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# AUGIWorld

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# Editor's Note

# AUGI



Hello, AUGIWorld!

es, you are part of the "AUGI World" because you are reading this fine publication! This magazine is your magazine. You, the AUGI membership, create the content for it and do so to not only improve your own personal skill set and professional standing, but also to help

share your knowledge with the rest of the world at large. And with that I thank you and, further in this issue, the editors of this issue have pointed you out!

So onward... each issue of *AUGIWorld* has a theme to shoot for and this issue is no different. This month, on the heels of Autodesk University, we focus on industry insights. However, with the pressure of AU on many of our authors I think my little note here may be the extent of the topic! No worries, though—what our authors have contributed this month is great stuff!

As I write this letter I have just returned home from AU so I am quite full of insight I can share. First up is that AU was bigger than last year. Back in 2007 we saw a huge crowd at AU, I think it was +12,000, but after that, attendance took a huge hit with the economy woes. It has slowly been climbing back since then and this year there were close to 9,000 attendees. This was great to see and gives me hope for even greater things next year.

A visible mass of liquid droplets or frozen crystals made of water or various chemicals suspended in the atmosphere above the surface of a planetary body (http://en.wikipedia.org/ wiki/Cloud) were all the rage this year. Otherwise known as clouds, or "the cloud" in software terms, it began +2 years ago and looks to be the thing in 2013—whether you want it or not. Like most things that get developed, look for very tangible reasons to get "lifted" into the cloud (http://goo.gl/FsHPj ).

The other major development I noticed was apps. Autodesk is really looking for the next big enhancement to its primary software products to come from you—the "custom-izers." Who better to know what else is needed than the everyday users of the software? Create something cool to benefit yourself, and then consider sharing with the world. Perhaps you'll become famous as well (http://goo.gl/7dmbn)!

Lastly, something very new is Autodesk Expert Elite (http://goo.gl/SPpp9). Autodesk has begun an effort to formally recognize those users within the Autodesk sphere of support that help users worldwide. We at AUGI are looking at this as well to see how this fits in our mode of operation.

Okay, so that's a wrap for 2012! It has been a wonderful year for AUGI and *AUGIWorld* magazine. Come January you may notice a few tweaks to our design and layout as we work to become even more efficient at communicating our message. We know we have a great magazine and take great pride in moving it forward.

Take care, David Harrington

Until next month, happy reading!

# **AUGIWorld**

www.augiworld. com

Editors Editor-in-Chief

David Harrington - david.harrington@augi.com
Copy Editor

Marilyn Law - marilyn.law@augi.com

Layout Editor Tim Varnau - tim.varnau@augi.com

### **Content Managers**

3ds Max - Osama Ali AutoCAD - Curt Moreno AutoCAD Architecture - Melinda Heavrin AutoCAD Civil 3D - Christopher Fugitt AutoCAD MEP - William Campbell Column: Inside Track - Erik Lewis Inventor - John Evans Navisworks - Michael Smith Product Review - Lonnie Cumpton Revit Architecture - Jay Zallan Revit MEP - Todd Shackelford Revit Structure - Phil Russo

### Advertising / Reprint Sales

David Harrington - salesdirector@augi.com

AUGI Management President

David Harrington

Vice President

Peter Jamtgaard

Executive Director Mark Kiker

Treasurer

Desirée Mackey

**Secretary** Melanie Perry

### **AUGI Board of Directors**

R. Robert Bell Shaun Bryant Scott Ebert Tommy Holder Matt Worland Scott Wilcox

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# We don't really care.

That's right. We don't care which Revit version you use, because ARCAT.com has created the largest BIM library covering all formats.



## by: Curt Moreno

# AutoCAD 2013

# Smart AutoCAD Installs

t is hard to believe, but 2012 is nearly over and by the time you read this, 2013 will be even closer! With the new year looming so near, plenty of CAD professionals are writing resolutions for the new year that include those chores we all try to put off. You know the ones I'm talking about. The list that includes the bittersweet task of upgrading all of your users to the latest release of AutoCAD<sup>®</sup>!

It is both a joyous and a fearsome task.

# **IN A PERFECT WORLD**



With just a few week's worth of night times left between now and the release of AutoCAD 2014, I imagine that more than a few of us will dream of a perfect world with frictionless upgrades. Dancing in the sleeping minds of CAD managers everywhere is a world where installations are instant and every workstation is prepped

and primed for the upgrade. We dream of a time when users willingly schedule time into their day for us to come in, riding white horses, with the shiny AutoCAD packaging held high above our heads, ready to install without scheduling conflicts. We certainly have at least daydreamed of a world where installations of the newest AutoCAD release was headed for a workstation with plenty of free hard drive space and RAM to spare.

All of this, of course, is not even accounting for the adulation we would receive from our collective users for rescuing them from CAD obsolescence. Yes, this is a world of magic CAD unicorns and instant, effortless upgrades.

## THE COLD, HARSH TRUTH

Unfortunately there is a harsher reality that exists far from the land of CAD unicorns. It is one fraught with perils for the CAD manager 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 warriors. And like every great war, this one is made up of smaller battles that each needs to be won.



# AutoCAD 2013

The simple procurement of the latest AutoCAD release can be a true difficulty if your firm is not part of the Autodesk subscription plan. It can seem as if no amount of new features or improved workflows and user interfaces can sway some tight-walleted 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. How many of us have gone gray fighting the uphill battle against this sort of situation? Too many, I am certain.

Let's not fool ourselves into believing that the bumps in the road end once you've ridden the upgrade cart past the boss. No, there are the users. That's right, the very people you are trying to help can most often be unintentional obstacles themselves. Whether it be production schedules that preclude any possibility of software installation during normal hours or that "helpful" user who finds the deployment and upgrades himself. Users can be difficult. Sometimes even the simplest user aspect 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. No sir, from OS updates to hardware requirements workstations are a topic that deserves attention in the planning of any upgrade process.

### A BETTER PATH

The fortunate part of this AutoCAD upgrade tale is that there are always solutions to whatever problem may present itself. This fact is no less true in the path to upgrade nirvana. It's just a matter of planning and steady execution.

First, we need to be more aware of the obstacles our users face on a daily basis. This is an observational effort that we, as CAD managers, should make throughout the year. When we get questions beyond "What's the name of that command?" that require us to put on the

old thinking cap, that is one to mark down. Similarly, "workarounds" that we develop in the office to circumvent some issue should also be noted. This list of notes, along with some generalizations about lost production time, can be invaluable when trying to get upgrade approval from management.



As official word of the new release hits the streets, 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.

It is imperative that we remember that users are not our enemies, and we also need to hope that they realize the same about us. No matter the office location or type, the end user of AutoCAD is a production or design professional who is in business to design or produce. That means that every moment that their workstation is unavailable to them is production revenue lost. So we must do our best to plan and execute the upgrade process so the user is impacted as little as possible.

Communication is the key to making the upgrade process as smooth as possible. First contact announcing the upgrade initiative should come at least two weeks prior to installation. While this



# AutoCAD 2013

may seem like an excessive amount of time, I am sure 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.

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

Active and participatory users will make short work of replying to you and setting up times. Again, some users require a little nudge and there will always be one person who has to be told what is coming. In the end you should have a staff of users who are excited about the new AutoCAD version and who know when to expect this hot new release. Now you are ready to put some boots on the ground.

When approaching the workstation, no special stance is required. Even though these evil little beasties want to bite, they cannot



unless you are careless. So 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. Removal of old installations is beneficial to both workstation and user. It ensures that no lingering bits of shared libraries or other resources are left behind to cause issues. It also helps reluctant users avoid the temptation to keep using the old version. In the process you want to make sure you get all those little directories that may be left behind by the uninstall process. In addition, a tool such as CCleaner from Piriform (www.ccleaner. com) can do wonders for cleaning your registry while also creating backups of removed data.

Beware: some users keep old installs for plug-in compatibility issues. I'm looking at you, hydro people!

Hardware that is found to be subpar, defective, or absent should be listed and reported to your IT department (which may also be you). Let the user know that you are not able to install the new release of AutoCAD onto their workstation and what parts require attention. Then 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!

This sort of approach ensures the workstation is a clean slate of capable hardware that will serve as a solid platform to build a new AutoCAD install. Now you are ready to get in there and install that awesome new AutoCAD.

### DON'T FORGET THE ICING

The final topping on this AutoCAD installation sundae is all about the little things. But, little or not, they are vastly 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 the user will thank you for it. Now it is time to make that next appointment on the list or serve up

# AutoCAD 2013



that long stretch of support until the next upgrade cycle. A CAD manager's job is never done!

# **IN CONCLUSION**

While getting the newest, shiniest tools available in the new release of AutoCAD is always a great bit of excitement, the actual upgrade process can be frenetic. This is the cue that you need to take a more managed, measured approach to upgrades. You may suddenly realize that your little two-drafter team has become a 30-person workforce and playing things by ear just won't cut it.

With good planning, good communication, and good execution you will find the endless advancement through the AutoCAD releases much easier to handle and not something to fear. And, hey, if something goes less than perfect this year, that's okay. 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, highly rated Autodesk University speaker, and training content developer. In his spare time Curt writes, games, and spends time with his dog and horses.

# AND HERE'S HOW ... TO STRIKETHROUGH SINGLE LINE TEXT

# **By: Michael Beall**

I was covering the features of Mtext not long ago and discovered a new option in AutoCAD 2013, found on the Formatting panel of the contextual Text Editor tab when adding Mtext: Strikethrough.

Being a proponent of both Single and Multiline text (use the appropriate tool for the job) I was wondering if you have the Strikethrough option when editing single line text. The answer is 'Yes', but let me show you how I found it.

### THE LOGIC

- A. By default, when editing single line text, a 'frameless' editor is displayed, but the right-click menu has no option for Strikethrough.
- B. If you use the Strikethrough on Mtext, then Explode it, you still have the Strikethrough characters.
- C. Set the variable DTEXTED to <1> for the legacy Edit Text dialog box for editing single line text.



D. Double-click single line text with the Strikethrough characters, and you see your answer: %%K

As my buddy Hugh Bathurst always said, "Job done!"



Michael E. Beall (B. Arch.) is an Autodesk Authorized Author and the owner of CAD Trainer Guy, LLC. He has been presenting on-site CAD training around the planet for more than 30 years. Contact him at michael.beall@cadtrainerguy.com, or give him a call at 502.500.2267.

# **Revit Architecture 2013**

# Who Owns The BIM?

Ust recently I was reading the newly published New York City *BIM Guidelines,* issued by the NYC Department of Design and Construction (DDC). You can find it here:

http://www.nyc.gov/html/ddc/html/pubs/publications.shtml

For this article I am going to quote heavily from this publication. This doesn't mean, however, that the NYC DDC is doing something out of the ordinary. Their document is more or less similar to lots of others I have seen these last few years. But this one does take it to a whole new level.

### **GENERAL GUIDELINE PURPOSE**

So why does one need BIM guidelines? They are needed for settling the technical details including:

- General agreements about the project, scope, participants, and so on
- Software and ICT infrastructure
- Level of development
- Model and drawing standards
- + Responsibilities and liabilities

There is also another use: settling ownership rights. In addition, it is this point that often leads to some weird developments.

## HOW DID WE DO THIS, AGAIN?

Not so long ago, in a place similar to ours, there were buildings built from drawings. Architecture was pure and unspoiled, which resulted in mind-blowing pen drawings. Or, with more sophisticated methods, the Rotring pen was traded for a computer mouse and the lines were drawn on screen.

Anyway, the point is the design was, by definition, a conceptual idea

of what the building should look like. It was simply not possible to draw the entire building, so architects and engineers resorted to drawing the typical parts once and then some exceptions to those parts. With that, the owner and contractor had the tools to envision and/or construct the building.

In those days, too, there were often quarrels about who "owned" the design. Architects positioned themselves as a form of artist, and their work as a form of art and, therefore, protected by artistic copyright laws.

Owners and contractors in their turn argued that they should have the right to amend and change this "design intent" as they saw fit. After all, they paid for it.

In my humble opinion, both were somewhat right. An architect's (and engineer's) work often is the result of creative, artistic thinking. Architects (and engineers) have given the people of this world structures of unspeakable beauty that enriched our environment. Moreover, at times they have given horrific ugliness, but that's beside the point.

But all these structures are not the same as paintings, sculptures, and similar types of art. They're objects of use—meant to be worn down, revitalized, adapt to changing needs. Upholding this copyright too vigorously would dramatically decrease the lifespan and usability of these structures.

