Autodesk QTO

The Best Little Program You *Aren't* Using!

A Q&A with David Harrington, AUGI President

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Autodesk QTO – The Best Little Program You *Aren't* Using!

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AUGIWorld Q&A

with David Harrington

In January, David Harrington took the lead as AUGI's new president. A long-time AUGI champion and volunteer, he plans to hit the ground running with a clear list of objectives and a vision for achieving them. In this *AUGIWorld* Q&A, David describes the improvements that AUGI members will see in 2011.

Q I'm guessing that most AUGI members are interested in moving AUGI forward. Describe your top three (or more) goals for the organization in 2011.

A Well certainly a biggie is stability and growth in the website. With the new website and forums we have experienced some growing pains as we moved to a more robust content management system. Next for me is community, in all aspects. We know that members like to "group" into smaller common areas of interest. Some areas of interest are country specific, others locally focused, and others industry and product. I would love to see each unique grouping be empowered to do not only what they want, but also what helps one another. Lastly is the AUGI Volunteer Core. Did you know that nearly 100 volunteers are involved in all the work we do? From authoring, to moderating, to management, there are many opportunities to improve and grow. Frankly, in some ways the top level of AUGI management needs to properly empower and support the volunteer level and then "get out of the way." They know what they need to do and just need to be properly missioned to do it.

Q This isn't your first stint at the AUGI helm. You served as president in 1999 as well. Besides the obvious change in number of members, what other changes do you note in the membership today compared to a dozen years ago?

A Yeah, that is a flashback! There is almost nothing the same as before. Back then, Autodesk had a fully staffed department led by Lynn Allen. That staff was the muscle behind the curtain, making things happen for the organization. The membership itself is certainly different as well. Previously it was the annual event (AU) that drove membership numbers. The website was just a way to join and get information about AUGI. Now the forums contain most of the day-to-day activity, but we hope to increase other channels in 2011.

Q AUGI recently revamped its website. It clearly has a new "look," but what else is new about it? What improvements have been made to the underlying technology? What are some website features that weren't on the old site?

A We now have a more robust content management system (CMS), which allows us to better organize all of the information that is added to the website. We have a new component called the Library—a warehouse for articles published in AUGI media including *AUGI AEC|Edge, AUGIWorld,* and *AUGI HotNews*. This has great potential for members to really contribute to the masses. Not only can someone write and be published in a digital magazine, but also that content will have a life beyond that issue via HTML within the Library.

Q What are you plans to increase the membership in 2011 if, in fact, that's on your list of things to do?

A I'm a big believer in not targeting membership numbers. The membership numbers will be what the infrastructure of the organization will support. For example, if we had only ever made one forum for AutoCAD, it would be full of AutoCAD users and no others. Plus it would eventually reach a comfort level of activity. People join because they find value in membership. We have to provide that value by developing content and networking opportunities for each member. If we do that right, membership will increase accordingly.

Q To what extent will AUGI take advantage of social and/or professional networking such as Twitter, Facebook, LinkedIn?

A We are currently providing many of those channels for our membership. We look to expand those in 2011 by keeping a close eye on this area for emerging channels so that we can ride the next wave. AUGI will work with the channels to provide the best value to our membership while maintaining the high standard of integrity our membership expects.

Q Does AUGI have plans to refurbish long-time programs such as the Wish List and the AUGI Training Program (ATP)? What about others?

A We do have a number of programs, so let me stick to the ones you quoted. The Wish List System (WLS) will be totally revamped from what we had before. Not only will we be expanding to many, if not all, products, but the member interaction with the WLS will be much more lively and have immediate feedback.

The quick answer for the AUGI Training Program (ATP) is that we plan to have at least one semester of classes. All of our programs require volunteers. The more volunteers we have, the more comprehensive our programs can be. In the case of the ATP, if we have more instructors, we can run more classes.

Q There has been talk about changes in AUGI publications lately. What will happen in 2011 with *AUGI-World*, *AUGI | AEC Edge*, and *AUGI HotNews*? Are there plans to produce more magazines/newsletters in 2011?

A Yes, this is an area dear to my heart. The biggest change planned so far is that *AUGI | AEC EDGE* is increasing to bi-monthly publication. The tools used in the AEC industry have seen resurgence in recent years so there is a lot of interest and a lot to "say" by members. Now the other industries have been busy as well and as soon as we can find the authors we will produce special edition titles for Civil and Manufacturing. Now for *AUGI HotNews*. Functionally it is staying the same but the method to produce it has been dramatically changed. The addition of the Library has had a great impact on AUGI publications.

Q Reflecting back on the most recent Autodesk University, are there plans to make substantial changes to any AUGI-themed activities at the 2011 event?

A AU 2011 already? I haven't even gotten over the last one! I don't know if huge changes would be expected but we will certainly try to improve as always. We had changes this year as the *HotNews Daily* was not produced in paper and put out by email or web. Personally that probably should go back to paper to really serve the attendees it is created for. The Annual Meeting will be similar but might be a bit more *something* and I expect the AUGI booth to be very much the same.

Q Trying to get AUGI CAD Camp running again has been daunting, with some locations attracting much larger groups than others. Are there plans to host AUGI CAD Camp again in 2011 and, if so, what will AUGI do differently?

A Our 2010 experience has proven if you build it, they still may not come. We find CAD Camps to be an exciting and enriching experience for our members. However, in this economy it is difficult to break

even on these events. We are working on a model that will accomplish both and we hope to have some CAD Camps in 2011. Stay tuned!

Q Change is often painful and AUGI has undergone some changes in the last year or two that have been, well, unpleasant at times. Clearly, the organization has weathered the storm, but what did you personally learn from the conflict?

A Oh yes, it has been painful at times. But you work through it because you see the vision on the other side. Personally, I have seen that many members cannot get too much information. I have seen a lack of information be met with negativity. But once fully informed, members understand why we do what we do and generally agree. So I'll work to help the Board be more open publically, but certainly will continue to personally be available to members who seek me out.

Q Anything you'd like to add?

A I'd like to address the members directly. Why am I here? Simple–to help the organization at the highest level. You, the member, can help as well. There are many areas in which you can *contribute to your* organization—from authoring for a publication, teaching an ATP class, posting regularly in the AUGI Forums, or even helping as a program volunteer. The point is to do something, and you will find it has rewards for you personally and helps your fellow members.

Take care,
David Harrington
AUGI President

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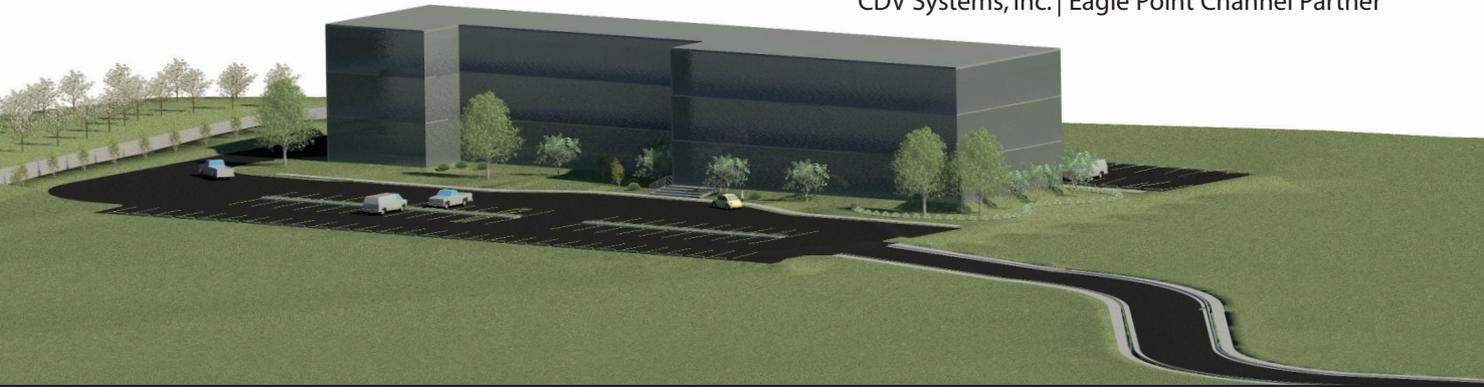
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Big Room Drawing Health

In this article, I'm going to describe a CAD management issue. Unlike most articles, I'm not going to just describe the problem and what needs to be done to correct it. Instead, I'm going to walk you through what I did, the order in which I did it, and even describe revisiting and redoing a working solution I found. You'll also see what obstacles I encountered and how I overcame them.

The rationale for approaching the article in this manner is to not just describe a problem and solution, but also to shed light on a way of approaching this or any problem because, let's face it, our problems and situations are always different and often require different solutions.

One big happy

The industry is full of buzzwords, one of which is "collaboration." A trend among a lot of larger construction jobs is the "Big Room" concept, otherwise known as Co-Location, where staff from most major project participants share a common office.

Here more than anywhere, people often buy into the concept of everyone working together in a collaborative environment. This is a great thing but can often have some undesired consequences. One such consequence is the concept of a shared server, often provided by the general contractor, owner, or architect. Here, all project participants post or even work on their drawings live.

This sounds great until you realize that the small specialty sub who has never done CAD or BIM before doesn't understand the importance of purging drawings. Or perhaps it's even the larger firm, very experienced, but whose staff is now isolated from their CAD/BIM manager who shouldered the burden of file management for them so they could focus on design or coordination. Or perhaps it's just a project partner who uses a third party-application that doesn't mesh well with the third-party applications used in the project.

This can lead to drawings becoming contaminated with things such as excess Registered Applications (RegApps) or ScaleList entries simply by Xrefing the data of others live. They save their drawing and suddenly you go from a 30 second open/save to 10 minutes, simply because you referenced their drawing that has a half-million excess Regapps. And now your drawing is contaminated as well.

The elephant in the room

Autodesk has a couple of utilities, CleanupRegApp and CleanupScales, that perform cleanup operations on DWG files. When manually running these utilities, an analysis of the reports often shows the issues are with the drawings of project partners who are co-located but not those off site. This leads me to believe that firms working off-site (just as we do) download project data and clean it prior to distributing to their staff (they consume clean data). When it's ready to be shared, it's again cleaned before being sent to project participants (they distribute clean data).

Because this type of cleaning is often done by a CAD/BIM manager, it usually doesn't happen in a co-located environment unless someone like the general contractor is performing this type of CAD/BIM administration. Often they are reluctant (and for good reason), to take the liberty to clean other firms' data in the event something inadvertently changes.

Recreate what works

To combat this issue, I can recreate the isolated environment within the co-located office with my own server, dedicated desktop, or even production system at night. The first step was to stop using the shared server for production work. There are several utilities and technologies available to do this. One of the cheapest and simplest is a free utility from Microsoft called RoboCopy. This utility can sync a file structure from one server to another. RoboCopy is a command line utility making it the perfect tool for an old-style DOS batch file, which we can easily schedule using Window's built-in task scheduler. I won't get into all the details and options available with Robocopy, but in its simplest form the following code will mirror one folder structure to another.

```
robocopy.exe "S:\Source" "D:\Destination" *.* /MIR
```

Using Robocopy from a nightly scheduled task, the data everyone else posts throughout the day is copied to a semi-isolated environment controlled by us for our staff's use. There are cases where something gets posted that you need immediate access to, but that's the beauty of a co-located environment—the person who has just posted the data you asked for can easily let you know, and you now manually copy that data to your semi-isolated environment as an exception to the rule.

The cleanup…

Now that we're utilizing the data in a semi-isolated way, we might as well run Autodesk's CleanupRegapp and Cleanup-Scales utilities. While you could run them manually, you'll have to do it repeatedly to

catch new/changed files that are synced with your semi-isolated environment. Reading the help file that comes with the utilities, it becomes clear we can run both of these utilities from a DOS command line, which allows us to include them in the same batch file running our RoboCopy sync nightly.

```
c:
cd\
cd "Program Files\AutoCAD MEP 2011"
CleanupRegapp.exe /c "D:\Destination"
CleanupScales.exe /c "D:\Destination"
```

When running these utilities from a batch file, they use the default or last used settings of the utilities. You can manually run these tools to set things like "Include Xrefs" or you could change them by editing them in the following registry keys

HKEY_CURRENT_USER\Software\Autodesk\CleanupRegapp\Settings

HKEY_CURRENT_USER\Software\Autodesk\CleanupScales\Settings

You could even import the registry settings within your batch file by importing a REG file you've previously exported from the registry.

```
regedit.exe /s "C:\Cleanup.REg"
```

...and then the roadblock

Now that we're utilizing the data in a semi-isolated environment, we also get the opportunity to clean it prior to our use. However, we hit a snag. We've manually run these utilities to test our process without a problem. However, when running them from a batch file, some data produces a strange error and halts the operation.

Here's where I call upon Subscription Support, knowing full well these are free utilities and likely "unsupported." I don't' expect support, but I try anyway.

The person from Subscription Support can't get the commands to run, but it's clear he's talking about the AutoCAD command line rather than a DOS command line, so I explain. I'm then told they can't help when using them in a non-intended way. I point out that it is intended functionality and point them to the help file. This process continues, and continues. Maybe your syntax is wrong (if it were wrong, none would work, not some). You're running the 32-bit version utilities on a 64-bit version of AutoCAD® (doing this yields a completely different error), and so on. I repeatedly keep challenging the solutions and explanations. Finally, the reply I was expecting: It's your

data. These tools aren't part of Subscription Support anyway.

We're not done here. Okay, the software "is" on subscription support and I can't argue that the tools aren't supported, so I ask them to tell me how to make the software work to not create the "bad" data in the first place. I also ask why, if the data is bad, the tools work manually from the user int erface and not a DOS batch file and why is it just not my data, but random data on the files of 20 different trade partners. I also leverage the miscommunication earlier to suggest that perhaps a different support person would be more knowledgeable and request assistance from someone else.

I've previously worked for an Autodesk reseller doing support so I know how tough it is—you can't recreate the environment the person likely hadn't told you everything, etc. The point here is to keep challenging them with "reasonable" questions. Don't just accept the first answer you're given. In the end, this process lasted over a month with several emails and finally a reasonable solution (which I'll cover later).

You have a 30 percent chance of getting a different treatment option or diagnosis by getting a second opinion in health care, why not try it this approach with tech support? Keep in mind, good support means you should understand and agree with the answer...even if you don't like it. I didn't challenge the information I was given just because I didn't like it. I challenged because I saw holes in their logic.

The detour

Every roadblock usually has a detour. Because I couldn't count on a solution from Autodesk (perhaps it would be a bug that had no solution), I continued down a parallel path of options while still challenging Subscription Support.

The obvious thing is that the utilities worked manually through the interface, but not from a batch file. So it seemed logical to automate the graphical user interface. But is that even possible? Absolutely! I used a great little utility called WinBatch from Wilson WindowWare (http://www.winbatch.com).

This utility has been around for years and is designed to automate Windows, including dialog boxes. WinBatch costs only $99 for a version that doesn't compile to an executable. It also has a 30-day trial with a 90-day money-back guarantee so I can make sure it works before I buy it. A quick install of the trial version quickly showed promising results once overcoming the short learning curve.

WinBatch can automate dialogs by using a scripting language. In this language, you

tell it to run a program, then "wait" for a dialog with a particular title. Then it sees a dialog with the specified title, you tell it to click the button with a particular text string. In my case I tell it to wait until the dialog with the title "Regapp ID Cleanup Utility" exists, then click the "Select Files" button. It took a little coaxing to get everything just right, but it worked flawlessly....almost.

Roadblock number two

While the CleanupRegApp Utility worked fine, the CleanupScales utility hit a snag. WinBatch looks for dialogs with certain titles. When the utilities run, there's a dialog that shows the progress, and when finished, a second dialog that tells you it's done and where the log file is created. Those last two dialogs in the RegApp utility have different titles so I can tell WinBatch to wait for the proper dialog and close it. But the last two dialogs in the ScaleList utility have the same title so WinBatch can't distinguish between the two.

These utilities come with an EXE and a DLL. Doing a text search on the EXE and DLL for the title text of the dialogs shows that it exists in the DLL—that's where those dialogs are defined. Even a binary file like a DLL contains some readable text.

To edit a binary file, a Hex (short for Hexidecimal) editor is needed. You can find free/shareware/commercial versions all over the Internet. While I don't understand what I'm looking at, I can find the text string of the dialog title. Because two dialogs have the same text, I'm assuming the last dialog the utility displays would be last in the DLL file so I modify the text to something unique. Running the utilities again manually shows my gamble paid off. Now WinBatch can determine when that last dialog is displayed and dismiss it.

Persistence pays off

Now everything is in place and working properly. The data our staff consumes is copied to our environment nightly and cleaned before being consumed the following day. I could (and do) even clean our own created data this way. I could (and also do) use the same RoboCopy utility to copy our data back to the co-located offices shared server for others to consume. I'm now consuming and posting clean data which ultimately I feel it's our responsibility to do.

Despite everything working, I keep hassling Autodesk Subscription Support. Not because I'm difficult, but because there's likely a simpler solution and because I truly believe it's a bug in their utility that should be corrected in the future. Persistence pays off.

Subscription Support has a different technician on the case. This time, my arguments stuck with him as he understood my observations and took a personal interest in finding the problem. It seems that some of the data contained custom objects that caused the utility to load an incorrect DBX. The solution was as simple as renaming the DBX before calling the utilities, and renaming it back when finished running.

```
c:
cd\
cd "Program Files\AutoCAD MEP 2010"
if exist "AecModeler60.dbx" rename "AecModeler60.dbx" "*.dbxSAVE"
CleanupRegapp.exe /c "D:\Destimation"
CleanupScales.exe /c "D:\Destimation"
if exist "AecModeler60.dbxSAVE" rename "AecModeler60.dbxSAVE" "*.dbx"
```

At this point I abandon the working WinBatch solution and opt for this more simplified solution, believing simpler is better. To arrive at this point took several guesses as well as gambling on a couple options. It also took not settling on failure. If you put your mind to it, these seemingly big obstacles can often be easily overcome.

Summary

I didn't get into a great deal of all the details, rather just a discussion on the major points. There's a lot more to the actual solution than was described here. For instance, the logs generated by the Cleanup utilities are renamed according to the date they are run, so I can check results from any night.

This process also doesn't clean the drawings of unpurged blocks, etc. This, as well as my process, could have been done with an AutoCAD script file, but Script files are a little more finicky, not to mention the large volume of files couldn't be processed nightly. Even the ScaleLists now have a variable in AutoCAD that helps a user control and limit them so this piece could be left out if needed. Other things such as excess layers, materials, and blocks can automatically be purged when users open a drawing using some AutoLISP routines. There are a lot of options available and what you should do really is determined by your needs.

While this article isn't long enough to teach DOS batch file writing or WinBatch scripting, I will gladly share with you simplified versions of the files I'm using and attempt to explain them as best I can. Just email me and I'll gladly forward them your way.

CleanupRegapp Utility for AutoCAD 2010/2011

http://usa.autodesk.com/adsk/servlet/ps/dl/item?siteID=123112&id=13723477&linkID=9240618

CleanupScaleList Utility for AutoCAD 2010/2011

http://usa.autodesk.com/adsk/servlet/ps/dl/item?siteID=123112&id=13723349&linkID=9240618

CleanupRegapp Utility for AutoCAD 2009/2008

http://usa.autodesk.com/adsk/servlet/ps/dl/item?siteID=123112&id=11807875&linkID=9240618

CleanupScales Utility for AutoCAD 2009/2008

http://usa.autodesk.com/adsk/servlet/ps/dl/item?siteID=123112&id=11062617&linkID=9240618

Darren Young is the Systems Integration Manager for Southland Industries, a design-build mechanical contractor in Irvine, California. An Autodesk Registered Developer, Darren has been automating CAD systems in the Manufacturing and Construction industries for nearly two decades.

Bootstrap Your AutoCAD Deployments

The power of AutoCAD® is due in large part to its customizability. Companies can add features that make AutoCAD perform the tasks that are important to that organization. These added customizations make the company more productive, which is important in any economy.

The price of customization includes the question, "How do we reliably roll out these customizations when we deploy a new version of the software?" This question has the tendency to force organizations to delay deployments or skip releases due to the agony of supporting customizations.

The deployment process

AutoCAD requires administrator privileges for initial installation. If that was the limit of the installation, there would be little need for this article. There are good tools from a variety of sources for performing installation of software with administrator privileges.

The issue with deploying AutoCAD is that the software also launches a secondary installer for each new user attempting to use the software on a specific workstation. This secondary installer is the source of heartache for many companies creating a deployment strategy.

The launch of the secondary installer is out of the hands of the CAD manager and/or IT department. It can occur at any time during the lifetime of the software on the workstation. It can occur multiple times for a specific user if they login on different workstations.

Yet this secondary installer creates files and registry information that is critical to the operation of AutoCAD. Many of the customizations of AutoCAD are stored in the user's profile by default in AutoCAD. This secondary installer is the monkey wrench in the deployment process.

A bootstrap process recognizes when the secondary installer has just been run and AutoCAD started in a default, out-of-the-box condition. It takes over at that point and imports the needed profiles to support the company's customizations.

Forget about walking around with a DVD installing AutoCAD. If you have a network and a server there are distinct advantages to using network licensing, and deployment is a huge reason for selecting network licensing. Network licensing groups all your licenses under one serial number. This immediately simplifies deployment because deployments do not need to be customized for multiple serial numbers.

Deploying customizations

It is possible to create a deployment package that contains all the required customizations for a company. However, there are issues with such an approach that may not be immediately obvious.

Packaging a static set of customization may be performed using the network deployment wizard. Yet how much customization is truly static? Is it realistic to expect that a deployment package's customizations will not need modification for the life of the deployment? That's just crazy talk. It may provide a sense of security to provide all needed customizations in the deployment, but the management of the deployments will be significant. How will updates be provided when all customization is tied up in the deployment? How will the deployment package be updated to reflect changes to customization? The process of updating the deployment package alone is tedious enough to make another approach desirable.

