AUGIWorld

The Official Publication of Autodesk User Group International

May 2017

Introducing Autodesk 2018

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- AutoCAD Enhances xrefs and more
- Highlights from 3ds Max 2018

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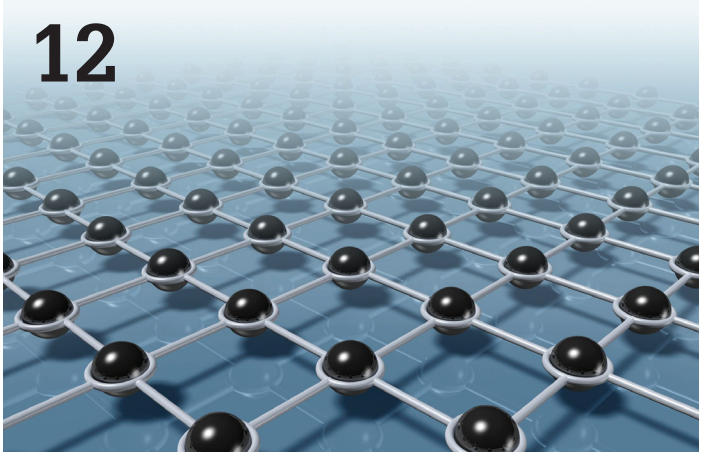

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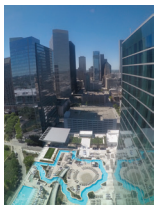

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Letter from the President

We've been talking a lot at my office lately about work-life balance. I'm always happy to have those conversations, because it means our firm cares about its employees' well-being.

But what does it mean today to balance work and life? It used to be that you could identify the workaholics by the number of hours they spent at their desks. Now, thanks to improvements in telecommuting technologies, the boundaries between "office" and "home" can blur.

Don't get me wrong—I'm not arguing against the use of laptops, cell phones, and VPN. I use all three all the time. Mostly from the office, true, but there have been many times when I've been grateful for the ability to stay connected on the go.

The fuzziness of the "work space" means that we have to be extra careful about letting work seep into all areas of our lives. And it gets even more complex when you consider people who are passionate about their careers. I bet most of you are reading this letter in your spare time. You care enough about your work to keep up with industry news and with your professional community, even if you're not technically getting paid for your time.

Does that mean you have no work-life balance? No! The "life" side of the equation should include things that interest you, that capture your imagination, that entertain and inspire you. For some of us, that list includes our chosen profession.

For others, "work" is just that—something that you do to pay your bills and fund your other interests. I hope you find some reward in your job, or it makes it hard to get through the day. But there's also nothing wrong with leaving work at the office and concentrating your energies on other pursuits. These "hobbies" may not be profitable from a monetary perspective, but they enrich our lives in other ways.

In the end, it's up to each of us to find our own balance. What works for me may not be right for you, and vice versa. And as much as we can, we should suspend our judgment when observing other people's (apparent) work-life balance. For one thing, we may not have their whole story. (Maybe he puts in an extra two hours every night after the kids go to bed. Maybe she commutes by train, and has figured out how to be productive while she rides.) And really, unless someone's lack of actual productivity is affecting us or our team, it's probably none of our business, right?

I know nothing in here is exactly revolutionary. You've probably heard (or thought) it before. But it's always good to take a step back and make sure that your life is balanced the way you want it.

May is usually a beautiful month, no matter where you live. My advice is to use some of that lovely weather to balance out the fluorescent light. Step outside for a bit, enjoy some sunshine, and come back to work refreshed.

Kate Morrical
AUGI President

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by: Brian Benton and Jaiprakash Pandey

Xref Enhancements & Font Fixes in AutoCAD 2018

Last month Brian Benton presented an overview of what's new in AutoCAD® 2018. This month he dives deeper into the xref features in the new release. Joining him is Jaiprakash Pandey with a look into the SHX font from PDF enhancements.

BRIAN BENTON

AutoCAD 2018 has several new feature enhancements as a part of its update. The biggest change is the new 2018 DWG file type. This could affect many users and those who share files with outside sources, vendors, and municipalities. Beyond the file change, I can't point to any one "big ticket" item that makes AutoCAD 2018 a "must have" update. However, the new release does contain several enhancements, additions, or improvements to existing commands, tools, settings, and features that are a long time coming. In this article I will focus on external references or xrefs.

Xrefs are not new, and we have all used them in one way or another. They are likely the most used method of sharing data across drawings, departments, and projects in AutoCAD. Even a single person working a project is likely to use xrefs.

Xrefs are relatively simple to use. You make a drawing file and want to show linework from a "base" file. Xref that base file into your drawing file and you have it. In this article, I'll discuss issues that may arise and how AutoCAD 2018 can resolve them.

RELATIVE PATH

If a file gets moved to a different folder location a reference could break. AutoCAD 2018 will help reduce that because now the default Path Type is now Relative Path instead of Full Path. Better yet, there is now a systems variable where you can set which path type is default. REFPATHTYPE has three settings: 0 for No Path, 1 for Relative Path (the default setting now), and 2 for Full Path. You can keep the Full Path as your default if you wish.

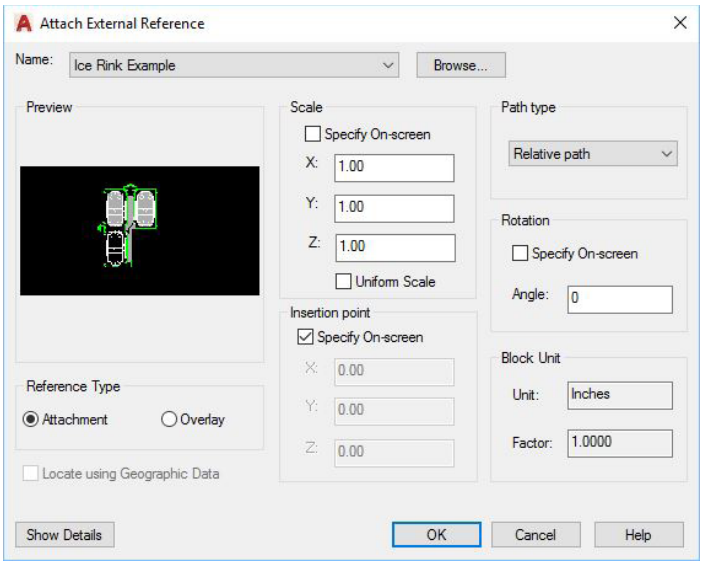

Figure 1: Out-of-the-box setting will create external references as a Relative Path in AutoCAD 2018

With previous releases, often when I started a new drawing the first thing I did was try to create an xref. As I typically use Relative Paths for my references I could not do this until I saved the drawing file first. AutoCAD 2018 now allows you to set a relative path without having to save your file beforehand. It's a small thing, but one that can save a few minutes of time if you start with an xref.

REPAIR BROKEN LINKS

If you are working in a file and save it to a new location (for example: saveas), then your relative path references will likely break. AutoCAD 2018 cautions you ahead of time with a pop-up prompting you to update the relative paths and it provides a button (one-click) to automate fixing these links.

Another aid in fixing xref paths are two new options that are available when you right-click a missing reference file in the reference manager. The normal list of options are still there: Attach, Unload, Reload, Detach, etc. But now there are also "Select New Path" and "Find and Replace." You could always access this type of path change by selecting the file in the manager and going down to the Details section, clicking the path, and re-browsing to the proper location. These right-click options make it a bit simpler.

The "Select New Path" option allows you to more quickly start browsing for the proper pathway, but then gives you the option to apply this change to the other missing xrefs in the current file. "Would you like to apply the same path to the other missing references?" Click yes or no. Nice and easy.

The "Find and Replace" is similar, but is a bit more controlled. It locates the references that use a specific folder path and replaces them with a new one you browse to. This is nice if you move a base file to a new folder and want to tell your drawing to stop looking over there and start looking over here.

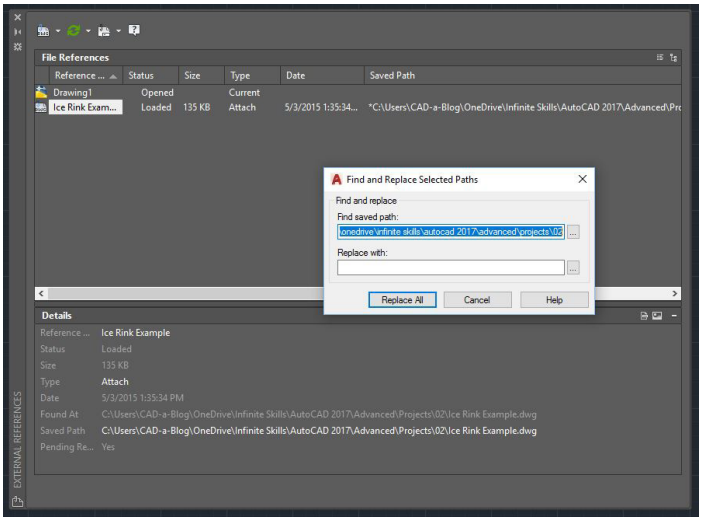

Figure 2: Right-click a referenced file and use the new Find and Replace or Select New Path tools to repair broken links

IT'S THE LITTLE THINGS THAT HELP

Changing the Path Type is easy enough, just right-click the file in the manager, select Change Path Type—and select the file path type you want to use. AutoCAD 2018 will now gray out the current file path type, keeping you from accidently picking the current type and having to start over again. It's not a huge change, but it is something that should be there.

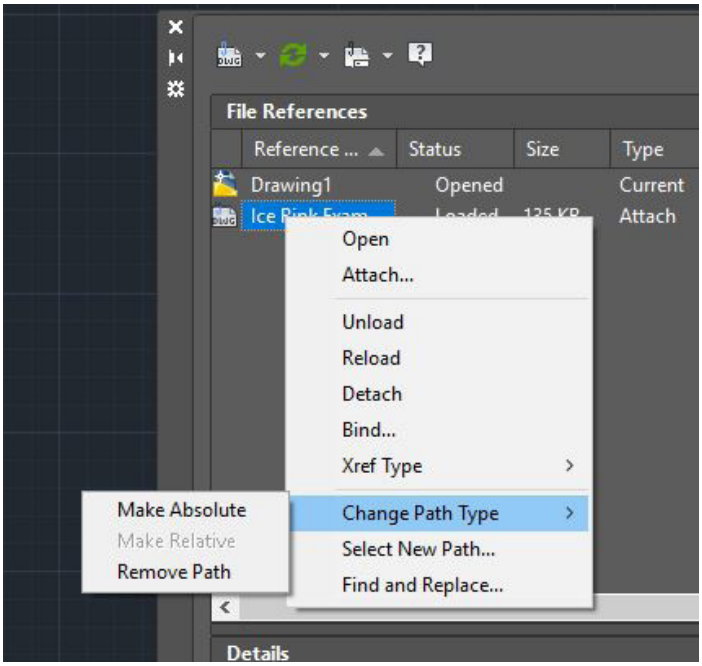

Figure 3: The current file path type of the referenced drawing is unclickable when trying to change it

Many times, a reference file will have other files refenced into it and you get to deal with them. Aren't you lucky? If those files can't be found, AutoCAD formerly listed them as "Unreferenced." Now they are listed as "Orphaned." You don't have to guess if they are unloaded or lost.

AutoCAD 2018

One of the cool things about the Reference Manager is that it makes opening a linked file easy. Just open the manager, right-click the reference file, and select OPEN. You couldn't do that if a file wasn't loaded. You had to load the file, wait, then open the file, then go back and unload the file because it was probably unloaded for a reason. That's annoying. AutoCAD 2018 allows you to open unloaded files.

Renaming an unloaded xref will no longer automatically load the file. It will remain unloaded. If you rename a referenced file with a tool other than the Reference Manager, you no longer have to manually reload the file for the name to be applied. You can rename referenced files through the Rename tool or through the CLASSICXREF command.

Perhaps the smallest change but one that might help is the change in wording when a file is opened that contains missing reference files. AutoCAD formerly prompted "Number of missing reference files" but now says "Number of references that are Not Found."

WRAP UP – TLDR

AutoCAD 2018 has added several small changes to external reference tools that will make using and maintaining them easier. Relative Paths are now default, but you can change that. You can assign a relative path without saving the file first, repeating broken xref paths has new tools and is simpler, changing a file path type is less clunky, missing nested xrefs are now listed as orphaned instead of unloaded, and you can open unloaded xref files from the manager.

JAIPRAKASH PANDEY

SHX FONT IMPORT FROM PDF

When plotted to a PDF, shape fonts or SHX fonts are stored as geometrical shapes because PDFs don't recognize SHX fonts. When you import these PDF drawings back in AutoCAD you will get polylines instead of a shape font.

With AutoCAD 2018 you can easily convert these geometries into SHX fonts. To explain this feature, I will use the drawing shown in Figure 1, which contains lots of text information in the form of a SHX font.

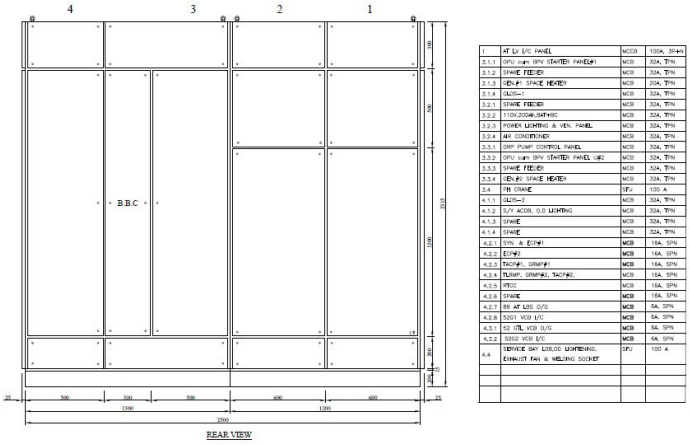

Figure 1: Sample drawing with SHX font

Start with a blank drawing and select the PDF Import tool from the Import panel under the Insert tab or use the PDFIMPORT command. From the file browser, select the PDF file and click on Open; keep all options on the Import PDF window unchanged and click OK.

