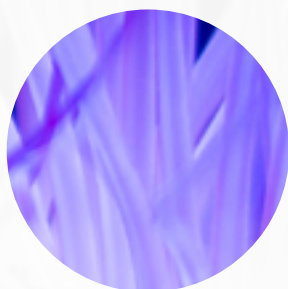


How is the construction industry responding to AI (and some issues to consider in its implementation)

Artificial intelligence (AI), including generative AI (GenAI) such as ChatGPT, is transforming how lawyers approach their work. Has the construction sector seen a similar shift?

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Introduction

In December 2024, we considered whether the construction sector was ready for artificial intelligence (AI) and the transformative potential of AI to change construction operations.¹ In the year since, it certainly feels like there has been much change – but is that really the case? Most then thought that the integration of transformative AI technology such as generative AI (GenAI) into construction processes was still far off. Dentons’ 2024 survey, *Laws of AI Traction*,² found that construction companies were using AI for IT, cybersecurity, customer service and accounting use cases but also highlighted fears about AI skills gaps and investment costs. A year on, the examples we share below point to the emergence of a more positive attitude within construction about the potential benefits of using AI – but not necessarily a wider take up.

Our use of GenAI...

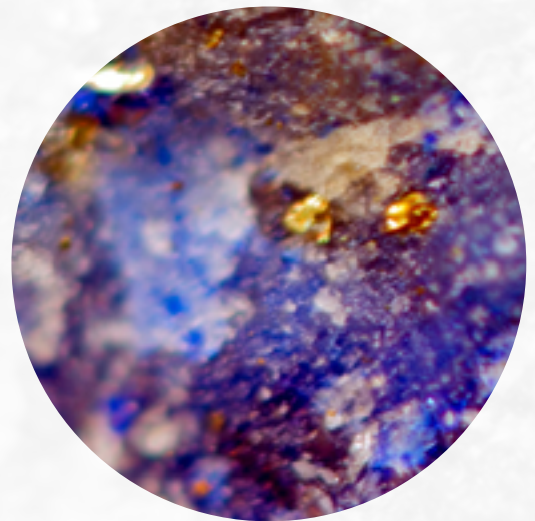
In the spirit of transparency, (a key consideration for lawyers and other professionals using AI), we used our in-house, confidential large language model (LLM) platform “FleetAI” to kick-start our research on construction’s AI progress. LLMs are deep-learning models that are trained on huge text datasets so that they can process data rapidly to produce answers (**output**) to questions (**prompts**). For those unfamiliar with AI, keep in mind that there are multiple different types of AI of which GenAI is one. (You can find more detail in the recently published government guidance, [AI Insights: Generative AI \(HTML\)](#).)

We also kept in mind the “three core rules of AI” for lawyers and judges as promulgated by the Master of the Rolls and legal technology champion, Sir Geoffrey Vos, (see: “What a difference a year makes³”): “first, that you need to understand what an LLM is doing before you use it; secondly, you need to avoid putting private data into a public LLM, and thirdly, you need to check what comes out of an LLM (like ChatGPT) before you use it for any purpose at all”. We prompted FleetAI to review each of the statements made in our December 2024 article, to confirm any updates in the last year and to provide examples and sources. The results were checked against the sources.

So, what has changed?

In December 2024, we did not regard construction as a trailblazer in developing new AI applications, partly due to the multiple challenges facing the industry such as new building safety law, tight operational margins, skills and materials shortages and cost inflation.

This lack of trailblazing remains the case according to The Royal Institution of Chartered Surveyors (**RICS**) *AI in Construction Report*⁴ of September 2025 (**RICS Report**) which shared the results of various surveys. Respondents reported “very limited AI adoption among construction organisations globally” and AI preparedness remaining “low across the construction sector”. However, professional respondents believed “AI could significantly improve several aspects of construction projects” in tactical areas such as progress monitoring and resource optimisation but also skills training, regulatory compliance, autonomous robotics, predictive digital twins, low-carbon and circular construction, safety and wellbeing, document drafting and operational efficiency.



