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AUGIWorld

The Official Publication of Autodesk User Group International

June 2014

Powerful,
Versatile,
Plentiful
Third-Party
Applications

*Introducing
R. Robert Bell,
the new AUGI
President*



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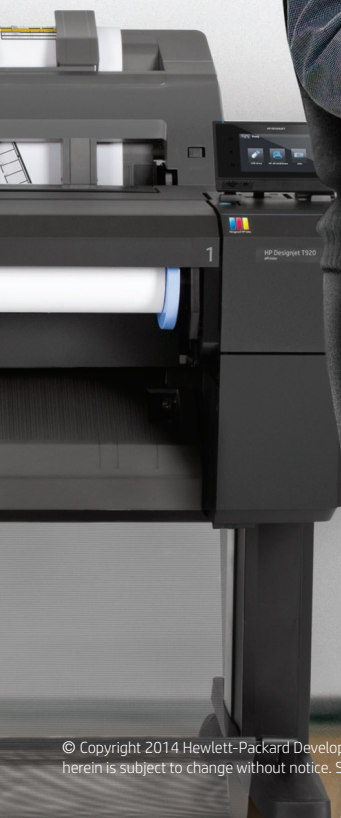
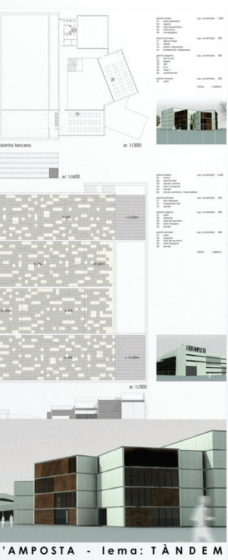
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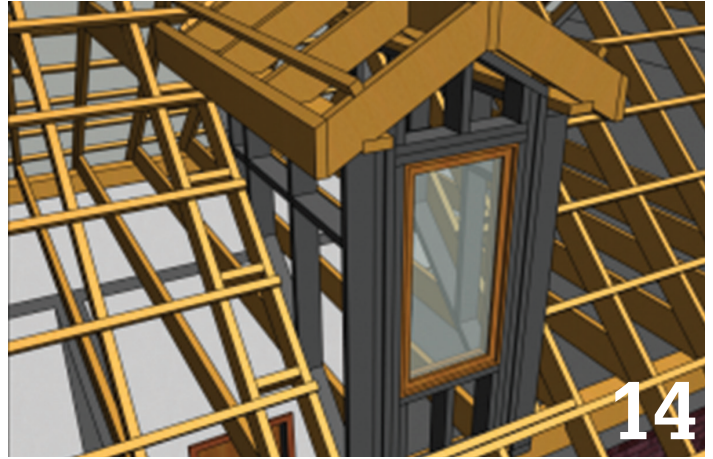


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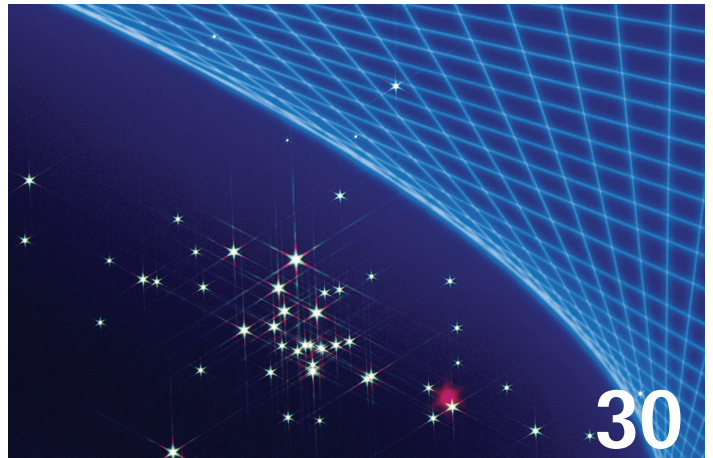
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Letter from the President



AUGI



CHANGE HAPPENS

There were some exciting changes that happened during the May 2014 AUGI Board of Directors meeting. First, as you have no doubt noticed, it's my face here in *AUGIWorld* as the newest President of AUGI while maintaining my role as Chairman of the Board. David Harrington stepped down as the President of AUGI in a planned transition to myself. David's term as president was immensely valuable to the organization and he did so much for AUGI. But David isn't disappearing!

AUGI is taking the responsible step of creating a management team to handle the operations, communications, and finances of the organization. David will be our new Director of Operations, which allows him to stay involved with the organization about which he feels so passionate. Kevin Merritt is AUGI's Director of Communications, a role that he was already in, and is working on the external face of AUGI to the rest of the world. July Ratley, our current accountant, has agreed to become the new Director of Finance, a position for which she is well qualified, to make sure AUGI is well-funded and fiscally responsible.

These three directors form the management team of AUGI and report to your Board of Directors. The board is confident that this management team has the skills, knowledge, and talent to provide you with more features than AUGI has ever provided in the past. All three of these individuals have already been acting in this capacity to some degree so there is actually little disruption to the day-to-day operation of AUGI.

The creation of this management team frees the Board of Directors to concentrate on strategic planning for your organization. For years it has been recognized that the board needs to be more strategic and not buried in the day-to-day operation of AUGI. So what is next for the board? We ask that you participate in upcoming surveys and tell us what you want. While the board tries to determine what is best for AUGI, we love it when you talk directly to us. Please reach out to the board members to tell us what is important to you. You can reach us in the forums, by email (board@augi.com), and by speaking to us at events. We want to hear from you.

Another significant change is that Ray Eisenberg, AUGI's liaison at Autodesk, will be leaving Autodesk soon. This means that we have a new liaison, Olivier Le Pord. We met with both of them at our meeting and we know Ray is leaving us in capable hands, but Ray will still be missed.

In closing I want to express my appreciation to the Board of Directors for their confidence in electing me as President of AUGI. Change happens, and I hope that my term as President helps AUGI provide even more reasons for you to want to be a member of AUGI.

R. Robert Bell

AUGI President/Chairman of the Board

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Published by:

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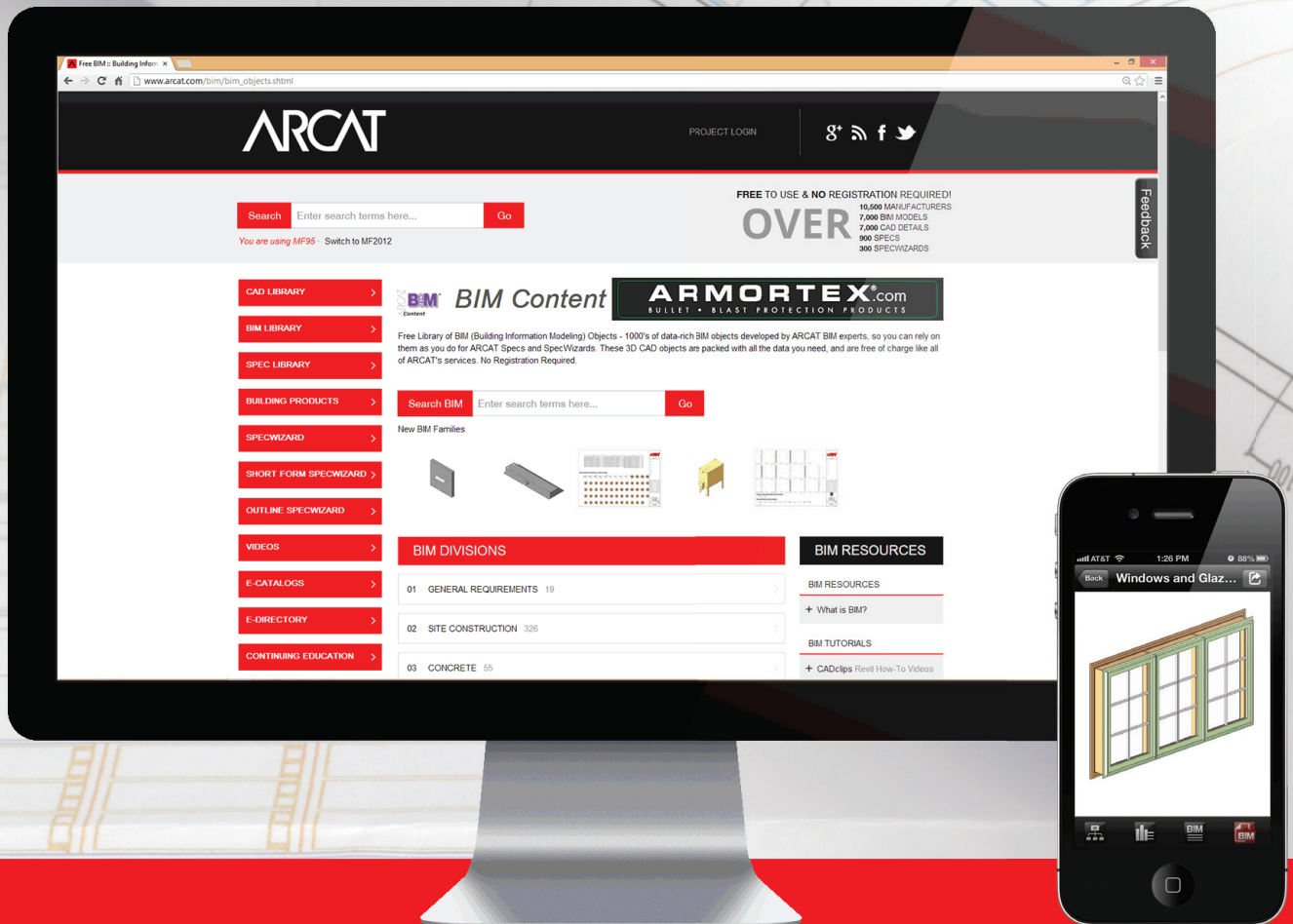
AUGIWorld (San Francisco, Calif.)
ISSN 2163-7547





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Third Party “Chaps”



PCMAGs encyclopedia provides a good working definition of a Third-Party App: An application that is provided by a vendor other than the manufacturer of the device. For example, the iPhone comes with its own camera app, but there have been camera apps from third parties that offered advanced features such as a self-timer and simple editing.

Tech leaders have long embraced third-party development—either in hardware, such as adding a graphics card to your PC, or software, such as adding small or large programs to your Autodesk tools. It allows you to tap into the extended creativity and efforts from those who are not originally involved in the creation or expansion of the hardware or software.

Many device developers could not have seen the embrace and expansion of their devices without third-party developers making so many great apps. From small to large, the many offerings that are out there can be overwhelming at times. They all help you get your job done. They expand your productivity, increase your connectivity, and unleash your creativity.

But what about third-party apps for your leadership or career? What would they be? How would you find them? What would they do?

First, let me expand the concept of third-party “apps.” I want you to think of third party as people. These people are those who might assist you in getting your job done. Anyone who

expands your productivity, increases your connectivity, and unleashes your creativity is, in my thinking, a third-party “chap.” Sorry for the pun. Sorry for the male only connotation of that term—I speak of all genders, but needed a word that rhymed with app. So now that you are thinking of chaps instead of apps, let’s dive in.

PRODUCTIVITY

Leaders need people to get things done. Some leaders have direct reports and can assign work to them. Others do not have any direct reports and need to get things done through people who do not work for them. They have no authority to make them do anything. If this describes you then you need to cast a vision that attracts others to your goals. You need to see where they might fit in and offer to have them engaged. Be sure to provide clear expectations: What they can and cannot do. Get good at delegating by defining the task, stating the resources that can be used, setting a timeline, and marking out areas that they should not include. Scoping tasks is part of the delegation. Most people will appreciate knowing what is expected. Make sure you clearly outline that they should tell you if they cannot finish a task. Remember, they do not work for you. Their available time is controlled by others.

Keep expanding the list of available staff that might help you out. Keep track of which folks get things done and which ones are unable to complete on time. Hone the list to those you can invest in and reap returns. Invest your time, talent, and support, and return the favor by helping them get something done.

CONNECTIVITY

Most leaders know that they need to create and nurture a network of people who can assist them when needed. You know that in order to have a good network you have to be a good person for others to have in their network. You do this by helping others to connect. Stay connected and connect others.

Make sure you touch base every so often. It might be a quick email, a phone call, or a meeting. Whatever it is, keep it up. This is hard for some folks (me included). By connecting to others you get an opportunity to expand your network and to be of service to others.

CREATIVITY

Tapping into other peoples’ brains is one of the most valuable applications I can make in advancing my career, leadership, and friendship with others. It is a mutual exchange of ideas. You should regularly pick the brains of others. Ask for input. Provide input when asked. Listen more than you speak. The best ideas are often dropped into conversations that flow on to other things. Follow up with someone who mentioned an interesting idea and dig a little deeper.

Ask for others to critique your plans and ideas. Run them past others who might disagree with your focus. Run them past allies to refine them. Take it all in and improve your targets. Blend together creative ideas that allow you to mix them into new

Tapping into other peoples’ brains is one of the most valuable applications I can make in advancing my career, leadership, and friendship with others.

recipes for success. Find out what others are doing in differing markets and see how you might apply their productivity to your own area. Ask to see their standards. Share your own. Ask about software upgrades and how they did the training. Ask them what third-party apps they are adding onto the foundation that Autodesk has laid.

TAPPING INTO REMOTE “CHAPS”

You can also tap into remote connections via the AUGI Forums. Today’s opportunities for interacting go way beyond geographic locations. It is nice to meet face to face when you can, but reaching across a continent is fantastic. Frequent the Forums. Dive into the discussion groups.

THINKING THIRD PARTY

So here is the definition that I can provide to frame your thinking...

Third Party Chap: A person, other than yourself, who provides an idea, concept, or practice.


Tap into this wealth by interacting with others in new ways. Speak up, ask questions, and listen.



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

case

Remote collaboration with Revit

 While technology makes it easier for people to work together, people are spreading further and further apart. Employees are dispersed between multiple offices, work from home or on the road, and sit in different cities and different countries. For example, CASE has 40 people working from nine cities in North America, South America, and Europe; HP has approximately 300,000 people working from more than 170 countries.

Remote collaboration with Revit remains a major pain point. The problem is far from solved, but there are a number of ways to approach it without getting on a plane. In this article we discuss some of these approaches.

TYPES OF COLLABORATION

There are two primary ways to use Revit remotely. The first is to use virtualization. In essence, you use your computer to virtually control a computer already inside the local network—a bit like screen sharing. The second way is to send Revit files across a wide area network (WAN).

The advantage of virtualization is that you can interact with others on the network as if they were all local to one another. The advantage of WAN collaboration is that it works with most existing IT infrastructures. We'll do a deep dive of virtualization in another article and for now focus on the best ways to use Revit across the WAN.

CONFIGURING MODELS FOR COLLABORATION

In general, collaborating on a model over a WAN is much like collaborating on a model within your local office. The Revit Server has a central model—that is, the definitive copy of the project. Users copy this model onto their local machine and check out

worksets. The worksets effectively block others from making changes to certain parts of the central model while the user is editing elements on a workset. Once the user returns the workset, all the modifications are synced with the central model and the design marches forward.

The main difference between collaborating over a WAN compared to working locally is the capacity and latency of the links between the local machines and the central servers. This difference can be orders of magnitude. A file that takes seconds to send on a local network can take minutes or even hours to send outside the network across a WAN. For this reason, file size matters.

The model should be clean and well structured. Purge unused elements, make sure families are lightweight (generally you want them less than 1MB), and resist the temptation to over-model. Avoid linked files such as linked AutoCAD files, point clouds, and texture images. If linked files are used, put them on a separate worksheet so users can control whether they are downloaded. Performance can be further increased by occasionally compressing the central file, which can be done in the dialogue box that opens when you synchronize with the central model.

To avoid synchronization conflicts, the model needs to be segregated in such a way that users can checkout the elements they need without blocking others from doing so. There are a range of strategies for segregating the model. In general, related elements should be grouped on the same workset. The grouping should follow how the team works. So if one person is responsible for casework, put all the casework on a worksheet together. But if the fit-out is being done floor by floor, divide the casework between the appropriate fit-out worksheets. Be careful about over-segregating the model since having too many worksheets (and poorly named worksheets) makes it hard to ensure people are contributing to the correct worksheet.

On large projects it may be necessary to use multiple models. To avoid coordination issues, the models should not be dependent upon one another. Ideally each model would encapsulate an isolated aspect of the project. For example, a multi-tower development might place separate buildings in their own independent models.

Whatever the segregation strategy, it is important that the project team understands the model structure. This is especially pertinent if those working remotely have come from outside your organization, and are therefore, unfamiliar with your working methods. These project standards should be agreed upon at project kickoff and then documented in the BIM execution plan.

NETWORK CONFIGURATIONS

There are a number of ways users can set up a WAN connection. The easiest is through a VPN connection. Once users establish a VPN connection to the network hosting the central server, they are essentially part of that network. They can sync and check out worksets just like they would on the local network. The major downside is that the connection is being made through the internet rather than the local network. This method can become extremely slow if the connection is bad or the VPN swamped with other connections.

Revit Multisite gets around some of these problems by creating local copies of the central server. These local copies are called accelerators, and each office can have their own accelerator. Users get the speed benefit of working locally, while the accelerators send data between each other in the background to ensure everything is in sync. There is some cost and time involved in setting up the accelerators, so unlike a VPN this isn't a solution you can quickly access on the road. But for permanent workplaces, this solution works well. Users may find the multi-server/accelerator setup confusing, so some time should be set aside to teach best practices.

Both VPN collaboration and Revit Multisite can benefit from WAN acceleration. Essentially a device like Panzura Controller or Riverbed Steelhead is placed at either end of the connection between offices. These devices compress the data as it is sent, which significantly reduces the amount of data being sent. While effective, they are unfortunately expensive, so perhaps not suitable for every office.

HP REMOTE GRAPHICS SOFTWARE

We'll go into virtualization in depth in a future article. For now, suffice to say, setting up VPNs and server accelerators are not the only way to collaborate remotely. If you want to experiment with virtualization using the infrastructure and equipment you have today, you might want to try HP's Remote Graphics Software (RGS). With RGS on HP Workstations that offer Intel® Xeon® processors and Intel® Core™ processors, you can log on to a remote workstation and control it from wherever you are. This means that the workstation can be on the same local network as the Revit Server, allowing super fast model syncing even though you are not part of the local network.

Unlike other screensharing software, RGS is optimized for graphics-intensive workflows like Revit, so responsiveness is great. It also includes HP Velocity, which improves the remote connection on poor network connections. Its advanced compression algorithm reduces bandwidth requirements by as much as 50 percent, and it supports multiple displays and remote USB connections.

In addition to using RGS to explore virtualization, you can use it to collaborate with colleagues on a shared screen in real time, which makes it a nice tool for remote design reviews and remote classrooms.

One more thing that is really cool about the just-released RGS 7.0: it has a special set of features for Windows 8 tablets, including customizable multi-touch commands (turn swipes into hotkeys and pinches into camera zoom), and the ability to use the entire screen as a track pad.

HP RGS is available for around \$200 per seat. However, if you have an HP Z Workstation, it is included for free. You can download it at www.hp.com/go/rgs.

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A Robust & Versatile Dynamo

 If you have not heard the word Dynamo before in relation to Autodesk® Revit®, it is about time you did. It is the newest, most amazing add-in to hit Revit. It is literally the future of Revit and other Autodesk software. It's hard to explain what Dynamo is because it does so much. For the purposes of this article Dynamo will be kept in the context of being used as an add-in for Revit. Of course, Dynamo could also be used as a standalone program or used as an add-in for other Autodesk programs. Yes, it is an Autodesk program that is open source and free! The software can be downloaded from <http://dynamoBIM.org>, and source code is at <https://github.com/ikeough/Dynamo>. It is currently available for Revit 2013, 2014, and 2015.

DESIGN SCRIPT AND DYNAMO VERSION .70

Dynamo is developing so fast that it has daily builds, meaning that a new version is released on a daily basis. Of course, most of it is untested so there are “stable” builds that are released about every two months or so. The latest version of Dynamo (version .70) had the back-end code rewritten to include and incorporate Design Script methodology.

This article will not go into too much detail about Design Script, but just be aware that all the Dynamo functionality could be done using simple Design Scripting. Design Script is a text-based programming language developed by Autodesk to simplify text programming for designers. When I say simplify, I mean it is the

easiest text-based programming language to use. If you want more information on Design Script, visit the following link <http://designscript.ning.com/>.

EVERY USER GETS TO TOUCH THE API

Let's face it, the Revit API is a very difficult thing to utilize. For the most part you need to be an Autodesk developer or an experienced .net programmer to use the API and write programs. The API was developed *for* developers *by* developers and, therefore, many Revit users will find it difficult to understand, let alone try to use.

I am happy to say that Dynamo basically allows users to use the Revit API through visual programming using “nodes” and “wires” instead of text. This means that any Revit user could use the API and create simple custom routines without having to know .net language or without having to hire an outside API consultant.

DYNAMO BASICS AND THE DYNAMO INTERFACE

Nodes are the boxes you place and connect together with wires to form a program. Nodes can represent any function of the API.

Wires connect between nodes to pass information between nodes. Wires flow only in one direction.

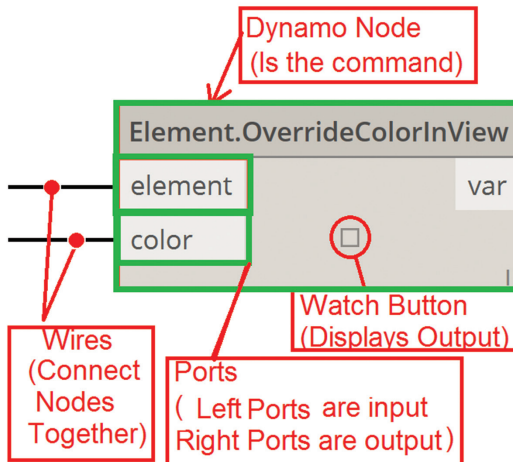


Figure 1: The Dynamo node

Wires connect the output port from one node to the input port of another node. To create a wire, simply use the mouse and left click hold and drag from one port to another port. Wires are dashed while being dragged and then turn solid when connected. You could also pull the wire away to disconnect it from the port.