Practical beings that we are, most of the time a compromise is made: the owner/contractor can amend things, but once the design intent is at stake, the architect/engineer gets a say. Of course, there are always exceptions, in both ways. Some architects get bullied into

# **Revit Architecture 2013**

giving up their rights; other times owners are left with a completely useless heap of bricks and steel that does not meet their demands without the possibility to change it.

### SO WHAT CHANGED?

In the old days, an architect was designing buildings. That's it. And he had a bunch of engineers providing him with valuable feedback and technical responses to his design. When the design was finished, the contractor got the drawings, made some more of his own, and then the entire thing was built. Period.

Each party was responsible for his/her own part. They all made their own drawings, reports, calculations, and so on. At best, they could use information provided by other team members as an underlay for their own work.

Now let's look at the comprehensive list of uses the DDC sees for BIM:

- 1. Existing Conditions
- 2. Site Analysis
- 3. Programming
- 4. Engineering Analysis
- 5. Design Authoring
- 6. Sustainability (LEED) Evaluation
- 7. Design Review
- 8. Code Validation
- 9. Clash Detection
- 10. Cost Estimation
- 11. Construction System Design
- 12. Phase Planning
- 13. Digital Fabrication
- 14. Record Modeling
- 15. Asset Management

Now this stuff was bound to happen in the old days, too—in one way or another. The difference lies in the amount of integration between all these workflows. As the DDC puts it:

BIM strengthens collaboration by allowing all members of the design team to accurately add to a shared database information about how a building looks and functions. Using this information, the BIM database creates a virtual model of a building at every stage—from design conception through construction and occupancy.

This integrated workflow means two things:

- It's no longer possible to just get away with "design intent." A BIM is, by definition (if applied to all 15 uses), a fully functional virtual building.
- 2. All this information is contained within a single file. When there are multiple files, they are connected.

So this has a major influence on the whole ownership debate. It's not about "just" the design anymore. It's about owning all the information contained within the BIM. It's about the participants' technical knowledge, patents, copyrights, and highly sensitive corporate information.

This statement seems bold, but is ironically stressed by the DDC's

take on model ownership:

DDC holds ownership of the BIMs including all inventions, ideas, designs, and methods contained within the model. This includes, but is not limited to; the content submitted as part of the BIMs itself.

Outside resources, such as consultants and/or contractors, using the BIM are granted temporary use of it for the duration of the project. After project completion they are required to return all copies of the BIM to the DDC.

DDC holds ownership of all the contents within the models from project conception (pre-schematic design) all the way to completion (construction)

### WHY IS THIS BAD?

Let's look more closely at what the DDC is stating here because basically, it's a dead letter—wrong in so many ways it seems discordant with the rest of the document which, in fact, seems well thought through.

- I can relate to the DDC taking ownership of the design. I don't agree, but it's a never ending struggle. They're not the first entity thinking this will benefit them, and they won't be the last. But that is only the beginning...
- Ownership of all ideas and inventions? Seriously? Maybe they can get away with bullying an architect or engineer into surrendering their design, but this will not ever work. Does the DDC really think a manufacturer like, say, Alcoa (biggest manufacturer of aluminum building facades) is going to surrender its patented products?
- Ownership of methods contained within the model. Is this about modeling methods? So we can't model things twice in the same way? Autodesk<sup>®</sup> will love this one. Or are we talking about construction methods specified in the model? Contractors cannot use the same work methods again?
- DDC holds ownership of all the content? Again: Alcoa will have to surrender its BIM content? Or Autodesk, for that matter?
- All outside resources are required to return all copies of the BIM? Who is going to check this? How do they want to enforce this? What about insurance companies demanding to keep a copy of one's work for liability reasons?

It seems as though I am exaggerating a bit, but I'm really not. This is what the DDC is stating, down to the letter.

- Is it their intention to be so rigid? I hope not, for several reasons:
- It would cost an arm and a leg in lawyer fees to enforce this. I mean, it's not like manufacturers are going to comply. Or any other design/build party for that matter. And they can't. Surely the IRS, their accountants, and/or their liability insurance would want some proof of their work.
- It rules out warranty on a job well done. So a model is turned over to the DDC. And, at some point in the future, it turns out to be wrong—costing the DDC, or one of the associated public agencies, a load of money. How will they hold their

# **Revit Architecture 2013**

design/build partners liable? They don't have a model anymore. They can simply state, "It wasn't me. Can't prove it, since I had to turn over everything, but it wasn't me." I'm no lawyer, but my common sense says that when the DDC willingly took ownership, they took ownership with all faults and defects.

It kills innovation. So I got a job for the DDC. I can do either one of two things:

a. Get the job done. Just get it done—nothing more and nothing less.

b. Get the job done and do it in the best way possible. Explore innovative new thoughts and ideas. Invest in new production methods because when they turn out to work, I can reuse them in future projects.

Now look back at the DDC's take on Model Ownership and tell me which route you are going to take. I bet it's not option b. Why? There's no long term for you. You get paid, you deliver, and then you lose all rights to your work. So why put in something extra for future benefits?

It's just plain and utterly wrong. A person's, or company's, ideas, thoughts, inventions are theirs. It's the foundation of our economic system. You come up with something brilliant? Then you get to benefit from it—whether it's something everybody uses thoughtlessly day in, day out like a paper clip, a staggering world-changing thing, or just capturing the concept of beauty in a pile of dirt and metals. The fact that somebody else will be using this does not make a difference.

### WHAT WAS THE DDC THINKING?

I cannot look in the hearts and minds of the people drafting this Guideline. I can, however, tell you what most companies want: CONTROL.

They want to be able to use and leverage their BIM. And they should—they paid for it. They want to be able to change it, alter it, expand it. In five years they want to be able to implement new insights.

What they don't want is to be dependent on third parties for the above things. Pay extra every time they want to change the model in any way. To be suddenly faced with a bankrupcy of the model owner. Or a "misplaced" file. A server crash, wiped backups, and so on.

Let me be very clear: all of these are equally valid arguments. They come from a long line of real-life examples.

## **IS THERE A SOLUTION?**

Look around you. Almost everything you see, use, and hear is subject to the same solution. There is even an acronym for it (and boy, do we love our acronyms): EULA—End User License Agreement.

They come very simple (Best to Use before), somewhat more complicated (Warranties that come with consumer goods) to downright ugly (lease contracts on buildings and insurance policies).

That's basically what we need for BIM, too. An agreement which constitutes the following things:

- Ownership of the BIM who owns what piece of the model, the ideas, innovations, and processes it contains? In my humble opinion, everybody keeps their share. But that's just me.
- User rights which parties are entitled to use and/or alter the BIM, and for what purposes? For instance, an architect remains owner of the design and is entitled to use it for commercial reference, but not to rebuild the building somewhere else or sell any data in or relating the BIM. The building owner does not own the model, but has full user rights to maintain, alter, or delete any information in his/her copy. And so on...

OR the architect surrenders his ownership (see point 1) but is granted certain user rights.

- Warranty What if something is wrong with the model? Who is liable? And for what? And for what period of time until the warranty expires?
- Warranty limitations What actions limit the warranty of the model and the data inside? For instance, if an owner decides to do a renovation, the data concerning the mechanical systems may not be valid anymore.
- User limitations What actions are specifically NOT allowed by users? Think about reselling the BIM or any content in it, re-use of other participants' vital company information, and so on.

The basic point is that writing down "Put your hands where I can see them and hand over the BIM" just doesn't cut it anymore.



Martijn de Riet is a self-employed BIM Consultant from the Netherlands, working with Revit since version 5.1. Martijn has a bachelor degree in Building Science. After his studies, he started his own engineering firm working for contractors, architects and private clients. Starting in 2007 his company transformed into a full-time BIM consultancy service. At the moment, Martijn's clients vary from midsized architectural firms to the largest Dutch General Contracter and MEP Engineering firms, with a focus on specific corporate solutions, design and implementations of Revit and BIM workflows. Martijn is a member of the Dutch Revit User Group and currently working on creating a Master Template and Component Library. He provides lectures for companies, technical universities, and seminars on a regular basis.

# Autodesk Exchange Apps Debuts Across Multiple Products

esign and engineering professionals face a diverse set of challenges, and require specialized tools to get their job done. Although Autodesk<sup>®</sup> makes a wide variety of products, customization on top of the software with third-party applications (apps) can provide even greater tools and options.

AutoCAD<sup>®</sup> first featured AutoLISP in 1986, and users have customized their CAD installations ever since. Today, custom apps range from content libraries to drafting shortcuts. Although these apps are quite useful, they were spread over

many different locations, making them hard to find. Now, these apps are in one centralized place called Autodesk Exchange Apps, which can be accessed from within many Autodesk products, or on the Web at: http://apps.exchange.autodesk.com/.

# WHAT IS AUTODESK EXCHANGE APPS?

Autodesk Exchange Apps is an online marketplace where a CAD user can find a variety of add-on apps for customizing his or her software. Within Autodesk Exchange Apps, you can search by app name or a description of the app, or you can simply browse by category. Once you find an app you are interested in, you may learn more by taking a look at the user reviews. Autodesk also reviews and tests each app before it is published.

Originally, Exchange Apps was available only to AutoCAD users, but now Autodesk offers storefronts for 13 major products, including AutoCAD<sup>®</sup>, Autodesk<sup>®</sup> Alias<sup>®</sup>, Autodesk<sup>®</sup> Inventor<sup>®</sup>, Autodesk<sup>®</sup> Revit<sup>®</sup>, Autodesk<sup>®</sup> Vault , Autodesk<sup>®</sup> Simulation Suite, and the discipline focused AutoCAD<sup>®</sup> products (such as AutoCAD<sup>®</sup> Architecture, AutoCAD<sup>®</sup> Civil 3D<sup>®</sup>, AutoCAD<sup>®</sup> Mechanical, etc.).

# WHAT KINDS OF APPS ARE AVAILABLE?

Within Autodesk Exchange Apps there is a tremendous assortment of apps, most of which are free. Some interesting apps are Excel2CAD (http://bit.ly/NoCzXr), which imports Microsoft Excel spreadsheets as native AutoCAD objects, Okala (bit.ly/NoCEuf), a tool which helps designers select appropriate ecological design strategies, and Command Trends (http://bit.ly/KQWajf), a plug-in which tracks and reports on your AutoCAD command usage to increase efficiency.



Revit<sup>®</sup>, Figure 1: The AutoCAD Architecture Exchange Apps store.



Figure 2: Command Trends app screenshot.

There are solutions for some of even the most complex engineering, simulation, and rendering needs.

This variety of apps within Autodesk Exchange Apps means that almost everyone will find something useful. In addition to this, reviews and screenshots provide more information than ever, helping users make good decisions about which apps they want to try.



Figure 3: Sample Apps information.

# **BOOSTING THE DEVELOPER NETWORK**

One of the biggest advantages of Autodesk Exchange Apps is that it helps app developers distribute their own apps more readily. The challenges of setting up a website, marketing, and collecting fees for purchased apps are significantly reduced. In addition, with apps being easier to find and download, an increased number of users are downloading apps. If you'd like to find out more about publishing your own apps, start by visiting the Autodesk Exchange Apps Developer Center at http://bit.ly/nixe0P for detailed information. At this site you will find guidelines and recommendations, answers to frequently asked questions, and tutorial videos. Currently, APIs are available for .NET, LISP, ActiveX and ObjectARX (C++) apps. If you have any additional questions about developing and posting apps to Autodesk Exchange Apps, please email appsinfo@autodesk.com

### WHAT'S NEXT FOR EXCHANGE APPS?

Autodesk Exchange Apps has only been available for a short while, but the feedback has been positive, both from developers and end users. We are always looking into solutions for our customers and are open to suggestions as well as requests.

New apps and updates to apps are being released almost every day, and one way to keep up with the most recent developments is with social media. If you would like to learn about new apps, check out the Autodesk Facebook page and Twitter feeds for the Autodesk products of interest. Another great way to learn about new apps is with an app itself! The Featured Apps plug-in, available in the AutoCAD store of Autodesk Exchange Apps, lets you easily keep track of the store's latest apps.

With Autodesk Exchange Apps built into many Autodesk products, and also available on the Web, you are just a few clicks away from a world of new features, shortcuts, and possibilities. Please take advantage of Autodesk Exchange Apps and let us know what you think.



Setu Upadhya is a civil engineer and member of the AutoCAD product management team. He is currently working on Autodesk Exchange Apps, as well as the latest version of AutoCAD. You can contact the Autodesk Exchange Apps team at appsinfo@Autodesk.com



Figure 4: The Featured Apps plug-in.

