Collecting Imagery For Great 3D Models

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In aerial mapping, it's usually best to collect your images with your camera pointing straight down (nadir) in an automated grid pattern with the necessary amount of overlap. We recommend using our Skycatch Flight app if you fly DJI drones for easy mission planning and execution. If you're not using a compatible DJI drone, we recommend reviewing our data capture guidelines for more details.

However, to get a perfect 3D model of a structure or building, you'll also need to include oblique photos to capture the sides of vertical objects.

Below we've outlined three easy steps as the best method for ensuring you have the right images and coverage to generate amazing 3D models.

Step 1 - Collect a set of nadir images

To start, fly the area of interest to get a set of nadir images, using the same overlap, altitude, and grid pattern as if you were collecting imagery for an aerial map. Skycatch COMMANDER for DJI is great for this step if you have a compatible drone.

Step 2 - Collect a set of oblique images

The next step after collecting your nadir imagery is to collect oblique photos with a minimum of 60% overlap. You can do this by adjusting your camera to a 45 degree angle and fly at the same altitude as your nadir images in a circle around the structure with the camera pointing at the base of the object of interest.

If you're flying with a DJI drone, we recommend opening up the DJI Go app and using tilt control to tilt the camera 45 degrees. It’s helpful to get more of the subject in the field of view as opposed to less so you don’t want to be too close to the object. You may need to make adjustments based on size of structure. We recommend avoiding flying closer than 20ft or farther than 100ft.

If the object is taller and is difficult to fit into the shot vertically, a second orbit at a higher altitude should be performed. We would recommend using a camera tilt of 60 degrees (where 0 degrees is the horizon and 90 degrees is pointing straight

down). You'll want to avoid including any of the horizon or surrounding landscape in your oblique photos as this can cause suboptimal photo stitching.

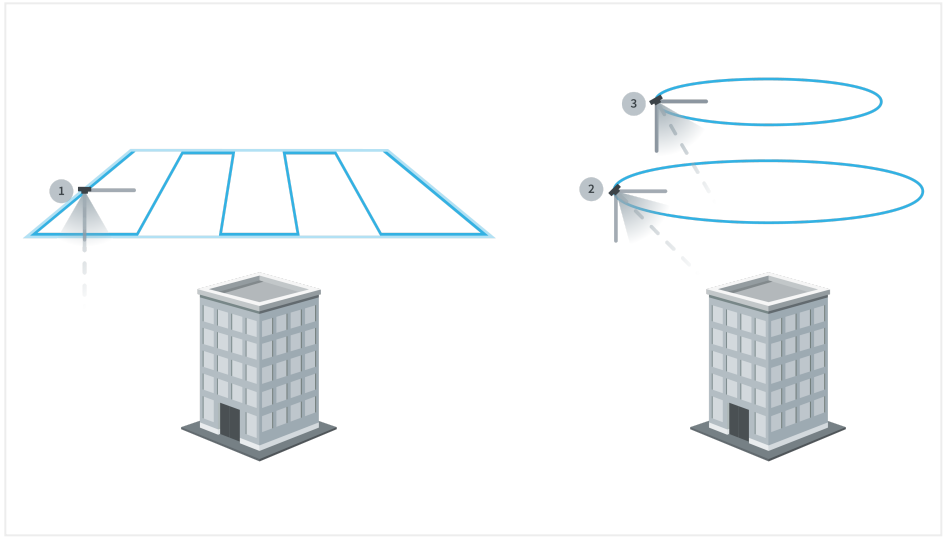


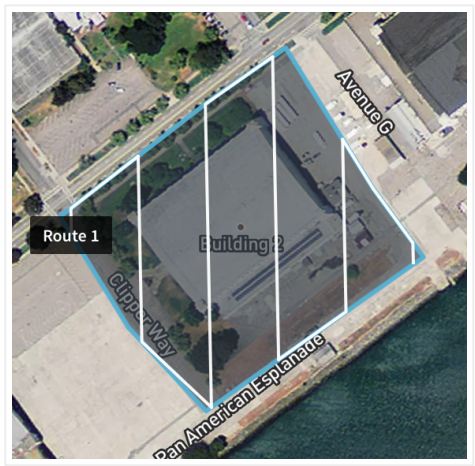
Diagram showing flight plans for nadir images (1), oblique images (2), and an optional set of oblique images at a higher altitude (3)

Step 3 (optional) - Collect nadir imagery in crosshatch pattern

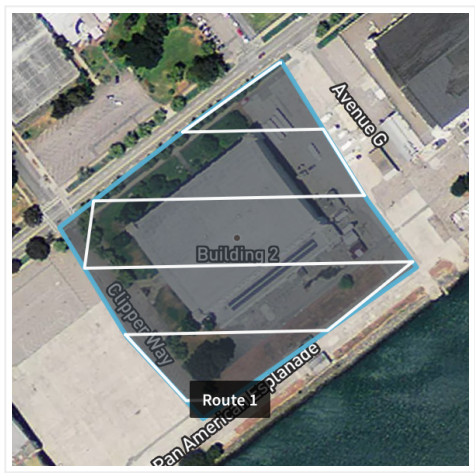
As an optional but very useful step, you can fly your mission area twice using the "crosshatch" method. Adding an extra nadir mission will help for areas with a large amount of vertical variation (such that doing step 2 for every vertical object would be too time-consuming).

It works like this: re-fly this area at the same overlap and altitude as your first nadir mission but adjust your mission plan so the legs of your new flight are at 90 degree angles to your first mission.

The images below illustrate this concept. We've set the first mission for a North/South orientation and the second mission for an East/West orientation, thus achieving 90-degree offset between each mission. You should now have images that you've collected in a "cross hatch" grid pattern.



North/South orientation



East/West orientation

Submit your images for processing

Login to your Skycatch account at app.skycatch.com to upload your photos for processing. Upload your nadir and oblique images together so they'll be

processed together into one model. You can find further instructions here for details on how to upload your photos.

Check out and share your 3D model!

Once your map has finished processing, you can view your model using the 3D point cloud or 3D mesh viewer directly in your web browser on your Skycatch account. You can also download your LAS or OBJ files to view in other software or apps as well!

Share your 3D mesh model by using the public share link. Public share links do not require a Skycatch account to view the model. When viewing your 3D model in the Skycatch viewer, click the "Share" button in the upper right hand corner to get the URL!

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