PointCab TUTORIALS

DELTA

With the Delta tool you can easily create difference comparisons and analyses of your laser scan data.

Create step-by-step difference comparisons and visualise or log deviations on horizontal and vertical planes such as ground surfaces or facades.

In this tutorial we show you how to calculate deviations from a plane and when to use the delta functionality. We will also show you some examples and applications where the delta tool is used. We start with the evaluation of facade deformations.

Evaluate facade deformation

The Delta Tool is part of the Layout/Section tool - it is one of the five sheets we can output when we calculate a 2D orthophoto. Therefore, we activate the Layout/Section tool and create a new vertical section in the top view of our project.

We set the first point and the second point of the reference plane in the top view. The yellow area marks the point clouds that will be evaluated. We can adjust this area visually or via coordinates in the Job Editor.
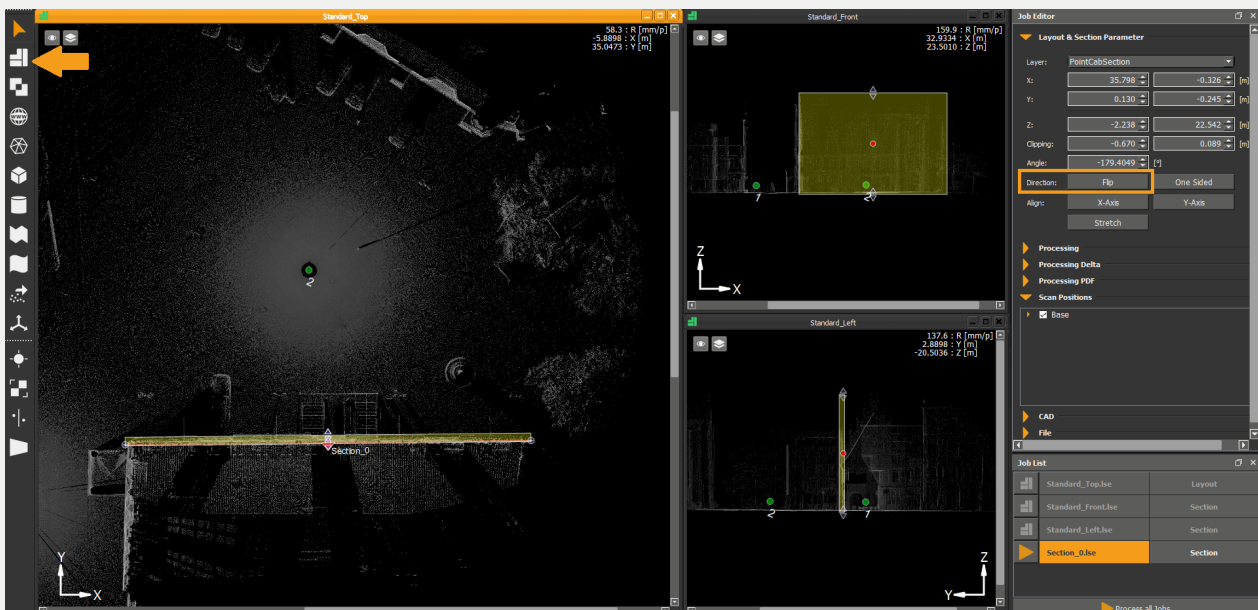
To actually create the delta calculation, we have to tell PointCab to write a separate file for the delta calculation together with the section. In the job editor we navigate to the tab „Process Delta" and activate the button „Process". We can choose whether we also want to write a PDF documentation file in case we want to pass the results on to third parties, for example.
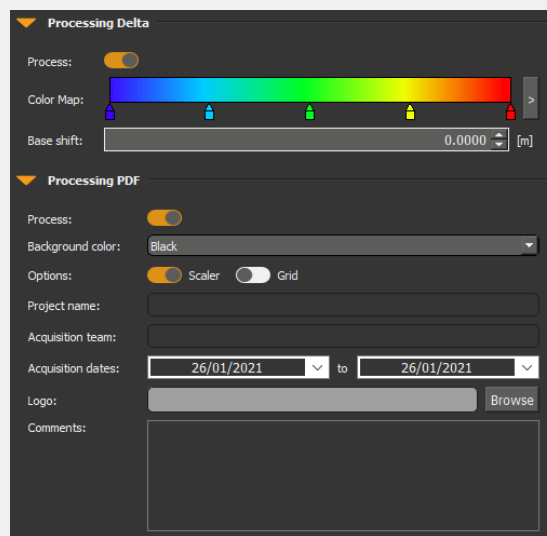

