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The Official Publication of Autodesk User Group International

July 2018

Taking Control of Processes, Projects, Data and More

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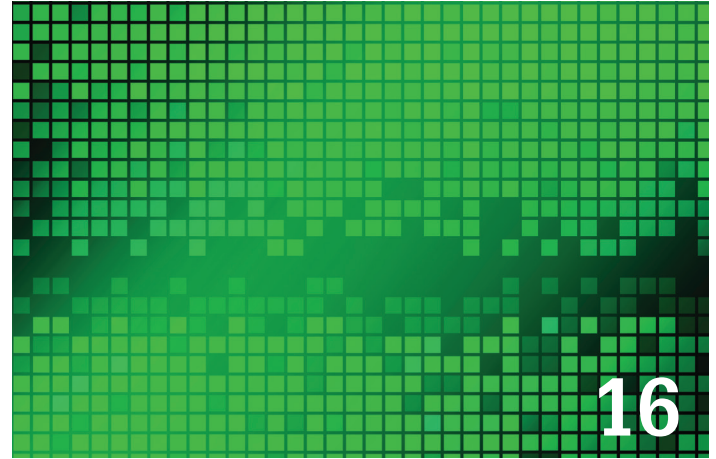


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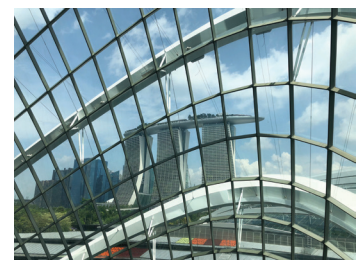
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Cover image:
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Marina Bay Sands as seen from
within the Cloud Forest, Singapore



Letter from the President



Almost as soon as we learn to talk, we learn how to brag. As children, it's natural to enjoy our accomplishments and want to share our excitement. Even the simplest tasks are greeted with a joyous "I did it!" Soon enough, though, we have to be trained out of treating everyday occurrences as cause for celebration. ("Yes, dear, you tied your shoes again. Good for you. Now get in the car.") After that, it doesn't take long to realize that our friends aren't all that interested in hearing every detail of our successes, especially if they don't share in them.

The Internet is full of quotes and sayings that portray bragging or boasting in a negative light. I'd include a few here... if I could find credible sources for them. (Of course it's the pithiest ones that seem to be the least reliable.) And we all probably have that one friend who can be counted on to tell long-winded, self-congratulatory tales until we exclaim "Oh, look at the time!" and then hurry away.

So we dial back the bragging, restraining ourselves from telling others about the great things we just did, until some of us even learn to deflect real praise with an "Oh, it was nothing," or even the dreaded "No problem."

Here's the thing, though: While "limit your bragging" is usually good advice in friendships, it can't apply at work.

All right, maybe your peers don't want to hear you go on and on about how great you are any more than your friends do. Let me be more specific. If you want to advance your career, you have to learn how to brag to your boss. I've decided to call it "bragging up."

Some of you might be pretty good at this already. Your manager always knows what latest and greatest things you're working on—not necessarily because she asked, but because you told her. You've learned how to present your work so the focus is on the benefit to the company, not just on the cool thing you've just figured out (Even if the "cool factor" is what got you excited about that project in the first place.) If so, congratulations! You probably don't need to read the rest of this letter.

What if you're not quite ready to brag? Maybe you're not quite sure what your management is looking for when they consider promotions and raises. Ideally, you'd get this information through performance reviews of one form or another, but if you don't, there's still a simple way to find out: ask. Set up a one-on-one conversation with your manager, and discuss your potential career path. What do you want your role to be? Are you on track to achieve it? If not, what should you be doing to get there?

With that information, you can start gathering data. Consider keeping a notebook or document summarizing your work every week. You can track projects you've worked on, questions you've asked and answered, or non-project challenges you've solved. Writing it down as you go along might sound like work, but it's easier than trying to remember it later!

Then, in a few months, you can have another check-in. "Remember those goals we set? Here's what I've been working on to accomplish them, and here's what I've learned along the way." Include hard data when you can—was your project under budget? Did you complete a task ahead of schedule?—and if you don't have actual numbers, be as specific with other details as you can.

It might be uncomfortable at first, but learning to present your achievements in a descriptive, matter-of-fact way is an extremely useful skill. Remember, your colleagues have their own work to do—they can't keep up with what you're doing without a little help. Polish up your bragging skills, and you'll guarantee that your valuable contributions are noticed.

What do you think? We had "lean in" a few years ago...can we make "brag up" the next big thing?

Kate Morrical
AUGI President

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NEWSLETTER

Details Without Lines



Revit® is not a drafting software.

Revit is not AutoCAD®.

CAD* is not BIM (*as understood in normal conversation).

CAD processes do not work in BIM. Any part of “traditional” or drafting-based approaches will fail in BIM.

Yes, any and every. Every old process or part thereof fails in BIM. We, though, are going to focus on one area where value can be generated if applied comprehensively: using Detail Components and Not Lines in Details (Tags, Keynotes for No Text, too ;)

If you are going to callout, or point to, or list in any way, or maybe even just look at now or sometime in the future, use Detail Components for items (never lines) and Tags and/or Keynotes in place of dumb text, to provide “the words and numbers.” *Toward a Zen of Revit: No Text = No Chasing*

Details using lines, arcs, circles, and text are a disaster, but disasters land on a continuum and there are worse details in Revit blunders:

- A. Linking .dwgs in (10 to 30 percent longer project time)
- B. Importing .dwgs in (15 to 40 percent longer project time) converting .dwg linework (10 to 25 percent longer project time)

I understand that most offices have many hundreds of standard details or typical details that are used as starting points. With that in mind, the workflow entails re-creating (yep, re-create) all of the existing, “appropriate” details in Revit natively, using only Detail Components for items that will be called out and specified... then use Keynotes and Tags instead of text when detailing.

The quality of the data “between” details using this setup will pay off for years, literally. Not doing it will add hidden losses to every project, also for years.

A few typical questions:

Is it difficult? *Yes, but less effort and more productivity than not doing it.*

Does this make details and projects better? *Yes, resoundingly, and can be better coordinated.*

Saves time in the long run? *On many business levels, but in the short term also.*

Using Detail Components (for every item) can be more possible than you might think right now—be creative!

Assess | Plan | Create | Validate

Okay, on to those details sans lines. I am not talking about lines within “sketch modes,” etc. either; in fact, the detail component that we will be creating in this article will ultimately use a line (though at the family level, so it doesn’t count lol). The logic is: “When the line-based family is used to make a detail component, it may work and look like a simple line, but it has become far more than that... it becomes a **Data Enlightened Object**.”

In the example below we are looking at a waterproofing membrane (Figure 1) to be specified.

Perhaps even create or use Detail Components for standard/generically specified items such as “FINISH FLOOR PER PLANS”, etc. Oh, and YES, the wall below would NOT have the waterproofing membrane on the exterior of finish. I merely used it as an example about these Detail Components!

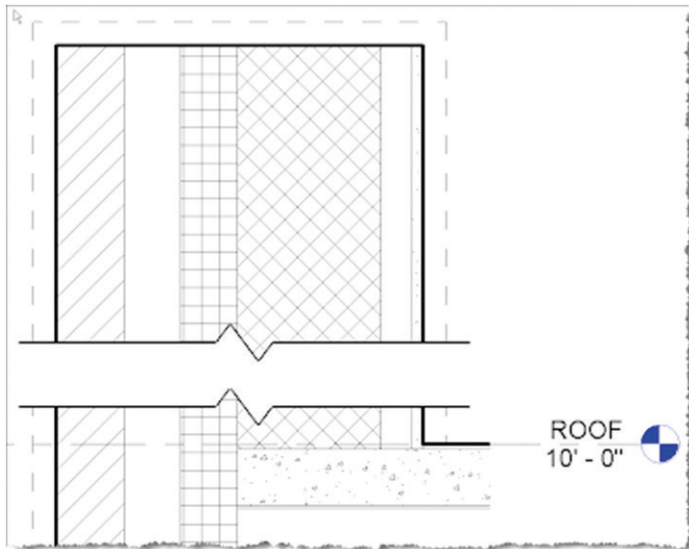


Figure 1

As described above, instead of using lines and pointing to them with not associative text, we will use “Line Based Detail Components” or “Detail Component line based” (Figure 2), as the family template is so named (depending on what year you read this ;).

This all serves to remove the needs, among other things, for chasing text and naming around all of your details at every change.

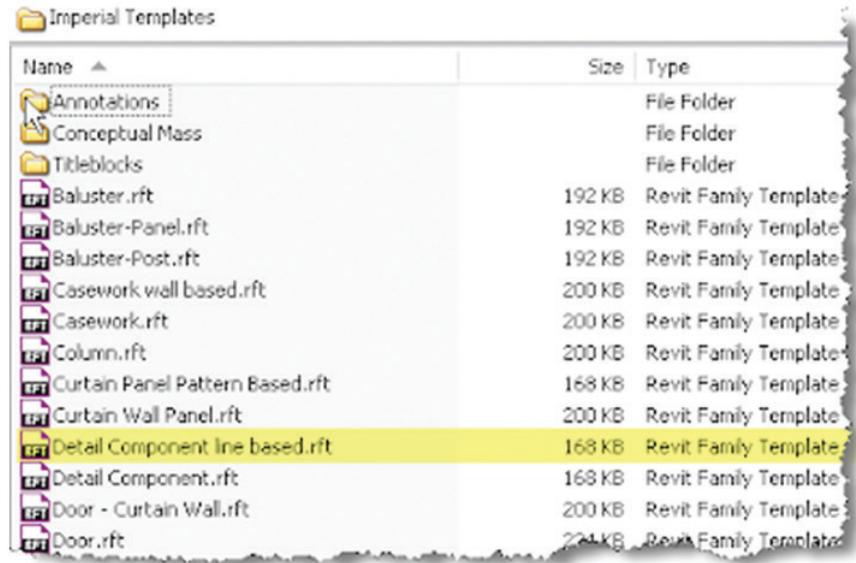


Figure 2 (Revit circa 1842)

The procedures to “draw” with these Line Based Detail Components once in a project are similar to pulling lines around, with a few main differences:

1. Depending on how built, these can add “offset” and more productivity.
2. When there is a fundamental change in a detail component, all the other instances will change, in every detail, on every sheet... the Tags & Keynotes, too! Thus, we leverage one Power of BIM: Change it once and it changes everywhere.

The following should be clear if you have a basic to intermediate understanding of Revit Family Creation.

MAKING A LINE BASED DETAIL COMPONENT

1. Using the Big “R”, at the top/left of Revit (aka: the Application Button) choose the flyout arrow next to NEW, then choose FAMILY.
2. Select the Detail Component line based template (Figure 2).
3. Create a line in the new family.

There, I said it... my rule is technically broken if you are thinking how I usually think, though in this case I am not being that literal (ahh, the contradictions of communication).

4. Lock it to the REF PLANES (Figure 3).

Revit Architecture 2019

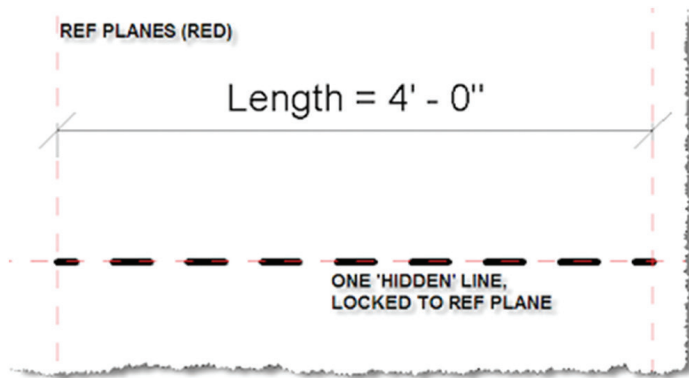


Figure 3

5. Flex the length. If all is working then move on, if not try again...
6. Save the family. (Use a good naming convention and library location, right? But you knew that...)

Okay, ready for the proof? Here we go...

These four details (Figure 4) are the same, right? Not really... one uses lines, the other three share a Detail Component of the line based variety.

