



Elevate Your Build: A Playbook for Drone Data in the Construction Industry

Introduction

If you look at construction sites across the country, you see a colossal amount of assets: from the land that's being built on, to the equipment, to the teams working on the project.

But there's one asset that might be less visible, and perhaps even more valuable: DroneDeploy software at a construction professional's fingertips. After all, there's a reason why DroneDeploy customers **noted** the top three benefits of the software were innovation, increased efficiency and speed, and cost-effectiveness.

In this e-book, we'll detail how you can leverage drones and drone software throughout every stage of your construction project lifecycle. Your workers will thank you – and so will your bottom line.

We'll explain how drone software can empower you at every process, including:

Pre-Build

- Pre-Bid Inspections
- Creating An Accurate, Effective Bid
- Streamlining Logistics

During the Build

- Communication + Collaboration
- Safety & Compliance
- Inspections

Post Build

- Delivering On Time, Under Budget
- Resolving Disputes
- Extending Building Life

This is your drone data playbook for construction. Let's dive in.

Pre-Build

Surveys and Pre-Bid Inspections

As you start to put together a bid and get an understanding of a building site, drones and drone software can provide the precise information you need, at a fraction of the time taken by traditional surveying methods.

Traditional survey methods can take weeks for data collection and post-processing, creating a CAD rendering, and a final report. Drones and drone software cut this down to days.