Now we start the calculation in the Job List.
The result of the section is opened in PointCab by double-clicking on the calculated job. We achieve the same via the context menu and then via the Open option. The context menu can be accessed by right-clicking on the calculated job. To display the delta calculation in Point-Cab, we open the Layers Menu on the left side of the orthophoto and select „Delta":
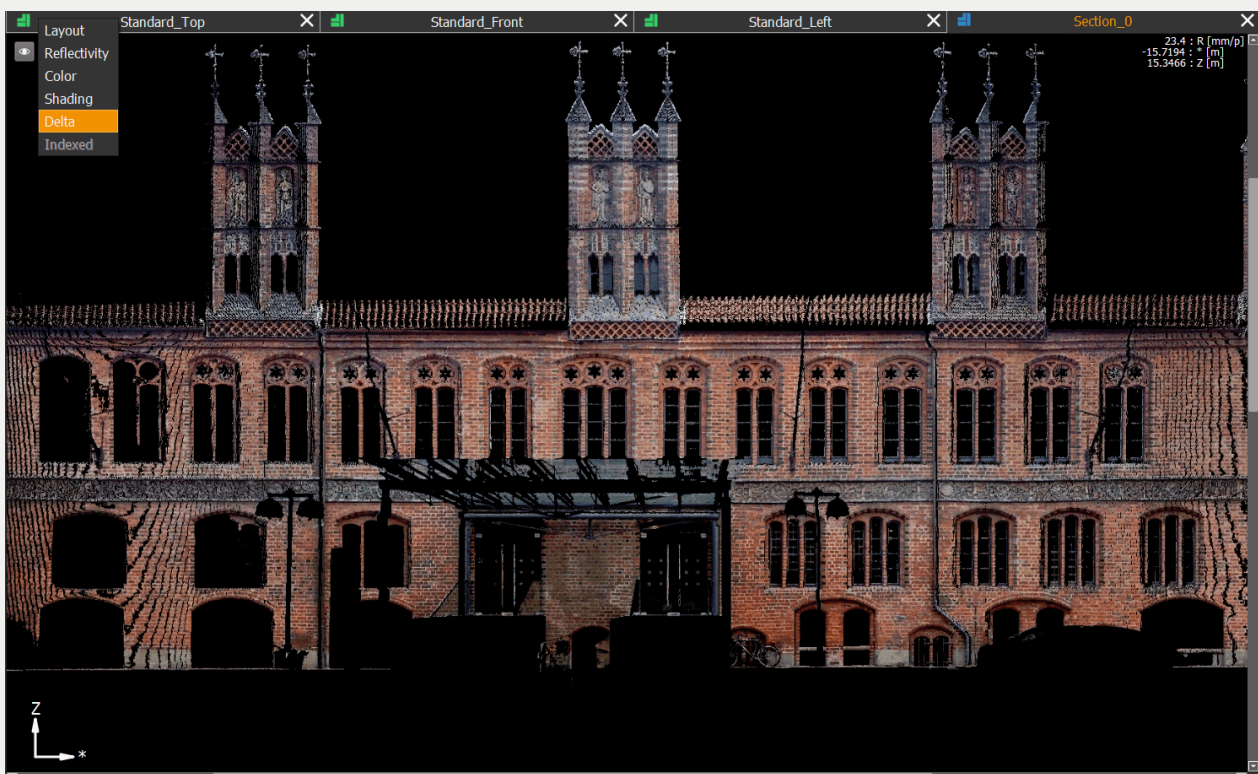
And this is how our result looks in PointCab:
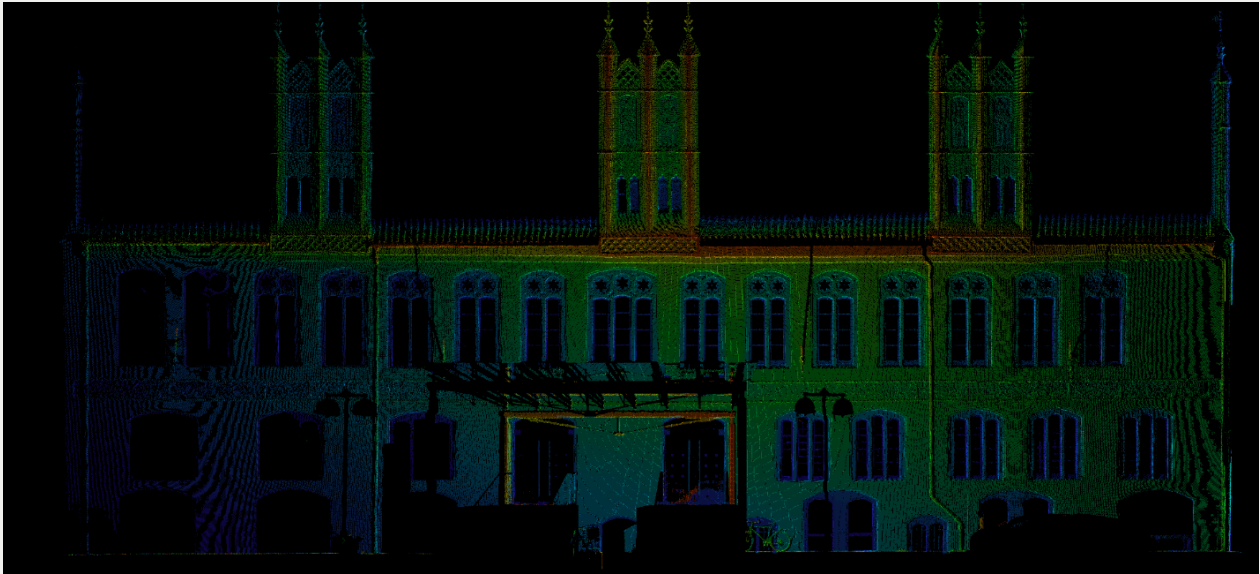
Evaluate floor unevenness