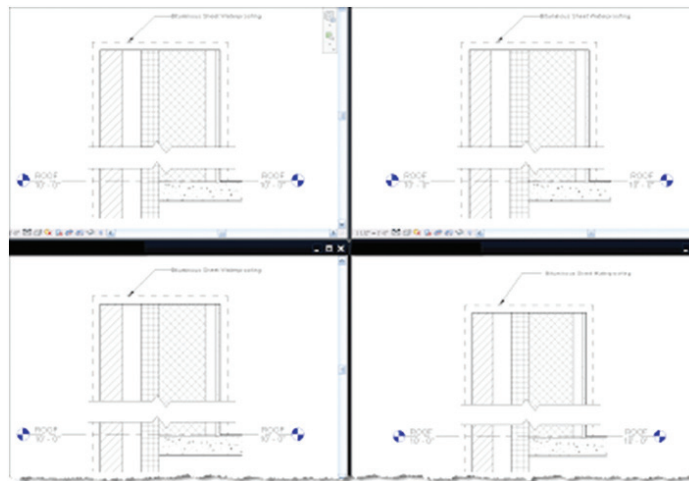


Figure 4 (looks can be deceiving)

In the next image there is a change to the Detail Component from being "Bituminous Sheet Waterproofing" to "6 Mil. Polyethylene." Note the text becomes instantly wrong, in a lot of places...

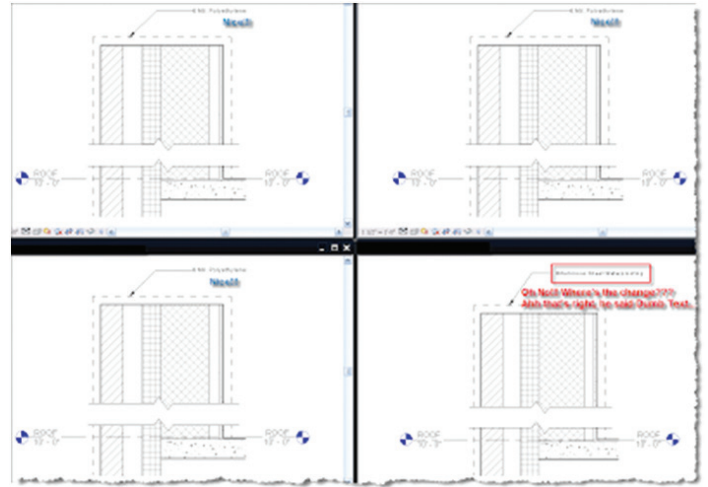


Figure 5 (Quality In = Quality Out)

Now extrapolate this type of change out to the multitude of components in the numerous details you may have and you can probably see the benefit of taking a little extra time up front to find and create your Detail Components (line based or otherwise) AS *DETAIL COMPONENTS* for every specific case necessary.

Word to the wise: if you have never looked at how many detail components there are in the OOTB Revit library, go bounce there ASAP!

Happy Detailing!



Art-Architecture-Technology-Creativity

With over 20 years of Architectural experience Jay B. Zallan enjoys a varied and diverse portfolio spanning high-end custom residential design, large mixed-use developments, major transportation and infrastructure projects through most every large scale project type. President of LARUG (Los Angeles Revit Users Group) and an Autodesk Implementation Certified Expert (ICE), Jay combines unique insights into the creative and business process of AECO with proven management, creativity, and project generating strategies. Enabling, empowering, and inspiring teams to realize their own dreams and potentials beyond limitations (whether real or perceived).



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<http://www.juanosborne.com/>

MATCH ROTATION



A perfect complement for Autodesk® Revit® Align command, Match Rotation will try to match Z rotation between almost any Revit Element.

It will help in all those cases where align doesn't work, for example:

- Rotate Section View or Elevation to align to Facades
- Rotate Scope or SectionBox to align to Wall or Grids
- Rotate Annotations or Detail Items
- Rotate Plan View itself by selecting crop to align to a grid or any other element

If you Shift+Click on target it will rotate perpendicular to target.

<https://www.3yourmind.com>

3D PRINTING APP FOR AUTODESK FUSION 360



This easy-to-use app installs our 3D printing app in Autodesk® Fusion 360™. After clicking the 3D print button, you can repair, analyze, and scale your model. On the platform you can choose among a

wide range of materials and compare different 3D printing services.

The app features:

- one-click upload
- showing prices from 3D printing services
- effective 3D repairment
- wall thickness analysis
- download of the repaired file (STL)
- secure file transfer with SSL

This plug-in is free of charge with no hidden costs.



<https://apps.autodesk.com/RVT/en/Detail/Index?id=885904972067683246&appLang=en&os=Win64>

ALIGN VIEWS

Placing a drawing view onto a drawing sheet is simple enough, but aligning the views isn't, especially if you want to have the plan view aligning in the same position on every drawing.

This plug-in will help you align views on many different drawing sheets with just a few clicks.

This has also been updated to Autodesk® Revit® 2019.

https://apps.autodesk.com/ACD/en/Detail/Index?id=6552547771782641959&appLang=en&os=W in32_64



ZERO LEVEL

Calculation of vertical sections' levels requires a lot of time and effort. Zero Level plug-in for AutoCAD® is designed to benefit AutoCAD users in calculating the vertical sections' levels in all engineering fields to save time and effort, and giving more accuracy.

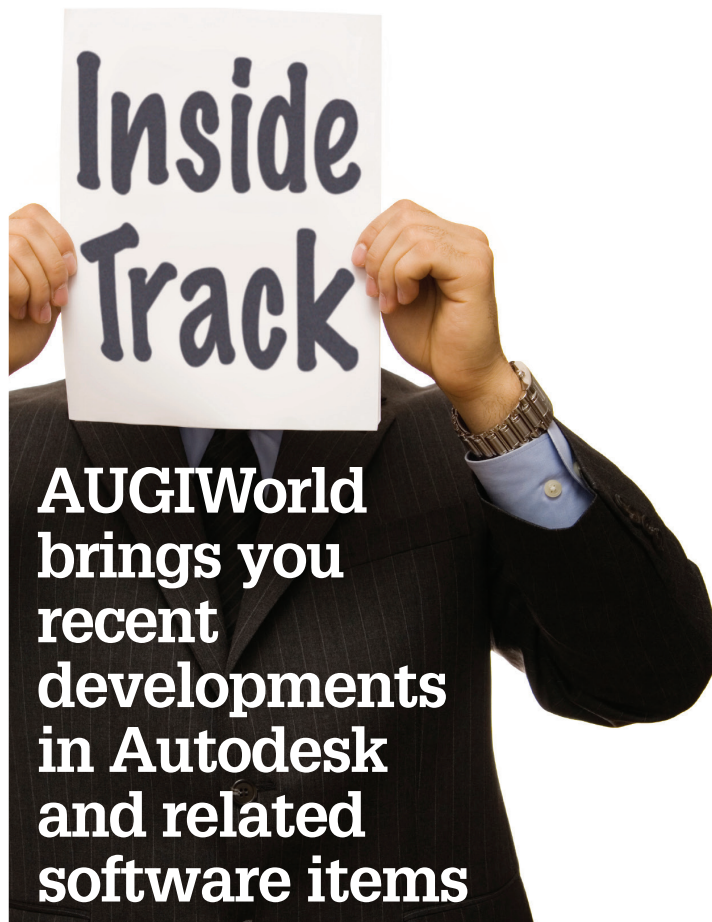
Features:

- Correct section levels' values depend on variable base value.
- Create new levels' values in two ways starting from base value.
- Increase or decrease all levels' values with variable input.

System requirements:

- AutoCAD® 2012 to 2019.
- A block having at least one attribute.

If you have some news to share with us for future issues, please let us know. Likewise, if you are a user of a featured product or news item and would like to write a review, we want to know: brian.andresen@augi.com



HP ZBook 14u and 15u G5, powered by AMD graphics – Ultra Portable Workstation Performance

INTRODUCING HP'S THINNEST MOBILE WORKSTATION¹



Any mobile workstation that's powerful enough for tough CAD jobs must be thick and heavy, right? I mean how could a machine be thin and light with great battery life and still run CAD well? The HP ZBook 14u—HP's thinnest mobile workstation—and its slightly larger HP ZBook 15u sibling do, in fact, deliver great CAD performance in an ultra-portable package.

Using the latest generation Intel® Core™ i5/i7 quad core processors, high-speed RAM, Radeon™ Pro professional graphics and high performance NVMe solid state disc (SSD) technology performance is outstanding, yet the packaging is super thin and light with valuable options for CAD using road warriors.



Figure 1: The HP ZBook 15u is a 15.6" diagonal display machine that is thin, light and powerful enough to run 3D rendering programs like Autodesk® 3ds Max®.

AMPLE SPECS, MINIMUM SIZE

The HP ZBook 15u is a 15.6" diagonal screen form factor machine with thin/light measurements of 18.25mm/0.72"¹ and starts at 3.89lbs² in its base configuration. The slightly smaller ZBook 14u with a 17.9mm/0.71"¹ case thickness starting at a superlight 3.27lbs² in its basic configuration. Either workstation provides a variety of high-end options (more in a moment) while being ultra-portable.

But despite their compact size, these HP ZBooks deliver the latest technologies and components to yield no-compromise CAD performance.

Let's start with the major system components:

- Up to 8th Gen Intel® Core™ i7 processors at 4.2GHz Turbo Frequency³
- Up to 32 GB 2400 MT/s DDR4 memory
- Up to 2TB of SSD storage with 1TB M.2 NVMe and 1TB PCIe NVMe SSD drives^{4,5}
- Integrated: Intel® HD graphics 620
- Discrete: AMD Radeon™ Pro WX 3100 professional graphics (2 GB dedicated GDDR5)^{5,6}
- Windows 10 Pro⁵ operating system.

For mainstream Autodesk applications, these specifications provide the fast Turbo clock rates, ample memory and fast Z Turbo Drive G2 SSD based I/O (over 4X faster than conventional SATA SSD's) that speeds CAD processing. And with the discrete 2GB AMD graphics, all but the most demanding 3D modelling workflows are well supported. In fact, most Autodesk users would be happy to have a desktop workstation machine meeting these specs at the office, particularly as the WX 3100 is fully certified for tools like Autodesk® Revit® and Autodesk® 3ds Max®.

Paul Grimston, Excitech Technical Consultant based in the UK, who is an advanced Revit trainer and power user mentioned, "The performance of this HP mobile workstation gave results far above what I expected from Revit on a mobile workstation."

It easily coped with the largest of project files, so no need to worry about splitting up models. The AMD graphics allowed for a responsive viewport with minimal dropout and strong interaction when in 3D walk mode. The model redraw was instant even in Realistic shading mode. In short, this is a great system for when you're onsite."

POWER MANAGEMENT AND BATTERY LIFE

But what about when you're travelling, presenting or not doing CAD work? In these environments rapid boot up and long battery life are principle concerns. The ZBook 14u/15u workstations are equally comfortable in these environments due to their power management skills.

When not in full turbo mode the available Intel® Core™ processors step their clock rate down and graphics support is passed to the integrated Intel® HD graphics system while the discrete AMD Radeon™ Pro graphics card shuts off. By using this scheme for lower power application requirements these ZBook workstations can power through CAD applications, yet switch into low power mode for less aggressive usage scenarios to extend the life of the 50WHr battery up to 14 hours.⁷

And if you're ever stuck in an airport trying to top off your battery between flights the included HP fast charging battery system allows up to 50% recharge rates in just 30 minutes.⁸

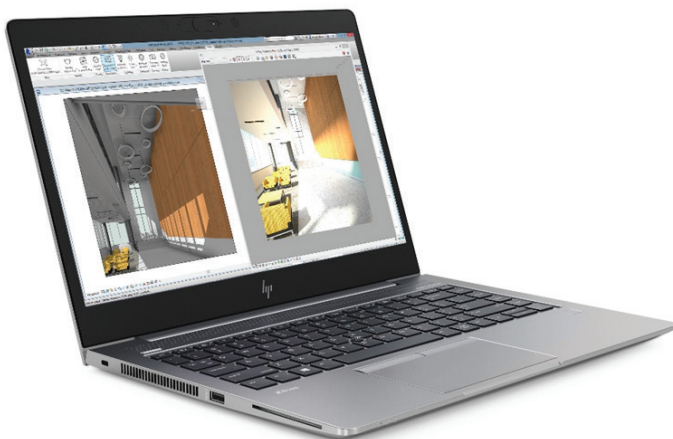


Figure 2: The HP ZBook 14u is a 14.0" diagonal display machine that is more compact than the HP ZBook 15u, yet still powerful enough to run 3D modelling programs like Autodesk® Revit®.

