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August 2011

Let's Collaborate!

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- **Electrical and Mechanical Coordination**
- **Value-Driven Project Delivery**
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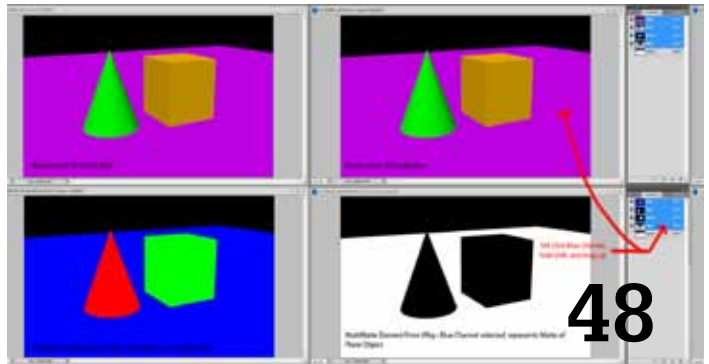
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AUGI



Olá Autodesk user! Last issue we tackled management in the Autodesk software world, so this month our focus is centered on collaboration. No matter what you are doing, more than likely you do not work in a vacuum. That is the essence of collaboration.

With each issue I have been trying to find cover photography that relates to our theme for the issue. Take another look at the cover—do you see the collaboration? No? Okay, I might have a great imagination, but here is what I see. For one, the stone mason had to collaborate and coordinate with the placement and color of the building. The stair is pretty intricate—welded up in a shop, which had to coordinate with the concrete forming contractor. This building is in Canada, so I'm sure the architect collaborated with the window manufacturer on energy-efficient skylights. Basically, collaboration is anytime you get beyond your doors and have to work with another party, or parties more often than not.

Okay, so let's begin the rundown this month. Our former AutoCAD Content Manager Brian Benton shares his keys to success with collaboration in the AutoCAD environment. Melinda Heavrin is back again for AutoCAD Architecture, but showing how one can collaborate with Design Review. Then we have a special feature by Stephen Preston of Autodesk, sharing insight into the Autodesk Exchange Apps store that launched a few months ago. This is really cool—I think I will be submitting some gems of my own!

Andra Marquardt is grounded with the right stuff in her application of AutoCAD MAP and using Data Connect for collaboration. Then our intrepid investigator William Troeak brings us the latest updates and services packs from Autodesk.com. Note, we have moved to using QR codes – no more huge URLs. ☺

This month we get the real story from Shawn Hendriks in our Autodesk Insider column. Shawn is from the media and entertainment arena of Autodesk. You know—the movie magic factory! Find out what the behind-the-scenes world is really like! Then Bryan Tanner discusses how you can collaborate in a multi-disciplinary and multi-firm environment.

Next John Evans is building in collaboration methods using Autodesk Inventor Publisher 2011 and 2012. This application is simply amazing—if you have not loaded up the trial, you really need to do that. Then Todd Shackelford lets us know how to let Revit MEP do the work for electrical and mechanical coordination. And Erik Lewis gives us the scoop on the latest and greatest tools to hit the streets in this month's Inside Track.

Troy Gates provides a history lesson describing Revit collaboration, then and now. Revit Server is now! Then Phil Russo dives into Work Sharing with Revit Structure—can't we all just get along? Yes! Next, Anthony Hauck exposes collaboration and data management for AEC Projects in our new Revit Platform column. Then Andrew Abernathy shares his method to success in value-drive project delivery. Finally, Seth Borne gets in the interoperability surrounding 3ds Max and how collaboration is a critical path issue in that application as well.

On the management side of *AUGIWorld*, everything is settling in pretty well. We have a great slate of Content Managers already, but we could use a few more! There are some great products under-represented such as Autodesk Electrical, Plant 3D, and Maya. Perhaps you have it in you to help out? Or at least write an article or two?

Okay, that's it for August! Turn the collaborative page and get in-the-know today! Until next month...

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Keys to Collaboration Success



It's very rare that any of us has to work in AutoCAD® by ourselves. Even solo designers have to deal with clients. Is there a right way to collaborate with others?

That's a difficult question to answer because there are so many AutoCAD users and each one has his/her way of doing things. Those ways aren't necessarily wrong, but they could be difficult to discern. Think about the times when you opened somebody else's file and couldn't figure out what the designer did. Now think about the times when somebody else opened your file and grumbled a few choice words about you under their breath! It's happened, trust me.



Figure 1: Collaborating will be difficult if everyone does their own thing.

WHAT DOES IT MEAN TO COLLABORATE?

Collaboration means different things. What it is and how you collaborate depends on what you are trying to accomplish. One definition I found for collaboration was, "To work, one with another." To collaborate means working with another person. That's the trick, working with other people on the same design project. AutoCAD allows only one person at a time to edit a file. That's good.

But how do users really work together? Each of our fellow collaborators must handle specific parts of the project. AutoCAD can help us with that. Perhaps one of the biggest collaboration tools are external file references. The Xref Manager is a tool that is used by most of us, but many are not using it to its fullest potential or at its best efficiency level. There are best practices when implementing reference files. If you are collaborating with other AutoCAD users on a project and aren't using references then you are making things more difficult for yourself and the potential for errors is increased.

Before you begin referencing data, make a plan. Stop thinking of AutoCAD files as drawings. While some of them are, files are actually different forms of data. That data is then placed into a drawing. The drawing is then annotated, plotted, and submitted.

Don't put all of your data in one file. One big all-encompassing data file is bulky and inefficient. Create base files that contain specific data types (like site info in one file, building info in another, and so on) then reference that data into your drawing files. Reference files as an overlay instead of as an attachment. That keeps your data free to be seen but not forced upon other files. Once your data is divided up and organized, everyone can get exactly what they need when they need it. It also means that when the data is updated, everyone who needs that data is also updated. Don't copy and paste data into your drawing file. That changes it from a drawing file to a data file. Keep your base file names the same. When they are revised, copy them and rename the old file.

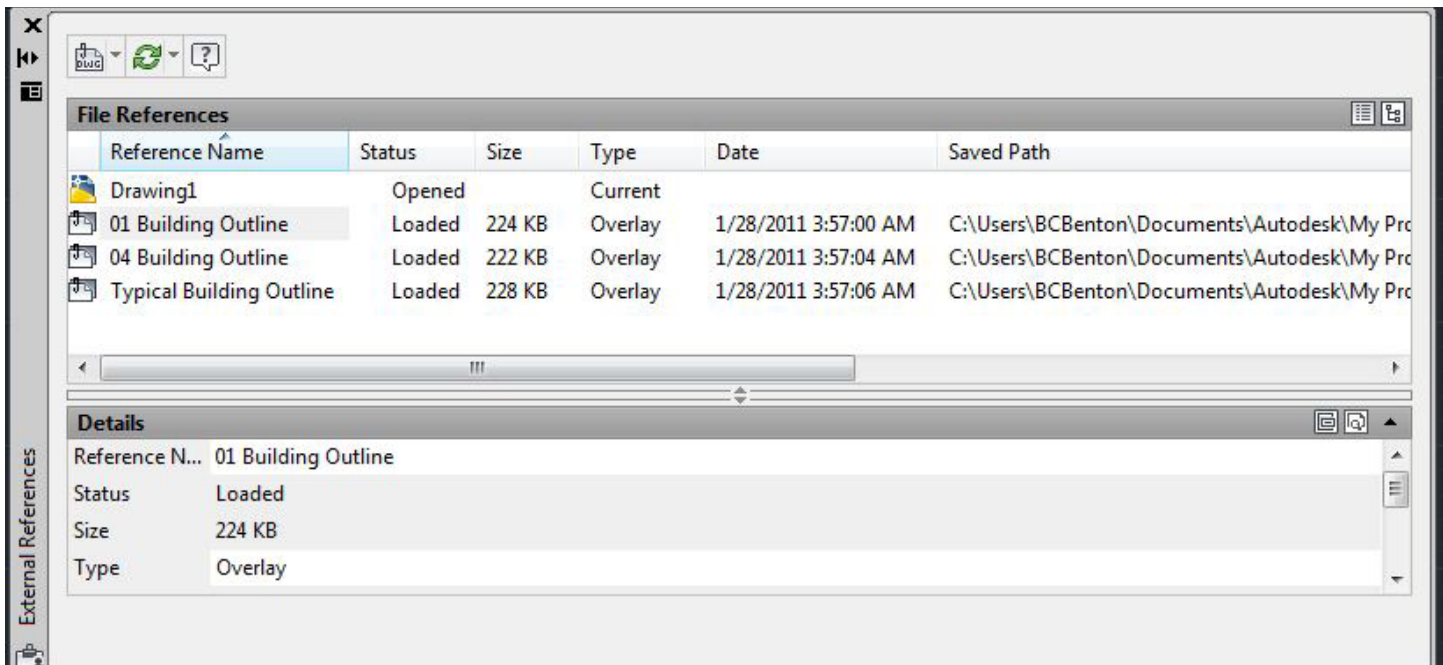


Figure 2: Cross referencing (XRef) files in AutoCAD is one essential tool in collaborating with other AutoCAD users.

That way your references, and the references of others, won't be broken. And everyone will always know which file is the current data file.

COLLABORATING IN HOUSE

Everyone involved in your project has a part. If any one part is out of step it will affect the entire project. When collaborating in AutoCAD, make a plan. That's the most important thing to do. The exact details of the plan are not as important as is having some sort of plan. That means having CAD standards in place before the work begins. In your standards you need to create a few ways of doing things such as folder structure and file naming conventions. These two aspects will make or break your collaboration abilities.

FOLDER STRUCTURE

Where do you store your files? Why do you store your files? How do you store your files? Let's look at these things one at a time.

Why? Because you or somebody else may (will) need them in the future.

Where? It doesn't really matter where you store the folders as long as they are accessible to those who need them when they need them.

How? This is the make or break part. If you don't know why (or what) to save, save everything. If you don't know where, then just put it on the server. But how? How do I know what to save where? Does this make sense? Your CAD standards needs to have a method to show users how to determine what to save and where. A formula, in other words. Two important tips: Keep it simple and make sure it isn't linear ($X=Y$). Otherwise, you will be forced to make a formula for every possible scenario and that is impos-

sible. Its OK to have a short list of absolutes, but you will find that not every project is exactly the same.

For example, say you work in a small civil engineering firm that also has in-house surveying. Obviously members of the engineering and surveying departments will need to collaborate with each other. They will need data from each other. Create a system where the engineers manage their data while the surveyors manage theirs. Makes sense and it's simple.

Now create a system for the surveyors where they put their data in a similar format and in a similar place every time. That way the engineers will know where to go to access the data. Sounds simple and logical enough, right? The problem comes when you do the next job. If you use the same filing system as before then the engineers will know what to expect. So will the surveyors. So will the administrative staff. Do it the same way—all the time, every time. What system should you use? Doesn't matter so much. Just put the field data in the same place in the project folder all the time and everyone will always know where to find it.

An easy way to ensure consistency is to use a template, just as you do in AutoCAD (you *are* using templates in AutoCAD, right?) If you find that the folders don't work, change them. (Keep the changes to a minimum, though.) Put in place a regularly scheduled time to review and update your folder procedures. Make sure everyone knows how to organize files in the folders. That means everyone—from top to bottom. That way everyone can do their jobs the same way everyone else is.

FILE NAMING CONVENTIONS

Use the same theory as in the folder procedures. It doesn't matter what you name your files. In this case a name is simply a unique identifier for a set of data. Come up with a naming formula. In the United States, the NCS (National CAD Standards), has a

pretty good file naming guide. It's a guide with some absolutes of course, but remember to keep them to a minimum. What does a file name need? It needs to clearly describe what it is, but briefly. There was a time when file names could be only eight characters long and could not contain spaces. That's not the case anymore but back then we were typically much better at file naming. Here are a few suggestions to consider:

Project number (or name). This helps make sure the file is in the proper folder. Accidents happen and files get dragged out of place and into the wrong folder. More often the file is sent via email (or some other form of file transportation). Having a project identifier in the filename will help keep it straight. Here are a few more: Department identifier, project type, data type, and a basic description. Essentially a file name can contain any bit of information. Remember to set up a format for the name so that all names have the same structure. That makes it easier to identify the file and to know what's inside. A possible formula could be this: project name-department-description. With this simple, three-part naming convention, all users will be able to understand the file without opening it. They will know the project to which the file belongs, which department created the data, and what the file contains.

NAMING STANDARDS

Just as your folders and files have structures, so do their parts. With regard to the subfolders in your project folder, create a deliberate method of determining where files go. Make sure you have a place to put everything. Use subfolders—the same subfolders every time. This is where a project folder template will serve you well. The subfolders need to be logical. Create subfolders for different departments. That will allow departments to create the subfolders they need to manage their data. Don't reinvent the subfolder structure every project. Keep it the same. This enables all users to know where to go when specific data is needed. If you find that you have to email a file (or its file path) to coworkers so they can find it, then there is a problem. That is a sign of an inefficient folder structure. If you can't find the files you need in house, then how can you ensure accuracy in your projects? How do you know you used the proper data when producing your drawings? If the engineers in our example need a site survey for a project they should be able to find it on their own.

In this example the engineer only needs to go to the proper folder. If the work has been done, then the data is there. The engineer can reference the file and do his/her engineering magic. See how efficient that is? On the other hand, if the engineer doesn't know where the data is, then he/she has to contact the surveyor and they will have to find it, get it, and send it. Now there are two copies of the same data source and it took more time and effort than it ever should have. Everything needs a place. (Make sure the engineers have read-only abilities—we don't want them messing with survey data. They only need to use it, not change it.)

Do the same with your file names. Create a naming format and create consistent standards for each name part. Project names or numbers should be created in the same way. If done



Figure 3: Get everyone working with the same method and collaboration will be more efficient.

correctly, when a file is seen it will be easy to know to which project it belongs. Do the same with department and data/file type designations.

THE GOAL OF COLLABORATION

The goal of collaborating is to get more work accomplished correctly in a shorter period of time. It also allows a group to take advantage of skill sets possessed by other people. One employee may excel at writing permit applications while another excels at designing site plans.

While one person could always do all of the work, it is a great idea to get skilled workers to contribute to your project. This ensures a higher quality of production. If your product or service is high quality, then your chance of continued success is increased. The skill of your collaborators means little if you can't work together efficiently. The key to working together is to create a system that is efficient and simple to understand, but powerful enough to get the work done. When determining your collaboration method keep in mind it needs to be a method where the folders and file names will almost fill in the blanks for you. The key to collaboration success is in the method.



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Collaboration With Autodesk Design Review



First of all, what is Autodesk® Design Review? Autodesk Design Review 2012 is a free program used to create and review DWF files. DWF (Design Web Format) is an open, published, and secure file that enables you to combine and publish 2D- and 3D-design data

and share it with others. Much like Adobe PDF files, DWF files are no more alterable than printed paper copies. However, unlike PDF files, DWF files retain detailed design information and scale. This makes them more suitable for architects, engineers, and designers.

When DWF drawings are marked up in Autodesk Design Review, you can then view these markups in AutoCAD® Architecture and make changes to your drawings. How does this work? When you want to submit designs for review, you can publish a DWF file from AutoCAD Architecture and then send it to the reviewer of your designs. The reviewer can open the DWF file in Autodesk Design Review, mark up the file electronically and then send it back to you. When you open the marked up DWF file in AutoCAD Architecture, you can view the redline markups in the AutoCAD Architecture drawing area, turn them off, make your changes, and republish the DWF file to send out for another review. Doing all this electronically using AutoCAD Architecture and Autodesk Design Review will greatly decrease time normally spent in collaboration with others.

PUBLISH DRAWINGS FOR REVIEW

Once your design is complete in AutoCAD Architecture, it is time to publish the drawings for review. To ensure that electronic markups created in Autodesk Design Review align with the original drawing geometry, it is important not to change elements in your drawing file that can affect this alignment after you have published the DWF file for review. These elements include the following:

- Layers and layer states
- Layers to which objects are tied
- View rotation
- Number and placement of viewports in layouts
- Position and scale of objects within viewports

To publish a drawing set in AutoCAD Architecture to a DWF file, select the Output tab on the ribbon and on the Plot panel, select Batch Plot (see Figure 1). This brings up the Publish dialog box. If the Automatically Load All Open Drawings option is selected in the Publish dialog box, all the layouts in the current drawing are listed in the sheet list. You can modify the list of sheets in the Publish dialog box, as needed. When your list of drawing sheets is assembled and configured the way you want for your drawing set, click the Save Sheet List button (see Figure 2). In the Save List As dialog box, enter a name for the list in the File Name box and then click Save. The drawing set list is saved as a drawing set descriptions (DSD) file. Now, in the Publish dialog box, under Publish To, select DWF File. Then click Publish. Next, in the Specify DWF File dialog box, enter a file name.

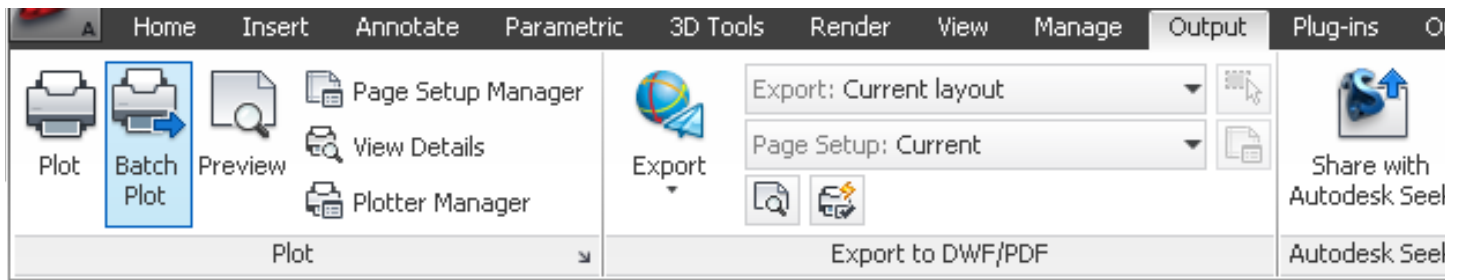


Figure 1: Batch plot

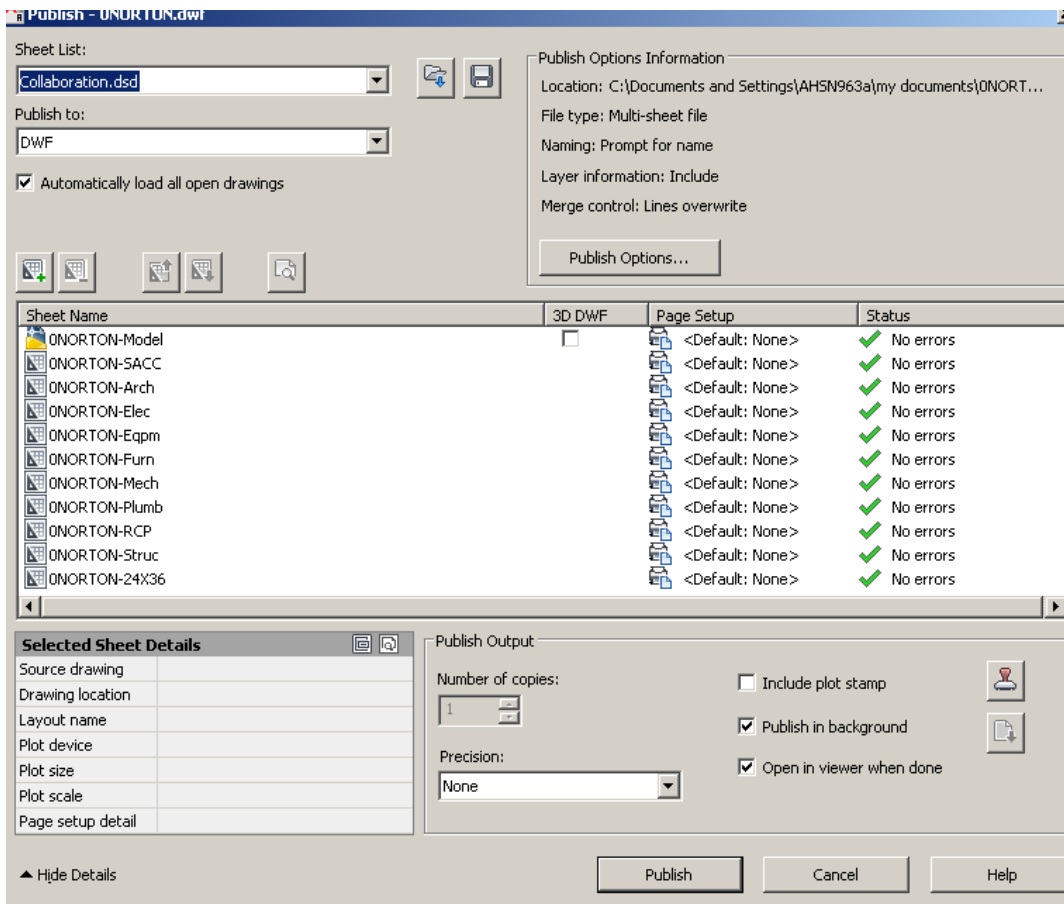


Figure 2: Publish dialog box

The Files of Type is DWF based on the selected DWF format. Click Select to provide the name and destination for the DWF file. Click Save to start the electronic drawing set creation.

INSERT MARKUPS

A markup can be either a single comment or a redline geometry correction that is inserted into a DWF file. Once the AutoCAD Architecture drawing has been published for review, you can use Autodesk Design Review to add markups electronically, just as you would mark up a paper version of the drawing. You can also assign a status to the markup and add comments. After you have made the markups you wish to make, resave the DWF file. Now the markups can be viewed and corrections made. Markups can be made using the Markup & Measure tab on the ribbon (see Figure 3).

VIEW MARKUPS

Now that you have received markups, it is time to review them so corrections can be made. To view the markups in your designs, load the markup set into the Markup Set Manager. (A markup set is a group of markups contained within a single DWF

file.) To open the Markup Set Manager, select the View tab on the ribbon in AutoCAD Architecture, then click the Markup Set Manager button on the Palettes panel. This brings up the Markup Set Manager palette (see Figure 4).

Now, in the Markup Set Manager, click the Markup Set list control and select Open. When you load a markup set into the Markup Set Manager, the tree view will display each marked up drawing sheet and its associated markups. It is important to note that if you try to load a markup set by opening a DWF file that does not contain markups, you will not be able to open the DWF file in AutoCAD Architecture. You can, however, open the DWF file in the DWF file viewer.

While in the Markup Set Manager, you can view details of an individual markup. To do this,

click on an individual markup node. The Markup Details area in the lower portion of the Markup Set Manager will display details for the selected markup. These details can include creator of the markup, date and time it was created, and any comments associated with the markup. It is important to note that markups are color-coded and have icons that are specific to their status (see Figure 5).

When you double-click a model space markup in the Markup Set Manager, the original drawing file opens in model space. The drawing automatically reverts to the view rotation that was current when the drawing was published. Note that if you then change the view rotation, the markups will not be shown in the drawing until you double-click a model space markup and revert to the published view. Also, note that visual style and Shade-mode must be set to 2D Wireframe.

The Markup Set Manager allows you to specify what is displayed in the drawing area. You can show or hide the originating drawing file, the reviewed DWF file geometry, and the redline geometry. This allows you to view the redline geometry, turn it off to make

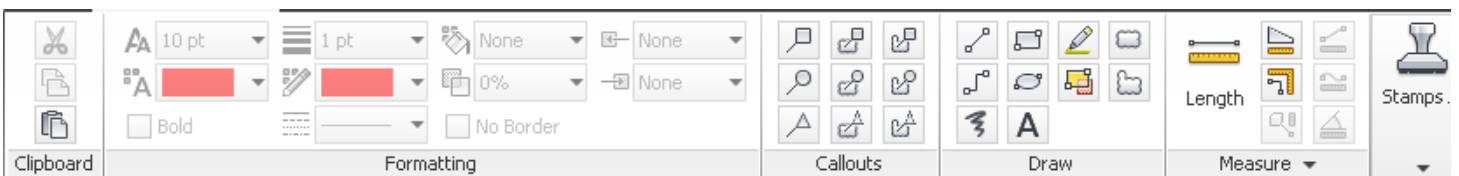


Figure 3: Markup & Measure tab



Figure 4: Markup Set Manager

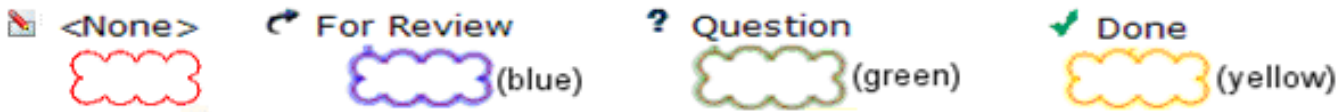


Figure 5: Color-coded markups

the changes in your drawing file, and then view the redline geometry again in AutoCAD Architecture to check your corrections. If you wish to hide DWG geometry for drawing sheets with associated markups, click the View DWG Geometry button. You can click the same button again to show the DWG geometry. If you wish to show DWF file geometry in the drawing area, click the View DWF Geometry button to show the DWF geometry. You can click the same button again to hide the DWF geometry. If you wish to show or hide redline geometry (markups) in the drawing area, click a markup node to view the redline geometry in the drawing area. Then click the View Redline Geometry button to hide the redline geometry. You can click the same button again to show the redline geometry.

