# Using Drone Captures to Track Construction Progress

## Why drone captures have become essential for construction progress tracking

Construction projects move fast, and keeping everyone on the same page about what has been completed and what is behind schedule is a constant challenge. Traditional progress tracking methods - paper logs, static photos, and manual reports - often fail to capture the full picture. They can be slow to compile, hard to share across teams, and prone to human error. Drone captures offer a practical alternative. By flying a drone over a construction site on a regular basis, project managers can collect detailed aerial imagery that shows exactly how work is progressing. This approach saves time, reduces disputes, and gives stakeholders a clear, objective record of what was done by each flight date.

To get the most out of drone progress tracking, you need a systematic process. It is not enough to simply fly a drone and look at the pictures. You need a consistent workflow that ensures every capture is useful, comparable, and easy to share. The steps below outline a practical method for using drone captures to monitor construction progress effectively.

## Step 1: Plan your flight schedule and ground control points

The first step is to decide how often you will fly and where you will place ground control points. For most construction projects, a weekly or biweekly flight schedule works well. This cadence gives you enough data to spot trends without overwhelming your team with images. Pick a consistent time of day - early morning or late afternoon often provides the best light and reduces shadows that can obscure details.

Ground control points are physical markers placed around the site that the drone can see. They help ensure that every set of images aligns perfectly with the previous one. Without them, you might struggle to compare two captures taken weeks apart. Place markers at fixed locations that will not be disturbed by construction activity, such as corners of existing structures or permanent survey points. Record their GPS coordinates so you can reference them later.




## Step 2: Conduct the site capture

On each flight date, fly the drone over the entire construction site. Use a flight planning app to set a consistent grid pattern and altitude so every capture covers the same area from the same height. This consistency is critical for later comparison. The drone should take overlapping images - typically 70 to 80 percent overlap - so the software can stitch them together into an orthomosaic. An orthomosaic is a geometrically corrected, high-resolution map of the site that shows everything in its true position.

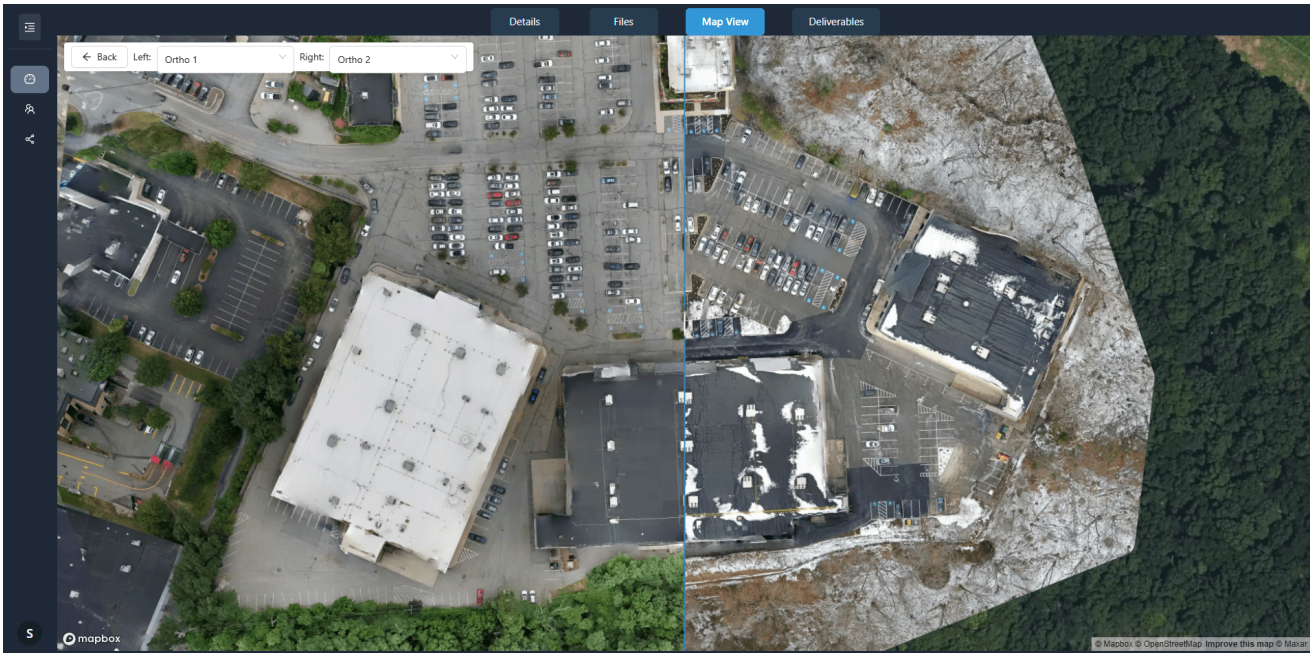
During the flight, watch for obstacles like cranes, scaffolding, or new structures that might have appeared since the last flight. Adjust the flight path as needed to avoid collisions. If the site is large or complex, you may need multiple flights to cover it completely. Always check the weather before flying; high winds or rain can ruin the data and damage the drone.