Typical customized deployment

The typical deployment scenario is this:
- Make sure the customizations are available (locally or on the

network)
- Deploy a profile that "sees" the customizations first
- Deploy a shortcut that launches AutoCAD using the required profile

This approach provides "warm fuzzies" because all the required components are all neatly packaged together. But there are issues.

- Do not forget that there is the secondary installer
- The secondary installer is where the profiles are created/stored
- To launch AutoCAD with the correct profile the user must use the provide shortcuts

It is possible to provide a complete experience only when the user is the sole individual ever using the computer and the user does not need to be quickly swapped to new hardware and the user launched the initial administrative deployment. This is asking for too much.
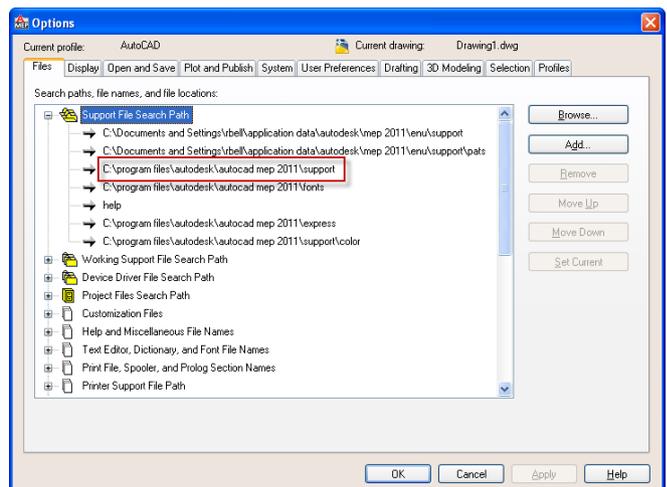

Figure 1: Support folder in %ProgramFiles%

Bootstrap deployments

The less modification that needs to be made to the deployment the easier it will be to maintain over the long run. That is the essence of a bootstrap deployment of AutoCAD. A bootstrap can be performed with the addition of a single file to the deployment.

The bootstrap avoids secondary installer issues. The bootstrap will recognize when it is running in a situation that appears to be the initial launch of AutoCAD for a new user. This means that the user does not need to use a provided shortcut to properly launch AutoCAD. If the user chooses to use the shortcut, that's fine. But if the user launches AutoCAD by some unexpected approach, the bootstrap will still provide the correct experience.

The key to the bootstrap is to leverage the AutoCAD startup sequence. One of the first customized files that AutoCAD loads is Acad.lsp, a user-created file. This file will only execute once per AutoCAD session, when AutoCAD is configured by default with AcadLspAsDoc=0 as it should be. Each folder specified in the AutoCAD search path is checked for Acad.lsp and it is automatically executed when found.

The default search path for AutoCAD includes %ProgramFiles%\Autodesk\<AutoCAD>\Support (see Figure 1).

Once the correct profile is loaded (see Bootstrap.lsp below) the search paths are changed so that the normal Acad.lsp file, located on the network, is executed rather than the one needed by the bootstrap.

Profiles

The AutoCAD profiles play an important role in the proper setup of AutoCAD. It is easy to create a profile and deploy it via the Network Deployment Wizard. The real issue is that you have no control over how the users launch the application.

The users may launch AutoCAD for the first time using several methods:

- Launch AutoCAD from the desktop shortcut provided by deployment (preferred since it will use the correct profile)
- Launch AutoCAD from the Start menu which may have several options (bet they pick the wrong one)
- Right-click on a DWG file and select the AutoCAD DWG Launcher (all bets are off)
- Double-click directly on a DWG file (did I mention the bets?)

What is really needed is a way to have AutoCAD recognize, during the initial per-user launch of AutoCAD, that the correct profile is not loaded or current. The power of AutoCAD's customizability provides the solution.

Profiles should be created *before deployment* and exported from AutoCAD as ARG files on the network to be used as part of the bootstrap process.

Visual LISP profile functions

Although you could spend time writing your own functions to control profiles, the code has already been written by Jimmy Bergmark of JTB World. His website contains many free examples of code that he has written. Visit http://www.jtbworld.com

Among the gems is some Visual LISP code for controlling AutoCAD profiles: http://www.jtbworld.com/lisp/profiles.htm

Functions that are immediately useful include:

getAllProfileNames	returns a list of profiles in AutoCAD for the current user
existProfile	returns T if a profile exists
importProfile	imports a profile
forceImport	imports a profile and makes it current

Acad.lsp for starting the bootstrap

I advocate placing all customization on the network when possible. Therefore, the locally deployed Acad.lsp file placed in %ProgramFiles%\Autodesk\<AutoCAD>\Support, should do no more than locate another LSP file on the network and execute it.

```
(setq fqn "P:\\AutoCAD MEP 2011\\Bootstrap.
lsp")
(cond ((findfile fqn)
       (princ "\nLoading bootstrap version
of Acad.lsp... done.")
       (load fqn)))
(princ)
```

The above code is straightforward. The first line is used to declare the fully qualified filename for the LSP file that is used to perform the bootstrap. The second line checks to see if the bootstrap file can be found. If so, the third line prompts the user and the fourth line loads the file. The final line is a clean exit from Acad.lsp.

Bootstrap.lsp

The Bootstrap.lsp file performs the work of importing required profiles when AutoCAD is launched without using the provided desktop shortcuts. The code can accommodate multiple AutoCAD verticals in addition to vanilla AutoCAD, as shown below.

```
(load "P:\\Acad\\Code\\Utilities\\JTB Pro-
files")
(setq allProfiles (getAllProfileNames))
(setq incPaths 1)
(setq msgInfo (strcat "Sparling's profiles
have been imported."
                "\nAutoCAD must be
restarted to update the support paths."
```

```
                "\n\nAutoCAD will be
closed after dismissing this dialog box."))

(cond ((and (member "AutoCAD MEP (US Impe-
rial)" allProfiles)
        (not (existProfile "Sparling
MEP")))
    (princ "\nExecuting Bootstrap.")
    ;; Add missing profiles
    (setq profPath "P:\\AutoCAD MEP
2011\\")
    (forceImport "Sparling MEP" (strcat
profPath "Sparling MEP.arg") incPaths)
    (importProfile "Sparling MEP Metric"
(strcat profPath "Sparling MEP Metric.arg")
incPaths)
    (importProfile "ILAZ Legacy" (strcat
profPath "ILAZ Legacy.arg") incPaths)
    (alert msgInfo)
    (command "._Quit"))
    ;; Vanilla AutoCAD deployments
    ((and (member "Initial Setup Profile"
allProfiles)
        (not (existProfile "Sparling
Vanilla")))
    (princ "\nExecuting Bootstrap.")
    ;; Add missing profiles
    (setq profPath "P:\\AutoCAD 2011\\")
    (forceImport "Sparling Vanilla"
(strcat profPath "Sparling Vanilla.arg")
incPaths)
    (alert msgInfo)
    (command "._Quit")))
(princ)
```

The following is a line-by-line description of the code:

```
(load "P:\\Acad\\Code\\Utilities\\JTB Pro-
files")
```

Load the LSP file downloaded from JTB World and stored on the network.

```
(setq allProfiles (getAllProfileNames))
```

Use a function from JTB World's code to get all the profiles defined in the user's instance of AutoCAD.

```
(setq incPaths 1)
```

Define a constant that makes later code easier to read.

```
(setq msgInfo (strcat "Sparling's profiles
have been imported."
                "\nAutoCAD must be
restarted to update the support paths."
                "\n\nAutoCAD will be
closed after dismissing this dialog box."))
```

Define a message used in multiple locations in later code.

```
(cond ((and (member "AutoCAD MEP (US Impe-
rial)" allProfiles)
        (not (existProfile "Sparling
MEP")))
    (princ "\nExecuting Bootstrap.")
```

This checks to see if AutoCAD MEP is the vertical version of AutoCAD that was launched. If so, then check if the primary profile is not found. If the tests pass, then provide a message to the user that the bootstrap is starting.

```
    (setq profPath "P:\\AutoCAD MEP
2011\\")
```

Define the path where the external profiles (ARG files) are stored.

```
    (forceImport "Sparling MEP" (strcat
profPath "Sparling MEP.arg") incPaths)
```

Use a function from JTB World's code to import a profile and make it current, in-

cluding the paths defined in the ARG file.

```
(importProfile "Sparling MEP Metric"
(strcat profPath "Sparling MEP Metric.arg")
incPaths)
```

Use a function from JTB World's code to import a profile, but don't make it current and include the paths defined in the ARG file.

```
(alert msgInfo)
```

Warn the user that AutoCAD will be closed because the new profile's changed support folders require AutoCAD to be relaunched.

```
(command "._Quit"))
```

Close AutoCAD.

```
((and (member "Initial Setup Profile"
allProfiles)
      (not (existProfile "Sparling
Vanilla")))
    (princ "\nExecuting Bootstrap.")
```

This checks to see if vanilla AutoCAD is the version of AutoCAD that was launched. If so, then check if the primary profile is not found. If the tests pass, then provide a message to the user that the bootstrap is starting.

```
(setq profPath "P:\\AutoCAD 2011\\")
```

Define the path where the external profiles (ARG files) are stored.

```
(forceImport "Sparling Vanilla"
(strcat profPath "Sparling Vanilla.arg")
incPaths)
```

Use a function from JTB World's code to import a profile and make is current, including the paths defined in the ARG file.

```
(alert msgInfo)
```

Warn the user that AutoCAD will be closed because the new profile's changed support folders require AutoCAD to be relaunched.

```
(command "._Quit")))
```

Close AutoCAD.

```
(princ)
```

Provide a clean exit from Bootstrap.lsp.

Preventing bootstrap from executing

After the correct AutoCAD profile is imported and set current there is no need to run the bootstrap again, unless the user's Windows profile has AutoCAD wiped from it. Preventing the bootstrap from running is simply done by making sure that the folders containing the necessary company customizations (including the "real" Acad.lsp file) are located before the default support folder in the AutoCAD support paths. AutoCAD will execute only the first Acad.lsp file found. Once the correct profile is set current, AutoCAD will execute the Acad.lsp file located on the network rather than the one located in %ProgramFiles%\Autodesk\<AutoCAD>\ Support from the deployment.

Change the deployment with a wizard

There are three areas to change in the deployment package.
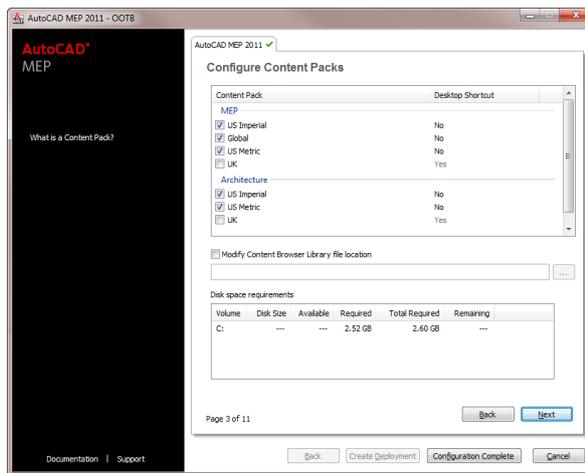

Figure 2: No default shortcuts on desktop

1. Change the content packs to *not* install desktop shortcuts (see Figure 2). The hope is that the users may select the customized shortcuts on the desktop created in a later step. There is no need to provide the default profiles as desktop shortcuts unless you need to provide access to those profiles for normal users which is atypical. The default profiles are still installed and can be launched from the Start menu so there is little need for them on the desktop if you are going to use your own profile.
2. Add Acad.lsp to the Support folder (see Figure 3).
3. Create custom desktop shortcuts that load the desired external profiles (see Figure 4). These are provided to give the users a way to launch AutoCAD with the correct profile, especially when multiple profiles may be required (such as Imperial or Metric.) These shortcuts will be installed to the %AllUsersProfile%\Desktop, which protects them from accidental deletion as long as the users are limited users.

Conclusion

Bootstrapping AutoCAD from the secondary installer removes a great deal of the complexity in deploying AutoCAD. The addition of a single file to the deployment package can make deploying AutoCAD to

users a seamless experience. When the bootstrap is combined with locating the user's customizations on the network the user no longer suffers as large a productivity hit when he or she uses new hardware.

The bootstrap also makes the CAD Manager's and IT staff's life much easier because the complexity of dealing with the secondary installer has been mitigated.

The bootstrap should make it easier to roll out new versions of AutoCAD in a timely manner because less time needs to be spent configuring a deployment approach.
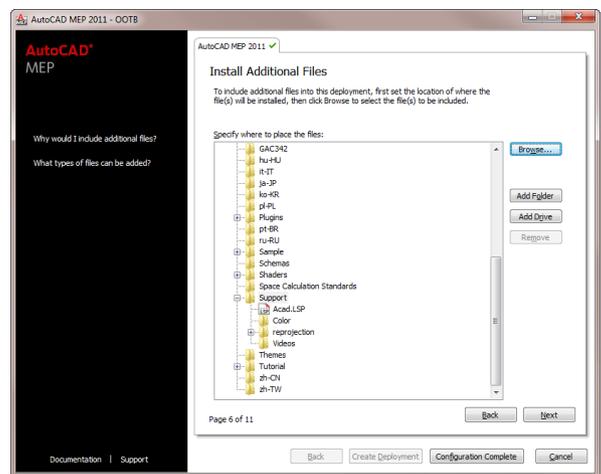

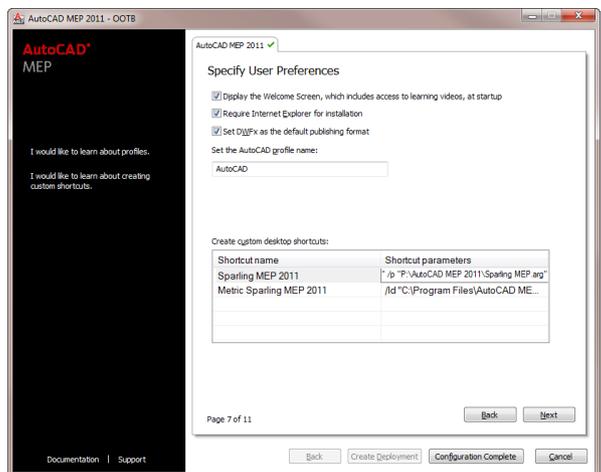*Figure 3: Add Acad.lsp to deployment*

Figure 4: Create shortcuts for the desktop

R. Robert Bell works for Sparling in Seattle, Washington, USA, as Design Technology Manager. He has used AutoCAD since v2.18 (AutoLISP!). He has served on the AUGI Board of Directors.

Autodesk QTO – The Best Little Program You *Aren't* Using!

Generally on any building project there is a fine line that is drawn when it comes to technology. On one end of the spectrum you have architects and engineers who rely on technology to get their work done. On the other end you have subcontractors and trade specialists who use years of experience, common-sense, and good judgment to turn a set of plans into a living breathing building.

What has always been interesting to me is that while those on the design portion of the equation have been so dependent on technology to get their work done, those on the construction side of the equation seemingly have very little use for advanced technology of any type. When you walk the halls of a dry wall or flooring contractor you invariably see construction plans rolled up in corners or spread out on drafting tables. And usually there is a person huddled over them wearing glasses and manually calculating material quantities to determine what it is going to cost them to do this job. This is a tough group to reach out to because they are not traditionally CAD users.

Now that we are living in a world where IPD is a reality, all parties need to take advantage of the situation and leverage the technology available to make each job more profitable. So now comes the question: "Why aren't these guys using Autodesk Quantity Takeoff (QTO)?" I mean this piece of software can make life easier for architects, engineers, and subcontractors and almost nobody seems to be using it.

In fact, my own exposure to the product was somewhat accidental. Before I went into business for myself, I was working for an Autodesk reseller when a nondescript package arrived in the mail. I had received these packages fairly often containing what are referred to as NFR (not for resale) copies of the software. So when I received QTO, which I had heard of but never used, I decided to load it up and take it for a spin. What I found was a pleasant surprise. This software can cut the amount of time spent doing a count and takeoff by more than 60 percent, and the accuracy factor is dramatically increased as well.

What you will notice first about QTO is that it doesn't require any additional equipment to use. Some of the more popular on-screen takeoff programs come bundled with digitizer pads or require the purchase of interactive touch screen pen displays similar to the Waacom Cintique tablets.

With QTO all you need is a monitor and a mouse. QTO is built on Autodesk proprietary DWF technology. This technology was originally aimed at keeping Autodesk customers from having to purchase software from Adobe Systems (Acrobat) in order to communicate with each other. Personally I like the DWF format—if it did nothing more for us than to push Adobe to pay better attention to the needs of the engineering and design community, it has done enough.

But DWF also gives us the ability to communicate using precise vector lines or lightweight 3D models seeded with object property data. That may be the reason that a lot of people shy away from using it. Some of the files generated look a lot like AutoCAD DWG files and there could be concerns about file security. Some of those concerns are partially justified by the efforts recently to create programs that convert 2D DWF files into usable DWG or DXF files. While I am of the opinion that someone may figure that out eventually, I don't think the tech is there yet. Most of the programs I have seen fall short of providing a file that is truly usable without requiring a lot of clean up. So while people are still unsure about DWF and the free Autodesk Design Review package, it is this functionality that enables programs like QTO to leverage the DWF file to make quantity takeoff much easier.

As you open the program you will notice that it is project based. The startup wizard asks you to select a name for your takeoff project. The program will group all necessary drawings together, allowing them to be accessed in the future by simply opening the project to which they pertain. Next you are asked to select your system of measurement, imperial or metric, and the currency you will be using. You see, while the program itself is called Quantity Takeoff, it can be used to do cost estimating as well.

After selecting the currency you get an opportunity to select an organizational model for your takeoff project. Several popular formats are preloaded into the system including CSI 16, 48, and Uniformat systems. You can select one of these at this point or select none if you intend to apply your own organizational structure or if you will make the decision about which to use later in the project. On the next panel you are given the opportunity to select the drawing files that will be part of your project.

QTO is based on DWF technology, but you can select drawings that are in just about any commonly used format. Directly supported files formats include DWF, DWFx, DWG, PDF, and Image file types such as BMP, JPEG, GIF, and CAL. You can choose any one or a combination of several images to combine in the same takeoff project. While most other takeoff programs give you that capability, what makes QTO unique is that it allows you to load not only sheet-based documents but also model files generated from programs such as Autodesk Revit. Though the RVT isn't supported for direct import, if you export an RVT model as a 3D Dwfx file, it can be loaded into your project while retaining the original object properties. It is primarily in this way that this program is uniquely valuable. No other takeoff program on the market today so seamlessly supports both a 2D and 3D workflow.

Once the individual drawing files have been loaded to create your takeoff project, it's time to get to work. If you don't have access to a 3D model of the project, you will probably be working from raster file formats, pdf, or dwf files. While it doesn't matter which file you are working with, I believe that you get better drawing fidelity

> When I received QTO, which I had heard of but never used, I decided to load it up and take it for a spin. What I found was a pleasant surprise.

when working with pdf files created directly from the CAD file. When you plot directly to pdf, as opposed to, let's say, simply scanning a printed sheet, you get better line quality and that can help the tools in Autodesk QTO work for you. But quantity takeoff on projects today is primarily a 2D operation, at least for now. So it was important when this tool was developed that the current condition be well supported.

The next feature was so smart that I almost missed its true impact. You have the ability to go into a file, used a scale reference operation to set the scale of the drawing, and then instantly apply that scale factor to all the drawings in your project. Correct scaling guarantees accuracy for spatial data and the project-based approach of Autodesk QTO saves time by eliminating redundant tasks.

Once the scaling has been set you are ready to begin your count and what you will find is a simple set of tools that give fast access to item count and spatial information within the plan set.

Items are easily identified with simple geometric shapes that can be color-coded for ease of use. Once a shape is assigned to a particular object and its properties are established, a count is created and updated every time a new object is selected. This means a simple click can be used to add new objects to an overall total. In addition, each item counted can also have cost information applied to it. The object selection mode for counting manufactured items (door, windows, and so on) is very easy to use and you will find it extremely intuitive.

But that is only part of the equation. QTO really flexes its muscles when counting surfaces such as floors or walls in the project. Both of these operations are assisted by the fact that QTO has the ability to use a function similar to Object Snap in AutoCAD, to detect the endpoints intersections of lines on the page. Floor areas are detected by selecting their corners and applying a uniform shading pattern to them annotated with square foot data.

Walls are even easier with the option to use a two-click (1 endpoint, 2 endpoint) operation to get the wall length or a single-click operation near the wall midpoint that will allow its length to be automatically detected. As various items are selected, a count workbook is created containing spreadsheets customized for the type of object being quantified.

For example, when door items are selected a spreadsheet is created that contains a cost function that allows for the inclusion of information such as material cost and labor cost. For walls, the spreadsheet cost formula accounts for length, wall height, and construction. This means that if a contractor is accustomed to hand calculating most of his costs, he now has a streamlined spreadsheet within QTO to use for costing purposes.

As the count project develops, you can also choose to export the data in a variety of formats such as Microsoft Excel, or the Timberline estimating package by Sage. So no more juggling plans and packages of highlighters around and anchoring yourself to a drafting board just to handle a takeoff. Autodesk QTO can keep the entire operation on the computer and still generate reliable quantities and (even though it's not advertised) reliable costing information with a slightly better margin of error than a purely manual process.

So even when it's merely replicating what other count packages are capable of, Autodesk QTO is an excellent tool. But just think of what is possible if you can actually get your hands on a 3D DWF model with exported DWF sheets from a Revit RVT file. When a Revit file set is published, the QTO process increases in efficiency by an order of magnitude.

First QTO is able to organize an established link between the 3D model and the plan set. As items are selected on the model, you can instantly go to every point in the plan set where that item appears and the item will have a box around it letting you know that item has been selected.

