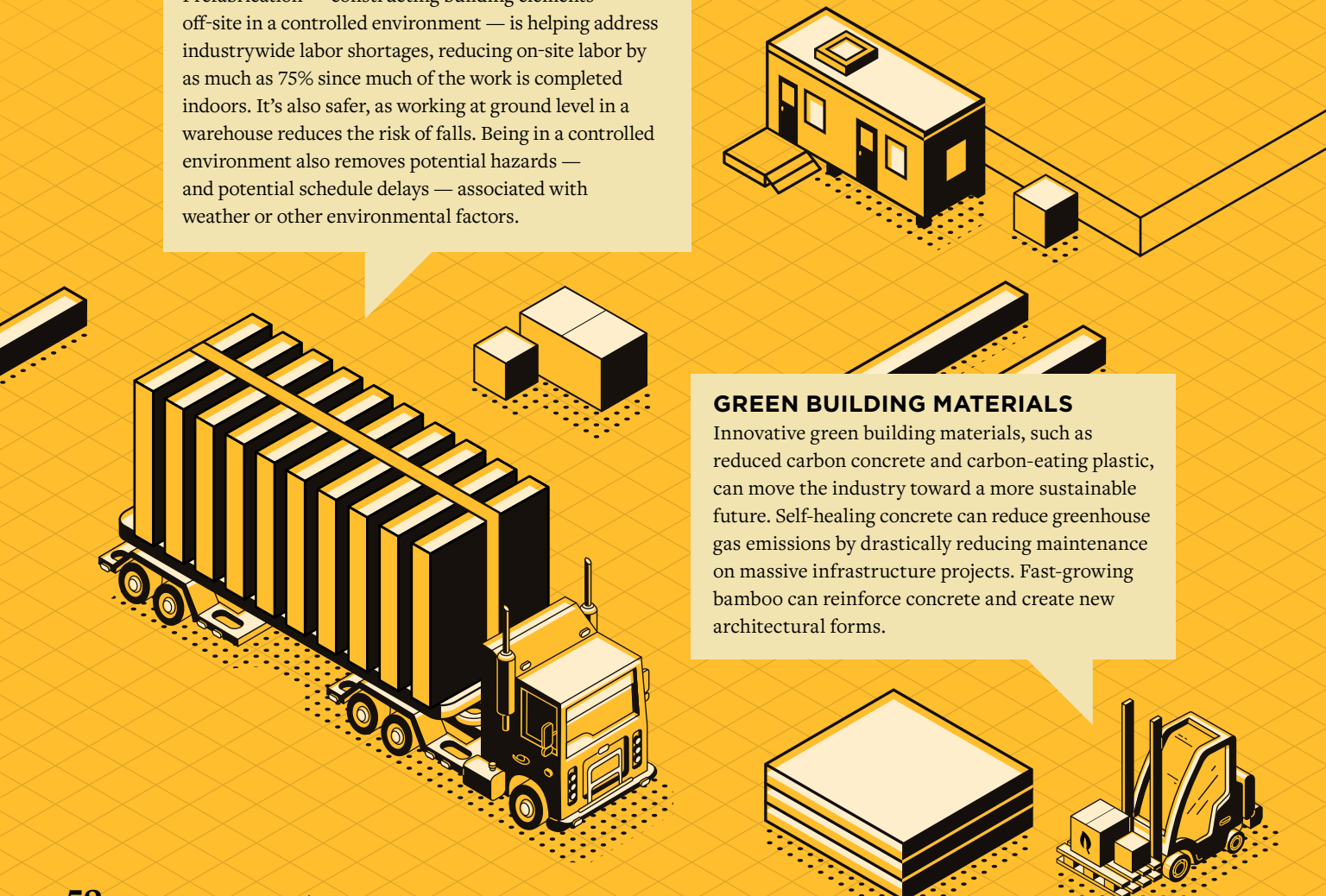
Tomorrow's Tech and Trends for Construction

The construction industry faces ongoing challenges regarding safety, efficiency, productivity and profitability — all while continuing to contend with the additional issue of substantial labor shortages. These trends, technologies and tools are helping transform the industry in 2019 and beyond.

