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May 2014

Implementation Strategies

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Editor's Note



Hello, *AUGIWorld* Reader!

By now I am sure many of you have already received your Autodesk upgrades, I have as well. I have a dozen apps myself to “roll out” and build deployments for. Do you think for a second I know how best to do this?

No way. I can make a good run at it, but knowing the nuances of installation and what to do next isn't so simple. Lucky for you we have a magazine full of some great insight!

But before we begin I need to give a special thanks to Daniel Hurtubise for his great photography this month. I asked for something that is “rolling out” and damn, Daniel delivered. We never know what we might get, but it always fits like a glove.

Beginning this month we have a special contribution from Brad Hofman who shares how to use digital signatures with PDFs and make them secure. Next we have Phil Russo covering upgrading Revit Structure to the 2015 release. And then for our tech insights of the month, case speaks to design visualization using a number of Autodesk applications.

We then have David Butts getting past implementation issues when using Revit MEP. And along those lines, Gordon Price tries easing the pain of deployment. Preparing for an annual song and dance, Curt Moreno puts on his top hat and shoes and pulls out his implementation in AutoCAD. Curt is followed up by Michael Beall's monthly AutoCAD tip, using Layer Walk effectively.

Next up is a Product Review covering a Xi MTower workstation. Tested by myself, this system has a ton to offer, if you like really fast computers. Then Mark Kiker explains how sometimes CAD Managers find that success in their work can lead to failure. And Melinda Heavrin puts a spotlight on workspaces in AutoCAD Architecture.

For Inventor this month, Paul Munford gives us an introduction to surface continuity. Don't know what that means? Read the article. Moving back to implementation issues, Tom Cipolla integrates his visualization workflow when using 3ds Max. And continuing an article from a couple months ago, Scott Moyses and Gavin Bath explain using CNC cut files with Autodesk Product Design Suites.

Then we have Shaun Herring, who shares his successful implementation of AutoCAD Civil 3D. And wrapping up the issue is our monthly Inside Track article by Lee Ambrosius with revelations about three new products coming to market.

So that's it, folks. Read on!

Take care,

David Harrington

AUGIWorld Editor-in-Chief

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AUGIWorld

www.augiworld.com

Editors

Editor-in-Chief

David Harrington - david.harrington@augi.com

Copy Editor

Marilyn Law - marilyn.law@augi.com

Layout Editor

Debby Gwaltney - debby.gwaltney@augi.com

Content Managers

3ds Max - Brian Chapman

AutoCAD - Curt Moreno

AutoCAD Architecture - Melinda Heavrin

AutoCAD Civil 3D - Christopher Fugitt

AutoCAD MEP - William Campbell

CAD Manager - Mark Kiker

Column: Inside Track - Lee Ambrosius

Inventor - John Evans

Navisworks - Michael Smith

Product Review - Lonnie Cumpston

Revit Architecture - Jay Zallan

Revit MEP - Todd Shackelford

Revit Structure - Phil Russo

Advertising / Reprint Sales

Chris Porter - salesmanager@augi.com

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BIM Library

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Digital Plan Set Publishing with Digital Signatures



In this piece I'll describe the road Snohomish County Public Works traveled to arrive at our current capabilities to sign PDF plan sets with digital signatures. The focus of this is on engineering record documents, but the reality is that digital signatures are useful at all levels in Washington State government for just about anything that now requires a wet signature.

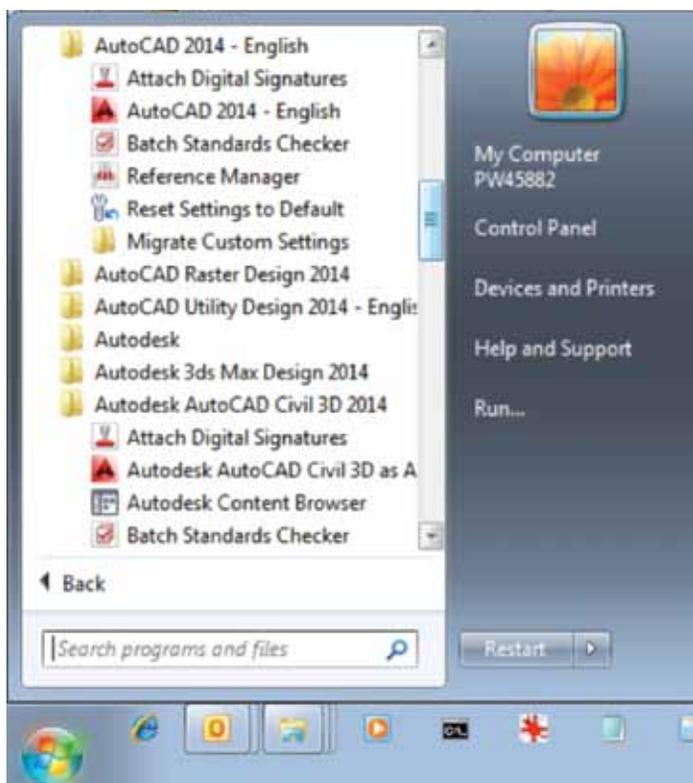
Credit goes to ARX, Inc., which gave me permission to use some of their words and graphics.

In 1999 or so, Autodesk shipped a version of AutoCAD® that included a "digital signature" extension/tool, so one could affix a digital certificate to a DWG file, a tool that still exists in the product.

This tool piqued my interest and I started researching the topic. There were several agencies back east and in Canada that were early adopters of digital signatures. In 2002, I first pitched the idea to my management; also, I saw several ways to improve the tool:

- The tool affixes only one digital signature per DWG, but most of our record construction documents require multiple signatures on several layouts per DWG.
- At least for us, the DWG format is not useful as a final electronic publishing format. For many reasons, we've settled on PDF as our preferred publishing format and Autodesk doesn't support multiple digital signatures in its PDF outputs.

Once I started to think about digital signatures, the bigger picture started to emerge. I realized that if we could satisfy the signing/sealing requirements for our Professional Engineers and Professional Land Surveyors to create a completely digital lifecycle for our construction documents,



Embedded Autodesk Digital Signature tools

we would have satisfied, from a Washington State standpoint, the requirements for a typical county for signing almost all documents that now have to have a wet signature. In a nutshell, a digital signature ensures that there have been no changes to a file after it has been signed—not a single bit has been changed—a required validation for record electronic documents.

In 1997, the State of Washington enacted the Electronic Authentication Act “to facilitate commerce by means of reliable electronic messages.” This is the basis of authority for our implementation, and our Secretary of State and State Board of Registration for Professional Engineers and Land Surveyors have repeatedly refined the language in the code to improve the environment for digital signing and sealing of construction contract documents in the public and private sectors. Each state will have its own regulatory environment in this area. Some states may not have progressed to allowing publishing contract documents as files signed with digital signatures—you will have to do the research and get sponsorship from your legal folks. But don’t believe it when “someone” says it can’t be done. This bridge was built at the federal level in the 1990s and the technology has been in place for more than 10 years, so if you’re really interested, search your Secretary of State’s website, and talk to your Board.

I characterized this project as a business improvement project with significant possibilities outside the scope of the project. Given the limited scope of our initial project—to automate the elaborate signing ceremonies for construction documents—it was also important to bring our licensed professionals into the conversation early in the project. In fact, our County Engineer, County Surveyor, and the Director of Engineering Services were project sponsors. It is their signing ceremony workflow that we were aiming to simplify and automate, and so we had to be absolutely sure everybody understood the business case, ROI, and had an idea of what the digital signing process would look like. In addition, it’s important to partner with your Information Services, since they provide the infrastructure and can take the message to the enterprise. The project included many staffers in Engineering Services and Administrative Operations, several tiers in Information Ser-

Embedded Autodesk Digital Signature Tools

- Guarantee document security. Ensure signer identity
- Ensure data integrity of documents and transactions
- Provide non-repudiation of documents and transactions
- Ensure greater legal compliance and employment of worldwide regulations
- Provide audit trail
- Enable verification of document source
- Streamline business processes (e.g., approval procedures, audit trails)
- Increase employee productivity and efficiency
- Facilitate a paperless environment
- Eliminate the risk of misappropriation of intellectual property
- Easy deployment of digital signatures
- Quick ROI
- Significant cost savings
- e-archiving
- Easy access to information

vices, and other interested departments. Please understand that this is a transformational technology that should help automate each instance when we have to sign something. I fully expect that within three years, every new hire at Snohomish County will be issued a digital signature so that each staffer can attest to their input to an electronic timekeeping system, as well as electronically sign whatever is the equivalent of their timesheets. Electronic leave requests and approvals will be another early use case.

For me, this was a “business improvement project” based on standard, generic business goals for projects like this. We need to think in terms of:

- Reducing our fixed costs
- Reducing the costs per item (each construction plan in this case)
- Reducing the time it takes to process an item (sometimes it would take two weeks to get a plan set signed with wet signatures)
- Increasing throughput – think about our County Engineer having to wet sign almost every page of a 300-page plan set, then routing to the Traffic Engineer, County Surveyor, Project Manager, and so on.
- Reducing errors
- Continuing to strive for business improvement – think about embedding the signing ceremony in a SharePoint workflow)

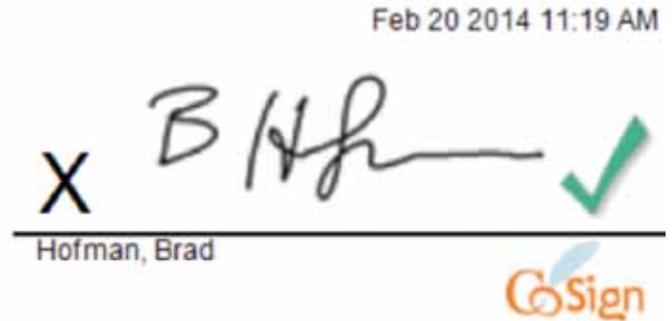
These are all improved using digital signatures, and risk is mitigated. Each one of these items will reduce the burden on our taxpayers.

By the way, the return on investment (ROI) for this project was quite good. A cost-benefit analysis showed the labor costs and consumables needed to publish a typical year’s worth of annual construction program plan sets are about \$80,000 per year. It cost us about \$40,000 to purchase the system and licenses. My initial ROI calculation yielded a net cash flow stream of about \$312,000 through N+4. Using a different algorithm, our Department of Information Services calculated an ROI of 407 percent. This didn’t include as-builts, specifications, reports, etc.

There are many ways to describe what a digital signature is, and many of them are wrong—go to www.ARX.com for the theory

and practice. Our shop chooses to capture each licensed professional’s graphical signature with a pad, and incorporate that bit-map into the PW and PLS seals. Simply put, a digital signature has two parts.

What you can see:

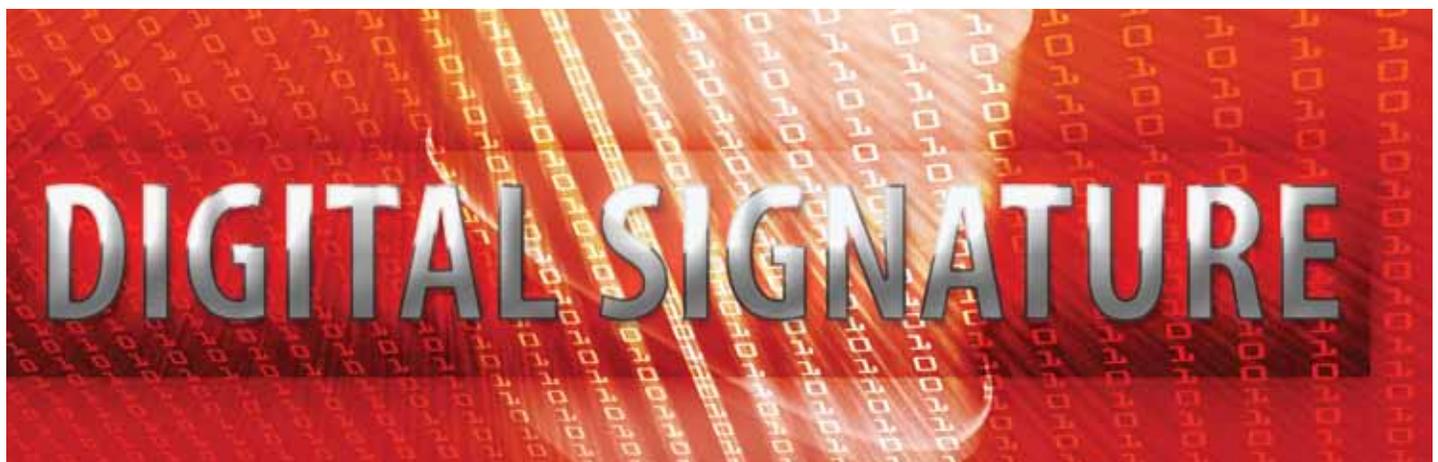


What you don’t see:

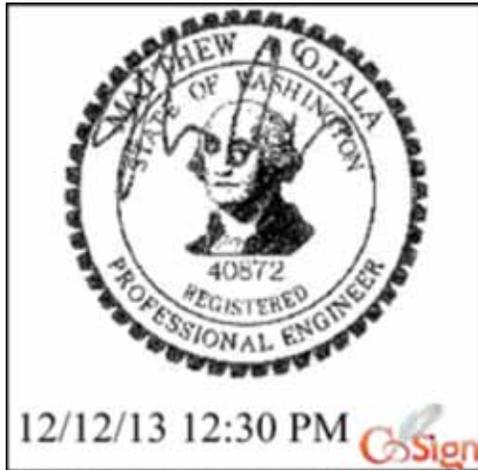


The critical part of a digital signature is the digital certificate associated with the signer and embedded in the digital signature—the code is assigned to the signer and is unique, and the digital signature/digital certificate is based on PKI encryption.

Each signer’s signature can appear in many different ways, for many different purposes.



And here is an example of how our PE stamp with graphical signature and date stamp looks when affixed to a construction plan (thanks to Matt Ojala, PE, for sharing this snip).



Typical PE stamp as affixed to a plan set

How easy is it to sign a document? Pretty darn easy—we publish our plan sets to PDF, then using the CoSign OmniSign tool, each signer affixes his digital signature to the file with a few mouse clicks:

1. Open the PDF in the OmniSign tool
2. Choose the correct location for the signature in the document
3. Choose the signature appropriate to the document
4. Push the “sign” button

In our environment it is permissible to sign the entire multi-page file one time—to digitally sign each page in a large document is laborious and adds weight to the file.

One of the explicit goals for our project was to reduce the stress associated with the traditional signing ceremony for our construction record documents. When we sign hard copy plans with wet signatures, our county engineer and each project manager has to sign almost every page in the plan set, which can be difficult to schedule and coordinate, plus there are usually four or five others who also sign or initial plan sets, specifications, reports, etc. Wouldn't it be nice if professionals could sign their documents at their desks and have a system that would notify each signer in the workflow in the correct sequence? The system we purchased will allow for signing at individual desks and integrates well into SharePoint.

What led us to choosing the ARX CoSign system? It was within our budget range, it is manufactured as an “appliance”—rack it up, turn the lights on, integrate with Active Directory, and capture and integrate graphical signatures. Most importantly, the system allows many staffers to sign a single file—a “must have” feature for construction plans. As we use the system in more and more critical signing opportunities, we can easily add another appliance for high availability and automatic failover for continuity purposes. It's hard to know how many hundreds of forms my agency uses, but



every time I've looked at a form and its suitability for a digital signature, there was no obstacle other than conversations needed to redesign the workflow from paper-based to electronic (in a shared workspace on the network) and the five-minute training required per person to affix one's digital signature.

For planning purposes, it might take 10 minutes to capture a person's graphical signature and integrate it with their digital signature, 10 minutes for a SysEng to integrate a digital certificate with the person's digital signature, and the individual training can take place as the user's graphical signature is collected and tested with the digital signature. Each enterprise will need a SysAdmin for occasional firmware and client upgrades, and there will be some system management required to track administrative tasks such as renewing digital signatures.

This is a transformational, “disruptive” technology, especially in the context of local government and the “traditional” practices of civil engineering and surveying—my dad kept his architect's rubber stamp and embossing tool under lock and key. Some individuals will feel unease considering this change, but budget savings alone should carry the day, assuming the necessary laws and regulations are in place. This is way outside the box for some folks, so be prepared for some resistance. However, as more folks in management understand the massive potential savings in staff time, and the reduction in costs of storage of physical records coupled with much more transparent workflows as workplaces move to SharePoint for this kind of production work, the road to digital signatures should be self-evident.



Brad Hofman earned his undergraduate degree at the University of Wisconsin and completed his graduate work in architecture and structural engineering at Yale. He has worked for Morrison-Knudsen Power Group, Washington Water Power, and ALCOA/Northwest Alloys. He currently works at Snohomish County Public Works as CADD Systems Administrator and Business Process Analyst.



So You Want to UPGRADE to Revit Structure 2015

With every software upgrade there are always many moving parts that need to be considered. In this article I will cover some that come into play when upgrading to the latest version of Autodesk® Revit® Structure. Keep in mind these are recommendations and every software implementation is different because there are so many factors to consider.

TIMING/DEPLOYMENTS



I personally do not like to upgrade to the latest release until the first service packs are released. Once Revit Structure 2015 is available, it is a good idea to install on the CAD Manager's/BIM Manager's machine and maybe one power user for testing. There are many factors to consider and it is a good time for testing while waiting for the first service packs to come out. The rest of this article will scratch the surface on other considerations.

SERVICE PACK(S)

After the initial product release, Autodesk will release service packs for bug fixes, etc. within the first quarter. My recommendation is to wait for a period of four to five months after the initial product release before upgrading. This waiting period is an ideal time for testing some of the items that are discussed below.

THIRD-PARTY ADD-ONS

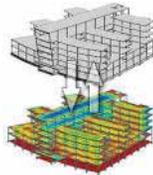
If your firm is utilizing any third party add-ons, you will want to make sure you have the 2015 version of them that you can include in your deployments. There are so many third-party developers for Revit, and as Autodesk continues to open up the API, more and more are coming out of the woodwork. So proceed with caution—some of these developers may not be ready for the new release, and if their tools are a part of your internal workflow it could have a big impact on production with your software upgrade.

TEMPLATES/CONTENT



Make sure you understand all the new features of Revit Structure 2015 and how it may impact your existing project start-up templates. A simple example may be your preset analytical views. Revit Structure 2015 has a new local coordinate system for analytical model elements. You may need to test your predefined analytical views to ensure the visibility is correct so you can take advantage of that new feature.

The content libraries you have been developing will need to be looked at. As you load families, they will be upgraded. If you are running two versions for a period of time you need to consider copying your content library and giving it a review. Look at the Revit Structure 2015 Family templates—some may have been enhanced and you should replace the ones you are using. During the testing phase, someone needs to review the content and templates you are using.



ANALYTICAL SOFTWARE COMPATIBILITY

A big part of the workflow for structural engineers is the analytical tools they use for structural analysis. This should probably be your first and most important testing before implementing any upgrade to Revit Structure. Understand your workflow. Maybe to this day, the structural engineer still makes a separate analytical model and does not try any interoperability with Revit, so it will not be as big a concern. However, if you are linking your Revit model into RISA or Robot structural analysis, you need to make sure the 2015 version is ready and understand the new features. You need to understand any impact this may have on your workflow and test some existing models for validation. The CAD/BIM manager needs to rely heavily on the engineering staff for this testing.



COMPATIBILITY

Compatibility is not only a firm-wide consideration—it includes your consultants and current projects. Understand the projects you have currently underway and if you are working with outside consultants as part of the collaborative team, are they upgrading? Not all firms immediately upgrade to the latest. Some firms, such as the one I work for, will upgrade every other release unless it is required to do so sooner. So be aware of who you interact with and how that will affect your project. Just because a new version of software is out with some new features does not mean you need to immediately pull the trigger. You may run two versions based on project requirements. If so, make sure you test that install environment as well.

TRAINING



Training is a must with any new software release. Without training, software will be used how it was used yesterday and this will not take advantage of new features. Some of these new features could have a major impact on production and workflow. Do not expect staff members to learn on their own, though some individuals will. You need to have a training plan in place during your software upgrade so it is fresh in users' minds and is timely.