In the inserted PDF file, when you hover your cursor over SHX text you will notice that they are inserted as Polylines.

RECOGNITION SETTINGS

Before actually using the text conversion tool we need to configure its settings. Select the Recognition Settings option from the Import panel under the Insert tab. A new PDF Text Recognition setting window will open up with a list of default SHX fonts in the upper left panel of the window as shown in Figure 2.

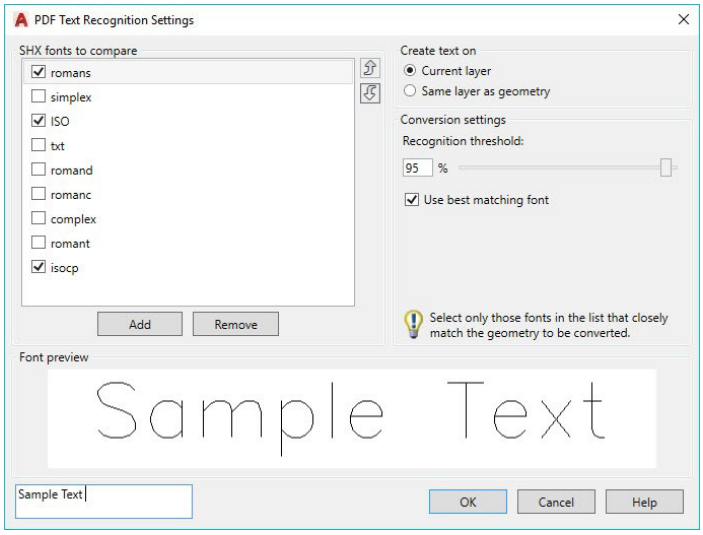

Figure 2: PDF Text Recognition Settings

In the "SHX fonts to compare" panel, use the Add button to add all the fonts that are similar to the fonts used in the imported PDF. You can also remove fonts that are not similar by using the Remove button at the bottom of this panel. To sort the order of fonts, use the up and down arrows.

In the list, try to put similar fonts at the top of the list to get quick output because AutoCAD starts its comparison from the first font in the list and gradually moves down in the list if required fonts are not found. Also, select the checkboxes for all the fonts you want to include in the comparison from this list.

You can change the layer setting and also change the recognition threshold for the geometries to be recognized as fonts. Lowering the recognition threshold could result in the conversion of geometries to similar but different fonts. For our example, I will keep this value at 95 percent.

Select the "Use best matching font" checkbox if you want AutoCAD to compare the geometries in the drawing with all the fonts in the list, then select the best matching font from the comparison. Once these settings are made, click on OK and select all SHX text geometries from the drawing. You can include Mtext and other geometries in this selection set; they will be automatically filtered out from text conversion.

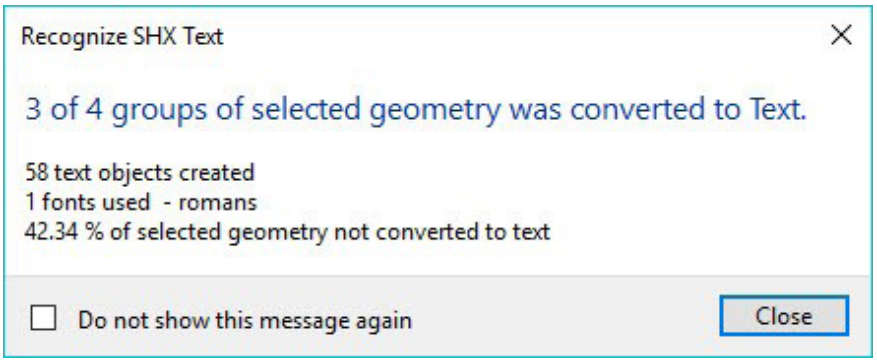

Figure 3: Recognize SHX Text message

When the text conversion is complete you will see a window with stats of the text conversion as shown in Figure 3. If AutoCAD fails to convert all geometries into SHX text, you can try converting them again by decreasing the recognition threshold and selecting smaller chunks of geometries in a selection set.

COMBINE TEXT

You can combine the converted text into a single Mtext unit as well with the Combine Text tool on the Import panel. You can also customize the settings of the Combine Text tool.

Click on the Combine Text tool on the Import panel under the Insert tab or use its command equivalent TXT2MTXT. Click on the settings option on the command line and the panel shown in Figure 4 will appear.

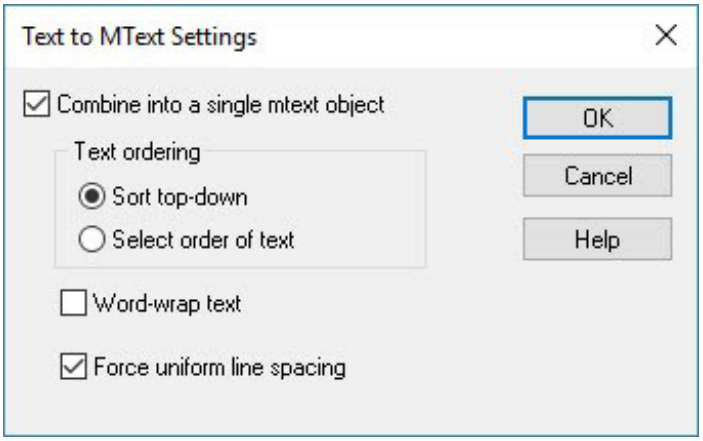

Figure 4: Text to MText Settings

If you have single line text that you want to convert to multi-line text without combining them into a single Mtext object, then uncheck the first checkbox of this panel. You can also keep "Force uniform line spacing" unchecked if you want to keep the original line spacing between the Text lines you are combining. Once these settings are made, click on OK then select the text and press enter again.

All the selected text will be combined into a single Mtext unit. You can also access this tool from the Express tools panel in AutoCAD.

Have you upgraded to AutoCAD 2018? Do you have a favorite feature in this or maybe one of the last couple versions you have grown to love? If so, drop me a line and let me know—I would love to hear what everyone else is finding to be their favorites. Email to: walt@functionsense.com

– Walt Sparling,
AutoCAD Content Manager, *AUGIWorld*

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by: Mark Kiker

Unmute

Have you ever been on a conference call and asked someone a question just to hear nothing in reply? The conversation is flowing between the participants and then someone asks a person on the other end of the phone a question and the chatter goes silent. After a long pause, someone says, "I think you are muted. You need to unmute." Then another short pause and the other end of the phone sparks to life and the person says, "Sorry, I was on mute." After a quick chuckle, the conversation continues. The person repeats everything they just said so people can now hear it. Later in that same con call, the same thing might happen again. We all forget that sometimes we are on mute.

Being on mute is frustrating. It slows things down. I have felt like I was on mute a few times when I was not even on the phone. I have discussed, presented, emailed, written it down, passed it out… and nothing gets through. Are they hearing me? Do they care? Is this not a big deal? I have doubted my plans, my perspectives, my efforts, and more as I have seen person after person just not getting what I am trying to convey.

SIGNS YOU ARE ON MUTE

Like the person on the phone call, you may not know you are muted. You happily continue to talk when no one actually hears you. You think they are silent because your points are spot on. You think that you have command of the conversation and all ears are on you. But they really hear nothing at all. Ever felt like that? Here are some warning signs that indicate you might be muted.

Nothing is changing. You have told someone what needs to happen. You have stated the cause, effect, and cure so succinctly, but nothing happens. They just go on their way as if you said nothing and continue down the road they are traveling. It might be a group of people, an entire project team, or just one person, but they must not have heard a thing.

No one is responding. You lay out your goals and plans. You mention what you are going to do next. You wait for some indication of understanding, but they say nothing and move right on to the next subject as if nothing was said.

No one is joining you. You map out your targets for the march of technology and encourage others to come along. But no one lines up. No one throws in with you. No one seems to care about where you are headed. Did they hear you?

HOW TO UNMUTE

When you feel you have a valid message and no one is hearing it, you need to unmute. You need to make sure that the message is getting across. You must do something different or you will continue to talk just to yourself.

Talk more. Maybe the answer is just to talk more. Take every opportunity to discuss, review, remind, and interact with others. That might just do the trick—unless you are just annoying them more. Keep your antenna up for signals that people are bored with the topic.

Use pictures. Try diagrams, drawings, sketches, and more to convey your intent. I have found that many times when I thought everyone was on the same page, a quick bubble diagram or scribbles on the whiteboard unveiled a misconnection. I have also seen a picture that is worth more than a thousand words. Simple diagrams with boxes, lines, and text go so far in clarifying what is being said.

Plan your words. Develop your message in 10-second sound bites, two-minute elevator pitches, and short discussion points. Sprinkle these into conversations when reporting to others on status, or even just in reply to a "how's it going?" question.

Say it again. Repeat yourself. I wrote on this a while back for *AUGIWorld*. Dig up the article from the February 2016 issue and "repeat" your reading of it. Sometimes you just need to say it more than once or twice.

Have people tell you what you just said. Ask questions that encourage people to reply back with your message. Ask what part they think will cause concerns. Then listen to see if they have heard and processed the plan and can give some indication that they heard it.

Let others do the talking. I let my associates and others on the project give summaries of the next steps. I listen to see if I need to clarify what they might have heard. I am encouraged when they reflect my perspective to others. It means that they "got it."

Think out loud. Do some of your campaigning via the process of thinking out loud. Ask more questions of yourself in front of others. Then allow them to join in your deliberations on the subject.

Communicate slower. Maybe you are just moving too fast. There are so many things going on in today's business environment that some may be unable to add anything to their list. Others may just not have time. Some may not want to even consider another effort to make technology better. Maybe you need to slow down the change process and provide smaller chunks of information and bite-size efforts for making progress.

When others appear to not hear what you have said, take the time to think about their side of the conversation. When they have hit the mute button on your delivery, then it might be time to regroup and try another tactic.

BEFORE YOU TRY TO UNMUTE, HIT THE PAUSE BUTTON. FIRST EXAMINE YOUR MESSAGE. MAYBE IT IS WRONG. MAYBE YOU DO NOT KNOW SOMETHING THAT OTHERS DO. MAYBE YOU ARE HEADING IN THE WRONG DIRECTION, RUNNING TOO FAST, LOOKING FOR THE END OF THE WRONG RAINBOW. MAYBE THE TIMING IS WRONG, THE FUNDS ARE NOT THERE, THE STAFF IS TOO BUSY. IF YOU HAVE DONE YOUR HOMEWORK, THIS IS PROBABLY NOT THE CASE. BUT YOU NEED TO HIT PAUSE BEFORE YOU HIT UNMUTE. RETHINK, REFOCUS, AND THEN MOVE FORWARD.

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

by: Kimberly Fuhrman

Connections Galore, Advance Steel Collaboration & More

Last year, we introduced new Steel Connections for Autodesk® Revit® Structure. This year, the developers have continued to add connections—well over 130 new ones. Steel Connections for Revit is an add-in that can be accessed in your Autodesk Account. If the add-in is not installed, only the Generic Connection placeholder element will be available.

LOADING CONNECTIONS

Once the add-in is installed, add Steel Connections by clicking the Manage tab ▶ Settings panel ▶ Structural Settings ▶ Connection Settings.

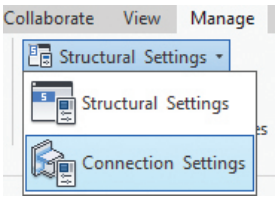


Figure 1: Connection settings location

Select the Connections required. To create a connection, click Connection on the Structure tab. Select the components to connect, and press Enter or Esc to complete the connection. The ability to show connections helps to bridge the gap between design and fabrication.

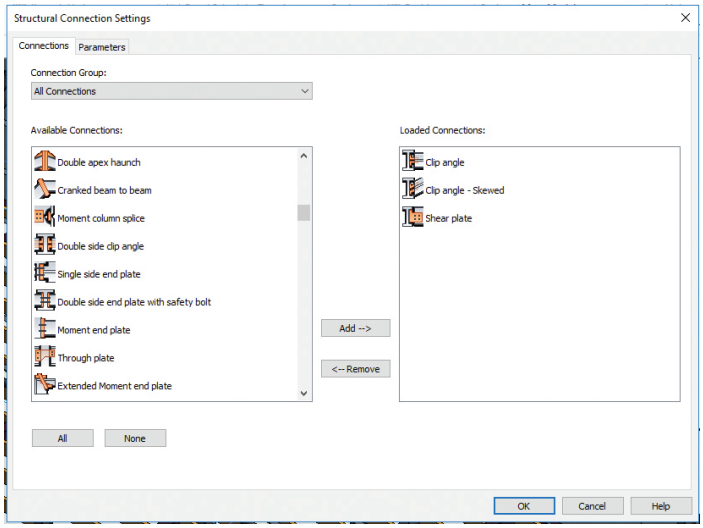


Figure 2: Connection settings dialog

Some important things to note: in Revit 2018, users are now able to create connections in projects and templates that have been upgraded from older versions of Revit, in custom families, and in families from older versions. Hooray for compatibility!

Of course, this is all dependent on the parameters in the Structural Section Geometry group (listed under Type Properties). If there are customized framing components, the geometry parameters need to be created. Revit makes the distinction between Certified steel elements and Custom steel elements in which the Shape Type property is not applied. Certified steel elements include the section shape and the parameters for Structural Section Geometry are already defined. Revit will attempt to identify a custom element's shape properties and choose the best match steel section shape.

ADVANCE STEEL 2018

Advance Steel is AutoCAD-based software for steel detailing. In Advance Steel 2018, users can migrate specific settings to the new version.