GRAPHICS

The AMD Radeon™ Pro WX 3100 graphics is redefining entry-level workstation graphics. The WX 3100 provides up to 2.3x performance over the previous generation, providing mainstream performance at an entry-level graphics price point. As part of the Radeon™ Pro WX range from AMD, it is application certified on many of today's popular professional applications to help ensure you get the best experience from the onboard graphics.

OTHER USEFUL OPTIONS

Beyond the powerful basic specs, HP ZBook 14u/15u have other available options that allow you to customize it to suit your workload requirements. A few of these features to note:

- ♦ **Available FHD, FHD Touch, FHD Privacy and 4K screen options.** Supporting full HD (1920x1080) in touch, non-touch or SureView privacy⁹ mode, along with a conventional 4K (3840x2160) non-touch screen options^{10,11} and an integrated HDMI or DisplayPort™ 1.2 via the Thunderbolt™ dock connector dual monitor configurations at a variety of resolutions can be used to support typical CAD workflows.
- ♦ **Exchange data rapidly with typical field devices.** Multiple interface ports, including a USB Type-C™ (Thunderbolt™ 3), HDMI, USB 3.1 and a USB 3.0 Charging port.
- ♦ **Wired network connection.** Unlike many other laptops on the market, these ZBook workstations include a wired RJ-45 network connector and available 4G LTE support to provide maximum connection flexibility in corporate environments or remote locations where WIFI connections may not be preferred.
- ♦ **Great audio.** Bang & Olufsen audio includes a discrete amp to offer premium sound quality along with an external mic for conference calls that works in tandem with HP Noise Cancellation Software to mute background noise.
- ♦ **HP Thunderbolt Dock G2.** Add DisplayPort™ connections for a total of three monitors, more USB and Thunderbolt™ 3 connectors¹², as well as charging capabilities at your desk.

RELIABILITY AND SECURITY

Though compact, the HP ZBook 14u/15u workstations don't cut any corners in terms of reliability or security features. Like all HP Mobile Workstations, they both undergo HP's Total Test Process of 120,000 hours of total system testing and also provide the following features:

- ♦ **Security.** With HP's BIOSphere suite included, your workstation boots with a fresh BIOS to avoid system corruption or hacking with no administrative action required¹³. Add the HP FingerPrint Sensor, HP SureView Privacy display to prevent visual hacking, HP Power On Authentication and HP Privacy Camera with its sliding web-cam cover, and your HP ZBook 14u/15u is secured against unauthorized access—a key concern when travelling with important CAD information.

Tech Insights

- **ISV Certification.** Independent software vendor certification assures that these ZBooks with AMD graphics run industry standard software packages reliably without driver or hardware conflicts.
- **Expanded MIL-STD testing.** The 14 punishing MIL STD 810-G tests for extremes in temperature, humidity, altitude and repeated drops help assure durability even in rough environments like an aircraft overhead bin.¹⁴
- **Warranty.** Parts, labor and next business day depot coverage for a full three (3) years.

WRAPPING UP

If you find yourself in an increasingly mobile job that requires you to run powerful Autodesk software applications, the HP ZBook 14u/15u workstations allow you to have your CAD and travel, too. As workforce mobility increases, it's more and more likely that you'll need a workstation with a professional graphics card that can provide the power your CAD applications demand, yet still be light, portable, durable and secure enough to go on the road without worry.

The HP ZBook 14u and 15u workstations with AMD professional graphics measure up to the challenge by providing cutting-edge technology combined with classic HP reliability and performance.

DISCLAIMERS

1. Thickness measured at machine's thickest point.
2. Weight will vary by configuration.
3. Multi-Core is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance.
4. For hard drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30GB (for Windows 10) of system disk is reserved for system recovery software.
5. Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com>.
6. Sold as a configurable option.
7. Windows 10 MM14 battery life will vary depending on various factors including product model, configuration, loaded applications, features, use, wireless functionality, and power management

settings. The maximum capacity of the battery will naturally decrease with time and usage. See www.bapco.com External link icon for additional details

8. Recharges the battery up to 50% within 30 minutes when the system is off or in standby mode. Power adapter with a minimum capacity of 65 watts is required. After charging has reached 50% capacity, charging will return to normal. Charging time may vary +/-10% due to System tolerance.

9. HP Sure View integrated privacy screen is an optional feature that must be configured at purchase.

10. 4K and touch are optional configurations.

11. 4K and anti-glare display are optional or sold separately.

12. Based on Thunderbolt™ docks that support USB-C™ charging, video, and the ability to deliver power to notebooks that require up to 200W power as of January 17th, 2018.

13. Based on HP's unique and comprehensive security capabilities at no additional cost and HP's Manageability Integration Kit's management of every aspect of a PC including hardware, BIOS and software management using Microsoft System Center Configuration Manager among desktop workstation vendors as of Sept. 2017 on HP Mobile Workstations with 8th Gen Intel® Processors.

14. MIL-STD-810G testing is completed. Testing is not intended to demonstrate fitness of U.S. Department of Defense (DoD) contract requirements or for military use. Test results are not a guarantee of future performance under these test conditions. Accidental damage requires an optional HP Accidental Damage Protection Care Pack.



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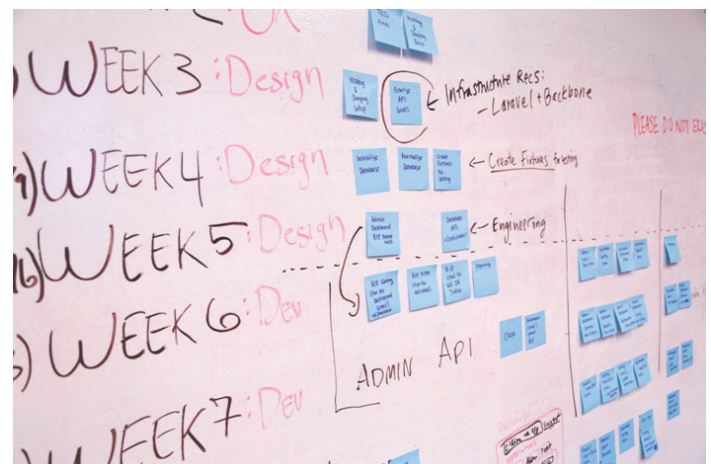
Robert Green provides CAD management consulting, programming, speaking, and training services for clients throughout the United States, Canada, and Europe. A mechanical engineer by training and alpha CAD user by choice, Robert is also well known for his insightful articles and book, Expert CAD Management: The Complete Guide. Reach Robert at rgreen@greenconsulting.com



Many people consider themselves, are labeled as, or actually hold the title of Project Manager (PM).

Project manager positions exist in nearly every industry; from construction to food service to medical care, there are PM roles everywhere.

Until recently, I worked in the AEC design industry as a Project Manager. During the 30 years I worked in this industry, I basically did the same type of work, which for me involved managing design projects in the architectural, mechanical, and electrical design disciplines for commercial buildings. This management function



Project Management



involved monitoring and managing schedules, communication, and deliverables. From my experience, the vision I saw of a project manager was someone who coordinated, executed, and oversaw a team or a series of processes on a regular basis in order to achieve a specific positive outcome (your vision may be a little different). In my new role I serve as an owner's rep/project manager for construction and renovation projects that range from \$100k to over \$10 million dollars. No matter the size or costs, the processes are the same.

Based on the AUGI Salary Survey, there are a fair number of Project Managers in our ranks, but some may wonder exactly what project managers do. As the title would suggest, project managers manage projects; sounds simple enough, but what exactly does that mean? Even though project management comes in a variety of forms and industries, there should be a basic understanding or definition of what project management means.

Fortunately there are organizations that have covered this in much detail. The Project Management Institute (PMI), which is the largest project management organization in North America, provides the following definition:

"Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. Project management is accomplished through the appropriate application and integration of the 47 logically grouped project management processes which are categorized into five process groups."

This definition comes from PMI's "Project Management Body of Knowledge (PMBOK Guide), 5th Edition".

According to PMI, every project goes through a series of process groups: Initiating, Planning, Executing, Monitoring and Controlling, and Closing. Within these groups you follow a specific set of processes. A simple summary of the process groups follows, although you can get a much more detailed definition and explanation in the PMBOK Guide mentioned above. A project has a start and a finish, but it also has a series of steps or "processes" in between. The PMBOK Guide covers 47 processes in a project's life cycle, which it organizes under the five process groups.

INITIATING

Initiating is the process group used to define a new project or a subsequent phase(s) of an ongoing project. This is where the scope is defined and finances are committed to the project, stakeholders are identified, and the project manager is often assigned.

PLANNING

In this series of processes, the scope is better defined and refined, objectives are set, and a course of action is developed.

EXECUTING

This is where the work gets done on the plan—where the tasks are performed in order to meet the project objectives.

MONITORING AND CONTROLLING

This is the process group that covers monitoring and tracking in order to review the progress of the project and its overall health. This monitoring is what identifies possible issues that may require changes or updates to the project plan.

CLOSING

This is the end of the project cycle. This is where a project is finalized and reviewed to make sure that contractual obligations have been met.

Although most people will not think in the detail above, understanding the flow of a project and what happens in each phase is important to make the outcome successful.

Now that we have some definition of what project management is and have an idea of flow, what defines a project? According to PMI, a project is:

"A temporary endeavor undertaken to create a unique product, service or result."

A project is temporary in that it has a defined beginning and end time, and therefore defined scope and resources. This definition comes from PMI's "Project Management Body of Knowledge (PMBOK Guide), 5th Edition".

As mentioned above, PMI is the biggest player in North America, and like AUGI, they are also an international organization. PMI is not the only project management resource, though. Other organizations include the International Project Management Association (IPMA), the Association for Project Management (APM), and the American Society for the Advancement of Project Management (ASAPM).

The IPMA and the ASAPM are member organizations made up of other Project Management associations from around the world (APM in the UK, AIPM in Australia, PMAC of Canada, GPM in Germany, IPM in Ireland, etc.). There is no shortage of available project management resources out there.

Now that we have definitions of both project management and a project, what does that mean for the role or roles of the Project Manager?

The PM has many roles, and because of this, requires many skill sets. Some of the most critical skills of successful PMs are good communication, organization, negotiation, and discipline. These and many other skills allow a PM to keep a project on track through its various stages. I will cover more about the Project Manager's skill sets in a future article.

Projects happen in all industries, but for the sake of this article, let's look at how a typical building design project may go through the previous mentioned flow.

INITIATING

Initiating is the phase that many in the design world get brought in after. This phase still happens, but it typically happens at the customer's level with their executive team. If they think they are in need of a building, whether it be a new factory, office building, or warehouse for distribution and storage, or just an expansion or renovation to an existing facility, they need to do some homework.

The customer will create a list of their needs and resources, generate a business case, and pitch it to their board or advisors. At some point they will reach out to a developer or possibly directly to an architect if they already have the real estate they need. Obviously, architects, developers, and contractors can come in at various parts of the initiating process because as we know from the definition of a project, it is unique—each one is different.

PLANNING

The planning phase is the most critical part of a project and it may include some or all of the previously mentioned parties. The planning phase is so important because it is where the majority of the work gets done that can make or break a project. The design team is put together, the needs are established, vetted, and organized on their level of importance, costs are determined, and a schedule is developed. During the planning stage a methodology is chosen to move the project forward, which could be Design Bid Build, Design Build, Construction Manager, or possibly Integrated Project Delivery (IPD). Typically the more time spent in the planning stage, the better the project's outcome.

EXECUTING

The executing stage is where the work gets done and is typically the longest phase of the project. In the AEC world, this is where the contractor(s) start the actual building process. The project shifts from paper or model to a real world building. Depending on how well the planning was done, this part of the project can go very smoothly or can be a rough ride.

MONITORING AND CONTROLLING

Monitoring and controlling is not a standalone phase—it actually starts during the planning phase, and covers the executing and closing phases as well. Monitoring and controlling is how the budget, schedule, and project methodology are monitored, reported on and, of course, controlled. This entails verifying when extra costs come up or schedule delays happen that need to be corrected. By constantly monitoring the schedule and budget, you can catch issues before they spiral out of control.