Property and spatial data is included with the model when it is exported so the entire model—that's right—the entire model can be counted and sorted in a single click. The counts are again published into a workbook and from there the choice is yours. You can either use the internal spreadsheet to start costing or load the quantity information into the cost application of your choice using your own customized costing data to generate estimates in a fraction of the time it would take performing this work manually.

What once took days or weeks can now be done in minutes or hours and for the most part the design and construction community is blissfully unaware this program even exists! And I find myself completely baffled by this. With an extremely cost-sensitive economic environment out there everyone should be interested in anything that can help them to perform a takeoff on a project.

This includes the architects, who are expected to know more about the cost of their proposals than ever before and who are constantly being asked questions about cost and value engineering throughout the course of the project.

Construction managers should be interested in tools that would help them to quickly verify the accuracy of material and quantity estimates coming in from subcontractors to determine whether they are truly getting a good deal or merely dealing with someone who can't count. And the subcontractors are constantly working on guaranteed maximum price projects and have to suffer as each mistake made in a manual process erodes their already thin profit margins. All this from a program that costs about as much as a decent laptop computer and which will pay for itself (in labor cost alone) on the first project on which it is used.

So why isn't anybody using this thing? When I recently pitched QTO to a design and construction firm in Atlanta, I found out one thing that is hampering the process. The model workflow in QTO requires that the person using the software have access to a model file of sufficient quality from which to pull the data.

I actually sat across from a BIM manager who, after months spent in BIM based design efforts, said he would never let the pre-construction team use one of their models for estimating because the models weren't accurate. I seriously about fell out of my chair, but the guy was just being honest. And that highlights a point that I have made again and again. No one saves money by opting out of training in Revit or any other BIM application.

In fact everything that you bought into when you decided to go to Revit is only made possible when you adequately train your staff. If your people can't accurately create a BIM model, BIM probably won't save you a dime on the project and in fact it will typically make the project cost more—if not in actual time and dollars, then definitely in the amount of frustration experienced when trying to get your work done.

Does your team have the right stuff to fully benefit from BIM? Find a consultant that you trust, send them a recently completed project and find out. If you need some help finding someone shoot me an email for a referral.

Software companies don't usually push products that people won't buy. And Autodesk has not seen the need to release Autodesk QTO 2011. So while the handwriting may be on the wall as far as this program goes, I urge you to give it some thought. QTO is a vital piece of the mosaic for any firm who is serious about working in BIM. It would be a shame to see it die on the vine due to lack of interest.

Judah Jackson has 21 years of experience using Autodesk design solutions. Judah is a Revit Implementation Certified Expert and the Business Development Manager at Advanced AEC Solutions in Atlanta, Georgia. You can contact him via email at jjackson@aaecs.com.

A BIM-less World

In my previous *AUGIWorld* article, I provided some of my initial views on civil visualization for a water treatment facility. This article will continue with my experience of creating an Autodesk® Navisworks® model for the project. Recently a submittal milestone was reached, which included the model of the project to date compiled within Navisworks. So far the reviews of the model have been positive. I wish I could say the same for the process of bringing the civil portion of the model into Navisworks.

Civil design objects

The most glaring omission of the process is the lack of BIM objects that make up a typical civil site within AutoCAD® Civil 3D®. I felt like a castaway on *Gilligan's Island*. I could model almost any ground modeled object I wanted as long as it was a TIN surface; much in the same way most items found on Gilligan's Island were made up of bamboo. Want asphalt pavement over aggregate base material? Well, you get the TIN surface with a material applied. What about curb and gutter, landscaping, fencing, and concrete swales? Once again, a TIN surface with the appropriate material applied.
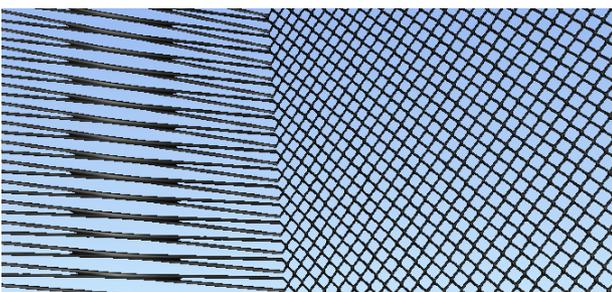
Other common objects are missing as well. Let's look at chain link fences, for example. There isn't an intelligent fence BIM object within Civil 3D. The method I chose to utilize was to create a surface comprised of breaklines for the top and bottom of the fence and apply chain link fence material to it from within Navisworks. Unfortunately, since the object is not smart, any changes to the design surface mean I have to go in and adjust the elevations of the breaklines. Changes to the fence location and grades happened more than once and the process could greatly be improved.
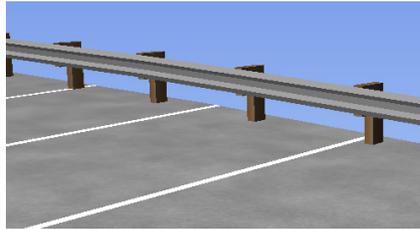
Other objects included in the model were metal beam guardrail (MBGR) and cement masonry unit (CMU) retaining walls. Again, there aren't any of these commonly found real-world objects in Civil 3D. To model these objects, I used AutoCAD® solids and beefed up on learning the AutoCAD EXTRUDE, IMPRINT, and PRESS-PULL commands. While the process to model the retaining walls and MBGR was fairly easy the first time, making any changes to the model became tedious and screamed for an a process that updated automatically with changes to the design surfaces.

Surface problems

Utilizing surfaces to model a site wouldn't be that bad if Navisworks could import in the various surface masks applied to a surface in Civil 3D. Unfortunately, Navisworks can't, ensuring an efficiency killer exists in taking
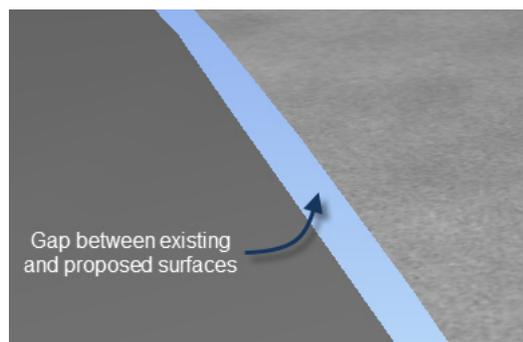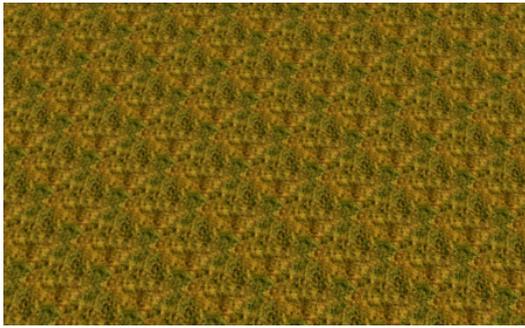
a completed TIN surface and splitting it up into multiple TIN surfaces: one surface for each material type required. This process may lend itself to errors in updating the numerous boundaries, creating gaps or overlaps between the proposed and existing surface. I'd expect a BIM product to accommodate these types of issues much like in Revit, where a wall adjusts to door and window changes.
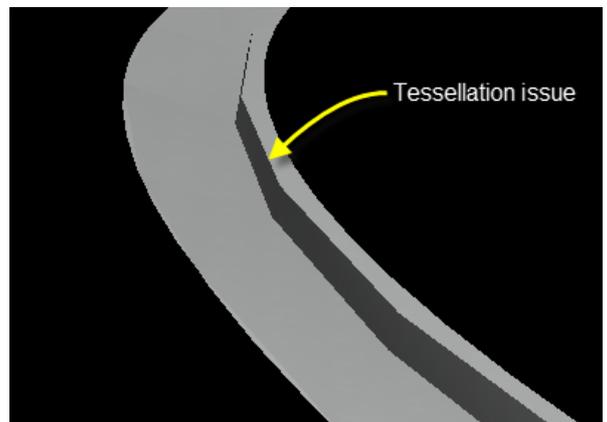
Another surface problem is tessellation. When I first created the necessary polyline boundaries and added them to the surface, I neglected to take tessellation value into consideration . After applying all of the boundaries and bringing in the model, I found considerable display issues caused by using the default tessellation values. It appeared as though I had gaps between the curb surfaces and asphalt paving surfaces. To resolve the issue, the boundaries required removal from the surfaces and reapplication using a smaller tessellation value. The problem makes me wish for a curb and gutter object modeled as a solid. Unlike a TIN surface, this would be able to better model a real-world object.

Materials

For the most part I'm able to create a model of the objects that will be constructed based on the plans. My most challenging problem in creating the model is materials. Placing materials in Navisworks is accomplished by using Presenter, available in Navisworks Manage and Simu-

Other objects included in the model were metal beam guardrail (MBGR) and cement masonry unit (CMU) retaining walls.

Tessellation issue

Gap between existing and proposed surfaces

late. As shown in the chain link fence image, the application of materials can be problematic for a novice. The fence looks correct on the right, but on the left the fence looks a bit off. It takes a bit of exploring the Texture Space to adjust the material to get the desired look. In the landscape pattern image, my material looks too fake. I still need to work on getting it to look correct. As the project progresses, I hope to better understand how materials work and how to effectively modify them to get the desired appearance.

pected pan and orbit results. Turning off the layers prevented the objects from being brought into Navisworks, though there is an option to import turned off layers in Navisworks.

One oft-repeated comment was the lack of a hard hat for the avatar. There are additional avatars that ship with the program and one has a hard hat (Human 2). It would be nice if there were a drop-down to change the avatar, but instead the avatar selection drop-down is buried within the program.

Navisworks provides the ability to create selection sets. Selection sets make it easy to group objects for easy isolation or hiding. For instance, the numerous chain link fences didn't always need to be seen, so it provides an easy way to select the selection set and then right-click and hide the objects. Getting the objects to unhide is found on the Home tab of the ribbon in the Vis-

ing process of pen and paper, neglecting the benefits of a different workflow with today's technology. Do we really need to cling to a TIN workflow of connecting points to create contours when the ability to have actual solid objects exists? On the other hand, Autodesk has been marketing Civil 3D as a BIM product, and as such I have certain expectations of what a BIM product is based on my exposure to Revit, Plant 3D, and MEP. Based on what I've seen of the other products, Civil 3D has a limited feature set of BIM products.

A major push Autodesk has given is the life cycle aspect of BIM, where an entire life cycle of a project may be tracked. I'd consider pavement one of the largest long-term investments a civil project encompasses. Civil 3D has no obvious way to connect the asphalt pavements composition, maintenance requirements, and condition over its useful life. With this information contained within the model, civil engineers could make smart decisions on what pavement type to use and have a model to provide to the owner to justify the decision to use higher upfront material costs for long-term savings over the pavement's life. Can Civil 3D be called a BIM product without this and many other features?

Please note this article does not focus on utilizing corridors in the design. Corridors do have advantages over using surfaces, in that the code set style assigns a material to the corridor. Due to the layout of the site, which had numerous 90 degree angles and was unsymmetrical, a corridor didn't lend itself to the site geometry.
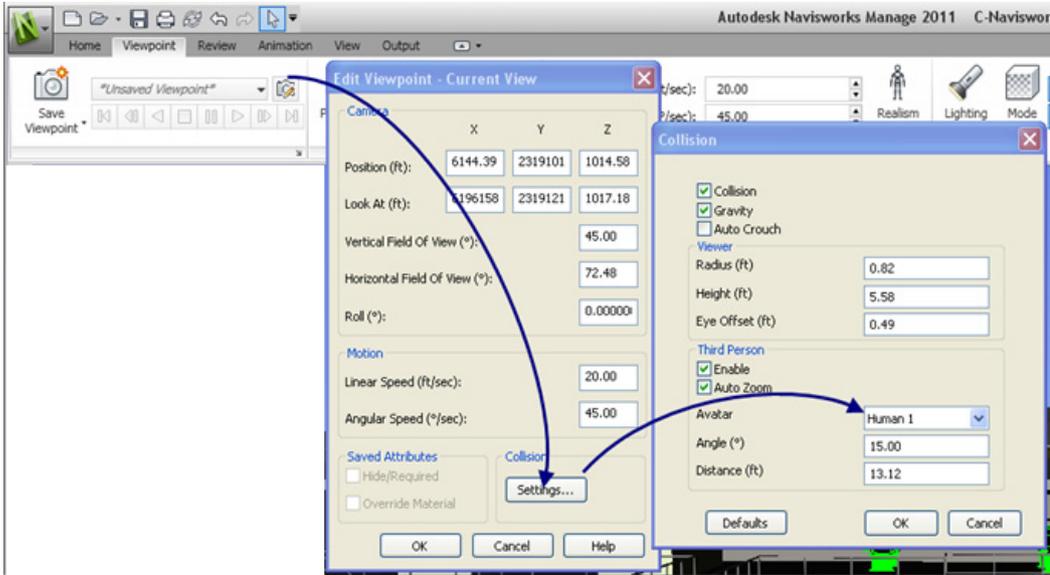
Viewing the model

Once the model is complete in Civil 3D, it may be brought into Navisworks for viewing and exploring. One issue I discovered is the inability of Navisworks to bring in data shortcuts when the drawing file is appended to the model. While it would be most beneficial for Navisworks to recognize data shortcuts, it isn't that big of a deal since individual surfaces need to be created from the surfaces that are typically used via data shortcuts. If the NWCOUT command is used, the data shortcuts are recognized. However, I had to make sure to turn off the layer the data shortcut was on to avoid getting the missing data shortcut text from showing up at 0,0. With the text at 0,0 the viewing of the model became difficult with unex-

ibility pane. Also useful is the Saved Viewports, which make it easy to zoom to a specific area of interest of the model. For this project a view was created for each group of process equipment used in the project.

Final thoughts

Overall the process of getting the model from Navisworks into Civil 3D has been achievable. The main issues are the lack of BIM objects in Civil 3D. While I could put all of the blame on Autodesk for not providing a civil product that provides for a BIM model, part of the blame goes to the purchasers of Civil 3D who are not actively requesting BIM features.

Most of the requests I've seen are for improvements in the design and model-

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/

The Art of Sharing with eTransmit

Back in the "old days," exchanging AutoCAD® data with others was a simple matter of emailing a DWG file. Today, projects can be much more involved, as AutoCAD drawings are capable of referencing images, PDFs, DWFs, DGNs, as well as other DWG files. If you use sheet sets or data links, there are even more files to consider.

Does your client also need to print your drawing? If so you'll have to send your pen tables, fonts, and custom shape files too. It doesn't take long to realize that file sharing can be a painful and time consuming process.

Today, working in AutoCAD 2011, we can easily share our designs regardless of how many files are tied to our drawing. Using AutoCAD's eTransmit command, we can wrap up everything associated with a DWG file into a single package that our client can use to easily view or print our drawings. Let's take a look.

Overview of eTransmit

The eTransmit command has been a part of AutoCAD since release 2000i when it was added as a replacement for the "Pack-and-Go" bonus tool. Over the years eTransmit has evolved to become a "must have" tool for exchanging files with others. The power behind eTransmit is in its ability to consolidate everything related to a drawing—xrefs, images, shape files, pen tables, data links, and so on—into a nice neat package that can be sent via email.

The command itself (after some initial setup) is as easy to use as the SAVE command, meaning you can easily share your most complicated project drawings in just a couple clicks.

The eTransmit command can be found on the Application menu inside the Send collection of tools. As a shortcut, eTransmit can also be launched by simply clicking "Send" in the menu. See Figure 1.
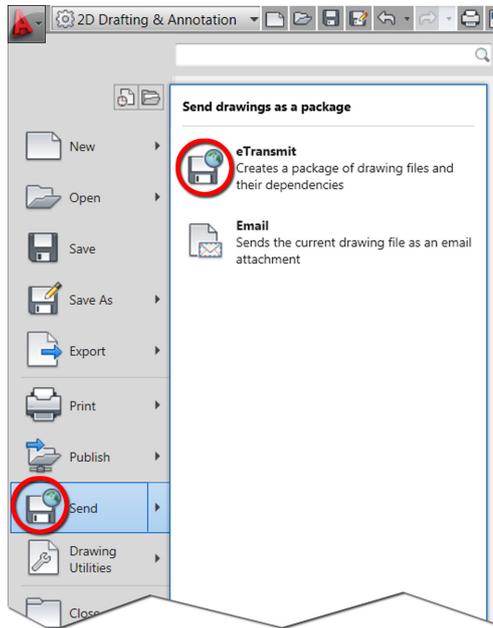
Figure 1: After opening the Application Menu, eTransmit can be launched by clicking at either location.

It's all about the transmittal setup

The key to efficient file sharing is knowing how to take advantage of transmittal setups. You see, there are many settings that control how our data is packaged and a transmittal setup is simply a "name" given to a collection of these settings. Using transmittal setups, we can create custom "packaging rules" that can be used over and over again.

After launching eTransmit, AutoCAD displays the Create Transmittal dialog box. See Figure 2.

On the right side of the dialog is where you can select a transmittal setup. Initially only the Standard setup is available. We can use Standard as a starting point to create our own setups.

Creating a transmittal setup

Before creating a transmittal setup, I'd like to define a goal. Let's say I'm working with a client called ArchTech Consulting, which requires CAD files in AutoCAD 2004 format. Let's also say they'd like to make prints of my drawings using my pens, fonts, and so on.

To create a transmittal setup, I'll click the Transmittal Setups button (highlighted in Figure 2.) When the dialog box appears, I'll click New. I will then name the setup "ArchTech Consulting" and click Continue.

At this point AutoCAD displays the Modify Transmittal Setup dialog box (see Figure 3). This is where I define the rules for my transmittal.

As you can see, there are several settings, many of which are self-explanatory. If you have questions about a specific setting, you can always "hover" over
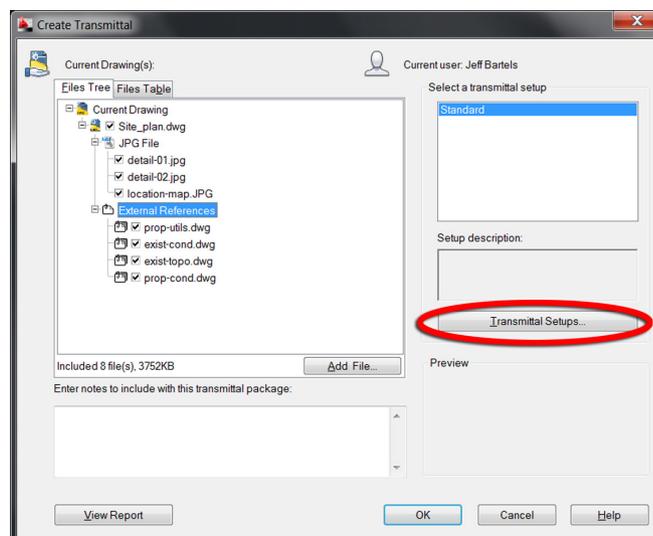

Figure 2: Use the Transmittal Setups button to create, modify, or delete custom transmittal setups.
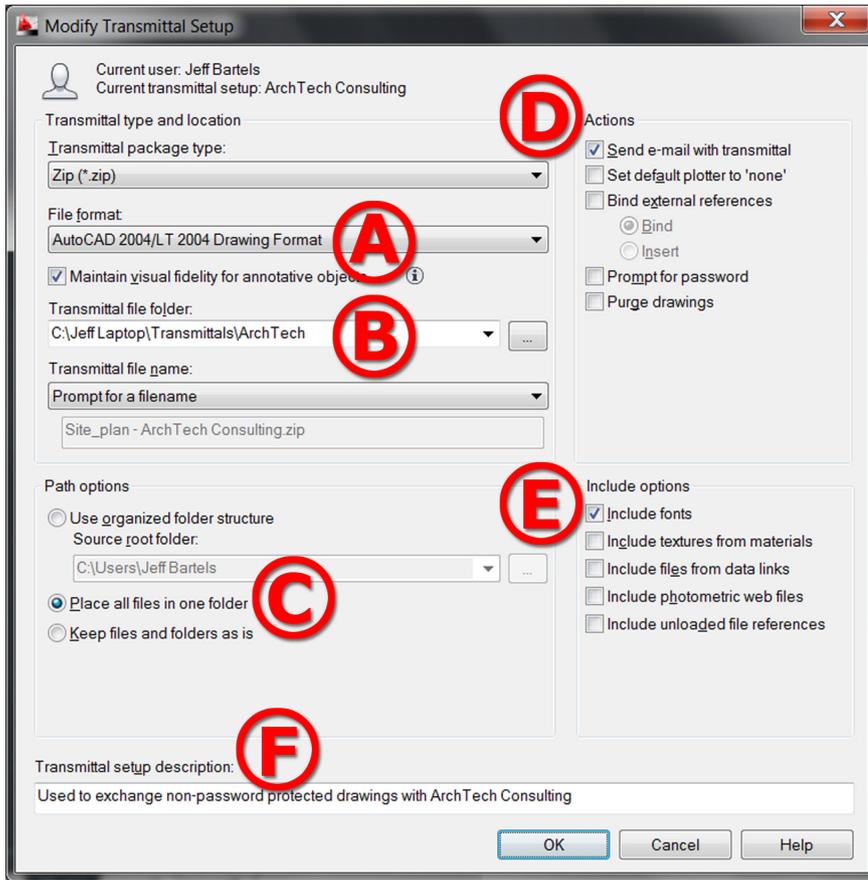
Figure 3: The Modify Transmittal Setup dialog box is where we control how our data is packaged.

it with your cursor for a more detailed description, or you can click the Help button at the bottom of the dialog for more information.

While this dialog box may appear a little daunting at first glance, we have to go through the settings process once. After a transmittal setup has been defined for ArchTech Consulting, I can easily share drawings with them in the future by selecting their setup from the list.

Defining the settings for a transmittal setup

I'm afraid a comprehensive discussion of all of the transmittal settings is beyond our scope in this article. Instead, I'm going to talk about the settings you'll be adjusting most often.