Information flows through the ports from left to right.

See Figure 2 for all the nomenclature on the Dynamo interface. When you download the latest version of Dynamo, simply click to install it. It will then show up under your “add-in” tab in Revit. Click on the Dynamo button and it will open a separate window that is the Dynamo interface. It is best to use dual monitors when using Dynamo.

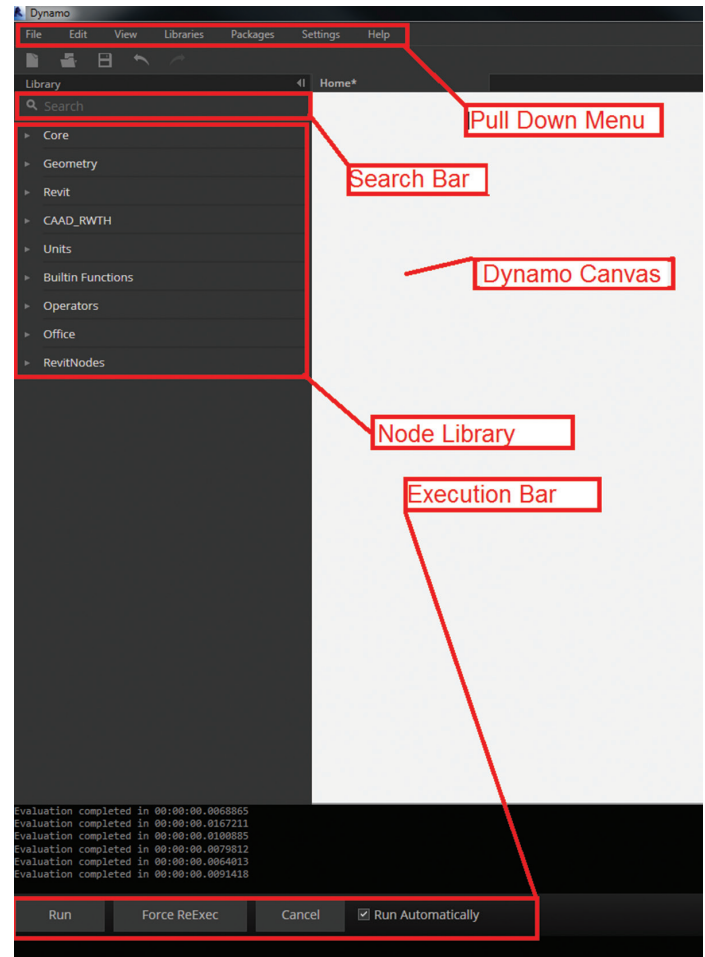


Figure 2: The Dynamo interface

The pull-down menu is used to open and save Dynamo files, copy and paste operations, change settings, and access the “Package Manager.” The Package Manager allows Dynamo users to create custom Dynamo nodes with either Python Scripting or Nesting other nodes into each other and then posting them as a “Package” so other Dynamo users can use them. Yes, that’s right—you could become a Dynamo developer and share your custom content!

The Node Library is similar to the view and browser in Revit where it shows all the available nodes.

The Dynamo Canvas is the main “workspace” environment for creation of all Dynamo visual programming. The Execution Bar runs or executes the current workspace. What is unique to programming in Dynamo is the ability to run the program in real time and if you want to do that, simply click the “Run Automatically” box.

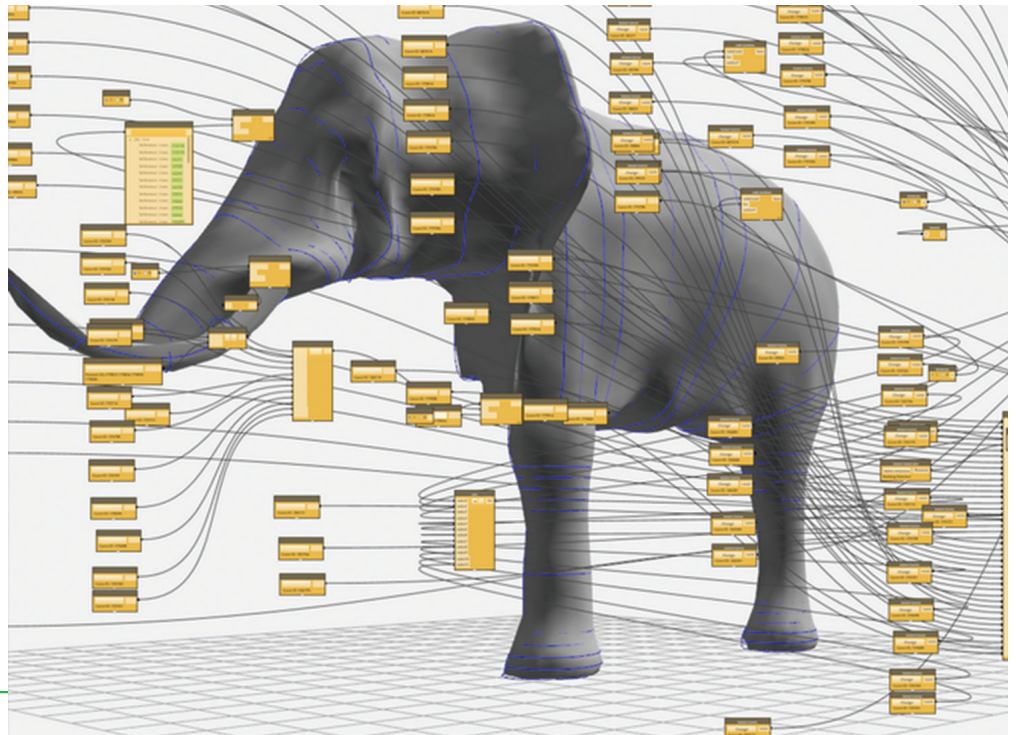
You can save the Workspace as a Dynamo file for later reuse.

A SIMPLE EXAMPLE

The code at the top of Figure 3 uses C# programming to tap the API to temporarily override the color of a selected wall element—in this case, red. In the bottom image, the C# code shows that same method using dynamo nodes. Which programming language do you prefer to work in? Yes—Dynamo is that simple.

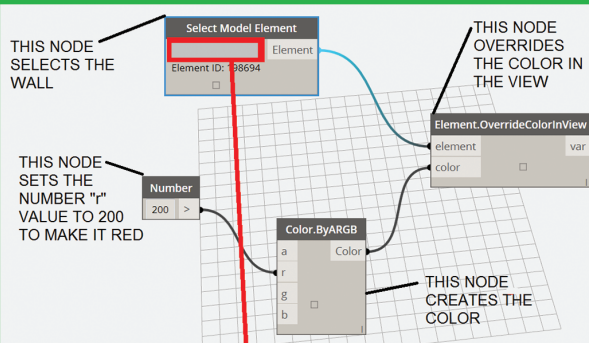
Revit Architecture 2015

There are so many applications of Dynamo I could not even begin to get into all of them within this article. Take comfort in knowing that Dynamo is a handy toolset for any Revit user. Dynamo is easy to use and could be applied on a daily basis. Dynamo is useful for everyday practical tasks such as setting family parameters equal to each other from one family to another or exporting and importing data via Excel. Dynamo is ever-evolving, so now is the time to download load it and learn it. Why wait? It's free! By the way, Dynamo could also be used to create an elephant in Revit as shown in the figure to the right.

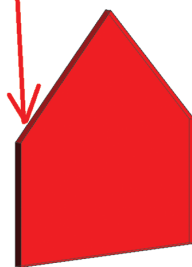


```
public override Value Evaluate(FSharpList<Value> args)
{
    var color = (System.Drawing.Color)((Value.Container) args[0]).Item;
    var elem = (Element) ((Value.Container) args[1]).Item;
    var view = dynRevitSettings.Doc.ActiveView;
    var ogt = new OverrideGraphicSettings();
    if (solidFill == null)
    {
        var patternCollector = new FilteredElementCollector(
            dynRevitSettings.Doc.Document);
        patternCollector.OfClass(typeof(FillPatternElement));
        solidFill = patternCollector.ToElements().
            Cast<FillPatternElement>().
            First(x => x.DefinitionName == "Solid Fill");
    }
    ogt.SetProjectionFillColor(new Autodesk.Revit.DB.Color(
        color.R, color.G, color.B));
    ogt.SetProjectionFillPatternId(solidFill.Id);
    view.SetElementOverrides(elem.Id, ogt);
    return Value.Number(1);
}
```

Change Wall Color Via C#



Change Wall Color Via Dynamo



WALL IN REVIT
THAT CHANGED
COLOR

Revit



Marcello is the BIM Director at John A. Martin & Associates Structural Engineers in Los Angeles, CA. He has been using Autodesk products for over 15 years including AutoCAD, 3ds Max, and Revit. Marcello is heavily devoted to helping advance the use and knowledge of BIM solutions within the AEC community. He is well known for modeling elements and creating workflows that others have thought not possible. He also frequently presents at Autodesk University and at The Revit Technology Conference where he has been voted the top rated speaker two years in a row at both conferences. He has worked on many well-known projects in the past including the Walt Disney Concert Hall in Los Angeles, CA, the Stata Center at MIT, and the Tom Bradley International Terminal Expansion at LAX. Marcello received B.S. and M.S. degrees in Civil Engineering and is a licensed Civil and Structural Engineer. He could be reached via email: marcellojs@hotmail.com, Twitter: [@marcellogamb](https://twitter.com/marcellogamb), or at his blog site: www.therevitcomplex.blogspot.com

Figure 3: Changing an element's color using C# versus using Dynamo

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Before achieving the status of Autodesk® Revit® software lecturer and a project manager for an Autodesk Authorized Developer, I had been working in the architectural design company for some years. I have experience on a variety of building projects in the roles of designer and software consultant as well. My architectural drafting experience and skills acquired by working with Revit and in high education (I hold a Master's degree in Engineering and Computer Graphics) help me to be a part of the staff that develops BIM solutions and extensions for Autodesk Revit software.

In this article I will present some third-party add-ons that are used in Revit Structure to increase the performance of professionals who prepare structural engineering projects. Since 2009, I have been furthering the development of AGA CAD applications for Revit. These apps are being developed and continually improved due to the high number of Autodesk Revit platform users who are willing to step up and facilitate project preparation work.

I would like to describe some of the AGA CAD 28 different productivity enhancing tools vital for Revit users. Properly speaking, the functionality of those applications was expanded so much that we call these ultra-high-performance products "BIM solutions" because, according to their volume, they do not correspond to the notion of "add-ons."

So, what are the products I am talking about? I will focus on two BIM solutions that address the most painful design processes for

structural engineers: modeling of wood or metal framework and shop drawing of reinforced concrete assemblies.

PREPARATION OF SHOP DRAWINGS COULD BE EASY

Building design is one of the construction industry sectors with a great need to make the design process faster and economically efficient. Every structural engineer who uses Autodesk Revit Structure knows very well the headaches that come from working with Revit assemblies. Using plain Revit software in the preparation of shop drawings takes outrageous time inputs because engineers need to perform a lot of manual operations.

I do not like that plain Revit doesn't have enough automatic tools for the preparation of shop drawings. If I need to add dimensions or dimension notes on every element face, rebar, hosted, or nested element, I feel constrained to do that manually.

Furthermore, plain Revit allows for the preparation of a shop drawing just for one assembly at a time. Therefore, creating shop drawings is time wasting activity for structural engineers because they have to manually create all assembly sheets one by one. Would you like to count how long it takes to prepare shop drawings of all assemblies if there are 50 or 100 different elements in the Revit model? It's scary to think about this.

A productivity-enhancing BIM solution was developed that saves Revit Structure users a huge amount of time. Smart Assemblies

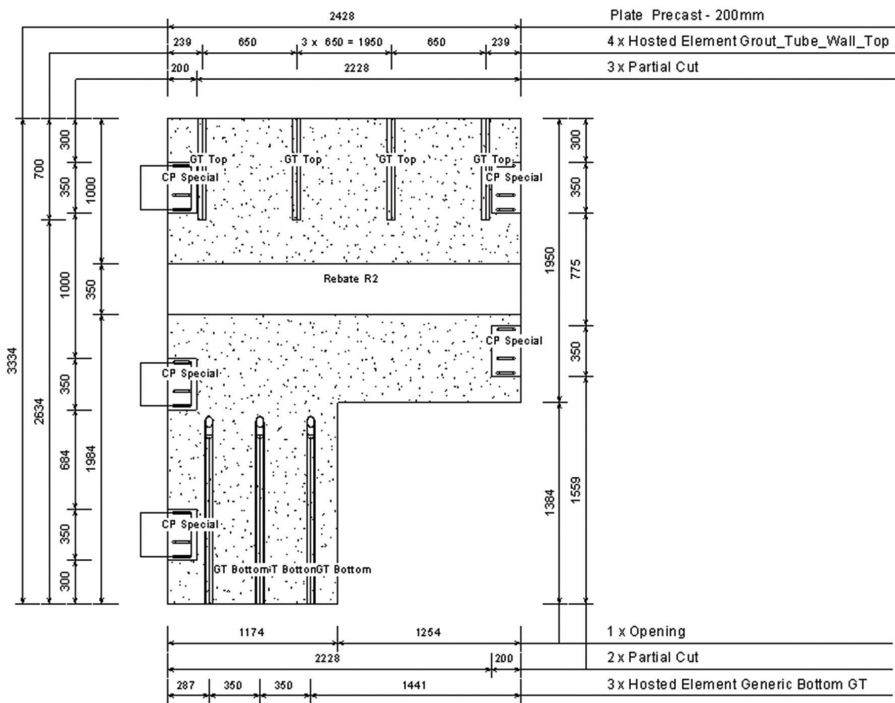


Figure 1: Front view of a wall assembly created with the Smart Assemblies application

provides a set of intuitive tools for the generation of shop drawings. Revit users just need to select structural beam, column, wall, floor, or other structural element, then the application will collect all the rebar and other hosted concrete or steel elements and make an assembly with predefined views and schedules.

Smart Assemblies is a third-party add-on that allows Revit Structure users to create assemblies and corresponding views from selected architectural or structural elements and automatically generates shop drawings with required schedules and dimensions in views.

HOW SMART ASSEMBLIES WORKS

Using the feature Workshop Drawing Configuration, the designer has to define the views that will be created for the assembly; the same for schedules, view/schedule templates, title block, etc. When the settings for dimensions and views are defined, the Smart Assemblies user just needs to select the main element from the project and click "Create Assembly." That's it! Smart Assemblies will create user-defined assembly views with dimensions and place them in the worksheets automatically.

This application creates assemblies from walls, parts, floors, structural framings, architectural columns, structural columns, or structural foundations you select in the project. Moreover, it allows you to control element orientation in Assembly Front View. This setting goes for family-based elements (such as columns, beams, and generic models).

Smart Assemblies shows the situation with all created assemblies in a separate convenient dialog. At the same time, users can see the list of elements that are not yet assembled. Such elements can be filtered and assembled with one click. And it doesn't matter how many Revit elements you choose: Shop drawings will be generated for all at one time!

Smart Assemblies automatically generates dimensions in views by predefined rules. Notes can be added to dimension lines, too. Assembly sheets are generated automatically by predefined sheet templates where views and schedules are placed in the right places. Legend views can be placed on the sheet also, if it is required.

Using Smart Assemblies, structural engineers can prepare shop drawings with ease because an assembly combines multiple hosted or nested concrete and steel elements into a single entity that can be dimensioned, scheduled, tagged, and isolated to create assembly views and sheets.

It is very handy that dimensions and notes can be automatically added on every assembly view. Revit users can predefine how to measure main elements (wall, part, floor, beam, column, and foundation), hosted metal, hosted concrete elements, rebar, and so on. Dimensioning rules and shop drawing configurations can be saved to a separate XML file for the future projects. This can be placed into a network server for sharing among users and colleagues.

The Smart Assemblies application defines the views that have to be created for the assembly; the same as dimensioning configuration

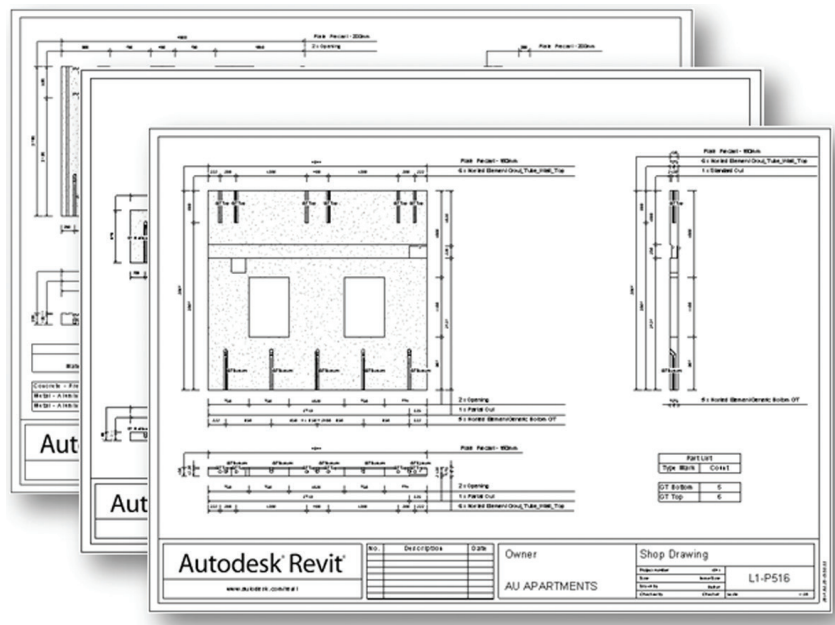


Figure 2: Autodesk Revit workshop, Smart Assemblies sheets

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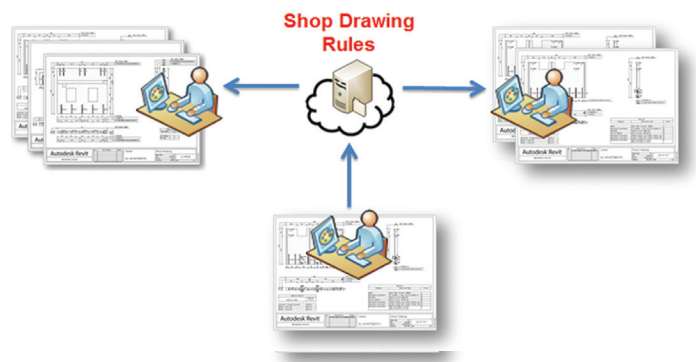


Figure 3: Smart Assemblies rules for Autodesk Revit shop drawings

for every view, schedule, view/schedule template, tag, legend, and title block. Also it adds “weight” and “mass” parameters to the assembly and calculates true weight and mass values automatically. Mandatory condition for weight and mass calculations: Every element has to have material assigned with “density” value.

Assembly Sheets are automatically generated by predefined user template. Users can point to where every assembly view or schedule has to be placed. When compared to plain Revit software, the Smart Assemblies application allows you to predefine view templates, schedule templates, title blocks for the future assemblies and to put assembly views into the same place on all sheets. Also, it allows users to create two or more sheets if needed.

AUTOMATIC ASSEMBLY UPDATES

The very convenient Smart Assemblies feature is an automatic update. If there are changes in the model, Smart Assemblies can save time when updating your existing assemblies.

After any change in the project, the structural engineer simply needs to select the assembly and update it with the “Update Assembly” feature. Smart Assemblies provides a detailed report with warnings after making or updating the assembly. Every assembly is displayed with a separate color that indicates its status, allowing Revit users to easily understand what assemblies are up-to-date or should be updated. The report can be exported to a PDF if necessary. All assembly updates happen in real time, which helps users avoid mistakes and control all process of shop drawings creation easily.

| Naming Category | Level | Type | Assembly Created-Updated | SDC |
|--------------------|--------------------|---------|--------------------------|--------------|
| Structural Framing | 1st Floor RL16.550 | ST2 | | |
| Walls | 1st Floor RL16.550 | L1-P519 | | |
| Walls | 1st Floor RL16.550 | L1-P518 | 2014.02.25 14:40:25 | Example Shop |
| Walls | 1st Floor RL16.550 | L1-P516 | 2014.02.25 14:40:16 | Example Shop |
| Walls | 1st Floor RL16.550 | L1-P520 | 2014.02.25 14:40:12 | Example Shop |
| Walls | 1st Floor RL16.550 | L1-P522 | 2014.02.25 14:40:06 | Example Shop |
| Walls | Ground RL13.200 | GF-P69 | | |
| Walls | Ground RL13.200 | GF-P127 | 2014.02.25 15:25:07 | My config |
| Walls | Ground RL13.200 | GF-P137 | | |
| Walls | Ground RL13.200 | GF-P133 | | |

Legend

- Assemblies are Up to Date
- Assemblies need Update
- Assemblies with Deleted SDC

Figure 4: Smart Assemblies update

The main goal of SmartAssemblies is to help Revit users simplify the assemblies workflow. This unique application solves many headaches of Revit users who need to prepare a large amount of documentation to the construction industry. It can save hundreds of hours of work required for shop drawing creation, because it gives Revit Structure users incredibly speedy workflow, easy control process, and error prevention.

Smart Assemblies enables you to prepare shop drawings for many selected reinforced concrete elements. The “Update Assembly” feature will automatically update any changes in the project to all selected assemblies.

This powerful Revit-based BIM solution is compatible with Revit releases 2013-2015. Try this helpful application and you’ll see that preparation of shop drawings could be very easy. You can save hundreds of hours per project using Smart Assemblies for the automation of shop drawing creation. You will not need to add dimensions to assembly views or compose shop drawings manually anymore!