IMPLEMENTATION

After you have taken all of the above into consideration, it is time to implement your software upgrade. If you use deployments, make sure they have been tested thoroughly. After software is rolled out it is a good idea to stay in constant contact with the staff to make sure you can head off any issues. Plan some lunchtime training webinars on new features to reinforce the training that should have taken place as the software upgrade was happening. And of course, record any lessons learned because by the time the dust settles, a new version will be coming out soon.

SUMMARY

New features in Revit Structure 2015 specific to the structural discipline fill in some gaps with reinforcement and analytical model control. These features should help the industry move even closer to a complete solution by allowing the Revit model to link better to fabrication and analysis, improving overall workflow. During every software upgrade, be properly prepared with a plan!



Philip Russo began with AutoCAD version 2.5 in 1986. Through the years he has held positions in the CAD industry as CAD Draftsman, CAD Manager, Sr, Applications Engineer, and is a Certified Autodesk Instructor. Lately Phil's focus has been on the implementation of standard practices for the Revit platform. He currently holds the position of Corporate BIM Applications Manager at O'Brien & Gere Limited and has his professional product certifications for Revit Architecture 2014, 3DS Max 2103 and AutoCAD 2014. O'Brien & Gere is an engineering firm located in Syracuse, New York. Phil can be reached at phil.russo@obg.com

case

Design Visualization



Visualization traces the history of design—from charcoal sketches and mechanically drawn perspectives to acetate plans and electronic renderings. Designers don't create objects as much as they create the visualizations that inspire and instruct the creation of objects.

A visualization serves two purposes. First as an object of contemplation. Here the visualization gives designers a mirror through which to see their designs and the possibilities they present. The other purpose is to communicate the design intent. Here the representation facilitates discussions, which in turn sell, inform, and ensure the outcome is as envisioned.

Designers have more options for creating their visualizations than ever before. In this month's column, we look at some of the options available to Autodesk Revit users and show how designers can get the most from these options.

REVIT 3D VIEW

The most obvious way to visualize a design is through Revit's built in 3d View. The 3d View is ideal for producing quick in-process visualizations and can be easily switched to ray tracing mode in order to produce more detailed static renders.

To make the transition from modeling to rendering as smooth as possible, the model should correctly utilize Revit families, categories, and parameters. If you are already producing high-quality, well-structured Revit models, then generally the only additional model preparation is in the setup of the materials. By creating a well-structured model, you'll make it easier to filter and hide geometry, as well as export the model for downstream applications.

In order to get precise shadows, it is important that the project is accurately located. Make sure the project's city is correctly set in Revit > Manage > Location. Also ensure the north arrow points

in the right direction. It's a simple mistake to make.

Once your render is set up, save the settings as a View Template (View tab > Graphics Panel > View Templates). View Templates helps maintain consistency by making it easy to reuse the rendering settings pertaining to shadows, lighting, render background, image quality, annotations, and geometry filters. In previous versions of Revit, the View Template locked all the settings, but as of Revit 2014, there is an option to create a temporary View Template, which allows you to override individual settings in the applied View Template.

In terms of hardware, Revit's 3d View makes use of your computer's GPU in everything except ray traced renders. A mid-range GPU will suffice unless you are working with large models or models with lots of environmental effects, such as realistic mode, ambient occlusion, surface transparency, and anti-aliasing. Ray tracing is the exception since it employs the CPU instead of the GPU.

To ray trace a drawing, select it from the Visual Display Options menu on the control bar along the bottom of the 3d View. Ray tracing uses every available CPU core. Therefore it benefits from a multi-core processor, and dual processors. Intel® Xeon® Hyper-Threading Technology gives an additional boost to the ray tracing performance by virtually doubling the number of processing cores.

AUTODESK 360

Autodesk 360 allows you to produce multiple high-quality renders without tying up your computer. The downside is that there is a fairly basic set of rendering options, and each render costs Autodesk Cloud Credits to produce.

Any view can be sent to the cloud by choosing Render in Cloud from the View tab. From here you can choose which views to render. By selecting multiple views, you can render multiple images simultaneously. The only control you have over the renderings is a couple of basic settings for image size, render quality, and exposure



settings. Pressing Render sends all the geometry and materials to the Autodesk 360 cloud. You'll get an email when the render completes, which is generally fairly quickly.

Besides producing still images, Autodesk 360 can also produce interactive panoramas, sun studies, and illuminance renders. These types of renders require multiple exposures. Cloud rendering is ideally suited to these types of visualizations, since multiple renders can be generated simultaneously in the cloud.

AUTODESK SHOWCASE

Autodesk Showcase lets you choreograph an interactive presentation. The presentation can consist of preselected perspectives mixed with interactive walkthroughs. A typical presentation might start with a predefined fly-through, transition to an improvised walkthrough, and then finish with a series of preselected viewpoints. Considering that everything is rendered in real-time, the quality is remarkably good.

The Suite Workflow menu connects Revit to Showcase. Export a model to Showcase by selecting the File Menu > Suite Workflows > Showcase Realistic Presentation. This will send the Revit geometry and textures over to Showcase. Once inside Showcase, you can begin setting up the predefined views, background, and textures. Generally you'll get better results from the built-in Showcase textures than the imported Revit ones.

Showcase is an extremely GPU-intensive application for real-time presentation. An NVIDIA K4000 is recommended if using Showcase to visualize Revit datasets. There is also a ray tracing mode in Showcase for final frame rendering. As with Revit 3d View, Showcase's ray tracing mode benefits from a multi-core CPU and dual processors, as well as Intel® Xeon® Hyper-Threading Technology.

3DS MAX DESIGN

3ds Max Design produces cinematic quality still and animated renderings. It is an enormous program—a program that would take years to master. But don't let this put you off, since generating a render from Revit doesn't have to be difficult.

The Suite Workflow menu connects Revit to 3ds Max Design. A dialog box will open when you select Suite Workflows > 3dsMax Design Exterior Render. Most of the settings in the dialog box are self-explanatory, but make sure you look at the Group By settings at the bottom of this dialog box, since the model's grouping will make it easier to apply materials and manage geometry in 3ds Max Design. A second dialog box will appear and give you the option of

keeping the 3ds Max Design model in sync with any subsequent changes to the Revit model.

3ds Max Design's render options are accessible via the menu bar. One important option is the rendering engine. The mental ray rendering engine uses the CPU. Intel® Xeon® is the best choice for CPU rendering because it is available with many cores and the option of hyper-threading. Mental ray enables batch and satellite renderings, which take advantage of other CPUs in your local area network to speed up the rendering process.

The i-ray rendering engine is a recent addition to 3ds Max Design. It uses both the CPU and Cuda cores in an NVIDIA GPU and can provide a nearly instantaneous view of the final rendering in an ActiveShade window. This workflow is an ideal way to learn about rendering and tune your rendering in low resolution before committing to a high-resolution version (pre-visualization).

OPTIMIZING YOUR HARDWARE FOR RENDERING

To help select the ideal hardware configurations for your preferred rendering option, HP has created a graphics optimization guide. Download the guide at <http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA4-9959ENUC.pdf>

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Getting Over the Implementation Bubble

It has been about three years since we, Gannett Fleming, started our push to Autodesk® Revit® as our primary design tool for a variety of projects. And as expected, it hasn't exactly gone as one would think. It was easy, as a consultant on the outside looking in at an engineering firm, saying "fix this," or "change that." Plans change, and you work to adapt to the fluid project environment. One of the biggest challenges I've come across hasn't been using the ever-improving software tools, but getting into the culture of a company and learning how to fit the tools in the environment.

Engineers, by their very nature, are creatures of habit. Disruptive software and work methods cause them great discomfort, and is usually the main reason why implementations fail. As leaders in this process, BIM managers have to understand the big As—awareness, adaptability, and actions. Let's take a look at these items, and learn how to use them to help you get over the implementation hump.

AWARENESS. PROJECT TASKS. CONFUSION.

How often have you had a project manager or lead engineer come up and say, "I need to do the BIM thing...you've got 15 minutes to make it work on my job, which is requiring it...?" The problem isn't that these folks aren't aware of the term—what they aren't aware of is how it affects project schedules, deadlines, and design tasks. Typically, when novice managers start a BIM project, their inclination is to go with what they know—how to apply money and time to CAD tasks so a set of paper documents can be delivered. With most jobs, the document is still the end goal of the design process, so BIM managers can't ignore this.

Where you need to train your staff is how BIM alters CAD tasks and changes the time and location. For example, on water treatment plants, one of the first steps is to define a process diagram that outlines the treatment process. During this stage, engineers acquire data regarding typical equipment such as filters, mixing devices, chemical treatment systems, and more. Most of the time,

they'll refer to something used on a previous job, and then ask a vendor to provide a *cut sheet*. This document includes information about the equipment, and can include electrical data as well.

Here's where traditional work process fails. Many engineers will wait until the last minute to engage the electrical design team and not provide critical data that's needed to define systems and circuits. Since Revit works best when the equipment along with parameters storing data such as voltage, load, phase and more is placed in the model first and then used to define electrical circuits within the model.

To make this a little easier, firms need to address the design process and inject explanations where a BIM project benefits from the change. Here's an example of a workflow diagram to help explain this:



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Along with the diagram, you need to include other relevant information, such as the task cost per unit, roles and responsibilities, and any other information to help the project manager and engineer understand the required tasks. It also helps explain why this task is important at this stage, and the downstream benefits of completing the task this way.

AWARENESS. PROJECT SCOPE. EXISTING.

Another area where project managers get into trouble relates to using BIM for existing work. I love it when people tell me that BIM isn't suited to existing renovation work, or think that BIM is really nothing more than 3D (and also that laser scans, photo captures, etc. are complete alternatives to a true BIM file). Let's clear this up so your company is better prepared to deal with this type of work.

Not every project is worthy of being modeled. Do your risk assessment early to determine this. In some cases, scanning and imaging are great ways to capture existing conditions, but they are only static points in time and don't replace the need for a vibrant, data rich model. One of the key items I've always thought gets overlooked in planning is the data, and how important it is to incorporate as much of this information as possible into a model.

There have been a ton of articles devoted to model level of development, and the latest version of the National BIM Standard (<http://www.nationalbimstandard.org/>) addresses this in better detail, but they only go so far as to identify how much detail is included and how the information is classified. (For the uninitiated, Revit follows OmniClass, <http://www.omniclass.org/>. Spend the time to get to know it!).

There are two ways to classify information in a model file. The traditional method, by element, addresses typical specifications for materials such as brick, block, mortar, and reinforcing. OmniClass expands the information to include products as a composite, so the elements become the equipment, or wall type, based on shell or interior conditions.

What does this have to do with existing conditions? It's easy—with an existing structure, it's not about capturing every nut and bolt, but about capturing enough detail in modeled components to associate data with it. One of our major projects the last couple of years was a water treatment plant renovation project in Pleasant Hills, Pennsylvania.

The majority of this project was a renovation with a few additional structures added, but the guts of the facility replaced. In this case, we spent significant time with the project managers and engineers reviewing how to quickly model the existing conditions, which we settled at LOD 200 for architectural and structural. The client wasn't concerned about capturing existing data associated with MEP and process equipment, so we added only enough existing items to address coordination. Demolition items were defined as 2D elements, based on our original project CAD drawings (we designed the original facility). All new items were modeled to LOD 300, suitable for construction documents. OmniClass labels were added to all new families to help us sort the information easily for post design database usage.

The point is that we made the design team fully aware of what elements and data needed to be included, and what didn't—and why it was important—*before* the job started. Situational awareness helped us understand how important other specific tasks were, such as placing all MEP and process items in one Revit project file, separating new and existing architectural and structural models, and leveraging worksets for visibility control for phases. And most importantly, by creating true BIM objects to represent as-built conditions, we give the client and ourselves a better starting point for future designs and renovations. If a specific object, such as a wall, needs renovation or replacement, the design can start from the BIM object, making the changes easier.

It's important that all projects identify the BIM tasks prior to the start of the job, and review them with the project management and design team. This way you don't wind up with budget surprises before you finish the design.



Pleasant Hills Water/Sewer Authority - ©Copyright 2014, Gannett Fleming

ADAPTABILITY. WEBSTER. DEFINITION.

Adaptability is based on the word *adaptable*, meaning *able to change or be changed in order to fit or work better in some situation for some purpose*. Also *able to adapt or be adapted*. Thank you, Mr. Webster (<http://www.merriam-webster.com/dictionary/adaptability>).

BIM users throw this word around, but what does this mean in a BIM implementation? Most people think that means *replacing* drafting with modeling, but that's only part of the picture. What does this mean to the design team, from the principal to the end user? One thing we've told people is to throw away everything that you learned about CAD because BIM is different. But, boy, does that get taken the wrong way. That doesn't mean that a BIM project totally excludes CAD and drafting. In fact, one of the advantages of BIM with regard to how you use CAD is that it helps force standardization while clearly outlining tasks. The strength and weakness of CAD is its ability to make changes quickly, and the same rule applies to modeling. But out-of-control BIM is just as bad as out-of-control CAD, and in some cases, can be even more costly.

So how does being adaptable help the BIM team get over the hump? Easy—by learning what still needs to be drafted versus modeled, prior to the start of a project. Technicians have to be proficient in both platforms, although a strong skill set in one doesn't necessarily translate to the other. The user has to be able to understand and create based on design skills as opposed to drafting.

The point is to model as much of the physical representation as makes sense, and then fill in the gaps with CAD. For example, instrumentation diagrams aren't BIM's strong suit, so we adapted AutoCAD® P&ID for most of this. It wasn't because it was the basis for modeling in Plant 3D, or because it was a faster drafting tool. It had more to do with its real-time link to a SQL database, which allowed us to gain efficiencies in areas such as I/O reports. Eventually, we'll link the data between the diagram and the model, but planning ahead for this was a critical decision for us. We also leverage other applications (a great example is the HVAC Solutions software for HVAC 1D system design) to help us with 1D and 2D diagramming. So knowing what these tools are, and how they will be integrated on a project, is essential for proper planning.

ACTIONS. LOUDER THAN WORDS.

During the course of an implementation, it's going to boil down to the simple tasks of just getting things done. Implementing BIM means a lot more than just setting up templates with lineweights, annotation styles, and default schedules. It means more than scheduling classes to cover the basics. It means identifying areas in your work process where you have weaknesses, and then leveraging BIM tools to improve them. This culture change is the hardest, since most long-term users will cling to plain AutoCAD until you drag them away from the keyboard and their 2,000 shortcut key combinations.

To supplement the design team's task, it's important to clearly define your BIM management team's long-term roles in the company.

In smaller companies, this is often a strong designer who only manages BIM part time, while larger companies will find that having a full-time dedicated staff works best. It doesn't have to be a huge team, but it has to be positioned in such a way that specific tasks that can take up billable project hours are better handled by non-project staff.

If you need proof of the success of your implementation, you only need to review your own content library. In our case, project support mainly revolves around content and ongoing, over-the-shoulder training. We have some strong users that like to make their own stuff, but when a new user gets on the job, we'd rather they spend their time focusing on applying BIM work processes, such as the four-step system (analyze and add equipment, define air/fluid/power systems and circuits, create connecting geometry, and annotating a project). If they need something complex, we'll make it for them. One advantage to this includes the ability to use company standard parameters that align with predefined schedules to help project teams expedite this task.

And we've been very fortunate to have users that like to take actions on their own. They've discovered that BIM isn't about a physical building, but is about the *building process*. We're using it for dams, power, transportation, environmental, and other projects, in addition to old-school schools. It's that willingness to take action and work outside the box that makes the implementation work, so choose your staff wisely.

CONCLUSION. AMAZED.

Get used to it: BIM implementations, like layer standards, will constantly evolve. There isn't a magic button to make anything happen automatically. And it's a good thing to be aware, adaptable, and ready to take action when projects need help. Look back at how we were doing things a mere couple of decades ago, and be amazed at where we've come as a design industry. And don't get scared, running home to 2D. It's all going to be okay.



David Butts is a BIM Specialist for Gannett Fleming. He provides BIM Implementation and training for the firm's engineering design software, including Revit, Navisworks, AutoCAD MEP/PE&ID, and more. David has 13 years working as an instructor and consultant for the Autodesk building design product line. He was a member of the Autodesk ATC Advisory Board for 2009-10. He is a Revit Architecture Certified Professional and MEP Implementation Certified Expert. David and was named the Top Speaker for both labs and lectures at AU 2011. As an author, he contributes to 4D Technology's CADLearning training programs and has written several training manuals for Revit MEP.

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Easing the Pain of Deployment

INTRODUCTION

It's that time of year again: Cherry blossoms and new Autodesk products. And that means a whole new round of testing, customizing, and ultimately installing. That last one—Deployments and Installs, can be really painful. The topic is a massive one, and *AUGIWorld* really doesn't want me going on (and on, and on, and on) about it. So instead, I am going to cover just a few key ideas to take a little pain out of the process.

STALLED DEPLOYMENTS (OR NOT)

If you have ever installed or built a Deployment of a front line Autodesk product (Autodesk® Revit®, AutoCAD® Architecture, etc.), you have probably found yourself frustrated by a “crashed” or “stalled” install or deployment creation. However, it has been my experience that the vast majority of the time the install/deployment creation is not stalled, but rather immersed in some slow task that it will eventually finish if given time.

The usual technique for seeing if an install has stalled is to check CPU activity in Task Manager (Figure 1, A). Most of the time this works, but there is one situation where Task Manager will give you a false positive for failure, and it happens to be the longest lull you are likely to experience installing Revit, ACA or AutoCAD: the content install phase. Depending on the speed of your machine, you could see anywhere from 10s of minutes to hours of flatlined CPU during this phase. However, there is a better tool than Task

Manager, the less well-known Resource Monitor, which is conveniently available from the performance tab of Task Manager (Figure 1, B), as well as in All programs/Accessories/System Tools in the start menu.

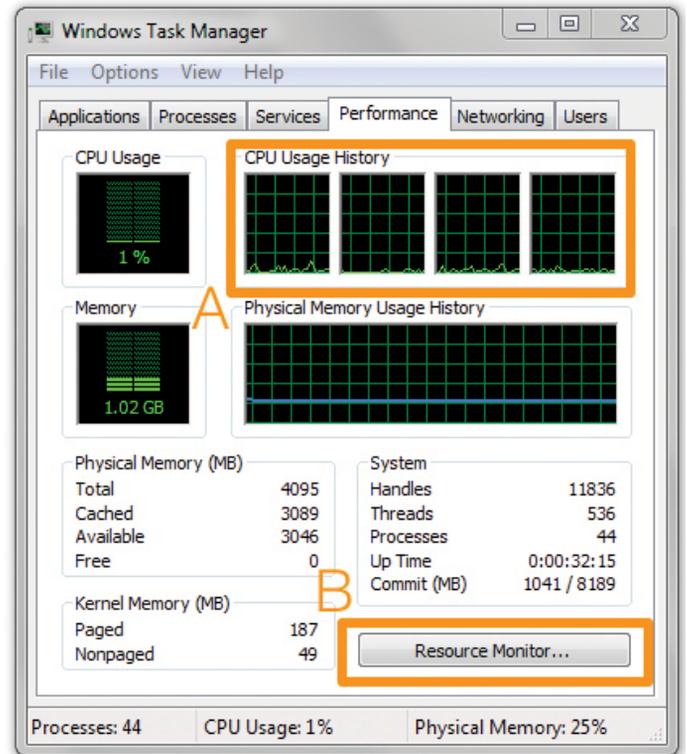


Figure 1



In an effort to provide *AUGIWorld* readers with the most timely information on the 2015 release of Revit, the articles in the April issue of *AUGIWorld*, the annual “What’s New from Autodesk”, were written based on functionality in the beta releases.

Beta releases provide Autodesk with an opportunity to get user feedback on new functionality to ensure that it performs to the satisfaction of their customers, and functionality in testing is not always aligned with commercial release plans. The images and descriptions of Family Browser and MEP Fabrication Parts features described on pages 11, 23, and 26 in the April 2014 issue were erroneously included in our reporting of the Revit 2015 releases.

Performance Monitor gives you a more complete picture of machine activity, including drive activity. In our case, a look at the Disk trace on the Overview tab (Figure 2, A) will show many small writes occurring while CPU activity stays near zero (Figure 2, B). As long as that disk activity continues, your install or deployment creation has not crashed and you should avoid the temptation to Ctrl-C out of it. Be patient. It will (eventually) finish.