A. File Format: Using the menu I can choose to have my DWG files packaged as an older release. (If I'm accessing eTransmit from a vertical product such as Civil 3D or AutoCAD Architecture, I can also have my AEC objects exploded to anonymous blocks when they're added to the Zip file.) Since my client needs AutoCAD 2004 drawings, I'll select AutoCAD 2004 from the menu.

B. Transmittal file folder: This is where I choose a default folder to store Zip files created for ArchTech Consulting. As you

can see in Figure 3, I've created an ArchTech folder within the Transmittals folder on my hard drive.

C. Path options: Typically I select "Place all files in one folder." This consolidates all transmittal items into a single directory.

D. Actions: Checking "Send e-mail with transmittal" will automatically launch my default mail program when the transmittal is finished and load the Zip file as an attachment.

E. Include options: Checking "Include Fonts" will ensure that all fonts used in the drawings (AutoCAD - .shx or TrueType - .ttf) are added to the transmittal. It will also ensure that any shape files used in custom linetypes will be included. Because my client would like to create prints of my drawings, I'll be sure to check this box so that they have what they need.

Warning: Including copies of certain TrueType fonts may be considered copyright infringement. All .shx and .ttf files included with AutoCAD can be freely transmitted.

F. Transmittal setup description: Adding a description is optional, however, the more transmittal setups you create, the more helpful these descriptions become!

When I'm finished adjusting my settings,

I'll click OK to complete the ArchTech Consulting transmittal setup.

At this point, AutoCAD returns me to the Create Transmittal dialog box where I can click OK, give my Zip file a name, and be taken directly to my email program where I can enter my client's email address and click Send.

Workflow for sharing files with clients

Once a transmittal setup has been defined, emailing drawings (even complicated ones involving many references) can be done in just a couple clicks. For instance, in the last section we defined a transmittal setup to be used when sharing files with ArchTech Consulting.

Let's assume I've made revisions to my Site_plan.dwg file and several of its references. Let's also assume I would like to send ArchTech the updated files.

All I have to do is open the Site_plan.dwg file, launch eTransmit, and when the Create Transmittal dialog box appears, I will select the ArchTech transmittal setup and click OK. That (generally speaking) is it! My email program will open automatically with the zip file attached, ready to be sent on its way.

I have just sent my client the revised site plan drawing, plus all of the referenced files, (automatically saved back to AutoCAD 2004) not to mention everything else they need to reproduce my drawing, in about five clicks of the mouse.

Adding and removing data from a transmittal

But wait, there's more! Let's say I needed to send yet another email to ArchTech Consulting. *(It's the last one, I promise!)* We'll assume I've just launched the eTransmit command and selected the ArchTech transmittal setup in the dialog box (see Figure 4).

Now, take a look at the "Files" window on the left. Based on the transmittal setup I've selected, this window displays the contents of the transmittal "package."

The files in this window can be viewed in two ways, Tree view (shown) and Table view, (similar to Microsoft Excel). In either view, files can be added or removed from the transmittal by using the checks next to the file names.

Initially, the files shown in the window are the ones directly tied to the current drawing. Clicking the Add File button allows you to include other project files if desired. Collateral files might include hydrology calculations, cost estimates, database files, project photos, and so on. Using this window we have complete control over the contents of a transmittal.
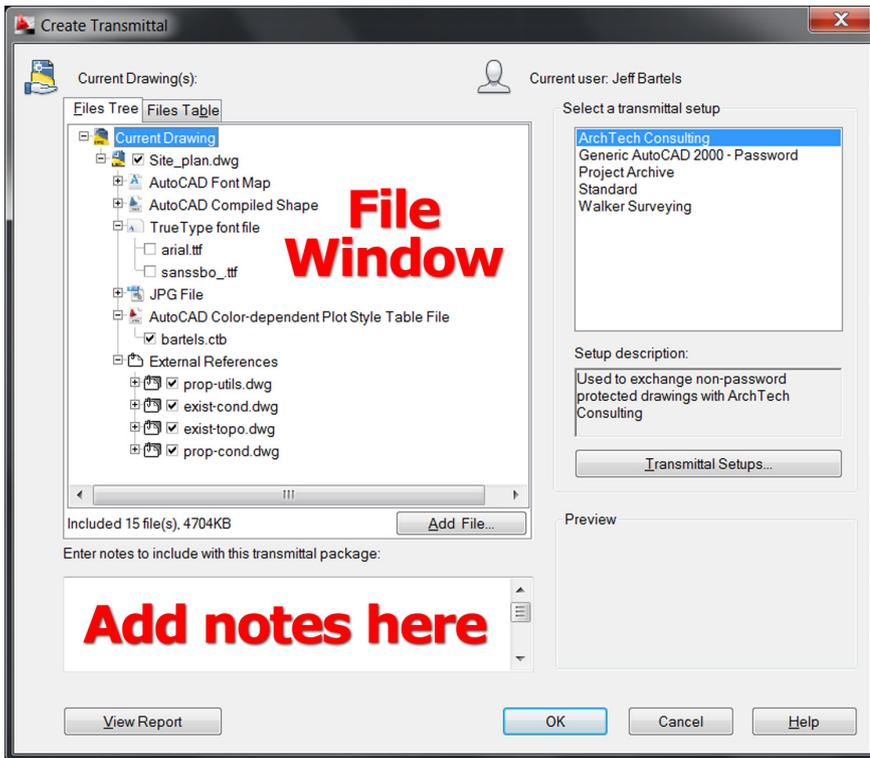
Figure 4: Using the files window on the left, we can easily add or remove data from a transmittal.

Documenting a transmittal

As a courtesy, AutoCAD creates a written report that fully documents the contents of a transmittal package. The report is called filename.txt where filename is the name of the current drawing. It is automatically included in the transmittal. This document is much like the store receipt the clerk gives you when you make a purchase.

Not only does this report catalog all of the files included in the transmittal, it also identifies the files that were excluded. Better still, it contains instructions for your client that detail where they should put pen tables and fonts on their system so that AutoCAD can easily find them.

To view the report, click the View Report button at the bottom of the Create Transmittal dialog box shown in Figure 4. In the viewer that pops up, you can use the slider to scroll up and down and review the information, or you can click Save As to save a copy of the report to your network (see Figure 5).

Click Close to dismiss the report viewer.

Consider using this report as an easy way to log the files you send to clients.

Including notes with a transmittal

At the bottom of the Create Transmittal dialog box is an area where you can add notes to your transmittal (see Figure 4). Anything entered in this box will be included in the transmittal report that we discussed in the previous section.

Likewise, if your transmittal setup includes the "Send e-mail with transmittal" setting, this text will become the body of your email! This means that you can take care of 99 percent of your email work right here.

Figure 5: The report viewer displays everything you need to know about a transmittal.

We can take this concept one step further. Do you include some sort of standardized text in the majority of your CAD emails? For instance, many firms include a legal disclaimer in the form of a "CAD Data Transfer Agreement."

Rather than copying and pasting that verbiage into the box or into the email itself, paste the text into Notepad and save the file on your network as etransmit.txt. Next, go to OPTIONS, and on the File Tab, inside the Support File Search Path group, click the Add button, and add a path to where you saved the text file.

Now, each time you launch eTransmit, the contents of the etransmit.txt file will automatically be added to the transmittal, and be incorporated into the body of your email (see Figure 6).

Taking eTransmit to the next level

eTransmit can be used for more than just emails. Imagine creating a transmittal setup that keeps files in their original format, includes all possible associated files, and places everything into a single folder. This setup could be used to archive project data, or create a snapshot of a particular milestone in your project.

If you utilize the same directory structure at multiple offices in your organization, you could create a transmittal setup that "Keeps files and folders as is." This setup could be used to install your project onto another system.

In the event a font used in your drawing becomes corrupt, eTransmit takes the guesswork out of which font file you need to extract from another machine in the CAD department. Simply open the drawing on a "good" machine, eTransmit the drawing, and remove everything except the font file from the transmittal.
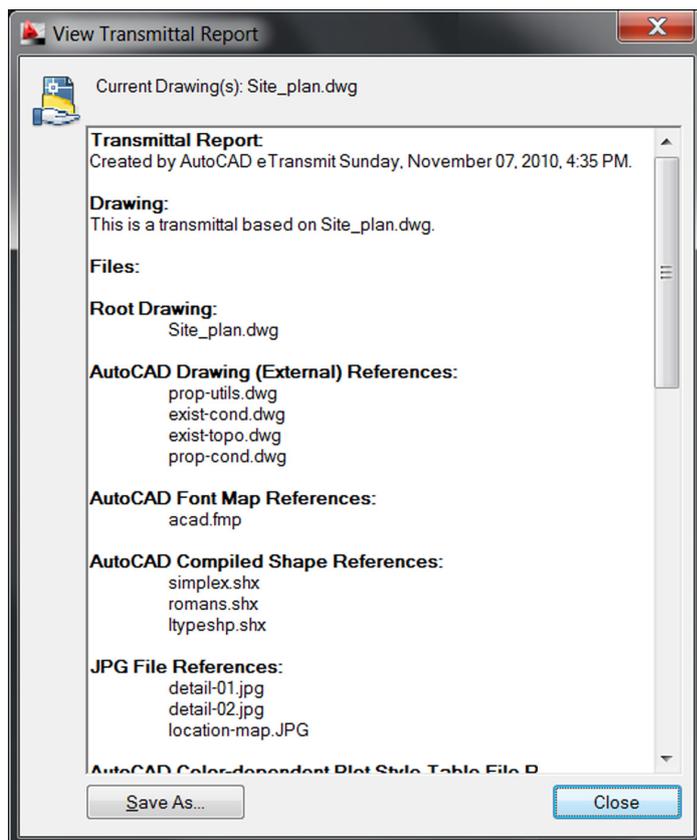
Figure 6: etransmit.txt file is automatically incorporated into the body of the email.

Note: When launching eTransmit from the Sheet Set Manager, you will select from a different group of Transmittal Setups.

One thing is certain—using the eTransmit command ensures that you'll be spending more time on your designs and less time preparing drawings for email. Who knows? eTransmit just might make file sharing enjoyable!

Jeff Bartels is the Sr. Engineering Technician at Wills Burke Kelsey Associates where he works with Civil 3D and Auto-CAD. He is the author of eleven AutoCAD video training titles for Lynda.com. Jeff is also on the faculty at Elgin Community College in Illinois, where he teaches the Advanced AutoCAD courses. Jeff can be reached via e-mail at jbartels@realworldcad.com Follow him on Twitter – @JeffBartels where he regularly posts AutoCAD tips and shortcuts.

Conclusion

The way to know you've mastered any feature is when you start using it for a purpose for which it was *not* intended.

I wish I could say that we've seen everything that eTransmit can do, but there is still much to explore. Take some time and review all of the settings associated with Transmittal Setups. You'll find that you can automatically purge or bind references before packaging, or even apply password protection to your transmittals.

If you use sheet sets, eTransmit will package the sheet set data as well. In the Sheet Set Manager, right-click on the project name and select eTransmit from the menu.

One Man Shop: Consulting vs. Freelancing *Part Two*

This article explores some of the elements that make up a successful one-person visualization operation. In the last issue, we discussed the business side of making a go of it and getting a running start. This article will address some of the details of working with clients you already have, including client relations, communication, working with other consultants, and planning a project's workflow. We will also touch on some of the psychological factors inherent in self employment as a 3D artist.

Quantity vs. quality

When it comes to clientele, more is not always better. Typically you will find that you can do well with fewer clients if their projects are sizable and they have come to rely on you. Four small one-time jobs can turn out to be more work and stress than one medium-sized project for a returning client.

Developing a proven track record of successful work with a client is essential if you are to become their "go to" consultant. This extends beyond the delivery of what is needed; surpass their expectations when possible—this includes technical and personal ingredients that make the relationship positive for everyone. The best clients are the ones who specifically want to work with *you*.

Communication—easy does it

On the technical side, it is important to make communication as easy as possible. Transferring data can be a challenge whether working locally or remotely. Some clients may have an ftp site for large file transfers; others may not. It is not difficult to set up a secure ftp site for yourself, with client or consultant logins, to keep projects readily available and accessible to specific people on the project. Investigate ways to make the site as simple to use as you can, preferably with a drag-and-drop interface.

This will go a long way toward keeping work moving smoothly. It will also lend credibility to your organization as a whole. In the past I have used a free online file transfer service which proved to be more reliable that some of my clients' own ftp sites. Still, creating your own ftp site is the best way to go.

File format can sometimes be an issue, so be sure you can read a client's files. In the right circumstances you might make them aware of best practices when exporting drawings or models, which can save you time and work and save them money. Fairly often you'll be given a model done in Sketchup or Autodesk® Revit® that will need significant preparation on your part to make it useful. In the past, I developed a habit of getting models from BIM in two formats; .fbx and .dwg. The new .fbx file link in the newest Autodesk®

3ds Max® may change this. For Sketchup I prefer to use the Connection Extension add-on and import straight into 3ds Max. No matter what you may hear or want to think, you'll *always* need to clean up the model in 3ds Max. It's up to you to develop an efficient, reliable workflow. The same is true for third-party renderers with their own material types.

Stay neutral

On the personal interaction side of things remember that personalities are at the center of maintaining a profitable relationship with a client. Often a project will be well-planned and go smoothly because it is run sensibly, efficiently, and transparently. In these cases personality differences don't cloud decision making.

Other times a job may be poorly run and meetings can be uncomfortable because the design team is at odds. Be careful not to take sides. If a project team has tensions it's wisest to avoid being perceived as choosing one camp over another. It's up to the client to present a united front to you and to all consultants. From your position, basic Human Interaction 101 will get you by.

Keep the balance

From a psychological standpoint it's wise to see the larger picture to maintain the longevity of your operation. Staying focused means staying sane. We got into 3D in the first place because it's fun, but it can

specific strengths. For example, some are better nurbs modelers than others; some may be needed in order to work with a specific client. Whatever route you choose, in the end it is the artist and not the tool that counts.

Lastly, remember the concept of Mutability—the future can be unpredictable and work will ebb and flow. For example, at one end of the scale you might be so busy that you'll need to hire others to help with the volume of work. On the opposite end things might slow down enough that you need to take on other work to get by. My own fallback turned out to be web development, which has made for a good balance. From time to time I've done some training sessions and even tutored a few architecture students. All in all, the most important thing to keep in mind is that you can succeed in business doing something you love by keeping the balance right.

Tom Cipolla is a digital artist specializing in architectural visualization. Born in New York, he trained as a sculptor and transitioned to working digitally in 2000. Tom has taught foundry practice, sculpture, drawing, and 3D software. His company, Onion3d, is a consulting and animation studio located in South Boston, Massachusetts.

be possible to lose sight of that when the pressure is on and deadlines are looming. Pace yourself and schedule your time realistically to avoid burning out. When you have extra time, continue to do your own creative work. Step away from the computer once in a while and take a walk or read a book.

Remember that to grow as a person is to grow as an artist. Learning is a process that shouldn't end, so absorb all you can. Stay current with both the tools and trends in 3D and visualization. Take advantage of demo versions and absorb the vast sea of knowledge available online. Don't hesitate to explore new software. Most packages have their own

Planned Plotting

It's a safe bet that everyone reading this article knows how to plot. So why even consider writing about plotting? Well, just because you can plot a drawing doesn't mean you can't improve the process.

What do you do? You issue the plot command, but there's far more to it than that.

The plot command has been around as long as I've been using AutoCAD® and before that. After all, when you create your design, at some point you want to share it and the most common method is a plotted sheet. The plot dialog box layout has changed some over the years, but the same common elements still apply. What are you plotting (extents, window, view)? To what hardware are you plotting? What sheet size will you be choosing? To what scale will your sheet be plotted? What plot style will be used?

Let's start with hardware. Look at the se-

lection from your pull-down list of plotters first. Does this plotter have a name with *.pc3* included in it? What is this?
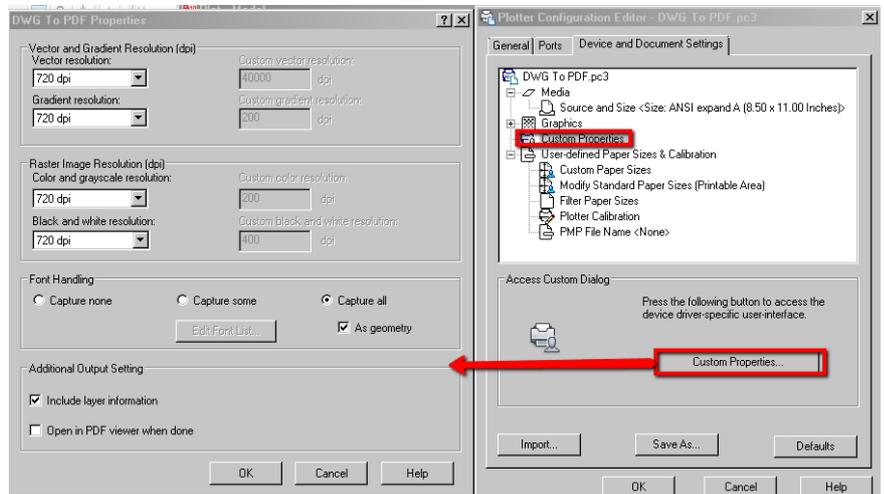
A *.pc3* file is a customized file with the

printer settings. What I've found is that many users aren't able to how to set up plotters with the properties they want, so when they plot from AutoCAD they choose the plotter from the drop-down list and then select the Properties button to the right of the plotter. Often this is because the IT department doesn't have the plotter preferences or properties set on the server, so everyone has to roll through this in AutoCAD.

Choosing the properties button allows you to change the paper size and many other printer properties. I'm showing the DWG to PDF custom properties in the figure below to illustrate some non-plotter specific options that can be changed.

Once you make changes with this method, you can save those changes to your local computer as a *.pc3* file. Choose the SaveAs button in the Plotter Configuration Editor before you exit back to your regular plot dialog box. If you don't choose this button and attempt to return to plot, you will be prompted with the following message.

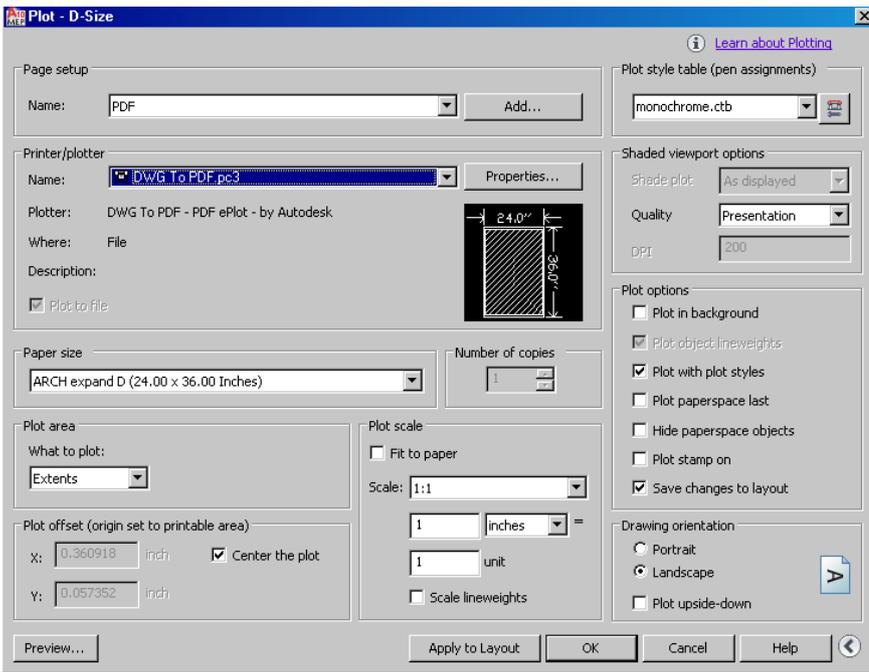If you want these changes to be for this plot only, then the default of "Apply chang-

"Laser." I might have a completely different page setup for "Plotter" or "PDF."

Rather than choosing paper sizes, scales, plot styles, and plotters each time you plot, you only need to use the drop-down box from the Page Setup Name at the top left hand side of the Plot dialog box.
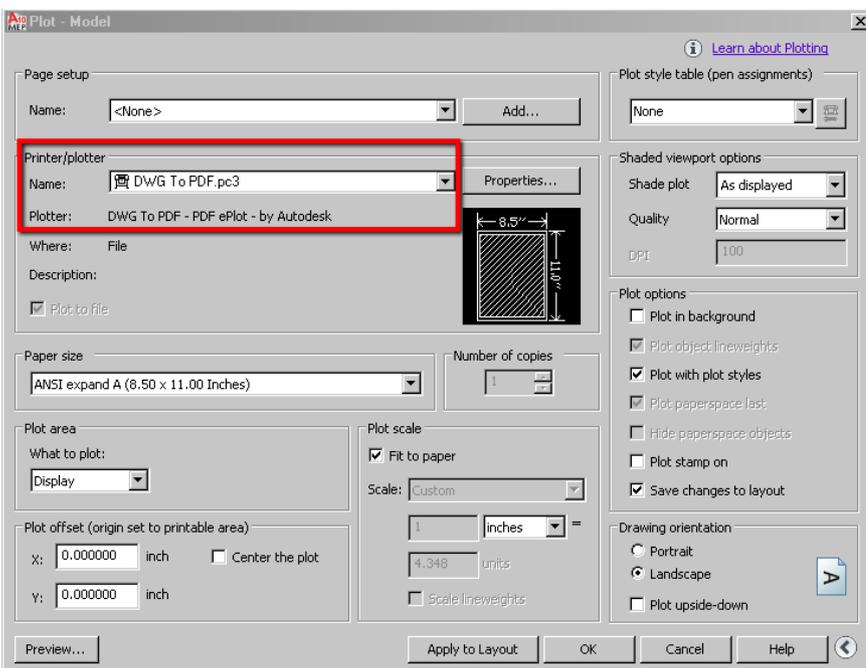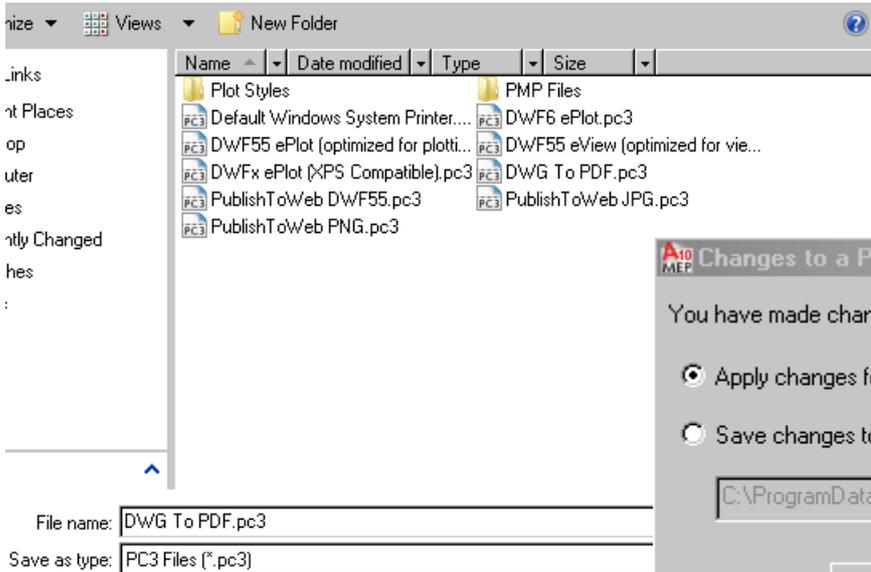
es for the current plot only" would be fine. Using these changes for every plot to this device would require you to select Save changes to the following file. You can then name the file whatever you like or accept the name provided for you.

