

Manual Sputnik Web User

Geoscan

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1 Introduction

Sputnik Web is a service which opens up new opportunities in the field of online cartography. Create and publish your maps, unleash the full potential of your UAV with getting 3D models, provide users access to your projects without extra software. Use a browser which supports WebGL to run Sputnik Web on your PC or a smartphone.

At the moment WebGL is included in the package of browser tools on most known devices. [More details about WebGL.](#)

Test your browser for WebGL compatibility [here](#). If the picture is displayed correctly then you can continue.

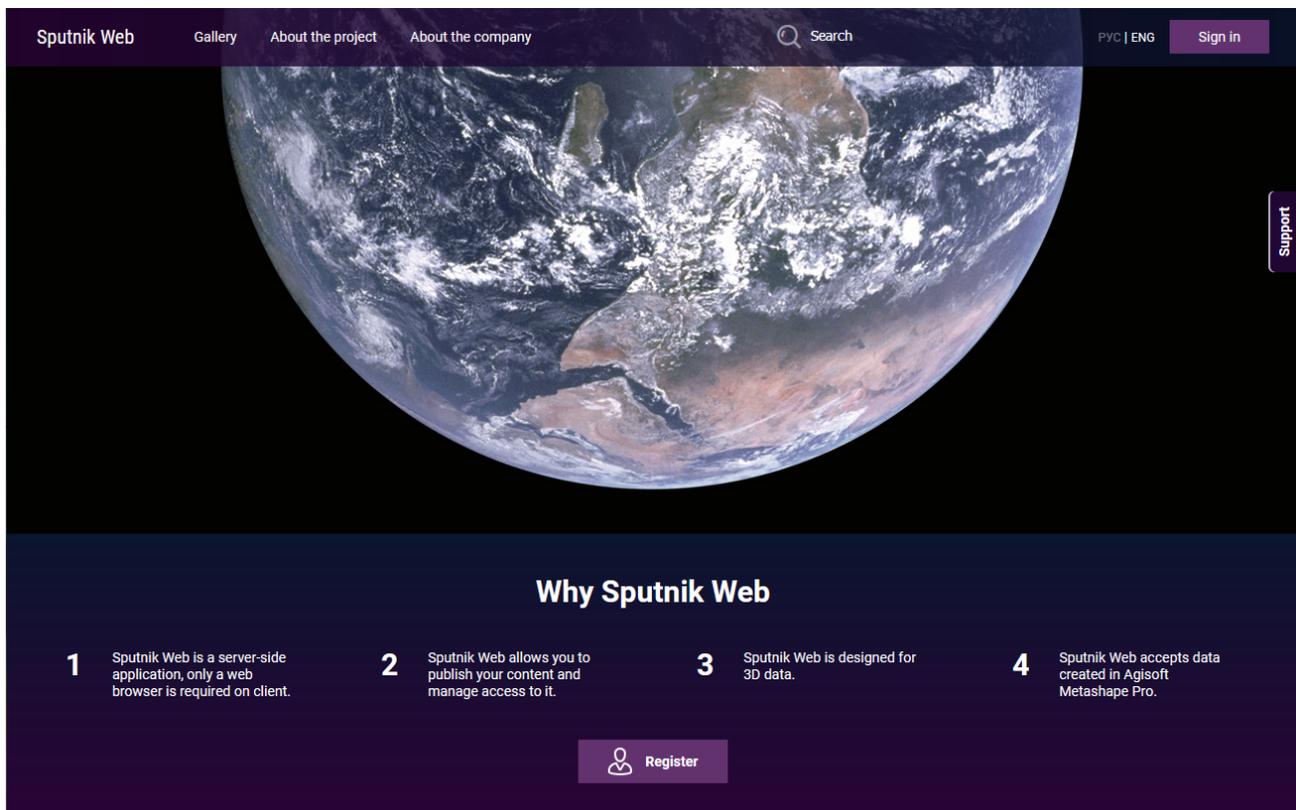


Figure 1. Home page Sputnik Web

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2 Sign Up

Follow the [link](#) to sign up in the service. Fill in all necessary fields and confirm your e-mail. After you finish registration you can start using Sputnik Web.

Most of the basic functions are available in a free version. Additional features available to tariff plans subscribers. Tariffs information available to authorized users in the profile.

The transition to the profile is possible through the navigation in the header of the page (fig. 2):

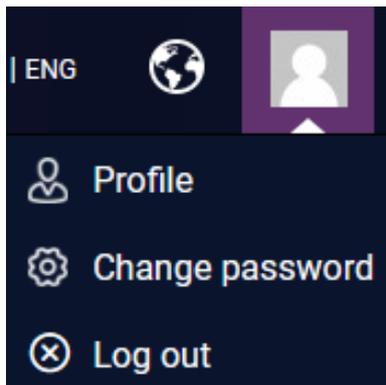


Figure 2. Profile menu

You can choose a tariff by clicking the “Choose plan” button on the right side of the page (fig. 3):

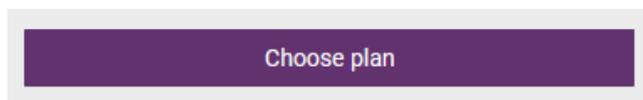


Figure 3. Choose plan

Next you need to select a suitable tariff, mark the usage parameters and then make a payment. After payment the current tariff and available resources will be reflected in your profile.

3 Data upload

3.1 Upload layer

Layer – graphical representation of geodata in a specific format (set of aerial photographs, a single georeferenced image, digital terrain model (DTM), Collada model, Cesium3dTiles (in archive format) or following formats of data: CZML, KML, KMZ, SHP, TLS, OC3, GLTF, OBJ).

In order to upload a layer select the appropriate menu section named “Upload layer”.



Figure 4. Profile navigation

Select the required file(-s), choose a file format, edit the layer name and start the upload (fig. 5).

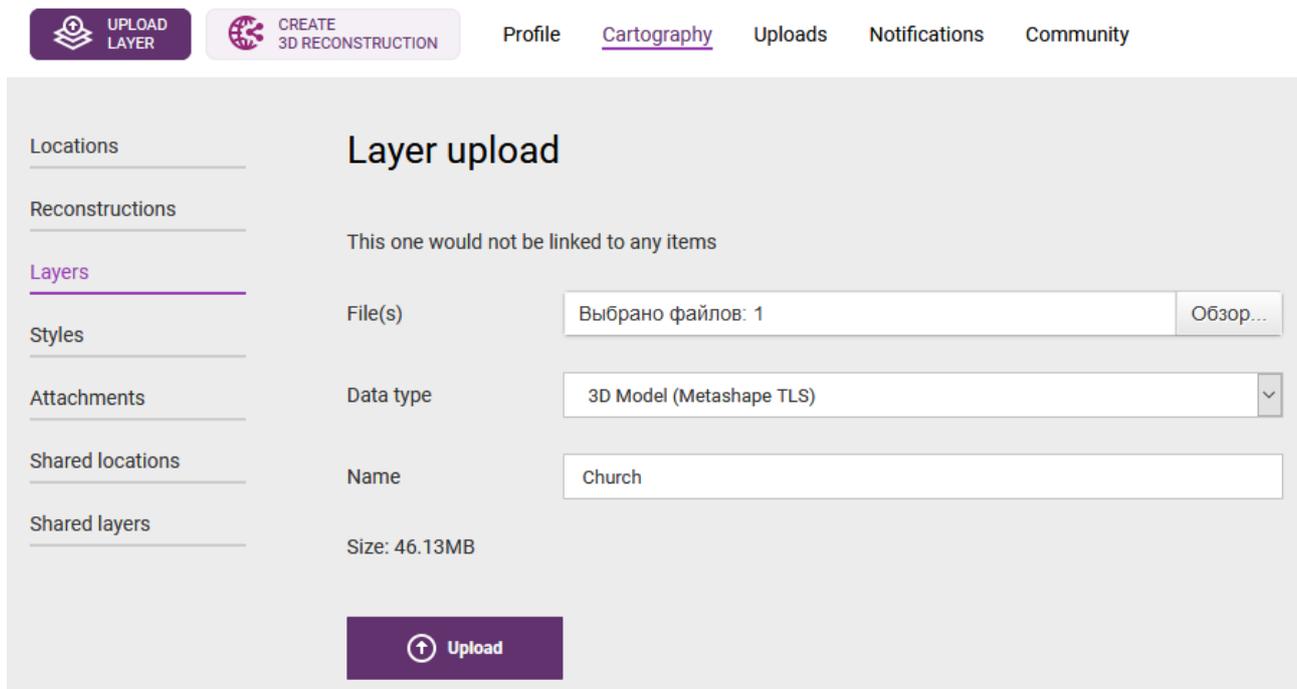


Figure 5. Layer upload

Attention! If files do not meet the necessary requirements or exceed the hosting quota the layer will not be loaded.

After the upload is finished you will be redirected to the “Uploads” page. This page contains a list of uploaded files. There is also convenient to track the status of uploads being processed data and recently uploaded data.

From the list of recently uploaded files (fig. 6) you can get to the page “Layers” (just click on the link “Show in list”) or open the data view on the map (click on the link “Show on map”).

