AEC Guide

Building ambition.

Four factors that empower AEC professionals to turn vision into reality.

AMD

Contents

The architecture, engineering and construction industry is at a crossroads.

And it’s one that’s familiar to high-achieving AEC professionals everywhere. At its heart, the profession is still deeply driven by craft and individual expertise but the forces acting on it are becoming steadily more systemic, digital and political.

This guide explores some of the key shifts taking place in the industry and spotlights the stories of three AEC professionals who have brought ambitious projects to fruition. You’ll learn how, when your hardware boosts performance and productivity, and gives you the personalization and protection you need, you can operate at the top of your game.

Things are shifting in AEC.

Sustainability takes center stage.

Environmental responsibility has moved from being a worthy ambition to an essential requirement of every project. Whole-life carbon, embodied carbon, circularity, and climate resilience are increasingly part of AEC workflows. It's not just about designing for sustainability; you need to be able to quantify the impact. A 2025 NBS survey of 559 AEC professionals found that 60.3% had used digital technologies to calculate embodied carbon in the last 12 months, up from 40% in 2023.[1]

Systems thinking is shaping design.

The global digital twin market is projected to grow from USD 33.97 billion in 2026 to USD 384.79 billion by 2034,[2] according to Fortune Business Insights. This growth reflects a broader shift in the industry: buildings are no longer seen in isolation, but as part of interconnected systems spanning mobility, data, energy, and wider societal and environmental ecosystems. The convergence between architecture and infrastructure is a prime example. It's never been more important for AEC professionals to be able to think, design and operate with a broader perspective.

Decisions are increasingly digitally driven.

Digital tools are now shaping decisions at every stage: from option generation and compliance, to optimizing costs and analyzing CO_2. For example, Autodesk's 2025 State of Design & Make: Spotlight on Construction report found 63% of construction organizations are leveraging AI to be more sustainable.[3] Digital technology means more possibilities can be explored faster and speeds up feedback and iteration, so it's no surprise that, of the organizations Autodesk surveyed in its 2025 State of Design & Make report, 99% said that digital transformation had improved innovation to lead to better ideas and 100% said it had improved productivity.[4]

Things are shifting in AEC.

Everything's accelerating.

There's constant pressure to do everything faster. Advances in visualizations, 3D models, collaboration tools and common data environments are transforming how projects are designed, built and operated, according to Construction Briefing.[5] "Increasingly, design conversations will take place directly within 3D models," writes Andy Brown in the publication, "Enabling quicker iterations, faster workflows and stronger alignment."

But as speed and complexity increase, that alignment matters more than ever. If you can translate that complexity into clarity, you'll ensure the best decisions get made at the right time.

Cost pressures continue to build.

Exacerbated by everything from inflation to supply chain volatility and labor shortages, cost pressure impacts every part of every project. Value engineering is creeping earlier in the process and finding ways to reduce cost while maintaining performance is an ongoing challenge. Autodesk's 2025 'State of Design and Make' report found that 34% of leaders in architecture, engineering, construction, and operations cited cost control as a top challenge.[6] Finding ways to balance quality and design intent with financial realities is crucial.

Fragmented teams are the future.

Disparate teams and hybrid working are here to stay: statistics from World Metrics show remote work adoption of 92% in architecture, 87% in engineering and 78% in construction.[7] But they also report that 31% of AEC professionals feel remote collaboration is 'less effective' than in-person, especially for complex projects.[7] Add in global consultants and stakeholders and siloed specialists and it's easy to see how teams can become misaligned and risk creeps in as coordination complexity increases. Those individuals and firms who excel at integrating teams and disciplines will have the edge.

There’s a gap between vision and reality.

AEC professionals can clearly see ways to make the world we live in better, safer, greener and more human-centric. But your ability to achieve that vision is constantly constrained by budgets, timelines, complexity and mismatched priorities. It pays to learn when to push for your vision, when to compromise and which small changes will make a big difference.