PREFABRICATION

Prefabrication — constructing building elements off-site in a controlled environment — is helping address industrywide labor shortages, reducing on-site labor by as much as 75% since much of the work is completed indoors. It's also safer, as working at ground level in a warehouse reduces the risk of falls. Being in a controlled environment also removes potential hazards — and potential schedule delays — associated with weather or other environmental factors.

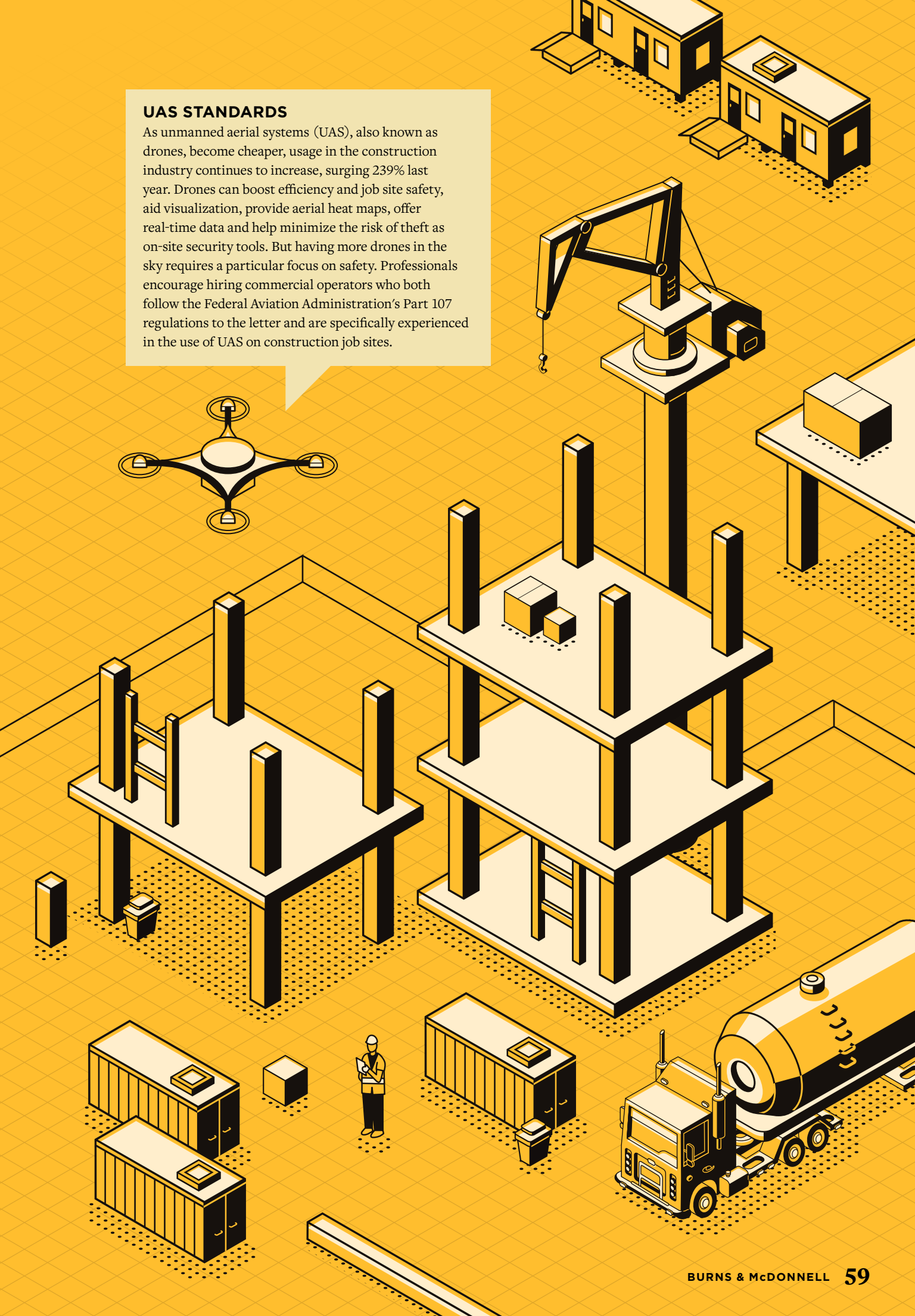


GREEN BUILDING MATERIALS

Innovative green building materials, such as reduced carbon concrete and carbon-eating plastic, can move the industry toward a more sustainable future. Self-healing concrete can reduce greenhouse gas emissions by drastically reducing maintenance on massive infrastructure projects. Fast-growing bamboo can reinforce concrete and create new architectural forms.