ADD-ONS FOR AUTOMATED FRAMING LAYOUT

The next high challenge for structural engineers who use Revit Structure is a demand to create a full framing layout in 3D that should be very accurate. Also, it is desirable for the framing process to be creatively flexible so as to be able to correctly form things such as cripple hips and a wide range of cut outs, let-ins, doubling up, raking cuts, junctions in larger sized ridge beams, and the like. I know from my practical experience that not a few Revit Structure users need to get additional tools for Revit for automatic roof or whole building framing.

Revit has a tool to automate the layout of frame of a building, but its functionality is rather weak. Therefore, structural engineers often seek and apply any third-party program whose functionality allows them to simplify the framework process and shop drawing creation.

One of the examples of excellent third-party products could be the AGA CAD BIM solution Wood & Metal Framing Pro, which consists of independent modules Rafter+, Truss+ RT, and Wall+. Revit users have been using them for a few years, with positive results.

The first Revit add-on, Rafter+ by the AGA CAD team, was designed for Revit 2009 version. This add-on for roof frame construction was developed when we discovered that Revit, at that time, didn’t have anything like the ArchiCAD module for wood framing. Talking to customers and getting feedback, we decided to expand Autodesk Revit’s capabilities. After Rafter+ was released, we got a huge interest from Revit users. That success showed us that we were headed in the right direction. After that, a whole series of other productivity enhancing framing products was released. These products include the Wood & Metal Framing Pro suite, whose separate

modules enable users to handle complicated modeling tasks quickly, accurately, and effortlessly.

Wood & Metal Framing Pro is a powerful modular BIM solution with an intuitive set of functions for wall and roof framing and elements scheduling. As was mentioned previously, this suite consists of the independent modules Rafter+, Truss+ RT, and Wall+. To introduce all these modules for Revit Structure users, I will present each of them briefly.

POWERFUL WALL FRAMING INSTRUMENTS

Framing in Autodesk Revit has never been an easy task. It is a disaster when it comes to modeling all the framing and it gets

the function from the menu. Wall+ has almost all possible wall framing situations in its workflow that can be easily configured. It automatically generates the vertical and horizontal wood framing members of walls including openings for a timber- or steel-framed building model.

Wall+ is made for both modular and non-modular framing design. Main benefits of modularity are that it enables you to reduce construction price and increase construction speed and precision, which are needed for energy efficient buildings. It allows you to finish your modeling with a built-in shop drawing generator and deliver your wall framing estimation the same time.

There are all main framing types available. You are free to frame structural framing, nailers, sidings, and even log walls. Wall+ is suitable for framing dormer roof walls, too. You just model structural wall framings then build your complete workshop drawings with dimensioning, part lists, and material take-off automatically.

Wall framing structure is defined with your Revit wall types. It allows designers to think only about building design and not bother about the wall framing part. After the design is ready, users just need to configure a few settings, setting up as many configurations for different wall framing types as they like. Save them and the template is created. Reuse them anytime and for any project.

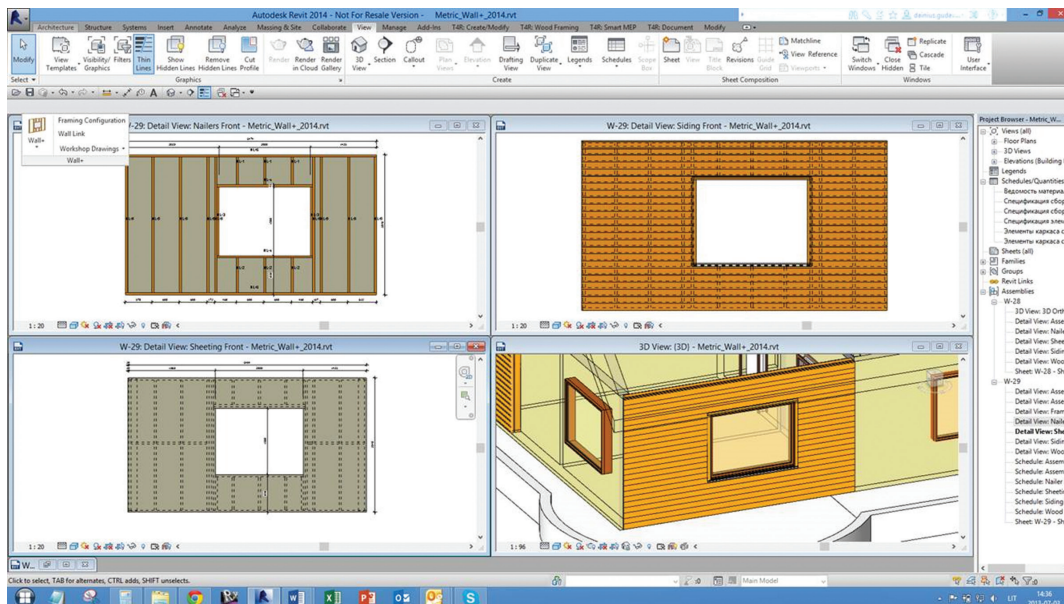


Figure 5: Views of a framed wall

worse when we get to the point where updates or changes are needed. Therefore, I recommend the use of add-ons to make the modeling process easier.

All AGA CAD framing solutions are built for quick framing project development, but with different design objects. For example, the Wall+ solution provides a set of intuitive automated functions for modeling wall frame, using native Revit elements and making shop drawings just created with several mouse clicks. This application helps Revit users to create their sustainable buildings excluding all the dirty drafting work from their everyday processes. Just build the frame design, modify it if something doesn't fit well, and get back to detailing.

Everything in Wall+ is a mouse click away. Choose what needs to be modified and click

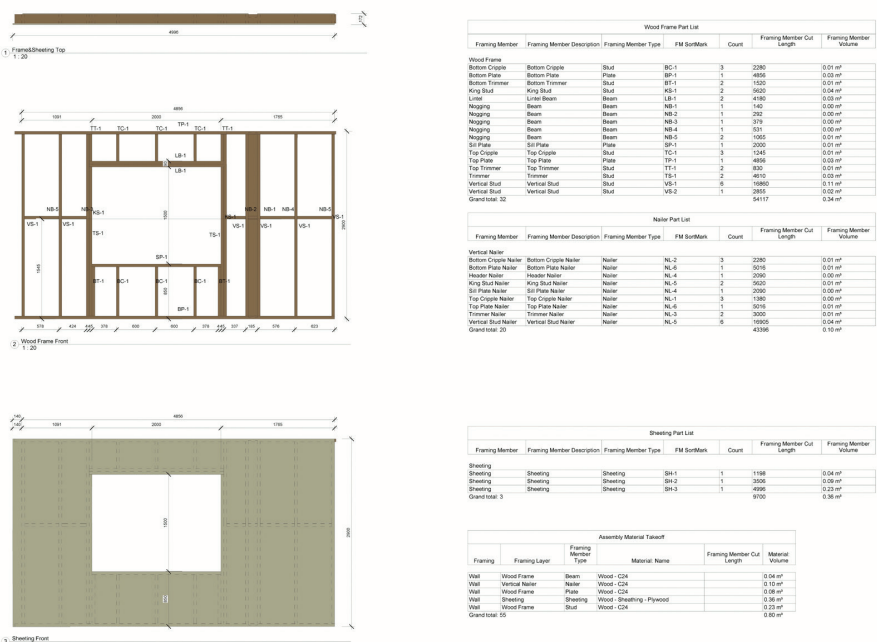


Figure 6: Sample of workshop drawing

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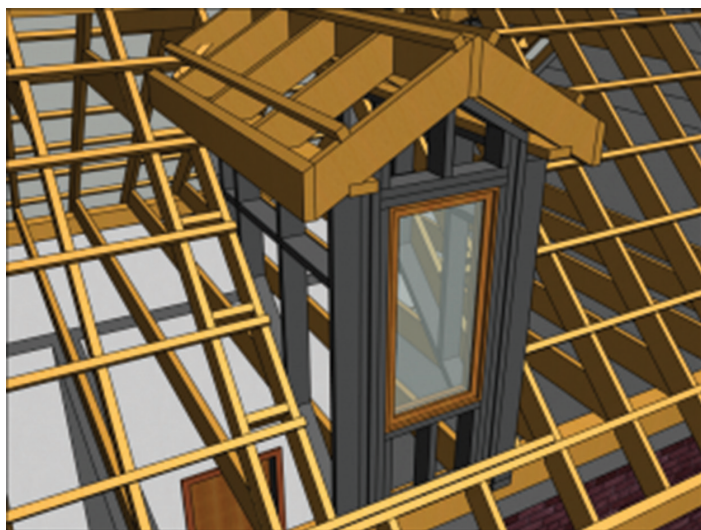


Figure 7: Wall+ frames dormer walls

Timber, metal, or composite studs, plates, and bracing are available. Profiles can be changed all at one time or one at a time, as the designer prefers. There are lots of modification capabilities because Revit users can modify each framing element separately. Every part of the framing (noggin, bracing, headers, top plates, sills, etc.) can be sorted and listed in schedules automatically. Wall+ makes automatic updates in all schedules, drafts, and workshop drawings when project changes are being made. So if you make any changes to the structure, your wall dimensions and tags will be generated automatically.

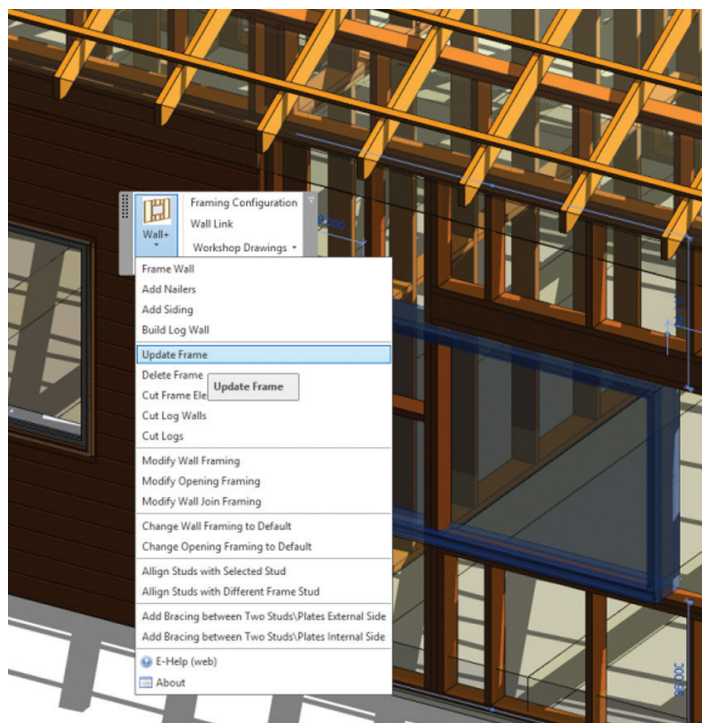


Figure 8: Wall+ enables to move openings and updates framing quickly

Using Wall+ frame modeling in Revit is easy. Modeling with changes might take approximately 30 minutes and what is left are the workshop drawings, which are done completely automatically.

WIDE-RANGING TOOLS FOR ROOF FRAMING

BIM software such as Autodesk Revit allows all designers to implement their decisions in a model. But many designers across the world are trying to find the answer of how to easily model their roof (gable, flat, pent-roof, etc.) designs in the Autodesk Revit platform.

If you're a structural engineer or modeler in a firm that designs framed or modular buildings, modeling with Revit Structure is not an easy job for you. When it is not automated, this process can become a nightmare, so helpers are crucial to getting things done quickly. Truss+ RT and Rafter+ are my favorite Revit add-ons. They save a lot of time creating roof framing plans, with the advantage of creating take-offs immediately.

There are two options to make roof design: rafter roof and truss roof. Sometimes roof framing systems are complex, having different common roof types and structural solutions. For example, the same type of roof can be done using rafters or trusses. For the rafter roof design, I suggest the independent Wood & Metal Framing Pro module in the Rafter+ that enables users to quickly lay out rafters, valley rafters, beams, and so on. This BIM solution for wooden roof framing provides a powerful set of intuitive functions for automated roof rafter system design and elements scheduling. Rafter+ allows Revit users to very easily complete the framing of any roof shape—with dormers or without.

Rafter+ allows users to frame a whole roof quickly as well as floor systems. Only the architectural part of the roof has to be done if you want to use Rafter+. You don't need to make a beam system for every roof slope manually as well as roof opening, dormers, or floors. The product automatically generates common rafter

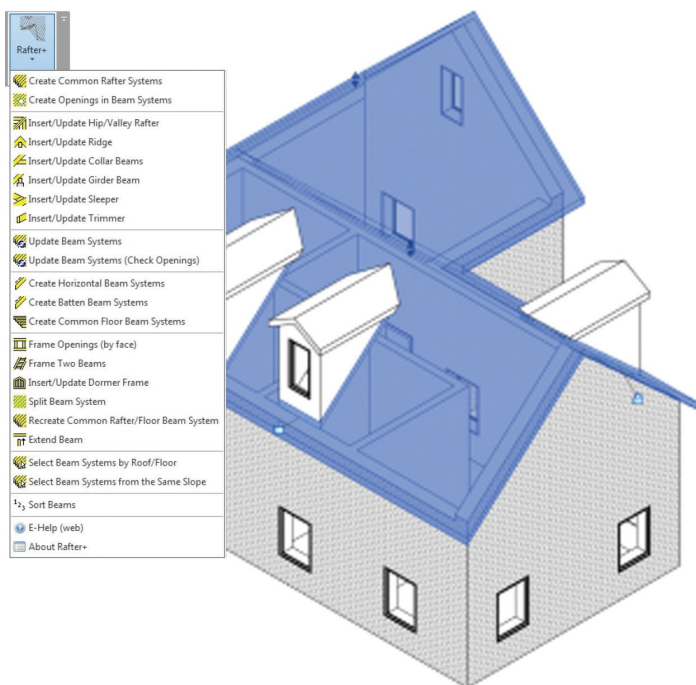


Figure 9: Rafter+ features

systems (including jack rafters) on all slopes for the selected roof. Also, automatic generation goes for a collar beam system between two selected rafters in opposite roof slopes. Vertical distance from a ridge or a level to the collar beam system can be predefined and edited later.

Rafter+ easily models ridge and girder beams with control of notch in parameters of common, jack, hip, and valley rafters. Also it creates hip/valley rafters after selection of two beam systems from the adjacent slopes (or all). This Revit-based solution automatically detects whether the element is a hip or a valley rafter.

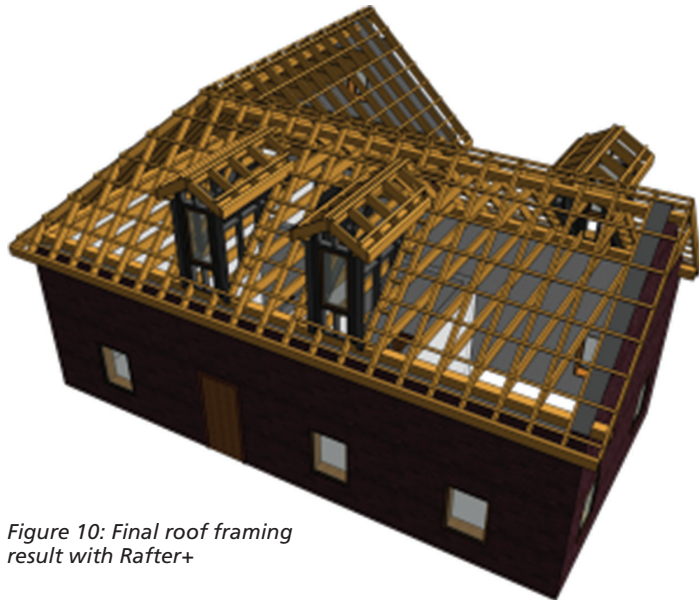


Figure 10: Final roof framing result with Rafter+

The application has several functions for horizontal system design. It creates horizontal beam systems, inserts sleepers and trimmers, generates floor beam systems automatically, detects and frames openings in floor slabs, and cuts wood beams in consideration with opening geometry. Also Rafter+ creates additional horizontal or sloped framing on top of rafters or floor beam systems using the very useful feature Create Batten Systems. Powerful functions for custom framing enables users to extend or trim beams, and split or recreate beam systems.

When you create openings, frame them, insert valley and hip rafters, ridges, collar beams, girders and trimmers, battens, and all necessary frame elements, then use the Update Beam Systems feature to cut all beams together.

Rafter+ automatically updates parameters of modeled rafter or beam systems. Flexible scheduling technology allows you to quickly define how to mark and sort different roof framing elements that are all covered by notes and specs, which should be represented in shop drawings correctly. The Sort function groups, sorts, and rennumbers framing elements according to predefined solutions. Examples of popular schedules are included with software installation.

Another Revit add-on that allows Revit users to model roof frame systems quickly, simply, and accurately is Truss+ RT. This versatile application enables users to build a truss system, analyze it, and make documentation in minutes rather than hours.

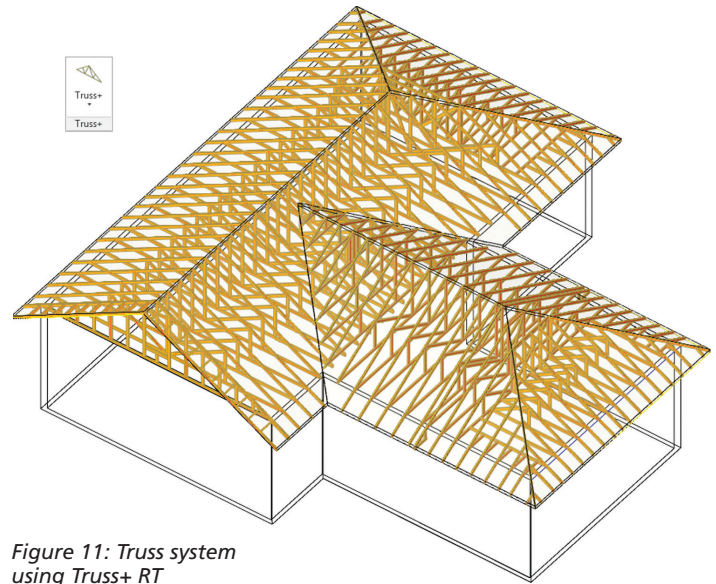


Figure 11: Truss system using Truss+ RT

Revit users who create sloped roofs often have questions about truss design, as follows: Is it possible to make complex truss systems

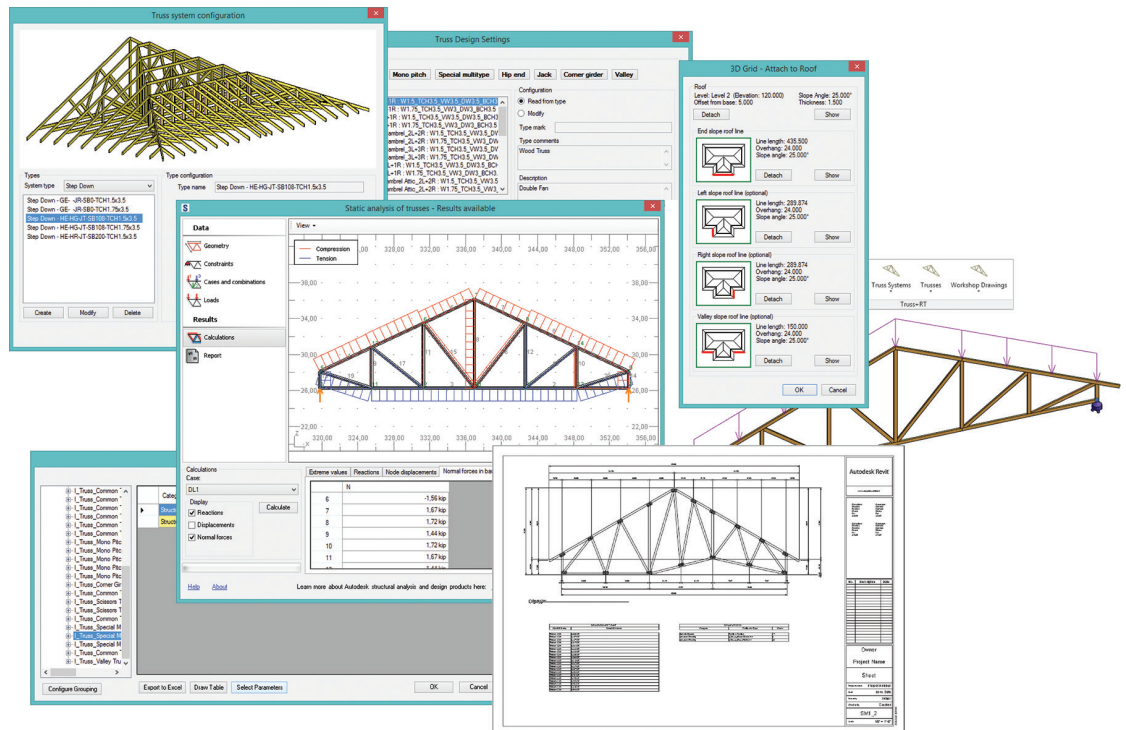


Figure 12: Truss+ RT features.

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in Revit? How do I make custom trusses? Can I make structural analysis of trusses in Revit? How do I make workshop drawings of individual trusses? How do I sort truss elements in Revit much quicker?

Truss+ RT solves all user headaches. It simplifies metal and wood truss design. Truss+ RT allows you to make structural analysis of all trusses created in Revit project.

With Truss+ RT, all design and analysis work can be done in Revit without the need to export/import your files. Following are some of the software's features.

- Draws your own custom truss. Truss+ RT has a built-in Truss builder that allows you to draw custom truss design and use it straight in a project.
- Creates workshop drawings by selected truss. Using templates, the documentation process is done in seconds.
- Sorts and tags truss members and copes them with one click.
- Calculates truss volume, etc.