TRADITIONAL SITE SURVEY



Accept Survey: 1-2 days

Data Collections & Post-processing: 1-2 weeks

Delivery of PDF, CAD File, Contour Map: 1-2 weeks

TOTAL TIME: 2-3 WEEKS

WITH DRONEDEPLOY



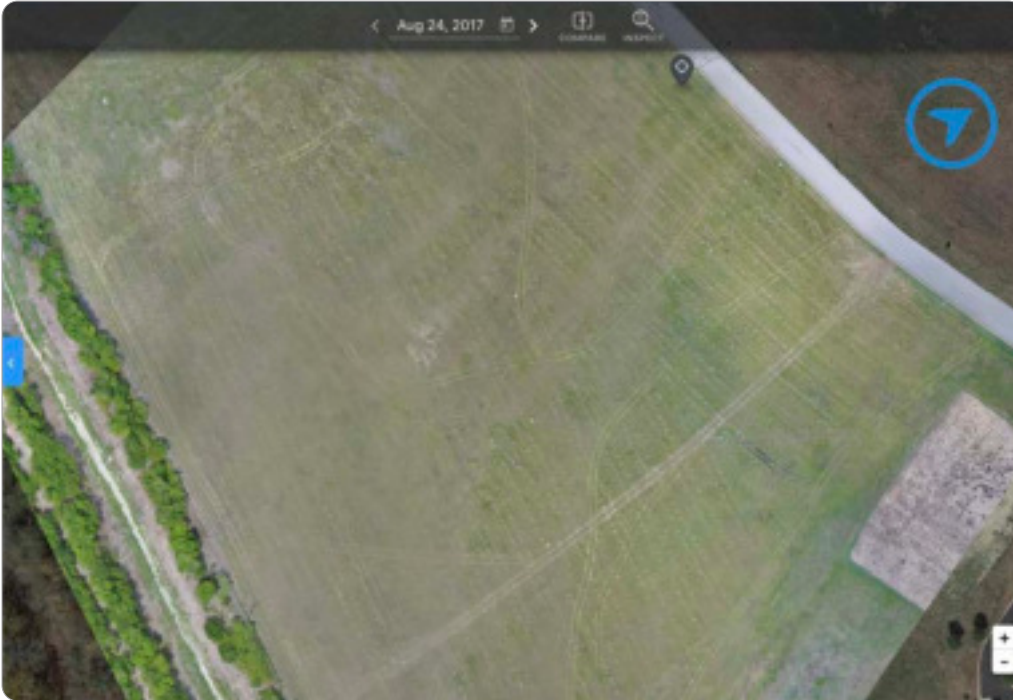
Mobilize to Site: 1 day

Fly Drone & Collect Data: 1-2 days

Delivery of PDF, CAD File, Contour Map: 1-2 days

TOTAL TIME: 1-4 DAYS



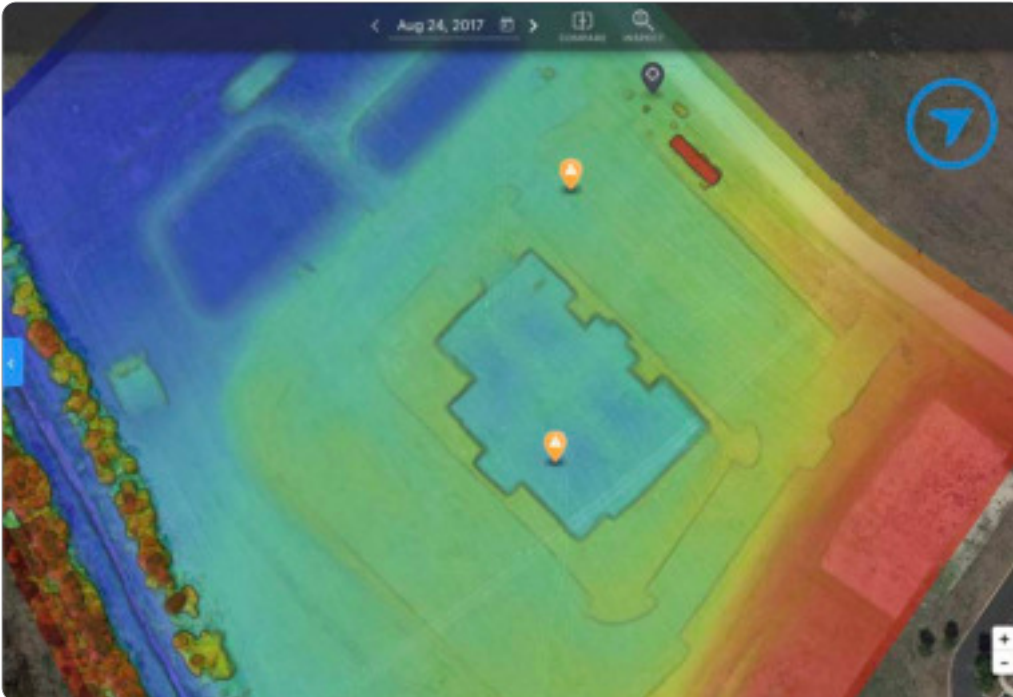


For example, Brasfield & Gorrie (B&G), a leading U.S. construction company, was starting to collect site data for a hospital bid. According to Charles Curtis, a B&G field engineer for the company, completing the same project with traditional methods would have required over 1,000 survey shots.

“Normally, we would use the robotic total station to shoot a grid of elevation correct points. I would have to use, at a minimum, a 50’ x 50’ grid for a site such as this one,” says Curtis. “With approximately 61 acres, that would have required over 1,000 individual shots with multiple setups. Trying to fit it in with our normal work would likely have taken many weeks or serious overtime.”

Overall, the project demonstrated the massive time and cost savings that drone mapping is bringing to the industry. Curtis estimates that DroneDeploy cost the company a third or less of what it would have required to do the job manually.

Meanwhile, Chasco Constructors, a Texas-based construction company, started using drones in 2017 and immediately saw a plethora of benefits as well.



“It was about a 75 percent savings by using the drone to perform some surveys that were very time-consuming, but where thousandths of a foot were not absolutely necessary.”