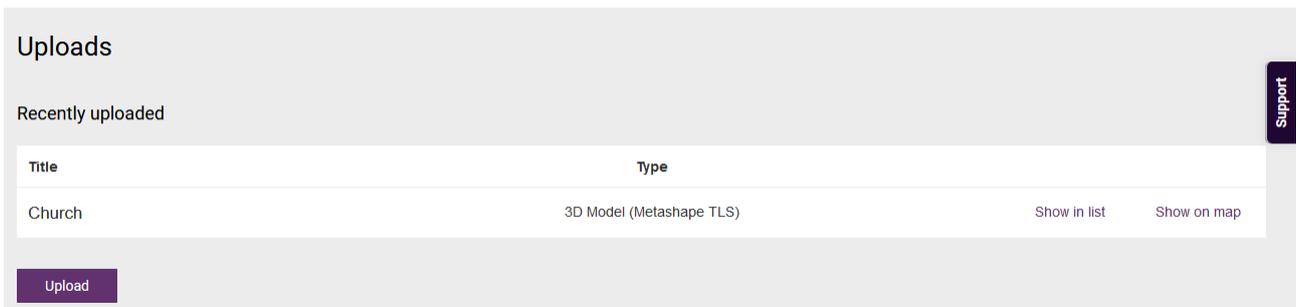


Figure 6. Recently uploaded

The main content of the page is the list of uploaded layers (fig. 7). You can also click on the “Load layer” button in the “Layers” section to load a new layer.

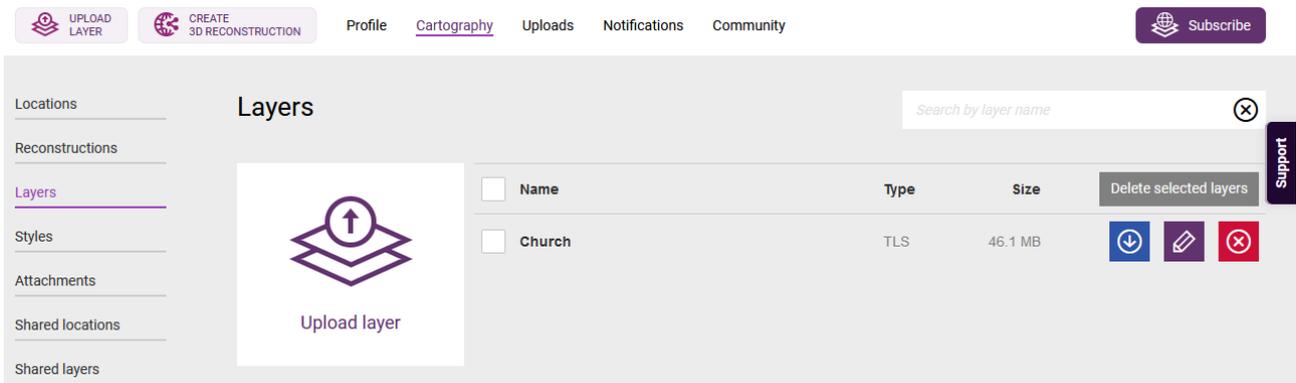


Figure 7. Section “Layers”

There are operations which are available for each layer:



To display a layer on the surface of a virtual globe click on the layer name in the list.

3.2 Create location

Location – the representation of grouped data of layers and attachments that are in a single geospace.

In order to create a location you need to select the appropriate menu section called “Locations”. This page contains all the locations you have created (fig. 8).

To create a new location, you need to click on the “Create location” button.

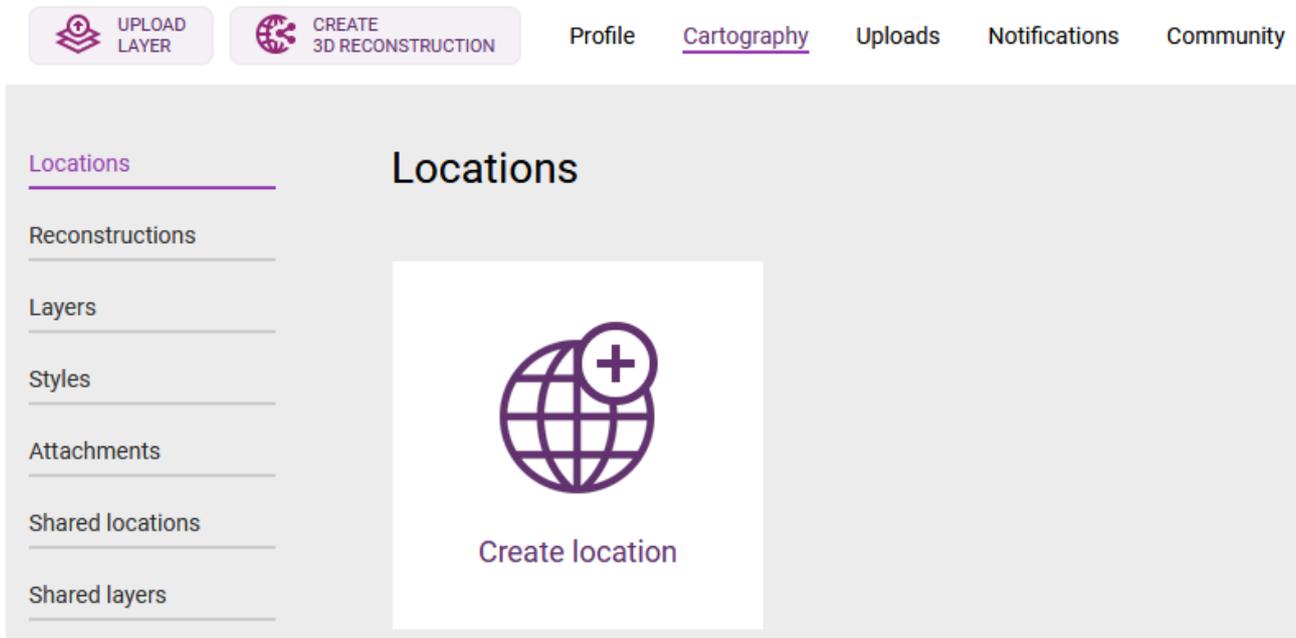


Figure 8. Page “Locations”

Fill in all required fields and click “Create” button (fig. 9).

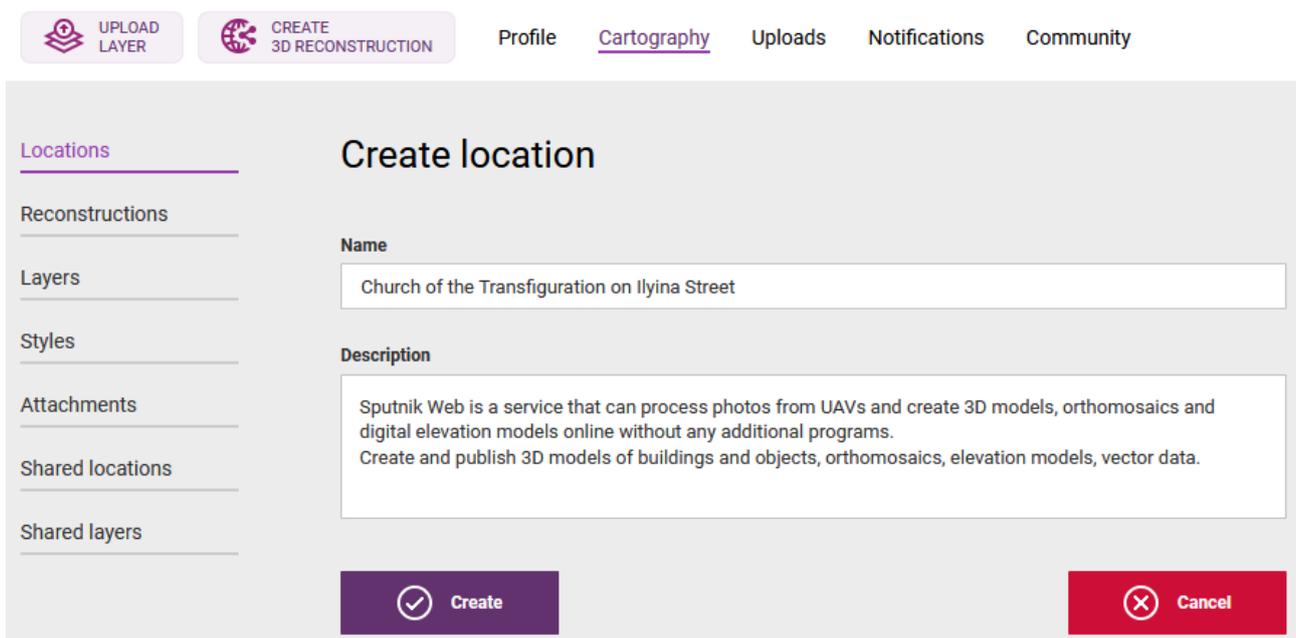


Figure 9. Create location

After the location is created you will be redirected to the page “Edit the location”.

3.3 Edit location

On “Edit the location” page you can edit the name and description, manage access to the location, add/upload layers, upload attachments (fig. 10). In order to delete layer or attachment click the “Delete” button.