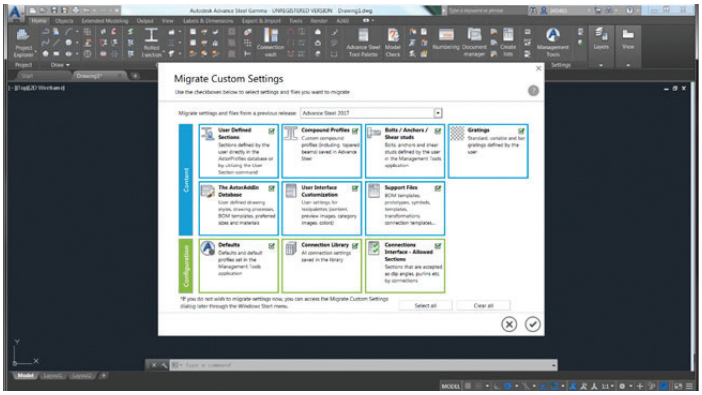


Figure 3: Advance Steel custom migration (image courtesy of Autodesk)

Revit models are exported to Advance Steel. By exporting the model in an .smlx format, bidirectional support is enabled from Advance Steel. This means that the user is now able to sync the Advance Steel model with the Revit model. Any changes made in Advance Steel will update the Revit model.

Another new feature in Advance Steel is the addition of Blowup Details. By creating a Callout, detail views are created to aid in visually specifying connections.

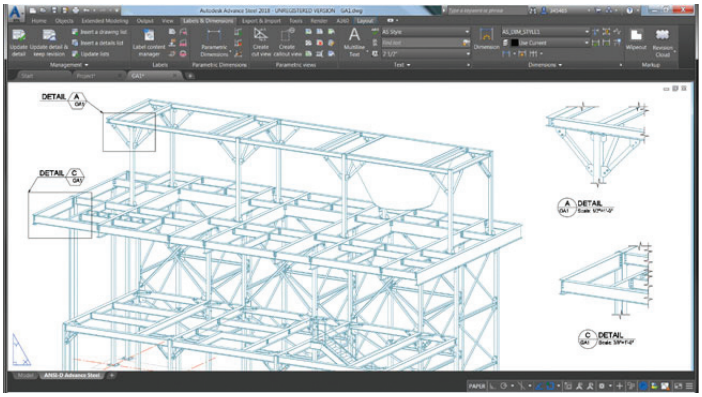
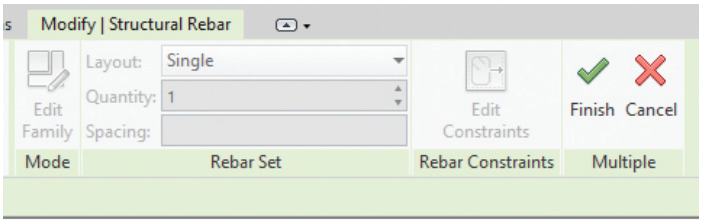


Figure 4: Blowup details in Advance Steel (image courtesy of Autodesk)

REBAR REHAB

It is now possible to edit rebar constraint properties in a 3D view. Select the rebar, and on the Contextual tab, select Edit Constraints on the Rebar Constraints panel. The rebar constraint reference is highlighted in orange. Clicking the dots along the length of the rebar toggles through the different rebar constraints that can be modified individually.



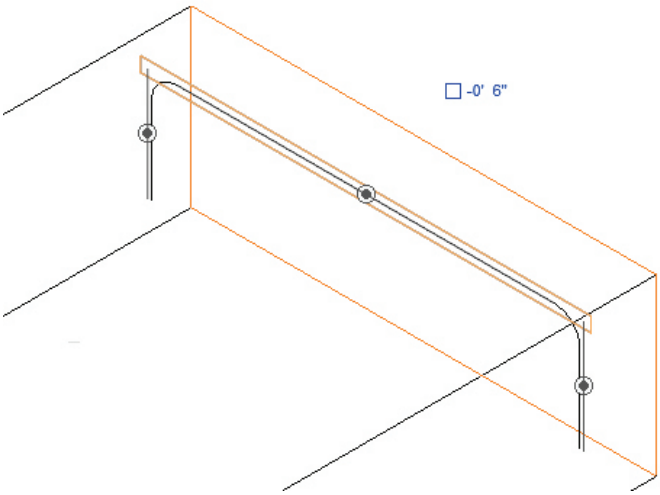


Figure 5: Rebar Constraints

These are just a few of the improvements to Revit Structure 2018 and Advance Steel. The push continues for better integration with the fabrication process. Every little bit helps, and we will continue to look for more development in this arena.

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by Robert Green

Mini Workstations – Big ROI

Is 2017 the year of the mini workstation for Autodesk users? When considering the total cost of deployment and ownership using the new HP Z2 Mini Workstation it may be. The HP Z2 Mini Workstation achieves the great performance Autodesk users demand with the low cost of implementation IT teams desire. Taken together the performance and low cost of ownership of the HP Z2 Mini Workstation provides a high return on investment (ROI) that merits investigation. In this edition of Tech Insights, we'll explore the possibilities.

Z2 MINI PERFORMANCE

The first component of ROI to consider on any workstation is if it saves users time by crunching through software applications faster, with fewer crashes than older hardware platforms. After all, what good is deploying a mini workstation if it can't outperform the old hardware it is replacing? While the HP Z2 Mini Workstation may be small (measuring just 8.5"x8.5"x2.3") it provides great performance for the most commonly used Autodesk applications (think AutoCAD, Inventor and Revit) where single processor architectures with high clock speeds and high bandwidth subsystems delivers maximum return on investment.

Figure 1 - HP's Z2 Mini provides workstation power in an elegant, small enclosure.

The HP Z2 Mini Workstation provides a range of high speed Intel® Core™ and Xeon® processors[1] (including the 4.1GHz Intel Xeon E3-1245v6), up to 32 GB of high speed DDR4 RAM[2,3], lightning fast HP Z Turbo Drive G2 solid state drives (delivering 4x the speed of conventional SSD drives), optional 1 TB hard drives[4], and available NVIDIA® Quadro® M620 graphics subsystem driving up to four (4) 4K monitors. At a price point of $1729 for a 4.1GHz Xeon with 16 GB RAM, a 512GB Z Turbo Drive G2 and NVIDIA Quadro GPU the Z2 Mini performs like a full size, multi-monitor CAD crunching workstation, not a toy.

ROI component: *How many hours of design/engineering time could you save over three (3) years with the HP Z2 Mini's high performance? Well, if you save 1/2 hour per week of a $65/hr engineer's time that can add up to an estimated $5,070 (0.5 hr/wk * 156 wks * $65/hr).*

DEPLOYMENT OPTIONS

So now that we've established the HP Z2 Mini Workstation's CAD credentials let's move to IT and deployment considerations. Just as we want to save engineering/design time with a new workstation it would also be great if we could save IT hassle to lower ownership cost while we're at it. In this regard the HP Z2 Mini Workstation provides significant cost advantages over full size workstations. Consider the following:

Small size. The Z2 Mini's small dimensions makes it easy to place in almost any nook or cranny available. The chassis' cleverly designed corners assure proper airflow even if the unit is placed against walls and the wireless keyboard/mouse combination make remote placement of the unit easy.

Rear monitor mounting options. An available VESA compliant mounting bracket[5] even allows the Z2 Mini to be mounted on the back of a monitor – even large demo screens in conference rooms – where they become almost invisible.

Expansion connectors. In addition to the power input and DisplayPort™ connectors required for basic install, a variety of USB ports, an RJ45 1 Gbit LAN connector and security locking slot are provided so users can utilize their own USB devices, IT departments can use wired LANs (rather than wireless), and units can be secured from theft.

Ease of redeployment. Users need to visit a remote site or head down to the conference room for a presentation? Just have them throw the Z2 Mini in a briefcase, plug into a monitor and network hookup, and they're in business. When your workstation is smaller than a router moving becomes easy.

ROI component: *How many hours of IT and user down time could you save over a three-year workstation lifespan (3) by making workstations easier to deploy and move? If you save 2 hours of user and IT time per install/move at a $65/hr labor rate it can add up to an estimated $390 (2hr/yr * 3 years * $65/hr).*

Figure 2 - Remote power-on capability and rear monitor mounting options[5] allow the HP Z2 Mini Workstation to consume zero deskspace with no extra wires.

HP RELIABILITY

Of course, none of this makes any sense if your workstations aren't in service because of glitches or driver issues. Any time a problem is encountered IT and user time will be lost dealing with the problems which costs money. In this area, the HP Z2 Mini Workstation benefits from over 380,000 hours of application testing, Autodesk software certification and HP's 3 Year Limited Warranty so your workstations perform as they should with no cost surprises.

And like other HP Workstations, the HP Z2 Mini includes HP Performance Advisor software for system optimization and driver maintenance so your IT staff doesn't have to search for drivers or spend time configuring them.

ROI component: *How many hours of IT and user down time could you save over a three-year workstation lifespan (3) if your workstations kept themselves configured with Autodesk certified drivers as CAD software updates rolled out? If you save just 4 hours of user and IT time per software update at a $65/hr labor rate it can add up to an estimated $780 (4hr/yr * 3 years * $65/hr).*

SMALL THINGS YIELD BIG ROI

All Autodesk software users want a reliable, fast and productive workstation – that much has always been true – but why should your company give you that workstation? The answer is because they'll get a great return on investment (ROI) by doing so. Using our examples above over a three-year workstation lifespan we were able to save $6240 by implementing the HP Z2 Mini Workstation – paying for its $1729 cost in less than 10 months! Of course, your IT costs, CAD user labor rates and calculations will vary, but you should now understand how to compute your own return on investment numbers.

With the HP Z2 Mini Workstation your Autodesk users can have the great, reliable performance they desire, your IT department can have low cost of deployment and maintenance, and company ownership can get a great return on their computing investment. This win-win-win high ROI scenario makes the HP Z2 Mini a unique, game changing workstation for mainstream Autodesk users. But don't take my word for it, run the numbers yourself.

ABOUT HP

HP helps you stay ahead of the curve with professional desktop and mobile workstations designed for large and complex datasets, dispersed teams, and tight deadlines. HP Z Workstations deliver the innovation, high performance, expandability, and extreme reliability you need to deliver your 3D CAD projects in less time. To learn how to configure a HP Z Workstation, visit the HP and Autodesk page at www.hp.com/go/autodesk.

ABOUT ROBERT GREEN

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

1. Multi-Core is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering is not a measurement of higher performance.
2. Intel® Xeon® and Intel Pentium processors can support either ECC or non-ECC memory. Intel® Core™ i5/i7 processors only support non-ECC memory.
3. Each processor supports 2 (Intel® Core™) or 4 (Intel® Xeon®) channels of DDR4 memory. To realize full performance at least 1 DIMM must be inserted into each channel. Actual memory speeds dependent on processor capability.
4. For hard drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for system recovery software.
5. Mounting hardware sold separately. 3rd party displays must have a 100mm x 100mm VESA hole pattern to be compatible

By: Todd Shackelford

The History and Future of Revit MEP

FIRST, THE HISTORY

Back in the 1900s Autodesk wasn't publicly traded. The average time between releases of AutoCAD® was around 24 months. When perpetual licenses were the thing, firms would often choose not to upgrade for the sake of upgrading. AutoCAD was and is completely backwards compatible, so firms could remain on a known solid version like 14 (not 2014, just 14), while others could move on, exploring productivity enhancements such as Scroll to Zoom and the Sheet Set Manager. The point is, often it took a major enhancement to shake the money loose for an upgrade. It's wasn't just the cost of the software, but the time and effort to manage the upgrade and bring any customization forward.

Starting around the turn of the century, Autodesk moved to a subscription-based model, the idea of "flavors of AutoCAD" were being pursued, and Revit was created. Each of these events play a major role in how we manage Autodesk software today.

In the perpetual licensing days, AutoCAD was delivered on CDs, DVDs, and flash drives, giving users the impression they owned the software. Autodesk contends that their software is licensed and cannot be resold. This was litigated in Vernor v. Autodesk, Inc. between 2008 and 2010. The favorable ruling toward Autodesk hinged on the wording of the right of first-sale doctrine that Congress could still change. With implications to other industries including movies, books, and music, Autodesk is hedging its ownership rights by shutting down perpetual licensing, moving to a subscription-based model, and not providing their products in shrink-wrapped boxes any more.

At eight years old, Autodesk was looking to diversify and add new revenue streams. AutoCAD can do anything. Users could easily customize it for their individual needs, but what if it came pre-customized at a premium? Other industries were having success with spin-off products. If you are old enough, you may remember there being only one kind of Doritos, Mountain Dew, and Snickers. Nothing had the prefix of "Extreme," "Lite," or "Ultra." Autodesk's response was 2000i, Architectural Desktop, Autodesk Building Systems, AutoCAD Electrical, and many more.

While Autodesk was pushing an evolutionary approach expanding AutoCAD, a revolutionary upstart called Revit entered the market. Parametric-driven design software was not new, but Revit did bring a database approach where 2D, 3D, or schedule views all update as single database elements. Also new was the concept of the family editor where users could design and customize elements for their own use. It didn't take long for Autodesk to purchase Revit and proclaim it their "flagship" for the architectural market.

What does all of this have to do with the new features of Autodesk® Revit® MEP 2018? In short, this history lesson helps explain why there aren't many new MEP features and why there really haven't been many for a while. It seems to me that Autodesk's main focus has been on maintaining revenue over producing the very best product—i.e., the subscription model over a perpetual license. Autodesk gets a steady flow of income, and users got a yearly release cycle to justify the expense. Where in the past, a complete new release could take more than two years to produce, a yearly cycle necessitated less ambitious changes per release.

