MCX
CMAA Construction Management Association of America
Member Communication Experience

Robots on Construction Sites Are Raising Legal Questions

Written by: Peter C. Sheridan, Chair, Glaser Weil's Construction Law Practice Group

Mark Twain said that "good decisions come from experience. Experience comes from making bad decisions." Aesop warns "be careful what you wish for…." But is there a good decision to be made now to employ robots on your next project? There is not a lot of experience to help us make that decision, and the robotic laborer that does not tire or need breaks or desire a raise or promotion looks like an option we might all wish for when planning our next project.

Are there pitfalls, traps for the unwary? Always. Spotting them is the trick. After a brief glimpse into the past for appropriate context, there are a few traps that need to be considered.

Revolution is Evolution

Three prior industrial revolutions, illustrated by the ages of the steam engine, mass production, and electricity, and the emergence of digital technology, ushered in change at an ever-accelerating pace. Robotics is included by many observers as part of the Fourth Industrial Revolution.

The integrated circuit (IC) is what makes robotics possible (as it does for all modern computing). Gordon Moore, who in 1975 predicted the doubling each year of the number of transistors in an IC, might not have thought that today, in 2023, a single IC contains 58 billion transistors.

Technology entered our industry long ago. For example, at a basic level, camera drones started inspecting bridges in 1995. Now, large projects typically have several drones flying each day to capture what progress they can of the job.

Keep in mind that there is no race against these machines that can be won, as Kevin Kelly, the founder of Wired magazine, has said, "If we race against them, we lose. This is a race with the machines. You'll be paid in the future based on how well you work with robots." Money is pouring into construction robotics as well, an indicator as to where our industry is headed.

While the industry is still catching up to other industries in the sophistication of its robots, there are already many useful robots on the market and in daily use, including those used for repetitive work by programmable, mobile, strong, workhorse robots or data-gathering devices that can resemble small tanks or dogs.

Giving the complexity and ever-changing nature of a construction site, with cluttered worksites, unforeseen conditions and revisions happening in real time, adding robots to the mix may make it easier, or harder, to control the project.

Ask these questions: How do you integrate the robot into your team? How does the robot learn the experience your team already has? A few ideas on how to establish control and plan to use robots effectively are out there, and executives and counsel need to consider them not in five years, but now, as robots become more advanced with every passing day.

Three Legal Scenarios to Consider

Scenario 1: Suppose a data-gathering autonomous LiDAR robot crawls around your project on rubber tracks, goes upstairs on its own, and knows the AUTO-CAD layout. It records the progress and tolerance compliance, or lack thereof, of your overhead MEP (mechanical, electrical, plumbing). That robot can be required in your MEP specs, triggering the duty of the design-build MEP trade partners to use that robot and gather data and supply it to the general contractor and owner. In that vein, if the architect does not include the robot requirement in its draft specs, some may argue that not including it reflects the lack of the requisite professional skill and care ordinarily provided by architects working on modern, large, and complex projects.

Now apply a similar standard to a general contractor looking for the right MEP design-build trade partners. The "good-and-workmanlike-manner" standard requires a quality of work performed "by one who has the knowledge, training, or experience necessary" performing in a manner "that is generally considered proficient…" Proficient in a world of robots means using robots, some might argue, so be prepared. Perhaps include in your contract that such robots are required or that not using them is considered for this project to nonetheless be proficient.

Scenario 2: Your paper plan days are over, and a layout robot you required in the specs uploads the AUTO-CADs and then prints a digital full-size floorplan on the concrete deck of levels eight through 45 of your high-rise hotel project. It even prints that plan on the dangerous edges of that project, which workers must avoid. Safety improves, but the operator of the robot has not properly programmed it or a bug in the processing arises, and floors nine through 15 are laid out incorrectly and delays in build-out and fit-out ensue.

The architect included use of this robot in the specs but did not include a verification protocol. The general reviewed the work on the eighth floor where it was first used, but not after, and the vendor actually using and operating the robot blames the AUTO-CAD upload. Not your normal dispute, your counsel encourages hiring a programmer expert to come to the DRB during the project to help resolve this issue and ascribe blame. The DRB for your project has now become a venue for forensic review of robot programming, use, and timely verification of accurate layout. Does the robot-using trade partner have insurance, or the general contractor, the architect, the owner, for this cause of loss? Is this form of loss a covered loss under your insuring requirements in the governing contracts or arguably excluded?

Scenario 3: Your specified site-inspection robot on a cast-in-place structure, programmed to avoid damaging in-place concrete shoring and to avoid workers, nonetheless runs into several initial shores, and wet concrete from above falls and injures workers on the floor below.

Or your scaffolding robotic assistant throws a bag of tools to a worker and hits the worker, injuring him.

Robotics providers may not have the financial wherewithal to respond to these injuries. The owner and general contractor need to know all the contractual arrangements that bring the robots to the site and control for the risks created. Keep in mind that there are currently no OSHA standards for the robotics industry (according to the OSHA website). ANSI (R15.06), however, does set forth safety requirements; thus, your contracts might reference the correct safety requirements.

If You Can't Beat Them, Join Them

Robots will replace a certain amount of construction workers, like they have in other industries—a recent MIT Sloan Business School study says so, and it may come just before or alongside the heightening skills crisis in the key trades that nine of 10 construction businesses (studied in Europe) predict to occur by 2030.

Think of it like this — after 2030, will there ever be another drywall apprentice? McKinsey thinks that by 2065 up to 44% of

all construction jobs will be automated. Worldwide, that means 82 million jobs in construction lost to automation.

So, trades companies, start training your apprentices in automation and programming. All responsible persons in this industry need to start adapting their contracts, their insurance, and their mindsets to the present and increasing future use of robots on your projects. The Fourth Industrial Revolution is here, so race with or ahead of the machines, not against them.

About the Author

Peter C. Sheridan, chair of Glaser Weil's Construction Law Practice Group, heads a team of firm attorneys who focus on construction law primarily and also handle complex real estate, land use, eminent domain, and inverse condemnation cases. He represents owners, developers, architects, and government entities in California, Nevada, and internationally, and is the current president of the Construction Lawyers Society of America.

About the Article

Republished from Construction Executive, a publication of Associated Builders and Contractors. Associated Builders and Contractors is a national construction industry trade association representing more than 21,000 members. Based on the merit shop philosophy, ABC helps its members develop people, win work, and deliver work safely, ethically, and profitably for the betterment of the communities in which they work.