This BIM solution quickly develops a truss system. Users can choose timber or steel truss framing. Quickly evaluate the design and economical differences and choose which system to use.

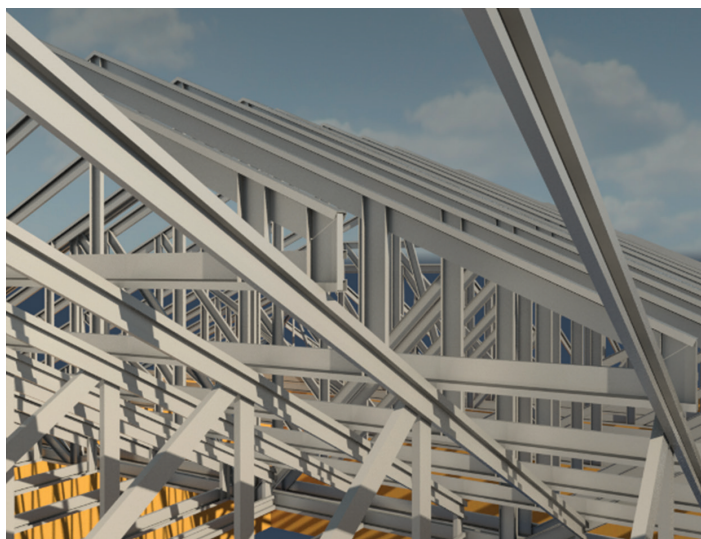


Figure 13: Modeling with steel trusses

If there are situations when you need to insert flat trusses in your project, you can use Truss+ RT for that, too. Looking at it conceptually, flat trusses are common trusses with zero slope angle and higher heel height and it is easy to add them in your Revit project.

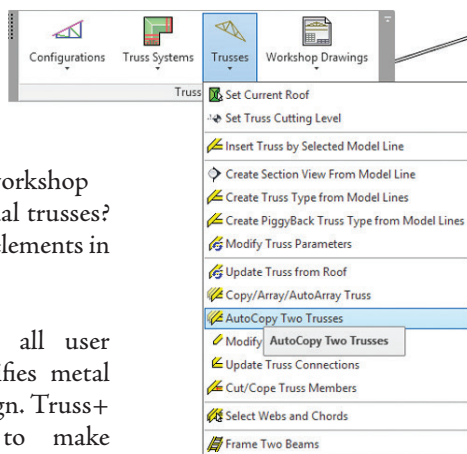
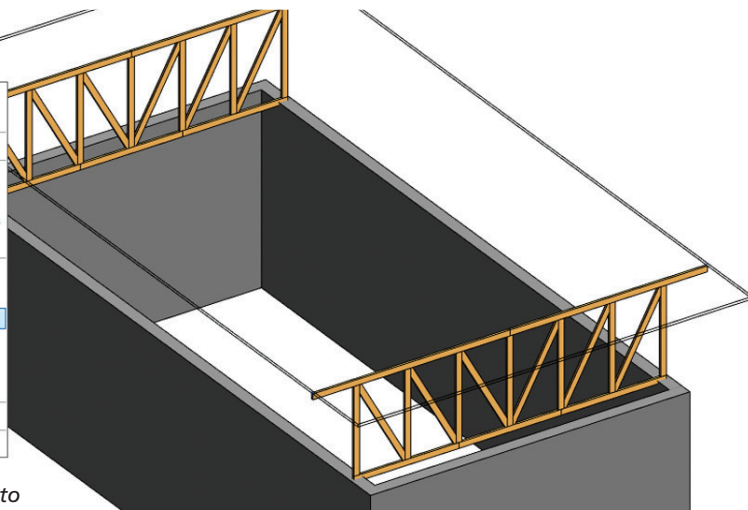


Figure 14: Truss+ RT helps to create flat truss framing



All modifications happen in real time, which helps users avoid mistakes and control all processes of family parameter changes easily. However, the main benefit of Truss+ RT is speedy workflow. This Revit add-on builds truss systems in seconds. Frame changes are controlled by a click of the mouse.

If you are a structural engineer or build modular buildings, I recommend the Wood & Metal Framing Pro app pack.

With these applications for Revit, designers can concentrate on their design, solve all their issues, and deliver all shop drawings to manufacturers in less time. Wood & Metal Framing Pro suite saves owners and designers time and money.

SUMMARY

Developer AGA CAD Ltd has a lot of productivity tools for Revit that are developed by users for users. Some could be called general platform solutions and some are very specific to an industry. Solutions range from the simple productivity app to small vertical solutions on top of Revit. I have highlighted just a few of them.

Features in the presented applications fill in some gaps with shop drawing creation of reinforced concrete assemblies and timber or metal framed system design. These tools help to speed up the BIM model design and project documentation process.



Renata Jociene is an Autodesk Certified Revit Professional at AGA CAD. Having practical experience as a designer and a professional Revit user since release Autodesk Revit Building 8.1, she's furthering the development of a full range of Revit add-ons. Renata can be reached for comments and questions at renata@aga-cad.com

How ACA Users Benefit from SketchUp



In every industry, there are many third-party tools that can help in all aspects of drawing quality. For AutoCAD® Architecture, among these tools is Google SketchUp. In this article, we'll look at some basic tools of Google SketchUp and you can see for yourself how user-friendly this application is.

WHAT IS GOOGLE SKETCHUP?

SketchUp is an excellent tool used by architects and civil engineers for creating, editing, and sharing 3D models. SketchUp drawings can be exported to AutoCAD Architecture very easily. There are two versions of SketchUp: SketchUp Pro and a free downloadable version that is very limited in its use. The free download includes integrated tools for use in uploading to Google Earth. The remainder of this article will discuss SketchUp Pro.

SketchUp is part of the same product family as Google Earth. With this tool, you can import a scaled aerial photograph from Google Earth to SketchUp with the click of a button. This can include topographical information as well.

SketchUp Pro comes with Layout, which is a 2D companion to SketchUp Pro. With Layout you can create professional design documents, dimensioned drawings, and presentation documents from the 3D models you created in SketchUp Pro. When the model is updated in SketchUp Pro, the changes are automatically updated in Layout.

USING SKETCHUP FOR THE FIRST TIME

When using SketchUp for the first time, it may be helpful to go to the Help menu and select Help Center, SketchUp Reference

Guide, and then Quick Reference Card, where you can print a PDF showing some helpful shortcuts. There is a link for SketchUp as well as a link for Layout.

Here are a few helpful tips to help you get started. When using your mouse, the left button is for tool operations and the right button is for the context menu. The middle button (wheel) has several functions: click and drag to orbit, shift click and drag to pan, double click to re-center your view, and scroll to zoom. The spacebar operates the Select Tool. You can use ctrl spacebar to add to a selection set, shift spacebar to toggle in and out of a selection set, ctrl A to select all, and shift ctrl to subtract from a selection set. Please print and read the Quick Reference Card before proceeding to use SketchUp.

COMPATIBLE FILE FORMATS

One of the many great features of Google SketchUp is that it uses a wide variety of file formats, including DWG, DXF, OBJ, FBX, XSI, and WRL. If you don't want to take the time to import a file into ACA, you can also create a screenshot of the file and save it in BMP, JPG, PNG, PDF, EPS, and TIF formats for presentation purposes.

IMPORTING AN ACA FILE INTO SKETCHUP

Now that we've looked at a few basic features of SketchUp, let's try importing a file from AutoCAD Architecture into SketchUp. The process is easy. Begin by opening SketchUp and select the File menu. Next select Import. Under the Preview area, you will see an Options button. Select Options and then select the options that you need in the dialog box that opens. Click OK (Figure 1).

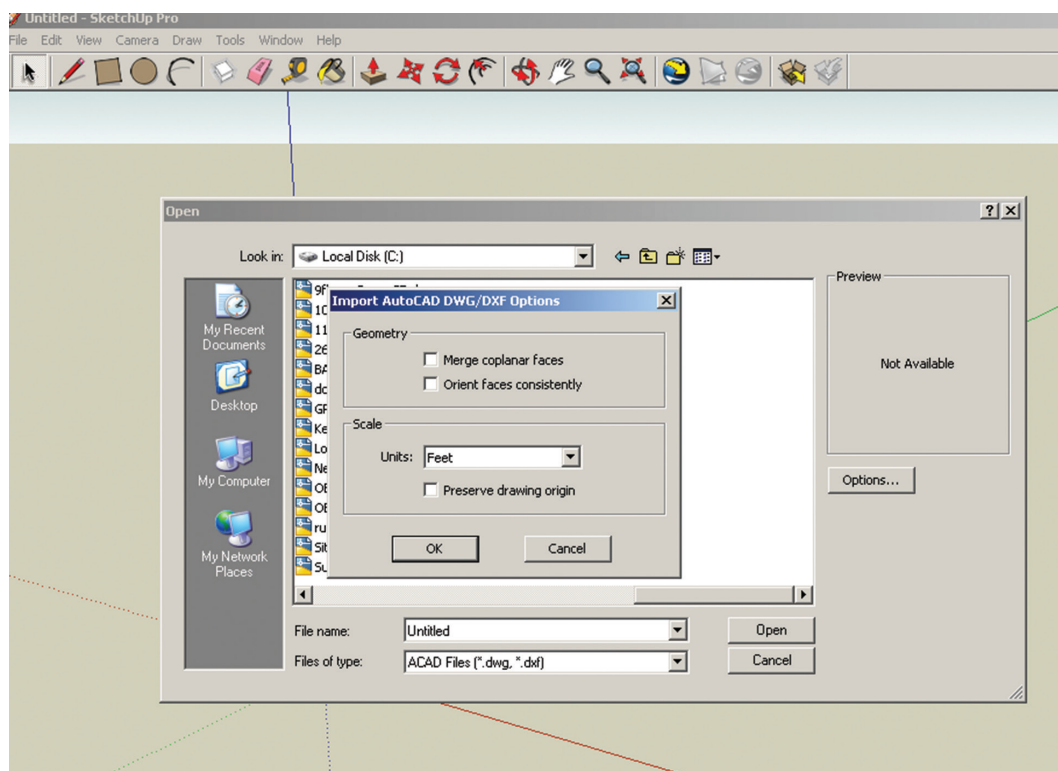


Figure 1: Import dialog box

Now select the file that you wish to import and click open. If you do not see the file you are looking for, be sure to click on the drop-down next to File Type to ensure that you are searching for the correct file type. You have now successfully imported a drawing into Google SketchUp! It is important to note that the SketchUp file will have the same 0,0 origin as your AutoCAD Architecture drawing.

CREATING WALLS

Now that you have a drawing imported into Google SketchUp, let's say the walls are in 2D and you want to make them 3D in SketchUp. Here's how you do that.

Begin by right-clicking and selecting Make Group. Then select the Line tool and select any corner of the perimeter to start the line. Now, enter the wall height in the Measurements box and press enter. Next select the Rectangle tool. Begin your rectangle by selecting the endpoint of the line you just drew and end the rectangle at a point on the wall. Continue until all exterior walls are erected. I have found that it's easier to complete the exterior first.

Now that all exterior walls have been erected and closed, you have created a face. The face is used to build the roof once you are ready to do so. Next, select the face, select the Offset tool, and enter the thickness for the exterior walls you have just created. Now select the face and use the Push/Pull tool. Push the face down to create the interior face of the walls. This will develop the interior face of the exterior walls so you can continue to create the interior walls at this point using the steps above.

ADDING DOORS AND WINDOWS

At this point, you have walls created. Now you will need to decide on header heights, door and window sizes and styles before continuing. Once you are ready, be sure you are in X-ray mode. Now insert the door component you selected and place it by referencing a point on an opening in your imported AutoCAD Architecture file. Continue placing all door components using X-ray mode. Next place all windows using the same method stated above for door placement. For example, if you were placing a window component above an overhead door, you would reference a point on the window and a point on the door.

VIEWING A MODEL IN 3D

A camera is used by SketchUp to represent your point of view of the model. Basically, the program treats you as though you are a camera that is looking at your model as you work. SketchUp uses several tools for viewing your model in 3D space. These are tools familiar to you in AutoCAD Architecture: Pan, Orbit, Zoom, and Zoom Extents. Each of these tools can be found on the Camera toolbar.

DYNAMIC COMPONENTS

Dynamic Components can be defined as components that have parametrics. For example, a cabinet component has doors that open and close. A component is only considered dynamic when it has parametric data. Dynamic components will display with a special badge when parametric data is present. Attaching attributes to a component is what makes the component dynamic. Attributes are items such as the component's name, description, location, size, and number of copies. Some attributes are predefined, which means that they are automatically available for every dynamic component. There are also custom attributes that are unique attributes defined by the developer of the dynamic component.

Every attribute of a component has a value that can be a textual string, a number, or the result of a formula. Each attribute and its associated value is called an attribute name/value pair. Formulas can consist of predefined functions, mathematical operators, or the values of other attributes. Functions are shortcuts that perform an operation, such as calculating the square root of a number.

It is important to note that all SketchUp users can use dynamic components. However, only SketchUp Pro users can develop dynamic components.

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- NVIDIA®Quadro® K2000 2GB
- 250GB Samsung® EVO™ SSD
- 27" 1920x1080 LCD Monitor
- Xi®MTower 700/1000W HAF
- MS Windows® 7/8.1Pro®-Linux®

1x4-C E5-1620v2 3.9GHzTB \$1,999
2x8-C E5-2687Wv2 3.4GHz \$6,949

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NVIDIA®MAXIMUS™ TECHNOLOGY Certified
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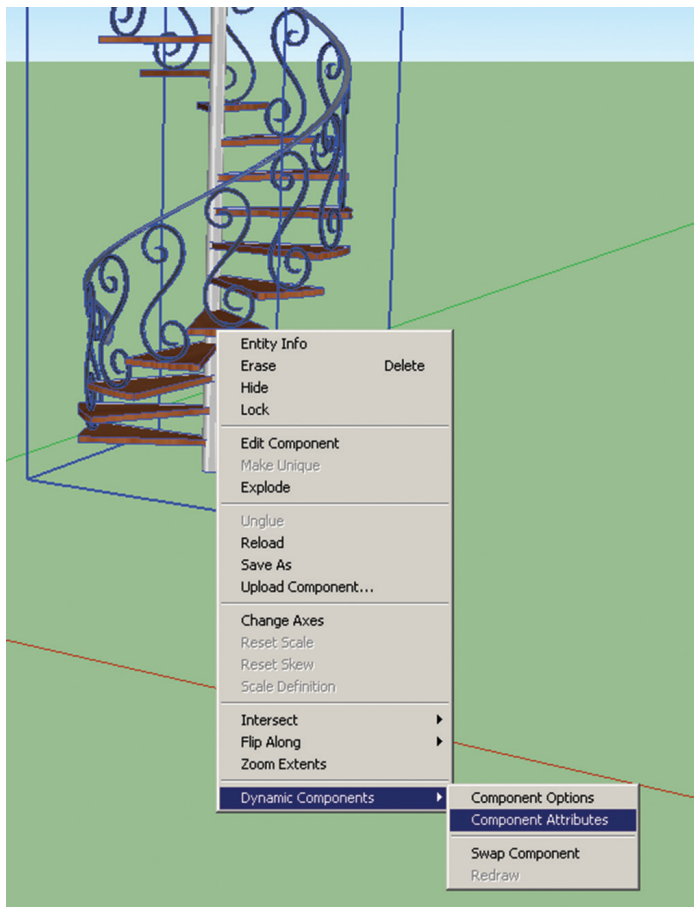


Figure 2: Dynamic components

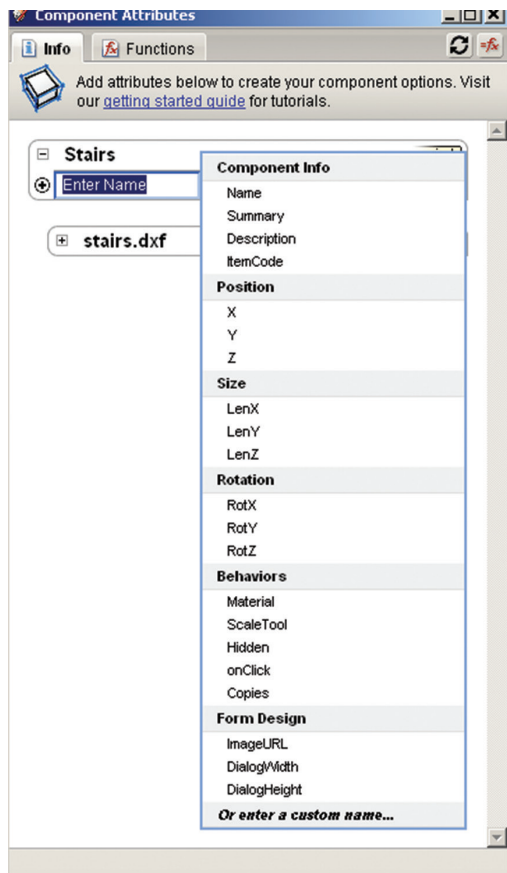


Figure 3: Component attributes

To make a component dynamic, right-click on the component, select Dynamic Components, and then select Component Attributes (see Figure 2). Select Add Attributes and a dialog box will display with attributes that can be added to your component (see Figure 3). Once you have added the attributes, the new dynamic component can be saved to a component file for additional use later.

EXPORTING A SKETCHUP FILE INTO AUTOCAD ARCHITECTURE

Exporting a Google SketchUp file into AutoCAD Architecture is easy. Once you are ready to export, select the File menu and select Export. Next select 2D Graphic or 3D Model, depending on the file you are exporting. Select the export file type from the drop-down. We are exporting to AutoCAD Architecture, so you would select AutoCAD DWG. By selecting the Options button at the bottom, you can choose which AutoCAD version you are exporting to as well as the drawing scale and size. Select OK and then select Export. The export is now complete! It is important to note that you can alternate between ACA and SketchUp multiple times. Your drawing does not have to be complete before importing it into SketchUp or from SketchUp into ACA.

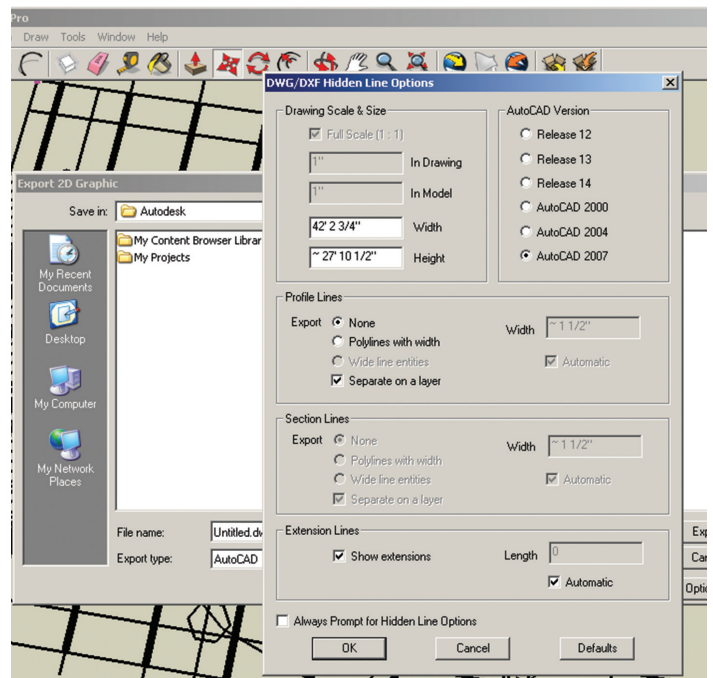


Figure 4: Export dialog box

3D WAREHOUSE

A great feature of SketchUp is the 3D Warehouse, which allows you to search for 3D models made by other users as well as contribute 3D models of your own. It contains 3D models of buildings, cars, bridges, interior furnishings, and much more. A new feature allows you to search for similarly shaped models instead of relying on a text search. This really saves time when you're in a hurry to find a specific item. The 3D Warehouse is a wealth of information and can help you design quickly when facing a tough deadline. Best of all, this feature is free!

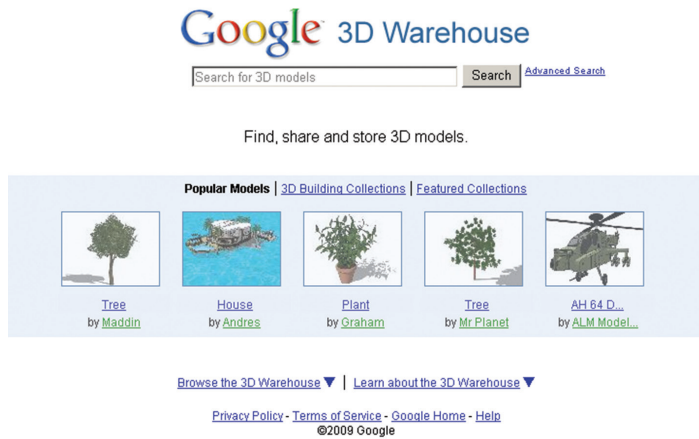


Figure 5: 3D Warehouse

LAYOUT TOOL

SketchUp contains a vast library of colors, textures, shadows, lighting, and so on. You are limited only by your imagination when completing renderings in SketchUp. Rendering tools and materials libraries in ACA combined with the tools in SketchUp can produce awesome presentation renderings! To use the library, select the File menu and select Send To Layout. This will open Layout, a feature that's included with SketchUp Pro and is used for creating and sharing presentations made from SketchUp. You can add title blocks, save templates, add graphics, and create multi-page documents. Layout gives you more control over color, style, and weight of the lines and faces in your SketchUp model.