The advent of BIM meant that Revit Building really needed a Structural and MEP complement. Revit Structure came in 2005 and Mechanical and Electrical came in 2006. There were starts and stops in Revit MEP as it was being developed. Base Revit was made for architects. Trying to make that base work for engineers was not/is not a natural fit. In 2008 it was useable; by 2012 it seemed to peak. Revit was getting ready to go to a one-box solution in 2013 where all Revit flavors were sold in a single version.

Autodesk seems to be focused on having a single-source BIM solution for the AEC community. In this context, MEP has only a small share of the importance of Autodesk's new overall BIM solution. This was evident in the constant social media complaints of MEP users waiting for Wish List items to be addressed. This continues to this day.

NOW, THE FUTURE

2018 brings the same near non-existing drip of improvements that MEP users have grown accustomed to. For mechanical design engineers, improvements for hydronic systems and the ability to customize Space types are the only real changes. There are fabrication improvements for slope control, the addition of dampers controls, and the ability to create PCF files. These mean nothing to design professionals and only highlights that fabrication has taken a front seat to design in Autodesk's eyes. Mechanicals can take heart in that there is only one new electrical feature granting control over circuit length paths.

There are improvements in base Revit that will give MEP the feel that things are changing, but my impression remains that Revit MEP has had only minor upgrades for nearly 8 years.

Time to walk through the new features.

Closed loop hydronic networks can now be set to aggregate pressure drop and total flow of separate systems in an overall pipe system. A classification parameter has been added to mechanical equipment. Once set, it enables a Calculated Flow parameter and Calculated Pressure Drop parameter. Pipe now has a Critical Path yes/no parameter that is available in view filters for visualization. Users must define the critical path for these calculations. If needed, warning markers will identify where Revit is having trouble understanding the critical path. If users prefer the classic method, there is a Hydronic Networks tab in mechanical settings where users can disable this feature.

Hydronic systems can now have Analytical Pipe Connections. The connections can be added to mechanical equipment via a contextual tab and associated with nearby pipe with a default pressure drop of zero PSI. There is a new toggle in the View Control bar to turn the analytical connections on and off.

Space types and Building types can now be duplicated and renamed. This gives users the ability to create space types specifically for their needs and set to the required parameters to suit their individual needs. Tools for creating, duplicating, renaming, and deleting space and building types can be found in the Building/Space Type Settings dialog (Figure 1). Open it from the Manage tab under MEP settings.

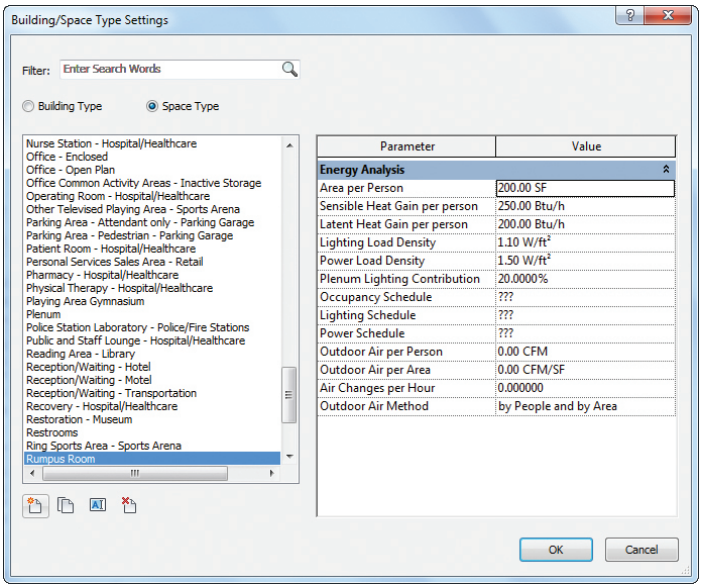

Figure 1

The length of an electrical circuit formerly was a read-only parameter. It is determined by the shortest vertical, horizontal, and depth path from beginning to end point. Users now have the ability to override the length parameter to address voltage drop and other calculations. The circuit depth offset can be set globally in the Electrical settings dialog (Figure 2). Individual offsets can be manually set per circuit path.

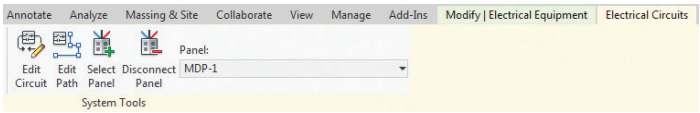

Figure 2

That is the entire MEP hit list for 2018. As mentioned earlier, there are updates to the base that are worthy of mention.

The first thing most will notice is what Autodesk refers to as Visual Enhancements. The ribbon has fewer colors, lines, and gradients. It's cleaner and easier to read. The Application menu has been reduced to a blue "R" that does nothing. Find those functions under an old friend in the form of the File tab (Figure 3).

Revit MEP 2018

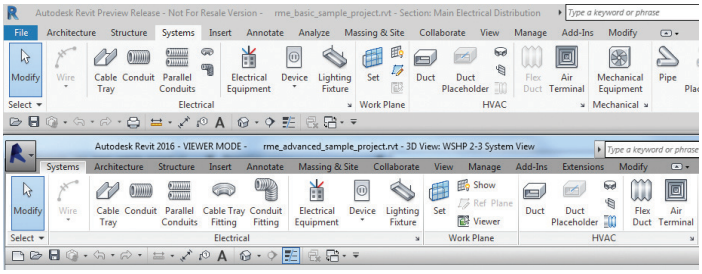

Figure 3: Revit 2018 (top); Revit 2016 (bottom)

This is a departure from the original alignment with Microsoft and the adoption of the ribbon interface. This could be the beginnings of an interface more appropriate for hosted versions.

Visually, users should also notice a host of fixes including addressing a problem with blocked pop-up dialogs. Users should no longer have issues with the properties dialog going blank and being unusable. Similarly, a glitch with the options bar disappearing has been addressed. Scaling issues with the View Cube, Navigation bar, and the steering wheel has been corrected along with scaled annotations and schedule views in high DPI environments. In short, with DPI settings 200 and higher, all sorts of things would be unpredictably tiny. While making something work as intended may not feel like an upgrade, it is highly welcome in this case.

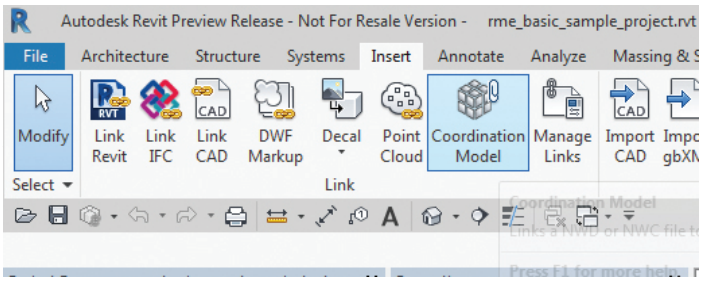

Figure 4

The most useful of the base new features is the inclusion of a symbols fly-out on the text right-click menu while placing text. Now users can right-click to add a degree or delta symbol without memorizing character map key-ins. The character map for the current font can be invoked inside Revit by selecting "Other…" at the bottom of the Symbols fly-out menu (Figure 5).

The 2018 version of Revit should be an easy jump for MEP users and administrators alike. We understand the drill by now and don't have complicated changes to learn this time around. What remains is the feeling that the singular needs of mechanical and electrical users may never be addressed. Maybe Autodesk feels that the MEP portion of Revit is "good enough." Maybe it will never be possible to make an architectural software truly fulfill the unique needs of multiple engineering disciplines. Perhaps both are true. No matter the reasons, we got what we got.

In the AutoCAD environment, it was much easier to customize workarounds and personalize solutions. This environment does offer customization, but many MEP users are stuck between using

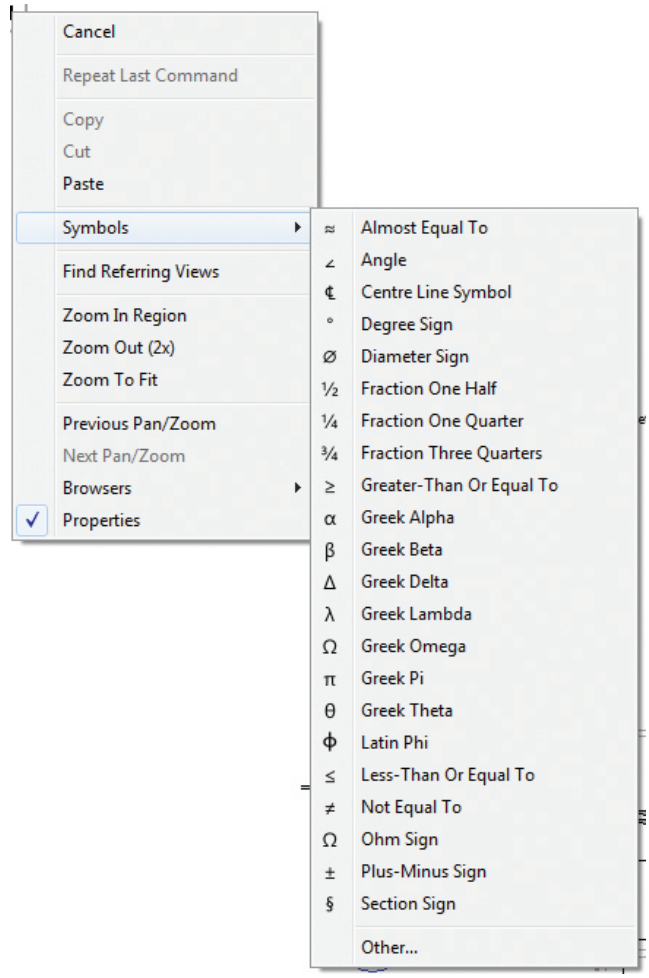

Figure 5

Revit as a modeling or a design software. Revit does not perform all the calculations we need, nor does it connect easily to the trusted software we currently use. Until Revit gives us finer control over the calculations we have, and access to the calculations we need (internal or external), we will remain stuck. We will continue to use Revit mostly because everyone else is using it, not because it works better than the alternatives.

Todd Shackelford provides strategic BIM leadership for Alvine Engineering and is an Industry Fellow at the University of Nebraska. A regional advocate for Revit and BIM, he was instrumental in forming the Omaha BIM Collaborative and the Central States Revit Workshops, where he served as Co-Director. He authors two Blogs; CAD Shack and The Lazy Drafter. A Revit Certified Professional, Todd is driven by a desire to make BIM easy. Tweet Todd @ ShackelfordTodd or email Todd at tmshackelford@gmail.com

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by: Brian Chapman

3ds Max Highlights

Autodesk released 3ds Max® 2018 with a number of upgrades and new features. The following list, while nowhere near comprehensive, include some of the notable additions. Following that, we look more closely at a select few.

3DS MAX FEATURES

- Arnold Renderer
- Motion Path
- DataChannel Modifier (sub-object manipulation, Tension, Curvature, DeltaMush, Decay, Node Influence, Element Transform)
- Blended Box Maps (with Cubic Projection, Projection Randomization, Projection Map Baking)
- UI enhancements including a Qt5 framework with enhanced Docking, Timeline tear off, and continuous Hi-DPI icon conversion, StateSet with SlateSDK- based UI and node-based render pass management, quad intersections checkbox to the Chamfer Modifier, Alembic visibility track support, and shape suffice management via MAXScript
- Unwrap improvements
- A large list of upgrades to the MCG system

ARNOLD (MAXTOA)

For those unfamiliar with it, Arnold is a ray tracing renderer used by studios across the globe to work on feature-length animated films and visual effects. If you've seen anything in the last decade with visual effects or animation, Arnold was likely involved in some capacity. A plug-in for Arnold called MaxtoA bridges the connection and provides 3ds Max users the ability to work with Arnold directly in 3ds Max. I imagine this is good news for studios using 3ds Max. The plug-in includes several features: integration with 3ds Max shapes, lights, cameras and shaders, image-based lighting support with physical sky, ActiveShade, support for AOVs and Deep EXR files, texturable mesh lights, cloud rendering, and more (Figure 1).

DATACHANNEL MODIFIER

The DataChannel Modifier was one of the more popular features in the beta program and users shared some very cool examples of what they were able to accomplish. I'm convinced that data-crunchers will dive into its operators, showing off everything they've learned to do with it within the first few months of upgrading.

Essentially the modifier allows us to manipulate objects using operands that affect the various components in the object. Typically, this has been accomplished with more complicated methods, but a simple modifier will likely streamline many of these operations. The options are nearly infinite with the ability to distort or change nearly every aspect of an object using whatever data suits our needs. Users can quickly and easily animate earthquakes, represent motion velocity, animate melting objects, collapse blocks, and much more using various curves and simple values within the modifier. The basic input operands are demonstrated in Figure 2.