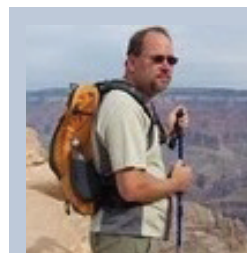
CLOSING

The closing process is where the record drawings are finalized to match what was actually installed (important for facilities maintenance), make sure all outstanding invoices are paid, liens are released, warranty information is collected and filed, and a "lessons learned" review is done. The lessons learned can come in handy for future projects that the customer may do and will be very helpful for the design and construction team to make sure any issues or benefits that were discovered during the process can be applied to their future projects.

Do these process groups and steps seem familiar or fall in line with your day-to-day workflow? If so, you may be a project manager.

RESOURCES:

<https://www.pmi.org/>
<http://www.ipma.world/>
<https://www.apm.org.uk/>



Walt Sparling has spent the last 30 years in the design and project management side of the industry until recently switching to a Senior Project Management role on the construction side. Walt can be reached for questions and comments via email at: walt@functionsense.com

Managing Civil 3D Data



As a Senior CADD Manager and roadway designer, I am always trying to find an easy and convenient way to manage data, files, projects, sheets, xrefs, and data links. I have found that proper setup at the beginning of a project goes a long way! I find that if you start your project right, it has a much better chance of ending well. In this article I will demonstrate some of tools I use to manage my project data.

MANAGING PROJECT SETUP/KICKOFF

I have learned through the years that most projects that start out quick and dirty will sadly end that way, too. So I treat all work as if it were a final design—with deliverables, deadlines, clients, and standards. Conceptual designs, final designs, and even user “sandbox” files are set up using our Project CADD Standards.

Schedule a CADD Kickoff meeting and invite anyone using CADD to this meeting.

Be prepared. Have an agenda, templates, pen tables, and naming conventions for all file types, data shortcut rules, and contact information available at this meeting. And I cannot stress this enough:

FOLLOW UP via email with the attendees. Make your life easier by creating project team email groups in your email software.

The desired outcome of this kickoff meeting is to establish your CADD Management Plan (CMP).

Creating a CMP should be a part of every project. Discuss this with your project manager ahead of time because it will seem (to your project manager) unnecessary and wasteful. You may have to convince your project manager of the cost savings.

A well-written CMP will save more money and time than it costs up front. See the next few points to help you finish off the plan.

MANAGING DATA SHORTCUTS

I work in a large company with multiple offices, multiple project team members, and multiple project standards. We use Projectwise by Bentley to manage our data. Regardless of your file management system, data shortcuts are a regular part of your day. And managing them can be daunting.

AutoCAD® Civil 3D® 2018 has made this a little easier with folders (see Figure 1). Making folders allows you to sort your data in order to keep USER files separate from PROJECT files. Create a naming convention for folders and objects. Document these in your CMP.

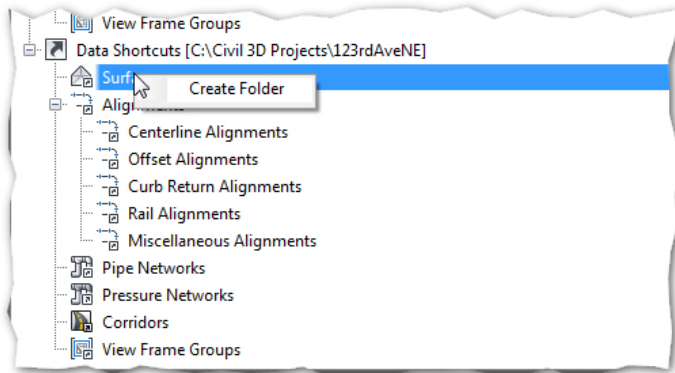


Figure 1

Note: I have noticed that the data shortcut files are generally 1kb or 2kb; when these files are much larger than that, I usually see project speed issues. To fix this, delete those large files and re-create them. Nine times out of 10, this improves project speed.

Since data shortcuts are pointers to data in other files, those other files are explored and evaluated every time you load a file that references data from them. Keep your “source” files small, tidy, purged, audited, and avoid cross-referencing data back into this file. For example, avoid xrefing an alignment display file back into an alignment source file. This is also true in sheet files—avoid referencing “source” files and “display” files to the sheets. Although this workflow works, it also creates unnecessary and time-consuming checking, and re-checking, while you are loading a file.

DISPLAY FILES

I have concluded that data shortcutting directly into sheet files is not a good practice for most of my linear projects. Instead, I create “display” files. I will briefly discuss why I do not shortcut directly into sheets, then I will explain some of the benefits of the display files for managing my design data.

Users tend to not follow directions and standards, get lazy, or just do not pay attention. I like my alignments to appear the same in each discipline they show in. If I allow users to shortcut the alignment in directly, they can set it to any style they want, making their drawing unique in its appearance. This makes their version look different than other disciplines.

To avoid this, I create a display file into which I data shortcut the alignment(s), making sure that I have the alignments on unique layers using the ambient settings in toolspace to ensure users have freeze/off flexibility. Document the naming convention in your CMP. Because I use Projectwise to manage files, I can add a description that says “DISPLAY FILE,” but you may need some

characters in the file name. I offer *Alignment_Display.DWG* as a suggestion. With display files, you can have a single place to display the data you want for your team. Alignments, surfaces, and corridors all work well in a display, but I have found that pipe networks are not as easy to manage this way. I have found that part styles do not update to reflect part changes and part swaps.

You can still reference the alignments or surfaces for labeling through this display file xref. You can also switch labels to reference a different source in the Properties dialog box.

PROJECT CADD STANDARDS

Among the most difficult things to manage on a project are the CADD standards—the “look and feel” of a project set. We all want our civil sheets to use the same standards as our structural sheets and landscape sheets. We all want the users to use the same fonts, blocks, colors, linetypes, and reference each other’s sheets in the same way.

I have implemented tool palettes to help my users navigate our standards and make it simple for them to follow the rules. I taught a class at Autodesk University last year and discussed tool palettes briefly and the follow-up questions were amazing! Many people were scared by them, worried that they did not have the time to manage the data. Although this article will not go into the details of how to create a tool palette collection, I want to stress the ease of creation, the tremendous benefits, and the joy I get when someone says, “thanks for creating this tool for us.”

It’s easy to start. Right-click in your existing Tool Palette window and select New Palette (Figure 2) and give it a name. In your drawing, click and hold on an object until you see a little square beside the object (Figure 3). Now drag and drop that object into the new palette you created. You can now right-click on the icon in the tool palette and explore its many properties and functions. Once you are satisfied with your new palette of time-saving objects, you can right-click in it and select Customize Palettes, then find it in the left-hand column and select Export. Place this exported file in a network location for other users to import when they need access to those objects you added.

Note: The file you drag objects from also needs to be in a shared network location so users can add and find the symbols and blocks you added.

I have added AutoCAD commands to a tool palette as well—some custom LISP routines and actual AutoCAD commands that I want users to find easily. Custom Assemblies can also be added for a project team to use for consistency in sub-assemblies.

There are many tutorials online regarding tool palettes, and if you have a good relationship with your IT staff, you can make your custom palettes part of your initial AutoCAD install package for an even smoother transition to CADD standards euphoria.

AutoCAD Civil 3D

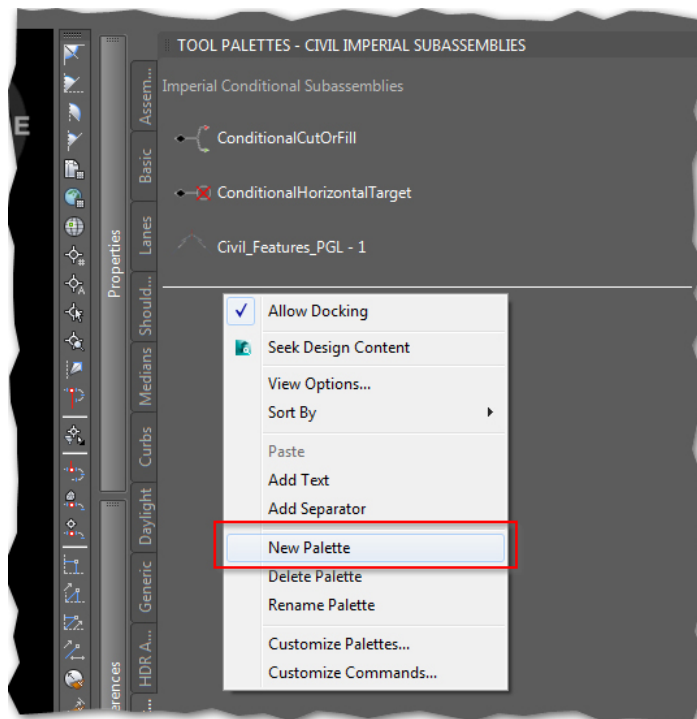


Figure 2

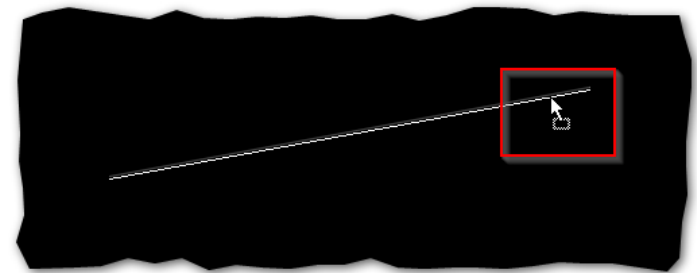


Figure 3

SHEET SETS

Hopefully you are using Sheet Set Manager in your day-to-day projects. If not, you are really missing out on a great tool. I use SSM for updating titleblock data, sheet indexing, and sheet numbering. One thing that SSM lacks is an Excel interface. I found a product called SSMPPropEditor by JTB World. This little add-on to SSM has a nifty Export to Excel function. This allows us to quickly get valuable data into a more universal format, allows quick sheet numbering, attribute copy and paste, and exporting to other programs. Once you are done in Excel, you import the file back into SSMPPropEditor, then save that back to your sheet set. The program also creates a backup of the .dst file in case something goes wrong. In Figure 4, you can see the available export options. This program was \$50 when I purchased it, and I saved that and more the first time I used it.

CURRENT PDFS

I suggest keeping a set of sheet file PDFs up to date for your team. As a rule of thumb, I monitor the sheet files folders and do a quick

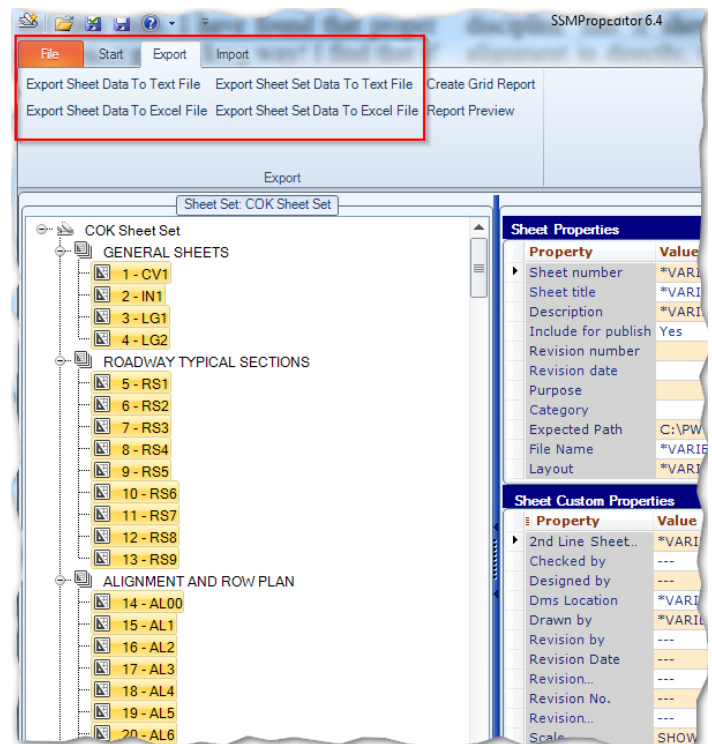


Figure 4

publish (even faster if you use Sheet Set Manager) to PDF and keep those files available for the team. This may seem like overkill and not important, but think how many times you have been asked to "plot me a new set of plans." I let the sheet set publish while I am at lunch, in a meeting, or headed home for the night, depending on the size of the project.