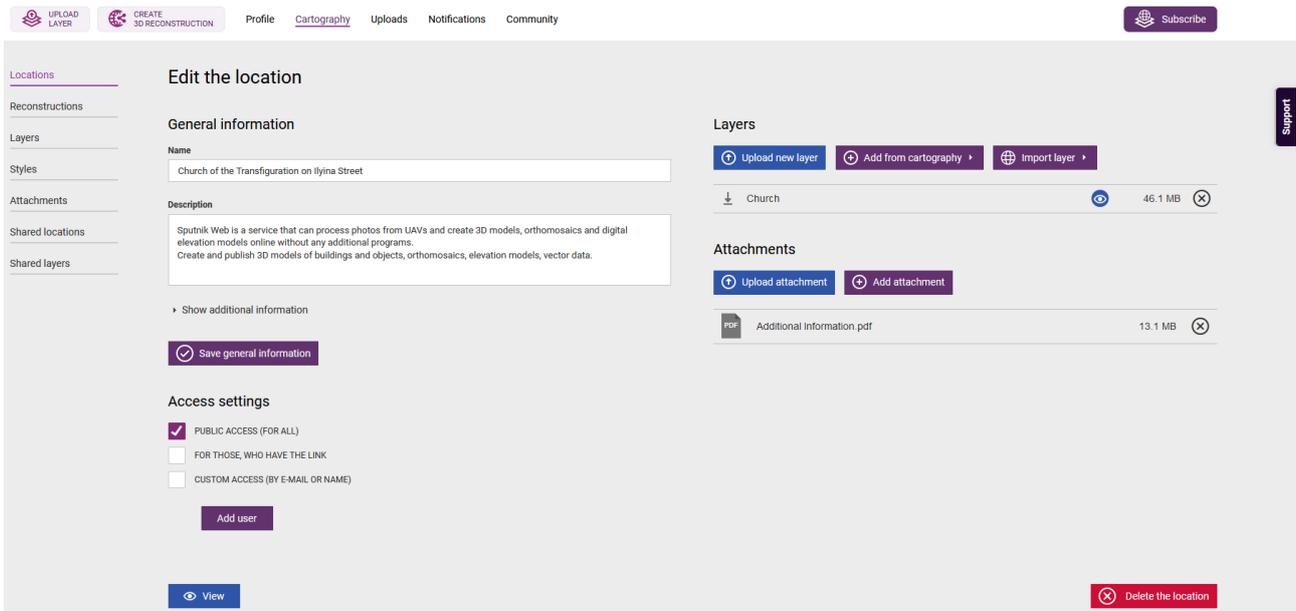


Figure 10. Location editing

To manage access, select the desired item from the “Access settings” menu.

To configure access to location for a specific user select “Custom access” and click on the “Add user” button, enter in the field the name or e-mail of the user to whom you want to grant access to the location and data in it. After that click on save button (fig. 11).



Figure 11. Custom access

Additional information data can be uploaded to the location as an attachment. Click on the “Upload attachment” button, select the desired file and click “Upload” button. Description and attachments are displayed in the side menu of the map (fig. 12).

You always can see the list of attachments and download required files.

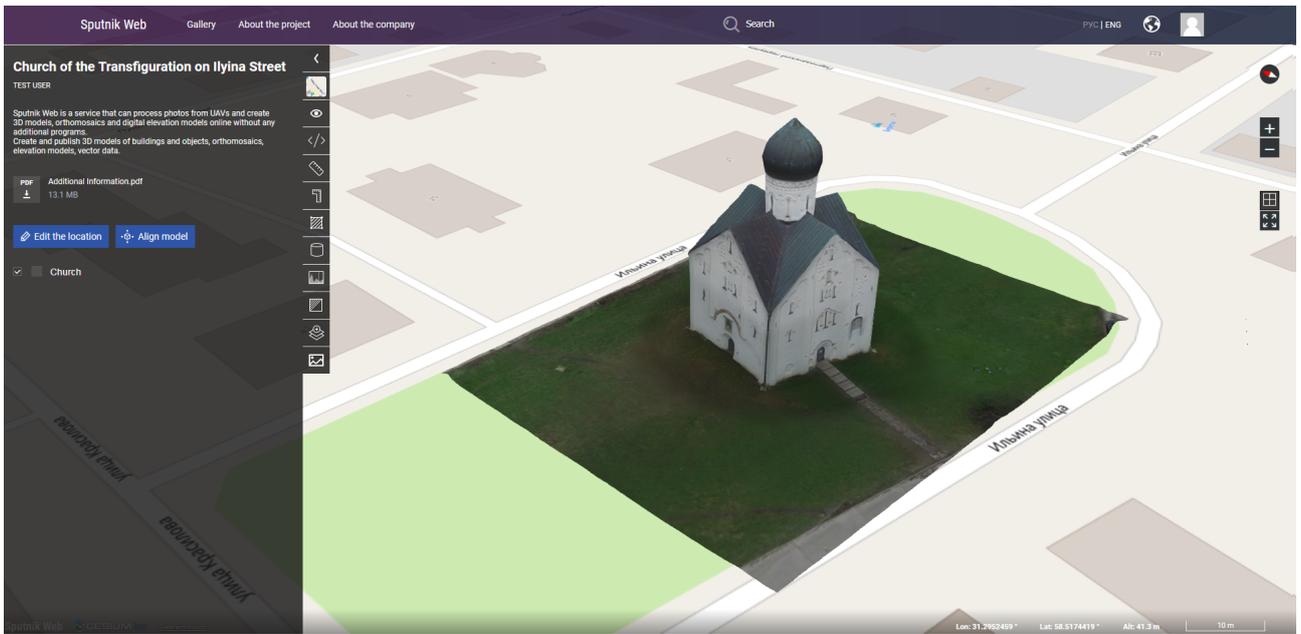


Figure 12. View location

4 Prices

Sputnik Web is able to create 3D model of terrain, building or other object using your photographs. The cost of using the service consists of two components:

- **Hosting.** Disk space required to store primary data, processed or downloaded models. You can buy an additional amount of disk space according to tariff plan
- **Gigapixels (GPix).** Gigapixels are calculated by following formula:

$$\frac{\frac{xy}{1000000}z}{1000} = GPix,$$

where x - length (Px), y - width (Px),
 z - number of photos

Example:

You have 100 photos with resolution of 4600 x 3448.

$$\frac{4600 * 3448}{1000000} = 15.8MPix,$$

$$\frac{15.8 * 100}{1000} = 1.58GPix$$

Taking into account these two parameters you are able to estimate the necessary tariff plan.

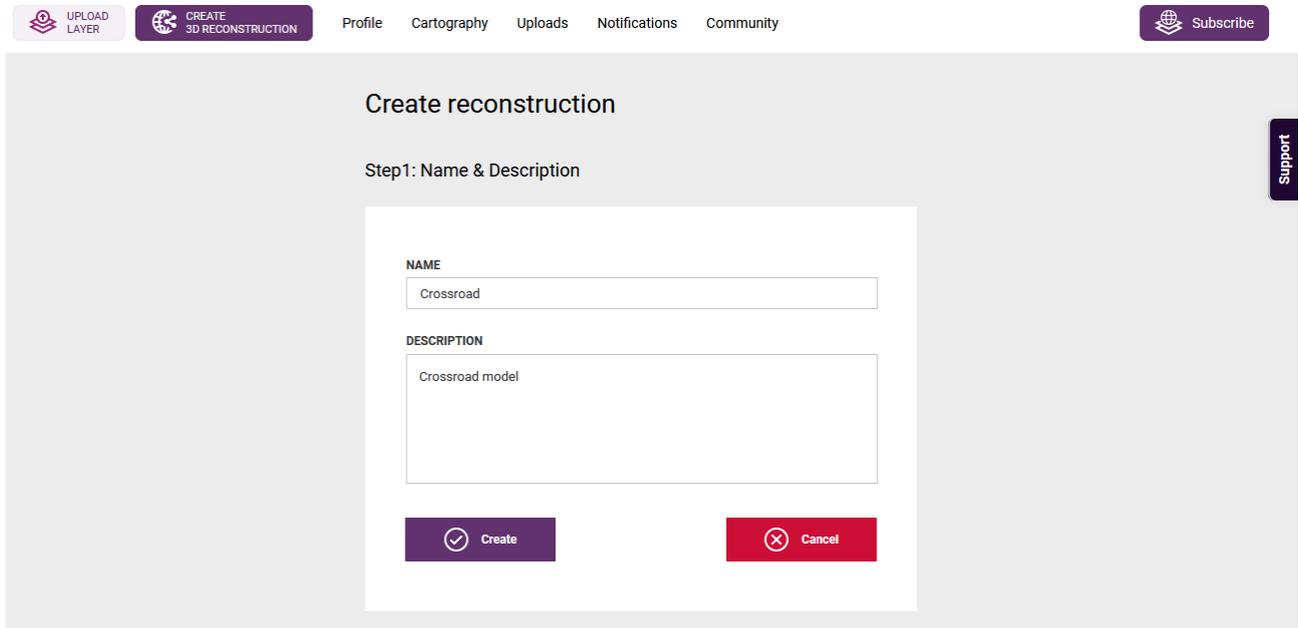
Starting Subscription provides you with 1 GPix for trial processing. In order to expand the volume of storage and processing resources it is necessary to pay in accordance with a suitable tariff plan.

It is noteworthy that if there is a certain amount of GPix on your account, a part of them will be written off after a project processing (according to calculations).

5 Image processing and creating 3D-model

In order to process images you need to visit a page “[Creating 3D reconstruction](#)”.