### by: Scott Moyse

# AutoCAD WS

DUCT FOCUS

# **NOVING FORWARD**

SCOTT MOYSE INTERVIEWS AUTOCAD WS PRODUCT MANAGER ILAI ROTBAEIN

arly in 2012 I was wondering where Autodesk were going with two very similar products: Design Review Mobile and AutoCAD WS. At the time, their functionality and real-world use cases were extremely similar, so I decided to have a good look at it and write a two-part blog series on the differences between the two. This led to two things:

- Sandy Yu (Autodesk 360 Product Manager) contacted me and asked if I would be interested in testing Autodesk 360 mobile prior to its release. That led to the Design & Motion Blog post and an AUGI article reviewing the App.
- 2. I got contacted by the @AutoCAD\_WS twitter account asking if I would be interested in interviewing an AutoCAD WS product manager about the product.

So here we are. I set up an interview with one of the AutoCAD WS Product Managers, Ilai Rotbaein, who works for Autodesk from Israel. Pretty cool! So let's get cracking.

### **INTERVIEW**

(Let's just start with a big one.)

**Scott:** What can you tell us about your future plans? Will your team focus on expanding features or creating new ones?

**Ilai:** Since we launched AutoCAD WS two years ago, we've made continuous efforts to improve and expand the app's capabilities with each release. This year you're going to see major improvements in the overall experience, making it easier, smoother, and even more



enjoyable to use. In addition, as you've seen in previous versions of AutoCAD WS, we are taking our users and their requests very seriously and do our best to provide them with the tools and features they are asking for. This year we'll be delivering quite a few of our users' popular wish list items, and adding a number of new, exciting tools. Although we can't reveal anything too specific at this point, what I can say is that with this new functionality, users will be able to create, draw, markup, collaborate, and edit like never before.



**Scott:** What did you and your team take away from the two post series I wrote on Design & Motion?

**Ilai:** I think that one of the things that really stood out there for me was the confusion between the AutoCAD WS and Autodesk Design Review Mobile apps. We are aware of this matter and are working to make it as intuitive as possible for a non-CAD user via upcoming features.

**Scott:** Why does it appear that AutoCAD WS and Autodesk 360 are being developed separately from one another? Do you plan

to integrate them in the future? That is, opening DWGs in WS from 360 and using the Autodesk sign-on to log into the AutoCAD WS website?

**Ilai:** AutoCAD WS and Autodesk 360 share the same backend, so your AutoCAD WS account is also your Autodesk 360 account and all the files stored on your account are available in both services. We are working on integrating those two services more closely together.

**Scott:** Since everything is touted to go into the cloud and AutoCAD is the most likely CAD application to be first, how will AutoCAD on the cloud affect AutoCAD WS? Or do you guys see WS being AutoCAD in the cloud? It's likely a number of AutoCAD LT customers would be satisfied with the tools available within AutoCAD WS as it stands.

**Ilai:** Our current focus is doing what makes sense on that specific platform and providing the best possible solution for our users. AutoCAD WS is our AutoCAD in the cloud today; in the future you might see additional delivery methods of AutoCAD that will be more suitable for the needs of certain customers. What we're seeing today is that our users are increasingly more open to the cloud and the advantages it offers. Our focus is ultimately to provide the best experience possible for AutoCAD users regardless of the platform they're accessing it from—web, mobile or the desktop.

(On that note I thought it was appropriate to pop in a question to ascertain Ilai's stance on the social opportunities within the cloud space.)







**Scott:** How do you foresee the changing nature of cloud, social, and mobile affecting the future of WS?

**Ilai:** Many of our mobile app users leverage AutoCAD WS for on-site reviews. With that in mind, we're looking at taking advantage of the unique capabilities that mobile devices offer, including leveraging the device's GPS feature to allow users to track their position and add notes and markups to specific locations within a drawing. In addition we've also leveraged the camera that mobile devices offer, allowing users to take photos on site and add them to the drawing.

Our most recent release also exemplifies how we're leveraging the social web and associated communications to improve the design collaboration, review, and approval process: Design Feed, a popular and powerful new tool in AutoCAD WS, allows users to post comments that are contextually linked to a specific location within the drawing, tag other colleagues or stakeholders to specific posts to notify them of changes or questions we have, and even add images to posts to provide more clarity or brainstorm ideas.

We've also integrated AutoCAD WS with the Autodesk 360 cloud-based products, enabling users to take advantage of all the powerful features that this platform has to offer. Ultimately we feel the cloud, social, and mobile provide the best opportunities to solve some of the most difficult problems our users face.

**Scott:** Are there any plans to support other file types? Even those outside of Autodesk?

**Ilai:** AutoCAD WS is a relatively young product and there are still many things that we would like to add to it in the future. We are looking at other file formats, but for now we're focusing on DWG, DXF, DWF, PDF, PNG, JPEG, BMP, and TIFF.

(I've noticed something interesting about AutoCAD WS integration

*in iOS with regard to DWF, so I figured I'd sneak in a question about it.*)

**Scott:** In my posts I mentioned that when you open a DWF file from an email on OSx, it opens up the file with AutoCAD WS. The DWF icon shows up as valid within the App, but then the drawing fails to load. Is this a clue of what's to come or a bug?

**Ilai:** Sounds like a bug to me. We still have some additional work to do in our DWF support. I would also suggest trying to open it in Autodesk 360.

**Scott:** When will the polyline tool in AutoCAD WS mobile'do what it says on the tin' in the sense that the icon suggests you can draw an arc in place within the command, but in fact you can only draw a series of attached straight lines.

**Ilai:** This is a great example of one of the things you can expect this year. We listen very closely to what our users request and are working to respond as quickly as possible.

**Scott:** I have to say I love the new Design Feed feature. The 360 team really needs to get some of that into their mobile app and the browser-based UI as well. Will you guys cough up the code for them?

<complex-block>

**PRODUCT FOCUS** 



**Ilai:** First of all, thank you. We believe that the Design Feed is going to change the way that people collaborate on designs. We're already seeing some really interesting ways our customers are using this powerful tool in unique ways, and how it's improving their overall collaboration experience. All comments made in Autodesk 360 and AutoCAD WS are actually synced so the gaps are not as wide as you might think. I believe that in the next few months you'll see significant improvements in the Design Feed and in Autodesk 360 in general.

(As a Vault Professional user one of my issues with all this yummy cloud-based social awesomeness is the lack of a closed-loop process to pull comments and reviews from the cloud back inside the firewall to be Vaulted. As a CAD/Design Manager I want control over this stuff.)

**Scott:** When will you be able to support the Design Feed within the Desktop version of AutoCAD? And since it would be a grand

way of managing the review process of drawings, will there ever be a way of archiving or passing that information and status of the comments to Autodesk Vault?

**Ilai:** Great question. I agree that adding the Design Feed in the AutoCAD desktop would be extremely powerful. Passing the Design Feed information to Autodesk Vault is something that we're looking into. At the moment all the comments (whether they are open or resolved/archived) are synced between AutoCAD WS and Autodesk 360 so some of that solution already exists.

**Scott:** What's the most impressive thing you have ever done with AutoCAD WS?

**Ilai:** Back when we started with AutoCAD WS, we targeted small use cases that our product could support. Today we see groups of 30+ people working for a single organization, sitting in different parts of the world, all collaborating on a single drawing at the same time.

It's very cool to see this, and wildly exceeds what we were originally looking to accomplish with this app. Another interesting story that stands out is a college professor who contacted us and told us that he now requests all of his students to submit their homework through AutoCAD WS and he reviews them using his iPad on his couch at home. What a great use case!

(I don't know about everyone else, but I've been wondering this for a while and now I have the opportunity to get the answer from the horse's mouth.)

**Scott:** What does WS stand for?

**Scott:** Well, that's an interesting question and the truth is that there is more than one correct answer here. The most common interpretation is Web Service, but you can also look at it as White

Sheet, Work Space, and more. You're welcome to add your own interpretation here as well.

(How about Wicked Stuff? I know what the answer is going to be for the following question, but I have to ask.)

**Scott:** When do you anticipate supporting Windows Phone 7.5 or 8?

**Ilai:** That is one of the most frequent questions we're getting from users. Just like everyone else, I'm curious to see how the Windows 8 mobile devices will be adopted. Our current offering of mobile apps is limited to iOS and Android, but we are actively investigating opportunities to broaden offerings to include Windows 8 mobile versions.





**Scott:** It's very impressive how far WS has come in the last two years. Do you think you will be able to achieve as much as you have already in the next two years?

**Ilai:** Although we've passed the 10M downloads milestone, I believe that we have only begun to scratch the surface of the potential market and capabilities this app can unlock. The cloud, the web, and the mobile worlds keep growing and adding more and more opportunities. Identifying those opportunities and providing valuable, cost-efficient solutions to customers based on those technologies is what we'll continue doing in the future. Two years ago, people were dreaming of opening a drawing using their mobile device. Today we know that this is only the first step and there are some really exciting possibilities ahead of us.

**Scott:** Are there any plans to start charging for the use of AutoCAD WS? Or at least for premium versions?

**Ilai:** While I can't answer that question, what I can say is that if we were to deliver a premium version of AutoCAD WS, we'll make sure it's well worth paying for.

(For those of you who follow me on Twitter you know I'm an F1 fan and have more than likely had your Twitter feed flooded with healthy streams of arguments about Formula One and NASCAR. Since this was my first time interviewing someone, I thought I would end this interview with a rhetorical question.)

Scott: Formula One or NASCAR?



**Ilai:** I'm more of the basketball kind of guy; I'll leave that one to the readers and tweeters.

(I was really hoping you would settle that one for us, Ilai!)

I'd like to thank Autodesk for allowing this interview to take place and providing the amazing imagery. But most of all, I thank Ilai for taking the time to answer these questions. I think he did a great job of answering them while cleverly skirting around some of the more curly aspects Autodesk would understandably like to avoid.



Scott Moyse is the Design Manager for SMI Group, a Super Yacht Interiors company in New Zealand. His background is in Motorsport Engineering & CNC programming. Scott has been using various Autodesk software for 9 years, most recently he has been implementing Vault Pro. He can be reached using Twitter @scottmoyse & scott\_moyse@hotmail.com

Images courtesy of Autodesk

# All About External References

he Drawing Management feature in AutoCAD®Architecture 2013 uses external references (xrefs) as a means to create a project and maintain it. This means that elements are referenced into constructs, constructs are referenced into views, and views are referenced into sheets. The mechanism of referencing is identical to the regular AutoCAD External References Management feature. However, the background methods employed have additional features.

Xrefs that have been created in drawing management can automatically make use of project data, while those created manually through the xref palette or command line cannot. For example, a construct that is placed on a specific level will use that level's elevation data to control the Z-axis insertion point when being xrefed into a view. If you are working in a project environment, the best practice for referencing project drawings into other project drawings is to use the Project Navigator rather than the standard AutoCAD Architecture Xref Manager. The AutoCAD Architecture Xref Manager cannot differentiate between project drawings and non-project drawings. If you reference a non-project file into a project file by mistake, you cannot use the full Drawing Management functionality on that file.

Keep these considerations in mind when working with a project:

- Do not delete any XML files generated by the Drawing Management feature. They are vital for the project.
- Use the Project Navigator to create, modify, and reference project files within the project. If you want to use existing non-project files in a project, convert them to project files first.
- Drawing Management supports the use of relative paths for external references. In the project setup, you can decide

whether to use full paths or relative paths. Working with relative xref paths makes moving the project and transmitting it easier and reduces the need to repath the project.

### EXTERNAL REFERENCES PALETTE

The External References palette in AutoCAD Architecture organizes, displays, and manages referenced files such as DWG files (xrefs), DWF, DWFx, PDF, and raster images. These files can be opened directly from the External References palette. The External References palette contains several buttons and is split into two panes (see Figure 1). The upper pane, called the File References Pane, can display file references in a list or in a tree structure. Shortcut menus and function keys provide options for working with the files. The lower pane, called the Details/Preview Pane, can display properties for the selected file references or it can display a thumbnail preview of the selected file reference.

It is important to note that when using the External References palette, it is recommended that you turn on the Auto-hide feature or anchor the palette. The palette will then hide automatically when you move the cursor away from the palette.

You can use the buttons at the top of the External References palette to choose the types of files to attach to the drawing and to refresh the status of file references that you already have attached. The following options are displayed:

- Attach (file type) Button The Attach button displays a list of file types you can attach (see Figure 2).
- Refresh/Reload All References Button The Refresh button synchronizes the status data of referenced drawing files with the data in memory. Reload All References updates all file references to ensure that the most current version is used.

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Figure 1: External References palette

Updating also occurs when you first open a drawing that contains file references.