— Michael Lambert, VDC Manager at Chasco

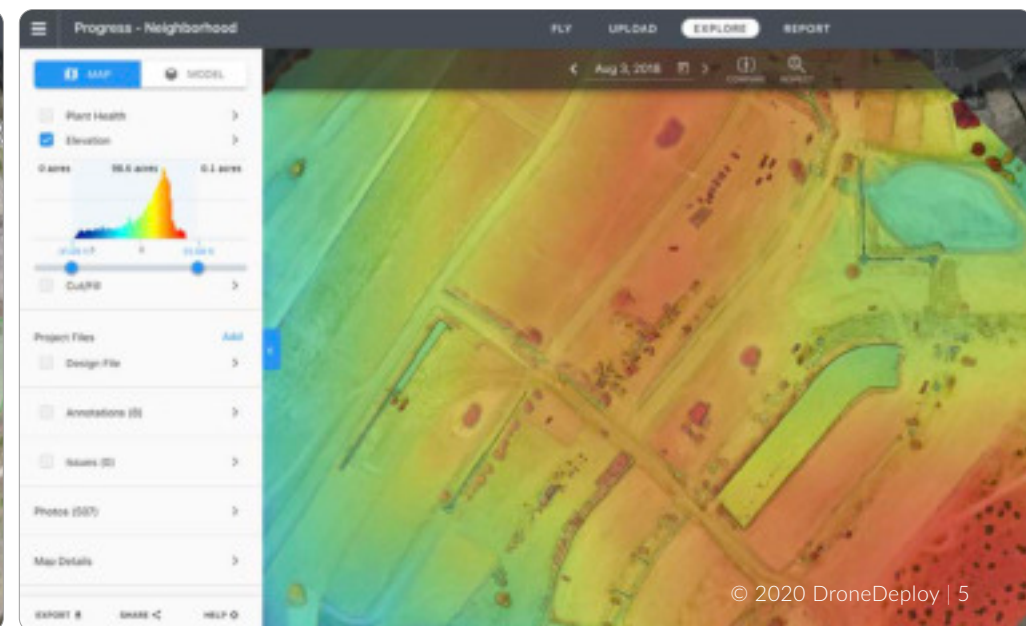
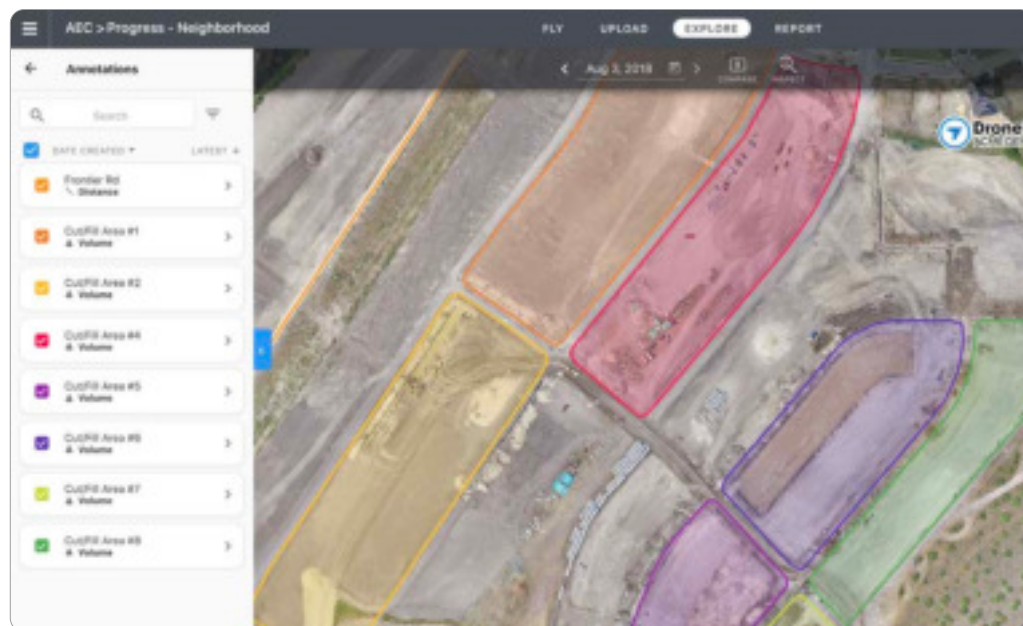
Using drone imaging analysis enabled Chasco to capture and analyze much more granular site detail than a ground-based survey team could collect. It simultaneously freed up surveyors to conduct other priority work.

Surveying work is vital to any construction project. But that doesn't mean it needs to take weeks to conduct, and sap your budget before you even get started on a build.

Creating An Accurate, Effective Bid

If your company is participating in an RFP, you need the most accurate and precise information for you to put together a winning bid — but also one that is realistic and profitable.

If you have put together over-the-top bids that won, they usually end up exceeding budget and irritating clients. Building a strong client relationship starts before a project begins. In the bidding process,



drones empower you to be honest, transparent, and practical with prospective clients, setting you up for long-term success throughout the build and beyond.