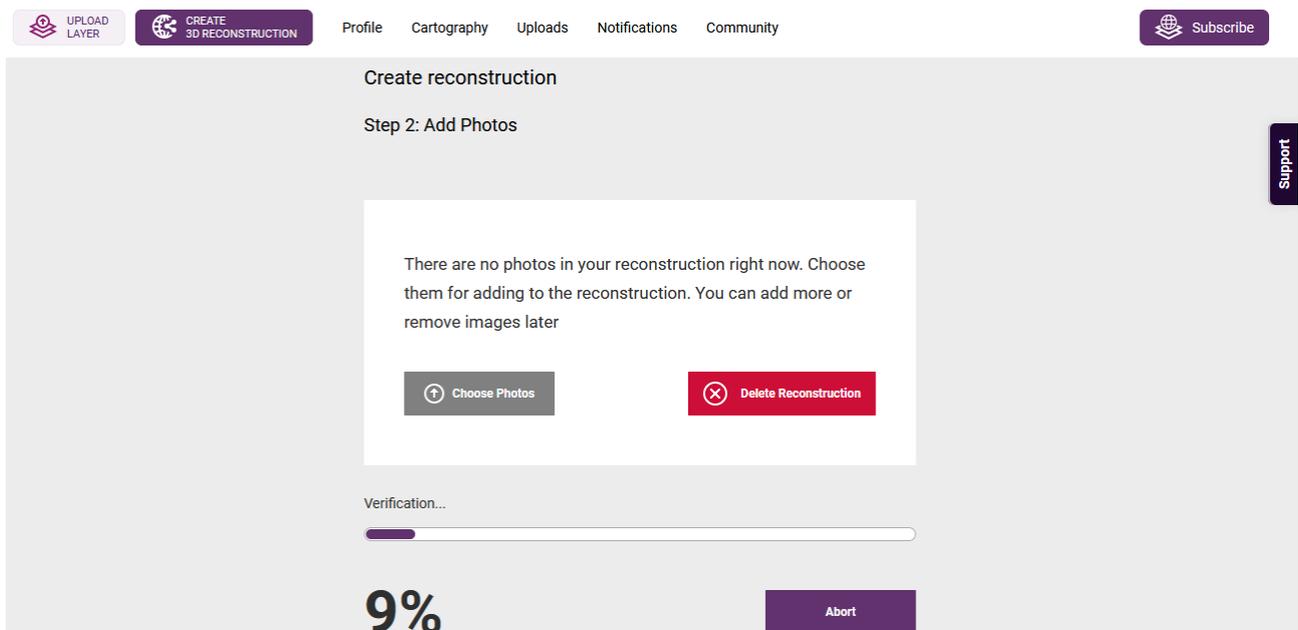
Enter reconstruction name and description and move to the next page (fig. 13).



The screenshot shows the 'Create reconstruction' interface. At the top, there is a navigation bar with 'UPLOAD LAYER' and 'CREATE 3D RECONSTRUCTION' buttons, and links for 'Profile', 'Cartography', 'Uploads', 'Notifications', and 'Community'. A 'Subscribe' button is also present. The main content area is titled 'Create reconstruction' and 'Step 1: Name & Description'. It features a form with two input fields: 'NAME' containing 'Crossroad' and 'DESCRIPTION' containing 'Crossroad model'. Below the form are two buttons: a purple 'Create' button with a checkmark icon and a red 'Cancel' button with an 'X' icon. A vertical 'Support' button is on the right side.

Figure 13. Creating 3D reconstruction

You need to select photos for reconstruction (fig. 14). After files are selected and uploaded, photos are being reconciled with requirements. If something goes wrong the system will notify you. Photos which do not meet the requirements will be excluded from the reconstruction list.



The screenshot shows the 'Create reconstruction' interface at 'Step 2: Add Photos'. The navigation bar is the same as in Figure 13. The main content area is titled 'Create reconstruction' and 'Step 2: Add Photos'. It displays a message: 'There are no photos in your reconstruction right now. Choose them for adding to the reconstruction. You can add more or remove images later'. Below the message are two buttons: a grey 'Choose Photos' button with a plus icon and a red 'Delete Reconstruction' button with an 'X' icon. At the bottom, there is a 'Verification...' progress bar showing 9% completion, with an 'Abort' button next to it. A vertical 'Support' button is on the right side.

Figure 14. Validation of photos

At the next step, photographs can be excluded from the list of reconstruction or supplement the reconstruction with other photographs.

After validation is finished the photos can be sent for processing using the button “Start reconstruction” (fig. 15).

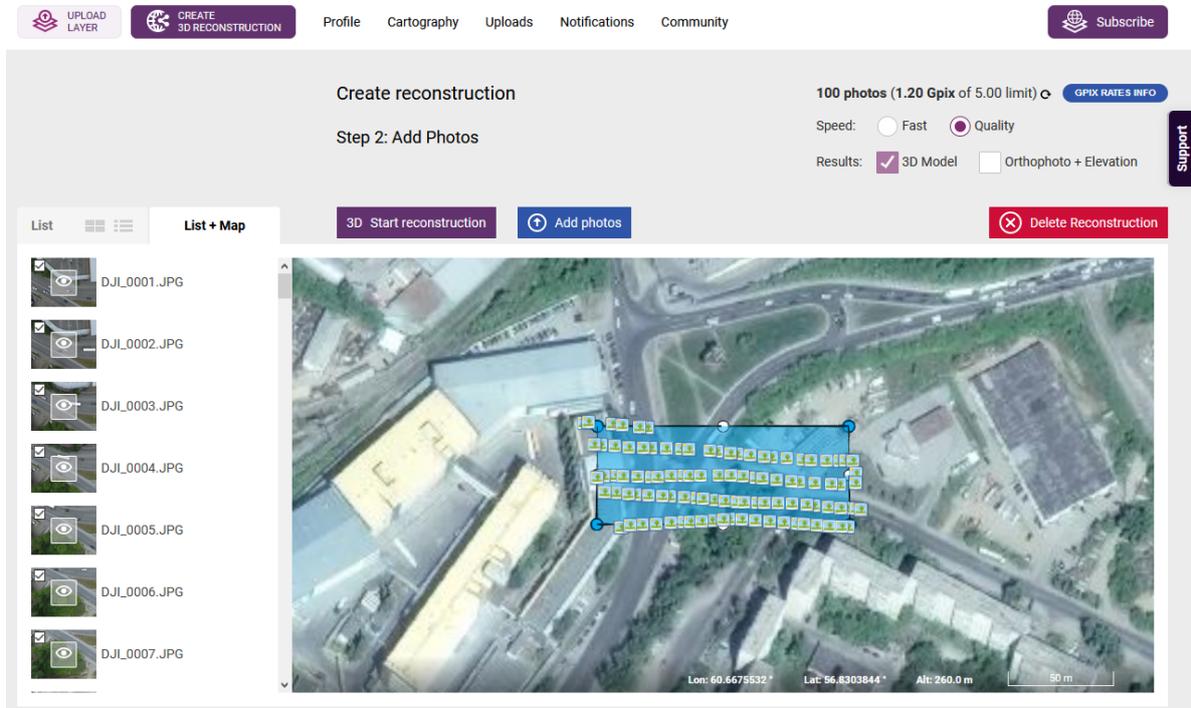


Figure 15. Image selection

This process takes some time and depends on the number of photos and the complexity of the project (fig. 16).

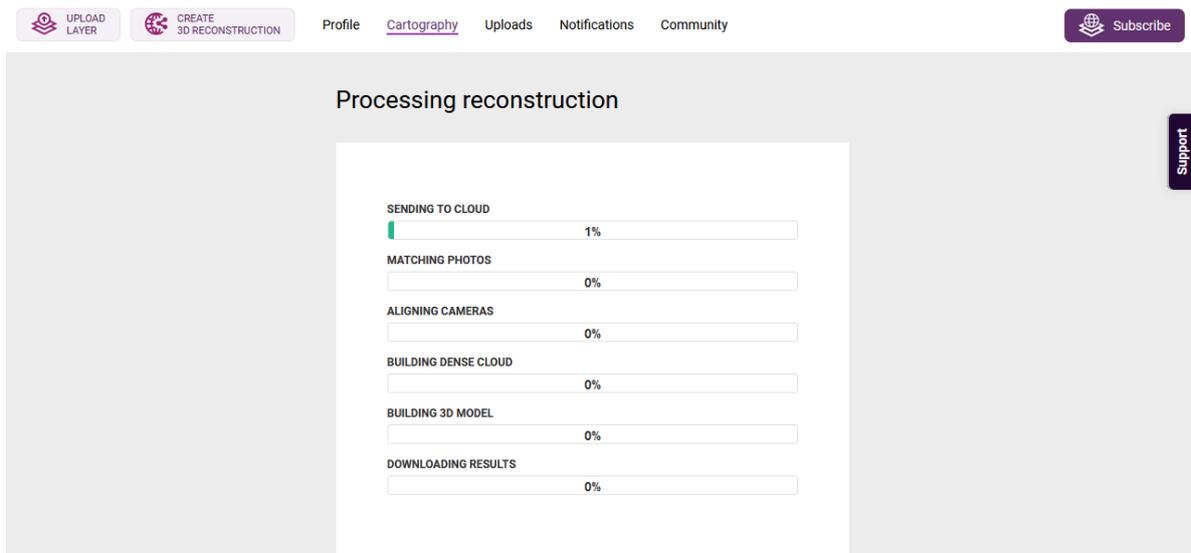


Figure 16. Processing reconstruction

After processing is finished you can select a tab “Location” or “Layer” and see the assembled model as a result.

6 Interface navigation

If you open a location or layer you can see the data created by reconstruction or previously loaded data (fig. 17).

