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BOOSTING REVIT & AUTOCAD 2027

Autodesk® AutoCAD® 2027 and Autodesk® Revit® 2027 both embrace modern graphics technology, shifting more power to the GPU for ultra-smooth navigation of drawings and 3D models. Paired with the AMD Ryzen™ AI Max PRO processor, the latest HP Z Workstations deliver professional-grade performance for CAD and BIM in compact, energy-efficient form factors

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CAD and BIM software is entering a new era. Autodesk® AutoCAD® and Autodesk® Revit® — two of the most widely used design tools in Architecture, Engineering and Construction (AEC) — are now getting more out of modern graphics APIs and software frameworks, enabling them to fully tap into the power of today's advanced Graphics Processing Units (GPUs).

This shift offloads more of the processing from the CPU to the GPU, easing a common performance bottleneck. The result? Smoother model navigation, more responsive design environments, and a significant boost in productivity — with less need for model simplification or performance workarounds.

Meanwhile, workstation hardware is evolving just as fast. Traditionally, integrated graphics — where the GPU is built into the CPU — was often seen as inadequate for professional use. Discrete GPUs used to be the standard. But that assumption is now being challenged.

AMD Ryzen™ AI Max PRO processors feature integrated Radeon™ GPUs with levels of performance once reserved for discrete solutions. These GPUs are not only powerful and energy efficient, but also fully compatible with, and optimized for, the advanced graphics features in AutoCAD 2027 and Revit 2027.

This convergence of next-gen software and hardware marks a turning point. Architects and engineers using some of the latest HP Z Workstations — such as the slimline 14-inch HP ZBook Ultra G1a and 16-inch HP ZBook Ultra G3a laptops and compact HP Z2 Mini G1a mini desktop — can now access the advanced graphics capabilities of Revit 2027 and AutoCAD 2027, without needing a discrete GPU. The benefits? Lower cost, reduced power consumption, and sleeker, more portable hardware.

As software and hardware continue to advance in tandem, the future of CAD and BIM promises to be faster, smoother, and more flexible than ever.

REVIT: ACCELERATED GRAPHICS

The HP ZBook Ultra G1a & G3a laptops and HP Z2 Mini G1a desktop with AMD Ryzen™ AI Max PRO processor, are well positioned to maximize the benefits of Revit 2027 and its next-gen graphics engine — delivering a significant performance boost, particularly when navigating complex models

Snowdon Tower project from Autodesk® Revit® 2027

Snowdon Tower project from Autodesk® Revit® 2027

Revit 2027 introduces a new graphics technology designed to significantly improve performance in both 3D and 2D views. 'Accelerated Graphics', which first appeared as a 'Tech Preview' in Revit 2026, delivers smoother, more responsive model navigation when panning, orbiting, or zooming. Those working with particularly complex Revit models should experience the most noticeable performance benefit.

To unlock these performance gains, the Revit development team has harnessed the latest technology in both software and hardware. This includes Universal Scene Description (USD) — an XML framework born out of Pixar® but increasingly used in AEC for data exchange and collaboration. However, Revit uses USD in a different way. With Accelerated Graphics it's employed solely to draw the graphics on screen, faster. A direct export of Revit models to USD is not currently on Autodesk's roadmap.