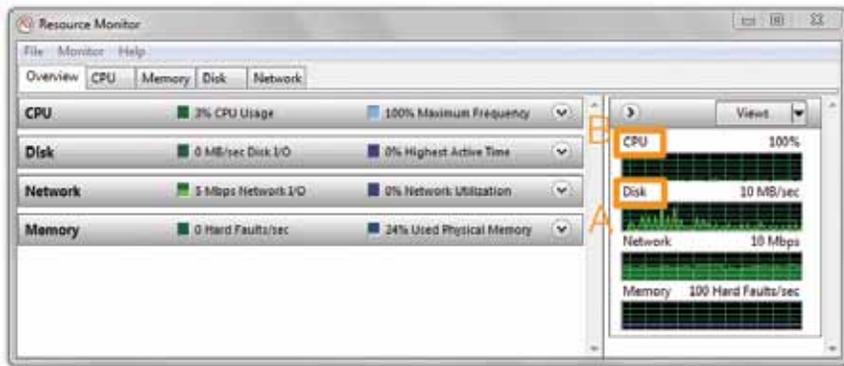


Figure 2

DEPLOYMENT FAILURE PROBLEM SOLVING

Invariably you will, at some point, encounter a deployment install that simply fails. It runs and runs and when it's done... nothing. No shortcut on the desktop, no software installed, seemingly nothing. If you do a search for "rollback" in the log file created by the deployment you will find the first bread crumb to follow. This is the indication that something went wrong, but not an indication of what did go wrong. And unfortunately, all the possible things that could go wrong are much too large a topic for *AUGIWorld*. Or even a small book. However, all is not as dire as it seems, as there are just a few techniques that will address 99 percent of the failures you could encounter, before they happen.

In my experience the majority of these failures stem from a series of related issues, all of which "fail" with either an error code of 1306 or 1603. This family of failures shares a single feature—they are failures of "prerequisites" such as Visual C++ redistributables or .NET components.

These installs can "fail" if the file being replaced is still in use when the update happens, which then requires a reboot before the file is available. The error message associated with these errors is actually "Successful, Reboot Required" or some variation. However, the Autodesk installer still sees this as a failure of a required component and the main install fails also.

Alternately, the Autodesk installer may be trying to install an older version of the component than what is already on the machine. This also causes install "failures" with error code 1306 or 1603 and subsequent failure of the Autodesk product install.

Lastly, I have found that 32-bit components being installed on 64-bit Windows cause an inordinate number of these kinds of failures. This was especially true with the 2013 products, but rather less so for 2014. And because the error codes are all the same, I really don't know if it is Autodesk installing older components or files in use or what. I just know that certain 32-bit components are more likely to be problematic.

I have found three techniques that address the vast majority of these issues.

1. **Always run installs on a freshly restarted machine.** This minimizes the chances that a file is in use, because no programs have been launched.
2. **Always install using a dedicated Install user,** with nothing set to run automatically, to further ensure that no prerequisite files are already in use. This is also a good security technique. Staff user accounts can be configured with limited permissions, and your dedicated "Install User" can get regular password changes or even be deactivated when not needed. Even for a sole proprietor, I strongly recommend a "Regular" user account for daily work, and an "Admin" account (with a strong password!) for installs and the like.

3. Set Ignore_Error=Yes

Go to the folder where you chose to put your deployment when you created it. There you will find your "Deployment Image" folder. For older programs this was called *AdminImage*, while Revit 2014 and some newer programs are using simply *img*. Inside this folder you will find a "Deployment INI" file, which is simply an ini file with the same name as your deployment, RVT_2014 as shown in Figure 3, A.

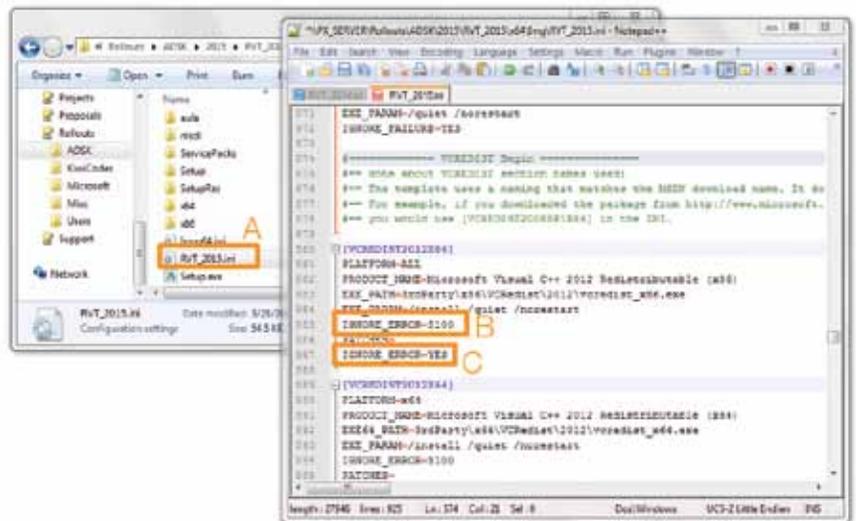


Figure 3

Revit Architecture 2014

Open this file in a good editor (shout out to NotePad ++) and search for VCREDIST Begin, and as you scroll down you will notice a number of “x86” references. You will recall that x86 refers to the 32-bit CPU architecture, while x64 refers to 64-bit. So, what we are seeing here is the ADSK deployment trying to install 32-bit components on a 64-bit machine.

You will also notice the seed to our solution, in the IGNORE_ERROR=5100 line (Figure 3, B). This is in the out-of-the-box version of the ini file, and is simply Autodesk configuring this particular component to ignore error 5100. Obviously there is a very specific and non-catastrophic error here, and Autodesk doesn’t want the overall install to fail because of it.

We just want to take this a step further. Instead of ignoring just error 5100, you can set IGNORE_ERROR=Yes, and no error on this particular component will cause the rest of the install to fail (Figure 3, C).

Now, you might be the cautious type, and only want to ignore errors 1306 and 1603, but historically I have simply set all errors to ignore and I have never yet encountered a problem that could be traced back to this decision, but I have seen a massive reduction in failed installs. And again, barring actual failures traced to other items, I only take this action on 32-bit (i.e., x86) components, and only the Visual C++ components. And I add my IGNORE_ERROR=Yes at the bottom of each component to make it obvious which ones I revised. Lastly, if it sets your mind at ease at all, you will find that some of these already have this setting, so perhaps all we are really doing is picking up the ones that Autodesk missed.

One last thing to note. Thus far we have been talking about revising the ini in a deployment. However, when you are simply installing Revit directly, the installer will unpack effectively a standalone deployment in the Autodesk folder on the C drive, which will have a Setup.ini in the root folder for a particular product. This setup.ini is the equivalent of the deployment-specific ini and can be modified the same way. My preferred approach is to copy this “Installer” folder to the network or an external drive (and rename the folder something short and sweet while I am at it) and modify setup.ini there. Now I can use this single shared installer image to install without waiting for the EXE to unpack, with any customization already applied. I find it useful even for a sole proprietor to keep the install image off the C: drive, and modified to minimize problems. A failed hard drive, a new machine, any number of reasons can come up for needing to re-install something, so having a deployment/installer library external to your machine is a good idea in any size office.

COPYING/MIGRATING DEPLOYMENTS

There are a number of common scenarios where moving or copying a deployment is beneficial. You might have structured your deployments storage

with all deployments in a single folder and now want to organize them differently—by vendor or year or what have you.

You may have also moved the entire deployment store to a new server, or simply renamed the old server.

Or, if your firm has multiple offices you may need to install from a local server if your WAN doesn’t offer the performance for a single deployment source. The ideal solution here is DFS, which allows for identical paths to local network storage. However, in the real world we often deal with not only different server names, but different folder structures at each location. Recreating deployments at each location is time consuming, and maintaining consistent settings in every deployment is difficult. A better approach is to build and test deployments once, then copy them to each location as needed. But a deployment contains references to the path in which it was created, so without a little revision the copied or relocated deployment won’t work.

The first step is to identify the pathing differences between your various final deployment locations. The portion of the path you are concerned with is up to but not including the “Deployment Image” folder discussed earlier.

In this example, I am moving a Revit 2014 deployment (the deployment is actually called RVT_2014) from an old server and folder structure to a new one. Specifically:

`\\Support\Deployments\RVT_2014\x64\Img` becomes

`\\Px_Server\Rollouts\ADSK\2014\RVT_2014\x64\Img`

Once I have my deployment relocated, I need to make changes to a number of files.

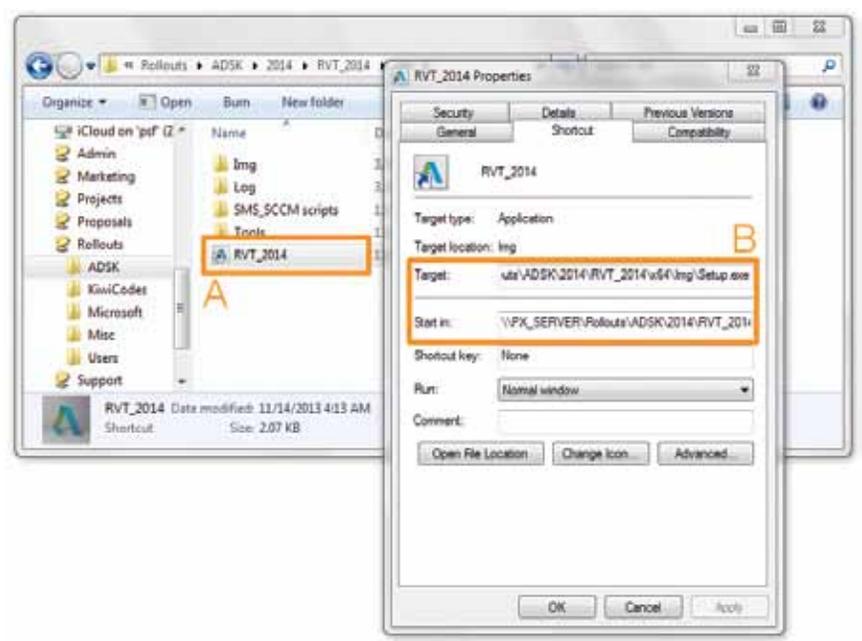


Figure 4

The first is the deployment shortcut, which can be found in the same folder as the AdminImage or img folder, and will have the same name you gave to your deployment (Figure 4, A).

You'll need to right-click and choose Properties, and replace the old portion of the path with the new; once in *Start In* and twice in *Target* as you see here in the revised values (Figure 4, B).

Target:

```
\\PX_SERVER\Rollouts\ADSK\2014\RVT_2014\x64\Img\Setup.exe /qb /I \\PX_SERVER\Rollouts\ADSK\2014\RVT_2014\x64\Img\RVT_2014.ini /language en-us
```

Start In:

```
\\PX_SERVER\Rollouts\ADSK\2014\RVT_2014\x64\Img
```

And given how awkward editing the target value is, I suggest two things. Make a backup copy of the shortcut just in case, and copy the contents of the Target field into a text editor (Notepad will do in this case, as will NotePad ++)

to modify and copy back. Next, we need to replace the path in the "Deployment" ini file. This is the same file we modified to address 32-bit CV++ components above, and requires two replacements in the Global MSI Properties section. You will need to revise the path in the ADMIN_IMAGE_LOCATION line, as well as NETWORK_LOG_PATH (Figure 5).

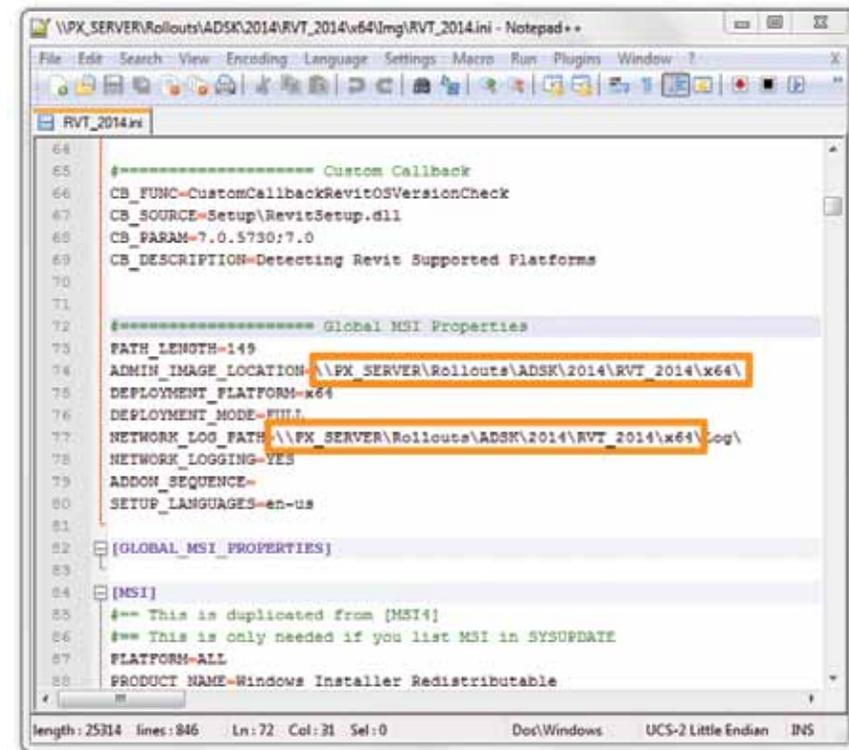


Figure 5

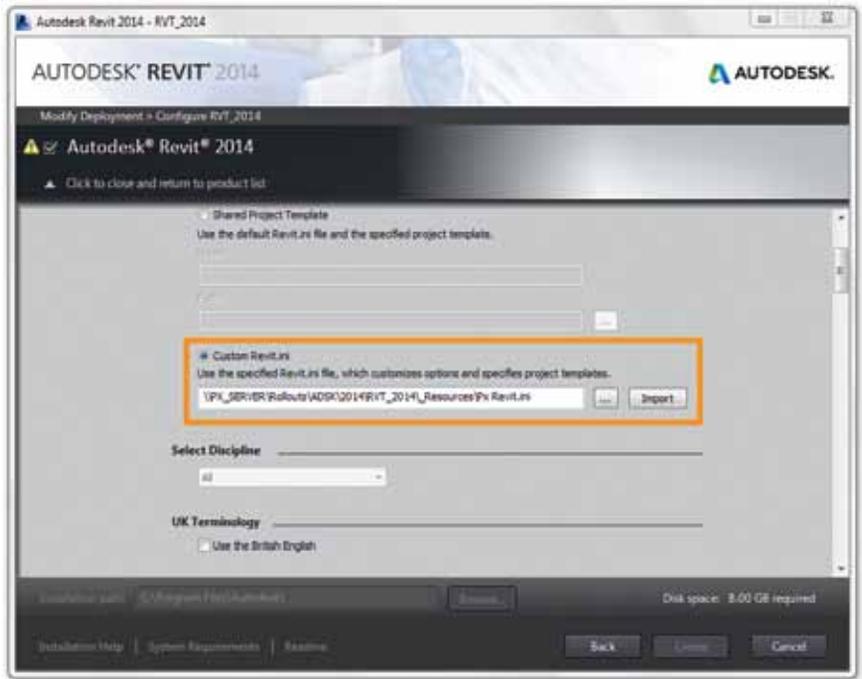


Figure 6

At this point I have a functioning relocated deployment, but if I am making copies of the deployment for other offices, things are a little more involved.

The first thing to be aware of is that you can move and copy a deployment, but you can't (easily) rename one. The name gets encapsulated in an MST file, which is a binary file format that requires specialized tools to edit. The takeaway here is, if you want to make a single Deployment and copy it, give it a generic name such as RVT_2014, not a location-specific name such as RVT_2014_Berlin.

The last thing to be aware of is a Revit-specific issue. If you are using a "Custom" Revit.ini file that you imported into the deployment (Figure 6), and that Revit.ini has location specific pathing (maybe the template and family files have a different path in different offices) you will need to revise that Revit.ini also. Now, you could just edit the deployment in each office and load the right one, but editing a deployment has some pitfalls (see Bonus #1 below).

So, the quick and dirty (and better) answer is to drill down to the ...Img\CustomSettings folder, where you will find a Revit.ini with the name of your deployment tacked on the front. Revise any paths here for the specific location and your deployment will install as expected with those custom settings. Note that this CustomSettings folder is for Revit 2014 and 2015. Revit 2013 wouldn't even let you load a custom Revit.ini until SP2, I believe, and also uses a different folder, as does Revit 2012. If you are addressing deployments for older versions, you will need to do some homework, but the basic process is the same.

BONUS

1. Deployments are fragile! Editing them can cause all sorts of problems, so as a general rule, try to find alternatives to modifying deployments with the *Create & modify a deployment* tool.

That said, sometimes you just need to do something simple such as change the license server or serial number. In that case, edit, but be aware that editing ANYTHING reseleects content. Every time. So, every single time you get into a deployment, go back to the content selection step and make sure it is off, if that is the condition you intend. Otherwise your installs will be slow and your hard drives full.

2. Revit server accelerator. When creating the deployment, there is a setting for Revit Server Accelerator (Figure 7). However, in Revit 2013 and 2014 this setting is ignored, and users have had to manually assign an accelerator at first launch. This setting in the deployment just sets the value of an Environment Variable when it is working, and that can be done externally from the deployment as well.

Because this can be done externally anyway, I just skip assigning an accelerator in the deployment, and then assign it via script, Group Policy, etc. post install. This makes it even easier to use a single deployment for multiple offices, even with Revit 2012 or 2015 where the bug doesn't exist. Who wants to make a new deployment just to point at a different RS Accelerator? The EnvironmentVariable you want is `RSACCELERATOR####` with `####` being the version year in question, and while you can do this either as a User or a System Environment Variable, I recommend System in most cases. This is also what the deployment setting does in those versions where it isn't broken.

3. FlexLM assignment. The FlexLM setting is a little different in that it creates the LIC file that is pushed to the machine during install. However, LIC files are a VERY bad way to

handle license server assignment (you can get more detail on why at my blog). A better approach is to assign License Server via System Environment Variable just like we did the Revit Server accelerator. You can then change the setting later if, for example, you need to migrate to a new FlexLM server name. The Env Var is `ADSKFLEX_LICENSE_FILE`, and again you want to use a System Environment Variable under most circumstances.

Also, you may come across a situation where for some users, after the uninstall of an old program, say AutoCAD® 2010 or some other program (maybe even the new version of Revit), will fail to get a license. You might not even realize that removing AutoCAD was the trigger, which makes this a rather insidious problem to troubleshoot. The key here is that the first place Revit, or any other Autodesk product, looks for a FlexLM server is a User Registry value. If that value references a LIC file from certain old programs, and that LIC file is missing, then some newer programs will fail to find the proper FlexLM server, be that in an Environment Variable or a LIC file. The solution is to delete the registry value at `HKEY_CURRENT_USER\Software\Flexlm License Manager\ADSKFLEX_LICENSE_FILE`, at which point the next time you launch, the data will be re-read from either the Environment Variable or the correct LIC file if you aren't using the Environment Variable. This is a rather more detailed topic than we have space for here, but again, more detail can be found on my blog.

And with that, I hope you have a good Install Spring, and an even better User Training Summer.