We can also use the Delta tool as horizontal sections, for example to analyse the floor unevenness or ceiling unevenness.

First we create a floor plan in the side view or in the front view. We set the first point and the second point of the reference plane. The yellow area marks the point cloud that will be analysed. We can adjust this area visually or via coordinates in the Job Editor. For a delta evaluation of a floor, the viewing direction should point downwards, but if we would represent the unevenness of the ceiling, the viewing direction should of course point upwards, so use the „Invert" button in the Job Editor as needed. Now we can start the calculation:
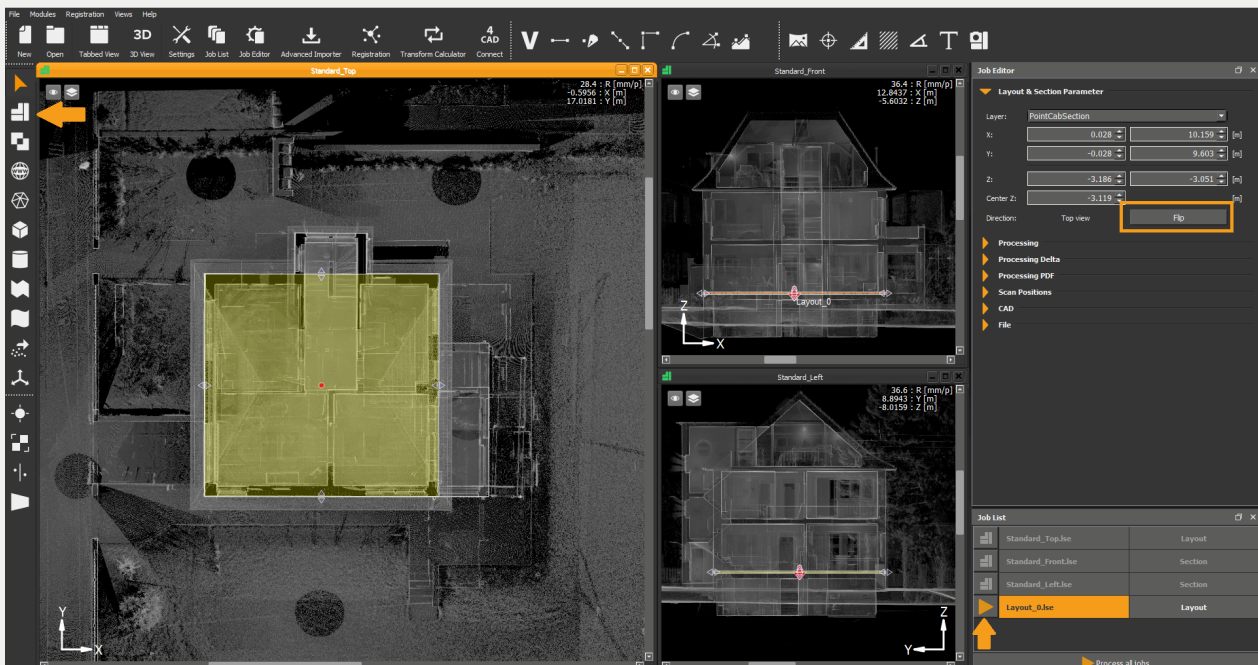
The floor plan is opened by double-clicking on the calculated job in PointCab. We achieve the same via the context menu and then via the Open option. The context menu can be accessed by right-clicking on the calculated job. To display the delta calculation in PointCab, we open the Sheets Menu on the left side of the orthophoto and select „Delta":
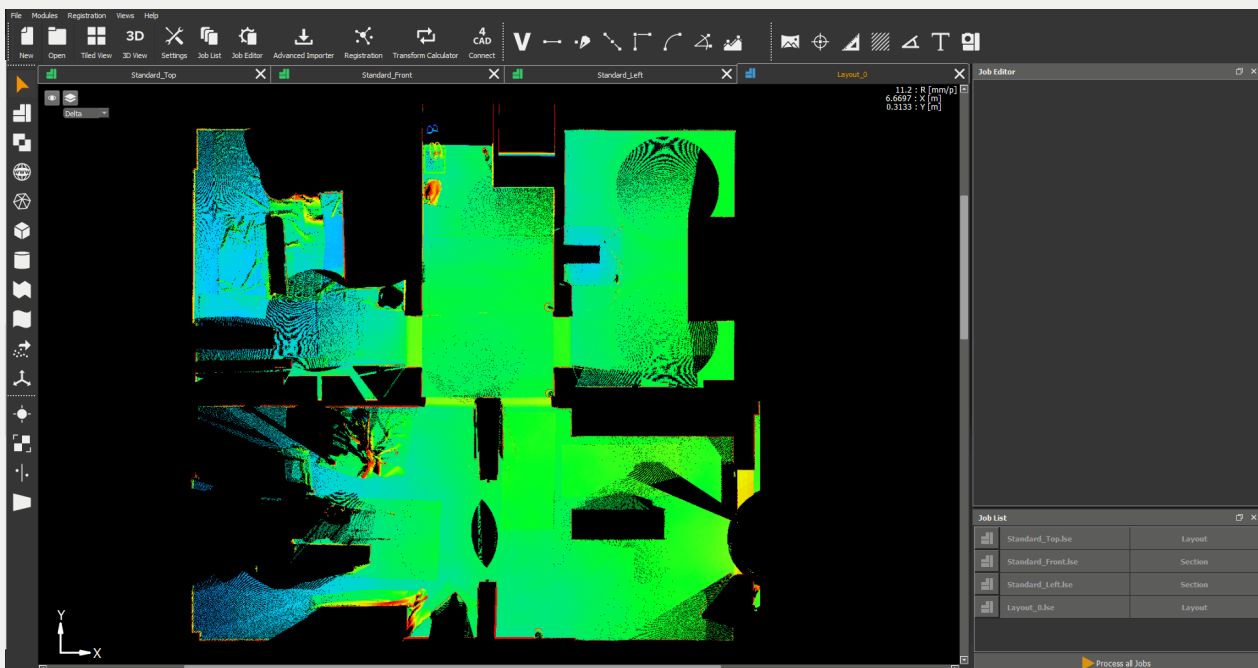