RESPOND TO MARKUPS

Now that you have reviewed markups, you can change their status and add comments that are saved with the markup. In the Markup Set Manager, select an individual markup in the tree view and the Markup Details area displays information about the markup. In this area, you can change the status of the markup or you can right-click on a markup and select an option on the Markup Status shortcut menu. You will notice that the default status for new markups is <None>. A markup's status can be changed to Question, For Review, or Done.

In the Markup Set Manager, you can add comments or notes for the selected markup in the Notes area under Markup Details. Changes in markup status as well as added comments are automatically saved in the DWF file and are included when you republish it. Markup changes can also be saved by right-clicking the markup set node and clicking Save Markup History Changes on the shortcut menu.

REPUBLISH A MARKUP SET

After you have viewed a markup set and made necessary changes to your drawings, you can then republish the markup set for another review, if needed. It is important to note that when you republish the markup set, the markups and any changes that have been made to them are saved in the DWF file. When anyone reviews the republished DWF file in Autodesk Design Review, the changes that have been made to the drawings are visible as well as any changes that have been made to the status and the details of the markups. If you republish a DWF file that has had sheets deleted from it or rearranged within it in Autodesk Design Review, the new order of sheets will be reflected in the republished DWF file. However, if any sheets were added to the DWF

file in Autodesk Design Review, those sheets will not be included in the republished DWF file.

To republish a markup set, click the Republish Markup DWF button at the top of the Markup Set Manager. Next, select one of the following:

- Republish All Sheets – Clicking this option republishes all sheets within the marked up DWF.
- Republish Markup Sheets – Clicking this option republishes only those sheets in the marked up DWF file that have associated markups.

Then in the Specify DWF File dialog box, select a DWF file or enter a name for the file and click Select. By default, the previously created marked up file name is displayed and is overwritten with a file of the same name that contains the drawing and markup changes.

PRINT A DRAWING WITH MARKUPS

If you desire, you can print a drawing with markups. Begin in Windows Explorer and double-click a DWF file that contains markups. The DWF file will open in Autodesk Design Review. You can then print the marked-up DWF file.

CONCLUSION

As you are in the final stages of a design, drawings can be published for review. Then you can receive corrections and comments electronically. These can then be implemented and you can respond to these comments and then republish your drawings. Doing all this electronically streamlines communication and results in a more efficient design process. What better way to accomplish this than through the use of AutoCAD Architecture and Autodesk Design Review? If your company is looking at “going green,” this is a perfect solution to stop printing all those paper drawings for markup and review.



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

The Autodesk Exchange Apps Store



If you're using AutoCAD® 2012, you may have noticed a new tab that recently appeared in the AutoCAD online help window. This is the link to the new Autodesk Exchange Apps store for AutoCAD that was launched in June 2011.

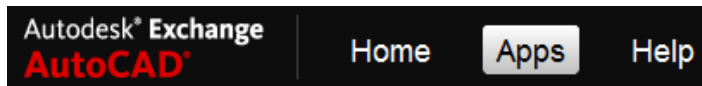


Figure 1: Where did that come from?

Your first question when you saw this may have been:
How will this help me?

And perhaps that was followed by:
How do I publish my own stuff?

I'll answer both questions in this article along with a third question that some CAD and IT Managers will be asking: How do I disable it?

HOW WILL THIS HELP ME?

Many AutoCAD users write their own plug-ins and macros using LISP, ObjectARX, .NET, or VBA, and there is a large and thriving community of programmers and experts who make a living selling applications and content based on Autodesk products. If you're not customizing or programming AutoCAD, then you're really only using half the product. Even just writing a few simple utility macros to automate common tasks can greatly increase your productivity.

Plug-ins for AutoCAD are nothing new, but the Autodesk Exchange Apps store is. The store creates a single marketplace where you can quickly find the utilities you need. There, you'll find plug-ins, block libraries, e-books, training videos, standalone applications, and other products that help you to be more productive when working with AutoCAD.

Autodesk reviews and tests every submitted app before it is published to help ensure it is of suitable quality and that it follows some simple usability requirements. The vast majority of apps are

AutoCAD plug-ins and block libraries—these make use of the new AutoCAD 2012 Autoloader feature and a standard installer template to ensure a consistent installation and discovery experience. That means they all install the same way and users can always find the user interface and helpfile in the same place.

A SIMPLE EXAMPLE ...

Let's say you're working in a drawing that contains several inserts of the same block. You need to create offset geometry for the lines contained in just one of those block inserts (i.e., you don't want to use BEDIT to edit the block definition to create the offset lines inside all of the block inserts). You could do something like explode the block insert, draw your offset lines, and then reinsert the block. Or you could search the store to see if there are any utilities that might help. Let's do that now.

First, we open the Exchange Window (EXCHANGE command), select the Apps tab and search for "offset" (Figure 2).



Figure 2: The Apps homepage

That first hit for the search looks promising—the OffsetInXref plug-in (see Figure 3). Even better, it's free. Other apps are trials or must be purchased. Purchase transactions can be made through PayPal.

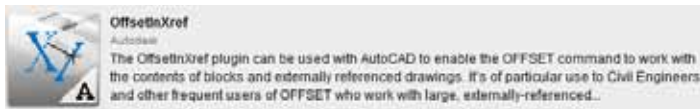


Figure 3: We found a suitable app—OffsetInXref

We open up the product description page, check the ratings and comments made by other users, and read through the helpfile documentation. It looks like this does just what we need, so we click the download link. The plug-in installer automatically runs and adds a new panel to the AutoCAD Plug-ins tab, which confirms that installation was successful (see Figure 4).

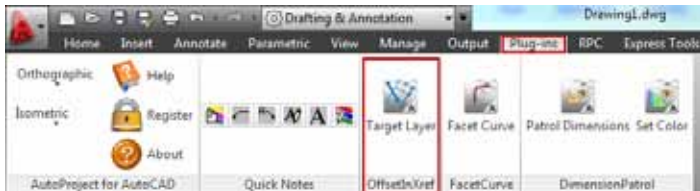


Figure 4: Each plug-in adds a panel or tab to the AutoCAD ribbon so you can easily find it.

Now we're ready to start offsetting geometry from inside the block inserts that we couldn't work with before. We don't even have to restart AutoCAD.

OffsetInXref was originally posted as an Autodesk Developer Network (ADN) Plugin of the Month on the Autodesk Labs website (<http://bit.ly/nfN73w>). The Plugin of the Month program is intended to demonstrate that you can create productivity enhancing tools and utilities with relatively little investment in learning to program using Autodesk Application Programming Interfaces (APIs). All Plugins of the Month come with full source code to allow you to study and enhance them.

THREE FREE APPS

A large part of my work at Autodesk over the last six months has been coordinating the review and testing of apps submitted to the store to make sure the shelves were full when it launched. That means I've played with almost all the apps that are published there today. Many are free; many are trial versions (offering either functionality-limited or time-limited use); others can be bought via a simple PayPal transaction. Prices for purchased apps range from less than \$5 to more than \$1,000. I'll come back and review some interesting purchased apps in the future. But to whet your appetite, here are my suggestions for three free apps to try if you want to experiment with the Autodesk Exchange Apps store.

COINS Translate

COINS is a global company that creates and sells construction industry software solutions. COINS has posted a fun, free app to the store called COINS Translate. This ticks all the boxes for me as a cool plug-in: it's simple, it's useful, and (with the whole world going nutty over cloud computing) it uses a web service.

Working with colleagues around the world, I often have to translate text into English. COINS Translate uses the Google Translate web service to translate MText and Text in drawings.

Here's a very simple example. I received a drawing with some annotations that I want to translate (see Figure 5).

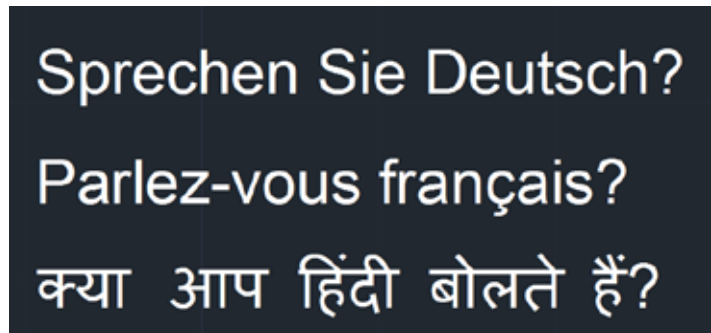


Figure 5: Mtext to translate.

After installing the app, I simply click the button it added to the Plug-ins ribbon tab and select all the MTexts I want to translate. A dialog then lets me choose the language to translate from and to (Figure 6). It even includes an option to auto-detect the 'from' language. (I'm using the auto-detect option on the text in Figure 5.)



Figure 6: Selecting translation options

Click the 'Go' button in the dialog, and the selected text is replaced with the translation. My MText now looks like Figure 7.

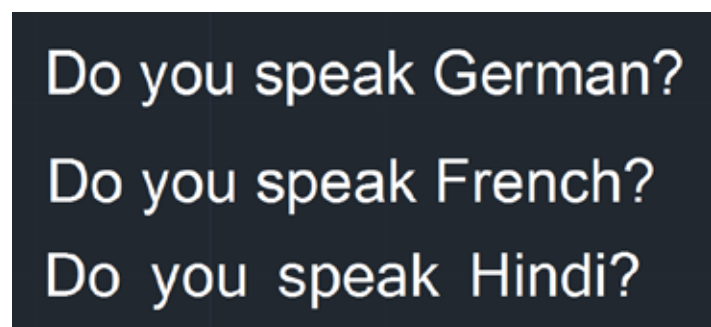


Figure 7: The result of the translation

ADN DWF/PDF Batch Publish

DWF/PDF Batch Publish is another ADN Plugin of the Month. This was by far the most popular download from the Autodesk Labs website, and it's already topping the download list in the

Exchange Apps store. This is another example of a simple plug-in that does what it does really well. As you no doubt guessed from the name, it helps you quickly publish a batch of drawings to DWF and/or PDF format. As a Plug-in of the Month, it includes source code, and so also serves as an example of good coding practice when batch processing drawings.

Again, the plug-in is launched by simply clicking the button installed to the plug-ins tab. A dialog lets you select the folder containing the DWGs to process, the output folders for the DWF and PDF files, and a few configuration options (see Figure 8).

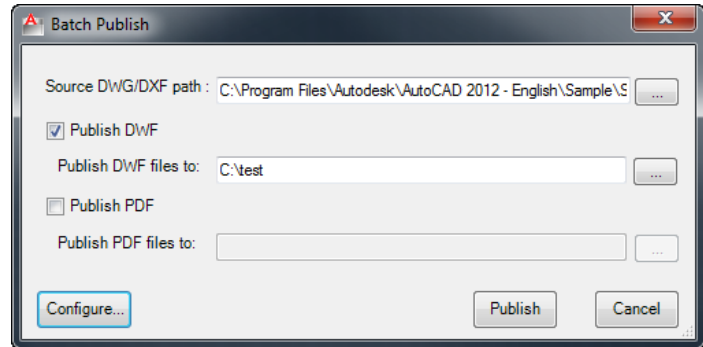


Figure 8: The DWF/PDF Batch Publish dialog

Click the Publish button and you're off. The plug-in whips through your selected DWGs (Figure 9) quickly creating your DWFs/PDFs.

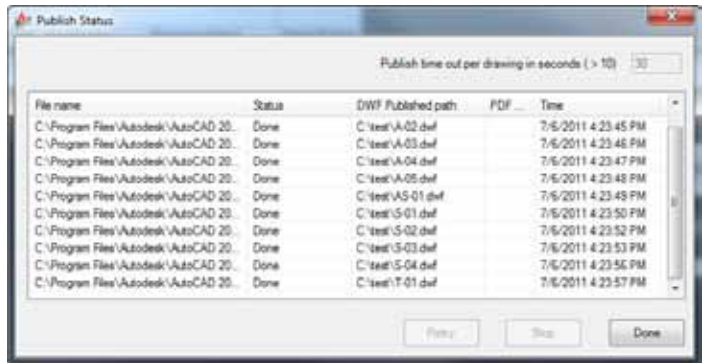


Figure 9: The Batch Publish status dialog

DotSoft OrderByLayer

DotSoft has been writing productivity improving plug-ins for AutoCAD since 1988. These plug-ins range in complexity, but many of them are designed to tweak or enhance existing AutoCAD features to make them quicker and easier to use. The free DotSoft OrderByLayer plug-in does just this. It builds on the DRAWORDER command to allow users to quickly set the relative draw order of all geometry on a selected layer. Without OrderByLayer, you'd probably run the QSELECT command to create a query to select all the geometry on a layer, and then run the DRAWORDER command. After installing the plug-in, simply run the ORDERBYLAYER command (at the command line or by clicking the button added to the ribbon) to display the OrderByLayer dialog. Figure 10 shows a simple example draw-

ing with three solid hatched circles on three different layers along with the OrderByLayer dialog.

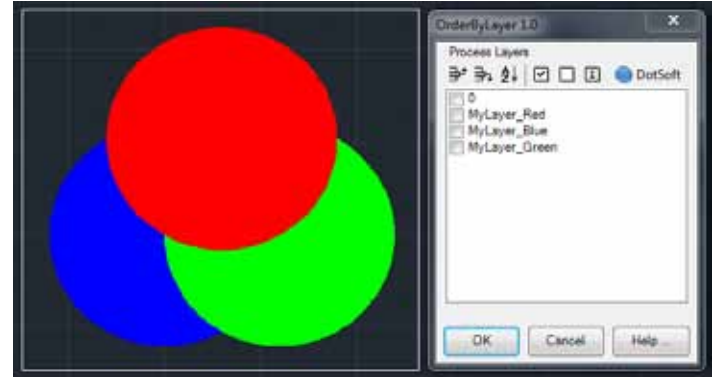


Figure 10: The default draw order has MyLayer_Blue at the back

Click the checkboxes next to the layers for which you want to change the relative draw order, and then use the Move Up/Move Down buttons on the dialog to set the order. Clicking OK will dismiss the dialog and redraw the drawing in the changed order (Figure 11)—much quicker than setting the draw order by layer without the plug-in.

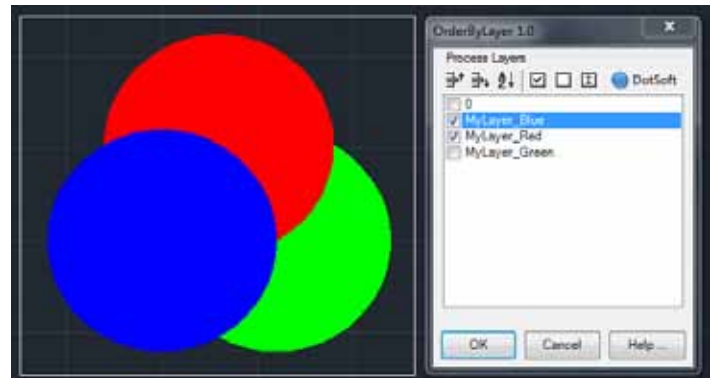


Figure 11: Objects on MyLayer_Blue are now drawn in front of MyLayer_Red

Take some time to search and browse the store to see what else is there. At the time of writing there are already 150 apps posted—plug-ins, standalone helper apps, block libraries, e-books, and training videos—and more are being added all the time. Download a few more free ones to see how it works.

HOW DO I PUBLISH MY OWN STUFF?

The Autodesk Exchange Apps store isn't just for professional programmers. Many of us have our own collections of helper utilities, block libraries, or other AutoCAD content. And anyone can submit their apps to be published on the store. Click on the button on the Exchange Apps tab to get started (see Figure 12).

You'll be asked to agree to the publisher terms and conditions and provide some information about yourself and your app. Once submitted, Autodesk will review your app and (if there are no problems) publish it within two weeks.

As long as your app is useful to other AutoCAD users and doesn't do anything nasty (like crashing AutoCAD) then it's probably something you can publish. (Detailed product guidelines are

available on Autodesk Exchange as part of the publisher terms and conditions.) And if you want to sell your stuff (instead of posting it for free) then you need to create a PayPal account.

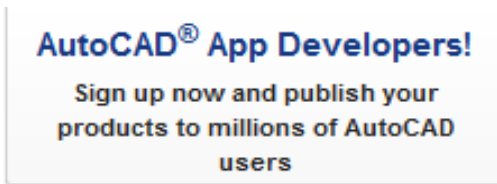


Figure 12: Click on this button on the Apps tab to publish your own apps

ANATOMY OF AN APP

The vast majority of apps available in the store are plug-ins and block libraries. Both of these app types use the Autoloader feature (new in AutoCAD 2012). In the case of block libraries, this is to install the partial CUI that defines the UI elements (ribbon panels, toolbars, etc.) that drive the content. An Autoloader 'bundle' is a simple folder structure that is copied by the installer to a location on your hard drive where AutoCAD can find it. That's normally %appdata%\Autodesk\ApplicationPlugins (%appdata% translates to C:\Users\\AppData\Roaming on a standard Windows 7 installation). We call it a 'bundle' because the names of folders containing Autoloader plug-ins end in 'bundle' so that AutoCAD can identify them. A bundle for an Exchange store app is made up of the following.

Autoloader configuration file: Every Autoloader bundle contains an XML file (called 'PackageContents.xml'). AutoCAD reads this XML file to determine whether the plug-in is compatible with this version of AutoCAD, and so it knows how to load the various plug-in components and what support paths it has to set up. For example, you normally want your partial CUI to load when AutoCAD is launched, but (for performance reasons) you would typically only load the DLL containing the implementation of your plug-in when a command it defines is invoked.

Partial CUI file: Every plug-in (and block library) posted to the store is required to add information to the ribbon—either a panel on the Plug-ins tab, or a new tab for a larger plug-in that makes use of multiple panels. This is done by creating a partial CUI that is loaded when AutoCAD is launched. The user interface defined in this partial CUI must make it easy for the user to quickly get up and running with the plug-in, either by providing a simple and obvious user interface or providing access to the helpfile for the plug-in.

Helpfile: Regardless of any other (more detailed) helpfiles installed with a plug-in, every plug-in published to the Exchange Apps store must include a simple 'getting started' helpfile in HTML format. The information to populate this HTML file is gathered on the app submission form, and the helpfile is auto-generated from this information. The HTML file is viewable online (using a link from the app's page on the Exchange Apps tab), and is also installed with the plug-in. The locally installed copy of this helpfile can be displayed from the installer after installation is complete and can be accessed from the balloon notification AutoCAD displays when it detects a newly installed plug-in.

Plug-in components: Autoloader bundles support plug-ins written in .NET, ObjectARX (ARX and DBX) and LISP (LSP, FAS, VLX). How AutoCAD should load these modules, and the inter-dependencies between them, is described by the Autoloader configuration file.

Block libraries are handled a bit differently. An Autoloader bundle is used to install the partial CUI file that accompanies the library and to define any support paths needed to access the blocks from the user interface defined in the CUI. Many block libraries are driven through menus or other CUI elements (image tile libraries for example). These are installed as normal using the Autoloader bundle. The block library files (DWGs) must also be viewable using the Content Explorer palette (new in AutoCAD 2012). The actual blocks (DWGs) are installed to a location where Content Explorer (CONTENTEXPLORER command) can find them (see Figure 13). On Windows 7 this is %public%\Documents\Autodesk\Downloaded Content (%public% translates to C:\Users\Public\ on a standard Windows 7 installation).

Other stuff: Autoloader only supports certain file types, but you can put anything you like inside the .bundle folder. This might include extended helpfiles, or support or sample files. Autoloader doesn't replace any of the old ways to load plug-ins and files into AutoCAD, so you can put anything not directly supported by Autoloader into the .bundle and access it from the plug-in files that Autoloader can handle. Just don't use hardcoded paths to access these files. Instead, use relative paths, support paths defined in the configuration files, expand the %appdata% environment variable, or query the location of your DLL at runtime using Windows APIs.

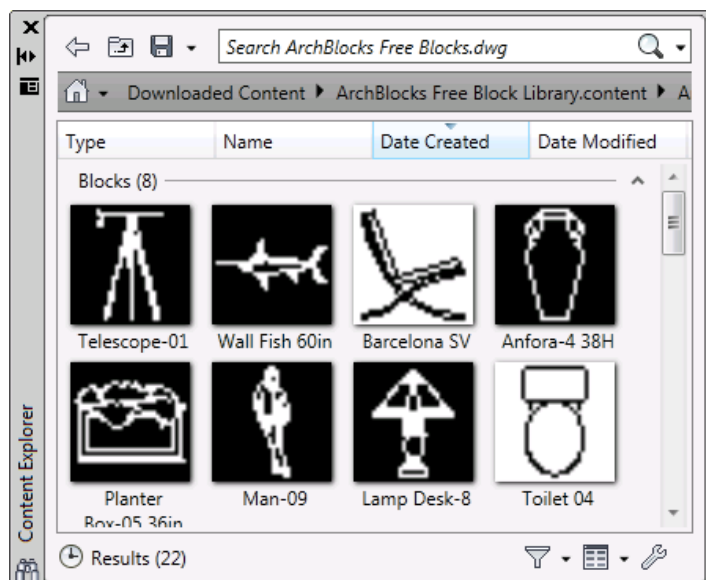


Figure 13: Block libraries can be accessed using Content Explorer

DISABLING EXCHANGE

I promised at the beginning of this article that I would also answer a third question that is particularly important for CAD and IT Managers:

How do I disable the Exchange Apps tab?

If you're managing projects that demand every workstation have exactly the same configuration, then you're probably not too keen on putting an Exchange Apps store on every computer in your network.

Not a problem. There are four ways you can disable the Exchange Apps tab in AutoCAD 2012, although disabling this tab will have the side effect of turning off online help (i.e., AutoCAD will only display the locally installed helpfiles using your default web browser).

These methods are described in detail in the "CAD Manager Reference - How to Block Access to Autodesk Exchange" document. You can download this from <http://bit.ly/qhsf8I>, but before you rush off to read that, I suggest you keep the Exchange Apps store enabled on your admin computer—you might just find some apps that will help your team with their work.

Here is a summary of the four methods.

Custom deployment

You can create a custom deployment with Exchange disabled from the AutoCAD setup.exe. You can then install AutoCAD to all your workstations using this custom deployment. This method is for disabling the Exchange window at installation time. It isn't suitable if you've already deployed AutoCAD.

CAD Manager Control Utility

The CAD Manager Control Utility can be installed from the AutoCAD setup.exe (select the "Install Tools & Utilities" option), and can be used to disable the Exchange window after you've deployed AutoCAD 2012. The CAD Manager Control Utility can be installed and used on the computer on which you want to disable the Exchange window, or it can be used to create a .reg file that you can push to workstations on your network using your preferred method.

Disable Exchange plug-in

The simplest way to disable/re-enable the Exchange window on a single computer is to install 'Disable Exchange' from the Autodesk Exchange Apps tab. This installs a plug-in—only usable by users with Admin privileges—that allows them to toggle the Exchange window on and off from the computer on which the plug-in is installed.