UAS STANDARDS

As unmanned aerial systems (UAS), also known as drones, become cheaper, usage in the construction industry continues to increase, surging 239% last year. Drones can boost efficiency and job site safety, aid visualization, provide aerial heat maps, offer real-time data and help minimize the risk of theft as on-site security tools. But having more drones in the sky requires a particular focus on safety. Professionals encourage hiring commercial operators who both follow the Federal Aviation Administration's Part 107 regulations to the letter and are specifically experienced in the use of UAS on construction job sites.



ARTIFICIAL INTELLIGENCE

Artificial intelligence (AI) can help boost productivity. Machine learning helps scrutinize massive amounts of data and elevates critical issues to project managers. Artificial neural networks can keep large projects on budget by predicting potential cost overruns. AI also can give safety an upgrade, using tools like SmartVid.io to automatically detect safety hazards and speedily capture field observations. And, when fully automated equipment becomes a reality, 5G bandwidth will be a necessity.

SPEEDY VR VISUALIZATION

It's easier than ever to develop 360-degree visualizations that help clients envision a project before it begins and track it during construction. Digital files are easily shared among members of the full project team, reducing the need for travel and enabling faster decision-making. InstaVR offers a web-based tool that makes developing interactive virtual reality (VR) applications a speedier, easier process — even for users with no coding experience.

BUILDING TECH FUNDING

Venture capitalists are betting big on technology in construction. According to Crunchbase, construction tech startups raised upward of $1.3 billion in 2018, an increase of roughly 130% over the previous year. Companies such as Autodesk and Trimble also spent billions to acquire construction tech startups. While funding in 2019 might not match those soaring numbers, the emerging reliance on tech in construction should keep the investment money flowing.

DATA-DRIVEN DELIVERY

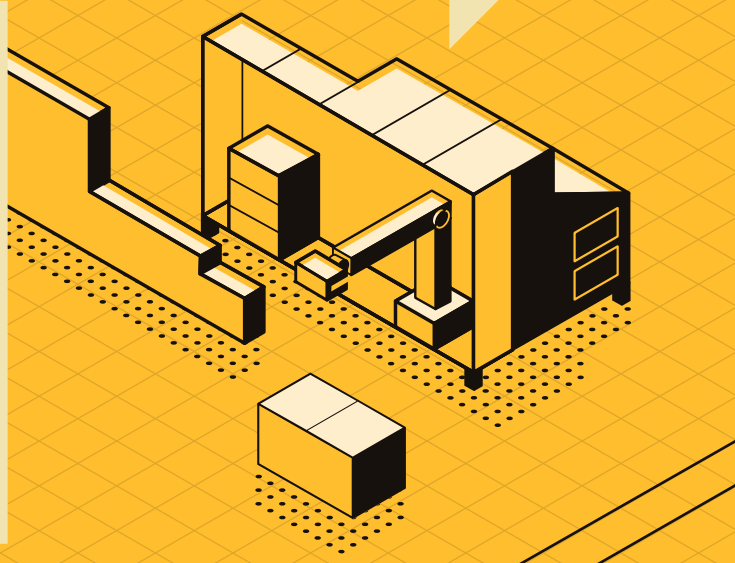
Data analytics is driving the future of business intelligence in the construction industry. New tech tools and processes are helping interpret large amounts of data for meaningful implementation. Wide-ranging software options analyze data to help improve safety, efficiency and quality. With these tools, contractors can forecast markets, reduce risk, increase safety, improve workflows, identify opportunities for automation, reduce waste and more.