1. <https://www.dentons.com/en/insights/articles/2024/december/10/is-the-construction-sector-ready-for-ai/>
2. <https://www.dentons.com/en/services-and-solutions/digital-solutions/all-knowledge-hubs/ai-hub/laws-of-ai-traction-report/>
3. What a difference a year makes: speech about AI by the Master of the Rolls, 16 October 2025, <https://www.judiciary.uk/speech-about-ai-by-the-master-of-the-rolls-what-a-difference-a-year-makes/>
4. RICS’s AI in Construction Report 2025 (RICS), 12 Sept 2025, <https://www.rics.org/news-insights/artificial-intelligence-in-construction-report/>

What do industry bodies have to say on AI use?

The RICS is not alone in actively monitoring and reporting on the rise of AI use to find new use cases and answers to challenges such as how AI should be regulated. AI-related reports published this year include:

- The RICS Report which reports on AI's rapid progress, with "recent breakthroughs in **deep learning architecture**" and the release of GenAI tools. According to the results of a skills survey quoted in the RICS Report, nearly 70% of both project managers and quantity surveyors⁵ held a strong belief that AI will help to deliver future value. However, 45% of organisations report no AI use so far, only 34% are in early pilot phases, only 1.5% report use across multiple processes and less than 1% say they have scaled AI across projects. The RICS Report indicates that this "sharp drop-off suggests significant barriers to scaling AI use, including skills gaps, integration challenges, data availability and high implementation costs".
- The Health and Safety Executive (**HSE**) published the HSE's regulatory approach to [AI]⁶ (2025) which confirmed that its role in regulating the use of AI includes where AI implementation impacts on: health and safety in the workplace; the design, manufacture and supply of workplace machinery, equipment and products for use in the workplace; and HSE's role to protect people and places, (including building safety). HSE's action to date includes the creation of an internal AI common interest group, working with the UK government to shape the approach to AI regulation, collaboration with industry and academic stakeholders and setting up and trialling an Industrial Safetytech Regulatory Sandbox.⁷
- The Civil Engineering Contractors Association (**CECA**)'s *AI in UK Construction Report, May 2025*⁸ (**CECA Report**) in which CECA recommends that existing standards for AI adoption in construction be promoted, the development of a specific review of the risks of AI use in construction and consideration of a confidential reporting system for that risk.
- The Royal Institute of British Architects (**RIBA**)'s *AI Report 2025* RIBA⁹ (**RIBA Report**) which reports that the percentage of architect practices using AI now stands at 59% in 2025, compared to 41% in 2024. RIBA president, Muyiwa Oki notes that questions relating to the role of AI in architecture are no longer theoretical. He explains that RIBA's Report "confronts the reality of AI's place in [the architect] profession" and is about "recalibration". He notes: AI's potential to address key challenges of climate resilience, inequality, urban sustainability and material efficiency alongside the need to use AI in an ethical framework; the balance between addressing concerns about AI (such as job displacement) and AI's undeniable potential lying in "steering the technology, not being steered by it"; "RIBA's role is clear. We need to make sure AI serves the profession, not the opposite"; and "the challenge is no longer about whether to adopt AI, but how – and on whose terms".
- The Chartered Institute of Building (**CIOB**)'s AI Playbook (June 2024)¹⁰, while predating our December 2024 article, is also worth a mention as much of its content considering what AI might mean for construction remains relevant now. Written by members of CIOB's Digital & Innovation Advisory Panel, the CIOB AI Playbook is intended to provide readers with "a set of insights and practical applications to using AI in your workplace".

The fact that so many of the industry's respected bodies are producing guidance for their members and the industry at large underlines the potential importance – and relevance – of AI for construction. Let's take a look at some of the use cases.

5. According to data from the RICS skills survey of 22 May 2025: Understanding the skills challenge – our global skills survey, <https://www.rics.org/news-insights/understanding-the-skills-challenge-our-global-skills-survey/>

6. HSE's regulatory approach to Artificial Intelligence (AI), <https://www.hse.gov.uk/news/hse-ai.htm/>

7. Creating the first Industrial Safetytech Regulatory Sandbox for the UK construction sector, <https://www.discoveringsafety.com/reports/creating-first-industrial-safetytech-regulatory-sandbox-uk-construction-sector/>

8. Civil Engineering Contractors Association (CECA)'s AI in UK Construction, Report May 2025, <https://www.ceca.co.uk/wp-content/uploads/2025/05/CECA-AI-in-UK-Construction-Report-May-2025.pdf>

9. RIBA's Royal Institute of British Architects (RIBA) – AI Report 2025 RIBA, <https://www.riba.org/work/insights-and-resources/professional-features/ai-professional-features/riba-ai-report-2025/>

10. The CIOB's AI playbook, <https://www.ciob.org/industry/research/AI-Playbook/>

Use cases

Our Dentons' survey in 2024, **The laws of AI traction**, found that the most popular use cases for AI by real estate developers and construction companies included IT and cybersecurity, with 75% of sector respondents saying they already use AI for this purpose, followed by customer service and accounting (both at 71%).