CONCLUSION

Hopefully you can use a couple of these nuggets to improve your workflow and boost productivity in your office. I realize there are many ways of doing the same thing in AutoCAD Civil 3D and I have only scratched the surface on the power of some of these. I really believe that EVERY CLICK COSTS MONEY and I do my best to help users eliminate un-needed clicks.



Jeff Frye has more than 28 years of experience as a CADD manager and roadway designer. He focuses on productivity and production-related tips and tricks. He has taught at AU and internally at HDR. Jeff can be reached for comments or questions at jeff.frye@hdrinc.com.

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Your Model in InfraWorks: Be the Boss!

One of the key components in managing processes within any application is the ability to control the basic settings that apply to the common ground and general scope of a project. In InfraWorks® 2019, we are referring to the conditions and properties that make our model capable of being shared across multiple platforms.

Let's discuss a basic workflow from original creation of our model to the first proposal to be shared with the team.

MODEL BUILDER – EXISTING CONDITIONS

When using this tool (Figure 1), it is important that you understand and identify the limits of the project, as the size of the encompassed area along with the resources available to manage your project are going to have a considerable impact on the performance of your file. When combined with a proper file storage procedure in the new Autodesk BIM 360™ Document Management tool, the process of sharing and working in a collaborative environment is easier and more efficient.

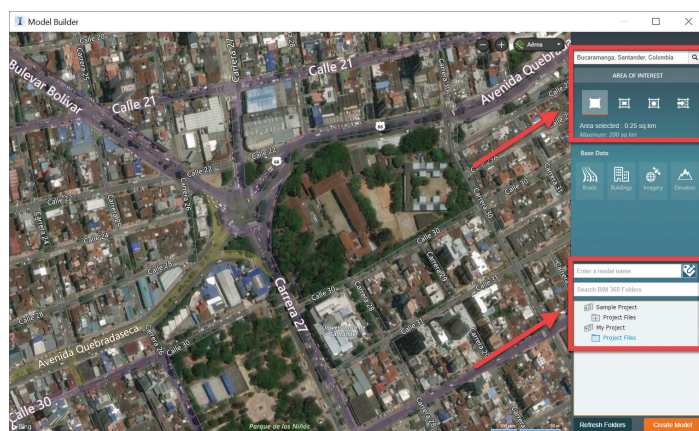


Figure 1

SETTINGS – MODEL PROPERTIES

Defining the proper coordinate system for your model is the first step when assigning the project properties as you work along the creation of your master proposal (Figure 2). At this time, communication with all the members of the team, especially surveyors, is vital to ensure that not only are you placing your model in the proper location, but also matching what has been done in other platforms within the same project.

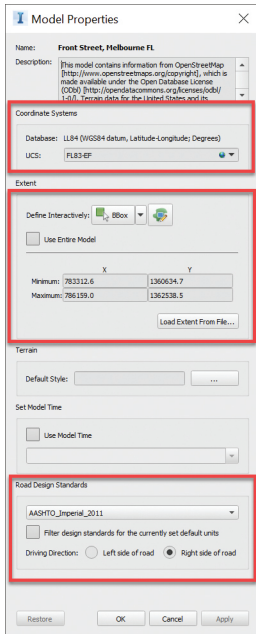


Figure 2

The next step is to narrow the specific area location if model builder has given a wider location and it needs to shrink to a specific point. Whether you have survey points (such as Bench Marks, plot descriptions, etc.) or a layout already defined for the scope of the project, this is the place and time to define it.

Finally, make sure you are selecting the proper sets of rules and units for analyzing the different components of your model under road design standards.

APPLICATION OPTIONS – PERFORMANCE

Performance is vital for the proper use of resources when working on a project; the same is true for InfraWorks.

Application options offers a wide variety of opportunities to work faster and more efficiently. My advice is to step away from detailed graphics, animations, shadows, and the like. Though these items will make your screen look better, your processes suffer in function of time and efficiency. Under 3D Graphics – Optimize Graphics, the default settings under Optimize for Speed are sufficient to allow you to work in a 3D graphic environment while keeping effective use of your available resources (Figure 3).

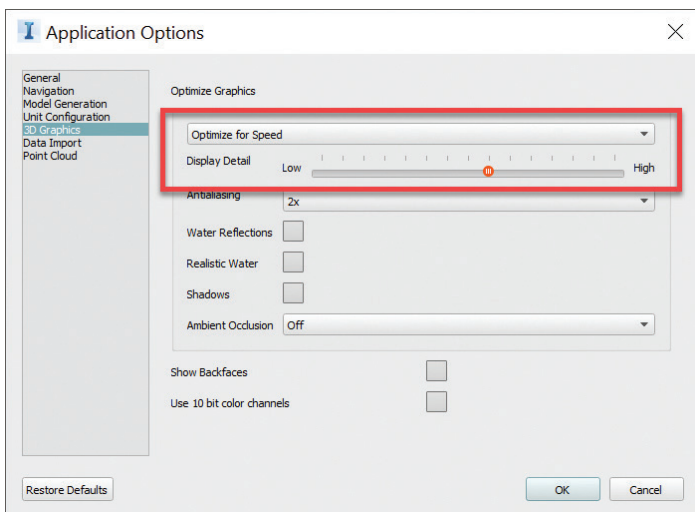


Figure 3

Defining the proper coordinate system, assigning the necessary resources to work on the model, and compiling the necessary data sets in a consistent manner to create the basic model with all the existing conditions are the first steps before commencing our modeling/analysis/pre-design process. In InfraWorks, this translates to creating different proposals for the project.

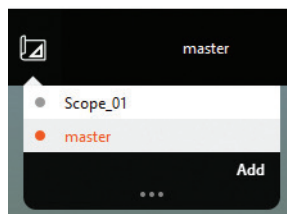


Figure 4

DATA SOURCES

Managing the different types of files/databases that Infra Works can process at any point within your model is as important as the previous steps already described. As a data aggregator application, InfraWorks allows us to import and puzzle together masses of information, from Bentley's .dgn to Autodesk's .dwg, along several distinct types of metadata.

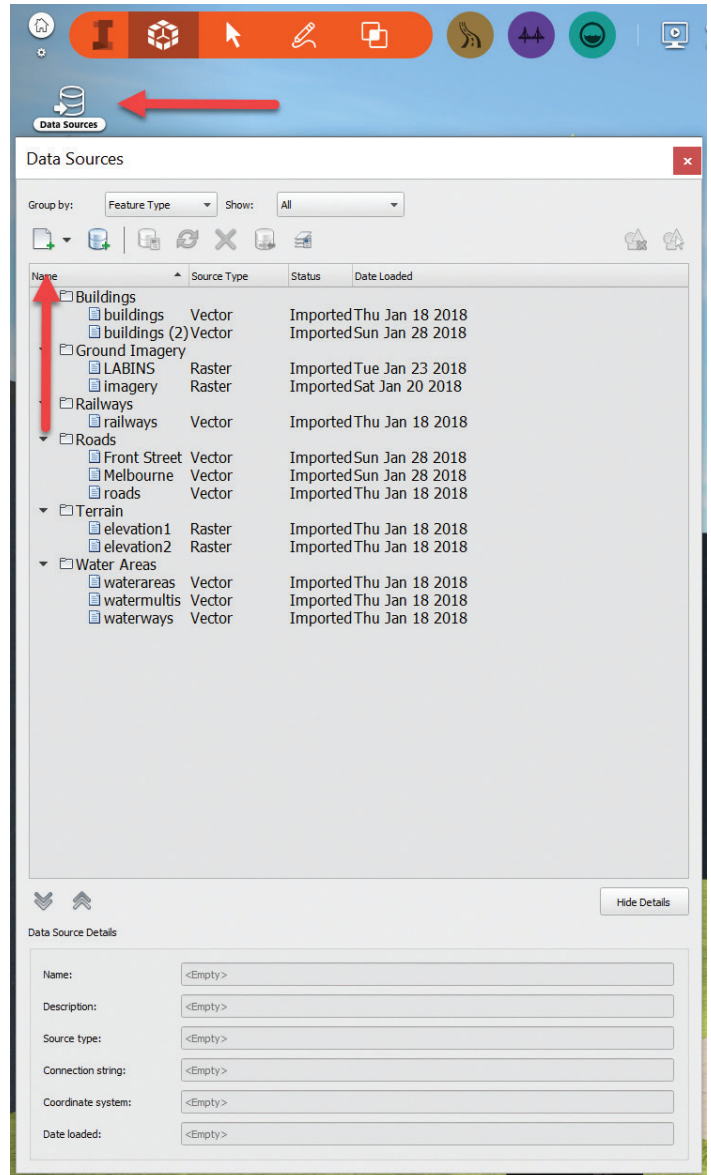


Figure 5

Defining the key extension files that will represent the project scope, as well as understanding the main applications to be used during the project's life, can considerably help to identify the crucial types of databases that will work together, defining our models regardless of the platforms to be used and combined.

From Infra Works, it is desirable to have consistent types of data together that can be managed and shared. For example, within our organization's internal standard workflows, we can have data types such as 3D models: dae, fbx, obj, or dxf; metadata such as Shapefiles .shp; and precise design data as DGN 3D Models or AutoCAD® Civil 3D® dwg, to name a few.

InfraWorks 2019

Another crucial point to mention is that any effort we make to have this consistency across the board with all the platforms to be used will boost our efficiency and make our design/modeling processes less difficult and cumbersome.

EXPORTING YOUR MODEL

When you are ready to share your model with the rest of the team, there are some considerations to ensure that you are following a correct protocol.

In order to export an efficient model, it is recommended to only select the area of interest where the key components are located within the model, then verify that the coordinate system is a match with what has been defined for the project (regardless of the platform).

Finally, save and archive your model following the internal operating procedures within your organization so any team member can easily locate the file at any given point (Figure 6).

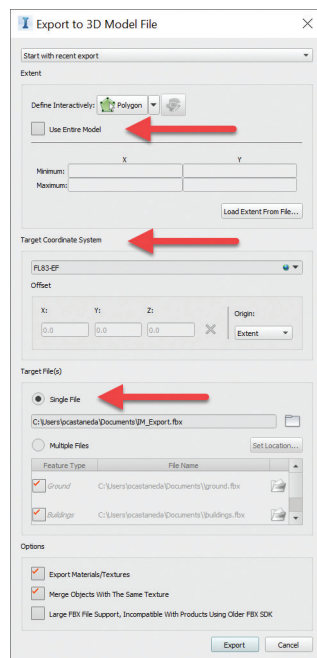


Figure 6

If there are other considerations that need to be accounted for in creating your model, communication with your CADD manager is important and necessary, not only for compliance with your company's standards, but also your client's requirements.

SHARING AND COLLABORATION

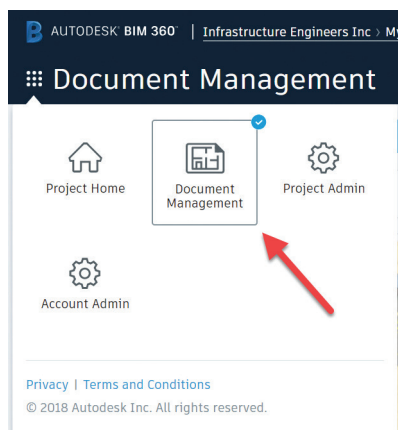


Figure 7

There have been changes to the way we share our model with multiple users. BIM 360 is a cloud-based platform that allows data for a BIM project to transition from design to planning to construction. To be more specific, BIM 360 Docs, which is the location where you will publish your InfraWorks models when you want to collaborate with others, is now the tool we have at our disposal to share and collaborate in a multi-platform environment (Figure 7).

This is a change that came with InfraWorks 2019, and it is based on a simple principle: an InfraWorks model is part of an overall project already being designed and analyzed in other applications by many team members.

When sharing our proposals, it is extremely important to remember that InfraWorks models are not backward compatible, so you need to make sure that all team members with rights to modify models are set with the same version of the application.

And as with many other applications/platforms, changes are happening quickly and we need to keep our internal workflows as updated as we possibly can to avoid unnecessary loss of data, inefficient use of resources, and time waste.

