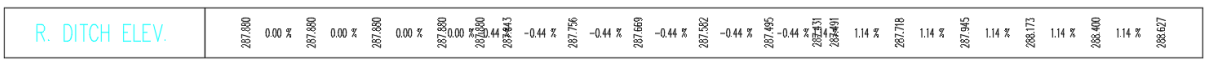
2. Check the boxes for the "Elevation-labels" and "Slope-labels" options, and then click OK.

**If you want the elevation to be displayed for each sample line, also tick the "Label in profiles" option.*



In the "Ditch elevation" row, elevations and slopes are displayed. In the "L. DITCH ELEV." row, data for the ditch on the left is displayed, while in the "R. DITCH ELEV." row, data for the ditch on the right side of the road is shown.

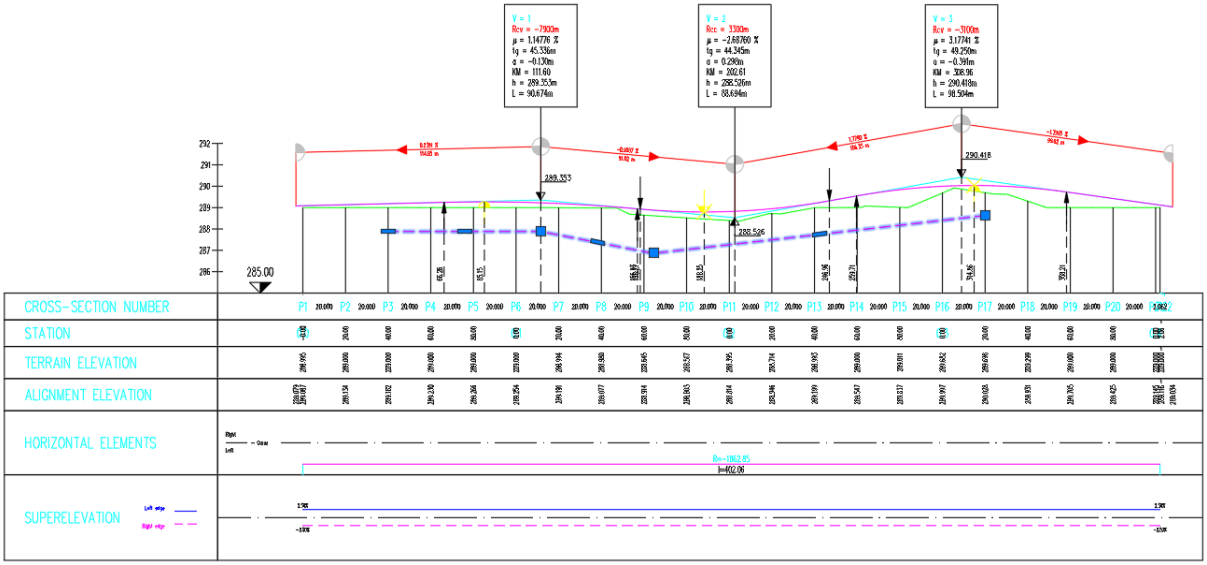
In the case where we check the "Label in profiles" option:



5. Editing a Ditch

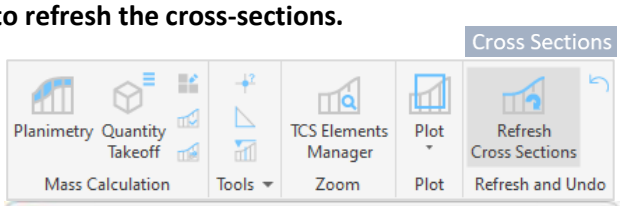
5.1 Editing in the Longitudinal Profile

1. In the longitudinal profile, click on the polyline representing the ditch, and then, with the mouse, click on any vertex of the polyline and move it.



After editing the ditch in the profile, you need to refresh the cross-sections.