Figure 1

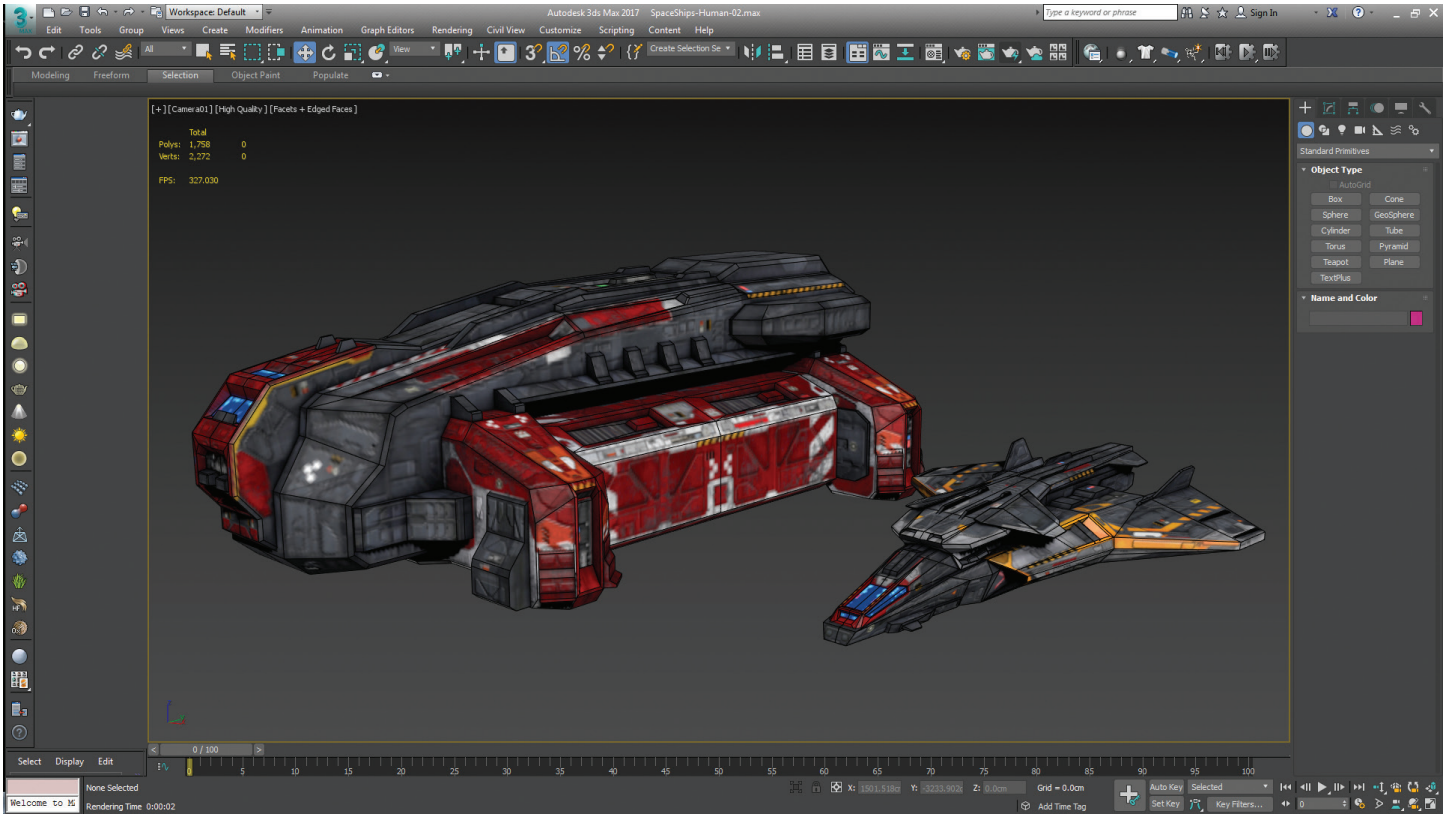


Figure 3

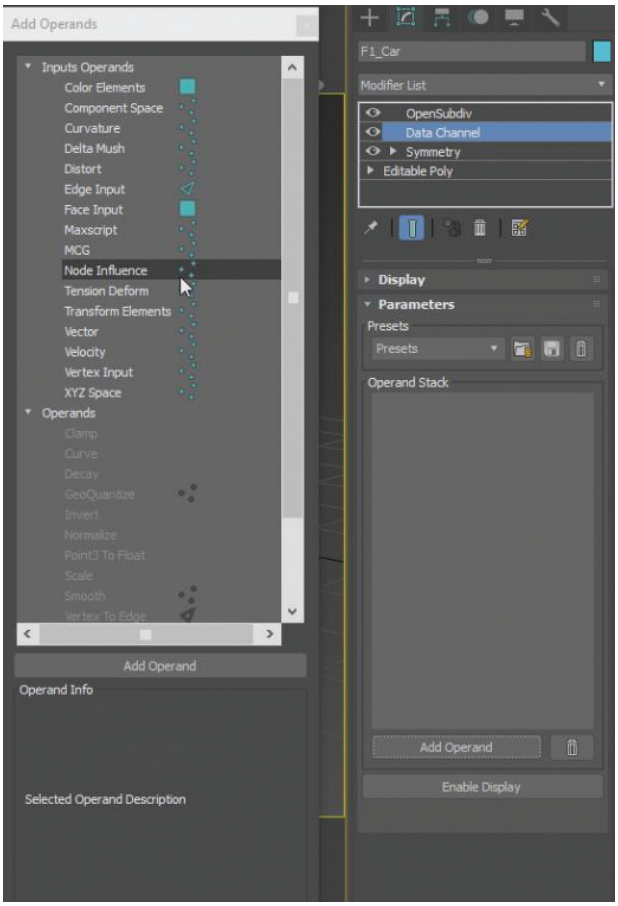


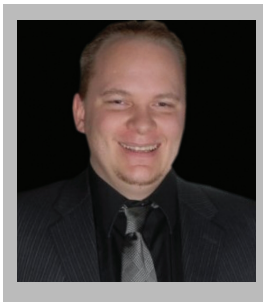
Figure 2

BLENDED BOX MAP

The Blended Box Map allows us to project multiple images onto an object (or multiple objects) with the ability to manipulate the projections and blend them. It includes the ability to build bounding boxes to manipulate the projections more. In the past, to generate the same effect we were typically required to unwrap the object or provide a texture created with another software where we've already blended the images together. The Blended Box Map can be used to generate organic or inorganic textures creatively and quickly by modifying values in the map properties without having to bounce back and forth between programs to get the texture of an object how we'd like it.

CONCLUSION

For 2017 there were over a thousand modifications to 3ds Max based on input from its users. Autodesk continues to work hard to improve the software and provide users with more features to use 3ds Max in more diverse, creative, and efficient ways. That includes 3ds Max 2018.



Brian Chapman is an Autodesk Authorized Developer, creator of Pro-Cad.Net and Senior Designer for Slater Hanifan Group, a civil engineering and planning firm dedicated to superior client service. Brian can be reached at procadman@pro-cad.net.

by: Shawn Herring

What's New in Civil 3D 2018?

Just installed Civil 3D 2017? Maybe just downloaded Civil 3D 2017 v1? Well never fear….2018 is here! That was somewhat sarcastic, but I do some see much-needed improvements to AutoCAD 2018 and its vertical products such as Civil 3D. You saw throughout the year that you get more periodic updates. Civil 3D 2017 v1 was a great update and I see this trend continuing.

This article looks at some of the top new features within AutoCAD Civil 3D 2018 and may help you make your decision to download and install today.

VERSION INTEROPERABILITY

This may be a sticking point with many people moving forward with Civil 3D, and I completely understand why. Autodesk hasn't changed the file version since AutoCAD 2013, but AutoCAD 2018 uses a new file format. It means unless you save the file to an older version, you can't open AutoCAD 2018 files with AutoCAD 2013-2017.

How does that affect Civil 3D? Objects saved in AutoCAD Civil 3D 2018 are available only as proxies when the drawing is opened

in a prior version of the software. Within AutoCAD Civil 3D 2018, set the PROXYGRAPHICS drawing setting to 1 to save the graphics with the drawing; otherwise you get all the bounding boxes when the drawing is opened in a prior version of the software.

PRODUCTION EFFICIENCY

Create Plan/Plan and Profile/Profile sheets

You now have more options when utilizing the plan production tools. You have a Plan/Plan option as well as a Profile/Profile option. I consult often with individuals who will find the plan/plan to be a big help. This may seem like a simple thing, but the extra flexibility will really help in those projects where plan views and sections are the main aspect.

There are new templates that ship with 2018, but it is a simple fix within your current plan production template as well (Figure 1).

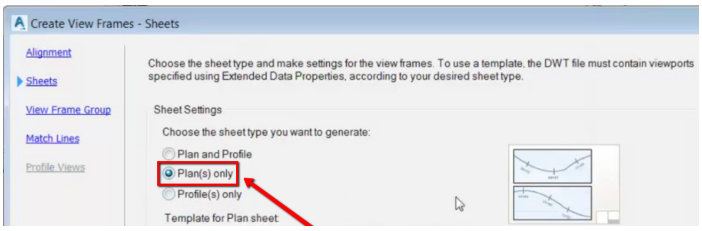


Figure 1

Move Sections Views from One Section View Group to Another

You can now move section views between section view groups and update the sheet layout. When updating the section view layout, resized or inserted section views are respected.

Add Property Set Data to Labels

This came out with the 2017 v1 release, and I feel this is a huge, often overlooked capability of Civil 3D. So, I chose to highlight this a bit more.

- First, launch the PropertySetDefine command, or from MANAGE tab on the ribbon, to the far right, select DEFINE PROPERTY SETS (Figure 2).

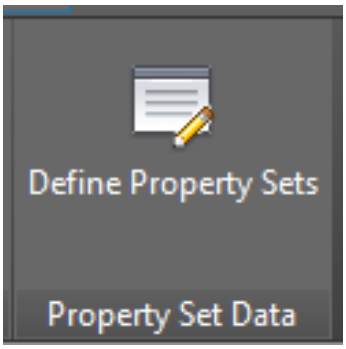


Figure 2

- Right-click on Property Set Definition and select NEW (Figure 3). For this example, I will use PipeYear as I want to label the year installed on my pipes.
- On the "Applies To" tab, select the type of object for which you want to create a custom property. I chose PIPE for this example.
- On the Definition tab, add your new properties. Click the top button on the right side (ADD MANUAL PROPERTY) to create the new property, and then fill in the data. I chose to call mine InstallYear.
- Select OK.

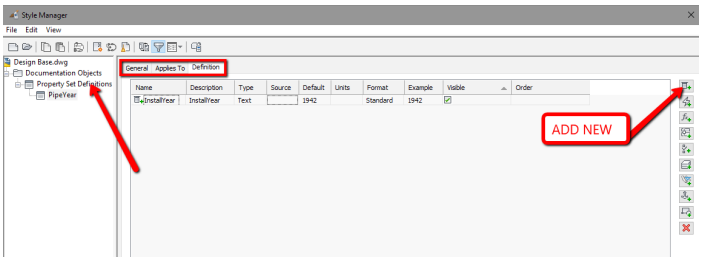


Figure 3

One more step in order to see this new property. On the Extended Data tab of your properties, you'll need to select the object (or objects) you want these properties assigned to and click the button at the bottom left of the properties, "Add Property Sets" (Figure 4).

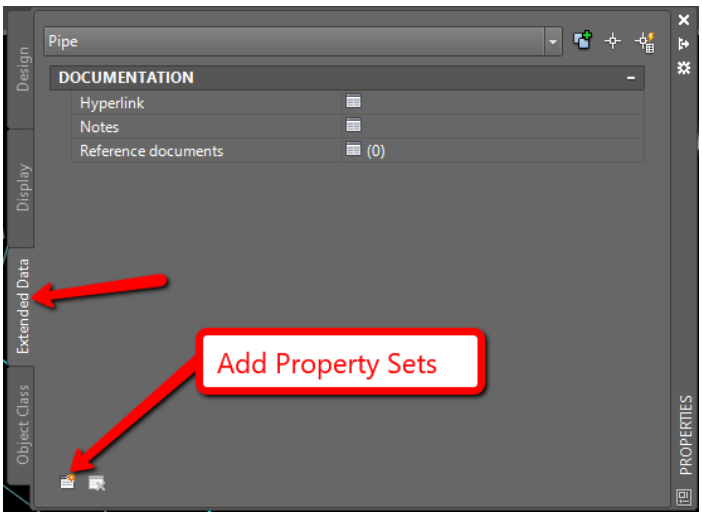


Figure 4

This will bring up another dialog box. Choose the property(ies) you wish to add to the objects, and select OK. You will now see them in your properties dialog box!

That is where it ended in 2016. But now, with 2018 (and 2017 v1), we can add that to a label style. Once you go into your label style composer and select one of the components to edit, you now have a third tab called "Property Sets." You can select and add to your styles as needed (Figure 5).

AutoCAD Civil 3D 2018

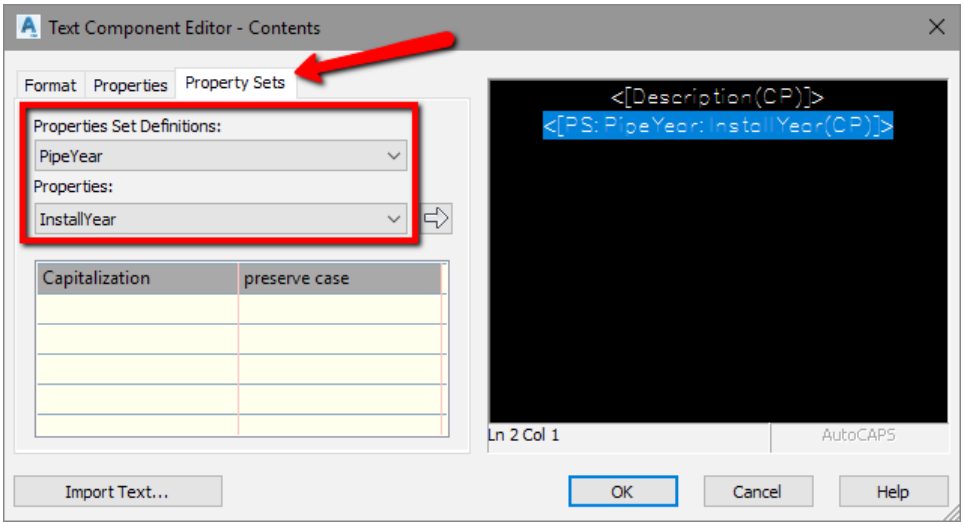


Figure 5

The possibilities are endless with this function. The example above shows how to add custom properties in order to label. But you can also add custom properties that are derived from the objects themselves. For example, if you want to know the volume of a surface, you must view it in the Surface Properties or use the Volumes Dashboard. But now you can view the automatic data for one object at a time. Very cool, in my opinion!