Manually

The above three methods essentially do the same thing—edit this registry key:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Autodesk\
AutoCAD\R18.2\ACAD-A001:409\CadManagerControl\
Help\EnableOnlineHelp
```

You can simply add/edit this key yourself using RegEdit or a .reg file. Setting this key to '0' will disable the Exchange window, setting it to '1' will re-enable it. (By the way, the 'A001' in that

registry key is the AutoCAD product code and the '409' in the key is the locale code. (The locale code will be different if you have a non-English AutoCAD version.)

You can also block access to the Exchange URLs through your corporate firewall.

FURTHER READING

If you'd like to find out more about publishing your own apps, start by visiting the Autodesk Exchange Apps Developer Center at <http://bit.ly/nixe0P> for more detailed information than I have room to include here. At this site you'll find guidelines and recommendations, answers to frequently asked questions, and tutorial videos. If you have any additional questions about developing and posting apps to Autodesk Exchange Apps, then please email appsinfo@autodesk.com.

Visit the AutoCAD Developer Center at <http://bit.ly/oPJ39C> for more general information on developing AutoCAD Plug-Ins and customizing AutoCAD.

My 'AutoCAD 2012 - New APIs' article in the April 2011 issue of *AUGIWorld* includes an overview of the Autoloader feature used by plug-ins in the store.

Kean Walmsley's 'Through the Interface' blog (<http://bit.ly/rcBWtR>) contains a wealth of information on programming AutoCAD in general, and some additional information on the Autoloader. Kean also manages the ADN Plugin of the Month program. The Plug-ins are posted to the Autodesk Labs website (<http://bit.ly/rqGQTF>).



Stephen Preston has worked for the Autodesk Developer Network team since 2000. Originally from the UK, he is currently based in the Autodesk San Rafael, California, office, where he manages the Developer Technical Services team in the Americas and is the ADN AutoCAD Workgroup Technical Lead. In this capacity he works closely with the AutoCAD engineering team on future improvements to the AutoCAD APIs. Stephen has been working with the Autodesk Exchange Apps store development team since its inception. He is currently managing the review and testing of apps submitted to the store, and helping programmers convert their plug-ins to the Autoloader format required by AutoCAD. You can contact Stephen at stephen.preston@autodesk.com.

COLLABORATION AND DATA MANAGEMENT FOR AEC PROJECTS

As the architecture, engineering, and construction (AEC) industry has evolved to meet the growing needs of the world's population, so has the need for industry collaboration grown ever more acute. As buildings become more complex and as the scale of projects becomes larger, more diverse and local talents are needed to realize design intent and satisfy construction requirements. The AEC workforces extended around the world have opportunities scarcely imaginable a decade ago; closely collaborating designers might never meet face to face, instead contributing critical expertise while thousands of miles apart; building problems that might once have seemed intractable yield to talent applied from across the globe. The AEC industry is improving life for millions of people around the world every year, and in large part our new ability to collaborate at a distance can be credited with the accelerating pace of that improvement.

At Autodesk, our vision is to provide a complete, accurate, digital view of a project, throughout the project lifecycle, with access to project data wherever and whenever it's needed. We call this Autodesk BIM 360. In BIM 360, we envision a set of scalable solutions that deploy quickly and interoperate smoothly, targeted to supply the level and type of data access and collaboration required by design teams, project teams, and enterprises trying to manage BIM information. Because the state of a project at any given moment is collectively summarized in models, components, cut sheets, specifications, shop drawings, RFIs, design bulletins, analytical results, e-mails, transmittals, warranties, and other documentation, adroit management of a project or a facility requires tools that deliver the right information to the right people at the right time. Our Autodesk BIM 360 vision supports dispersed project and construction teams by making information available when and where it's needed. By taking advantage of expanding connectivity and cloud computing, Autodesk is helping close the information gaps that exist between design intent, field execution, and ongoing facilities management.

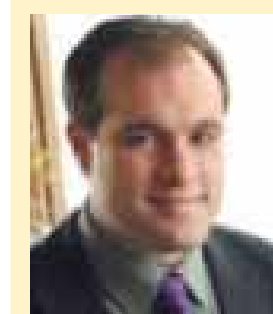
To support this vision, Autodesk is introducing Autodesk® Vault Collaboration AEC software. With more than 400,000 users of Vault in the manufacturing industry, the software is a proven, scalable technology. Vault has been greatly enhanced for the AEC market through integrations with Autodesk® Revit® 2012 soft-

ware products, AutoCAD® Civil 3D® 2012 software, Autodesk® Navisworks® 2012 software products and Autodesk® Buzzsaw® software as a service. Vault can handle virtually any file format, and in addition to many Autodesk products, it offers integrations in more than 35 other applications including ERP programs such as SAP.

<http://bit.ly/mQndHK>

Now, users can manage their design files and data without having to leave their native design environment, searching for and accessing project content directly from Revit software and Civil 3D, promoting higher productivity, faster user adoption, and effective deployment of project data management. To extend collaboration and data sharing to multiple design firms and other constituencies (including outside or third parties) in a building project, Vault Collaboration AEC also integrates with Autodesk Buzzsaw, Autodesk's cloud-based collaboration solution. Because Vault can automatically synchronize files and data with Buzzsaw, the two deployments work in concert to enable a truly complete collaboration and data management solution, specific to the AEC industry.

As the industry continues to wrestle with huge amounts of data generated on today's complex AEC projects, collaboration and data management processes and technology need to be developed and deployed to support project workflows characterized by multi-discipline and geographically dispersed players. We believe our Autodesk BIM 360 vision, and the use of Autodesk Vault Collaboration AEC and Autodesk Buzzsaw Software as a Service, can help meet the challenge.



Anthony Hauck is a Revit Design Product Line Manager at Autodesk (AEC). You can reach him at Anthony.hauck@autodesk.com.

Speaking the Same Language



In an international world, where good communication is necessary, the ability of software to “speak” different languages—specifically to import and export multiple file formats—is crucial.

AutoCAD® Map handles this well. The software can import and export ArcGIS shape files and coverages, Microstation, and Map-Info, to name a few.

With more companies moving to GIS systems, it's imperative for companies to implement their own GIS, or at least create the ability to not only view but manipulate data provided by other companies or government agencies. Map is versatile enough to create and manipulate data based on a company's unique needs.

TYPICAL SCENARIO – USING CITY GIS SYSTEMS

The City of Bismarck in North Dakota has put together a robust GIS system of the entire city, including some parts of Burleigh County. Even better, all the data is made available to the public in ArcGIS shape files. They are organized first by data type such as land base (subdivisions, lots, blocks and address points), water, sanitary sewer, electrical, storm, topography, and image files. For private engineering and land survey firms, the data is not only useful, but saves a tremendous amount of research time (see Figure 1).

Once we decide what data we need, it's now a matter of deciding how to import it.

USING MAP IMPORT

The quickest way to import shape files is with Map Import (Insert Tab on the Ribbon > Map Import or type MAPIMPORT). Using this method, you can import multiple shape files at once. The benefit

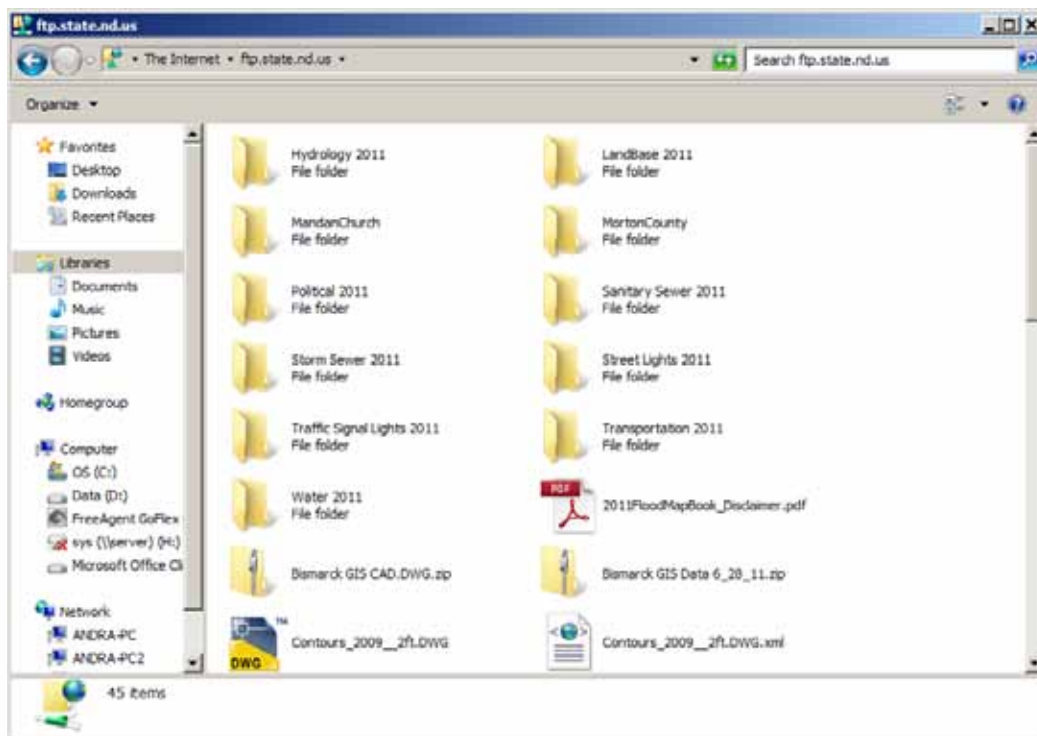


Figure 1: City of Bismarck's public GIS FTP site.

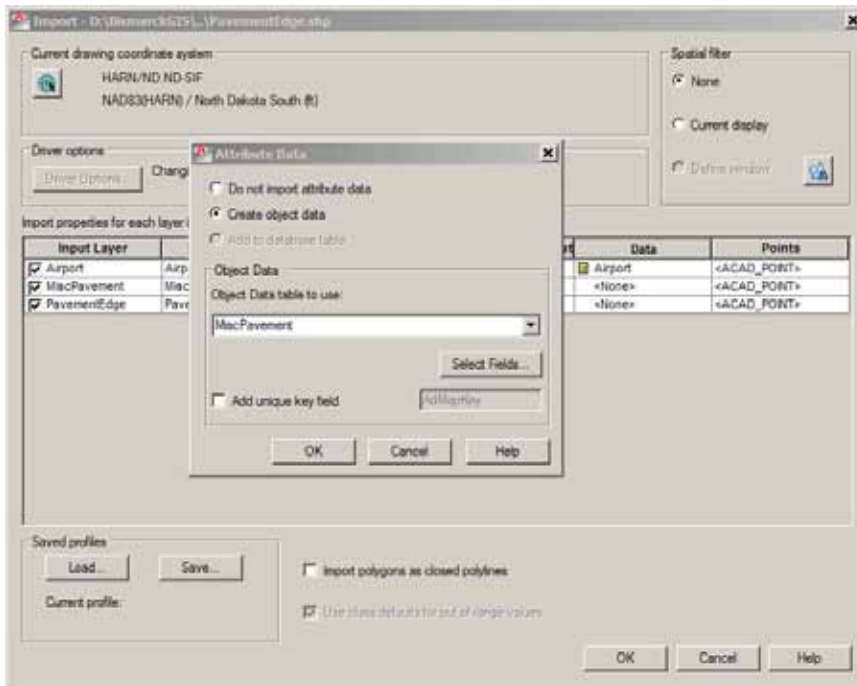


Figure 2: Using Map Import

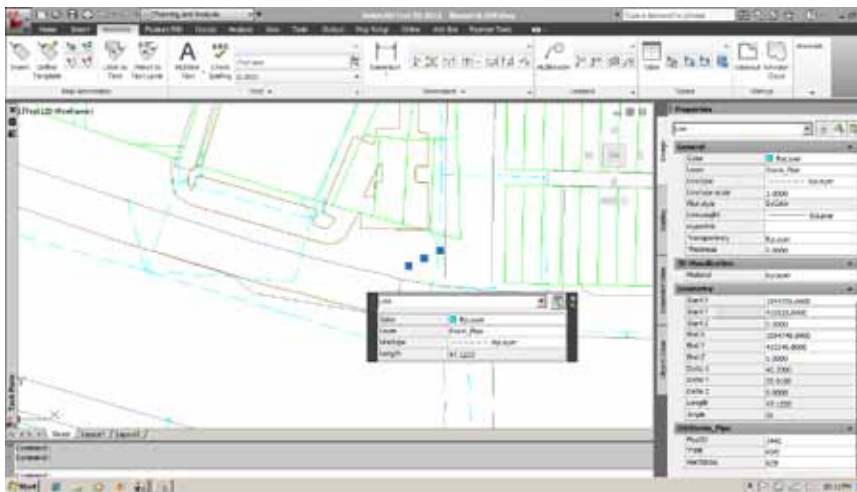


Figure 3: Viewing imported data

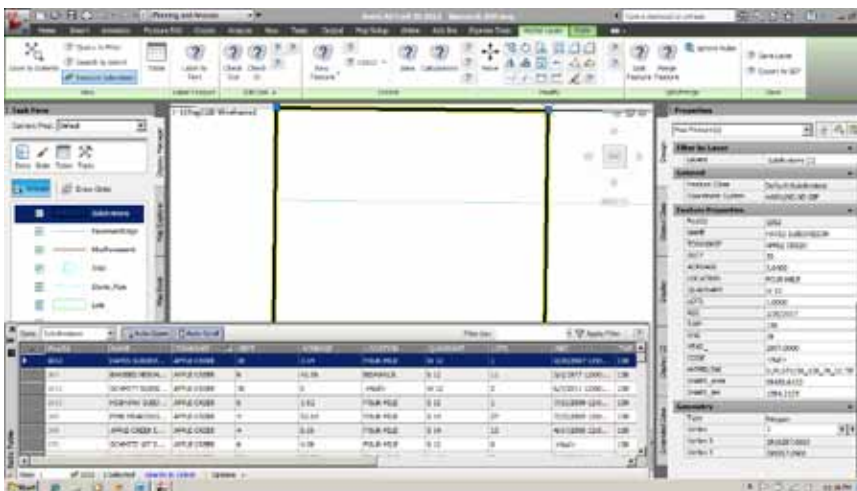


Figure 4: Using Data Tables

is time savings, because you're not importing data one type at a time. It's also useful for those who have AutoCAD® standard or AutoCAD® LT, and still need access to the linework of some data.

Another benefit to this method is the ability to determine how much data to bring in from the shape file (see Figure 2).

If you only want the linework, you can choose not to import any attribute data. Or you can choose the "Create object data" option. I usually choose this option, because as a surveyor and engineer, I'm equally interested in the data as well as its location.

The one downside to this method is you can't search for specific data such as a manhole type or subdivision. All you can do is pick it and view the data within Properties (see Figure 3).

Although the data is included in the AutoCAD entities, it is not linked to the original shape files. Therefore, any changes you make to the linework or properties will not be updated. This could be a good thing, because someone working in the AutoCAD file cannot inadvertently make changes or deletions to the original data.

USING DATA CONNECT

When it comes to being able to search data, especially within larger areas, using Data Connect is a better option.

Often we are hired to survey a specific lot in a subdivision, but sometimes we don't know exactly where it's located. For example, by bringing in the Subdivision and Lot shape files, I can bring up the data table (Task Pane > Right-Click on Feature > Show Data Table), and organize by column in ascending or descending order. I can also create a calculation or filter out specific data. Once I find what I'm looking for, all I need to do is double click on the gray box to the left of the table. Map will zoom in and highlight the feature I need (see Figure 4).

By using Data Connect, you can also modify or add any features, and the shape files will be updated. For instance, if we created a new subdivision within the City of Bismarck, instead of waiting for their GIS to be updated and uploaded to the FTP site, we can add it to our system.

EXPORTING DATA CONNECTED FEATURES

When working with shape files you might encounter a situation in which someone within your company or a different firm needs the same data, but has only AutoCAD. You could start another drawing and



Figure 5: Connected data



Figure 6: Exported drawing file

import using Map Import, but if there is a lot of data, that would take a considerable amount of time.

A better way is to Save Current Map to AutoCAD in the Output tab of the Ribbon (command MAPTOACAD). Note to AutoCAD® Civil 3D® users: Both the ribbon and typed command will give you an “Unknown command” error. Instead type MAPEXPORTCURRENTMAPTODWG. (How’s that for a lengthy command?)

The drawing it creates now has all the linework, polygons, and symbols of the original drawing, but without the feature data (see Figures 5 and 6).

The difference is all the linework are polylines. Polygons, are closed polylines with hatches, and any symbols are basically exploded into their basic parts, such as lines and circles.

CREATING A SIMPLE GIS

My firm was recently hired by a small town about 30 miles outside of Bismarck to create a GIS system similar to Bismarck’s. We showed them what Bismarck did with theirs, and they decided that’s exactly what they wanted.

They also asked for our recommendation of software to view and manipulate the data once it was created. We went back and forth between AutoCAD Map and ArcGIS. Eventually we decided on ArcGIS, because it was designed for GIS, not drafting. AutoCAD Map would have too large of a learning curve for the city. However, we did decide to create their system using Map, because we were already familiar with the software. And with our experience using Bismarck’s system, exporting out to shape files was fairly simple. The most time-consuming portion of building the system was compiling all the data and deciding what to include. Luckily we had surveyed most of the city and had all the data in an AutoCAD file using Civil 3D. From there it was a matter of creating Object Classes for each type of data such as storm sewer manholes and street lights.

Once we had all the data compiled into Map including Internet links to tax data and an Excel file of all parcel ownerships, all we have to do now is export ESRI Shape files using Map Export (under the Output Tab). Using ESRI’s ArcGIS, all the city has to do is attach the shape files, create a link to the Excel file, and they are ready to roll.

There were other ways to create a system that would be more robust, secure, and efficient than shape files, but for a small city just starting out using GIS, it was the best option.

In the end it’s about communicating data across a variety of software platforms made available to multiple companies and governmental agencies. Whether using AutoCAD, Microsoft Excel, or ESRI’s ArcGIS, it is crucial that the software communicates as seamlessly as possible in today’s information age. AutoCAD Map makes that happen.












Andra Marquardt is a Registered Land Surveyor in the State of North Dakota and has worked for Toman Engineering Company – a civil engineering firm – since 1997. She has used AutoCAD beginning with Version 9, and has been using the Map’s GIS capabilities more extensively within the last year. If you’d like to write articles specific to Map, please email her at amarq013@yahoo.com

HEADS UP!










Updates, Service Packs and Top Known Issues obtained from product pages at Autodesk.com

AUTOCAD/ACA/AMEP




-  (2011-July-04) How to upgrade your AutoCAD Mechanical seats to the Autodesk Product Design Suite 2012
-  (2011-July-13) AutoCAD 2012 Block Editor Save Corruption Hot Fix
-  (2011-July-07) Vault 2012 Client Update for AutoCAD 2011
-  (2011-July-14) Performance issues with AutoCAD 2012
-  (2011-July-07) Express Tools not available in AutoCAD Mechanical 2012
-  (2011-July-20) AutoCAD 2012 Installation Error 1603, "Error: Please install DirectX" before installing AutoCAD
-  (2011-July-12) How to decline the automatic upgrade to Product Design Suite 2012 Standard
-  (2011-July-21) Windows Vista support for AutoCAD and AutoCAD LT
-  (2011-July-12) Serial number activation error with previous release of AutoCAD Mechanical




CIVIL 3D/MAP 3D

-  [Top Knowledge Base Issues \(2011-June-30\) AutoCAD Civil 3D 2011 Update 2](#)
-  [\(2011-July-04\) AutoCAD Civil 3D 2012 Cartogramma Extension](#)
-  [\(2011-July-07\) AutoCAD Civil 3D 2011 – Autodesk Vault 2012 \(Server\) Support Patch](#)
-  [\(2011-July-11\) 2012: Resolving installation issues with a clean install of AutoCAD Civil 3D](#)
-  [\(2011-July-13\) Exporting to a Shapefile](#)
-  [\(2011-July-15\) Autodesk Subassembly Composer Support Pack for AutoCAD Civil 3D 2011 & 2012](#)
-  [\(2011-July-16\) Autodesk Storm and Sanitary Analysis 2012 Hotfix \(localized Civil 3D and Map3D versions only\)](#)
-  [\(2011-July-18\) Autodesk Infrastructure Administrator 2012 Oracle System Message Translation Hofix \(for AutoCAD Map 3D 2012\)](#)
-  [\(2011-July-28\) CAiCE Translator Extension for AutoCAD Civil 3D 2012](#)




REVIT ARCHITECTURE/MEP/STRUCTURE






-  [\(2011-July-07\) Autodesk Revit Server 2012 Update Release 1](#)
-  [\(2011-July-13\) Revit Architecture 2012 Deployment Utility](#)
-  [\(2011-July-21\) Revit 2011 or 2012 products crash when attempting to replace material render appearance](#)

NAVISWORKS






-  [\(2011-July-13\) Supported file formats and applications for Autodesk Navisworks products](#)

AUTODESK INVENTOR AUTODESK INVENTOR PROFESSIONAL 2012








-  [\(2011-June-23\) Hotfix – Hole feature termination type defaults to Through ALL **Review readme file prior to installation of this Hotfix**](#)
-  [\(2011-July-11\) Clean uninstall of Inventor 2012](#)
-  [\(2011-July-12\) Empty browser name for origin work features](#)

-  [\(2011-July-12\) Updated 6/30/2011 - Autodesk Inventor 2011 Service Pack 2 Client Update for Autodesk Vault 2012 Server Releases](#)