In this guide we’ll explore four hardware factors that can help ambitious AEC professionals take their vision further:

1 **PERFORMANCE**

2 **PRODUCTIVITY**

3 **PERSONALIZATION**

4 **PROTECTION**

We’ll also see how two firms worked with technology that offered all these elements to make seemingly impossible projects possible.

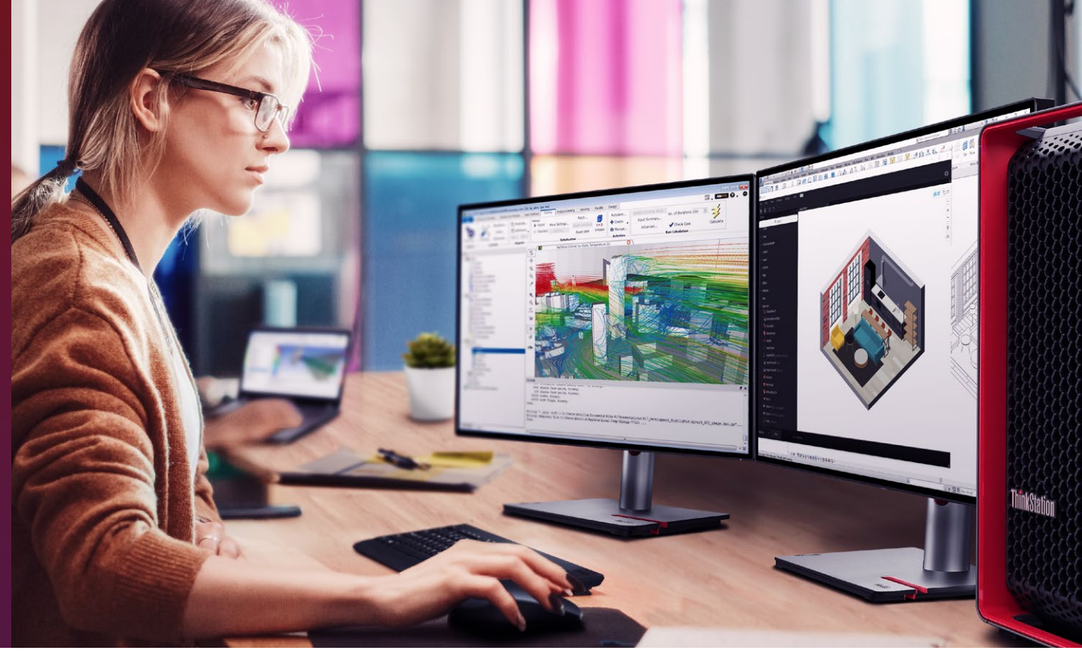
1

PERFORMANCE

Ambition without limits.

Don’t let mounting project complexity, expanding datasets and shifting workflows restrict your creative confidence.

With the right mindset, and the right technology, you can take on projects that might seem impossible.



The capacity to keep pace as workflows evolve.

AEC workflows are always shifting. Whether it’s terabyte-scale datasets, increasingly intricate simulations or the expanding role of AI, you need to be ready to handle the workflows of tomorrow.

ThinkPad P16s

How your hardware can help.

To do it, you’ll need hardware designed to expand and flex as your ways of working change. Look for easily expandable memory, storage and graphics so you can handle larger models, more complex simulations, and new software demands, extending your workstation’s lifespan far into the future.

Sustainability and performance-led design.

As commitment to net zero extends beyond the building itself and into the supply chain, there is a huge opportunity for AEC professionals to create a better future. This could be everything from achieving the more exact calculations needed to help you accurately calculate embodied carbon emissions and reduce waste, to generative design and building simulation technology to help you evaluate the best possible options to reduce operational carbon emissions.

How your hardware can help.

These workflows put serious demands on your machine’s compute performance, moving beyond complex BIM models and into intricate calculations, rapid iterations, intensive simulations and analyses. You’ll want to make sure your workstation has the CPU and GPU performance to keep up.