Display terrain surfaces

Another application where our Delta shows its strengths is the visualisation of colour maps of terrain models. You thus achieve a very quick documentation of the elevations in your project.

We could proceed to create a delta calculation on the front or side view of our project, as we did in the sections before, or we can directly set PointCab to calculate a delta on every ortho-photo creation. Let's look at how we can achieve the result right from the start.

Before we import our point cloud, we open the Settings menu. In the tab Layout/Section we activate the button Process Delta and we can also set PointCab to calculate the PDF documen-tation. We add some more settings to create reflectivity and colour orthophotos in the same process:
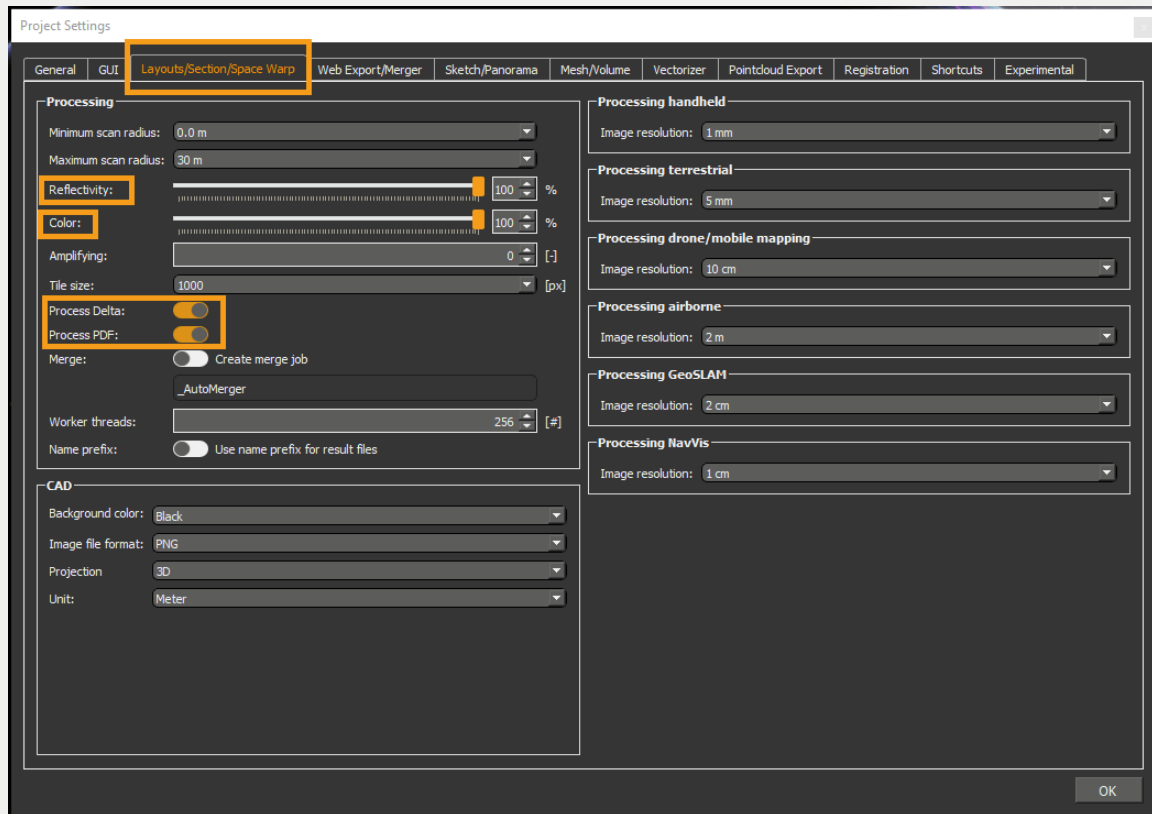
Now we import the point cloud and wait for the standard views to be created automatically. In the Sheets menu we can switch between the different layers that PointCab has created. Here is the delta calculation in the top view we need:
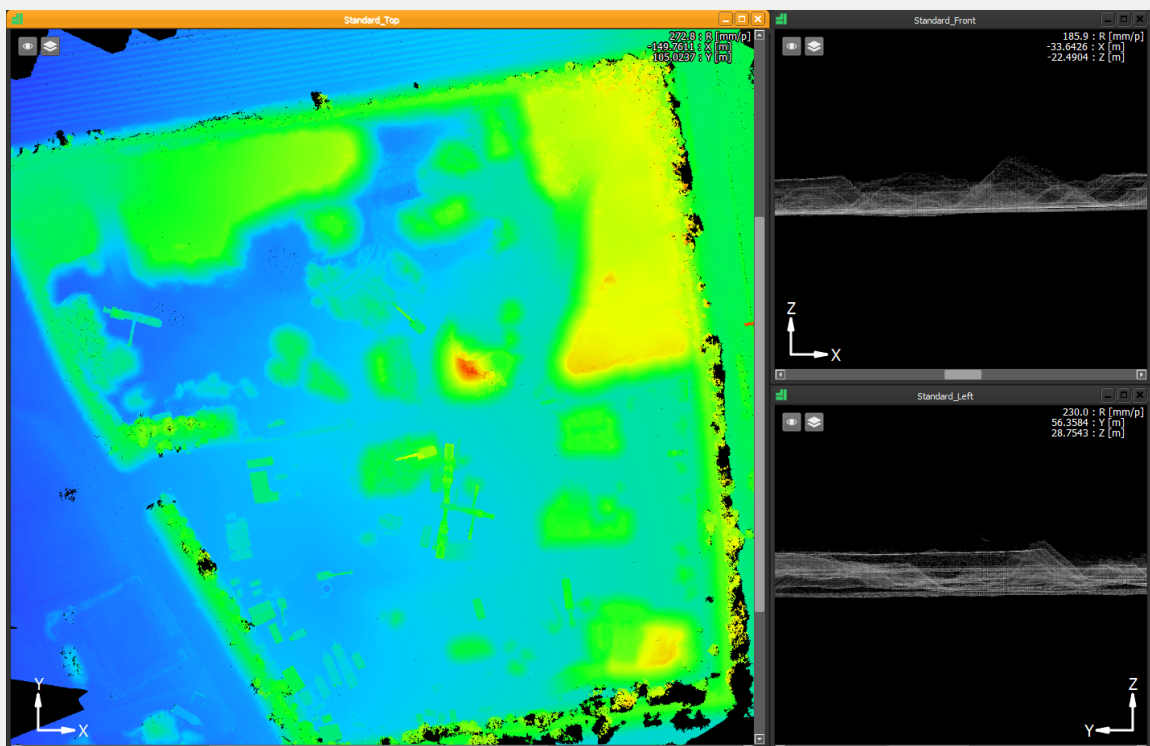
Using the delta as an „auxiliary" function