Here is a link from Eric Chappell with good content about this new platform:

<https://www.youtube.com/watch?v=3W383ZaOP2s>

Finally, whether you are working on a simple corridor/site model or a multi-collaborative environment where hundreds of databases are to be combined for the creation of your master proposal, defining the set of rules that will govern your 3D approach from pre-design to final renders is vital to the performance and efficiency of the workflows in place; hence, constant communication and consistency in your internal procedures will define your success.



Oscar Castaneda is a Professional Engineer at Infrastructure Engineers Inc. with 13 years of design experience working in projects for multiple jurisdictions across the United States. He is proficient in numerous software applications such as Civil 3D, InfraWorks, Revit, ReCap Pro, ReCAP Photo, AutoCAD, Microstation/GeopacK, Pix4D, Navisworks, and Revu Blue Beam among many others. As an avid flying enthusiast, Oscar is a certified airman for small UAV's under FAA Part 107 and is currently developing and implementing precise workflows for the use of these technologies within transportation design projects. He is a regular instructor at national, state, and local training events where he shares his experiences with fellow colleagues. Oscar can be reached for comments and questions at ocastaneda@go-iei.com.



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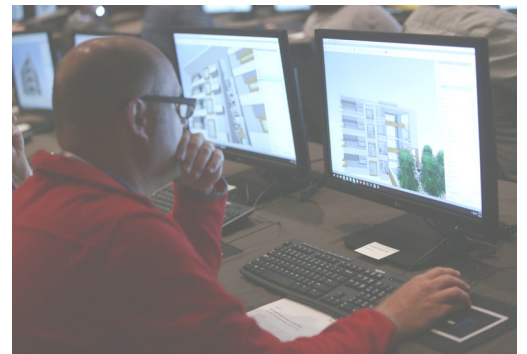
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Managing Assets for 3ds Max

One of the primary challenges today is the integration and control of assets in production environments. Providers do their best to develop plug-ins or streamline a system for users to collect, install, and use the assets, but the constant upgrades and patches of the software place a heavy load on their teams. They also have to combat pirating and budgeting constraints, making it difficult to address the problem quickly. Generally, this leads to a system where in-house managers become librarians—downloading, storing, and distributing the data.

The situation becomes more complicated for those in more massive operations that involve licensing/rights, remote management, tracking, archiving, updates, revisions, quality control/review/acceptance, compatibility, categorization (per scene), and more. For each of those, some procedures include controls such as file naming conventions and structures to share, review, and track. This is the base of the production environment, embedded into users brains through years of training, testing, trials, and sometimes tribulation. Sounds costly, right? Well, it is. These are all complicated tasks, but the key to them (and pretty much anything else) is to break them down into individual smaller steps that become manageable. In this article, I'll be discussing some of the tools available to do just that.

MAPPING IT OUT

Mapping out the system you've developed to control your assets is essential. Simply put, it's a roadmap available to anyone who aims to improve the route. Without it, we drive blind. Refer to Figure 1 where I mapped out a basic approach to managing digital assets for small operations. I'll be discussing various tools and methods your users can implement to get more value from the work they do through each of the steps.

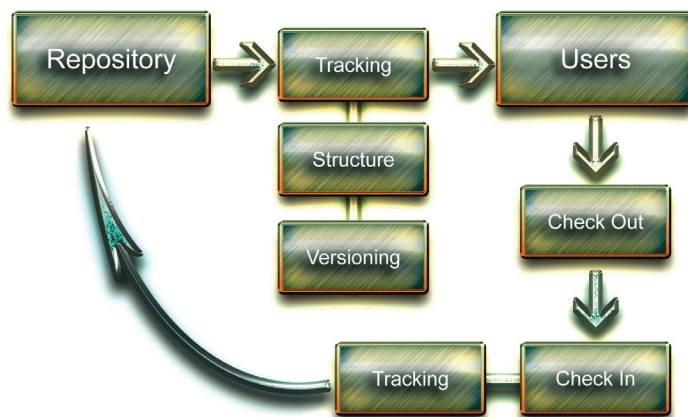


Figure 1: Asset Management System (basic)

REPOSITORY

The storage requirements for assets is extraordinary. Couple with that protection, backup/backup redundancy, and associated costs and it's hard to ignore the impact they have on production. Then add to that the increasing power of the software to work with more massive data sets (meshes generated from Zbrush / Lidar, for example) and file bloating becomes a significant problem. Server costs range in the tens of thousands of dollars, so merely purchasing more is not a viable solution.

To combat volume and file size, we need to implement a few rules. The first rule is to use only the highest quality assets and archive the rest (but provide an image of the archive for reference). For example, I can't think of a situation where having 17 cherry blossom trees would be necessary, but I've seen users with them. Imagine compounding that file with three LODs (level of details) that we were required to split out into separate files. That would be 51 files. A quick look online shows a cherry blossom tree file (exclud-

ing the textures) to be roughly 74 MB. The 17 files alone would be 1,258 MB (1.3 GB) excluding any of the LOD files or textures. You see how quickly this compounds. It's easy for users to ignore this, but it's essential for the manager to understand this cost and mitigate it as best as possible.

To determine the highest quality asset, there are several factors to consider, but I can think of a particularly good example to mimic generated by Turbosquid (www.turbosquid.com), the world's most extensive library of 3D models in any format. Introduced not too long ago, their Stencil models follow strict guidelines including (but not limited to) clean geometry, limited polygons (minimal density), texture requirements, and PBR workflows. While your structure doesn't have to follow their standard (though you might research the benefits), developing controls like that will ensure you can reuse the data as much as possible.

That brings us to the second rule, which is to reuse data as much as possible. Continuing with the 17 cherry blossom tree files I mentioned earlier for an example of what not to do, each of the trees had a texture file for the bark. The problem with their files was the texture file was the exact same, simply copied 17 times for each of the versions of the tree. The key is to develop systems to store items such as textures like these so the files can reference the same one. Following rule number one, this allows you choose only the highest quality textures, allowing you to produce the best content with the minimal amount of load on your systems.

TRACKING

Making it simple to use data helps to reduce duplicate files or users spending unnecessary time re-creating something that might already exist. To do this, we need to search for them. We accomplish that by implementing a way to store data and track it, which we accomplish through metadata files or plug-ins. Probably the most powerful example of a plug-in capable of this that I know of is K-Studio's Project Manager. Using the Manager we can store data that we can use to search our asset library. For example, if we have one hundred files called "sofa-xxx," it hardly does anyone favors. However, if there was information tied to that file such as the style, material, and color, we can search for any one of those where the manager can display the items found. See Figure 2 for example.

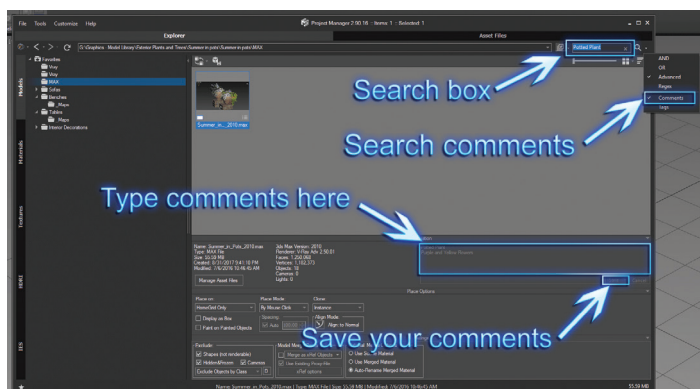


Figure 2: Project Manager tracking system

STRUCTURE AND VERSIONING

We can use metadata, or tools such as Project Manager's information and comment section, to assist with structure and versioning as well. Users can add information about revisions they completed, dates, reasons for revisions, and more—a necessary step to minimize the amount of data we are storing by reusing assets across multiple projects. As a manager, it is necessary to standardize required data while allowing the user to input their notes. Required data might include geometry type (polygonal for example), polygon/vertex count, revision dates with a reason for it, classification systems (types, colors, styles), and more.

Tip: By using information/metadata to track versioning, rather than something like a naming convention with dates, we can ensure scenes don't lose referenced assets and that they are using the latest version.

CHECK IN AND CHECK OUT

Just opening a file and saving it is a form of checking in and checking out a file. While vaults and programs have been developed to access files, edit them, update them, and add user notes, I'd like to focus more on the data we can use to track files users have checked in or checked out. There are different methods, but one I work with includes a script that copies the log files generated by the software with the user's name to a directory I can access. The log file generated by 3ds Max® stores a significant amount of data, and we can control the number of days the data is tracked or limit the amount of data tracked by file size. Using those files, we can determine which users have accessed and find those users to assist with troubleshooting or perhaps merely find a file a team member might have been working on when they are out sick for a day (if we don't feel like calling them at the ball game).


TRACKING (AGAIN)

Limiting changes to assets to specific team members who are aware of potential risks of changes is essential, but it can be just as helpful for those members to be held accountable for communicating those changes to others using tools such as Project Manager, or alternative applications like Smartsheet. I recommend doing some research to find the most appropriate application to get your teams on board.



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What's New in 2019

 Most of the new features for Structural in Revit® 2019 enhance the tools for those who do more detailed models or use Revit to develop shop drawing-level structural models. These new features were developed to provide more detail to the model and to use Revit as a starting point for developing fabrication models. This article will discuss those new structural features, enhancements to some features that we first saw in Revit 2018, and enhancements to improve the interoperability with detailing software such as Advance Steel.

New tools were added in this year's release of Revit to enhance the modeling and development of steel connections and documentation of structural models.

The enhanced structural steel tools are located in a separate steel connection tool palette next to the structural tab that is used for all other modeling of the structure. This new Steel palette contains tools for modeling connections, plates and other fabrication elements such as bolts and welds. This tool palette also contains tools for making precision modifications to modeled members for better documentation of special cuts and copes of members. This is done through the parametric modifiers.

Other enhancements to Revit 2019 (structural specific tools) include Structural Pre-cast enhancements, Transfer Steel data, and free form rebar shape matching.

Autodesk also upgraded the look and feel of the overall performance of Revit with some general tools to make modeling a little more efficient. Some of these tools help with workflow and others are nice adds for appearance and presentation of the end product.

STEEL TOOL PALETTE

One important thing to remember when using the tools in the Steel tab is that these items are for higher level detailing of the model. Therefore, for elements to display properly in the model you need to use the Fine level of detail setting. If fine level of detail is not set for the active view, the objects will not display and you will see the default warning indicating objects may not show properly.

The Steel Connection tools that appeared in 2017 can still be found under the Structure tab, and still work the same. In 2019 you will now see also see a Steel tab. This tab contains the tool palette for the new connection tools.

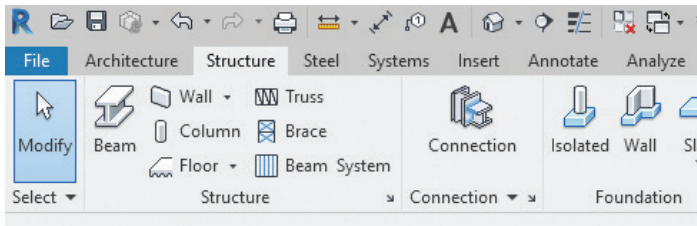


Figure 1: Steel tool palette

The first tool in the new Steel tool palette is the steel connection tool. This tool works the same as the connection tool that appears in the Structure tab. They access the same library of connections and work just like they did in the previous versions of Revit. First you load the connections to the project from the library, then place the connection in the model. While the connection is still highlighted in the 3D view, select the desired connection from the properties dialog.

Tip: If the connection doesn't display in the 3D view, check to make sure that the view detail level is set to Fine (sometimes you need to switch the detail level to Coarse or Medium then back to Fine to get the connections to display initially).

After the connections are added to the model, you can modify the default settings by selecting the connection and using Modify Parameter in the properties dialog. When selected, this opens a dialog box with all the settings associated with the selected connection such as plate information, bolt/weld settings, and cope information, to name a few. When you are finished, simply select the apply button to accept the modifications and the model will update accordingly.