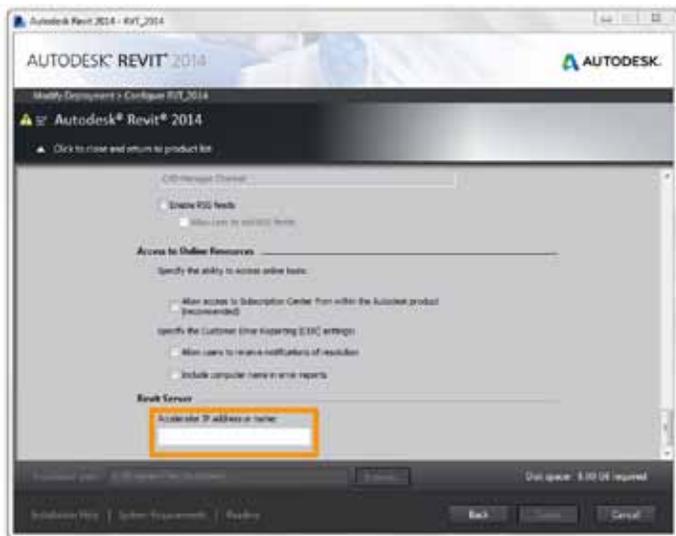


Figure 7



Over the last 15 years Gordon Price has been a Job Captain, CAD Manager, BIM Lead, BIM Manager, and IT Manager. He has implemented and managed Revit in multiple offices, and has supported teams on projects ranging from small scale commercial tenant improvements to a \$500,000,000 signature Higher Ed project. He has always believed that happy and productive staff is key to a firm's success, and found as many ways as possible to make the IT aspects of BIM Management efficient so he could focus on the training and support aspects of that role. In 2010 he founded Pragmatic Praxis (formerly the Pragmatic Reviteer) to provide web-based Revit training, tools and support. www.PragmaticPraxis.com

Put on Your Implementation Hat



Spring is in the air and, just like every year, there are more things blossoming than pretty flowers. In fact, Autodesk has a fresh new bounty of products available for your CAD pleasure. Not the least of which, of course, is AutoCAD® 2015. As we all know, new releases mean that it is time for CAD managers everywhere to put on their implementation hats and get to work rolling out the new releases.

You do have an implantation hat ... don't you?

IN A PERFECT WORLD

Wouldn't it be amazing if we lived in a world where installations are instantaneous and every workstation is prepped and primed for the pending upgrade? What would it be like if users were 100 percent cooperative and willing to accommodate installations and all you had to do was show up and perform the install? Certainly we have wished for a world where installations of the newest AutoCAD release were headed for workstations with plenty of free hard drive space and RAM to spare.

THE COLD, HARSH TRUTH

Sadly, the real world of CAD management and production can be a far cry from the "perfect" version we wish for. CAD managers must deal with the perils of planning upgrades to the latest release of AutoCAD for even the smallest work groups. The list of issues and complications can seem nearly endless to all but the most experienced CAD managers.

If your firm is not part of the subscription plan, then the simple act of getting sign-off for the software acquisition can be a daunting challenge. It often seems as if no amount of new features or improved workflows and user interfaces can sway some bosses. Even worse are the poor CAD managers caught between a subscription and a boss who feels that yearly upgrades are a waste of time and would rather "skip" a release or two. The number of CAD managers who have gone gray fighting the uphill battle against this sort of situation must be too many to count.

As difficult as it may be to actually get the software, don't believe that the bumps in the road end once you've ridden the upgrade cart past the boss. The very people you are trying to help can most often be unintentional obstacles themselves. That's right, the users.

From production schedules that make scheduling software installations all but impossible during normal business hours to the "helpful" user who finds the deployment and upgrades himself—users can be difficult.

Sometimes even the simplest thing such as a list of who needs the new software can require a surprising amount of effort due to less-than-cooperative personnel. Then there are the users who just never seem to get around to returning those pesky emails. I think we love them the most.

Finally, there are the workstations. Those little beige or black boxes hiding under people's desks are just waiting to pounce on the unsuspecting CAD manager. You can find outdated versions of the operating system or even a total lack of updates, both minor and critical. All of this not only contributes to the stability of the workstation, in general, but also makes for a poor foundation for a fresh install of AutoCAD. Yes sir, from OS updates to hardware requirements, workstations are a topic that deserves attention in the planning of any upgrade process.

A BETTER PATH

Things do not have to be all doom and gloom where AutoCAD upgrades are concerned. There are always solutions to whatever problem may present itself. It is just a matter of planning and steady execution.

The first step to successful implementation is to be aware of the obstacles users face on a daily basis. This should be an observational effort that we, as CAD managers, make throughout the year. An active CAD manager will make note of the issues that arise in the course of normal production. These notations will account for questions beyond, "What's the name of that command?" that require us to put on the old thinking cap. Similarly, "workarounds" that we develop in the office to circumvent some issues should also be noted. This list of notes, along with some generalizations about lost production time, can be invaluable when trying to justify software upgrades to management.

AutoCAD 2015

Immediately following the announcement of the new version release, take your list and search for solutions in the description of tools that are new or improved. Correlate what you find in the new capabilities with a positive impact on your group's production up time and you are sure to get the sign off to acquire and install the latest revision of AutoCAD.

That will put you past the "getting" stage and get you closer to the "installation" stage, and that means dealing with the user.

Regardless of the office location or type, the AutoCAD end user is a production or design professional who is in business to design or produce. That means that every moment their workstations are unavailable to them is production revenue lost. So we must do our best to plan and execute the upgrade process so users are impacted as little as possible.

The key to a smooth upgrade process is "communication." The initial announcement of the upgrade should come at least two weeks prior to installation. While this may seem like an excessive amount of time, we all know that there are those in the office who seem to take special pleasure in avoiding communications. In these cases, we must build in extra time for repeated contact with individuals and even the odd personal visit. Let your users know what to expect.

Explaining some of the exciting improvements made in the new AutoCAD release will relate the upcoming benefits to a users' work. Detail any preparatory steps they should take to ensure all is smooth. And finally, fill them in on your upgrade schedule and how long the actual installation should take. Lay out appointment slots and allow them to choose their own install times.

Users will make short work of replying to you and setting up times once they understand the benefits in store for them. There will always be some users who require a little nudge, but in the end you should have a staff of users excited about the new AutoCAD version. Now you are ready to put some boots on the ground.

When approaching the workstation take all the normal precautions when working with PCs and be sure to assess the condition of the workstation before beginning installs. A quick checklist might include the following:

1. Are there old installations of AutoCAD (more than one release back) on the workstation for no reason?
2. Are there old shared directories from previous versions of AutoCAD?
3. Are there broken references in the registry from old AutoCAD installations?
4. Does the PC meet the recommended requirements for the new release of AutoCAD?

If any of these areas raise a flag, be certain to address them prior to installation. Removing old installations and making sure you get all those little directories that may be left behind by the uninstall process can make a world of difference. Not only will you remove the temptation of using the old installation, you will also remove any lingering directories that could be a nuisance in the future. Using a tool such as CCleaner from Piriform (www.ccleaner.com) can do wonders for cleaning your registry while also creating backups of removed data.

While removing previous installations is a good rule of thumb, some users may need to hang on to those installs for various reasons. Whether they have to use specific plug-ins that have not been rewritten for the new release or they simply need to finish a project, exceptions to the general rule may be required.

Evaluating current hardware may prove it to be subpar, defective, or absent. All of these should be listed and reported to your IT department (which may also be you). In such cases, inform the user that you are not able to install the new release of AutoCAD and what parts require attention. It will be up to your IT support to upgrade or replace that workstation. There is no benefit to cramming a new release of AutoCAD onto a slow, insufficient, or failing workstation. That is a recipe for unhappy users and repeated calls and emails for you!

Following a process similar to the one listed above will provide a workstation that is a clean slate of capable hardware for the new installation. Now you are ready to get in there and install that awesome new AutoCAD.

DON'T FORGET THE ICING

Adding the final touches to this AutoCAD installation is all about the "little things." Little or not, these points can be very important to your end user! So never forget to finish what you start with this little checklist.

1. Check that custom support paths in the Option > File listings are correct
2. Check for plotter support files and drivers
3. Check for shortcut icons present on desktop
4. Transfer command alias and environmental settings from the previous install

These are the final touches that will allow the user to sit down and get right back to work and he will thank you for it. Now it is time to make that next appointment on the list or serve up that long stretch of support until the next upgrade cycle.

A CAD manager's job is never done!

IN CONCLUSION

Moving your firm to the latest version of AutoCAD with all the latest tools and features is always cause for excitement.

Take this situation as your opportunity to take a more managed, measured approach to upgrades. You may suddenly realize that your little team of two drafters has erupted into a 30-person workforce. In situations like this, playing things by ear just won't cut it anymore.

Proper planning, good communication, and dedicated execution will make the endless advancement through the AutoCAD releases much easier to handle and not something to fear. However, if you follow all this sage advice and something happens to go wrong, that's nothing to be upset about. The good news is that you'll get another chance to get it right next year!



Based in Houston, Texas, Curt Moreno is a CAD Coordinator for a civil engineering firm and the owner and editor of the Kung Fu Drafter blog. He began using AutoCAD with Release 10 and has spent the past 20+ years working with various Autodesk products including AutoCAD, Civil 3D, Map 3D, and SketchBook Designer. Curt is also a freelance content creator, featured Autodesk University speaker, and training content developer. In his spare time he writes, games, and spends time with his dog and horses.

And Here's How to... Use Layer Walk Effectively

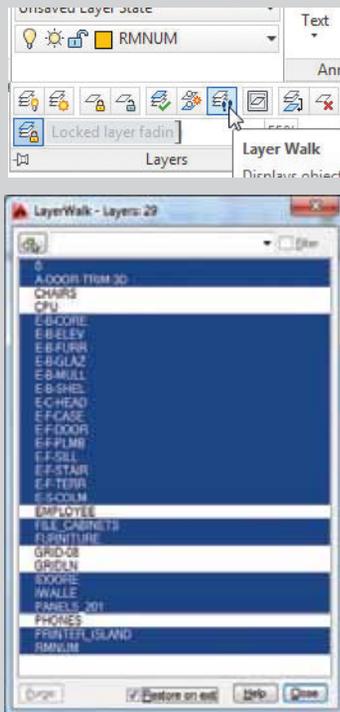
Layer Walk [Home tab > expanded Layers panel] has been around since the Release 11 Bonus CD and is still a mighty powerful tool. The Layer Walk dialog box displays a list of layers and when you select one, it displays the contents of that layer ... even if the layer is Off or Frozen.

Quick Tip: Right-click on Layer Walk, then click Add to Quick Access Toolbar.

COOL FEATURES OF LAYER WALK

Default: Layers that are currently On. Layers that are not highlighted (white) are either Off or Frozen. Use Ctrl or Shift to select multiple layers to view the layer contents.

Need To Know: Restore On Exit check box at the bottom. If that box is checked, after having your way with layer visibility from within the Layer Walk dialog box and when you click Close, the drawing's layer condition goes back to what it was when you first launched Layer Walk.



Nice feature: Right-click menu with Select All and Save Layer State.

IDEAS ON WHEN TO USE LAYER WALK

- A. When you receive a drawing from an outside source, Save Layer State and call it 'RECEIVED' or 'GOT IT LIKE THIS'.
- B. Use Layer Walk to Thaw and turn On every layer using Select All, then Save Layer State called 'ALL LAYERS'.
- C. Identify which layers are the building shell or key components of your drawing, then Save Layer State and call it 'BUILDING SHELL'.
- D. After selecting the primary layers of interest, click Hold Selection, then you can click additional layers to view without using Ctrl or Shift.

Such a fun command! Hope you enjoy it, too.



Michael E. Beall (B. Arch.) won the AU 2013 Speaker Award for Hands-on Labs and is an Autodesk Authorized Author. He is the owner of CAD Trainer Guy, LLC in Shelbyville, KY and has been presenting onsite CAD training around the planet since 1982. Contact him anytime at michael.beall@cadtrainerguy.com, on LinkedIn at <http://www.linkedin.com/in/cadtrainerguy/> or give him a call at 502.500.2267.

The Xi[®] MTower[™] PCIe Workstation

For starters, any hardware review is, by its very nature, subjective. My experience with a system is just that—*my experience*. Your experience can and probably will be different, based on what you have and what you do with it.

I think the one thing we all can agree on is that desktop systems still have a valuable role to play in today's business environment. Even with solid and high-performance laptops, the ability to crack open a box and fiddle with the innards is something that many find crucial to making the most of their system and their valuable time using the system.

When I got the call that a package was up front, I was excited! Then I turned the corner and I had to pause for a moment. I went



back to my storeroom to get a dolly. This box is HUGE. When shipping a system across country, @Xi doesn't skimp on the packaging. Once back at my desk and after finding about 3 square feet free to open the box, I finally got to see what was waiting for me. The shipping box opened up well enough and had a good deal of that black foam-like packaging to keep everything in place and protect the contents. The top layer was wedged in pretty tight and took some effort to remove. But after a minute or two I managed to free it and access the actual "box."

For those who are impressed with a computer enclosure, this system from @Xi will not disappoint. The case is a product from Cooler Master, the Cosmos SE full tower enclosure. It has a good deal of lighting and from what I found out about the case, you can

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- 500GB Seagate® 7200 16MB C.
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- Microsoft® Windows® 7/8.1-64Bit

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- 16GB DDR3-1600 ECC to128G
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Hardware

get blue or red. If you are the type to move your box around, then the robust handles on top and stand bars on the bottom will suit you fine.

Occupying the front face of this system is just about every connection I have ever seen on a computer. You get two USB2.0 connections, microphone and headphone 1/8" jacks, and two USB3.0 connections. Then, using one of two full-size drive bays is a 3½" wide Rosewill RDCR-11003 internal media card reader with yet another USB3.0 port.

Next, below in the other 5¼" drive bay is a Dual side Rewritable DVD burner and player. Personally I would have upgraded to Blu-Ray, just in case I wanted to kick back and watch a movie on my PC. Of course, I don't have time for that, so whatever... Then up on top of the case are a few more controls. We have a lighted power off/on button, a hard reset button, and a switch to turn off and on the front fan LED lighting.

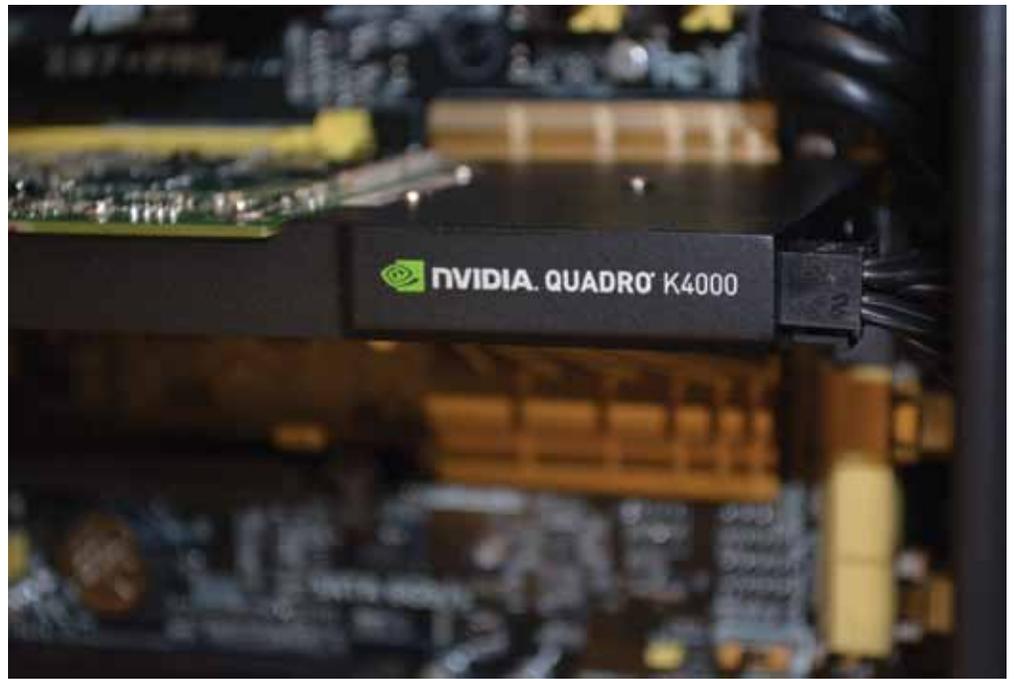
Next is the heart and soul of a PC box, the inside! The first thing I notice is a Borg-like set of black tubes running from the CPU to a dual fan radiator at the top of the case. Hidden under this tubed contraction is an Intel i7-4770K processor operating overclocked at 4.3GHz. The contraption attached to the CPU is a CORSAIR Hydro Series H100i sealed water cooling system with two fans.

To go along with a heart and soul, you have to have eyes and this system has them via a NVIDIA® Quadro® K4000 3GB DDR5 video card. It has one DVI and dual DisplayPort connections. Also contributing to the memory of this system is 16GB DDR3 of Corsair in two RAM sticks. The brain itself is an ASUS Z87-PRO motherboard and it has two more slots available for RAM, so I can add more as I wish. The system only came with 16GB of RAM, so this is another upgrade you should make.

The lungs of this beast is a Corsair RM850 power supply that offers plenty of breathing room for more stuff later. And this Cosmos case has the room. As configured, there are six free hard drive bays, with a Samsung® 840 EVO™ 500GB SATA Solid State primary drive and a Seagate® Barracuda 1TB 7200RPM SATA secondary drive using up the remaining two drive spaces.

In general, the interior space of the case is open and invites you to poke around and perhaps even store stuff (non-metallic of course). To make the interior so roomy the case is configured such that all cabling is hidden on the backside of the motherboard under a metal plate.

Moving to the rear of the case, we have four more USB2.0 ports and four more USB3.0 ports! And this doesn't include the two



USB ports used up by the fanned radiator at the top. The motherboard has video on-board, providing DVI/DisplayPort/HDMI/Optical connections. Of course, with the Quadro card slotted this will not be active. The remaining ports are the typical fare of network and surround sound connections.

Now on to usage. To be honest, this is the fastest system I have ever used. Certainly part of that performance is the overclocking of the CPU from 3.5GHz to 4.3GHz. But the huge solid state hard drive running Windows 7 is another key player. Averaged results put this system about 40 percent faster than typical desktop systems you might be using. In one rendering test I ran, my i7-3940XM laptop was 43 percent slower. So obviously CPU intensive activities will flat-out scream using this system. If you are running large Revit models, pop in 16GB more RAM to really keep performance at peak levels.

The base price of this system is \$1,079, with price as tested at \$3,199. In the article, I have provided reference hyperlinks to key system components. Unless you are a computer geek, I would leave building a powerful computer system to the professionals. If you do contact @Xi Computers, be sure to say that AUGIWorld sent you. ☺



David Harrington first began using AutoCAD in 1987 in the Structural Engineering discipline. He later joined the Board of Directors for NAAUG, and later AUGI, for which he currently serves as president. He is an established technical editor and author, having worked on more than eight books. He also teaches at Autodesk University and occasionally writes for magazines including AUGIWorld.

How Success Can Lead to Failure

Everyone knows what happens when we fail. We feel crummy and dejected. We look to blame—ourselves or others. We look for how others may have not gotten things right. We look inside ourselves for what we did that may have contributed. We think back on the delays and detours along the road to success that drove us into the ditch of failure.

Learning from failure is a fairly common topic of discussion. When failure comes we tend to think about what went wrong and how we can avoid failing in the future. We dig into reasons for what went wrong. We look for things that caused the process or project to get derailed. We delve into procedures and perspectives to find the root of the failure. We then create checklists and modify processes to help us avoid missing the mark in the coming months and years. Analysis is soon followed by corrective actions. Everyone feels better moving forward because they think they have a grasp on the problems that came about and have a plan for not going down that road again.

But what happens when we succeed?

We don't look back much at all. We celebrate and feel great. We congratulate ourselves and others for a good job done well. We accept accolades and feel confident about the future. We start looking for the next hill to climb, with the inner focus that the next effort will produce the same results.

But will it?

Maybe not. According to recent articles in *Harvard Business Review* by Francesca Gino and Gary Pisano, there are three items that can blind a leader to the upcoming curves in the road that might cause failure. Their list, when applied to leaders, can make for troubled progress.

- When leaders succeed, they tend to give too much credit to their own talent. Not that you are not good at what you do, but are you the cause of success or was it other factors? Take some pride in what you have done, but don't let it go to your head.
- Success can make leaders feel overconfident and that there is no need for change. Everyone can and should get better at what they do. Resting on the past can make you lethargic in your efforts to improve.

- Leaders tend to not investigate success as much as failure. Take the time to look back after the celebration has ended. Do not move on until you find a few key points to capitalize on or improve.

And contributor to *Forbes* magazine, Greg Satell, adds another:

- Leaders often build networks of supporters, clients, and staff that encourage the continuation of the new status quo. Doing something well may not spur you on like failing at it. Sometimes the things that you do best actually make you stall in developing new skills.

So when you are thinking of implementing a new version of software, you may want to think a little about what you have done in the past—even if it worked. We often repeat the past, expecting it to produce success in the future. Approaching a new rollout of software exactly as you have done before without some thoughtful planning and review can end in some unexpected ways.