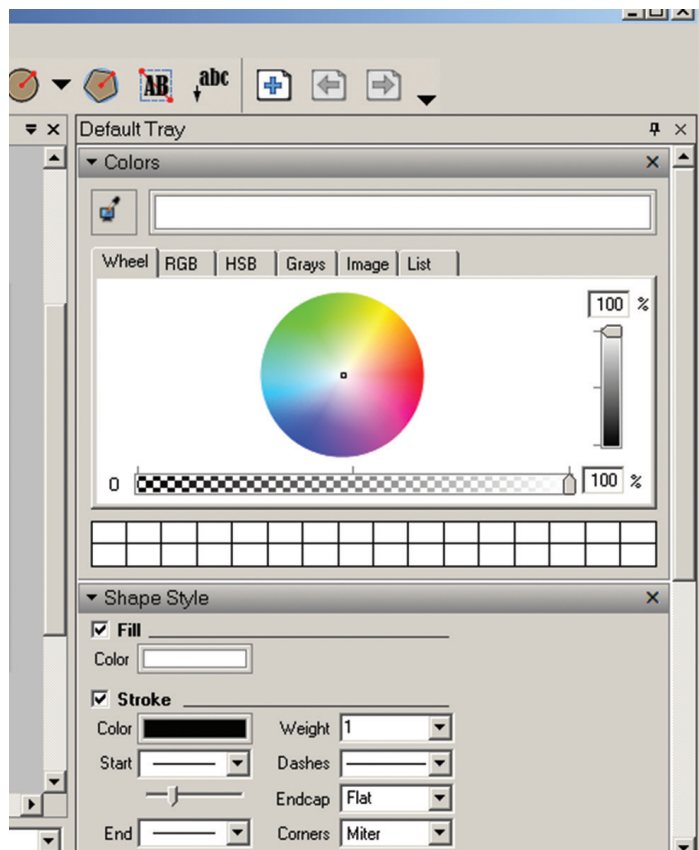


Figure 6: Layout



Figure 7: Layout rendering

CONCLUSION

Google SketchUp has many capabilities for great quality presentation drawings. We've barely scraped the tip of the iceberg, so it's your turn. Download the free version, give it a try and see how you like it. There is nothing better than going to a meeting with awesome drawings that took only minutes to complete!

Need more SketchUp training? SketchUp's Getting Started application includes self-paced tutorials that will introduce you to many tools, techniques, and procedures.



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@norton-healthcare.org.

Easy & Effective: ProSoft PowerTools



The ProSoft PowerTools is a collection of tools developed by civil designers/engineers for civil designer/engineers. These tools bring new functionality to AutoCAD® Civil 3D® to help improve your workflow and increase productivity. In conjunction with CGS Software, ProSoft, based out of Utah, helps bring these tools to a whole new level.



**ProSoft
PowerTools**

Figure 1: ProSoft PowerTools from ProSoft of Salt Lake City, Utah

These tools help out by providing some overlooked functionality that does not exist within Civil 3D. They are simple to install, simple to use, and a valuable add-on to your software. Following are the details of what I think are the top tools within this product.

OVERVIEW HIGHLIGHTS

With full integration with AutoCAD Civil 3D, the intuitive user interface follows the core concept of the Civil 3D UI. It feels as though you are working in native Civil 3D because of the ribbon interface and the fact that the tools work with your Civil 3D objects, therefore preserving the Civil 3D model.

With an emphasis on dynamic updating, objects created within the ProSoft

PowerTools are dynamically connected with the Civil 3D objects. Users can control how objects are updated, either automatically or manually.

One of the biggest benefits of utilizing these tools is that fact that ProSoft is always developing new, better, customer-demanded tools. As the newest tools are released, the user can easily update the tools using the fully automated update process.

SURVEY / POINTS

One of the most-used tools within PowerTools is the ability to Add a Station and Offset to Points. Many customers buy the tools for this feature alone.

The points associate with an alignment and add the appropriate station and offset values to the point (Figure 2).

Users can easily create a point table that shows the station and offset along with other information you wish to see. If points or alignment changes, then the table is automatically updated.

| Point Number | Easting | Northing | Point Elevati... | Name | Raw Descripti... | Full Descript... | Station | Offset | RefAlignment |
|--------------|-------------|-------------|------------------|-------|------------------|------------------|---------|---------|--------------|
| 4 | 19888.9069' | 21076.9713' | 95.436' | GRND | GRND | GRND | 1+55.64 | -73.551 | Alignment2 |
| 5 | 19889.7110' | 21205.2833' | 97.833' | GRND | GRND | GRND | 2+83.92 | -76.563 | Alignment2 |
| 6 | 19890.2416' | 21136.5660' | 96.612' | GRND | GRND | GRND | 2+15.25 | -73.989 | Alignment2 |
| 7 | 19891.2471' | 20986.9661' | 97.474' | GRND | GRND | GRND | 0+65.75 | -68.535 | Alignment2 |
| 8 | 19892.5010' | 20942.4705' | 97.856' | GRND | GRND | GRND | 0+21.31 | -65.958 | Alignment2 |
| 9 | 19893.3261' | 21033.2971' | 95.738' | GRND | GRND | GRND | 1+12.12 | -67.834 | Alignment2 |
| 19 | 19917.0702' | 21296.7646' | 98.189' | GRND | GRND | GRND | 3+76.18 | -51.937 | Alignment2 |
| 22 | 19927.6022' | 21225.8627' | 97.360' | GRND | GRND | GRND | 3+05.62 | -39.301 | Alignment2 |
| 43 | 19992.3778' | 21236.2434' | 95.719' | GRND | GRND | GRND | 3+17.92 | 25.137 | Alignment2 |
| 51 | 19999.5759' | 21015.6088' | 96.183' | BRKL | BRKL | BRKL | 0+97.60 | 38.894 | Alignment2 |
| 52 | 20000.3806' | 21123.2053' | 94.571' | GRND | GRND | GRND | 2+05.17 | 36.498 | Alignment2 |
| 54 | 20001.1396' | 21299.9867' | 98.465' | CURBB | CURBB | CURBB | 3+81.90 | 31.999 | Alignment2 |
| 58 | 20002.2031' | 21275.8171' | 95.778' | BRKL | BRKL | BRKL | 3+57.77 | 33.781 | Alignment2 |
| 59 | 20002.7233' | 20970.7688' | 97.028' | BRKL | BRKL | BRKL | 0+52.87 | 43.374 | Alignment2 |

Figure 2: Station and offset points

| Point # | Description | Elevation | Station | Offset |
|---------|-------------|-----------|----------|---------|
| 724 | CURBF | 28.95 | 0+047.67 | 0.019 |
| 646 | CURBB | 29.59 | 0+009.48 | -8.418 |
| 623 | CURBF | 29.48 | 0+006.98 | -9.612 |
| 730 | CURBB | 29.10 | 0+053.67 | 0.605 |
| 652 | CURBB | 29.40 | 0+102.06 | -6.172 |
| 661 | CURBB | 29.36 | 0+099.23 | -6.640 |
| 773 | CURBF | 29.17 | 0+081.76 | -15.382 |
| 750 | CURBF | 29.13 | 0+086.02 | -14.748 |
| 681 | CURBF | 29.18 | 0+095.31 | -8.172 |
| 690 | CURBB | 29.40 | 0+017.44 | -4.953 |
| 765 | CURBB | 29.25 | 0+072.76 | -8.848 |
| 710 | CURBB | 29.27 | 0+022.01 | -4.979 |
| 739 | CURBB | 29.14 | 0+059.51 | -0.488 |
| 716 | CURBB | 29.17 | 0+035.34 | -2.285 |
| 647 | CURBF | 29.44 | 0+009.50 | -8.912 |
| 633 | CURBB | 29.43 | 0+000.00 | 0.000 |
| 768 | CURBF | 29.10 | 0+072.72 | -7.329 |
| 731 | CURBF | 28.95 | 0+052.12 | 0.179 |
| 653 | CURBF | 29.25 | 0+102.06 | -6.672 |
| 774 | CURBF | 29.13 | 0+075.02 | -9.991 |

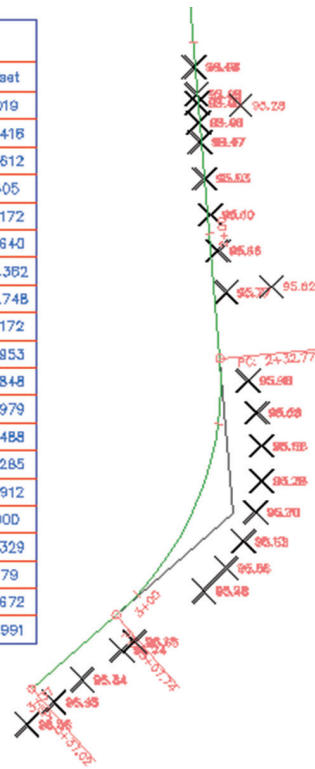


Figure 3: Station and offset points in table

Another useful tool within the Points options is the ability to Extract Blocks from Points. Many firms choose to use point groups and/or description key sets to automatically put in their symbols, but this tool allows users to extract those blocks and automatically have them inserted into their file. The user also has multiple methods of doing so, either ALL, by Group, or by Numbers or Selection.

ALIGNMENTS AND PROFILES

For the surveyor in you (and me!), you now have the ability to Create Alignment with Stick Method, an innovative, effective, and simple way of creating a Civil 3D alignment and recreating deeds or calls. This tool allows you to sequentially draw lines,

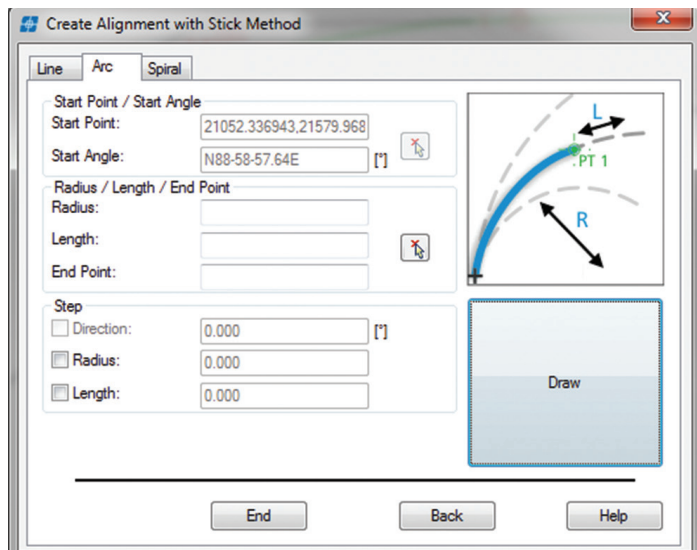


Figure 4: Alignment by Stick Method

arcs, and spirals without the need to jump back and forth between commands.

You also have the option to Create Profile from Points, which lets you define left and right alignment offset within the command as it is searching for the points. Points with lower or higher elevations than expected can be excluded from the selection.

Use Create/Edit Traverse to create or edit polylines by entering traverse data (bearing / distance / delta) into a table. This easy-to-use tool can also be used to edit existing polylines.

The Alignment to LandXML converts polylines and C3D Alignments to LandXML file, specifically for Lieca Geosystems gear. The LandXML output from Civil 3D is different from what Lieca requires.

PIPES

There are several great pipe tools! Some of these can really help improve workflows and add another dimension of accuracy to your plans. I'll save the best (in my opinion) for last.

Edit Pipe Profile – a good example is that a user can edit a pipe run between structures by defining a new start invert and a slope while still preserving the drop within the structures. This tool is a dramatic improvement of the Civil 3D pipe usability.

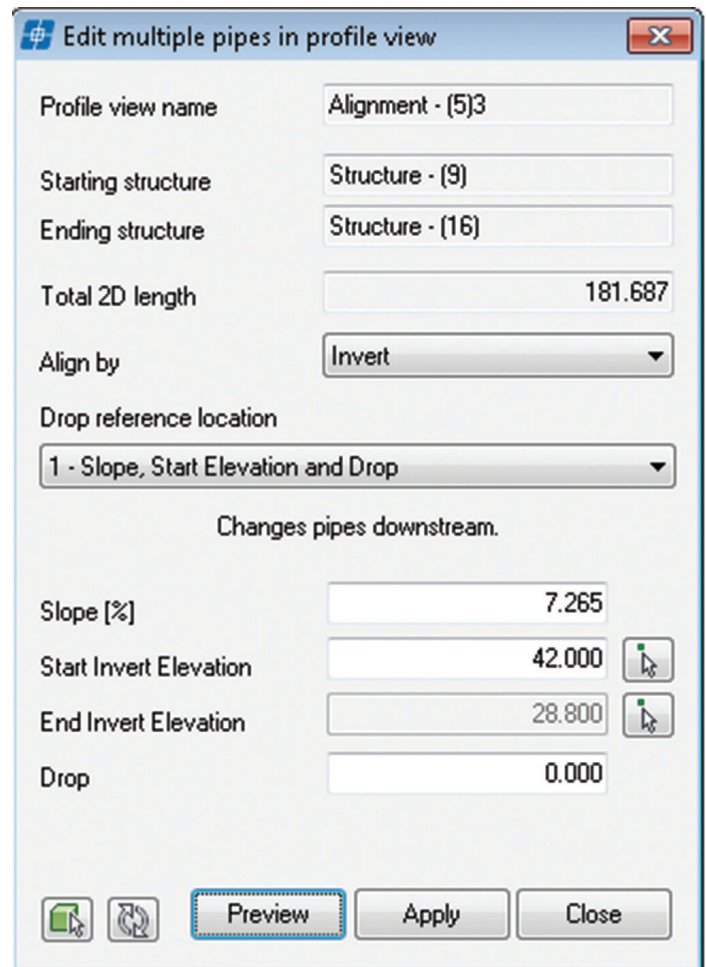


Figure 5: Edit pipe profile

AutoCAD Civil 3D 2015

Pipe Network from Multiple Polylines – Doesn't need much explaining, right? Very nice tool.

Swap Multiple Parts – Yep... about time, huh? You can now select multiple parts within plan or profile and swap them all at once! You can also swap between different pipe catalogs if needed.

Label Pipe Interference – The best for last! I like this tool—it really helps with design checking and quality control. It labels the existing pipe network interferences within the drawing. It creates a table with important interference data such as Northing, Easting,

| INTERFERENCE DATA | | | | | |
|-------------------|----------|----------|---------------|-----------|--------|
| Interference # | Northing | Easting | Network | Elevation | Depth |
| 1 | 4073.175 | 4821.888 | Network - (1) | 647.300 | -1.941 |
| | | | Network - (1) | 647.241 | |
| | | | Network - (1) | | |
| 2 | 4101.409 | 4961.688 | Network - (1) | | |
| | | | Network - (1) | | |
| | | | Network - (1) | | |
| 3 | 4101.870 | 4963.849 | Network - (1) | | |
| | | | Network - (1) | | |
| | | | Network - (1) | | |
| 4 | 4102.194 | 4962.150 | Network - (1) | | |
| | | | Network - (1) | | |
| | | | Network - (1) | | |
| 5 | 4102.426 | 4962.051 | Network - (1) | | |
| | | | Network - (1) | | |
| | | | Network - (1) | | |
| 6 | 4102.033 | 4962.788 | Network - (1) | | |
| | | | Network - (1) | | |

Figure 6: Label Interference

Elevation, and Difference between pipes.

MISCELLANEOUS TOOLS

It seems at every class, in every training session, I get the question, "How do I get the stepped offset of a feature line to be dynamic?"

Well, one option is to grade it. Or you can use your new favorite tool from the ProSoft PowerTools, Dynamic Stepped Offset. The command creates 3D Polylines and the XYZ from the original object is maintained. When the original object is edited, guess what—all new objects adjust accordingly!

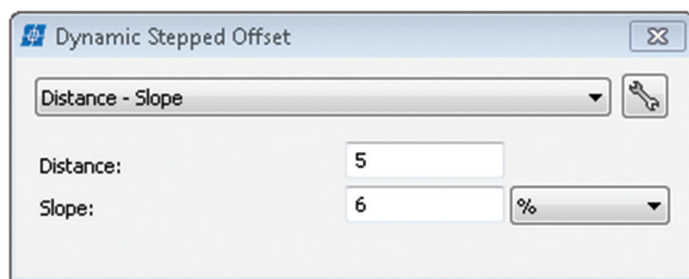


Figure 7: Dynamic Stepped Offset

Another tool, Label Assemblies, places a named label on each selected assembly in the drawing that is dynamically linked to your assembly name properties.

VERSIONER

The Versioner enables contractors to easily verify plans for the latest versions on site by adding a unique QR code to the design sheet and avoid mistakes and mishaps caused by outdated documentation.

Every change made to the design is instantly available on any mobile device, smartphone, or tablet that has the Versioner mobile app installed. Users can easily identify if a drawing is current or out of date by simply scanning the Versioner generated QR code. There is also a mode that enables team members to get instant notifications concerning any further design changes.

FUTURE EVOLUTION

As mentioned briefly above, these tools are continually being developed. The developer has an online form to submit a "wish list" of features and any feedback is very much welcomed. As new tools are released throughout the year, users can update the tools with a simple process. No waiting for the next year to get the cool stuff!

NEW FOR CIVIL 3D 2015

There are several new items for the first rollout of the 2015 version. Here I chose to highlight the grading tools.

Grading tools enables you to create 3D projection polylines from any polyline or feature line. Grading is defined with a set of grading criteria, which are applied to a footprint. The following grading criteria are supported:

- Offset/slope
- Offset/relative elevation
- Slope/relative elevation
- Slope/surface
- Drape
- Offset/drape/elevation

Grading object consists of several 3D polylines, each one representing grading criteria. Grading definition can be saved and applied on other footprints. Several grading objects can be applied on a single polyline or feature line.

Grading tools enables you to verify different designs by changing grading criteria or footprint. You can move or modify a footprint and grading is updated automatically. Or run an edit grading command and add, change, or remove grading criteria from a grading dialog.

This powerful functionality will help you design complex 3D objects and tasks such as road/railway embankments, dikes, intersections, road islands, sidewalks, landfills, and plateaus.

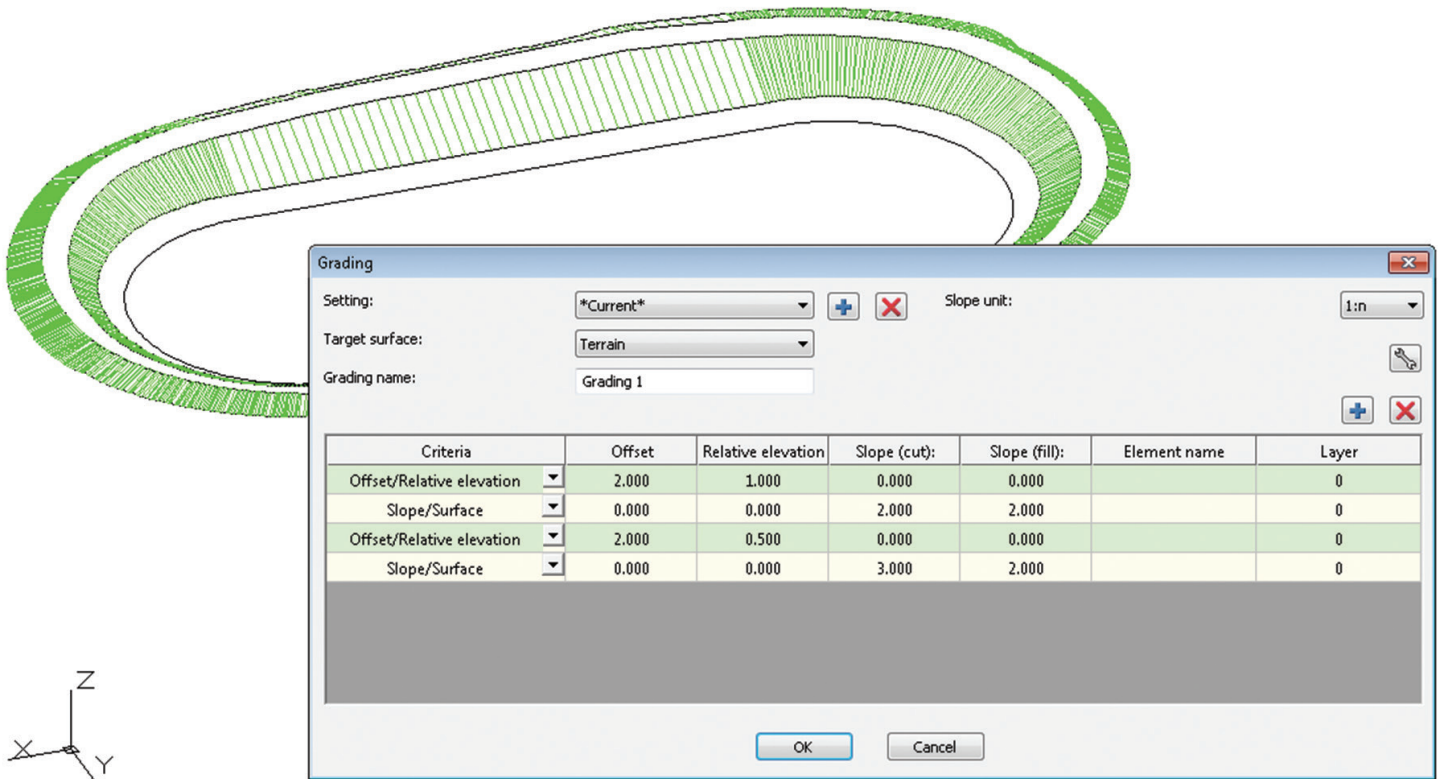


Figure 8: Grading tools

Finally, there is the Pipe Depth Summary Report, a tool that calculates pipe depths for selected Civil 3D profile and creates a summary report. We can set different depth intervals: 0-8, 8-10, 10-12, ... 20+. Pipe depth can be calculated from bottom, invert, center, crown, or top of the pipe. If pipe profile is changed, summary depth report is updated automatically.