-  [\(2011-July-12\) Updated 6/30/2011 - Autodesk Inventor 2011 Subscription Advantage Pack Service Pack 2 Client Update for Autodesk Vault 2012 Server Releases](#)
-  [\(2011-July-13\) Inventor 2012 Readme](#)
-  [\(2011-July-26\) Autodesk Inventor 2010 Service Pack 4 Client Update for Autodesk Vault 2012 Server Releases](#)
-  [\(2011-July-28\) Some common problems in Inventor service pack installer and how to solve them](#)

3DS MAX/MAYA

-  [\(2011-July-01\) Autodesk Maya 2012 Hotfix 4](#)
-  [\(2011-July-15\) How to install Maya 2011 on a Mac](#)
-  [\(2011-July-15\) How to install Maya 2011 on Windows](#)
-  [\(2011-July-26\) Hotfix 2 – Autodesk 3ds Max Design 2012](#)
-  [\(2011-July-26\) Hotfix 2 – Autodesk 3ds Max 2012](#)

MULTIPLE AUTODESK PRODUCTS

-  [\(2011-July-25\) Licensing Cascading Behavior of Autodesk Manufacturing Products and Suites](#)
-  [\(2011-July-25\) License Sharing Behavior of Autodesk Manufacturing Products and Suites](#)
-  [\(2011-July-25\) Dynamic Licensing Behavior of Autodesk Manufacturing Products and Suites](#)
-  [\(2011-July-25\) Hotfix – Unable to open CATIA V5 R20 files with DirectConnect 2012](#)
-  [\(2011-July-25\) Hotfix – Import shrink option not functioning properly with DirectConnect 2012](#)
-  [\(2011-July-28\) Failure Creating Deployment for Autodesk Building Suite Ultimate 2012 on Windows 7 x64 or Vista x64](#)
-  [\(2011-Aug-01\) 2012: FLEXnet feature codes for Autodesk products](#)

15 Questions with Shawn Hendriks

Senior Technical Marketing & Video Production Manager

Media & Entertainment Marketing

What's your role at Autodesk, Shawn?

I'm the Sr. Manager of video production and technical marketing in Media and Entertainment as well as a little bit of every other job I have had in this company over the years. You really never completely get rid of a job once you have done it for a while. Nobody ever seems to forget.

How long have you been with Autodesk doing this? Any other roles?

According to MyHR, I have been with Autodesk for 13.5 years. In that time I have tried on a number of roles. I started as the AE for 3ds Max for Canada for four years. That led to being a technical marketing manager. Then things went crazy and I became, simultaneously mind you, Client relations, Community and Video Production manager (that was a busy couple years). The last couple of years I settled into my current role. Throughout most of this time I have also played the role of MC and public face at many of our live events and trade shows. Over the 13 years, I have had business cards that said I worked for Autodesk, Kinetix, Discreet Logic, Discreet, and finally back around to Autodesk again. All without ever changing employers.

Tell us a little about your background and how you came to be doing what you do now?

I was trained in Computer Graphics specializing in 3D. My first job out of school was actually working for one of Autodesk's Resellers, IC technology. It was a fantastic first job.

I was able to get my hands on everything to do with the CG industry. I was pre- and post-sales as well as a trainer for 3d animation, non-linear editing, web development, interactive graphics, and anything else the Reseller thought might be profitable. At the same time I was doing freelance production in everything from commercials to design visualization and accident reconstruction.

I ended up helping IC Tech and Autodesk close a big deal that sold 3ds max to a majority of the Disney studios around the world. That was when Autodesk came knocking. Big thanks to Mickey for helping with my career path.

What does a typical day look like at your desk?

That's a hard one. I have two different typical days. I spend about half my time on the road for events and producing video shoots with our customers. When I'm in the office I usually start with clearing off the night's email and then reviewing whatever dailies have been posted for videos we are currently editing as well as working on any plans for upcoming video shoots. That leads to some time spent working in our software figuring out new tools, etc. When you spend entire days with our top customers you have to stay sharp. During low energy times of the day I generally do social media stuff like twitter and blogs. The end of the day is usually more reviews of videos. My life would be perfect except the day is broken up by three to four hours of conference calls and meetings—things like upcoming tradeshow, and product launches. If it's a typical travel day, then its lots of time in airports and



airplanes and at customer facilities learning all about what they do. Then fit everything from my normal office day into the gaps and usually in the evenings at the hotel.

What kind of challenges do you and those you work with deal with?

Major events and launches are the biggest challenge for my team. It's hard to sum up the experience in a few sentences. Our task is to create presentations, demos, and videos that make customers want to buy our new software. The challenge is we need to start three months before the software ships using barely functional Alpha code that has a UI that's a moving target. It's really about coordination and rolling with the punches. There are lots of punches.

Can you say how many people work with you or perhaps how the work you do is shared?

Well, I manage a team of five. Everyone has their specialties but we all work to chip in and help wherever possible. Beyond that, I have what I call my personal org chart. This is made up of all the people I have worked with over the years at Autodesk that I know will deliver when I need it and I like to think they see me the same way. It has almost no correlation to the corporate org chart at this point, but it still keeps saving my butt.

Do you have a role at Autodesk University or other events?

This year I am helping coordinate the new Entertainment track at AU. I am also creating my own class that looks at animated builds with 3ds Max. Basically how to do a lot of that transformer type stuff that is so popular these days.

You've been blogging for several years. When did you start, how do you decide what to post, and how is readership growing?

I started blogging five years ago when I moved over to the community side of the business. Honestly I've been moving away from it the last couple years as I moved more into Twitter etc. I prefer micro blogging since it fits into the gaps in my schedule a lot better than full blog posts.

Where do you find the inspiration for your posts?

Everything I do on social media is driven by what I have found recently that I think is interesting. I often taken ideas from questions people have in our Forums on AREA as a starting point for a blog post.

What are some of your favorite blogs?

I'm a big fan of technology and science blogs in general like Gizmodo. I generally need to get my fix at least once a day.

What sort of things do you do for distraction, hobbies, travel?

God no. When you travel as much as I do, staying home is the vacation ;-). My main hobby is woodworking. When I get the time I like to make furniture. I just recently completed a dining room table. My whole work world centers on making virtual things so it's nice to build something tangible. I'm also an avid reader and, thanks to my trusty Sony e-reader and a long commute, I go through two or three books a week.

What would we be most surprised to know about you?

After this interview I don't think I have any surprises left—at least not ones that would be safe to share with a large audience ;-).

Where is your favorite place in the world?

From a vacation point of view it would have to be the Greek islands. I was never so relaxed. I spent my last few days there trying to figure out how I could retire there. If you have ever been there you might have noticed that they have plenty of flying bugs but oddly no one seems to have screening on their windows. I suspect there's a retirement business in there somewhere.

Collaboration in a Multi-Disciplinary/ Multi-Firm Environment



We all deal with it on a regular basis—sharing our drawing files with others. You won't always be the only person working on a drawing file for a project and you should always treat these files as such—preparing information along the way for the next person

needing to pick up where you left off. What happens when there are compatibility issues, though? How about if you need to continue to work on your files even after sending them off to a coworker or client? These are the kinds of questions I'll address in this article, as well as several others.

LOW-TECH COLLABORATION

There are all sorts of new, fancy ways to share your Civil files and documentation internally and with clients. Let's not forget, however, the many ways available to us over the years. The first of these methods I'd like to explore is through working with the PROXYGRAPHICS system variable.

Although not a complete solution, understanding how the PROXYGRAPHICS setting works will be your first round of defense for sharing intelligent AutoCAD® Civil 3D® files with your coworkers, subcontractors, or clients not utilizing Civil 3D for their own efforts. Proxy graphics store the last viewed image of Civil 3D objects, which lets users view your drawing without modifying the original objects. Also, they

only hold the graphical representation of the current, active viewport when the drawing file is saved.

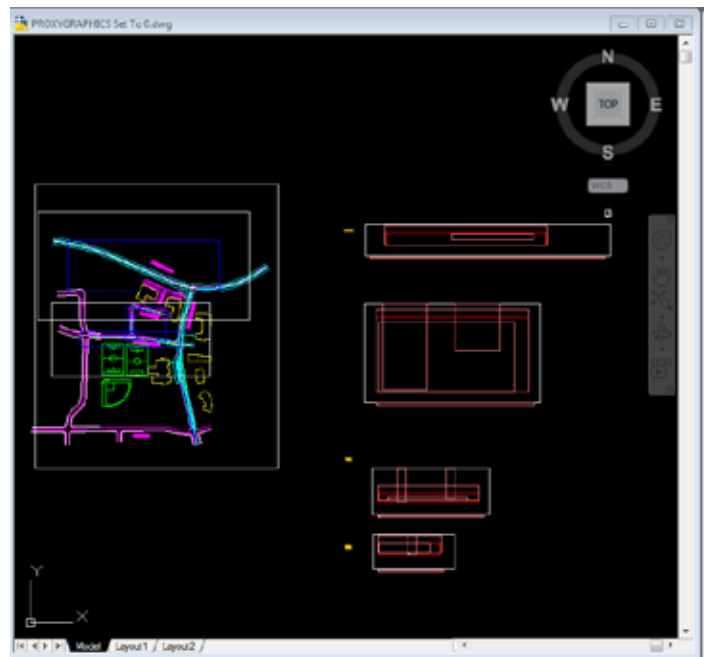


Figure 1: A drawing file created with Civil 3D, saved with PROXYGRAPHICS set to "0" and opened in AutoCAD®. Note the Civil 3D entities are broken. (Compare with Figure 2.)

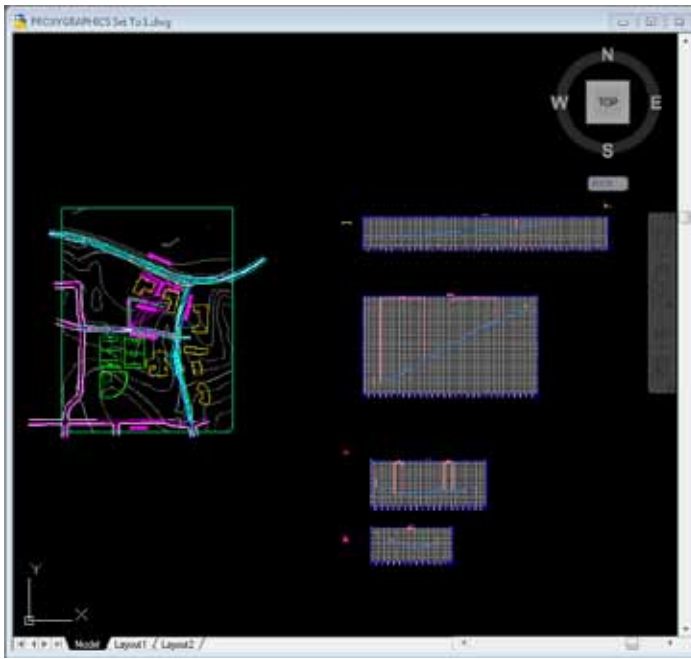


Figure 2: A drawing file created with Civil 3D and saved with PROXYGRAPHICS set to "1" and opened in AutoCAD.

Setting up the PROXYGRAPHICS system variable is easy enough. Simply type it in at the command line and set it to "1." The default is "0" and we'll explore the differences in this section as a point of comparison. With PROXYGRAPHICS set properly, SAVE your drawing.

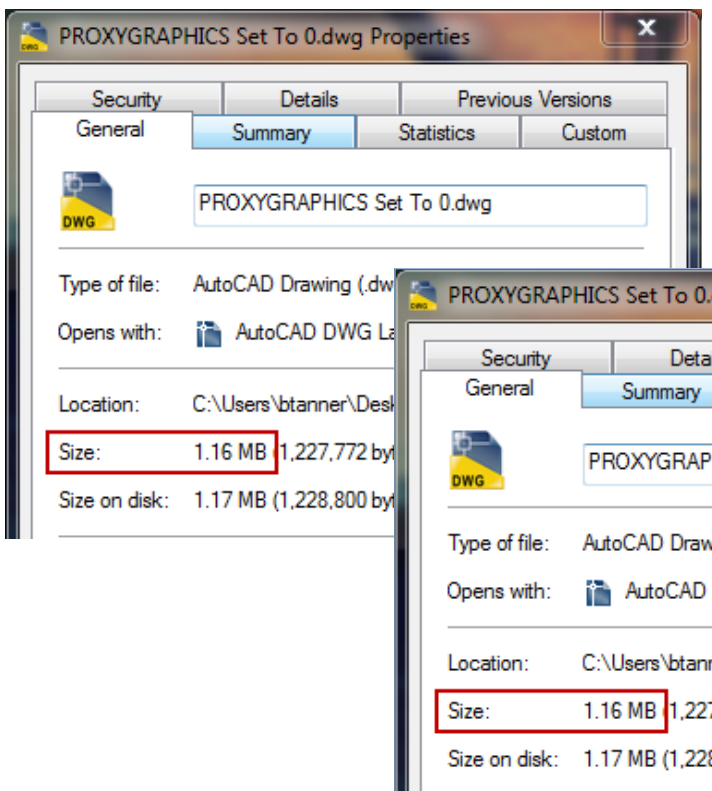


Figure 3: The PROXYGRAPHICS system variable has a drastic effect on file size.

It isn't that simple though, as there is an immediately apparent downfall of using PROXYGRAPHICS to control the visibility for your Civil 3D entities. The more complex a drawing file, the larger it becomes with PROXYGRAPHICS set to "1" compared with the default. Such a problem this may become, Autodesk even suggests in the Help documentation to save a copy of the original before attempting to apply the PROXYGRAPHICS system variable to your drawings.

The better option when going for a low-tech option for sharing your files? See if you can convince your counterpart or client to download and install the Civil 3D object enablers for their AutoCAD installation (<http://bit.ly/nfN73w>). It will save everyone time and headaches in the long run. However, proxy graphics are your only option for sharing on AutoCAD WS.

TRANSFERRING FILES

There are several options for sending a drawing file. Email, FTP server, and burned to a CD or DVD are the traditional solutions to this issue. Before exploring other transfer options in a later section, we first need to address the problem of ensuring your drawings look and act the same on any other person's workstation as they did on yours—before sending them.

One of the most likely issues in this regard is delivering a DWG that contains a broken or missing reference. Not only is this an annoyance for a client or collaborator to have to track down the correct file or path, but it may also be unworkable if the file used as a reference was never included to begin with. You could always bind your external references and promote your data references, but what if you have a

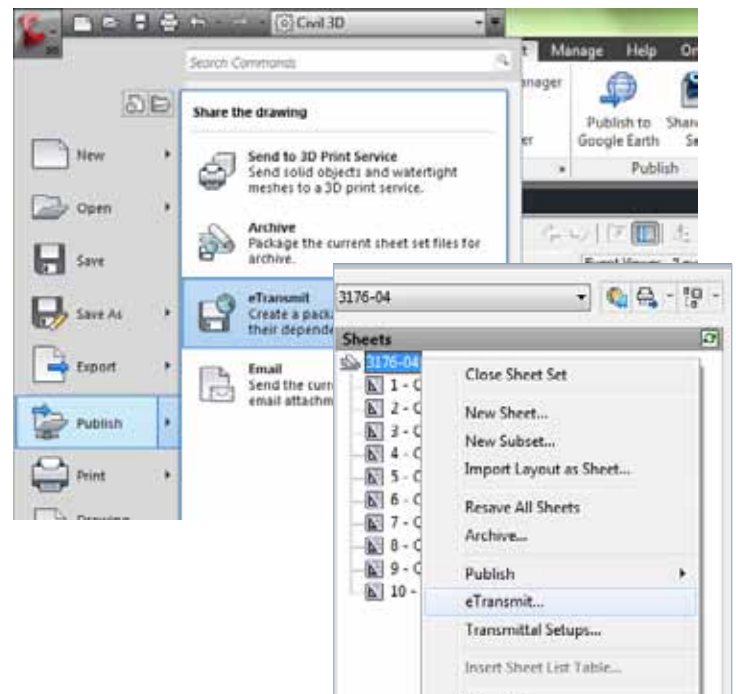


Figure 4: eTransmit from the Application Menu or SSM.

project consisting of dozens or even hundreds of drawing files? No one would want to be handed the task of opening, binding/promoting, saving, and closing all of those files.

This is where a simple solution called eTransmit comes into play. Sure there are other methods out there, but this is easily the simplest and most comprehensive way to package your project drawings for delivery to a client. The eTransmit tool will look for every reference file, pen settings, .CTB/.STB files, plotter drivers, font files, images, and anything else that has a relationship to the file(s) contained within the eTransmit job. It'll do all this and change all paths to relative, as well as add them to the files table to be packaged.

The biggest perk of all, in my humble opinion, is when this package (a .ZIP or a self-extracting .EXE file) is extracted. All files are referenced accordingly to their new location on a hard drive or network and all paths are automatically updated. Thus, there should be no concern or confusion over broken or missing references.

You can choose to run eTransmit from the Publish tools in the Application Menu or command line to package your open drawing file or from a Sheet Set Manager file to combine all relevant files for an entire project.

Packaged eTransmittals can be set up to also accommodate many other challenges faced when working with subcontractors or a client. The "Transmittal Setups..." portion of the Create Transmittal dialog easily allows formatting all files to a different DWG version than the one in which they were saved, exploding AEC objects for those without Civil 3D or the object enablers, and many other functions to improve compatibility.

It is also very easy to add files pertinent to the project, which wouldn't otherwise be associated to any of the drawing files. These could include transmittal forms, calculation tables, reports; there is no limit to what file types can be added. All in all, eTransmitting is a simple and straightforward process.

CONSTANT UPDATES INTERNALLY

With any project comes change; in many cases, constant change. Autodesk has aided in dealing with this for internal collaboration in Civil 3D 2012 by integrating the Sheet Set Manager with Autodesk Vault 2012. More specifically, this integration is only available to the following version of Vault 2012: Vault Workgroup, Vault Collaboration, and Vault Professional.

This integration allows you to perform the following actions from Sheet Set Manager:

- Add sheet sets to Vault
- Access and modify sheet sets in a multi-user and multi-site environment
- Provide Vault status information for sheet drawings

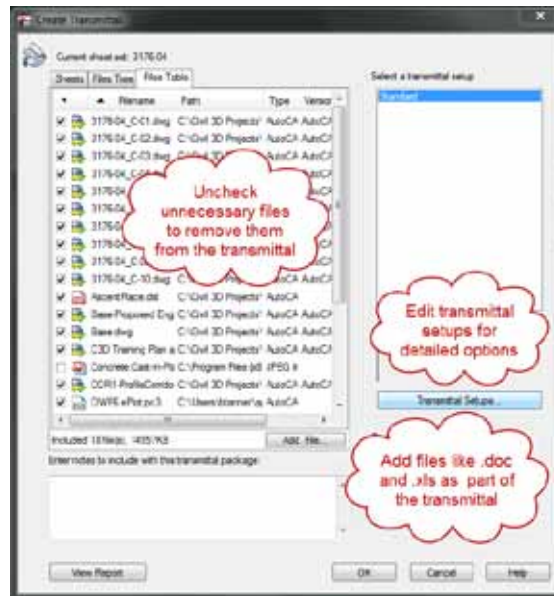


Figure 5: Configuring the eTransmittal for packaging.

CARLSON POINT CLOUD

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Put Your Scanned Data to Use with Carlson Point Cloud

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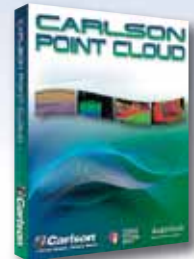
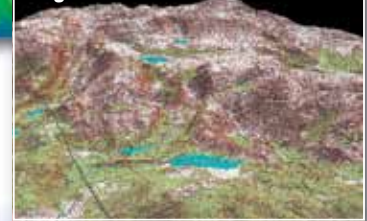


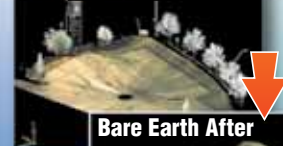
Image Before



Image After



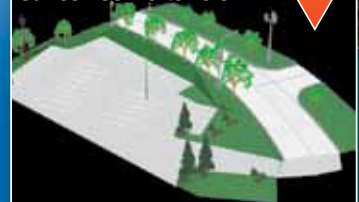
Bare Earth Before



Bare Earth After



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Vault also supports all sheet set functionality. This includes property management, plotting, and publishing tasks. Within Vault Explorer, search capabilities can be used to find sheets and sheet sets based on properties inside of the Sheet Set Manager. Relationships between sheets and associated drawings are kept, though sheets are represented as individual files with Vault.

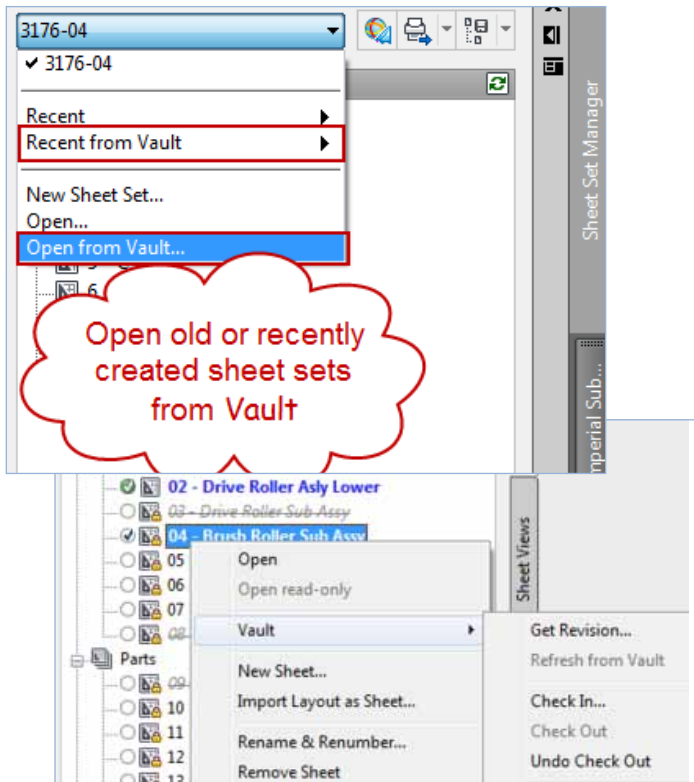


Figure 6: Sheet Set Manager integration with Vault 2012.

CONSISTENT UPDATES GLOBALLY

Another scenario to consider is sharing your files externally and pushing consistent updates to those stakeholders and collaborators. Autodesk Buzzsaw comes to the rescue, and, just our luck, Autodesk integrated Buzzsaw into Autodesk Vault via Project Sync. Project Sync is a utility that is built into Vault and allows for updating information directly from Buzzsaw. This is a quick and easy way to keep files unified internally and through exchange with external parties.

Hot Tip: Project Sync and Buzzsaw Sync are two separate applications. Where Project Sync allows for quick additions in Vault from Buzzsaw, Buzzsaw Sync “watches” folders for updated files for inclusion in Buzzsaw.

ANALYZING COMBINED MODELS

As much as we do within the Civil industry to ensure our models are accurate and work with real-world conditions, we also have to consider what other disciplines are doing. Suffice it to say, Navisworks is Autodesk’s flagship application for collaboration between multiple disciplines, consultants, and design software applications. Autodesk has developed tools and standards over the years (such as the .ADSK file