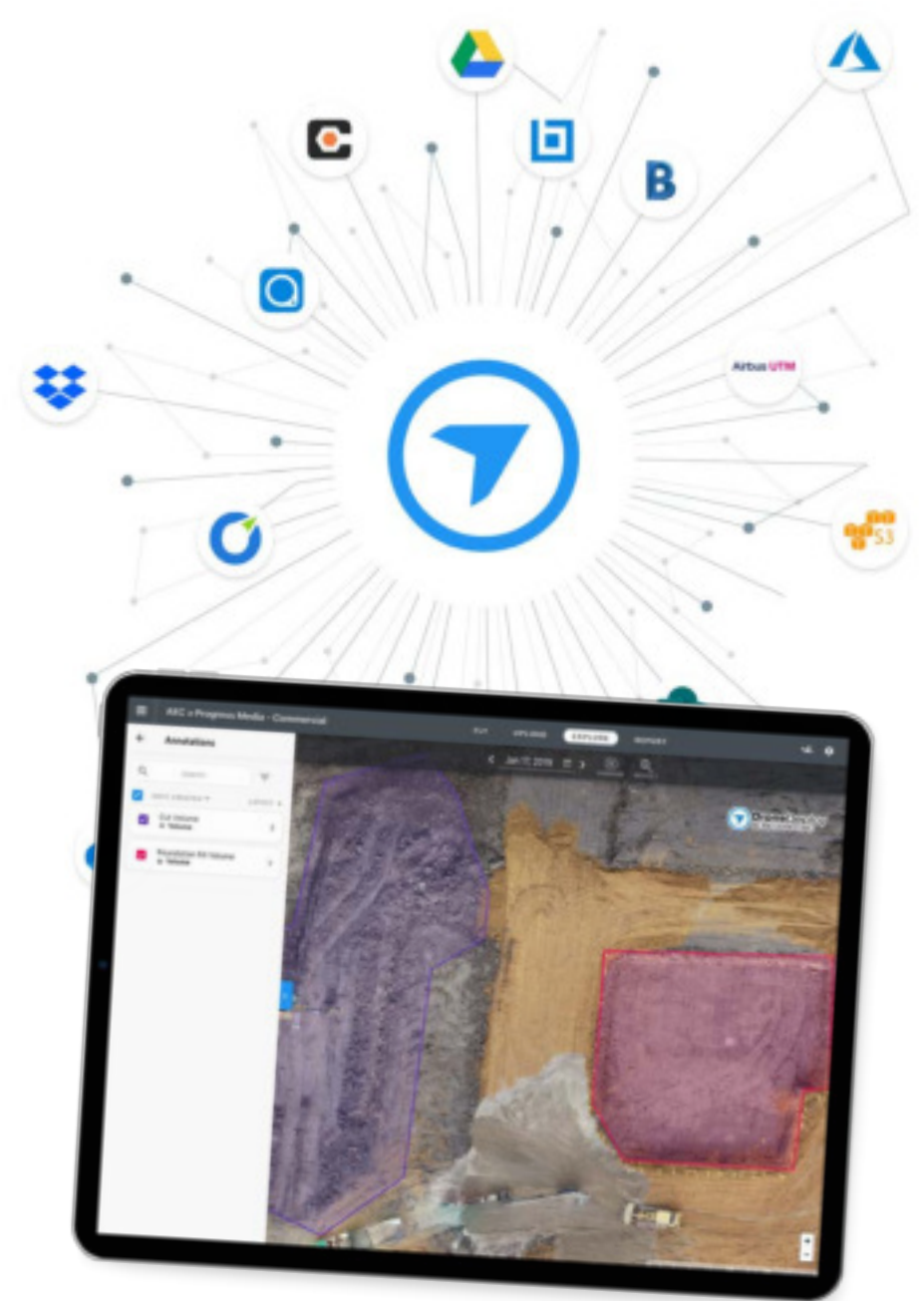
DroneDeploy provides an unprecedented, real-time look at site conditions, going way beyond traditional maps. You can share the maps and 3D models with subcontractors, who can develop their plans and provide precise cost estimates for a bid. DroneDeploy, through its integration with Procore and AutoDesk BIM 360, can also empower you to overlay your plans and blueprints with the site map. That lets you better collaborate with subcontractors but also put together a more compelling, three-dimensional bid.

After winning the bid, construction companies can continue to fly regularly and have their maps immediately synced with Procore and AutoDesk BIM 360 – enabling real-time collaboration while keeping key stakeholders updated on progress.

Streamlining Logistics

The final way you want to set your build up for success is by creating a workflow on site that is the most efficient, safe, and effective. Every job site is different and has its unique quirks and challenges. There are countless aspects that you have to take into account, from the terrain to existing structures to nearby roads and pedestrian walkways.

DroneDeploy maps, images, videos, and panoramas give your team guidance on the best area to place heavy machinery, the job trailer, trucks, and more. You'll also be able to measure stockpile volume and track earthworks precisely and seamlessly, which can unlock cost savings and deliver ROI. There's a lot to track when it comes to stockpile materials on construction sites, including dirt, concrete, materials for utility, and excavation.