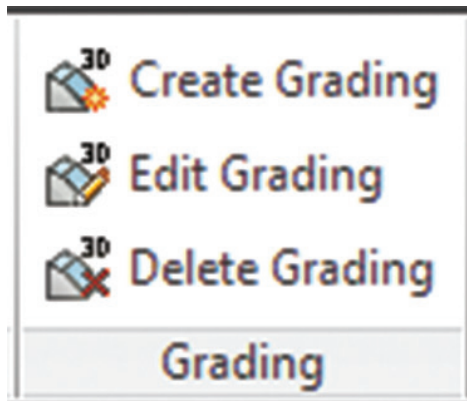


Figure 9: Grading tools ribbon

CONCLUSION

One last thing that I really like about the tools is the easy access to the team, via social media or direct contact. There is a Social Media icon with access to videos and more information directly from the ribbon!

I know there are a lot of tools out there, some very useful. But I have had the opportunity of seeing these tools in action and seeing how helpful these tools are for customers of any size. So take your

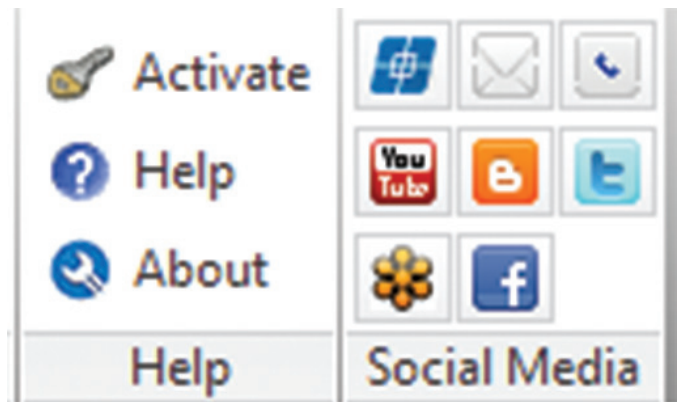


Figure 10: Social media

productivity to a whole new level and give the ProSoft PowerTools a free test drive.



Shawn Herring is a Civil Engineer based out of Utah. Shawn has been a part of the design engineering community for roughly 12 years in all aspects of design, construction and software implementations. He has implemented and trained companies across the country on Civil 3D and other infrastructure tools and their best practice workflows. Shawn can be reached for comments or questions at awaitocad-civil3dcm@augi.com.

Powerful Para 3d

Let's face it, there's a plug-in for everything, with no exception for 3ds Max. There are plug-ins for exporting, animating, unwrapping, lighting, modeling, twisting, turning, driving, spilling, exploding, launching, rendering, shading, and smashing. There are plug-ins to grow vines, build rocks, shape trees, make creatures talk, guns shoot, ships fly, and cars drive. There are even plug-ins that create fire, rain, snow, water, glass, metal, and more. Every once in a while, though, I find one that screams, "Hey! Look at me!" This year that plug-in is Para 3d, which can be found online at <http://torabiarchitect.com/parametric-array/>.

Para 3d is a very impressive 3ds Max plug-in for advanced, dynamic, parametric arrays providing users with the ability to array objects with an unlimited number of options. Para 3d allows users to control every single aspect of an array using node-based drag/drop actions we are familiar with by using the Material Slate Editor. Creating parametric walls, fractal pyramids, and arrays conforming to curves with the ability to change and update on the fly becomes a matter of simply clicking, dragging, dropping, or changing values. In a matter of minutes, users can present multiple concepts while manipulating objects heights, widths, rotations, thickness, and more while conforming to a multitude of shape or position controls that impact every object arrayed.

GETTING STARTED

Makers of Para 3d have worked hard to provide an efficient program that uses the least amount of memory possible. After

download, installation, and startup, 3ds Max users are directed to set up a few toolbars and license the software. Directions are clear and concise, with a multitude of text and video tutorials to assist users if they run into any problems. Once completed, users restart 3ds Max, create an object, and initialize the program.

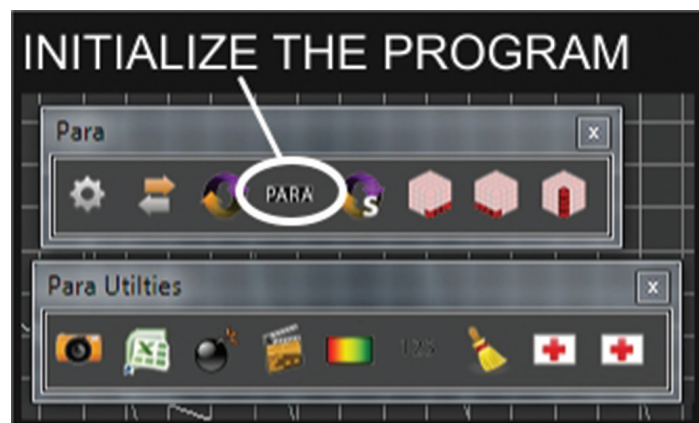


Figure 1: Initialize the program

The program begins by asking users if they want to create an array or assign a controller, copy the object selected or create instances, keep the original object intact or not, and how many copies users want to manipulate. Once the options are selected, Para 3d opens with an attractive editor interface populated with a node representing the objects being arrayed.

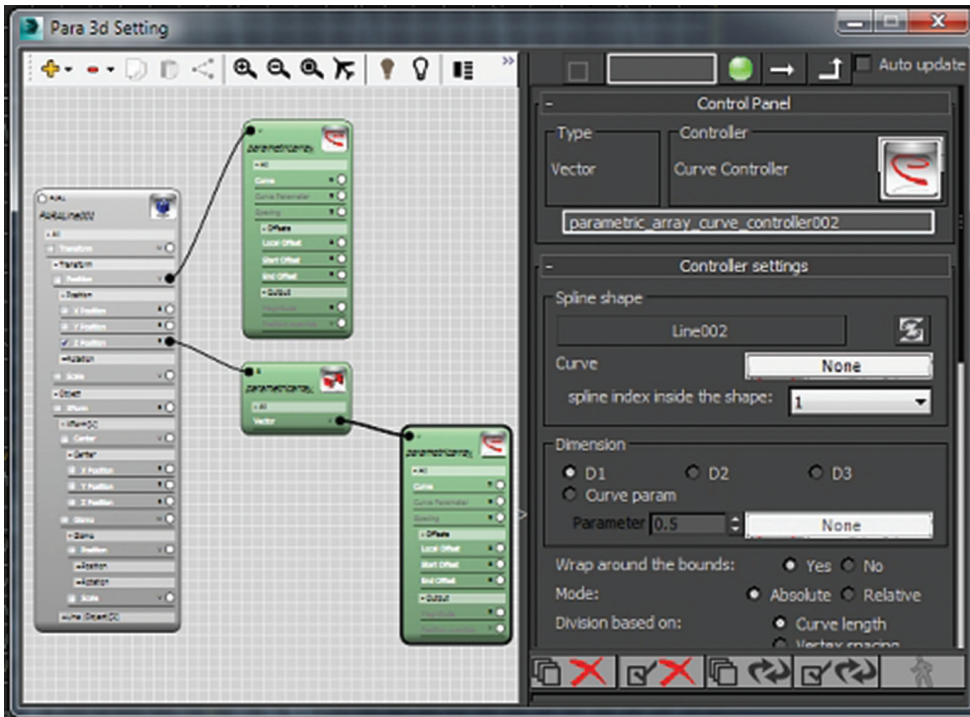


Figure 2: Para 3d editor

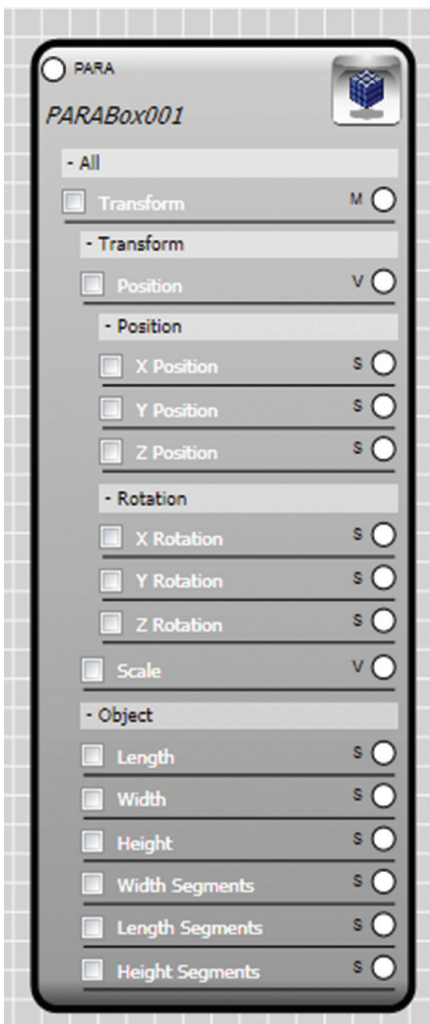


Figure 3: Array node

The options are endless. With that said, I won't cover any specific ones. But simply put, users can control virtually any number of values associated with an array using its node-



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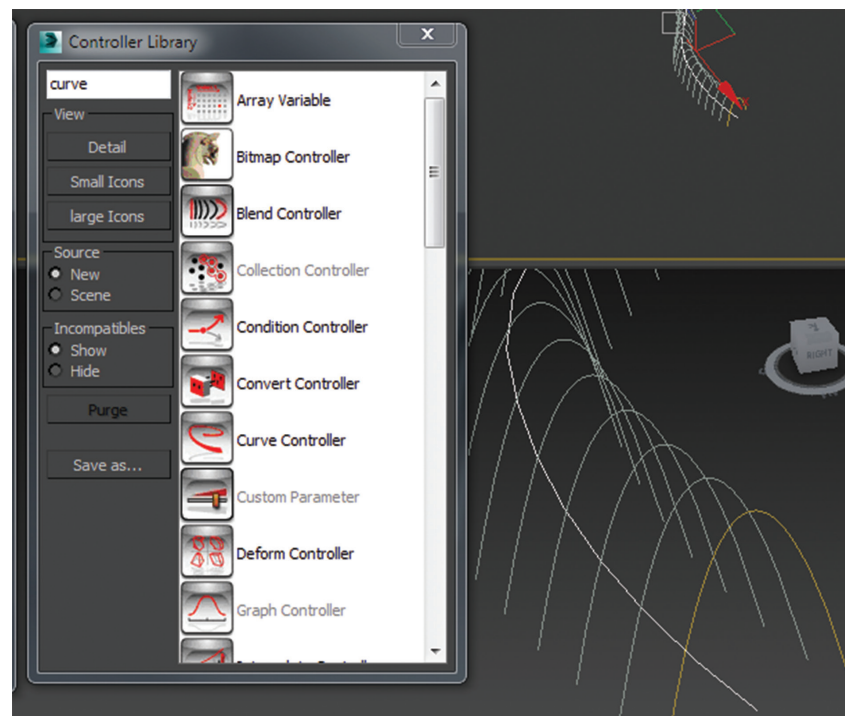



Figure 4 – Controllers

based control and values. We have the ability to transform objects by position and rotation using the xyz values, scale objects, and alter the various width, height, and length values of every segment.

In addition, users can attach a multitude of controllers to each of the nodes' values to manipulate them further. With controllers, users can force arrayed objects to follow curves, shapes, deform, or adjust in linear or non-linear fashion, following virtually any value or path a user desires.

Last I checked, there were more than 70 tutorials on the Para 3d website showing users how to complete complex tasks in just a matter of minutes. Please visit the site at <http://torabiarchitect.com/parametric-array/> to see if this plug-in is right for you.

Dynamic AutoCAD

 The focus this issue of *AUGIWorld* is on third-party apps and there are quite a few of them out there. Some can greatly increase your productivity by automating design and drawing processes. Most of these apps build on the power of AutoCAD® while making the process easier for the end user.

But there's a powerful tool within AutoCAD itself. The product's ability to create and use custom blocks allows you to make virtually any symbology you wish to represent real-world items and save them as blocks. By creating a block, you can reuse geometry over and over without redrawing it. Blocks are a great way to minimize repeating drawing tasks and maintain a standard look for your symbols. Architects tend to deal with architectural real-world "symbols" such as doors, windows, furniture, appliances, etc. Engineers use some of the same types of real-world symbology in lights and equipment.

In the course of a design day or project timeline, these symbols are moved, copied, mirrored, rotated, and sometimes completely replaced. An efficient way to reduce your workload and speed up these changes is to use dynamic blocks. Dynamic blocks were introduced in AutoCAD 2006 and can be created and used in AutoCAD LT as well. Creating blocks that have dynamic properties or adding dynamic properties to an existing block will enhance the block's usability and can greatly reduce block counts. In this short article, I will go over some basic features of dynamic blocks that can make your blocks more flexible and save you editing time.

Let's start with an example of something that affects both architects and electrical engineers—lighting. Architects use lighting to enhance the visual appeal of spaces while electrical engineers use it to provide required illumination. In order to show the different types of lighting in a building, you could put letters and numbers next to a light symbol to indicate what it is, then a schedule could be referenced to describe the fixture in more detail. But if you actually gave each block a unique look, you could tell what it is just by looking at it. This also helps the project owner or client visually see what the light is by just looking at the floor plan. One commonly used light fixture is the 2x4 or 2x2 recessed fixture found on almost every commercial project. Although these fixtures are one size, they can represent a variety of lighting types (prismatic, parabolic, LED, direct/indirect as well as the "emergency" version of each).

Figure 1 shows a small variety of light fixture types. All of these light fixtures are actually in one block and use the Visibility Dynamic option to change to views that represent each individual look. With this one block, you could place 2x4 fixtures throughout your project. Then in rooms that needed specialty fixtures such as parabolics, you would highlight the fixtures in the room or rooms, right-click and select Quick Properties, and choose the parabolic version from the drop-down menu. You could repeat the same process for the lights required to be emergency or night lights as well. The variety of lighting types used on a project that are similar in nature but have some unique characteristics could easily be shown in a single block and quickly changed using the dynamic Visibility State option.

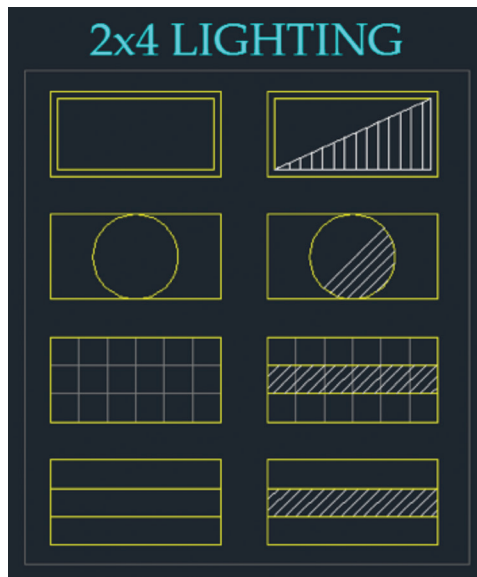


Figure 1

Since I currently work in the electrical design world, the example block I will use is one of the dynamic blocks I use on a regular basis. The steps outlined here will work for any trade or block—you just need to determine which feature will benefit you in your work and use that when defining or modifying your blocks. I use dynamic blocks for two primary reasons: to minimize the number of blocks required to represent items in a drawing, and to make changes quicker.

You may want to start using dynamic blocks by creating new blocks from scratch. Because you probably already have an extensive block library, a better approach may be to modify an existing block that you currently use by adding dynamic features to it.

Let's take a basic duplex outlet and add some parameters to make it more flexible. You can follow along with any type of block that you already have and want the ability to change its look on the fly (Visibility State).

Like any customization process, there are a series of steps that you would typically go through to implement your ideas.

DYNAMIC BLOCK CREATION STEPS

1. Start out by planning what you want your block to do. Often this comes from experience with blocks that you keep replacing, rotating, flipping, or changing out.
2. Draw your block geometry or edit an existing block to add dynamic features.
3. Choose a Parameter. There are various parameters to choose—see Figure 2 for a screenshot of the dynamic options palette and the descriptions of each option we will be covering.
4. Match an Action with your parameter (see Figure 3).
5. Test your option.
6. Repeat steps 1 - 5 for each dynamic option.

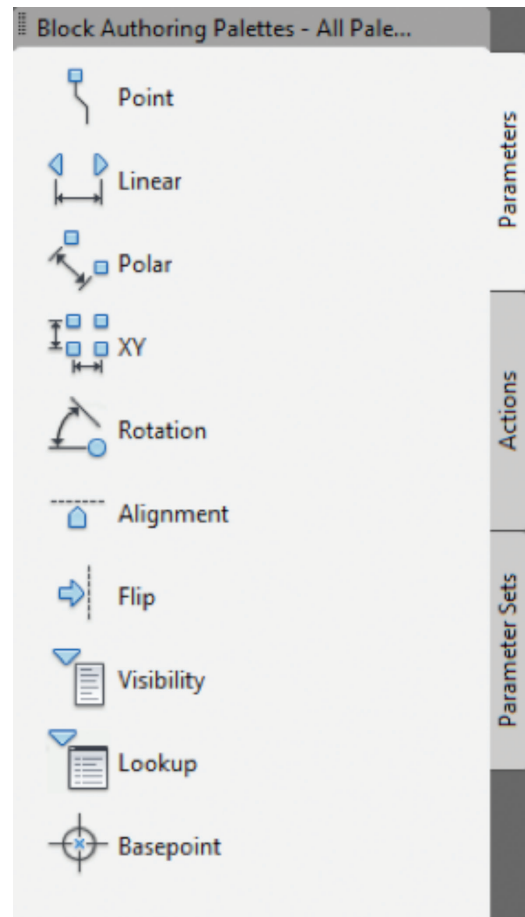


Figure 2

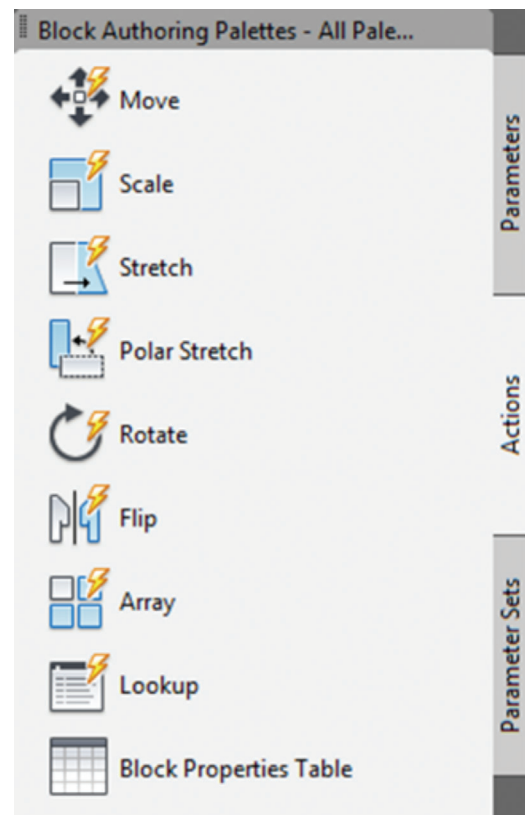


Figure 3

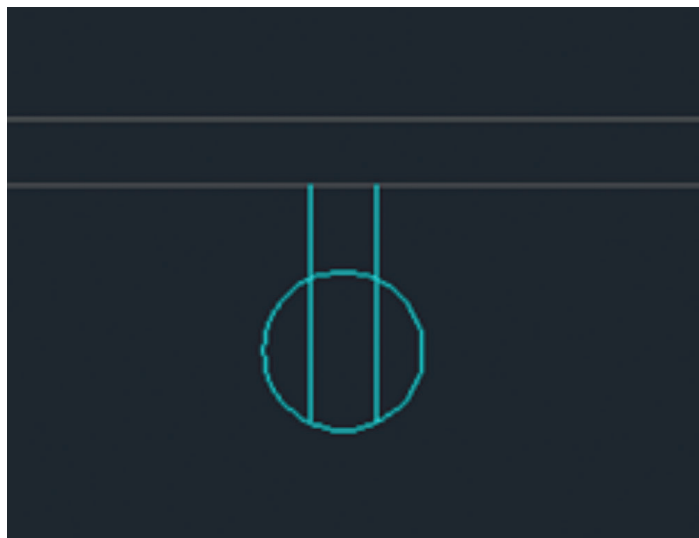


Figure 4

For this article I will cover the Visibility, Flip, and Move Parameters/Actions.

For the dynamic block demonstration here, I will start with a simple duplex receptacle outlet and then add a variety of options and features to that block to enhance its usability.

DUPLEX OUTLET

Like many blocks, a duplex outlet is composed of basic lines and a circle. From my experience working with duplex outlets, I know that the basic outlet often gets changed out for a quad outlet or combined with TV or data jacks. To make my job easier, I do not want to erase the old block and insert a new one for each change I need to make. So let's start there and build on it. I will resolve the first issue with Visibility States, using a Visibility Parameter. Visibility States allow you to change the look of a block by selecting a pull-down menu and choosing the new look or "state." Note that Visibility is the one parameter that does not require an Action item associated with it.

I open an existing block called 'OUTLET' in AutoCAD and type Bedit to open the block editor. Figure 5 shows the block editor toolbar. If you are not a ribbon rebel like me, see Figure 6 for the ribbon version of the block editor.