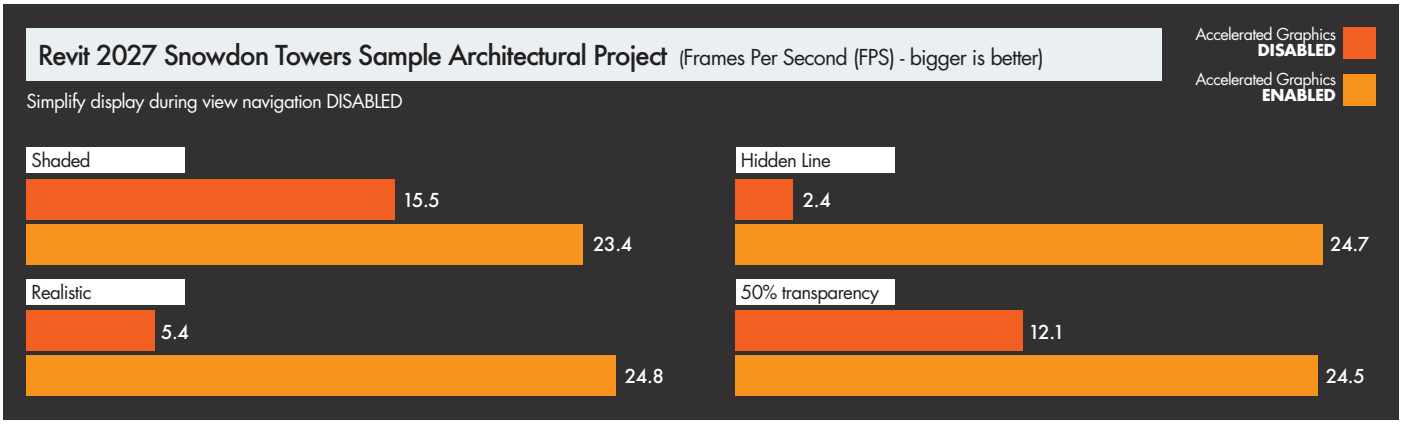
Accelerated Graphics also makes much better use of modern GPUs — processors that are well-suited for graphics rendering. By offloading more of the graphics workload to the GPU, visual performance is significantly improved while also freeing up the CPU to handle other tasks — helping boost overall system performance.

Accelerated Graphics in Revit supports a wide range of display styles including 'shaded', 'hidden line', 'realistic' and 'transparency'. It also allows section boxes to update live, so users can cut through the model and see the section change in real time.

Accelerated Graphics can be toggled on and off at any time. This is useful for certain workflows, since some elements, such as materials in realistic views, and some data types, such as point clouds, are not yet supported.

To get the best performance Autodesk recommends a workstation with at least 64 GB of RAM and a GPU with at least 8 GB. In the past, this would have required a workstation with a discrete GPU. However, with the AMD Ryzen AI Max PRO processor — featured in the HP ZBook Ultra G1a and G3a laptops and HP Z2 Mini G1a desktop workstation — users now have access to an integrated AMD Radeon™ GPU with the equivalent performance of a mid-range discrete GPU. Coupled with up to 128 GB of system memory (or 192 GB in the case of the HP ZBook Ultra G3a), of which up to 75% (G1a) and 83% (G3a) can be assigned to the GPU, the chip is fully capable of handling Revit's new graphics demands.

When running Revit's Snowdon Tower sample project on the HP ZBook Ultra G1a with an AMD Ryzen AI Max+ PRO 395 processor, the viewport feels significantly more responsive compared to the traditional graphics engine. Model navigation is silky smooth, and the model is not simplified in any way — a technique often used to maintain full interactivity with larger models. As shown in our benchmarks below, performance (measured in frames per second) is between 1.5 and ten times faster.



Test machine: HP ZBook Ultra G1a with AMD Ryzen AI Max+ PRO 395, 128 GB memory (64 GB allocated to AMD Radeon 8060S GPU). Resolution 2,880 x 1,800 (150%).

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TWINMOTION: BEYOND BIM

Bring your BIM models to life with advanced real-time visualization

Snowdon Tower project from Twinmotion

Twinmotion for Revit by Epic Games, included with select Revit subscriptions, brings high-quality, real-time visualization directly into your BIM workflow. The software is GPU-accelerated, and the AMD Ryzen AI Max PRO processor is well suited to handling mainstream visualization tasks. A key advantage is the ability to directly allocate up to 75% of the total system memory to the processor's integrated AMD Radeon GPU — far more than most discrete GPUs with comparable performance.