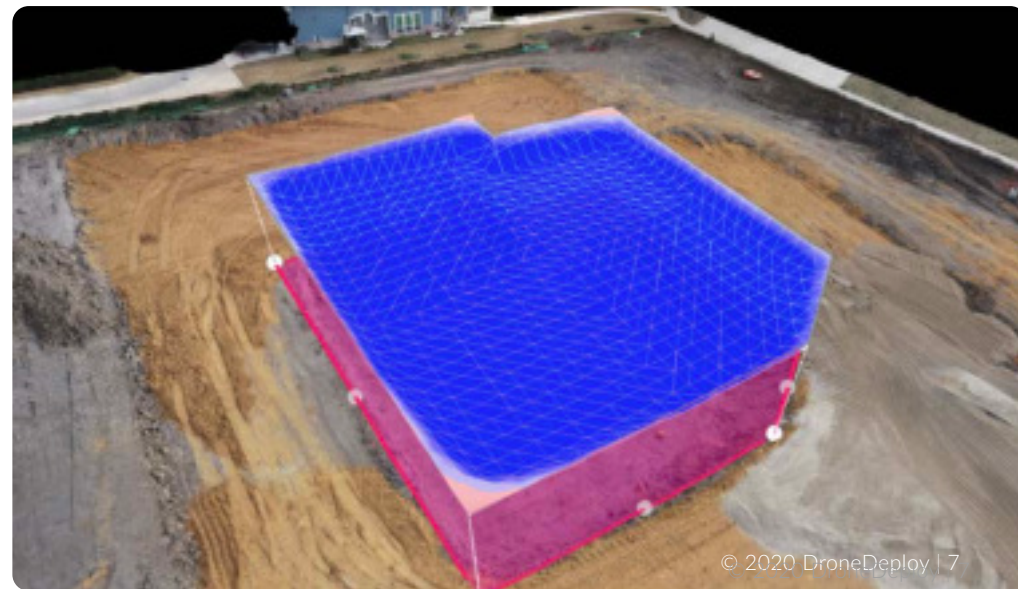
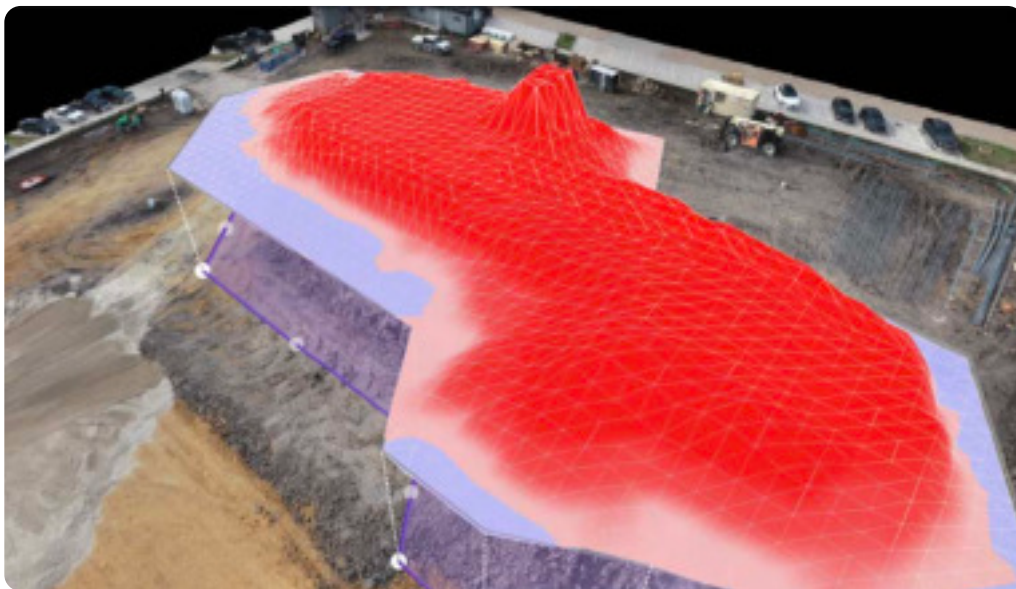
“We have anywhere from 10 to 30 stockpiles on every job site,” **says** Michael Lambert, VDC Manager at Chasco Constructors. “It can be a really handy tool when it comes to material logistics.”

Depending on needs, Chasco can shift materials to different job sites based on DroneDeploy’s precise measurement, saving the company time, materials, and money.

The software helps convert that drone data into actionable business intelligence; Chasco also uses DroneDeploy’s annotation and measurement features to measure stockpile volumes and comment on maps, which makes it easy to update project progress. When it comes to earthworks, drone data can help provide a 360-view of terrain to augment traditional surveys, ensuring that companies are not unnecessarily moving earth — and verify work completed by subcontractors through cut/fill measurement tools.

“One of the major milestones is what we call reaching sub-grade. When we surveyed the sub-grade, it wasn’t entirely correct. With the help of [DroneDeploy], we were able to easily visualize the areas that were high or low.”

— Michael Lambert, VDC Manager at Chasco Constructors



During the Build

Communication + Collaboration

All construction professionals know that your build is only as successful as your client communication. You can deliver a project on time and under budget, but if you're not keeping a client updated and providing them progress reports, they're going to lose trust.

Communication and collaboration are essential when it comes to fostering goodwill. Drones can be flown more regularly and capture images for a fraction of a price than photographs from airplanes and helicopters, helping stakeholders stay more informed.

If there are obstacles and road bumps during construction, having images can help illustrate and explain the problem for stakeholders. If some bad weather rolls in, for example, and there's flooding in one part of your site that's delaying construction, having photographs make the pain points real to stakeholders — much more so than just describing the situation.