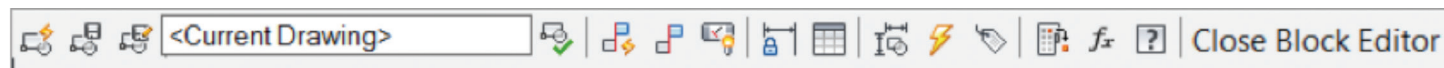


Figure 5

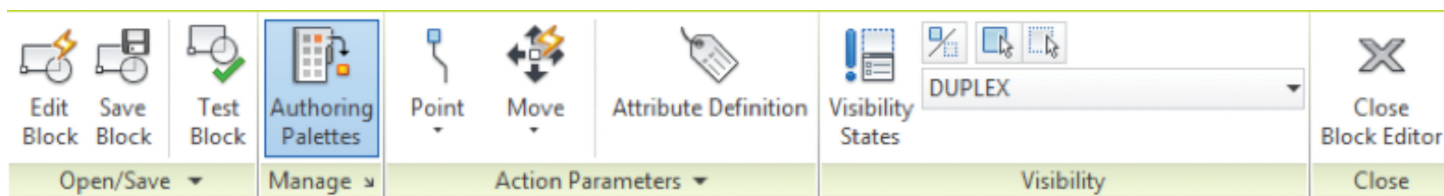


Figure 6

When entering the block editor, you will get the dynamic options palette shown in Figures 2 and 3, and the block editor toolbar or palette shown in Figures 5 and 6. As stated above, my first step is going to make the outlet represent either a duplex or quad outlet, and to do this I will use the Visibility option off the dynamic block palette.

I select the Visibility parameter option and place it next to my block. When doing this, think about how your final block look will change so that your parameter does not end up under some of your line work. I now see a new toolbar on the screen, the visibility toolbar (Figure 7). I select the button that opens up the Visibility States option and rename the default menu item to 'DUPLEX'. I then select 'New', and name the new state 'QUAD'. You may be asked if you want to "Leave the visibility of the existing objects unchanged in the new state." I am only going to be adding line work for this particular view, so I will choose the option to leave the objects in the new visibility state as it currently is. Note that you can determine the default view or visibility state by moving the one you want as default to the top of the Visibility States list (Figure 8).

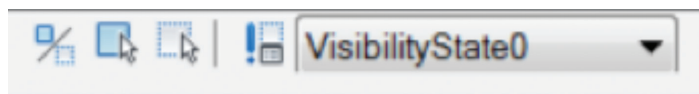


Figure 7

With the QUAD state checked off in the list, I'll then draw my two horizontal lines across my duplex outlet to represent the quad outlet. Once this is done, on the block editor toolbar/palette there is a small symbol with a check mark next to it. This is the symbol to test the new dynamic options.

Once the block is highlighted in the test mode, a blue triangle will show up off to the side. By selecting the triangle I can choose between the duplex and quad display options. If all is well, I can move on to the next parameter; if not, I can make the necessary corrections and test again. Once testing is complete, this block will now have two visibility states and will have many more added.

Because many times data jacks are placed next to outlets, it would be nice to be able to add a data jack on the fly and keep it locked or linked to the power outlet if it gets moved. This is done by inserting the data outlet block adjacent to the duplex outlet. By inserting the data block rather than redrawing the geometry, you have

created even more flexibility. If your company standards change or you need to present the data outlets in a particular fashion on a single project, you can modify the data block by itself and it will update all of the data and duplex/quad outlet combinations. To keep items lined up, draw some temporary sketch lines if needed. Just remember to delete them before you do your final save and close of the block.

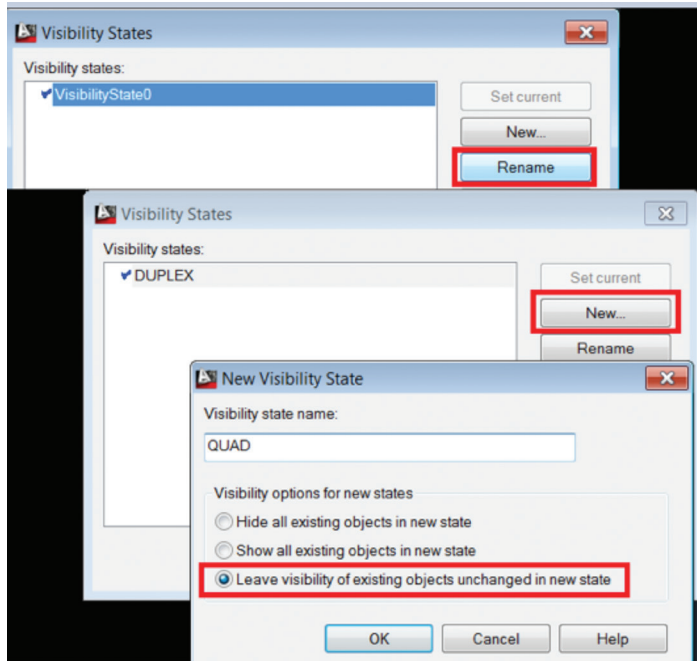


Figure 8

With the duplex and a quad outlet and a data outlet all in one block, there are now four possible scenarios or visibility states: the duplex or the quad outlets by themselves or combine each one with a data outlet for total of four visibility states.

Now that we have a more flexible outlet, another issue that often comes up is that we sometimes need to flip the data outlet or TV outlet to the other side of the power outlet. For this, I will add a Flip parameter and a Flip action.

Tip: When adding new parameters and actions and you have multiple visibility states, make sure you are on the state that you wish to perform the new action. This is not a deal-breaker, as it can be corrected with a few extra steps, but keep it in mind.

For the flip action, I will select the Flip parameter on the Parameters palette. A prompt will require selecting two points. The two points will be the line that I will mirror or flip about and will be placed at a location on the block symbol that represents a good mirror location line. Since my block base point is at 0,0 and it is symmetrical, I will type 0,0 for the base point. For the endpoint of the reflection (mirror/flip) line I will choose the top-center of the outlet.

Once the parameter is placed, I switch to the actions section of the palette and choose the Flip action. The purpose of the

Flip action is to mirror or 'flip' something like the data jack to the opposite side of the power outlet. When adding an action to a dynamic block, I need to select the parameter and then the objects that the action will affect—in this case, the data jack. Remember to test the block before moving on to other features. Do the same flip action for objects in each visibility state for any items that require flipping. In the case of the duplex and quad outlets with data combination, I will make sure that the Flip action is visible in each state.

Now that we have added the Flip parameter and action, another one that could come in handy is the Move action. An example for this would be an outlet that has a GFI text item placed next to it. Depending on how busy the drawing is, the GFI notation may need to be moved around to remain readable. I'll start by setting the Duplex visibility state as current, and create a new state called DUPLEX-GFI, then add the GFI text to the screen near the outlet using the Dtext command.

The Move action does not have a Move parameter, so I need to choose another parameter to accomplish this. On the Parameters palette I will select the Point parameter option and place it at the insertion point of the GFI text. This will become my move grip. On the Actions palette, I then select the Move option and select my Point parameter and then my text when prompted to select objects. As per all previous parameter/action additions, I then will test the block before moving on to the next step.

Note that the GFI text may show up on the quad or duplex outlet, so when I place the GFI text and move parameter I will want to make sure that it shows up in any visibility state where it is an option. For demonstration purposes I am only going to include the GFI in the DUPLEX-GFI and QUAD-GFI visibility states (new states). Since this text and move option were only added to the new DUPLEX-GFI visibility state, I need to make some other adjustments. I will go to the Visibility State menu and choose the QUAD state and select 'New.' I will add a visibility state called QUAD-GFI and make sure it is set current.

There are multiple buttons on the visibility state menu. One allows selecting objects to be turned off in the current state (hidden open square), and another allows turning objects on in the current state (solid filled square). In order to turn objects on in the current state that aren't visible, I will need to select the third option, which is represented by two squares—one shaded, one open. When this option is selected, all items appear on the screen but those that are not in the current visibility state will be greyed out or lighter. Because the GFI text was added to the DUPLEX-GFI visibility state, it will show up in the QUAD-GFI visibility state lighter. Select the single shaded square to select items that you want on in the current state. For this you will need to select both the text and the move parameter and action. Now the GFI text and the ability to move it will show up in both the DUPLEX-GFI and the QUAD-GFI visibility states.

I continued these options to add TV outlets as well as a center shaded area in the outlets to show whether an outlet was to be installed at standard height or at countertop height. After that I

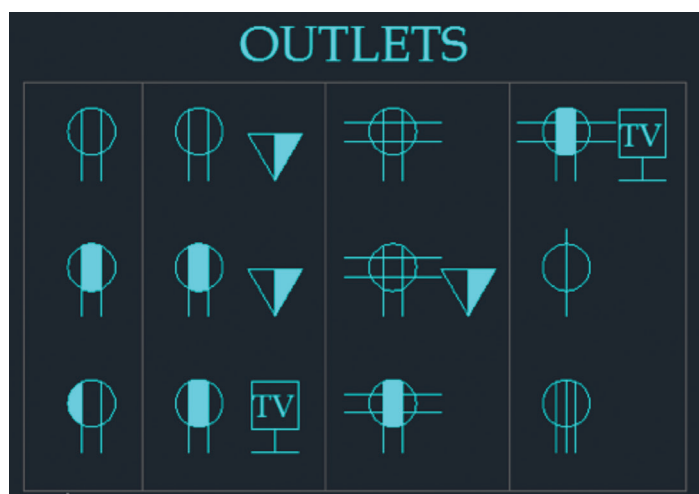


Figure 9

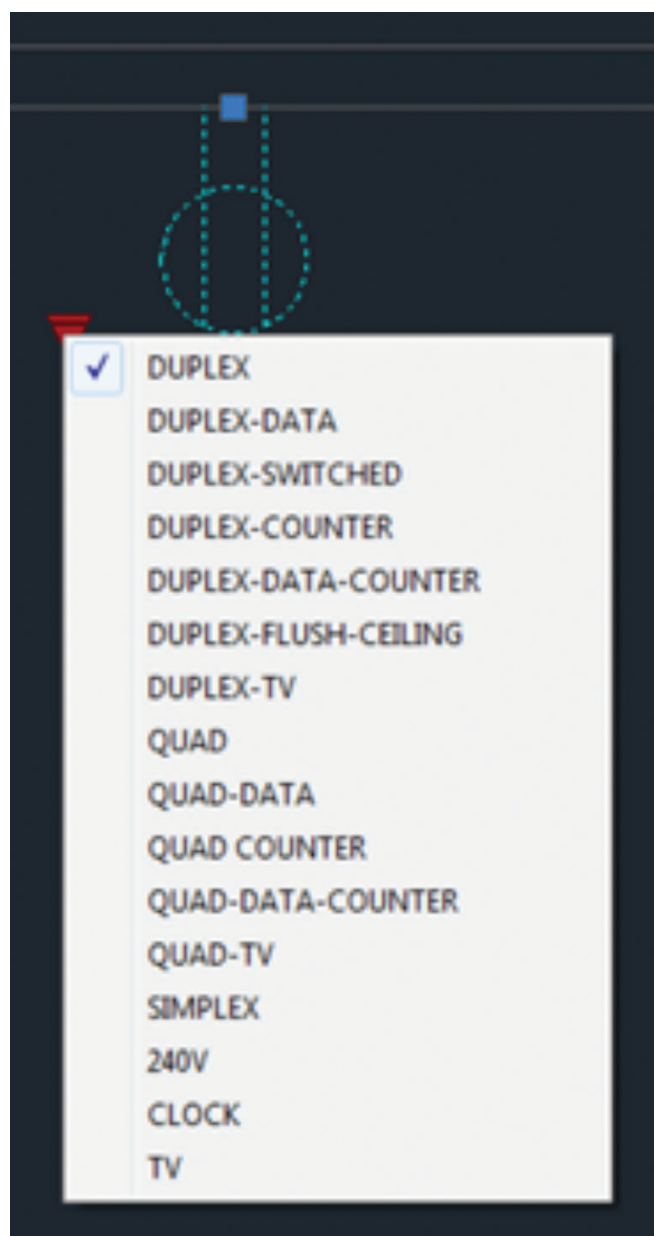


Figure 10

Tip/Trick: If you individually insert quad outlets by themselves as often as duplex outlets and you do not wish to choose that state each time, start by creating your master OUTLET block, save it as a block called OUTLET-D, then do a Saveas to Outlet-Q and set the QUAD state as default. When adding features, be sure to Saveas to each block name and verify that the proper default state is set to current.

added a couple specialty outlets and combinations. With all these additions, I now have a total of 12 visibility states within one block (see Figures 9 and 10).

There are far more powerful options in the dynamic block palettes that are not covered here, but I encourage you to investigate them and see how they can benefit you further. For instance, the rotate, scale, and stretch parameters and actions will add even more flexibility to your blocks.

Combining Wipeouts into your blocks will add even more flexibility. For instance, in our light fixture block, adding a wipeout behind the fixture keeps anything else on the ceiling plan from bleeding through; e.g., putting fixtures in a gypsum board ceiling that is hatched with a pattern. Other examples would include room name blocks that have wipeouts to mask the background or door blocks that have wipeouts to hide the wall underneath, making it appear that wherever you place your door on that wall is automatically cleaned up.

SUMMARY

With dynamic blocks, you can include all variations in one file and manipulate its visual appearance rotation and direction by using dynamic options. You can also make widespread changes in a project by selecting all the fixtures you wish to change and do it with the Properties or Quick Properties commands rather than by removing and re-inserting different blocks. With dynamic blocks, you can minimize the number of blocks required to represent items in a drawing and can make changes quicker.



Walt Sparling has worked in the building design industry for 25+ years, starting as a hand drafter. He moved on to CADD in the mid 1980s and then into CADD and networking training and consulting. Walt has served as project manager and designer in the mechanical and architectural realms and currently works with an electrical engineering firm in Tampa, Florida. In his spare time, Walt maintains a couple of blogs and a personal website: FunctionSense.com and waltsparling.com

And Here's How to...

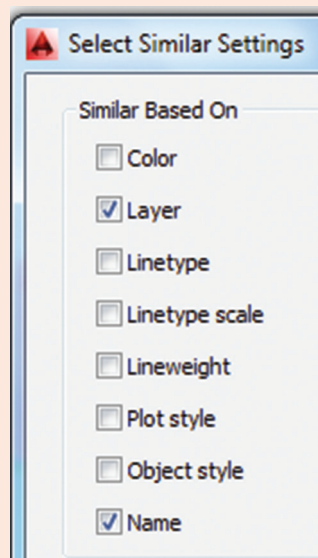
Modify the Settings for Select Similar

The Select Similar command is absolutely fabulous, but to establish the 'similar' criteria, you need to type(!) the command **SELECTSIMILAR**, then click or enter SE to open the Settings dialog box for the command (shown here). Curiously, the right-click menu doesn't even have a cascading menu for Settings, so let's put it on the Quick Access Toolbar!

How to Add Select Similar Settings to the QAT:

1. Open the CUI, then navigate to the command Select Similar.
2. Right-click on Select Similar in the list, then click Duplicate.
3. Under Properties on the right, change the Command name to Select Similar Settings, then modify the Macro to read as follows:

`^C^C_SelectSimilar;SE`

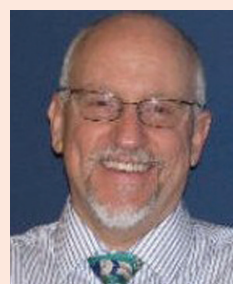
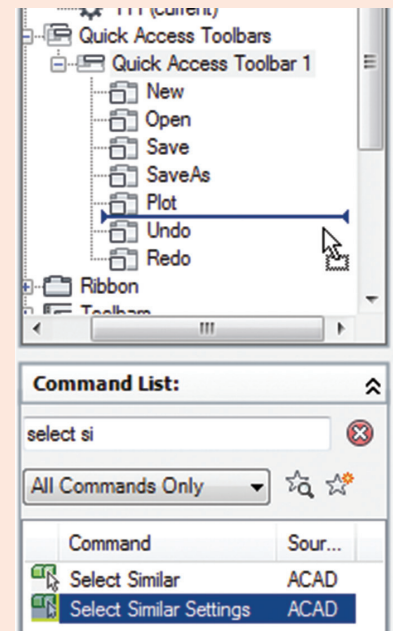


| Command | |
|---------------|-----------------------------------|
| Name | Select Similar Settings |
| Description | Selects all objects similar to th |
| Extended Help | |
| Command Dis | |
| Macro | ^C^C_SelectSimilar;SE |
| Tags | |

4. In the Button Image area at the top, click Edit, then check the box for the Grid.


5. After creating your masterpiece, click Save, then enter a name for this button top.
6. Close the Button Editor, and you will see your button image alongside your command.
7. In the upper left, under Customizations in All Files, expand Quick Access Toolbars, then expand Quick Access Toolbar 1.
8. Now drag your newly minted command and drop it in the list of commands on the Quick Access Toolbar.

The next time you use Select Similar, first configure the settings with your new button, then you can go right into using the command!



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

Flatten Files In Autodesk Inventor

 This month I wanted to take another look at the Autodesk App store. I rarely use third-party apps, which has positive and negative impact on my performance. On one hand it is much easier to support teams when my day-to-day workflow remains out-of-the-box. On the other hand, I do love some good coding.

For those who are not familiar, Autodesk has an App store that houses numerous published apps for Autodesk Inventor® and many other software platforms. Some are free, while others are installable for a fee. Most of the free apps are simply trials. There wasn't time to try out the service for this article, but I did want to mention it for the benefit of our Inventor readers.

In this article, I present a promising third-party app, Flatter Files from CMV Technologies LLC.

WHAT IS FLATTER FILES?

Flatter Files is a cloud-based publishing platform for drawings that is based on the Google cloud infrastructure. It allows users to easily access their company's drawings and associated data securely. The company wanted to make a service that permitted organizations

to access their drawing content more effectively and efficiently for CAD technicians and recipients alike.

While the service is designed to be an access point for the drawing PDF deliverables, the native Inventor model files can be uploaded along with each checked-in revision. While the native files can be included with the drawing PDF, the service is a publishing platform for your content and not a Vault-type Product Data Management system.

The service is configured and operated by two components: the desktop Uploader app and the web client.

Accounts and Users

Flatter Files service fees are tiered by the number of contributors of content in the organization. Each tier is priced according to the number of users in each tier and the amount of storage available. There are two types of users involved in Flatter Files services: Creators and Viewers. Creators have read/write rights on the system and are part of the organization tier. An organization can, however, invite as many viewers as they desire during the sharing processes. Viewers can view and comment on shared files as their shared rights permit.

THE UPLOADER APP

The Flutter Files Uploader allows users to publish their drawings and documents to the Flutter Files cloud. The Uploader app resides in the Windows application tray and can be started at any time.

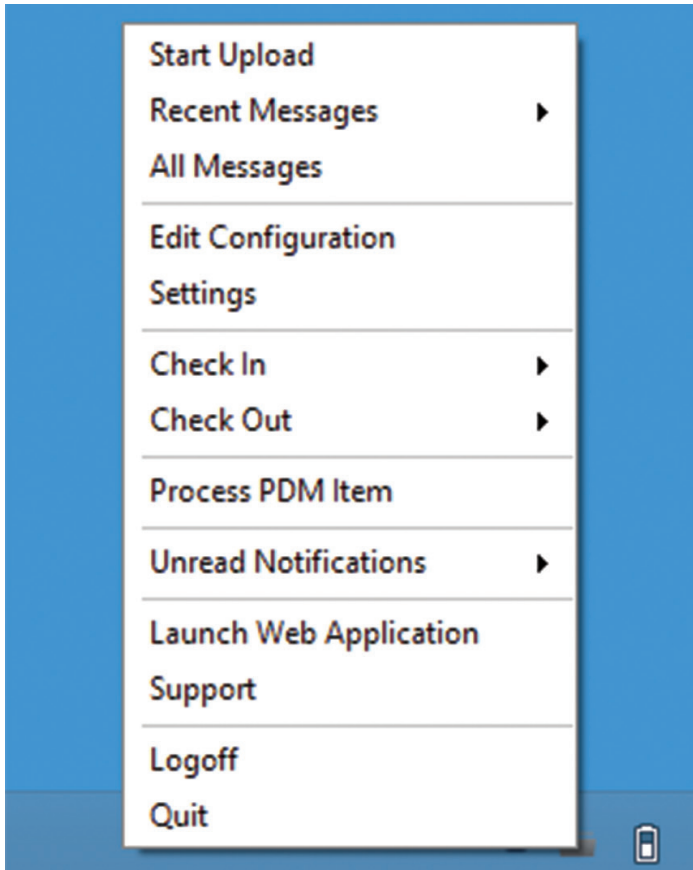


Figure 1: The Uploader app

Configuration

The Configuration button launches a dialog that allows users to define what file types are associated with Drawings and Documents.

This configuration is based on a folder structure, and allows users to define what type of files are expected in each folder location. As many folders as needed can be defined and added to the folder list. The “oldversions” sub-folder is skipped.

This configuration tells the Uploader what programs cores are required to develop the appropriate PDF files during the upload process. The applications supported are AutoCAD®, Inventor, SolidWorks, Visio, Word, and PowerPoint. PDF files that are already created by the users are simply uploaded.

Flutter Files Uploader can be configured to upload documents in one of three ways:

- Manual selection
- By a scheduled time interval
- Automatically when the files are updated

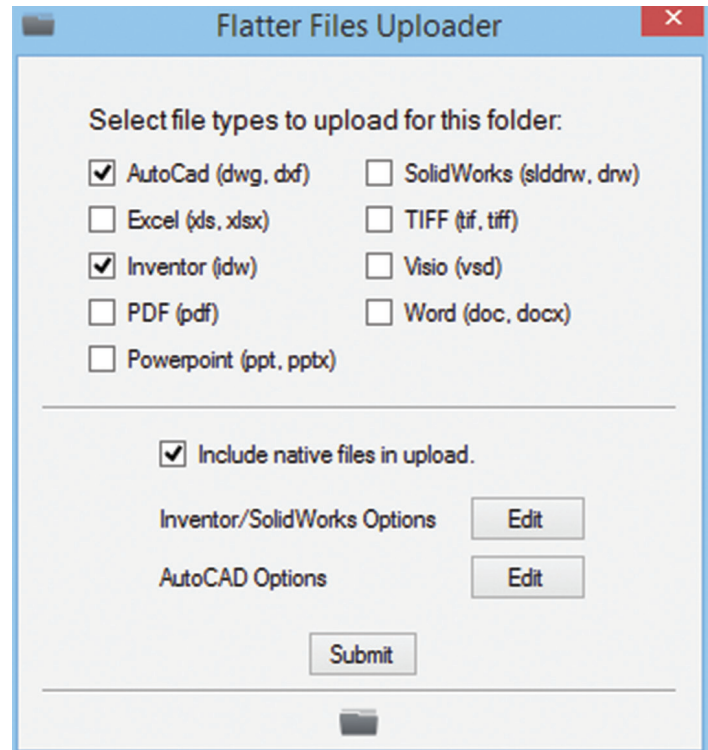


Figure 2: Flutter Files folder configuration

Uploading Folders

Once the configuration is complete the workflow becomes reasonably simple.