There is a drawback to this method and it is why I'm not among the group in favor of *.pc3* files. Each of these is saved on the local

users more consistent as well.

Say you have a laser printer to which you send proof plots in black and white. You can choose the laser printer, paper size of letter, scale of plot to fit, and plot style of monochrome.

Once I set everything that I am about to plot, I choose Add and name this page setup

I've noticed that users aren't always aware of two other plot-related items. One is the plot stamp. When the box under Plot options is unchecked you will not see any way to set this. If you select the "Plot stamp on" option then you will see a button appear.

A plot stamp is a string of text that plots along the margin of your drawing. It can be customized with various bits of information. The most common use it to place the date and time of the plot. Why would you want to do that? Well, imagine that you have several sheets on a table. They are all of the same drawing and all have the same titleblock information. How would you know which one is different? How would you know which one is the oldest or which one is the newest? A simple plot stamp would tell you that.

computer; therefore, there is no standardization within your company. Granted, if you are a the sole employee maybe it's not as big of an issue. If you have two or more workstations, however, then each of these files could be slightly different and named the same. So purely from a CAD standards or management standpoint, I do not recommend *.pc3* files.

One method for streamlining and standardizing plotting is to use named page setups. While you can use the Page Setup Manager, I like to do this right from the plot dialog box. Named page setups can be set in your template so they are available in all new drawings.

What is a named page setup? It involves taking the same steps as you do to plot a drawing, but allows you to name what you just did. So if you plot to different plotters, use different sizes of paper, or different plot styles this will save you time and make your
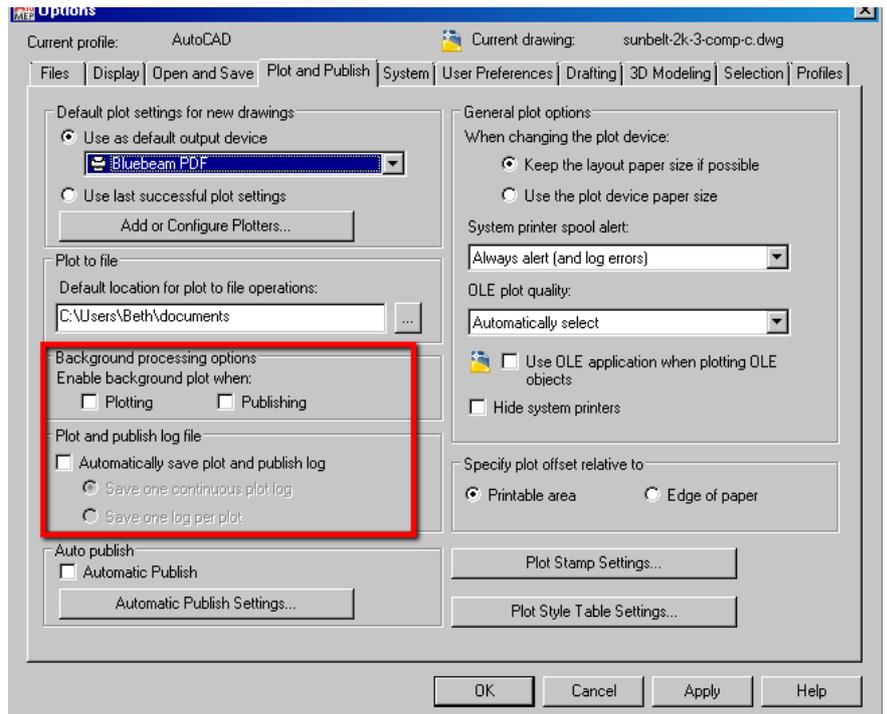
Go to Options and the Plot and Publish tab.

You will see in the middle of the left-hand side of this tab Background processing and Plot and publish log file.

By default (depending on the version of AutoCAD that you are using) one or both of the check boxes will be checked. I generally uncheck these. This is a feature that allows you to immediately begin working again after plotting. AutoCAD plots in the background, which is great, but I get complaints of it taking longer. Also, if you open a file to plot and then open another file to plot you will be prompted that background plotting is happening and you'll have to wait to plot.

Unless you are using a plot log to keep track of costs, I recommend unchecking this box so that you do not end up creating a huge log file of all your plots. These are just my personal preferences and ones that I use as a standard when setting up Auto-CAD for other users. If you've found either of these features useful in your office, by all means use them. Write and let me know about it as well.

Simply uncheck the Plot stamp on box and no plot stamp will be used.

The last plotting area that I want to point out is one that is saved in Options.

Yes, we have had plot stamps for decades now, but the newer generation of users haven't seen this feature, which is why I've started pointing it out again.

I do recommend testing it on your plotter. Different plotters have different margins. The idea is that you want your plot stamp on the edge of the page, not inside your drawing or titleblock border. The height is the plotted height so you might want it .0625 [1/16"] high or .125 [1/8"]. You might want a simple Romans font for it. Give it a try and see if it's a help to you. And remember you can always turn it off on your final plots if your boss doesn't like seeing it on the drawings going out the door.

Beth Powell owns CAD Fuel Design. She produces drawings for the fueling industry and provides training and support for AutoCAD and AutoCAD MEP. Her blog is http://bethscadblog.blogspot.com/. She can be reached at beth@cadfuel.com.
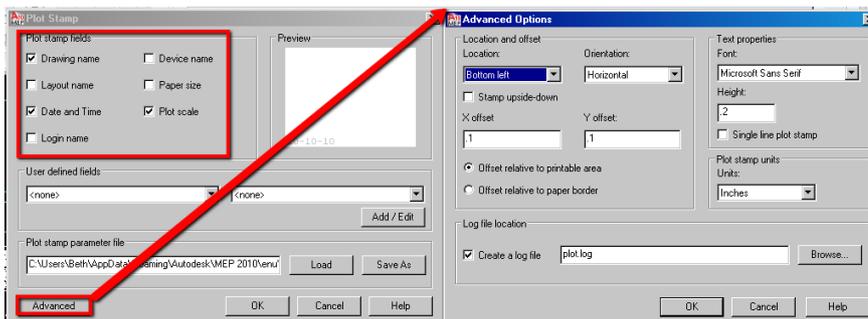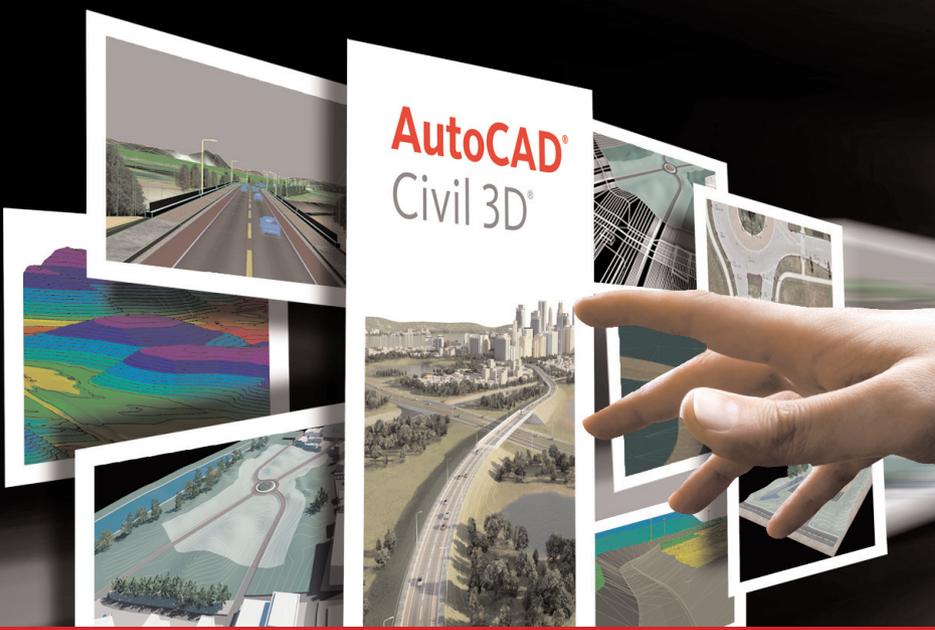
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  CADD Department Manager
  Robinson Engineering, LTD

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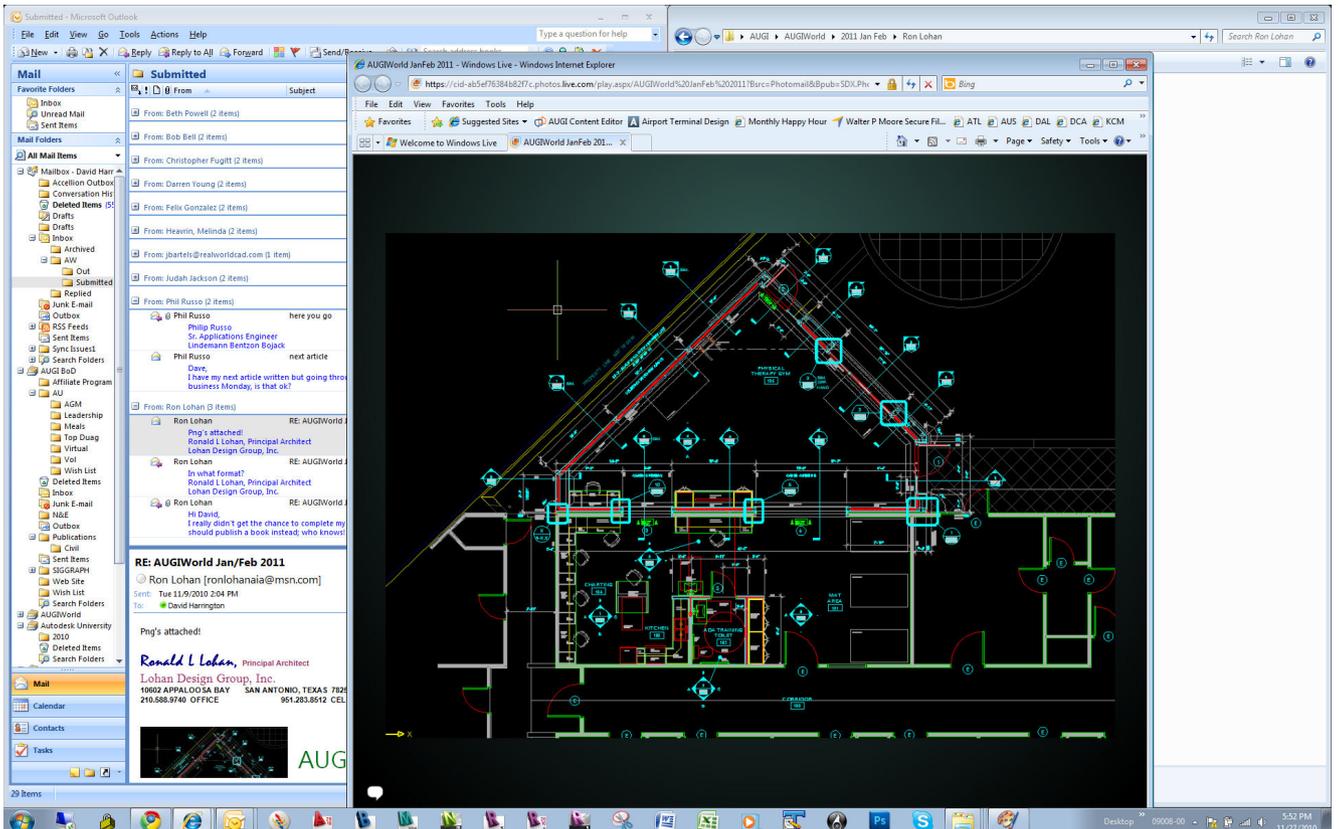
As I write this, I couldn't help thinking over the past quarter-century when I was first introduced to AutoCAD®. I knew from the beginning that this was going to be the future; even as I was an accomplished, pencil-laden Senior Draftsman/Project Manager. Frightening? You bet! A lot of reading and late-night experimenting (sleepless nights, too), typing commands to see what it can do! Many of us have been there, right?

Today, I look to the future and can't help help thinking where my profession (architecture) is going and who is coming up through the ranks to lead the way. This too is frightening when I think that our future leaders are individuals who were taught by friends, classmates, and even a company that is not Autodesk registered. That sends a chill up my spine! It is the "blind leading the blind" syndrome.

A few months ago a former employer asked me to come in and evaluate his AutoCAD team. A small firm and a good one. Their AutoCAD output has a lot of room to facilitate additional speed and profitability, which I sincerely hope it does!

Here's the kicker. To this day, I don't know what it is that drives the attitude in AutoCAD professionals. Is it religion? Ethics? Ignorance? Arrogance? I am not an attitude expert, but I've heard it said: The individual's attitude drives the projects profitability or lack thereof. This also equates to an individual's longevity with the firm as well.

A case in point

One weekend, I created a floor plan, including a special (file) toolbar for either drag-and-drop referencing or blocks to be added to an informational, after-hours "debate" that was scheduled. Annotative was discussed and became the debatable issue for about week, because no one was willing to leave his or her comfort zone to learn more about what AutoCAD® Architecture 2010 has to offer.

To be fair, I wanted first to follow their office's practiced procedures with this layout. Then I would show them the capabilities of Annotative (Visibility, Scaling, Text, Dimensions, and so on) to simplify their process. The office was going be closed Friday and the showdown was scheduled for Thursday after hours—pizza, salad, and diet drinks provided. (Sadly, no beer!)

I asked John (not his real name) to demonstrate with everyone watching, adding Room Name Blocks, Dimensions, and Text for three different scales that would normally be used to the Floor Plan and with the Blocks that I provided. After working 52 minutes, adding layers, setting up Layer States Manager, a toilet room blowup with additional notes and dimensions for clarity, he was finished.

Next, in a separate file, I proceeded to demonstrate the use of AutoCAD's Annotative Attributes. Within 17 minutes, I had a layout identical to John's. I heard a lot of "Wow, that's neat!" or "How did you that, again?" What amazed them most was that no additional layers were required. Just the use of An-

notative Visibility and Scaling. I could see almost everyone's eyes sparkle! But there were others who did not want to change what they are already familiar with, claiming it would be "too complex and time consuming." Huh?

Fortunately, the office adopted these new techniques to help produce projects faster. And I turned out to be the bad guy, which I knew would happen anyway!

With regret, one individual is no longer working with this firm because of his "refusal" to adapt. I asked, "Why not adapt to the new techniques?" This individual's answer shocked me. "It was the way I was taught. It is easier for me and this is the way I will always do it."

If you haven't said "Wow" by now, think about this. If this is the attitude in year 2010, I wonder what the year 2020 will bring? Stay tuned.

Ron Lohan is an architect who practices in multiple states (California, Arizona, and Texas) providing Planning, Design Consulting and Construction Management for Hospitality, Institutional, Educational, Industrial, Commercial, and Custom Residential projects. Lohan Design Group, Inc., provides a variety of AutoCAD, AutoCAD Architecture, Revit Architecture and Sketchup Pro Services, depending on the clients' requirements. He can be reached at ronlohanaia@msn.com.
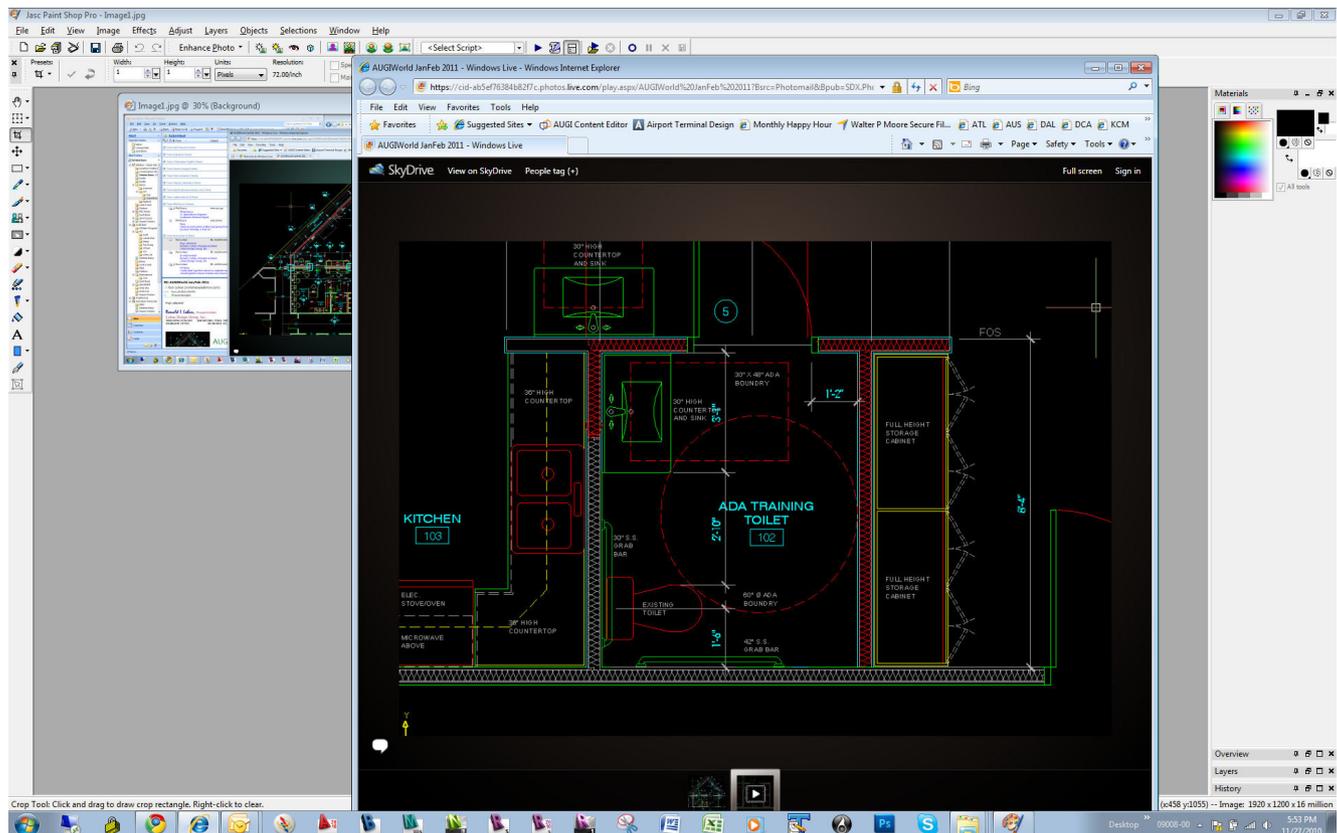
What's the Point of This Roof?

Many of the seminars, books, and tutorials that discuss the subject of roofs show examples of sloped roofs or extruded roofs. Yet in many commercial and institutional projects, we need to create roofs that require roof drains and crickets for the water to run off that are not the simple straightforward sloped roofs shown in demonstrations. This article will look at making a roof with a shaped surface to create crickets using the roof shape editing tools and explore some of the situations that you may encounter with these roofs.

Figure 1: Roof tools

Creating roofs

Creating a roof is fairly simple, particularly if it is flat. It is not that much different than making a floor slab. The roof creation tools are located in the Build panel of the Home tab in the ribbon menu. Use Roof by Footprint tool to create a flat roof (see Figure 1).

If the open view is not the top plan view Autodesk® Revit® will ask you to select the level in which to draw the roof. Keep in mind that a flat roof is justified at the bottom face, meaning that the level you select will be the bottom of your roof.

Once you are at the appropriate level, Revit switches to sketch mode and you can start drawing the outline of your roof. The pink lines in Figure 2 above indicate the boundary lines of the roof that follow the building footprint. Make sure the Define Slope option is not checked in the Options Toolbar when creating the roof boundary lines.

In the Element Properties dialog, click the Edit Type button to select and define the type and properties of

the roof. Notice that in the Edit Assembly window **(Figure 3)**, one of the roof materials has the Variable property checked. This allows material thickness to increase or decrease so the roof to be shaped with ridges and valleys. Any other materials above the variable one will follow the slope of the variable material.

Click OK to close the Edit Assembly dialog and then click the big green checkmark button in the Modify/Create Roof by Footprint tab to finish the roof. This is where the fun begins!

Figure 2: Uncheck Define Slope to create a flat roof.