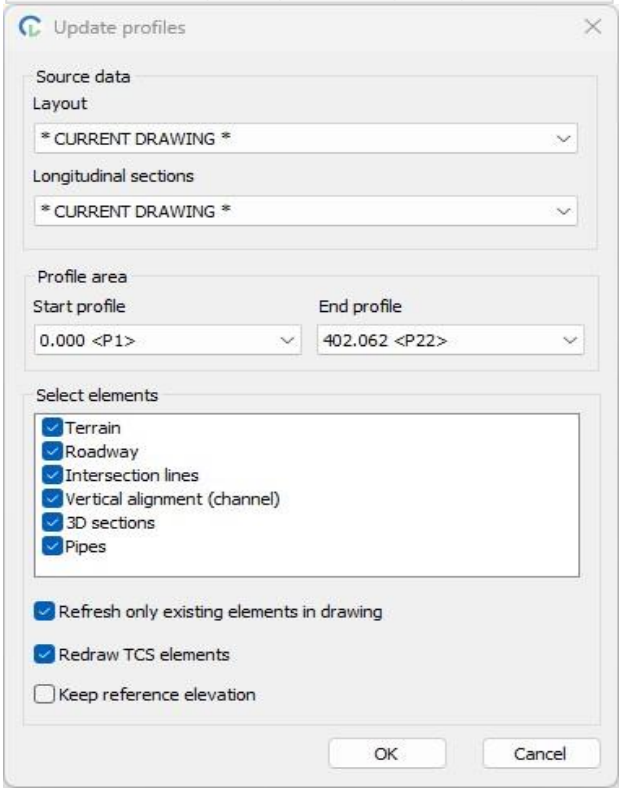
1. Run the "Refresh Cross Sections (41X)" command.



2. Select the start and end profile.

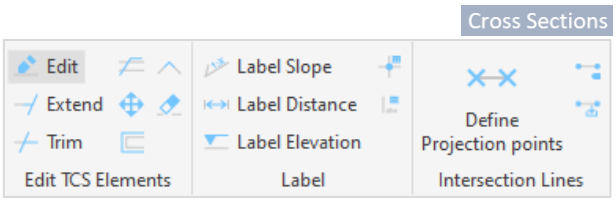
Then, be sure to check the boxes for the **Intersection lines** and **Redraw TCS elements** options. You have to select both because the Intersection lines option will refresh the projection point, and the Redraw TCS elements option will refresh elements of the Ditch.

Next, click OK.

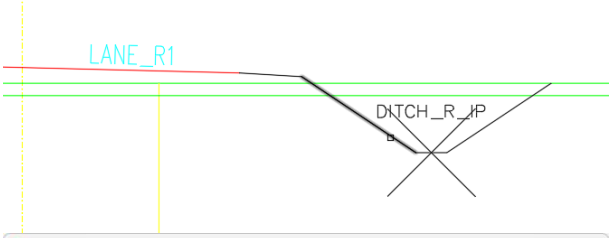


5.2 Editing in Cross-Sections

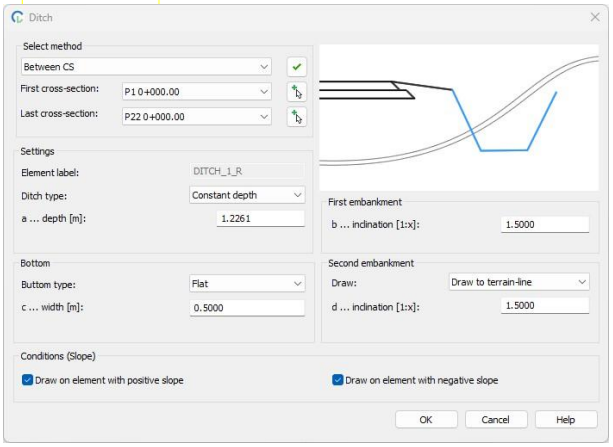
1. Run the "Edit (41I8)" command.



2. Select the Ditch in one cross-section.

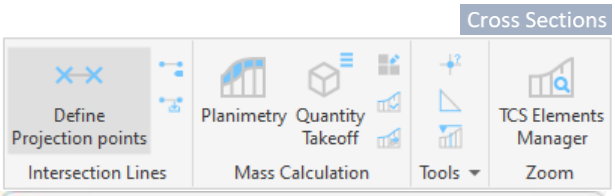


3. At the top of the dialogue box, you select the first and last cross-section, then change parameter values and confirm by pressing the OK button.