### ATTACHING AND DETACHING XREFS

You can attach an entire drawing file to the current drawing as a referenced drawing (xref). With xrefs, changes made in the referenced drawing are reflected in the current drawing. Attached xrefs are linked to, but not actually inserted in, another drawing. Any changes to a referenced drawing are displayed in the current drawing when it is opened or reloaded. With xrefs you can build drawings without significantly increasing the drawing file size.

By using referenced drawings in AutoCAD Architecture, you can:

- coordinate your work with the work of others by referencing other drawings in your drawing to keep up with the changes being made by other designers.
- ensure that the most recent version of the referenced drawing is displayed. When you open your drawing, each referenced drawing is automatically reloaded, so it reflects the latest state of the referenced drawing file.
- keep the names of layers, dimensioning styles, and text styles in your drawing separate from those in referenced drawings.

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Figure 2: Attach file types

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 bind attached referenced drawings permanently with your current drawing when the project is complete and ready to be archived.

A drawing file can be attached as an xref to multiple drawings at the same time. Also, multiple drawings can be attached as referenced drawings to a single drawing. To attach an xref, click the Insert tab, Reference panel, Attach. Select the file you wish to reference and select Open. This will bring up the Attach External Reference dialog box where you can choose to attach or overlay, scale, insertion point, path type, and rotation (see Figure 2). Click OK when finished. It is important to note that if an xref contains any variable block attributes, they are ignored. Once the xref is attached to the drawing, an xref icon will be displayed in the lower-right corner of the application window. When one or more xrefs are not found, an exclamation point is added to the xref icon. If you click the xref icon, the External References palette will be displayed.

To completely remove xrefs from your drawing, you need to detach them rather than erase them. Erasing xrefs does not remove layer definitions associated with those xrefs. Using the Detach option removes the xrefs and all associated information.

Sometimes it becomes necessary to find an xref in a complex drawing. To do this, select an item in the External References palette to highlight all visible instances in the drawing. Also, you can select an external reference in the drawing to highlight its name in the External References palette.

You can control the visibility, color, and linetype of an xref's layers and make these changes temporary or permanent. If the VISRETAIN system variable is set to 0, these changes apply only to the current drawing session. They are discarded when you end the drawing session or when you reload or detach the xref. You can also control the fade display of the DWG xref. The XDWGFADECTL system variable defines the fade percentage for all DWG xrefs.

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Attachment     Overlay	Y: 0.00	Unit: Inches
	Z: 0.00	Factor: 1.0000
Locate using Geographic Data		
Show Details	OK	Cancel Help

Figure 3: External Reference dialog box

# UPDATING REFERENCED DRAWING ATTACHMENTS

When you open a drawing, all xrefs update automatically. You can also use the Reload option from the External References palette to update xrefs whenever you want to ensure that the most current versions are displayed in your drawing (see Figure 4). Whenever you modify and save an externally referenced drawing in a network environment, other people can access your changes immediately by reloading the xrefs in their open drawings.

When you attach xrefs to a drawing, the program periodically checks whether the referenced files have changed since the last time the xrefs were loaded or reloaded. The XREFNOTIFY system variable controls xref notification. By default, if a referenced file has changed, a balloon message is displayed near the xref icon in the lower-right corner of the application window. Click the link in the balloon to reload all changed xrefs. If you close the balloon message without reloading, an exclamation point is added to the xref icon. If you click the xref icon, the External References palette is displayed.

By default, the program checks for changed xrefs every five minutes. You can change the number of minutes between checks by setting the XNOTIFYTIME system registry variable using (setenv "XNOTIFYTIME""n") where n is a number of minutes between 1 and 10080 (seven days). It is important to note that when changing the value of XNOTIFYTIME, you must enter the system variable with the capitalization as shown.

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Figure 4: Reload Referenced Drawings

# NESTING AND OVERLAYING REFERENCE DRAWINGS

Xrefs can be nested within other xrefs—meaning you can attach an xref that contains another xref. You can attach as many copies of an xref as you want and each copy can have a different position, scale, and rotation. It is important to note that when using the parametric drawing feature, you can only constrain objects in the drawing to the insertion point of an xref and not its nested objects. The saved path for an xref can be a full path, a relative (partially specified) path, or no path. For a nested xref, a relative path always references the location of its immediate host and not necessarily the currently open drawing.

You can also overlay an xref on your drawing. Unlike an attached xref, an overlaid xref is not included when the drawing itself is attached or overlaid as an xref to another drawing. Overlaid xrefs are designed for data sharing in a network environment. By overlaying an xref, you can see how your drawing relates to the drawings of other groups without changing your drawing by attaching an xref.

## ISOLATING OBJECTS IN EXTERNAL REFERENCES

When working in drawings with external references, you should note the following points.

- You can isolate an external reference within a host drawing as a whole by selecting it and isolating it.
- You can isolate individual objects within an external reference by opening the external reference, isolating and hiding objects as needed, saving the external reference drawing, and then reloading the external reference.
- You cannot isolate or hide objects in an external reference while editing it with REFEDIT in the host drawing. You need to use XOPEN and save the desired Hide/Isolate settings within the external reference.



Figure 5: Clip External Reference

 You cannot redisplay hidden objects in an external reference while editing it with REFEDIT in the host drawing. You need to use XOPEN and save the desired Hide/Isolate settings within the external reference.

You can save a drawing in which object isolation is currently active. The next time you open the drawing, it will display with the isolation settings you defined. It is important to note that if you want to distribute a drawing with isolated objects, make sure that you and the recipient of the drawing are working with the same version of AutoCAD Architecture. A recipient who is working with an earlier version of the software, plain AutoCAD, or Object Enabler is not able to display the hidden objects. In this case, end the object isolation before saving and distributing the drawing.

External References are an excellent tool to help keep file sizes to a minimum yet have as much information in a drawing as possible.

### **CLIPPING EXTERNAL REFERENCES**

You can clip external references such as DGN, DWF, IMAGE, PDF underlays, or block references. With a clipping boundary, you can determine the portions of an external reference or block reference that you want to display by hiding the redundant parts of the reference inside or outside the boundary. You can control the display of the clipping boundary with a clipping frame. The clipping system variable for XREF, PDF, DGN, DWG, and IMAGE underlays are XCLIPFRAME, PDFFRAME, DGNFRAME, DWGFRAME, and IMAGEFRAME, respectively.

The clipping boundary can be a polyline, rectangle, or a polygon with vertices within the boundaries of the image. You can change the boundary of a clipped image. When you clip a boundary, the objects in the external reference or block are not altered. Only their display has changed.

After an external reference or block reference has been clipped, it can be moved, copied, or rotated just like an unclipped external reference or block reference. The clipping boundary moves with the reference. If an xref contains nested clipped xrefs, they appear clipped in the drawing. If the parent xref is clipped, the nested xrefs are also clipped.

If you want to change the shape or size of a clipping boundary for external references and block references, you can use grips to edit the vertices just as you edit any object with grips. In the case of rectangular grip editing, you can maintain the closed four-sided rectangle or square shape of the rectangular clipping boundary because two vertices of the same side of the rectangular clipping boundary are edited together. With clipping boundaries, you cannot display self-intersecting polygonal boundaries. An error message is displayed and the boundary reverts to the last boundary.

To clip a boundary for an external reference, begin by clicking the Insert tab, Reference panel, and then select Clip (see Figure 5). Next, select an xref. At the prompt, specify New Boundary by pressing Enter. Select a polyline or specify a rectangular or polygonal clipping boundary. Specify the corners or vertices of the boundary. The xref is clipped based on the area that you specified.

### CONCLUSION

External References are an excellent tool to help keep file sizes to a minimum yet have as much information in a drawing as possible. If you are not currently using external references in your AutoCAD Architecture projects, I encourage you to try them out.



Melinda Heavrin is a CAD Coordinator and 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

# AUGI 2012 TOP TEN WISH LIST

# AUTOCAD

#	Author	Feature	Title	Description
1	Carey Edwards	Help	AutoCAD Help needs more help	You should be able to go to Help to find useful info. Most of the time, you enter a key word and only find non-related suggestions. You can enter some commands and there won't even be a single help item.
2	Enzo Di Paolo	Blocks	Drop Down Lists for Attributes in Blocks	I'd like to have a combo list of value making a block with attributes.
3	Ray Mendoza	Blocks	Visibility Parameter Enhancement	The ability to add more than one visibility parameter to a dynamic block.
4	Yair Yes	Drawing Tools 2D	Lock Drawing Order of Specific Objects	I would like to have the possibility to lock the drawing order of specific objects, so that the object I select is always on top without consideration of which object has been created first, for instance.
5	Jake Delgado	Linetype	Complex linetypes	AutoCAD needs linetypes that can use entities other than shapes to show geometry in linetypes. I'd like to draw a simple shape, like a filled triangle or half circle or even use a line at an angle away from the line, and incorporate that object into a linetype.
6	Jim Gerth	XREF	Override the overrides	It would help a lot if the XREF attachment included toggles to ignore display property overrides, such as colors, from displaying in attached/overlain reference files.
7	Michael Shick	Dimensions	Text Wrap in Dimensions	Dimensions need to contain text wrap! The text in a dimension should have same capability as mtext.
8	Brad Crouse	Other	Abort a function	I would like to have the ability to abort a hung up function in AutoCAD without shutting down the program.
9	Tim Turner	Layouts	Edit Page Setup for Multiple Layouts	In the Page Setup Manager I would like to be able to CTRL+Select and/or SHIFT+Select the layouts that I wish to apply the page setup to.
10	Jimmy Bergmark	Drawing Tools 2D	Wipeout Frame	Add a command (WIPEOUTFRAME) or drawing variable to control the wipeout frame just like IMAGEFRAME.

# **AUTOCAD ARCHITECTURE**

#	Author	Feature	Title	Description
1	Kenneth Siegel	AEC Polygons	Polygon center	Is it possible for a polygon (square, for instance) to have a center pick point at the time it is made? (Like a circle does.) This way it will be quicker to drop a circle into the center of a square and vice versa.
2	Jared Kelm	Doors	Insert Doors	Allow door insertion to be at either a set increment from edge of wall or at center of wall by default.
3	Matthew Dougherty	Multi-View Blocks	Dynamic Array settings	Would like to be able to independently control the array spacing as well as the number of objects for each instance of a dynamic block.
4	Jared Kelm	Publishing to PDF	Save previous file folder location for Export to PDF	Automatically use previous file folder location when exporting drawings to PDF.
5	Floyd Putnam	Display System	Change LT Scale of all objects	I would LOVE the ability to change the Line Scale of all objects in the drawing at the same time.
6	A. K.	Detail Components	Detail Component Manager acting like Properties Window	Detail Component Manager acting like Properties Window or XREF Window.
7	Joe Perkins	Tools	Synchronized Tool Sets	There is a wide variance between the cursor menus and other tool sets among Autodesk products. This needs to be corrected so the same tools are available across the product line.
8	Fabrice Maicel	Curtain Walls	Splitting selected cells on Curtain Walls	Curtain walls in ACA 2012: Today, I can merge selected cells in a curtain wall, but I can't split selected cells.
9	Melinda Heavrin	Walls	Walls under Style Manager/Display Properties	It would be great to have a flag indicate that the wall you are exploring under Style Manager/ Display Properties has an object override.
10	Melinda Heavrin	Spaces	Stretching Spaces	Currently when a space is selected on the center point, it will only move and not stretch. It would be great if there were an option for the space to stretch no matter which point is selected.

# **AUTOCAD CIVIL 3D**

#	Author	Feature	Title	Description
1	James Lord	Feature Line	Dynamically link feature lines created via stepped offset	When using "Stepped Offset" to create a feature line, that reference should be dynamic.
2	Doug Roberts	Other	Include Current Technology features	I would like to see Civil 3D able to ping or utilize all 4 quadrants of the Intel Quad Core Chip at least with a 64-bit install option.
3	Steve Boon	Feature Line	Linetype Generation on Feature Lines	Feature Lines should display linetypes correctly when PLINEGEN variable is set to 1.
4	Cyndy Davenport	Import/Export	Create Civil 3D Deliverables	eTransmit for Civil 3D projects with options to promote data references and export Civil 3D objects to AutoCAD entities with setting options per feature to use component or object layers.
5	Chris Brenton	Pipe Network	Civil 3D pipes should lock inverts and slopes at points of interest	I wish Civil 3D pipes could lock manhole inverts and pipe slopes at points of interest. An example would be to hold a starting existing invert, a junction point in the middle of your system, or the high end. This would allow us to apply our pipe and structure rules more than once when designing big networks.
6	Sebastien Leonard	User Interface	Upgrade OSNAP Functionality	OSNAP seems to be limited when it comes to Civil 3D objects, and the difference between 2D and 3D OSNAP is still very primitive. Upgrade the system to work as intended for all Civil 3D objects.
7	Kevin Mills	Other	Multiple VPORT Label Styles	I would like labels to behave the same as AutoCAD annotative text, so that their positions can be adjusted relative to individual viewports.
8	Mike Pryor	Profile	Show intersecting profiles	Automatically show intersecting alignments on the profile.
9	Guido Bonin	Alignments	Join alignments and profiles	Join/divide two concurrent alignments (and profiles).
10	Sonia Borba	Profile	Linetype Generation in Profiles	Layout profiles and static profiles should honor linetype generation.