Drafting the roof

Take a look at your roof and think about how the roof will slope and where you need to place crickets. Then, using detail lines, draft the roof slope lines. Believe me when I say that this step is going to save you time and frustration because you will have a pattern to go by when using the roof shape editing tools to create the slopes.

Firestone Building Products has a roof tapered insulation design guide available online that I highly recommend. This guide will show you actual configurations of crickets using tapered insulation.
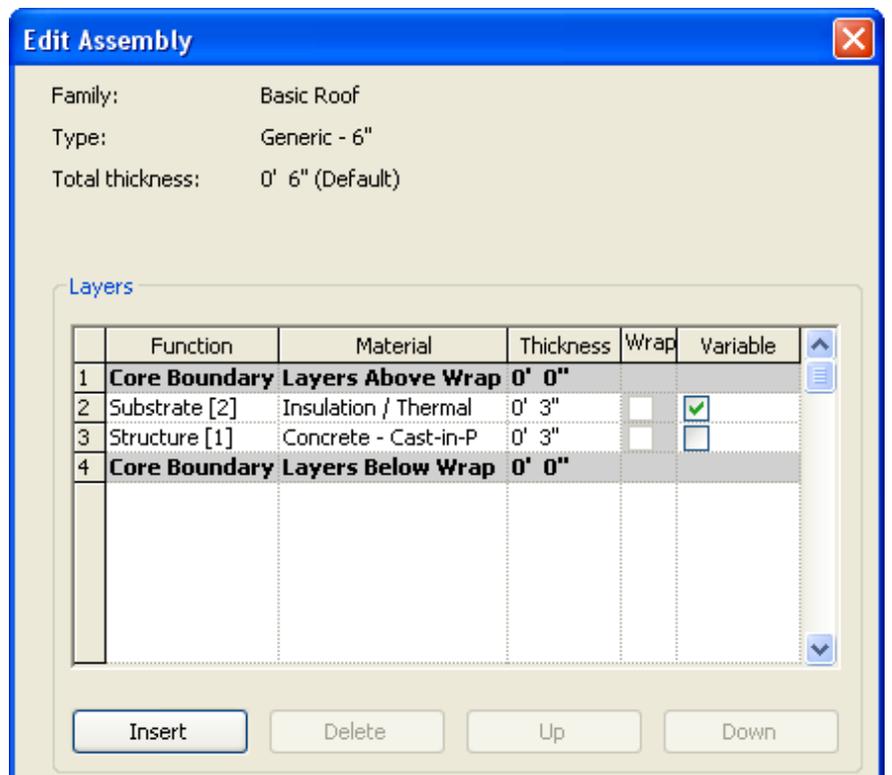
Figure 3: Define a variable thickness material.
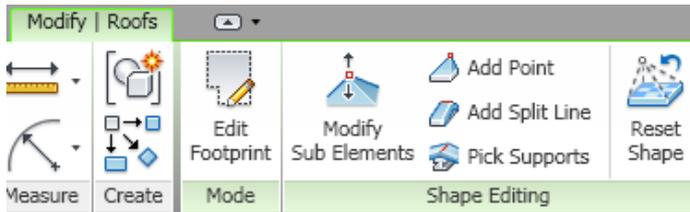
Figure 4: Roof Shape Editing Tools

(http://www.mwacrs.com/Files/MWA_Guide/MWATaperedGuide.pdf).

Once you have drafted the roof lines, select the roof object to display the roof shaping tools in the ribbon bar (see Figure 4). These tools are only available for editing flat roofs and floors. If you slope the roof by defining sloped edges, the shape editing tools will not be displayed.

Modify Sub Elements: Use this tool to edit points and edges of the roof.

Add Point: Use this tool to add new shape control points to the surface of the roof.

Add Split Line: Use this tool to add new ridge and valley lines on the surface of the roof.

Pick Supports: Use this tool to shape the roof based on selected structural members and wall locations.

Reset Shape: Use this tool to remove all modifications and restore the roof to its original state.

Using the Add Split Tools, you can now draw the actual roof slope lines following the drafted lines done earlier. As you draw the lines, new roof shape control points will be inserted at the ends of each line.

Up to this point you still have a flat roof because all the control points have the same elevation.

You may wonder if you have to calculate all those points all over your roof. Don't sweat it, because you don't have to. Before you start pulling points up and down and calculating elevations, let me give you another tip.

1. Create at least two section views to see the roof section at the edges and at the roof drain locations (see Figure 5).
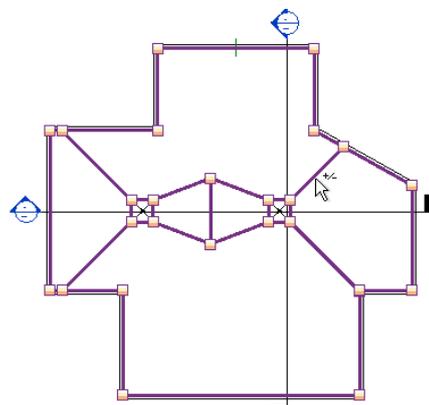
Figure 5: Use Section Views to adjust roof elevations.

2. In section view, draw a reference line from the lowermost point of the surface of the roof, usually the roof drain, and extend it past the outer edge of the roof at any angle above the surface. You will use this reference plane as a guide to adjust the roof shape control point elevations.

3. Create an angular dimension from the roof surface to the reference line.

4. Select the reference line and enter the following in the dimension text box: =atan[1/4"/12"] (This example formula calculates the angle of a ¼" per foot slope.)

Repeat these steps to establish the slope line reference of your roof for the other roof sides.
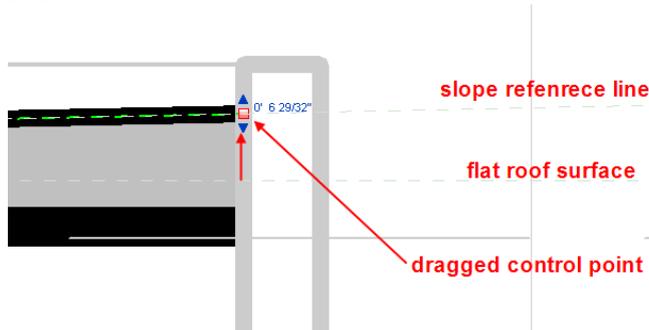
Figure 6: Drag roof control point to the reference line.

Shaping the roof

Now comes the easy part. With all your reference lines established, all you need to do now is drag the roof surface control points to the reference line. To edit the control points you must select the roof first and then click the Modify Sub Elements tool. Using the point's directional arrows, drag the point until it snaps with the reference line (Figure 6).

It is important to keep track of the points you are changing to avoid dragging points from a different side of the roof as some of them will be visible as well. Make use of reference lines in plan to guide you to the correct point locations if you need them.

The benefits of using this method of roof creation are as follows:

• Depending on the complexity of the building footprint, the entire roof can be made with one object.
• No calculations are required to get the correct slopes and point elevations.
• The roof layers will display correctly in section without the need for further roof modification. This could be a big issue if you have a lot of wall sections.

An alternate approach

Please keep in mind that the roof shape editing tools are only available for flat roofs. But what if you have a sloping roof structure and yet crickets are required for roof drains as is common in many office buildings? In that case you need to slope the roof by defining a roof edge with a slope when creating its boundaries. Then use more roof objects to create each cricket as needed. The advantage of defining a slope edge is that regardless of the shape of the building, the edges of the roof will show the correct slope relationship, particularly with curved walls. Curved walls are difficult to work with using the method described earlier.

If that's the case, why use the control point method at all? If the building structure is flat and you use a sloped roof object, you will need to modify the roof in section to display the roof layers correctly. For example, the roof insulation layer should show thicker or thinner depending on where the wall section is cut without having to modify every section. This could amount to some significant amount of work. On the other hand, if the roof structure slopes, then you have no other choice but to use a sloped roof and create your crickets with more roof objects. This means that you may have some editing to do in section later on.

Take a small building like the example in this article and try creating roofs using both of these methods to see which one you feel more comfortable with. Then you will have a better feel for the effort and time required to create roofs with each approach.

Felix M. Gonzalez is the Senior Project Coordinator and Medical Equipment Planner for Hunton-Brady Architects, PA. in Orlando, Florida. He has a bachelor's degree in computer programming and has been working with Autodesk products for 20 years. Felix can be contacted at fgonzalez@hunton-brady.com.

Wood Framing Walls

When you embark on your first project in Autodesk® Revit®, there is a desire to push the software as far as possible. Whether this project is a single family home or a large commercial project, once you start modeling you may find yourself wanting to add more details or schedule more objects. This article will explore the Wood Framing Walls extension inside Autodesk Revit Structure. This is one of those tools that can quickly add more information into your model without a lot of effort.
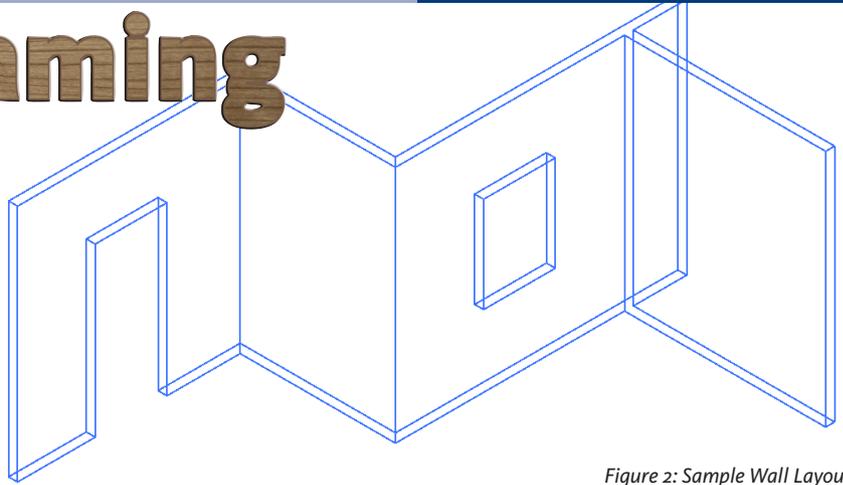

Figure 2: Sample Wall Layout
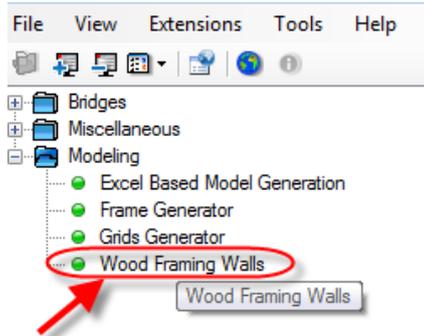
Figure 1: Wood Framing Walls found in the Extensions Manager

Navigating the tool

To take full advantage of this exercise-driven article, I suggest you sketch out a few walls with a door and window opening. The image shown in Figure 2 can be used as an guide.

The key to launching the Wood Framing Walls tool is to first select the walls to which you want to apply framing. Once the walls are selected, you can double-click on the Wood Framing Walls tool to enter into the dialog box. The dialog box is shown below in Figure 3. The dialog is the key element in defining the rules that will apply the wood framing to your selected walls.

The Wood Framing Walls dialog box has three main sections as shown in Figure 4. Section one in the top left is used to navigate to the different elements to set the framing rules. Section two in the top center is the graphic display of the walls you have selected. Below is a list of tips to help control the display.

You can individually select a wall by hovering over the wall and selecting with the left mouse button.

If you have a Microsoft wheel mouse, you can hold down the wheel to pan around.
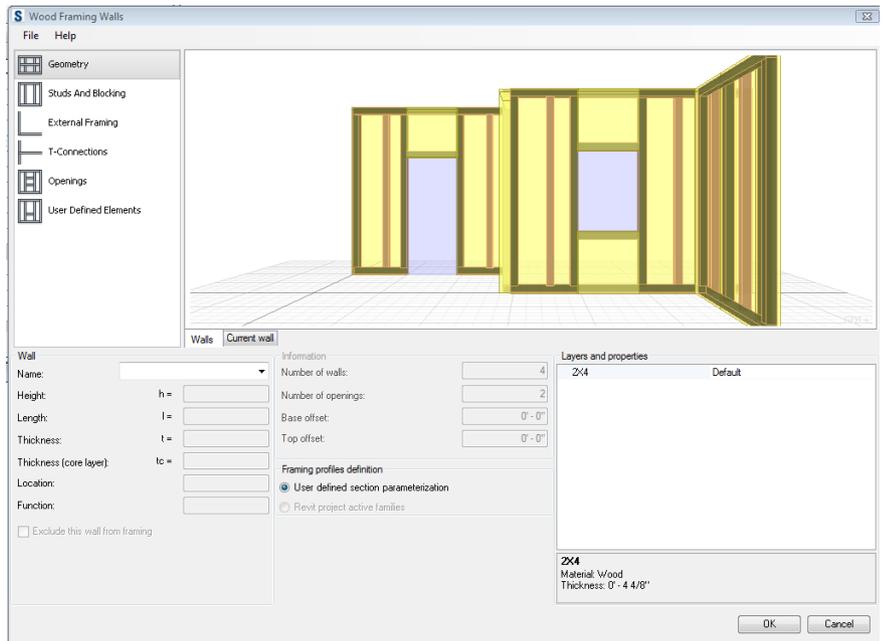
Figure 3: Wood Framed Walls dialog box
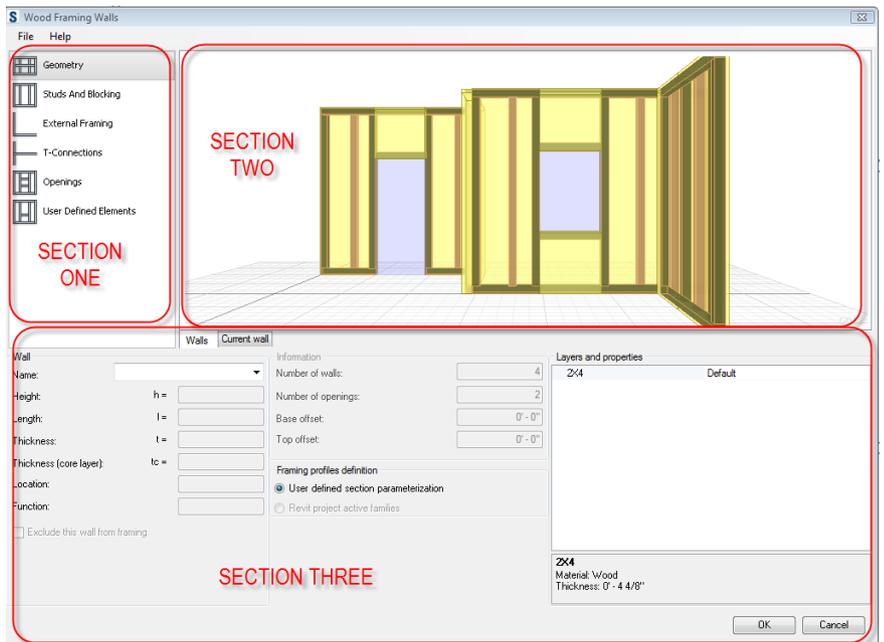
Figure 4: Three Major Sections of Wood Framed Walls Dialog Box

Holding down the right mouse button will allow you to orbit around the drawing to give yourself a better view.

Section three on the lower half of the dialog box is where you specify your components to be used for framing. Here you will see two tabs, one labeled "Walls," which is a global setting for all walls you have selected. The other tab is for "Current Wall."
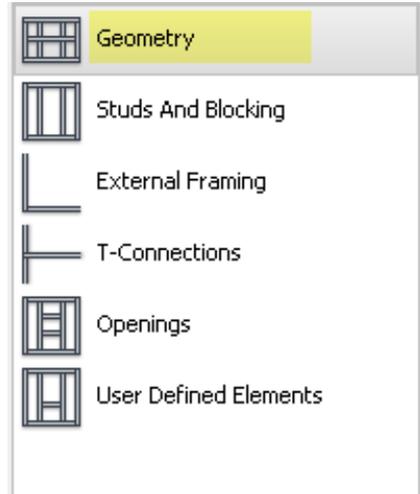
Figure 5: Geometry
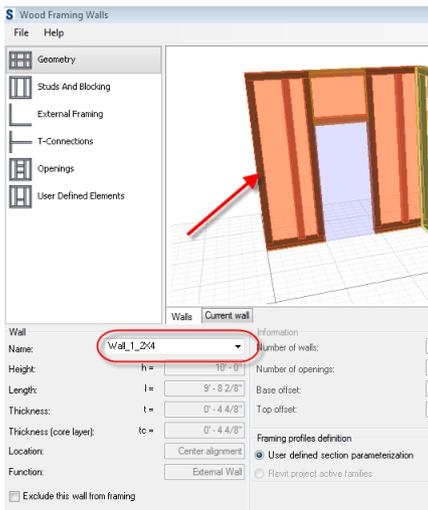
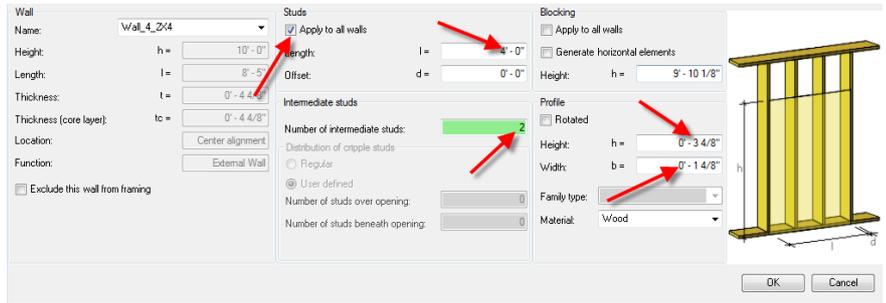*Figure 6: Geometry of selected wall*
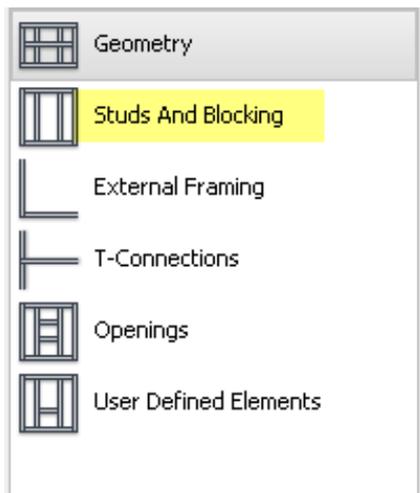
Figure 7: Studs and Blocking

Figure 8: Specifying Studs and Blocking
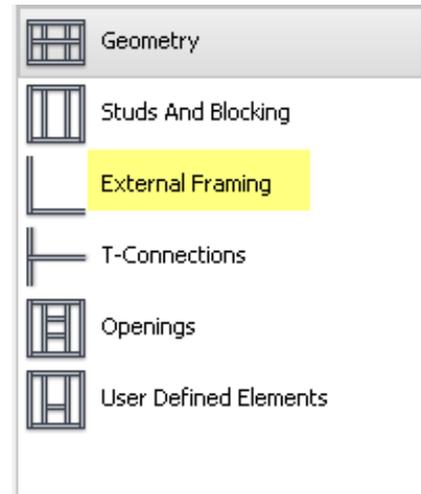
Figure 9: External Framing
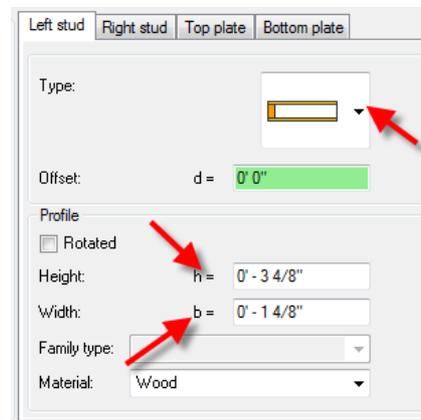
Figure 10: Specifications for Left and Right Stud
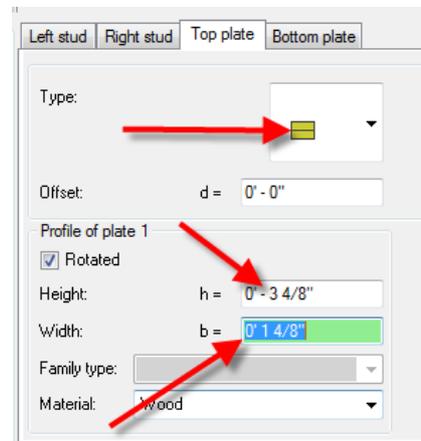
Figure 11: Specifications for top plate

This tab allows you to define specific rules that will apply to one wall selected.

Applying your settings

Section one in the dialog box allows you look at the geometry of the selected walls.

As you can see in Figure 6, the Geometry section shows a unique name that identifies the selected wall. All other values are grayed out in the lower section of the dialog box. The grayed out values are the geometric properties of the wall. If you need to make any changes to the geometry of the wall, you need to exit out of the Wood Framing Walls dialog box to make your changes to the walls in the model. Once the geometry is changed,
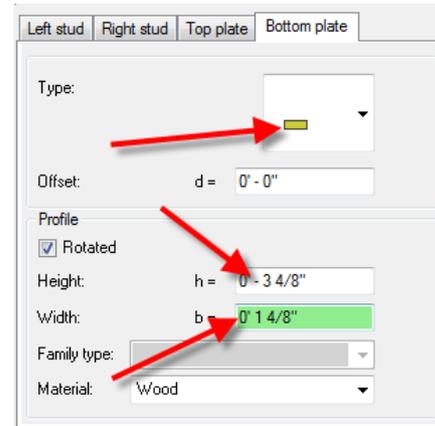
Figure 12: Specifications for bottom plate
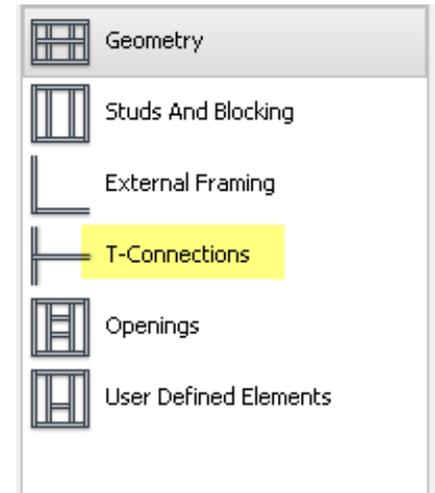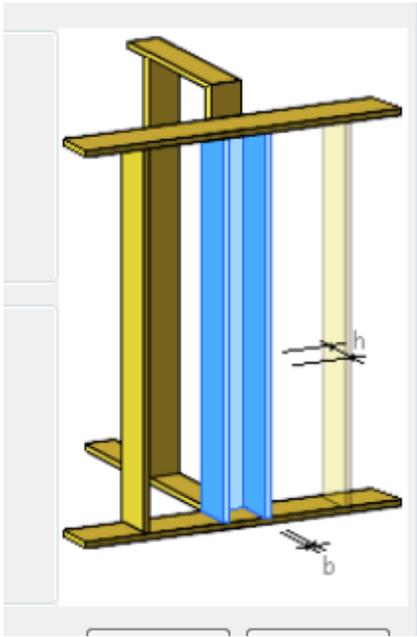

Figure 13: T-connections

Figure 14: Default T-connection

Figure 15: Door King stud specifications

enter back into the Wood Framing Walls extension to continue.