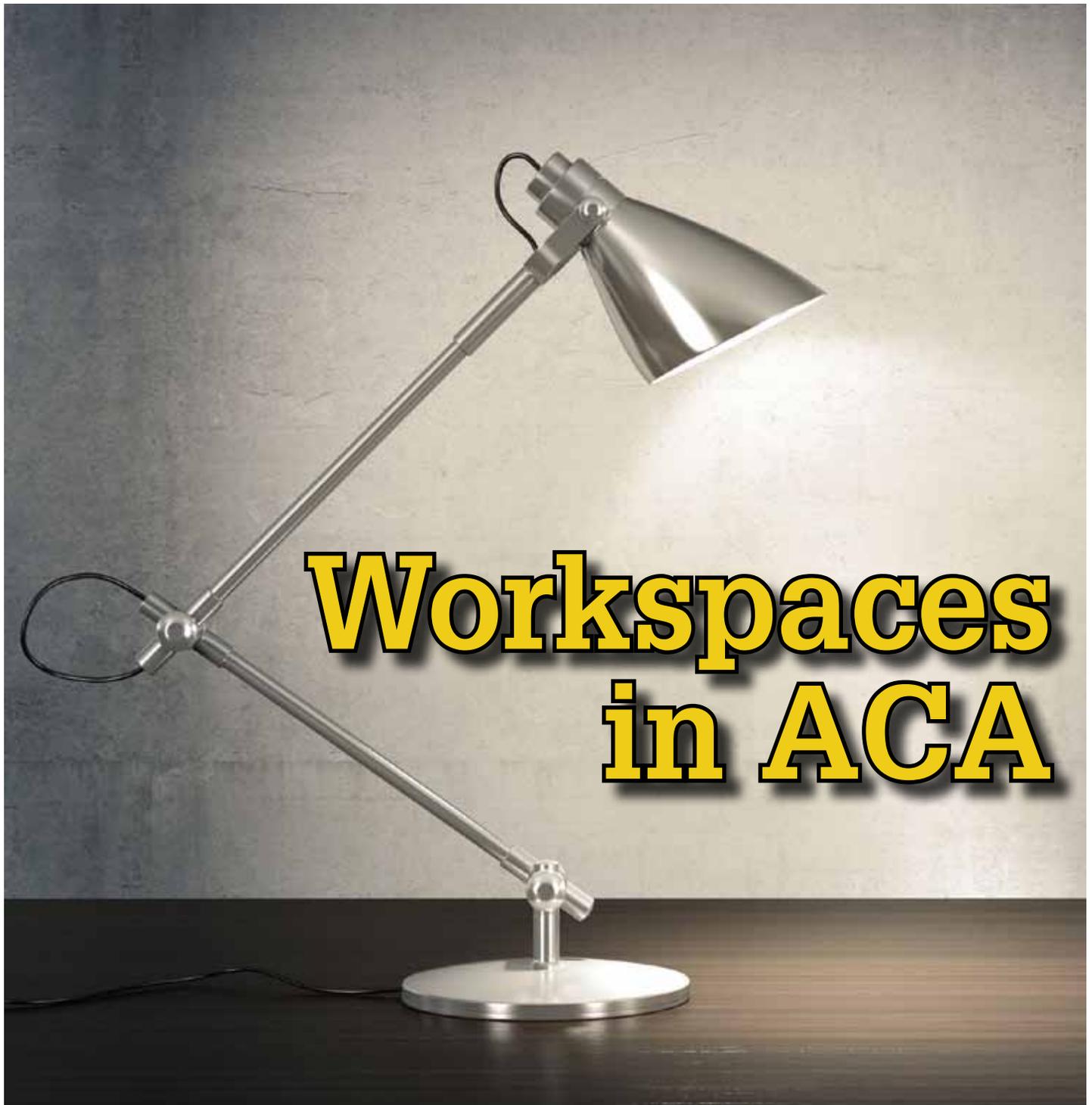
Even when you have a process that you go through each time you think of upgrading and updating, you may need to think about it again. Have things changed? Is the company in a different place than it was last time you upgraded? Are there many employees that were not with the firm since the last deployment? Are money and time as available as they were the last time? Do clients have the same needs as before?

If you implement the newest release on old assumptions, you may see less success than before. Take some time and think about the current landscape of your office, users, firm, and industry. Do not allow a past success to prime you for failure.



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.



Workspaces in ACA

A workspace in AutoCAD® Architecture is the basic user interface that includes those palettes, commands, and controls you need for your architectural process.

When you first start AutoCAD Architecture during implementation, the default Architecture workspace is displayed. The workspace can be reconfigured according to your preferences as you work. You can move or hide various components as needed, display additional ribbon controls, or add new tools and tool palettes. You can even save your customization as a new workspace that you can access for later drawing sessions. You can also switch from one workspace to another at any time.

THE WORKSPACE USER INTERFACE

The workspace is designed to make it easier and faster for you to find and use the tools and commands you need. The workspace user interface consists of several components.

- ✦ **The Ribbon** – Similar to Microsoft Office, AutoCAD Architecture 2014 uses the ribbon as the central access point for commands. The ribbon contains a number of tabs on which commands are grouped according to conceptual task types or selected objects. The ribbon replaces the menu bar and the toolbars as the primary command access point.

- ♦ **The Application Menu** – The application menu contains basic commands pertaining to the drawing as a whole, such as Open, Save and Print. Like the menu browser it replaces, the application menu is accessed by clicking in the upper-left corner of the workspace.
- ♦ **Workspaces** – AutoCAD Architecture is equipped with a single default workspace (Architecture). The menus and commands associated with the previously provided workspaces (Design, Document, Detailing, and Visualization) can be accessed from the tabs of the ribbon.
- ♦ **Help Access** – With the removal of the menu bars in favor of the ribbon, the commands to access Help features have been moved into the InfoCenter at the top right of the application window. Here, you can find the online resources of InfoCenter and the Help menu, which allows access to Help, Tutorials, and other interactive resources.
- ♦ **Autodesk Seek** – You can use Autodesk Seek to find product design information. Many content providers, both corporate partners and individual contributors, publish to Autodesk Seek. Content includes 3D models, 2D drawings, specifications, brochures, and other descriptions of products or components.
- ♦ **Import Design Content into AutoCAD Architecture** – You can also share your own content with others using Autodesk Seek. Upload drawings or blocks to Autodesk Seek to give your partners and customers ready access to your content.

CUSTOMIZING A WORKSPACE

Workspaces control the display of sets of user interface elements and they are typically organized by function or workflow. You can create and manage workspaces from the user interface with the WSSAVE command or Customize User Interface (CUI) Editor. You can also define the properties of a workspace with the CUI Editor. These properties allow you to identify the workspace from other workspaces in the CUIx file and control the behavior of some of the user interface elements related to the application window.

A workspace must be set current to update the user interface based on the properties and settings of the workspace. Only workspaces in the main and enterprise CUIx file can be set current. If a workspace is in a partial CUIx file and you want to use it, you must transfer the workspace with the Transfer tab in the CUI Editor to the main CUIx file before it can be set current. The most recent workspace is set current after closing and restarting the program. If you are setting up a network deployment, you can define which workspace to set as the current workspace the first time the program is started by setting a workspace as default. The CUIx file containing the workspace set as default must be defined as the main or enterprise file with the deployment. A workspace set as default is also set as the current workspace when the CUIx file containing the workspace is loaded with the CUILOAD command.

If you wish to set a workspace current, you can use the Quick Access toolbar, click the Workspace drop-down list, and select the workspace you want to set current. You can also set a workspace current

from the CUI Editor by clicking on the Manage tab of the ribbon, customization panel, and select User Interface. In the Customize tab, Customizations In <file name> pane, click the plus sign (+) next to the Workspaces node to expand it. Right-click the workspace you want to set current and select Set Current. Last, select Apply.

Workspaces in a CUIx file can be marked as default. Setting a workspace as default determines that it should be restored when the CUIx file is loaded into the program the first time or after the CUIx file has been loaded with the CUILOAD command. To do this, click on the Manage tab of the ribbon, Customization panel, and select User Interface. In the Customize tab, Customizations In <file name> pane, click the plus sign (+) next to the Workspaces node to expand it. Right-click the workspace you want to set as default and then select Set Default. Last, select Apply.

You can save changes to an existing workspace from the Application window. On the Quick Access toolbar, click the Workspace drop-down list and select Save Current As. In the Save Workspace dialog box, Name box, enter a name to create a new workspace or select an existing workspace from the drop-down list to overwrite it. Click Save to create or modify the workspace.

If you wish to create and customize a new workspace, begin with the Manage tab on the ribbon, Customization panel, User Interface. Now, in the Customize tab, in the Customizations In <file name> pane, right-click on the Workspaces node and select New Workspace (see Figure 1). A new, empty workspace (named Workspace1) is placed at the bottom of the Workspaces. Right-click on Workspace, select Rename, and enter a new workspace name. Now, in the Workspace Contents pane, click Customize Workspace. In the Customizations In <file name> pane, click the plus sign (+) next to the user interface elements to expand them. Click the check box next to each user interface element that you want to add to the workspace. The selected user interface elements are added to the workspace. In the Workspace Contents pane, select Done and then select Apply.

Once you have created your new workspace, you may find that you need to change the properties of that Workspace. To do this, select the Manage tab on the ribbon, Customization panel, User Interface. In the Customize tab, Customizations In <file name> pane, click the workspace whose properties you want to change. In the Properties pane, do any of the following (see Figure 2):

- ♦ In the Name box, enter a name for the workspace
- ♦ In the Description box, enter a description
- ♦ In the Start On box, select an option (Model, Layout, Do Not Change)
- ♦ In the Menu Bar box, select an option (Off, On)
- ♦ In the Status Bar box, select an option (Application only, All Off, All On, Drawing Status Bar Only)
- ♦ In the Navigation Bar box, select an option (Off, On)
- ♦ In the Model/Layout Tabs box, select an option (On, Off, Do Not Change)
- ♦ In the Scroll Bars box, select an option (On, Off, Do Not Change)

AutoCAD Architecture 2014

Once your changes are complete, select Apply.

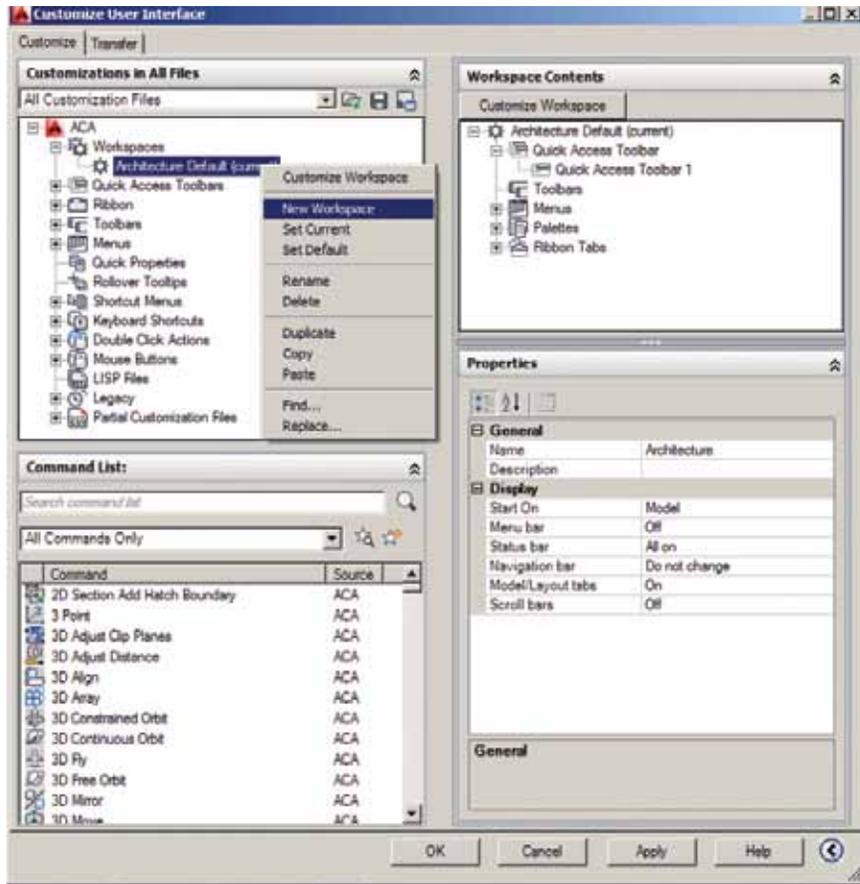


Figure 1: New workspace

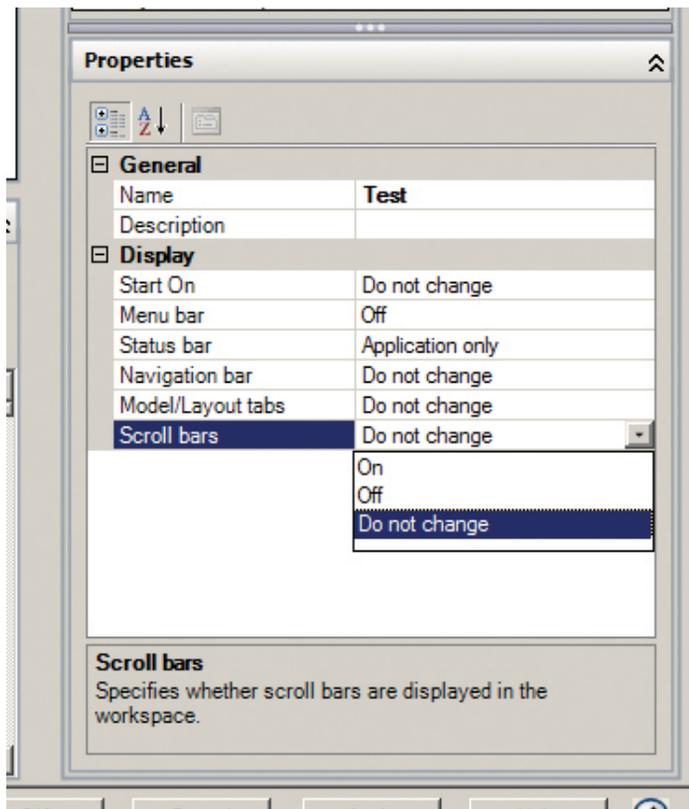


Figure 2: Workspace properties

WORKING WITH OBJECTS IN A WORKSPACE

The AutoCAD Architecture workspace is where you add and manipulate the architectural objects that make up your drawings. You can use tools to add objects to the drawing. Tools generally have preset creation parameters called properties. When you click an object tool to add an object in the drawing, the Properties palette opens and you can change properties for the new object if desired. If not, you can go ahead and place the object in the drawing. Tools are arranged on tool palettes for easy access. To open the default Design tool palette, click Home tab on the ribbon, Build panel, Tools drop-down and then select Design Tools (see Figure 3).

You can modify an object in a workspace using any of the following methods:

- Object-specific ribbon tab – When you select an object, an object-specific tab is displayed on the ribbon. The object-specific tab contains commands that apply to the selected object.
- Properties palette – The Properties palette is one of the central locations for entering and changing information about an object. This palette has categories that group the properties by type.

- Matching properties between objects – You can use the Match Properties command to copy the style and display properties of one AEC object and apply them to one or more other objects of the same type.
- Context menu – Right-click the object to display its available commands.
- Direct editing with grips – Commands for modifying an object are accessible from the object's grips. Click an object in a two-dimensional (2D) or three-dimensional (3D) view to display its grips.



Figure 3: Design tools

COPYING TOOL PALETTES AND TOOL PACKAGES TO A WORKSPACE

You can create a linked or unlinked copy of the tool palette. A linked copy remains connected to the original in the tool catalog, so you can easily update the copy with any changes made to the

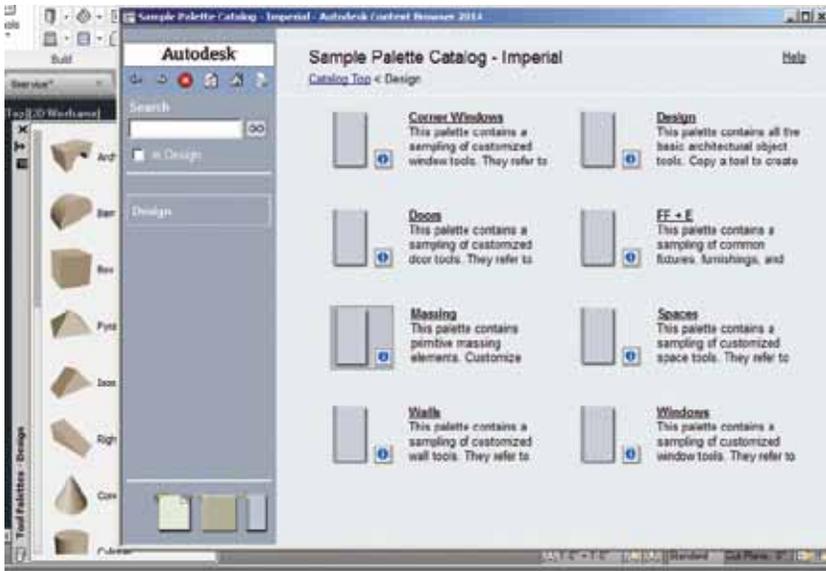


Figure 4: Tool palette

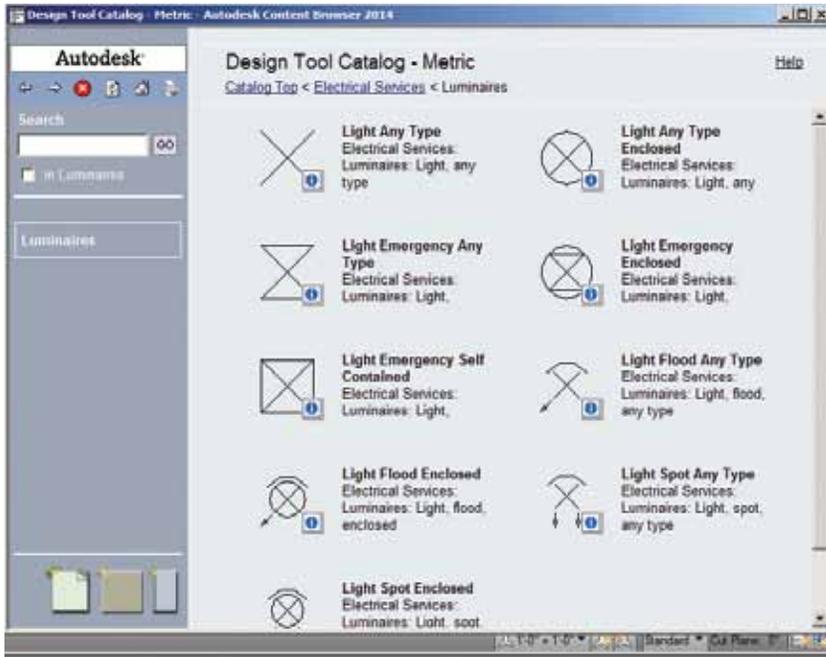


Figure 5: Tool package

original. An unlinked copy is treated as a new tool palette, with no relationship to the original.

To do this, begin by clicking the Home tab on the ribbon, Build panel, Tools drop-down, and then select Content Browser. Open the tool catalog containing the tool palette to copy to the tool palette set. If the palette is located in a specific category of the catalog, open that category. Move the pointer over the i-drop icon next to the tool palette, so the pointer image changes to an eyedropper (see Figure 4). To copy multiple tool palettes, press and hold Ctrl while clicking each palette and then position the eyedropper over any of the selected palettes. Drag the eyedropper according to the

desired action. If you want to store a linked copy of the tool palette in the tool palette set, then click the eyedropper and drag it to a tool palette in the tool palette set. If you want to create an unlinked copy of the tool palette in the tool palette set, then press and hold Alt. Then click the eyedropper and drag it to a tool palette in the tool palette set.