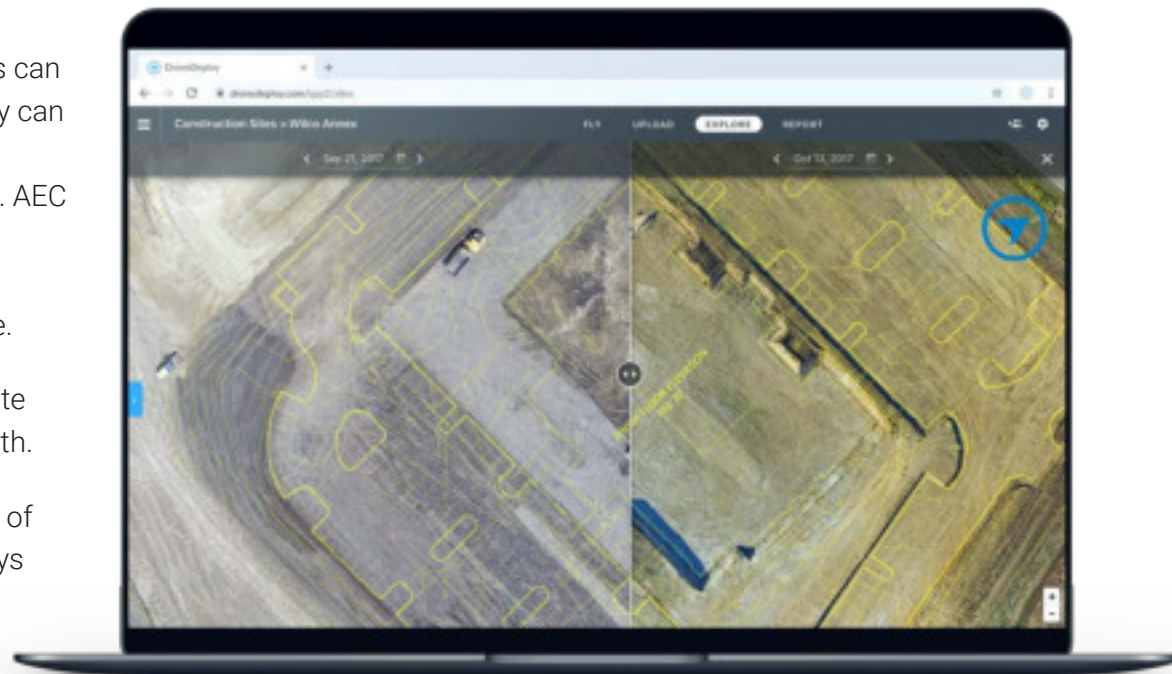
“Drones change the game in communication. A [drone] photo is worth a thousand words, and potentially millions of dollars.”

— Ryan Moret, Field Solutions Manager, McCarthy Building Companies

As the project advances, DroneDeploy helps companies measure progress accurately. Construction professionals can create flight plans and re-fly the same plan regularly. They can use the images and analytics to validate “as-built” versus “as-designed” work with consistent, auditable, aerial data. AEC professionals can compare this visual record of action against design plans, identify issues more quickly, and communicate them with the right stakeholders to resolve.

It also creates a unified hub for your team to communicate and collaborate — all from a single source of historical truth.

“The administrative panel quickly lets me see a snapshot of all DroneDeploy flight activity within our organization,” says Hunter Cole, Innovation & Tech Ops, at Brasfield & Gorrie.





Safety & Compliance

Drones provide their highest value when it comes to keeping workers safe and out of harm's way.

Any time a drone can do a dangerous job which a worker previously had to do, you are potentially saving a life: OSHA **found** nearly 1,000 construction workers died in 2017 on worksites. No matter how safe your sites are, there is an inherent risk in construction. Drones eliminate the possibility altogether by keeping workers out of aerial lifts, off of roofs, and safely on the ground.

It's no wonder that a recent DroneDeploy poll found that more than 50% of construction customers cited improved safety as a benefit of deploying drones on the job site.

A case in point is ReconnTECH, the technology solutions branch of major field inspection company USIC. ReconnTECH crews used to regularly climb newly constructed water and cell towers to conduct inspections. Now they use drones to get the job done. "Everything's about safety in our industry," says Chris Bartlett, Director of Technology at ReconnTECH. "Introducing drones increases safety in the workforce by giving our customers tools to perform inspections more safely."

With the power to reshape job site safety, drone adoption in the construction industry is on the rise. Drone use on the job site has skyrocketed in the last year — **surging 239%**. And construction is now the leading sector using DroneDeploy.

Inspections

Inspections are another area where drones and drone data can play a pivotal role in accelerating processes while providing unprecedented collaboration.