1

PERFORMANCE IN ACTION

Digitizing Alcatraz Island.

NAME: Peter Kelsey

ROLE: Founder, VCTO Labs

AMBITION: Create a digital twin of Alcatraz Island. In 3 weeks.

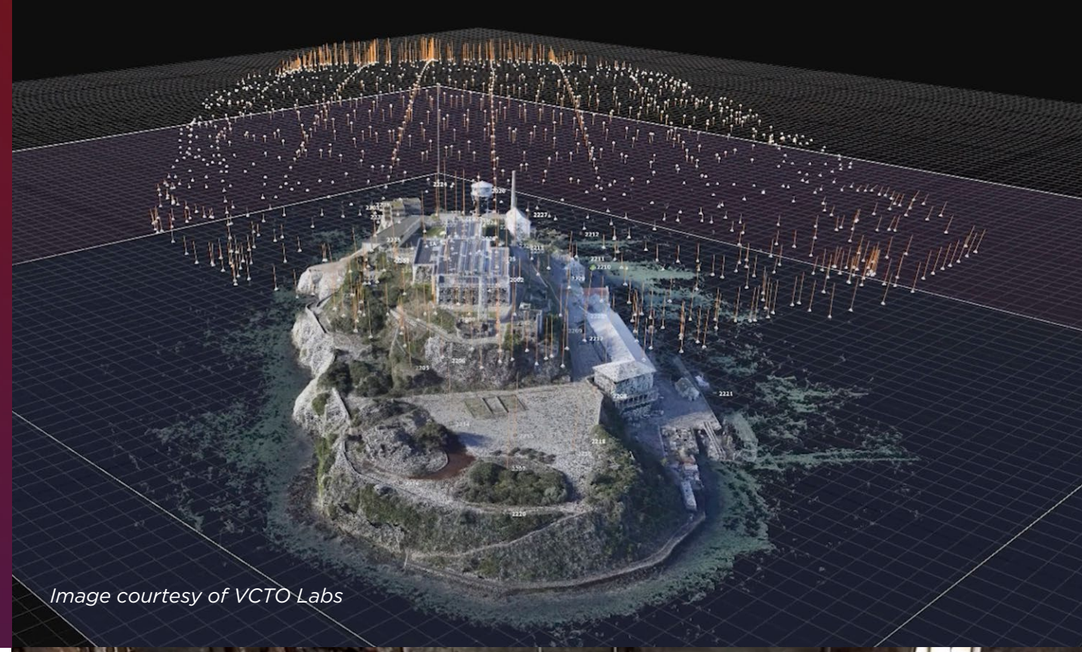


Image courtesy of VCTO Labs

Notoriously remote site. Harsh conditions. Limited connectivity. And just three weeks to scan every inch of it.

Peter Kelsey knew it wouldn't be easy. The National Park Service had tasked him with creating a detailed digital twin of Alcatraz Island. But the timelines were so tight, and the windows for scanning were so narrow that, to complete the project, Peter had to make a drastic decision. He and his team would spend three weeks on Alcatraz: spending their nights sleeping in cells and their days scanning every bit of the inhospitable site.

Processing an island's worth of data.

There would be no escape until the team had scanned every space on Alcatraz. And there was only one way to be certain: post-process everything before leaving the island. But with terabyte-scale reality capture datasets and very little time, that was no small feat. Add in the island's slow Wi-Fi which meant the cloud wasn't an option and processing all that data on site started seeming impossible.

1 PERFORMANCE IN ACTION

Image courtesy of VCTO Labs

Portable performance and a processing powerhouse.

That all changed thanks to the Lenovo ThinkStation P8 and ThinkPad P16s. While the ThinkPad's MIL-SPEC-tested durability and portable processing power advanced by AMD Ryzen™ AI PRO processors let the team work in the damp, dirty, dusty conditions of the historic site, the ThinkStation P8 changed the game completely, and made the project possible.