A year on, the RICS and RIBA Reports etc. referenced above indicate generally that back-office AI use still dominates. While design and engineering functions are emerging/increasing, the RICS Report found that "more frequent use of AI on construction projects is still relatively rare: just under 12% of respondents reported regular use of AI in specific processes and only 1.5% reported use across multiple processes. This sharp drop-off, according to the RICS and as noted above, "suggests significant barriers to scaling AI use, including skills gaps, integration challenges, data availability and high implementation costs".

Design optioneering and evaluation

In December 2024, we highlighted some widely discussed use cases including the possibility of creating better informed designs using analytics trained on increasingly large specialist architectural and engineering datasets; sophisticated 3D modelling capabilities; and autonomous machines that can improve site monitoring and safety.

The RICS Report found that design optioneering and evaluation was the area where construction professionals found AI's "primary value proposition" to lie with 40% of those surveyed believing "AI-led design evaluation could become the next frontier of competitive advantage", particularly given the growing pressure to build smarter and faster.¹¹

A fascinating insight into AI-led design, was given at the JCT Povey lecture on 13 November 2025.¹² The speaker, Diego Padilla-Philips, a director at WSP, shared his work and insights on the way that "AI and augmented intelligence is already changing the industry" and how we work and live. He explained how augmented intelligence, the combination of AI and human, is using a combination of algorithms

to support "co-design": a systems-level, integrative design approach that unites multiple disciplines to collaboratively address the complexities of whole-building performance". The models Padilla-Philips shared were extraordinary: he ran live models that showed how the structure and dimensions of a building adapt within the model as the algorithms are applied, ultimately producing the most effective design to meet a client's specific brief. The **lecture** is well worth an hour of your time.

Streamlining project management

AI is being considered more widely to support more **effective project management** with functions such as data analysis, predictive scheduling and risk analysis when managing people, materials and equipment as well as delay. See **this discussion** in Digital Construction Today of the impact of AI on scheduling, cost management and site safety by Dan Ashton of Proicere Examples who adds that "no technology can replace the discipline, experience and common sense that epitomise construction project managers and their teams" – but AI can "empower the workforce to work smarter, safer and more [profitably]"¹³.

Site security

In December 2024, another area in which we thought AI might prove helpful included reducing thefts from construction sites. AI-based site security is now available on the market in the form of CCTV, smart cameras and video analytics systems using machine-learning to detect unauthorised site access and regulatory compliance on site. Facial and vehicle recognition are also being adopted to protect expensive plant, materials and site infrastructure. (As an aside, those looking into these services need to ensure compliance with data protection laws.)

Sector specific use cases: e.g. smart dams

Dams have always met a vital, societal need for electricity, irrigation, drinking water and flood protection. To meet increasingly complex demands arising as a result of climate change challenges, population growth and heightened expectations

11. Paragraph 3.5, RICS report

12. JCT Povey Lecture 2025: "Human-Centred, Evidence-Based, Augmented Intelligence in Building Design". November 13, 2025, <https://corporate.jctltd.co.uk/category/jct-povey-lecture/>

13. How AI is set to transform project management in construction, Dan Ashton, Proicere Digital, in Digital Construction Today, <https://www.pbctoday.co.uk/news/digital-construction-news/construction-technology-news/how-ai-is-set-to-transform-project-management-in-construction/151499/>

for environmental and social responsibility, the hydropower industry is embracing “smart dams”. Smart dam projects introduce new contractual, regulatory and risk-allocation issues that must be addressed but the benefits of combining civil engineering with digital innovation to transform engineering practice can be seen in enhanced operational efficiency and safety. AI-enabled dams do not simply react to scenarios; they use weather and environmental data to anticipate what is about to happen and adjust operations accordingly. They utilise digital twins – virtual, data-connected models of physical assets or systems – that are built from live sensor data and historical performance to enable forecasts of rainfall and inflows. You can read more here: **Smart dams and digital twins: re-imagining water infrastructure in the age of AI.**

AI is also being used in multiple other, construction sector use cases including in 3D printing processes to design parts that print better, to generate and optimise how the nozzle/laser moves, to integrate thermal simulation into planning (to manage heat build-up and avoid warping/defects) and to monitor and detect defects.