Whether during or after the build, many inspectors or project managers go out to a worksite and walk around, take photographs, and try to capture as many issues as they can manually. They might take notes on certain areas of concern. If a problem is identified, workers will try to address it, but the photographs and notes might not show exactly where or what the issue is. Workers may not understand the request once they find the problem. Once work is completed, an inspector needs to return and ensure the work has been done correctly. All of this creates a major back and forth that can grind construction to a halt.

DroneDeploy's 3D imagery addresses problems quickly and confidently. Inspectors can look closely at the 360-degree view and high-resolution images and mark areas that are concerning and what the potential issues are. DroneDeploy creates a list of issues in its solution, streamlining the inspection process and helping workers prioritize the most critical problem areas. This single source of truth allows companies to identify, collaborate, and resolve issues faster than ever before. Construction company Rogers O'Brien, for example, [saw](#) a 99% decrease in inspection costs on one of their projects after leveraging DroneDeploy.



Post Build

Delivering On-Time, Under Budget

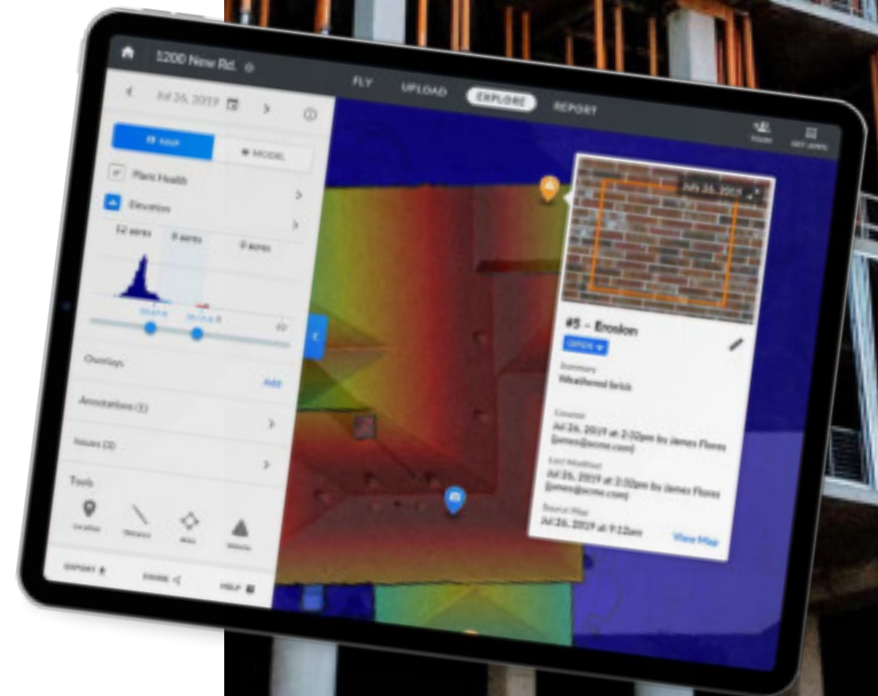
When you make a change during the planning stage, it's easy to implement a new strategy, update the CAD renderings, and adjust on the fly. If there's a mistake or change during the physical build, it can cost you thousands of dollars and, most importantly, the trust of your client.

There will be mistakes made at every phase, and there's always ever-evolving external factors—from weather to zoning laws to a customer changing their mind. However, if you're unable to **react quickly and effectively**, it can mean expensive delays in the build.

For example, Brasfield & Gorrie was working on a building when they detected a water leak on several glass panels on the 25th floor. Traditional methods call for a manual inspection, which means sending workers up in an aerial man lift.

B&G had initially budgeted \$250,000 for the manual inspection of this building. Instead, the general contractor deployed drones to perform the checks: resulting in the entire inspection costing \$2,500—one percent of the original budgeted cost. Meanwhile, zero workers were put at risk.

Drones empowered B&G to make quick decisions on the job site without interrupting construction progress. Since this initial use case, B&G has completed over 750 successful flights.



Resolving Disputes

Resolving disputes after the build has become so common that many construction companies account for this cost in their budget. This litigation can be between owners, architects, contractors, subcontractors—you name it. Drone data provides a historical source of truth that can prove invaluable in defending your company and finding resolutions.