DESIGN EFFICIENCY

Create Feature Lines that Are Dynamic to Surfaces

This is a fantastic update, and one that is well overdue. Feature line elevations can now be obtained from a surface and can also be relative to a surface, so if the surface is updated, the feature line is updated.

The update behavior of relative feature lines is different depending on whether the feature line was set to be relative to a surface when it was created, or whether it was created at fixed or non-dynamic elevations and then set to be relative (Figure 6).

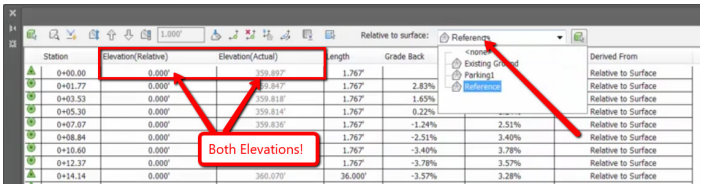


Figure 6

Create Offset Alignment Profiles that Are Relative to the Main Alignment Baseline

You can create dynamic offset profiles using the same command you use to create offset alignments. The profile geometry is offset using a default cross slope, which you can modify by editing the profile properties. You can create multiple offsets in a single operation, including a different number on each side of the parent alignment. The offset distance can be different on each side of the parent alignment.

Useful why? Maybe you have to show a borrow ditch, TBC profiles or pretty much anything that is relative to your main profile. There are current workarounds, but this should help a lot of people.

Create Connected Alignments & Profiles

You can use the connected alignments feature to create a new dynamically linked alignment and profile that transitions between two selected alignments and their profiles. You can use this feature to create a curb return, an exit ramp, a merging/diverging road, or you can connect an existing road with a proposed road. The connected alignment is created between two selected alignments at a specified radius. The geometry of the connected profile is automatically generated from the parent profiles you select. The start and end elevations and slope are taken from the parent profiles, and the middle section of the connected profile is calculated depending on whether extensions of the parent profiles intersect (Figure 7).

A lot going on there, right? This streamlined method works great for manually creating those intersections and will save a lot of time on editing.

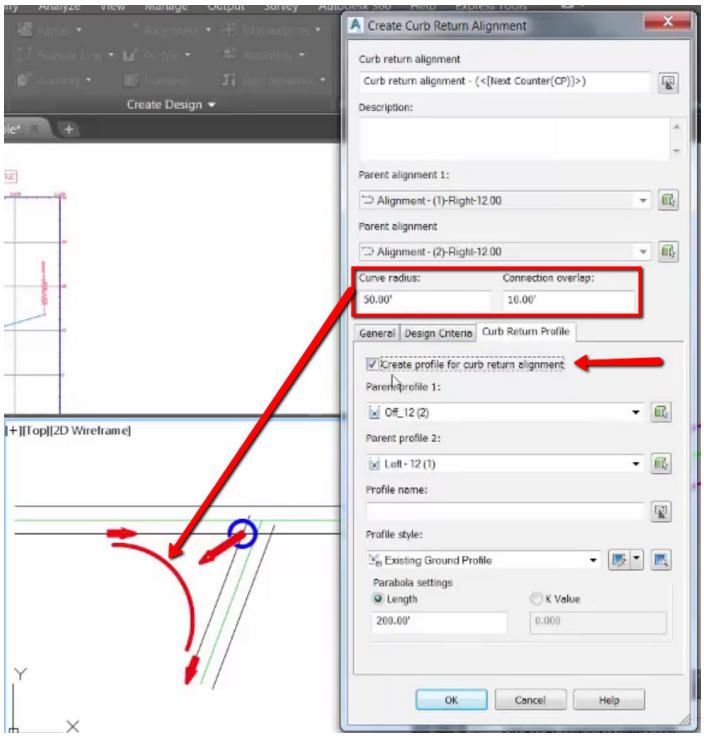


Figure 7

Resolution of Corridor "Bowties" in Daylight Conditions

Where corridor tangents intersect at a corner, and where the corridor is created at a fixed width, the inner and outer corners of corridors are cleaned up automatically. If you have a corridor that you are bringing forward from a prior version of AutoCAD Civil 3D and the corners need to be cleaned up, all you need to do is a simple edit to the corridor and then rebuild it. In other situations, when the corridor is created at a non-fixed width (such as when daylighting to a surface), you can use the CLEARUPCORRIDORBOWTIE command (Figure 8).

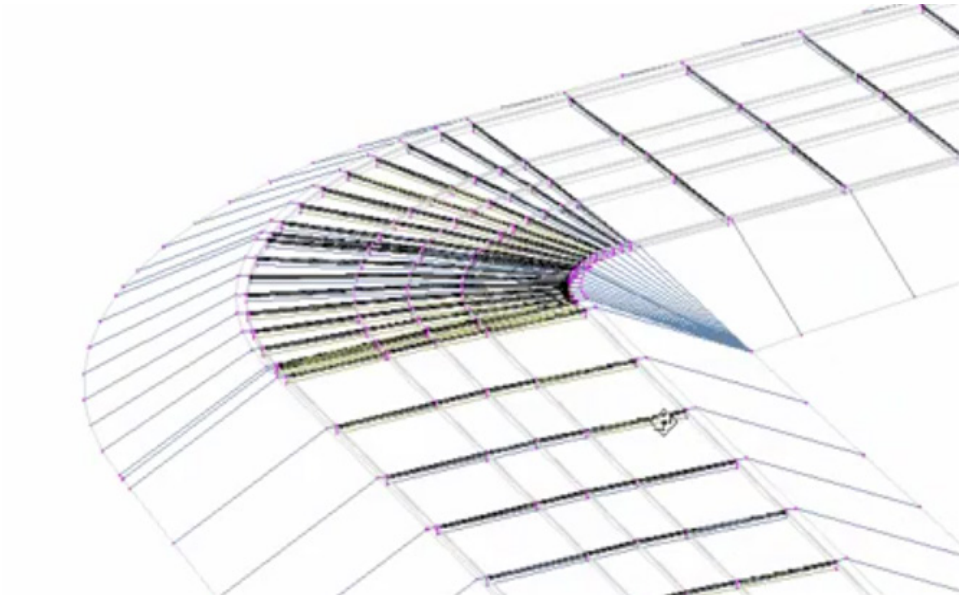


Figure 8

CIVIL 3D 2017 V1 FEATURES

Most if not all of the Productivity Pack enhancements have been rolled into the software, along with other subscription perks throughout the 2017 release.

Here are a few additional enhancements to note:

- Analyze Gravity Network
  Resize pipes and reset inverts and compute the energy and hydraulic grade lines according to HEC-22 2009 standards.
- Swap Pressure Parts
  Swap pressure network pipes, fittings, and appurtenances with parts of another size or type.
- Traverse Editor/Adjustments
  Input, edit, and apply an adjustment method to traverse data.

AUTOCAD 2018

As usual, Civil 3D will include all the base product enhancements of AutoCAD 2018. I do want to mention the following enhancements that I think may be a great addition to your workflow.

Xref Improvements – If you utilize a lot of xrefs, then you will really enjoy this feature

- Now xrefs default to relative, reducing broken paths.
- Easily find and apply the correct path to missing references.
- When you right click on a missing file in xref palette, you can see there are new items in the contextual menu: Select New Path and Find and Replace.

BING Map Service

- Support for Bing Maps v8.0.

Enhanced PDF Import Options

- Intelligently bring in text (SHX and TrueType text) and geometry from PDFs and use them like any other AutoCAD object.
- Use the SHX text recognition tool to quickly convert imported geometry from SHX text to text objects. The SHX text recognition tool analyzes clusters of geometry and automatically replaces them with Mtext objects.

CONCLUSION

There may not seem like a ton of new features, but the new features and enhanced features will help in your everyday workflows.

I would love to hear from you regarding the new features and features you would like to see added or enhanced, so feel free to call or email me anytime.

Shawn Herring has been a part of the design engineering community for roughly 12 years in all aspects of design, construction and software implementations. He has implemented and trained companies across the Country on Civil 3D and other infrastructure tools and their best practice workflows. Shawn can be reached for comments or questions at awautocadcivil3dcm@augi.com.

by: Melinda Heavrin

What's New? PDF Import

AutoCAD® Architecture saw the addition of the PDF Import feature a few releases ago and Autodesk has consistently improved this great feature each time. The 2018 release is no different. This is a feature I have utilized a lot and I receive questions on it from time to time so I thought this would be the perfect time to delve in to the PDF Import feature. I will also discuss an overview of the PDF Export feature as they are both very useful.

IMPORTING PDF FILES

PDF files are a common way of publishing and sharing design data for review and markup. AutoCAD Architecture supports the creation of PDF files as a publishing output for ACA drawings and importing PDF data into AutoCAD Architecture using either of two options:

- PDF files can be attached to drawings as underlays, which can be used as a reference when collaborating on projects.
- PDF data can be imported as objects, which can be used as a reference and also modified. If you import PDF data, you can choose to specify a page from a PDF file or you can convert all or part of an attached PDF underlay into AutoCAD Architecture objects.

When a PDF file is generated, all supported objects are translated into paths, fills, raster images, markups, and TrueType text. In PDF, paths are composed of line segments and cubic Bézier curves, either connected or independent. However, when a PDF file is imported into AutoCAD Architecture, note the following:

- Bézier curves are converted into circles and arcs if they are within a reasonable tolerance to those shapes. Otherwise, they are converted into 2D polylines.
- Elliptical shapes can be converted into 2D polylines, splines, or ellipses depending on how they were stored in the PDF.
- As an option, each set of approximately collinear segments can be combined into a polyline with a dashed linetype named PDF_Import.

- Compound objects such as dimensions, leaders, patterned hatches, and tables result in many separate objects as if these objects were exploded.
- Solid-filled areas are imported as 2D solids. They are assigned a 50 percent transparency to make sure that any text within the areas is visible.
- Text that used TrueType fonts is preserved, but text that originally used SHX fonts is imported as separate geometric objects.
- Raster images generate PNG format files that are attached to the drawing file as external references. These image files are saved in a folder specified by the PDFIMPORTIMAGEPATH system variable, which can also be specified in the Options dialog box, Files tab.
- Point objects are converted to zero-length polylines.
- Markups are not imported.

After you import a PDF, you can use the PDFSHXTEXT command to convert the geometric representation of any SHX text into multiline text objects. The conversion process compares the selected geometry successively against the selected SHX fonts listed in the dialog box. When the geometry and an SHX font are a close enough match to pass the recognition threshold that you specify, the geometry is converted into multiline text objects. You can then use the TXT2MTXT command to combine the multiline text objects that you select into a single multiline text object.

When an AutoCAD Architecture DWG file is exported as a PDF file, both information and precision are unavoidably lost. It is important to be aware of the degree of visual fidelity that can be reasonably expected. The data in DWG files are stored as double-precision floating-point numbers, while the data in PDF files are only single precision. This reduction rounds off coordinate values, and the loss of precision is most noticeable in the following cases:

- Computed locations such as tangent points, the endpoints of arcs, and the endpoints of rotated lines
- Data with a large dynamic range from the largest to the smallest values
- Large coordinates in PDF files such as those found in maps
- PDF files that were generated with a low dpi (dots per inch) setting

IMPORTING PDF DATA

You can import the objects in a PDF file or PDF underlay into your current drawing file. To import the objects in a PDF file, click Insert tab, Import panel, PDF Import, and then select Find. In the Import PDF dialog box, specify the PDF file that you want to import and click Open. If the PDF has multiple pages, choose the page to import by clicking a thumbnail image or by entering a page number. Now choose any of the options and click OK. Specify the insertion point if prompted (see Figure 1).

To import the objects in a PDF underlay, click Insert tab, Import panel, PDF Import, and then select Find (see Figure 2). Now select the PDF underlay. On the PDF Underlay Contextual tab, click Import as Objects and then click Find. At the prompt, click two diagonal points that define a rectangular crossing area or choose one of the other options. A crossing area is similar to a crossing selection. The Settings option displays a dialog box in which you can choose what types of objects to import, how layers should be accommodated, whether the imported objects should be imported as a block, and several other options. Choose whether you want to keep, detach, or unload the attached PDF after the selected objects have been imported. The specified area of the attached PDF is imported into the drawing as AutoCAD objects.

To convert SHX geometry into multiline text objects, click Insert tab, Import panel, Recognition Settings, and then click Find. In the PDF Text Recognition Settings dialog box, under SHX Fonts to Compare, click one or more fonts that appear to be the most similar to the imported SHX geometry. Click the up or down arrow buttons to order the list so the most likely font is at the top. Choose any other options as desired and then click OK. Select the geometric objects that represented the SHX text in the PDF and press Enter. Be careful to avoid selecting any objects that are not part of the characters. A dialog box reports the percent of the objects that could not be converted to multiline text. The characters that were converted are highlighted. If the threshold percent you set is not achieved, then the next font that you specified on the list is processed. If none of the fonts pass the threshold, try one of the following:

- Select fewer objects for processing. This can help you identify problems and extraneous geometry.
- Select a different font that might be a better match.
- Lower the success threshold percent in the PDF Text Recognition Settings dialog box.

Once you're satisfied with your settings, the process for converting SHX geometry into multiline text becomes much simpler: Click Insert tab, Import panel, Recognize SHX Text, and then select Find.