Health and safety and efficiency: replacing workers with robots

Upskilling the workforce and ensuring the right level of digital skills in the workforce remains a significant risk for construction – an industry already struggling to fill vacancies for skilled manual trades. However, it remains difficult to generalise about how AI will affect the sector given the vast range of skills and roles. While robotics and automation are increasingly in evidence in UK-based technology pilots, the full replacement of manual site roles largely remains something for the future. Current AI usage appears to be more focused on inspection and/or monitoring of human output rather than replacing humans. Businesses should, however, monitor developments in this field not least because the potential for robots and automation to be used alongside human workers in performing the more dangerous manual tasks could significantly reduce both the number of construction accidents and better manage the down time associated with human shift patterns. AI safety tools are already available to help reduce

site accidents such as the wearable technology powered by AI that warns plant operatives of pedestrians in potential danger from collision.¹⁴

Industry approach to investment and implementation

In December 2024, Dentons’ 2024 survey reported that many in business saw the benefit of investing in AI as a means to reduce risks associated with data breaches, skills shortages and maintaining competitiveness. Ongoing skilled labour shortages and the acknowledgement by many that GenAI is starting to affect desk-based roles means many were – and still are – concerned about how to address the industry’s digital skills gap. Yet many organisations, particularly smaller subcontractors, were lacking the knowledge, capital and risk appetite to invest in the effective deployment of AI, raising concerns about falling behind rivals and potential negligence claims if AI-driven safety measures were to become the norm without implementing necessary safeguards like reviewing output. Larger companies were the ones more likely to absorb early research and development costs even while AI adoption in construction was viewed as inevitable.

A year later, the approach to AI investment and the barriers to implementation remain largely the same based on statistics such as those shared in several of the reports referenced above. For example, key barriers to AI implementation given in the RICS Report (see survey in May 2025¹⁵) included a lack of skilled personnel (46%), poor data quality and availability (30%) and integration challenges (37%).

Ultimately, construction businesses are no different from those in other sectors in looking for AI tools that deliver improved margins and other competitive advantages but with low risk of technological failure or obsolescence. Most construction-focused AI tools (with some exceptions) are at the early stages of experimental implementation. It is not surprising therefore that most are reluctant to use AI in high-risk areas, such as supply chain management. Fortunately, there are many examples of AI-powered use cases in construction from which the reluctant can take inspiration including:

14. AI-powered wearables: transforming workplace health and safety, British Safety Council, 8 December 2025, <https://www.britsafe.org/safety-management/2025/ai-powered-wearables-transforming-workplace-health-and-safety/>
15. Understanding the skills challenge – our global skills survey, 22 May 2025, <https://www.rics.org/news-insights/understanding-the-skills-challenge-our-global-skills-survey/>

- WSP's co-design tool (see the JCT Povey lecture);
- Vinci Construction's use of OpenSpace to capture building sites at every stage of a build¹⁶;
- Sir Robert McAlpine's use of AI to automatically generate real-time project status reports¹⁷;
- The HSE's active development of an AI regulatory sandbox to enable innovation in safety-critical use cases¹⁸;
- Innovate UK's Bridge AI programme, a fund to support AI and GenAI applications in sectors including construction¹⁹; and
- the Construction Leadership Council's Construct AI programme which promotes the use of AI and supports the development of an AI lab to explore AI use cases in construction.²⁰

Risks of AI implementation

The CECA Report of May 2025 acknowledges that the AI revolution is already underway but also highlights the new risks for construction companies in using AI. These included "reduced privacy, overdependence on AI tools, cyber security concerns, ethical issues and the loss of intellectual property". Its recommendations for AI use by UK construction include 10 recommendations that cover managing risk (including the use of standards for the adoption of AI, a review of AI risks in construction and a confidential AI risk reporting system); cross-industry collaboration (including the development of an AI community within construction and an AI implementation plan); and training (including signposting existing training, role specific training and the inclusion of AI training in professional development).