# **INVENTOR**

#	Author	Feature	Title	Description
1	Jim Durkin	Processors	Make Inventor Compatible with Multicore Processors	Have Inventor be able to utilize dual core - quad core processors and therefore use more of the available RAM.
2	Rick Hageman	Assemblies	Positionally Constrain a Slot to a Hole	Have the ability to constrain a hole to a slotted part and quickly center the two together.
3	David Salyer	Part Modeling	Calculate the Volume of a Container	Have the ability to calulate the volume of a shelled or hollowed out part and find the specific gravity if it was filled with a virtual material.
4	David Gaskill	Other	Escape key to cancel commands	There are times when the software hangs up; it would be nice to be able to terminate the command without the software crashing or taking several minutes to give us an error message.
5	OI Sh	Drawing Manager	Better Table Feature in IDW	Expand the current table options to be more like an Excel table with the same functionality.
6	Josh Hunt	Assemblies	Assembly Insert Constraint and Lock Rotation	Add a Lock Rotation option to the Insert Constraint.
7	Pasi Annila	Assemblies	Deformity of Parts in Assemblies	Have the option to create a part that has the elasticity to conform to required shapes.
8	Duncan Anderson	ΑΡΙ	Record Macros	There is a big need for the ability to record VBA macros just like MS Word and Solidworks.
9	Pasi Annila	Assemblies	Quickly constrain parts	Add button for creating origin planes flash constraint between 2 or more parts (or assemblies) at once.
10	Rudy Pont	Drawing Manager	Verification of Section/ Detail View Lettering	Have program accurately track view letters, so even if a view is deleted all the other views update with consecutive lettering.

# **NAVISWORKS MANAGE**

#	Author	Feature	Title	Description
1	Jason Matthews	Clash Detective	Clash Detection Groupings	The organization of groupings of clashes is lacking. It would be extremely helpful to be able to place groups within groups to further breakdown the hierarchy of clashes.
2	Michael Smith	Clash Detective	Refresh only one model	During coordination, a team member will give you a new model. It would be nice to be able to update just that model instead of having to wait for Navisworks to re-compile the entire project.
3	Michael Smith	Clash Detective	Clash auto Groupings	I would like to be able to set a proximity and have all clashes within the zone be grouped together.
4	Joe Perkins	Find Items	Find Items Dialog too sensitive	When building a Find Item search, there are many aggravations to using the dialog box. These are in no particular order: sensitivity, wait time for searching, no function to re-order statements.
5	Zoran Markovski	Animations	Watermark	A permanent onscreen displayed watermark.
6	Michael Smith	Navigation Tools	Shortcut keys	It would be very beneficial to be able to define my own shortcut keys. For instance, in the clash detective to be able to toggle filter selection on and off, to select the ellipse redline tool, or even to turn on a 3d avatar.
7	Colin Magner	Redlining	Multi-user reviews of Models	Navisworks needs to enable multi-user workflows to allow for effective review of multi- discipline models of whole buildings.
8	David Sutcliff	Quick Properties	PDMS Attribute data in properties panel	Please could the reading of data past line 1757003 in a PDMS attribute file be included in the Navisworks model.
9	Daron Denton	Clash Detective	Zone Based Clashing	Functionality that allows the user to create clash tests confined to a 3 dimensional zone within the building based on a selected mass object of any shape.
10	David Mettler	Animations	Multi-processor Presenter rendering	Add true 64-bit multi-processing multi-core rendering to the Presenter rendering engine.

# **REVIT ARCHITECTURE**

#	Author	Feature	Title	Description
1	Bret Thompson	Site tools	Site tools	The wish of the ages: allow Revit to build roads, curbs, sidewalks, ridges and swales that all modify the toposurface.
2	Laura Sharpe	Rooms	User friendly Room Scheduling	Room schedules don't currently take advantage of the data base of info available. Why can't the room schedule directly use Floor, Cieling, Wall info? Currently coordinating schedules is a massive undertaking when a ceiling changes type or height and that doesn't automatically update the schedule.
3	Thomas Chuffart	Other	More control on formatting text.	It would be nice to control the way schedules are displayed on the sheets—like set the totals to bold and black while subtotals would be grey and formatting headers, too.
4	Cliff Collins	Walls	Non-vertical walls	Tool to specify angle of wall from non-vertical.
5	Hans Andrasko	Architectural Family Contents/ Components	Polygonal crop regions	I wish call out boundaries and other view crop regions could also be polygons, other than just rectangles. We could perhaps enter "sketch mode" to define the boundary, just like we do with plan regions.
6	Rick Bulic	Walls	Sloping walls	Sloping walls, whether straight or curved, should be easier to model and not require editing of masses to achieve these forms.
7	Robert Manna	Stairs	Better railing functionality	A railing tool that better deals with real-life conditions of required railing extensions and returns (including multi-flight stairs & landing transitions), and baluster locations. Also, better handling of common commercial/institutional railing types like monolithic glass.
8	Greg Hale	Revit Extensions	Create custom .pat within Revit	Develop an easy graphic user interface that creates a custom hatch .pat for use in Revit.
9	Rick Bulic		Object snap between 2 points	Provide an Object Snap option for the midpoint between two selected points.
10	David Keller	Annotation Tools	Multiple "send to back" and "bring to front"	Select multiple annotation items and have the ability to send the entire set backwards or forwards in the view. Currently we can only send one at a time to the back or to the front.

# **REVIT MEP**

#	Author	Feature	Title	Description
1	Colin Magner	MEP Mechanical Systems	Tell us why our systems are not well connected	The triangle warning symbols added to 2012 helped to identify problems with systems, but Revit can still complain that systems are not well connected but not tell us why, even though it knows.
2	Nick Crane	Other	Connectors across a linked model	Connectors across a linked model.
3	Le Hien Huynh	Other	Duplicate sheets in order	Ability to duplicate sheets so views/schedules show up in same location creates a duplicate of the views/schedules via duplicating the sheet.
4	Daniel Rodriguez	MEP Electrical Circuits - (Electrical)	Create coordinated single-line diagrams	The ability for Revit to create a Single-Line Diagram of the electrical system based on the connection of circuits.
5	Daniel Rodriguez	MEP Electrical Circuits - (Electrical)	Calculate length thru pipe, duct, conduit, etc.	It would be nice if there was a way to calculate length thru a run of pipes, ducts, conduit and cable tray. It would also be nice to calculate this length with the fittings in place, too.
6	Mitchell Voss	Other	Keep parameters in order	Add a "move up/move down" option so I can control the order that they appear in the category.
7	Colin Magner	MEP Spaces - Mechanical	Spaces to cope with vertically irregular spaces	Spaces work great if you've got a space that's a straight 'extrusion' or tapers towards the top, but not if the space expands upwards or wraps over.
8	Matt Boynton	MEP Mechanical Systems	Duct and piping systems—V/G override	Ability to turn on/off a Piping/Ducting system.
9	Kevin McGlothlin	Other	Fix Pipe up and down single line symbology	Have piping that turns up or down to show properly regardless of its location within the view range.
10	Aaron Bulla	Annotation Tools	Add a footer/notes section to schedules	Add an option for a footer in all schedules.

# **REVIT STRUCTURE**

#	Author	Feature	Title	Description
1	Jeffrey Bonnet	Annotation Tools	Annotation text editing & formatting features	I have discovered it is sometimes easier/necessary to create text in AutoCAD and then insert this text into Revit as an image or linked CAD file. But it would sure be nice if Revit had the same text formatting capabilities.
2	Rebecca Frangipane		Revision Cloud Sketch	I wish I could draw a revision cloud along a polyline instead of clicking multiple times.
3	Jacob Mellor	Beam System	The beam system tool	Add ability to control beam location within beam systems.
4	Shaun Peppers	Beams	Grade Beam Object Class	Add a grade beam category separate from regular beams.
5	Arnout van IJsseldijk	Annotation Tools	Tag alignment, all angles possible	Make it possible to align tags of all categories of objects—not just walls. Option rotate with object or just align to (detail) line.
6	Melissa Breiter	Other	Phasing properties and relationships	Should have the option to maintain the phasing properties of objects and the phasing relationships between objects when binding a linked architecture model, copying and pasting from the arch model, or using copy/monitor.
7	Allen Wear	Structural members	Make joist extended ends visible	Make joist extended ends visible on coarse view.
8	Steve Saltsman	Annotation Tools	Tag the elevation	Several items have the ability to tag part of an elevation, you can tag the invert elevation of a pipe as long as you want the elevation of the closest edge. You can tag the bottom of a struct foundation, but you cannot tag the top. Give us access to all the elevation possibilities.
9	Rick Blankenship	Structural Family Contents/ Components	Pier and Grade Beams	Would like to see Pier and Grade Beams instead of using round columns and concrete beams.
10	David Keller	Walls	Wall layers properties	Define wall layers as architectural or structural to control visibility in views.



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# Celebrating 300,000 Members



### AUGI Membership Percentage by Region

- Region 1: North America (US and Canada) 54-5%
- Region 2: Latin America and Caribbean 8.6%
- Region 3: EMEA (Europe, Middle East, Africa) 23%
- Region 4: APAC (Asia/Pacific) 13.9%

AUGI has passed a milestone in its continuing expansion. The 300,000th member joined AUGI in mid November. The member who pushed us over the landmark number was a Canadian and joined the ranks of others from the more than 195 countries where we have members. Our membership is growing consistently at almost 3,000 new members per month on average. Growth continues to rise for Latin America, which had our largest expansion of 21% year over year. Next came EMEA with a 15% growth rate and then APAC with 13%.

### Membership Percentage by Industry Representation



### AUGI Membership Growth (2002-2012)



### Membership Percentage by Position/Title



# AutoCAD MEP 2013

n a previous article we discussed the ability to create our own MVPart using block-based parts, and some of the benefits that can come from that process. This time, I'd like to explore some of those benefits in more detail and discuss how they can help us today in the growing field of Navis models, BIM, and data entry into drawings and models.

In just the few years that I have been doing CAD, things have changed immensely. There were no Navis models, there was no BIM coordination, and there were no 3D file exchanges. Now all of these are commonplace in many projects and generally are a requirement for all MEP trades. And rightly so! The process, done correctly, can simplify and lessen the cost of field installation for all trades. More and more often I see companies taking their "coordinated/ signed-off" files right from the model and turning them into shop/ fab drawings. Knowing that they will have minimal problems in the field helps all trades have the confidence to pre-fab systems ahead of time, allowing them to save time and money.

That is a perfect-world scenario and we all know that real-world construction isn't perfect, but we're far ahead of where we were just a few years ago.

Let's move beyond standard BIM coordination and shop drawings to look at Autodesk<sup>®</sup> Navisworks<sup>®</sup> Manage and its tools, which help during construction and after completion. With the models generated from Navis we now have the ability to use Autodesk's BIM 360 Field program in the field. This is an iPad app that, among other things, allows us to view current BIM models and plans in the field. Again, more integration between the BIM process and the field installation process allows for saved time and money. If there are problems in the field we have the ability, within the app, to create and review issues. We have the ability to mark up plans and photos utilizing the app's built-in tools to illustrate what the issues are or to suggest a fix. This can also be used as a quality control tool to check off rooms/areas as work is completed to track a field crew's work. Once synced to Autodesk® BIM 360, these issues and marked-up plans and drawings can be viewed by anyone assigned to that job. Once again, we are shortening the time between identifying an issue and getting the right people on the job to fix it. These are just some of the uses for BIM 360 Field during construction, but I'd like to move into other usesafter completion.

The insertion of data into our drawings and the model has become more requested and even required by owners. This data

# AutoCAD MEP 2013

includes items as simple as part numbers all the way up to full PDF submittal information. This is allowing end users to actually utilize the completed, coordinated model after completion for facilities management. This can be called Computer Maintenance Management Solution or CMMS.

The process begins with the detailers and coordinators adding the required information into their respective drawings before the model exists. There are a few different methods to accomplish this. A driving force behind which option you use will depend on the trade to which you belong. Some options within AutoCAD<sup>®</sup> include using MVParts with property set data or blocks with property fields filled out.