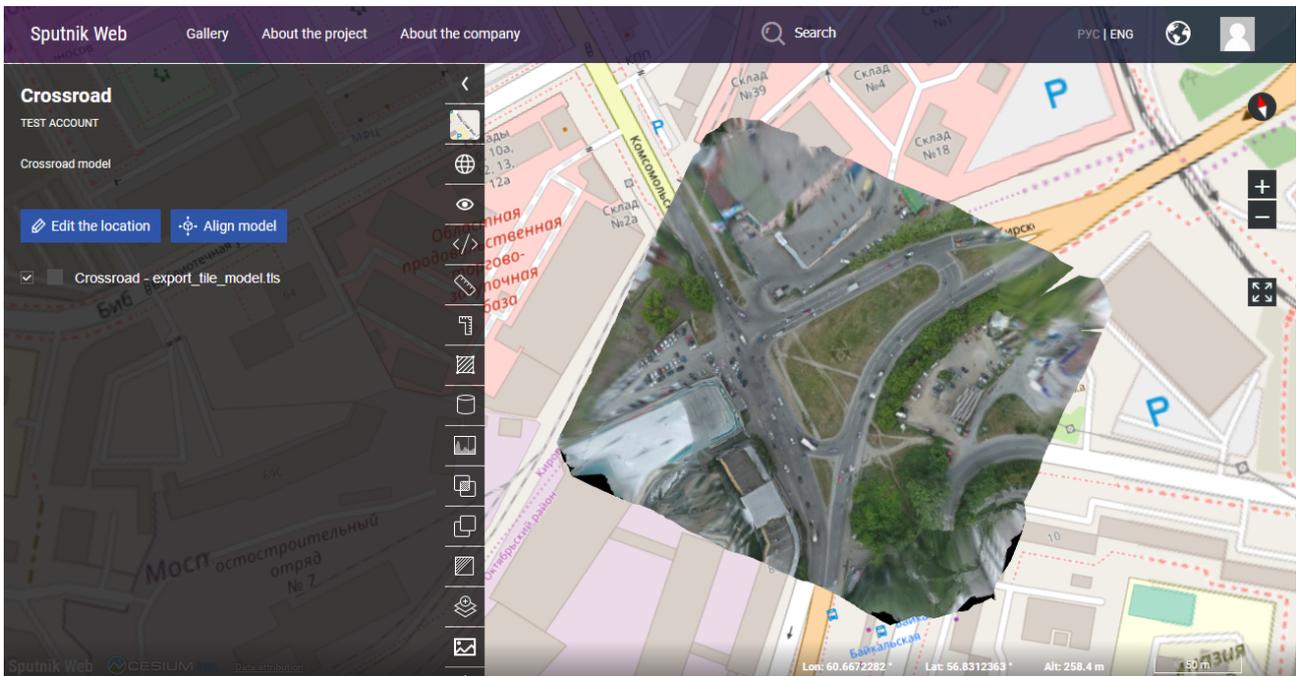


Figure 17. View reconstruction

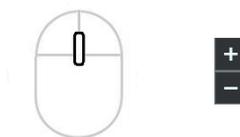
The main elements that are on the toolbar depending on the content location:

Icon	Title	Conditions
	Hide/show menu	Always on the map
	Capture the view	Always in locations
	HTML for embedding	Always in personal locations
	Ruler	Always on the map
	Vertical ruler	Always on the map
	Area	Always on the map
	Volume	Always on the map

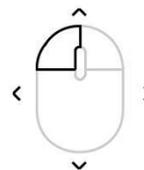
Icon	Title	Conditions
	Volumes difference	Always in locations with terrain
	Section	Always on the map
	Build isohypses	Always in locations with terrain
	Layer editor	Always in locations
	Make screenshot	Always in locations

Navigation in the interface is carried out using the following buttons:

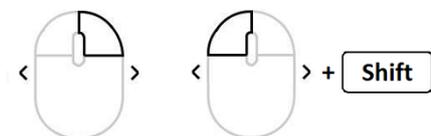
Zoom in/out



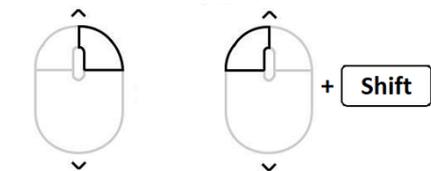
Moving (rotating the globe around its center)



Rotate clockwise/counterclockwise (rotating the globe around a point on the surface)



Changing the vertical viewing angle (rotating the globe around a point on the surface)



Camera positioning / north pointer



7 Tools

7.1 Manage layer visibility

In the menu on the left side of the page there is an edit location button. To control the visual content of the location there are check-boxes with which the displayed layers are marked. (fig. 18):

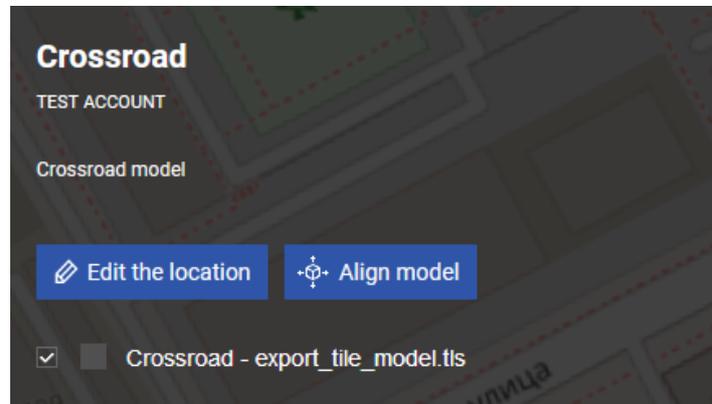


Figure 18. Contents of the location

To show or hide layers check or uncheck the corresponding layers.

7.2 TLS layer properties

Double click on the 3D model can change layer properties¹ (fig. 19):

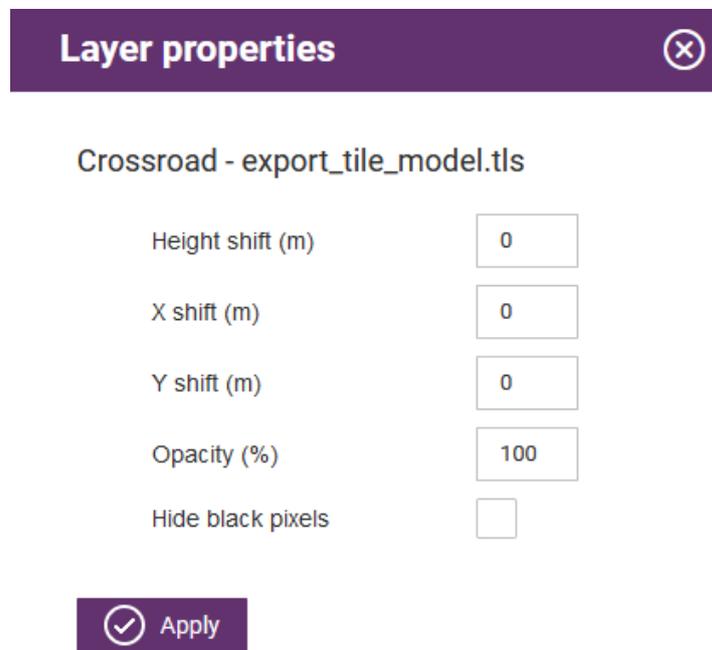


Figure 19. Layer properties

¹This functionality is available only in the TLS-layer view in the location

In the window that opens you can enter the necessary shift parameters, as well as adjust the transparency and hide the black pixels of the model.

7.3 Base layer

To select a cartographic base layer click on the icon with the corresponding element (fig. 20):

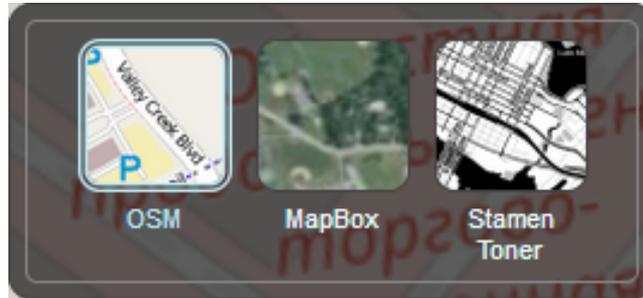


Figure 20. Base layer selection

Switch the types of cartographic base – the cartographic coverage will change according to your choice.

7.4 Capture the view

The “Locations” page displays all the locations you created.

You can set the image to preview the contents of the location. To do this go to the viewing location by clicking on the name or image of the location.

To save the cover of the location for the convenience of displaying in the general list, as well as the angle of loading the location, you must click on the button “Capture the view”  .

7.5 Embedding map

To get the code for embedding your location in your website you need to click on the button “HTML for embedding” with the icon  . After that pop-up with parameters and html-code will open.

You have the opportunity to choose the necessary embedding parameters (fig. 21). After that you can select the html-code and insert into the code of the page on which you want to display the model.

HTML for embedding ✕

- Can move
- Map autoplay
- Constrain maximum camera distance (m)

```
<iframe allowfullscreen="allowfullscreen" style="border: none;"
src="https://soutnik.aeoscan.aero/embedded
/idl?ll=26.420349604%2C-108.618752011&z=39.24&
heading=5.128&pitch=-1.565&roll=0.000&mode2D=false&
```

Figure 21. HTML for embedding

7.6 Ruler

To measure the model size you can use the “Ruler tool” .

Simply click once on one point on a map, then click again on the second point. The real distance between the points should then be displayed (fig. 22).