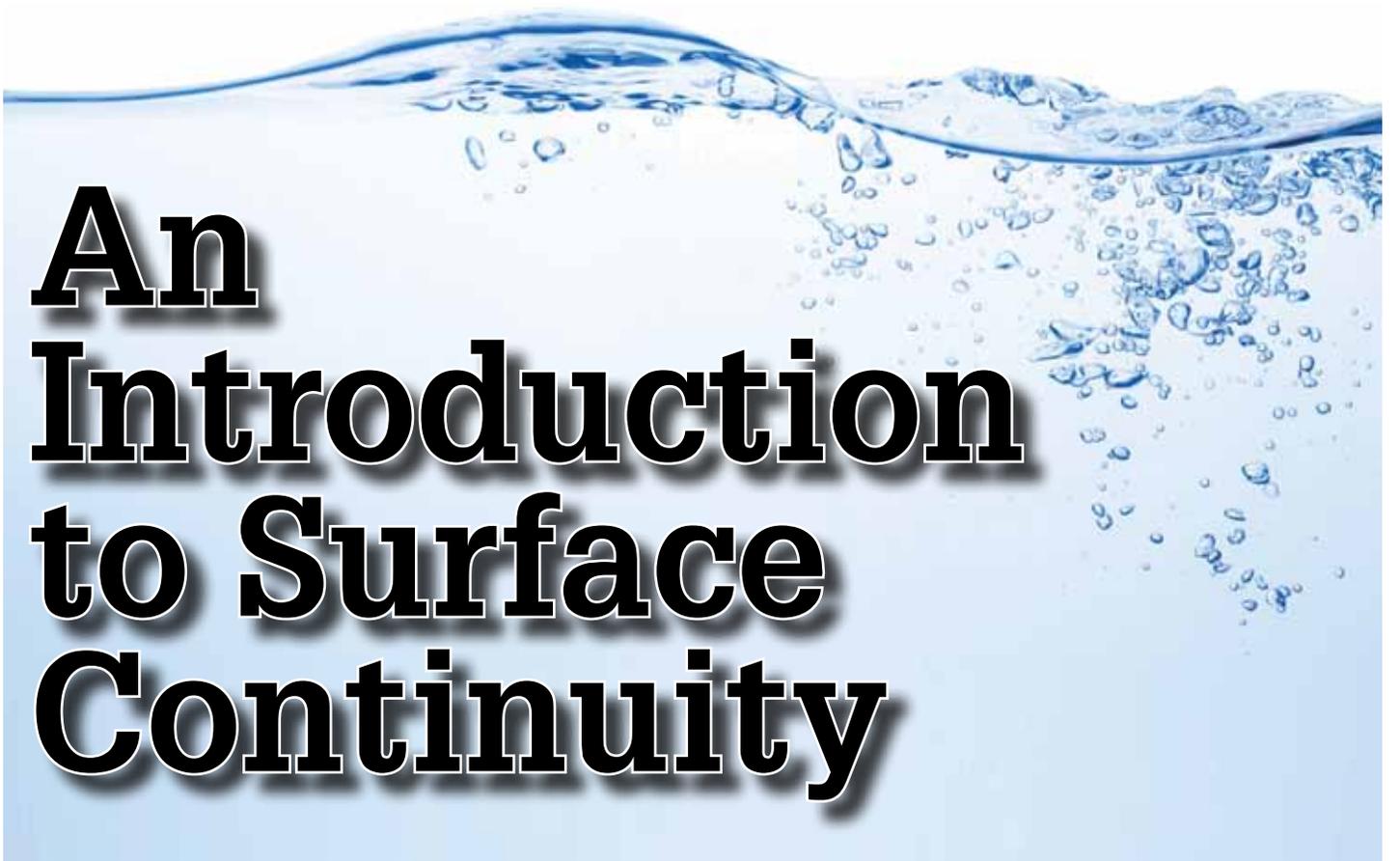
You can also create linked or unlinked copies of the tools in the package. A linked copy remains connected to the original in the tool catalog, so you can easily update the copy with any changes made to the original. An unlinked copy is treated as a new tool, with no relationship to the original. Just as you did with the tool palette above, begin by clicking the Home tab on the ribbon, Build panel, Tools drop-down, and then select Content Browser. Open the tool catalog containing the tool package to copy into the tool palette set. If the package is located in a specific category of the catalog, open that category. Move the pointer over the i-drop icon next to the tool package, so the pointer image changes to an eyedropper (see Figure 5). To copy multiple tool packages, press and hold Ctrl while clicking each package and then position the eyedropper over any of the selected packages. Drag the eyedropper according to the desired action. If you want to store linked copies of the package's tools in the tool palette set, then click the eyedropper and drag it to a tool palette in the tool palette set. If you want to create unlinked copies of the package's tools in the tool palette set, press and hold Alt, then click the eyedropper and drag it to a tool palette in the tool palette set.

CONCLUSION

Workspaces are sets of menus, toolbars, palettes, and ribbon control panels that are grouped and organized so you can work in a custom, task-oriented drawing environment. Workspaces keep things organized and easy to find within AutoCAD Architecture. It is important to customize your workspace so you are as productive as you can be.



Melinda Heavrin is a CAD Coordinator & Facility Planner for Norton Healthcare in Louisville, Kentucky. She has been using AutoCAD Architecture since release 2000. Melinda can be reached for comments and questions at melinda.heavrin@nortonhealthcare.org



An Introduction to Surface Continuity

Hard Surface modelling is possibly the most challenging discipline within 3D CAD, and the most rewarding, once you've gotten the way of it.

With a bit of surfacing theory, you too can relish meeting the challenge with Autodesk Inventor®!



WHAT'S SURFACE MODELLING?

Surface modelling is the art of building complex geometrical features, one surface at a time. Usually surface modelling is used to create flowing, organic shapes, so the junctions between surfaces are terribly important.

We describe the 'smoothness' of a junction, where one surface meets another, using the term 'G' (G stands for 'Geometry'). We can add a suffix to our G to describe how many like characteristics each surface has. The more alike the surfaces (that is, the more conditions that match across the pair of inputs) the more smoothly the adjoining surfaces flow.

G_ = NOTHING



Figure 1: Image from Disney Wikia

I always fondly remember being taken to our local library as a kid to see the movies on a big screen. This was before cable TV and the Internet, and describing it makes me feel old!

One personal favourite were the “Herbie” films, in which a plucky VW Beetle comes to life with hilarious results. The memorable scene is when Herbie breaks in half during a race, and ends up winning first and third place!



Like the bikes in “Tron” (The original “Tron”... again, feeling my age) the two surfaces meet and change direction very sharply, forming a distinct edge.

Two surfaces that don’t touch at all have no continuity. No ‘G’, nothing, nada, zip. As I try and imagine this in my mind’s eye, I can’t help but think of the bifurcated Herbie’s classically styled lines—so similar, but sadly not connected.

GO = CONTINUITY

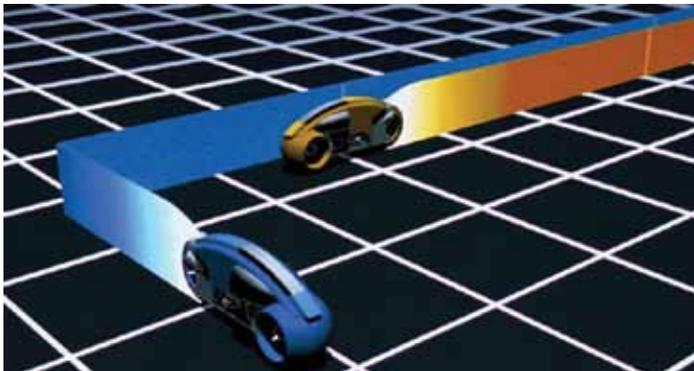
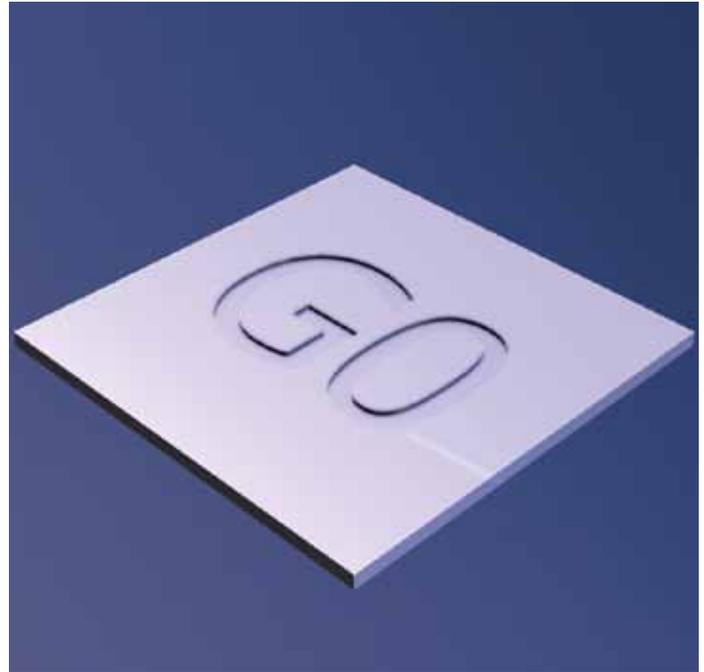
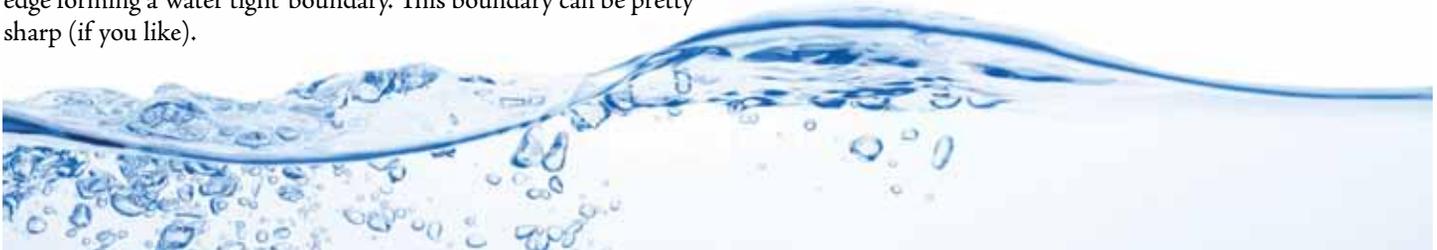


Figure 2: Image from Tron Wikia



Fact: Did you know that the CGI sequences on the original “Tron” movie were rendered on a computer that had only 2MB RAM and 330MB storage? The scenes were rendered one pixel height line across the image at a time—no one saw the final images until they were re-composited back onto film!

‘GO’ then is the first order of surface continuity, and it simply means that the two surfaces touch. They meet along a common edge forming a ‘water tight’ boundary. This boundary can be pretty sharp (if you like).



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G1 = CONTINUITY + TANGENCY



Figure 3: Images from 'Internet Movie Car Database'

In Tim Burton's 1989 movie "Batman," Michael Keaton, playing the part of Batman, fires a side-mounted grappling hook from the Batmobile, snagging a nearby lamp post and allowing the Batmobile to execute an almost perfect 90 degree turn.

This is a great example of Tangency. The Batmobile is travelling along a set vector, then it turns through a fixed point before heading off in a new direction. In surfacing this is the second order of continuity, which we call 'G1' = Continuity + Tangency.



You've probably created G1 surfaces without even knowing it. Any surface you created with Autodesk Inventor's fillet tool has G1 continuity built in.



G1 curves are sometimes referred to as Engineering Fillets, implying that they are best used for practical reasons (knocking sharp edges off a manufactured part) rather than aesthetic ones (smoooooth transitions).

G2 = CONTINUITY + TANGENCY + CURVATURE

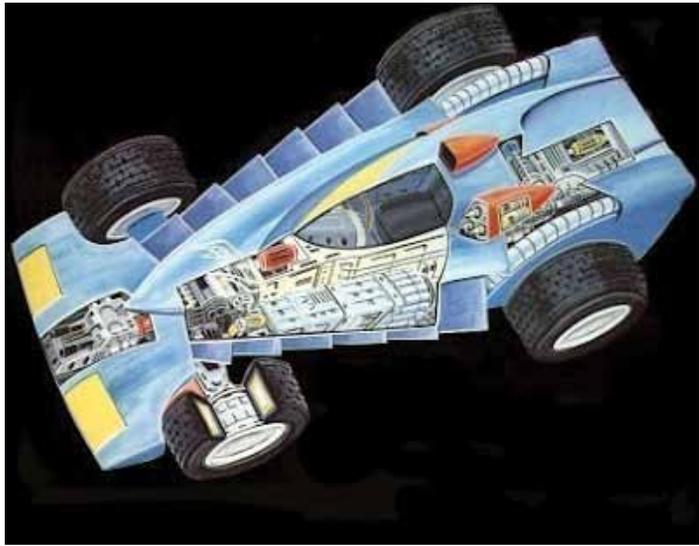


Figure 4: Image from The Dork Review

The coolest racing car ever, bar none, was Jason's Spacemobile from G-Force "Battle of the Planets." By weird coincidence, its number is G-2, which I did not recall when I started writing this article!

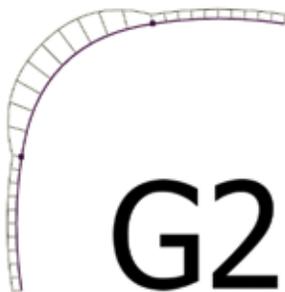
In real life, race car drivers aren't able to execute 90 degree turns, with or without the aid of grappling hooks! To minimise breaking and maximise speed through a corner, the driver takes the "racing line," the smoothest curve through the corner that the width of the road will allow.

G2 continuity adds another order (condition) that must match across our pair of curves. Our curves must now touch, be tangent with each other, and have the same curvature, at the point where they touch.

Technically, this means that our input geometry must be now be curved as well. Straight lines have no curvature (or infinite curvature, depending on your point of view) so a pair of inputs containing a straight line can't meet G2 conditions*.

Arcs have a constant curvature. A pair of tangent arcs with the same curvature where they touch would either form a circle or an 'S' shape. Abandoning lines and arcs, of course, means that splines become really important input geometry from G2+ surfaces.

The easiest way to demonstrate equal curvature is to use 2D curvature comb analysis. Right-click on any curved 2D geometry to turn this on.



The 'porcupine spines' in the image are heading in the same direction where the two curves meet, indicating that they are tangent. The spines are also the same length, indicating that the curves have equal radius at the contact point.

In real terms, G2 continuity means that the relationship between your two surfaces will be very smooth. In most cases this will be all you need to get a great result.

* you can cheat it though, and get close :D



However, for those rare occasions when "good enough isn't good enough," we can introduce a further order of continuity.

G3 CONTINUITY + TANGENCY + CURVATURE + ACCELERATION

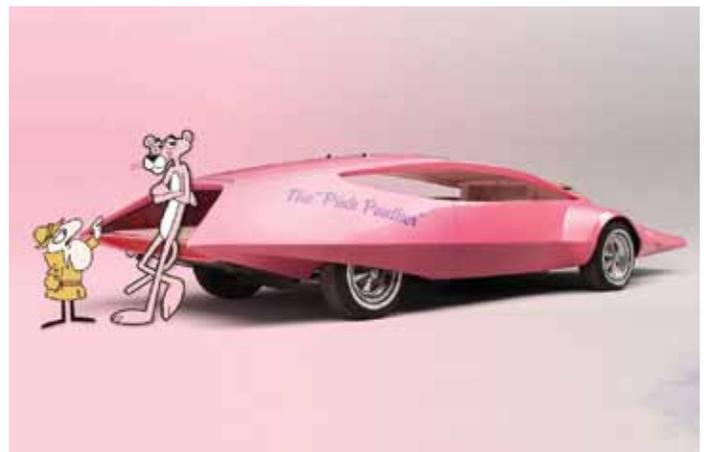


Figure 5: Image from formidablemag.com

It was a choice between the Pink Panther Mobile and Lady Penelope's Roller. I love Lady P, but the Panther's Limo doesn't get as much press ;)

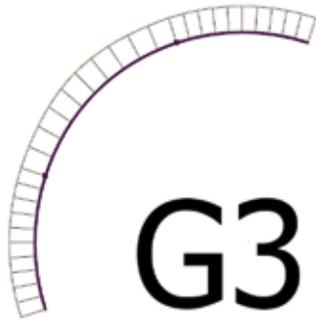
Chauffeurs don't blast around like an F1 driver. Every move must be considered and graceful to prevent the precious cargo from being rattled about (let's pretend that the precious cargo is you and me!).

The limo driver must accelerate gently, take corners without sliding us passengers across the seats and anticipate breaking early enough to be able to come to a complete stop without so much as a judder.

Inventor 2014

G3 curvature continuity includes the concept of 'Acceleration' of curvature. That is, the amount of change in the curvature, over the length of the curve.

Now this one is a bit trickier. Inventor doesn't have a G3 continuity sketch constraint. There is no G3 option in the fillet tool (or any other surfacing tool in Inventor). However, you can create G3 relationships—you just need to know how to recognise one when you see it.



Let's take another look at our 2D curvature combs. To achieve G3 continuity, the curvature combs should be heading in the same direction (Tangency), be the same length (Curvature), and, crucially, should also be tangent (Acceleration, or rate of change).

With a little careful tweaking, we can coax a G3 relationship out of our input geometry. The curvature analysis of a G3 junction should remind you of a ride in our limo—super smooth acceleration all the way through.



BEYOND G3?

Mathematically, you can keep on adding more 'orders' across curves to create G4, G5 - Gn continuity, but we are practical realists, so we are going to stop here. Even if you could create 'smoother' surfaces it would be pretty difficult to measure it, so no one would believe you anyway.

SMOOTH OPERATOR

If you've never tried surface modelling with Autodesk Inventor, I hope this article encourages you to give it a try. If you've tried and not succeeded, I hope this article gives you some insights into what might have gone wrong and a renewed enthusiasm to pick it up and try again.

Have fun, you old smoothy you.

IMAGE CREDITS:

Here are links to the images used in this article

Herbie the love bug split in half:

<http://disney.wikia.com/wiki/Herbie/Gallery?file=Love-bug-disneyscreencaps.com-11931.jpg>

Tron 1st Generation Light Cycles:

http://tron.wikia.com/wiki/File:Light_Cycle_1st_Generation_65.jpg

Batmobile:

<http://www.imcdb.org/vehicle.php?id=16573&l=en>

G-Force "Battle of the Planets" Jason's Racing car G-2:

<http://thedorkreview.blogspot.com/2012/08/gatchaman-vehicles.html>

Pink Panther Mobile:

<http://www.formidablemag.com/pink-panther-car/>



Paul Munford is the mind behind the CadSetterOut.com blog and is the Author of 'Surfacing for Inventor' for Infiniteskills.com. In his spare time he models spoons and other kitchen equipment because his is always hungry for more CAD. Find out more at <http://www.cadsetterout.com/autodesk-inventor-surfacing>.



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Implementing Integrated Visualization Workflow

The valuable role of 3D Visualization in architectural design is recognized by architects and designers more than ever before. When properly implemented, digital visualization can go beyond illustrating a milestone and become an important tool for gaining feedback and inspiring creativity throughout the development of a design. As visualization continues to grow and informs the design process itself, the days of panicked realizations that a rendering is needed for tomorrow's meeting will be over.

With the availability of online cloud rendering solutions, including Autodesk® 360, the element of time no longer drives the decision about whether to render an image or to go without.

In order to facilitate the office-wide success of a visualization pipeline that has a genuine influence on design decision making, several elements need to be in place. To synchronize image creation with the BIM mindset, it should be recognized that visualization will need to adopt the *central versus local* approach embodied by Revit.

GETTING STARTED: PLANNING

Planning an office's visualization pipeline should be a coordinated effort across multiple groups including information technology, design, interiors, marketing, and all 3ds Max® users. Standardization is as crucial to a Visualization Manager as it is to a CAD Manager. Whether there will be one or ten Max users, the setup and practices should be the same, enabling flexibility and efficiency as the workload evolves over time.

After the decision is made about the number of licenses to purchase, the next step to getting the visualization system up and running is coordinating with IT. For Viz Managers, it is important to map out precisely what is required of the network in terms of permissions, file access, storage, and deployments.