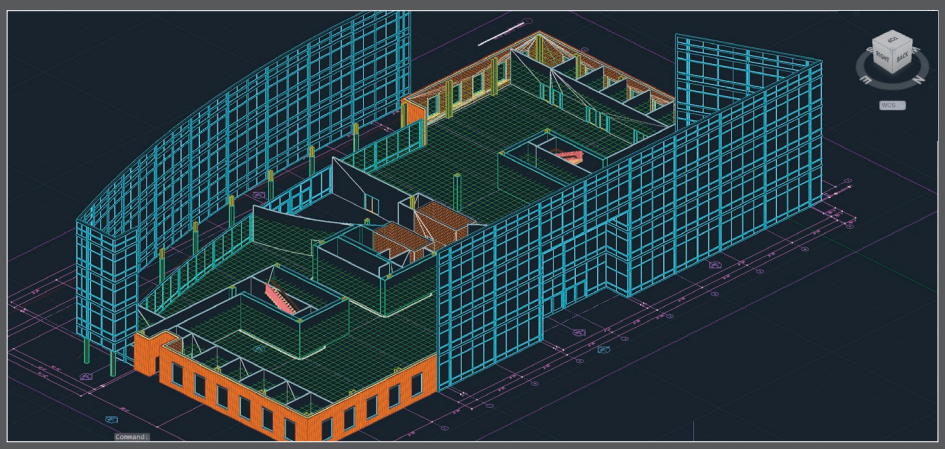
On test with the HP ZBook Ultra G1a, powered by the AMD Ryzen AI Max+ PRO 395 processor, the Revit Snowdon Tower sample project consumes 8.1 GB of GPU memory on load. This increases to 14.2 GB when rendering at 4K and 35.1 GB when rendering at 8K.

With the test machine configured with 128 GB of system memory, of which 64 GB is allocated to the GPU, the system maintains ample headroom throughout.

In contrast, when a discrete GPU runs out of dedicated memory, it must offload data to system memory — a process that can introduce latency, slow performance, and significantly increase render times.

ADVANCING AUTOCAD

AutoCAD 2027 feels faster and smoother when navigating 3D models, thanks to Graphics System Fabric (GSF), a powerful graphics engine built on DirectX 12 that harnesses the power of modern GPUs



Sample architectural project from AutoCAD® Architecture

AutoCAD has enjoyed some major performance improvements over the last couple of releases, including file open times up to 11x faster and application launch speeds up to 4x faster[1].

One of the most impactful — yet less talked about — enhancements lies in the graphics pipeline. Users of AutoCAD 2026 and 2027 can expect noticeably smoother navigation of 3D models compared to AutoCAD 2025 and a significantly more responsive design experience when using 'wireframe', 'conceptual', and 'hidden' visual styles. In AutoCAD 2027 this extends to 'realistic', materials, and lighting.

These improvements are enabled by enhancements to Graphics System Fabric (GSF), a next-generation graphics engine built on Microsoft® DirectX® 12 that optimizes GPU utilization.

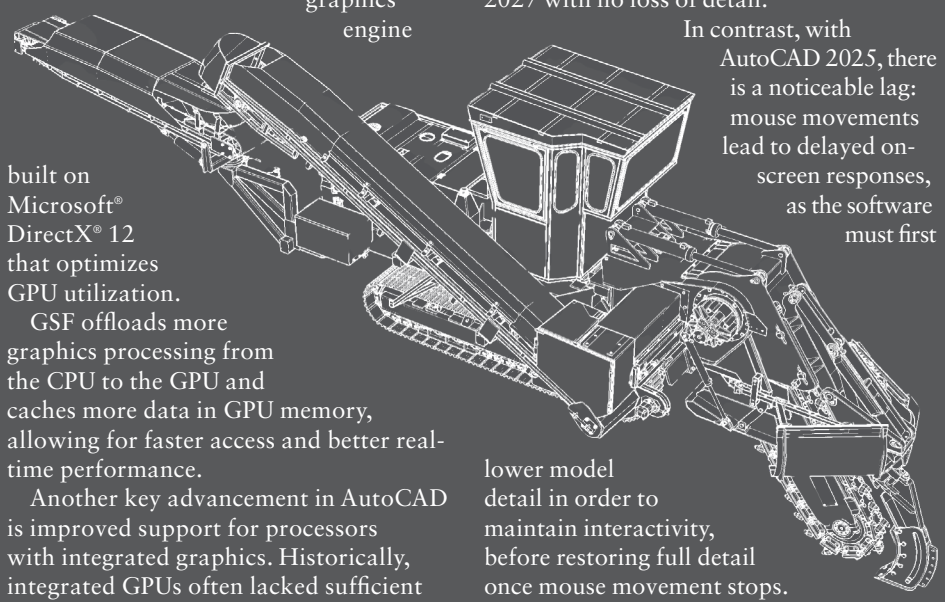
GSF offloads more graphics processing from the CPU to the GPU and caches more data in GPU memory, allowing for faster access and better real-time performance.

Another key advancement in AutoCAD is improved support for processors with integrated graphics. Historically, integrated GPUs often lacked sufficient memory to be supported by GSF, which typically requires between 4 GB and 8 GB of dedicated GPU memory.

That limitation is effectively removed with the AMD Ryzen AI Max PRO processor, which can allocate up to 96 GB (Ryzen AI Max+ PRO 395) or 160 GB (Ryzen AI Max+ PRO 495) of its total system memory to its integrated Radeon GPU — far exceeding the capacity of most discrete GPUs in its class.

In real-world testing on an HP ZBook Ultra G1a powered by the AMD Ryzen AI Max+ PRO 395 processor, the benefits of GSF are clear. Navigating a complex Mastenbroek heavy machinery model *(pictured)* in hidden, conceptual or realistic view style is instant and fluid in AutoCAD 2027 with no loss of detail.

In contrast, with AutoCAD 2025, there is a noticeable lag: mouse movements lead to delayed on-screen responses, as the software must first lower model detail in order to maintain interactivity, before restoring full detail once mouse movement stops.



Heavy machinery model courtesy of Mastenbroek

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To support the independent testing carried out by AEC Magazine for this special report, Autodesk provided complimentary licenses of Autodesk® AutoCAD® 2025/2027 and Autodesk® Revit® 2027

Footnote 1: Results may vary based on user experience, machine, operating system, filters, and even source material

INTEGRATED GRAPHICS, REDEFINED

Accelerated by the AMD Ryzen™ AI Max PRO processor, the HP ZBook Ultra G1a & G3a and the HP Z2 Mini G1a deliver impressive performance for CAD, viz and AI – without the need for a discrete GPU

For CAD and BIM workflows, architects and engineers have traditionally relied on workstations with separate CPUs and discrete GPUs. Processors with integrated graphics have often fallen short — lacking the 3D performance, application-specific optimizations, and software certifications required for professional use.

But the AMD Ryzen AI Max PRO processor at the heart of the HP ZBook Ultra G1a / G3a mobile workstations and HP Z2 Mini G1a desktop workstation is redefining what's possible with integrated graphics.

The AMD Ryzen AI Max+ PRO 395 and 495 processors feature powerful Radeon™ 8060S and 8065S GPUs respectively, delivering performance that rivals that of a mid-range discrete GPU. Both chips enable smooth, responsive viewports in Revit and AutoCAD, even when working with large models, and can also handle real-time visualization workflows in Twinmotion for small to medium-sized projects.

This leap in capability is powered not only by the AMD RDNA 3.5 graphics architecture, but also the ability to allocate large amounts of system memory to the GPU — far more than the fixed on-board memory of most comparable discrete GPUs.

In the BIOS, users can allocate up to 96 GB with the AMD Ryzen AI Max+ PRO 395 and up to 160 GB with the AMD Ryzen AI Max+ PRO 495. However, dedicating large amounts of memory to the GPU isn't always necessary. In some workflows the GPU can dynamically borrow additional memory from the system when needed, without the severe performance penalties that occur when discrete GPUs exceed their onboard memory and must fall back on slower system RAM.

The processor's large memory pool also unlocks new possibilities in AI. With 96 GB of allocated VRAM, the GPU can run colossal 128B parameter Large Language Models (LLMs) – roughly the size of Chat GPT 3.0 – well beyond the limits of most fixed-memory GPUs. With 160 GB it can go even higher — up to 300B+ parameters at 4-bit quantization.

For architects, more memory also unlocks practical creative advantages in other AI-driven workflows. Text-to-image tools like Stable Diffusion, ideal for early-stage viz, can benefit directly. With fast, direct access to a large pool of GPU memory, it becomes feasible to generate high-resolution images — far beyond the practical pixel limits imposed by GPUs with restricted memory.

Finally, the AMD Ryzen AI Max+ PRO 395 and 495 also come with a Neural Processing Unit (NPU), which is designed to handle mainstream AI tasks efficiently. Respectively, the NPU can deliver up to 50 and 55 TOPS of AI performance, meeting Microsoft's requirements for a Copilot+ PC.

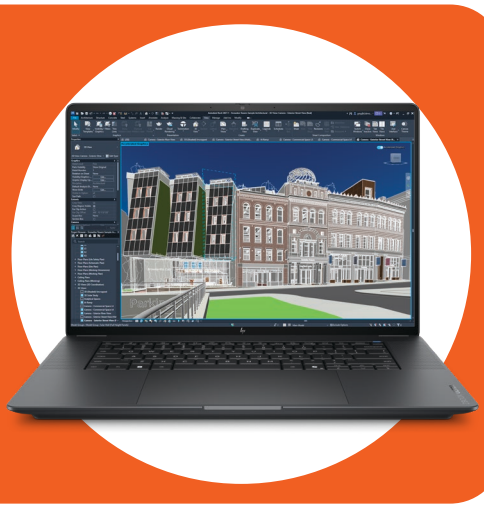
HP ZBook Ultra G1a & G3a – 14"/16" mobile workstation

The HP ZBook Ultra G1a (14-inch) and G3a (16-inch) *(pictured right)* are exceptionally powerful thin-and-light mobile workstations, powered by the AMD Ryzen AI Max PRO processor.

Both deliver upgrades over comparable laptops: up to 16 high-performance CPU cores, stronger graphics (on the G1a), and generous system RAM — up to 128GB (G1a) or 192GB (G3a).

They're also remarkably slim: the G3a is just 17.9mm thick, the thinnest ZBook ever, with the G1a close behind at 18.5mm. Starting weights are 1.50kg and 1.81kg respectively. HPs Vaporforce thermals keep both systems running cool and quiet.

Efficient power delivery matters too: the G1a charges via a 100W or 140W adapter, while the G3a uses 140W or 180W. That higher 180W option lets the G3a's processor draw more power, adding a performance edge on top of what it gets from the slightly more powerful Ryzen AI Max PRO 495 chip.



HP Z2 Mini G1a – mini desktop workstation

Despite its diminutive form factor, the HP Z2 Mini G1a is a very powerful desktop workstation.

Like its laptop sibling, it features the same AMD Ryzen AI Max PRO processor. However, with a 300W internal power supply, the ultra compact desktop workstation can deliver significantly more sustained power to the processor, resulting in optimized performance in multi-threaded CPU and graphics-intensive workflows.

One of the most compelling use cases for the Z2 Mini G1a is in rack-mounted deployments, where multiple units serve as a centralized remote workstation resource. Using HP Z Remote Graphics Software (RGS), each user connects to their own dedicated workstation via a 1:1 session, ensuring both simplicity in deployment and predictable, high-performance access.

Up to five workstations can be installed side by side in a 4U rack space, offering impressive density and scalability for teams.

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