There are some issues inherent with working this way. You have to make each individual block, MVPart an individual entity that can be searched and have its data extracted. This can be done a few different ways using the properties within the blocks, but it still has to be done and can be time consuming. Once all the devices/ blocks are put in the model, the end user might want to extract the data. This can be done with Navisworks and BIM 360 Field. You can make selection sets within Navis that can be exported to Excel. Then you can edit, add, or subtract information using Excel and push the data back to the Navis model.

Another option we have to include equipment data using Navis is linking PDFs to specific pieces of equipment or even having a link to a website with that equipment's information. This can be a great way to accomplish data entry in the model, but there's a compliance drawback. If you're going to link PDFs into the model, then when you hand the model over to the end user, that user must maintain the folder and file structure you've created. Otherwise, all the links you've created will get broken and become unusable. If you're going to link information to outside websites, the end user must have Internet access and also ensure that firewalls don't block the program from pulling up those pages. Furthermore, this method doesn't necessarily work with BIM 360 Field like embedding the information with the previous method. If the end user doesn't need to link the model to facilities management software and just wants product data linked to the model, this is a great way to do it.

These requirements are generally driven by the end users' software that will be managing the building maintenance. But the idea is the same—use the model as a living, electronic document that can be viewed, updated, and modified as things change and get replaced or repaired. On my current project, the facility management team will be able to create and track work orders, complete scheduled maintenance, manage drawings, and perform general inspections—all utilizing CMMS software and the final completed model.

This trend is actually generating a new position within companies at the front line of this process —a competent Navis manager to be on staff to manage the model, its drawings, and the data contained within it. Be aware, though, that all the work spent will be for nothing if the end user doesn't keep the model up to date and utilize it as intended. It's an exciting and quickly growing field and the innovations and progress we're making as an industry are fantastic. I can't wait to see where we are in another five years!



Elisha Sage currently works for Walker Engineering in San Antonio, Tx. He is the BIM Coordinator and CAD Engineer for Walker's San Antonio branch. He grew up in Michigan and Attended Lawrence Technological University where he received his Bachelors in Mechanical Engineering. He has had almost 4 years' experience in the BIM coordination and CAD field working for electrical and low voltage contractors. He plans on utilizing his CAD and BIM skills to allow him to continue to grow with his company. He is married to his wife of 1 year in June, who works as an RN at a children's hospital.

More and more often I see companies taking their "coordinated/ signed-off" files right from the model and turning them into shop/fab drawings.

# Revit MEP 2013



here comes a time when users of Autodesk<sup>®</sup> Revit<sup>®</sup> MEP move beyond merely 3D drafting a project and start leveraging the Revit database to increase confidence in the design and increase design efficiency. There are a lot of entry points to penetrate the Revit database. Leveraging Revit's scheduling function makes a lot of sense for this task because it should already be a familiar tool and it has the ability to directly query the database. While it is not the most intuitive tool, most everything in the database can be directly scheduled. This article will focus on tips and tools for mining that data to help validate design information and increase design accuracy.

Scheduling in Revit MEP requires MEP families in the model. These families need to contain required data for design. This is typically in the form of parameters inside the family. It takes considerable thought to get just the right data in the right place when it comes to making the process of design work for individual firms, but some things are right in the base product. The data is a common thread through the design. Crafty BIM managers will have to thread quite a few needles to optimize the perfect Revit setup. There are some basics tips to consider before diving too deep into the pool.

- The number of decimal places influences calculations, so round accordingly.
- When Space schedules are used, ensure that the upper limit of spaces in the model are set to the level above or higher to ensure the entire volume of the space is considered.
- In certain situations, use the calculation Point tool new in 2013 to add diffusers and lights to a room or space even when they don't intersect the space.
- Be careful of phasing in projects, rooms, and spaces among other things that are phase-aware.

The rest of this article assumes a basic understanding of Revit schedules. If you need a primer, check out Carla Edwards' article "Flexible Scheduling" in the August 2012 edition of *AUGIWorld*.

There are tons of parameters in the out-of-the-box version of Revit. All are valuable and can be used right away. These can be added to any schedule or simply used to report data to the engineer. A good practice is to actually segregate design schedules from construction document schedules in the Project Browser.

This can be done by adding a subcategory to the design schedules and sorting the Project Browser by subcategory.

The real power is in creating new parameters to perform some of the mundane tasks that engineers constantly face. Here are some situations followed by parameters and formulas.

# HVAC CALCULATIONS

Many HVAC calculations require engineers to find the area in a space per person. Like most of the formulas to follow, this one is only really functional inside a space schedule. First, use the roundup function in Revit to round the number of people to a whole number. In this example, the new parameter is called CalcPeople.

### Actual Number of People CalcPeople = Roundup (Number of People)

Then divide the Area of the space by the actual number of people:

### Area per Person AreaPerPerson = Area / CalcPeople

Outside air calculations require some pretty simple math:

Basic Corridor Calculation (0.06\*Area)

We can use the area per person parameter to help find the basic office load:

Basic Office Load Calculation (AreaPerPerson \* 5sf) + (0.06 \* Area)

The LEED EQc2 naturally follows from that:

### LEED EQc2 Calculation (Office 0A \* 1.3)

If/Then statements can be used to add another layer of automation to calculations. In the example below, the room occupancy is checked to see whether or not it is an office space. If it is an office space, the actual number of people in the office are added to the calculation; otherwise the actual number of people is skipped.

## IF(Room:Occupancy="Office",( (CalcPeople \* 5sf) + (0.06 \* Area)), (0.06 \* Area) )

Labs, medical spaces, and other room types are required to be positively pressured. The formula below can determine if the design pressure for the room is positive.

## Room Pressure = Actual Supply Airflow-Actual Return Airflow-Actual Exhaust Airflow

Conditional formatting can be used to display rooms with negative pressure in red. Under the Formatting tab, select the Conditional Format button and have it alert the user to a condition less than or equal to zero room pressure.

Conditions to Use: Room Pressure <= 0			Backgr	ound Color:
Room Pressure	<ul> <li>Less Than or Equal</li> </ul>	• 0	and	0
ield:	Test:	Value:		

# LOCATION, LOCATION, LOCATION

Some Revit family categories are aware of their location in the model. See the table below for some of them and what they can report.

CATEGORY	LEVEL	ROOM	SPACE
Multi-Category	Х	Х	Х
Electrical Equipment	Х	Х	Х
Electrical Fixtures	Х	Х	Х
Lighting Fixtures	Х	Х	Х
Mechanical Equipment	Х	Х	Х
Plumbing Fixtures	Х	Х	Х
Specialty Equipment	Х	Х	Х
Rooms	Х		
Floor	Х		
Ceilings	Х		
Doors	Х	To and From	
Structural Framing	Х		

elds Filter Sor	ting/Grouping For	matting Appearance	
Sort by:	Level	<ul> <li>Ascending</li> </ul>	O Descending
Header	Footer:	Title, count, and totals	<ul> <li>Blank line</li> </ul>
Then by:	Family	<ul> <li>Ascending</li> </ul>	Descending
Header	Footer:	Title, count, and totals	Blank line
Then by:	(none)	<ul> <li>Ø Ascending</li> </ul>	Descending
Header	Footer:		Blank line
Then by:	(none)	⊸	Descending
Header	Footer:		Blank line
Grand totals:	Title, cou	nt, and totals 🔹	
Ttemize every in	stance		

CSRW - Multi-Category Schedule				
Level	Family			
Level 2	E-Li Can_v3			
E-Li Can_v3: 2				
Level 2	E-Li Recessed_v3			
E-Li Recessed_v3: 14				
Level 2	M-Hv 2x2 Diffusser Round Neck_v			
M-Hv 2x2 Diffusser Round Neck_v3: 10				
Level 2	M-Hv 2x2 Grille Return Square Nec			
M-Hv 2x2 Grille Return Square Neck_v3: 7				
Level 2: 33				
Grand total: 33				

# Revit MEP 2013

To find out how many of these objects are on any given level, create a multi-category schedule and sort it by level.

Ceiling height seems like a pretty simple thing to get, but it is not so direct in schedules, or is it? Take a couple of things you do know—such as volume and area—and divide them. What's left? Ceiling height, and for some unknown reason the math works out and gives you a ceiling height in feet and inches. There are plenty of reasons to want the ceiling height of a space, and this little formula allows you to put it in any space schedule.

### Ceiling Height = Volume/Area

A similar formula can be used to calculate the window area in a space. Once a space is determined, the windows in that area can yield their area by multiplying window height by window width. Weird, but true—the space has to know the windows are there and has trouble recognizing the windows that are accurately placed. To help Revit find the windows, reverse them so the panes are in the inside of the space instead of the outside.

### Window Area= Height/Width

### **INSIDE THE INSIDE**

Nothing gets as awkward or as complicated as embedding a schedule in a schedule. In the example below, a window schedule is embedded into a space schedule. The ceiling height is added for good measure.

	Window Area						
Room: Numb	Room: Name	Area	Volume	Ceiling Height			
Mark	Window Height	Window Width	Window Area				
100	GENE'S OFFICE	100 SF	800.00 CF	8' - 0"			
101	PAUL'S OFFICE	100 SF	800.00 CF	8' - 0"			
102		00.05	769 00 05	e. 0"			
102	FETER'S OFFICE	- 30 SF	700.00 CF	0-0			
103	MICKEY'S OFFICE	90	768.00 CF				

Embedding space-aware objects into a space schedule can be used to document light fixtures, electrical devices, mechanical equipment, and air terminals by space, reaping such wonderful data as footcandles, watts, and CFM per room or space. Think about how often this is estimated or required and the valuable time of the engineer used to acquire it. If a user can be just as sure of the information without doing a hand calculation, then it should be obvious that the saved time will either be profit or well utilized, creating a better product.

These are just a few examples of the types of information a schedule can provide. It is straightforward to think of the normal schedules on a sheet. This information is the stuff that designers and engineers can use as they design—providing direction and validation early in the process. Scheduling for design considers a firm's processes and the required information of engineering, and then applies a little out-of-the-box thinking to streamline design.



Todd Shackelford is the BIM Manager for Alvine and Associates, the president of the BIM Board of Omaha, and an instructor for the University of Nebraska. He authors three Blogs: CAD Shack, The Lazy Drafter, and Revit Basics. Todd has been a featured speaker at Autodesk University, AUGI CAD Camps, CSI, IEEE and AIA events. ContactTodd at tshackelford@alvine.com

This information is the stuff that designers and engineers can use as they design—providing direction and validation early in the process.



n the hospital construction industry some trends have been developing. Utilizing BIM and IPD in hospital design and construction, all team members are able to coordinate directly and early amongst disciplines, which creates close team

collaboration and communication throughout design, planning, and execution. This article will share some things to keep in mind while helping to coordinate above ceilings in hospitals for overhead equipment. Similar to computer technology, medical equipment becomes obsolete overnight, changes rooms, grows in size, changes manufacturer, and so on. All this information can be tied to the model (room number/equipment number) to help you with future coordination. All of the Boom models and additional miscellaneous steel described in this article were made into groups, with names based on equipment numbers. Cropped 3D views named by room number for quick reference is also helpful. The "individual" Boom groups were also grouped into an "overall" Boom group, making it



Figure 1: Booms – Seismically anchored mounting supports for overhead hospital equipment. The Image at far right reflects a Boom within strutsupported framing for imaging equipment.



Figure 2: The left side reflects a "Placeholder" for a Boom. Once the final Boom design is developed, the placeholder "model group" can be exchanged with the actual, which will allow for quick design changes—reflected on the right.

possible to hide all Booms in framing plans at once. View filters to hide specified family types can also be used.

# UTILIZING PLACEHOLDERS

Elements that require structure above the ceiling and below the framing should be modeled as soon as possible. For architectural and medical equipment that needs seismic bracing, structural coordination is required. If the exact location and design of a piece of equipment is unknown, you can share what you know with the project team by utilizing a placeholder. This lets the other disciplines on the project team know what rooms will have seismic bracing frames and other elements above the ceiling. Knowing what rooms have these obstructions will be helpful as they lay out early on in the project.

### LEVEL OF DETAIL AND DEVELOPMENT

The placeholder example (Figure 2) would be, for Booms needing (4) kickers, +/-90 degrees from each other in plan. An upsidedown pyramid in the general vicinity can be modeled to give the



Figure 3: Bracing elements (kickers) exactly 45 degrees; rarely are they installed at exactly that angle. That brace has tolerance of roughly 15 degrees, which can help other disciplines coordinate their elements in the same area. This can mitigate clashes in Navisworks. team a heads up that this area will be a "no-fly zone." Your next model will include more information about the Boom Frame; mounting plate size, center of post and size, rod or angle pattern, location relative to the center point, bracing elements, installed mounting heights, access holes, and so on.