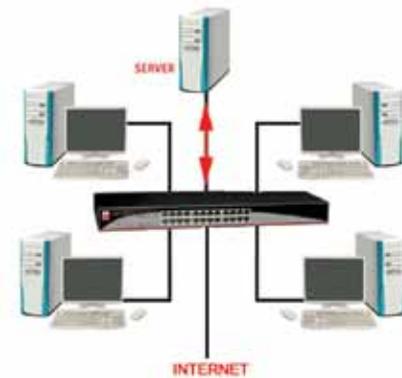


Figure 1

CENTRAL AND LOCAL

The practice of working locally and saving to the network is ideal for enabling 3ds Max to perform at peak efficiency. With Max, centralization means standardizing asset locations on the server. For example, if a Max file resides on the server along with its associated assets, bitmaps, textures, plug-ins, etc., the links do not need to be changed when the file is opened on another workstation. Within all Max files UNC (universal naming convention) asset paths must be used:

```
\\<servername>\<sharename>\<directory>
```

This is specified in the 3ds Max Asset Manager. This consistency allows any Max file to be opened by any user on any local machine where Max is installed without having to re-path broken links to assets.

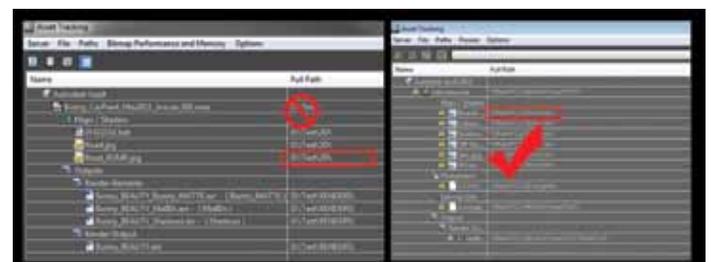


Figure 2

This also simplifies the network rendering component of the production process by ensuring that all machines in the queue have access to the same assets, and have permissions to write to specified destination folders. Common issues that arise when Back Burner is added to an existing local installation usually come from permissions inconsistencies and/or linking discrepancies, causing dropped frames, missing maps, and lost production time.

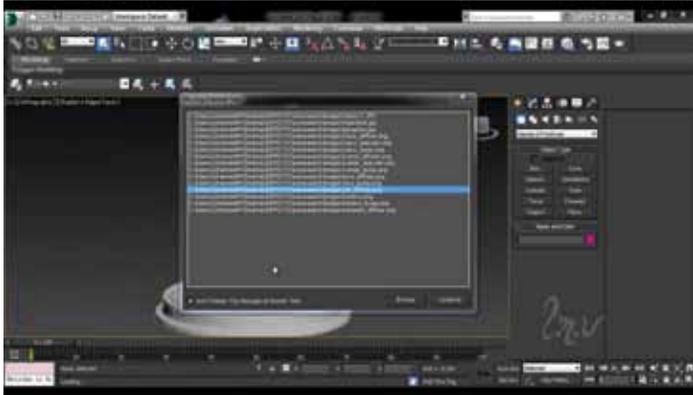


Figure 3

IMPLEMENTATION

Ideally, the install will be a network deployment, even if there is only one seat of 3ds Max to be used. This will enable the system to grow without needing to be retooled. During the deployment process the installer will guide you through the steps for setting network folder locations and files for each local installation.

Proper deployment requires that you have made a few choices ahead of time. Does it make sense to add Max folders to the project folders already on the network? Depending on available space, this may be acceptable. If volume should increase and especially if animation becomes a common part of your work, you'll want to dedicate 30 or more GB of disk space for the render destination folders alone. A 500-frame shot with six passes each means that you are rendering, and storing, 3,000 uncompressed frames. This can add up quickly.

MANAGEMENT

As a Viz Manager, your job will extend beyond putting the hardware and software systems in place. You will also need to set working standards for all users to learn and follow. These standards are two-fold. First, standardization of file naming conventions is vital to keeping logical track of revisions and option studies. Wherever possible, users should synchronize Max file names with other files created by the design team.

The second standard that must be followed is that of keeping the network files up to date. It is usually faster to work in Max locally. With large files, nothing can compare to the speed and responsiveness of a local workstation's RAM, CPU, and GPU power. This, in itself, is not a problem. However, at the end of the day all local files must be put on

the server, *without exception*. Although these two requirements might be unfamiliar to some users, in a short time they will recognize how much easier work becomes by adhering to these two practices.

For example, if a user creates a custom texture map on his local computer, he must avoid the temptation to link it directly into the scene. Instead, it is best to save the map to the appropriate folder on the network and link it into the Max file via a UNC path. This way anyone who opens the file is automatically linked to the correct assets. Another tip is to avoid reusing file names, thereby overwriting assets. If a user titles a texture map "Carpet_blue.jpg" and the finish choice gets changed, it is crucial to add a revision suffix to the file name such as "Carpet_blue_version_02.jpg". (Be sure to upload it to the correct network folder.)

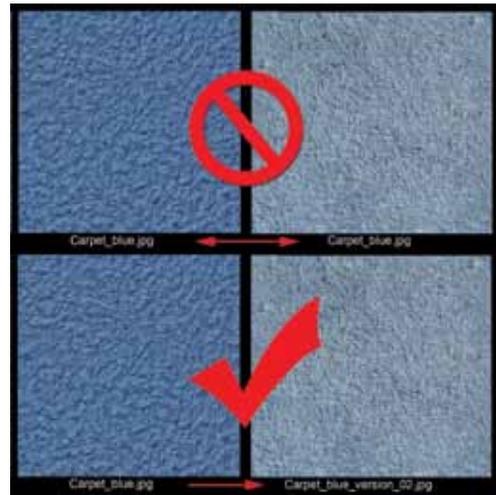


Figure 4

CONSISTENCY

Once a logical infrastructure is in place and consistent working methods are established, the value of visualization dramatically increases, both in the design process and in marketing initiatives. Proper use of a centralized rendering pipeline also streamlines network rendering, since all render nodes will use the correct textures whether through Back Burner or in a cloud-based system.

In conclusion, it is clear that the visualization component of the design process is most valuable when it coincides with the central versus local mindset embodied by the BIM paradigm.



Tom Cipolla is a digital artist specializing in architectural visualization. Born in New York and trained as a sculptor, he transitioned to working digitally in 2000. Tom has taught foundry practice, sculpture, drawing, and 3D software. Located in Boston, his studio, Onion 3D, provides visualization and animation services to designers, architects, and planners nationwide.

CNC Cut Files with Autodesk Product Design Suites, Part 2

INTRODUCTION

 **T**his handout was written as a supplement to the Autodesk University 2013 class given by Scott Moyse and Gavin Bath. They were kind enough to permit it to be formatted in two parts and displayed here. Some of the information was covered in more or less detail to suit that limited class format.

Part 1 (*AUGIWorld*, March 2014) covered various methods of producing 2D CNC cut files or tool paths within Autodesk Inventor®.

The conclusion, Part 2, covers iPropWiz, a third-party tool you can use to prepare manufacturing information associated with your designs. This will provide an understanding of how you can configure your Inventor design environment to benefit you in the long run. Also discussed is the concept of using Autodesk Vault to manage your design data, then ultimately your CAM and manufacturing data and some methods of presenting that to CAM programmers and staff on the shop floor.

CONTENTS

Introduction

- iPropwiz – Leveraging Your Manufacturing Information Configuration**
- Lists & Expressions**
- Model Properties Tab**
- Sheet Metal Properties Tab**
- User Defined UCS & Component Extents**

- Delivering/Presenting Manufacturing Information with Vault**

3D CNC Cut Files

- Parts Sorted By Material and Thickness into Assemblies**
- Inventor HSM Express**

Credits

IPropWiz – LEVERAGING YOUR MANUFACTURING INFORMATION

iPropWiz is an Inventor add-in created to simplify and ease the management of component properties. iPropWiz presents all the properties you are interested in, within a single view. Over the years it has matured, moving way beyond just presenting properties to the user.

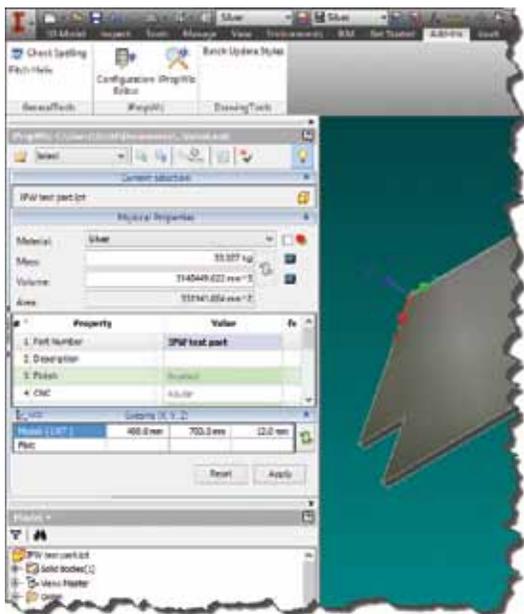


Figure 1: iPropWiz's non-modal dockable window

The iPropWiz property editor is a non-modal and dockable window, which means you can continue to work while it's open. Being able to keep it on a second monitor means you are constantly aware of, and working with, the properties fundamental to the design and ultimately the manufacturing processes.

CONFIGURATION

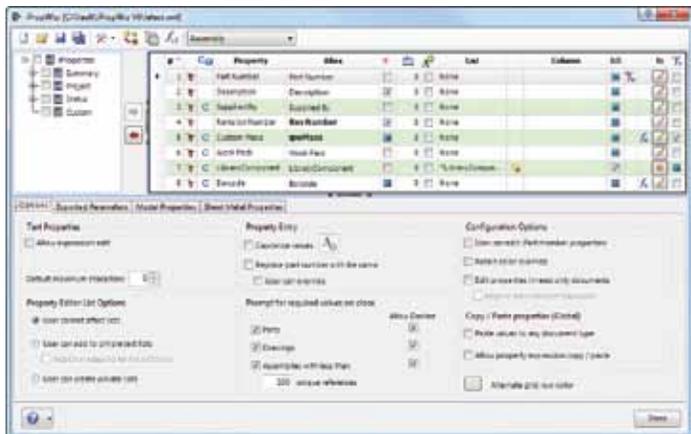


Figure 2: iPropWiz V6's configuration editor

Within the password-protected administration dialog box, you can set up formatting rules for physical properties, specify required

properties, and manage lists and expressions. In addition you can configure iPropWiz to check property compliance in real time or upon closing the files. All this will allow you to create a more stable environment for iLogic rules, add-ins, or Autodesk Vault Professional to guide the users, work in the correct direction for the benefit of CAM and manufacturing.

LISTS AND EXPRESSIONS

The new list types are some of the most powerful new features in iPropWiz V6 (see Figure 3). The Multi-Property, Material, and Parameter-based multi-property lists allow the administrator to monitor the value of a targeted property. When that property matches the criteria set by the list rule, it takes control of other preset properties. This can either be in the form of enforcing a value, or chopping and changing lists assigned to these controlled properties. Using material as a good example, steel has a different set of finishing requirements than plastic. These tools allow you to present those options to the user. Very cool stuff! In this article, we will use lists to create fixed values, which will drive the categorization of parts as they are checked into Vault.

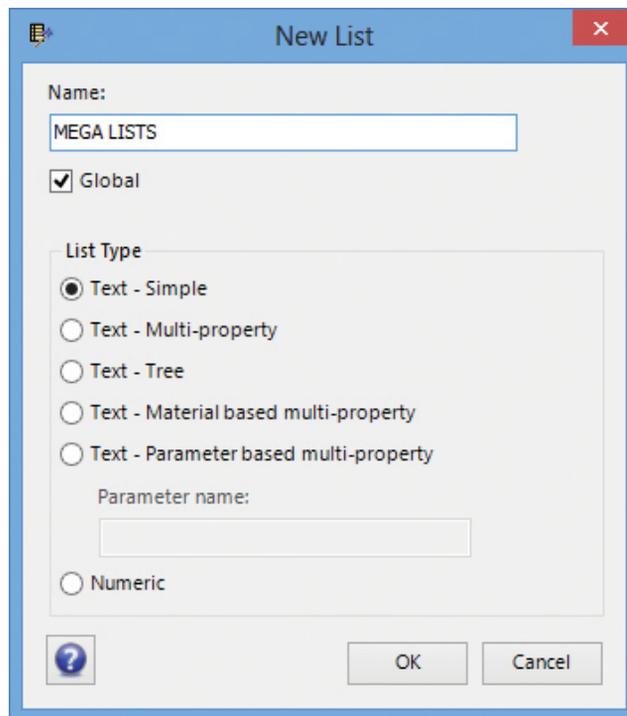


Figure 3: iPropWiz V6 sports clever new list types

MODEL PROPERTIES TAB



Figure 4: The Model Properties tab provides conditional formatting of physical properties

Inventor 2014

Notice the 2,77,999 tick box just to the right of the Secondary Format Rule drop-down list in Figure 4. That little sucker enables sorting of the three Extents properties from the smallest to the largest. This means you can use property expressions to map Length to the largest value and thickness to the smallest—or whatever your standard may be. For instance, if you don't select that option, you can permanently tie the Length property to the Extent in the X direction. In the woodworking industry, some companies would want to allow Inventor users to align the length property with the grain direction of the part.

As soon as the Extents tick box is enabled in iPropWiz Model Properties tab, it will create the following six custom iProperties:

Ordered Extents

- + ipwModelExtents1
- + ipwModelExtents2
- + ipwModelExtents3

Aligned Extents

- + ipwModelExtentsX
- + ipwModelExtentsY
- + ipwModelExtentsZ

SHEET METAL PROPERTIES TAB

iPropwiz provides three options for exported flat pattern area. By default, Inventor provides only one of these:

- + Bounding box
- + Outer loop area
- + Face area



Figure 5: There are a number of tools for managing Sheet Metal properties

The ability to automatically extract inner and outer loop distances can be utilized for pricing and planning CNC machine run times and consumable usage.

USER DEFINED UCS AND COMPONENT EXTENTS

iPropWiz allows the user to place a User-Defined UCS onto a part, then use it to calculate the extents of the entire component relative to that coordinate system.

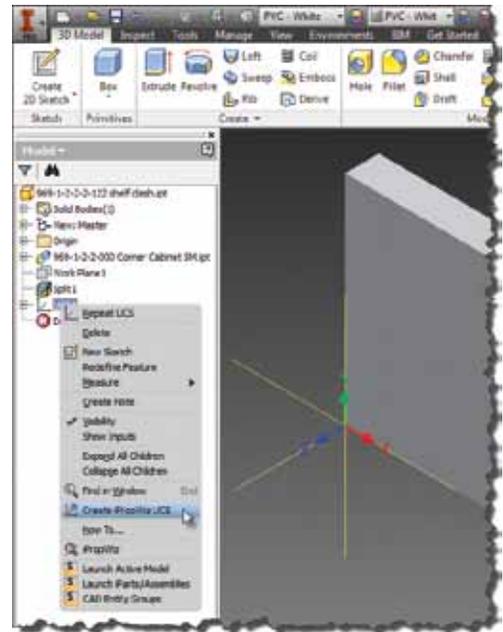


Figure 6: Create an iPropWiz UCS to calculate the extents of a component that isn't aligned to the WCS

With this in mind, you can now go back and take advantage of the Model Extents features mentioned earlier. The result can be seen in Figure 7.

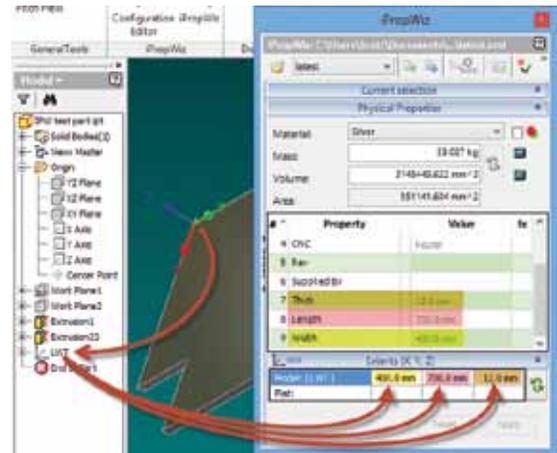


Figure 7: Using an IPW User-Defined UCS enables you to pre-populate essential BOM information automatically

The next advantage of placing a User-Defined UCS is that it suddenly gives you an index for placing and orienting parts for CNC toolpathing and machining. For instance, the X axis can be aligned with any grain/pattern direction you may need to consider, and the XY plane could be the bed of your CNC machine or clamp. Or maybe you have a saw blade add-on for your machine, but its axis is locked. With this you could ensure the appropriate axis is aligned with the modelled groove, which represents the saw cut.

Another way to take advantage of this information would be to create a little iLogic rule in your template document that could constantly keep an eye on the values, then inform the user when the part is too large to manufacture on any machinery at your disposal, or maybe exceeds the available stock size.

DELIVERING/PRESENTING MANUFACTURING INFORMATION WITH VAULT

Delivering the CAM and manufacturing-related information to those who need it has been referred to throughout this article. However, there are a few additional things that can be done with Vault to focus the view of end users within manufacturing. I'll focus on different CNC operators to illustrate the example.

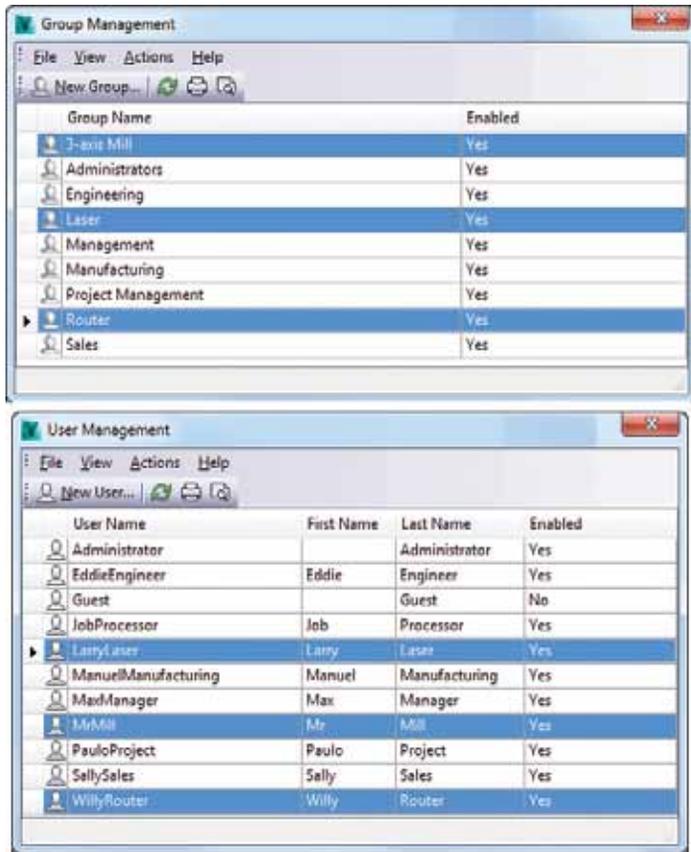


Figure 8: Create a group for each CNC type (above) and create CNC users and add them to their respective CNC groups (below)

Create a lifecycle for each CNC type.

Vault Professional 2014 Lifecycle Definition – CNC Lifecycle

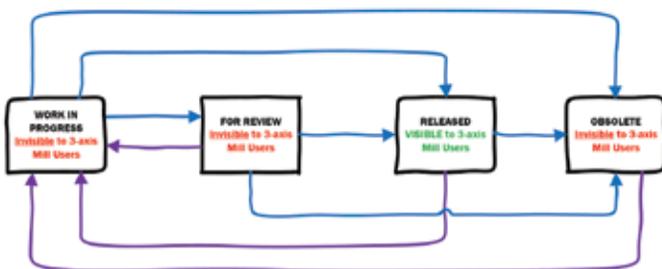


Figure 9: The 3-axis Mill group can only see files participating in the CNC for their CNC type when the files are released

Create a Category for each CNC type and assign a Lifecycle Definition, a Revision Scheme, and all the properties you want enforced on files of that category.