The Uploader app allows users to upload the configured folders, whereupon all pre-configured document and drawing file types in all sub-folders are uploaded to the cloud.

Temporary PDF files are then created by the identified software (here that would be Inventor). Additional options include:

- Automatic STEP, IGES, STL, and DXF file creation.
- Associated native files such as Inventor Assemblies may be included.
- 3D geometry for the web client’s 3D model viewer can be included.

A notification window is present to keep the user aware of the status of the upload.

Check In and Out

When working with files in Inventor, users can use the app to “Check-Out Open Files.” This tells the cloud account to release the hold on the drawings associated with the parts and assemblies that are being modified. Once the components are modified and the respective drawings are updated and saved, the user can “Check-in Files” and the check-in and review process is started. A review dialog is presented, and once selected, the check-in is completed and designated users are then notified that the files are ready to review.

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PDM/PLM Integration

If you are using an on-site product data management (PDM) system, the Flutter Files Uploader can be configured to integrate with it. Currently, Enterprise PDM by SolidWorks is fully integrated while an upcoming release will include simple integration with most PDM and PLM system including Autodesk Vault. With this option, PDM data revisions are automatically uploaded upon release and the entire review process can be skipped because this has already occurred within the PDM system.

THE WEB INTERFACE

The remaining half of the scenario is the web client which handles the administration and collaborative efforts.

Web User Interface

The interface is divided into a Library and Folder browser, the assembly file view, a small preview of the assembly or document PDFs, and the detailed view. The web client includes a built-in 3D model viewer for Inventor files as well.

Libraries

Libraries are configurable lists, such as saved search criteria, but permit both easy organization of file data and specific permission assignments for shared files.

The default libraries are Drawings, Documents, and Assemblies. Drawings and Documents are simply the flat list of data based on whichever search criteria is used.

Assembly Views

Your assembly drawings are automatically grouped into assembly views respective to the Inventor component Bill of Materials (BOM) associated, such that all of the associated drawings (part drawings or sub-assembly drawings) needed for a sub-assembly or top assembly can be viewed within a single PDF. This is a great way to organize the drawing data, and can also be manually created as desired with any drawings or documents.

Each assembly view is displayed in the familiar collapsing tree grouping. Picking the Assembly displays the hierarchy, and limits the drawing previews to only those in that assembly and in the order of the BOM list.

Searching

All data is searchable, including metadata that is handed off during the upload and PDF conversion processes.

Advanced search strings are allowed including category key words as well as AND/OR statements.

Drawing Views

The drawing view allows team members to see a selected drawing in its current revision.

Button controls above the view allow zooming and review of each associated revision. Changes on each revision can be highlighted.

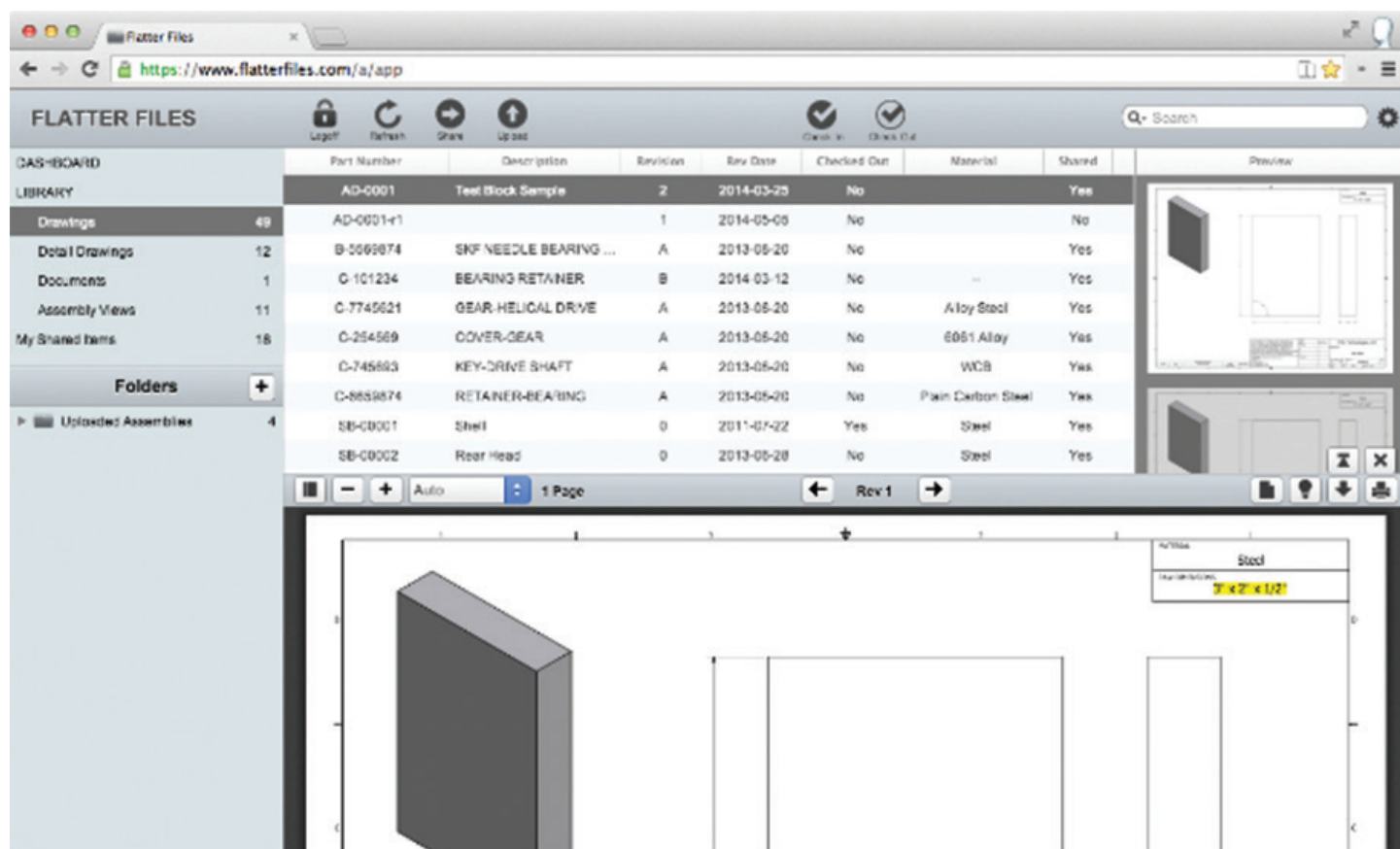


Figure 3: Highlighted changes—notice the “highlight Changes” option used here

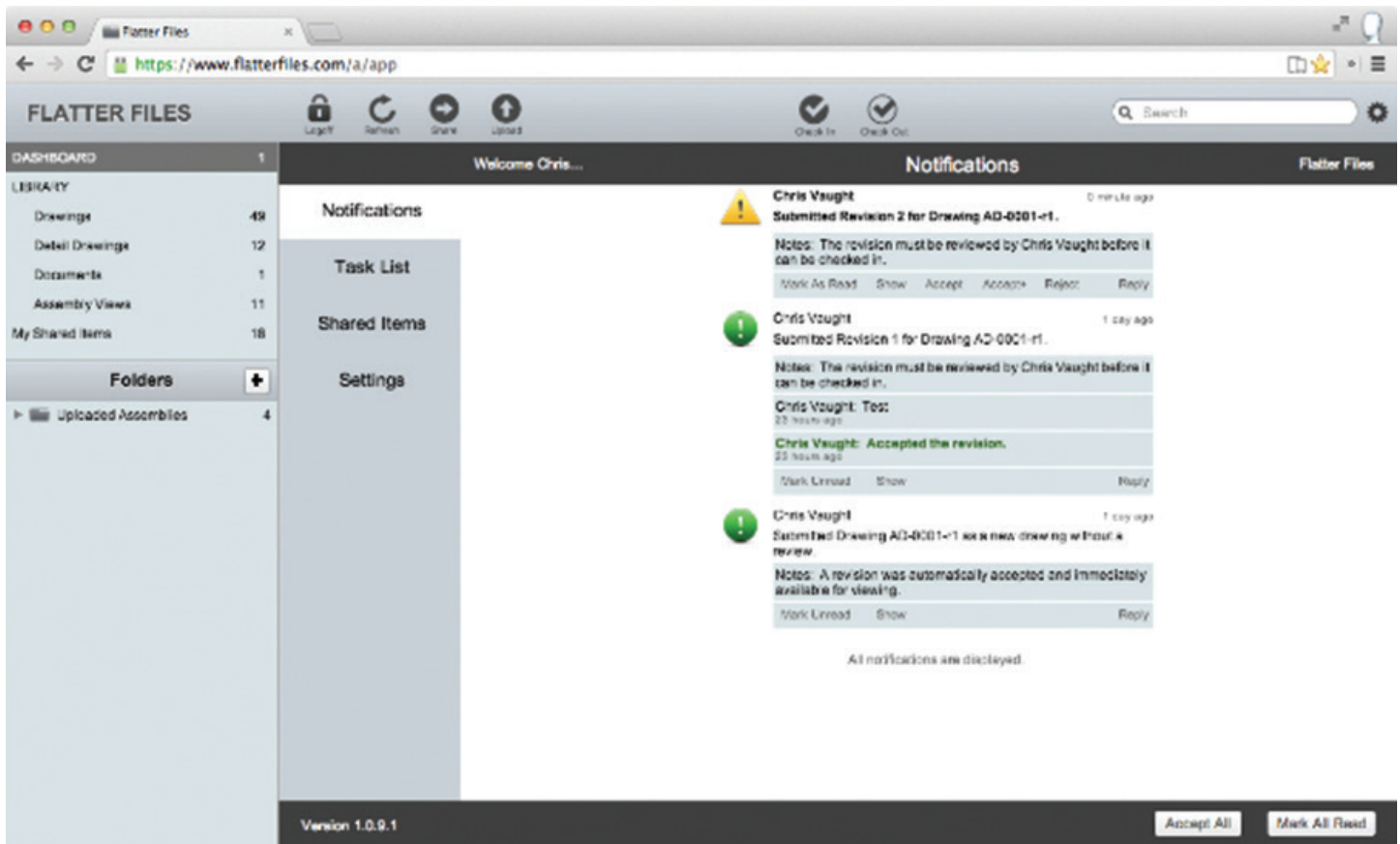


Figure 4: The Creator Account Dashboard, displaying a check-in review request

Additional buttons allow users to:

- Request revisions
- View attachments
- Download the PDF, native, STEP, etc.
- Print

File Sharing and Review

As files are created they are added to the Library, but are held in stasis as checked-out without revision awaiting the designated reviewer's approval of the file check-in. The reviewer can either accept or decline.

Once approved, the files are checked-in, the revision is assigned, and everyone in the organization can view them.

External sharing is simple and well organized. Users can pick the Share button and identify by selection which files to share with external viewers.

Flutter Files uses simple and secure link-based external sharing. The content is password protected and always stays up to date even if the drawing or documents are revised.

Once a drawing is shared, that status is indicated in the main drawing data list. The drawing can be unshared with the push of a button.

The list of shared external viewers is maintained for each drawing. Viewers can be added or removed as needed and shared data can be logged for usage tracking.

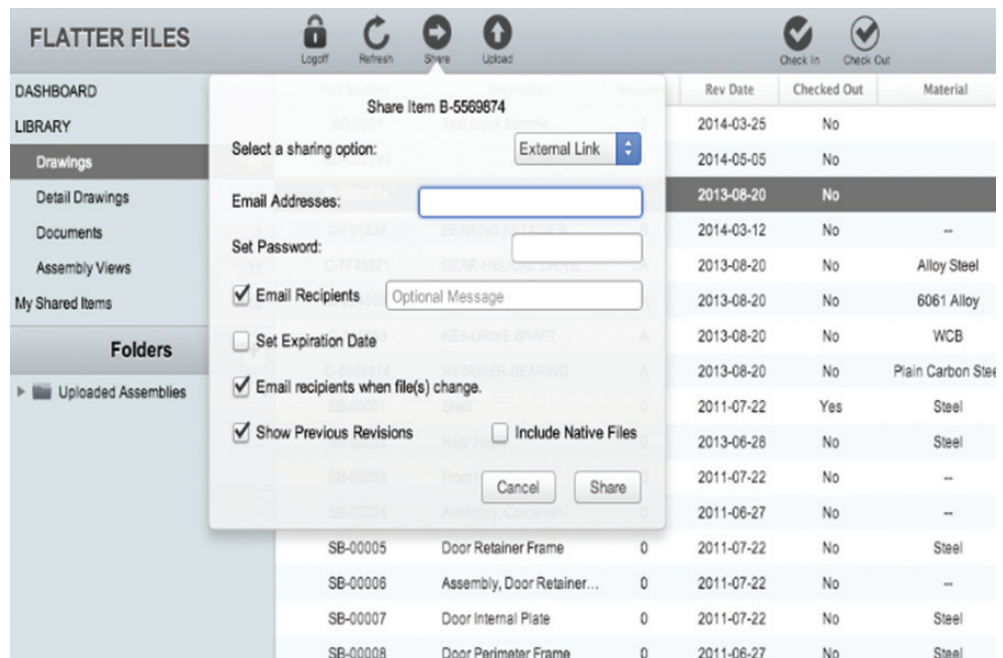


Figure 5: Sharing files

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MOBILE VIEWING AND ANNOTATIONS

The Flatter Files site can be navigated by both web client and Flatter Files mobile apps. Each permits navigation and drilling down through assemblies.

PDF files can be annotated by any viewing user with the recently supported PDF markup features, included in all mobile and web platforms (iOS requires the purchase of a \$9.95 supporting app). Once the markups are completed, the PDF file is then reloaded to the Flatter Files library as a revision.

Revisions and markup notifications are automatically sent to the specified file creators.

MY THOUGHTS

This type of service has been tried a few times from the desktop, and really did not do well because of extreme costs and IT complexities. However, implementing it from the cloud is a wonderful way to approach the task.

Flatter Files has really streamlined the review process for deliverables and I can think of numerous ways this platform would be welcomed in manufacturing and permitting review processes, not to mention a single point for all file version validation.

What would I like to see soon in Flatter Files? Vault integration, as well as handshaking (bi-directional notification) extensions for companies that use other data management cloud solutions such as SharePoint, etc., but lack the streamlined easy-to-employ nature of Flatter Files.

I think the ROI-price intersection is not too hard to see and appreciate. The first tier is \$1,500 per year for five contributors, 500 GB of storage, and unlimited viewers. That price may keep many small companies struggling with deliverables; \$300/year for each user could easily be eaten up with the unproductive tasks associated with ensuring that all the contractors have the right documentation, not to mention the court costs and delayed payments when things get built from the old drawings. Just a thought ☺

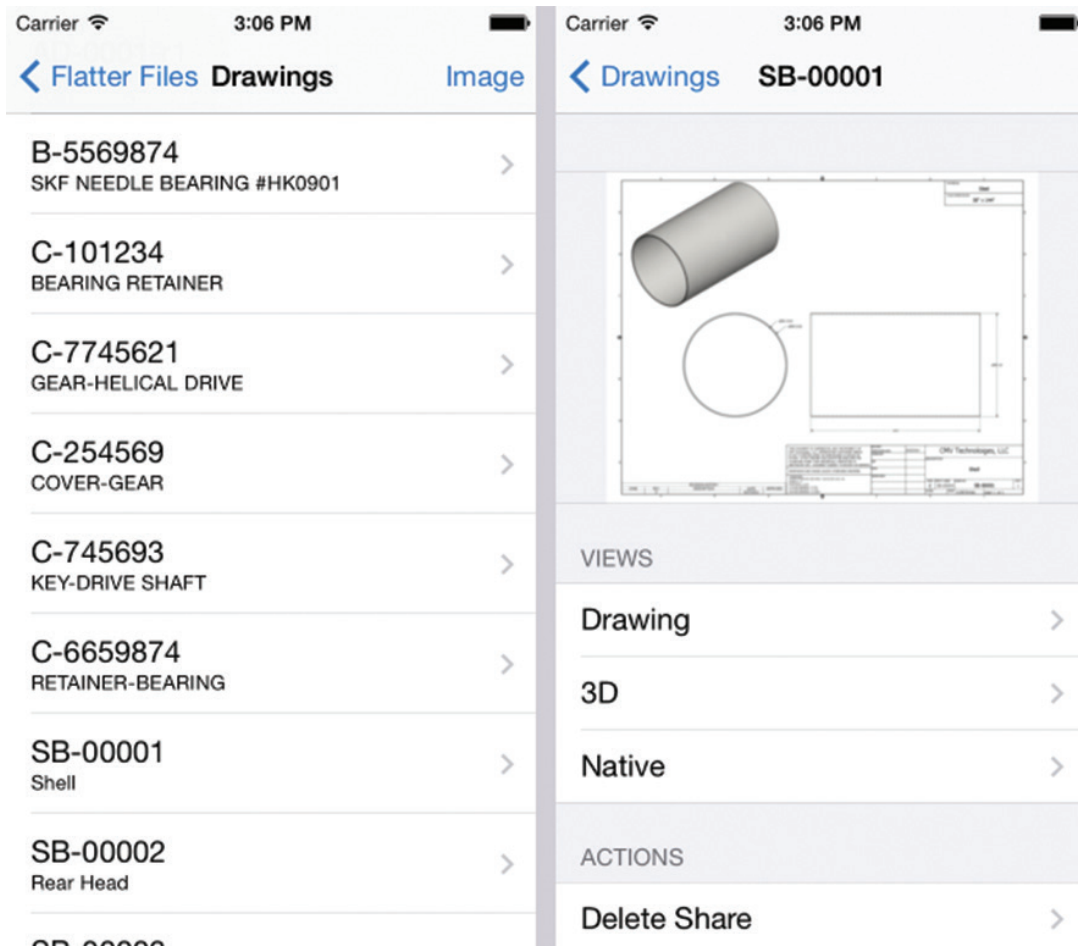


Figure 6: The iPhone app



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SuperDoor Add-in for Autodesk Revit 2015 by CTC

<http://bit.ly/Syu8Dw>



SuperDoor is an Autodesk® Revit® add-in developed by CTC to generate door families.

“The SuperDoor system leverages the advanced parametric capabilities of the Autodesk Revit software, and empowers users to generate virtually infinite variations of panel and frame configurations with Revit.

Rather than having individual families loaded for each variation, when using SuperDoor only the parts needed are loaded. This can decrease the family file size footprint within a Revit project by as much as 85%.

This tool provides a graphical wizard interface that guides Revit users through the selection of door components for quickly defining various configurations of high quality door families and then immediately placing them into the Revit project.”

SuperDoor has the following benefits:

- Simplifies the selection of door components.
- Generates virtually any door family.
- Eliminates the need to create custom families per assembly.
- Maintains smaller project file sizes.

BIMLink 2015 and Explorer for Revit 2015

<http://bit.ly/1j1abtL>



BIMLink 2015 and Explorer for Revit 2015 are tools developed by Ideate software to enhance the workflows and management of designs in Autodesk® Revit®.

“With Ideate BIMLink, you can pull information from a Revit file into user-friendly

**Inside
Track**

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

Microsoft Excel and push volumes of precise, consequential BIM data from Excel into Revit with speed, ease and accuracy. Data management tasks take a small fraction of the time they once took. The cumulative time saving advantage means more than hours freed. You gain unprecedented access to the Revit data you need.”

Some of the features in the new release of BIMLINK are:

- Improvements to project standards management.
- Create quantity takeoffs using out-of-the-box sample content.
- Rename System Type or System Name values, edit circuit naming schemas, report on the Schedule Level property, and access to new properties.
- Assign Space Type and Condition Type values to space elements.

“You can use Ideate Explorer for Revit extensively to manage Revit models. With it, you can search for and find any and all elements in the current view or entire Revit file—even ‘missing’ and hard-to-find ones—clean-up Revit projects and keep them clean, delete problem items to dramatically reduce cumbersome, erroneous file size, and analyze files quickly. This essential Revit tool makes it easy to assess Revit file health, execute necessary changes quickly and get a BIM project back on the right path.”

Some of the features in the new release of Explorer for Revit are:

- Zoom In / Zoom Out / Zoom Extents within the current view without exiting Ideate Explorer.
- Isolate / Hide by selected elements or by category to quickly analyze project elements.
- Dialog position and size are retained during the Revit session, making it easier for those using multiple monitors to work efficiently.
- The Display and Filter settings are retained during the Revit session, making it easier to complete repetitive tasks.

JTB FlexReport 8.0

<http://bit.ly/1ikGFDF>



JTB FlexReport 8.0 is an application that helps to manage, forecast, and report license usage for Autodesk and other software programs that utilize a licensing system such as FlexNet / FLEXlm (flexlm license manager) and IBM LUM (IBM License Use Management). With Process Monitor, the usage of any Windows application such as Acrobat, Visio, single licensed Autodesk® AutoCAD® or AutoCAD LT® can be reported.

The following are some of the changes in the latest release:

- Added support for monitoring of Reprise License Manager (RLM), Venturis (TRICAD) license, and Ranorex license usage.
- Email PNG reports automatically added to chart client.
- More settings available before a report is created on the Report Settings tab in the chart client.
- Filtering added for lists in the chart client.

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.

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