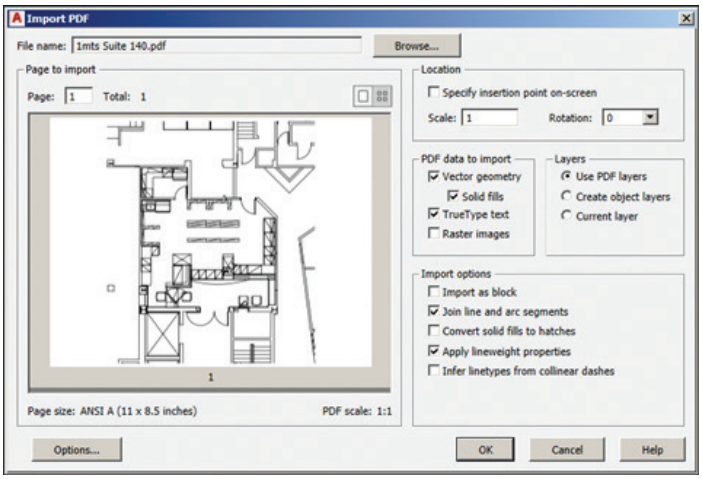


Figure 1: Import PDF

AutoCAD Architecture 2018

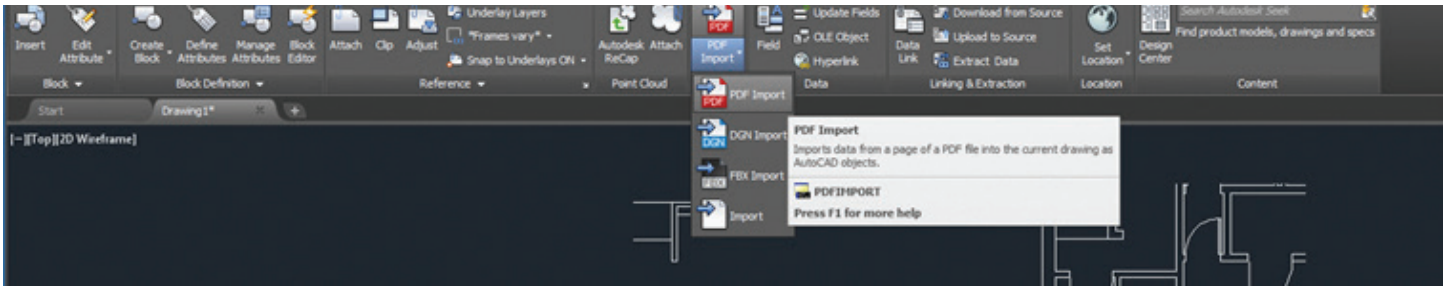


Figure 2: PDF Import ribbon

ATTACHING PDF FILES AS UNDERLAYS

You can attach a PDF file as an underlay to a drawing file. You can reference and place underlay files in drawing files the same way you do raster image files; they are not actually part of the drawing file. Like raster files, the underlay is linked to the drawing file through a path name, which can be changed or removed at any time. However, you cannot bind an underlay to a drawing and you cannot edit or modify the underlay's content. By attaching underlays, you can access files in your drawing without greatly increasing the drawing file size.

There are a few special considerations to think about:

- PDF files with more than one page are attached one page at a time.
- You can drag underlays directly into the current drawing.
- You can reattach an underlay multiple times, treating it as a block. Each underlay has its own clip boundary and settings for contrast, fade, and monochrome.
- You can view PDF underlays only in the 2D Wireframe visual style.
- Hypertext links from PDF files are converted to text.

A file that you attach to a drawing as an underlay can be password protected. PDF file passwords are case sensitive. You cannot attach the file until you have entered the correct password and you will be prompted for the underlay file's password each time you open the drawing. If the drawing has several password-protected underlays attached, you will be prompted for multiple passwords.

If you wish to attach a PDF underlay, click Insert tab, Reference panel, Attach. In the Select Reference File dialog box, select the PDF file you want to attach and click Open (see Figure 3). In the Attach PDF Underlay dialog box, select one page or use SHIFT or CTRL to select multiple pages (see Figure 4). Now you can select Specify On-Screen to use the pointing device to attach the underlay at the location, scale, or angle you want or you can clear Specify On-Screen and enter values for Insertion Point, Scale, and Rotation at the command prompt. Now click OK.

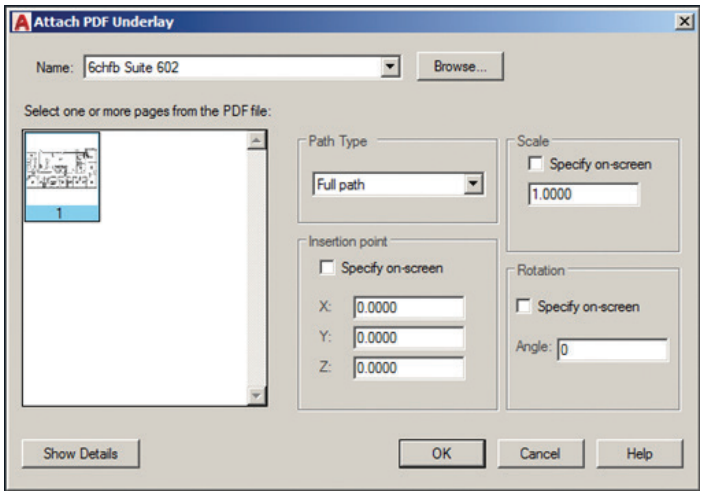


Figure 3: Attach PDF underlay

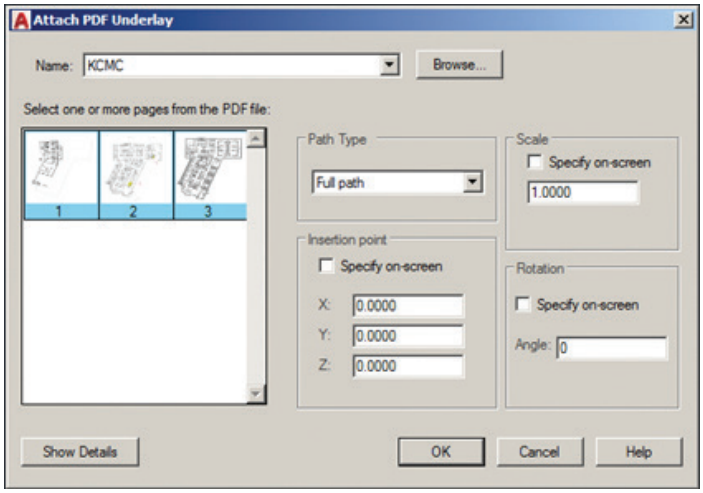


Figure 4: PDF underlay select pages

EXPORT TO PDF

You can export AutoCAD Architecture files to PDF as well. There are many commands and methods you can use to produce PDF files, as follows:

- Export model space or a single layout to a PDF file using the PLOT or EXPORTPDF command (see Figure 5).
- Export all layouts of a drawing to a PDF file using the EXPORTPDF command.

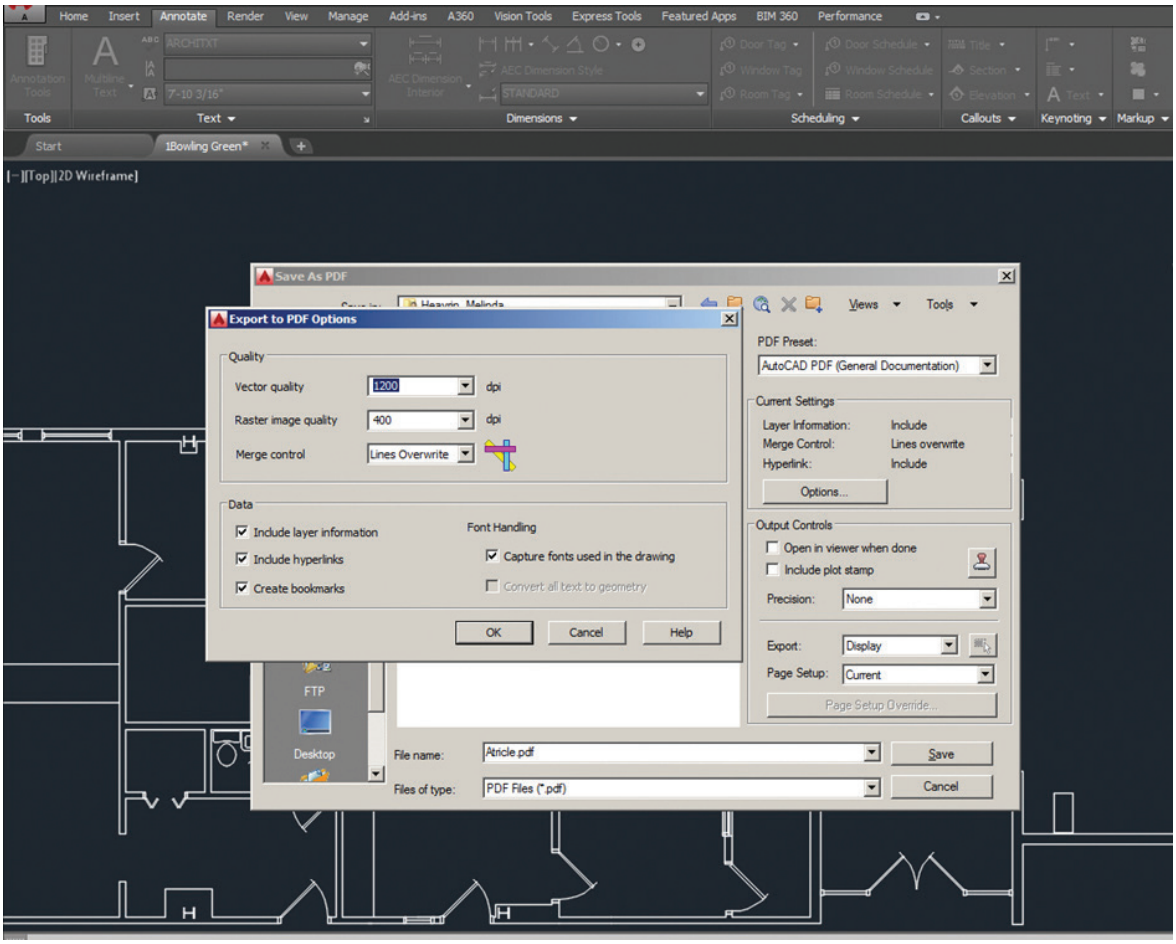


Figure 5: Export to PDF options

- Export selected layouts of a drawing to PDF using the PUBLISH command.
- Export model space and selected layouts to PDF using the PUBLISH command.
- Export multiple drawing files to PDF using the PUBLISH command.
- Export a sheet set to a PDF file using the Publish to PDF option in the Sheet Set Manager.

PDF presets are named groups of settings that control the PDF creation process and are saved as plotter configuration files (*.pc3). Presets let you balance the file size with quality and functionality, depending on how you want to use the PDF files. The predefined PDF presets listed address most typical usage scenarios. However, if you have specific requirements that a predefined preset cannot meet, customize an existing preset and save it as a *.pc3 file with a different name.

If a PDF viewer does not have access to a font that you used in a drawing, it displays the affected text using a substitute font. Often, the substitute font doesn't match up to the original font. Consequently, the text in the drawing can appear different than the text in the PDF file. You can prevent font substitution by capturing the font in the drawing and embedding it in the PDF file. Alternatively, you can convert all text to geometry. Converting text to geometry ensures that the text in the PDF file is identical to that of the drawing. However, the PDF file size increases and text pixilation can occur when you view the PDF file at a high magnification. You can reduce pixilation by increasing raster image quality.

Exporting a DWG to PDF has a few limitations:

- Resolution – The highest possible resolution of PDF data is 4800 dpi.
- 3D Visual Styles – All viewports, model space or layout that have a 3D Visual style applied to them are converted to raster images when plotted to PDF. As a result, drawing information such as the layers within the viewport is lost. Furthermore, text within the viewport is not searchable and hyperlinks are removed.
- Printing PDF files – If you use the Adobe Acrobat Reader default printer settings to print a PDF drawing, transparent objects and wipeouts might not print correctly. If the PDF file contains transparent objects, you may need to adjust some settings in Adobe Acrobat. Set Transparency Flattening to "Print as Image" or reduce the Raster/Vector Balance in Adobe Acrobat.
- Loss of precision – PDF stores data in single precision numbers, while DWG stores data as double-precision numbers.

Melinda Heavrin is a CAD Coordinator & Facility Planner in Louisville, Kentucky. She has been using AutoCAD Architecture since release 2000. Melinda can be reached for comments and questions at melindaheavrin@windstream.net.

by: Tony Carcamo

New Features for Roads & Bridges

Spring is here and you know that means? It's time for the latest Autodesk software releases. As most of you already know, AutoCAD® 2018 was recently released, and this month Autodesk will release InfraWorks® 360 2018.0. Several key changes were made and enhanced when working with roads, bridges, visualization, and city furniture. In the next few paragraphs I will briefly discuss some of the key 2018 feature enhancements in InfraWorks 360.

ROAD IMPROVEMENTS

To streamline and automate features and improve work efficiency, Autodesk added a new feature for use when you are converting design roads to components roads. When you right-click on a design road and select "Convert to Component Road," you now have the option to select "Automatic" feature (Figure 1). The Automatic feature basically replaces design road styles with matching component roads assembles. This feature mimics the road attributes, materials, and road width by reading the elements in the style zones and converting them to road components. For those who want to use road components but don't want to build their own road assemblies, this feature tool basically helps elevate multiple steps into one for the user.

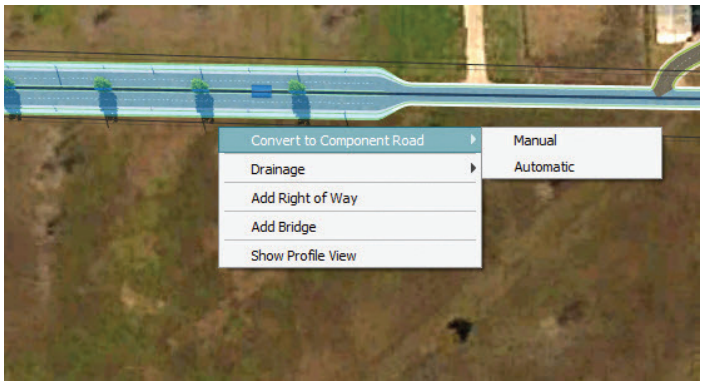


Figure 1

The next new road enhancement is road stationing labels (Figure 2). Version 2018.0 now displays 100' and 50' interval station labels along a component road when selected. The station units can be controlled through Application Options – Unit Configuration – Transportation tab.