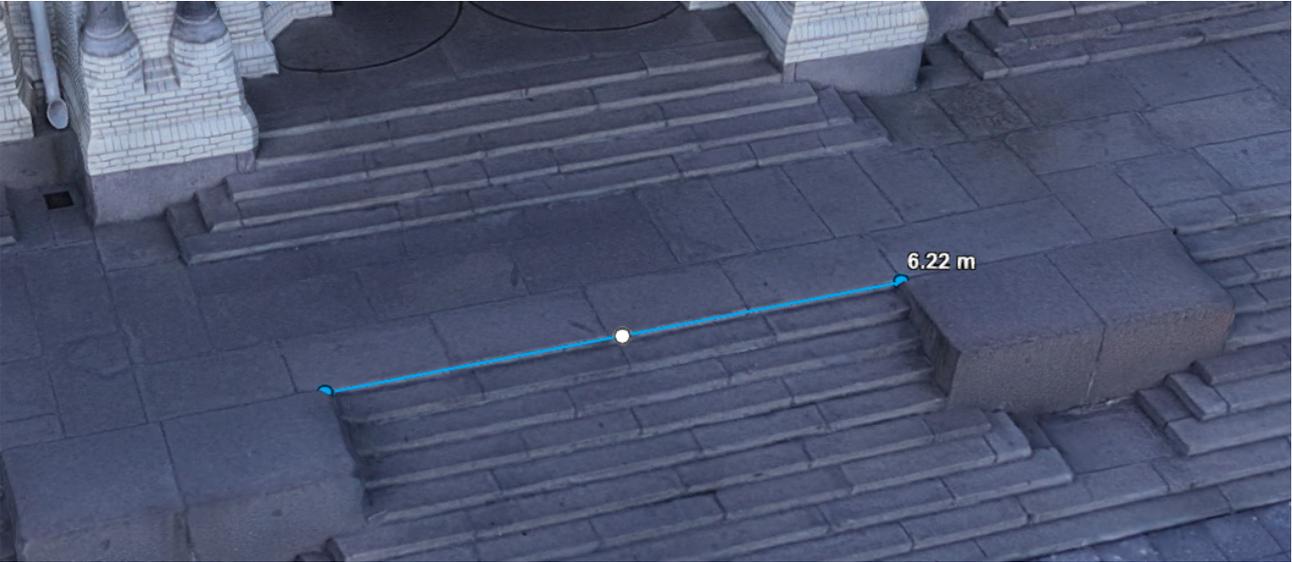


Figure 22. Ruler measurement

The position of the points can be changed by clicking on the marked point and moving it to the required place on the map. It is also possible to continue the measurements, sequentially marking points on the map for subsequent segments.

If you want to delete a point just click on the desired point with the right mouse button.

7.7 Vertical ruler



You can use the “Vertical ruler” tool to measure the excess, horizontal position, shortest distance and slopes between two points of the model (fig. 23).

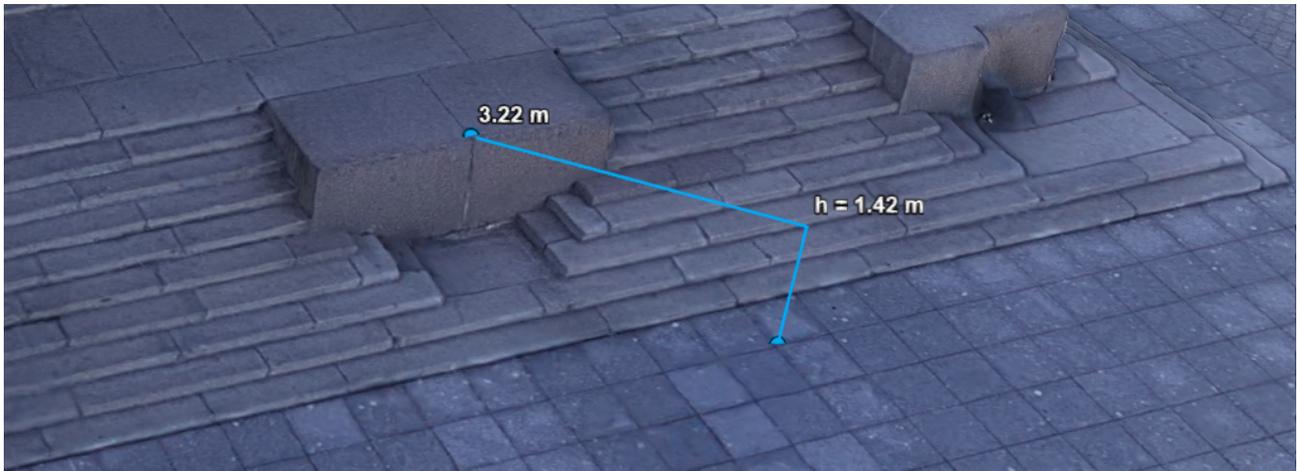


Figure 23. Vertical ruler measurement

7.8 Area

The area measurement tool allows you to measure the area on the model surface. To measure the area you need at least three points.



Select the area measurement tool, and then successively press to highlight the polygon to count (fig. 24).

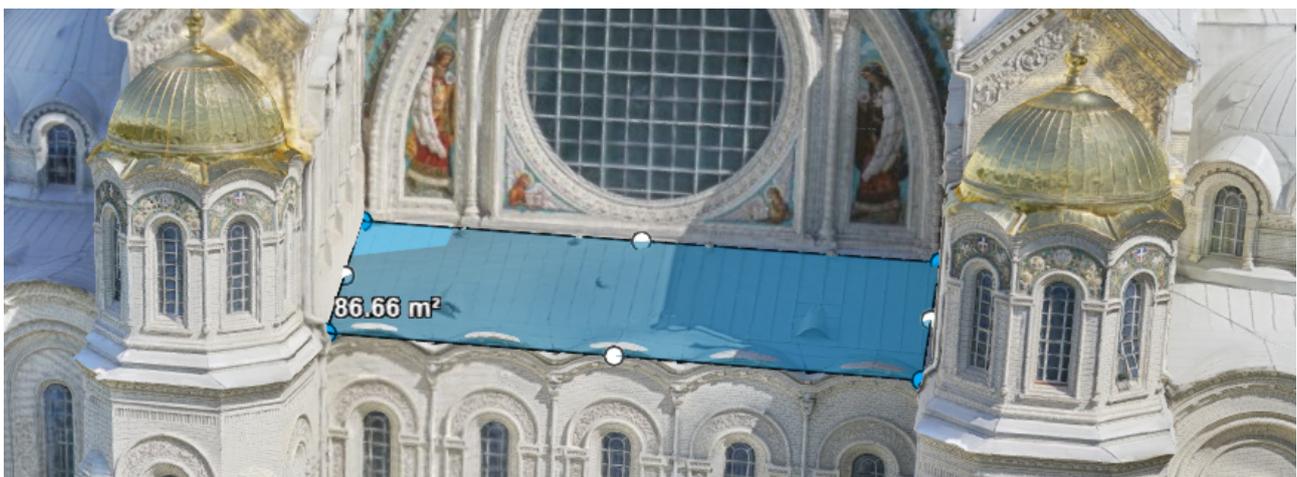


Figure 24. Area measurement

7.9 Volume and volumes difference

You can use the volume calculation tool to measure the volume of terrain elements or 3D models .

Select a tool, in the tool parameters window set the accuracy and the area of calculations from the desired surface. You can also set a flag to draw the cut/fill (fig. 25).

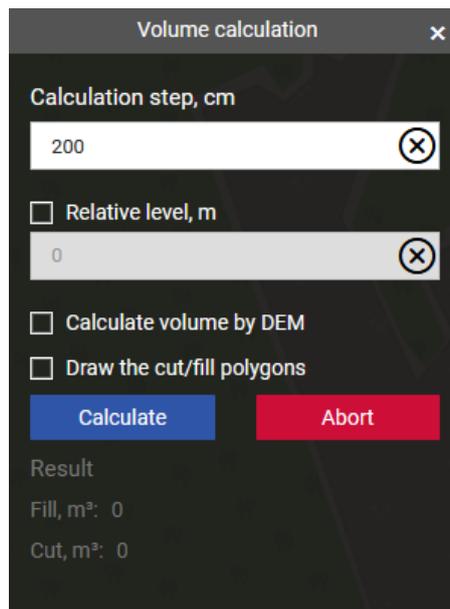


Figure 25. Volume measurement

The results of the calculation of embankment and excavation will be reflected in the corresponding block of the tool window after the end of the calculations.

With a digital elevation model (DEM) the “Calculate by DEM” flag appears, it allows you to perform a calculation based on the selected terrain layer.

The owner of the location can also save the marked polygons for repeated calculations by it. Saved polygons can be renamed and deleted (fig. 26).

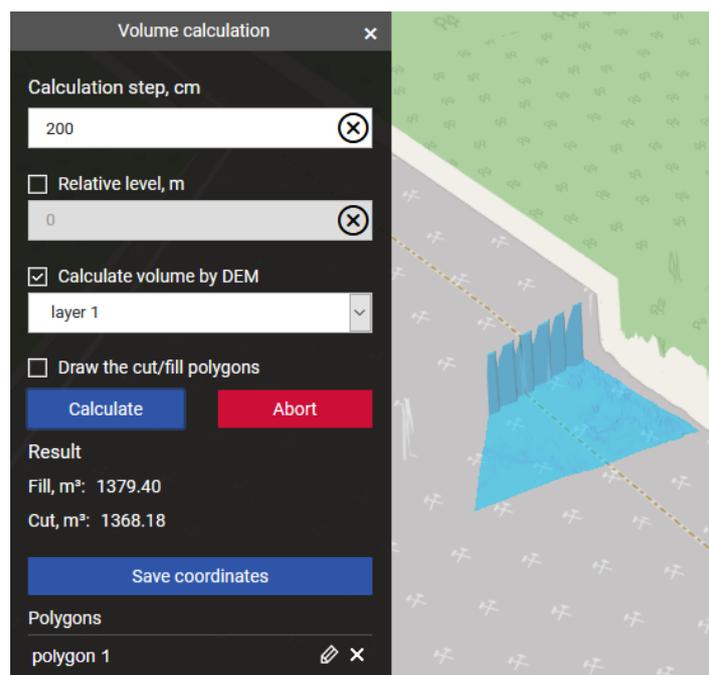


Figure 26. Volume measurement by DEM

To once again calculate the volume of the saved polygon, just click on its name – the polygon will appear on the terrain automatically. After that you can continue the calculations.