6. Drawing a Ditch in the Layout

1. Run the "Define Projection points (41K1) " command.



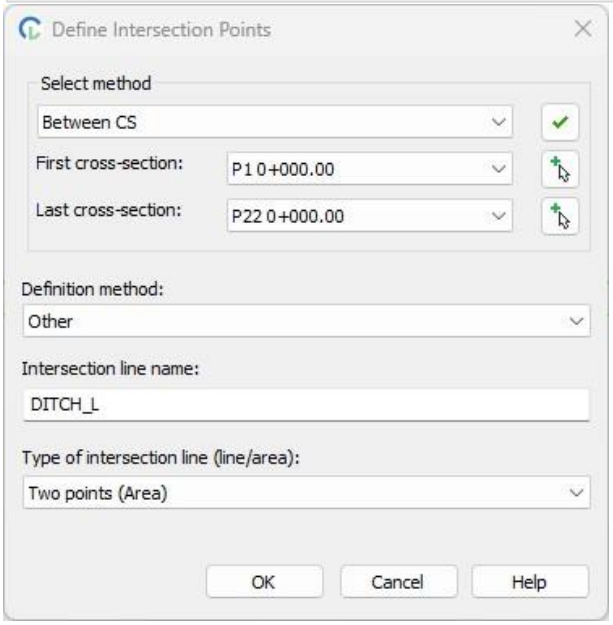
2. Define the first and last cross-section.

3. Select 'Other' for the definition method.

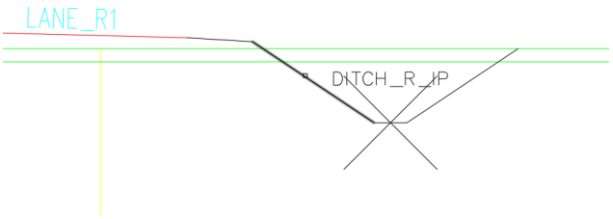
4. Define the intersection line name.

5. Select **two points (area)** for the type of intersection line from the drop-down menu.

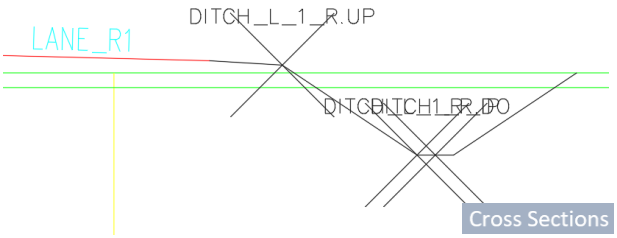
6. Click OK.



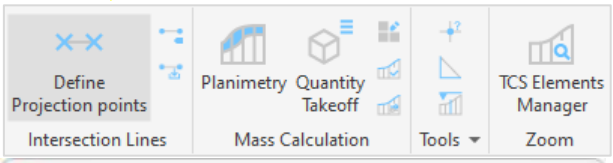
7. Select element: left side of the ditch.



8. Two insertion points are automatically created on both sides of the left side of the ditch.



9. Run the "Define Projection points (41K1) " command again.



10. Next, you repeat the same procedure for the right side of the ditch.

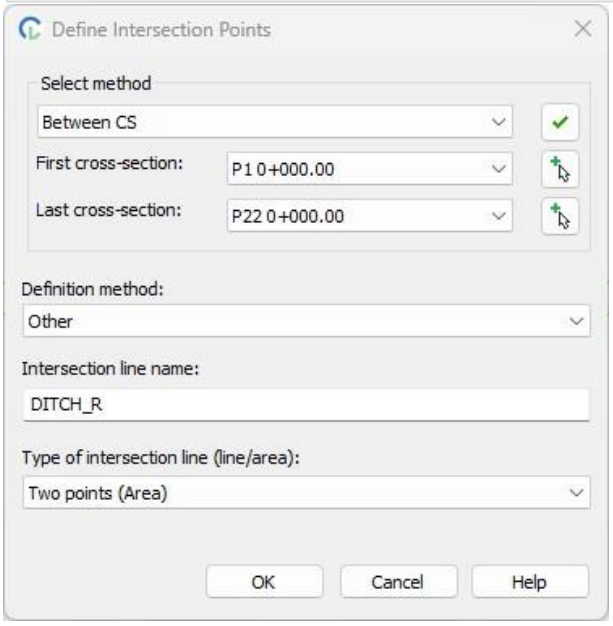
11. Define the first and last cross-section.

