How to set up Ground Control Points (GCP)

Ground control points orientate the model and improve the accuracy of calculated model. Minimum required number of GCPs to orientate the model is 3, however it is highly recommended you always use more than required. We advise you to set up a minimum of 10 GCPs per 10 acres (most common area size that can be mapped with a Drone on a single battery).

Use 3Dsurvey ground control target templates (http://www.3dsurvey.si/downloads/) to be used as your GCPs, place them down on the ground before the flight and measure them with a survey-grade GPS (GNSS) or a total station. Use the advanced automatic orientation in 3Dsurvey.

*In case you are not using 3Dsurvey ground control target template you can measure any characteristic point in the area of interest, such as manholes, curbs, road markings, etc. That still enables you to do the orientation in 3Dsurvey but in this case semi-automatic.

Accuracy of the end model depends on:

- Camera type

- Flying height (image resolution)

- Number of GCPs and correct setup

Best practice GCP setup

- Square areas

GCPs should be spread across the whole area as uniformly as possible and should not be placed to close to the border of the area of interest.
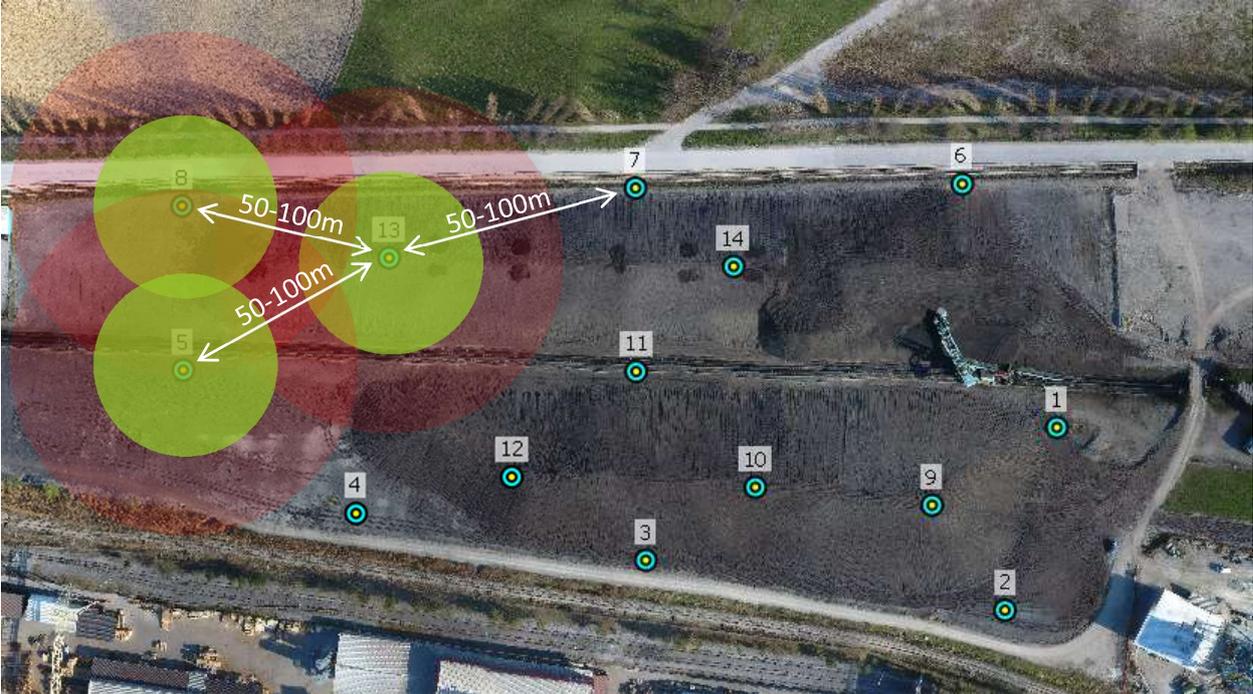

Figure 1. Good GCP setup

In case of uneven (or rugged) terrain it is highly recommended to place GCPs on both lowest and highest points of your area of interest.

To achieve survey-grade accuracy, place your GCPs 50-100 m apart. Higher density of GCPs also means higher accuracy of end results.

- **Road/Railway example of GCP setup**

To achieve survey-grade accuracy (up to 4 cm) we advise to set up GCPS in pairs every 50 – 100 m – one to the left and one to the right of the object of interest (road, railway, river bank, etc). This will provide you with a stable and consistent accuracy across the whole area – around the pairs as well as between them.

Figure 4. Good GCP setup

- See the following tutorial for further guidance on how to set up GCPs: http://www.3dsurvey.si/tutorials/ground-control-targets-setup