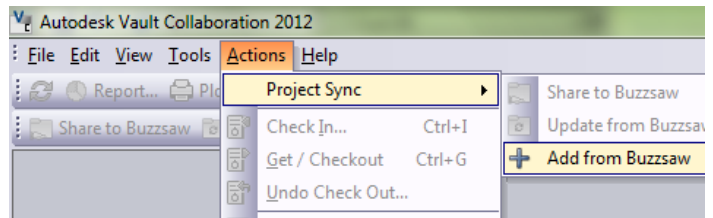


Figure 7: Add files to Autodesk Vault from Buzzsaw with Sync.

extension) to assist in data portability between applications, but nothing else comes close to the power, capabilities, and flexibility of Navisworks.

Without going into a full-depth review of Navisworks, it would be nice to know how to best work with Civil 3D for later use in Navisworks. There are few methods to do so, but your best bet for consistent results without unnecessary amounts of additional effort is to export a Civil 3D drawing for direct use in Navisworks. This should simply consist of freezing layers and hiding items you don’t want displayed in Navisworks, then using the NWCOUT command and saving the new .NWC file to the proper location.

Important: The NWCOUT command won’t be available in Civil 3D unless you had Civil 3D installed before installing Navisworks Simulate or Manage. Also, if you or your company doesn’t own a license of Navisworks, a free exporter utility can be downloaded from the Autodesk website.

CONCLUSION

With all these tools available (along with many more), hopefully you can discover a solution to any of your current hurdles in collaboration and coordination internally, as well as with client and subcontractors alike. Finding what works best for you and, more importantly, your clients, will be a constant evolution. Thankfully, Autodesk understands this and continues to develop new tools to aid in the process. (Just check out Autodesk Labs whenever you get a chance!)



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Collaborating with Autodesk Inventor Publisher 2011/2012



The need for collaboration is growing tremendously throughout the world. There is no single factor pushing this growth, but instead, a world changing under the influence of communication and technology.

As companies shuffle responsibilities among offices and collective work-from-home groups continue to emerge, the ability to convey design-related information in a fast, easy-to-understand format is needed.

As clients become more focused on meeting competitive performance criteria, the ability to share information in an accessible format is now becoming a contract requirement.

As consumers become more dependent on technology, everyone is releasing help and instructional documents online, and the need to access that information is part of the value perceived by the consumer.

Autodesk Inventor® Publisher meets many needs and supplements many workflows that paves the way for conveying thoughts and instructions.

This article will briefly touch on the collaborative benefits of Publisher in the following areas:

- Autodesk Inventor Publisher
- Model access
- Manipulation

- Visualization
- Documentation

AUTODESK INVENTOR PUBLISHER

Inventor Publisher is a revolutionary tool that gives anyone with a computer the ability, by way of numerous formats, to access very specific information about an Autodesk Inventor design.

Publisher can load any Inventor model through both file-based projects and Vault. The user can then depict any number of feature-specific

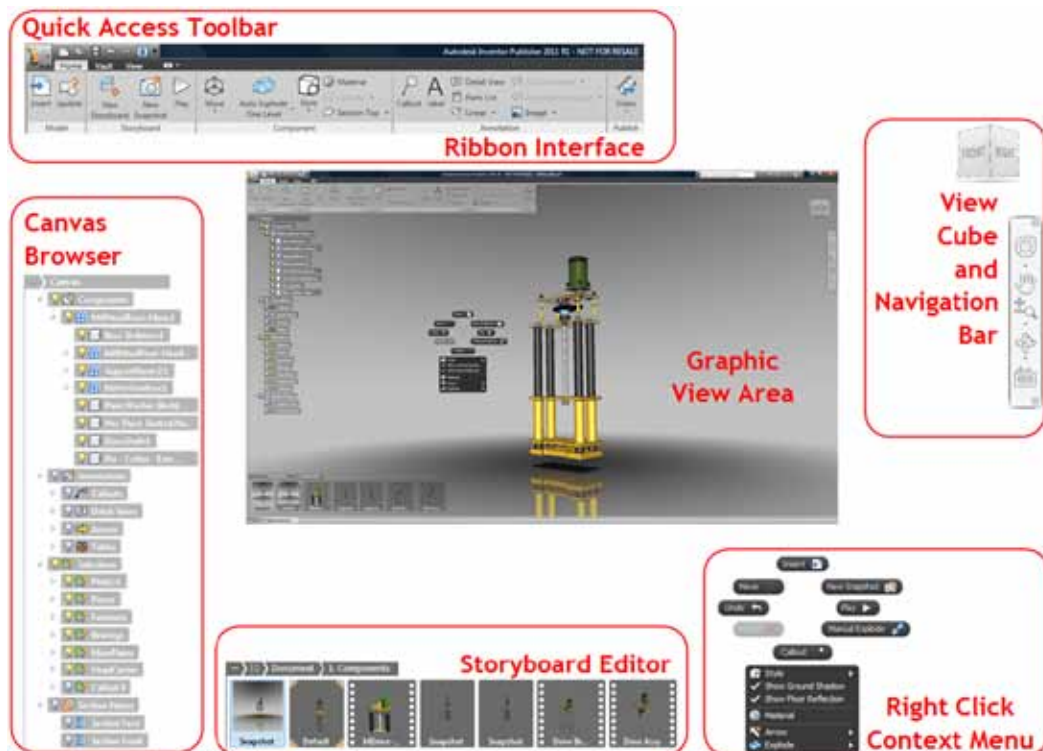


Figure 1: The Publisher interface

thoughts, including exploded views, assembly instructions, and design limitations through graphical views, videos, notes, and text leaders. Almost any form of graphic depiction you can think of in Inventor, is available in Publisher.

These can then be shared with others in a multitude of formats including video, PowerPoint, mobile, and document-based outputs.

MODEL ACCESS

Within the enterprise workgroup, there are always members who can benefit the company by having access to the design model without the ability to modify it. Publisher opens Inventor part and assembly files in read-only mode, giving access to component manipulation and BOM data in a non-destructive environment.

Not only having access to in-house design files, Publisher opens numerous other formats including DWG, CATIA, IGES, ProE, SAT, STEP, and DWF files. This gives access to files from other offices and companies, without having to have their software available, or even needing to install Inventor on a workstation.

When the Inventor model is updated by engineering, it is dynamically updated in Publisher, which allows documentation teams to start quite early in the design process rather than waiting for the design to be completed. This is great for teams that collaborate via Publisher, as the organized views update automatically when older design files are replaced by updated models.

One of the wonderful things about Publisher is that it doesn't have to be used as a publishing tool. It's an awesome viewer. Does the boss have a tendency to rearrange things accidentally on occasion when viewing design information? Give him Publisher. He can access anything he likes, and monkey with it to his heart's content. No worries.

MANIPULATION

Conveying specific thoughts about how a motor will be mounted or a stator will be fit can be quite tricky, and often involves a video and

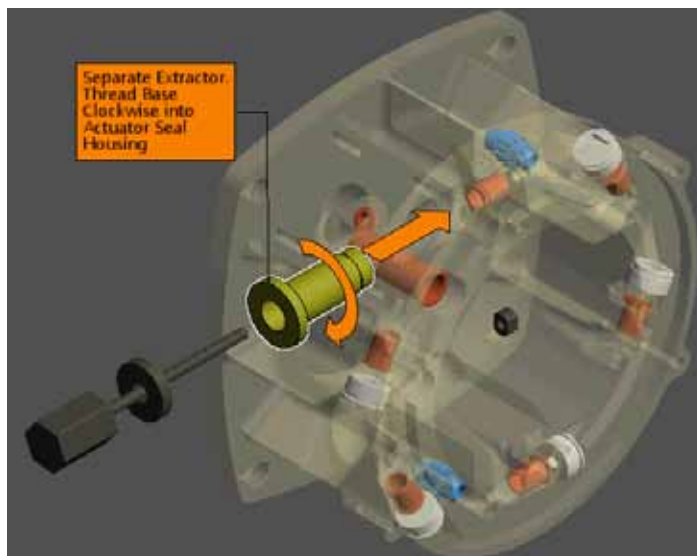


Figure 2: Using additional models to clarify hands-on instructions

dialog that needs to be painstakingly edited in order to relay the information properly. Publisher provides tools that make getting the point across remarkably easy, allowing components and component assemblies to be moved and positioned in any manner you like.

When it comes time to deliver instructions to crews and consumers, or relate a problem to team members, a little out-of-the-box thinking can be employed. Additional components can be introduced into Publisher as desired in order to support various functions, such as a tool that's required, in order to complete an operation.

This is as easy as inserting another component and positioning it in the frames that are relevant. You can easily turn it off where you don't want it to appear.

Positioning

The Move Triad offers 6 DOF for anything that can be selected.

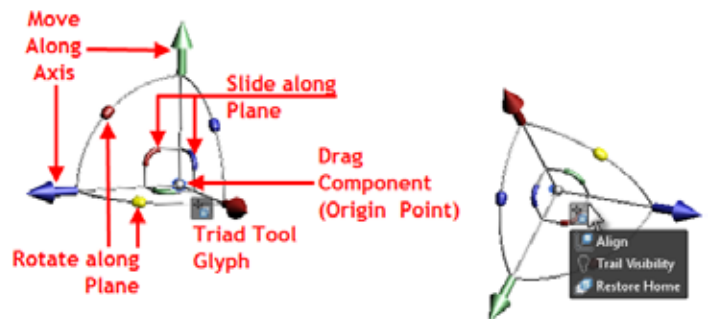


Figure 3: The Publisher Move Triad

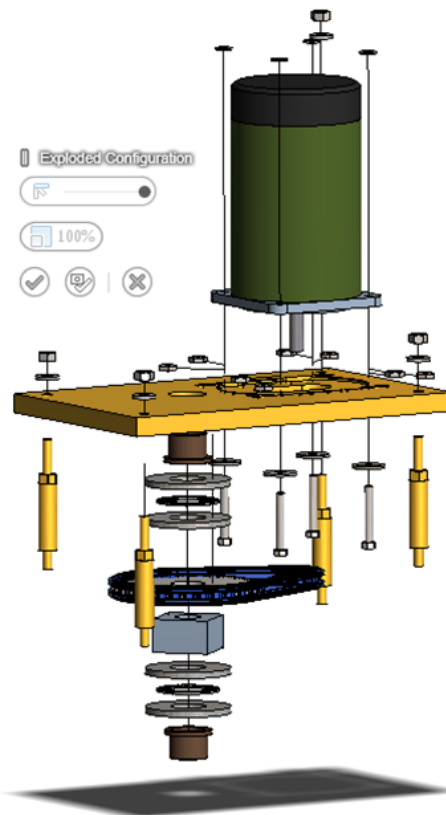


Figure 4: Manual Explode feature

Groups of components as well as sub-assembly components can be moved to new locations and exploded or detailed as needed.

Auto and Manual Explode options make exploded views super simple to prepare.

All these operations are non-destructive, and can be sent back to their original position with the click of a button.

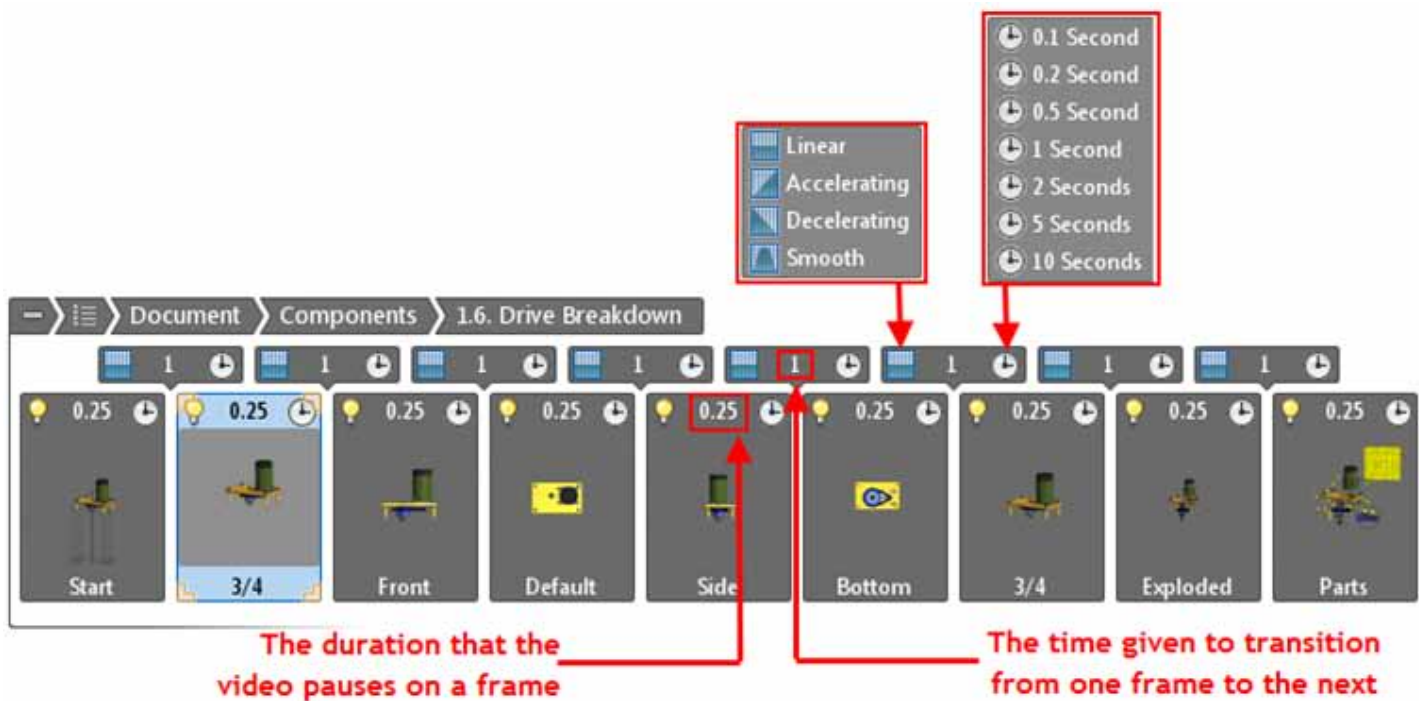


Figure 5: The Storyboard

Snapshot and Storyboard Organization

As each component is positioned, its location and orientation is stored in a view that I like to call a frame. Each of these can be saved in a series of snapshots that either conveys thoughts on very specific features, or are played in sequence and exported in a movie format.

When videos are played, and subsequently documented, Publisher simply transitions between the frames as directed through timing and delay, which the user can fine tune as needed.

Each frame is simply a view, and any arrangement that is needed can be applied. Changes to placements can be sent through the remaining snapshots or made selectively in specific views.

This permits a really nice way to record specific views of features in the design, and then share the information as needed with contractors and customers alike.

VISUALIZATION

Along with positioning the components, there is a host of visualization tools to use.

- Background
- Orthographic and perspective views
- Ground shadows
- Reflections
- Materials and properties
- Visual styles

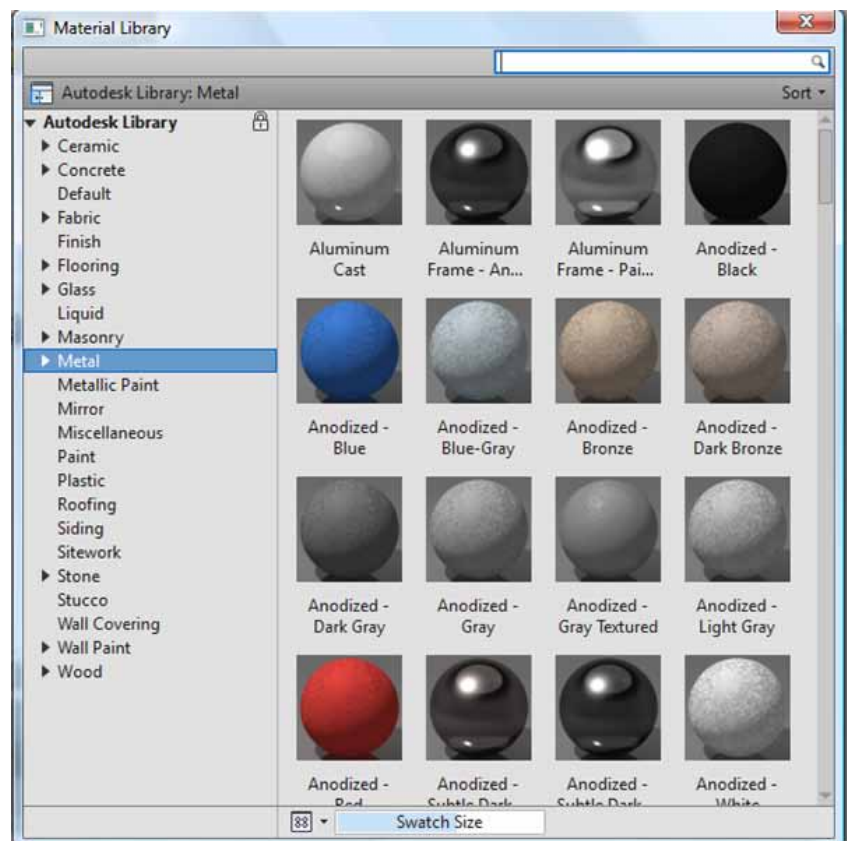


Figure 6: The Autodesk Materials Library

Combining various visualization tools with exploded views and component positions can dramatically alter the way the information being conveyed is actually perceived.

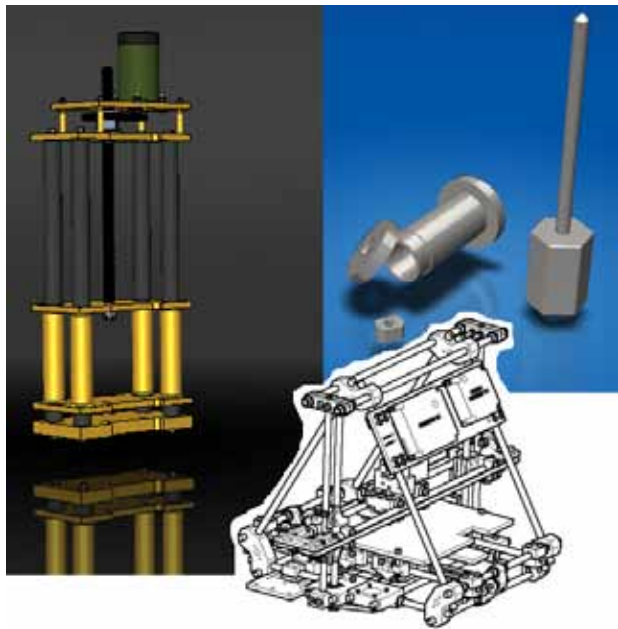


Figure 7: Visual styling

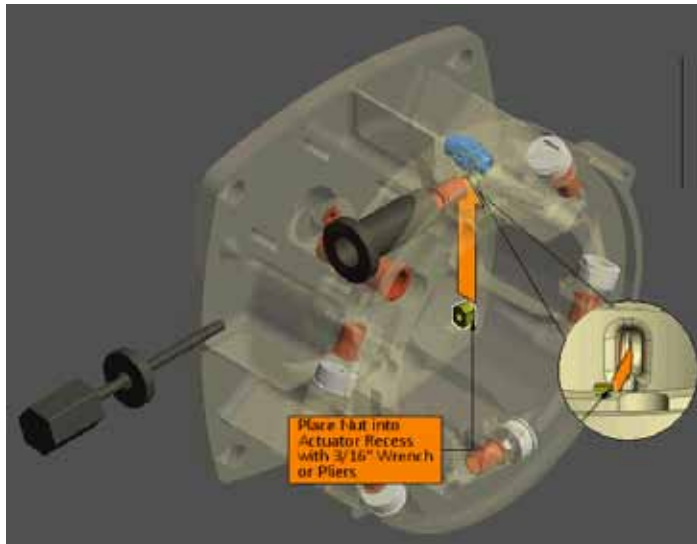


Figure 8: Detailing

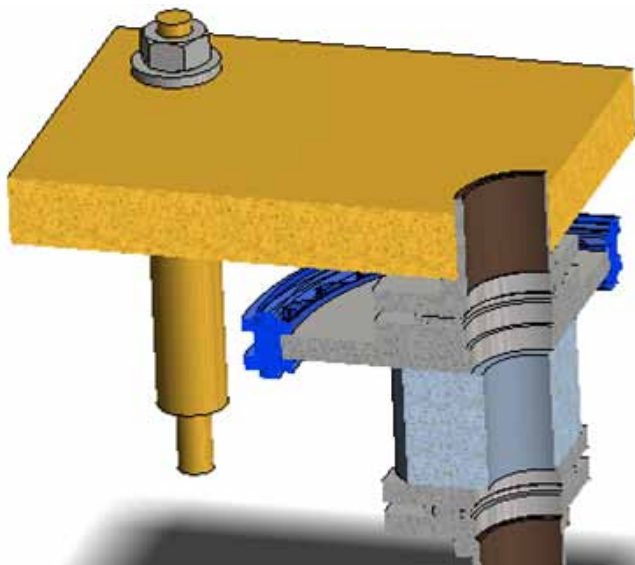


Figure 9: Multiple adjustable section views

Is it a bid presentation? Get busy with the Autodesk Materials Library. How about instructions for assembling the components? Add some section views and detailed cutaways. It's all in there.

Annotations

Notes and leadered text can be applied anywhere in the document. Numerous tools from the Inventor Drawing Manager are present, allowing component properties to be dropped into fields and BOM information to be added.

Parts lists are a cinch to produce from BOM linked in from the inserted model.

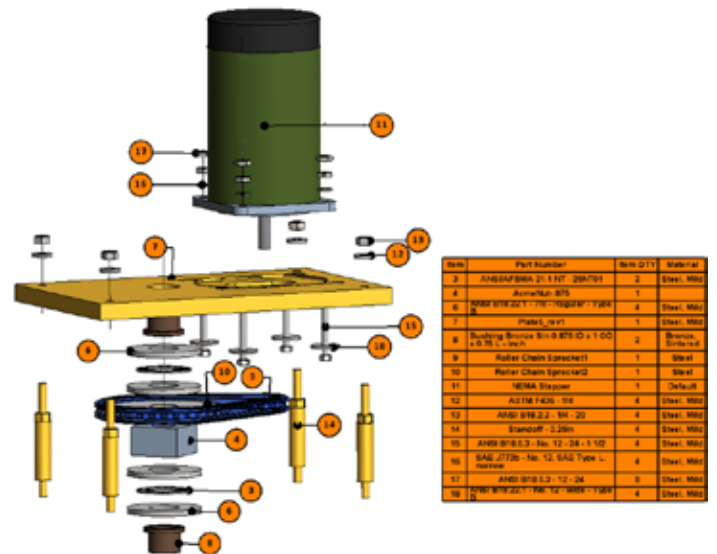


Figure 10: Parts list from BOM

In addition to text-related items, there are curved and straight arrows that can be added to really deliver a better understanding of complex instruction.

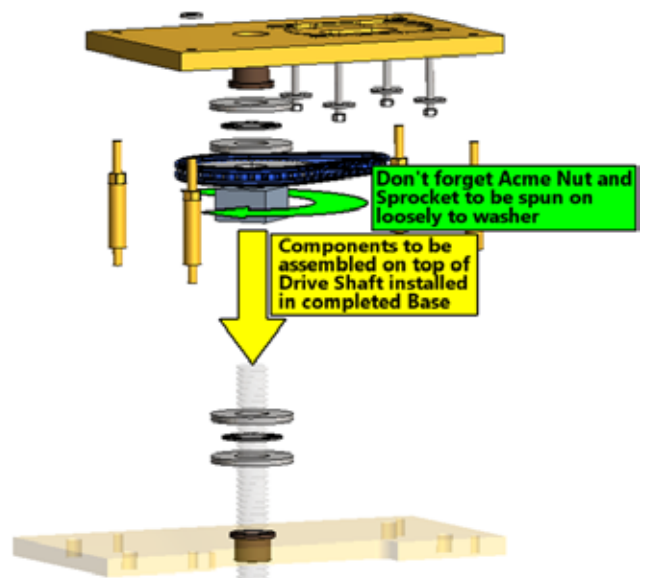


Figure 11: Linear and curved arrows

DOCUMENTATION

Aside from the fact that a Publisher file can be saved along with the model information, it can also convey information through numerous formats including DWF, PDF, Microsoft Word, mobile formats such as the iPad, iPhone, Android, and, of course, video.

Each function has its own dialog that directs the output. Each has the ability to selectively and globally write out the organized snapshots to these formats.

While this is great, we often need more than a few notes and some video. Having the documentation sent straight to Word, where the remainder of the documentation can be completed, is a huge blessing. Templates for these formats are available and can be tailored to make documentation substantially easier.

Video and Flash

Publisher-played storyboards are simply transitions from one designated snapshot to another. We can then save these videos to both AVI and Flash formats.

The intended output resolution can be set, and options for video compression and annotation scaling are available as well.

DWF, PDF, PowerPoint, and Word

These formatted publications are created by exporting still images of the indicated Snapshots, along with their name and descriptions, into pages or frames of the output document.

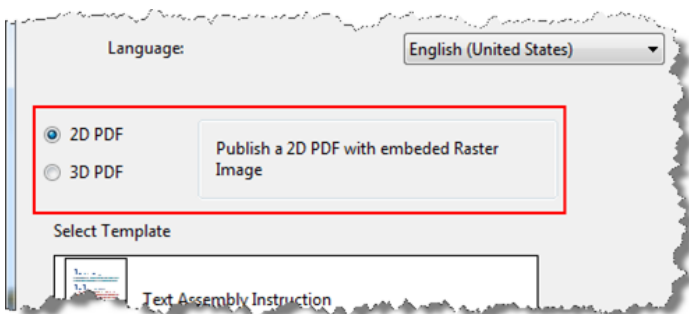


Figure 12: Publishing PDF

PowerPoint, Word, and PDF document creation provides templates to more easily customize the process. Language selection is available for document formats that support these, and PDF files can be developed as both 2D and 3D documents as well.

Images produced along with the text for these types of formats can be made with transparent backgrounds in order to deliver additional flexibility in the output document.

Document Templates

Whether you are documenting the assembly of a new toy to a consumer, or depicting the fuel line connections for a team mounting a turbo-jet engine, preparing your documents is a critical and often tedious job.

Publisher employs templates that are customizable and, once formatted properly, make your documentation job much smoother.

In addition, we can tune our templates to meet the basic requirements of various companies to really streamline the workflow of publishing.

The existing document templates that are provided with Publisher are stored in the Vista path:

C:\ProgramData\Autodesk\Inventor Publisher 2011\Templates

We can easily copy one of the standard templates found there, and re-name the file as our own.

Open the template with Word, and enable the “Developer” tab in the Word options dialog located in the Popular settings list.

Tags are used in a template to extract information from the Publisher document at the time of publishing. Tags supported by a Word template are:

- Storyboard\Number
- Storyboard\Name
- Storyboard\Description
- Storyboard

The Storyboard Tag must be used to wrap up all the other Tags for the template to work.

Images

Images can be produced from the Snapshots and saved in one of six formats as shown in the image below.

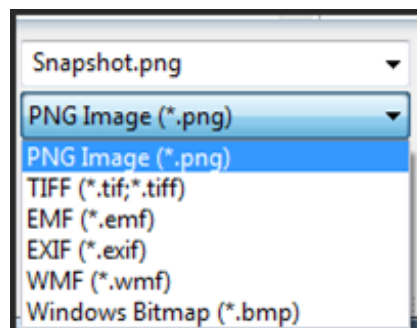


Figure 13: Image formats

Since the images are likely to be used in other documentation, transparent backgrounds are optional as well as Anti-Aliasing.

Vector

The Adobe .svg format is available; it is used to create 2D images without loss of clarity and actually takes up significantly less

space than many other formats.

Mobile

Publishing to the Publisher Mobile format produces documents that can be viewed on iPads, iPhones, and iPod touch devices. As of June 2011, Android devices have been added to the list. The Autodesk Inventor Publisher mobile viewer app is free to download from the Apple App Store as well as from the Android Market. The file format used is the Autodesk Inventor Publisher .ipb.

Once the snapshots and videos are published, they can be downloaded to the respective mobile devices and watched from wherever the job takes you.

Video instructions not enough? The actual 3D model is present in the mobile file.

You can zoom, pan, orbit, etc. during any portion of the presentation in order to get a better feel for the operation being discussed. I consider this to be one of the finest capabilities in the entire Publisher lineup.



Figure 14: Autodesk's Rob Cohee Mobile Lego how-to video.

Publisher will save the output files locally or to the Autodesk Online Account that makes sharing the information easy and accessible using the published document's URL.

Locally saved files can be emailed and shared easily, and then loaded onto the appropriate devices through the iTunes application.

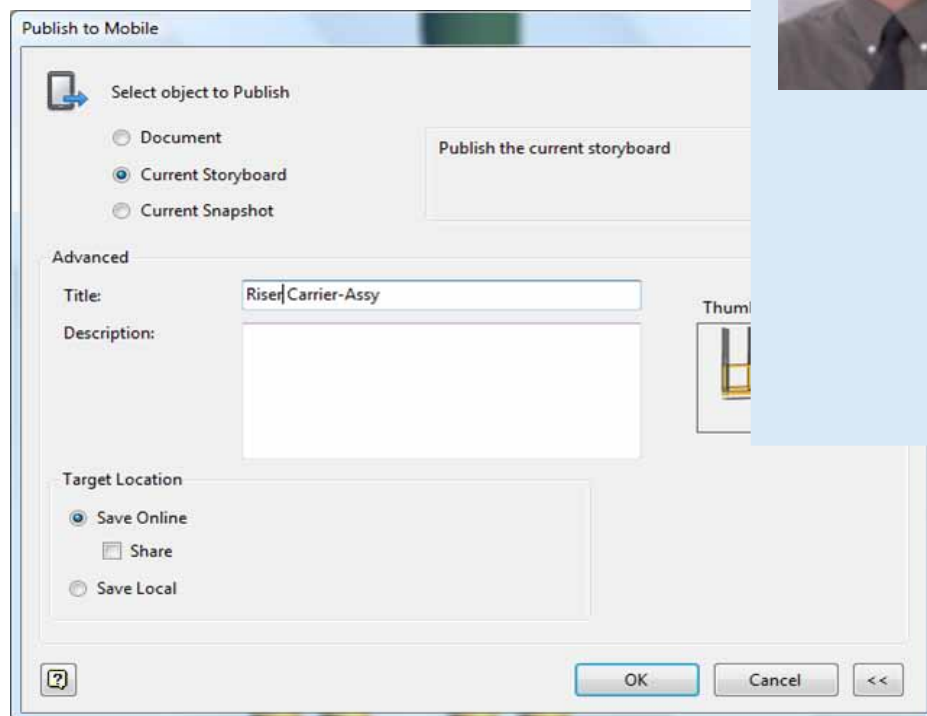


Figure 15: Publish to mobile

To publish online, you'll need to register for the free Autodesk Account. Once Publisher is logged into the service, it will remember the settings and automatically send the .ipb file to the account.

To set up an account go to <http://accounts.autodesk.com>.

COMMENTS

I have enjoyed using Publisher. It is simple to use, and after the R1 update for 2011, most everything I wanted to be available in the application has been added.

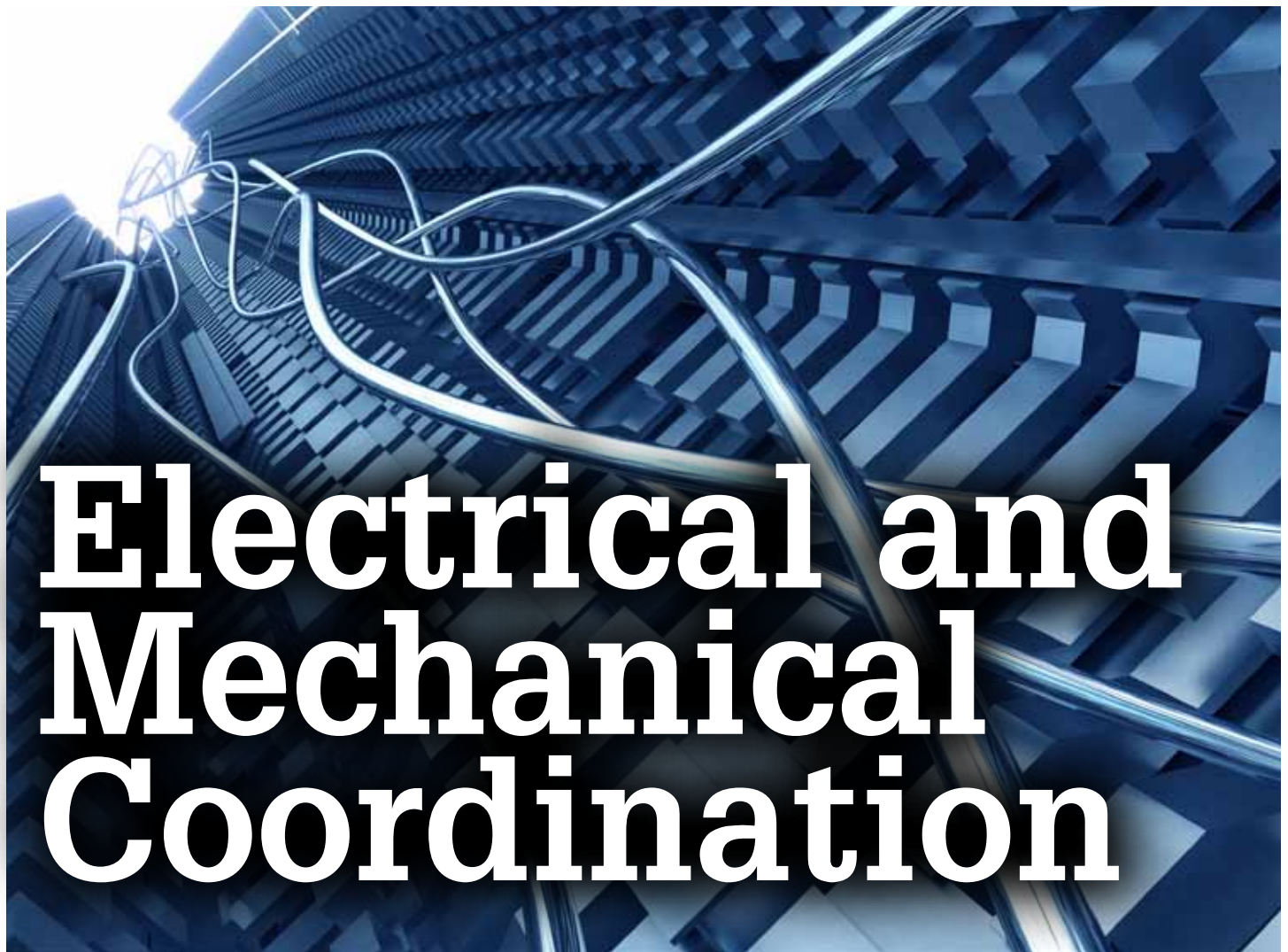
This tool is a great addition to your collaborative effort, both in issuing instructions and reviewing components emailed from almost anyone—without having to install Inventor.

The mobile features are some of my favorites. Once the Android view became available, I installed it. Viewing documents from the Autodesk site was a built-in function in the Viewer framework. It asked for login information (which it automatically uses now) and logged me into my account. Sitting there were all the files I had published nearly a year ago. Nice.

One last thing: I cut a video that I showed at Autodesk University 2010, which depicts how I put some of the cool features in Publisher to work in order to convey some specific instructions. I'll post it to Design & Motion so you can check it out. <http://bit.ly/nonW35> Seal Removal.avi



John Evans is an Autodesk Certified Inventor Professional living in the Florida Panhandle, where he provides technical troubleshooting at Gustin, Cothern, and Tucker, Inc. His career through the Aerospace Design, manufacturing, and maintenance spans 24 years and includes a tour in the USAF. John now works as a design consultant and author from his company John Evans Design and manages the blog "Design and Motion", where he combines his passions: Autodesk Inventor, simulation, and motion control. He is a regular attendee of Autodesk University and has recently joined Tekni Consulting as a contributing author for the Creative Inventor training series. He can be reached at john@john-evans-design.net.



Electrical and Mechanical Coordination

It is not uncommon to have mechanical and electrical engineers working at the same firm and coordinating efforts on projects. Because Autodesk® Revit® MEP is essentially a database, there are opportunities to make that coordination tighter than ever before. Take, for example, mechanical equipment. This equipment often requires an electrical connection, but not always. This equipment is drawn on mechanical sheets, but if it requires an electrical connection it must also be shown on an electrical sheet. The mechanical equipment that is not powered should not be shown on the electrical power sheets. Revit MEP can make this a relatively seamless process.

The normal workflow here is that the two engineers speak often about any mechanical equipment on the project. Cut sheets are provided and views are updated as required. Electrical power views may have all mechanical equipment turned on, and hide in view may be used on any mechanical equipment that is not required. This type of interaction opens the door to human error. If the wrong piece of equipment is hidden in view, the resulting change order can be costly, especially by the time it is discovered.

