Taking Construction to New Heights

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Though still in a regulatory grey area, the potential impact of drones on construction is huge. Typically, only larger construction firms currently use drones, as equipment costs are not the only factor involved in operation.

In June, the Federal Aviation Administration (FAA) passed updated regulations stating drone operators must be at least 16 years old and have a remote pilot airman certificate with a small UAS rating (or be supervised by someone with the certificate). Drones can only be operated as high as 400 feet and as quickly as 100 mph, and can only be used during the daytime or at twilight with anti-collision lights.

In addition, operators must keep the drones in their line sight at all times without being aided by tools such as binoculars. The drones also cannot be flown over people not participating in the project.

These regulations replace previous rules that required operators to hold a Certificate of Waiver or Authorization. Firms that currently hold that certificate can continue to legally fly drones until it expires. After its expiration, they will need to adhere to the new regulations.

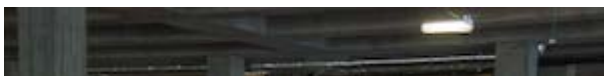
Contractors that are able to make these rules work see benefits in increased jobsite safety, easier-to-conduct inspections and images of construction progress.

“Right now, there are two key uses for drones. One is for additional safety. When you would normally put someone on a ladder or up high, you can replace that activity with a drone,” says Oren Schauble, vice president of marketing for 3DR, a California-based designer and manufacturer of drone and unmanned aerial vehicle technology. “Two is gathering data. Models have a lot of different applications, such as calculating the volume of a pile of dirt. There are lots of ways to use data in the construction process to gauge how progress is going.”

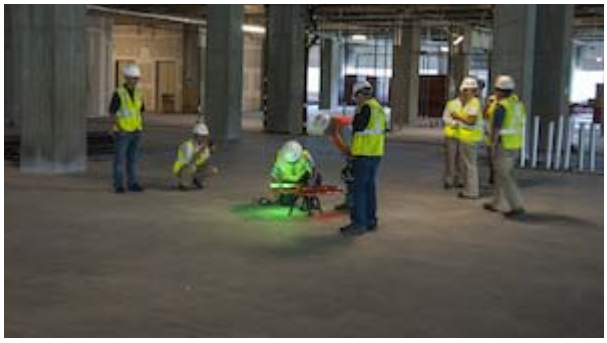
The industry has just scratched the surface on drones’ capabilities, and contractors currently able to use them are pioneering the way. Brasfield & Gorrie, a general contractor based in Birmingham, Ala., has used drones on about four jobs. So far, the company has used drones for glazing verification to detect leaks, eliminating hazardous safety inspections and aerial verification of roofs. Recently, Brasfield & Gorrie started using drones for photogrammetry to create 3-D point clouds based on data collected from drones.

“The point clouds give us physical models of existing structures we can overlay in the BIM model. That allows us to see if what was built matches what was planned,” says Russ Gibbs, regional director of virtual design and construction for Brasfield & Gorrie. “That’s really the Holy Grail for us.”

FUTURE APPLICATIONS



If regulations loosen, Brasfield & Gorrie plans on using drones on all jobs to ensure accuracy, which also will positively impact construction schedules and budgets. By having real-time drone data feed into a BIM model, the company will be able to detect errors before construction progresses. This will keep jobs running on schedule and reduce unnecessary materials and labor costs.



Drone automation also will reduce costs and save time on the jobsite. “The future is automation; you will be able to schedule what you want to see and how frequently you want to see it,” Schauble says. “Right now, we’re already close to fully autonomous; users can circle an area and the drone will go to it.”

Schauble also expects sensor technology to improve and increase drones’ capabilities. Currently, some sensors are being integrated into drones on a small scale with single capabilities. But research is being conducted that would result in drones with sensors that can track details on a construction site, such as air quality and what’s going on with nearby vegetation.

“As sensors get more compact and drones get stronger, you’ll see a diverse array of sensor applications that can be fit into small packages,” Schauble says.

Gibbs also expects drones to begin working in tandem with radio-frequency identification (RFID) devices. The technology is not available yet, but RFIDs and drones may allow contractors to track equipment, deliveries, job progress and employees’ locations in real time, simply by flying a drone-mounted RFID over the jobsite.

“Detecting where personnel are located on the job would help give us feedback on path detection and lines of movement,” Gibbs says. “It would allow us to avoid putting humans in harm’s way.”

This data also will help office personnel monitor jobsites better because they will be able to see progress on a daily, or even hourly, basis—reducing the possibilities of miscommunication and misinformation between office and field personnel.

RE-EVALUATING REGULATIONS

The FAA is expected to continue re-evaluating current regulations and providing more information about proper drone use. Schauble says the regulations are expected to become more liberal, which would follow the lead of Australia and other countries with more progressive drone rules.

With less strict regulations, drones likely will become standard procedure in construction. Brasfield & Gorrie plans to purchase 250 drones to use on all jobsites if regulations loosen. With the typical cost of a drone being $1,500, according to Gibbs, even smaller contractors will be able to take advantage of enhanced data collection that corroborates construction progress, schedules and costs in real time.

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