We can even create delta maps as a tool for calculating volumes.
Let's take the example of a stockpile. Your task is to determine the exact volume of this heap.
To better see the boundaries of the heap, you can calculate a horizontal delta orthophoto, then place the volume polygon exactly on the boundaries of the heap and calculate the volume.Here is the example in images:
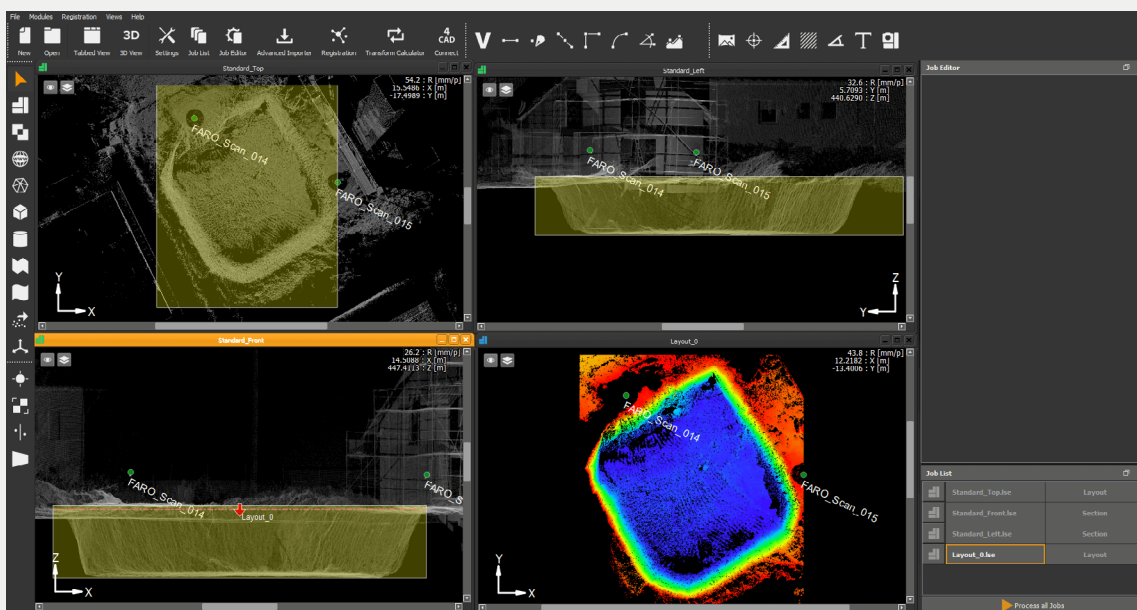

Calculation of a new floor plan with Delta
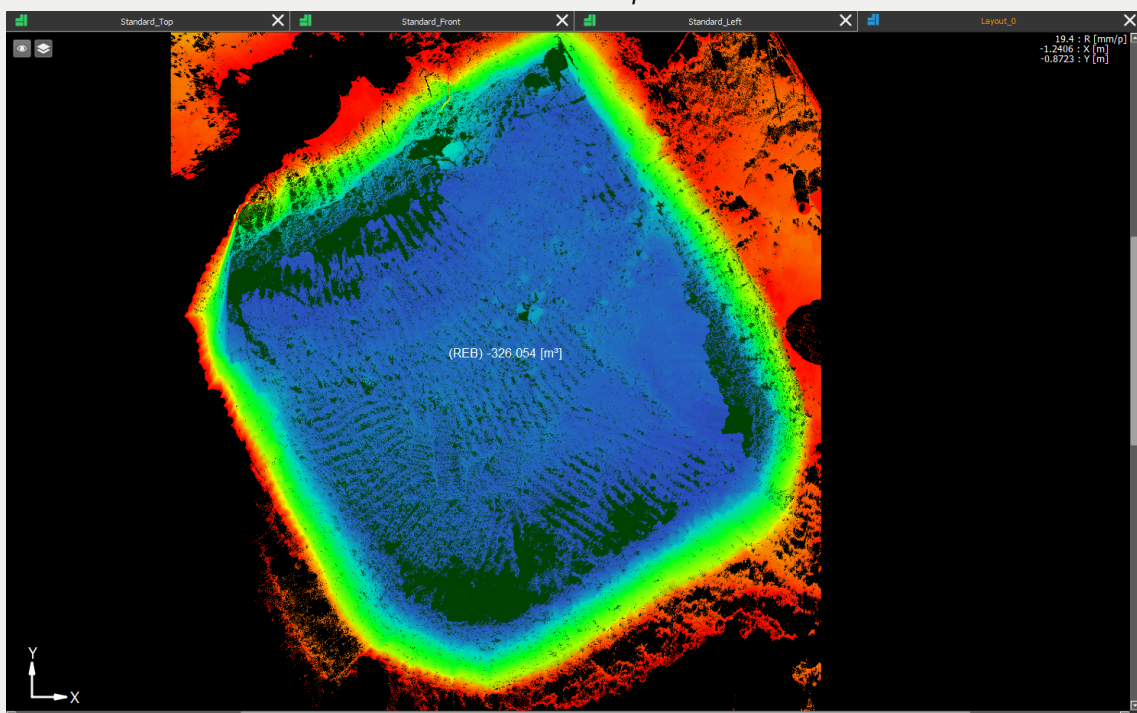
*Volume calculation on the height limits using the delta*

Delta Options

Since the delta tool is just a layer of the Layout/Section tool, the same parameters in the Job Editor apply to both.