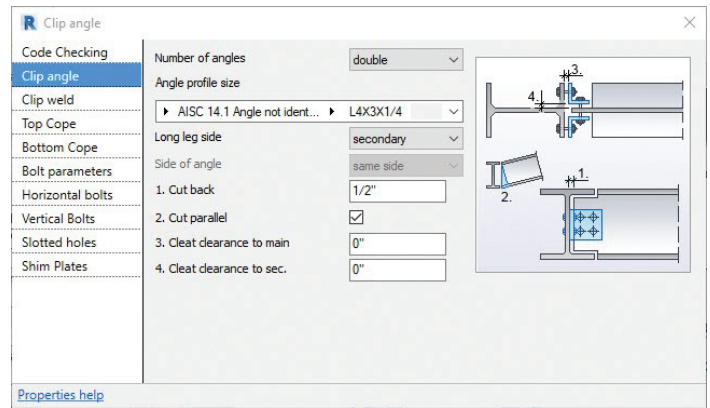


Figure 2: Clip angle connection

The next group of tools is Fabrication Elements, which is used for modeling plates, placing bolts (bolts, anchors, holes and shear studs), and welds in the model. When modeling plates, bolts, and welds, you can group these items to develop a library of custom connections you frequently use from project to project. The help file has guidelines to building custom connections that can be helpful when setting up a custom connections library.

Another group of tools found in the Steel palette are the model modifiers, which are used to further detail objects in the structural model by adding modifiers to such objects as plates and beams. These modifiers add features to elements so you can create pieces and parts details from modeled objects. An example of this process is documenting and detailing connection plates for a braced frame or a moment connection. The tools in this group allow you to add cuts, copes to skewed modeled members, and shorten members and contours to modeled objects before adding annotations to the members.

The last group of tools (new to Revit 2019) in the new Steel palette are the Parametric Cuts. These are the coping tools, miter tools cut through and cut by tools for punching holes in members to be detailed. These tools are used again to add features to modeled members that will then be used to create detailed views for pieces and parts for fabrication or construction documents.

With the release of Revit 2018 we saw the addition of Structural Precast tools for modeling. In Revit 2019 Autodesk has enhanced the Precast Modeling tools by adding Precast Lattice Girder Slabs automation. This enhancement means that structural walls and floors can be divided into configurable panels and floor assemblies in your models for detailing the building components for the project.

Autodesk has also exposed the API features so you can create and modify drawing information for precast elements. This ability allows you to customize the precast tools to accommodate individual firm's workflows. The precast concrete industry is a highly complex and specialized workflow and each firm has likely developed their own workflows over the years. Exposing the API

Revit Structure 2019

language allows those companies to customize and develop tools for Revit to help them maximize their modeling efficiencies for precast objects.

MISCELLANEOUS STRUCTURAL ENHANCEMENTS

Other enhancements to the Revit Structural platform in 2019 include the transfer of steel elements to Advance Steel and Rebar shape matching.

Revit 2019 enhancements gives users the ability to now transfer steel plates, bolts, anchors, welds and connections from Revit to Advance Steel for further detailing and to develop more detailed drawings of elements and connections to the model. Advance Steel is more of a shop drawing level of detail modeling than Revit. With this enhancement there are more objects that can be exported out of the Revit model for detailing with Advance Steel.

In Revit 2019 Autodesk made some enhancements to improve the scheduling and annotations of rebar. Autodesk has enhanced free form rebar to now match existing rebar shape families or create new families from the bar geometry definitions. Other rebar enhancements include the development of rebar schedules. This ability lists the location, mark, type, and size to name a few, but the scheduling tools also include shape images to the rebar schedule, making for a more detailed set of drawings.

REVIT PLATFORM ENHANCEMENTS

Along with the structural platform new features and enhancements, Autodesk also implemented multiple new features that apply to all disciplines that enhance the modeling environment.

Some of the new features added to the general overall performance of Revit will be a big improvement moving forward. It will take time to get accustomed to some of the new tools just because of workflows that have been developed over the years to work with what was available. Other tools allow for a quicker transition, making it difficult to go back to working on old projects where you will miss these new features.

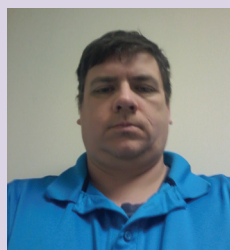
One feature I like is the new Tab Views. Now when you open multiple views it places them as tabs along the top of the view window, like tabs in a web browser. The ctrl + Tab key still cycles through open views in your model.

After the views are tabbed across the top, you can grab and slide the tabs into a specific order if desired. If you select the Tile Views icon, the views will rearrange on the screen as in previous versions of Revit. To arrange the views back in the tab order you can simply drag the view frame and drop them on one of the other view frames or use the Tab Views icon to return to a tabbed view.

Another tool that many users have long waited for is the ability to display the level names in a 3D view. This tool works like levels in an elevation or section view in older versions of Revit. To expand the level line, it is best to make sure that the section box is turned on in the 3D view. This will allow you to select the edge of the section box and expand the level line by the level work plane. Level information such as level name and elevation can now be modified either in elevation or in 3D views simply by selecting or de-selecting the check box next to the datum marker in the view.

Autodesk added the ability to now utilize multi-monitor workstations in Revit 2019. Let's face it—most Revit users have multiple monitor systems and would take advantage of the extra real-estate by moving views to the second monitor. Sure, you can span the single application window across multiple monitors, but to me it's just not the same as being able to pull a model window to a second monitor and quickly see a change in another view as the model is modified or to be able to zoom into a specific area when looking at a connection while working the model in a second view.

The general feature I like the most is the ability to now create filters with conditional rules. This will make filters much more flexible for people to use. Autodesk has added the ability to string together multiple rules using the “and” & “or” statements to rules. Rules that use the “and” constraint are only applied if all statements are true, while when using the “or” statement only one rule has to satisfy the argument in order to be applied to the model.



Kenn Farr is the BIM Manager for Teasley Services Group and has more than 24 years of experience in modeling, development, and implementation of technology.





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World Standards Day

 I am writing this article in advance so you can prepare: World Standards Day 2018 is October 14th. Get ready for the party! It is also ANSI Standards 100th anniversary. Gotta love it... I love standards!

From Wikipedia:

“World Standards Day (or International Standards Day) is celebrated internationally each year on 14 October. The day honours the efforts of the thousands of experts who develop voluntary standards within standards development organizations such as the International Electrotechnical Commission (IEC), International Organization for Standardization (ISO), International Telecommunication Union (ITU), Institute of Electrical and Electronics Engineers (IEEE) and Internet Engineering Task Force (IETF). The aim of World Standards Day is to raise awareness among regulators, industry and consumers as to the importance of standardization to the global economy.

“14 October was specifically chosen to mark the date, in 1946, when delegates from 25 countries first gathered in London and decided to cre-

ate an international organization focused on facilitating standardization. Even though ISO was formed one year later, it wasn't until 1970 that the first World Standards Day was celebrated.”

From the website of the NIST (which celebrates it on the 18th): “As technological advances propel American industries to new heights, the 2018 U.S. Celebration of World Standards Day on October 18, 2018, will commemorate voluntary standards and conformity assessment's fundamental role in supporting a safe and efficient “Innovation Nation.” The event will include a reception and gala dinner at the Fairmont Washington in Washington, D.C.

“World Standards Day was initially launched in 1970, and is now celebrated by nations around the globe. U.S. activities are organized annually by a planning committee consisting of representatives from the standards and conformity assessment community. The American National Standards Institute (ANSI) will serve as the event's 2018 administering organization, in honor of its 100-year anniversary.”

No matter what you might do (or what date you might pick) to celebrate standards, Tech Managers live in this space. We create standards. We embrace and extend them. I sometimes tell people, "If there is a rule or standard, I follow it. If there is no rule or standard, I make one, then I follow it."

This year's theme is the Fourth Industrial Revolution. The World Economic Forum explains it like this: *"The First Industrial Revolution used water and steam power to mechanize production. The Second used electric power to create mass production. The Third used electronics and information technology to automate production. Now a Fourth Industrial Revolution is building on the Third, the digital revolution that has been occurring since the middle of the last century. It is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres."*

"There are three reasons why today's transformations represent not merely a prolongation of the Third Industrial Revolution but rather the arrival of a Fourth and distinct one: velocity, scope, and systems impact. The speed of current breakthroughs has no historical precedent. When compared with previous industrial revolutions, the Fourth is evolving at an exponential rather than a linear pace. Moreover, it is disrupting almost every industry in every country. And the breadth and depth of these changes herald the transformation of entire systems of production, management, and governance."

THE BENEFITS OF POLICIES, PROCEDURES, PROCESSES, AND STANDARDS

You may need all four of these workhorses in your environment. Policies are codified principles that, in general terms, provide a statement of intent. *It is a policy that the front office doors are always unlocked during business hours so that clients can get in.* Procedures are the planned means and methods of how you achieve the policy. *It is the plan of attack. We provide a key to all staff so they can open the door each day.* The Processes are the actions you perform to complete the task. *Turn the key to the left, verify that the door is unlocked, and remove your key.* Standards are the targets you need to hit. *They provide tangible measures of quality and success. The door will be unlocked during business hours. When the day is done, we lock the door.*

Having these four in place help staff not take a trial-and-error approach to getting the job done. You memorialize the lessons learned and the best practices that others have created over time. They allow others the comfort of knowing that when others pass work on to them, they can expect certain structures to be in place. They speed things along. They aid in training. They also show a certain amount of focus on quality workmanship. We take pride in what we do.

- They allow your users to work together. As mentioned before, we share files between staff members. They need to know what

they are getting and you need to pass on a solid product that others can work with.

- They allow you to save time by not rethinking everything, every time. Repeat processes that have been defined and agreed upon let you get to work quicker and finish early.
- They allow your firm to unify output. What goes out the door or over the wire is important and reflects on your firm. By producing a consistent digital product, others will be impressed. They allow your team to deliver good output.
- They allow you to reuse portions of prior work. Many items that are part of a new project come from portions of old projects. You have libraries built and families created. Reusing these allows you to move quicker and save time. But they must be standardized in order to work.
- They allow you to automate. Data will not be scattered and disjointed on every file. Since standard block names are used, staff can find what they need. You can create automation tools that pull in standardized objects. You can trust that what you added to your file from a library is compliant.
- They allow your management to think about other things. No one wants to worry about file stability and workability. They just want it all to work. By framing the work flow, your senior folks can focus on delivering client needs and desires. Your design staff can think about great design and not CAD output.
- They allow you to measure success. When you produce files and models, their compliance to standards can be measurable. You either get it right or you do not. You can set up review processes that quickly expose anomalies and you can correct them.

Policies, procedures, processes, and standards tell others that you know what you are doing. They project success through structured guidelines. They let your client know that you have a depth of knowledge about your development and delivery beyond others in your field. They make your work go smoother. They make you more productive. They allow you collaborate with others.

What's not to love about standards?



Mark Kiker has more than 25 years of hands-on experience with technology. He is fully versed in every area of management from deployment planning, installation, and configuration to training and strategic planning. As an internationally known speaker and writer, he is a returning speaker at Autodesk University since 1996. Mark is currently serving as Director of IT for SIATech, a non-profit public charter high school focused on dropout recovery. He maintains two blog sites, www.caddmanager.com and www.bimmanager.com.

Under Pressure: Bridging the Gap Between CAD Manager and IT



Becoming a CAD manager has been one of my most rewarding journeys, but that does not mean it was easy. Not every CAD manager takes the same path to get to this kind of role. Personally, I had to pave the way and create what my position is today as it was initially established out of necessity.

Going from an end user designer/drafter type role to more of a management role undoubtedly created a very different dynamic in the department. Pairing this with the fact that our department has grown significantly in the last few years, I found myself under greater pressure to make the most of my support capabilities and responsibilities.

The departmental growth affected not only the physical amount of space, but also our support resources that went beyond what I could personally do. Eventually, we were transitioned to a different building, separate from our IT Department, which ultimately created its own set of unique circumstances.

As many of you would know, your peers may see you as the “go-to” person or the maker of magic. Well, it can be quite challenging to be that maker of magic when you feel the pressure of being the “middle man” between two departments that have equally valid but perhaps differing perspectives. So what is a CAD manager to do in order to bridge that gap between a growing Design Department and the IT Department?