Studs and Blocking is another setting in Section one of the dialog box.

The bottom of the dialog box remains grayed out until you select a wall or all walls to which you want to apply framing rules. Select all walls as shown in Figure 2.

Once you have all the walls selected, verify that your settings match those shown below in Figure 8. You will see that each value has an identifier that coincides with the image in the lower right hand corner of the dialog box. In the "Stud" section, verify that "Apply to all walls" is selected. Next, set the length value to 4'-0", the distance between two studs. In this example the distance of 4'-0" may represent the width of a sheet of gypsum wall board. The number of intermediate studs needs to be specified. One intermediate stud would represent 2'-0" on center spacing. Two intermediate studs would represent 1'-4" on center spacing. Set the number of intermediate studs to

two. The last item to specify in this section is the size of our studs. Set the height to 3 4/8" and the width to 1 4/8". In this exercise we will not be specifying any blocking.

Next we will move into the External Framing section.

When External Framing is selected, you will notice the bottom half of the dialog box changes. There are four tabs allowing

us to specify the four outside sections of our walls—the left stud, right stud, top plate, and bottom plate. Only one wall at a time can be done when specifying the left and right stud. Select each wall individually and specify the left and right stud for each wall as indicated in Figure 10. There is a type drop-down that gives you a choice of various end conditions. For this
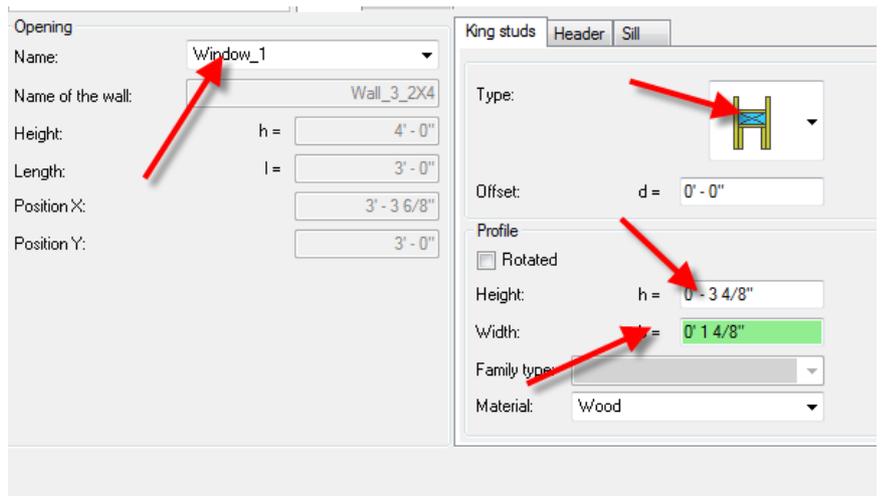

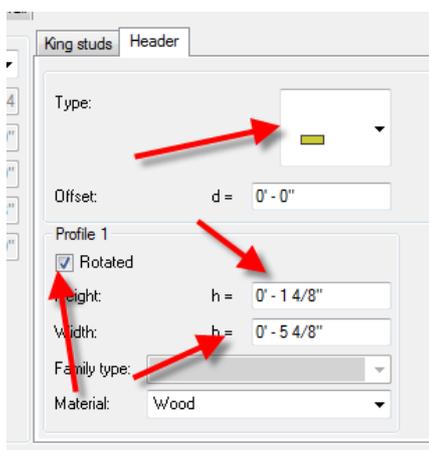Figure 17: King stud specifications

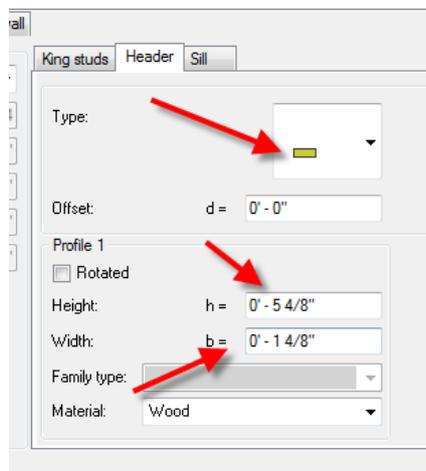Figure 16: Door Header specifications
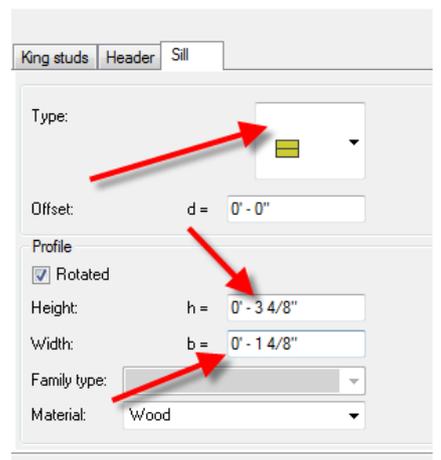

Figure 18: Header specification

Figure 19: Sill specifications

exercise, we will keep it basic and just use a single stud for both the left- and right-hand conditions.

The top and bottom plate can be specified for all the walls at once. Select all the walls, then set your top and bottom plate according to Figures 11 and 12. Specify a double 2x4 top plate and a single 2x4 bottom plate.

Next we will move into the specifications for "T-Connections." T-Connections default as shown in Figure 14. After the Wood Framing Walls tool is complete, manual adjustments can be made at the T-connections as needed.

The framing rules for openings such as doors and windows will be set next. This will be done one opening at a time. With a wall selected that contains opening(s), the drop-down menu allows you to define your framing rules one opening at a time. If you have a door opening selected, you will spec-ify king studs and the header framing rules. If you have a window opening selected you will specify the king studs, header, and sill framing rules. Select the wall containing the door opening and specify the king studs and header as shown in Figures 15 and 16.

With the wall which contains the window selected, specify the king studs, header and sill as shown in figures 17, 18, and 19.

The last section is "User defined elements." This is used if you need to place any additional lumber at specific locations. This may be for some additional blocking support for wall mounted items. Figure 20 is a snapshot of this dialog box.

Now that we have specified all of our framing rules, select OK to perform the operation. Figure 21 shows the framing complete.
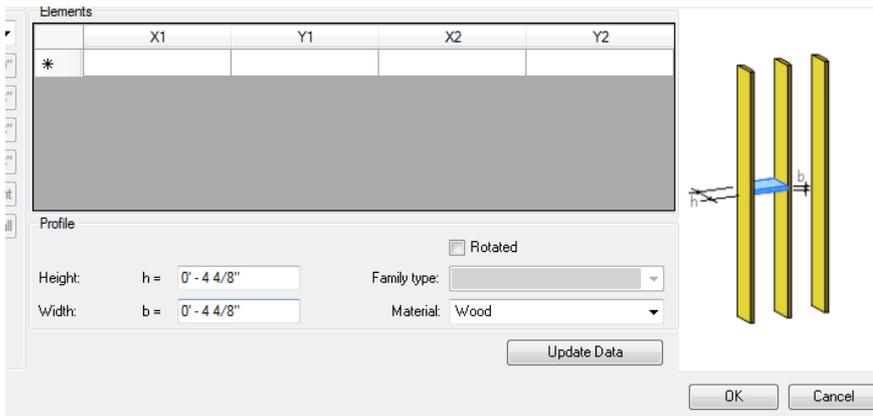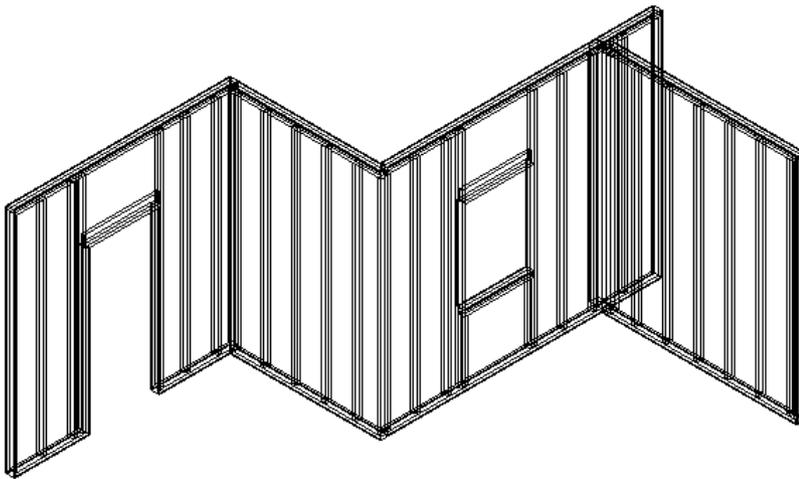

Figure 20: User defined elements

Figure 21: Sill specifications

Figure 22: Shaded display

Displaying your results

If you need to create a view that displays only your framing, use the visibility graphic settings for your view. These components fall under the category of structural framing. Because these components are structural framing members, you can turn off walls in the visibility graphics settings. For presentation reasons you may want to adjust your material settings as shown in Figure 22 to display the framing.

Additional information

One downfall of the framing is that once it is placed in your model it is not associated to the wall. If you move your wall the framing does not move with it. However, if you simply select all your walls and launch the Wood Framing Walls extension, all your settings are stored. This way you just select OK, and all your specifications are re-applied to the walls and your framing will be updated.

You also may want to consider creating a workset for your wood framing, which will allow better visibility controls.
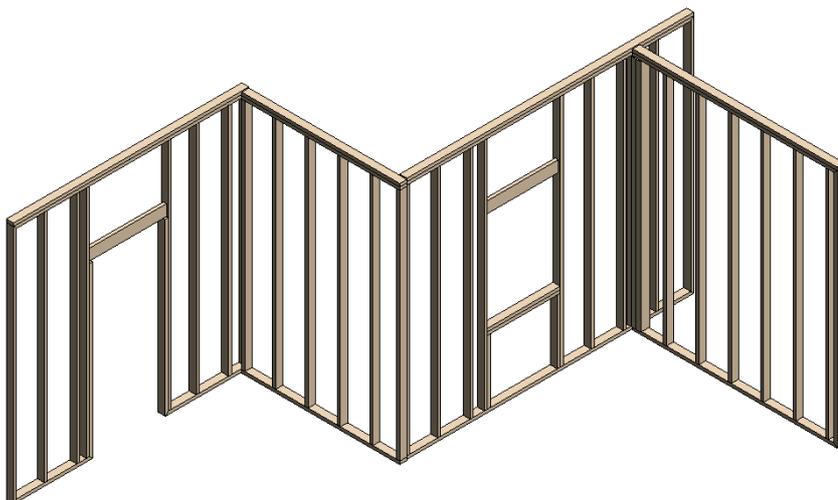
Phil Russo began with AutoCAD version 2.5 in 1986. Through the years, he has held positions in the CAD industry as CAD draftsman, CAD manager, applications engineer, and Autodesk Certified Instructor. Lately Phil's focus has been on the development and implementation of standard practices for the Autodesk Revit product line including Revit Architecture, Revit Structure, and Revit MEP. He currently works at Lindemann Bentzon Bojack, an architectural and engineering firm located in Clermont, Florida. He can be reached at philr@lbbe.com.

Own the Interface

While sitting around reflecting on AutoCAD® (yeah, I do that), I had a thought. There seems to be more tools for customizing the interface than there are for creating and altering geometry. This is one of the things hard-core users love about AutoCAD, but new users may not yet have taken advantage of.

The interface can be as individual as the user. AutoCAD has a succession of options that gives users the comfort of living in their personal space as opposed to the "living in a hotel room" feeling that you can get from other software. If you ever had to work on someone else's workstation, it is kind of like driving their car. You need to adjust the seat and mirrors, and change the music before you even get going. In this article, AutoCAD will get an extreme makeover. The many options to control the interface will be explored and altered, leaving an AutoCAD that is, perhaps, unrecognizable.

Starting at the top of the default interface, the Quick Access Toolbar (QAT) has options to add or remove the standard QAT tools, but any defined command (custom and otherwise) can be added to the QAT by selecting the *More Commands...* tool from the fly down found at the end of the QAT. It can also be placed above or below the ribbon from that same drop-down menu.
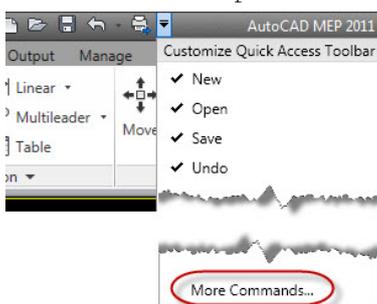
The Application Menu (also know as the Big Red A) has a little-used option to display the files currently open rather than the recent files list. This is a great way to navigate between open files when there are many open. The display of the files can be changed from small or big icons or images by selecting the tool at the top of the list.
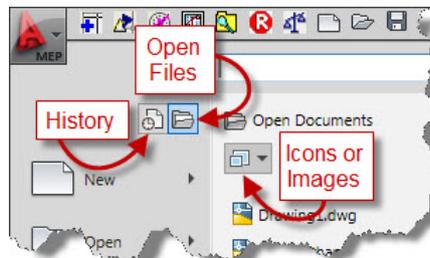
Right click on the View Cube and select *View Cube Settings*. The dialog that appears is used to change the view cube's location, size, opacity, and other settings, for turning on and off the compass, and the UCS menu as well as changing other the zoom, orientation, and transition defaults.

The Navigation Bar, which contains the steering wheel, pan, zoom, and other tools, is sometimes linked to the View Cube. Click the down arrow located at the end of the navigation bar to turn on and off elements of the bar or select the *Docking Positions* fly to change its attachment to the view cube or relocate its default location.

The Ribbon is the Swiss army knife of interface tools, and most of its options are available only by editing the CUI. There are options that one can take without opening the CUI. The buttons at the end of the ribbon can be used to cycle through showing the whole ribbon, or just the Tabs, Panel Titles, or Panel Buttons.
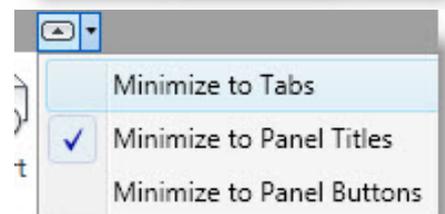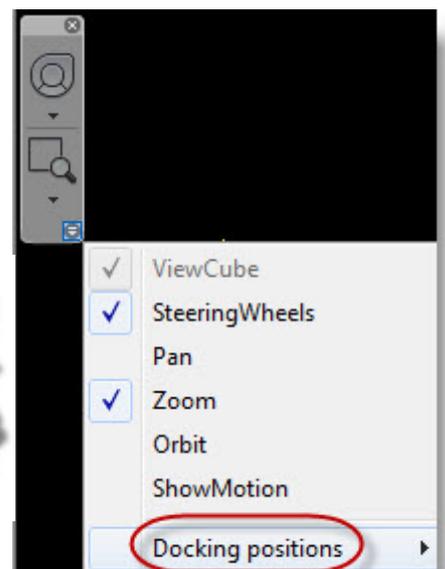
The ribbon itself is really just an extremely cool palette. Right-click in an unoccupied space on the ribbon and choose the *Undock* command to release the ribbon from the top of the screen. It can float or re-dock to the sides or top of the screen. It will not dock at the bottom. Individual ribbon panels can be reordered by dragging them to new locations in the ribbon. Panels can be removed from the ribbon and placed anywhere on the screen. A panel that has been removed from tab "A" will remain visible when tab "B" is currently open. This is great for a panel that gets a lot of use during an array of activities.

Palettes can be docked to the edge of the screen, meaning that's where they will stay until moved, or they can be anchored, meaning they pop out when the curser touches them. When anchored, right-click on the bar into which they are anchored to select *Icons* or *Text*. Having icons in the bar reduces the number of times the palette is accidently opened because the icons are so much smaller than the descriptive text that would otherwise be there.
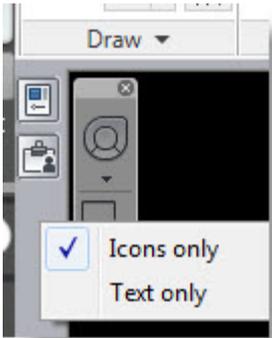

Some palettes allow transparency. Right-click on the edge of the Properties palette and select the Transparency tool. This opens the Transparency dialog that can be used to change this palette or all the palettes.

The Application Status Bar is at the bottom of the screen. At the far right is a tiny black triangle that pops up the Application Status Bar menu.
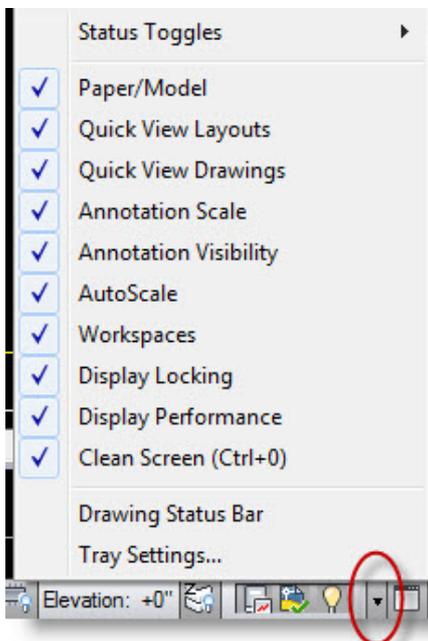

Out of curiosity, I turned everything on. It fit, but just barely. A better use of this menu is getting the items that aren't used out of the way. Be careful, though—sometimes it is useful to have a toggle for tools just to turn them off. The Drawing Status Bar can be detached from the Application Status bar in the same menu. A little known gem is the ability to right click on the Status Toggles to switch between the new icons for Snap,

Ortho, etc. and the traditional words that graced our screens back in the 1900s. Just click the Use Icons tool on the right-click menu to switch back and forth.
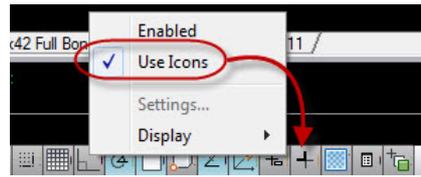
The Options dialog can be used to customize the colors and fonts used by the interface. Invoke options by typing it on the command line or selecting from the bottom of the application menu. The Display tab has a Window Elements section which contains buttons to open the Colors and Fonts dialogs.
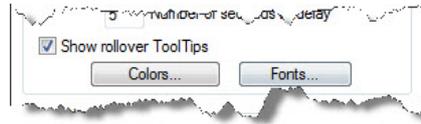
For the most part, the font tool controls only the command line. This is great for making the command line look like a classic DOS prompt. The size of the crosshairs and the display of other default elements can be changed in the Display tab of the Options dialog box. Anything changed in the Options dialog with a DWG icon next to it will only affect the current drawing. If no icon is present, the changes apply to all drawings system wide.

Saving a Profile is a great way to secure the options that have been created. Go to the *Profile* tab in the *Options* dialog and select the *Export* button on the right to save the configuration. That profile can now be imported into any AutoCAD session and used to easily make the interface changes current. Some CAD managers have a habit of forcing a profile when the AutoCAD icon on the desktop is double clicked. This is done by adding a switch to the Icon. Right click on the AutoCAD icon and select *Properties*. In the Target box add "/P." This tells AutoCAD to use the profile found at the path that comes next. Then add a path enclosed in quotation marks.


Every time the icon is used to start AutoCAD, the saved profile will be loaded and used.

Using the options discussed in this article to change AutoCAD, the following screen shot of an extremely made over AutoCAD was generated. Yeah, it's still AutoCAD. Now go make one for yourself.

 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. Contact Todd at tshackelford@alvine.com
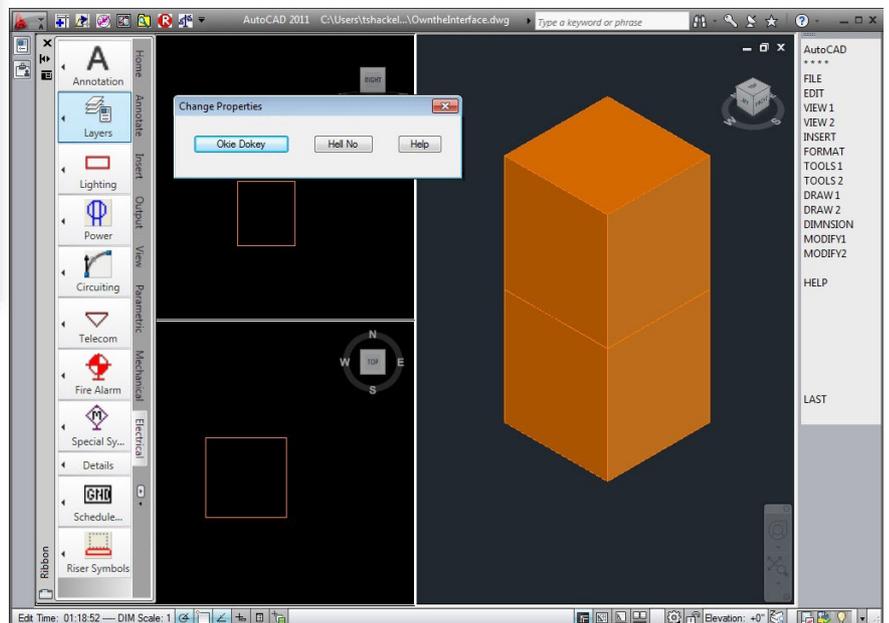
SPACES
in AutoCAD Architecture

Spaces are style-based architectural objects (2D or 3D) that contain spatial information about a building. This includes floor and wall area, volume, surface information, and much more. Spaces can begin to define the layout of a building's internal rooms and areas. They can also define rooms and areas for scheduling purposes and for area calculations and evaluations.