For example, we can change the position and bounding box of our orthophoto and we can reverse the view direction of the section. All the parameters of the section, such as the image resolution, are also applied to the delta calculation.
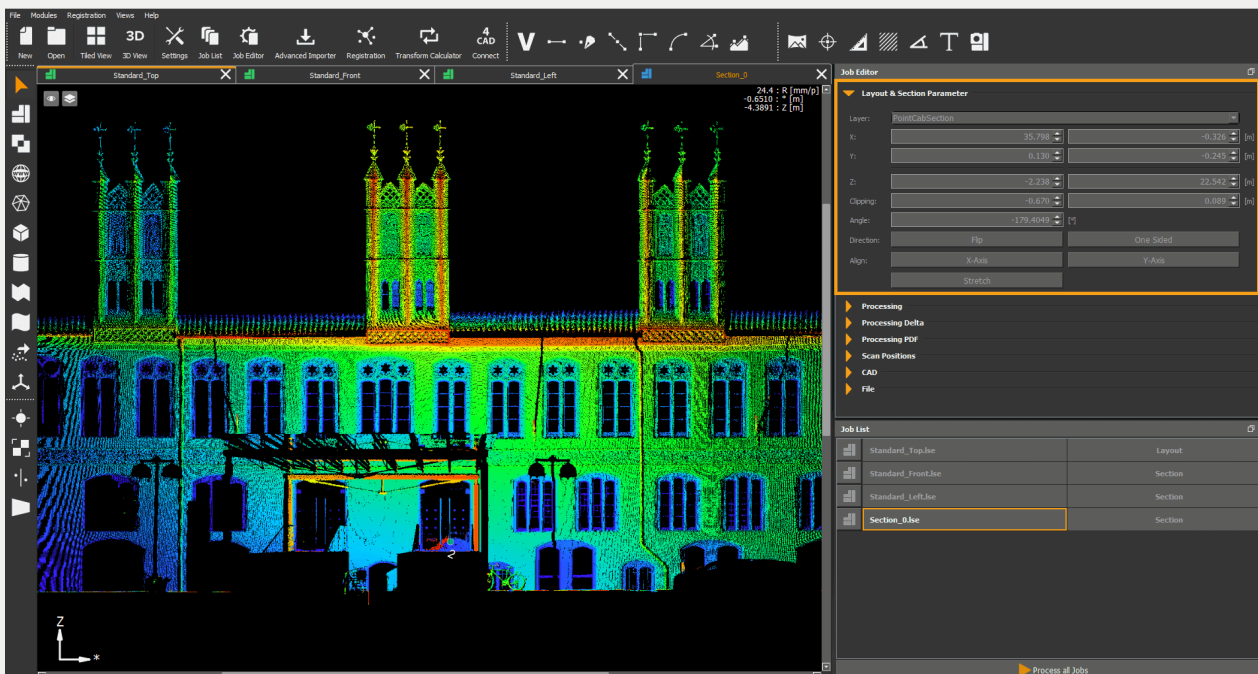

The specific parameters for Delta are located in the tabs **Processing Delta** and **Processing PDF**.
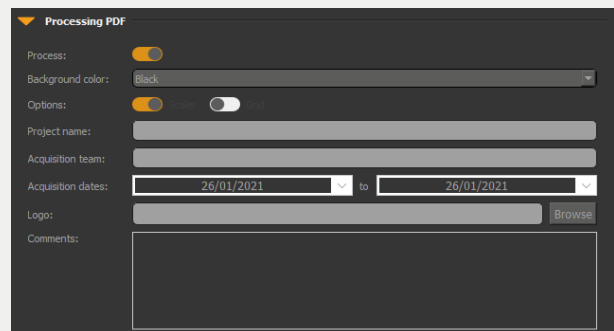
Colour scale settings:

To the right of the colour scale is a button with an arrow, with which you open a dropdown menu. In this dropdown menu you can, for example, set a discrete gradient (hard edges of the colour gradient) or precisely define the individual steps of the colour change.