3D PRINTING

Though 3D-printed buildings were once hailed as a revolution for the built industry, the uptake for this type of use has been slow. Why? Along with regulatory challenges, such construction requires large-scale printers, which are scarce and expensive; cost and speed factors also need enhancement. But the tipping point might be arriving, courtesy of the military sector. As reported in *Fast Company*, the U.S. Marine Corps is exploring the technology to rethink how emergency housing and infrastructure is built, printing a 500-square-foot concrete barracks hut.

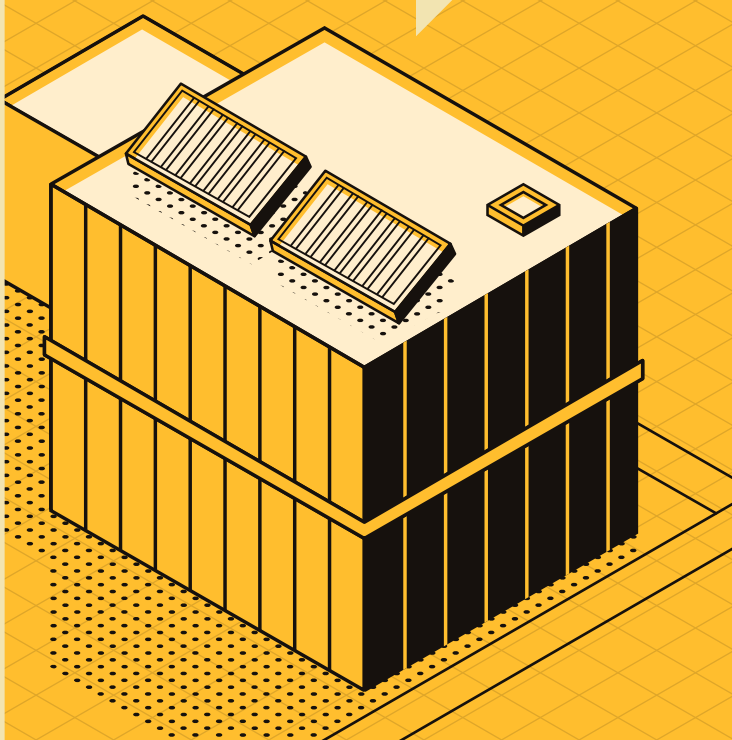
ROBOTICS

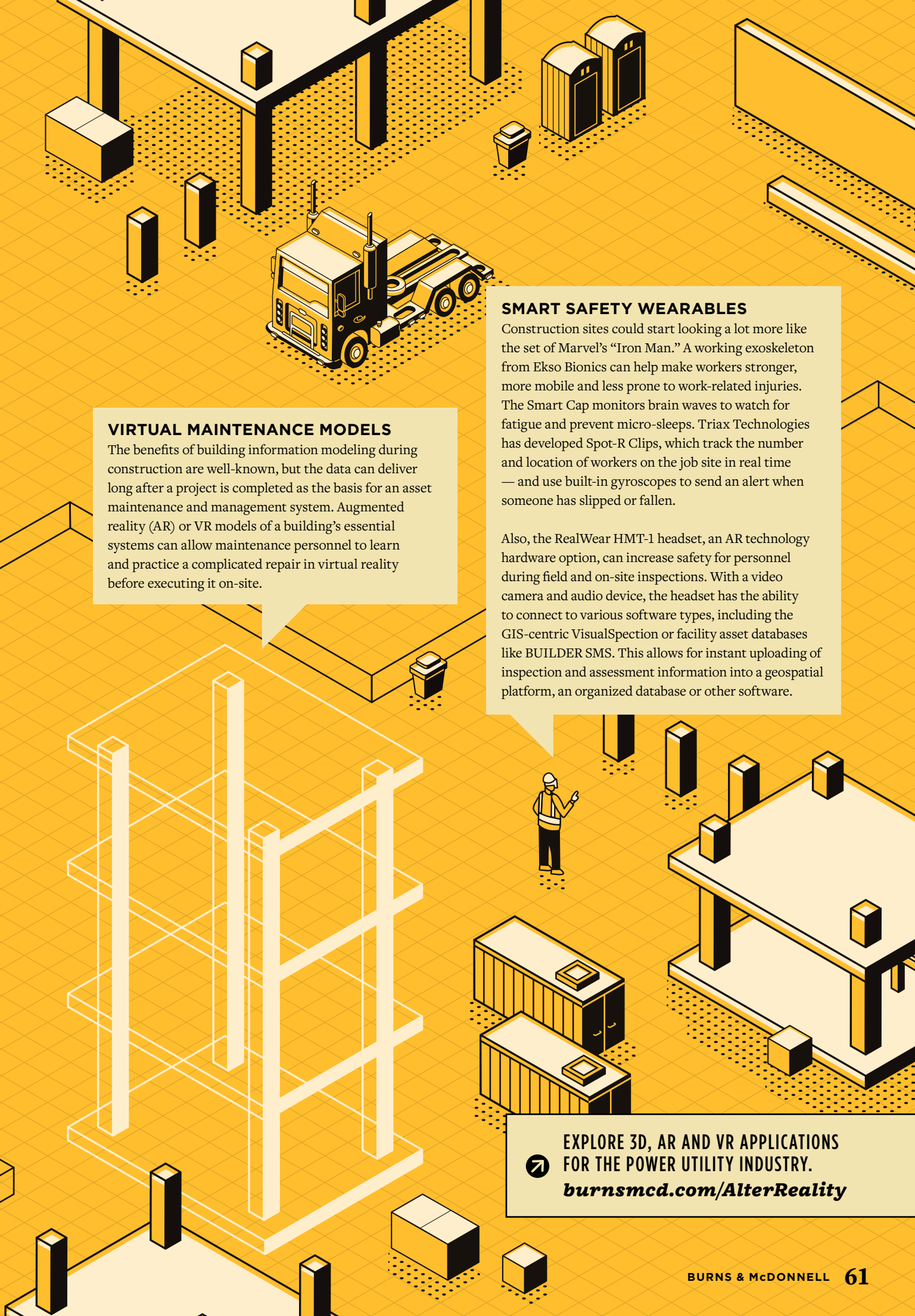
The robot revolution is coming to the building trade, too. The SAM100 masonry robot from Construction Robotics can lay a speedy 350 bricks per hour. But much of robotic technology is designed to boost efficiency in human workers instead of replacing them. The MULE (material unit lift enhancer), also from Construction Robotics, helps workers easily move material weighing as much as 135 pounds.



SELF-POWERED BUILDINGS

Buildings account for nearly 40% of annual global greenhouse gas emissions, according to Architecture 2030, a nonprofit that advocates for energy-efficient construction. But the industry can rewrite the story by developing buildings that do more than power themselves. In the U.K., the Active Classroom at Swansea University is leading the way. Using a mix of technologies to maximize energy output, the building generated more than 50% of the energy it consumed in its first year.





VIRTUAL MAINTENANCE MODELS

The benefits of building information modeling during construction are well-known, but the data can deliver long after a project is completed as the basis for an asset maintenance and management system. Augmented reality (AR) or VR models of a building's essential systems can allow maintenance personnel to learn and practice a complicated repair in virtual reality before executing it on-site.

SMART SAFETY WEARABLES

Construction sites could start looking a lot more like the set of Marvel's "Iron Man." A working exoskeleton from Ekso Bionics can help make workers stronger, more mobile and less prone to work-related injuries. The Smart Cap monitors brain waves to watch for fatigue and prevent micro-sleeps. Triax Technologies has developed Spot-R Clips, which track the number and location of workers on the job site in real time — and use built-in gyroscopes to send an alert when someone has slipped or fallen.

Also, the RealWear HMT-1 headset, an AR technology hardware option, can increase safety for personnel during field and on-site inspections. With a video camera and audio device, the headset has the ability to connect to various software types, including the GIS-centric VisualSpection or facility asset databases like BUILDER SMS. This allows for instant uploading of inspection and assessment information into a geospatial platform, an organized database or other software.

EXPLORE 3D, AR AND VR APPLICATIONS FOR THE POWER UTILITY INDUSTRY.
burnsmcd.com/AlterReality