



BUILDING SMARTER

PUTTING QUALITY AT THE HEART OF INFRASTRUCTURE INNOVATION

If you were asked to assess the quality of the world's infrastructure, would you know how to answer? Thankfully, there are people who have already done the job for you.

Every four years, the American Society of Civil Engineers assesses the infrastructure that keeps the US running—the bridges, schools, water treatment facilities, and the like—and assigns it a letter grade.

The 2021 report delivered some good news and some bad news. The good news: The nation's infrastructure achieved its highest grade since 1988. The bad news? That grade was a C-

This is not an issue limited to the US, with similar issues found across the globe. But there is hope: Architecture, Engineering,

and Construction (AEC) professionals hold the power to correct many of these failings, contributing to a more reliable, equitable, sustainable, and resilient built environment.

The root causes of poor-quality infrastructure are complex and varied, but many are linked to structural flaws in the AEC sector, including atomized project teams, a culture of low bidding, and shortsighted value engineering. These and other challenges put projects at risk.

Individual designers and builders can't solve all these problems alone, but collectively they can—and must—make a difference. In a very real sense, society's future depends on AEC professionals stepping up to produce better, more useful, and higher quality infrastructure.





Committing to BIM

Taking advantage of Building Information Modeling (BIM) is one way to make meaningful change. BIM gives AEC professionals a common point of knowledge across every phase of a project's lifecycle, from inception through to eventual decommissioning. This approach reduces industry fragmentation and helps teams to work more efficiently and accurately.

When used in conjunction with technologies like augmented reality and laser scanning, BIM can offer greater clarity throughout the design and construction process. By pushing for the use of BIM within their companies and on their own projects, designers and builders can help raise the quality of their work.

Despite BIM's proven benefits, adoption has been relatively slow. JoAnn, an architect in the US, tells us that while BIM is becoming a must-have for many clients, no one in her firm knows how to implement it.

By committing to developing BIM skills, then introducing it on their projects (or pushing its use further), AEC professionals can both improve the reliability of their work while making themselves available to a wider array of clients.

Proactive communication

Communicating proactively with key project stakeholders is another essential consideration for successful projects. BIM is one important way to reduce the slow exchange of information between different parties during a project. But it's not the only one.

Integrated Project Delivery, an approach in which contracts are structured to encourage collaboration between team members, has been consistently touted as one solution, but its use remains relatively limited. However, individual practitioners can apply some of its guiding principles even within traditional project delivery structures by proactively communicating with all concerned parties throughout the lifespan of a project.

For Tim, a contractor in the US, this model has clear benefits over approaches where different disciplines have limited interaction. "I like the idea of having architects and engineers involved right away, because you can start spotting problems sooner," he observes.



Diverse teams, better outcomes

The makeup of the team is also critical. The construction sector has traditionally been the preserve of men, and more specifically, white men. This narrow focus could well hamper firms in two ways—first by sticking too rigidly to a specific way of thinking and working, and second, by hampering growth and development.

In their Harvard Business Review article *Why Diverse Teams are Smarter*,¹ researchers David Rock and Heidi Grant make a simple case. “Enriching your employee pool with representatives of different genders, races, and nationalities is key for boosting your company’s joint intellectual potential,” they write.

Building diverse teams, therefore leads to higher-quality projects because more diversity brings in a greater variety of perspectives and experiences, which help to produce higher quality buildings. Josh, an architect in the US, sees strong correlations between issues of equity and reliability in the building sector.

“I’m a big believer in making sure that in every stage in hiring you have benchmarks of interviewing people outside your circle,” he asserts. “There’s significant data that having input from people with a variety of experience and viewpoints can result in a better outcome in group decision making.”

Printing for quality

But even if you have the right people and the right lines of communication, much still depends on having the right technology. And in AEC, one of the pieces in the jigsaw is the printer.

That's because many AEC professionals view printing as a critical step in quality control. Cath, an architect in the UK, finds it easier to spot errors on paper than on screen. "Before any information is issued, I will always print it and check it over," she reports.

Mike, an engineer in the US, also prints digital files before distributing them in order to make sure the information is correct. "That's a great way to catch mistakes and to really say, 'OK, this doesn't make sense,'" he says. Understanding scale and spatial relationships can be particularly difficult when zooming in and out digitally. Translating large spaces

and high volumes of information onto small screens does not always lead to intuitive results. Using large-format print makes it easier to identify areas of concern.

Mike also finds prints easier to annotate than digital files once opportunities for improvement have been identified. "A print is great because you can write on it and take notes or make changes. You can't do that really easily on a phone or a tablet," he asserts. "You can use a quick note or a different color or something relatively easily on a big drawing."

Contractor Tim believes that prints can assist AEC professionals in making better, faster decisions. "When you see it on a drawing, it's very easy to specify, 'That wall's in the wrong spot,' or 'This I-beam is going to be right where you want something to be an open ceiling,'" he notes.



The right tools for the job

HP plotters help AEC professionals redesign and rebuild our built environment while integrating seamlessly into their workflows and meeting stringent quality standards.

Full color, high resolution plots that can be produced at the speed of a toner, thin lines and great accuracy regardless of the paper used, and smoother workflows that allow AEC professionals to spend less time on complex processes and more time on high-impact work. They all combine to help

AEC professionals take an important step toward a vital goal: Creating a more just, inclusive, and resilient world for the benefit of all.

HP large format, DesignJet, and PageWide XL printers are essential tools to help redesign and rebuild the world more effectively and with the quality levels that are required for such a task.



i. <https://hbr.org/2016/11/why-diverse-teams-are-smarter>