The ethical problems associated with advances in technology and use within construction must not be forgotten. In the RICS Report, the implications "for professional skills and expertise, productivity, job security and displacement, health and safety, security and sustainability" were acknowledged.²¹

The legal consequences of AI use in construction projects must also be considered thoroughly before implementation. For example, those using project management tools must consider what "documents" will be produced as part of AI's output. Is there an audit trail? How did the model reach its result? Will AI models be used to generate contractual notices? Such issues could cause problems when collating evidence if disputes arise.

Conclusion

AI's adoption curve has been extraordinarily steep across sectors. In construction, AI is already being used to carry out many largely "back-room" tasks, more quickly, cheaply and reliably. AI is increasingly regarded by many as a tool that can improve productivity, safety and competitiveness across UK construction, even while its full potential is only being explored by a comparatively small subset of better resourced, forward-thinking businesses.

Like many sectors, the construction industry stands at an unprecedented inflection point. AI integration is accelerating at a rate few could have predicted even a year ago – driven by a combination of increasingly tech savvy employees, who are using AI in their day-to-day use of social media, commercial pressure for productivity gains and rapidly developing, more accessible tools. Businesses that understand and act on the opportunities now arising – construction's trailblazers – will gain competitive advantages.

In answer to our opening question, is GenAI transforming how construction is approaching its work, the answer is yes – for some but implementation is patchy for most. Certain businesses are leading the way and experimenting (for example, WSP with their approach to design) but the results of their time and money investments, combined with the support of industry bodies, will, inevitably, trickle through the supply chain to improve industry efficiency overall. For those still considering AI implementation, the trick lies in identifying low-risk use cases for adoption and accessing available guidance and support such as ConstructAI and Innovate UK's BridgeAI.

16. <https://www.openspace.ai/resources/case-studies/vinci-construction-uk/>

17. For example, see IHP taps Buildots' AI platform to drive construction efficiency at Nottingham University Hospitals National Rehabilitation Centre, <https://www.srm.com/news-and-comment/buildots-ai-powers-nrc-construction-with-ihp/>

18. New Smarter Regulatory Sandbox developed to increase compliance, 24 June 2025, <https://www.gov.uk/government/case-studies/new-smarter-regulatory-sandbox-developed-to-increase-compliance>

19. <https://www.constructionleadershipcouncil.co.uk/news/bridge-ai-programme/>

20. <https://www.constructionleadershipcouncil.co.uk/workstream/next-generation-delivery/digital-data-and-knowledge/>

21. <https://www.rics.org/news-insights/artificial-intelligence-in-construction-report/>

Issues to consider when implementing AI in construction

- Who will be accountable for the AI model's outputs such as the design, reporting, decisions on safety? Remember that the use of AI does not alter statutory or contractual responsibility.
- If site and employee surveillance tools are to be used (especially biometrics), ensure compliance with all relevant data protection laws to ensure lawful use.
- Manage confidential information by ensuring it is clear what data can be entered into an AI model, where it is stored or processed, and whether it will be used to train third party AI models.
- Clarify who will own any AI outputs be they drawings, text, reports and so on. Can the project data or Building Information Models be [re]used beyond the project? On what basis?
- Establish a process for AI outputs to be checked by humans. Will any margins for error be built into the process? Ensure clear, easily accessible audit trails of all inputs into the AI model and any assumptions made as well as the model versions used to ensure a full set of evidence in the event of a dispute.
- Review, in the context of AI use, at both the procurement and contract stage: appropriate warranties, limitations of liability, management of change control, cybersecurity safeguards and commitments, and how data can be extracted from the system / shared.
- Will AI-generated reports become part of the project record? How will this be managed? Who is responsible? How will such reports be preserved and disclosed for the purposes of dispute resolution?
- Are your site and office teams sufficiently trained both in using systems incorporating AI technology – and in your authorised process for such usage?

The above list is a brief summary of the issues to be considered when considering AI implementation on construction projects. Please contact us if you want to discuss the ramifications of using AI on your specific project.

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