LET REVIT MEP DO THE WORK

Improving this process with Revit MEP takes a solid understanding of Revit, but it is easy for users and produces better results. The approach is as easy as 1,2,3.

1. Add a yes/no parameter to all mechanical equipment families that indicates if that piece of equipment requires an electrical hook up.
2. The mechanical designer indicates if the equipment requires electrical hook up when the equipment is placed by checking the parameter (yes) on mechanical equipment that requires an electrical hook up and (no) when it doesn't.
3. The electrical views apply a filter that leverages the Yes/No parameter to turn off all mechanical equipment not requiring electricity.

HOW TO DO IT

First, a shared parameter needs to be created that indicates if an electrical hook up is required.

If you are unfamiliar with the concept of shared parameters, it is worth pausing here and researching shared parameters in the help file. It also makes sense to give some thought to how to organize and name shared parameters.

Go to the Manage tab of the ribbon and select the Shared Parameters tool. If the project does not have a shared parameters file associated with it, one can be assigned for it with the Browse button or use the Create button to make one. For this example, a shared parameters file will be created. Revit will ask for a name and location for the new file. Place it in a shared location where the whole office has access and name it something obvious like ACME Shared Parameters File.txt. In the Edit Shared parameters file, parameters and groups can be added. Groups help sort parameters. Some example groups would be Lighting, Power, HVAC, Plumbing, Title Block, and Common. Create a group by selecting the New button under the Groups heading and name it Common.

Define the new parameter by clicking the New button under the Parameters heading and filling out the Parameter Properties dialog with the name "Requires Electrical Hook-Up", a discipline of "Common" and type of parameter "Yes/No."

Select OK twice to exit all open dialogs.

The newly created shared parameter must be made into a project parameter to be applied to all mechanical equipment in the project. On the Manage tab of the ribbon, select the Project Parameters tool and then select the Add button on the Project Parameters dialog. Yet another dialog appears—the Parameter Properties dialog. (Hang in there, it's almost over.)

Select the Shared parameter radio button, followed by the Select button underneath it. Find the Requires Electrical Hook-Up parameter under the Common group and select it. On the right-hand side of the Parameter Properties dialog, ensure that the category of Mechanical Equipment is checked. Click OK twice to exit all open dialogs.

What did going through all this trouble do for us? Each instance of every family in this project will

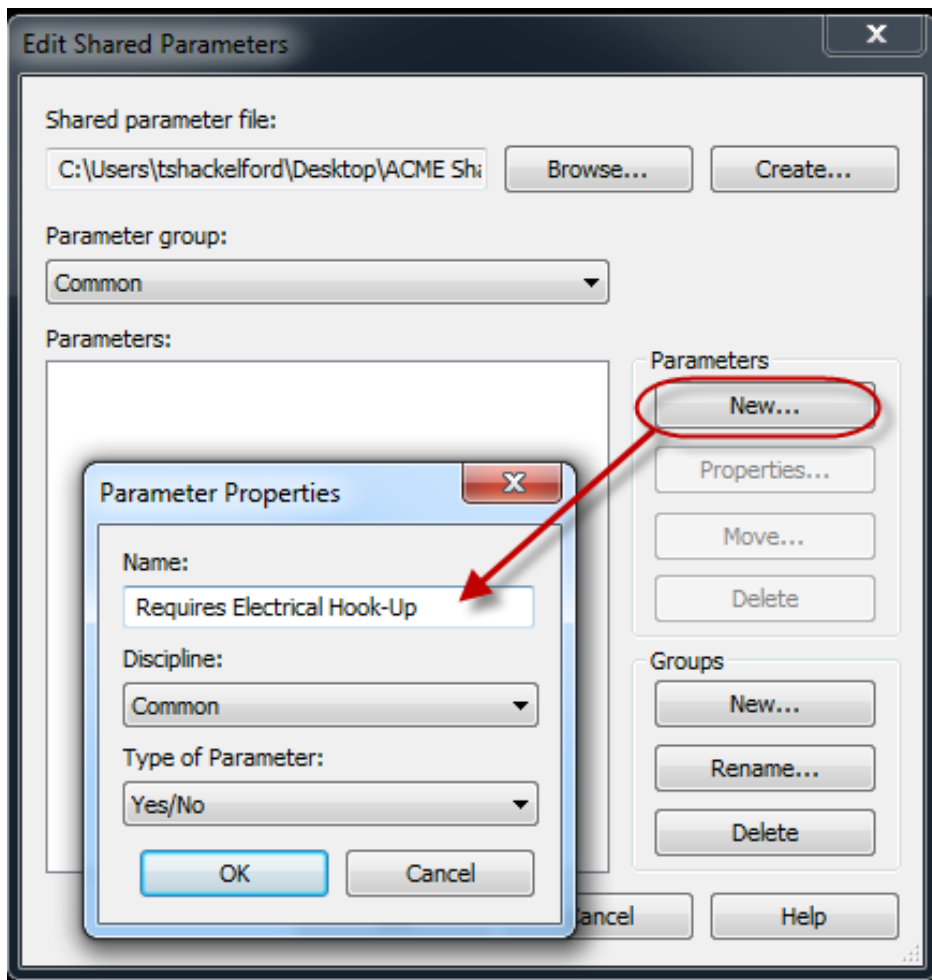


Figure 1

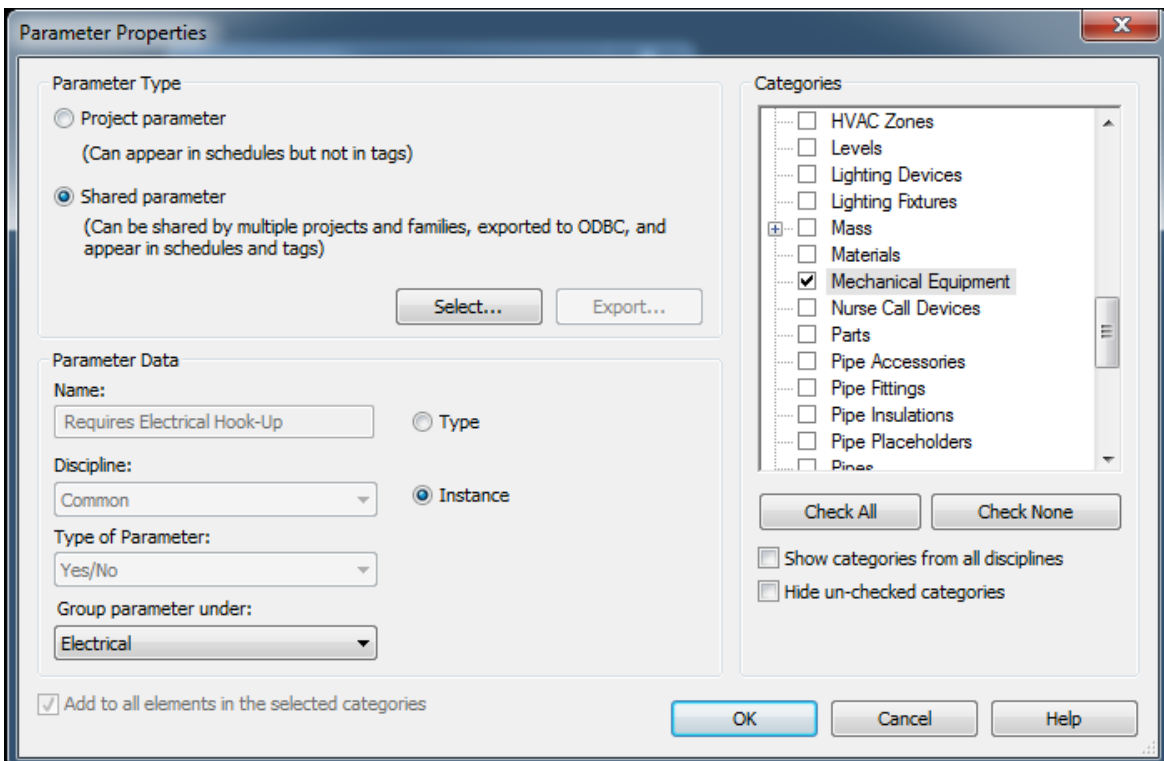
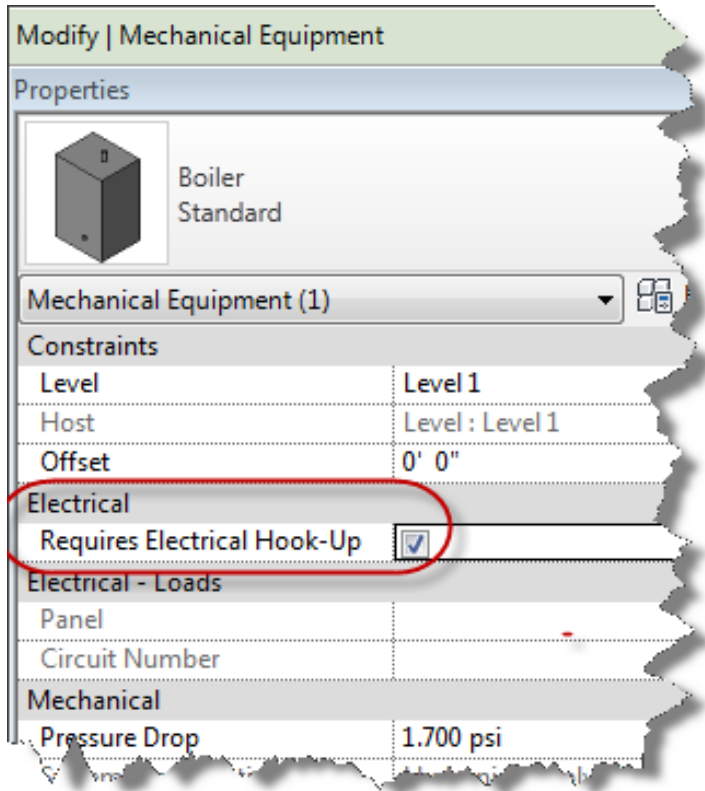


Figure 2

now have a check box indicating if an electrical hook-up is required. The check mark will initially be grey, indicating that it is neither checked nor unchecked. Mechanical designers can clear the check mark or add the check mark. It is also easy to select all instances of a piece of mechanical equipment and assign the proper state.



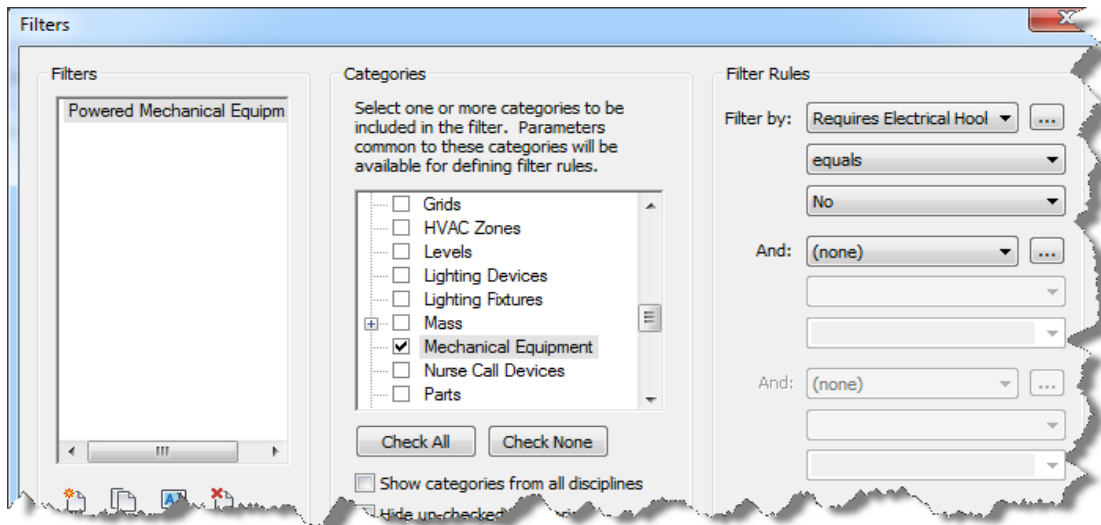
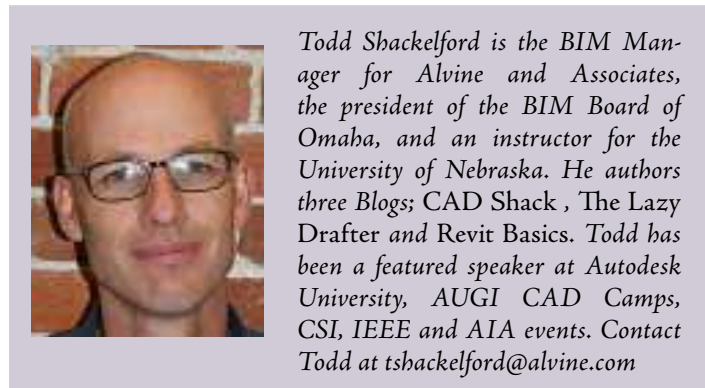
On the electrical side of things, a visibility filter needs to be created to hide the mechanical equipment that does not require electrical hook up. This can be done by going to an electrical view and typing VG to open the Visibility Graphics dialog. Click the Edit/New... button to open the Filters dialog. There is a new filter button directly under the Filters heading indicated in the image below. Select this to give the new filter a name such as "Powered Mechanical Equipment." Under the

Categories heading, select Mechanical Equipment. Under the Filter Rules heading, filter by the Requires Electrical Hook-Up parameter and set equals to No.

Add the new filter to the list of filters for this view. The new filter finds every piece of mechanical equipment that does not require electricity. In the Filters tab of the Visibility Graphics dialog, simply uncheck the Visibility check box. This leaves only mechanical equipment needing an electrical hook-up visible in the electrical view.

With a pre-made filter and the shared parameter added to mechanical equipment families that may need power already in a template file, the mechanical user is left only to specify with a check box if power is required and the electrical user is immediately shown new equipment that requires a power connection.

The true power of Revit MEP is the endless ways in which the data in the model can be manipulated. This example can be used as a template for any instance of objects that cross disciplines and need to be controlled. Thinking outside of the box, this example could be used to leverage existing architectural parameters in walls, such as are they structural or not, and in fire ratings. It could be used to show only vertical duct, pipe, and cable tray for shaft coordination. Consider what worked procedurally in AutoCAD® and try to replicate that in Revit MEP. Consider ways to improve the process. It is likely that Revit's advanced capabilities can make a good thing even better.



Wall Opening Area for Revit (Plug-in)

Wall opening Area for Revit from Autodesk Labs
<http://bit.ly/rqGQTF>

Autodesk "Plug-in of the Month"

Wall Opening Area for Revit

Shared Parameter	Description
Opening Area Smaller Max	Sum all area values smaller than a specific value

This plugin calculates the sum of openings on each wall and stores the values in two shared parameters for each wall.

iconstruct For Autodesk Navisworks

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

From the website: Utilizing a range of data management tools, iConstruct provides the ability to configure and manage the information from various consultants' design models in Navisworks and additional data required from external sources into a simplified and formatted display to suit the end user. This allows design teams and consultants to provide better communication on design intent and construction methodology to onsite construction teams throughout the project.

Project Photofly 2.1

Project Photo fly from Autodesk Labs at <http://bit.ly/npfHSY>

Overview: Capturing the reality as-built for various purposes (renovation, rapid energy analysis, add-on design, historic preservation, game development, visual effects, fun, etc.) is now possible using your standard point-and-shoot digital camera, thanks to advanced computer vision technologies made available through Project Photofly. Videos and Screenshots available on the site.

The Newest Update includes:

- FBX export (mesh, cameras, user geometry)
- Corrections in proxy management
- Proper handling of names containing non-ASCII characters
- More accurate user feedback on failure cases
- Optimization of the data downloaded by the worker machines in the Autodesk Cloud
- Better use of EXIF data from photographs by the calibration engine
- Improved manual stitching workflow
- Multiple-selection of image thumbnails
- IPM exported files (Inventor Publisher format) now support both iPhone and Android
- One installer with the End User License Agreement available in multiple languages

Xrev Transmit

Xrev Transmit from Cadway at <http://bit.ly/q9FYuG>

Overview: Xrev Transmit transforms the tedious and redundant task of issuing drawings into a simple step-by-step process with these features:

- Centrally managed settings
- Simultaneous printing and exporting of multiple formats
- In-built PDF support
- Automatic file naming
- Predefined output locations
- Customisable, automatically generated Word transmittals

One Blogger says: think of it as "eTransmit on steroids"

Videos available on the site.

Until next issue!


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



Inside
Track

**AUGIWorld
brings
you recent
developments
in Autodesk
and related
software
items**

Revit Collaboration: Then and Now

 When Autodesk® Revit® was first released, it had a very different collaboration workflow than the traditional CAD file-based systems. Revit uses one file for multiple consecutive users while the traditional CAD systems used multiple files with a single user in each file at a time. This challenged companies early on to figure out how to share their Revit projects with other people outside their network or office. Over the past few years, several technologies have surfaced to help Revit projects be more collaborative.

Early on, many companies found that the way to share a Revit project was to divide the project into either multiple files and link them together or to split the project up into many worksets that could be checked out. The files were usually shared via FTP on a daily basis. The files, once retrieved from the FTP, would require someone on the receiving end to merge the files together, sometimes requiring copying and pasting objects from one project file to another. This method worked, but was very cumbersome and time consuming.

Some companies have distributed file systems (DFS), which allow for cloning a storage space on one server to another. This has been a great solution for sharing CAD files from one office to another across a long distance. This immediately was thought to be a great solution for Revit, but initially it had an obstacle. Even though users open Revit files from a network drive letter, Revit uses a UNC (universal naming convention) path. DFS servers have different names, thus Revit thought the cloned projects were different. Eventually, a solution was found where the DFS share could be

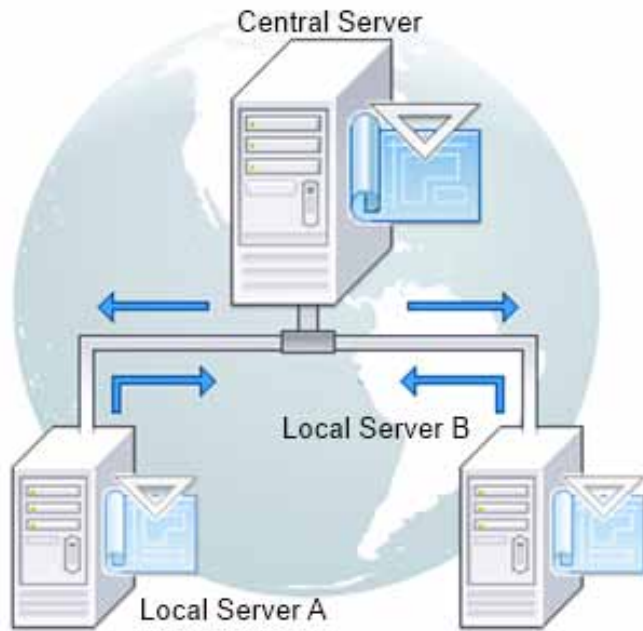
mapped to a drive letter via the SUBST command in Windows. This tricks Revit into thinking the DFS share is a local drive instead of on a server. All Revit users of the DFS share are required to have the substituted drive letter in order to work on the project. While this solved working on a project within a common network, it still didn't allow for external parties to collaborate on the project.

Another network solution has surfaced in the past few years that has greatly helped Revit succeed in multiple office networks. These are hardware devices called Network Accelerators. A popular brand is Riverbed from Riverbed Technology, which has targeted the AEC industry with devices that are optimized for both CAD and Revit files. These devices are set up at each location and then caches files that are frequently opened. This mechanism allows for faster consecutive opens as the cached files reside in the local office on the device there. The devices keep the most popular files up to date in the cache. These devices can work in tandem with many of the collaboration technologies discussed in this article to make them even faster.

Along with hardware network accelerators, some companies have created software based network accelerators. One such solution has targeted BIM with specific support for Revit files. This software is called WAFS by Globalscape. WAFS works by replicating (caching) files from one server to another in real time. This allows Revit users in multiple offices to work on the same project at the same time and have it cloned to another server. This again is a good solution for multiple offices within one company, but doesn't help when external parties are working on the project.

Another solution that works for sharing Revit files are the file syncing solutions such as Buzzsaw Sync, DropBox, Box.net, and many more. These services replicate files from one computer to another. This doesn't work with Revit projects that need multiple users working on the same file, but works well for sharing files with other parties that only need to link in your model. By sharing the files via these services, they can be updated in real time or on a set schedule. There is very little interaction that needs to be done after the initial setup.

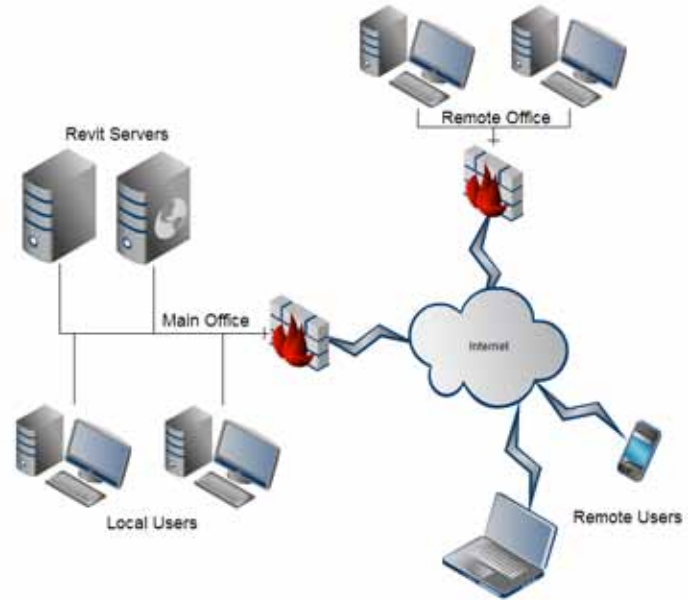
In the last year, Autodesk has released a collaboration tool for Revit called Revit Server. It initially was released in Fall 2010 for subscription customers and has since been included as part of the Revit 2012 installer. Revit Server is Autodesk's first attempt at creating a collaboration system that allows for multiple people in multiple offices to work on the same Revit project file at the same time.



Revit Server.png - Revit Server's Hub and Spoke layout

The Revit Server operates on a hub-spoke system. The hub is a central server that houses all the projects on the server. The spokes are local servers housed in each of the offices that want to work on the projects on the central server. Each local server houses only a local cached copy of the projects that have been opened on it. After a project has been opened on the local server, the central server will keep it in sync. This system allows a company to share all its Revit projects with everyone else within the company regardless of their location. Revit Servers work best within a WAN and on a common domain. As with many of the other solutions, it doesn't work with outside parties working on the model.

In the last couple years a new buzzword, Cloud Computing, has been gaining huge ground. Several companies have surfaced that are building cloud-based collaboration systems that work with Revit. These cloud systems are built with newer technologies that allow Revit to be stored on a server and al-



Revit Cloud.png - A simplified Revit Cloud diagram

lows users remote access. This enables the server to do the heavy Revit work and only serve up the graphics to the local device including laptops, tablets, or smart phones. These solutions use different technologies like RDP (Remote Desktop Protocol), VNC (Virtual Network Computing), Video-over-IP (VOIP), and more. These cloud-based technologies are still very new and haven't been adopted widely yet, but the advantage to these systems is that any member of the team within the company or outside could be given access to work on the project.

Many companies are using one or more of the methods described in this article with varying degrees of success to collaborate on Revit projects. While there isn't a one-size-fits-all solution, amongst these technologies should be one that can help your company collaborate better on Revit projects.



Troy Gates is a graduate of Western New Mexico University with degrees in both Design and Operations Management. He worked for several years in the Civil/Infrastructure industry before joining the AEC industry in 2000 where he immediately became an early adopter, user, and implementer of Revit while serving in CAD/BIM/Technology management roles with several AEC companies. In addition to Troy's direct experience using BIM/Design technology tools, 3D Modeling platforms and software programming, he is an Autodesk Revit Certified Professional and an Autodesk Revit Implementation Certified Expert.

Collaboration with Revit Structure - Work Sharing



Collaboration means working together to achieve a goal. Follow these recommendations for doing it right or risk sabotaging the effort.

WORKSETS

The first step in preparing a project for multiple users is to divide your model into logical groupings of objects that are set up for single-user access. In Autodesk® Revit® this object grouping is achieved with worksets. When setting up the worksets, you must take into consideration the size of the project, each person's task, and the size of the team. Workset naming should be related to the function and/or location of the objects that will be in that grouping, which will allow new team members to easily adapt to the project.

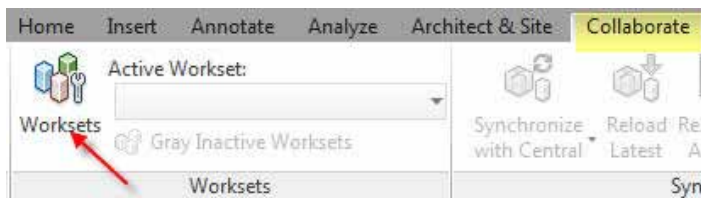


Figure 1: Worksets tool

To enable worksharing, select the Worksets tool located on the Collaborate panel.

When you first activate worksets, a couple of things happen. First, the initial dialog box is automatically moving levels and grids to a workset and then assigning everything else to a different workset. Some default workset names are provided in the dialog box; however, you can change them at this time.

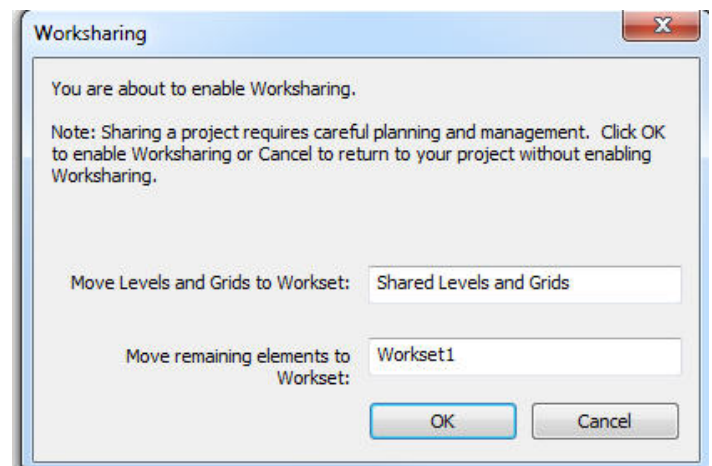


Figure 2: Worksharing default worksets

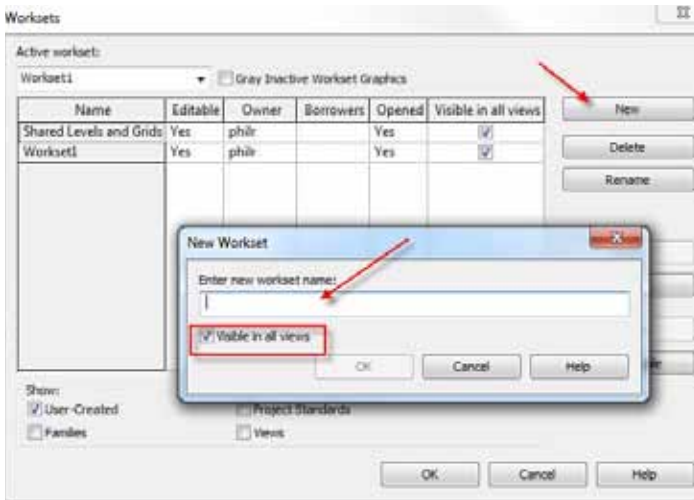


Figure 3: Worksets dialog box—creating a new workset