You can manually set the distances between the colours by moving the colour arrows. The colours can be adjusted individually. Double-click on the individual colour arrows to open the colour palette. Superfluous colour arrows can be removed with a left mouse click:
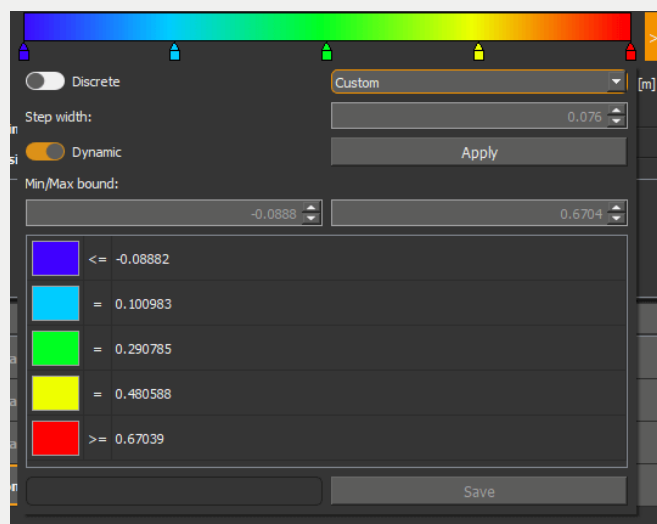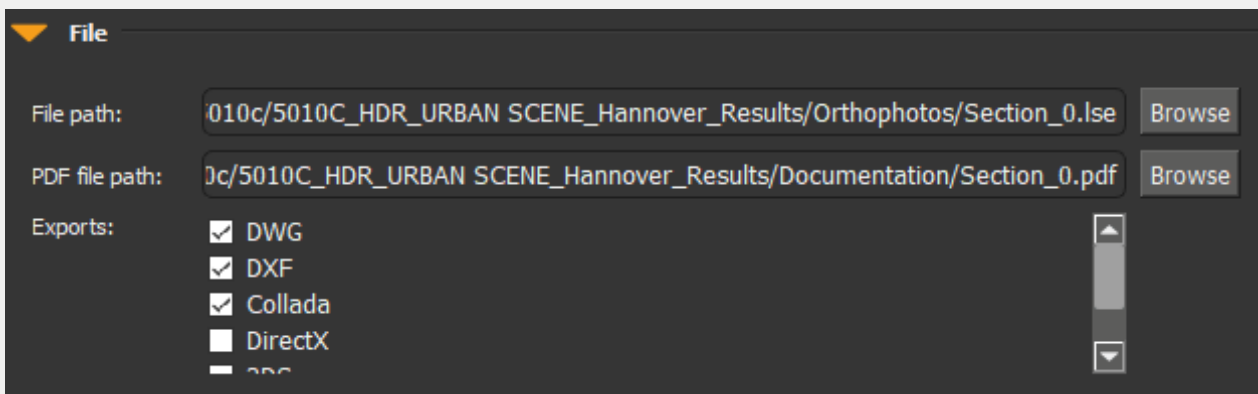

CAD:

In the CAD output options you can make changes to the export unit, background colour and image format of the orthophotos.
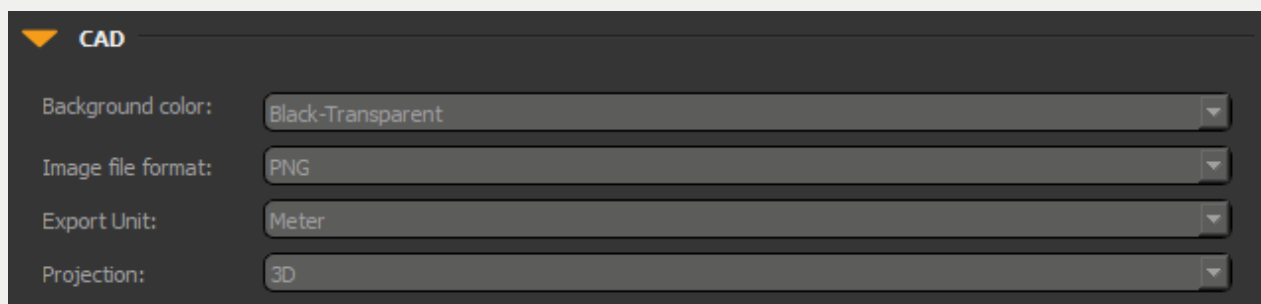
File:

Here you can select individual storage locations for the PDF protocol and the created ortho-photos, as well as the output format of the orthophotos. You have the option to output DWG, DXF and DAE.

Overview of Delta results

In this tutorial we would like to show you a short overview of the **Delta** results created by PointCab.

The following results are created by PointCab on **Delta:**

1. PDF protocol
2. Orthophoto in CAD format (DWG, DXF or DAE)

PDF protocol

The PDF protocol is created in the **Project_Results** directory in the **Documentation** folder. The following contents are documented in the PDF protocol:

• Cover sheet with project name, recording period and your comments.
• Orthophoto of the evaluated area
• Deviations from the projection plane
• Statistical evaluation of the results with histogram

Orthophoto in CAD format (here in the example DWG)

The Delta orthophoto is located in the Project_Results directory in the Orthophotos folder. The name of the Delta result is OrthofotoName_delta. The DWG can now be read into your CAD application and evaluated further depending on the task: