CADD CARE Certified Helpdesk
2023 HARDWARE RECOMMENDATIONS
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Introduction

The world of Architecture, Engineering, Construction, and Design is constantly changing and growing. At CADD Microsystems, our goal is not only to help you adapt to and adopt those changes but to stay ahead of them. Often, the minimum system requirements put out by software developers are just that — the bare minimum, the specs needed successfully launch the software. However, these recommendations don't account for the heavy multi-tasking environments we work in, and as a result, the increased load and demand we place on our work machines.

When CADD Care set out to create a document aimed at Hardware Recommendations, our goal was to outline the hardware specifications of machines that **we** would want to work in ourselves. One that could meet and exceed the demands of the graphic-intensive software that we use and help customers troubleshoot every day. We hope those of you looking to purchase or build new PCs or laptops for Autodesk and Bluebeam software will find this document helpful.

Disclaimer

The recommendations outlined in this document are general in nature and do not account for some unique conditions that you, your company, or your customers may require. They are not applicable to all situations. Most supported prior versions and features should function without an issue when using the hardware outlined in this document, but there is no guarantee. Please feel free to reach out to our CADD Care Helpdesk team with any questions or concerns about your specific environment.

It is also important to keep in mind that while CADD Care provides general hardware recommendations, we do not provide support, repairs, or replacements for hardware or operating systems like Windows, Mac, Linux, etc. This document is provided 'as is' — even high-end hardware from reliable brands may occasionally malfunction. For support with hardware and operating systems issues, it is highly recommended to reach out to your internal IT department, or directly to the developer/manufacturer.

Lastly, while this document is provided free of charge for all to use, CADD Care Helpdesk is only provided for CADD Microsystems customers.

What is CADD Care?

CADD Care Certified Helpdesk is a division of CADD Microsystems dedicated to providing world-class support for our customers. We're a small, but mighty team whose expertise includes over 15 years of combined support experience for Autodesk products, Certified Bluebeam technical support experts, and guidance and insight from some of the industry's most established professionals.

Call your sales rep today to learn more about CADD Care Certified Helpdesk.

Contact CADD Care

Monday through Friday 8:00 AM – 5:00 PM
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Recommended PC Specifications

Hobbyists or Light Users: 2D Designers

These technical specifications are recommended for users who may only occasionally use 2D software like AutoCAD or Bluebeam. These users may be reviewing documents or making light edits in AutoCAD — but not creating and drafting the original design. Alternatively, these users may do some design work, but the projects are not very intensive in load.

Operating System	64-bit Microsoft® Windows® 11 or 10 (version 1809 or above).
Processor (CPU)	Multi-core i5 processor with speeds starting around 2.5GHz. **Examples:** Intel Core i5-12400F; 11th Gen Intel® Core™ i5-1135G7
Memory (RAM)	16GB installed physical memory. While 8GB is the minimum system requirement, we find that it's insufficient memory to power all the functions of the modern workday without significant slowdowns.
Storage	**Two-drive option:** ❖ Drive #1: Approx. 250GB internal storage dedicated solely to application installations ❖ Drive #2: 250GB-500GB of dedicated storage space for documents and files. This can be any type of drive: internal, external, portable, SSD, HDD, etc. **One-drive option:** 500GB M.2 or SSD **Note:** We also recommend some sort of cloud storage solution for backups and/or transfer of important files (OneDrive, Box, Dropbox, Autodesk Drive, Google Drive, etc.)
Graphics (GPU)	A discrete or dedicated graphics card, with at least 1-2 GB of VRAM, 29GB/s bandwidth, and DirectX 11 compliance is recommended for the best performance. ❖ Integrated video cards may work for these users but are generally underpowered for 2D or 3D design work. ❖ Autodesk Certified Graphics Hardware has a list of tested graphics cards, however, it hasn't been updated for 2022 or 2023 software.
Network	When working with Revit Cloud Worksharing, Autodesk Construction Cloud products, or Bluebeam Sessions, an Internet connection capable of at least 25 Mbps is recommended by Autodesk. However, we recommend at least 200 Mbps speeds to handle most functions of Cloud Worksharing and remote work. **Note:** Wi-Fi connections are fine, but the best performance will be seen with a hardwired ethernet connection (LAN).

Professional Users: 2D and 3D Design Generalists

These technical specifications are recommended for users who immerse themselves often in 2D or 3D design software like AutoCAD and Revit. These users may also use add-ins or other potentially intensive programs to accomplish work, but only have one instance of 3D design software running at a time. This is also a good starting point for users in the Media & Entertainment sector, who may work in 3D modeling with a focus on one application like Maya or 3DS Max.

Operating System	64-bit Microsoft® Windows® 11 or 10 (version 1809 or above)
Processor (CPU)	Multi-core i7 processor with speeds starting around 2.5GHz-3.5GHz. **Examples:** Intel Core i7-12700K, 11th Gen; 11th Gen Intel® Core™ i7-11850H
Memory (RAM)	32GB installed physical memory.
Storage	**Two-drive option:** ❖ Drive #1: Approx. 250-500GB M.2 or Internal SSD dedicated solely to application installations ❖ Drive #2: 500GB dedicated storage space for documents and files. This can be any type of drive: internal, external, portable, SSD, HDD, etc. **One-drive option:** 1TB M.2 or SSD **Note:** We also recommend some sort of cloud storage solution for backups and/or transfer of important files (OneDrive, Box, Dropbox, Autodesk Drive, Google Drive, etc.)
Graphics (GPU)	A discrete or dedicated graphics card, with at least 2-4 GB of VRAM, 106GB/s bandwidth, and DirectX 12 compliance is recommended for the best performance. ❖ Avoid integrated video cards, as they are built into the CPU and generally underpowered for 2D or 3D design work. ❖ Autodesk Certified Graphics Hardware has a list of tested graphics cards, however, it hasn't been updated for 2022 or 2023 software.
Network	When working with Revit Cloud Worksharing, Autodesk Construction Cloud products, or Bluebeam Sessions, an Internet connection capable of at least 25 Mbps is recommended by Autodesk. However, we recommend at least 200 Mbps speeds to handle most functions of Cloud Worksharing and remote work. If possible, gigabit internet is the best option. **Note:** Wi-Fi connections are fine, but the best performance will be seen with a hardwired ethernet connection (LAN).

Power Users: 3D Specialists

These users are heavy specialists with 3D Design software like Revit, Maya, 3DS Max, etc. They may do a lot of focused design work and/or rendering and typically have multiple versions of Revit running at once if they are working on multiple large projects. These types of users are much rarer, but their ability to work productively is very much tied to the power and capability of their workstation.

Operating System	64-bit Microsoft® Windows® 11 or 10 (version 1809 or above).
Processor (CPU)	Multi-core i7 or i9 processor with speeds starting around 2.5GHz-3.5GHz. **Examples:** Intel Core i7-12700K, 11th Gen; 11th Gen Intel® Core™ i7-11850H; Intel Core i9-12900K
Memory (RAM)	32GB-64GB installed physical memory.
Storage	**Two-drive option:** ❖ Drive #1: Approx. 500GB M.2 or Internal SSD dedicated solely to application installations ❖ Drive #2: 1TB dedicated storage space for documents and files. This can be any type of drive: internal, external, portable, SSD, HDD, etc. **One-drive option:** 1TB-2TB M.2 or SSD **Note:** We also recommend some sort of cloud storage solution for backups and/or transfer of important files (OneDrive, Box, Dropbox, Autodesk Drive, Google Drive, etc.)
Graphics (GPU)	A discrete or dedicated graphics card, with 4GB-6GB VRAM, 106GB/s bandwidth, and DirectX 12 compliance is recommended for the best performance. ❖ Avoid integrated video cards, as they are built into the CPU and generally underpowered for 2D or 3D design work. ❖ Autodesk Certified Graphics Hardware has a list of tested graphics cards, however, it hasn't been updated for 2022 or 2023 software.
Network	When working with Revit Cloud Worksharing, Autodesk Construction Cloud products, or Bluebeam Sessions, an Internet connection capable of at least 25 Mbps is recommended by Autodesk. However, we recommend at least 200 Mbps speeds to handle most functions of Cloud Worksharing and remote work. If possible, gigabit internet is the best option. **Note:** Wi-Fi connections are fine, but the best performance will be seen with a hardwired ethernet connection (LAN).

Task-Specific Breakdown

The recommendations above are intended for baseline day-to-day use broken down by three distinct types of users and should be sufficient for most. However, some individuals are outliers and may need specs more tailored for their work. This section of the document is designed to highlight the specific tasks of the computer's main components to better understand the choices outlined above and adjust accordingly, based on the needs of certain users.

Most performance gains are found in the following pieces of hardware (by order of impact), and as such, they are the best place to start when considering customizations:

- ❖ Graphics Card (GPU)
- ❖ Storage
- ❖ Memory (RAM)
- ❖ Processor (CPU)

Graphics Card (GPU)

The GPU is a specialized processor dedicated specifically to accelerating graphics renderings. GPUs can often process a lot of data very quickly and efficiently, making them a standout for things like 3D designing, rendering, machine learning, video editing, etc. GPU also has VRAM, or video RAM, that stores temporary imaging data and evens out the processing and display of the graphics being rendered. The power of more dedicated VRAM can be seen in applications that display complex image textures or render polygon-based three-dimensional (3D) structures. A user who works mostly with administrative or cloud-based software won't find much use for a dedicated graphics card, but a specialist who spends time working with large Revit models or renders models from Maya or 3DS Max in a game engine like Unreal can't live without it, and a good one at that.

What About Gaming Computers?

Many companies provide designated CAD workstations, however, some independent users like consultants or contractors consider gaming PCs when looking to purchase hardware, due to the dedicated GPUs designed specifically to handle heavily graphic intensive software for hours at a time. While there is nothing wrong with a gaming PC that fits your needs, pay close attention to the overall specifications of the machine as the nature of CAD work vs. Gaming can vary.

Storage

Storage refers to the amount of available space on the machine that's accessible to the user to install software, and store files. To future proof the machine, consider the size of modern-day programs or files and acknowledge that as technology advances these things will only get larger.

In the example to the right, 1.86TB is the true available size of the installed 2TB drive. The Windows OS and Autodesk applications will naturally take up space on the drive. Large Revit or Civil 3D projects and point clouds can also be huge files, especially when paired with Cloud Worksharing which will boost the number of temporary files as well. The above screenshot was taken on a regular "Professional User's" machine, and as you can see, nearly 500GBs of space is already used up. If the user had only had 250GB or 500GB or storage, they would have run into issues either at the productivity or functionality level by now.

OS (C:) - 1.86 TB

409 GB used   1.45 TB free

This is how your storage is used and how you can free up space.

Other		102 GB
Manage other large folders		
Apps & features		80.8 GB
Uninstall unused or undesired apps & features		
Documents		53.3 GB
Manage the Documents folder		
Temporary files		46.3 GB
Choose which temporary files to remove		
Mail		2.47 GB
Manage mail with the default app		

Memory (RAM)

RAM, or Random Access Memory, is temporary storage that allows the CPU to quickly access the most important data to accomplish its task. RAM gives your CPU the space to accomplish all its simultaneous tasks and allows the computer to run more smoothly. A general rule of thumb is "the more RAM the better" however, in most cases 64GB or 128GB is where most power users max out their systems.

It's never recommended to match your RAM to the minimum system requirements of a program like AutoCAD or Revit. Most programs only require 4-8GB, however, once a user starts doing all the tasks, they need throughout the day it will quickly become apparent that 4GB is unusable, and 8GB is a bottleneck at best for users who are doing more than using a web browser and a word processor.

Processor (CPU)

The CPU, or Central Processing Unit, determines how much data, and how quickly, the computer can handle at one time. Most processors these days have multiple cores, which can split up the tasks of the processor itself, making it faster and more efficient (think "divide and conquer"). However, the software itself is what determines how many cores are used. To maximize cost, it's important to understand the usage and match the software's system requirements with core availability. For example, Revit's multi-core functionality maxes out at 16-cores, while the majority of AutoCAD and specialized toolsets can only utilize a single core of the CPU.

In some cases, a higher clock speed (reflected in GHz) does not necessarily make the processor more powerful or better. The number of cores and threads in the processor are just as important, if not more so. Researching CPU benchmarks like this one, from Passmark Software, can be very helpful for comparing different CPUs. Please note that ARM Processors are not supported by Autodesk and should be avoided.

Operating Systems Considerations

❖ 32-bit Operating Systems are not supported by Autodesk
❖ Windows 7, Windows Vista, or Windows XP do not meet minimum system requirements and are no longer supported by Microsoft®
❖ Windows 8 and 8.1 is acceptable for Bluebeam software, however, Microsoft® will begin its end-of-life support for Windows 8 products beginning January 2023, so for longevity, it isn't recommended
❖ For certain software, Windows Server is an unsupported OS

Virtualization

Throughout the industry, many firms are opting for a virtualized environment. In addition to becoming more affordable, it allows for flexibility for workers and collaboration across firms.

Autodesk applications have unique requirements for a virtualization host, and one application's requirements may not match another. CADD recommends identifying your specific applications and working with the VM solution vendor to determine if they align. This is for both on-premises hosted solutions — such as Citrix or VMWare — as well as cloud-hosted solutions — like Workspot (**Note:** Bluebeam has confirmed is *not* compatible with the Revu software).

Refer to the resources from Autodesk below:

❖ Autodesk Citrix-Ready Certified Products
❖ Virtual installation guidelines and Terms of Use
❖ Virtual Environments support with 3ds Max and Maya
❖ Bluebeam Revu in a Citrix Environment | Revu 20

Please note that CADD Care does not support virtualization software, and while we can support the application – we are limited in the type of support we can offer, especially when using a non-supported environment.

Additional Resources

❖ System requirements for AutoCAD 2023 including Specialized Toolsets
❖ BIM 360 System Requirements
❖ Bluebeam® Revu® 20 Compatibility & System Requirements
❖ Network License Manager system requirements