ANALYZE YOUR DEPARTMENT'S CURRENT SITUATION

I currently support around 40 people in our Design Services Department. Our exponential growth began impacting turnaround times on projects due to our lack of resources to keep things running smoothly. Many times, simple fixes such as admin credentials for minor trusted software updates were holding up big jobs. Sitting on hold for support caused frustration and delays, and I personally couldn't do much to help due to lack of admin rights on all design computers.

For a department that targets quick turnaround times on projects, we have to minimize downtime. Being a CAD manager in this kind of environment requires quickly thinking on your feet, prioritizing issues, and utilizing the right resources to provide solutions.

Given this information, I built a case for improvement in collaboration between the two departments. I essentially followed these steps to analyze my department's current situation:

1. Find the bottlenecks.
2. Use the bottlenecks to determine what kind of time/effort is spent in the current situation.
3. Start building a case for improvement.

BUILD A CASE

One of the most challenging things I do as a CAD manager is build cases for change and improvement. In the instance of building a case for change and improvement in collaborating better with the IT Department, I found it needed to be a multi-faceted approach. The two main themes I saw in this multi-faceted approach in order to achieve a "win-win" situation were technology based and communication based, as shown in Figure 1. Focusing on only one aspect won't fully result in a "win-win" situation that suits a cohesive work environment.

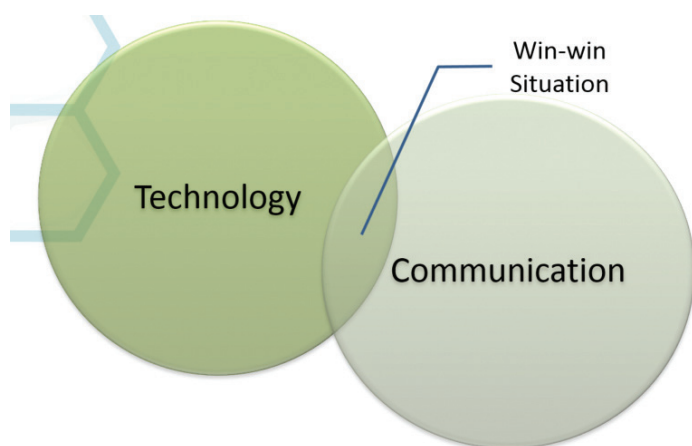


Figure 1: Themes

TAKE STEPS TO UNDERSTAND YOUR IT DEPARTMENT AND BECOME A TRUSTED ALLY

Focusing on technology and communication led me on a quest to learn some essential concepts to be able to talk about issues more effectively with the IT Department. Here are some concepts I've had to personally manage when supporting our CAD/BIM users.

File Security – These are the measures put in place to protect data from damage or loss. This could be project files, backup of data, company data such as contracts, directories, etc. Damage or loss of data is a serious concern for the IT Department.

Permissions – This is the user's access level for altering data. You can assign levels of access in multiple ways, such as Named User, Groups, and Administrator. This was a big one for me because I felt I really needed admin rights to be able to support our design software properly.

Licensing/Databases – These are the keys that a software platform or add-on needs to work as it communicates with licensing and/or a database on the server. This may represent learning about server names or a MAC address to configure a network license file for Autodesk products. Our other software platforms need to connect to an SQL database to work effectively. Simply learning and documenting what is needed is enough to save time when it comes to configuring these things.

The next three concepts reference data on the server as end users work with files. This applies to downloading files, loading files, etc. I'm going to relate this area to cars on a highway as everyone can understand this concept.

Bandwidth – Think of this as lanes on a highway. The capacity of the lanes affects the number of cars passing through an area during a certain span of time. For example, if you have two lanes of highway with 50 cars that can pass by in 30 seconds, that is the highway's total capacity. Keep in mind, you could always increase this highway's capacity by adding more lanes. To put it back in data terms, this is about the amount of data you are able to transfer over in a certain amount of time (often expressed in Mb/sec).

Throughput – Think of this as the number of cars you actually see driving by on the highway during rush hour. Sure, there may be multiple lanes of highway to be able to handle so many cars going by in a certain amount of time, but in rush hour, that actual number of cars driving by has drastically reduced because of all the traffic at that time of day. This is the *actual capacity* of the highway at this time of day as opposed to *total capacity*, which is what the highway should be able to handle without any other factors involved. In data terms, if there are multiple people trying to download something at the same time, the traffic affects the throughput as it relates to bandwidth. You can increase the bandwidth to help with throughput, and in the end it will average out over the network.

AutoCAD

Latency – Think of this as the length of the highway itself and the time it takes to cross it. There are different types of cars on this highway as they travel from Point A to Point B. Some cars may be fast sports cars that can carry only a couple people at a time; some may be slower buses that can carry a lot of people at once. These are different means of transmission as they travel that distance. In data terms, there are distances from server to server and different means of transmission as they relate to throughput (i.e., Wi-Fi versus hardwired in). The data needs to go from Point A to Point B, and that means of transmission will help determine the kind of time involved to do so.

As with the means of transmission, you might also choose to take a shorter route to go from Point A to Point B. These are the things that can help improve latency. Increasing bandwidth, however, is *not* a way to improve latency. It is ideal to determine the appropriate amount of throughput and a lower latency in a network. Latency is often expressed in msec.

See Figure 2 for a diagram that visualizes these three concepts as they are often easily confused.

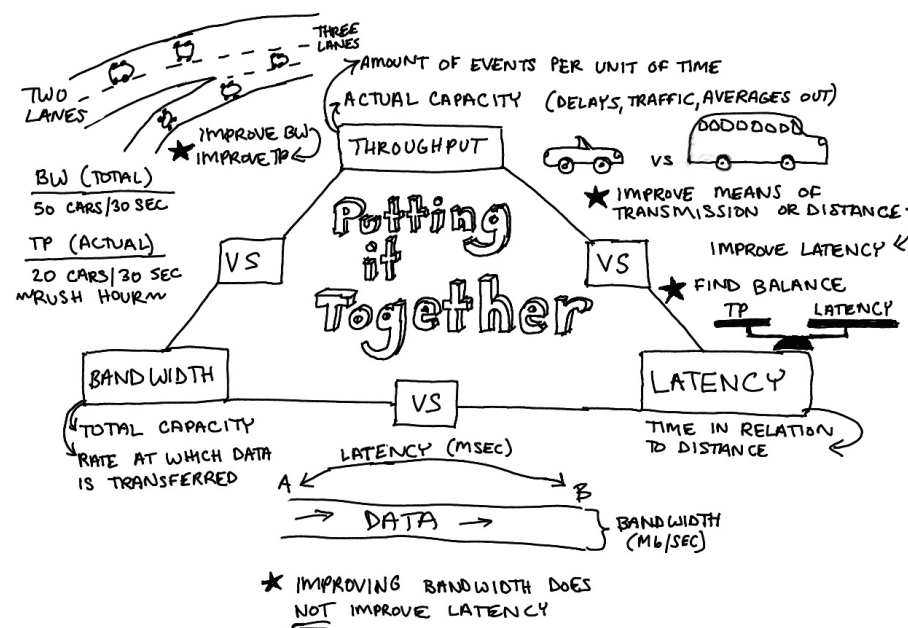


Figure 2: Putting it together

So, what's the importance of knowing this? Learning these concepts will help you better describe issues when communicating with your IT Department so you can provide more timely solutions to end users. The goal here is to take those first steps away from phrases such as "it's slow," "it doesn't work," or "it's broken."

I once had to troubleshoot why a third-party add-on that was calling an SQL database on the server in a different building caused a file to crash at one point of the day but not at another point of the day. The person loading the file was in the same physical location in relation to the server and was hardwired in both times.

In this case, we were able to determine that latency was likely not a direct factor in the crash, but throughput, as it related to bandwidth, was a contributing factor. There was more traffic at a different point of the day, and it caused a bit of a chain reaction that ultimately led to a file crashing. Latency may be an underlying issue, in general, if things seem slow no matter what between servers in different offices, but in this case, it seemed like bandwidth was the ultimate culprit.

Had the person loaded the third-party add-on with the file at home at a different time of day, the latency and bandwidth variables would likely be different. We would then be considering the latency in going from the server through a whole different network path to the person's house. We would also be considering things like the kind of Internet connection (bandwidth) and traffic on that bandwidth. That person may not have a sea of designers also downloading data at the same time at his or her house, but he or she likely would have other devices that may be tied into that bandwidth, creating extra traffic.

As you can see, by at least trying to understand the concepts, you can then effectively describe the situation and troubleshoot. From there, the IT Department can help provide you with options on how to proceed and improve the situation. This is just one way to help bridge the gap between two different departments, and it doesn't take an extensive background in IT to be able to do it.

UNDERSTAND THE IT DEPARTMENT'S POSITION

From understanding these IT terms, it can be inferred that the IT Department is understandably paranoid for a good reason. The IT

Department needs to protect data in not just your department, but also in multiple other departments. When something bad happens, support people such as IT (and CAD managers) are expected to fix it. It is for this reason that everyone needs to be on the same page.

Try to address IT's concerns while bringing up your own. For instance, I understand my IT Department doesn't want just anything installed on end-user computers, but I still need to realistically support the installation, configuration, and updates of approved software. Admin rights for the CAD manager are essential to be able to do this. Local admin rights or

admin credentials set up on individual computers wasn't an ideal scenario, so I made the case for being granted admin rights that worked on a group of computers specifically in our department. This allowed for a much more realistic scenario for support.

BE TRANSPARENT

To help build my case and prevent any surprises, I provided the IT Department with a list of all software platforms I support in some way. I understand that "going rogue" is very much frowned upon, so I'm very willing to provide any sort of transparency to build that trust. My motive is to be a trusted resource and ally by collaborating and providing secure software solutions, and this often results in getting faster turnaround times.

A test of this transparency presents itself when I turn down totally valid requests that might seem risky. It's nothing against the person who requests it, but if I sense that it might not be the safest way to go, I suggest going through the proper channels and presenting it as a case instead of going around IT and inadvertently causing damage.

Putting on my "IT hat" in these situations helps everyone stay afloat because I try to bridge that gap and communicate in ways that make sense to everyone. To build upon that idea, I have no problem asking questions if I am ever unsure about something. I would much rather come up with a recommendation based on what I do know and collaborate with IT to fill in the rest than to try to wing it on my own.

One of our software platforms comes with more than a hundred pages of release notes on a bunch of different installation methods, many of which create a decent amount of downtime for all end users. It gives me anxiety just thinking about it, so I come up with my own game plan recommendation and run it by IT, allowing us to collaborate on a solution that results in the least amount of downtime.

AIM FOR A "WIN-WIN" SITUATION

Aiming for a "win-win" situation should be the main goal. Taking the time to understand concepts and different perspectives will help create a scenario where everyone triumphs.

To reiterate my themes, I've found that a "win-win" situation has both technological and communication components. It's okay to not know everything, but learning technological concepts certainly helps. When in doubt, be very descriptive about issues to reach a solution faster. Always look for ways to improve the flow of information. This could take place by documenting procedures, creating backup plans, and collaborating together on tasks to be better prepared for the next time.

CAD managers need to evolve and collaborate with IT more than ever. Gone are the days of traditional drafting tables and

drafting tools. Technology is advancing rapidly and with that comes unique challenges to do what we do best while also protecting data.

MY WIN-WIN RESULTS

After years of building a case to better fulfill my role and turn it into what it is today, here are results from my own "win-win" situation:

1. I was added to a "group" that gave me admin rights that worked on all our Design computers.
2. Because I was a trusted resource that provided a list of software I supported to IT, several approved installs and updates were implemented with faster turnaround times. I also keep IT in the loop if I need additional help with network licensing on their end or big installs that involve multiple steps.
3. As a whole, there is much better communication between the two departments. IT still has a secure hold on data, and we as a department are often able to achieve faster turnaround times.
4. My transparency in communication and willingness to learn has set me apart as a trusted ally to the IT Department. Not only am I a "go-to" person for software, I am also the liaison between two different departments. We are now both able to provide timely solutions to our CAD/BIM users.
5. This goes without saying, but I don't experience nearly as much pressure anymore because I can leverage my own elevated capabilities and collaborate resources when needed.

These results prove the benefits of learning technological concepts as well as communication tools to bridge the gaps between your department and the IT Department. I hope that my own experience and approach to something so crucial in our roles as CAD managers will help inspire you to create your own "win-win" situation.



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