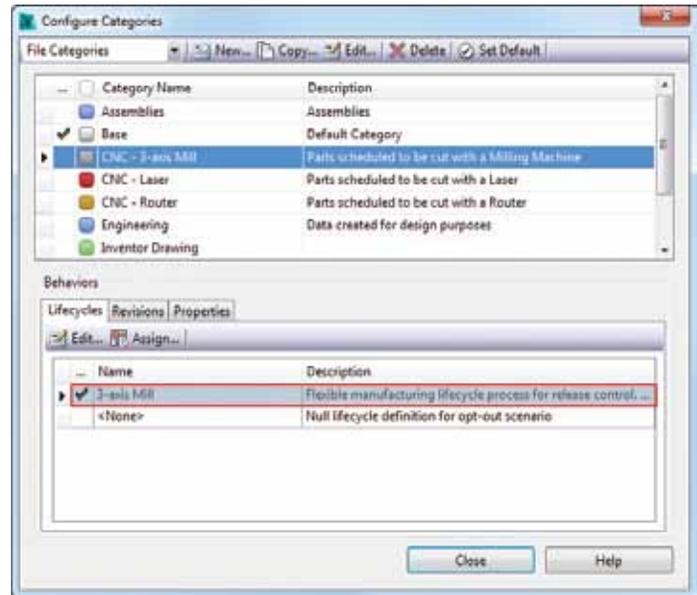


Figure 10: The 3-axis Mill lifecycle has been assigned to the 3-axis Mill category

Now you can create a rule for that category so any files meeting the Rule Criteria when checked in for the first time get categorized automatically.

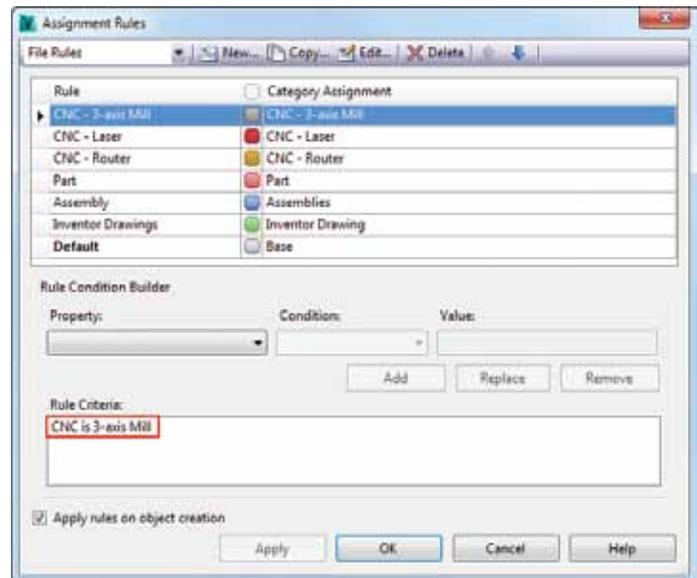


Figure 11: Using the Inventor CNC property, users can automatically assign categories upon first Check In

The idea behind this approach means you can configure Vault in such a way that CAM programmers and CNC operators can only see files that are relevant to them. You could expand on these lifecycles, allowing them to move the files off into another state once they have been programmed or machined, and so on.

Inventor 2014

You could then take advantage of Vault's excellent reporting tool to present status information to management and clients.

If you don't want users to have to rummage about in the depths of folder structures, you can simply create some search folders and combine them with some predefined custom views in much the same way as I did in the section on Parts Sorted By Material and Thickness into Assemblies below.

3D CNC CUT FILES

This is where you start to see data management software come into its own. Vault isn't just a means to look after your CAD data, but you can use it to make the most of the data and the information contained within it. We will now show you how you can use all that metadata to speed up the production of CNC cut files and get your designs to CAM faster.

PARTS SORTED BY MATERIAL AND THICKNESS INTO ASSEMBLIES

Using Vault's Custom View tools, sort and group parts by material and thickness.

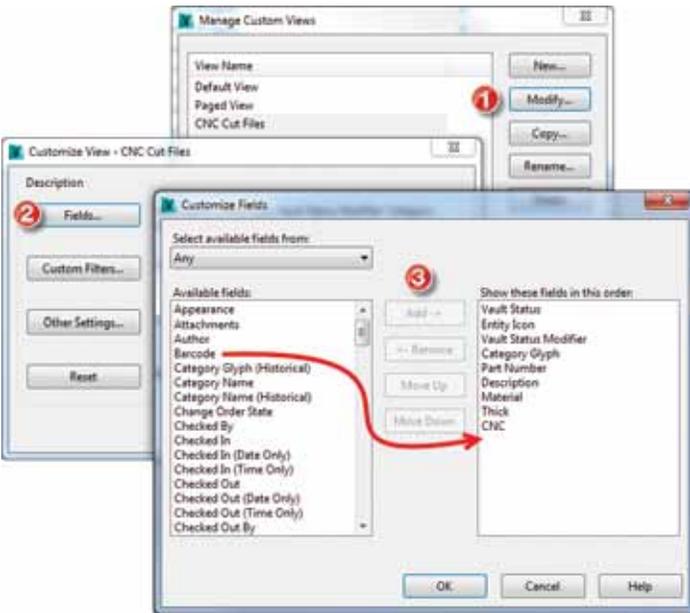


Figure 12: Create a custom view in Vault Explorer

You can also set up custom filters and other settings for your custom view. These tools can be surprisingly powerful once you learn to use them.

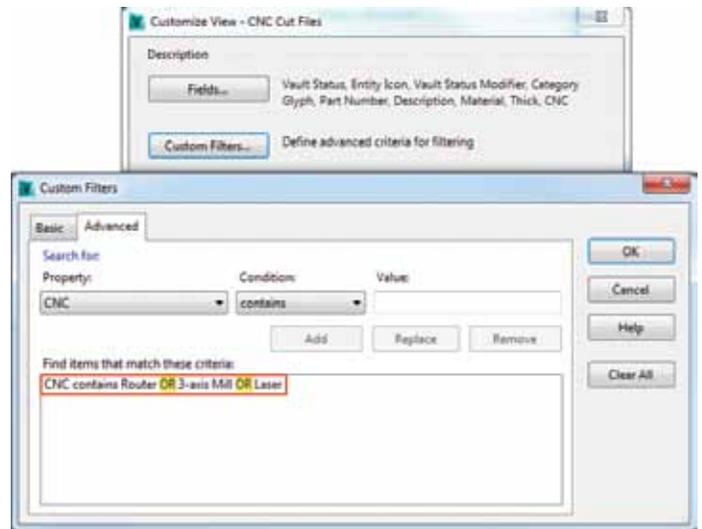


Figure 13: This is a sneaky Vault tip to get around the standard 'AND' nature of this dialog

Drag and drop the grouped parts from Vault Explorer into an Inventor assembly.

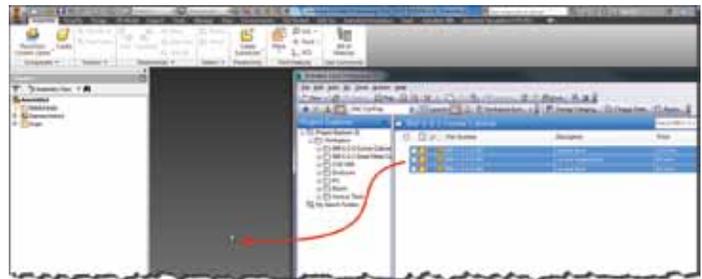


Figure 14: Drag and Drop CNC parts from Vault. Vault shows the custom filter created above activated

Constrain parts into place using the IPW User Defined UCS, aligning axis if appropriate.

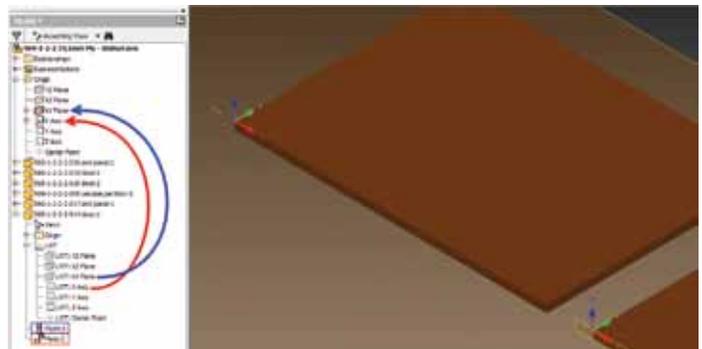


Figure 15: Constrain IPW UCS with the assembly origin

Save the assembly into a folder of the same name using the material and thickness as the filename for the assembly. Use a unique identifier as well, such as a contract/project number.



➔ **T**he implementation of AutoCAD® Civil 3D® can be a daunting task. For both small and large firms, the questions/concerns surrounding a full implementation of Civil 3D are relatively the same: How much time will full implementation really take? What are the costs associated with it? How will it affect productivity? How long until we will see a return on our investment?

Many companies have attempted to make the transition to Civil 3D since its inception in 2005. Some of them have made the transition look easy, even seamless, with minimal hiccups, while other companies have miserably failed. My goal with this article is to help you avoid some of the common pitfalls and establish a few best practices (some Dos and Don'ts) for a successful Civil 3D implementation.

GET THE “BUY IN” FROM ABOVE

The magnitude of a Civil 3D implementation is vastly underrated. We have all heard, “This should only take a week, right?” or “How hard can a CAD program be to learn? Google it!”

Well, first thing—if you don't have management support, you have nothing! Take the initiative to prove to your company's managers the various reasons for implementation. Gather case studies if needed and show the reasons why you may have lost recent projects. If “The Man” can see the potential for the company as a whole becoming more productive and efficient, the more likely management is to invest in the effort that is about to occur. Remember, you pay for what you get. Put minimal time and money into this, and you will see minimal return on that investment.

I recently asked a local company owner what he thought about when beginning an implementation. Here is what he said:

“I guess the biggest fear was the down-time that was going to have to happen in order to be proficient at doing what we were already doing. I had spent years getting fast and efficient in R14, and now to change was a huge fear.”

How can you argue with that? You can't! That is an absolute fact. Our job is to help management have that “ah-ha” moment—that moment when the light bulb turns on and they can get past the fear and see the value of what you are suggesting. This is the first and most critical step. Remember, you are literally changing the future and nature of *their* business, their baby. For you to succeed, management must not only be on board, but *excited* about moving forward.

PLAN, PLAN, THEN PLAN AGAIN

I like to keep my implementations set into multiple phases and multiple tasks, with each task needing a review and approval before moving onto the next task. This helps the QC process and ensures customer satisfaction and sign off throughout.

Brainstorm a while. Map it out. Outline the broader tasks, such as those below:

- Task 1 – The Health Check (Standards/Workflows)
- Task 2 – The Template
- Task 3 – The Training
- Task 4 – The Pilot

Use “Mind Mapping” software to help if needed. This will allow you to review, add, and make notes as you go through your brainstorming sessions.



Figure 1: Sample “mind map”

FIND YOUR “CAD SHRINK”

Okay...well this might not be an actual profession, but I may start a practice soon! Find someone who is willing to listen and give advice along the way, whether that is your favorite Autodesk partner or your buddy down the road. At times it can be frustrating and you may want to find someone who can be a support system for you. Occasionally you will want need somebody to vent to, bounce ideas off of, and collaborate with. Choose someone with a positive attitude who can help lift your spirits, not add fuel to your fire.

I have a good friend at a local engineering company who I need to coax off the ledge about once a week. And typically he talks his own way through the problem, or we brainstorm on ideas together. After that, he backs down off the ledge and continues his work. Remember as much as you will need support, you will need to be the voice of reason to others as well.



Figure 2: Yep! I've been on both sides of this one

NOW IS THE TIME TO SET STANDARDS

You have no idea how many companies out there have ZERO defined standards and ZERO defined workflows. Well, for those that don't, now is the time to set a standard style and a standard look and feel to your plans. Now is the time to make your plans, *your plans!* You want owners and contractors to look at a set of plans with no title block and say “This is a XXXX Company set of plans.” Strong plans equate to more business, especially repeat business.

Define your workflows. Define your naming conventions and folder structures. The more that can be defined, the fewer obstacles you will see during implementation. This is the time to clean up all those bad habits and begin to find those weak spots that every company has. Creating a “CAD Committee” may not be a bad idea. It gives those who care a forum for speaking out and giving their ideas on how to make things better. After all, this is a change for everyone in the company.

THE TEMPLATE

This is, by far, where I see most people fail, get frustrated, and give up. However correct your design may be, without a solid template you will spend more time fighting the look and feel of object and label styles than anything else you may do. This is the 800 pound gorilla, and it is something you have to take on and complete.

The #1 thing to me is: Do this prior to any training! I can't stress enough the importance of having a Civil 3D template, or series of templates if needed.

The #2 thing to me is: Don't let anyone tell you they can build a template 100 percent for you! The template is never 100 percent, and shouldn't be. You will always learn how to make things better, make a better style, or hundreds of dynamic labels.

An often overlooked part of a Civil 3D template is the command settings found within almost all individual categories. This will allow you to set those default styles and settings that appear when launching commands. Nothing bugs me more than to sit there and change style after style while doing certain tasks, especially when you are first starting out and are training the end users. Get them accustomed to trusting the template, and then they can get more familiar with different styles. This also ensures that standards are being met.

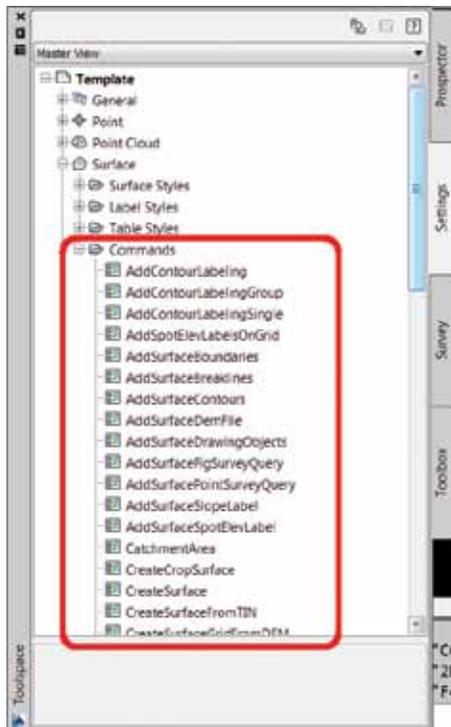


Figure 3: Command settings in Civil 3D

THE TRAINING

DO NOT try this in-house. Yes, some may succeed and spend months learning and training. But I have found it to be a much better outcome when you bring in somebody that has been there and done that. And I'm not only saying that because...well...that's what I get paid to do! But I fully believe that an outside set of eyes, the right set of eyes, can deliver a very successful implementation. Choose your implementation partner wisely. Find someone who is truly invested and cares about the outcome of the implementation and the future success of your company.

Books are great. Grab the "Essential" or "Mastering" books and you can learn a lot. Start at the fundamental level and you can really pick up the picks and click of the software. But a true implementation and training needs to happen on your projects, on your workflows, using your template. I would never train a company based on somebody else's template; (and this is the reason to complete Task 2 prior to launching the training). Choose a past project, or even a current project to utilize during the training. Choosing a past project works great. You have some of the details already ironed out and you know what the expected deliverable should be. It is also a good way to gauge the software, and to compare the "old" way of doing things to the "new" way.

THE PILOT

No, not a pilot to fly you away from this mess forever! It's not over once you get past the initial training. Choose a team and some internal "champions," and move into a live project. Don't make your pilot project a 4-leaf clover interchange with about 30 alignments, corridors, existing road widenings, etc. (Yes, this has happened to me.)

Instead, choose a project that is not too tough, but not extremely easy either. Pick something that may encompass a little of everything. This is where your template file will really begin to take form. There is only so much that can be done in a mock project, so utilize the pilot as time to clean up the template and add things as needed.

The pilot project also allows you to make some of those engineering decisions that may not happen in a training setting. Use this as an overall assessment of how the rest of your implementation plan succeeded. During the pilot phase, it is very helpful to include management as well. Let them see the "Wow Factor" and see the results of the money they have put into this.

Some choose to do more than one pilot project, and that is okay as long as you have... what? Management Buy In!

DON'T DO IT ALONE

I have seen many try to go at this alone, and as always, some succeed. But most fail. It is good to struggle through things, it is good to get frustrated, and that's how I learn best. But don't be afraid to swallow your pride and pick up the phone. Bring in a PARTNER, and I emphasize partner because that is exactly what the right person should be. As I previously mentioned, find someone who is truly invested and cares about the outcome of the implementation and the future success of your company.

DON'T GIVE UP!

You may hate me now, but you will thank me later. At least that's what I tell everybody up front at the beginning stages of an implementation. There has never been an "easy" Civil 3D implementation. It is a process, and in some cases a painful process. But when I see that light bulb turn on, when the wheels start to grind and you drink my Kool-Aid, you will then understand when I tell you that it is all worth it in the end.

GOOD LUCK :)

I wish you all the best in a successful implementation. This can launch your company in a whole new direction. This can launch the careers of those who want to be the next corporate CAD Manager. It is not easy, it may not seem fun, but at the end you will know that you have made the right decision. Good luck!



Shawn Herring is a civil engineer based in Utah. He has been a part of the design engineering community for roughly 12 years in all aspects of design, construction, and software implementations. Shawn has implemented and trained companies across the country on Civil 3D and best practice workflows.

URBANO V8.1.0.5 SHIPPED FOR SEWAGE, WATER DESIGN IN AUTOCAD

<http://www.studioars.com/default.asp> (<http://bit.ly/1iQr3wc>)
STUDIOARS

Urbano is designed for civil engineers that use Autodesk® AutoCAD®, AutoCAD Civil 3D®, and AutoCAD® Map 3D to design piping infrastructure.

The latest release introduces many improvements requested by customers. Some of the key features in the latest update are:

- New Terraform supports dynamic behavior, and is faster and easier to design digital terrain models.
- System summary shows a list of all systems in the drawing.
- Interactive topology editor allows interactive editing of topology nodes and sections.
- Drawing sections by specified angle.
- Draw auxiliary elements in longitudinal sections.
- Drawing and editing house connections.
- Bind data with pipes/manholes.



Inside
Track

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PDF3D REPORTGEN

http://www.pdf3d.com/pdf3d_reportgen.php (<http://bit.ly/1gxRFt7>)



PDF3D ReportGen is a desktop application that allows for the conversion of 3D modeling designs created with Autodesk® AutoCAD® and other programs into a 3D interactive document; 3D PDF file. The latest version now supports AutoCAD 2014.

“PDF3D ReportGen is a stand-alone end-user desktop application for generating 3D PDF documents. It operates as a converter to 3D PDF from various model formats. As part of the PDF3D family of publishing solutions for the Visual Enterprise, the 3D interactive documents created are viewable by the free Adobe Reader. PDF3D ReportGen converts 3D models from 70+ 3D file formats, by selecting input file and pushing the Convert button. With PDF3D ReportGen, enterprise work-flows can be extended to convert to 3D PDF, publish, share and distribute interactive models through email or the web, using an extensible collection of 2D and 3D templates.”

PDF3D ReportGen is suitable for a vast range of uses, for example:

- Scientific & Engineering Data Visualization Reporting
- Earth Science, Geophysical and Geological Modelling
- Reverse Engineering from Scanning and 3D Inspection Software
- CAD and PLM (production life-cycle management) production systems
- CFD, Hydraulics Engineering, 3D Hydrodynamic Modelling
- FEA (finite element analysis of structures)
- Geospatial 3D Reporting with Measurement
- Healthcare Anatomical 3D Reconstructions
- Interactive Training, Marketing, Sales-Quote Collateral

CLOUD RENDERER FOR AUTODESK REVIT

http://apps.exchange.autodesk.com/RVT/en/Detail/Index?id=appstore.exchange.autodesk.com%3acloudrenderer_windows32and64%3aen (<http://bit.ly/1gxSNgi>)



Cloud Renderer is a plug-in for Autodesk® Revit® developed by AMC Bridge LLC.

“Cloud Renderer is a family of add-ins for Autodesk® Revit® that enables physically based rendering of Revit 3D models on the Microsoft Windows Azure cloud platform. 3D models created in Revit can be displayed in photo-realistic views or rendered with built-in photo-realistic renderers. It is reasonably fast and produces high quality images. Physically based rendering provides images of much higher fidelity, but requires significant computational resources. For this reason Cloud Renderer utilizes advantages of cloud resources for rendering.

Cloud Renderer uses the LuxRender engine for the photo-realistic rendering. LuxRender is a free and open source software rendering system. Based on state of the art algorithms, LuxRender simulates the flow of light according to physical equations, thus producing realistic images of photographic quality. It is based on the PBRT project, but differs from that program by focusing on production rendering and artistic efficiency instead of scientific purposes.”

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