Figure 4: Imaging Frame made up of strut groups (highlighted in blue) copied as required on center. Groups used in each direction and another for the bridging and rails.

Mounting plate heights defined in the manufacturer's cut sheets and specifications are extremely important to coordinate with the general contractor. The bottom of plate with the designed thickness per the details controls the kicker location. Other disciplines on the project team may need you to adjust kickers the 15 degrees +/- of flexibility, whatever allowed by the structural engineer to steer clear of any obstruction before it becomes an issue in the field. The next generation of this 3D model verified with the shop drawings. A verified "As-Built" can be captured via LiDAR and/or supplemented with a link to the 3D shop model (if created) and archived for future use or handover at the end of the project.

### **IMAGING FRAMES**

Another large above-ceiling structure within a hospital for sliding imaging equipment is called an imaging frame. Here, struts can be



Figure 5: The bridging elements (two perpendicular struts highlighted in blue) are centered (design intent) but will be offset (1) hole up or down to either side of the mid-point / centerline, whatever the specified connector allows.

located and modeled accurately at the ceiling line, but any midheight bridging struts will be installed wherever the struts (1-5/8"o.c.) bolt hole lands, closest to center by the installer.



Figure 6: Modeling "bottom flange bracing" lets everyone know what's really going on.

# BOTTOM FLANGE BRACING (AKA "KICKERS")

Another important element that can get overlooked while coordinating above ceiling structures is "Bottom Flange Bracing." I'd like to share a couple modeling techniques that help me place some of these "bottom flange bracing" elements. Always create a "named" Reference plane in plan at the Centerline of where the brace should be placed. Remember to place the reference plane on a reference plane workset, or else others working in your model and linked to your model will be overwhelmed with reference planes. Next, use a view tool that is specific to Autodesk<sup>®</sup> Revit<sup>®</sup> Structure called "Framing Elevation." This starts the beginning of the "view range" cut/elevation/section at the grid—or, in this case, the named reference plane to which it is attached. If a sloping steel structure is in view, set the view depth as shallow as possible to not view portions of the structure sloping away.

Next, use the Beam tool, not the Brace tool, for this condition. Place the brace angle in plan or elevation to start off and adjust the angle in your framing elevation by adjusting the workpoints to match your detail requirements.



Figure 7: Elevation of "Bottom Flange Bracing."

Utilizing BIM and IPD in hospital design and construction, all team members are able to coordinate directly and early amongst disciplines, which creates close team collaboration and communication throughout design, lanning, and execut

Depending on the typical detail/office standard, Bottom Flange Bracing may have a work point 2" above the top of the bottom flange. You may pull out your hair trying to model this accurately in Revit, especially when connecting to sloping structures. For the sloping and or skewed WF Beam, it is easy to select the intersection of the top of beam at centerline, but selecting the rest of the edges of the sloping and or skewed WF Beam is nearly impossible another good place to utilize reference planes!

To locate the kickers at the correct workpoint, utilize a reference plane in section (remembering to put it on the reference plane workset). The bottom workpoint of a sloping or skewed wide flange beam takes the longest to locate. Start off by utilizing "thin lines" to verify accurate start placement (top center). Start by placing a reference plane down the center of the intersecting beam to locate the workpoint which is the only definable/selectable point on sloping or skewed beam. In elevation, create a horizontal reference plane and copy or move the reference plane down the "beam depth" of the intersecting beam. (See Figure 8 intersecting beam properties) then 2" up, plus the additional thickness of the beam flange (again, see Figure 8 intersecting beam properties).



Figure 8: Select the intersecting beam, open the property of that size (Edit Type). The Flange Thickness "tf" and Depth "d" are used to locate the workpoint of the bottom flange brace.

Multiple kickers under flat floor framing bay can be copied parallel within a bay. Kickers for sloping structures, typically at the roof, must be created one at a time since the angle of the geometry changes along the slope. There may be a way to do this with a Revit "beam system" if you can define a work point along a given edge, possibly adding a formula to grab the defined beams workpoints +2" +flange thickness... would make this process much faster and easier to manage.

### COMMUNICATING WITH OTHER DISCIPLINES

Before everyone starts modeling, the BIM team pre-determines in which area of a corridor they'll model/run their main lines. This helps, for when the team tries its hardest to stay within their constraints; it starts the project off a little smoother.

How this relates to Structural is when the SLRS "Seismic Load



Figure 9: Images above reflect the corridor with MEP shooting through, hanging straps, a compression strut, and bracing. Typically there is much more going on here, but you get the point. The actual corridor may have sloping members and bottom flange bracing. Add fireproofing, sprinklers, pneumatic tube, more disciplines, everyone's struts and straps, seismic bracing, access for maintenance, metal stud soffit framing with kickers, etc.—now we have a problem!

Resisting System" is adjacent to a corridor. Bottom Flange Bracing is used along the load path (to help with beam rotation along that chord line/collector line/frame) and can kick down through corridors causing unforeseen challenges if not modeled correctly (or even at all). What everyone thought was a big open square tunnel above the flat-framed corridor is actually a smaller triangle shape with sloped framing and bottom flange bracing.

# TIMING OF REVISIONS IS CRUCIAL

Design changes can be tough to coordinate within Revit when producing prints for postapproval documents. Sometimes more than one package is being worked on/in review/ changing/coming in/going out... going backwards? It's scary. You must carefully plan your work and work your plan.



For local building officials reviewing the

documents, it is an administrative code requirement to not work on altered documents that have not been approved or appropriately identified. During CA (the Construction Administration phase), it can be hard to not reflect changes before they're supposed to occur. The model needs to be updated with the "latest and greatest" for the BIM team, but construction documents cannot get ahead of themselves. However you work your magic, be sure to double check your output electronically (PDF, DWF) to verify nothing was changed that was not accepted on the previously approved document, unless it is clouded with delta. I suggest looking into any software that can help you to compare or overlay two structural sheets (PDF, DWF) atop each other. Utilize a QA/QC "Quality Assurance, Quality Control" checklist for the project or from your office. If one is not made, create your own and share with the team—you may find other QA/QC checklists hiding around.



Figure 10: Another example of an above-ceiling obstruction is a seismic support for a sliding partition. Although the rods are spaced closely together, other disciplines will squeeze in between. (Don't forget to review the shop drawing submittal.)

# THE CUP (CENTRAL UTILITY PLANT) AND MISCELLANEOUS MODELED ELEMENTS

The CUP includes items such as plumbing, gas, electricity—vital elements that enable a hospital to run. Typically only the Site Superintendent and the O&M (Operation & Maintenance) team enter this area of the hospital. It contains large equipment needed to keep the hospital operational including additional backup systems in case of a disaster. Visualize seismic restraints and flex connectors gone wild! A coordination nightmare...

Figure 11: New and old CUP joining together. Housekeeping pads highlighted in blue, pipe runs outside and within, heading off towards the main hospital.

Since the O&M staff members are typically the only people working in this area of the hospital, the construction requirements are different. There is a strong possibility that housekeeping pads will be needed for supports (highlighted blue in Figure 11). The entire project team can benefit from you modeling those housekeeping pads and curbs. So instead of using 2D "Detail" line, model those bad boys.

Also helpful is modeling free-standing pipe support frames, aligned roughly 10 to 20 feet apart. This is worth coordinating together in a big room meeting with the team installing, designing, and modeling the pipes and installing the frame. The option is a bunch of back-n-forth coordination with images and emails, which is not productive and can be time consuming. Utilizing the Internet works, but so does a face-to-face coordination meeting where modelers can update "live and in real time" if you'd like. That might work best here.



Adam Muñoz is a structural drafter in HGA's Sacramento office who specializes in 3D modeling and animation as well as structural drafting and design. HGA is an integrated architecture, engineering and planning firm that helps prepare its clients for the future. With offices in Sacramento, San Francisco, and Los Angeles, California; Minneapolis and Rochester, Minnesota; Milwaukee, Wisconsin; and Washington DC, the nationally recognized firm has developed expertise in the higher education, healthcare, corporate, arts, community, and science/technology industries since 1953. HGA's culture for interdisciplinary collaboration, knowledge sharing and design investigation enables its clients to achieve success with responsive, innovative and sustainable design. For more information, please visit www.hga.com Adam Muñoz can be reached at amunoz@hga.com

# Navisworks Manage 2013



f you could ask the model anything, what would it be? We will share with you what we have asked and how Autodesk® Navisworks® has answered, time and time again. On behalf of the rest of my team at AEC Factory, I welcome this opportunity to humbly share our experiences using Navisworks to go beyond simple clash detection and ultimately generate faster, more accurate, and constructible models.

As a business development manager I am often the interface between our client and our internal technical team. Part of the excitement in my role is that each client brings a new challenge, poses an original question, or has a unique problem. It's my job to react, answer, and solve. As a value added reseller (VAR) for Autodesk, we find that many of the initial client requests are software based. What tools are best suited to meet their specific needs? In the case of Navisworks, the question becomes: Which version is appropriate for their role in the project?

My confidence in sharing the intricacies and capabilities of each tool within the Architecture, Engineering, and Construction (AEC) segment of Autodesk products comes directly from my technical team and their prowess with the software. In fact, I couldn't write this article without the technical insight and practical input from my technical team, especially our Technical Services Manager, Christopher Suggs.

As an Autodesk Certified Training Center, we are required to be proficient with the software. However, I believe our greatest knowledge has been earned through challenges we have faced working on real-world projects as modelers, detailers, and Building Information Modeling (BIM) coordinators.

# NAVISWORKS: FINDING THE RIGHT VERSION

The three versions of Navisworks software offered by Autodesk start with the no cost reader/viewer and basic query tool that is Navisworks Freedom. Anyone with a relatively current computer and an internet connection can download and run this software to view and measure any published Navisworks Document (NWD) file.

Next, we have Navisworks Simulate, which is included in the Building Design Suite Premium package or available as a standalone product. Navisworks Simulate offers a multitude of options including model aggregating, scheduling, and object animation. If you're into site logistics and time lining, this one is all you.

The third version, available standalone or as part of the Building Design Suite Ultimate, is Navisworks Manage. This version is the true BIM Coordination tool. Manage includes all of the features found in the first two flavors of Navisworks while adding the ability to run and manage clash detection and resolution from the first hit to the final resolved RFI. The following Navisworks comparison chart offers more detail.

Navisworks	Manage	2013
------------	--------	------

Feature	Autodesk Navisworks Manage	Autodesk Navisworks Simulate	Autodesk Navisworks Freedom
Project Viewing			
Real-Time 3D Visualization & Navigation	*	~	×
Whole Team Review	~	×	×
Project Review			
File & Data Aggregation	×	×	
Review Toolkit	×	×	
NWD & DWF Publishing	~	×	
Collaboration Toolkit	~	×	
Simulation & Analysis			
Photorealistic Visualization	~	×	
Object Animation	~	×	
5D Scheduling	~	×	
Coordination			
Clash & Interference Detection	×		
Clash & Interference Management	~		

Figure 1: Autodesk Navisworks comparison chart

### A COMMON MISCONCEPTION

Autodesk<sup>®</sup> Revit<sup>®</sup> is an incredibly powerful and capable authoring tool for the A, E, and C industries from Schematic Design (SD) to Construction Administration (CA). Believe me, we use and promote it—often in the face of naysayers. Its "Interference Check" feature is great for quick checks to see if items from one file or category touch objects from another file or category. But what if you could ask more? What if you could drill down and clash objects with varying parametric values from a multitude of different authoring software with specific clearance criteria? What if you could quickly test several solutions for a given situation using move, scale, and rotate tools without constraint? What if... what if... what if...

What I'm trying to convey is this: You're only as good as your tools, and Revit is not adequate for BIM Coordination. It's like bringing a knife to a gun fight, and as you may or may not know, BIM coordination often mimics this analogy. Project teams relying on Revit in this manner are not able to fully see conflicts and design issues or quickly test possible solutions as they could if they were using a purpose-built tool such as Navisworks Manage.

### **BEGIN WITH THE END IN MIND**

Does a clash-free model really mean no clashes? And more to the point, does it mean the model is buildable? Running basic clash detection involves clicking the "Add Test" button, selecting two appended models, clicking "Run Test," and then popping through one result at a time. This is where we all started as "noobs," but its not enough to achieve a clash-free, or even a clash-minimal, model. It's comparable to Revit's "Interference Check" feature with a leg up given the extra reported data per clash and built-in management tools within Manage. Navisworks isn't the most intuitive software at first and it relies on the human element for success.





