# How robotics and AI are revolutionising construction safety and efficiency



The construction industry is on the precipice of significant transformation as innovative technologies such as robotics and artificial intelligence (AI) increasingly reshape how buildings are designed and constructed. This shift promises to change traditional practices that have long defined construction, including the prevalence of straight walls, rising costs, project delays, and frequent workplace accidents.

April 28 marked the World Day for Safety and Health at Work, with this year’s theme focusing on the impact of digitalisation and AI in modern workplaces. The International Trade Union Confederation’s General Secretary, Luc Triangle, highlighted concerns in an interview with Wood Central, stating, “Too often, artificial intelligence is being deployed not as a tool for progress but as a weapon against workers. From warehouses to hospitals, delivery bikes to data labs, workers are under pressure like never before. The deployment of new technologies must respect the norms of any other changes in the workplace: workers have a right to be consulted and included. This basic, democratic, workplace right will ensure the use of AI is designed with safety, fairness and dignity at its core. Workers and their unions must have a seat at the table for the benefit of all.”

While acknowledging these challenges, experts also emphasise the positive potential AI holds for the construction sector. A key example is the increasing adoption of robotic technologies in off-site manufacturing facilities, which can produce safer and faster building components at scale.

One pioneering facility is Randek AB, located in Snickaregatan, Sweden. In 2023, a delegation from Australia’s Wood Solutions and Timber Development Association toured Randek’s highly automated robotic manufacturing plant. The facility, led by CEO Christian Olofsson, employs the Randek Zero Labour Robotic system, which automates the entire prefabrication process for house construction from digital designs. BoKlok, a former joint venture between IKEA and construction company Skanska, has utilised this technology to deliver over 15,000 affordable homes across Sweden, Finland, Norway, and the UK.

Australia’s Timbertruss, the nation’s largest component prefabrication company, has also integrated Randek’s robotics technology into its production lines. This adoption has enhanced manufacturing accuracy, speed, and safety for building materials such as roof trusses, wall frames, posi-struts, and cassette floor panels, helping facilitate the company’s expansion nationwide.

Clarissa Brandt, Strategic Relations Manager at Timber Queensland and part of the Australian delegation visiting Randek, commented on the technology’s potential: “The benefits are many, including reducing workplace health and safety risks. In a time-motion study, one of their clients indicated a robot saved 22,000 tonnes of lifting for one person in one year.”

Though a relatively small enterprise with fewer than 100 employees, Randek AB has made a significant impact on the construction industry by enabling mass production of CAD-designed timber components in factory settings, requiring minimal on-site assembly.

Randek’s global profile enhanced in December 2021 when the company formed a strategic partnership with SCM, one of the world’s leading machinery suppliers. This collaboration aims to deliver a one-stop supply solution for the entire timber construction process, distributing an extensive range of robotic solutions tailored for beams, walls, timber frames, and cross-laminated timber (CLT) panels. The union strengthens the technological offerings available to the construction sector and supports widespread adoption of automated manufacturing.

Alongside robotic manufacturing, modular housing is gaining traction internationally. Forbes describes volumetric modular manufacturing (VMM) as a process where entire residential units are produced off-site at a factory, with as much as 95% of the house—including windows, flooring, painted drywall, plumbing, lighting, doors, and even kitchen cabinets—fully fitted before being shipped to installation sites.

Further research continues to push the boundaries of construction robotics. Late in 2022, MIT’s Centre for Bits and Atoms reported breakthroughs in robot systems capable of assembling almost any structure, with footage shared publicly demonstrating this potential.

Looking ahead, construction companies are integrating automated assembly lines with robotics like the Randek Zero Labour Robotic System, alongside AI-driven supply chain management. This integration frees workers from repetitive and hazardous tasks, allowing technicians and engineers to focus on programming and maintaining specialised machinery that ensures consistent quality and precision in building components.

The Wood Central is reporting that as digital tools and AI become integral to off-site manufacturing processes, the construction industry stands at the forefront of a technological renaissance that promises faster, safer, and more efficient building methods worldwide.

Source: [Noah Wire Services](https://www.noahwire.com)

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