> "Without Lenovo, this project wouldn't have worked. It's that simple."
>
> Peter Kelsey, Founder, VCTO Labs

ThinkPad P16s

The team would drop LiDAR, photogrammetry, TLS and multispectral imagery data to the cellhouse office for processing and head back out to scan more of the island. The gigabytes were mounting up. And time was running out.

Kelsey used the full power of the ThinkStation P8's 96 cores to crunch through vast quantities of data, turbocharge his workflow and get the project completed on schedule. By running simultaneous workloads, Kelsey could get up to fifteen sessions running at the same time, adding more workloads until all 96 cores were running. The ThinkStation handled it all with ease.

PRODUCTIVITY

2 Maintaining momentum from concept to completion.

As demands increase, cost pressures intensify and timelines evaporate, keeping projects moving at pace is more important than ever.

At the same time, there are key moments in every project where the right decision at the right time can have an outsized impact on everything from cost to quality to carbon emissions.

Better decisions, earlier.

Any time you can claw back in the early stages of a project can give you the breathing—and thinking—space you need to plan, model and simulate until you hit on the most cost, time, and carbon efficient solution. And let's face it, the faster you can iterate, the longer you can keep clients' minds open and the more ground you can cover before your deadlines close in.

How your hardware can help.

Exploring the 'What ifs' of a construction project demand a lot of your machine. Where once you might have been comparing a handful of options, AI, automation and generative design now mean you're routinely working with hundreds. And with workflows like parametric massing modeling, daylight simulations and rapid visualizations, you need the right levels of CPU and GPU performance to let you blast through heavy workloads, accelerate design iterations, and help you make the most of your early stage exploration time.

Putting the great into integration.

All too often, errors and misalignment can slip into a project at the interface between disciplines, causing delays, rework and wasted time and materials. Master the people and process management needed for good cross-discipline integration and coordination, and you'll not only keep projects moving, you'll also get end results that are closer to achieving your vision—and your budget too.

How your hardware can help.

Coordination, clash detection and integration often involve large complex models, huge point cloud datasets and real-time updates and decisions. Equipped with a workstation built to handle heavy workloads and multitask with ease, you'll keep multidisciplinary teams connected and productive from concept to construction. Enable multitasking across design platforms, real-time collaboration in shared BIM environments, and rapid file exchanges that keep iterations and approvals flowing effortlessly.

3

PERSONALIZATION

Performance, tailored to you.

The way you work should be shaped by your specialism and your ambition—not the limitations of your hardware.

With technology tailored to the way you work, you can keep projects moving fluidly between teams and locations, and keep pace when workflows change.

The freedom to evolve.

AEC workflows are distinct from discipline to discipline and from individual to individual. They're also shifting in ways we can plan for but never perfectly predict. We can expect workflows to become increasingly digital, AI-powered and compute heavy. So, switched on AEC professionals must focus on refining their workflows today, and be ready for them to evolve in the future.

How your hardware can help.

Your workflow isn't one size fits all. Your workstation shouldn't be either.

That's why Lenovo workstations are performance optimized for maximum speed and stability in leading AEC software and they can be fine-tuned for the way you work. When your workflows inevitably shift, you need a machine ready to adapt. Lenovo ThinkStations make upgrades easy with modular design and toolless access, as well as letting you add more storage and expand memory—so you and your machine stay unstoppable, whatever compute demands the future holds.

Keep work flowing between fragmented teams.

Remote sites. Hybrid teams. Siloed specialisms. In the AEC industry, work has never happened in just one location. Add in faster project cycles and increasingly digital workflows and you risk delayed decisions, clunky collaborations and projects that slow right down when teams are spread out. But if you can find ways to keep projects moving no matter where teams are working from, your timelines and your clients will thank you.