Interference Check Categories from Categories from Current Project AEC Factory Test.rvt Floors Air Terminals Structural Columns
 Structural Framing
 Walls Duct Acces **Duct Fittings** Ducts Flex Ducts Mechanical Equips Pipe Accessories Pipe Fittings Pipes Plumbing Fixtures Selection Selection None Al Invert Al Invert None OK Cancel

# Navisworks Manage 2013

Settings			
Type: Cleara	nce • Tolerance:	Oft 2in	Run Test
Links Mana	- Chara (see )	0.1	

### Figure 3: Clearance

We have found that selecting objects by the parameters they contain (ala "search sets") is mandatory to truly deliver viable and goal specific clash report results such as structural members of a certain size, shape, material, and so on. In a project where the steel is spec'd to be monocoated, the structural detailer is typically not required to model this material as it is not within his/her scope. How do you truly coordinate to what is not modeled? In this case we use the "Clearance" setting within the Clash Detective to create a non-modeled buffer around modeled objects. If the neutral zone is violated, we get a big red hit!

Tests like this are the heart of what a coordinated BIM model strives to be. By "beginning with the end in mind" and taking this clash detection tool beyond the basics, we drill down until we hit gold, or pyrite as the case may be. This protocol has become standard operating procedure for us and literarily is the difference between delivering a buildable model and wasting time and money in the field later. Constructability reviews and constantly checking for clearance as the model evolves is imperative to protect the project stakeholders and deliver ultimate project success.

### **DISASTER AVOIDED**

Using Navisworks to go beyond the box has proven effective on many projects and the value add it brings the construction side of project development is measurable. One notable project involved a science laboratory with complex piping systems throughout. We began like every other project, setting up our base tests to run reports and gather data, and while flying the model we noticed something peculiar. A non-sloping storm drain? Could it be? Checked its properties and sure enough, Slope = 0.00 so we set off to optimistically prove this was just a small oversight by the detailer. How do we find all offenders quickly and without the ol' click and read of each pipe while delivering a meaningful and useful report?

Navisworks Manage and Simulate have these two wonderful features: Find Items and Search Sets. When used in tandem, they allow you to build very specific queries and save them for later use. Example: Find all whose Element Category equals "Pipes," whose System Classification equals "Sanitary," whose Size is greater than or equal to "3 ½," and whose Slope is less than 0.01 (1%). The model lit up! We saved it as a Search Set and began another query. This time looking for a size of 3" and under with a slope of less than 0.02 (2%). Again, the model lit up and we created another Search Set. Considering that Sanitary applies to all drain, waste, and vent, this was a very important catch and the design team

had a detailed to-do list, with Element IDs, that took us roughly 10 minutes to produce. Had we gone back to the authoring tool, which in this case was Revit, this same investigation could have taken hours.

The greatest value to identifying this problem was the timing of it. We learned of it during our initial due diligence fly-through of the model during the design development (DD) phase of the project, well before coordination began.

### **PEELING THE ONION**

The question I would like to pose to Navisworks users everywhere is "Are you using Navisworks to its full capacity?" Most of us "don't know what we don't know." We at AEC Factory are not an exception to this truth. However, through trial and error and working to meet our customers' needs, we have peeled some of the layers and discovered new and creative uses for Navisworks. We encourage you to do the same. There is always more to be learned and sharing among peers is how we do that. It is for that reason we feel so honored to write this article. We will continue to work with our eyes wide open, looking for new solutions, learning from both our customers and our colleagues. We welcome the opportunity to hear your thoughts, answer your questions, or offer any insight beyond this article. Please feel free to contact us at contact@aecfactory.com



Kim Perelli is the Business Development Manager at AEC Factory, located in Torrance, California. Kim is not new to the construction world and spent much of her early career working for a large mechanical contracting firm. Kim is a published author and a graduate of the University of Southern California. You can reach Kim at kim@aecfactory.com

# Step into the Present

n the past I've been a bit hard on AutoCAD<sup>®</sup> Civil 3D<sup>®</sup> and its lack of BIM features. If you are using an older civil software product you might want to look past those critiques and see the benefits Civil 3D does offer. There are a whole

bunch of improvements in the software to make the step forward worthwhile.

### **SURFACES**

One of the biggest improvements is in how surfaces perform. No more continually rebuilding a surface through a dialog box that asks you the same confusing questions each time. Civil 3D obscures many of the options in the surface properties dialog box, which you may choose to ignore. Instead, the ability to right- click and rebuild the surface at will is available. While I haven't had much luck in the actual use of rebuild automatic, it is available if you don't mind waiting a second or two after each modification you make to the objects that make up the surface.

Another benefit of surfaces is the ability to add points along tangents and curves of Polylines, 3DPolylines, and Feature Lines. This means you can keep the geometry of the objects whole without adding supplementing points before adding breaklines to a surface, which was an often used step in Land Desktop to provide better looking surfaces.

Speaking of Feature Lines, they provide a vast improvement over the use of 3DPolylines in Land Desktop. It's now possible to have curves without tessellating the geometry before adding it to a surface. The

# AutoCAD Civil 3D 2013



### PROFILES

Similar to alignments, profiles also have moved into the world of free, fixed, and float terms. There is still the ability to work old school with PVIs and vertical curves. If you do happen to create a profile with PVIs, you'll want to add the vertical curves as float type vertical curves. Similar to older software products, the proposed type profiles are typically independent of a location in plan space. This means if you change the geometry of the alignment, the profile will not update accordingly. It still retains the original station elevation values; the station of the profile PVI does not adjust to be at the same location in plan view.

Figure 1: An unremarkable surface picture.

tessellations are handled by the surface when the feature line is added to the surface as a breakline. It is possible to specify the tessellation distance when the feature line is added to the surface. The editing tools of modifying the feature lines are great. The tools encompass many of the calculations you'd want to perform. Need to figure out the high point along the feature based on an incoming and outgoing grade specification? Well, it's in Civil 3D.

### ALIGNMENTS

In Land Desktop I was never able to figure out how to modify an alignment. I'm sure there had to be a better way than deleting and recreating the alignment from a polyline. With Civil 3D those modifications are fairly painless. Need to add a PI point? Simply open the Alignment Geometry Toolbar, press the Add PI tool, and select the location of the new PI point (some rules and restrictions may apply; see product documentation for further information).

Station labeling updates after modifications to the geometry are complete. No more deleting and recreating the labeling—Civil 3D handles it for you. Of course, there are times when you have constraints in the alignment creation and Civil 3D can assist in maintaining those restrictions. With the use of fixed-type alignment segments (such as tangents and curves) it is possible to place the fixed segments and then tie into them using float and free type segments.

Don't worry if you don't understand the terms of free, fixed, and float—you can still use Civil 3D without using those terms and create alignments with PI points only with curves. There is even a command to facilitate this type of alignment creation. Note, though, that the power of Civil 3D alignments increases exponentially with an understanding of those terms. The last statement is important

to recognize. I know when I was first introduced to the product, it was often stated that when the alignment changes the profiles change. Little did I recognize the difference between sampled from a surface profile and profiles created as a design. The profiles sampled from a surface do update when the geometry of the alignment changes. Despite this drawback, the advantages of this updating on the profiles is worth upgrading from Land Desktop to Civil 3D.

### POINTS

With points, you either love them or hate them. I happen to love them, mainly because I usually don't have to contort point labels to be visible and non-overlapping in a drawing. Civil 3D has a wonderful way of grouping similar points together in Point



# AutoCAD Civil 3D 2013

Figure 2: Assembly in Civil 3D.

Groups. Filters are applied to the points located in a drawing and they are then grouped together in the point group. The point groups may then control their appearance and label style. Don't worry, there is the ability to override the appearance and label if you want the point to be different than what is specified in the point group.

The point group may then be added to a surface definition. Any additional points imported into a drawing, say from a later survey, will automagically be inserted into the point group. Then when the surface is rebuilt the additional points will show up in the surface. If you design a surface by using points you'd love the above mentioned capability. This feature will save you numerous steps by not having to manually rebuild the surface after creating new points.



# CORRIDORS

When designing a project that utilizes a linear type approach, such as some roadways, levees, and bike trails, then corridors are the way to go. Corridors make it easy to utilize a section-based design workflow. The geometry required for the sections are most easily created by the use of assemblies and subassemblies. Assemblies are the container for the section geometry. The subassembly objects are the individual components that make up the geometry. Subassemblies represent curbs, pavement, landscaping, or other geometric shapes. These shapes may have targets for both the horizontal and vertical changes in geometry, providing greater flexibility.

Often there are designs that demand greater design requirements than can be performed with the out-of-the-box subassemblies. That is where Subassembly Composer comes to the rescue (at least for Civil 3D 2012 and 2013). Subassembly Composer allows you to build complex designs that would be difficult otherwise. I've used Subassembly Composer to consolidate curb and gutter types for agencies. This way I don't have to replace subassemblies if they change; I change the property of the subassembly to reflect the new curb type.

In this article I've shared some of the features I like about Civil 3D and why I use the product in production. I've been a long-time user and blogger, since Civil 3D 2007.



Christopher Fugitt is a Civil Engineer and has spent the last eight years designing government projects as well as residential subdivisions. Before working as a Civil Engineer, Christopher worked for a General Engineering Contractor on subdivision and mining projects. Christopher earned his B.S. degree in Civil Engineering from California Polytechnic State University, San Luis Obispo. Christopher maintains and authors the Civil 3D Reminders blog at http://blog.civil3dreminders.com/

# **Thank You!**

Listed on this page are all the authors who contributed to *HotNews* and *AUGIWorld* in 2012. The AUGI Board of Directors and AUGI members in general very much appreciate their contributions to the growth and success of AUGI publications. Without their help we would not have content to publish! The editors of *AUGIWorld* and *HotNews* sincerely wish everyone a wonderful holiday season and a happy new year! See you in 2013!

Osama Ali Jason Bailly Dan Banach Peter Baston Steve Bennett Brian Benton Michael E. Beall Lisa Bernacchi Ammar Berrou Anamaria Brown David Butts William Campbell Robin Capper Paul Chambers Scott Chatterton Tom Cipolla Murray Clack James Clifton James Coppinger Lonnie Cumpton Cyndy Davenport Elisa de Dios Martijn de Riet

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## **FAMILY CATEGORIZER**

http://www.kiwicodes.com/products/27-family-categorizer.html Kiwi Codes Solutions Ltd.

Family Categorizer Tool	83
This tool takes all the families located in the specified folder and folders and organizes them into Category named folders in the directory. Depending on the number of families this can take a time.	i sub target long
Family Location including Sub Folders	
Target Location	
Run	

This tool takes all the families located in the specified folder and subfolders and organizes them into Category named folders in the target directory. Depending on the number of families, this can take a long time.

There is some confusion about whether the tool is a free trial (as some users have experienced) or a free seat (as it seems to state on the website.) If I hear more, I will clarify next month.

# AUGIWorld brings you recent developments in Autodesk and AECrelated software items

Inside

Track

# **REVIT PRECAST FOR HOLLOWCORE** SLAB DESIGN

http://www.idat.de/home-en-GB/

### IDAT GmbH

Germany-based Autodesk Authorized Developer IDAT has announced the release of a Revit-based solution for the design of precast hollowcore slabs. This solution includes the ability to produce bills of material, shop drawings, CAD/CAM data, and trailer loading lists for supply chain management.



Check out the video at the website noted above.

# AUTODESK 360 CLOUD SERVICES (FOR STUDENTS)

http://students.autodesk.com/?nd=360cloud

Autodesk

While we have explored 360 Cloud Services in this space before, it has come to my attention that students have free access to the tools through the Autodesk Education Community. More information at the link above.



Free

## **REVIT INTEGRATOR**

http://www.cscworld.com CSC

CSC's Revit Integrator helps engineers and technicians improve project communication and increase productivity, while experiencing greater control when synchronizing concrete structures between CSC's code- based design software Fastrak and Orion and Revit.

- Synchronize your code-based Fastrak or Orion model with Revit Structure
- Increase your productivity and save valuable design and drafting time by building only one model
- Use audit features to show what's been added, changed, or deleted during synchronization
- Improve your project communication, react to changes quickly, and reduce the risk of errors and repetition
- Synchronize models throughout the project without compromising existing modeling work

Free

### Until next issue!

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



# Unleash Your Creativity

At BOXX, we make the world's fastest and most reliable workstations and rendering systems. Innovative features like liquid cooling, over clocked processors, and multiple GPUs remove your workflow limitations, allowing you the freedom to create—and never compromise.

Discover how our solutions can optimize your Autodesk workflow at http://go.boxxtech.com/pro.html





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