To interrupt the calculation you can click the “Abort” button, after that the calculation process will be suspended.

To reset the measurement results, you can close the tool window with a cross.

The service also includes a tool for calculating the difference volumes which is designed to analyze time-varying elements of the terrain. To activate the tool, click on the icon  in the toolbar.

Calculation parameters are also available to volumes difference tool. The only difference is that you need to choose two layers for comparison. The result of the calculations will also be displayed in the corresponding block of the tool window (fig. 27).

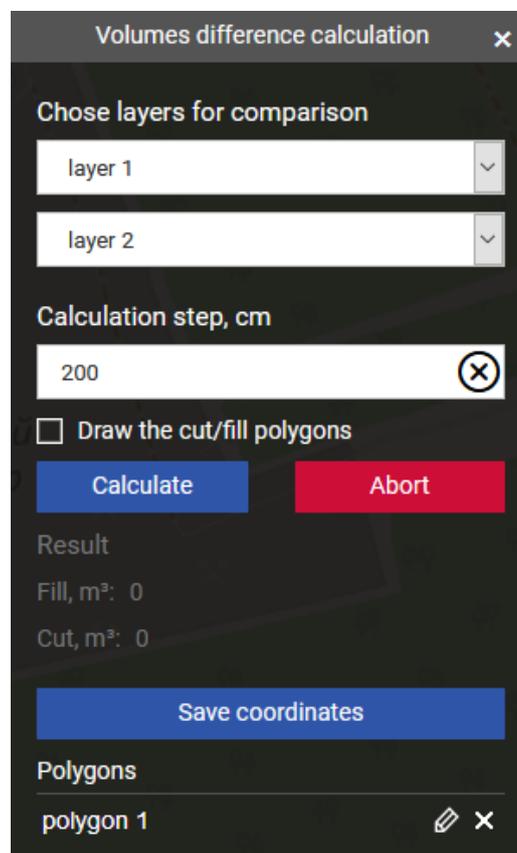


Figure 27. Volumes difference calculation

7.10 Section

The section calculation tool builds a cross section of the relief within the designated line.

Activate the tool  to do the calculation, in the tool window specify the calculation step, mark the required line and then click the “Calculate” button.

After processing the terrain profile will be displayed in the tool window (fig. 28).

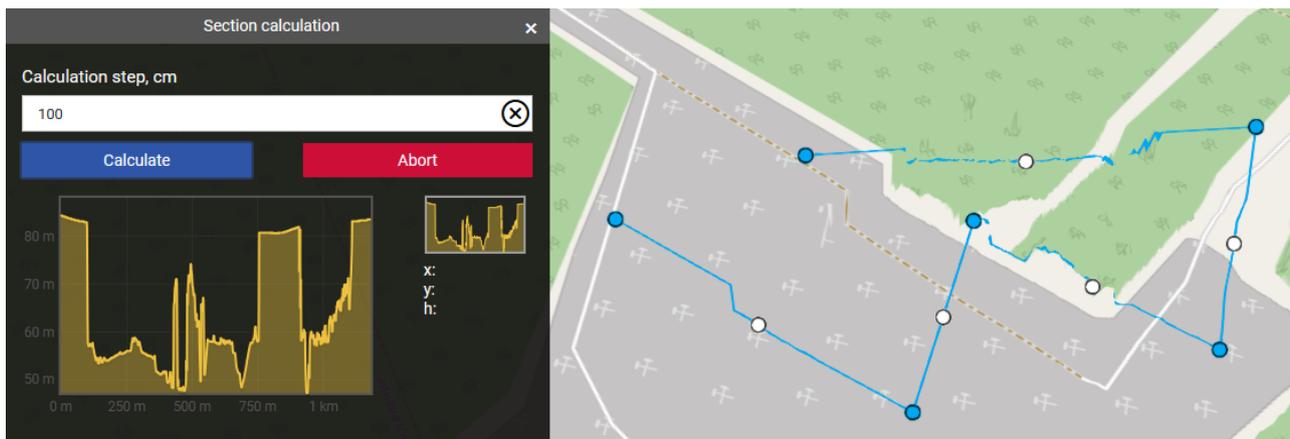


Figure 28. Section calculation

If you hover the cursor on the constructed profile the coordinates will be shown and the point will be displayed on the marked line on the relief (fig. 29).

When moving along the constructed profile the point will also be synchronously projected onto the line. Near the point its height is displayed in meters (h).

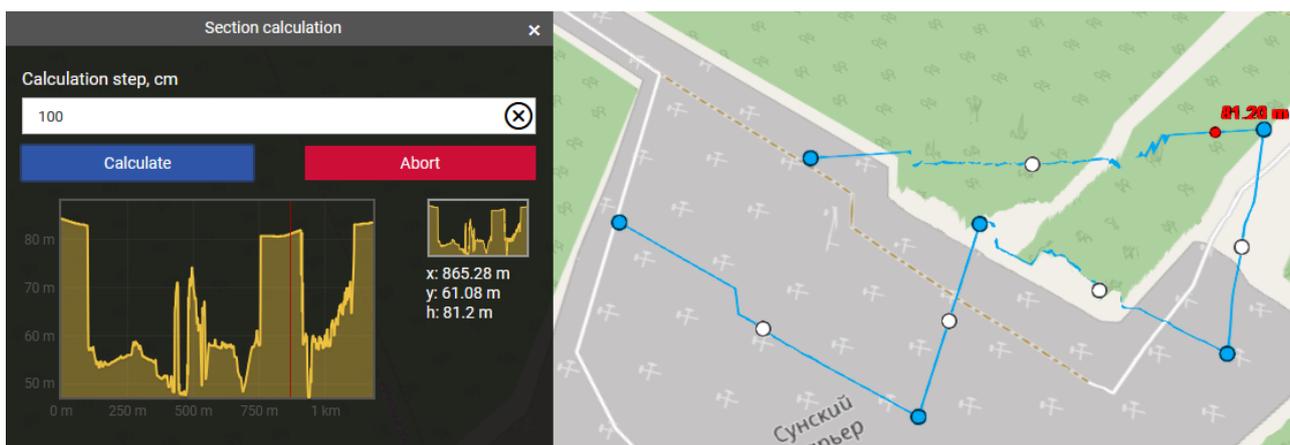


Figure 29. Analysis of the built section

Close the tool window to reset the measurement results.

7.11 Build isohypses

The isohypses construction tool is used to display on the map lines connecting points with the same height.

To create isolines select the tool , in the tool window specify the calculation step and initial height, select the desired layer, create a polygon and select "Build" button (fig. 30).

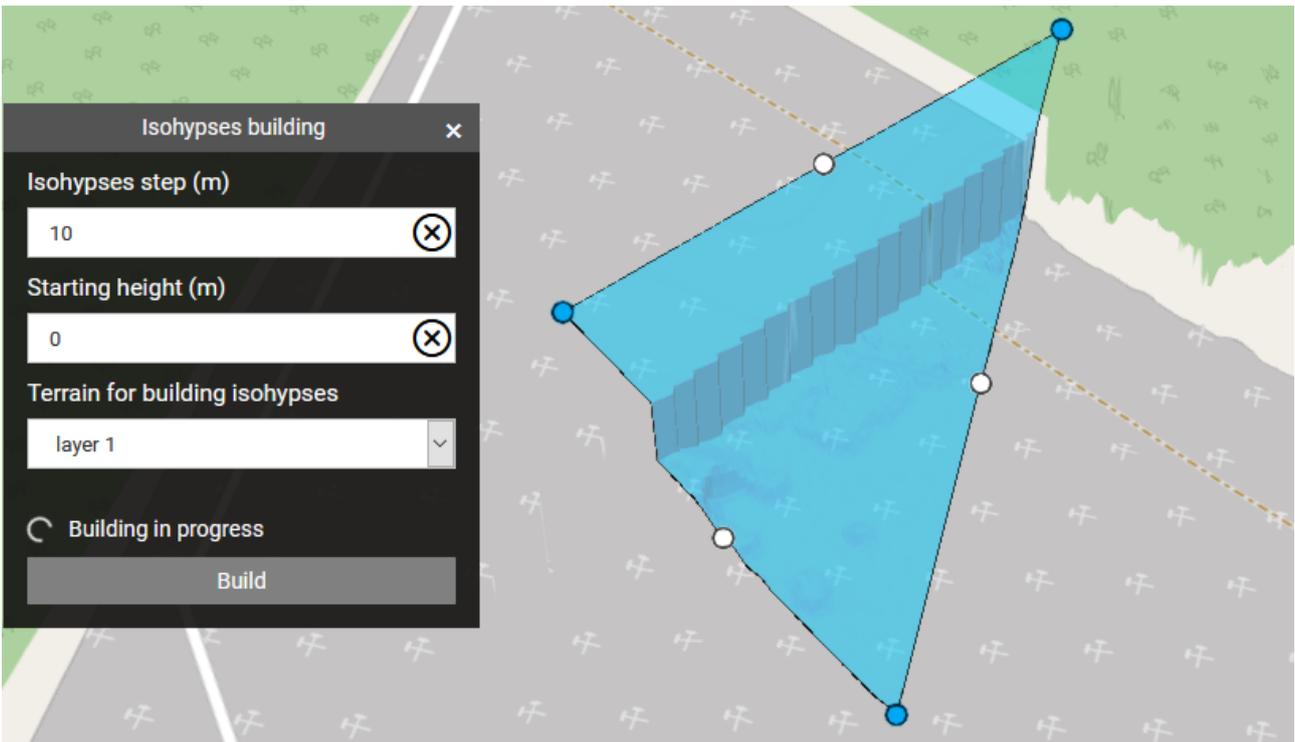


Figure 30. Build isohyps

A separate layer with the constructed isohypse will be created after the building is completed (fig. 31).