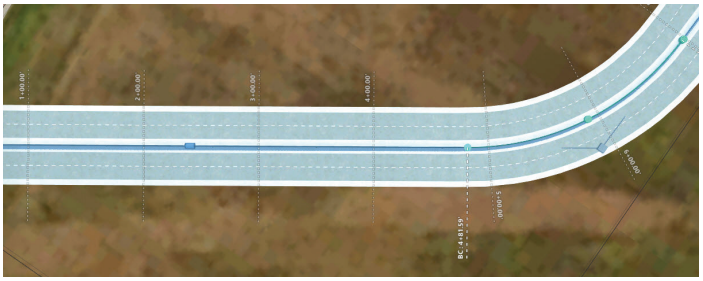


Figure 2

It is import to note that when zooming out, the labels readjust. At one point, the station labels will only show 100' intervals. When you zoom in closer, the 50' station interval will appear.

When sketching out roads, it is important that roads meet design standards according to either local or state standards. In order to help design professionals with the design process, InfraWorks has implemented design check features to ensure designed roads meet the road design standards such as AASHTO Imperial 2011. When a horizontal road curve or spiral curve does not meet the assigned road standards, the road curve centerline is highlighted yellow. This is a visual design check aid that greatly helps designers (Figure 3).

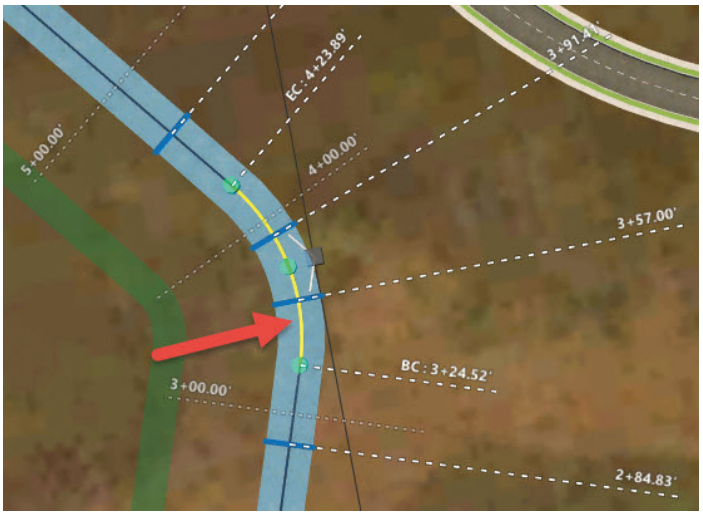


Figure 3

In addition to the curve being highlighted yellow in the model, on the Stack the Curve Geometry attribute section is also highlighted yellow, indicating that the road radius needs to be revised to meet the current drawing road design standards.

The road standards assigned to the road can be found in the Model Properties tool at the bottom of the dialog box, under Road Design Standards (Figure 4).

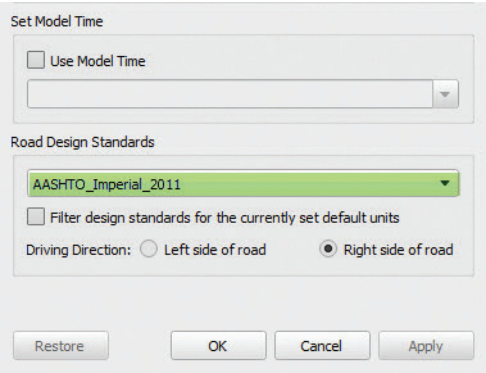


Figure 4

BRIDGE IMPROVEMENTS

Another big improvement to InfraWorks 360 2018 is the ability to import and export Parametric Bridge Content from the Styles palette. When you open the Styles palette, the Bridge Template is now included as a tab (Figure 5). Pre-built bridge templates have already been included in the Bridge Template Tab for you to use.

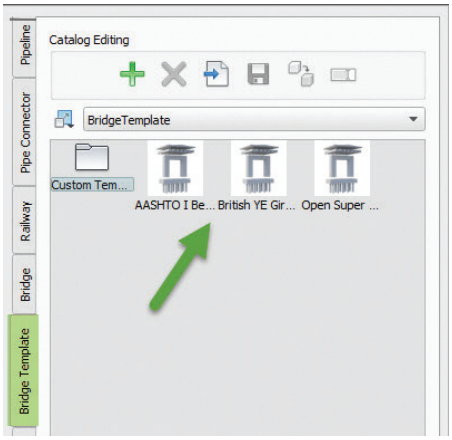
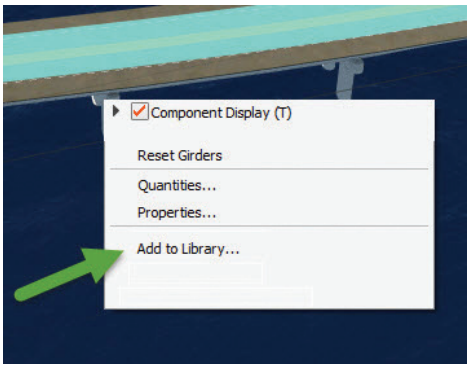


Figure 5

One of the best benefits from this feature is when you customize and build a bridge, you can include it to the Bridge template library by simply selecting the bridge and right-clicking. This will bring up the context menu, and at the bottom you have the options to "Add to Library." A small dialog box appears asking you to provide a name for the bridge template (Figure 6).



InfraWorks 360 2018

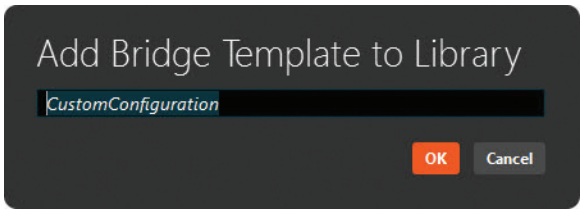


Figure 6

Another bridge enhancement is the Send to Revit feature, which allows the user to select a bridge and send directly to Revit as complete model (Figure 7). This a great tool for bridge designers who want to make changes to the bridge model within Revit. To use this feature, you must have Autodesk® Revit® 2016 or more recent

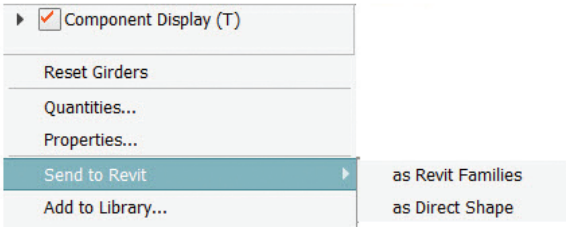


Figure 7

release. In addition, if your model is using a geographic coordinate system such LL84, InfraWorks 360 will ask you to assign a new project coordinate. Once InfraWorks 360 finishes processing the part element conversion, Revit will automatic open to display the bridge model.

OTHER ENHANCEMENTS

Now in 2018, the default visualization setting for new models is the Engineering View. Typically, the Engineering View is the best visualization setting to use when design and importing data into InfraWorks 360 because it reduces the visual effects and produces faster performance. When you have finalized the design, change the visualization setting to Conceptual View to produce much higher resolution rending quality (Figure 8).

Figure 8

To improve model performance and level of detail for models that contain a large number of trees or forests, Autodesk created the adaptive trees. Adaptive trees provides a high level of detail by geometry automatically adapting to the camera distance, thus improving the model visualization and performance (Figure 9).

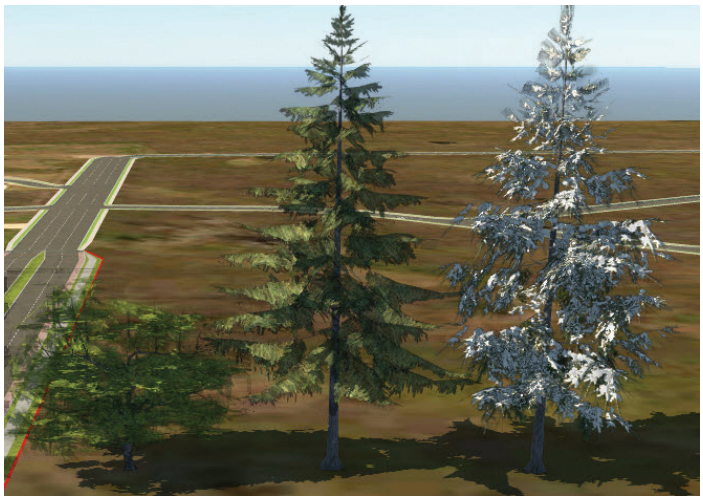


Figure 9

Also new to 2018 are the ROW text labels and marker display on Road Cross Section Viewer (Figure 10). When you add ROW to a road it will now display on the cross section view. For now the ROW markers show up only on the Cut Fill Area view settings.

Figure 10

In conclusion, Autodesk has made several enhancements to road and bridge features to help improve the software performance and feature efficiency.

Tony Carcamo is the Corporate CAD Manager at Peloton Land Solutions. He has 20 years of experience in the civil engineering field performing different task from surveying and platting to site and utility design. In addition, Tony has also spent several years Autodesk software implementation and CAD management. Tony is a blogger, sits on several Autodesk committees and council groups, is president of the DFW BIM Infrastructure User Group, and is a certified professional in AutoCAD Civil 3D and InfraWorks 360 and an Autodesk Expert Elite member.

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by: Brian Andresen

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KUBITY EXPORTER 2017

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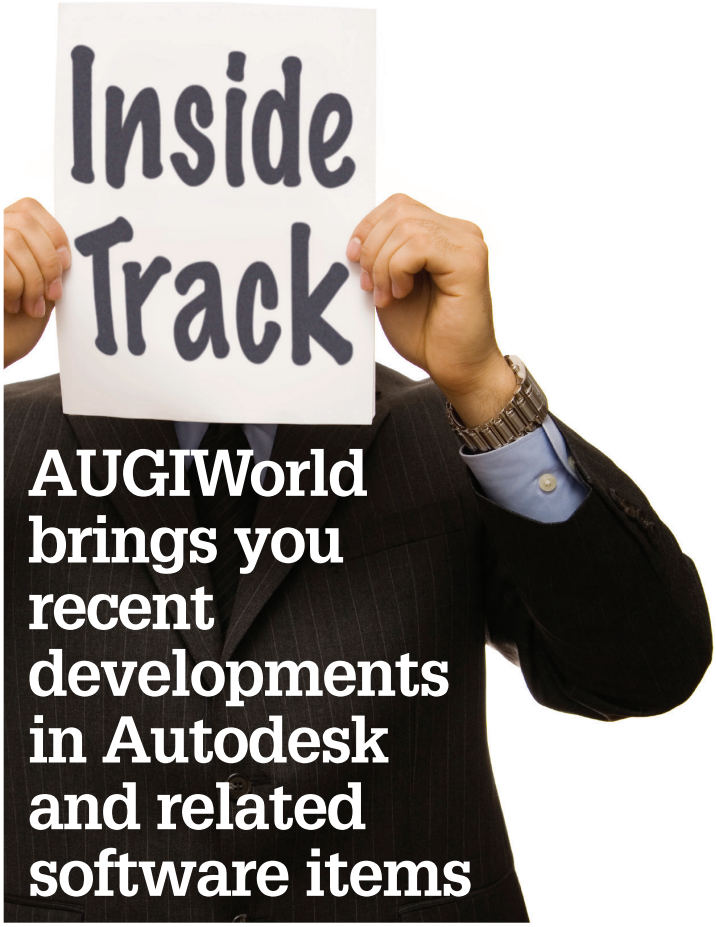
- **Cinematic Tour** – Fly through your model with pre-set scenes automatically imported from SketchUp.
- **First-Person Perspective** – Walk. Jump. Explore. Find the fun in discovering models from a first person point-of-view.



https://apps.autodesk.com/ACD/en/Detail/Index?id=2136331629271009666&appLang=en&os=Win32_64

BLACKBOX AUTOPURGEREG

BlackBox AutoPurgeReg for Autodesk® AutoCAD® allows users to automagically Purge Registry Applications (RegApps) at drawing Open and Save.

There are many ways to purge unused Registry Applications from a drawing, and users have been doing so for years. The difference is, this plug-in does it for you and faster than traditional LISP or Command calls.

https://apps.autodesk.com/INVNTOR/en/Detail/Index?id=8937641407966433186&appLang=en&os=Win32_64

NUPSIMPLEPLOT

How often do you print 2D-drawing extractions in Autodesk® Inventor® with standardized printer settings?

NuPSimplePlot allows you to define and save up to eight printer settings in Inventor. Quickly choosing between different printer settings for printing documentations or presentations saves time. Select paper size, scale, and color options for your document from the upper ribbon in Inventor.

The app needs just one simple installation and can then be used throughout all design stages (drawing, assembly group, assembly) by accessing the print-settings and prompting the printing process.

Besides this app, there are other tools to increase your productivity with Inventor, Autodesk® Vault, and Autodesk® Revit®. The following tools are available in the store:

Autodesk Inventor:

- NuPFits – Automatic insertion of fits lists on 2D drawings
- NuPPlotDate – Automatic update of the print date when printing drawings

Autodesk Vault:

- NuPiFolder – Create local folder structures on several levels
- NuPFileBrowser – Display local folders directly in the Vault-Explorer

Autodesk Revit:

- NuPDoorWin – Create practical door/window lists with linked parameters

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

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- *AUGIWorld* (last 12 months)

DUES: Free

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