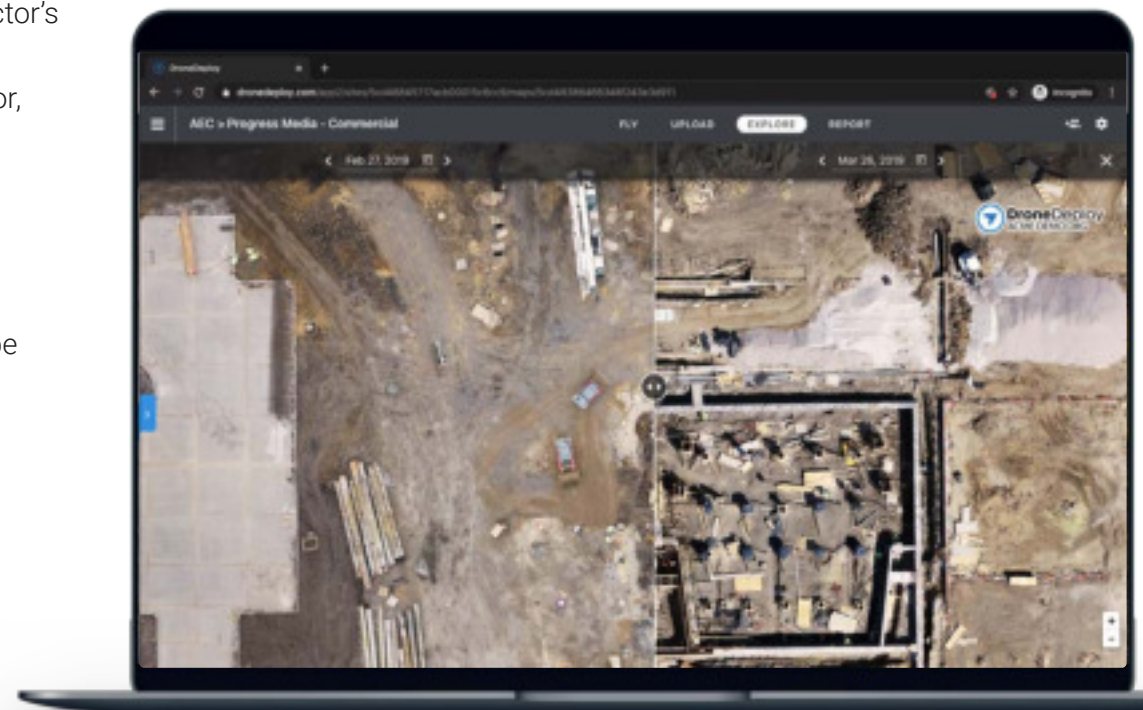
For example, one of Rogers-O'Brien ("RO") subcontractors attempted to charge RO more than the original quote for services rendered. In the past—as we've detailed in this e-book—manually surveying land for projects was time-consuming and inaccurate. The end result usually was that the owner paid the subcontractor's quote without having accurate verification. But RO found they could avoid the subcontractor's change order by using DroneDeploy's maps as visual verification: RO presented these maps to the subcontractor, providing concrete proof that the change order was unnecessary. The result: saving thousands of dollars.

This case caused RO to use drones and DroneDeploy to produce progress photos for enhanced quality assurance throughout builds. These flights are far cheaper and can be conducted more regularly than photos captured from a crewed aircraft.

Extending Building Life

After the ribbon-cutting ceremony, DroneDeploy can continue to play a vital role in extending and improving the life of a structure and minimizing maintenance costs.

Drone data provides a historical source of truth that can prove invaluable in defending your company and finding resolutions.



That's important, as it is **estimated** that just 25% of costs come from a building's construction; the rest come from maintenance and operations over its service life. One of the most significant advantages of drone software solutions is that companies can be proactive—instead of reactive—in their monitoring and maintenance of a building.

Let's say your building, once completed, is using far more energy than similar buildings. BIM could be used to model how alternative energy sources, such as solar, could be implemented and reduce costs and the environmental footprint. DroneDeploy's thermal maps would augment these efforts by identifying any existing inefficiencies—like where a building is experiencing energy loss and costing you money.

Similarly, an existing building along a fault line might be at an earthquake risk. Drone images and analytics can help identify foundational issues such as sinking, while modeling brings to life what a retrofitted building will look like both internally and externally. This two-pronged approach enables you to diagnose current issues faster and design an effective resolution.

Clearly, the use of drone solutions does not end upon building completion. It's vital to be forward-thinking in your use of drone software—to minimize long-term costs of buildings and optimize the life of all structures.

Looking Ahead

From surveying to ongoing building maintenance—no matter how you use drones today in your construction business, there are even more opportunities to reap the benefits tomorrow.



**“The future of where drones are going,”
says Grant Hagen, Virtual Design &
Construction Manager for Beck Group,
a Dallas-Fort Worth based general
contracting company, “is limitless.”**

DroneDeploy is the leading drone software solution trusted by over 5,000 companies across a variety of industries, including construction, energy, agriculture, and mining. From drone fleet management to data analysis, DroneDeploy makes aerial data accessible and productive for everyone. Simple by design, DroneDeploy enables professional mapping, 3D modeling, and reporting from any drone on any device.