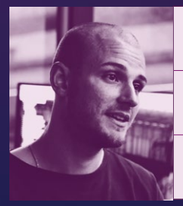
How your hardware can help.

The right mobile workstation keeps you productive in the studio, on site and everywhere in between. Machines like the Lenovo ThinkPad P14s and P16s pack all-day battery life, fast processors and professional-grade graphics into a lightweight chassis. With the right displays connected to a dock like the Thunderbolt 5 Smart Dock, you can switch locations by unplugging just one cable. And when you need more power on the go, Lenovo Access gives you virtual access to your ThinkStation from anywhere.

3

PERSONALIZATION IN ACTION

Designing for extreme environments.



NAME: Sebastian Aristotelis and Karl-Johan Sørensen

ROLE: Founders, SAGA Space Architects

AMBITION: Help humans thrive in outer space.

SAGA Space Architects is a small studio with colossal ambitions.

They're dreaming of—and designing for—a future where human beings spend more time living in space. And founders Sebastian Aristotelis and Karl-Johan Sørensen know that they have the skills and the vision to create lunar habitats where people can thrive, not just survive.

The constraints are enormous. For a start, a structure designed to house multiple people must be able to fit inside a rocket and withstand extreme forces and temperatures. Precision and accuracy are paramount when designing for space. And, in order to test structures like their LUNARK moon habitat, the team spent months in the arctic, living inside the structure and enduring extreme conditions.

A heavy lift for hardware.

Faced with these challenges, the last thing Sebastian and Karl-Johan need is hardware that adds even more limits.

Designing, building and constructing lunar habitats like LUNARK, involves complex 3D models, realistic 3D renders and graphics-hungry visualizations as well as heavy computation and simulations. The CPU and GPU demands are considerable.

So, compute power and powerful graphics are critical to the team's success. Try to do this kind of work on a machine with insufficient compute power, and you'll run into low frame rates and lag which, Karl-Johan Sørensen says is, "Incredibly disruptive for the creative process."

ThinkStation P8

3 PERSONALIZATION IN ACTION

Images courtesy of SAGA Space Architects

A gamechanger for creativity.

A machine like the Lenovo ThinkStation P8, advanced by AMD Ryzen™ Threadripper™ PRO processors, changes all that. “Working with a computer that’s powerful enough that I’m not working at the speed it allows, it’s working at the speed I want is a gamechanger,” says Karl-Johan.

> “We’re lucky that we exist in a time where accessibility to powerful computers is within our reach.”
>
> Sebastian Aristotelis, Founder,
> SAGA Space Architects

ThinkStation P8

Built for an ambitious future.

Sebastian Aristotelis predicts that SAGA Space Architects’ workflows will get ever more digital and computationally demanding. With supercomputers sitting on their desks, he’s excited about what his team will achieve: “Imagine what the future looks like,” he says, “when you have access to these powerful workstations.”

> “We can do things as a small studio that wouldn’t have been possible just 10 years ago.”
>
> Sebastian Aristotelis, Founder,
> SAGA Space Architects

4

PROTECTION

Protect what you've built.

In an industry where trust is crucial, success depends on protecting your reputation and your creations.

The key is adding security without adding unnecessary friction that dents productivity and slows progress.

Protection without friction.

When your colleagues and clients are spread across locations and even continents, and your models pass between consultants, clients and contractors the opportunity for security breaches and the damage to IP and reputation is significant. At the same time, firms can't afford for security measures to slow down project progress or limit collaboration. Teams need to be able to work collaboratively, remotely, and securely.

How your hardware can help.

The right hardware can give you complete protection for your project data whether you're in the studio, on site or on the go. Look for security you can customize to fit your policies, client standards and project requirements and keep work moving with secure access to CAD and BIM models and project files, wherever you are.

More valuable work demands top security.