Space types

There are a few different types of spaces that can be modeled in AutoCAD® Architecture. Let's take a look at each one.

Associative spaces are generated from boundary objects. The space will update accordingly when the boundary objects change. In addition to associative spaces, non-associative spaces with user-defined geometry can also be created. You can use a non-associative space to generate calculations just like you would use an associative space or it can standalone in a drawing. Non-associative spaces can be connected to boundary objects after their creation. In the same way, associative spaces can be disconnected from their boundary objects.

2D spaces can display spatial information in 2 plan dimensions. The Z direction is set to 0 by default and is ignored during creation, editing, and scheduling the space. 2D spaces can be polygonal or rectangular and associative or non-associative. A 2D space can be bounded by linework and 3D objects. 2D spaces are typically used where 3D information is not needed, such as Plan view.

An extruded 3D space is similar to a 2D space; however, it has a user-defined extrusion height. Extruded spaces are useful for regularly shaped 3D spaces; for example, uniform-height rooms in a building. Extruded spaces can have ceiling and floor components as well as space above the ceiling and below the floor. The space above the ceiling is often used to place cables, ductwork, and electrical installations in a room. Extruded 3D spaces can be associative to linework and 3D objects; however, they are bound only in the X and Y directions. The Z direction is defined by the extrusion height.

3D freeform spaces are generated from boundary objects and are associative to them. Associative 3D freeform spaces must be bound in all directions to form a valid boundary shape. A 3D freeform space is a complex 3D geometry with any number of surfaces needed to generate the space shape.

Space styles

A space style is a set of parameters that determines the appearance of the space object to which it is assigned, as well as other characteristics. You may want to create different space styles to represent different types of spaces, depending on the scope of the drawing. For example, you may want a space style for office space, another one for common area, another one for mechanical space, and so on. You can use styles for controlling the following aspects of spaces:

- Name List – You can select from a list of allowed names for spaces of a particular style. This helps to maintain a consistent naming system across a building project.
- Boundary Offsets – You can specify the distance that a space's usable, net and gross boundaries will be offset from its base boundary. Each boundary has its own display components, to which you can set according to your needs.
- Target Dimensions – You can define a target area, length, and width for spaces that are inserted with a specific style.
- Displaying Different Space Types – You can draw construction spaces, demolition spaces, and traffic spaces that each utilizes different display properties.

Creating space styles

To create a Space Style, begin by clicking the Manage tab on the ribbon, select the Style & Display panel, and then select Style Manager (see Figure 1). The Style Manager will display with the current drawing expanded in the tree view. Expand Architectural Objects and then expand Space Styles.

You can create a new Space Style by right-clicking on Space Styles and selecting New (see Figure 2). You can also create a Space Style from an existing style by right-clicking the Space Style you want to copy and selecting Copy. Next you will right-click and select Paste. Enter a name for the new Space Style and hit Enter. Now you will need to edit the new Space Style according to how the space should appear—its size, and so on. Once finished, you can add the new Space Style to your tool palette for easy access.
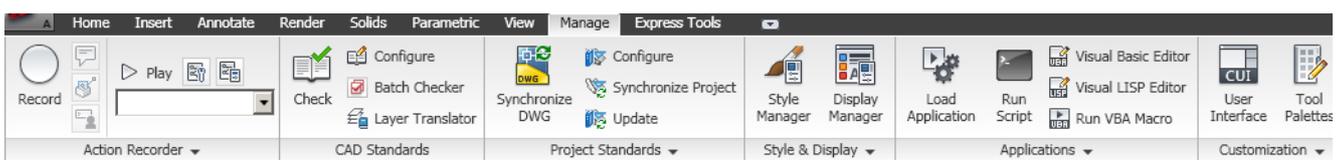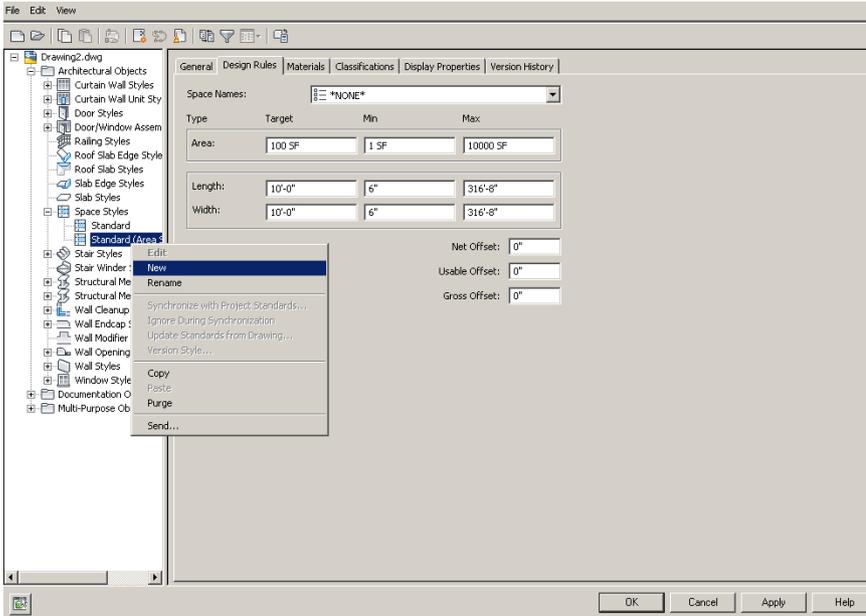

Figure 1: Ribbon

Figure 2: Style Manager

Figure 3: Space Tool Palette

Figure 4: Space Tab

Creating spaces in your drawing

AutoCAD® Architecture provides tools that allow you to quickly place spaces by selecting a space tool with a specific space style as well as other predefined properties. You can use the tool as is with its default settings or you can change any of the properties that are not controlled by the style. You can also use space tools to apply tool properties to existing objects to create new spaces. Space tools can be found on the space tab of the tool palette (see Figure 3). To begin creating spaces in your drawing, drag and drop the desired space from the tool palette to your drawing and begin. You can also find space tools in the Stock Tool Catalog, the Sample Palette Catalog, and the Design Tool Catalog. Once you are in the Space command, the Space tab will appear in the Ribbon (see Figure 4).
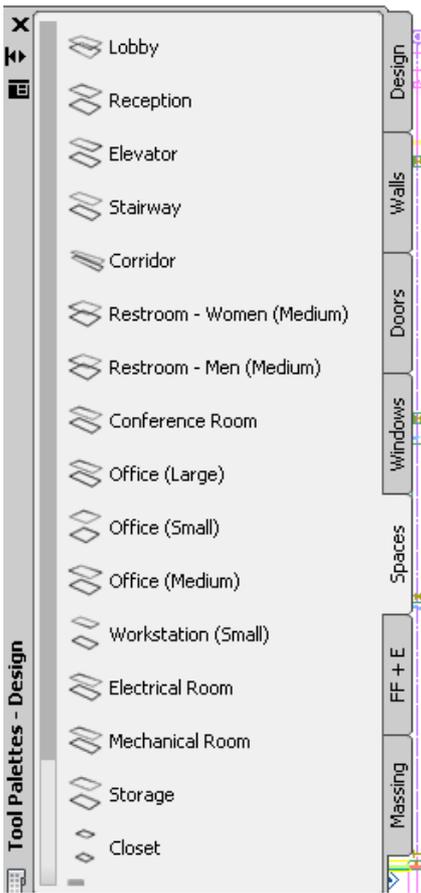
You can also create Spaces in your drawing by converting polylines, object outlines, and profiles to spaces. Simply open the Space tool palette and right-click on the Space tool you wish to use. Next, select Apply Tool Properties To and then select Linework And AEC Objects (see Figure 5). Select the objects and/or polylines you wish to convert and hit Enter. Under Cut Plane Height on the Convert to Space worksheet, enter the height at which the object should be cut to generate the profile of the new space. Select OK.

Space boundaries

Spaces have four different boundaries that can be used to display, edit, and schedule different aspects of the space. You can turn off the display components for the additional boundaries if different boundaries are not needed for the same space (see Figure 6). Some uses for individual boundaries are listed below.

- Base Boundary – This normally represents the inner area of a room covered by a space. This is the area generated by boundary objects in an associative space.
- Net Boundary – This boundary can be used for detailed design as well as planning. The net boundary can also be used
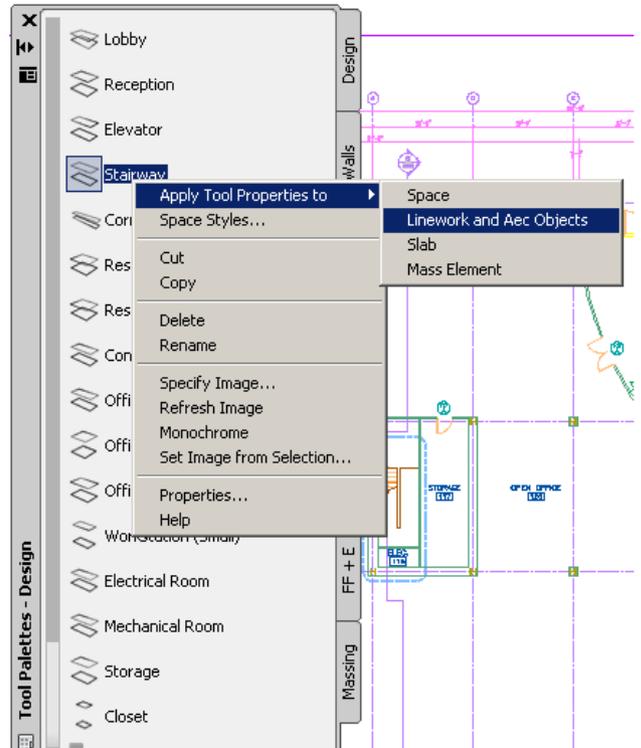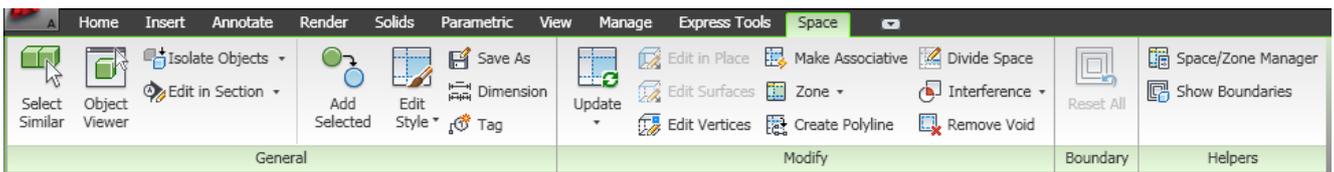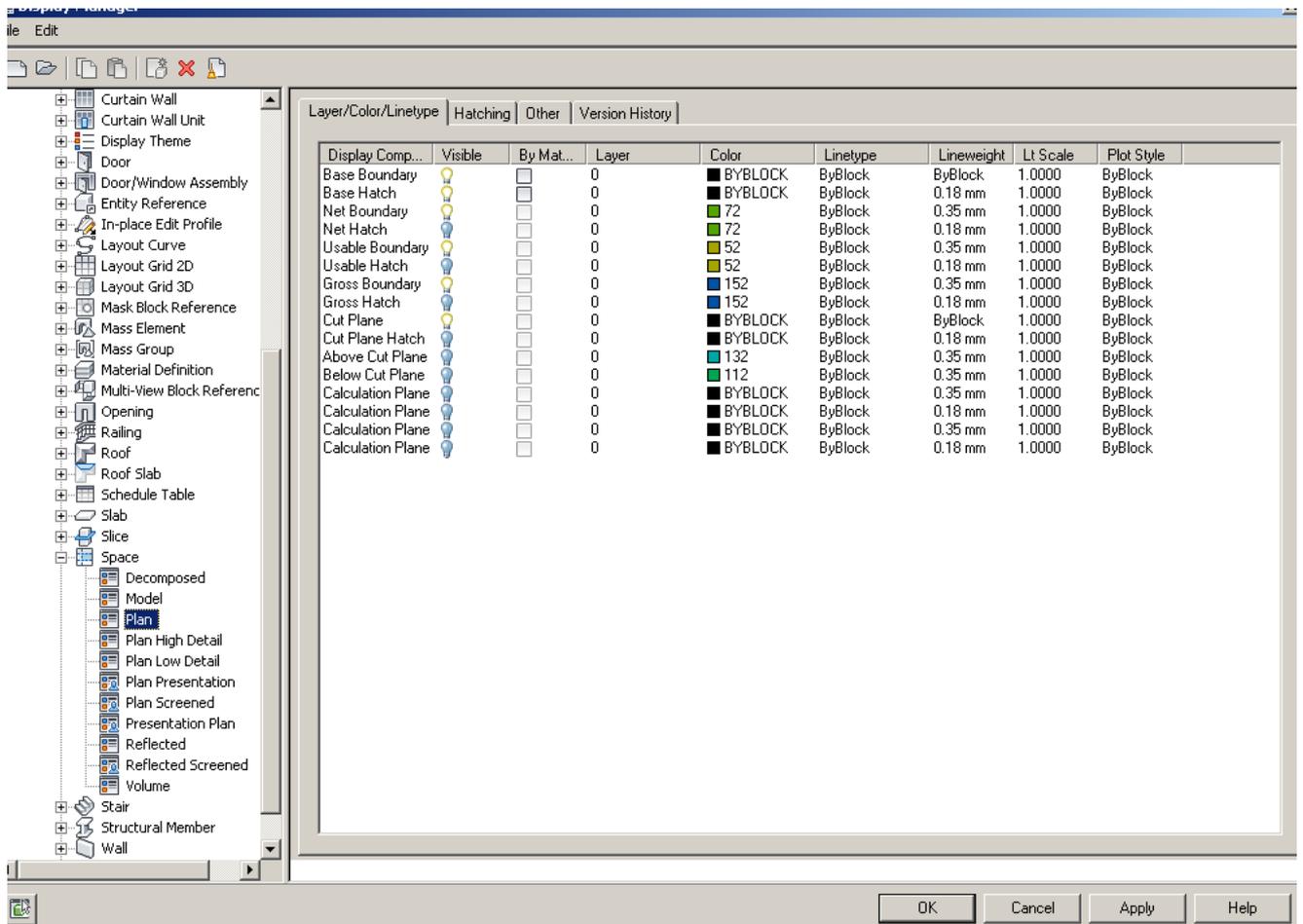

Figure 5: Apply Tool Properties

Figure 6: Space Display Manager

for special applications when the calculated area of a space is smaller than the base boundary.
- Usable Boundary – This boundary is used for detailed design and planning, maintenance, pricing, renting calculations, and much more. Usable boundaries typically extend from the inside of the exterior walls to the middle of the interior walls.
- Gross Boundary – This boundary can be used in connection with cost calculation, price estimates, key numbers for the building or floor, and much more. Typically, the gross boundary is measured from the outside of the exterior walls to the middle of the interior walls.

Spaces, then and now

I have received many comments and questions from people who are upgrading from an earlier version of Architectural Desktop (around 2005 or 2006) to AutoCAD Architecture 2011 concerning differences they are seeing in the space tools. They are correct, as there are a number of changes in the space planning features.

In AutoCAD Architecture 2011, spaces, space boundaries and areas have all been unified into one space object. This space object contains the properties that were formerly associated with these other objects, as well as several new and enhanced features. Let's look at a few of these.

Spaces now contain the properties that were associated with spaces and areas prior to AutoCAD Architecture 2011. These spaces can be grouped into zones and then processed as space evaluations.

Space boundaries are now a part of the space object, whereas these were previously separate objects. If you have space boundaries that were created in previous versions, they will be converted to walls when the drawing is opened in AutoCAD Architecture 2011.

Areas are now integrated with spaces, including properties that were formerly specific to areas. When a drawing is opened in AutoCAD Architecture 2011 that contained areas in an earlier release, the areas are automatically converted to spaces. When this happens, all area properties are converted to the corresponding space properties. Area groups, however, are converted to zones. Both area tools and area group tools are no longer needed in the software and, therefore, have been omitted.

The area evaluation feature has now been converted to the space evaluation feature. Space evaluation is a documentation feature. It calculates the area and perimeter information to be used in a finished floor plan. This information is displayed as a separate file that you can export to a spreadsheet. Space evaluation can be used for submitting floor plans to building authorities, cost estimates, organizing facility management of buildings, and much more.

There are several more changes not discussed here, so feel free to get in there and explore!

Conclusion

Spaces are an essential part of the AutoCAD Architecture software. They help you to extract data contained in the drawing for use in scheduling, tagging, and analysis. Spaces are an integral part in enhancing your productivity for facility management as well as the working drawing phase of your project. I encourage you to explore the possibilities with spaces and see how far you can go!

Melinda Heavrin is a CAD Coordinator for Norton Healthcare in Louisville, Kentucky. She can be reached for comments and questions at melindahearin@alltel.net.
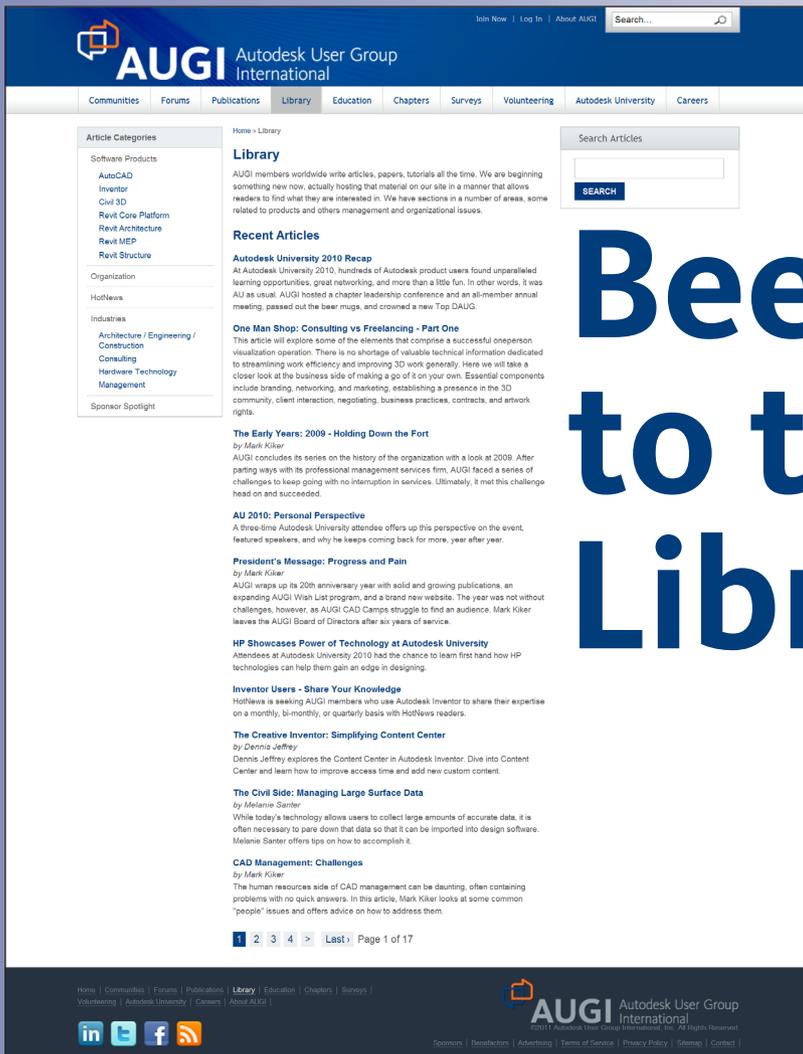
Been to the Library?

If you've visited www.AUGI.com recently, then you've seen a highly visible improvement in AUGI's member interface. But one of the most exciting features is still flying under the radar and that is the Library.

The Library is the home for articles and whitepapers that the membership contribute to the organization. There is a tremendous amount of material generated by members and until now that content 'shelf life' was pretty short. Since magazines come out monthly, an article's time in the spotlight is brief. Well, no longer! As issues of *AUGIWorld*, *AUGI | AEC EDGE* are replaced by new ones, the staff at AUGI will be posting article content on the website in HTML. The magazine PDFs will stay, of course. Consider the AUGI Library a new area to read some great content. Finding articles from past issues is a breeze, because searching and categorization can now be applied to these articles. In addition, the Library is the real home for *AUGI HotNews*, an email-based monthly publication.

Are you ready to write?

AUGI, through the contributions of members, produces monthly magazines such as *AUGIWorld*. Well the articles in these magazines don't grow on trees! The content comes from members willing to contribute. If you are an AUGI member, you probably use an Autodesk product. Do you know your product pretty well? Have you ever sat down with someone else to explain how Paper Space works, or how to explode polylines, or customize the CUI? These messages you share casually with others are the same messages that others outside of your area need to hear. Just imagine… even though you have been using AutoCAD since R9, today, somewhere in the world, someone started using AutoCAD for the first time. And that expert level change you made to your CUI to work better with your PGP today? Tomorrow someone else will begin that exercise as well and you could save them some time with your insight. So, get out there and join the fun – contribute to your magazines and your fellow members. Share your knowledge and expertise with beginners and advanced users alike. People are ready to hear what you have to say. For more details contact david.harrington@augi.com