Other standard groupings that happen automatically when you activate Worksharing are Families, Project Standards, and views. This is important so if one user is annotating a view, another user cannot be doing the same.

To create a new workset select “New” in the worksets dialog box. Note that worksets also can be turned on and off in different views. When you create them, you can have them on or off in all views as default. This is very useful if you are modeling something you do not want to appear in all views.

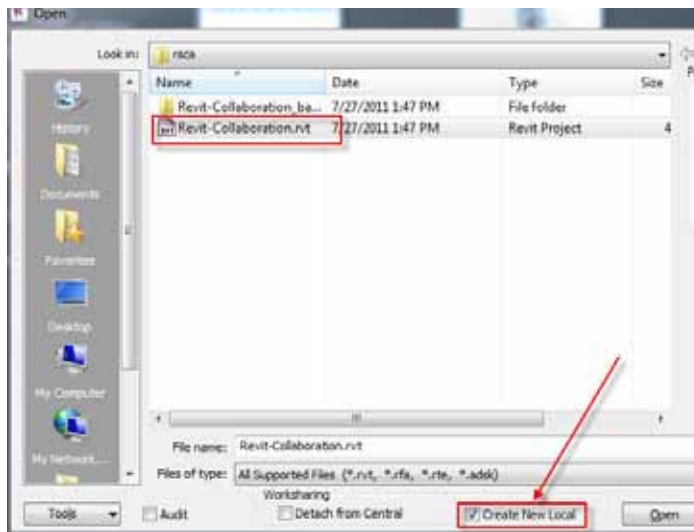


Figure 4: Create a local copy

CENTRAL FILE VS. LOCAL FILE

When worksets are activated, your Revit file becomes a Central file. A Central file allows multiple users to create a local copy of the model and synchronize their changes back to the Central file. When you activate your Worksets for the first time you are creating a Central file. This means once your worksets are established you need to close the Central file and open a local copy to begin the project. Figure four illustrates this action.

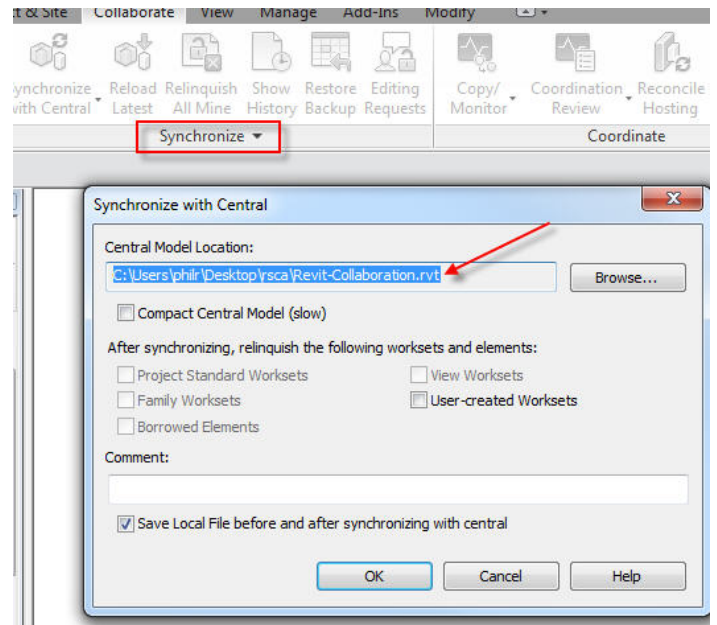


Figure 5: Synchronize settings

Another way to create a local copy is to make a copy of the Revit Central file in a browser window, place it somewhere locally, then rename the file. To ensure you are connected and synchronizing your changes to the Central file, you can check the settings in the Synchronize drop-down on the Collaborate panel.

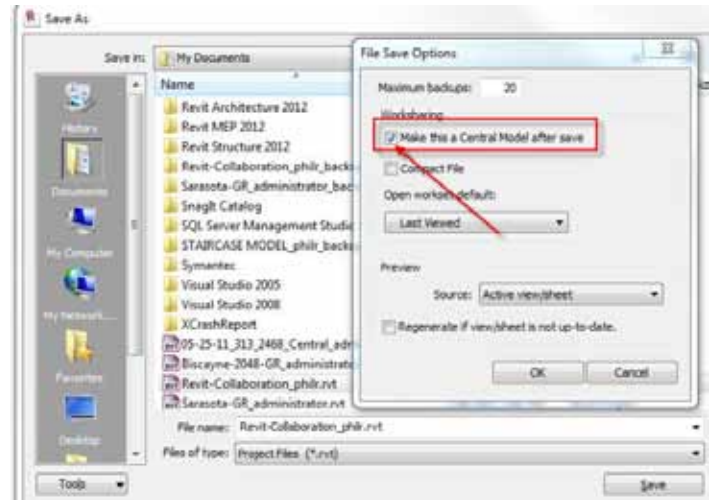


Figure 6: Create a new Central file

If the Central file ever becomes corrupt, misplaced, or deleted and unrecoverable, you can change a local copy into a new Central file. When you open up your local Revit Structure file you may get an error that the Central file has moved. You can accept this error and still get into your local copy of the Central file. Then you can save your local file as a new Central file.

Once the new Central file is established, other users can make a new local copy of the Central file and it will be up and running in no time.

ELEMENT BORROWING AND EDITING REQUESTS

Any member of the project team connected to the Central file through a local copy can borrow parts of the model to work on. To understand how this all works we have to start with the user name. The user name will appear in the worksets dialog box showing what worksets are borrowed for editing.

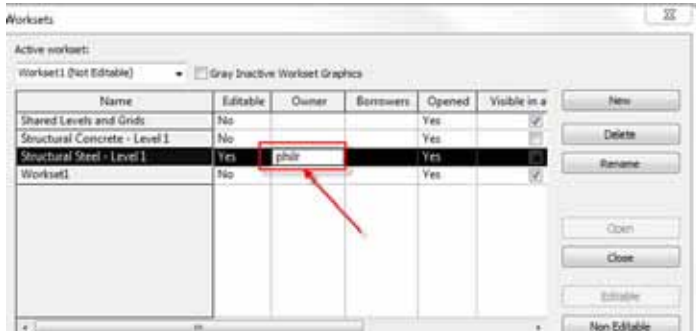


Figure 7: Worksets borrowed

Recommendation: Make your user name descriptive enough so other team members can identify you. In a large firm, adding your phone extension to your username is useful in case someone needs to talk with you to collaborate. To set your user name, select options from your main application drop-down menu.

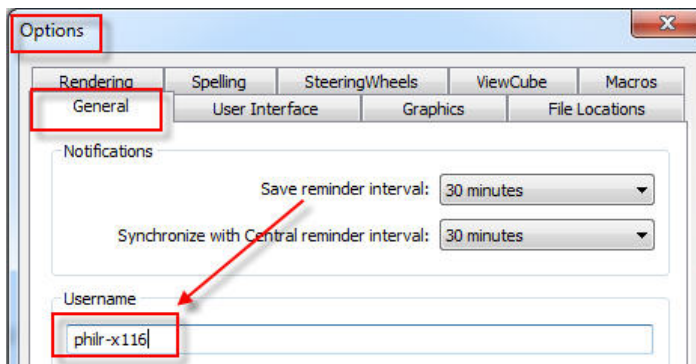


Figure 8: Setting your user name

If you select an element belonging to a workset that someone has borrowed, you need to place a request to edit that element. To do this select the element and click the "Make element editable" button indicated in Figure 9. If no one is editing that element it will open to make it available to you. If someone else has that element you will get an error and need to place a request to edit.

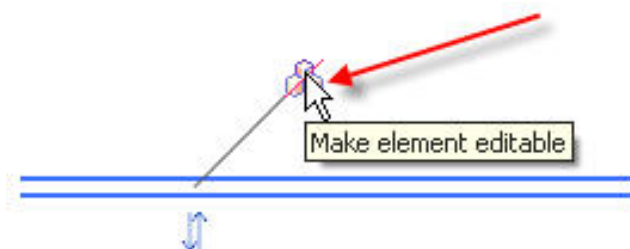


Figure 9: Make element editable

If you place a request to edit an element the user will get a notification alerting them of your request. If they grant you permission, they need to synchronize with the Central file. Once they synchronize, you do the same to receive the permission to make the edits.

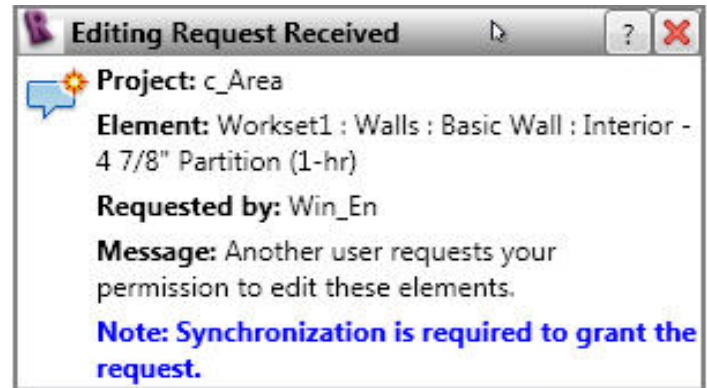


Figure 10: Request notification

There are a couple of ways you can get a status on your editing requests. First, you can select Editing requests from the Collaborate panel. Second, there is a counter for the number of requests next to your active worksets.



Figure 11: Editing requests in the Collaborate panel

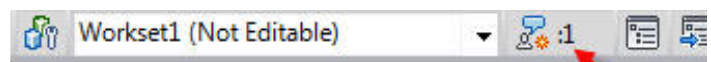


Figure 12: Number of requests

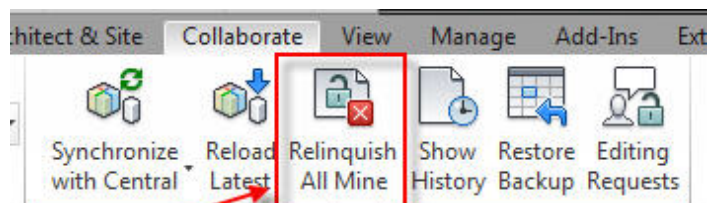


Figure 13: Relinquishing all Worksets and Elements

Recommendation: When you are done working and performed your last synchronization, DO NOT forget to relinquish all your worksets and elements. Do this by selecting "Relinquish All Mine" from the Collaborate panel.

VISIBILITY

All views in your Revit Structure model have visibility settings that allow you to globally turn on and off items that belong to a workset. When worksets are activated in a model, a workset tab can be found in the visibility settings of a view.

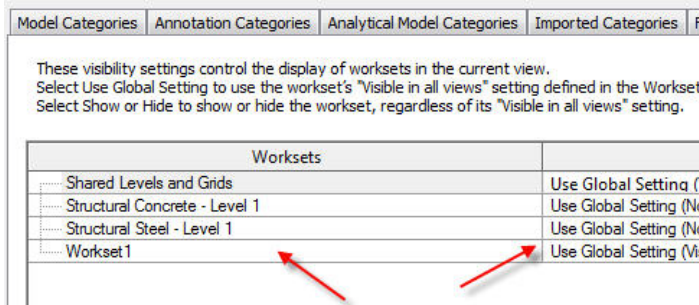


Figure 14: Workset visibility

CLOSING TIP

There will be an occasion when you are in a collaborative environment where a team member forgets to relinquish a workset he/she had control of. To make it even worse, this team member may not be in the office and you need to work on some elements that belong to that workset.

The workaround for this is to change your user name to that of the team member, then relinquish the workset. Once the worksets are relinquished, synchronize with the Central file. Finally, change your user name back and continue to work on the file. The caution I must add is to make sure the user synchronized his/her changes to the Central file—otherwise, any changes that users made will be lost.

Follow these rules, recommendations, and tips and you will have success collaborating with your team. Don't be a traitor and break the rules! The team will suffer the consequences.



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Value-driven Project Delivery



Six Keys to Project Success

1 ASSESSMENT

Clearly understanding the needs and requirements of clients is critical to delivering successful projects. The first step is to determine the goals for the project. A thorough investigation of all the shared aspirations of team members and stakeholders need to be documented. These aspirations should then be categorized into segments with similar requirements. The next step is to analyze the value that the various segments contribute to the overall project success.

Stakeholders for projects include owners, users, vendors, trades and design disciplines, maintenance, operations and capital asset management. These parties should be consulted for input, such as requests for functional design requirements, enhanced data relating to installation requirements, material availability, operation and warranty data, and sustainability goals to help better define the project targets.

Wherever possible, this information should be converted into metrics that will answer questions such as:

- Who is asking for this particular information or activity?
- How much impact will there be for not having this information?

- What is the potential risk reduction these services provide?
- What kind of increased efficiency will this service or technique deliver?
- How does this request support the project goals and objectives?

As you define potential goals and service relationships, quantify the benefits to the client, such as improvements in the performance of the client's own products or services, and cost and time savings. Then look at the value each potential service can provide to your business in the form of revenues, profits, increased efficiencies, reduced errors, and resulting market share, among others. The importance of increasing the efficiency of all participants is more important than activities that enhance only one or a few participants. Where the same activity delivers value to multiple parties you leverage effort to create greater overall value to the project.

Finally, quantify the risks involved in each potential initiative. Risk factors to be considered include effects on design, economic effectiveness, time, technological viability, and environmental impacts. These risks should also be presented in a scorecard used to assess their acceptability to the team members.

Assessment begins the process of defining the requirements of a project. Clear communication between all the parties is required for success. A process known as dialog mapping focuses conversations toward consensus during the entire delivery cycle. Open conversations pointed toward solutions reveals the differences in language and meaning different stakeholders bring to a project. Dialog mapping reveals those differences and replaces assumption with clarity allowing more efficient, clear communication between stakeholders.

2 ALIGNMENT

Alignment is a function of aligning project objectives between the parties with the overall goals for the project. Alignment of objectives is a key factor to providing effective delivery in any project effort. Peter Drucker is quoted: "There is no loss to the customer by eliminating activities that do not add value." Therefore, all activities in the project should be aligned to creating value to the project.

Agile management theory has a major tenant that all work scheduled should be aligned to creating the greatest value in the moment for the project given adequate information to determine the work. This alignment of information, resources, and agreement is the foundation of efficient project delivery. Establishing these goals provides an effective tool for communication across the boundaries of all the stakeholders in the project delivery.

Where goals are aligned with delivering the greatest value to the project during the entire project duration, all participants realize the greatest potential for profit and positive return on investments. These goals become the central tenants of communication through all participating organizations. Understanding these mutual goals will allow all the participants to better prioritize their time and other resources. Now every team member can focus on delivering value through their activities that contribute most to the value needed at any given point in time, eliminating those activities that do not add value.

3 ACHIEVABILITY

From the time a project is first considered until it is delivered, its achievability should be continually evaluated against the goals for the project and team participants' capabilities. Planning aimed at developing delivery mechanisms that achieve the highest value at the moment of need creates the most effective model of project delivery. As new elements are needed for a project, they should be evaluated against team resources and capabilities. For the best solutions, evaluate multiple mixes of initiatives to determine which one provides the maximum value to the project.

Human and financial resources should be focused on those ideas that deliver the most value to the owner and the team. It is important to continually evaluate whether or not the work can be delivered within the right time frame and the right cost. Model-

ing time, resources, logistics, and cash availability in concert with the physical models are required to determine the right mix.

Achievability is a mix of both capability and proper planning to deliver the highest value elements at the right time.

4 ACCESSIBILITY

Making information accessible to everyone involved with the project lifecycle is critical to value-driven project management. Too often, each group involved in the initiative creates its own repository of information that is hidden from other participants.

An information portal for the product team can provide a single source for work completed. The portal should provide the ability to view the entire project portfolio, from graphic to written and multi-media file formats. Role-based dashboards can enable all stakeholders to view progress and comment on proposals and work-in-progress.

Bringing information together in an ideal project portal should increase visibility of requirements, goals, cost data, design performance, and other project-related information. Logistical analysis can show the tradeoffs between different design or construction options.

By having all information in a central location, the collection, delivery, and review of information are expedited. Each participant can review and contribute information and be assured that others will have access to their contributions without having to spend time with email distribution or difficult software interfaces.

5 AGILITY

Agility is expressed in more than terms of organizational flexibility in the architecture, engineering, construction and operations vertical market segment. Each of these vertical professional efforts traditionally have operated in their own silo of influence. It is rare for these professional segments to overlap as an integrated delivery platform. Our heritage of project delivery has not changed for more than 200 years. Since we share a common legal heritage with England, our common law-based system is largely unchanged. An adversarial relationship is the basis of common contract law. This common heritage continues to persist in every phase and part of the delivery process for buildings and infrastructure projects. To make any advances in this business, we have to get all the parties out of their silos and bunkers and out on a field of interaction.

That segmentation has led to significant waste in time and material, and results in additional project cost. Both the construction and design communities have been trying to find new management methods to bring efficiencies to their respective professions. Agility has recently been expressed in the design effort as flexible, chaos management, based on Scrum or Agile management methods. In the construction industry, a page has been borrowed

from the management practice of the manufacturing world and repurposed lean manufacturing into lean construction.

While both management practices are based on the same theory of flexibility, team solutions, and creating the greatest value within a timeframe, the resulting efforts are largely the same with more flexibility in work scheduling and less risk in performing work that is incorrect. Inherent in both of these efforts is a continuous quality loop that stresses quality assurance with each unit of work that is produced. A concept of task/test is a foundational concept.

6 ACCOUNTABILITY

Collaborative teams are built on the premise that the members are all willing to accept responsibility for their own actions. Without accountability there is little, if any, chance that the effort will be value-driven. Using continual work testing against agreed-upon standards provides a significant basis for consistent value delivery. The premise of both Agile and Lean theories is based on that effort—quality, time, and budget are all elements of every work effort. By naming the standards and expectations for each work effort and how it fits with the adjacent work elements will determine the highest possible value delivered. The importance of getting the high-value work in place overrides the traditional work division methods of the past. Now the entire team is responsible for delivering the work effort in the most efficient manner possible.

Without clear objectives and commitment to achieving these objectives, successful delivery is unlikely. But where there is consistent language that supports the objectives and available data to support decision-making, successful results are much more likely. The greatest successes are built on two bridge buttresses: cooperation and reliable data spanned by action.

BENEFITS OF VALUE-DRIVEN PROJECTS

Many have questioned the validity of value-driven projects built around collaboration. After all, many of us have been working closely with other professions and disciplines for quite some time. The results of these efforts have largely been hit-and-miss. Often these efforts were hardly organized or had any expressed objectives, goals, or open discussion about the responsibilities of the participants.

True value-driven efforts have several distinctive attributes.

1. A complete team is brought together for a declared purpose.
2. Goals and objectives are mutually agreed upon, which become the 'ground stakes' that govern further decisions.
3. Incentives are derived to reward those who uphold the objectives of the project and move collaboration forward for themselves and others around them.
4. Risk is shared by those who have the ability to bear and influence it.
5. Decisions are made by those who have the best experience and information, not just because it is the traditional way.

6. Focus on the productivity of a team as a whole rather than transactional activities of individuals.
7. The elimination of waste and corrective work are always high priorities achieved through multi-disciplinary planning and investigation.
8. Technology is a tool for progress, not a crutch for excuses and failure.