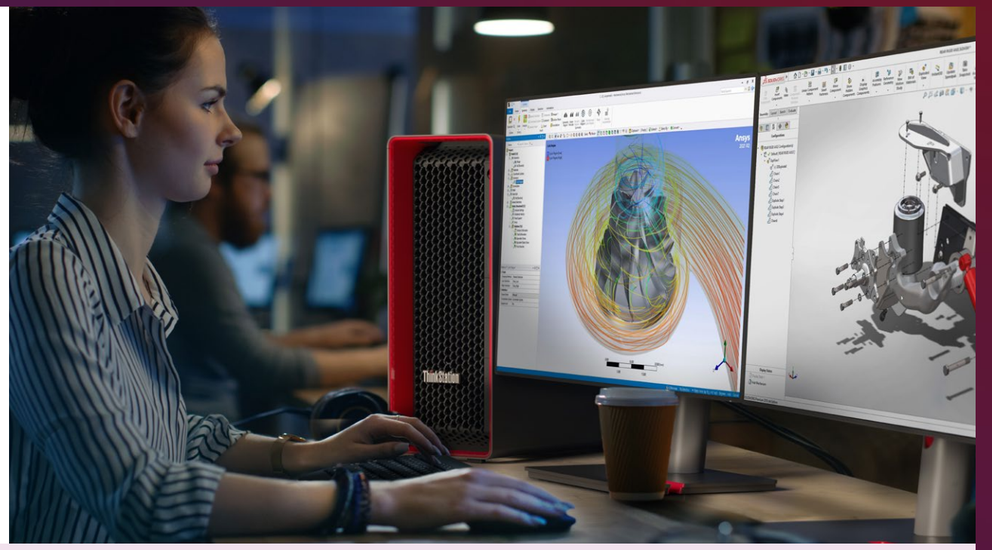
As regulation ramps up and the scope and value of digital models expands to encompass digital twins, parametric scripts and carbon databases, protecting your work is more vital than ever. Not only are you securing your IP and your client data, but you're also staying compliant, preserving client trust and safeguarding your investments and reputation.

How your hardware can help.

When security starts at the hardware level, you get the peace of mind you need. AI-powered predictive threat detection and endpoint protection is built into Lenovo hardware with ThinkShield so you can defend your work against evolving threats in real time. At the same time, AMD Ryzen PRO processors add multilayered device security, including the integration of Microsoft Pluton Security Processor on Windows 11, so credentials, identities, personal data, and encryption keys are always protected.

Shaping the future of AEC.

The industry is entering a new chapter—one defined by accountability, acceleration and ambition. Now, sustainability is measurable, teams are scattered, decisions are digitally driven. Models are becoming more valuable, and they're central to compliance all the way from design to demolition.



The opportunity for ambitious AEC professionals is clear: those who can combine craft with computational confidence, systems thinking with speed, and creativity with clarity will shape what gets built—and how. But here's the quiet truth many firms miss: the computer on your desk doesn't just affect your productivity—it shapes what kind of professional you can become. A slow machine trains caution and discourages experimentation, while a powerful, responsive workstation makes way for curiosity and invites ambition.

Lenovo ThinkStations, advanced by AMD, are precisely this kind of machine. The performance, productivity, personalization and protection they give you enable a new kind of practice. One that can quantify carbon impact, explore hundreds of options early, integrate fragmented teams seamlessly and safeguard increasingly valuable digital IP.

One that can supercompute your vision.

Dive deeper.

Read our AEC workflow guide to learn exactly how these principles translate into real-world workflows.

Read the guide

1 Digital Construction Report 2025, NBS, 2025

2 Digital Twin Market Size, Share & Industry Analysis, Fortune Business Insights, 2026

3 2025 State of Design & Make: Spotlight on Construction report, Autodesk, 2025

4 2025 State of Design and Make, Autodesk, 2025

5 Seven construction technology trends for 2026, Construction Briefing, 2025

6 2025 State of Design and Make, Autodesk, 2025

7 Report: Remote And Hybrid Work In The Aec Industry Statistics, World Metrics, 2026

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