## Step 3: Process the images into an orthomosaic and 3D model

Once the flight is complete, transfer the images to a computer and run them through photogrammetry software. This software uses the overlapping images and the ground control points to create an orthomosaic and, optionally, a digital surface model or 3D model. The orthomosaic serves as a detailed, measurable map of the site. You can use it to measure distances, areas, and volumes - for example, how much earth has been moved or how far a foundation extends.

Processing can take anywhere from a few hours to a day, depending on the number of images and the resolution you need. While it runs, you can note the flight date on a project timeline so

everyone knows when the data was collected. The processed outputs give you a permanent, objective record of the site at that moment in time.




## Step 4: Compare captures over time

This is where drone progress tracking really shines. Load two or more orthomosaics taken on different flight dates into a comparison tool. Overlay them to see exactly what has changed. This process is called change detection. You can highlight areas where new foundations have been poured, walls have gone up, or grading has been completed. The software can even calculate the volume of material added or removed, which is useful for tracking earthmoving progress.

When comparing captures, pay attention to the project timeline. Are the completed areas matching the schedule? If a section that should have been finished by a certain date still shows bare ground, you know there is a delay. This kind of map-based progress reporting for projects gives you a clear, visual way to communicate status to clients, investors, and subcontractors. Instead of relying on someone's memory or a written report, you can show them the actual site conditions on each date.

## Step 5: Add site annotations and share via a client portal

Raw orthomosaics are useful, but annotations make them even more valuable. After comparing captures, add site annotations directly onto the map. Mark the boundaries of completed phases, highlight areas that need attention, or note where work is ahead of schedule. You can also draw measurement lines to show distances or areas. These annotations turn the map into a working document that everyone can reference.

The final step is to deliver the annotated maps and comparison reports to your team and clients. A client portal is the ideal way to do this. It allows authorized users to view the latest orthomosaics, compare them side by side with older ones, and download the data they need. The portal keeps everything organized by project and flight date, so no one has to hunt through email attachments or shared drives. This kind of map-based progress reporting for projects becomes a central source of truth that reduces misunderstandings and speeds up decision-making.




## What to watch out for at each stage

Drone progress tracking is straightforward, but a few common pitfalls can undermine the results. Here are the main ones to avoid:

- **Inconsistent flight plans.** If you change altitude or grid pattern between flights, the images will not align, making comparison difficult. Stick to the same settings every time.
- **Poor ground control points.** If markers are moved or obscured by construction, the alignment will drift. Check them before each flight and reposition if needed.
- **Weather surprises.** Clouds, shadows, or wind can degrade image quality. Reschedule flights if conditions are not ideal.

- **Data overload.** Collecting images every day produces too much data to process and compare. A weekly or biweekly schedule is usually enough to track meaningful progress.

By following this process, you turn drone captures from a novelty into a reliable tool for construction progress tracking. The key is consistency: fly the same route, process the same way, and compare methodically. Over time, you build a detailed visual history of the project that supports better planning, clearer communication, and fewer surprises.