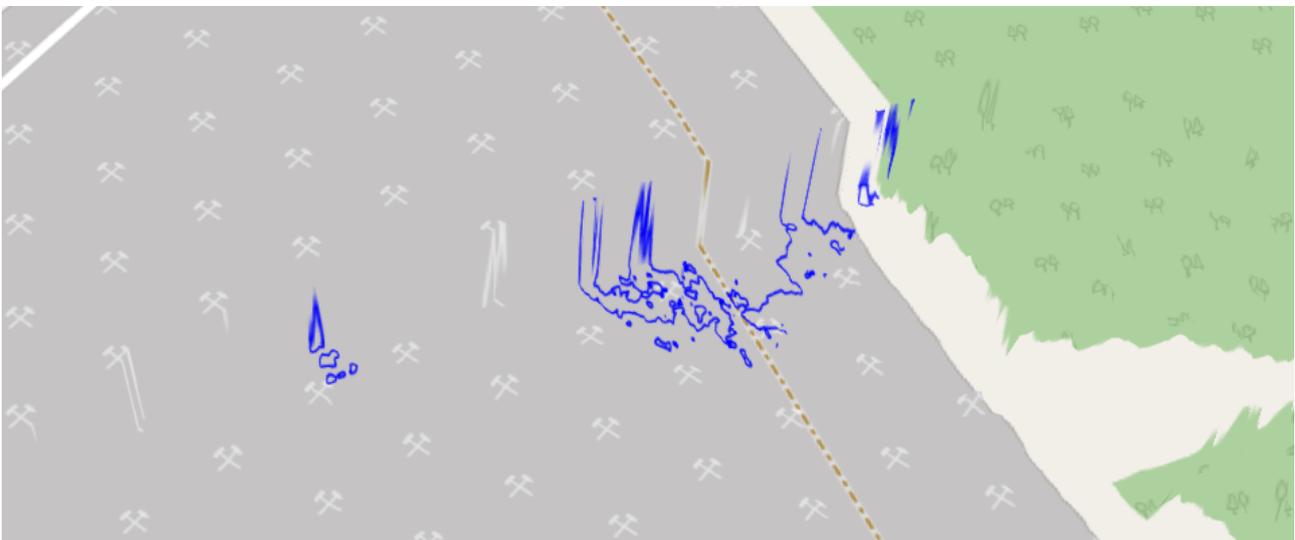


Figure 31. Result of building

7.12 Layer editor

This functionality is available in any location created by the user and it allows you to create vector geometric layers with attributes.

Using the layer editor you can draw elements of the following types:

- **Point.** It may contain a name and description, you can adjust the height mode and extruded height;
- **Line.** It also may contain a name, description, settings of the height mode and extruded height, and you can set the line style (line color, line width, extruded color, fill opacity);
- **Polygon.** It has similar parameters and settings as for the line.

You must open your location to use the tool to create vector layers. Then activate the

“Layer Editor” tool  .

Select the item to add to the map in the tool window. All saved items will be reflected in the “Elements list” (fig. 32).

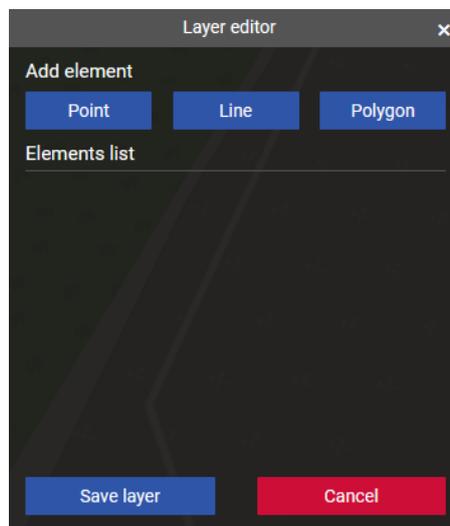


Figure 32. Layer editor

Element “Point” creates a point on the map by clicking the left mouse button. You can set the point display parameters in the tool window by switching the tabs and setting the desired values (fig. 33).

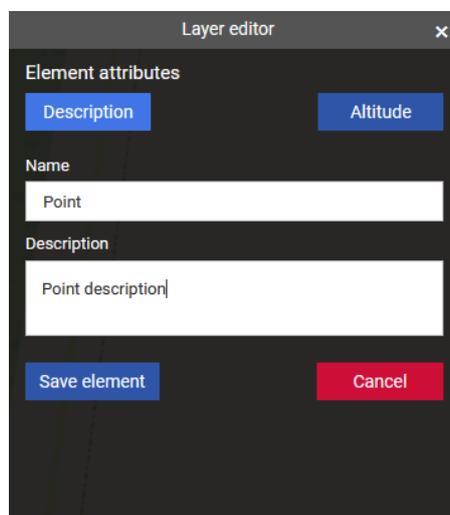


Figure 33. Element attributes

Fill in the required fields and adjust the position of the point relative to the ground or from the ellipsoid. Click “Save element” to save changes – the saved point is displayed in the list of saved items.

To create a line or polygon repeat the same steps. For these elements, it is possible to set the style: color and line width, fill color and fill opacity (fig. 34).

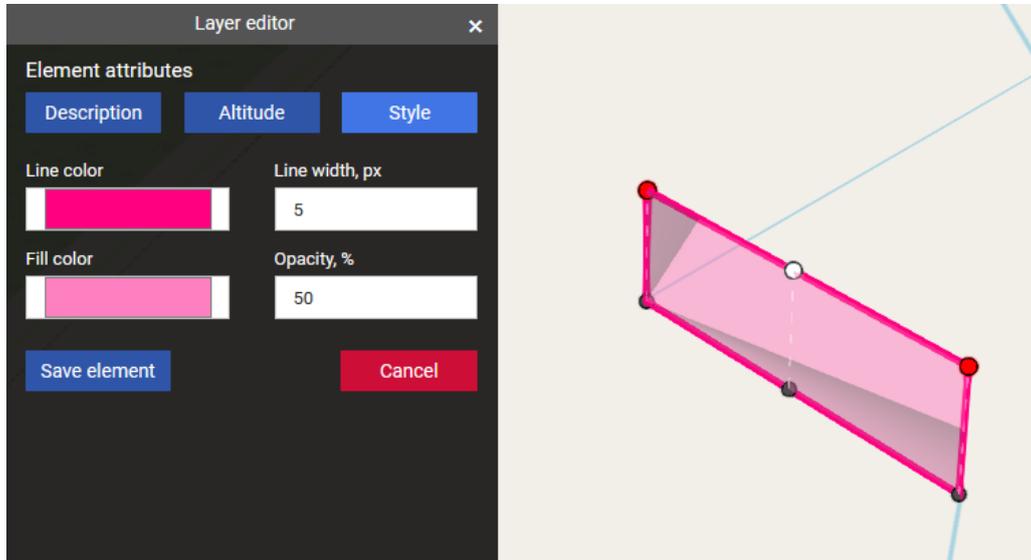


Figure 34. Style settings

Click “Save layer” in the tool window to successfully save the created vector data. Enter a layer name and save the result – a new layer with the specified name, which contains the drawn elements, will appear in the location’s content menu.

By clicking the left mouse button on the item an information window will appear with the header-name and description of the selected item (fig. 35).

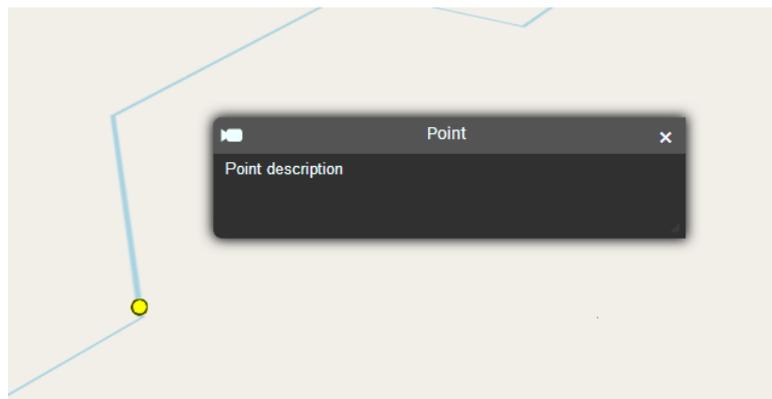


Figure 35. Information of the selected item

7.13 Make screenshot

The “Make screenshot” tool allows you to save an image of the current camera position. To save the image just click on the tool icon  .