12. Select 'Other' for the definition method.

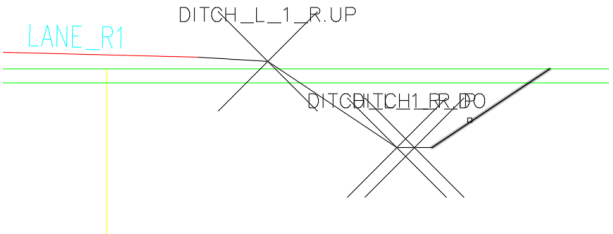
13. Define the intersection line name.

14. Select **two points (area)** for the type of intersection line from the drop-down menu.

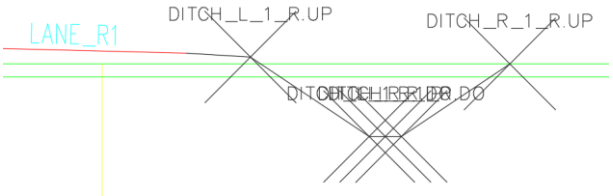
15. Click OK.



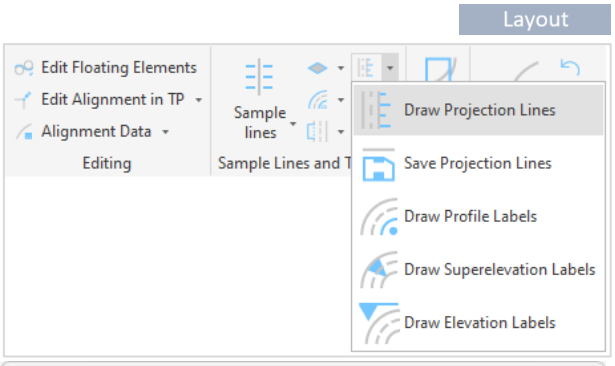
16. Select element: right side of the ditch.



17. Two insertion points are automatically created on both sides of the right side of the ditch.



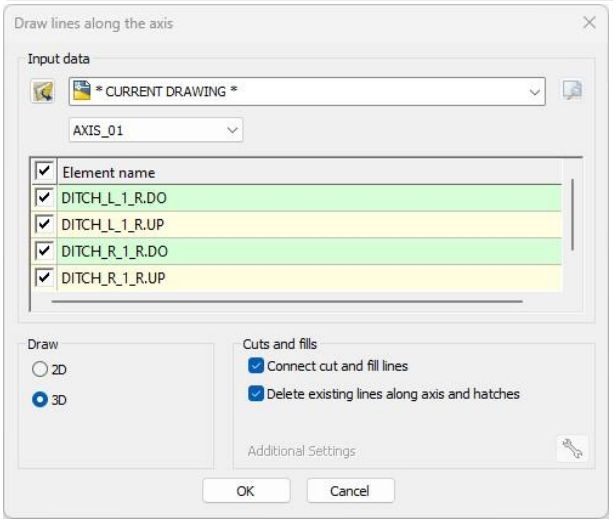
18. Run the "Draw projection Lines (21M1)" command.



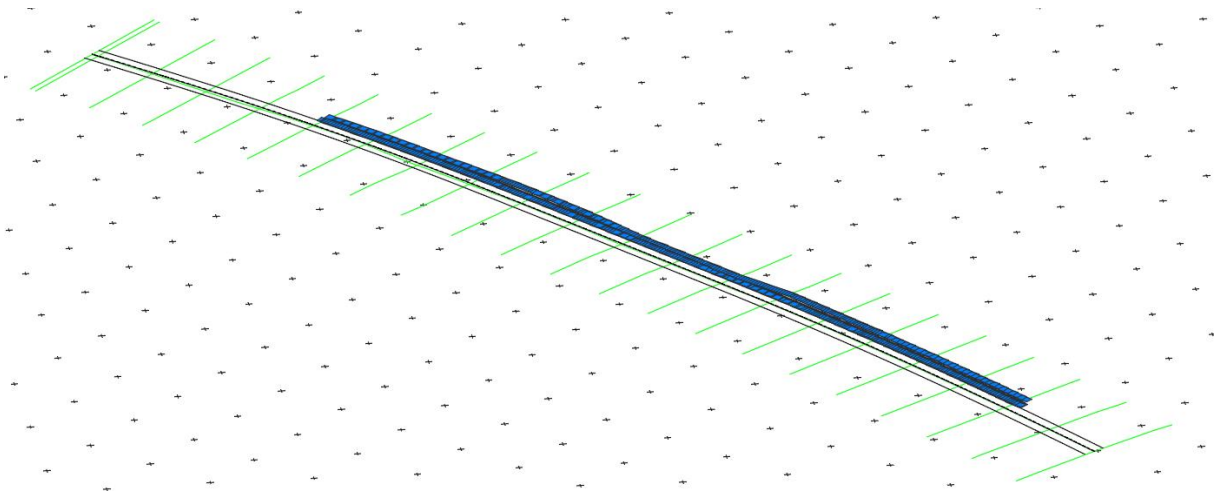
19. Check the boxes at the projection lines that represents the ditch.

Check the box at the 3D option.

Click OK.

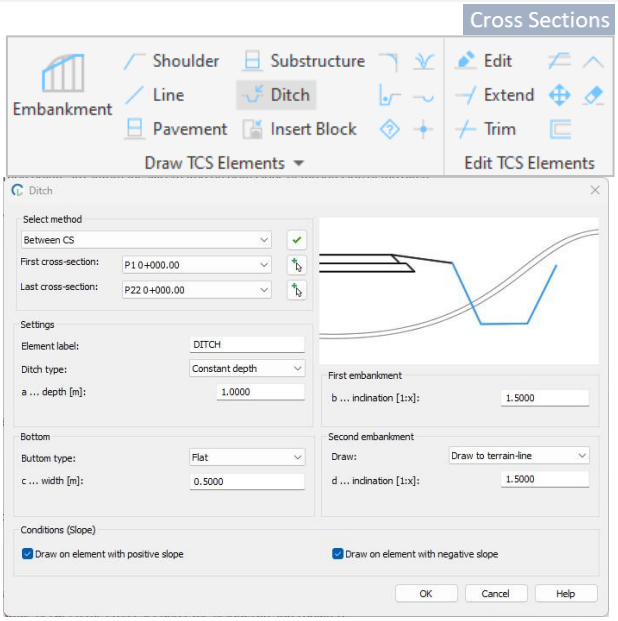


In the layout, we obtain a 3D polyline of the ditch. The elevations are accurate on the sample line, while the elevations between the cross-sections are interpolated.



METHOD 2: Drawing a Ditch Directly in Cross-Sections

1. Run the "Ditch (41G6)" command.



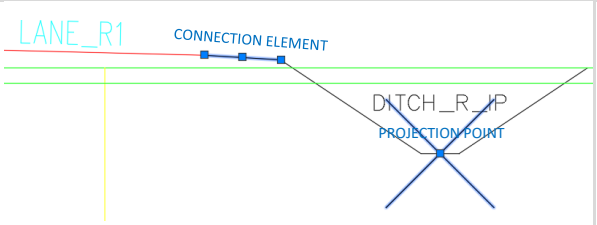
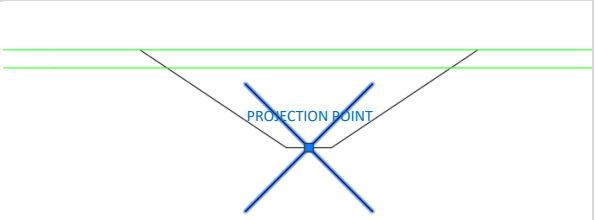
2. At the top of the dialogue box, you select the first and last cross-section, then change parameter values and confirm by pressing the OK button.

3. Then you select ditch connection element and it is automatically inserted in the drawing.

Ditch Type

In the "Ditch" dialogue box, you can choose from **4 types of ditches**:

- **Constant depth:** The ditch bottom is drawn at a constant depth.
- **Intersection point:** The ditch bottom is defined according to the reference projection point provided. (In this tutorial, it was demonstrated using a projection line transferred from the longitudinal profile, but it could also be transferred from the layout or drawn as a point in the cross-section.) With the intersection point, the ditch is connected to another element besides the projection point.
- **Floating element:** Similar to the intersection point, the ditch bottom is defined according to the reference projection point provided. However, in this case, no connection element is specified.

Intersection point	Floating element
	
The ditch is drawn based on the projection point and connection element.	The ditch is drawn solely based on the projection point data. This can be used to draw an independent ditch that is not connected to any road element.

- **Maximum depth:**
  - a - depth from the bottom of the ditch to the connection element
  - f - depth from the bottom of the ditch to the terrain line
  - If a > f, it will take a for the depth.
  - If f > a, it will take f for the depth.