9. Information is the basis of decision-making. Information is shared by the entire team. Each party has a vested interest to create, share, and use highly available information created by the team members.

CONCLUSION

This paper has explained the concept of value-driven project delivery and how it can help you create successful projects. With value-driven project delivery, you:

- Declare the staged goals and objectives of each project.
- Build a team based on consensus and collaboration.
- Share both risk and reward equitably.
- Capture information and make it accessible to the entire delivery team.
- Maintain the agility to rapidly adapt to changing circumstances.
- Maintain transparency in tracking and accounting for the results of every initiative.

With these best practices, you can deliver projects that deliver the highest value to owners and users of the BUILT environment.



Andrew Abernathy's experience with data and graphic systems began in 1984 at the advent of GIS and building informatics at McDonnell Douglas AEC group and continued via a consultancy assisting Greiner Engineering (now URS), HNTB Engineering, and Dallas Area Rapid Transit System implement advanced systems. Andrew stayed abreast of the advancements as an early adopter of Revit, serving as a features tester from 2001 until 2003. Currently he is an Adjunct Lecturer at the University of Arizona College of Architecture and Landscape Architecture on topics of Collaboration, Professional Practice and BIM. At the forefront of moving professional design practice in an integrated direction, Andrew works with professionals from research, finance, design, construction, fabrication, maintenance and operations. Leveraging BIM and lightweight project management as strategic business tools Andrew reduced overhead and increased productivity up to 50% at three firms.

Collaboration & Interoperability

In the spring of 1963, Bob Dylan took the stage at New York City's Town Hall to recite the poem, "Last Thoughts on Woody Guthrie." As a preface, Dylan said, "I was asked to write something about Woody, something like, what does Woody Guthrie mean to you in 25 words or less?" Continuing, Dylan joked: "Well, I couldn't do it. I wrote out five pages." In a similar respect, I found it difficult to constrain all the topics I wanted to cover concerning collaboration and interoperability with Autodesk® 3ds Max®.

As a senior production artist, I am well versed in dealing with assets from a number of different sources—real estate developers, architects, and artists to name a few. These assets are created in a variety of different programs, by individuals with varying skill sets. Over the years, I have learned how to make something out of anything. I will limit the scope of this article to the integration of 3D model assets from the most common third-party modeling programs, while also looking at plug-ins and scripts that quickly integrate assets into 3ds Max, including those that help in post-production with rendering and compositing.

MODELERS

3ds Max is a successful modeling platform, but when it comes to personal workflow and budget, or perhaps industry, it can have some limitations or too many features. There are a number of modeling applications that fill these gaps and are used across a variety of industries. I'll give a quick rundown for each program, highlight the strengths and weaknesses for each, and give some suggestions for the best ways I have found to bring these assets into 3ds Max.

SketchUp

SketchUp is a very popular modeling application originally developed by @Last Software and now made by Google. It is well known in the design professions, specifically architecture and planning, but it is not limited to these sectors. Created as "a modeler for everyone," SketchUp certainly doesn't disappoint. The program has "Keep it Simple, Stupid" at its core, allowing a user to go from novice to expert in a very short time. It has a clean interface, great tools, and an oracle of online help and tutorials. SketchUp has tight integration with Google Earth, which allows modelers to geo-locate their models and place them into Google

Earth's 3D building layer with a few simple clicks, as well as make the assets available for download on 3D Warehouse, an online repository of SketchUp models. In addition, there is an importer that ships standard with 3ds Max since the 2011 version. The importer is effective; however, not my choice as the most efficient solution. This is a personal workflow issue that we will cover a bit later in the scripts section.

Autodesk Revit

Autodesk® Revit® is Autodesk's flagship BIM software offering. It allows architects and consultants to build a virtual model of a project, which can then be used to generate all the requisite building drawings, spreadsheets, and even energy analysis. Revit has an AutoCAD® look and feel and has a depth and minutia in the program that is certainly impressive. Exporting models from Revit to 3ds Max is straightforward, with a few main options to consider, such as .fbx and .dwg. Everyone has their favorites; I find that exporting a .dwg as a polymesh combined with the ACAD Legacy .dwg importer in 3ds Max tends to produce the best results.

The strength of Revit certainly comes from what it can produce for designers (construction documents, the plans and sections) from its detailed models, yet this model complexity can become problematic for the novice Revit-to-3ds Max importer. I strongly recommend learning how to filter unimportant information before importing Revit models into 3ds Max. For example, learning to shut off unimportant interior fixtures (toilets, sinks, etc.) can save a huge amount of time if you are exporting a model for an exterior hero shot, not just in export time from Revit, or import time in 3ds Max, but also in file performance in 3ds Max down the road. On that same thread, many native Revit models (furniture, fixtures, etc.) tend to be a bit lacking in surface/polygon detail for polished, high-resolution images, especially interior fixtures. This low detail causes most production artists to remodel the items so that they are workable within a detailed interior scene.

Rhino

Rhino is a NURBS modeling program, so it is generally found in sectors such as industrial design, but is also utilized by architects and other designers who are looking for a set of tools that allows easier free-form, organic 3D modeling. Rhino has good CAD integration, and seems to work best imported into 3ds Max as a .sat file. Spend a few moments in the support/script section of the website at <http://www.rhino3d.com/> and you will find a rhinoscript that will export each layer of a Rhino model to the .sat format and name that file based on the file name and the layer name. These .sat files, once exported, can be imported all at once (look for the "add files" button in the .sat importer dialog) and your 3ds Max Layer Manager will build automatically from the file names. A tip for free: watch how the files import with the name relationship to the 3ds Max Layer Manager; you'll find that these files can be a very powerful tool for importing and organizing your Max file for a speedy workflow.

PLUGINS: SCRIPTS

"If you do something in 3D Studio more than 17 times, you should script it." This is the adage of one of Neoscape's founders, and the thought still rings true today. As 3ds Max's user base grows, the native tools and interfaces tend to be Jacks of All Trades and Masters of None. Scripting returns control back to users to create efficient custom workflows and tools, but it is not limited to just that. For the most part, if you can dream it, you can script it.

Before we go too far down the rabbit hole, I wanted to point out some good resources for MaxScripting. There are many sources on the Internet—www.scriptspot.com is the one I frequent almost daily. Both cgsociety.org and area.autodesk.com have forums devoted to scripting as well. There are some great tutorial discs online too, and once you get the rhythm of the basic components, it's pretty easy to pick up the rest, and even to learn from what others scripters have done. Also, it is good to understand that MaxScript generally only exists inside 3ds Max. Unlike other programs, which use more universal languages like Python, MaxScript is completely devoted to just running things inside 3ds Max—so you won't see it elsewhere, and it can be a bit esoteric in methodologies from time to time.

While scripting allows you to do many things, we will cover the scripts that I think are most useful for integrating model assets, including those that really help get some things done efficiently for post-processing/compositing. Most of the scripts discussed below are free online. The ones that I have personally developed are not available, but with a bit of study and online research, you'll be able to create or find ones of your own.

SoulburnScripts: Created by Neil Blevins, SoulburnScripts, are the granddaddy of all script packages. These are a set of his personal scripts which every 3D Production Artist and 3ds Max Enthusiast should have in their toolbox. Memorize them, use every one at least once, and you will be amazed at what they can do. I use at least one of the SoulburnScripts every day; it is probably more accurate to say every hour. There are tons of useful scripts in this pack, some of which I have highlighted below.



PutPivot: PutPivot will place your pivot point in one of the 27 points, which are determined from the object's bounding box. Center (Middle) Bottom is what I use 90 percent of the time for placing correct pivots on setdressing items such as trees, cars, etc. If the pivot of your object is set correctly, you can use a plug-in such as GLUE or "Object Dropper" from SoulburnScripts to "glue" the model to a surface, rather than using the transform dialog or moving it by hand.



ObjectPainter: This script will allow you to "paint" single or multiple objects to a surface (or to many surfaces). It includes the ability to paint the objects as bounding boxes and to add random transformations while painting. The script has two modes: "Paint," which works like a paint brush, placing items on intervals while the cursor moves; and "Place," which places objects per

click. This script is great for creating background/context forests, shrub beds, and the like.



ObjectReplacer: ObjectReplacer will replace selected objects (or groups) with other objects. This is great for replacing low polygon assets received in files from clients with high polygon, properly textured assets from your production library.



TransformRandomizer: TransformRandomizer changes the transforms of one or multiple objects through numeric values set in parameters. I use TransformRandomizer daily, especially for adding variety to setdressing such as trees and shrubs. If you have a mass/volume of plants in one area that are all the same model (or proxy), you'll end up with a very consistent-looking render.

Use TransformRandomizer to change the rotation and scale of all the objects independently, which creates massing of items that look like they have tremendous amounts of variety, but are created with one model asset. TransformRandomizer works in conjunction with the object's pivot point, so make sure that is set properly first or you might be surprised with the result! My recommended settings would be: min -45, max 45 for the rotation variation (in the Z), and random scale min 85 max 115 (you can do x, y, z independently with these values or all at once, or some more than others!). The script will execute these parameters every time you click "apply," and the effect is both random (it will do different settings for each item each time, so it could get smaller once, or larger once, depending on the settings) and cumulative. It is best to do small increments in order to find something satisfactory in just a few clicks.

A few others:



NameManager cleans up names of objects quickly, which is good for 3D party models or model assets from Evermotion or Turbosquid.



ViewportControl is great for getting to those views that aren't set to hotkeys by default, such as "Right" and "Back."



ObjectDetacher quickly explodes large meshes into individual objects by elements, which is very handy when trying to glean down geometry, or drill down a curtain wall or some other large geometric object for animation.

PERSONAL SCRIPTS

For the last part of this article, I wanted to share two of my own scripts: the SketchUp Import Awesomizer (SIA) and GBuffer ID Script. SIA was developed and refined through several months of SketchUp model imports and mimics my personal workflow for importing SketchUp models into 3ds Max. The GBuffer ID

script utilizes the GBuffer ID, which is present and editable on every object in 3ds Max. This script streamlines the creation of mattes, which will render and output at the same time as the main image pass, thus saving time and energy since they don't need to be created separately. It also speeds up the transition into post production software such as Adobe After Effects or Adobe PhotoShop.

SketchUp Import Awesomizer: Although 3ds Max supports opening/importing SketchUp files with a native .skp importer, this method has its shortfalls. Since the importer brings in the model with the SketchUp layers, components, object names, and materials, the model can be a bit of a hassle to use in 3ds Max because the programs handle the information differently. In addition, the quality of the SketchUp model, or rather, the quality of the import, depends on the quality of the modeler and their personal workflow and habits. The inconsistency in these variables can be quite inconvenient for using SketchUp information directly in 3ds Max, so for my workflow, this script fills that gap.

My preferred workflow is to export the model out of SketchUp as a .3ds file, by materials. Then, I import the file into 3ds Max and use the "layer by material" portion of the SIA script to organize the model into layers by material (these will build in my Layer Manager as well). Once this is sorted, I can begin to sort geom-

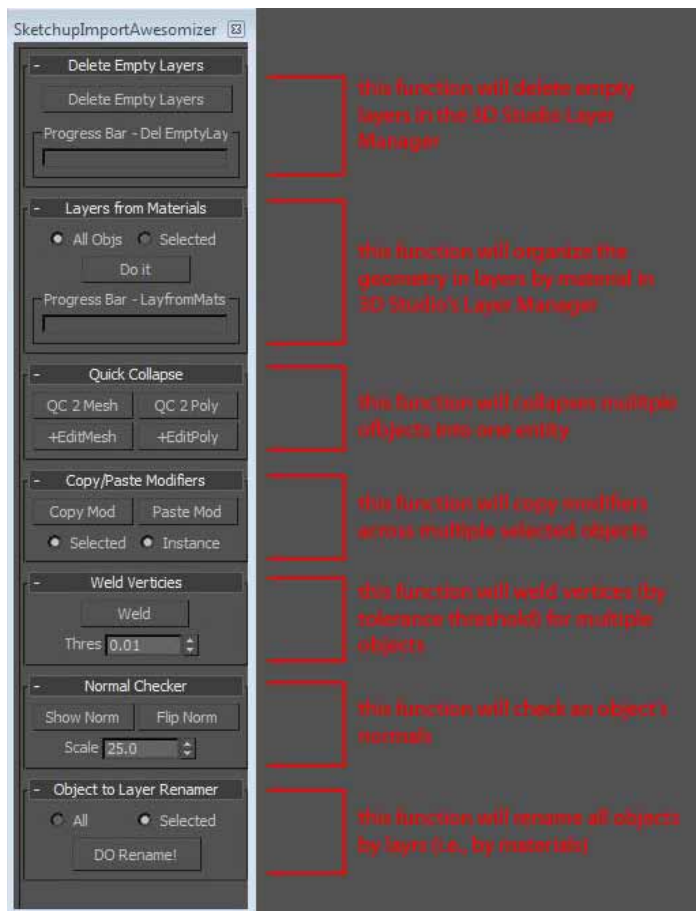


Figure 1: Screenshot of the SketchUp Import Awesomizer Script

etry into more defined layers by collapsing objects into larger meshes and applying UVs and appropriate modifiers where necessary—like shell for glass. What is gained through this process is that the artist in 3ds Max is not bound by the SketchUp modeler's components or layers. Instead, the artist can use the base organizational information of the asset, the materials, to drive the process. One caveat: this script/workflow only works if the model received has materials applied!

GBuffer ID Script: This script is very similar to EffectChannelSet, a script by Track on ScriptSpot. The script sets the GBuffer ID in an object's properties to a numerical value, which is then coordinated with a Multimatte Render Element (if using V-Ray). Please note V-Ray's Multimatte Render Element is similar to the Matte Element (if using Default Scanline). When the scene ren-

ders, 3ds Max will generate an image file with the GBuffer ID in one of the color channels (R, G, or B) which can then be used in either PhotoShop or After Effects to set mattes. The good thing about this method is that mattes are generated with the main render, and will continue to be updated every time you render (as long as the Render Element is turned on!) Another good thing is that you get three mattes for the price of one luma matte!

CONCLUSION

This article has covered popular third-party modeling programs and described techniques to integrate assets created in these programs into 3ds Max. We have also covered some different scripts and techniques to quickly manage, integrate and transform model assets. It is my hope that you will be able to take some of these tips and advice and apply them to your work in a way that helps you work more quickly and efficiently in 3ds Max.

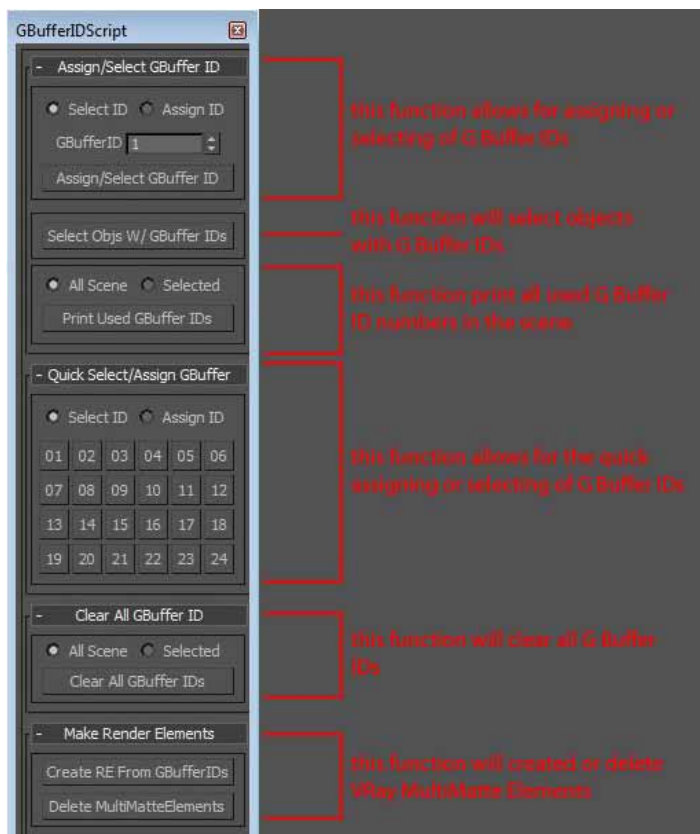
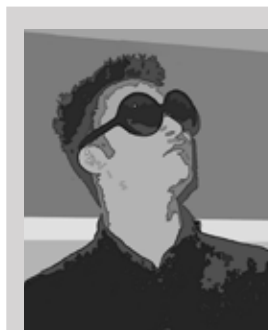


Figure 2: Screenshot of GBuffer ID Script interface.



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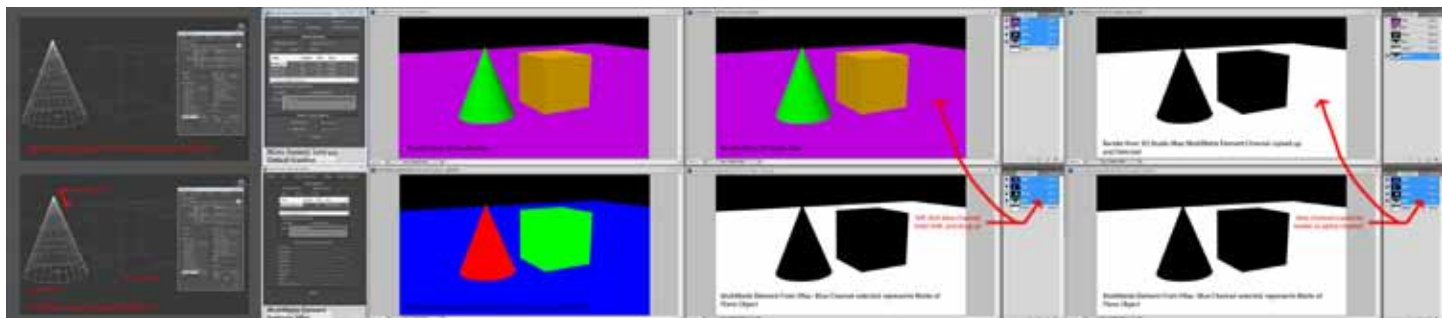
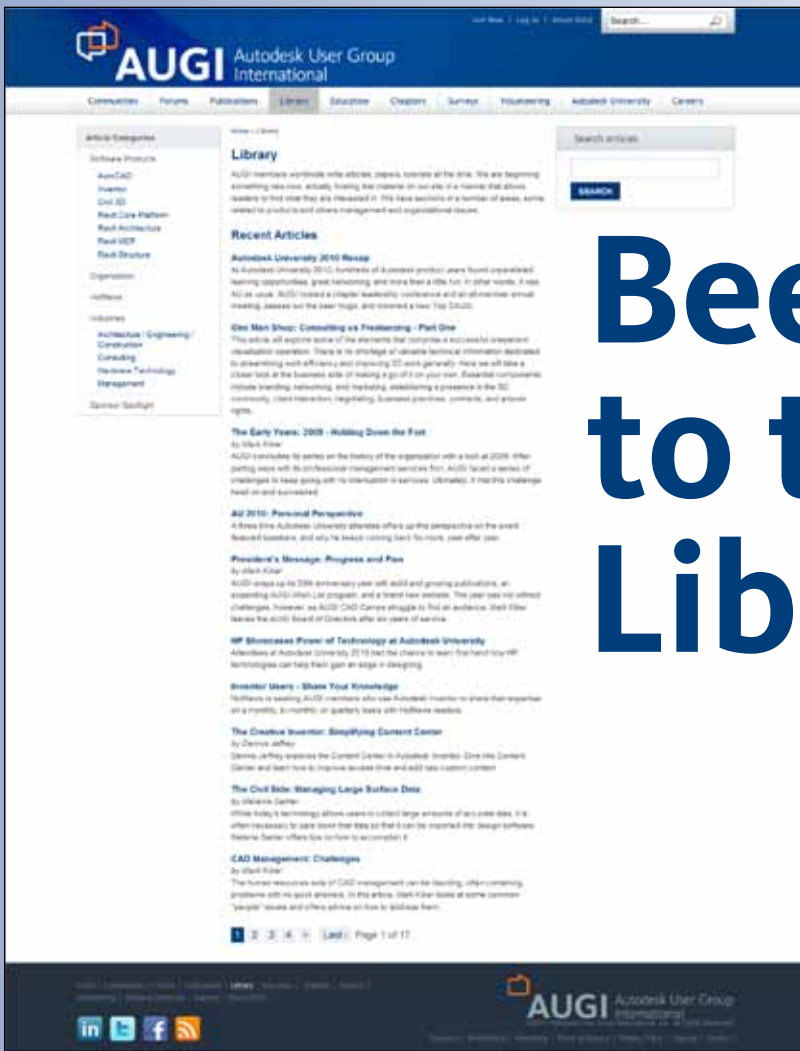


Figure 3: Screenshot of how GBuffer ID works with Adobe PhotoShop.



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

Been to the Library?

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.

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

Are you ready to write?

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